BLUE PEAK ENGINEERING

PRELIMINARY DRAINAGE STUDY

For:
Victorville Retail Project
SWC US 395 & SR-18
Victorville, CA.

Prepared by:
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This study was prepared under my responsible charge:

03/01/2019

Steven Johnson, P.E. **Date**

Section I Project Description

INTRODUCTION

This report has been prepared to analyze the hydrological and hydraulic effects of the Victorville Retail Project at the SWC of US 395 & SR 18.

IMPROVEMENTS

The subject property is currently undeveloped. The existing burger king building at the northeast corner of the site is not a part of the scope.

The proposed development for 15.39 acres. The new development will include street dedications resulting in a total onsite area of 14.80 acres, which includes, 10 buildings at a total gross building area of approximately 96,300 square feet. The project will be divided into two main phases; phase 1 will includes 36,500 square feet of building, the Master Storm Drain Line E-01, the onsite storm drain systems, and all water quality BMPs, phase 2 will include the construction of 60,000 square feet of building. Both phases will also include the development of new AC parking lots, drive isles, sidewalks, and landscaping.

EXISTING DRAINAGE PATTERN

The existing drainage pattern within the proposed development area sheet flows from the southwest to the northeast, towards an existing Caltrans drainage outlet structure located adjacent to Palmdale Road in a Caltrans Easement, tributary to two 7'x3' RCB culverts that cross Palmdale Road and connect into the existing 8'x7' box culvert master storm drain north of Palmdale Road.

As part of the proposed improvements and per Victorville Master Plan Drainage Study, a proposed regional 84" RCP storm drain will be installed in Highway 395, adjacent to the proposed project site, and sweep across the proposed site in a drainage easement, at which point the storm drain transitions to 2-7'x3' RCB culverts, for the ultimate connection to the existing two 7'x3' RCB culverts.

As part of the preliminary drainage study, Victorville's proposed regional 84" RCP storm drain and 2-7'x3' RCB culvert sizing will be confirmed given the already calculated flow rates provided by Ludwig Engineering's Drainage Study and Exhibit attached in the Appendix.

For analyzing the pre and post development runoff rate, there are two existing onsite drainage sub-areas, Areas AA3.1 and AA3.2.

Subarea AA3.1:
This area is 13.75 acres onsite, that sheet flows from the southwest to the northeast Caltrans drainage outlet structure located adjacent to Palmdale Rd. Currently this entire sub-area is undeveloped, however there are two natural drainage flowlines conveying the majority of the undeveloped runoff to the existing Caltrans drainage outlet structure, tributary to the two 7'x3' RCB which crosses Palmdale Road and connects to the drainage inlet structure north of Palmdale Road.

Subarea AA3.2:
This area is 1.01 acres located at the northwest corner of the site. Currently the runoff sheet flows from the site into Palmdale Road curb and gutter, and discharges into the grated inlet at the existing Burger King driveway entrance, in Palmdale Road. The grated inlet discharges into an existing 18" storm drain line crossing Palmdale Road and connecting into the existing drainage inlet structure on the north side of Palmdale Road.

DEVELOPED DRAINAGE PATTERN

Generally, the developed drainage pattern is consistent with the existing drainage pattern. The developed site drainage is divided into eight drainage areas (DA-1 to DA-9) with twenty two subareas (A-V), all tributary to one ultimate outfall location (Outlet 1).

Drainage Area 1:

Subareas P and M contribute to Drainage Area 1, which collects the 100-year storm event in an underground retention system, promoting the natural soils infiltration rate.

Subarea Area P:
This subarea is 0.36 acres located at the southeast corner of the site. This area is designed to sheet flow and collect the subarea's runoff via curb and gutter, tributary to the curb inlet basin (CB-P) which connects directly to the underground retention system (DT-1) located in subarea M.

Subarea Area M:
This subarea is 1.42 acres located at the southeast corner of the site. This area is designed to sheet flow and collect the subarea's runoff via curb inlet basin (CB-M) which connects directly to the underground retention system (DT-1) located within this subarea.

Drainage Area 2:

Subareas L, N, and O contribute to Drainage Area 2, which collects the 100-year storm event in an underground retention system, promoting the natural soils infiltration rate.

Subarea Area L:
This subarea is 0.24 acres located at the southeast corner of the site. This area is designed to sheet flow and collect the subarea's runoff via curb and gutter, tributary to the curb inlet basin (CB-L) which connects directly to the underground retention system (DT-2) located in subarea L.

Subarea Area N:
This subarea is 0.51 acres located at the southeast corner of the site, within the proposed gas station parcel. This area is designed to collect the runoff via grated catch basin inlet (CB-N) and connect directly into the underground retention system (DT-2) located in Subarea L.

Subarea Area O:
This subarea is 0.31 acres located at the southeast corner of the site, within the proposed gas station parcel. This area is designed to collect the runoff via grated catch basin inlet (CB-O) and connect directly into the underground retention system (DT-2) located in Subarea L.

Drainage Area 3:
Subareas I and J contribute to Drainage Area 3, which collects the 100-year storm event in an underground retention system, promoting the natural soils infiltration rate.

Subarea Area I:
This subarea is 0.16 acres located west, in between Pads 9 and 10. This subarea will sheet flow to curb inlet (CB-I) that connects directly to the underground retention system (DT-3) located in subarea J.

Subarea Area J:
This subarea is 1.41 acres located west, adjacent to Pad 9. This subarea will sheet flow to a curb inlet (CB-J) that connects directly to the underground retention system (DT-3) located within this subarea.

Drainage Area 4:
Subareas C, D, F, G and V contribute to Drainage Area 4, which collects the 100-year storm event in an underground retention system, promoting the natural soils infiltration rate.

Subarea Area C:
This subarea is 0.42 acres located north, in between Pads 2 and 3. This subarea will sheet flow to a curb inlet (CB-C) that connects directly to the underground retention system (DT-4) located within this subarea D and F. The curb inlet acts as a diversion structure, diverting the necessary 100-year storm event (low-flow) to the underground retention system. The high-flow will be piped via storm drain and connect directly into the proposed Regional storm drain main.

Subarea Area D:
This subarea is 1.87 acres located north, south of Pad 3. This subarea will sheet flow to a curb inlet (CB-D) that connects directly to the underground retention system (DT-4) located within this subarea D and F. The curb inlet acts as a diversion structure, diverting the necessary 100-year storm event (low-flow) to the underground retention system. The high-flow will be piped via storm drain and connect directly into the proposed Regional storm drain main.

Subarea Area F:
This subarea is 2.55 acres located at the center of the site, east of Pad 8. This subarea will sheet flow to a curb inlet (CB-F) that connects directly to the underground retention system (DT-4) located within this subarea D and F. The curb inlet acts as a diversion structure, diverting the necessary 100-year storm event (low-flow) to the underground

retention system. The high-flow will be piped via storm drain and connect directly into the proposed Regional storm drain main.

Subarea Area G:
This subarea is 0.78 acres located at the center of the site, west of Pad 4. This subarea will sheet flow to a curb inlet (CB-G) that connects directly to the underground retention system (DT-4) located within this subarea D and F. The curb inlet acts as a diversion structure, diverting the necessary 100-year storm event (low-flow) to the underground retention system. The high-flow will be piped via storm drain and connect directly into the proposed Regional storm drain main.

Subarea Area V:
This subarea is 0.29 acres located west of the site, adjacent to the right of way and future Fern Hill Street. This subarea will sheet flow to a curb inlet (CB-V) that connects directly to the underground retention system (DT-4) located within this subarea D and F.

Drainage Area 5:
Subareas H contributes to Drainage Area 5.

Subarea Area H:
This subarea is 0.31 acres located at the west of the site, adjacent to the right of way and the future Fern Hill Street. This subarea will sheet flow offsite into the future Fern Hill Street. This subarea is small in comparison to the entire site area, therefore, has minimal offsite impacts. In addition, this subarea has been included in the overall site discharge calculations, therefore equivalently accounting for this subarea to not increase 90% of the 100-year storm event.

Drainage Area 6:
Subareas A, B and E contribute to Drainage Area 6, which collects the 100-year storm event in an underground retention system, promoting the natural soils infiltration rate.

Subarea Area A:
This subarea is 0.74 acres located at the northwest, including Pads 1. This subarea will sheet flow to a curb inlet (CB-A) that connects directly to the underground retention system (DT-6) located within this subarea A. The curb inlet acts as a diversion structure, diverting the necessary 100-year storm event (low-flow) to the underground retention system. The high-flow will be piped via storm drain and connect directly into the proposed Regional storm drain main.

Subarea Area B:
This subarea is 0.23 acres located at the main drive entrance, in between Pads 1 and 2. This subarea will sheet flow to a curb inlet (CB-B) that connects directly to the underground retention system (DT-6) located within this subarea A. The curb inlet acts as a diversion structure, diverting the necessary 100-year storm event (low-flow) to the underground retention system. The high-flow will be piped via storm drain and connect directly into the proposed Regional storm drain main.

Subarea Area E:
This subarea is 0.32 acres located east, adjacent to Pad 8. This subarea will sheet flow to a grated inlet (CB-E) that connects directly to the underground retention system (DT-6) located within this subarea A. The curb inlet acts as a diversion structure, diverting the necessary 100-year storm event (low-flow) to the underground retention system. The high-flow will be piped via storm drain and connect directly into the proposed Regional storm drain main.

Drainage Area 7:
Subareas S and Q contribute to Drainage Area 7, which sheet flows the runoff offsite.

Subarea Area S:
This subarea is 0.91 acres located north of the site, adjacent to the existing burger king site. This subarea will sheet flow into a proposed grated inlet (CB-S), adjacent to the existing Caltrans Drainage Structure. This subarea is located at the site's low point and cannot connect directly to an onsite underground retention system; therefore, the runoff from this area will be collected via grated inlet and discharged directly into the proposed 60" Regional storm drain system. This subarea is small in comparison to the entire site area, therefore, has minimal offsite impacts. In addition, this subarea has been included in the overall site discharge calculations, therefore equivalently accounting for this subarea to not increase 90% of the 100-year storm event.

Subarea Area Q:
This subarea is 0.23 acres located at the north of the site, adjacent to the right of way in Highway 18. This subarea will sheet flow offsite into Palmdale Road. This subarea is small in comparison to the entire site area, therefore, has minimal offsite impacts. In addition, this subarea has been included in the overall site discharge calculations, therefore equivalently accounting for this subarea to not increase 90% of the 100-year storm event.

Drainage Area 8:
Subarea R contributes to Drainage Area 8, which sheet flows the runoff offsite.

Subarea Area R:
This subarea is 0.34 acres located at the east of the site, adjacent to the right of way in Highway 395. This subarea will sheet flow offsite into Highway 395. This subarea is small in comparison to the entire site area, therefore, has minimal offsite impacts. In addition, this subarea has been included in the overall site discharge calculations, therefore equivalently accounting for this subarea to not increase 90% of the 100-year storm event.

Drainage Area 9:
Subarea K, U, and T contribute to Drainage Area 9, which collects the 100-year storm event in an underground retention system, promoting the natural soils infiltration rate.

Subarea Area K:
This subarea is 0.94 acres located at the center of the site, west of Pad 5. This subarea will sheet flow the runoff into a flowline within the finger island planter and will be collected by a downstream grated inlet within the landscape area. The grated inlet acts as a diversion structure, diverting the necessary 100-year storm event (low-flow) to the underground retention system. The high-flow will be piped via storm drain and connect directly into the proposed Regional storm drain main.

Subarea Area U:
This subarea is 0.28 acres located east of Pad 5, adjacent to US Route 395. This subarea will sheet flow the runoff to a curb inlet located within the proposed drive-thru. The curb inlet (CB-U) will connect directly into the underground retention system (DT-8) located in Subarea G.

Subarea Area T:
This subarea is 0.23 acres located east of Pad 4, adjacent to US Route 395. This subarea will sheet flow the runoff to a curb inlet located within the proposed drive-thru. The curb inlet (CB-T) will connect directly into the underground retention system (DT-8) located in Subarea G.

HYDROMODIFICATION

As required by the City of Victorville, the runoff from the developed site must not be greater than 90% of the pre-development 100-year storm event. Per the San Bernardino County Technical Guideance Document, Hydromodification shall not exceed the 10-year storm event from pre to post development volume and flow rate.

Both of these design parameters were used in the HydroCAD calculations included in the Appendix and as summarized below.

Project Area (643,066sf)	100-Year			10-Year		
	Runoff Volume (cf)	Peak Flow Rate (cfs)		Runoff Volume (cf)	Peak Flow Rate (cfs)	
Existing Conditions	181,340	49.27		86,162	23.17	
Proposed Conditions	55,539	41.70		24,437	19.52	

As concluded, the site has reduced the post-development peak flow rate and runoff volumes by implementing onsite underground retention systems; therefore, the site will have no negative impacts downstream.

RUN-ON

As described above, site run-on is anticipated from the undeveloped site located south of the proposed development, as well as site run-on from the developed housing Tract 16677 southwest of the proposed Victorville Retail project. Per Ludwig Engineering's Hydrology Analysis, the total run-on for the adjacent lots south and southeast of the proposed Fern Pine Street, tributary to Highway 395, results in a peak 100 year flow rate of 47 cfs (portion of AA2 plus AA3 as provided on Ludgwig Engineering's Exhibit).

Additional site run-on is additionally anticipated for the developed and undeveloped lots west of Fern Pine Street, tributary to Palmdale Road. Per Ludwig Engineering's Hydrology Analysis, the total run-on is 94 cfs (portions of AA1, AA6, AA7, and AA8 as provided on Ludwig Engineering's Exhibit).

As part of the proposed development, catch basin inlets or riser inlet pipes are placed onsite, at two locations; one adjacent to Highway 395 to collect the run-on from east of the proposed Fern Pine Street, and one in the knuckle of the proposed Fern Pine Street to collect run-on from west of the future road. Currently there is no existing inlet within Highway 395 or the proposed Fern Pine Street.

This run-on has been included in sizing the Regional Master Storm Drain System.

MASTER STORM DRAIN LINE E-01

As part of the proposed improvements and per Victorville Master Plan Drainage Study, a proposed regional 84" RCP storm drain E-01 will be installed adjacent to Highway 395, on the proposed development within a dedicated easement, and sweep across the proposed site at which point the storm drain will transition to 2-7'x3' RCB culverts, for the ultimate connection to the existing two 7'x3' RCB culverts at the north end of the site.

As part of the preliminary drainage study, Victorville's proposed regional 84" RCP storm drain and 2-7'x3' RCB culvert sizing will be confirmed given the already calculated flow rates provided by Ludwig Engineer's Drainage Study and Exhibits provided in the Appendix. Additional refer to Section V herein for further information.

As described above, run-on is anticipated for the lots south of the proposed development. A temporary inlet will be placed in highway 395, at the southwest corner of the site and within the existing flowline, to collect site run-on and convey to the proposed Master Storm Drain Line E-01.

RUN-ON PUBLIC STORM DRAIN LINE E-01.A

As described above, run-on is anticipated from the lots west of the future Fern Pine Street. As part of the proposed development and phase 1 construction, a public storm drain line will be installed to collect the existing site run-on at the future Fern Pine Street knuckle. This un-on storm drain line E-01.A will collect and convey the runoff to the Master Storm Drain Line E-01.

The pipe has been sized accordingly herein this report.

OFFSITE FACILITIES:

There is an existing drop inlet basin just west of the existing Caltrans Outlet Structure, within the gutter of Palmdale Road. As part of the road widening on Palmdale Road, the existing gutter flowline will be relocated as well as the existing drop inlet. The relocated inlet will be south of the existing condition and the existing 18" storm drain will be extended to the new inlet location.

Section II Methodology

RUNOFF DETERMINATION METHODS (ONSITE ONLY)

Two main methods are used in the San Bernardino County area to determine design discharges, the Rational Method and the Unit Hydrograph method.

The Rational Method is used for determining the peak runoff values for the pre-developed conditions.

The Rational Method is also used for calculating the time of concentration values for the post-developed conditions.

The Unit-Hydrograph Method is used for creating the runoff hydrographs for the post-developed conditions. These hydrographs are then routed through the proposed retention basin. The 2, 10, and 100 Year storms are analyzed and routed through the proposed detention basin to ensure that the outflow from the basin will not exceed 90% of the pre-developed peak flow.

RATIONAL METHOD (ONSITE ONLY)

The Rational method is based on the following equation:

$Q = C\ I\ A$

Where:
Q = peak discharge, in cubic feet per second (cfs)

C = runoff coefficient, proportion of the rainfall that runs off the surface (no units)

C=0.9*(ai+((I-Fp)*ap)/I); for I greater than Fp
C=0.90*ai; for I less than or equal to Fp

I = average rainfall intensity for a duration equal to the Tc for the area, in inches per hour (Note: If the computed Tc is less than 5 minutes, use 5 minutes for computing the peak discharge, Q). I is obtained from the Intensity-Duration Curves from the SB Manual.

A = drainage area contributing to the design location, in acres

a_i = Impervious area percentage

a_p = Pervious area percentage

F_p = Loss rate for Soils Group B (in/hr) from San Bernardino County Hydrology Manual

Curve Numbers:
Curve numbers are obtained from Figure C-8 of the San Bernardino County Hydrology Manual, for Herbaceous Cover, Soil B, 40% cover density, undeveloped; CN=74.

The value for developed commercial is obtained from Figure C-3, Urban Landscape, Soil B; CN=56.

AMC III will be used.

Section III Rational Method Hydrology Calculations

Runoff Calculations
(Onsite)

The San Bernardino County Hydrology Methodology was used, and the HydroCAD program calculated the existing and proposed runoff for the project for the 2-, 10-, and 100-Year Storm Events. Below is a summary of the calculations concluded. Refer to the appendix for the complete calculations performed.

Existing Condition

SUBBAREA AA3.1
Tc=24 Min.
0% Impervious
Flow Length=580'
CN=88
A=13.79 Acres

Storm Event	Rainfall Depth	Q (cfs)
2	1.49	7.63
10	2.64	20.63
100	4.70	45.84

SUBBAREA AA3.2
Tc=18.5 Min.
0% Impervious
Flow Length=870'
CN=88
A=1.010 Acres

Storm Event	Rainfall Depth	Q (cfs)
2	1.49	0.66
10	2.64	1.75
100	4.70	3.88

Total Q100 Pre Development = 49.41 cfs

Proposed Condition

Storm Event (2-Year)

Rainfall Depth=1.49”

DA	DMA	Area (ac).	Impervious	Slope (ft/ft)	Length	Q (cfs)
DA-1	P	0.36	0.85	1.7	164	0.75
(Dt-1)	M	1.42	0.85	1.1	329	2.66
DA-2	L	0.24	0.85	1	122	0.5
(Dt-2)	N	0.51	0.85	1.1	215	1.03
	O	0.31	0.85	1.5	190	0.64
DA-3	I	0.16	0.85	0.7	129	0.35
(Dt-3)	J	1.41	0.85	2	256	2.88
DA-4	V	0.29	0.85	0.5	185	0.57
(Dt-4)	D	1.82	0.85	2.3	457	3.38
	G	0.78	0.85	1.2	243	1.48
	F	2.55	0.85	1.5	553	4.21
	C	0.42	0.85	1.6	249	0.86
DA-6	A	**0.74**	0.85	0.7	182	1.49
(Dt-6)	B	**0.23**	0.85	1.6	153	0.48
	E	**0.32**	0.85	0.4	394	0.51
DA-9	T	**0.23**	0.85	0.5	127	0.47
(Dt-9)	U	**0.28**	0.85	1	125	0.58
	K	**0.94**	0.85	1	254	1.85
SUBTOTAL		**13.01**				**24.69**

Runoff

DA	DMA	Area (ac).	Impervious	Q(cfs)
DA-5	H	0.31	0.85	0.67
DA-7	S	0.91	0.85	1.87
	Q	0.23	0.85	0.49
DA-8	R	0.34	0.1	0.11
SUBTOTAL		**1.79**		**3.14**

Storm Event (10-Year)
Rainfall Depth=2.64”

DA	DMA	Area (ac).	Impervious	Slope (ft/ft)	Length	Q (cfs)
DA-1	P	0.36	0.85	1.7	164	1.4
(Dt-1)	M	1.42	0.85	1.1	329	4.99
DA-2	L	0.24	0.85	1	122	0.9
(Dt-2)	N	0.51	0.85	1.1	215	1.93
	O	0.31	0.85	1.5	190	1.2
DA-3	I	0.16	0.85	0.7	129	0.63
(Dt-3)	J	1.41	0.85	2	256	5.4
DA-4	V	0.29	0.85	0.5	185	1.06
(Dt-4)	D	1.82	0.85	2.3	457	6.35
	G	0.78	0.85	1.2	243	2.78
	F	2.55	0.85	1.5	553	7.92
	C	0.42	0.85	1.6	249	1.62
DA-6	A	**0.74**	0.85	0.7	182	2.79
(Dt-6)	B	**0.23**	0.85	1.6	153	0.89
	E	**0.32**	0.85	0.4	394	0.97
DA-9	T	**0.23**	0.85	0.5	127	0.88
(Dt-9)	U	**0.28**	0.85	1	125	1.09
	K	**0.94**	0.85	1	254	3.47
SUBTOTAL		**13.01**				**46.27**

Runoff

DA	DMA	Area (ac).	Impervious	Q(cfs)
DA-5	H	0.31	0.85	1.25
DA-7	S	0.91	0.85	3.5
	Q	0.23	0.85	0.92
DA-8	R	0.34	0.1	0.51
SUBTOTAL		**1.79**		**6.18**

Storm Event (100-Year)
Rainfall Depth=4.70”

DA	DMA	Area (ac).	Impervious	Slope (ft/ft)	Length	Q (cfs)
DA-1	P	0.36	0.85	1.7	164	2.55
(Dt-1)	M	1.42	0.85	1.1	329	9.1
DA-2	L	0.24	0.85	1	122	1.63
(Dt-2)	N	0.51	0.85	1.1	215	3.52
	O	0.31	0.85	1.5	190	2.18
DA-3	I	0.16	0.85	0.7	129	1.14
(Dt-3)	J	1.41	0.85	2	256	9.84
DA-4	V	0.29	0.85	0.5	185	1.94
(Dt-4)	D	1.82	0.85	2.3	457	11.58
	G	0.78	0.85	1.2	243	5.07
	F	2.55	0.85	1.5	553	14.46
	C	0.42	0.85	1.6	249	2.94
DA-6	A	**0.74**	0.85	0.7	182	5.07
(Dt-6)	B	**0.23**	0.85	1.6	153	1.63
	E	**0.32**	0.85	0.4	394	1.77
DA-9	T	**0.23**	0.85	0.5	127	1.61
(Dt-9)	U	**0.28**	0.85	1	125	1.98
	K	**0.94**	0.85	1	254	6.33
SUBTOTAL		**13.01**				**84.34**

Runoff

DA	DMA	Area (ac).	Impervious	Q(cfs)
DA-5	H	0.31	0.85	2.28
DA-7	S	0.91	0.85	6.36
	Q	0.23	0.85	1.68
DA-8	R	0.34	0.1	1.44
SUBTOTAL		**1.79**		**11.76**

Total Proposed Flow Generated (Q_{100}) = 96.1 cfs

Per the City of Victorville Hydrology requirements, the post-development runoff rate from the site shall be 90% of the pre-developed runoff rate. In order to comply with this requirement, and in order to address water quality and Hydromodification requirements set forth by the WQMP

Technical Guideance Document, underground retention units will be implemented. Further calculations are provided in the Appendix, however, after implementing these BMPs and promoting the natural infiltration, the total site runoff rate for the 100-year storm event is reduced to 41.70 cfs.

Total Flow Reduction by Retention Units: 54.4 cfs
Total Proposed Flow Discharged (Q_{100}): 41.70cfs

(Pre-Development Rate) 49.27 cfs *0.90= 44.34 cfs
(Post-Development Rate) 41.70< 44.34cfs →Okay

Section IV **Hydrograph Calculations**

The San Bernardino County Hydrograph Methodology was used, and the HydroCAD program calculated the existing and proposed runoff for the project for the 2-, 10-, and 100-Year Storm Events. Below is a summary of the calculations concluded. Refer to the appendix for the complete calculations performed.

Existing Condition

SUBBAREA AA3.1
Tc=24 Min.
0% Impervious
Flow Length=580'
CN=88
A=13.75 Acres

Storm Event	Rainfall Depth	V (af)
2	1.49	0.66
10	2.64	1.73
100	4.70	2.51

SUBBAREA AA3.2
Tc=18.5 Min.
0% Impervious
Flow Length=870'
CN=88
A=1.010 Acres

Storm Event	Rainfall Depth	V (af)
2	1.49	0.048
10	2.64	0.126
100	4.70	0.18

Total V100 Pre Development = 2.697 af

Post-Development

Storm Event (2-Year)
Rainfall Depth=1.49"

DA	DMA	Area (ac).	Impervious	Slope (ft/ft)	Length	V(ac.ft)
DA-1	P	0.36	0.85	1.7	164	0.035

(Dt-1)	M	1.42	0.85	1.1	329	0.139
DA-2	L	0.24	0.85	1	122	0.025
(Dt-2)	N	0.51	0.85	1.1	215	0.05
	O	0.31	0.85	1.5	190	0.03
DA-3	I	0.16	0.85	0.7	129	0.017
(Dt-3)	J	1.41	0.85	2	256	0.138
DA-4	V	0.29	0.85	0.5	185	0.028
(Dt-4)	D	1.82	0.85	2.3	457	0.178
	G	0.78	0.85	1.2	243	0.076
	F	2.55	0.85	1.5	553	0.249
	C	0.42	0.85	1.6	249	0.041
DA-6	A	**0.74**	0.85	0.7	182	0.072
(Dt-6)	B	**0.23**	0.85	1.6	153	0.023
	E	**0.32**	0.85	0.4	394	0.031
DA-9	T	**0.23**	0.85	0.5	127	0.023
(Dt-9)	U	**0.28**	0.85	1	125	0.027
	K	**0.94**	0.85	1	254	0.092
SUBTOTAL		**13.01**				**1.274**

Runoff

DA	**DMA**	**Area (ac).**	**Impervious**	**Q(cfs)**
DA-5	H	0.31	0.85	0.03
DA-7	S	0.91	0.85	0.089
	Q	0.23	0.85	0.023
DA-8	R	0.34	0.1	0.006
SUBTOTAL		**1.79**		**0.148**

Storm Event (10-Year)

Rainfall Depth=2.64”

DA	**DMA**	**Area (ac).**	**Impervious**	**Slope (ft/ft)**	**Length**	**V(ac.ft)**
DA-1	P	0.36	0.85	1.7	164	0.069
(Dt-1)	M	1.42	0.85	1.1	329	0.272
DA-2	L	0.24	0.85	1	122	0.048
(Dt-2)	N	0.51	0.85	1.1	215	0.098
	O	0.31	0.85	1.5	190	0.059
DA-3	I	0.16	0.85	0.7	129	0.032

(Dt-3)	J	1.41	0.85	2	256	0.27
DA-4	V	0.29	0.85	0.5	185	0.056
(Dt-4)	D	1.82	0.85	2.3	457	0.349
	G	0.78	0.85	1.2	243	0.15
	F	2.55	0.85	1.5	553	0.489
	C	0.42	0.85	1.6	249	0.081
DA-6	A	**0.74**	0.85	0.7	182	0.142
(Dt-6)	B	**0.23**	0.85	1.6	153	0.044
	E	**0.32**	0.85	0.4	394	0.061
DA-9	T	**0.23**	0.85	0.5	127	0.044
(Dt-9)	U	**0.28**	0.85	1	125	0.054
	K	**0.94**	0.85	1	254	0.18
SUBTOTAL		**13.01**				**2.498**

Runoff

DA	DMA	Area (ac).	Impervious	Q(cfs)
DA-5	H	0.31	0.85	0.059
DA-7	S	0.91	0.85	0.175
	Q	0.23	0.85	0.044
DA-8	R	0.34	0.1	0.025
SUBTOTAL		**1.79**		**0.303**

Storm Event (100-Year)

Rainfall Depth=4.70”

DA	DMA	Area (ac).	Impervious	Slope (ft/ft)	Length	V(ac.ft)
DA-1	P	0.36	0.85	1.7	164	0.13
(Dt-1)	M	1.42	0.85	1.1	329	0.515
DA-2	L	0.24	0.85	1	122	0.089
(Dt-2)	N	0.51	0.85	1.1	215	0.185
	O	0.31	0.85	1.5	190	0.112
DA-3	I	0.16	0.85	0.7	129	0.06
(Dt-3)	J	1.41	0.85	2	256	0.511
DA-4	V	0.29	0.85	0.5	185	0.105
(Dt-4)	D	1.82	0.85	2.3	457	0.659
	G	0.78	0.85	1.2	243	0.283

	F	2.55	0.85	1.5	553	0.924
	C	0.42	0.85	1.6	249	0.152
DA-6	A	**0.74**	0.85	0.7	182	0.268
(Dt-6)	B	**0.23**	0.85	1.6	153	0.083
	E	**0.32**	0.85	0.4	394	0.116
DA-9	T	**0.23**	0.85	0.5	127	0.083
(Dt-9)	U	**0.28**	0.85	1	125	0.101
	K	**0.94**	0.85	1	254	0.341
SUBTOTAL		**13.01**				**4.717**

Runoff

DA	DMA	Area (ac).	Impervious	Q(cfs)
DA-5	H	0.31	0.85	0.112
DA-7	S	0.91	0.85	0.33
	Q	0.23	0.85	0.083
DA-8	R	0.34	0.1	0.07
SUBTOTAL		**1.79**		**0.595**

Total Proposed Volume Generated (V100) = 5.31 ac.ft.

Per the City of Victorville Hydrology requirements, the post-development volume shall be 90% of the pre-developed volume. In order to comply with this requirement, and in order to address water quality and Hydromodification requirements set forth by the WQMP Technical Guideance Document, underground retention units will be implemented. Further calculations are provided in the Appendix, however, after implementing these BMPs and promoting the natural infiltration, the total site runoff rate for the 100-year storm event is reduced to 1.275 ac.ft.

Total Volume Reduction by Retention Units: 4.04 ac.ft.
Total Proposed Volume Discharged (V100): 1.275 ac.ft.

(Pre-Development Rate) 2.70 ac.ft *0.90= 2.43 ac.ft
(Post-Development Rate) 1.275< 2.43 ac.ft →Okay

Section V City of Victorville Line E-01 Analysis

STORM DRAIN E-01 ANALYSIS:

As part of this hydrology analysis, the City of Victorville will condition the property to install the new Regional Storm Drain Line E-01 as part of the proposed developments. The Regional Storm Drain will start at the south corner of the property, and traverse through the site and connect to the existing 2-7'x3' RCB culverts to the north. An inlet will be installed at the southeast corner of the site, within Highway 395, to collect all the existing run-on and discharge directly into the proposed Regional Storm Drain Main E-01.

An overall Master Drainage Study performed by Ludwig Engineering shows the total Regional Storm Drain E-01 shall be designed for the peak flow rate Q_{100} of 424 cfs.

Using the FHWA Hydraulic Toolbox Calculator, and inputting the following parameters:

Input:
Type: Circular
Pipe Diameter: 7'
Longitudinal Slope (assumed slope of existing Highway 395): 0.005
Manning's Roughness for RCP Storm Drain: 0.012
Flow Rate: 424 cfs

The results, provided in the Attachment, show the 7' RCP can adequately convey the 424 cfs required.

Due to site constraints, a portion of the proposed 7' RCP storm drain pipe will not maintain adequate cover; therefore a RCB will be required. Using the FHWA Hydraulic Toolbox Calculator, and inputting the following parameters:

Input:
Type: Rectangular
Pipe Width: 7'
Longitudinal Slope (assumed slope of existing Highway 395): 0.005
Manning's Roughness for RCB Storm Drain: 0.012
Flow Rate: 300 cfs

The results, provided in the Attachment, show a 7'x3' RCB can convey 242 cfs. A double 7'x3' RCB will be required for a total flow capacity of 484 cfs. In conclusion, a double 7'x3' RCB culvert will be installed upstream of the existing double 7'x3' RCB culvert. Once the onsite minimum pipe cover can be maintained, the proposed RCB will covert to the 7' RCP pipe for the remaining Regional Storm Drain segment. See the provided preliminary storm drain plans located within the Appendix.

STORM DRAIN E-01.A ANALYSIS:

An additional City storm drain main is proposed to collect and convey site run-on from the future corner of Fern Pine Street to the City of Victorville Master storm drain line E-01. For the purposes of this report, the proposed storm drain line shall be referenced as line E-01.A. As provided above, the site run-on anticipated for this location is 94 cfs. Using the FHWA Hydraulic Toolbox Calculator, and inputting the following parameters:

Input:
Type: Circular
Pipe Diameter: 48”
Longitudinal Slope (assumed slope of existing site): 0.01
Manning’s Roughness for RCP Storm Drain: 0.012
Flow Rate: 94 cfs

The results, provided in the Attachment, show the 48” RCP can adequately convey the 94 cfs required. In conclusion, a proposed 48” RCP storm drain is required for Line E-01.A.

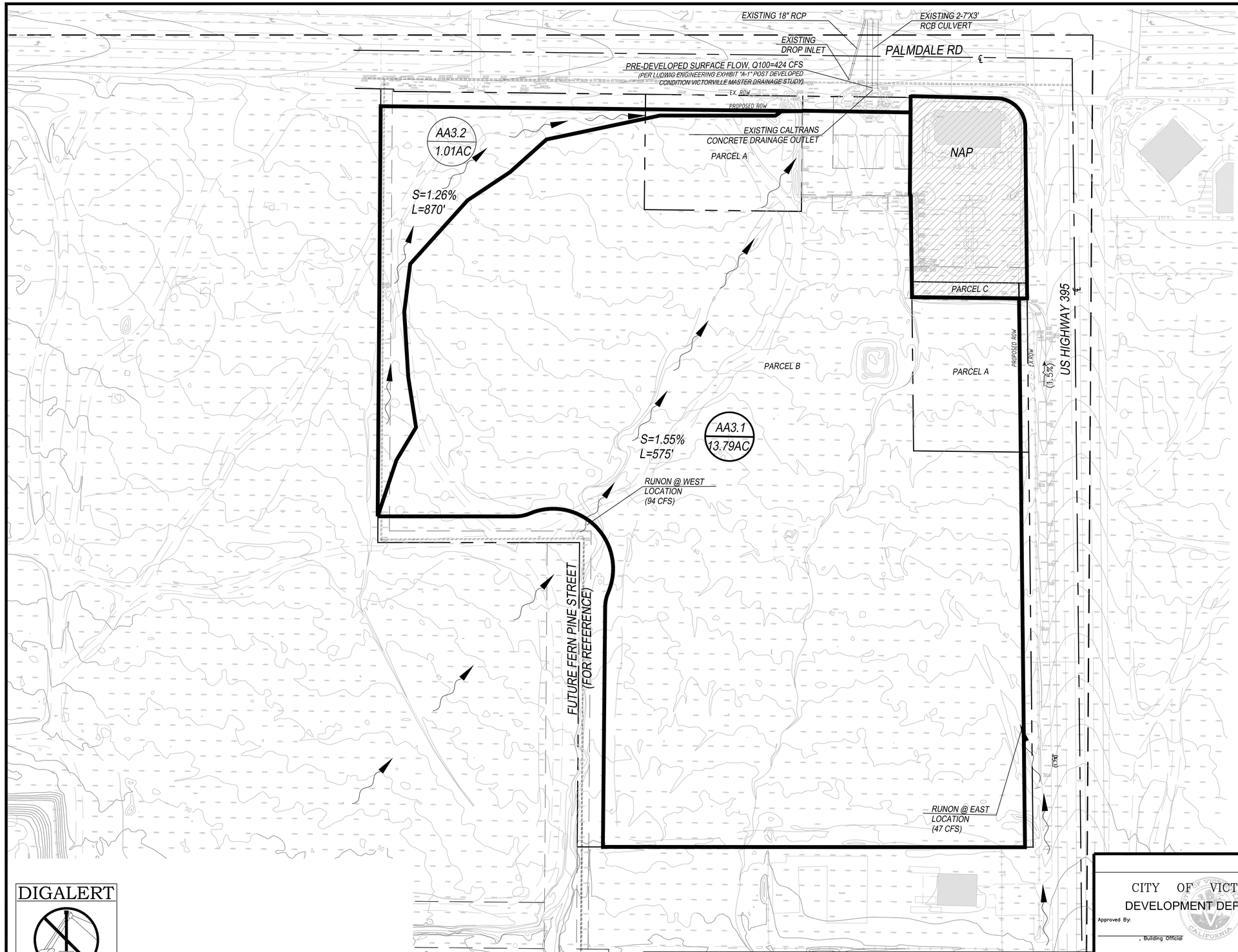
Section IV **Conclusion**

Per Ludwig Engineer's Master drainage Study, Exhibit A-1 Post Developed Condition, the Q100 of 424 cfs was used to confirm the sizing of the City of Victorville 84" Regional storm drain main.

Additionally, it was concluded the post-development 100-year storm event will not exceed more than 90% of the pre-development 100-year storm event with the mitigation outlined in this study. Therefore, this site will have no negative impacts downstream and hydromodification requirements are not applicable for the site.

In addition, BMP's will be installed that satisfy the City's water quality requirements, which will reduce the pollutants generated from the project.

Appendix



PRE-HYDROLOGY EXHIBIT

DIGALERT

CALL BEFORE YOU DIG
1-800-227-2600
AT LEAST
2 WORKING DAY
NOTICE REQUIRED

PRE-DEVELOPMENT HYDROLOGY ANALYSIS
(ONSITE ONLY)

AREA	ACRES	TC	Q100	Q10	Q2
AREA AA3.1	13.79 AC.	24	45.84 CFS	20.63CFS	7.63CFS
AREA AA3.2	1.01 AC.	18.5	3.88 CFS	1.75CFS	0.66CFS
TOTAL	14.80 AC.		49.41CFS	22.38CFS	8.29CFS

CITY CASE NO.

CITY OF VICTORVILLE
DEVELOPMENT DEPARTMENT
Approved By:
, Building Official — DATE

CITY OF VICTORVILLE
ENGINEERING DEPARTMENT
Approved By:
Brian Gengler
City Engineer
RCE 44730 Exp. 03-31-20 — DATE

CLIENT:
BROADWAY CHINATOWN, LLC
PO BOX 15813
LOS ANGELES 15813

BLUE PEAK ENGINEERING, INC.
18543 YORBA LINDA BL., #235
YORBA LINDA, CA 92886
714.749.3077
714.281.1640 FAX

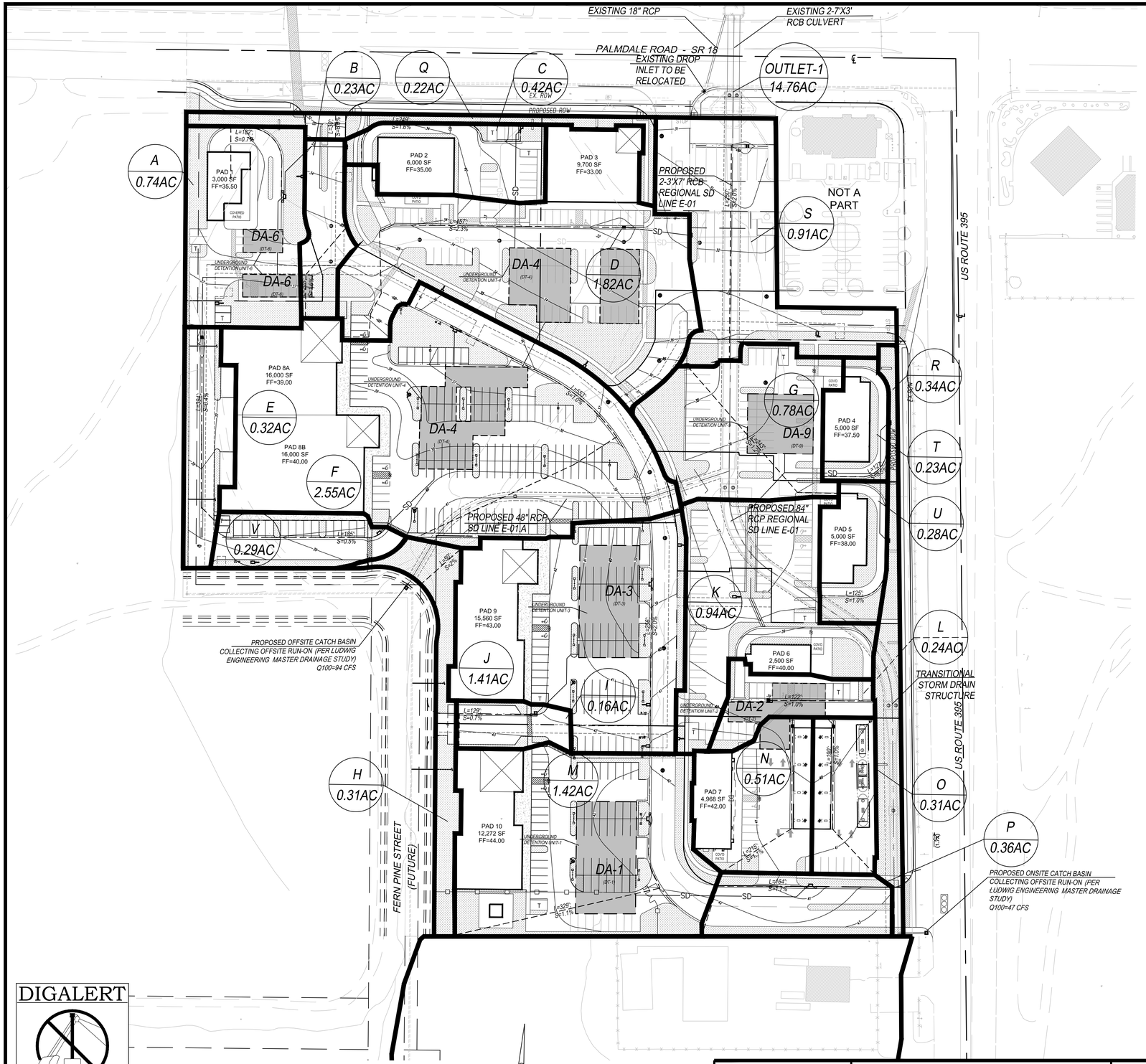
REGISTERED PROFESSIONAL ENGINEER
STEVEN B. JOHNSON
No. 83319
Exp. 03-31-19
CIVIL
STATE OF CALIFORNIA

NO.	REVISIONS	BY	DATE

VICTORVILLE RETAIL PROJECT
SWC US 395 & SR-18

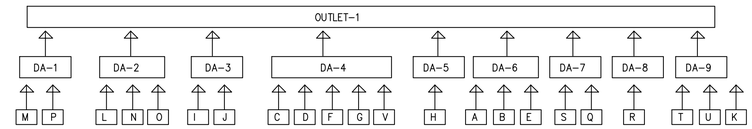
DESIGN BY: S.J.
DRAWN BY: S.J.
CHECKED BY: T.H.
DATE: 03/01/2019

SHEET NO. ___ OF 8



LEGEND

- TRAVEL PATH
- DRAINAGE AREA
- AREA / ACRE — DRAINAGE CALLOUT
- LANDSCAPE
- CONCRETE
- UNDERGROUND DETENTION SYSTEM



HYDROLOGY FIGURES:

DA	DMA	AREA(AC.)	Q100(CFS)	V100 (AC.FT)
DA-1 (DT-1)	P	0.36	2.55	0.13
	M	1.42	9.10	0.515
DA-2 (DT-2)	L	0.24	1.63	0.089
	N	0.51	3.52	0.185
	O	0.31	2.18	0.112
DA-3 (DT-3)	I	0.16	1.14	0.060
	J	1.41	9.84	0.511
DA-4 (DT-4)	V	0.29	1.94	0.105
	D	1.82	11.58	0.659
	G	0.78	5.07	0.283
	F	2.55	14.46	0.924
	C	0.42	2.94	0.152
DA-6	A	0.74	5.07	0.268
	B	0.23	1.63	0.083
	E	0.32	1.77	0.116
DA-5	H	0.31	2.28	0.112
DA-7	S	0.91	6.36	0.330
	Q	0.23	1.68	0.083
DA-8	R	0.34	1.44	0.070
DA-9	T	0.23	1.61	0.083
	U	0.28	1.98	0.101
	K	0.94	6.33	0.341
TOTAL		14.80	96.1 CFS	5.31 AC.FT
TOTAL REDUCTION BY RETENTION UNITS			54.40 CFS	4.04 AC.FT
TOTAL DISCHARGED FROM SITE			41.70 CFS	1.275 AC.FT

POST-HYDROLOGY EXHIBIT

DIGALERT

CALL BEFORE YOU DIG
1-800-227-2600
AT LEAST
2 WORKING DAY
NOTICE REQUIRED

CITY CASE NO.

CITY OF VICTORVILLE
DEVELOPMENT DEPARTMENT
Approved By:
, Building Official — DATE

CITY OF VICTORVILLE
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Approved By:
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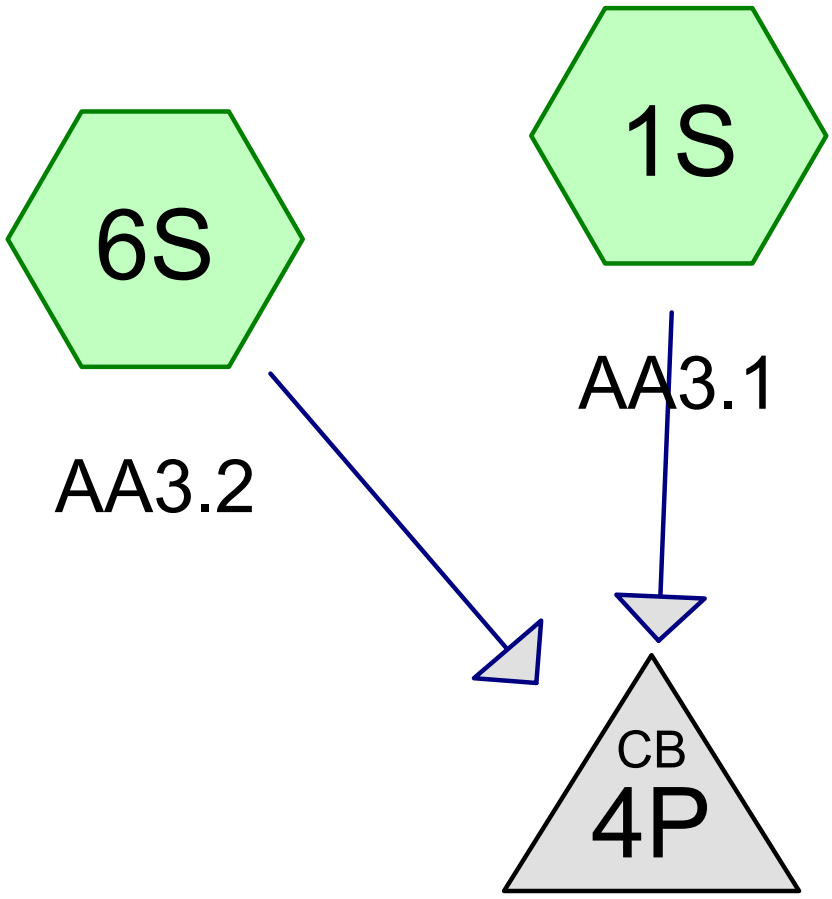
REGISTERED PROFESSIONAL ENGINEER
STEVEN B. JOHNSON
No. 83319
Exp. 03-31-19
CIVIL
STATE OF CALIFORNIA

NO.	REVISIONS	BY	DATE

VICTORVILLE RETAIL PROJECT
SWC US 395 & SR-18

DESIGN BY: S.J.
DRAWN BY: S.J.
CHECKED BY: T.H.
DATE: 03/07/2019

SHEET NO. ___ OF 9



EX. CALTRANS BASN

Subcat Reach Pond Link

Routing Diagram for Pre Development Condition
Prepared by Microsoft, Printed 2/26/2019

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
14.800	74	(1S, 6S)
14.800	**74**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
14.800	Other	1S, 6S
14.800		**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
0.000	0.000	0.000	0.000	14.800	14.800		1S, 6S
0.000	**0.000**	**0.000**	**0.000**	**14.800**	**14.800**	**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	4P	25.10	19.00	89.0	0.0685	0.012	36.0	0.0	0.0

Time span=5.00-48.00 hrs, dt=0.05 hrs, 861 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: AA3.1 Runoff Area=13.790 ac 0.00% Impervious Runoff Depth=0.57"
Flow Length=580' Tc=24.0 min AMC Adjusted CN=88 Runoff=7.63 cfs 0.660 af

Subcatchment6S: AA3.2 Runoff Area=1.010 ac 0.00% Impervious Runoff Depth=0.57"
Flow Length=870' Tc=18.5 min AMC Adjusted CN=88 Runoff=0.66 cfs 0.048 af

Pond 4P: EX. CALTRANSBASN Peak Elev=26.19' Inflow=8.22 cfs 0.708 af
36.0" Round Culvert n=0.012 L=89.0' S=0.0685 '/' Outflow=8.22 cfs 0.708 af

Total Runoff Area = 14.800 ac Runoff Volume = 0.708 af Average Runoff Depth = 0.57"
100.00% Pervious = 14.800 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: AA3.1

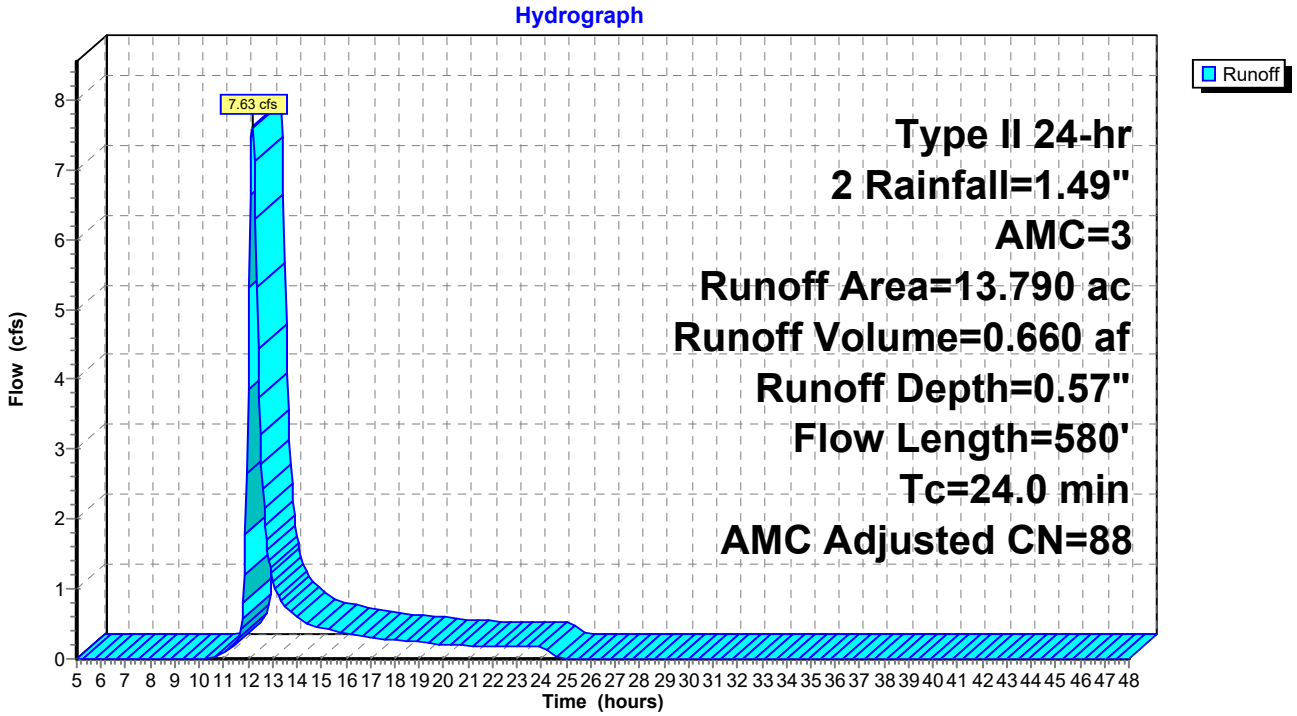
Runoff = 7.63 cfs @ 12.19 hrs, Volume= 0.660 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	13.790	74		
	13.790	74	88	Weighted Average, AMC Adjusted
	13.790			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	580		0.40		**Direct Entry,**

Subcatchment 1S: AA3.1



Summary for Subcatchment 6S: AA3.2

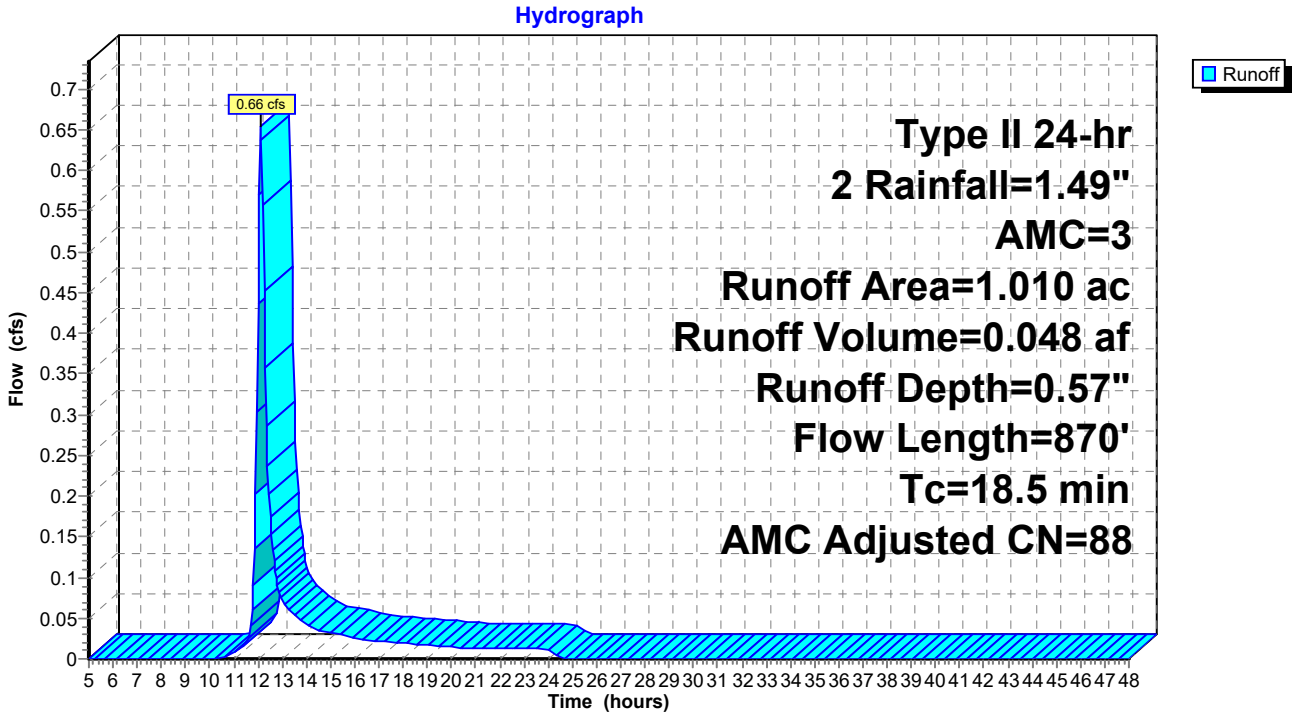
Runoff = 0.66 cfs @ 12.12 hrs, Volume= 0.048 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	1.010	74		
	1.010	74	88	Weighted Average, AMC Adjusted
	1.010			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	870		0.78		**Direct Entry,**

Subcatchment 6S: AA3.2



Summary for Pond 4P: EX. CALTRANS BASN

[57] Hint: Peaked at 26.19' (Flood elevation advised)

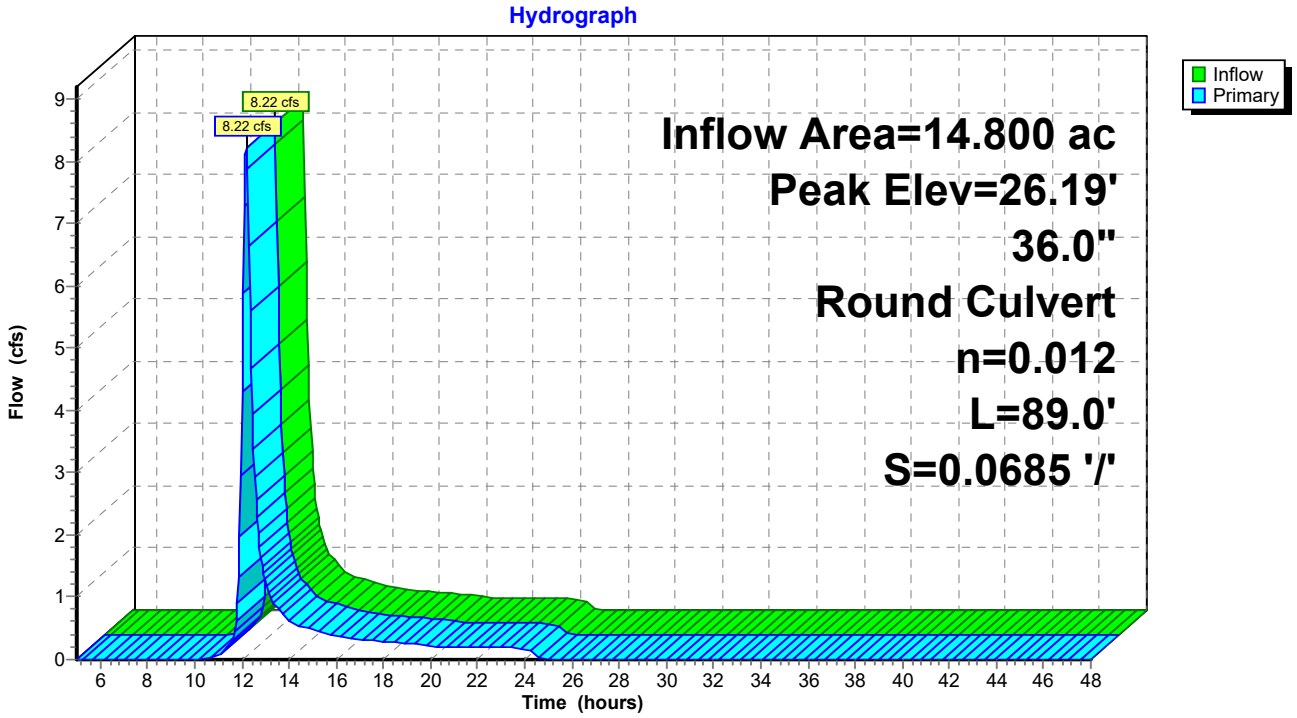
Inflow Area = 14.800 ac, 0.00% Impervious, Inflow Depth = 0.57" for 2 event
Inflow = 8.22 cfs @ 12.18 hrs, Volume= 0.708 af
Outflow = 8.22 cfs @ 12.18 hrs, Volume= 0.708 af, Atten= 0%, Lag= 0.0 min
Primary = 8.22 cfs @ 12.18 hrs, Volume= 0.708 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 26.19' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	25.10'	**36.0" Round RCP_Round 36"** L= 89.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 25.10' / 19.00' S= 0.0685 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=8.15 cfs @ 12.18 hrs HW=26.18' (Free Discharge)
1=RCP_Round 36" (Inlet Controls 8.15 cfs @ 3.54 fps)

Pond 4P: EX. CALTRANS BASN



Time span=5.00-48.00 hrs, dt=0.05 hrs, 861 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: AA3.1 Runoff Area=13.790 ac 0.00% Impervious Runoff Depth=1.50"
Flow Length=580' Tc=24.0 min AMC Adjusted CN=88 Runoff=20.63 cfs 1.726 af

Subcatchment6S: AA3.2 Runoff Area=1.010 ac 0.00% Impervious Runoff Depth=1.50"
Flow Length=870' Tc=18.5 min AMC Adjusted CN=88 Runoff=1.75 cfs 0.126 af

Pond 4P: EX. CALTRANSBASN Peak Elev=27.00' Inflow=22.24 cfs 1.853 af
36.0" Round Culvert n=0.012 L=89.0' S=0.0685 '/' Outflow=22.24 cfs 1.853 af

Total Runoff Area = 14.800 ac Runoff Volume = 1.853 af Average Runoff Depth = 1.50"
100.00% Pervious = 14.800 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: AA3.1

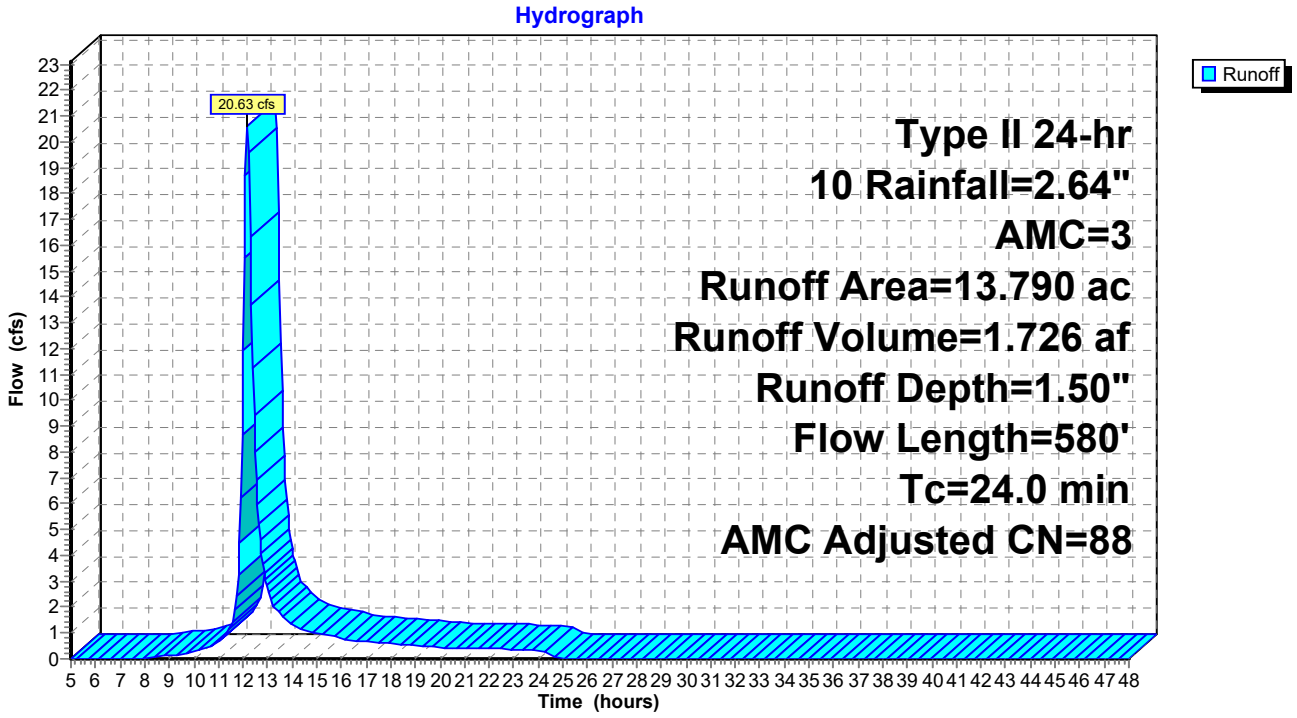
Runoff = 20.63 cfs @ 12.17 hrs, Volume= 1.726 af, Depth= 1.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	13.790	74		
	13.790	74	88	Weighted Average, AMC Adjusted
	13.790			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	580		0.40		**Direct Entry,**

Subcatchment 1S: AA3.1



Summary for Subcatchment 6S: AA3.2

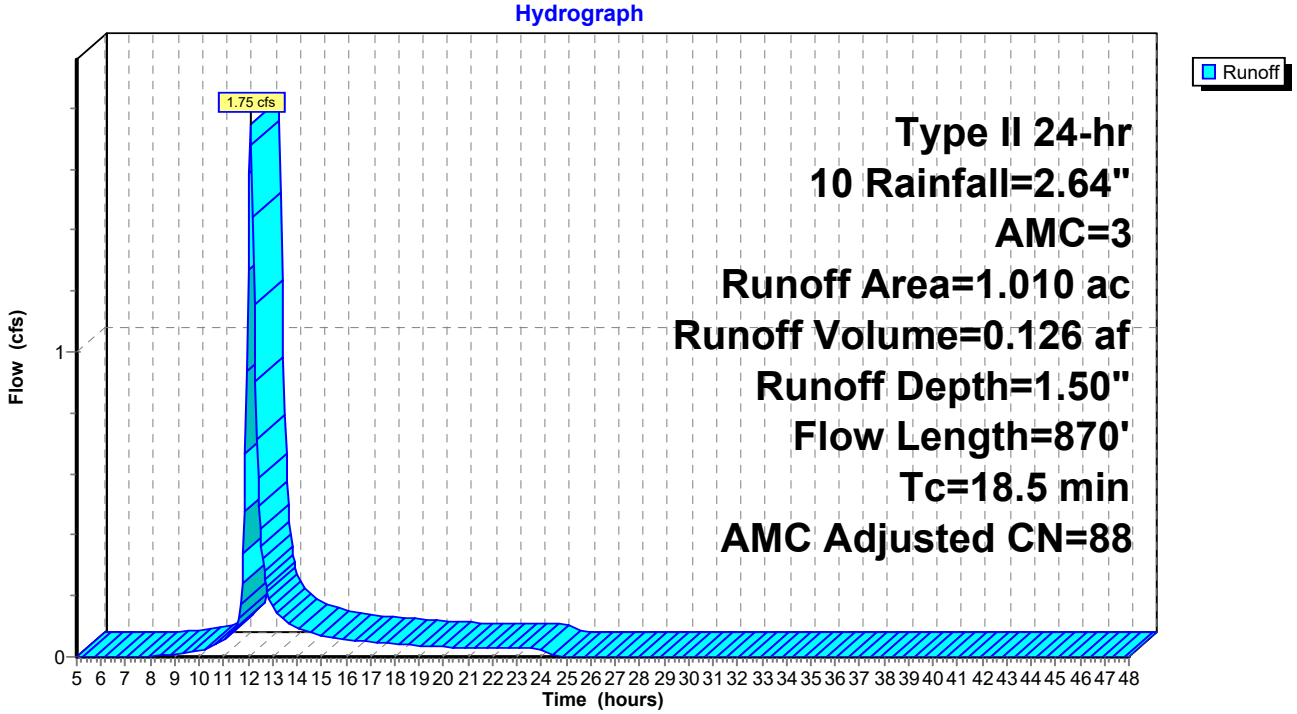
Runoff = 1.75 cfs @ 12.11 hrs, Volume= 0.126 af, Depth= 1.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	1.010	74		
	1.010	74	88	Weighted Average, AMC Adjusted
	1.010			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	870		0.78		**Direct Entry,**

Subcatchment 6S: AA3.2



Summary for Pond 4P: EX. CALTRANS BASN

[57] Hint: Peaked at 27.00' (Flood elevation advised)

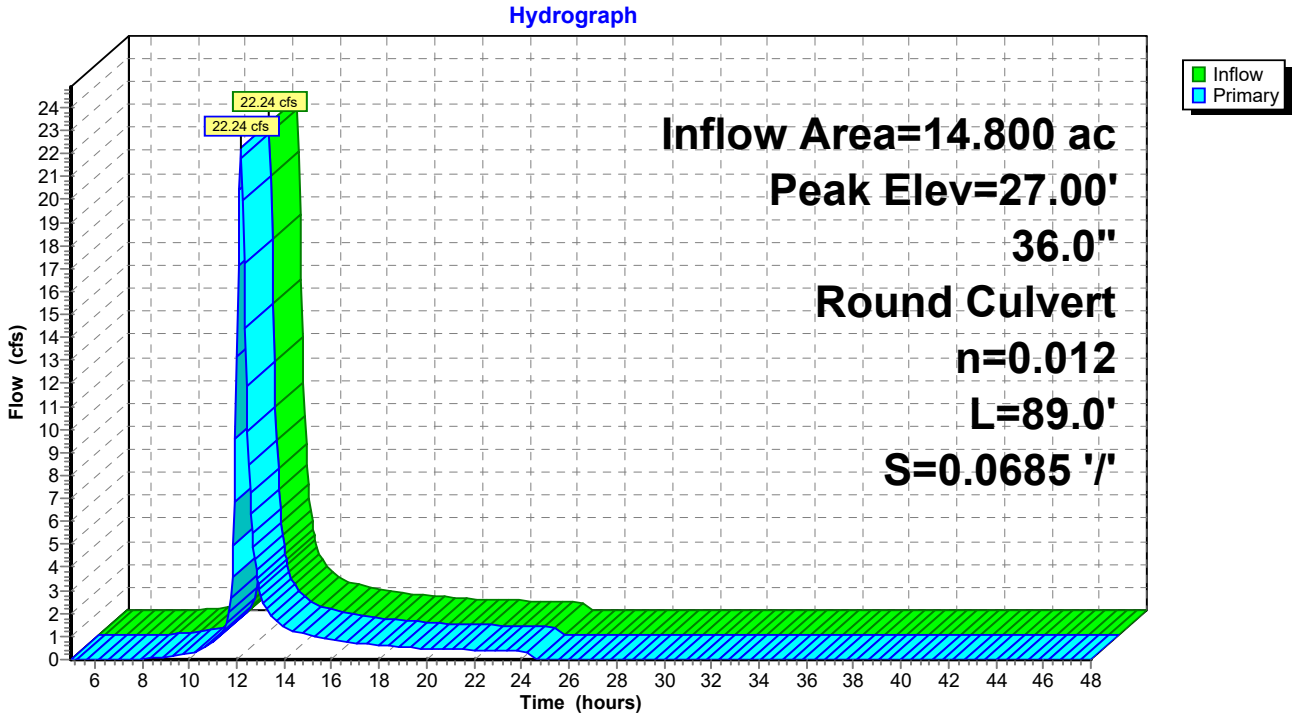
Inflow Area = 14.800 ac, 0.00% Impervious, Inflow Depth = 1.50" for 10 event
Inflow = 22.24 cfs @ 12.17 hrs, Volume= 1.853 af
Outflow = 22.24 cfs @ 12.17 hrs, Volume= 1.853 af, Atten= 0%, Lag= 0.0 min
Primary = 22.24 cfs @ 12.17 hrs, Volume= 1.853 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 27.00' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	25.10'	**36.0" Round RCP_Round 36"** L= 89.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 25.10' / 19.00' S= 0.0685 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=22.02 cfs @ 12.17 hrs HW=26.99' (Free Discharge)
1=RCP_Round 36" (Inlet Controls 22.02 cfs @ 4.68 fps)

Pond 4P: EX. CALTRANS BASN



Time span=5.00-48.00 hrs, dt=0.05 hrs, 861 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: AA3.1 Runoff Area=13.790 ac 0.00% Impervious Runoff Depth=2.19"
Flow Length=580' Tc=24.0 min AMC Adjusted CN=88 Runoff=29.95 cfs 2.513 af

Subcatchment6S: AA3.2 Runoff Area=1.010 ac 0.00% Impervious Runoff Depth=2.19"
Flow Length=870' Tc=18.5 min AMC Adjusted CN=88 Runoff=2.54 cfs 0.184 af

Pond 4P: EX. CALTRANSBASN Peak Elev=27.52' Inflow=32.29 cfs 2.697 af
36.0" Round Culvert n=0.012 L=89.0' S=0.0685 '/' Outflow=32.29 cfs 2.697 af

Total Runoff Area = 14.800 ac Runoff Volume = 2.697 af Average Runoff Depth = 2.19"
100.00% Pervious = 14.800 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: AA3.1

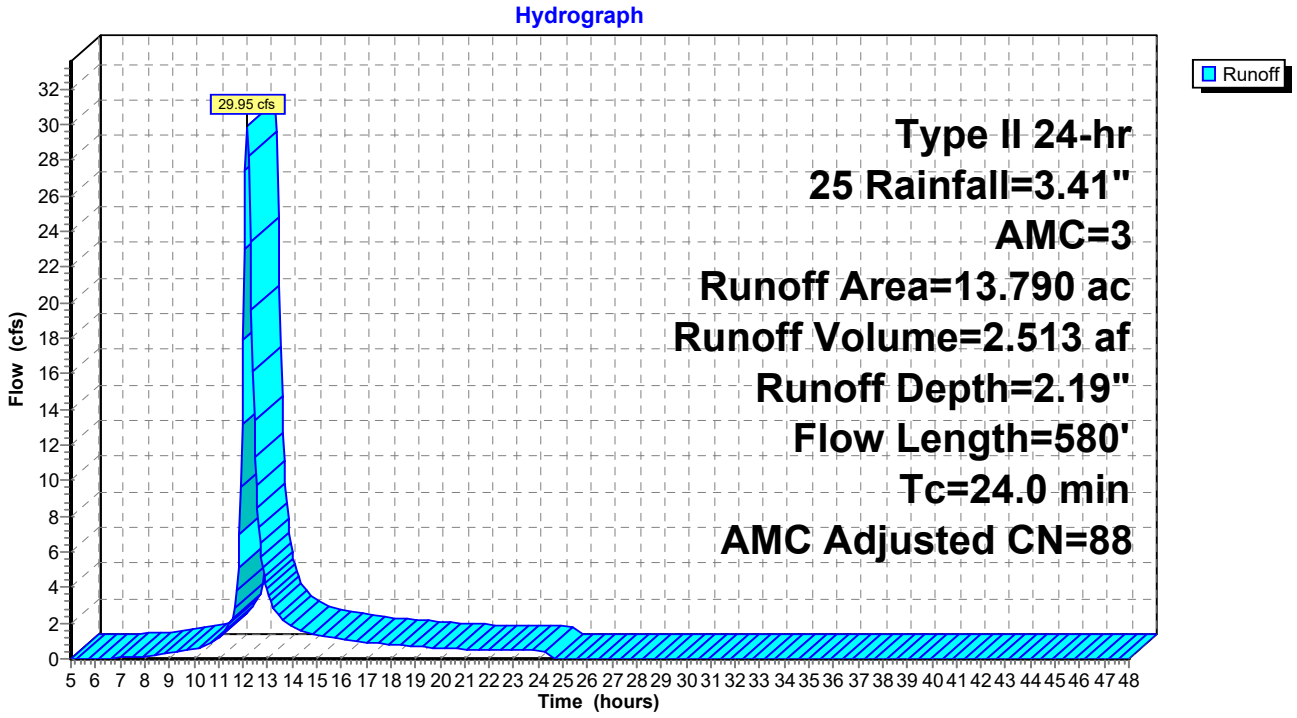
Runoff = 29.95 cfs @ 12.17 hrs, Volume= 2.513 af, Depth= 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 Rainfall=3.41", AMC=3

	Area (ac)	CN	Adj	Description
*	13.790	74		
	13.790	74	88	Weighted Average, AMC Adjusted
	13.790			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	580		0.40		**Direct Entry,**

Subcatchment 1S: AA3.1



Summary for Subcatchment 6S: AA3.2

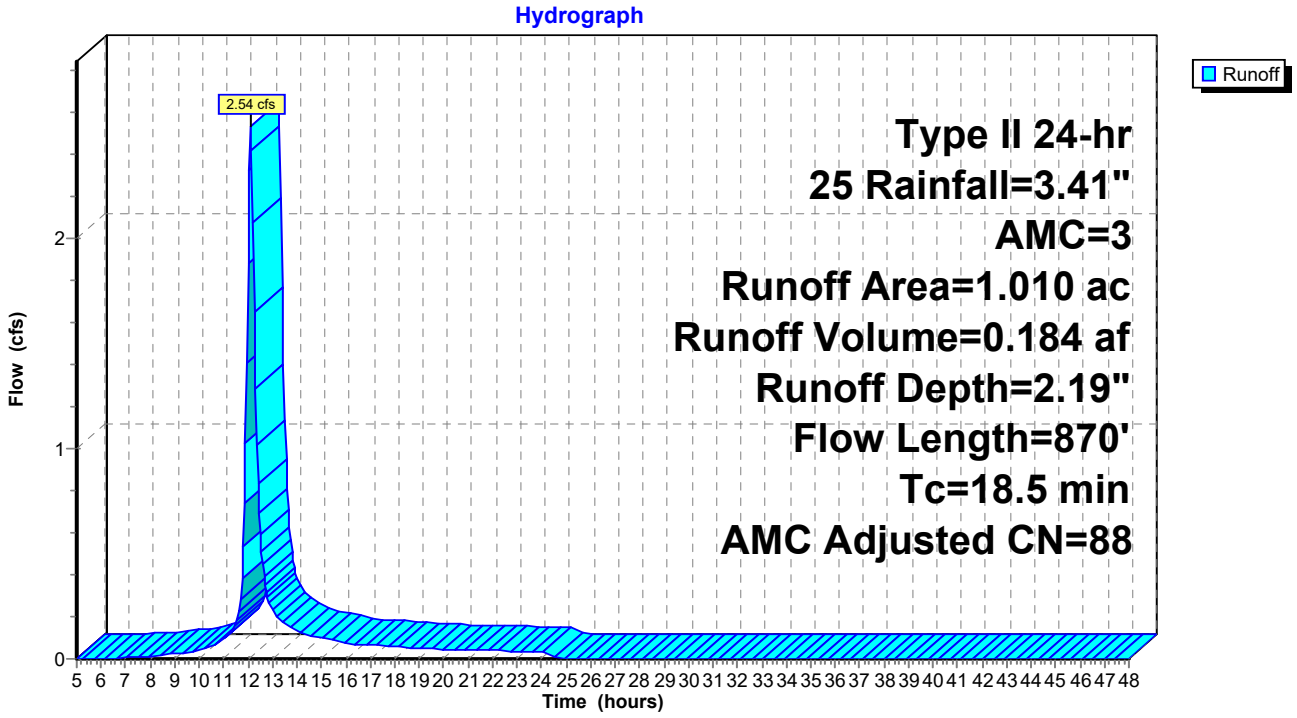
Runoff = 2.54 cfs @ 12.11 hrs, Volume= 0.184 af, Depth= 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 Rainfall=3.41", AMC=3

	Area (ac)	CN	Adj	Description
*	1.010	74		
	1.010	74	88	Weighted Average, AMC Adjusted
	1.010			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	870		0.78		**Direct Entry,**

Subcatchment 6S: AA3.2



Summary for Pond 4P: EX. CALTRANS BASN

[57] Hint: Peaked at 27.52' (Flood elevation advised)

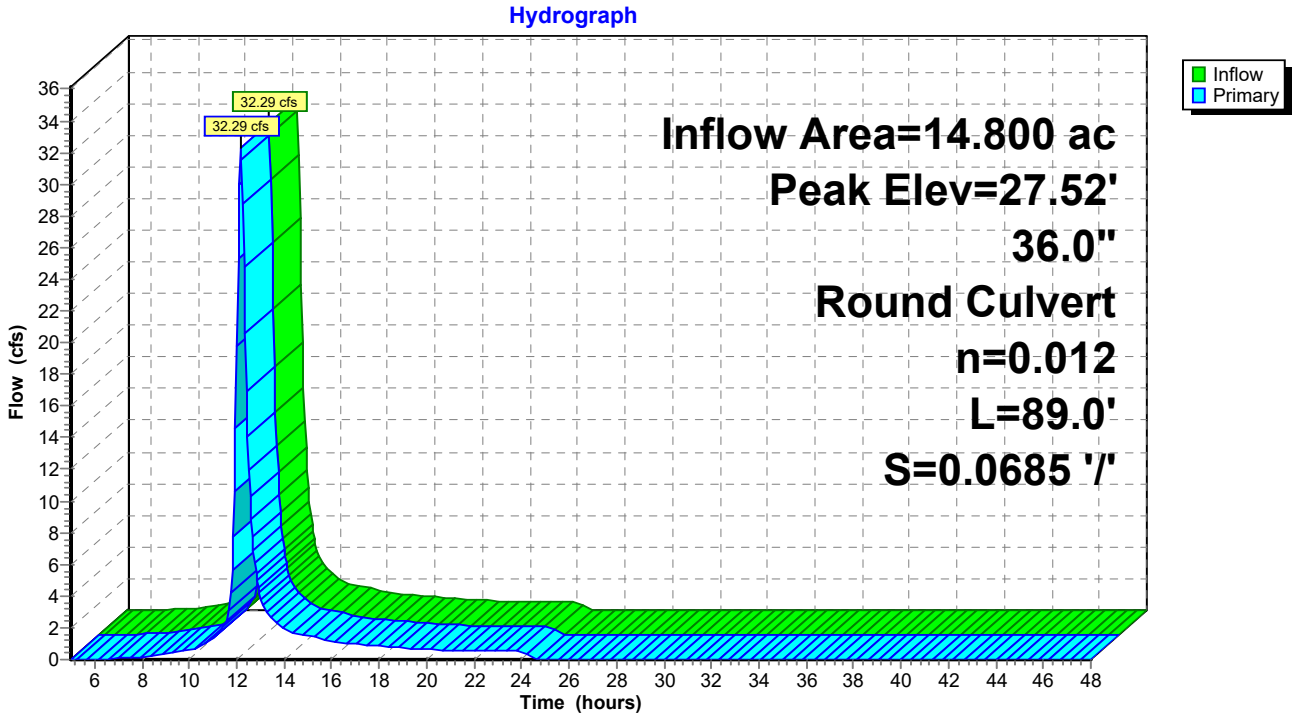
Inflow Area = 14.800 ac, 0.00% Impervious, Inflow Depth = 2.19" for 25 event
Inflow = 32.29 cfs @ 12.16 hrs, Volume= 2.697 af
Outflow = 32.29 cfs @ 12.16 hrs, Volume= 2.697 af, Atten= 0%, Lag= 0.0 min
Primary = 32.29 cfs @ 12.16 hrs, Volume= 2.697 af

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 27.52' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	25.10'	**36.0" Round RCP_Round 36"** L= 89.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 25.10' / 19.00' S= 0.0685 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=32.00 cfs @ 12.16 hrs HW=27.50' (Free Discharge)
1=RCP_Round 36" (Inlet Controls 32.00 cfs @ 5.28 fps)

Pond 4P: EX. CALTRANS BASN



Time span=5.00-48.00 hrs, dt=0.05 hrs, 861 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: AA3.1 Runoff Area=13.790 ac 0.00% Impervious Runoff Depth>3.38"
Flow Length=580' Tc=24.0 min AMC Adjusted CN=88 Runoff=45.84 cfs 3.890 af

Subcatchment6S: AA3.2 Runoff Area=1.010 ac 0.00% Impervious Runoff Depth>3.38"
Flow Length=870' Tc=18.5 min AMC Adjusted CN=88 Runoff=3.88 cfs 0.285 af

Pond 4P: EX. CALTRANSBASN Peak Elev=28.71' Inflow=49.41 cfs 4.174 af
36.0" Round Culvert n=0.012 L=89.0' S=0.0685 '/' Outflow=49.41 cfs 4.174 af

Total Runoff Area = 14.800 ac Runoff Volume = 4.174 af Average Runoff Depth = 3.38"
100.00% Pervious = 14.800 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: AA3.1

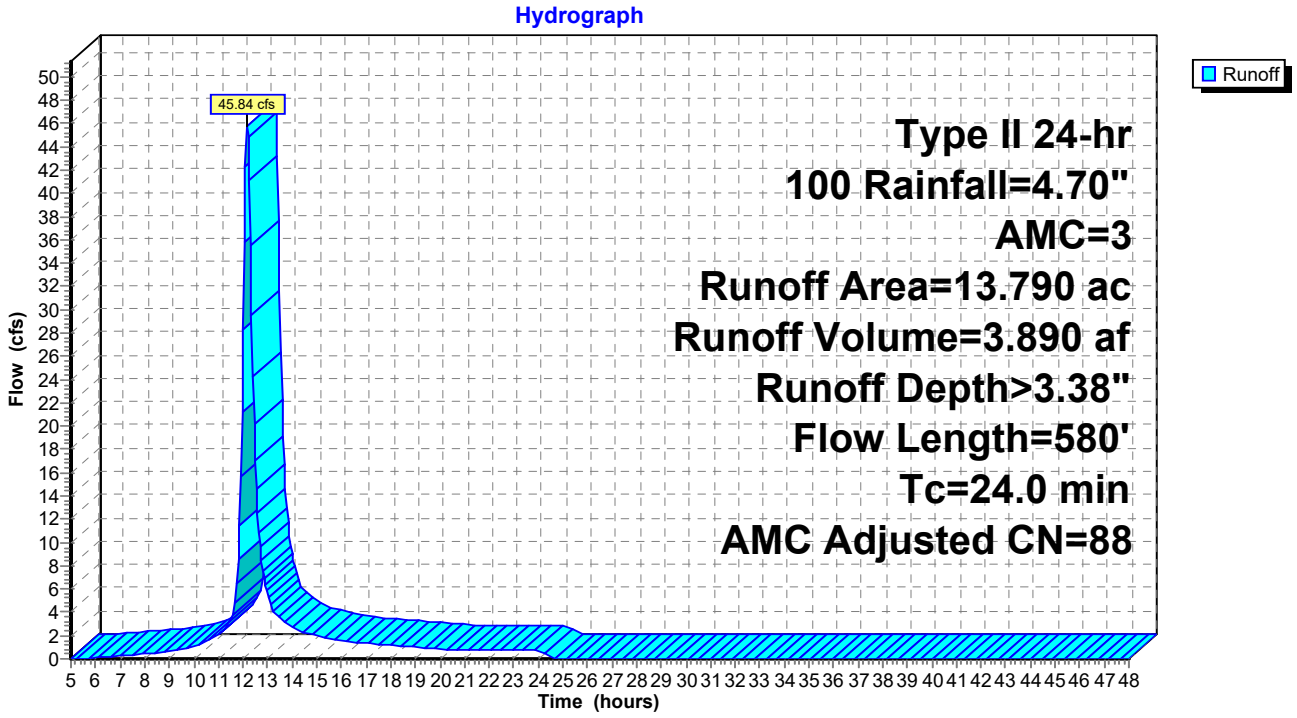
Runoff = 45.84 cfs @ 12.17 hrs, Volume= 3.890 af, Depth> 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	13.790	74		
	13.790	74	88	Weighted Average, AMC Adjusted
	13.790			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	580		0.40		**Direct Entry,**

Subcatchment 1S: AA3.1



Summary for Subcatchment 6S: AA3.2

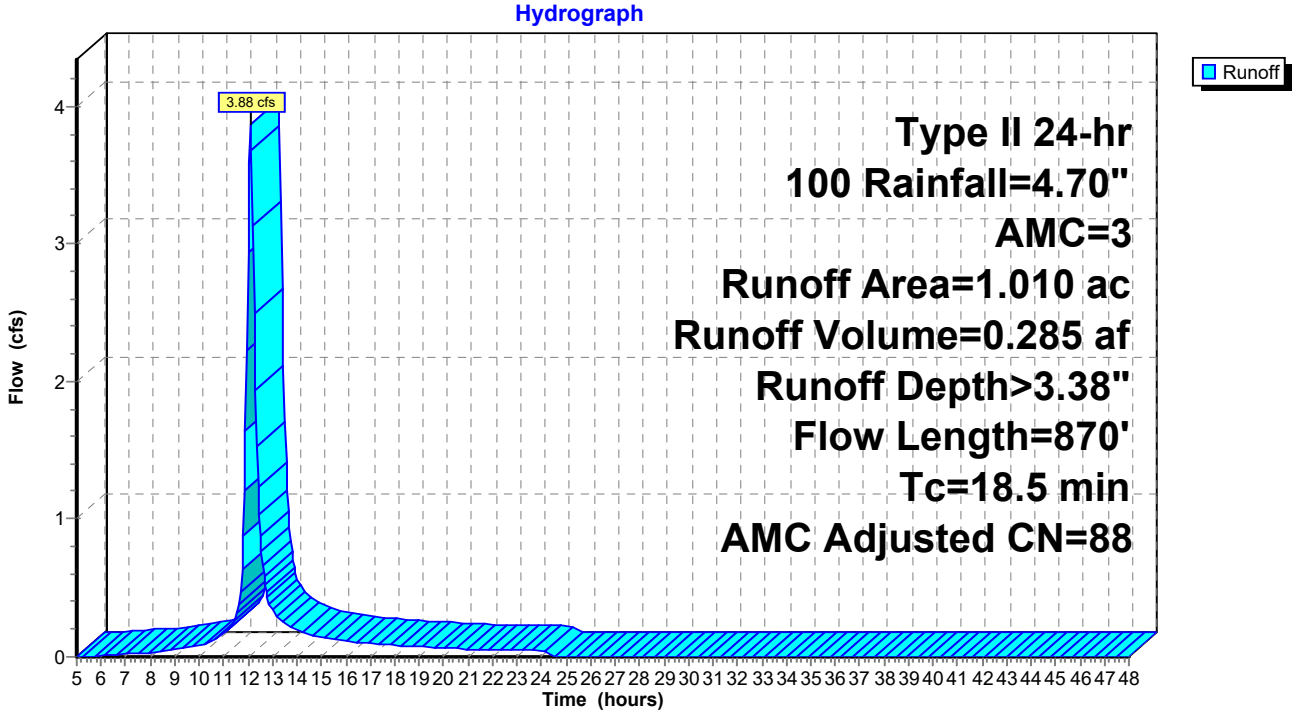
Runoff = 3.88 cfs @ 12.10 hrs, Volume= 0.285 af, Depth> 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	1.010	74		
	1.010	74	88	Weighted Average, AMC Adjusted
	1.010			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	870		0.78		**Direct Entry,**

Subcatchment 6S: AA3.2



Summary for Pond 4P: EX. CALTRANS BASN

[57] Hint: Peaked at 28.71' (Flood elevation advised)

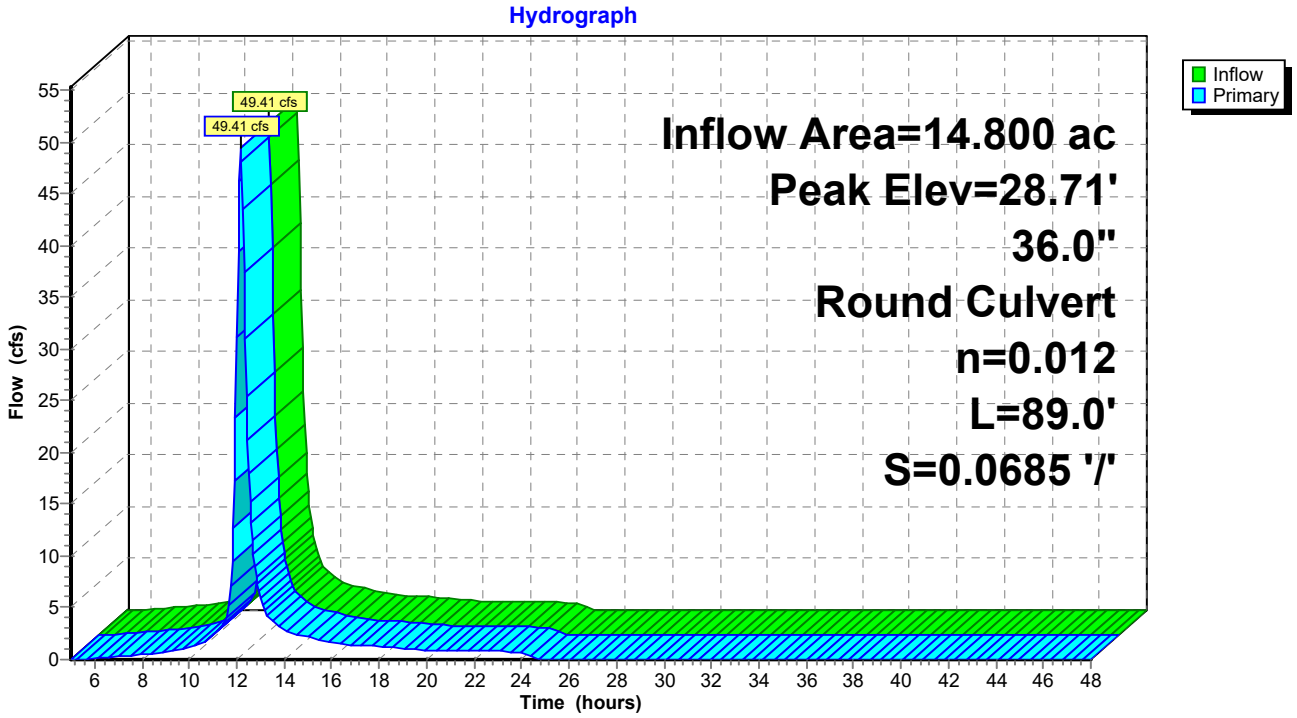
Inflow Area = 14.800 ac, 0.00% Impervious, Inflow Depth > 3.38" for 100 event
Inflow = 49.41 cfs @ 12.16 hrs, Volume= 4.174 af
Outflow = 49.41 cfs @ 12.16 hrs, Volume= 4.174 af, Atten= 0%, Lag= 0.0 min
Primary = 49.41 cfs @ 12.16 hrs, Volume= 4.174 af

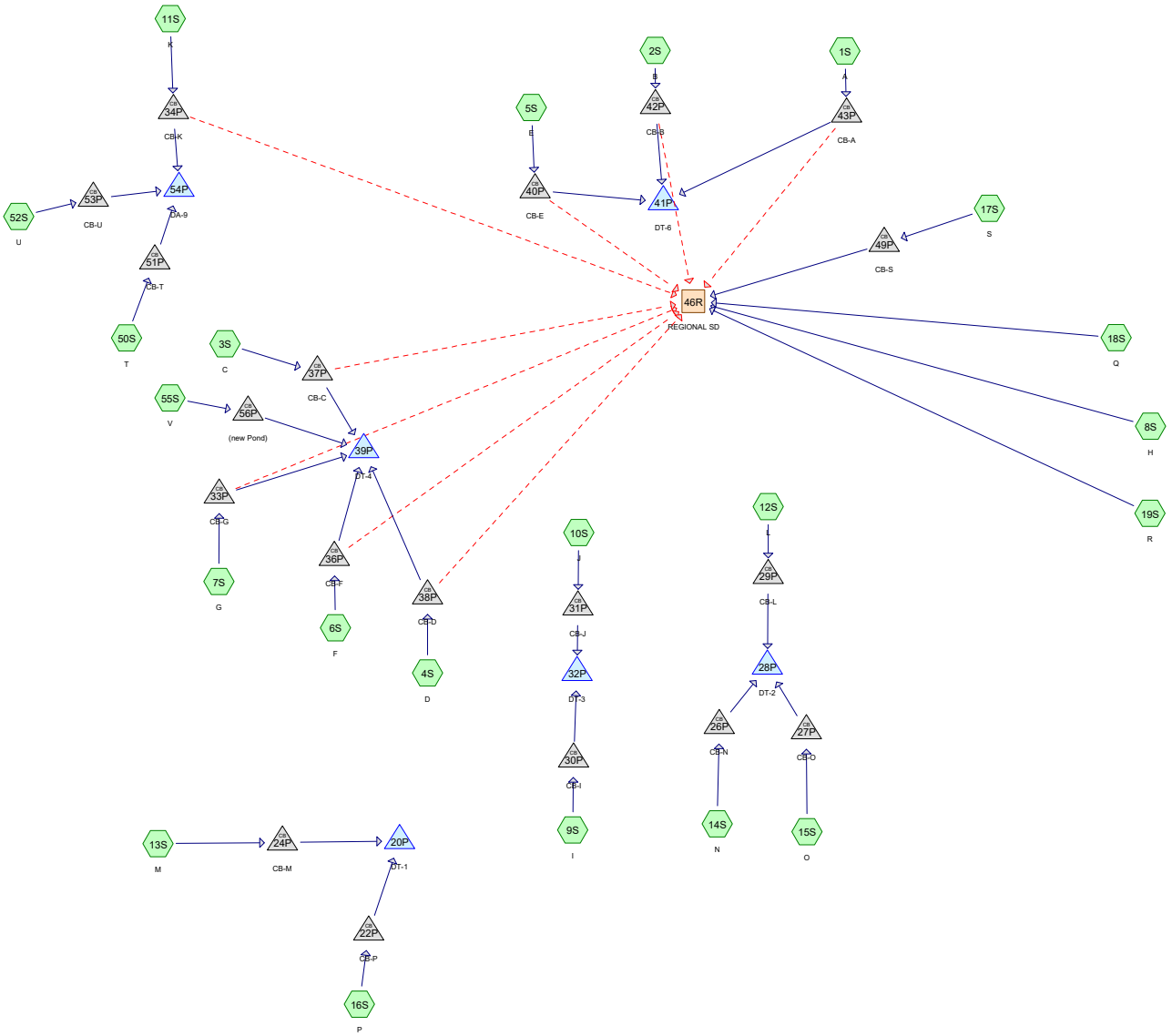
Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 28.71' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	25.10'	**36.0" Round RCP_Round 36"** L= 89.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 25.10' / 19.00' S= 0.0685 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=49.05 cfs @ 12.16 hrs HW=28.68' (Free Discharge)
1=RCP_Round 36" (Inlet Controls 49.05 cfs @ 6.94 fps)

Pond 4P: EX. CALTRANS BASN





Subcat Reach Pond Link

Routing Diagram for Post Development Condition-REV1
Prepared by Microsoft, Printed 2/26/2019

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
12.310	98	(1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 50S, 52S, 55S)
2.490	56	(1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 50S, 52S, 55S)
14.800	**91**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
14.800	Other	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 50S, 52S, 55S
14.800		**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
0.000	0.000	0.000	0.000	14.800	14.800		1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 50S, 52S, 55S
0.000	**0.000**	**0.000**	**0.000**	**14.800**	**14.800**	**TOTAL AREA**	

Time span=1.00-48.00 hrs, dt=0.05 hrs, 941 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: A Runoff Area=0.740 ac 85.14% Impervious Runoff Depth=1.17"
Flow Length=182' Slope=0.0070 '/' Tc=4.4 min AMC Adjusted CN=97 Runoff=1.49 cfs 0.072 af

Subcatchment2S: B Runoff Area=0.230 ac 82.61% Impervious Runoff Depth=1.17"
Flow Length=153' Slope=0.0160 '/' Tc=2.7 min AMC Adjusted CN=97 Runoff=0.48 cfs 0.023 af

Subcatchment3S: C Runoff Area=0.420 ac 85.71% Impervious Runoff Depth=1.17"
Flow Length=216' Slope=0.0160 '/' Tc=3.6 min AMC Adjusted CN=97 Runoff=0.86 cfs 0.041 af

Subcatchment4S: D Runoff Area=1.820 ac 85.16% Impervious Runoff Depth=1.17"
Flow Length=457' Slope=0.0230 '/' Tc=6.4 min AMC Adjusted CN=97 Runoff=3.38 cfs 0.178 af

Subcatchment5S: E Runoff Area=0.320 ac 84.38% Impervious Runoff Depth=1.17"
Flow Length=394' Slope=0.0040 '/' Tc=11.3 min AMC Adjusted CN=97 Runoff=0.51 cfs 0.031 af

Subcatchment6S: F Runoff Area=2.550 ac 85.10% Impervious Runoff Depth=1.17"
Flow Length=553' Slope=0.0100 '/' Tc=10.5 min AMC Adjusted CN=97 Runoff=4.21 cfs 0.249 af

Subcatchment7S: G Runoff Area=0.780 ac 84.62% Impervious Runoff Depth=1.17"
Flow Length=340' Slope=0.0150 '/' Tc=5.8 min AMC Adjusted CN=97 Runoff=1.48 cfs 0.076 af

Subcatchment8S: H Runoff Area=0.310 ac 83.87% Impervious Runoff Depth=1.17"
Flow Length=50' Slope=0.0200 '/' Tc=1.0 min AMC Adjusted CN=97 Runoff=0.67 cfs 0.030 af

Subcatchment9S: I Runoff Area=0.160 ac 87.50% Impervious Runoff Depth=1.27"
Flow Length=129' Slope=0.0090 '/' Tc=3.0 min AMC Adjusted CN=98 Runoff=0.35 cfs 0.017 af

Subcatchment10S: J Runoff Area=1.410 ac 85.11% Impervious Runoff Depth=1.17"
Flow Length=256' Slope=0.0200 '/' Tc=3.8 min AMC Adjusted CN=97 Runoff=2.88 cfs 0.138 af

Subcatchment11S: K Runoff Area=0.940 ac 85.11% Impervious Runoff Depth=1.17"
Flow Length=254' Slope=0.0100 '/' Tc=4.9 min AMC Adjusted CN=97 Runoff=1.85 cfs 0.092 af

Subcatchment12S: L Runoff Area=0.240 ac 87.50% Impervious Runoff Depth=1.27"
Flow Length=254' Slope=0.0100 '/' Tc=4.9 min AMC Adjusted CN=98 Runoff=0.50 cfs 0.025 af

Subcatchment13S: M Runoff Area=1.420 ac 85.21% Impervious Runoff Depth=1.17"
Flow Length=329' Slope=0.0110 '/' Tc=6.2 min AMC Adjusted CN=97 Runoff=2.66 cfs 0.139 af

Subcatchment14S: N Runoff Area=0.510 ac 84.31% Impervious Runoff Depth=1.17"
Flow Length=215' Slope=0.0110 '/' Tc=4.2 min AMC Adjusted CN=97 Runoff=1.03 cfs 0.050 af

Subcatchment15S: O Runoff Area=0.310 ac 83.87% Impervious Runoff Depth=1.17"
Flow Length=190' Slope=0.0150 '/' Tc=3.3 min AMC Adjusted CN=97 Runoff=0.64 cfs 0.030 af

Subcatchment16S: P Runoff Area=0.360 ac 83.33% Impervious Runoff Depth=1.17"
Flow Length=164' Slope=0.0170 '/' Tc=2.8 min AMC Adjusted CN=97 Runoff=0.75 cfs 0.035 af

Subcatchment17S: S Runoff Area=0.910 ac 84.62% Impervious Runoff Depth=1.17"
Flow Length=250' Slope=0.0200 '/' Tc=3.7 min AMC Adjusted CN=97 Runoff=1.87 cfs 0.089 af

Subcatchment18S: Q Runoff Area=0.230 ac 82.61% Impervious Runoff Depth=1.17"
Flow Length=87' Slope=0.0400 '/' Tc=1.2 min AMC Adjusted CN=97 Runoff=0.49 cfs 0.023 af

Subcatchment19S: R Runoff Area=0.340 ac 8.82% Impervious Runoff Depth=0.23"
Flow Length=56' Slope=0.0500 '/' Tc=6.3 min AMC Adjusted CN=78 Runoff=0.11 cfs 0.006 af

Subcatchment50S: T Runoff Area=0.230 ac 82.61% Impervious Runoff Depth=1.17"
Flow Length=127' Slope=0.0050 '/' Tc=3.7 min AMC Adjusted CN=97 Runoff=0.47 cfs 0.023 af

Subcatchment52S: U Runoff Area=0.280 ac 85.71% Impervious Runoff Depth=1.17"
Flow Length=125' Slope=0.0100 '/' Tc=2.8 min AMC Adjusted CN=97 Runoff=0.58 cfs 0.027 af

Subcatchment55S: V Runoff Area=0.290 ac 86.21% Impervious Runoff Depth=1.17"
Flow Length=185' Slope=0.0050 '/' Tc=5.1 min AMC Adjusted CN=97 Runoff=0.57 cfs 0.028 af

Reach 46R: REGIONAL SD Avg. Flow Depth=0.48' Max Vel=6.35 fps Inflow=7.57 cfs 0.221 af
84.0" Round Pipe n=0.013 L=500.0' S=0.0150 '/' Capacity=782.41 cfs Outflow=6.95 cfs 0.221 af

Pond 20P: DT-1 Peak Elev=33.89' Storage=0.080 af Inflow=3.34 cfs 0.174 af
Outflow=0.18 cfs 0.174 af

Pond 22P: CB-P Peak Elev=37.55' Inflow=0.75 cfs 0.035 af
12.0" Round Culvert n=0.012 L=100.0' S=0.0100 '/' Outflow=0.75 cfs 0.035 af

Pond 24P: CB-M Peak Elev=36.88' Inflow=2.66 cfs 0.139 af
24.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=2.66 cfs 0.139 af

Pond 26P: CB-N Peak Elev=37.26' Inflow=1.03 cfs 0.050 af
Outflow=1.03 cfs 0.050 af

Pond 27P: CB-O Peak Elev=37.10' Inflow=0.64 cfs 0.030 af
12.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.64 cfs 0.030 af

Pond 28P: DT-2 Peak Elev=31.97' Storage=0.050 af Inflow=2.16 cfs 0.106 af
Outflow=0.10 cfs 0.106 af

Pond 29P: CB-L Peak Elev=34.58' Inflow=0.50 cfs 0.025 af
18.0" Round Culvert n=0.012 L=20.0' S=0.0100 '/' Outflow=0.50 cfs 0.025 af

Pond 30P: CB-I Peak Elev=38.86' Inflow=0.35 cfs 0.017 af
12.0" Round Culvert n=0.012 L=100.0' S=0.0100 '/' Outflow=0.35 cfs 0.017 af

Pond 31P: CB-J Peak Elev=36.22' Inflow=2.88 cfs 0.138 af
24.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=2.88 cfs 0.138 af

Pond 32P: DT-3 Peak Elev=33.03' Storage=0.073 af Inflow=3.23 cfs 0.155 af
Outflow=0.15 cfs 0.155 af

Pond 33P: CB-G Peak Elev=30.66' Inflow=1.48 cfs 0.076 af
Primary=0.84 cfs 0.068 af Secondary=0.65 cfs 0.009 af Outflow=1.48 cfs 0.076 af

Pond 34P: CB-K Peak Elev=34.22' Inflow=1.85 cfs 0.092 af
Primary=1.08 cfs 0.083 af Secondary=0.77 cfs 0.009 af Outflow=1.85 cfs 0.092 af

Pond 36P: CB-F Peak Elev=32.47' Inflow=4.21 cfs 0.249 af
Primary=3.31 cfs 0.239 af Secondary=0.90 cfs 0.010 af Outflow=4.21 cfs 0.249 af

Pond 37P: CB-C Peak Elev=29.53' Inflow=0.86 cfs 0.041 af
Primary=0.81 cfs 0.041 af Secondary=0.05 cfs 0.000 af Outflow=0.86 cfs 0.041 af

Pond 38P: CB-D Peak Elev=29.82' Inflow=3.38 cfs 0.178 af
Primary=2.19 cfs 0.163 af Secondary=1.19 cfs 0.015 af Outflow=3.38 cfs 0.178 af

Pond 39P: DT-4 Peak Elev=25.81' Storage=0.262 af Inflow=7.47 cfs 0.539 af
Outflow=0.39 cfs 0.539 af

Pond 40P: CB-E Peak Elev=35.57' Inflow=0.51 cfs 0.031 af
Primary=0.20 cfs 0.026 af Secondary=0.31 cfs 0.006 af Outflow=0.51 cfs 0.031 af

Pond 41P: DT-6 Peak Elev=28.04' Storage=0.040 af Inflow=0.71 cfs 0.097 af
Outflow=0.07 cfs 0.097 af

Pond 42P: CB-B Peak Elev=32.99' Inflow=0.48 cfs 0.023 af
Primary=0.24 cfs 0.020 af Secondary=0.23 cfs 0.003 af Outflow=0.48 cfs 0.023 af

Pond 43P: CB-A Peak Elev=32.35' Inflow=1.49 cfs 0.072 af
Primary=0.28 cfs 0.051 af Secondary=1.20 cfs 0.021 af Outflow=1.49 cfs 0.072 af

Pond 49P: CB-S Peak Elev=27.35' Inflow=1.87 cfs 0.089 af
Outflow=1.87 cfs 0.089 af

Pond 51P: CB-T Peak Elev=34.51' Inflow=0.47 cfs 0.023 af
12.0" Round Culvert n=0.120 L=100.0' S=0.0100 '/' Outflow=0.47 cfs 0.023 af

Pond 53P: CB-U Peak Elev=34.27' Inflow=0.58 cfs 0.027 af
12.0" Round Culvert n=0.012 L=100.0' S=0.0100 '/' Outflow=0.58 cfs 0.027 af

Pond 54P: DA-9 Peak Elev=30.03' Storage=0.063 af Inflow=2.13 cfs 0.133 af
Outflow=0.10 cfs 0.133 af

Pond 56P: (new Pond) Peak Elev=35.88' Inflow=0.57 cfs 0.028 af
12.0" Round Culvert n=0.012 L=40.0' S=0.0100 '/' Outflow=0.57 cfs 0.028 af

Total Runoff Area = 14.800 ac Runoff Volume = 1.424 af Average Runoff Depth = 1.15"
16.82% Pervious = 2.490 ac 83.18% Impervious = 12.310 ac

Summary for Subcatchment 1S: A

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

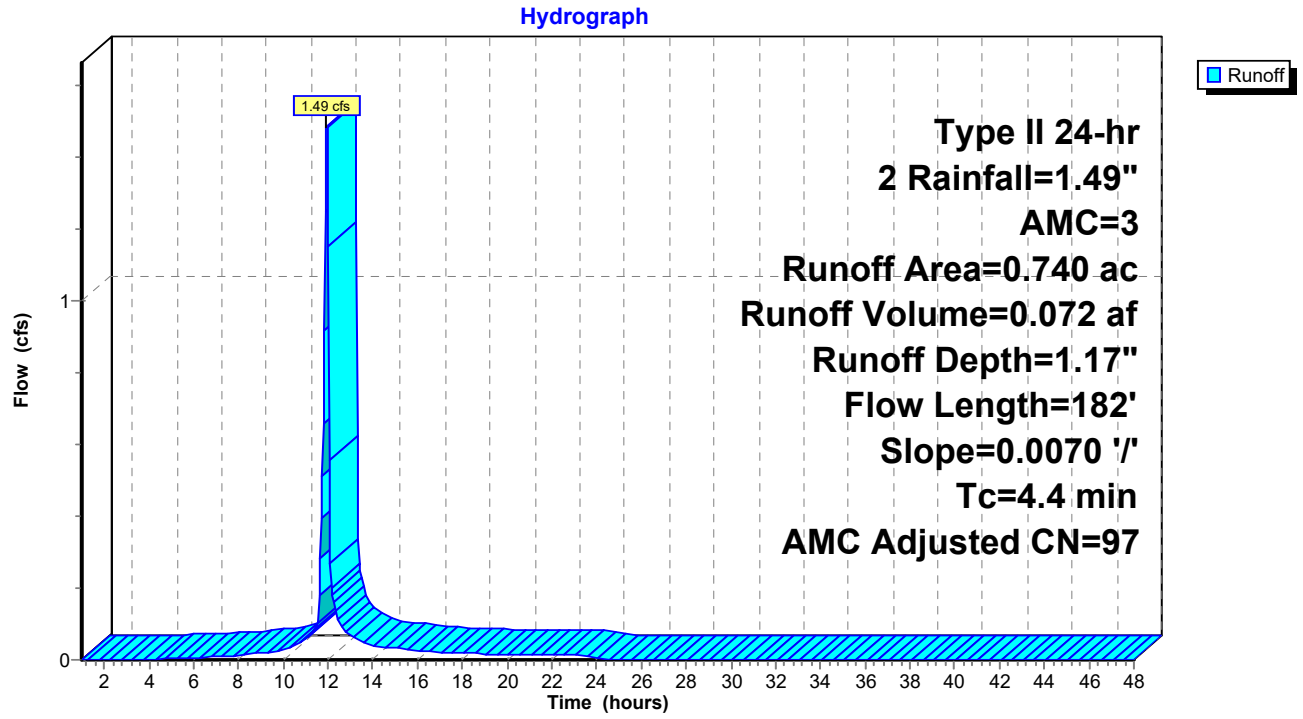
Runoff = 1.49 cfs @ 11.95 hrs, Volume= 0.072 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.630	98		
*	0.110	56		
	0.740	92	97	Weighted Average, AMC Adjusted
	0.110			14.86% Pervious Area
	0.630			85.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	182	0.0070	0.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 1S: A



Summary for Subcatchment 2S: B

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

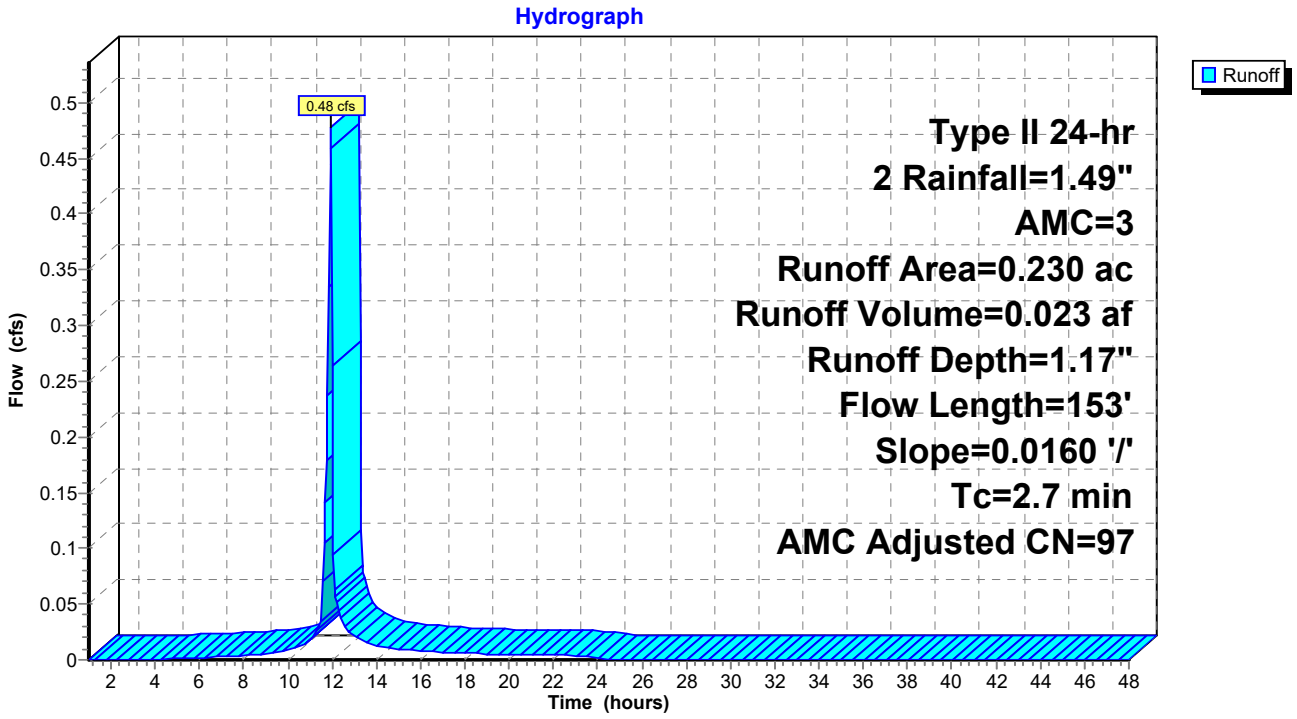
Runoff = 0.48 cfs @ 11.93 hrs, Volume= 0.023 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.190	98		
*	0.040	56		
	0.230	91	97	Weighted Average, AMC Adjusted
	0.040			17.39% Pervious Area
	0.190			82.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	153	0.0160	0.93		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 2S: B



Summary for Subcatchment 3S: C

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

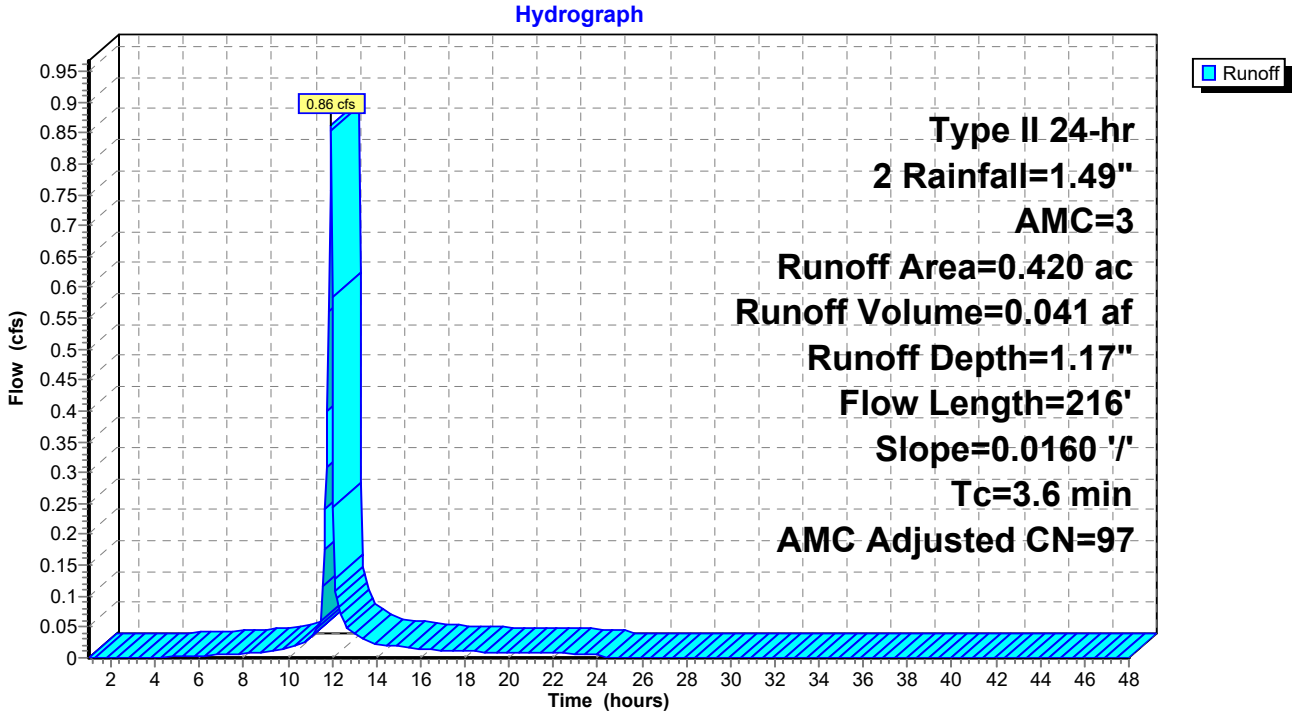
Runoff = 0.86 cfs @ 11.94 hrs, Volume= 0.041 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.360	98		
*	0.060	56		
	0.420	92	97	Weighted Average, AMC Adjusted
	0.060			14.29% Pervious Area
	0.360			85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	216	0.0160	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 3S: C



Summary for Subcatchment 4S: D

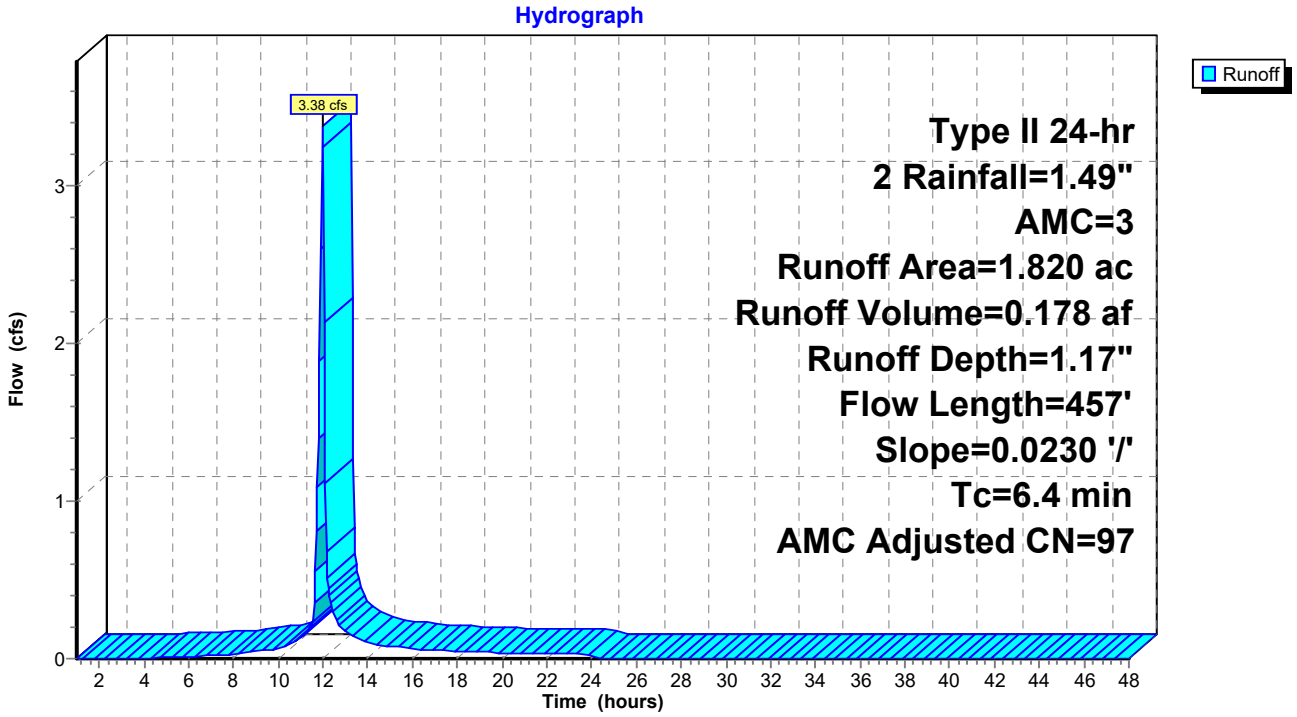
Runoff = 3.38 cfs @ 11.97 hrs, Volume= 0.178 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	1.550	98		
*	0.270	56		
	1.820	92	97	Weighted Average, AMC Adjusted
	0.270			14.84% Pervious Area
	1.550			85.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	300	0.0230	1.24		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
2.4	157	0.0230	1.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
6.4	457	Total			

Subcatchment 4S: D



Summary for Subcatchment 5S: E

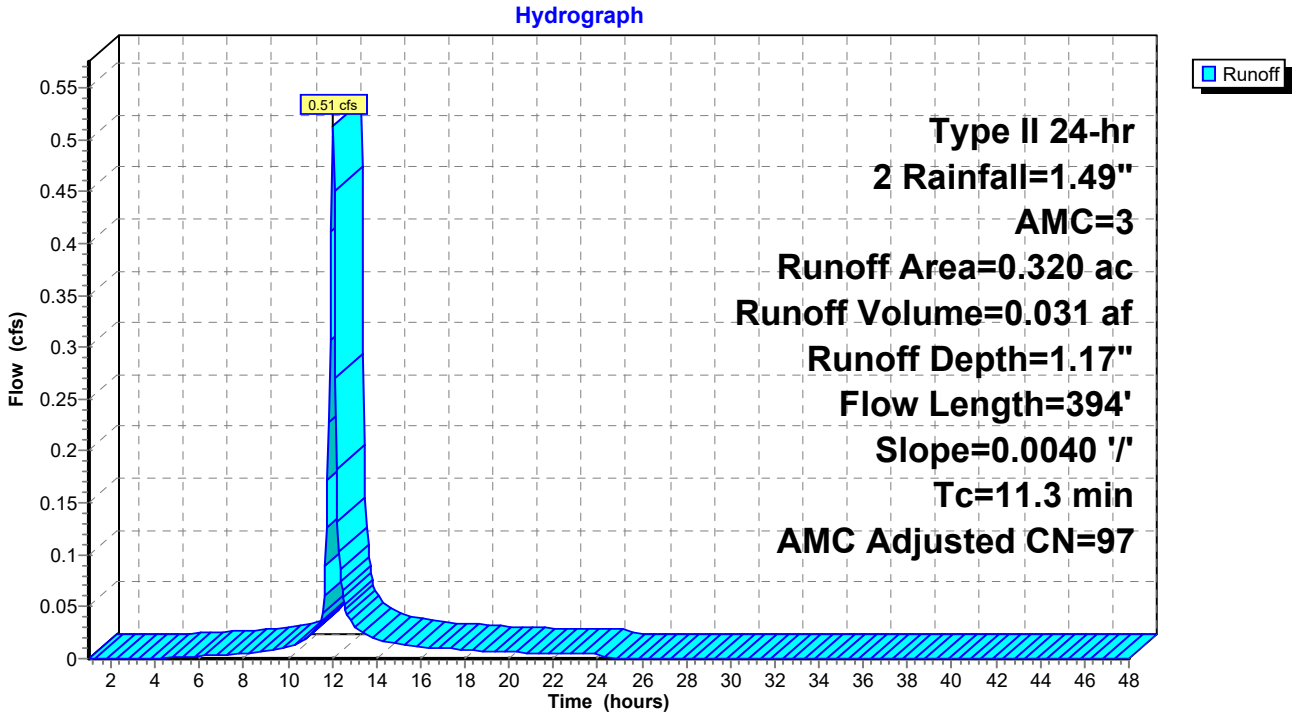
Runoff = 0.51 cfs @ 12.02 hrs, Volume= 0.031 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.270	98		
*	0.050	56		
	0.320	91	97	Weighted Average, AMC Adjusted
	0.050			15.63% Pervious Area
	0.270			84.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	300	0.0040	0.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
3.2	94	0.0040	0.49		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
11.3	394	Total			

Subcatchment 5S: E



Summary for Subcatchment 6S: F

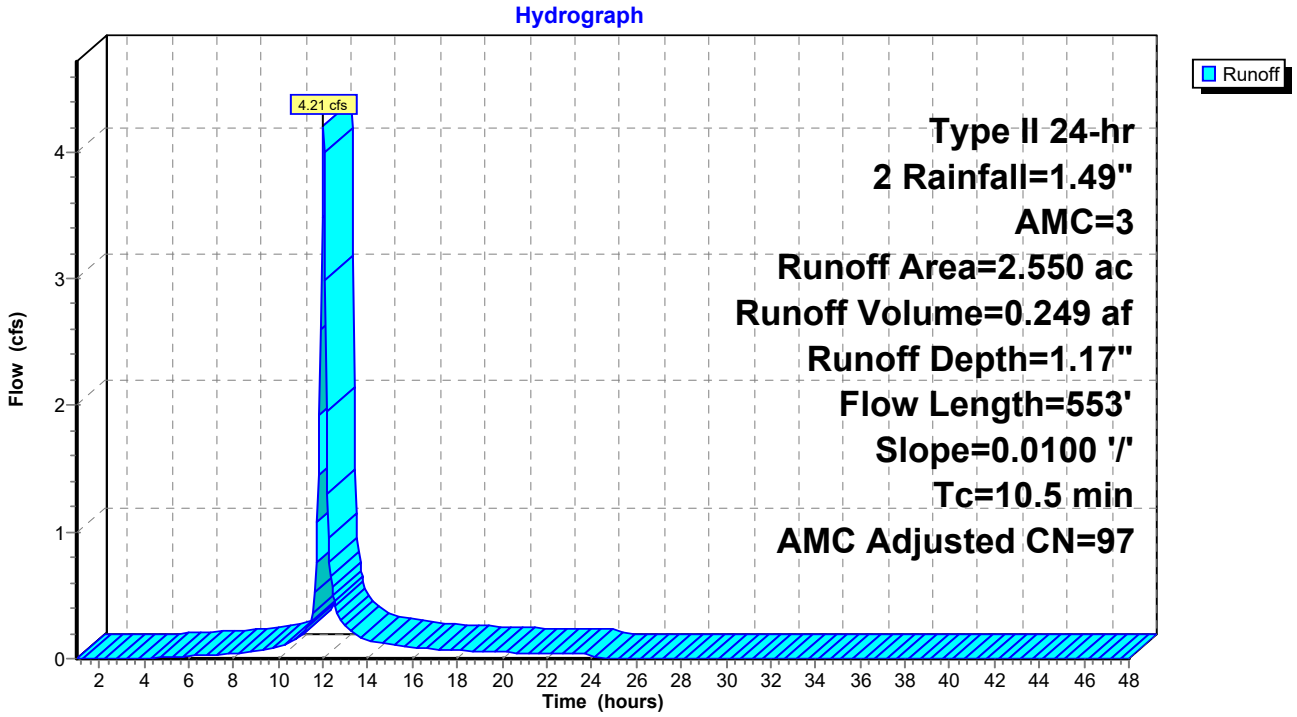
Runoff = 4.21 cfs @ 12.01 hrs, Volume= 0.249 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	2.170	98		
*	0.380	56		
	2.550	92	97	Weighted Average, AMC Adjusted
	0.380			14.90% Pervious Area
	2.170			85.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	300	0.0100	0.89		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
4.9	253	0.0100	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
10.5	553	Total			

Subcatchment 6S: F



Summary for Subcatchment 7S: G

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

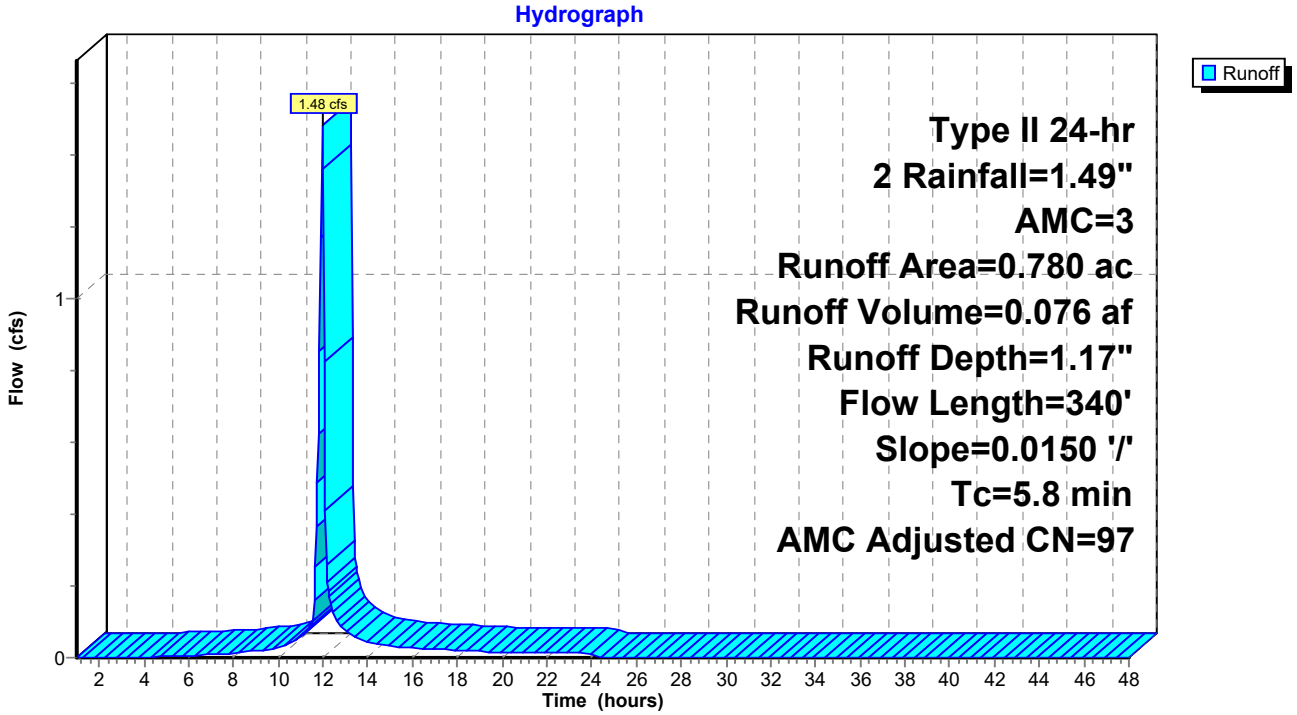
Runoff = 1.48 cfs @ 11.96 hrs, Volume= 0.076 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.660	98		
*	0.120	56		
	0.780	92	97	Weighted Average, AMC Adjusted
	0.120			15.38% Pervious Area
	0.660			84.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	300	0.0150	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
1.0	40	0.0150	0.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
5.8	340	Total			

Subcatchment 7S: G



Summary for Subcatchment 8S: H

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

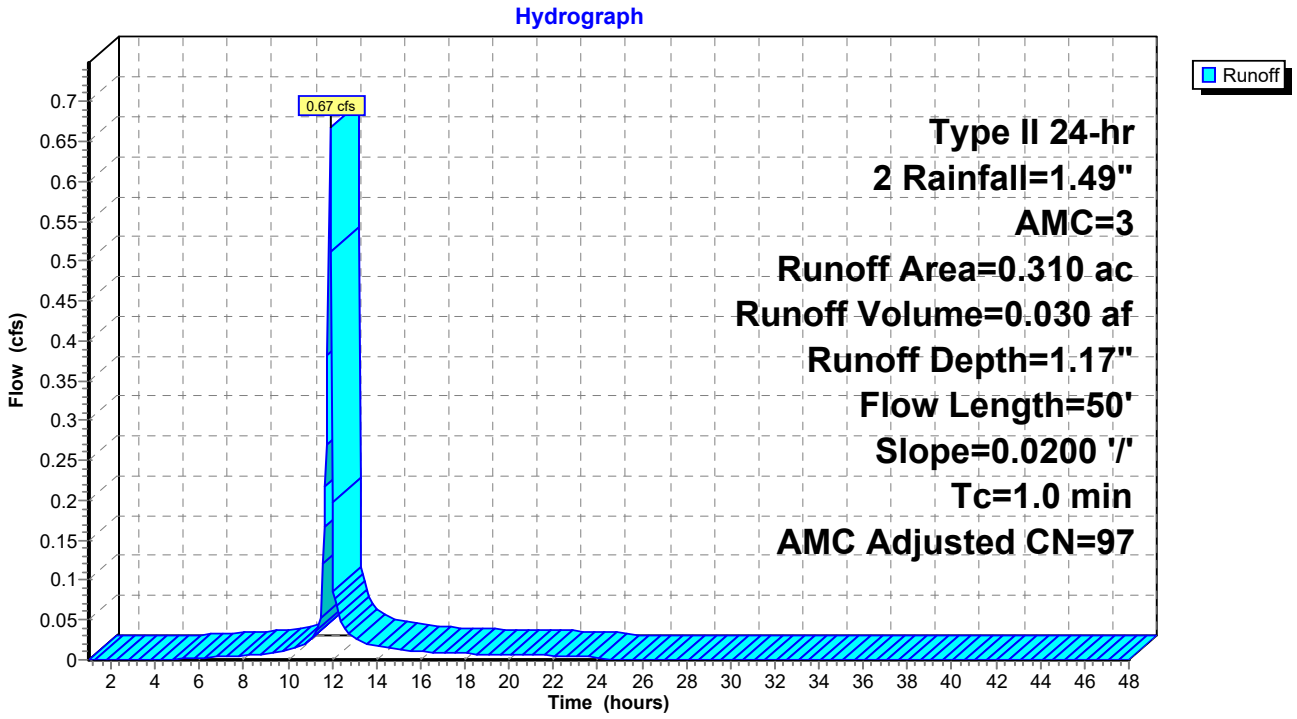
Runoff = 0.67 cfs @ 11.90 hrs, Volume= 0.030 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.260	98		
*	0.050	56		
	0.310	91	97	Weighted Average, AMC Adjusted
	0.050			16.13% Pervious Area
	0.260			83.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0200	0.82		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 8S: H



Summary for Subcatchment 9S: I

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

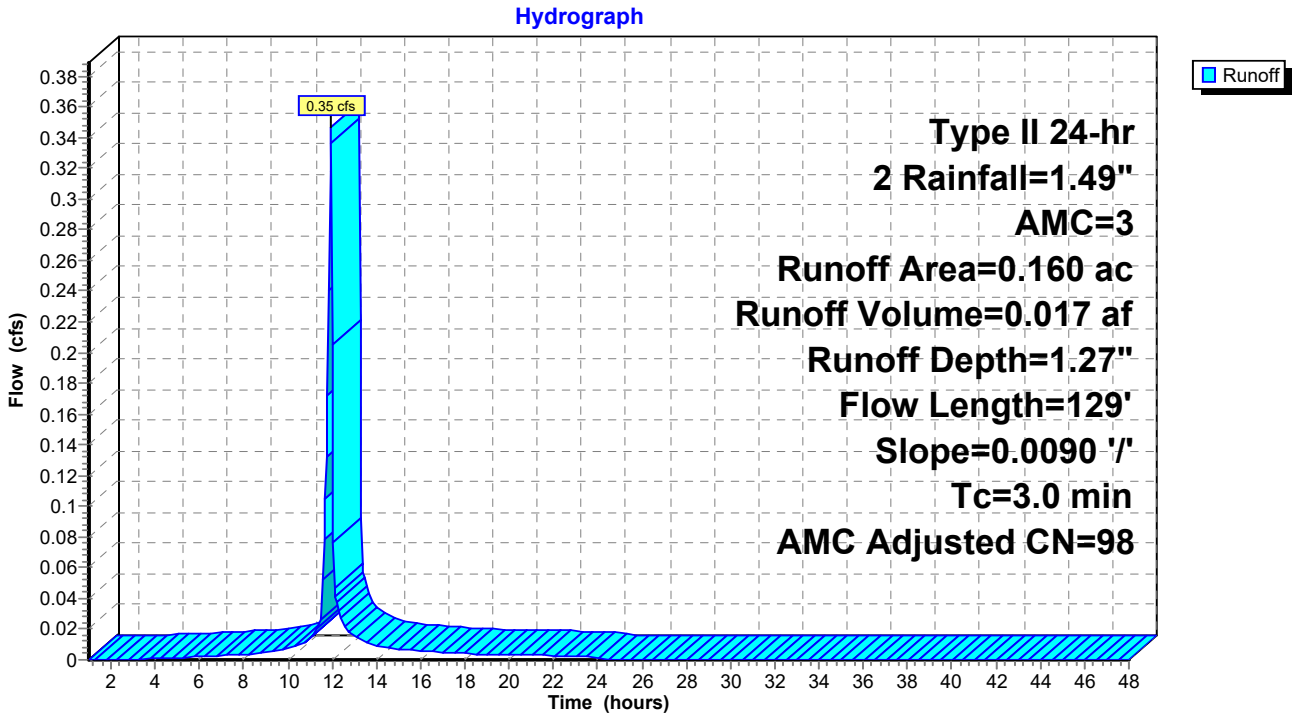
Runoff = 0.35 cfs @ 11.93 hrs, Volume= 0.017 af, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.140	98		
*	0.020	56		
	0.160	93	98	Weighted Average, AMC Adjusted
	0.020			12.50% Pervious Area
	0.140			87.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	129	0.0090	0.72		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 9S: I



Summary for Subcatchment 10S: J

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

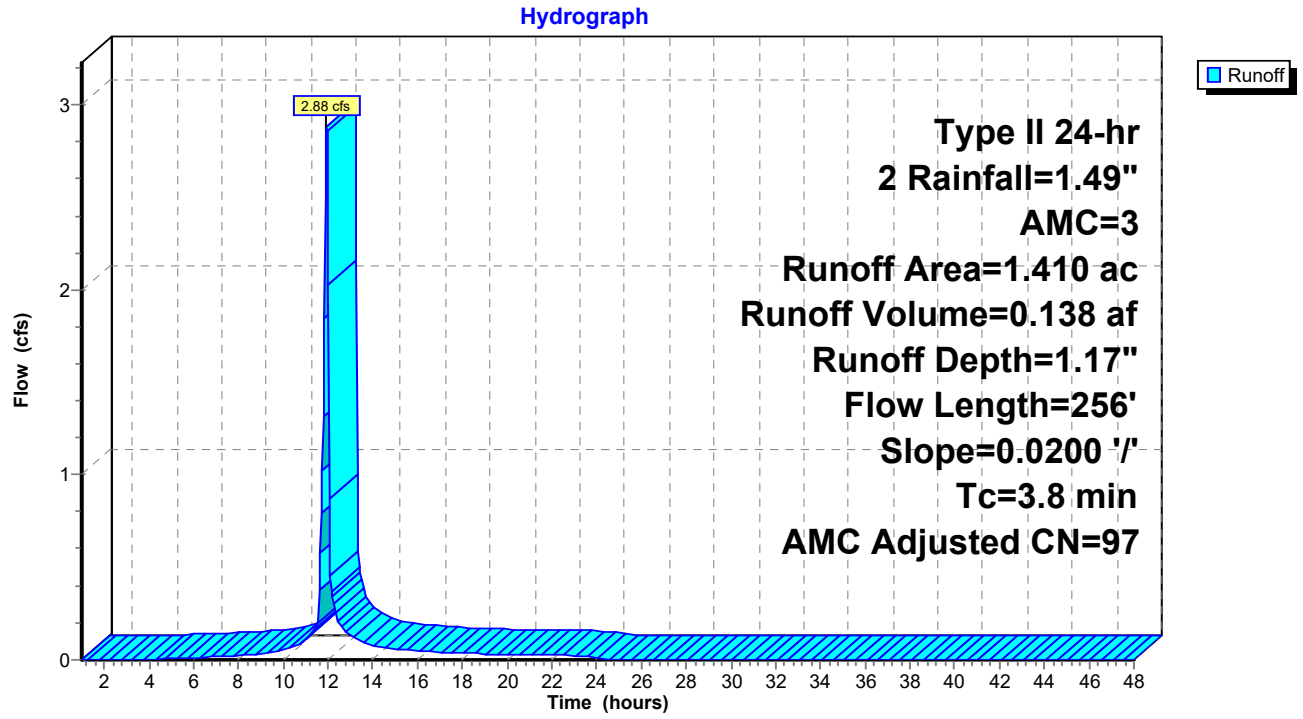
Runoff = 2.88 cfs @ 11.94 hrs, Volume= 0.138 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	1.200	98		
*	0.210	56		
	1.410	92	97	Weighted Average, AMC Adjusted
	0.210			14.89% Pervious Area
	1.200			85.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	256	0.0200	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 10S: J



Summary for Subcatchment 11S: K

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

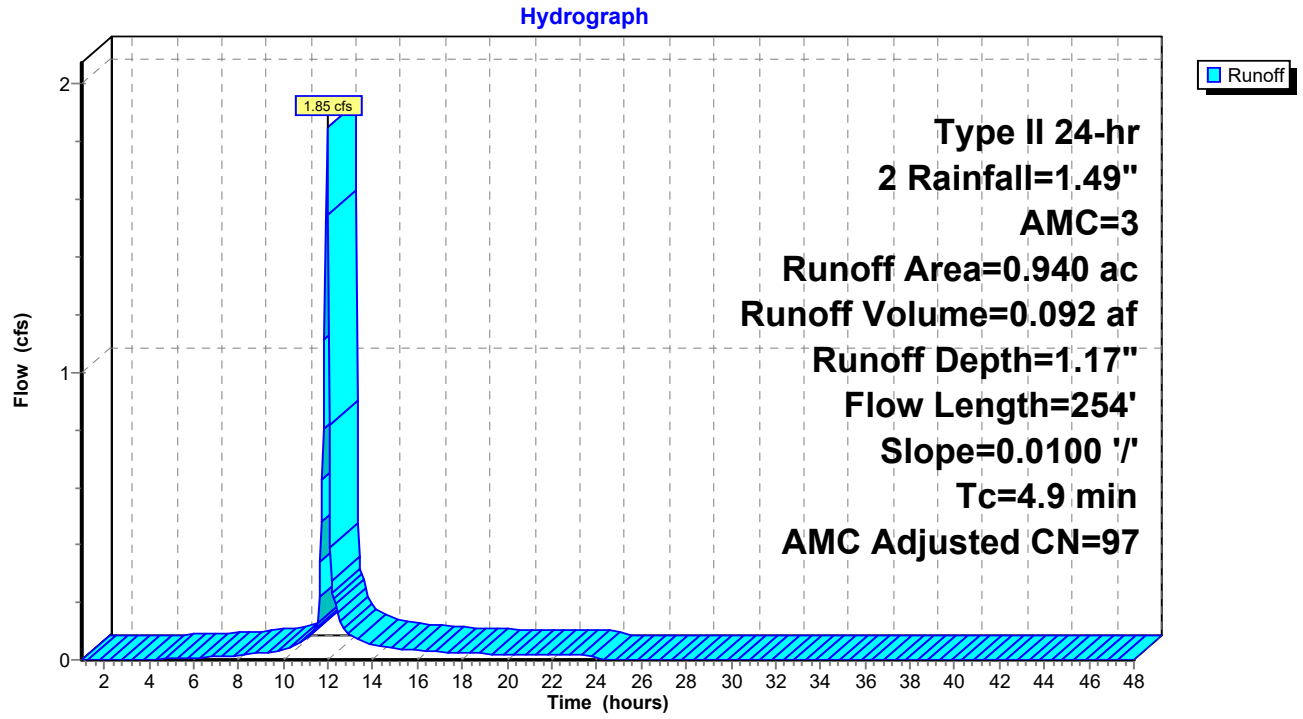
Runoff = 1.85 cfs @ 11.95 hrs, Volume= 0.092 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.800	98		
*	0.140	56		
	0.940	92	97	Weighted Average, AMC Adjusted
	0.140			14.89% Pervious Area
	0.800			85.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	254	0.0100	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 11S: K



Summary for Subcatchment 12S: L

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

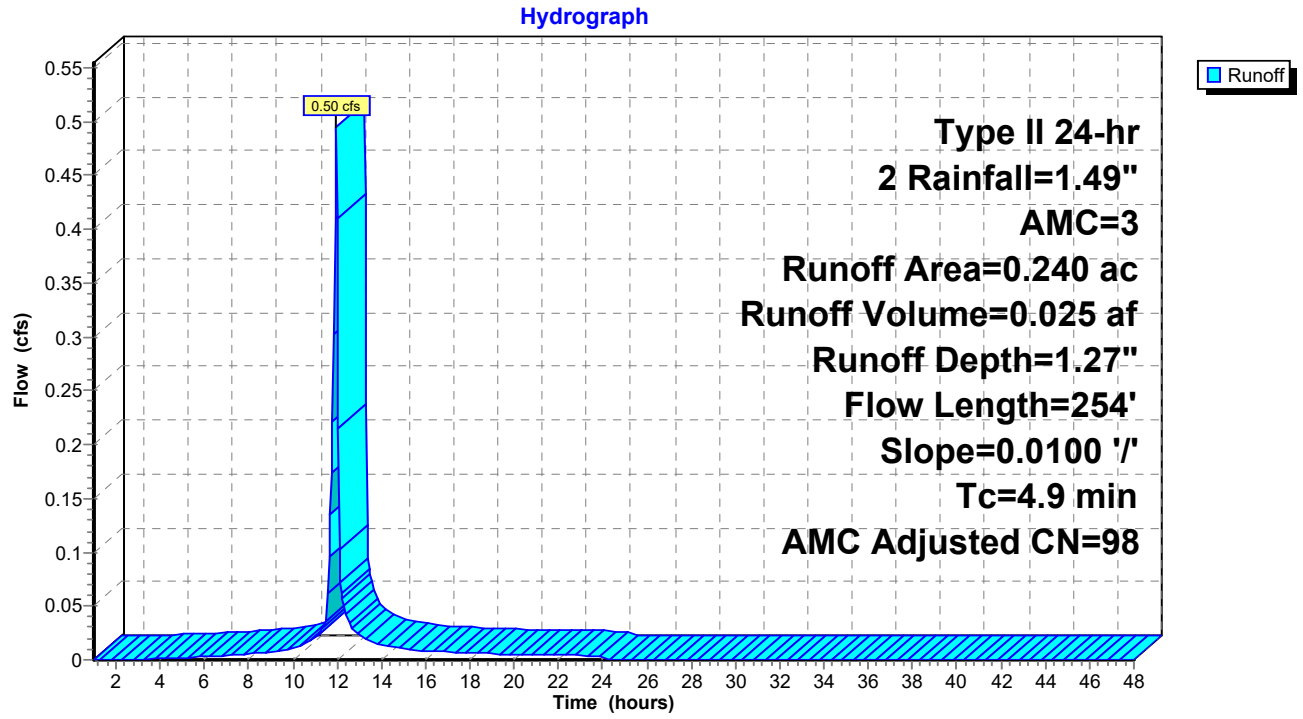
Runoff = 0.50 cfs @ 11.95 hrs, Volume= 0.025 af, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.210	98		
*	0.030	56		
	0.240	93	98	Weighted Average, AMC Adjusted
	0.030			12.50% Pervious Area
	0.210			87.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	254	0.0100	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 12S: L



Summary for Subcatchment 13S: M

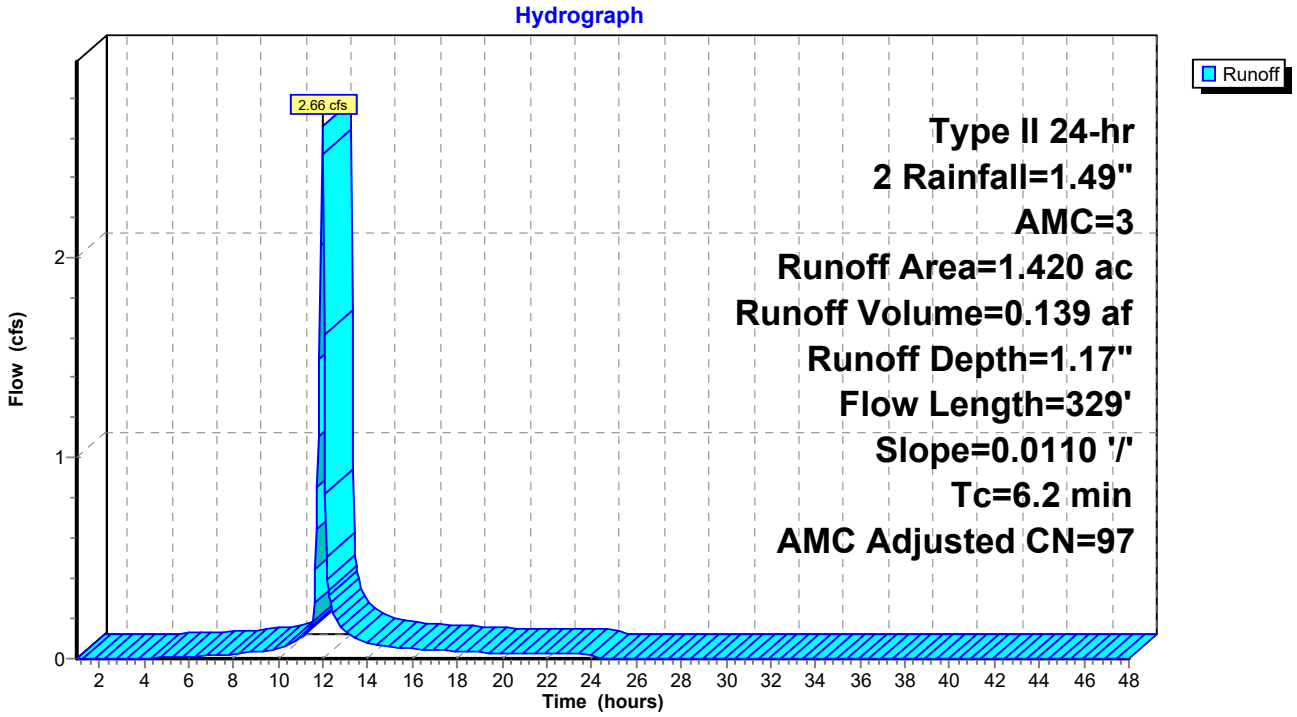
Runoff = 2.66 cfs @ 11.97 hrs, Volume= 0.139 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	1.210	98		
*	0.210	56		
	1.420	92	97	Weighted Average, AMC Adjusted
	0.210			14.79% Pervious Area
	1.210			85.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	300	0.0110	0.92		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
0.8	29	0.0110	0.58		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
6.2	329	Total			

Subcatchment 13S: M



Summary for Subcatchment 14S: N

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

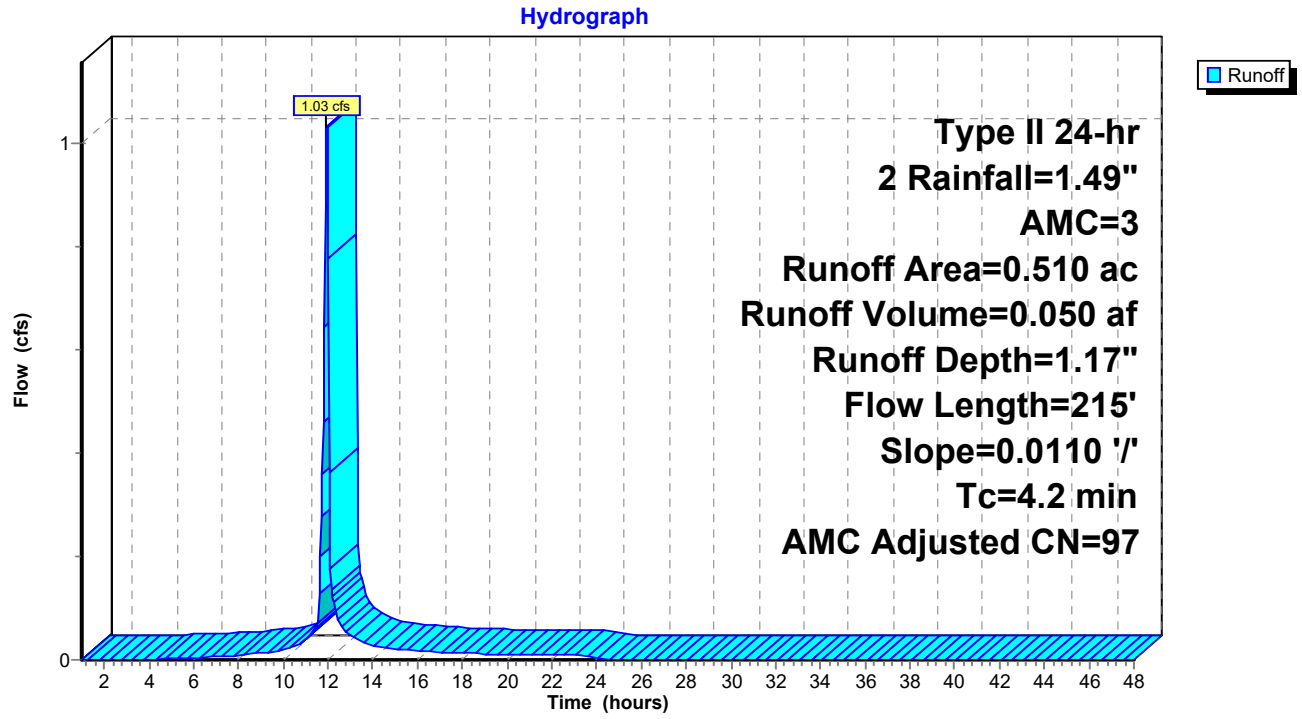
Runoff = 1.03 cfs @ 11.94 hrs, Volume= 0.050 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.430	98		
*	0.080	56		
	0.510	91	97	Weighted Average, AMC Adjusted
	0.080			15.69% Pervious Area
	0.430			84.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	215	0.0110	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 14S: N



Summary for Subcatchment 15S: O

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

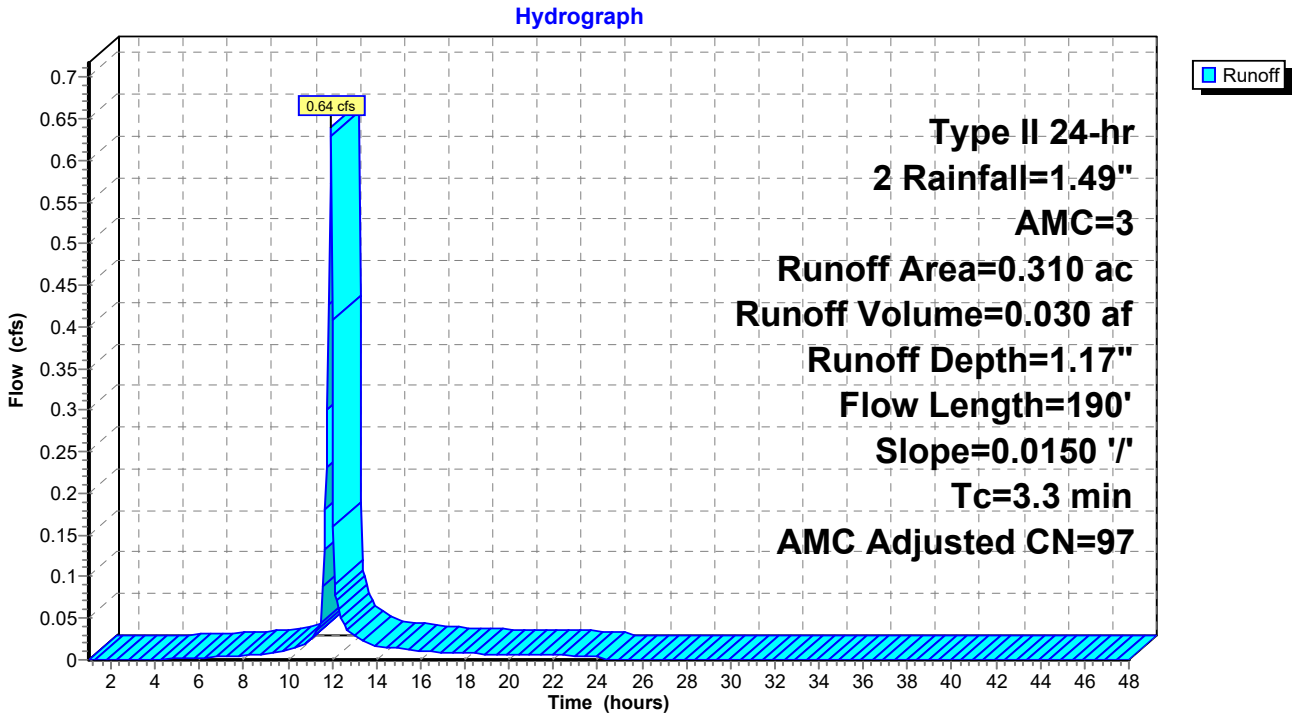
Runoff = 0.64 cfs @ 11.94 hrs, Volume= 0.030 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.260	98		
*	0.050	56		
	0.310	91	97	Weighted Average, AMC Adjusted
	0.050			16.13% Pervious Area
	0.260			83.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	190	0.0150	0.95		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 15S: O



Summary for Subcatchment 16S: P

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

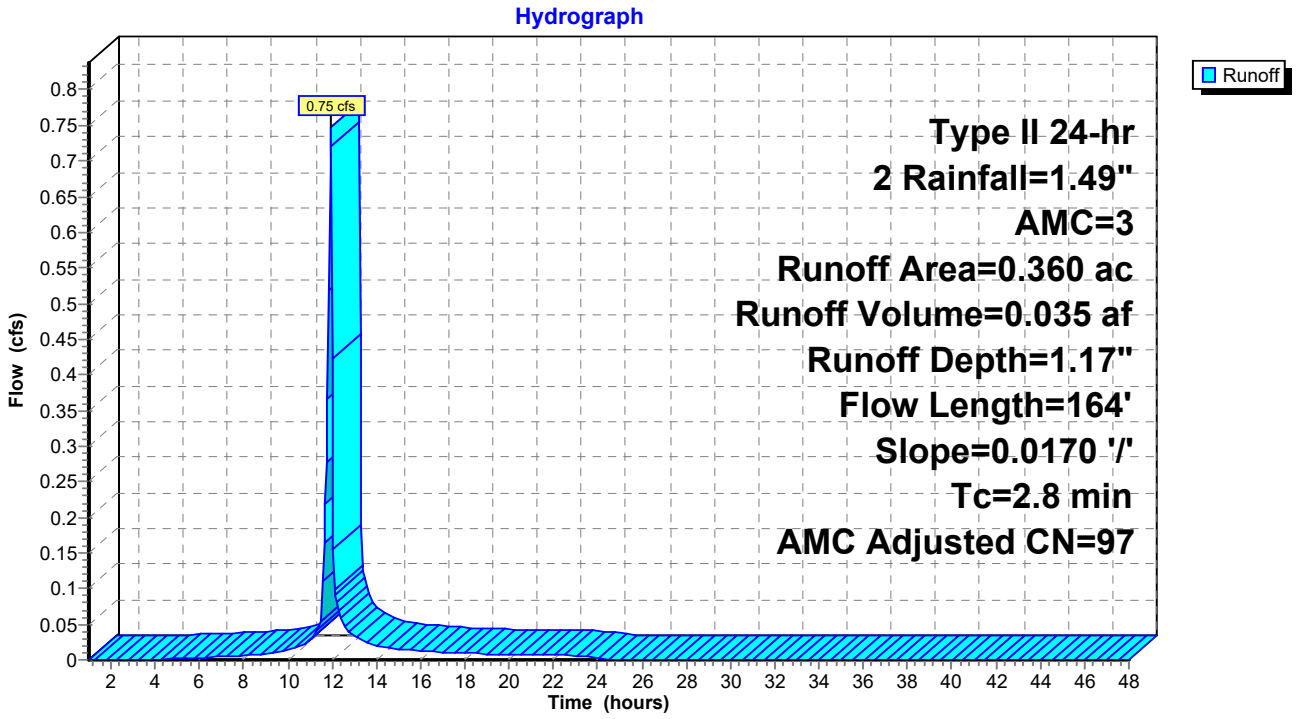
Runoff = 0.75 cfs @ 11.93 hrs, Volume= 0.035 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.300	98		
*	0.060	56		
	0.360	91	97	Weighted Average, AMC Adjusted
	0.060			16.67% Pervious Area
	0.300			83.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	164	0.0170	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 16S: P



Summary for Subcatchment 17S: S

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

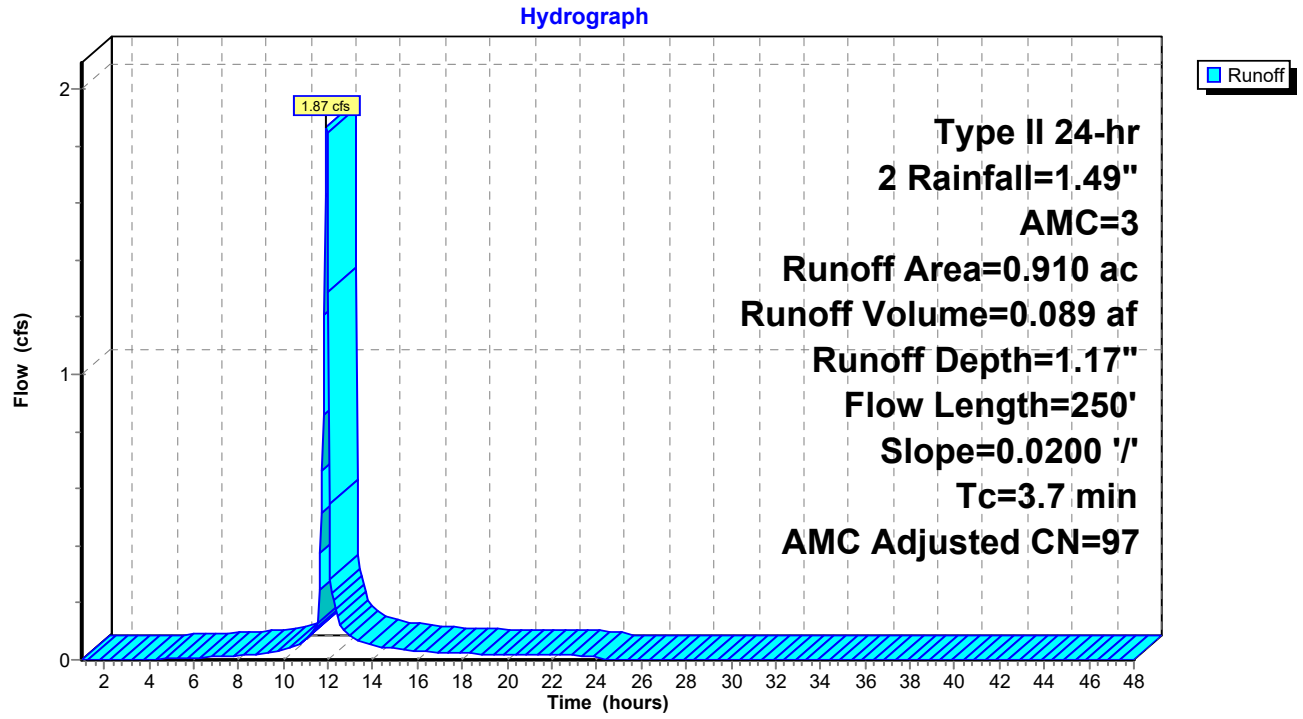
Runoff = 1.87 cfs @ 11.94 hrs, Volume= 0.089 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.770	98		
*	0.140	56		
	0.910	92	97	Weighted Average, AMC Adjusted
	0.140			15.38% Pervious Area
	0.770			84.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	250	0.0200	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 17S: S



Summary for Subcatchment 18S: Q

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

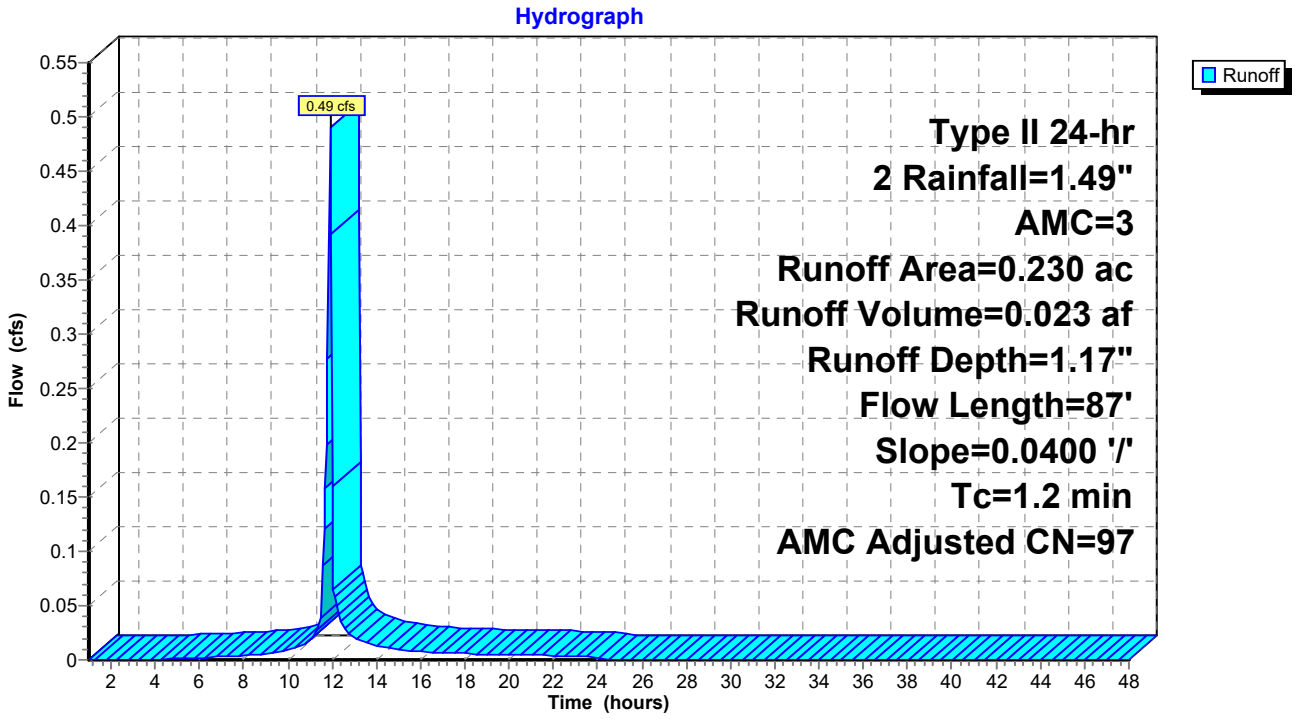
Runoff = 0.49 cfs @ 11.90 hrs, Volume= 0.023 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.190	98		
*	0.040	56		
	0.230	91	97	Weighted Average, AMC Adjusted
	0.040			17.39% Pervious Area
	0.190			82.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	87	0.0400	1.20		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 18S: Q



Summary for Subcatchment 19S: R

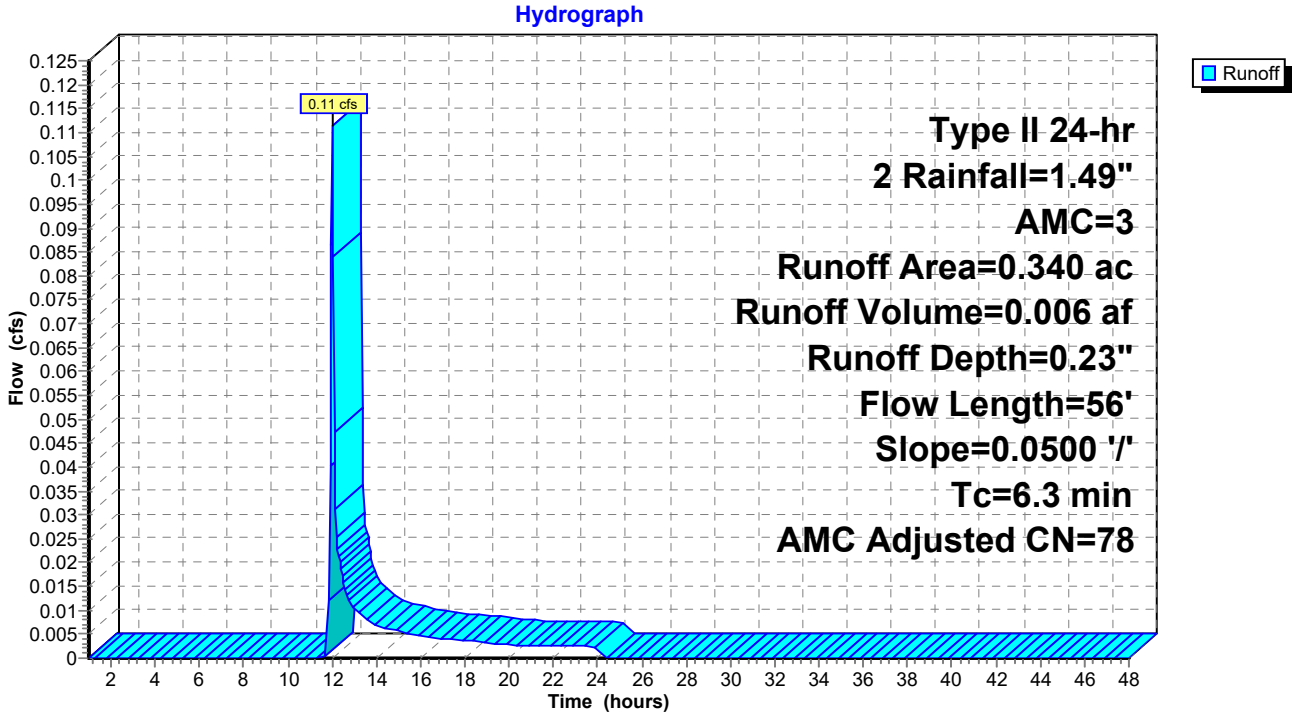
Runoff = 0.11 cfs @ 12.00 hrs, Volume= 0.006 af, Depth= 0.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.030	98		
*	0.310	56		
	0.340	60	78	Weighted Average, AMC Adjusted
	0.310			91.18% Pervious Area
	0.030			8.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	56	0.0500	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 1.49"

Subcatchment 19S: R



Summary for Subcatchment 50S: T

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

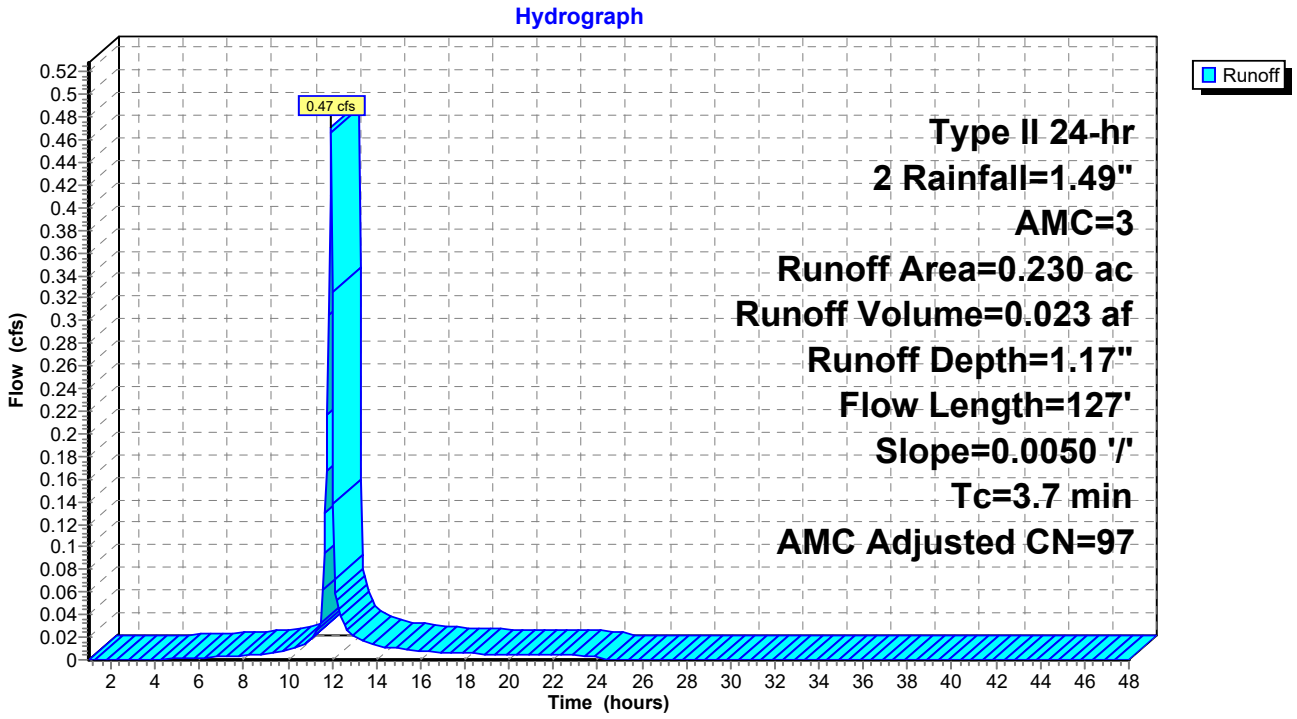
Runoff = 0.47 cfs @ 11.94 hrs, Volume= 0.023 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.190	98		
*	0.040	56		
	0.230	91	97	Weighted Average, AMC Adjusted
	0.040			17.39% Pervious Area
	0.190			82.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	127	0.0050	0.57		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 50S: T



Summary for Subcatchment 52S: U

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

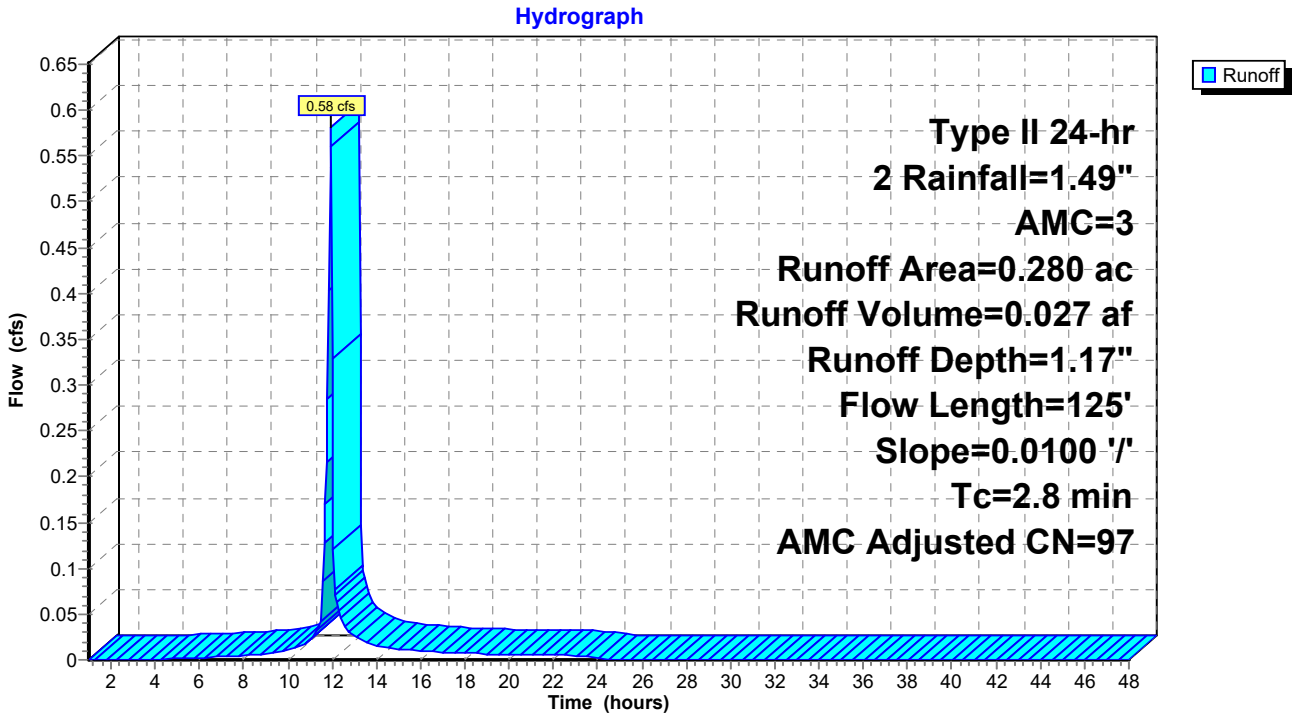
Runoff = 0.58 cfs @ 11.93 hrs, Volume= 0.027 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.240	98		
*	0.040	56		
	0.280	92	97	Weighted Average, AMC Adjusted
	0.040			14.29% Pervious Area
	0.240			85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	125	0.0100	0.74		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 52S: U



Summary for Subcatchment 55S: V

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

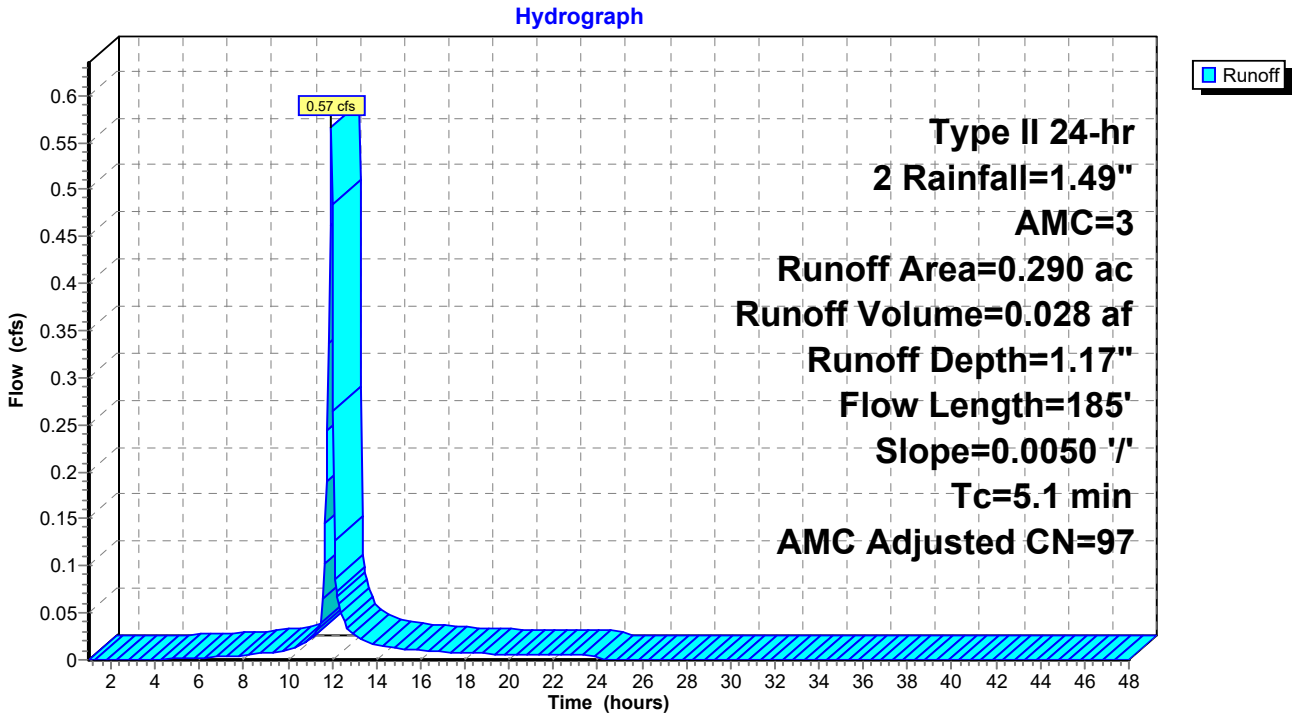
Runoff = 0.57 cfs @ 11.95 hrs, Volume= 0.028 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Rainfall=1.49", AMC=3

	Area (ac)	CN	Adj	Description
*	0.250	98		
*	0.040	56		
	0.290	92	97	Weighted Average, AMC Adjusted
	0.040			13.79% Pervious Area
	0.250			86.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	185	0.0050	0.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 55S: V



Summary for Reach 46R: REGIONAL SD

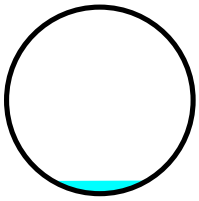
[52] Hint: Inlet/Outlet conditions not evaluated

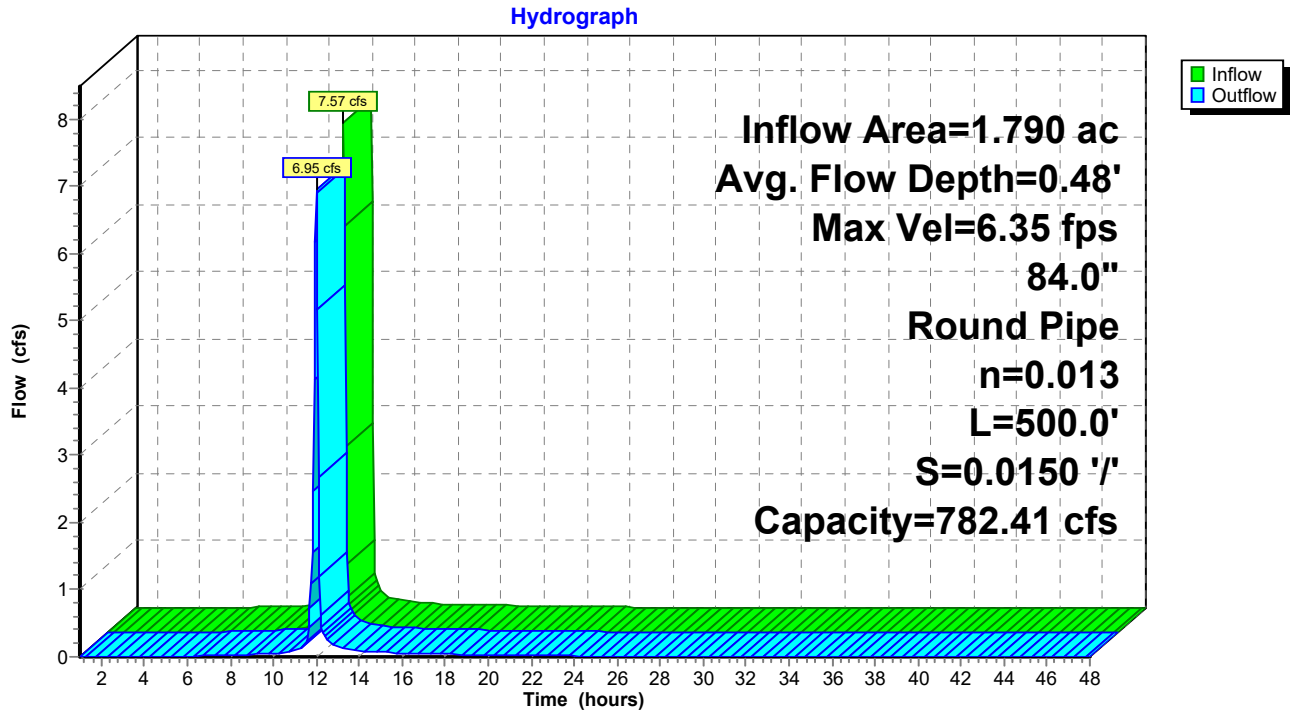
Inflow Area = 1.790 ac, 69.83% Impervious, Inflow Depth = 1.48" for 2 event
Inflow = 7.57 cfs @ 11.95 hrs, Volume= 0.221 af
Outflow = 6.95 cfs @ 11.99 hrs, Volume= 0.221 af, Atten= 8%, Lag= 2.3 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.35 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.91 fps, Avg. Travel Time= 4.4 min

Peak Storage= 567 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.48'
Bank-Full Depth= 7.00' Flow Area= 38.5 sf, Capacity= 782.41 cfs

84.0" Round Pipe
n= 0.013
Length= 500.0' Slope= 0.0150 '/'
Inlet Invert= 25.10', Outlet Invert= 17.60'





Summary for Pond 20P: DT-1

Inflow Area = 1.780 ac, 84.83% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 3.34 cfs @ 11.95 hrs, Volume= 0.174 af
Outflow = 0.18 cfs @ 12.87 hrs, Volume= 0.174 af, Atten= 95%, Lag= 55.0 min
Discarded = 0.18 cfs @ 12.87 hrs, Volume= 0.174 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 33.89' @ 12.87 hrs Surf.Area= 0.210 ac Storage= 0.080 af

Plug-Flow detention time= 159.7 min calculated for 0.174 af (100% of inflow)
Center-of-Mass det. time= 159.6 min (944.3 - 784.7)

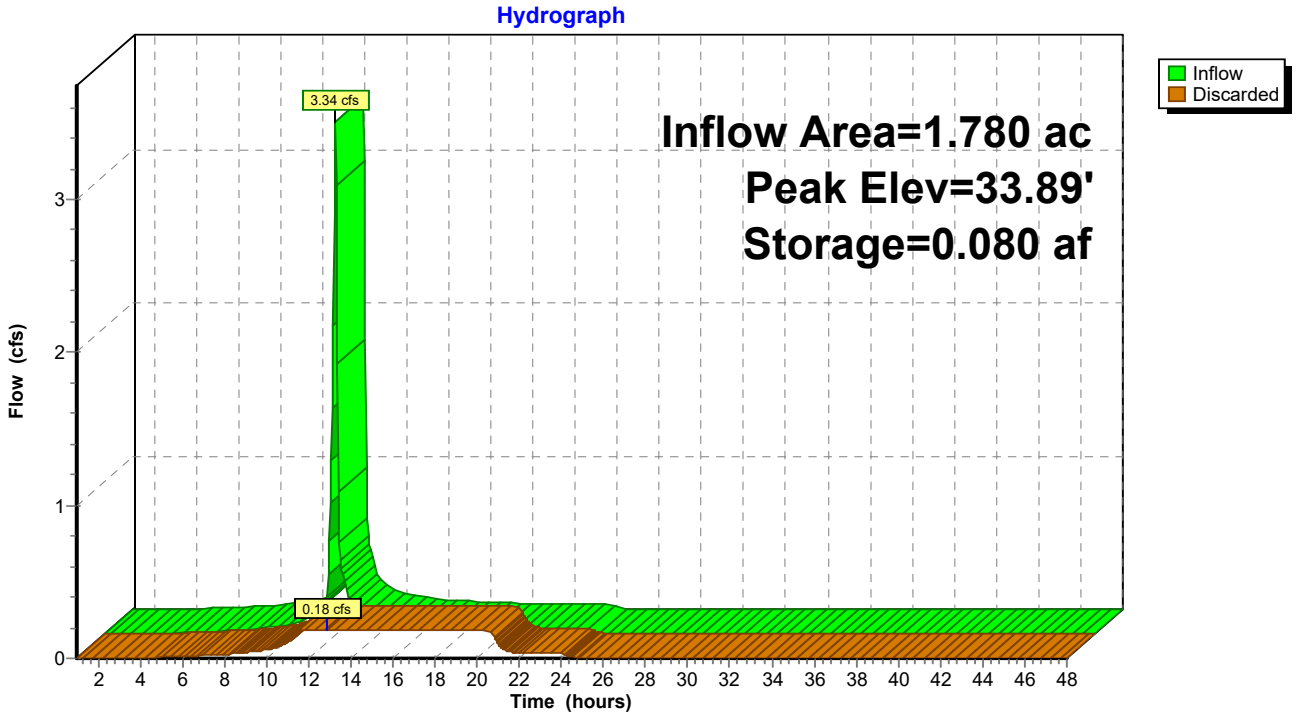
Volume	Invert	Avail.Storage	Storage Description
#1	33.50'	0.509 af	**Custom Stage Data (Irregular)** Listed below (Recalc) 0.525 af Overall x 97.0% Voids

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
33.50	0.210	402.0	0.000	0.000	0.210
36.00	0.210	402.0	0.525	0.525	0.233

Device	Routing	Invert	Outlet Devices
#1	Discarded	33.50'	**0.850 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.18 cfs @ 12.87 hrs HW=33.89' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Pond 20P: DT-1


Hydrograph
Inflow
Discarded
3.34 cfs
0.18 cfs
Inflow Area=1.780 ac
Peak Elev=33.89'
Storage=0.080 af
Flow (cfs)
0
1
2
3
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Pond 22P: CB-P

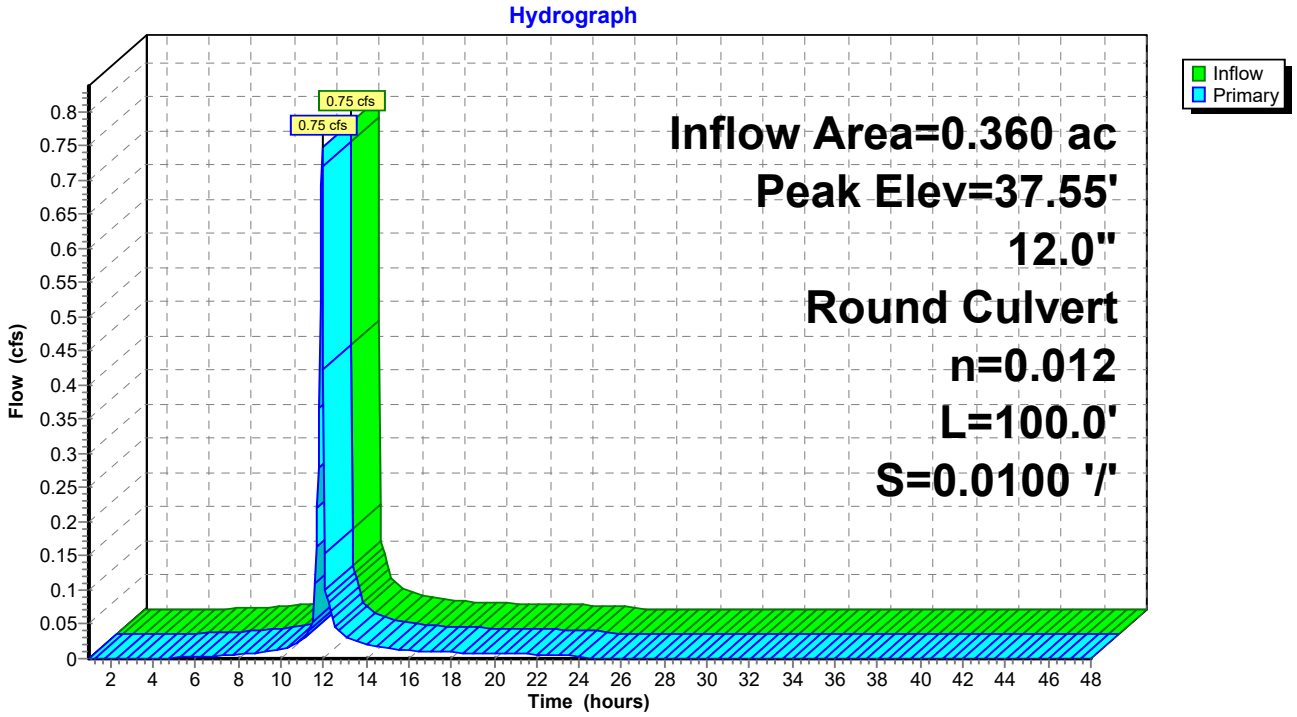
Inflow Area = 0.360 ac, 83.33% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 0.75 cfs @ 11.93 hrs, Volume= 0.035 af
Outflow = 0.75 cfs @ 11.93 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min
Primary = 0.75 cfs @ 11.93 hrs, Volume= 0.035 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.55' @ 11.93 hrs
Flood Elev= 40.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	37.00'	**12.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 37.00' / 36.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.71 cfs @ 11.93 hrs HW=37.53' (Free Discharge)
1=Culvert (Inlet Controls 0.71 cfs @ 1.69 fps)

Pond 22P: CB-P



Summary for Pond 24P: CB-M

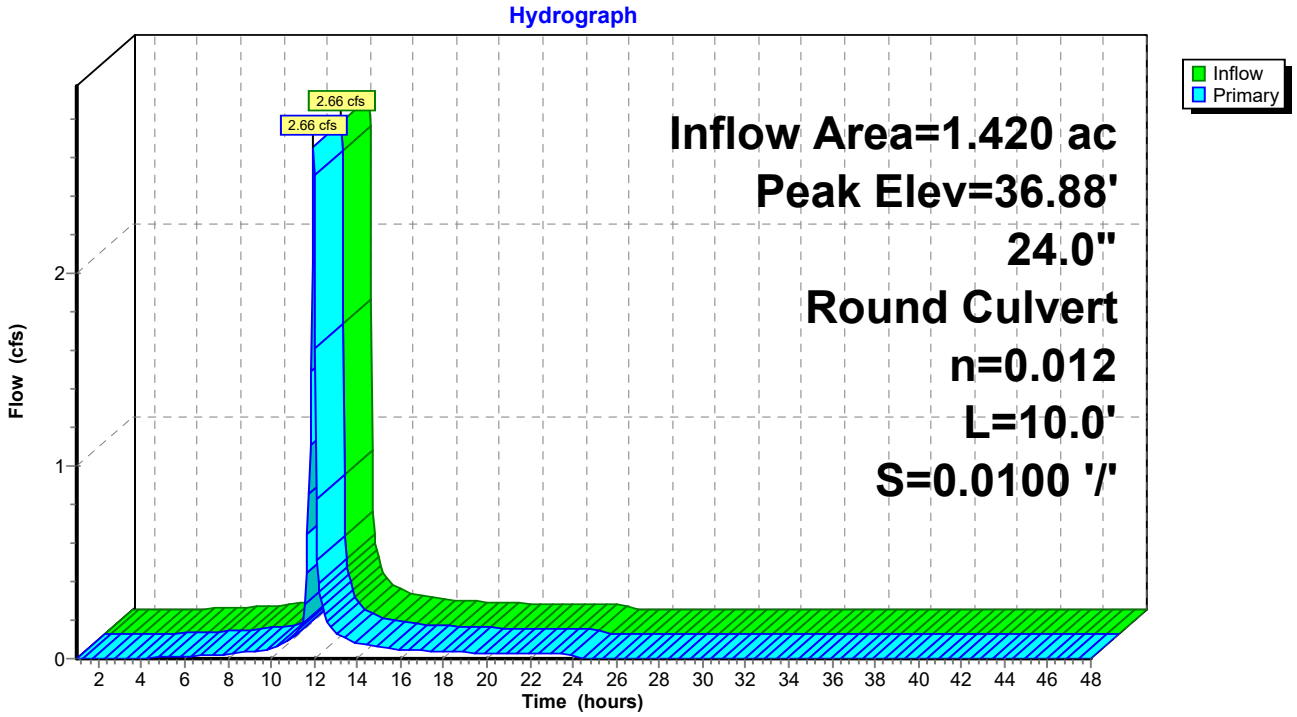
Inflow Area = 1.420 ac, 85.21% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 2.66 cfs @ 11.97 hrs, Volume= 0.139 af
Outflow = 2.66 cfs @ 11.97 hrs, Volume= 0.139 af, Atten= 0%, Lag= 0.0 min
Primary = 2.66 cfs @ 11.97 hrs, Volume= 0.139 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 36.88' @ 11.97 hrs
Flood Elev= 40.89'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.00'	**24.0" Round Culvert** L= 10.0' Ke= 1.200 Inlet / Outlet Invert= 36.00' / 35.90' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=2.58 cfs @ 11.97 hrs HW=36.86' (Free Discharge)
1=Culvert (Barrel Controls 2.58 cfs @ 2.93 fps)

Pond 24P: CB-M



Summary for Pond 26P: CB-N

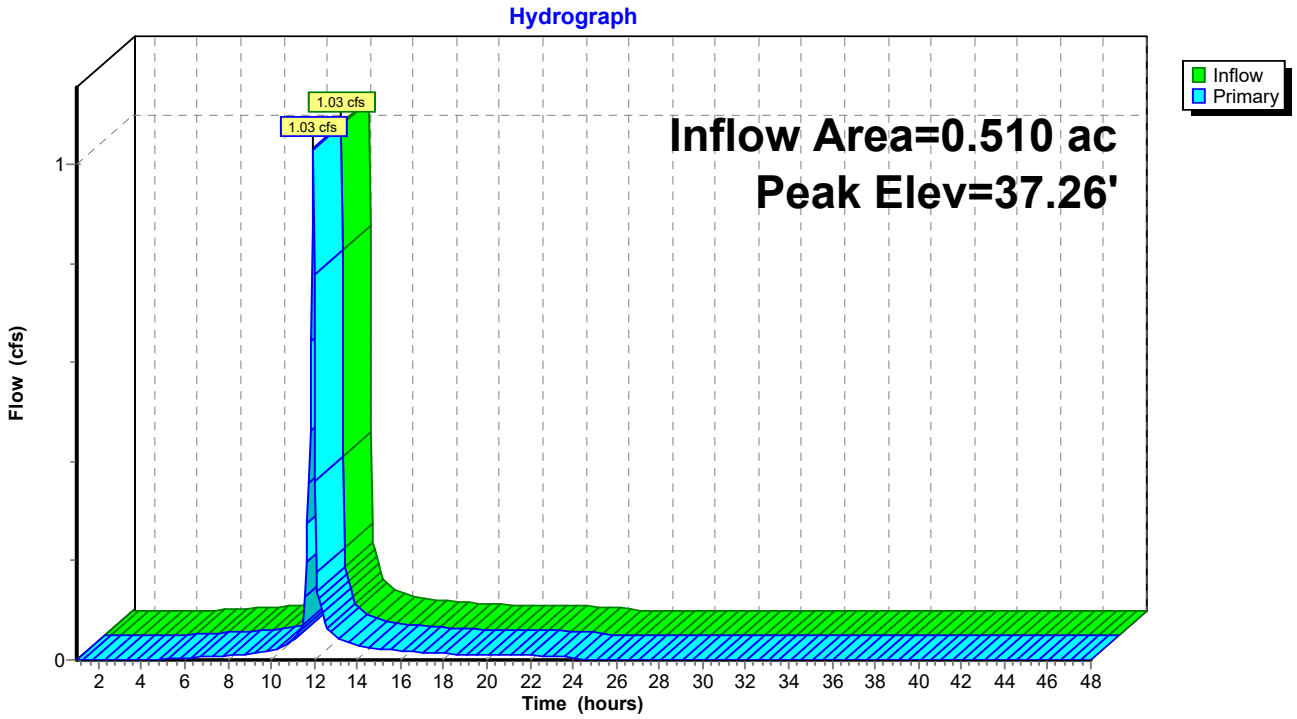
Inflow Area = 0.510 ac, 84.31% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 1.03 cfs @ 11.94 hrs, Volume= 0.050 af
Outflow = 1.03 cfs @ 11.94 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.0 min
Primary = 1.03 cfs @ 11.94 hrs, Volume= 0.050 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.26' @ 11.94 hrs
Flood Elev= 39.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.57'	**12.0" x 12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	36.60'	**12.0" Round Culvert** L= 10.0' Ke= 1.200 Inlet / Outlet Invert= 36.60' / 36.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.01 cfs @ 11.94 hrs HW=37.26' (Free Discharge)
1=Orifice/Grate (Controls 0.00 cfs)
2=Culvert (Barrel Controls 1.01 cfs @ 2.62 fps)

Pond 26P: CB-N



Summary for Pond 27P: CB-O

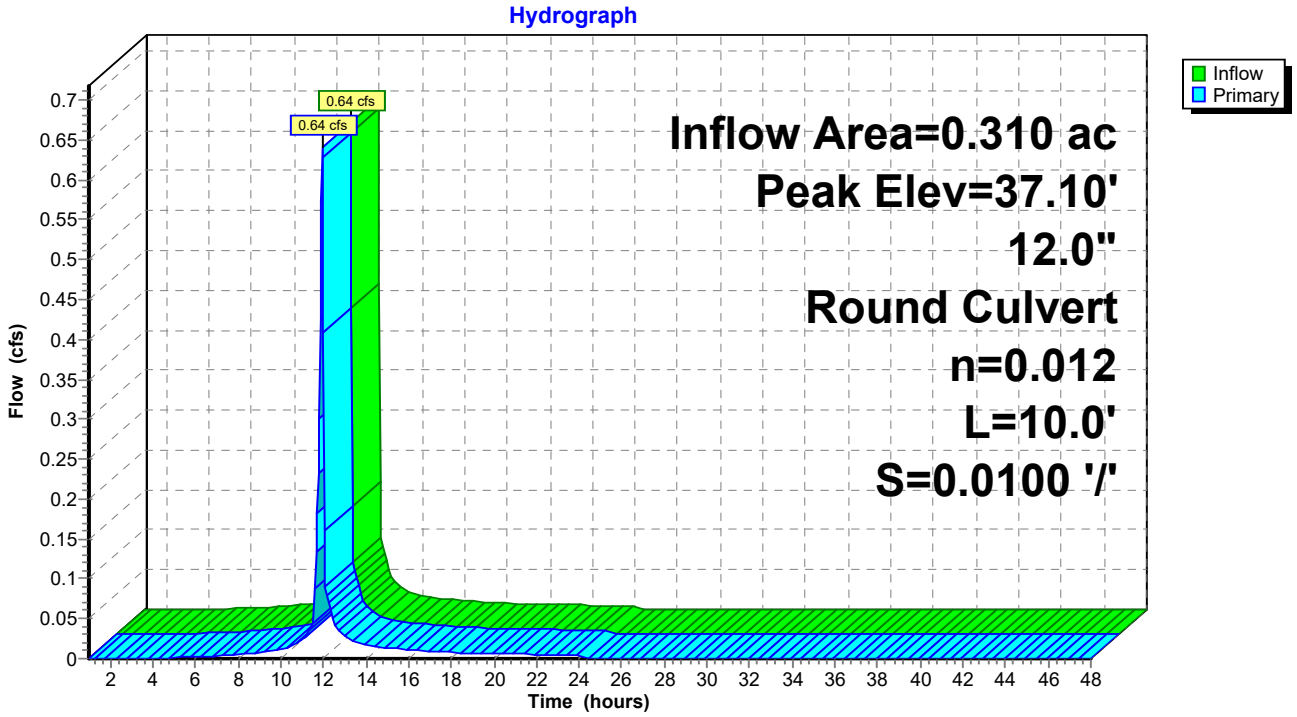
Inflow Area = 0.310 ac, 83.87% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 0.64 cfs @ 11.94 hrs, Volume= 0.030 af
Outflow = 0.64 cfs @ 11.94 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min
Primary = 0.64 cfs @ 11.94 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.10' @ 11.93 hrs
Flood Elev= 39.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.60'	**12.0" Round Culvert** L= 10.0' Ke= 1.200 Inlet / Outlet Invert= 36.60' / 36.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.61 cfs @ 11.94 hrs HW=37.09' (Free Discharge)
1=Culvert (Barrel Controls 0.61 cfs @ 2.36 fps)

Pond 27P: CB-O



Summary for Pond 28P: DT-2

Inflow Area = 1.060 ac, 84.91% Impervious, Inflow Depth = 1.20" for 2 event
Inflow = 2.16 cfs @ 11.94 hrs, Volume= 0.106 af
Outflow = 0.10 cfs @ 12.99 hrs, Volume= 0.106 af, Atten= 95%, Lag= 62.9 min
Discarded = 0.10 cfs @ 12.99 hrs, Volume= 0.106 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 31.97' @ 12.99 hrs Surf.Area= 0.110 ac Storage= 0.050 af

Plug-Flow detention time= 189.3 min calculated for 0.106 af (100% of inflow)
Center-of-Mass det. time= 189.2 min (969.4 - 780.3)

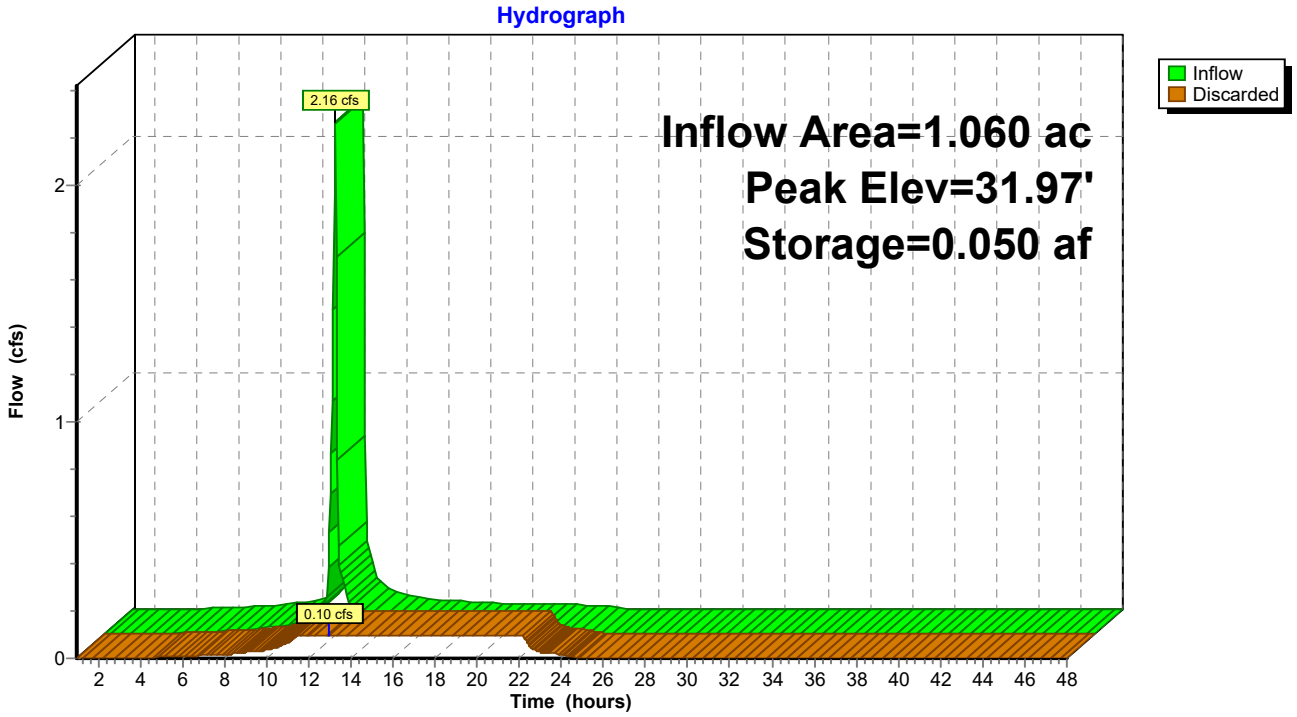
Volume	Invert	Avail.Storage	Storage Description
#1	31.50'	0.267 af	**Custom Stage Data (Irregular)** Listed below (Recalc) 0.275 af Overall x 97.0% Voids

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
31.50	0.110	477.0	0.000	0.000	0.110
34.00	0.110	477.0	0.275	0.275	0.137

Device	Routing	Invert	Outlet Devices
#1	Discarded	31.50'	**0.850 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.10 cfs @ 12.99 hrs HW=31.97' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.10 cfs)

Pond 28P: DT-2


Hydrograph
Inflow
Discarded
2.16 cfs
0.10 cfs
Inflow Area=1.060 ac
Peak Elev=31.97'
Storage=0.050 af
Flow (cfs)
0
1
2
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Pond 29P: CB-L

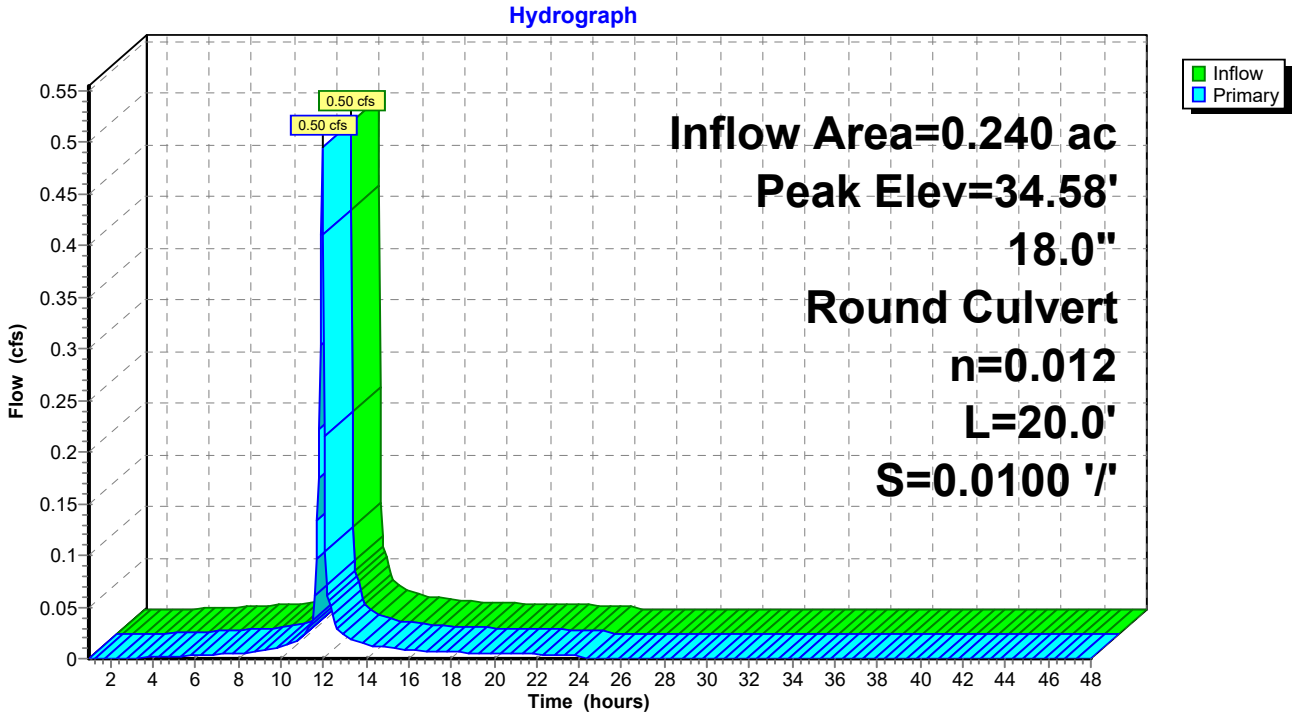
Inflow Area = 0.240 ac, 87.50% Impervious, Inflow Depth = 1.27" for 2 event
Inflow = 0.50 cfs @ 11.95 hrs, Volume= 0.025 af
Outflow = 0.50 cfs @ 11.95 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.0 min
Primary = 0.50 cfs @ 11.95 hrs, Volume= 0.025 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 34.58' @ 11.95 hrs
Flood Elev= 37.15'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.20'	**18.0" Round Culvert** L= 20.0' Ke= 1.200 Inlet / Outlet Invert= 34.20' / 34.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.49 cfs @ 11.95 hrs HW=34.58' (Free Discharge)
1=Culvert (Inlet Controls 0.49 cfs @ 1.42 fps)

Pond 29P: CB-L



Summary for Pond 30P: CB-I

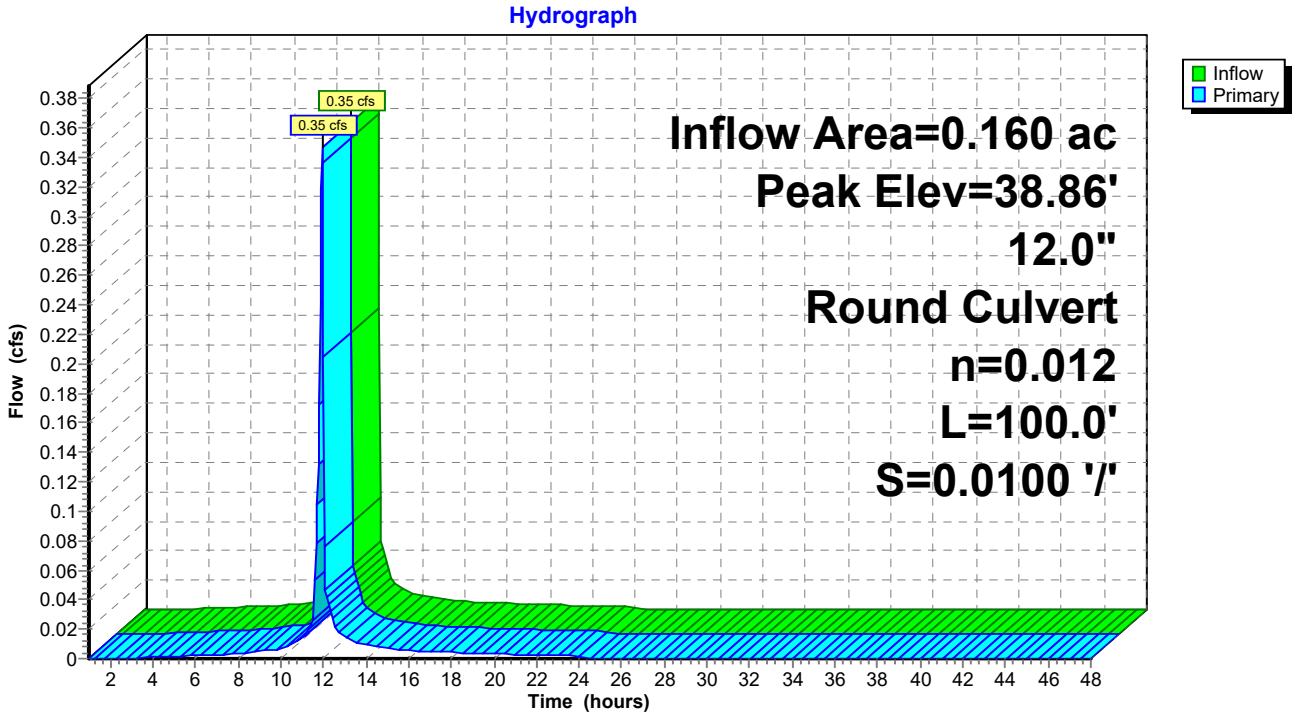
Inflow Area = 0.160 ac, 87.50% Impervious, Inflow Depth = 1.27" for 2 event
Inflow = 0.35 cfs @ 11.93 hrs, Volume= 0.017 af
Outflow = 0.35 cfs @ 11.93 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Primary = 0.35 cfs @ 11.93 hrs, Volume= 0.017 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 38.86' @ 11.93 hrs
Flood Elev= 41.99'

Device	Routing	Invert	Outlet Devices
#1	Primary	38.50'	**12.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 38.50' / 37.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.33 cfs @ 11.93 hrs HW=38.85' (Free Discharge)
1=Culvert (Inlet Controls 0.33 cfs @ 1.37 fps)

Pond 30P: CB-I



Summary for Pond 31P: CB-J

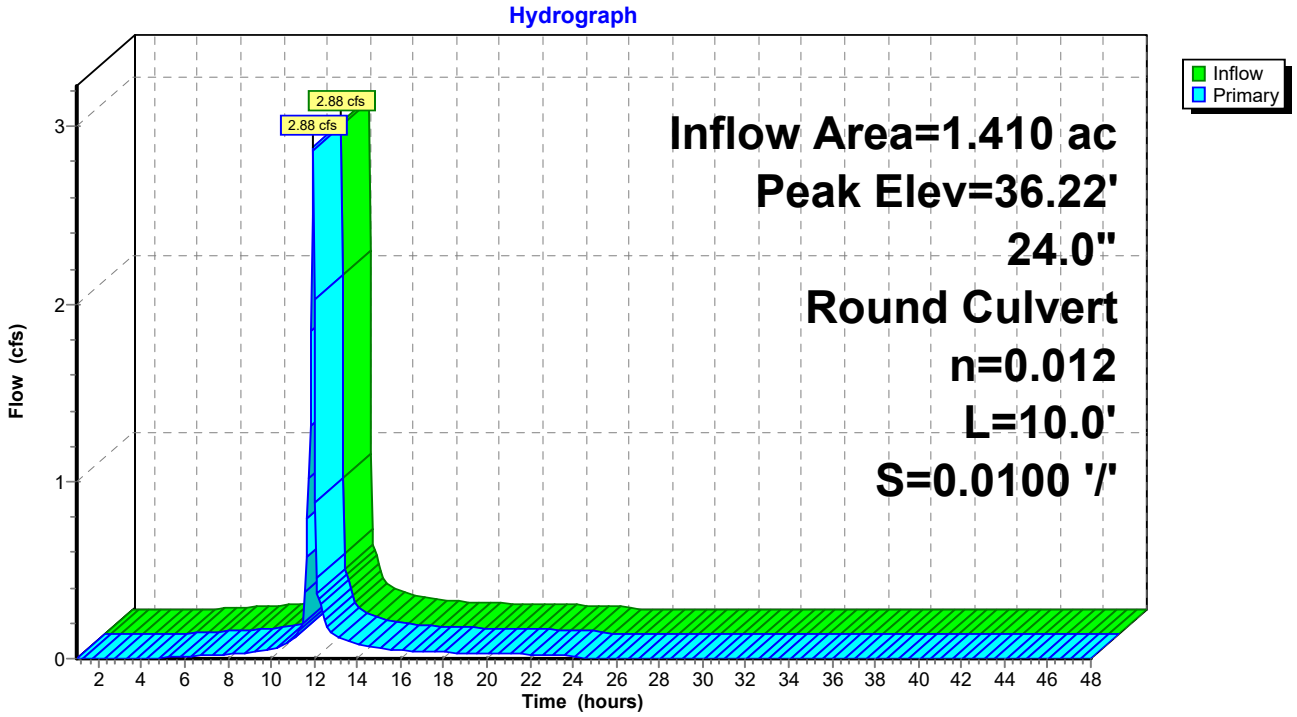
Inflow Area = 1.410 ac, 85.11% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 2.88 cfs @ 11.94 hrs, Volume= 0.138 af
Outflow = 2.88 cfs @ 11.94 hrs, Volume= 0.138 af, Atten= 0%, Lag= 0.0 min
Primary = 2.88 cfs @ 11.94 hrs, Volume= 0.138 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 36.22' @ 11.94 hrs
Flood Elev= 38.26'

Device	Routing	Invert	Outlet Devices
#1	Primary	35.30'	**24.0" Round Culvert** L= 10.0' Ke= 1.200 Inlet / Outlet Invert= 35.30' / 35.20' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=2.79 cfs @ 11.94 hrs HW=36.20' (Free Discharge)
└**1=Culvert** (Barrel Controls 2.79 cfs @ 2.98 fps)

Pond 31P: CB-J



Summary for Pond 32P: DT-3

Inflow Area = 1.570 ac, 85.35% Impervious, Inflow Depth = 1.18" for 2 event
Inflow = 3.23 cfs @ 11.94 hrs, Volume= 0.155 af
Outflow = 0.15 cfs @ 12.95 hrs, Volume= 0.155 af, Atten= 95%, Lag= 61.0 min
Discarded = 0.15 cfs @ 12.95 hrs, Volume= 0.155 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 33.03' @ 12.95 hrs Surf.Area= 0.170 ac Storage= 0.073 af

Plug-Flow detention time= 181.6 min calculated for 0.155 af (100% of inflow)
Center-of-Mass det. time= 181.3 min (962.9 - 781.6)

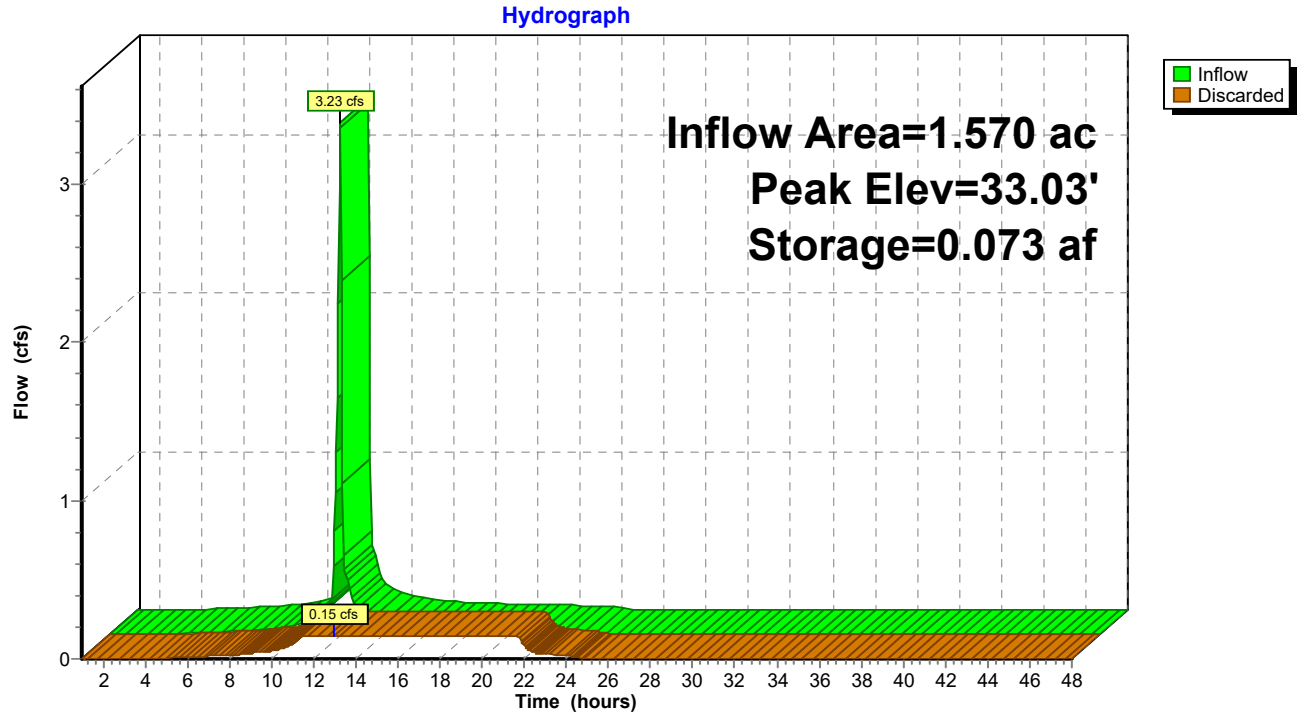
Volume	Invert	Avail.Storage	Storage Description
#1	32.60'	0.425 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
32.60	0.170	403.0	0.000	0.000	0.170
35.10	0.170	403.0	0.425	0.425	0.193

Device	Routing	Invert	Outlet Devices
#1	Discarded	32.60'	**0.850 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.15 cfs @ 12.95 hrs HW=33.03' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Pond 32P: DT-3



Summary for Pond 33P: CB-G

Inflow Area = 0.780 ac, 84.62% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 1.48 cfs @ 11.96 hrs, Volume= 0.076 af
Outflow = 1.48 cfs @ 11.96 hrs, Volume= 0.076 af, Atten= 0%, Lag= 0.0 min
Primary = 0.84 cfs @ 11.96 hrs, Volume= 0.068 af
Secondary = 0.65 cfs @ 11.96 hrs, Volume= 0.009 af

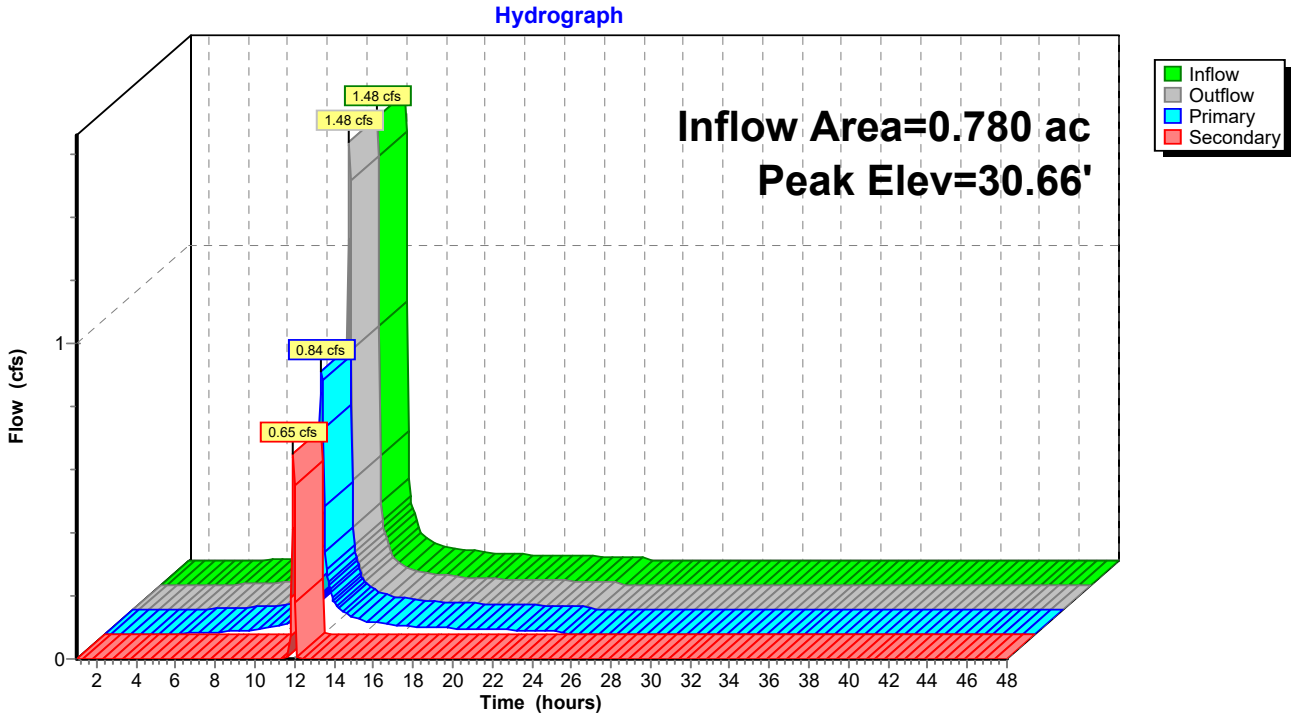
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 30.66' @ 11.96 hrs
Flood Elev= 32.88'

Device	Routing	Invert	Outlet Devices
#1	Primary	29.80'	**8.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 29.80' / 28.80' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Secondary	30.23'	**18.0" Round Culvert** L= 15.0' Ke= 1.200 Inlet / Outlet Invert= 30.23' / 30.08' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.83 cfs @ 11.96 hrs HW=30.65' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.83 cfs @ 2.37 fps)

Secondary OutFlow Max=0.62 cfs @ 11.96 hrs HW=30.65' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.62 cfs @ 1.51 fps)

Pond 33P: CB-G



Summary for Pond 34P: CB-K

Inflow Area = 0.940 ac, 85.11% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 1.85 cfs @ 11.95 hrs, Volume= 0.092 af
Outflow = 1.85 cfs @ 11.95 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min
Primary = 1.08 cfs @ 11.95 hrs, Volume= 0.083 af
Secondary = 0.77 cfs @ 11.95 hrs, Volume= 0.009 af

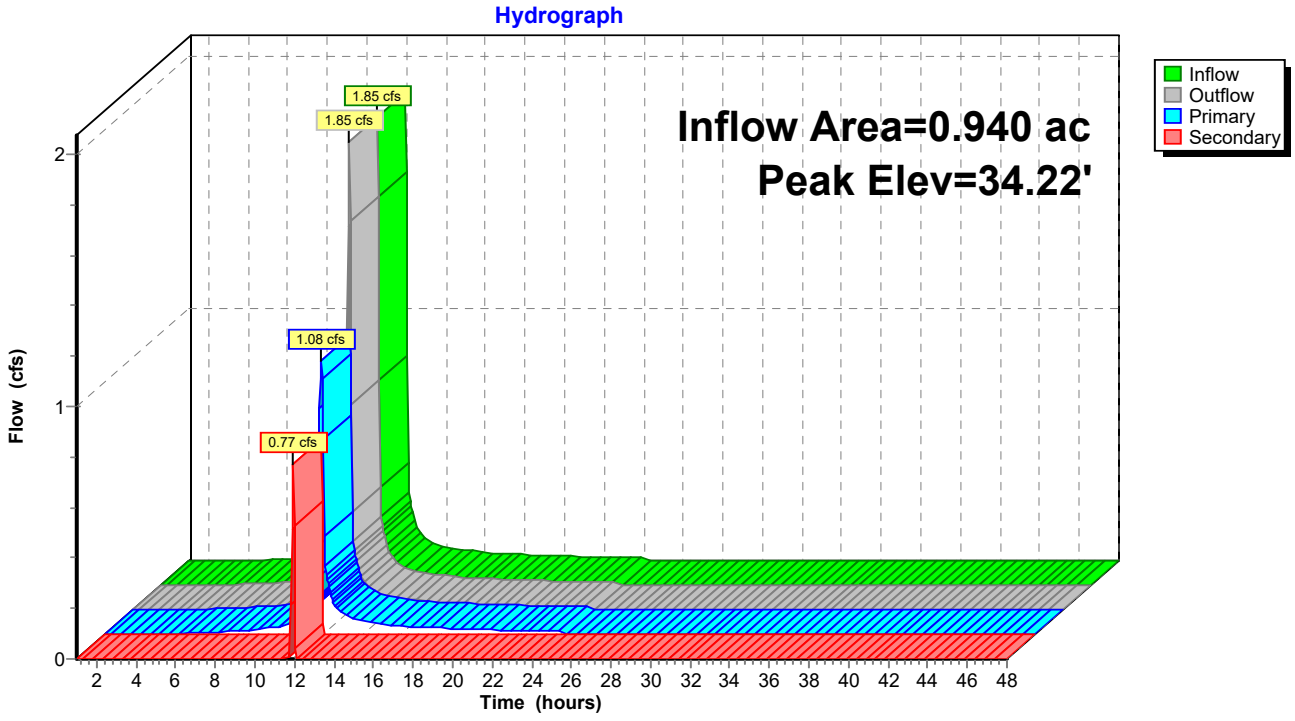
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 34.22' @ 11.95 hrs
Flood Elev= 36.06'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.00'	**8.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 33.00' / 32.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Secondary	33.67'	**12.0" Round Culvert** L= 20.0' Ke= 1.200 Inlet / Outlet Invert= 33.67' / 32.78' S= 0.0445 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.08 cfs @ 11.95 hrs HW=34.22' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.08 cfs @ 3.09 fps)

Secondary OutFlow Max=0.77 cfs @ 11.95 hrs HW=34.22' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.77 cfs @ 1.72 fps)

Pond 34P: CB-K



Summary for Pond 36P: CB-F

Inflow Area = 2.550 ac, 85.10% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 4.21 cfs @ 12.01 hrs, Volume= 0.249 af
Outflow = 4.21 cfs @ 12.01 hrs, Volume= 0.249 af, Atten= 0%, Lag= 0.0 min
Primary = 3.31 cfs @ 12.02 hrs, Volume= 0.239 af
Secondary = 0.90 cfs @ 12.01 hrs, Volume= 0.010 af

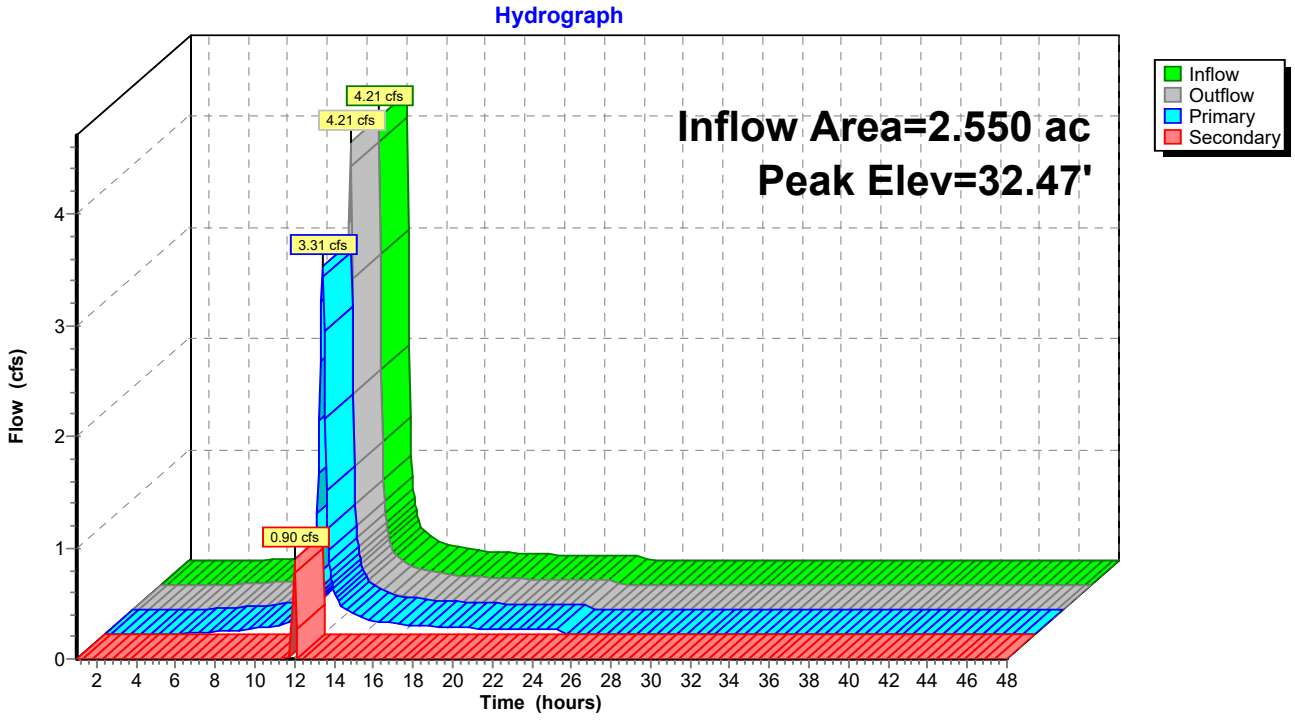
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 32.47' @ 12.02 hrs
Flood Elev= 35.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.17'	**15.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 31.17' / 30.17' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Secondary	32.00'	**24.0" Round Culvert** L= 200.0' Ke= 1.200 Inlet / Outlet Invert= 32.00' / 30.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=3.27 cfs @ 12.02 hrs HW=32.45' (Free Discharge)
└**1=Culvert** (Inlet Controls 3.27 cfs @ 2.67 fps)

Secondary OutFlow Max=0.84 cfs @ 12.01 hrs HW=32.46' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.84 cfs @ 1.57 fps)

Pond 36P: CB-F



Summary for Pond 37P: CB-C

Inflow Area = 0.420 ac, 85.71% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 0.86 cfs @ 11.94 hrs, Volume= 0.041 af
Outflow = 0.86 cfs @ 11.94 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.0 min
Primary = 0.81 cfs @ 11.94 hrs, Volume= 0.041 af
Secondary = 0.05 cfs @ 11.95 hrs, Volume= 0.000 af

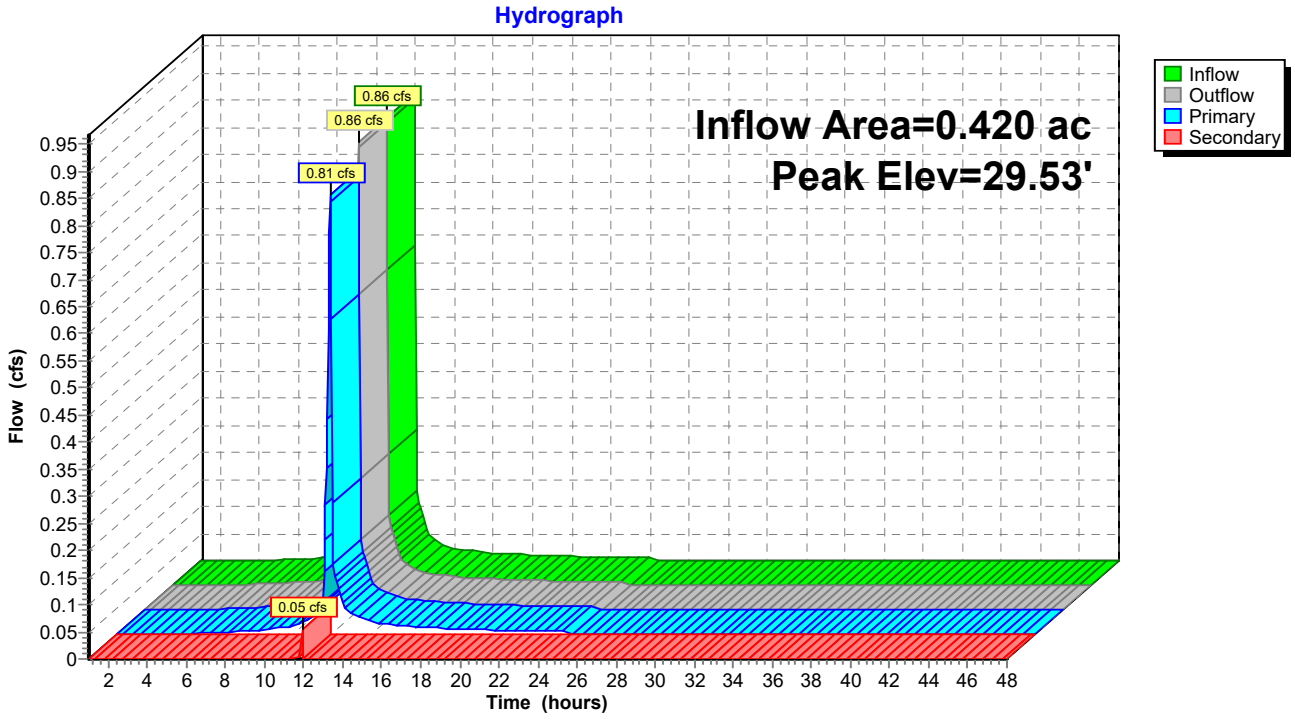
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 29.53' @ 11.94 hrs
Flood Elev= 32.01'

Device	Routing	Invert	Outlet Devices
#1	Primary	28.70'	**8.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 28.70' / 27.70' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Secondary	29.37'	**8.0" Round Culvert** L= 200.0' Ke= 1.200 Inlet / Outlet Invert= 29.37' / 27.67' S= 0.0085 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.78 cfs @ 11.94 hrs HW=29.50' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.78 cfs @ 2.24 fps)

Secondary OutFlow Max=0.05 cfs @ 11.95 hrs HW=29.51' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.05 cfs @ 0.88 fps)

Pond 37P: CB-C



Summary for Pond 38P: CB-D

Inflow Area = 1.820 ac, 85.16% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 3.38 cfs @ 11.97 hrs, Volume= 0.178 af
Outflow = 3.38 cfs @ 11.97 hrs, Volume= 0.178 af, Atten= 0%, Lag= 0.0 min
Primary = 2.19 cfs @ 11.97 hrs, Volume= 0.163 af
Secondary = 1.19 cfs @ 11.97 hrs, Volume= 0.015 af

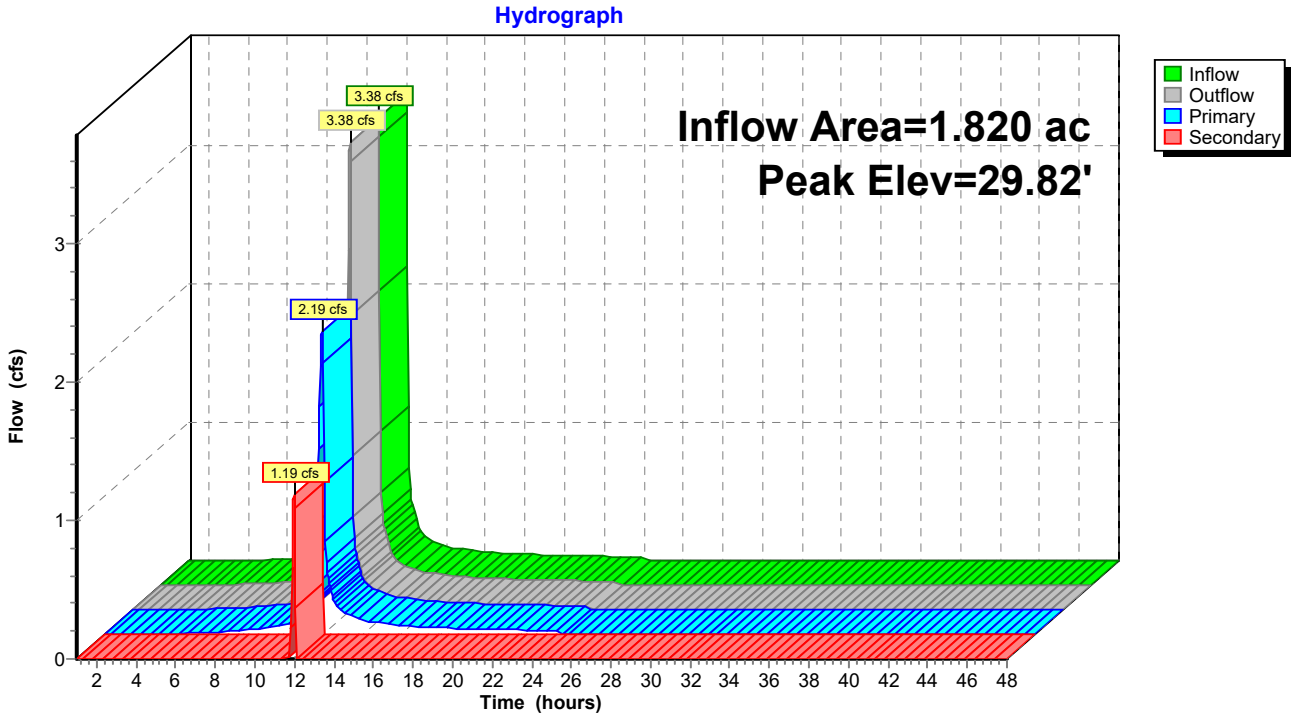
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 29.82' @ 11.97 hrs
Flood Elev= 31.59'

Device	Routing	Invert	Outlet Devices
#1	Primary	28.60'	**12.0" Round Culvert** L= 40.0' Ke= 1.200 Inlet / Outlet Invert= 28.60' / 28.20' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Secondary	29.27'	**24.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 29.27' / 28.27' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=2.16 cfs @ 11.97 hrs HW=29.80' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.16 cfs @ 2.75 fps)

Secondary OutFlow Max=1.13 cfs @ 11.97 hrs HW=29.80' (Free Discharge)
└**2=Culvert** (Inlet Controls 1.13 cfs @ 1.69 fps)

Pond 38P: CB-D



Summary for Pond 39P: DT-4

Inflow Area = 5.860 ac, 85.15% Impervious, Inflow Depth = 1.10" for 2 event
Inflow = 7.47 cfs @ 11.97 hrs, Volume= 0.539 af
Outflow = 0.39 cfs @ 13.67 hrs, Volume= 0.539 af, Atten= 95%, Lag= 101.8 min
Discarded = 0.39 cfs @ 13.67 hrs, Volume= 0.539 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 25.81' @ 13.67 hrs Surf.Area= 0.440 ac Storage= 0.262 af

Plug-Flow detention time= 270.6 min calculated for 0.539 af (100% of inflow)
Center-of-Mass det. time= 270.3 min (1,061.5 - 791.2)

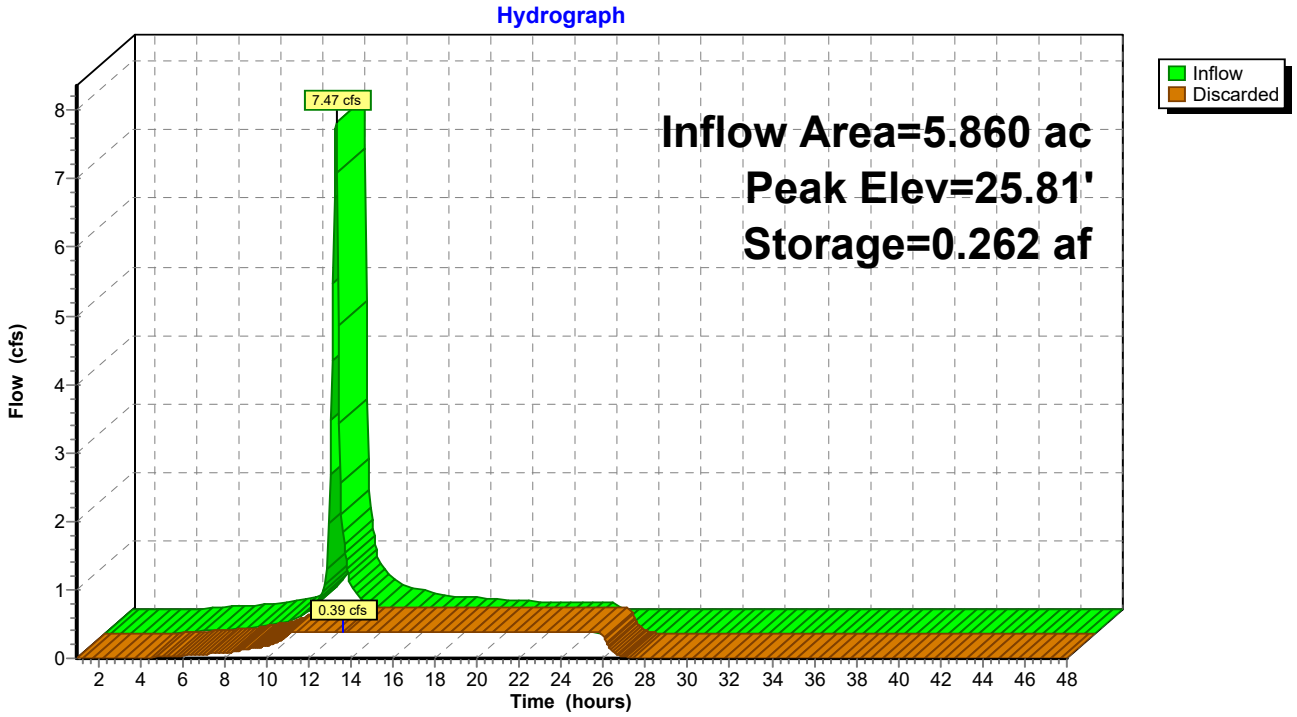
Volume	Invert	Avail.Storage	Storage Description
#1	25.20'	1.067 af	**Custom Stage Data (Irregular)** Listed below (Recalc) 1.100 af Overall x 97.0% Voids

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
25.20	0.440	871.0	0.000	0.000	0.440
27.70	0.440	871.0	1.100	1.100	0.490

Device	Routing	Invert	Outlet Devices
#1	Discarded	25.20'	**0.850 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.39 cfs @ 13.67 hrs HW=25.81' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.39 cfs)

Pond 39P: DT-4


Hydrograph
Inflow
Discarded
7.47 cfs
0.39 cfs
Inflow Area=5.860 ac
Peak Elev=25.81'
Storage=0.262 af
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48

Summary for Pond 40P: CB-E

Inflow Area = 0.320 ac, 84.38% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 0.51 cfs @ 12.02 hrs, Volume= 0.031 af
Outflow = 0.51 cfs @ 12.02 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min
Primary = 0.20 cfs @ 12.02 hrs, Volume= 0.026 af
Secondary = 0.31 cfs @ 12.02 hrs, Volume= 0.006 af

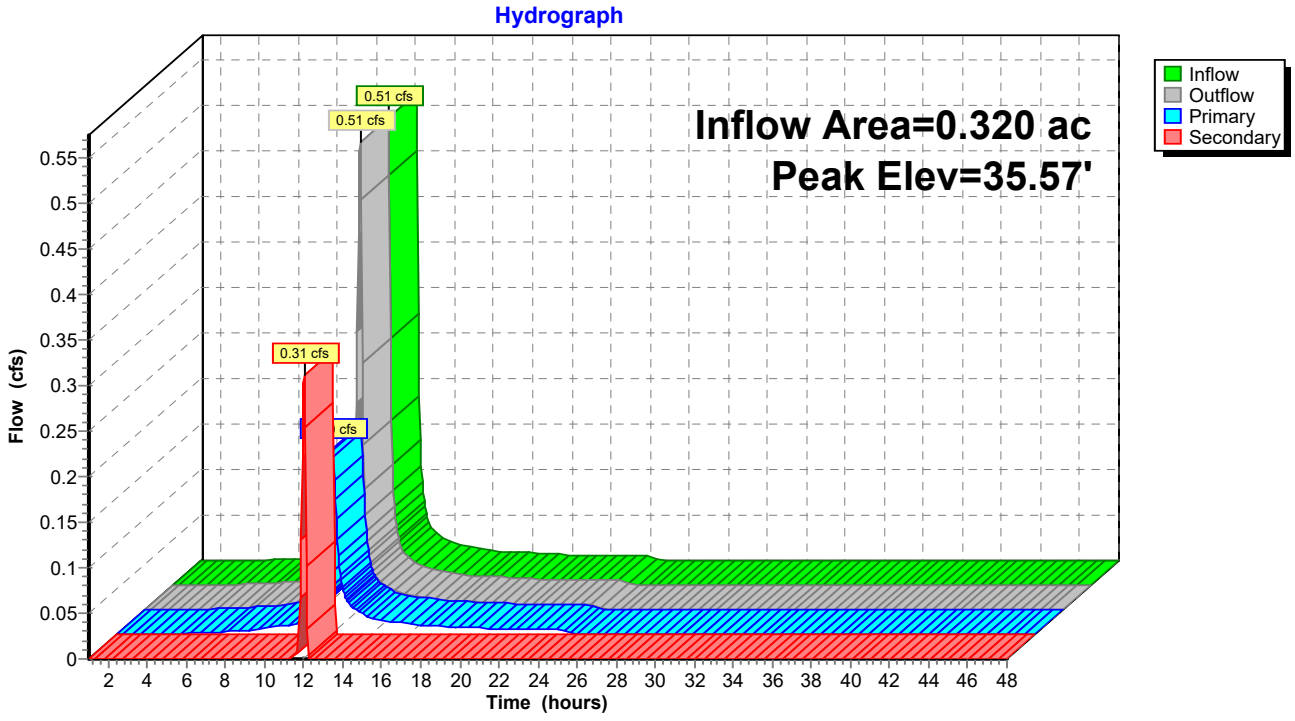
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 35.57' @ 12.02 hrs
Flood Elev= 37.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.90'	**4.0" Round Culvert** L= 75.0' Ke= 1.200 Inlet / Outlet Invert= 34.90' / 34.15' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Secondary	35.23'	**12.0" Round Culvert** L= 200.0' Ke= 1.200 Inlet / Outlet Invert= 35.23' / 33.40' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.20 cfs @ 12.02 hrs HW=35.56' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.20 cfs @ 2.31 fps)

Secondary OutFlow Max=0.30 cfs @ 12.02 hrs HW=35.56' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.30 cfs @ 1.33 fps)

Pond 40P: CB-E



Summary for Pond 41P: DT-6

Inflow Area = 1.290 ac, 84.50% Impervious, Inflow Depth = 0.90" for 2 event
Inflow = 0.71 cfs @ 11.95 hrs, Volume= 0.097 af
Outflow = 0.07 cfs @ 14.08 hrs, Volume= 0.097 af, Atten= 90%, Lag= 128.0 min
Discarded = 0.07 cfs @ 14.08 hrs, Volume= 0.097 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 28.04' @ 14.08 hrs Surf.Area= 0.075 ac Storage= 0.040 af

Plug-Flow detention time= 235.5 min calculated for 0.097 af (100% of inflow)
Center-of-Mass det. time= 235.4 min (1,041.6 - 806.2)

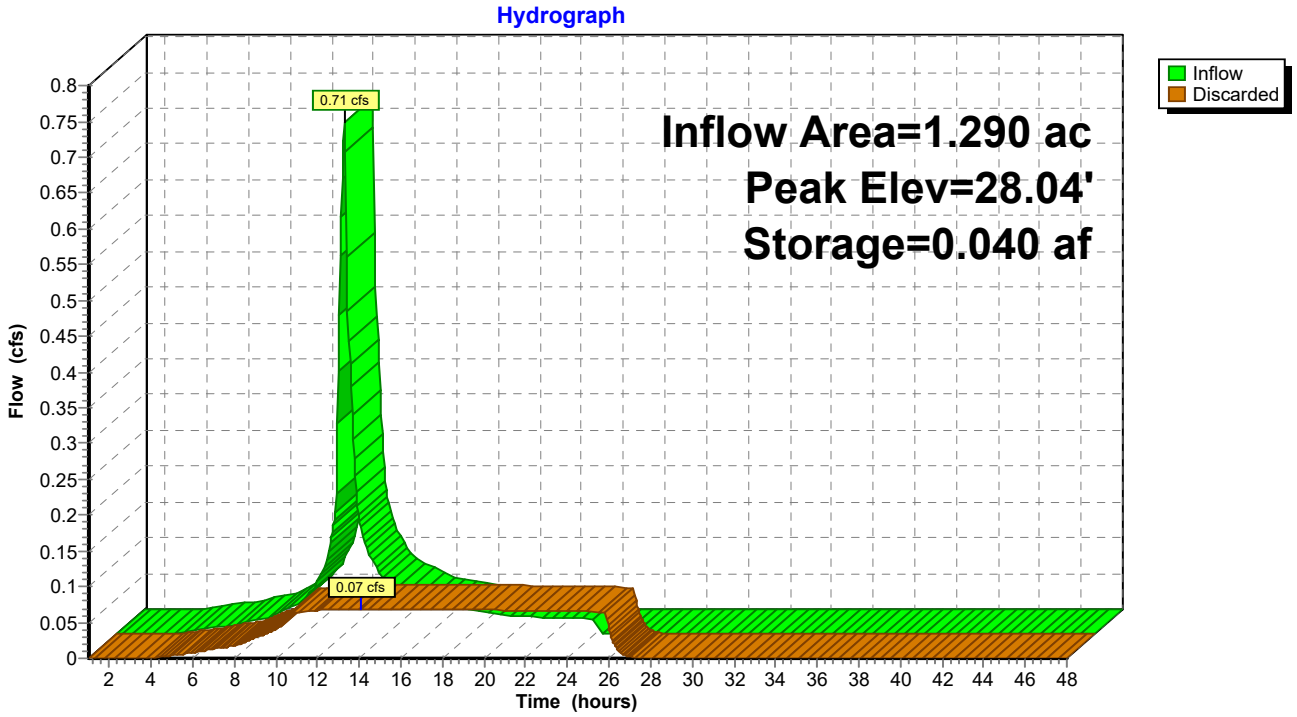
Volume	Invert	Avail.Storage	Storage Description
#1	27.50'	0.182 af	**Custom Stage Data (Irregular)** Listed below (Recalc) 0.187 af Overall x 97.0% Voids

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
27.50	0.075	482.0	0.000	0.000	0.075
30.00	0.075	482.0	0.187	0.187	0.103

Device	Routing	Invert	Outlet Devices
#1	Discarded	27.50'	**0.850 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.07 cfs @ 14.08 hrs HW=28.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.07 cfs)

Pond 41P: DT-6


Hydrograph
Inflow
Discarded
Inflow Area=1.290 ac
Peak Elev=28.04'
Storage=0.040 af
0.71 cfs
0.07 cfs
Flow (cfs)
Time (hours)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
0.55
0.6
0.65
0.7
0.75
0.8
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 42P: CB-B

[57] Hint: Peaked at 32.99' (Flood elevation advised)

Inflow Area = 0.230 ac, 82.61% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 0.48 cfs @ 11.93 hrs, Volume= 0.023 af
Outflow = 0.48 cfs @ 11.93 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min
Primary = 0.24 cfs @ 11.93 hrs, Volume= 0.020 af
Secondary = 0.23 cfs @ 11.93 hrs, Volume= 0.003 af

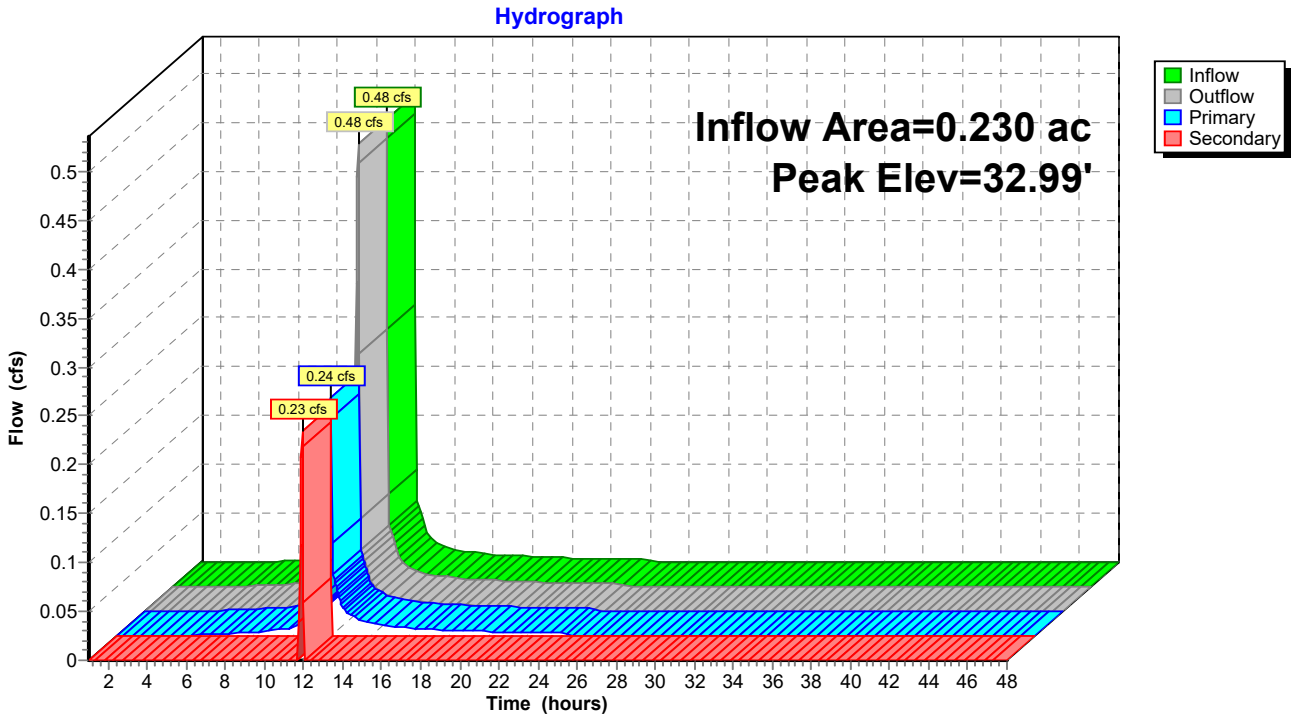
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 32.99' @ 11.93 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.10'	**4.0" Round Culvert** L= 50.0' Ke= 1.200 Inlet / Outlet Invert= 32.10' / 31.20' S= 0.0180 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Secondary	32.60'	**6.0" Round Culvert** L= 200.0' Ke= 1.200 Inlet / Outlet Invert= 32.60' / 30.60' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.24 cfs @ 11.93 hrs HW=32.96' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.24 cfs @ 2.74 fps)

Secondary OutFlow Max=0.21 cfs @ 11.93 hrs HW=32.96' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.21 cfs @ 1.40 fps)

Pond 42P: CB-B



Summary for Pond 43P: CB-A

Inflow Area = 0.740 ac, 85.14% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 1.49 cfs @ 11.95 hrs, Volume= 0.072 af
Outflow = 1.49 cfs @ 11.95 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 11.95 hrs, Volume= 0.051 af
Secondary = 1.20 cfs @ 11.95 hrs, Volume= 0.021 af

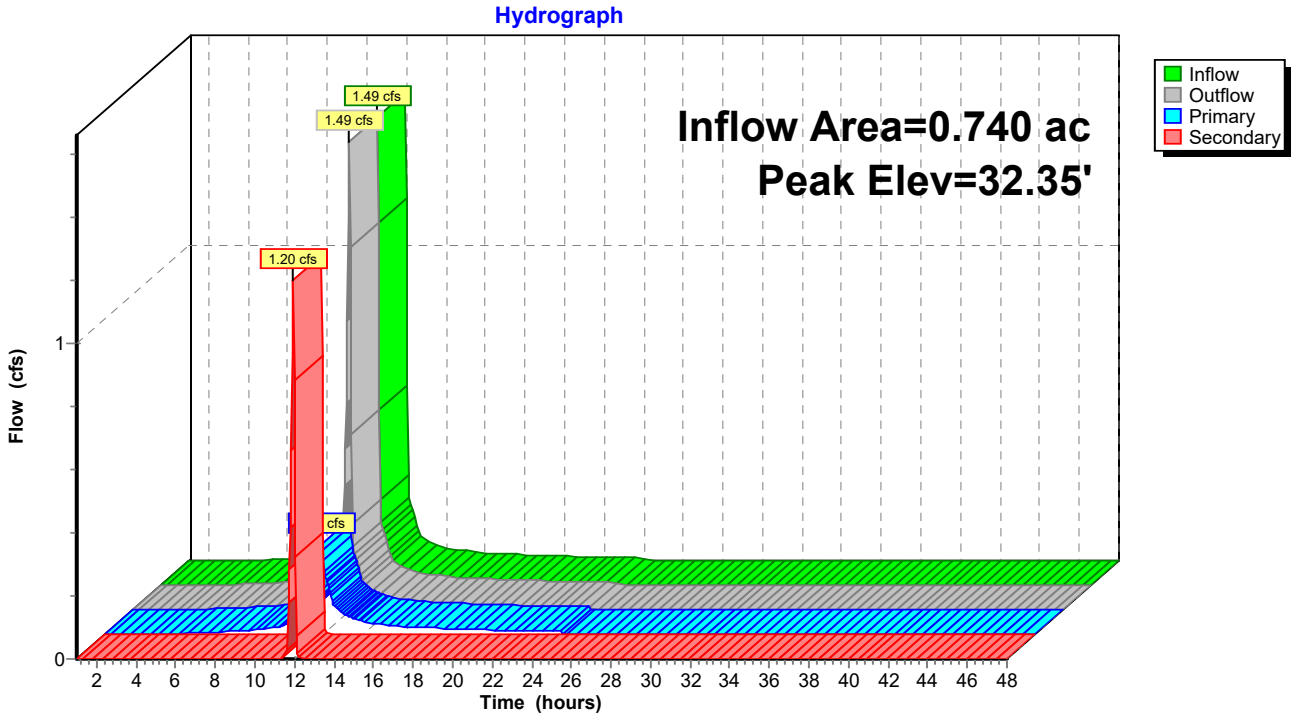
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 32.35' @ 11.95 hrs
Flood Elev= 34.22'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.20'	**4.0" Round Culvert** L= 30.0' Ke= 1.200 Inlet / Outlet Invert= 31.20' / 30.00' S= 0.0400 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Secondary	31.70'	**15.0" Round Culvert** L= 200.0' Ke= 1.200 Inlet / Outlet Invert= 31.70' / 29.70' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.28 cfs @ 11.95 hrs HW=32.34' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.28 cfs @ 3.24 fps)

Secondary OutFlow Max=1.18 cfs @ 11.95 hrs HW=32.34' (Free Discharge)
└**2=Culvert** (Inlet Controls 1.18 cfs @ 1.86 fps)

Pond 43P: CB-A



Summary for Pond 49P: CB-S

[57] Hint: Peaked at 27.35' (Flood elevation advised)

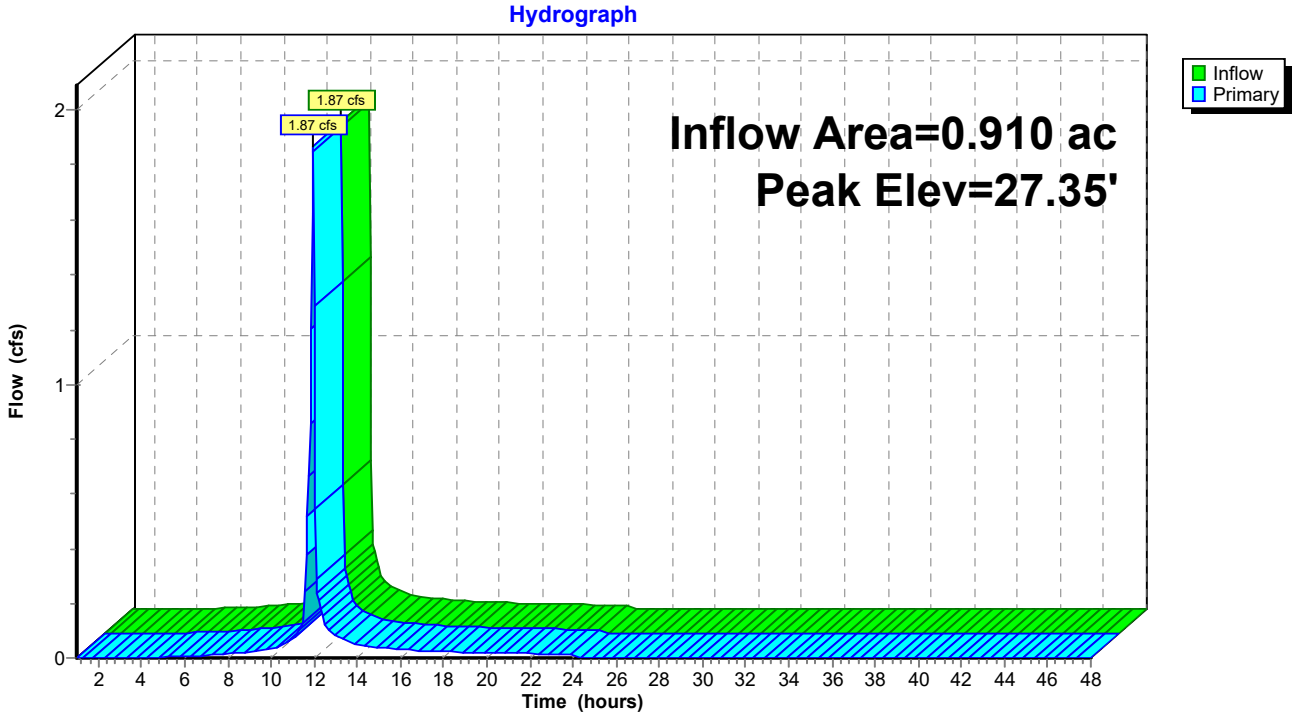
Inflow Area = 0.910 ac, 84.62% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 1.87 cfs @ 11.94 hrs, Volume= 0.089 af
Outflow = 1.87 cfs @ 11.94 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.0 min
Primary = 1.87 cfs @ 11.94 hrs, Volume= 0.089 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 27.35' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	26.60'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.80 cfs @ 11.94 hrs HW=27.33' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 1.80 cfs @ 2.92 fps)

Pond 49P: CB-S



Summary for Pond 51P: CB-T

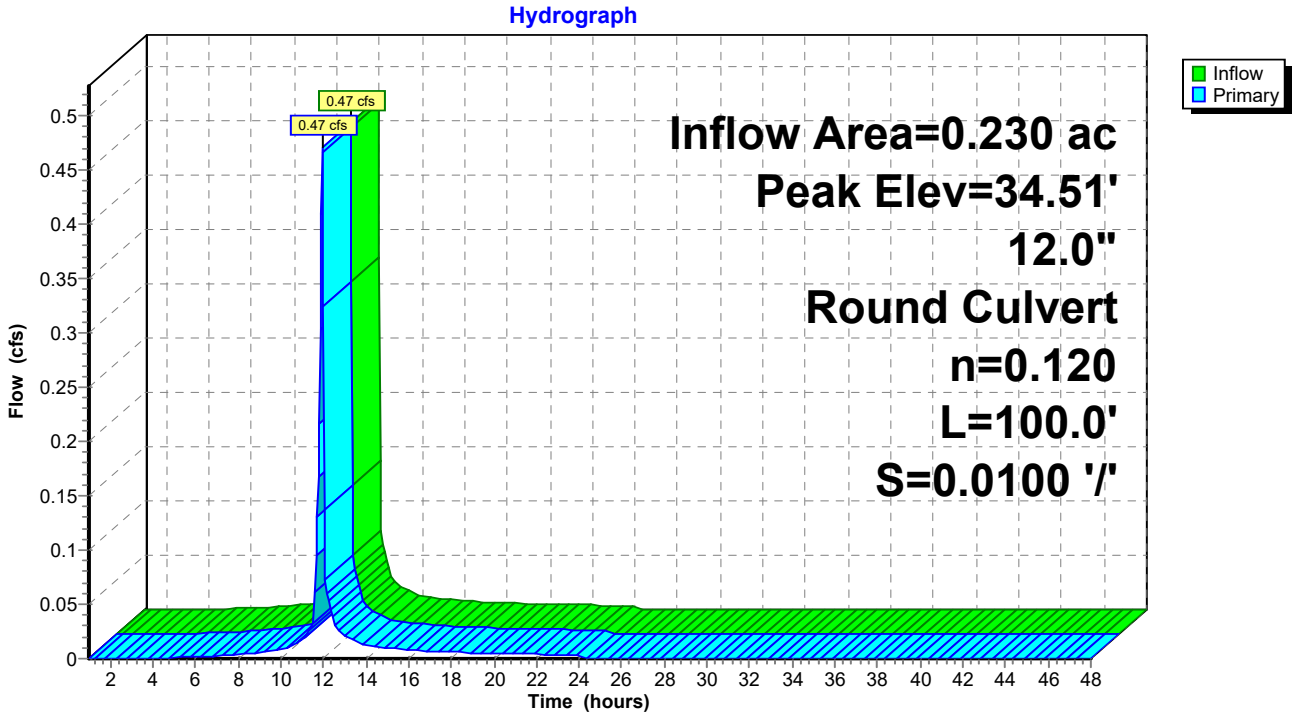
Inflow Area = 0.230 ac, 82.61% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 0.47 cfs @ 11.94 hrs, Volume= 0.023 af
Outflow = 0.47 cfs @ 11.94 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min
Primary = 0.47 cfs @ 11.94 hrs, Volume= 0.023 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 34.51' @ 11.94 hrs
Flood Elev= 36.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.30'	**12.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 33.30' / 32.30' S= 0.0100 '/' Cc= 0.900 n= 0.120, Flow Area= 0.79 sf

Primary OutFlow Max=0.46 cfs @ 11.94 hrs HW=34.47' (Free Discharge)
1=Culvert (Barrel Controls 0.46 cfs @ 0.63 fps)

Pond 51P: CB-T



Summary for Pond 53P: CB-U

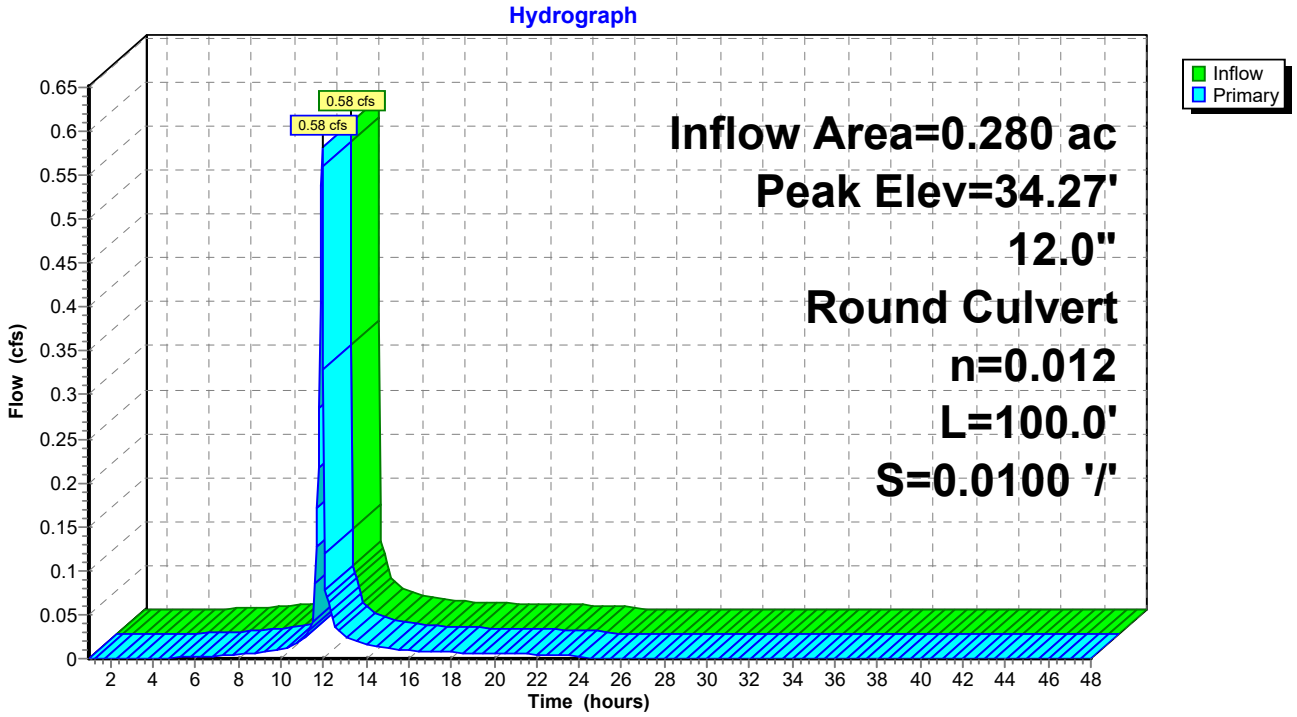
Inflow Area = 0.280 ac, 85.71% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 0.58 cfs @ 11.93 hrs, Volume= 0.027 af
Outflow = 0.58 cfs @ 11.93 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min
Primary = 0.58 cfs @ 11.93 hrs, Volume= 0.027 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 34.27' @ 11.93 hrs
Flood Elev= 36.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.80'	**12.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 33.80' / 32.80' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.55 cfs @ 11.93 hrs HW=34.26' (Free Discharge)
1=Culvert (Inlet Controls 0.55 cfs @ 1.57 fps)

Pond 53P: CB-U



Summary for Pond 54P: DA-9

Inflow Area = 1.450 ac, 84.83% Impervious, Inflow Depth = 1.10" for 2 event
Inflow = 2.13 cfs @ 11.94 hrs, Volume= 0.133 af
Outflow = 0.10 cfs @ 11.25 hrs, Volume= 0.133 af, Atten= 95%, Lag= 0.0 min
Discarded = 0.10 cfs @ 11.25 hrs, Volume= 0.133 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 30.03' @ 13.48 hrs Surf.Area= 0.120 ac Storage= 0.063 af

Plug-Flow detention time= 240.2 min calculated for 0.133 af (100% of inflow)
Center-of-Mass det. time= 240.0 min (1,028.0 - 788.0)

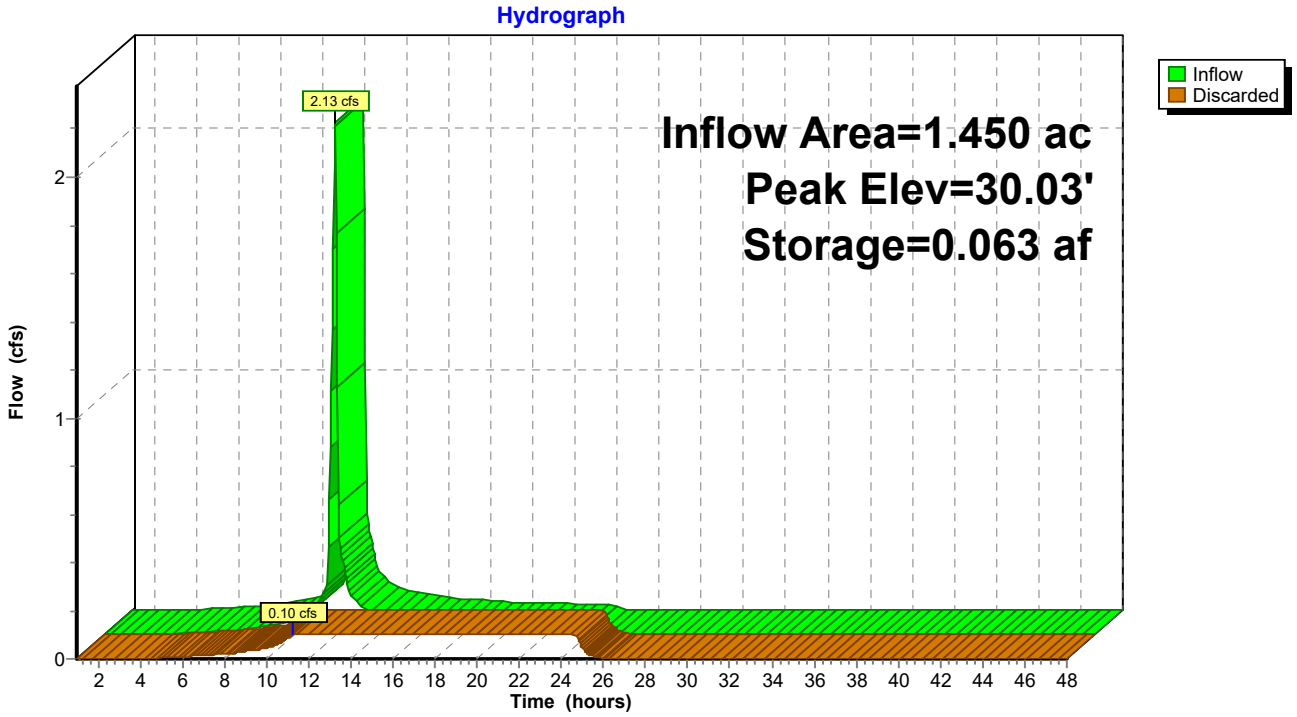
Volume	Invert	Avail.Storage	Storage Description
#1	29.50'	0.300 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
29.50	0.120	0.000	0.000
32.00	0.120	0.300	0.300

Device	Routing	Invert	Outlet Devices
#1	Discarded	29.50'	**0.850 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.10 cfs @ 11.25 hrs HW=29.53' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Pond 54P: DA-9



Summary for Pond 56P: (new Pond)

[57] Hint: Peaked at 35.88' (Flood elevation advised)

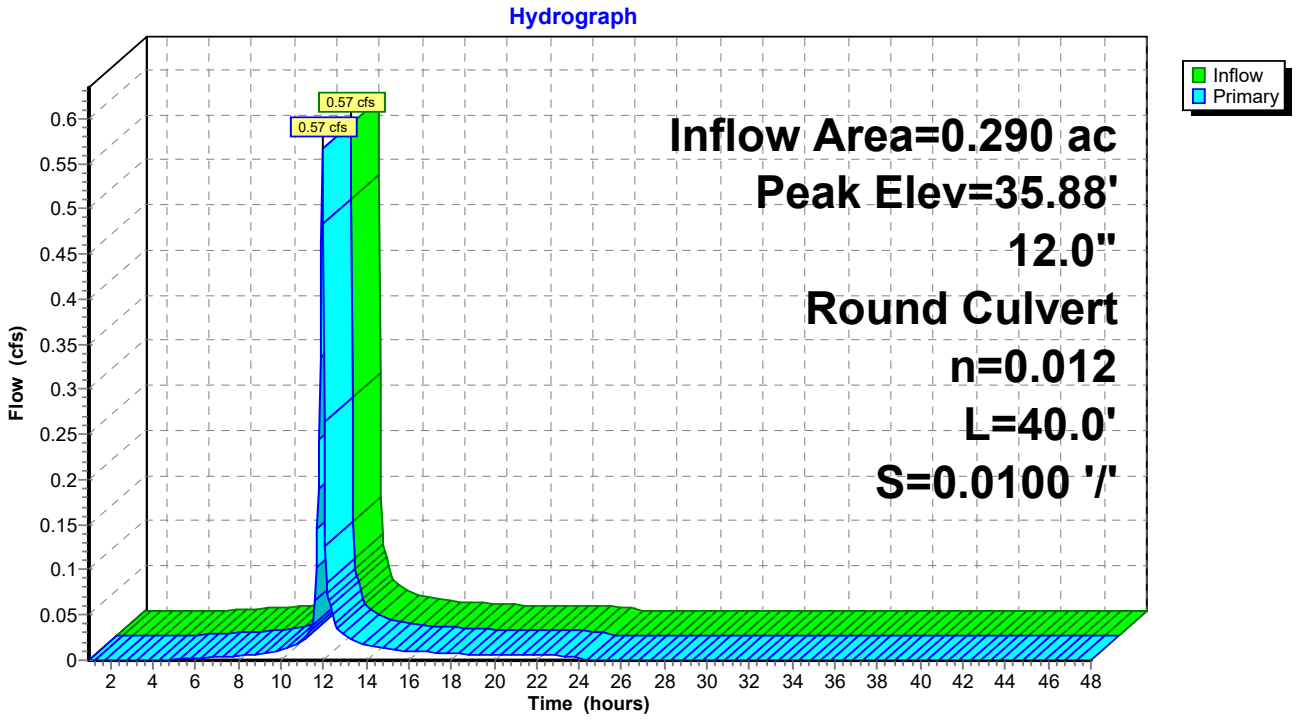
Inflow Area = 0.290 ac, 86.21% Impervious, Inflow Depth = 1.17" for 2 event
Inflow = 0.57 cfs @ 11.95 hrs, Volume= 0.028 af
Outflow = 0.57 cfs @ 11.95 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min
Primary = 0.57 cfs @ 11.95 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 35.88' @ 11.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	35.41'	**12.0" Round Culvert** L= 40.0' Ke= 1.200 Inlet / Outlet Invert= 35.41' / 35.01' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.56 cfs @ 11.95 hrs HW=35.87' (Free Discharge)
1=Culvert (Inlet Controls 0.56 cfs @ 1.58 fps)

Pond 56P: (new Pond)



Time span=1.00-48.00 hrs, dt=0.05 hrs, 941 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: A Runoff Area=0.740 ac 85.14% Impervious Runoff Depth=2.30"
Flow Length=182' Slope=0.0070 '/' Tc=4.4 min AMC Adjusted CN=97 Runoff=2.79 cfs 0.142 af

Subcatchment2S: B Runoff Area=0.230 ac 82.61% Impervious Runoff Depth=2.30"
Flow Length=153' Slope=0.0160 '/' Tc=2.7 min AMC Adjusted CN=97 Runoff=0.89 cfs 0.044 af

Subcatchment3S: C Runoff Area=0.420 ac 85.71% Impervious Runoff Depth=2.30"
Flow Length=216' Slope=0.0160 '/' Tc=3.6 min AMC Adjusted CN=97 Runoff=1.62 cfs 0.081 af

Subcatchment4S: D Runoff Area=1.820 ac 85.16% Impervious Runoff Depth=2.30"
Flow Length=457' Slope=0.0230 '/' Tc=6.4 min AMC Adjusted CN=97 Runoff=6.35 cfs 0.349 af

Subcatchment5S: E Runoff Area=0.320 ac 84.38% Impervious Runoff Depth=2.30"
Flow Length=394' Slope=0.0040 '/' Tc=11.3 min AMC Adjusted CN=97 Runoff=0.97 cfs 0.061 af

Subcatchment6S: F Runoff Area=2.550 ac 85.10% Impervious Runoff Depth=2.30"
Flow Length=553' Slope=0.0100 '/' Tc=10.5 min AMC Adjusted CN=97 Runoff=7.92 cfs 0.489 af

Subcatchment7S: G Runoff Area=0.780 ac 84.62% Impervious Runoff Depth=2.30"
Flow Length=340' Slope=0.0150 '/' Tc=5.8 min AMC Adjusted CN=97 Runoff=2.78 cfs 0.150 af

Subcatchment8S: H Runoff Area=0.310 ac 83.87% Impervious Runoff Depth=2.30"
Flow Length=50' Slope=0.0200 '/' Tc=1.0 min AMC Adjusted CN=97 Runoff=1.25 cfs 0.059 af

Subcatchment9S: I Runoff Area=0.160 ac 87.50% Impervious Runoff Depth=2.41"
Flow Length=129' Slope=0.0090 '/' Tc=3.0 min AMC Adjusted CN=98 Runoff=0.63 cfs 0.032 af

Subcatchment10S: J Runoff Area=1.410 ac 85.11% Impervious Runoff Depth=2.30"
Flow Length=256' Slope=0.0200 '/' Tc=3.8 min AMC Adjusted CN=97 Runoff=5.40 cfs 0.270 af

Subcatchment11S: K Runoff Area=0.940 ac 85.11% Impervious Runoff Depth=2.30"
Flow Length=254' Slope=0.0100 '/' Tc=4.9 min AMC Adjusted CN=97 Runoff=3.47 cfs 0.180 af

Subcatchment12S: L Runoff Area=0.240 ac 87.50% Impervious Runoff Depth=2.41"
Flow Length=254' Slope=0.0100 '/' Tc=4.9 min AMC Adjusted CN=98 Runoff=0.90 cfs 0.048 af

Subcatchment13S: M Runoff Area=1.420 ac 85.21% Impervious Runoff Depth=2.30"
Flow Length=329' Slope=0.0110 '/' Tc=6.2 min AMC Adjusted CN=97 Runoff=4.99 cfs 0.272 af

Subcatchment14S: N Runoff Area=0.510 ac 84.31% Impervious Runoff Depth=2.30"
Flow Length=215' Slope=0.0110 '/' Tc=4.2 min AMC Adjusted CN=97 Runoff=1.93 cfs 0.098 af

Subcatchment15S: O Runoff Area=0.310 ac 83.87% Impervious Runoff Depth=2.30"
Flow Length=190' Slope=0.0150 '/' Tc=3.3 min AMC Adjusted CN=97 Runoff=1.20 cfs 0.059 af

Subcatchment16S: P Runoff Area=0.360 ac 83.33% Impervious Runoff Depth=2.30"
Flow Length=164' Slope=0.0170 '/' Tc=2.8 min AMC Adjusted CN=97 Runoff=1.40 cfs 0.069 af

Subcatchment17S: S Runoff Area=0.910 ac 84.62% Impervious Runoff Depth=2.30"
Flow Length=250' Slope=0.0200 '/' Tc=3.7 min AMC Adjusted CN=97 Runoff=3.50 cfs 0.175 af

Subcatchment18S: Q Runoff Area=0.230 ac 82.61% Impervious Runoff Depth=2.30"
Flow Length=87' Slope=0.0400 '/' Tc=1.2 min AMC Adjusted CN=97 Runoff=0.92 cfs 0.044 af

Subcatchment19S: R Runoff Area=0.340 ac 8.82% Impervious Runoff Depth=0.88"
Flow Length=56' Slope=0.0500 '/' Tc=6.3 min AMC Adjusted CN=78 Runoff=0.51 cfs 0.025 af

Subcatchment50S: T Runoff Area=0.230 ac 82.61% Impervious Runoff Depth=2.30"
Flow Length=127' Slope=0.0050 '/' Tc=3.7 min AMC Adjusted CN=97 Runoff=0.88 cfs 0.044 af

Subcatchment52S: U Runoff Area=0.280 ac 85.71% Impervious Runoff Depth=2.30"
Flow Length=125' Slope=0.0100 '/' Tc=2.8 min AMC Adjusted CN=97 Runoff=1.09 cfs 0.054 af

Subcatchment55S: V Runoff Area=0.290 ac 86.21% Impervious Runoff Depth=2.30"
Flow Length=185' Slope=0.0050 '/' Tc=5.1 min AMC Adjusted CN=97 Runoff=1.06 cfs 0.056 af

Reach 46R: REGIONAL SD Avg. Flow Depth=0.75' Max Vel=8.51 fps Inflow=19.52 cfs 0.561 af
84.0" Round Pipe n=0.013 L=500.0' S=0.0150 '/' Capacity=782.41 cfs Outflow=18.40 cfs 0.561 af

Pond 20P: DT-1 Peak Elev=34.39' Storage=0.181 af Inflow=6.28 cfs 0.341 af
Outflow=0.19 cfs 0.341 af

Pond 22P: CB-P Peak Elev=37.80' Inflow=1.40 cfs 0.069 af
12.0" Round Culvert n=0.012 L=100.0' S=0.0100 '/' Outflow=1.40 cfs 0.069 af

Pond 24P: CB-M Peak Elev=37.26' Inflow=4.99 cfs 0.272 af
24.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=4.99 cfs 0.272 af

Pond 26P: CB-N Peak Elev=37.66' Inflow=1.93 cfs 0.098 af
Outflow=1.93 cfs 0.098 af

Pond 27P: CB-O Peak Elev=37.33' Inflow=1.20 cfs 0.059 af
12.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=1.20 cfs 0.059 af

Pond 28P: DT-2 Peak Elev=32.54' Storage=0.111 af Inflow=4.03 cfs 0.206 af
Outflow=0.10 cfs 0.206 af

Pond 29P: CB-L Peak Elev=34.72' Inflow=0.90 cfs 0.048 af
18.0" Round Culvert n=0.012 L=20.0' S=0.0100 '/' Outflow=0.90 cfs 0.048 af

Pond 30P: CB-I Peak Elev=39.00' Inflow=0.63 cfs 0.032 af
12.0" Round Culvert n=0.012 L=100.0' S=0.0100 '/' Outflow=0.63 cfs 0.032 af

Pond 31P: CB-J Peak Elev=36.63' Inflow=5.40 cfs 0.270 af
24.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=5.40 cfs 0.270 af

Pond 32P: DT-3 Peak Elev=33.56' Storage=0.164 af Inflow=6.03 cfs 0.303 af
Outflow=0.15 cfs 0.303 af

Pond 33P: CB-G Peak Elev=30.97' Inflow=2.78 cfs 0.150 af
Primary=1.05 cfs 0.121 af Secondary=1.73 cfs 0.029 af Outflow=2.78 cfs 0.150 af

Pond 34P: CB-K Peak Elev=34.82' Inflow=3.47 cfs 0.180 af
Primary=1.40 cfs 0.148 af Secondary=2.08 cfs 0.032 af Outflow=3.47 cfs 0.180 af

Pond 36P: CB-F Peak Elev=32.98' Inflow=7.92 cfs 0.489 af
Primary=4.39 cfs 0.432 af Secondary=3.53 cfs 0.058 af Outflow=7.92 cfs 0.489 af

Pond 37P: CB-C Peak Elev=29.92' Inflow=1.62 cfs 0.081 af
Primary=1.08 cfs 0.075 af Secondary=0.53 cfs 0.005 af Outflow=1.62 cfs 0.081 af

Pond 38P: CB-D Peak Elev=30.26' Inflow=6.35 cfs 0.349 af
Primary=2.78 cfs 0.292 af Secondary=3.57 cfs 0.057 af Outflow=6.35 cfs 0.349 af

Pond 39P: DT-4 Peak Elev=26.43' Storage=0.526 af Inflow=10.12 cfs 0.975 af
Outflow=0.40 cfs 0.975 af

Pond 40P: CB-E Peak Elev=35.77' Inflow=0.97 cfs 0.061 af
Primary=0.24 cfs 0.045 af Secondary=0.73 cfs 0.017 af Outflow=0.97 cfs 0.061 af

Pond 41P: DT-6 Peak Elev=28.61' Storage=0.081 af Inflow=0.88 cfs 0.171 af
Outflow=0.07 cfs 0.171 af

Pond 42P: CB-B Peak Elev=33.59' Inflow=0.89 cfs 0.044 af
Primary=0.33 cfs 0.035 af Secondary=0.56 cfs 0.009 af Outflow=0.89 cfs 0.044 af

Pond 43P: CB-A Peak Elev=32.70' Inflow=2.79 cfs 0.142 af
Primary=0.33 cfs 0.091 af Secondary=2.45 cfs 0.051 af Outflow=2.79 cfs 0.142 af

Pond 49P: CB-S Peak Elev=27.95' Inflow=3.50 cfs 0.175 af
Outflow=3.50 cfs 0.175 af

Pond 51P: CB-T Peak Elev=38.56' Inflow=0.88 cfs 0.044 af
12.0" Round Culvert n=0.120 L=100.0' S=0.0100 '/' Outflow=0.88 cfs 0.044 af

Pond 53P: CB-U Peak Elev=34.48' Inflow=1.09 cfs 0.054 af
12.0" Round Culvert n=0.012 L=100.0' S=0.0100 '/' Outflow=1.09 cfs 0.054 af

Pond 54P: DA-9 Peak Elev=30.60' Storage=0.132 af Inflow=3.35 cfs 0.246 af
Outflow=0.10 cfs 0.246 af

Pond 56P: (new Pond) Peak Elev=36.08' Inflow=1.06 cfs 0.056 af
12.0" Round Culvert n=0.012 L=40.0' S=0.0100 '/' Outflow=1.06 cfs 0.056 af

Total Runoff Area = 14.800 ac Runoff Volume = 2.802 af Average Runoff Depth = 2.27"
16.82% Pervious = 2.490 ac 83.18% Impervious = 12.310 ac

Summary for Subcatchment 1S: A

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

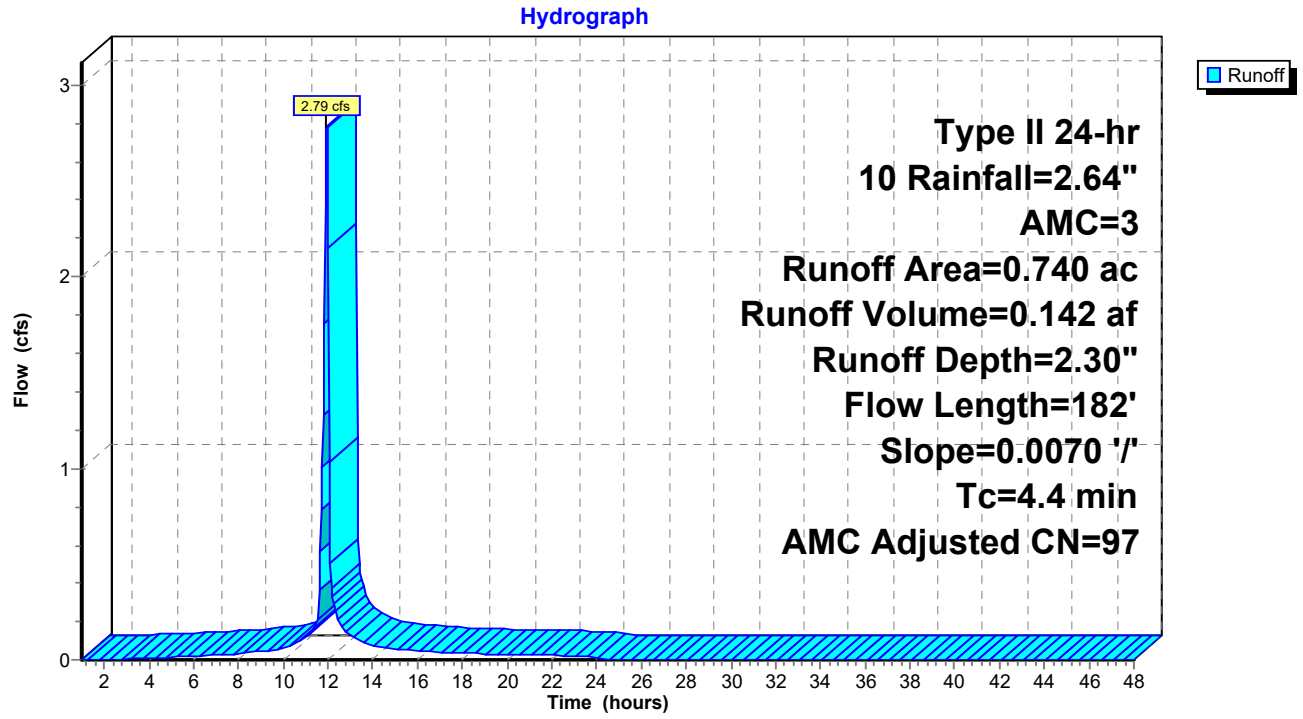
Runoff = 2.79 cfs @ 11.94 hrs, Volume= 0.142 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.630	98		
*	0.110	56		
	0.740	92	97	Weighted Average, AMC Adjusted
	0.110			14.86% Pervious Area
	0.630			85.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	182	0.0070	0.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 1S: A



Summary for Subcatchment 2S: B

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

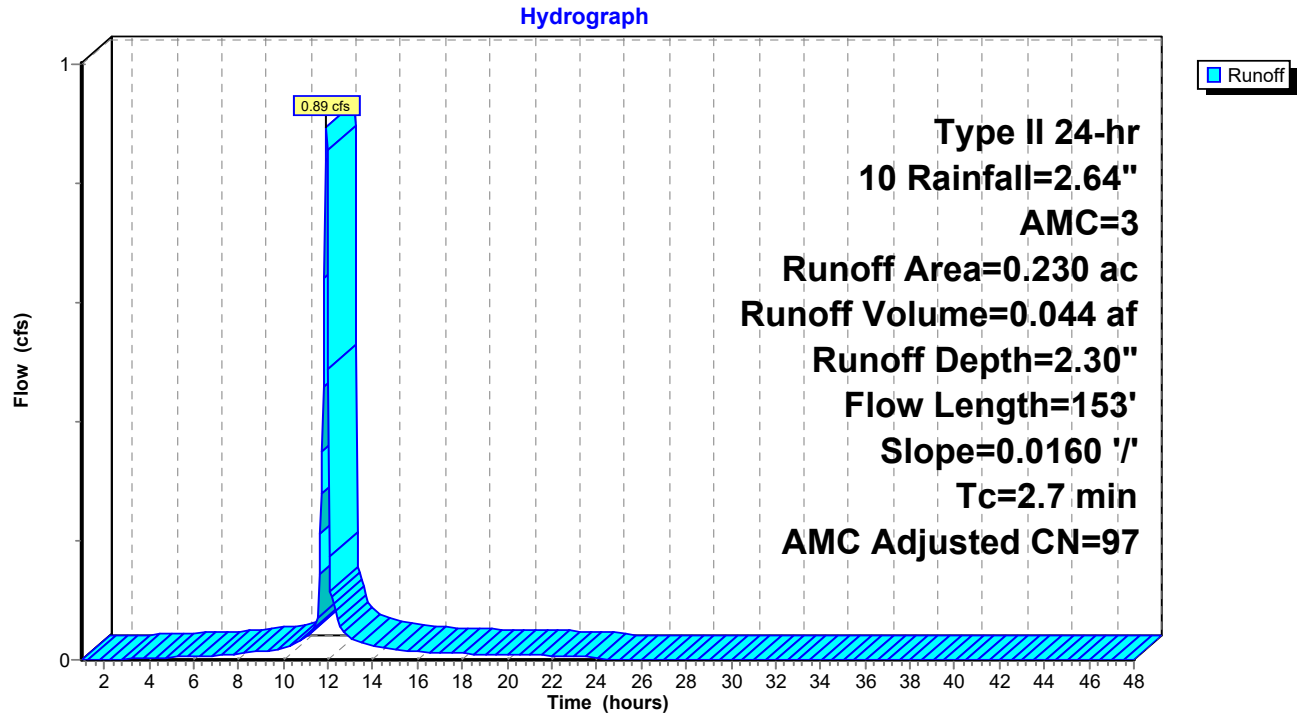
Runoff = 0.89 cfs @ 11.93 hrs, Volume= 0.044 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.190	98		
*	0.040	56		
	0.230	91	97	Weighted Average, AMC Adjusted
	0.040			17.39% Pervious Area
	0.190			82.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	153	0.0160	0.93		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 2S: B



Summary for Subcatchment 3S: C

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

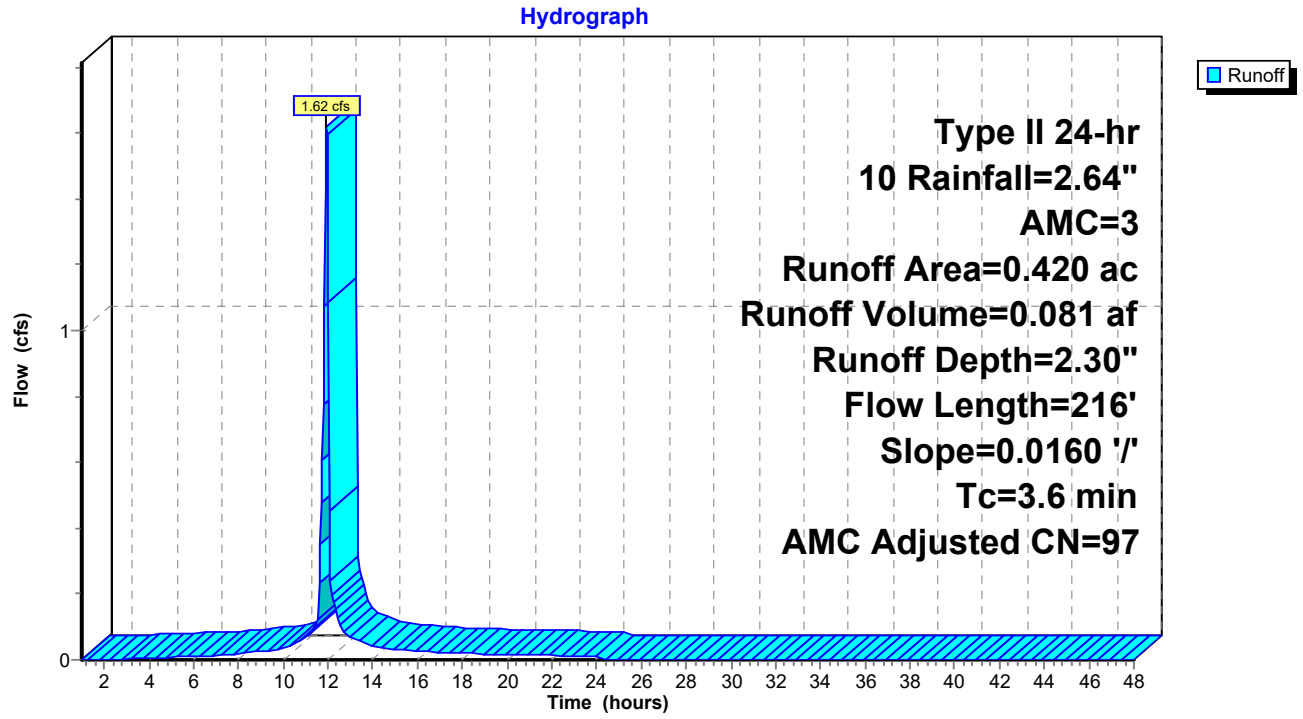
Runoff = 1.62 cfs @ 11.94 hrs, Volume= 0.081 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.360	98		
*	0.060	56		
	0.420	92	97	Weighted Average, AMC Adjusted
	0.060			14.29% Pervious Area
	0.360			85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	216	0.0160	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 3S: C



Summary for Subcatchment 4S: D

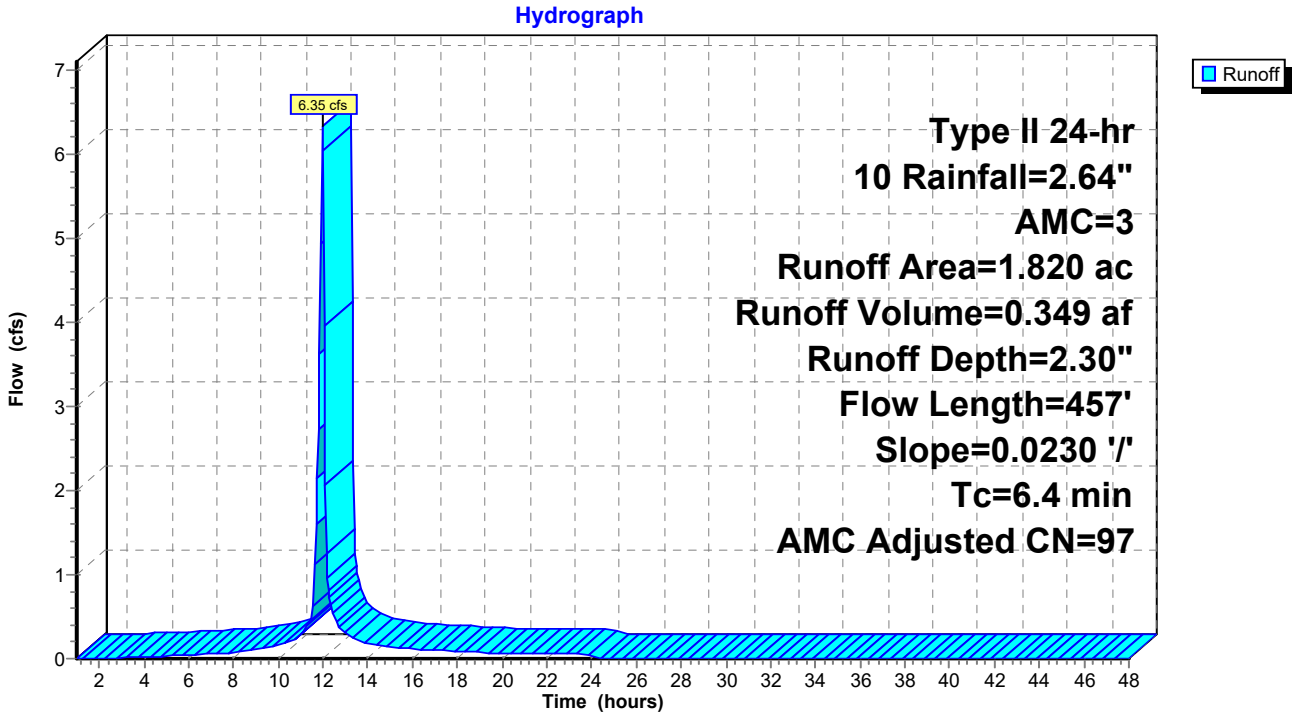
Runoff = 6.35 cfs @ 11.97 hrs, Volume= 0.349 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	1.550	98		
*	0.270	56		
	1.820	92	97	Weighted Average, AMC Adjusted
	0.270			14.84% Pervious Area
	1.550			85.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	300	0.0230	1.24		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
2.4	157	0.0230	1.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
6.4	457	Total			

Subcatchment 4S: D



Summary for Subcatchment 5S: E

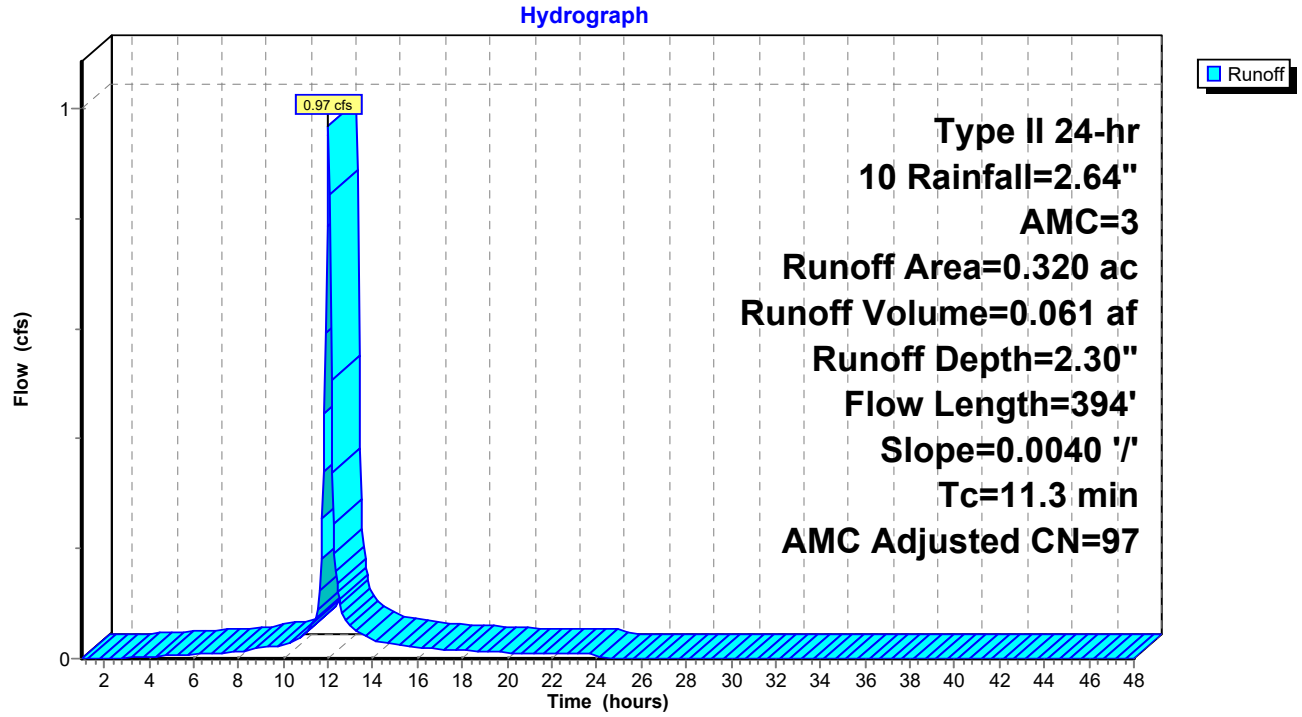
Runoff = 0.97 cfs @ 12.02 hrs, Volume= 0.061 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.270	98		
*	0.050	56		
	0.320	91	97	Weighted Average, AMC Adjusted
	0.050			15.63% Pervious Area
	0.270			84.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	300	0.0040	0.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
3.2	94	0.0040	0.49		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
11.3	394	Total			

Subcatchment 5S: E



Summary for Subcatchment 6S: F

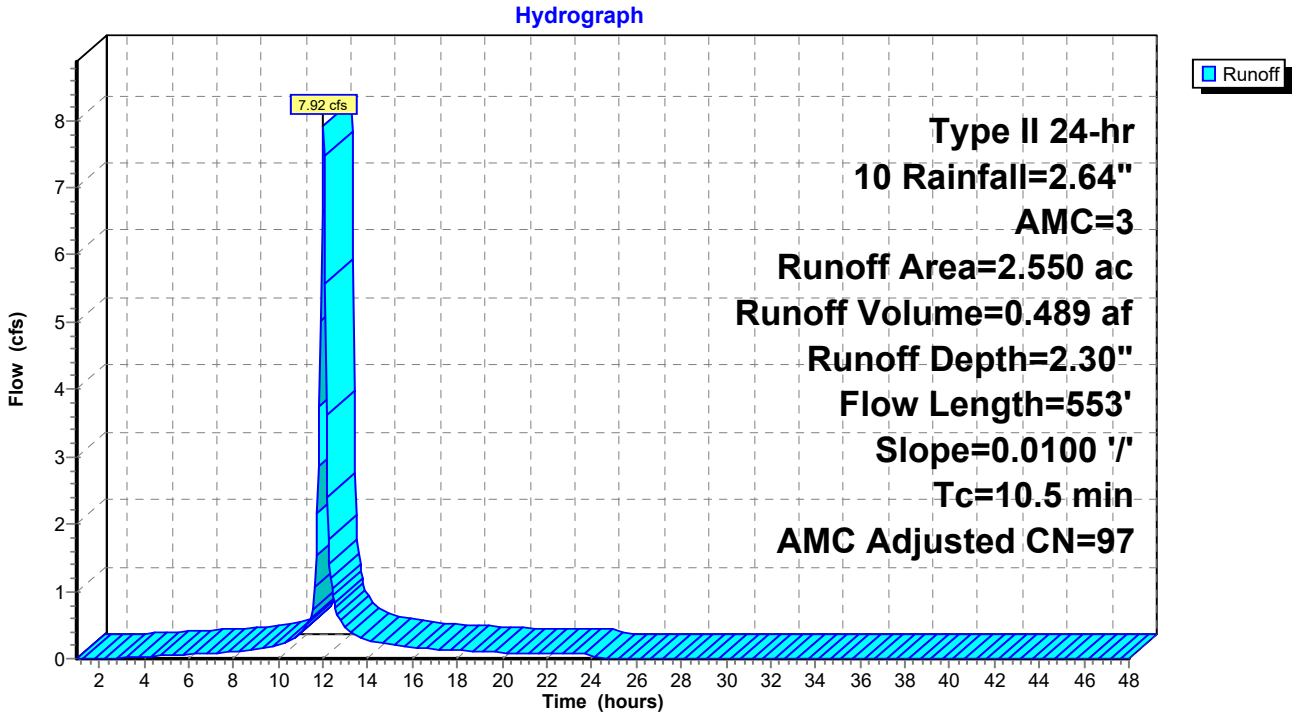
Runoff = 7.92 cfs @ 12.01 hrs, Volume= 0.489 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	2.170	98		
*	0.380	56		
	2.550	92	97	Weighted Average, AMC Adjusted
	0.380			14.90% Pervious Area
	2.170			85.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	300	0.0100	0.89		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
4.9	253	0.0100	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
10.5	553	Total			

Subcatchment 6S: F



Summary for Subcatchment 7S: G

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

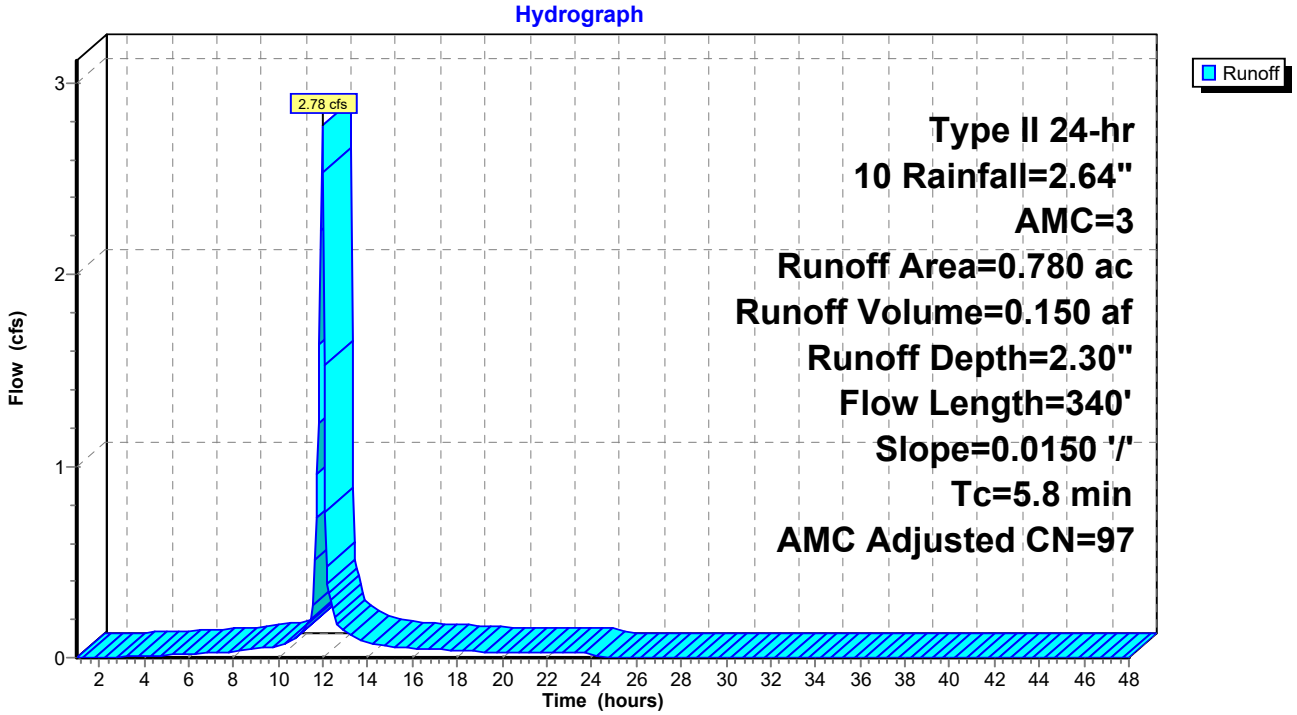
Runoff = 2.78 cfs @ 11.96 hrs, Volume= 0.150 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.660	98		
*	0.120	56		
	0.780	92	97	Weighted Average, AMC Adjusted
	0.120			15.38% Pervious Area
	0.660			84.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	300	0.0150	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
1.0	40	0.0150	0.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
5.8	340	Total			

Subcatchment 7S: G



Summary for Subcatchment 8S: H

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

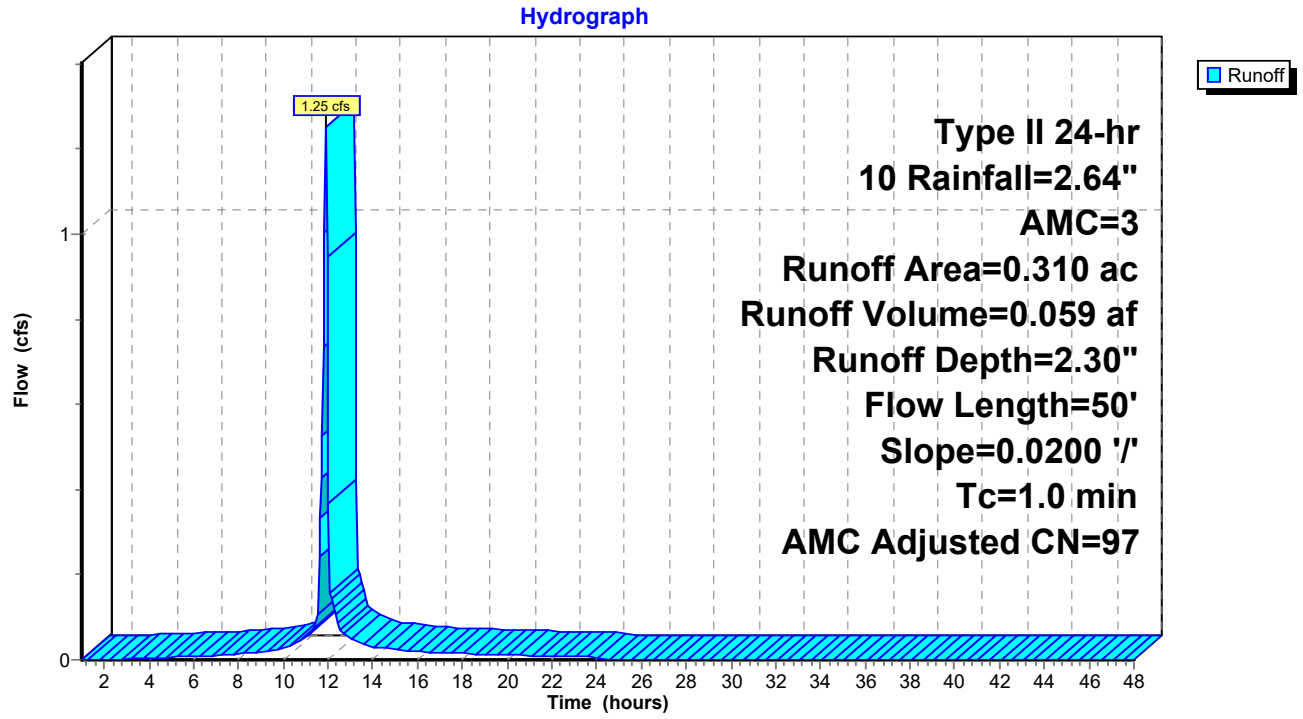
Runoff = 1.25 cfs @ 11.90 hrs, Volume= 0.059 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.260	98		
*	0.050	56		
	0.310	91	97	Weighted Average, AMC Adjusted
	0.050			16.13% Pervious Area
	0.260			83.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0200	0.82		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 8S: H



Summary for Subcatchment 9S: I

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

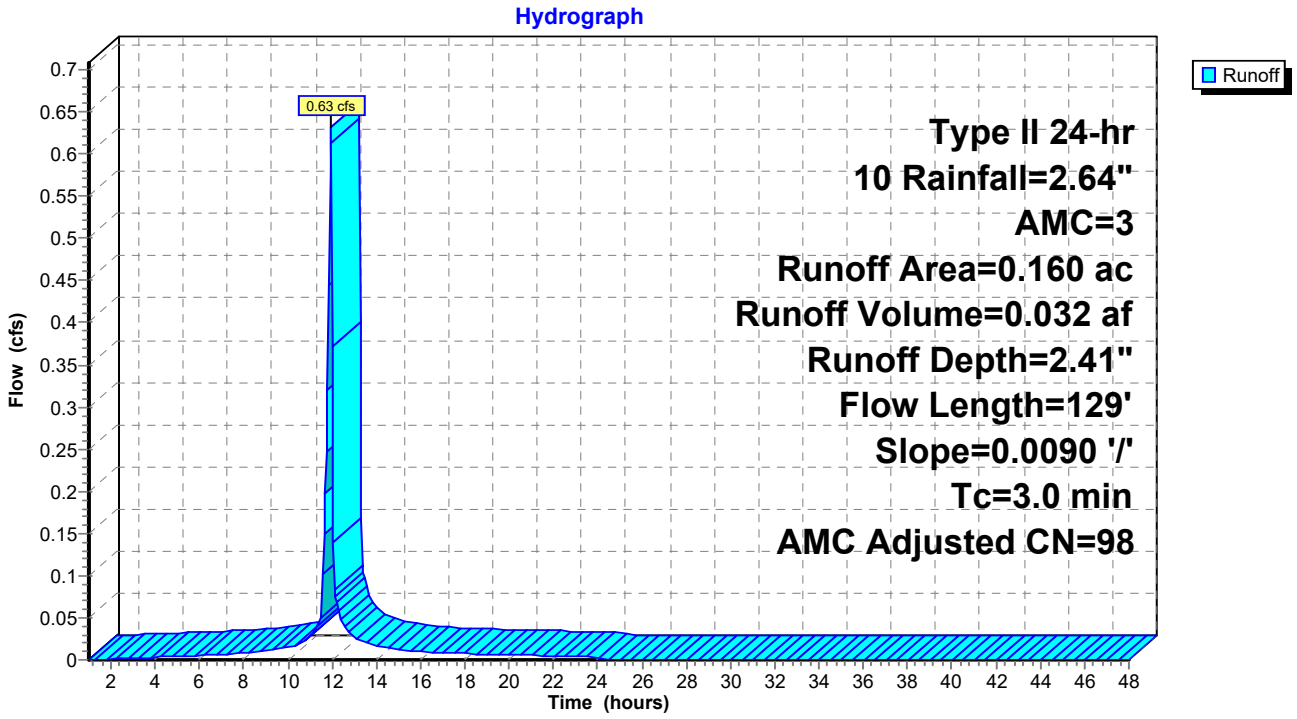
Runoff = 0.63 cfs @ 11.93 hrs, Volume= 0.032 af, Depth= 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.140	98		
*	0.020	56		
	0.160	93	98	Weighted Average, AMC Adjusted
	0.020			12.50% Pervious Area
	0.140			87.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	129	0.0090	0.72		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 9S: I



Summary for Subcatchment 10S: J

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

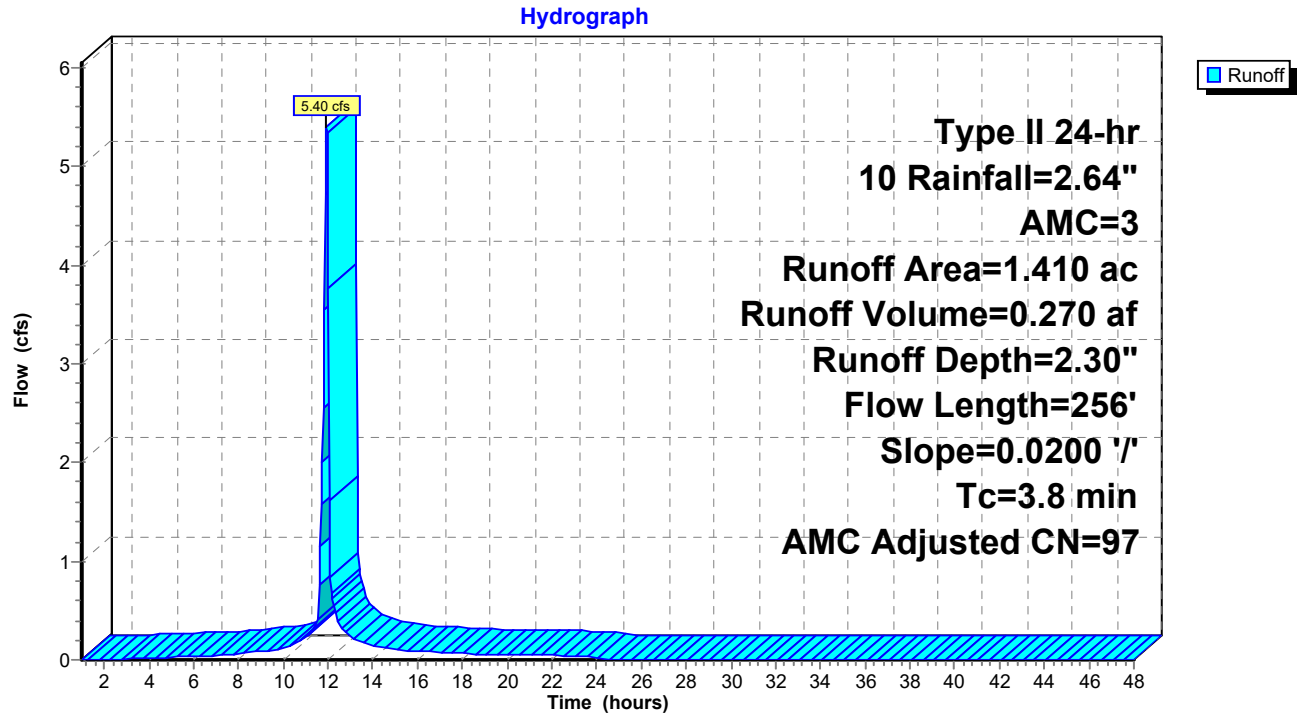
Runoff = 5.40 cfs @ 11.94 hrs, Volume= 0.270 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	1.200	98		
*	0.210	56		
	1.410	92	97	Weighted Average, AMC Adjusted
	0.210			14.89% Pervious Area
	1.200			85.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	256	0.0200	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 10S: J



Summary for Subcatchment 11S: K

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

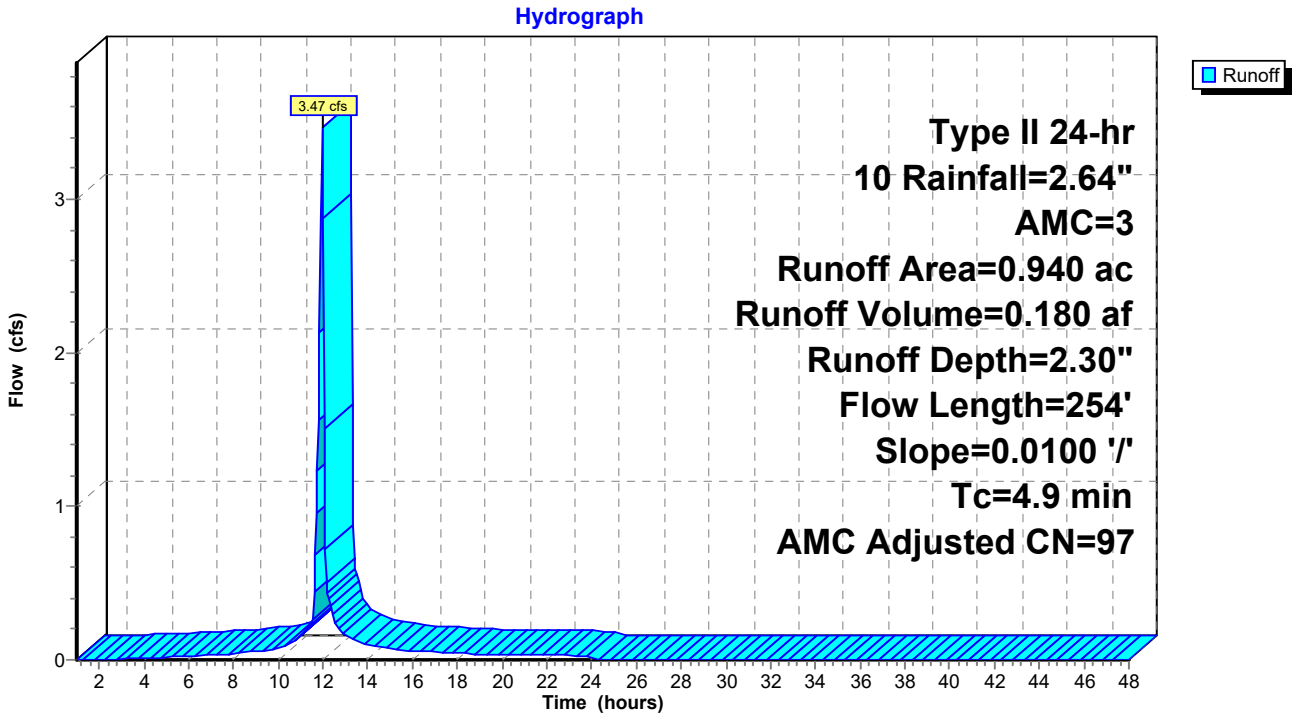
Runoff = 3.47 cfs @ 11.95 hrs, Volume= 0.180 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.800	98		
*	0.140	56		
	0.940	92	97	Weighted Average, AMC Adjusted
	0.140			14.89% Pervious Area
	0.800			85.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	254	0.0100	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 11S: K



Summary for Subcatchment 12S: L

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

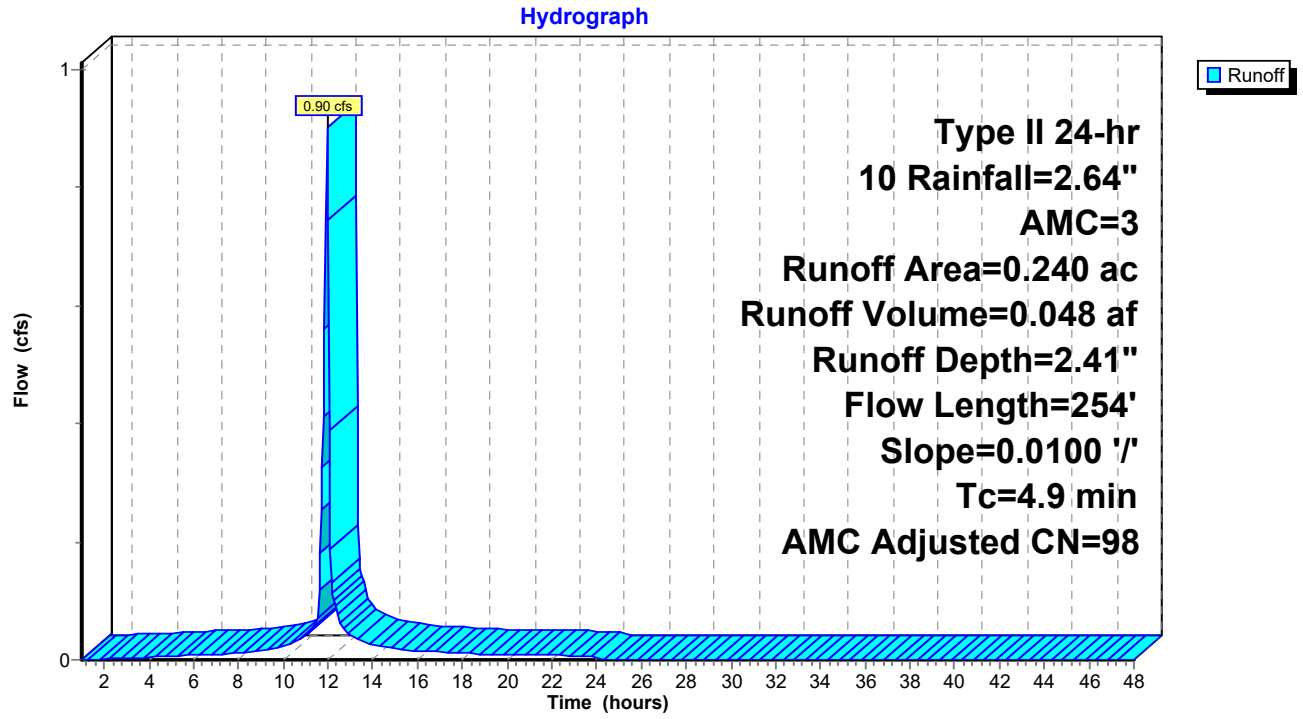
Runoff = 0.90 cfs @ 11.95 hrs, Volume= 0.048 af, Depth= 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.210	98		
*	0.030	56		
	0.240	93	98	Weighted Average, AMC Adjusted
	0.030			12.50% Pervious Area
	0.210			87.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	254	0.0100	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 12S: L



Summary for Subcatchment 13S: M

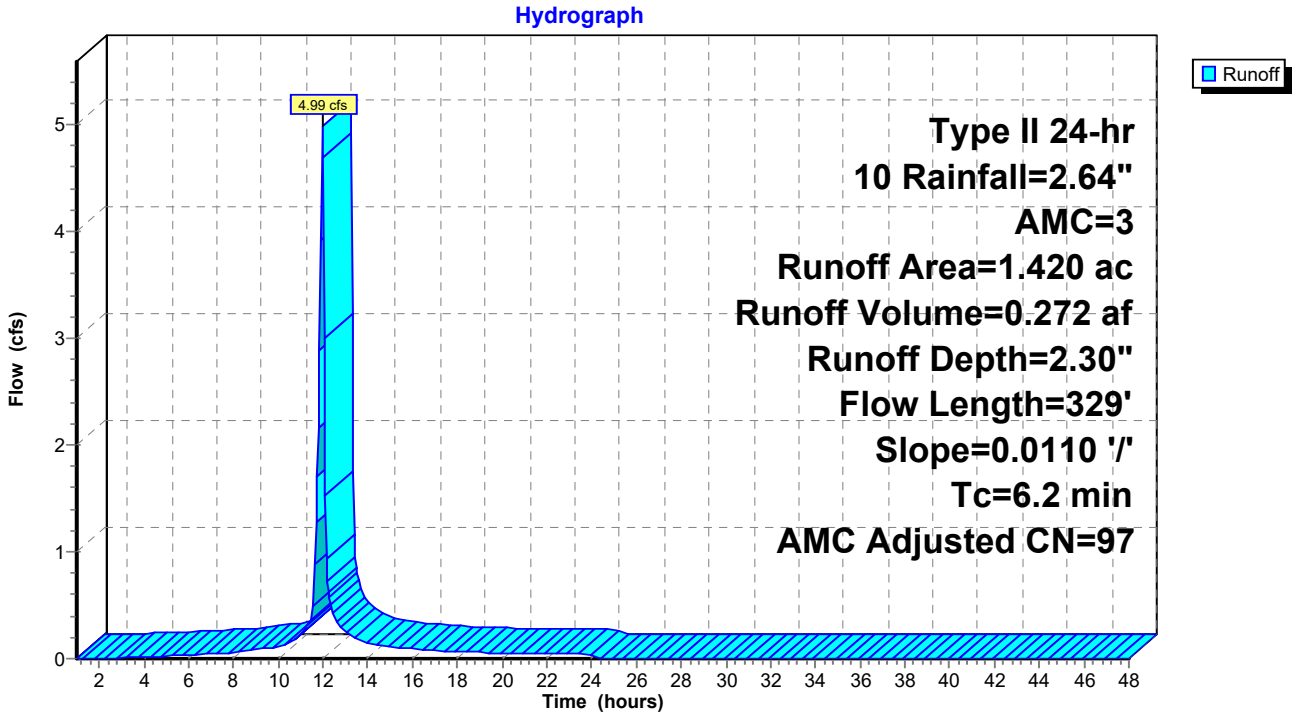
Runoff = 4.99 cfs @ 11.97 hrs, Volume= 0.272 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	1.210	98		
*	0.210	56		
	1.420	92	97	Weighted Average, AMC Adjusted
	0.210			14.79% Pervious Area
	1.210			85.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	300	0.0110	0.92		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
0.8	29	0.0110	0.58		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
6.2	329	Total			

Subcatchment 13S: M



Summary for Subcatchment 14S: N

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

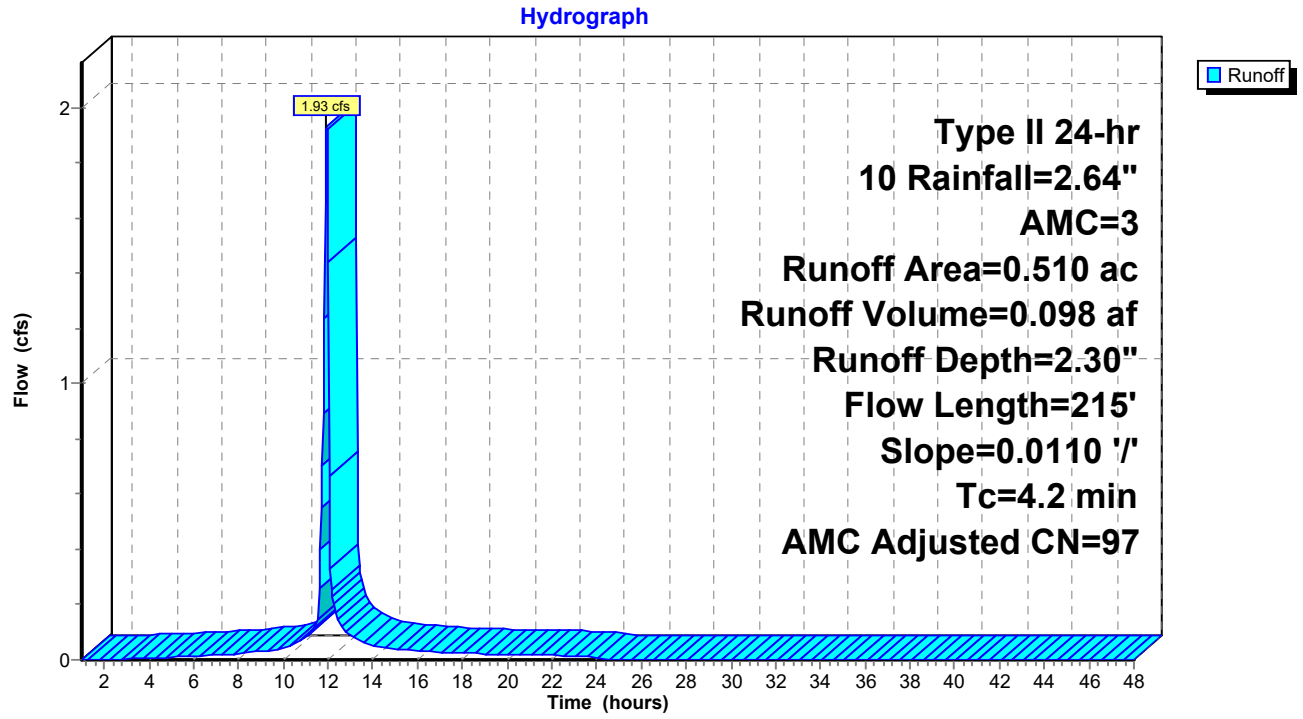
Runoff = 1.93 cfs @ 11.94 hrs, Volume= 0.098 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.430	98		
*	0.080	56		
	0.510	91	97	Weighted Average, AMC Adjusted
	0.080			15.69% Pervious Area
	0.430			84.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	215	0.0110	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 14S: N



Summary for Subcatchment 15S: O

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

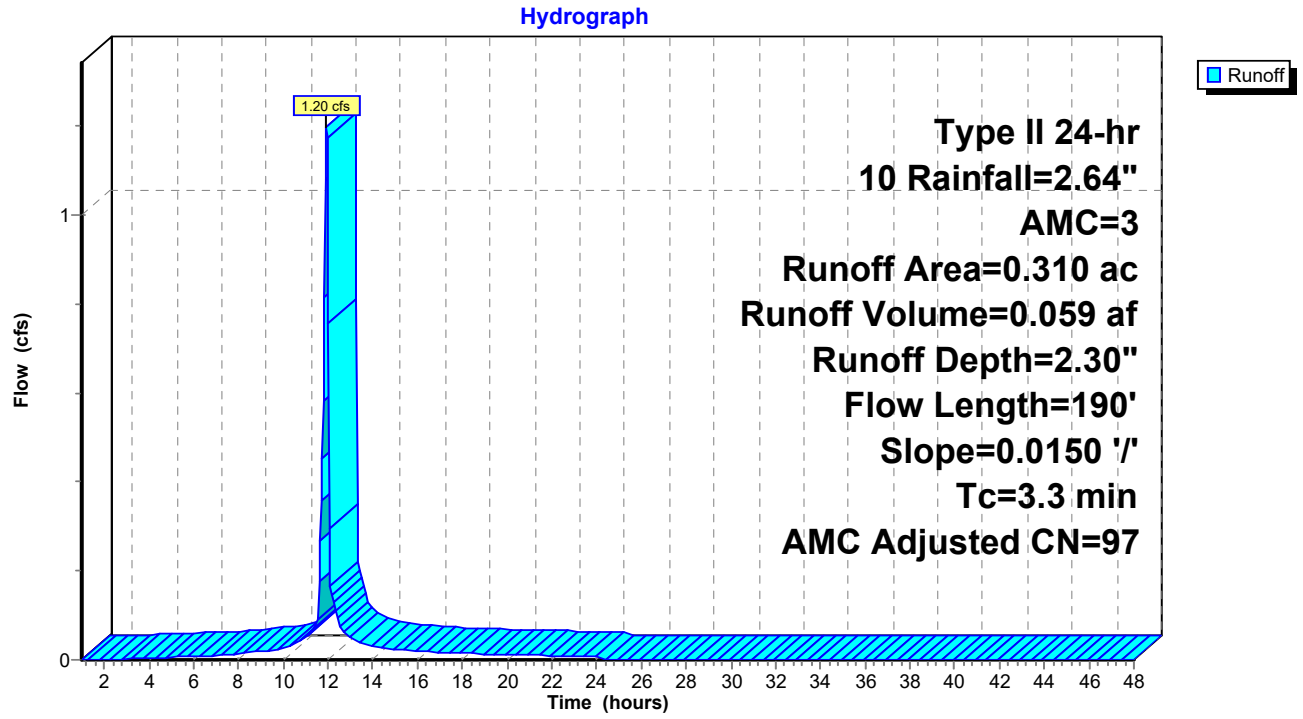
Runoff = 1.20 cfs @ 11.93 hrs, Volume= 0.059 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.260	98		
*	0.050	56		
	0.310	91	97	Weighted Average, AMC Adjusted
	0.050			16.13% Pervious Area
	0.260			83.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	190	0.0150	0.95		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 15S: O



Summary for Subcatchment 16S: P

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

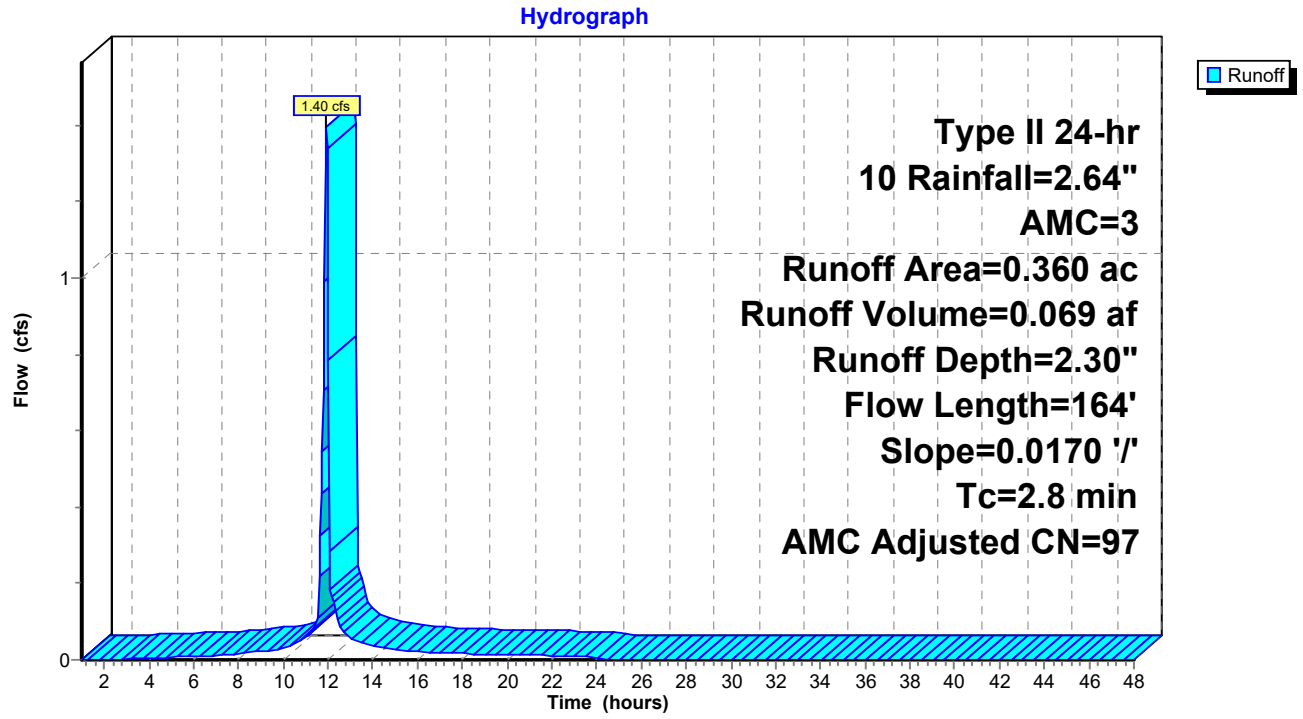
Runoff = 1.40 cfs @ 11.93 hrs, Volume= 0.069 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.300	98		
*	0.060	56		
	0.360	91	97	Weighted Average, AMC Adjusted
	0.060			16.67% Pervious Area
	0.300			83.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	164	0.0170	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 16S: P



Summary for Subcatchment 17S: S

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

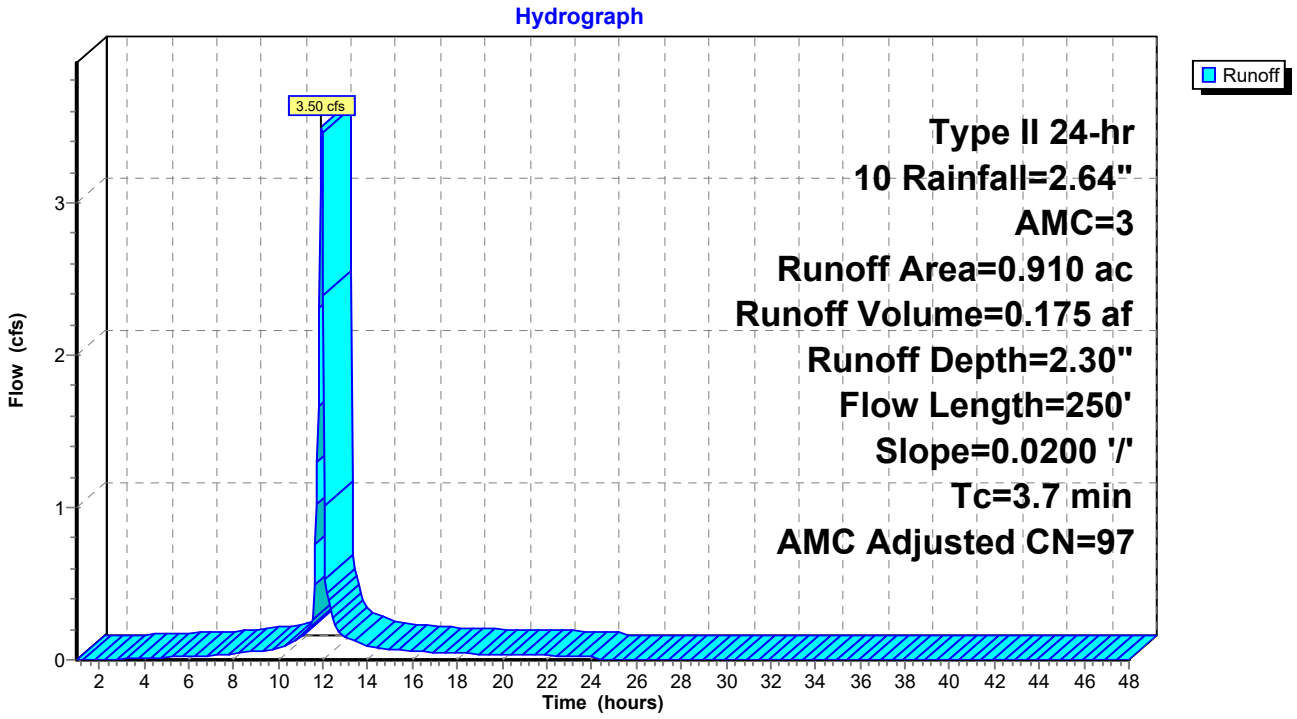
Runoff = 3.50 cfs @ 11.94 hrs, Volume= 0.175 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.770	98		
*	0.140	56		
	0.910	92	97	Weighted Average, AMC Adjusted
	0.140			15.38% Pervious Area
	0.770			84.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	250	0.0200	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 17S: S



Summary for Subcatchment 18S: Q

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

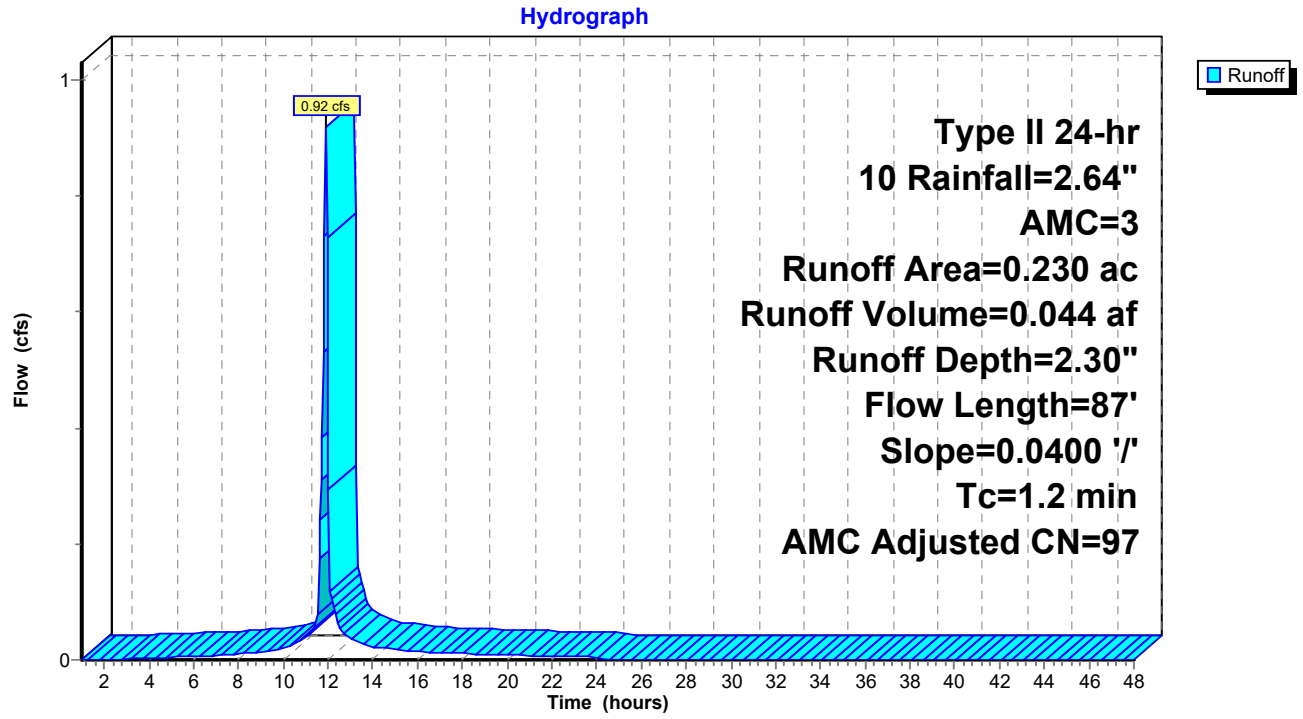
Runoff = 0.92 cfs @ 11.90 hrs, Volume= 0.044 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.190	98		
*	0.040	56		
	0.230	91	97	Weighted Average, AMC Adjusted
	0.040			17.39% Pervious Area
	0.190			82.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	87	0.0400	1.20		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 18S: Q



Summary for Subcatchment 19S: R

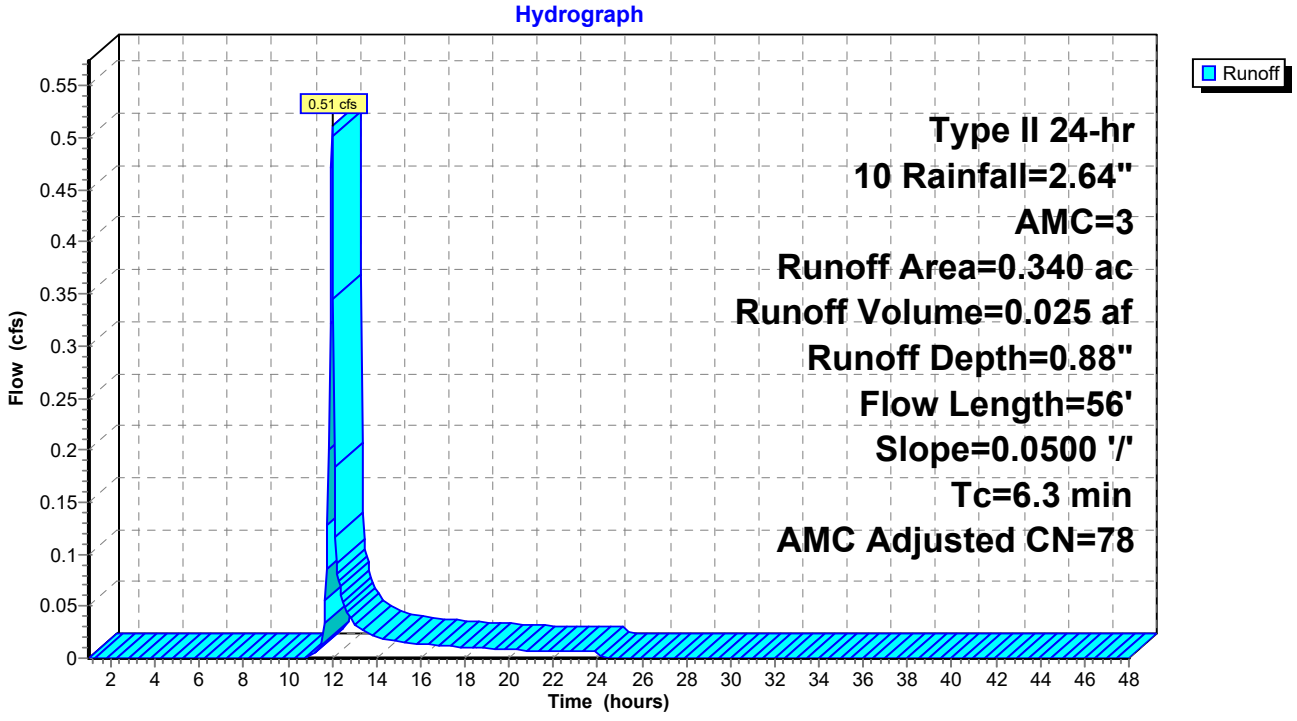
Runoff = 0.51 cfs @ 11.98 hrs, Volume= 0.025 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.030	98		
*	0.310	56		
	0.340	60	78	Weighted Average, AMC Adjusted
	0.310			91.18% Pervious Area
	0.030			8.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	56	0.0500	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 1.49"

Subcatchment 19S: R



Summary for Subcatchment 50S: T

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

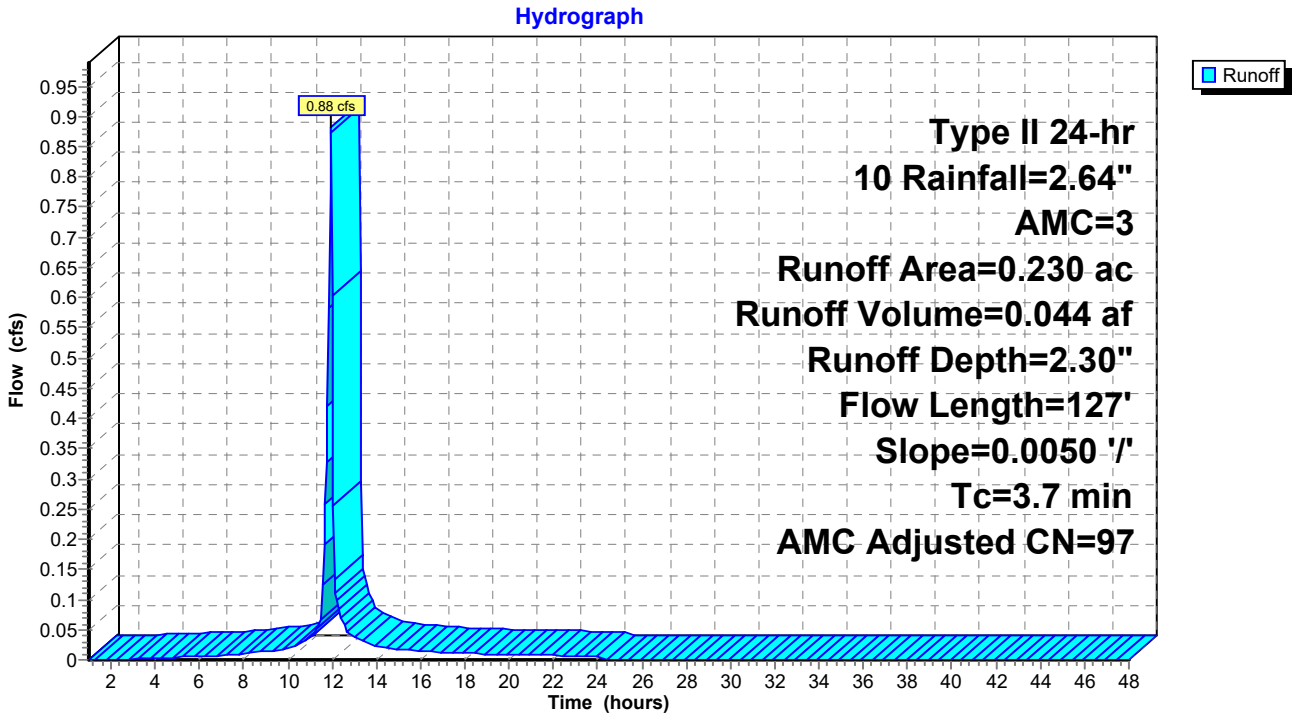
Runoff = 0.88 cfs @ 11.94 hrs, Volume= 0.044 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.190	98		
*	0.040	56		
	0.230	91	97	Weighted Average, AMC Adjusted
	0.040			17.39% Pervious Area
	0.190			82.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	127	0.0050	0.57		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 50S: T



Summary for Subcatchment 52S: U

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

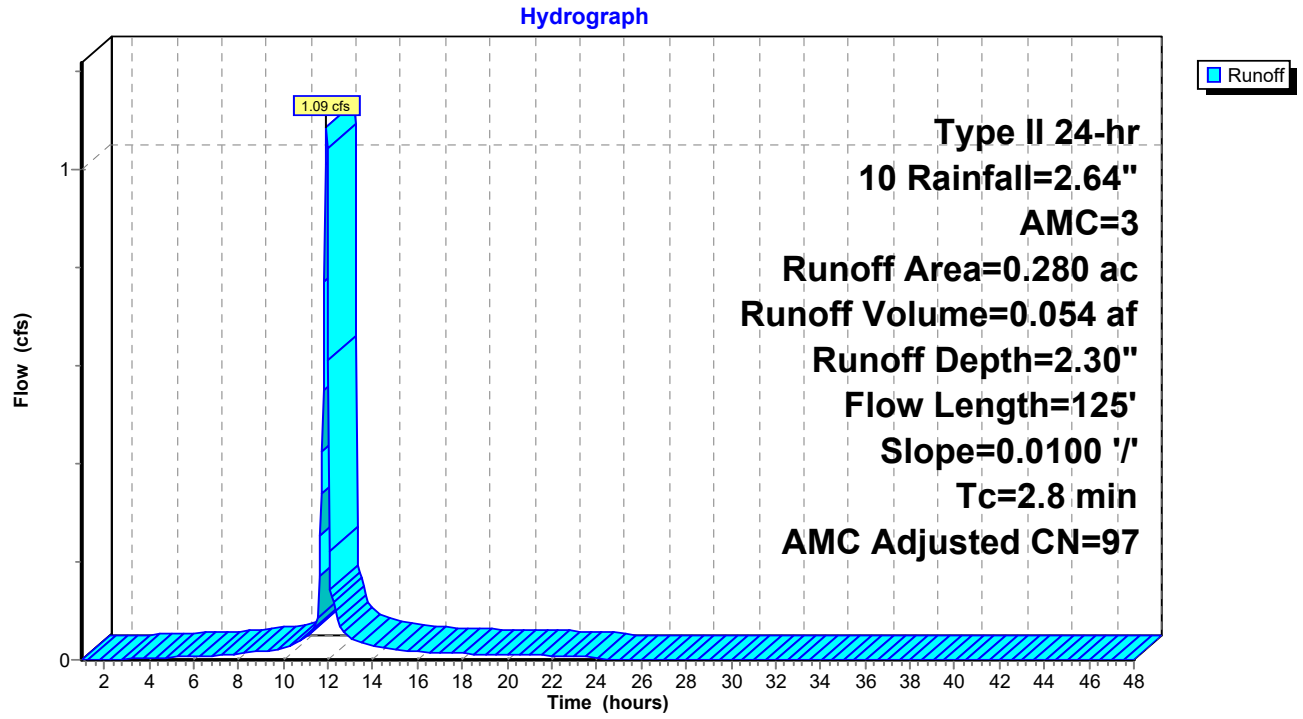
Runoff = 1.09 cfs @ 11.93 hrs, Volume= 0.054 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.240	98		
*	0.040	56		
	0.280	92	97	Weighted Average, AMC Adjusted
	0.040			14.29% Pervious Area
	0.240			85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	125	0.0100	0.74		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 52S: U



Summary for Subcatchment 55S: V

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

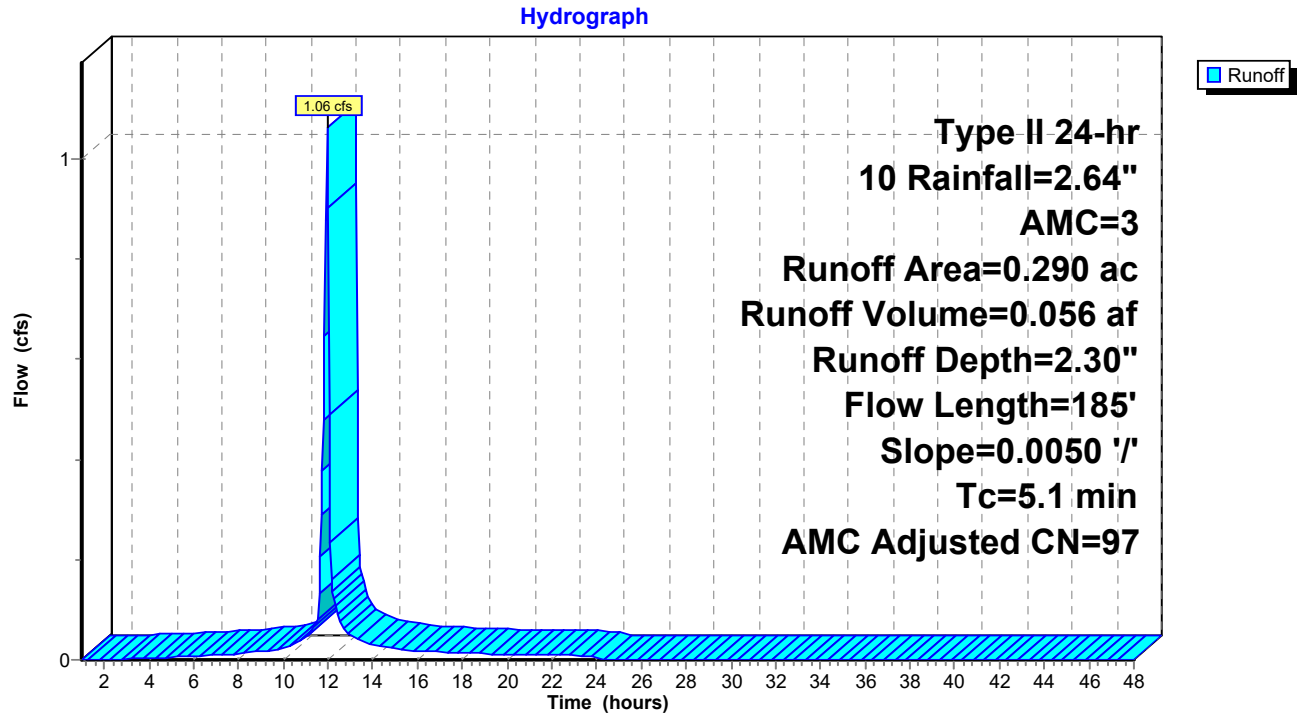
Runoff = 1.06 cfs @ 11.95 hrs, Volume= 0.056 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Rainfall=2.64", AMC=3

	Area (ac)	CN	Adj	Description
*	0.250	98		
*	0.040	56		
	0.290	92	97	Weighted Average, AMC Adjusted
	0.040			13.79% Pervious Area
	0.250			86.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	185	0.0050	0.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 55S: V



Summary for Reach 46R: REGIONAL SD

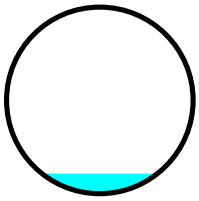
[52] Hint: Inlet/Outlet conditions not evaluated

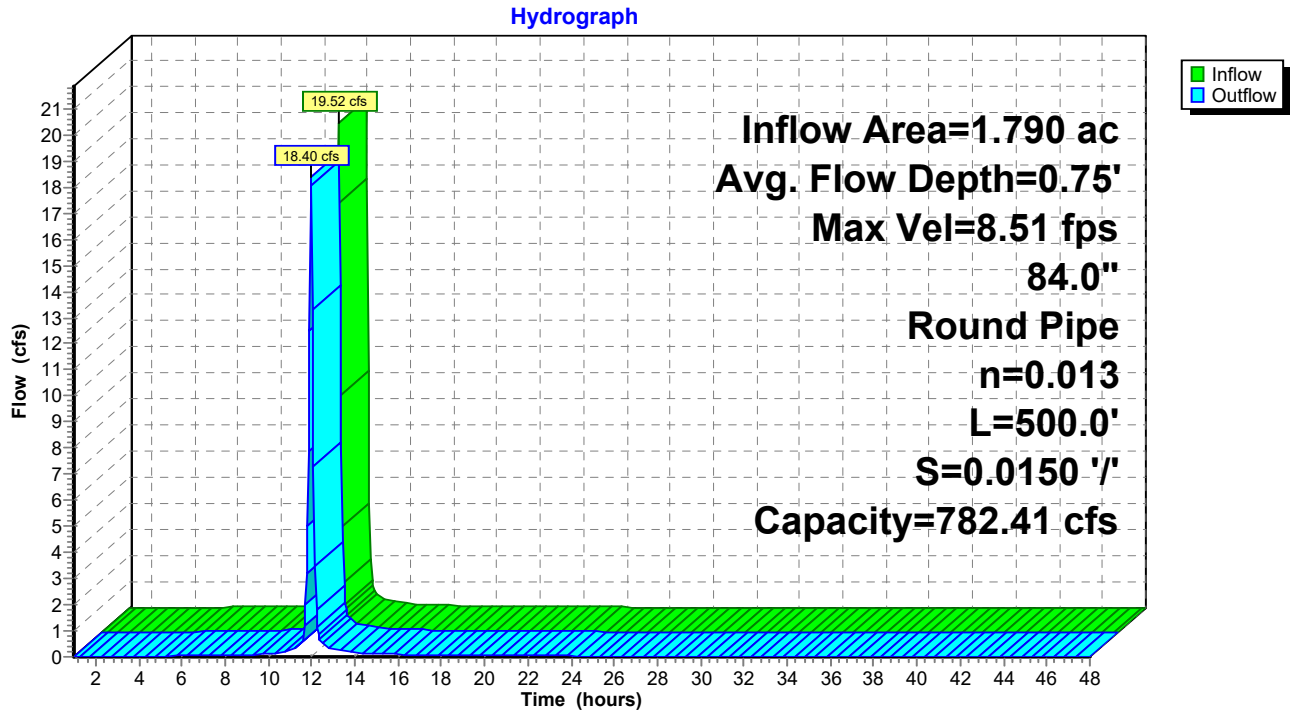
Inflow Area = 1.790 ac, 69.83% Impervious, Inflow Depth = 3.76" for 10 event
Inflow = 19.52 cfs @ 11.95 hrs, Volume= 0.561 af
Outflow = 18.40 cfs @ 11.98 hrs, Volume= 0.561 af, Atten= 6%, Lag= 1.7 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.51 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 2.03 fps, Avg. Travel Time= 4.1 min

Peak Storage= 1,115 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.75'
Bank-Full Depth= 7.00' Flow Area= 38.5 sf, Capacity= 782.41 cfs

84.0" Round Pipe
n= 0.013
Length= 500.0' Slope= 0.0150 '/'
Inlet Invert= 25.10', Outlet Invert= 17.60'





Summary for Pond 20P: DT-1

Inflow Area = 1.780 ac, 84.83% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 6.28 cfs @ 11.95 hrs, Volume= 0.341 af
Outflow = 0.19 cfs @ 13.93 hrs, Volume= 0.341 af, Atten= 97%, Lag= 118.5 min
Discarded = 0.19 cfs @ 13.93 hrs, Volume= 0.341 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 34.39' @ 13.93 hrs Surf.Area= 0.210 ac Storage= 0.181 af

Plug-Flow detention time= 382.1 min calculated for 0.341 af (100% of inflow)
Center-of-Mass det. time= 381.8 min (1,148.9 - 767.1)

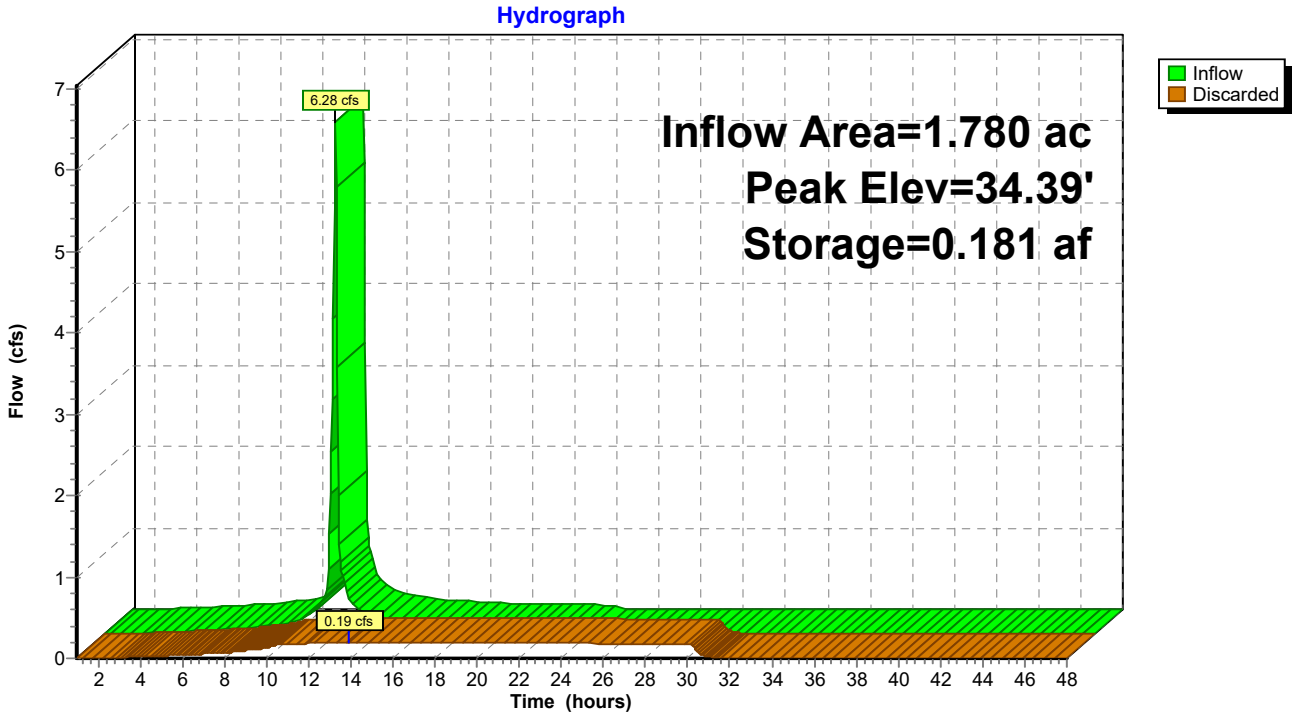
Volume	Invert	Avail.Storage	Storage Description
#1	33.50'	0.509 af	**Custom Stage Data (Irregular)** Listed below (Recalc) 0.525 af Overall x 97.0% Voids

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
33.50	0.210	402.0	0.000	0.000	0.210
36.00	0.210	402.0	0.525	0.525	0.233

Device	Routing	Invert	Outlet Devices
#1	Discarded	33.50'	**0.850 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.19 cfs @ 13.93 hrs HW=34.39' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.19 cfs)

Pond 20P: DT-1


Hydrograph
Inflow
Discarded
Inflow Area=1.780 ac
Peak Elev=34.39'
Storage=0.181 af
6.28 cfs
0.19 cfs
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48

Summary for Pond 22P: CB-P

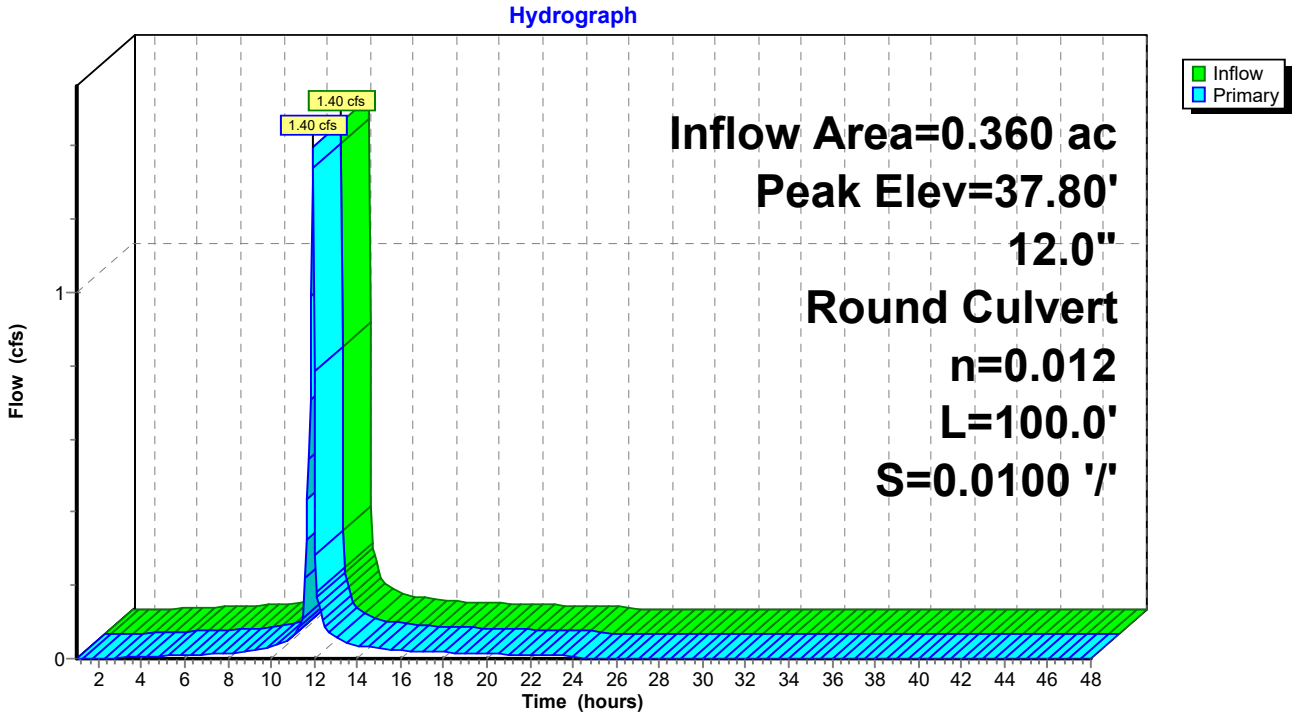
Inflow Area = 0.360 ac, 83.33% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 1.40 cfs @ 11.93 hrs, Volume= 0.069 af
Outflow = 1.40 cfs @ 11.93 hrs, Volume= 0.069 af, Atten= 0%, Lag= 0.0 min
Primary = 1.40 cfs @ 11.93 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.80' @ 11.93 hrs
Flood Elev= 40.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	37.00'	**12.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 37.00' / 36.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.33 cfs @ 11.93 hrs HW=37.77' (Free Discharge)
1=Culvert (Inlet Controls 1.33 cfs @ 2.04 fps)

Pond 22P: CB-P



Summary for Pond 24P: CB-M

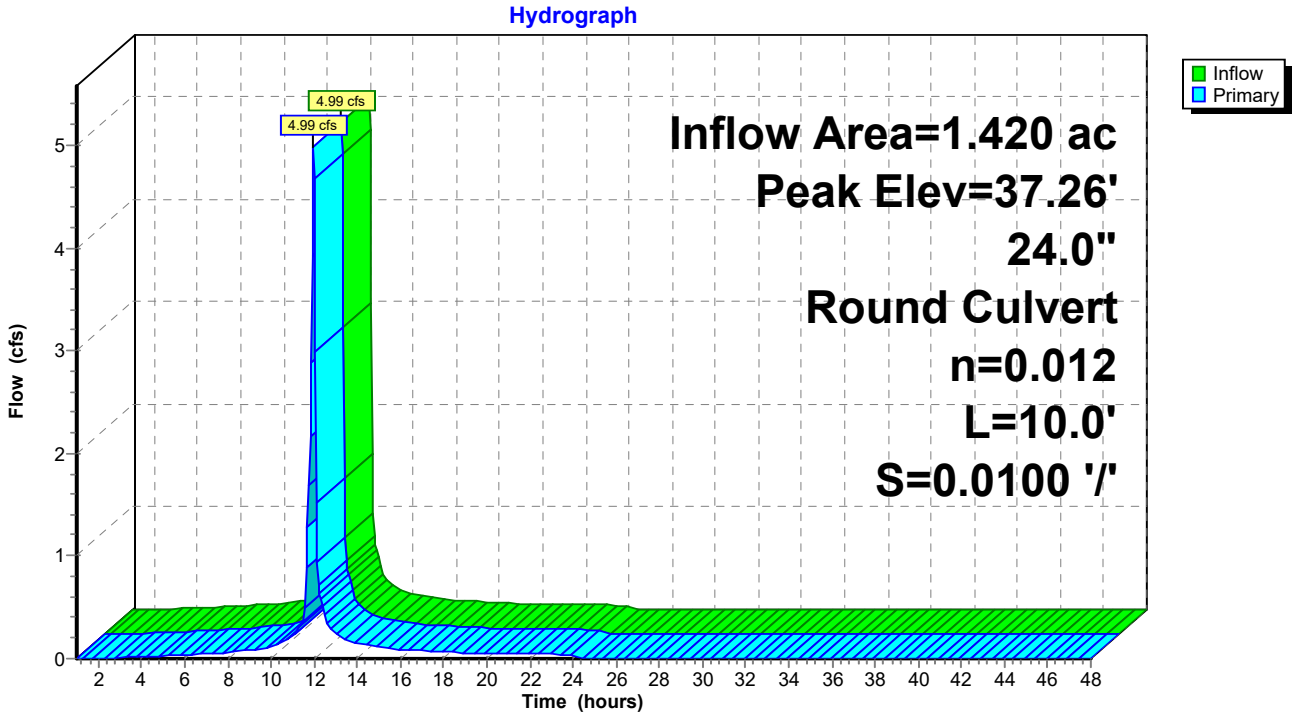
Inflow Area = 1.420 ac, 85.21% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 4.99 cfs @ 11.97 hrs, Volume= 0.272 af
Outflow = 4.99 cfs @ 11.97 hrs, Volume= 0.272 af, Atten= 0%, Lag= 0.0 min
Primary = 4.99 cfs @ 11.97 hrs, Volume= 0.272 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.26' @ 11.97 hrs
Flood Elev= 40.89'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.00'	**24.0" Round Culvert** L= 10.0' Ke= 1.200 Inlet / Outlet Invert= 36.00' / 35.90' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=4.86 cfs @ 11.97 hrs HW=37.24' (Free Discharge)
1=Culvert (Barrel Controls 4.86 cfs @ 3.38 fps)

Pond 24P: CB-M



Summary for Pond 26P: CB-N

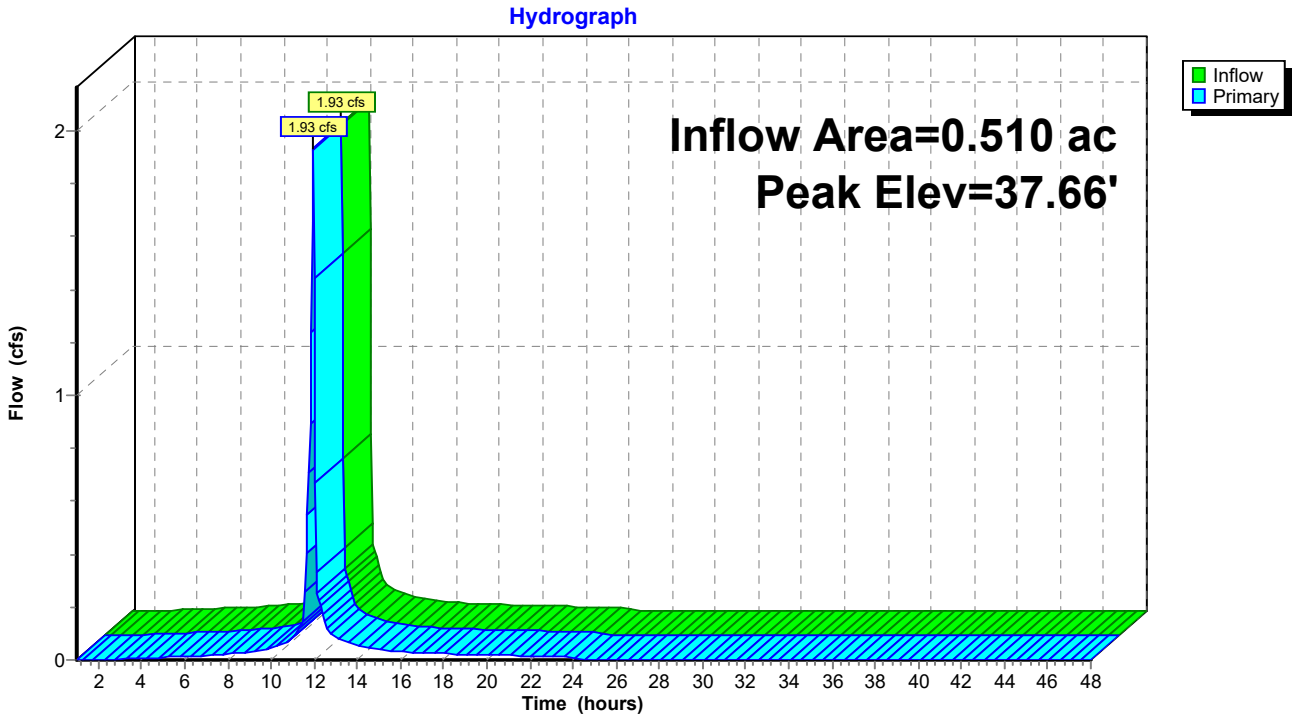
Inflow Area = 0.510 ac, 84.31% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 1.93 cfs @ 11.94 hrs, Volume= 0.098 af
Outflow = 1.93 cfs @ 11.94 hrs, Volume= 0.098 af, Atten= 0%, Lag= 0.0 min
Primary = 1.93 cfs @ 11.94 hrs, Volume= 0.098 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.66' @ 11.94 hrs
Flood Elev= 39.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.57'	**12.0" x 12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	36.60'	**12.0" Round Culvert** L= 10.0' Ke= 1.200 Inlet / Outlet Invert= 36.60' / 36.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.89 cfs @ 11.94 hrs HW=37.64' (Free Discharge)
1=Orifice/Grate (Controls 0.00 cfs)
2=Culvert (Inlet Controls 1.89 cfs @ 2.40 fps)

Pond 26P: CB-N



Summary for Pond 27P: CB-O

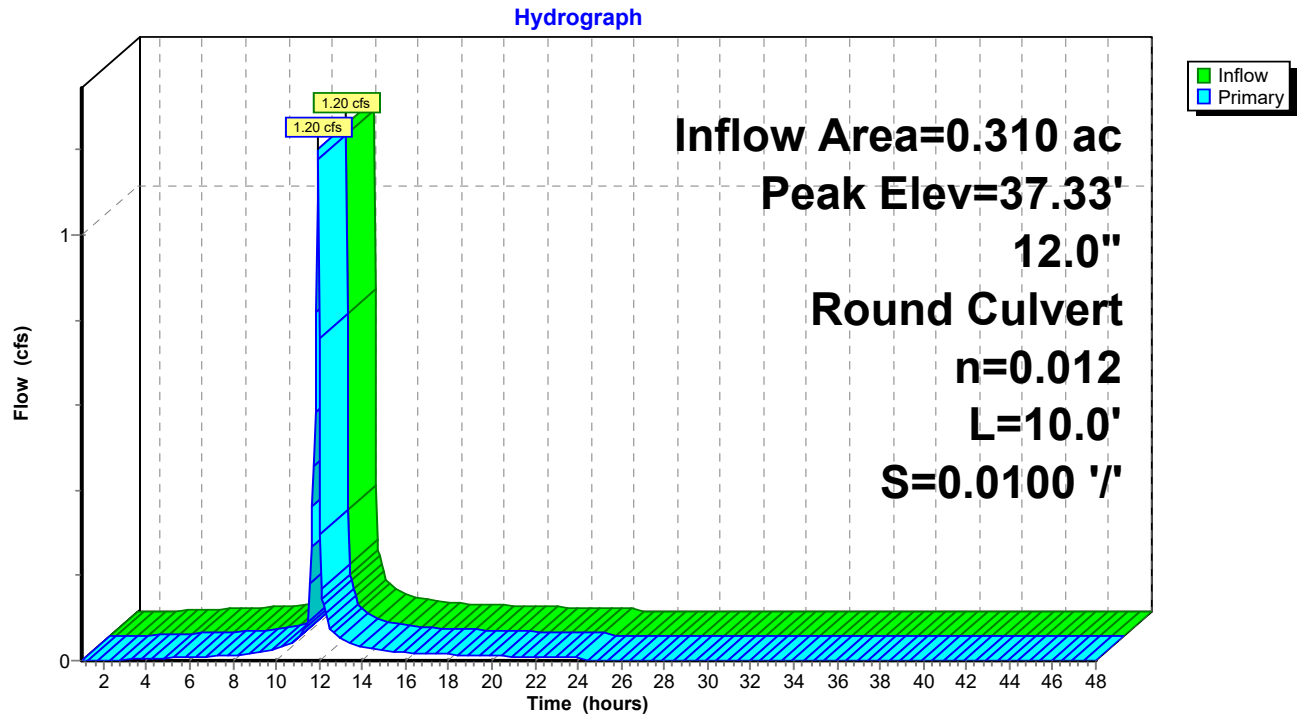
Inflow Area = 0.310 ac, 83.87% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 1.20 cfs @ 11.93 hrs, Volume= 0.059 af
Outflow = 1.20 cfs @ 11.93 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min
Primary = 1.20 cfs @ 11.93 hrs, Volume= 0.059 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.33' @ 11.93 hrs
Flood Elev= 39.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.60'	**12.0" Round Culvert** L= 10.0' Ke= 1.200 Inlet / Outlet Invert= 36.60' / 36.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.14 cfs @ 11.93 hrs HW=37.31' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.14 cfs @ 2.70 fps)

Pond 27P: CB-O



Summary for Pond 28P: DT-2

Inflow Area = 1.060 ac, 84.91% Impervious, Inflow Depth = 2.33" for 10 event
Inflow = 4.03 cfs @ 11.94 hrs, Volume= 0.206 af
Outflow = 0.10 cfs @ 14.05 hrs, Volume= 0.206 af, Atten= 97%, Lag= 126.6 min
Discarded = 0.10 cfs @ 14.05 hrs, Volume= 0.206 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 32.54' @ 14.05 hrs Surf.Area= 0.110 ac Storage= 0.111 af

Plug-Flow detention time= 429.6 min calculated for 0.205 af (100% of inflow)
Center-of-Mass det. time= 429.8 min (1,193.0 - 763.3)

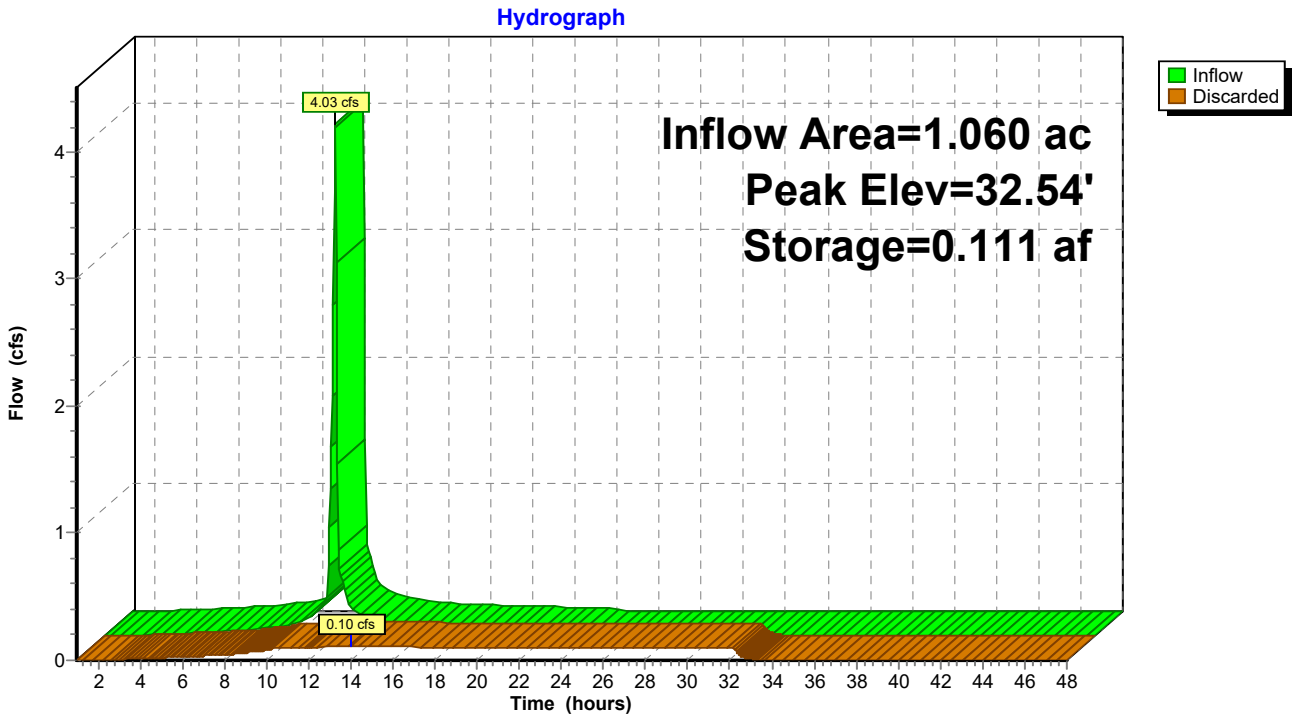
Volume	Invert	Avail.Storage	Storage Description
#1	31.50'	0.267 af	**Custom Stage Data (Irregular)** Listed below (Recalc) 0.275 af Overall x 97.0% Voids

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
31.50	0.110	477.0	0.000	0.000	0.110
34.00	0.110	477.0	0.275	0.275	0.137

Device	Routing	Invert	Outlet Devices
#1	Discarded	31.50'	**0.850 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.10 cfs @ 14.05 hrs HW=32.54' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.10 cfs)

Pond 28P: DT-2


Hydrograph
Inflow
Discarded
Inflow Area=1.060 ac
Peak Elev=32.54'
Storage=0.111 af
4.03 cfs
0.10 cfs
Flow (cfs)
Time (hours)
0
1
2
3
4
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 29P: CB-L

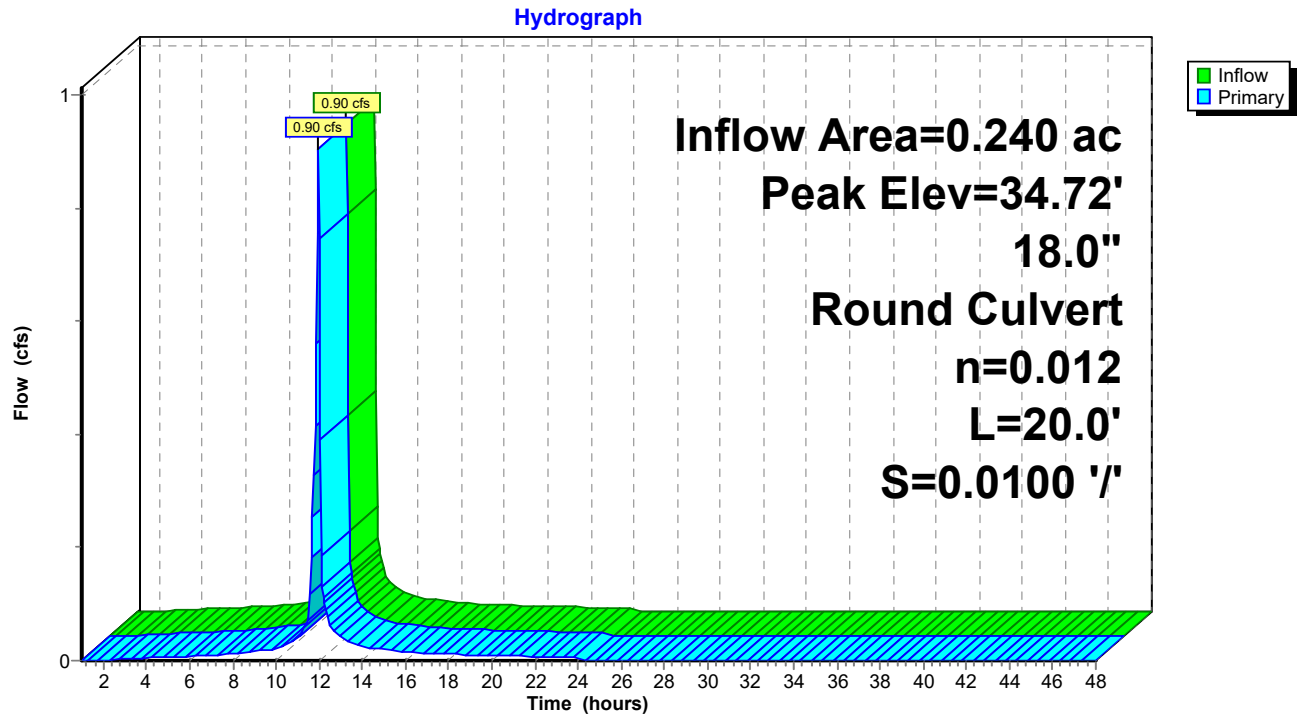
Inflow Area = 0.240 ac, 87.50% Impervious, Inflow Depth = 2.41" for 10 event
Inflow = 0.90 cfs @ 11.95 hrs, Volume= 0.048 af
Outflow = 0.90 cfs @ 11.95 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min
Primary = 0.90 cfs @ 11.95 hrs, Volume= 0.048 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 34.72' @ 11.95 hrs
Flood Elev= 37.15'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.20'	**18.0" Round Culvert** L= 20.0' Ke= 1.200 Inlet / Outlet Invert= 34.20' / 34.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.90 cfs @ 11.95 hrs HW=34.72' (Free Discharge)
1=Culvert (Inlet Controls 0.90 cfs @ 1.67 fps)

Pond 29P: CB-L



Summary for Pond 30P: CB-I

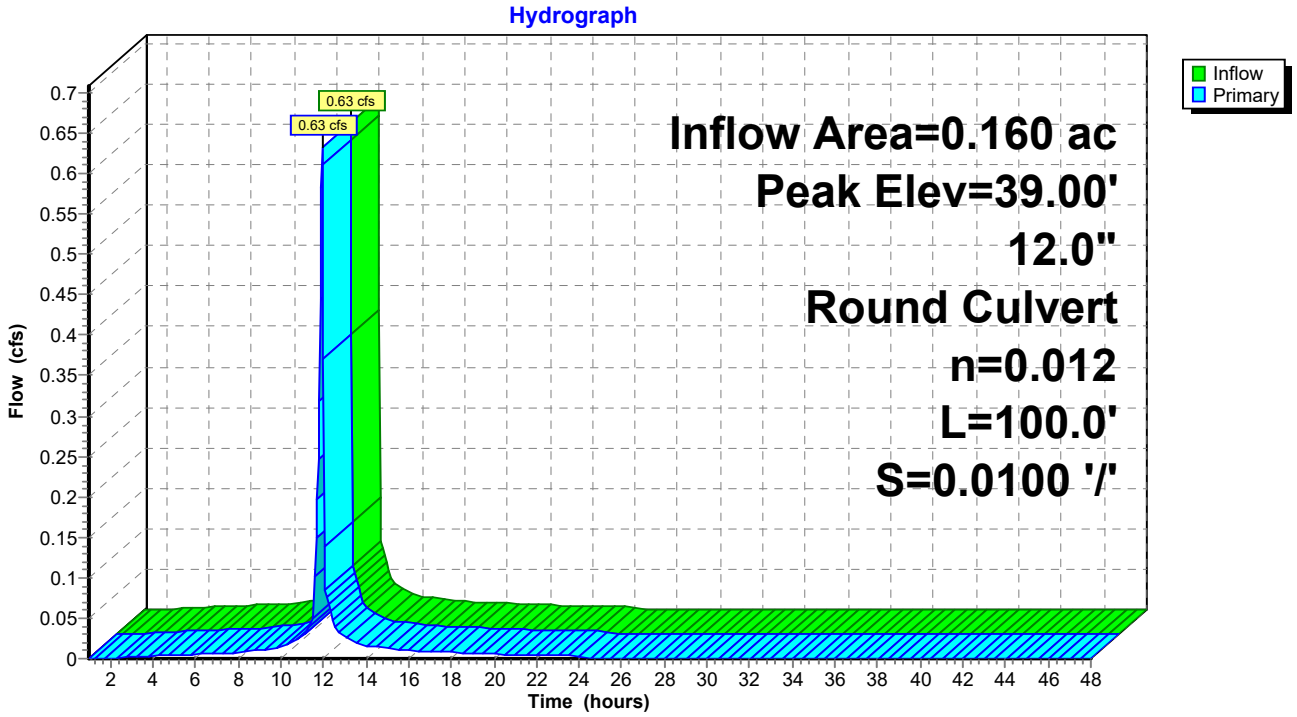
Inflow Area = 0.160 ac, 87.50% Impervious, Inflow Depth = 2.41" for 10 event
Inflow = 0.63 cfs @ 11.93 hrs, Volume= 0.032 af
Outflow = 0.63 cfs @ 11.93 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 11.93 hrs, Volume= 0.032 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 39.00' @ 11.93 hrs
Flood Elev= 41.99'

Device	Routing	Invert	Outlet Devices
#1	Primary	38.50'	**12.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 38.50' / 37.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.60 cfs @ 11.93 hrs HW=38.98' (Free Discharge)
1=Culvert (Inlet Controls 0.60 cfs @ 1.61 fps)

Pond 30P: CB-I



Summary for Pond 31P: CB-J

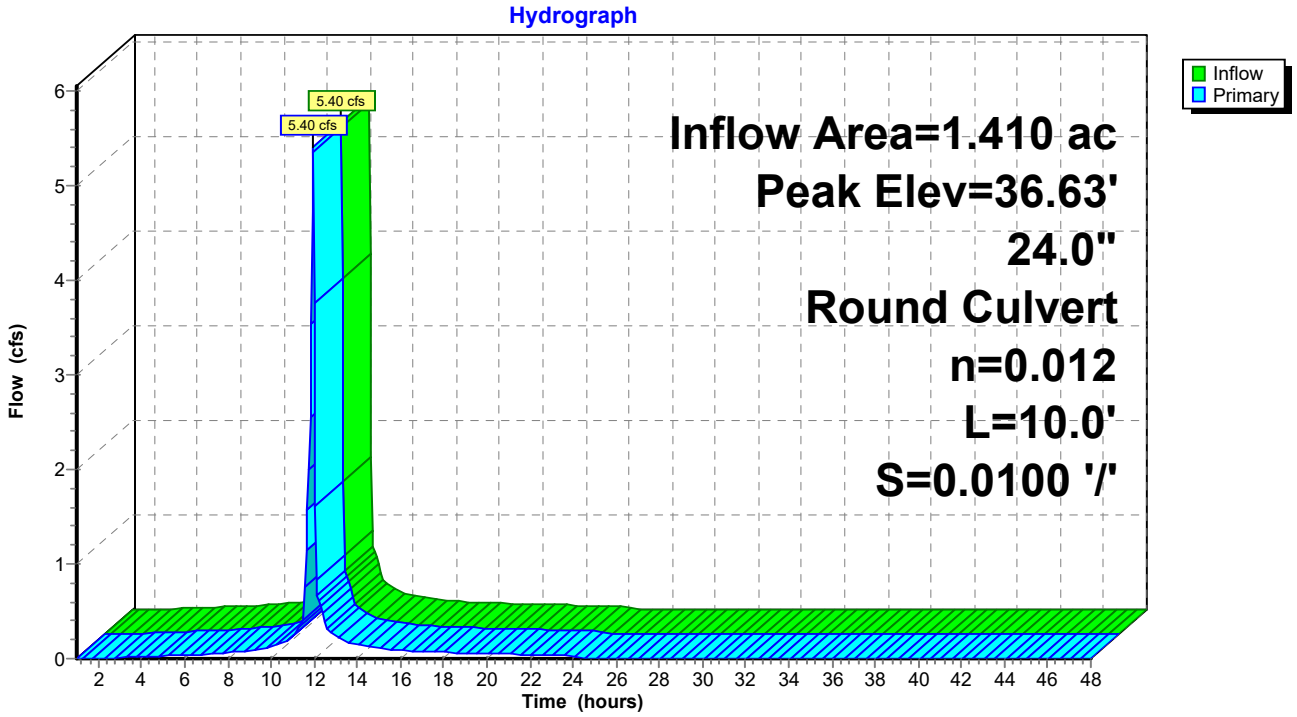
Inflow Area = 1.410 ac, 85.11% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 5.40 cfs @ 11.94 hrs, Volume= 0.270 af
Outflow = 5.40 cfs @ 11.94 hrs, Volume= 0.270 af, Atten= 0%, Lag= 0.0 min
Primary = 5.40 cfs @ 11.94 hrs, Volume= 0.270 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 36.63' @ 11.94 hrs
Flood Elev= 38.26'

Device	Routing	Invert	Outlet Devices
#1	Primary	35.30'	**24.0" Round Culvert** L= 10.0' Ke= 1.200 Inlet / Outlet Invert= 35.30' / 35.20' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=5.21 cfs @ 11.94 hrs HW=36.60' (Free Discharge)
1=Culvert (Barrel Controls 5.21 cfs @ 3.44 fps)

Pond 31P: CB-J



Summary for Pond 32P: DT-3

Inflow Area = 1.570 ac, 85.35% Impervious, Inflow Depth = 2.31" for 10 event
Inflow = 6.03 cfs @ 11.94 hrs, Volume= 0.303 af
Outflow = 0.15 cfs @ 14.06 hrs, Volume= 0.303 af, Atten= 97%, Lag= 127.1 min
Discarded = 0.15 cfs @ 14.06 hrs, Volume= 0.303 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 33.56' @ 14.06 hrs Surf.Area= 0.170 ac Storage= 0.164 af

Plug-Flow detention time= 424.8 min calculated for 0.302 af (100% of inflow)
Center-of-Mass det. time= 424.9 min (1,189.2 - 764.3)

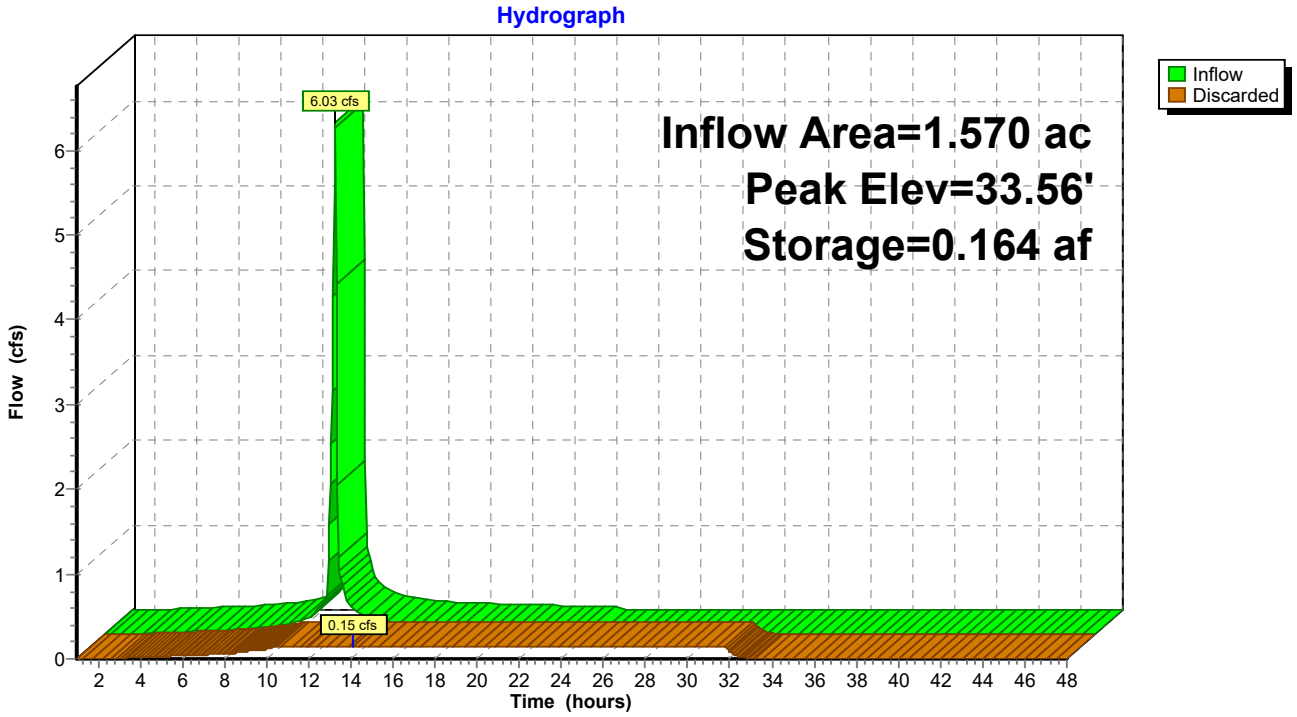
Volume	Invert	Avail.Storage	Storage Description
#1	32.60'	0.425 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
32.60	0.170	403.0	0.000	0.000	0.170
35.10	0.170	403.0	0.425	0.425	0.193

Device	Routing	Invert	Outlet Devices
#1	Discarded	32.60'	**0.850 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.15 cfs @ 14.06 hrs HW=33.56' (Free Discharge)
↳**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Pond 32P: DT-3



Summary for Pond 33P: CB-G

Inflow Area = 0.780 ac, 84.62% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 2.78 cfs @ 11.96 hrs, Volume= 0.150 af
Outflow = 2.78 cfs @ 11.96 hrs, Volume= 0.150 af, Atten= 0%, Lag= 0.0 min
Primary = 1.05 cfs @ 11.96 hrs, Volume= 0.121 af
Secondary = 1.73 cfs @ 11.96 hrs, Volume= 0.029 af

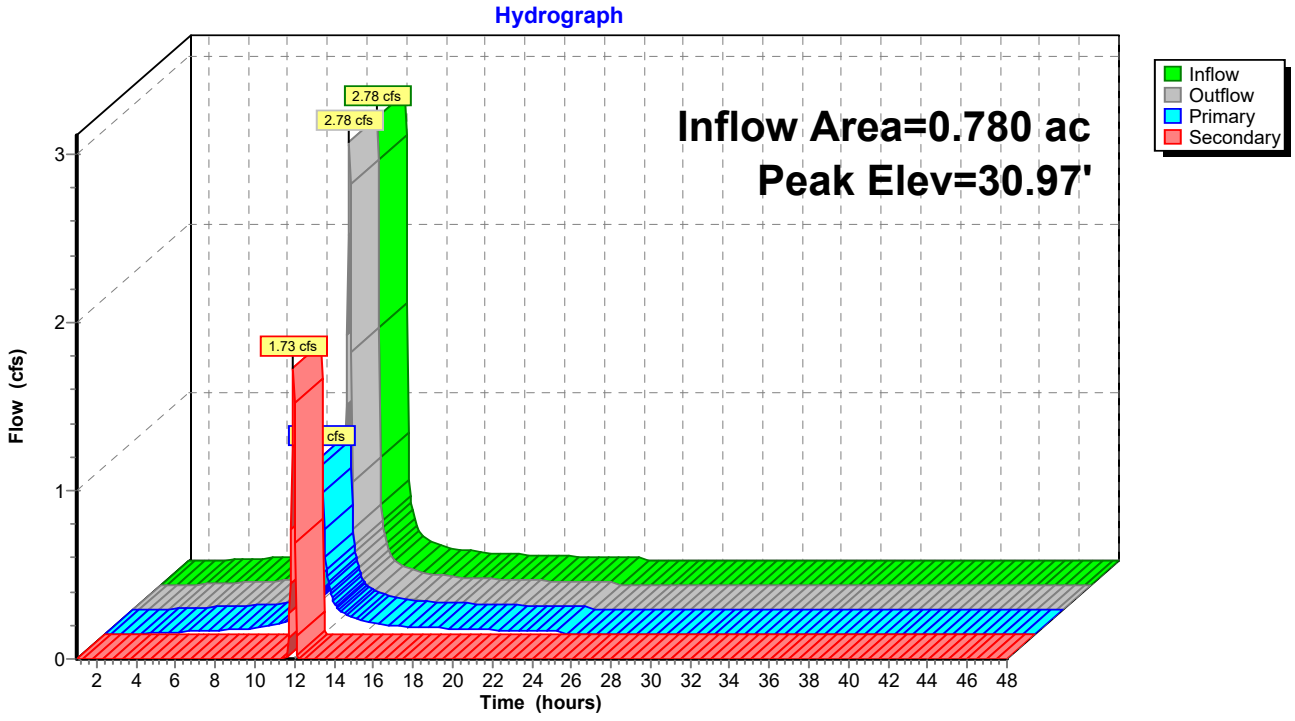
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 30.97' @ 11.96 hrs
Flood Elev= 32.88'

Device	Routing	Invert	Outlet Devices
#1	Primary	29.80'	**8.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 29.80' / 28.80' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Secondary	30.23'	**18.0" Round Culvert** L= 15.0' Ke= 1.200 Inlet / Outlet Invert= 30.23' / 30.08' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.04 cfs @ 11.96 hrs HW=30.96' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.04 cfs @ 2.98 fps)

Secondary OutFlow Max=1.68 cfs @ 11.96 hrs HW=30.96' (Free Discharge)
└**2=Culvert** (Inlet Controls 1.68 cfs @ 1.98 fps)

Pond 33P: CB-G



Summary for Pond 34P: CB-K

Inflow Area = 0.940 ac, 85.11% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 3.47 cfs @ 11.95 hrs, Volume= 0.180 af
Outflow = 3.47 cfs @ 11.95 hrs, Volume= 0.180 af, Atten= 0%, Lag= 0.0 min
Primary = 1.40 cfs @ 11.95 hrs, Volume= 0.148 af
Secondary = 2.08 cfs @ 11.95 hrs, Volume= 0.032 af

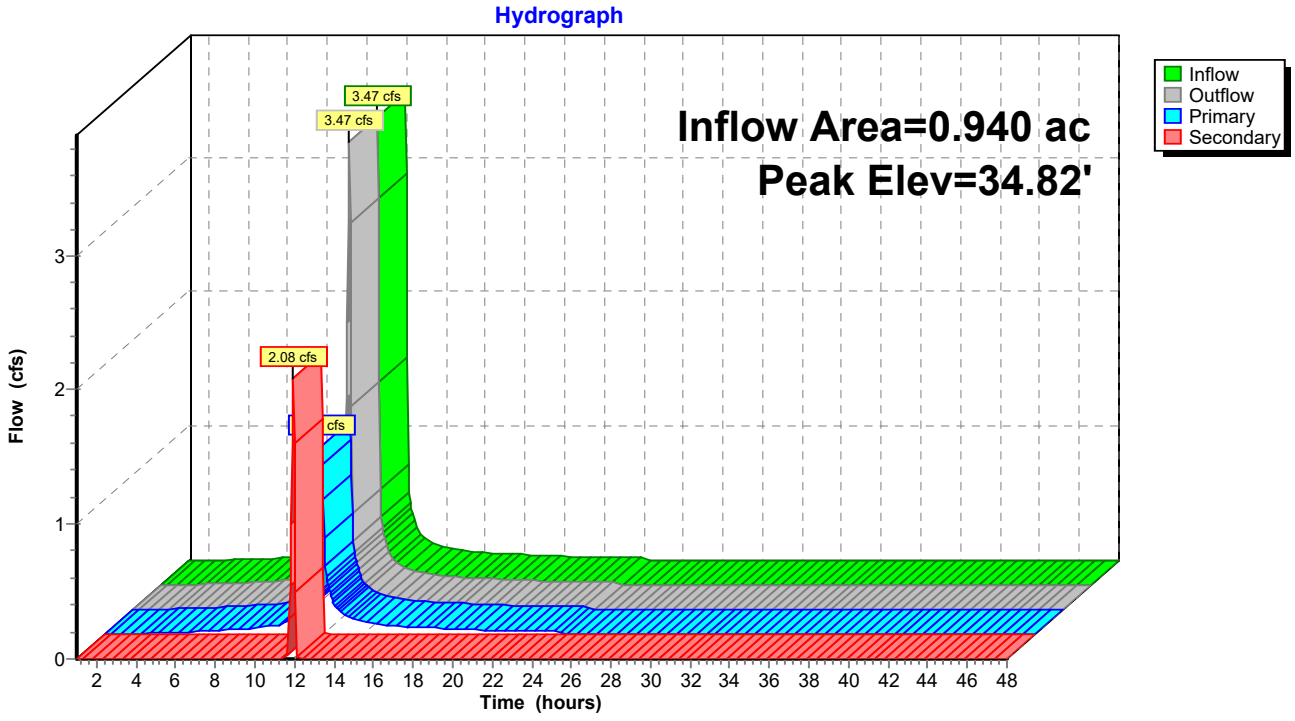
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 34.82' @ 11.95 hrs
Flood Elev= 36.06'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.00'	**8.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 33.00' / 32.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Secondary	33.67'	**12.0" Round Culvert** L= 20.0' Ke= 1.200 Inlet / Outlet Invert= 33.67' / 32.78' S= 0.0445 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.40 cfs @ 11.95 hrs HW=34.82' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.40 cfs @ 4.00 fps)

Secondary OutFlow Max=2.08 cfs @ 11.95 hrs HW=34.82' (Free Discharge)
└**2=Culvert** (Inlet Controls 2.08 cfs @ 2.64 fps)

Pond 34P: CB-K



Summary for Pond 36P: CB-F

Inflow Area = 2.550 ac, 85.10% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 7.92 cfs @ 12.01 hrs, Volume= 0.489 af
Outflow = 7.92 cfs @ 12.01 hrs, Volume= 0.489 af, Atten= 0%, Lag= 0.0 min
Primary = 4.39 cfs @ 12.01 hrs, Volume= 0.432 af
Secondary = 3.53 cfs @ 12.01 hrs, Volume= 0.058 af

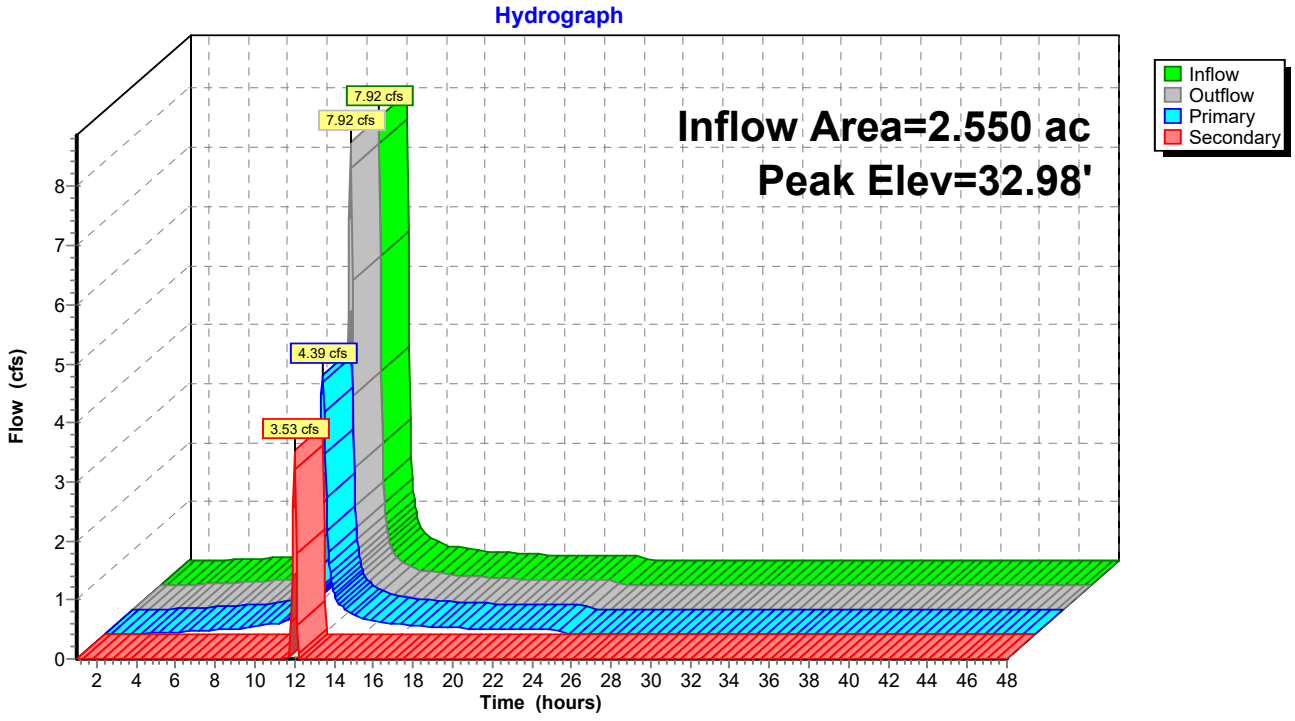
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 32.98' @ 12.01 hrs
Flood Elev= 35.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.17'	**15.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 31.17' / 30.17' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Secondary	32.00'	**24.0" Round Culvert** L= 200.0' Ke= 1.200 Inlet / Outlet Invert= 32.00' / 30.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=4.35 cfs @ 12.01 hrs HW=32.96' (Free Discharge)
└**1=Culvert** (Inlet Controls 4.35 cfs @ 3.55 fps)

Secondary OutFlow Max=3.41 cfs @ 12.01 hrs HW=32.96' (Free Discharge)
└**2=Culvert** (Inlet Controls 3.41 cfs @ 2.28 fps)

Pond 36P: CB-F



Summary for Pond 37P: CB-C

Inflow Area = 0.420 ac, 85.71% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 1.62 cfs @ 11.94 hrs, Volume= 0.081 af
Outflow = 1.62 cfs @ 11.94 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min
Primary = 1.08 cfs @ 11.94 hrs, Volume= 0.075 af
Secondary = 0.53 cfs @ 11.94 hrs, Volume= 0.005 af

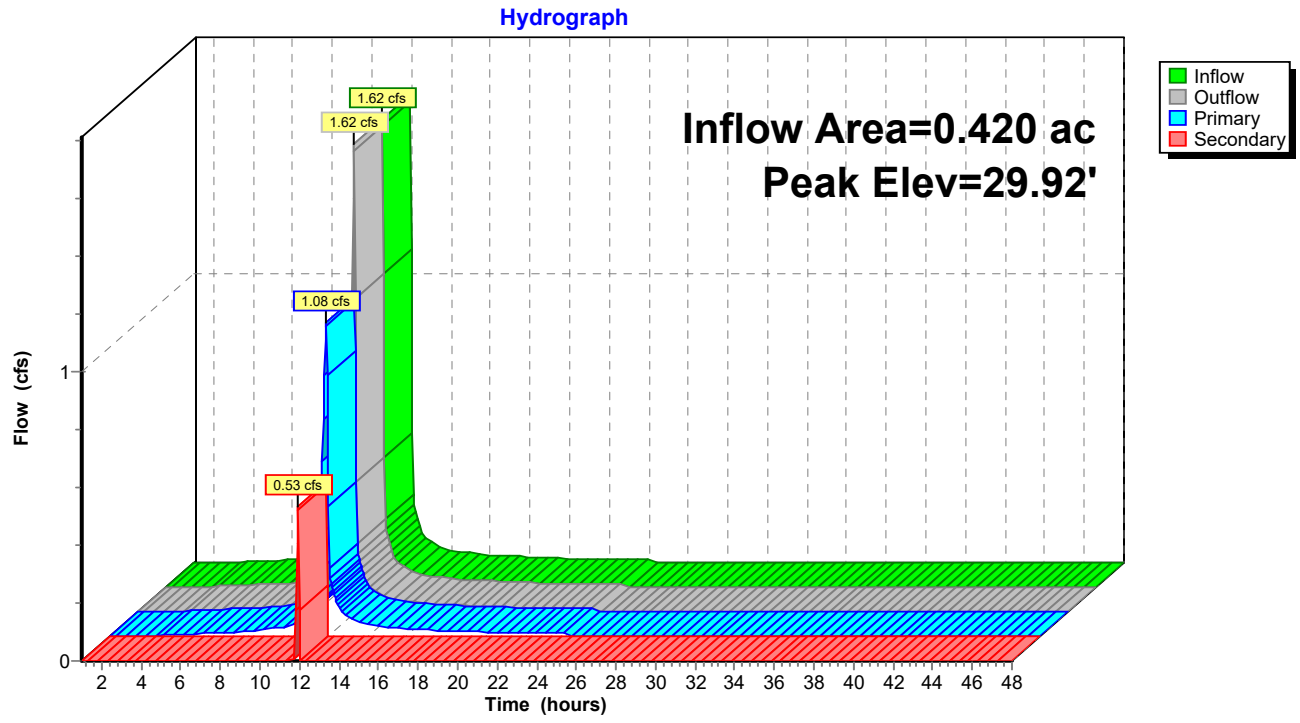
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 29.92' @ 11.94 hrs
Flood Elev= 32.01'

Device	Routing	Invert	Outlet Devices
#1	Primary	28.70'	**8.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 28.70' / 27.70' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Secondary	29.37'	**8.0" Round Culvert** L= 200.0' Ke= 1.200 Inlet / Outlet Invert= 29.37' / 27.67' S= 0.0085 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=1.06 cfs @ 11.94 hrs HW=29.89' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.06 cfs @ 3.04 fps)

Secondary OutFlow Max=0.49 cfs @ 11.94 hrs HW=29.89' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.49 cfs @ 1.68 fps)

Pond 37P: CB-C



Summary for Pond 38P: CB-D

Inflow Area = 1.820 ac, 85.16% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 6.35 cfs @ 11.97 hrs, Volume= 0.349 af
Outflow = 6.35 cfs @ 11.97 hrs, Volume= 0.349 af, Atten= 0%, Lag= 0.0 min
Primary = 2.78 cfs @ 11.97 hrs, Volume= 0.292 af
Secondary = 3.57 cfs @ 11.97 hrs, Volume= 0.057 af

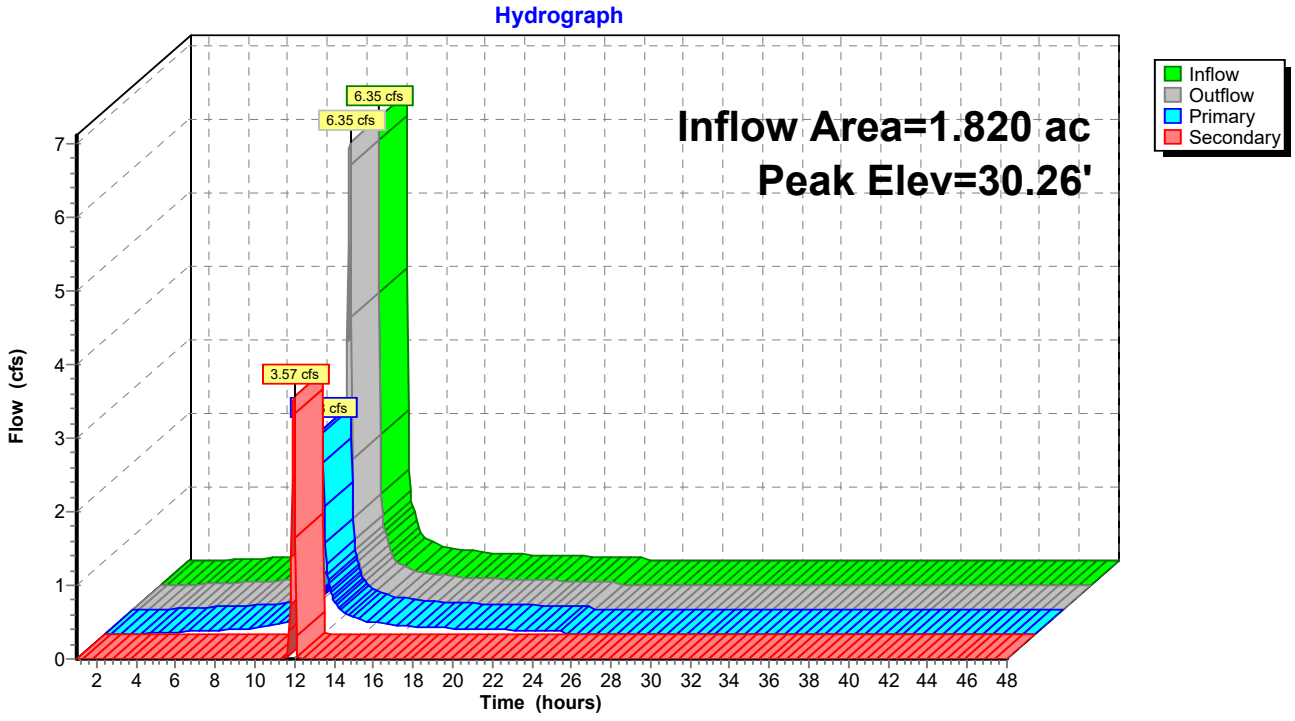
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 30.26' @ 11.97 hrs
Flood Elev= 31.59'

Device	Routing	Invert	Outlet Devices
#1	Primary	28.60'	**12.0" Round Culvert** L= 40.0' Ke= 1.200 Inlet / Outlet Invert= 28.60' / 28.20' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Secondary	29.27'	**24.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 29.27' / 28.27' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=2.75 cfs @ 11.97 hrs HW=30.24' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.75 cfs @ 3.50 fps)

Secondary OutFlow Max=3.43 cfs @ 11.97 hrs HW=30.24' (Free Discharge)
└**2=Culvert** (Inlet Controls 3.43 cfs @ 2.28 fps)

Pond 38P: CB-D



Summary for Pond 39P: DT-4

Inflow Area = 5.860 ac, 85.15% Impervious, Inflow Depth = 2.00" for 10 event
Inflow = 10.12 cfs @ 11.97 hrs, Volume= 0.975 af
Outflow = 0.40 cfs @ 15.70 hrs, Volume= 0.975 af, Atten= 96%, Lag= 224.1 min
Discarded = 0.40 cfs @ 15.70 hrs, Volume= 0.975 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 26.43' @ 15.70 hrs Surf.Area= 0.440 ac Storage= 0.526 af

Plug-Flow detention time= 537.1 min calculated for 0.974 af (100% of inflow)
Center-of-Mass det. time= 537.5 min (1,314.6 - 777.1)

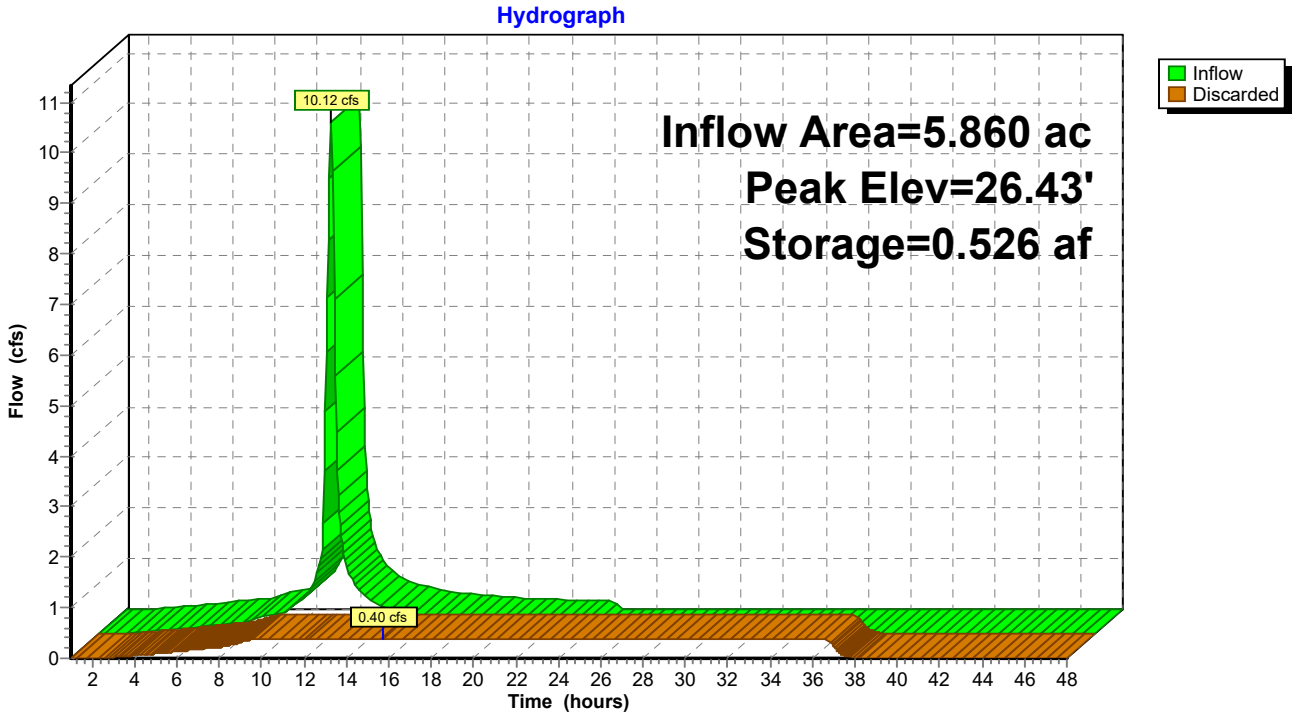
Volume	Invert	Avail.Storage	Storage Description
#1	25.20'	1.067 af	**Custom Stage Data (Irregular)** Listed below (Recalc) 1.100 af Overall x 97.0% Voids

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
25.20	0.440	871.0	0.000	0.000	0.440
27.70	0.440	871.0	1.100	1.100	0.490

Device	Routing	Invert	Outlet Devices
#1	Discarded	25.20'	**0.850 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.40 cfs @ 15.70 hrs HW=26.43' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.40 cfs)

Pond 39P: DT-4


Hydrograph
Inflow
Discarded
10.12 cfs
0.40 cfs
Inflow Area=5.860 ac
Peak Elev=26.43'
Storage=0.526 af
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48

Summary for Pond 40P: CB-E

Inflow Area = 0.320 ac, 84.38% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 0.97 cfs @ 12.02 hrs, Volume= 0.061 af
Outflow = 0.97 cfs @ 12.02 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min
Primary = 0.24 cfs @ 12.02 hrs, Volume= 0.045 af
Secondary = 0.73 cfs @ 12.02 hrs, Volume= 0.017 af

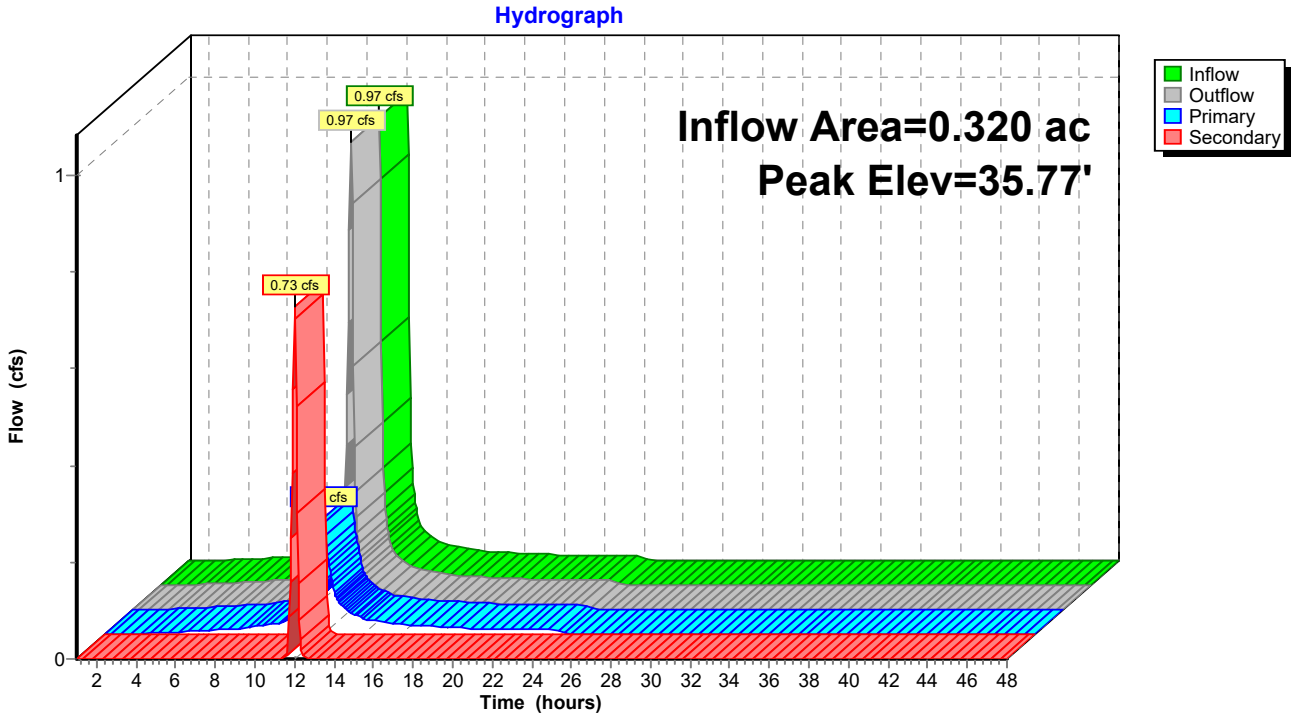
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 35.77' @ 12.02 hrs
Flood Elev= 37.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.90'	**4.0" Round Culvert** L= 75.0' Ke= 1.200 Inlet / Outlet Invert= 34.90' / 34.15' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Secondary	35.23'	**12.0" Round Culvert** L= 200.0' Ke= 1.200 Inlet / Outlet Invert= 35.23' / 33.40' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.24 cfs @ 12.02 hrs HW=35.76' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.24 cfs @ 2.73 fps)

Secondary OutFlow Max=0.71 cfs @ 12.02 hrs HW=35.76' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.71 cfs @ 1.69 fps)

Pond 40P: CB-E



Summary for Pond 41P: DT-6

Inflow Area = 1.290 ac, 84.50% Impervious, Inflow Depth = 1.59" for 10 event
Inflow = 0.88 cfs @ 11.94 hrs, Volume= 0.171 af
Outflow = 0.07 cfs @ 16.45 hrs, Volume= 0.171 af, Atten= 92%, Lag= 270.4 min
Discarded = 0.07 cfs @ 16.45 hrs, Volume= 0.171 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 28.61' @ 16.45 hrs Surf.Area= 0.075 ac Storage= 0.081 af

Plug-Flow detention time= 458.8 min calculated for 0.171 af (100% of inflow)
Center-of-Mass det. time= 459.1 min (1,249.5 - 790.3)

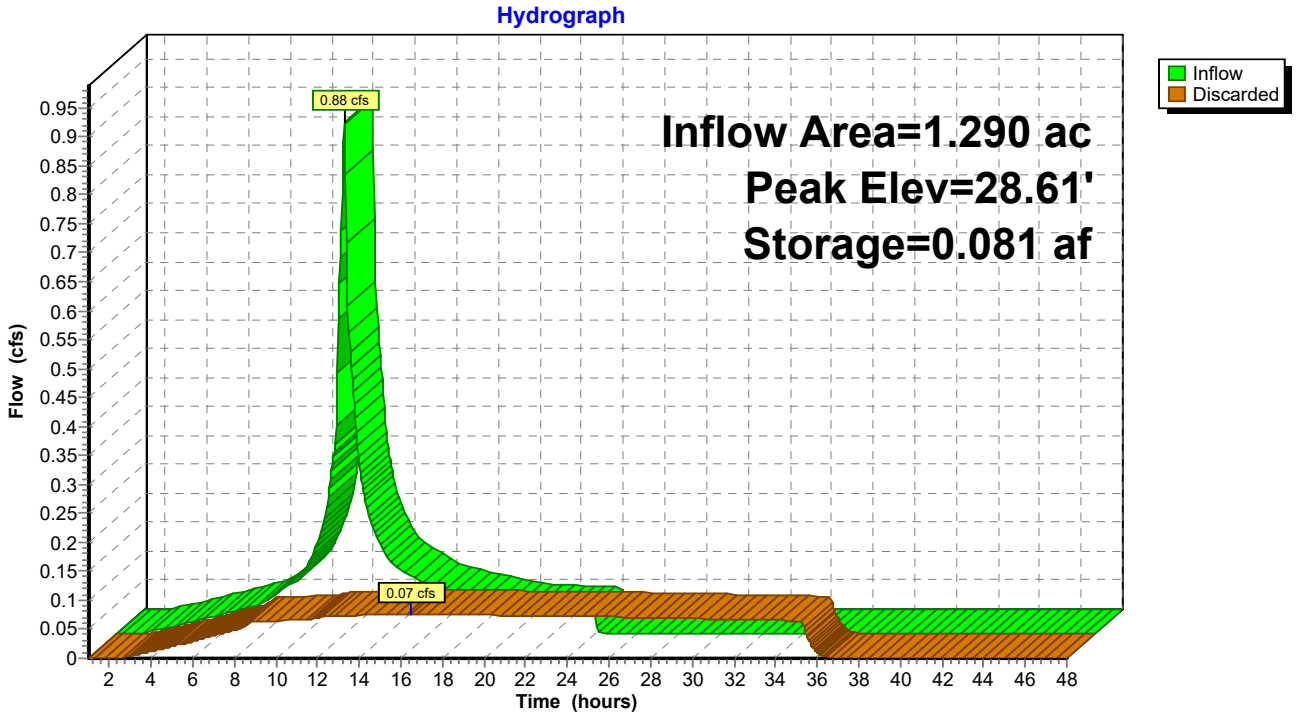
Volume	Invert	Avail.Storage	Storage Description
#1	27.50'	0.182 af	**Custom Stage Data (Irregular)** Listed below (Recalc) 0.187 af Overall x 97.0% Voids

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
27.50	0.075	482.0	0.000	0.000	0.075
30.00	0.075	482.0	0.187	0.187	0.103

Device	Routing	Invert	Outlet Devices
#1	Discarded	27.50'	**0.850 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.07 cfs @ 16.45 hrs HW=28.61' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.07 cfs)

Pond 41P: DT-6


Hydrograph
Inflow
Discarded
Inflow Area=1.290 ac
Peak Elev=28.61'
Storage=0.081 af
0.88 cfs
0.07 cfs
Flow (cfs)
Time (hours)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
0.55
0.6
0.65
0.7
0.75
0.8
0.85
0.9
0.95
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 42P: CB-B

[57] Hint: Peaked at 33.59' (Flood elevation advised)

Inflow Area = 0.230 ac, 82.61% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 0.89 cfs @ 11.93 hrs, Volume= 0.044 af
Outflow = 0.89 cfs @ 11.93 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.0 min
Primary = 0.33 cfs @ 11.93 hrs, Volume= 0.035 af
Secondary = 0.56 cfs @ 11.93 hrs, Volume= 0.009 af

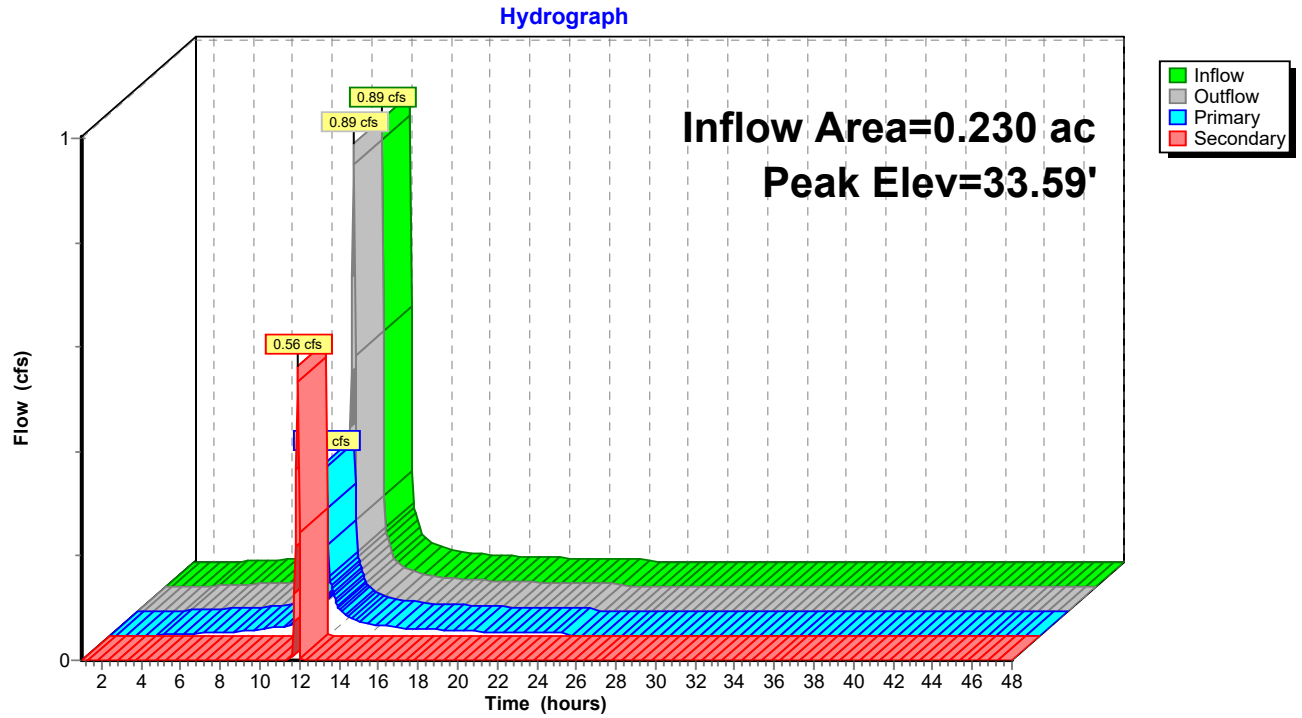
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 33.59' @ 11.93 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.10'	**4.0" Round Culvert** L= 50.0' Ke= 1.200 Inlet / Outlet Invert= 32.10' / 31.20' S= 0.0180 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Secondary	32.60'	**6.0" Round Culvert** L= 200.0' Ke= 1.200 Inlet / Outlet Invert= 32.60' / 30.60' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.32 cfs @ 11.93 hrs HW=33.52' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.32 cfs @ 3.67 fps)

Secondary OutFlow Max=0.53 cfs @ 11.93 hrs HW=33.52' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.53 cfs @ 2.68 fps)

Pond 42P: CB-B



Summary for Pond 43P: CB-A

Inflow Area = 0.740 ac, 85.14% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 2.79 cfs @ 11.94 hrs, Volume= 0.142 af
Outflow = 2.79 cfs @ 11.94 hrs, Volume= 0.142 af, Atten= 0%, Lag= 0.0 min
Primary = 0.33 cfs @ 11.94 hrs, Volume= 0.091 af
Secondary = 2.45 cfs @ 11.94 hrs, Volume= 0.051 af

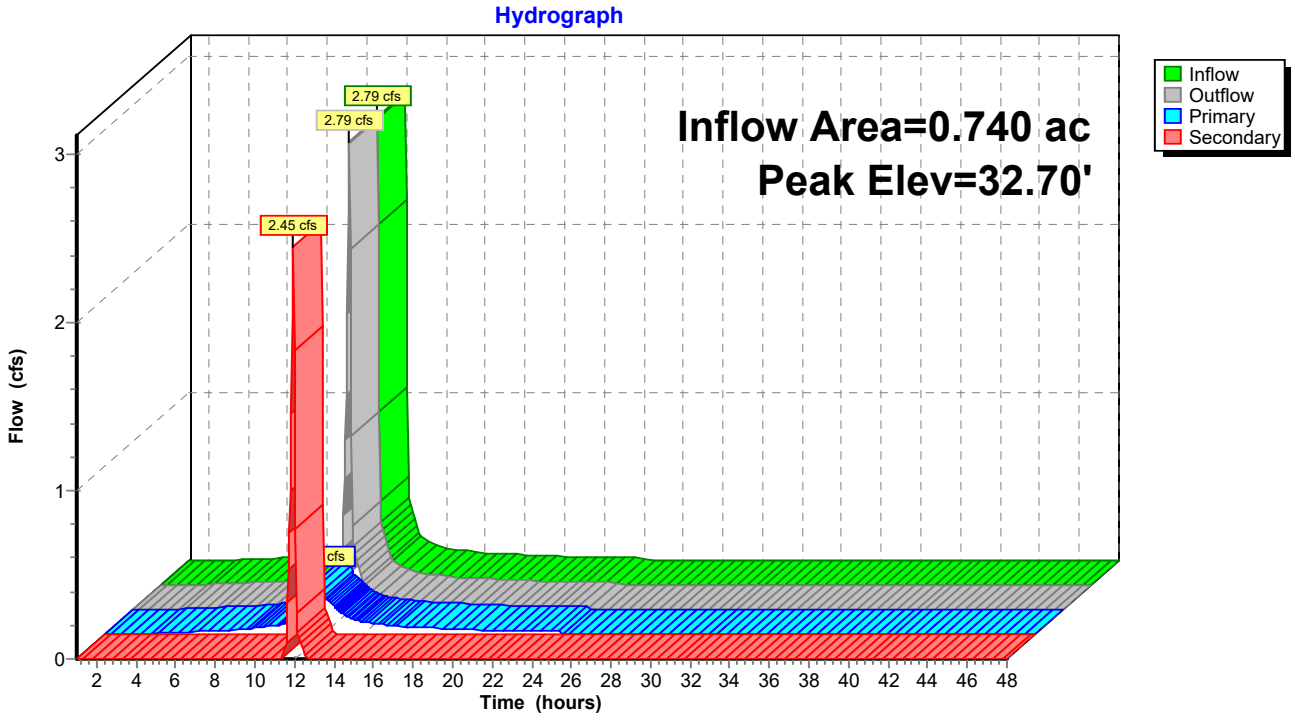
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 32.70' @ 11.94 hrs
Flood Elev= 34.22'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.20'	**4.0" Round Culvert** L= 30.0' Ke= 1.200 Inlet / Outlet Invert= 31.20' / 30.00' S= 0.0400 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Secondary	31.70'	**15.0" Round Culvert** L= 200.0' Ke= 1.200 Inlet / Outlet Invert= 31.70' / 29.70' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.33 cfs @ 11.94 hrs HW=32.69' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.33 cfs @ 3.78 fps)

Secondary OutFlow Max=2.41 cfs @ 11.94 hrs HW=32.69' (Free Discharge)
└**2=Culvert** (Inlet Controls 2.41 cfs @ 2.31 fps)

Pond 43P: CB-A



Summary for Pond 49P: CB-S

[57] Hint: Peaked at 27.95' (Flood elevation advised)

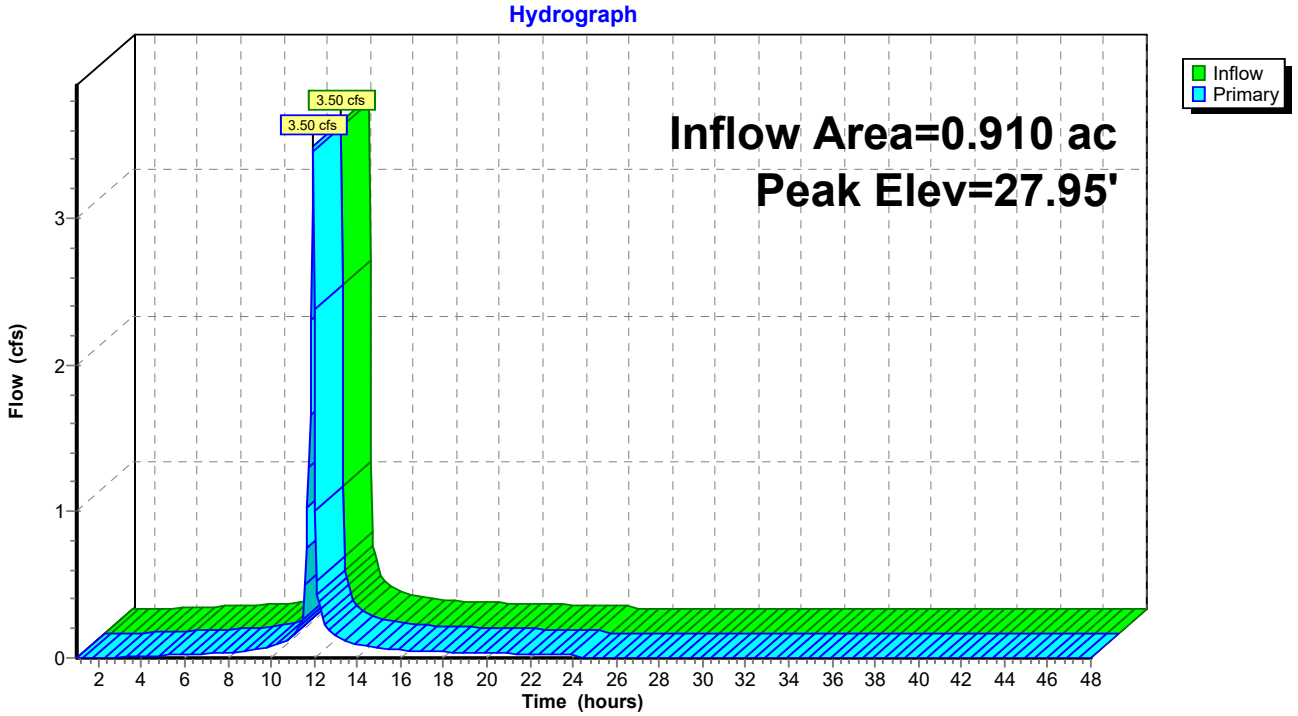
Inflow Area = 0.910 ac, 84.62% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 3.50 cfs @ 11.94 hrs, Volume= 0.175 af
Outflow = 3.50 cfs @ 11.94 hrs, Volume= 0.175 af, Atten= 0%, Lag= 0.0 min
Primary = 3.50 cfs @ 11.94 hrs, Volume= 0.175 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 27.95' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	26.60'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=3.37 cfs @ 11.94 hrs HW=27.89' (Free Discharge)
1=Orifice/Grate (Orifice Controls 3.37 cfs @ 4.29 fps)

Pond 49P: CB-S



Summary for Pond 51P: CB-T

[58] Hint: Peaked 1.76' above defined flood level

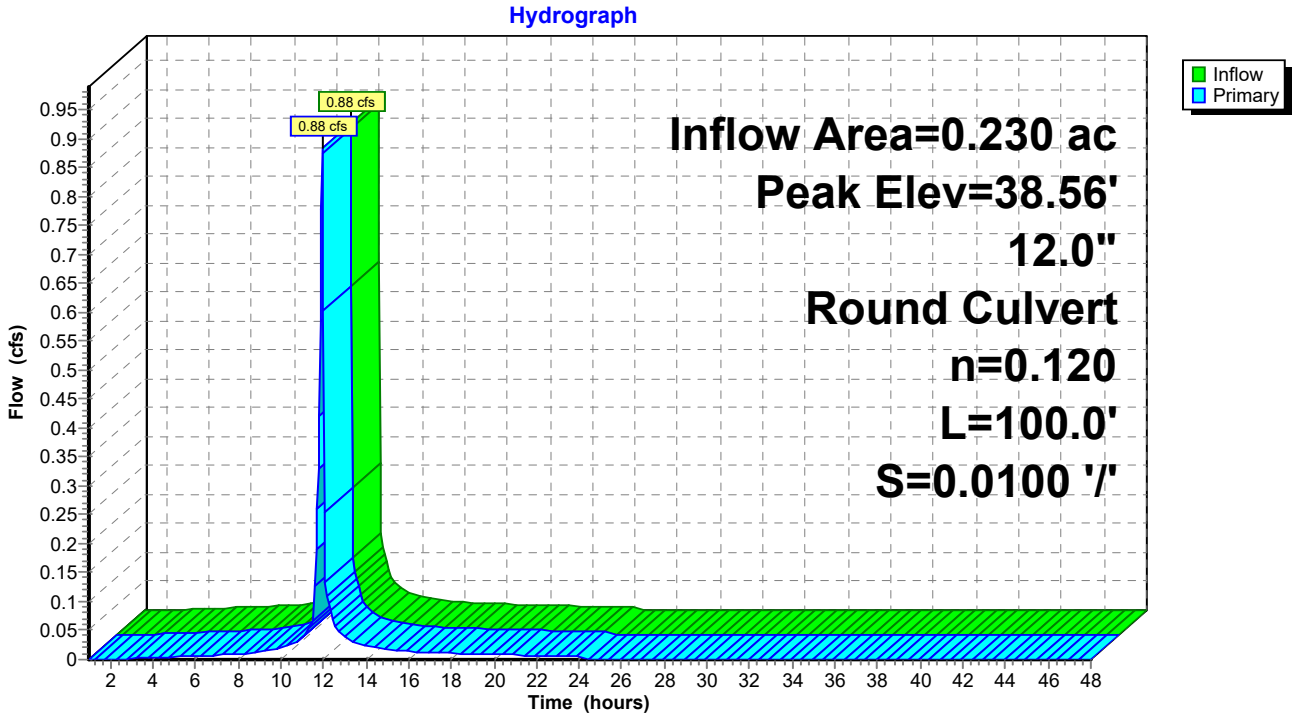
Inflow Area = 0.230 ac, 82.61% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 0.88 cfs @ 11.94 hrs, Volume= 0.044 af
Outflow = 0.88 cfs @ 11.94 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.0 min
Primary = 0.88 cfs @ 11.94 hrs, Volume= 0.044 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 38.56' @ 11.94 hrs
Flood Elev= 36.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.30'	**12.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 33.30' / 32.30' S= 0.0100 '/' Cc= 0.900 n= 0.120, Flow Area= 0.79 sf

Primary OutFlow Max=0.85 cfs @ 11.94 hrs HW=38.22' (Free Discharge)
1=Culvert (Barrel Controls 0.85 cfs @ 1.08 fps)

Pond 51P: CB-T



Summary for Pond 53P: CB-U

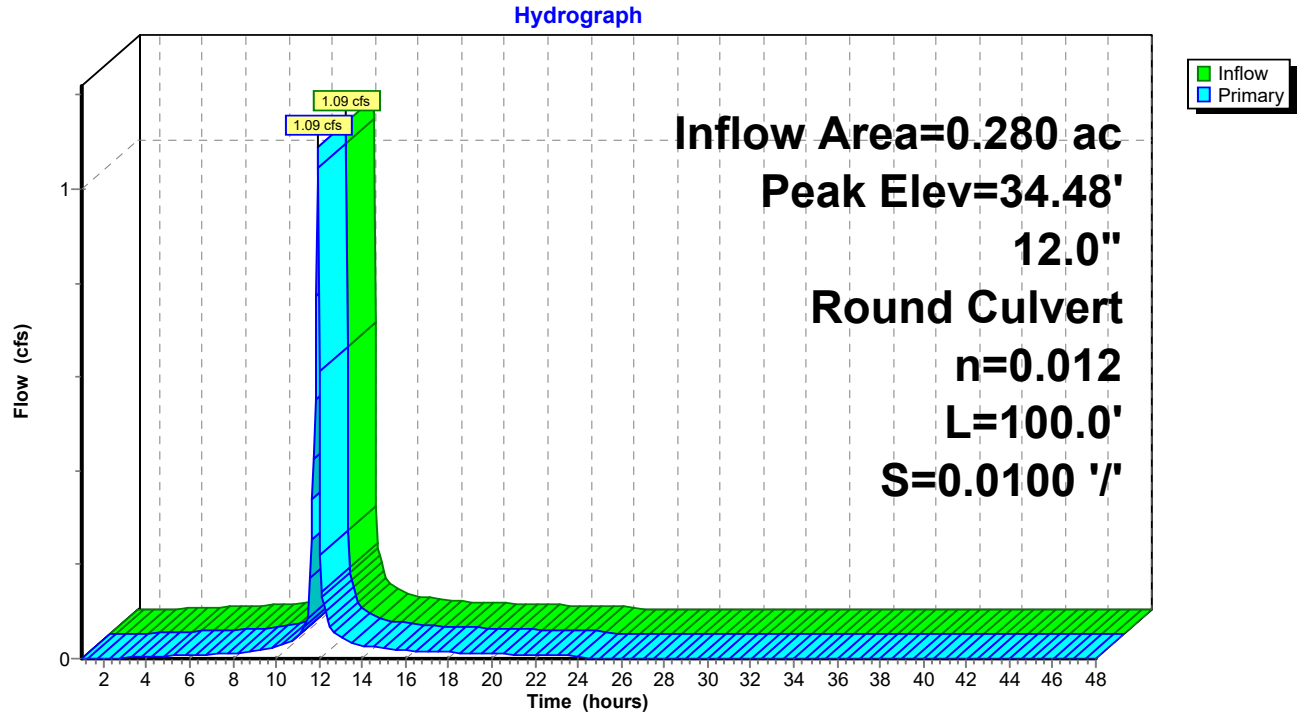
Inflow Area = 0.280 ac, 85.71% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 1.09 cfs @ 11.93 hrs, Volume= 0.054 af
Outflow = 1.09 cfs @ 11.93 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min
Primary = 1.09 cfs @ 11.93 hrs, Volume= 0.054 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 34.48' @ 11.93 hrs
Flood Elev= 36.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.80'	**12.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 33.80' / 32.80' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.03 cfs @ 11.93 hrs HW=34.46' (Free Discharge)
1=Culvert (Inlet Controls 1.03 cfs @ 1.88 fps)

Pond 53P: CB-U



Summary for Pond 54P: DA-9

Inflow Area = 1.450 ac, 84.83% Impervious, Inflow Depth = 2.04" for 10 event
Inflow = 3.35 cfs @ 11.94 hrs, Volume= 0.246 af
Outflow = 0.10 cfs @ 9.95 hrs, Volume= 0.246 af, Atten= 97%, Lag= 0.0 min
Discarded = 0.10 cfs @ 9.95 hrs, Volume= 0.246 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 30.60' @ 15.49 hrs Surf.Area= 0.120 ac Storage= 0.132 af

Plug-Flow detention time= 514.5 min calculated for 0.246 af (100% of inflow)
Center-of-Mass det. time= 514.3 min (1,286.8 - 772.6)

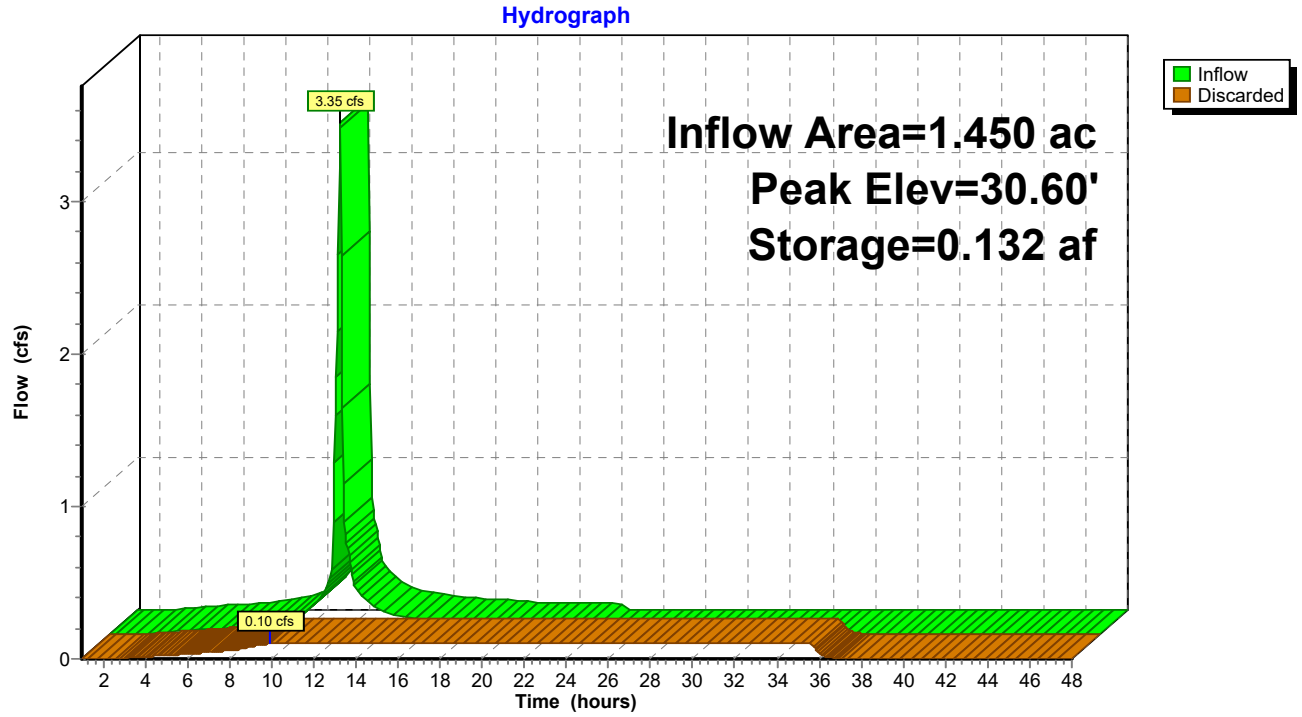
Volume	Invert	Avail.Storage	Storage Description
#1	29.50'	0.300 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
29.50	0.120	0.000	0.000
32.00	0.120	0.300	0.300

Device	Routing	Invert	Outlet Devices
#1	Discarded	29.50'	**0.850 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.10 cfs @ 9.95 hrs HW=29.53' (Free Discharge)
↳**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Pond 54P: DA-9



Summary for Pond 56P: (new Pond)

[57] Hint: Peaked at 36.08' (Flood elevation advised)

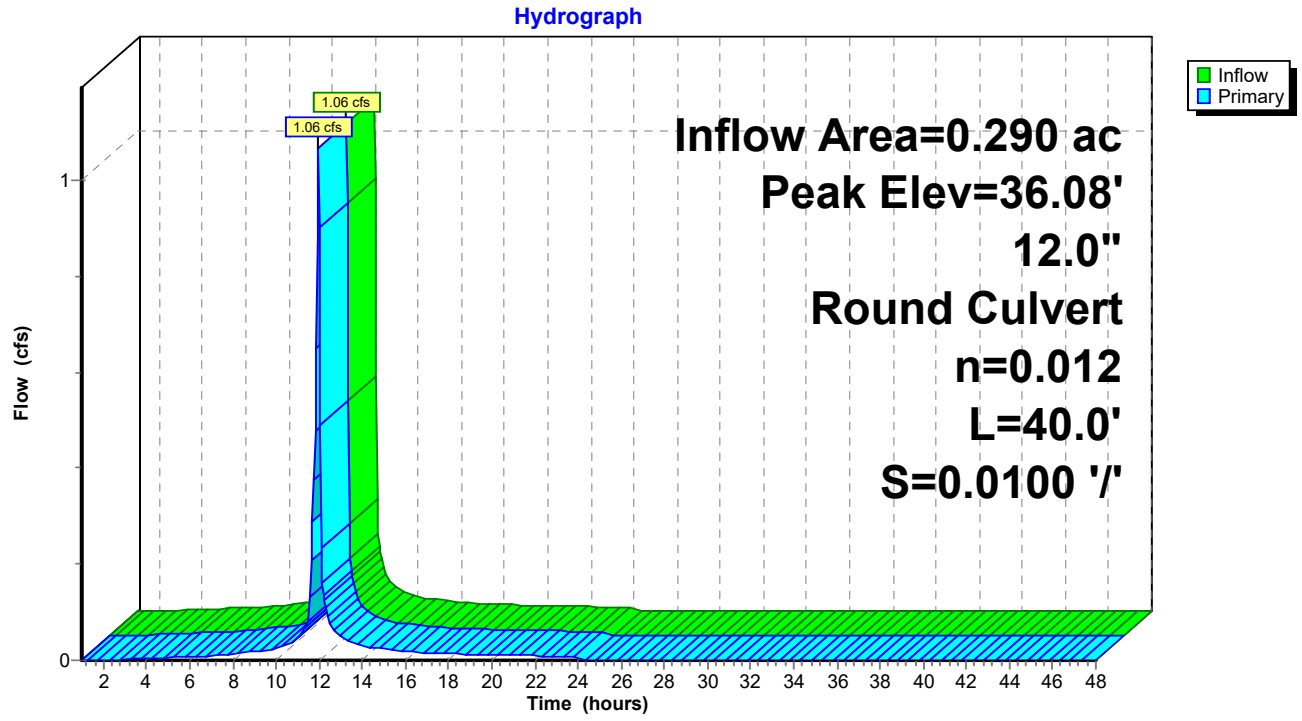
Inflow Area = 0.290 ac, 86.21% Impervious, Inflow Depth = 2.30" for 10 event
Inflow = 1.06 cfs @ 11.95 hrs, Volume= 0.056 af
Outflow = 1.06 cfs @ 11.95 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min
Primary = 1.06 cfs @ 11.95 hrs, Volume= 0.056 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 36.08' @ 11.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	35.41'	**12.0" Round Culvert** L= 40.0' Ke= 1.200 Inlet / Outlet Invert= 35.41' / 35.01' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.06 cfs @ 11.95 hrs HW=36.08' (Free Discharge)
1=Culvert (Inlet Controls 1.06 cfs @ 1.90 fps)

Pond 56P: (new Pond)



Time span=1.00-48.00 hrs, dt=0.05 hrs, 941 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: A Runoff Area=0.740 ac 85.14% Impervious Runoff Depth=4.35"
Flow Length=182' Slope=0.0070 '/' Tc=4.4 min AMC Adjusted CN=97 Runoff=5.07 cfs 0.268 af

Subcatchment2S: B Runoff Area=0.230 ac 82.61% Impervious Runoff Depth=4.35"
Flow Length=153' Slope=0.0160 '/' Tc=2.7 min AMC Adjusted CN=97 Runoff=1.63 cfs 0.083 af

Subcatchment3S: C Runoff Area=0.420 ac 85.71% Impervious Runoff Depth=4.35"
Flow Length=216' Slope=0.0160 '/' Tc=3.6 min AMC Adjusted CN=97 Runoff=2.94 cfs 0.152 af

Subcatchment4S: D Runoff Area=1.820 ac 85.16% Impervious Runoff Depth=4.35"
Flow Length=457' Slope=0.0230 '/' Tc=6.4 min AMC Adjusted CN=97 Runoff=11.58 cfs 0.659 af

Subcatchment5S: E Runoff Area=0.320 ac 84.38% Impervious Runoff Depth=4.35"
Flow Length=394' Slope=0.0040 '/' Tc=11.3 min AMC Adjusted CN=97 Runoff=1.77 cfs 0.116 af

Subcatchment6S: F Runoff Area=2.550 ac 85.10% Impervious Runoff Depth=4.35"
Flow Length=553' Slope=0.0100 '/' Tc=10.5 min AMC Adjusted CN=97 Runoff=14.46 cfs 0.924 af

Subcatchment7S: G Runoff Area=0.780 ac 84.62% Impervious Runoff Depth=4.35"
Flow Length=340' Slope=0.0150 '/' Tc=5.8 min AMC Adjusted CN=97 Runoff=5.07 cfs 0.283 af

Subcatchment8S: H Runoff Area=0.310 ac 83.87% Impervious Runoff Depth=4.35"
Flow Length=50' Slope=0.0200 '/' Tc=1.0 min AMC Adjusted CN=97 Runoff=2.28 cfs 0.112 af

Subcatchment9S: I Runoff Area=0.160 ac 87.50% Impervious Runoff Depth>4.46"
Flow Length=129' Slope=0.0090 '/' Tc=3.0 min AMC Adjusted CN=98 Runoff=1.14 cfs 0.060 af

Subcatchment10S: J Runoff Area=1.410 ac 85.11% Impervious Runoff Depth=4.35"
Flow Length=256' Slope=0.0200 '/' Tc=3.8 min AMC Adjusted CN=97 Runoff=9.84 cfs 0.511 af

Subcatchment11S: K Runoff Area=0.940 ac 85.11% Impervious Runoff Depth=4.35"
Flow Length=254' Slope=0.0100 '/' Tc=4.9 min AMC Adjusted CN=97 Runoff=6.33 cfs 0.341 af

Subcatchment12S: L Runoff Area=0.240 ac 87.50% Impervious Runoff Depth>4.46"
Flow Length=254' Slope=0.0100 '/' Tc=4.9 min AMC Adjusted CN=98 Runoff=1.63 cfs 0.089 af

Subcatchment13S: M Runoff Area=1.420 ac 85.21% Impervious Runoff Depth=4.35"
Flow Length=329' Slope=0.0110 '/' Tc=6.2 min AMC Adjusted CN=97 Runoff=9.10 cfs 0.515 af

Subcatchment14S: N Runoff Area=0.510 ac 84.31% Impervious Runoff Depth=4.35"
Flow Length=215' Slope=0.0110 '/' Tc=4.2 min AMC Adjusted CN=97 Runoff=3.52 cfs 0.185 af

Subcatchment15S: O Runoff Area=0.310 ac 83.87% Impervious Runoff Depth=4.35"
Flow Length=190' Slope=0.0150 '/' Tc=3.3 min AMC Adjusted CN=97 Runoff=2.18 cfs 0.112 af

Subcatchment16S: P Runoff Area=0.360 ac 83.33% Impervious Runoff Depth=4.35"
Flow Length=164' Slope=0.0170 '/' Tc=2.8 min AMC Adjusted CN=97 Runoff=2.55 cfs 0.130 af

Subcatchment17S: S Runoff Area=0.910 ac 84.62% Impervious Runoff Depth=4.35"
Flow Length=250' Slope=0.0200 '/' Tc=3.7 min AMC Adjusted CN=97 Runoff=6.36 cfs 0.330 af

Subcatchment18S: Q Runoff Area=0.230 ac 82.61% Impervious Runoff Depth=4.35"
Flow Length=87' Slope=0.0400 '/' Tc=1.2 min AMC Adjusted CN=97 Runoff=1.68 cfs 0.083 af

Subcatchment19S: R Runoff Area=0.340 ac 8.82% Impervious Runoff Depth=2.46"
Flow Length=56' Slope=0.0500 '/' Tc=6.3 min AMC Adjusted CN=78 Runoff=1.44 cfs 0.070 af

Subcatchment50S: T Runoff Area=0.230 ac 82.61% Impervious Runoff Depth=4.35"
Flow Length=127' Slope=0.0050 '/' Tc=3.7 min AMC Adjusted CN=97 Runoff=1.61 cfs 0.083 af

Subcatchment52S: U Runoff Area=0.280 ac 85.71% Impervious Runoff Depth=4.35"
Flow Length=125' Slope=0.0100 '/' Tc=2.8 min AMC Adjusted CN=97 Runoff=1.98 cfs 0.101 af

Subcatchment55S: V Runoff Area=0.290 ac 86.21% Impervious Runoff Depth=4.35"
Flow Length=185' Slope=0.0050 '/' Tc=5.1 min AMC Adjusted CN=97 Runoff=1.94 cfs 0.105 af

Reach 46R: REGIONAL SD Avg. Flow Depth=1.09' Max Vel=10.72 fps Inflow=41.70 cfs 1.275 af
84.0" Round Pipe n=0.013 L=500.0' S=0.0150 '/' Capacity=782.41 cfs Outflow=39.98 cfs 1.275 af

Pond 20P: DT-1 Peak Elev=35.45' Storage=0.396 af Inflow=11.45 cfs 0.645 af
Outflow=0.20 cfs 0.645 af

Pond 22P: CB-P Peak Elev=38.45' Inflow=2.55 cfs 0.130 af
12.0" Round Culvert n=0.012 L=100.0' S=0.0100 '/' Outflow=2.55 cfs 0.130 af

Pond 24P: CB-M Peak Elev=37.83' Inflow=9.10 cfs 0.515 af
24.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=9.10 cfs 0.515 af

Pond 26P: CB-N Peak Elev=38.96' Inflow=3.52 cfs 0.185 af
Outflow=3.52 cfs 0.185 af

Pond 27P: CB-O Peak Elev=37.81' Inflow=2.18 cfs 0.112 af
12.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=2.18 cfs 0.112 af

Pond 28P: DT-2 Peak Elev=33.76' Storage=0.241 af Inflow=7.31 cfs 0.386 af
Outflow=0.12 cfs 0.377 af

Pond 29P: CB-L Peak Elev=34.91' Inflow=1.63 cfs 0.089 af
18.0" Round Culvert n=0.012 L=20.0' S=0.0100 '/' Outflow=1.63 cfs 0.089 af

Pond 30P: CB-I Peak Elev=39.20' Inflow=1.14 cfs 0.060 af
12.0" Round Culvert n=0.012 L=100.0' S=0.0100 '/' Outflow=1.14 cfs 0.060 af

Pond 31P: CB-J Peak Elev=37.23' Inflow=9.84 cfs 0.511 af
24.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=9.84 cfs 0.511 af

Pond 32P: DT-3 Peak Elev=34.70' Storage=0.358 af Inflow=10.97 cfs 0.570 af
Outflow=0.16 cfs 0.551 af

Pond 33P: CB-G Peak Elev=31.42' Inflow=5.07 cfs 0.283 af
Primary=1.30 cfs 0.209 af Secondary=3.78 cfs 0.074 af Outflow=5.07 cfs 0.283 af

Pond 34P: CB-K Peak Elev=36.81' Inflow=6.33 cfs 0.341 af
Primary=2.14 cfs 0.261 af Secondary=4.19 cfs 0.080 af Outflow=6.33 cfs 0.341 af

Pond 36P: CB-F Peak Elev=33.73' Inflow=14.46 cfs 0.924 af
Primary=5.61 cfs 0.745 af Secondary=8.85 cfs 0.179 af Outflow=14.46 cfs 0.924 af

Pond 37P: CB-C Peak Elev=31.02' Inflow=2.94 cfs 0.152 af
Primary=1.62 cfs 0.133 af Secondary=1.32 cfs 0.019 af Outflow=2.94 cfs 0.152 af

Pond 38P: CB-D Peak Elev=30.90' Inflow=11.58 cfs 0.659 af
Primary=3.46 cfs 0.505 af Secondary=8.12 cfs 0.155 af Outflow=11.58 cfs 0.659 af

Pond 39P: DT-4 Peak Elev=27.68' Storage=1.058 af Inflow=13.55 cfs 1.697 af
Outflow=0.42 cfs 1.465 af

Pond 40P: CB-E Peak Elev=36.07' Inflow=1.77 cfs 0.116 af
Primary=0.27 cfs 0.077 af Secondary=1.50 cfs 0.039 af Outflow=1.77 cfs 0.116 af

Pond 41P: DT-6 Peak Elev=29.79' Storage=0.166 af Inflow=1.29 cfs 0.294 af
Outflow=0.09 cfs 0.281 af

Pond 42P: CB-B Peak Elev=37.42' Inflow=1.63 cfs 0.083 af
Primary=0.61 cfs 0.064 af Secondary=1.02 cfs 0.020 af Outflow=1.63 cfs 0.083 af

Pond 43P: CB-A Peak Elev=33.65' Inflow=5.07 cfs 0.268 af
Primary=0.43 cfs 0.153 af Secondary=4.64 cfs 0.115 af Outflow=5.07 cfs 0.268 af

Pond 49P: CB-S Peak Elev=29.91' Inflow=6.36 cfs 0.330 af
Outflow=6.36 cfs 0.330 af

Pond 51P: CB-T Peak Elev=50.74' Inflow=1.61 cfs 0.083 af
12.0" Round Culvert n=0.120 L=100.0' S=0.0100 '/' Outflow=1.61 cfs 0.083 af

Pond 53P: CB-U Peak Elev=34.88' Inflow=1.98 cfs 0.101 af
12.0" Round Culvert n=0.012 L=100.0' S=0.0100 '/' Outflow=1.98 cfs 0.101 af

Pond 54P: DA-9 Peak Elev=31.87' Storage=0.284 af Inflow=5.70 cfs 0.446 af
Outflow=0.10 cfs 0.373 af

Pond 56P: (new Pond) Peak Elev=36.48' Inflow=1.94 cfs 0.105 af
12.0" Round Culvert n=0.012 L=40.0' S=0.0100 '/' Outflow=1.94 cfs 0.105 af

Total Runoff Area = 14.800 ac Runoff Volume = 5.313 af Average Runoff Depth = 4.31"
16.82% Pervious = 2.490 ac 83.18% Impervious = 12.310 ac

Summary for Subcatchment 1S: A

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

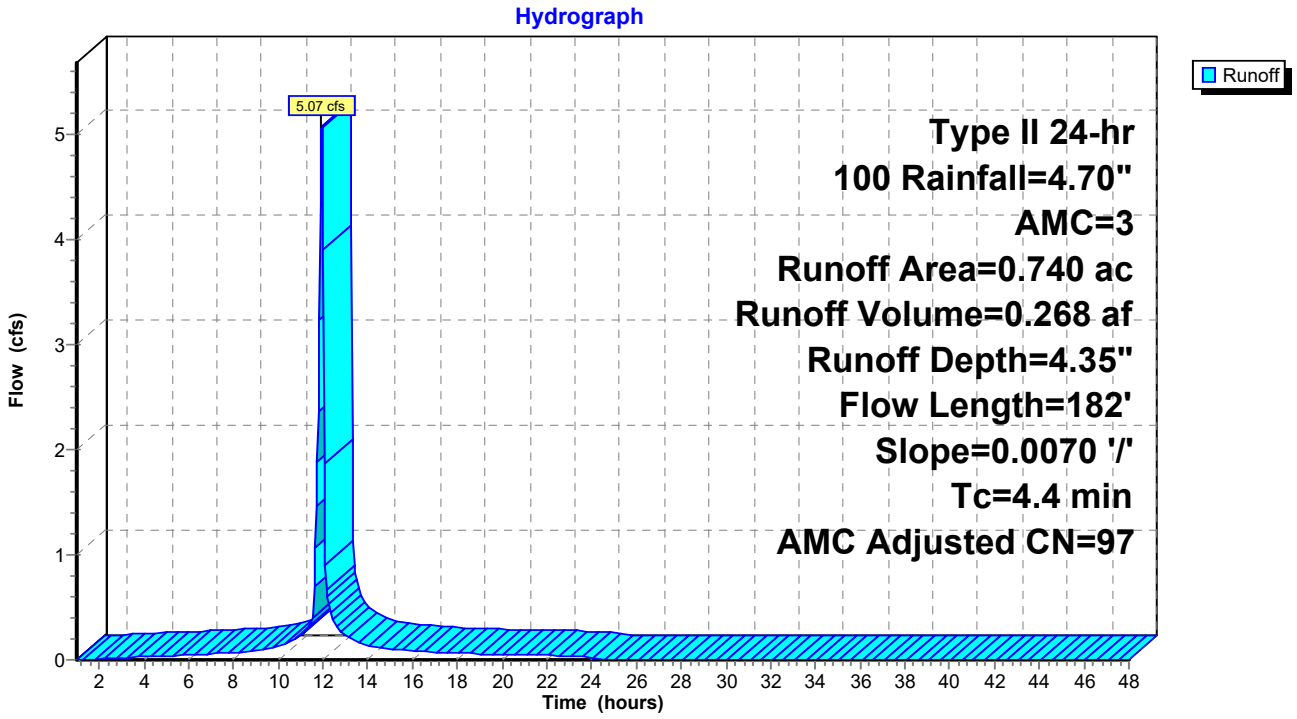
Runoff = 5.07 cfs @ 11.94 hrs, Volume= 0.268 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.630	98		
*	0.110	56		
	0.740	92	97	Weighted Average, AMC Adjusted
	0.110			14.86% Pervious Area
	0.630			85.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	182	0.0070	0.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 1S: A



Summary for Subcatchment 2S: B

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

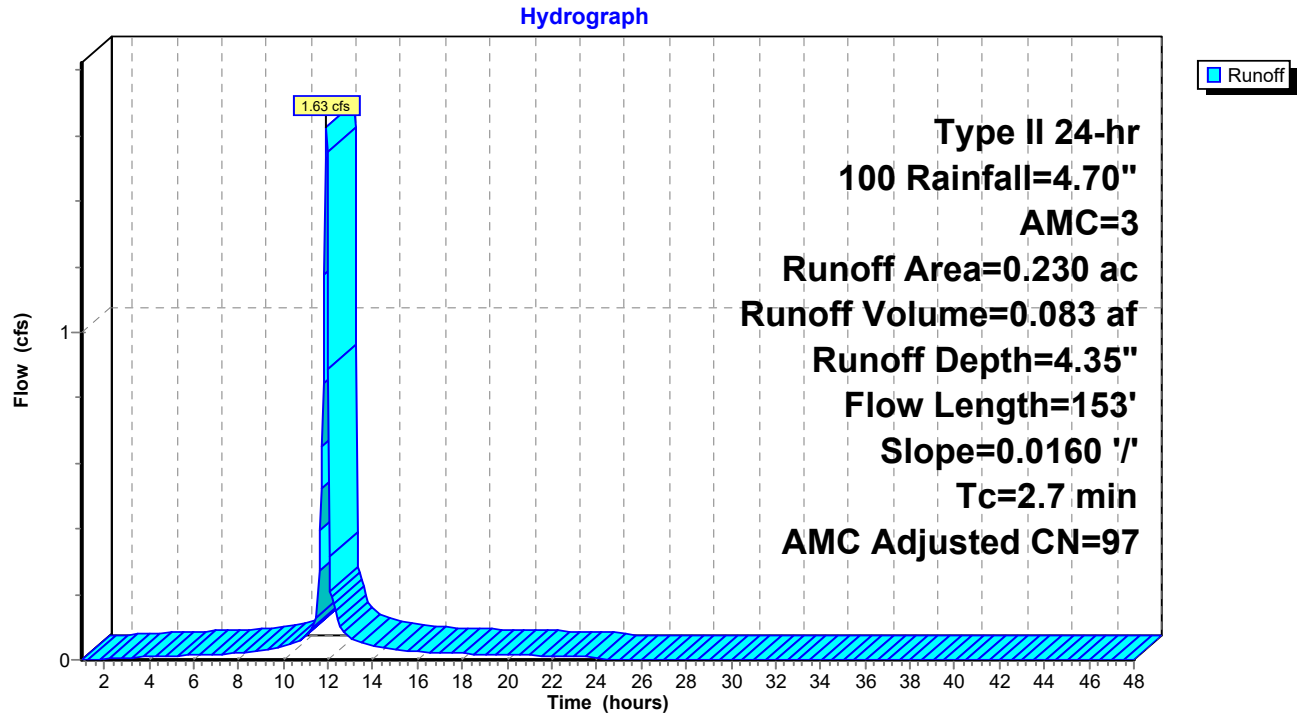
Runoff = 1.63 cfs @ 11.93 hrs, Volume= 0.083 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.190	98		
*	0.040	56		
	0.230	91	97	Weighted Average, AMC Adjusted
	0.040			17.39% Pervious Area
	0.190			82.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	153	0.0160	0.93		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 2S: B



Summary for Subcatchment 3S: C

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

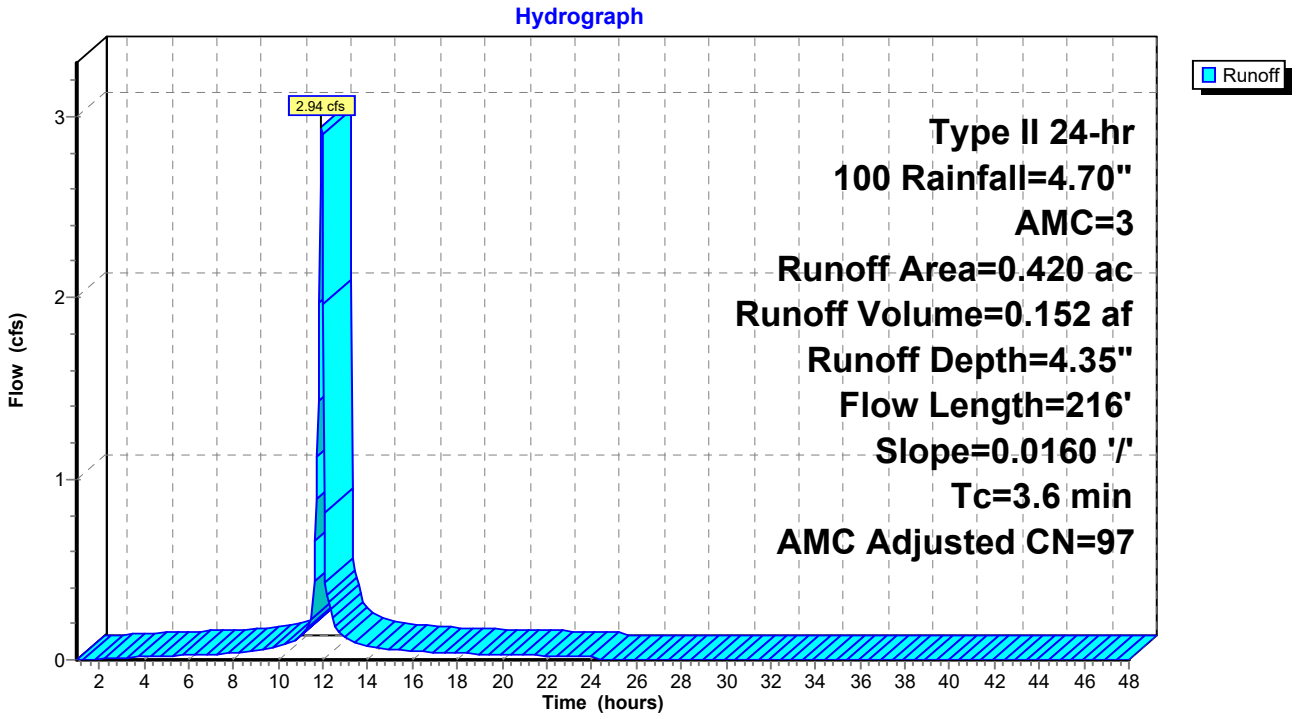
Runoff = 2.94 cfs @ 11.94 hrs, Volume= 0.152 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.360	98		
*	0.060	56		
	0.420	92	97	Weighted Average, AMC Adjusted
	0.060			14.29% Pervious Area
	0.360			85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	216	0.0160	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 3S: C



Summary for Subcatchment 4S: D

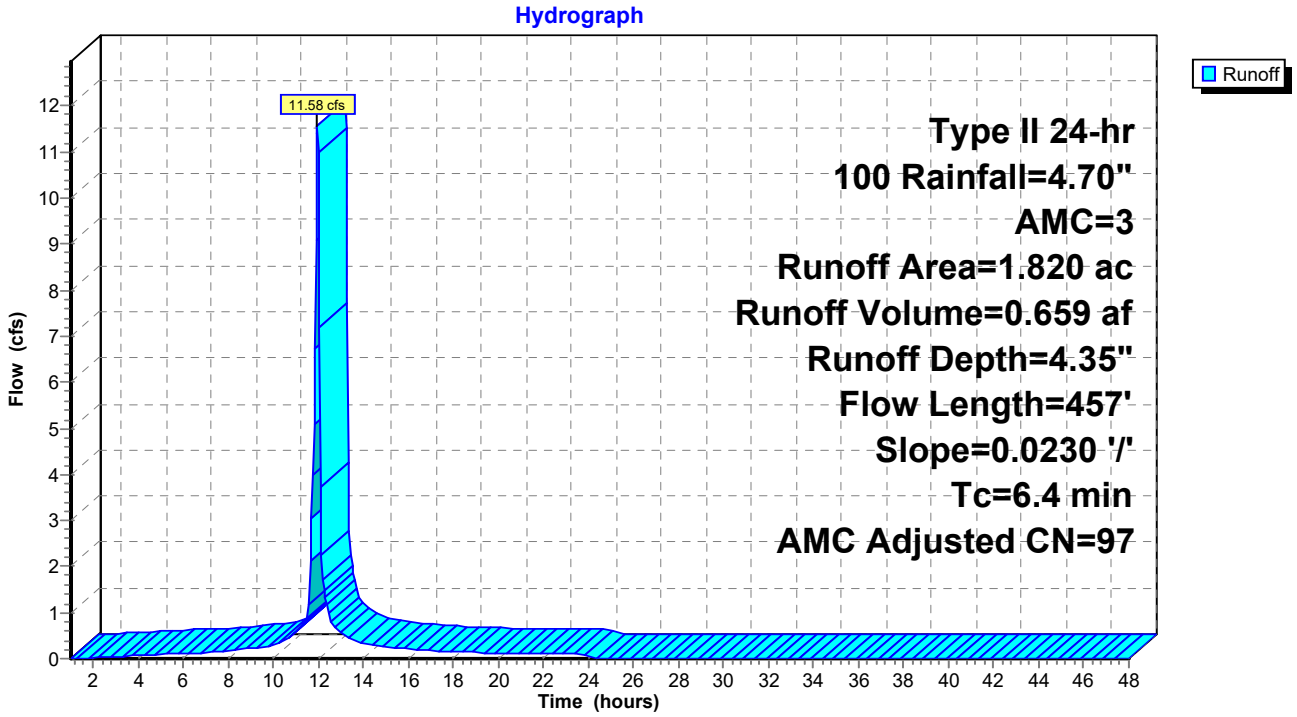
Runoff = 11.58 cfs @ 11.97 hrs, Volume= 0.659 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	1.550	98		
*	0.270	56		
	1.820	92	97	Weighted Average, AMC Adjusted
	0.270			14.84% Pervious Area
	1.550			85.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	300	0.0230	1.24		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
2.4	157	0.0230	1.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
6.4	457	Total			

Subcatchment 4S: D



Summary for Subcatchment 5S: E

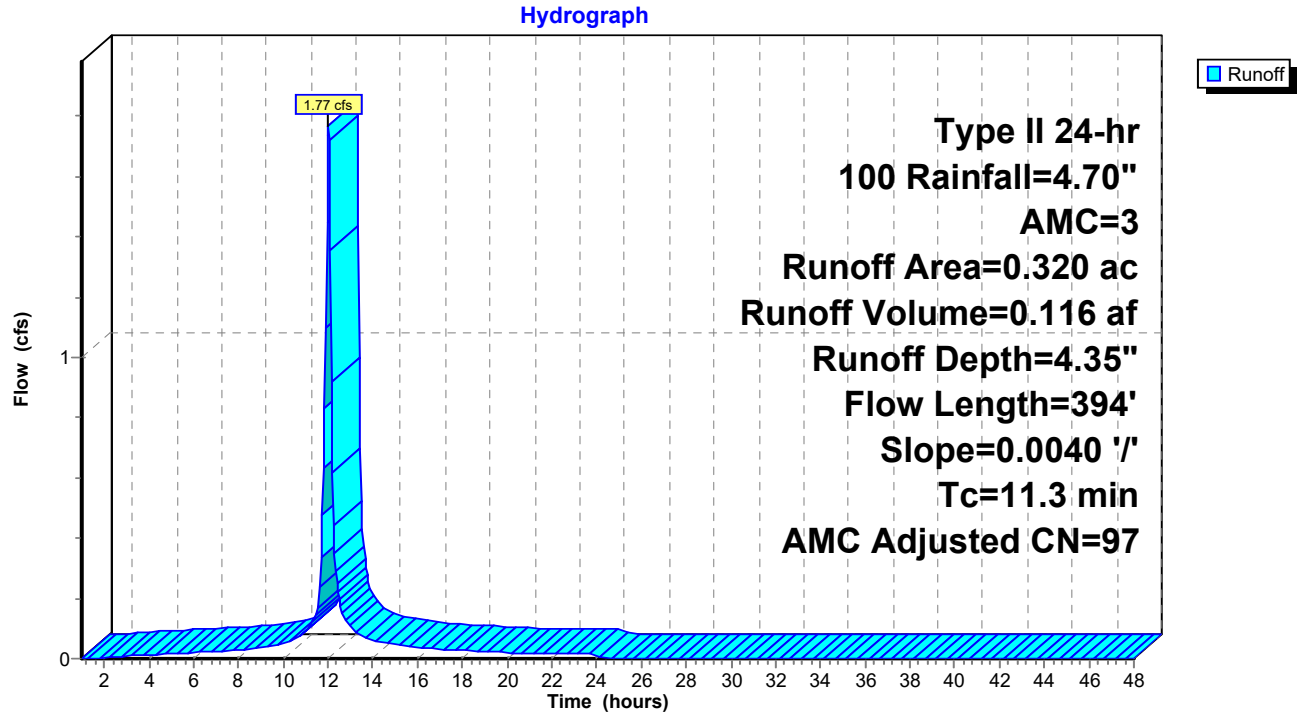
Runoff = 1.77 cfs @ 12.02 hrs, Volume= 0.116 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.270	98		
*	0.050	56		
	0.320	91	97	Weighted Average, AMC Adjusted
	0.050			15.63% Pervious Area
	0.270			84.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	300	0.0040	0.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
3.2	94	0.0040	0.49		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
11.3	394	Total			

Subcatchment 5S: E



Summary for Subcatchment 6S: F

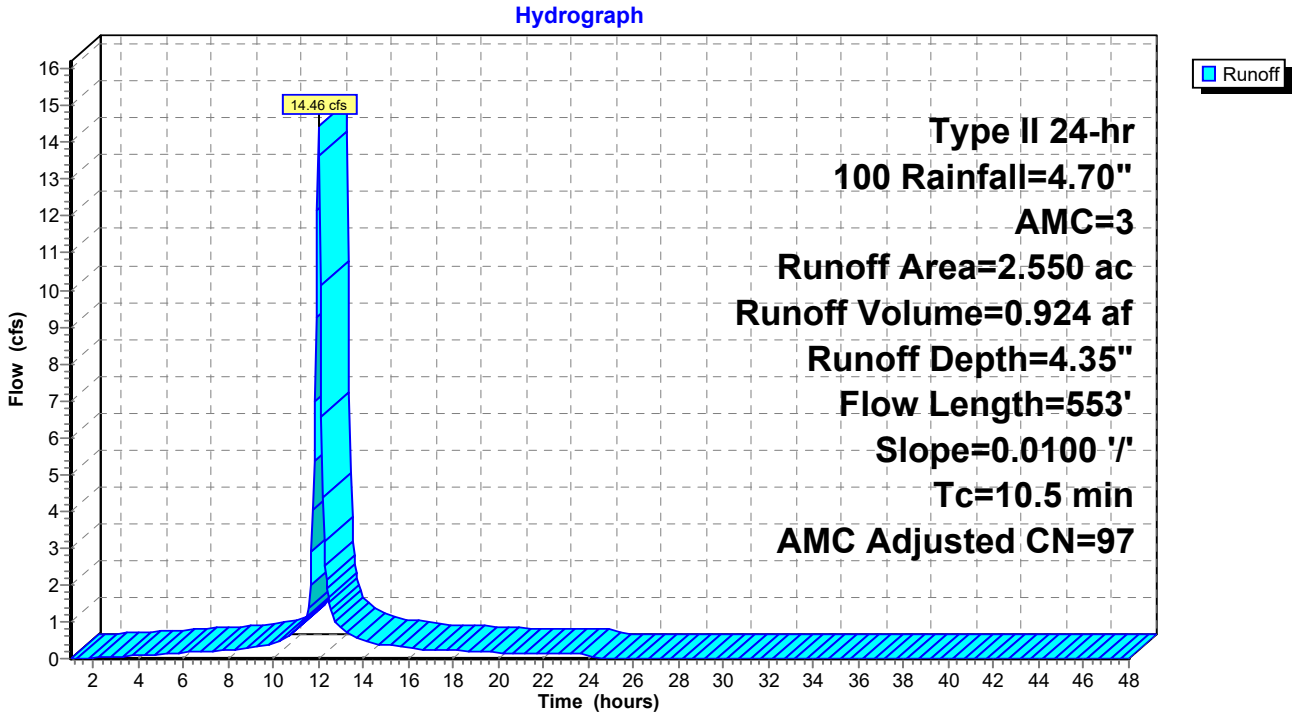
Runoff = 14.46 cfs @ 12.01 hrs, Volume= 0.924 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	2.170	98		
*	0.380	56		
	2.550	92	97	Weighted Average, AMC Adjusted
	0.380			14.90% Pervious Area
	2.170			85.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	300	0.0100	0.89		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
4.9	253	0.0100	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
10.5	553	Total			

Subcatchment 6S: F



Summary for Subcatchment 7S: G

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

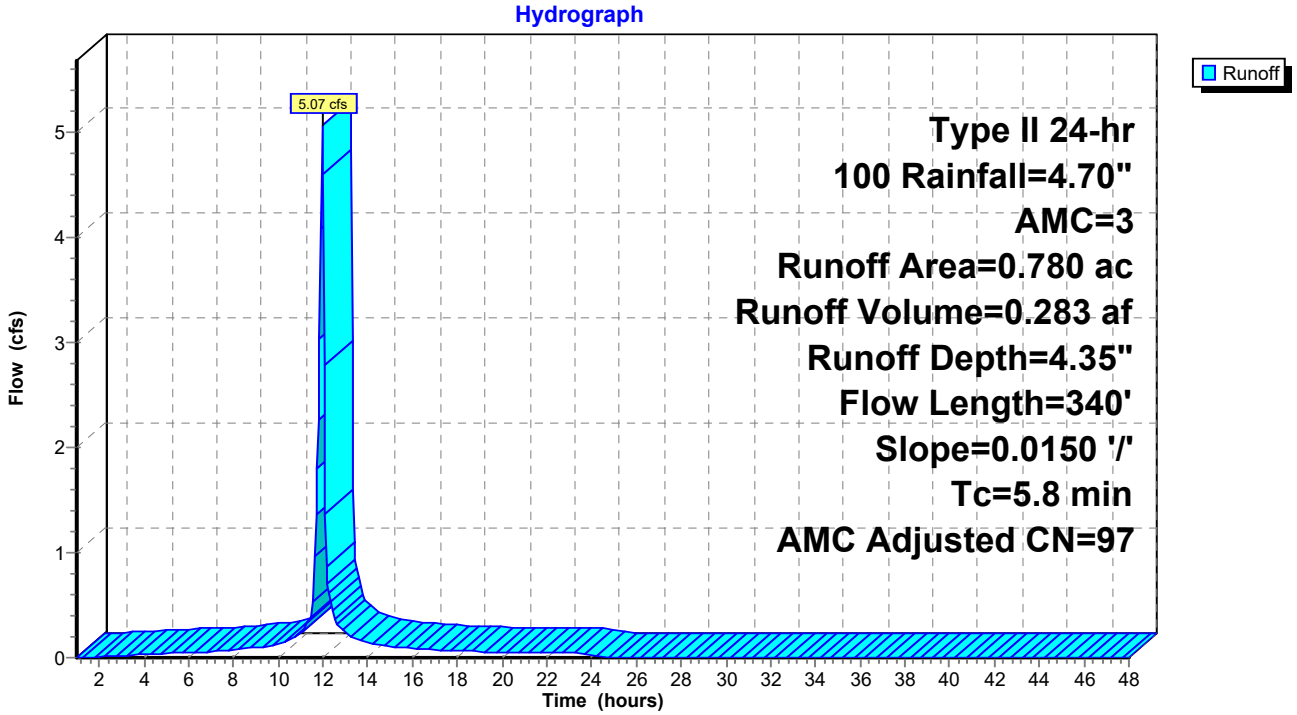
Runoff = 5.07 cfs @ 11.96 hrs, Volume= 0.283 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.660	98		
*	0.120	56		
	0.780	92	97	Weighted Average, AMC Adjusted
	0.120			15.38% Pervious Area
	0.660			84.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	300	0.0150	1.04		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
1.0	40	0.0150	0.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
5.8	340	Total			

Subcatchment 7S: G



Summary for Subcatchment 8S: H

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

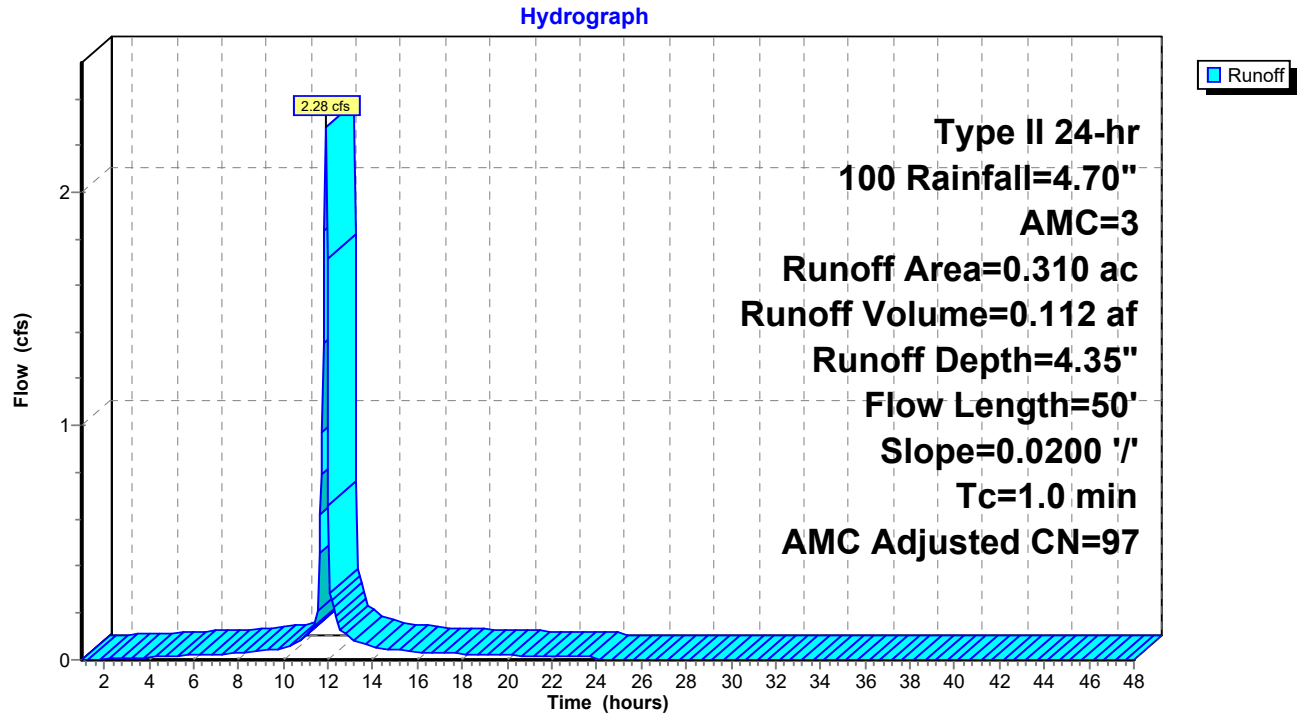
Runoff = 2.28 cfs @ 11.90 hrs, Volume= 0.112 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.260	98		
*	0.050	56		
	0.310	91	97	Weighted Average, AMC Adjusted
	0.050			16.13% Pervious Area
	0.260			83.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0200	0.82		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 8S: H



Summary for Subcatchment 9S: I

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

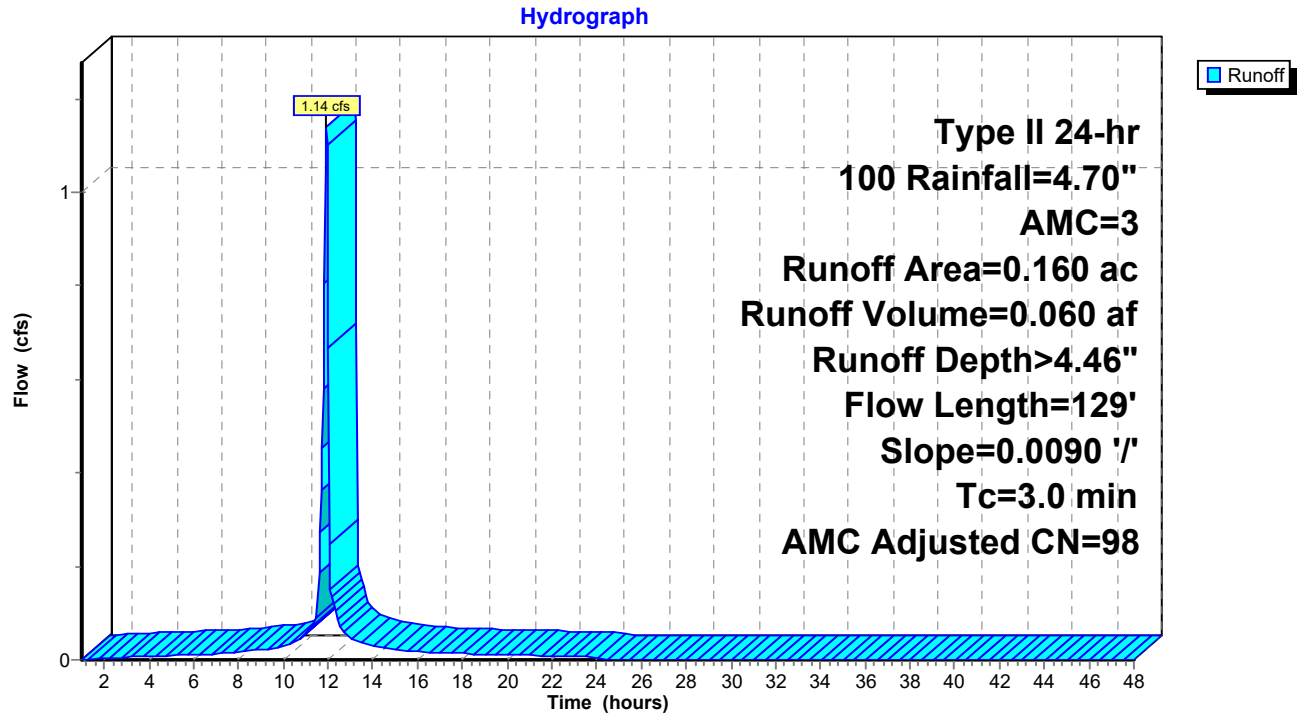
Runoff = 1.14 cfs @ 11.93 hrs, Volume= 0.060 af, Depth> 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.140	98		
*	0.020	56		
	0.160	93	98	Weighted Average, AMC Adjusted
	0.020			12.50% Pervious Area
	0.140			87.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	129	0.0090	0.72		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 9S: I



Summary for Subcatchment 10S: J

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

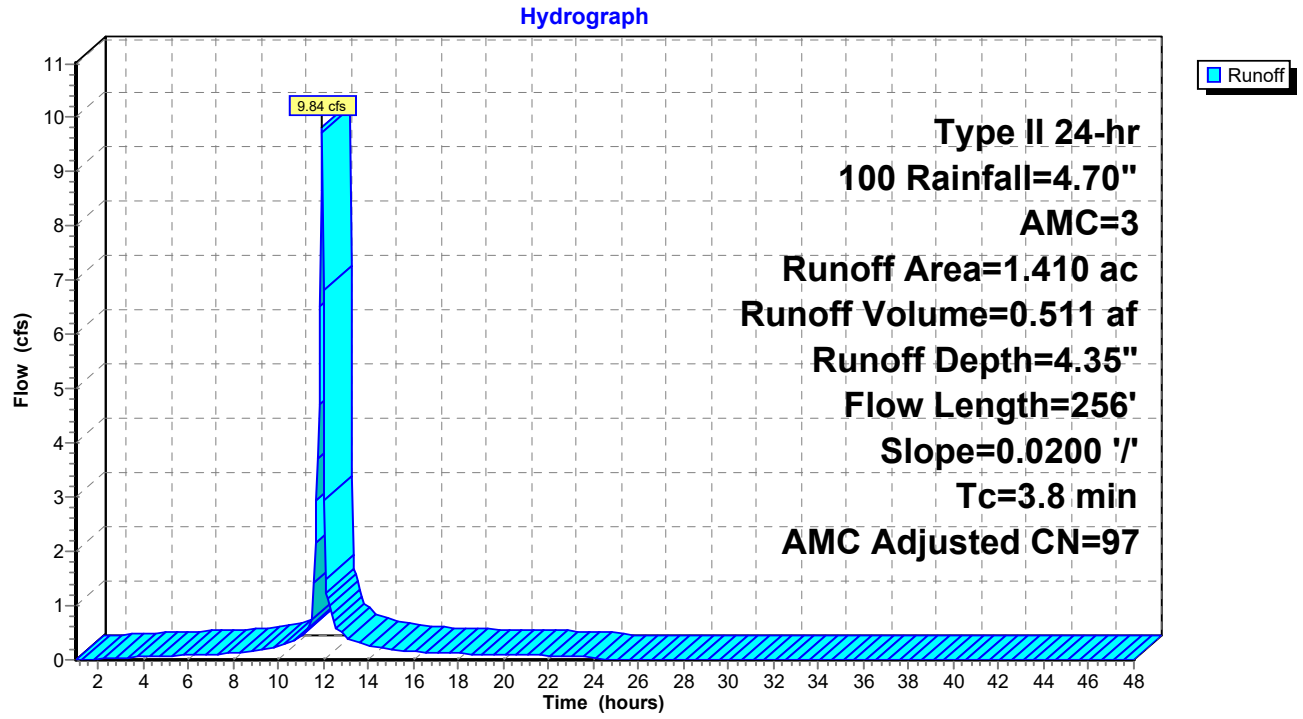
Runoff = 9.84 cfs @ 11.94 hrs, Volume= 0.511 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	1.200	98		
*	0.210	56		
	1.410	92	97	Weighted Average, AMC Adjusted
	0.210			14.89% Pervious Area
	1.200			85.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	256	0.0200	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 10S: J



Summary for Subcatchment 11S: K

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

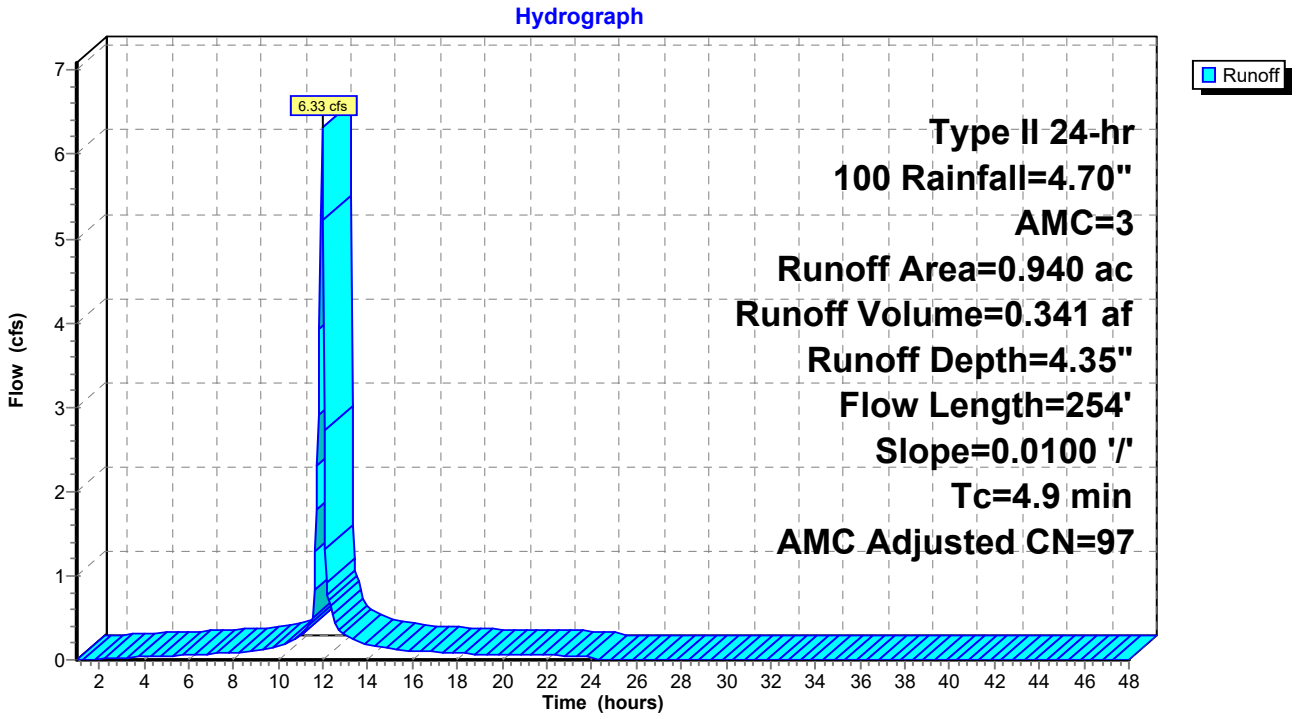
Runoff = 6.33 cfs @ 11.95 hrs, Volume= 0.341 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.800	98		
*	0.140	56		
	0.940	92	97	Weighted Average, AMC Adjusted
	0.140			14.89% Pervious Area
	0.800			85.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	254	0.0100	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 11S: K



Summary for Subcatchment 12S: L

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

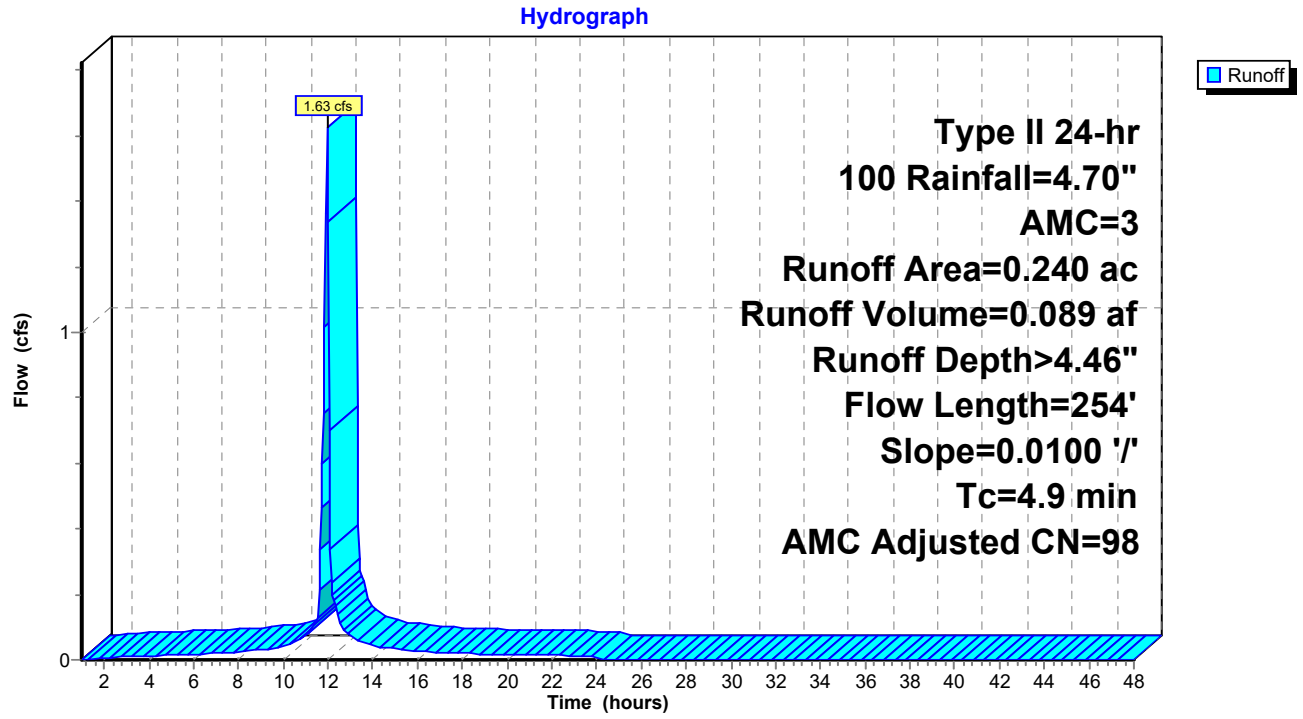
Runoff = 1.63 cfs @ 11.95 hrs, Volume= 0.089 af, Depth> 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.210	98		
*	0.030	56		
	0.240	93	98	Weighted Average, AMC Adjusted
	0.030			12.50% Pervious Area
	0.210			87.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	254	0.0100	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 12S: L



Summary for Subcatchment 13S: M

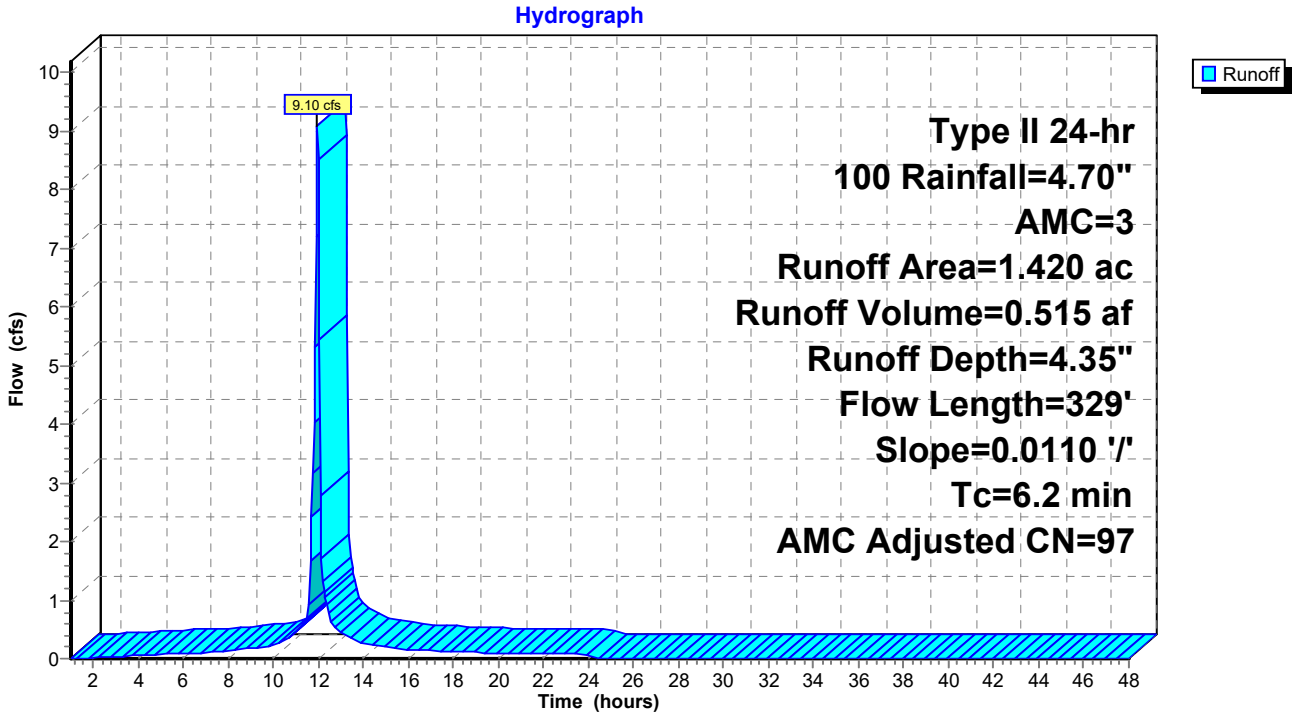
Runoff = 9.10 cfs @ 11.96 hrs, Volume= 0.515 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	1.210	98		
*	0.210	56		
	1.420	92	97	Weighted Average, AMC Adjusted
	0.210			14.79% Pervious Area
	1.210			85.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	300	0.0110	0.92		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
0.8	29	0.0110	0.58		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"
6.2	329	Total			

Subcatchment 13S: M



Summary for Subcatchment 14S: N

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

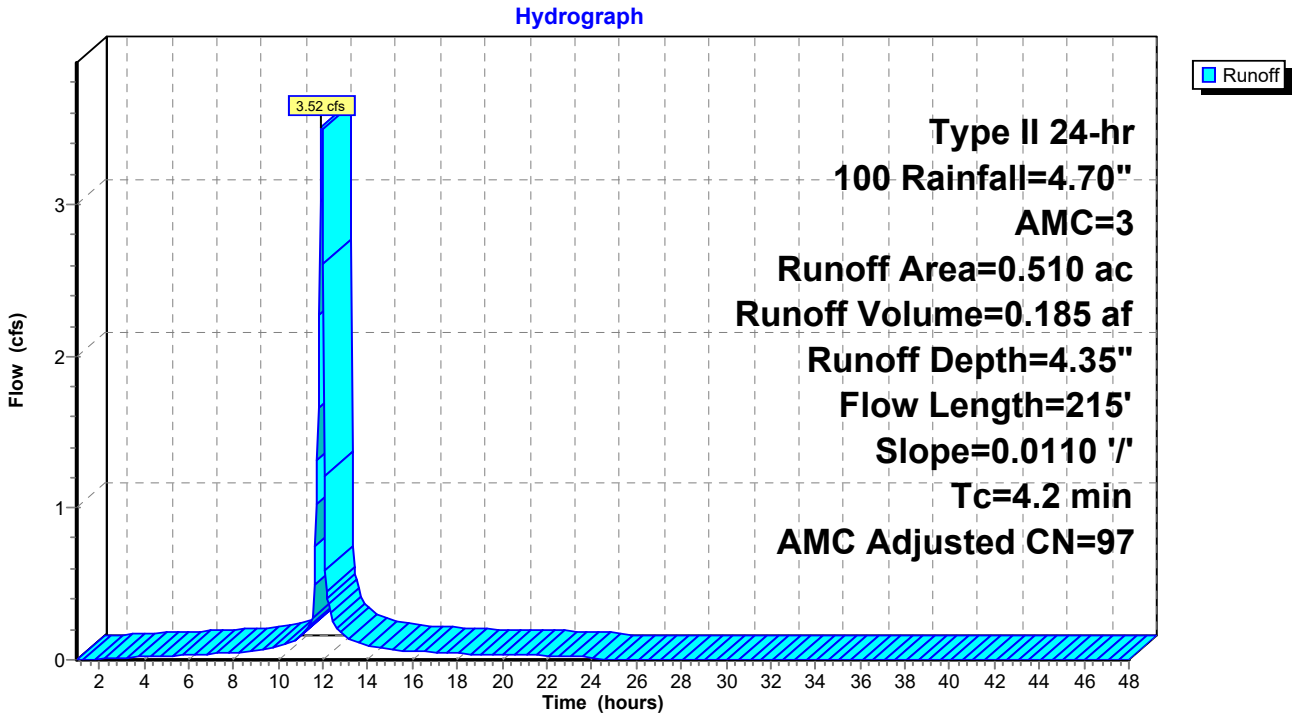
Runoff = 3.52 cfs @ 11.94 hrs, Volume= 0.185 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.430	98		
*	0.080	56		
	0.510	91	97	Weighted Average, AMC Adjusted
	0.080			15.69% Pervious Area
	0.430			84.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	215	0.0110	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 14S: N



Summary for Subcatchment 15S: O

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

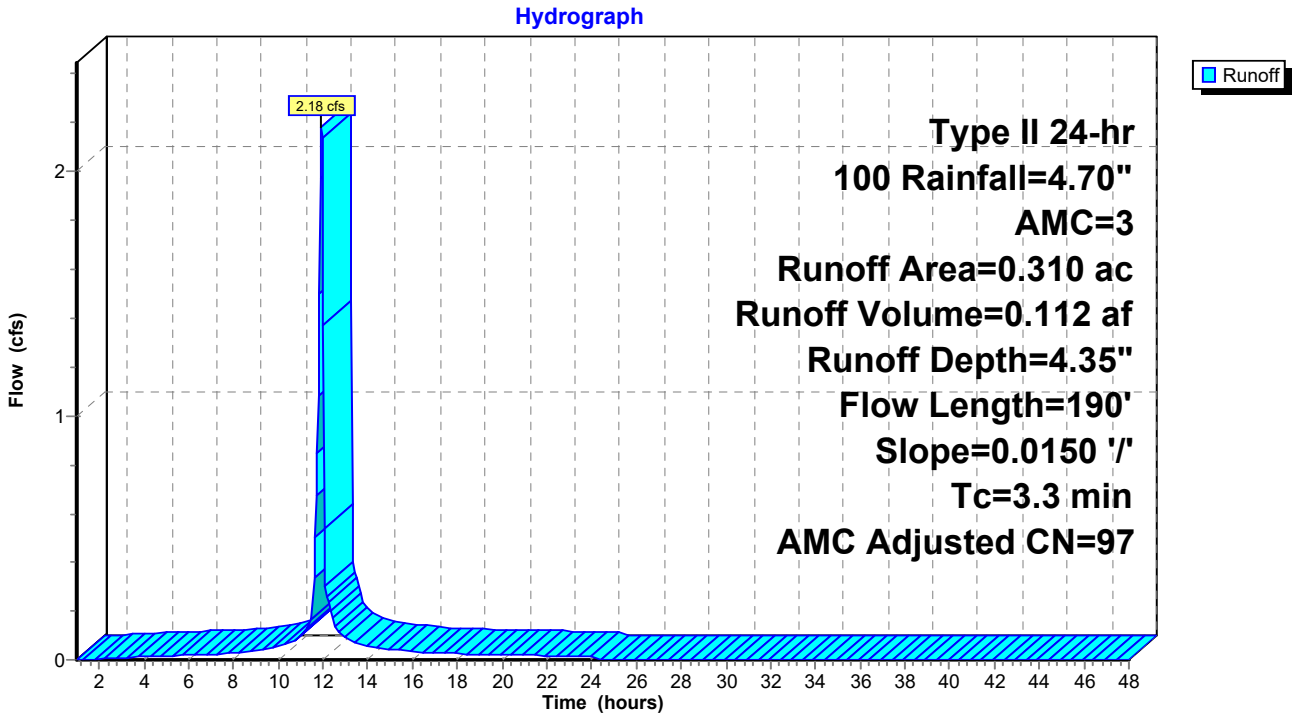
Runoff = 2.18 cfs @ 11.93 hrs, Volume= 0.112 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.260	98		
*	0.050	56		
	0.310	91	97	Weighted Average, AMC Adjusted
	0.050			16.13% Pervious Area
	0.260			83.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	190	0.0150	0.95		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 15S: O



Summary for Subcatchment 16S: P

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

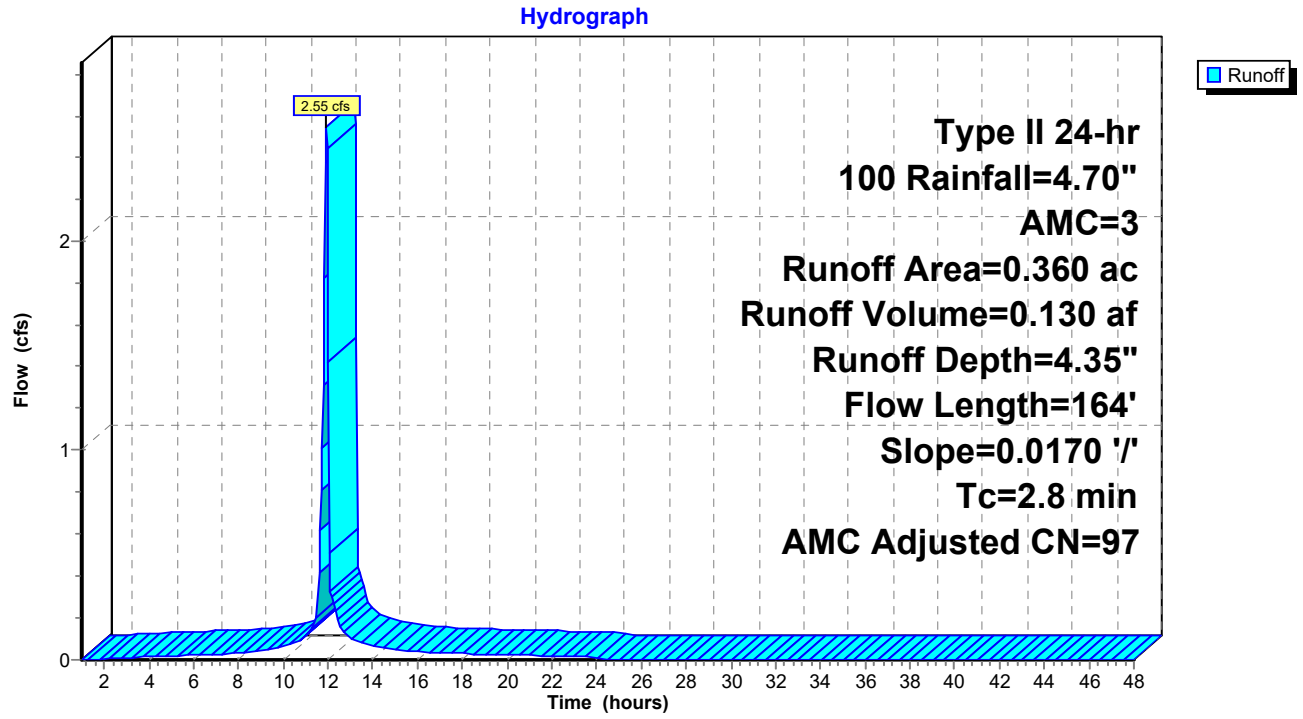
Runoff = 2.55 cfs @ 11.93 hrs, Volume= 0.130 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.300	98		
*	0.060	56		
	0.360	91	97	Weighted Average, AMC Adjusted
	0.060			16.67% Pervious Area
	0.300			83.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	164	0.0170	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 16S: P



Summary for Subcatchment 17S: S

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

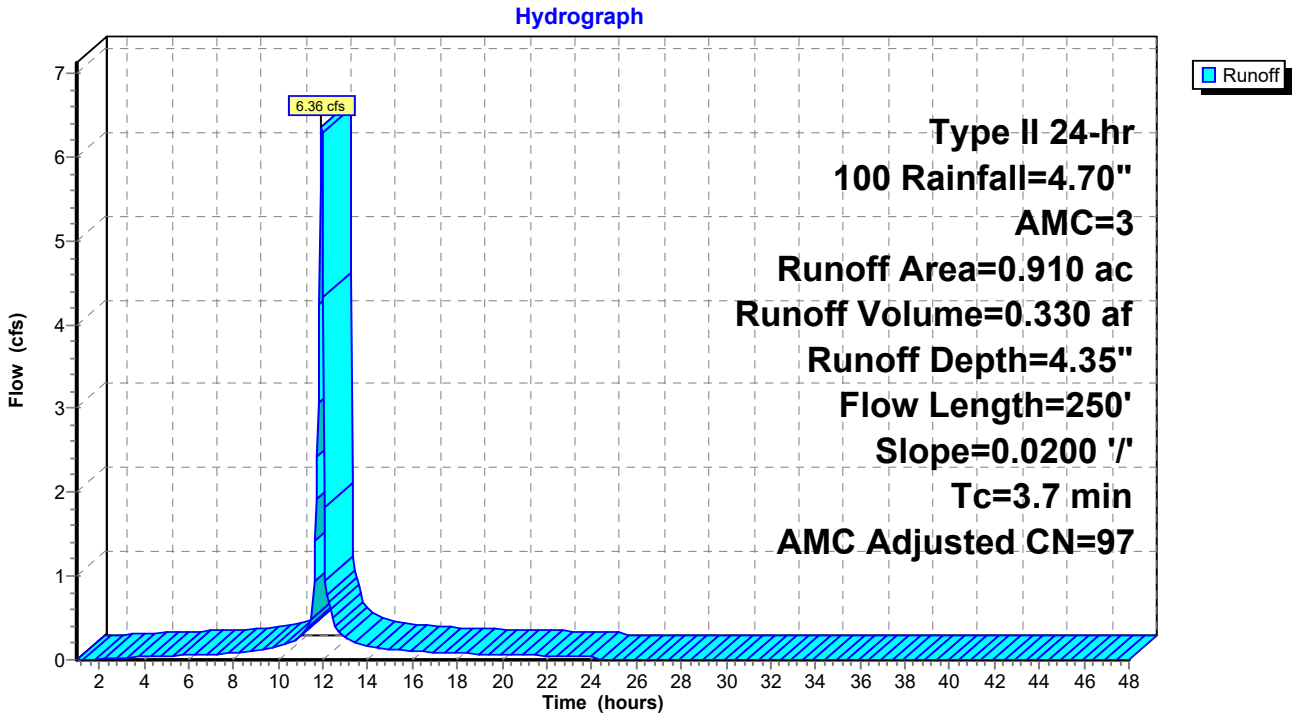
Runoff = 6.36 cfs @ 11.94 hrs, Volume= 0.330 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.770	98		
*	0.140	56		
	0.910	92	97	Weighted Average, AMC Adjusted
	0.140			15.38% Pervious Area
	0.770			84.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	250	0.0200	1.13		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 17S: S



Summary for Subcatchment 18S: Q

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

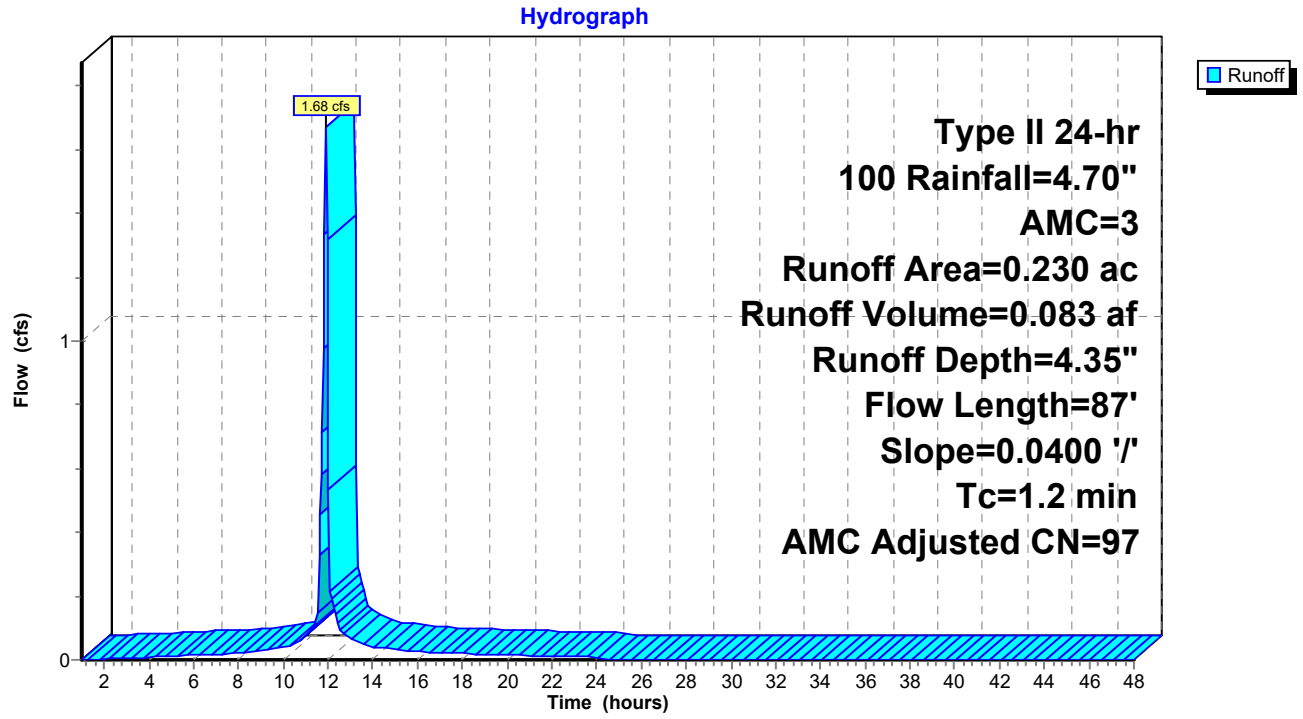
Runoff = 1.68 cfs @ 11.90 hrs, Volume= 0.083 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.190	98		
*	0.040	56		
	0.230	91	97	Weighted Average, AMC Adjusted
	0.040			17.39% Pervious Area
	0.190			82.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	87	0.0400	1.20		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 18S: Q



Summary for Subcatchment 19S: R

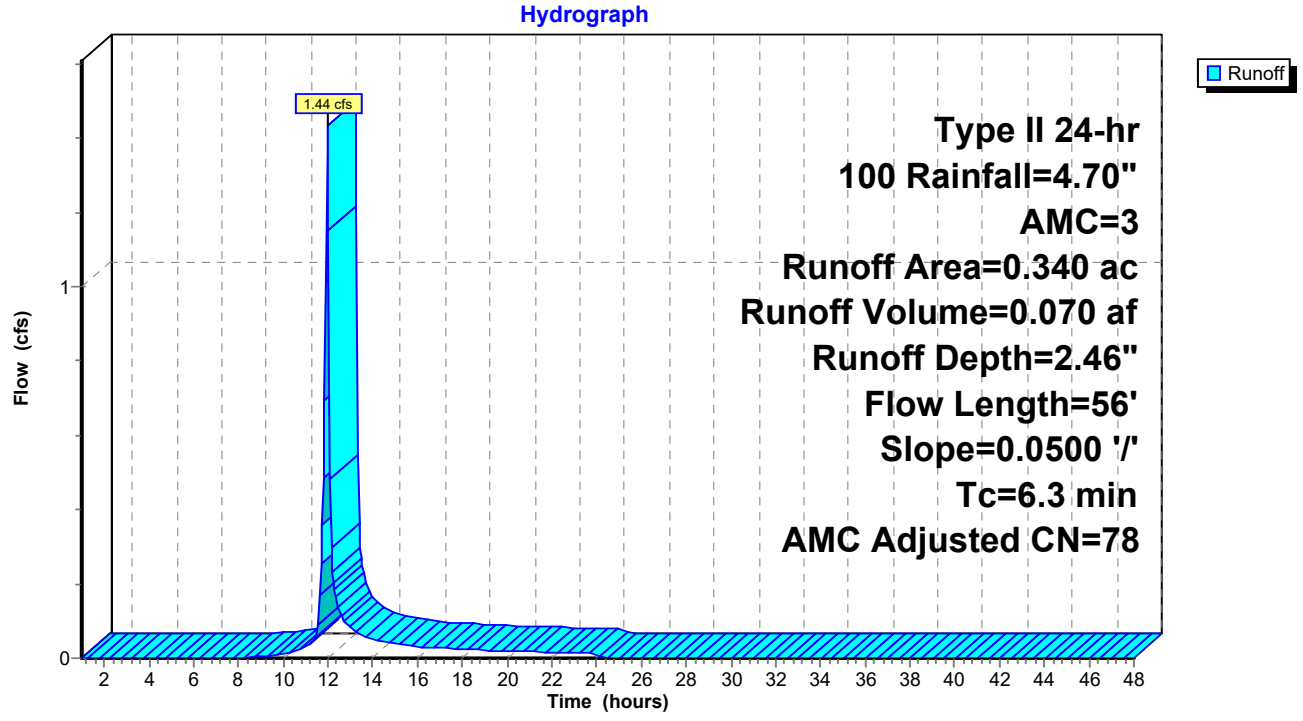
Runoff = 1.44 cfs @ 11.98 hrs, Volume= 0.070 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.030	98		
*	0.310	56		
	0.340	60	78	Weighted Average, AMC Adjusted
	0.310			91.18% Pervious Area
	0.030			8.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	56	0.0500	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 1.49"

Subcatchment 19S: R



Summary for Subcatchment 50S: T

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

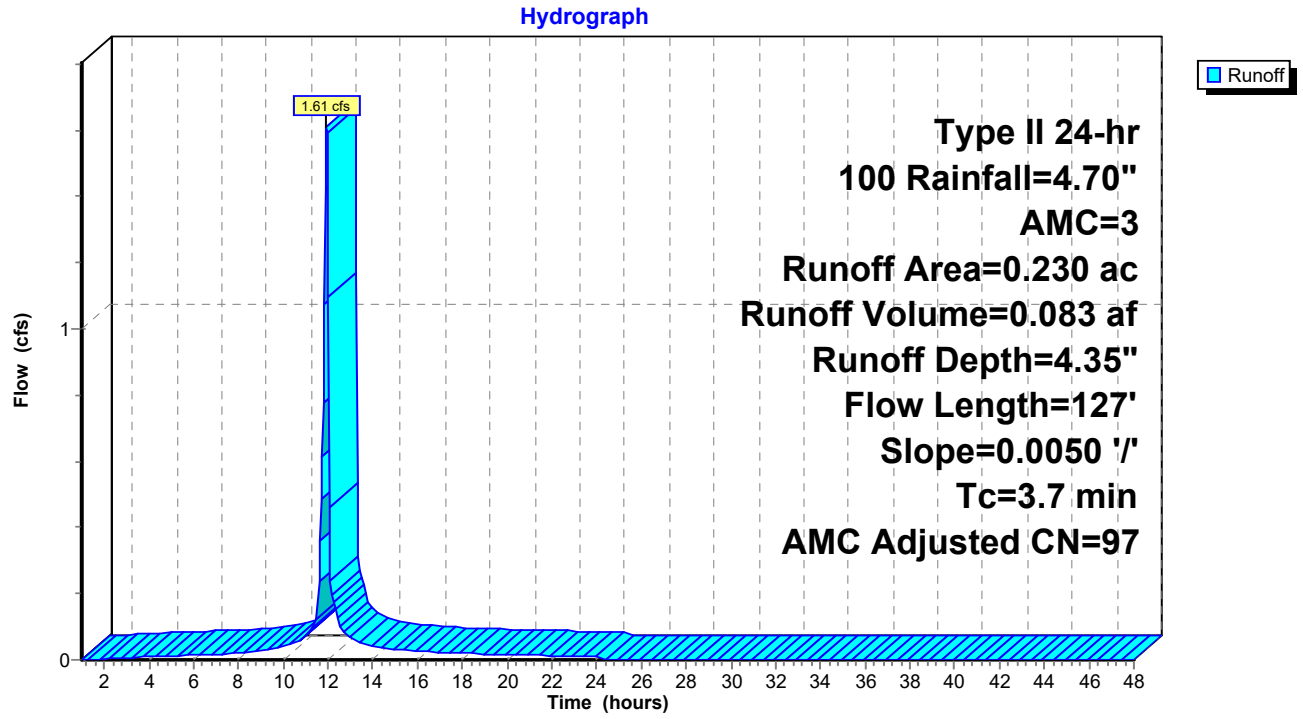
Runoff = 1.61 cfs @ 11.94 hrs, Volume= 0.083 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.190	98		
*	0.040	56		
	0.230	91	97	Weighted Average, AMC Adjusted
	0.040			17.39% Pervious Area
	0.190			82.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	127	0.0050	0.57		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 50S: T



Summary for Subcatchment 52S: U

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

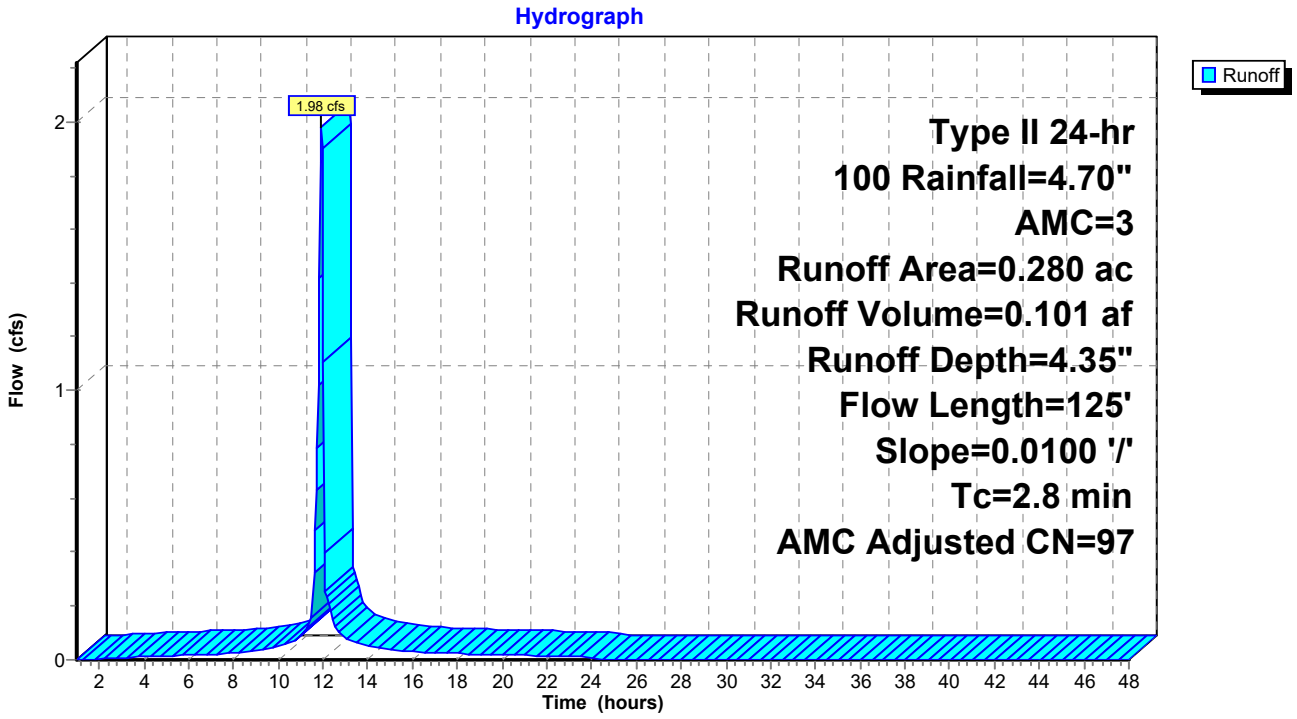
Runoff = 1.98 cfs @ 11.93 hrs, Volume= 0.101 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.240	98		
*	0.040	56		
	0.280	92	97	Weighted Average, AMC Adjusted
	0.040			14.29% Pervious Area
	0.240			85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	125	0.0100	0.74		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 52S: U



Summary for Subcatchment 55S: V

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

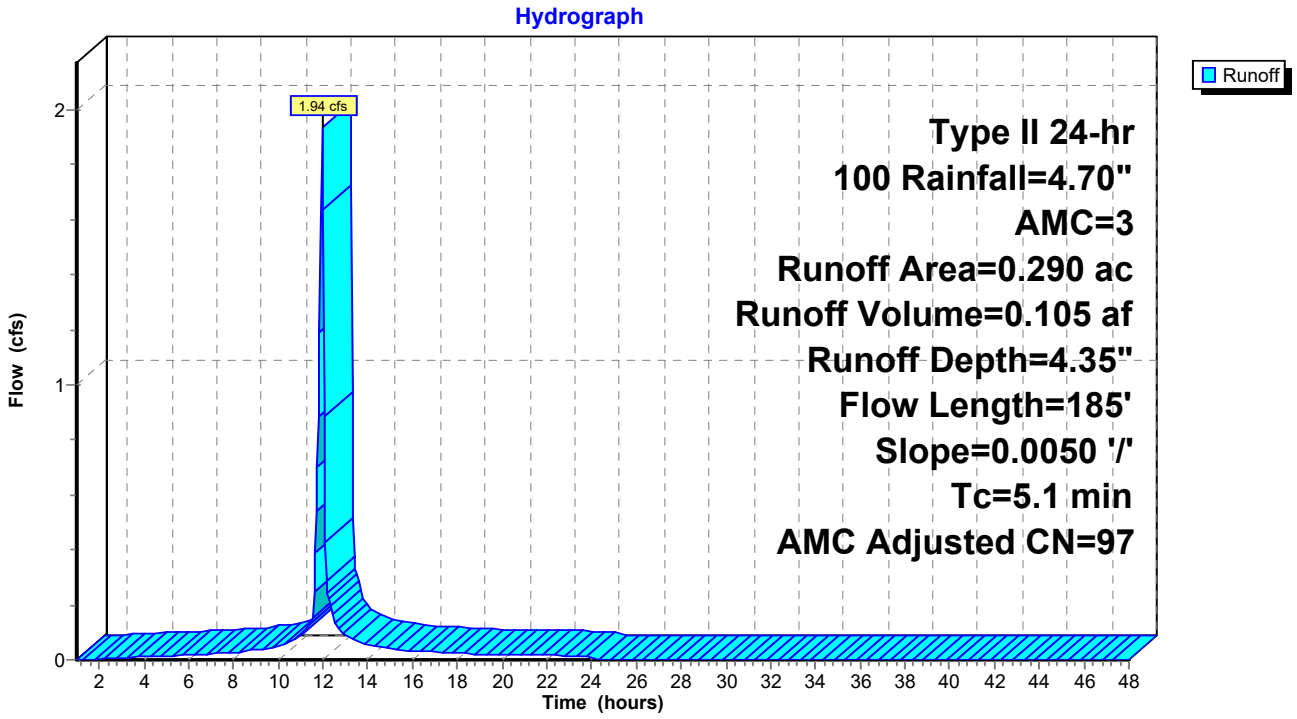
Runoff = 1.94 cfs @ 11.95 hrs, Volume= 0.105 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 Rainfall=4.70", AMC=3

	Area (ac)	CN	Adj	Description
*	0.250	98		
*	0.040	56		
	0.290	92	97	Weighted Average, AMC Adjusted
	0.040			13.79% Pervious Area
	0.250			86.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	185	0.0050	0.61		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 1.49"

Subcatchment 55S: V



Summary for Reach 46R: REGIONAL SD

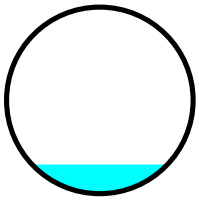
[52] Hint: Inlet/Outlet conditions not evaluated

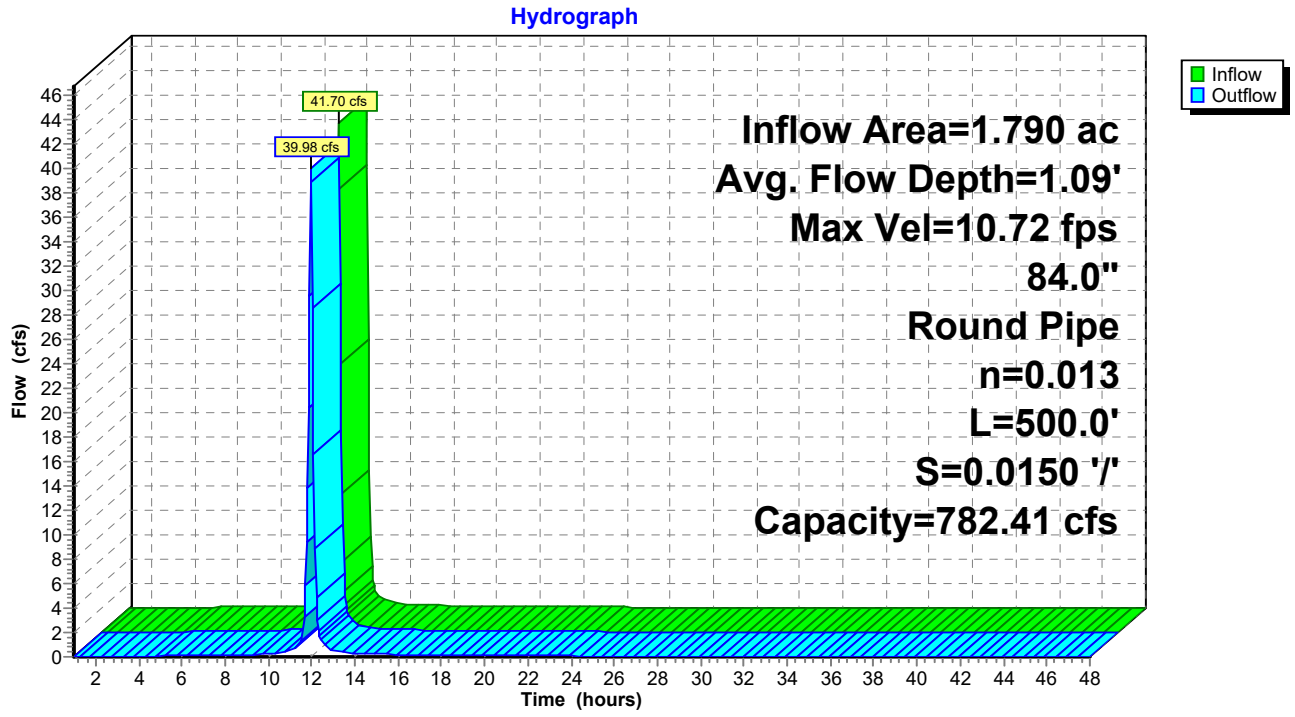
Inflow Area = 1.790 ac, 69.83% Impervious, Inflow Depth = 8.55" for 100 event
Inflow = 41.70 cfs @ 11.95 hrs, Volume= 1.275 af
Outflow = 39.98 cfs @ 11.98 hrs, Volume= 1.275 af, Atten= 4%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 10.72 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.26 fps, Avg. Travel Time= 3.7 min

Peak Storage= 1,910 cf @ 11.96 hrs
Average Depth at Peak Storage= 1.09'
Bank-Full Depth= 7.00' Flow Area= 38.5 sf, Capacity= 782.41 cfs

84.0" Round Pipe
n= 0.013
Length= 500.0' Slope= 0.0150 '/'
Inlet Invert= 25.10', Outlet Invert= 17.60'





Summary for Pond 20P: DT-1

Inflow Area = 1.780 ac, 84.83% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 11.45 cfs @ 11.95 hrs, Volume= 0.645 af
Outflow = 0.20 cfs @ 16.05 hrs, Volume= 0.645 af, Atten= 98%, Lag= 246.0 min
Discarded = 0.20 cfs @ 16.05 hrs, Volume= 0.645 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 35.45' @ 16.05 hrs Surf.Area= 0.210 ac Storage= 0.396 af

Plug-Flow detention time= 802.8 min calculated for 0.644 af (100% of inflow)
Center-of-Mass det. time= 803.4 min (1,556.1 - 752.7)

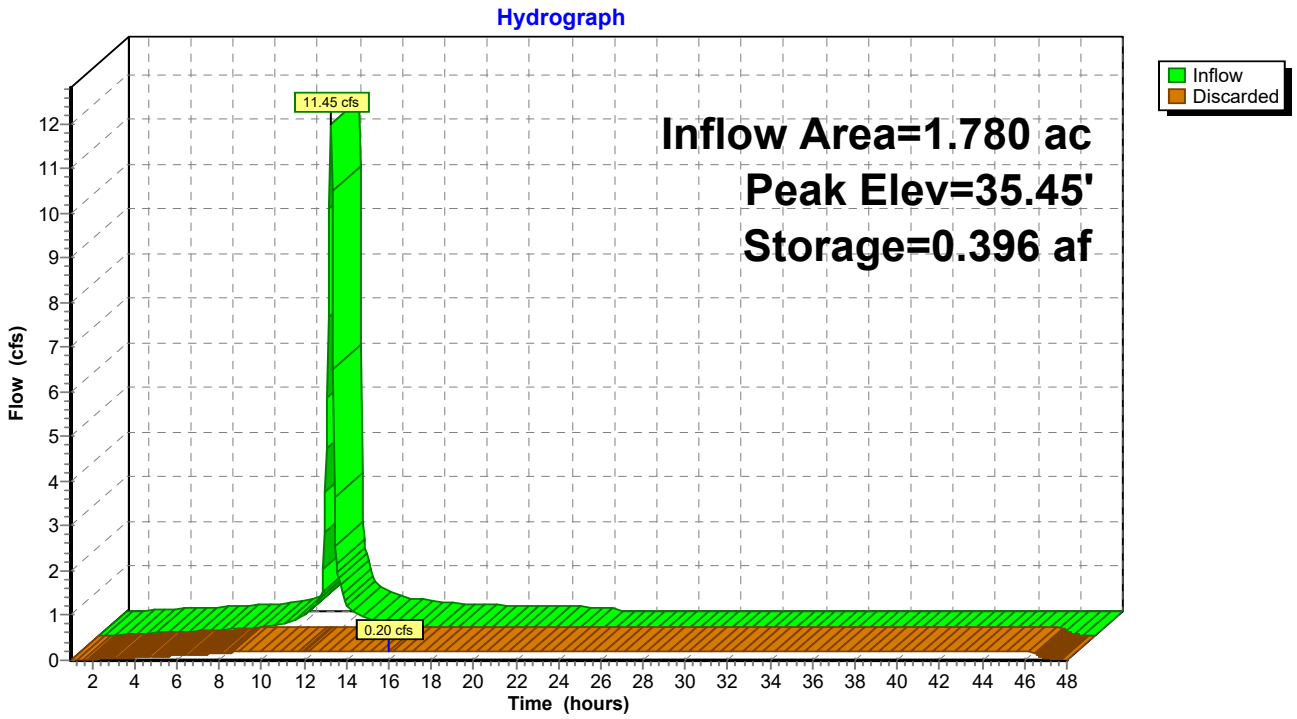
Volume	Invert	Avail.Storage	Storage Description
#1	33.50'	0.509 af	**Custom Stage Data (Irregular)** Listed below (Recalc) 0.525 af Overall x 97.0% Voids

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
33.50	0.210	402.0	0.000	0.000	0.210
36.00	0.210	402.0	0.525	0.525	0.233

Device	Routing	Invert	Outlet Devices
#1	Discarded	33.50'	**0.850 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.20 cfs @ 16.05 hrs HW=35.45' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.20 cfs)

Pond 20P: DT-1


Hydrograph
Inflow
Discarded
11.45 cfs
0.20 cfs
Inflow Area=1.780 ac
Peak Elev=35.45'
Storage=0.396 af
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48

Summary for Pond 22P: CB-P

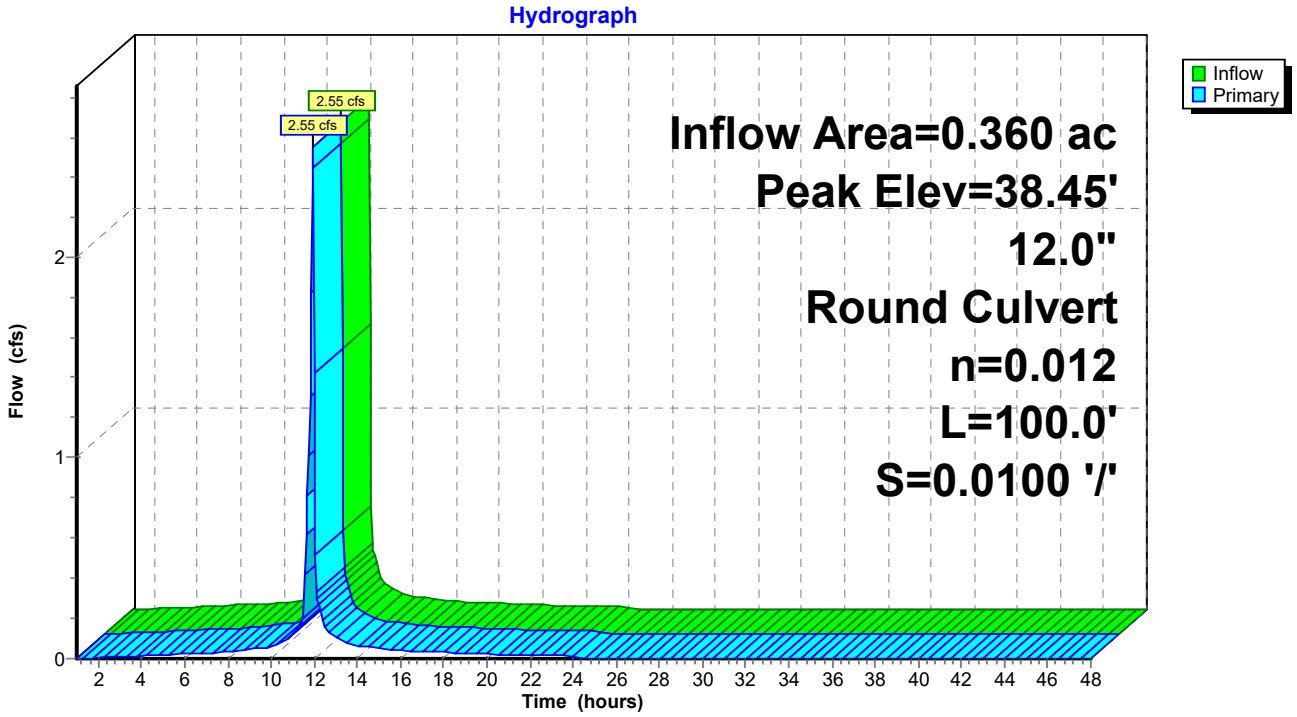
Inflow Area = 0.360 ac, 83.33% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 2.55 cfs @ 11.93 hrs, Volume= 0.130 af
Outflow = 2.55 cfs @ 11.93 hrs, Volume= 0.130 af, Atten= 0%, Lag= 0.0 min
Primary = 2.55 cfs @ 11.93 hrs, Volume= 0.130 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 38.45' @ 11.93 hrs
Flood Elev= 40.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	37.00'	**12.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 37.00' / 36.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.41 cfs @ 11.93 hrs HW=38.38' (Free Discharge)
1=Culvert (Inlet Controls 2.41 cfs @ 3.07 fps)

Pond 22P: CB-P



Summary for Pond 24P: CB-M

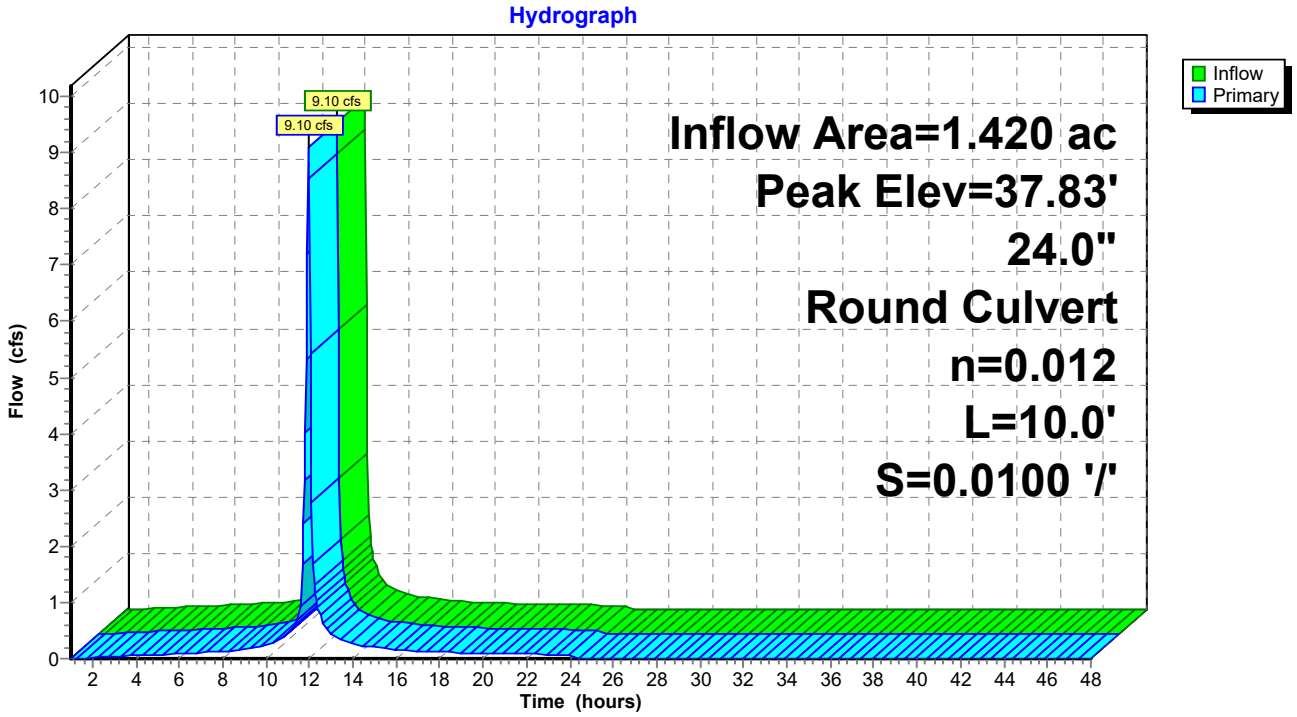
Inflow Area = 1.420 ac, 85.21% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 9.10 cfs @ 11.96 hrs, Volume= 0.515 af
Outflow = 9.10 cfs @ 11.96 hrs, Volume= 0.515 af, Atten= 0%, Lag= 0.0 min
Primary = 9.10 cfs @ 11.96 hrs, Volume= 0.515 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.83' @ 11.96 hrs
Flood Elev= 40.89'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.00'	**24.0" Round Culvert** L= 10.0' Ke= 1.200 Inlet / Outlet Invert= 36.00' / 35.90' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=8.86 cfs @ 11.96 hrs HW=37.80' (Free Discharge)
1=Culvert (Barrel Controls 8.86 cfs @ 3.93 fps)

Pond 24P: CB-M



Summary for Pond 26P: CB-N

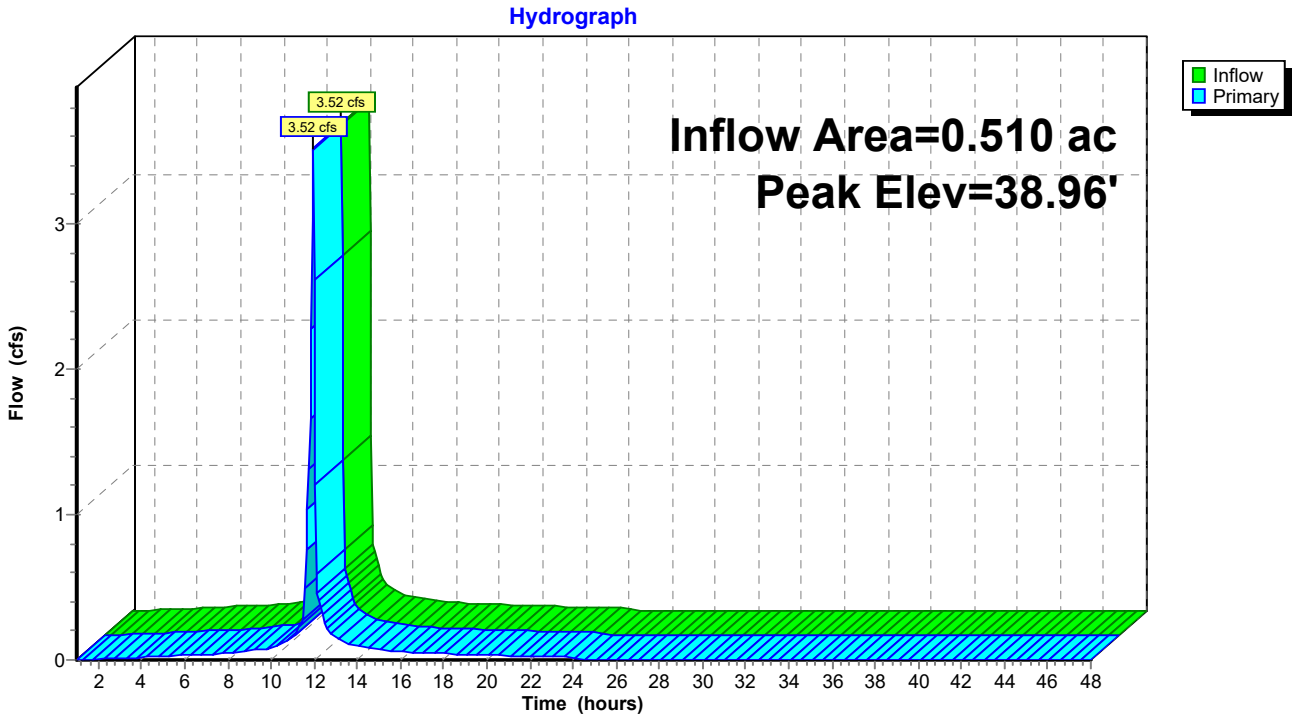
Inflow Area = 0.510 ac, 84.31% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 3.52 cfs @ 11.94 hrs, Volume= 0.185 af
Outflow = 3.52 cfs @ 11.94 hrs, Volume= 0.185 af, Atten= 0%, Lag= 0.0 min
Primary = 3.52 cfs @ 11.94 hrs, Volume= 0.185 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 38.96' @ 11.94 hrs
Flood Elev= 39.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.57'	**12.0" x 12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	36.60'	**12.0" Round Culvert** L= 10.0' Ke= 1.200 Inlet / Outlet Invert= 36.60' / 36.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=3.43 cfs @ 11.94 hrs HW=38.87' (Free Discharge)
1=Orifice/Grate (Controls 0.00 cfs)
2=Culvert (Inlet Controls 3.43 cfs @ 4.37 fps)

Pond 26P: CB-N



Summary for Pond 27P: CB-O

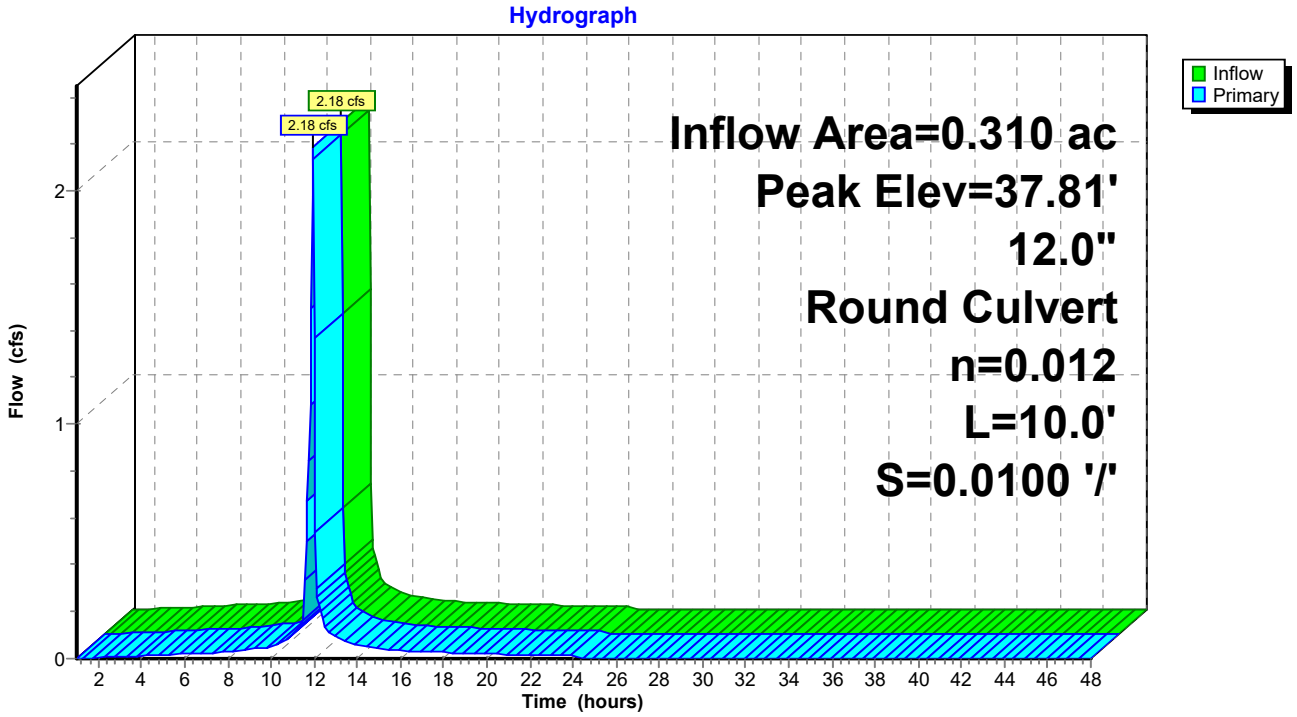
Inflow Area = 0.310 ac, 83.87% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 2.18 cfs @ 11.93 hrs, Volume= 0.112 af
Outflow = 2.18 cfs @ 11.93 hrs, Volume= 0.112 af, Atten= 0%, Lag= 0.0 min
Primary = 2.18 cfs @ 11.93 hrs, Volume= 0.112 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.81' @ 11.94 hrs
Flood Elev= 39.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.60'	**12.0" Round Culvert** L= 10.0' Ke= 1.200 Inlet / Outlet Invert= 36.60' / 36.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.08 cfs @ 11.93 hrs HW=37.75' (Free Discharge)
1=Culvert (Inlet Controls 2.08 cfs @ 2.65 fps)

Pond 27P: CB-O



Summary for Pond 28P: DT-2

Inflow Area = 1.060 ac, 84.91% Impervious, Inflow Depth > 4.37" for 100 event
Inflow = 7.31 cfs @ 11.94 hrs, Volume= 0.386 af
Outflow = 0.12 cfs @ 16.06 hrs, Volume= 0.377 af, Atten= 98%, Lag= 247.3 min
Discarded = 0.12 cfs @ 16.06 hrs, Volume= 0.377 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 33.76' @ 16.06 hrs Surf.Area= 0.110 ac Storage= 0.241 af

Plug-Flow detention time= 834.2 min calculated for 0.377 af (98% of inflow)
Center-of-Mass det. time= 819.6 min (1,569.1 - 749.5)

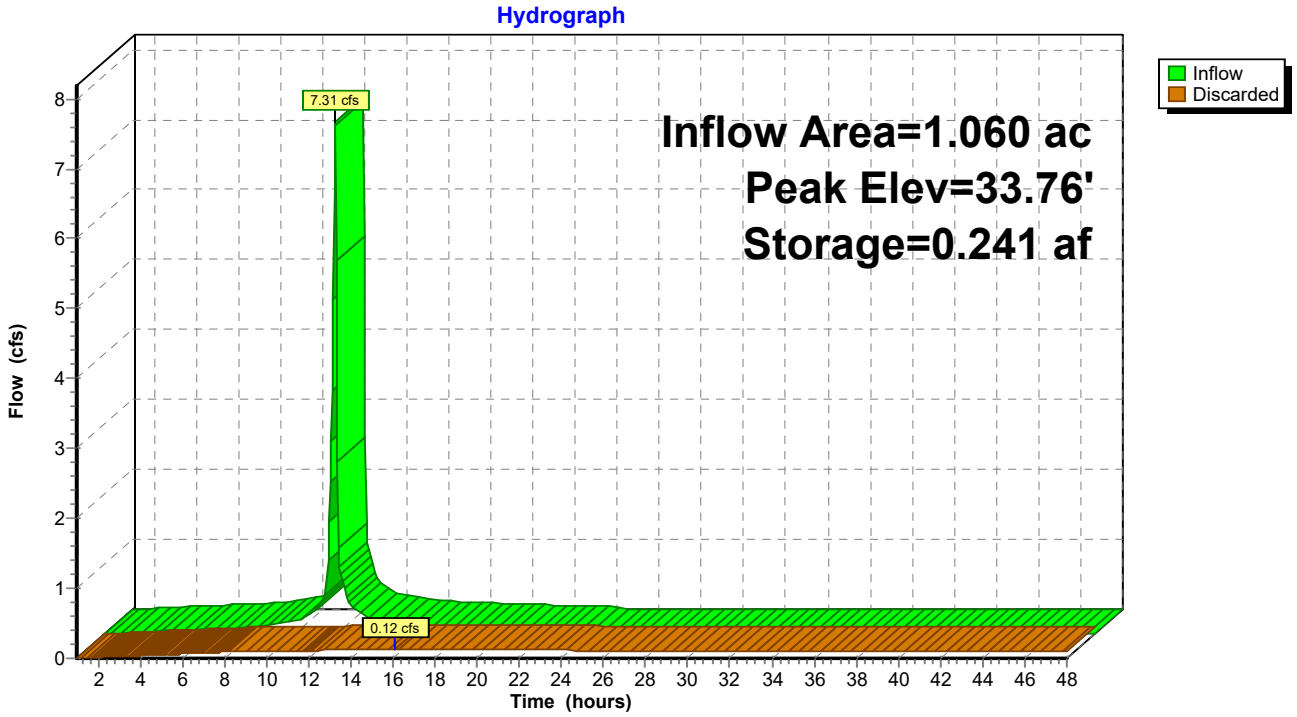
Volume	Invert	Avail.Storage	Storage Description
#1	31.50'	0.267 af	**Custom Stage Data (Irregular)** Listed below (Recalc) 0.275 af Overall x 97.0% Voids

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
31.50	0.110	477.0	0.000	0.000	0.110
34.00	0.110	477.0	0.275	0.275	0.137

Device	Routing	Invert	Outlet Devices
#1	Discarded	31.50'	**0.850 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.12 cfs @ 16.06 hrs HW=33.76' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Pond 28P: DT-2


Hydrograph
Inflow
Discarded
Inflow Area=1.060 ac
Peak Elev=33.76'
Storage=0.241 af
7.31 cfs
0.12 cfs
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48

Summary for Pond 29P: CB-L

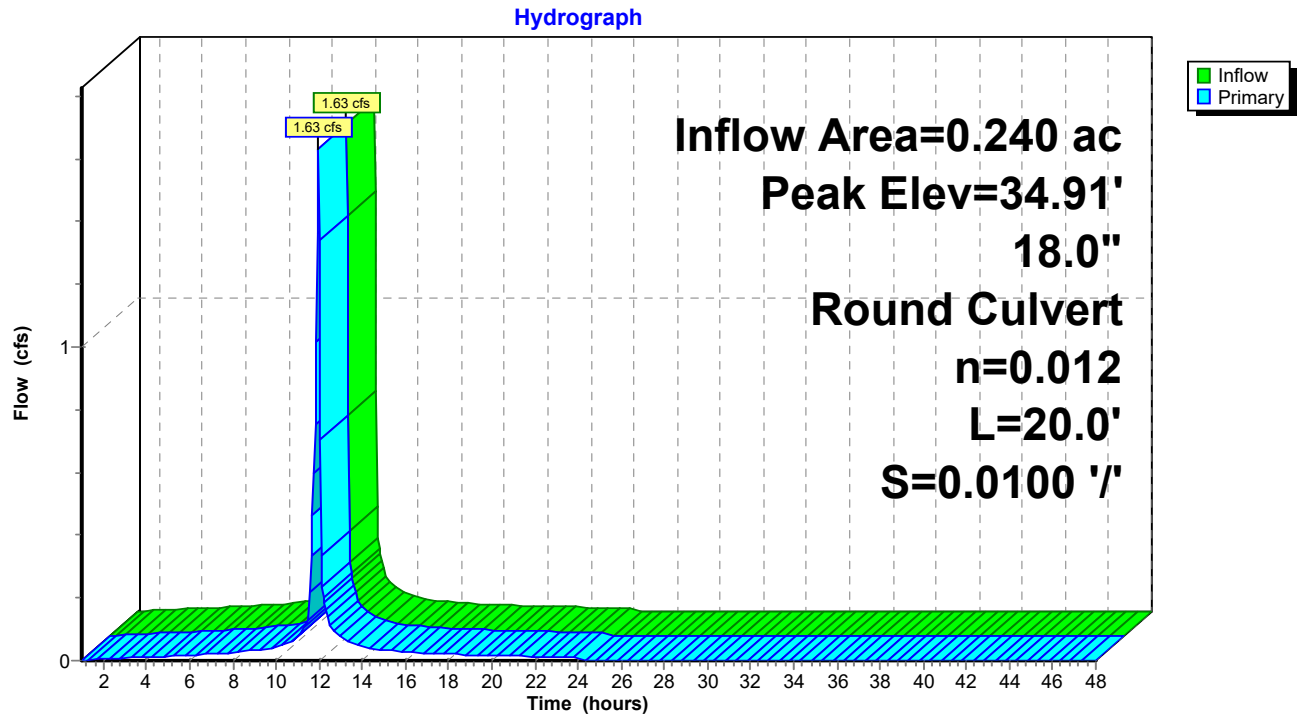
Inflow Area = 0.240 ac, 87.50% Impervious, Inflow Depth > 4.46" for 100 event
Inflow = 1.63 cfs @ 11.95 hrs, Volume= 0.089 af
Outflow = 1.63 cfs @ 11.95 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.0 min
Primary = 1.63 cfs @ 11.95 hrs, Volume= 0.089 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 34.91' @ 11.95 hrs
Flood Elev= 37.15'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.20'	**18.0" Round Culvert** L= 20.0' Ke= 1.200 Inlet / Outlet Invert= 34.20' / 34.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.62 cfs @ 11.95 hrs HW=34.91' (Free Discharge)
1=Culvert (Inlet Controls 1.62 cfs @ 1.96 fps)

Pond 29P: CB-L



Summary for Pond 30P: CB-I

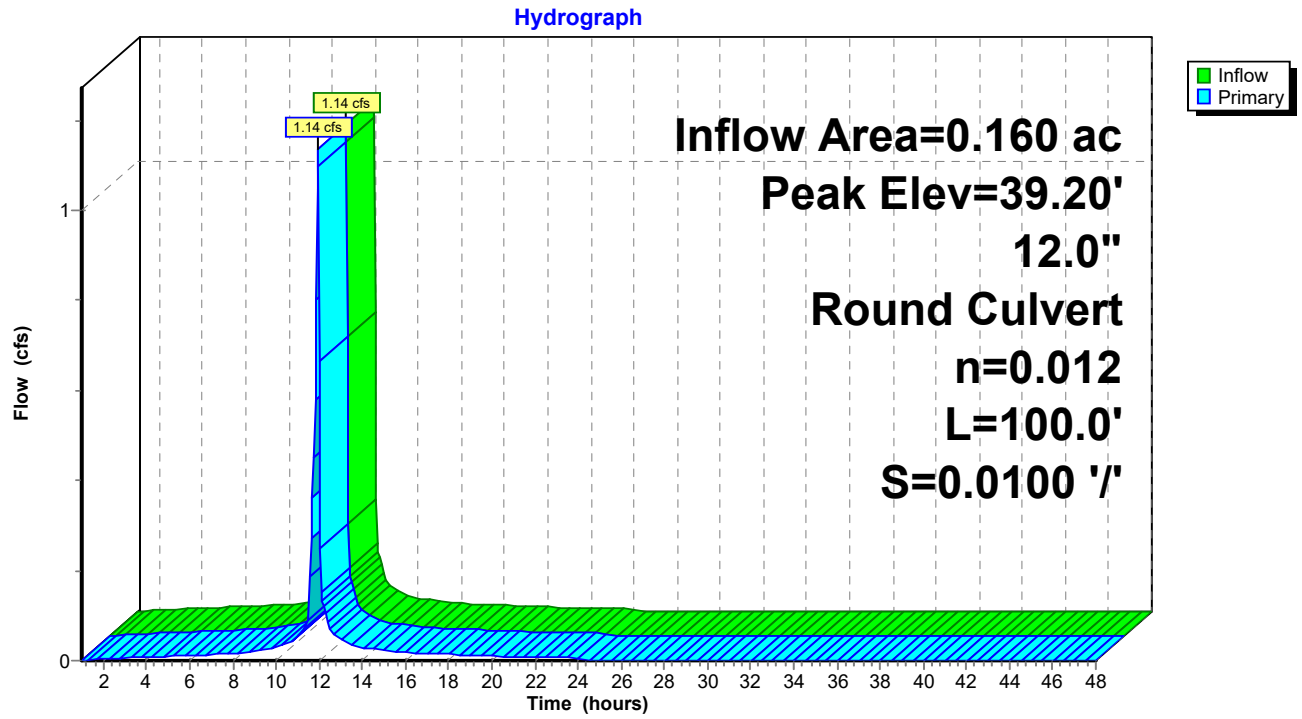
Inflow Area = 0.160 ac, 87.50% Impervious, Inflow Depth > 4.46" for 100 event
Inflow = 1.14 cfs @ 11.93 hrs, Volume= 0.060 af
Outflow = 1.14 cfs @ 11.93 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min
Primary = 1.14 cfs @ 11.93 hrs, Volume= 0.060 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 39.20' @ 11.93 hrs
Flood Elev= 41.99'

Device	Routing	Invert	Outlet Devices
#1	Primary	38.50'	**12.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 38.50' / 37.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.08 cfs @ 11.93 hrs HW=39.18' (Free Discharge)
1=Culvert (Inlet Controls 1.08 cfs @ 1.91 fps)

Pond 30P: CB-I



Summary for Pond 31P: CB-J

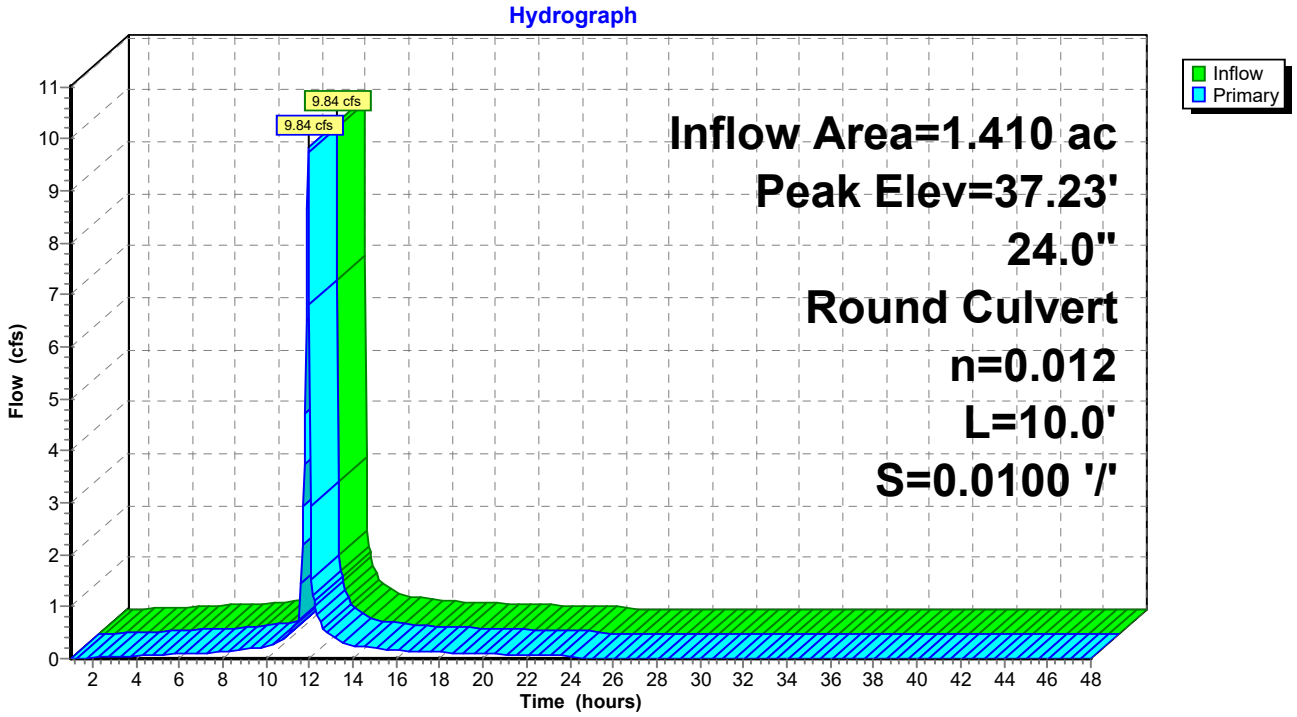
Inflow Area = 1.410 ac, 85.11% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 9.84 cfs @ 11.94 hrs, Volume= 0.511 af
Outflow = 9.84 cfs @ 11.94 hrs, Volume= 0.511 af, Atten= 0%, Lag= 0.0 min
Primary = 9.84 cfs @ 11.94 hrs, Volume= 0.511 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.23' @ 11.94 hrs
Flood Elev= 38.26'

Device	Routing	Invert	Outlet Devices
#1	Primary	35.30'	**24.0" Round Culvert** L= 10.0' Ke= 1.200 Inlet / Outlet Invert= 35.30' / 35.20' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=9.48 cfs @ 11.94 hrs HW=37.18' (Free Discharge)
1=Culvert (Barrel Controls 9.48 cfs @ 4.01 fps)

Pond 31P: CB-J



Summary for Pond 32P: DT-3

Inflow Area = 1.570 ac, 85.35% Impervious, Inflow Depth = 4.36" for 100 event
Inflow = 10.97 cfs @ 11.94 hrs, Volume= 0.570 af
Outflow = 0.16 cfs @ 16.49 hrs, Volume= 0.551 af, Atten= 99%, Lag= 273.0 min
Discarded = 0.16 cfs @ 16.49 hrs, Volume= 0.551 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 34.70' @ 16.49 hrs Surf.Area= 0.170 ac Storage= 0.358 af

Plug-Flow detention time= 852.6 min calculated for 0.551 af (97% of inflow)
Center-of-Mass det. time= 830.9 min (1,581.1 - 750.2)

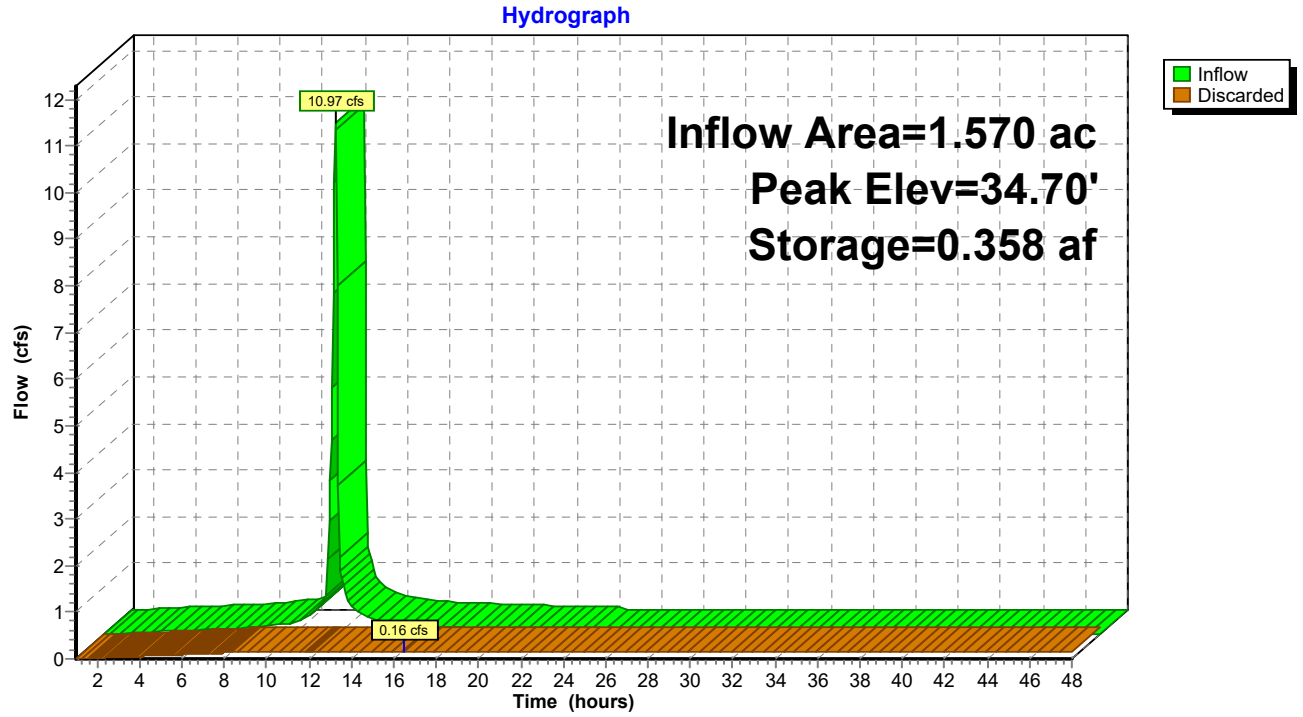
Volume	Invert	Avail.Storage	Storage Description
#1	32.60'	0.425 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
32.60	0.170	403.0	0.000	0.000	0.170
35.10	0.170	403.0	0.425	0.425	0.193

Device	Routing	Invert	Outlet Devices
#1	Discarded	32.60'	**0.850 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.16 cfs @ 16.49 hrs HW=34.70' (Free Discharge)
↳**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Pond 32P: DT-3



Summary for Pond 33P: CB-G

Inflow Area = 0.780 ac, 84.62% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 5.07 cfs @ 11.96 hrs, Volume= 0.283 af
Outflow = 5.07 cfs @ 11.96 hrs, Volume= 0.283 af, Atten= 0%, Lag= 0.0 min
Primary = 1.30 cfs @ 11.96 hrs, Volume= 0.209 af
Secondary = 3.78 cfs @ 11.96 hrs, Volume= 0.074 af

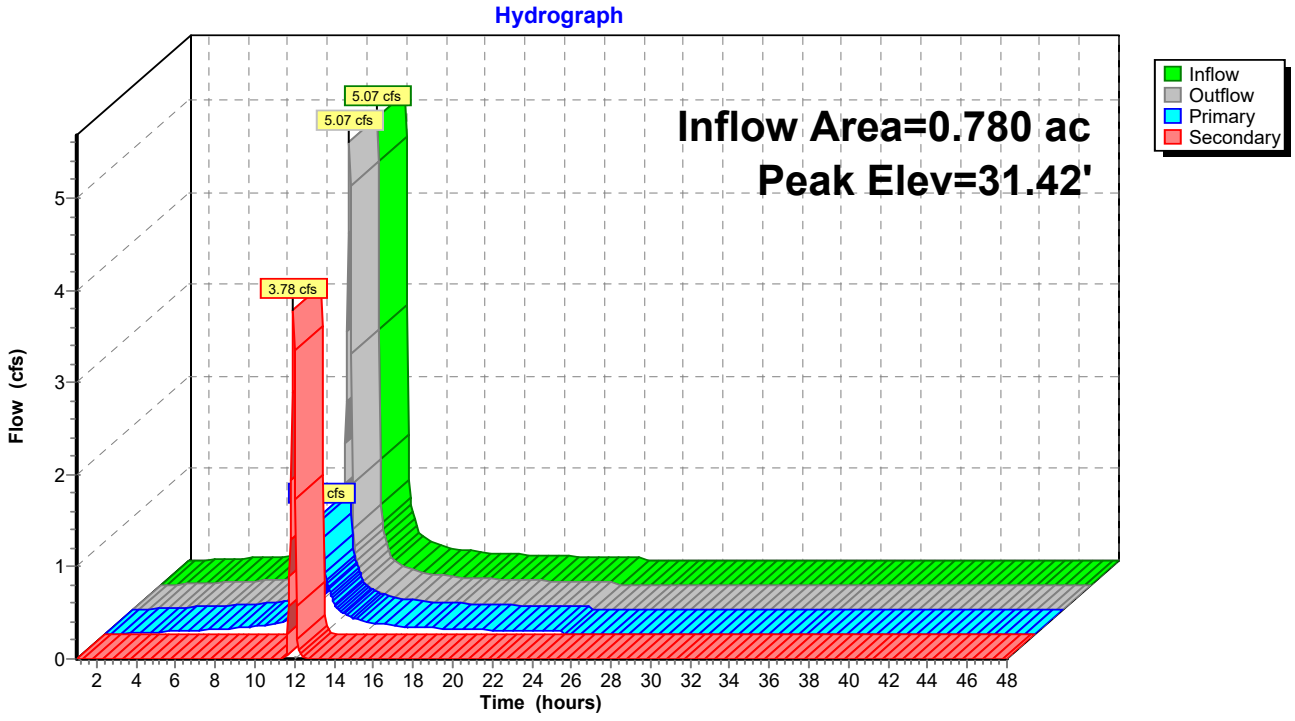
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 31.42' @ 11.96 hrs
Flood Elev= 32.88'

Device	Routing	Invert	Outlet Devices
#1	Primary	29.80'	**8.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 29.80' / 28.80' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Secondary	30.23'	**18.0" Round Culvert** L= 15.0' Ke= 1.200 Inlet / Outlet Invert= 30.23' / 30.08' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.29 cfs @ 11.96 hrs HW=31.40' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.29 cfs @ 3.69 fps)

Secondary OutFlow Max=3.68 cfs @ 11.96 hrs HW=31.40' (Free Discharge)
└**2=Culvert** (Barrel Controls 3.68 cfs @ 3.44 fps)

Pond 33P: CB-G



Summary for Pond 34P: CB-K

[58] Hint: Peaked 0.75' above defined flood level

Inflow Area = 0.940 ac, 85.11% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 6.33 cfs @ 11.95 hrs, Volume= 0.341 af
Outflow = 6.33 cfs @ 11.95 hrs, Volume= 0.341 af, Atten= 0%, Lag= 0.0 min
Primary = 2.14 cfs @ 11.95 hrs, Volume= 0.261 af
Secondary = 4.19 cfs @ 11.95 hrs, Volume= 0.080 af

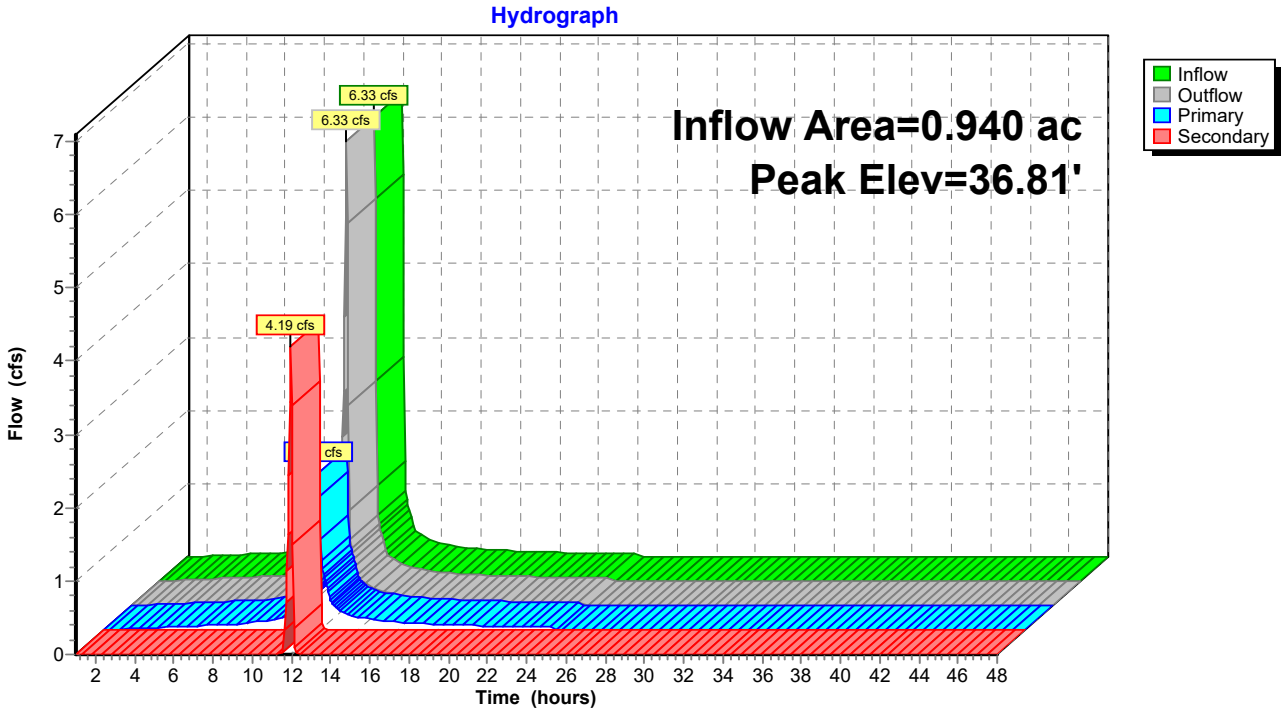
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 36.81' @ 11.95 hrs
Flood Elev= 36.06'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.00'	**8.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 33.00' / 32.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Secondary	33.67'	**12.0" Round Culvert** L= 20.0' Ke= 1.200 Inlet / Outlet Invert= 33.67' / 32.78' S= 0.0445 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.13 cfs @ 11.95 hrs HW=36.80' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.13 cfs @ 6.11 fps)

Secondary OutFlow Max=4.18 cfs @ 11.95 hrs HW=36.80' (Free Discharge)
└**2=Culvert** (Inlet Controls 4.18 cfs @ 5.32 fps)

Pond 34P: CB-K



Summary for Pond 36P: CB-F

Inflow Area = 2.550 ac, 85.10% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 14.46 cfs @ 12.01 hrs, Volume= 0.924 af
Outflow = 14.46 cfs @ 12.01 hrs, Volume= 0.924 af, Atten= 0%, Lag= 0.0 min
Primary = 5.61 cfs @ 12.01 hrs, Volume= 0.745 af
Secondary = 8.85 cfs @ 12.01 hrs, Volume= 0.179 af

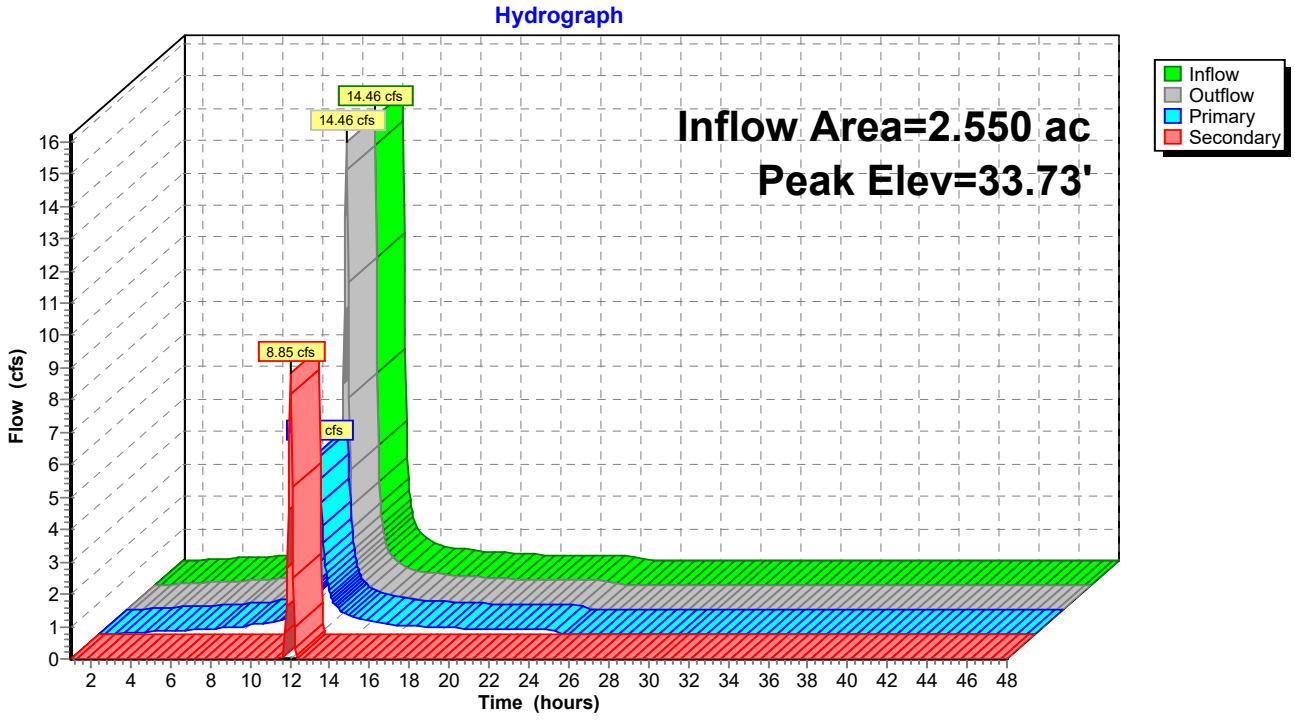
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 33.73' @ 12.01 hrs
Flood Elev= 35.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.17'	**15.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 31.17' / 30.17' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Secondary	32.00'	**24.0" Round Culvert** L= 200.0' Ke= 1.200 Inlet / Outlet Invert= 32.00' / 30.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=5.56 cfs @ 12.01 hrs HW=33.70' (Free Discharge)
└**1=Culvert** (Inlet Controls 5.56 cfs @ 4.53 fps)

Secondary OutFlow Max=8.63 cfs @ 12.01 hrs HW=33.70' (Free Discharge)
└**2=Culvert** (Inlet Controls 8.63 cfs @ 3.03 fps)

Pond 36P: CB-F



Summary for Pond 37P: CB-C

Inflow Area = 0.420 ac, 85.71% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 2.94 cfs @ 11.94 hrs, Volume= 0.152 af
Outflow = 2.94 cfs @ 11.94 hrs, Volume= 0.152 af, Atten= 0%, Lag= 0.0 min
Primary = 1.62 cfs @ 11.94 hrs, Volume= 0.133 af
Secondary = 1.32 cfs @ 11.94 hrs, Volume= 0.019 af

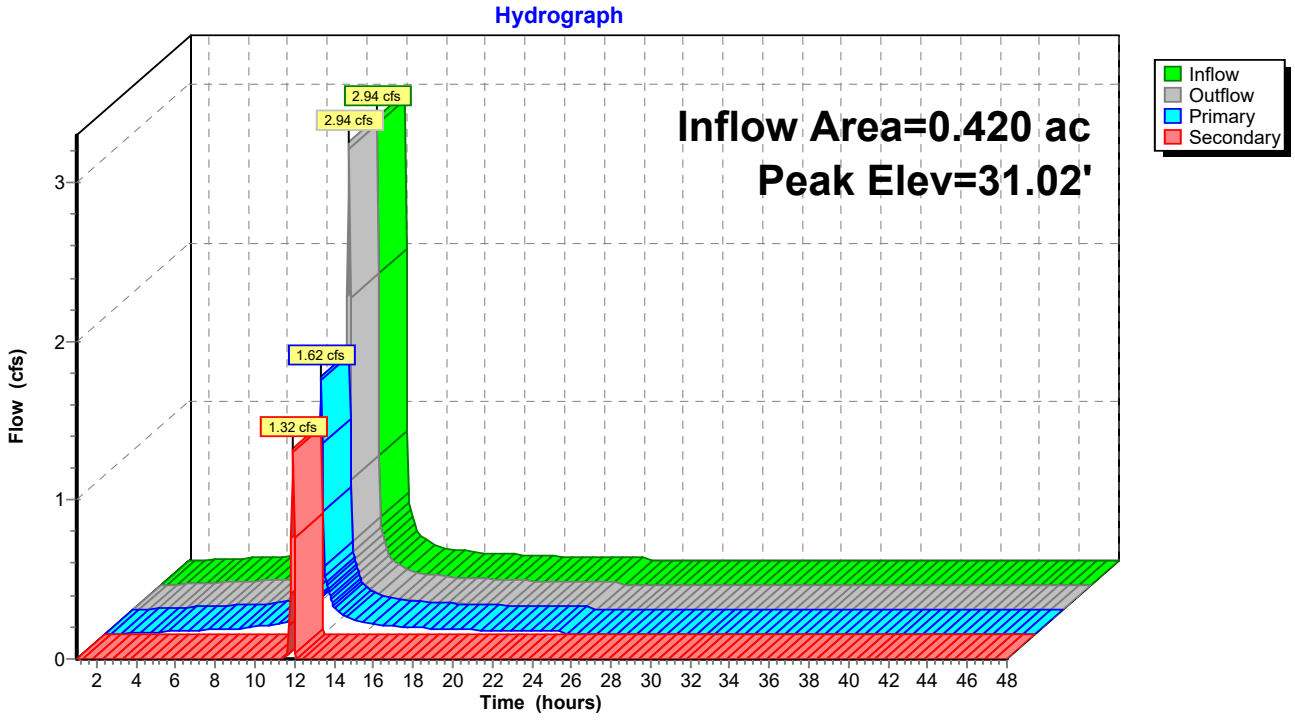
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 31.02' @ 11.94 hrs
Flood Elev= 32.01'

Device	Routing	Invert	Outlet Devices
#1	Primary	28.70'	**8.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 28.70' / 27.70' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Secondary	29.37'	**8.0" Round Culvert** L= 200.0' Ke= 1.200 Inlet / Outlet Invert= 29.37' / 27.67' S= 0.0085 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=1.57 cfs @ 11.94 hrs HW=30.91' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.57 cfs @ 4.50 fps)

Secondary OutFlow Max=1.26 cfs @ 11.94 hrs HW=30.91' (Free Discharge)
└**2=Culvert** (Inlet Controls 1.26 cfs @ 3.60 fps)

Pond 37P: CB-C



Summary for Pond 38P: CB-D

Inflow Area = 1.820 ac, 85.16% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 11.58 cfs @ 11.97 hrs, Volume= 0.659 af
Outflow = 11.58 cfs @ 11.97 hrs, Volume= 0.659 af, Atten= 0%, Lag= 0.0 min
Primary = 3.46 cfs @ 11.97 hrs, Volume= 0.505 af
Secondary = 8.12 cfs @ 11.97 hrs, Volume= 0.155 af

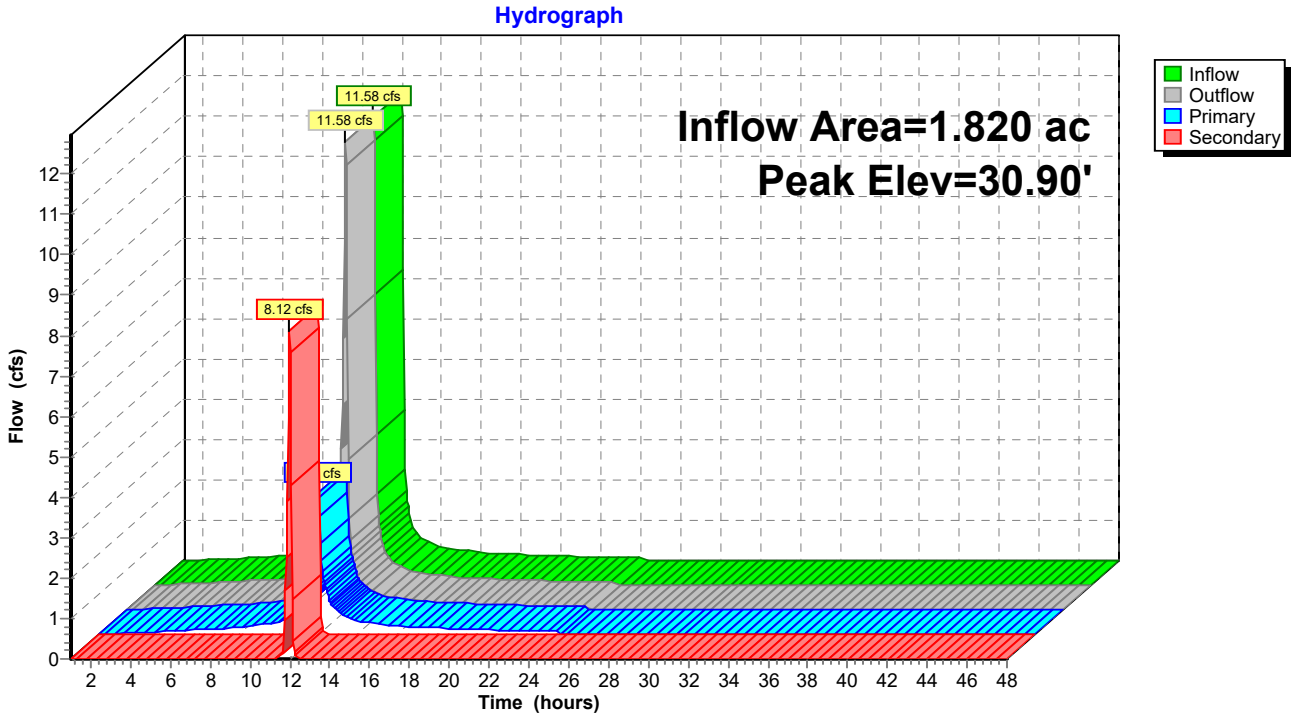
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 30.90' @ 11.97 hrs
Flood Elev= 31.59'

Device	Routing	Invert	Outlet Devices
#1	Primary	28.60'	**12.0" Round Culvert** L= 40.0' Ke= 1.200 Inlet / Outlet Invert= 28.60' / 28.20' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Secondary	29.27'	**24.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 29.27' / 28.27' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=3.42 cfs @ 11.97 hrs HW=30.86' (Free Discharge)
└**1=Culvert** (Inlet Controls 3.42 cfs @ 4.36 fps)

Secondary OutFlow Max=7.85 cfs @ 11.97 hrs HW=30.86' (Free Discharge)
└**2=Culvert** (Inlet Controls 7.85 cfs @ 2.93 fps)

Pond 38P: CB-D



Summary for Pond 39P: DT-4

Inflow Area = 5.860 ac, 85.15% Impervious, Inflow Depth = 3.48" for 100 event
Inflow = 13.55 cfs @ 11.96 hrs, Volume= 1.697 af
Outflow = 0.42 cfs @ 19.25 hrs, Volume= 1.465 af, Atten= 97%, Lag= 437.2 min
Discarded = 0.42 cfs @ 19.25 hrs, Volume= 1.465 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 27.68' @ 19.25 hrs Surf.Area= 0.440 ac Storage= 1.058 af

Plug-Flow detention time= 865.1 min calculated for 1.463 af (86% of inflow)
Center-of-Mass det. time= 795.7 min (1,560.0 - 764.3)

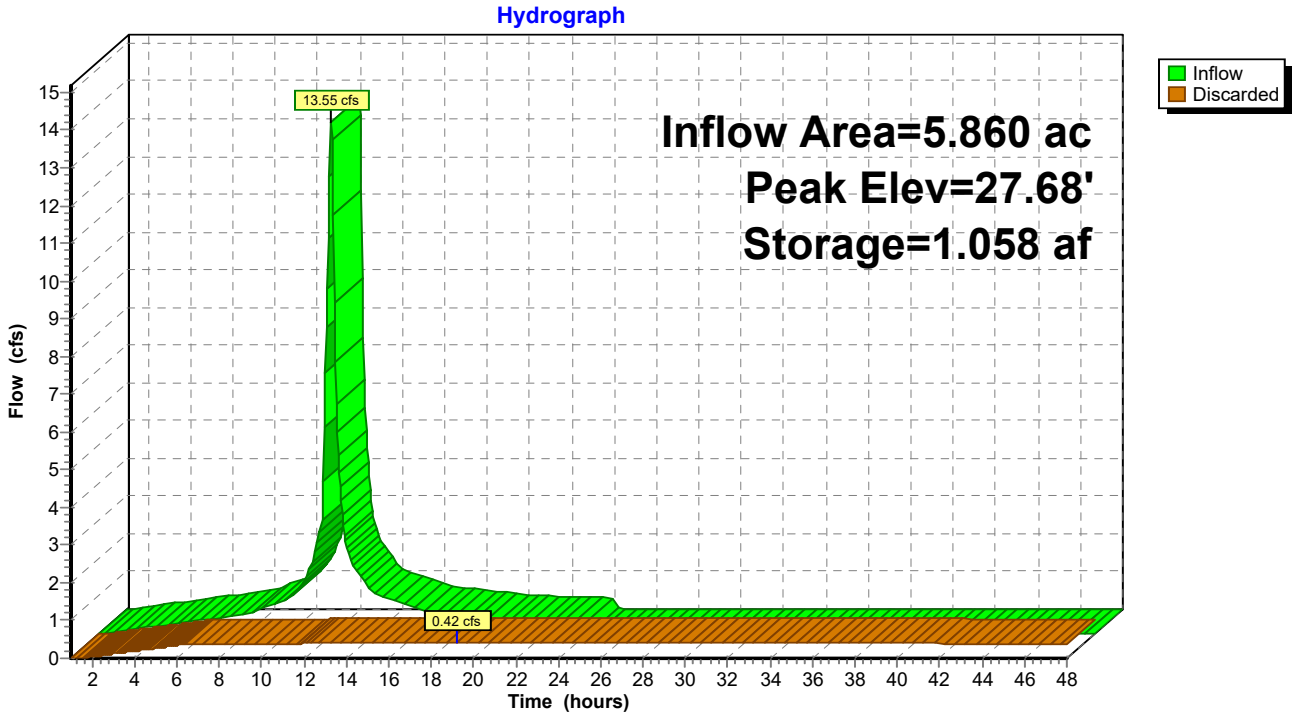
Volume	Invert	Avail.Storage	Storage Description
#1	25.20'	1.067 af	**Custom Stage Data (Irregular)** Listed below (Recalc) 1.100 af Overall x 97.0% Voids

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
25.20	0.440	871.0	0.000	0.000	0.440
27.70	0.440	871.0	1.100	1.100	0.490

Device	Routing	Invert	Outlet Devices
#1	Discarded	25.20'	**0.850 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.42 cfs @ 19.25 hrs HW=27.68' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.42 cfs)

Pond 39P: DT-4


Hydrograph
Inflow
Discarded
13.55 cfs
0.42 cfs
Inflow Area=5.860 ac
Peak Elev=27.68'
Storage=1.058 af
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
2
4
6
8
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12
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Summary for Pond 40P: CB-E

Inflow Area = 0.320 ac, 84.38% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 1.77 cfs @ 12.02 hrs, Volume= 0.116 af
Outflow = 1.77 cfs @ 12.02 hrs, Volume= 0.116 af, Atten= 0%, Lag= 0.0 min
Primary = 0.27 cfs @ 12.02 hrs, Volume= 0.077 af
Secondary = 1.50 cfs @ 12.02 hrs, Volume= 0.039 af

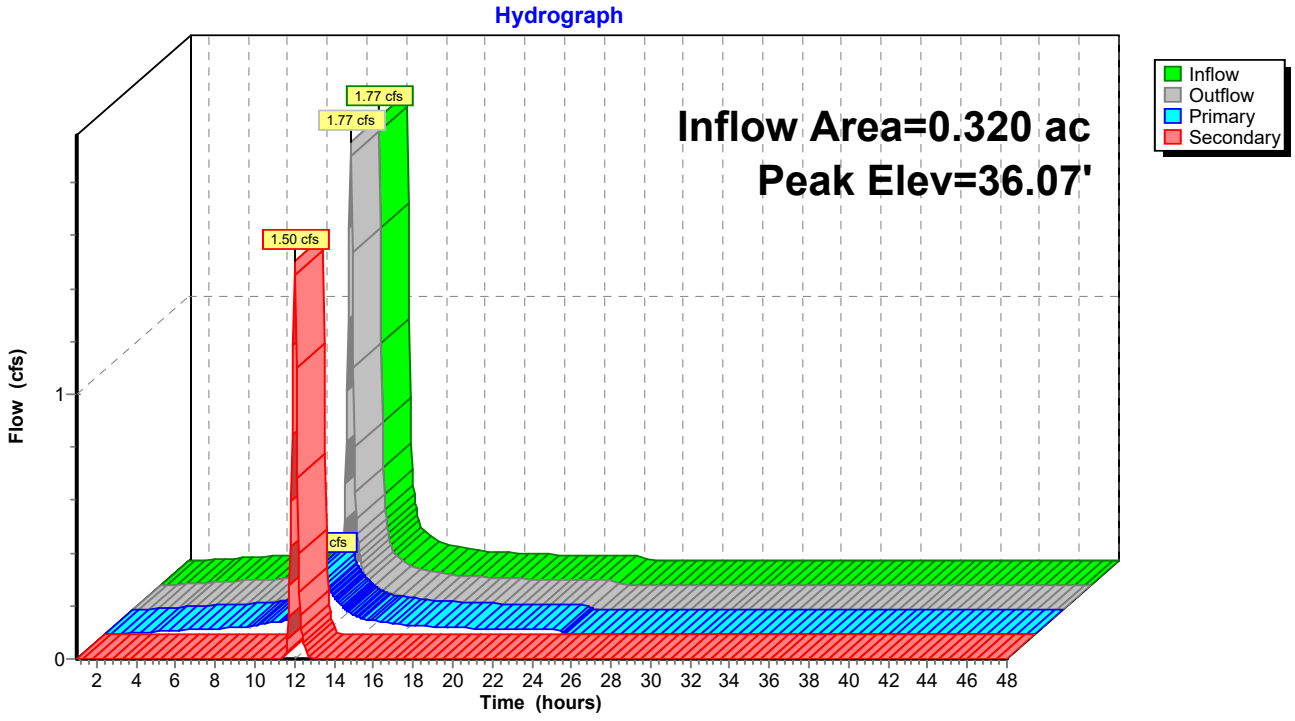
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 36.07' @ 12.02 hrs
Flood Elev= 37.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.90'	**4.0" Round Culvert** L= 75.0' Ke= 1.200 Inlet / Outlet Invert= 34.90' / 34.15' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Secondary	35.23'	**12.0" Round Culvert** L= 200.0' Ke= 1.200 Inlet / Outlet Invert= 35.23' / 33.40' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.27 cfs @ 12.02 hrs HW=36.06' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.27 cfs @ 3.05 fps)

Secondary OutFlow Max=1.46 cfs @ 12.02 hrs HW=36.06' (Free Discharge)
└**2=Culvert** (Inlet Controls 1.46 cfs @ 2.11 fps)

Pond 40P: CB-E



Summary for Pond 41P: DT-6

Inflow Area = 1.290 ac, 84.50% Impervious, Inflow Depth = 2.73" for 100 event
Inflow = 1.29 cfs @ 11.93 hrs, Volume= 0.294 af
Outflow = 0.09 cfs @ 19.64 hrs, Volume= 0.281 af, Atten= 93%, Lag= 462.5 min
Discarded = 0.09 cfs @ 19.64 hrs, Volume= 0.281 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 29.79' @ 19.64 hrs Surf.Area= 0.075 ac Storage= 0.166 af

Plug-Flow detention time= 789.3 min calculated for 0.280 af (95% of inflow)
Center-of-Mass det. time= 762.0 min (1,536.8 - 774.8)

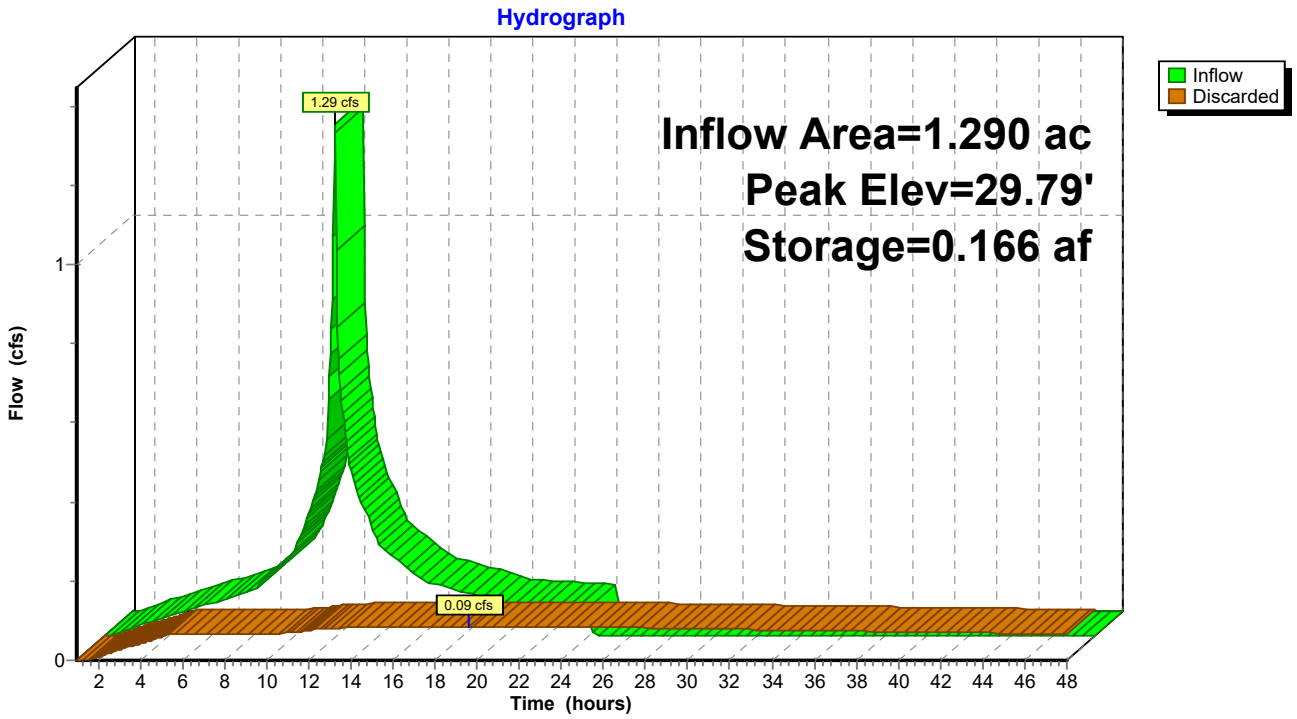
Volume	Invert	Avail.Storage	Storage Description
#1	27.50'	0.182 af	**Custom Stage Data (Irregular)** Listed below (Recalc) 0.187 af Overall x 97.0% Voids

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
27.50	0.075	482.0	0.000	0.000	0.075
30.00	0.075	482.0	0.187	0.187	0.103

Device	Routing	Invert	Outlet Devices
#1	Discarded	27.50'	**0.850 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.09 cfs @ 19.64 hrs HW=29.79' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.09 cfs)

Pond 41P: DT-6


Hydrograph
Inflow
Discarded
1.29 cfs
0.09 cfs
Inflow Area=1.290 ac
Peak Elev=29.79'
Storage=0.166 af
Flow (cfs)
0
1
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Pond 42P: CB-B

[57] Hint: Peaked at 37.42' (Flood elevation advised)

Inflow Area = 0.230 ac, 82.61% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 1.63 cfs @ 11.93 hrs, Volume= 0.083 af
Outflow = 1.63 cfs @ 11.93 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.0 min
Primary = 0.61 cfs @ 11.93 hrs, Volume= 0.064 af
Secondary = 1.02 cfs @ 11.93 hrs, Volume= 0.020 af

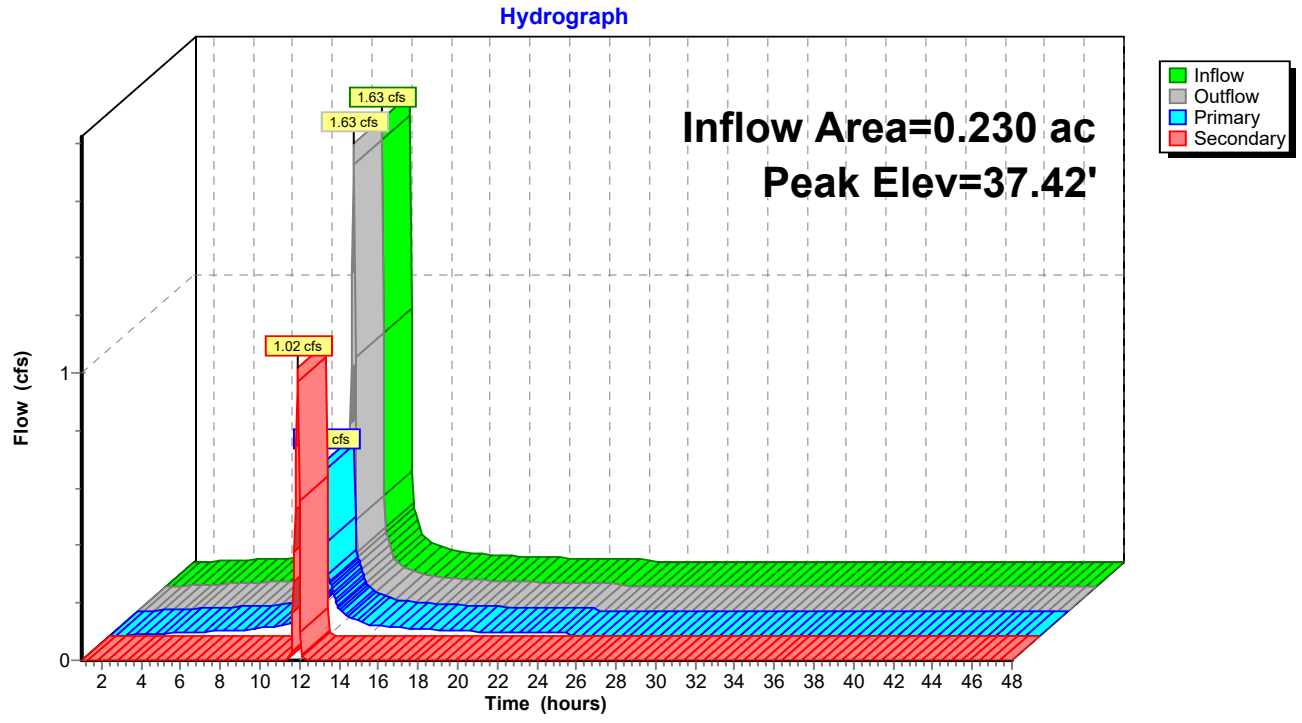
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.42' @ 11.93 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.10'	**4.0" Round Culvert** L= 50.0' Ke= 1.200 Inlet / Outlet Invert= 32.10' / 31.20' S= 0.0180 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Secondary	32.60'	**6.0" Round Culvert** L= 200.0' Ke= 1.200 Inlet / Outlet Invert= 32.60' / 30.60' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.58 cfs @ 11.93 hrs HW=36.97' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.58 cfs @ 6.62 fps)

Secondary OutFlow Max=0.96 cfs @ 11.93 hrs HW=36.97' (Free Discharge)
└**2=Culvert** (Barrel Controls 0.96 cfs @ 4.91 fps)

Pond 42P: CB-B



Summary for Pond 43P: CB-A

Inflow Area = 0.740 ac, 85.14% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 5.07 cfs @ 11.94 hrs, Volume= 0.268 af
Outflow = 5.07 cfs @ 11.94 hrs, Volume= 0.268 af, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 11.94 hrs, Volume= 0.153 af
Secondary = 4.64 cfs @ 11.94 hrs, Volume= 0.115 af

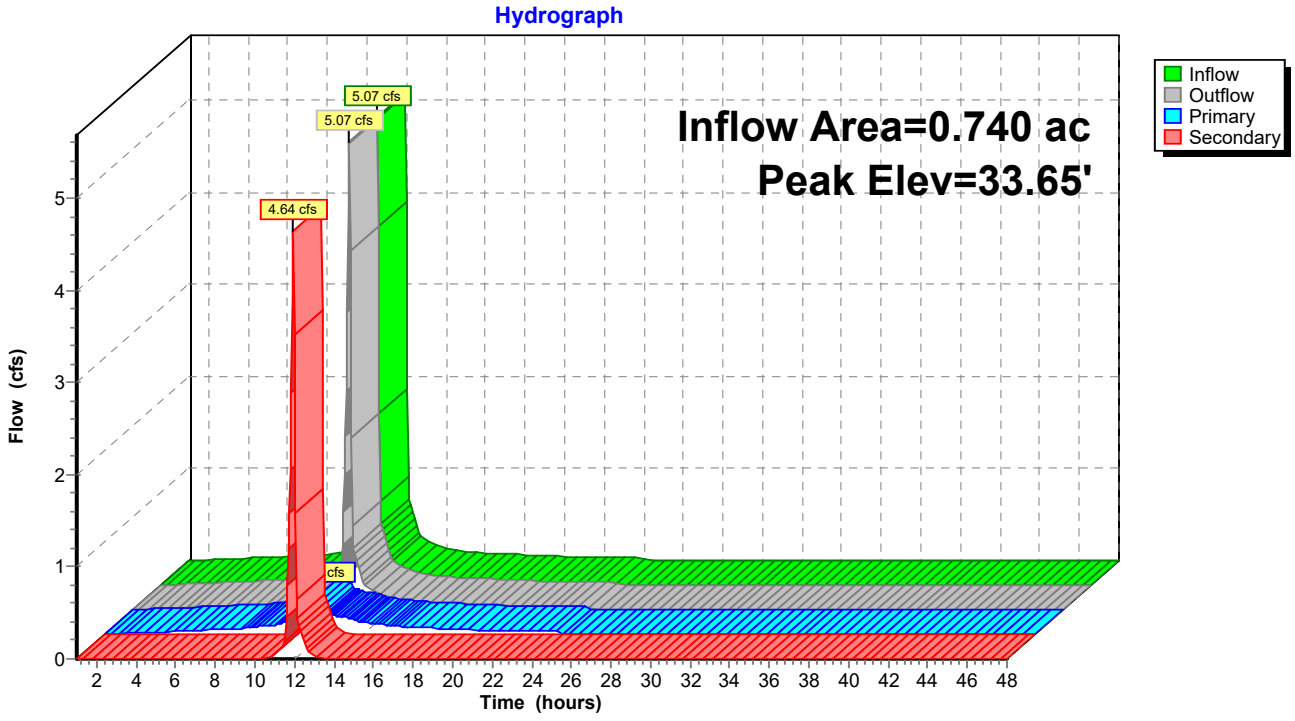
Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 33.65' @ 11.94 hrs
Flood Elev= 34.22'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.20'	**4.0" Round Culvert** L= 30.0' Ke= 1.200 Inlet / Outlet Invert= 31.20' / 30.00' S= 0.0400 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Secondary	31.70'	**15.0" Round Culvert** L= 200.0' Ke= 1.200 Inlet / Outlet Invert= 31.70' / 29.70' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.43 cfs @ 11.94 hrs HW=33.60' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.43 cfs @ 4.91 fps)

Secondary OutFlow Max=4.55 cfs @ 11.94 hrs HW=33.60' (Free Discharge)
└**2=Culvert** (Inlet Controls 4.55 cfs @ 3.71 fps)

Pond 43P: CB-A



Summary for Pond 49P: CB-S

[57] Hint: Peaked at 29.91' (Flood elevation advised)

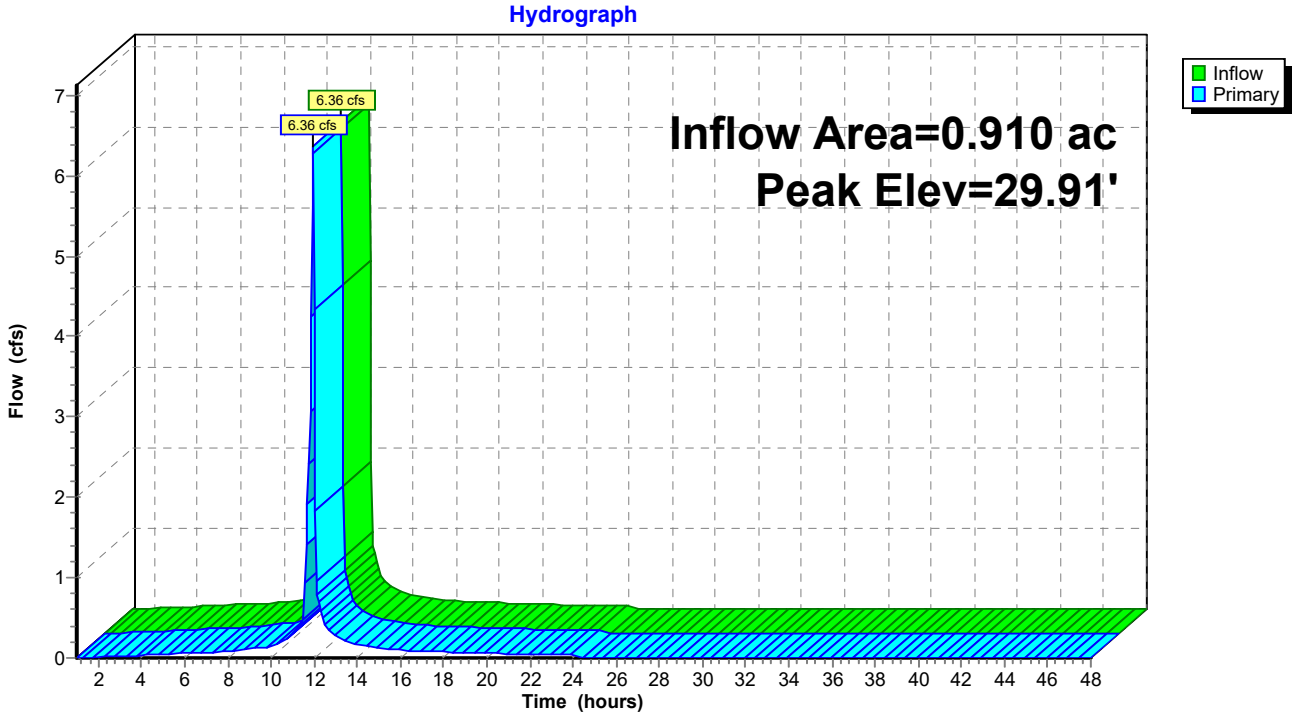
Inflow Area = 0.910 ac, 84.62% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 6.36 cfs @ 11.94 hrs, Volume= 0.330 af
Outflow = 6.36 cfs @ 11.94 hrs, Volume= 0.330 af, Atten= 0%, Lag= 0.0 min
Primary = 6.36 cfs @ 11.94 hrs, Volume= 0.330 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 29.91' @ 11.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	26.60'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=6.13 cfs @ 11.94 hrs HW=29.72' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 6.13 cfs @ 7.80 fps)

Pond 49P: CB-S



Summary for Pond 51P: CB-T

[58] Hint: Peaked 13.94' above defined flood level

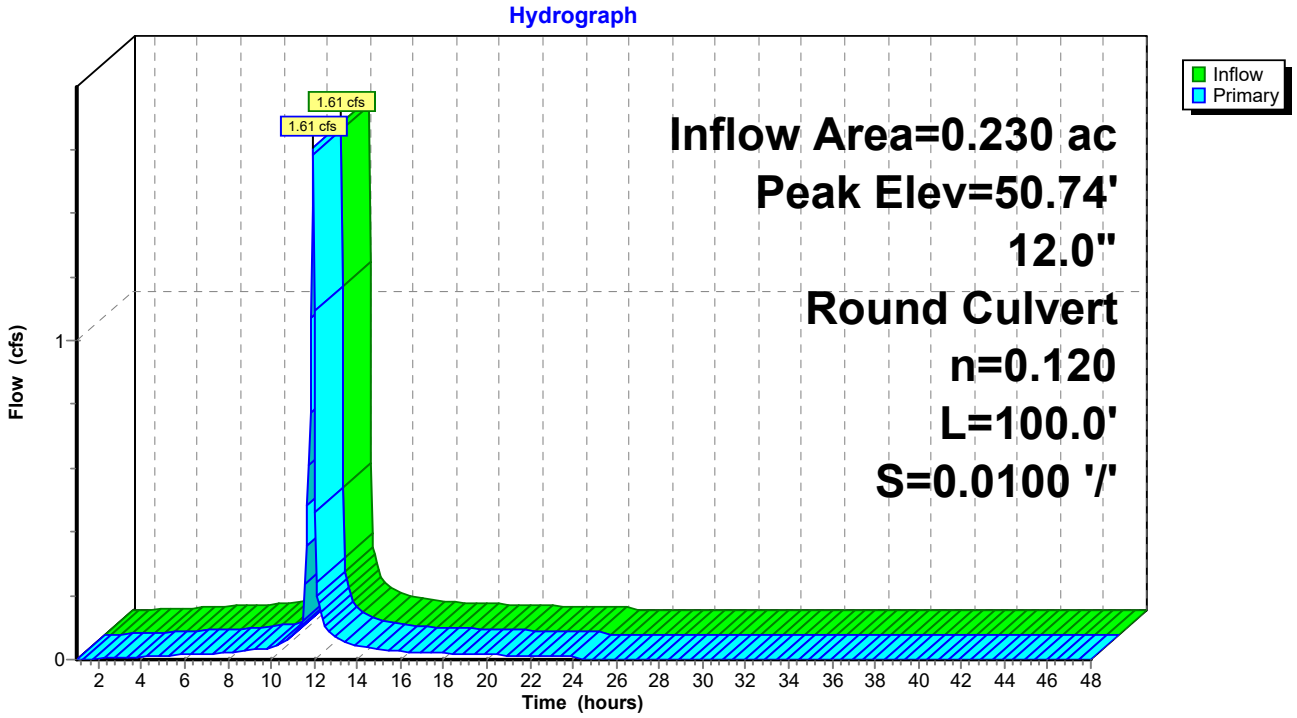
Inflow Area = 0.230 ac, 82.61% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 1.61 cfs @ 11.94 hrs, Volume= 0.083 af
Outflow = 1.61 cfs @ 11.94 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.0 min
Primary = 1.61 cfs @ 11.94 hrs, Volume= 0.083 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 50.74' @ 11.94 hrs
Flood Elev= 36.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.30'	**12.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 33.30' / 32.30' S= 0.0100 '/' Cc= 0.900 n= 0.120, Flow Area= 0.79 sf

Primary OutFlow Max=1.55 cfs @ 11.94 hrs HW=49.58' (Free Discharge)
1=Culvert (Barrel Controls 1.55 cfs @ 1.97 fps)

Pond 51P: CB-T



Summary for Pond 53P: CB-U

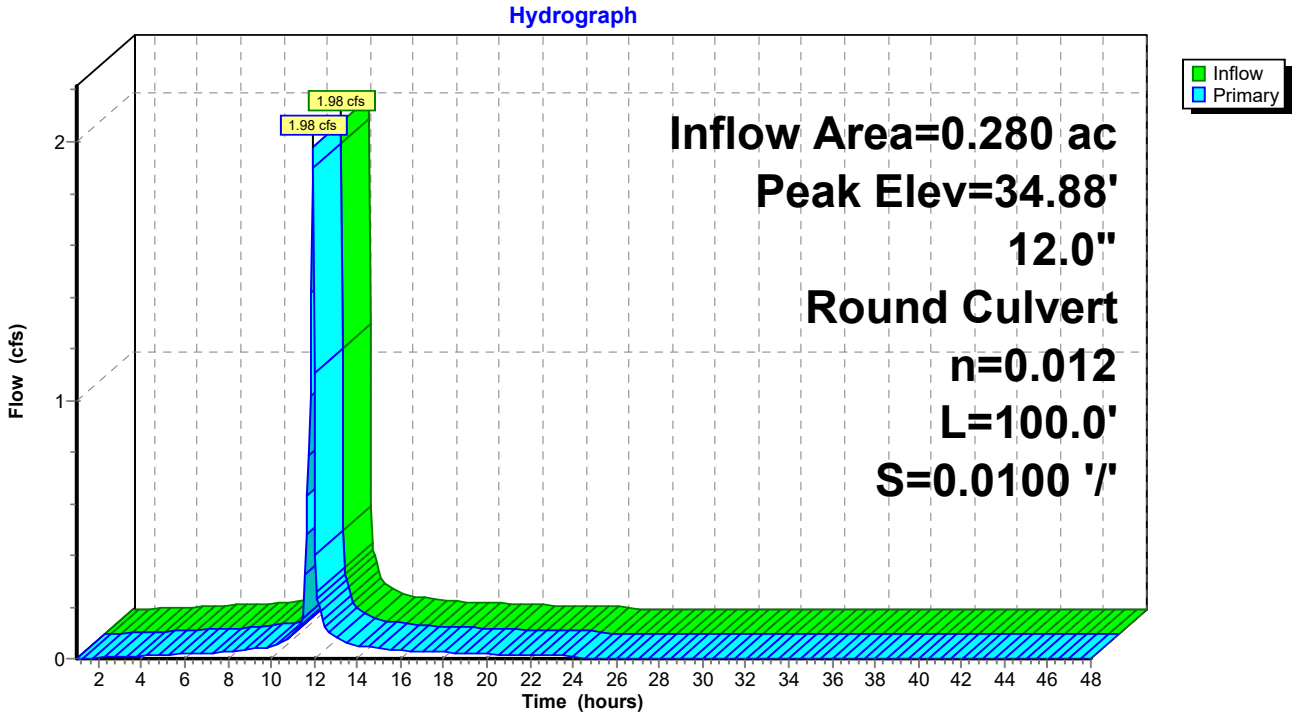
Inflow Area = 0.280 ac, 85.71% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 1.98 cfs @ 11.93 hrs, Volume= 0.101 af
Outflow = 1.98 cfs @ 11.93 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.0 min
Primary = 1.98 cfs @ 11.93 hrs, Volume= 0.101 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 34.88' @ 11.93 hrs
Flood Elev= 36.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.80'	**12.0" Round Culvert** L= 100.0' Ke= 1.200 Inlet / Outlet Invert= 33.80' / 32.80' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.88 cfs @ 11.93 hrs HW=34.83' (Free Discharge)
1=Culvert (Inlet Controls 1.88 cfs @ 2.39 fps)

Pond 53P: CB-U



Summary for Pond 54P: DA-9

Inflow Area = 1.450 ac, 84.83% Impervious, Inflow Depth = 3.69" for 100 event
Inflow = 5.70 cfs @ 11.94 hrs, Volume= 0.446 af
Outflow = 0.10 cfs @ 6.95 hrs, Volume= 0.373 af, Atten= 98%, Lag= 0.0 min
Discarded = 0.10 cfs @ 6.95 hrs, Volume= 0.373 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 31.87' @ 19.25 hrs Surf.Area= 0.120 ac Storage= 0.284 af

Plug-Flow detention time= 883.2 min calculated for 0.372 af (84% of inflow)
Center-of-Mass det. time= 806.3 min (1,564.5 - 758.2)

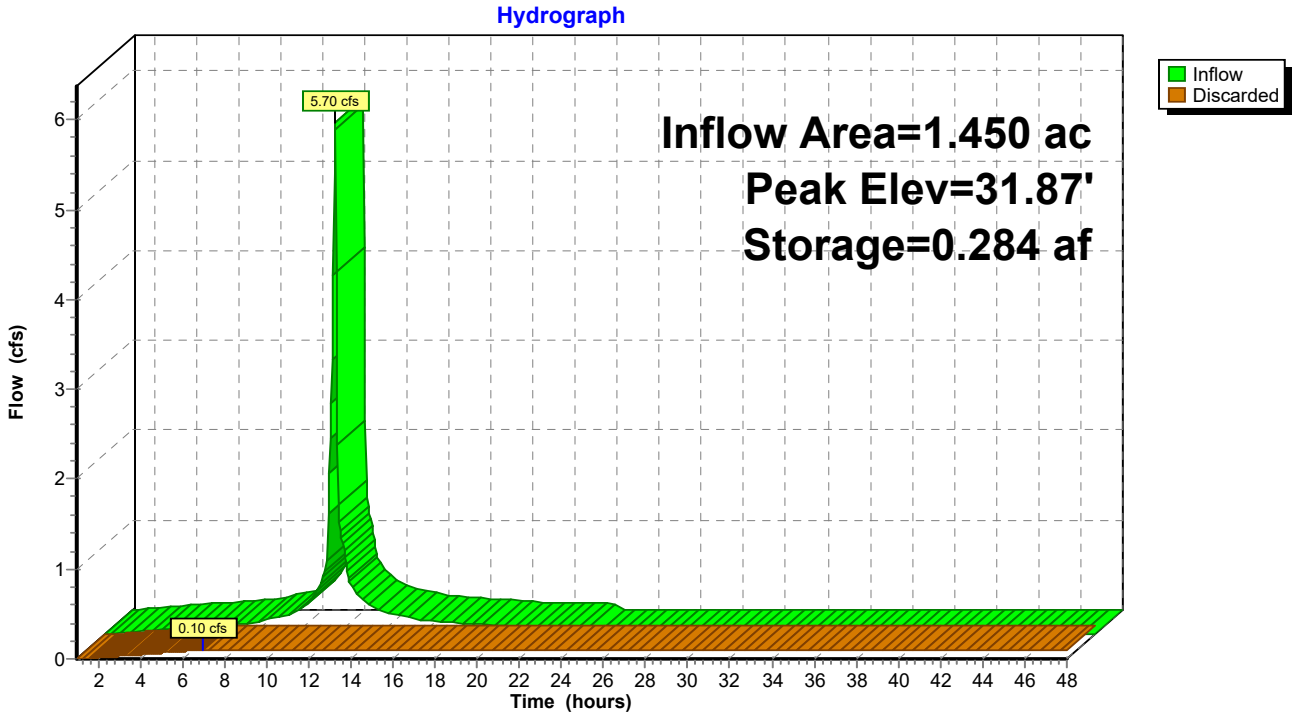
Volume	Invert	Avail.Storage	Storage Description
#1	29.50'	0.300 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
29.50	0.120	0.000	0.000
32.00	0.120	0.300	0.300

Device	Routing	Invert	Outlet Devices
#1	Discarded	29.50'	**0.850 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.10 cfs @ 6.95 hrs HW=29.53' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Pond 54P: DA-9



Summary for Pond 56P: (new Pond)

[57] Hint: Peaked at 36.48' (Flood elevation advised)

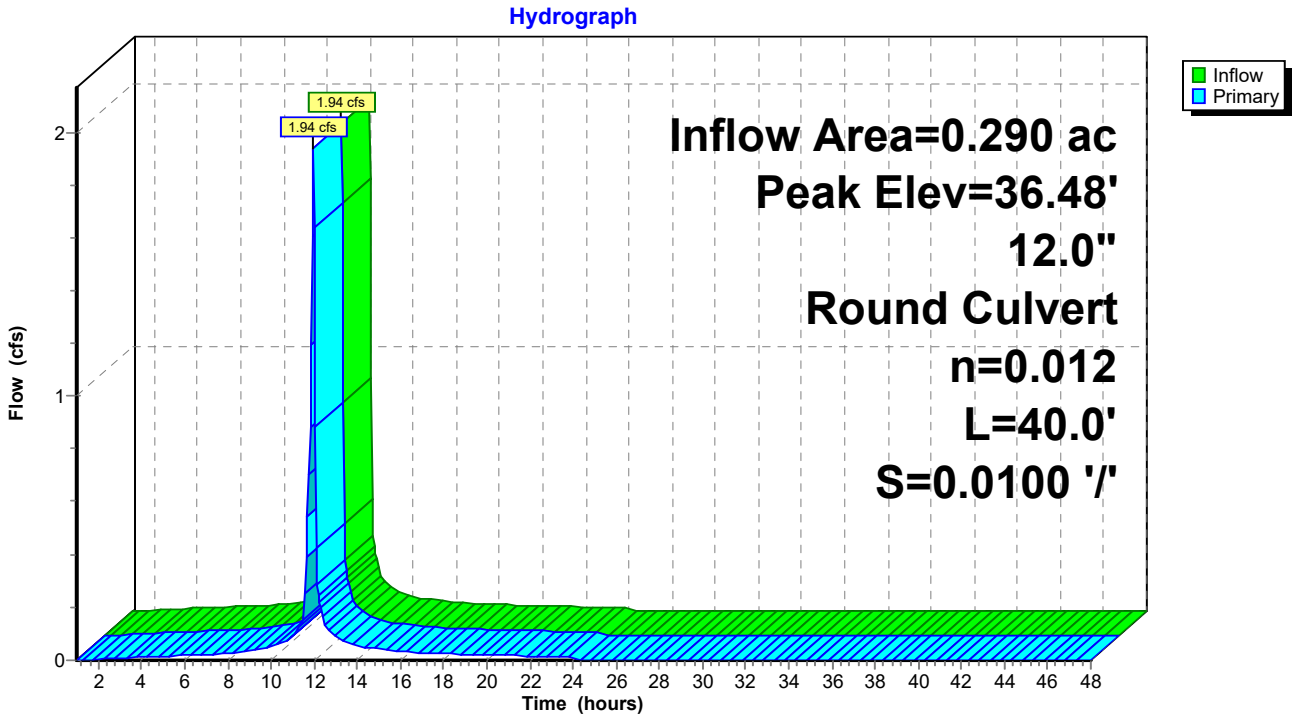
Inflow Area = 0.290 ac, 86.21% Impervious, Inflow Depth = 4.35" for 100 event
Inflow = 1.94 cfs @ 11.95 hrs, Volume= 0.105 af
Outflow = 1.94 cfs @ 11.95 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.0 min
Primary = 1.94 cfs @ 11.95 hrs, Volume= 0.105 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 36.48' @ 11.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	35.41'	**12.0" Round Culvert** L= 40.0' Ke= 1.200 Inlet / Outlet Invert= 35.41' / 35.01' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.93 cfs @ 11.95 hrs HW=36.47' (Free Discharge)
1=Culvert (Inlet Controls 1.93 cfs @ 2.46 fps)

Pond 56P: (new Pond)



Curve (1) Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparral, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparral, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	71	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent.)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	25	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		77	86	91	94

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

CURVE NUMBERS FOR PERVIOUS AREAS

Figure C-3 (1 of 2)

Curve (1) Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
AGRICULTURAL COVERS (Continued)					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Evergreen (Citrus, avocados, etc.)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
Pasture, Dryland (Annual grasses)	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Pasture, Irrigated (Legumes and perennial grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor	72	81	88	91
	Good	67	78	85	89
Small grain (Wheat, oats, barley, etc.)	Poor	65	76	84	88
	Good	63	75	83	87

Notes:

1. All curve numbers are for Antecedent Moisture Condition (AMC) II.
2. Quality of cover definitions:

   Poor-Heavily grazed, regularly burned areas, or areas of high burn potential. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.

   Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.

   Good-Heavy or dense cover with more than 75 percent of the ground surface protected.
3. See Figure C-2 for definition of cover types.

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

CURVE NUMBERS FOR PERVIOUS AREAS

Figure C-3 (2 of 2)

Hydraulic Analysis Report

Project Data

Project Title: **84" RCP E-01 SD**

Designer:

Project Date: Wednesday, November 14, 2018

Project Units: U.S. Customary Units

Notes:

Channel Analysis: Channel Analysis

Notes:

Input Parameters

Channel Type: Circular

Pipe Diameter: 7.0000 ft

Longitudinal Slope: 0.0050 ft/ft

Manning's n: 0.0120

Flow: 424.0000 cfs

Result Parameters

Depth: 5.0328 ft

Area of Flow: 29.6185 ft^2

Wetted Perimeter: 14.1688 ft

Hydraulic Radius: 2.0904 ft

Average Velocity: 14.3154 ft/s

Top Width: 6.2930 ft

Froude Number: 1.1628

Critical Depth: 5.4209 ft

Critical Velocity: 13.2586 ft/s

Critical Slope: 0.0042 ft/ft

Critical Top Width: 5.85 ft

Calculated Max Shear Stress: 1.5702 lb/ft^2

Calculated Avg Shear Stress: 0.6522 lb/ft^2

Hydraulic Analysis Report

Project Data

Project Title: **DOUBLE 3'X7' RCB**

Designer:

Project Date: Wednesday, November 14, 2018

Project Units: U.S. Customary Units

Notes:

Channel Analysis: Channel Analysis

Notes:

Input Parameters

Channel Type: Rectangular

Channel Width: 7.0000 ft

Longitudinal Slope: 0.0050 ft/ft

Manning's n: 0.0120

Depth: 2.9000 ft

Result Parameters

Flow: 241.7367 cfs **X 2 FOR DOUBLE FLOW = 483 CFS**

Area of Flow: 20.3000 ft^2

Wetted Perimeter: 12.8000 ft

Hydraulic Radius: 1.5859 ft

Average Velocity: 11.9082 ft/s

Top Width: 7.0000 ft

Froude Number: 1.2323

Critical Depth: 3.3333 ft

Critical Velocity: 10.3602 ft/s

Critical Slope: 0.0034 ft/ft

Critical Top Width: 7.00 ft

Calculated Max Shear Stress: 0.9048 lb/ft^2

Calculated Avg Shear Stress: 0.4948 lb/ft^2

Hydraulic Analysis Report

Project Data

Project Title: STORM DRAIN LINE E-01A

Designer:

Project Date: Wednesday, November 14, 2018

Project Units: U.S. Customary Units

Notes:

Channel Analysis: Channel Analysis

Notes:

Input Parameters

Channel Type: Circular

Pipe Diameter: 4.0000 ft

Longitudinal Slope: 0.0100 ft/ft

Manning's n: 0.0120

Flow: 119.0000 cfs

Result Parameters

Depth: 2.6200 ft

Area of Flow: 8.7229 ft^2

Wetted Perimeter: 7.5440 ft

Hydraulic Radius: 1.1563 ft

Average Velocity: 13.6423 ft/s

Top Width: 3.8029 ft

Froude Number: 1.5874

Critical Depth: 3.2852 ft

Critical Velocity: 10.7750 ft/s

Critical Slope: 0.0058 ft/ft

Critical Top Width: 3.06 ft

Calculated Max Shear Stress: 1.6349 lb/ft^2

Calculated Avg Shear Stress: 0.7215 lb/ft^2

NOAA Atlas 14, Volume 6, Version 2
Location name: Adelanto, California, USA*
Latitude: 34.5067°, Longitude: -117.3995°
Elevation: 3129.85 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.080** (0.066-0.098)	**0.114** (0.094-0.140)	**0.160** (0.131-0.196)	**0.197** (0.161-0.244)	**0.249** (0.197-0.319)	**0.290** (0.224-0.378)	**0.331** (0.250-0.443)	**0.375** (0.275-0.516)	**0.434** (0.306-0.623)	**0.481** (0.327-0.714)
10-min	**0.114** (0.095-0.140)	**0.163** (0.135-0.200)	**0.229** (0.188-0.281)	**0.283** (0.231-0.350)	**0.357** (0.282-0.457)	**0.415** (0.321-0.542)	**0.475** (0.358-0.635)	**0.537** (0.394-0.739)	**0.622** (0.438-0.893)	**0.689** (0.469-1.02)
15-min	**0.138** (0.114-0.169)	**0.198** (0.163-0.242)	**0.277** (0.228-0.340)	**0.342** (0.279-0.423)	**0.432** (0.341-0.552)	**0.502** (0.388-0.656)	**0.574** (0.433-0.768)	**0.649** (0.477-0.894)	**0.753** (0.530-1.08)	**0.833** (0.567-1.24)
30-min	**0.203** (0.167-0.248)	**0.289** (0.239-0.354)	**0.405** (0.333-0.497)	**0.500** (0.408-0.619)	**0.632** (0.499-0.809)	**0.735** (0.568-0.960)	**0.841** (0.634-1.13)	**0.951** (0.698-1.31)	**1.10** (0.776-1.58)	**1.22** (0.830-1.81)
60-min	**0.264** (0.218-0.322)	**0.377** (0.311-0.461)	**0.527** (0.434-0.647)	**0.651** (0.532-0.806)	**0.823** (0.650-1.05)	**0.956** (0.740-1.25)	**1.09** (0.826-1.46)	**1.24** (0.908-1.70)	**1.43** (1.01-2.06)	**1.59** (1.08-2.36)
2-hr	**0.369** (0.305-0.451)	**0.500** (0.413-0.612)	**0.679** (0.559-0.834)	**0.831** (0.678-1.03)	**1.05** (0.826-1.34)	**1.22** (0.942-1.59)	**1.40** (1.06-1.87)	**1.59** (1.17-2.19)	**1.85** (1.31-2.66)	**2.07** (1.41-3.07)
3-hr	**0.458** (0.378-0.560)	**0.611** (0.504-0.748)	**0.823** (0.677-1.01)	**1.00** (0.820-1.24)	**1.26** (0.997-1.62)	**1.47** (1.14-1.92)	**1.70** (1.28-2.27)	**1.93** (1.42-2.66)	**2.27** (1.60-3.26)	**2.54** (1.73-3.77)
6-hr	**0.623** (0.514-0.761)	**0.824** (0.680-1.01)	**1.11** (0.911-1.36)	**1.35** (1.10-1.67)	**1.71** (1.35-2.18)	**2.00** (1.54-2.61)	**2.31** (1.74-3.09)	**2.65** (1.94-3.64)	**3.13** (2.21-4.49)	**3.53** (2.40-5.24)
12-hr	**0.776** (0.641-0.949)	**1.06** (0.877-1.30)	**1.47** (1.21-1.80)	**1.81** (1.48-2.24)	**2.31** (1.83-2.96)	**2.73** (2.11-3.56)	**3.17** (2.39-4.24)	**3.64** (2.68-5.02)	**4.33** (3.05-6.22)	**4.90** (3.33-7.28)
24-hr	**1.05** (0.929-1.21)	**1.49** (1.32-1.72)	**2.11** (1.87-2.44)	**2.64** (2.32-3.08)	**3.41** (2.89-4.11)	**4.04** (3.35-4.96)	**4.70** (3.81-5.93)	**5.43** (4.28-7.03)	**6.47** (4.89-8.74)	**7.33** (5.35-10.2)
2-day	**1.13** (1.00-1.30)	**1.61** (1.43-1.86)	**2.29** (2.02-2.64)	**2.87** (2.51-3.34)	**3.71** (3.15-4.47)	**4.40** (3.65-5.41)	**5.14** (4.17-6.48)	**5.95** (4.69-7.71)	**7.12** (5.38-9.61)	**8.09** (5.91-11.3)
3-day	**1.21** (1.07-1.39)	**1.72** (1.52-1.98)	**2.44** (2.15-2.81)	**3.05** (2.68-3.56)	**3.95** (3.35-4.76)	**4.69** (3.89-5.76)	**5.48** (4.44-6.90)	**6.35** (5.00-8.22)	**7.60** (5.75-10.3)	**8.65** (6.32-12.1)
4-day	**1.30** (1.15-1.49)	**1.84** (1.63-2.12)	**2.60** (2.30-3.01)	**3.26** (2.86-3.80)	**4.21** (3.57-5.07)	**5.00** (4.15-6.14)	**5.84** (4.73-7.36)	**6.76** (5.32-8.75)	**8.09** (6.12-10.9)	**9.20** (6.72-12.9)
7-day	**1.39** (1.24-1.60)	**1.96** (1.74-2.26)	**2.77** (2.44-3.20)	**3.46** (3.03-4.03)	**4.45** (3.77-5.36)	**5.27** (4.37-6.47)	**6.13** (4.97-7.72)	**7.07** (5.57-9.15)	**8.41** (6.36-11.4)	**9.52** (6.95-13.3)
10-day	**1.48** (1.31-1.71)	**2.08** (1.84-2.40)	**2.92** (2.58-3.38)	**3.65** (3.20-4.25)	**4.70** (3.98-5.66)	**5.55** (4.60-6.82)	**6.45** (5.22-8.12)	**7.42** (5.84-9.61)	**8.81** (6.66-11.9)	**9.94** (7.26-13.9)
20-day	**1.76** (1.56-2.02)	**2.47** (2.19-2.85)	**3.48** (3.07-4.02)	**4.35** (3.81-5.07)	**5.61** (4.75-6.75)	**6.63** (5.51-8.15)	**7.72** (6.25-9.73)	**8.89** (7.00-11.5)	**10.5** (7.96-14.2)	**11.9** (8.66-16.6)
30-day	**2.03** (1.80-2.34)	**2.84** (2.52-3.27)	**4.00** (3.53-4.62)	**5.01** (4.39-5.84)	**6.48** (5.49-7.80)	**7.67** (6.37-9.44)	**8.94** (7.24-11.3)	**10.3** (8.11-13.3)	**12.2** (9.23-16.5)	**13.7** (10.0-19.2)
45-day	**2.37** (2.10-2.73)	**3.30** (2.92-3.80)	**4.62** (4.08-5.34)	**5.79** (5.07-6.75)	**7.51** (6.36-9.04)	**8.92** (7.40-11.0)	**10.4** (8.43-13.1)	**12.0** (9.46-15.6)	**14.3** (10.8-19.3)	**16.1** (11.7-22.5)
60-day	**2.65** (2.35-3.05)	**3.64** (3.23-4.20)	**5.09** (4.50-5.88)	**6.37** (5.58-7.42)	**8.26** (7.00-9.95)	**9.83** (8.16-12.1)	**11.5** (9.32-14.5)	**13.3** (10.5-17.2)	**15.8** (12.0-21.3)	**17.8** (13.0-24.9)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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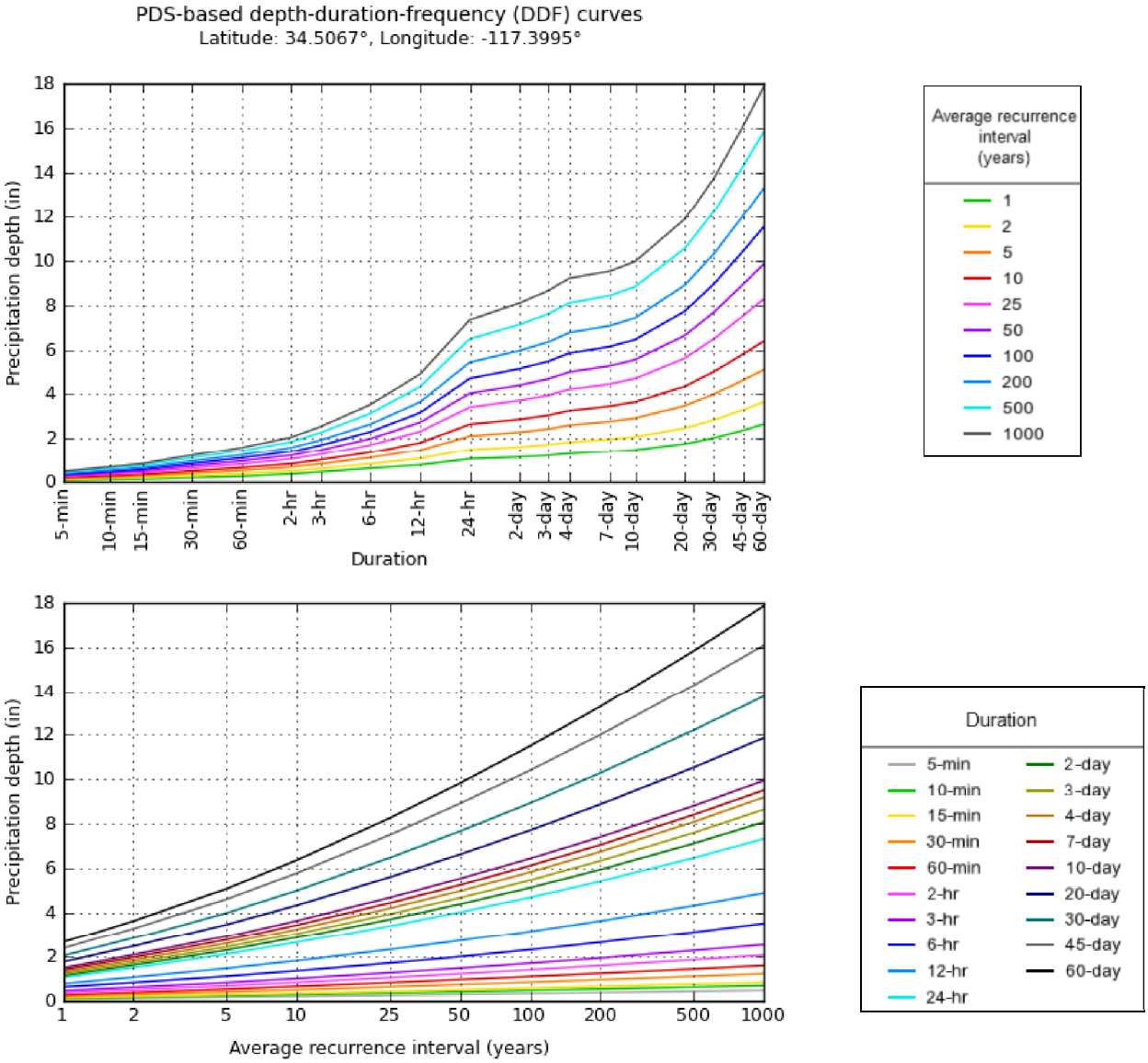
PF graphical



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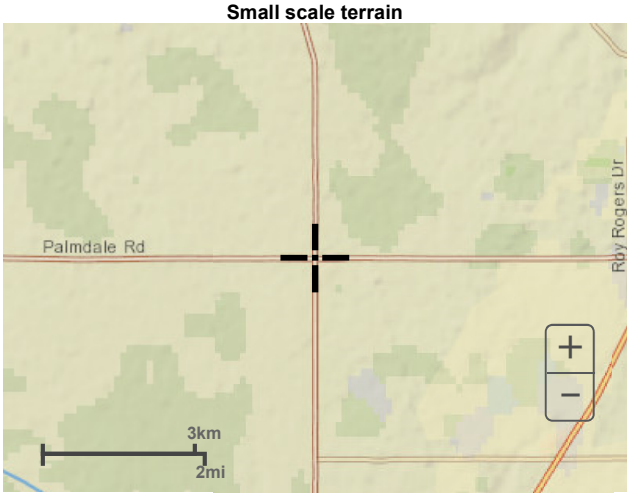
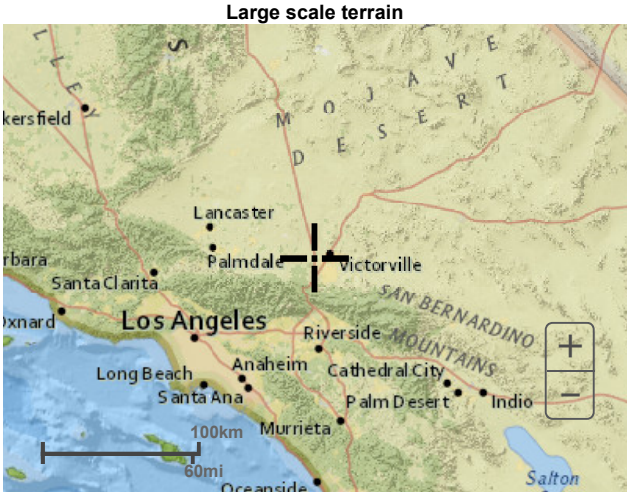
Maps & aerials

Small scale terrain



Large scale terrain



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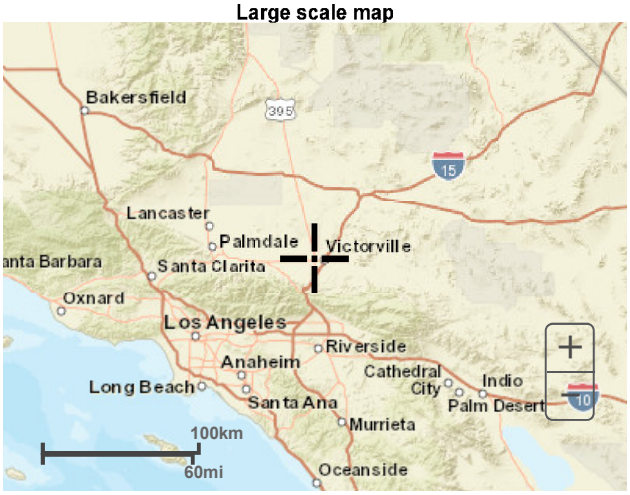

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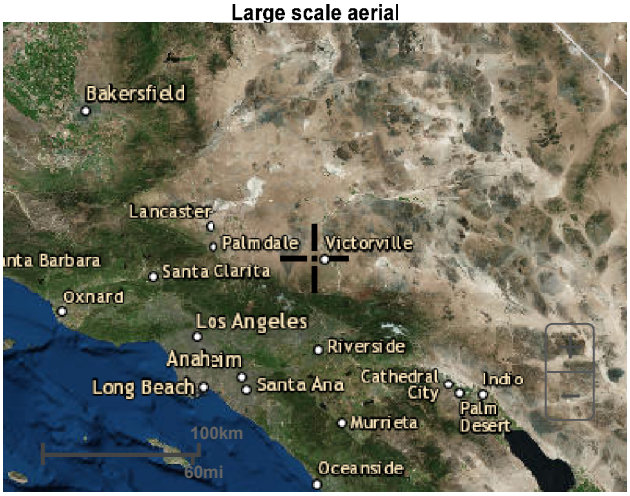

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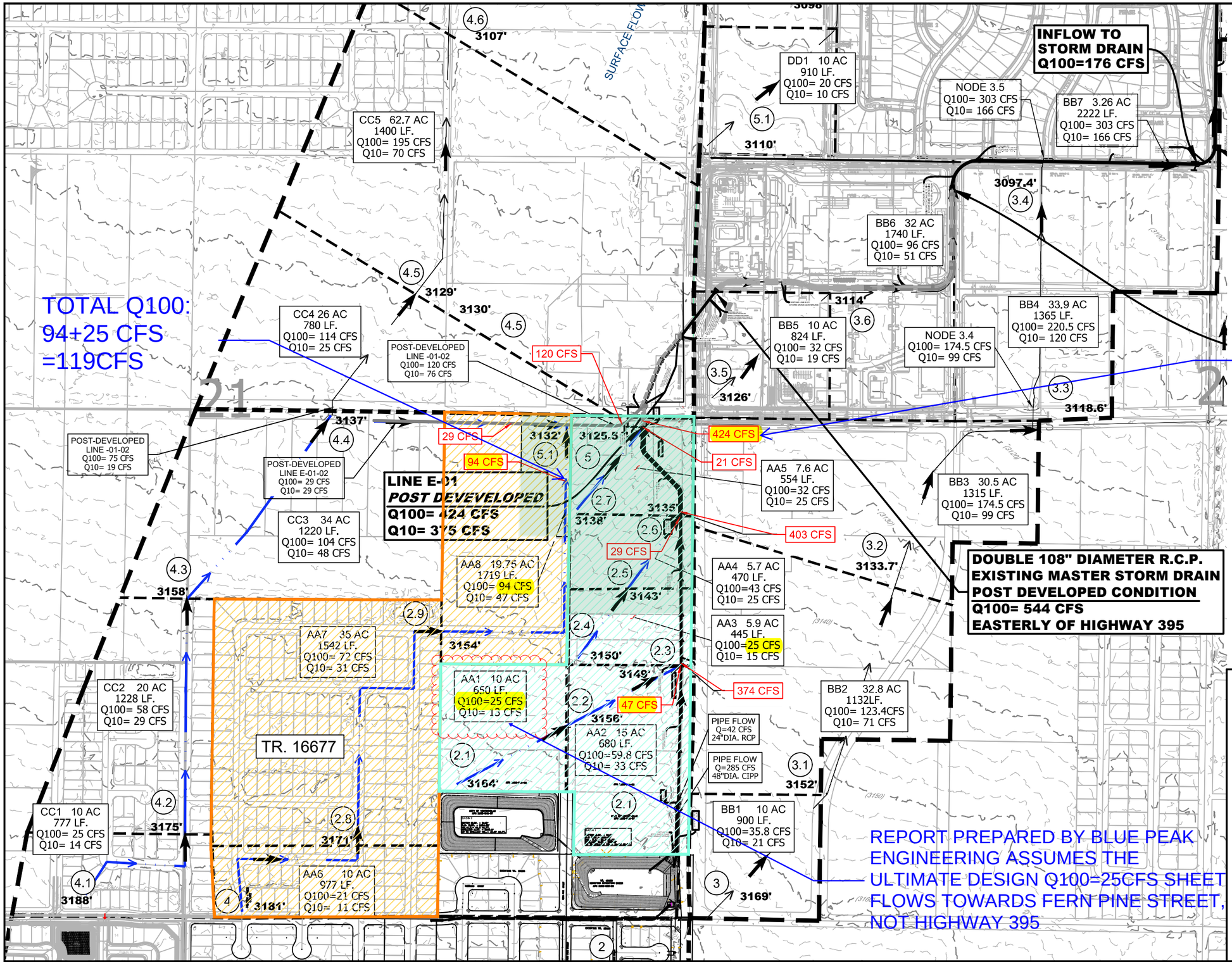

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HYDROLOGY STUDY
FOR
TRACT 16677

bordered by Dos Palmas Road on the south, and
Mesa View Road on the west;
west of U.S. Highway 395,
south of Palmdale Road (Route 18)

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June 23, 2005

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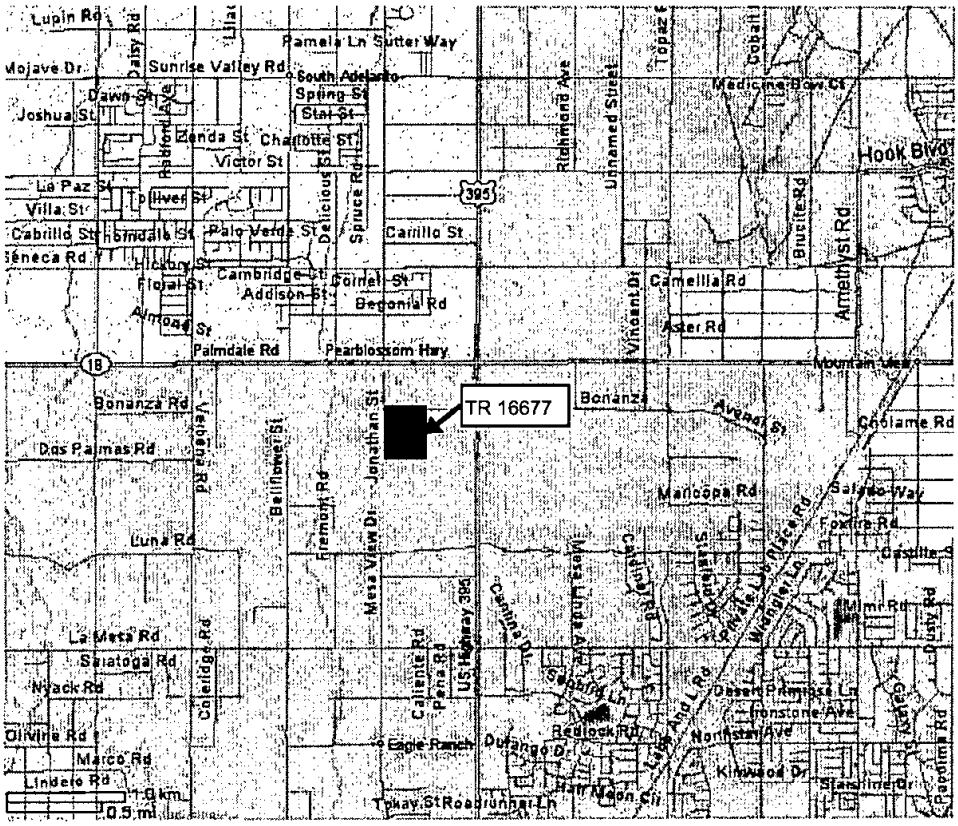


Figure 1: Vicinity Map

1 Introduction

Tract 16677 is located in Victorville, bordered by Dos Palmas Road on the south, and Mesa View Road on the west; west of U.S. Highway 395, south of Palmdale Road (Route 18). The existing drainage patter is generally from the south to the north. There is no well-defined drainage course through the site. The average slope is about 1.5%. The site is about 50.3 acres in size and will contain 215 single-family lots.

46.9 acres drain toward the north-east corner of the site. The rest, (3.4 acres) toward the north-west corner. Since the runoff from this 3.4-acre portion is small, a drywell is proposed at the north-west corner of the tract, in Mesa View Street, that will pick up the nuisance water, and low-intensity storm runoff.

The majority of the runoff concentrates and flows easterly on Far Hills Street. The owner of the property to the east has accepted this runoff, which in the future will be carried on the street further east and eventually discharged into the master-plan drainage facility E-01 (See Appendix F). This will be an earthen channel, running south to north, ~600 feet east of the tract boundary.

In the interim, the flow is captured by catch basins in Brynwood Street and Far Hills Street and conveyed into a detention basin in the north-east corner of the tract. The basin is discharged through a reinforced concrete box at the north-east corner of the basin, into an existing 20 foot wide storm drain & sewer easement. This easement, running south to north, approximately follows the historic drainage route.

When the property east of the project site is developed, the storm drain system and the detention basin will be abandoned.

The purpose of this study is to determine the pre- and post-development runoff from the site; and to verify that the proposed design satisfies the required storm protection criteria.

2 Methodology

The Rational Method is used for determining the peak runoff values for the pre-developed conditions, because only peak values are needed (no hydrographs).

The Rational Method is used also for calculating the time of concentration values for the post-developed conditions. These are necessary for determining the lag for the unit-hydrograph method. Within the site a stream line is selected that extends from the point of concentration at the downstream end of the watershed (at the detention basin) to the most hydraulically remote point. Only the areas contributing to this stream line are analyzed by the Rational Method, because this stream produces the time of concentration that is representative to the whole area.

The Unit-Hydrograph method is used for creating the runoff hydrographs for the post-developed conditions. These hydrographs then routed through the proposed basin.

2-, 10-, 25-, and 100-year storms are analyzed and routed through the proposed detention basin to ensure that the outflow from the basin will not be greater than 90% of the pre-development peak flow. Pre-development flows are calculated according to the County's criteria:

a) 10-year peak flow rate shall be calculated using 5-year rainfall,

Appendix E

Detention Basin Routing Calculations

E.1 100-year Runoff

Time [min]	O U T F L O W Inflow [cfs]	Low-Level [cfs]	Weir [cfs]	Total [cfs]	Depth [Ft]	W.S. Elev	Storage [Ac-Ft]
4.00	0.01	0.00	0.00	0.00	0.00	3147.50	0.00
8.00	0.04	0.00	0.00	0.00	0.00	3147.50	0.00
12.00	0.10	0.00	0.00	0.00	0.01	3147.51	0.00
16.00	0.24	0.00	0.00	0.00	0.03	3147.53	0.00
20.00	0.36	0.00	0.00	0.00	0.07	3147.57	0.00
24.00	0.44	0.00	0.00	0.00	0.11	3147.61	0.01
28.00	0.49	0.00	0.00	0.00	0.17	3147.67	0.01
32.00	0.53	0.00	0.00	0.00	0.23	3147.73	0.01
36.00	0.57	0.00	0.00	0.00	0.30	3147.80	0.01
40.00	0.59	0.00	0.00	0.00	0.37	3147.87	0.02
44.00	0.62	0.00	0.00	0.00	0.44	3147.94	0.02
48.00	0.63	0.00	0.00	0.00	0.50	3148.00	0.02
52.00	0.65	0.00	0.00	0.00	0.52	3148.02	0.03
56.00	0.66	0.00	0.00	0.00	0.54	3148.04	0.03
60.00	0.68	0.00	0.00	0.00	0.56	3148.06	0.03
64.00	0.69	0.00	0.00	0.00	0.57	3148.07	0.04
68.00	0.70	0.00	0.00	0.00	0.59	3148.09	0.04
72.00	0.71	0.00	0.00	0.00	0.61	3148.11	0.05
76.00	0.72	0.00	0.00	0.00	0.63	3148.13	0.05
80.00	0.73	0.00	0.00	0.00	0.65	3148.15	0.05
84.00	0.73	0.00	0.00	0.00	0.67	3148.17	0.06
88.00	0.74	0.00	0.00	0.00	0.69	3148.19	0.06
92.00	0.75	0.00	0.00	0.00	0.71	3148.21	0.07
96.00	0.75	0.00	0.00	0.00	0.73	3148.23	0.07
100.00	0.76	0.00	0.00	0.00	0.75	3148.25	0.07
104.00	0.76	0.00	0.00	0.00	0.77	3148.27	0.08
108.00	0.76	0.00	0.00	0.00	0.79	3148.29	0.08
112.00	0.77	0.00	0.00	0.00	0.81	3148.31	0.09
116.00	0.77	0.00	0.00	0.00	0.84	3148.34	0.09
120.00	0.78	0.00	0.00	0.00	0.86	3148.36	0.10
124.00	0.78	0.00	0.00	0.00	0.88	3148.38	0.10
128.00	0.78	0.00	0.00	0.00	0.90	3148.40	0.10
132.00	0.79	0.00	0.00	0.00	0.92	3148.42	0.11
136.00	0.79	0.00	0.00	0.00	0.94	3148.44	0.11
140.00	0.79	0.00	0.00	0.00	0.96	3148.46	0.12
144.00	0.80	0.00	0.00	0.00	0.98	3148.48	0.12
148.00	0.80	0.00	0.00	0.00	1.01	3148.51	0.13
152.00	0.80	0.00	0.00	0.00	1.03	3148.53	0.13

156.00	0.80	0.00	0.00	0.00	1.05	3148.55 0.13
160.00	0.81	0.00	0.00	0.00	1.07	3148.57 0.14
164.00	0.81	0.00	0.00	0.00	1.09	3148.59 0.14
168.00	0.81	0.00	0.00	0.00	1.11	3148.61 0.15
172.00	0.81	0.00	0.00	0.00	1.14	3148.64 0.15
176.00	0.82	0.00	0.00	0.00	1.16	3148.66 0.16
180.00	0.82	0.00	0.00	0.00	1.18	3148.68 0.16
184.00	0.82	0.00	0.00	0.00	1.20	3148.70 0.17
188.00	0.82	0.00	0.00	0.00	1.23	3148.73 0.17
192.00	0.83	0.00	0.00	0.00	1.25	3148.75 0.18
196.00	0.83	0.00	0.00	0.00	1.27	3148.77 0.18
200.00	0.83	0.00	0.00	0.00	1.29	3148.79 0.18
204.00	0.83	0.00	0.00	0.00	1.32	3148.82 0.19
208.00	0.84	0.00	0.00	0.00	1.34	3148.84 0.19
212.00	0.84	0.00	0.00	0.00	1.36	3148.86 0.20
216.00	0.84	0.00	0.00	0.00	1.38	3148.88 0.20
220.00	0.85	0.00	0.00	0.00	1.41	3148.91 0.21
224.00	0.85	0.00	0.00	0.00	1.43	3148.93 0.21
228.00	0.85	0.00	0.00	0.00	1.45	3148.95 0.22
232.00	0.85	0.00	0.00	0.00	1.48	3148.98 0.22
236.00	0.86	0.00	0.00	0.00	1.50	3149.00 0.23
240.00	0.86	0.00	0.00	0.00	1.52	3149.02 0.23
244.00	0.86	0.00	0.00	0.00	1.55	3149.05 0.24
248.00	0.87	0.00	0.00	0.00	1.57	3149.07 0.24
252.00	0.87	0.00	0.00	0.00	1.59	3149.09 0.25
256.00	0.87	0.00	0.00	0.00	1.62	3149.12 0.25
260.00	0.87	0.00	0.00	0.00	1.64	3149.14 0.25
264.00	0.88	0.00	0.00	0.00	1.66	3149.16 0.26
268.00	0.88	0.00	0.00	0.00	1.69	3149.19 0.26
272.00	0.88	0.00	0.00	0.00	1.71	3149.21 0.27
276.00	0.89	0.00	0.00	0.00	1.74	3149.24 0.27
280.00	0.89	0.00	0.00	0.00	1.76	3149.26 0.28
284.00	0.89	0.00	0.00	0.00	1.78	3149.28 0.28
288.00	0.90	0.00	0.00	0.00	1.81	3149.31 0.29
292.00	0.90	0.00	0.00	0.00	1.83	3149.33 0.29
296.00	0.90	0.00	0.00	0.00	1.86	3149.36 0.30
300.00	0.91	0.00	0.00	0.00	1.88	3149.38 0.30
304.00	0.91	0.00	0.00	0.00	1.91	3149.41 0.31
308.00	0.91	0.00	0.00	0.00	1.93	3149.43 0.31
312.00	0.92	0.00	0.00	0.00	1.96	3149.46 0.32
316.00	0.92	0.00	0.00	0.00	1.98	3149.48 0.32
320.00	0.92	0.00	0.00	0.00	2.01	3149.51 0.33
324.00	0.93	0.00	0.00	0.00	2.03	3149.53 0.33
328.00	0.93	0.00	0.00	0.00	2.06	3149.56 0.34
332.00	0.93	0.00	0.00	0.00	2.08	3149.58 0.34
336.00	0.94	0.00	0.00	0.00	2.11	3149.61 0.35
340.00	0.94	0.00	0.00	0.00	2.13	3149.63 0.35
344.00	0.94	0.00	0.00	0.00	2.16	3149.66 0.36
348.00	0.95	0.00	0.00	0.00	2.18	3149.68 0.36
352.00	0.95	0.00	0.00	0.00	2.21	3149.71 0.37
356.00	0.96	0.00	0.00	0.00	2.23	3149.73 0.38
360.00	0.96	0.00	0.00	0.00	2.26	3149.76 0.38
364.00	0.96	0.00	0.00	0.00	2.29	3149.79 0.39
368.00	0.97	0.00	0.00	0.00	2.31	3149.81 0.39
372.00	0.97	0.00	0.00	0.00	2.34	3149.84 0.40
376.00	0.98	0.00	0.00	0.00	2.37	3149.87 0.40
380.00	0.98	0.00	0.00	0.00	2.39	3149.89 0.41
384.00	0.98	0.00	0.00	0.00	2.42	3149.92 0.41
388.00	0.99	0.00	0.00	0.00	2.45	3149.95 0.42
392.00	0.99	0.00	0.00	0.00	2.47	3149.97 0.42
396.00	1.00	0.00	0.00	0.00	2.50	3150.00 0.43
400.00	1.00	0.00	0.00	0.00	2.51	3150.01 0.43
404.00	1.00	0.00	0.00	0.00	2.53	3150.03 0.44
408.00	1.01	0.00	0.00	0.00	2.54	3150.04 0.45
412.00	1.01	0.00	0.00	0.00	2.56	3150.06 0.45
416.00	1.02	0.00	0.00	0.00	2.57	3150.07 0.46
420.00	1.02	0.00	0.00	0.00	2.59	3150.09 0.46
424.00	1.03	0.00	0.00	0.00	2.60	3150.10 0.47
428.00	1.03	0.00	0.00	0.00	2.61	3150.11 0.47
432.00	1.04	0.00	0.00	0.00	2.63	3150.13 0.48
436.00	1.04	0.00	0.00	0.00	2.64	3150.14 0.49
440.00	1.05	0.00	0.00	0.00	2.66	3150.16 0.49
444.00	1.05	0.00	0.00	0.00	2.67	3150.17 0.50
448.00	1.06	0.00	0.00	0.00	2.69	3150.19 0.50

452.00	1.06	0.00	0.00	0.00	2.70	3150.20	0.51	600.00	1.30	0.00	0.00	0.00	3.32	3150.82	0.75
456.00	1.07	0.00	0.00	0.00	2.72	3150.22	0.51	604.00	1.31	0.00	0.00	0.00	3.33	3150.83	0.75
460.00	1.07	0.00	0.00	0.00	2.73	3150.23	0.52	608.00	1.32	0.00	0.00	0.00	3.35	3150.85	0.76
464.00	1.08	0.00	0.00	0.00	2.75	3150.25	0.53	612.00	1.33	0.00	0.00	0.00	3.37	3150.87	0.77
468.00	1.08	0.00	0.00	0.00	2.76	3150.26	0.53	616.00	1.34	0.00	0.00	0.00	3.39	3150.89	0.78
472.00	1.09	0.00	0.00	0.00	2.78	3150.28	0.54	620.00	1.34	0.00	0.00	0.00	3.41	3150.91	0.78
476.00	1.09	0.00	0.00	0.00	2.79	3150.29	0.54	624.00	1.35	0.00	0.00	0.00	3.43	3150.93	0.79
480.00	1.10	0.00	0.00	0.00	2.81	3150.31	0.55	628.00	1.36	0.00	0.00	0.00	3.45	3150.95	0.80
484.00	1.10	0.00	0.00	0.00	2.83	3150.33	0.56	632.00	1.37	0.00	0.00	0.00	3.47	3150.97	0.81
488.00	1.11	0.00	0.00	0.00	2.84	3150.34	0.56	636.00	1.38	0.00	0.00	0.00	3.49	3150.99	0.81
492.00	1.11	0.00	0.00	0.00	2.86	3150.36	0.57	640.00	1.39	0.00	0.00	0.00	3.51	3151.01	0.82
496.00	1.12	0.00	0.00	0.00	2.87	3150.37	0.57	644.00	1.40	0.00	0.00	0.00	3.53	3151.03	0.83
500.00	1.13	0.00	0.00	0.00	2.89	3150.39	0.58	648.00	1.41	0.00	0.00	0.00	3.55	3151.05	0.84
504.00	1.13	0.00	0.00	0.00	2.90	3150.40	0.59	652.00	1.42	0.00	0.00	0.00	3.57	3151.07	0.84
508.00	1.14	0.00	0.00	0.00	2.92	3150.42	0.59	656.00	1.43	0.00	0.00	0.00	3.59	3151.09	0.85
512.00	1.14	0.00	0.00	0.00	2.94	3150.44	0.60	660.00	1.45	0.02	0.00	0.02	3.61	3151.11	0.86
516.00	1.15	0.00	0.00	0.00	2.95	3150.45	0.61	664.00	1.46	0.11	0.00	0.11	3.63	3151.13	0.87
520.00	1.16	0.00	0.00	0.00	2.97	3150.47	0.61	668.00	1.47	0.18	0.00	0.18	3.64	3151.14	0.87
524.00	1.16	0.00	0.00	0.00	2.99	3150.49	0.62	672.00	1.48	0.26	0.00	0.26	3.66	3151.16	0.88
528.00	1.17	0.00	0.00	0.00	3.00	3150.50	0.62	676.00	1.49	0.33	0.00	0.33	3.68	3151.18	0.89
532.00	1.17	0.00	0.00	0.00	3.02	3150.52	0.63	680.00	1.50	0.40	0.00	0.40	3.69	3151.19	0.89
536.00	1.18	0.00	0.00	0.00	3.04	3150.54	0.64	684.00	1.52	0.46	0.00	0.46	3.71	3151.21	0.90
540.00	1.19	0.00	0.00	0.00	3.05	3150.55	0.64	688.00	1.53	0.54	0.00	0.54	3.72	3151.22	0.91
544.00	1.19	0.00	0.00	0.00	3.07	3150.57	0.65	692.00	1.54	0.65	0.00	0.65	3.74	3151.24	0.91
548.00	1.20	0.00	0.00	0.00	3.09	3150.59	0.66	696.00	1.56	0.75	0.00	0.75	3.75	3151.25	0.92
552.00	1.21	0.00	0.00	0.00	3.10	3150.60	0.66	700.00	1.57	0.84	0.00	0.84	3.76	3151.26	0.92
556.00	1.22	0.00	0.00	0.00	3.12	3150.62	0.67	704.00	1.58	0.92	0.00	0.92	3.77	3151.27	0.92
560.00	1.22	0.00	0.00	0.00	3.14	3150.64	0.68	708.00	1.60	1.00	0.00	1.00	3.78	3151.28	0.93
564.00	1.23	0.00	0.00	0.00	3.15	3150.65	0.68	712.00	1.61	1.08	0.00	1.08	3.79	3151.29	0.93
568.00	1.24	0.00	0.00	0.00	3.17	3150.67	0.69	716.00	1.63	1.15	0.00	1.15	3.79	3151.29	0.93
572.00	1.24	0.00	0.00	0.00	3.19	3150.69	0.70	720.00	1.64	1.21	0.00	1.21	3.80	3151.30	0.94
576.00	1.25	0.00	0.00	0.00	3.21	3150.71	0.70	724.00	1.65	1.27	0.00	1.27	3.81	3151.31	0.94
580.00	1.26	0.00	0.00	0.00	3.22	3150.72	0.71	728.00	1.65	1.32	0.00	1.32	3.81	3151.31	0.94
584.00	1.27	0.00	0.00	0.00	3.24	3150.74	0.72	732.00	1.63	1.36	0.00	1.36	3.82	3151.32	0.94
588.00	1.28	0.00	0.00	0.00	3.26	3150.76	0.73	736.00	1.56	1.39	0.00	1.39	3.82	3151.32	0.94
592.00	1.28	0.00	0.00	0.00	3.28	3150.78	0.73	740.00	1.50	1.41	0.00	1.41	3.82	3151.32	0.94
596.00	1.29	0.00	0.00	0.00	3.30	3150.80	0.74	744.00	1.47	1.42	0.00	1.42	3.82	3151.32	0.94

748.00	1.46	1.43	0.00	1.43	3.82	3151.32	0.94
752.00	1.45	1.43	0.00	1.43	3.82	3151.32	0.94
756.00	1.45	1.43	0.00	1.43	3.82	3151.32	0.94
760.00	1.45	1.44	0.00	1.44	3.82	3151.32	0.94
764.00	1.46	1.44	0.00	1.44	3.82	3151.32	0.94
768.00	1.46	1.44	0.00	1.44	3.82	3151.32	0.95
772.00	1.48	1.44	0.00	1.44	3.82	3151.32	0.95
776.00	1.49	1.45	0.00	1.45	3.82	3151.32	0.95
780.00	1.50	1.46	0.00	1.46	3.83	3151.33	0.95
784.00	1.52	1.46	0.00	1.46	3.83	3151.33	0.95
788.00	1.53	1.47	0.00	1.47	3.83	3151.33	0.95
792.00	1.55	1.48	0.00	1.48	3.83	3151.33	0.95
796.00	1.57	1.49	0.00	1.49	3.83	3151.33	0.95
800.00	1.59	1.50	0.00	1.50	3.83	3151.33	0.95
804.00	1.61	1.52	0.00	1.52	3.83	3151.33	0.95
808.00	1.64	1.53	0.00	1.53	3.83	3151.33	0.95
812.00	1.66	1.55	0.00	1.55	3.83	3151.33	0.95
816.00	1.69	1.56	0.00	1.56	3.84	3151.34	0.95
820.00	1.71	1.58	0.00	1.58	3.84	3151.34	0.95
824.00	1.74	1.60	0.00	1.60	3.84	3151.34	0.95
828.00	1.77	1.62	0.00	1.62	3.84	3151.34	0.95
832.00	1.81	1.64	0.00	1.64	3.84	3151.34	0.95
836.00	1.84	1.67	0.00	1.67	3.85	3151.35	0.95
840.00	1.87	1.69	0.00	1.69	3.85	3151.35	0.95
844.00	1.91	1.72	0.00	1.72	3.85	3151.35	0.96
848.00	1.95	1.75	0.00	1.75	3.85	3151.35	0.96
852.00	2.00	1.78	0.00	1.78	3.86	3151.36	0.96
856.00	2.04	1.81	0.00	1.81	3.86	3151.36	0.96
860.00	2.09	1.84	0.00	1.84	3.86	3151.36	0.96
864.00	2.15	1.88	0.00	1.88	3.87	3151.37	0.96
868.00	2.20	1.92	0.00	1.92	3.87	3151.37	0.96
872.00	2.26	1.96	0.00	1.96	3.88	3151.38	0.97
876.00	2.32	2.00	0.00	2.00	3.88	3151.38	0.97
880.00	2.38	2.05	0.00	2.05	3.88	3151.38	0.97
884.00	2.45	2.10	0.00	2.10	3.89	3151.39	0.97
888.00	2.53	2.15	0.00	2.15	3.89	3151.39	0.97
892.00	2.60	2.20	0.00	2.20	3.90	3151.40	0.97
896.00	2.69	2.26	0.00	2.26	3.91	3151.41	0.98
900.00	2.78	2.33	0.00	2.33	3.91	3151.41	0.98
904.00	2.88	2.39	0.00	2.39	3.92	3151.42	0.98
908.00	2.99	2.46	0.00	2.46	3.93	3151.43	0.98
912.00	3.12	2.56	0.00	2.56	3.93	3151.43	0.99
916.00	3.25	2.67	0.00	2.67	3.94	3151.44	0.99
920.00	3.40	2.78	0.00	2.78	3.95	3151.45	0.99
924.00	3.57	2.91	0.00	2.91	3.96	3151.46	1.00
928.00	3.78	3.04	0.00	3.04	3.97	3151.47	1.00
932.00	4.05	3.20	0.00	3.20	3.98	3151.48	1.01
936.00	4.46	3.38	0.00	3.38	3.99	3151.49	1.01
940.00	5.03	3.62	0.00	3.62	4.01	3151.51	1.02
944.00	5.88	3.95	0.00	3.95	4.04	3151.54	1.03
948.00	7.04	4.44	0.00	4.44	4.07	3151.57	1.04
952.00	8.64	5.11	0.00	5.11	4.11	3151.61	1.06
956.00	10.89	6.03	0.00	6.03	4.17	3151.67	1.08
960.00	14.40	7.33	0.00	7.33	4.26	3151.76	1.11
964.00	22.91	9.92	0.00	9.92	4.40	3151.90	1.17
968.00	36.58	14.33	0.00	14.33	4.62	3152.12	1.27
972.00	58.49	21.83	0.00	21.83	4.95	3152.45	1.43
976.00	85.63	34.64	0.00	34.64	5.44	3152.94	1.68
980.00	77.53	40.97	0.00	40.97	5.92	3153.42	1.91
984.00	54.90	43.11	0.00	43.11	6.19	3153.69	2.05
988.00	41.28	43.44	0.00	43.44	6.24	3153.74	2.07
992.00	31.82	42.97	0.00	42.97	6.16	3153.66	2.04
996.00	26.45	42.03	0.00	42.03	6.01	3153.51	1.96
1000.00	22.17	39.92	0.00	39.92	5.83	3153.33	1.87
1004.00	18.53	37.57	0.00	37.57	5.63	3153.13	1.77
1008.00	15.83	33.98	0.00	33.98	5.42	3152.92	1.66
1012.00	13.77	29.01	0.00	29.01	5.23	3152.73	1.57
1016.00	12.28	24.99	0.00	24.99	5.08	3152.58	1.50
1020.00	10.93	21.79	0.00	21.79	4.95	3152.45	1.43
1024.00	10.05	19.15	0.00	19.15	4.84	3152.34	1.38
1028.00	8.90	16.99	0.00	16.99	4.74	3152.24	1.33
1032.00	7.89	15.17	0.00	15.17	4.66	3152.16	1.29
1036.00	7.55	13.60	0.00	13.60	4.58	3152.08	1.25
1040.00	6.88	12.24	0.00	12.24	4.52	3152.02	1.22

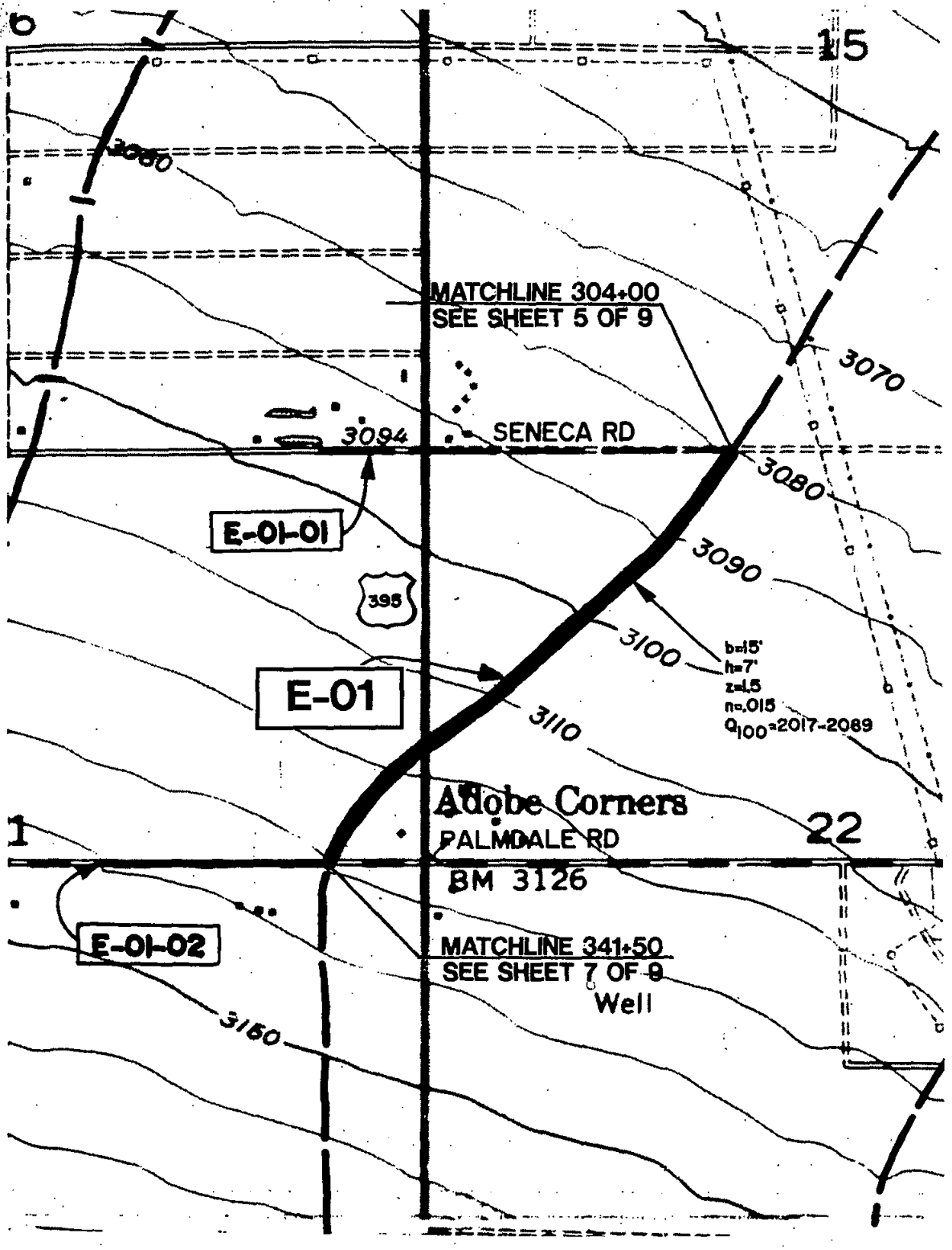
1044.00	6.10	10.95	0.00	10.95	4.45	3151.95	1.19	1192.00	1.28	1.45	0.00	1.45	3.83	3151.33	0.95
1048.00	5.54	9.74	0.00	9.74	4.39	3151.89	1.17	1196.00	1.26	1.43	0.00	1.43	3.82	3151.32	0.94
1052.00	5.04	8.68	0.00	8.68	4.34	3151.84	1.14	1200.00	1.25	1.41	0.00	1.41	3.82	3151.32	0.94
1056.00	4.52	7.80	0.00	7.80	4.29	3151.79	1.13	1204.00	1.23	1.38	0.00	1.38	3.82	3151.32	0.94
1060.00	4.03	7.11	0.00	7.11	4.24	3151.74	1.11	1208.00	1.22	1.36	0.00	1.36	3.82	3151.32	0.94
1064.00	3.63	6.47	0.00	6.47	4.20	3151.70	1.09	1212.00	1.20	1.34	0.00	1.34	3.81	3151.31	0.94
1068.00	3.30	5.88	0.00	5.88	4.16	3151.66	1.08	1216.00	1.19	1.32	0.00	1.32	3.81	3151.31	0.94
1072.00	3.04	5.35	0.00	5.35	4.13	3151.63	1.06	1220.00	1.18	1.30	0.00	1.30	3.81	3151.31	0.94
1076.00	2.83	4.88	0.00	4.88	4.10	3151.60	1.05	1224.00	1.17	1.29	0.00	1.29	3.81	3151.31	0.94
1080.00	2.67	4.46	0.00	4.46	4.07	3151.57	1.04	1228.00	1.15	1.27	0.00	1.27	3.81	3151.31	0.94
1084.00	2.57	4.10	0.00	4.10	4.05	3151.55	1.03	1232.00	1.14	1.25	0.00	1.25	3.81	3151.31	0.94
1088.00	2.50	3.82	0.00	3.82	4.03	3151.53	1.02	1236.00	1.13	1.24	0.00	1.24	3.80	3151.30	0.94
1092.00	2.47	3.58	0.00	3.58	4.01	3151.51	1.02	1240.00	1.12	1.22	0.00	1.22	3.80	3151.30	0.94
1096.00	2.48	3.39	0.00	3.39	4.00	3151.50	1.01	1244.00	1.11	1.21	0.00	1.21	3.80	3151.30	0.94
1100.00	2.44	3.23	0.00	3.23	3.98	3151.48	1.01	1248.00	1.09	1.19	0.00	1.19	3.80	3151.30	0.94
1104.00	2.34	3.08	0.00	3.08	3.97	3151.47	1.00	1252.00	1.08	1.18	0.00	1.18	3.80	3151.30	0.93
1108.00	1.77	2.90	0.00	2.90	3.96	3151.46	1.00	1256.00	1.07	1.17	0.00	1.17	3.80	3151.30	0.93
1112.00	1.71	2.69	0.00	2.69	3.94	3151.44	0.99	1260.00	1.06	1.15	0.00	1.15	3.80	3151.30	0.93
1116.00	1.67	2.52	0.00	2.52	3.93	3151.43	0.99	1264.00	1.05	1.14	0.00	1.14	3.79	3151.29	0.93
1120.00	1.64	2.40	0.00	2.40	3.92	3151.42	0.98	1268.00	1.04	1.13	0.00	1.13	3.79	3151.29	0.93
1124.00	1.61	2.30	0.00	2.30	3.91	3151.41	0.98	1272.00	1.03	1.12	0.00	1.12	3.79	3151.29	0.93
1128.00	1.58	2.20	0.00	2.20	3.90	3151.40	0.97	1276.00	1.02	1.11	0.00	1.11	3.79	3151.29	0.93
1132.00	1.56	2.12	0.00	2.12	3.89	3151.39	0.97	1280.00	1.02	1.09	0.00	1.09	3.79	3151.29	0.93
1136.00	1.54	2.05	0.00	2.05	3.88	3151.38	0.97	1284.00	1.01	1.08	0.00	1.08	3.79	3151.29	0.93
1140.00	1.51	1.98	0.00	1.98	3.88	3151.38	0.97	1288.00	1.00	1.07	0.00	1.07	3.79	3151.29	0.93
1144.00	1.49	1.91	0.00	1.91	3.87	3151.37	0.96	1292.00	0.99	1.06	0.00	1.06	3.79	3151.29	0.93
1148.00	1.47	1.86	0.00	1.86	3.87	3151.37	0.96	1296.00	0.98	1.05	0.00	1.05	3.79	3151.29	0.93
1152.00	1.45	1.81	0.00	1.81	3.86	3151.36	0.96	1300.00	0.97	1.04	0.00	1.04	3.78	3151.28	0.93
1156.00	1.43	1.76	0.00	1.76	3.86	3151.36	0.96	1304.00	0.96	1.03	0.00	1.03	3.78	3151.28	0.93
1160.00	1.41	1.71	0.00	1.71	3.85	3151.35	0.96	1308.00	0.96	1.02	0.00	1.02	3.78	3151.28	0.93
1164.00	1.39	1.67	0.00	1.67	3.85	3151.35	0.95	1312.00	0.95	1.01	0.00	1.01	3.78	3151.28	0.93
1168.00	1.38	1.63	0.00	1.63	3.84	3151.34	0.95	1316.00	0.94	1.00	0.00	1.00	3.78	3151.28	0.93
1172.00	1.36	1.60	0.00	1.60	3.84	3151.34	0.95	1320.00	0.93	1.00	0.00	1.00	3.78	3151.28	0.93
1176.00	1.34	1.57	0.00	1.57	3.84	3151.34	0.95	1324.00	0.93	0.99	0.00	0.99	3.78	3151.28	0.93
1180.00	1.32	1.54	0.00	1.54	3.83	3151.33	0.95	1328.00	0.92	0.98	0.00	0.98	3.78	3151.28	0.93
1184.00	1.31	1.51	0.00	1.51	3.83	3151.33	0.95	1332.00	0.91	0.97	0.00	0.97	3.78	3151.28	0.93
1188.00	1.29	1.48	0.00	1.48	3.83	3151.33	0.95	1336.00	0.91	0.97	0.00	0.97	3.78	3151.28	0.93

1340.00	0.90	0.96	0.00	0.96	3.78	3151.28	0.93
1344.00	0.89	0.95	0.00	0.95	3.77	3151.27	0.93
1348.00	0.89	0.95	0.00	0.95	3.77	3151.27	0.93
1352.00	0.88	0.94	0.00	0.94	3.77	3151.27	0.93
1356.00	0.87	0.93	0.00	0.93	3.77	3151.27	0.92
1360.00	0.87	0.93	0.00	0.93	3.77	3151.27	0.92
1364.00	0.86	0.92	0.00	0.92	3.77	3151.27	0.92
1368.00	0.86	0.91	0.00	0.91	3.77	3151.27	0.92
1372.00	0.85	0.91	0.00	0.91	3.77	3151.27	0.92
1376.00	0.85	0.90	0.00	0.90	3.77	3151.27	0.92
1380.00	0.84	0.89	0.00	0.89	3.77	3151.27	0.92
1384.00	0.83	0.89	0.00	0.89	3.77	3151.27	0.92
1388.00	0.83	0.88	0.00	0.88	3.77	3151.27	0.92
1392.00	0.82	0.87	0.00	0.87	3.76	3151.26	0.92
1396.00	0.82	0.87	0.00	0.87	3.76	3151.26	0.92
1400.00	0.81	0.86	0.00	0.86	3.76	3151.26	0.92
1404.00	0.81	0.86	0.00	0.86	3.76	3151.26	0.92
1408.00	0.80	0.85	0.00	0.85	3.76	3151.26	0.92
1412.00	0.80	0.85	0.00	0.85	3.76	3151.26	0.92
1416.00	0.79	0.84	0.00	0.84	3.76	3151.26	0.92
1420.00	0.79	0.84	0.00	0.84	3.76	3151.26	0.92
1424.00	0.79	0.83	0.00	0.83	3.76	3151.26	0.92
1428.00	0.78	0.82	0.00	0.82	3.76	3151.26	0.92
1432.00	0.78	0.82	0.00	0.82	3.76	3151.26	0.92
1436.00	0.77	0.81	0.00	0.81	3.76	3151.26	0.92
1440.00	0.77	0.81	0.00	0.81	3.76	3151.26	0.92
1444.00	0.75	0.80	0.00	0.80	3.76	3151.26	0.92
1448.00	0.72	0.80	0.00	0.80	3.76	3151.26	0.92
1452.00	0.65	0.78	0.00	0.78	3.75	3151.25	0.92
1456.00	0.51	0.76	0.00	0.76	3.75	3151.25	0.92
1460.00	0.39	0.73	0.00	0.73	3.75	3151.25	0.92
1464.00	0.31	0.68	0.00	0.68	3.74	3151.24	0.91
1468.00	0.26	0.64	0.00	0.64	3.74	3151.24	0.91
1472.00	0.22	0.59	0.00	0.59	3.73	3151.23	0.91
1476.00	0.18	0.55	0.00	0.55	3.73	3151.23	0.91
1480.00	0.16	0.51	0.00	0.51	3.72	3151.22	0.90
1484.00	0.13	0.48	0.00	0.48	3.72	3151.22	0.90
1488.00	0.12	0.46	0.00	0.46	3.71	3151.21	0.90
1492.00	0.10	0.44	0.00	0.44	3.71	3151.21	0.90
1496.00	0.09	0.42	0.00	0.42	3.70	3151.20	0.90
1500.00	0.08	0.40	0.00	0.40	3.70	3151.20	0.90
1504.00	0.07	0.38	0.00	0.38	3.69	3151.19	0.89
1508.00	0.06	0.37	0.00	0.37	3.69	3151.19	0.89
1512.00	0.05	0.35	0.00	0.35	3.68	3151.18	0.89
1516.00	0.04	0.33	0.00	0.33	3.68	3151.18	0.89
1520.00	0.04	0.31	0.00	0.31	3.68	3151.18	0.89
1524.00	0.03	0.30	0.00	0.30	3.67	3151.17	0.89
1528.00	0.03	0.28	0.00	0.28	3.67	3151.17	0.88
1532.00	0.02	0.27	0.00	0.27	3.66	3151.16	0.88
1536.00	0.02	0.25	0.00	0.25	3.66	3151.16	0.88
1540.00	0.02	0.24	0.00	0.24	3.66	3151.16	0.88
1544.00	0.01	0.23	0.00	0.23	3.65	3151.15	0.88
1548.00	0.01	0.22	0.00	0.22	3.65	3151.15	0.88
1552.00	0.01	0.20	0.00	0.20	3.65	3151.15	0.88
1556.00	0.01	0.19	0.00	0.19	3.65	3151.15	0.88
1560.00	0.01	0.18	0.00	0.18	3.64	3151.14	0.87
1564.00	0.01	0.17	0.00	0.17	3.64	3151.14	0.87
1568.00	0.01	0.16	0.00	0.16	3.64	3151.14	0.87
1572.00	0.00	0.15	0.00	0.15	3.64	3151.14	0.87
1576.00	0.00	0.14	0.00	0.14	3.63	3151.13	0.87
1580.00	0.00	0.14	0.00	0.14	3.63	3151.13	0.87
1584.00	0.00	0.13	0.00	0.13	3.63	3151.13	0.87
Total:	5.89	5.02	0.00	5.02	Acre-Feet		

Elevation	Storage Volume [Cubic-Feet]
3147.50	0.00
3148.00	1008.00
3150.00	18700.00
3152.00	52636.00
3154.00	95950.00

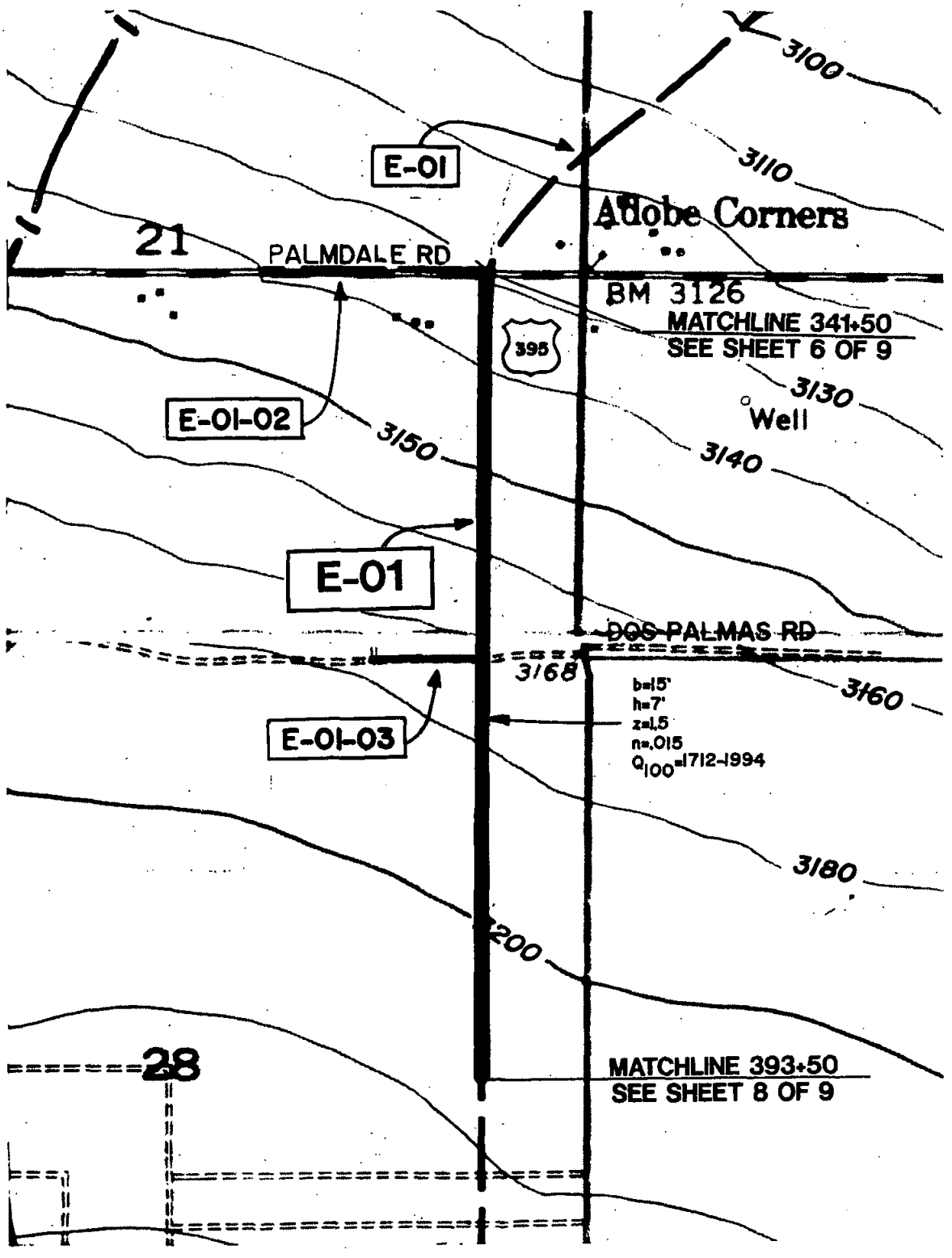
Appendix F

Victorville Master Plan of Drainage, Channel E-01



LEGEND			
	PROPOSED FACILITY		FLOODPLAIN
	FACILITY SHOWN ELSEWHERE		FLOODWAY
	WATERSHED BOUNDARY		DETENTION BASIN

VICTORVILLE MASTER PLAN OF DRAINAGE	COMPREHENSIVE STORM DRAIN PLAN LINE E-01 SHEET 6 OF 9	SCALE 1"=1000' WILLIAMSON SCHMID



LEGEND

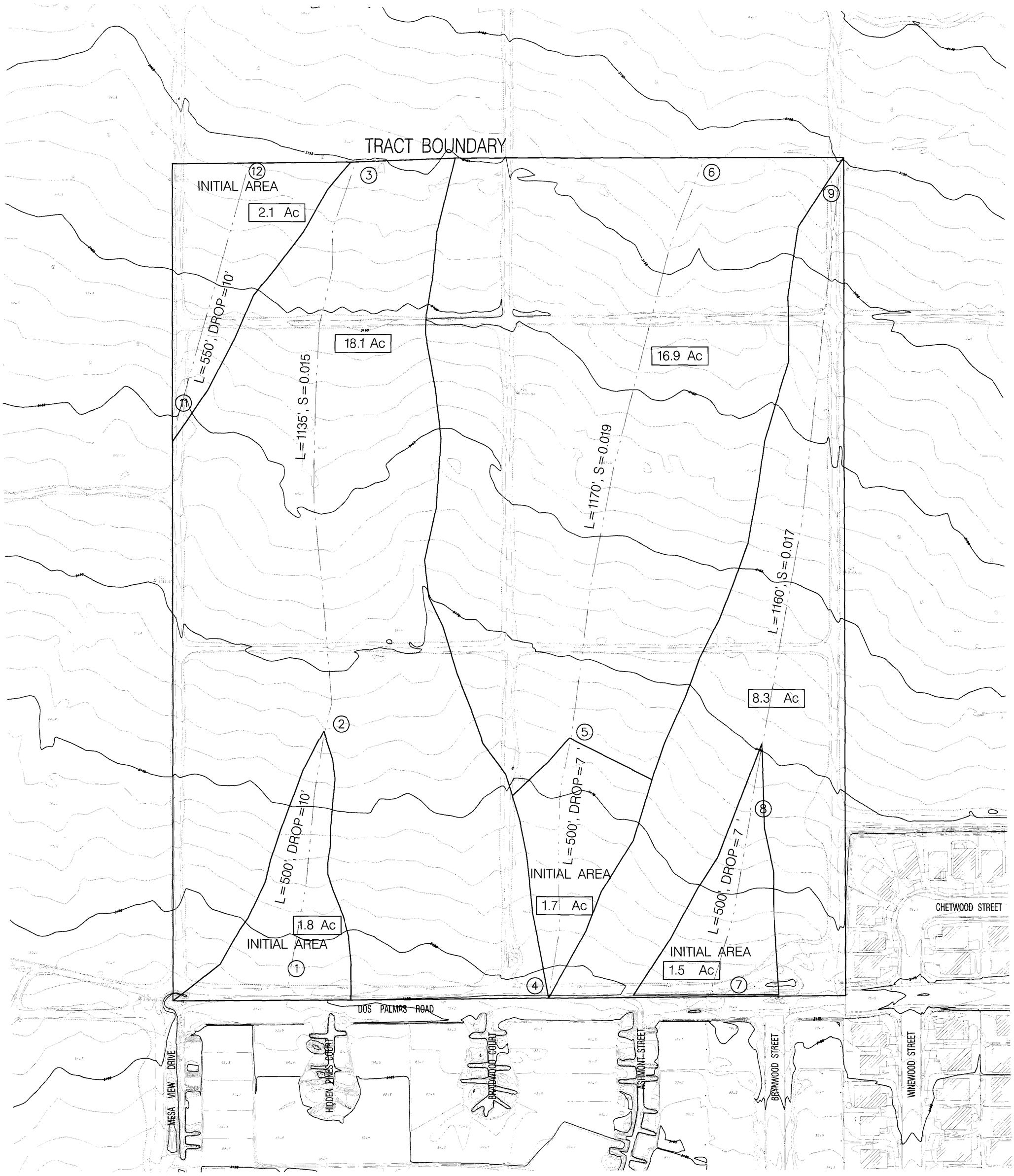
- PROPOSED FACILITY
- FACILITY SHOWN ELSEWHERE
- WATERSHED BOUNDARY
- FLOODPLAIN
- FLOODWAY
- DETENTION BASIN

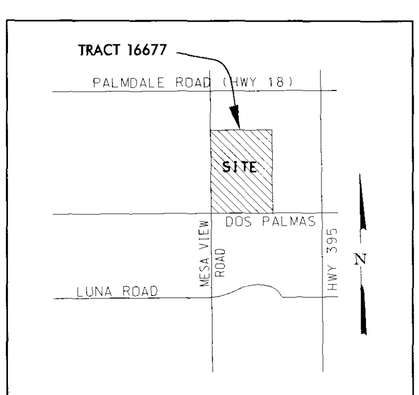
VICTORVILLE MASTER PLAN OF DRAINAGE

COMPREHENSIVE STORM DRAIN PLAN
LINE E-01
SHEET 7 OF 9

SCALE 1"=1000'

WILLIAMSON SCHMID





VICINITY MAP
N.T.S.

HYDROLOGIC PARAMETERS:

LAND USE	=	UNDEVELOPED
IMPERVIOUSNESS	=	0%
TOTAL AREA	=	50.3 ACRES
SOIL ZONE	=	B
SCS CURVE NUMBER, CN	=	74 (AMC II)
COVER DENSITY	=	40 %
COVER TYPE	=	HERBACEOUS
INFILTRATION RATE, Fp	=	0.48 IN/HR (AMC II)

ISOHYETALS [INCHES]:

2–YR, 6–HR	=	0.70
2–YR, 14–HR	=	1.00
10–YR, 1–HR	=	0.75
100–YR, 1–HR	=	1.10
100–YR, 6–HR	=	1.80
100–YR, 24–HR	=	3.00

N

SCALE: 1" = 100'
0 50 100 200

Metafile Date: Thu Jun 23 13:26:03 2005
Prf Name: $USER VTN W.O. NO.

PLANS PREPARED UNDER THE SUPERVISION OF CHANG-HSIN HSIEH FOR FRONTIER HOMES

VTN WEST, INC.
6946 VAN NUYS BLVD., SUITE 100
VAN NUYS, CA. 91405-3963
818/779-8740/50-FAX

RCE# 50211 EXP. 6-30-05 DATE

CITY OF VICTORVILLE

HYDROLOGY MAP
TRACT 16677
EXISTING CONDITION

EXHIBIT 1

PROPOSED DRY WELL
FOR NUISANCE
AND LOW FLOWS

(1) catch basin number in hydraulic calcs.

PROPOSED STORM DRAIN

Q100 = 24.8 CFS

Q100 = 59.3 CFS

FAR HILLS STREET

BOBCAT HILLS STREET

INDIAN HILLS STREET

HAPPY HILLS ROAD

HAPPY HILLS STREET

GROTTO HILLS STREET

HIDDEN PINES COURT

ASHMONT STREET

BRYNWOOD STREET

MESA VIEW DRIVE

12' DROP
700'

INITIAL SUBAREA

DOS PALMAS ROAD

Q100 = 4.4 CFS

Q100 = 3.1 CFS

ULTIMATE FLOW
PER TRACT 16138
HYDROLOGY STUDY

TRACT 16138
UNDER CONSTRUCTION

TRACT NO. 16138-3

TRACT 16677

PALMDALE ROAD (HWY 18)

SITE

DOS PALMAS

MESA VIEW ROAD

LUNA ROAD

HWY 395

N

VICINITY MAP
NTS

LEGEND

821'	WATERCOURSE AND LENGTH
	SUBAREA BOUNDARY
(22)	NODE NUMBER
33.3	ACRES

HYDROLOGIC PARAMETERS:

LAND USE	= SINGLE–FAMILY, 4.3 DU/AC
IMPERVIOUSNESS	= 45%
TOTAL AREA	= 50.3 ACRES
SOIL ZONE	= B
SCS CURVE NUMBER, CN	= 56 (AMC II)
INFILTRATION RATE, Fp	= 0.75 IN/HR (AMC II)

ISOHYETALS [INCHES]:

2–YR, 6–HR	=	0.70
2–YR, 14–HR	=	1.00
10–YR, 1–HR	=	0.75
100–YR, 1–HR	=	1.10
100–YR, 6–HR	=	1.80
100–YR, 24–HR	=	3.00

N

SCALE: 1" = 100'
100 75 50 25 0 100

Metafile Date: Thu Jun 23 13:26:09 2005
PH Name: $USER VTN W.O. NO.

PLANS PREPARED UNDER THE SUPERVISION OF CHANG-HSIN HSIEH FOR FRONTIER HOMES

VTN WEST, INC.
6946 VAN NUYS BLVD., SUITE 100
VAN NUYS, CA. 91405-3963
818/779-8740/50-FAX

RCE# 50211 EXP. 6-30-05 DATE

CITY OF VICTORVILLE

HYDROLOGY MAP
TRACT 16677
PROPOSED CONDITION

EXHIBIT
2

COORDINATE LISTING

#	NORTHERLY	EASTERLY
10	100002.34	49997.87
11	101359.48	50002.65
12	100045.68	49737.90
13	100061.63	49737.91
14	100290.40	49822.92
15	100400.38	49910.96
16	100283.84	49820.48
17	100427.27	49897.24
18	100399.27	49897.46
19	100430.05	49892.39
20	100463.72	49892.71
21	100394.41	49892.67
22	100394.70	49930.49

E.D.A. Award No. 074905428

S.A.E. PROJECT No. 106.0081

FIELD BOOK REF.			
MARK	REVISIONS	APPR.	DATE

City Of Adelanto

APPROVED

CITY ENGINEER DATE
WILSON F. SO
RCE C21651 EXP. 9/30/05

DESIGNED BY W.L./W.S.

DRAWN BY R.E.S.

CHECKED BY

PREPARED BY:
So & Associates Engineers Inc.
18209 KAMANA ROAD • P.O. BOX 1712
APPLE VALLEY, CALIFORNIA 92307
(760) 242-2365 • FAX (760) 242-3085

CITY OF ADELANTO
ADELANTO MARKETPLACE
ROAD IMPROVEMENT PROJECT
DRAINAGE FACILITY — PALMDALE ROAD TO STATE HWY 395

SUBMITTED BY:

DATE

SCALE AS SHOWN

DRAWING No. C-5

SHEET 6 OF 21