STONEFIELD
engineering & design

STORMWATER MANAGEMENT STATEMENT

To: **Township of Cranford**

Project: **Hartz Mountain Industries, Inc.**
Proposed Residential Redevelopment Plan
Tax Block 541, Lot 2
Township of Cranford, Union County, New Jersey

Dated: **November 28, 2018**

Reference: **Zoning Plans**
(Prepared by Stonefield Engineering & Design, LLC, last revised November 28, 2018)

Hartz Mountain Industries, Inc. is proposing the construction of a multi-family residential development with 5 residential buildings and two community clubhouses. The subject property is designated Block 541, Lot 2, commonly known as 750 Walnut Avenue. The total project area is 30.5 acres and will be divided into two phases. Approximately half of the site consisting of existing offices in the rear will remain operational as Phase 1 is built in the front of the site. The remaining portion of the project will be built during Phase 2. Phase 1 consists of two multi-family residential buildings with 433 total units. Phase 2 will add three additional buildings with 472 units for a total of 905 units for the full build out. The site is currently 65.5% impervious and contains two aboveground stormwater management basins to manage stormwater runoff.

This Stormwater Management Statement has been prepared to analyze the potential stormwater runoff impacts of the proposed project and discuss measures proposed to conform to the stormwater management requirements set forth by the Township of Cranford, Somerset-Union Soil Conservation District, and the New Jersey Department of Environmental Protection (NJDEP).

PRE-DEVELOPMENT DRAINAGE CONDITIONS

Under pre-development conditions the site is developed and consists of two office buildings and associated parking. About 42% of the site runoff is collected via catch basins and piped to an existing detention basin located at the northeast portion of Walnut Avenue. This basin discharges directly to an 18" RCP in Walnut Avenue, which is part of the municipal system. The remainder of the site is generally tributary to the detention basin located at the southern corner of the property. This basin also discharges directly to the municipal system within Walnut Avenue and connects to a 42" RCP. The 42" RCP is not directly connected to the 18" RCP, and thus two separate point of interests have been analyzed. It should be noted that per our analysis, both of the existing on-site basins are not sized to handle the 100-year storm event. The following table summarizes each existing drainage area utilized in the stormwater analysis.

TABLE 1: PRE-DEVELOPMENT DRAINAGE AREAS

Drainage Area	*Description*	*Area Extents*	*Impervious Area*	*Time of Concentration*
E-1	Runoff Tributary to Southeast Basin	801,600 SF	630,951 SF	10 Minutes
E-2	Runoff Tributary to Eastern Basin	395,371 SF	255,695 SF	10 Minutes
E-3	Uncollected Runoff	144,697 SF	6,373 SF	10 Minutes

PROPOSED DRAINAGE CONDITIONS

Under proposed conditions, the site will consist of the residential buildings and associated parking areas. The uncovered portion of the site will drain via sheet flow to proposed catch basins on-site. The proposed buildings will drain via roof leaders to connect to the proposed drainage system. The existing southeasterly aboveground basin is to remain and be expanded, while the existing easterly basin is proposed to be removed. Three basins, one aboveground, and two underground are proposed to replace the existing basin and provide further detention so that the all basins are designed for the 100-year storm event.

TABLE 2: POST-DEVELOPMENT DRAINAGE AREAS

Drainage Area	*Description*	*Area Extents*	*Impervious Area*	*Time of Concentration*
P-1A	Runoff Tributary to B-1A	767,481 SF	550,413 SF	10 Minutes
P-1B	Runoff Tributary to B-1B	90,292 SF	90,292 SF	10 Minutes
P-2A	Runoff Tributary to B-2A	154,386 SF	90,090 SF	10 Minutes
P-2B	Runoff Tributary to B-2B	195,136 SF	84,827 SF	10 Minutes
P-3	Uncollected Runoff	36,404 SF	35,365 SF	10 Minutes

STORMWATER MANAGEMENT ANALYSIS

The project disturbs more than one acre of land and is therefore defined as a Major Development as indicated in the Township Ordinance. The project is designed to conform to the stormwater management requirements set forth by the Township, Somerset-Union Soil Conservation District, and the New Jersey Department of Environmental Protection (NJDEP).

WATER QUALITY REQUIREMENTS

As the project results in a net decrease in impervious surfaces, water quality is naturally enhanced via the addition of lawn and landscaped areas.

GROUNDWATER RECHARGE REQUIREMENTS

As the site is reducing impervious coverage, groundwater recharge is naturally increased. Additionally, it is worth noting that the subject property is located within an Urban Planning Area defined by the NJDEP as the Metropolitan Planning Area (PA-1), where per NJAC 7:8-5.4, groundwater recharge requirements do not apply in portions of redeveloped area.

RUNOFF QUANTITY REQUIREMENTS

The proposed project will meet stormwater quantity requirements via designing stormwater management measures so that the post-construction peak runoff rates for the 2, 10, and 100 year storm events are 50%, 75%, and 80%, respectively, of the pre-construction peak runoff rates. It should be noted that since the existing basins are undersized, peak flow rates are higher for certain storm events. Therefore, as a conservative measure, the basins were not included as part of the existing conditions analysis. Under proposed conditions, during Phase 1, the existing southerly detention basin is to remain and be expanded. Three additional basins, one aboveground, and two underground are proposed to manage stormwater runoff. The underground basin south of Building 'A', will be encased in stone, as solely roof runoff will be conveyed. The Phase 2 development is proposed to tie into the proposed drainage system. Since the Phase 2 development results in a decrease of impervious surfaces when compared to the Phase 1 development, the facilities proposed in Phase 1 will be able to manage stormwater runoff. Stormwater runoff peak flow rates and volumes will be further reduced after the Phase 2 development is completed. The following are summary tables of the analyses. Refer to the appendix of this Statement for further information, including hydrographs and drainage area maps.

TABLE 3: QUANTITY COMPARISON POINTS OF INTEREST

Point of Interest	*Area Description*	*Existing Tributary Drainage Areas*	*Proposed Tributary Drainage Areas*
POI-1	Connection to 42" RCP	E-1, E-3	P-1A, P-1B, POI-2
POI-2	Connection to 18" RCP	E-2	P-2A, P-2B

TABLE 4: POI-1 STORMWATER PEAK DISCHARGE & VOLUME ANALYSIS SUMMARY

Storm Event	*Pre-Development Peak Discharge*	*Reduction Required*	*Post-Development Peak Discharge*	*Reduction Achieved*	*Pre-Development Runoff Volume*	*Post-Development Runoff Volume*
2-Year	70.48 CFS	50.0%	22.75 CFS	67.7%	268,373 CF	259,095 CF
10-Year	117.28 CFS	25.0%	43.75 CFS	62.7%	458,033 CF	447,056 CF
100-Year	208.76 CFS	20.0%	68.18 CFS	67.3%	841,752 CF	829,120 CF

*A minimum concentration of 10-minutes was utilized for all drainage areas.

TABLE 5: POI-2 STORMWATER PEAK DISCHARGE & VOLUME ANALYSIS SUMMARY

Storm Event	*Pre-Development Peak Discharge*	*Reduction Required*	*Post-Development Peak Discharge*	*Reduction Achieved*	*Pre-Development Runoff Volume*	*Post-Development Runoff Volume*
2-Year	20.63 CFS	50.0%	8.45 CFS	59.0%	77,275 CF	60,243 CF
10-Year	34.66 CFS	25.0%	13.46 CFS	61.2%	133,424 CF	108,203 CF
100-Year	61.83 CFS	20.0%	20.96 CFS	66.1%	246,941 CF	206,910 CF

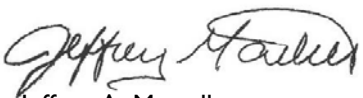
*A minimum concentration of 10-minutes was utilized for all drainage areas.

As shown in the tables above, peak stormwater discharge rates and runoff volumes are reduced by at least the required amount for each storm event. Project hydrographs and more detailed data can be found in the Appendix of this Report.

CONCLUSION

As the project meets Township and State stormwater management requirements and due to the overall decrease in impervious coverage as well as the proposed improvements, no adverse impacts to the municipal drainage system or adjacent properties are anticipated as a result of the project.

Prepared by:



Jeffrey A. Martell PE, PP, CME, LEED AP
New Jersey PE License No. 47290
Stonefield Engineering and Design, LLC

APPENDIX A
PROJECT MAPS

AERIAL MAP

500' 0' 500' 1000'

GRAPHIC SCALE IN FEET

1"= 500'

SOURCE: GOOGLE EARTH PRO, IMAGERY DATED 04/19/2016

HARTZ MOUNTAIN

PROPOSED RESIDENTIAL REDEVELOPMENT

BLOCK 541, LOT 2
750 WALNUT AVENUE (COUNTY ROUTE 632)
TOWNSHIP OF CRANFORD,
UNION COUNTY, NJ

DRAWN BY:	CAM
CHECKED BY:	SO
DATE:	09/05/2018
SCALE:	1" = 500'
PROJECT ID:	T-16509

STONEFIELD engineering & design

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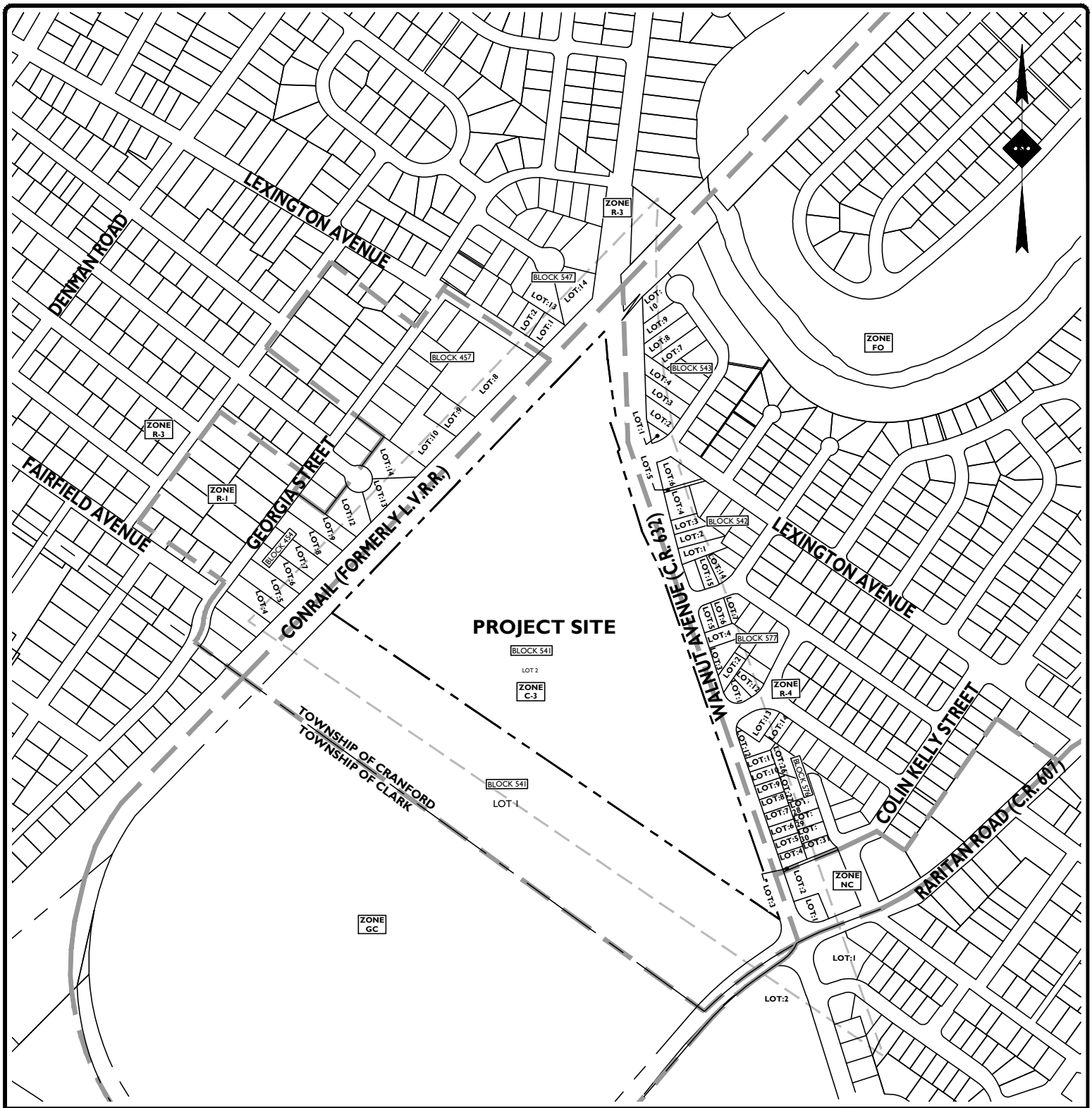

TAX AND ZONING MAP

500' 0' 500' 1000'

GRAPHIC SCALE IN FEET

1"= 500'

SOURCE: TOWNSHIP OF CRANFORD TAX MAP PAGES 96, 97, 129, 133, & 142, AND TOWNSHIP OF CRANFORD ZONING MAP

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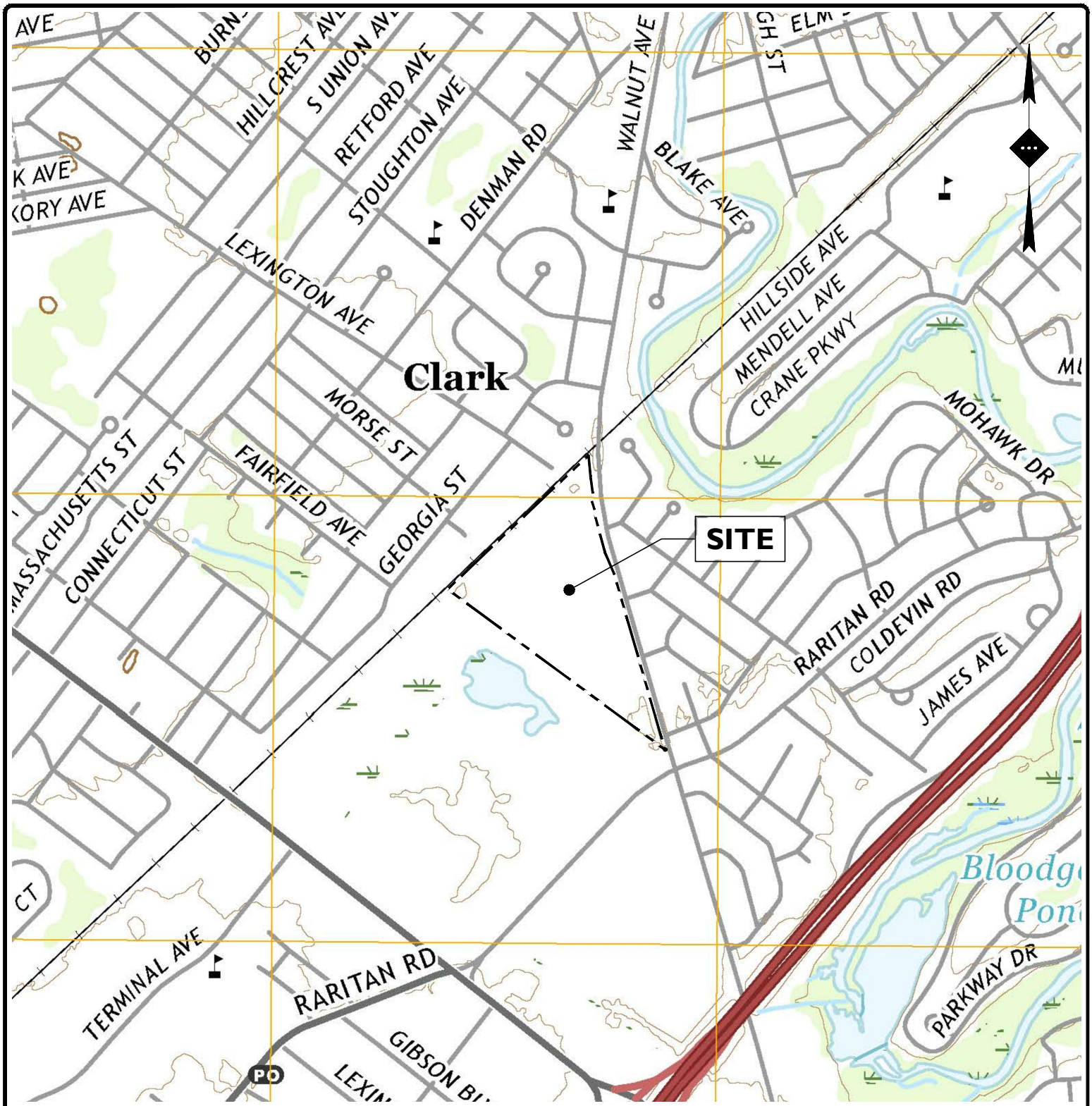

USGS QUADRANGLE MAP

1000' 0' 1000' 2000'

GRAPHIC SCALE IN FEET

1"= 1000'

SOURCE: USGS 7.5 MINUTE SERIES, ROSELLE, NJ QUADRANGLE MAP, DATED 2018 AND 7.5 MINUTE SERIES, PERTH AMBOY, NJ-NY QUADRANGLE MAP, DATED 2018

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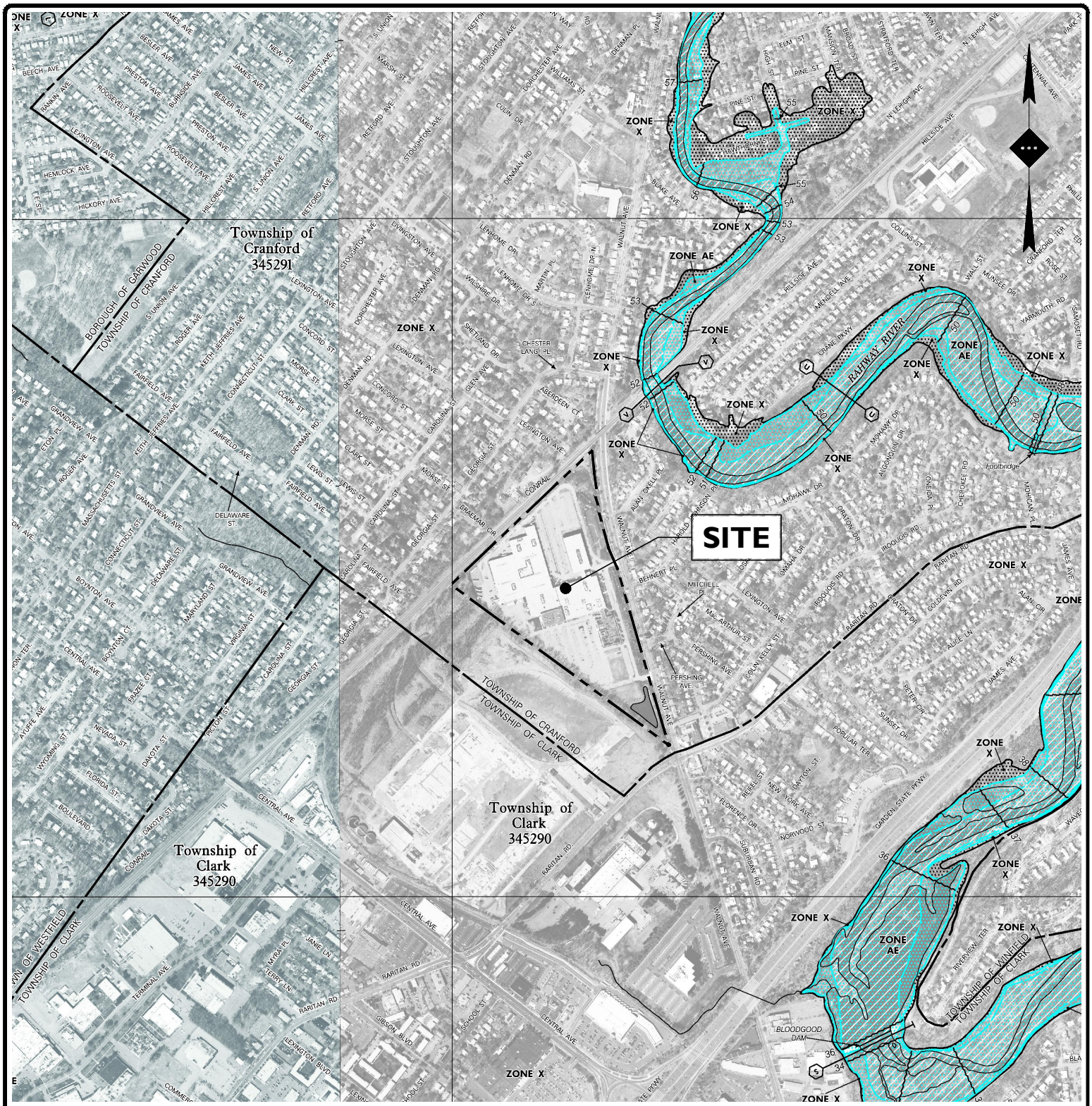

FEMA FLOOD INSURANCE RATE MAP (FIRM)

1000' 0' 1000' 2000'

GRAPHIC SCALE IN FEET

1"= 1000'

SOURCE: EFFECTIVE FEMA FIRM MAPS 34039C0031F & 34039C0032F, DATED 09/20/2006

HARTZ MOUNTAIN

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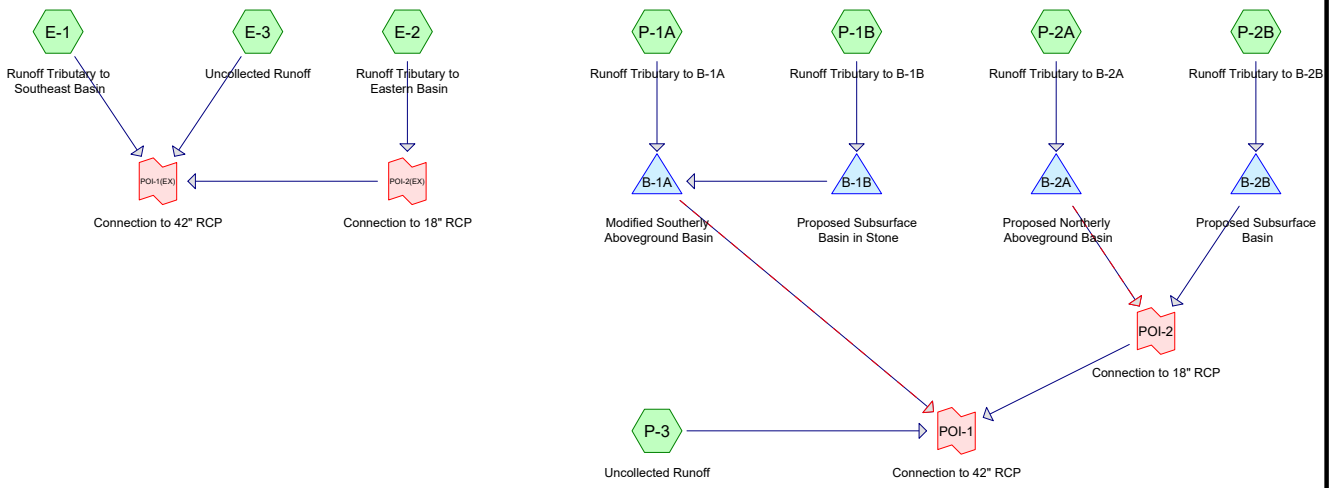
APPENDIX B
HYDROCAD DATA & ANALYSIS RESULTS



Subcat Reach Pond Link

Routing Diagram for 2018-11-26_Calculations-ZC

Prepared by {enter your company name here}, Printed 11/27/2018

Summary for Subcatchment E-1: Runoff Tributary to Southeast Basin

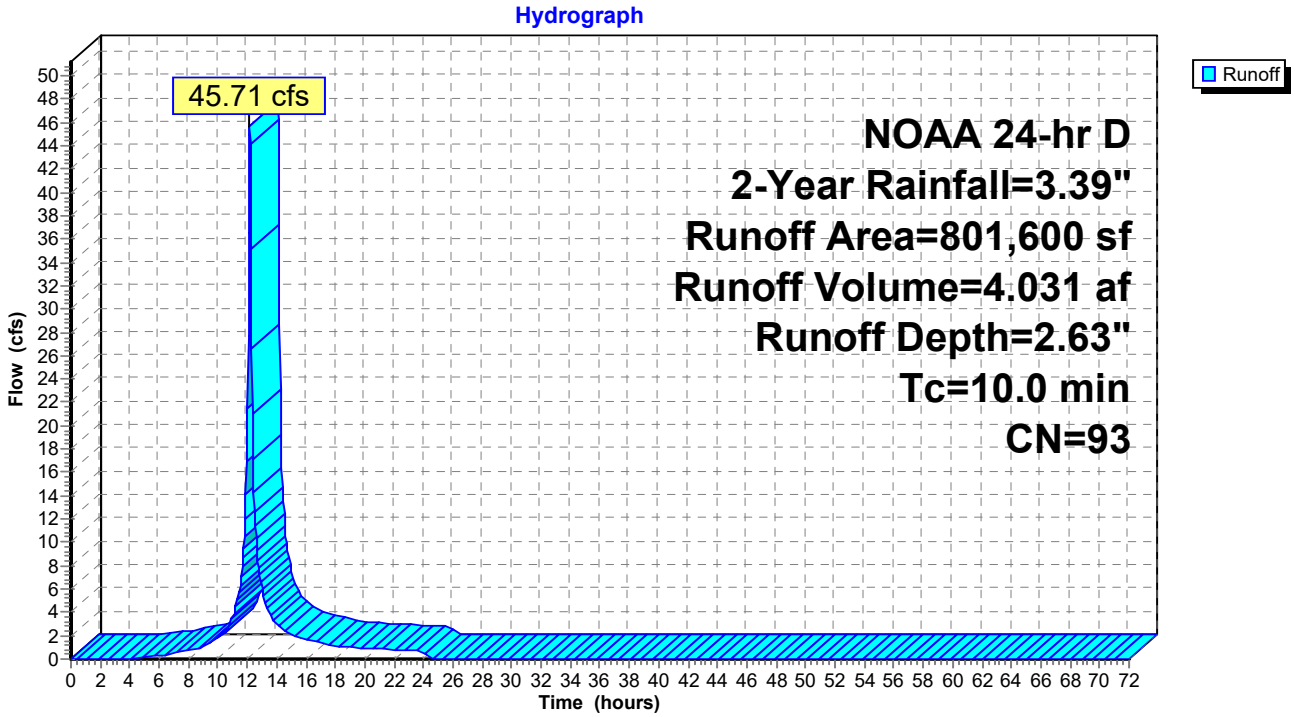
Runoff = 45.71 cfs @ 12.17 hrs, Volume= 4.031 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year Rainfall=3.39"

	Area (sf)	CN	Description
*	630,951	98	Impervious Surfaces
	92,120	74	>75% Grass cover, Good, HSG C
	78,529	80	>75% Grass cover, Good, HSG D
	801,600	93	Weighted Average
	170,649		21.29% Pervious Area
	630,951		78.71% Impervious Area

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

Subcatchment E-1: Runoff Tributary to Southeast Basin



Summary for Subcatchment E-2: Runoff Tributary to Eastern Basin

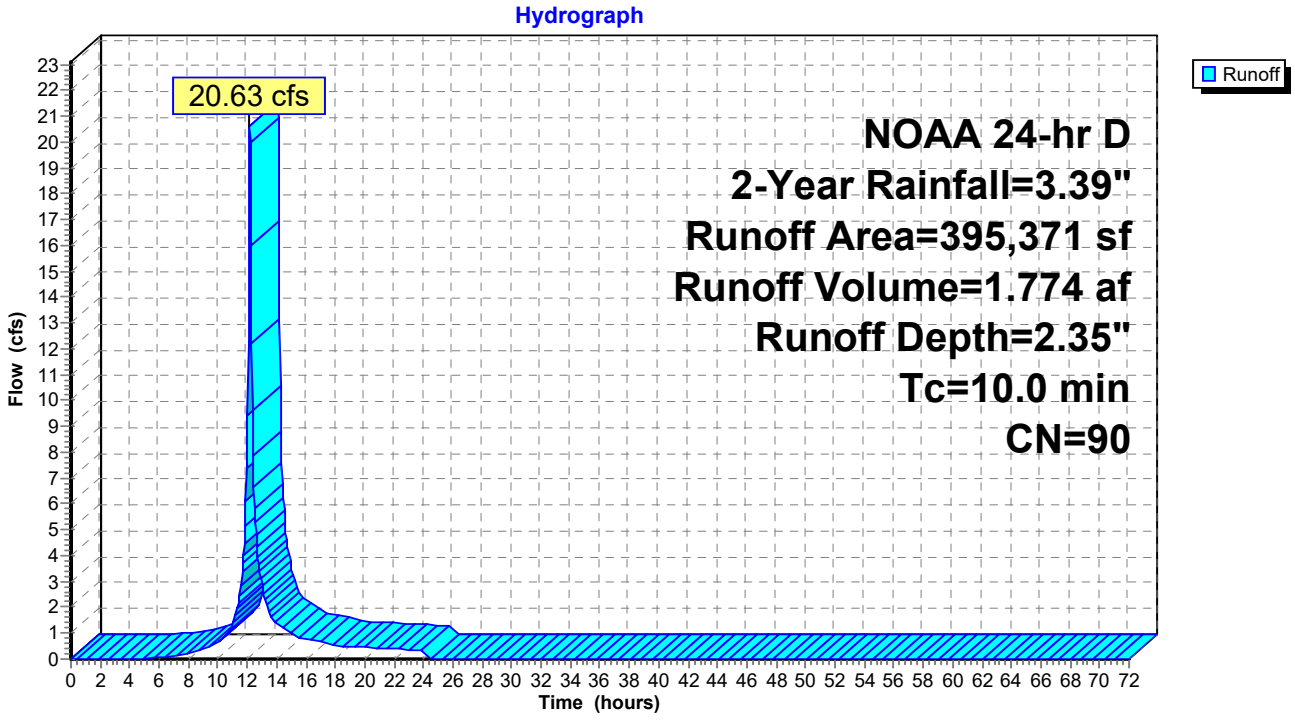
Runoff = 20.63 cfs @ 12.17 hrs, Volume= 1.774 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year Rainfall=3.39"

	Area (sf)	CN	Description
*	255,695	98	Impervious Surfaces
	109,755	74	>75% Grass cover, Good, HSG C
	29,921	80	>75% Grass cover, Good, HSG D
	395,371	90	Weighted Average
	139,676		35.33% Pervious Area
	255,695		64.67% Impervious Area

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

Subcatchment E-2: Runoff Tributary to Eastern Basin



Summary for Subcatchment E-3: Uncollected Runoff

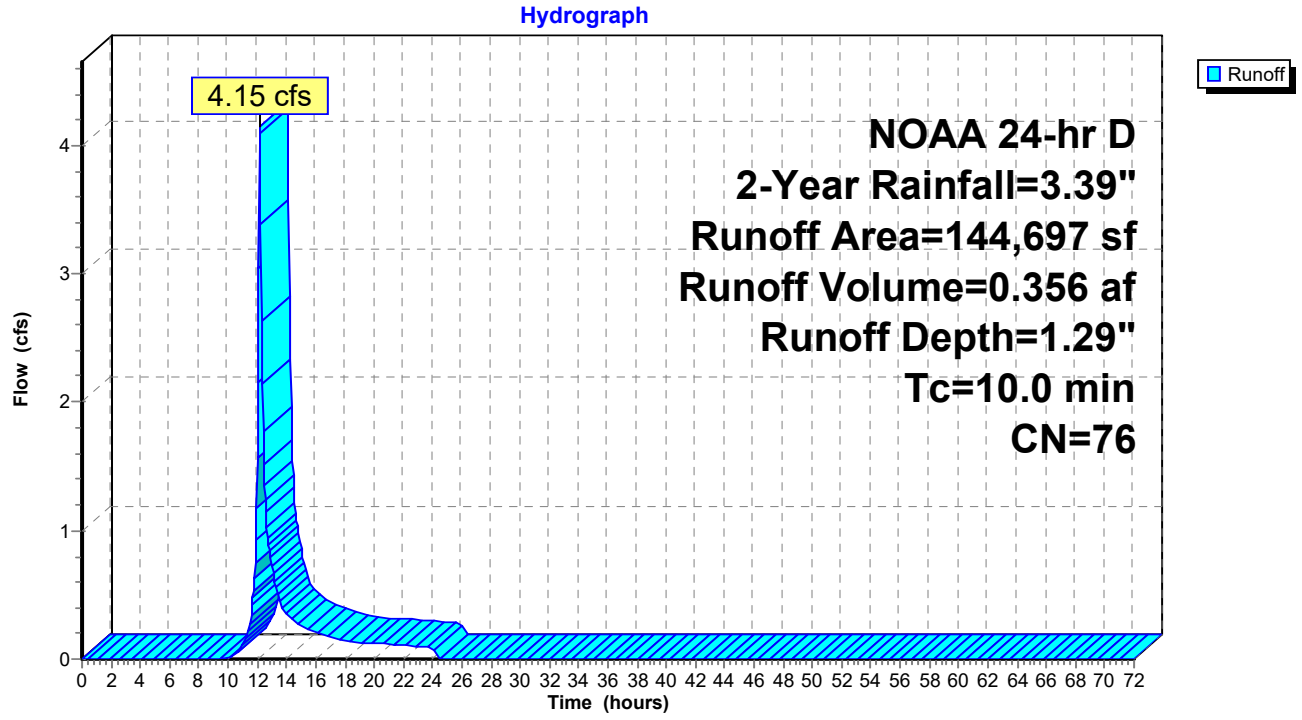
Runoff = 4.15 cfs @ 12.18 hrs, Volume= 0.356 af, Depth= 1.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year Rainfall=3.39"

	Area (sf)	CN	Description
*	6,373	98	Impervious Surfaces
	124,884	74	>75% Grass cover, Good, HSG C
	13,440	80	>75% Grass cover, Good, HSG D
	144,697	76	Weighted Average
	138,324		95.60% Pervious Area
	6,373		4.40% Impervious Area

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

Subcatchment E-3: Uncollected Runoff



Summary for Subcatchment P-1A: Runoff Tributary to B-1A

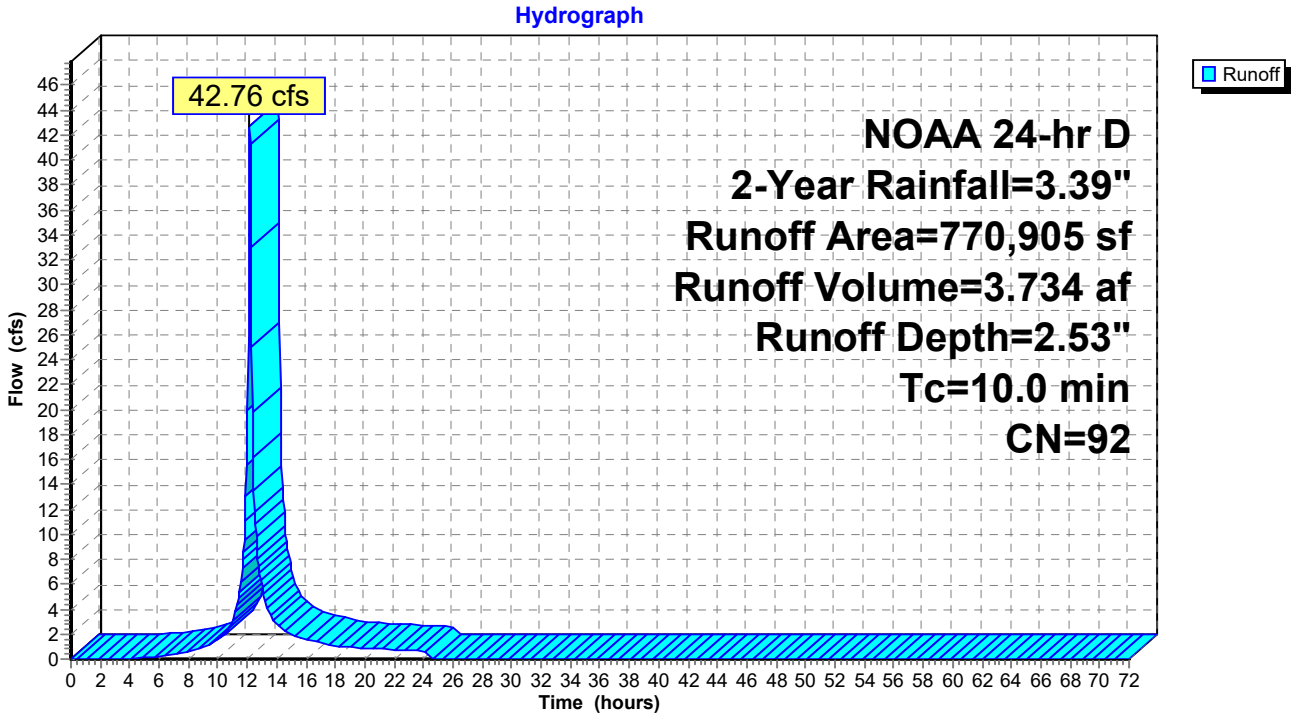
Runoff = 42.76 cfs @ 12.17 hrs, Volume= 3.734 af, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year Rainfall=3.39"

	Area (sf)	CN	Description
*	556,740	98	Impervious Surfaces
	101,064	74	>75% Grass cover, Good, HSG C
	113,101	80	>75% Grass cover, Good, HSG D
	770,905	92	Weighted Average
	214,165		27.78% Pervious Area
	556,740		72.22% Impervious Area

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

Subcatchment P-1A: Runoff Tributary to B-1A



Summary for Subcatchment P-1B: Runoff Tributary to B-1B

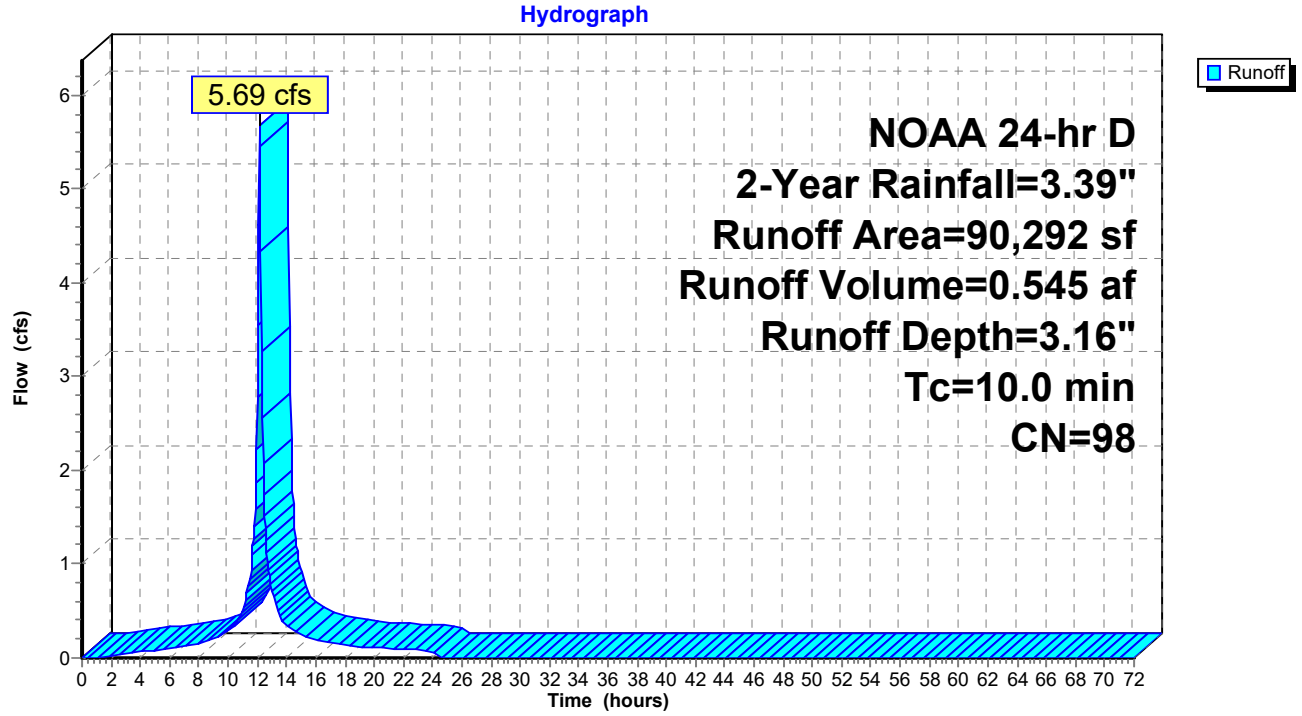
Runoff = 5.69 cfs @ 12.17 hrs, Volume= 0.545 af, Depth= 3.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year Rainfall=3.39"

	Area (sf)	CN	Description
*	90,292	98	Impervious Surfaces
	90,292		100.00% Impervious Area

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

Subcatchment P-1B: Runoff Tributary to B-1B



Summary for Subcatchment P-2A: Runoff Tributary to B-2A

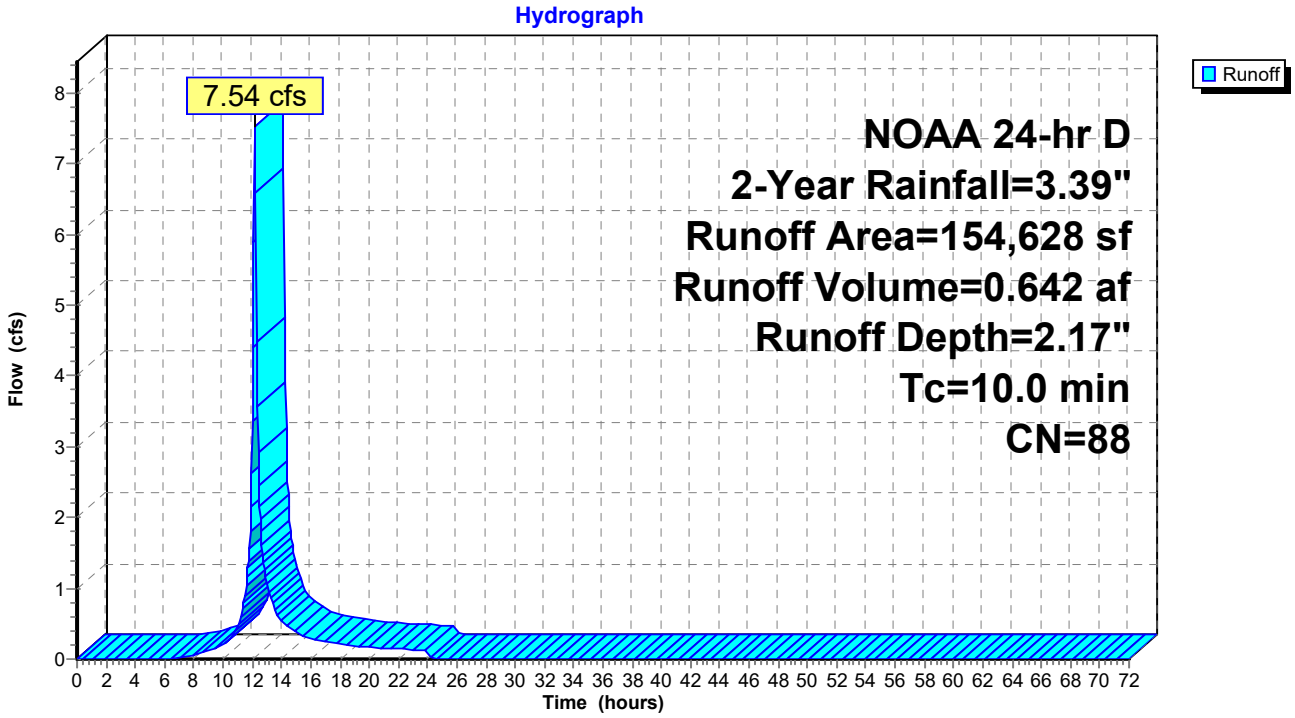
Runoff = 7.54 cfs @ 12.17 hrs, Volume= 0.642 af, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year Rainfall=3.39"

	Area (sf)	CN	Description
*	90,059	98	Impervious Surfaces
	51,674	74	>75% Grass cover, Good, HSG C
	12,895	80	>75% Grass cover, Good, HSG D
	154,628	88	Weighted Average
	64,569		41.76% Pervious Area
	90,059		58.24% Impervious Area

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

Subcatchment P-2A: Runoff Tributary to B-2A



Summary for Subcatchment P-2B: Runoff Tributary to B-2B

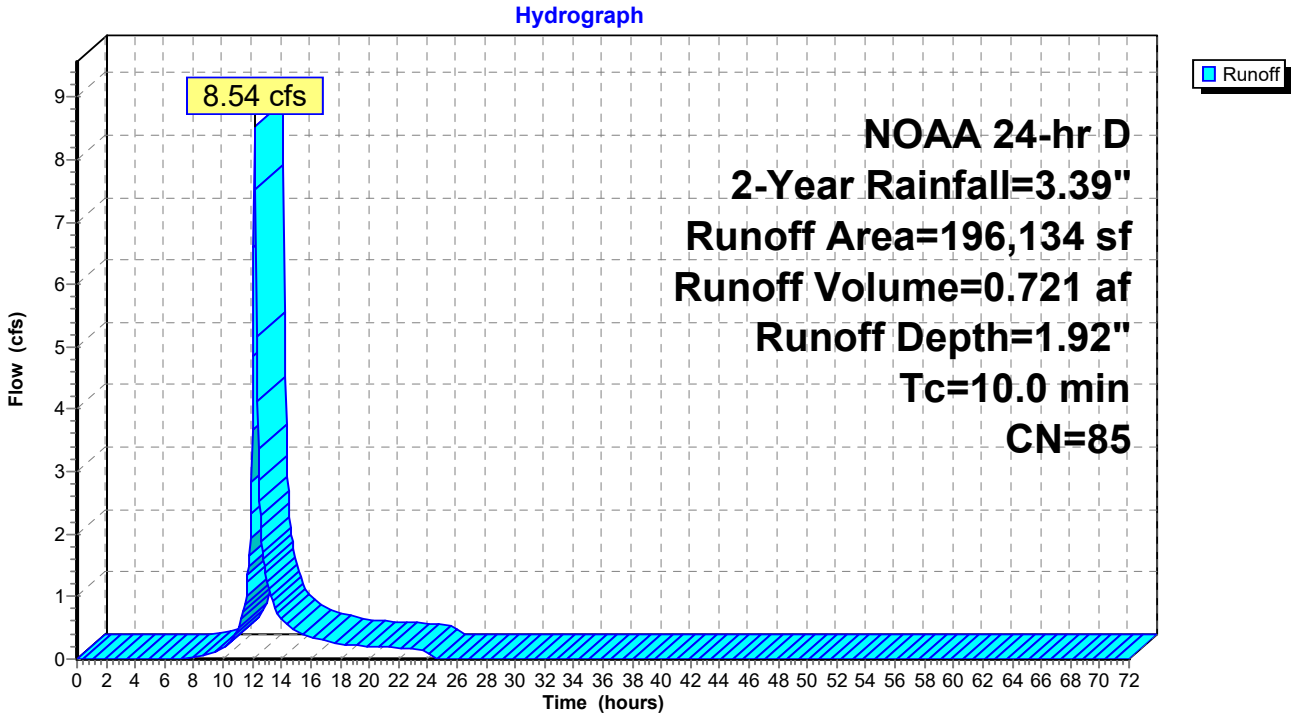
Runoff = 8.54 cfs @ 12.17 hrs, Volume= 0.721 af, Depth= 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year Rainfall=3.39"

	Area (sf)	CN	Description
*	84,845	98	Impervious Surfaces
	97,305	74	>75% Grass cover, Good, HSG C
	13,984	80	>75% Grass cover, Good, HSG D
	196,134	85	Weighted Average
	111,289		56.74% Pervious Area
	84,845		43.26% Impervious Area

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

Subcatchment P-2B: Runoff Tributary to B-2B



Summary for Subcatchment P-3: Uncollected Runoff

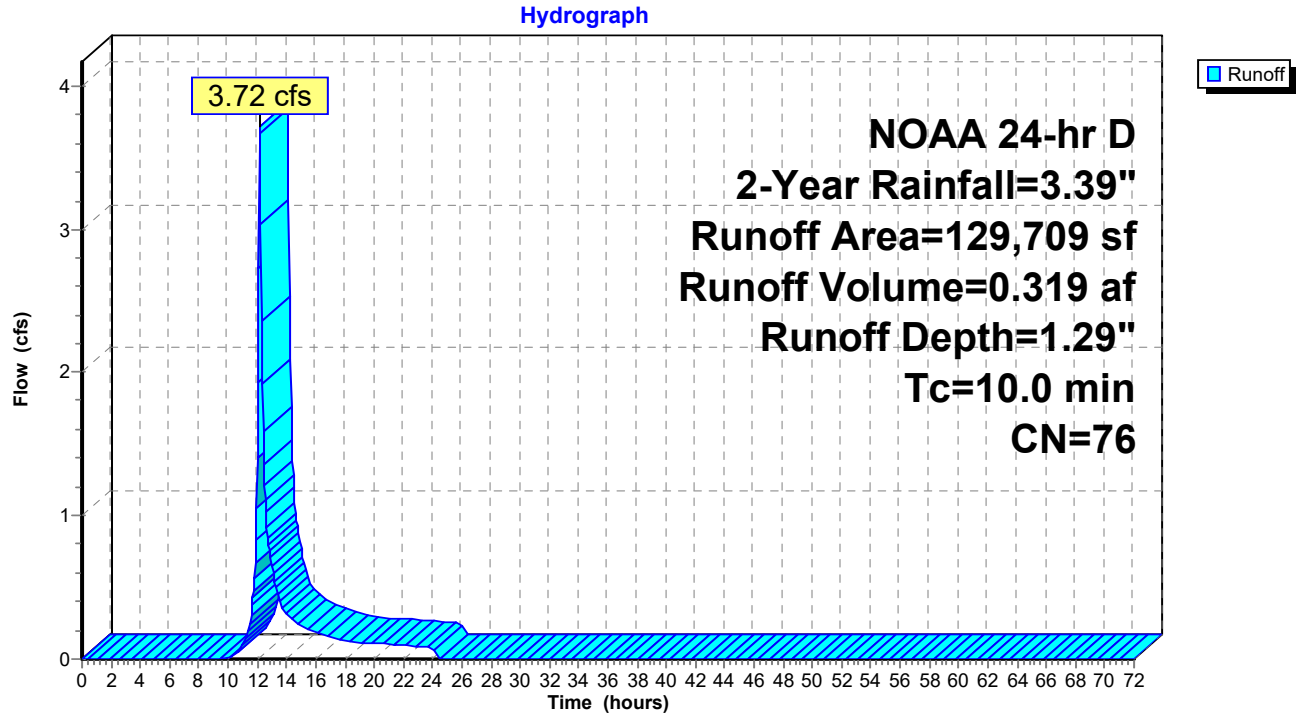
Runoff = 3.72 cfs @ 12.18 hrs, Volume= 0.319 af, Depth= 1.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year Rainfall=3.39"

	Area (sf)	CN	Description
*	6,994	98	Impervious Surfaces
	111,650	74	>75% Grass cover, Good, HSG C
	11,065	80	>75% Grass cover, Good, HSG D
	129,709	76	Weighted Average
	122,715		94.61% Pervious Area
	6,994		5.39% Impervious Area

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

Subcatchment P-3: Uncollected Runoff



Summary for Pond B-1A: Modified Southerly Aboveground Basin

Inflow Area = 19.770 ac, 75.13% Impervious, Inflow Depth = 2.58" for 2-Year event
Inflow = 45.26 cfs @ 12.17 hrs, Volume= 4.252 af
Outflow = 12.97 cfs @ 12.57 hrs, Volume= 4.251 af, Atten= 71%, Lag= 23.9 min
Primary = 12.97 cfs @ 12.57 hrs, Volume= 4.251 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 58.94' @ 12.57 hrs Surf.Area= 23,740 sf Storage= 59,926 cf

Plug-Flow detention time= 94.6 min calculated for 4.251 af (100% of inflow)
Center-of-Mass det. time= 94.4 min (899.9 - 805.5)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	177,944 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

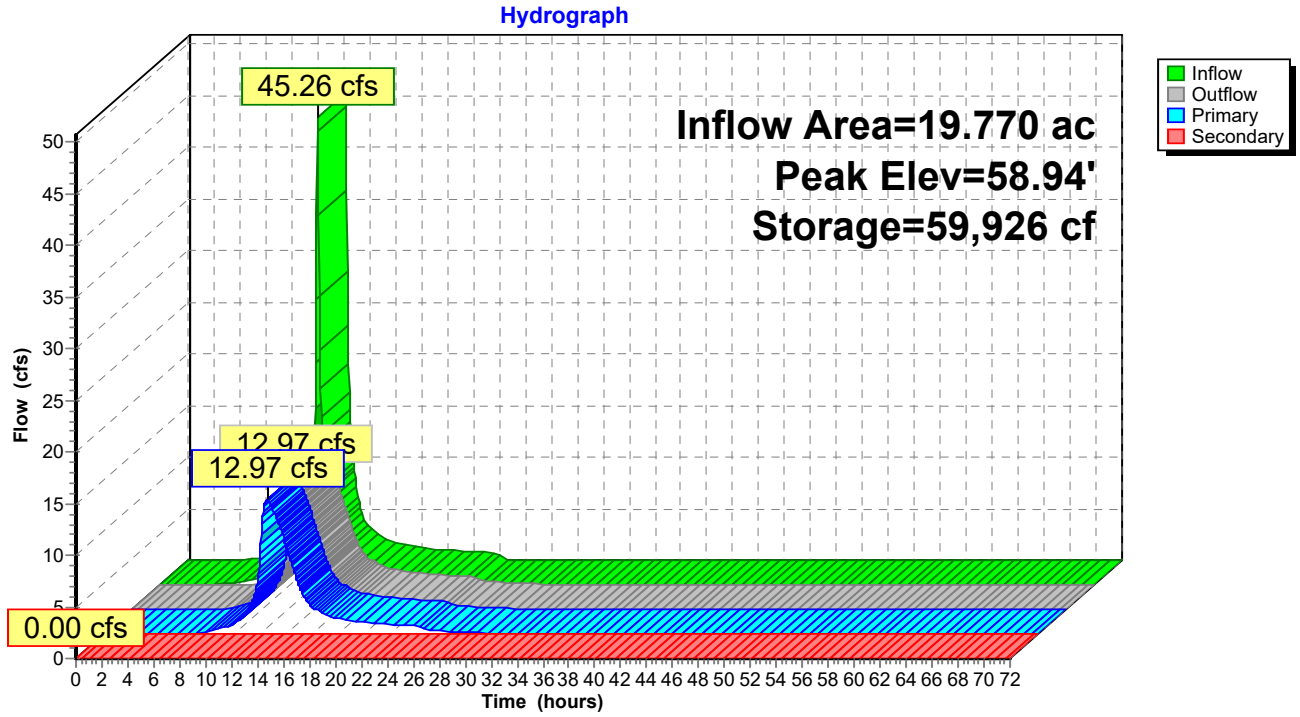
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.00	17,060	729.0	0	0	17,060
57.00	19,275	748.0	18,156	18,156	19,412
58.00	21,576	767.0	20,415	38,571	21,825
59.00	23,874	785.0	22,715	61,286	24,179
60.00	26,259	804.0	25,057	86,343	26,710
61.00	28,700	823.0	27,470	113,814	29,301
62.00	31,197	842.0	29,940	143,754	31,952
63.00	33,751	861.0	32,466	176,219	34,664
63.10	5,000	870.0	1,725	177,944	35,907

Device	Routing	Invert	Outlet Devices
#1	Primary	56.00'	**24.0" Round 24" Outlet Pipe** L= 19.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 56.00' / 55.14' S= 0.0453 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Device 1	56.00'	**18.0" Vert. 18" Orifice** C= 0.600
#3	Device 1	58.70'	**24.0" Vert. 24" Orifice** C= 0.600
#4	Secondary	63.00'	**20.0' long x 10.0' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=12.96 cfs @ 12.57 hrs HW=58.94' (Free Discharge)
└**1=24" Outlet Pipe** (Passes 12.96 cfs of 21.08 cfs potential flow)
  ├**2=18" Orifice** (Orifice Controls 12.60 cfs @ 7.13 fps)
  └**3=24" Orifice** (Orifice Controls 0.36 cfs @ 1.67 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=56.00' (Free Discharge)
└**4=Spillway** (Controls 0.00 cfs)

Pond B-1A: Modified Southerly Aboveground Basin



Summary for Pond B-1B: Proposed Subsurface Basin in Stone

Inflow Area = 2.073 ac,100.00% Impervious, Inflow Depth = 3.16" for 2-Year event
Inflow = 5.69 cfs @ 12.17 hrs, Volume= 0.545 af
Outflow = 2.90 cfs @ 12.33 hrs, Volume= 0.518 af, Atten= 49%, Lag= 9.5 min
Primary = 2.90 cfs @ 12.33 hrs, Volume= 0.518 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 66.57' @ 12.33 hrs Surf.Area= 0.074 ac Storage= 0.109 af

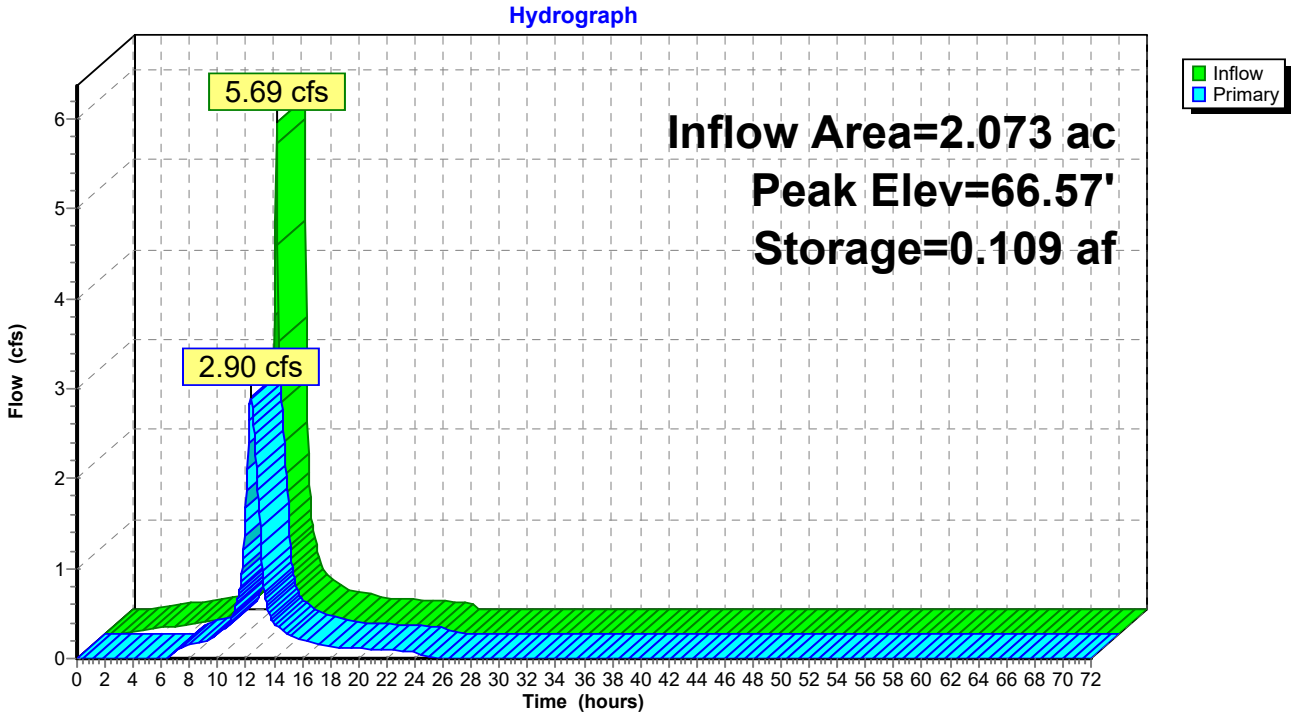
Plug-Flow detention time= 74.2 min calculated for 0.518 af (95% of inflow)
Center-of-Mass det. time= 44.8 min (805.6 - 760.8)

Volume	Invert	Avail.Storage	Storage Description
#1	64.87'	0.114 af	**36.0" Round Pipe Storage** x 7 Inside #2 L= 100.0' S= 0.0010 '/' 0.155 af Overall - 3.0" Wall Thickness = 0.114 af
#2	63.87'	0.087 af	**54.0" W x 60.0" H Box Stone** x 7 L= 103.0' S= 0.0010 '/' 0.372 af Overall - 0.155 af Embedded = 0.218 af x 40.0% Voids
		0.201 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	64.87'	**18.0" Round 18" Outlet Pipe** L= 17.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 64.87' / 64.79' S= 0.0047 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	64.87'	**12.0" W x 6.0" H Vert. 12" x 6" Slot** C= 0.600
#3	Device 1	66.56'	**30.0" W x 8.0" H Vert. 30" x 8" Slot** C= 0.600
#4	Device 1	67.87'	**6.0' long x 0.5' breadth 6' Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=2.90 cfs @ 12.33 hrs HW=66.57' (Free Discharge)
└**1=18" Outlet Pipe** (Passes 2.90 cfs of 7.10 cfs potential flow)
  ├**2=12" x 6" Slot** (Orifice Controls 2.89 cfs @ 5.78 fps)
  ├**3=30" x 8" Slot** (Orifice Controls 0.00 cfs @ 0.25 fps)
  └**4=6' Weir** (Controls 0.00 cfs)

Pond B-1B: Proposed Subsurface Basin in Stone



Summary for Pond B-2A: Proposed Northerly Aboveground Basin

Inflow Area = 3.550 ac, 58.24% Impervious, Inflow Depth = 2.17" for 2-Year event
Inflow = 7.54 cfs @ 12.17 hrs, Volume= 0.642 af
Outflow = 3.97 cfs @ 12.33 hrs, Volume= 0.641 af, Atten= 47%, Lag= 9.4 min
Primary = 3.97 cfs @ 12.33 hrs, Volume= 0.641 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 70.18' @ 12.33 hrs Surf.Area= 6,169 sf Storage= 6,644 cf

Plug-Flow detention time= 63.1 min calculated for 0.641 af (100% of inflow)
Center-of-Mass det. time= 64.4 min (888.9 - 824.5)

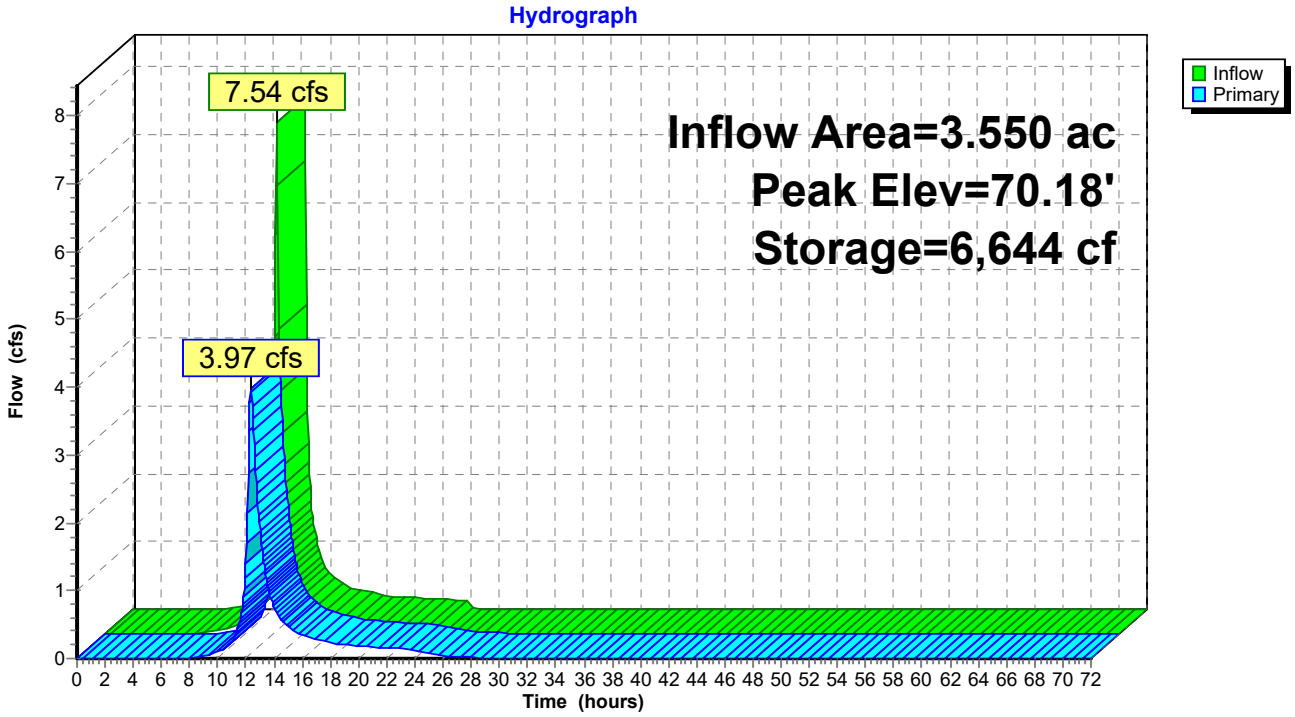
Volume	Invert	Avail.Storage	Storage Description
#1	69.00'	28,786 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
69.00	5,090	294.0	0	0	5,090
70.00	5,999	313.0	5,538	5,538	6,057
71.00	6,965	331.0	6,476	12,014	7,034
72.00	7,988	350.0	7,471	19,485	8,118
73.00	9,067	369.0	8,522	28,007	9,263
73.20	500	400.0	780	28,786	11,162

Device	Routing	Invert	Outlet Devices
#1	Primary	69.00'	**15.0" Round 15" Outlet Pipe** L= 107.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.00' / 68.47' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Primary	73.00'	**80.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=3.96 cfs @ 12.33 hrs HW=70.18' (Free Discharge)
1=15" Outlet Pipe (Barrel Controls 3.96 cfs @ 4.27 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond B-2A: Proposed Northerly Aboveground Basin



Summary for Pond B-2B: Proposed Subsurface Basin

Inflow Area = 4.503 ac, 43.26% Impervious, Inflow Depth = 1.92" for 2-Year event
Inflow = 8.54 cfs @ 12.17 hrs, Volume= 0.721 af
Outflow = 4.01 cfs @ 12.36 hrs, Volume= 0.721 af, Atten= 53%, Lag= 11.2 min
Primary = 4.01 cfs @ 12.36 hrs, Volume= 0.721 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 67.17' @ 12.36 hrs Surf.Area= 0.228 ac Storage= 0.151 af

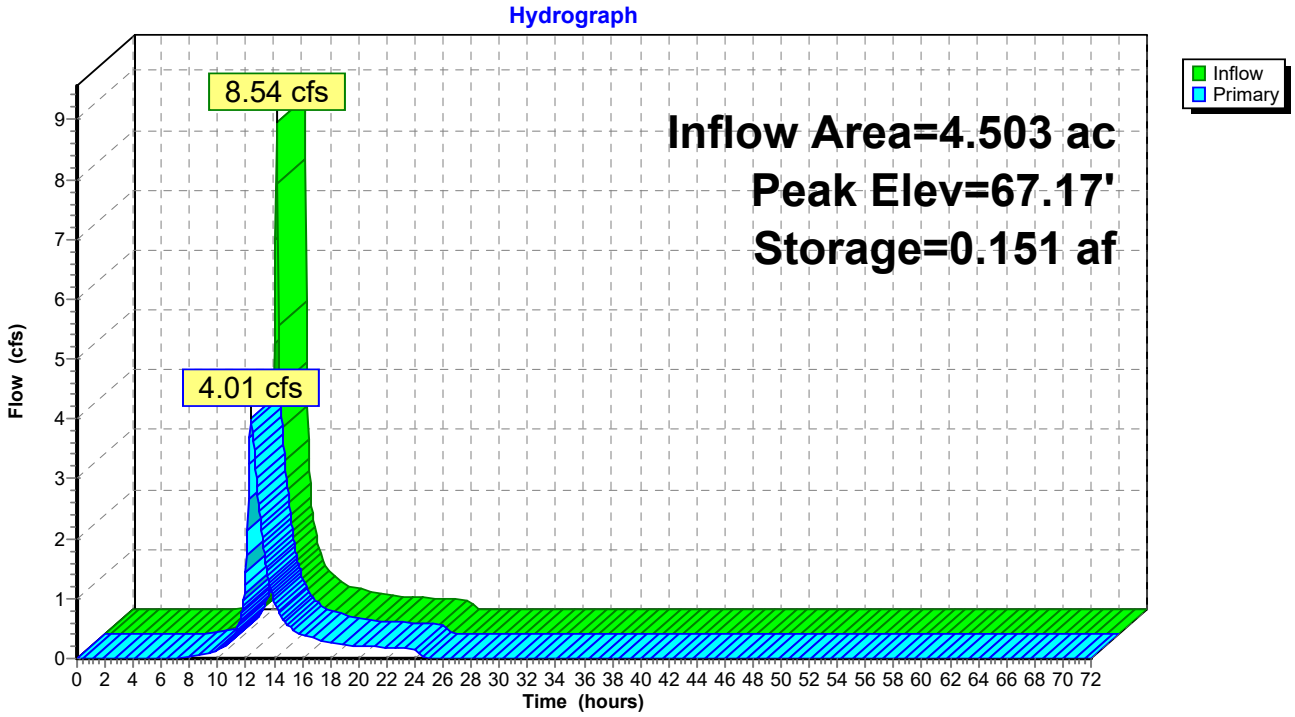
Plug-Flow detention time= 24.1 min calculated for 0.720 af (100% of inflow)
Center-of-Mass det. time= 24.1 min (860.6 - 836.5)

Volume	Invert	Avail.Storage	Storage Description
#1	66.10'	0.584 af	**36.0" Round Pipe Storage** x 12 L= 300.0' S= 0.0010 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.10'	**18.0" Round 18" Outlet Pipe** L= 64.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 66.10' / 65.78' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	66.10'	**18.0" Vert. 18" Orifice** C= 0.600
#3	Device 1	67.85'	**12.0" Vert. 12" Orifice X 0.00** C= 0.600
#4	Primary	69.30'	**6.0' long x 0.5' breadth 6 FT Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.00 cfs @ 12.36 hrs HW=67.16' (Free Discharge)
- **1=18" Outlet Pipe** (Barrel Controls 4.00 cfs @ 4.18 fps)
  - **2=18" Orifice** (Passes 4.00 cfs of 4.71 cfs potential flow)
  - **3=12" Orifice** (Controls 0.00 cfs)
- **4=6 FT Weir** (Controls 0.00 cfs)

Pond B-2B: Proposed Subsurface Basin

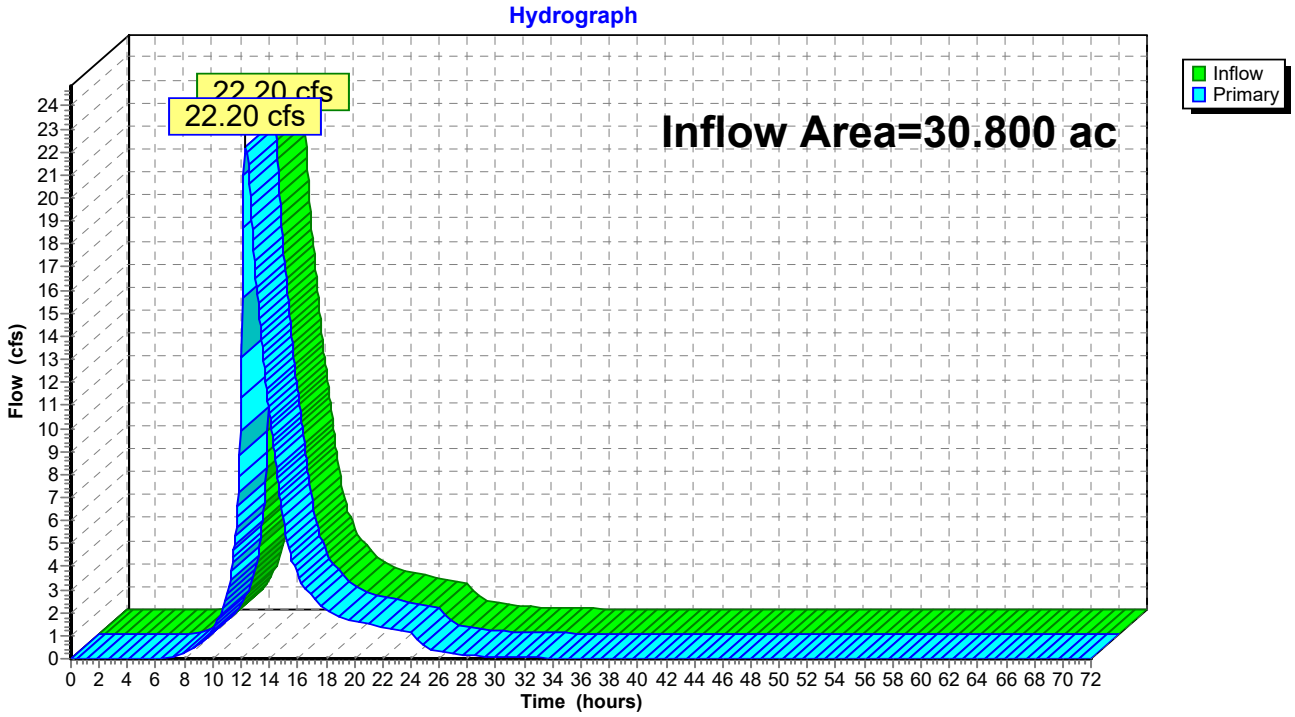


Summary for Link POI-1: Connection to 42" RCP

Inflow Area = 30.800 ac, 61.78% Impervious, Inflow Depth = 2.31" for 2-Year event
Inflow = 22.20 cfs @ 12.33 hrs, Volume= 5.932 af
Primary = 22.20 cfs @ 12.33 hrs, Volume= 5.932 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link POI-1: Connection to 42" RCP

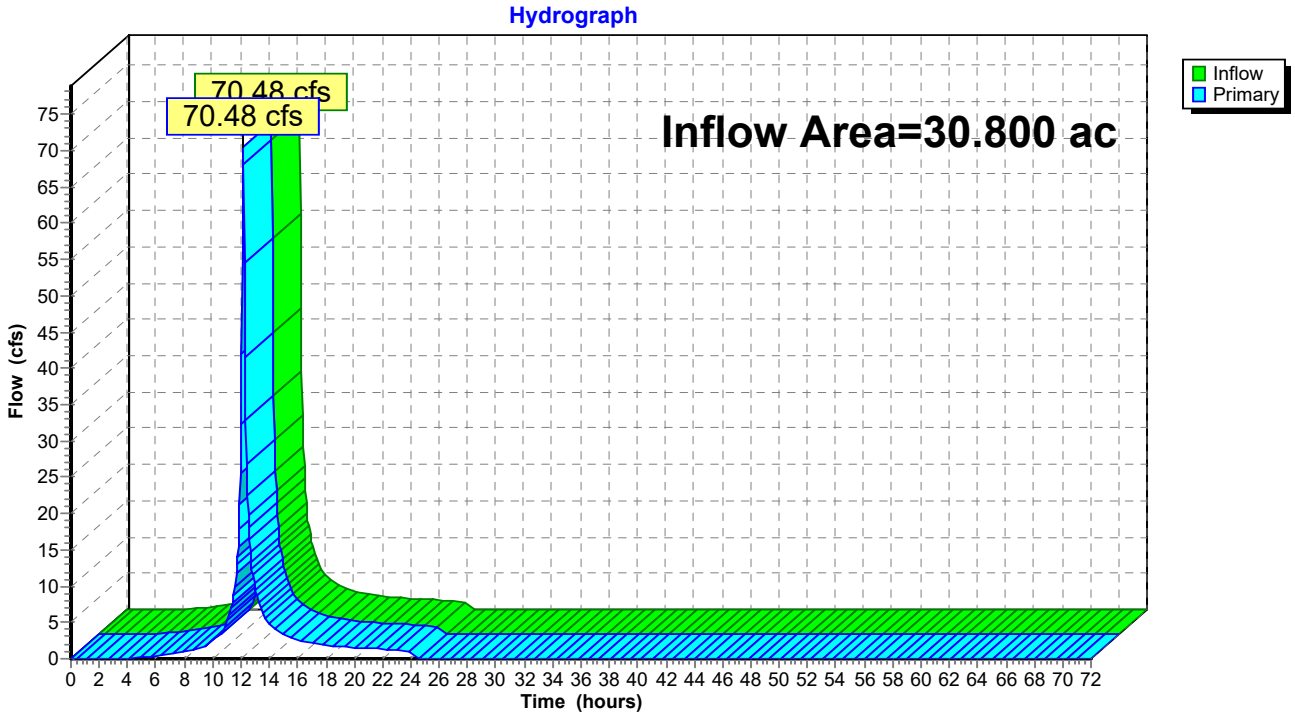


Summary for Link POI-1(EX): Connection to 42" RCP

Inflow Area = 30.800 ac, 66.56% Impervious, Inflow Depth = 2.40" for 2-Year event
Inflow = 70.48 cfs @ 12.17 hrs, Volume= 6.161 af
Primary = 70.48 cfs @ 12.17 hrs, Volume= 6.161 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link POI-1(EX): Connection to 42" RCP

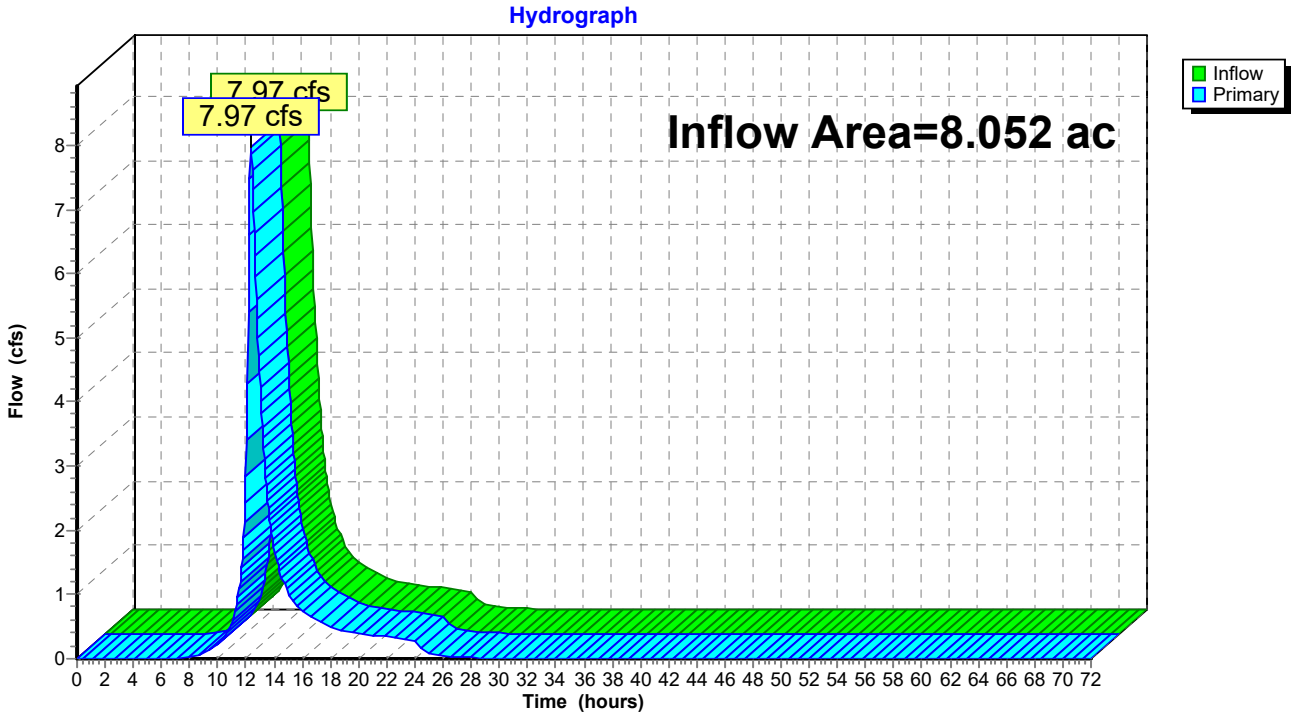


Summary for Link POI-2: Connection to 18" RCP

Inflow Area = 8.052 ac, 49.86% Impervious, Inflow Depth = 2.03" for 2-Year event
Inflow = 7.97 cfs @ 12.35 hrs, Volume= 1.362 af
Primary = 7.97 cfs @ 12.35 hrs, Volume= 1.362 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link POI-2: Connection to 18" RCP

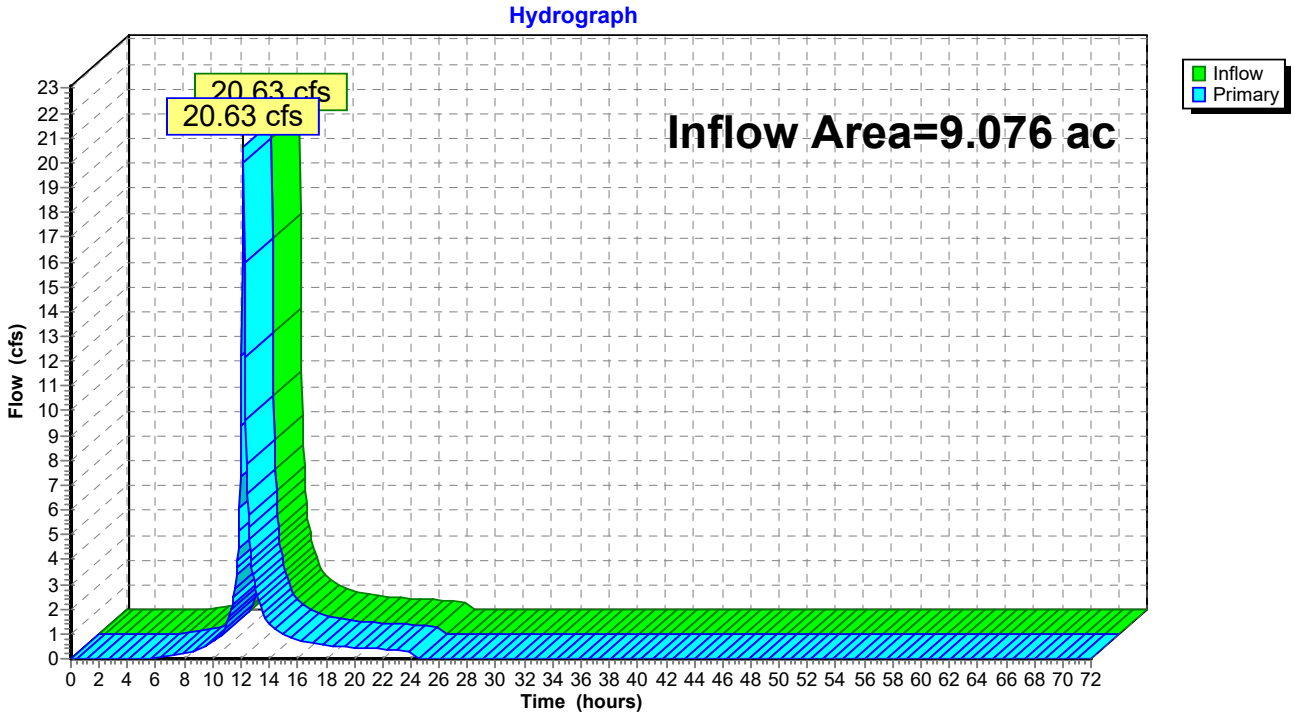


Summary for Link POI-2(EX): Connection to 18" RCP

Inflow Area = 9.076 ac, 64.67% Impervious, Inflow Depth = 2.35" for 2-Year event
Inflow = 20.63 cfs @ 12.17 hrs, Volume= 1.774 af
Primary = 20.63 cfs @ 12.17 hrs, Volume= 1.774 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link POI-2(EX): Connection to 18" RCP



Summary for Subcatchment E-1: Runoff Tributary to Southeast Basin

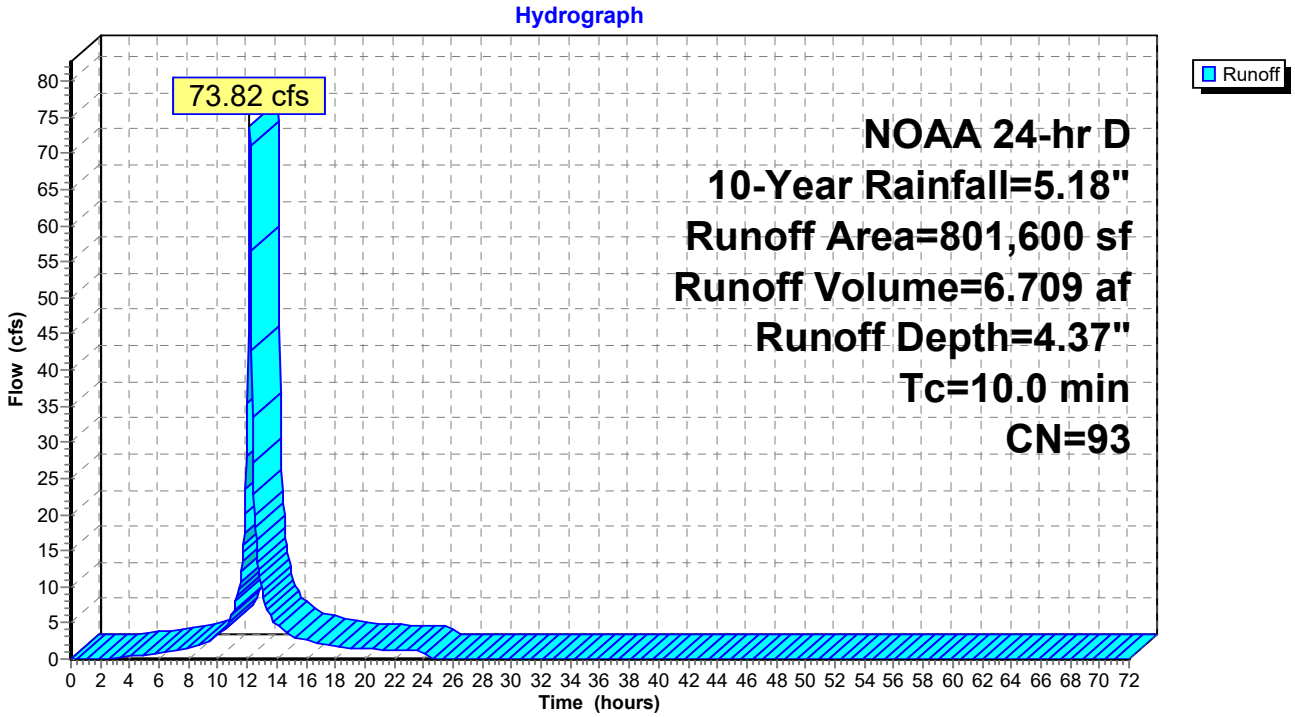
Runoff = 73.82 cfs @ 12.17 hrs, Volume= 6.709 af, Depth= 4.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year Rainfall=5.18"

	Area (sf)	CN	Description
*	630,951	98	Impervious Surfaces
	92,120	74	>75% Grass cover, Good, HSG C
	78,529	80	>75% Grass cover, Good, HSG D
	801,600	93	Weighted Average
	170,649		21.29% Pervious Area
	630,951		78.71% Impervious Area

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

Subcatchment E-1: Runoff Tributary to Southeast Basin



Summary for Subcatchment E-2: Runoff Tributary to Eastern Basin

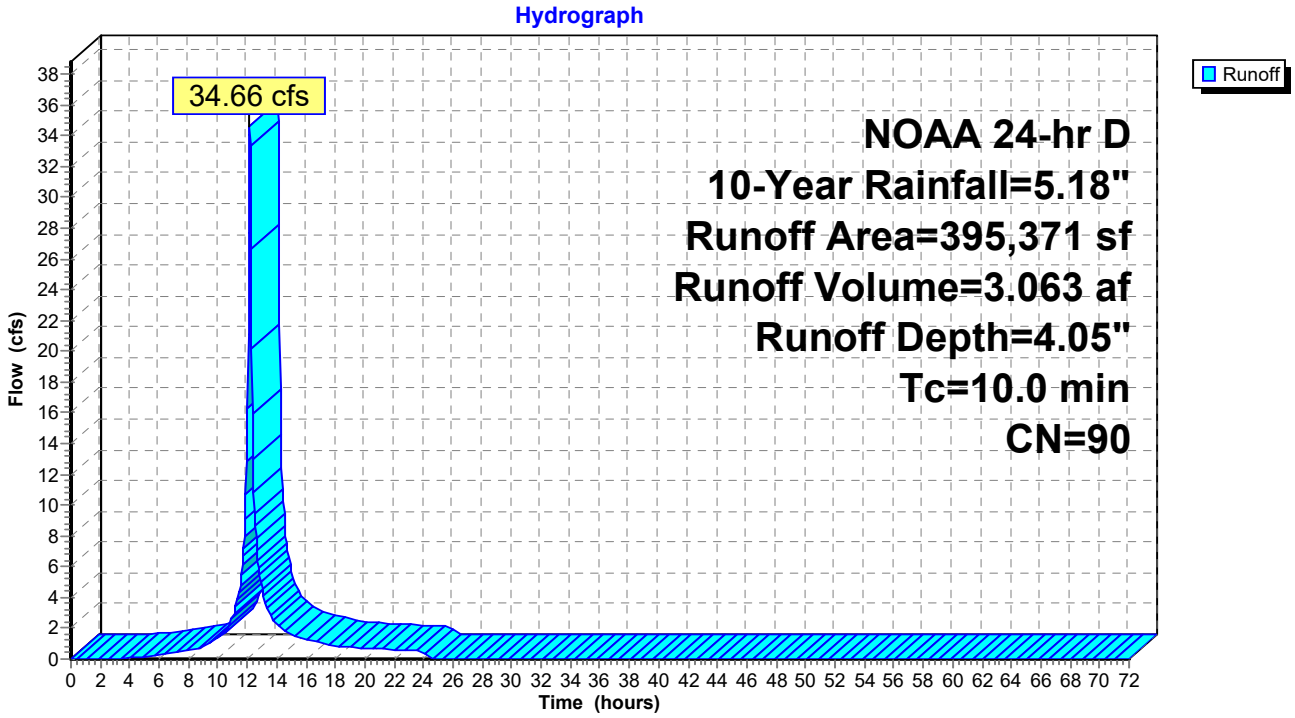
Runoff = 34.66 cfs @ 12.17 hrs, Volume= 3.063 af, Depth= 4.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year Rainfall=5.18"

	Area (sf)	CN	Description
*	255,695	98	Impervious Surfaces
	109,755	74	>75% Grass cover, Good, HSG C
	29,921	80	>75% Grass cover, Good, HSG D
	395,371	90	Weighted Average
	139,676		35.33% Pervious Area
	255,695		64.67% Impervious Area

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

Subcatchment E-2: Runoff Tributary to Eastern Basin



Summary for Subcatchment E-3: Uncollected Runoff

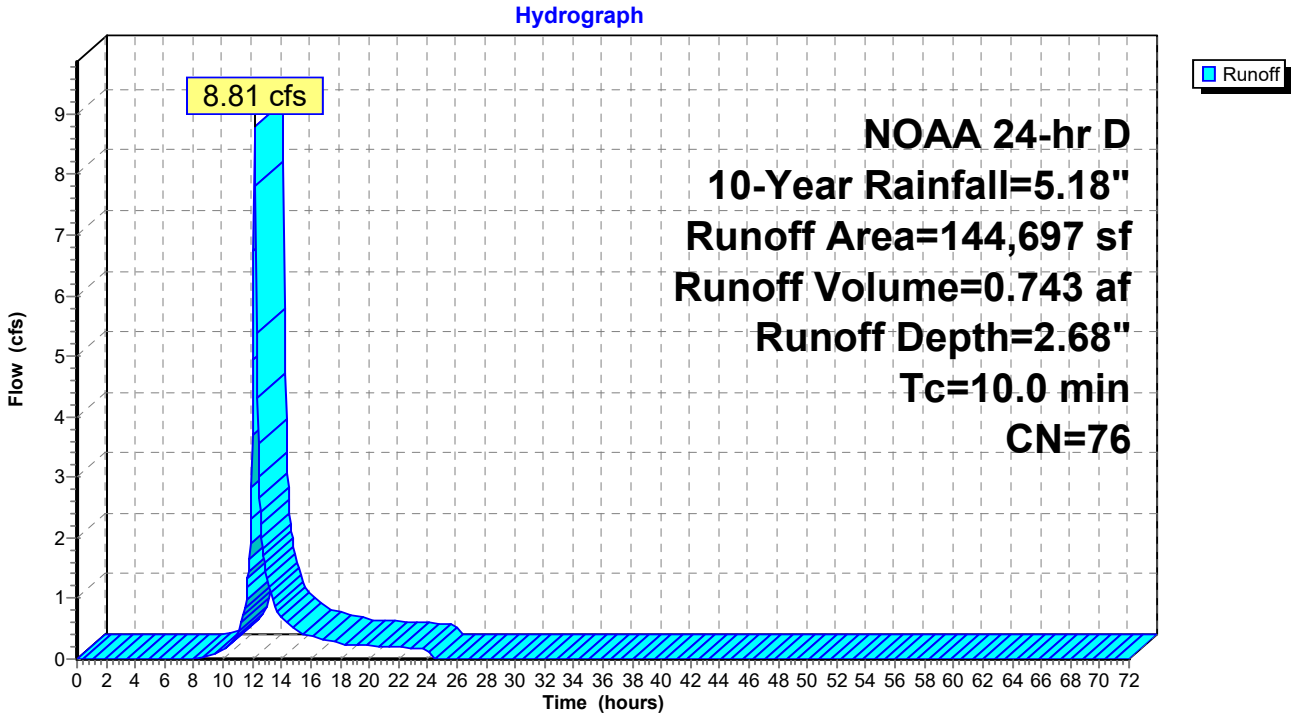
Runoff = 8.81 cfs @ 12.18 hrs, Volume= 0.743 af, Depth= 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year Rainfall=5.18"

	Area (sf)	CN	Description
*	6,373	98	Impervious Surfaces
	124,884	74	>75% Grass cover, Good, HSG C
	13,440	80	>75% Grass cover, Good, HSG D
	144,697	76	Weighted Average
	138,324		95.60% Pervious Area
	6,373		4.40% Impervious Area

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

Subcatchment E-3: Uncollected Runoff



Summary for Subcatchment P-1A: Runoff Tributary to B-1A

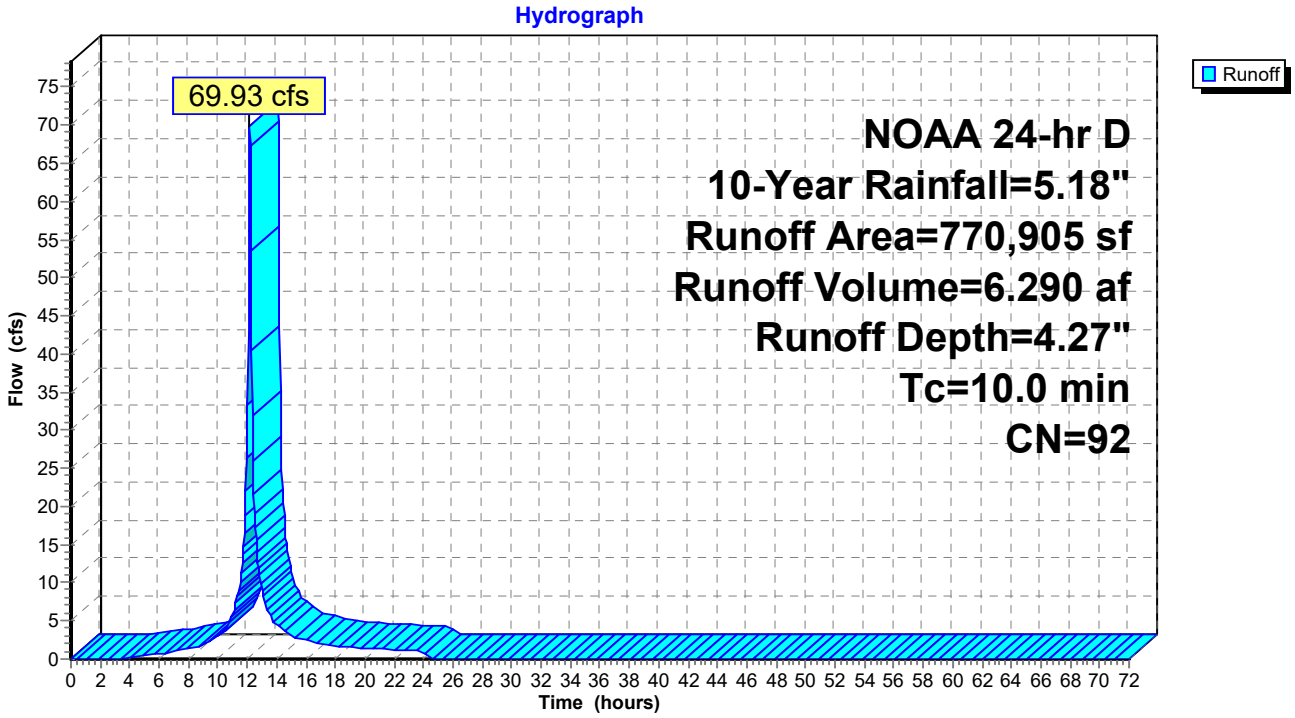
Runoff = 69.93 cfs @ 12.17 hrs, Volume= 6.290 af, Depth= 4.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year Rainfall=5.18"

	Area (sf)	CN	Description
*	556,740	98	Impervious Surfaces
	101,064	74	>75% Grass cover, Good, HSG C
	113,101	80	>75% Grass cover, Good, HSG D
	770,905	92	Weighted Average
	214,165		27.78% Pervious Area
	556,740		72.22% Impervious Area

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

Subcatchment P-1A: Runoff Tributary to B-1A



Summary for Subcatchment P-1B: Runoff Tributary to B-1B

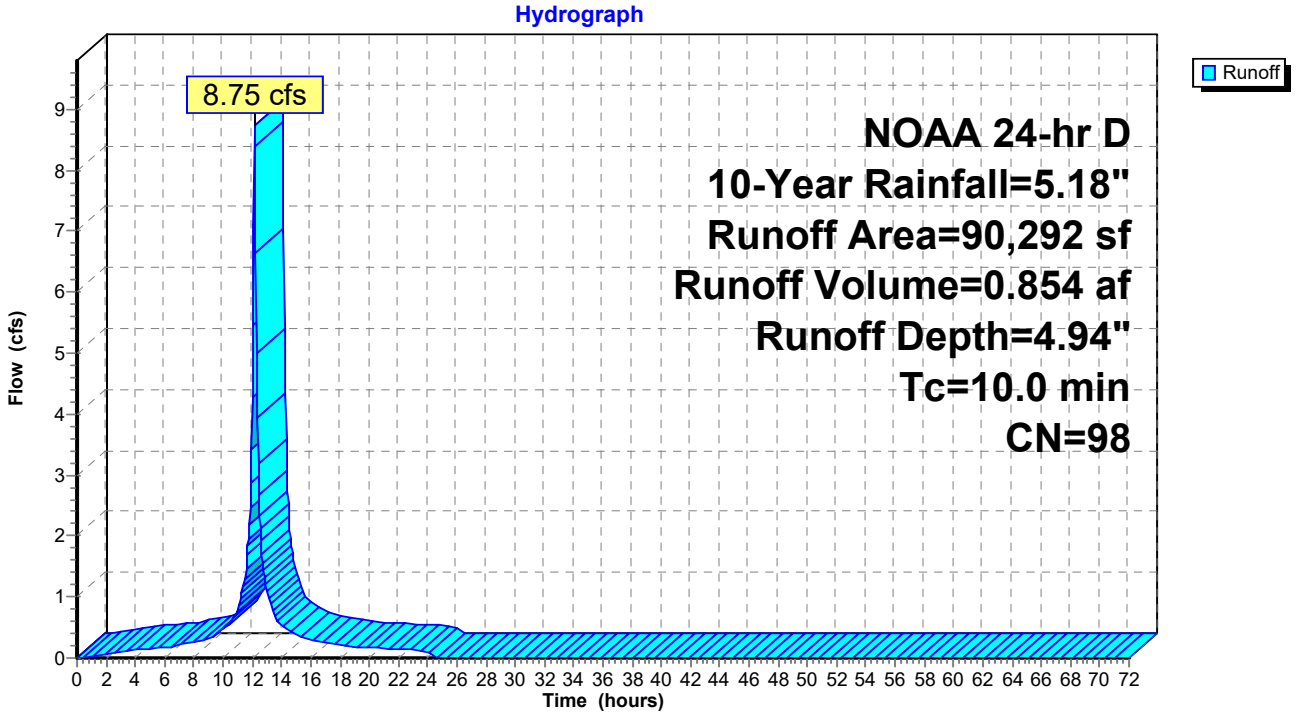
Runoff = 8.75 cfs @ 12.17 hrs, Volume= 0.854 af, Depth= 4.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year Rainfall=5.18"

	Area (sf)	CN	Description
*	90,292	98	Impervious Surfaces
	90,292		100.00% Impervious Area

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

Subcatchment P-1B: Runoff Tributary to B-1B



Summary for Subcatchment P-2A: Runoff Tributary to B-2A

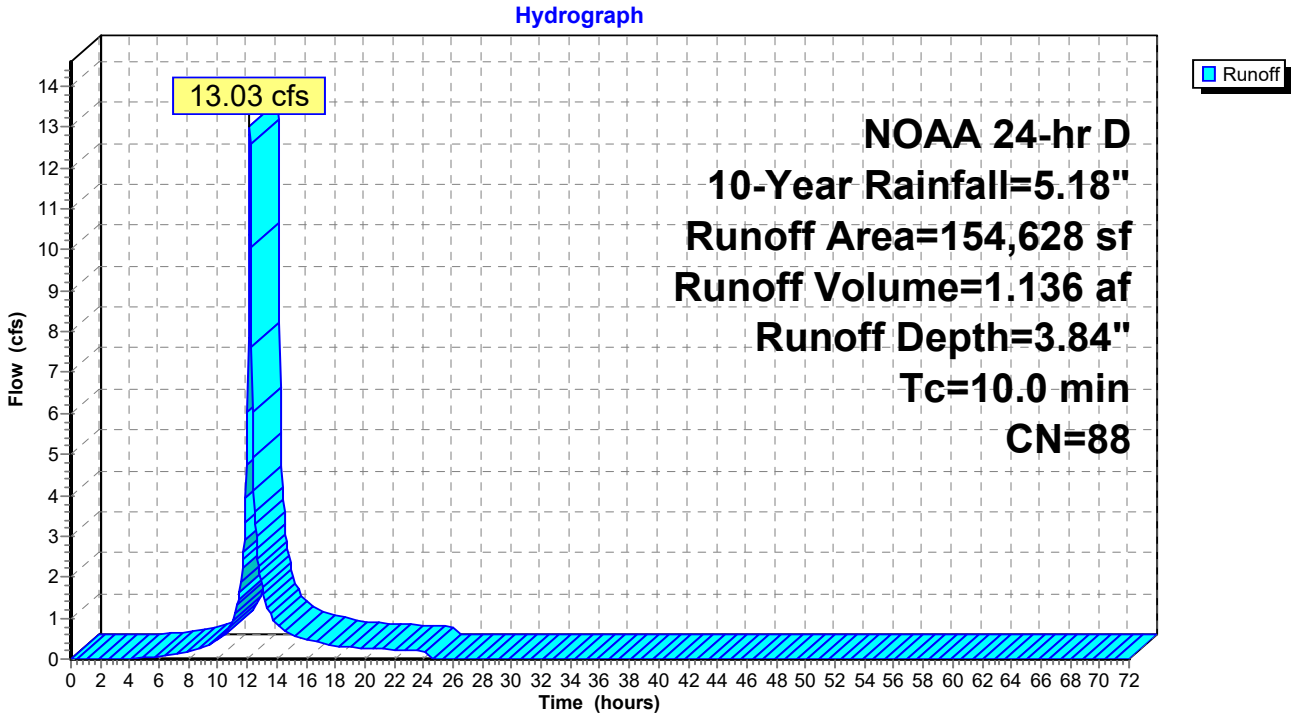
Runoff = 13.03 cfs @ 12.17 hrs, Volume= 1.136 af, Depth= 3.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year Rainfall=5.18"

	Area (sf)	CN	Description
*	90,059	98	Impervious Surfaces
	51,674	74	>75% Grass cover, Good, HSG C
	12,895	80	>75% Grass cover, Good, HSG D
	154,628	88	Weighted Average
	64,569		41.76% Pervious Area
	90,059		58.24% Impervious Area

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

Subcatchment P-2A: Runoff Tributary to B-2A



Summary for Subcatchment P-2B: Runoff Tributary to B-2B

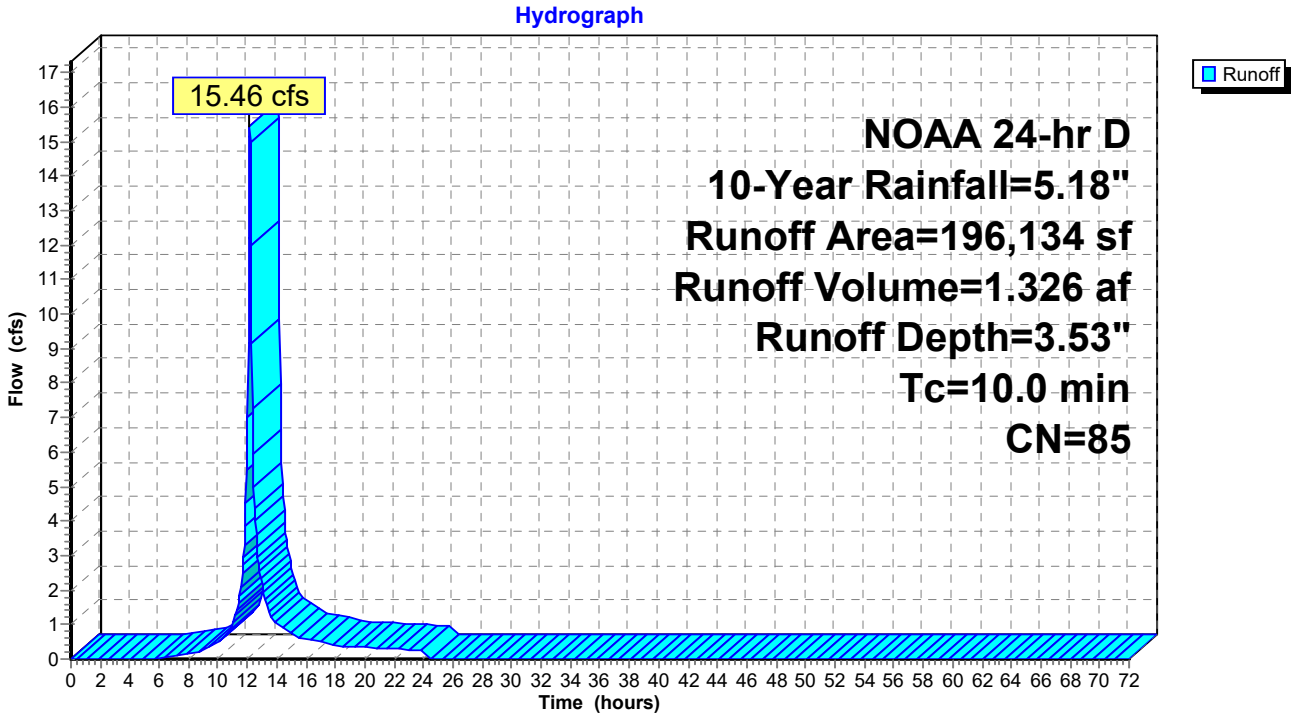
Runoff = 15.46 cfs @ 12.17 hrs, Volume= 1.326 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year Rainfall=5.18"

	Area (sf)	CN	Description
*	84,845	98	Impervious Surfaces
	97,305	74	>75% Grass cover, Good, HSG C
	13,984	80	>75% Grass cover, Good, HSG D
	196,134	85	Weighted Average
	111,289		56.74% Pervious Area
	84,845		43.26% Impervious Area

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

Subcatchment P-2B: Runoff Tributary to B-2B



Summary for Subcatchment P-3: Uncollected Runoff

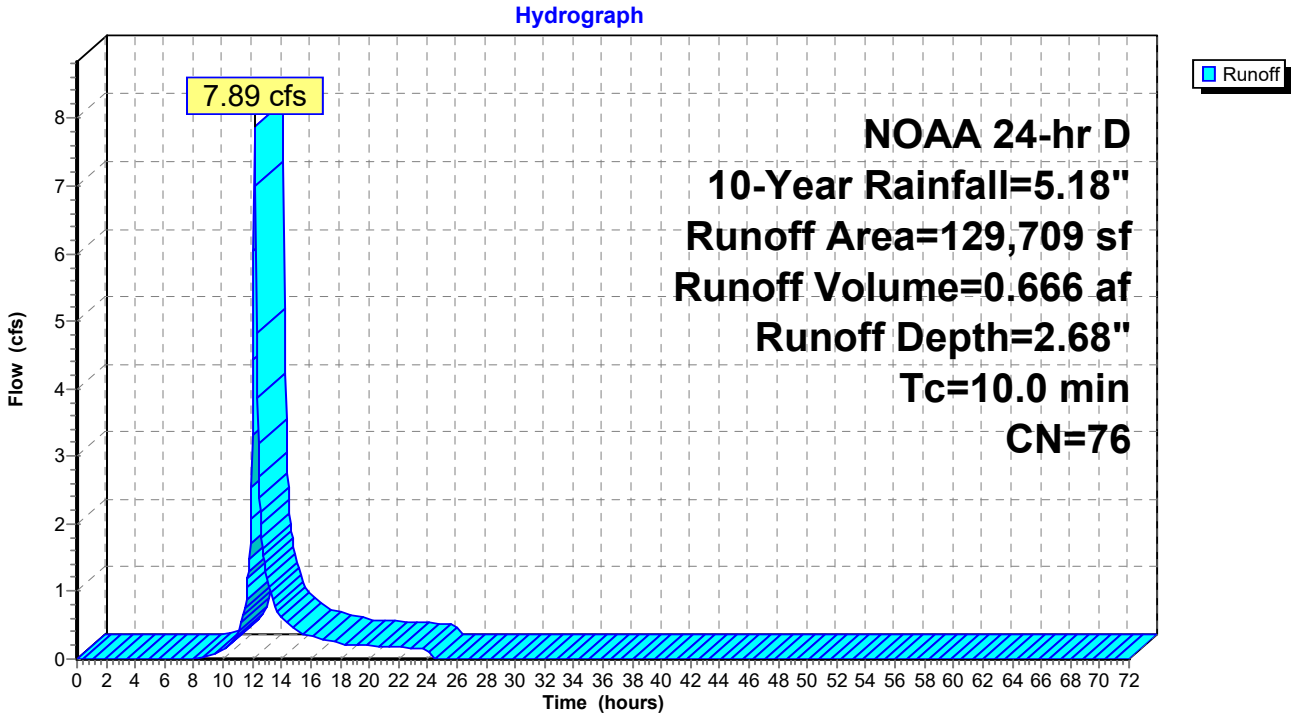
Runoff = 7.89 cfs @ 12.18 hrs, Volume= 0.666 af, Depth= 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year Rainfall=5.18"

	Area (sf)	CN	Description
*	6,994	98	Impervious Surfaces
	111,650	74	>75% Grass cover, Good, HSG C
	11,065	80	>75% Grass cover, Good, HSG D
	129,709	76	Weighted Average
	122,715		94.61% Pervious Area
	6,994		5.39% Impervious Area

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

Subcatchment P-3: Uncollected Runoff



Summary for Pond B-1A: Modified Southerly Aboveground Basin

Inflow Area = 19.770 ac, 75.13% Impervious, Inflow Depth = 4.32" for 10-Year event
Inflow = 74.69 cfs @ 12.18 hrs, Volume= 7.117 af
Outflow = 27.13 cfs @ 12.44 hrs, Volume= 7.116 af, Atten= 64%, Lag= 15.5 min
Primary = 27.13 cfs @ 12.44 hrs, Volume= 7.116 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 60.26' @ 12.44 hrs Surf.Area= 26,885 sf Storage= 93,274 cf

Plug-Flow detention time= 82.0 min calculated for 7.116 af (100% of inflow)
Center-of-Mass det. time= 81.7 min (871.4 - 789.7)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	177,944 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

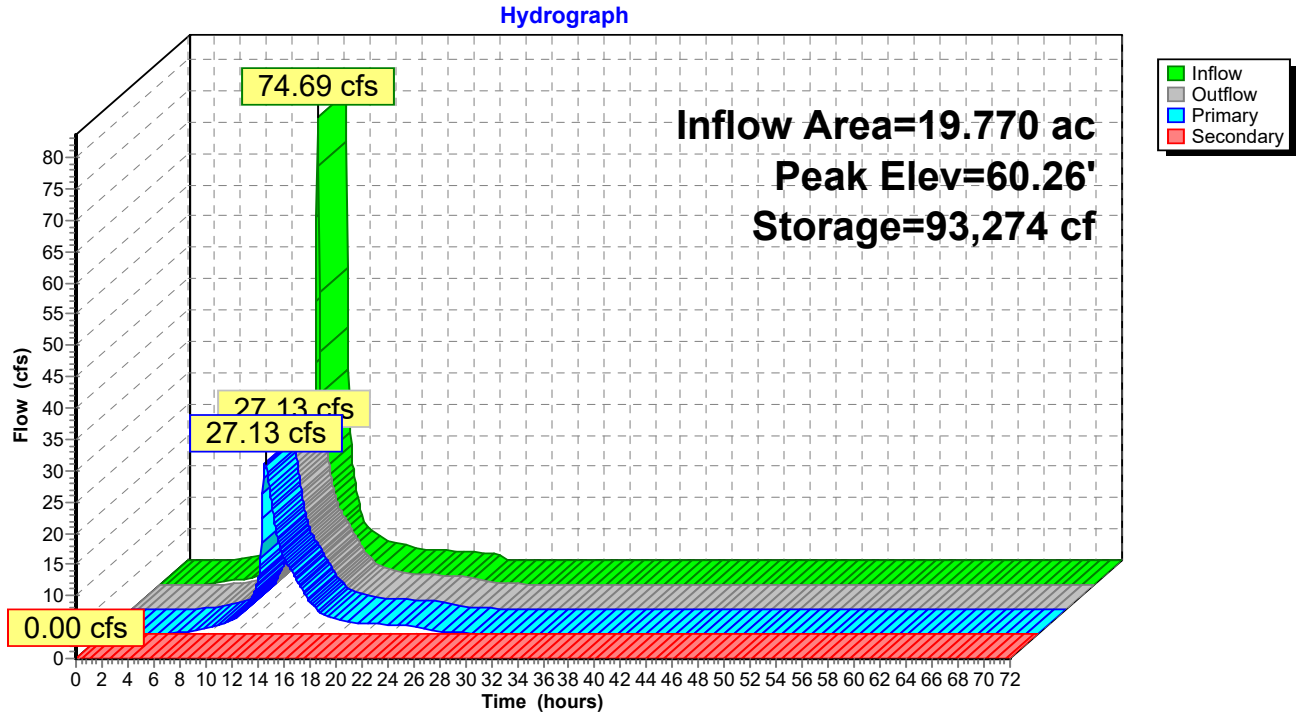
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.00	17,060	729.0	0	0	17,060
57.00	19,275	748.0	18,156	18,156	19,412
58.00	21,576	767.0	20,415	38,571	21,825
59.00	23,874	785.0	22,715	61,286	24,179
60.00	26,259	804.0	25,057	86,343	26,710
61.00	28,700	823.0	27,470	113,814	29,301
62.00	31,197	842.0	29,940	143,754	31,952
63.00	33,751	861.0	32,466	176,219	34,664
63.10	5,000	870.0	1,725	177,944	35,907

Device	Routing	Invert	Outlet Devices
#1	Primary	56.00'	**24.0" Round 24" Outlet Pipe** L= 19.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 56.00' / 55.14' S= 0.0453 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Device 1	56.00'	**18.0" Vert. 18" Orifice** C= 0.600
#3	Device 1	58.70'	**24.0" Vert. 24" Orifice** C= 0.600
#4	Secondary	63.00'	**20.0' long x 10.0' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=27.10 cfs @ 12.44 hrs HW=60.26' (Free Discharge)
└**1=24" Outlet Pipe** (Passes 27.10 cfs of 27.30 cfs potential flow)
  ├**2=18" Orifice** (Orifice Controls 15.94 cfs @ 9.02 fps)
  └**3=24" Orifice** (Orifice Controls 11.16 cfs @ 4.25 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=56.00' (Free Discharge)
└**4=Spillway** (Controls 0.00 cfs)

Pond B-1A: Modified Southerly Aboveground Basin



Summary for Pond B-1B: Proposed Subsurface Basin in Stone

Inflow Area = 2.073 ac,100.00% Impervious, Inflow Depth = 4.94" for 10-Year event
Inflow = 8.75 cfs @ 12.17 hrs, Volume= 0.854 af
Outflow = 6.84 cfs @ 12.25 hrs, Volume= 0.827 af, Atten= 22%, Lag= 5.2 min
Primary = 6.84 cfs @ 12.25 hrs, Volume= 0.827 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 67.13' @ 12.26 hrs Surf.Area= 0.074 ac Storage= 0.139 af

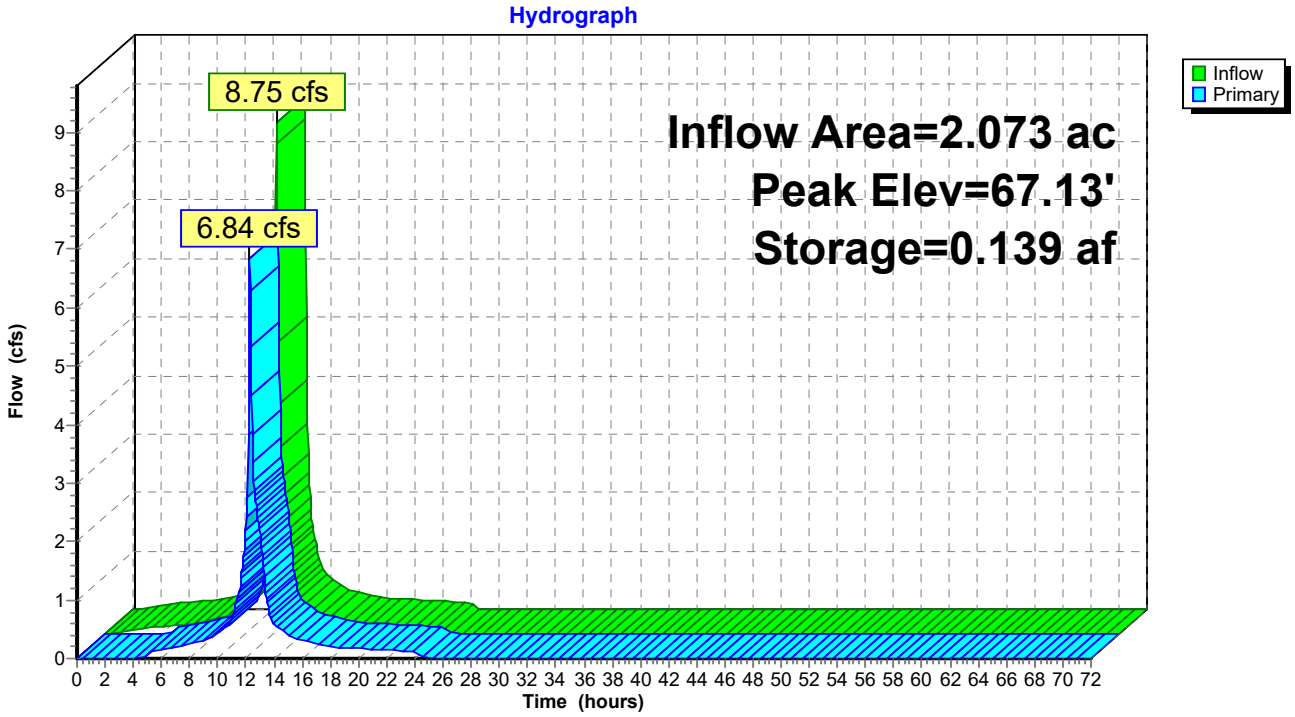
Plug-Flow detention time= 56.9 min calculated for 0.827 af (97% of inflow)
Center-of-Mass det. time= 36.0 min (788.4 - 752.4)

Volume	Invert	Avail.Storage	Storage Description
#1	64.87'	0.114 af	**36.0" Round Pipe Storage** x 7 Inside #2 L= 100.0' S= 0.0010 '/' 0.155 af Overall - 3.0" Wall Thickness = 0.114 af
#2	63.87'	0.087 af	**54.0" W x 60.0" H Box Stone** x 7 L= 103.0' S= 0.0010 '/' 0.372 af Overall - 0.155 af Embedded = 0.218 af x 40.0% Voids
		0.201 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	64.87'	**18.0" Round 18" Outlet Pipe** L= 17.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 64.87' / 64.79' S= 0.0047 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	64.87'	**12.0" W x 6.0" H Vert. 12" x 6" Slot** C= 0.600
#3	Device 1	66.56'	**30.0" W x 8.0" H Vert. 30" x 8" Slot** C= 0.600
#4	Device 1	67.87'	**6.0' long x 0.5' breadth 6' Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=6.78 cfs @ 12.25 hrs HW=67.12' (Free Discharge)
└**1=18" Outlet Pipe** (Passes 6.78 cfs of 9.96 cfs potential flow)
  ├**2=12" x 6" Slot** (Orifice Controls 3.40 cfs @ 6.81 fps)
  ├**3=30" x 8" Slot** (Orifice Controls 3.38 cfs @ 2.41 fps)
  └**4=6' Weir** (Controls 0.00 cfs)

Pond B-1B: Proposed Subsurface Basin in Stone



Summary for Pond B-2A: Proposed Northerly Aboveground Basin

Inflow Area = 3.550 ac, 58.24% Impervious, Inflow Depth = 3.84" for 10-Year event
Inflow = 13.03 cfs @ 12.17 hrs, Volume= 1.136 af
Outflow = 5.88 cfs @ 12.36 hrs, Volume= 1.136 af, Atten= 55%, Lag= 11.4 min
Primary = 5.88 cfs @ 12.36 hrs, Volume= 1.136 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 70.89' @ 12.36 hrs Surf.Area= 6,857 sf Storage= 11,266 cf

Plug-Flow detention time= 52.3 min calculated for 1.136 af (100% of inflow)
Center-of-Mass det. time= 52.1 min (858.6 - 806.5)

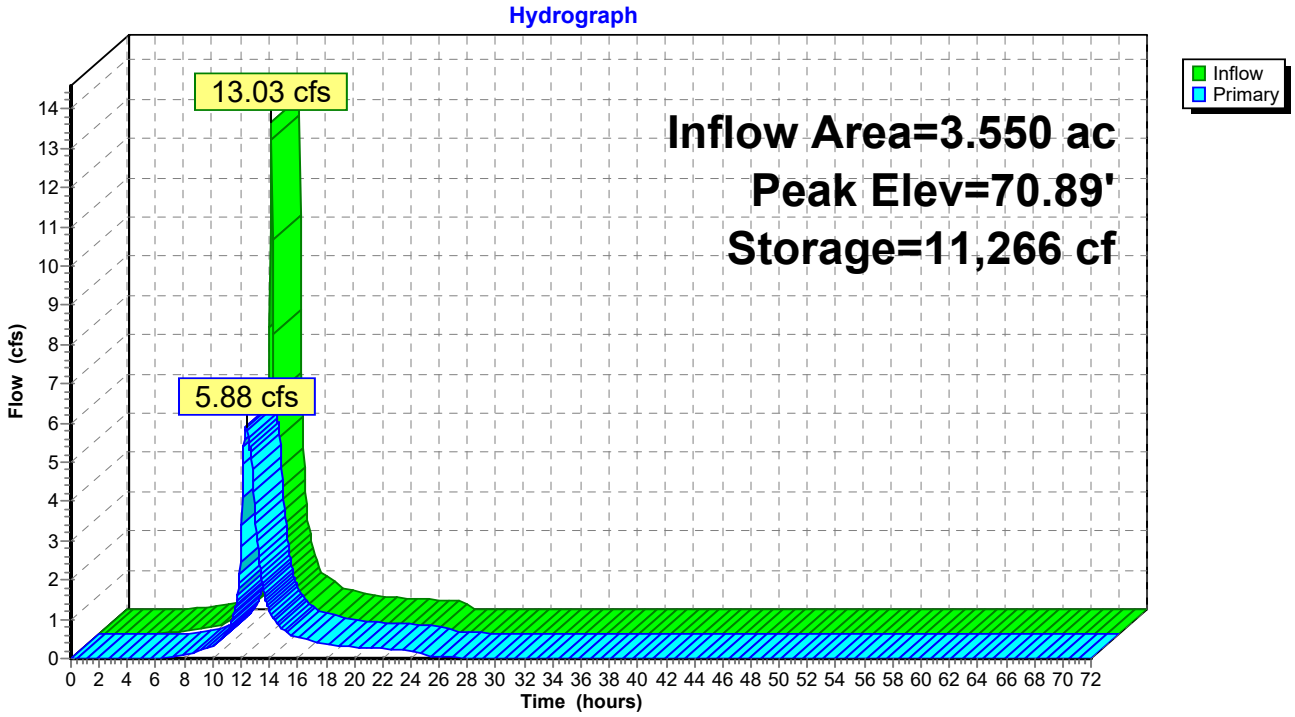
Volume	Invert	Avail.Storage	Storage Description
#1	69.00'	28,786 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
69.00	5,090	294.0	0	0	5,090
70.00	5,999	313.0	5,538	5,538	6,057
71.00	6,965	331.0	6,476	12,014	7,034
72.00	7,988	350.0	7,471	19,485	8,118
73.00	9,067	369.0	8,522	28,007	9,263
73.20	500	400.0	780	28,786	11,162

Device	Routing	Invert	Outlet Devices
#1	Primary	69.00'	**15.0" Round 15" Outlet Pipe** L= 107.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.00' / 68.47' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Primary	73.00'	**80.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=5.87 cfs @ 12.36 hrs HW=70.89' (Free Discharge)
1=15" Outlet Pipe (Barrel Controls 5.87 cfs @ 4.79 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond B-2A: Proposed Northerly Aboveground Basin



Summary for Pond B-2B: Proposed Subsurface Basin

Inflow Area = 4.503 ac, 43.26% Impervious, Inflow Depth = 3.53" for 10-Year event
Inflow = 15.46 cfs @ 12.17 hrs, Volume= 1.326 af
Outflow = 7.28 cfs @ 12.35 hrs, Volume= 1.326 af, Atten= 53%, Lag= 10.9 min
Primary = 7.28 cfs @ 12.35 hrs, Volume= 1.326 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 67.71' @ 12.35 hrs Surf.Area= 0.247 ac Storage= 0.282 af

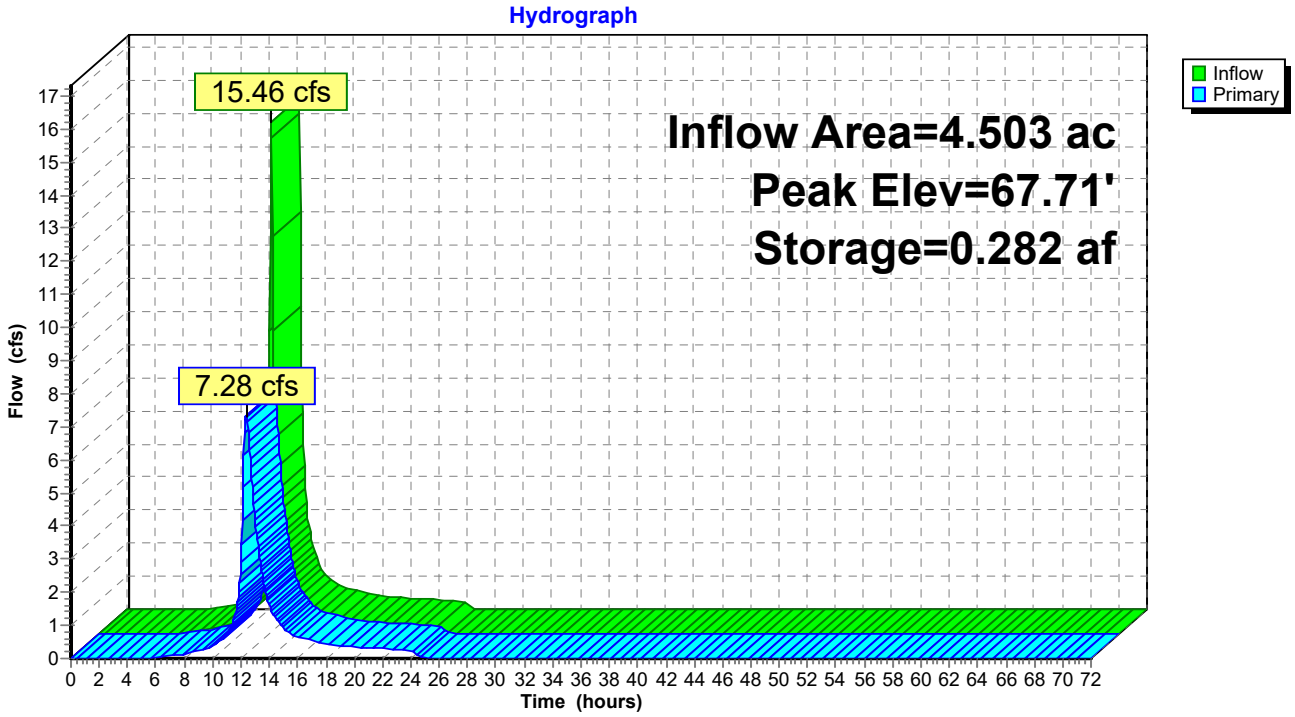
Plug-Flow detention time= 25.5 min calculated for 1.326 af (100% of inflow)
Center-of-Mass det. time= 25.4 min (842.6 - 817.2)

Volume	Invert	Avail.Storage	Storage Description
#1	66.10'	0.584 af	**36.0" Round Pipe Storage** x 12 L= 300.0' S= 0.0010 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.10'	**18.0" Round 18" Outlet Pipe** L= 64.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 66.10' / 65.78' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	66.10'	**18.0" Vert. 18" Orifice** C= 0.600
#3	Device 1	67.85'	**12.0" Vert. 12" Orifice X 0.00** C= 0.600
#4	Primary	69.30'	**6.0' long x 0.5' breadth 6 FT Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=7.28 cfs @ 12.35 hrs HW=67.71' (Free Discharge)
- **1=18" Outlet Pipe** (Barrel Controls 7.28 cfs @ 4.78 fps)
  - **2=18" Orifice** (Passes 7.28 cfs of 7.88 cfs potential flow)
  - **3=12" Orifice** (Controls 0.00 cfs)
- **4=6 FT Weir** (Controls 0.00 cfs)

Pond B-2B: Proposed Subsurface Basin

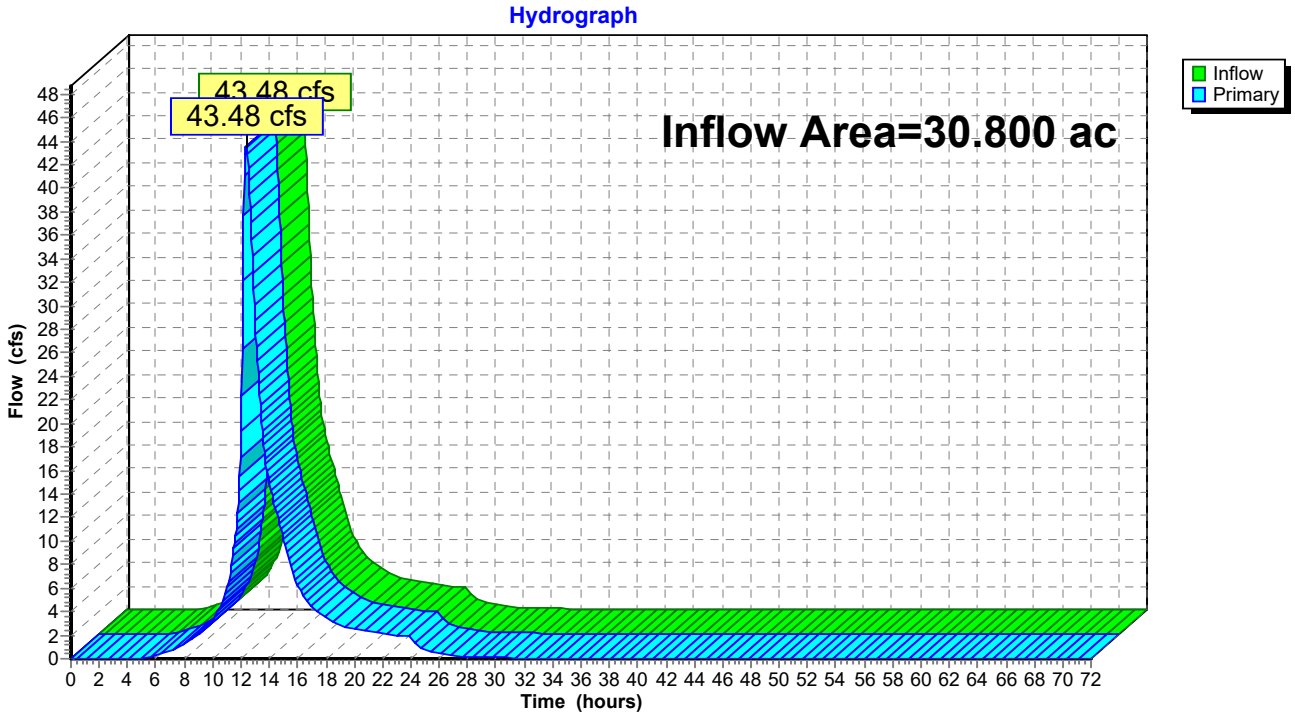


Summary for Link POI-1: Connection to 42" RCP

Inflow Area = 30.800 ac, 61.78% Impervious, Inflow Depth = 3.99" for 10-Year event
Inflow = 43.48 cfs @ 12.37 hrs, Volume= 10.244 af
Primary = 43.48 cfs @ 12.37 hrs, Volume= 10.244 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link POI-1: Connection to 42" RCP

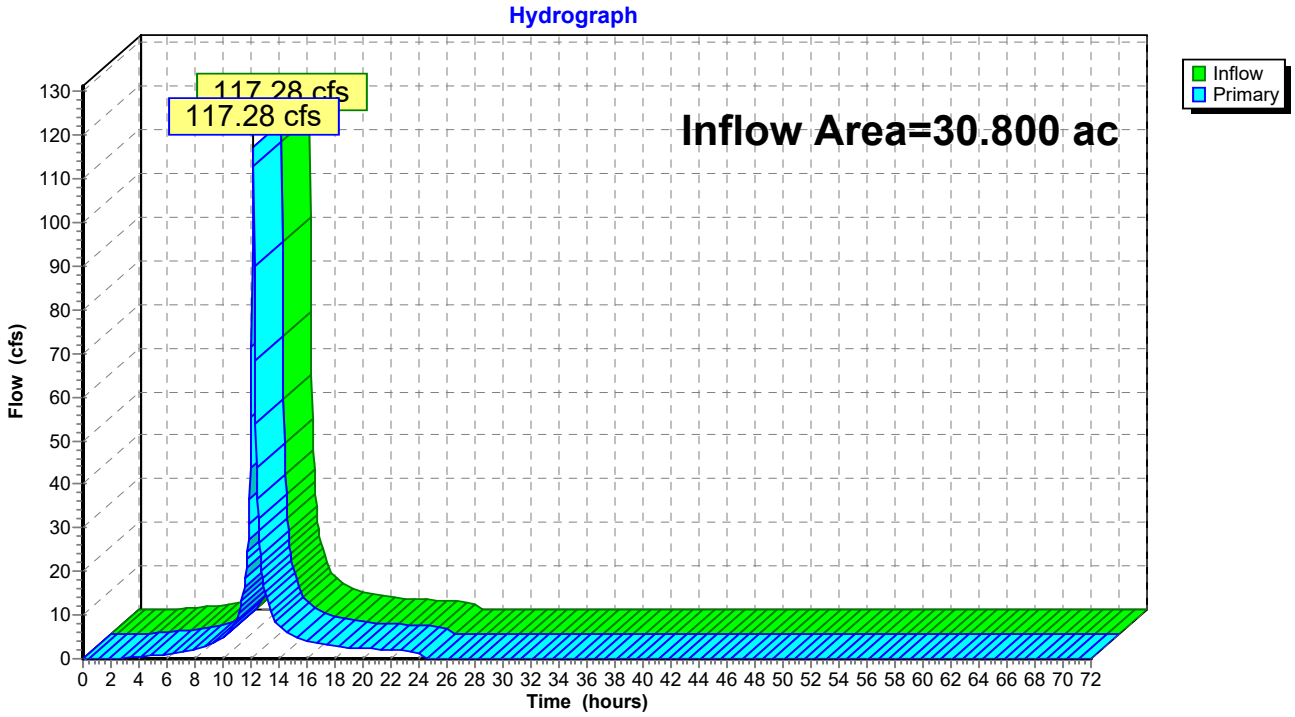


Summary for Link POI-1(EX): Connection to 42" RCP

Inflow Area = 30.800 ac, 66.56% Impervious, Inflow Depth = 4.10" for 10-Year event
Inflow = 117.28 cfs @ 12.17 hrs, Volume= 10.515 af
Primary = 117.28 cfs @ 12.17 hrs, Volume= 10.515 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link POI-1(EX): Connection to 42" RCP

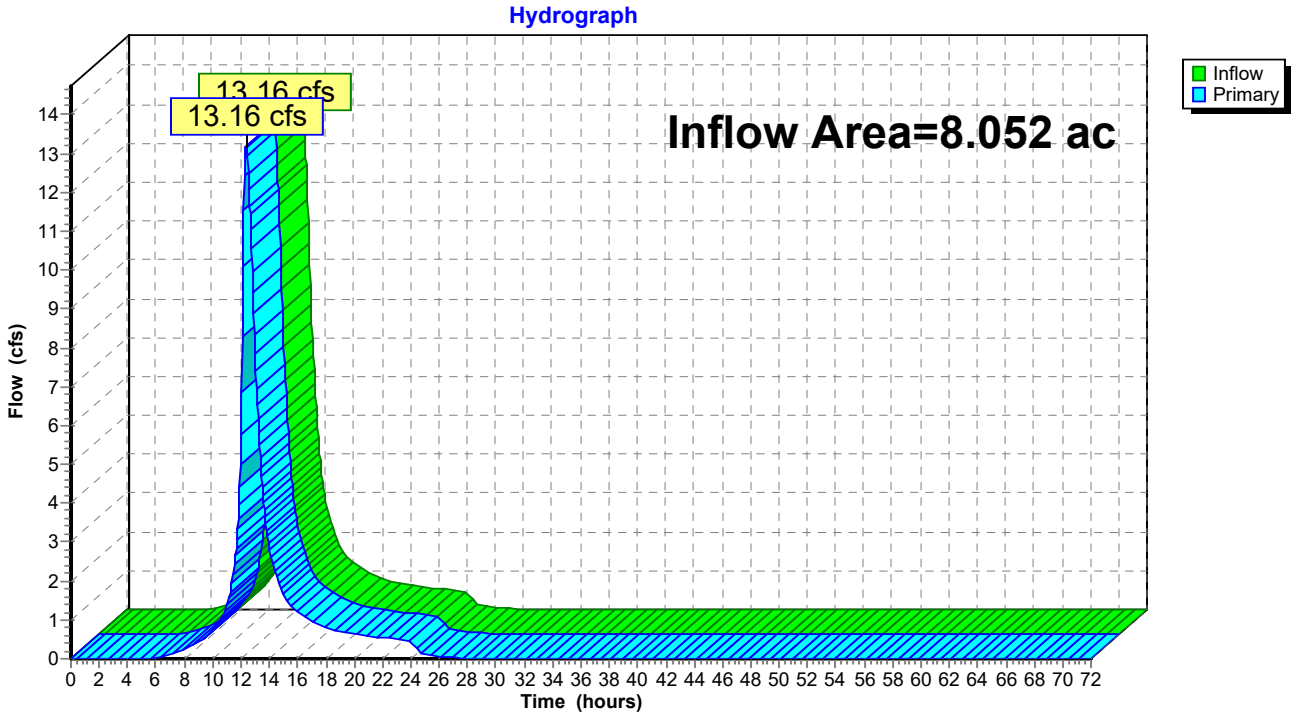


Summary for Link POI-2: Connection to 18" RCP

Inflow Area = 8.052 ac, 49.86% Impervious, Inflow Depth = 3.67" for 10-Year event
Inflow = 13.16 cfs @ 12.36 hrs, Volume= 2.462 af
Primary = 13.16 cfs @ 12.36 hrs, Volume= 2.462 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link POI-2: Connection to 18" RCP

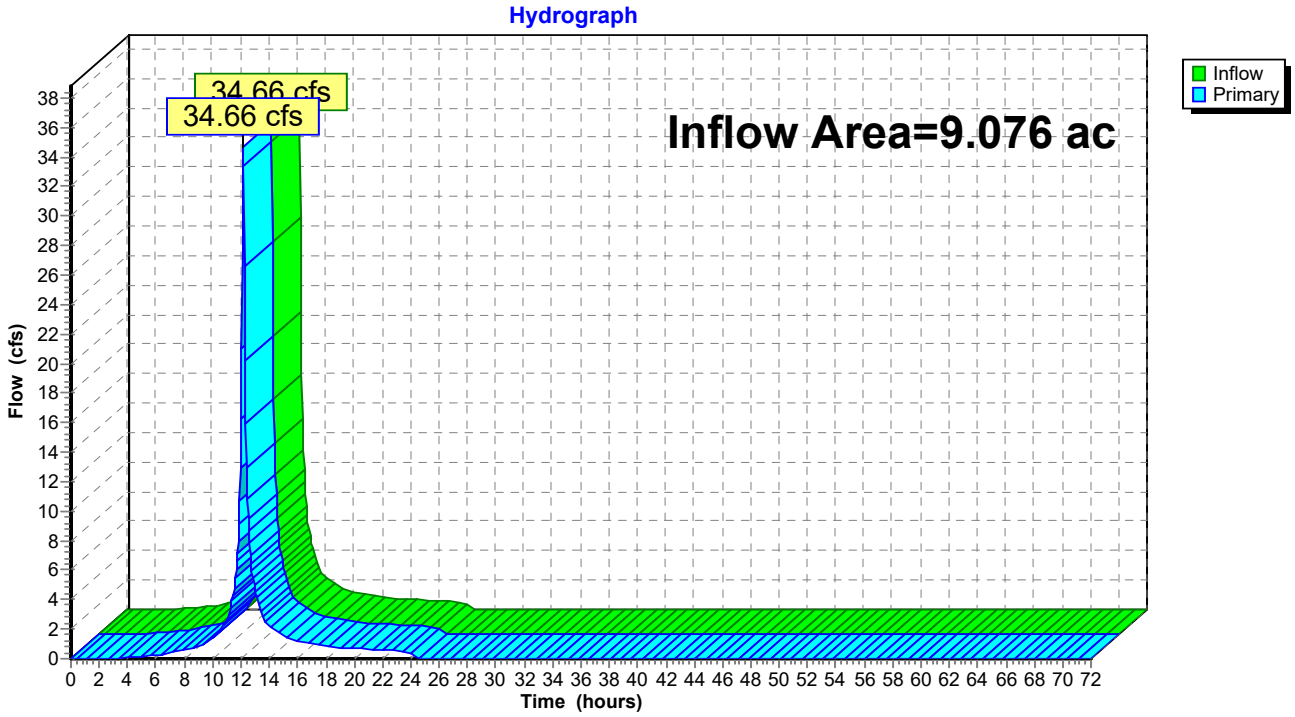


Summary for Link POI-2(EX): Connection to 18" RCP

Inflow Area = 9.076 ac, 64.67% Impervious, Inflow Depth = 4.05" for 10-Year event
Inflow = 34.66 cfs @ 12.17 hrs, Volume= 3.063 af
Primary = 34.66 cfs @ 12.17 hrs, Volume= 3.063 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link POI-2(EX): Connection to 18" RCP



Summary for Subcatchment E-1: Runoff Tributary to Southeast Basin

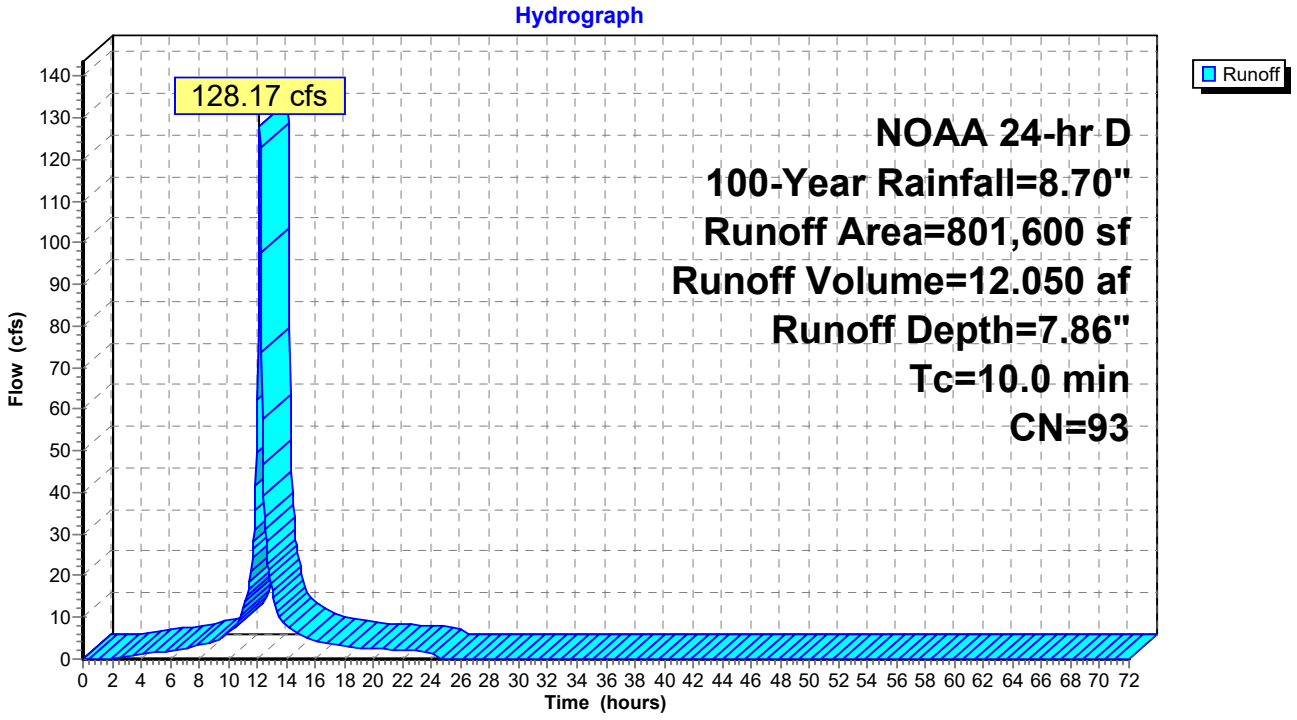
Runoff = 128.17 cfs @ 12.17 hrs, Volume= 12.050 af, Depth= 7.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year Rainfall=8.70"

	Area (sf)	CN	Description
*	630,951	98	Impervious Surfaces
	92,120	74	>75% Grass cover, Good, HSG C
	78,529	80	>75% Grass cover, Good, HSG D
	801,600	93	Weighted Average
	170,649		21.29% Pervious Area
	630,951		78.71% Impervious Area

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

Subcatchment E-1: Runoff Tributary to Southeast Basin



Summary for Subcatchment E-2: Runoff Tributary to Eastern Basin

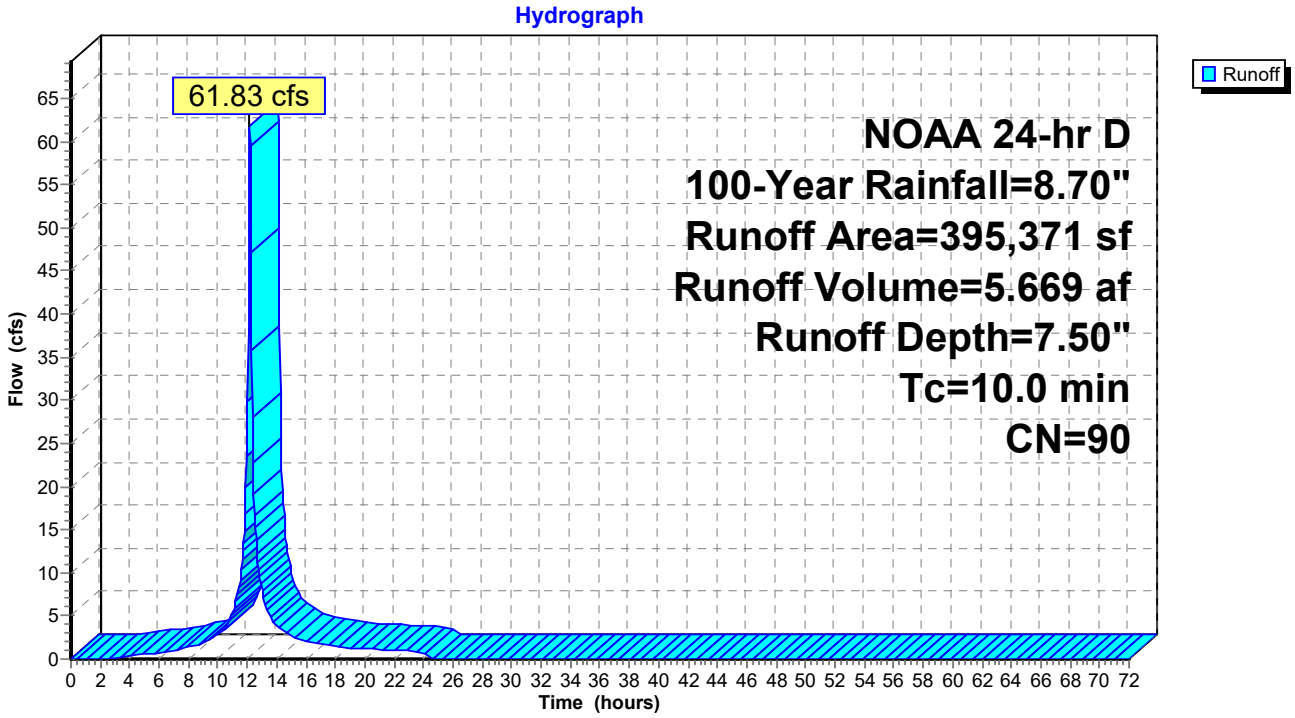
Runoff = 61.83 cfs @ 12.17 hrs, Volume= 5.669 af, Depth= 7.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year Rainfall=8.70"

	Area (sf)	CN	Description
*	255,695	98	Impervious Surfaces
	109,755	74	>75% Grass cover, Good, HSG C
	29,921	80	>75% Grass cover, Good, HSG D
	395,371	90	Weighted Average
	139,676		35.33% Pervious Area
	255,695		64.67% Impervious Area

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

Subcatchment E-2: Runoff Tributary to Eastern Basin



Summary for Subcatchment E-3: Uncollected Runoff

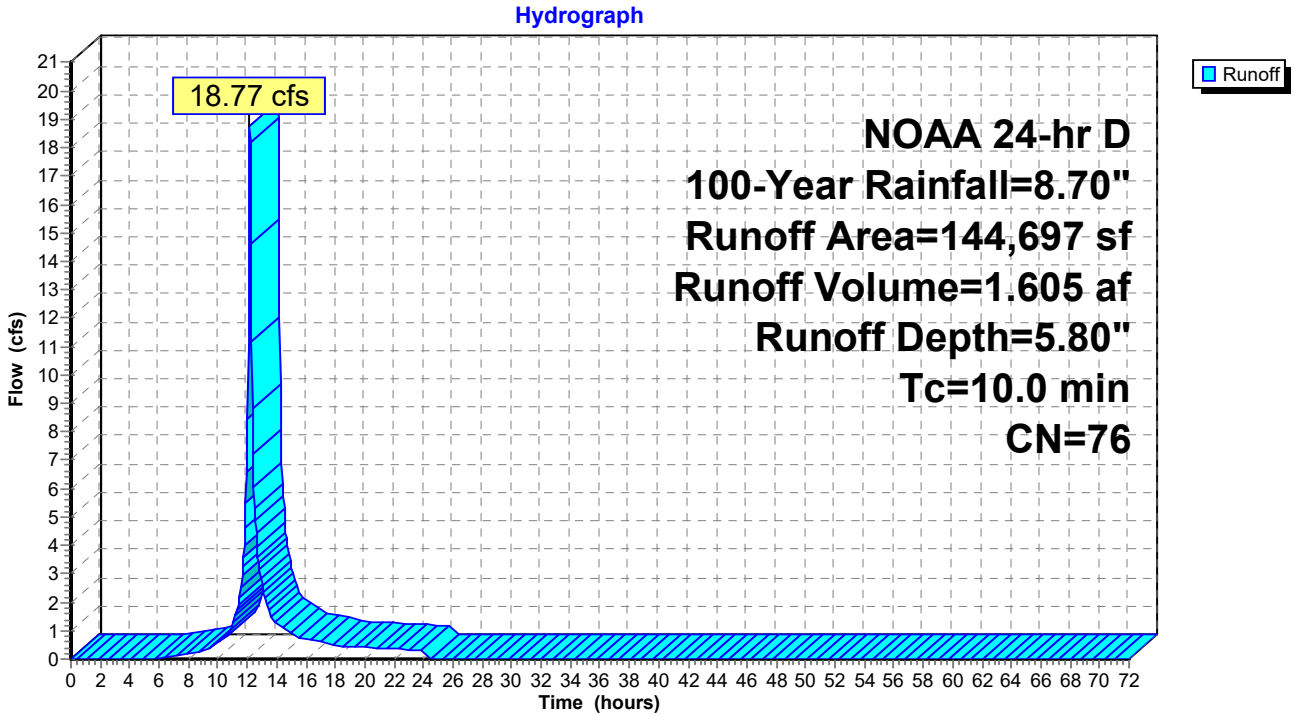
Runoff = 18.77 cfs @ 12.17 hrs, Volume= 1.605 af, Depth= 5.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year Rainfall=8.70"

	Area (sf)	CN	Description
*	6,373	98	Impervious Surfaces
	124,884	74	>75% Grass cover, Good, HSG C
	13,440	80	>75% Grass cover, Good, HSG D
	144,697	76	Weighted Average
	138,324		95.60% Pervious Area
	6,373		4.40% Impervious Area

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

Subcatchment E-3: Uncollected Runoff



Summary for Subcatchment P-1A: Runoff Tributary to B-1A

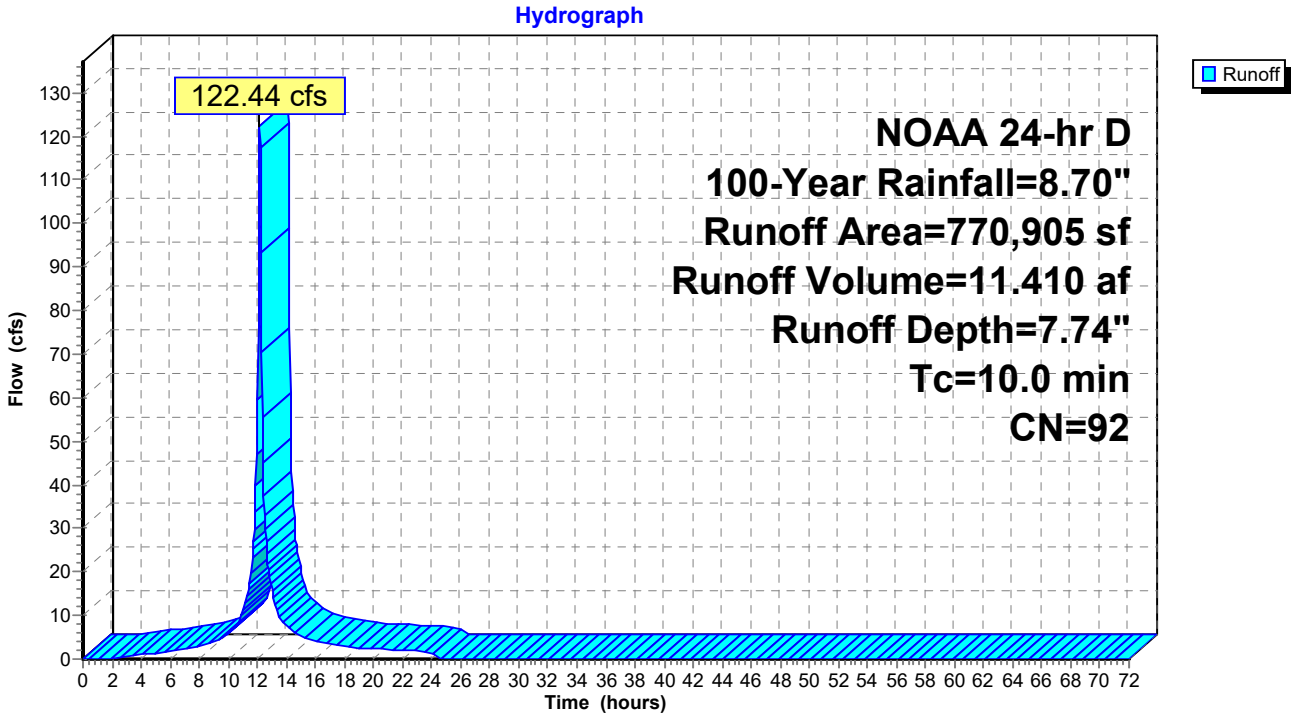
Runoff = 122.44 cfs @ 12.17 hrs, Volume= 11.410 af, Depth= 7.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year Rainfall=8.70"

	Area (sf)	CN	Description
*	556,740	98	Impervious Surfaces
	101,064	74	>75% Grass cover, Good, HSG C
	113,101	80	>75% Grass cover, Good, HSG D
	770,905	92	Weighted Average
	214,165		27.78% Pervious Area
	556,740		72.22% Impervious Area

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

Subcatchment P-1A: Runoff Tributary to B-1A



Summary for Subcatchment P-1B: Runoff Tributary to B-1B

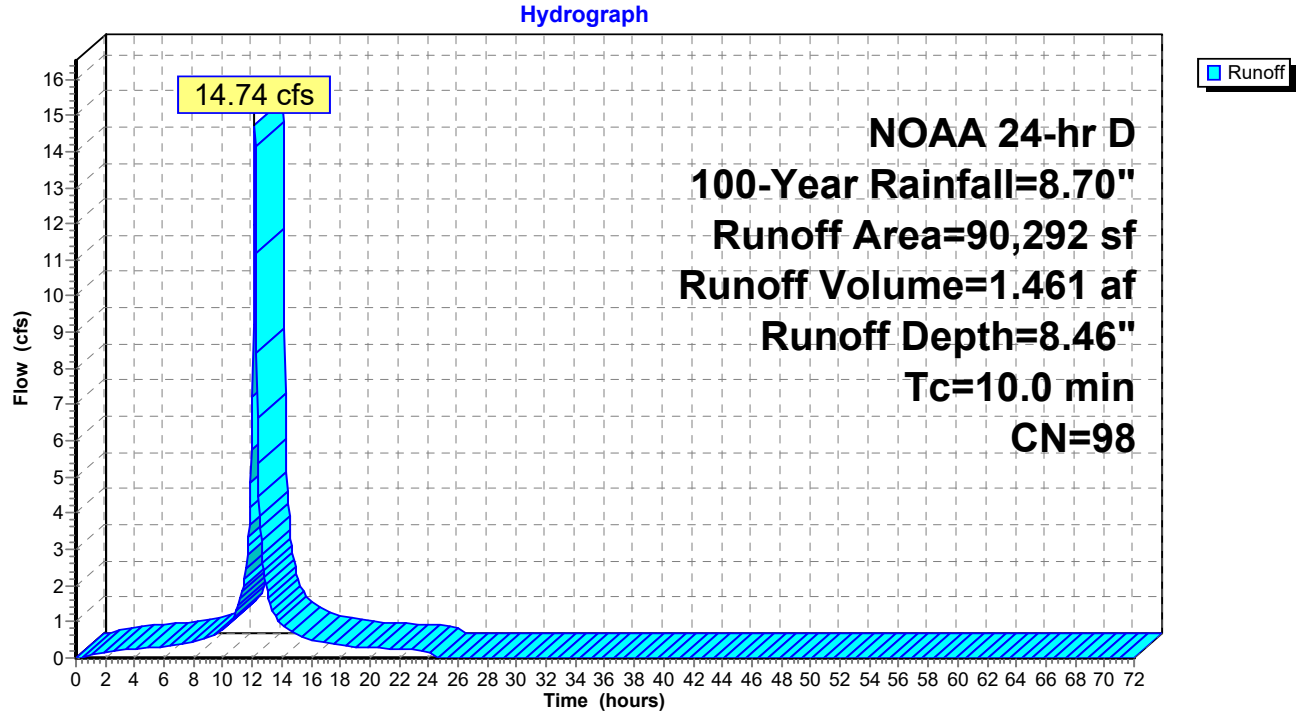
Runoff = 14.74 cfs @ 12.17 hrs, Volume= 1.461 af, Depth= 8.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year Rainfall=8.70"

	Area (sf)	CN	Description
*	90,292	98	Impervious Surfaces
	90,292		100.00% Impervious Area

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

Subcatchment P-1B: Runoff Tributary to B-1B



Summary for Subcatchment P-2A: Runoff Tributary to B-2A

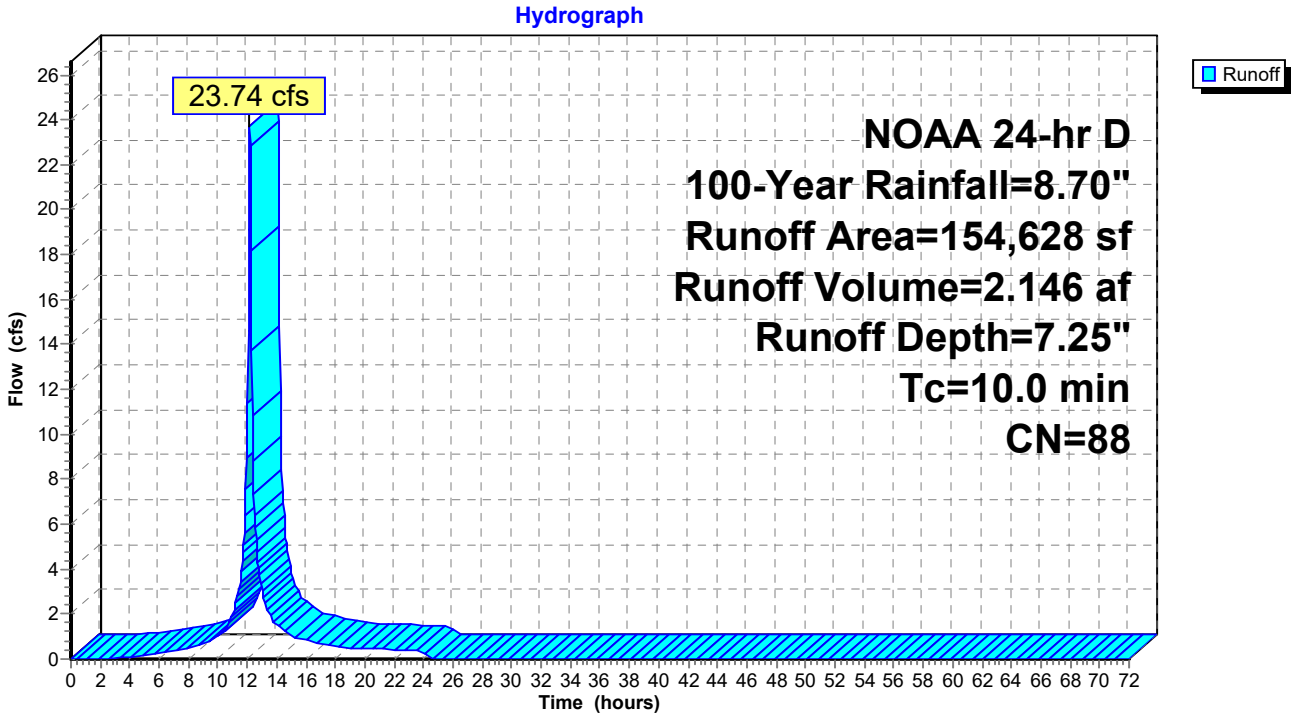
Runoff = 23.74 cfs @ 12.17 hrs, Volume= 2.146 af, Depth= 7.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year Rainfall=8.70"

	Area (sf)	CN	Description
*	90,059	98	Impervious Surfaces
	51,674	74	>75% Grass cover, Good, HSG C
	12,895	80	>75% Grass cover, Good, HSG D
	154,628	88	Weighted Average
	64,569		41.76% Pervious Area
	90,059		58.24% Impervious Area

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

Subcatchment P-2A: Runoff Tributary to B-2A



Summary for Subcatchment P-2B: Runoff Tributary to B-2B

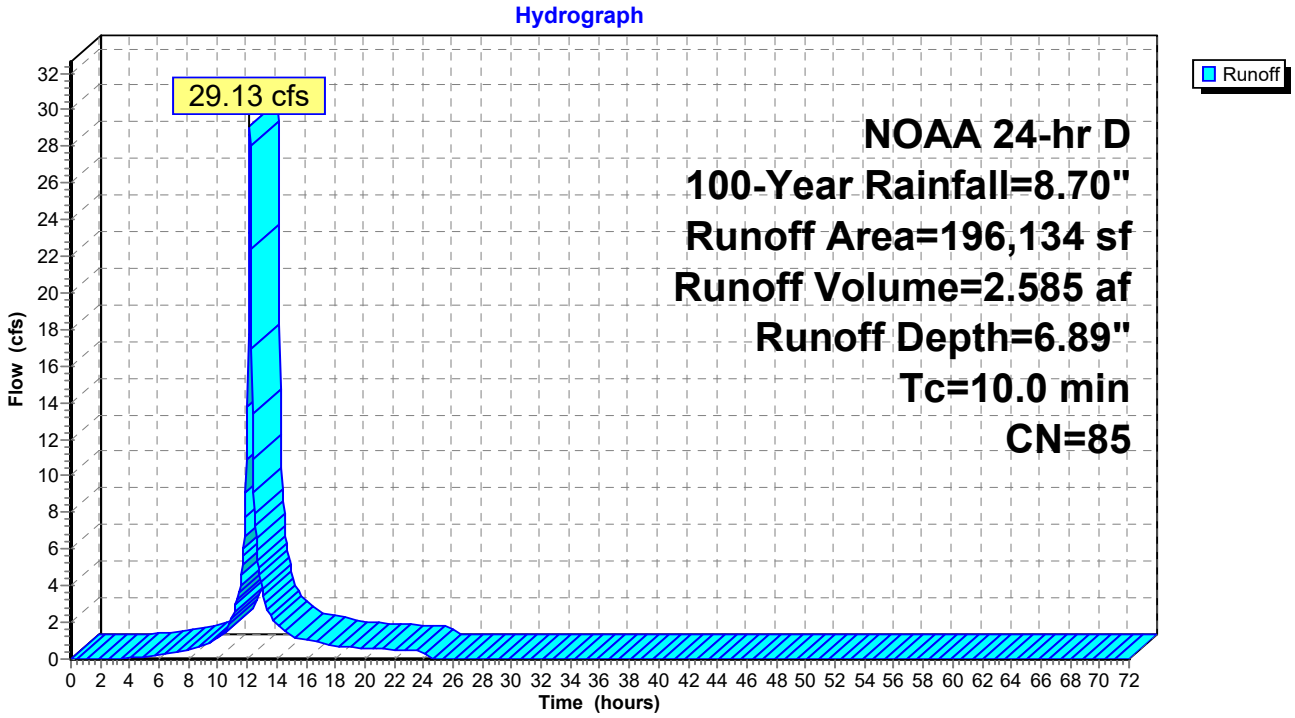
Runoff = 29.13 cfs @ 12.17 hrs, Volume= 2.585 af, Depth= 6.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year Rainfall=8.70"

	Area (sf)	CN	Description
*	84,845	98	Impervious Surfaces
	97,305	74	>75% Grass cover, Good, HSG C
	13,984	80	>75% Grass cover, Good, HSG D
	196,134	85	Weighted Average
	111,289		56.74% Pervious Area
	84,845		43.26% Impervious Area

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

Subcatchment P-2B: Runoff Tributary to B-2B



Summary for Subcatchment P-3: Uncollected Runoff

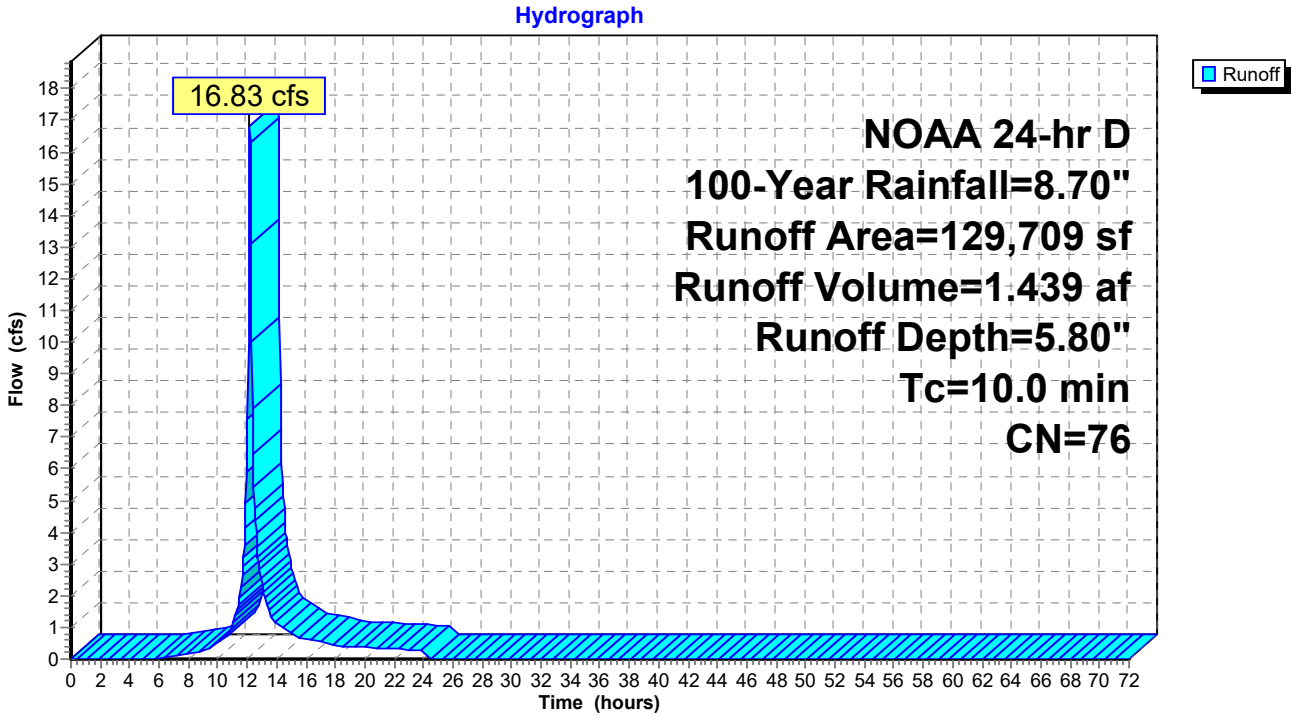
Runoff = 16.83 cfs @ 12.17 hrs, Volume= 1.439 af, Depth= 5.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year Rainfall=8.70"

	Area (sf)	CN	Description
*	6,994	98	Impervious Surfaces
	111,650	74	>75% Grass cover, Good, HSG C
	11,065	80	>75% Grass cover, Good, HSG D
	129,709	76	Weighted Average
	122,715		94.61% Pervious Area
	6,994		5.39% Impervious Area

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

Subcatchment P-3: Uncollected Runoff



Summary for Pond B-1A: Modified Southerly Aboveground Basin

Inflow Area = 19.770 ac, 75.13% Impervious, Inflow Depth = 7.80" for 100-Year event
Inflow = 133.96 cfs @ 12.17 hrs, Volume= 12.845 af
Outflow = 36.73 cfs @ 12.52 hrs, Volume= 12.844 af, Atten= 73%, Lag= 20.8 min
Primary = 36.73 cfs @ 12.52 hrs, Volume= 12.844 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 62.90' @ 12.52 hrs Surf.Area= 33,484 sf Storage= 172,760 cf

Plug-Flow detention time= 76.5 min calculated for 12.844 af (100% of inflow)
Center-of-Mass det. time= 76.2 min (849.6 - 773.4)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	177,944 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

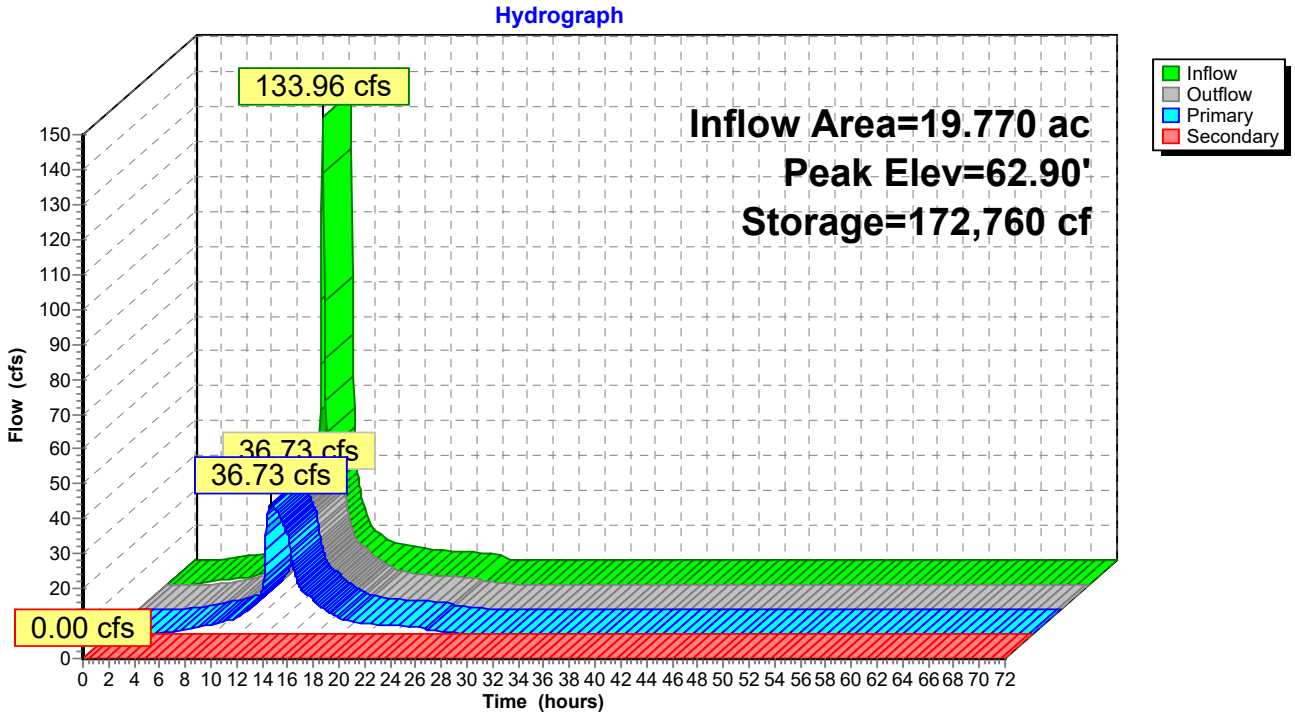
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.00	17,060	729.0	0	0	17,060
57.00	19,275	748.0	18,156	18,156	19,412
58.00	21,576	767.0	20,415	38,571	21,825
59.00	23,874	785.0	22,715	61,286	24,179
60.00	26,259	804.0	25,057	86,343	26,710
61.00	28,700	823.0	27,470	113,814	29,301
62.00	31,197	842.0	29,940	143,754	31,952
63.00	33,751	861.0	32,466	176,219	34,664
63.10	5,000	870.0	1,725	177,944	35,907

Device	Routing	Invert	Outlet Devices
#1	Primary	56.00'	**24.0" Round 24" Outlet Pipe** L= 19.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 56.00' / 55.14' S= 0.0453 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Device 1	56.00'	**18.0" Vert. 18" Orifice** C= 0.600
#3	Device 1	58.70'	**24.0" Vert. 24" Orifice** C= 0.600
#4	Secondary	63.00'	**20.0' long x 10.0' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=36.72 cfs @ 12.52 hrs HW=62.89' (Free Discharge)
└**1=24" Outlet Pipe** (Inlet Controls 36.72 cfs @ 11.69 fps)
  ├**2=18" Orifice** (Passes < 21.09 cfs potential flow)
  └**3=24" Orifice** (Passes < 27.03 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=56.00' (Free Discharge)
└**4=Spillway** (Controls 0.00 cfs)

Pond B-1A: Modified Southerly Aboveground Basin



Summary for Pond B-1B: Proposed Subsurface Basin in Stone

Inflow Area = 2.073 ac,100.00% Impervious, Inflow Depth = 8.46" for 100-Year event
Inflow = 14.74 cfs @ 12.17 hrs, Volume= 1.461 af
Outflow = 12.98 cfs @ 12.22 hrs, Volume= 1.434 af, Atten= 12%, Lag= 3.3 min
Primary = 12.98 cfs @ 12.22 hrs, Volume= 1.434 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 68.00' @ 12.22 hrs Surf.Area= 0.074 ac Storage= 0.174 af

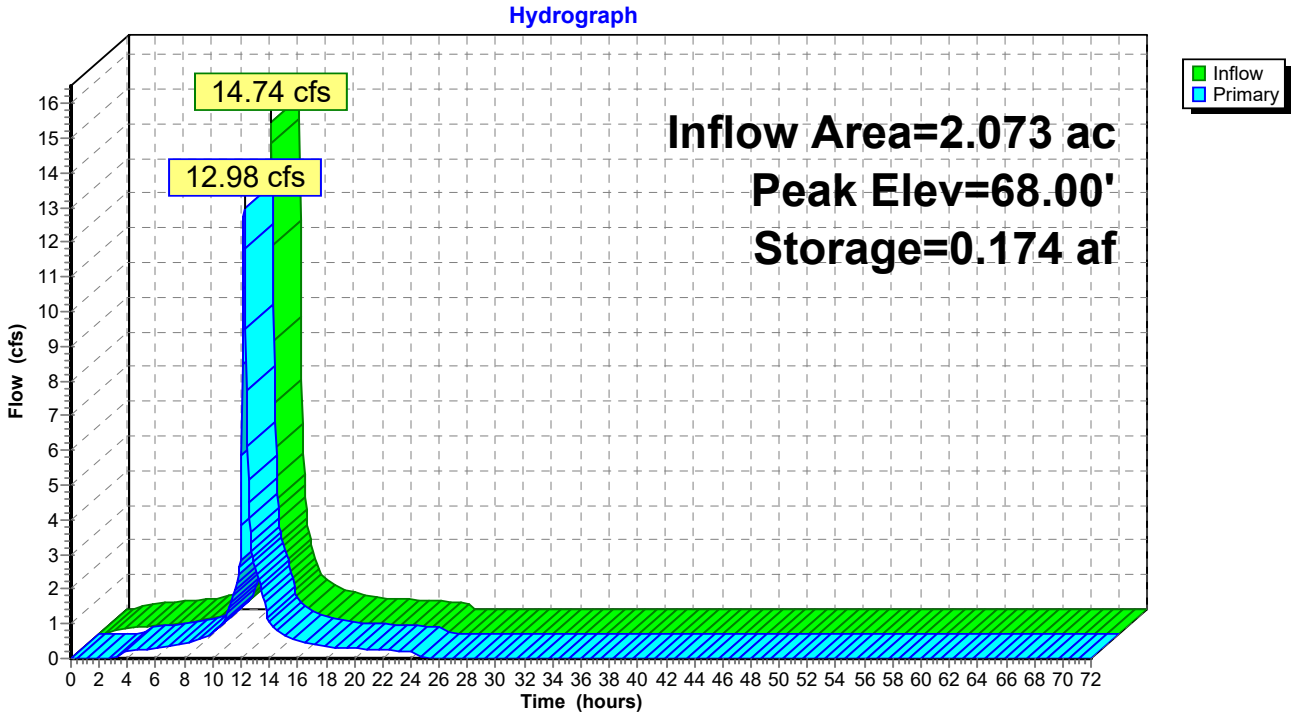
Plug-Flow detention time= 40.3 min calculated for 1.434 af (98% of inflow)
Center-of-Mass det. time= 27.2 min (771.8 - 744.7)

Volume	Invert	Avail.Storage	Storage Description
#1	64.87'	0.114 af	**36.0" Round Pipe Storage** x 7 Inside #2 L= 100.0' S= 0.0010 '/' 0.155 af Overall - 3.0" Wall Thickness = 0.114 af
#2	63.87'	0.087 af	**54.0" W x 60.0" H Box Stone** x 7 L= 103.0' S= 0.0010 '/' 0.372 af Overall - 0.155 af Embedded = 0.218 af x 40.0% Voids
		0.201 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	64.87'	**18.0" Round 18" Outlet Pipe** L= 17.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 64.87' / 64.79' S= 0.0047 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	64.87'	**12.0" W x 6.0" H Vert. 12" x 6" Slot** C= 0.600
#3	Device 1	66.56'	**30.0" W x 8.0" H Vert. 30" x 8" Slot** C= 0.600
#4	Device 1	67.87'	**6.0' long x 0.5' breadth 6' Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=12.72 cfs @ 12.22 hrs HW=67.96' (Free Discharge)
└**1=18" Outlet Pipe** (Passes 12.72 cfs of 13.01 cfs potential flow)
  ├**2=12" x 6" Slot** (Orifice Controls 4.05 cfs @ 8.11 fps)
  ├**3=30" x 8" Slot** (Orifice Controls 8.24 cfs @ 4.94 fps)
  └**4=6' Weir** (Weir Controls 0.42 cfs @ 0.82 fps)

Pond B-1B: Proposed Subsurface Basin in Stone



Summary for Pond B-2A: Proposed Northerly Aboveground Basin

Inflow Area = 3.550 ac, 58.24% Impervious, Inflow Depth = 7.25" for 100-Year event
Inflow = 23.74 cfs @ 12.17 hrs, Volume= 2.146 af
Outflow = 8.74 cfs @ 12.41 hrs, Volume= 2.146 af, Atten= 63%, Lag= 14.2 min
Primary = 8.74 cfs @ 12.41 hrs, Volume= 2.146 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 72.31' @ 12.41 hrs Surf.Area= 8,312 sf Storage= 21,987 cf

Plug-Flow detention time= 44.5 min calculated for 2.144 af (100% of inflow)
Center-of-Mass det. time= 45.5 min (833.0 - 787.5)

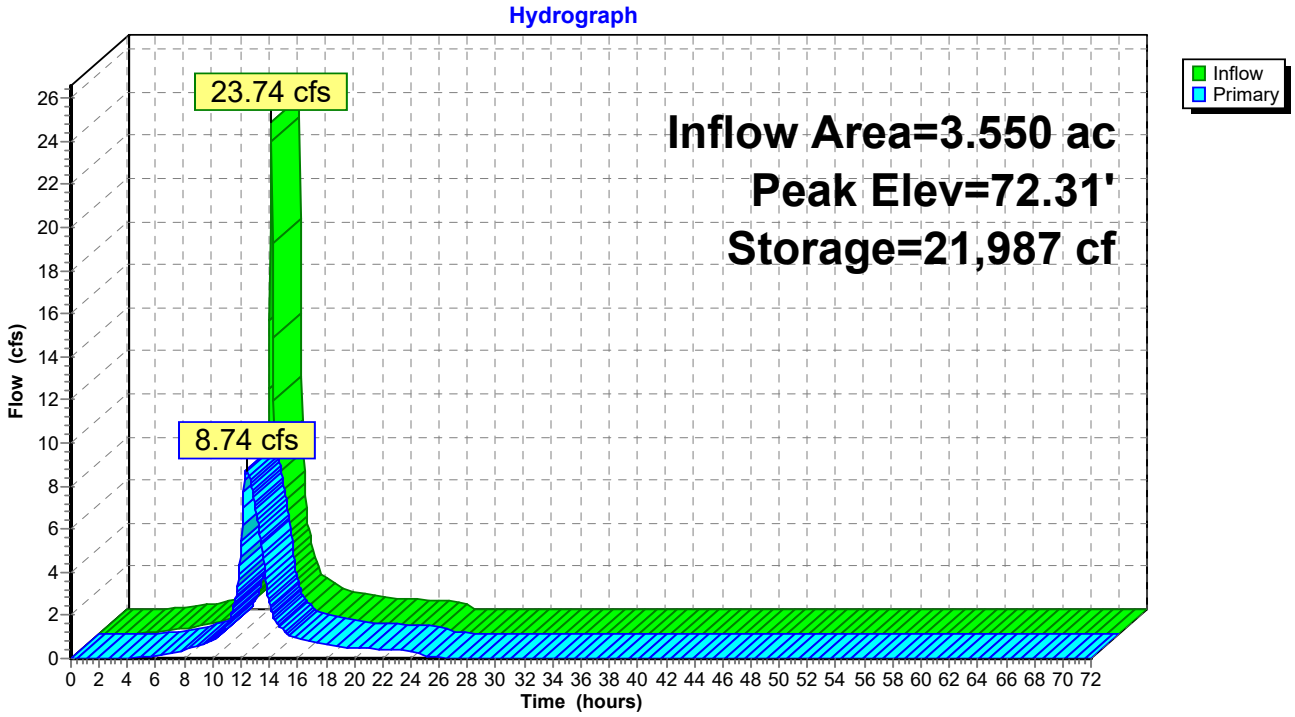
Volume	Invert	Avail.Storage	Storage Description
#1	69.00'	28,786 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
69.00	5,090	294.0	0	0	5,090
70.00	5,999	313.0	5,538	5,538	6,057
71.00	6,965	331.0	6,476	12,014	7,034
72.00	7,988	350.0	7,471	19,485	8,118
73.00	9,067	369.0	8,522	28,007	9,263
73.20	500	400.0	780	28,786	11,162

Device	Routing	Invert	Outlet Devices
#1	Primary	69.00'	**15.0" Round 15" Outlet Pipe** L= 107.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.00' / 68.47' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Primary	73.00'	**80.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=8.73 cfs @ 12.41 hrs HW=72.30' (Free Discharge)
1=15" Outlet Pipe (Barrel Controls 8.73 cfs @ 7.12 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond B-2A: Proposed Northerly Aboveground Basin



Summary for Pond B-2B: Proposed Subsurface Basin

Inflow Area = 4.503 ac, 43.26% Impervious, Inflow Depth = 6.89" for 100-Year event
Inflow = 29.13 cfs @ 12.17 hrs, Volume= 2.585 af
Outflow = 12.68 cfs @ 12.37 hrs, Volume= 2.585 af, Atten= 56%, Lag= 11.8 min
Primary = 12.68 cfs @ 12.37 hrs, Volume= 2.585 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 69.07' @ 12.37 hrs Surf.Area= 0.114 ac Storage= 0.569 af

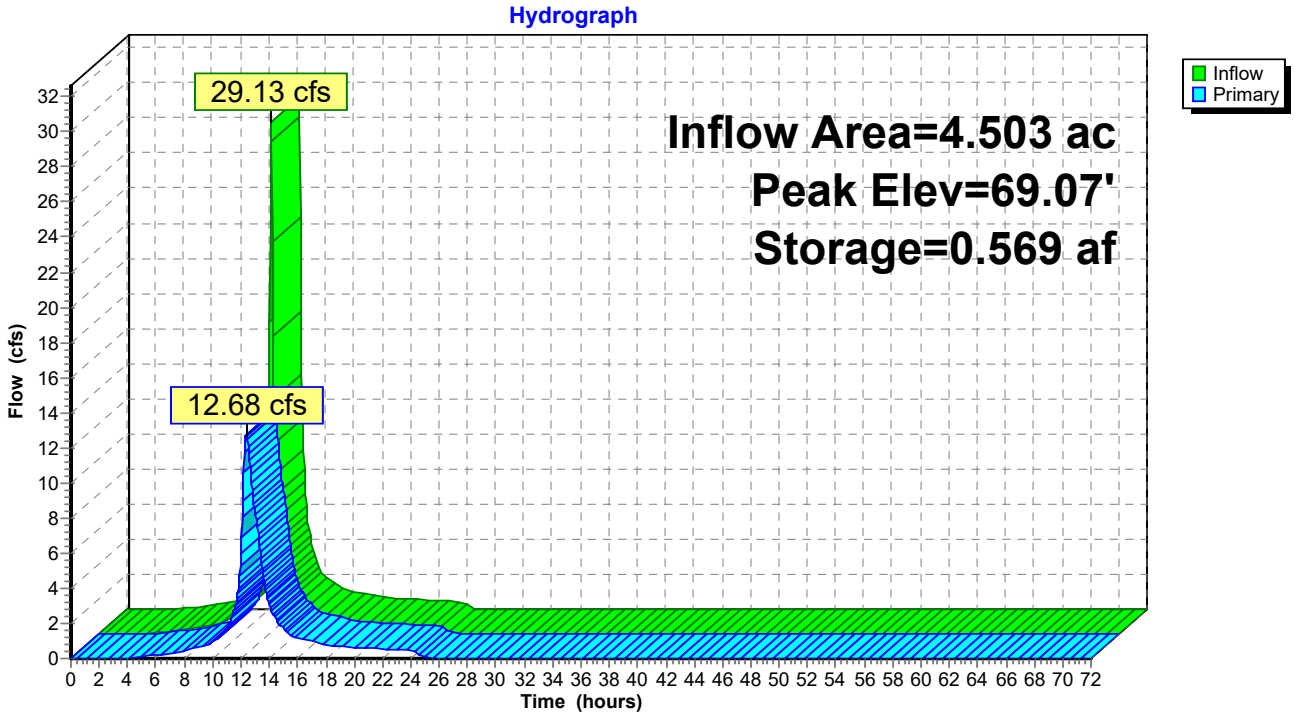
Plug-Flow detention time= 27.9 min calculated for 2.585 af (100% of inflow)
Center-of-Mass det. time= 27.9 min (824.4 - 796.6)

Volume	Invert	Avail.Storage	Storage Description
#1	66.10'	0.584 af	**36.0" Round Pipe Storage** x 12 L= 300.0' S= 0.0010 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.10'	**18.0" Round 18" Outlet Pipe** L= 64.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 66.10' / 65.78' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	66.10'	**18.0" Vert. 18" Orifice** C= 0.600
#3	Device 1	67.85'	**12.0" Vert. 12" Orifice X 0.00** C= 0.600
#4	Primary	69.30'	**6.0' long x 0.5' breadth 6 FT Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=12.64 cfs @ 12.37 hrs HW=69.06' (Free Discharge)
- **1=18" Outlet Pipe** (Controls 12.64 cfs)
  - **2=18" Orifice** (Orifice Controls 12.64 cfs @ 7.15 fps)
  - **3=12" Orifice** (Controls 0.00 cfs)
- **4=6 FT Weir** (Controls 0.00 cfs)

Pond B-2B: Proposed Subsurface Basin

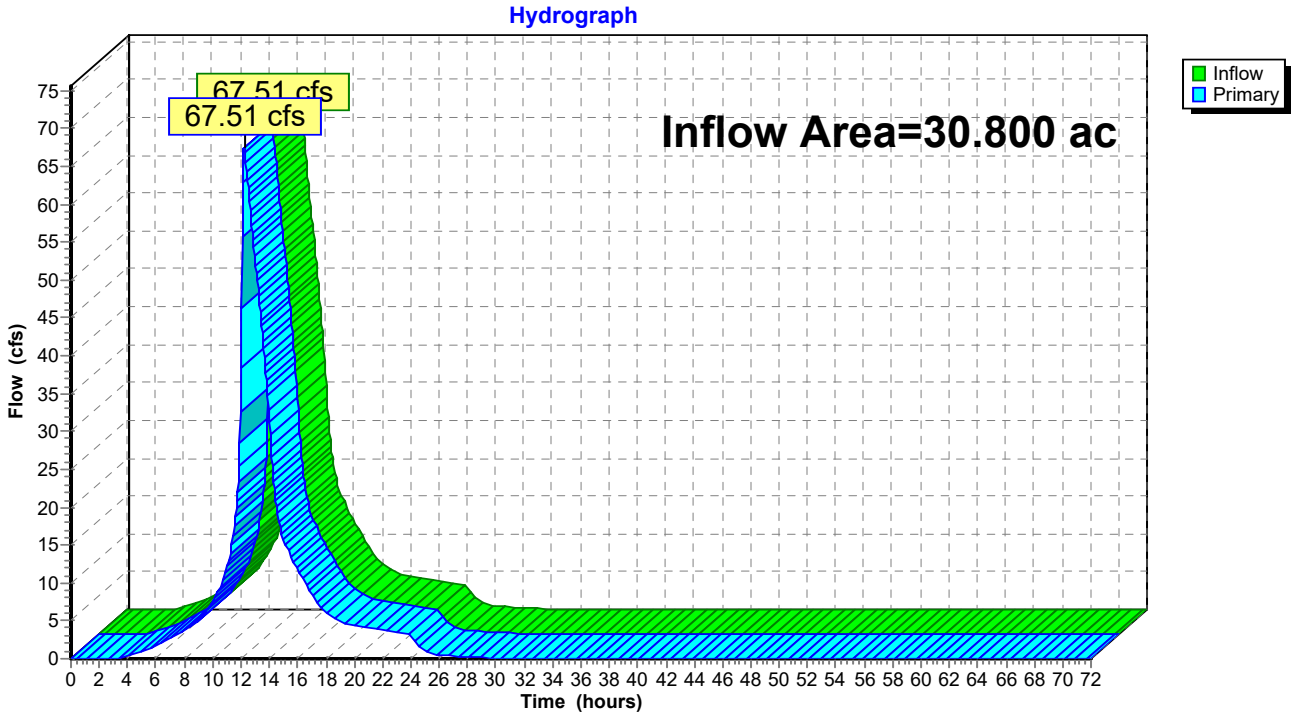


Summary for Link POI-1: Connection to 42" RCP

Inflow Area = 30.800 ac, 61.78% Impervious, Inflow Depth = 7.41" for 100-Year event
Inflow = 67.51 cfs @ 12.23 hrs, Volume= 19.014 af
Primary = 67.51 cfs @ 12.23 hrs, Volume= 19.014 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link POI-1: Connection to 42" RCP

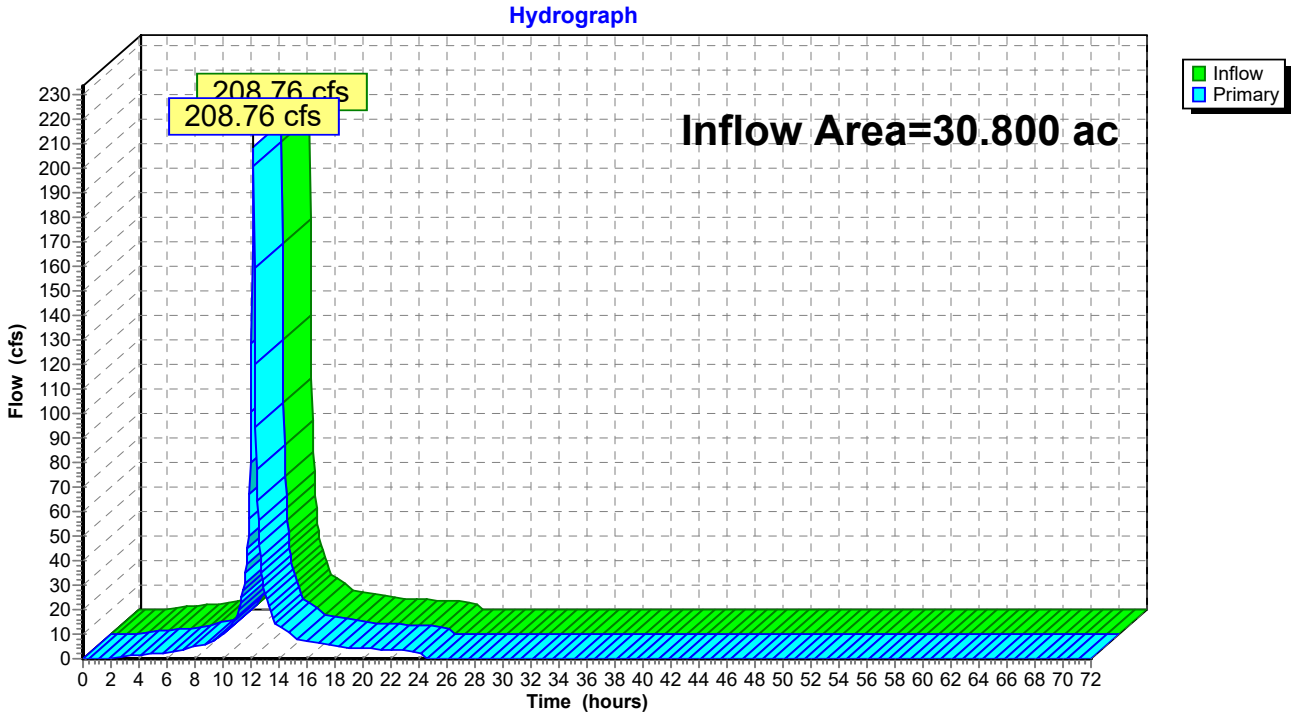


Summary for Link POI-1(EX): Connection to 42" RCP

Inflow Area = 30.800 ac, 66.56% Impervious, Inflow Depth = 7.53" for 100-Year event
Inflow = 208.76 cfs @ 12.17 hrs, Volume= 19.324 af
Primary = 208.76 cfs @ 12.17 hrs, Volume= 19.324 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link POI-1(EX): Connection to 42" RCP

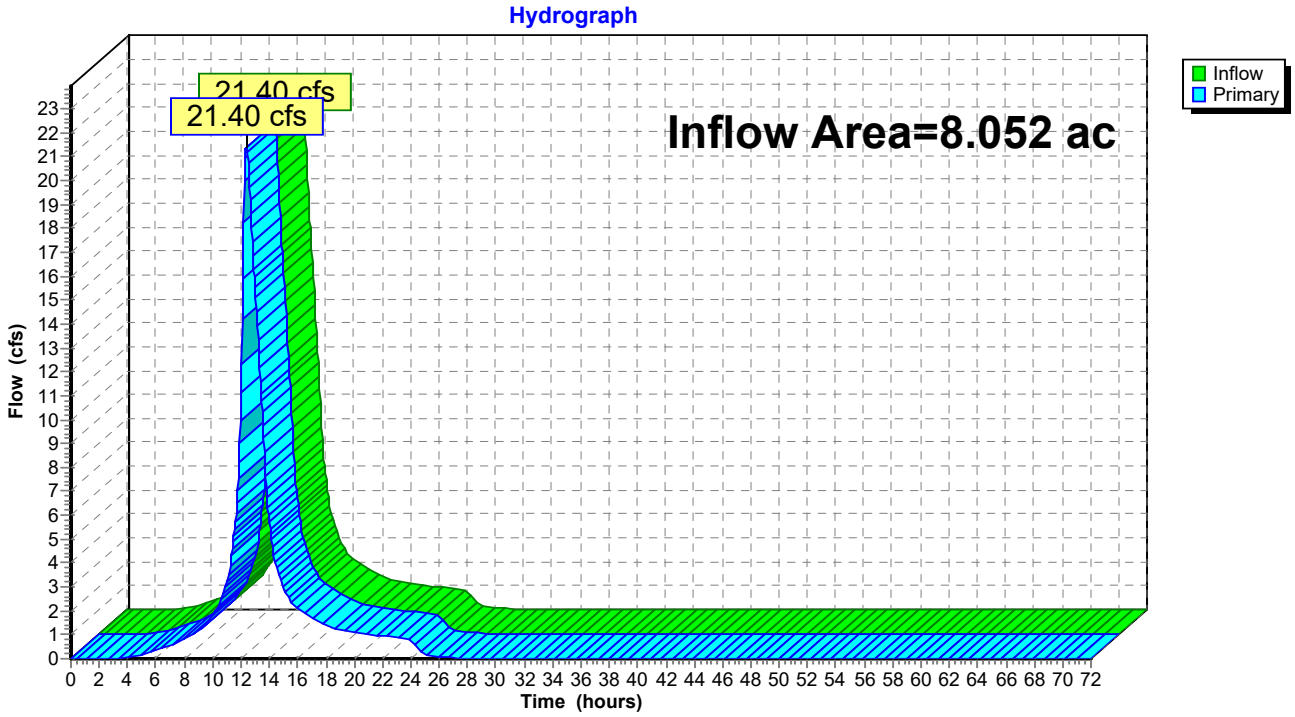


Summary for Link POI-2: Connection to 18" RCP

Inflow Area = 8.052 ac, 49.86% Impervious, Inflow Depth = 7.05" for 100-Year event
Inflow = 21.40 cfs @ 12.37 hrs, Volume= 4.731 af
Primary = 21.40 cfs @ 12.37 hrs, Volume= 4.731 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link POI-2: Connection to 18" RCP

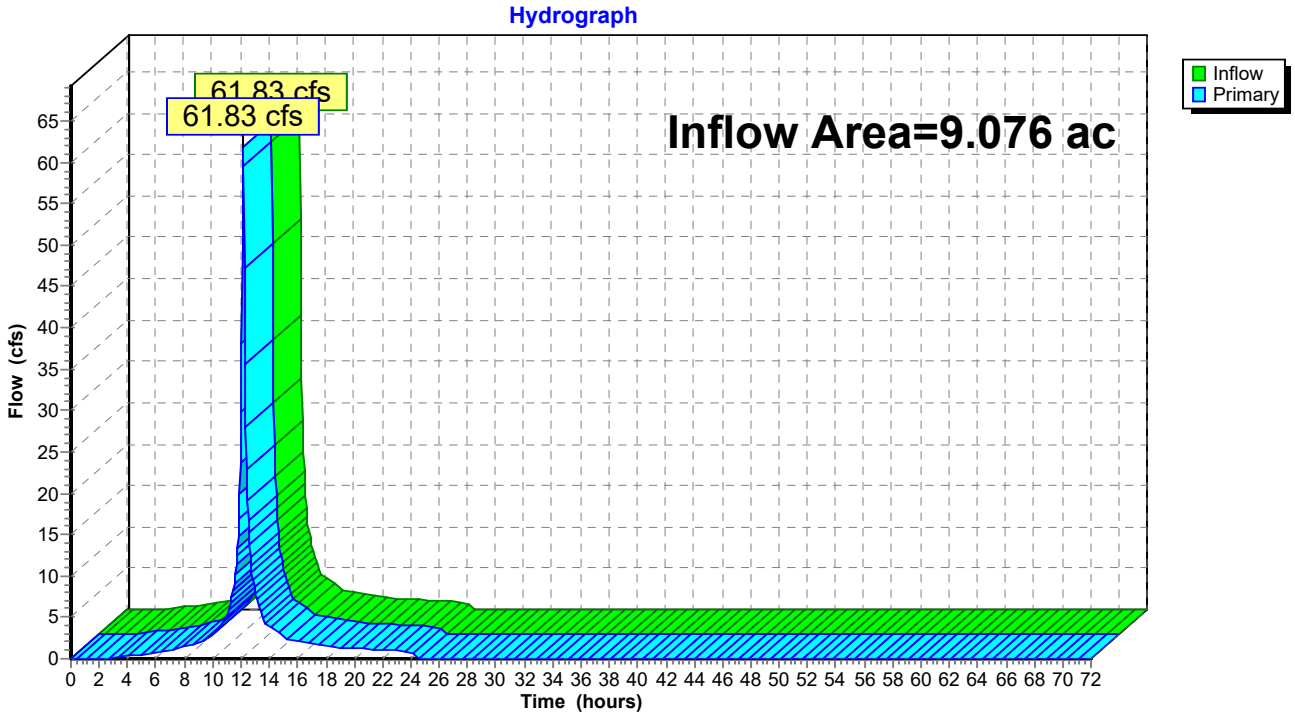


Summary for Link POI-2(EX): Connection to 18" RCP

Inflow Area = 9.076 ac, 64.67% Impervious, Inflow Depth = 7.50" for 100-Year event
Inflow = 61.83 cfs @ 12.17 hrs, Volume= 5.669 af
Primary = 61.83 cfs @ 12.17 hrs, Volume= 5.669 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link POI-2(EX): Connection to 18" RCP



Summary for Pond B-1A: Modified Southerly Aboveground Basin

Inflow Area = 19.770 ac, 75.13% Impervious, Inflow Depth = 7.80" for 100-Year event
Inflow = 133.96 cfs @ 12.17 hrs, Volume= 12.845 af
Outflow = 36.73 cfs @ 12.52 hrs, Volume= 12.844 af, Atten= 73%, Lag= 20.8 min
Primary = 36.73 cfs @ 12.52 hrs, Volume= 12.844 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 62.90' @ 12.52 hrs Surf.Area= 33,484 sf Storage= 172,760 cf

Plug-Flow detention time= 76.5 min calculated for 12.844 af (100% of inflow)
Center-of-Mass det. time= 76.2 min (849.6 - 773.4)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	177,944 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

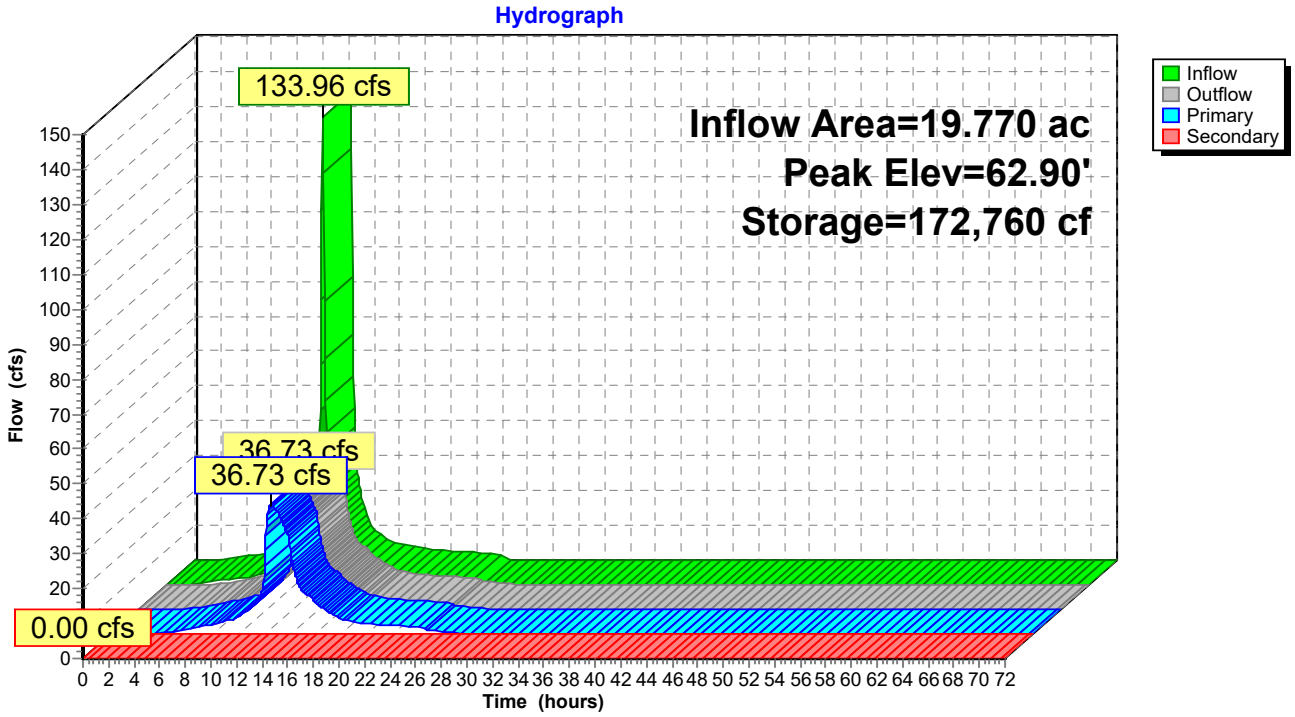
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.00	17,060	729.0	0	0	17,060
57.00	19,275	748.0	18,156	18,156	19,412
58.00	21,576	767.0	20,415	38,571	21,825
59.00	23,874	785.0	22,715	61,286	24,179
60.00	26,259	804.0	25,057	86,343	26,710
61.00	28,700	823.0	27,470	113,814	29,301
62.00	31,197	842.0	29,940	143,754	31,952
63.00	33,751	861.0	32,466	176,219	34,664
63.10	5,000	870.0	1,725	177,944	35,907

Device	Routing	Invert	Outlet Devices
#1	Primary	56.00'	**24.0" Round 24" Outlet Pipe** L= 19.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 56.00' / 55.14' S= 0.0453 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Device 1	56.00'	**18.0" Vert. 18" Orifice** C= 0.600
#3	Device 1	58.70'	**24.0" Vert. 24" Orifice** C= 0.600
#4	Secondary	63.00'	**20.0' long x 10.0' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=36.72 cfs @ 12.52 hrs HW=62.89' (Free Discharge)
└**1=24" Outlet Pipe** (Inlet Controls 36.72 cfs @ 11.69 fps)
  ├**2=18" Orifice** (Passes < 21.09 cfs potential flow)
  └**3=24" Orifice** (Passes < 27.03 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=56.00' (Free Discharge)
└**4=Spillway** (Controls 0.00 cfs)

Pond B-1A: Modified Southerly Aboveground Basin



Stage-Discharge for Pond B-1A: Modified Southerly Aboveground Basin

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
56.00	0.00	0.00	0.00
56.10	0.05	0.05	0.00
56.20	0.21	0.21	0.00
56.30	0.47	0.47	0.00
56.40	0.81	0.81	0.00
56.50	1.24	1.24	0.00
56.60	1.74	1.74	0.00
56.70	2.30	2.30	0.00
56.80	2.92	2.92	0.00
56.90	3.58	3.58	0.00
57.00	4.26	4.26	0.00
57.10	4.96	4.96	0.00
57.20	5.65	5.65	0.00
57.30	6.32	6.32	0.00
57.40	6.92	6.92	0.00
57.50	7.37	7.37	0.00
57.60	7.84	7.84	0.00
57.70	8.29	8.29	0.00
57.80	8.72	8.72	0.00
57.90	9.12	9.12	0.00
58.00	9.51	9.51	0.00
58.10	9.89	9.89	0.00
58.20	10.25	10.25	0.00
58.30	10.59	10.59	0.00
58.40	10.93	10.93	0.00
58.50	11.26	11.26	0.00
58.60	11.57	11.57	0.00
58.70	11.88	11.88	0.00
58.80	12.25	12.25	0.00
58.90	12.73	12.73	0.00
59.00	13.31	13.31	0.00
59.10	14.01	14.01	0.00
59.20	14.80	14.80	0.00
59.30	15.68	15.68	0.00
59.40	16.64	16.64	0.00
59.50	17.68	17.68	0.00
59.60	18.79	18.79	0.00
59.70	19.96	19.96	0.00
59.80	21.18	21.18	0.00
59.90	22.44	22.44	0.00
60.00	23.73	23.73	0.00
60.10	25.04	25.04	0.00
60.20	26.34	26.34	0.00
60.30	27.48	27.48	0.00
60.40	27.89	27.89	0.00
60.50	28.30	28.30	0.00
60.60	28.70	28.70	0.00
60.70	29.10	29.10	0.00
60.80	29.49	29.49	0.00
60.90	29.87	29.87	0.00
61.00	30.25	30.25	0.00
61.10	30.63	30.63	0.00
61.20	31.00	31.00	0.00
61.30	31.37	31.37	0.00
61.40	31.73	31.73	0.00
61.50	32.09	32.09	0.00
61.60	32.44	32.44	0.00
61.70	32.79	32.79	0.00
61.80	33.14	33.14	0.00
61.90	33.48	33.48	0.00
62.00	33.82	33.82	0.00
62.10	34.16	34.16	0.00
62.20	34.49	34.49	0.00
62.30	34.82	34.82	0.00
62.40	35.15	35.15	0.00
62.50	35.48	35.48	0.00
62.60	35.80	35.80	0.00
62.70	36.11	36.11	0.00
62.80	36.43	36.43	0.00
62.90	36.74	36.74	0.00
63.00	37.05	37.05	0.00
63.10	**38.93**	**37.36**	**1.57**

Stage-Area-Storage for Pond B-1A: Modified Southerly Aboveground Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
56.00	17,060	0
56.10	17,275	1,717
56.20	17,492	3,455
56.30	17,710	5,215
56.40	17,930	6,997
56.50	18,151	8,801
56.60	18,373	10,627
56.70	18,596	12,476
56.80	18,821	14,347
56.90	19,047	16,240
57.00	19,275	18,156
57.10	19,499	20,095
57.20	19,725	22,056
57.30	19,952	24,040
57.40	20,180	26,047
57.50	20,409	28,076
57.60	20,640	30,128
57.70	20,872	32,204
57.80	21,105	34,303
57.90	21,340	36,425
58.00	21,576	38,571
58.10	21,801	40,740
58.20	22,026	42,931
58.30	22,253	45,145
58.40	22,481	47,382
58.50	22,710	49,641
58.60	22,941	51,924
58.70	23,172	54,230
58.80	23,405	56,558
58.90	23,639	58,911
59.00	23,874	61,286
59.10	24,107	63,685
59.20	24,342	66,108
59.30	24,578	68,554
59.40	24,814	71,023
59.50	25,052	73,517
59.60	25,291	76,034
59.70	25,532	78,575
59.80	25,773	81,140
59.90	26,015	83,730
60.00	26,259	86,343
60.10	26,498	88,981
60.20	26,739	91,643
60.30	26,980	94,329
60.40	27,222	97,039
60.50	27,466	99,773
60.60	27,711	102,532
60.70	27,956	105,316
60.80	28,203	108,123
60.90	28,451	110,956
61.00	28,700	113,814
61.10	28,945	116,696
61.20	29,191	119,603
61.30	29,438	122,534
61.40	29,686	125,490
61.50	29,935	128,472
61.60	30,186	131,478
61.70	30,437	134,509
61.80	30,689	137,565
61.90	30,943	140,647
62.00	31,197	143,754
62.10	31,448	146,886
62.20	31,700	150,043
62.30	31,953	153,226
62.40	32,207	156,434
62.50	32,461	159,667
62.60	32,717	162,926
62.70	32,974	166,211
62.80	33,232	169,521
62.90	33,491	172,857
63.00	**33,751**	176,219
63.10	5,000	**177,944**

Summary for Pond B-1B: Proposed Subsurface Basin in Stone

Inflow Area = 2.073 ac,100.00% Impervious, Inflow Depth = 8.46" for 100-Year event
Inflow = 14.74 cfs @ 12.17 hrs, Volume= 1.461 af
Outflow = 12.98 cfs @ 12.22 hrs, Volume= 1.434 af, Atten= 12%, Lag= 3.3 min
Primary = 12.98 cfs @ 12.22 hrs, Volume= 1.434 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 68.00' @ 12.22 hrs Surf.Area= 0.074 ac Storage= 0.174 af

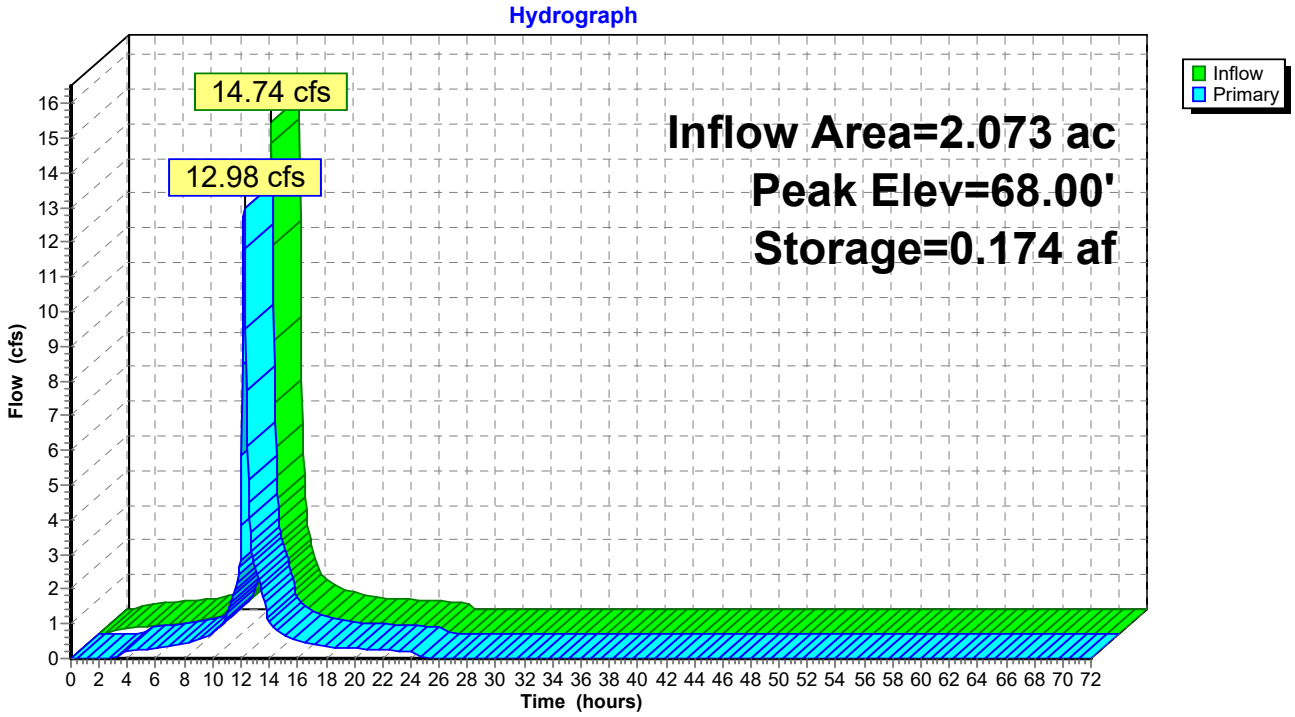
Plug-Flow detention time= 40.3 min calculated for 1.434 af (98% of inflow)
Center-of-Mass det. time= 27.2 min (771.8 - 744.7)

Volume	Invert	Avail.Storage	Storage Description
#1	64.87'	0.114 af	**36.0" Round Pipe Storage** x 7 Inside #2 L= 100.0' S= 0.0010 '/' 0.155 af Overall - 3.0" Wall Thickness = 0.114 af
#2	63.87'	0.087 af	**54.0" W x 60.0" H Box Stone** x 7 L= 103.0' S= 0.0010 '/' 0.372 af Overall - 0.155 af Embedded = 0.218 af x 40.0% Voids
		0.201 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	64.87'	**18.0" Round 18" Outlet Pipe** L= 17.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 64.87' / 64.79' S= 0.0047 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	64.87'	**12.0" W x 6.0" H Vert. 12" x 6" Slot** C= 0.600
#3	Device 1	66.56'	**30.0" W x 8.0" H Vert. 30" x 8" Slot** C= 0.600
#4	Device 1	67.87'	**6.0' long x 0.5' breadth 6' Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=12.72 cfs @ 12.22 hrs HW=67.96' (Free Discharge)
└**1=18" Outlet Pipe** (Passes 12.72 cfs of 13.01 cfs potential flow)
  ├**2=12" x 6" Slot** (Orifice Controls 4.05 cfs @ 8.11 fps)
  ├**3=30" x 8" Slot** (Orifice Controls 8.24 cfs @ 4.94 fps)
  └**4=6' Weir** (Weir Controls 0.42 cfs @ 0.82 fps)

Pond B-1B: Proposed Subsurface Basin in Stone



Stage-Discharge for Pond B-1B: Proposed Subsurface Basin in Stone

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
63.87	0.00	65.99	2.24	68.11	13.43
63.91	0.00	66.03	2.29	68.15	13.53
63.95	0.00	66.07	2.34	68.19	13.64
63.99	0.00	66.11	2.39	68.23	13.75
64.03	0.00	66.15	2.44	68.27	13.85
64.07	0.00	66.19	2.48	68.31	13.96
64.11	0.00	66.23	2.53	68.35	14.06
64.15	0.00	66.27	2.58	68.39	14.16
64.19	0.00	66.31	2.62	68.43	14.26
64.23	0.00	66.35	2.67	68.47	14.36
64.27	0.00	66.39	2.71	68.51	14.46
64.31	0.00	66.43	2.75	68.55	14.56
64.35	0.00	66.47	2.79	68.59	14.66
64.39	0.00	66.51	2.83	68.63	14.76
64.43	0.00	66.55	2.88	68.67	14.86
64.47	0.00	66.59	2.96	68.71	14.96
64.51	0.00	66.63	3.10	68.75	15.05
64.55	0.00	66.67	3.29	68.79	15.15
64.59	0.00	66.71	3.50	68.83	15.24
64.63	0.00	66.75	3.74	68.87	15.34
64.67	0.00	66.79	3.99	68.91	15.43
64.71	0.00	66.83	4.27	68.95	**15.53**
64.75	0.00	66.87	4.57		
64.79	0.00	66.91	4.88		
64.83	0.00	66.95	5.21		
64.87	0.00	66.99	5.55		
64.91	0.01	67.03	5.91		
64.95	0.03	67.07	6.28		
64.99	0.06	67.11	6.67		
65.03	0.11	67.15	7.06		
65.07	0.16	67.19	7.47		
65.11	0.23	67.23	7.89		
65.15	0.31	67.27	8.26		
65.19	0.40	67.31	8.58		
65.23	0.50	67.35	8.88		
65.27	0.61	67.39	9.16		
65.31	0.72	67.43	9.43		
65.35	0.85	67.47	9.69		
65.39	0.98	67.51	9.94		
65.43	1.13	67.55	10.18		
65.47	1.28	67.59	10.41		
65.51	1.43	67.63	10.64		
65.55	1.55	67.67	10.86		
65.59	1.63	67.71	11.07		
65.63	1.70	67.75	11.28		
65.67	1.77	67.79	11.49		
65.71	1.83	67.83	11.69		
65.75	1.90	67.87	11.88		
65.79	1.96	67.91	12.21		
65.83	2.02	67.95	12.64		
65.87	2.08	67.99	13.10		
65.91	2.13	68.03	13.21		
65.95	2.18	68.07	13.32		

Stage-Area-Storage for Pond B-1B: Proposed Subsurface Basin in Stone

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
63.87	0.000	65.99	0.077	68.11	0.177
63.91	0.000	66.03	0.079	68.15	0.178
63.95	0.001	66.07	0.081	68.19	0.179
63.99	0.002	66.11	0.083	68.23	0.180
64.03	0.003	66.15	0.085	68.27	0.181
64.07	0.004	66.19	0.088	68.31	0.182
64.11	0.006	66.23	0.090	68.35	0.184
64.15	0.007	66.27	0.092	68.39	0.185
64.19	0.008	66.31	0.094	68.43	0.186
64.23	0.009	66.35	0.096	68.47	0.187
64.27	0.010	66.39	0.099	68.51	0.188
64.31	0.012	66.43	0.101	68.55	0.190
64.35	0.013	66.47	0.103	68.59	0.191
64.39	0.014	66.51	0.105	68.63	0.192
64.43	0.015	66.55	0.108	68.67	0.193
64.47	0.016	66.59	0.110	68.71	0.194
64.51	0.018	66.63	0.112	68.75	0.196
64.55	0.019	66.67	0.114	68.79	0.197
64.59	0.020	66.71	0.116	68.83	0.198
64.63	0.021	66.75	0.119	68.87	0.199
64.67	0.022	66.79	0.121	68.91	0.200
64.71	0.023	66.83	0.123	68.95	**0.201**
64.75	0.024	66.87	0.125		
64.79	0.025	66.91	0.127		
64.83	0.026	66.95	0.129		
64.87	0.027	66.99	0.132		
64.91	0.028	67.03	0.134		
64.95	0.029	67.07	0.136		
64.99	0.030	67.11	0.138		
65.03	0.031	67.15	0.140		
65.07	0.032	67.19	0.142		
65.11	0.034	67.23	0.144		
65.15	0.036	67.27	0.146		
65.19	0.037	67.31	0.148		
65.23	0.039	67.35	0.150		
65.27	0.041	67.39	0.152		
65.31	0.042	67.43	0.154		
65.35	0.044	67.47	0.156		
65.39	0.046	67.51	0.157		
65.43	0.048	67.55	0.159		
65.47	0.050	67.59	0.161		
65.51	0.052	67.63	0.163		
65.55	0.054	67.67	0.164		
65.59	0.056	67.71	0.166		
65.63	0.058	67.75	0.167		
65.67	0.060	67.79	0.169		
65.71	0.062	67.83	0.170		
65.75	0.064	67.87	0.171		
65.79	0.066	67.91	0.173		
65.83	0.068	67.95	0.173		
65.87	0.070	67.99	0.174		
65.91	0.072	68.03	0.175		
65.95	0.074	68.07	0.176		

Summary for Pond B-2A: Proposed Northerly Aboveground Basin

Inflow Area = 3.550 ac, 58.24% Impervious, Inflow Depth = 7.25" for 100-Year event
Inflow = 23.74 cfs @ 12.17 hrs, Volume= 2.146 af
Outflow = 8.74 cfs @ 12.41 hrs, Volume= 2.146 af, Atten= 63%, Lag= 14.2 min
Primary = 8.74 cfs @ 12.41 hrs, Volume= 2.146 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 72.31' @ 12.41 hrs Surf.Area= 8,312 sf Storage= 21,987 cf

Plug-Flow detention time= 44.5 min calculated for 2.144 af (100% of inflow)
Center-of-Mass det. time= 45.5 min (833.0 - 787.5)

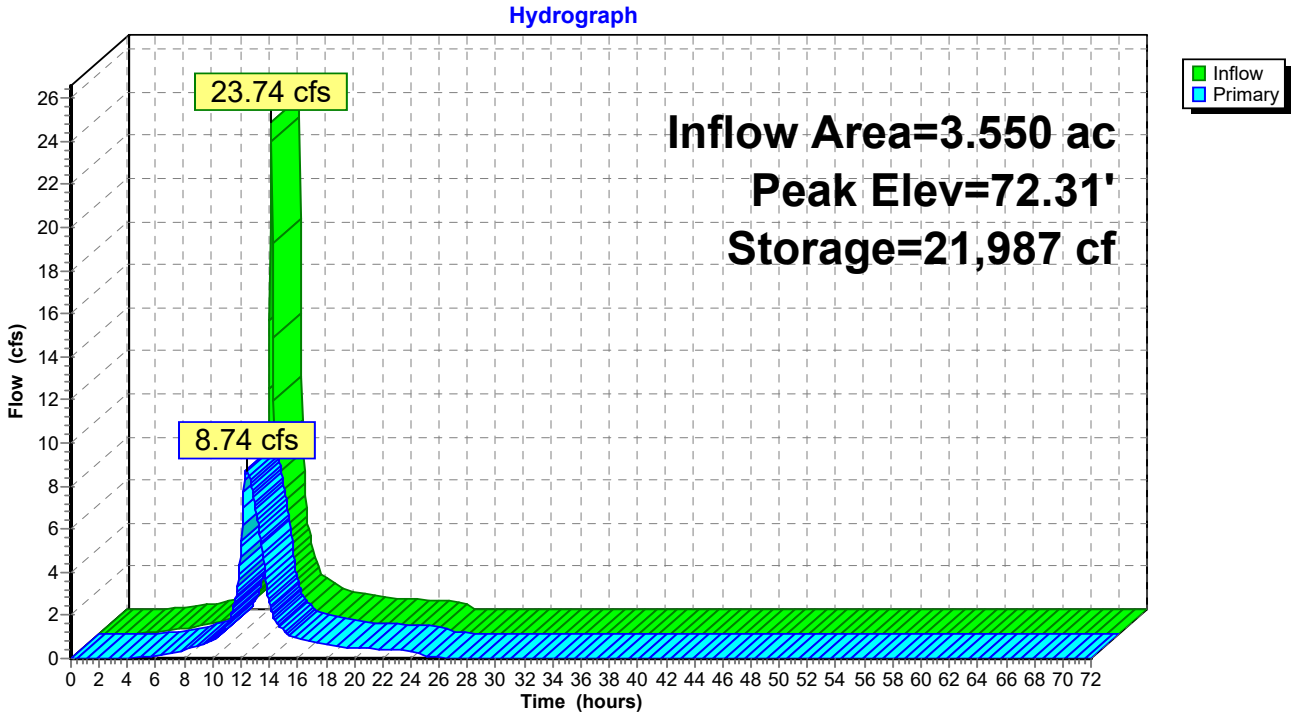
Volume	Invert	Avail.Storage	Storage Description
#1	69.00'	28,786 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
69.00	5,090	294.0	0	0	5,090
70.00	5,999	313.0	5,538	5,538	6,057
71.00	6,965	331.0	6,476	12,014	7,034
72.00	7,988	350.0	7,471	19,485	8,118
73.00	9,067	369.0	8,522	28,007	9,263
73.20	500	400.0	780	28,786	11,162

Device	Routing	Invert	Outlet Devices
#1	Primary	69.00'	**15.0" Round 15" Outlet Pipe** L= 107.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 69.00' / 68.47' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Primary	73.00'	**80.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=8.73 cfs @ 12.41 hrs HW=72.30' (Free Discharge)
└**1=15" Outlet Pipe** (Barrel Controls 8.73 cfs @ 7.12 fps)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B-2A: Proposed Northerly Aboveground Basin



Stage-Discharge for Pond B-2A: Proposed Northerly Aboveground Basin

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
69.00	0.00	70.06	3.40	71.12	6.43	72.18	8.52
69.02	0.00	70.08	3.50	71.14	6.47	72.20	8.55
69.04	0.01	70.10	3.59	71.16	6.52	72.22	8.59
69.06	0.01	70.12	3.69	71.18	6.56	72.24	8.62
69.08	0.02	70.14	3.78	71.20	6.61	72.26	8.66
69.10	0.04	70.16	3.87	71.22	6.65	72.28	8.69
69.12	0.06	70.18	3.96	71.24	6.70	72.30	8.73
69.14	0.08	70.20	4.05	71.26	6.74	72.32	8.76
69.16	0.10	70.22	4.14	71.28	6.79	72.34	8.79
69.18	0.13	70.24	4.23	71.30	6.83	72.36	8.83
69.20	0.16	70.26	4.32	71.32	6.87	72.38	8.86
69.22	0.19	70.28	4.41	71.34	6.91	72.40	8.89
69.24	0.23	70.30	4.49	71.36	6.96	72.42	8.93
69.26	0.27	70.32	4.57	71.38	7.00	72.44	8.96
69.28	0.31	70.34	4.65	71.40	7.04	72.46	8.99
69.30	0.36	70.36	4.73	71.42	7.08	72.48	9.02
69.32	0.41	70.38	4.81	71.44	7.12	72.50	9.06
69.34	0.46	70.40	4.88	71.46	7.17	72.52	9.09
69.36	0.51	70.42	4.95	71.48	7.21	72.54	9.12
69.38	0.57	70.44	5.02	71.50	7.25	72.56	9.15
69.40	0.63	70.46	5.09	71.52	7.29	72.58	9.19
69.42	0.69	70.48	5.15	71.54	7.33	72.60	9.22
69.44	0.75	70.50	5.20	71.56	7.37	72.62	9.25
69.46	0.82	70.52	5.25	71.58	7.41	72.64	9.28
69.48	0.88	70.54	5.30	71.60	7.45	72.66	9.31
69.50	0.95	70.56	5.34	71.62	7.49	72.68	9.35
69.52	1.02	70.58	5.37	71.64	7.53	72.70	9.38
69.54	1.10	70.60	5.40	71.66	7.57	72.72	9.41
69.56	1.17	70.62	5.41	71.68	7.61	72.74	9.44
69.58	1.25	70.64	5.40	71.70	7.64	72.76	9.47
69.60	1.33	70.66	5.36	71.72	7.68	72.78	9.50
69.62	1.41	70.68	5.32	71.74	7.72	72.80	9.53
69.64	1.49	70.70	5.38	71.76	7.76	72.82	9.56
69.66	1.57	70.72	5.43	71.78	7.80	72.84	9.60
69.68	1.65	70.74	5.49	71.80	7.83	72.86	9.63
69.70	1.74	70.76	5.54	71.82	7.87	72.88	9.66
69.72	1.83	70.78	5.59	71.84	7.91	72.90	9.69
69.74	1.91	70.80	5.65	71.86	7.95	72.92	9.72
69.76	2.00	70.82	5.70	71.88	7.98	72.94	9.75
69.78	2.09	70.84	5.75	71.90	8.02	72.96	9.78
69.80	2.18	70.86	5.80	71.92	8.06	72.98	9.81
69.82	2.27	70.88	5.85	71.94	8.09	73.00	9.84
69.84	2.36	70.90	5.90	71.96	8.13	73.02	10.42
69.86	2.46	70.92	5.95	71.98	8.17	73.04	11.46
69.88	2.55	70.94	6.00	72.00	8.20	73.06	12.80
69.90	2.64	70.96	6.05	72.02	8.24	73.08	14.37
69.92	2.74	70.98	6.10	72.04	8.27	73.10	16.16
69.94	2.83	71.00	6.15	72.06	8.31	73.12	18.13
69.96	2.93	71.02	6.19	72.08	8.35	73.14	20.27
69.98	3.02	71.04	6.24	72.10	8.38	73.16	22.57
70.00	3.12	71.06	6.29	72.12	8.42	73.18	25.01
70.02	3.21	71.08	6.34	72.14	8.45	73.20	**27.59**
70.04	3.31	71.10	6.38	72.16	8.49		

Stage-Area-Storage for Pond B-2A: Proposed Northerly Aboveground Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
69.00	5,090	0
69.05	5,134	256
69.10	5,178	513
69.15	5,222	773
69.20	5,266	1,036
69.25	5,310	1,300
69.30	5,355	1,567
69.35	5,400	1,835
69.40	5,445	2,107
69.45	5,490	2,380
69.50	5,535	2,656
69.55	5,581	2,933
69.60	5,626	3,214
69.65	5,672	3,496
69.70	5,718	3,781
69.75	5,765	4,068
69.80	5,811	4,357
69.85	5,858	4,649
69.90	5,905	4,943
69.95	5,952	5,240
70.00	5,999	5,538
70.05	6,046	5,839
70.10	6,092	6,143
70.15	6,139	6,449
70.20	6,186	6,757
70.25	6,234	7,067
70.30	6,281	7,380
70.35	6,329	7,695
70.40	6,377	8,013
70.45	6,425	8,333
70.50	6,473	8,656
70.55	6,521	8,980
70.60	6,570	9,308
70.65	6,619	9,637
70.70	6,668	9,970
70.75	6,717	10,304
70.80	6,766	10,641
70.85	6,816	10,981
70.90	6,865	11,323
70.95	6,915	11,667
71.00	6,965	12,014
71.05	7,014	12,364
71.10	7,064	12,716
71.15	7,114	13,070
71.20	7,164	13,427
71.25	7,214	13,787
71.30	7,265	14,149
71.35	7,315	14,513
71.40	7,366	14,880
71.45	7,417	15,250
71.50	7,468	15,622
71.55	7,519	15,996
71.60	7,570	16,374
71.65	7,622	16,753
71.70	7,674	17,136
71.75	7,726	17,521
71.80	7,778	17,908
71.85	7,830	18,299
71.90	7,883	18,691
71.95	7,935	19,087
72.00	7,988	19,485
72.05	8,040	19,886
72.10	8,093	20,289
72.15	8,145	20,695
72.20	8,198	21,104
72.25	8,251	21,515
72.30	8,305	21,929
72.35	8,358	22,345
72.40	8,411	22,764
72.45	8,465	23,186
72.50	8,519	23,611
72.55	8,573	24,038
72.60	8,627	24,468
72.65	8,682	24,901
72.70	8,736	25,336
72.75	8,791	25,775
72.80	8,846	26,216
72.85	8,901	26,659
72.90	8,956	27,106
72.95	9,011	27,555
73.00	**9,067**	28,007
73.05	5,930	28,379
73.10	3,456	28,611
73.15	1,646	28,736
73.20	500	**28,786**

Summary for Pond B-2B: Proposed Subsurface Basin

Inflow Area = 4.503 ac, 43.26% Impervious, Inflow Depth = 6.89" for 100-Year event
Inflow = 29.13 cfs @ 12.17 hrs, Volume= 2.585 af
Outflow = 12.68 cfs @ 12.37 hrs, Volume= 2.585 af, Atten= 56%, Lag= 11.8 min
Primary = 12.68 cfs @ 12.37 hrs, Volume= 2.585 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 69.07' @ 12.37 hrs Surf.Area= 0.114 ac Storage= 0.569 af

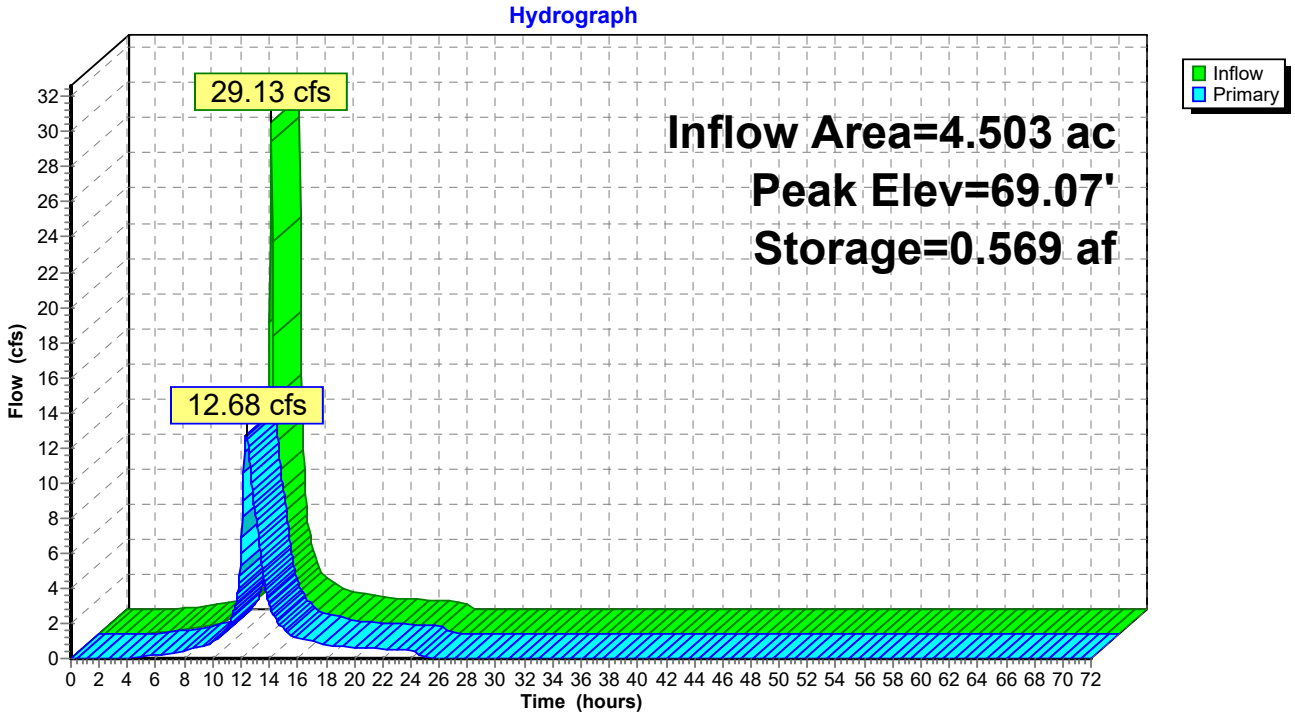
Plug-Flow detention time= 27.9 min calculated for 2.585 af (100% of inflow)
Center-of-Mass det. time= 27.9 min (824.4 - 796.6)

Volume	Invert	Avail.Storage	Storage Description
#1	66.10'	0.584 af	**36.0" Round Pipe Storage** x 12 L= 300.0' S= 0.0010 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	66.10'	**18.0" Round 18" Outlet Pipe** L= 64.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 66.10' / 65.78' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	66.10'	**18.0" Vert. 18" Orifice** C= 0.600
#3	Device 1	67.85'	**12.0" Vert. 12" Orifice X 0.00** C= 0.600
#4	Primary	69.30'	**6.0' long x 0.5' breadth 6 FT Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=12.64 cfs @ 12.37 hrs HW=69.06' (Free Discharge)
- **1=18" Outlet Pipe** (Controls 12.64 cfs)
  - **2=18" Orifice** (Orifice Controls 12.64 cfs @ 7.15 fps)
  - **3=12" Orifice** (Controls 0.00 cfs)
- **4=6 FT Weir** (Controls 0.00 cfs)

Pond B-2B: Proposed Subsurface Basin



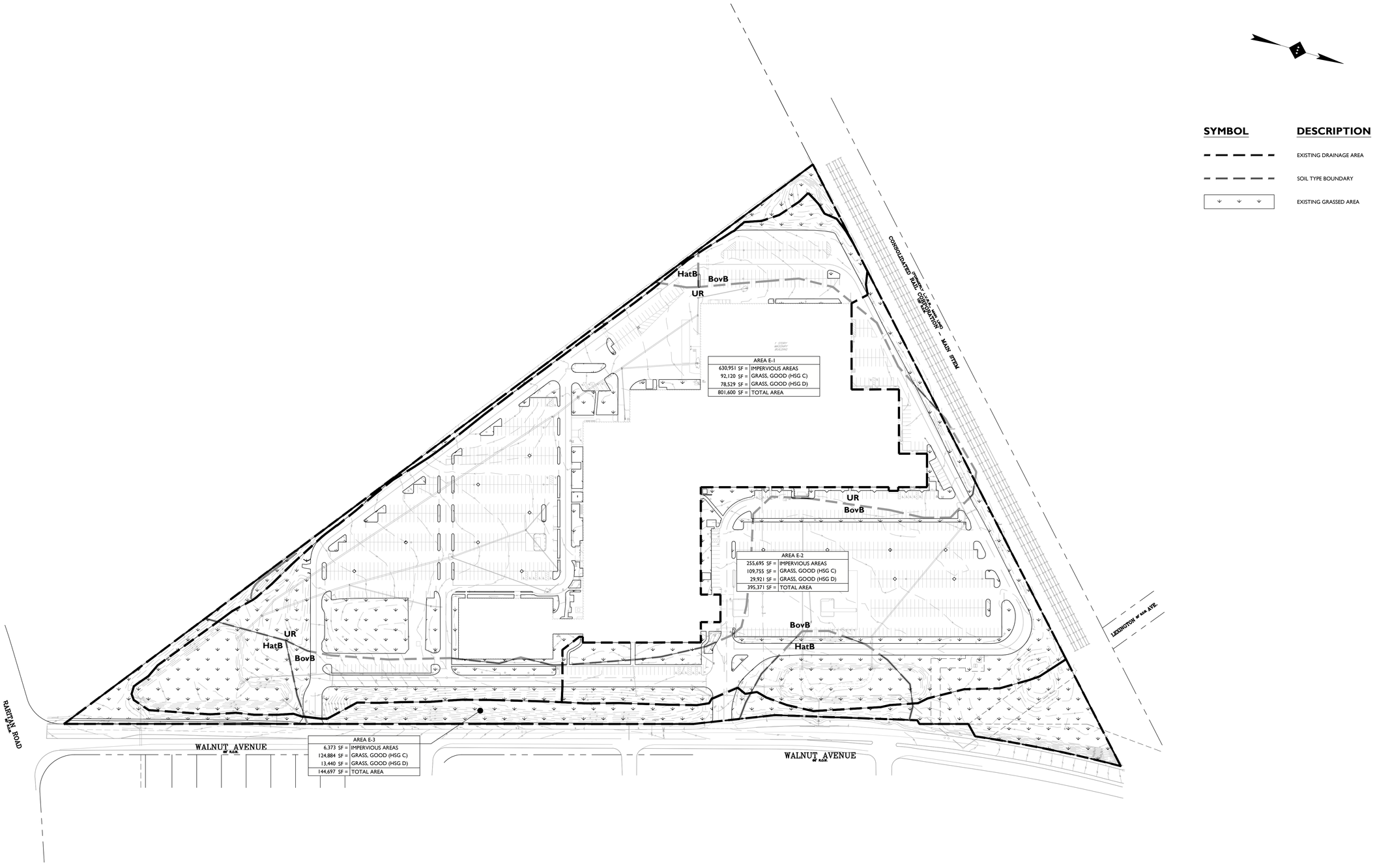
Stage-Discharge for Pond B-2B: Proposed Subsurface Basin

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
66.10	0.00	67.16	3.97	68.22	9.29	69.28	13.26
66.12	0.00	67.18	4.09	68.24	9.38	69.30	13.32
66.14	0.01	67.20	4.21	68.26	9.48	69.32	13.42
66.16	0.02	67.22	4.33	68.28	9.58	69.34	13.56
66.18	0.03	67.24	4.46	68.30	9.67	69.36	13.73
66.20	0.04	67.26	4.58	68.32	9.77	69.38	13.91
66.22	0.07	67.28	4.70	68.34	9.86	69.40	**14.12**
66.24	0.09	67.30	4.82	68.36	9.95		
66.26	0.12	67.32	4.95	68.38	10.04		
66.28	0.15	67.34	5.07	68.40	10.14		
66.30	0.19	67.36	5.20	68.42	10.23		
66.32	0.23	67.38	5.32	68.44	10.31		
66.34	0.27	67.40	5.44	68.46	10.40		
66.36	0.31	67.42	5.57	68.48	10.49		
66.38	0.36	67.44	5.69	68.50	10.58		
66.40	0.41	67.46	5.81	68.52	10.66		
66.42	0.47	67.48	5.94	68.54	10.75		
66.44	0.53	67.50	6.06	68.56	10.84		
66.46	0.59	67.52	6.18	68.58	10.92		
66.48	0.65	67.54	6.30	68.60	11.00		
66.50	0.72	67.56	6.42	68.62	11.09		
66.52	0.79	67.58	6.54	68.64	11.17		
66.54	0.86	67.60	6.66	68.66	11.25		
66.56	0.93	67.62	6.78	68.68	11.33		
66.58	1.01	67.64	6.90	68.70	11.41		
66.60	1.08	67.66	7.01	68.72	11.49		
66.62	1.16	67.68	7.12	68.74	11.57		
66.64	1.25	67.70	7.24	68.76	11.65		
66.66	1.33	67.72	7.35	68.78	11.73		
66.68	1.42	67.74	7.46	68.80	11.81		
66.70	1.51	67.76	7.56	68.82	11.89		
66.72	1.60	67.78	7.67	68.84	11.96		
66.74	1.69	67.80	7.77	68.86	12.04		
66.76	1.78	67.82	7.87	68.88	12.11		
66.78	1.88	67.84	7.97	68.90	12.18		
66.80	1.98	67.86	8.06	68.92	12.24		
66.82	2.08	67.88	8.16	68.94	12.30		
66.84	2.18	67.90	8.24	68.96	12.36		
66.86	2.28	67.92	8.33	68.98	12.42		
66.88	2.39	67.94	8.41	69.00	12.48		
66.90	2.49	67.96	8.48	69.02	12.53		
66.92	2.60	67.98	8.55	69.04	12.59		
66.94	2.71	68.00	8.61	69.06	12.65		
66.96	2.82	68.02	8.66	69.08	12.71		
66.98	2.93	68.04	8.71	69.10	12.76		
67.00	3.04	68.06	8.74	69.12	12.82		
67.02	3.15	68.08	8.75	69.14	12.88		
67.04	3.27	68.10	8.67	69.16	12.93		
67.06	3.38	68.12	8.78	69.18	12.99		
67.08	3.50	68.14	8.88	69.20	13.04		
67.10	3.62	68.16	8.98	69.22	13.10		
67.12	3.73	68.18	9.09	69.24	13.15		
67.14	3.85	68.20	9.19	69.26	13.21		

Stage-Area-Storage for Pond B-2B: Proposed Subsurface Basin

Elevation (feet)	Storage (acre-feet)
66.10	0.000
66.15	0.000
66.20	0.001
66.25	0.002
66.30	0.004
66.35	0.008
66.40	0.012
66.45	0.018
66.50	0.024
66.55	0.031
66.60	0.039
66.65	0.047
66.70	0.056
66.75	0.065
66.80	0.074
66.85	0.084
66.90	0.094
66.95	0.104
67.00	0.115
67.05	0.125
67.10	0.136
67.15	0.148
67.20	0.159
67.25	0.171
67.30	0.182
67.35	0.194
67.40	0.206
67.45	0.218
67.50	0.230
67.55	0.243
67.60	0.255
67.65	0.267
67.70	0.280
67.75	0.292
67.80	0.304
67.85	0.317
67.90	0.329
67.95	0.341
68.00	0.354
68.05	0.366
68.10	0.378
68.15	0.390
68.20	0.402
68.25	0.414
68.30	0.425
68.35	0.437
68.40	0.448
68.45	0.459
68.50	0.470
68.55	0.480
68.60	0.491
68.65	0.501
68.70	0.510
68.75	0.520
68.80	0.529
68.85	0.537
68.90	0.545
68.95	0.553
69.00	0.560
69.05	0.566
69.10	0.572
69.15	0.576
69.20	0.580
69.25	0.582
69.30	0.583
69.35	0.584
69.40	**0.584**

APPENDIX C
DRAINAGE AREA MAPS



ISSUE	DATE	BY	DESCRIPTION
1	11/27/2018	DD	ISSUED FOR REVIEW

NOT APPROVED FOR CONSTRUCTION

STONEFIELD engineering & design

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Phone 201.340.4468 · Fax 201.340.4472

DRAINAGE AREA MAPS

HARTZ MOUNTAIN INDUSTRIES

PROPOSED RESIDENTIAL REDEVELOPMENT PLAN

BLOCK 541, LOT 2
750 WALNUT AVENUE
TOWNSHIP OF CRANFORD
UNION COUNTY, NEW JERSEY

JEFFREY A. MARTELL, P.E.
NEW JERSEY LICENSE No. 47290
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: 1" = 100' | PROJECT ID: T-16509

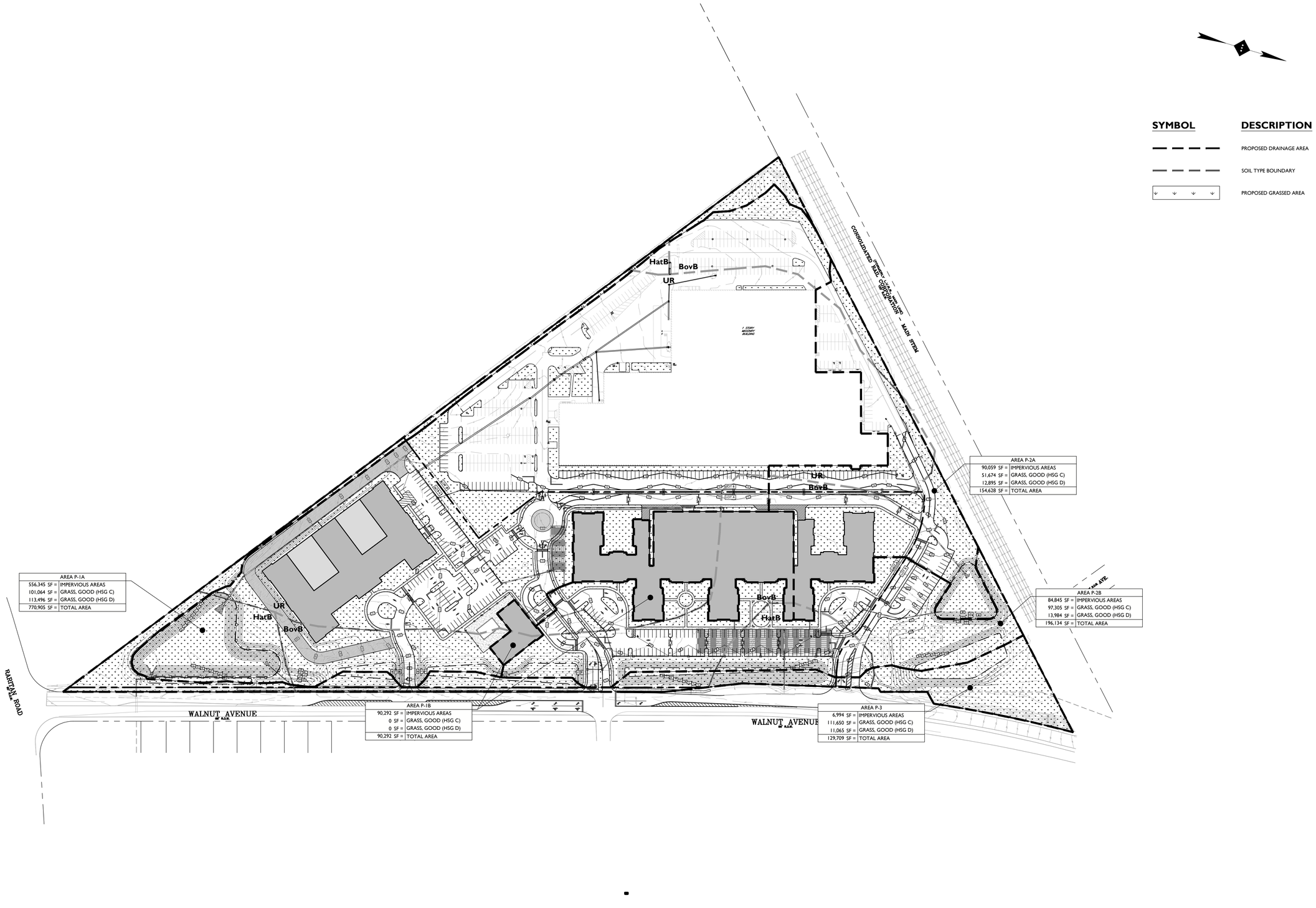
TITLE:

EXISTING DRAINAGE AREA MAP

DRAWING:

1 OF 2

T:\2016\T-16509 HARTZ MOUNTAIN - 750 WALNUT AVENUE, CRANFORD, NJ\CAD\EXHIBITS\2018.11.27 - EXISTING DRAINAGE AREA MAP.DWG



SYMBOL | **DESCRIPTION**

- PROPOSED DRAINAGE AREA
- SOIL TYPE BOUNDARY
- PROPOSED GRASSED AREA

ISSUE	DATE	BY	DESCRIPTION
1	11/27/2018	DD	ISSUED FOR REVIEW

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SCALE: 1" = 100' | PROJECT ID: T-16509

TITLE:

PROPOSED DRAINAGE AREA MAP

DRAWING:

2 OF 2

T:\16\16T-16509 HARTZ MOUNTAIN - 750 WALNUT AVENUE, CRANFORD, NJ\CAD\DRAWINGS\2018-11-27_PP\DRAINAGE AREA MAPS.DWG