



STORMWATER MANAGEMENT REPORT

FOR

Sifia By Gomes
525 Northfield Avenue
Lot 1.01, Block 159.04
Township of West Orange
Essex County, New Jersey

Prepared by
Jarmel Kizel Architects & Engineers, Inc.

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Jarmel Kizel Project No. GOMESGR24-223
Dated: October 22, 2025

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Signature

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Introduction

The purpose of this report is to present the stormwater runoff calculations performed for this development and to demonstrate compliance with the Townships Code on Stormwater Management and NJDEP Best Management Practices (BMP) specifically regarding the four (4) components of a major development: stormwater quantity, stormwater quality, groundwater recharge, and erosion control.

The project site is located at 525 Northfield Avenue, and is the site of the Essex House restaurant. The property has been designated as Tax Lots 1.01, 1.02 and 1.03, Block 159.04 on the current Township Tax Maps. The site has a total land area of 2.530 acres. The site is located on the corner of Northfield Avenue and Sheridan Avenue in the B-2 zone district, and it backs up to Masson Place and Lenox Terrace. Across the street from the site is the Turtle Back Zoo and the South Mountain Arena in South Mountain Reservation.

Existing Site Conditions

The site is currently occupied by a two-story masonry building with a parking lot for approximately 171 cars. The site is bisected by a 72" diameter concrete culvert pipe that flows east to west. The site's topography is such that the site receives off-site runoff from the residential properties to the northeast. Therefore the drainage study considers a total area of 2.848 acres. The site slopes considerably from the northeast corner, southwesterly toward the intersection of Northfield Avenue and Sheridan Avenue. The site has excessive slopes of approximately 50% along its northern boundary. These slopes terminate at the edge of the existing parking lot. The parking lot currently has an average slope of 5%. The site is currently composed of 69.2% impervious areas and 30.8% pervious areas. The pervious areas are, for the most part, located in the rear of the site. The vegetation in this area is mostly woods and shrubs. Access to the site is available from Northfield Avenue and Sheridan Avenue. There is no access to the site from Masson Place and Lenox Terrace because of the steep slopes in that section of the site.

Proposed Site Conditions

The proposed development requires to remove all existing building area, pavement, and site infrastructure for submission for preliminary and final site plans seeking approval to construct a multi-family 105-unit apartment building with an underground parking garage. The 52,940 square foot building will have (84) one-bedroom units, (16) two-bedroom units and (5) three-bedroom units. The building will also have 1,200sf retail space and 5,784sf of outdoor amenity area. The building will also have a total of (200) parking spaces.

The existing property has a total land area of 110,205 square feet (2.53 acres). The proposed conditions will have a reduction in impervious coverage by 3,265sf. Please also note that the

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proposed 5,784sf of outdoor amenity space has been considered impervious area to provide a conservative approach to our stormwater design. The amenity space will have planter area to infiltrate and absorb runoff. In proposed conditions we are maintaining drainage patterns as close to existing conditions as possible. Do to the fact that the proposal will disturbance more than one acre of land, causes the project to meet the definition of a "Major Development" under the State and local regulations.

Soils

From the Natural Resources Conservation Service, one soil type was found at the project site: BouB—Boonton substratum, 0 to 8 percent slopes. The soil is ranked with a hydraulic soil group C. For design purposes Hydrologic Soil Group C will be used for design comparison.

Nonstructural Best Management Practices (Bmps)

Stormwater management is an important aspect of the project, not only for the safety and convenience of potential residents, but for the environment as well. Thus, it has been endeavored to include various stormwater management techniques that include both natural and structural means to accomplish that task.

The following low impact, nonstructural, development approaches to site design have been incorporated into this project as per NJDEP storm water management regulations 7:8-5.3; notably:

7:8-5.3 (b) 5. Land disturbance would be minimized by maintaining as much native vegetation around the site as possible.

7:8-5.3 (b) 6. Much of the proposed building area has been previously disturbed and/or filled. It is these areas where most of the contemplated soil compaction would take place in order to construct the new buildings, parking areas, and drives. In other locations that have not seen extensive disturbance, rubber tired vehicles would be used to minimize compaction.

7:8-5.3 (b) 7. Extensive, supplemental landscaping would be added throughout the project site in the form of trees, shrubs, and ground cover.

Groundwater Recharge

This section of the report describes the groundwater recharge provisions of the stormwater management system's design. The site falls within the State's Planning Area 1 (Metropolitan) and therefore the site can be considered as part of the urban redevelopment area. A small amount of wooded area is being disturbed. Consequently, pursuant to NJAC 7:8-5.4(b)2 the groundwater recharge requirements do not apply to this development. The reduction in impervious coverage would likely allow groundwater infiltration.

Water Quality Management

As stated previously, since the project does not increase impervious cover by more than 0.25 acres (impervious cover is reduced in the proposed condition), the regulatory requirements at NJAC 7:8-5.5 are not applicable. Nevertheless, we believe implementation of the project will result in an improvement of runoff quality, when compared to existing site conditions and former use of the property. The anticipated improvement in water quality is based upon the net reduction in impervious cover, as well as a higher percentage of the post-project cover being comprised of roof areas. The NJDEP considers roof runoff "clean," not requiring TSS removal pursuant to State regulation.

Hydrology And Stormwater Management

Quantity Control (Peak Flow Attenuation)

Estimating runoff rates and volumes for quantity control purposes is done by utilizing what is referred to as the "NRCS Method", which is also known as the "TR-55" methodology. This is described at length in Chapter 5 of the BMP Manual

According to the National Engineering Handbook, as published by the NRCS, the combination of a hydrologic soil group and a land use and treatment class is a hydrologic soil-cover complex, to which a runoff curve number (CN) can be assigned. The CN is an indication of the complex's runoff potential. The Hydrologic Soil Group(s) for the project site were determined by referencing the NRCS's Web Soil Survey for the appropriate county.

The Time of Concentration, "Tc", for the existing and the proposed conditions have been calculated through modeling software and the paths are shown on the coverage maps. For the various ground covers, runoff coefficients, "CN", used in the analysis were 98 for impervious areas such as buildings, parking lot, and walkways, and 71-74 for wooded/landscape areas.

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The rainfall depths utilized for the project's design were derived from NOAA Atlas 14, Volume 2, Version 3 point precipitation frequency estimates. An adjustment factor increasing the runoff factor by 1%-6% was applied in per 54 NJR 2187(a) for current storms and another 23% to 46% was added to arrive at a "future" storm intensity. Below is a summary of the storm rainfall depths used for both the existing and proposed conditions.

Storm	2-year	10-year	100-year
Current-Year-2020	3.47 in	5.38 in	9.18 in
Future-Year-2050	4.09 in	6.37 in	11.52 in.

The project's approach for compliance with the regulatory requirements for "quantity control" are set forth at Subpart 5.6(b)(2) of the Stormwater Management Regulations (NJAC 7:8), specifically "demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the 2-, 10-, and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events." As the project is divided into two primary drainage areas with two design points, quantity control considerations are evaluated for each design point.

The TR-55 calculations provided in Appendix No. A and Appendix No. B indicate the total peak runoff and total runoff volumes from the subject drainage areas under pre-project and post-project conditions respectively. Tables below provide a summary of the peak runoff rates and total runoff volumes for the regulated storms under existing and proposed conditions for both design points and the overall site, respectively. The following data verifies the project's compliance with the standards pertaining to "quantity control" as the peak runoff rates for post-project conditions never exceed the pre-project conditions. There is a slight de-minimus increase in volume for post-conditions but will not cause any flood damage downstream. Our site currently connects to an existing 72" culvert pipe. The slight increase in volume will be confined to the existing pipe and safely conveyed downstream as existing condition.

Table No. 1				
Design Point #1				
Storm Freq.	Runoff Rates (cfs)		Total Volume Runoff (cf)	
	PRE	POST	PRE	POST
2-Year(2020)	6.63	6.32	22,950	24,297
10-Year(2020)	11.07	10.53	40,021	41,525
100-Year(2020)	20.05	19.17	75,713	77,618
2-Year(2050)	8.17	7.74	28,382	29,775
10-Year(2050)	13.59	12.90	49,173	50,772
100-Year(2050)	26.01	24.87	98,200	100,382

Table No. 2				
Design Point #2				
Storm Freq.	Runoff Rates (cfs)		Total Volume Runoff (cf)	
	PRE	POST	PRE	POST
2-Year(2020)	0.40	0.19	1,180	522
10-Year(2020)	0.65	0.36	1,993	1,016
100-Year(2020)	1.14	0.70	3,633	2,076
2-Year(2050)	0.48	0.24	1,442	677
10-Year(2050)	0.78	0.45	2,418	1,286
100-Year(2050)	1.44	0.92	4,648	2,748

Table No. 3				
Overall Site (Total)				
Storm Freq.	Runoff Rates (cfs)		Total Volume Runoff (cf)	
	PRE	POST	PRE	POST
2-Year(2020)	6.98	6.48	24,129	24,819
10-Year(2020)	11.63	10.81	42,014	42,541
100-Year(2020)	21.02	19.72	79,347	79,694
2-Year(2050)	8.59	7.93	29,824	30,453
10-Year(2050)	14.26	13.26	51,591	52,058
100-Year(2050)	27.25	25.58	102,849	103,130

5. Soil Erosion and Sediment Control Compliance

The project has also been designed to minimize erosion and sedimentation in accordance with The Standards for Soil Erosion and Sediment Control in New Jersey". "Soil Erosion and Sediment Control Plan" is included in the set of project plans, specifying numerous practices to achieve this goal. The project's "Soil Erosion and Sediment Control Plan" is subject to review and approval by the Hudson Essex Passaic Soil Conservation District (HEPSCD). The District's certification of the plan is required before any construction may commence, which provides further assurance that the project's implementation will minimize erosion and sedimentation.

6. Collection and Conveyance System Design

The project's storm water management system also includes a network of storm sewer pipes to convey the stormwater runoff to and from the various management facilities. Similarly, stormwater inlets are strategically located to collect runoff from the surface of the ground. The collection and conveyance systems (storm sewers) were designed for the peak rate of runoff during a 100-year storm calculated per the Rational Method. Appendix No. C of this report contains the storm sewer design calculations.

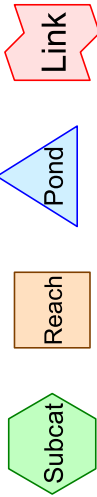
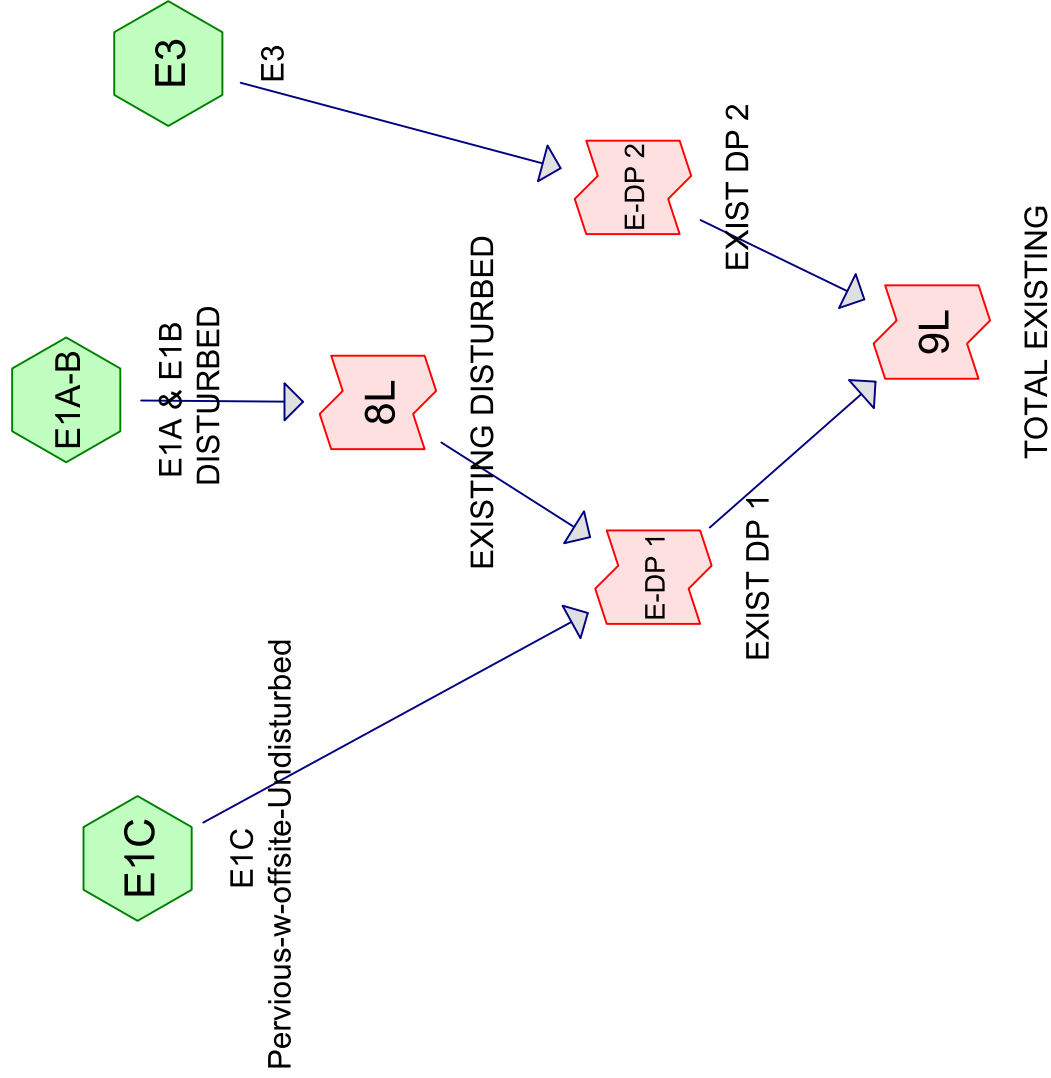
The Proposed Inlet Area Map presents the inlet drainage areas for each proposed inlet collecting roof runoff via downspout leaders. There are multiple storm sewers systems proposed: system B-F encompasses Proposed Drainage Area to mimic existing condition drainage patterns.

Conclusion

The proposed improvements are designed in accordance with local, county and state standards as specified herein. The measures and design provided herein are intended to prevent or limit the impact of the proposed development on the site and the surrounding areas with respect to stormwater quantity, quality, groundwater recharge, and erosion from stormwater runoff. The proposed project will not increase impervious surfaces within the property in question and will provide peak flow attenuation by reducing the peak flow as compared to existing conditions. As per the requirements for a major site development, there is a reduction in the existing peak runoff rates of stormwater leaving the site for the 2, 10, and 100-year storm events at each design point respectively and that the increased volume or change in timing of stormwater runoff will not cause any increase in flooding downstream of the site. It is our opinion that the calculations provided and summarized above demonstrate compliance with the regulations.

APPENDIX A

EXISTING DRAINAGE CALCULATIONS



24-223 DRAINAGE DESIGN-EXISTING-UPDATE

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
2,329	74	>75% Grass cover, Good, HSG C (E1C, E3)
1,220	98	Impervious (E1C)
2,721	71	Meadow, non-grazed, HSG C (E1C)
72,135	98	Paved parking, HSG C (E1A-B)
708	98	Roof-offsite (E1C)
4,142	98	Roofs, HSG C (E3)
7,928	72	Woods/grass comb., Good, HSG C (E1A-B)
32,886	70	wooded (E1C)

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
89,255	HSG C	E1A-B, E1C, E3
0	HSG D	
34,814	Other	E1C

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchment Numbers
0	0	2,329	0	0	2,329	>75% Grass cover, Good	E1C, E3
0	0	0	0	1,220	1,220	Impervious	E1C
0	0	2,721	0	0	2,721	Meadow, non-grazed	E1C
0	0	72,135	0	0	72,135	Paved parking	E1A-B
0	0	0	0	708	708	Roof-offsite	E1C
0	0	4,142	0	0	4,142	Roofs	E3
0	0	7,928	0	0	7,928	Woods/grass comb., Good	E1A-B
0	0	0	0	32,886	32,886	wooded	E1C

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Summary for Subcatchment E1A-B: E1A & E1B DISTURBED

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

Runoff = 6.16 cfs @ 12.09 hrs, Volume= 19,406 cf, Depth> 2.91"
Routed to Link 8L : EXISTING DISTURBED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (sf)	CN	Description
72,135	98	Paved parking, HSG C
7,928	72	Woods/grass comb., Good, HSG C

80,063	95	Weighted Average
7,928		9.90% Pervious Area
72,135		90.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	25	0.5000	0.22		Sheet Flow, Wooded
					Woods: Light underbrush n= 0.400 P2= 3.47"
1.5	413	0.0480	4.45		Shallow Concentrated Flow, Parking lot
					Paved Kv= 20.3 fps

3.4	438	Total
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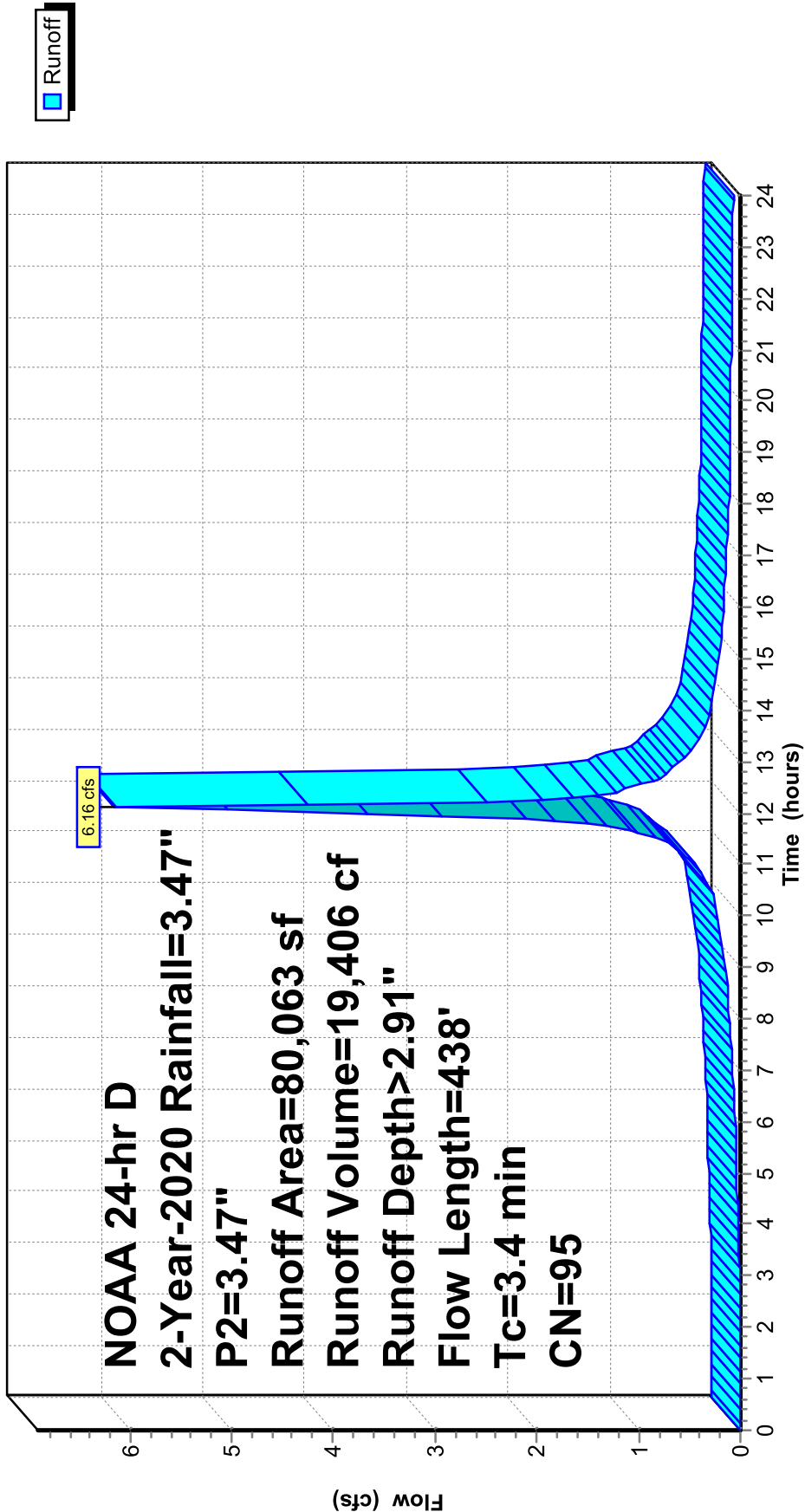
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

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Subcatchment E1A-B: E1A & E1B DISTURBED

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Summary for Subcatchment E1C: E1C Pervious-w-offsite-Undisturbed

Runoff = 0.83 cfs @ 12.23 hrs, Volume= 3,544 cf, Depth> 1.10"
Routed to Link E-DP 1 : EXIST DP 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (sf)	CN	Description
* 708	98	Roof-offsite
* 1,220	98	Impervious
2,721	71	Meadow, non-grazed, HSG C
* 32,886	70	wooded
1,240	74	>75% Grass cover, Good, HSG C
38,775	72	Weighted Average
36,847		95.03% Pervious Area
1,928		4.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0900	0.15		Sheet Flow, sheet flow Woods: Light underbrush n= 0.400 P2= 3.47"
0.6	123	0.5000	3.54		Shallow Concentrated Flow, SC Woodland Kv= 5.0 fps
1.6	431	0.0480	4.45		Shallow Concentrated Flow, Parking lot Paved Kv= 20.3 fps
13.5	654	Total			

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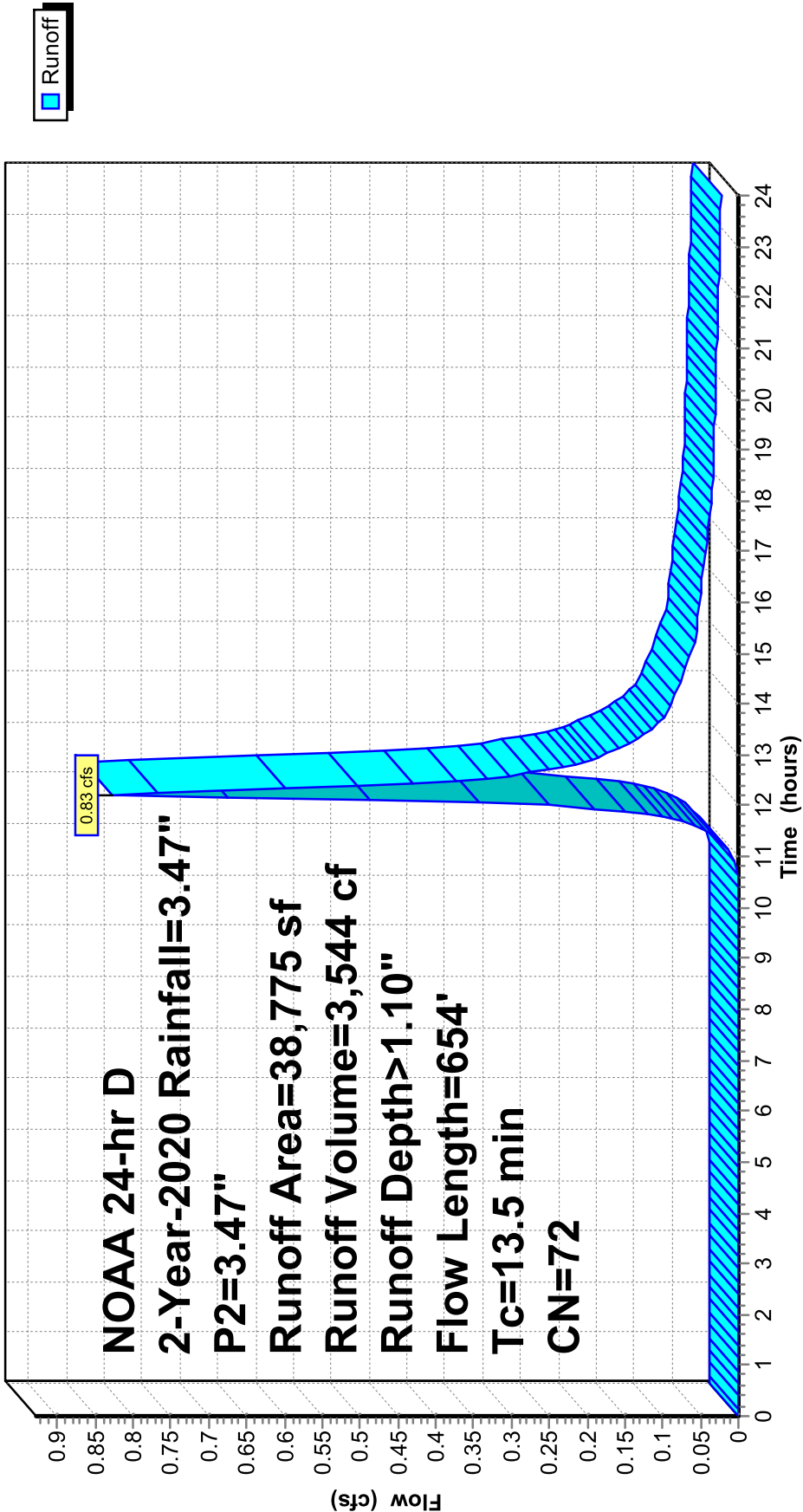
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Subcatchment E1C: E1C Pervious-w-offsite-Undisturbed

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Summary for Subcatchment E3: E3

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

Runoff = 0.40 cfs @ 12.06 hrs, Volume= 1,180 cf, Depth> 2.71"
Routed to Link E-DP 2 : EXIST DP 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (sf)		CN	Description		
1,089	74	>75% Grass cover, Good, HSG C			
4,142	98	Roofs, HSG C			
5,231	93	Weighted Average			
1,089		20.82% Pervious Area			
4,142		79.18% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	24	0.8330	4.79		Sheet Flow, Roof
					Smooth surfaces n= 0.011 P2= 3.47"
0.7	145	0.0480	3.53		Shallow Concentrated Flow, Lawn
					Unpaved Kv= 16.1 fps

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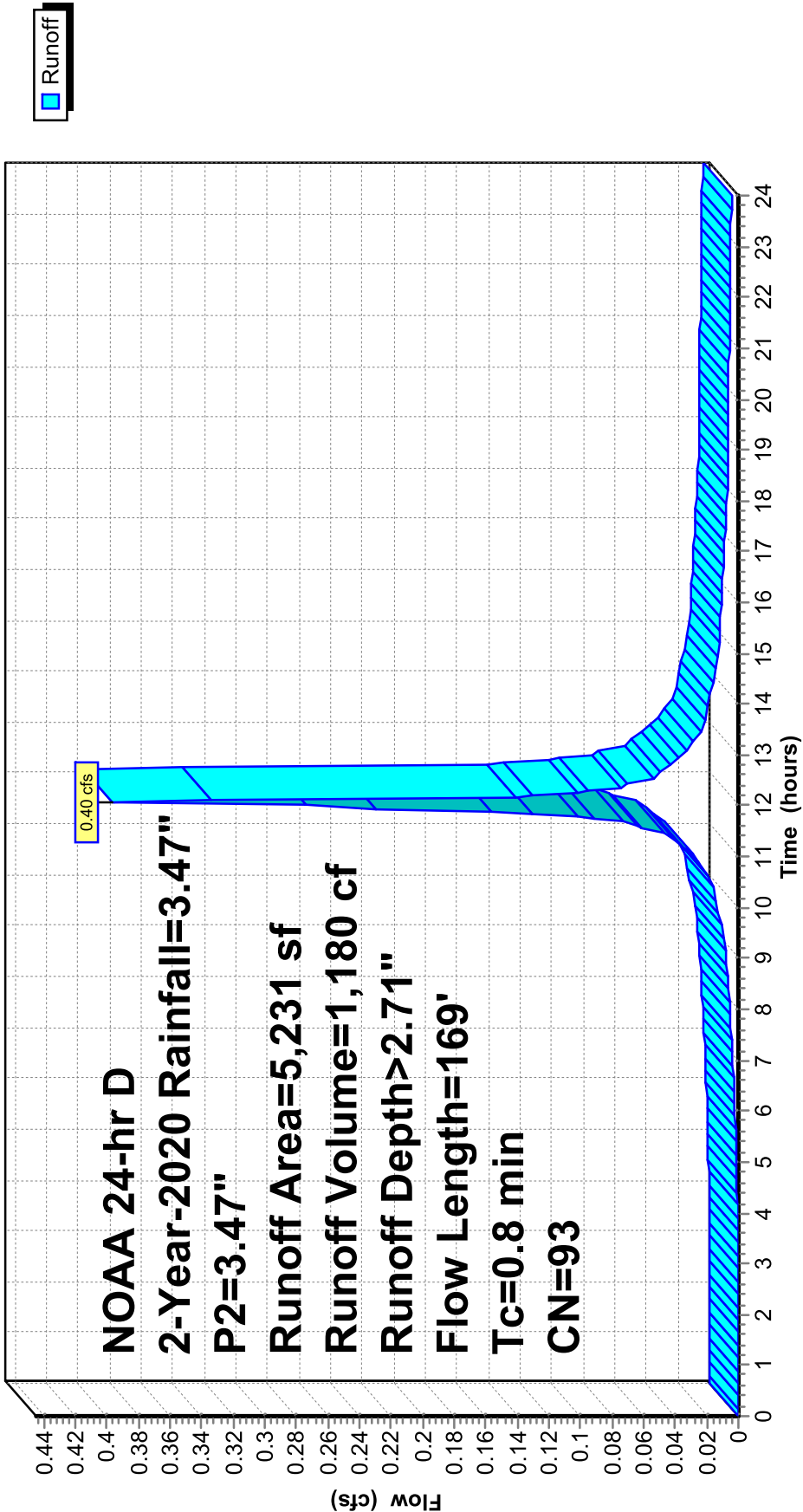
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Subcatchment E3: E3

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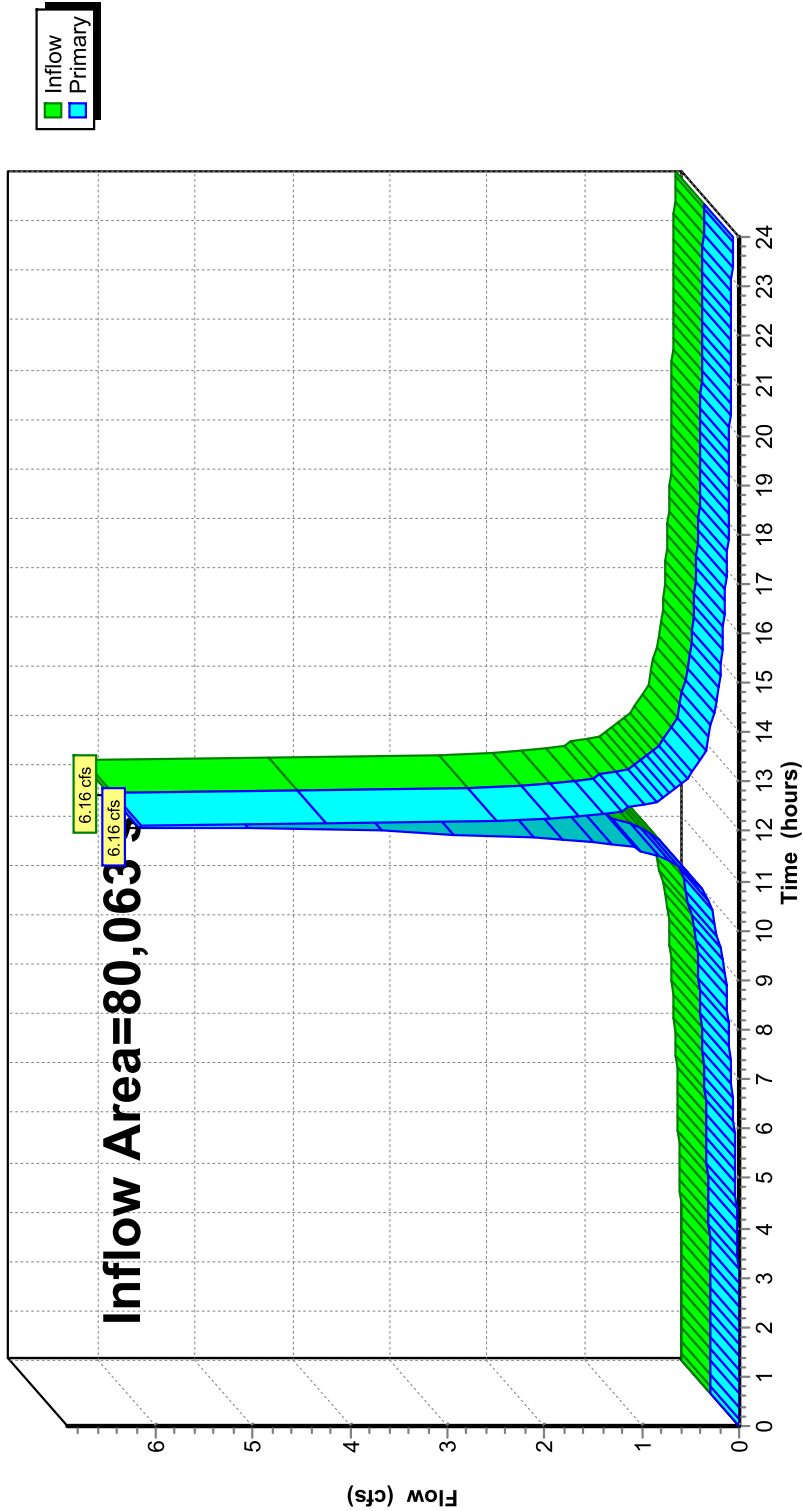
Summary for Link 8L: EXISTING DISTURBED

Inflow Area = 80,063 sf, 90.10% Impervious, Inflow Depth > 2.91" for 2-Year-2020 event
Inflow = 6.16 cfs @ 12.09 hrs, Volume= 19,406 cf
Primary = 6.16 cfs @ 12.09 hrs, Volume= 19,406 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E-DP 1 : EXIST DP 1

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: EXISTING DISTURBED

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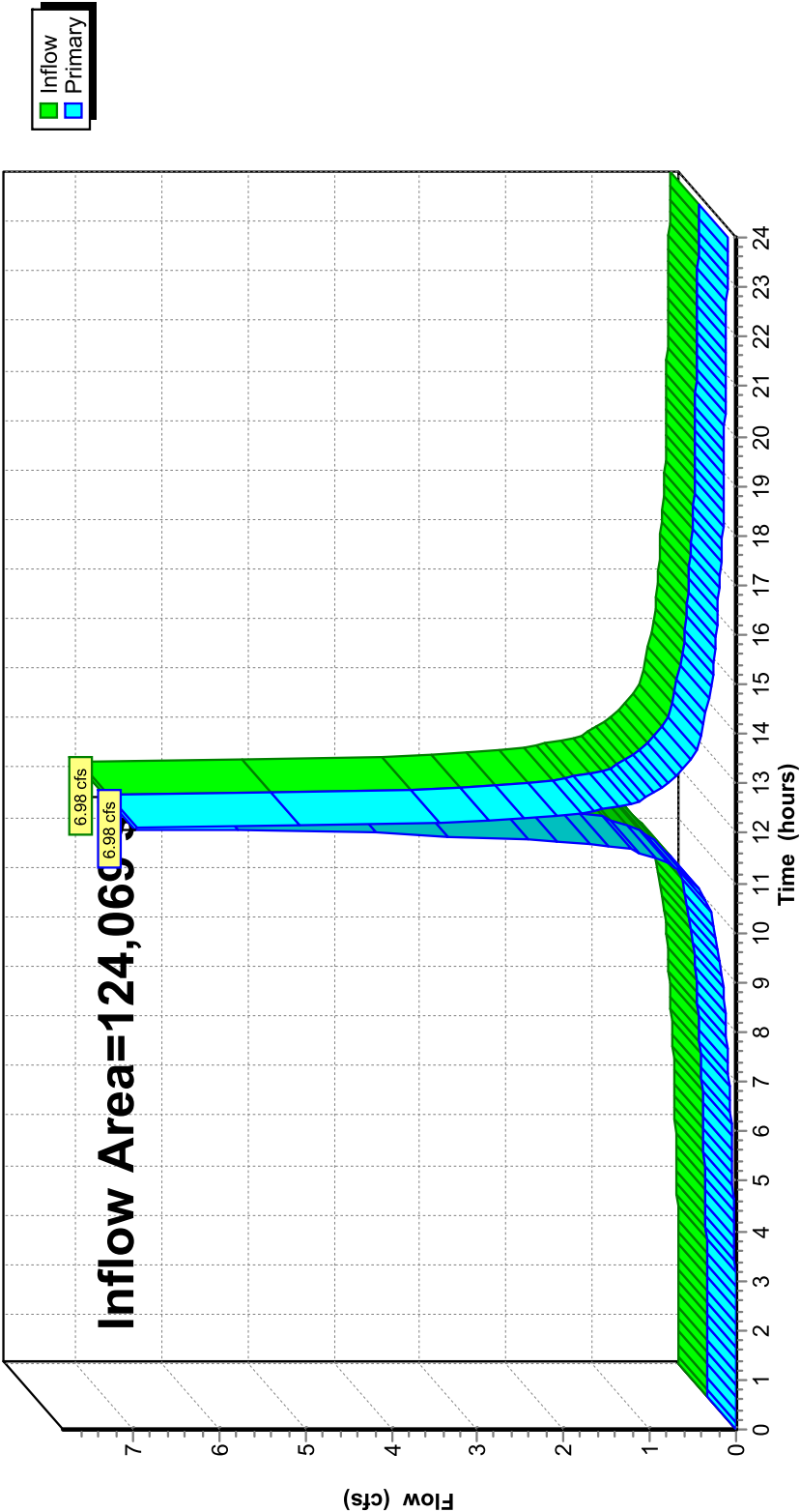
Summary for Link 9L: TOTAL EXISTING

Inflow Area = 124,069 sf, 63.03% Impervious, Inflow Depth > 2.33" for 2-Year-2020 event
Inflow = 6.98 cfs @ 12.09 hrs, Volume= 24,129 cf
Primary = 6.98 cfs @ 12.09 hrs, Volume= 24,129 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 9L: TOTAL EXISTING

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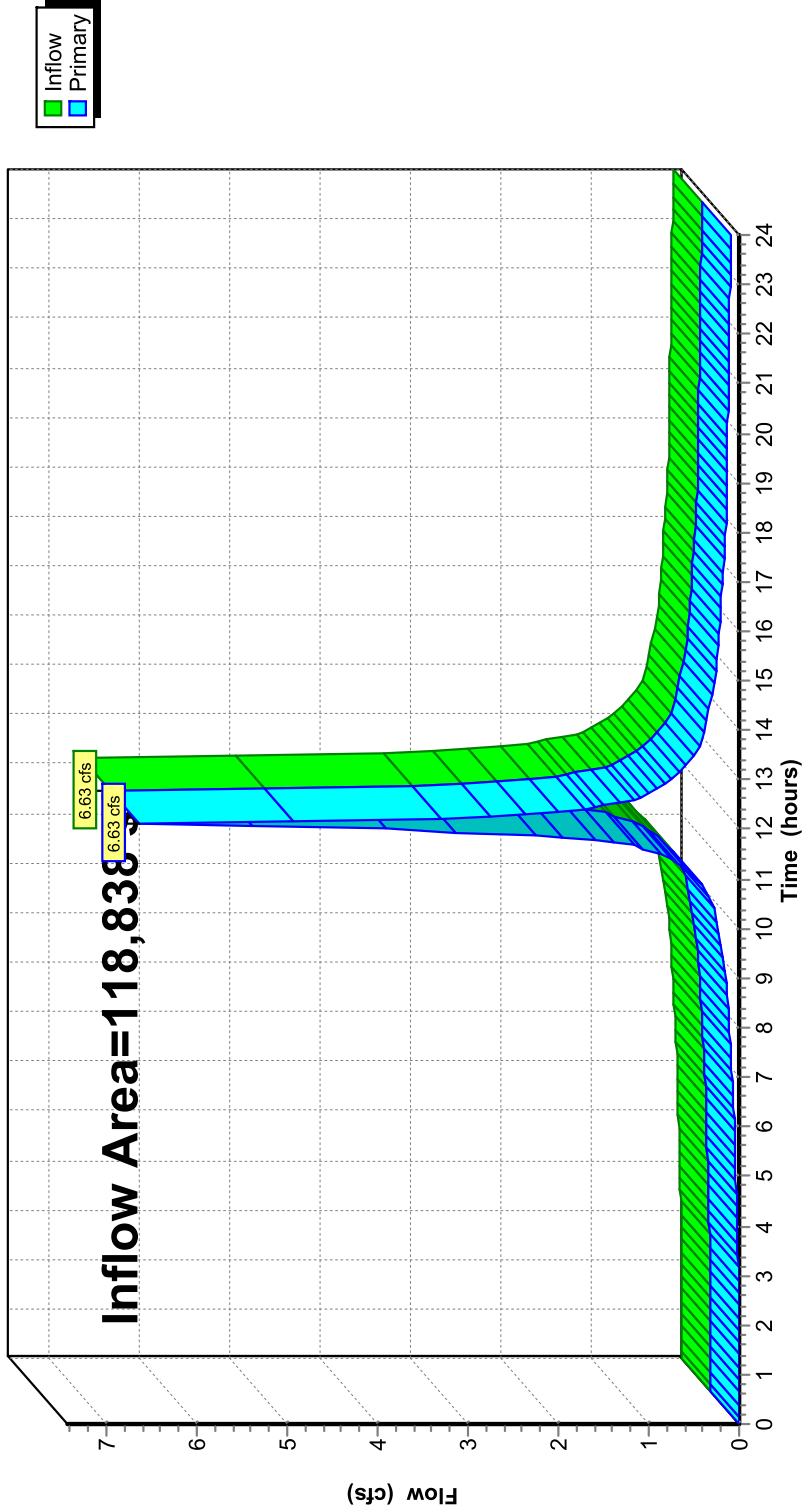
Summary for Link E-DP 1: EXIST DP 1

Inflow Area = 118,838 sf, 62.32% Impervious, Inflow Depth > 2.32" for 2-Year-2020 event
Inflow = 6.63 cfs @ 12.10 hrs, Volume= 22,950 cf
Primary = 6.63 cfs @ 12.10 hrs, Volume= 22,950 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 9L : TOTAL EXISTING

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link E-DP 1: EXIST DP 1

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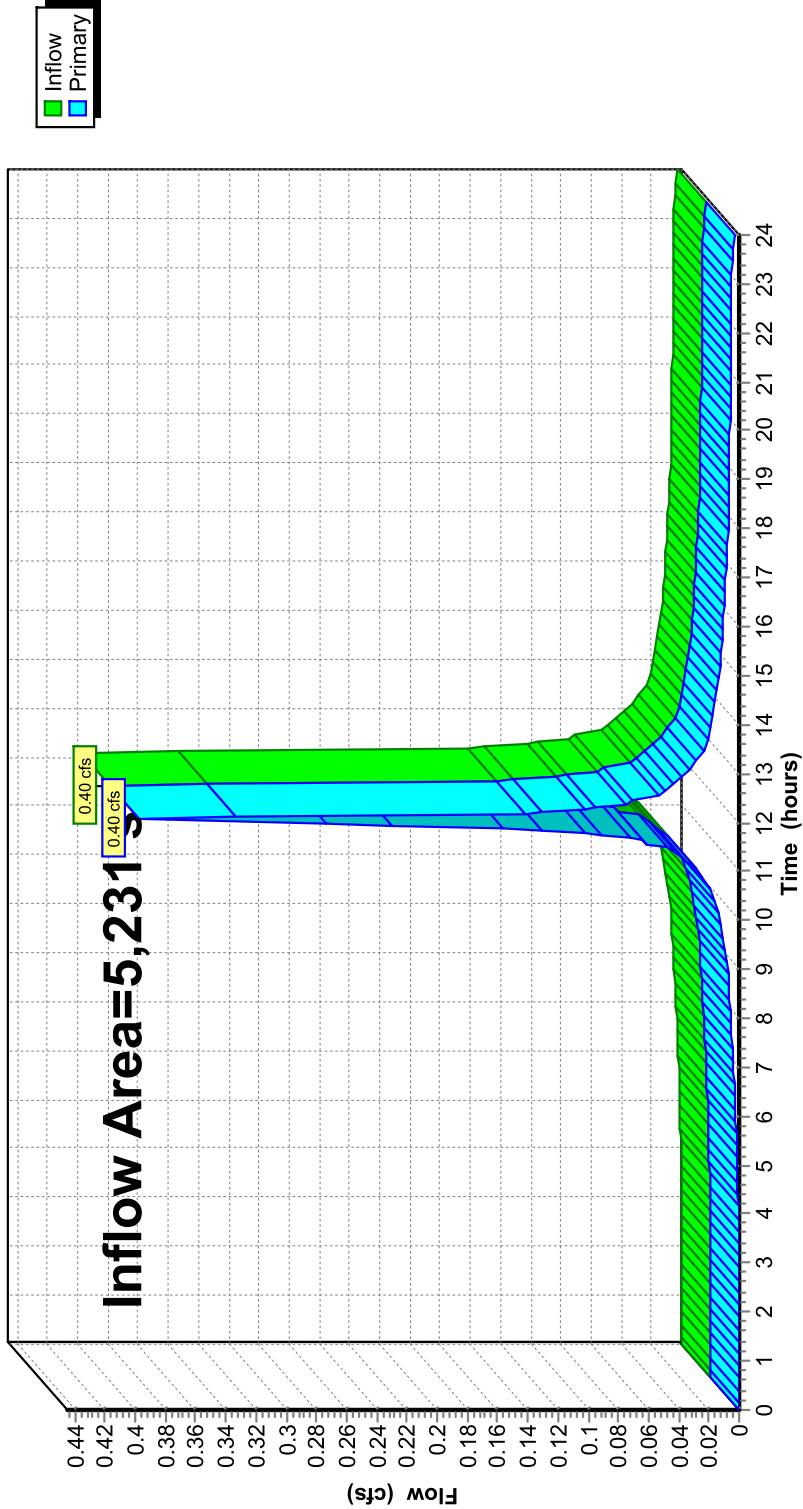
Summary for Link E-DP 2: EXIST DP 2

Inflow Area = 5,231 sf, 79.18% Impervious, Inflow Depth > 2.71" for 2-Year-2020 event
Inflow = 0.40 cfs @ 12.06 hrs, Volume= 1,180 cf
Primary = 0.40 cfs @ 12.06 hrs, Volume= 1,180 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 9L : TOTAL EXISTING

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link E-DP 2: EXIST DP 2

Hydrograph



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NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

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Summary for Subcatchment E1A-B: E1A & E1B DISTURBED

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

Runoff = 9.85 cfs @ 12.09 hrs, Volume= 31,989 cf, Depth> 4.79"
Routed to Link 8L : EXISTING DISTURBED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (sf)		CN	Description		
72,135	98		Paved parking, HSG C		
7,928	72		Woods/grass comb., Good, HSG C		
80,063	95		Weighted Average		
7,928			9.90% Pervious Area		
72,135			90.10% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	25	0.5000	0.22		Sheet Flow, Wooded
					Woods: Light underbrush n= 0.400 P2= 3.47"
1.5	413	0.0480	4.45		Shallow Concentrated Flow, Parking lot
					Paved Kv= 20.3 fps

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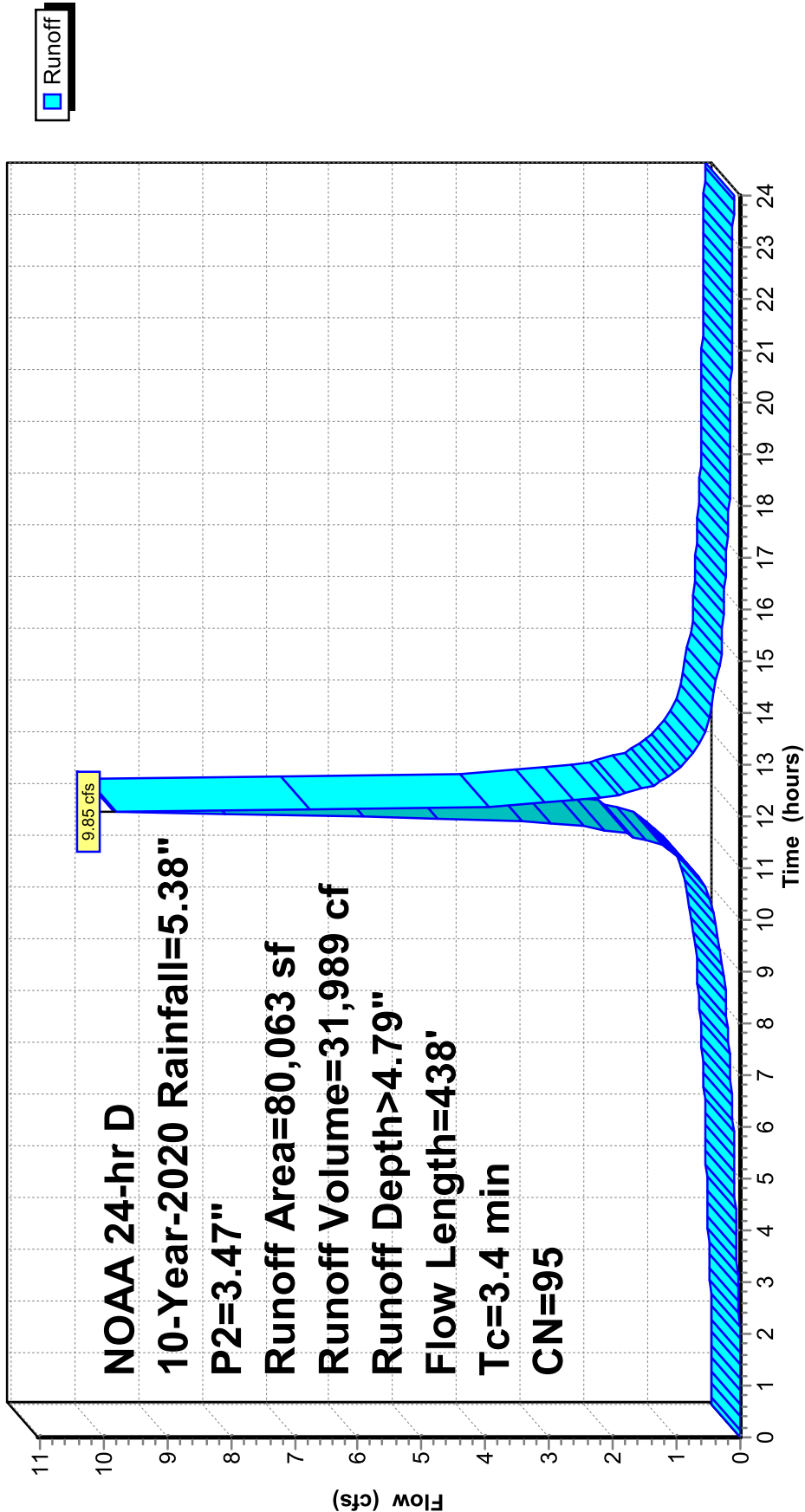
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

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Subcatchment E1A-B: E1A & E1B DISTURBED

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Summary for Subcatchment E1C: E1C Pervious-w-offsite-Undisturbed

Runoff = 1.98 cfs @ 12.22 hrs, Volume= 8,032 cf, Depth> 2.49"
Routed to Link E-DP 1 : EXIST DP 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (sf)	CN	Description
* 708	98	Roof-offsite
* 1,220	98	Impervious
2,721	71	Meadow, non-grazed, HSG C
* 32,886	70	wooded
1,240	74	>75% Grass cover, Good, HSG C
38,775	72	Weighted Average
36,847		95.03% Pervious Area
1,928		4.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0900	0.15		Sheet Flow, sheet flow Woods: Light underbrush n= 0.400 P2= 3.47"
0.6	123	0.5000	3.54		Shallow Concentrated Flow, SC Woodland Kv= 5.0 fps
1.6	431	0.0480	4.45		Shallow Concentrated Flow, Parking lot Paved Kv= 20.3 fps
13.5	654	Total			

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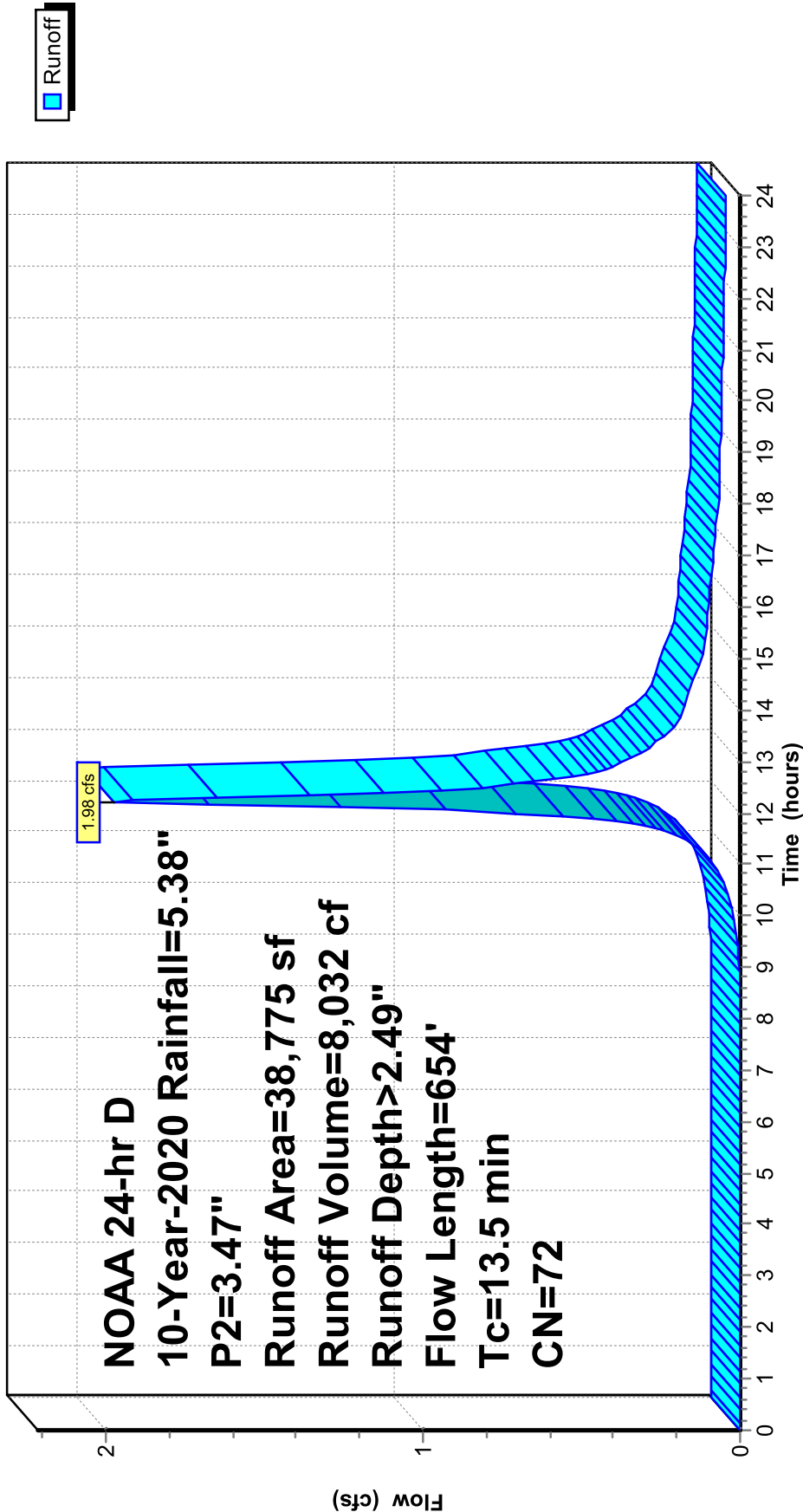
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Subcatchment E1C: E1C Pervious-w-offsite-Undisturbed

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NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

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Summary for Subcatchment E3: E3

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

Runoff = 0.65 cfs @ 12.06 hrs, Volume= 1,993 cf, Depth> 4.57"
Routed to Link E-DP 2 : EXIST DP 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (sf)		CN	Description		
1,089	74	>75% Grass cover, Good, HSG C			
4,142	98	Roofs, HSG C			
5,231	93	Weighted Average			
1,089		20.82% Pervious Area			
4,142		79.18% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	24	0.8330	4.79		Sheet Flow, Roof
					Smooth surfaces n= 0.011 P2= 3.47"
0.7	145	0.0480	3.53		Shallow Concentrated Flow, Lawn
					Unpaved Kv= 16.1 fps

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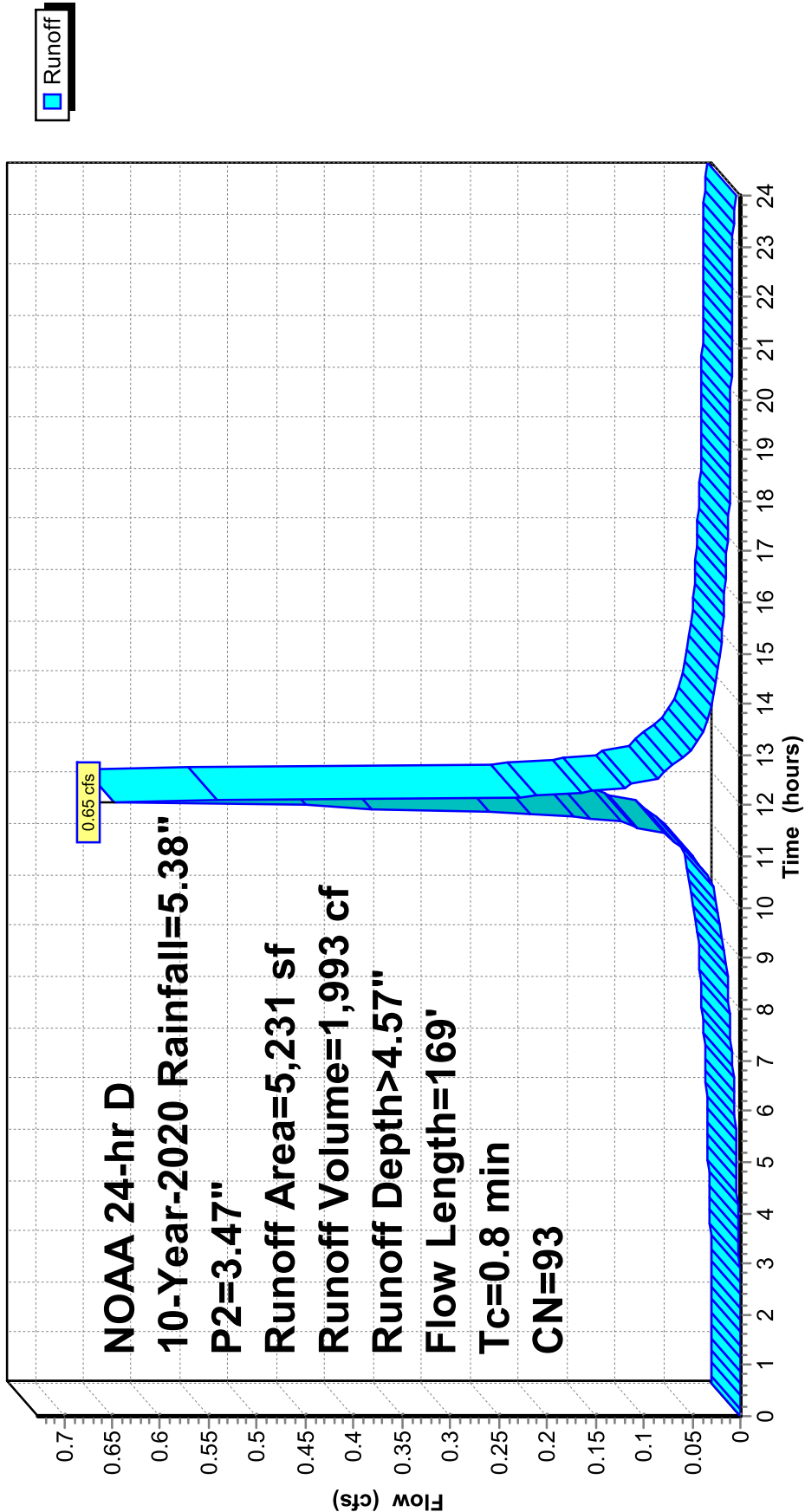
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Subcatchment E3: E3

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NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

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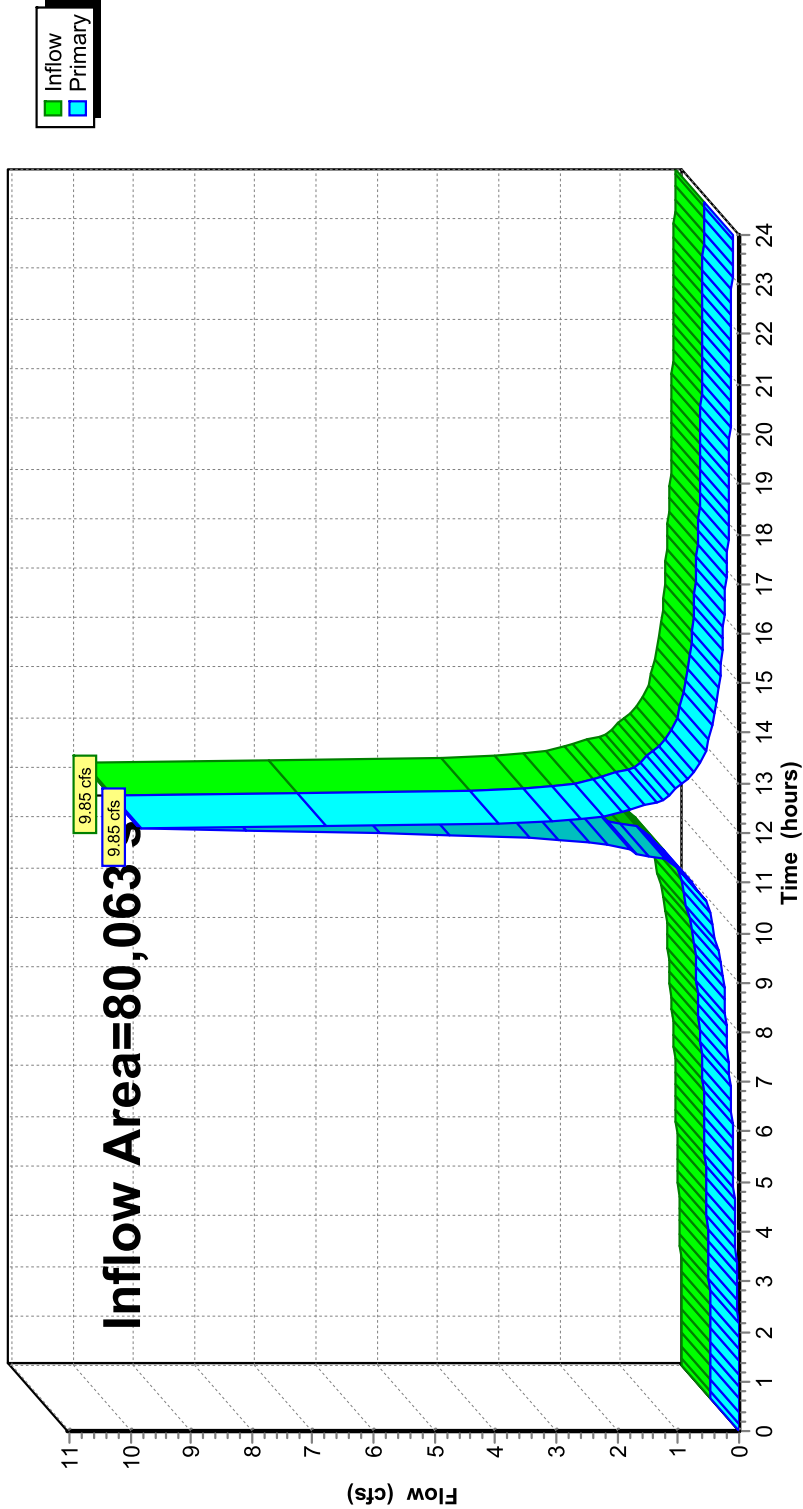
Summary for Link 8L: EXISTING DISTURBED

Inflow Area = 80,063 sf, 90.10% Impervious, Inflow Depth > 4.79" for 10-Year-2020 event
Inflow = 9.85 cfs @ 12.09 hrs, Volume= 31,989 cf
Primary = 9.85 cfs @ 12.09 hrs, Volume= 31,989 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E-DP 1 : EXIST DP 1

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: EXISTING DISTURBED

Hydrograph



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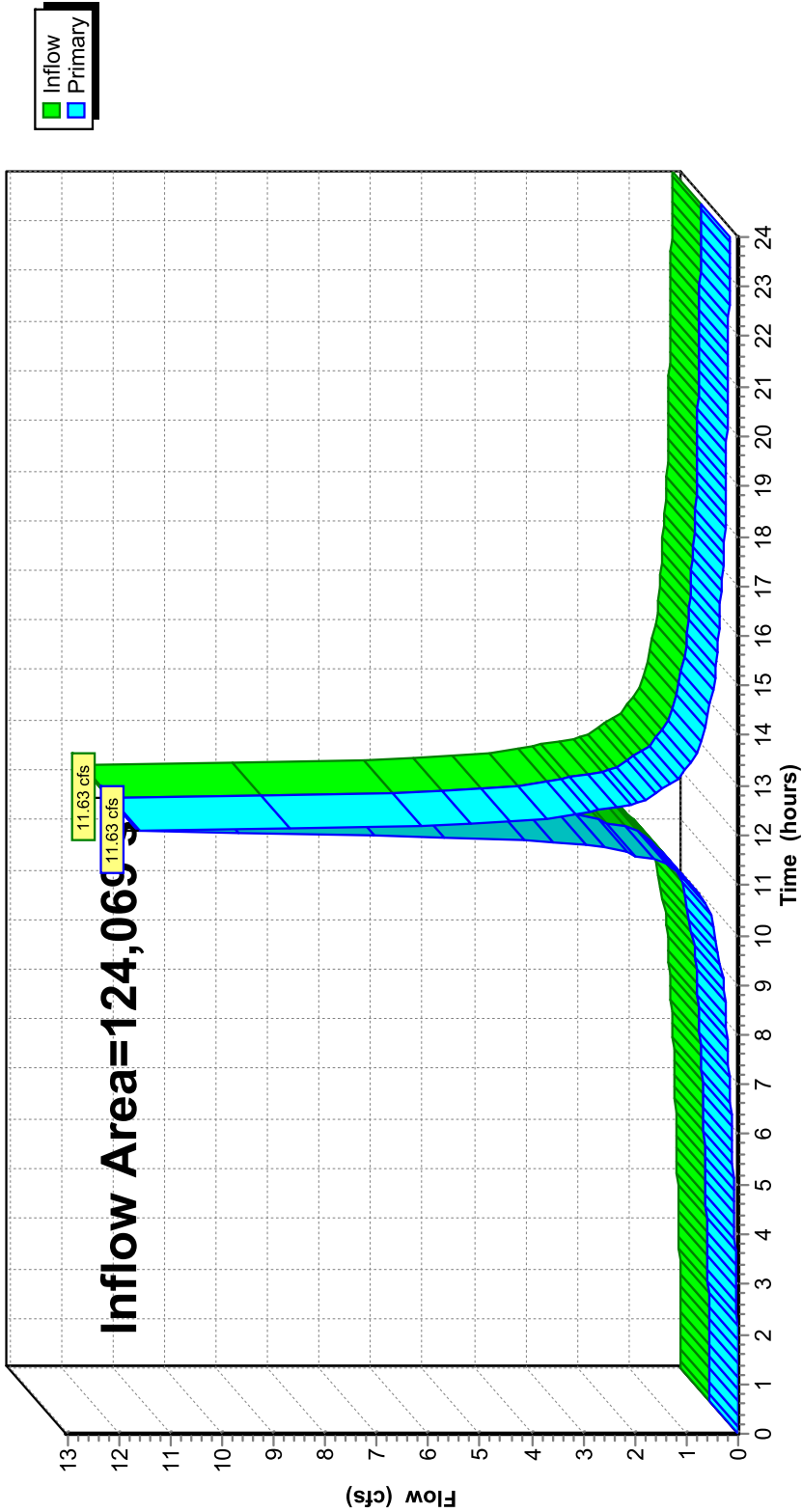
Summary for Link 9L: TOTAL EXISTING

Inflow Area = 124,069 sf, 63.03% Impervious, Inflow Depth > 4.06" for 10-Year-2020 event
Inflow = 11.63 cfs @ 12.09 hrs, Volume= 42,014 cf
Primary = 11.63 cfs @ 12.09 hrs, Volume= 42,014 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 9L: TOTAL EXISTING

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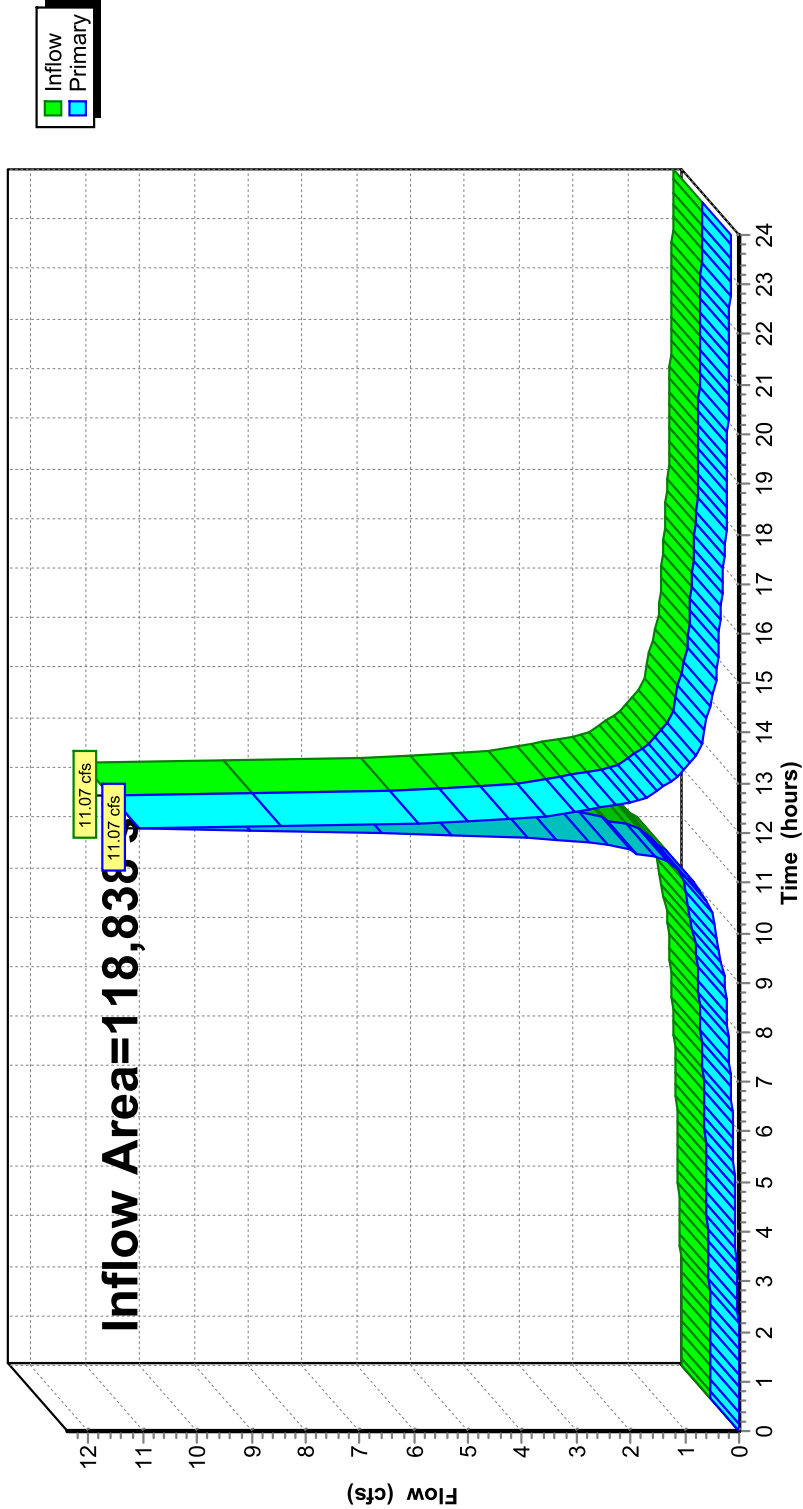
Summary for Link E-DP 1: EXIST DP 1

Inflow Area = 118,838 sf, 62.32% Impervious, Inflow Depth > 4.04" for 10-Year-2020 event
Inflow = 11.07 cfs @ 12.10 hrs, Volume= 40,021 cf
Primary = 11.07 cfs @ 12.10 hrs, Volume= 40,021 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 9L : TOTAL EXISTING

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link E-DP 1: EXIST DP 1

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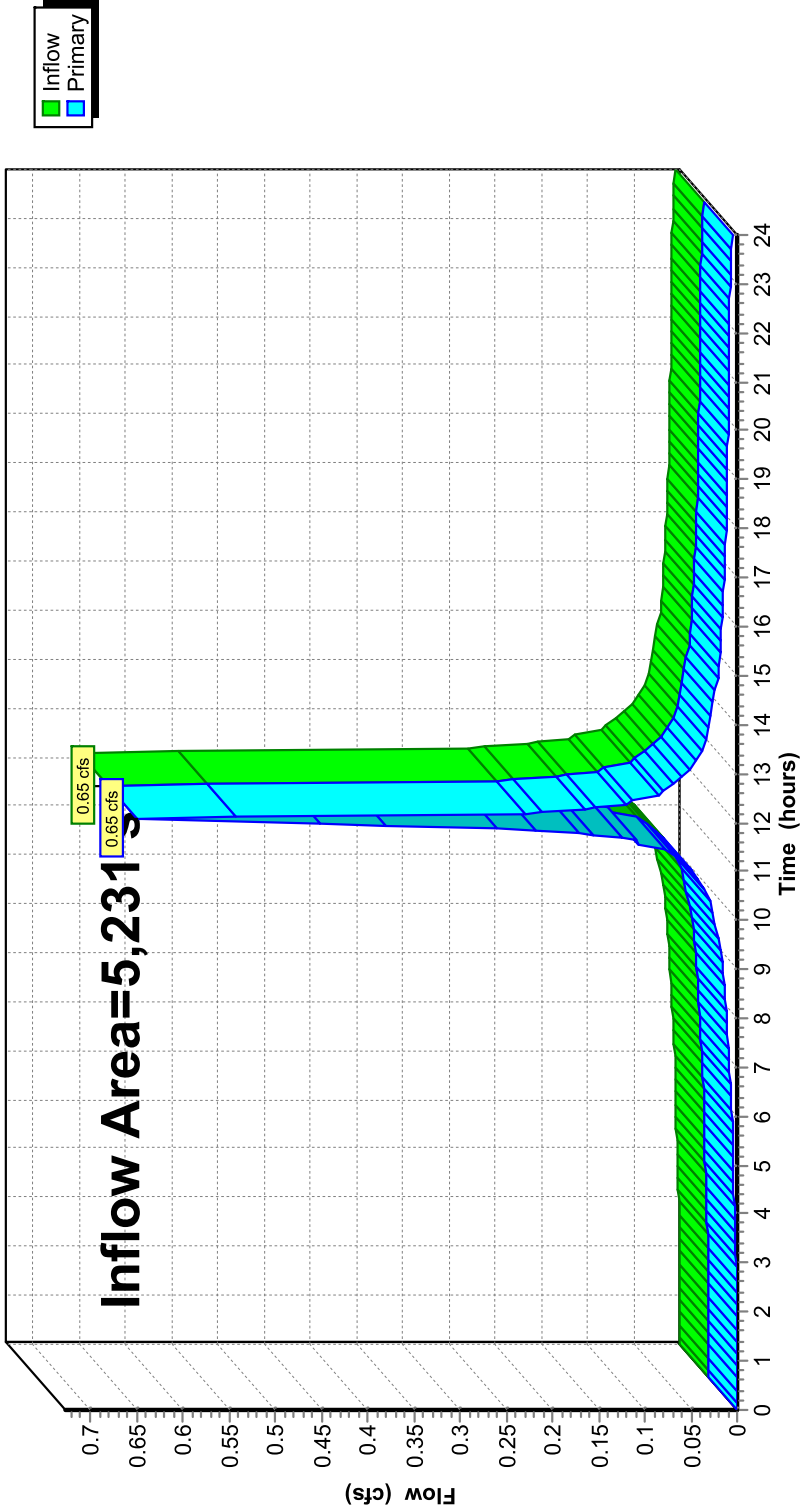
Summary for Link E-DP 2: EXIST DP 2

Inflow Area = 5,231 sf, 79.18% Impervious, Inflow Depth > 4.57" for 10-Year-2020 event
Inflow = 0.65 cfs @ 12.06 hrs, Volume= 1,993 cf
Primary = 0.65 cfs @ 12.06 hrs, Volume= 1,993 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 9L : TOTAL EXISTING

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link E-DP 2: EXIST DP 2

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Summary for Subcatchment E1A-B: E1A & E1B DISTURBED

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

Runoff = 17.08 cfs @ 12.09 hrs, Volume= 57,208 cf, Depth> 8.57"
Routed to Link 8L : EXISTING DISTURBED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (sf)	CN	Description
72,135	98	Paved parking, HSG C
7,928	72	Woods/grass comb., Good, HSG C

80,063	95	Weighted Average
7,928		9.90% Pervious Area
72,135		90.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	25	0.5000	0.22		Sheet Flow, Wooded
					Woods: Light underbrush n= 0.400 P2= 3.47"
1.5	413	0.0480	4.45		Shallow Concentrated Flow, Parking lot
					Paved Kv= 20.3 fps

3.4	438	Total
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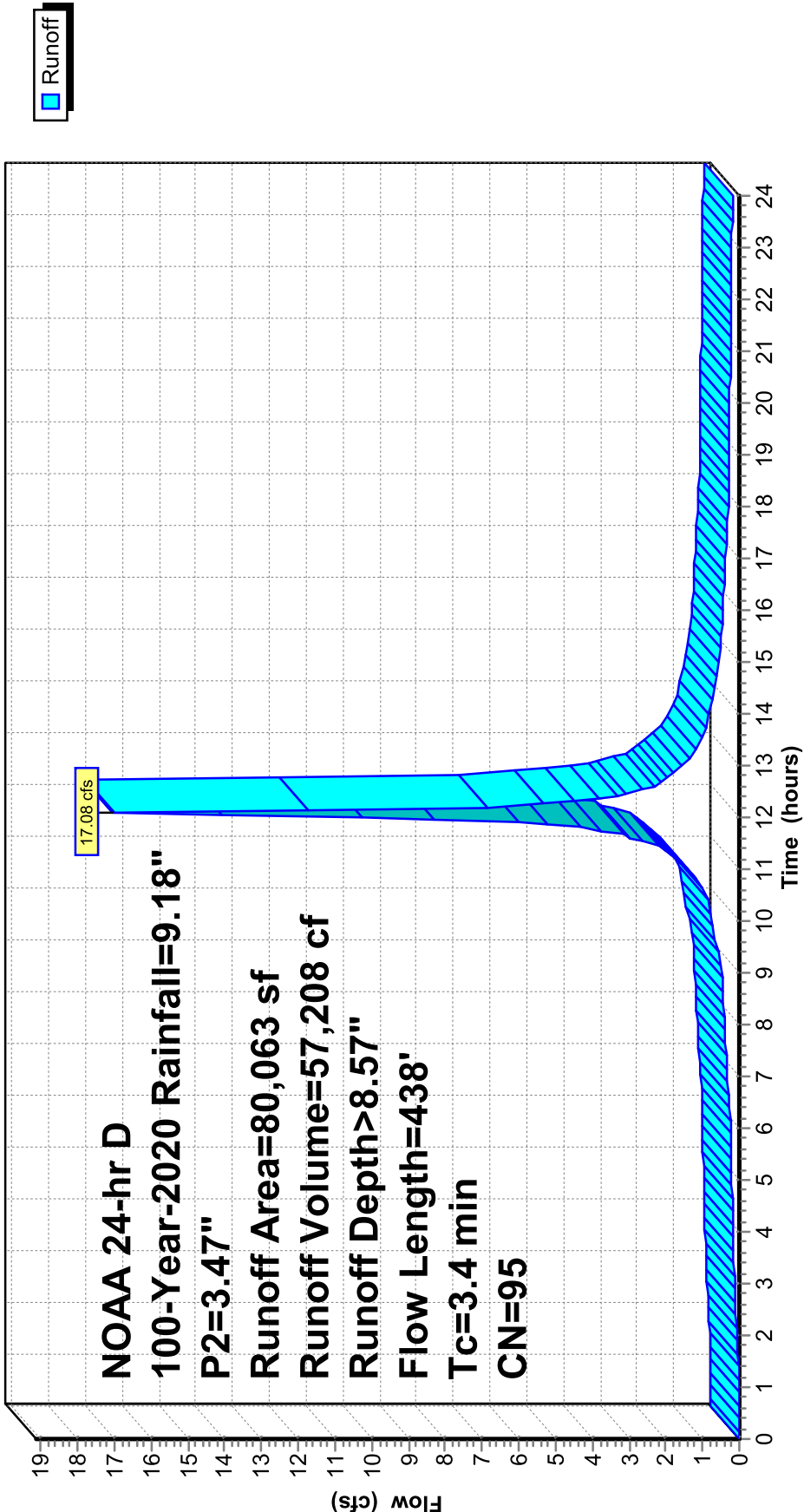
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Subcatchment E1A-B: E1A & E1B DISTURBED

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Summary for Subcatchment E1C: E1C Pervious-w-offsite-Undisturbed

Runoff = 4.54 cfs @ 12.21 hrs, Volume= 18,505 cf, Depth> 5.73"
Routed to Link E-DP 1 : EXIST DP 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

	Area (sf)	CN	Description
*	708	98	Roof-offsite
*	1,220	98	Impervious
	2,721	71	Meadow, non-grazed, HSG C
*	32,886	70	wooded
	1,240	74	>75% Grass cover, Good, HSG C
	38,775	72	Weighted Average
	36,847		95.03% Pervious Area
	1,928		4.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0900	0.15		Sheet Flow, sheet flow Woods: Light underbrush n= 0.400 P2= 3.47"
0.6	123	0.5000	3.54		Shallow Concentrated Flow, SC Woodland Kv= 5.0 fps
1.6	431	0.0480	4.45		Shallow Concentrated Flow, Parking lot Paved Kv= 20.3 fps
13.5	654	Total			

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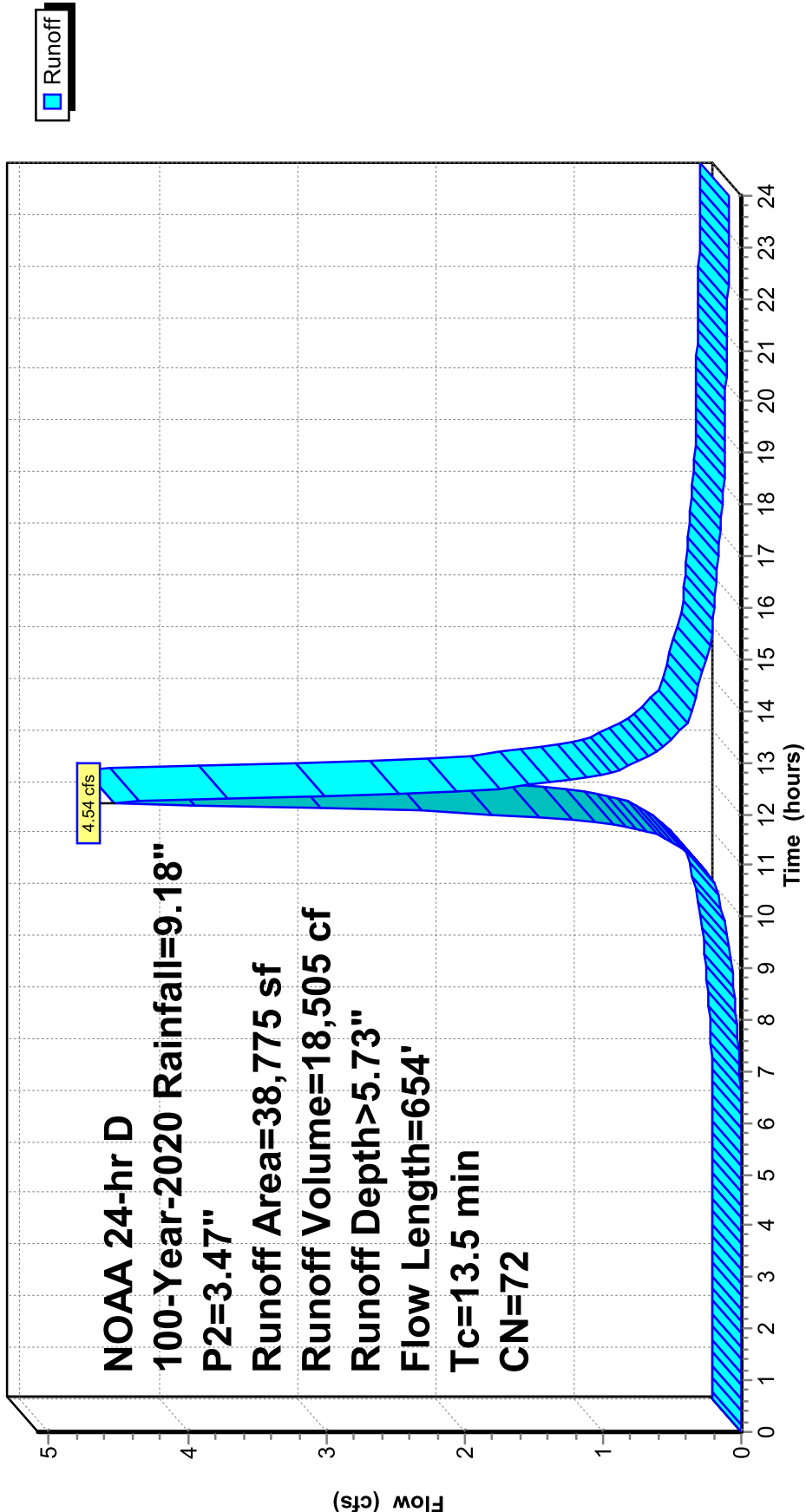
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Subcatchment E1C: E1C Pervious-w-offsite-Undisturbed

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NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

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Summary for Subcatchment E3: E3

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

Runoff = 1.14 cfs @ 12.06 hrs, Volume= 3,633 cf, Depth> 8.33"
Routed to Link E-DP 2 : EXIST DP 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (sf)		CN	Description		
1,089	74	>75% Grass cover, Good, HSG C			
4,142	98	Roofs, HSG C			
5,231	93	Weighted Average			
1,089		20.82% Pervious Area			
4,142		79.18% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	24	0.8330	4.79		Sheet Flow, Roof Smooth surfaces n= 0.011 P2= 3.47"
0.7	145	0.0480	3.53		Shallow Concentrated Flow, Lawn Unpaved Kv= 16.1 fps

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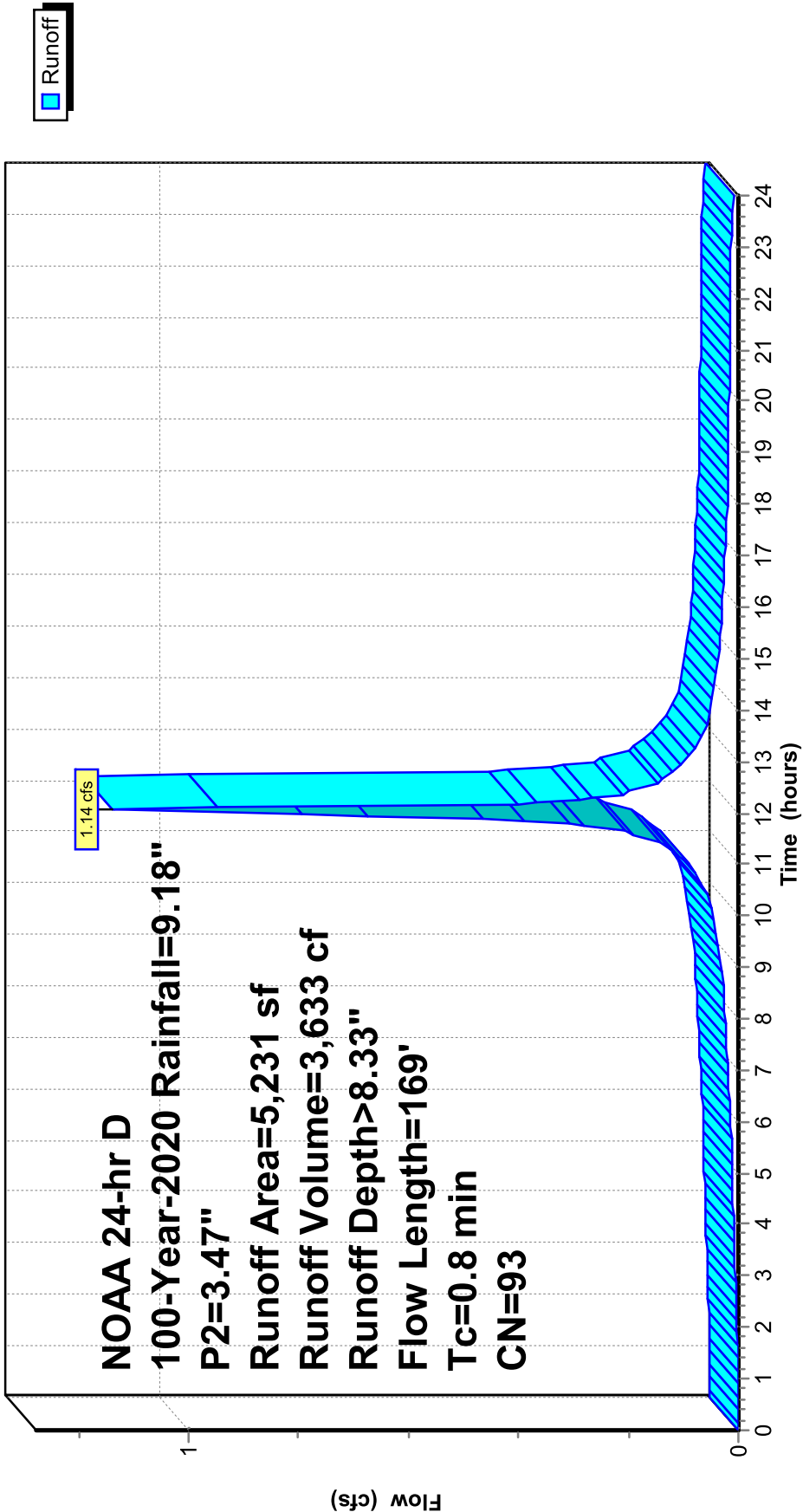
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Subcatchment E3: E3

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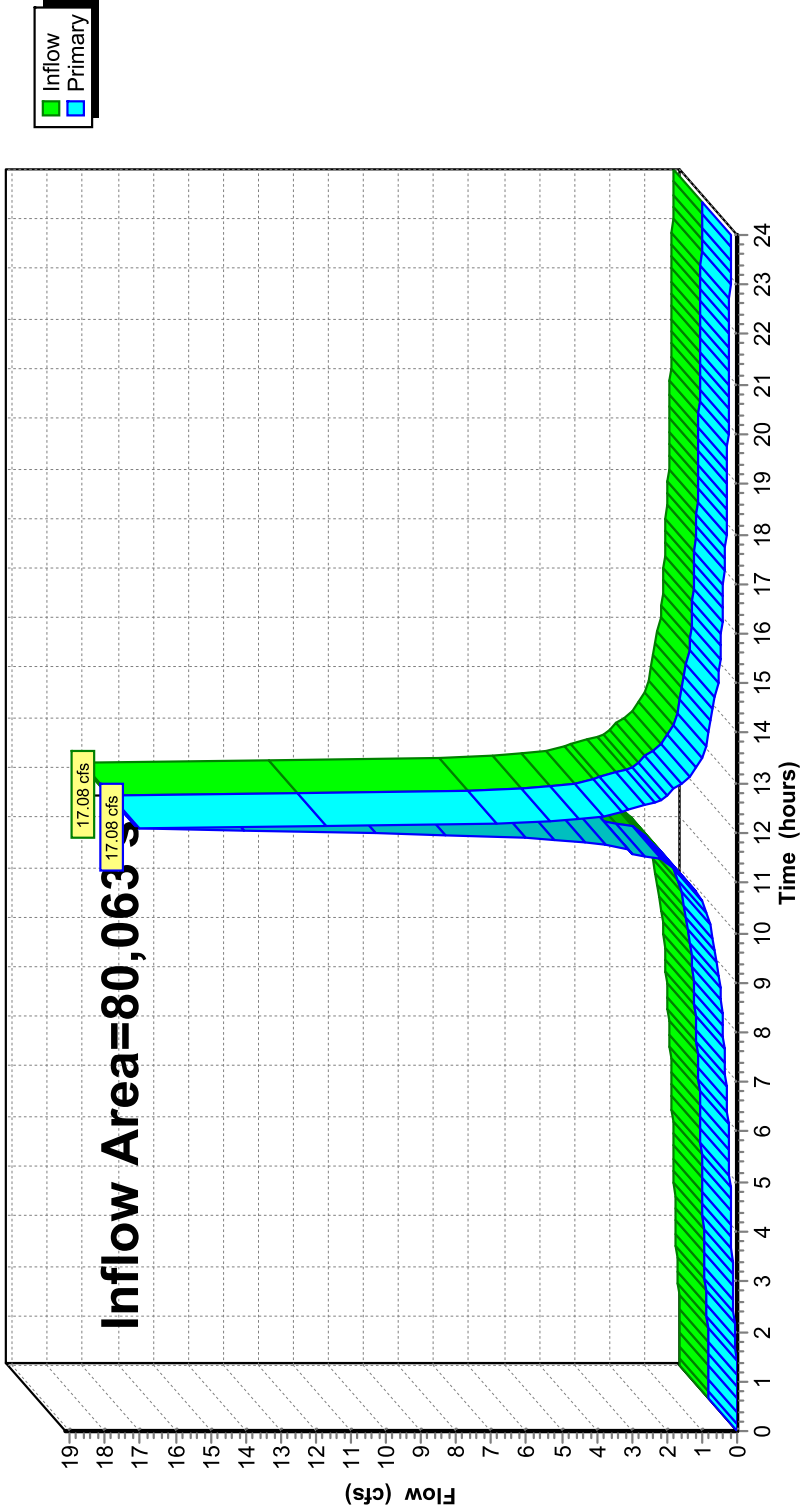
Summary for Link 8L: EXISTING DISTURBED

Inflow Area = 80,063 sf, 90.10% Impervious, Inflow Depth > 8.57" for 100-Year-2020 event
Inflow = 17.08 cfs @ 12.09 hrs, Volume= 57,208 cf
Primary = 17.08 cfs @ 12.09 hrs, Volume= 57,208 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E-DP 1 : EXIST DP 1

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: EXISTING DISTURBED

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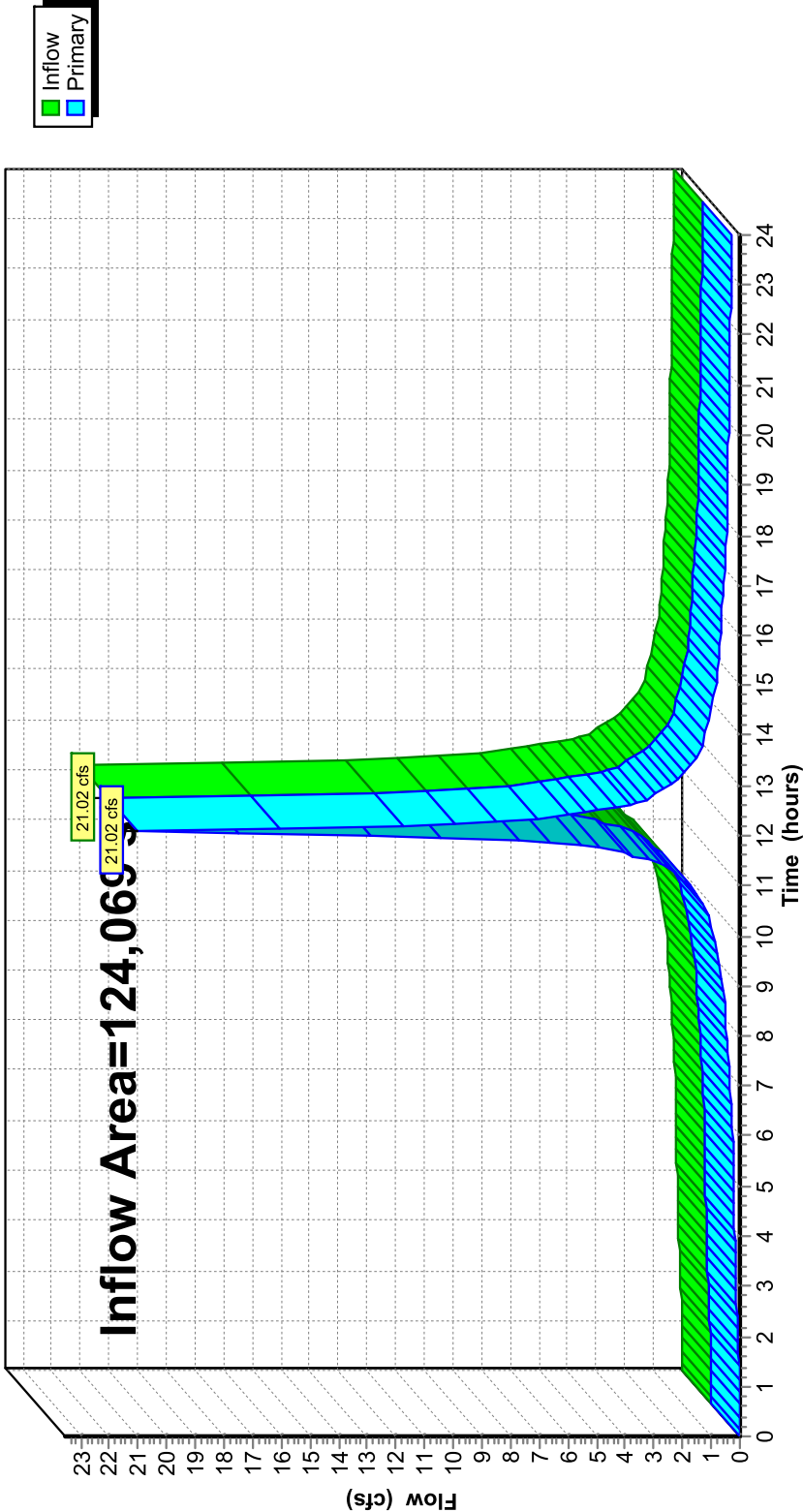
Summary for Link 9L: TOTAL EXISTING

Inflow Area = 124,069 sf, 63.03% Impervious, Inflow Depth > 7.67" for 100-Year-2020 event
Inflow = 21.02 cfs @ 12.10 hrs, Volume= 79,347 cf
Primary = 21.02 cfs @ 12.10 hrs, Volume= 79,347 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 9L: TOTAL EXISTING

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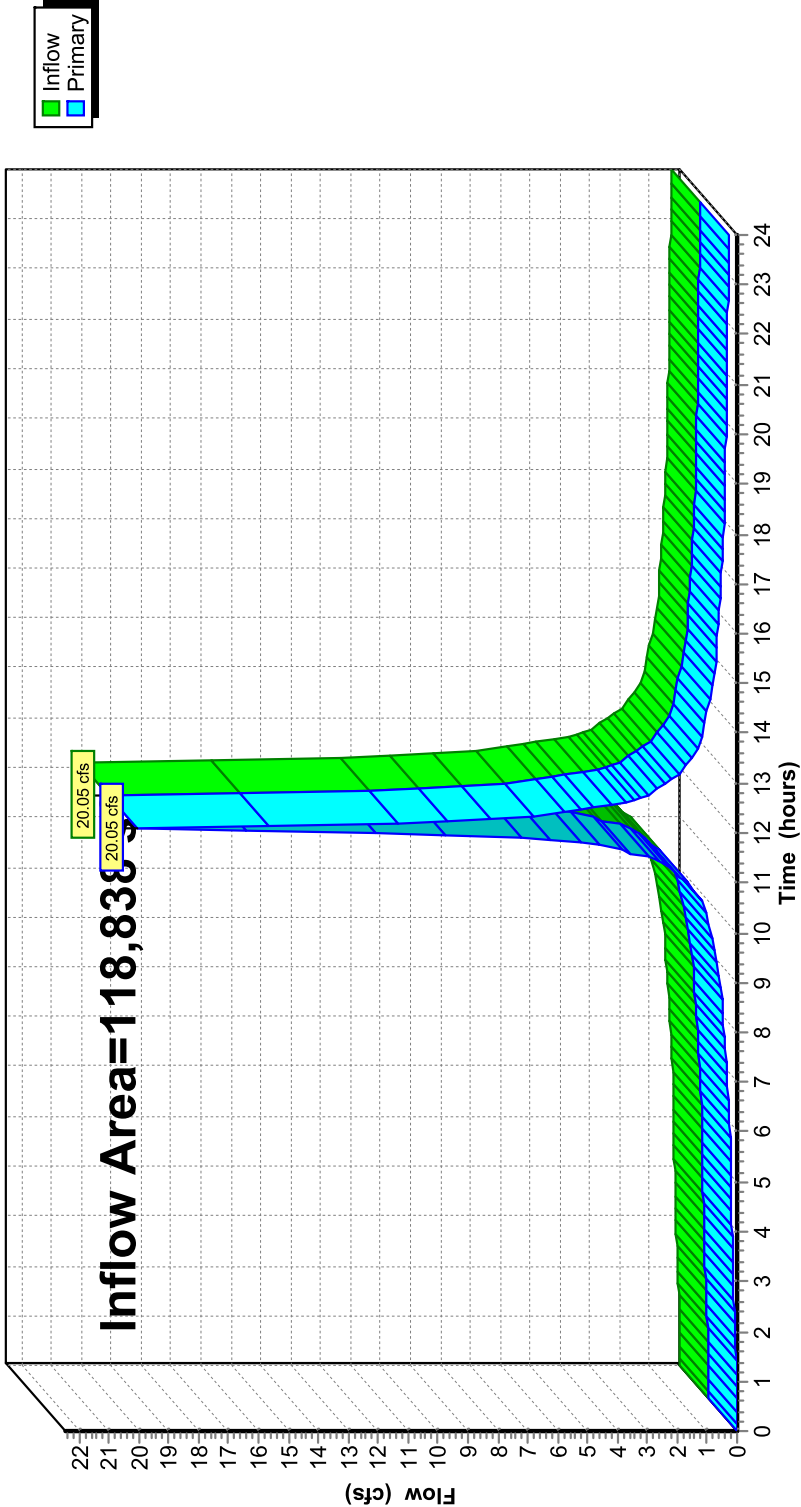
Summary for Link E-DP 1: EXIST DP 1

Inflow Area = 118,838 sf, 62.32% Impervious, Inflow Depth > 7.65" for 100-Year-2020 event
Inflow = 20.05 cfs @ 12.10 hrs, Volume= 75,713 cf
Primary = 20.05 cfs @ 12.10 hrs, Volume= 75,713 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 9L : TOTAL EXISTING

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link E-DP 1: EXIST DP 1

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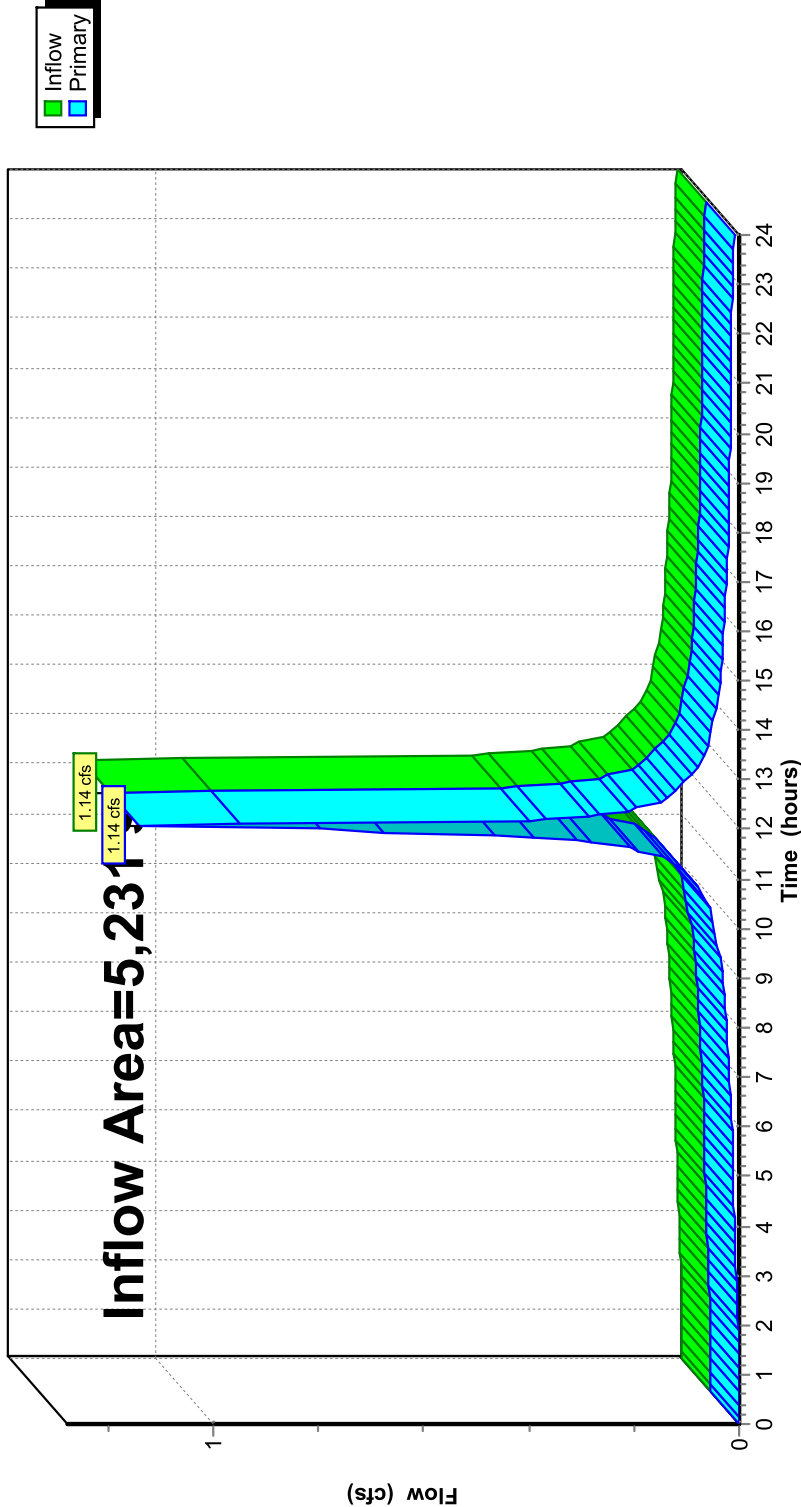
Summary for Link E-DP 2: EXIST DP 2

Inflow Area = 5,231 sf, 79.18% Impervious, Inflow Depth > 8.33" for 100-Year-2020 event
Inflow = 1.14 cfs @ 12.06 hrs, Volume= 3,633 cf
Primary = 1.14 cfs @ 12.06 hrs, Volume= 3,633 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 9L : TOTAL EXISTING

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link E-DP 2: EXIST DP 2

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NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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Summary for Subcatchment E1A-B: E1A & E1B DISTURBED

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

Runoff = 7.42 cfs @ 12.09 hrs, Volume= 23,477 cf, Depth> 3.52"
Routed to Link 8L : EXISTING DISTURBED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (sf)	CN	Description
72,135	98	Paved parking, HSG C
7,928	72	Woods/grass comb., Good, HSG C

80,063	95	Weighted Average
7,928		9.90% Pervious Area
72,135		90.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	25	0.5000	0.24		Sheet Flow, Wooded
					Woods: Light underbrush n= 0.400 P2= 4.09"
1.5	413	0.0480	4.45		Shallow Concentrated Flow, Parking lot
					Paved Kv= 20.3 fps

3.2	438	Total
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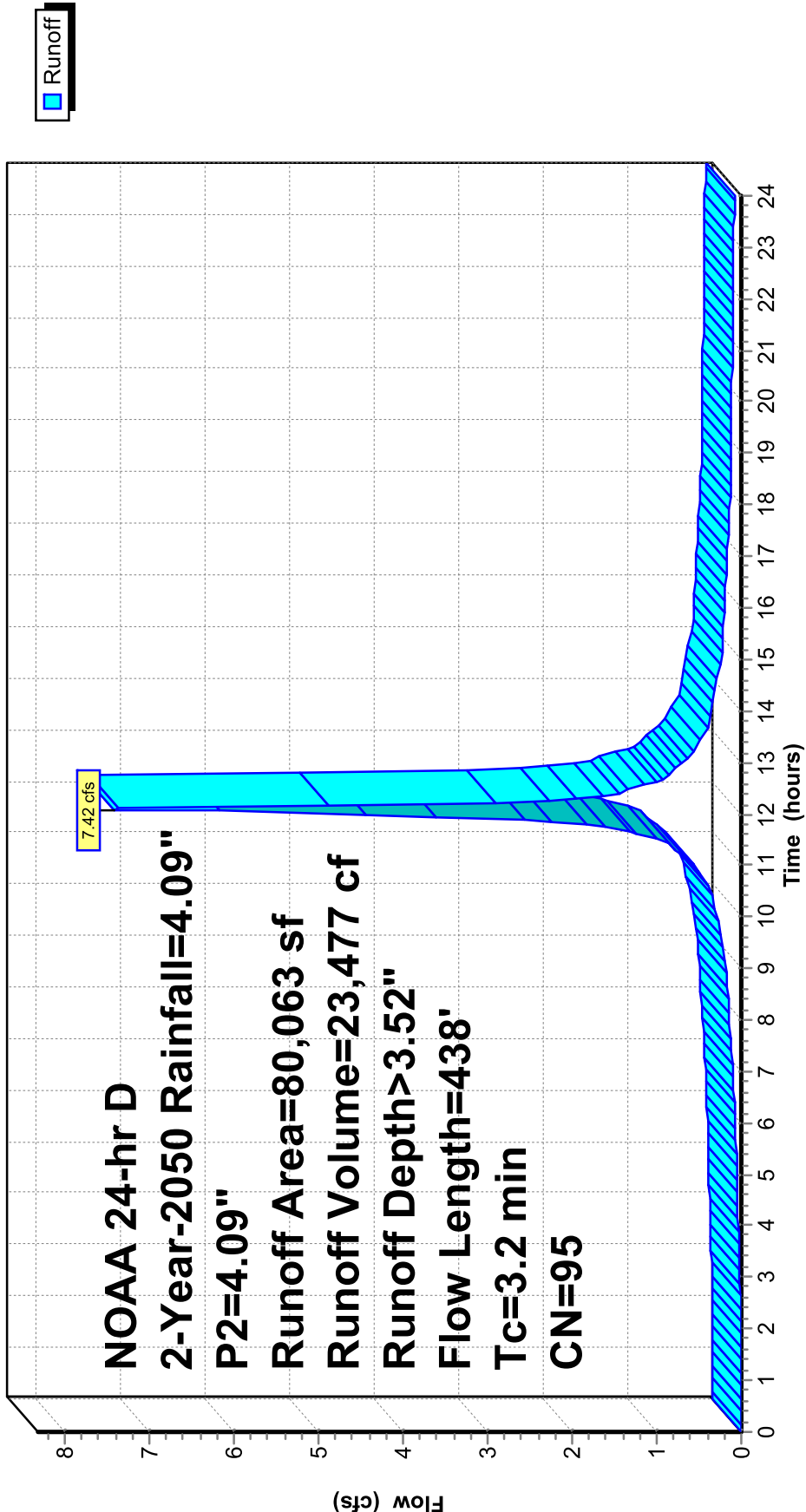
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Subcatchment E1A-B: E1A & E1B DISTURBED

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NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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Summary for Subcatchment E1C: E1C Pervious-w-offsite-Undisturbed

Runoff = 1.22 cfs @ 12.21 hrs, Volume= 4,905 cf, Depth> 1.52"
Routed to Link E-DP 1 : EXIST DP 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

	Area (sf)	CN	Description
*	708	98	Roof-offsite
*	1,220	98	Impervious
	2,721	71	Meadow, non-grazed, HSG C
*	32,886	70	wooded
	1,240	74	>75% Grass cover, Good, HSG C
	38,775	72	Weighted Average
	36,847		95.03% Pervious Area
	1,928		4.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0900	0.16		Sheet Flow, sheet flow Woods: Light underbrush n= 0.400 P2= 4.09"
0.6	123	0.5000	3.54		Shallow Concentrated Flow, SC Woodland Kv= 5.0 fps
1.6	431	0.0480	4.45		Shallow Concentrated Flow, Parking lot Paved Kv= 20.3 fps
12.6	654	Total			

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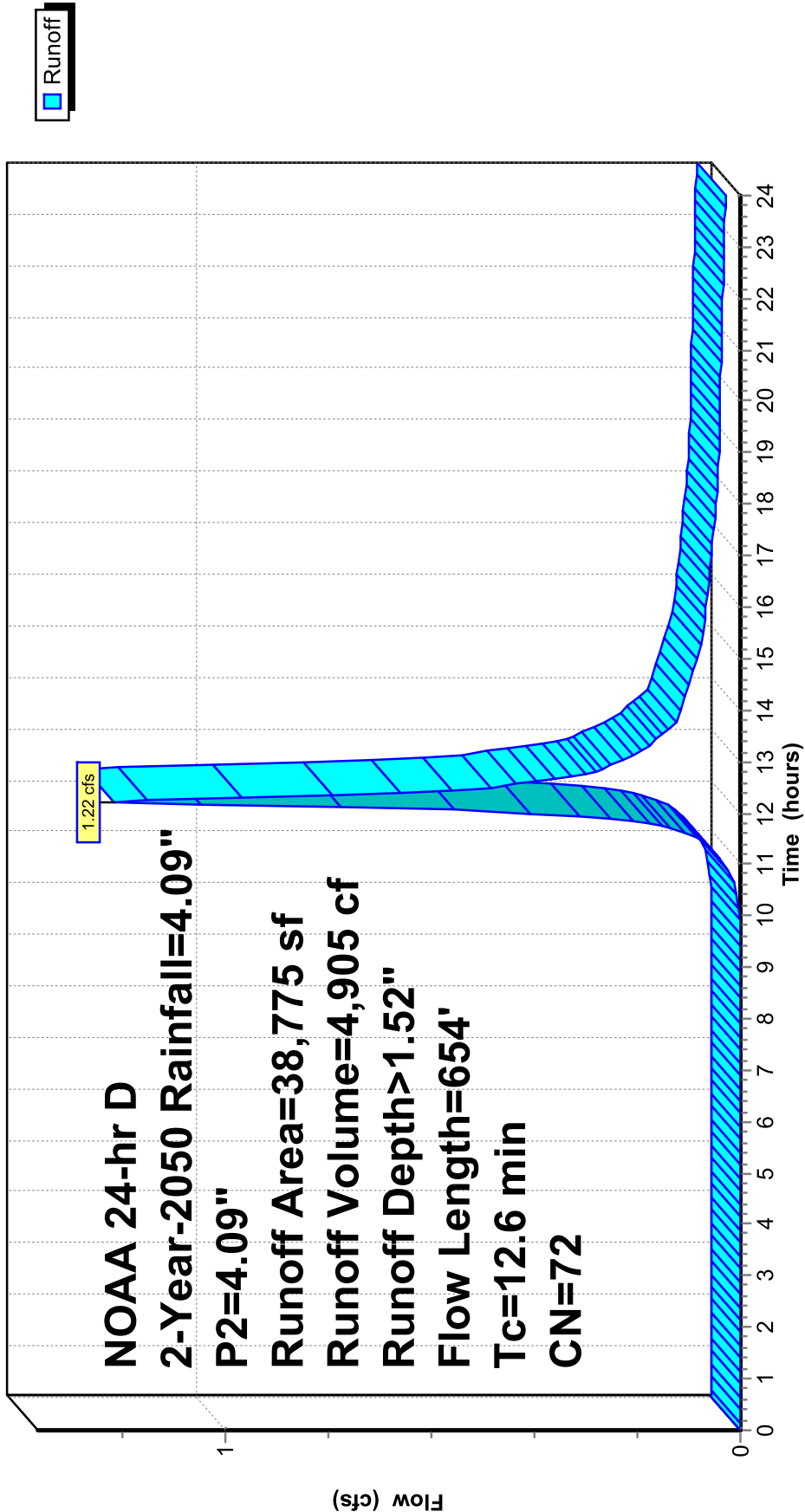
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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Subcatchment E1C: E1C Pervious-w-offsite-Undisturbed

Hydrograph



Summary for Subcatchment E3: E3

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

Runoff = 0.48 cfs @ 12.06 hrs, Volume= 1,442 cf, Depth> 3.31"
Routed to Link E-DP 2 : EXIST DP 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (sf)		CN	Description	
1,089	74	>75% Grass cover, Good, HSG C		
4,142	98	Roofs, HSG C		
5,231	93	Weighted Average		
1,089		20.82% Pervious Area		
4,142		79.18% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec) Capacity (cfs) Description	
0.1	24	0.8330	5.20	Sheet Flow, Roof
				Smooth surfaces n= 0.011 P2= 4.09"
0.7	145	0.0480	3.53	Shallow Concentrated Flow, Lawn
				Unpaved Kv= 16.1 fps

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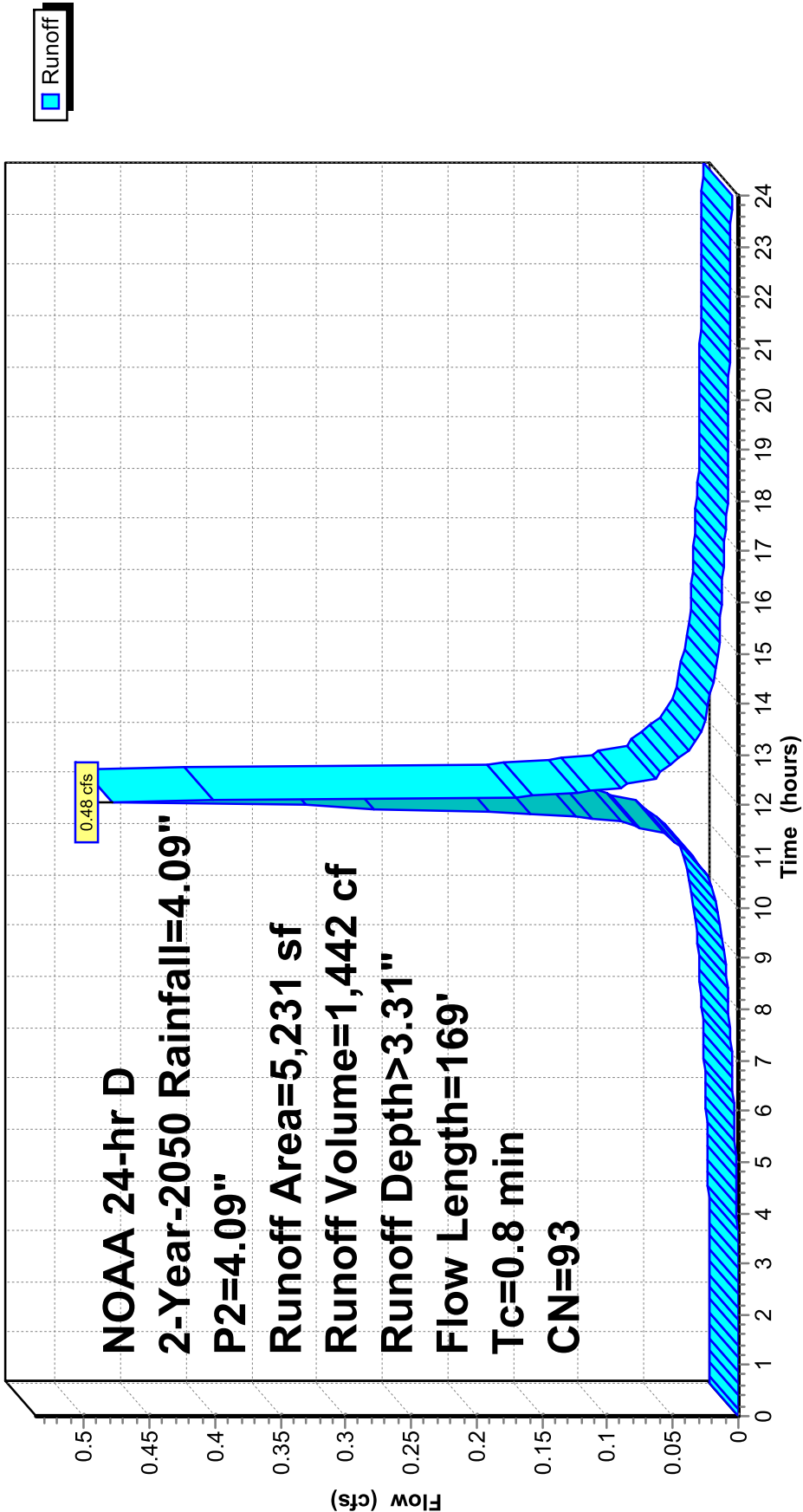
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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Subcatchment E3: E3

Hydrograph



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NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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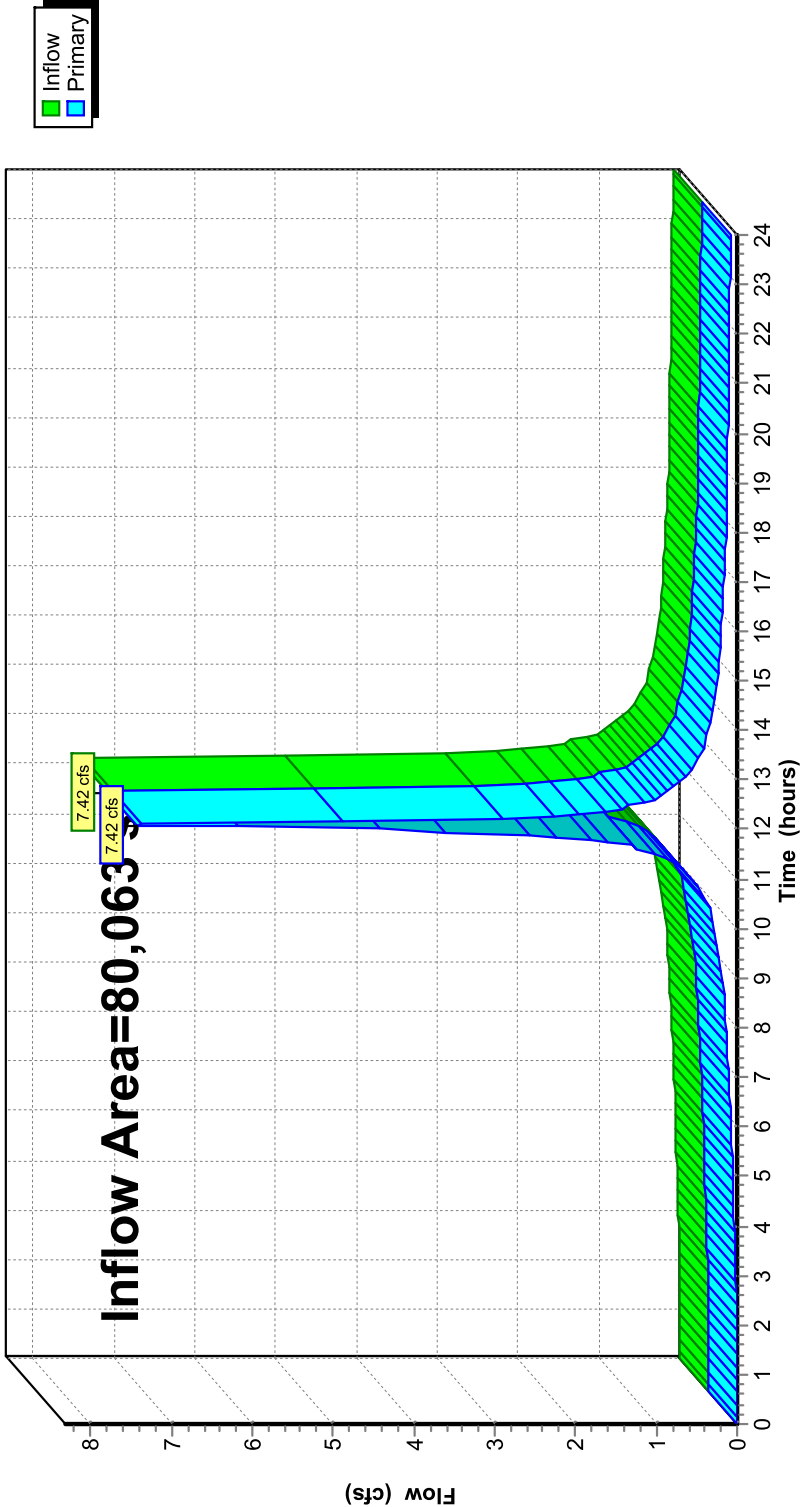
Summary for Link 8L: EXISTING DISTURBED

Inflow Area = 80,063 sf, 90.10% Impervious, Inflow Depth > 3.52" for 2-Year-2050 event
Inflow = 7.42 cfs @ 12.09 hrs, Volume= 23,477 cf
Primary = 7.42 cfs @ 12.09 hrs, Volume= 23,477 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E-DP 1 : EXIST DP 1

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: EXISTING DISTURBED

Hydrograph



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NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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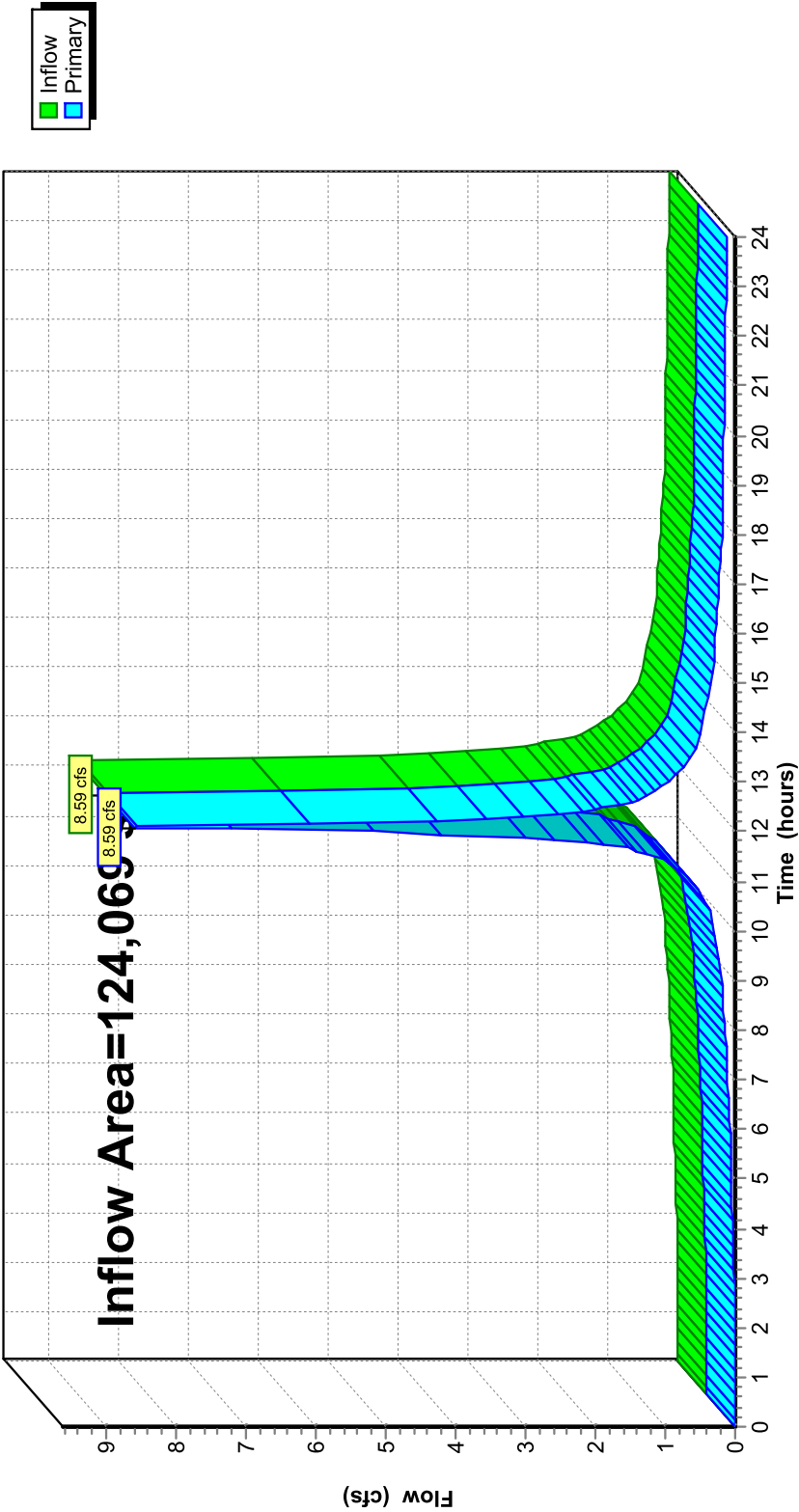
Summary for Link 9L: TOTAL EXISTING

Inflow Area = 124,069 sf, 63.03% Impervious, Inflow Depth > 2.88" for 2-Year-2050 event
Inflow = 8.59 cfs @ 12.09 hrs, Volume= 29,824 cf
Primary = 8.59 cfs @ 12.09 hrs, Volume= 29,824 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 9L: TOTAL EXISTING

Hydrograph



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NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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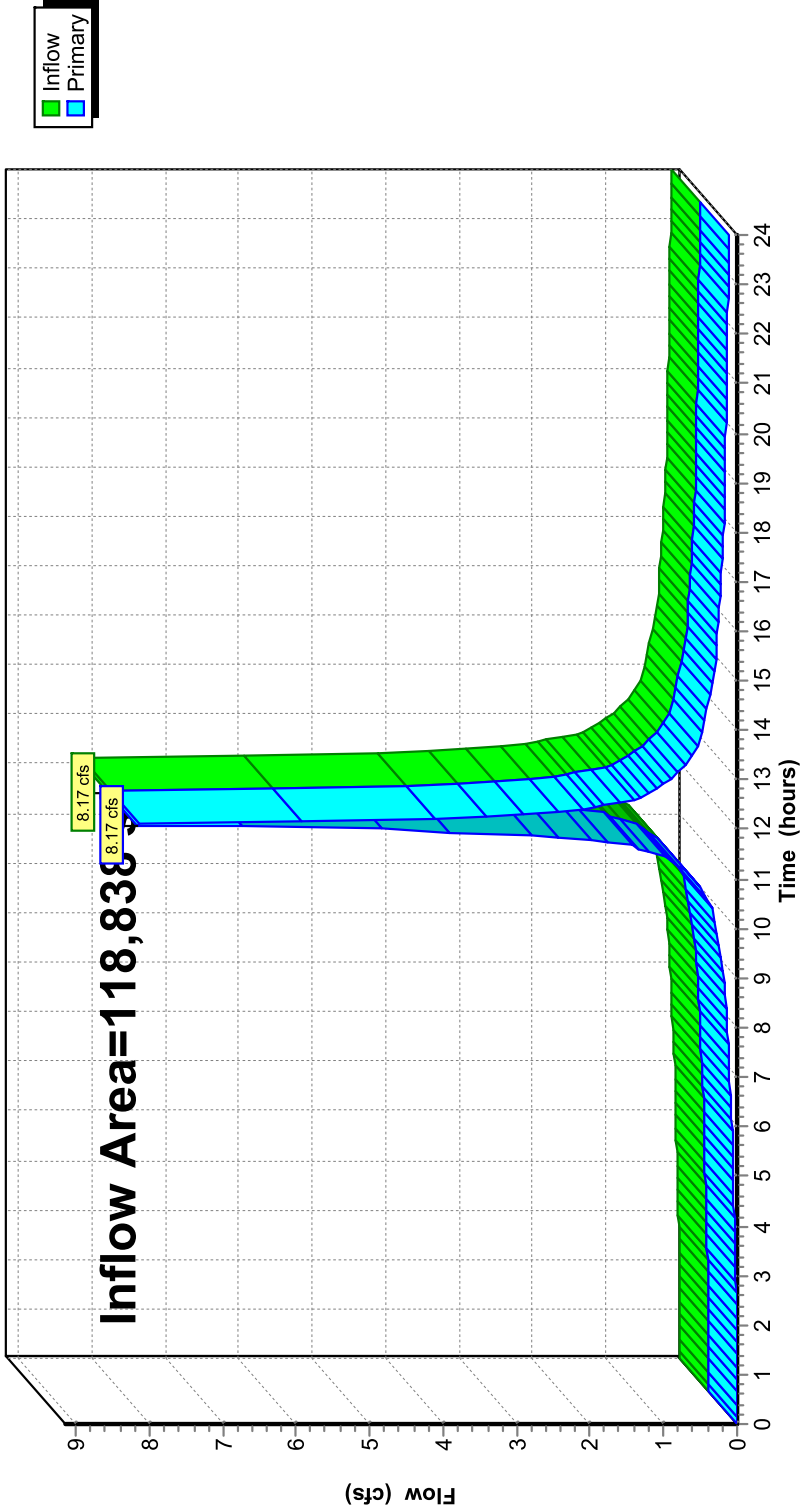
Summary for Link E-DP 1: EXIST DP 1

Inflow Area = 118,838 sf, 62.32% Impervious, Inflow Depth > 2.87" for 2-Year-2050 event
Inflow = 8.17 cfs @ 12.09 hrs, Volume= 28,382 cf
Primary = 8.17 cfs @ 12.09 hrs, Volume= 28,382 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 9L : TOTAL EXISTING

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link E-DP 1: EXIST DP 1

Hydrograph



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NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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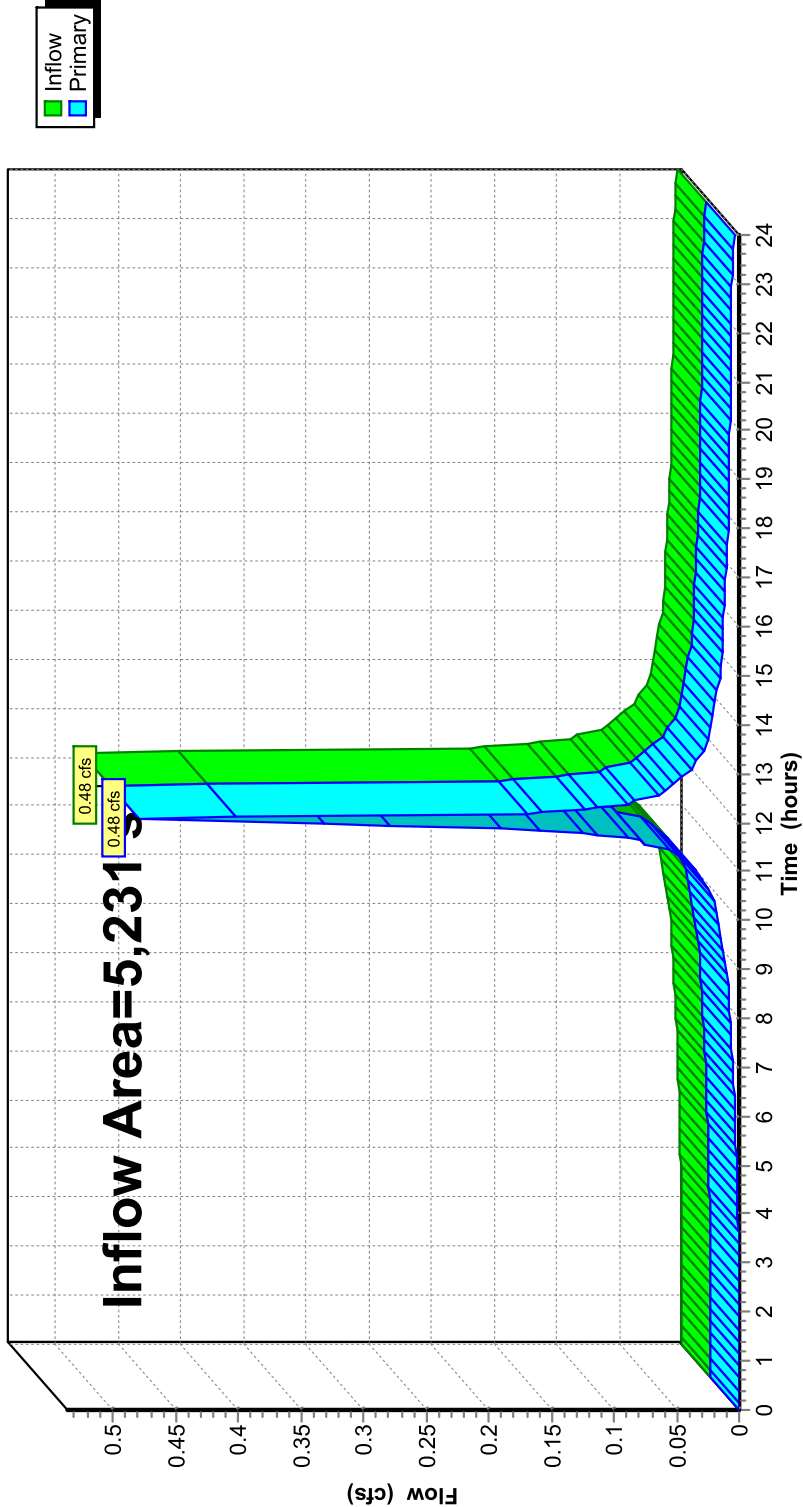
Summary for Link E-DP 2: EXIST DP 2

Inflow Area = 5,231 sf, 79.18% Impervious, Inflow Depth > 3.31" for 2-Year-2050 event
Inflow = 0.48 cfs @ 12.06 hrs, Volume= 1,442 cf
Primary = 0.48 cfs @ 12.06 hrs, Volume= 1,442 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 9L : TOTAL EXISTING

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link E-DP 2: EXIST DP 2

Hydrograph



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NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

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Summary for Subcatchment E1A-B: E1A & E1B DISTURBED

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

Runoff = 11.83 cfs @ 12.09 hrs, Volume= 38,547 cf, Depth> 5.78"
Routed to Link 8L : EXISTING DISTURBED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (sf)		CN	Description		
72,135	98		Paved parking, HSG C		
7,928	72		Woods/grass comb., Good, HSG C		
80,063	95		Weighted Average		
7,928			9.90% Pervious Area		
72,135			90.10% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	25	0.5000	0.24		Sheet Flow, Wooded
					Woods: Light underbrush n= 0.400 P2= 4.09"
1.5	413	0.0480	4.45		Shallow Concentrated Flow, Parking lot
					Paved Kv= 20.3 fps

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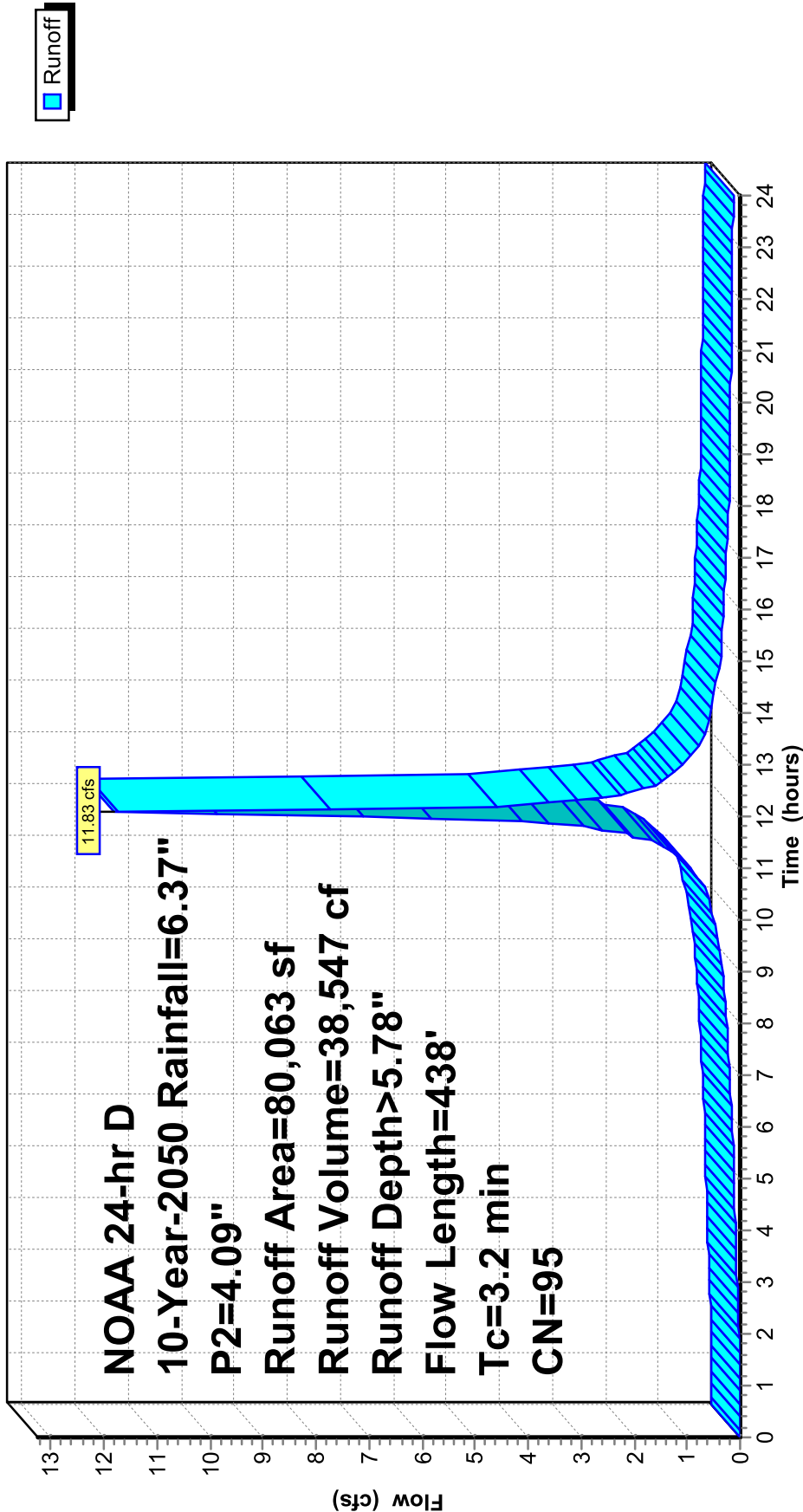
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

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Subcatchment E1A-B: E1A & E1B DISTURBED

Hydrograph



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NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

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Summary for Subcatchment E1C: E1C Pervious-w-offsite-Undisturbed

Runoff = 2.70 cfs @ 12.21 hrs, Volume= 10,626 cf, Depth> 3.29"
Routed to Link E-DP 1 : EXIST DP 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

	Area (sf)	CN	Description
*	708	98	Roof-offsite
*	1,220	98	Impervious
	2,721	71	Meadow, non-grazed, HSG C
*	32,886	70	wooded
	1,240	74	>75% Grass cover, Good, HSG C
	38,775	72	Weighted Average
	36,847		95.03% Pervious Area
	1,928		4.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0900	0.16		Sheet Flow, sheet flow Woods: Light underbrush n= 0.400 P2= 4.09"
0.6	123	0.5000	3.54		Shallow Concentrated Flow, SC Woodland Kv= 5.0 fps
1.6	431	0.0480	4.45		Shallow Concentrated Flow, Parking lot Paved Kv= 20.3 fps
12.6	654	Total			

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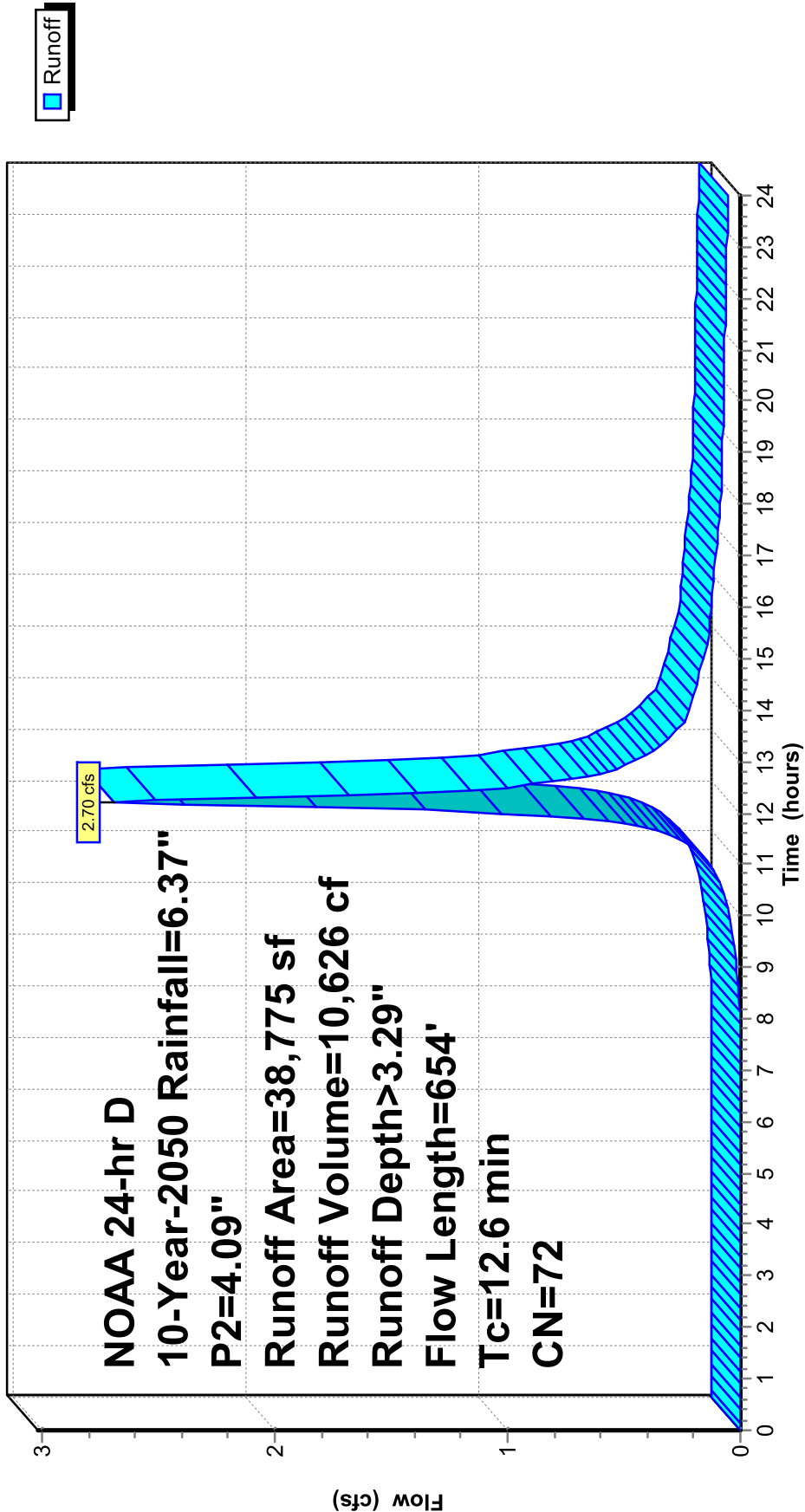
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Subcatchment E1C: E1C Pervious-w-offsite-Undisturbed

Hydrograph



Summary for Subcatchment E3: E3

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

Runoff = 0.78 cfs @ 12.06 hrs, Volume= 2,418 cf, Depth> 5.55"
Routed to Link E-DP 2 : EXIST DP 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (sf)		CN	Description		
1,089	74	>75% Grass cover, Good, HSG C			
4,142	98	Roofs, HSG C			
5,231	93	Weighted Average			
1,089		20.82% Pervious Area			
4,142		79.18% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	24	0.8330	5.20		Sheet Flow, Roof
					Smooth surfaces n= 0.011 P2= 4.09"
0.7	145	0.0480	3.53		Shallow Concentrated Flow, Lawn
					Unpaved Kv= 16.1 fps

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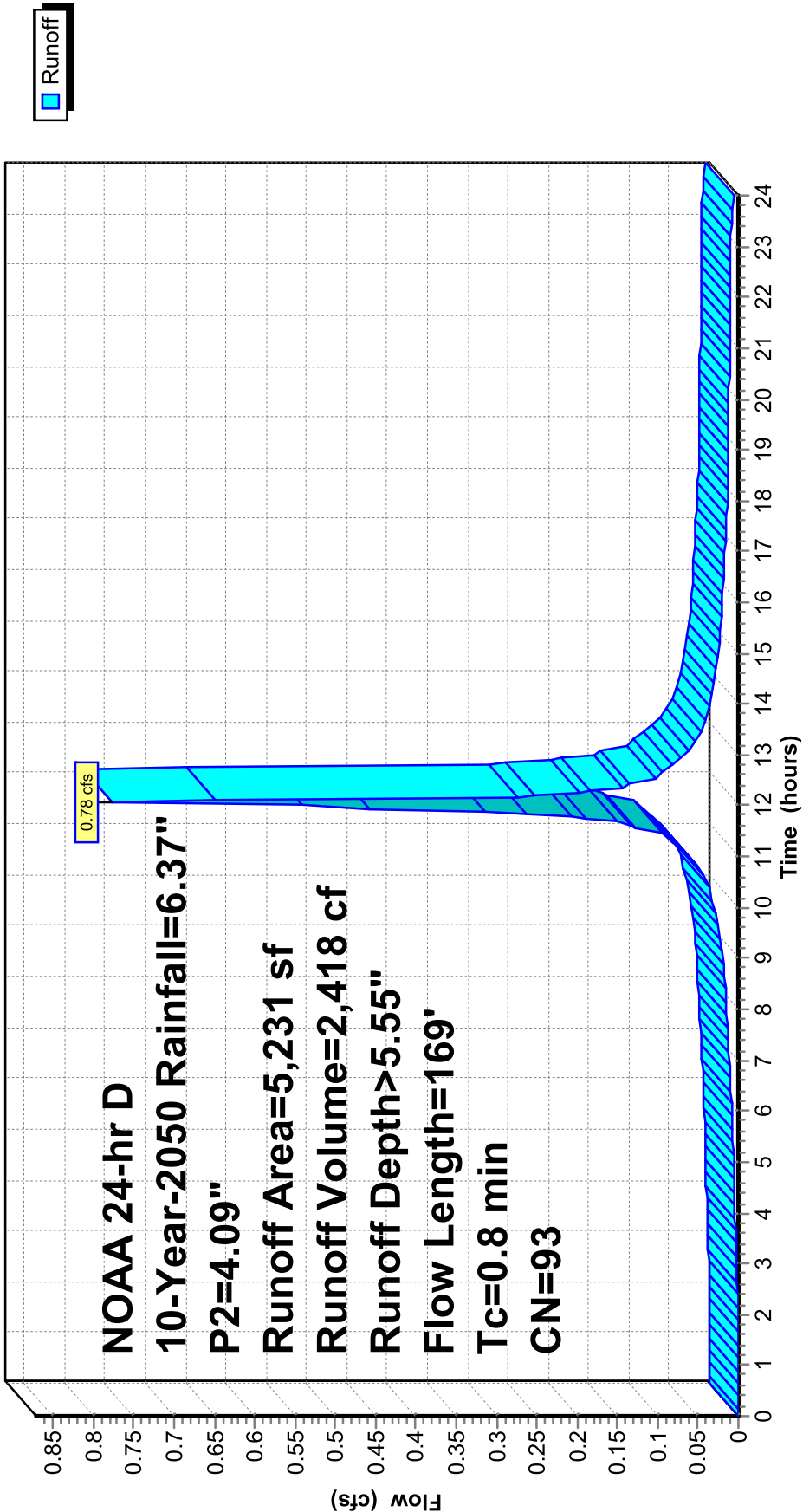
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Subcatchment E3: E3

Hydrograph



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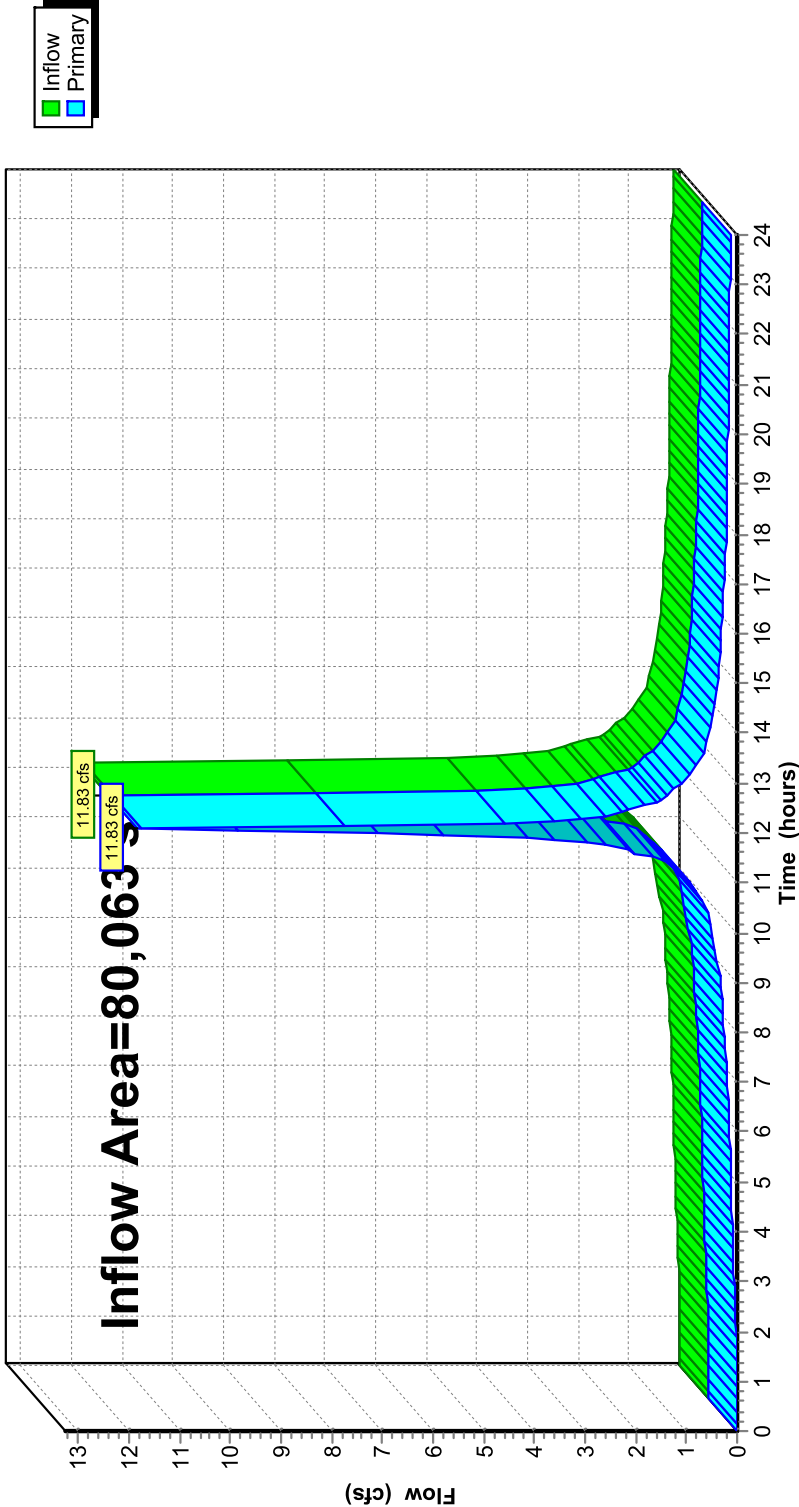
Summary for Link 8L: EXISTING DISTURBED

Inflow Area = 80,063 sf, 90.10% Impervious, Inflow Depth > 5.78" for 10-Year-2050 event
Inflow = 11.83 cfs @ 12.09 hrs, Volume= 38,547 cf
Primary = 11.83 cfs @ 12.09 hrs, Volume= 38,547 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E-DP 1 : EXIST DP 1

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: EXISTING DISTURBED

Hydrograph



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NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

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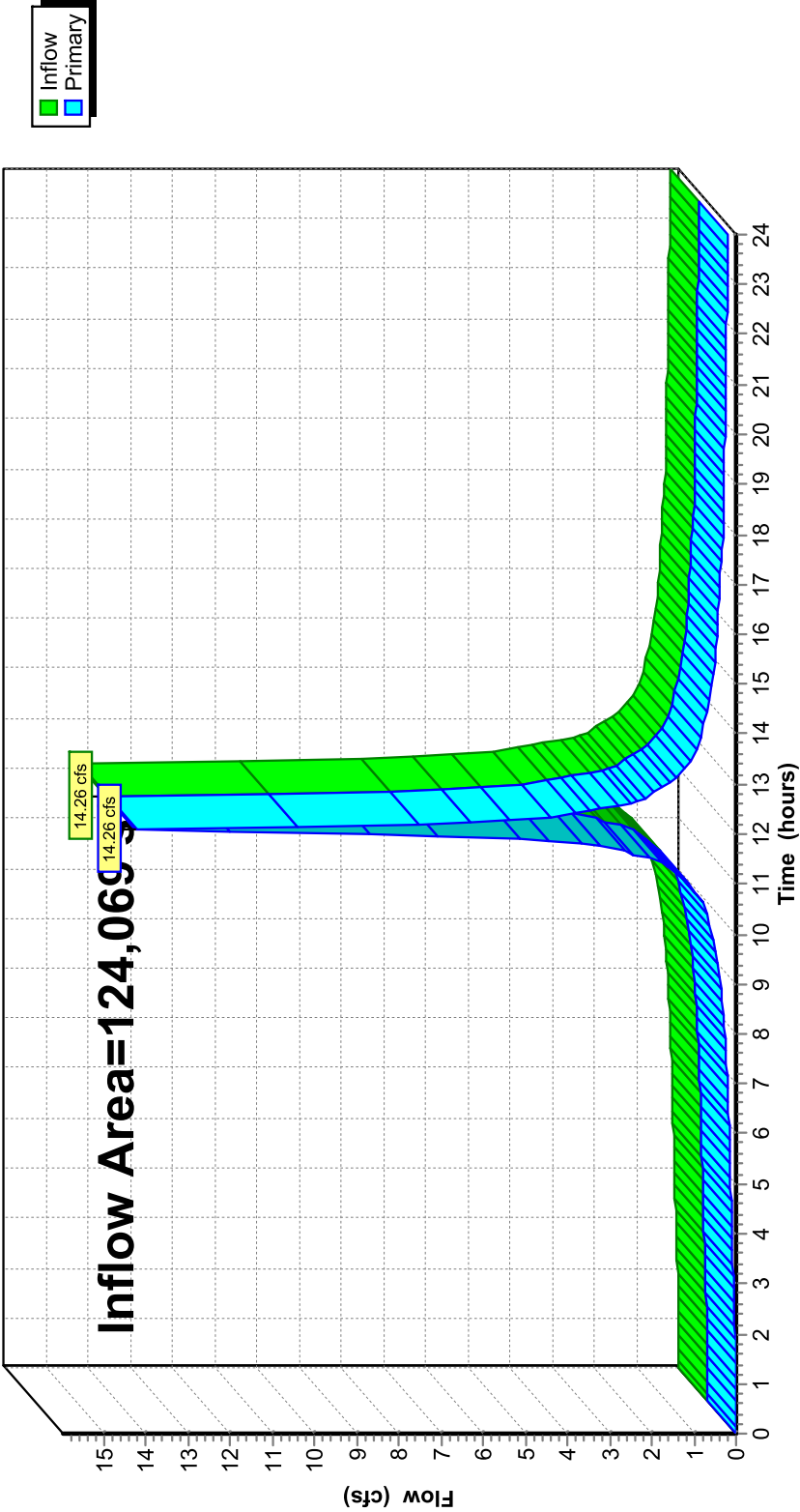
Summary for Link 9L: TOTAL EXISTING

Inflow Area = 124,069 sf, 63.03% Impervious, Inflow Depth > 4.99" for 10-Year-2050 event
Inflow = 14.26 cfs @ 12.09 hrs, Volume= 51,591 cf
Primary = 14.26 cfs @ 12.09 hrs, Volume= 51,591 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 9L: TOTAL EXISTING

Hydrograph



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NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

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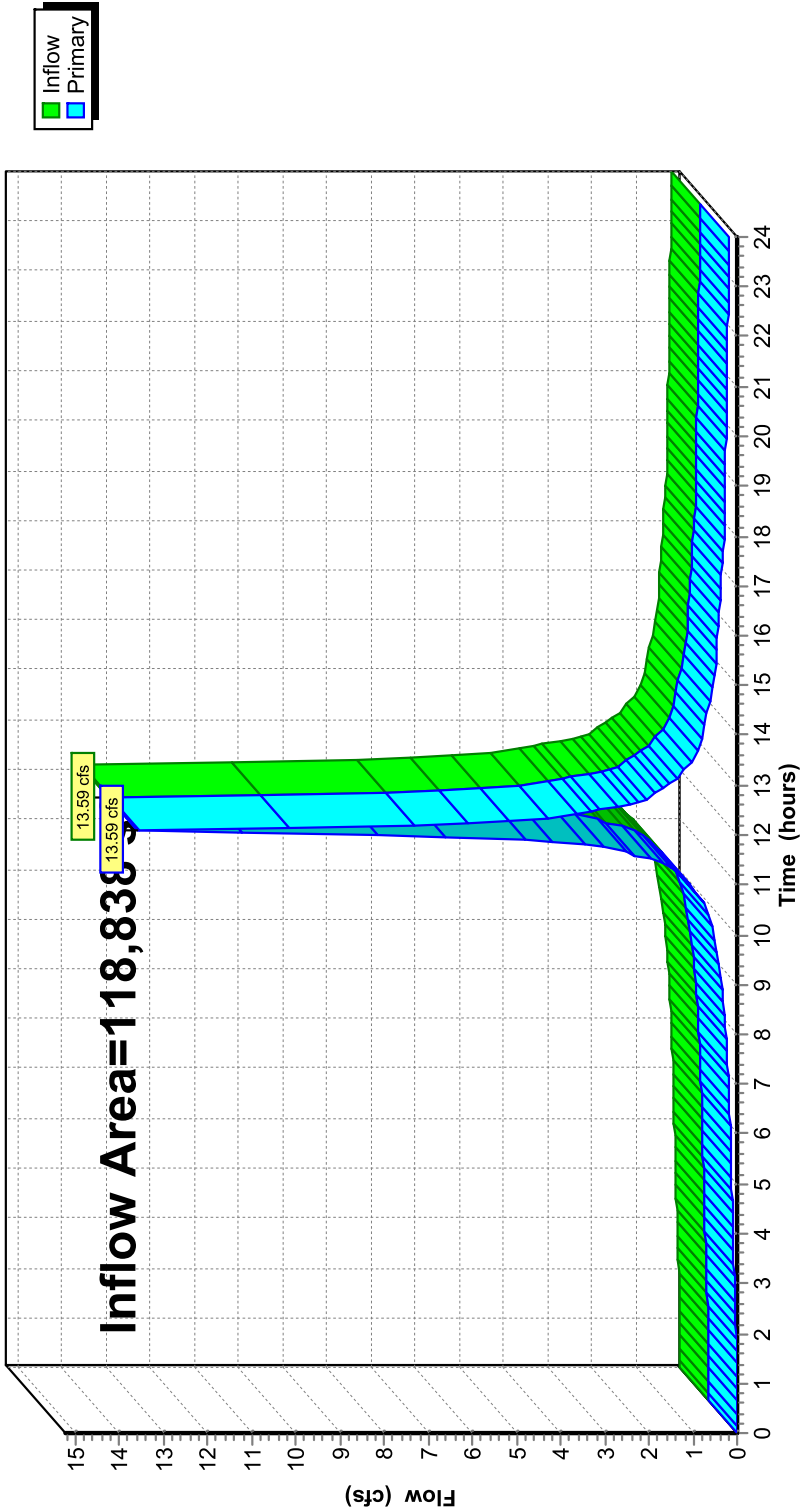
Summary for Link E-DP 1: EXIST DP 1

Inflow Area = 118,838 sf, 62.32% Impervious, Inflow Depth > 4.97" for 10-Year-2050 event
Inflow = 13.59 cfs @ 12.10 hrs, Volume= 49,173 cf
Primary = 13.59 cfs @ 12.10 hrs, Volume= 49,173 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 9L : TOTAL EXISTING

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link E-DP 1: EXIST DP 1

Hydrograph



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NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

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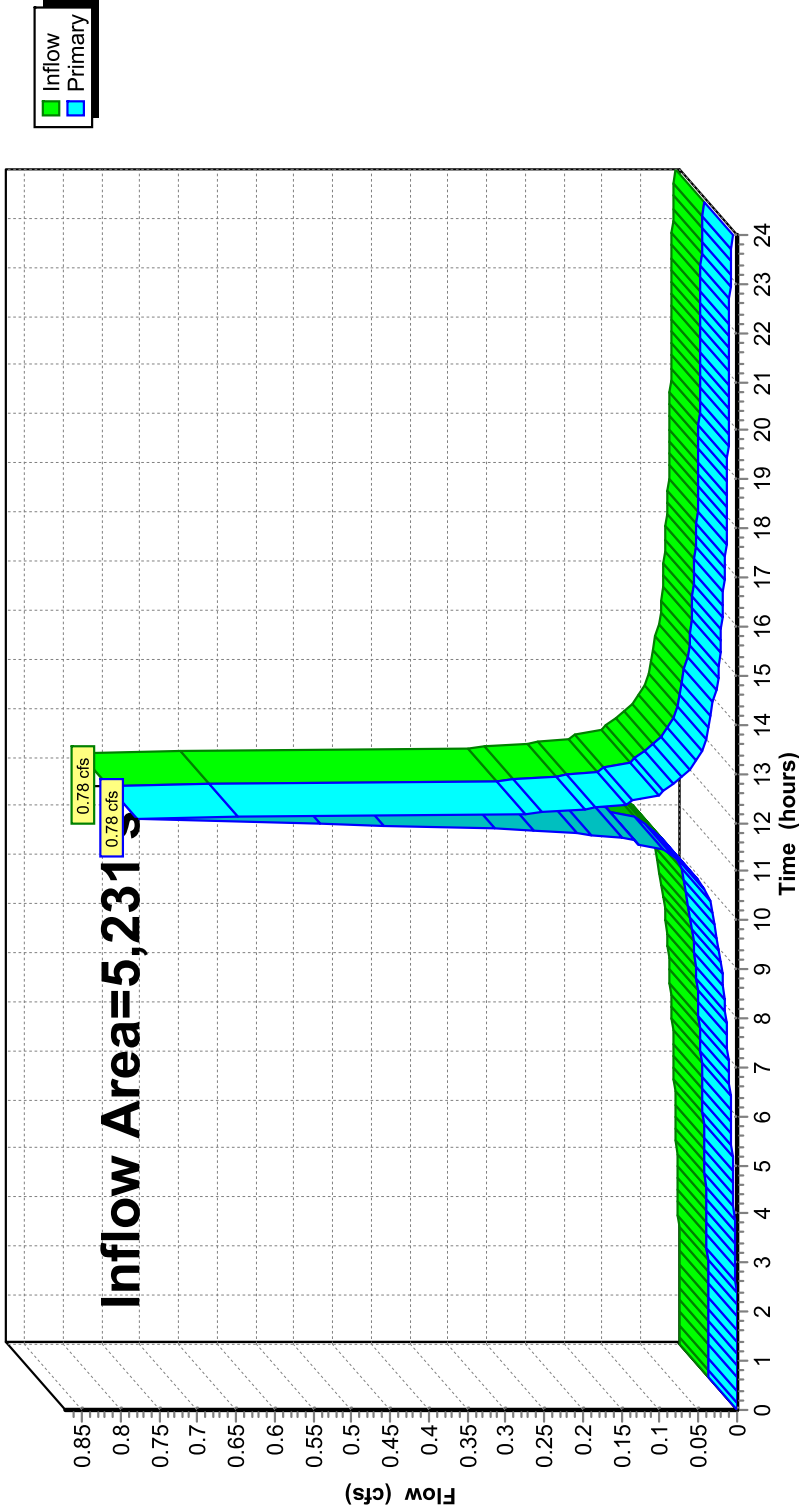
Summary for Link E-DP 2: EXIST DP 2

Inflow Area = 5,231 sf, 79.18% Impervious, Inflow Depth > 5.55" for 10-Year-2050 event
Inflow = 0.78 cfs @ 12.06 hrs, Volume= 2,418 cf
Primary = 0.78 cfs @ 12.06 hrs, Volume= 2,418 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 9L : TOTAL EXISTING

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link E-DP 2: EXIST DP 2

Hydrograph



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Summary for Subcatchment E1A-B: E1A & E1B DISTURBED

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

Runoff = 21.68 cfs @ 12.09 hrs, Volume= 72,780 cf, Depth>10.91"
Routed to Link 8L : EXISTING DISTURBED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (sf)		CN	Description		
72,135	98		Paved parking, HSG C		
7,928	72		Woods/grass comb., Good, HSG C		
80,063	95		Weighted Average		
7,928			9.90% Pervious Area		
72,135			90.10% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	25	0.5000	0.24		Sheet Flow, Wooded
					Woods: Light underbrush n= 0.400 P2= 4.09"
1.5	413	0.0480	4.45		Shallow Concentrated Flow, Parking lot
					Paved Kv= 20.3 fps

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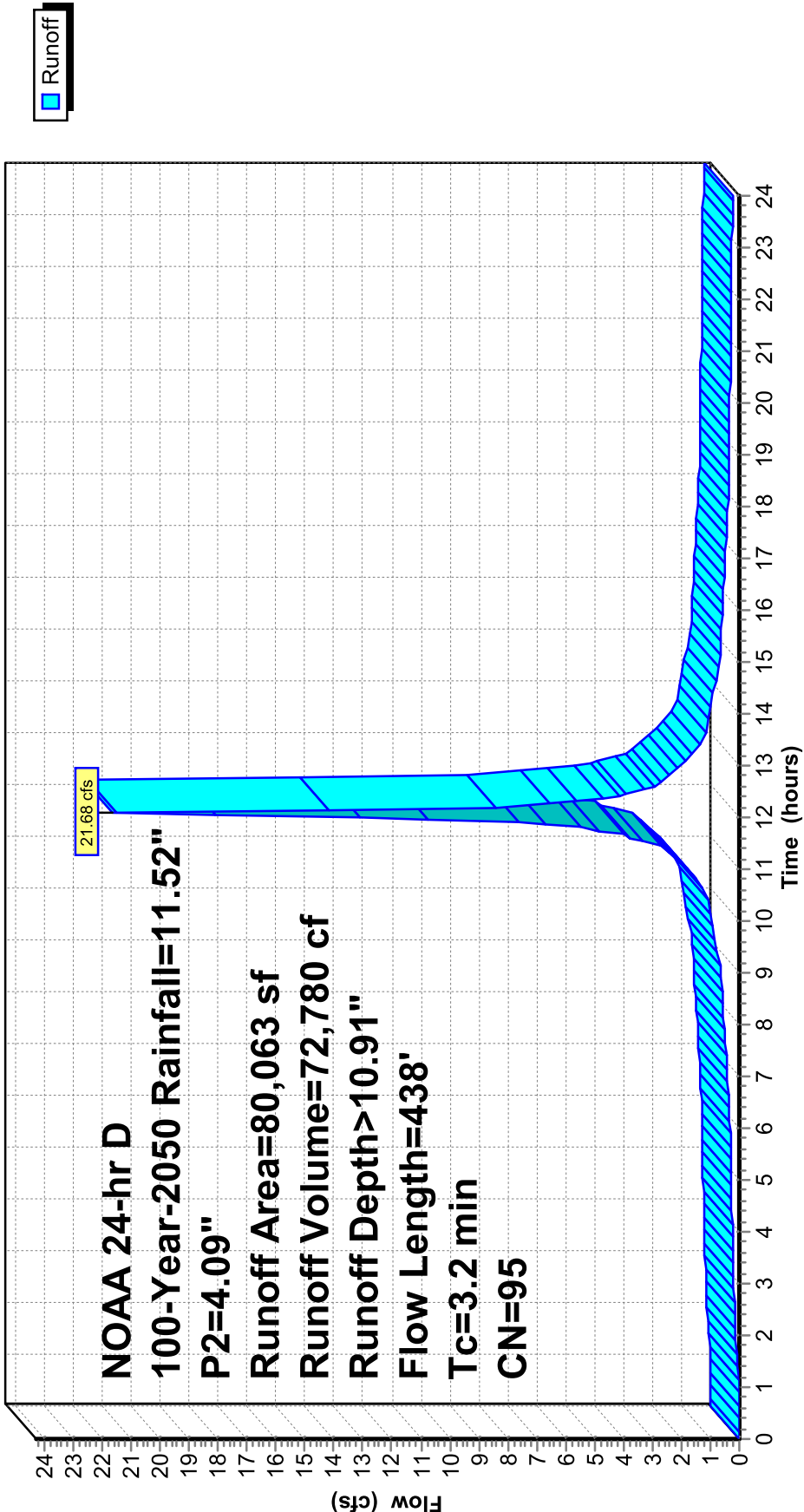
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

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Subcatchment E1A-B: E1A & E1B DISTURBED

Hydrograph



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NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

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Summary for Subcatchment E1C: E1C Pervious-w-offsite-Undisturbed

Runoff = 6.34 cfs @ 12.20 hrs, Volume= 25,420 cf, Depth> 7.87"
Routed to Link E-DP 1 : EXIST DP 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

	Area (sf)	CN	Description
*	708	98	Roof-offsite
*	1,220	98	Impervious
	2,721	71	Meadow, non-grazed, HSG C
*	32,886	70	wooded
	1,240	74	>75% Grass cover, Good, HSG C
	38,775	72	Weighted Average
	36,847		95.03% Pervious Area
	1,928		4.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0900	0.16		Sheet Flow, sheet flow Woods: Light underbrush n= 0.400 P2= 4.09"
0.6	123	0.5000	3.54		Shallow Concentrated Flow, SC Woodland Kv= 5.0 fps
1.6	431	0.0480	4.45		Shallow Concentrated Flow, Parking lot Paved Kv= 20.3 fps
12.6	654	Total			

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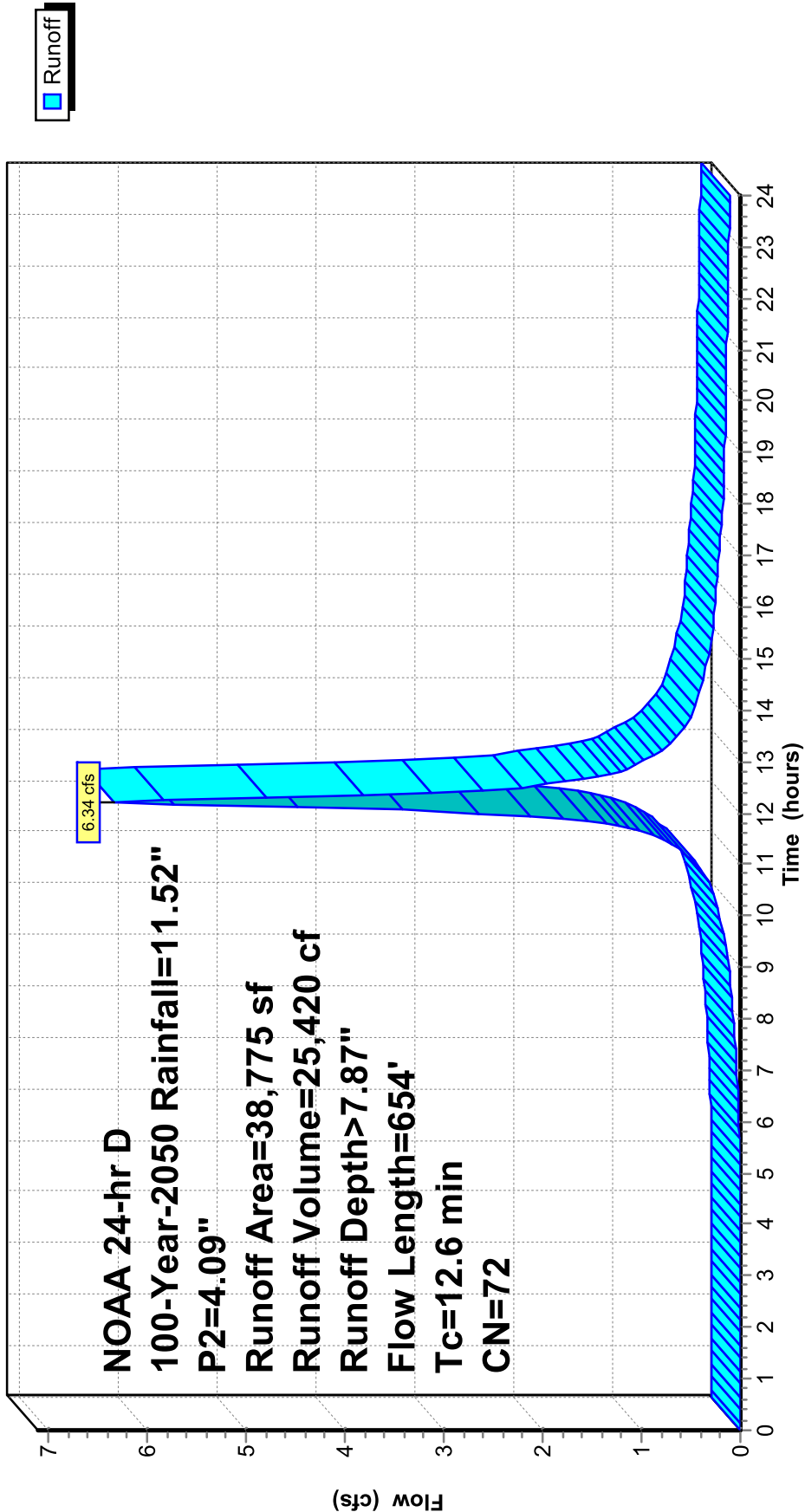
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

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Subcatchment E1C: E1C Pervious-w-offsite-Undisturbed

Hydrograph



Summary for Subcatchment E3: E3

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

Runoff = 1.44 cfs @ 12.06 hrs, Volume= 4,648 cf, Depth>10.66"
Routed to Link E-DP 2 : EXIST DP 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (sf)		CN	Description		
1,089	74	>75% Grass cover, Good, HSG C			
4,142	98	Roofs, HSG C			
5,231	93	Weighted Average			
1,089		20.82% Pervious Area			
4,142		79.18% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	24	0.8330	5.20		Sheet Flow, Roof
					Smooth surfaces n= 0.011 P2= 4.09"
0.7	145	0.0480	3.53		Shallow Concentrated Flow, Lawn
					Unpaved Kv= 16.1 fps

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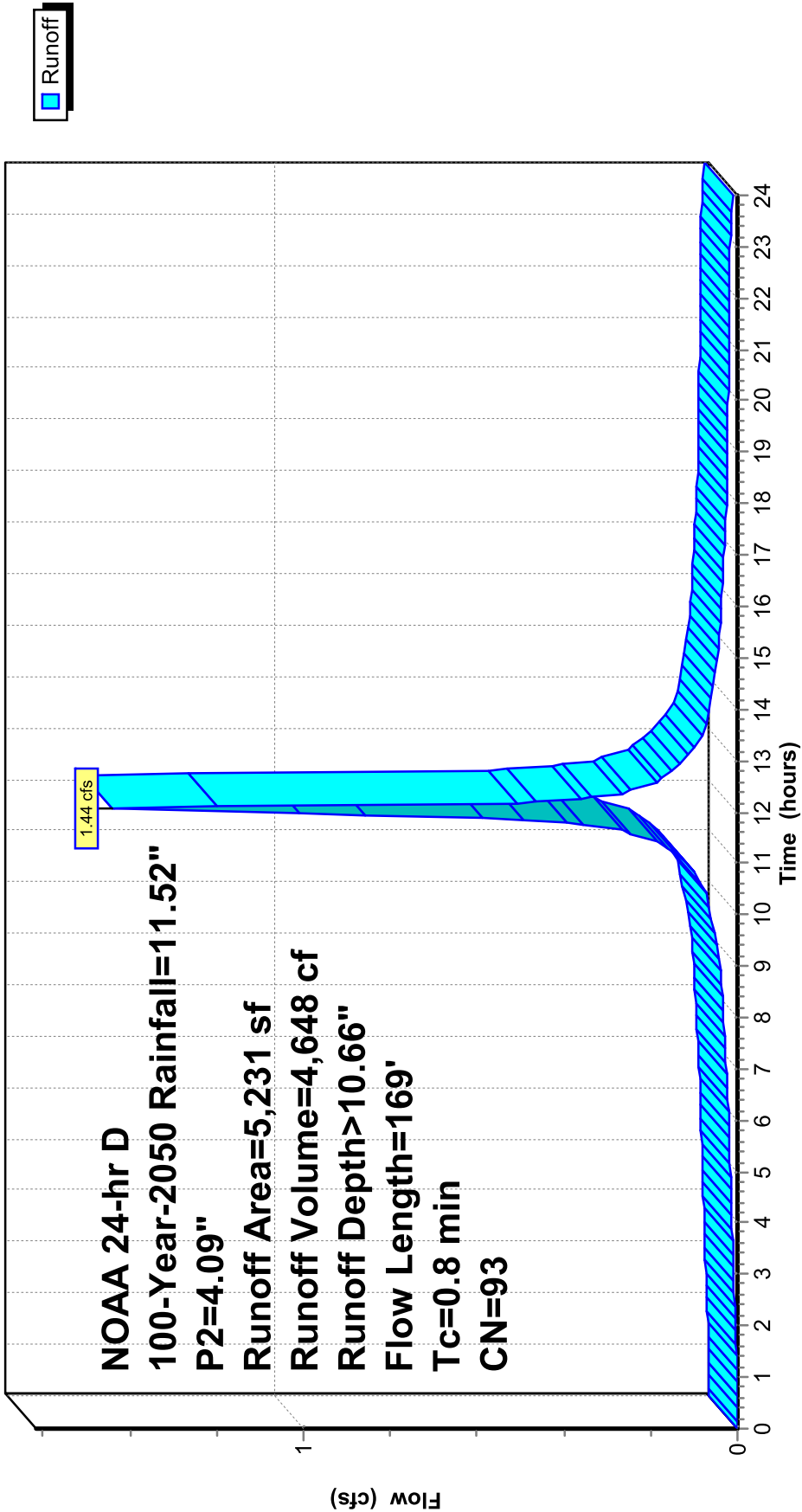
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Subcatchment E3: E3

Hydrograph



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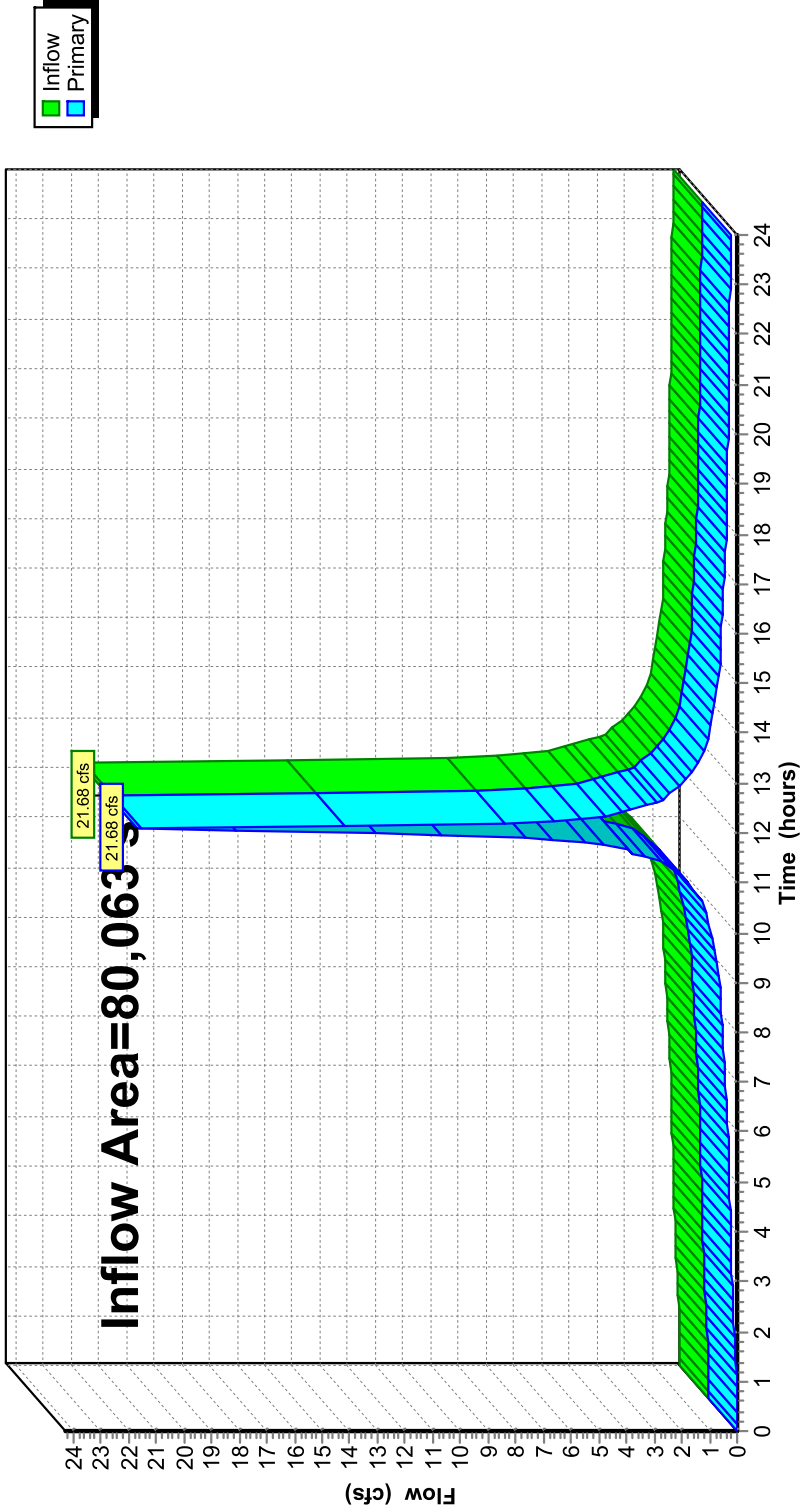
Summary for Link 8L: EXISTING DISTURBED

Inflow Area = 80,063 sf, 90.10% Impervious, Inflow Depth > 10.91" for 100-Year-2050 event
Inflow = 21.68 cfs @ 12.09 hrs, Volume= 72,780 cf
Primary = 21.68 cfs @ 12.09 hrs, Volume= 72,780 cf, Atten= 0%, Lag= 0.0 min
Routed to Link E-DP 1 : EXIST DP 1

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: EXISTING DISTURBED

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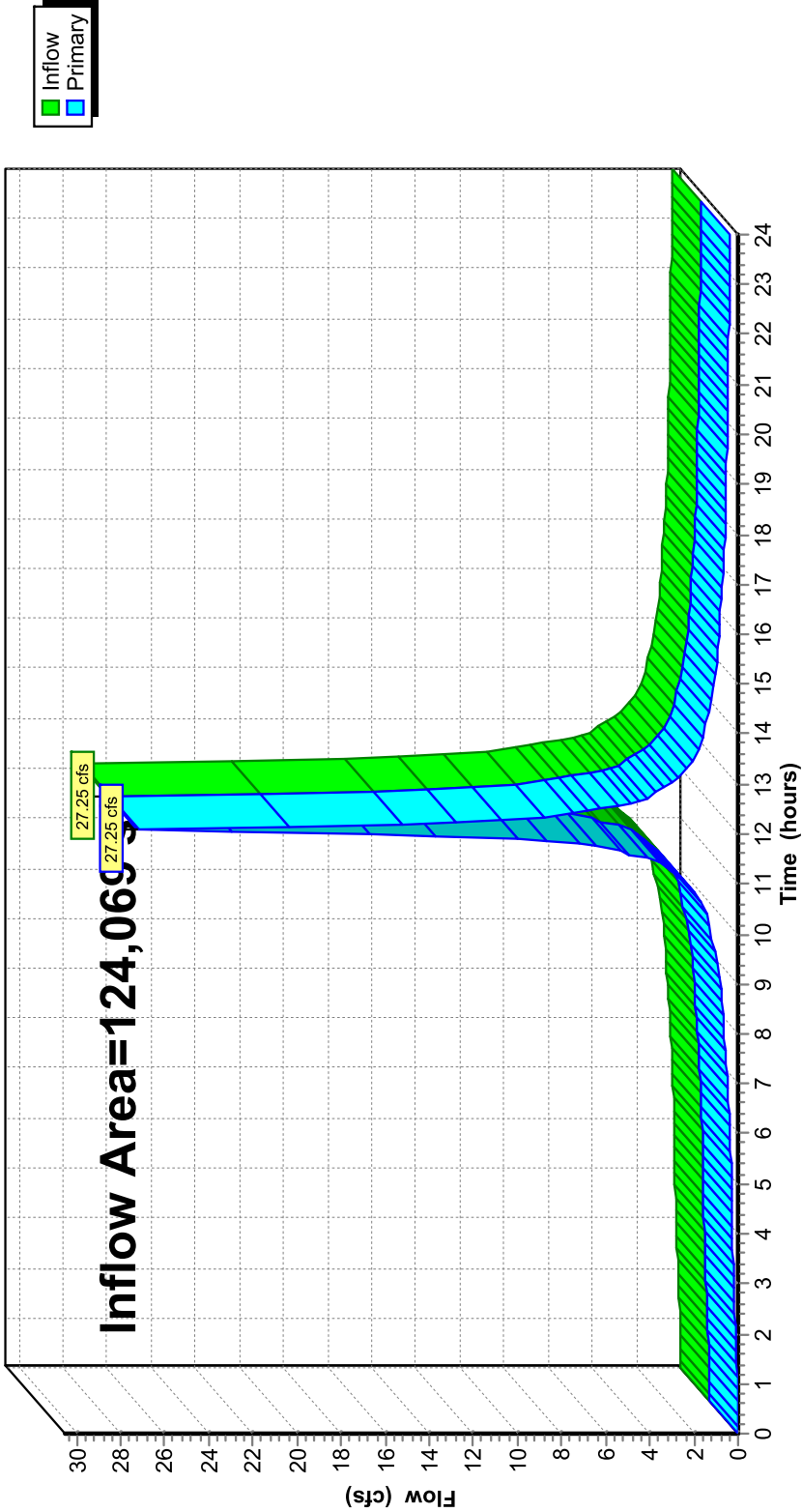
Summary for Link 9L: TOTAL EXISTING

Inflow Area = 124,069 sf, 63.03% Impervious, Inflow Depth > 9.95" for 100-Year-2050 event
Inflow = 27.25 cfs @ 12.09 hrs, Volume= 102,849 cf
Primary = 27.25 cfs @ 12.09 hrs, Volume= 102,849 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 9L: TOTAL EXISTING

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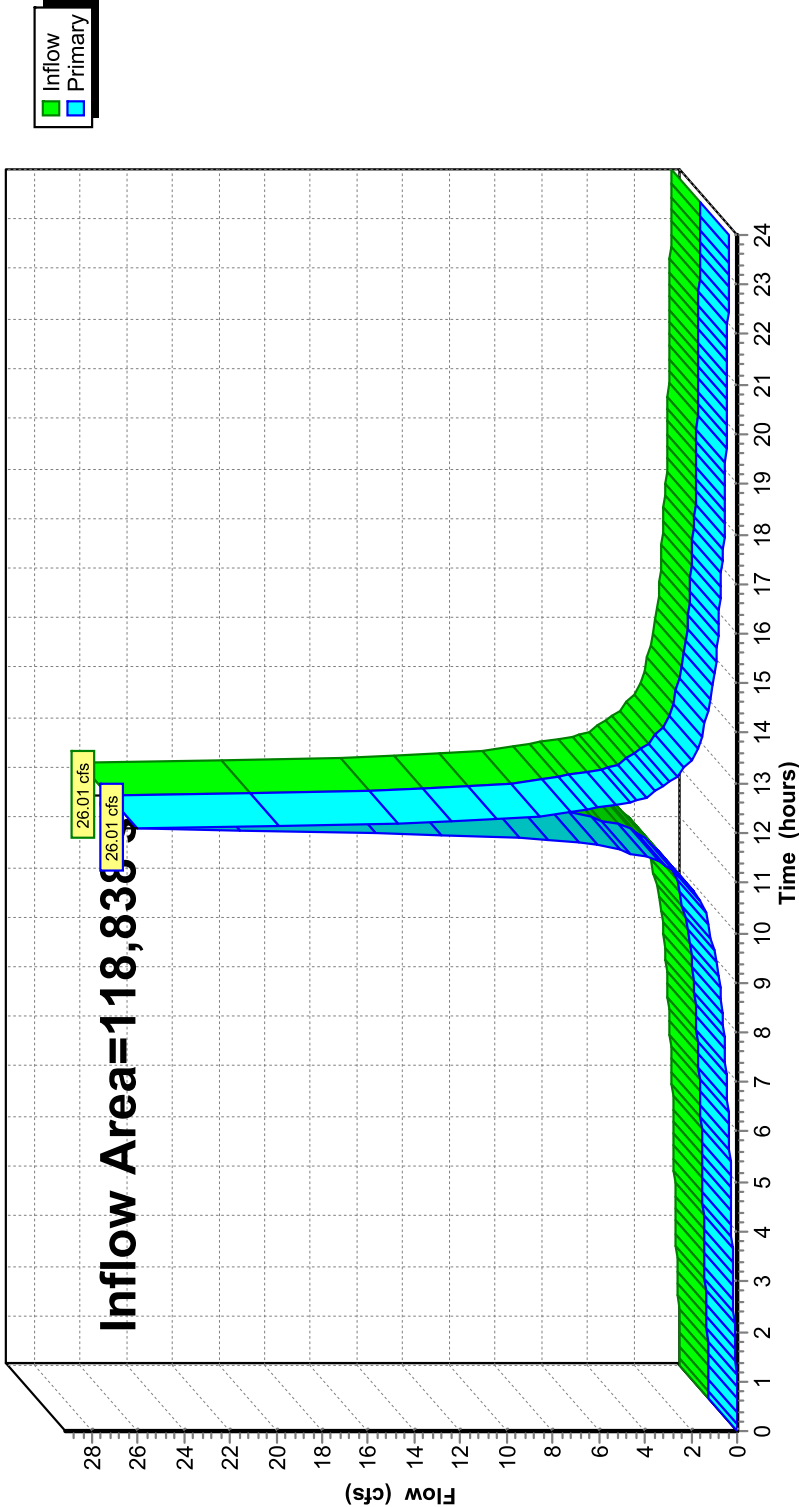
Summary for Link E-DP 1: EXIST DP 1

Inflow Area = 118,838 sf, 62.32% Impervious, Inflow Depth > 9.92" for 100-Year-2050 event
Inflow = 26.01 cfs @ 12.10 hrs, Volume= 98,200 cf
Primary = 26.01 cfs @ 12.10 hrs, Volume= 98,200 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 9L : TOTAL EXISTING

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link E-DP 1: EXIST DP 1

Hydrograph



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NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

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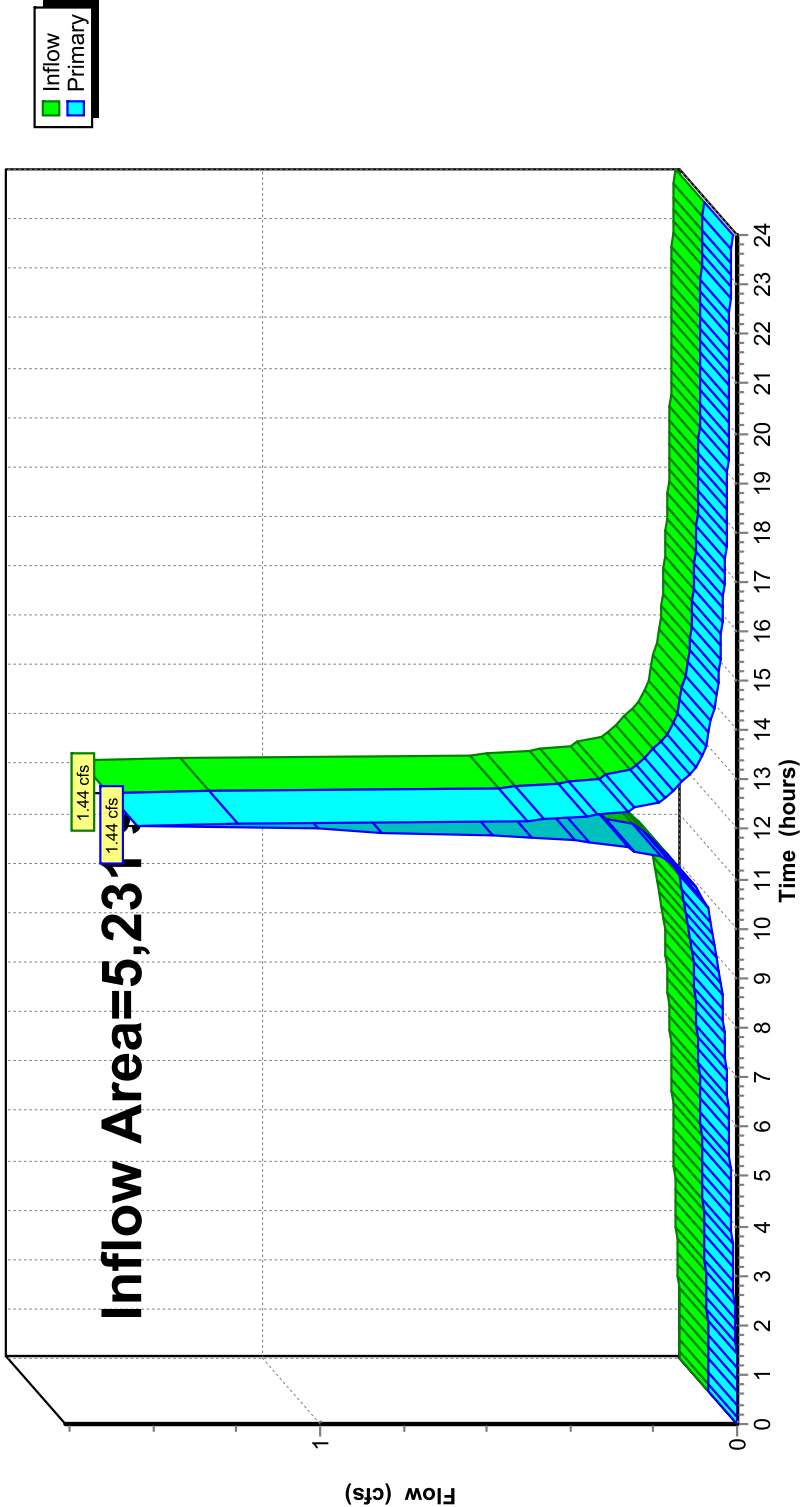
Summary for Link E-DP 2: EXIST DP 2

Inflow Area = 5,231 sf, 79.18% Impervious, Inflow Depth > 10.66" for 100-Year-2050 event
Inflow = 1.44 cfs @ 12.06 hrs, Volume= 4,648 cf
Primary = 1.44 cfs @ 12.06 hrs, Volume= 4,648 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 9L : TOTAL EXISTING

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

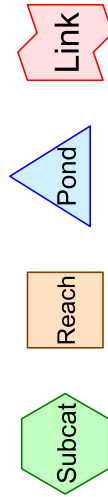
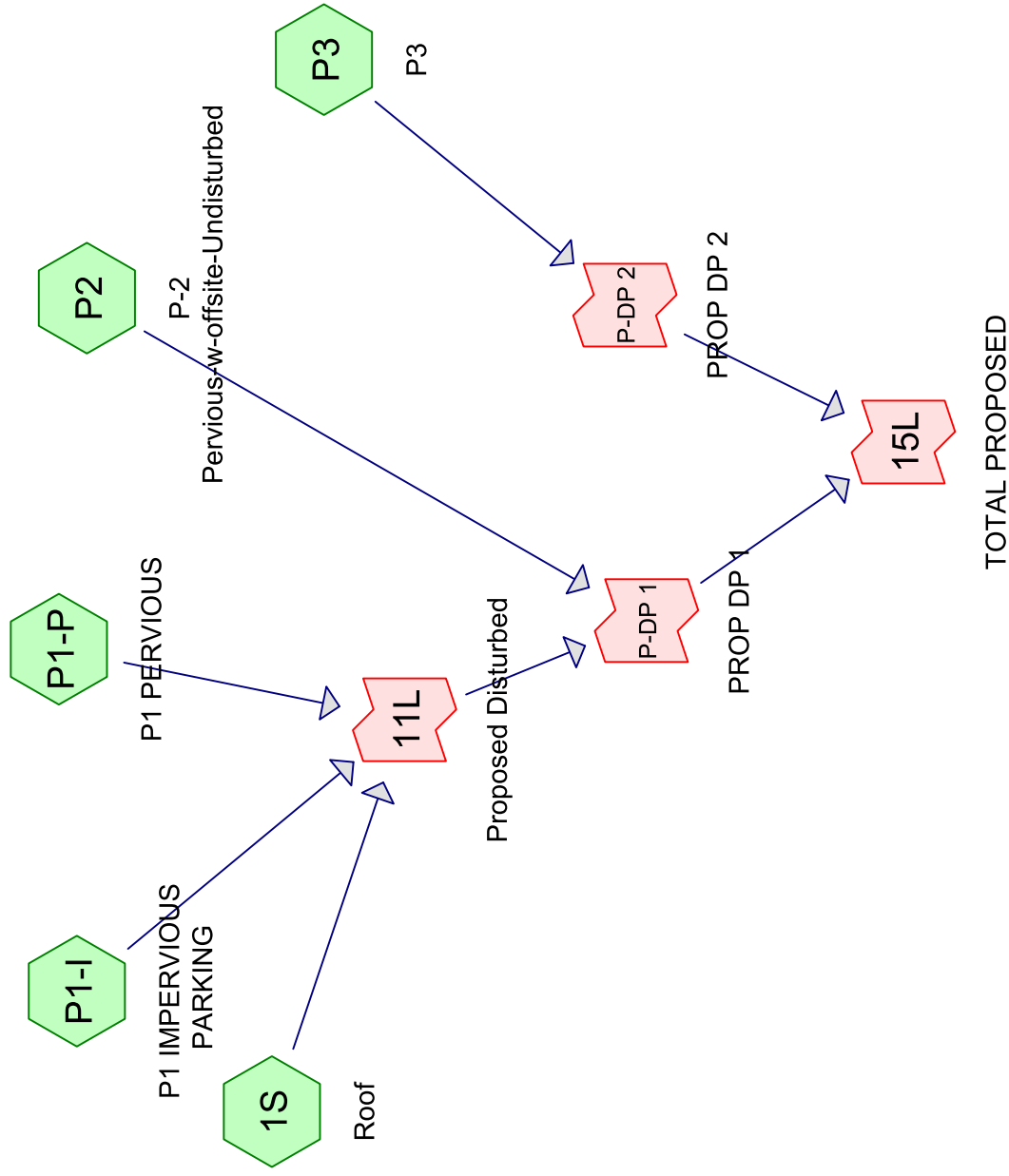
Link E-DP 2: EXIST DP 2

Hydrograph



APPENDIX B

PROPOSED DRAINAGE CALCULATIONS



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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
11,140	74	>75% Grass cover, Good, HSG C (P1-P, P3)
1,240	74	>75% Grass offsite (P2)
1,220	98	Impervious (P2)
1,506	71	Meadow, non-grazed, HSG C (P2)
1,142	98	Paved parking and s/w, HSG C (P3)
53,036	98	Roof and Amenity Area (1S)
2,744	98	Roof-offsite (P2)
19,976	98	Uncovered Paved parking, HSG C (P1-I)
32,065	70	wooded (P2)

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
33,764	HSG C	P1-I, P1-P, P2, P3
0	HSG D	
90,305	Other	1S, P2

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchment Numbers
0	0	11,140	0	0	11,140	>75% Grass cover, Good	P1-P, P3
0	0	0	0	1,240	1,240	>75% Grass offsite	P2
0	0	0	0	1,220	1,220	Impervious	P2
0	0	1,506	0	0	1,506	Meadow, non-grazed	P2
0	0	1,142	0	0	1,142	Paved parking and s/w	P3
0	0	0	0	53,036	53,036	Roof and Amenity Area	1S
0	0	0	0	2,744	2,744	Roof-offsite	P2
0	0	19,976	0	0	19,976	Uncovered Paved parking	P1-I
0	0	0	0	32,065	32,065	wooded	P2

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NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

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Summary for Subcatchment 1S: Roof

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

Runoff = 4.00 cfs @ 12.11 hrs, Volume= 14,296 cf, Depth> 3.23"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (sf)	CN	Description
* 53,036	98	Roof and Amenity Area
53,036		100.00% Impervious Area
Tc (min)	Length (feet)	Slope (ft/ft)
	Velocity (ft/sec)	Capacity (cfs)
5.0		Description

Direct Entry, Roof area

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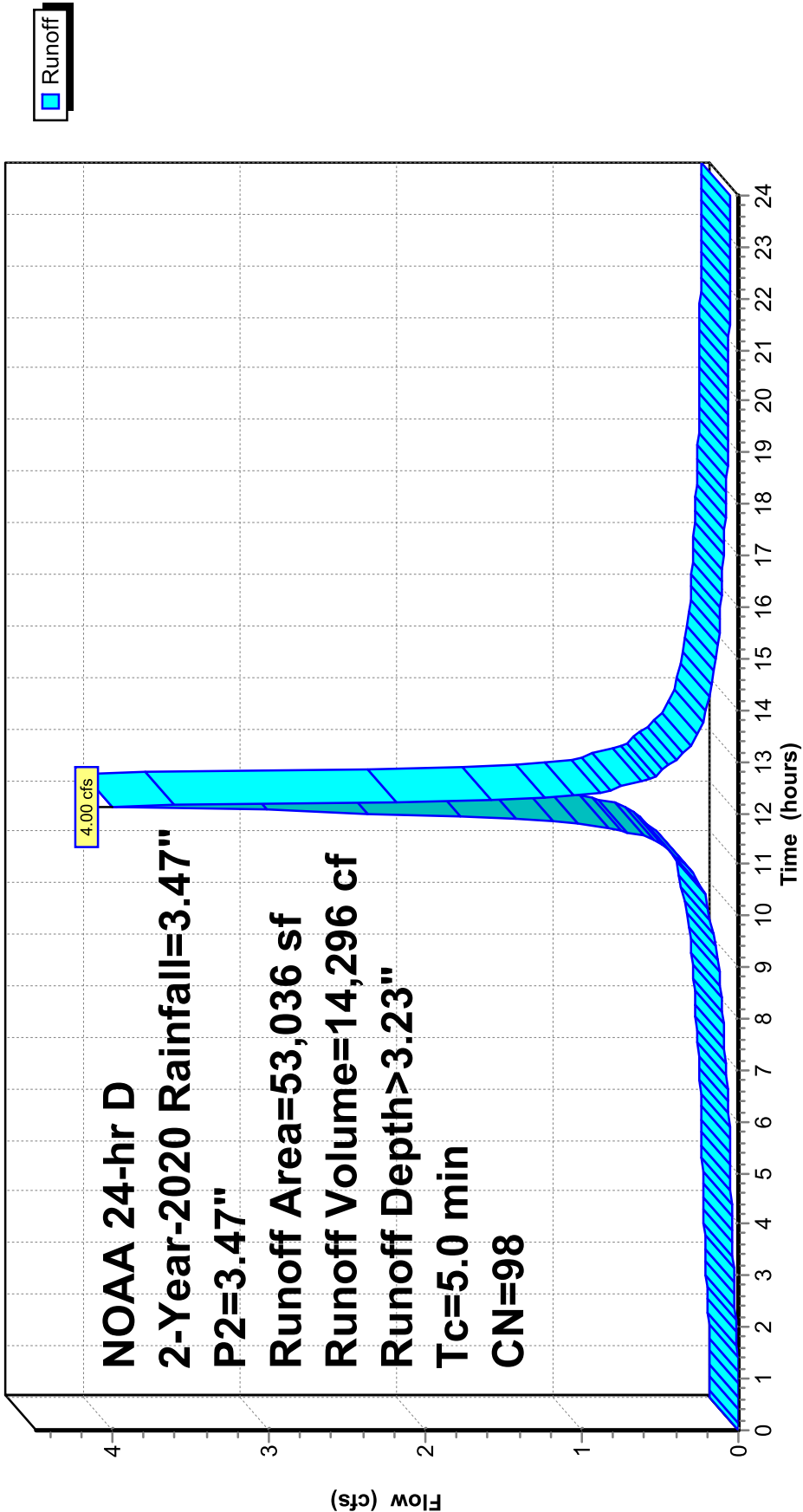
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

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Subcatchment 1S: Roof

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NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

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Summary for Subcatchment P1-I: P1 IMPERVIOUS PARKING

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

Runoff = 1.65 cfs @ 12.09 hrs, Volume= 5,387 cf, Depth> 3.24"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (sf)		CN	Description		
*	19,976	98	Uncovered Paved parking, HSG C		
	19,976		100.00% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0150	1.12		Sheet Flow, sheet flow Parking area n= 0.013 P2= 3.47"
0.9	127	0.0150	2.49		Shallow Concentrated Flow, parking area Paved Kv= 20.3 fps
0.3	198	0.0449	12.08	14.83	Pipe Channel, Pipe flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
2.7	425	Total			

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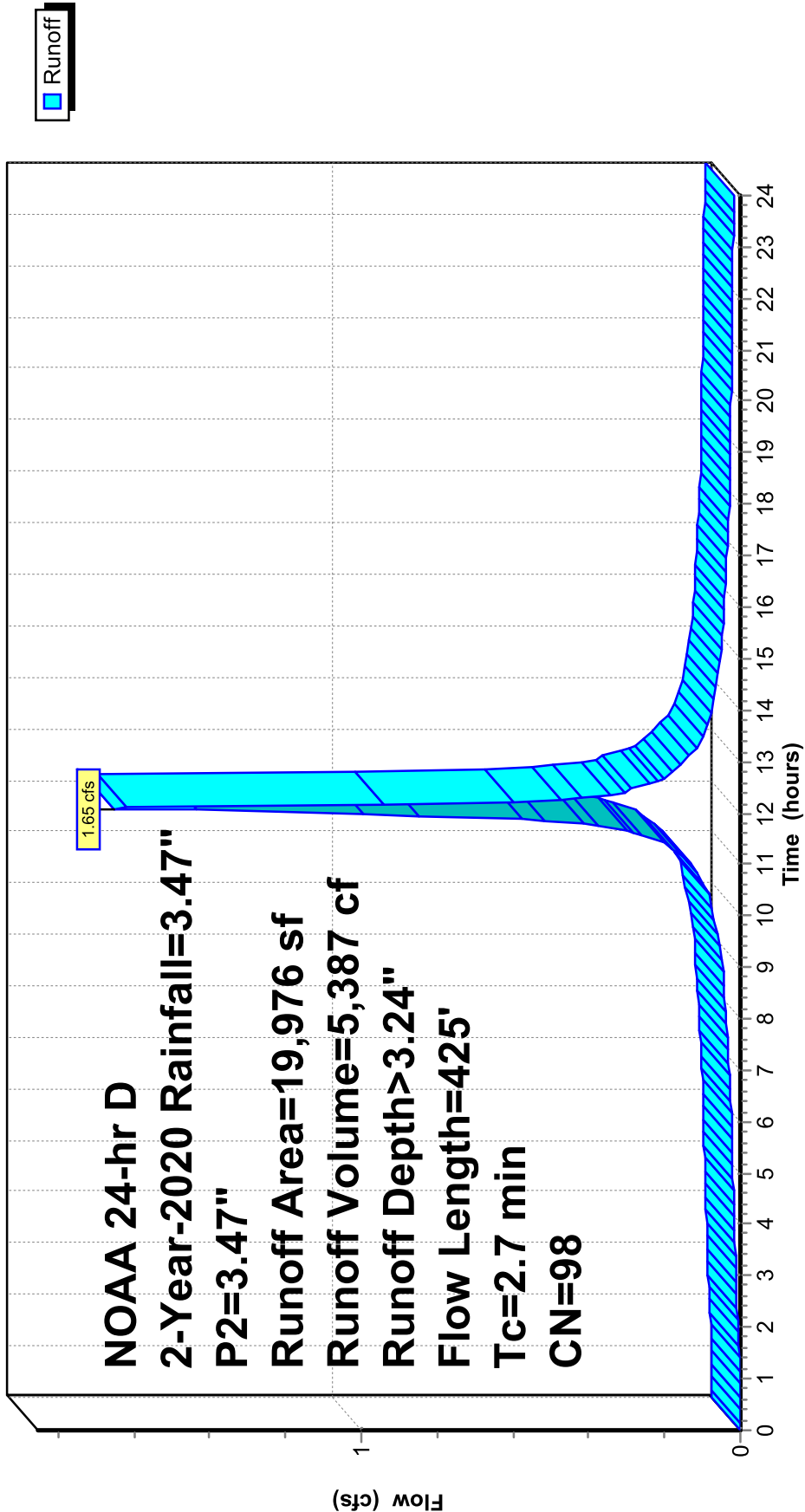
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

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Subcatchment P1-I: P1 IMPERVIOUS PARKING

Hydrograph



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Summary for Subcatchment P1-P: P1 PERVIOUS

Runoff = 0.26 cfs @ 12.15 hrs, Volume= 884 cf, Depth> 1.22"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (sf)		CN	Description	
8,717		74	>75% Grass cover, Good, HSG C	
8,717			100.00% Pervious Area	
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs) Description
7.5	100	0.0900	0.22	Sheet Flow, Grass: Dense n= 0.240 P2= 3.47"
0.1	44	0.0470	12.36	Pipe Channel, Yard Inlet 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.2	325	0.0450	31.77	Pipe Channel, 72" Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013
7.8	469	Total		

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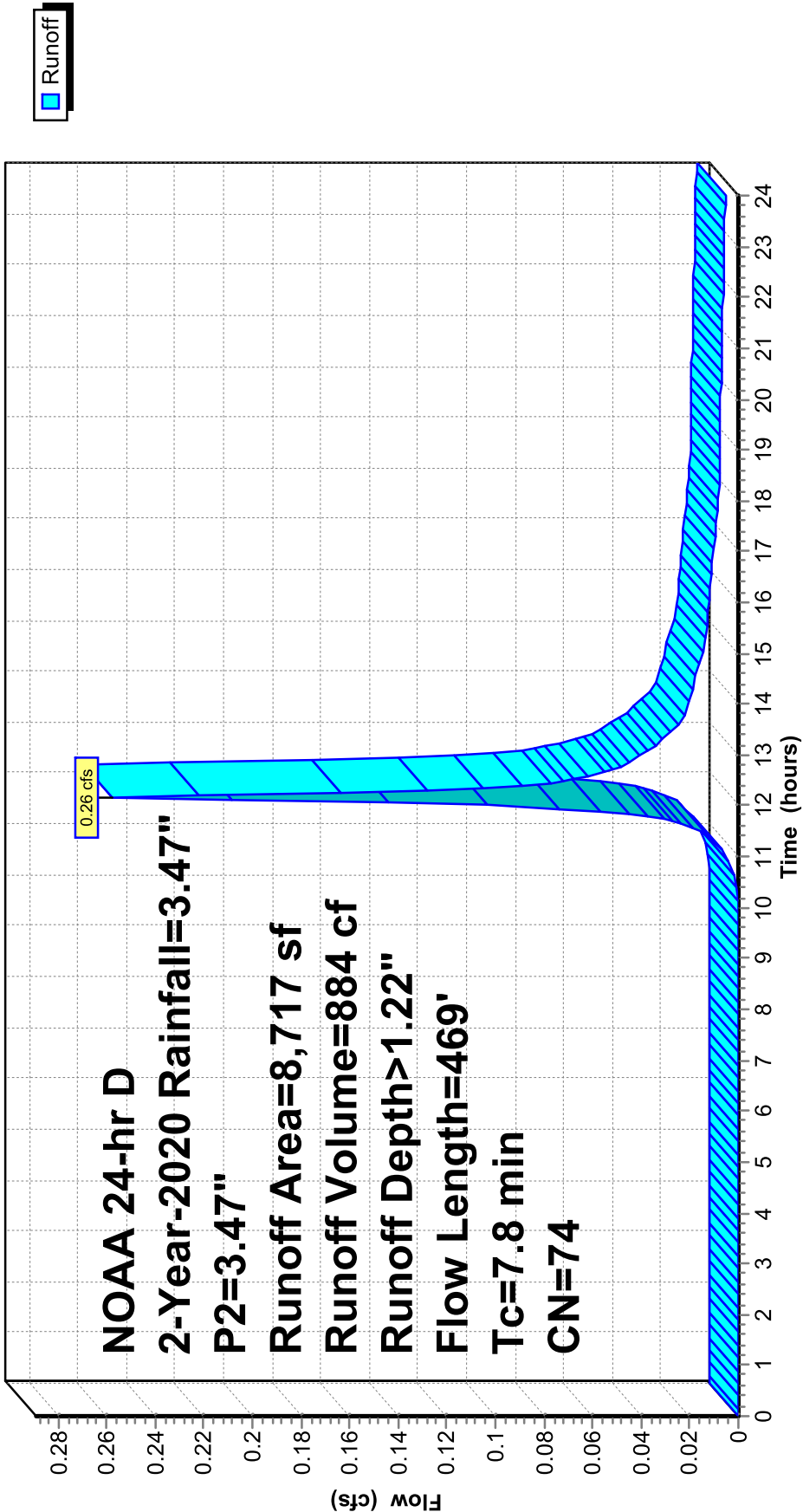
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Subcatchment P1-P: P1 PERVIOUS

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NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

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Summary for Subcatchment P2: P-2 Pervious-w-offsite-Undisturbed

Runoff = 0.87 cfs @ 12.23 hrs, Volume= 3,731 cf, Depth> 1.15"
Routed to Link P-DP 1 : PROP DP 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

	Area (sf)	CN	Description
*	2,744	98	Roof-offsite
*	1,220	98	Impervious
	1,506	71	Meadow, non-grazed, HSG C
*	32,065	70	wooded
*	1,240	74	>75% Grass offsite

	38,775	73	Weighted Average
	34,811		89.78% Pervious Area
	3,964		10.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0900	0.15		Sheet Flow, sheet flow Woods: Light underbrush n= 0.400 P2= 3.47"
1.8	110	0.0400	1.00		Shallow Concentrated Flow, SC Woodland Kv= 5.0 fps
0.5	109	0.0500	3.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	44	0.0500	12.75	15.65	Pipe Channel, Yard drains 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.2	325	0.0440	31.42	888.36	Pipe Channel, Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013
13.9	688	Total			

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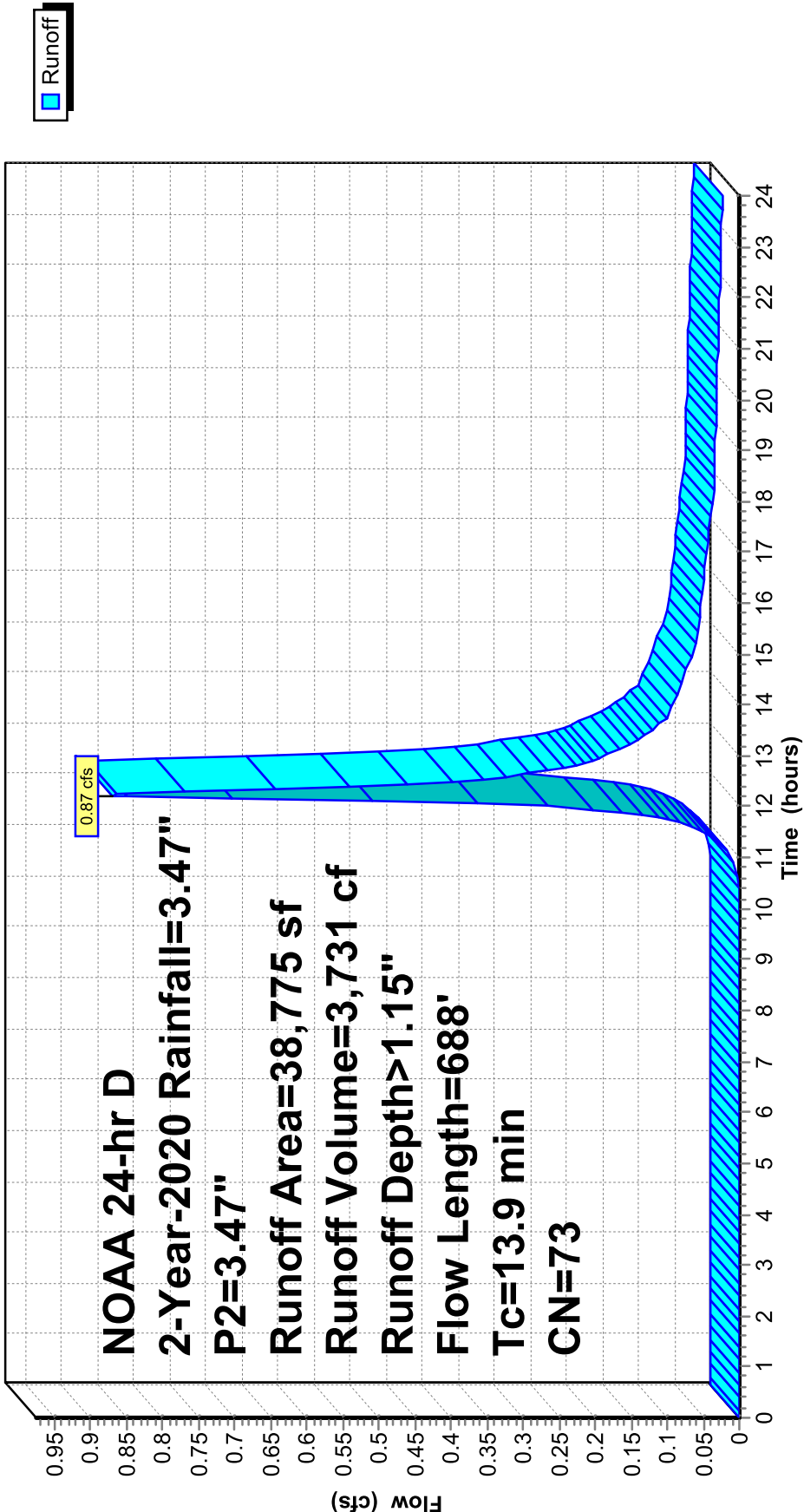
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

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Subcatchment P2: P-2 Pervious-w-offsite-Undisturbed

Hydrograph



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NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

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Summary for Subcatchment P3: P3

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

Runoff = 0.19 cfs @ 12.06 hrs, Volume= 522 cf, Depth> 1.76"
Routed to Link P-DP 2 : PROP DP 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

Area (sf)		CN	Description		
*	2,423	74	>75% Grass cover, Good, HSG C		
	1,142	98	Paved parking and s/w, HSG C		
	3,565	82	Weighted Average		
	2,423		67.97% Pervious Area		
	1,142		32.03% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description

Shallow Concentrated Flow, LAWN
Unpaved Kv= 16.1 fps

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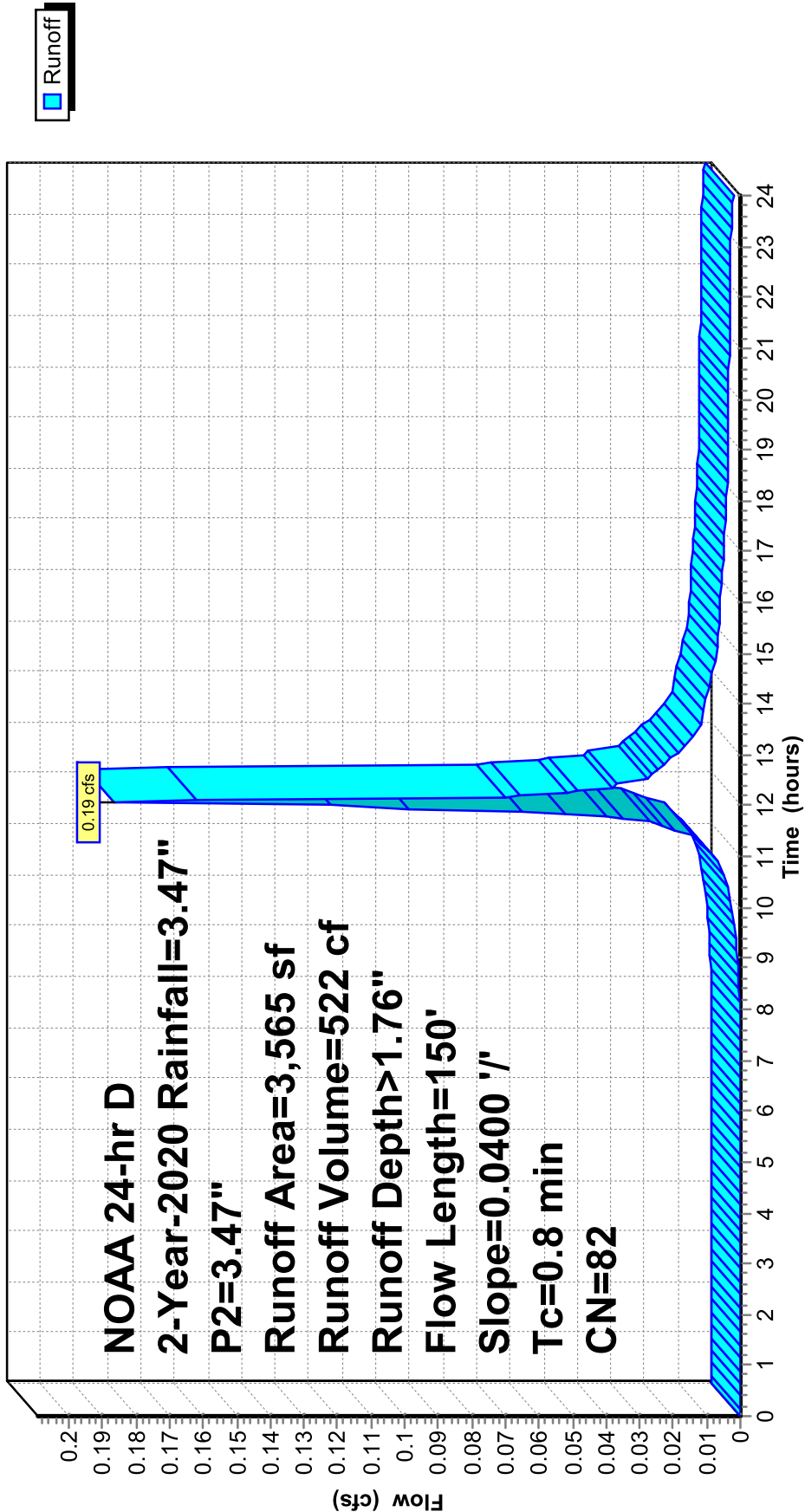
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Subcatchment P3: P3

Hydrograph



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NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

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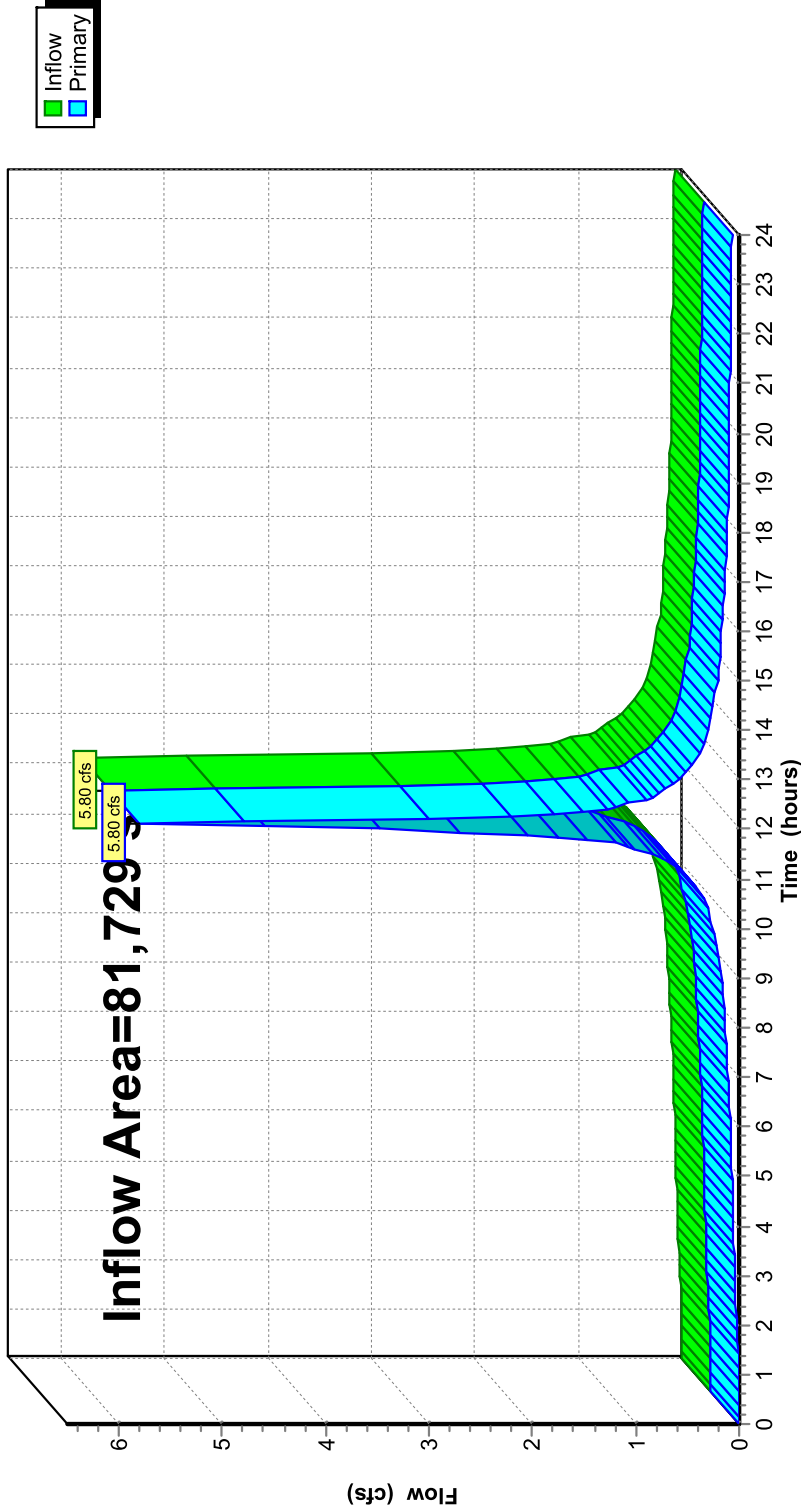
Summary for Link 11L: Proposed Disturbed

Inflow Area = 81,729 sf, 89.33% Impervious, Inflow Depth > 3.02" for 2-Year-2020 event
Inflow = 5.80 cfs @ 12.10 hrs, Volume= 20,566 cf
Primary = 5.80 cfs @ 12.10 hrs, Volume= 20,566 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P-DP 1 : PROP DP 1

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 11L: Proposed Disturbed

Hydrograph



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NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

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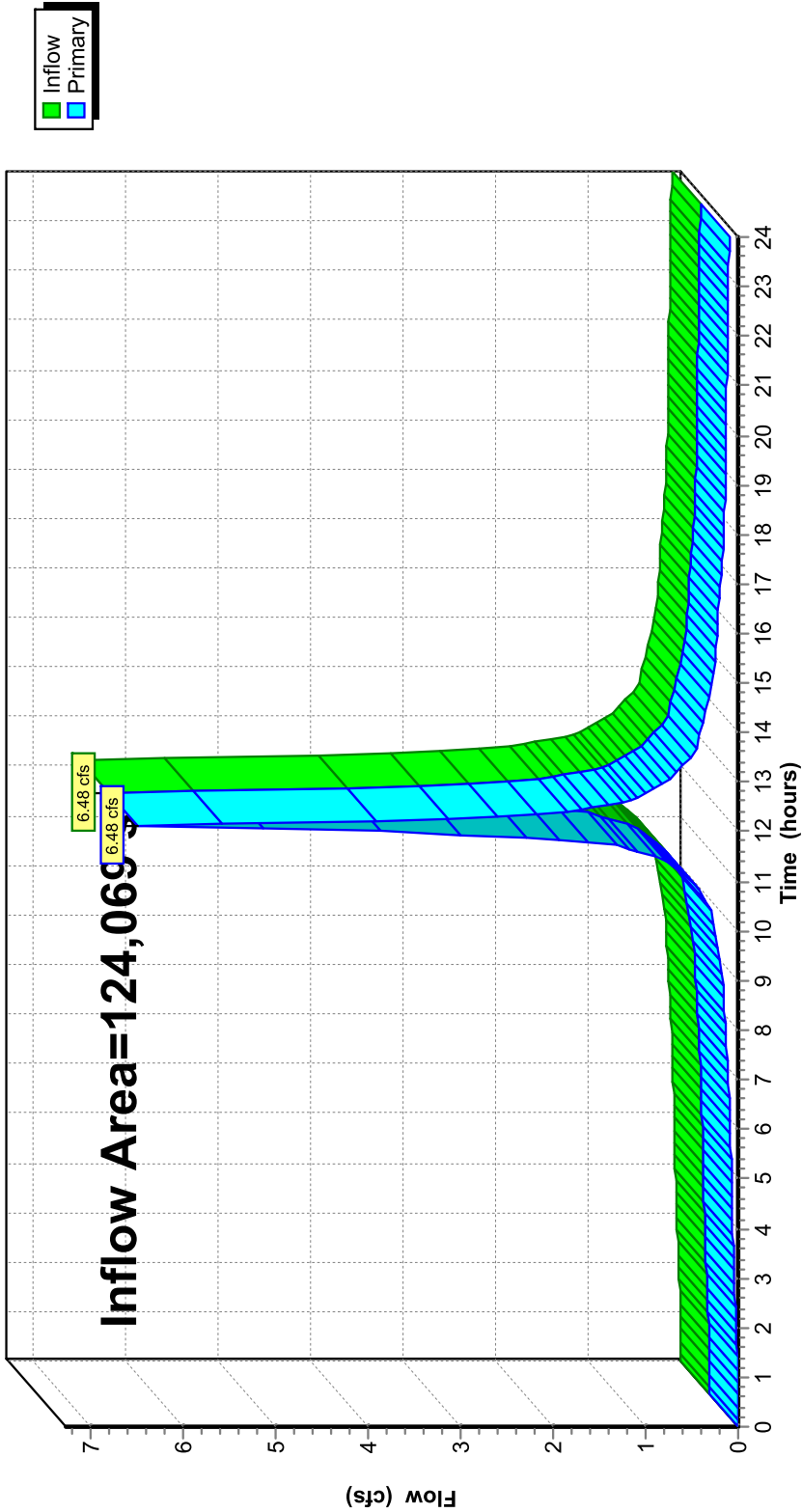
Summary for Link 15L: TOTAL PROPOSED

Inflow Area = 124,069 sf, 62.96% Impervious, Inflow Depth > 2.40" for 2-Year-2020 event
Inflow = 6.48 cfs @ 12.10 hrs, Volume= 24,819 cf
Primary = 6.48 cfs @ 12.10 hrs, Volume= 24,819 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 15L: TOTAL PROPOSED

Hydrograph



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NOAA 24-hr D 2-Year-2020 Rainfall=3.47", P2=3.47"

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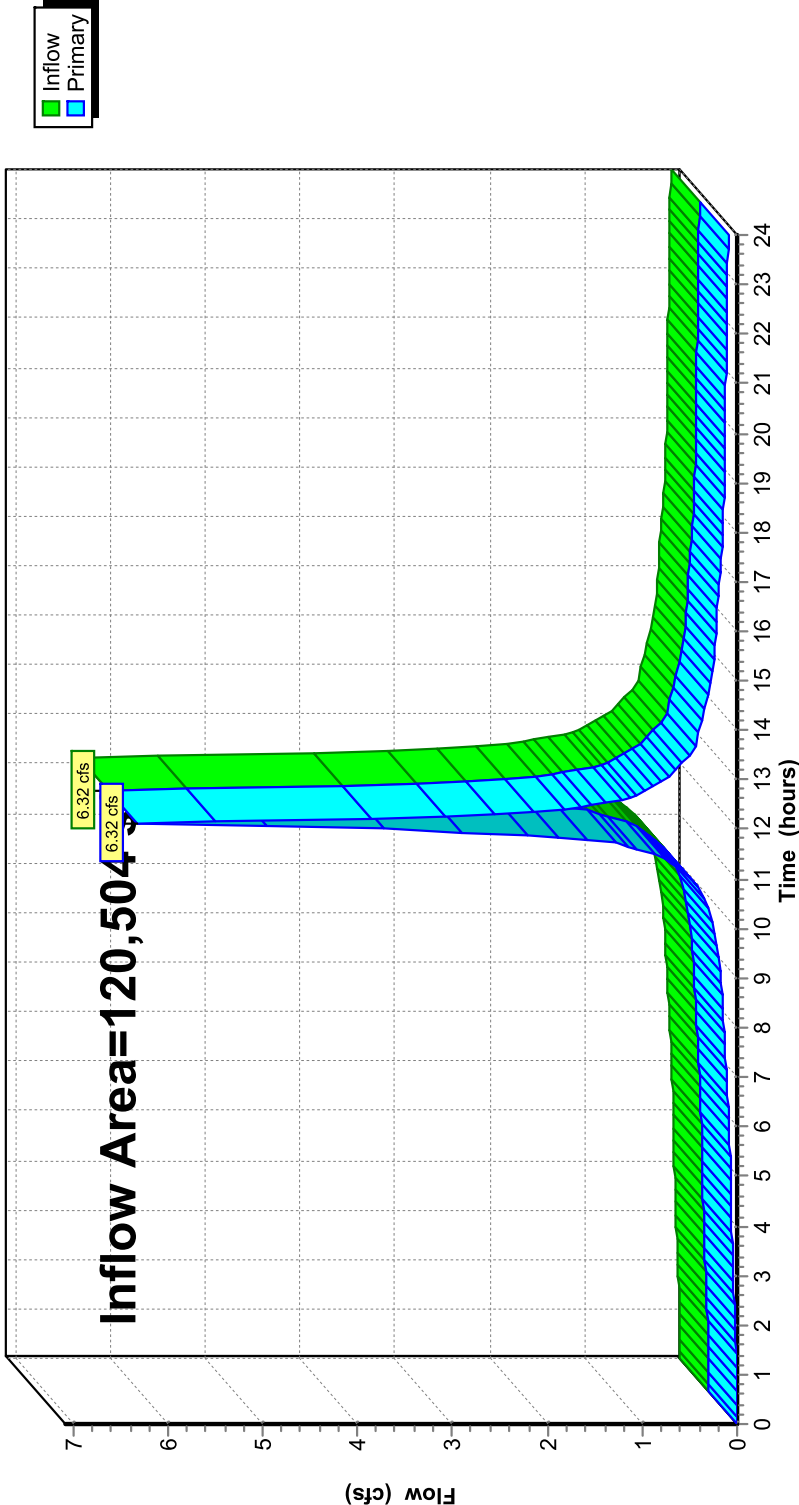
Summary for Link P-DP 1: PROP DP 1

Inflow Area = 120,504 sf, 63.88% Impervious, Inflow Depth > 2.42" for 2-Year-2020 event
Inflow = 6.32 cfs @ 12.11 hrs, Volume= 24,297 cf
Primary = 6.32 cfs @ 12.11 hrs, Volume= 24,297 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 15L : TOTAL PROPOSED

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link P-DP 1: PROP DP 1

Hydrograph



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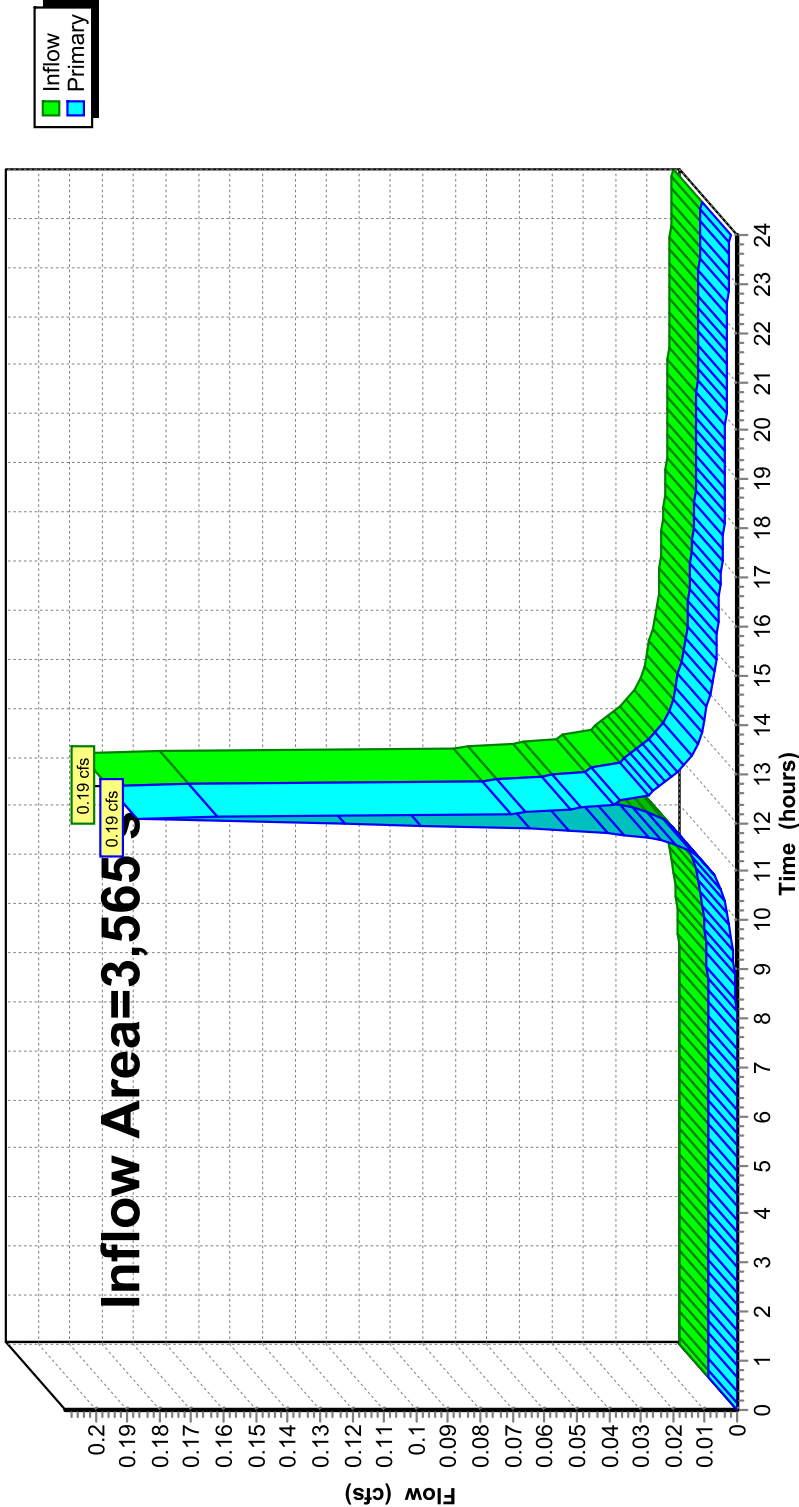
Summary for Link P-DP 2: PROP DP 2

Inflow Area = 3,565 sf, 32.03% Impervious, Inflow Depth > 1.76" for 2-Year-2020 event
Inflow = 0.19 cfs @ 12.06 hrs, Volume= 522 cf
Primary = 0.19 cfs @ 12.06 hrs, Volume= 522 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 15L : TOTAL PROPOSED

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link P-DP 2: PROP DP 2

Hydrograph



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NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

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Summary for Subcatchment 1S: Roof

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

Runoff = 6.24 cfs @ 12.11 hrs, Volume= 22,715 cf, Depth> 5.14"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (sf)	CN	Description
* 53,036	98	Roof and Amenity Area
53,036		100.00% Impervious Area
Tc (min)	Length (feet)	Slope (ft/ft)
	Velocity (ft/sec)	Capacity (cfs)
5.0		Description

Direct Entry, Roof area

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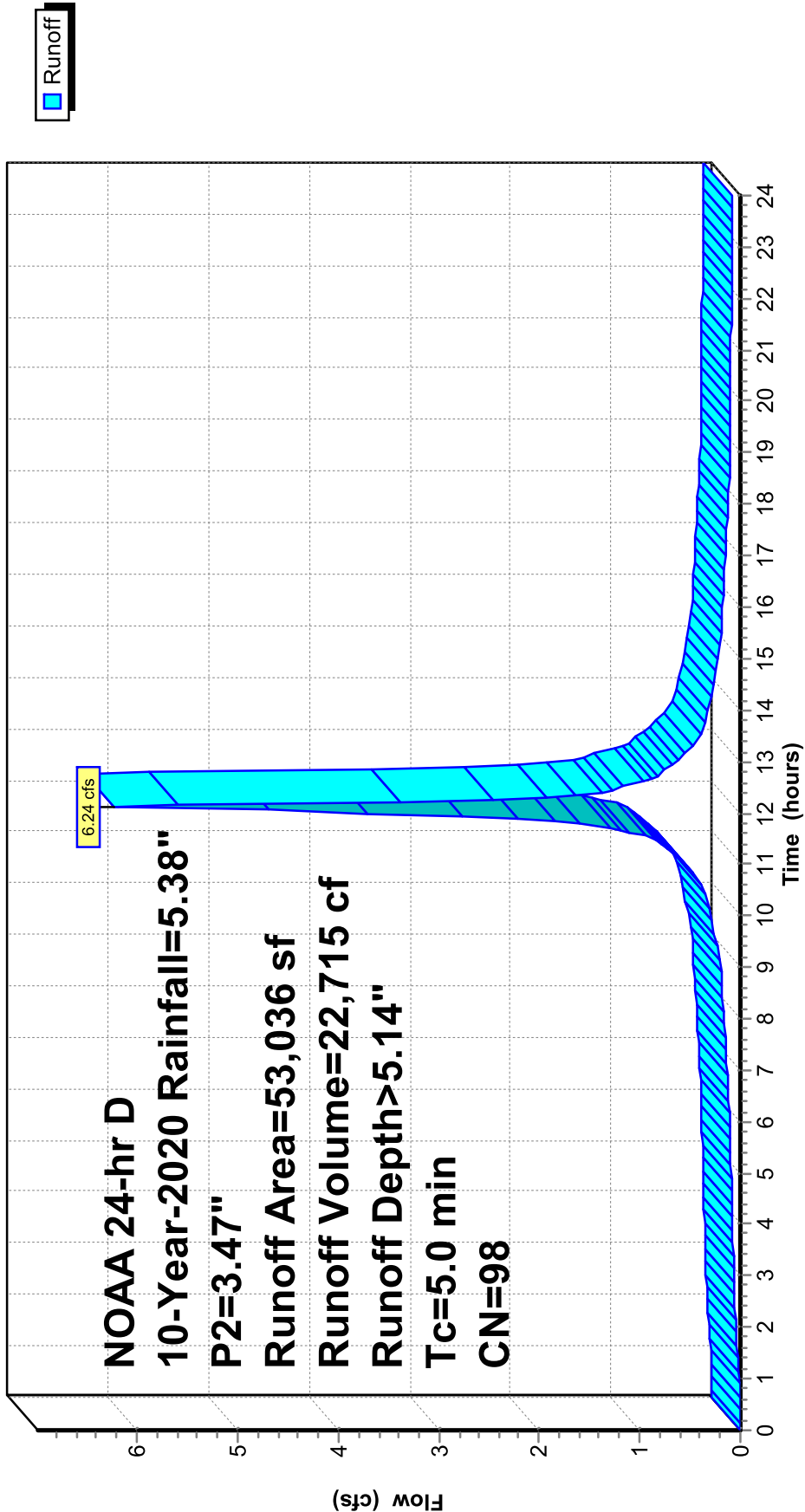
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Subcatchment 1S: Roof

Hydrograph



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NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

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Summary for Subcatchment P1-I: P1 IMPERVIOUS PARKING

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

Runoff = 2.58 cfs @ 12.09 hrs, Volume= 8,559 cf, Depth> 5.14"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (sf)		CN	Description	
*	19,976	98	Uncovered Paved parking, HSG C	
19,976		100.00% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs) Description
1.5	100	0.0150	1.12	Sheet Flow, sheet flow Parking area n= 0.013 P2= 3.47"
0.9	127	0.0150	2.49	Shallow Concentrated Flow, parking area Paved Kv= 20.3 fps
0.3	198	0.0449	12.08	Pipe Channel, Pipe flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
2.7	425	Total		

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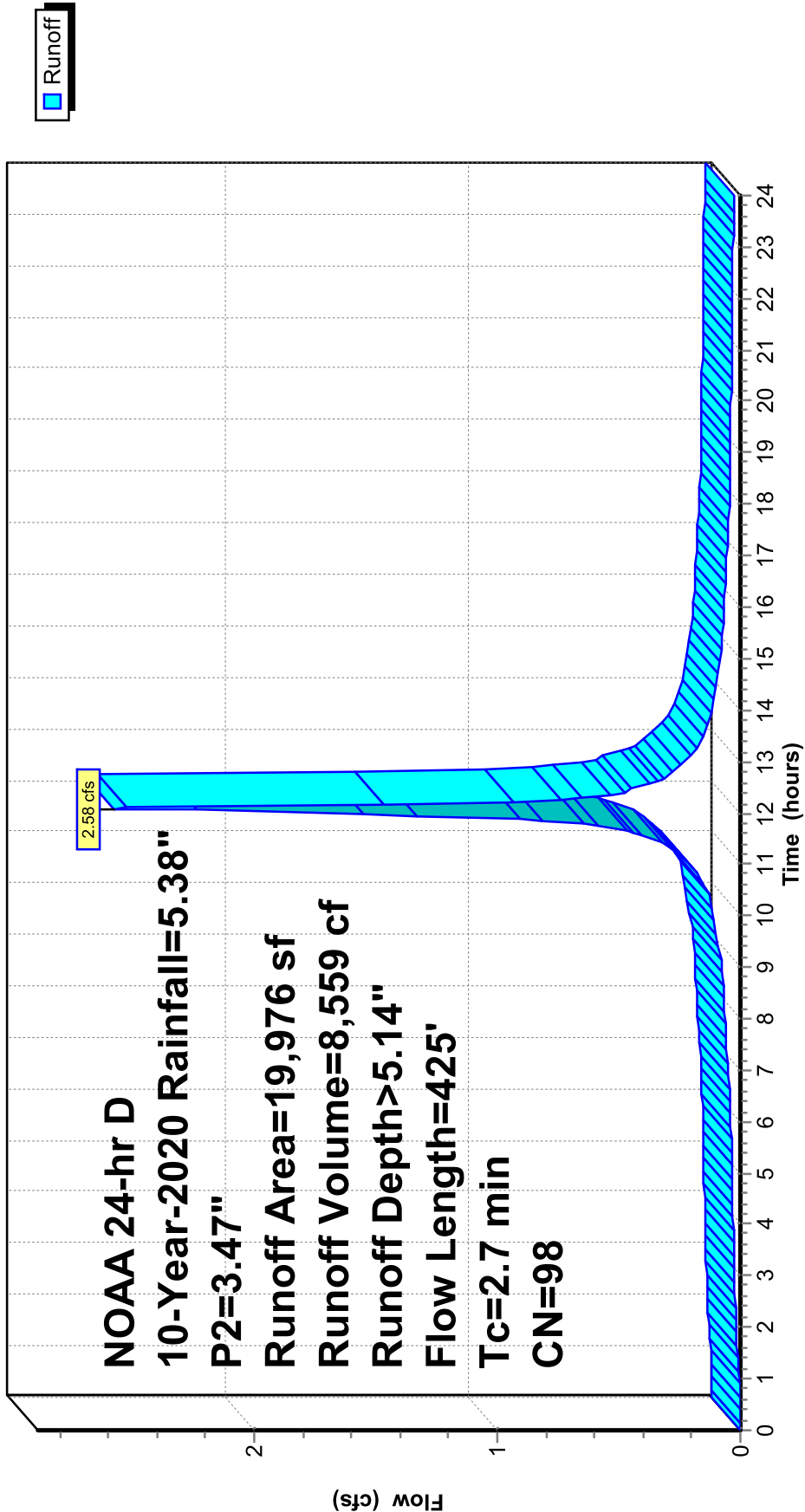
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Subcatchment P1-I: P1 IMPERVIOUS PARKING

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Summary for Subcatchment P1-P: P1 PERVIOUS

Runoff = 0.58 cfs @ 12.15 hrs, Volume= 1,937 cf, Depth> 2.67"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (sf)		CN	Description	
8,717		74	>75% Grass cover, Good, HSG C	
8,717			100.00% Pervious Area	
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs) Description
7.5	100	0.0900	0.22	Sheet Flow, Grass: Dense n= 0.240 P2= 3.47"
0.1	44	0.0470	12.36	Pipe Channel, Yard Inlet 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.2	325	0.0450	31.77	Pipe Channel, 72" Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013
7.8	469	Total		

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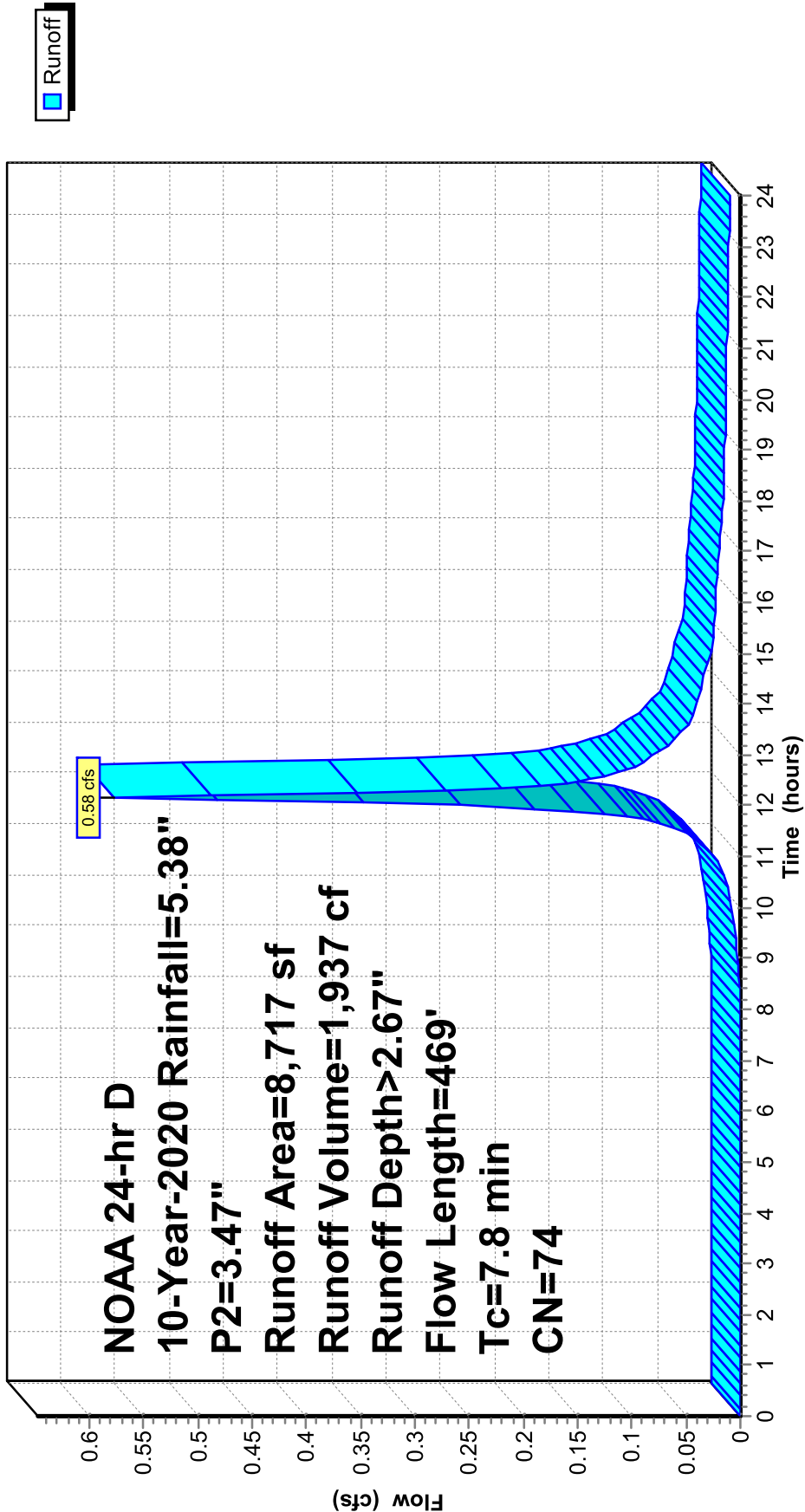
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Subcatchment P1-P: P1 PERVIOUS

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NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

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Summary for Subcatchment P2: P-2 Pervious-w-offsite-Undisturbed

Runoff = 2.02 cfs @ 12.22 hrs, Volume= 8,314 cf, Depth> 2.57"
Routed to Link P-DP 1 : PROP DP 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

	Area (sf)	CN	Description
*	2,744	98	Roof-offsite
*	1,220	98	Impervious
	1,506	71	Meadow, non-grazed, HSG C
*	32,065	70	wooded
*	1,240	74	>75% Grass offsite

	38,775	73	Weighted Average
	34,811		89.78% Pervious Area
	3,964		10.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0900	0.15		Sheet Flow, sheet flow Woods: Light underbrush n= 0.400 P2= 3.47"
1.8	110	0.0400	1.00		Shallow Concentrated Flow, SC Woodland Kv= 5.0 fps
0.5	109	0.0500	3.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	44	0.0500	12.75	15.65	Pipe Channel, Yard drains 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.2	325	0.0440	31.42	888.36	Pipe Channel, Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013
13.9	688	Total			

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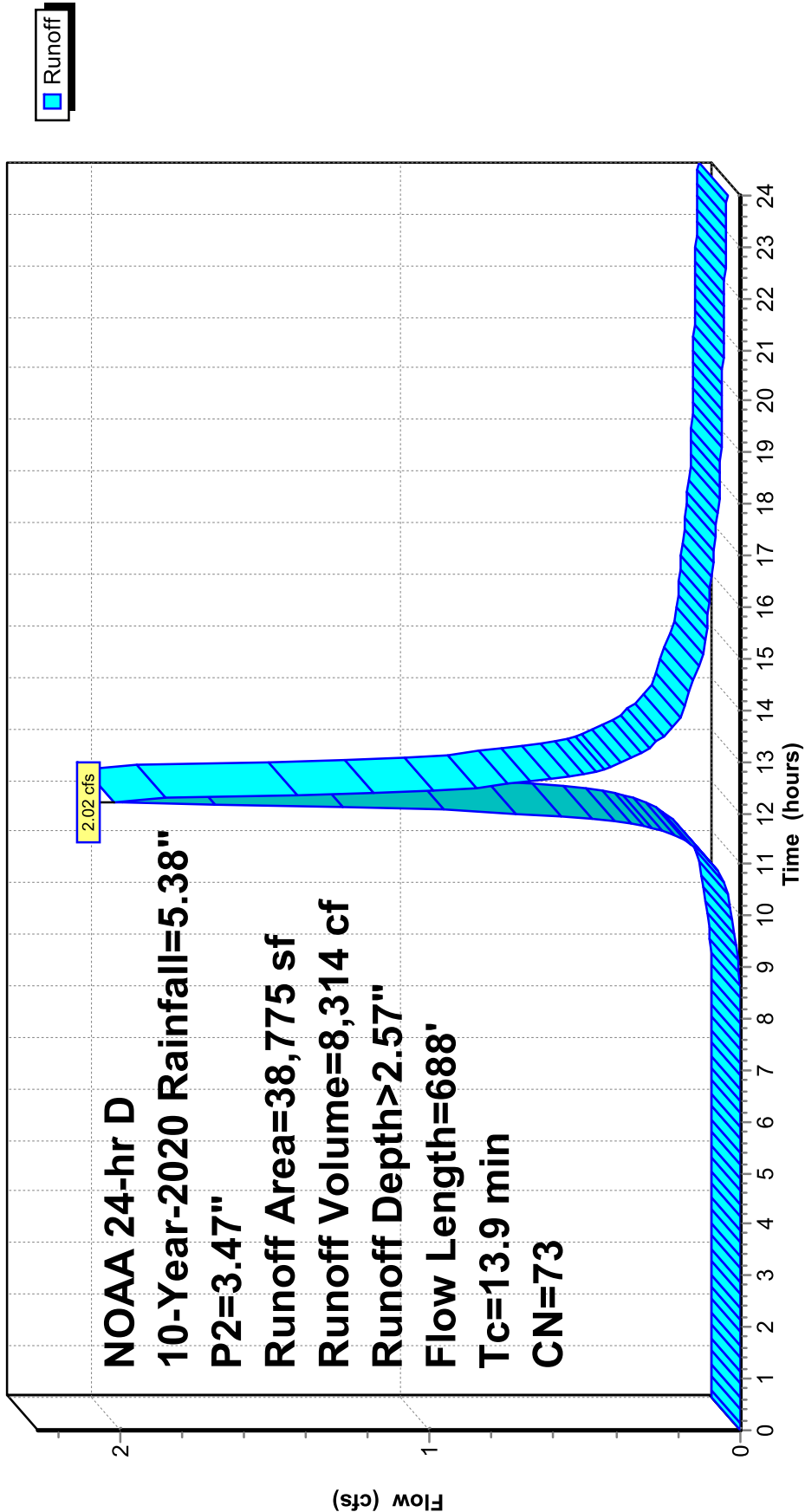
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

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Subcatchment P2: P-2 Pervious-w-offsite-Undisturbed

Hydrograph



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Summary for Subcatchment P3: P3

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

Runoff = 0.36 cfs @ 12.06 hrs, Volume= 1,016 cf, Depth> 3.42"
Routed to Link P-DP 2 : PROP DP 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year-2020 Rainfall=5.38", P2=3.47"

Area (sf)		CN	Description		
*	2,423	74	>75% Grass cover, Good, HSG C		
	1,142	98	Paved parking and s/w, HSG C		
	3,565	82	Weighted Average		
	2,423		67.97% Pervious Area		
	1,142		32.03% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description

Shallow Concentrated Flow, LAWN
Unpaved Kv= 16.1 fps

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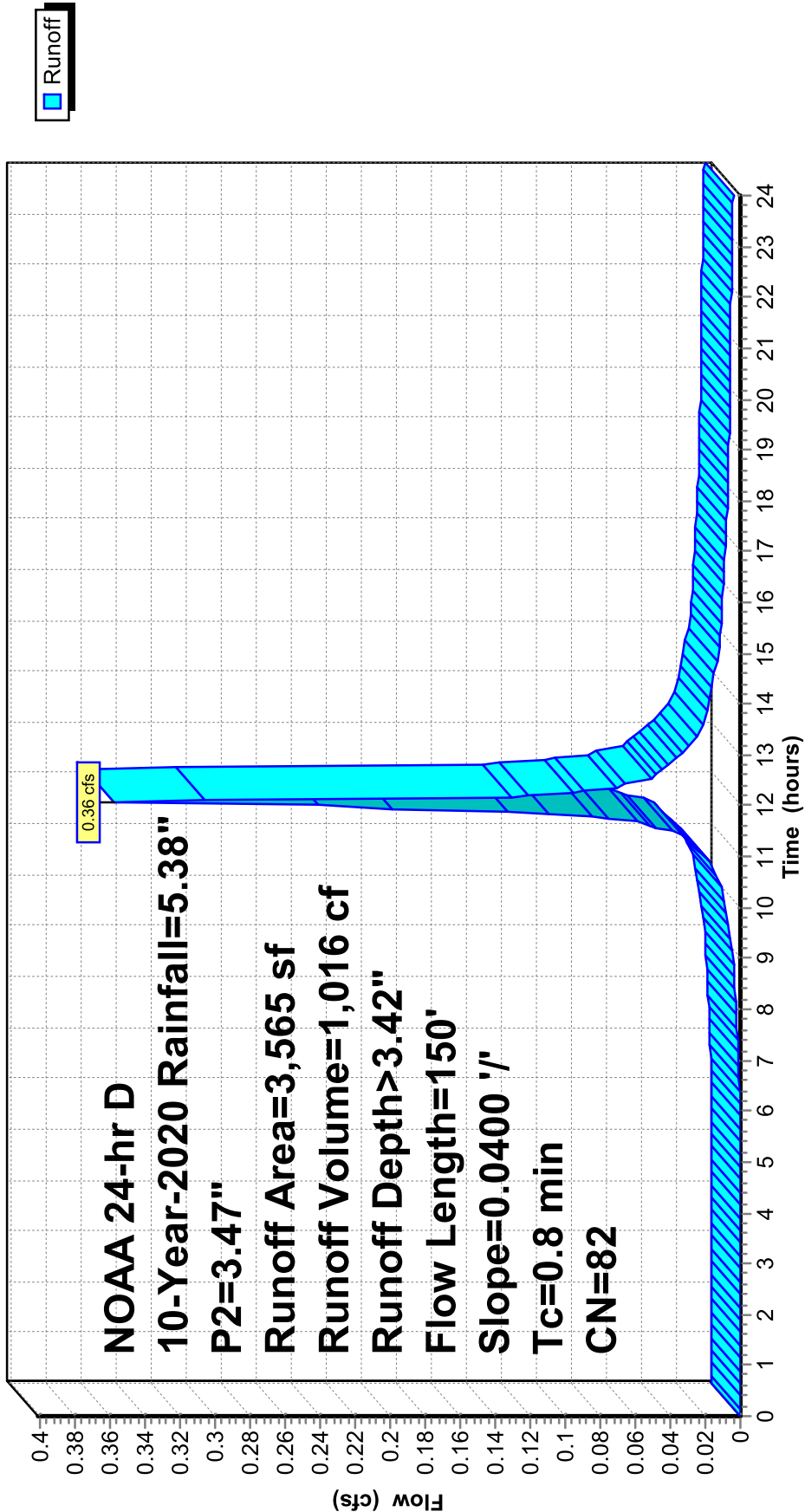
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Subcatchment P3: P3

Hydrograph



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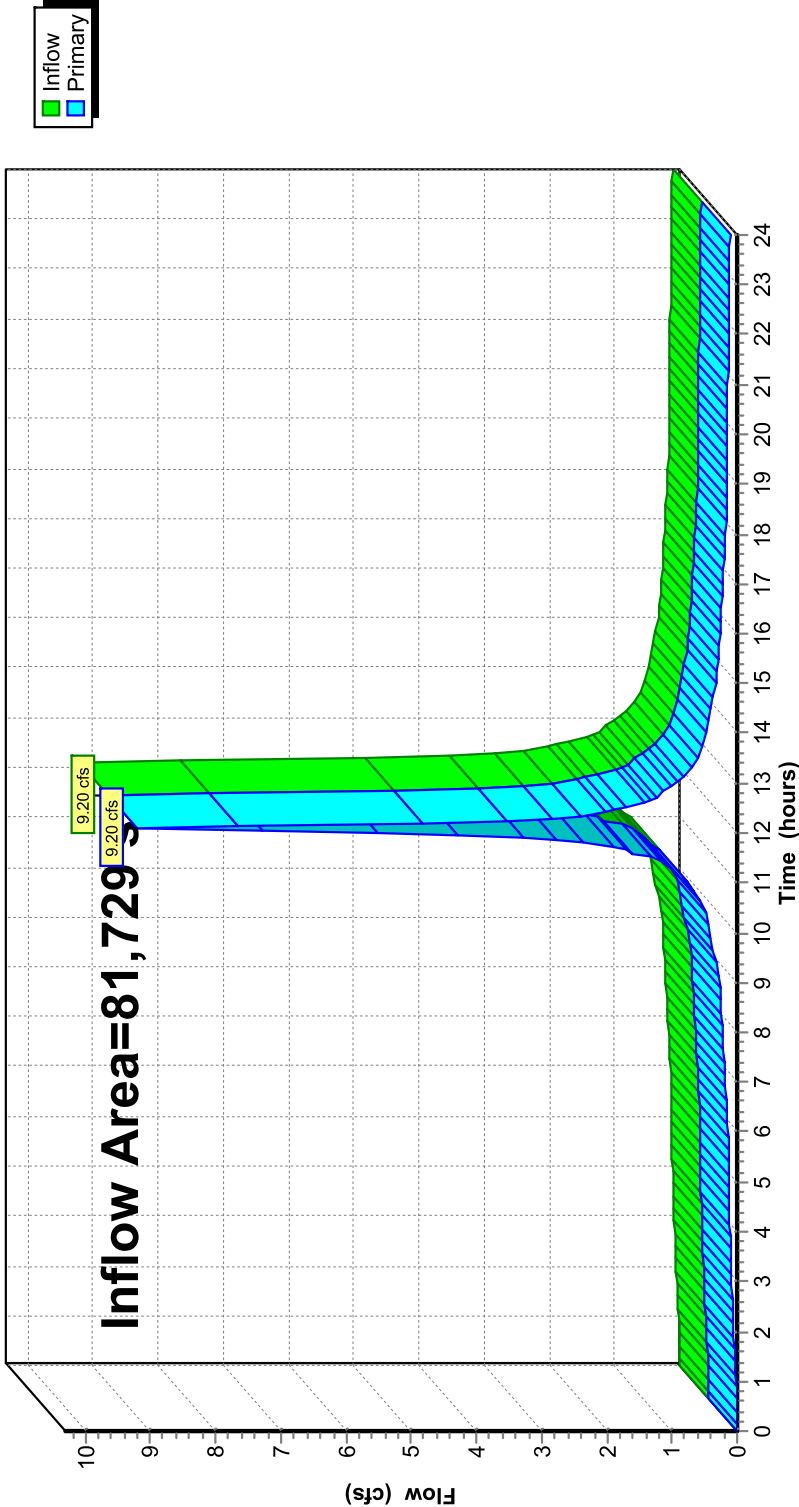
Summary for Link 11L: Proposed Disturbed

Inflow Area = 81,729 sf, 89.33% Impervious, Inflow Depth > 4.88" for 10-Year-2020 event
Inflow = 9.20 cfs @ 12.10 hrs, Volume= 33,211 cf
Primary = 9.20 cfs @ 12.10 hrs, Volume= 33,211 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P-DP 1 : PROP DP 1

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 11L: Proposed Disturbed

Hydrograph



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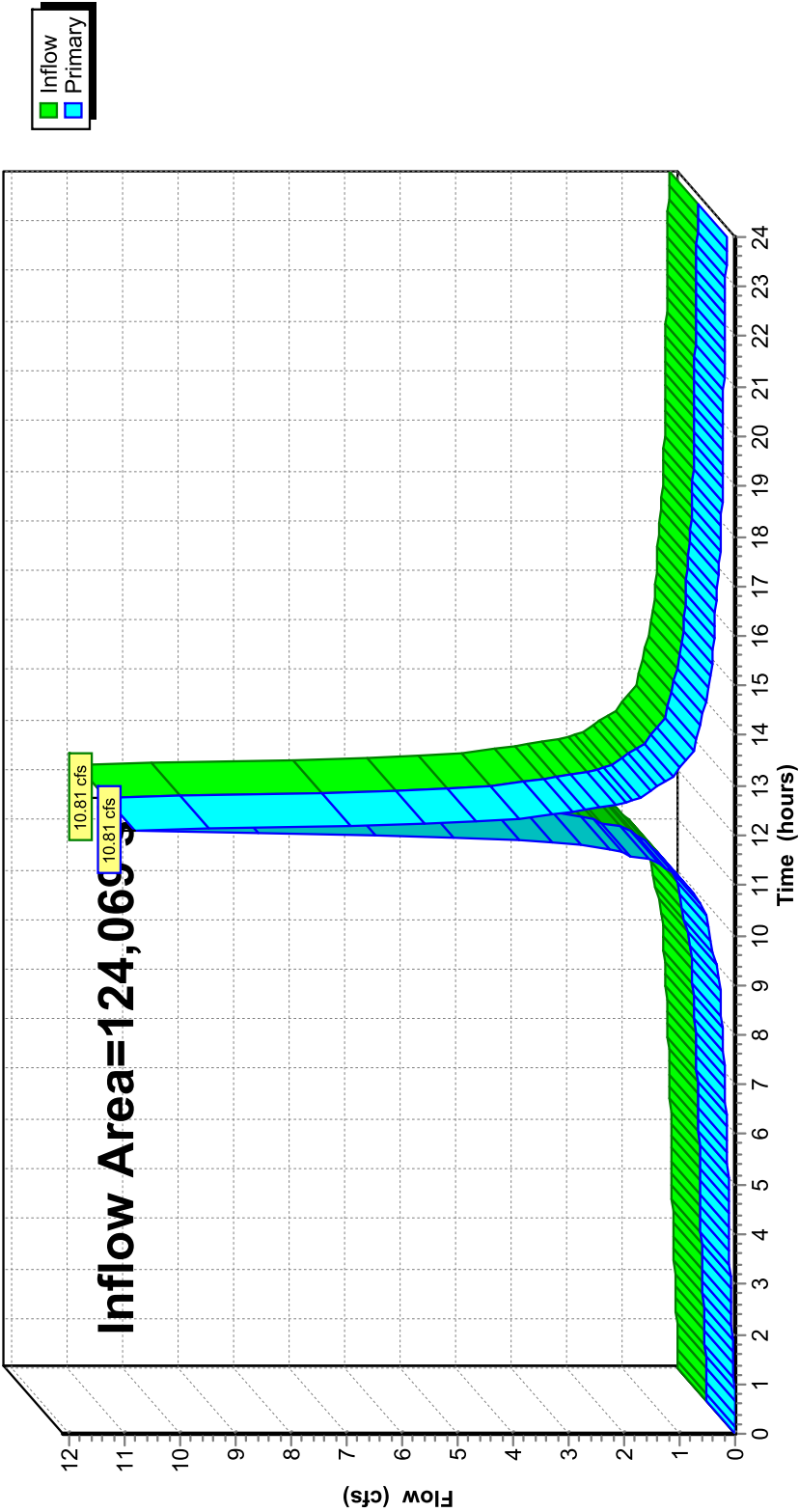
Summary for Link 15L: TOTAL PROPOSED

Inflow Area = 124,069 sf, 62.96% Impervious, Inflow Depth > 4.11" for 10-Year-2020 event
Inflow = 10.81 cfs @ 12.11 hrs, Volume= 42,541 cf
Primary = 10.81 cfs @ 12.11 hrs, Volume= 42,541 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 15L: TOTAL PROPOSED

Hydrograph



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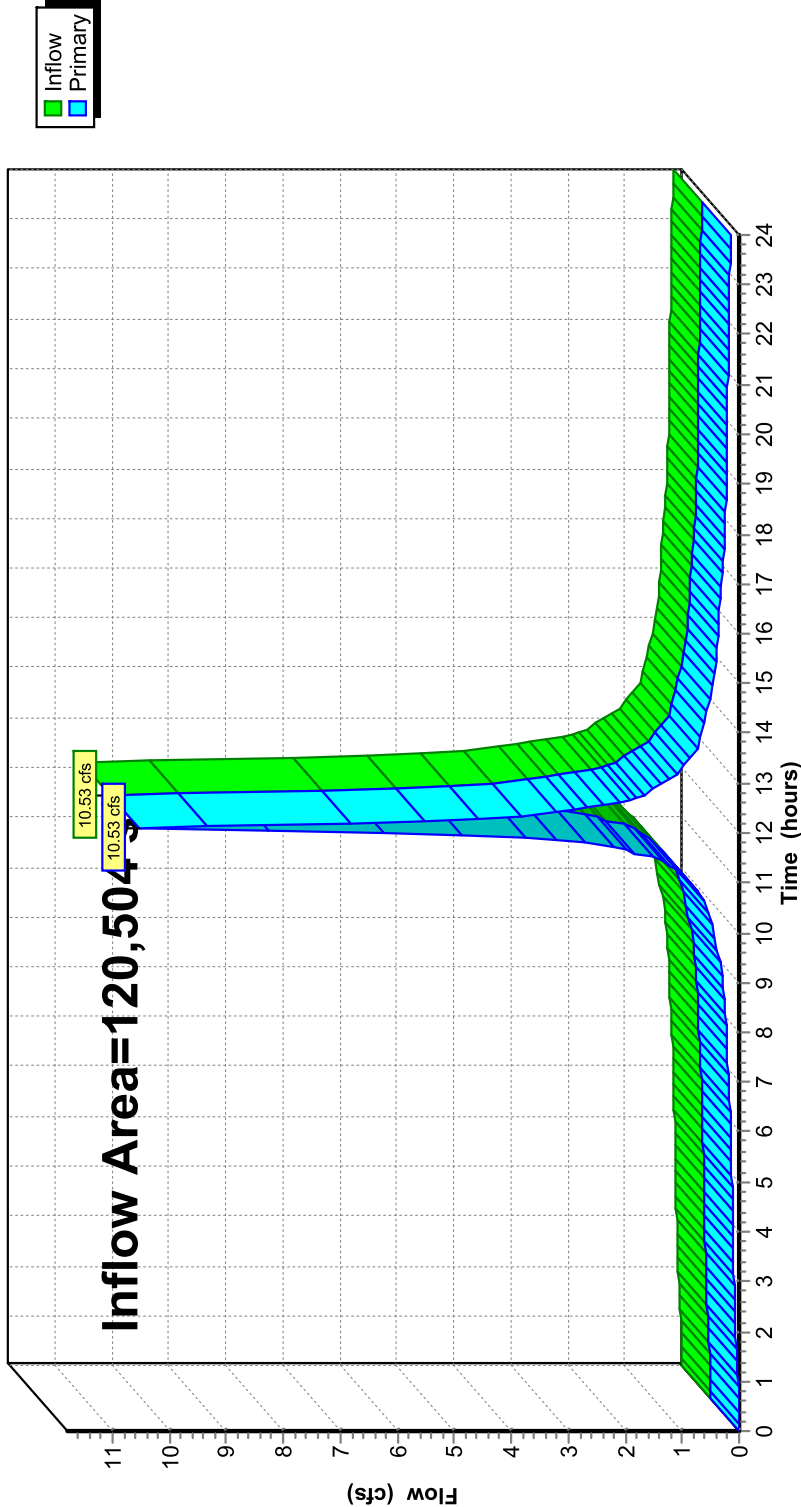
Summary for Link P-DP 1: PROP DP 1

Inflow Area = 120,504 sf, 63.88% Impervious, Inflow Depth > 4.14" for 10-Year-2020 event
Inflow = 10.53 cfs @ 12.11 hrs, Volume= 41,525 cf
Primary = 10.53 cfs @ 12.11 hrs, Volume= 41,525 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 15L : TOTAL PROPOSED

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link P-DP 1: PROP DP 1

Hydrograph



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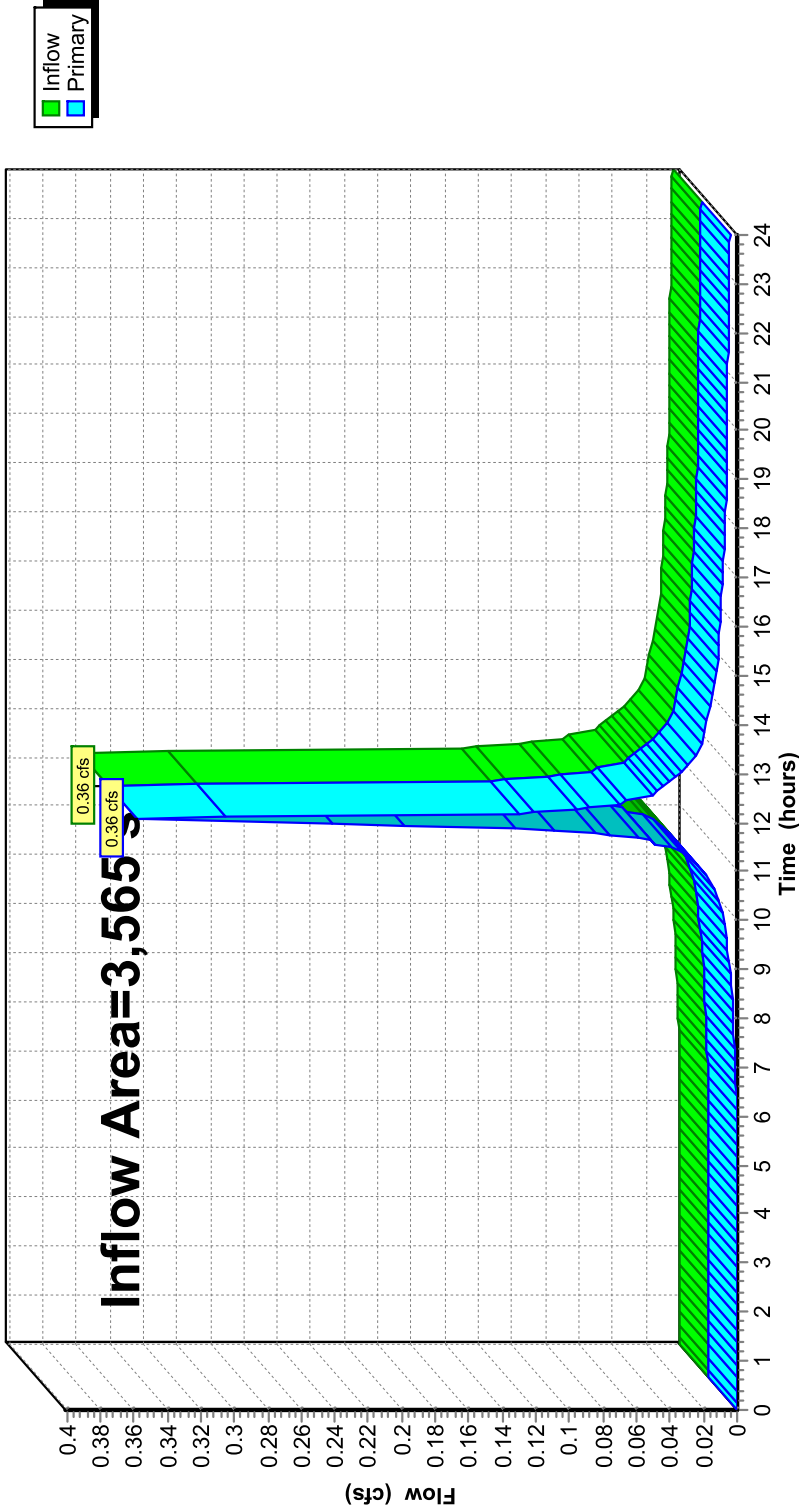
Summary for Link P-DP 2: PROP DP 2

Inflow Area = 3,565 sf, 32.03% Impervious, Inflow Depth > 3.42" for 10-Year-2020 event
Inflow = 0.36 cfs @ 12.06 hrs, Volume= 1,016 cf
Primary = 0.36 cfs @ 12.06 hrs, Volume= 1,016 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 15L : TOTAL PROPOSED

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link P-DP 2: PROP DP 2

Hydrograph



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Summary for Subcatchment 1S: Roof

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

Runoff = 10.68 cfs @ 12.11 hrs, Volume= 39,486 cf, Depth> 8.93"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (sf)	CN	Description
* 53,036	98	Roof and Amenity Area
53,036		100.00% Impervious Area
Tc (min)	Length (feet)	Slope (ft/ft)
	Velocity (ft/sec)	Capacity (cfs)
		Description
5.0		

Direct Entry, Roof area

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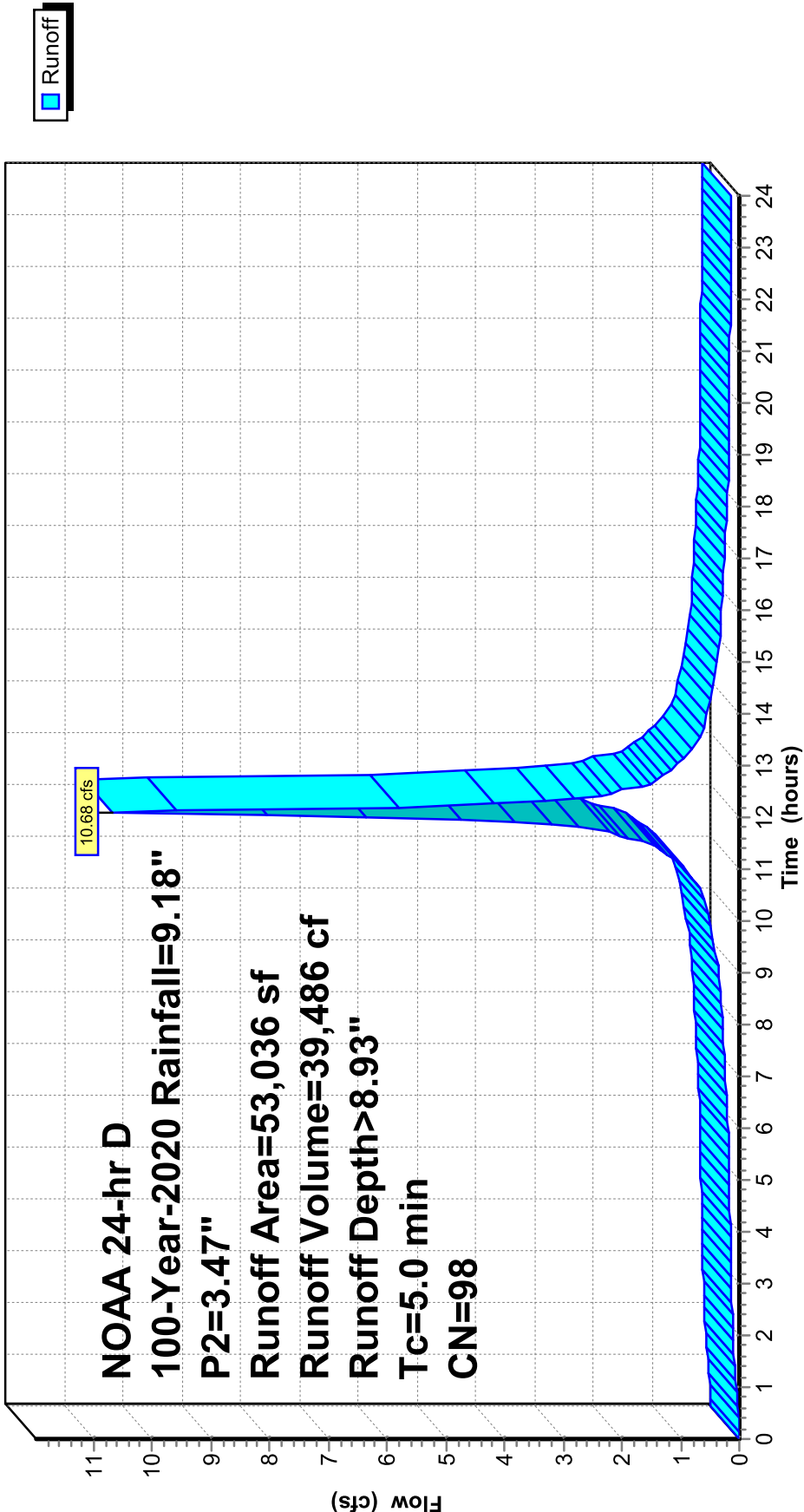
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Subcatchment 1S: Roof

Hydrograph



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Summary for Subcatchment P1-I: P1 IMPERVIOUS PARKING

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

Runoff = 4.41 cfs @ 12.09 hrs, Volume= 14,878 cf, Depth> 8.94"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (sf)		CN	Description	
*	19,976	98	Uncovered Paved parking, HSG C	
19,976		100.00% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs) Description
1.5	100	0.0150	1.12	Sheet Flow, sheet flow Parking area n= 0.013 P2= 3.47"
0.9	127	0.0150	2.49	Shallow Concentrated Flow, parking area Paved Kv= 20.3 fps
0.3	198	0.0449	12.08	Pipe Channel, Pipe flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012

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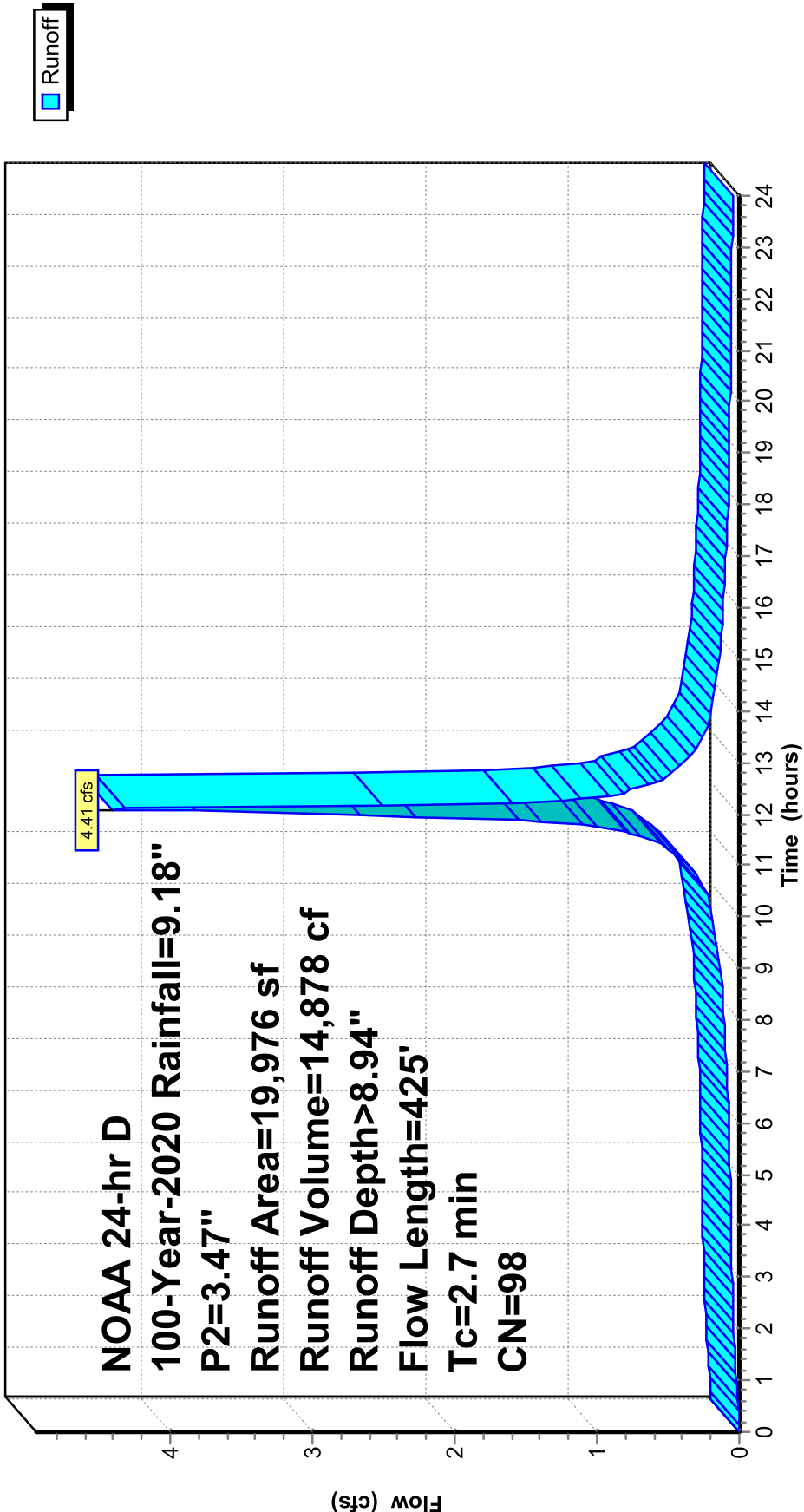
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Subcatchment P1-I: P1 IMPERVIOUS PARKING

Hydrograph



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Summary for Subcatchment P1-P: P1 PERVIOUS

Runoff = 1.28 cfs @ 12.15 hrs, Volume= 4,347 cf, Depth> 5.98"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (sf)		CN	Description	
8,717		74	>75% Grass cover, Good, HSG C	
8,717			100.00% Pervious Area	
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs) Description
7.5	100	0.0900	0.22	Sheet Flow, Grass: Dense n= 0.240 P2= 3.47"
0.1	44	0.0470	12.36	Pipe Channel, Yard Inlet 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.2	325	0.0450	31.77	Pipe Channel, 72" Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013
7.8	469	Total		

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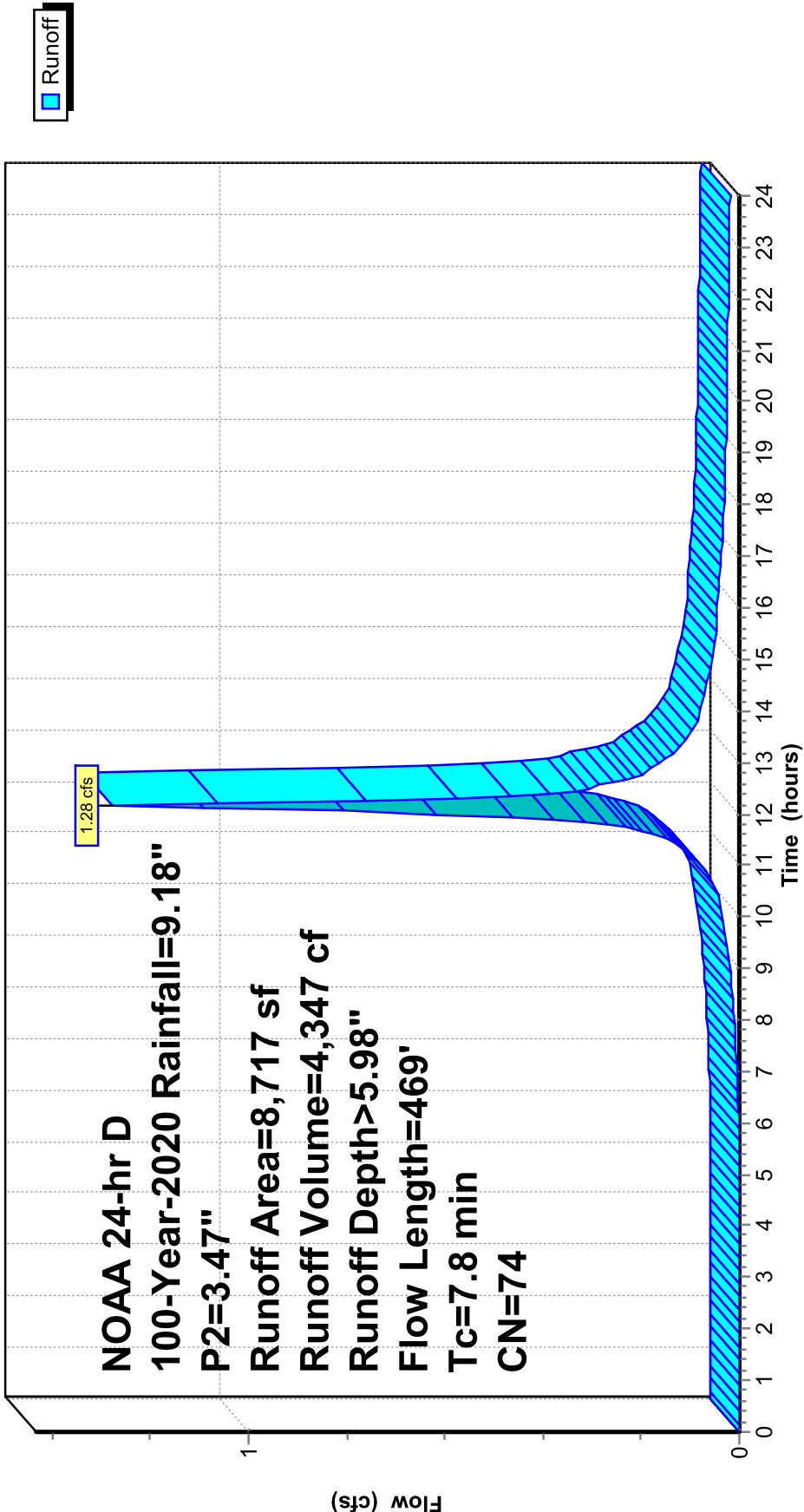
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Subcatchment P1-P: P1 PERVIOUS

Hydrograph



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Summary for Subcatchment P2: P-2 Pervious-w-offsite-Undisturbed

Runoff = 4.57 cfs @ 12.22 hrs, Volume= 18,906 cf, Depth> 5.85"
Routed to Link P-DP 1 : PROP DP 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

	Area (sf)	CN	Description
*	2,744	98	Roof-offsite
*	1,220	98	Impervious
	1,506	71	Meadow, non-grazed, HSG C
*	32,065	70	wooded
*	1,240	74	>75% Grass offsite

	38,775	73	Weighted Average
	34,811		89.78% Pervious Area
	3,964		10.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0900	0.15		Sheet Flow, sheet flow Woods: Light underbrush n= 0.400 P2= 3.47"
1.8	110	0.0400	1.00		Shallow Concentrated Flow, SC Woodland Kv= 5.0 fps
0.5	109	0.0500	3.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	44	0.0500	12.75	15.65	Pipe Channel, Yard drains 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.2	325	0.0440	31.42	888.36	Pipe Channel, Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013
13.9	688	Total			

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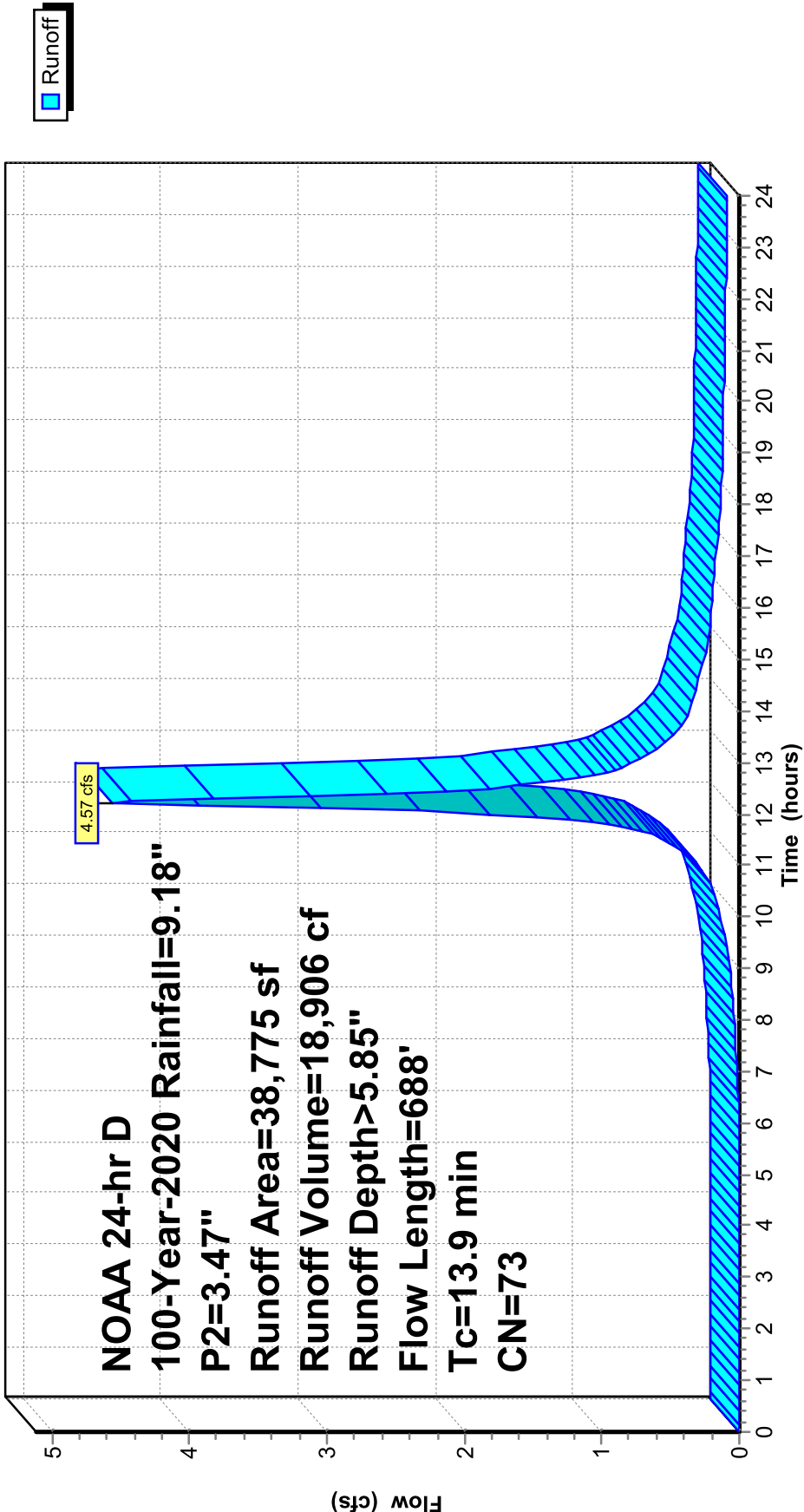
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Subcatchment P2: P-2 Pervious-w-offsite-Undisturbed

Hydrograph



Summary for Subcatchment P3: P3

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

Runoff = 0.70 cfs @ 12.06 hrs, Volume= 2,076 cf, Depth> 6.99"
Routed to Link P-DP 2 : PROP DP 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-2020 Rainfall=9.18", P2=3.47"

Area (sf)		CN	Description		
*	2,423	74	>75% Grass cover, Good, HSG C		
	1,142	98	Paved parking and s/w, HSG C		
	3,565	82	Weighted Average		
	2,423		67.97% Pervious Area		
	1,142		32.03% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description

Shallow Concentrated Flow, LAWN
Unpaved Kv= 16.1 fps

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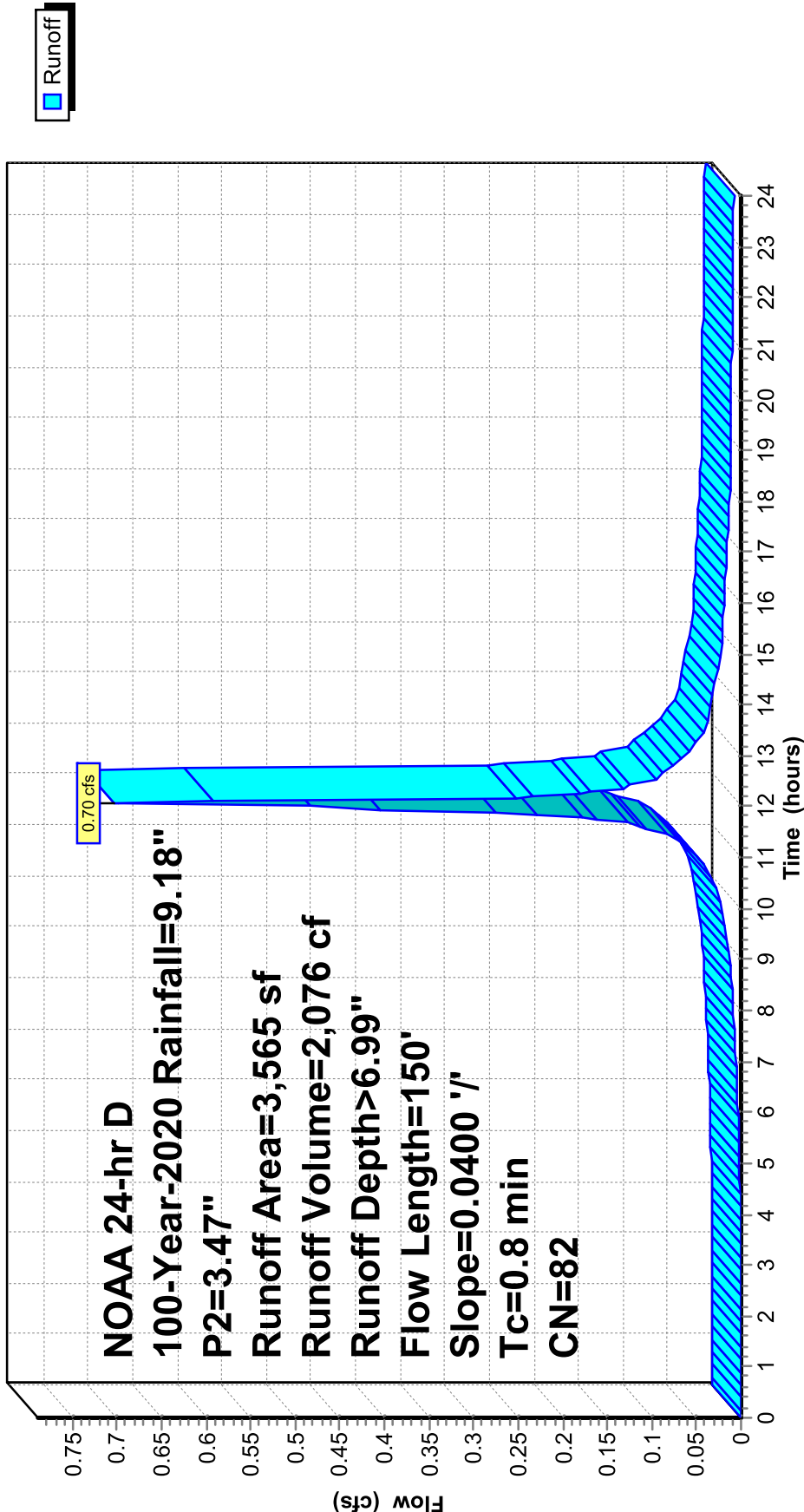
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Subcatchment P3: P3

Hydrograph



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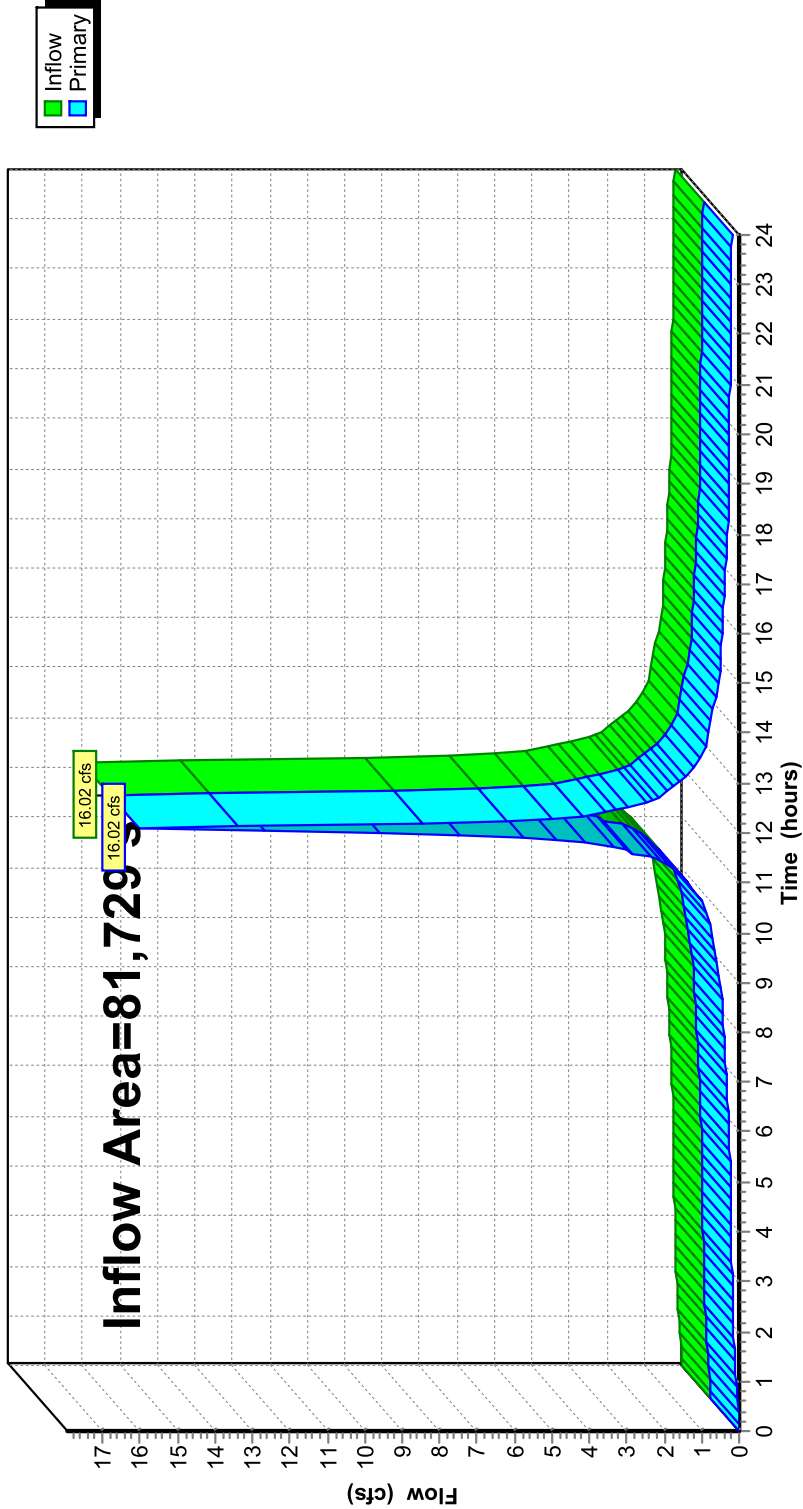
Summary for Link 11L: Proposed Disturbed

Inflow Area = 81,729 sf, 89.33% Impervious, Inflow Depth > 8.62" for 100-Year-2020 event
Inflow = 16.02 cfs @ 12.10 hrs, Volume= 58,712 cf
Primary = 16.02 cfs @ 12.10 hrs, Volume= 58,712 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P-DP 1 : PROP DP 1

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 11L: Proposed Disturbed

Hydrograph



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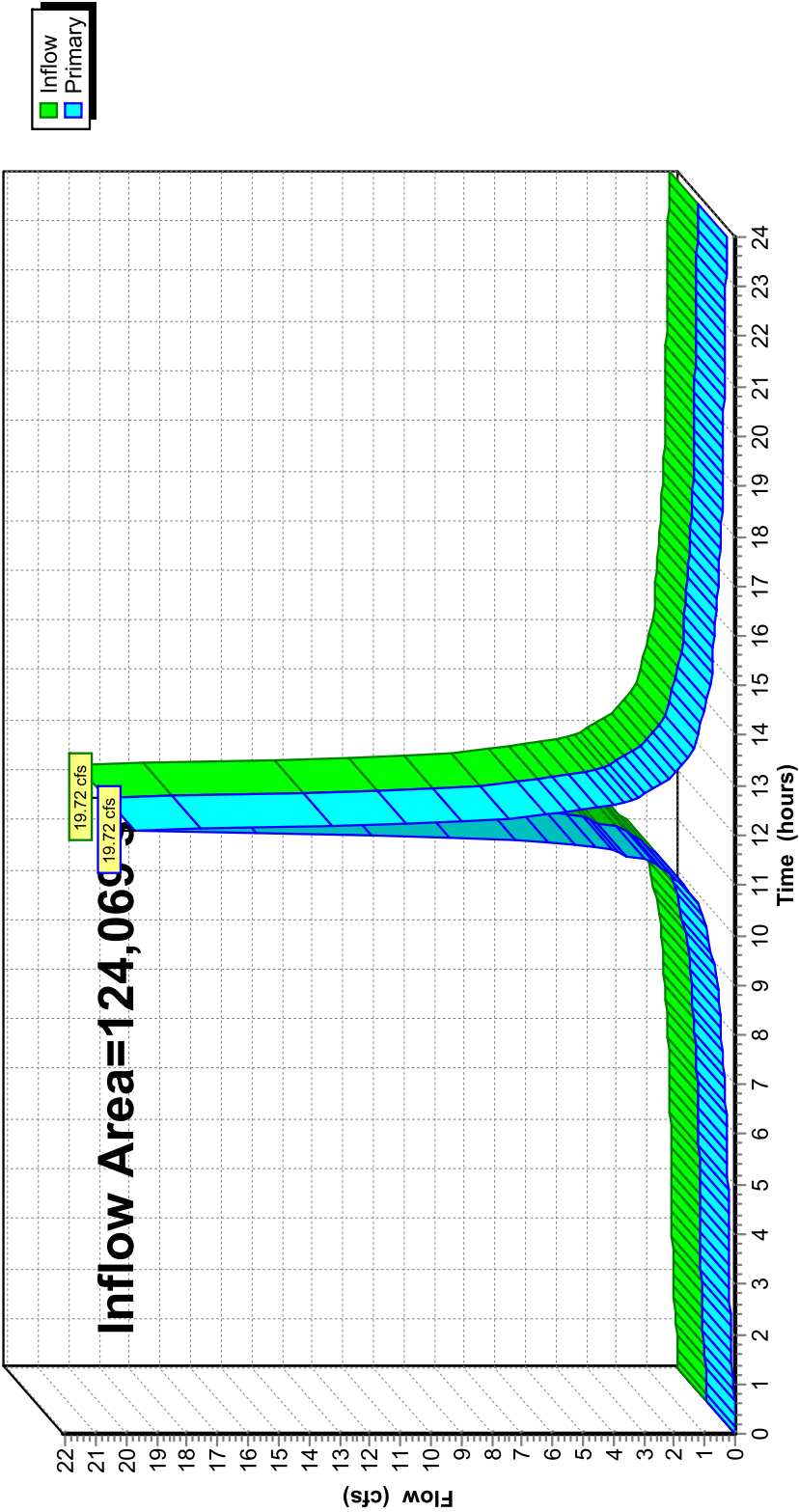
Summary for Link 15L: TOTAL PROPOSED

Inflow Area = 124,069 sf, 62.96% Impervious, Inflow Depth > 7.71" for 100-Year-2020 event
Inflow = 19.72 cfs @ 12.11 hrs, Volume= 79,694 cf
Primary = 19.72 cfs @ 12.11 hrs, Volume= 79,694 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 15L: TOTAL PROPOSED

Hydrograph



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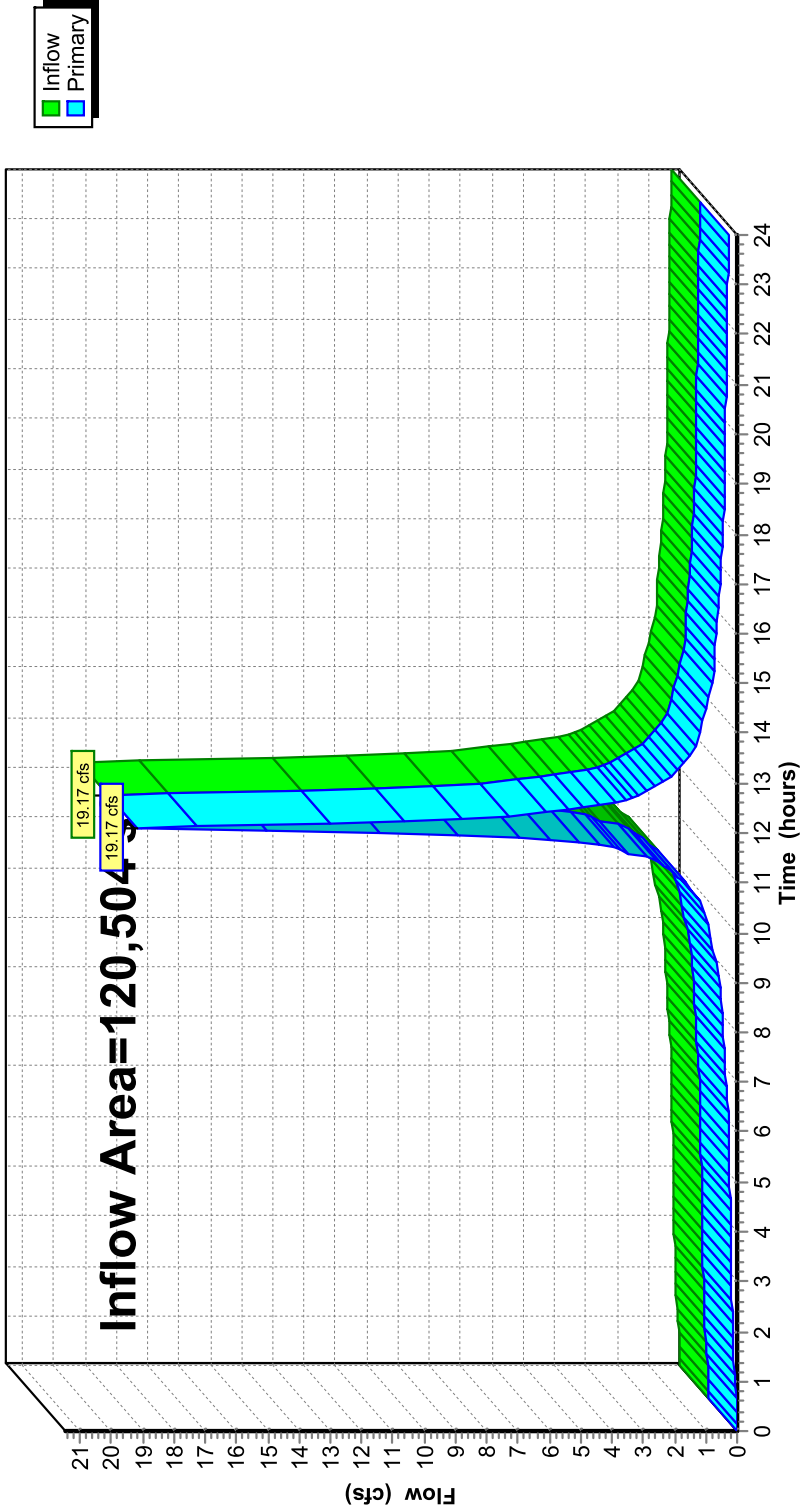
Summary for Link P-DP 1: PROP DP 1

Inflow Area = 120,504 sf, 63.88% Impervious, Inflow Depth > 7.73" for 100-Year-2020 event
Inflow = 19.17 cfs @ 12.11 hrs, Volume= 77,618 cf
Primary = 19.17 cfs @ 12.11 hrs, Volume= 77,618 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 15L : TOTAL PROPOSED

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link P-DP 1: PROP DP 1

Hydrograph



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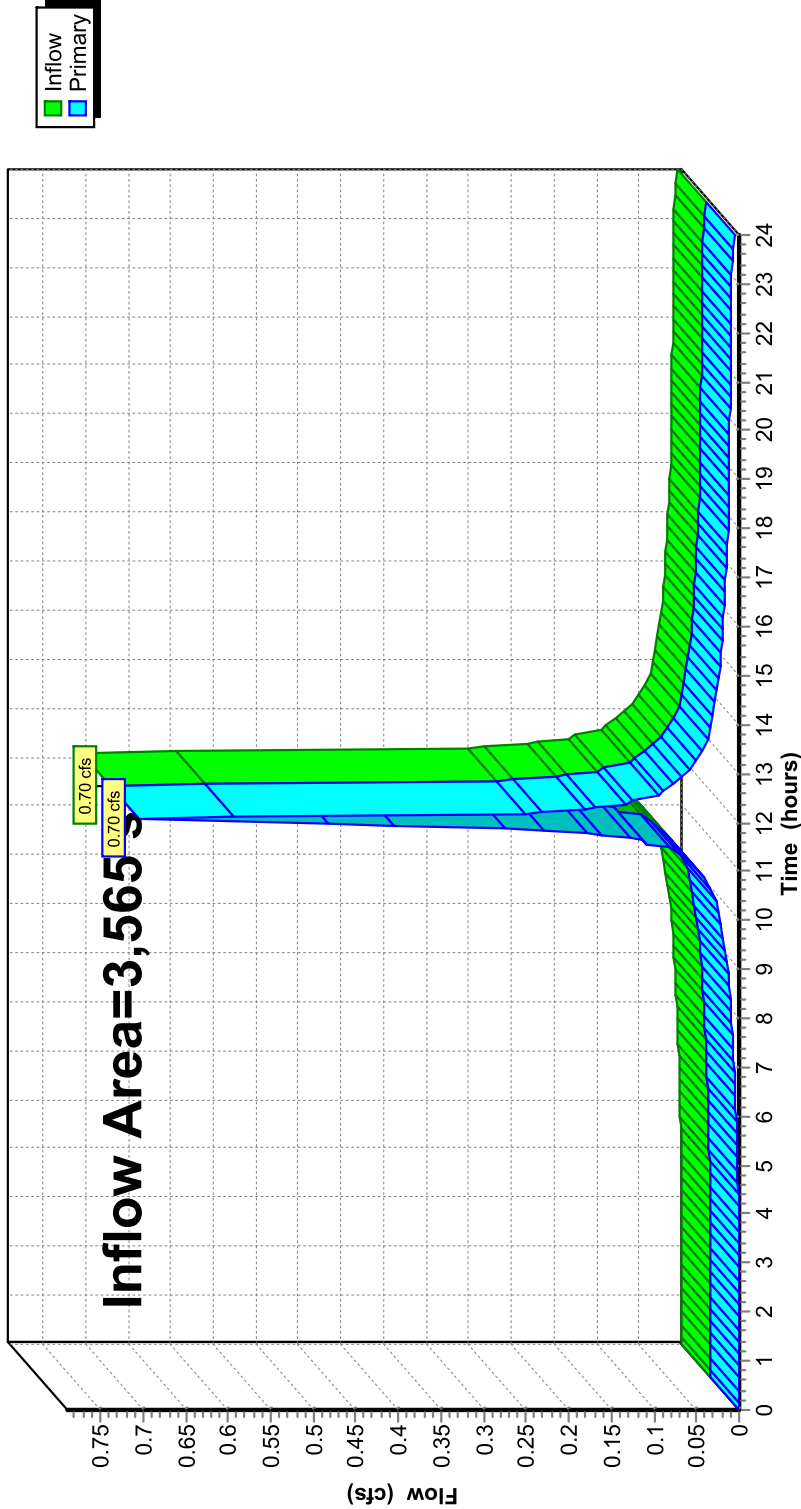
Summary for Link P-DP 2: PROP DP 2

Inflow Area = 3,565 sf, 32.03% Impervious, Inflow Depth > 6.99" for 100-Year-2020 event
Inflow = 0.70 cfs @ 12.06 hrs, Volume= 2,076 cf
Primary = 0.70 cfs @ 12.06 hrs, Volume= 2,076 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 15L : TOTAL PROPOSED

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link P-DP 2: PROP DP 2

Hydrograph



Summary for Subcatchment 1S: Roof

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

Runoff = 4.73 cfs @ 12.11 hrs, Volume= 17,027 cf, Depth> 3.85"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (sf)	CN	Description			
* 53,036	98	Roof and Amenity Area			
53,036		100.00% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description			

Direct Entry, Roof area

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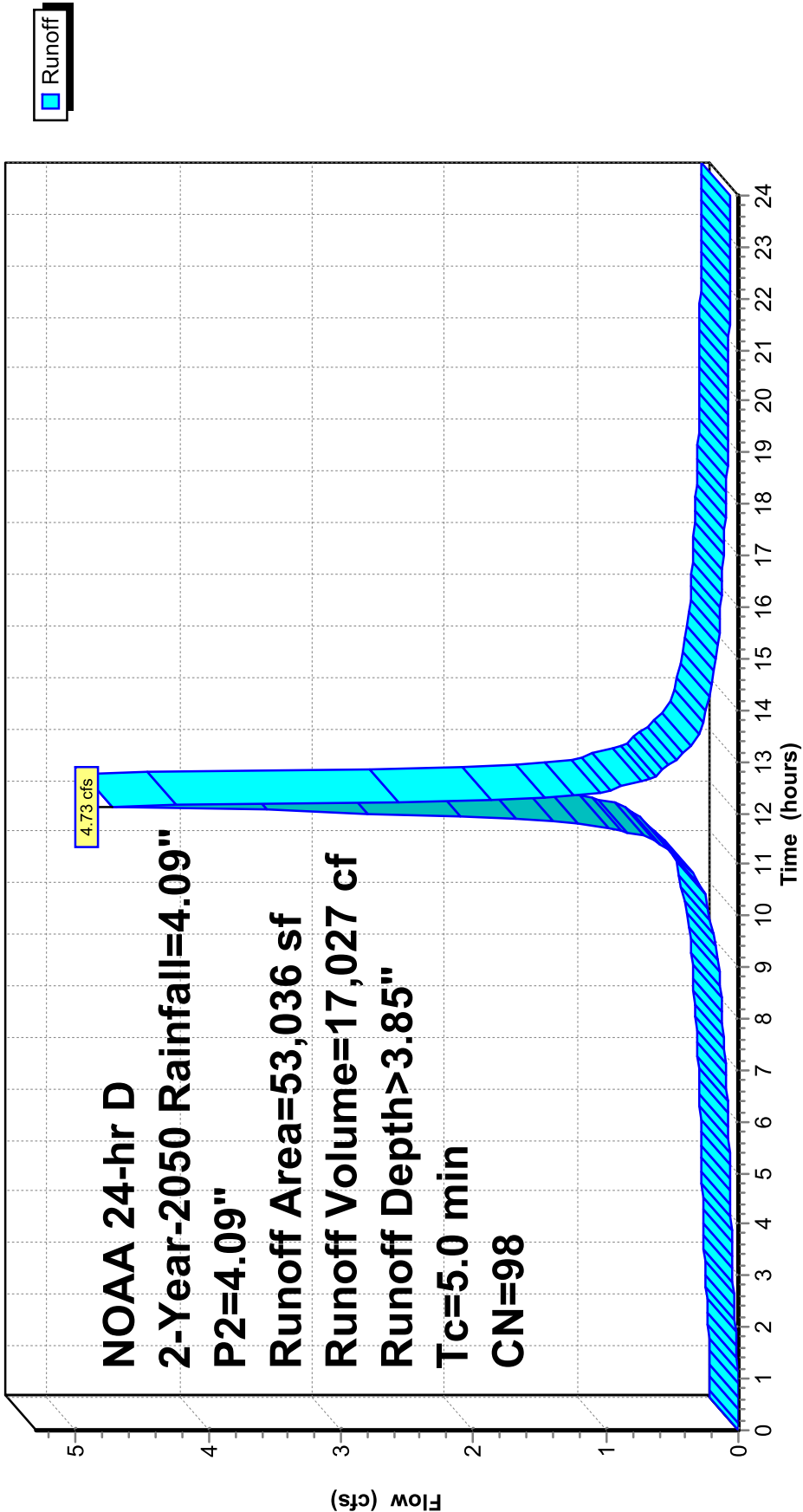
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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Subcatchment 1S: Roof

Hydrograph



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Summary for Subcatchment P1-I: P1 IMPERVIOUS PARKING

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

Runoff = 1.96 cfs @ 12.08 hrs, Volume= 6,416 cf, Depth> 3.85"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (sf)		CN	Description	
*	19,976	98	Uncovered Paved parking, HSG C	
19,976		100.00% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs) Description
1.4	100	0.0150	1.21	Sheet Flow, sheet flow Parking area n= 0.013 P2= 4.09"
0.9	127	0.0150	2.49	Shallow Concentrated Flow, parking area Paved Kv= 20.3 fps
0.3	198	0.0449	12.08	Pipe Channel, Pipe flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012

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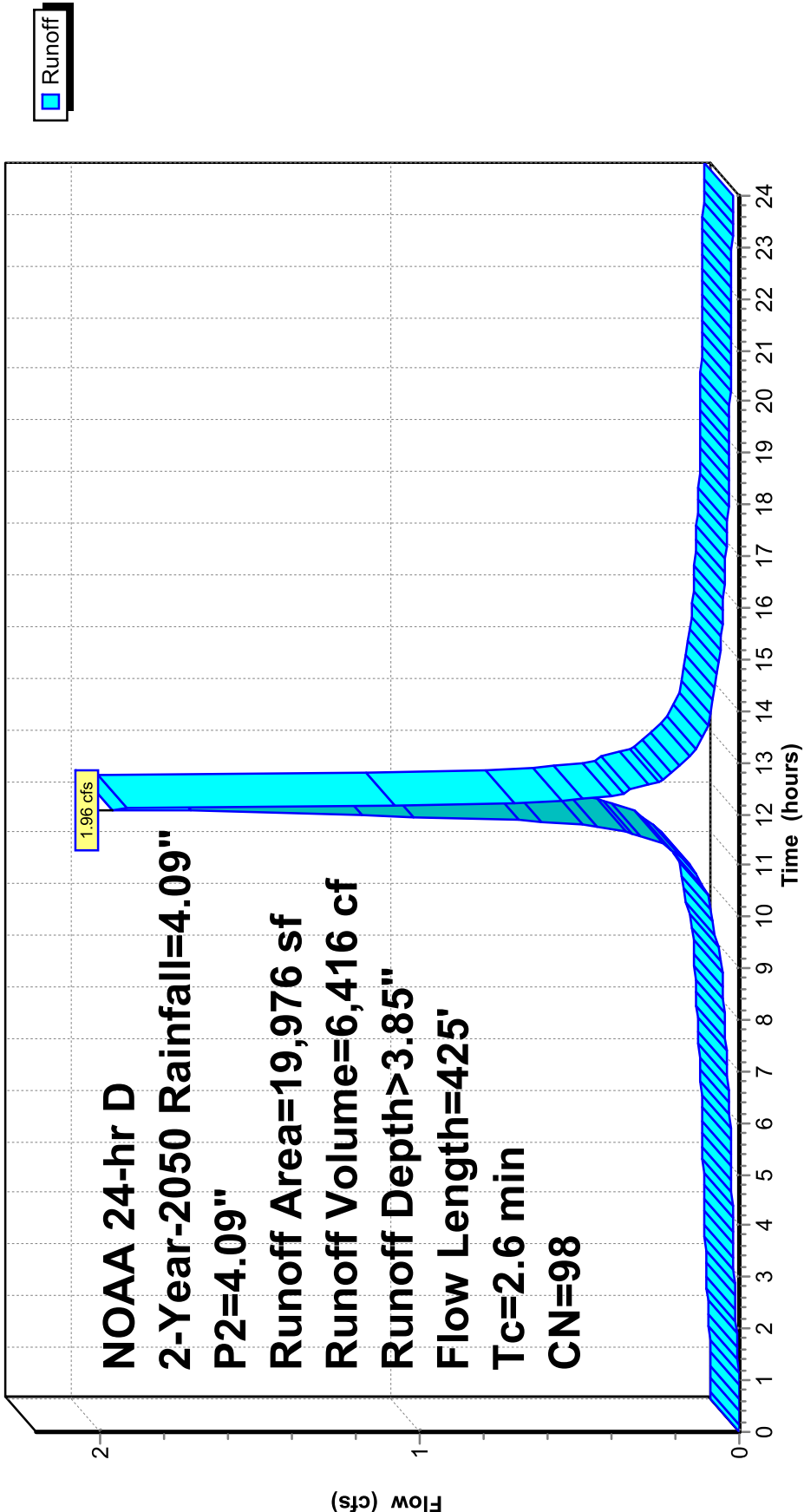
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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Subcatchment P1-I: P1 IMPERVIOUS PARKING

Hydrograph



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Summary for Subcatchment P1-P: P1 PERVIOUS

Runoff = 0.36 cfs @ 12.15 hrs, Volume= 1,206 cf, Depth> 1.66"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (sf)		CN	Description	
8,717		74	>75% Grass cover, Good, HSG C	
8,717			100.00% Pervious Area	
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs) Description
6.9	100	0.0900	0.24	Sheet Flow, Grass: Dense n= 0.240 P2= 4.09"
0.1	44	0.0470	12.36	Pipe Channel, Yard Inlet 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.2	325	0.0450	31.77	Pipe Channel, 72" Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013
7.2	469	Total		

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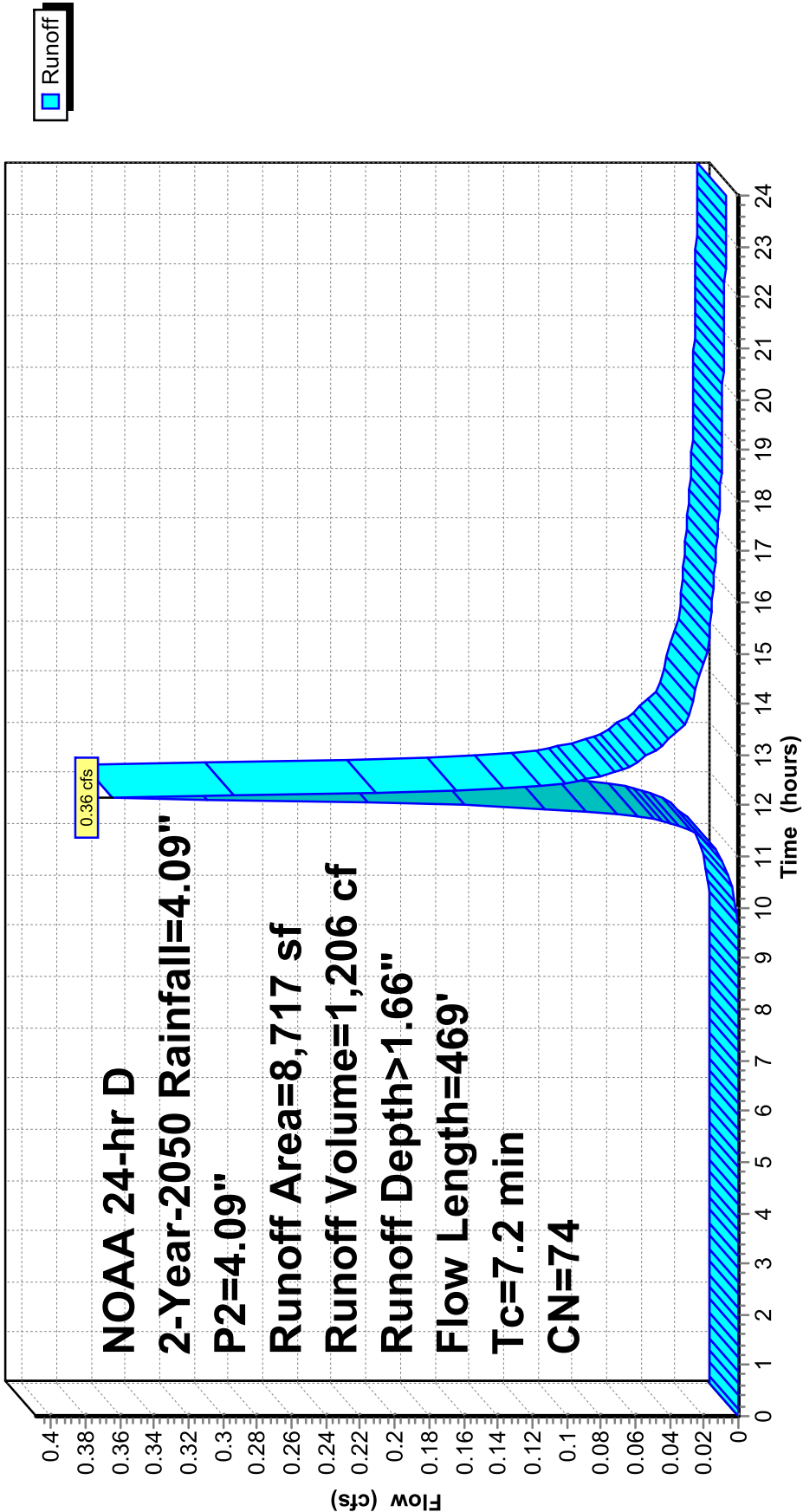
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

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Subcatchment P1-P: P1 PERVIOUS

Hydrograph



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Summary for Subcatchment P2: P-2 Pervious-w-offsite-Undisturbed

Runoff = 1.26 cfs @ 12.22 hrs, Volume= 5,127 cf, Depth> 1.59"
Routed to Link P-DP 1 : PROP DP 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

	Area (sf)	CN	Description
*	2,744	98	Roof-offsite
*	1,220	98	Impervious
	1,506	71	Meadow, non-grazed, HSG C
*	32,065	70	wooded
*	1,240	74	>75% Grass offsite

	38,775	73	Weighted Average
	34,811		89.78% Pervious Area
	3,964		10.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0900	0.16		Sheet Flow, sheet flow Woods: Light underbrush n= 0.400 P2= 4.09"
1.8	110	0.0400	1.00		Shallow Concentrated Flow, SC Woodland Kv= 5.0 fps
0.5	109	0.0500	3.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	44	0.0500	12.75	15.65	Pipe Channel, Yard drains 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.2	325	0.0440	31.42	888.36	Pipe Channel, Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013
13.0	688	Total			

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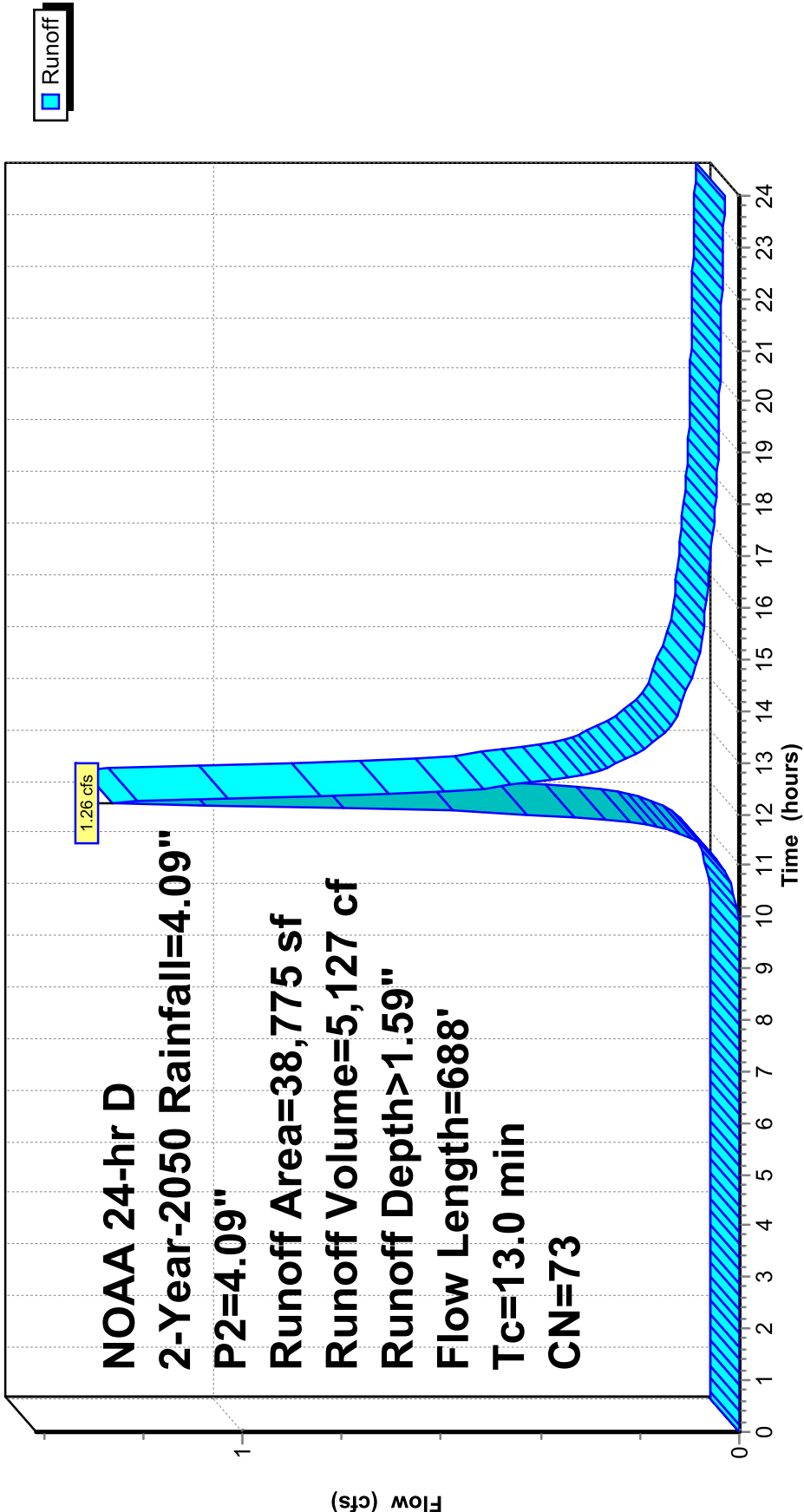
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Subcatchment P2: P-2 Pervious-w-offsite-Undisturbed

Hydrograph



Summary for Subcatchment P3: P3

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

Runoff = 0.24 cfs @ 12.06 hrs, Volume= 677 cf, Depth> 2.28"
Routed to Link P-DP 2 : PROP DP 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-Year-2050 Rainfall=4.09", P2=4.09"

Area (sf)		CN	Description		
*	2,423	74	>75% Grass cover, Good, HSG C		
	1,142	98	Paved parking and s/w, HSG C		
	3,565	82	Weighted Average		
	2,423		67.97% Pervious Area		
	1,142		32.03% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description

Shallow Concentrated Flow, LAWN
Unpaved Kv= 16.1 fps

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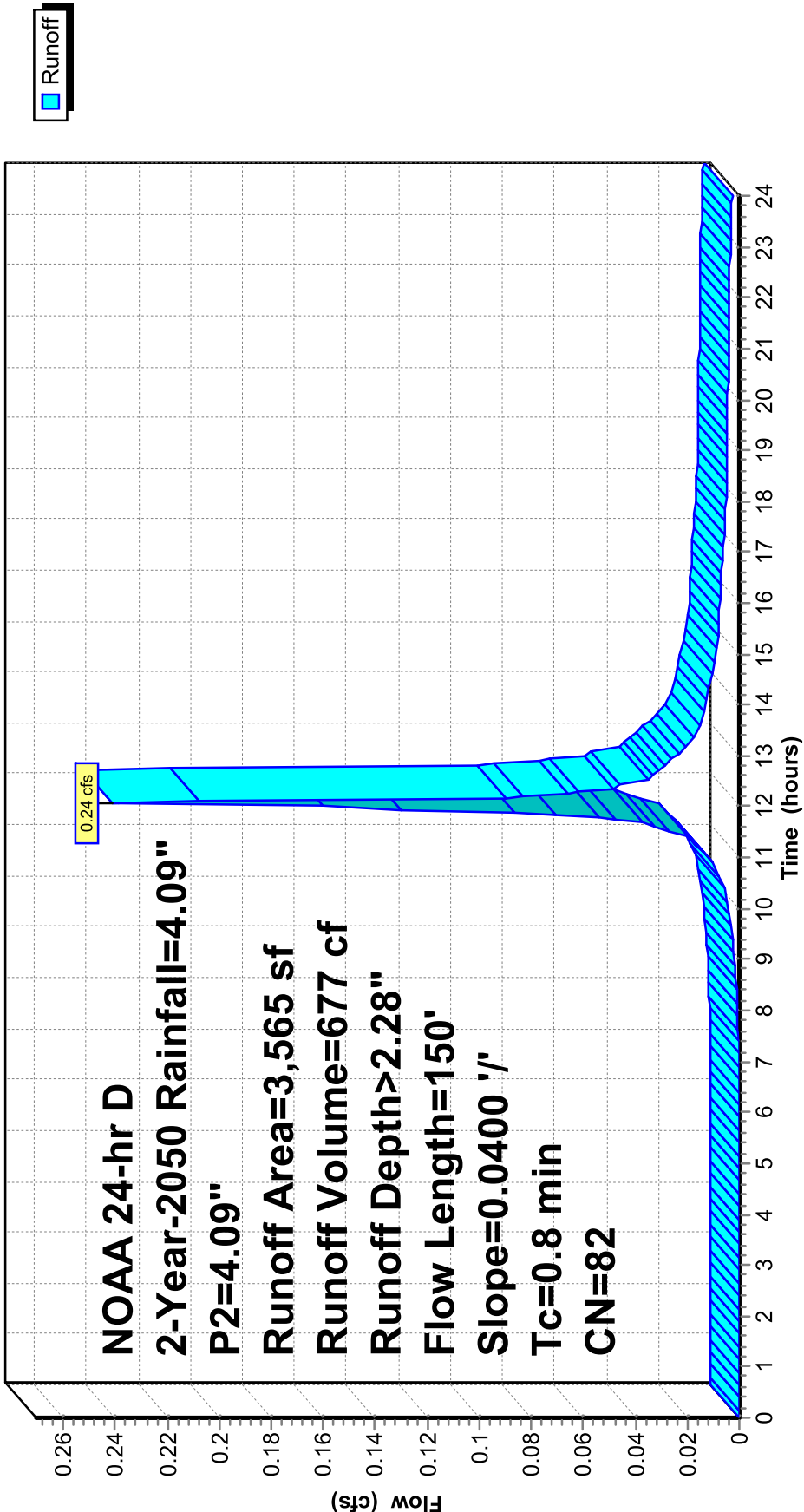
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Subcatchment P3: P3

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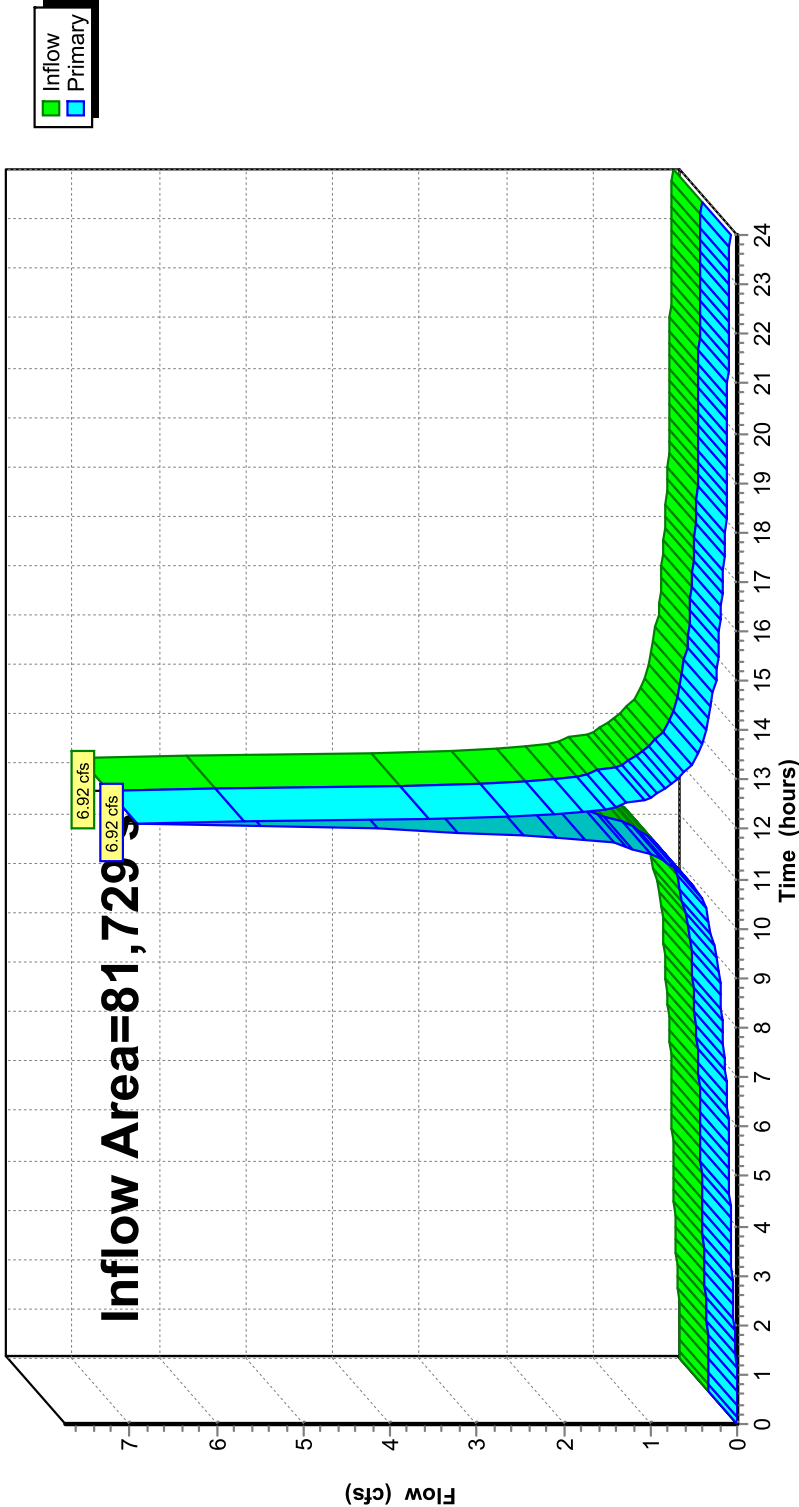
Summary for Link 11L: Proposed Disturbed

Inflow Area = 81,729 sf, 89.33% Impervious, Inflow Depth > 3.62" for 2-Year-2050 event
Inflow = 6.92 cfs @ 12.10 hrs, Volume= 24,649 cf
Primary = 6.92 cfs @ 12.10 hrs, Volume= 24,649 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P-DP 1 : PROP DP 1

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 11L: Proposed Disturbed

Hydrograph



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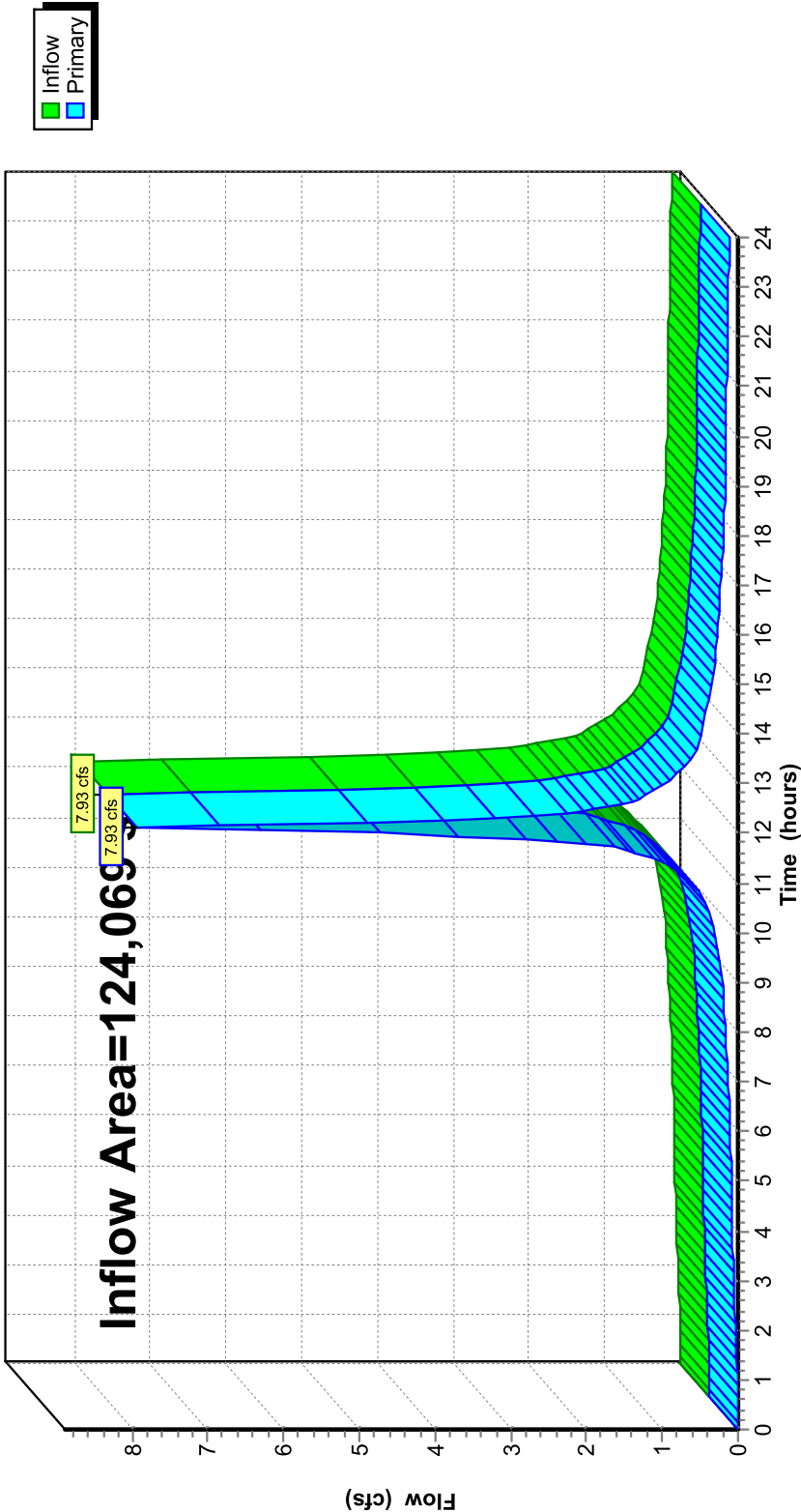
Summary for Link 15L: TOTAL PROPOSED

Inflow Area = 124,069 sf, 62.96% Impervious, Inflow Depth > 2.95" for 2-Year-2050 event
Inflow = 7.93 cfs @ 12.11 hrs, Volume= 30,453 cf
Primary = 7.93 cfs @ 12.11 hrs, Volume= 30,453 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 15L: TOTAL PROPOSED

Hydrograph



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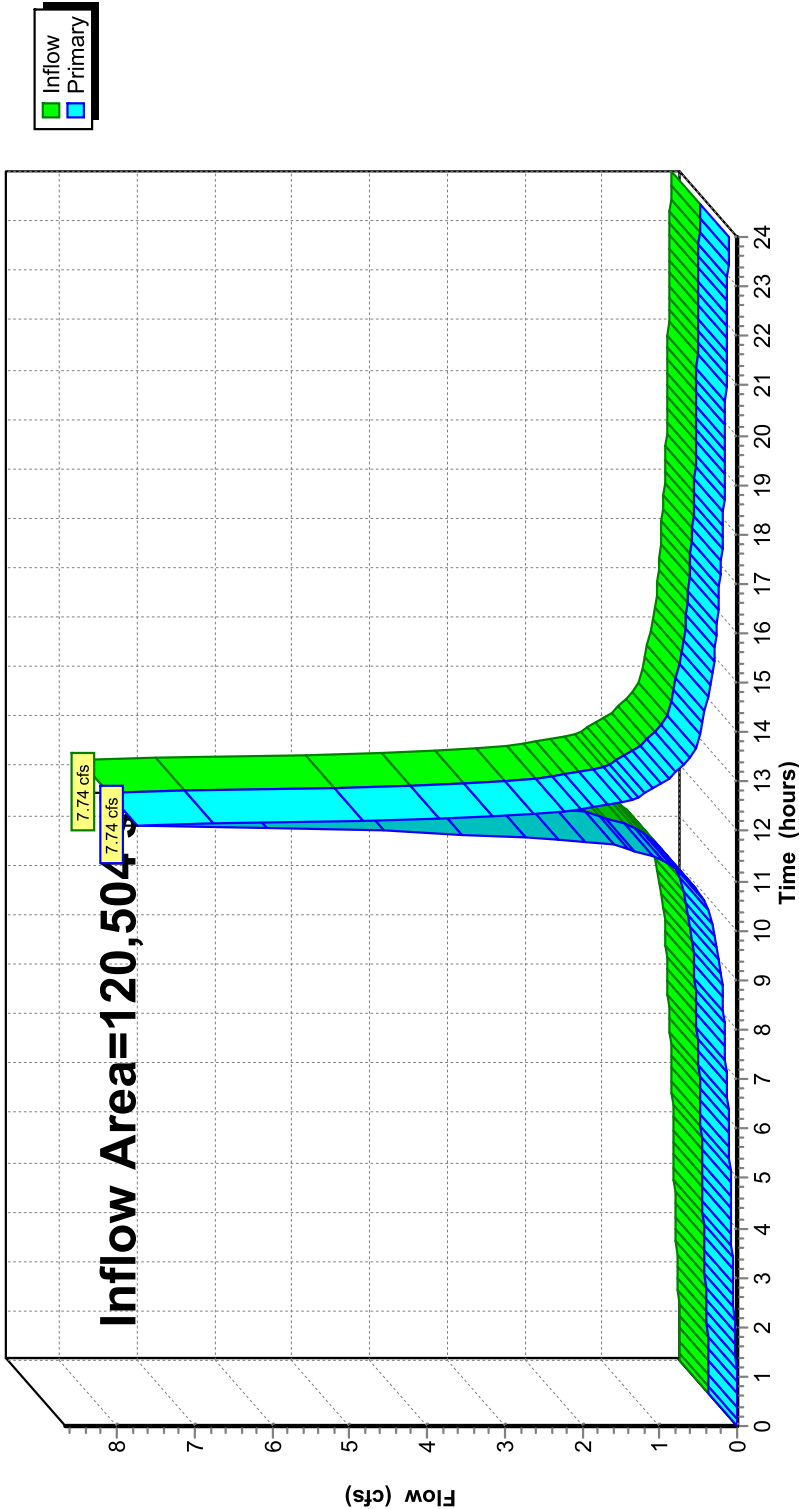
Summary for Link P-DP 1: PROP DP 1

Inflow Area = 120,504 sf, 63.88% Impervious, Inflow Depth > 2.97" for 2-Year-2050 event
Inflow = 7.74 cfs @ 12.11 hrs, Volume= 29,775 cf
Primary = 7.74 cfs @ 12.11 hrs, Volume= 29,775 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 15L : TOTAL PROPOSED

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link P-DP 1: PROP DP 1

Hydrograph



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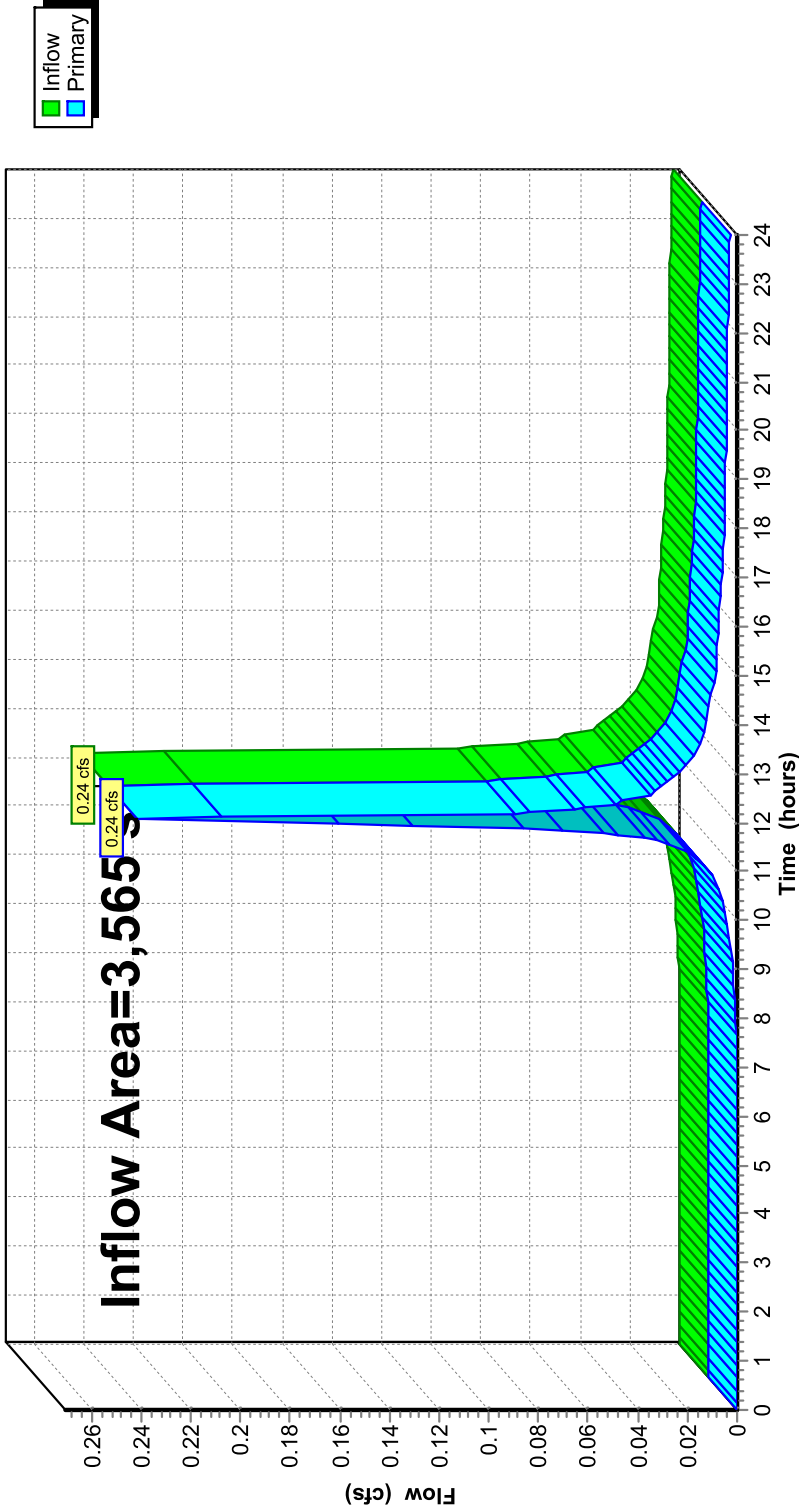
Summary for Link P-DP 2: PROP DP 2

Inflow Area = 3,565 sf, 32.03% Impervious, Inflow Depth > 2.28" for 2-Year-2050 event
Inflow = 0.24 cfs @ 12.06 hrs, Volume= 677 cf
Primary = 0.24 cfs @ 12.06 hrs, Volume= 677 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 15L : TOTAL PROPOSED

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link P-DP 2: PROP DP 2

Hydrograph



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Summary for Subcatchment 1S: Roof

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

Runoff = 7.40 cfs @ 12.11 hrs, Volume= 27,083 cf, Depth> 6.13"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (sf)	CN	Description
* 53,036	98	Roof and Amenity Area
53,036		100.00% Impervious Area
Tc (min)	Length (feet)	Slope (ft/ft)
	Velocity (ft/sec)	Capacity (cfs)
5.0		Description

Direct Entry, Roof area

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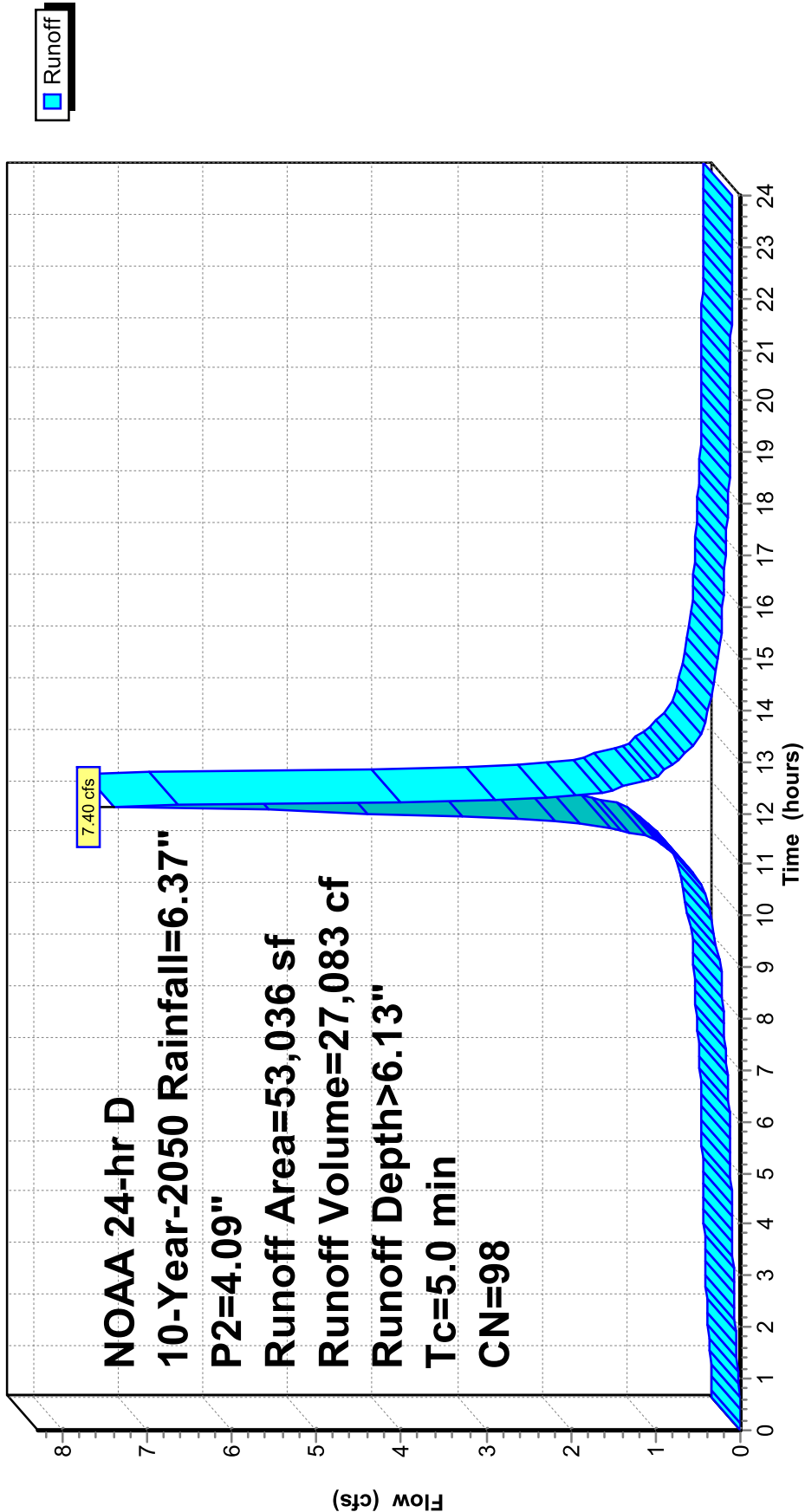
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

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Subcatchment 1S: Roof

Hydrograph



24-223 DRAINAGE DESIGN-PROPOSED-UPDATE

Summary for Subcatchment P1-I: P1 IMPERVIOUS PARKING

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

Runoff = 3.07 cfs @ 12.08 hrs, Volume= 10,205 cf, Depth> 6.13"

Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (sf)		CN	Description		
*	19,976	98	Uncovered Paved parking, HSG C		
	19,976		100.00% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0150	1.21		Sheet Flow, sheet flow Parking area n= 0.013 P2= 4.09"
0.9	127	0.0150	2.49		Shallow Concentrated Flow, parking area Paved Kv= 20.3 fps
0.3	198	0.0449	12.08	14.83	Pipe Channel, Pipe flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012

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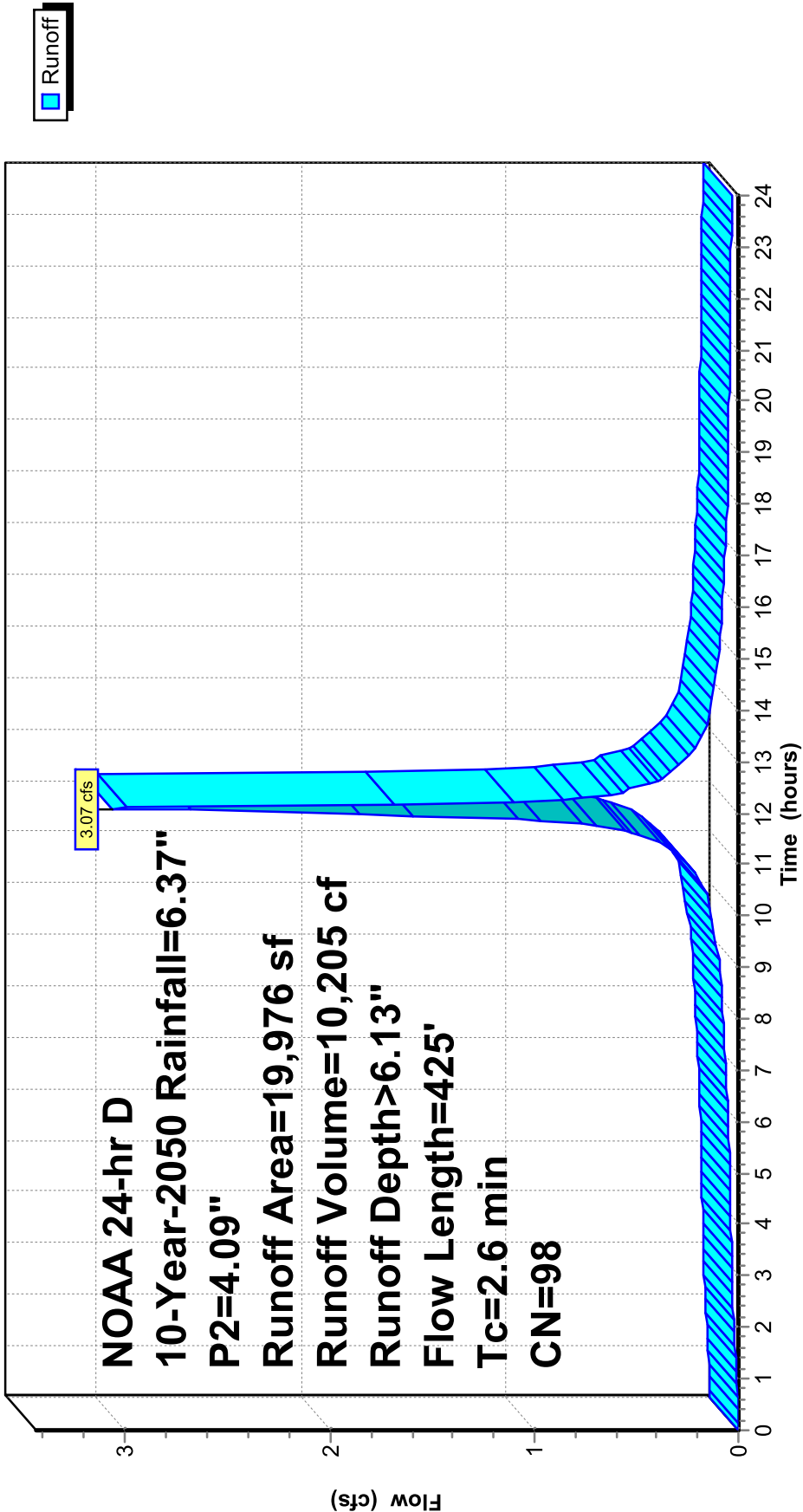
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

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Subcatchment P1-I: P1 IMPERVIOUS PARKING

Hydrograph



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Summary for Subcatchment P1-P: P1 PERVIOUS

Runoff = 0.77 cfs @ 12.14 hrs, Volume= 2,538 cf, Depth> 3.49"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (sf)		CN	Description	
8,717		74	>75% Grass cover, Good, HSG C	
8,717			100.00% Pervious Area	
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs) Description
6.9	100	0.0900	0.24	Sheet Flow, Grass: Dense n= 0.240 P2= 4.09"
0.1	44	0.0470	12.36	Pipe Channel, Yard Inlet 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.2	325	0.0450	31.77	Pipe Channel, 72" Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013
7.2	469	Total		

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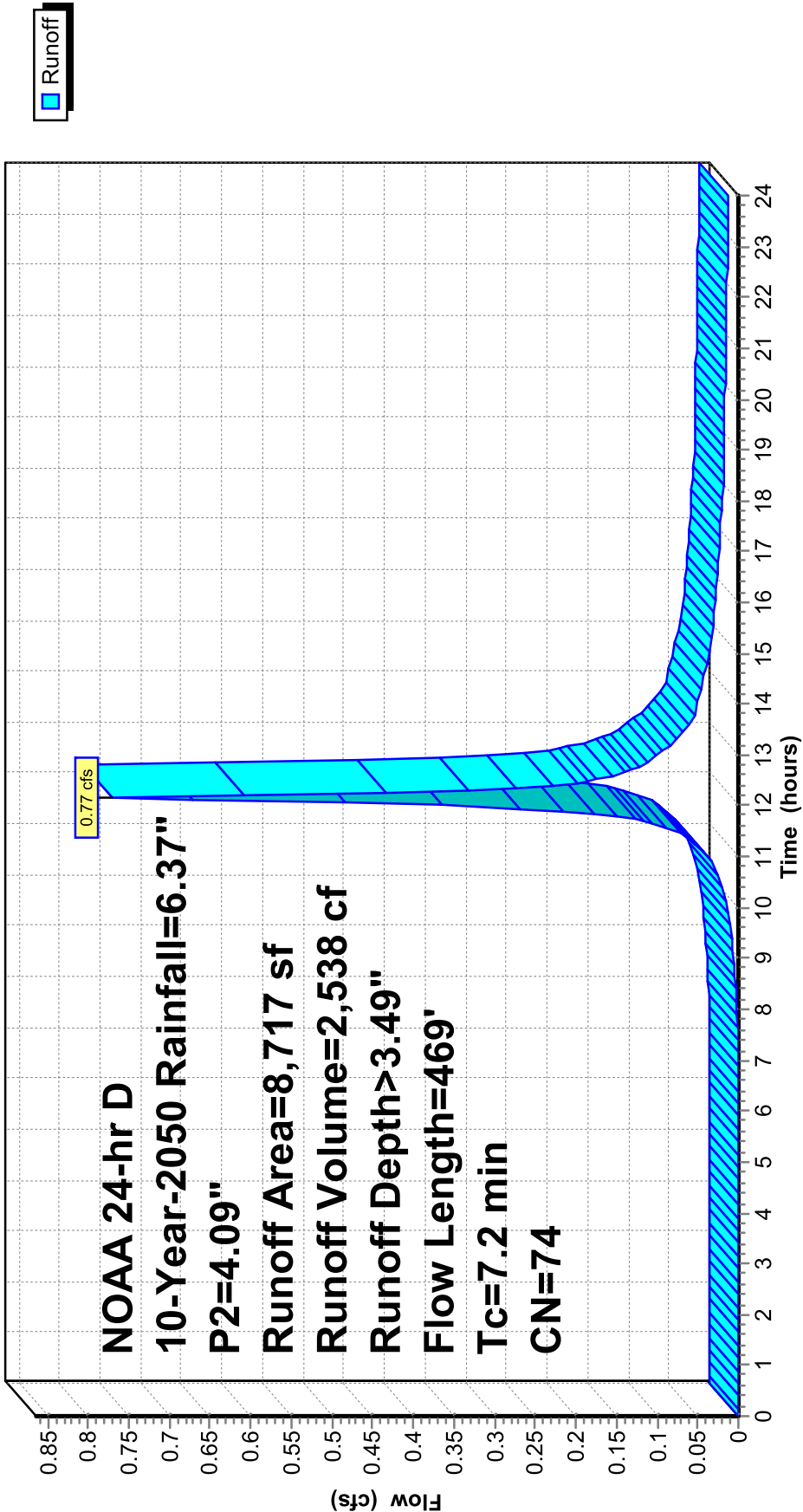
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Subcatchment P1-P: P1 PERVIOUS

Hydrograph



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Summary for Subcatchment P2: P-2 Pervious-w-offsite-Undisturbed

Runoff = 2.75 cfs @ 12.21 hrs, Volume= 10,946 cf, Depth> 3.39"
Routed to Link P-DP 1 : PROP DP 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

	Area (sf)	CN	Description
*	2,744	98	Roof-offsite
*	1,220	98	Impervious
	1,506	71	Meadow, non-grazed, HSG C
*	32,065	70	wooded
*	1,240	74	>75% Grass offsite

	38,775	73	Weighted Average
	34,811		89.78% Pervious Area
	3,964		10.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0900	0.16		Sheet Flow, sheet flow Woods: Light underbrush n= 0.400 P2= 4.09"
1.8	110	0.0400	1.00		Shallow Concentrated Flow, SC Woodland Kv= 5.0 fps
0.5	109	0.0500	3.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	44	0.0500	12.75	15.65	Pipe Channel, Yard drains 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.2	325	0.0440	31.42	888.36	Pipe Channel, Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013
13.0	688	Total			

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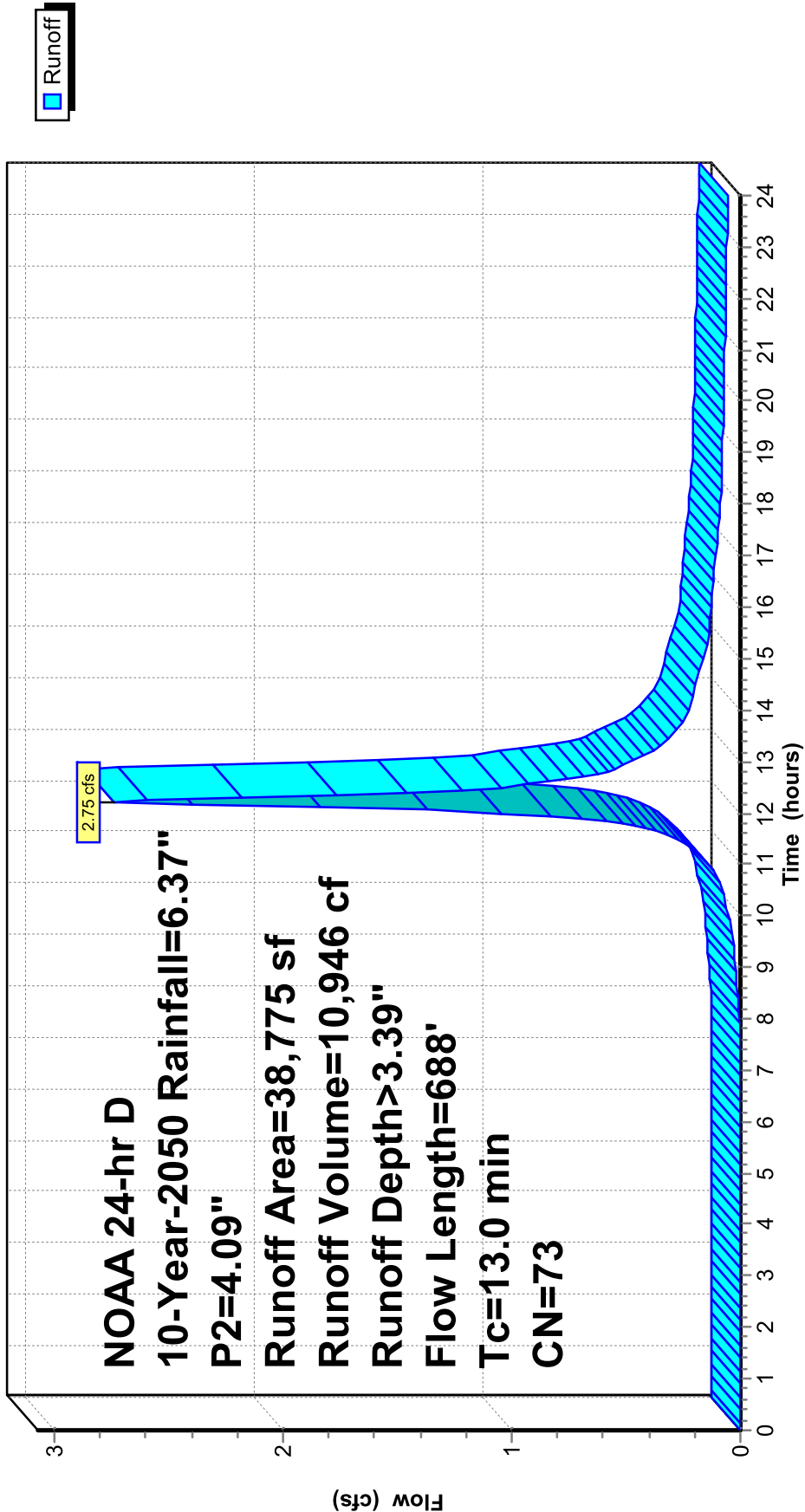
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Subcatchment P2: P-2 Pervious-w-offsite-Undisturbed

Hydrograph



Summary for Subcatchment P3: P3

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

Runoff = 0.45 cfs @ 12.06 hrs, Volume= 1,286 cf, Depth> 4.33"
Routed to Link P-DP 2 : PROP DP 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-Year-2050 Rainfall=6.37", P2=4.09"

Area (sf)		CN	Description		
*	2,423	74	>75% Grass cover, Good, HSG C		
	1,142	98	Paved parking and s/w, HSG C		
	3,565	82	Weighted Average		
	2,423		67.97% Pervious Area		
	1,142		32.03% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description

Shallow Concentrated Flow, LAWN
Unpaved Kv= 16.1 fps

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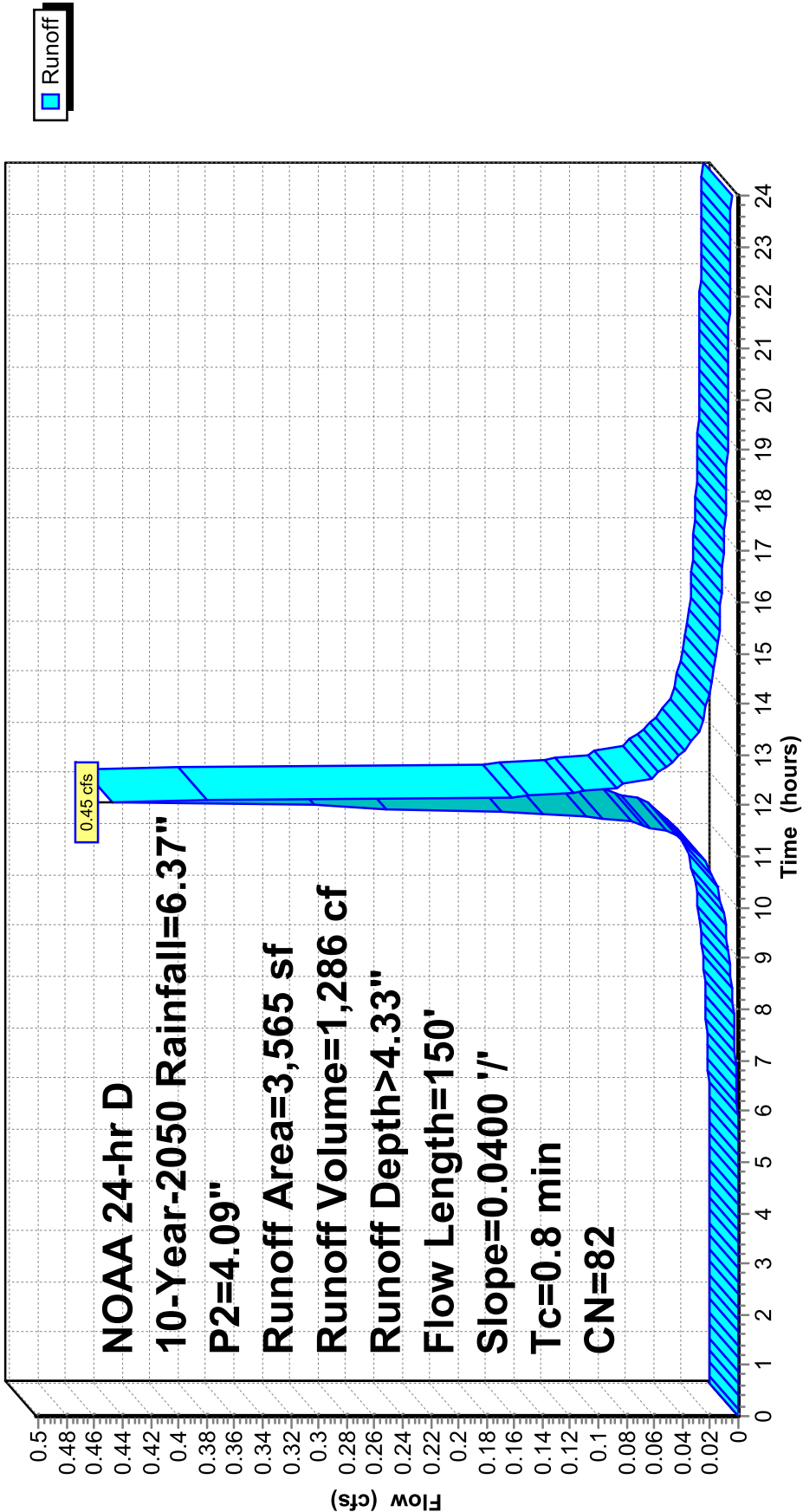
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Subcatchment P3: P3

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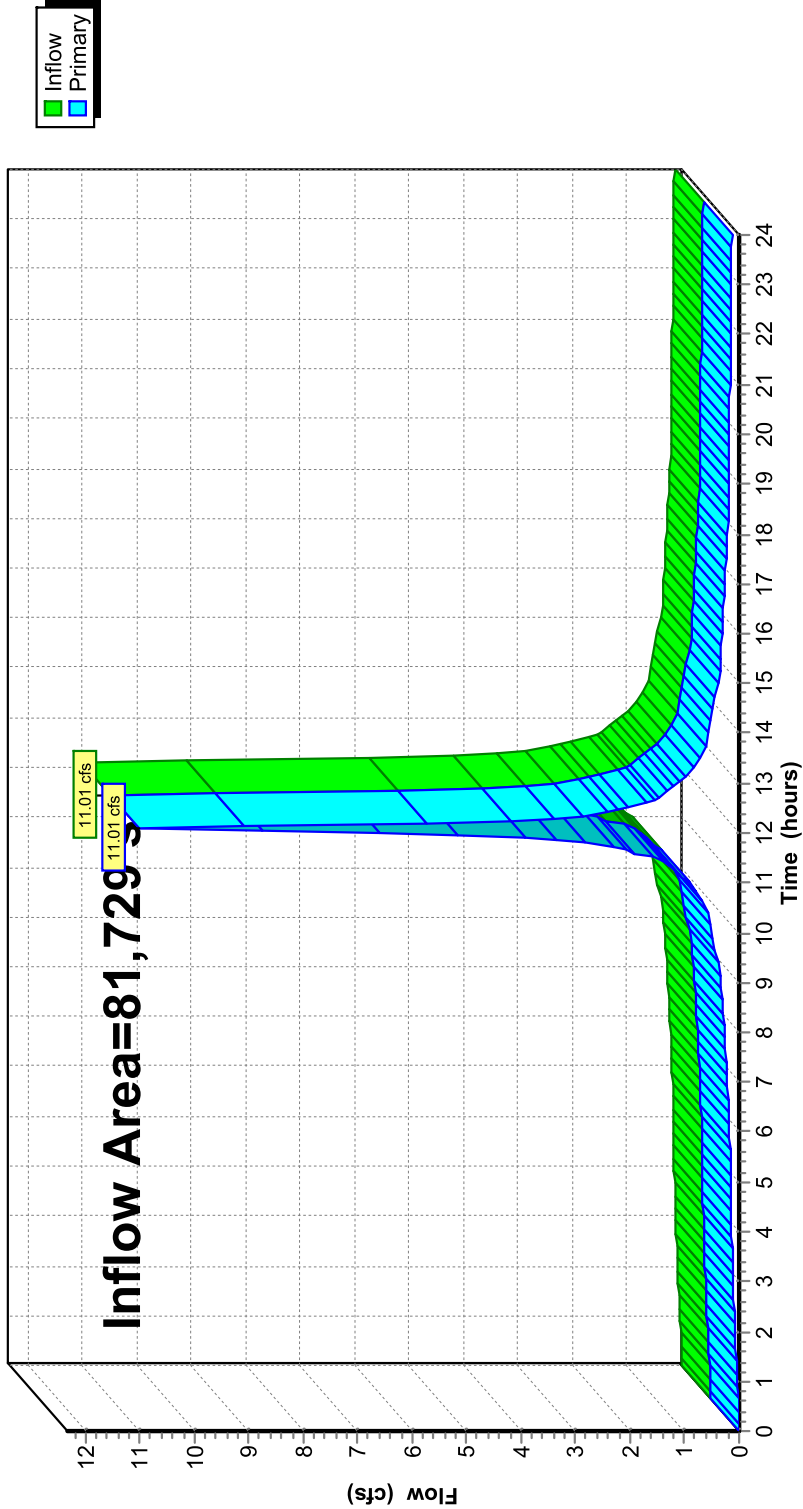
Summary for Link 11L: Proposed Disturbed

Inflow Area = 81,729 sf, 89.33% Impervious, Inflow Depth > 5.85" for 10-Year-2050 event
Inflow = 11.01 cfs @ 12.10 hrs, Volume= 39,825 cf
Primary = 11.01 cfs @ 12.10 hrs, Volume= 39,825 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P-DP 1 : PROP DP 1

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 11L: Proposed Disturbed

Hydrograph



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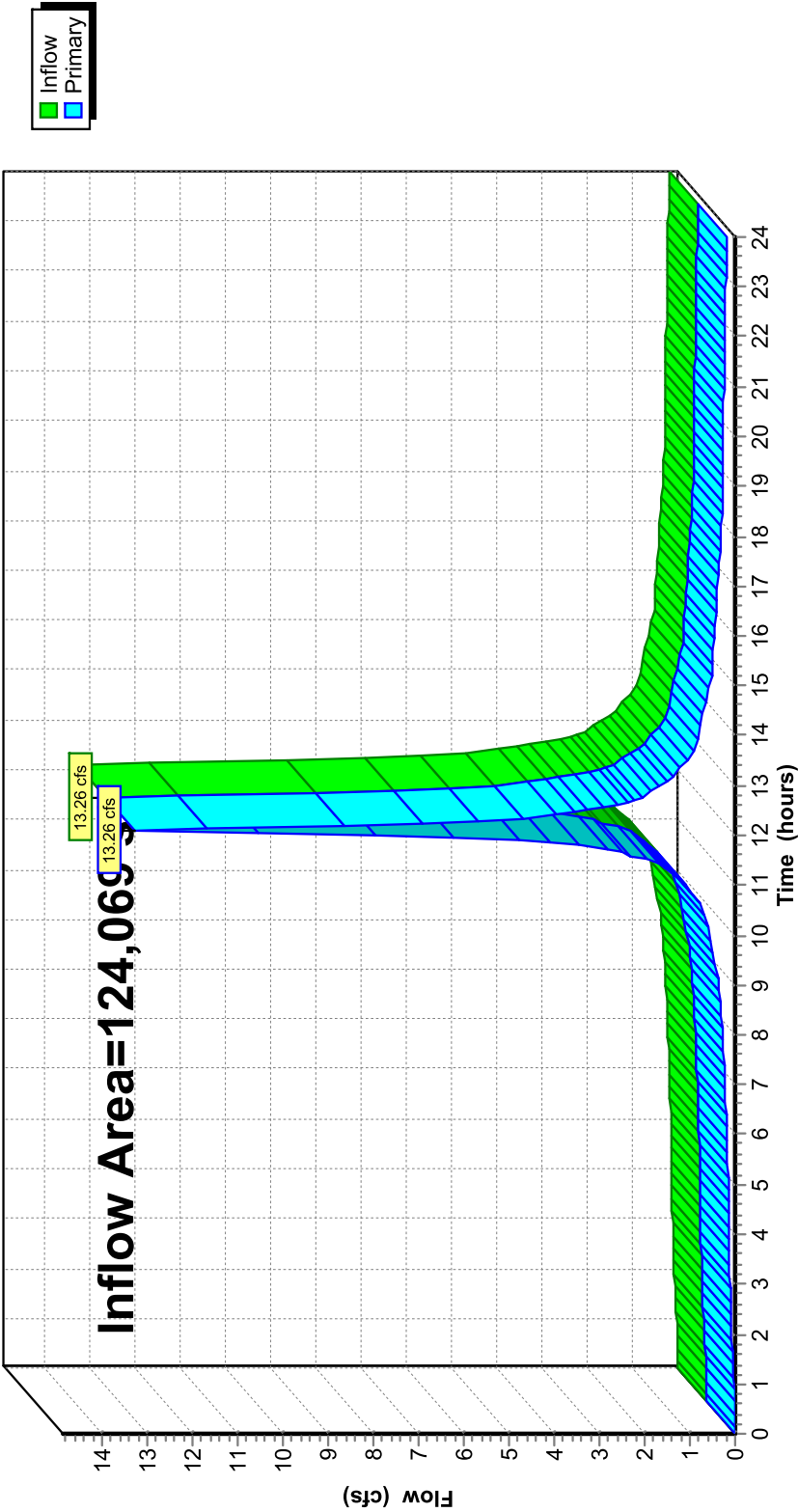
Summary for Link 15L: TOTAL PROPOSED

Inflow Area = 124,069 sf, 62.96% Impervious, Inflow Depth > 5.04" for 10-Year-2050 event
Inflow = 13.26 cfs @ 12.11 hrs, Volume= 52,058 cf
Primary = 13.26 cfs @ 12.11 hrs, Volume= 52,058 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 15L: TOTAL PROPOSED

Hydrograph



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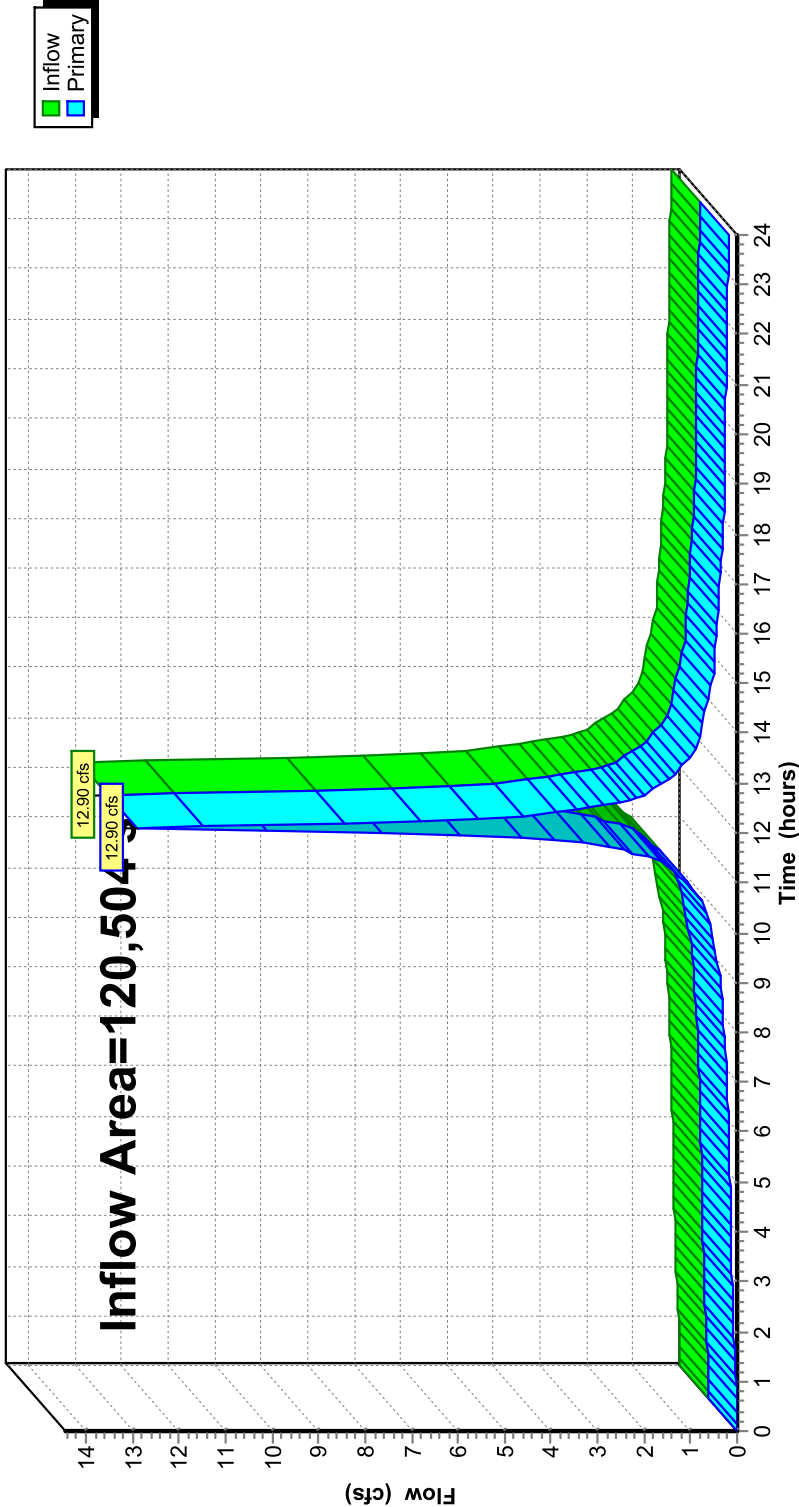
Summary for Link P-DP 1: PROP DP 1

Inflow Area = 120,504 sf, 63.88% Impervious, Inflow Depth > 5.06" for 10-Year-2050 event
Inflow = 12.90 cfs @ 12.11 hrs, Volume= 50,772 cf
Primary = 12.90 cfs @ 12.11 hrs, Volume= 50,772 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 15L : TOTAL PROPOSED

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link P-DP 1: PROP DP 1

Hydrograph



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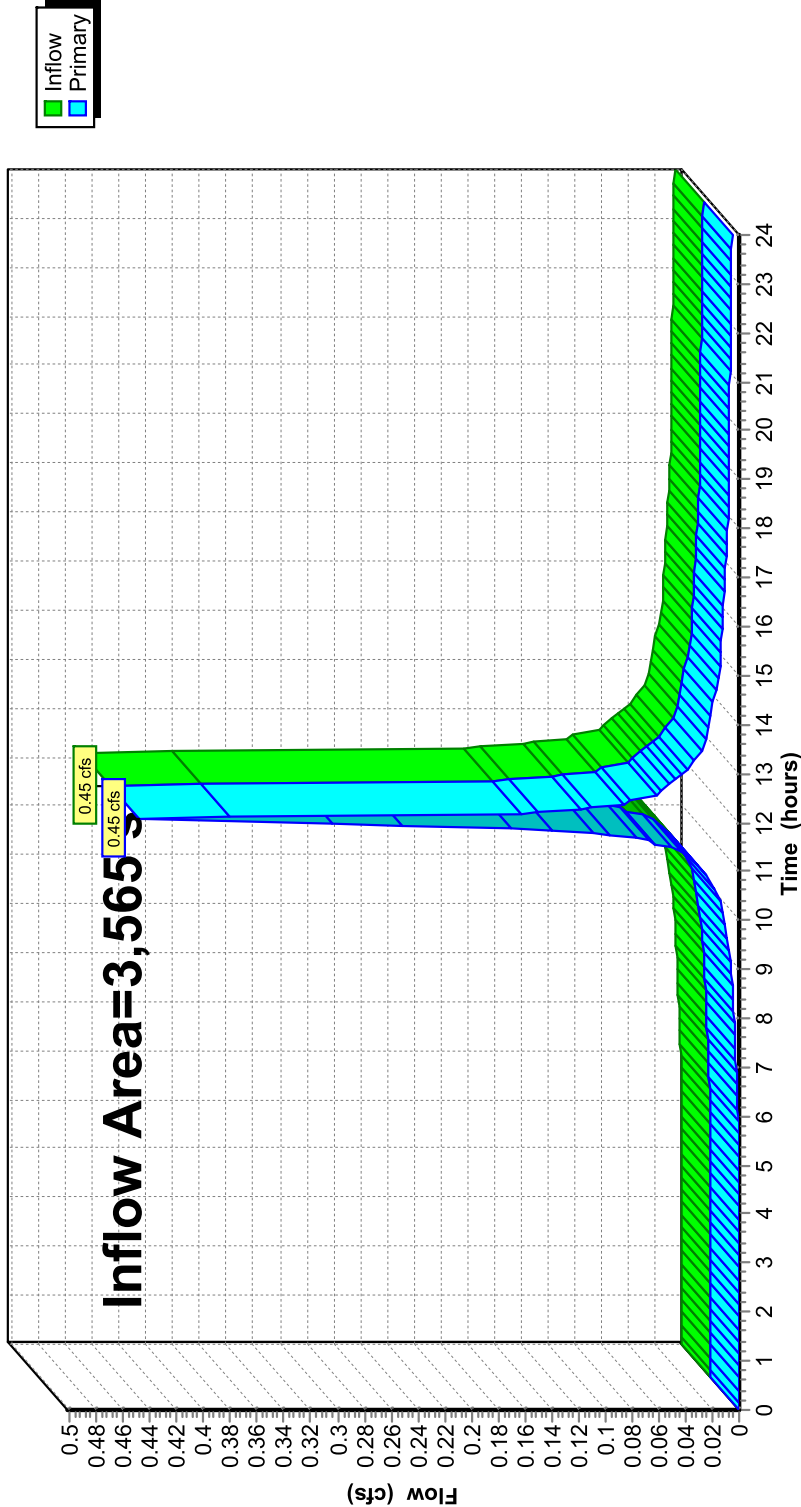
Summary for Link P-DP 2: PROP DP 2

Inflow Area = 3,565 sf, 32.03% Impervious, Inflow Depth > 4.33" for 10-Year-2050 event
Inflow = 0.45 cfs @ 12.06 hrs, Volume= 1,286 cf
Primary = 0.45 cfs @ 12.06 hrs, Volume= 1,286 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 15L : TOTAL PROPOSED

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link P-DP 2: PROP DP 2

Hydrograph



Summary for Subcatchment 1S: Roof

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

Runoff = 13.42 cfs @ 12.11 hrs, Volume= 49,819 cf, Depth>11.27"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (sf)	CN	Description
* 53,036	98	Roof and Amenity Area
53,036		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					

Direct Entry, Roof area

24-223 DRAINAGE DESIGN-PROPOSED-UPDATE

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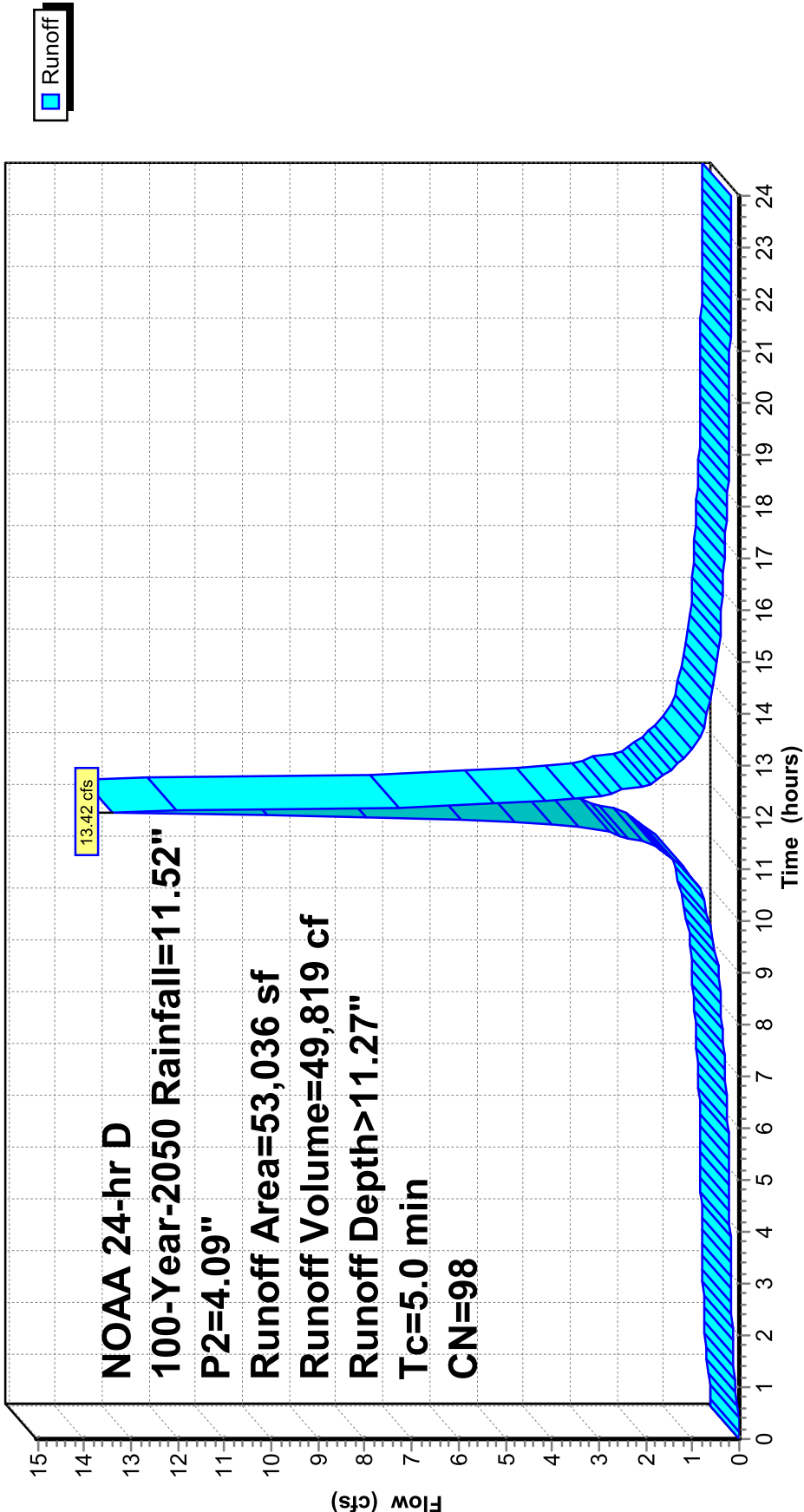
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

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Subcatchment 1S: Roof

Hydrograph



Summary for Subcatchment P1-I: P1 IMPERVIOUS PARKING

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

Runoff = 5.56 cfs @ 12.08 hrs, Volume= 18,772 cf, Depth>11.28"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (sf)		CN	Description	
*	19,976	98	Uncovered Paved parking, HSG C	
19,976		100.00% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs) Description
1.4	100	0.0150	1.21	Sheet Flow, sheet flow Parking area n= 0.013 P2= 4.09"
0.9	127	0.0150	2.49	Shallow Concentrated Flow, parking area Paved Kv= 20.3 fps
0.3	198	0.0449	12.08	Pipe Channel, Pipe flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012

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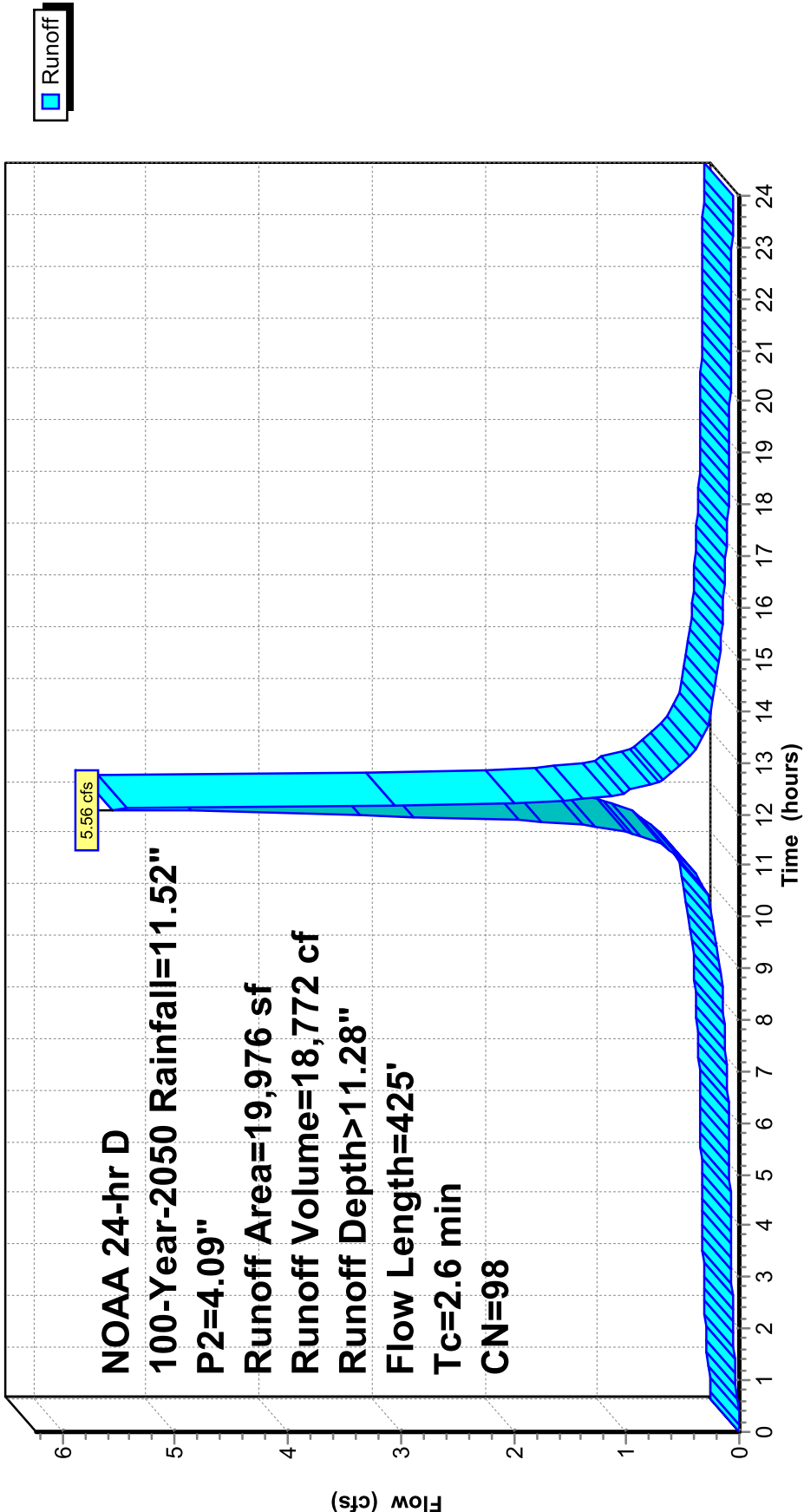
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

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Subcatchment P1-I: P1 IMPERVIOUS PARKING

Hydrograph



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NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

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Summary for Subcatchment P1-P: P1 PERVIOUS

Runoff = 1.75 cfs @ 12.14 hrs, Volume= 5,924 cf, Depth> 8.15"
Routed to Link 11L : Proposed Disturbed

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (sf)		CN	Description	
8,717		74	>75% Grass cover, Good, HSG C	
8,717			100.00% Pervious Area	
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs) Description
6.9	100	0.0900	0.24	Sheet Flow, Grass: Dense n= 0.240 P2= 4.09"
0.1	44	0.0470	12.36	Pipe Channel, Yard Inlet 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.2	325	0.0450	31.77	Pipe Channel, 72" Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013
7.2	469	Total		

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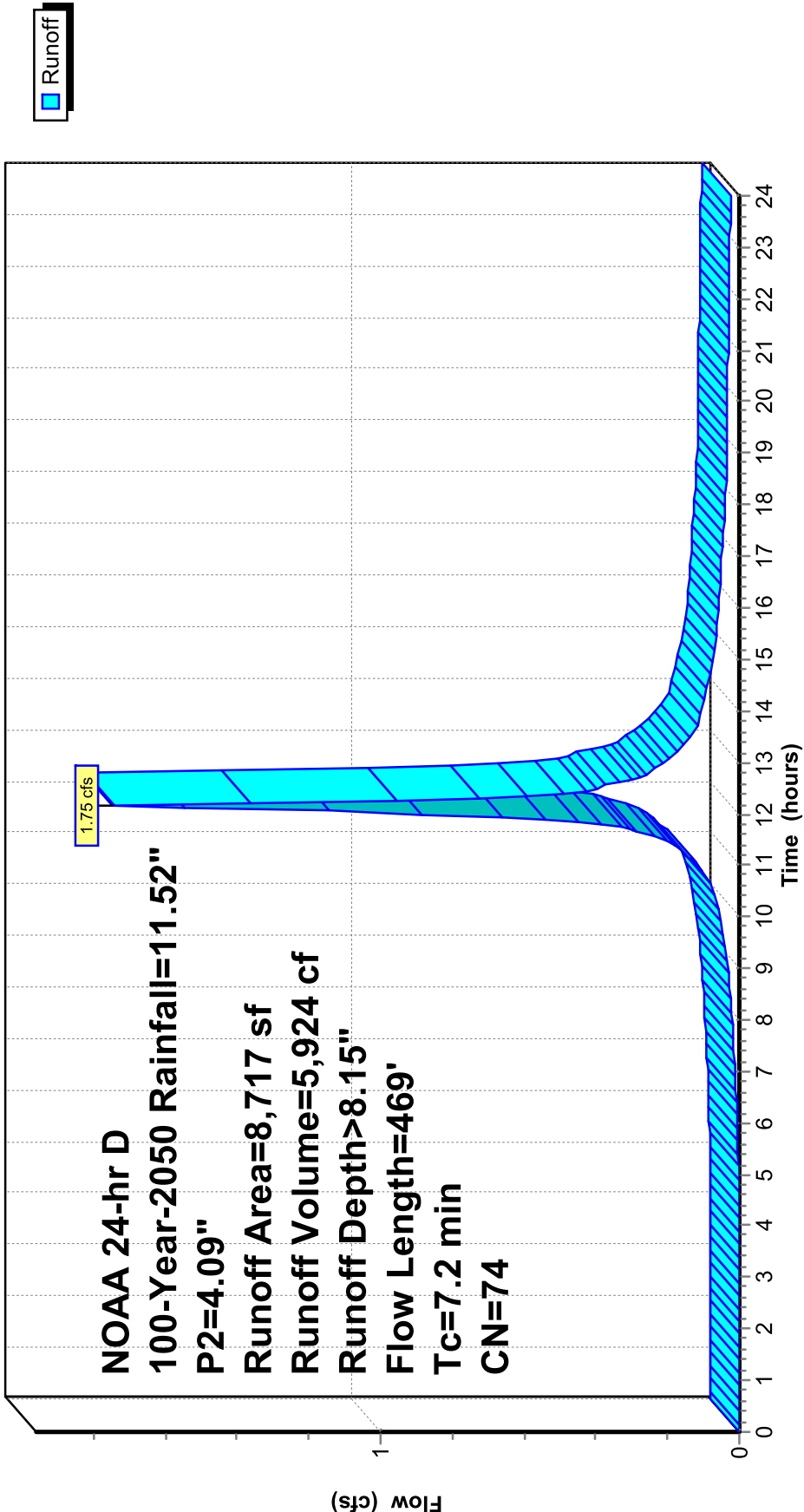
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

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Subcatchment P1-P: P1 PERVIOUS

Hydrograph



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Summary for Subcatchment P2: P-2 Pervious-w-offsite-Undisturbed

Runoff = 6.36 cfs @ 12.21 hrs, Volume= 25,868 cf, Depth> 8.01"
Routed to Link P-DP 1 : PROP DP 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (sf)		CN	Description
*	2,744	98	Roof-offsite
*	1,220	98	Impervious
	1,506	71	Meadow, non-grazed, HSG C
*	32,065	70	wooded
*	1,240	74	>75% Grass offsite
38,775		73	Weighted Average
34,811			89.78% Pervious Area
3,964			10.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0900	0.16		Sheet Flow, sheet flow Woods: Light underbrush n= 0.400 P2= 4.09"
1.8	110	0.0400	1.00		Shallow Concentrated Flow, SC Woodland Kv= 5.0 fps
0.5	109	0.0500	3.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	44	0.0500	12.75	15.65	Pipe Channel, Yard drains 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.2	325	0.0440	31.42	888.36	Pipe Channel, Culvert 72.0" Round Area= 28.3 sf Perim= 18.8' r= 1.50' n= 0.013
13.0	688	Total			

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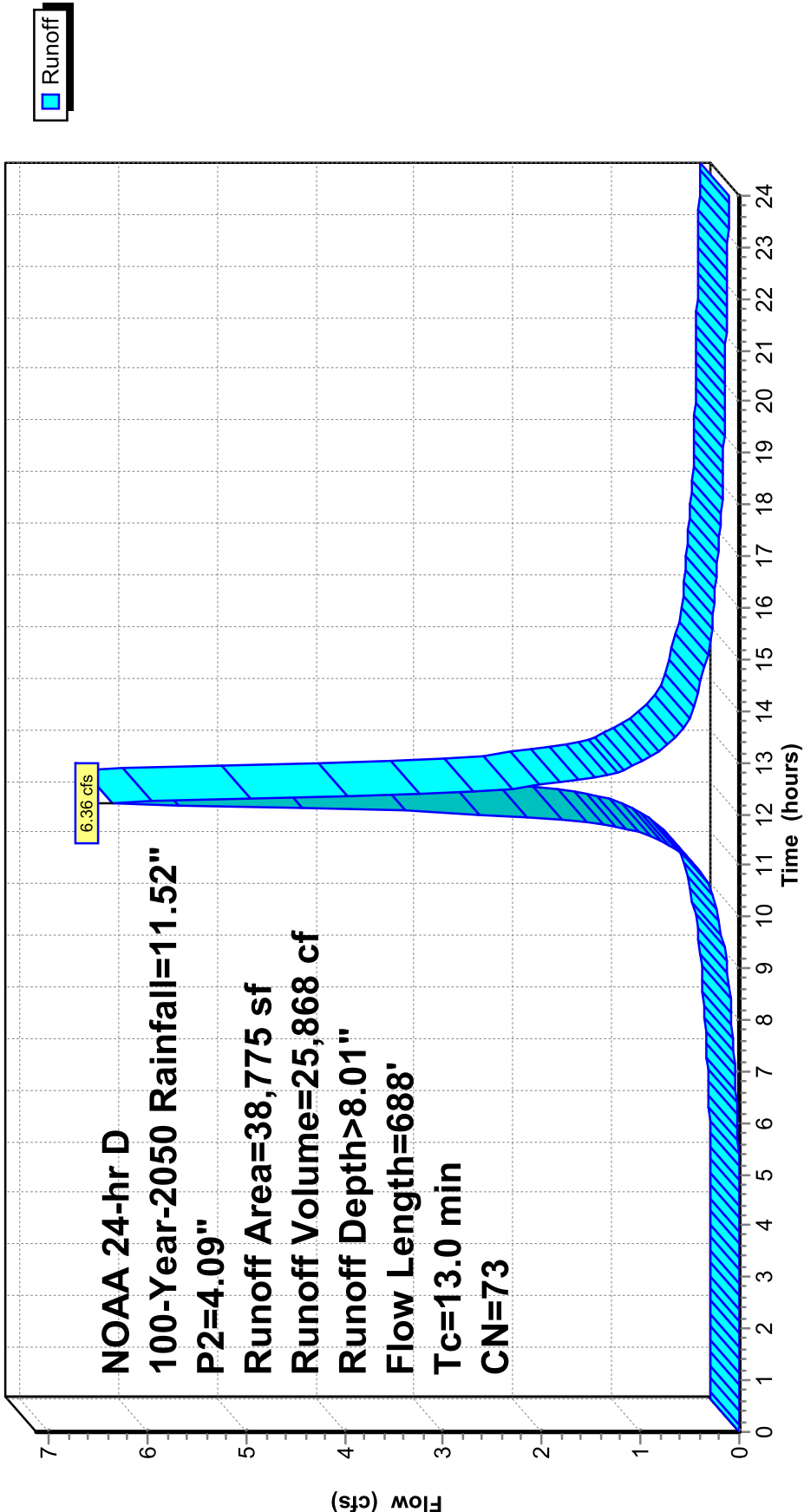
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

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Subcatchment P2: P-2 Pervious-w-offsite-Undisturbed

Hydrograph



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NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

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Summary for Subcatchment P3: P3

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

Runoff = 0.92 cfs @ 12.06 hrs, Volume= 2,748 cf, Depth> 9.25"
Routed to Link P-DP 2 : PROP DP 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

Area (sf)		CN	Description		
*	2,423	74	>75% Grass cover, Good, HSG C		
	1,142	98	Paved parking and s/w, HSG C		
	3,565	82	Weighted Average		
	2,423		67.97% Pervious Area		
	1,142		32.03% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description

Shallow Concentrated Flow, LAWN
Unpaved Kv= 16.1 fps

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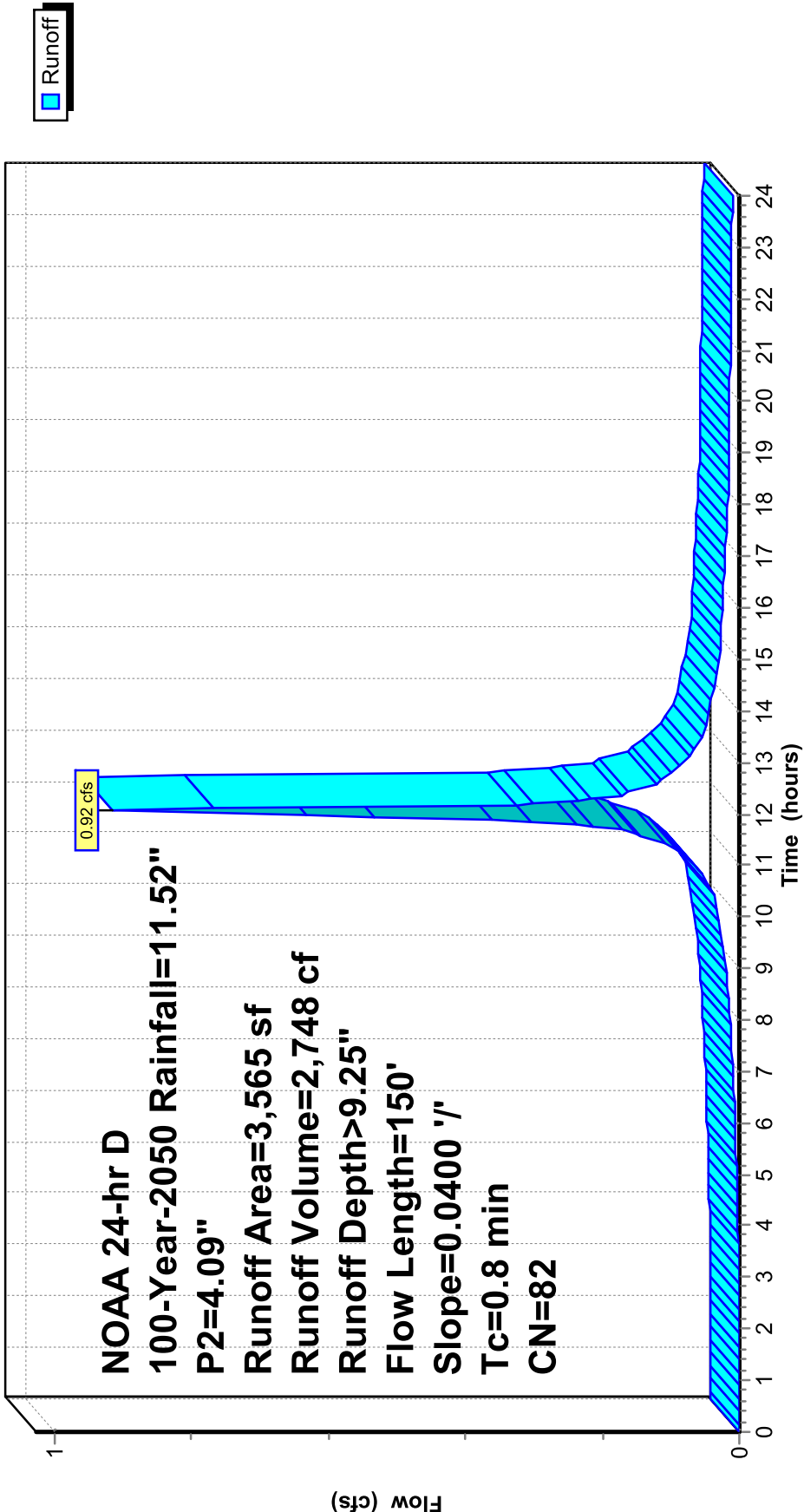
NOAA 24-hr D 100-Year-2050 Rainfall=11.52", P2=4.09"

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Subcatchment P3: P3

Hydrograph



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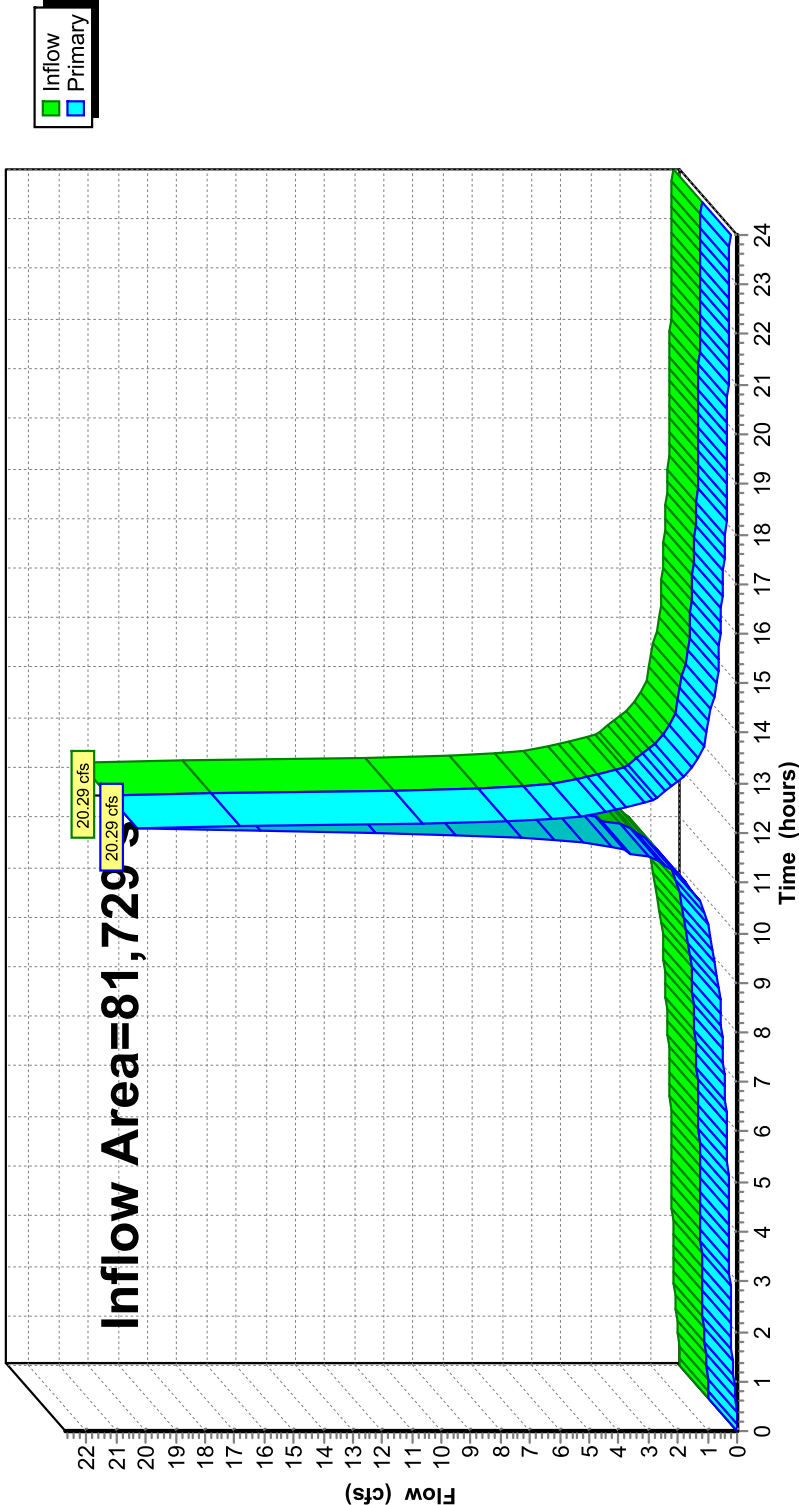
Summary for Link 11L: Proposed Disturbed

Inflow Area = 81,729 sf, 89.33% Impervious, Inflow Depth > 10.94" for 100-Year-2050 event
Inflow = 20.29 cfs @ 12.10 hrs, Volume= 74,514 cf
Primary = 20.29 cfs @ 12.10 hrs, Volume= 74,514 cf, Atten= 0%, Lag= 0.0 min
Routed to Link P-DP 1 : PROP DP 1

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 11L: Proposed Disturbed

Hydrograph



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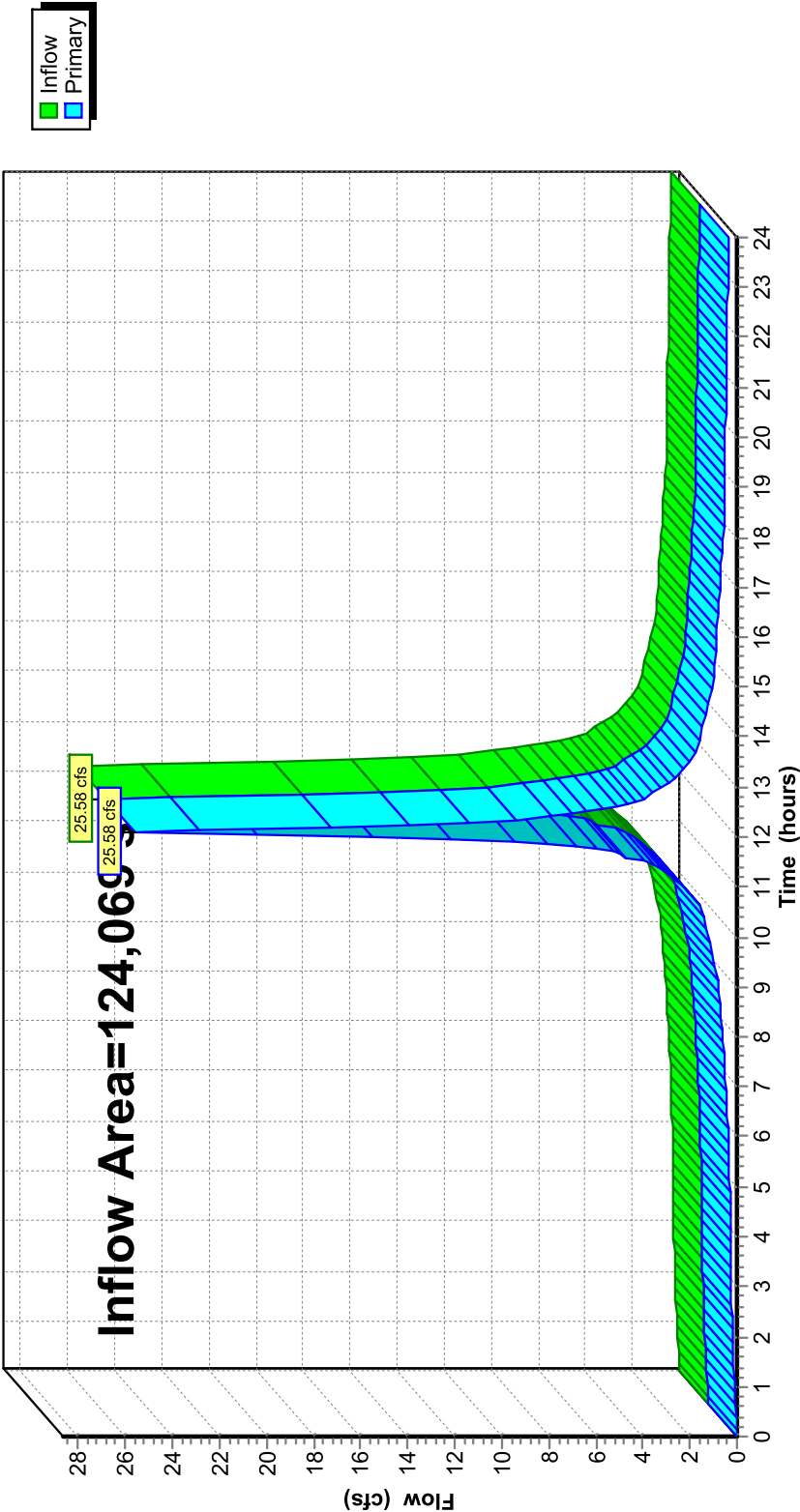
Summary for Link 15L: TOTAL PROPOSED

Inflow Area = 124,069 sf, 62.96% Impervious, Inflow Depth > 9.97" for 100-Year-2050 event
Inflow = 25.58 cfs @ 12.11 hrs, Volume= 103,130 cf
Primary = 25.58 cfs @ 12.11 hrs, Volume= 103,130 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 15L: TOTAL PROPOSED

Hydrograph



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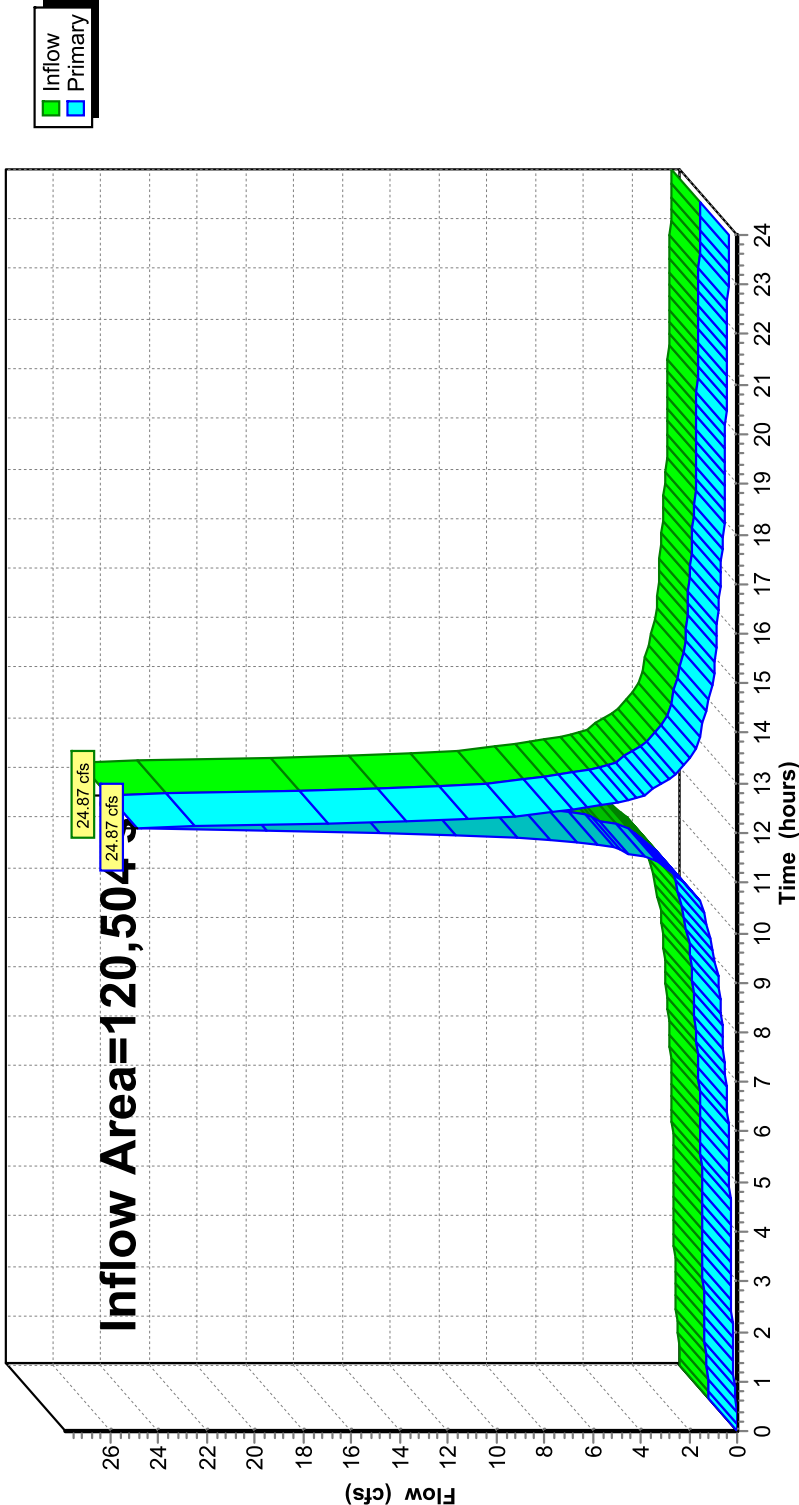
Summary for Link P-DP 1: PROP DP 1

Inflow Area = 120,504 sf, 63.88% Impervious, Inflow Depth > 10.00" for 100-Year-2050 event
Inflow = 24.87 cfs @ 12.11 hrs, Volume= 100,382 cf
Primary = 24.87 cfs @ 12.11 hrs, Volume= 100,382 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 15L : TOTAL PROPOSED

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link P-DP 1: PROP DP 1

Hydrograph



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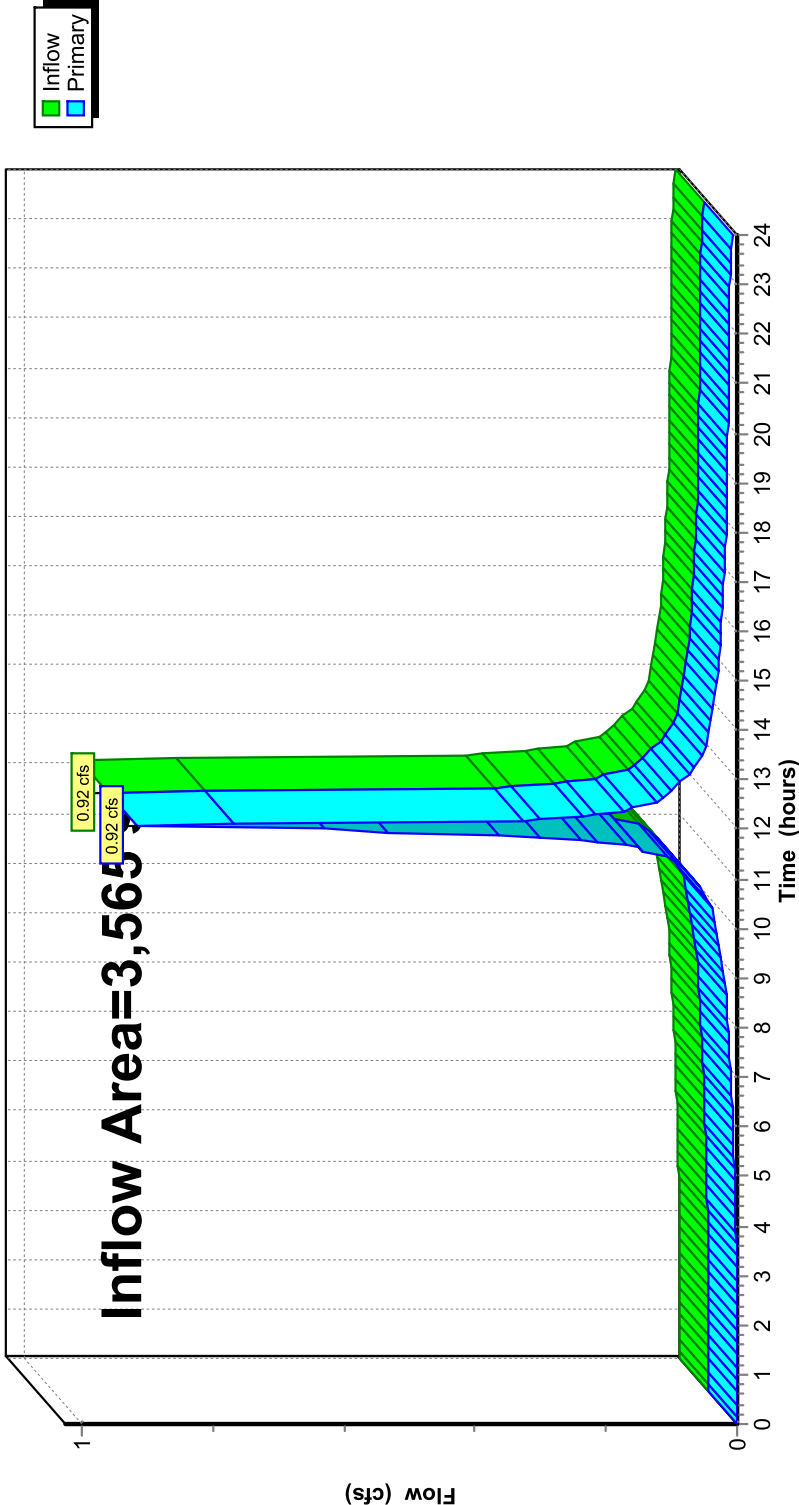
Summary for Link P-DP 2: PROP DP 2

Inflow Area = 3,565 sf, 32.03% Impervious, Inflow Depth > 9.25" for 100-Year-2050 event
Inflow = 0.92 cfs @ 12.06 hrs, Volume= 2,748 cf
Primary = 0.92 cfs @ 12.06 hrs, Volume= 2,748 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 15L : TOTAL PROPOSED

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link P-DP 2: PROP DP 2

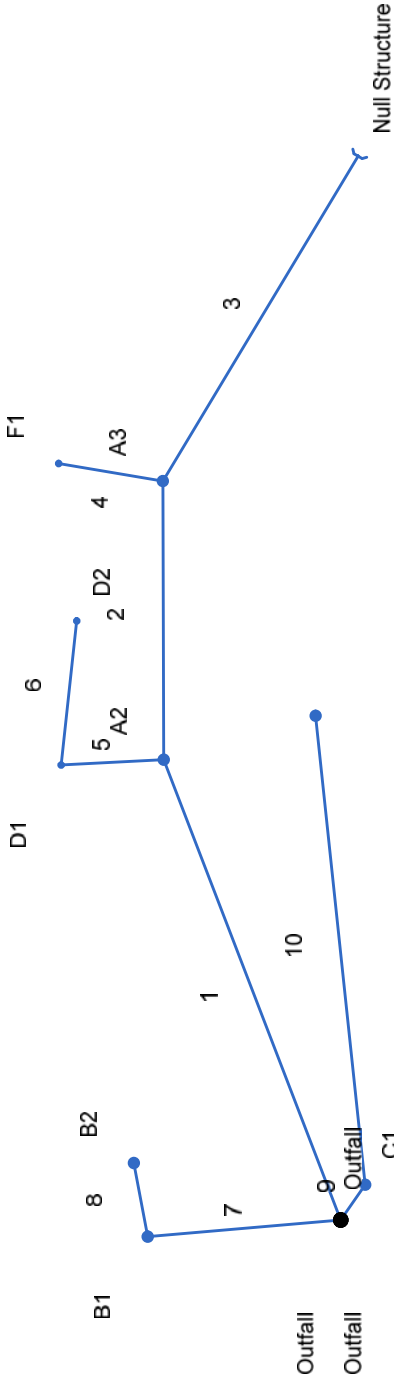
Hydrograph



APPENDIX C

STORM SEWER CAPACITY CALCULATIONS

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Storm Sewer Tabulation

Station		Line	Depth		Profile	Area		T		Vol	Cap	Val	Pipe		Inlet		Outlet		LineID
Line	To Line		In	Top		In	Top	In	Top				In	Top	In	Top	In	Top	
1	End	20'	0.0	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	A-4
2	1	47'	0.0	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	A-4
3	2	49'	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	B-300
4	2	44'	0.4	0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	P-43
5	1	44'	0.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	D-14
6	5	43'	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	E-0
7	End	8'	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	7	3'	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	B-30
9	End	3'	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C-44
10	9	48'	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	D-0

Project File: INLET.stm

Run Date: 10/28/2025

Number of lines: 10

NOTES: Intensity = 150.20 / (Inlet time + 15.60) ^ 0.91; Return period = Yrs. 100 ; c = cir e = ellip b = box

APPENDIX D

NRCS SOIL MAPPING DATA



Map Scale: 1:804 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Essex County, New Jersey
Survey Area Data: Version 21, Aug 28, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 10, 2022—Oct 16, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BouB	Boonton - Urban land, Boonton substratum complex, 0 to 8 percent slopes	2.6	100.0%
Totals for Area of Interest		2.6	100.0%

Essex County, New Jersey

BouB—Boonton - Urban land, Boonton substratum complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: b12f

Elevation: 50 to 500 feet

Mean annual precipitation: 30 to 64 inches

Mean annual air temperature: 46 to 79 degrees F

Frost-free period: 131 to 178 days

Farmland classification: Not prime farmland

Map Unit Composition

Boonton and similar soils: 50 percent

Urban land, boonton substratum: 40 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boonton

Setting

Landform: Ground moraines

Landform position (three-dimensional): Upper third of mountainflank, center third of mountainflank

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Coarse-loamy basal till derived from basalt

Typical profile

A - 0 to 5 inches: loam

BA - 5 to 8 inches: silt loam

BE - 8 to 17 inches: silt loam

Bt - 17 to 30 inches: silt loam

Btx1 - 30 to 40 inches: gravelly fine sandy loam

Btx2 - 40 to 47 inches: fine sandy loam

CBt1 - 47 to 58 inches: loamy sand

CBt2 - 58 to 72 inches: loamy sand

Properties and qualities

Slope: 0 to 8 percent

Depth to restrictive feature: 20 to 36 inches to fragipan

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water

(Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C

Ecological site: F144AY037MA - Moist Dense Till Uplands

Hydric soil rating: No

Description of Urban Land, Boonton Substratum

Setting

Landform: Ground moraines

Landform position (three-dimensional): Lower third of mountainflank, upper third of mountainflank, center third of mountainflank

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Typical profile

H1 - 0 to 12 inches: material

H2 - 12 to 47 inches: silt loam

2CBt1 - 47 to 58 inches: loamy sand

2CBt2 - 58 to 72 inches: loamy sand

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydric soil rating: Unranked

Minor Components

Udorthents, boonton substratum

Percent of map unit: 10 percent

Landform: Ground moraines

Landform position (three-dimensional): Lower third of mountainflank, upper third of mountainflank, center third of mountainflank

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

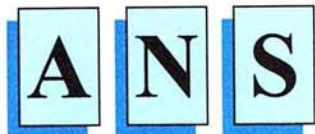
Data Source Information

Soil Survey Area: Essex County, New Jersey

Survey Area Data: Version 21, Aug 28, 2025

APPENDIX E

GEOTECHNICAL REPORT



CONSULTANTS, INC.
4405 South Clinton Avenue
South Plainfield, NJ 07080

Tel: (800) 545-ATUL
(908) 754-8383
Fax: (908) 754-8633

NJ EDA Approved Testing Laboratory • MBE/DBE Certified • NJ DEP Certified
www.ANSConsultants.net

Soil, Concrete, Masonry, Rebar, Asphalt, Structural Steel, Precast, Piles, Caissons, Fire-proofing, Roofing, Soil Boring, Concrete/Rock Coring, UST Removal, Environmental Testing & Reports

September 03, 2024

Gomes Management
P.O. Box 5277
Newark, NJ 07105

Attn: Mr. Jose Pacheco

Re: **Subsurface Soil Investigation & Foundation Recommendation Report**
Proposed 1-story retail building
525 Northfield Avenue
West Orange, NJ 07052
Block # 159.04, Lot # 1.01, 1.02 & 1.03

Dear Mr. Pacheco,

Enclosed, please find three (3) copies of the Subsurface Soil Investigation & Foundation Recommendation Report for the total of eight (8) Soil Borings performed on August 19, 2024; August 20, 2024 and August 21, 2024 at the project referenced above.

Soil samples collected during soil boring program will be discarded after thirty (30) days from the date of this report, if not requested in advance to do otherwise. We thank you very much for providing us an opportunity to service you on this project.

Should you have any questions or require additional information, please do not hesitate to contact the undersigned at (908)754-8383.

Sincerely,
ANS Consultants, Inc.

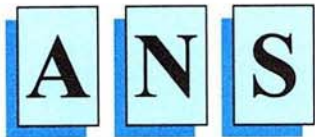
Atulkumar N. Shah, PE, PP, F. ASCE
President
NJ PE License #24GE03443900
ANS/RM

Reported: Gomes Management– (3); File – (1)

File: ANV-6549_01.SB

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September 03, 2024

Gomes Management
P.O. Box 5277
Newark, NJ 07105

Attn: Mr. Jose Pacheco

Re: **Subsurface Soil Investigation & Foundation Recommendation Report**
Proposed 1-story retail building
525 Northfield Avenue
West Orange, NJ 07052
Block # 159.04, Lot # 1.01, 1.02 & 1.03

Dear Mr. Pacheco,

Enclosed, please find three (3) copies of the Subsurface Soil Investigation & Foundation Recommendation Report for the total of eight (8) Soil Borings performed on August 19, 2024; August 20, 2024 and August 21, 2024 at the project referenced above. The soil boring work was performed in accordance with our signed revised proposal dated July 25, 2024.

Our **Scope of Services** included the following:

1. Drilling and full-time inspection of total of eight (8) borings, down to 27'-0" deep or to refusal whichever comes first, recording of groundwater level or depth to bedrock if encountered in the contracted depth.
2. Performance of engineering evaluation to determine the stratification and physical properties of the subsurface materials and to develop and recommend appropriate type of foundation systems.
3. Preparation of a written report summarizing all findings and recommendations.

PROPOSED CONSTRUCTION:

The project site is located at 525 Northfield Avenue, West Orange, NJ in Essex County. At the present time, the subject site consists of 2-story masonry restaurant building with parking lot. We understand that a 1-story retail building is proposed at the subject site. Our recommendations are based upon NJ IBC-2021 ASCE 7-22 and construction material loads for the Building Construction based upon American National Standards. Please see location plan in Appendix-A for the exact location and photographs in Appendix-C for the existing site conditions.

SITE CONDITIONS:

The subject site is located towards north side of Northfield Avenue. The site was noted to be fairly leveled during soil boring activities. The subject site is noted to be primarily surrounded by commercial and residential properties. The subject property is located at approximately Latitude N 40° 46' 13.75", Longitude W 74° 16' 38.96" on the USGS Digital elevation Model. It is at an approximate elevation of 385' above mean sea level. See the site location plan in Appendix-A for more details.

FIELD INVESTIGATION

The soil boring locations were selected and marked by an ANS field representative based upon the location plan provided by the client and also based upon the equipment access. Surface utility mark-out was performed by New Jersey One-Call System. Underground utilities were also cleared by GPR solutions, a Private Utility Mark out Company on August 19, 2024. Once cleared, the soil boring work began on August 19, 2024.

A total of eight (8) soil borings, B-1 to B-8 were drilled during the geo-technical investigation at the site are as follows:

Boring Number	Date Performed	Depth to Groundwater (feet)	Depth of Refusal (feet)
B-1	8/21/2024	-	11'-4"
B-2/2A	8/21/2024	Hole collapsed at 7'-5"	11'-4"
B-3	8/21/2024	Hole collapsed at 7'-2"	9'-5"
B-4	8/20/2024	Hole collapsed at 4'-4"	11'-2"
B-5/5A	8/20/2024	Hole collapsed at 9'-2"	19'-9"
B-6	8/20/2024	11'-1"	25'-7"
B-7	8/19/2024	-	14'-2"
B-8	8/19/2024	8'-9"	19'-2"

The soil boring locations are shown in the Soil Boring Location Plan which is included in Appendix-A. Soil boring work was performed under the direction and supervision of field Engineer Mr. Syed Abbas and Mr. Krunal Parmar. The borings were drilled using a 3" diameter hollow stem auger. Soil encountered was sampled continuously down to a depth of 12'-0" and then at 5'-0" interval down to augur refusal noted between 9'-5" to 19'-9" depth in borings B-1 to B-5, B-7 & B-8. Soil encountered was sampled continuously down to a depth of 12'-0" and then at 5'-0" interval down to spoon refusal noted at 25'-7" depth in boring B-6. Soil samples were extracted using a 2" diameter split spoon sampler as per the procedure specified in ASTM 1586-99.

Samples for the boring were obtained by the Standard Penetration Test (SPT) Method (ASTM D 1586), which consists of driving a 2-inch outside-diameter split-spoon sampler into the soil with a 140-pound weight falling freely from a distance of 30 inches. The samplers were driven in four successive 6-inch increments, with the number of blows per increment being recorded. The number of blows required to advance the sampler in the middle 12 inches is termed as the Standard Penetration Resistance (N-value) and is presented on the Field Test Boring Logs in Appendix-A.

During drilling operations, extracted soil samples were visually examined and classified by our Field Engineer. The soil sample description, Standard penetration test (SPT) blow counts and locations, strata changes, groundwater depth and other pertinent information were recorded on a detailed field log. Soil samples obtained from the split spoon sampler were visually classified according to the Unified Soil Classification System (USCS).

LABORATORY TESTING:

A total of eight (8) soil samples, one each from borings B-1 to B-8 were laboratory tested to determine in-place moisture content and to classify the soil as per Unified Soil Classification System, ASTM-D2487-93. The findings are summarized below. Laboratory test report are enclosed in Appendix -B.

Soil Boring Number	Soil Sample No.	Depth collected	Moisture Content (%)	Fines thru #200 Sieve	USCS Symbol
B-1	S-1	2'- 4'	10.9	31.1	GM
B-2A	S-2	4' - 6'	10.1	19.1	SM
B-3	S-3	6'- 8'	5.5	1.9	GP
B-4	S-4	8'- 10'	8.2	21.0	GM
B-5A	S-5	10'- 12'	5.8	24.7	SM
B-6	S-6	15'- 17'	13.3	28.8	SM
B-7	S-7	4'- 6'	7.5	23.7	SM
B-8	S-8	6'- 8'	14.2	26.3	SM

GM: silty gravels

SM: silty sands

GP: poorly graded gravels

SUBSURFACE CONDITIONS:

Detailed description of the soil encountered in the test boring is documented in the boring log which is presented in Appendix-A. The following gives a general description of the subsurface conditions encountered at the borings. While the borings may indicate that the subsurface conditions appear to be relatively uniform across the site, it should be recognized that the size of borings was small compared to the size of the site, and that the existence of anomalies cannot be precluded.

According to NJ Geoweb website, the geological formation is Rahway Till and geologic age is late Pleistocene, late Wisconsinan deposited directly from glacial ice during the late Wisconsinan glaciation. It consists of clayey silt to sandy silt with some to many pebbles and cobbles and few boulders; reddish brown, reddish yellow, yellowish brown, brown. As much as 100 feet thick, generally less than 40 feet thick.

Based on the results of soil borings and our geo-technical laboratory testing, we estimate the general stratigraphy of the site to consist of the following major units, in an increasing order of depth.

Stratum-1: Fill material containing very dark gray, brown/black silt, trace f/c sand, trace f/c gravel, trace wood chip, trace fragments of concrete, and fill material containing brown, black silty f/c sand, trace f/c gravel, trace fragments of asphalt & glass, plastic and fill material containing grayish brown f/c sand, trace silt, some f/c gray crushed stone and fill material containing dark gray, greenish gray clayey silt, trace f/c sand, trace fine gravel, trace fragments of asphalt was noted under this stratum in top 2'-6" in boring B-1, in top 4' in B-2/2A, in top 4'-11" in B-3, in top 5" in B-4, in top 2' in B-5/5A and in top 9" in B-8. No fill was noted in boring B-6 & B-7. The relative density of this material varied between loose to medium dense condition. The relative stiffness of this material varied between soft to medium stiff condition.

Stratum-2: Brown silt, trace f/c sand, reddish brown silty f/c sand & f/c gravel, trace silt and reddish brown silt, trace f/c sand, trace f/m gravel was noted under this stratum between 4 feet to spoon refusal @ 4'-3" in boring B-1, between 10 feet to spoon refusal @ 10'-9" in boring B-2/2A, between 2 feet to 4 feet & then between 6 feet to 10 feet in B-4, between 4 feet to down to spoon refusal @ 15'-3" in B-5/5A, between 2 feet to down to spoon refusal @ 25'-7" in B-6, down to 12 feet in B-7, between 2 feet to 11 feet & then between 15 feet to 17 feet in B-8. The relative density of this material varied between very loose to very dense condition. The relative stiffness of this material varied between soft to stiff condition.

Stratum-3: Reddish brown, purple f/c sand & f/c gravel, trace silt, was noted under this stratum between 6 feet to 10 feet in B-1, between 6 feet to 10 feet in boring B-2, between 8 feet to down to 9'-2" in B-3, between 10 feet to down to spoon refusal @ 10'-10" in B-4. The relative density of this material varied between medium dense to dense condition.

Stratum-4: Brown f/c sand, trace silt, some f/m gravel, f/c fragments of gray stone, some f/c gravel was noted under this stratum between 10 feet to down to spoon refusal @ 10'-8" in boring B-1, between 6 feet to 8 feet in boring B-3 and in top 24 inches in B-6. The relative density of this material was noted to be in medium dense condition.

Stratum-5: Augur Refusal indicating possible bedrock was encountered between 9'-5" to 19'-9" depth in borings B-1 to B-5, B-7 & B-8.

SUMMARY OF FINDINGS:

Boring Number	Depth in (feet)	Penetration Resistance N-Value	Soil Type	In-Place Soil Bearing Capacity (PSF)	Recommended Soil Bearing Capacity (PSF)
B-1	0 – 2	6	FILL	1200	1000
B-1	2 – 4	13	FILL	2600	2500
B-1	4 – 4'-3"	50/3	SM/GM	+5000	4000
B-1	6 – 7'-5"	137/11	SP/GP	+5000	5000
B-1	8 – 10	53	SP/GP	+5000	5000
B-1	10 – 10'-8"	50/2	SP-SM	+5000	5000
B-1	@11'-4"	Augur Refusal	-	+5000	8000

Boring Number	Depth in (feet)	Penetration Resistance N-Value	Soil Type	In-Place Soil Bearing Capacity (PSF)	Recommended Soil Bearing Capacity (PSF)
B-2/2A	0 – 1'-11"	25	FILL	5000	2500
B-2/2A	2 – 4	12	FILL	2400	2500
B-2/2A	4 – 6	25	FILL	5000	4000
B-2/2A	6 – 8	21	SP/GP	4200	4000
B-2/2A	8 – 10	39	SP/GP	+5000	4500
B-2/2A	10 – 10'-9"	54/3	SM/GM	+5000	5000
B-2/2A	@11'-4"	Augur Refusal	-	+5000	8000

Boring Number	Depth in (feet)	Penetration Resistance N-Value	Soil Type	In-Place Soil Bearing Capacity (PSF)	Recommended Soil Bearing Capacity (PSF)
B-3	0 – 2	14	FILL	2800	1500
B-3	2 – 4	7	FILL	1400	1500
B-3	4 – 6	30	FILL	+5000	4000
B-3	6 – 8	19	SP-SM	3800	4000
B-3	8 – 9'-2"	44/2	SP/GP	+5000	5000
B-3	@ 9'-5"	Augur Refusal	-	+5000	8000

Boring Number	Depth in (feet)	Penetration Resistance N-Value	Soil Type	In-Place Soil Bearing Capacity (PSF)	Recommended Soil Bearing Capacity (PSF)
B-4	0 – 2	9	FILL	1800	1000

B-4	2 – 4	15	SM/GM	3000	2500
B-4	4 – 5'-2"	45/2	GM-SM	+5000	4500
B-4	6 – 8	62	SM/GM	+5000	5000
B-4	8 – 10	94	SM/GM	+5000	5000
B-4	10 – 10'-10"	52/4	SP/GP	+5000	5000
B-4	@11'-2"	Augur Refusal	-	+5000	8000

Boring Number	Depth in (feet)	Penetration Resistance N-Value	Soil Type	In-Place Soil Bearing Capacity (PSF)	Recommended Soil Bearing Capacity (PSF)
B-5/5A	0 – 1'-8"	26	FILL	+5000	1500
B-5/5A	2 – 4	6	FILL	1200	1500
B-5/5A	4 – 6	15	SM/GM	3000	3000
B-5/5A	6 – 8	19	SM/GM	3800	4000
B-5/5A	8 – 10	55	SM/GM	+5000	5000
B-5/5A	10 – 11'-1"	93/7	SM/GM	+5000	5000
B-5/5A	15 – 15'-3"	78/3	SM/GM	+5000	5000
B-5/5A	@19'-9"	Augur Refusal	-	+5000	8000

Boring Number	Depth in (feet)	Penetration Resistance N-Value	Soil Type	In-Place Soil Bearing Capacity (PSF)	Recommended Soil Bearing Capacity (PSF)
B-6	0 – 2	21	SP-SM	4200	1500
B-6	2 – 4	8	SM/GM	1600	1500
B-6	4 – 6	6	SM/GM	1200	1500
B-6	6 – 8	5	SM/GM	1000	1000
B-6	8 – 10	13	SM/GM	2600	2500
B-6	10 – 12	28	SM/GM	+5000	5000
B-6	15 – 17	52	SM/GM	+5000	5000
B-6	20 – 22	47	SM/GM	+5000	5000
B-6	25 – 25'-7"	50/1	SM/GM	+5000	6000

Boring Number	Depth in (feet)	Penetration Resistance N-Value	Soil Type	In-Place Soil Bearing Capacity (PSF)	Recommended Soil Bearing Capacity (PSF)
B-7	0 – 2	16	SM/GM	3200	3000
B-7	2 – 4	17	SM/GM	3400	3500
B-7	4 – 6	23	SM/GM	4600	4000
B-7	6 – 8	7	SM/GM	1400	1500
B-7	8 – 10	10	SM/GM	2000	2000
B-7	10 – 12	18	SM/GM	3600	4000
B-7	@14'-2"	Augur Refusal	-	+5000	8000

Boring Number	Depth in (feet)	Penetration Resistance N-Value	Soil Type	In-Place Soil Bearing Capacity (PSF)	Recommended Soil Bearing Capacity (PSF)
B-8	0 – 2	15	FILL	3000	1500
B-8	2 – 4	25	SM/GM	5000	1500
B-8	4 – 6	5	SM/GM	1000	1000
B-8	6 – 7'-9"	5	SM/GM	1000	1000
B-8	9 – 11	6	SM/GM	1200	1500
B-8	11 – 13	19	SP/GP	3800	3500
B-8	15 – 17	44	SM/GM	+5000	4500
B-8	@19'-2"	Augur Refusal	-	+5000	6000

GROUNDWATER:

Groundwater was encountered in only two borings B-6 & B-8 below existing grade surface as follows:

Boring Number	Depth to Groundwater (feet)	Boring Number	Depth to Groundwater (feet)
B-1	-	B-5	Hole collapsed at 9'-2"
B-2	Hole collapsed at 7'-5"	B-6	11'-1"
B-3	Hole collapsed at 7'-2"	B-7	-
B-4	Hole collapsed at 4'-4"	B-8	8'-9"

It should be noted that groundwater level will fluctuate due to variations in rainfall or other factors not evident at the time of our investigation.

SEASONAL HIGH WATER TABLE:

Signs of black mottling was noted at 6 feet depth in only boring B-7, indicating SHWT below 6 feet.

CONCLUSIONS:

1. Groundwater was encountered at 11'- 1" in B-6 and at 8'- 9" in B-8 below existing grade surface. Consequently, we anticipate that groundwater management during construction will be critical.
2. Signs of black mottling was noted at 6 feet depth in only boring B-7, indicating SHWT below 6 feet.
3. Fill was noted in top 2'-6" in boring B-1, in top 4' in B-2/2A, in top 4'-11" in B-3, in top 5" in B-4, in top 2' in B-5/5A and in top 9" in B-8. Below fill, the majority of the on-site soil consists of silt with trace f/c sand & trace f/m gravel. The onsite soil will be suitable as structural fill. Depending upon the time of the year when the actual construction takes place, drying of excavated sandy soil and aeration may be required to reduce the moisture content. In-situ moisture content of soil varied between 5.5 % to 14.2 % which is generally considered moist.
4. The following parameters should be used for seismic design of the building in accordance with **IBC-2021 ASCE 7-22**:

Description	Parameter	Recommended value
Mapped Spectral Acceleration for short periods:	S _s	0.27
Mapped Spectral Acceleration for 1-sec period:	S ₁	0.05
Site Class:	C	Very dense Soil & Soft Rock
5 percent damped Design spectral response acceleration at short periods:	S _{DS}	0.18
5 percent damped Design spectral response acceleration at 1-sec periods:	S _{D1}	0.043

The following parameters should be used for seismic design of the building in accordance with **IBC-2018- ASCE 7-16**:

Description	Parameter	Recommended Value
Mapped Spectral Acceleration for short periods:	S _s	0.282
Mapped Spectral Acceleration for 1-sec period:	S ₁	0.059
Site Class:	C	Very dense Soil & Soft Rock
Site Coefficient:	F _a	1.3
Site Coefficient:	F _v	1.5
5 percent damped Design spectral response acceleration at short periods:	S _{DS}	0.245
5 percent damped Design spectral response acceleration at 1-sec periods:	S _{D1}	0.059

5. Any fill used as backfill material within the building and pavement areas should consist of approved portions of the on-site granular soils, which have been maintained at moisture contents suitable for compaction or select fill should be imported. All fill should be placed in lift in the order of twelve (12) inches in loose thickness and be uniformly compacted to at least 95% of its maximum dry density as determined by the modified proctor density values derived based upon ASTM D-1557-98 test procedure.

In addition, we recommend that backfill soil placed in confined areas, such as foundation or utility excavations, should be spread in lifts in the order of six (6) to eight (8) inches in loose thickness and it should be compacted to the same degree using manually operated vibratory compaction equipment. We recommend that temporary construction slopes be established at one vertical to two horizontal, or flatter, or as required by the governing safety codes.

FOUNDATION DESIGN CRITERIA:

As per the r2-coastal-fema.hub.arcgis.com website and FIRM-(flood insurance rate map), the Effective Flood Zone of the subject property is AE. The properties in these flood zones have a 1% chance of flooding each year.

Fill was noted in top 2'-6" in boring B-1, in top 4' in B-2/2A, in top 4'-11" in B-3, in top 5" in B-4, in top 2' in B-5/5A and in top 9" in B-8. We recommend that the foundation for the proposed 1-story retail building shall be supported by conventional shallow foundations established on the medium dense soil noted at 4' to 6' depth below grade. Foundation should be designed to impose maximum allowable net bearing pressure of 2,000 pounds per square foot. Excavation down to 10 feet depth will be required in borings B-6, B-7 & B-8 to get net bearing pressure of 4,000 psf. A complete removal of fill is recommended.

Any pockets of localized unsuitable soil encountered during foundation excavation should be completely removed. The over excavated area should be backfilled utilizing either controlled compacted fill or 3/4" size clean gravels. Any footing or slab placed in this area will require over excavation, removal of unsuitable material and backfilling with 3/4 size stones or controlled compacted fill. Placing additional reinforcing steel to strength the footing over soft soil may be required.

We recommend that exterior foundations be established at least three feet six inches below the adjacent exterior grade, or as required by local ordinance, to provide protection from frost penetration. The maximum post-construction settlements of foundations designed and constructed in accordance with our recommendations will be in the order of 3/4" or less.

FLOOR SLAB DESIGN CRITERIA:

Removal of fill from top 2'-6" in boring B-1, from top 4' in B-2/2A, from top 4'-11" in B-3, from top 5" in B-4, from top 2' in B-5/5A and from top 9" in B-8 will be required. The floor slab or patio slab shall be supported directly on the compacted sub-grade of onsite material or controlled compacted structural fill. Compaction of the sand below the floor slab sub-grade to 95% of its optimum density will be required. We recommend performing compaction test at the rate of one test per 200-sq.ft area. Recommended Modulus of Sub-Grade reaction is 75 pci.

Any back fill required for the structural area to be off site or $\frac{3}{4}$ " clean crushed stones may be utilized to minimize the influence of moisture on the first fill layer. All off-site fill should be composed of relatively well graded sand and gravel containing less than 15% by weight passing U.S. Standard #200 sieve and having a maximum particle size of six inches.

Acceptable soil materials for backfill and fill should be free of clay, rock or gravel larger than six (6) inches in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter and it should comply with ASTM D-2487-91 soil classification groups GW, GP, SM, SW and SP.

All fill should be placed in lifts in the order of twelve (12) inches in loose thickness and it should be uniformly compacted to at least 95% of its maximum dry density as determined by the modified proctor density values derived based upon ASTM D-1557-93 test procedure. In addition, we recommend that backfill soils placed in confined areas, such as foundation or utility excavations, should be spread in lifts in the order of six to eight inches in loose thickness and be compacted to the same degree using manually operated vibratory compaction equipment.

BELOW GRADE WALLS:

We recommend that the exterior building walls should be constructed with a continuous perimeter foundation drain to convey localized groundwater seepage away from the building and prevent the hydrostatic pressures built-up against the walls. The drain could consist of a 6 to 8 inch diameter PVC pipe surrounded on all sides by a minimum of six (6) inches of clean $\frac{3}{8}$ " crushed gravel. The pipe should drain by gravity to the site storm water system, if feasible, or should be connected to a sump pit where any water could be removed by pumping.

Soil Unit weight (total):	120 pcf
Angle of Internal Friction:	31 degrees
Coefficient of sliding friction:	0.4
Coefficient of active earth pressure:	0.28
Coefficient of passive earth pressure:	3.57

RECOMMENDATIONS FOR THE EARTHWORK FOUNDATION CONSTRUCTION:

Clearing and Stripping: Clearing and stripping would include removing vegetation and any boulders or any loose or unsuitable soil at the distance of 5 feet beyond the limits of the proposed building excavation, structure and paved areas. Limits of stripping should conform to construction permit limitations.

Soil Erosion and Sediment Control: Clearing and stripping should be performed in accordance with the requirements of the soil erosion and sediment control plan and environment permits.

Protection of Utilities: Existing utilities, in the area of construction should be marked to protect from damage during excavation and foundation construction. Excavations should be stopped if they could potentially undermine existing utilities.

Excavation & side slope: An unbraced excavation slope of 2.0 horizontal to 1 vertical or flatter may be considered in the planning for construction. Sheet piling and bracing, and or slope stabilization systems should be used wherever the unbraced slope passes beneath utilities or structures, the active roadway abutments and/or where it is found to be necessary or more cost effective to use sheet piling in order to limit the size of the excavations and maintain traffic. Sheet piling and bracing systems and excavation slopes may be designed using the soil properties presented in summary table provided earlier.

Proof rolling and compaction of Pavement and Fill Subgrades: Following stripping or excavation to plan elevations, all subgrades for placement of new foundation or parking lot pavement should be proof rolled using a vibratory roller with minimum 1 ton static weight in confined areas along side walls and 10 tons static weight in the footprint of the building and general roadway paved areas. Footing subgrades should be compacted with small area vibratory plate compactors. Proof rolling should be observed and evaluated by a qualified Geotechnical engineer or technician familiar with site conditions.

MINIMUM PAVEMENT DESIGN SECTIONS:

ACCESS ROAD AND TRUCK TRAFFIC AREAS

Bituminous Concrete Surface Course (NJDOT I-5)	2 inches
Bituminous Concrete Base Course (NJDOT I-2)	4 inches
Quarry Process Sub-Base Course (NJ DOT DGA)	<u>6 inches</u>
TOTAL SECTION THICKNESS	12 inches

AUTOMOBILE PARKING AREAS

Bituminous Concrete Surface Course (NJDOT I-5)	2 inches
Bituminous Concrete Base Course (NJDOT I-2)	3 inches
Quarry Process Sub-Base Course (NJ DOT DGA)	<u>4 inches</u>
TOTAL SECTION THICKNESS	9 inches

As previously discussed, it is recommended that the loose soils at the surface should be proof rolled and densified with a heavy vibratory compactor. With this recommended compaction, a CBR value of six (6) would be appropriate for use in the design of flexible pavements over site soils with imported granular fill, the CBR could be about eight (8).

RECOMMENDED SERVICES:

It is recommended that we should be retained to provide continuous observation and Soil engineering services during the excavation and foundation construction phases of the work. This is to observe compliance with the design concepts, specifications and recommendations, and to allow design changes in the event that subsurface conditions differ from those anticipated prior to start of construction.

LIMITATIONS:

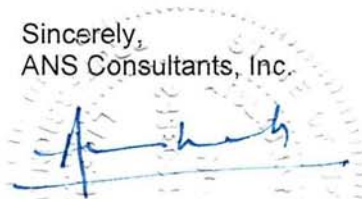
The recommendations contained in this report are our best professional judgment as

to be followed in the design and construction of the proposed project. There may be subsurface conditions not disclosed by the explorations adequately identify subsurface conditions for the purpose of this study. If during construction any differences are found between the report of the explorations and the actual subsurface conditions, they should be brought to our attention immediately so that the effect in our recommendations can be evaluated.

This report has been prepared in accordance with generally accepted Geo-technical Engineering practices for the exclusive use of our client, Gomes Management and their designated representative(s). No other warranty, express or implied, is made. Contractors' wishes to use the soil boring information may do at their own risk. Unless specifically indicated to the contrary in this report, this report does not address environmental considerations, which may affect the site development. The conclusions and recommendations of this report are not intended to supersede or overlook any N.J.D.E.P. Environmental conditions, which should be reflected in the site planning.

Should you have any questions or require additional information, please do not hesitate to contact the undersigned at (908)754-8383.

Sincerely,
ANS Consultants, Inc.

A handwritten signature in blue ink, appearing to read 'Atulkumar N. Shah', is written over a faint, circular, textured background.

Atulkumar N. Shah, PE, PP, F. ASCE
President
NJ PE License #24GE03443900
ANS/RM

Reported: Gomes Management– (3); File – (1)

Appendix - A

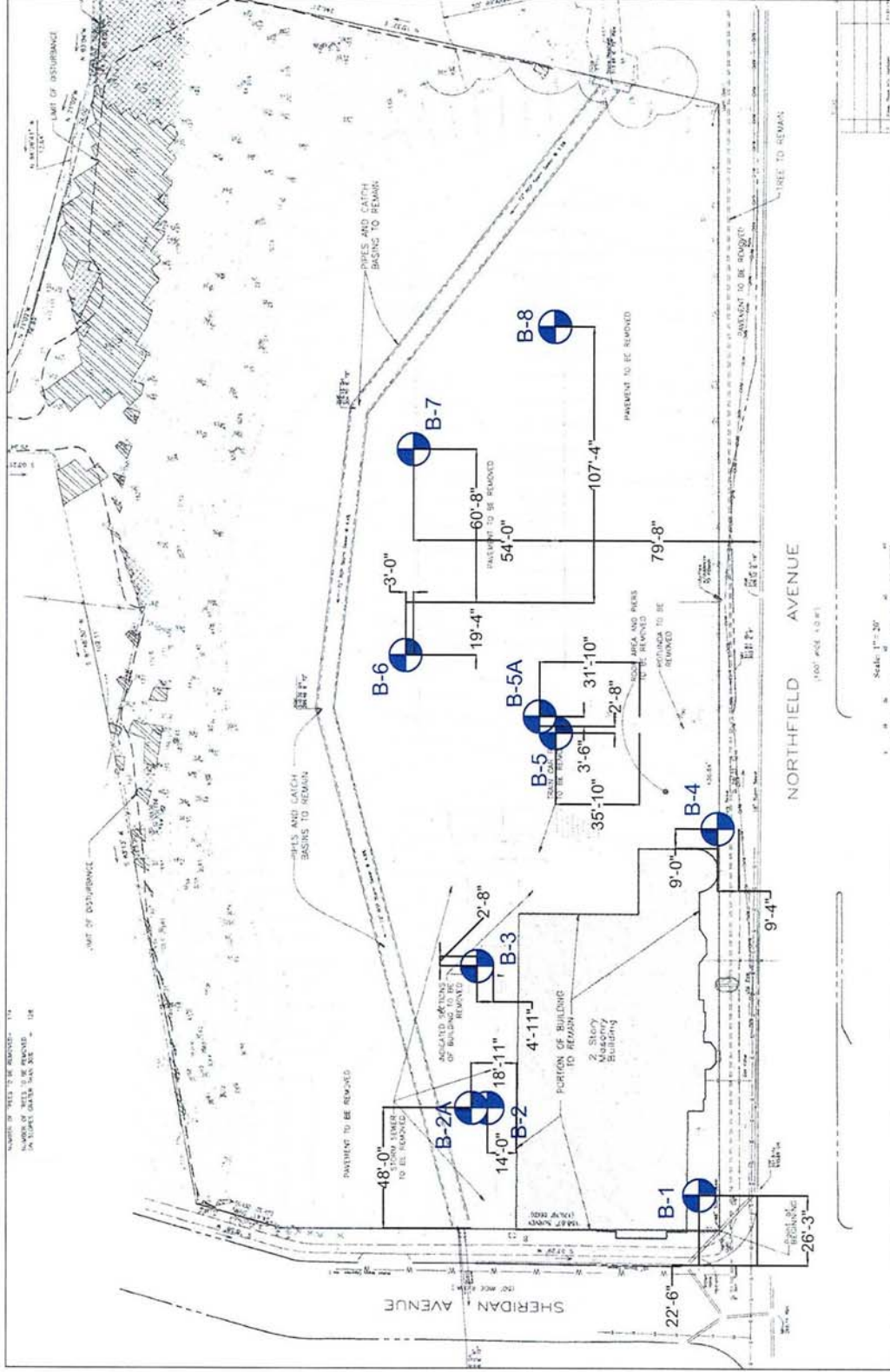
GOOGLE MAP



Client: Gomes Management
Project: 525 Northfield Avenue
West Orange, NJ



CONSULTANTS, INC.
4405 South Clinton Avenue
South Plainfield, NJ 07080



Soil Boring Location

SOIL BORING LOCATION PLAN

SCALE: N.T.S

Project No: ANV-6549

DRILL HOLE LOG

BORING NO.: B-1

PROJECT: Proposed 1-story retail building
 CLIENT: Gomes Management
 LOCATION: 525 Northfield Avenue, West Orange, NJ
 DRILLER: JESUS, David & A. SHAH
 DRILL RIG: ACKER XLS
 DEPTH TO WATER> INITIAL ∇ :

PROJECT NO.: ANV-6549
 DATE: 8-21-2024
 ELEVATION: N/A
 LOGGED BY: Krunal Parmar

AT COMPLETION ∇ :

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
0									10 30 50
		2- 3- 3- 1	FILL	Fill material containing very dark gray, brown silt, trace f/c gravel, trace wood chip, moist, soft.			0'-2'	6	
		2- 3- 10 - 26	FILL	Fill material containing brown, black silt, trace fine gravel, trace wooden chip, moist, medium stiff. @ 2'-7": Brown silt, trace f/c sand, some f/c gravel, moist, medium stiff.			2'-4'	13	
		50/ 3	SM/GM	Brown silt, trace f/c sand, coarse gravel at tip of the spoon, moist, dense.			4'-4'3"	50/	
6		30- 60-	SP/GP	Spoon Refusal @ 4'-3". Augured down to 6 feet.			6'-7'5"	137	137
		77/ 5	SP/GP	Reddish brown and purple f/c sand and f/c gravel, trace silt, slightly moist, very dense.			8'-10'	53	
9		28- 28- 25- 45	SP/GP	Spoon Refusal @ 7'-5". Augured down to 8 feet. Reddish brown f/c sand and f/c gravel, trace silt, slightly moist, very dense.			10'-10'8"	50/	
		63- 50/ 2	SP-SM	Brown f/c sand, trace silt, some f/m gravel, slightly moist. Spoon Refusal @ 10'-8". Augur Refusal @ 11'-4". End of boring.					
12									
15									
18									
21									

This information pertains only to this boring and should not be interpreted as being indicative of the site.

DRILL HOLE LOG

BORING NO.: B-2/B-2A

PROJECT: Proposed 1-story retail building
CLIENT: Gomes Management
LOCATION: 525 Northfield Avenue, West Orange, NJ
DRILLER: JESUS, David & A. SHAH
DRILL RIG: ACKER XLS
DEPTH TO WATER> INITIAL ∇ :

PROJECT NO.: ANV-6549
DATE: 8-21-2024
ELEVATION: N/A
LOGGED BY: Krunal Parmar

AT COMPLETION  :

[illegible]

Augur refusal was encountered at 1'-11" at B-2 location, so the location was moved to B-2A. (Please refer location plan).

Hole collapsed at 7'-5" for Ground Water.

This information pertains only to this boring and should not be interpreted as being indicative of the site.

DRILL HOLE LOG

BORING NO.: B-3

PROJECT: Proposed 1-story retail building
 CLIENT: Gomes Management
 LOCATION: 525 Northfield Avenue, West Orange, NJ
 DRILLER: JESUS, David & A. SHAH
 DRILL RIG: ACKER XLS
 DEPTH TO WATER> INITIAL ∇ :

PROJECT NO.: ANV-6549
 DATE: 8-21-2024
 ELEVATION: N/A
 LOGGED BY: Krunal Parmar

AT COMPLETION ∇ :

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
0									10 30 50
		6- 5- 9- 7	FILL	Asphalt-4". Fill material containing brown silty f/c sand and f/c gravel, trace silt, moist, slightly compact.			0'-2'	14	
		4- 3- 4- 1	FILL	Fill material containing dark gray, brown silt, trace f/c sand, little f/c gravel, trace fragments of glass, plastic, slightly wet, soft.			2'-4'	7	
3		1- 0- 30 -9	FILL	Fill material containing dark gray, brown silt, trace f/c sand, little f/m gravel, slightly wet. @ 5': Brown f/c sand, trace silt, some f/c gravel, moist, medium dense.			4'-6'	30	
6		70- 12- 7- 8	SP-SM	Brown f/c sand, trace silt, f/c fragments of gray stone, some f/c gravel, dry, medium dense.			6'-8'	19	
		14- 30- 14/ 2	SP/GP	Reddish brown f/c sand and f/c gravel, trace silt, moist, dense. Spoon Refusal @ 9'-2". Augur Refusal @ 9'-5". End of boring.			8'-9'2"	44/	
9									
12									
15									
18									
21									

Note: Hole collapsed at 7'-2" for Ground Water.

This information pertains only to this boring and should not be interpreted as being indicative of the site.

DRILL HOLE LOG

BORING NO.: B-4

PROJECT: Proposed 1-story retail building
 CLIENT: Gomes Management
 LOCATION: 525 Northfield Avenue, West Orange, NJ
 DRILLER: JESUS, David & A. SHAH
 DRILL RIG: ACKER XLS
 DEPTH TO WATER> INITIAL ∇ :

PROJECT NO.: ANV-6549
 DATE: 8-20-2024
 ELEVATION: N/A
 LOGGED BY: Krunal Parmar

AT COMPLETION ∇ :

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
0									10 30 50
			FILL	Asphalt-4". Fill material containing grayish brown f/c sand, trace silt, some f/c gray crushed stone, moist, loose.			0'-2'	9	
			SM/GM	@ 6": Brown clayey silt, trace f/c sand, trace f/m gravel, slightly wet, soft.			2'-4'	15	
3			GM-SM	Reddish brown silt, trace f/c sand, trace f/m gravel, moist, medium stiff. Augured down to 4 feet.			4'-5'2"	45/	
			SM/GM	Reddish brown silt, little f/c gravel, trace f/c sand, moist, dense. Spoon Refusal @ 5'-2". Augured down to 6 feet.			6'-8'	62	
6			SM/GM	Reddish brown silty f/c sand, little f/c gravel, moist, very dense.			8'-10'	94	
			SP/GP	Reddish brown f/c sand and f/c gravel, trace silt, moist, very dense. Spoon Refusal @ 10'-10". Augur Refusal @ 11'-2".			10'-10'9"	52/	
12				End of boring.					
15									
18									
21									

Hole collapsed at 4'-4" for Ground Water.

This information pertains only to this boring and should not be interpreted as being indicative of the site.

DRILL HOLE LOG

BORING NO.: B-5/B-5A

PROJECT: Proposed 1-story retail building
 CLIENT: Gomes Management
 LOCATION: 525 Northfield Avenue, West Orange, NJ
 DRILLER: JESUS, David & A. SHAH
 DRILL RIG: ACKER XLS
 DEPTH TO WATER> INITIAL ∇ :

PROJECT NO.: ANV-6549
 DATE: 8-20-2024
 ELEVATION: N/A
 LOGGED BY: Krunal Parmar

AT COMPLETION ∇ :

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
0									10 30 50
		8- 11-	FILL	Asphalt-3". Fill material containing reddish brown silty f/m sand and f/c gravel, moist, medium dense. Spoon refusal @ 1'-8"			0'-1'8"	26	
		15- 10/ 2	FILL	Augur refusal @ 1'-8"					
		1- 2- 4- 19		Augured down to 2 feet. Fill material containing dark brown silty f/c sand, little f/c gravel, trace fragments of asphalt, moist, loose.			2'-4'	6	
3		21- 8- 7- 7	SM/GM	Reddish brown silty f/c sand, some f/c gravel, moist, slightly compact. Augured down to 6 feet.			4'-6'	15	
6		4- 7- 12- - 12	SM/GM	Reddish brown silt, little f/c sand, trace f/c gravel, moist, stiff.			6'-8'	19	
		12- 25-	SM/GM	Reddish brown silty f/c sand, some f/c gravel, moist, very dense.			8'-10'	55	
9		30- 35							
		26- 62- 31/ 1	SM/GM	Reddish brown silty f/c sand, little f/c gravel, moist, very dense. Spoon Refusal @ 11'-1". Augured down to 15 feet.			10'-11'	93/	93/
12									
		78/ 3	SM/GM	Reddish brown silty f/c sand, little f/m gravel, moist. Spoon Refusal @ 15'-3". Augur Refusal @ 19'-9".			15'-15'3"	78/	78/
15									
18									
21				End of boring.					

Augur refusal was encountered @ 1'-8" at B-5 location, so the location was moved to B-5A location.
 (Please refer location plan).

Hole collapsed at 9'-2" for Ground Water.

This information pertains only to this boring and should not be interpreted as being indicative of the site.

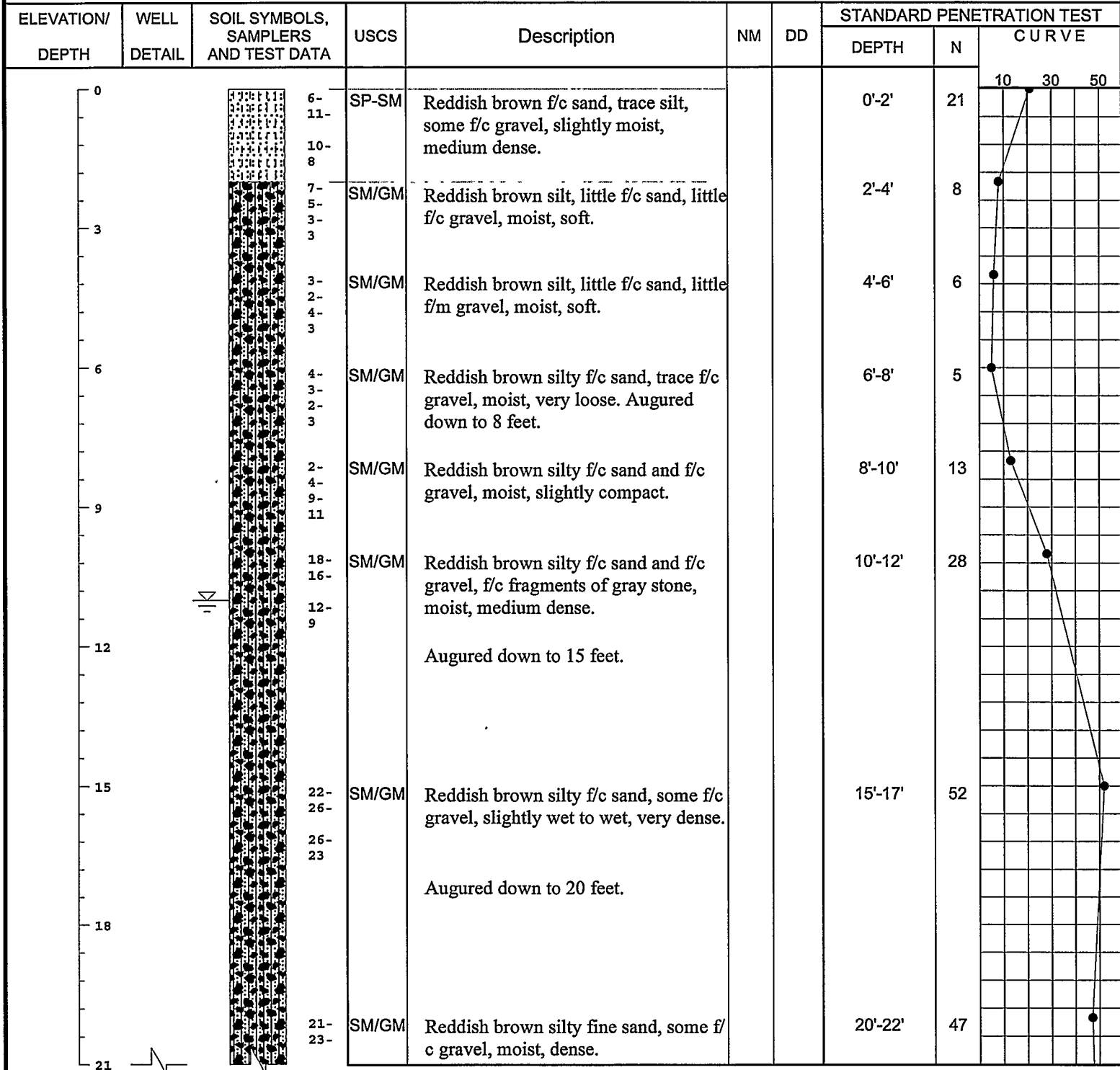
DRILL HOLE LOG

BORING NO.: B-6

PROJECT: Proposed 1-story retail building
 CLIENT: Gomes Management
 LOCATION: 525 Northfield Avenue, West Orange, NJ
 DRILLER: JESUS, David & A. SHAH
 DRILL RIG: ACKER XLS
 DEPTH TO WATER> INITIAL ∇ : 11'-1"

PROJECT NO.: ANV-6549
 DATE: 8-20-2024
 ELEVATION: N/A
 LOGGED BY: Krunal Parmar

AT COMPLETION ∇ :



This information pertains only to this boring and should not be interpreted as being indicative of the site.

BORING NO.: B-6

PROJECT NO.: ANV-6549

[illegible]

DRILL HOLE LOG

BORING NO.: B-7

PROJECT: Proposed 1-story retail building
 CLIENT: Gomes Management
 LOCATION: 525 Northfield Avenue, West Orange, NJ
 DRILLER: JESUS, David & A. SHAH
 DRILL RIG: ACKER XLS
 DEPTH TO WATER> INITIAL ∇ :

PROJECT NO.: ANV-6549
 DATE: 8-19-2024
 ELEVATION: N/A
 LOGGED BY: Krunal Parmar

AT COMPLETION ∇ :

ELEVATION/ DEPTH	WELL DETAIL	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	NM	DD	STANDARD PENETRATION TEST		
							DEPTH	N	CURVE
0									10 30 50
		16-10-	SM/GM	Asphalt-2.5". Dark brown silty f/c sand, some f/c gravel, moist, slightly compact.			0'-2'	16	
		6-7							
		9-8-9-5	SM/GM	Reddish brown silty f/c sand and f/c gravel, moist, medium dense.			2'-4'	17	
3									
		6-9-14-7	SM/GM	Reddish brown silty f/c sand, some f/c gravel, moist, medium dense. Augured donw to 6 feet.			4'-6'	23	
6									
		6-4-3-5	SM/GM	Brown silty f/c sand, some f/c gravel, black sign of mottling, moist, loose.			6'-8'	7	
		5-4-6-5	SM/GM	Reddish brown silty f/c sand, little f/c gravel, moist, loose.			8'-10'	10	
9									
		10-9-9-17	SM/GM	Dark brown silty f/c sand, some f/c gravel, moist to slightly moist, medium dense.			10'-12'	18	
12									
				Augur Refusal @ 14'-2".					
15									
				End of boring.					
18									
21									

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

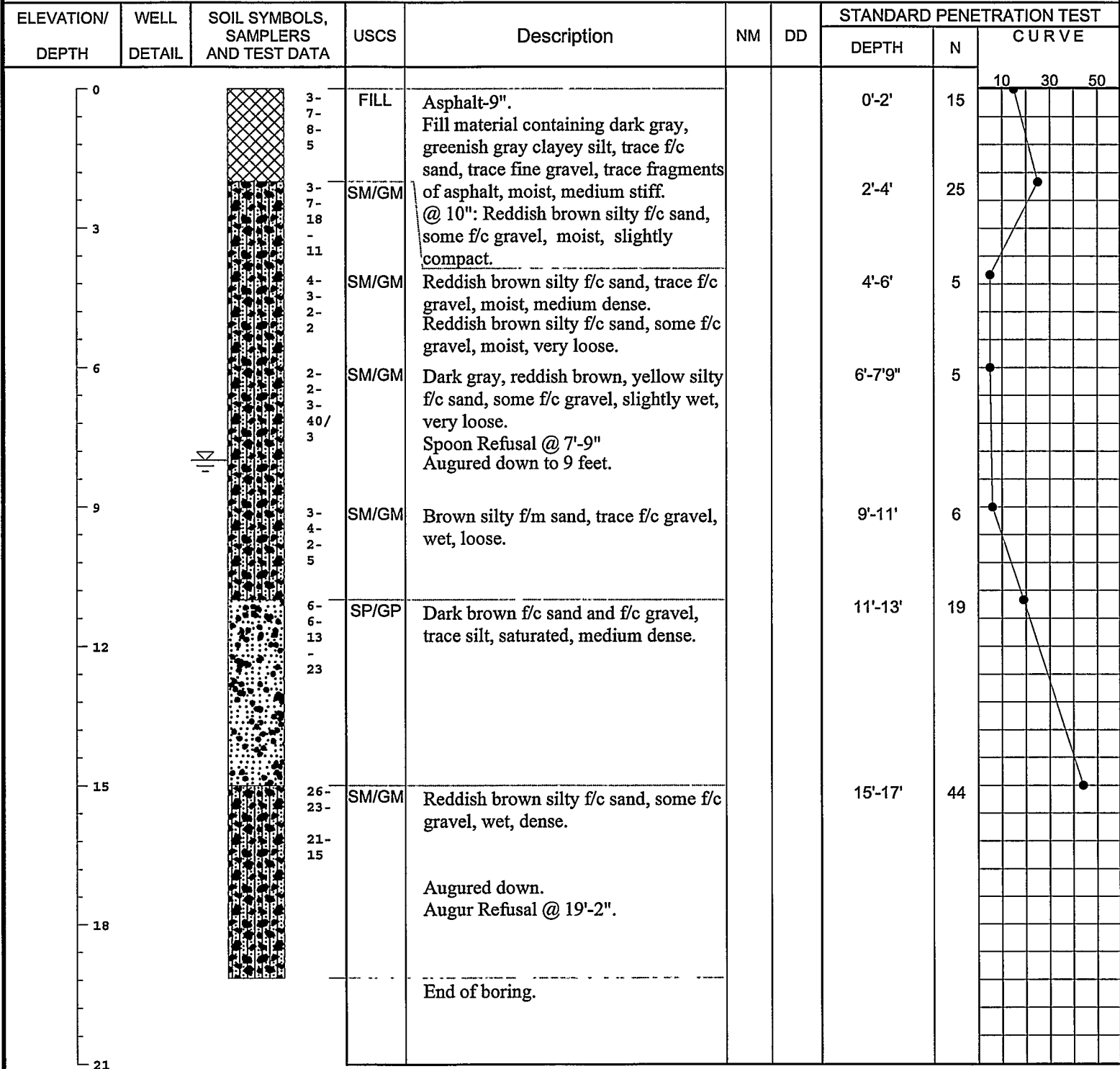
DRILL HOLE LOG

BORING NO.: B-8

PROJECT: Proposed 1-story retail building
 CLIENT: Gomes Management
 LOCATION: 525 Northfield Avenue, West Orange, NJ
 DRILLER: JESUS, David & A. SHAH
 DRILL RIG: ACKER XLS
 DEPTH TO WATER> INITIAL ∇ : 8'-9"

PROJECT NO.: ANV-6549
 DATE: 8-19-2024
 ELEVATION: N/A
 LOGGED BY: Krunal Parmar

AT COMPLETION ∇ :



This information pertains only to this boring and should not be interpreted as being indicative of the site.

KEY TO SYMBOLS

Symbol Description

Strata symbols



Fill



Silty sand and gravel



Poorly graded sand
and gravel



Poorly graded sand
with silt



Blank

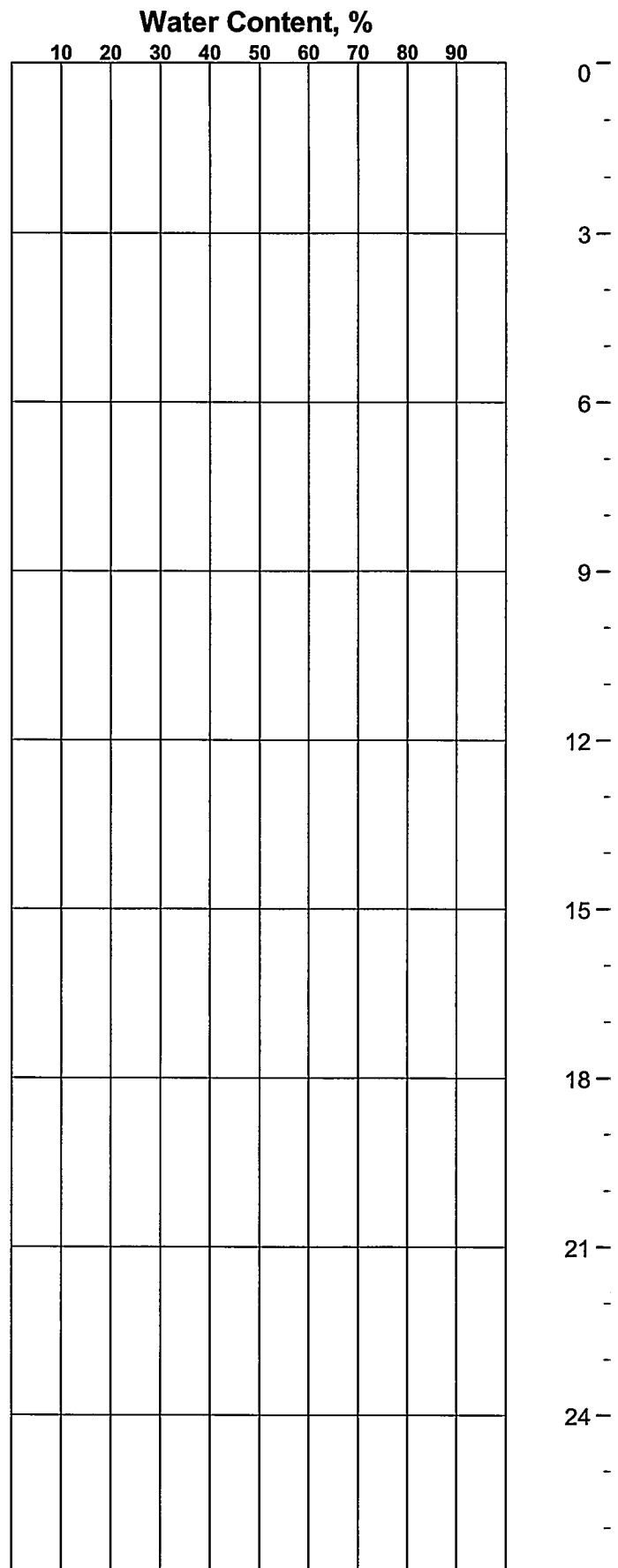
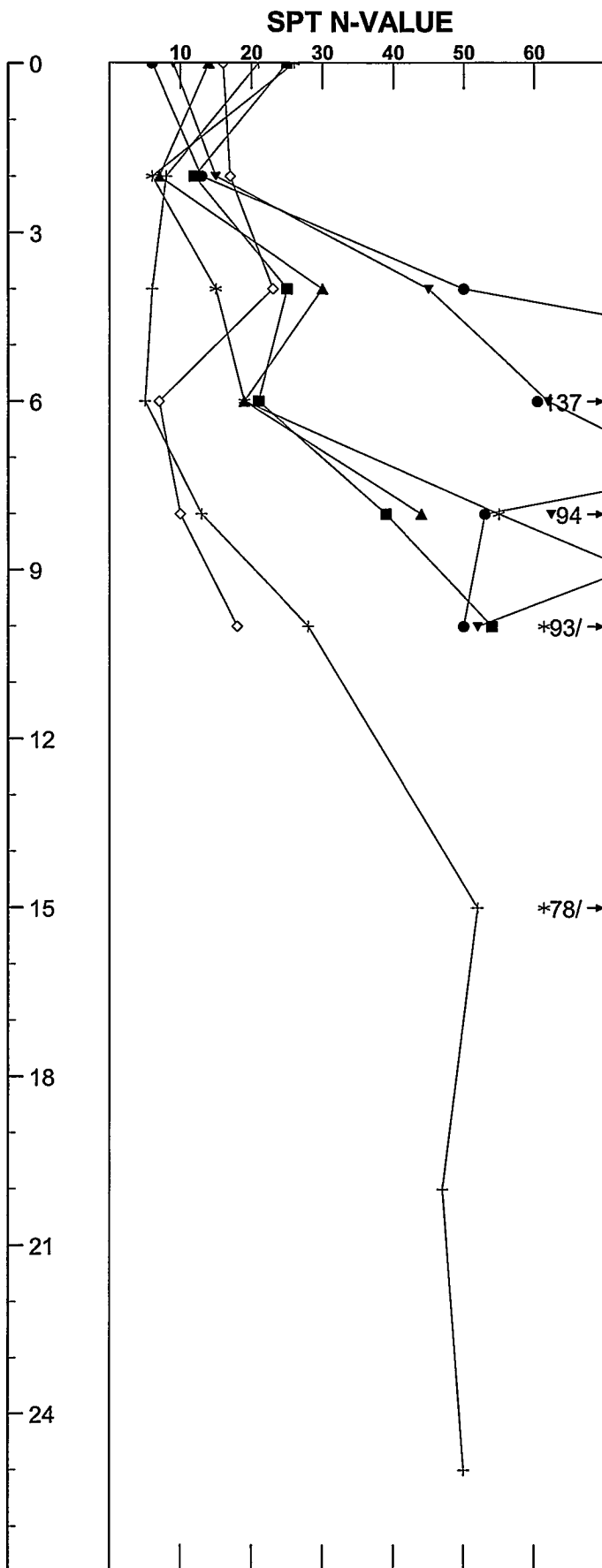
Misc. Symbols



Water table during
drilling

Notes:

1. Exploratory borings were drilled on 8-19-2024 using a 4-inch diameter continuous flight power auger.
2. No free water was encountered at the time of drilling or when re-checked the following day.
3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs.



Key to Borings

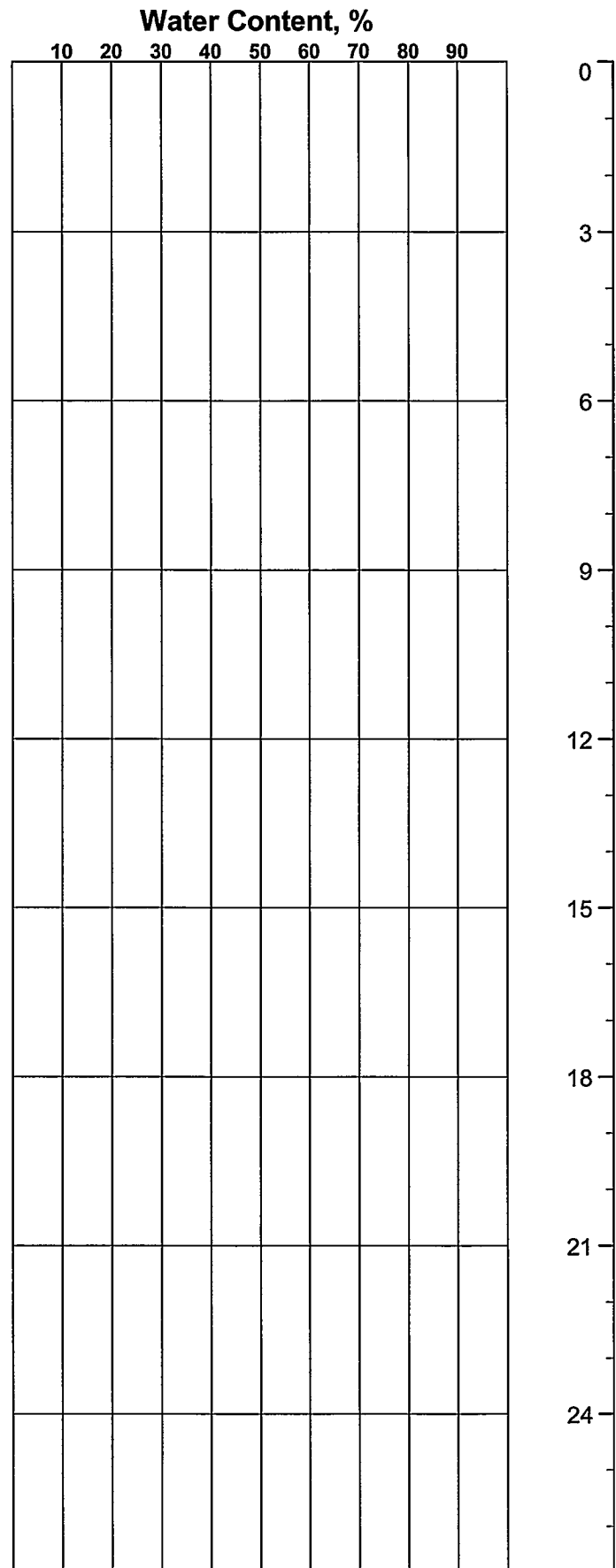
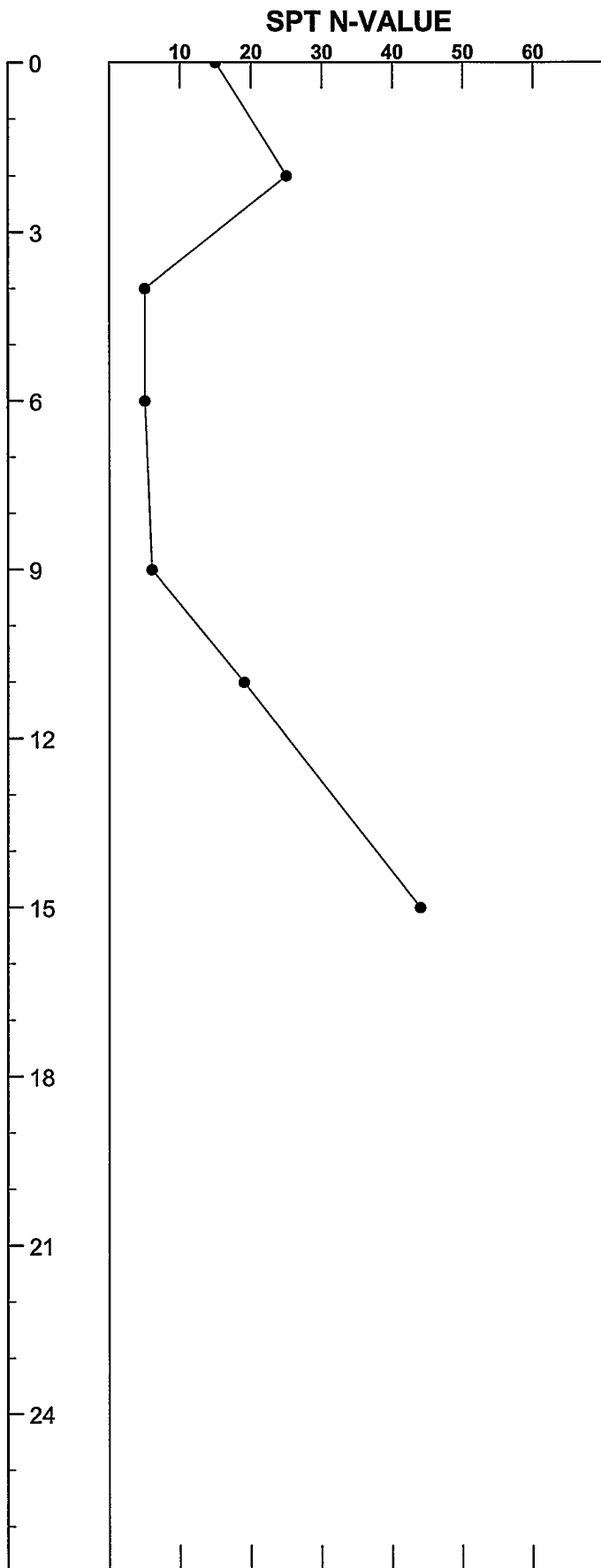
- B-1 ▲ B-3 * B-5/B-5A ◇ B-7
- B-2/B-2A ▼ B-4 + B-6

ANS CONSULTANTS, INC.

Proposed 1-story retail building

Vertical Scale: 1 to 3

Figure:



Key to Borings

- B-8

ANS CONSULTANTS, INC.

Proposed 1-story retail building

Vertical Scale: 1 to 3

Figure:

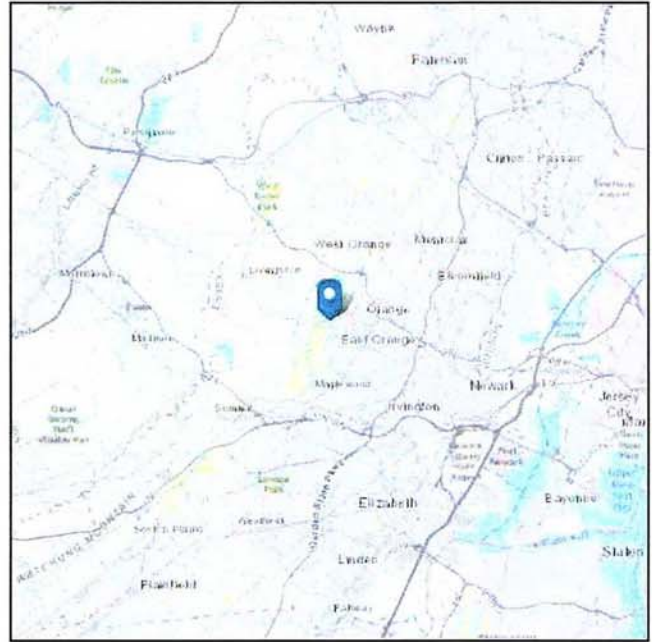
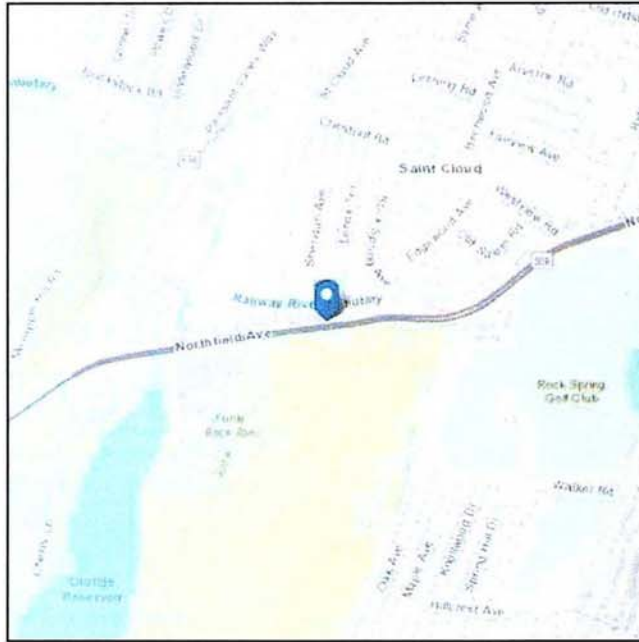


ASCE Hazards Report

Address:
525 Northfield Ave
West Orange, New Jersey
07052

Standard: ASCE/SEI 7-22
Risk Category: II
Soil Class: C - Very Dense
Soil and Soft Rock

Latitude: 40.770448
Longitude: -74.277032
Elevation: 391.14172377309643 ft
(NAVD 88)

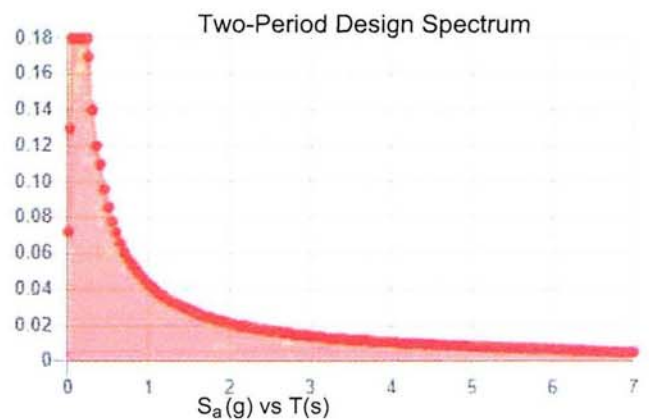
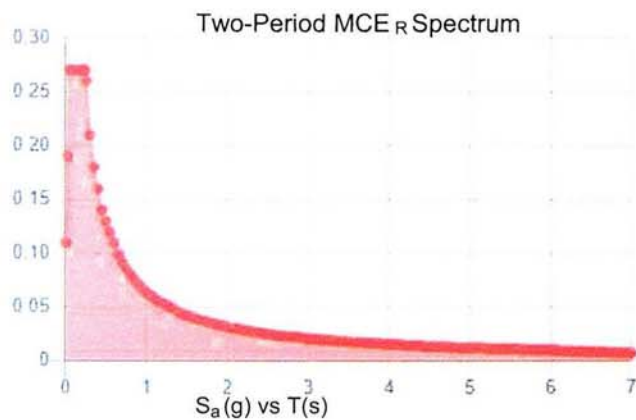
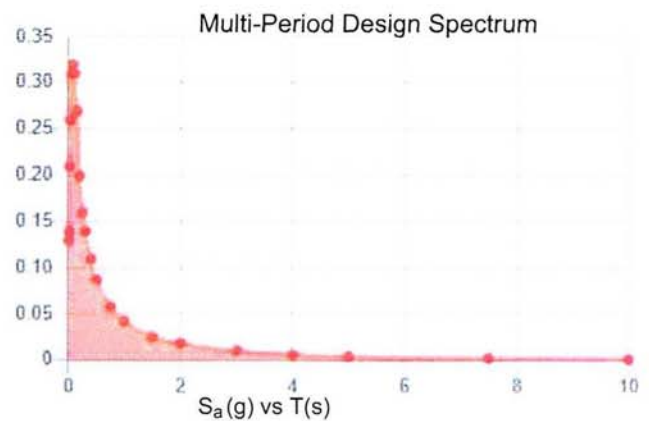
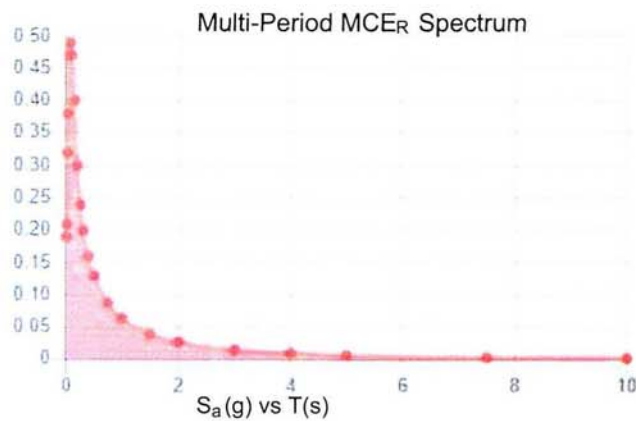


Site Soil Class: C - Very Dense Soil and Soft Rock

Results:

PGA _M :	0.17	T _L :	6
S _{MS} :	0.27	S _S :	0.27
S _{M1} :	0.064	S ₁ :	0.05
S _{DS} :	0.18	V _{S30} :	530
S _{D1} :	0.043		

Seismic Design Category: B



MCE_R Vertical Response Spectrum
Vertical ground motion data has not yet been made available by USGS.

Design Vertical Response Spectrum
Vertical ground motion data has not yet been made available by USGS.



Data Accessed: Tue Aug 27 2024

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-22 and ASCE/SEI 7-22 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-22 Ch. 21 are available from USGS.

The ASCE Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE Hazard Tool.



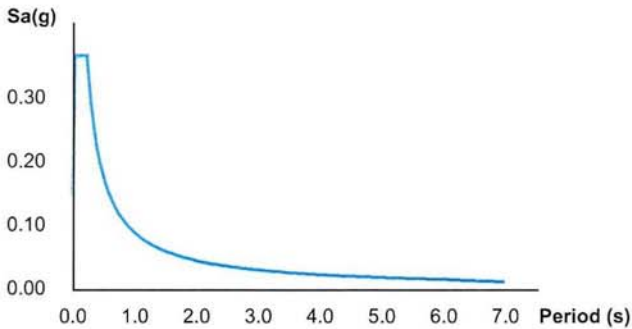
Hazards by Location

Search Information

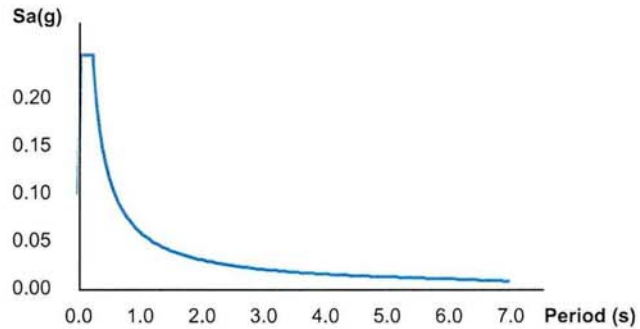
Address: 525 Northfield Ave, West Orange, NJ 07052, USA
Coordinates: 40.7705012, -74.2774591
Elevation: 385 ft
Timestamp: 2024-08-27T17:48:58.307Z
Hazard Type: Seismic
Reference Document: ASCE7-16
Risk Category: II
Site Class: C



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	0.282	MCE_R ground motion (period=0.2s)
S_1	0.059	MCE_R ground motion (period=1.0s)
S_{MS}	0.367	Site-modified spectral acceleration value
S_{M1}	0.089	Site-modified spectral acceleration value
S_{DS}	0.245	Numeric seismic design value at 0.2s SA
S_{D1}	0.059	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	B	Seismic design category
F_a	1.3	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.935	Coefficient of risk (0.2s)
CR_1	0.944	Coefficient of risk (1.0s)
PGA	0.173	MCE_G peak ground acceleration

F_{PGA}	1.227	Site amplification factor at PGA
PGA_M	0.213	Site modified peak ground acceleration
T_L	6	Long-period transition period (s)
SsRT	0.282	Probabilistic risk-targeted ground motion (0.2s)
SsUH	0.302	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.059	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.063	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. [Find out why.](#)

Disclaimer

Hazard loads are provided by the U.S. Geological Survey [Seismic Design Web Services](#).

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FIELD SOIL CLASSIFICATION SYSTEM

PARTICLE SIZE IDENTIFICATION

Boulders 8 inch diameter or greater
Cobbles 3 to 8 inch diameter
Gravel Coarse -- 1 to 3 inch
Medium -- 1/2 to 1 inch
Fine -- 4.75 mm to 1/2 inch
Sand Coarse -- 2.0 mm to 4.75 mm
(dia. of pencil lead)
Medium -- 0.425 mm to 2.0 mm
(dia. of broom straw)
Fine -- 0.075 mm to 0.425 mm
(dia. of human hair)
Silt & Clay . . . Smaller than 0.075 mm

RELATIVE PORTIONS

Descriptive Term	Percent
Trace - tr	1 - 10
Some - sm	11 - 20
Adjective - ly	21 - 35
And - &	36 - 50

ABBREVIATIONS

Bn - Brown	
Gy - Gray	
Blk - Black	
Rd - Red	
Or - Orange	
Bl - Blue	
Lt - Light	Coarse grained - c
Dk - Dark	Medium grained - m
Multi - Multi colored	Fine grained - f

COHESIONLESS SOIL

(Gravel, Sand, Silt and Combinations)

DENSITY

Very Loose 05 blows / ft or less
Loose 06 to 10 blows / ft
Medium Dense 11 to 30 blows / ft
Dense 31 to 50 blows / ft
Very Dense 51 blows / ft or more

COHESIVE SOIL

(Clay Silt and Combinations)

CONSISTENCY

Very Soft 01 blow / ft or less
Soft 02 to 4 blows / ft
Medium Stiff 05 to 8 blows / ft
Stiff 09 to 15 blows / ft
Very Stiff 16 to 30 blows / ft
Hard 31 blows / ft or greater

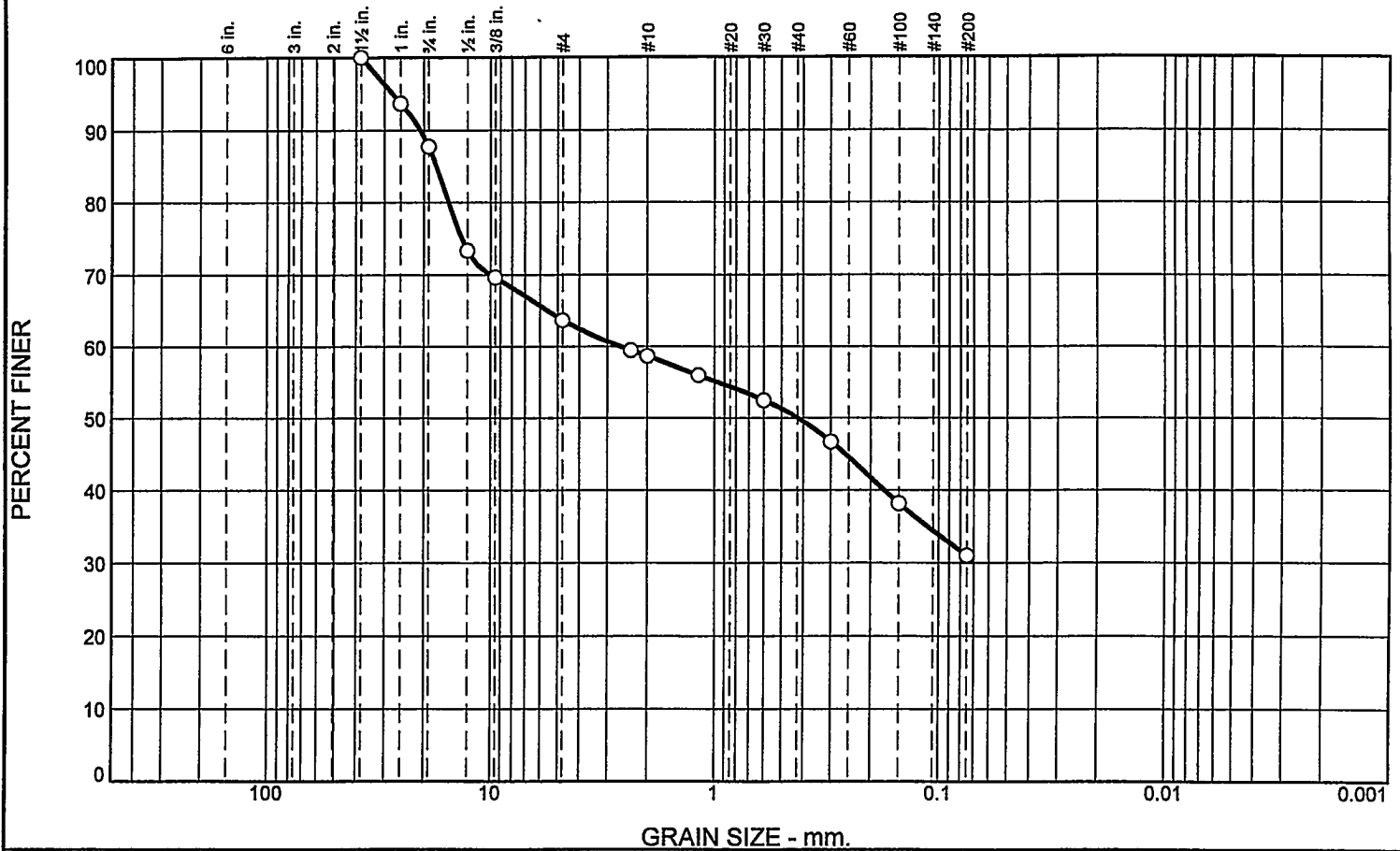
ROCK

R.Q.D.	Rock Quality
00 - 25	Very Poor
25 - 50%	Poor
50 - 75%	Fair
75 - 90%	Good
90 - 100%	Excellent

HSA - Hollow Stem Auger
SS- Split Spoon Sampler
WOR - Weight of Rods
WOH - Weight of Hammer
NR - No Recovery of Sample

Appendix-B

Particle Size Distribution Report As per ASTM D 6913



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.2	24.1	5.0	8.7	18.9	31.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	93.7		
3/4	87.8		
1/2	73.3		
3/8	69.7		
#4	63.7		
#8	59.5		
#10	58.7		
#16	56.0		
#30	52.5		
#50	46.7		
#100	38.2		
#200	31.1		

* (no specification provided)

<u>Material Description</u>		
Brown in color. silty gravel with sand		
<u>Atterberg Limits</u>		
PL= NP	LL= NV	PI= NP
<u>Coefficients</u>		
D ₉₀ = 20.7274	D ₈₅ = 17.5640	D ₆₀ = 2.6310
D ₅₀ = 0.4243	D ₃₀ =	D ₁₅ =
D ₁₀ =	C _u =	C _c =
<u>Classification</u>		
USCS= GM	AASHTO= A-2-4(0)	
<u>Remarks</u>		
Sample was collected on 08/21/24 and tested on 08/26/24. In-Situ %MC=10.9 F.M.=3.26		

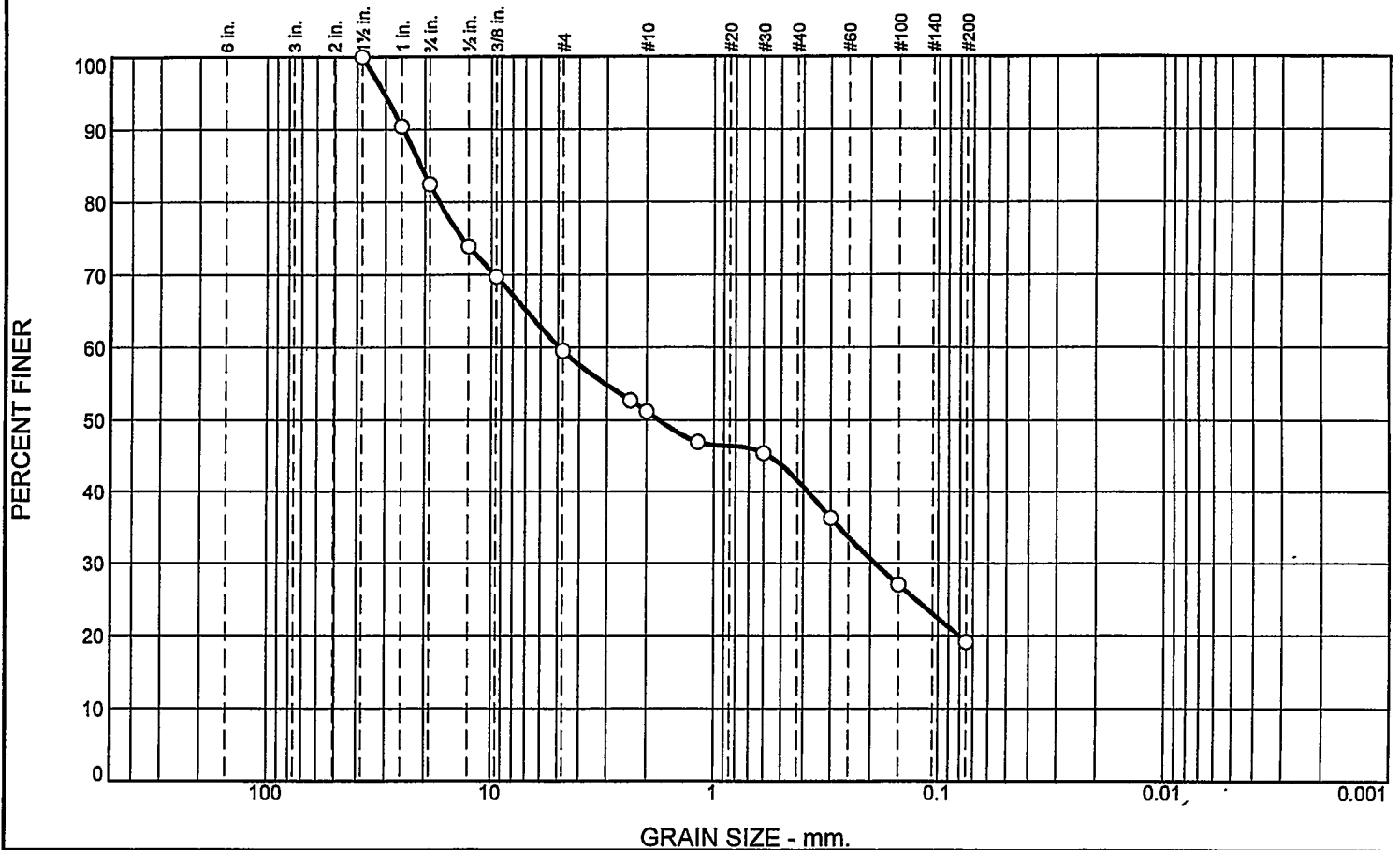
Location: B-1
Sample Number: S-1 Depth: 2'-4'

Date: 08/26/2024

ANS CONSULTANTS, INC.
South Plainfield, New Jersey

Client: Gomes Management
Project: 625 Northfield Avenue, West Orange, NJ Block 159.04, Lot # 1.01, 1.02 & 1.03
Project No: ANV-6549
Figure 1 F 1

Particle Size Distribution Report As per ASTM D 6913



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	17.5	22.9	8.4	9.6	22.5	19.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	90.4		
3/4	82.5		
1/2	73.9		
3/8	69.8		
#4	59.6		
#8	52.7		
#10	51.2		
#16	47.0		
#30	45.4		
#50	36.3		
#100	27.0		
#200	19.1		

* (no specification provided)

<u>Material Description</u>		
Dark brown in color. silty sand with gravel		
<u>Atterberg Limits</u>		
PL= NP	LL= NV	PI= NP
<u>Coefficients</u>		
D ₉₀ = 25.0083	D ₈₅ = 20.9050	D ₆₀ = 4.9198
D ₅₀ = 1.7641	D ₃₀ = 0.1912	D ₁₅ =
D ₁₀ =	C _u =	C _c =
<u>Classification</u>		
USCS= SM	AASHTO= A-1-b	
<u>Remarks</u>		
Sample was collected on 08/21/24 and tested on 08/26/24. In-Situ		
%MC=10.1		
F.M.=3.80		

Location: B-2A

Sample Number: S-2

Depth: 4'-6'

Date: 08/26/2024

ANS CONSULTANTS, INC.

South Plainfield, New Jersey

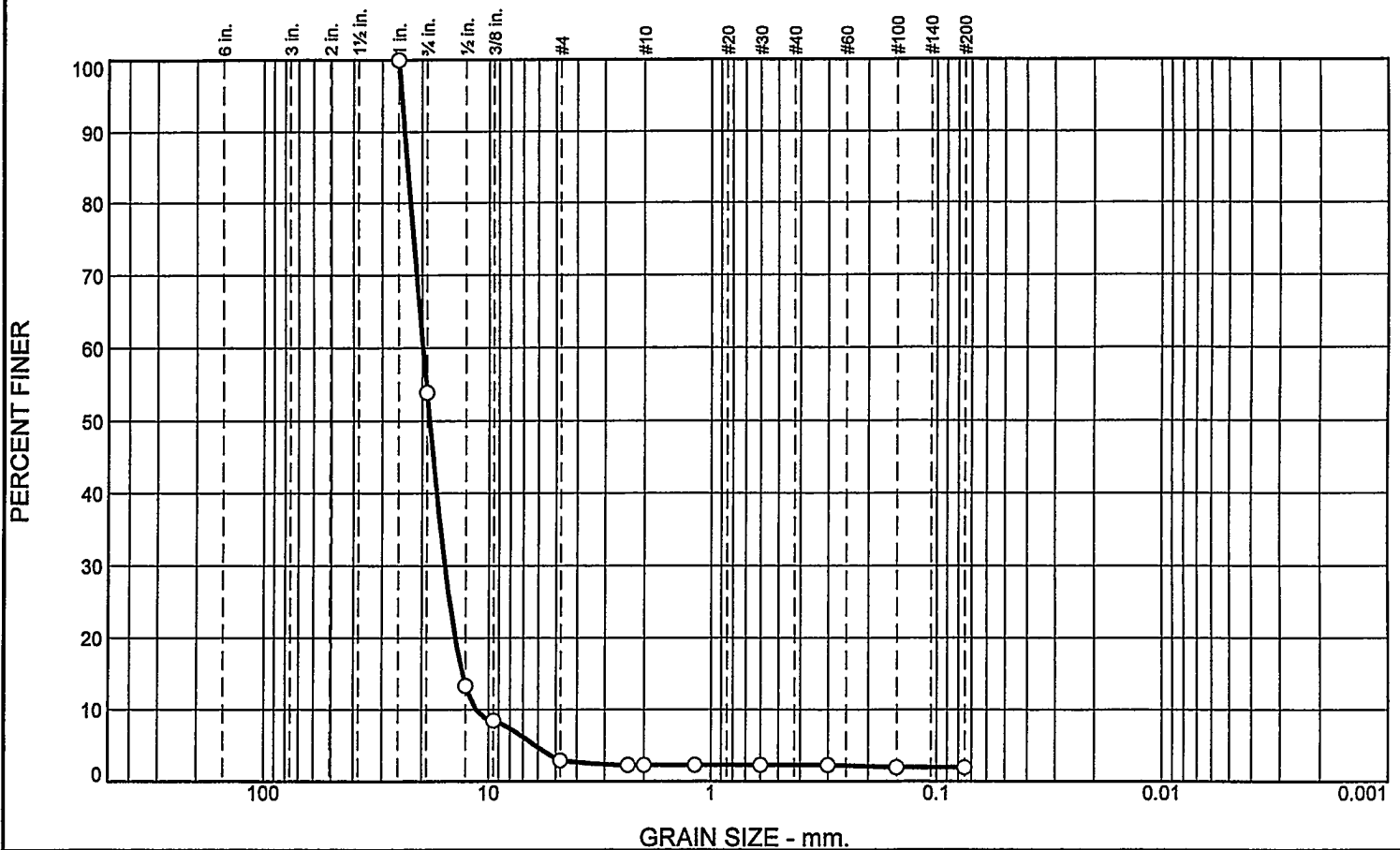
Client: Gomes Management

Project: 625 Northfield Avenue, West Orange, NJ Block 159.04, Lot # 1.01, 1.02 & 1.03

Project No: ANV-6549

Figure 2 F 1

Particle Size Distribution Report As per ASTM D 6913



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	46.1	51.0	0.6	0.0	0.4	1.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
3/4	53.9		
1/2	13.3		
3/8	8.4		
#4	2.9		
#8	2.3		
#10	2.3		
#16	2.3		
#30	2.3		
#50	2.3		
#100	1.9		
#200	1.9		

* (no specification provided)

Material Description

Grey in color. poorly graded gravel

Atterberg Limits

PL= NP

LL= NV

PI= NP

Coefficients

D₉₀= 23.9319

D₈₅= 23.2246

D₆₀= 19.8550

D₅₀= 18.5338

D₃₀= 15.7605

D₁₅= 13.1263

D₁₀= 11.4351

C_u= 1.74

C_c= 1.09

Classification

USCS= GP

AASHTO= A-1-a

Remarks

Sample was collected on 08/21/24 and tested on 08/26/24. In-Situ %MC=5.5
F.M.=7.24

Location: B-3

Sample Number: S-3

Depth: 6'-8'

Date: 08/26/2024

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South Plainfield, New Jersey

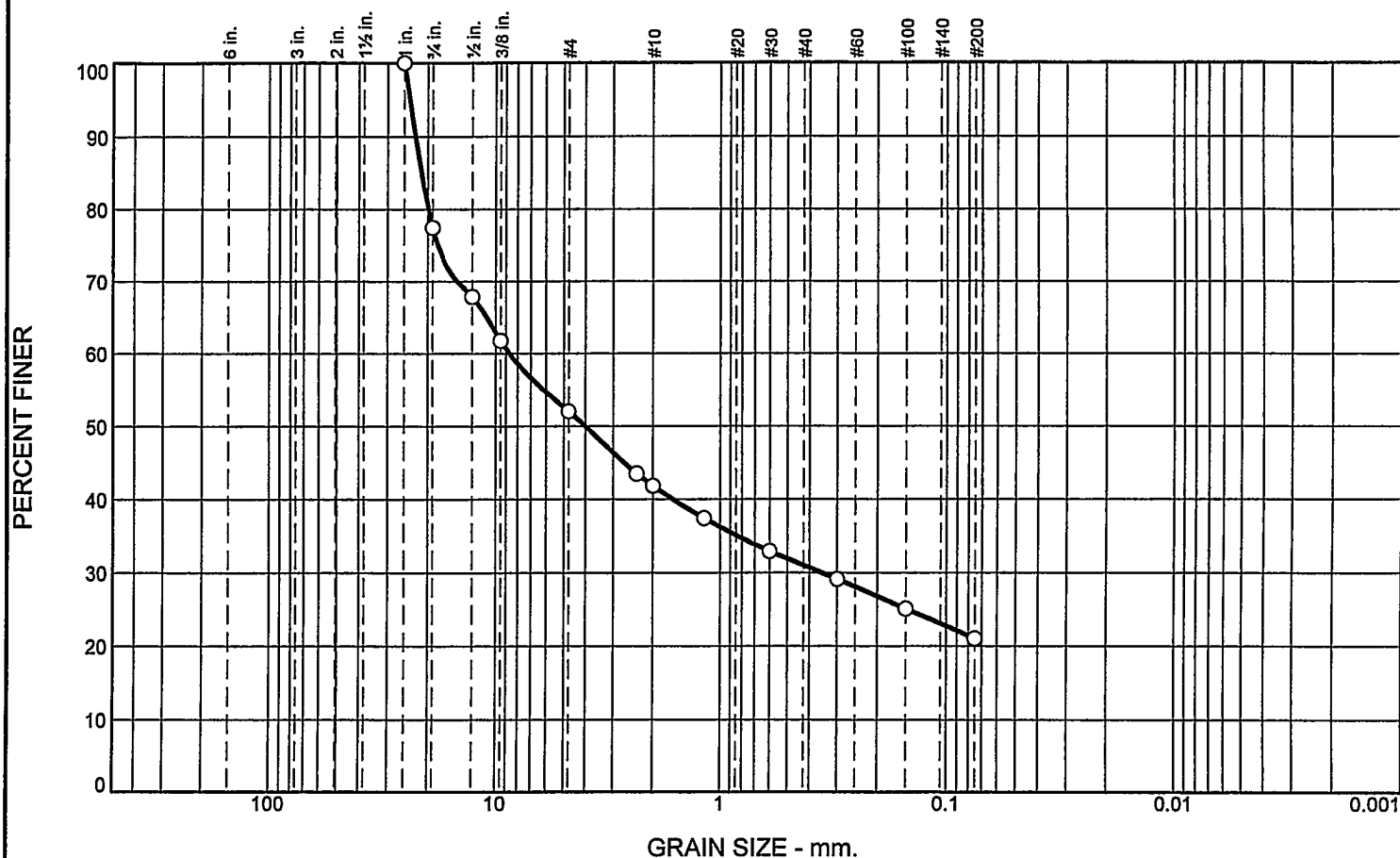
Client: Gomes Management

Project: 625 Northfield Avenue, West Orange, NJ Block 159.04, Lot # 1.01, 1.02 & 1.03

Project No: ANV-6549

Figure 3 F 1

Particle Size Distribution Report As per ASTM D 6913



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	22.5	25.5	10.1	10.9	10.0	21.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
3/4	77.5		
1/2	67.9		
3/8	61.8		
#4	52.0		
#8	43.5		
#10	41.9		
#16	37.4		
#30	32.9		
#50	29.1		
#100	25.1		
#200	21.0		

* (no specification provided)

Material Description

Brown in color. silty gravel with sand

Atterberg Limits

PL= NP

LL= NV

PI= NP

Coefficients

D₉₀= 22.6921

D₈₅= 21.3376

D₆₀= 8.7032

D₅₀= 4.0095

D₃₀= 0.3519

D₁₅=

D₁₀=

C_u=

C_c=

Classification

USCS= GM

AASHTO= A-1-b

Remarks

Sample was collected on 08/20/24 and tested on 08/26/24 In-Situ
 %MC=8.2
 F.M.=4.41

Location: B-4

Sample Number: S-4

Depth: 8'-10'

Date: 08/26/2024

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South Plainfield, New Jersey

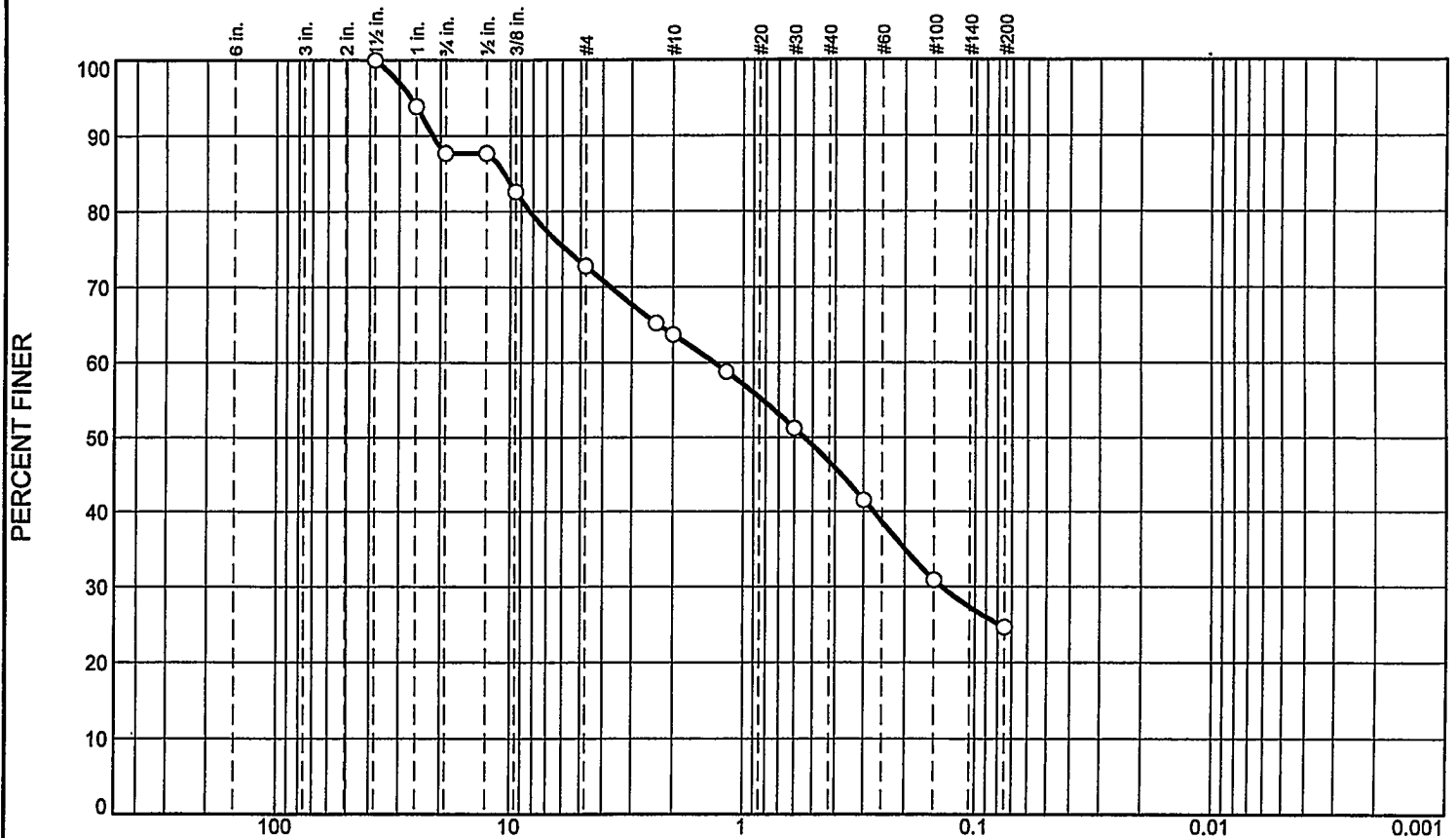
Client: Gomes Management

Project: 625 Northfield Avenue, West Orange, NJ Block 159.04, Lot # 1.01, 1.02 & 1.03

Project No: ANV-6549

Figure 4 F 1

Particle Size Distribution Report As per ASTM D 6913



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.3	14.9	9.1	17.0	22.0	24.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	93.9		
3/4	87.7		
1/2	87.7		
3/8	82.6		
#4	72.8		
#8	65.2		
#10	63.7		
#16	58.8		
#30	51.2		
#50	41.6		
#100	30.9		
#200	24.7		

* (no specification provided)

Material Description

brown in color. silty sand with gravel

Atterberg Limits

PL= NP

LL= NV

PI= NP

Coefficients

D₉₀= 21.6696

D₈₅= 10.6461

D₆₀= 1.3349

D₅₀= 0.5441

D₃₀= 0.1389

D₁₅=

D₁₀=

C_u=

C_c=

Classification

USCS= SM

AASHTO= A-1-b

Remarks

Sample was collected on 08/20/24 and tested on 08/26/24. In-Situ %MC=5.8
F.M.=3.09

Location: B-5A

Sample Number: S-5

Depth: 10'-12'

Date: 08/26/2024

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South Plainfield, New Jersey

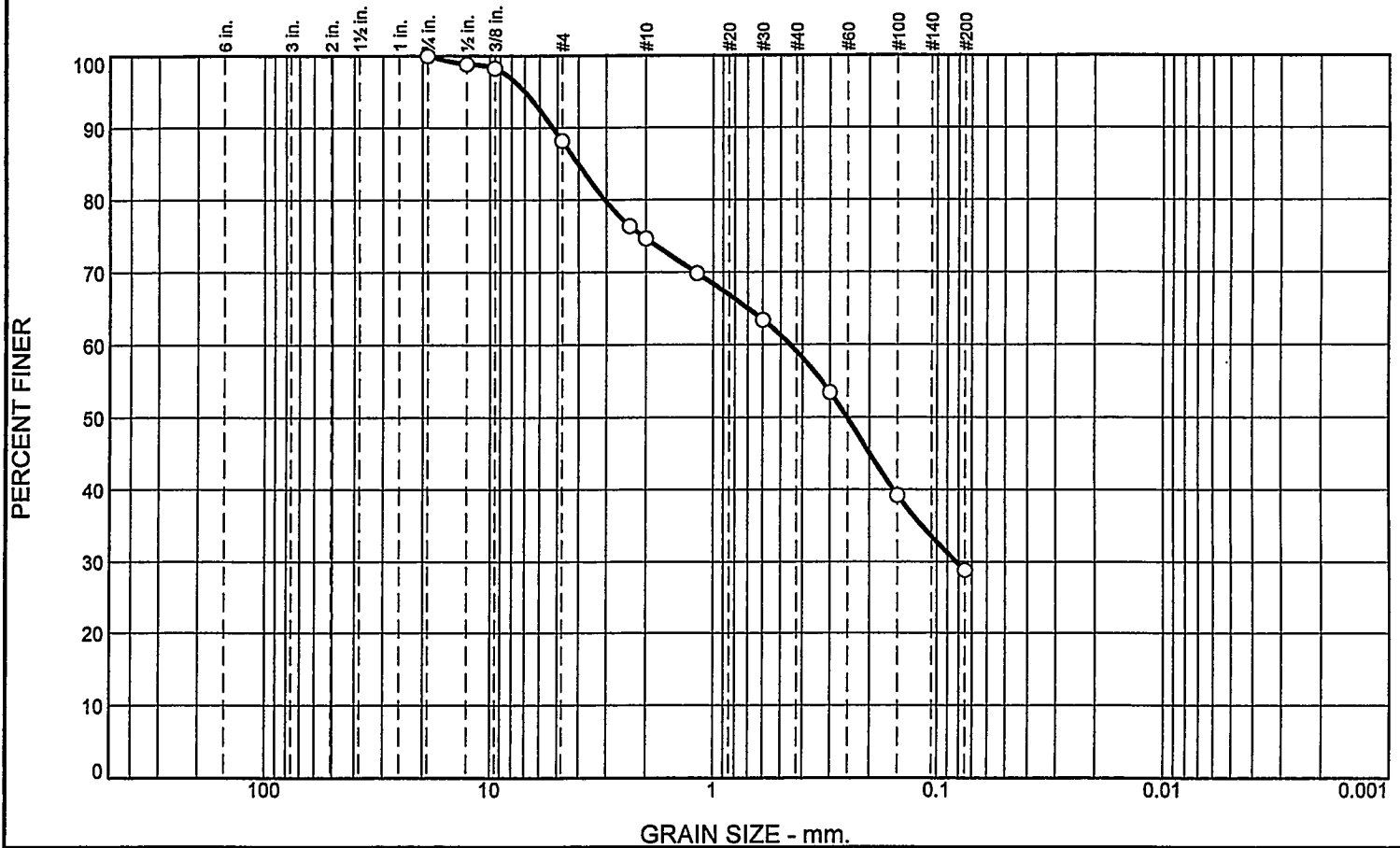
Client: Gomes Management

Project: 625 Northfield Avenue, West Orange, NJ Block 159.04, Lot # 1.01, 1.02 & 1.03

Project No: ANV-6549

Figure 5 F 1

Particle Size Distribution Report As per ASTM D 6913



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	11.9	13.5	15.5	30.3	28.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4	100.0		
1/2	98.8		
3/8	98.2		
#4	88.1		
#8	76.3		
#10	74.6		
#16	69.8		
#30	63.4		
#50	53.4		
#100	39.2		
#200	28.8		

* (no specification provided)

Material Description

Brown in color. silty sand

Atterberg Limits

PL= NP

LL= NV

PI= NP

Coefficients

D₉₀= 5.2325

D₈₅= 4.0345

D₆₀= 0.4539

D₅₀= 0.2524

D₃₀= 0.0820

D₁₅=

D₁₀=

C_u=

C_c=

Classification

USCS= SM

AASHTO= A-2-4(0)

Remarks

Sample was collected on 08/20/24 and tested on 08/26/24. In-Situ
%MC=13.3
F.M.=2.11

Location: B-6

Sample Number: S-6

Depth: 15'-17'

Date: 08/26/2024

ANS CONSULTANTS, INC.

South Plainfield, New Jersey

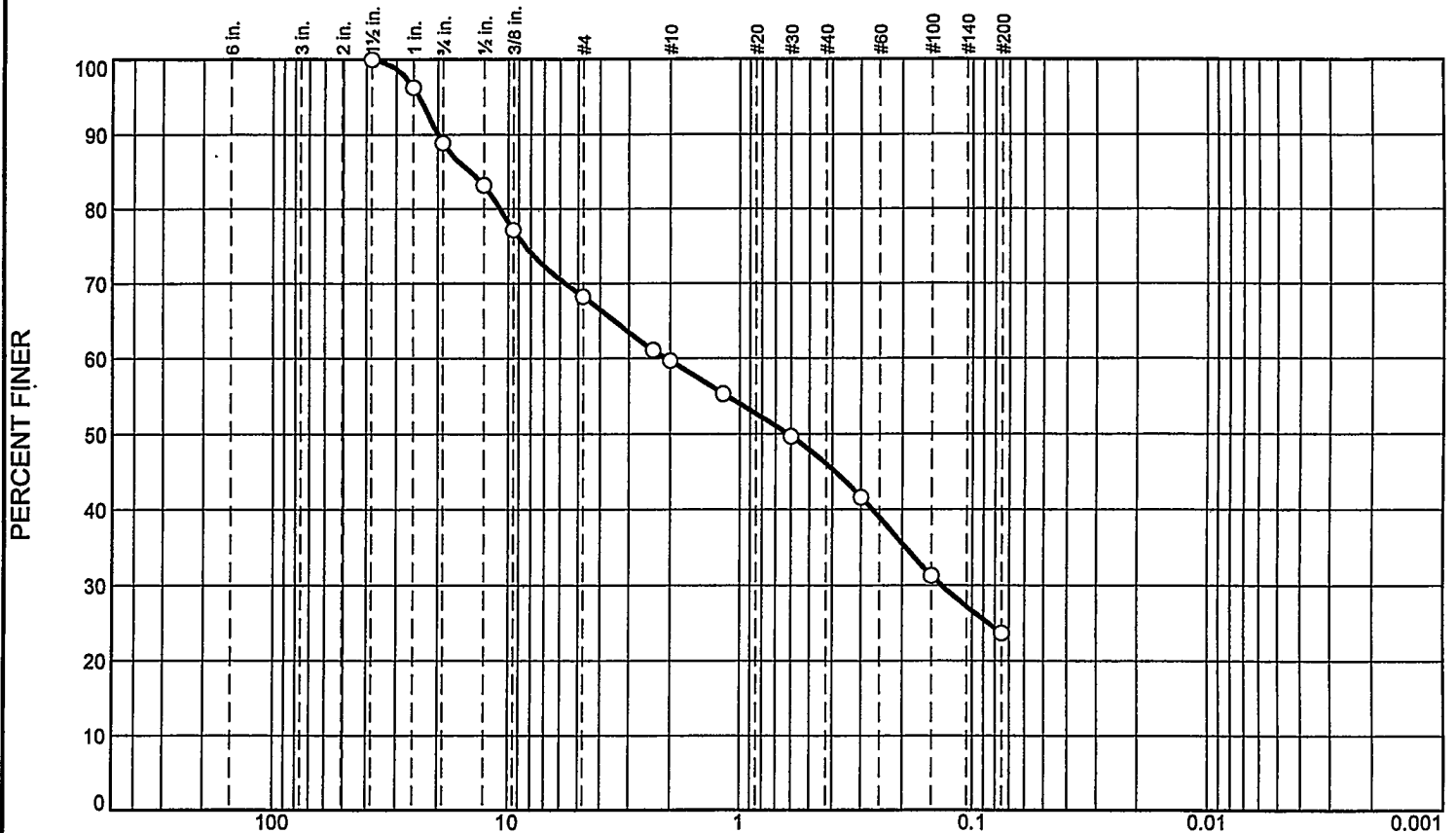
Client: Gomes Management

Project: 625 Northfield Avenue, West Orange, NJ Block 159.04, Lot # 1.01, 1.02 & 1.03

Project No: ANV-6549

Figure 6 F 1

Particle Size Distribution Report As per ASTM D 6913



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	11.2	20.6	8.5	13.6	22.4	23.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	96.3		
3/4	88.8		
1/2	83.2		
3/8	77.2		
#4	68.2		
#8	61.1		
#10	59.7		
#16	55.3		
#30	49.7		
#50	41.6		
#100	31.3		
#200	23.7		

* (no specification provided)

Material Description

Brown in color. silty sand with gravel

Atterberg Limits

PL= NP

LL= NV

PI= NP

Coefficients

D₉₀= 20.0068

D₈₅= 14.5408

D₆₀= 2.0845

D₅₀= 0.6227

D₃₀= 0.1357

D₁₅=

D₁₀=

C_u=

C_c=

Classification

USCS= SM

AASHTO= A-1-b

Remarks

Sample was collected on 08/19/24 and tested on 08/26/24. In-Situ
%MC=7.5
F.M.=3.27

Location: B-7

Sample Number: S-7

Depth: 4'-6'

Date: 08/26/2024

ANS CONSULTANTS, INC.

Client: Gomes Management

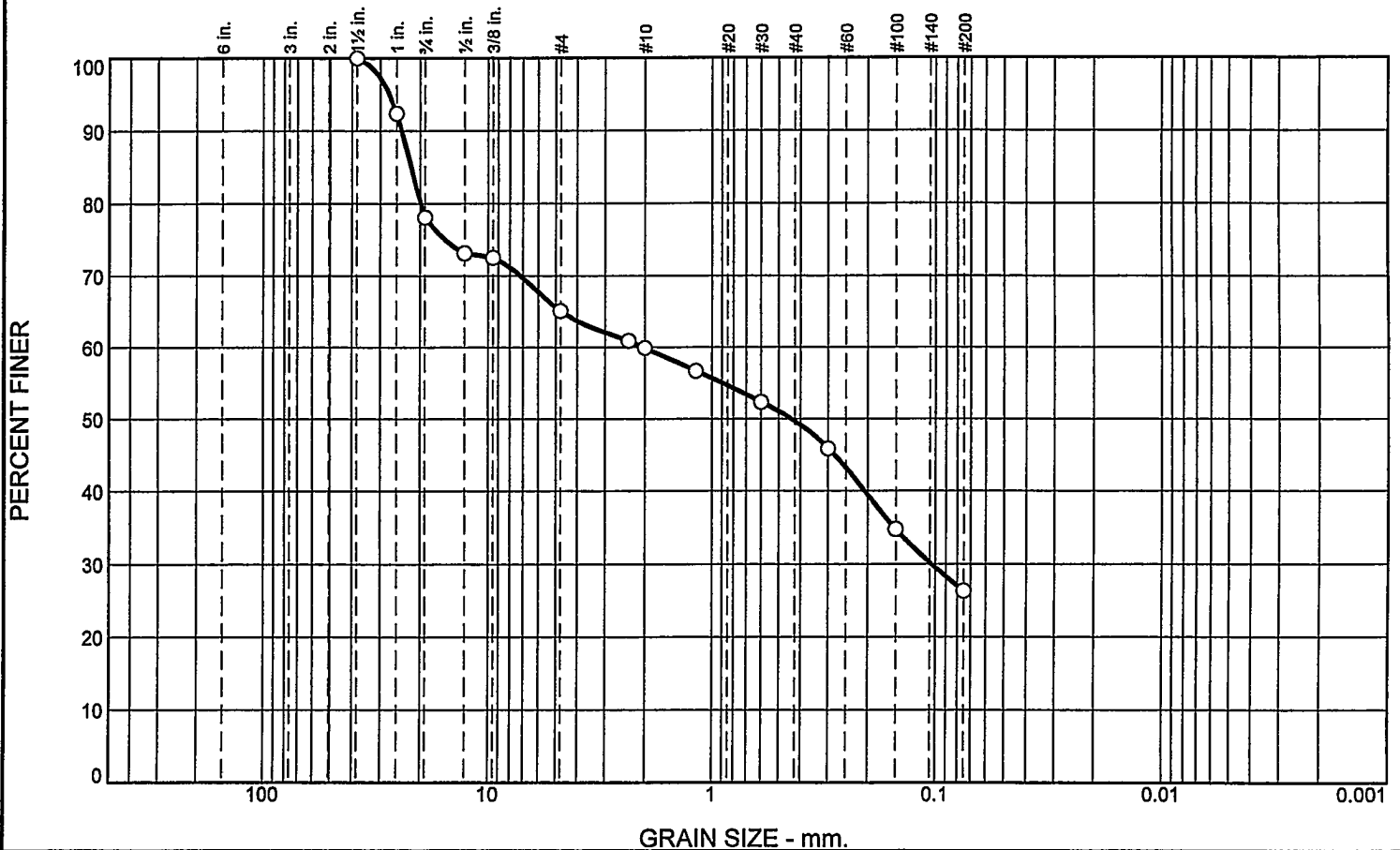
Project: 625 Northfield Avenue, West Orange, NJ Block 159.04, Lot # 1.01, 1.02 & 1.03

South Plainfield, New Jersey

Project No: ANV-6549

Figure 7 F 1

Particle Size Distribution Report As per ASTM D 6913



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	21.9	13.0	5.2	10.2	23.4	26.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	92.4		
3/4	78.1		
1/2	73.1		
3/8	72.5		
#4	65.1		
#8	60.9		
#10	59.9		
#16	56.7		
#30	52.3		
#50	45.9		
#100	34.8		
#200	26.3		

* (no specification provided)

Material Description

Brown in color, silty sand with gravel

Atterberg Limits

PL= NP

LL= NV

PI= NP

Coefficients

D₉₀= 24.1282

D₈₅= 21.9511

D₆₀= 2.0305

D₅₀= 0.4411

D₃₀= 0.1044

D₁₅=

D₁₀=

C_u=

C_c=

Classification

USCS= SM

AASHTO= A-2-4(0)

Remarks

Sample was collected on 08/19/24 and tested on 08/26/24. In-Situ
 %MC=14.2
 F.M.=3.34

Location: B-8

Sample Number: S-8

Depth: 6'-8'

Date: 08/26/2024

ANS CONSULTANTS, INC.

South Plainfield, New Jersey

Client: Gomes Management

Project: 625 Northfield Avenue, West Orange, NJ Block 159.04, Lot # 1.01, 1.02 & 1.03

Project No: ANV-6549

Figure 8 F 1

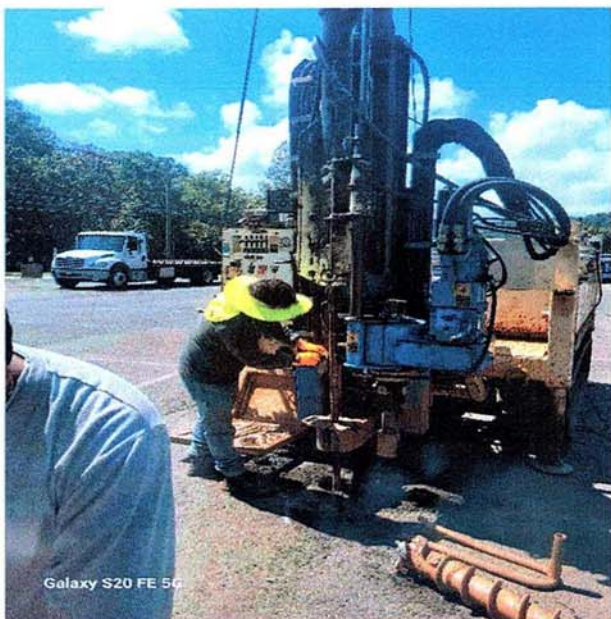
Appendix-C



CONSULTANTS, INC.
4405 South Clinton Avenue
South Plainfield, NJ 07080

Client: Gomes Management

Project: 525 Northfield Avenue, West Orange, NJ



Sample procurement using split spoon samplers and augurs



Sample recovery from split spoon samplers



CONSULTANTS, INC.
4405 South Clinton Avenue
South Plainfield, NJ 07080

Client: Gomes Management

Project: 525 Northfield Avenue, West Orange, NJ



Sample procurement using split spoon samplers and augurs



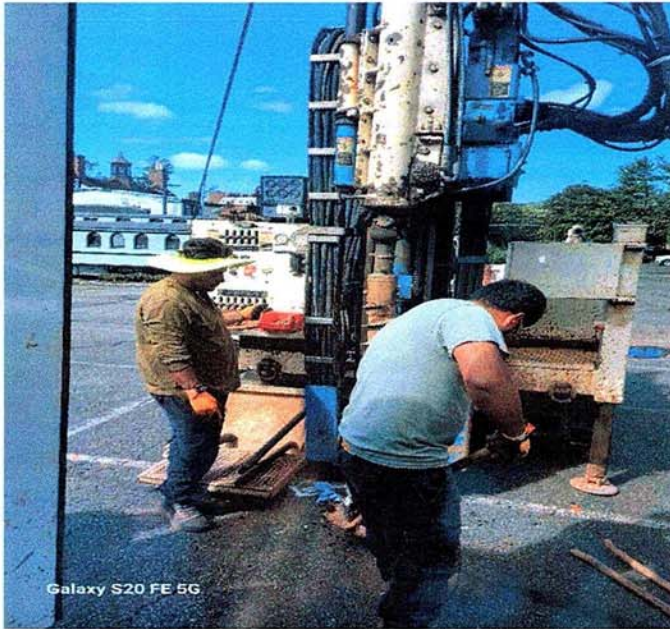
Sample recovery from split spoon samplers



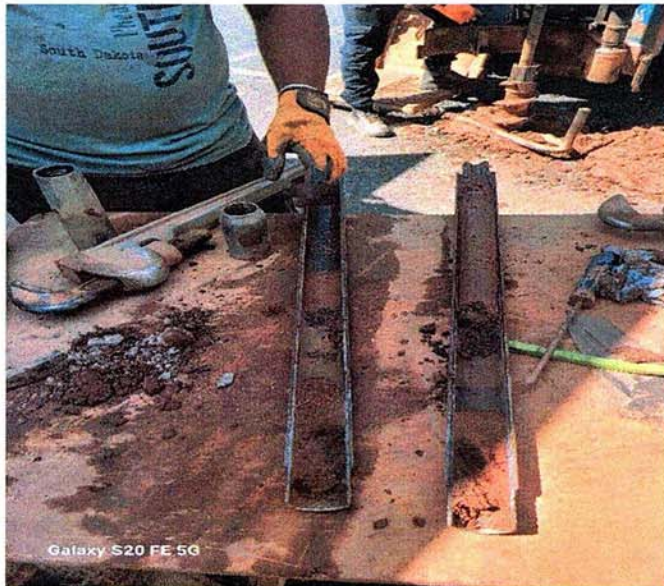
CONSULTANTS, INC.
4405 South Clinton Avenue
South Plainfield, NJ 07080

Client: Gomes Management

Project: 525 Northfield Avenue, West Orange, NJ



Sample procurement using split spoon samplers and augurs



Sample recovery from split spoon samplers



CONSULTANTS, INC.
4405 South Clinton Avenue
South Plainfield, NJ 07080

Client: Gomes Management

Project: 525 Northfield Avenue, West Orange, NJ



Sample procurement using split spoon samplers and augurs



Sample recovery from split spoon samplers

APPENDIX F

DRAINAGE AREA MAPS



Jarmel Kizel
ARCHITECTS AND ENGINEERS INC.
1100 WILSON AVENUE, SUITE 200
WILMINGTON, NEW JERSEY 07309
TEL: 856.734.4600
FAX: 856.734.4609
www.jarmelkizel.com

Architecture
Engineering
Interior Design
Implementation Services

NO.	DATE	DESCRIPTION	BY
-----	------	-------------	----

NO.	DATE	REVISION	DESCRIPTION	BY
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PRINCIPALS
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JARMEL KIZEL, INC.
ARCHITECTS & ENGINEERS
1100 WILSON AVENUE, SUITE 200
WILMINGTON, NEW JERSEY 07309
TEL: 856.734.4600
FAX: 856.734.4609
www.jarmelkizel.com

PROJECT
525 NORTHFIELD AVENUE
TOWNSHIP OF WEST ORANGE
ESSEX COUNTY, NEW JERSEY
TAX MAP NO. 100.00
PROJECT NUMBER
GOMESGR4-223
SHEET NO. 1 OF 1

DATE
11-1-2022
BY
AF

EXISTING
DRAINAGE
AREA
MAP

DA-1
1 OF 3

DATE
OCTOBER 12, 2022
ENGINEER OF RECORD

ANTHONY J. GOMES, P.E.





ISSUE		
NO	DATE	DESCRIPTION
		INT.

REVISION			
NO.	DATE	DESCRIPTION	INT.

PRINCIPALS

MATTHEW B. JENSEL, AIA, MBA
P2CHADRA, JENSEL, PC
FRENCH H. KETTEL, AIA, PE

ARCHITECTS & ENGINEERS

DEATZTAY ENGINEERS, PA
JERRY D. BOER, AIA
ANDREW P. BROOKHUISER, PE
SAMUEL D. COCHRAN, PE
TOMAS D. EMBREGER, PE
ANDREW C. ORR, PE
ANTHONY TACCONO, PE, BUS. DEV.
JOHN THOMAS, AIA, PE
RENNATA MALCONCINI & PARTNERS, INC., LIMITED LLP
CHRISTY SCHWARTZ, AIA
STEVAN J. VAN, PE

525 NORTHFIELD AVENUE
PRELIMINARY / FINAL SITE PLAN
TOWNSHIP OF WEST ORANGE
ESSEX COUNTY, NEW JERSEY
TAX MAP #94, BLOCK 159 04 LOT 1 01

Drawn By: JAMES GRZAK	AF	Approved By: AF
--------------------------	----	--------------------

Project Name: PROPOSED INLET DRAINAGE AREA MAP

Drawing Number: DA-3
3 OF 3
Print Date: OCTOBER 22, 2025

ENGINEER OF RECORD


ANTHONY FAGCHINO, PE, PLS
1-212-342-0100

