STORMWATER MANAGEMENT, WATER QUALITY AND GROUNDWATER RECHARGE ANALYSIS

For

USRD

McDonald's USA, LLC
L/C #29-1572

Proposed McDonald's Restaurant
741 N.J.S.H. Route 73 South
Block 36, Lot 4.07
Township of Evesham
Burlington County, NJ

Prepared by:

DYNAMIC ENGINEERING

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APPENDIX

1. Site Description & Project Overview

The subject site is located with frontage on New Jersey State Highway Route 73 in the Township of Evesham, Burlington County, New Jersey. The site is identified as Block 36, Lot 4.07 on the Township of Evesham Tax Map Sheet #6. The subject site is currently developed, consisting of an existing bank building with associated drive-through, parking and access aisles. The property is bounded to the north by multifamily and business uses, to the east and south by commercial uses, and to the west by woods and residential uses beyond.

The proposed project consists of the development of a 3,694 SF McDonalds with associated drive-thru facilities. The building will have a total footprint of 3,694 SF, with 0.46 acres of motor vehicle surface, 0.58 acres of impervious surface, and 0.64 acres of land disturbance. The proposed project will also include all associated site improvements including parking areas, landscaping, lighting, stormwater management facilities, and utilities.

2. Design Methodology

This report has been prepared to define and analyze the stormwater drainage conditions that would occur as a result of the development of the subject site. Based upon the fact that the proposed development will not result in more than one (1) acre of land disturbance, increase impervious coverage by more than ¼ acre, and increase motor vehicle surfaces by more than ¼ acre, this project is not classified as a “major development” as defined in NJAC 7:8. However, the proposed development will result in a disturbance greater than ½ acre, therefore, this project is classified as a “major development” as defined by the Township of Evesham Stormwater Rules in Non-Pineland Areas. As such, the proposed development has been designed to meet the stormwater runoff quantity, quality, and groundwater recharge standards, as set forth by the Township of Evesham Land Use Ordinance.

The following documents and data were used in support of the design of the project:

- ALTA/NSPS Boundary, Location & Topographic Survey prepared by Dynamic Survey, dated 09/19/2023, last revised 06/04/24
- Preliminary and Final Site Plan for Proposed McDonald’s Restaurant, prepared by Dynamic Engineering, dated 05/14/2025

- Field Reconnaissance on Date
- NRCS Soil Survey
- NJDEP Stormwater Management Best Management Practices Manual

The hydrology for the site was calculated using the NRCS Runoff Equation and Dimensionless Unit Hydrograph as noted in Part 630, Hydrology National Engineering Handbook. The following references were used:

- Curve Numbers were established via Chapter 9 – Hydrologic Soil-Cover Complexes
- Time of Concentrations were calculated in accordance with Chapter 15
- Rainfall Distributions are based on NOAA Type C rainfall distribution
- The Standard Unit Hydrograph was utilized
- The rainfall depths are based on Burlington County NOAA Atlas 14 Data and adjusted per NJAC 7:8-5.7 Tables 5-5 and 5-6 as noted below:

Return Period	NOAA Atlas 14 Rainfall Depth (inches)	Current Adjusted Rainfall Depth (inches)	Projected Adjusted Rainfall Depth (inches)
2 Year Storm	3.36	3.33	3.93
10 Year Storm	5.18	5.23	6.11
100 Year Storm	8.81	9.16	11.63

Based upon the Burlington County Soil Survey, the soil types native to the site include:

Soil Type	Soil Type Name	Hydrologic Soil Group
BumA	Buddtown-Deptford Complex	C

Based on the methodology and data noted above a hydrologic evaluation of the 2, 10, and 100-year storm events was prepared.

This report will address compliance with the following standards:

- Groundwater Recharge Standards (NJAC 7:8-5.4)
- Stormwater Runoff Quality Standards (NJAC 7:8-5.5)
- Stormwater Runoff Quantity Standards (NJAC 7:8-5.6)
- Calculation of Stormwater Runoff (NJAC 7:8-5.7)

- Green Infrastructure Standards (NJAC 7:8-5.3)

3. Existing Drainage Conditions

The area to be analyzed consists of approximately 1.03 acres and is comprised of a bank building, parking and drive aisles. Currently, stormwater runoff generated by the existing site drains to off-site conveyance structures via on-site inlets. Wooded and vegetated areas along the north and east portion of the site flow toward the New Jersey State Highway Route 73 Right-of-Way respectively. The subject site has been evaluated with the following drainage sub-watershed areas as depicted on the Existing Drainage Area Map included in the Appendix of this report.

Ex. Drainage Area 1 (EDA-1): This area consists of 0.35 acres to the north and east perimeter of the site which includes primarily grass covered areas and a portion of the access drive along Route 73. Under existing conditions, stormwater runoff generated by this area flows overland where it flows to the offsite wetlands or is collected off-site by conveyance structures located withing the New Jersey State Highway Route 73.

Ex. Drainage Area 2 (EDA-2): This area consists of 0.68 acres to the south and west corner of the site which includes the existing building, paved parking, and driveway areas with minimal landscape. Under existing conditions, stormwater runoff generated by this area sheet flows to localized low points on-site where it is collected by inlets. Runoff is then conveyed off-site to the existing drainage network.

Existing Conditions Input Summary Table

Drainage Area Name	Drainage Area (acres)	Current Storm Events Time of Concentration (minutes)	Curve Number (CN)
EDA-1-Impervious	0.02	0.4	98
EDA-1-Pervious	0.33	17.6	74
EDA-2-Impervious	0.54	2.6	98
EDA-2-Pervious	0.14	6.9	74

Existing Conditions Flow Summary Table

Drainage Area Name	Current Conditions Adjusted Rainfall			Projected Conditions Adjusted Rainfall		
	Q_2 (CFS)	Q_{10} (CFS)	Q_{100} (CFS)	Q_2 (CFS)	Q_{10} (CFS)	Q_{100} (CFS)
EDA-1	0.33	0.77	1.77	0.47	1.01	2.49
EDA-2	2.23	3.65	6.62	2.70	4.35	8.58

4. Proposed Drainage Conditions

The proposed development will incorporate a previous pavement system with R-Tank and one drywell into the layout of the facility for stormwater management. The pervious pavement system with R-Tank is designed to detain stormwater runoff generated by the development to meet the stormwater management requirements while the drywell is designed to infiltrate stormwater runoff generated by the roof area. The proposed site conditions have been evaluated using the following drainage sub-watershed areas as depicted on the Proposed Drainage Area Map included in the Appendix of this report.

Prop. Drainage Area 1 (PDA-1): This area consists of 0.35 acres along the north and east perimeter of the site which includes primarily grass covered areas, same as EDA-1. Under proposed conditions, stormwater runoff generated by this area maintains existing drainage patterns.

Prop. Drainage Area 2A (PDA-2A): This area consists of 0.29 acres of the site which includes proposed parking, driveway, and landscaped areas. Runoff generated by this area sheet flows overland to localized low points where it is collected by proposed inlets and the proposed pervious pavement system that releases runoff at a control rate within the lot area.

Prop. Drainage Area 2B (PDA-2B): This area consists of 0.08 acres of the site which includes the proposed building. Runoff generated by this area is collected by proposed roof leaders and directed to the proposed stormwater system, which then conveys the water off-site to the existing drainage network.

Prop. Drainage Area 2C (PDA-2C): This area consists of 0.31 acres of the site which includes proposed parking, driveway, and landscaped areas. Runoff generated by this area sheet flows overland to localized low points where it is collected by inlets and conveyed off-site to the existing drainage network.

Proposed Conditions Input Summary Table

Drainage Area Name	Drainage Area (acres)	Current Storm Events Time of Concentration (minutes)	Curve Number (CN)
PDA-1-Impervious	0.02	0.4	98
PDA-1-Pervious	0.33	17.6	74
PDA-2A-Impervious	0.26	3.0	98
PDA-2A-Pervious	0.03	6.2	74
PDA-2B-Impervious	0.08	1.0	98
PDA-2B-Pervious	0.00	0.0	74
PDA-2C-Impervious	0.24	2.5	98
PDA-2C-Pervious	0.07	4.1	74

Proposed Conditions Flow Summary Table

Drainage Area Name	Current Conditions Adjusted Rainfall			Projected Conditions Adjusted Rainfall		
	Q_2 (CFS)	Q_{10} (CFS)	Q_{100} (CFS)	Q_2 (CFS)	Q_{10} (CFS)	Q_{100} (CFS)
PDA-1	0.33	0.76	1.76	0.47	1.00	2.46
PDA-2	1.12	1.82	4.79	1.35	2.20	6.83

5. Stormwater Management System Design

A summary of the previous pavement system with R-Tank water surface elevation (WSEL) and outflow rates for the 2-, 10-, and 100-year storm event for both current and projected conditions are provided below. These WSELs and outflows assume normal operating conditions for the basin. Routing calculations for the basin is included in the Appendix.

Pervious Pavement Summary Table

Storm Event (years)	Water Surface Elevation (ft)	Outflow (CFS)
Current – 2	87.93	0.13
Current – 10	88.32	0.37
Current – 100	88.75	2.16
Projected – 2	88.09	0.14
Projected – 10	88.42	0.68
Projected – 100	88.93	3.22

6. Green Infrastructure Compliance

The basins noted above have been designed to comply with the stormwater runoff quantity, quality, and groundwater recharge requirements for the proposed development as applicable.

Each basin has been designed in accordance with NJAC 7:8 and the New Jersey Stormwater Best Management Practices. The tables below summarize the design considerations for each basin, see the Site Plan details for additional information.

Pervious Pavement (Table 5-1 – Quantity, Quality, & Recharge)

Design Criteria	Required	Provided
Pavement Area	--	3,275 SF
Total Drainage Area	--	12,743 SF
Max. Area of Additional Flow	≤ 3 x Area of System	2.9:1
Infiltration Rate of Pavement	6.4 in/hr	N/A
Max. Drain Time	72 hours	12.18 hours
Separation from SHWT	1 foot (Bottom of Storage Bed)	1.9 foot (Bottom of Storage Bed)
Design Permeability Rate	Min. = 0.5 in/hr Max. = 10 in/hr	N/A

Dry Well (Table 5-1 – Recharge)

Design Criteria	Required	Provided
Total Drainage Area	--	3,694 SF
Max. Area of Additional Flow	1 acre	< 1 acre
Groundwater Recharge	Yes	Yes
Separation from SHWT	2 feet	7.4 feet

7. Water Quantity Control Compliance

EDA-1 vs PDA-1: Due to the proposed reduction in impervious surface coverage and close alignment in the time of concentration for this drainage area between existing and proposed conditions, the post construction runoff hydrograph does not exceed the pre-construction runoff hydrographs at any point in time. This can be observed graphically and numerically via the Hydrograph Comparison Report included within the Appendix of this report, which shows compliance with the stormwater runoff quality standards set forth in N.J.A.C. 7:8.

EDA-2 vs PDA-2: This drainage area has been designed to meet the flow reduction requirements as noted in NJAC7:8-5.6(b)3. The point of analysis has been identified on the Drainage Area Maps as previously described. Below is a summary table demonstrating compliance with the flow reduction requirements.

EDA-2 vs PDA-2

Storm Event	Existing Peak Flow Rate (cfs)	Allowable Percentage of Flow	Allowable Peak Flow Rate (cfs)	Proposed Peak Flow Rate (cfs)
Current 2-year	2.23	50%	1.12	1.12
Current 10-year	3.65	75%	2.74	1.82
Current 100-year	6.62	80%	5.30	4.79
Projected 2-year	2.70	50%	1.35	1.35
Projected 10-year	4.35	75%	3.26	2.20
Projected 100-year	8.58	80%	6.86	6.83

8. Water Quantity Compliance

In accordance with NJAC 7:8-5.5, stormwater quality standards are applicable when a major development results in an increase of one-quarter acre or more of regulated motor vehicle surface. The proposed development does not result in an increase of motor vehicle surface of 0.04 acre; therefore, the stormwater quality standards are not applicable.

Despite the fact that water quality measures are not required, the proposed development includes a pervious pavement system that provides a TSS removal rate of 80%

9. Groundwater Recharge Compliance

The project has been designed to satisfy the groundwater recharge requirements set forth in NJAC 7:8-5.4 by infiltrating 100% of the annual post-development groundwater recharge volume deficit of 1,753 cubic feet. The New Jersey Groundwater Recharge Spreadsheet (NJGRS) – Based on GSR-32 has been utilized to verify satisfaction of the recharge requirement. The NJ Groundwater Recharge Spreadsheet is included within the appendix of the report.

Groundwater Recharge Summary	
Pre-Development Total Annual Recharge Volume	*20,603 CF*
Post-Development Total Annual Recharge Volume	*18,850 CF*
Post-Development Annual Recharge Deficit	*1,753 CF*
Basin A (Drywell)	24 CF
Total Annual Recharge Volume Provided	**1,896 CF**

10. Storm Sewer Design

The proposed stormwater management collection system has been designed to have hydraulic capacity for the 100-year storm event. The Rational Method was used to determine inflow rates to each structure and Manning's Equation was used to establish pipe capacity. In accordance with the NJDEP BMP Manual Chapter 5, weighted runoff coefficients were computed for each drainage area based on land cover and hydrologic soil group. A minimum time of concentration of ten minutes was assumed for each area. Rainfall intensity was based upon the Trenton Rainfall intensity curve. Supporting calculations and the Inlet Drainage Area Map can be found in the appendix.

11. Soil Erosion and Sediment Control Compliance

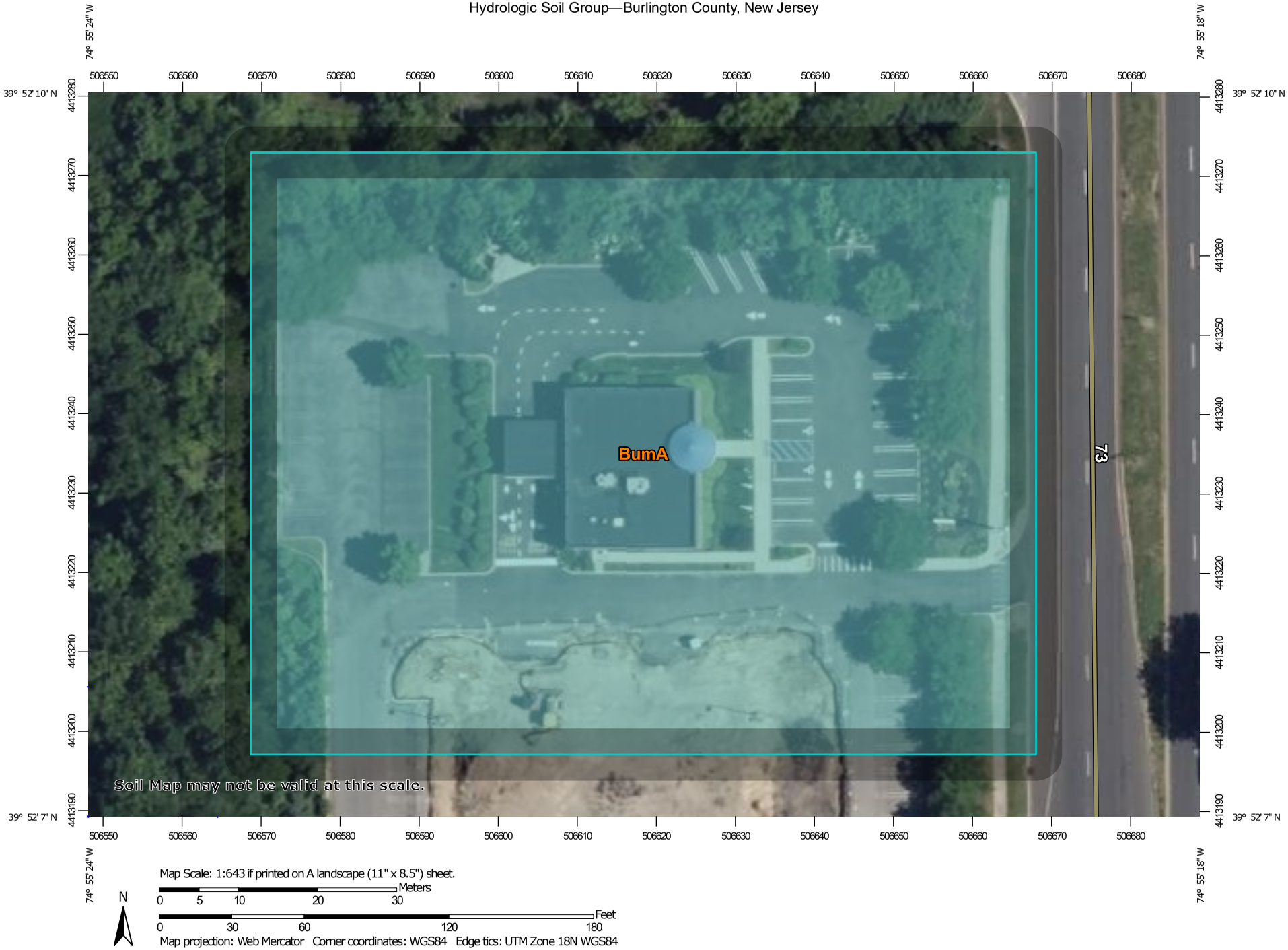
The project has been designed to comply with the Standards for Soil Erosion and Sediment Control in New Jersey. Soil erosion control measures such as a sediment barrier, inlet protection, tree protection, and silt fence are shown on the plans.

12. Conclusion

The proposed development has been designed with provisions for the safe and efficient control of stormwater runoff in a manner that will not adversely impact the existing drainage patterns, adjacent roadways, or adjacent parcels. In addition, the proposed development satisfies the runoff quantity, quality and groundwater recharge requirements set forth by the Township of Evesham Land Use Ordinance and NJAC 7:8 through the use of the proposed stormwater management system. With this stated, it is evident that the proposed development will not have a negative impact on the existing drainage conditions, water quality or groundwater recharge on-site or within the vicinity of the subject site.

APPENDIX

NRCS WEB SOIL SURVEY



Map Scale: 1:643 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5 10 20 30

Feet
0 30 60 120 180

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 Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Burlington County, New Jersey
Survey Area Data: Version 20, Aug 29, 2023

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

Date(s) aerial images were photographed: Data not available.

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BumA	Buddtown-Deptford complex, 0 to 2 percent slopes	C	1.9	100.0%
Totals for Area of Interest			**1.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Burlington County, New Jersey

BumA—Buddtown-Deptford complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: sjzx
Elevation: 30 to 150 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Buddtown and similar soils: 65 percent
Deptford and similar soils: 30 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Buddtown

Setting

Landform: Flats
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy eolian deposits and/or loamy fluviomarine deposits

Typical profile

Ap - 0 to 9 inches: fine sandy loam
Bt1 - 9 to 12 inches: very fine sandy loam
Bt2 - 12 to 26 inches: loam
Bt3 - 26 to 34 inches: loam
2C1 - 34 to 41 inches: loamy coarse sand
2C2 - 41 to 54 inches: loamy sand
2C3 - 54 to 65 inches: coarse sand
2C4 - 65 to 80 inches: coarse sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F149AY130NJ - Moist Loamy Upland
Hydric soil rating: No

Description of Deptford

Setting

Landform: Flats
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy eolian deposits and/or loamy fluviomarine deposits

Typical profile

Ap - 0 to 8 inches: very fine sandy loam
Bt1 - 8 to 12 inches: very fine sandy loam
Bt2 - 12 to 22 inches: loam
Btg - 22 to 46 inches: very fine sandy loam
BCtg - 46 to 50 inches: fine sandy loam
Cg1 - 50 to 62 inches: fine sandy loam
Cg2 - 62 to 80 inches: stratified loamy very fine sand to very fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 12 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F149AY130NJ - Moist Loamy Upland
Hydric soil rating: No

Minor Components

Jade run

Percent of map unit: 5 percent
Landform: Depressions, flats
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear

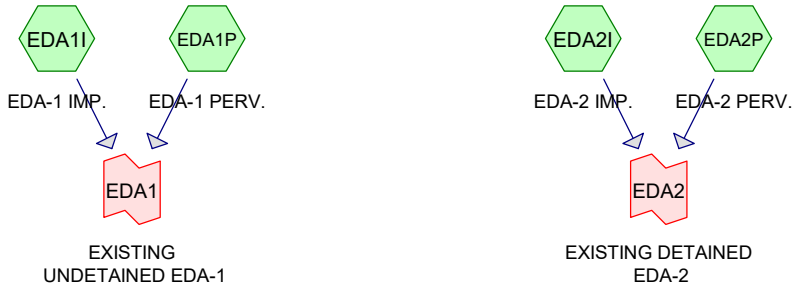
Ecological site: F149AY090NJ - Coastal Plain Hardwood Swamp
Hydric soil rating: Yes

Data Source Information

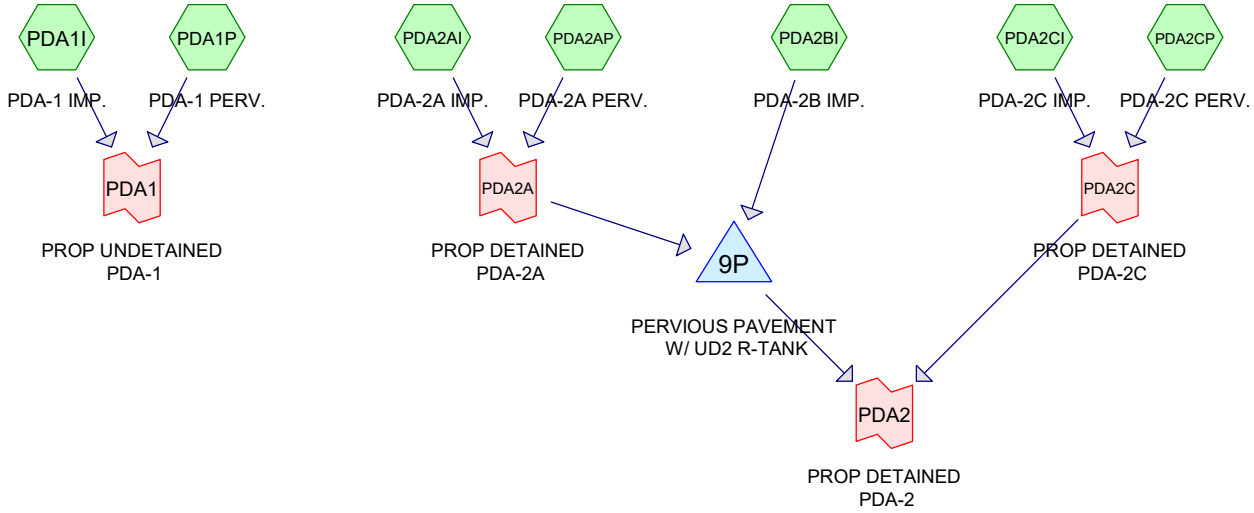
Soil Survey Area: Burlington County, New Jersey
Survey Area Data: Version 20, Aug 29, 2023

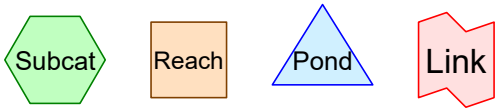
HYDROGRAPH SUMMARY REPORTS – EXISTING AND PROPOSED CONDITIONS 2YR, 10YR & 100-YEAR

Existing Conditions



Proposed Conditions





Routing Diagram for 2025-02-04 Drainage Calcs
Prepared by Dynamic Engineering, Printed 5/15/2025
HydroCAD® 10.20-6a s/n 08640 © 2024 HydroCAD Software Solutions LLC

Project Notes

Rainfall events imported from "NJ-Rain.txt" for 6613 NJ Morris-D
Rainfall events imported from "NJ-Rain.txt" for 6613 NJ Morris-D
Rainfall events imported from "NJ-Rain.txt" for 6613 NJ Morris-D

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	2-Year-Current	NOAA 24-hr	C	Default	24.00	1	3.33	2	3.33
2	2-Year-Projected	NOAA 24-hr	C	Default	24.00	1	3.93	2	3.93
3	10-Year-Current	NOAA 24-hr	C	Default	24.00	1	5.23	2	3.33
4	10-Year-Projected	NOAA 24-hr	C	Default	24.00	1	6.11	2	3.93
5	100-Year-Current	NOAA 24-hr	C	Default	24.00	1	9.16	2	3.33
6	100-Year-Projected	NOAA 24-hr	C	Default	24.00	1	11.63	2	3.93

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
39,167	74	>75% Grass cover, Good, HSG C (EDA1P, EDA2P, PDA1P, PDA2AP, PDA2CP)
50,765	98	Paved parking, HSG B (EDA1I, EDA2I, PDA1I, PDA2AI, PDA2BI, PDA2CI)
89,932	**88**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
50,765	HSG B	EDA1I, EDA2I, PDA1I, PDA2AI, PDA2BI, PDA2CI
39,167	HSG C	EDA1P, EDA2P, PDA1P, PDA2AP, PDA2CP
0	HSG D	
0	Other	
89,932		**TOTAL AREA**

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	Su Nu
0	0	39,167	0	0	39,167	>75% Grass cover, Good	
0	50,765	0	0	0	50,765	Paved parking	
0	**50,765**	**39,167**	**0**	**0**	**89,932**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA1I: EDA-1 IMP. Runoff Area=803 sf 100.00% Impervious Runoff Depth=3.10"
Flow Length=36' Slope=0.0420 '/' Tc=0.4 min CN=98 Runoff=0.07 cfs 207 cf

Subcatchment EDA1P: EDA-1 PERV. Runoff Area=14,598 sf 0.00% Impervious Runoff Depth=1.12"
Flow Length=203' Tc=18.7 min CN=74 Runoff=0.31 cfs 1,367 cf

Subcatchment EDA2I: EDA-2 IMP. Runoff Area=23,615 sf 100.00% Impervious Runoff Depth=3.10"
Flow Length=182' Tc=2.8 min CN=98 Runoff=2.09 cfs 6,095 cf

Subcatchment EDA2P: EDA-2 PERV. Runoff Area=5,950 sf 0.00% Impervious Runoff Depth=1.12"
Flow Length=187' Tc=7.3 min CN=74 Runoff=0.19 cfs 557 cf

Subcatchment PDA1I: PDA-1 IMP. Runoff Area=795 sf 100.00% Impervious Runoff Depth=3.10"
Flow Length=36' Slope=0.0420 '/' Tc=0.4 min CN=98 Runoff=0.07 cfs 205 cf

Subcatchment PDA1P: PDA-1 PERV. Runoff Area=14,453 sf 0.00% Impervious Runoff Depth=1.12"
Flow Length=203' Tc=18.7 min CN=74 Runoff=0.31 cfs 1,354 cf

Subcatchment PDA2AI: PDA-2A IMP. Runoff Area=11,408 sf 100.00% Impervious Runoff Depth=3.10"
Flow Length=160' Tc=3.2 min CN=98 Runoff=0.99 cfs 2,944 cf

Subcatchment PDA2AP: PDA-2A PERV. Runoff Area=1,335 sf 0.00% Impervious Runoff Depth=1.12"
Flow Length=186' Tc=6.6 min CN=74 Runoff=0.04 cfs 125 cf

Subcatchment PDA2BI: PDA-2B IMP. Runoff Area=3,694 sf 100.00% Impervious Runoff Depth=3.10"
Tc=1.0 min CN=98 Runoff=0.33 cfs 953 cf

Subcatchment PDA2CI: PDA-2C IMP. Runoff Area=10,450 sf 100.00% Impervious Runoff Depth=3.10"
Flow Length=147' Tc=2.6 min CN=98 Runoff=0.93 cfs 2,697 cf

Subcatchment PDA2CP: PDA-2C PERV. Runoff Area=2,831 sf 0.00% Impervious Runoff Depth=1.12"
Flow Length=178' Tc=4.4 min CN=74 Runoff=0.10 cfs 265 cf

Pond 9P: PERVIOUS PAVEMENT W/ UD2 Peak Elev=87.93' Storage=2,319 cf Inflow=1.34 cfs 4,023 cf
Outflow=0.13 cfs 3,623 cf

Link EDA1: EXISTING UNDETAINED EDA-1 Inflow=0.33 cfs 1,575 cf
Primary=0.33 cfs 1,575 cf

Link EDA2: EXISTING DETAINED EDA-2 Inflow=2.23 cfs 6,652 cf
Primary=2.23 cfs 6,652 cf

Link PDA1: PROP UNDETAINED PDA-1 Inflow=0.33 cfs 1,559 cf
Primary=0.33 cfs 1,559 cf

Link PDA2: PROP DETAINED PDA-2 Inflow=1.12 cfs 6,586 cf
Primary=1.12 cfs 6,586 cf

Link PDA2A: PROP DETAINED PDA-2A Inflow=1.03 cfs 3,069 cf
Primary=1.03 cfs 3,069 cf

Link PDA2C: PROP DETAINED PDA-2C Inflow=1.02 cfs 2,962 cf
Primary=1.02 cfs 2,962 cf

Total Runoff Area = 89,932 sf Runoff Volume = 16,771 cf Average Runoff Depth = 2.24"
43.55% Pervious = 39,167 sf 56.45% Impervious = 50,765 sf

Summary for Subcatchment EDA1I: EDA-1 IMP.

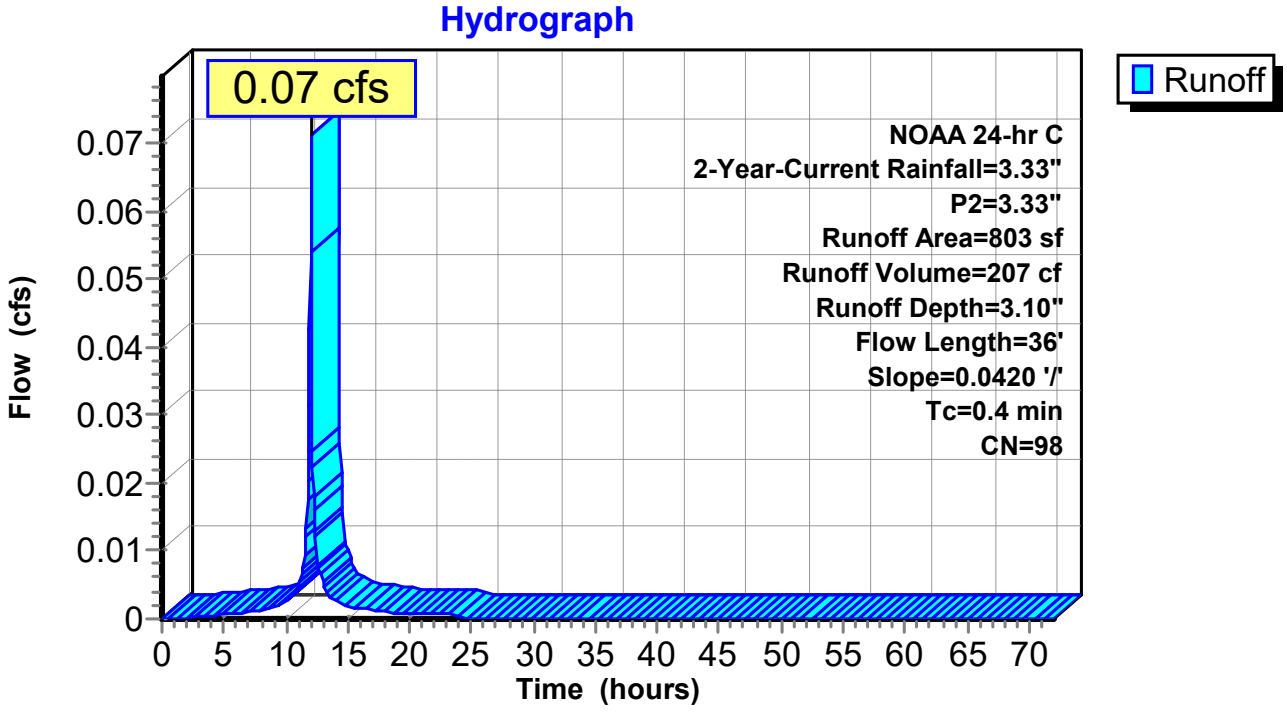
Runoff = 0.07 cfs @ 12.05 hrs, Volume= 207 cf, Depth= 3.10"
Routed to Link EDA1 : EXISTING UNDETAINED EDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Current Rainfall=3.33", P2=3.33"

Area (sf)	CN	Description
803	98	Paved parking, HSG B
803		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	36	0.0420	1.54		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"

Subcatchment EDA1I: EDA-1 IMP.



Summary for Subcatchment EDA1P: EDA-1 PERV.

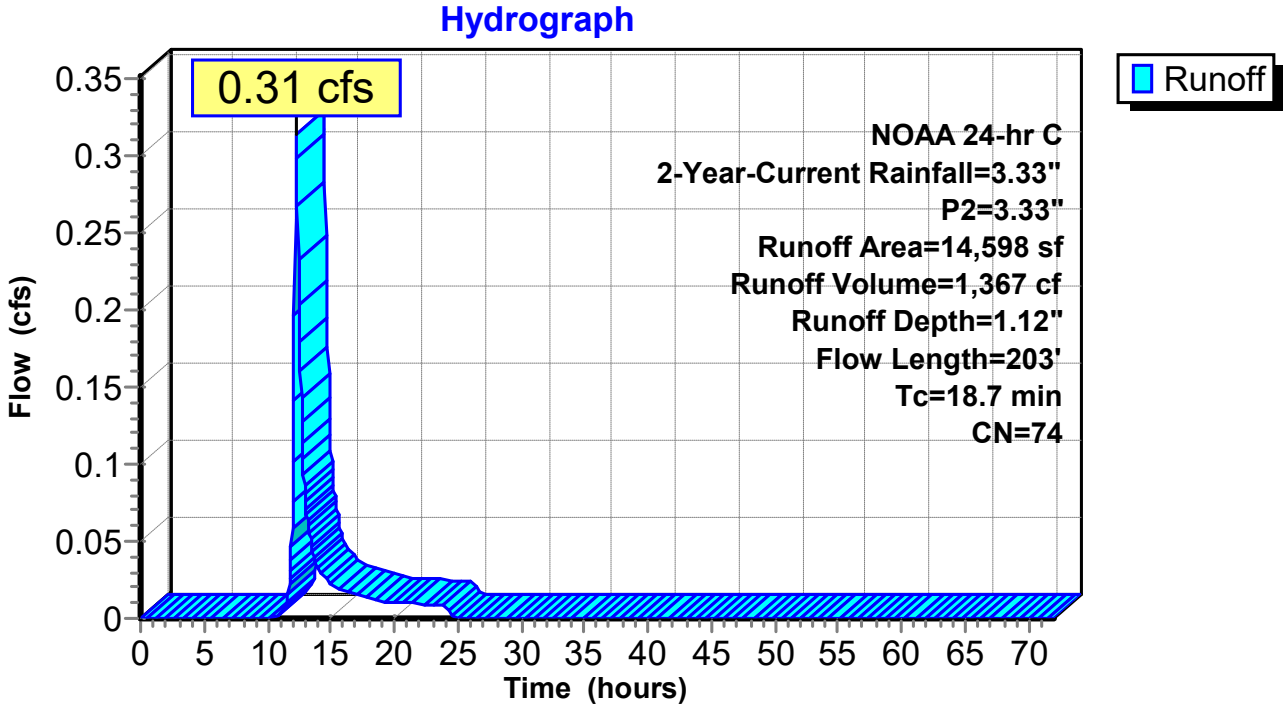
Runoff = 0.31 cfs @ 12.30 hrs, Volume= 1,367 cf, Depth= 1.12"
Routed to Link EDA1 : EXISTING UNDETAINED EDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Current Rainfall=3.33", P2=3.33"

Area (sf)	CN	Description
14,598	74	>75% Grass cover, Good, HSG C
14,598		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	8	0.1750	0.25		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.33"
0.5	11	0.4760	0.40		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.33"
0.7	11	0.1809	0.27		**Sheet Flow, CD** Grass: Short n= 0.150 P2= 3.33"
11.4	71	0.0065	0.10		**Sheet Flow, DE** Grass: Short n= 0.150 P2= 3.33"
5.6	102	0.0019	0.31		**Shallow Concentrated Flow, EF** Short Grass Pasture Kv= 7.0 fps
18.7	203	Total			

Subcatchment EDA1P: EDA-1 PERV.



Summary for Subcatchment EDA2I: EDA-2 IMP.

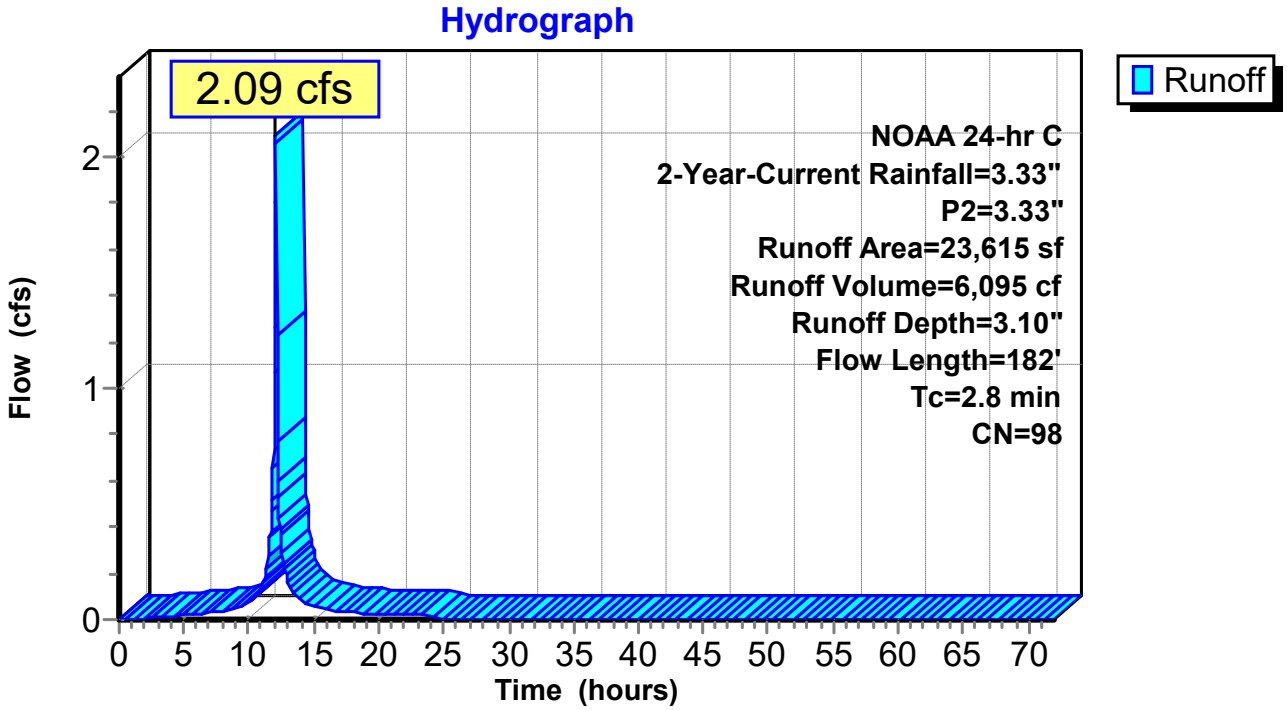
Runoff = 2.09 cfs @ 12.09 hrs, Volume= 6,095 cf, Depth= 3.10"
Routed to Link EDA2 : EXISTING DETAINED EDA-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Current Rainfall=3.33", P2=3.33"

Area (sf)	CN	Description
23,615	98	Paved parking, HSG B
23,615		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0208	1.24		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"
1.1	50	0.0060	0.75		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
0.2	42	0.0207	2.92		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.8	40	0.0017	0.84		**Shallow Concentrated Flow, DE** Paved Kv= 20.3 fps
2.8	182	Total			

Subcatchment EDA2I: EDA-2 IMP.



Summary for Subcatchment EDA2P: EDA-2 PERV.

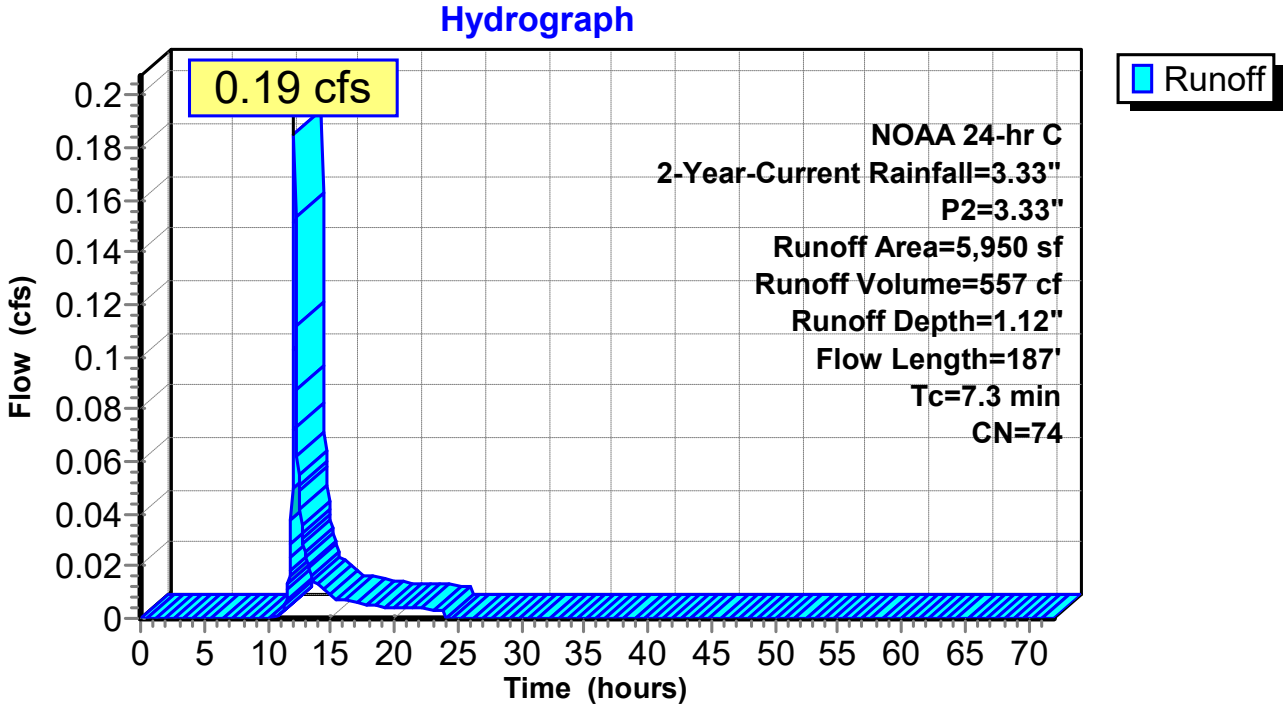
Runoff = 0.19 cfs @ 12.15 hrs, Volume= 557 cf, Depth= 1.12"
Routed to Link EDA2 : EXISTING DETAINED EDA-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Current Rainfall=3.33", P2=3.33"

Area (sf)	CN	Description
5,950	74	>75% Grass cover, Good, HSG C
5,950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	24	0.0064	0.08		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.33"
0.4	31	0.0226	1.17		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
1.0	45	0.0060	0.74		**Sheet Flow, CD** Smooth surfaces n= 0.011 P2= 3.33"
0.3	46	0.0207	2.92		**Shallow Concentrated Flow, DE** Paved Kv= 20.3 fps
0.8	41	0.0017	0.84		**Shallow Concentrated Flow, EF** Paved Kv= 20.3 fps
7.3	187	Total			

Subcatchment EDA2P: EDA-2 PERV.



Summary for Subcatchment PDA1I: PDA-1 IMP.

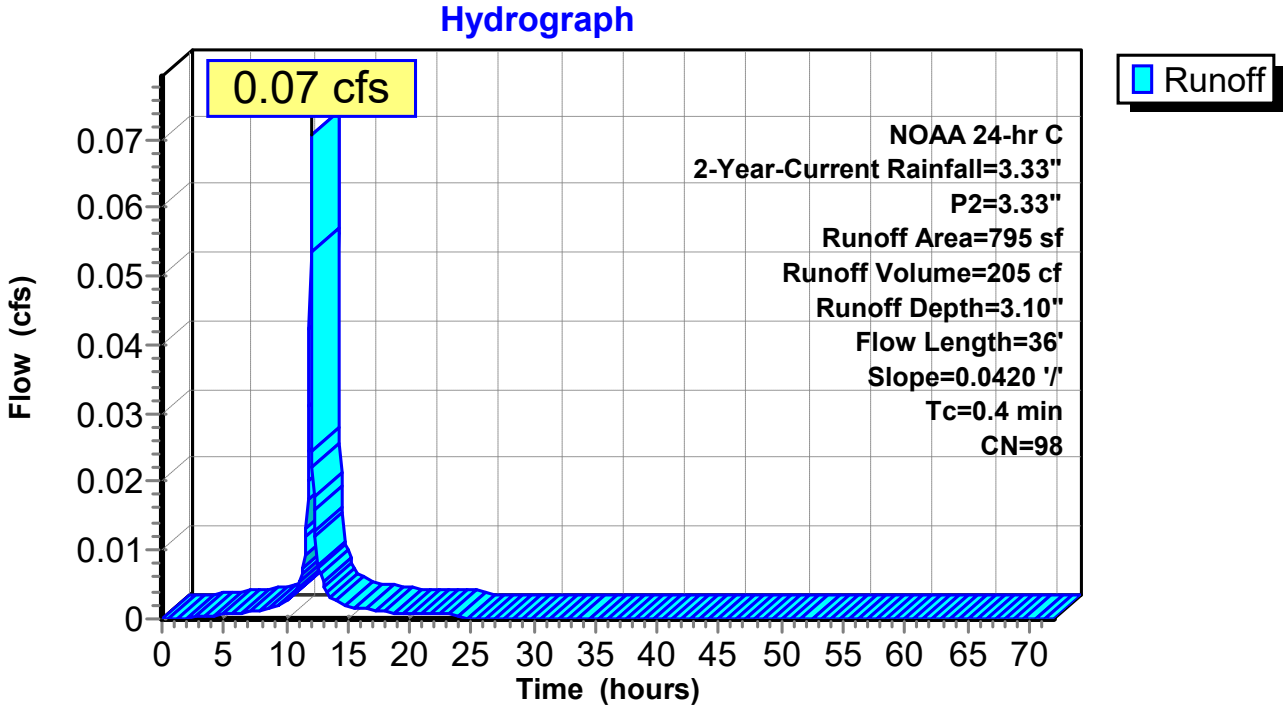
Runoff = 0.07 cfs @ 12.05 hrs, Volume= 205 cf, Depth= 3.10"
Routed to Link PDA1 : PROP UNDETAINED PDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Current Rainfall=3.33", P2=3.33"

Area (sf)	CN	Description
795	98	Paved parking, HSG B
795		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	36	0.0420	1.54		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"

Subcatchment PDA1I: PDA-1 IMP.



Summary for Subcatchment PDA1P: PDA-1 PERV.

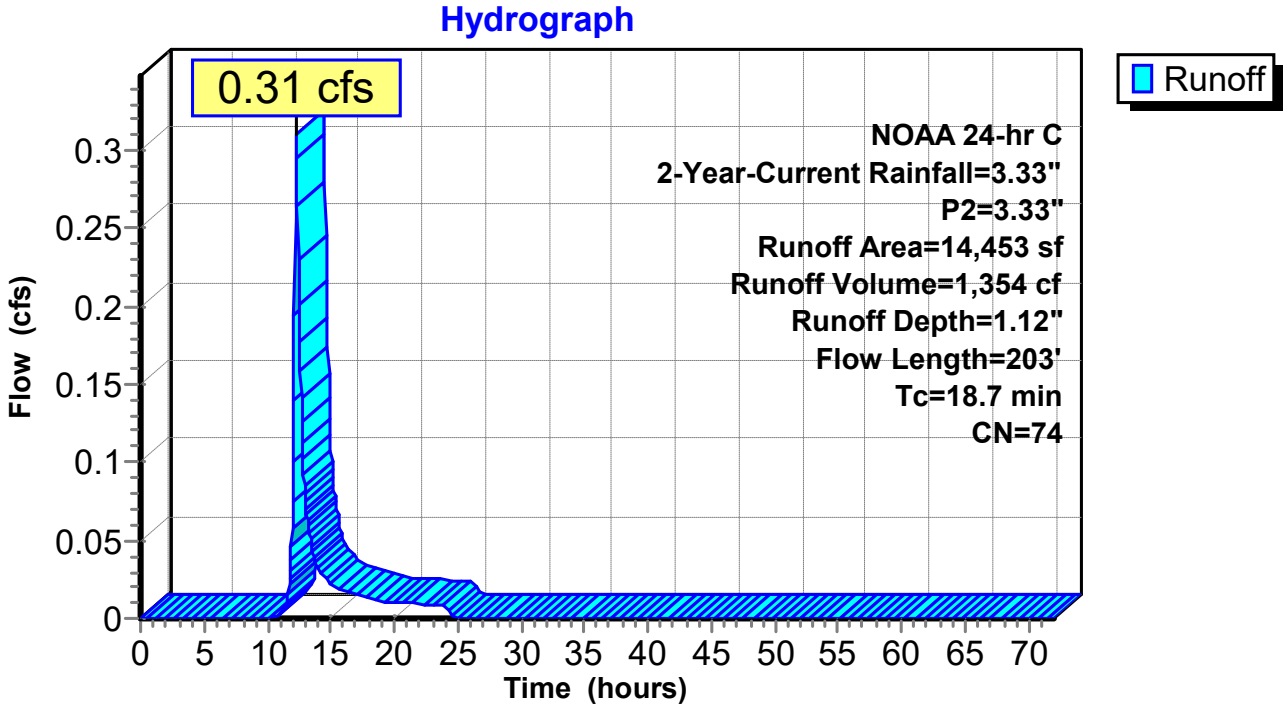
Runoff = 0.31 cfs @ 12.30 hrs, Volume= 1,354 cf, Depth= 1.12"
Routed to Link PDA1 : PROP UNDETAINED PDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Current Rainfall=3.33", P2=3.33"

Area (sf)	CN	Description
14,453	74	>75% Grass cover, Good, HSG C
14,453		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	8	0.1750	0.25		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.33"
0.5	11	0.4760	0.40		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.33"
0.7	11	0.1809	0.27		**Sheet Flow, CD** Grass: Short n= 0.150 P2= 3.33"
11.4	71	0.0065	0.10		**Sheet Flow, DE** Grass: Short n= 0.150 P2= 3.33"
5.6	102	0.0019	0.31		**Shallow Concentrated Flow, EF** Short Grass Pasture Kv= 7.0 fps
18.7	203	Total			

Subcatchment PDA1P: PDA-1 PERV.



Summary for Subcatchment PDA2AI: PDA-2A IMP.

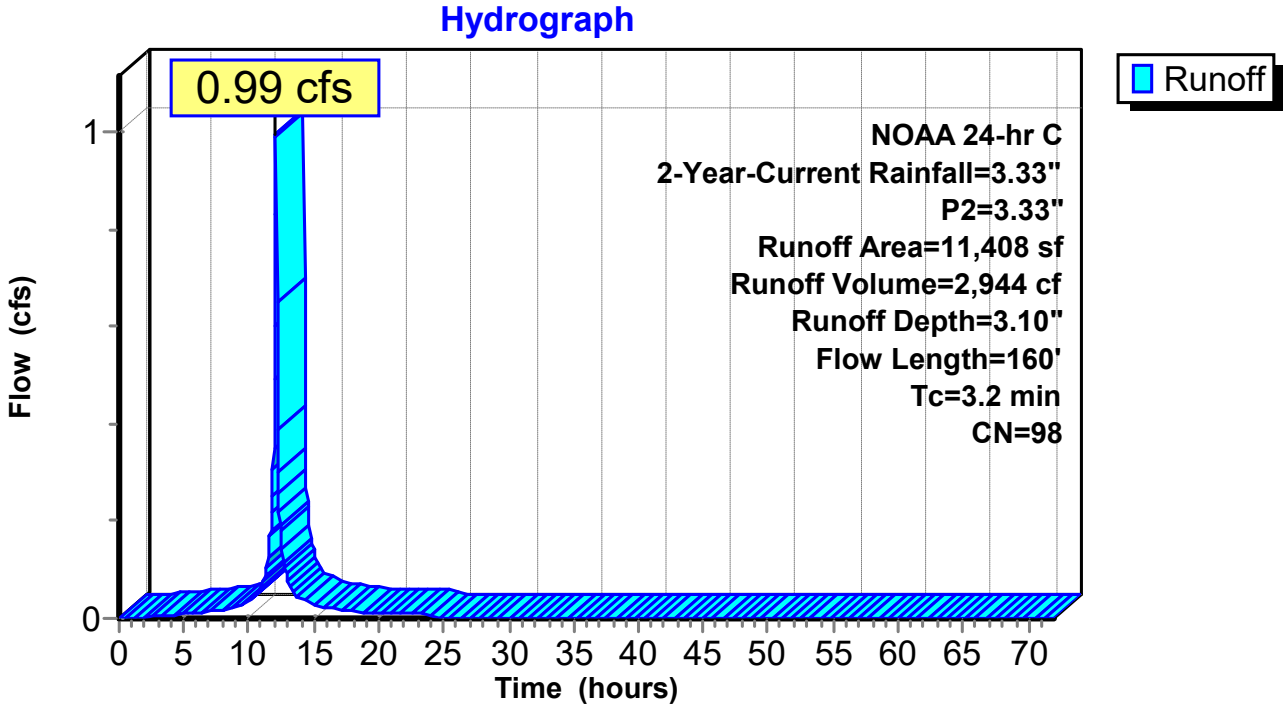
Runoff = 0.99 cfs @ 12.09 hrs, Volume= 2,944 cf, Depth= 3.10"
Routed to Link PDA2A : PROP DETAINED PDA-2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Current Rainfall=3.33", P2=3.33"

Area (sf)	CN	Description
11,408	98	Paved parking, HSG B
11,408		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	6	0.0100	0.61		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"
1.3	47	0.0036	0.61		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
1.0	47	0.0070	0.79		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
0.1	12	0.0200	2.87		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.6	48	0.0050	1.44		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
3.2	160	Total			

Subcatchment PDA2AI: PDA-2A IMP.



Summary for Subcatchment PDA2AP: PDA-2A PERV.

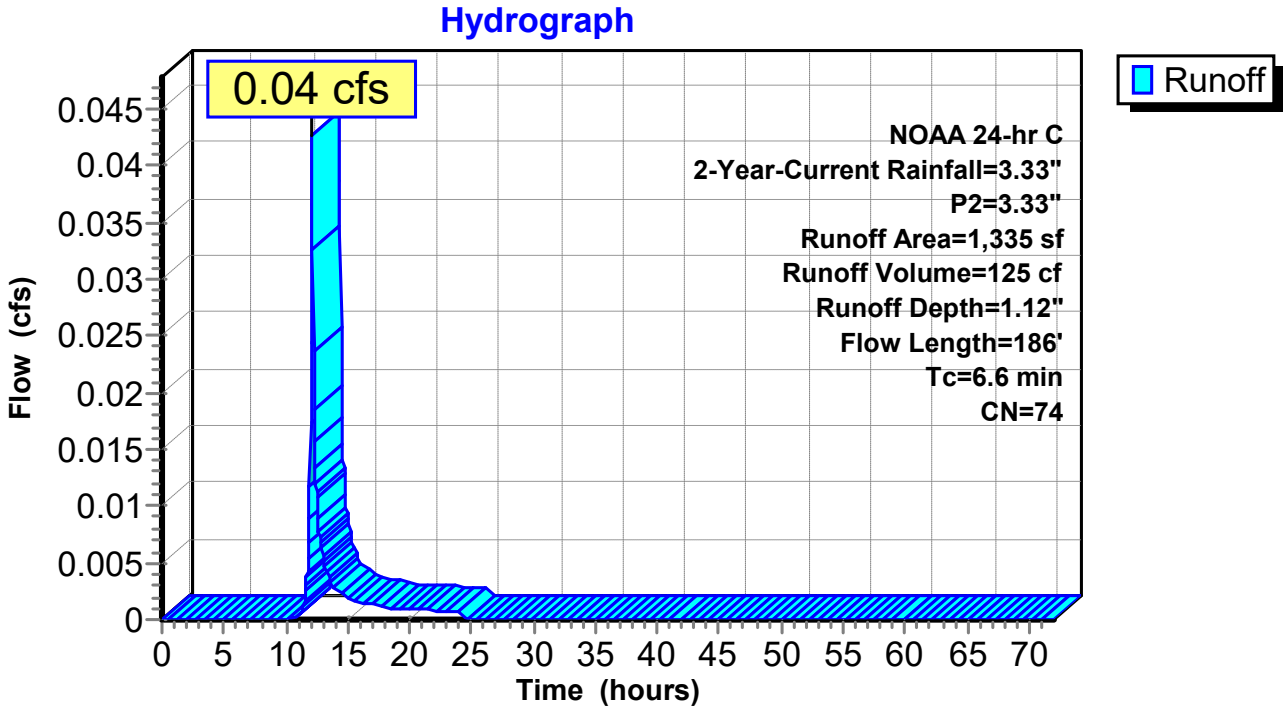
Runoff = 0.04 cfs @ 12.14 hrs, Volume= 125 cf, Depth= 1.12"
Routed to Link PDA2A : PROP DETAINED PDA-2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Current Rainfall=3.33", P2=3.33"

Area (sf)	CN	Description
1,335	74	>75% Grass cover, Good, HSG C
1,335		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	18	0.0050	0.07		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.33"
1.5	82	0.0070	0.89		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
0.4	39	0.0070	1.70		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	47	0.0050	1.44		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
6.6	186	Total			

Subcatchment PDA2AP: PDA-2A PERV.



Summary for Subcatchment PDA2BI: PDA-2B IMP.

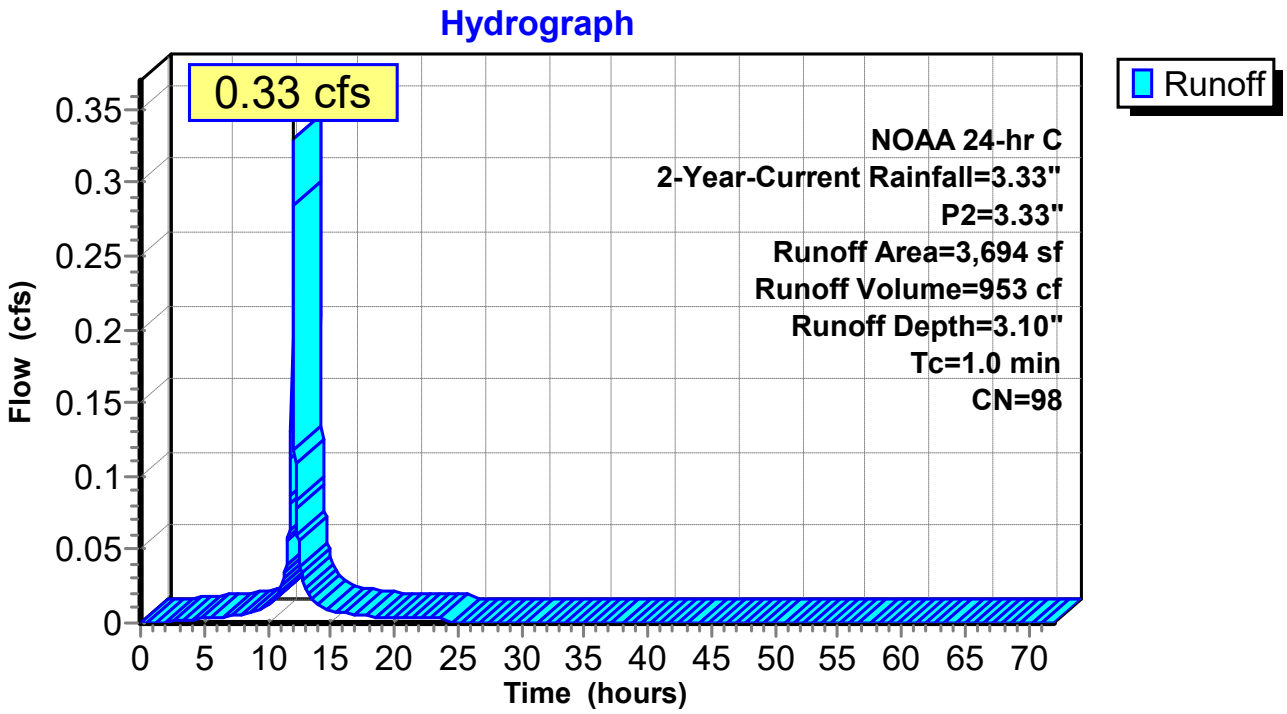
Runoff = 0.33 cfs @ 12.06 hrs, Volume= 953 cf, Depth= 3.10"
Routed to Pond 9P : PERVIOUS PAVEMENT W/ UD2 R-TANK

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Current Rainfall=3.33", P2=3.33"

Area (sf)	CN	Description
3,694	98	Paved parking, HSG B
3,694		100.00% Impervious Area

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

Subcatchment PDA2BI: PDA-2B IMP.



Summary for Subcatchment PDA2CI: PDA-2C IMP.

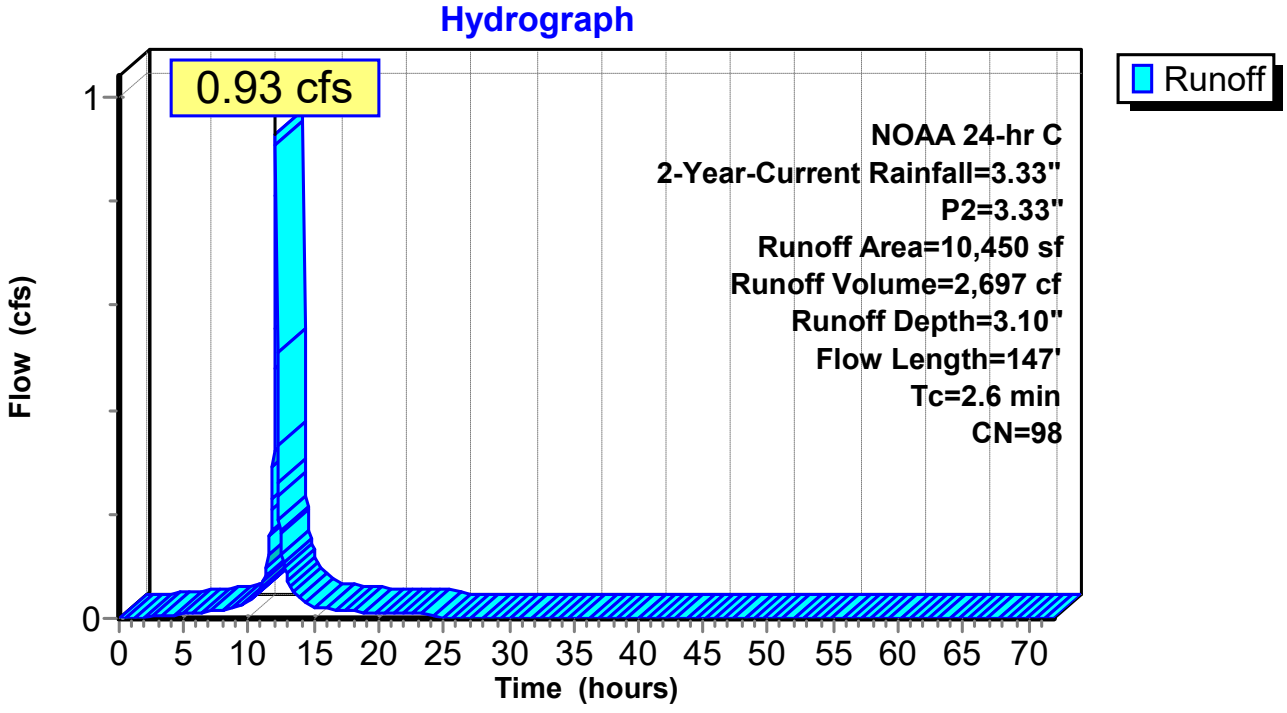
Runoff = 0.93 cfs @ 12.08 hrs, Volume= 2,697 cf, Depth= 3.10"
Routed to Link PDA2C : PROP DETAINED PDA-2C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Current Rainfall=3.33", P2=3.33"

Area (sf)	CN	Description
10,450	98	Paved parking, HSG B
10,450		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0100	0.67		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"
0.5	19	0.0050	0.58		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
1.3	71	0.0074	0.88		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
0.1	18	0.0600	4.97		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	29	0.0020	0.91		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
2.6	147	Total			

Subcatchment PDA2CI: PDA-2C IMP.



Summary for Subcatchment PDA2CP: PDA-2C PERV.

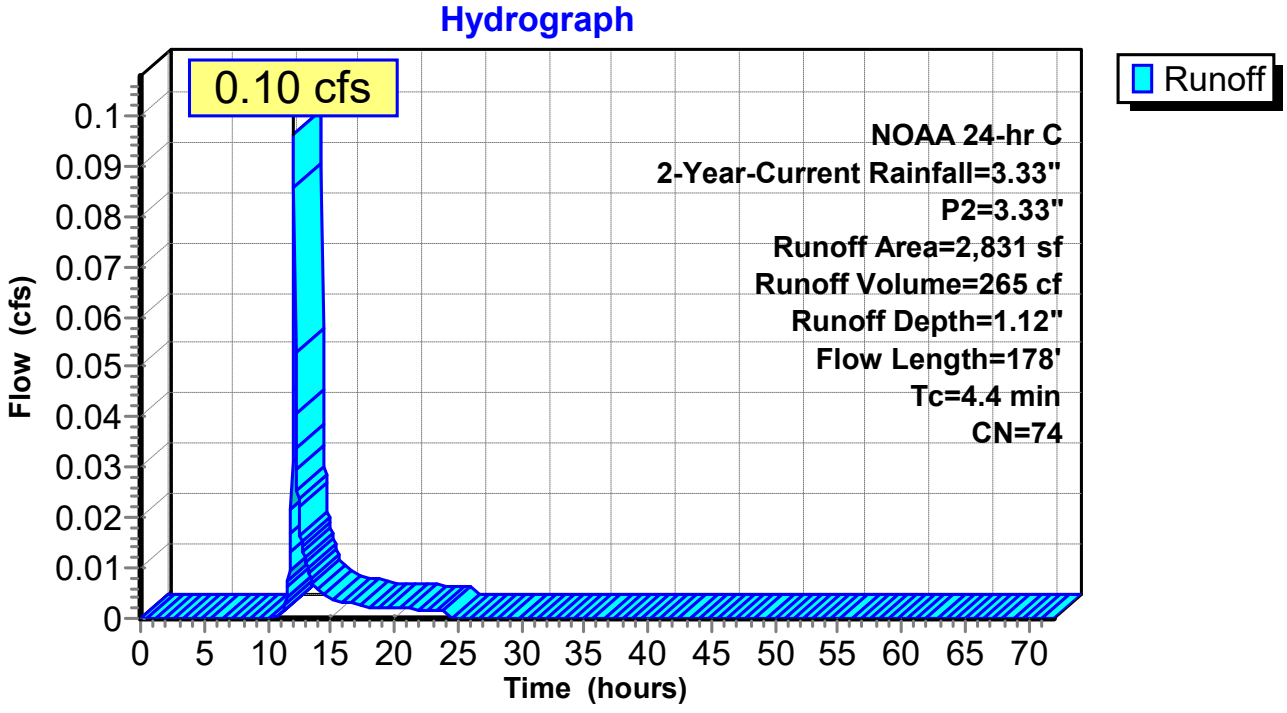
Runoff = 0.10 cfs @ 12.11 hrs, Volume= 265 cf, Depth= 1.12"
Routed to Link PDA2C : PROP DETAINED PDA-2C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Current Rainfall=3.33", P2=3.33"

Area (sf)	CN	Description
2,831	74	>75% Grass cover, Good, HSG C
2,831		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	8	0.0060	0.06		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.33"
0.7	42	0.0150	1.05		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"
0.7	50	0.0160	1.12		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
0.4	48	0.0090	1.93		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	30	0.0023	0.97		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
4.4	178	Total			

Subcatchment PDA2CP: PDA-2C PERV.



Summary for Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

Inflow Area = 16,437 sf, 91.88% Impervious, Inflow Depth = 2.94" for 2-Year-Current event
Inflow = 1.34 cfs @ 12.09 hrs, Volume= 4,023 cf
Outflow = 0.13 cfs @ 12.87 hrs, Volume= 3,623 cf, Atten= 91%, Lag= 46.8 min
Primary = 0.13 cfs @ 12.87 hrs, Volume= 3,623 cf
Routed to Link PDA2 : PROP DETAINED PDA-2

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 87.93' @ 12.87 hrs Surf.Area= 3,147 sf Storage= 2,319 cf

Plug-Flow detention time= 329.1 min calculated for 3,621 cf (90% of inflow)
Center-of-Mass det. time= 279.4 min (1,036.5 - 757.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	86.99'	1,331 cf	**35.50'W x 88.65'L x 2.76'H Field A** 8,696 cf Overall - 6,035 cf Embedded = 2,661 cf x 50.0% Voids
#2A	87.24'	5,733 cf	**Ferguson R-Tank UD 2** x 688 Inside #1 Inside= 23.6"W x 27.2"H => 4.23 sf x 1.97'L = 8.3 cf Outside= 23.6"W x 27.2"H => 4.46 sf x 1.97'L = 8.8 cf 688 Chambers in 16 Rows
		7,064 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	87.24'	**15.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 87.24' / 87.19' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	87.24'	**2.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	88.20'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.13 cfs @ 12.87 hrs HW=87.93' (Free Discharge)
└**1=Culvert** (Passes 0.13 cfs of 1.38 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.13 cfs @ 3.70 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK - Chamber Wizard Field A

Chamber Model = Ferguson R-Tank UD 2 (Ferguson R-Tank UD)
Inside= 23.6"W x 27.2"H => 4.23 sf x 1.97'L = 8.3 cf
Outside= 23.6"W x 27.2"H => 4.46 sf x 1.97'L = 8.8 cf

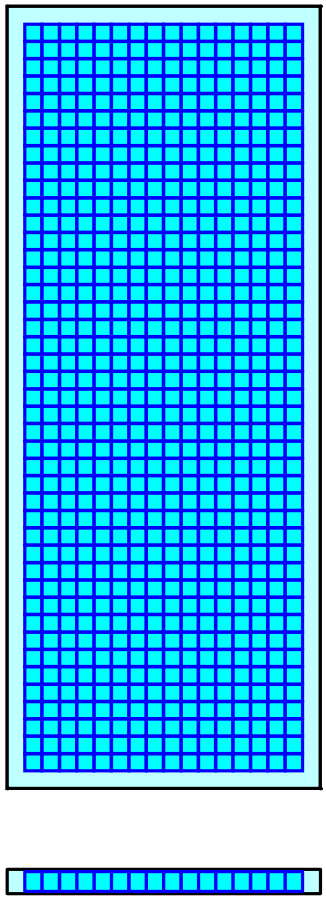
43 Chambers/Row x 1.97' Long = 84.65' Row Length +24.0" End Stone x 2 = 88.65' Base Length
16 Rows x 23.6" Wide + 24.0" Side Stone x 2 = 35.50' Base Width
3.0" Stone Base + 27.2" Chamber Height + 3.0" Stone Cover = 2.76' Field Height

688 Chambers x 8.3 cf = 5,733.5 cf Chamber Storage
688 Chambers x 8.8 cf = 6,035.2 cf Displacement

8,696.4 cf Field - 6,035.2 cf Chambers = 2,661.2 cf Stone x 50.0% Voids = 1,330.6 cf Stone Storage

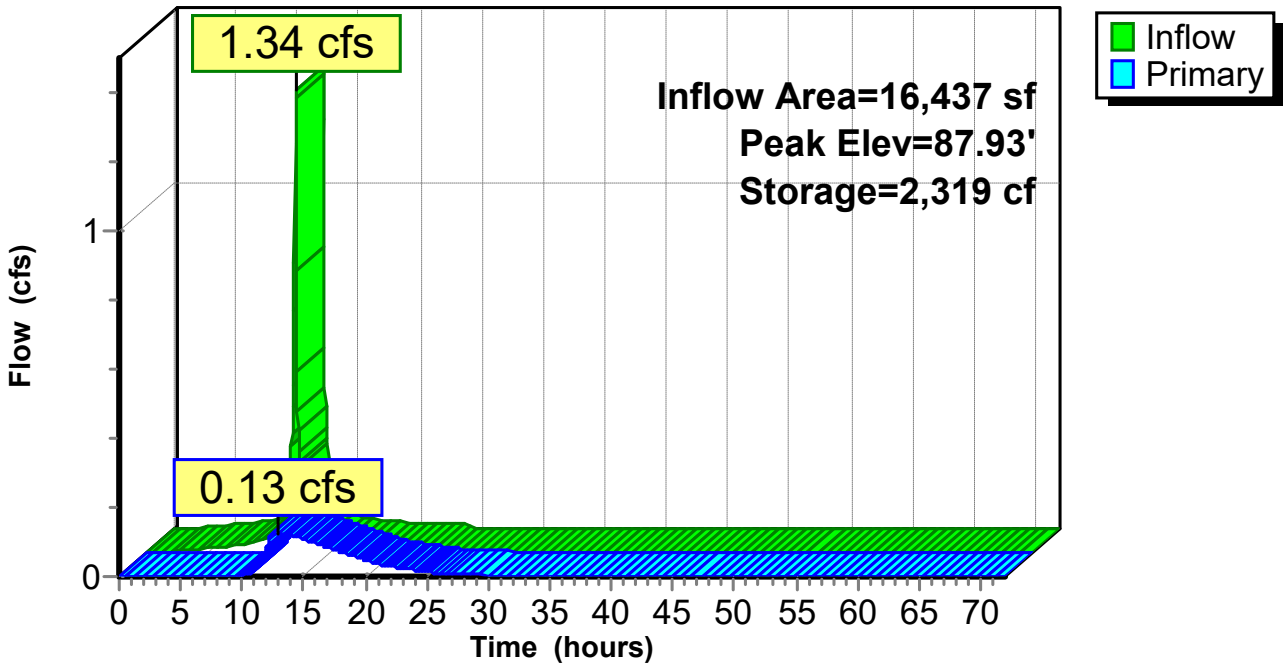
Chamber Storage + Stone Storage = 7,064.1 cf = 0.162 af
Overall Storage Efficiency = 81.2%
Overall System Size = 88.65' x 35.50' x 2.76'

688 Chambers
322.1 cy Field
98.6 cy Stone



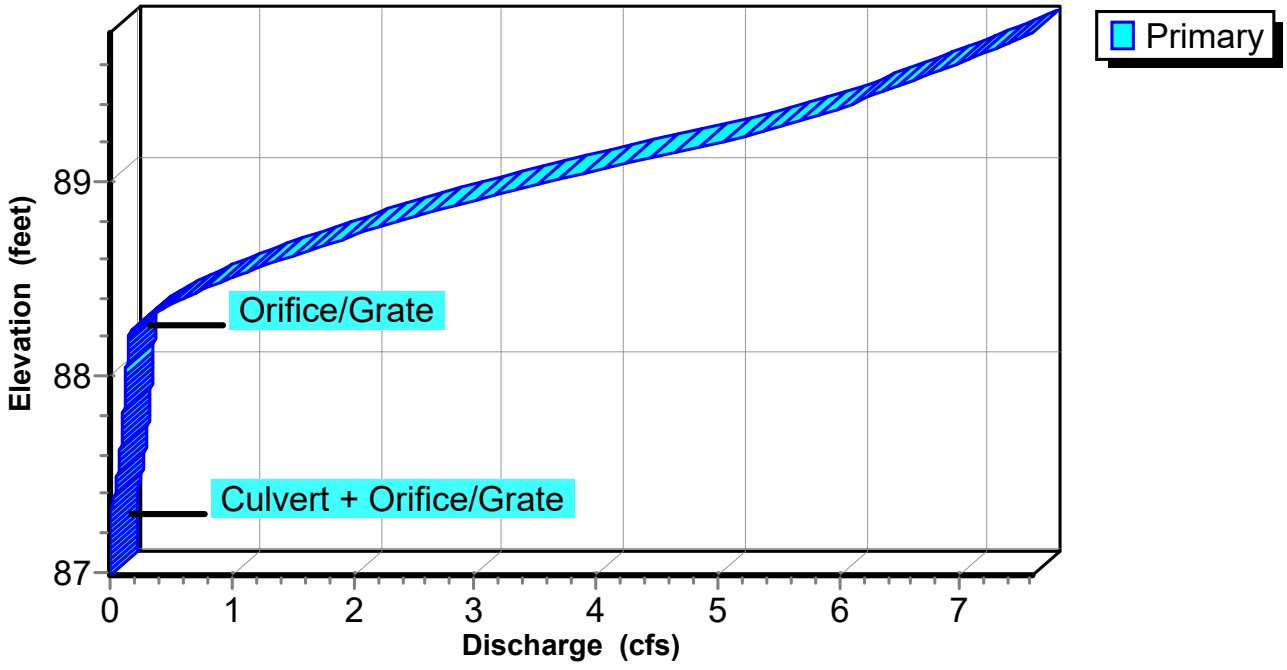
Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

Hydrograph

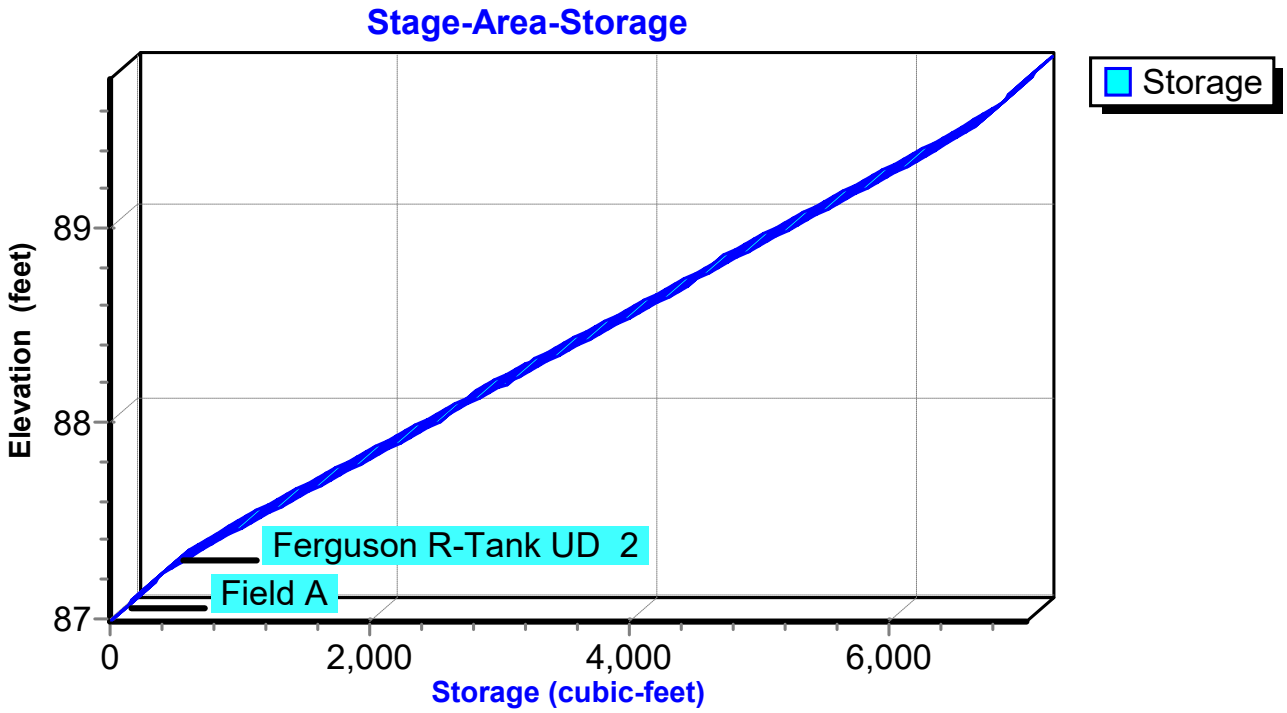


Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

Stage-Discharge



Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

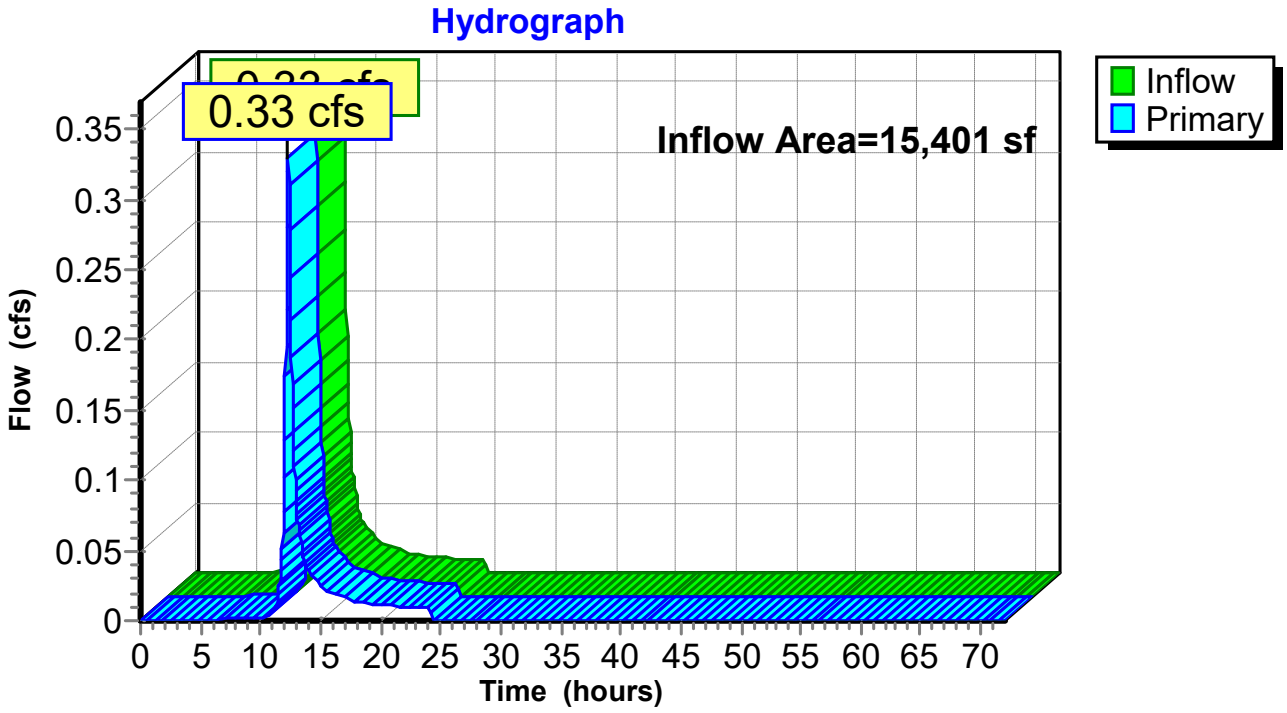


Summary for Link EDA1: EXISTING UNDETAINED EDA-1

Inflow Area = 15,401 sf, 5.21% Impervious, Inflow Depth = 1.23" for 2-Year-Current event
Inflow = 0.33 cfs @ 12.29 hrs, Volume= 1,575 cf
Primary = 0.33 cfs @ 12.29 hrs, Volume= 1,575 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 3L

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

Link EDA1: EXISTING UNDETAINED EDA-1

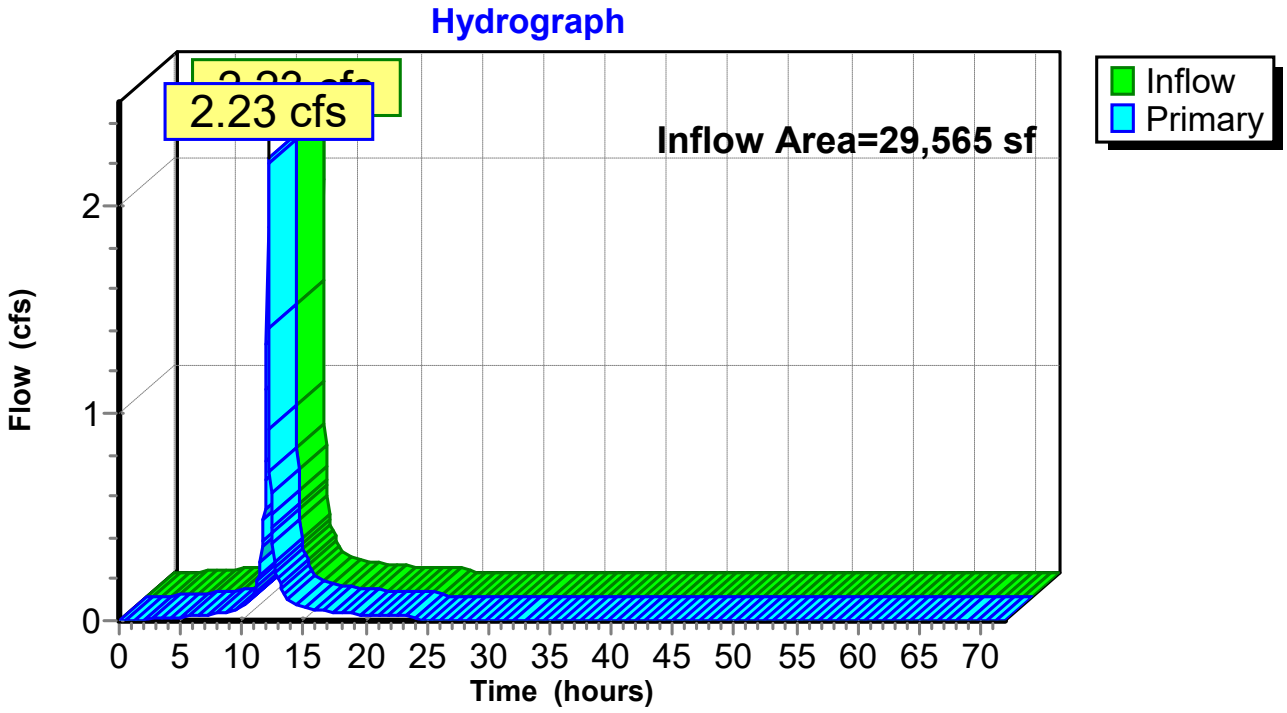


Summary for Link EDA2: EXISTING DETAINED EDA-2

Inflow Area = 29,565 sf, 79.87% Impervious, Inflow Depth = 2.70" for 2-Year-Current event
Inflow = 2.23 cfs @ 12.09 hrs, Volume= 6,652 cf
Primary = 2.23 cfs @ 12.09 hrs, Volume= 6,652 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node BDA2

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

Link EDA2: EXISTING DETAINED EDA-2

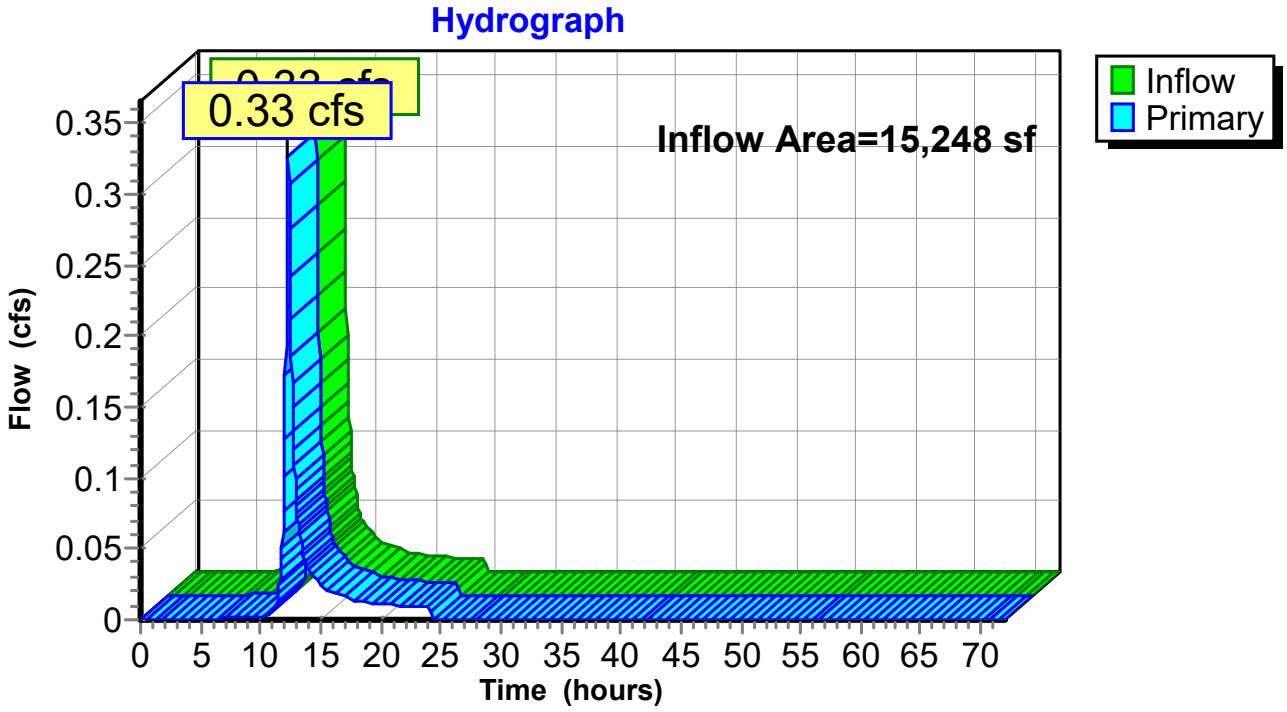


Summary for Link PDA1: PROP UNDETAINED PDA-1

Inflow Area = 15,248 sf, 5.21% Impervious, Inflow Depth = 1.23" for 2-Year-Current event
Inflow = 0.33 cfs @ 12.29 hrs, Volume= 1,559 cf
Primary = 0.33 cfs @ 12.29 hrs, Volume= 1,559 cf, Atten= 0%, Lag= 0.0 min

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

Link PDA1: PROP UNDETAINED PDA-1

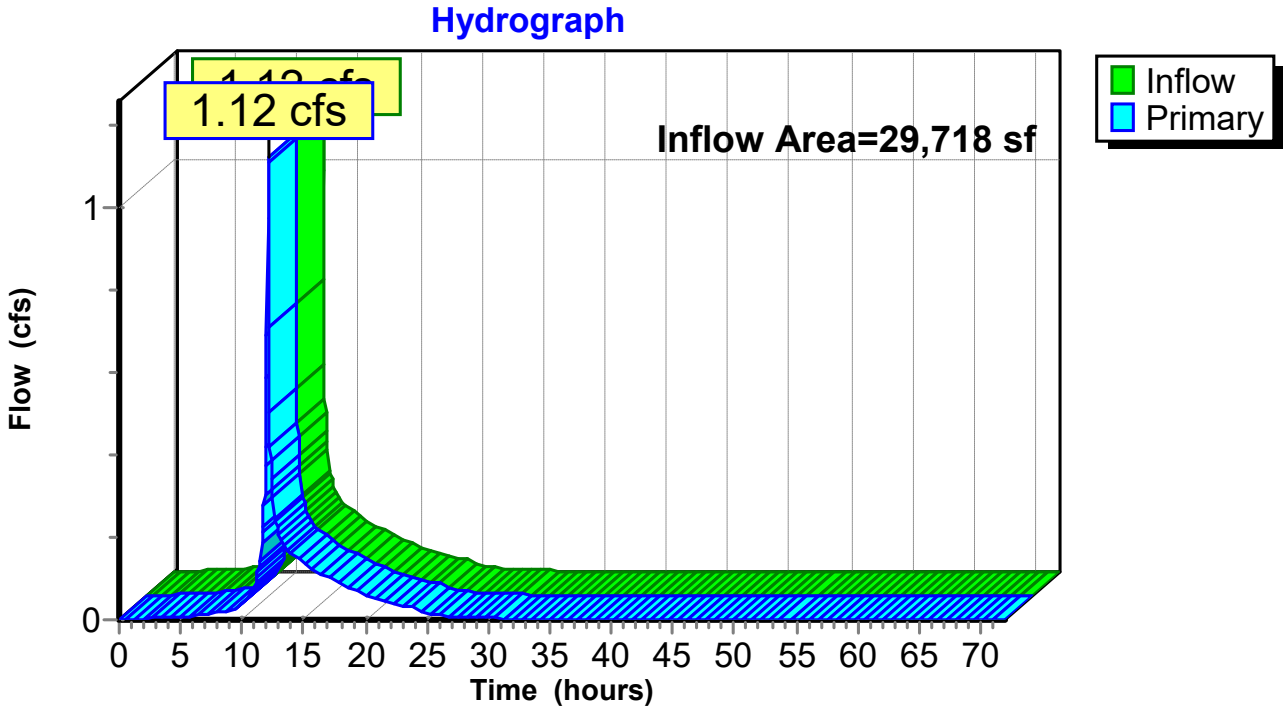


Summary for Link PDA2: PROP DETAINED PDA-2

Inflow Area = 29,718 sf, 85.98% Impervious, Inflow Depth > 2.66" for 2-Year-Current event
Inflow = 1.12 cfs @ 12.09 hrs, Volume= 6,586 cf
Primary = 1.12 cfs @ 12.09 hrs, Volume= 6,586 cf, Atten= 0%, Lag= 0.0 min

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

Link PDA2: PROP DETAINED PDA-2

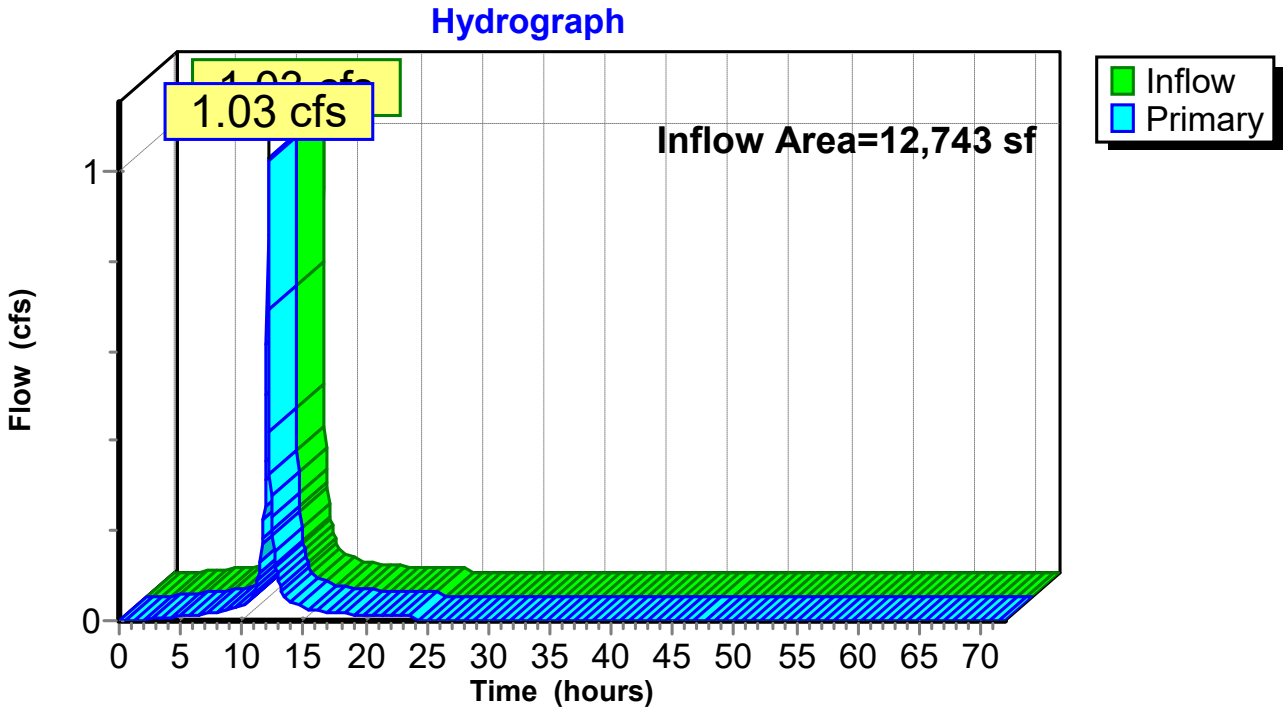


Summary for Link PDA2A: PROP DETAINED PDA-2A

Inflow Area = 12,743 sf, 89.52% Impervious, Inflow Depth = 2.89" for 2-Year-Current event
Inflow = 1.03 cfs @ 12.09 hrs, Volume= 3,069 cf
Primary = 1.03 cfs @ 12.09 hrs, Volume= 3,069 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 9P : PERVIOUS PAVEMENT W/ UD2 R-TANK

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

Link PDA2A: PROP DETAINED PDA-2A

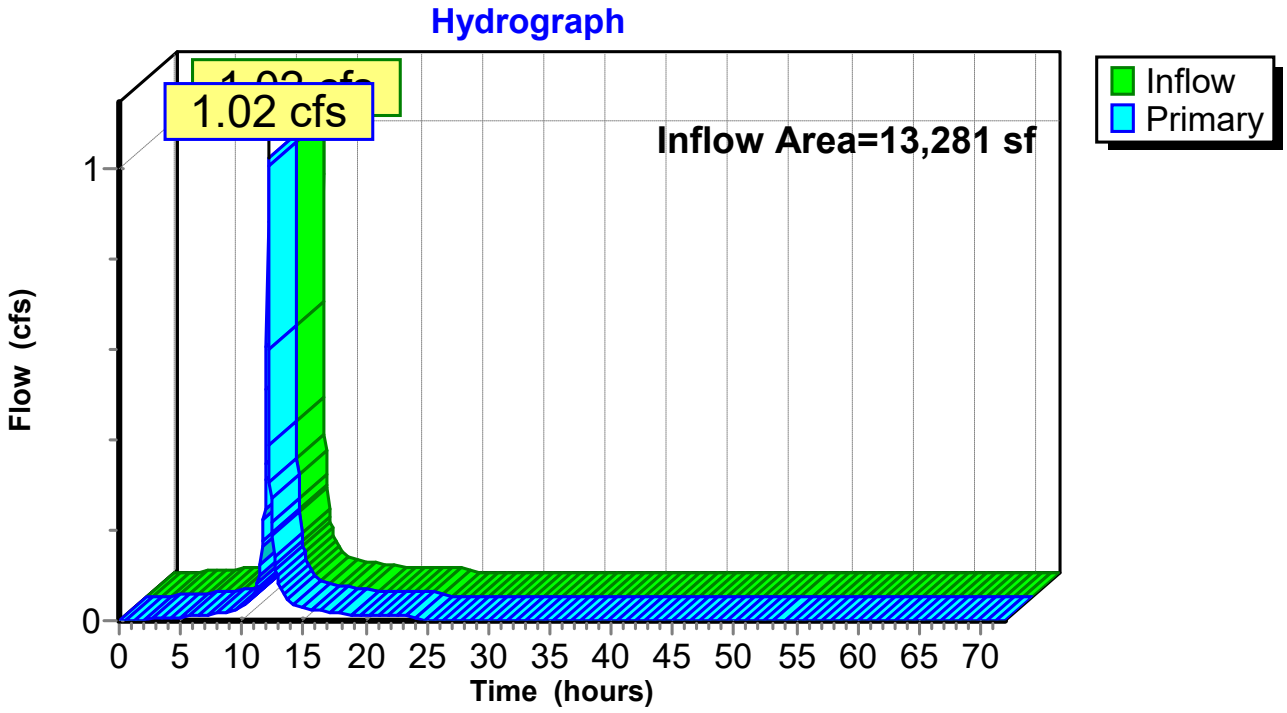


Summary for Link PDA2C: PROP DETAINED PDA-2C

Inflow Area = 13,281 sf, 78.68% Impervious, Inflow Depth = 2.68" for 2-Year-Current event
Inflow = 1.02 cfs @ 12.09 hrs, Volume= 2,962 cf
Primary = 1.02 cfs @ 12.09 hrs, Volume= 2,962 cf, Atten= 0%, Lag= 0.0 min
Routed to Link PDA2 : PROP DETAINED PDA-2

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

Link PDA2C: PROP DETAINED PDA-2C



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA1I: EDA-1 IMP. Runoff Area=803 sf 100.00% Impervious Runoff Depth=3.70"
Flow Length=36' Slope=0.0420 '/' Tc=0.4 min CN=98 Runoff=0.08 cfs 247 cf

Subcatchment EDA1P: EDA-1 PERV. Runoff Area=14,598 sf 0.00% Impervious Runoff Depth=1.55"
Flow Length=203' Tc=17.6 min CN=74 Runoff=0.45 cfs 1,880 cf

Subcatchment EDA2I: EDA-2 IMP. Runoff Area=23,615 sf 100.00% Impervious Runoff Depth=3.70"
Flow Length=182' Tc=2.6 min CN=98 Runoff=2.49 cfs 7,272 cf

Subcatchment EDA2P: EDA-2 PERV. Runoff Area=5,950 sf 0.00% Impervious Runoff Depth=1.55"
Flow Length=187' Tc=6.9 min CN=74 Runoff=0.26 cfs 766 cf

Subcatchment PDA1I: PDA-1 IMP. Runoff Area=795 sf 100.00% Impervious Runoff Depth=3.70"
Flow Length=36' Slope=0.0420 '/' Tc=0.4 min CN=98 Runoff=0.08 cfs 245 cf

Subcatchment PDA1P: PDA-1 PERV. Runoff Area=14,453 sf 0.00% Impervious Runoff Depth=1.55"
Flow Length=203' Tc=17.6 min CN=74 Runoff=0.45 cfs 1,861 cf

Subcatchment PDA2AI: PDA-2A IMP. Runoff Area=11,408 sf 100.00% Impervious Runoff Depth=3.70"
Flow Length=160' Tc=3.0 min CN=98 Runoff=1.19 cfs 3,513 cf

Subcatchment PDA2AP: PDA-2A PERV. Runoff Area=1,335 sf 0.00% Impervious Runoff Depth=1.55"
Flow Length=186' Tc=6.2 min CN=74 Runoff=0.06 cfs 172 cf

Subcatchment PDA2BI: PDA-2B IMP. Runoff Area=3,694 sf 100.00% Impervious Runoff Depth=3.70"
Tc=1.0 min CN=98 Runoff=0.39 cfs 1,138 cf

Subcatchment PDA2CI: PDA-2C IMP. Runoff Area=10,450 sf 100.00% Impervious Runoff Depth=3.70"
Flow Length=147' Tc=2.5 min CN=98 Runoff=1.11 cfs 3,218 cf

Subcatchment PDA2CP: PDA-2C PERV. Runoff Area=2,831 sf 0.00% Impervious Runoff Depth=1.55"
Flow Length=178' Tc=4.1 min CN=74 Runoff=0.14 cfs 365 cf

Pond 9P: PERVIOUS PAVEMENT W/ UD2 Peak Elev=88.09' Storage=2,752 cf Inflow=1.60 cfs 4,822 cf
Outflow=0.14 cfs 4,423 cf

Link EDA1: EXISTING UNDETAINED EDA-1 Inflow=0.47 cfs 2,127 cf
Primary=0.47 cfs 2,127 cf

Link EDA2: EXISTING DETAINED EDA-2 Inflow=2.70 cfs 8,038 cf
Primary=2.70 cfs 8,038 cf

Link PDA1: PROP UNDETAINED PDA-1 Inflow=0.47 cfs 2,106 cf
Primary=0.47 cfs 2,106 cf

Link PDA2: PROP DETAINED PDA-2 Inflow=1.35 cfs 8,005 cf
Primary=1.35 cfs 8,005 cf

Link PDA2A: PROP DETAINED PDA-2A Inflow=1.24 cfs 3,685 cf
Primary=1.24 cfs 3,685 cf

Link PDA2C: PROP DETAINED PDA-2C Inflow=1.24 cfs 3,582 cf
Primary=1.24 cfs 3,582 cf

Total Runoff Area = 89,932 sf Runoff Volume = 20,676 cf Average Runoff Depth = 2.76"
43.55% Pervious = 39,167 sf 56.45% Impervious = 50,765 sf

Summary for Subcatchment EDA1I: EDA-1 IMP.

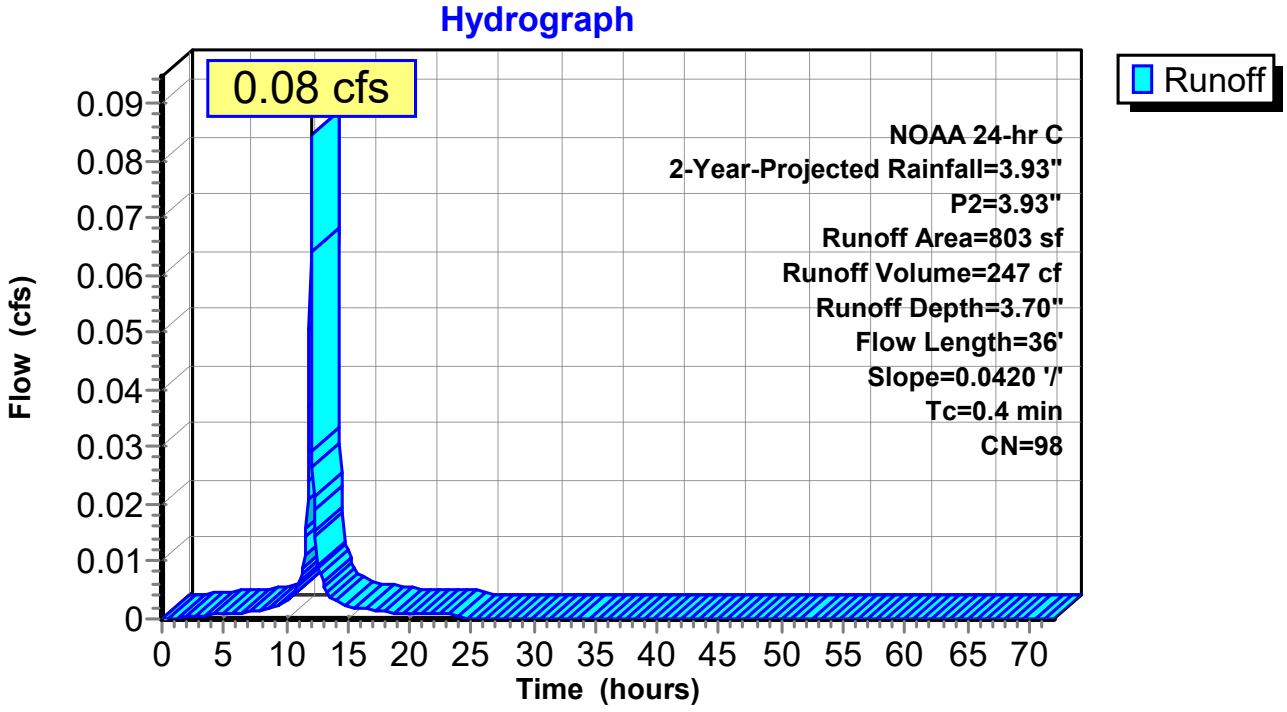
Runoff = 0.08 cfs @ 12.05 hrs, Volume= 247 cf, Depth= 3.70"
Routed to Link EDA1 : EXISTING UNDETAINED EDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Projected Rainfall=3.93", P2=3.93"

Area (sf)	CN	Description
803	98	Paved parking, HSG B
803		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	36	0.0420	1.67		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"

Subcatchment EDA1I: EDA-1 IMP.



Summary for Subcatchment EDA1P: EDA-1 PERV.

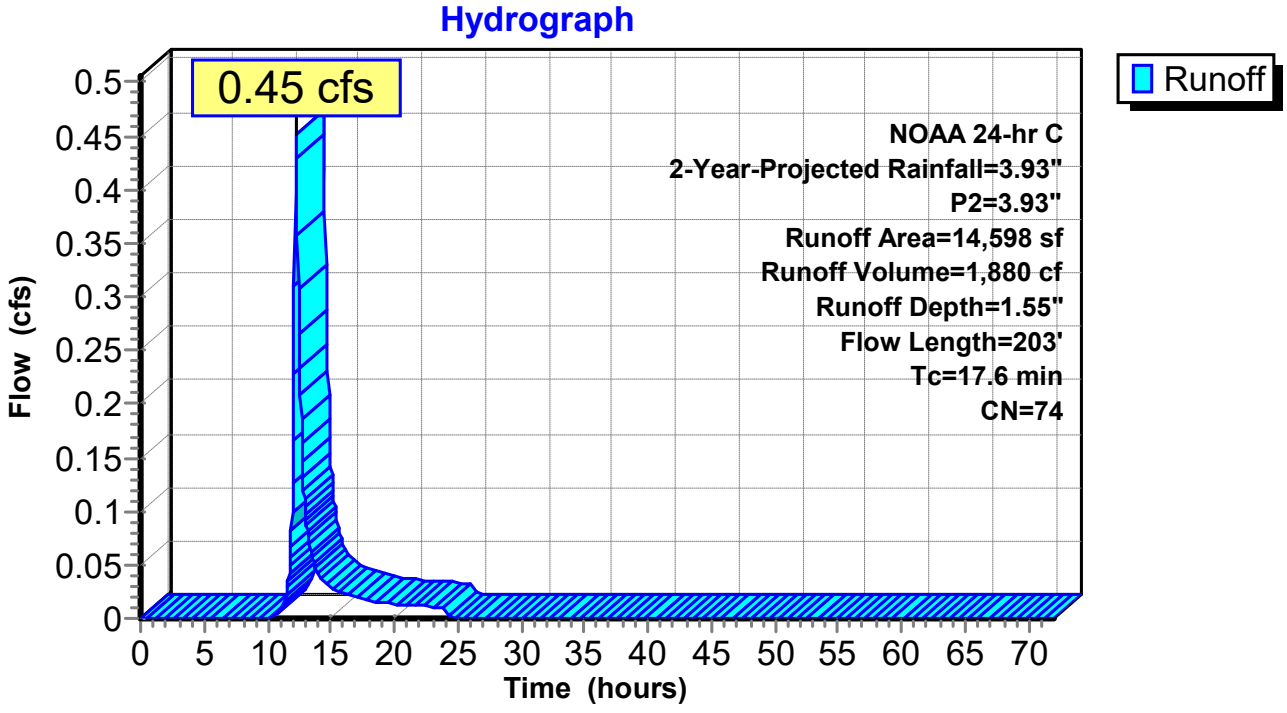
Runoff = 0.45 cfs @ 12.28 hrs, Volume= 1,880 cf, Depth= 1.55"
Routed to Link EDA1 : EXISTING UNDETAINED EDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Projected Rainfall=3.93", P2=3.93"

Area (sf)	CN	Description
14,598	74	>75% Grass cover, Good, HSG C
14,598		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	8	0.1750	0.27		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.93"
0.4	11	0.4760	0.43		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.93"
0.6	11	0.1809	0.29		**Sheet Flow, CD** Grass: Short n= 0.150 P2= 3.93"
10.5	71	0.0065	0.11		**Sheet Flow, DE** Grass: Short n= 0.150 P2= 3.93"
5.6	102	0.0019	0.31		**Shallow Concentrated Flow, EF** Short Grass Pasture Kv= 7.0 fps
17.6	203	Total			

Subcatchment EDA1P: EDA-1 PERV.



Summary for Subcatchment EDA2I: EDA-2 IMP.

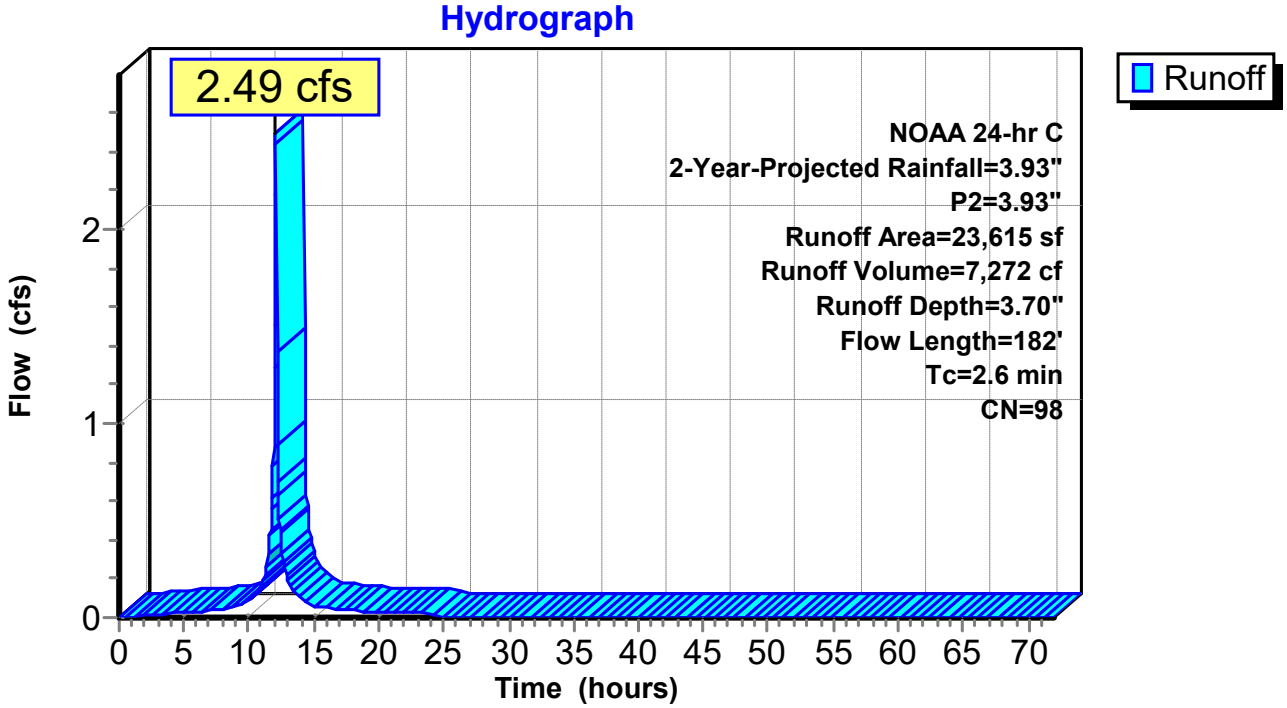
Runoff = 2.49 cfs @ 12.08 hrs, Volume= 7,272 cf, Depth= 3.70"
Routed to Link EDA2 : EXISTING DETAINED EDA-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Projected Rainfall=3.93", P2=3.93"

Area (sf)	CN	Description
23,615	98	Paved parking, HSG B
23,615		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0208	1.35		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"
1.0	50	0.0060	0.82		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.2	42	0.0207	2.92		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.8	40	0.0017	0.84		**Shallow Concentrated Flow, DE** Paved Kv= 20.3 fps
2.6	182	Total			

Subcatchment EDA2I: EDA-2 IMP.



Summary for Subcatchment EDA2P: EDA-2 PERV.

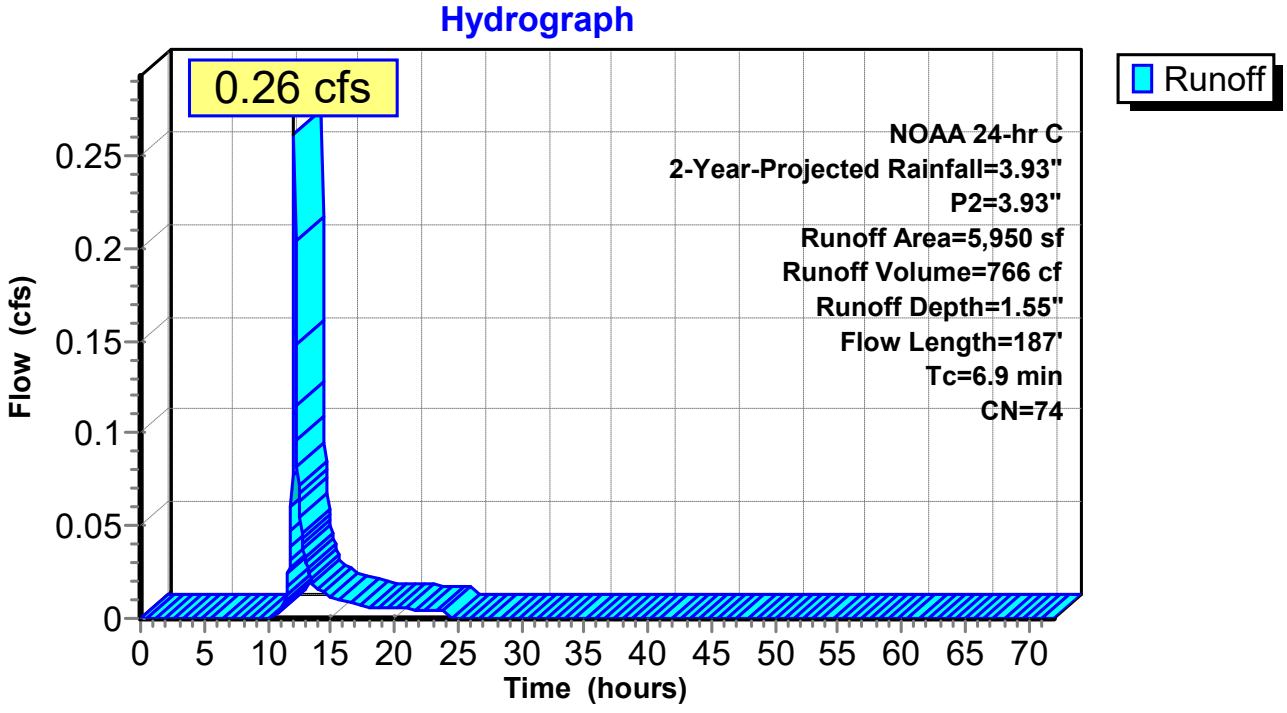
Runoff = 0.26 cfs @ 12.14 hrs, Volume= 766 cf, Depth= 1.55"
Routed to Link EDA2 : EXISTING DETAINED EDA-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Projected Rainfall=3.93", P2=3.93"

Area (sf)	CN	Description
5,950	74	>75% Grass cover, Good, HSG C
5,950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	24	0.0064	0.09		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.93"
0.4	31	0.0226	1.27		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.9	45	0.0060	0.80		**Sheet Flow, CD** Smooth surfaces n= 0.011 P2= 3.93"
0.3	46	0.0207	2.92		**Shallow Concentrated Flow, DE** Paved Kv= 20.3 fps
0.8	41	0.0017	0.84		**Shallow Concentrated Flow, EF** Paved Kv= 20.3 fps
6.9	187	Total			

Subcatchment EDA2P: EDA-2 PERV.



Summary for Subcatchment PDA1I: PDA-1 IMP.

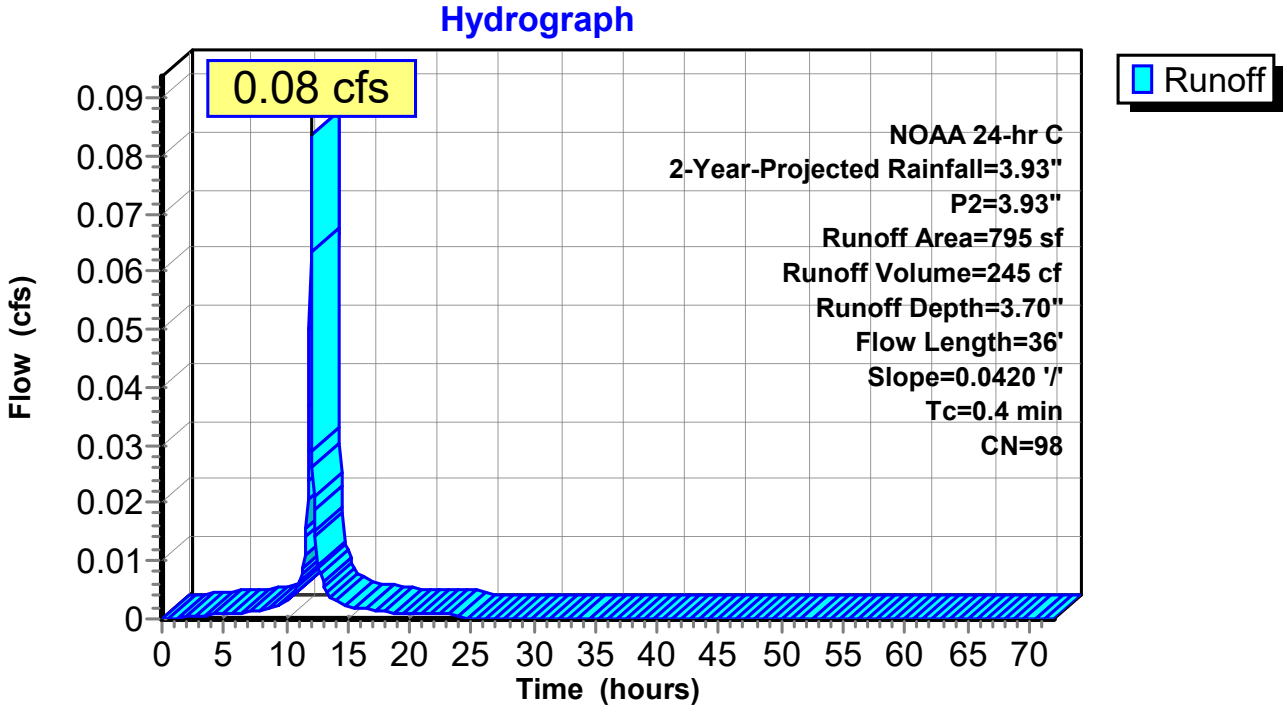
Runoff = 0.08 cfs @ 12.05 hrs, Volume= 245 cf, Depth= 3.70"
Routed to Link PDA1 : PROP UNDETAINED PDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Projected Rainfall=3.93", P2=3.93"

Area (sf)	CN	Description
795	98	Paved parking, HSG B
795		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	36	0.0420	1.67		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"

Subcatchment PDA1I: PDA-1 IMP.



Summary for Subcatchment PDA1P: PDA-1 PERV.

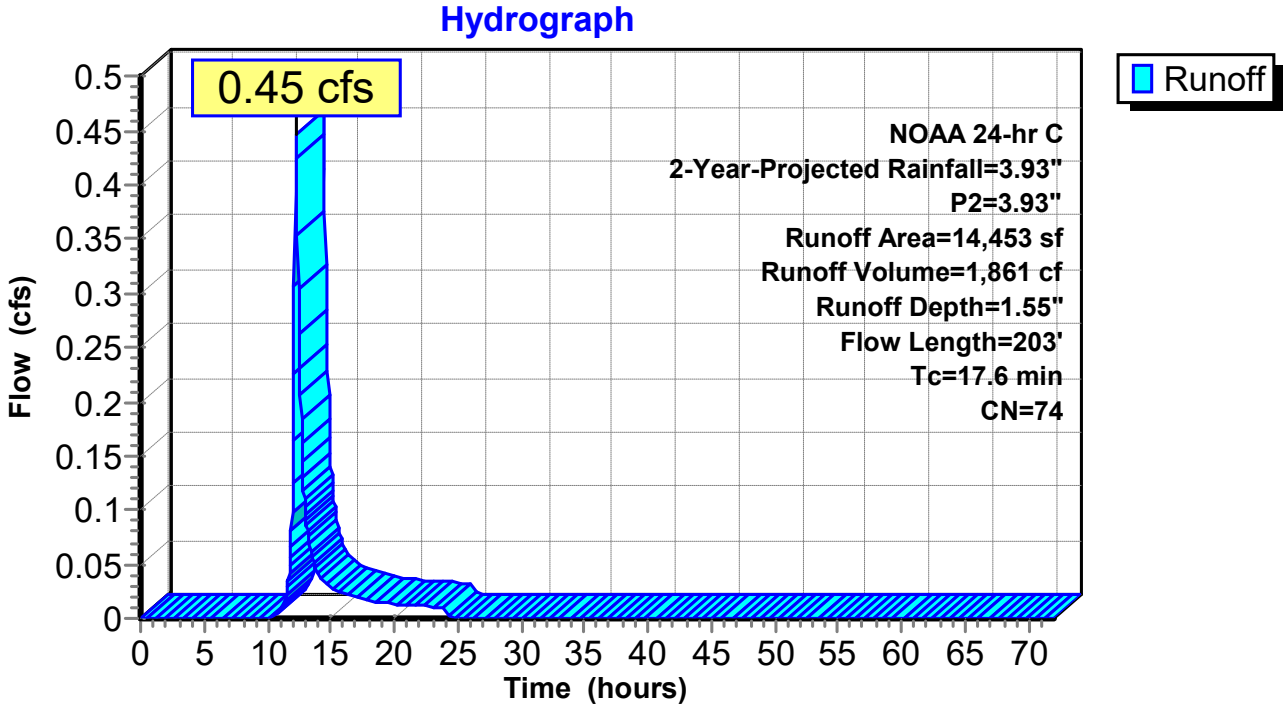
Runoff = 0.45 cfs @ 12.28 hrs, Volume= 1,861 cf, Depth= 1.55"
Routed to Link PDA1 : PROP UNDETAINED PDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Projected Rainfall=3.93", P2=3.93"

Area (sf)	CN	Description
14,453	74	>75% Grass cover, Good, HSG C
14,453		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	8	0.1750	0.27		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.93"
0.4	11	0.4760	0.43		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.93"
0.6	11	0.1809	0.29		**Sheet Flow, CD** Grass: Short n= 0.150 P2= 3.93"
10.5	71	0.0065	0.11		**Sheet Flow, DE** Grass: Short n= 0.150 P2= 3.93"
5.6	102	0.0019	0.31		**Shallow Concentrated Flow, EF** Short Grass Pasture Kv= 7.0 fps
17.6	203	Total			

Subcatchment PDA1P: PDA-1 PERV.



Summary for Subcatchment PDA2AI: PDA-2A IMP.

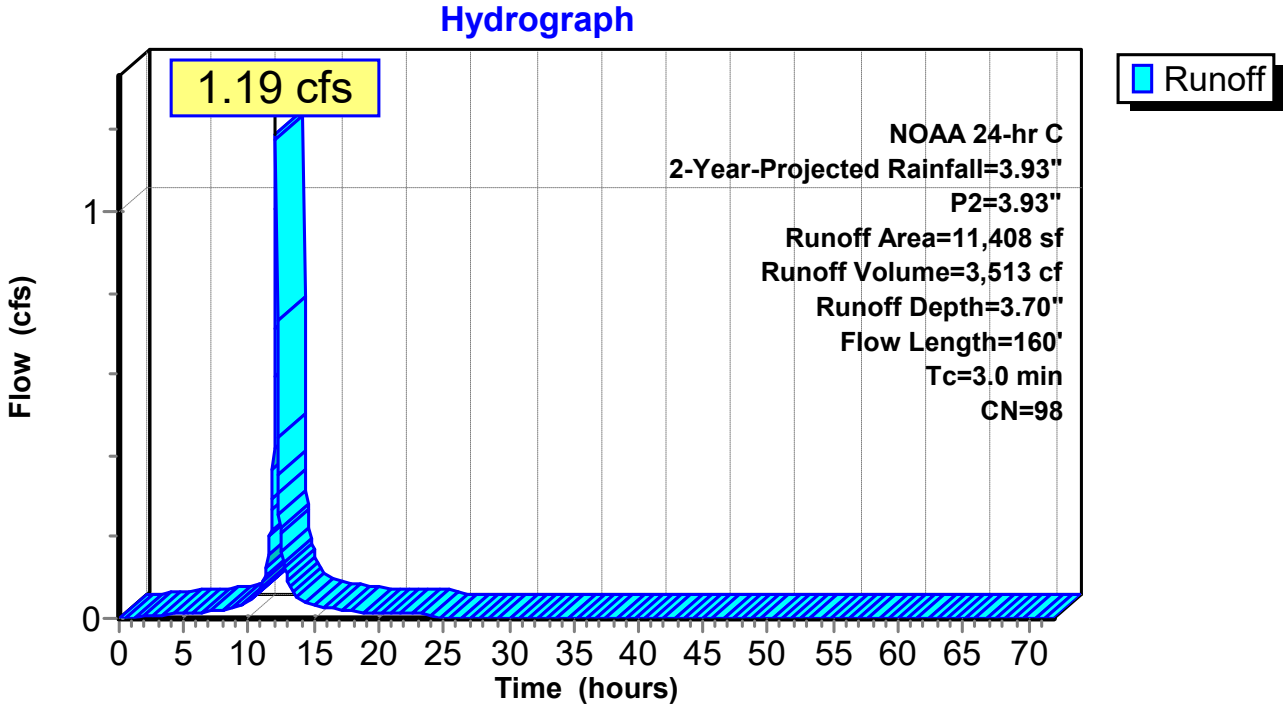
Runoff = 1.19 cfs @ 12.09 hrs, Volume= 3,513 cf, Depth= 3.70"
Routed to Link PDA2A : PROP DETAINED PDA-2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Projected Rainfall=3.93", P2=3.93"

Area (sf)	CN	Description
11,408	98	Paved parking, HSG B
11,408		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	6	0.0100	0.66		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"
1.2	47	0.0036	0.66		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.9	47	0.0070	0.86		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.1	12	0.0200	2.87		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.6	48	0.0050	1.44		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
3.0	160	Total			

Subcatchment PDA2AI: PDA-2A IMP.



Summary for Subcatchment PDA2AP: PDA-2A PERV.

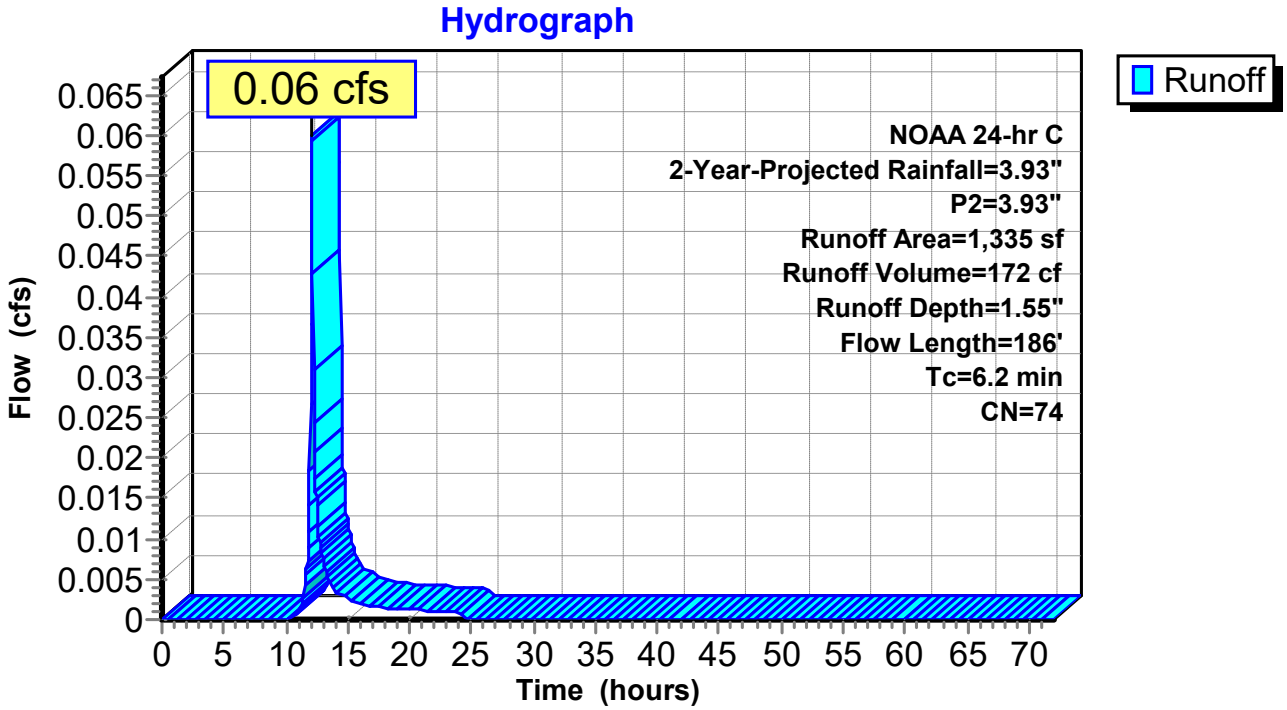
Runoff = 0.06 cfs @ 12.14 hrs, Volume= 172 cf, Depth= 1.55"
Routed to Link PDA2A : PROP DETAINED PDA-2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Projected Rainfall=3.93", P2=3.93"

Area (sf)	CN	Description
1,335	74	>75% Grass cover, Good, HSG C
1,335		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	18	0.0050	0.08		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.93"
1.4	82	0.0070	0.96		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.4	39	0.0070	1.70		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	47	0.0050	1.44		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
6.2	186	Total			

Subcatchment PDA2AP: PDA-2A PERV.



Summary for Subcatchment PDA2BI: PDA-2B IMP.

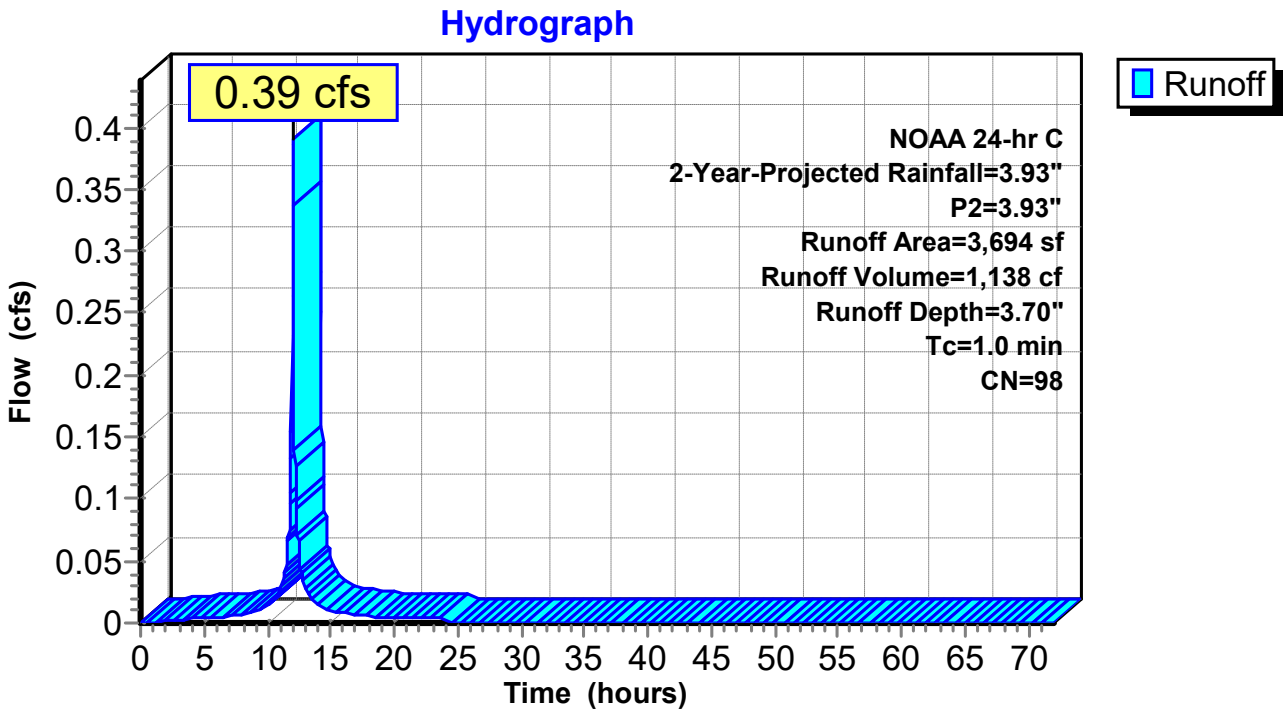
Runoff = 0.39 cfs @ 12.06 hrs, Volume= 1,138 cf, Depth= 3.70"
Routed to Pond 9P : PERVIOUS PAVEMENT W/ UD2 R-TANK

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Projected Rainfall=3.93", P2=3.93"

Area (sf)	CN	Description
3,694	98	Paved parking, HSG B
3,694		100.00% Impervious Area

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

Subcatchment PDA2BI: PDA-2B IMP.



Summary for Subcatchment PDA2CI: PDA-2C IMP.

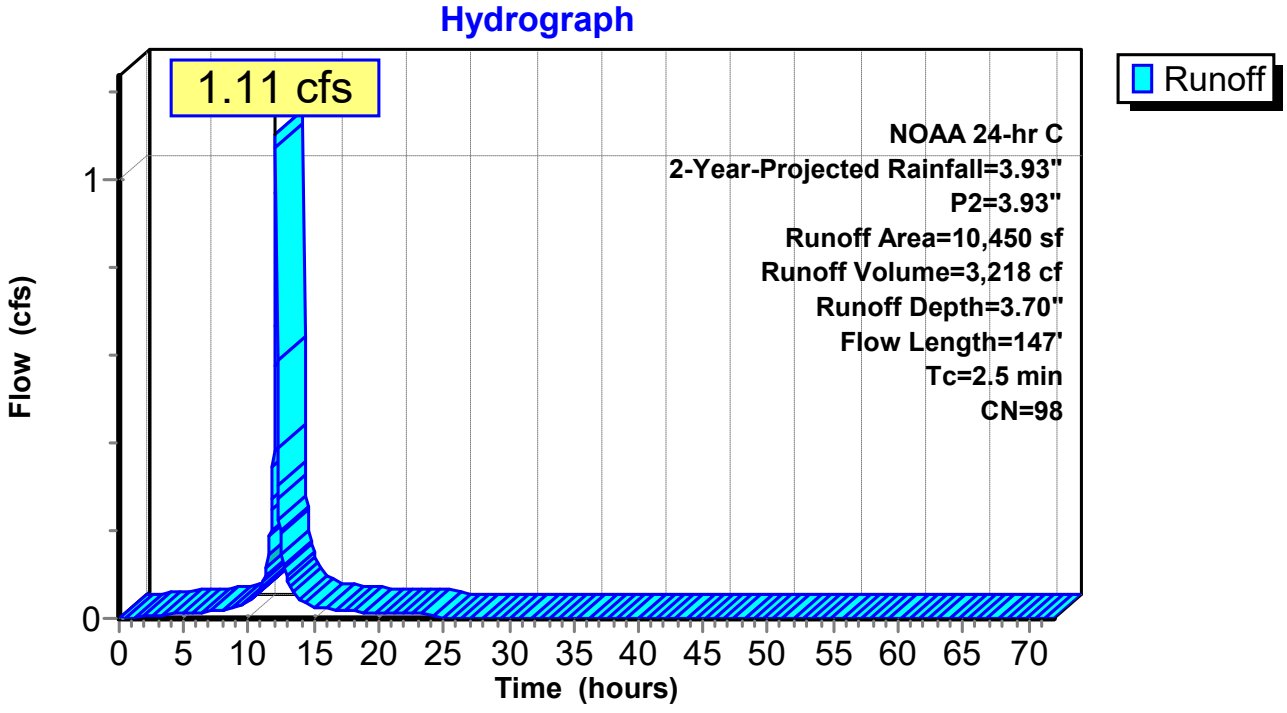
Runoff = 1.11 cfs @ 12.08 hrs, Volume= 3,218 cf, Depth= 3.70"
Routed to Link PDA2C : PROP DETAINED PDA-2C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Projected Rainfall=3.93", P2=3.93"

Area (sf)	CN	Description
10,450	98	Paved parking, HSG B
10,450		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0100	0.73		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"
0.5	19	0.0050	0.63		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
1.2	71	0.0074	0.96		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.1	18	0.0600	4.97		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	29	0.0020	0.91		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
2.5	147	Total			

Subcatchment PDA2CI: PDA-2C IMP.



Summary for Subcatchment PDA2CP: PDA-2C PERV.

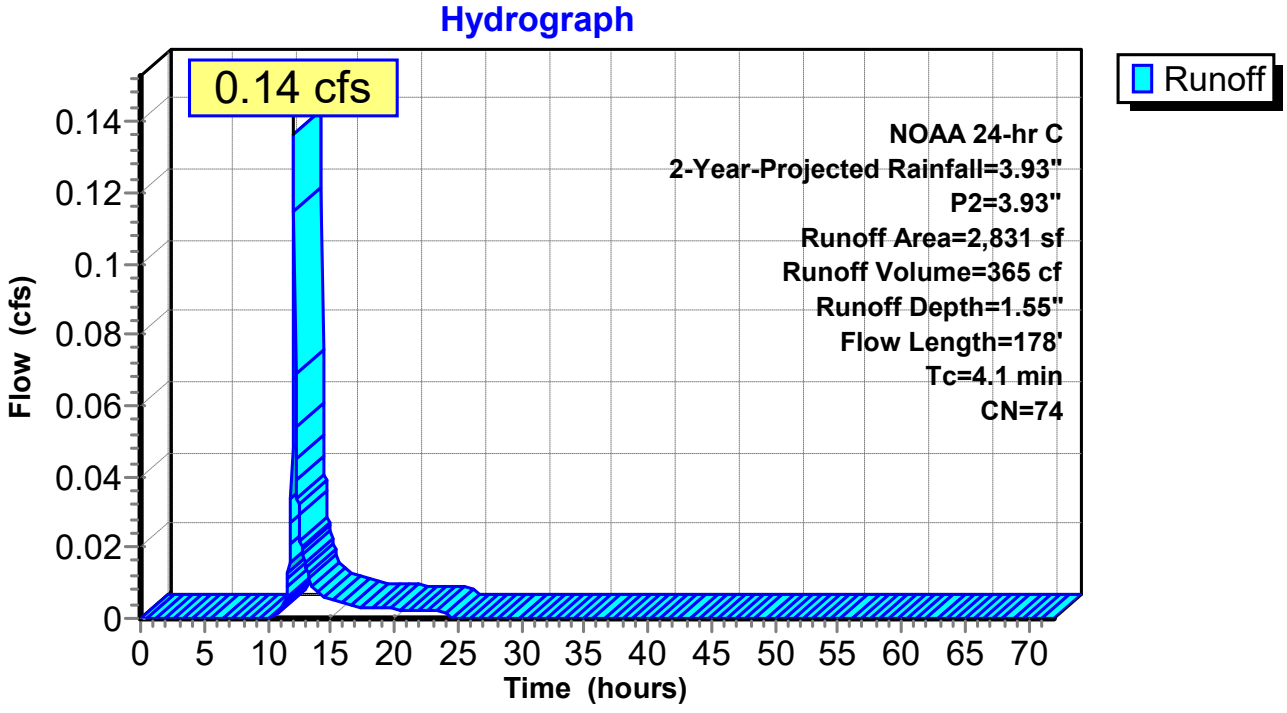
Runoff = 0.14 cfs @ 12.11 hrs, Volume= 365 cf, Depth= 1.55"
Routed to Link PDA2C : PROP DETAINED PDA-2C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year-Projected Rainfall=3.93", P2=3.93"

Area (sf)	CN	Description
2,831	74	>75% Grass cover, Good, HSG C
2,831		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	8	0.0060	0.07		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.93"
0.6	42	0.0150	1.14		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"
0.7	50	0.0160	1.21		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.4	48	0.0090	1.93		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	30	0.0023	0.97		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
4.1	178	Total			

Subcatchment PDA2CP: PDA-2C PERV.



Summary for Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

Inflow Area = 16,437 sf, 91.88% Impervious, Inflow Depth = 3.52" for 2-Year-Projected event
Inflow = 1.60 cfs @ 12.08 hrs, Volume= 4,822 cf
Outflow = 0.14 cfs @ 12.92 hrs, Volume= 4,423 cf, Atten= 91%, Lag= 49.9 min
Primary = 0.14 cfs @ 12.92 hrs, Volume= 4,423 cf
Routed to Link PDA2 : PROP DETAINED PDA-2

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 88.09' @ 12.92 hrs Surf.Area= 3,147 sf Storage= 2,752 cf

Plug-Flow detention time= 327.7 min calculated for 4,423 cf (92% of inflow)
Center-of-Mass det. time= 282.4 min (1,036.2 - 753.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	86.99'	1,331 cf	**35.50'W x 88.65'L x 2.76'H Field A** 8,696 cf Overall - 6,035 cf Embedded = 2,661 cf x 50.0% Voids
#2A	87.24'	5,733 cf	**Ferguson R-Tank UD 2** x 688 Inside #1 Inside= 23.6"W x 27.2"H => 4.23 sf x 1.97'L = 8.3 cf Outside= 23.6"W x 27.2"H => 4.46 sf x 1.97'L = 8.8 cf 688 Chambers in 16 Rows
		7,064 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	87.24'	**15.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 87.24' / 87.19' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	87.24'	**2.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	88.20'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.14 cfs @ 12.92 hrs HW=88.09' (Free Discharge)
└**1=Culvert** (Passes 0.14 cfs of 1.97 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.14 cfs @ 4.16 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK - Chamber Wizard Field A

Chamber Model = Ferguson R-Tank UD 2 (Ferguson R-Tank UD)
Inside= 23.6"W x 27.2"H => 4.23 sf x 1.97'L = 8.3 cf
Outside= 23.6"W x 27.2"H => 4.46 sf x 1.97'L = 8.8 cf

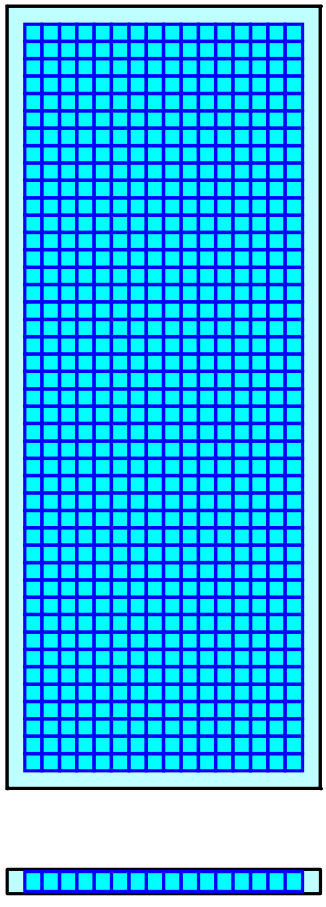
43 Chambers/Row x 1.97' Long = 84.65' Row Length +24.0" End Stone x 2 = 88.65' Base Length
16 Rows x 23.6" Wide + 24.0" Side Stone x 2 = 35.50' Base Width
3.0" Stone Base + 27.2" Chamber Height + 3.0" Stone Cover = 2.76' Field Height

688 Chambers x 8.3 cf = 5,733.5 cf Chamber Storage
688 Chambers x 8.8 cf = 6,035.2 cf Displacement

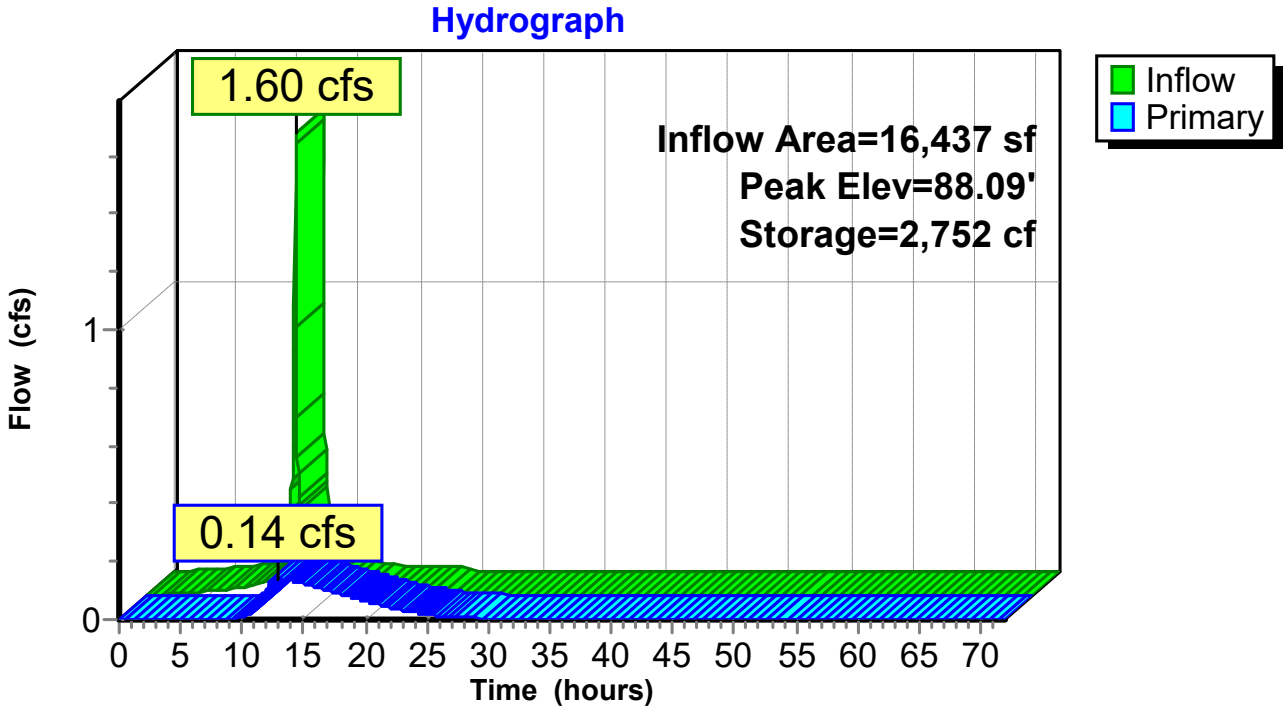
8,696.4 cf Field - 6,035.2 cf Chambers = 2,661.2 cf Stone x 50.0% Voids = 1,330.6 cf Stone Storage

Chamber Storage + Stone Storage = 7,064.1 cf = 0.162 af
Overall Storage Efficiency = 81.2%
Overall System Size = 88.65' x 35.50' x 2.76'

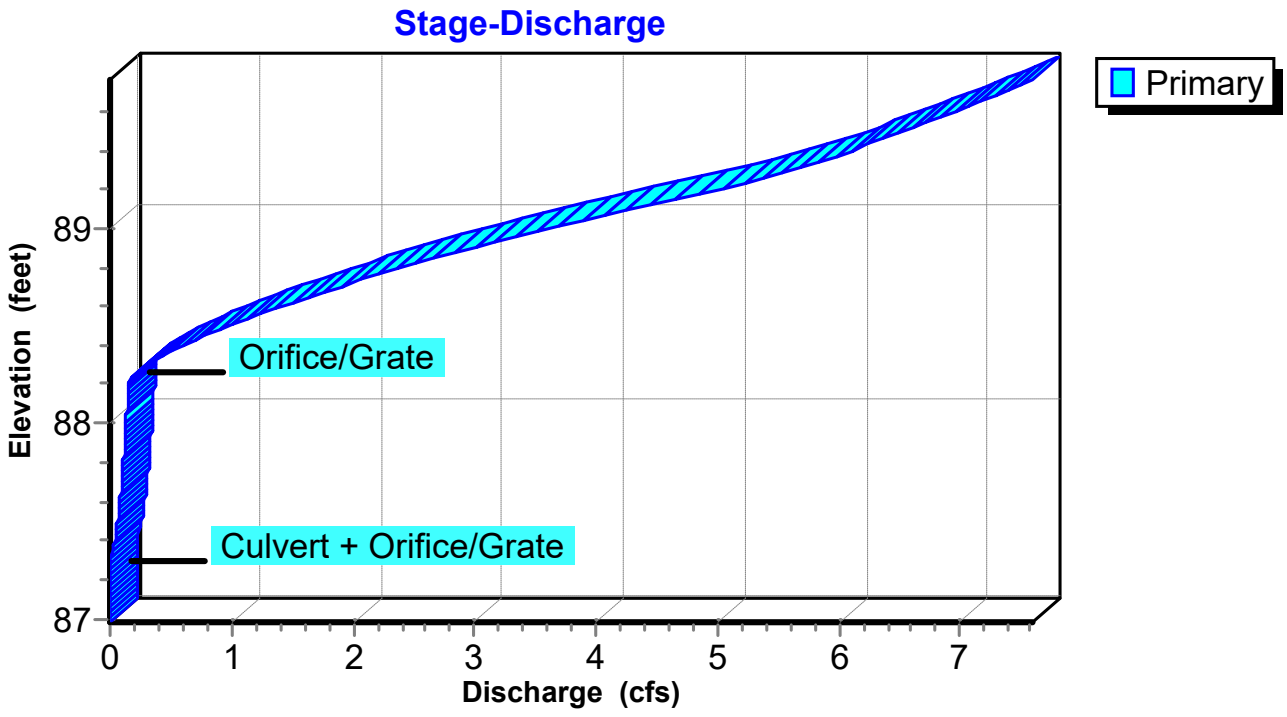
688 Chambers
322.1 cy Field
98.6 cy Stone



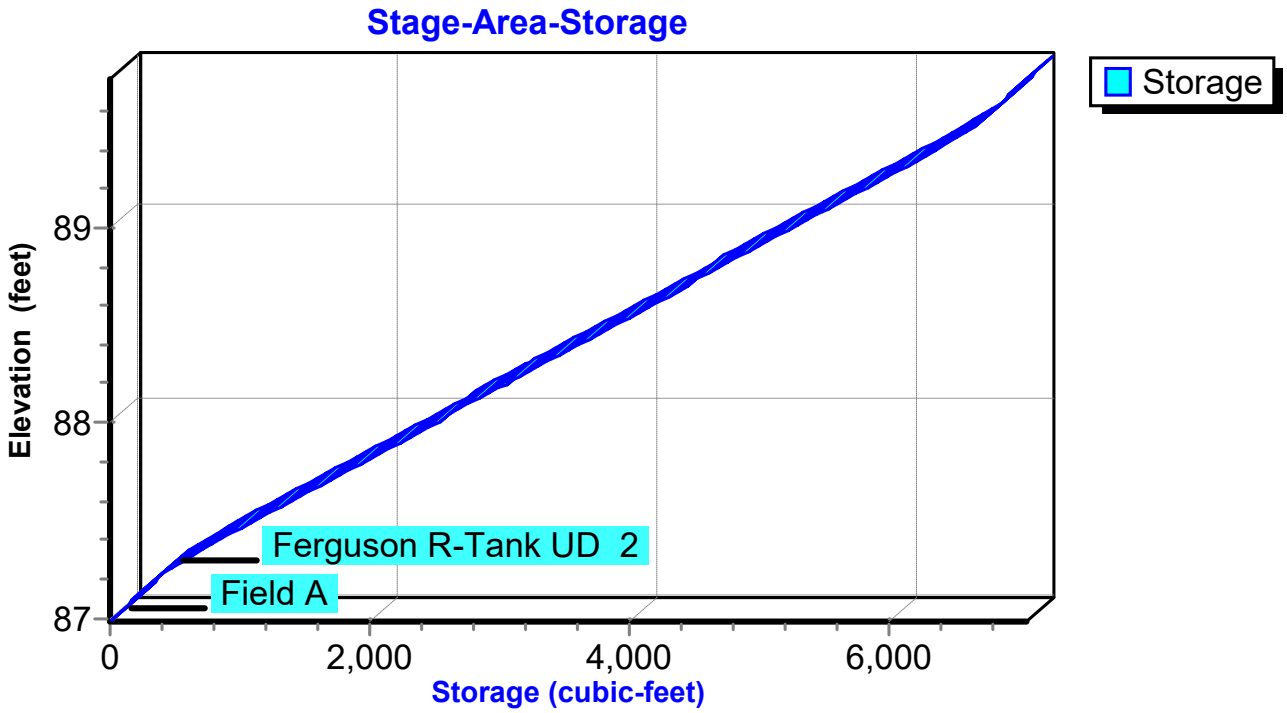
Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK



Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK



Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

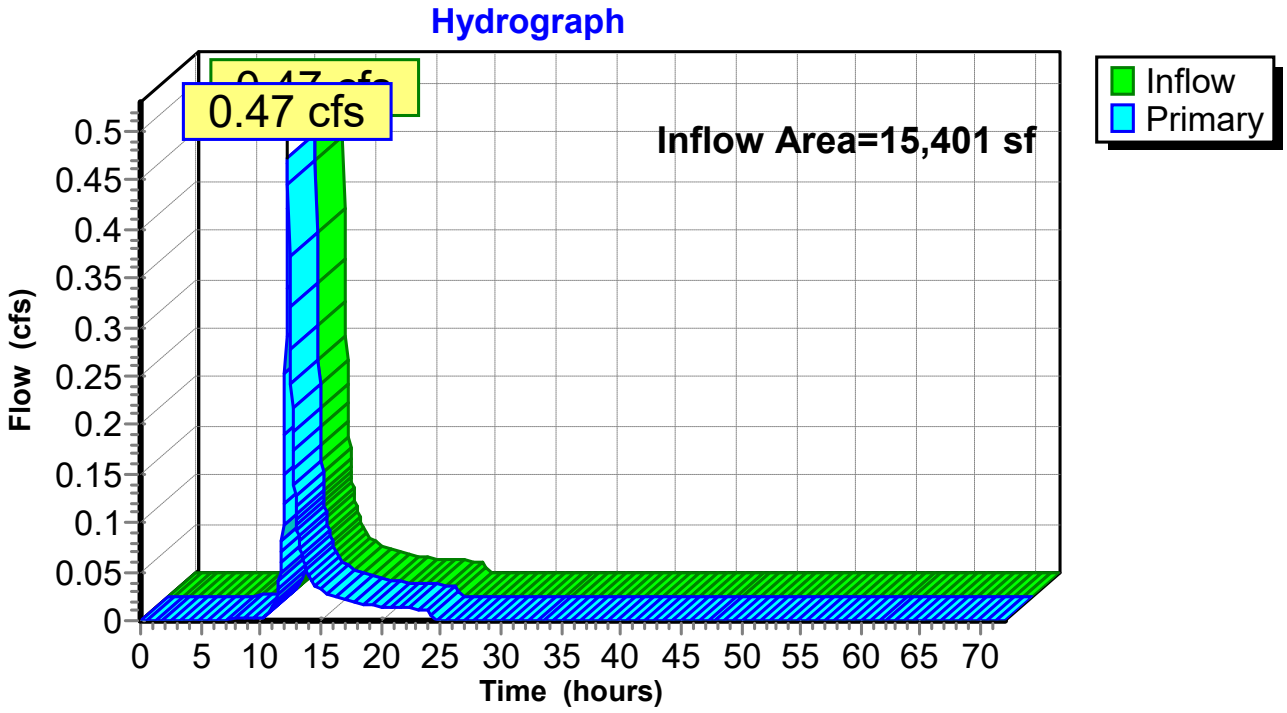


Summary for Link EDA1: EXISTING UNDETAINED EDA-1

Inflow Area = 15,401 sf, 5.21% Impervious, Inflow Depth = 1.66" for 2-Year-Projected event
Inflow = 0.47 cfs @ 12.27 hrs, Volume= 2,127 cf
Primary = 0.47 cfs @ 12.27 hrs, Volume= 2,127 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 3L

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

Link EDA1: EXISTING UNDETAINED EDA-1

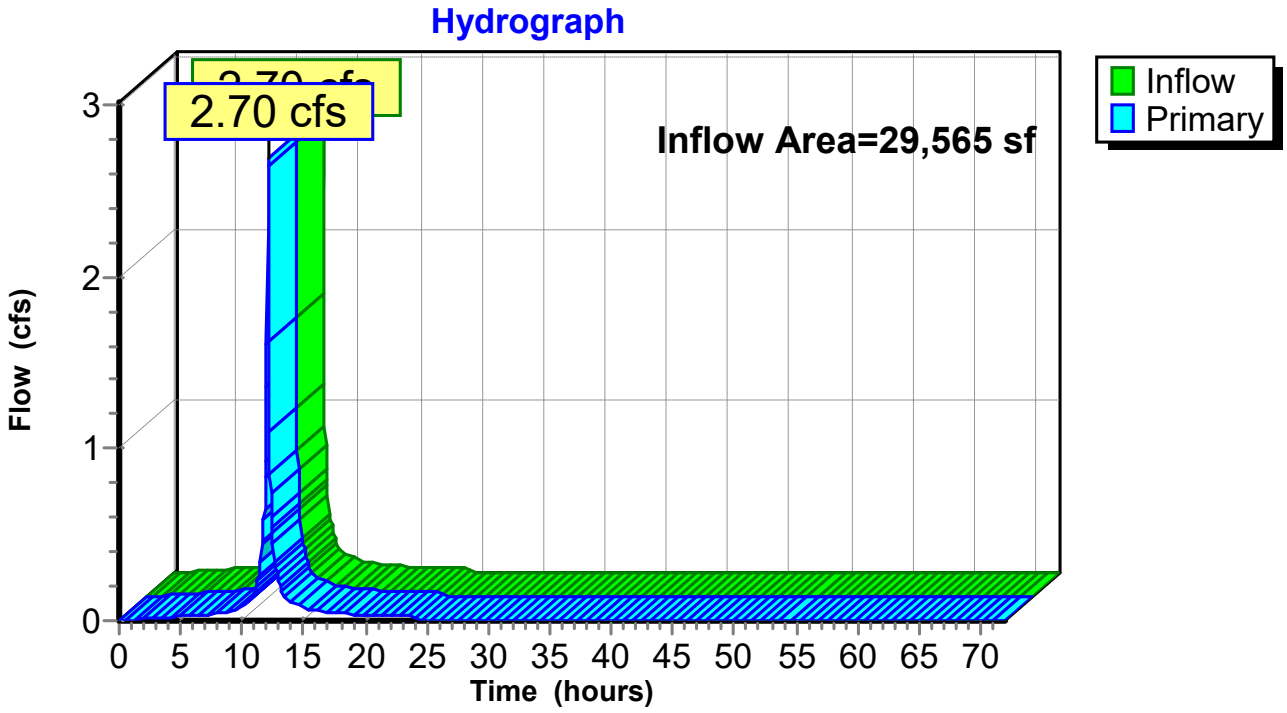


Summary for Link EDA2: EXISTING DETAINED EDA-2

Inflow Area = 29,565 sf, 79.87% Impervious, Inflow Depth = 3.26" for 2-Year-Projected event
Inflow = 2.70 cfs @ 12.09 hrs, Volume= 8,038 cf
Primary = 2.70 cfs @ 12.09 hrs, Volume= 8,038 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node BDA2

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

Link EDA2: EXISTING DETAINED EDA-2

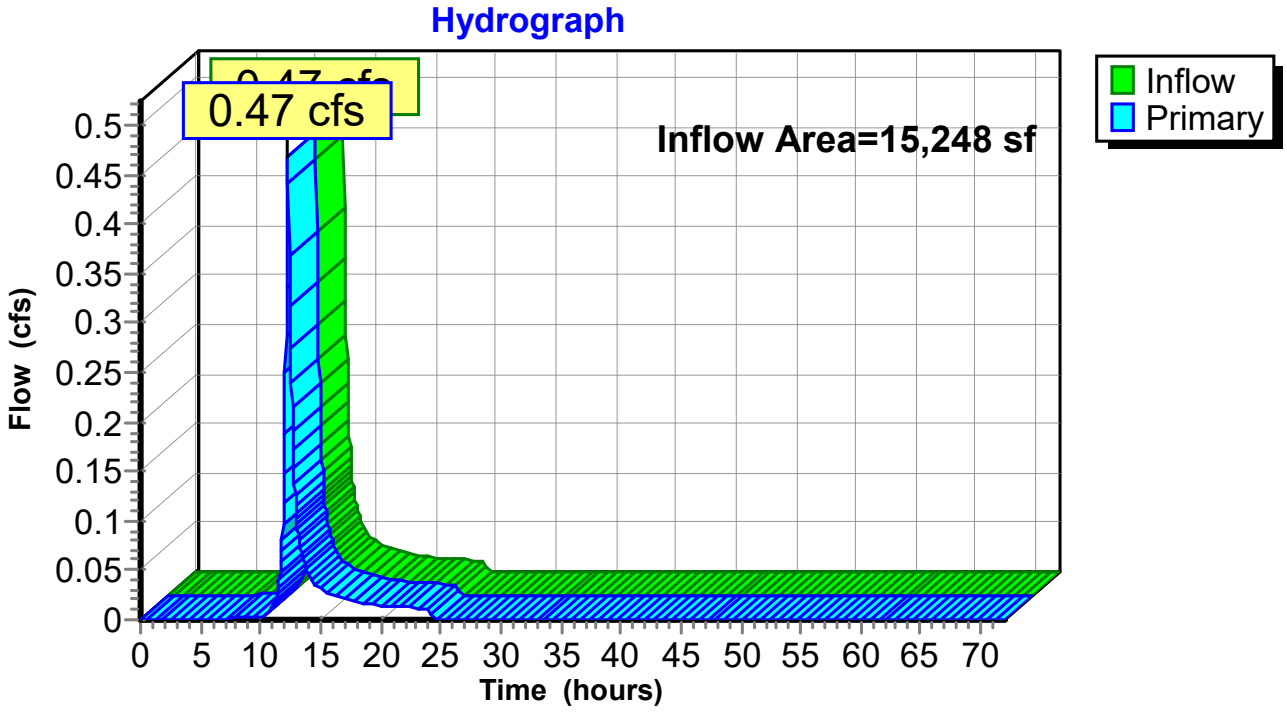


Summary for Link PDA1: PROP UNDETAINED PDA-1

Inflow Area = 15,248 sf, 5.21% Impervious, Inflow Depth = 1.66" for 2-Year-Projected event
Inflow = 0.47 cfs @ 12.27 hrs, Volume= 2,106 cf
Primary = 0.47 cfs @ 12.27 hrs, Volume= 2,106 cf, Atten= 0%, Lag= 0.0 min

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

Link PDA1: PROP UNDETAINED PDA-1

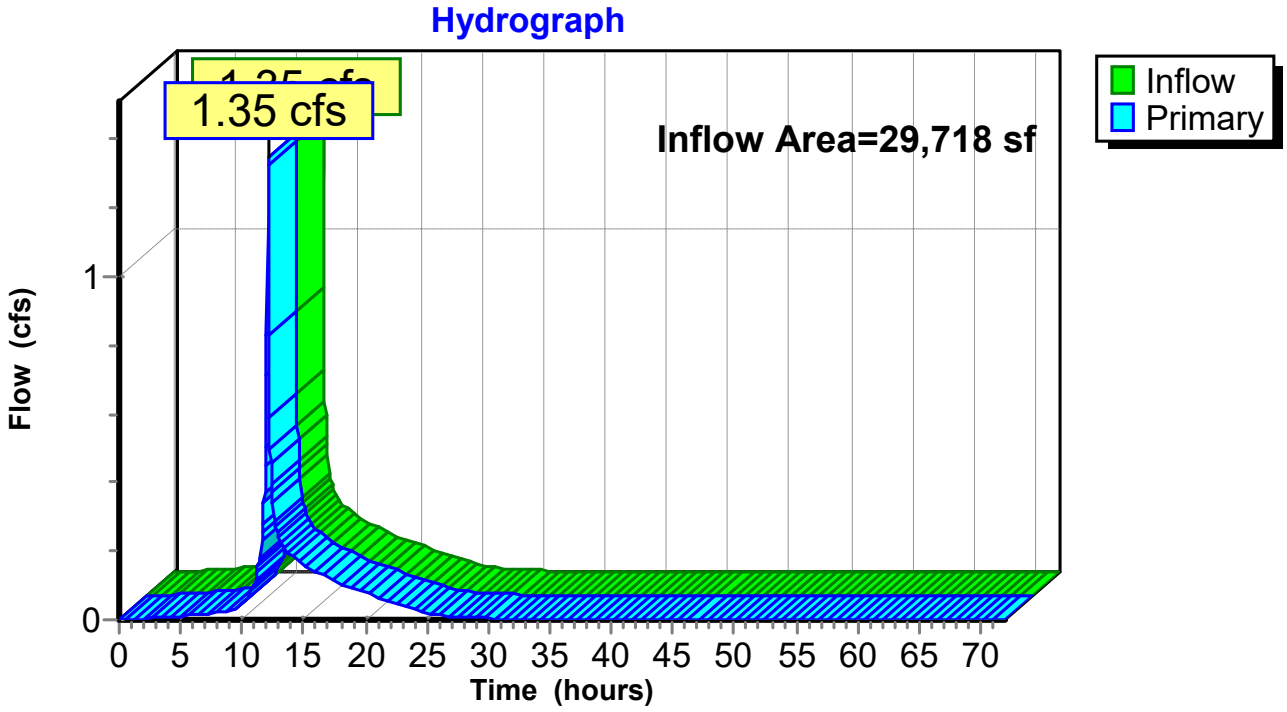


Summary for Link PDA2: PROP DETAINED PDA-2

Inflow Area = 29,718 sf, 85.98% Impervious, Inflow Depth = 3.23" for 2-Year-Projected event
Inflow = 1.35 cfs @ 12.09 hrs, Volume= 8,005 cf
Primary = 1.35 cfs @ 12.09 hrs, Volume= 8,005 cf, Atten= 0%, Lag= 0.0 min

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

Link PDA2: PROP DETAINED PDA-2

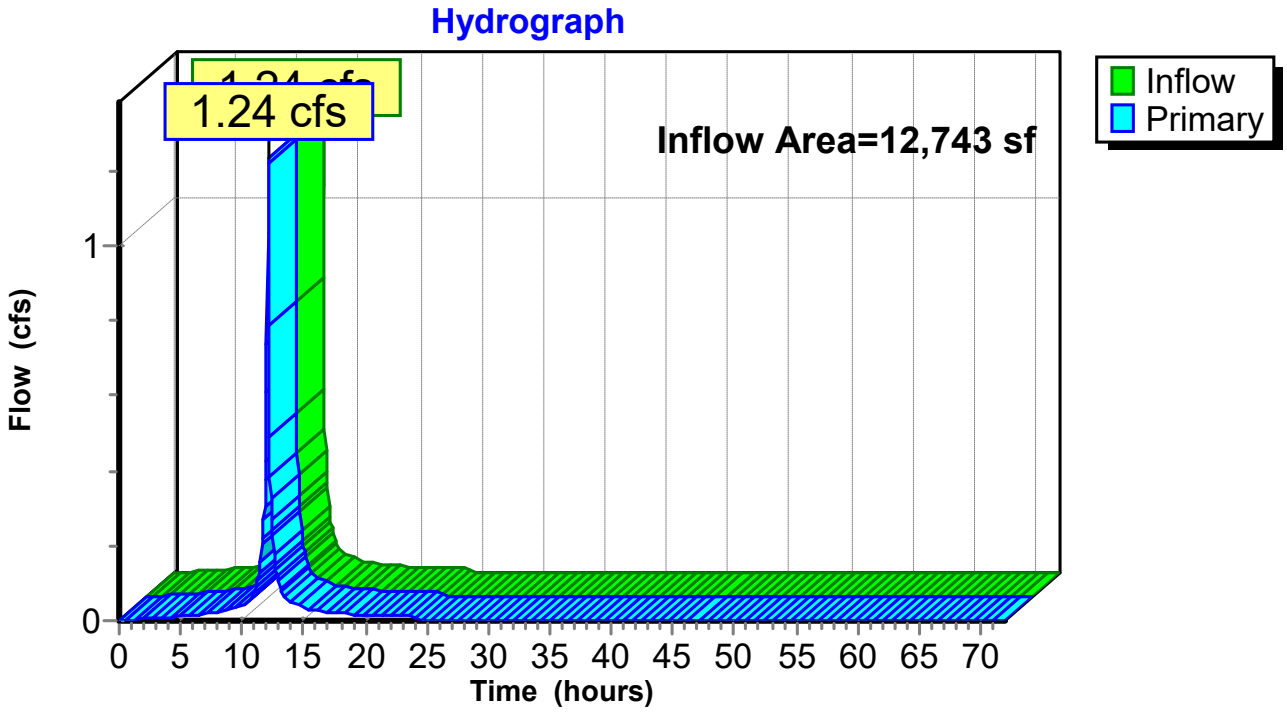


Summary for Link PDA2A: PROP DETAINED PDA-2A

Inflow Area = 12,743 sf, 89.52% Impervious, Inflow Depth = 3.47" for 2-Year-Projected event
Inflow = 1.24 cfs @ 12.09 hrs, Volume= 3,685 cf
Primary = 1.24 cfs @ 12.09 hrs, Volume= 3,685 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 9P : PERVIOUS PAVEMENT W/ UD2 R-TANK

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

Link PDA2A: PROP DETAINED PDA-2A

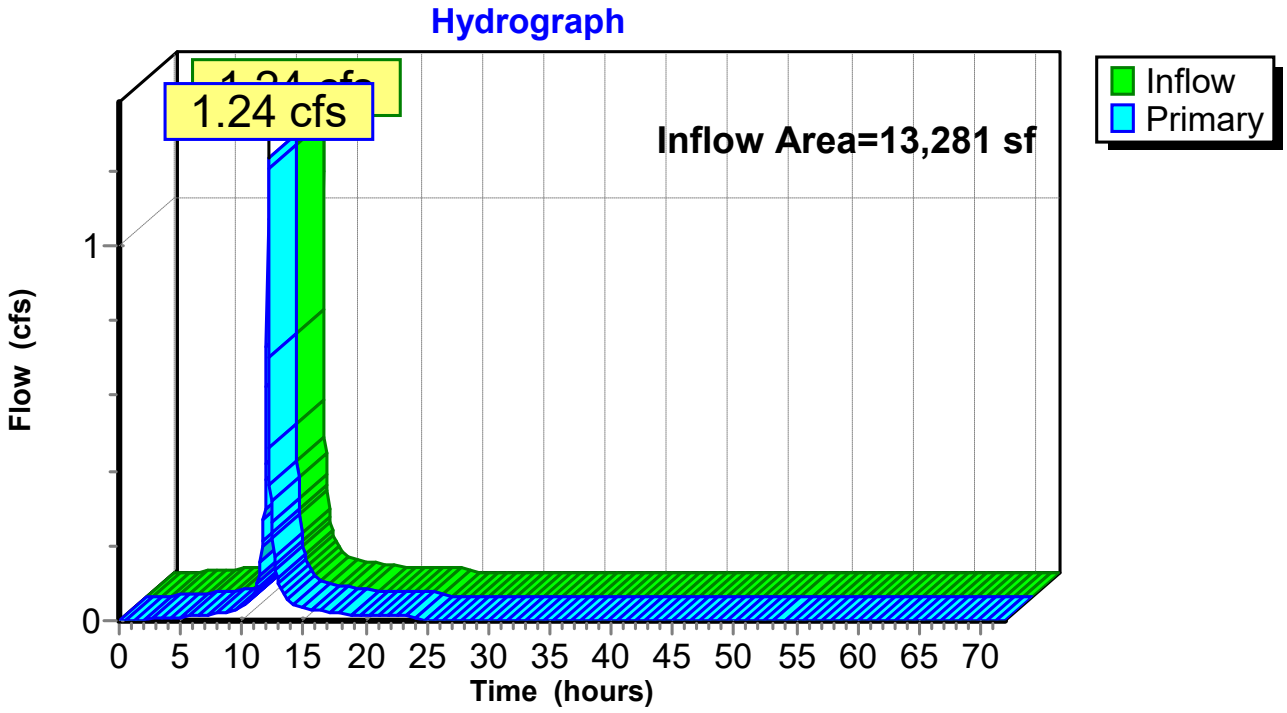


Summary for Link PDA2C: PROP DETAINED PDA-2C

Inflow Area = 13,281 sf, 78.68% Impervious, Inflow Depth = 3.24" for 2-Year-Projected event
Inflow = 1.24 cfs @ 12.09 hrs, Volume= 3,582 cf
Primary = 1.24 cfs @ 12.09 hrs, Volume= 3,582 cf, Atten= 0%, Lag= 0.0 min
Routed to Link PDA2 : PROP DETAINED PDA-2

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

Link PDA2C: PROP DETAINED PDA-2C



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA1I: EDA-1 IMP. Runoff Area=803 sf 100.00% Impervious Runoff Depth=4.99"
Flow Length=36' Slope=0.0420 '/' Tc=0.4 min CN=98 Runoff=0.11 cfs 334 cf

Subcatchment EDA1P: EDA-1 PERV. Runoff Area=14,598 sf 0.00% Impervious Runoff Depth=2.55"
Flow Length=203' Tc=18.7 min CN=74 Runoff=0.74 cfs 3,101 cf

Subcatchment EDA2I: EDA-2 IMP. Runoff Area=23,615 sf 100.00% Impervious Runoff Depth=4.99"
Flow Length=182' Tc=2.8 min CN=98 Runoff=3.30 cfs 9,825 cf

Subcatchment EDA2P: EDA-2 PERV. Runoff Area=5,950 sf 0.00% Impervious Runoff Depth=2.55"
Flow Length=187' Tc=7.3 min CN=74 Runoff=0.43 cfs 1,264 cf

Subcatchment PDA1I: PDA-1 IMP. Runoff Area=795 sf 100.00% Impervious Runoff Depth=4.99"
Flow Length=36' Slope=0.0420 '/' Tc=0.4 min CN=98 Runoff=0.11 cfs 331 cf

Subcatchment PDA1P: PDA-1 PERV. Runoff Area=14,453 sf 0.00% Impervious Runoff Depth=2.55"
Flow Length=203' Tc=18.7 min CN=74 Runoff=0.73 cfs 3,070 cf

Subcatchment PDA2AI: PDA-2A IMP. Runoff Area=11,408 sf 100.00% Impervious Runoff Depth=4.99"
Flow Length=160' Tc=3.2 min CN=98 Runoff=1.57 cfs 4,747 cf

Subcatchment PDA2AP: PDA-2A PERV. Runoff Area=1,335 sf 0.00% Impervious Runoff Depth=2.55"
Flow Length=186' Tc=6.6 min CN=74 Runoff=0.10 cfs 284 cf

Subcatchment PDA2BI: PDA-2B IMP. Runoff Area=3,694 sf 100.00% Impervious Runoff Depth=4.99"
Tc=1.0 min CN=98 Runoff=0.52 cfs 1,537 cf

Subcatchment PDA2CI: PDA-2C IMP. Runoff Area=10,450 sf 100.00% Impervious Runoff Depth=4.99"
Flow Length=147' Tc=2.6 min CN=98 Runoff=1.47 cfs 4,348 cf

Subcatchment PDA2CP: PDA-2C PERV. Runoff Area=2,831 sf 0.00% Impervious Runoff Depth=2.55"
Flow Length=178' Tc=4.4 min CN=74 Runoff=0.22 cfs 601 cf

Pond 9P: PERVIOUS PAVEMENT W/ UD2 Peak Elev=88.32' Storage=3,401 cf Inflow=2.14 cfs 6,567 cf
Outflow=0.37 cfs 6,167 cf

Link EDA1: EXISTING UNDETAINED EDA-1 Inflow=0.77 cfs 3,435 cf
Primary=0.77 cfs 3,435 cf

Link EDA2: EXISTING DETAINED EDA-2 Inflow=3.65 cfs 11,089 cf
Primary=3.65 cfs 11,089 cf

Link PDA1: PROP UNDETAINED PDA-1 Inflow=0.76 cfs 3,401 cf
Primary=0.76 cfs 3,401 cf

Link PDA2: PROP DETAINED PDA-2 Inflow=1.82 cfs 11,117 cf
Primary=1.82 cfs 11,117 cf

Link PDA2A: PROP DETAINED PDA-2A Inflow=1.66 cfs 5,030 cf
Primary=1.66 cfs 5,030 cf

Link PDA2C: PROP DETAINED PDA-2C Inflow=1.69 cfs 4,949 cf
Primary=1.69 cfs 4,949 cf

Total Runoff Area = 89,932 sf Runoff Volume = 29,442 cf Average Runoff Depth = 3.93"
43.55% Pervious = 39,167 sf 56.45% Impervious = 50,765 sf

Summary for Subcatchment EDA1I: EDA-1 IMP.

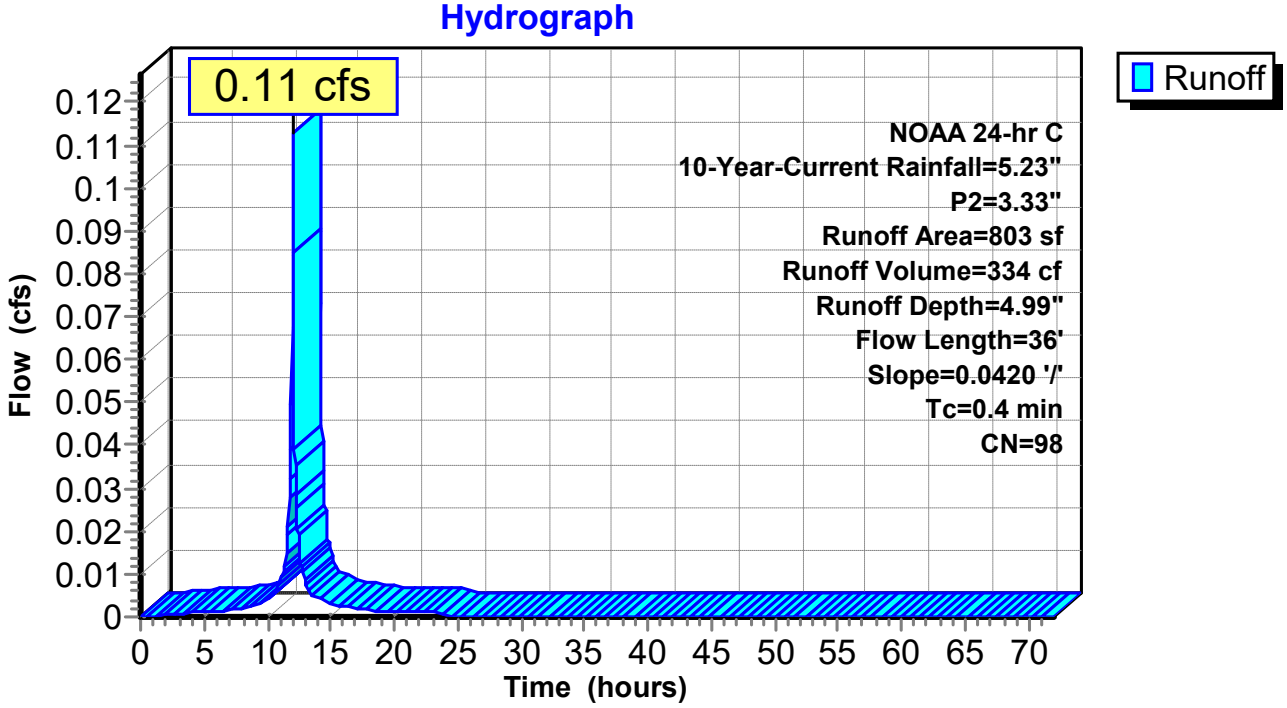
Runoff = 0.11 cfs @ 12.05 hrs, Volume= 334 cf, Depth= 4.99"
Routed to Link EDA1 : EXISTING UNDETAINED EDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.23", P2=3.33"

Area (sf)	CN	Description
803	98	Paved parking, HSG B
803		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	36	0.0420	1.54		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"

Subcatchment EDA1I: EDA-1 IMP.



Summary for Subcatchment EDA1P: EDA-1 PERV.

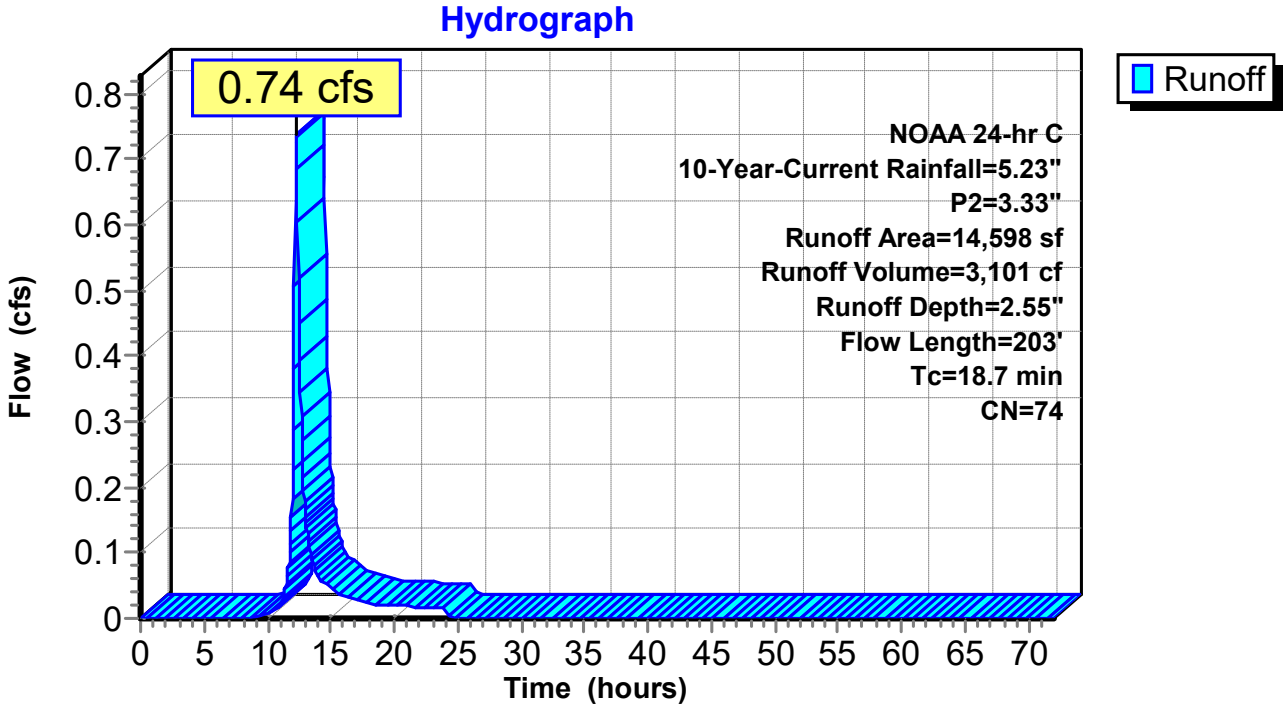
Runoff = 0.74 cfs @ 12.28 hrs, Volume= 3,101 cf, Depth= 2.55"
Routed to Link EDA1 : EXISTING UNDETAINED EDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.23", P2=3.33"

Area (sf)	CN	Description
14,598	74	>75% Grass cover, Good, HSG C
14,598		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	8	0.1750	0.25		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.33"
0.5	11	0.4760	0.40		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.33"
0.7	11	0.1809	0.27		**Sheet Flow, CD** Grass: Short n= 0.150 P2= 3.33"
11.4	71	0.0065	0.10		**Sheet Flow, DE** Grass: Short n= 0.150 P2= 3.33"
5.6	102	0.0019	0.31		**Shallow Concentrated Flow, EF** Short Grass Pasture Kv= 7.0 fps
18.7	203	Total			

Subcatchment EDA1P: EDA-1 PERV.



Summary for Subcatchment EDA2I: EDA-2 IMP.

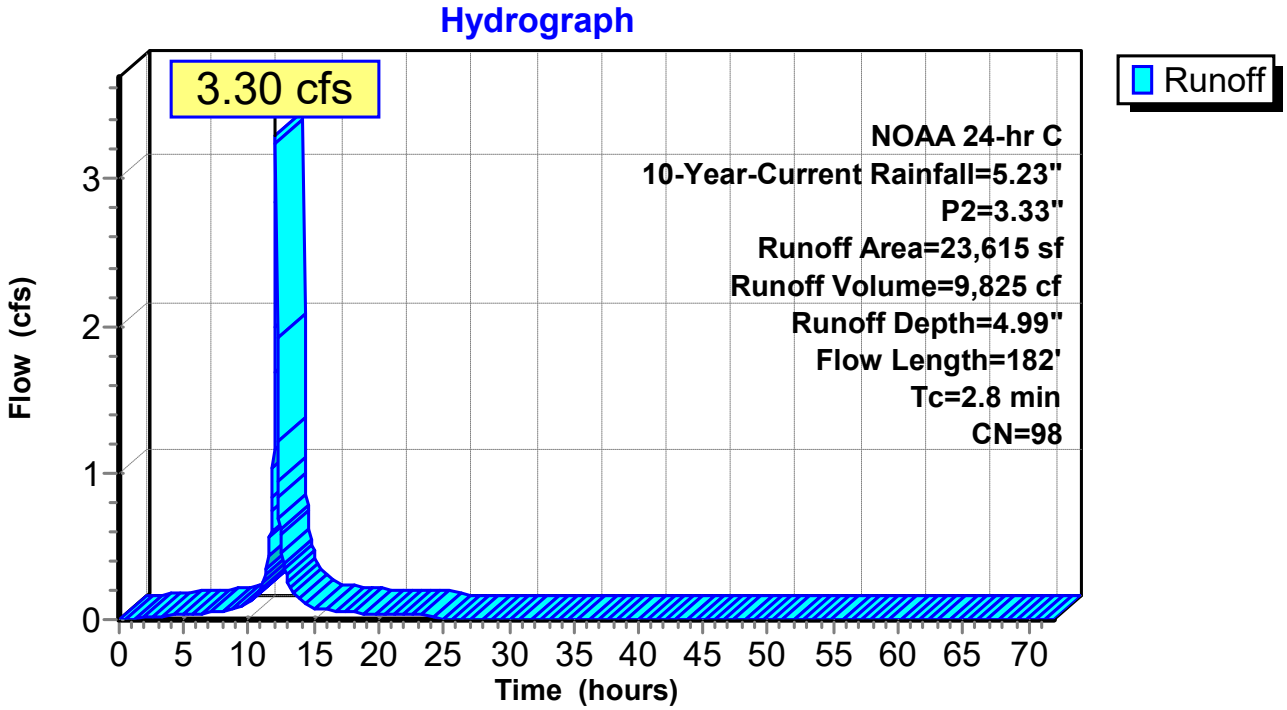
Runoff = 3.30 cfs @ 12.09 hrs, Volume= 9,825 cf, Depth= 4.99"
Routed to Link EDA2 : EXISTING DETAINED EDA-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.23", P2=3.33"

Area (sf)	CN	Description
23,615	98	Paved parking, HSG B
23,615		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0208	1.24		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"
1.1	50	0.0060	0.75		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
0.2	42	0.0207	2.92		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.8	40	0.0017	0.84		**Shallow Concentrated Flow, DE** Paved Kv= 20.3 fps
2.8	182	Total			

Subcatchment EDA2I: EDA-2 IMP.



Summary for Subcatchment EDA2P: EDA-2 PERV.

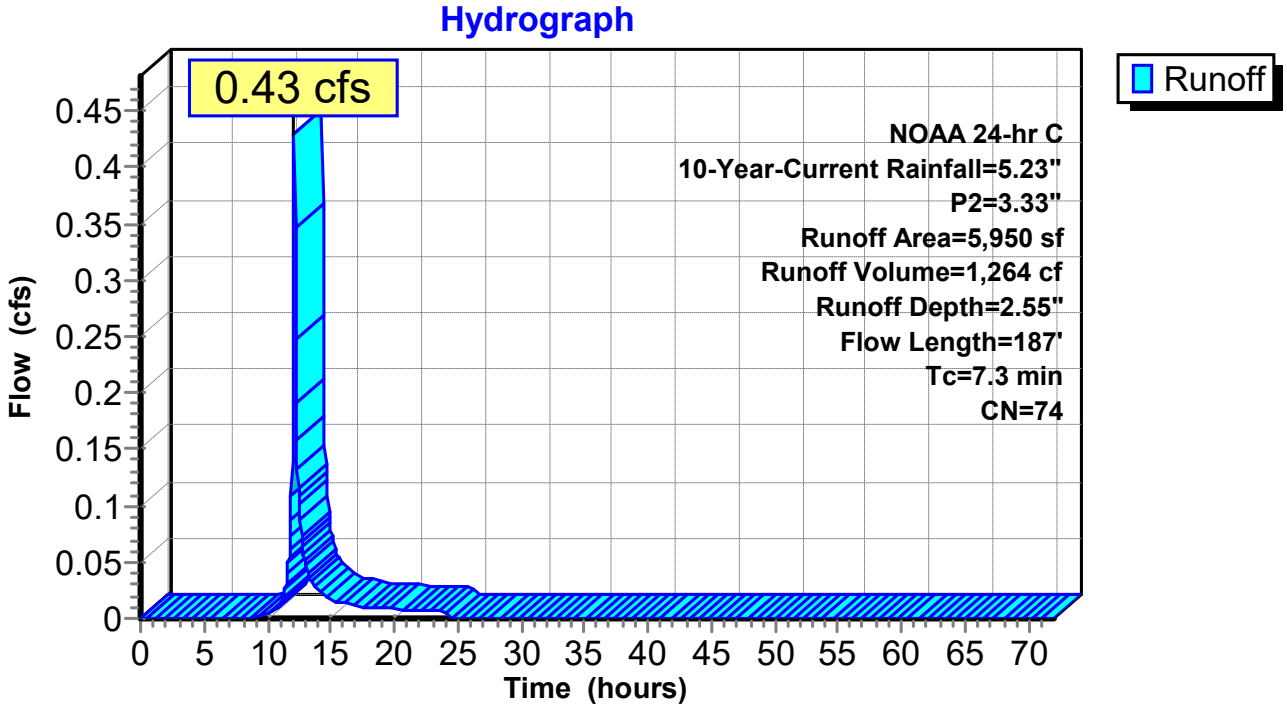
Runoff = 0.43 cfs @ 12.15 hrs, Volume= 1,264 cf, Depth= 2.55"
Routed to Link EDA2 : EXISTING DETAINED EDA-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.23", P2=3.33"

Area (sf)	CN	Description
5,950	74	>75% Grass cover, Good, HSG C
5,950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	24	0.0064	0.08		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.33"
0.4	31	0.0226	1.17		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
1.0	45	0.0060	0.74		**Sheet Flow, CD** Smooth surfaces n= 0.011 P2= 3.33"
0.3	46	0.0207	2.92		**Shallow Concentrated Flow, DE** Paved Kv= 20.3 fps
0.8	41	0.0017	0.84		**Shallow Concentrated Flow, EF** Paved Kv= 20.3 fps
7.3	187	Total			

Subcatchment EDA2P: EDA-2 PERV.



Summary for Subcatchment PDA1I: PDA-1 IMP.

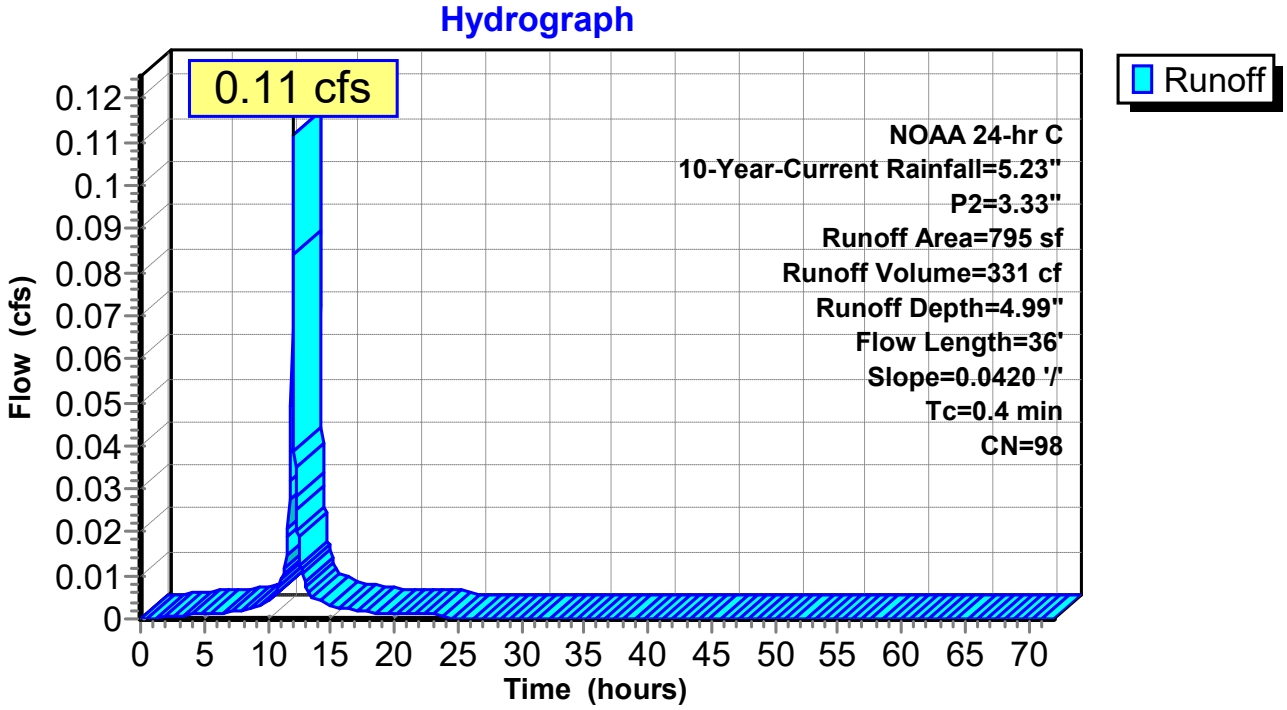
Runoff = 0.11 cfs @ 12.05 hrs, Volume= 331 cf, Depth= 4.99"
Routed to Link PDA1 : PROP UNDETAINED PDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.23", P2=3.33"

Area (sf)	CN	Description
795	98	Paved parking, HSG B
795		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	36	0.0420	1.54		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"

Subcatchment PDA1I: PDA-1 IMP.



Summary for Subcatchment PDA1P: PDA-1 PERV.

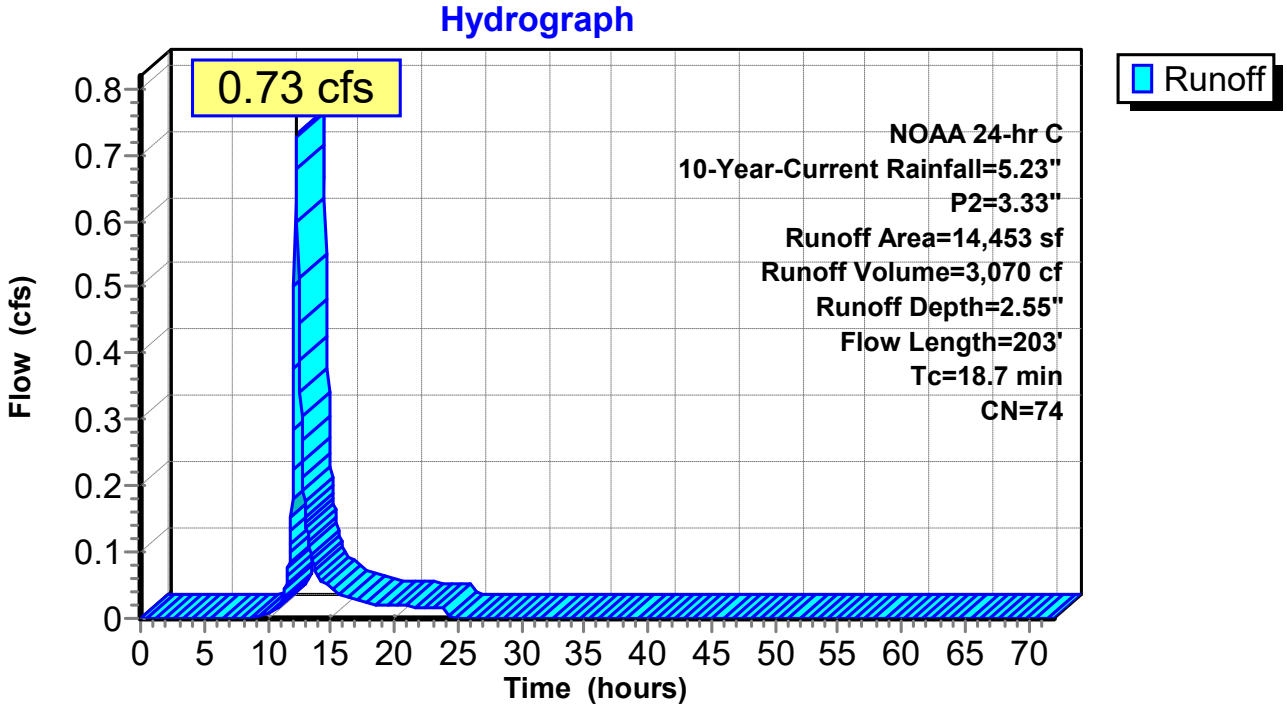
Runoff = 0.73 cfs @ 12.28 hrs, Volume= 3,070 cf, Depth= 2.55"
Routed to Link PDA1 : PROP UNDETAINED PDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.23", P2=3.33"

Area (sf)	CN	Description
14,453	74	>75% Grass cover, Good, HSG C
14,453		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	8	0.1750	0.25		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.33"
0.5	11	0.4760	0.40		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.33"
0.7	11	0.1809	0.27		**Sheet Flow, CD** Grass: Short n= 0.150 P2= 3.33"
11.4	71	0.0065	0.10		**Sheet Flow, DE** Grass: Short n= 0.150 P2= 3.33"
5.6	102	0.0019	0.31		**Shallow Concentrated Flow, EF** Short Grass Pasture Kv= 7.0 fps
18.7	203	Total			

Subcatchment PDA1P: PDA-1 PERV.



Summary for Subcatchment PDA2AI: PDA-2A IMP.

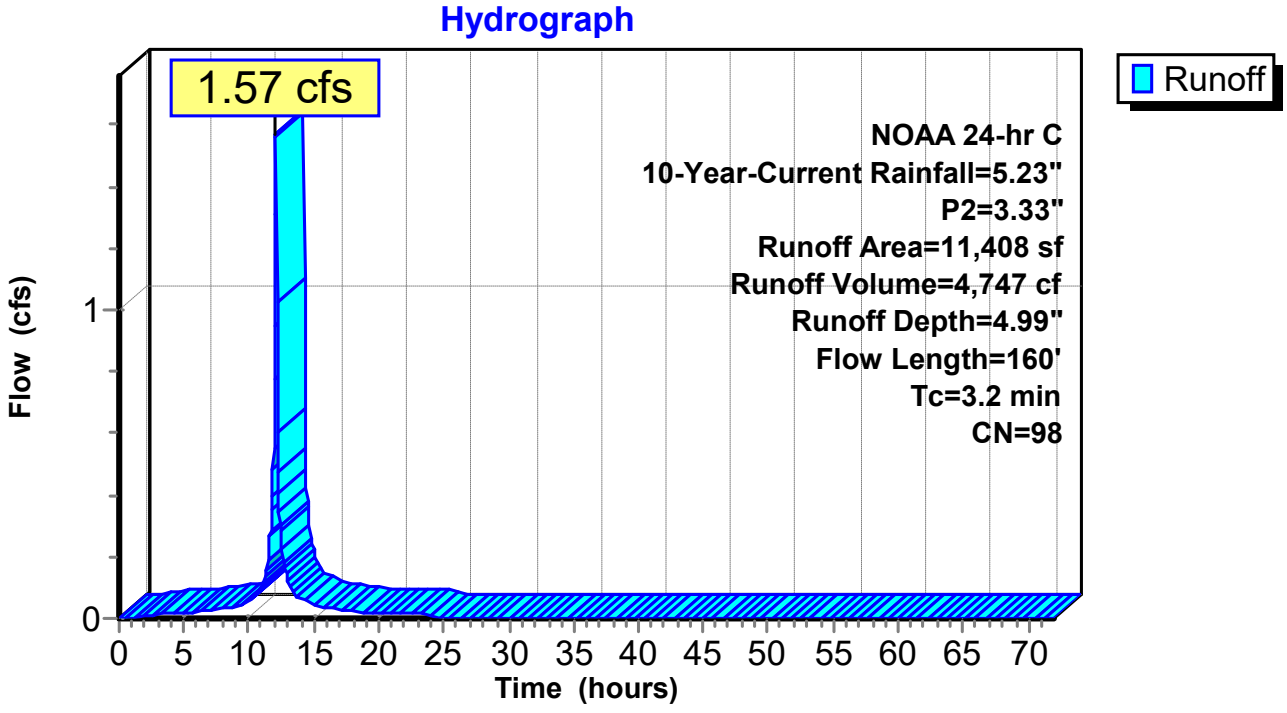
Runoff = 1.57 cfs @ 12.09 hrs, Volume= 4,747 cf, Depth= 4.99"
Routed to Link PDA2A : PROP DETAINED PDA-2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.23", P2=3.33"

Area (sf)	CN	Description
11,408	98	Paved parking, HSG B
11,408		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	6	0.0100	0.61		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"
1.3	47	0.0036	0.61		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
1.0	47	0.0070	0.79		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
0.1	12	0.0200	2.87		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.6	48	0.0050	1.44		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
3.2	160	Total			

Subcatchment PDA2AI: PDA-2A IMP.



Summary for Subcatchment PDA2AP: PDA-2A PERV.

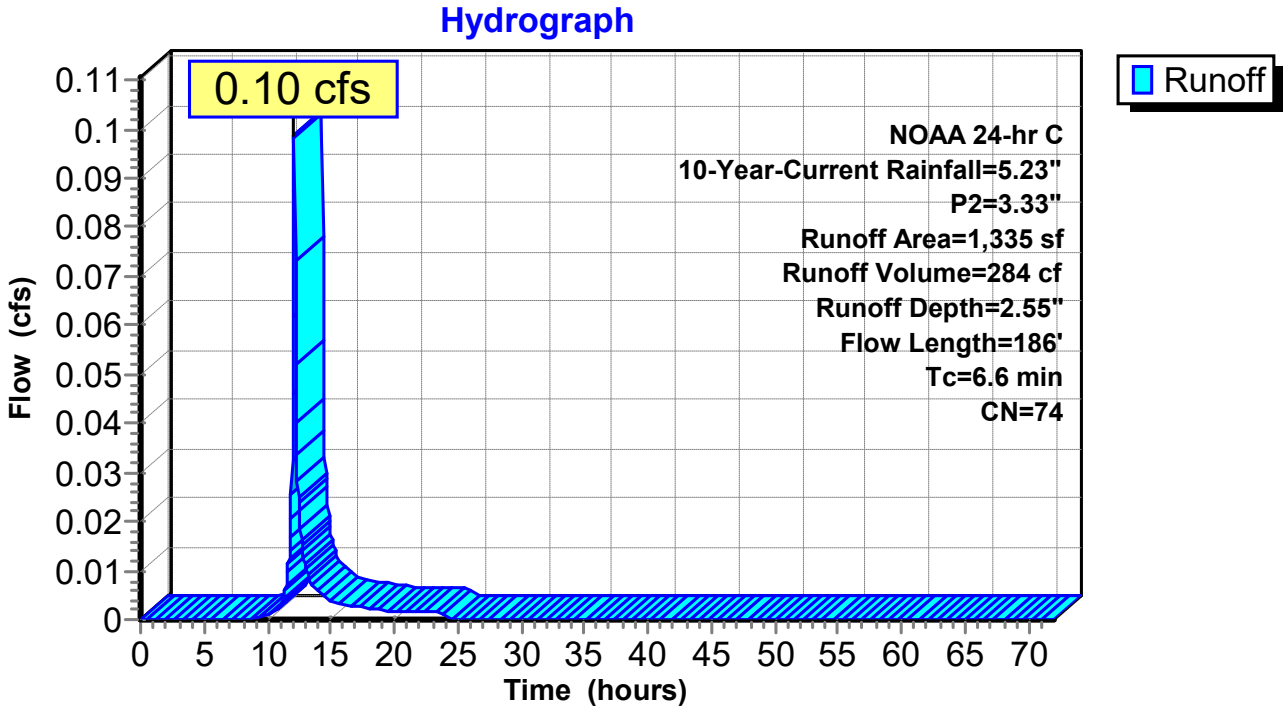
Runoff = 0.10 cfs @ 12.14 hrs, Volume= 284 cf, Depth= 2.55"
Routed to Link PDA2A : PROP DETAINED PDA-2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.23", P2=3.33"

Area (sf)	CN	Description
1,335	74	>75% Grass cover, Good, HSG C
1,335		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	18	0.0050	0.07		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.33"
1.5	82	0.0070	0.89		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
0.4	39	0.0070	1.70		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	47	0.0050	1.44		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
6.6	186	Total			

Subcatchment PDA2AP: PDA-2A PERV.



Summary for Subcatchment PDA2BI: PDA-2B IMP.

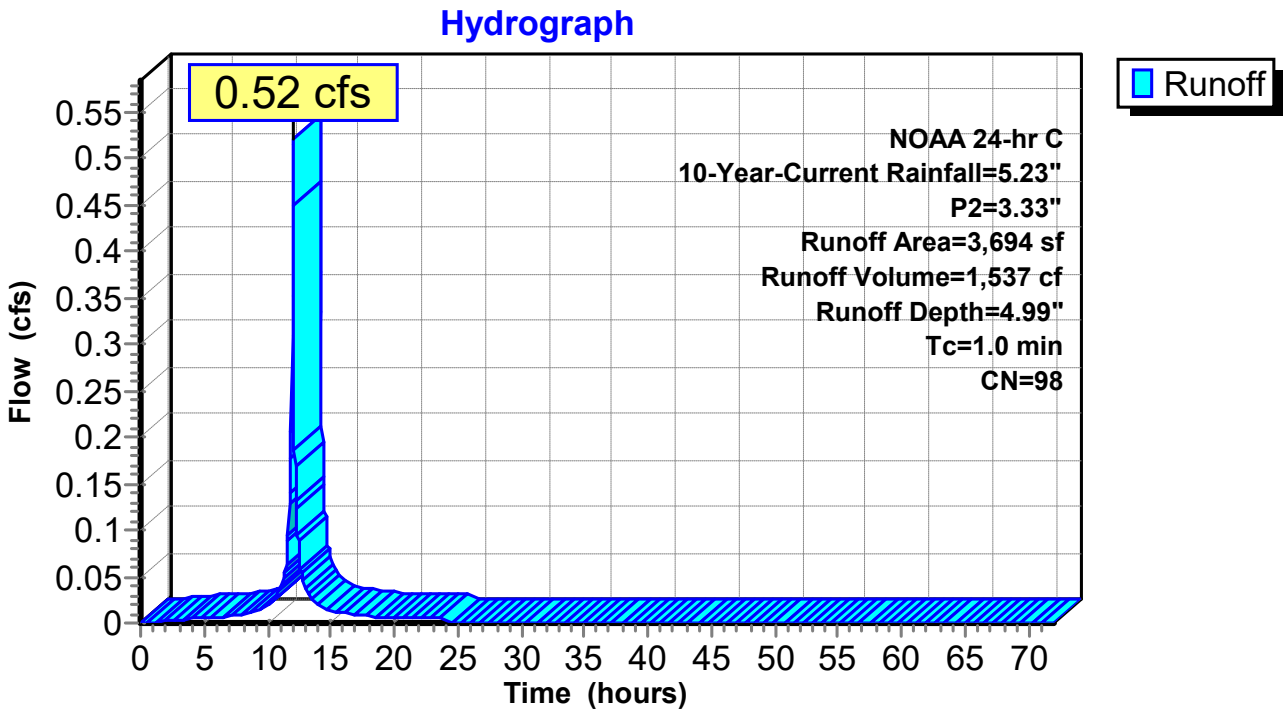
Runoff = 0.52 cfs @ 12.06 hrs, Volume= 1,537 cf, Depth= 4.99"
Routed to Pond 9P : PERVIOUS PAVEMENT W/ UD2 R-TANK

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.23", P2=3.33"

Area (sf)	CN	Description
3,694	98	Paved parking, HSG B
3,694		100.00% Impervious Area

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

Subcatchment PDA2BI: PDA-2B IMP.



Summary for Subcatchment PDA2CI: PDA-2C IMP.

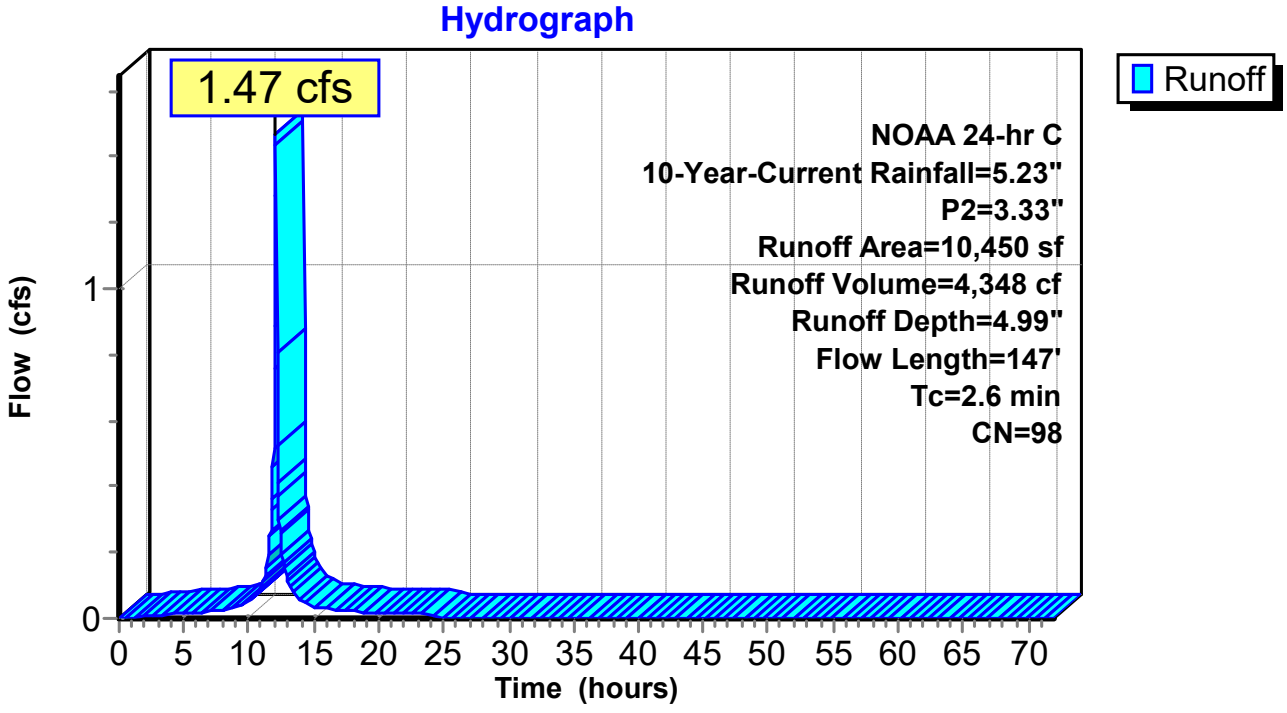
Runoff = 1.47 cfs @ 12.08 hrs, Volume= 4,348 cf, Depth= 4.99"
Routed to Link PDA2C : PROP DETAINED PDA-2C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.23", P2=3.33"

Area (sf)	CN	Description
10,450	98	Paved parking, HSG B
10,450		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0100	0.67		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"
0.5	19	0.0050	0.58		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
1.3	71	0.0074	0.88		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
0.1	18	0.0600	4.97		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	29	0.0020	0.91		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
2.6	147	Total			

Subcatchment PDA2CI: PDA-2C IMP.



Summary for Subcatchment PDA2CP: PDA-2C PERV.

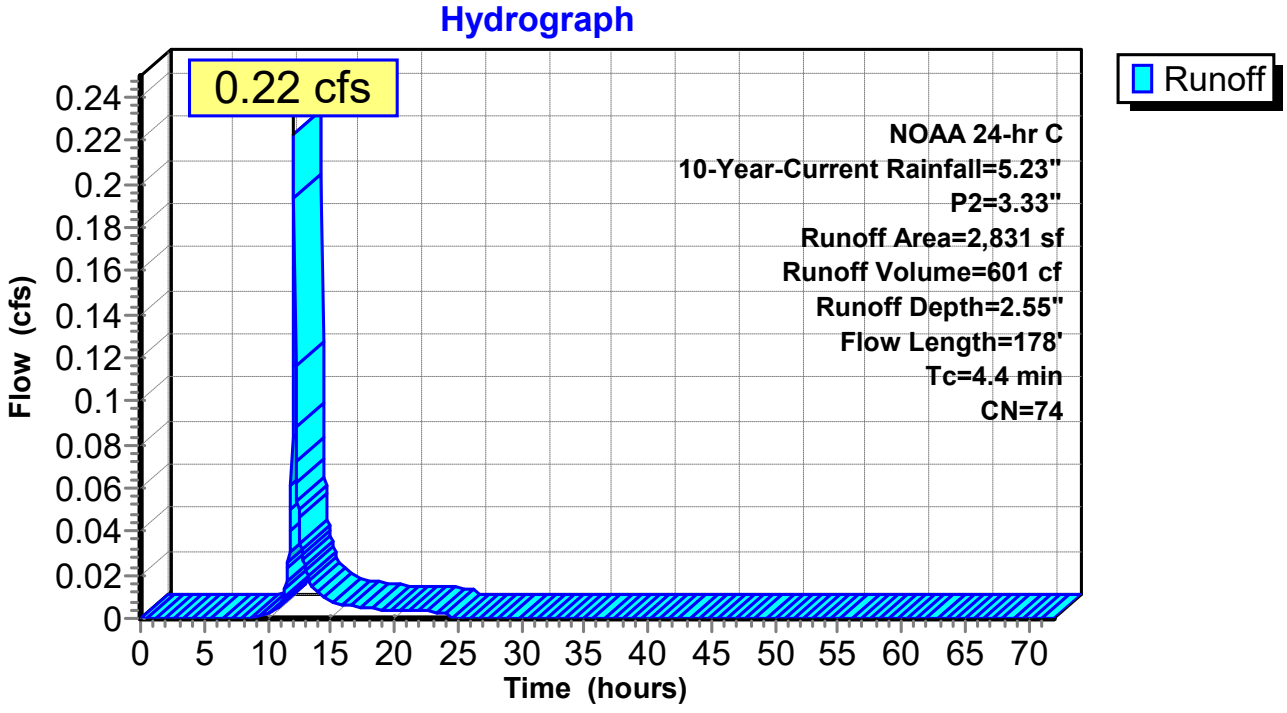
Runoff = 0.22 cfs @ 12.11 hrs, Volume= 601 cf, Depth= 2.55"
Routed to Link PDA2C : PROP DETAINED PDA-2C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Current Rainfall=5.23", P2=3.33"

Area (sf)	CN	Description
2,831	74	>75% Grass cover, Good, HSG C
2,831		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	8	0.0060	0.06		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.33"
0.7	42	0.0150	1.05		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"
0.7	50	0.0160	1.12		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
0.4	48	0.0090	1.93		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	30	0.0023	0.97		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
4.4	178	Total			

Subcatchment PDA2CP: PDA-2C PERV.



Summary for Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

Inflow Area = 16,437 sf, 91.88% Impervious, Inflow Depth = 4.79" for 10-Year-Current event
Inflow = 2.14 cfs @ 12.09 hrs, Volume= 6,567 cf
Outflow = 0.37 cfs @ 12.50 hrs, Volume= 6,167 cf, Atten= 82%, Lag= 24.6 min
Primary = 0.37 cfs @ 12.50 hrs, Volume= 6,167 cf
Routed to Link PDA2 : PROP DETAINED PDA-2

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 88.32' @ 12.50 hrs Surf.Area= 3,147 sf Storage= 3,401 cf

Plug-Flow detention time= 296.9 min calculated for 6,167 cf (94% of inflow)
Center-of-Mass det. time= 261.3 min (1,010.4 - 749.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	86.99'	1,331 cf	**35.50'W x 88.65'L x 2.76'H Field A** 8,696 cf Overall - 6,035 cf Embedded = 2,661 cf x 50.0% Voids
#2A	87.24'	5,733 cf	**Ferguson R-Tank UD 2** x 688 Inside #1 Inside= 23.6"W x 27.2"H => 4.23 sf x 1.97'L = 8.3 cf Outside= 23.6"W x 27.2"H => 4.46 sf x 1.97'L = 8.8 cf 688 Chambers in 16 Rows
		7,064 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	87.24'	**15.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 87.24' / 87.19' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	87.24'	**2.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	88.20'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.37 cfs @ 12.50 hrs HW=88.32' (Free Discharge)
└**1=Culvert** (Passes 0.37 cfs of 2.95 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.16 cfs @ 4.77 fps)
  └**3=Orifice/Grate** (Orifice Controls 0.21 cfs @ 1.13 fps)

Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK - Chamber Wizard Field A

Chamber Model = Ferguson R-Tank UD 2 (Ferguson R-Tank UD)
Inside= 23.6"W x 27.2"H => 4.23 sf x 1.97'L = 8.3 cf
Outside= 23.6"W x 27.2"H => 4.46 sf x 1.97'L = 8.8 cf

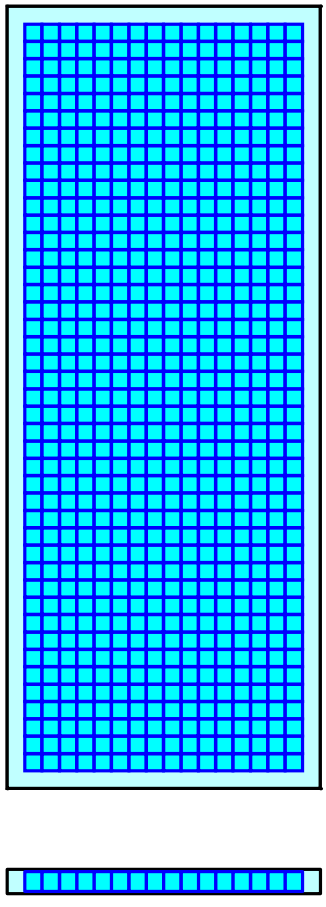
43 Chambers/Row x 1.97' Long = 84.65' Row Length +24.0" End Stone x 2 = 88.65' Base Length
16 Rows x 23.6" Wide + 24.0" Side Stone x 2 = 35.50' Base Width
3.0" Stone Base + 27.2" Chamber Height + 3.0" Stone Cover = 2.76' Field Height

688 Chambers x 8.3 cf = 5,733.5 cf Chamber Storage
688 Chambers x 8.8 cf = 6,035.2 cf Displacement

8,696.4 cf Field - 6,035.2 cf Chambers = 2,661.2 cf Stone x 50.0% Voids = 1,330.6 cf Stone Storage

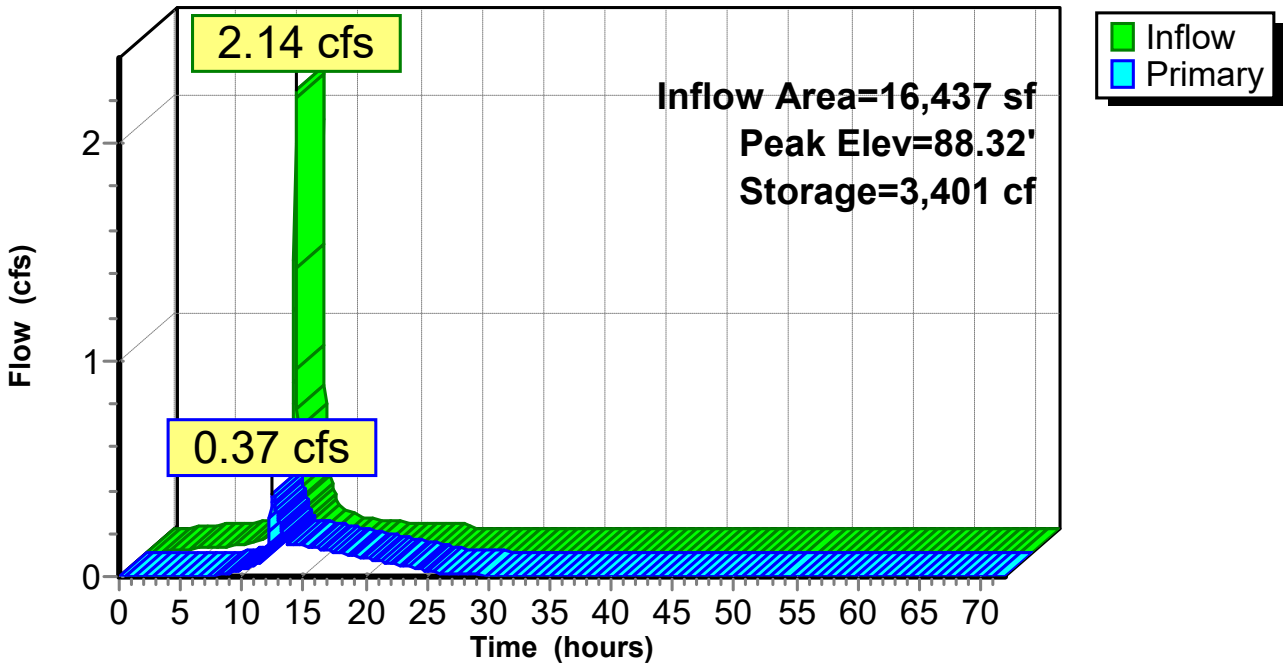
Chamber Storage + Stone Storage = 7,064.1 cf = 0.162 af
Overall Storage Efficiency = 81.2%
Overall System Size = 88.65' x 35.50' x 2.76'

688 Chambers
322.1 cy Field
98.6 cy Stone



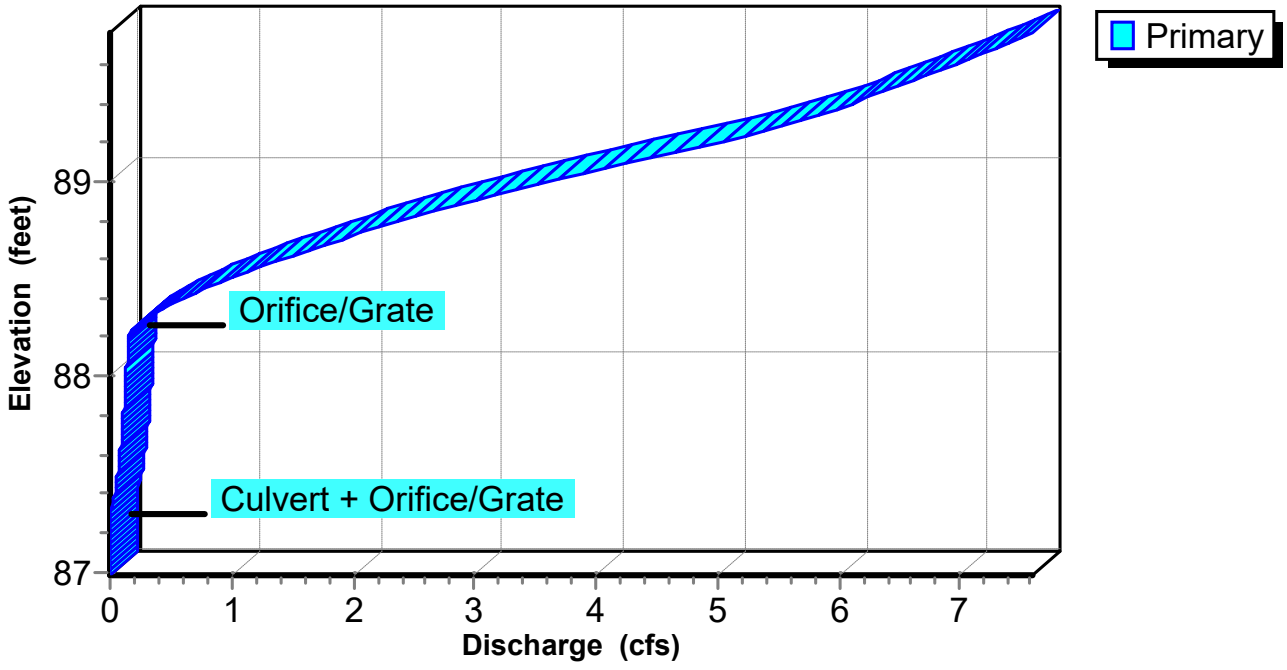
Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

Hydrograph

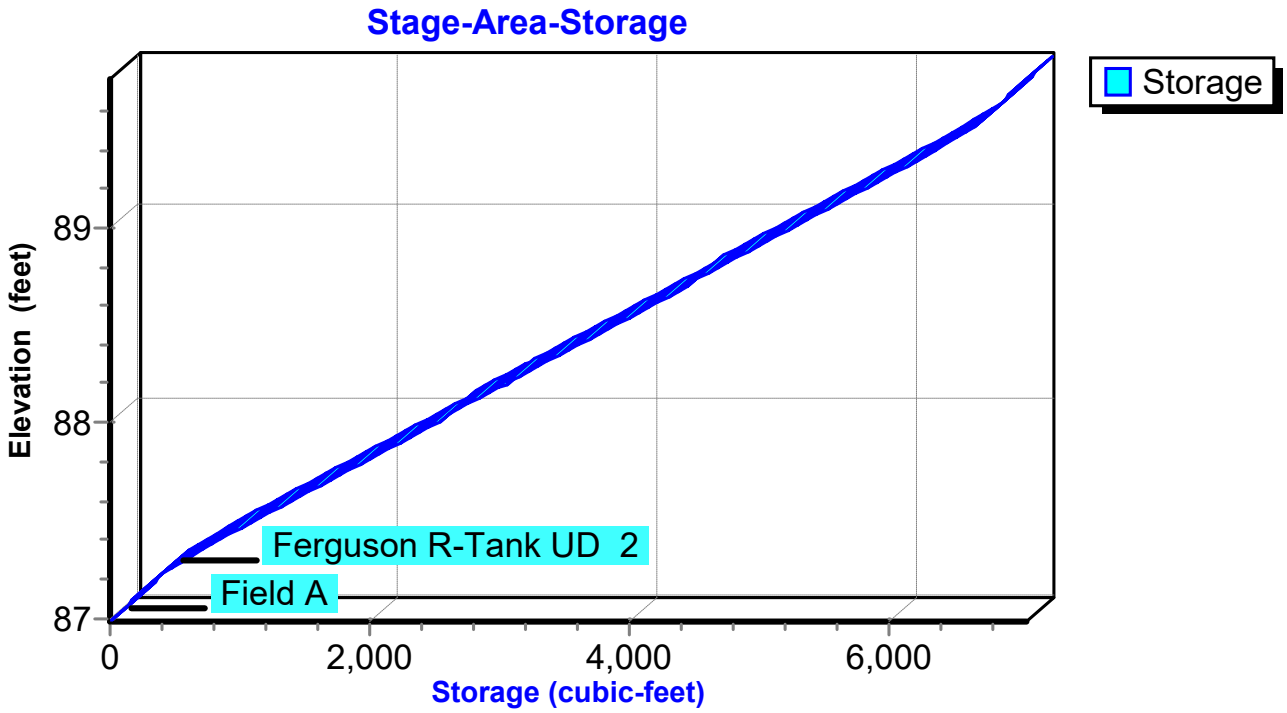


Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

Stage-Discharge



Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

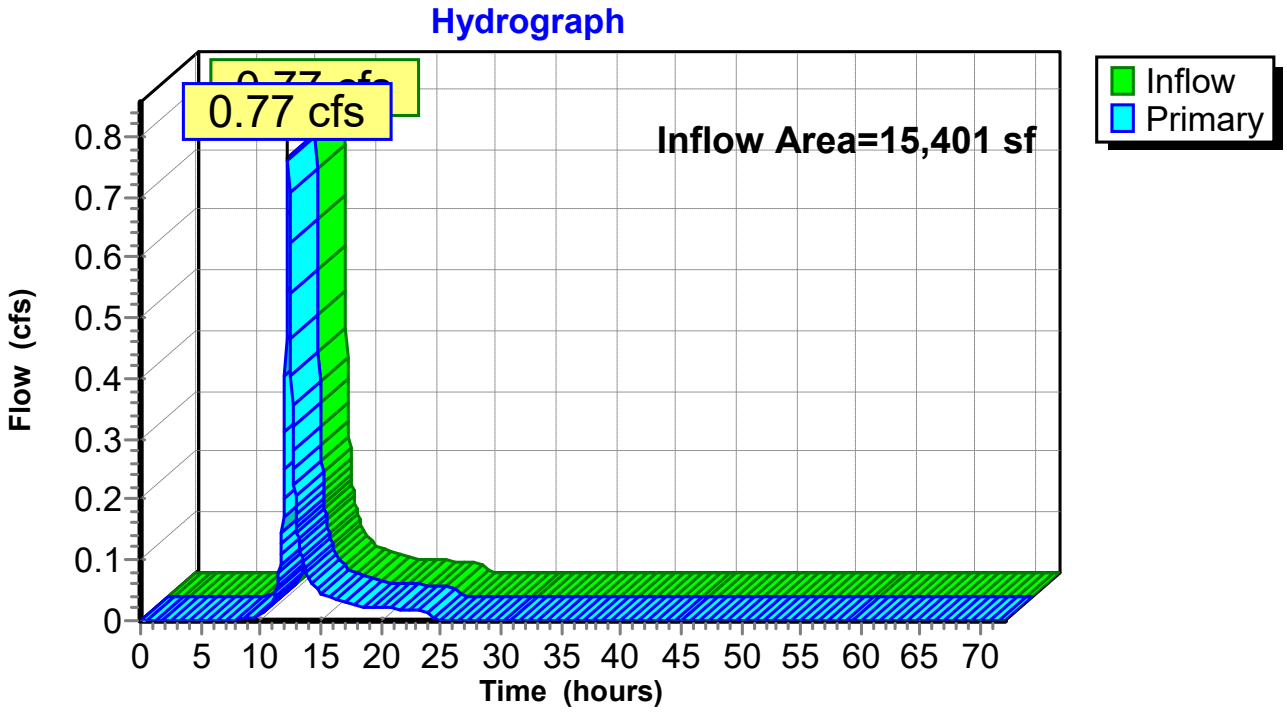


Summary for Link EDA1: EXISTING UNDETAINED EDA-1

Inflow Area = 15,401 sf, 5.21% Impervious, Inflow Depth = 2.68" for 10-Year-Current event
Inflow = 0.77 cfs @ 12.28 hrs, Volume= 3,435 cf
Primary = 0.77 cfs @ 12.28 hrs, Volume= 3,435 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 3L

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

Link EDA1: EXISTING UNDETAINED EDA-1

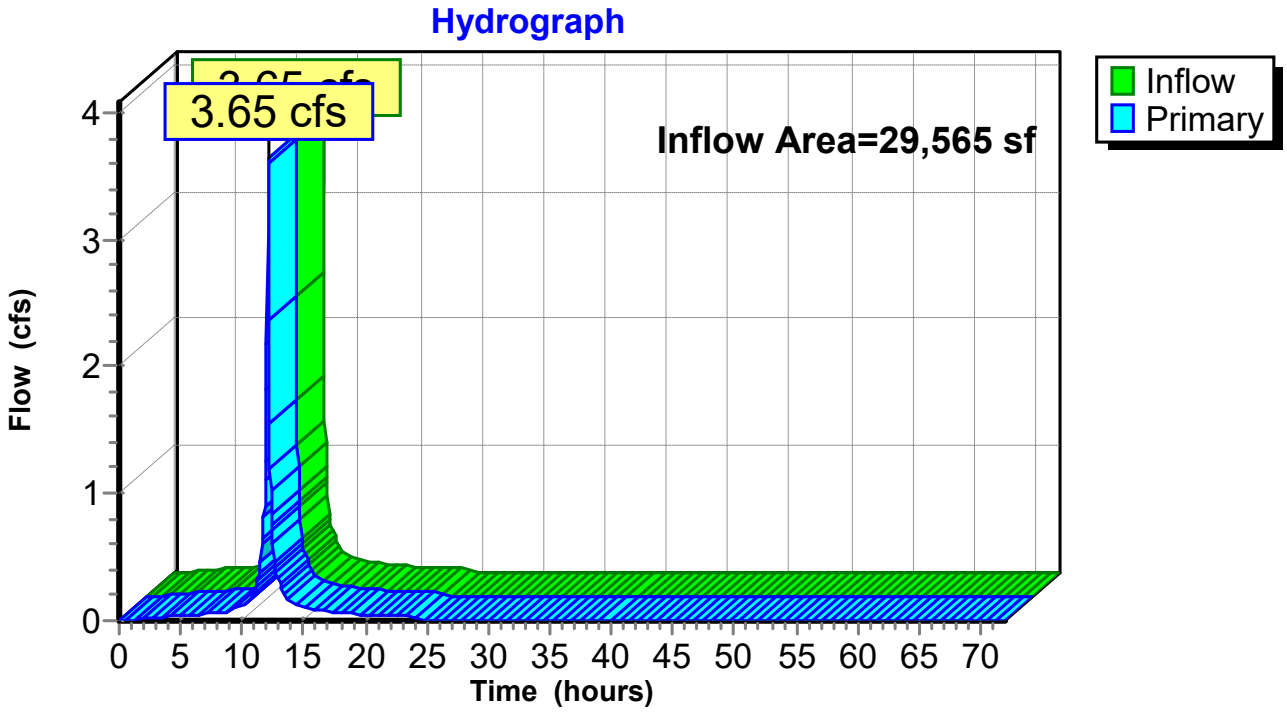


Summary for Link EDA2: EXISTING DETAINED EDA-2

Inflow Area = 29,565 sf, 79.87% Impervious, Inflow Depth = 4.50" for 10-Year-Current event
Inflow = 3.65 cfs @ 12.09 hrs, Volume= 11,089 cf
Primary = 3.65 cfs @ 12.09 hrs, Volume= 11,089 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node BDA2

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

Link EDA2: EXISTING DETAINED EDA-2

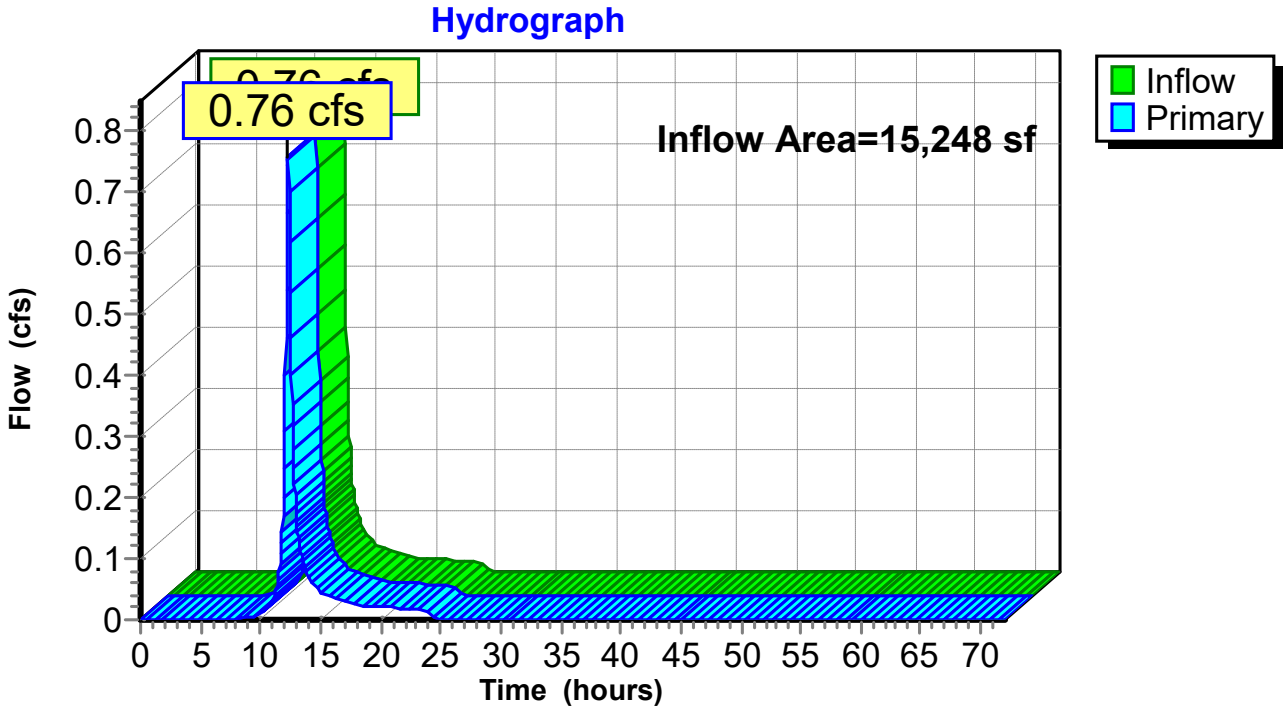


Summary for Link PDA1: PROP UNDETAINED PDA-1

Inflow Area = 15,248 sf, 5.21% Impervious, Inflow Depth = 2.68" for 10-Year-Current event
Inflow = 0.76 cfs @ 12.28 hrs, Volume= 3,401 cf
Primary = 0.76 cfs @ 12.28 hrs, Volume= 3,401 cf, Atten= 0%, Lag= 0.0 min

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

Link PDA1: PROP UNDETAINED PDA-1

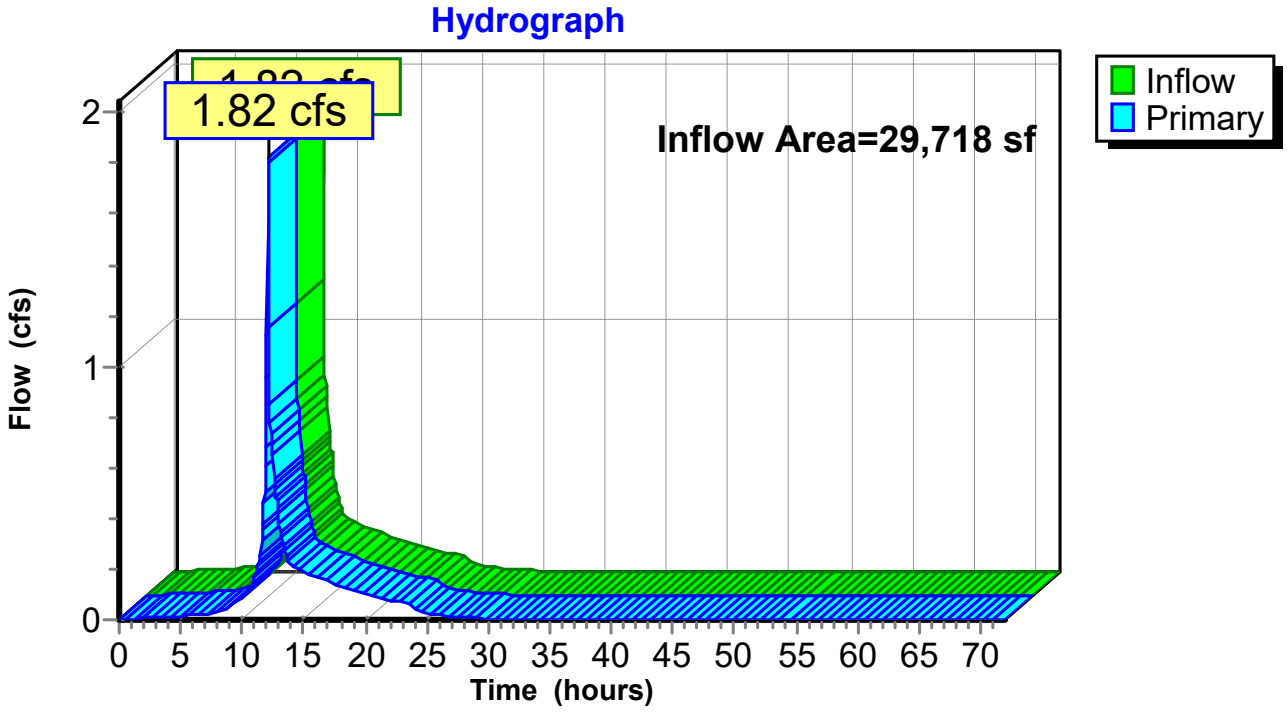


Summary for Link PDA2: PROP DETAINED PDA-2

Inflow Area = 29,718 sf, 85.98% Impervious, Inflow Depth = 4.49" for 10-Year-Current event
Inflow = 1.82 cfs @ 12.09 hrs, Volume= 11,117 cf
Primary = 1.82 cfs @ 12.09 hrs, Volume= 11,117 cf, Atten= 0%, Lag= 0.0 min

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

Link PDA2: PROP DETAINED PDA-2

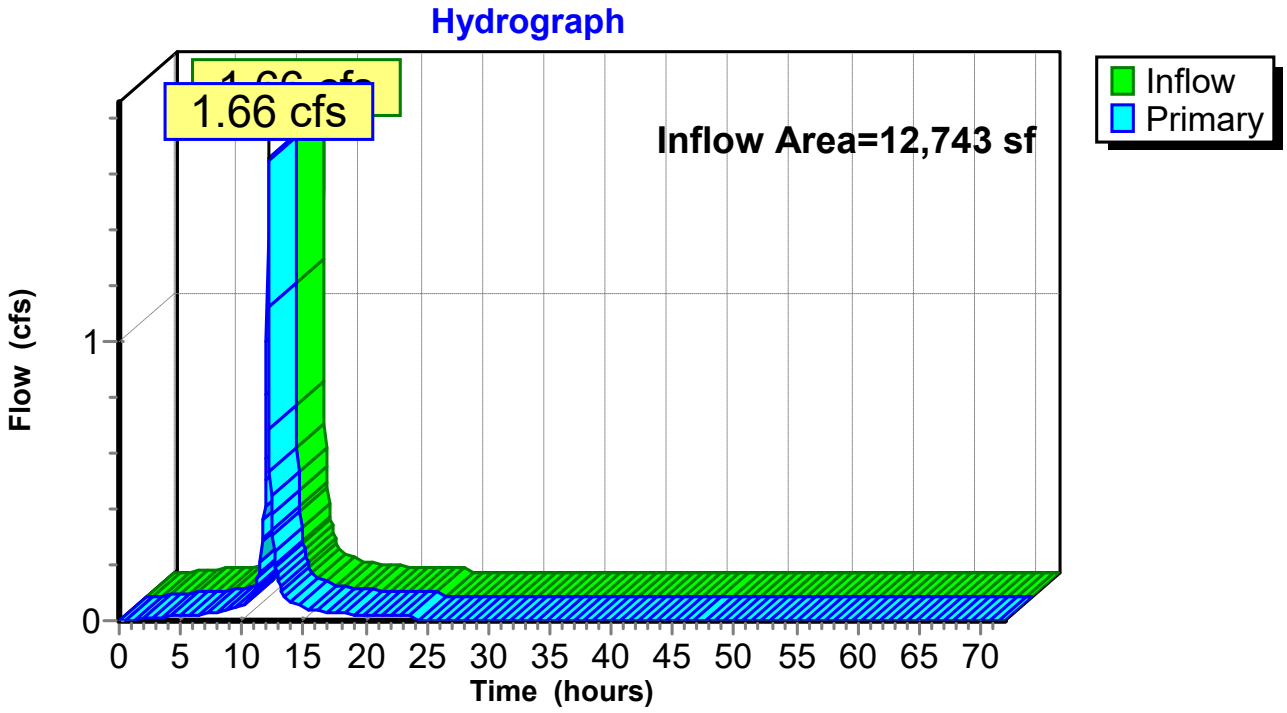


Summary for Link PDA2A: PROP DETAINED PDA-2A

Inflow Area = 12,743 sf, 89.52% Impervious, Inflow Depth = 4.74" for 10-Year-Current event
Inflow = 1.66 cfs @ 12.09 hrs, Volume= 5,030 cf
Primary = 1.66 cfs @ 12.09 hrs, Volume= 5,030 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 9P : PERVIOUS PAVEMENT W/ UD2 R-TANK

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

Link PDA2A: PROP DETAINED PDA-2A

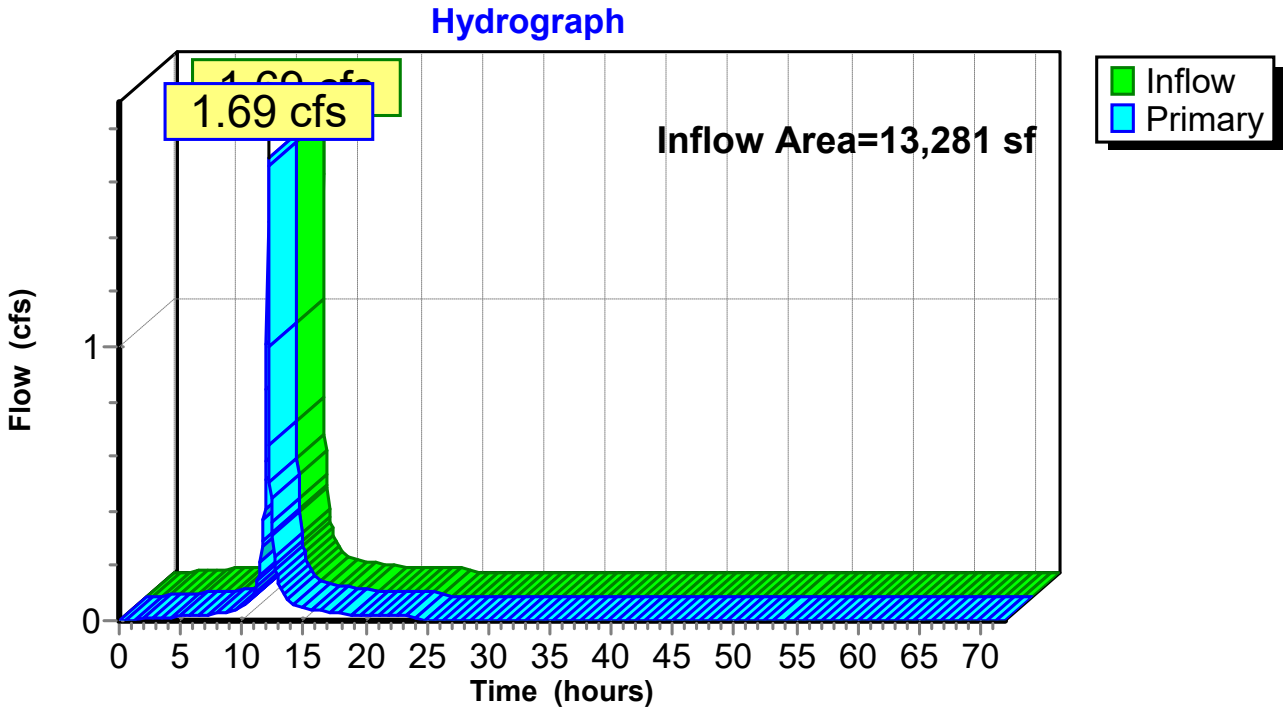


Summary for Link PDA2C: PROP DETAINED PDA-2C

Inflow Area = 13,281 sf, 78.68% Impervious, Inflow Depth = 4.47" for 10-Year-Current event
Inflow = 1.69 cfs @ 12.09 hrs, Volume= 4,949 cf
Primary = 1.69 cfs @ 12.09 hrs, Volume= 4,949 cf, Atten= 0%, Lag= 0.0 min
Routed to Link PDA2 : PROP DETAINED PDA-2

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

Link PDA2C: PROP DETAINED PDA-2C



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA1I: EDA-1 IMP. Runoff Area=803 sf 100.00% Impervious Runoff Depth=5.87"
Flow Length=36' Slope=0.0420 '/' Tc=0.4 min CN=98 Runoff=0.13 cfs 393 cf

Subcatchment EDA1P: EDA-1 PERV. Runoff Area=14,598 sf 0.00% Impervious Runoff Depth=3.28"
Flow Length=203' Tc=17.6 min CN=74 Runoff=0.98 cfs 3,987 cf

Subcatchment EDA2I: EDA-2 IMP. Runoff Area=23,615 sf 100.00% Impervious Runoff Depth=5.87"
Flow Length=182' Tc=2.6 min CN=98 Runoff=3.89 cfs 11,555 cf

Subcatchment EDA2P: EDA-2 PERV. Runoff Area=5,950 sf 0.00% Impervious Runoff Depth=3.28"
Flow Length=187' Tc=6.9 min CN=74 Runoff=0.56 cfs 1,625 cf

Subcatchment PDA1I: PDA-1 IMP. Runoff Area=795 sf 100.00% Impervious Runoff Depth=5.87"
Flow Length=36' Slope=0.0420 '/' Tc=0.4 min CN=98 Runoff=0.13 cfs 389 cf

Subcatchment PDA1P: PDA-1 PERV. Runoff Area=14,453 sf 0.00% Impervious Runoff Depth=3.28"
Flow Length=203' Tc=17.6 min CN=74 Runoff=0.97 cfs 3,948 cf

Subcatchment PDA2AI: PDA-2A IMP. Runoff Area=11,408 sf 100.00% Impervious Runoff Depth=5.87"
Flow Length=160' Tc=3.0 min CN=98 Runoff=1.85 cfs 5,582 cf

Subcatchment PDA2AP: PDA-2A PERV. Runoff Area=1,335 sf 0.00% Impervious Runoff Depth=3.28"
Flow Length=186' Tc=6.2 min CN=74 Runoff=0.13 cfs 365 cf

Subcatchment PDA2BI: PDA-2B IMP. Runoff Area=3,694 sf 100.00% Impervious Runoff Depth=5.87"
Tc=1.0 min CN=98 Runoff=0.61 cfs 1,808 cf

Subcatchment PDA2CI: PDA-2C IMP. Runoff Area=10,450 sf 100.00% Impervious Runoff Depth=5.87"
Flow Length=147' Tc=2.5 min CN=98 Runoff=1.73 cfs 5,113 cf

Subcatchment PDA2CP: PDA-2C PERV. Runoff Area=2,831 sf 0.00% Impervious Runoff Depth=3.28"
Flow Length=178' Tc=4.1 min CN=74 Runoff=0.29 cfs 773 cf

Pond 9P: PERVIOUS PAVEMENT W/ UD2 Peak Elev=88.42' Storage=3,674 cf Inflow=2.54 cfs 7,754 cf
Outflow=0.68 cfs 7,354 cf

Link EDA1: EXISTING UNDETAINED EDA-1 Inflow=1.01 cfs 4,380 cf
Primary=1.01 cfs 4,380 cf

Link EDA2: EXISTING DETAINED EDA-2 Inflow=4.35 cfs 13,180 cf
Primary=4.35 cfs 13,180 cf

Link PDA1: PROP UNDETAINED PDA-1 Inflow=1.00 cfs 4,337 cf
Primary=1.00 cfs 4,337 cf

Link PDA2: PROP DETAINED PDA-2 Inflow=2.20 cfs 13,241 cf
Primary=2.20 cfs 13,241 cf

Link PDA2A: PROP DETAINED PDA-2A Inflow=1.97 cfs 5,947 cf
Primary=1.97 cfs 5,947 cf

Link PDA2C: PROP DETAINED PDA-2C Inflow=2.01 cfs 5,887 cf
Primary=2.01 cfs 5,887 cf

Total Runoff Area = 89,932 sf Runoff Volume = 35,538 cf Average Runoff Depth = 4.74"
43.55% Pervious = 39,167 sf 56.45% Impervious = 50,765 sf

Summary for Subcatchment EDA1I: EDA-1 IMP.

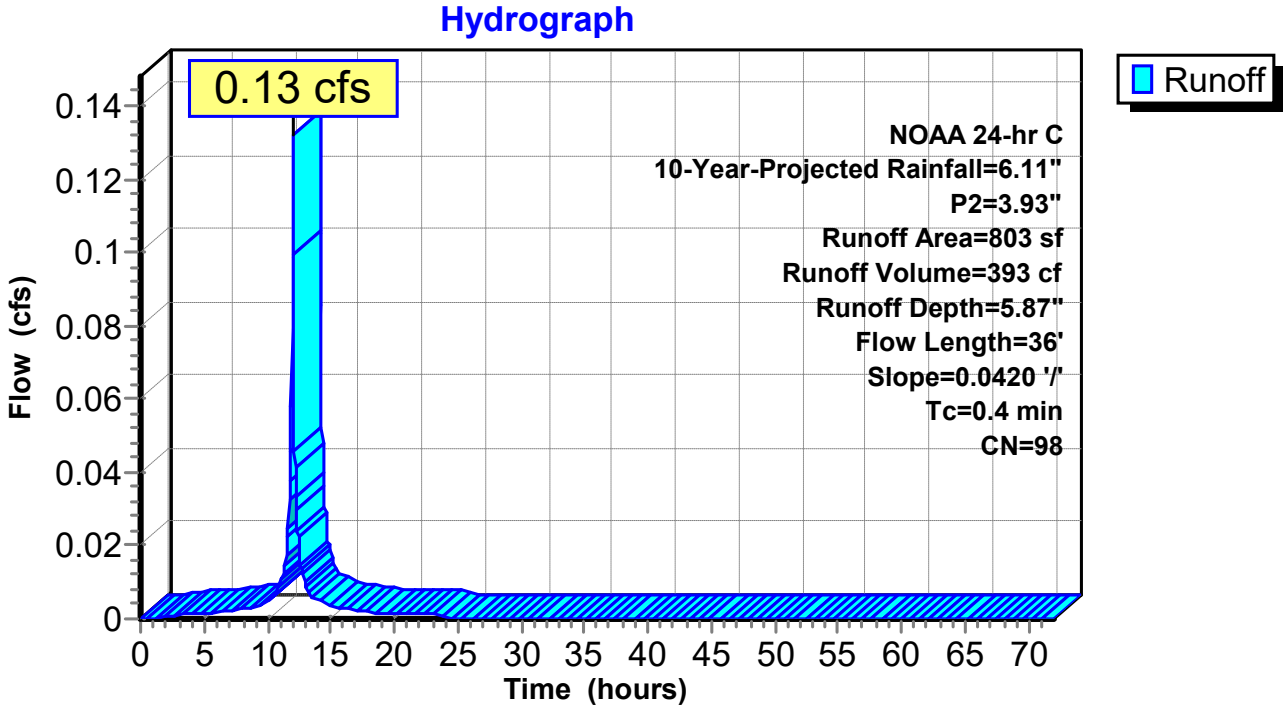
Runoff = 0.13 cfs @ 12.05 hrs, Volume= 393 cf, Depth= 5.87"
Routed to Link EDA1 : EXISTING UNDETAINED EDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Projected Rainfall=6.11", P2=3.93"

Area (sf)	CN	Description
803	98	Paved parking, HSG B
803		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	36	0.0420	1.67		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"

Subcatchment EDA1I: EDA-1 IMP.



Summary for Subcatchment EDA1P: EDA-1 PERV.

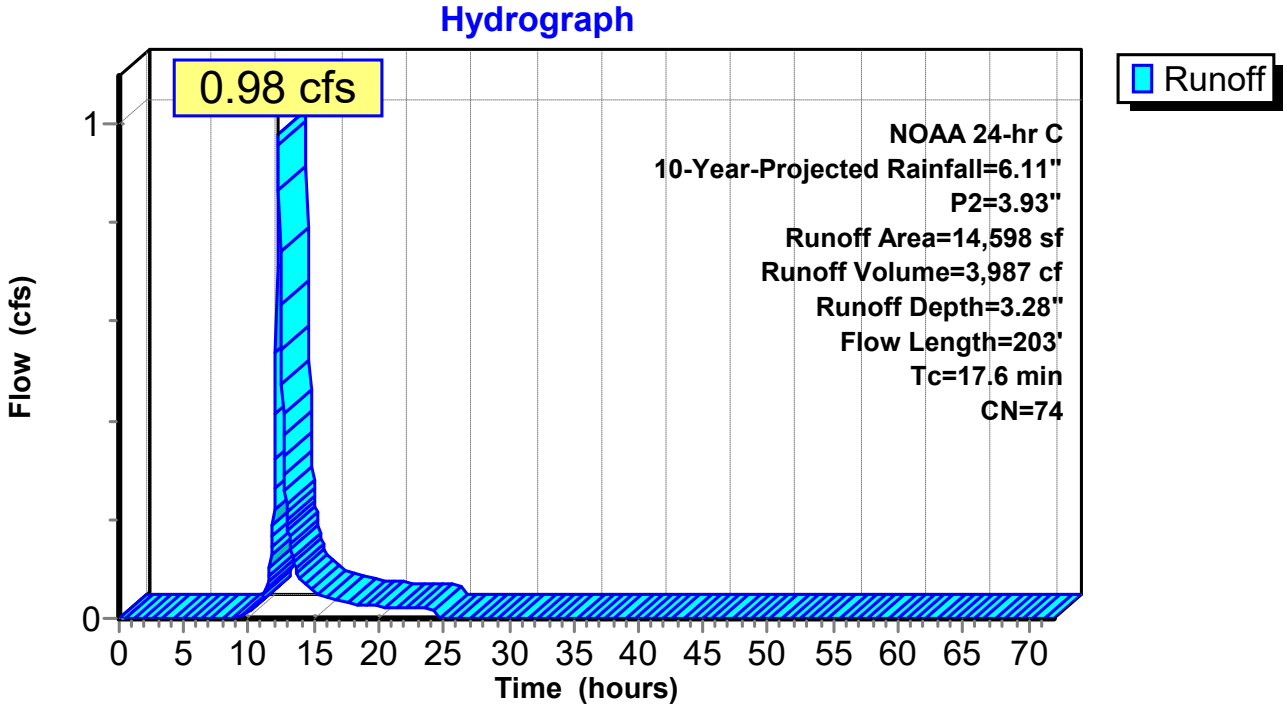
Runoff = 0.98 cfs @ 12.27 hrs, Volume= 3,987 cf, Depth= 3.28"
Routed to Link EDA1 : EXISTING UNDETAINED EDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Projected Rainfall=6.11", P2=3.93"

Area (sf)	CN	Description
14,598	74	>75% Grass cover, Good, HSG C
14,598		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	8	0.1750	0.27		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.93"
0.4	11	0.4760	0.43		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.93"
0.6	11	0.1809	0.29		**Sheet Flow, CD** Grass: Short n= 0.150 P2= 3.93"
10.5	71	0.0065	0.11		**Sheet Flow, DE** Grass: Short n= 0.150 P2= 3.93"
5.6	102	0.0019	0.31		**Shallow Concentrated Flow, EF** Short Grass Pasture Kv= 7.0 fps
17.6	203	Total			

Subcatchment EDA1P: EDA-1 PERV.



Summary for Subcatchment EDA2I: EDA-2 IMP.

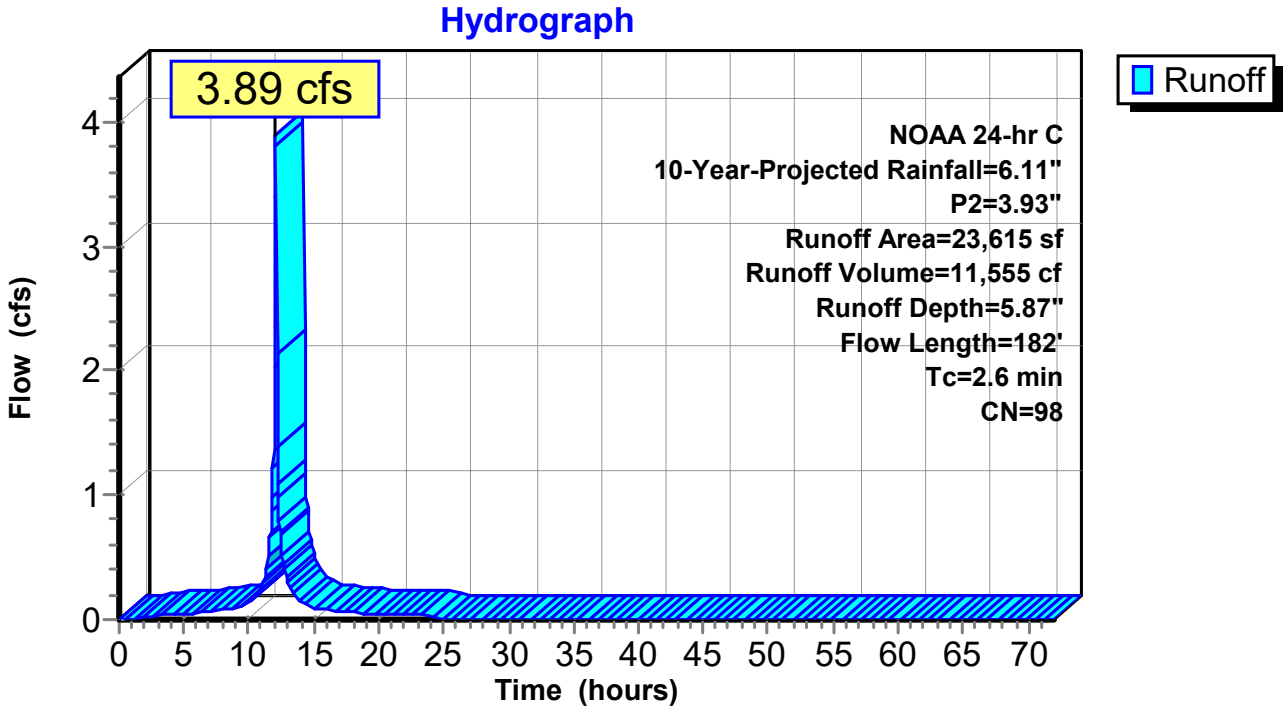
Runoff = 3.89 cfs @ 12.08 hrs, Volume= 11,555 cf, Depth= 5.87"
Routed to Link EDA2 : EXISTING DETAINED EDA-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Projected Rainfall=6.11", P2=3.93"

Area (sf)	CN	Description
23,615	98	Paved parking, HSG B
23,615		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0208	1.35		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"
1.0	50	0.0060	0.82		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.2	42	0.0207	2.92		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.8	40	0.0017	0.84		**Shallow Concentrated Flow, DE** Paved Kv= 20.3 fps
2.6	182	Total			

Subcatchment EDA2I: EDA-2 IMP.



Summary for Subcatchment EDA2P: EDA-2 PERV.

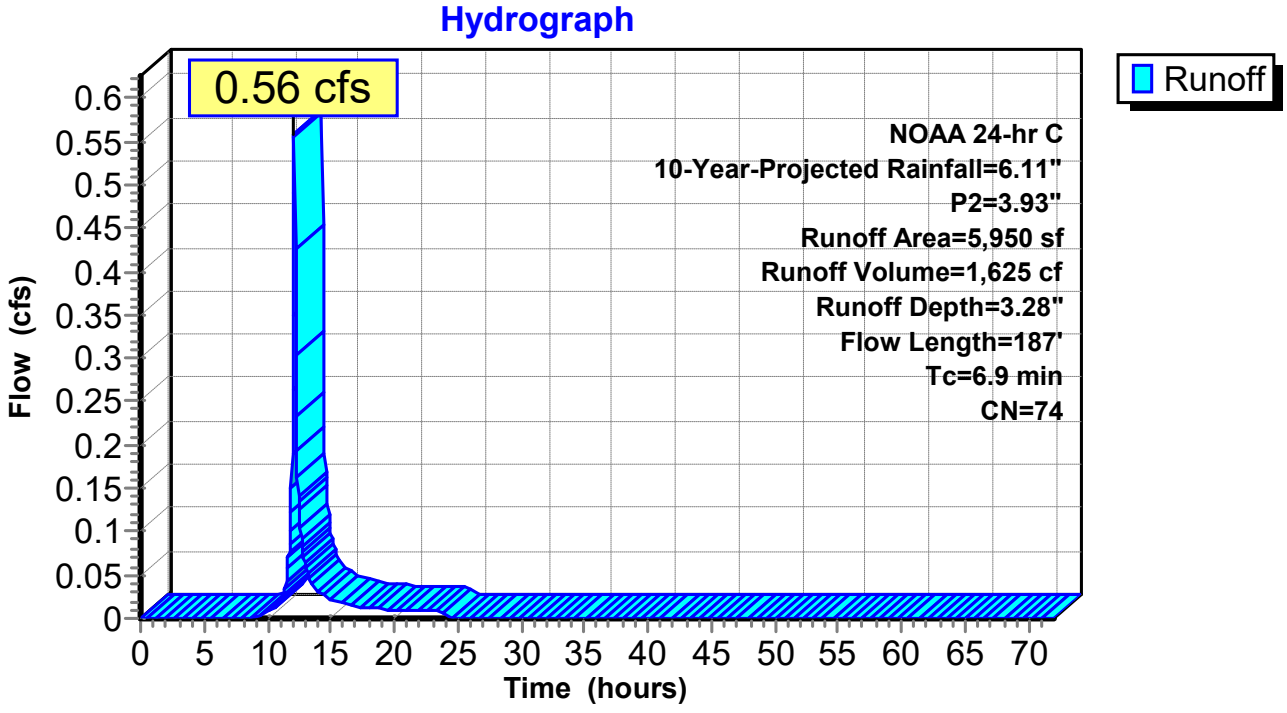
Runoff = 0.56 cfs @ 12.14 hrs, Volume= 1,625 cf, Depth= 3.28"
Routed to Link EDA2 : EXISTING DETAINED EDA-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Projected Rainfall=6.11", P2=3.93"

Area (sf)	CN	Description
5,950	74	>75% Grass cover, Good, HSG C
5,950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	24	0.0064	0.09		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.93"
0.4	31	0.0226	1.27		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.9	45	0.0060	0.80		**Sheet Flow, CD** Smooth surfaces n= 0.011 P2= 3.93"
0.3	46	0.0207	2.92		**Shallow Concentrated Flow, DE** Paved Kv= 20.3 fps
0.8	41	0.0017	0.84		**Shallow Concentrated Flow, EF** Paved Kv= 20.3 fps
6.9	187	Total			

Subcatchment EDA2P: EDA-2 PERV.



Summary for Subcatchment PDA1I: PDA-1 IMP.

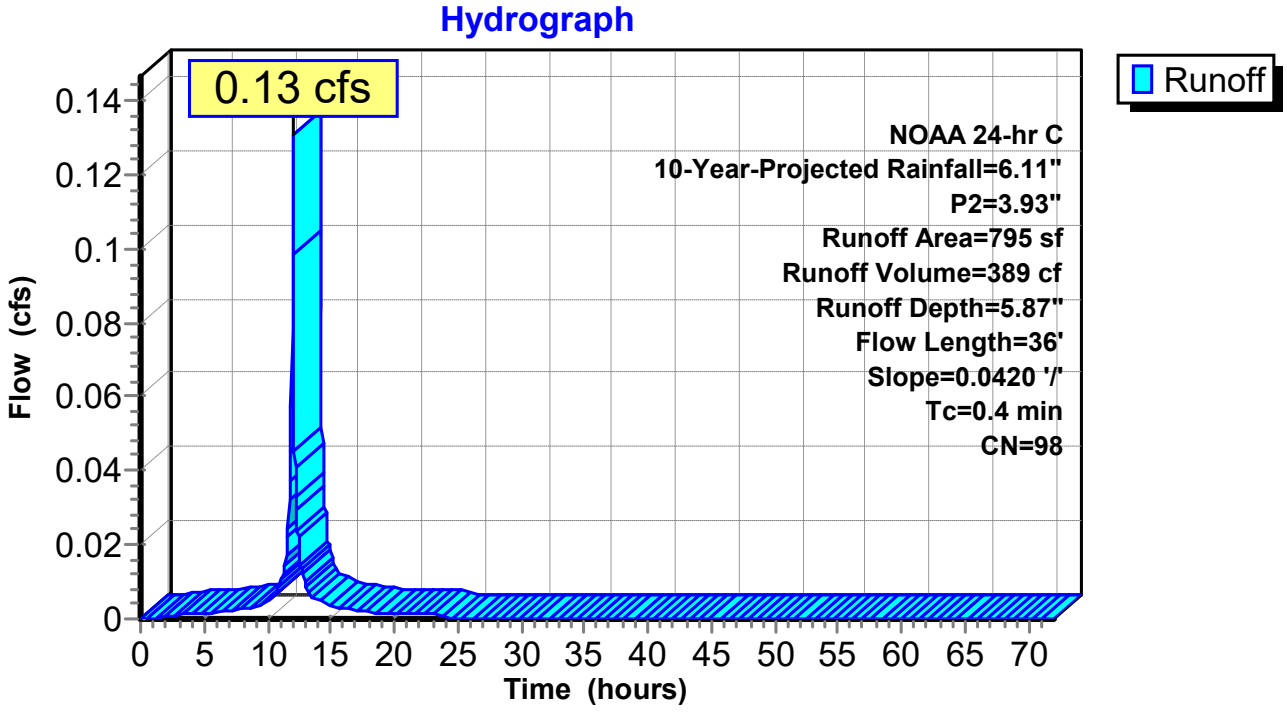
Runoff = 0.13 cfs @ 12.05 hrs, Volume= 389 cf, Depth= 5.87"
Routed to Link PDA1 : PROP UNDETAINED PDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Projected Rainfall=6.11", P2=3.93"

Area (sf)	CN	Description
795	98	Paved parking, HSG B
795		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	36	0.0420	1.67		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"

Subcatchment PDA1I: PDA-1 IMP.



Summary for Subcatchment PDA1P: PDA-1 PERV.

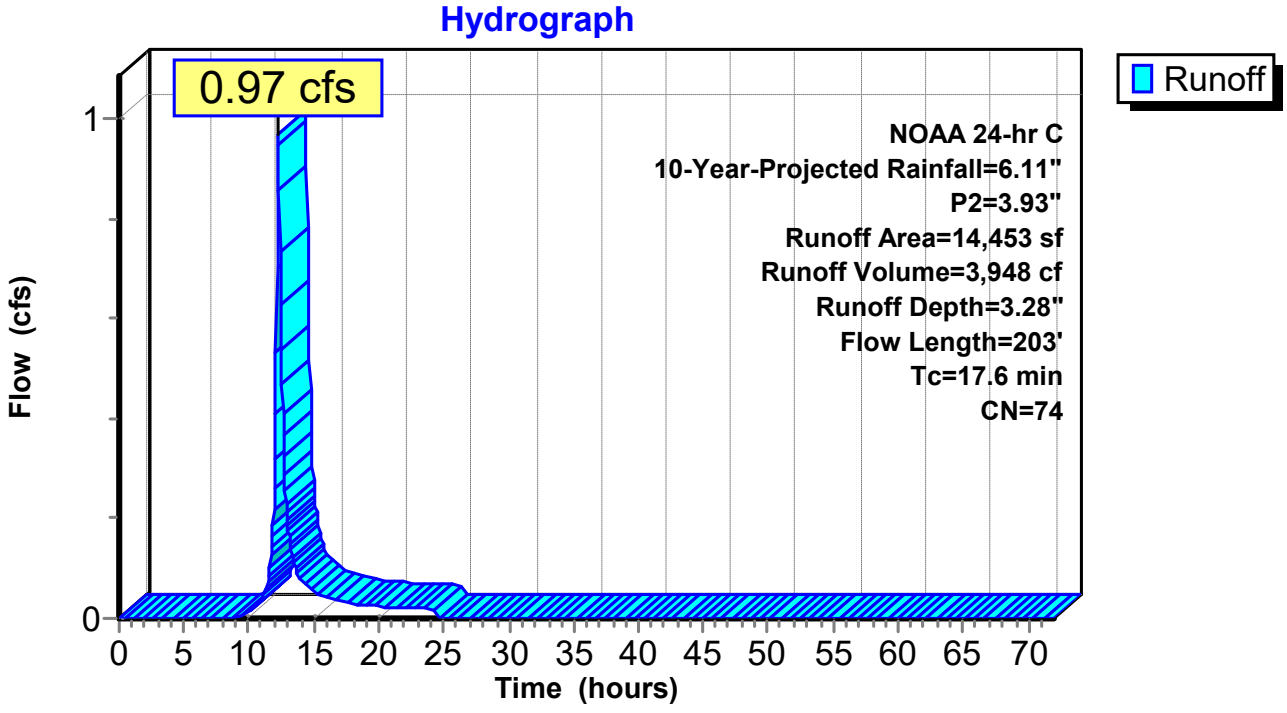
Runoff = 0.97 cfs @ 12.27 hrs, Volume= 3,948 cf, Depth= 3.28"
Routed to Link PDA1 : PROP UNDETAINED PDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Projected Rainfall=6.11", P2=3.93"

Area (sf)	CN	Description
14,453	74	>75% Grass cover, Good, HSG C
14,453		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	8	0.1750	0.27		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.93"
0.4	11	0.4760	0.43		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.93"
0.6	11	0.1809	0.29		**Sheet Flow, CD** Grass: Short n= 0.150 P2= 3.93"
10.5	71	0.0065	0.11		**Sheet Flow, DE** Grass: Short n= 0.150 P2= 3.93"
5.6	102	0.0019	0.31		**Shallow Concentrated Flow, EF** Short Grass Pasture Kv= 7.0 fps
17.6	203	Total			

Subcatchment PDA1P: PDA-1 PERV.



Summary for Subcatchment PDA2AI: PDA-2A IMP.

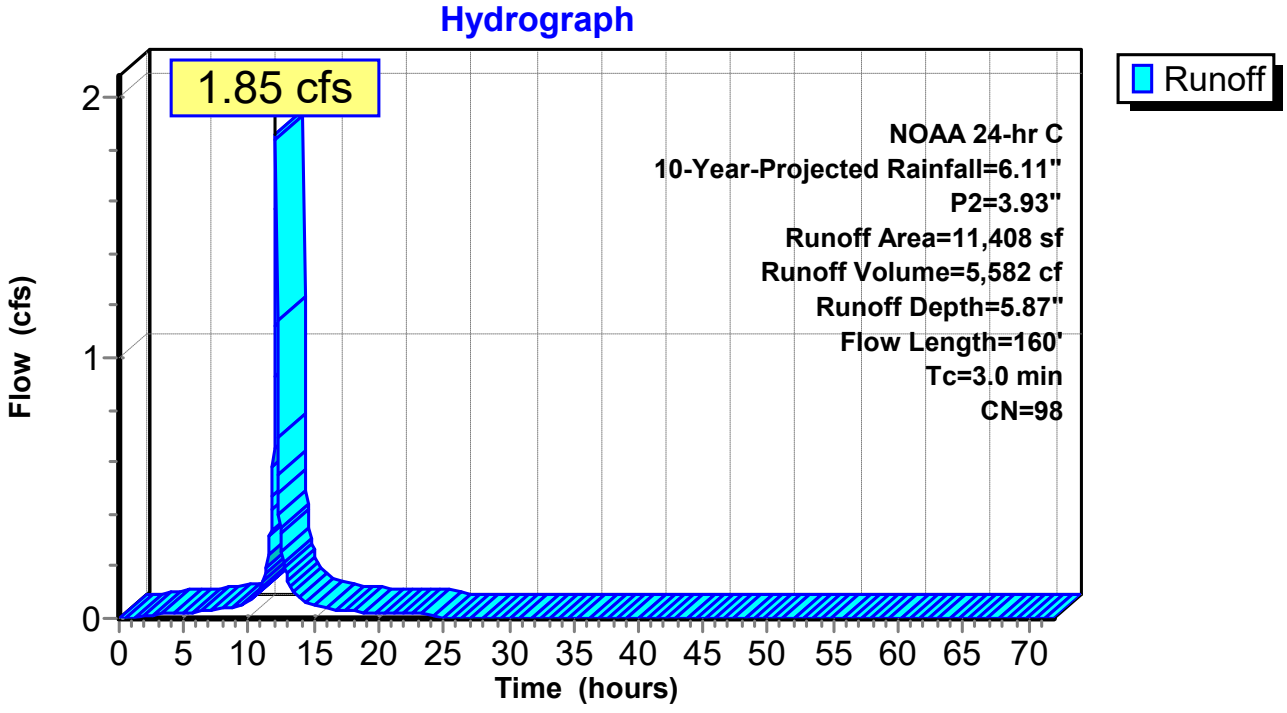
Runoff = 1.85 cfs @ 12.09 hrs, Volume= 5,582 cf, Depth= 5.87"
Routed to Link PDA2A : PROP DETAINED PDA-2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Projected Rainfall=6.11", P2=3.93"

Area (sf)	CN	Description
11,408	98	Paved parking, HSG B
11,408		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	6	0.0100	0.66		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"
1.2	47	0.0036	0.66		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.9	47	0.0070	0.86		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.1	12	0.0200	2.87		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.6	48	0.0050	1.44		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
3.0	160	Total			

Subcatchment PDA2AI: PDA-2A IMP.



Summary for Subcatchment PDA2AP: PDA-2A PERV.

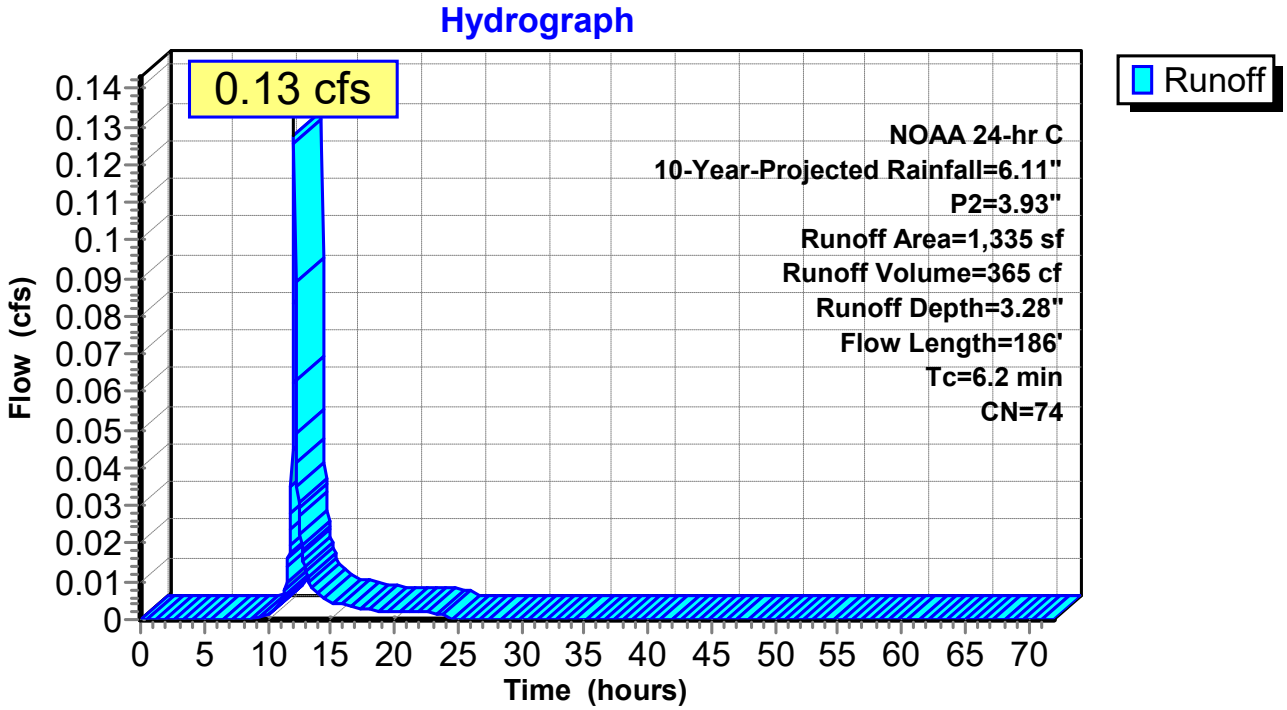
Runoff = 0.13 cfs @ 12.13 hrs, Volume= 365 cf, Depth= 3.28"
Routed to Link PDA2A : PROP DETAINED PDA-2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Projected Rainfall=6.11", P2=3.93"

Area (sf)	CN	Description
1,335	74	>75% Grass cover, Good, HSG C
1,335		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	18	0.0050	0.08		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.93"
1.4	82	0.0070	0.96		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.4	39	0.0070	1.70		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	47	0.0050	1.44		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
6.2	186	Total			

Subcatchment PDA2AP: PDA-2A PERV.



Summary for Subcatchment PDA2BI: PDA-2B IMP.

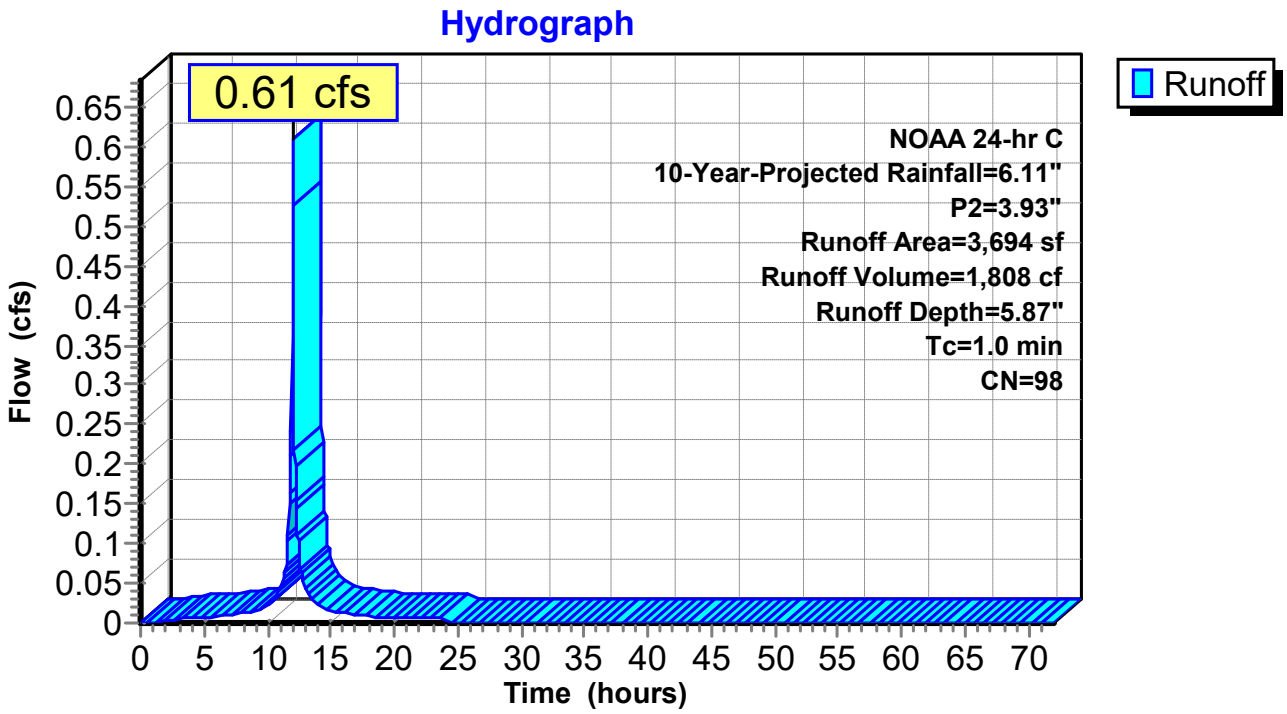
Runoff = 0.61 cfs @ 12.06 hrs, Volume= 1,808 cf, Depth= 5.87"
Routed to Pond 9P : PERVIOUS PAVEMENT W/ UD2 R-TANK

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Projected Rainfall=6.11", P2=3.93"

Area (sf)	CN	Description
3,694	98	Paved parking, HSG B
3,694		100.00% Impervious Area

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

Subcatchment PDA2BI: PDA-2B IMP.



Summary for Subcatchment PDA2CI: PDA-2C IMP.

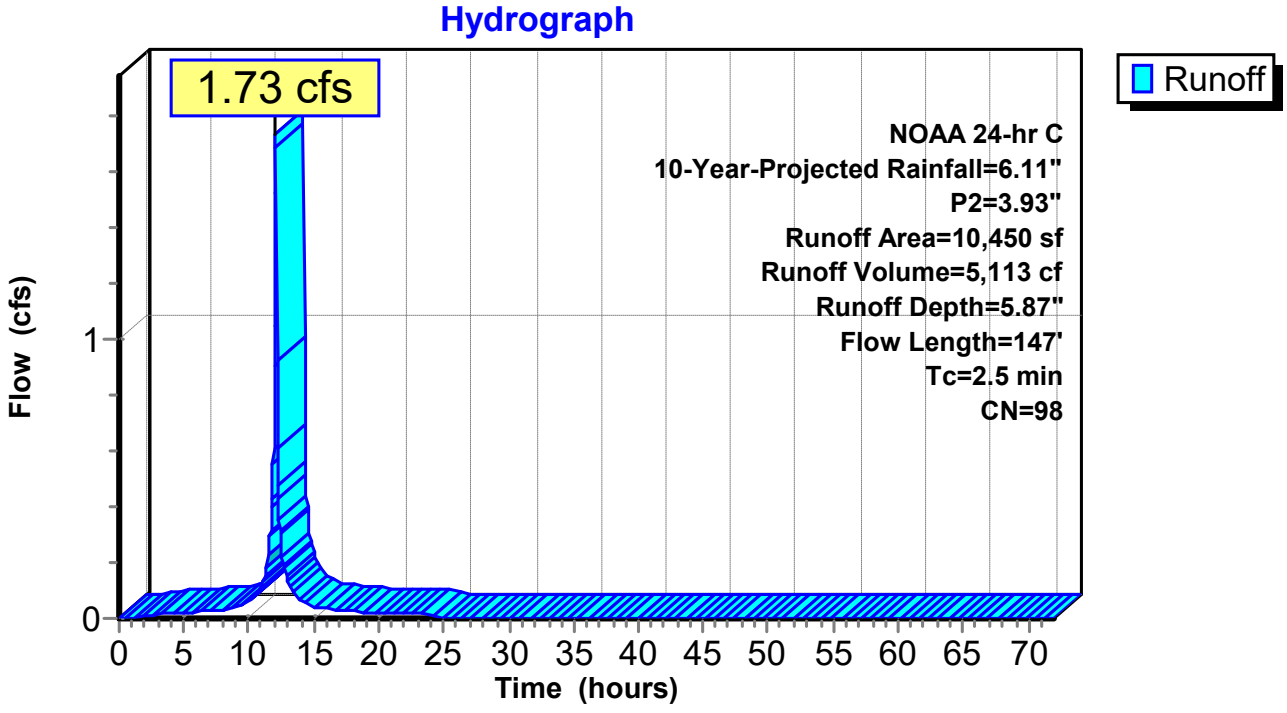
Runoff = 1.73 cfs @ 12.08 hrs, Volume= 5,113 cf, Depth= 5.87"
Routed to Link PDA2C : PROP DETAINED PDA-2C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Projected Rainfall=6.11", P2=3.93"

Area (sf)	CN	Description
10,450	98	Paved parking, HSG B
10,450		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0100	0.73		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"
0.5	19	0.0050	0.63		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
1.2	71	0.0074	0.96		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.1	18	0.0600	4.97		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	29	0.0020	0.91		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
2.5	147	Total			

Subcatchment PDA2CI: PDA-2C IMP.



Summary for Subcatchment PDA2CP: PDA-2C PERV.

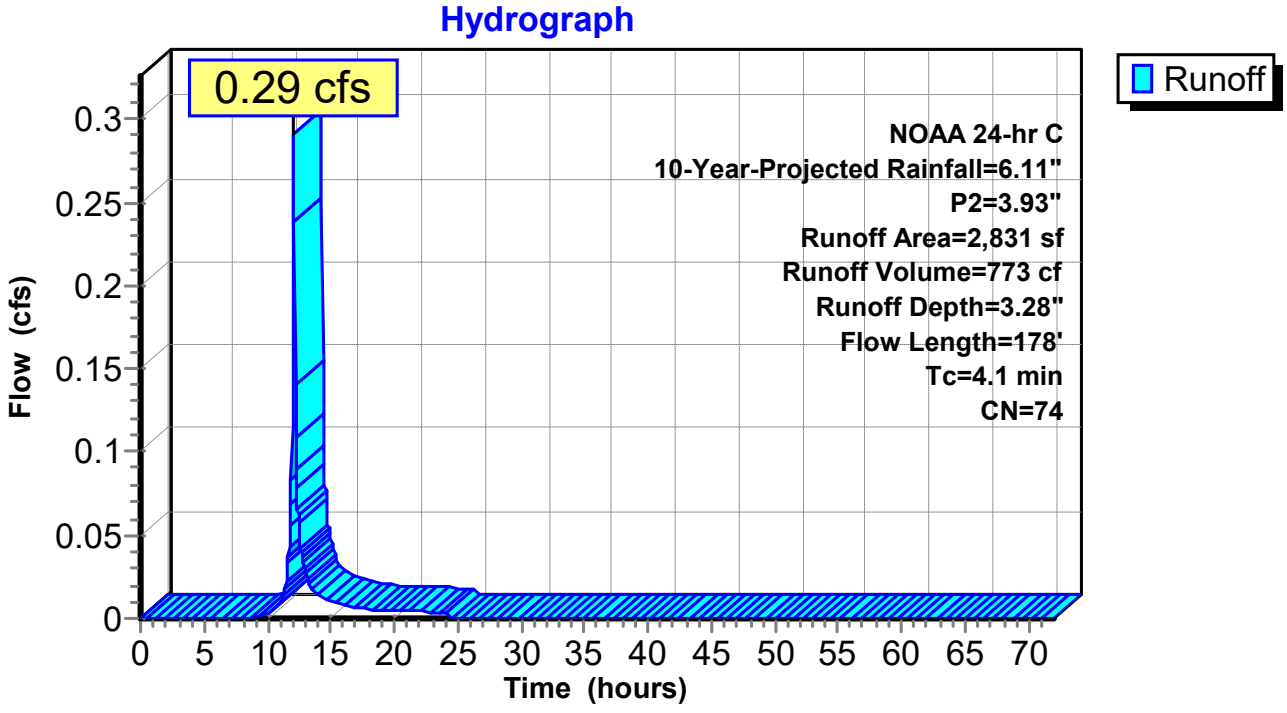
Runoff = 0.29 cfs @ 12.10 hrs, Volume= 773 cf, Depth= 3.28"
Routed to Link PDA2C : PROP DETAINED PDA-2C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year-Projected Rainfall=6.11", P2=3.93"

Area (sf)	CN	Description
2,831	74	>75% Grass cover, Good, HSG C
2,831		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	8	0.0060	0.07		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.93"
0.6	42	0.0150	1.14		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"
0.7	50	0.0160	1.21		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.4	48	0.0090	1.93		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	30	0.0023	0.97		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
4.1	178	Total			

Subcatchment PDA2CP: PDA-2C PERV.



Summary for Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

Inflow Area = 16,437 sf, 91.88% Impervious, Inflow Depth = 5.66" for 10-Year-Projected event
Inflow = 2.54 cfs @ 12.08 hrs, Volume= 7,754 cf
Outflow = 0.68 cfs @ 12.29 hrs, Volume= 7,354 cf, Atten= 73%, Lag= 12.6 min
Primary = 0.68 cfs @ 12.29 hrs, Volume= 7,354 cf
Routed to Link PDA2 : PROP DETAINED PDA-2

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 88.42' @ 12.29 hrs Surf.Area= 3,147 sf Storage= 3,674 cf

Plug-Flow detention time= 269.2 min calculated for 7,354 cf (95% of inflow)
Center-of-Mass det. time= 238.3 min (984.8 - 746.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	86.99'	1,331 cf	**35.50'W x 88.65'L x 2.76'H Field A** 8,696 cf Overall - 6,035 cf Embedded = 2,661 cf x 50.0% Voids
#2A	87.24'	5,733 cf	**Ferguson R-Tank UD 2** x 688 Inside #1 Inside= 23.6"W x 27.2"H => 4.23 sf x 1.97'L = 8.3 cf Outside= 23.6"W x 27.2"H => 4.46 sf x 1.97'L = 8.8 cf 688 Chambers in 16 Rows
		7,064 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	87.24'	**15.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 87.24' / 87.19' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	87.24'	**2.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	88.20'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.68 cfs @ 12.29 hrs HW=88.42' (Free Discharge)
└**1=Culvert** (Passes 0.68 cfs of 3.39 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.17 cfs @ 5.00 fps)
  └**3=Orifice/Grate** (Orifice Controls 0.51 cfs @ 1.51 fps)

Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK - Chamber Wizard Field A

Chamber Model = Ferguson R-Tank UD 2 (Ferguson R-Tank UD)
Inside= 23.6"W x 27.2"H => 4.23 sf x 1.97'L = 8.3 cf
Outside= 23.6"W x 27.2"H => 4.46 sf x 1.97'L = 8.8 cf

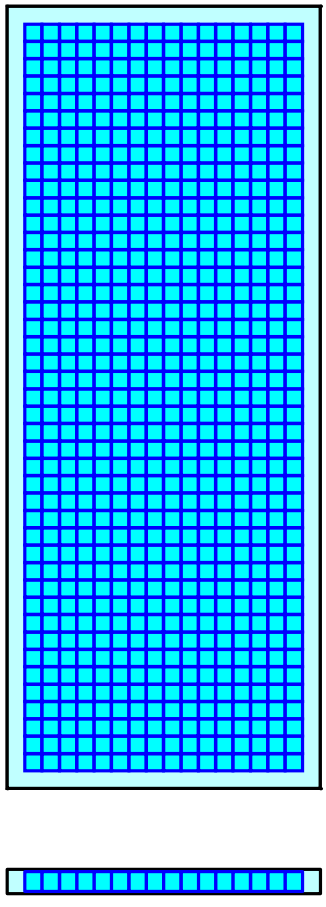
43 Chambers/Row x 1.97' Long = 84.65' Row Length +24.0" End Stone x 2 = 88.65' Base Length
16 Rows x 23.6" Wide + 24.0" Side Stone x 2 = 35.50' Base Width
3.0" Stone Base + 27.2" Chamber Height + 3.0" Stone Cover = 2.76' Field Height

688 Chambers x 8.3 cf = 5,733.5 cf Chamber Storage
688 Chambers x 8.8 cf = 6,035.2 cf Displacement

8,696.4 cf Field - 6,035.2 cf Chambers = 2,661.2 cf Stone x 50.0% Voids = 1,330.6 cf Stone Storage

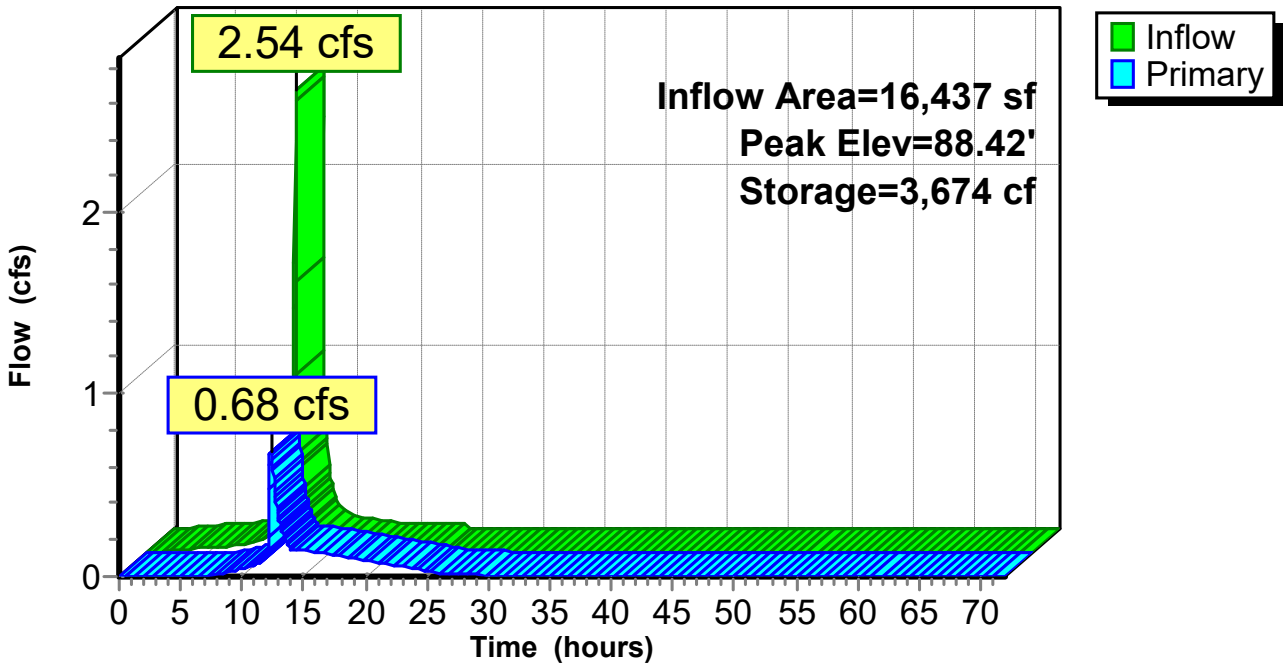
Chamber Storage + Stone Storage = 7,064.1 cf = 0.162 af
Overall Storage Efficiency = 81.2%
Overall System Size = 88.65' x 35.50' x 2.76'

688 Chambers
322.1 cy Field
98.6 cy Stone



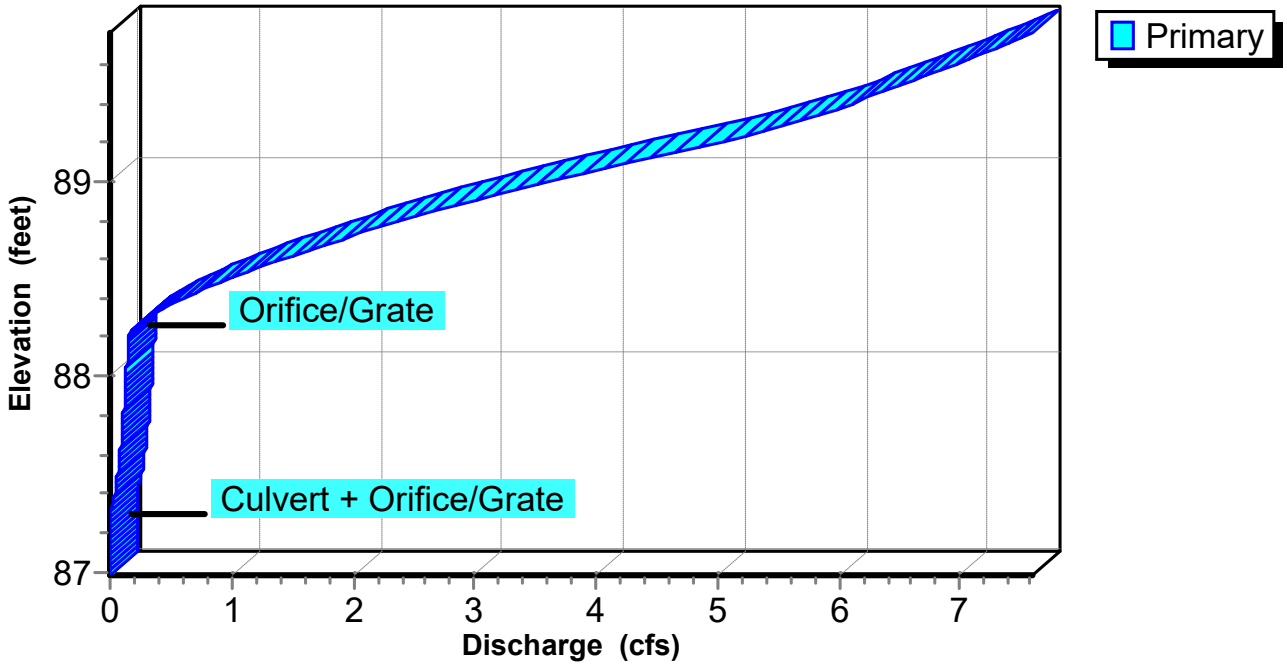
Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

Hydrograph

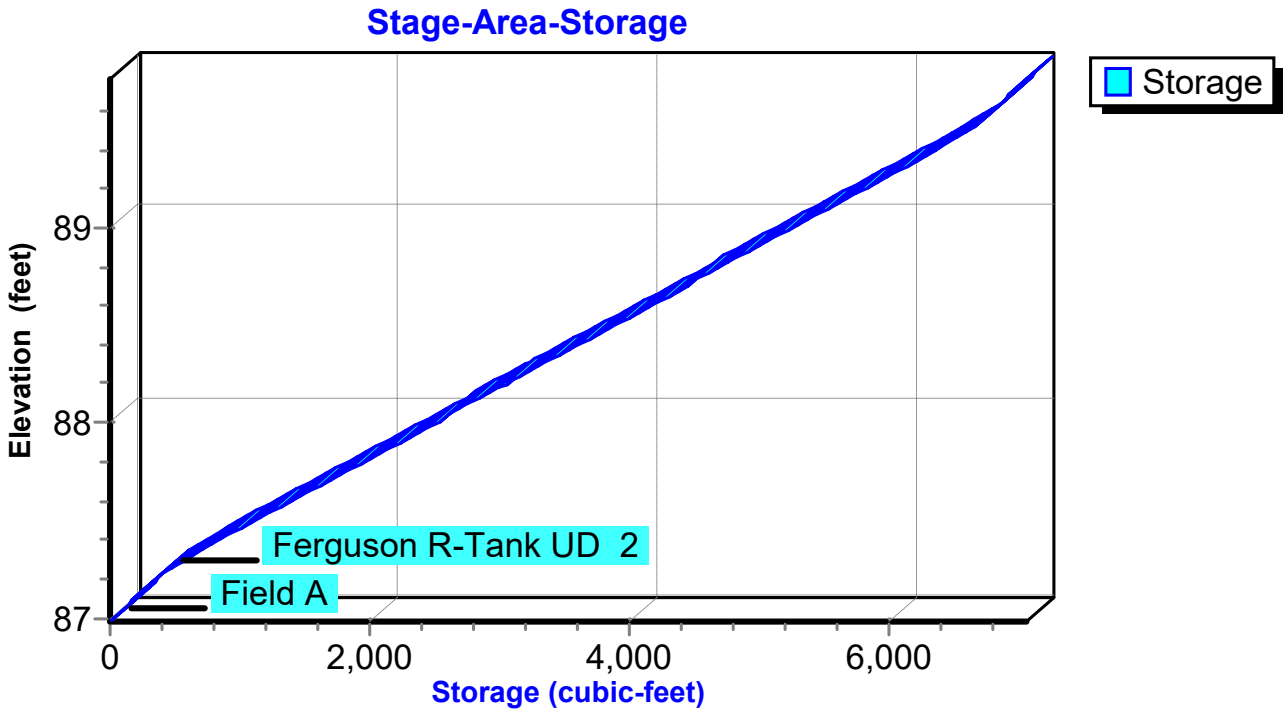


Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

Stage-Discharge



Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

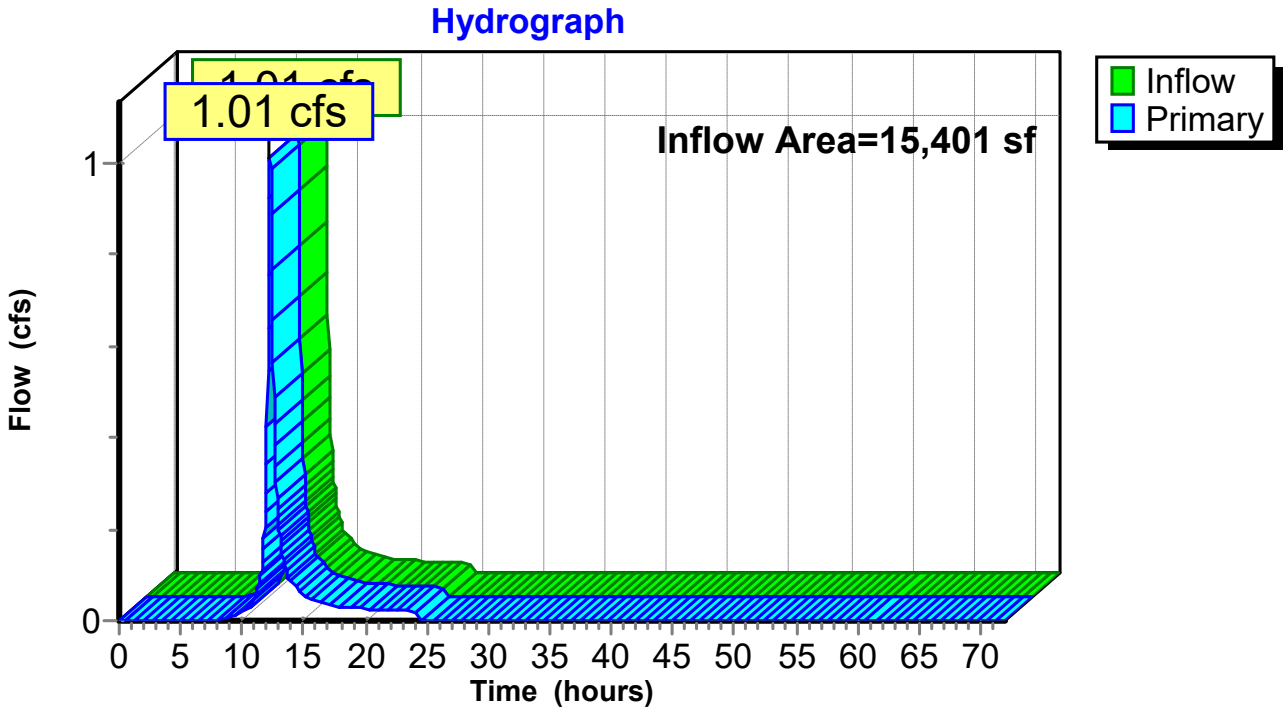


Summary for Link EDA1: EXISTING UNDETAINED EDA-1

Inflow Area = 15,401 sf, 5.21% Impervious, Inflow Depth = 3.41" for 10-Year-Projected event
Inflow = 1.01 cfs @ 12.27 hrs, Volume= 4,380 cf
Primary = 1.01 cfs @ 12.27 hrs, Volume= 4,380 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 3L

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

Link EDA1: EXISTING UNDETAINED EDA-1

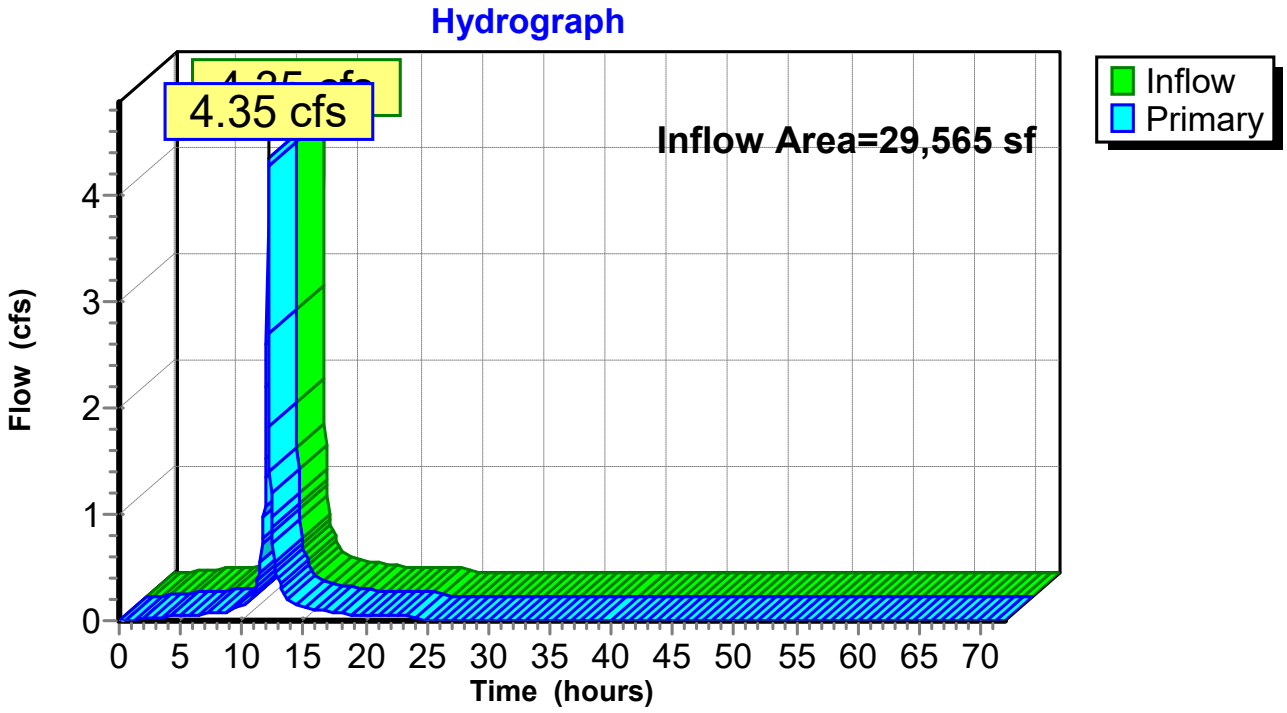


Summary for Link EDA2: EXISTING DETAINED EDA-2

Inflow Area = 29,565 sf, 79.87% Impervious, Inflow Depth = 5.35" for 10-Year-Projected event
Inflow = 4.35 cfs @ 12.09 hrs, Volume= 13,180 cf
Primary = 4.35 cfs @ 12.09 hrs, Volume= 13,180 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node BDA2

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

Link EDA2: EXISTING DETAINED EDA-2

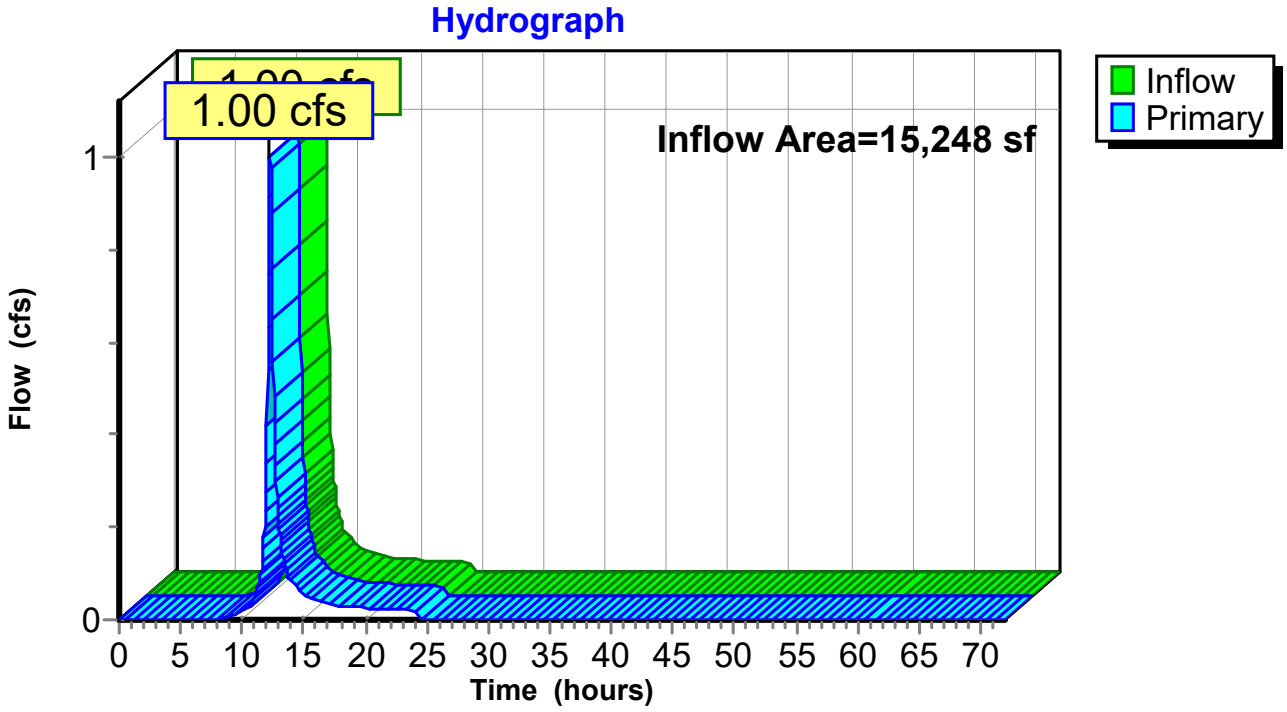


Summary for Link PDA1: PROP UNDETAINED PDA-1

Inflow Area = 15,248 sf, 5.21% Impervious, Inflow Depth = 3.41" for 10-Year-Projected event
Inflow = 1.00 cfs @ 12.27 hrs, Volume= 4,337 cf
Primary = 1.00 cfs @ 12.27 hrs, Volume= 4,337 cf, Atten= 0%, Lag= 0.0 min

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

Link PDA1: PROP UNDETAINED PDA-1

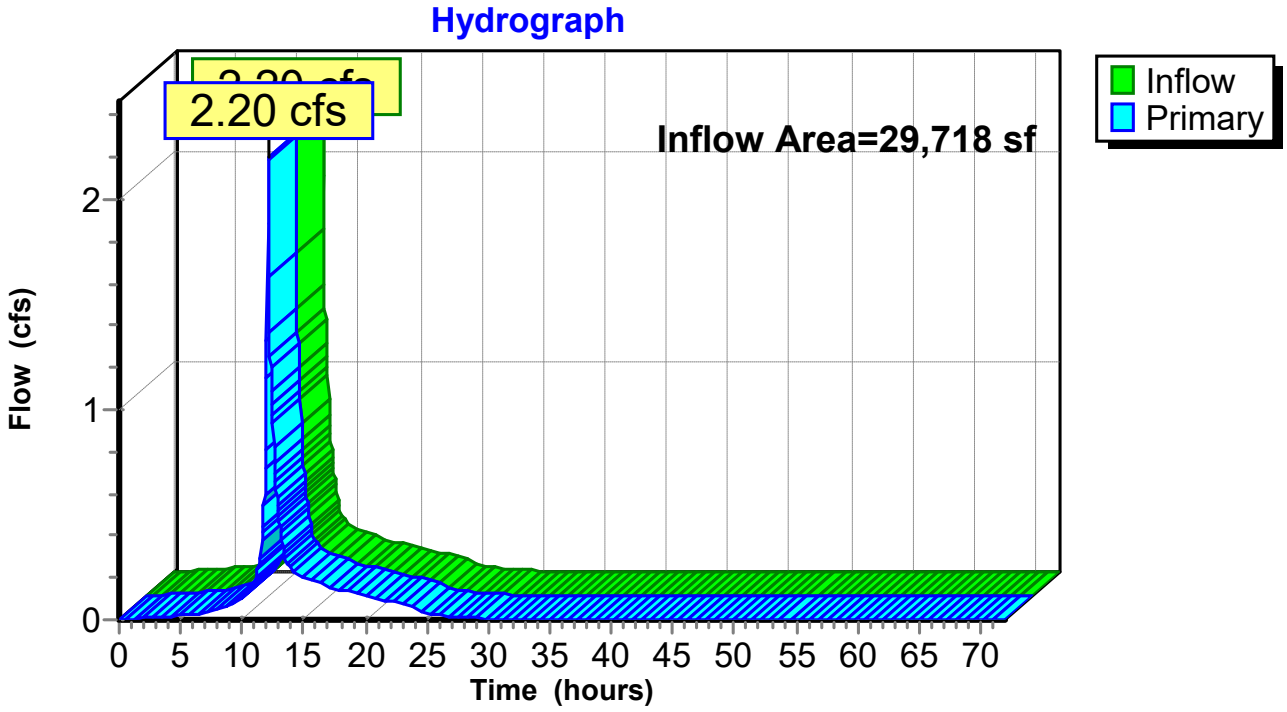


Summary for Link PDA2: PROP DETAINED PDA-2

Inflow Area = 29,718 sf, 85.98% Impervious, Inflow Depth = 5.35" for 10-Year-Projected event
Inflow = 2.20 cfs @ 12.09 hrs, Volume= 13,241 cf
Primary = 2.20 cfs @ 12.09 hrs, Volume= 13,241 cf, Atten= 0%, Lag= 0.0 min

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

Link PDA2: PROP DETAINED PDA-2

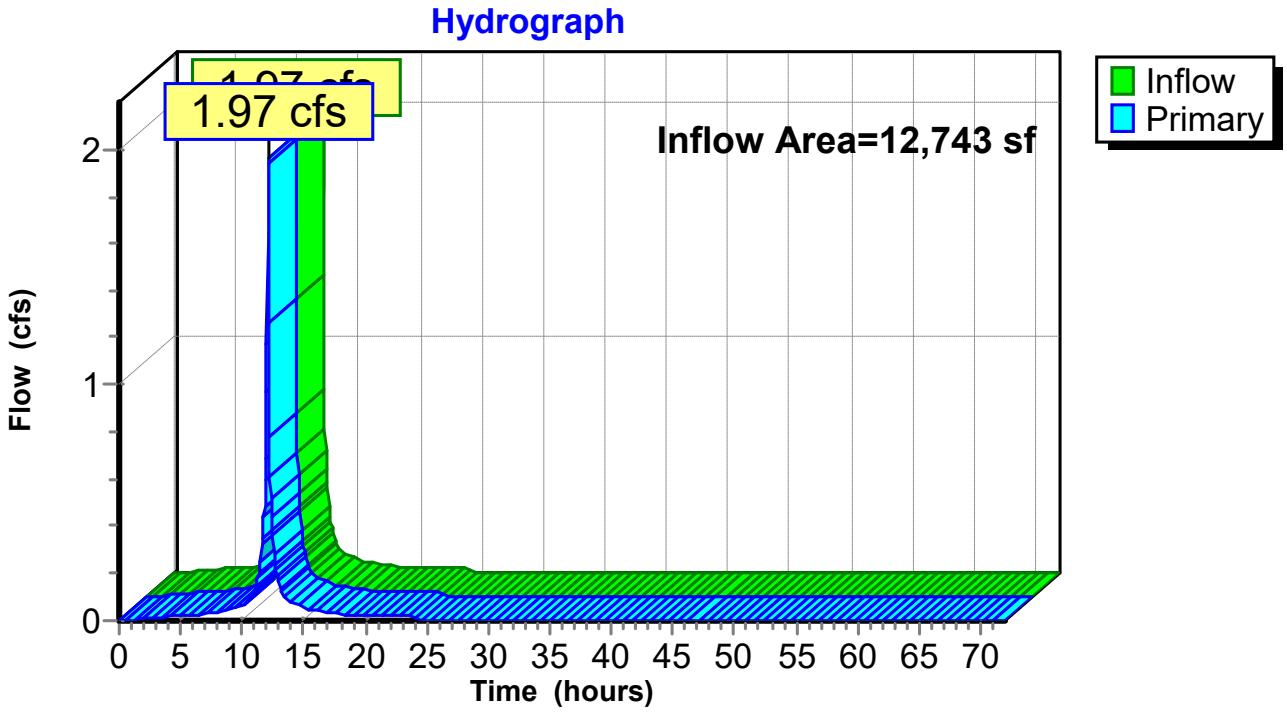


Summary for Link PDA2A: PROP DETAINED PDA-2A

Inflow Area = 12,743 sf, 89.52% Impervious, Inflow Depth = 5.60" for 10-Year-Projected event
Inflow = 1.97 cfs @ 12.09 hrs, Volume= 5,947 cf
Primary = 1.97 cfs @ 12.09 hrs, Volume= 5,947 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 9P : PERVIOUS PAVEMENT W/ UD2 R-TANK

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

Link PDA2A: PROP DETAINED PDA-2A

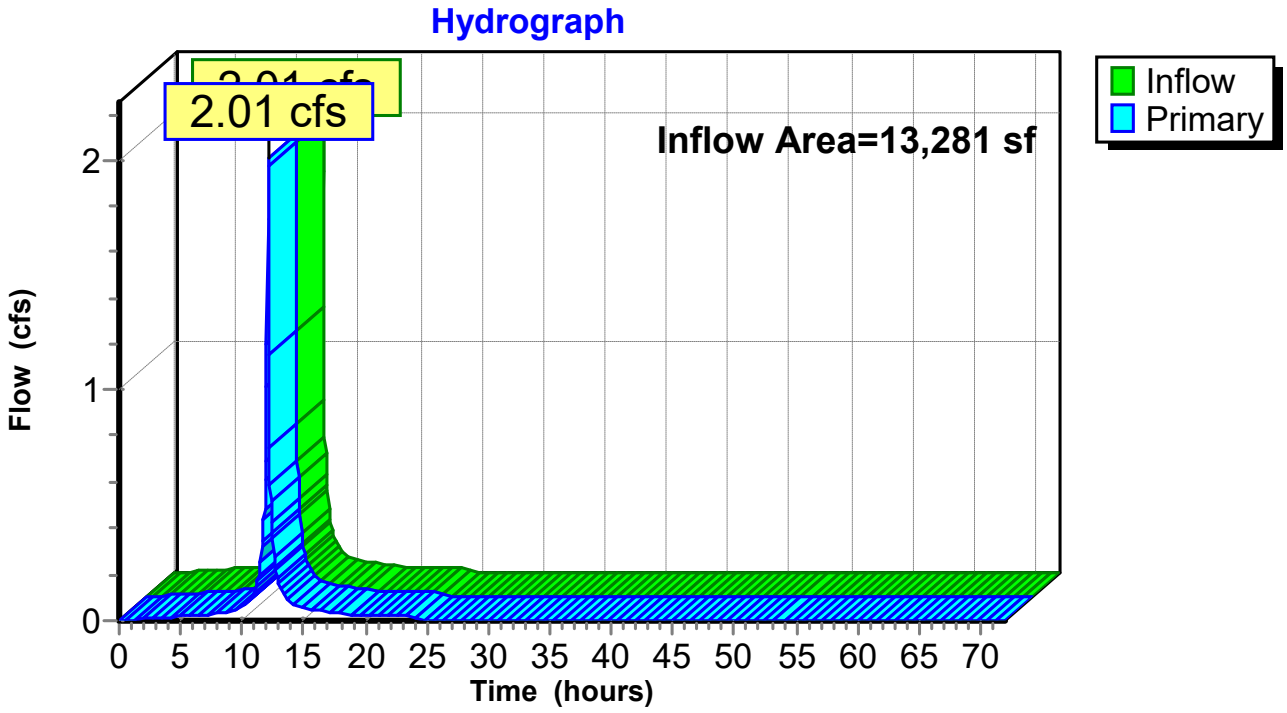


Summary for Link PDA2C: PROP DETAINED PDA-2C

Inflow Area = 13,281 sf, 78.68% Impervious, Inflow Depth = 5.32" for 10-Year-Projected event
Inflow = 2.01 cfs @ 12.09 hrs, Volume= 5,887 cf
Primary = 2.01 cfs @ 12.09 hrs, Volume= 5,887 cf, Atten= 0%, Lag= 0.0 min
Routed to Link PDA2 : PROP DETAINED PDA-2

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

Link PDA2C: PROP DETAINED PDA-2C



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA1I: EDA-1 IMP. Runoff Area=803 sf 100.00% Impervious Runoff Depth=8.92"
Flow Length=36' Slope=0.0420 '/' Tc=0.4 min CN=98 Runoff=0.20 cfs 597 cf

Subcatchment EDA1P: EDA-1 PERV. Runoff Area=14,598 sf 0.00% Impervious Runoff Depth=5.98"
Flow Length=203' Tc=18.7 min CN=74 Runoff=1.72 cfs 7,269 cf

Subcatchment EDA2I: EDA-2 IMP. Runoff Area=23,615 sf 100.00% Impervious Runoff Depth=8.92"
Flow Length=182' Tc=2.8 min CN=98 Runoff=5.80 cfs 17,553 cf

Subcatchment EDA2P: EDA-2 PERV. Runoff Area=5,950 sf 0.00% Impervious Runoff Depth=5.98"
Flow Length=187' Tc=7.3 min CN=74 Runoff=0.99 cfs 2,963 cf

Subcatchment PDA1I: PDA-1 IMP. Runoff Area=795 sf 100.00% Impervious Runoff Depth=8.92"
Flow Length=36' Slope=0.0420 '/' Tc=0.4 min CN=98 Runoff=0.20 cfs 591 cf

Subcatchment PDA1P: PDA-1 PERV. Runoff Area=14,453 sf 0.00% Impervious Runoff Depth=5.98"
Flow Length=203' Tc=18.7 min CN=74 Runoff=1.70 cfs 7,196 cf

Subcatchment PDA2AI: PDA-2A IMP. Runoff Area=11,408 sf 100.00% Impervious Runoff Depth=8.92"
Flow Length=160' Tc=3.2 min CN=98 Runoff=2.76 cfs 8,480 cf

Subcatchment PDA2AP: PDA-2A PERV. Runoff Area=1,335 sf 0.00% Impervious Runoff Depth=5.98"
Flow Length=186' Tc=6.6 min CN=74 Runoff=0.23 cfs 665 cf

Subcatchment PDA2BI: PDA-2B IMP. Runoff Area=3,694 sf 100.00% Impervious Runoff Depth=8.92"
Tc=1.0 min CN=98 Runoff=0.92 cfs 2,746 cf

Subcatchment PDA2CI: PDA-2C IMP. Runoff Area=10,450 sf 100.00% Impervious Runoff Depth=8.92"
Flow Length=147' Tc=2.6 min CN=98 Runoff=2.59 cfs 7,767 cf

Subcatchment PDA2CP: PDA-2C PERV. Runoff Area=2,831 sf 0.00% Impervious Runoff Depth=5.98"
Flow Length=178' Tc=4.4 min CN=74 Runoff=0.51 cfs 1,410 cf

Pond 9P: PERVIOUS PAVEMENT W/ UD2 Peak Elev=88.75' Storage=4,580 cf Inflow=3.81 cfs 11,890 cf
Outflow=2.16 cfs 11,489 cf

Link EDA1: EXISTING UNDETAINED EDA-1 Inflow=1.77 cfs 7,865 cf
Primary=1.77 cfs 7,865 cf

Link EDA2: EXISTING DETAINED EDA-2 Inflow=6.62 cfs 20,516 cf
Primary=6.62 cfs 20,516 cf

Link PDA1: PROP UNDETAINED PDA-1 Inflow=1.76 cfs 7,787 cf
Primary=1.76 cfs 7,787 cf

Link PDA2: PROP DETAINED PDA-2 Inflow=4.79 cfs 20,666 cf
Primary=4.79 cfs 20,666 cf

Link PDA2A: PROP DETAINED PDA-2A Inflow=2.96 cfs 9,144 cf
Primary=2.96 cfs 9,144 cf

Link PDA2C: PROP DETAINED PDA-2C Inflow=3.08 cfs 9,177 cf
Primary=3.08 cfs 9,177 cf

Total Runoff Area = 89,932 sf Runoff Volume = 57,235 cf Average Runoff Depth = 7.64"
43.55% Pervious = 39,167 sf 56.45% Impervious = 50,765 sf

Summary for Subcatchment EDA1I: EDA-1 IMP.

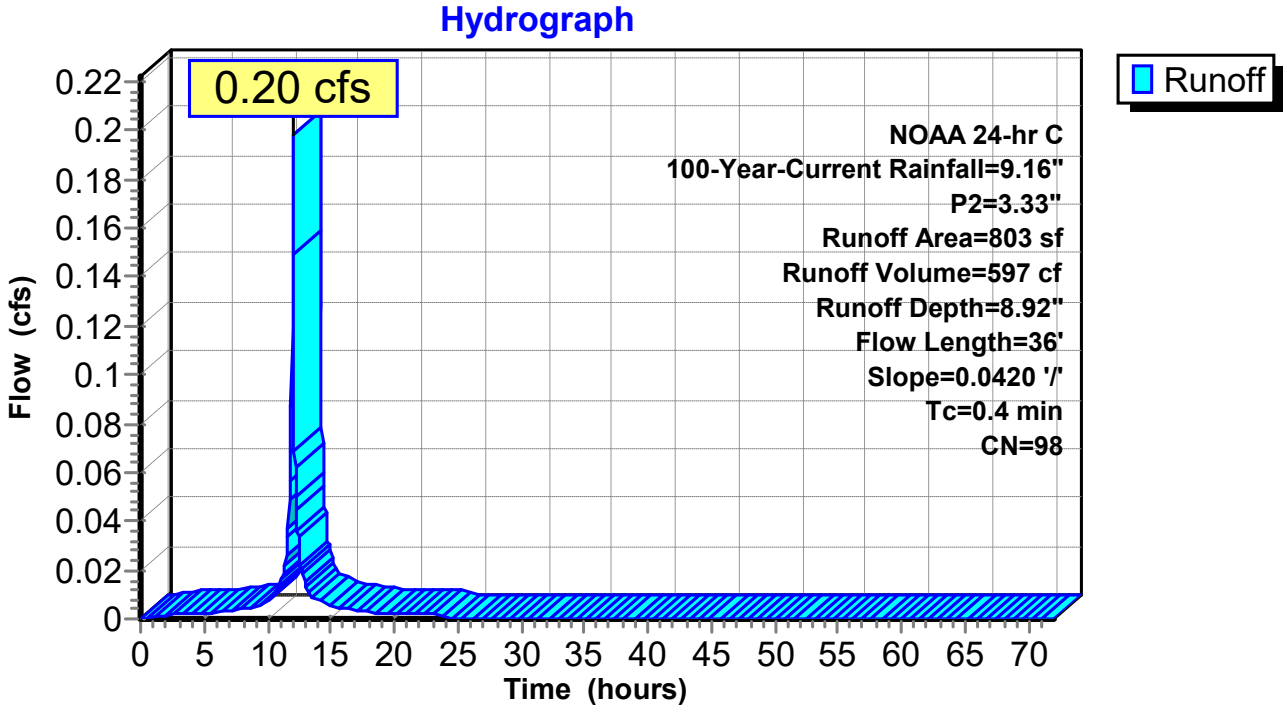
Runoff = 0.20 cfs @ 12.05 hrs, Volume= 597 cf, Depth= 8.92"
Routed to Link EDA1 : EXISTING UNDETAINED EDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Current Rainfall=9.16", P2=3.33"

Area (sf)	CN	Description
803	98	Paved parking, HSG B
803		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	36	0.0420	1.54		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"

Subcatchment EDA1I: EDA-1 IMP.



Summary for Subcatchment EDA1P: EDA-1 PERV.

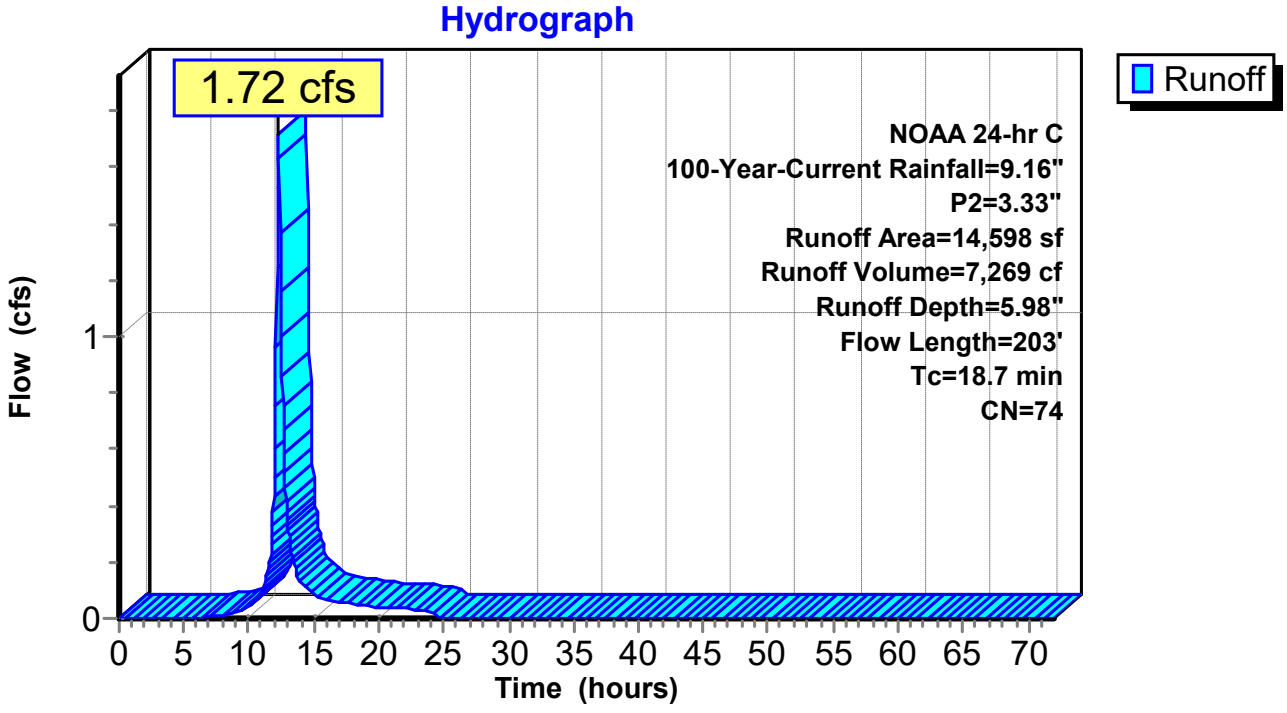
Runoff = 1.72 cfs @ 12.28 hrs, Volume= 7,269 cf, Depth= 5.98"
Routed to Link EDA1 : EXISTING UNDETAINED EDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Current Rainfall=9.16", P2=3.33"

Area (sf)	CN	Description
14,598	74	>75% Grass cover, Good, HSG C
14,598		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	8	0.1750	0.25		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.33"
0.5	11	0.4760	0.40		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.33"
0.7	11	0.1809	0.27		**Sheet Flow, CD** Grass: Short n= 0.150 P2= 3.33"
11.4	71	0.0065	0.10		**Sheet Flow, DE** Grass: Short n= 0.150 P2= 3.33"
5.6	102	0.0019	0.31		**Shallow Concentrated Flow, EF** Short Grass Pasture Kv= 7.0 fps
18.7	203	Total			

Subcatchment EDA1P: EDA-1 PERV.



Summary for Subcatchment EDA2I: EDA-2 IMP.

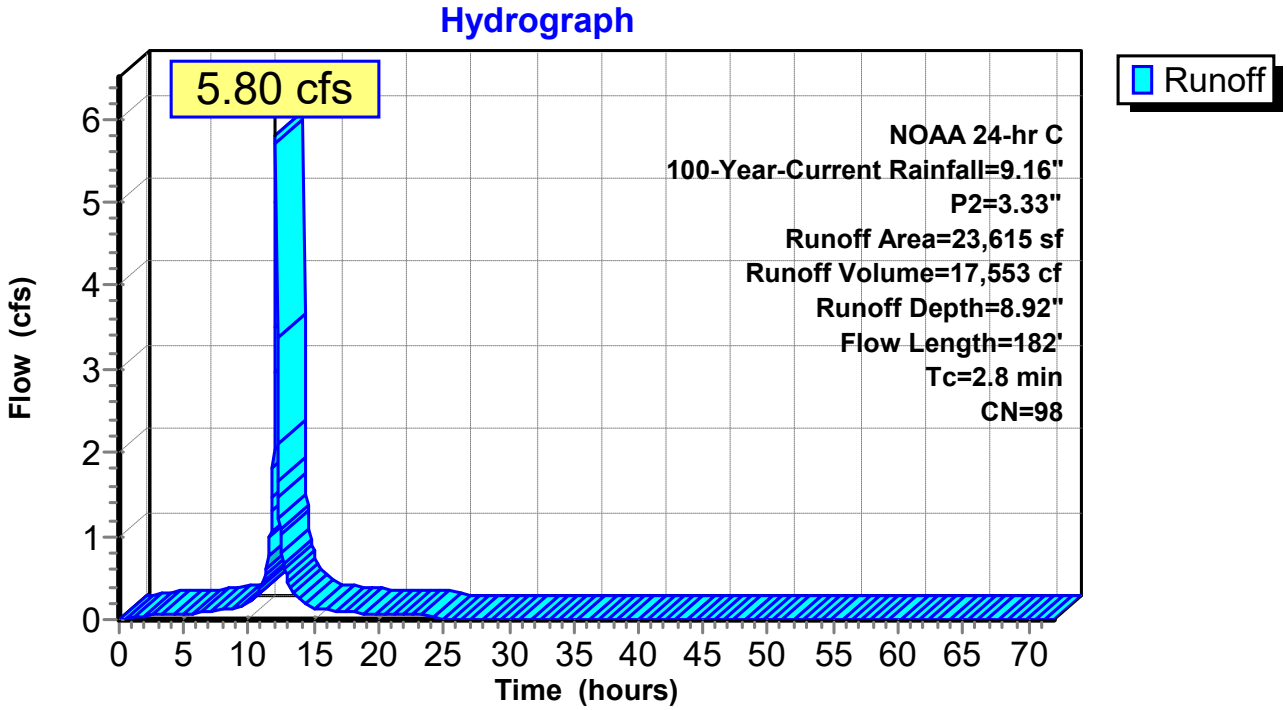
Runoff = 5.80 cfs @ 12.09 hrs, Volume= 17,553 cf, Depth= 8.92"
Routed to Link EDA2 : EXISTING DETAINED EDA-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Current Rainfall=9.16", P2=3.33"

Area (sf)	CN	Description
23,615	98	Paved parking, HSG B
23,615		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0208	1.24		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"
1.1	50	0.0060	0.75		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
0.2	42	0.0207	2.92		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.8	40	0.0017	0.84		**Shallow Concentrated Flow, DE** Paved Kv= 20.3 fps
2.8	182	Total			

Subcatchment EDA2I: EDA-2 IMP.



Summary for Subcatchment EDA2P: EDA-2 PERV.

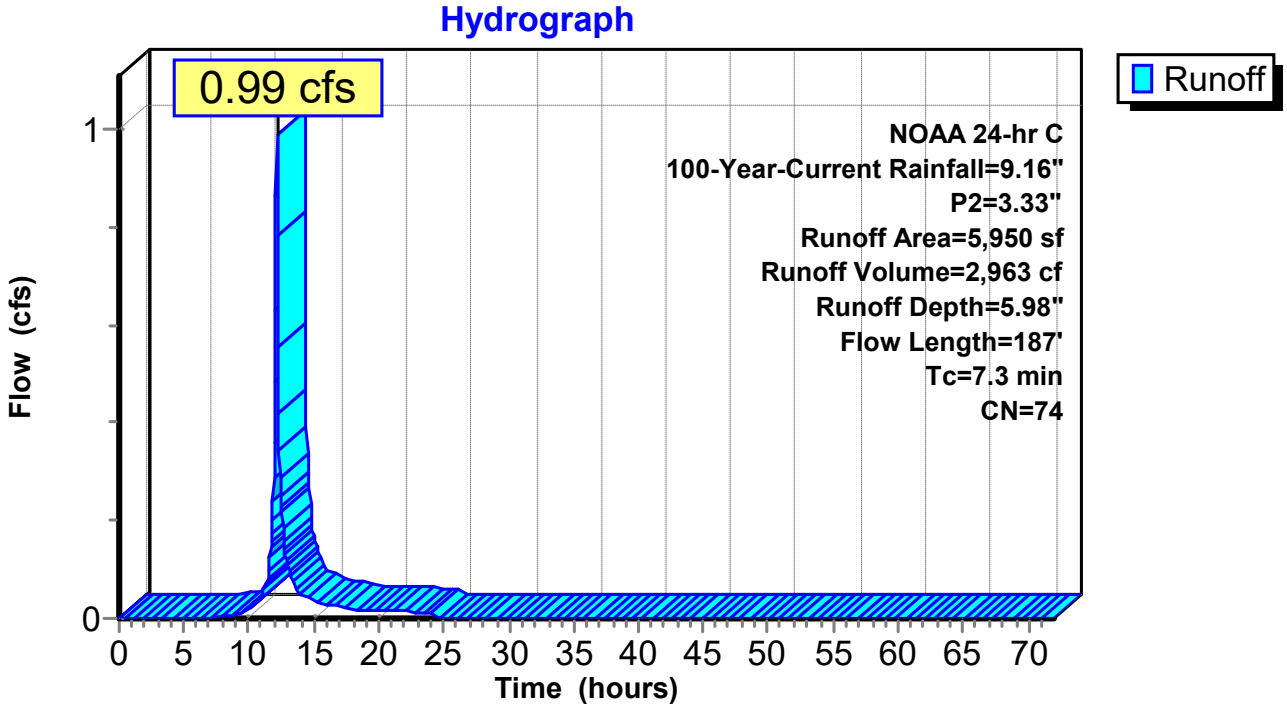
Runoff = 0.99 cfs @ 12.14 hrs, Volume= 2,963 cf, Depth= 5.98"
Routed to Link EDA2 : EXISTING DETAINED EDA-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Current Rainfall=9.16", P2=3.33"

Area (sf)	CN	Description
5,950	74	>75% Grass cover, Good, HSG C
5,950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	24	0.0064	0.08		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.33"
0.4	31	0.0226	1.17		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
1.0	45	0.0060	0.74		**Sheet Flow, CD** Smooth surfaces n= 0.011 P2= 3.33"
0.3	46	0.0207	2.92		**Shallow Concentrated Flow, DE** Paved Kv= 20.3 fps
0.8	41	0.0017	0.84		**Shallow Concentrated Flow, EF** Paved Kv= 20.3 fps
7.3	187	Total			

Subcatchment EDA2P: EDA-2 PERV.



Summary for Subcatchment PDA1I: PDA-1 IMP.

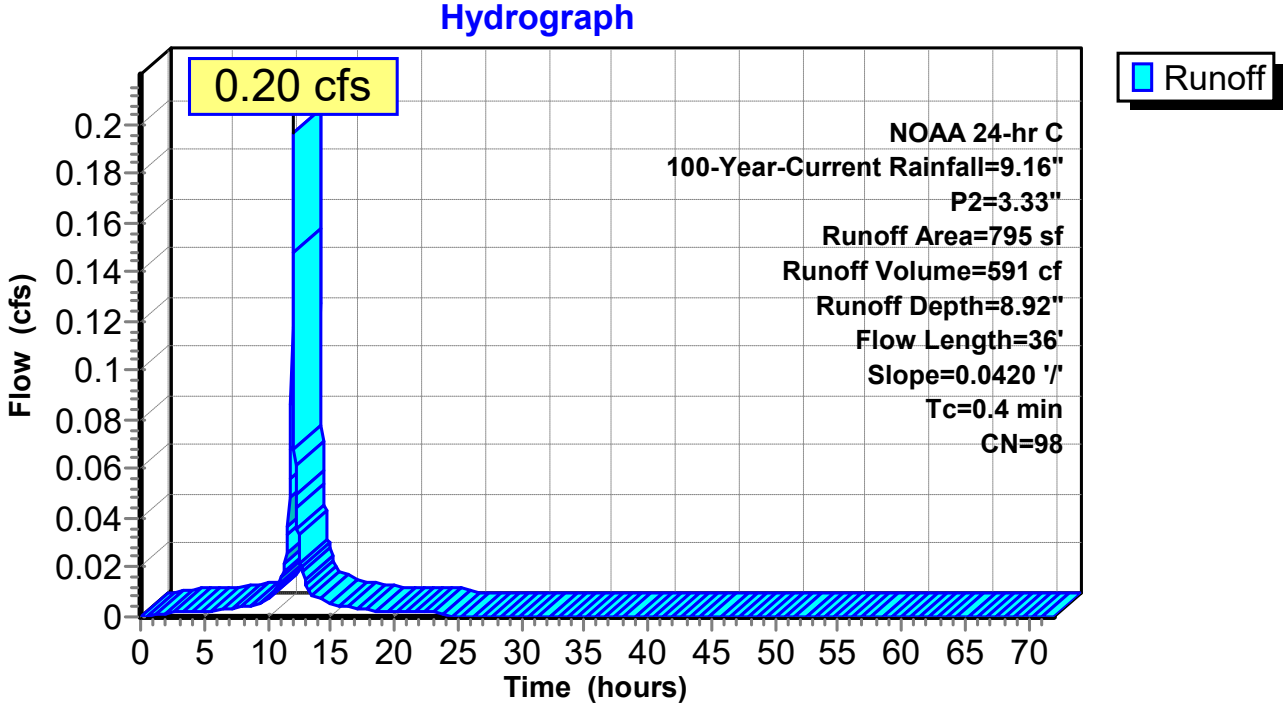
Runoff = 0.20 cfs @ 12.05 hrs, Volume= 591 cf, Depth= 8.92"
Routed to Link PDA1 : PROP UNDETAINED PDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Current Rainfall=9.16", P2=3.33"

Area (sf)	CN	Description
795	98	Paved parking, HSG B
795		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	36	0.0420	1.54		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"

Subcatchment PDA1I: PDA-1 IMP.



Summary for Subcatchment PDA1P: PDA-1 PERV.

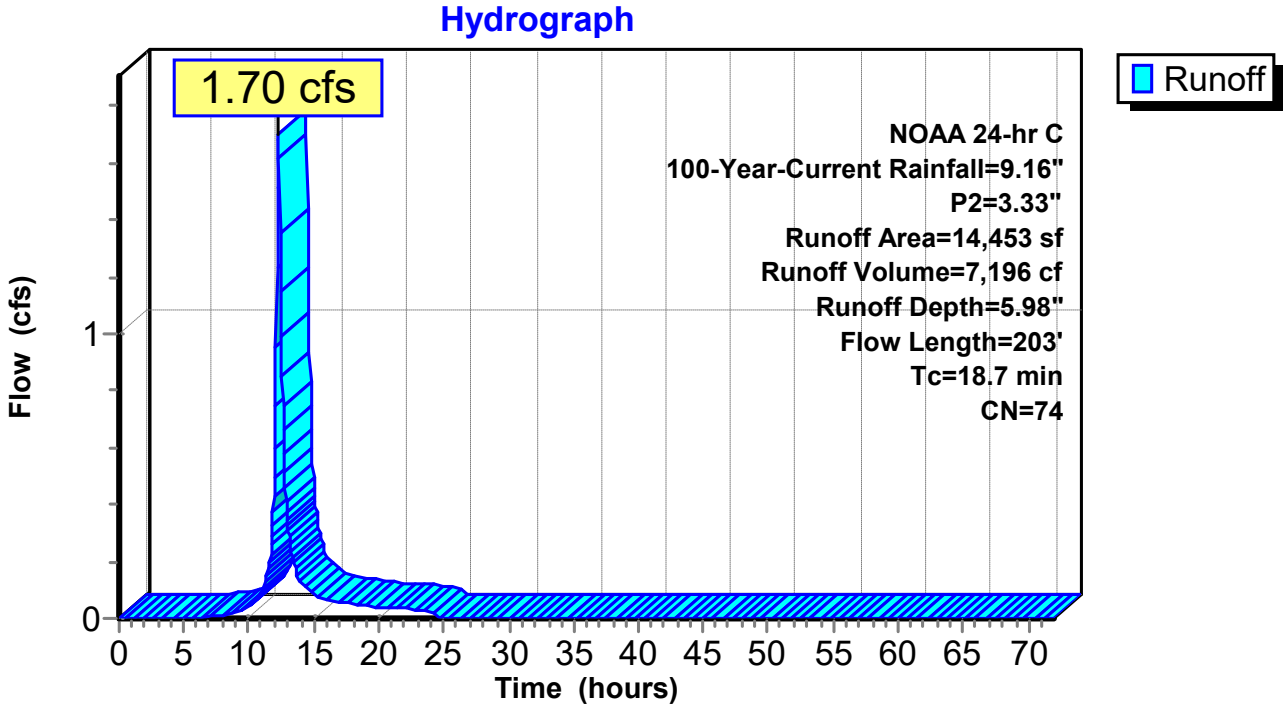
Runoff = 1.70 cfs @ 12.28 hrs, Volume= 7,196 cf, Depth= 5.98"
Routed to Link PDA1 : PROP UNDETAINED PDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Current Rainfall=9.16", P2=3.33"

Area (sf)	CN	Description
14,453	74	>75% Grass cover, Good, HSG C
14,453		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	8	0.1750	0.25		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.33"
0.5	11	0.4760	0.40		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.33"
0.7	11	0.1809	0.27		**Sheet Flow, CD** Grass: Short n= 0.150 P2= 3.33"
11.4	71	0.0065	0.10		**Sheet Flow, DE** Grass: Short n= 0.150 P2= 3.33"
5.6	102	0.0019	0.31		**Shallow Concentrated Flow, EF** Short Grass Pasture Kv= 7.0 fps
18.7	203	Total			

Subcatchment PDA1P: PDA-1 PERV.



Summary for Subcatchment PDA2AI: PDA-2A IMP.

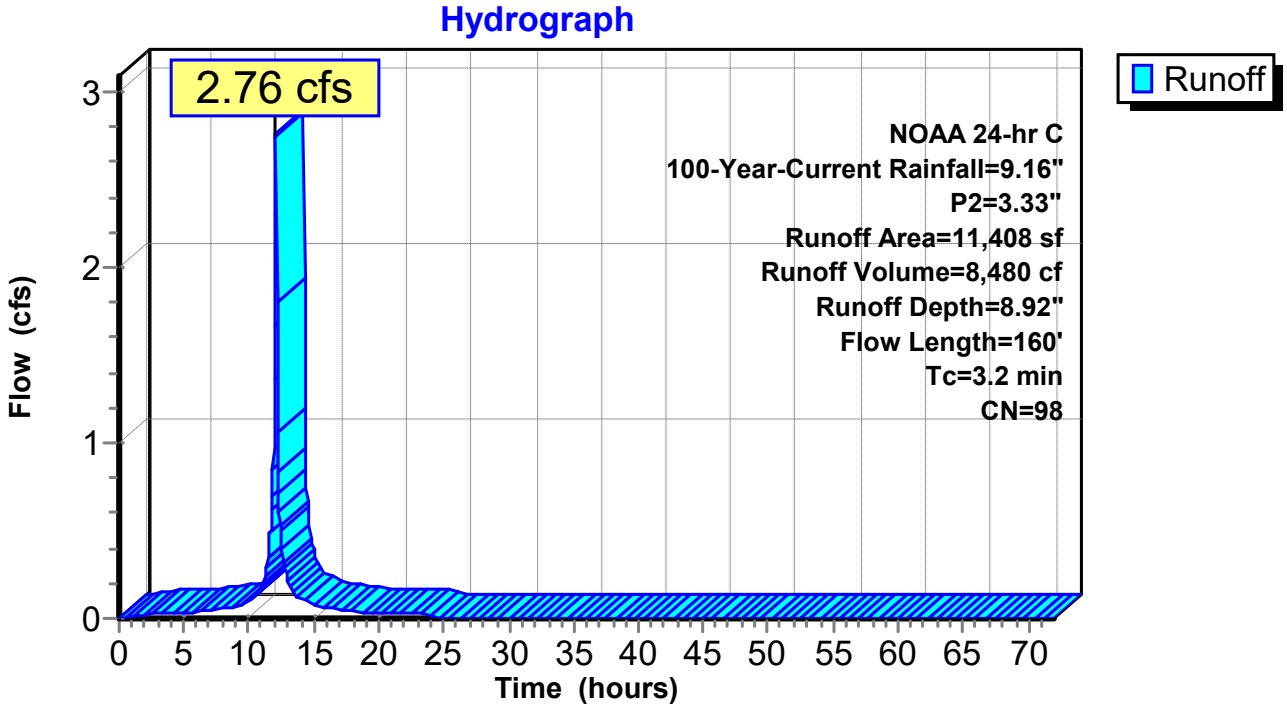
Runoff = 2.76 cfs @ 12.09 hrs, Volume= 8,480 cf, Depth= 8.92"
Routed to Link PDA2A : PROP DETAINED PDA-2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Current Rainfall=9.16", P2=3.33"

Area (sf)	CN	Description
11,408	98	Paved parking, HSG B
11,408		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	6	0.0100	0.61		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"
1.3	47	0.0036	0.61		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
1.0	47	0.0070	0.79		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
0.1	12	0.0200	2.87		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.6	48	0.0050	1.44		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
3.2	160	Total			

Subcatchment PDA2AI: PDA-2A IMP.



Summary for Subcatchment PDA2AP: PDA-2A PERV.

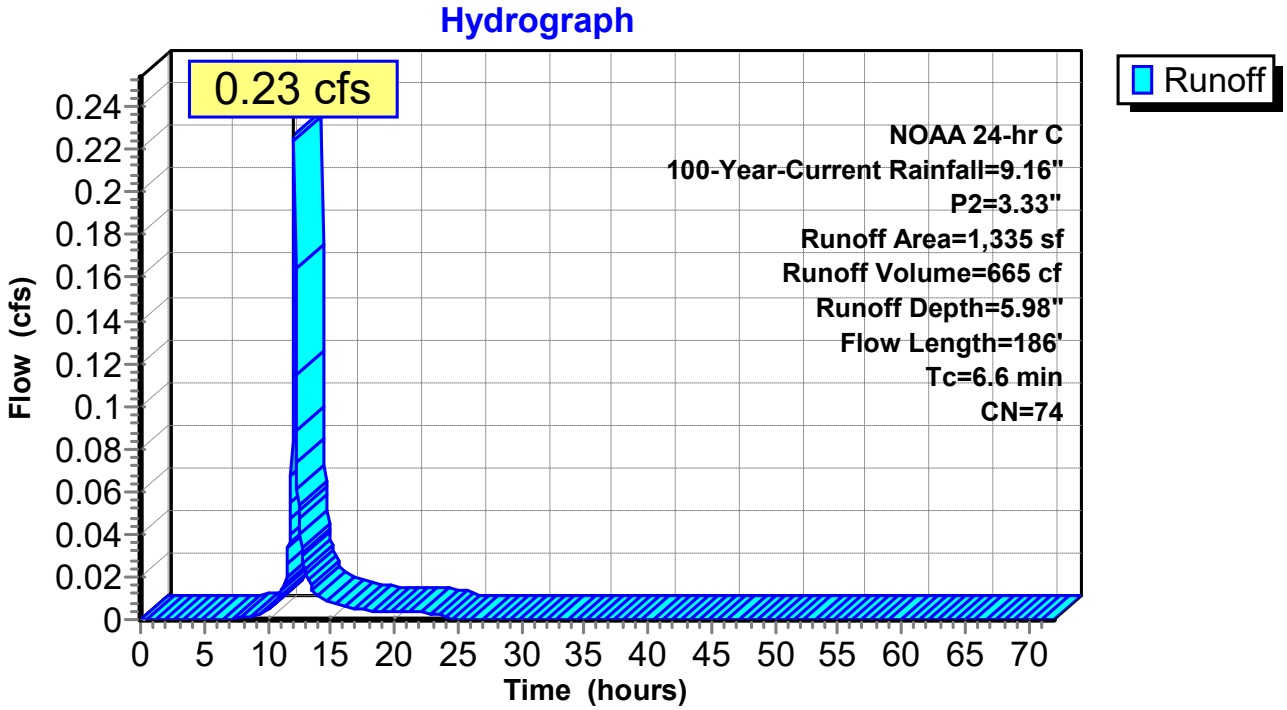
Runoff = 0.23 cfs @ 12.14 hrs, Volume= 665 cf, Depth= 5.98"
Routed to Link PDA2A : PROP DETAINED PDA-2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Current Rainfall=9.16", P2=3.33"

Area (sf)	CN	Description
1,335	74	>75% Grass cover, Good, HSG C
1,335		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	18	0.0050	0.07		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.33"
1.5	82	0.0070	0.89		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
0.4	39	0.0070	1.70		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	47	0.0050	1.44		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
6.6	186	Total			

Subcatchment PDA2AP: PDA-2A PERV.



Summary for Subcatchment PDA2BI: PDA-2B IMP.

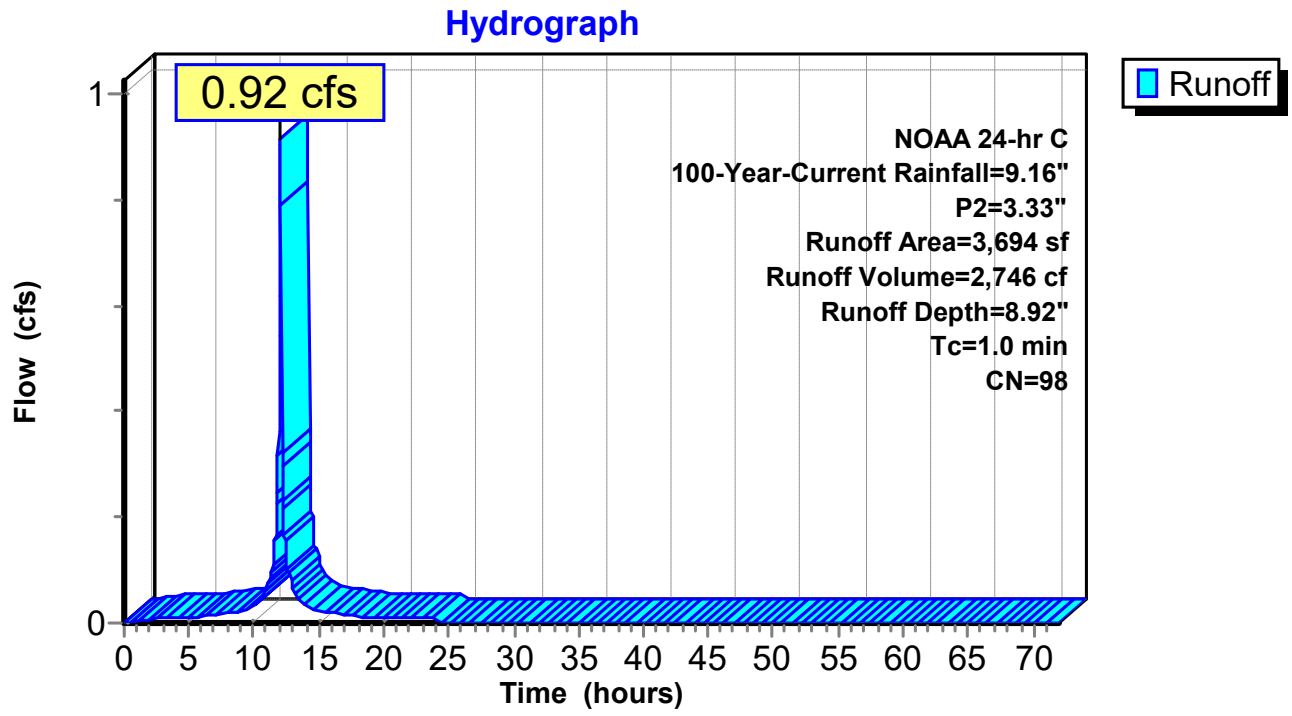
Runoff = 0.92 cfs @ 12.06 hrs, Volume= 2,746 cf, Depth= 8.92"
Routed to Pond 9P : PERVIOUS PAVEMENT W/ UD2 R-TANK

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Current Rainfall=9.16", P2=3.33"

Area (sf)	CN	Description
3,694	98	Paved parking, HSG B
3,694		100.00% Impervious Area

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

Subcatchment PDA2BI: PDA-2B IMP.



Summary for Subcatchment PDA2CI: PDA-2C IMP.

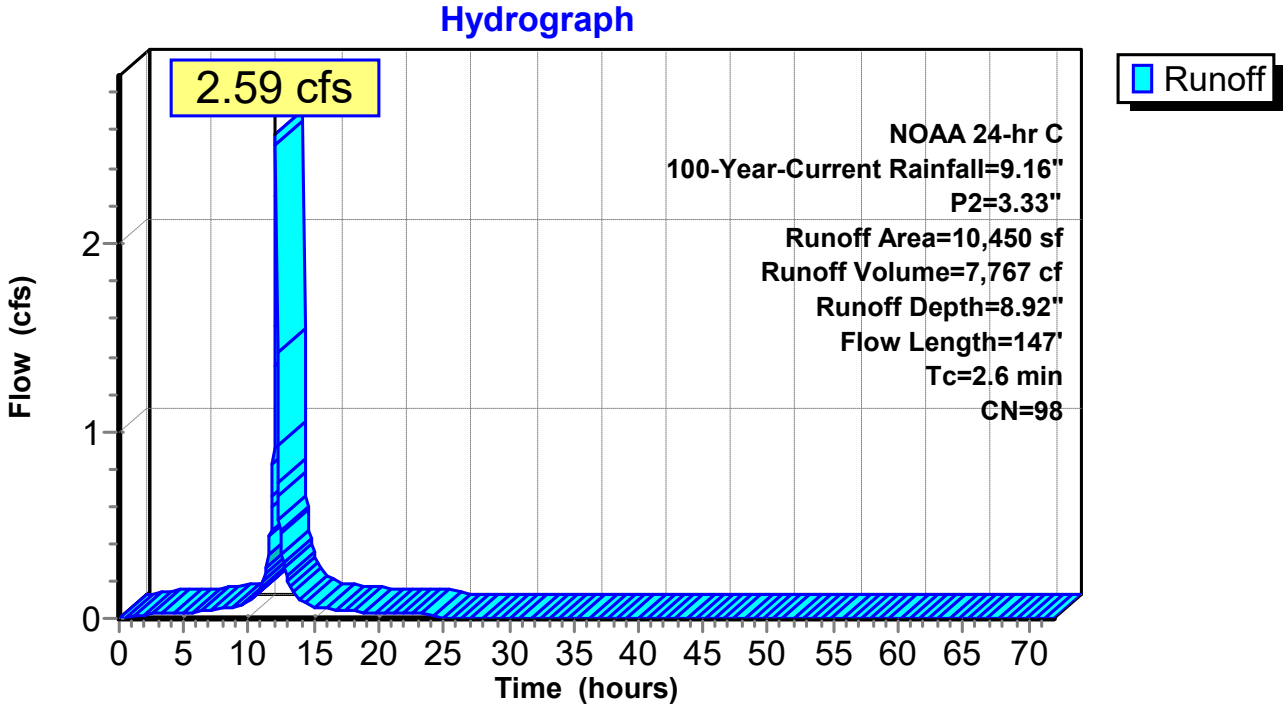
Runoff = 2.59 cfs @ 12.08 hrs, Volume= 7,767 cf, Depth= 8.92"
Routed to Link PDA2C : PROP DETAINED PDA-2C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Current Rainfall=9.16", P2=3.33"

Area (sf)	CN	Description
10,450	98	Paved parking, HSG B
10,450		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0100	0.67		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"
0.5	19	0.0050	0.58		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
1.3	71	0.0074	0.88		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
0.1	18	0.0600	4.97		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	29	0.0020	0.91		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
2.6	147	Total			

Subcatchment PDA2CI: PDA-2C IMP.



Summary for Subcatchment PDA2CP: PDA-2C PERV.

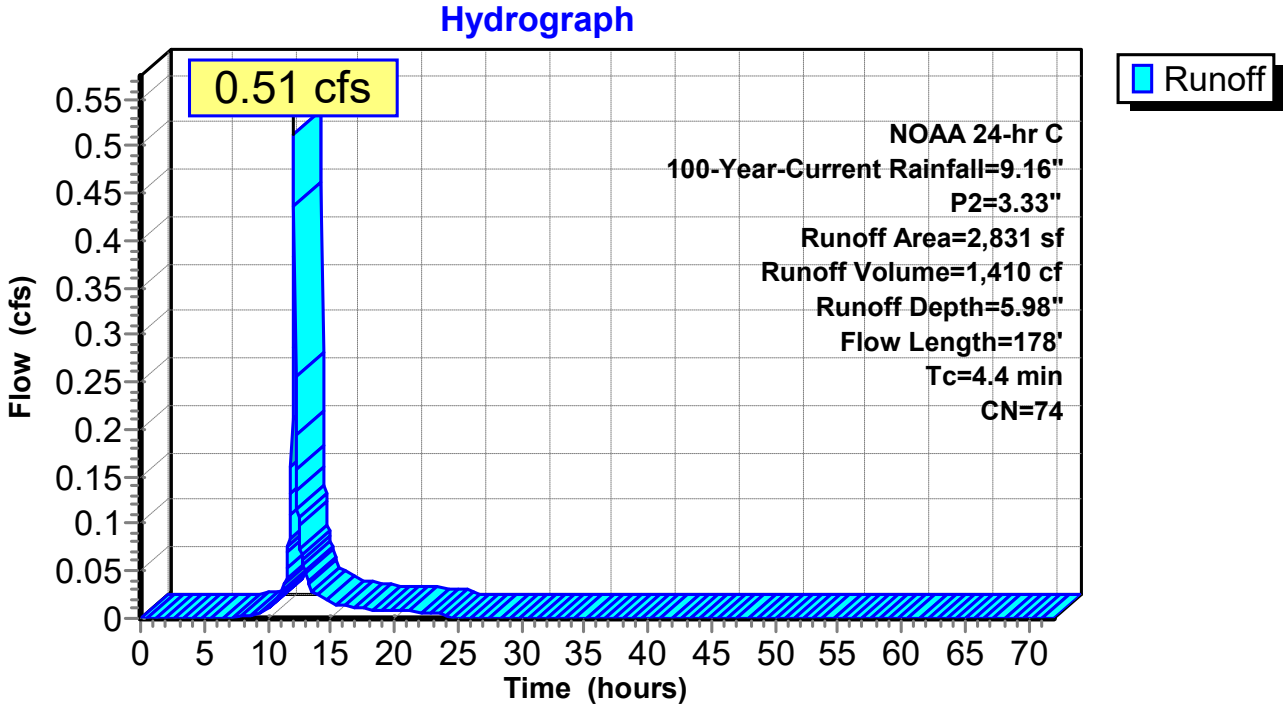
Runoff = 0.51 cfs @ 12.11 hrs, Volume= 1,410 cf, Depth= 5.98"
Routed to Link PDA2C : PROP DETAINED PDA-2C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Current Rainfall=9.16", P2=3.33"

Area (sf)	CN	Description
2,831	74	>75% Grass cover, Good, HSG C
2,831		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	8	0.0060	0.06		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.33"
0.7	42	0.0150	1.05		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.33"
0.7	50	0.0160	1.12		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.33"
0.4	48	0.0090	1.93		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	30	0.0023	0.97		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
4.4	178	Total			

Subcatchment PDA2CP: PDA-2C PERV.



Summary for Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

Inflow Area = 16,437 sf, 91.88% Impervious, Inflow Depth = 8.68" for 100-Year-Current event
Inflow = 3.81 cfs @ 12.09 hrs, Volume= 11,890 cf
Outflow = 2.16 cfs @ 12.17 hrs, Volume= 11,489 cf, Atten= 43%, Lag= 5.0 min
Primary = 2.16 cfs @ 12.17 hrs, Volume= 11,489 cf
Routed to Link PDA2 : PROP DETAINED PDA-2

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 88.75' @ 12.17 hrs Surf.Area= 3,147 sf Storage= 4,580 cf

Plug-Flow detention time= 211.6 min calculated for 11,489 cf (97% of inflow)
Center-of-Mass det. time= 190.2 min (931.5 - 741.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	86.99'	1,331 cf	**35.50'W x 88.65'L x 2.76'H Field A** 8,696 cf Overall - 6,035 cf Embedded = 2,661 cf x 50.0% Voids
#2A	87.24'	5,733 cf	**Ferguson R-Tank UD 2** x 688 Inside #1 Inside= 23.6"W x 27.2"H => 4.23 sf x 1.97'L = 8.3 cf Outside= 23.6"W x 27.2"H => 4.46 sf x 1.97'L = 8.8 cf 688 Chambers in 16 Rows
		7,064 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	87.24'	**15.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 87.24' / 87.19' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	87.24'	**2.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	88.20'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.11 cfs @ 12.17 hrs HW=88.74' (Free Discharge)
└**1=Culvert** (Passes 2.11 cfs of 4.69 cfs potential flow)
├**2=Orifice/Grate** (Orifice Controls 0.19 cfs @ 5.69 fps)
└**3=Orifice/Grate** (Orifice Controls 1.91 cfs @ 2.36 fps)

Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK - Chamber Wizard Field A

Chamber Model = Ferguson R-Tank UD 2 (Ferguson R-Tank UD)
Inside= 23.6"W x 27.2"H => 4.23 sf x 1.97'L = 8.3 cf
Outside= 23.6"W x 27.2"H => 4.46 sf x 1.97'L = 8.8 cf

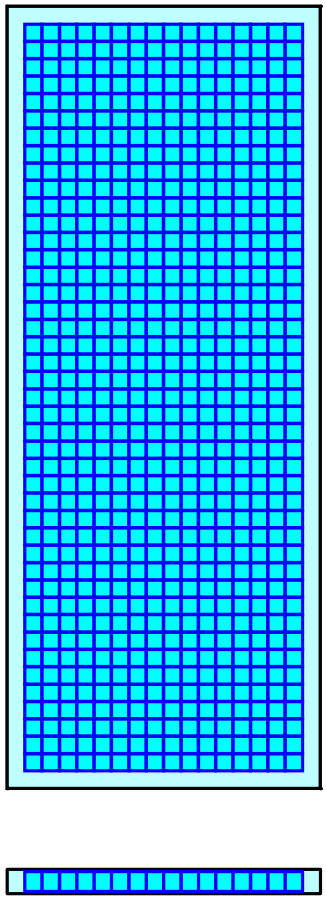
43 Chambers/Row x 1.97' Long = 84.65' Row Length +24.0" End Stone x 2 = 88.65' Base Length
16 Rows x 23.6" Wide + 24.0" Side Stone x 2 = 35.50' Base Width
3.0" Stone Base + 27.2" Chamber Height + 3.0" Stone Cover = 2.76' Field Height

688 Chambers x 8.3 cf = 5,733.5 cf Chamber Storage
688 Chambers x 8.8 cf = 6,035.2 cf Displacement

8,696.4 cf Field - 6,035.2 cf Chambers = 2,661.2 cf Stone x 50.0% Voids = 1,330.6 cf Stone Storage

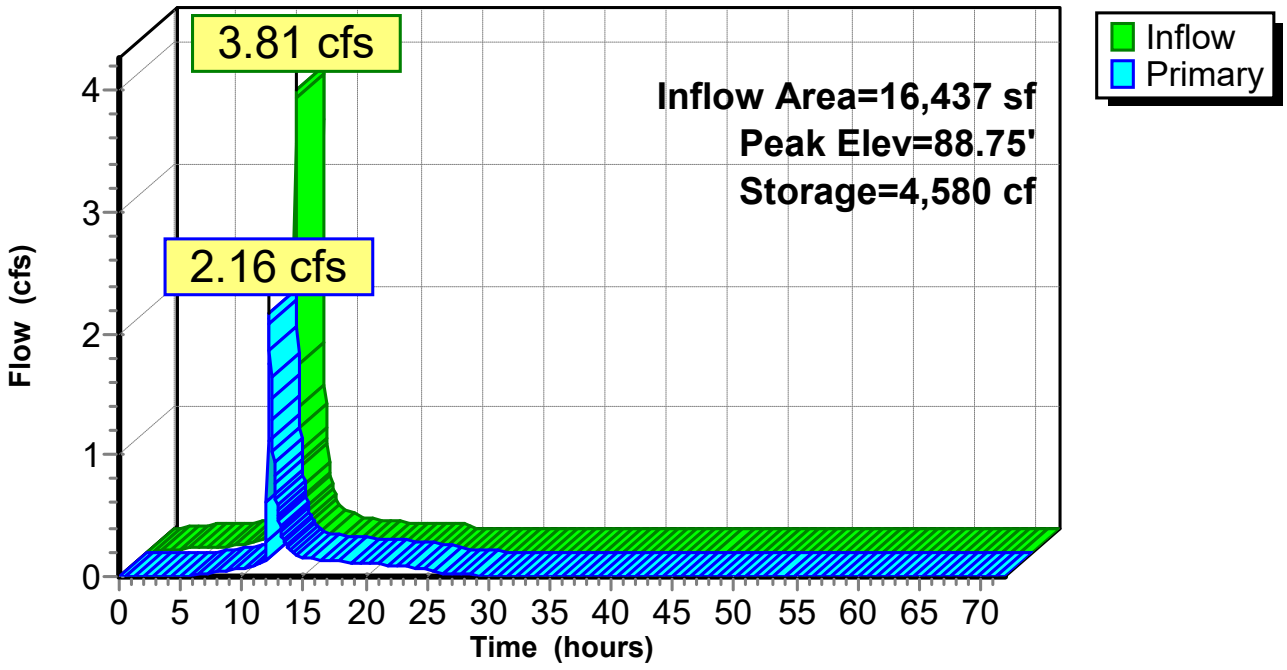
Chamber Storage + Stone Storage = 7,064.1 cf = 0.162 af
Overall Storage Efficiency = 81.2%
Overall System Size = 88.65' x 35.50' x 2.76'

688 Chambers
322.1 cy Field
98.6 cy Stone



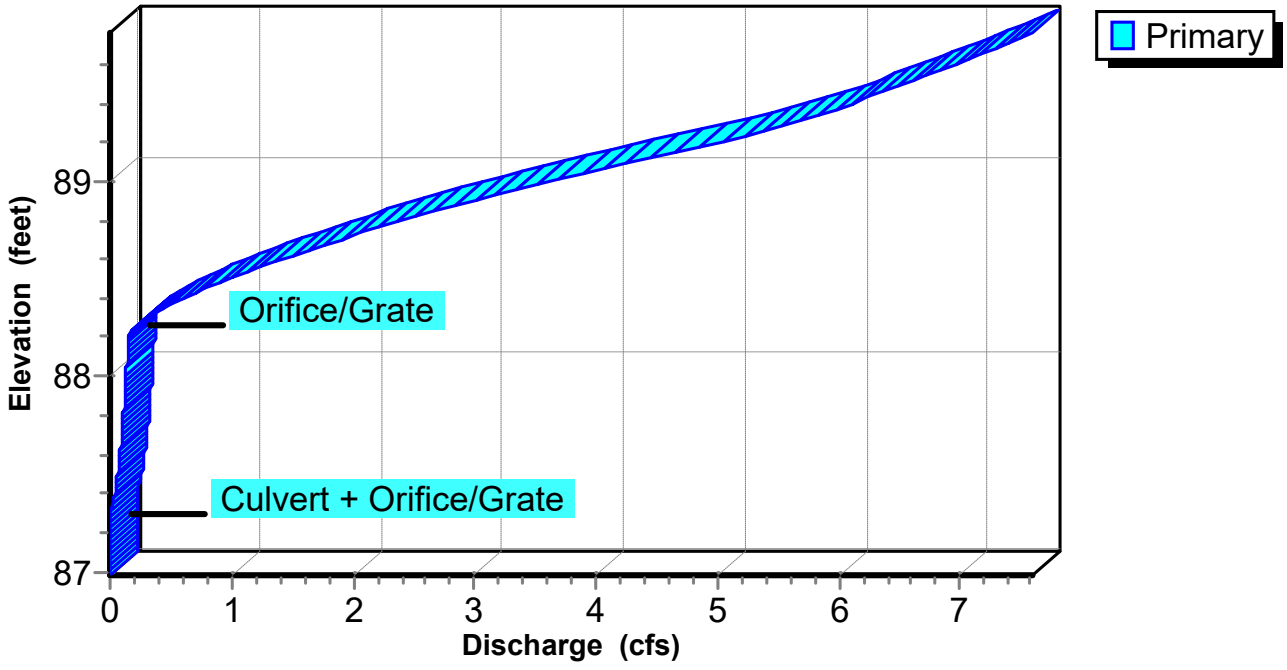
Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

Hydrograph

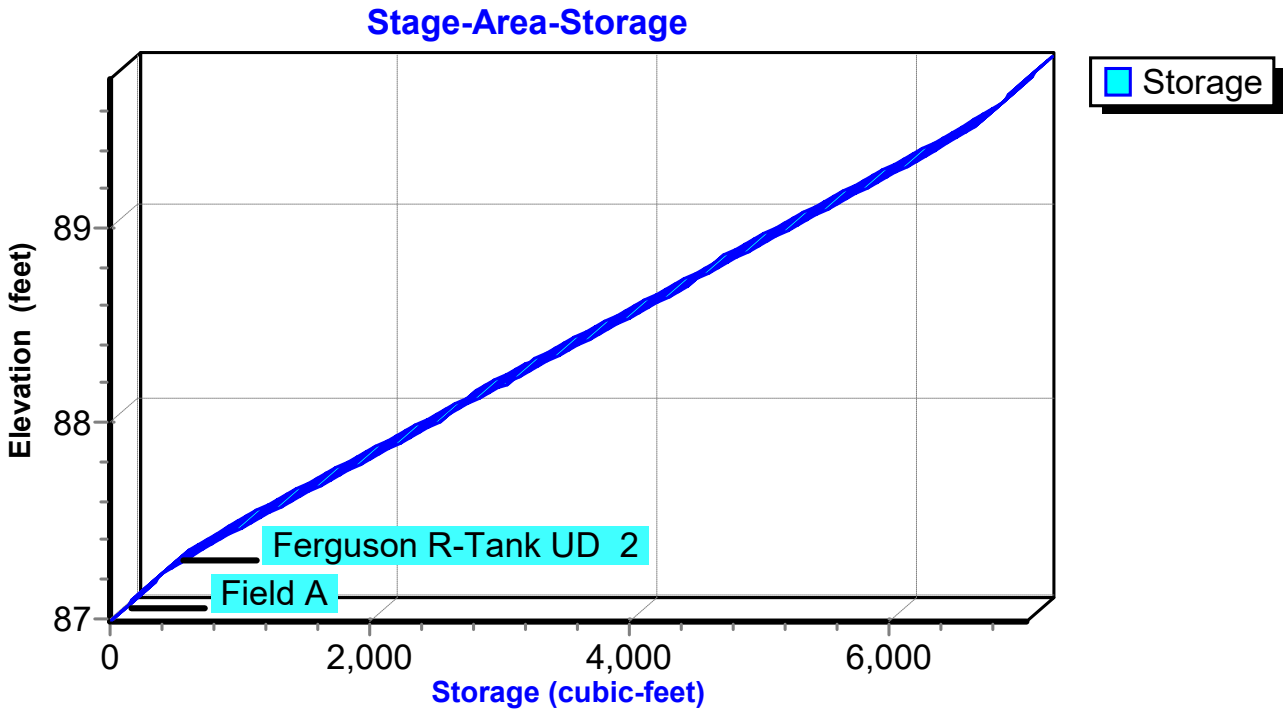


Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

Stage-Discharge



Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

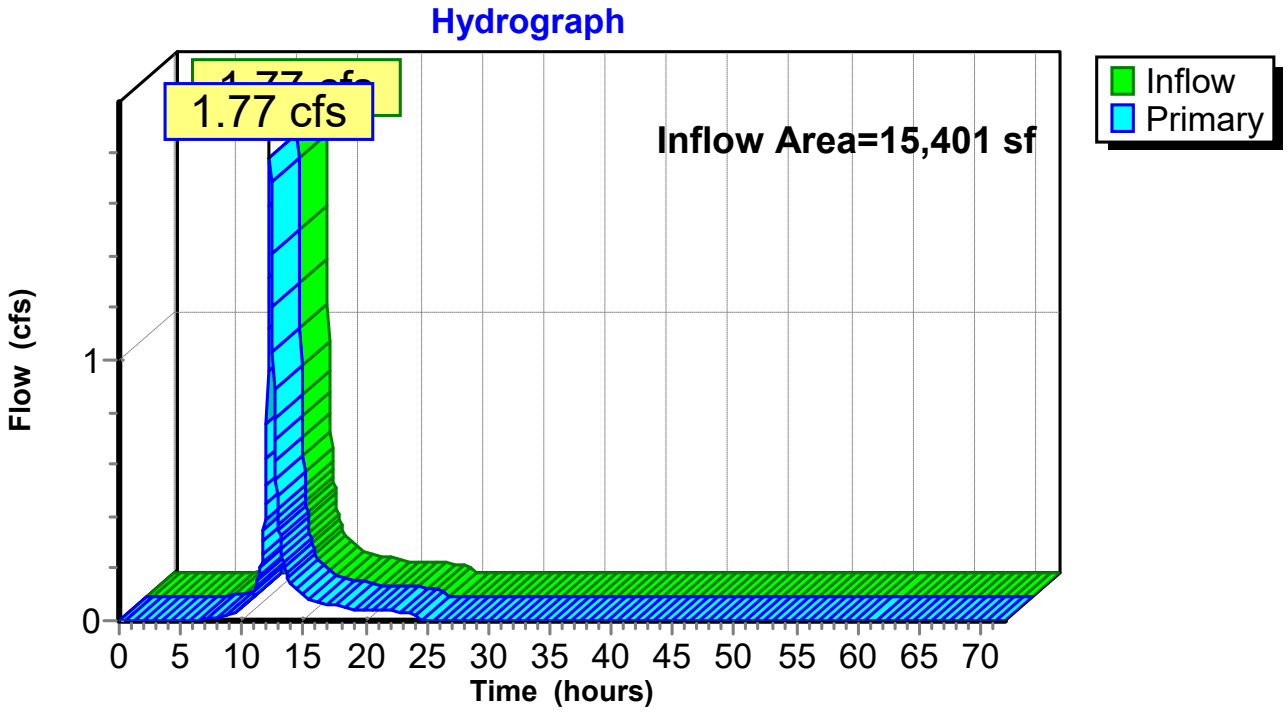


Summary for Link EDA1: EXISTING UNDETAINED EDA-1

Inflow Area = 15,401 sf, 5.21% Impervious, Inflow Depth = 6.13" for 100-Year-Current event
Inflow = 1.77 cfs @ 12.27 hrs, Volume= 7,865 cf
Primary = 1.77 cfs @ 12.27 hrs, Volume= 7,865 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 3L

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

Link EDA1: EXISTING UNDETAINED EDA-1

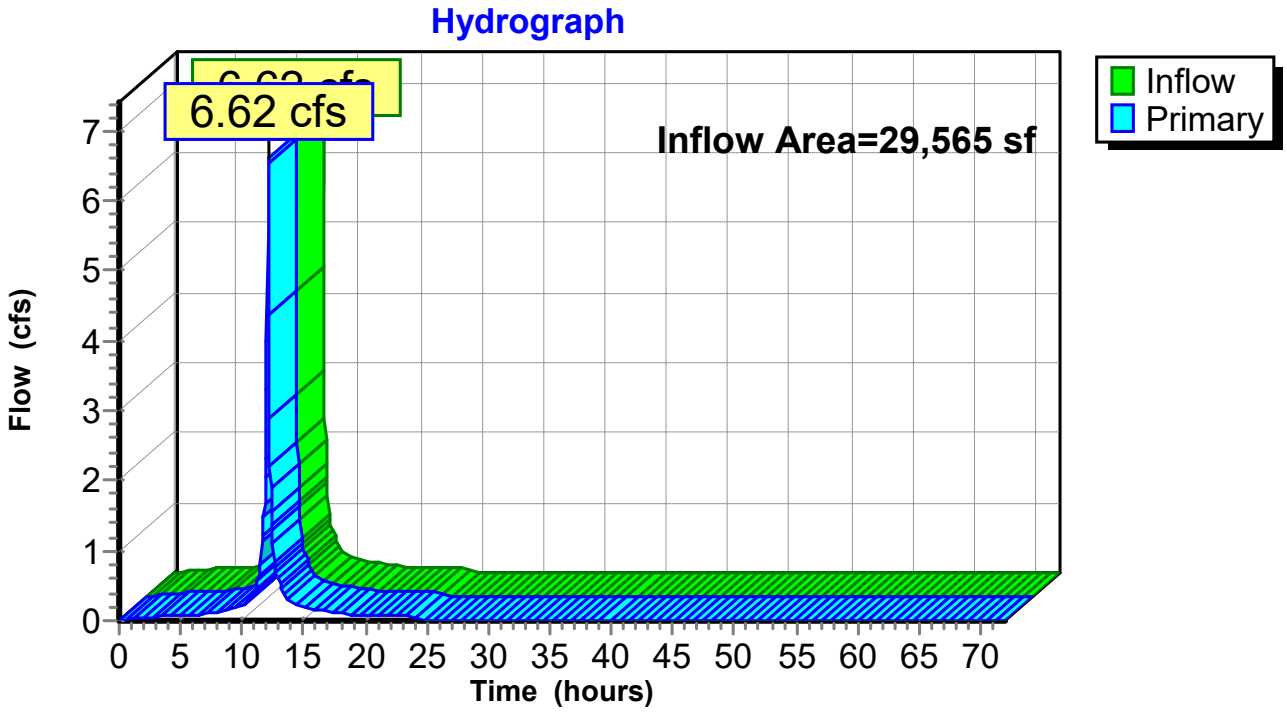


Summary for Link EDA2: EXISTING DETAINED EDA-2

Inflow Area = 29,565 sf, 79.87% Impervious, Inflow Depth = 8.33" for 100-Year-Current event
Inflow = 6.62 cfs @ 12.09 hrs, Volume= 20,516 cf
Primary = 6.62 cfs @ 12.09 hrs, Volume= 20,516 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node BDA2

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

Link EDA2: EXISTING DETAINED EDA-2

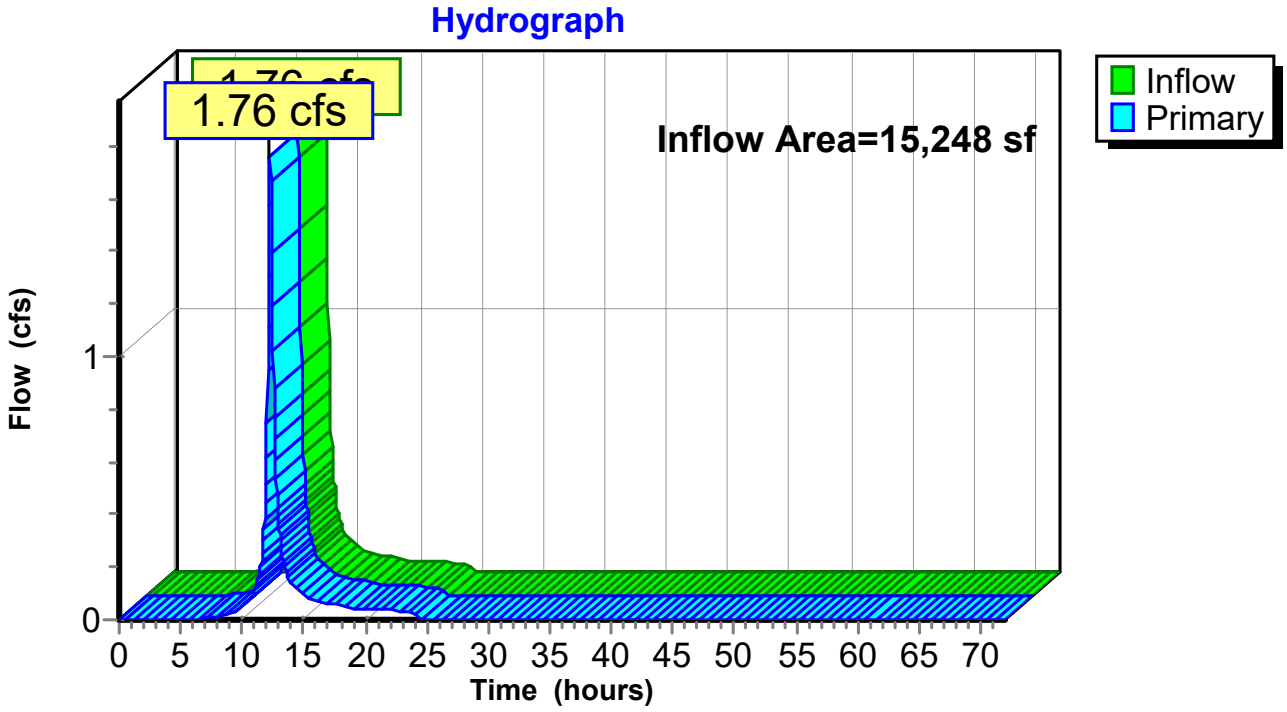


Summary for Link PDA1: PROP UNDETAINED PDA-1

Inflow Area = 15,248 sf, 5.21% Impervious, Inflow Depth = 6.13" for 100-Year-Current event
Inflow = 1.76 cfs @ 12.27 hrs, Volume= 7,787 cf
Primary = 1.76 cfs @ 12.27 hrs, Volume= 7,787 cf, Atten= 0%, Lag= 0.0 min

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

Link PDA1: PROP UNDETAINED PDA-1

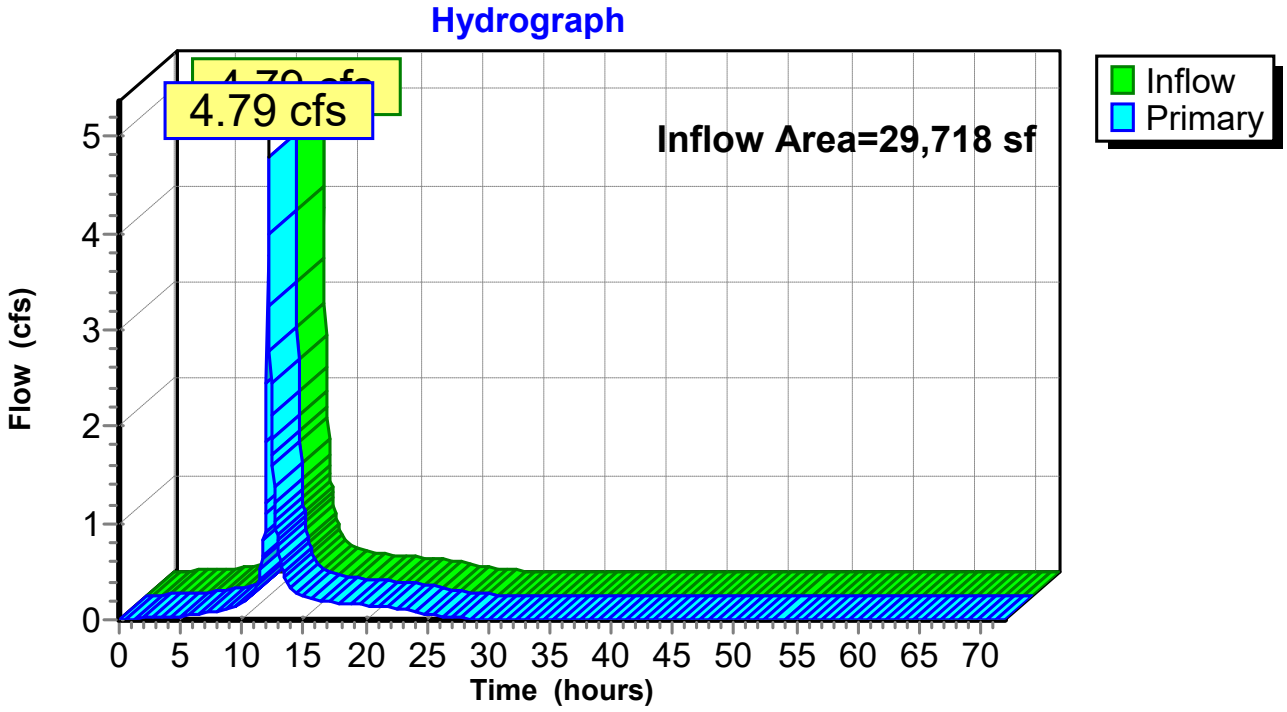


Summary for Link PDA2: PROP DETAINED PDA-2

Inflow Area = 29,718 sf, 85.98% Impervious, Inflow Depth = 8.35" for 100-Year-Current event
Inflow = 4.79 cfs @ 12.10 hrs, Volume= 20,666 cf
Primary = 4.79 cfs @ 12.10 hrs, Volume= 20,666 cf, Atten= 0%, Lag= 0.0 min

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

Link PDA2: PROP DETAINED PDA-2

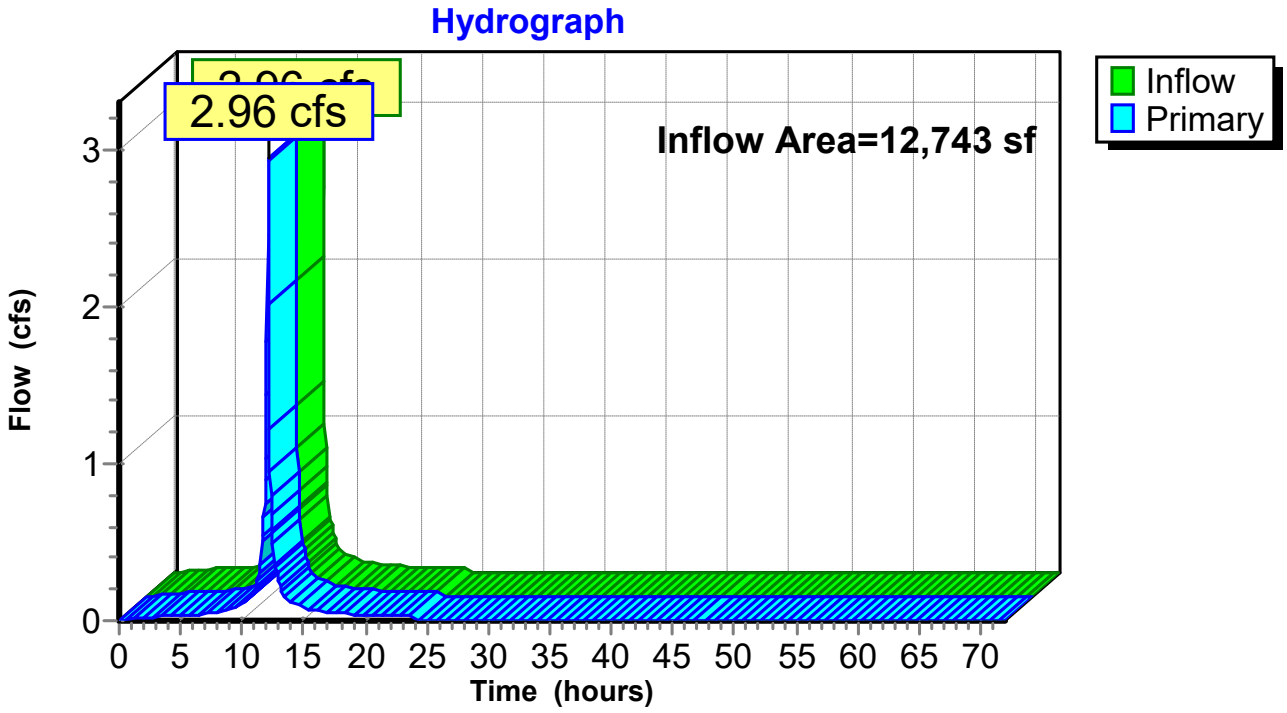


Summary for Link PDA2A: PROP DETAINED PDA-2A

Inflow Area = 12,743 sf, 89.52% Impervious, Inflow Depth = 8.61" for 100-Year-Current event
Inflow = 2.96 cfs @ 12.09 hrs, Volume= 9,144 cf
Primary = 2.96 cfs @ 12.09 hrs, Volume= 9,144 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 9P : PERVIOUS PAVEMENT W/ UD2 R-TANK

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

Link PDA2A: PROP DETAINED PDA-2A

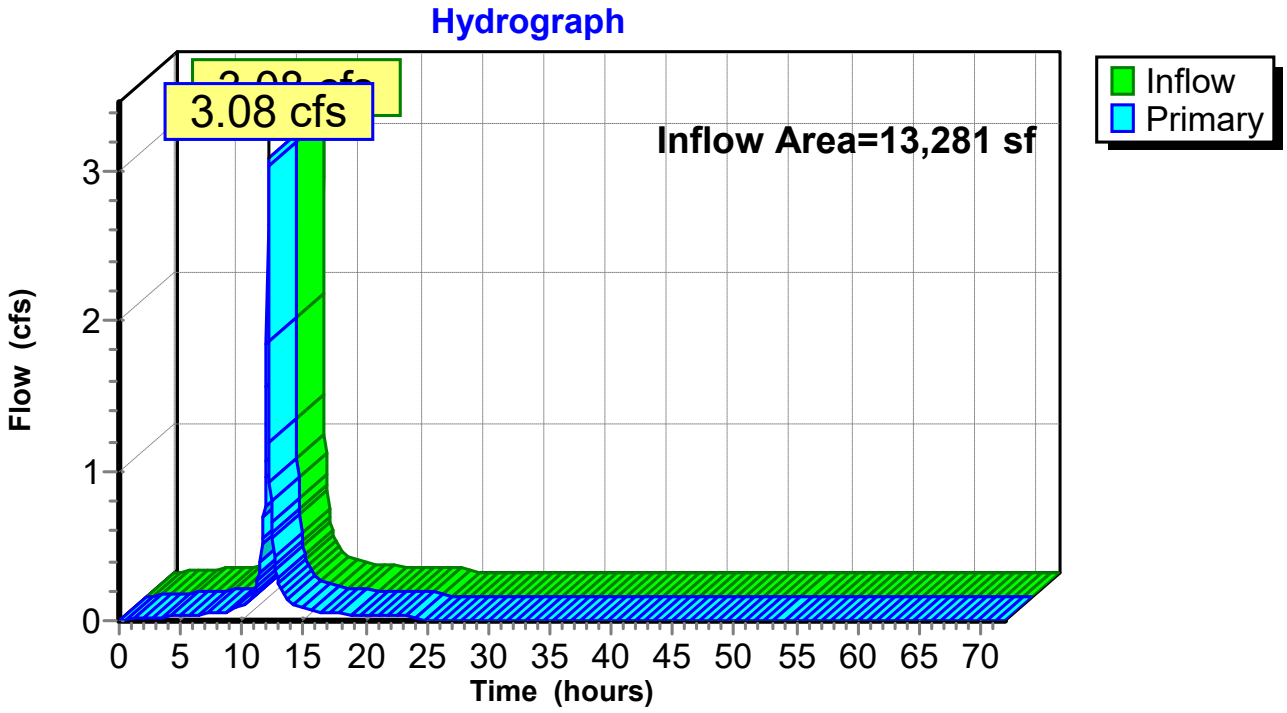


Summary for Link PDA2C: PROP DETAINED PDA-2C

Inflow Area = 13,281 sf, 78.68% Impervious, Inflow Depth = 8.29" for 100-Year-Current event
Inflow = 3.08 cfs @ 12.09 hrs, Volume= 9,177 cf
Primary = 3.08 cfs @ 12.09 hrs, Volume= 9,177 cf, Atten= 0%, Lag= 0.0 min
Routed to Link PDA2 : PROP DETAINED PDA-2

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

Link PDA2C: PROP DETAINED PDA-2C



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA1I: EDA-1 IMP. Runoff Area=803 sf 100.00% Impervious Runoff Depth=11.39"
Flow Length=36' Slope=0.0420 '/' Tc=0.4 min CN=98 Runoff=0.25 cfs 762 cf

Subcatchment EDA1P: EDA-1 PERV. Runoff Area=14,598 sf 0.00% Impervious Runoff Depth=8.27"
Flow Length=203' Tc=17.6 min CN=74 Runoff=2.43 cfs 10,059 cf

Subcatchment EDA2I: EDA-2 IMP. Runoff Area=23,615 sf 100.00% Impervious Runoff Depth=11.39"
Flow Length=182' Tc=2.6 min CN=98 Runoff=7.42 cfs 22,412 cf

Subcatchment EDA2P: EDA-2 PERV. Runoff Area=5,950 sf 0.00% Impervious Runoff Depth=8.27"
Flow Length=187' Tc=6.9 min CN=74 Runoff=1.36 cfs 4,100 cf

Subcatchment PDA1I: PDA-1 IMP. Runoff Area=795 sf 100.00% Impervious Runoff Depth=11.39"
Flow Length=36' Slope=0.0420 '/' Tc=0.4 min CN=98 Runoff=0.25 cfs 754 cf

Subcatchment PDA1P: PDA-1 PERV. Runoff Area=14,453 sf 0.00% Impervious Runoff Depth=8.27"
Flow Length=203' Tc=17.6 min CN=74 Runoff=2.40 cfs 9,959 cf

Subcatchment PDA2AI: PDA-2A IMP. Runoff Area=11,408 sf 100.00% Impervious Runoff Depth=11.39"
Flow Length=160' Tc=3.0 min CN=98 Runoff=3.54 cfs 10,827 cf

Subcatchment PDA2AP: PDA-2A PERV. Runoff Area=1,335 sf 0.00% Impervious Runoff Depth=8.27"
Flow Length=186' Tc=6.2 min CN=74 Runoff=0.31 cfs 920 cf

Subcatchment PDA2BI: PDA-2B IMP. Runoff Area=3,694 sf 100.00% Impervious Runoff Depth=11.39"
Tc=1.0 min CN=98 Runoff=1.16 cfs 3,506 cf

Subcatchment PDA2CI: PDA-2C IMP. Runoff Area=10,450 sf 100.00% Impervious Runoff Depth=11.39"
Flow Length=147' Tc=2.5 min CN=98 Runoff=3.30 cfs 9,918 cf

Subcatchment PDA2CP: PDA-2C PERV. Runoff Area=2,831 sf 0.00% Impervious Runoff Depth=8.27"
Flow Length=178' Tc=4.1 min CN=74 Runoff=0.71 cfs 1,951 cf

Pond 9P: PERVIOUS PAVEMENT W/ UD2 Peak Elev=88.93' Storage=5,086 cf Inflow=4.90 cfs 15,252 cf
Outflow=3.22 cfs 14,851 cf

Link EDA1: EXISTING UNDETAINED EDA-1 Inflow=2.49 cfs 10,821 cf
Primary=2.49 cfs 10,821 cf

Link EDA2: EXISTING DETAINED EDA-2 Inflow=8.58 cfs 26,512 cf
Primary=8.58 cfs 26,512 cf

Link PDA1: PROP UNDETAINED PDA-1 Inflow=2.46 cfs 10,713 cf
Primary=2.46 cfs 10,713 cf

Link PDA2: PROP DETAINED PDA-2 Inflow=6.83 cfs 26,720 cf
Primary=6.83 cfs 26,720 cf

Link PDA2A: PROP DETAINED PDA-2A Inflow=3.82 cfs 11,747 cf
Primary=3.82 cfs 11,747 cf

Link PDA2C: PROP DETAINED PDA-2C Inflow=3.99 cfs 11,868 cf
Primary=3.99 cfs 11,868 cf

Total Runoff Area = 89,932 sf Runoff Volume = 75,167 cf Average Runoff Depth = 10.03"
43.55% Pervious = 39,167 sf 56.45% Impervious = 50,765 sf

Summary for Subcatchment EDA1I: EDA-1 IMP.

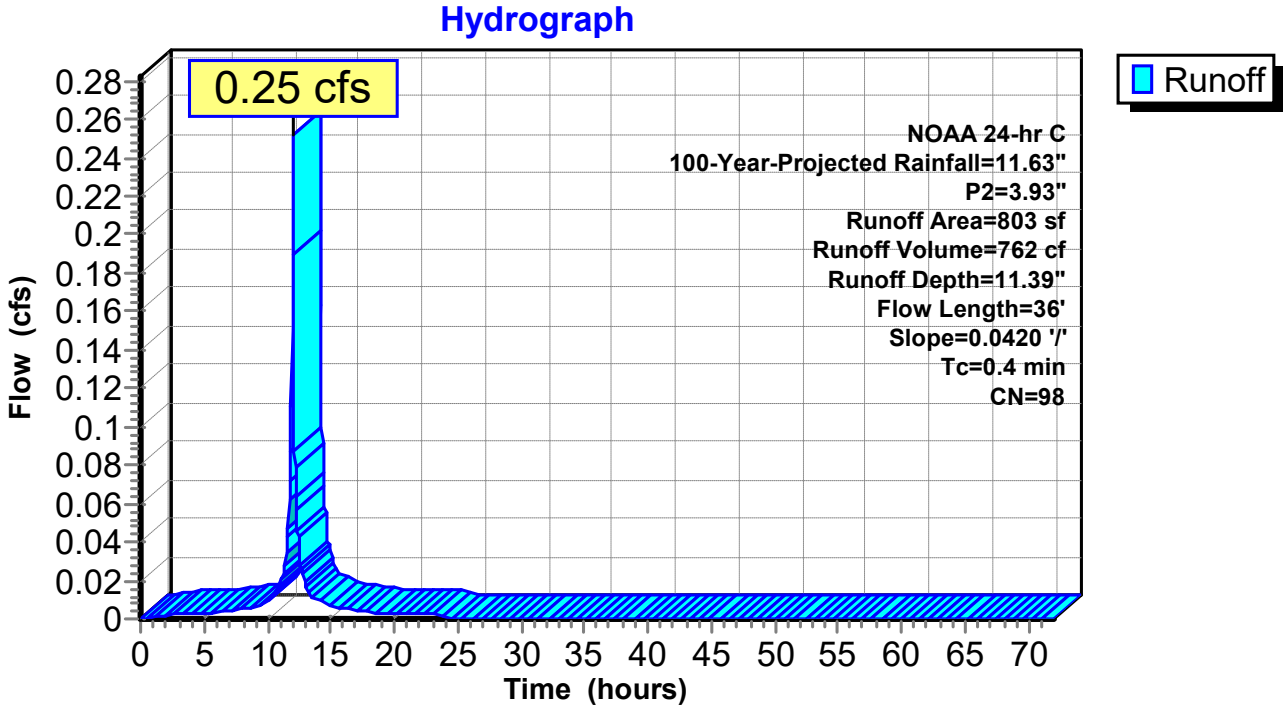
Runoff = 0.25 cfs @ 12.05 hrs, Volume= 762 cf, Depth=11.39"
Routed to Link EDA1 : EXISTING UNDETAINED EDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Projected Rainfall=11.63", P2=3.93"

Area (sf)	CN	Description
803	98	Paved parking, HSG B
803		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	36	0.0420	1.67		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"

Subcatchment EDA1I: EDA-1 IMP.



Summary for Subcatchment EDA1P: EDA-1 PERV.

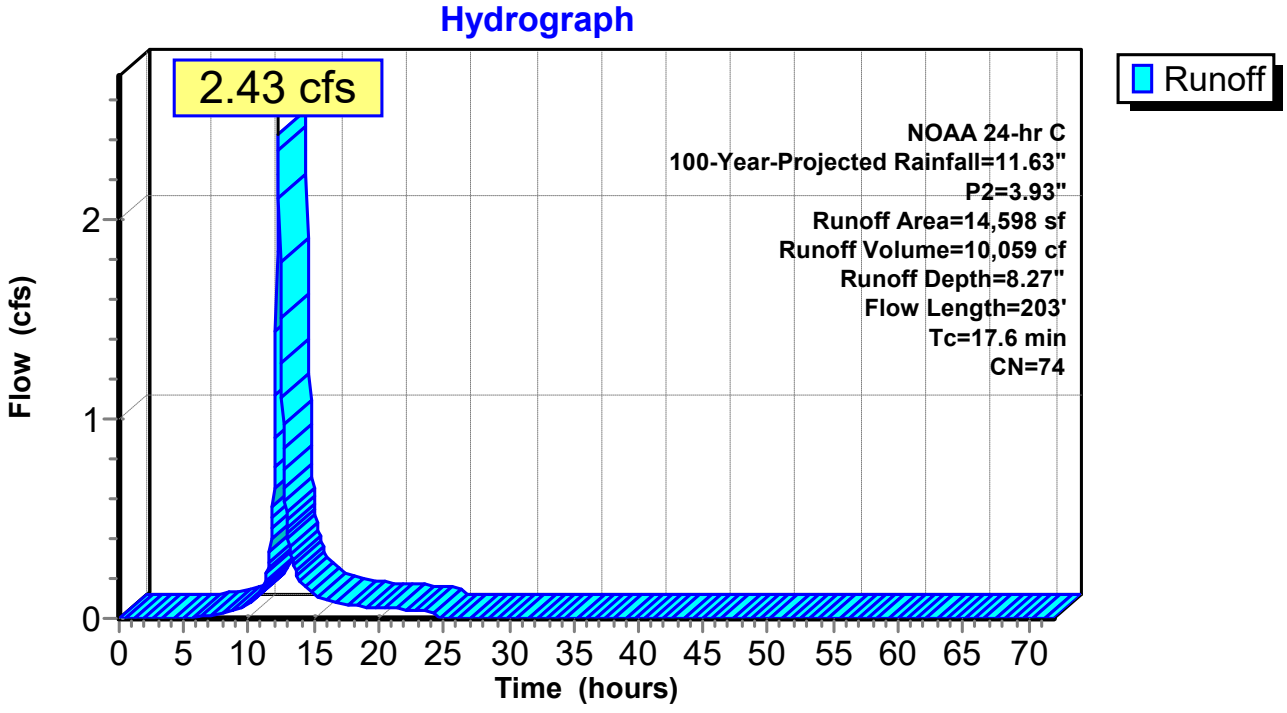
Runoff = 2.43 cfs @ 12.26 hrs, Volume= 10,059 cf, Depth= 8.27"
Routed to Link EDA1 : EXISTING UNDETAINED EDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Projected Rainfall=11.63", P2=3.93"

Area (sf)	CN	Description
14,598	74	>75% Grass cover, Good, HSG C
14,598		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	8	0.1750	0.27		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.93"
0.4	11	0.4760	0.43		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.93"
0.6	11	0.1809	0.29		**Sheet Flow, CD** Grass: Short n= 0.150 P2= 3.93"
10.5	71	0.0065	0.11		**Sheet Flow, DE** Grass: Short n= 0.150 P2= 3.93"
5.6	102	0.0019	0.31		**Shallow Concentrated Flow, EF** Short Grass Pasture Kv= 7.0 fps
17.6	203	Total			

Subcatchment EDA1P: EDA-1 PERV.



Summary for Subcatchment EDA2I: EDA-2 IMP.

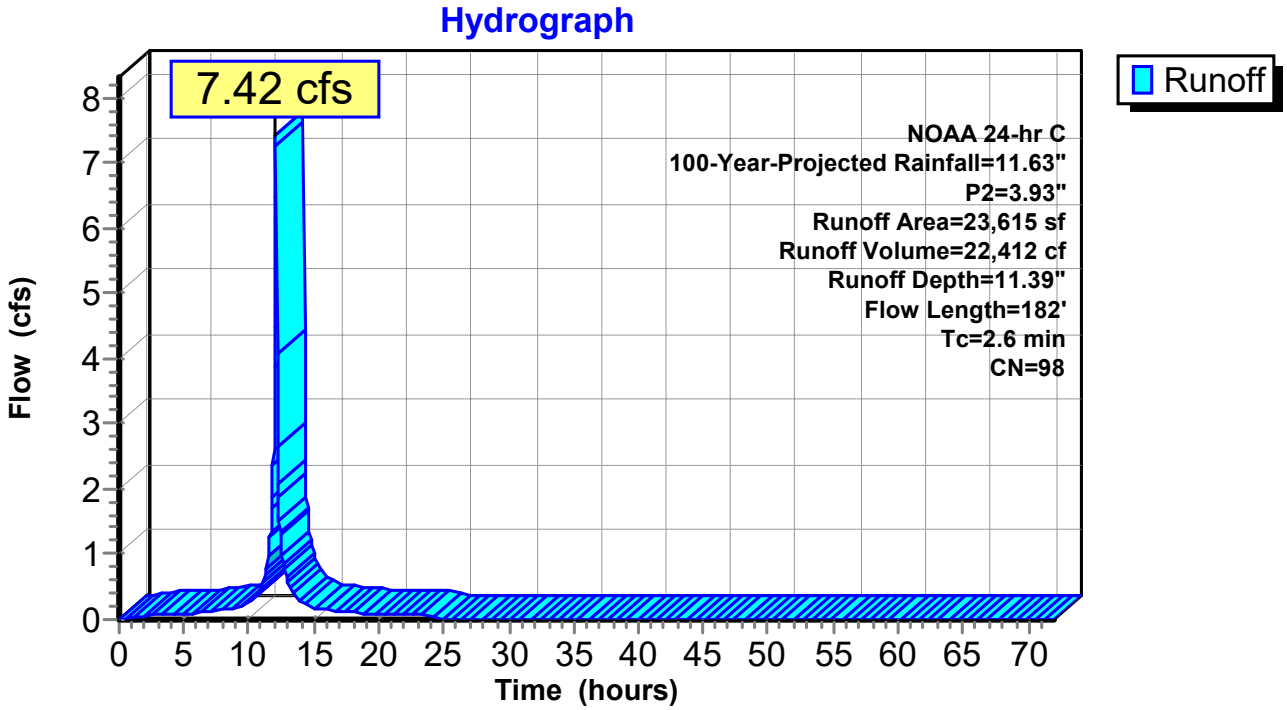
Runoff = 7.42 cfs @ 12.08 hrs, Volume= 22,412 cf, Depth=11.39"
Routed to Link EDA2 : EXISTING DETAINED EDA-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Projected Rainfall=11.63", P2=3.93"

Area (sf)	CN	Description
23,615	98	Paved parking, HSG B
23,615		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0208	1.35		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"
1.0	50	0.0060	0.82		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.2	42	0.0207	2.92		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.8	40	0.0017	0.84		**Shallow Concentrated Flow, DE** Paved Kv= 20.3 fps
2.6	182	Total			

Subcatchment EDA2I: EDA-2 IMP.



Summary for Subcatchment EDA2P: EDA-2 PERV.

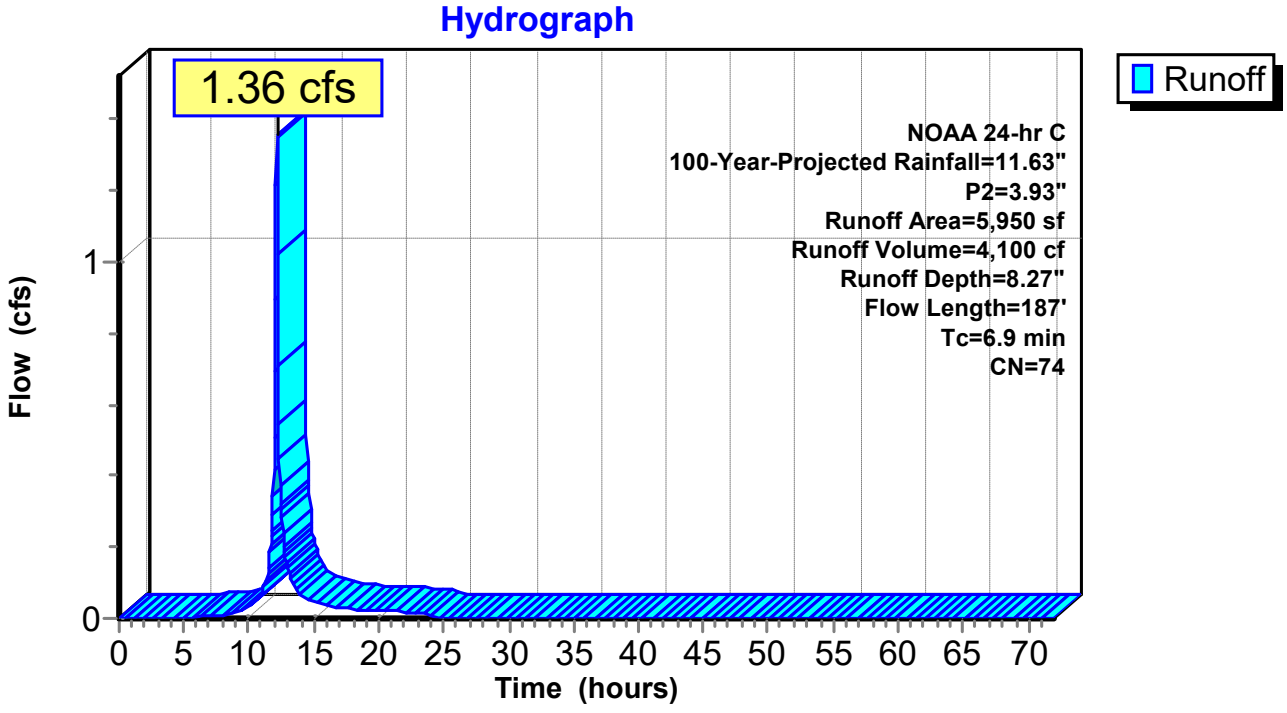
Runoff = 1.36 cfs @ 12.14 hrs, Volume= 4,100 cf, Depth= 8.27"
Routed to Link EDA2 : EXISTING DETAINED EDA-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Projected Rainfall=11.63", P2=3.93"

Area (sf)	CN	Description
5,950	74	>75% Grass cover, Good, HSG C
5,950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	24	0.0064	0.09		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.93"
0.4	31	0.0226	1.27		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.9	45	0.0060	0.80		**Sheet Flow, CD** Smooth surfaces n= 0.011 P2= 3.93"
0.3	46	0.0207	2.92		**Shallow Concentrated Flow, DE** Paved Kv= 20.3 fps
0.8	41	0.0017	0.84		**Shallow Concentrated Flow, EF** Paved Kv= 20.3 fps
6.9	187	Total			

Subcatchment EDA2P: EDA-2 PERV.



Summary for Subcatchment PDA1I: PDA-1 IMP.

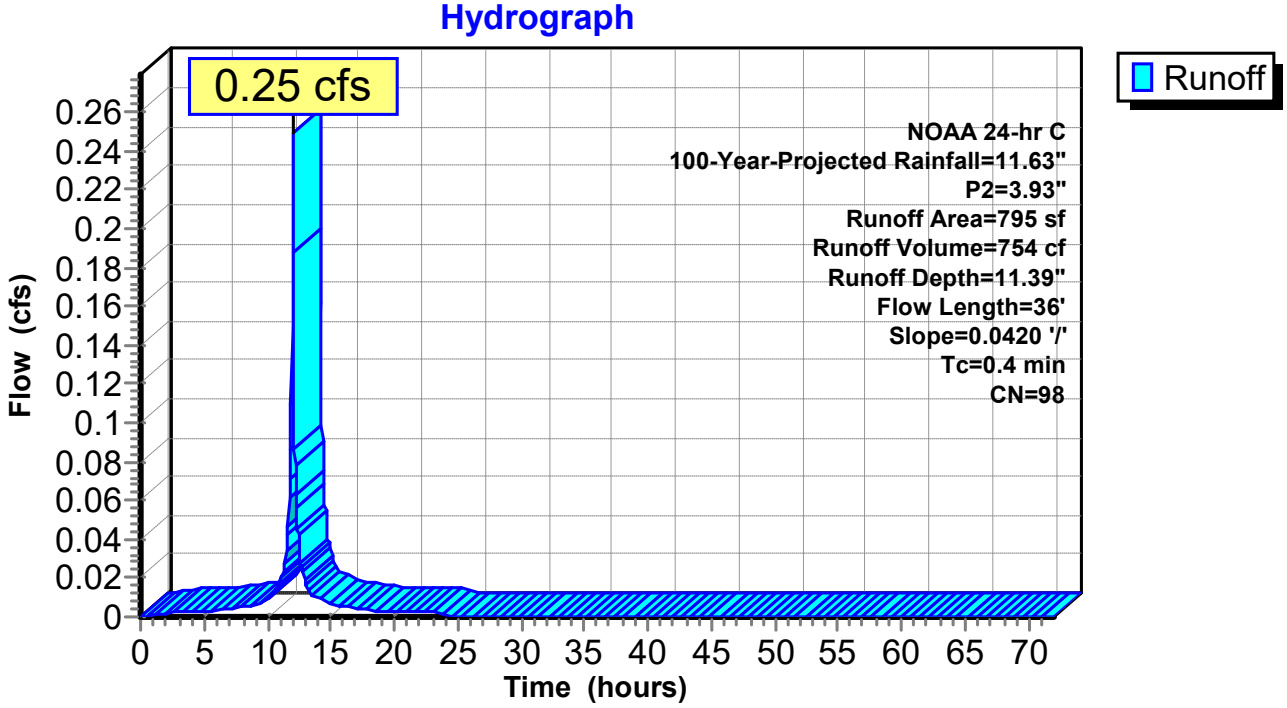
Runoff = 0.25 cfs @ 12.05 hrs, Volume= 754 cf, Depth=11.39"
Routed to Link PDA1 : PROP UNDETAINED PDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Projected Rainfall=11.63", P2=3.93"

Area (sf)	CN	Description
795	98	Paved parking, HSG B
795		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	36	0.0420	1.67		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"

Subcatchment PDA1I: PDA-1 IMP.



Summary for Subcatchment PDA1P: PDA-1 PERV.

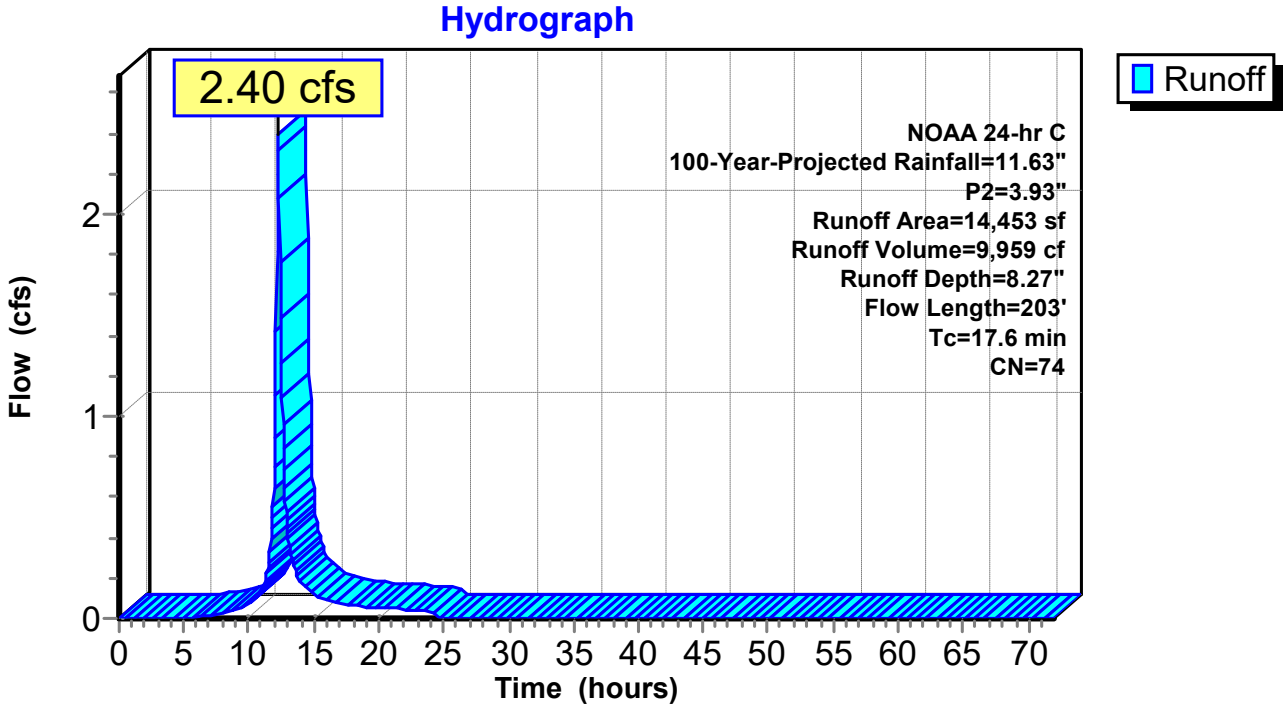
Runoff = 2.40 cfs @ 12.26 hrs, Volume= 9,959 cf, Depth= 8.27"
Routed to Link PDA1 : PROP UNDETAINED PDA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Projected Rainfall=11.63", P2=3.93"

Area (sf)	CN	Description
14,453	74	>75% Grass cover, Good, HSG C
14,453		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	8	0.1750	0.27		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.93"
0.4	11	0.4760	0.43		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.93"
0.6	11	0.1809	0.29		**Sheet Flow, CD** Grass: Short n= 0.150 P2= 3.93"
10.5	71	0.0065	0.11		**Sheet Flow, DE** Grass: Short n= 0.150 P2= 3.93"
5.6	102	0.0019	0.31		**Shallow Concentrated Flow, EF** Short Grass Pasture Kv= 7.0 fps
17.6	203	Total			

Subcatchment PDA1P: PDA-1 PERV.



Summary for Subcatchment PDA2AI: PDA-2A IMP.

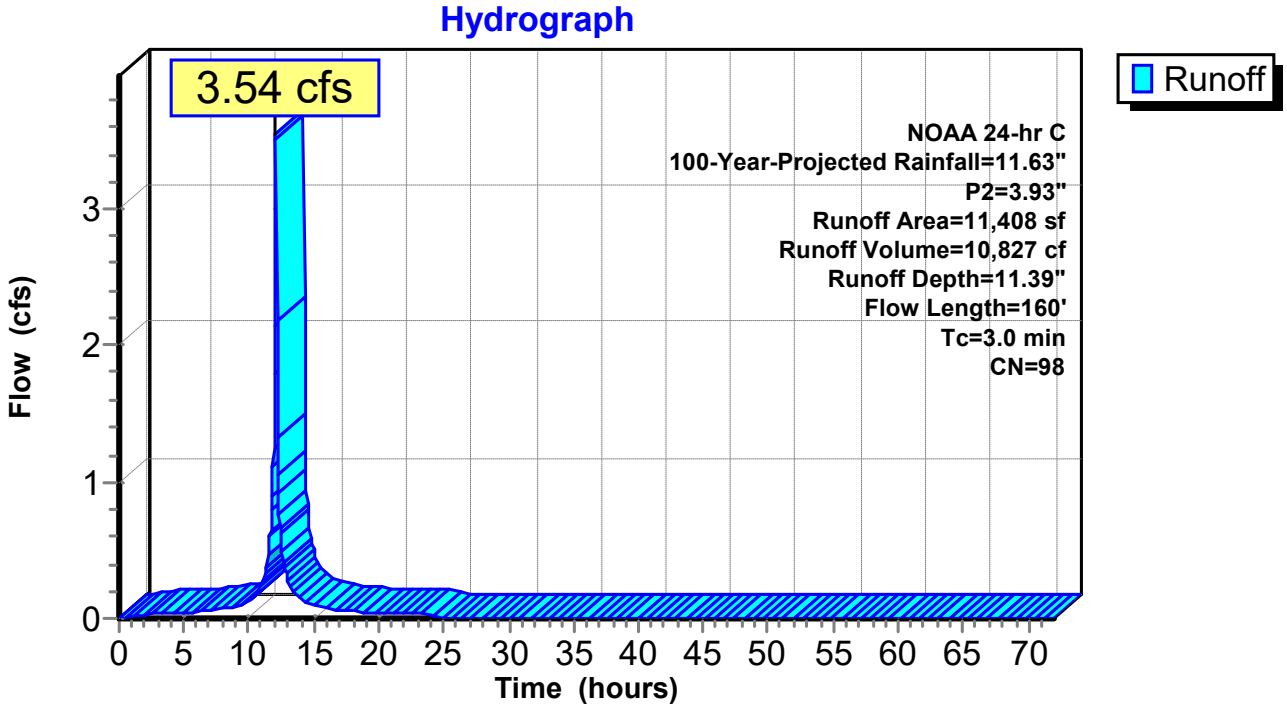
Runoff = 3.54 cfs @ 12.09 hrs, Volume= 10,827 cf, Depth=11.39"
Routed to Link PDA2A : PROP DETAINED PDA-2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Projected Rainfall=11.63", P2=3.93"

Area (sf)	CN	Description
11,408	98	Paved parking, HSG B
11,408		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	6	0.0100	0.66		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"
1.2	47	0.0036	0.66		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.9	47	0.0070	0.86		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.1	12	0.0200	2.87		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.6	48	0.0050	1.44		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
3.0	160	Total			

Subcatchment PDA2AI: PDA-2A IMP.



Summary for Subcatchment PDA2AP: PDA-2A PERV.

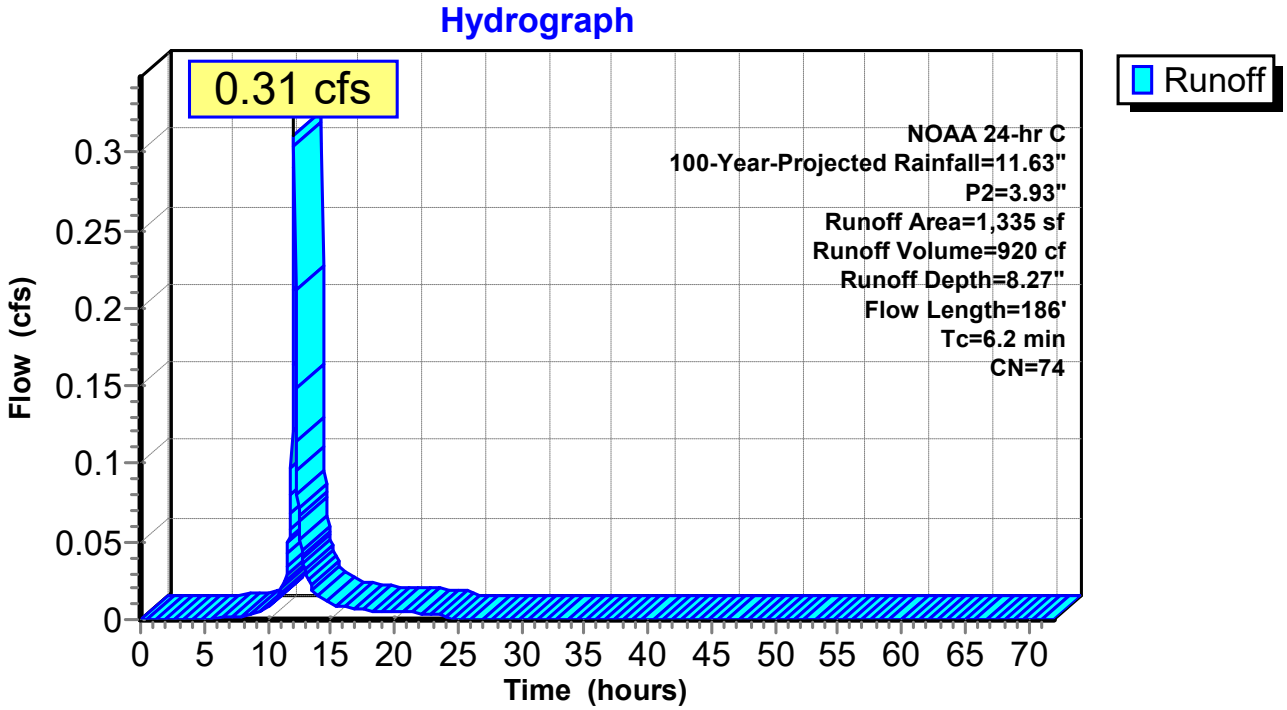
Runoff = 0.31 cfs @ 12.13 hrs, Volume= 920 cf, Depth= 8.27"
Routed to Link PDA2A : PROP DETAINED PDA-2A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Projected Rainfall=11.63", P2=3.93"

Area (sf)	CN	Description
1,335	74	>75% Grass cover, Good, HSG C
1,335		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	18	0.0050	0.08		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.93"
1.4	82	0.0070	0.96		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.4	39	0.0070	1.70		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	47	0.0050	1.44		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
6.2	186	Total			

Subcatchment PDA2AP: PDA-2A PERV.



Summary for Subcatchment PDA2BI: PDA-2B IMP.

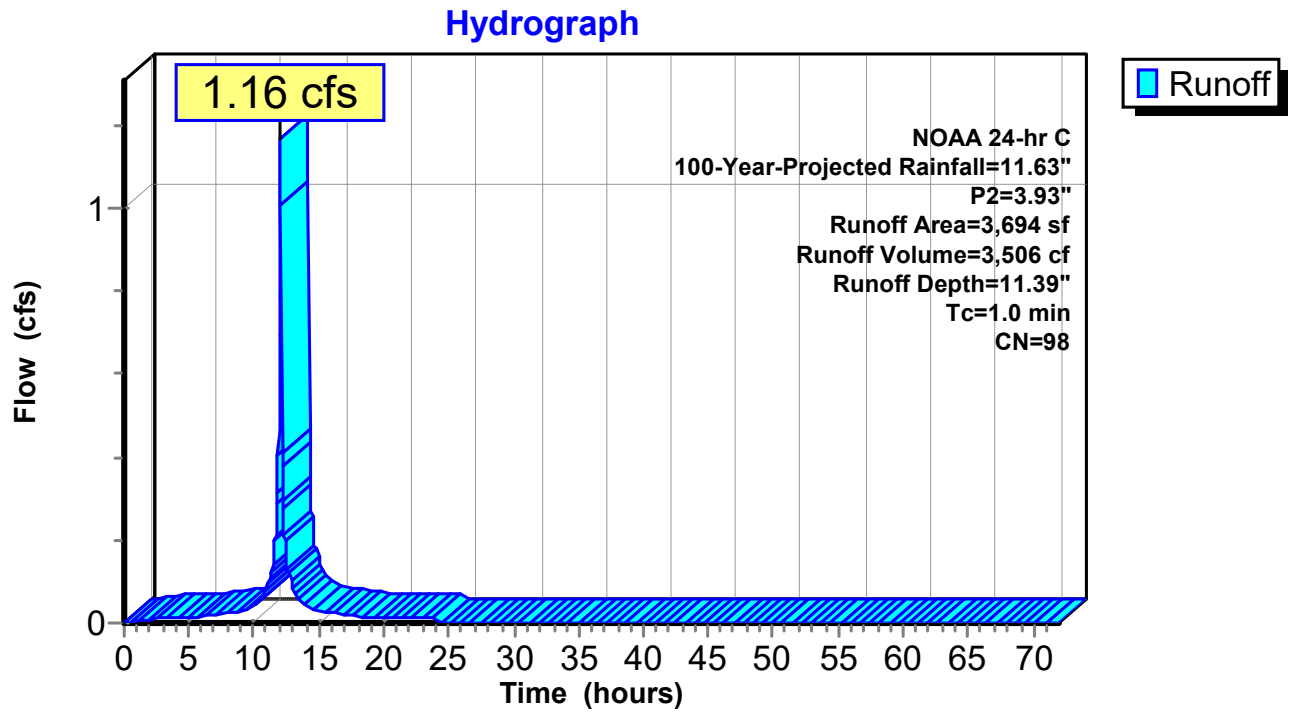
Runoff = 1.16 cfs @ 12.06 hrs, Volume= 3,506 cf, Depth=11.39"
Routed to Pond 9P : PERVIOUS PAVEMENT W/ UD2 R-TANK

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Projected Rainfall=11.63", P2=3.93"

Area (sf)	CN	Description
3,694	98	Paved parking, HSG B
3,694		100.00% Impervious Area

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

Subcatchment PDA2BI: PDA-2B IMP.



Summary for Subcatchment PDA2CI: PDA-2C IMP.

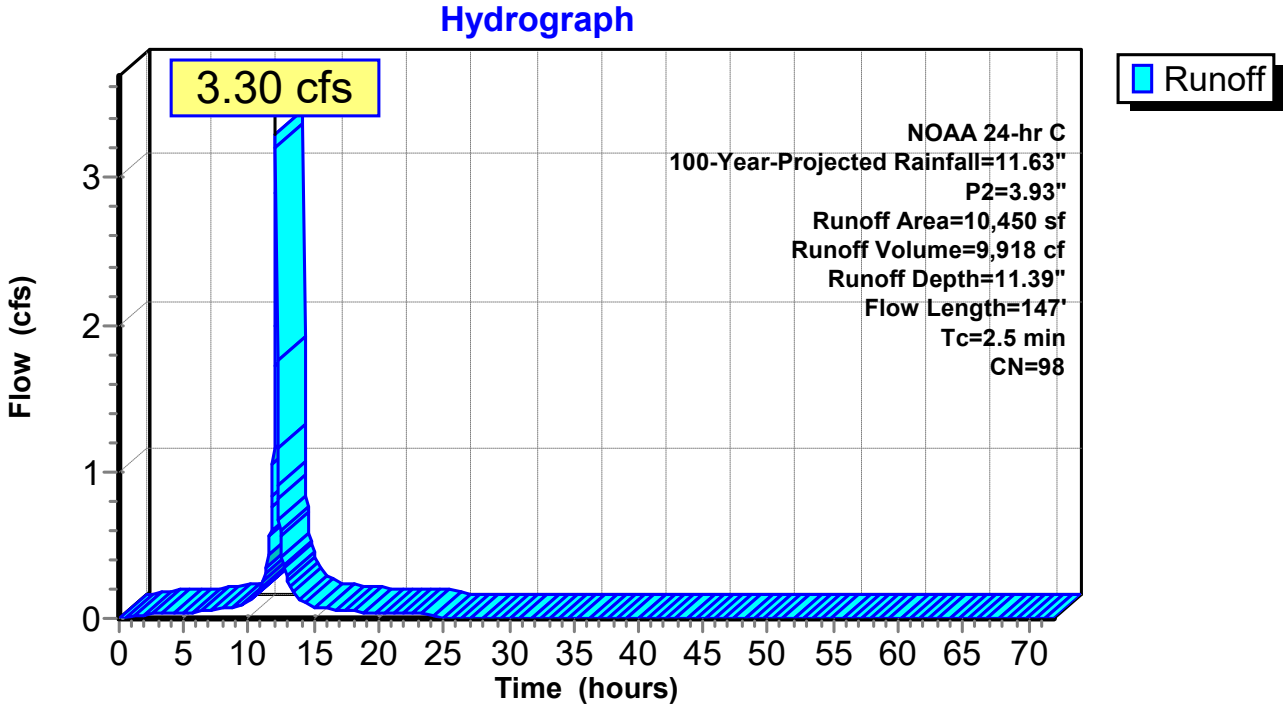
Runoff = 3.30 cfs @ 12.08 hrs, Volume= 9,918 cf, Depth=11.39"
Routed to Link PDA2C : PROP DETAINED PDA-2C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Projected Rainfall=11.63", P2=3.93"

Area (sf)	CN	Description
10,450	98	Paved parking, HSG B
10,450		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0100	0.73		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"
0.5	19	0.0050	0.63		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
1.2	71	0.0074	0.96		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.1	18	0.0600	4.97		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	29	0.0020	0.91		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
2.5	147	Total			

Subcatchment PDA2CI: PDA-2C IMP.



Summary for Subcatchment PDA2CP: PDA-2C PERV.

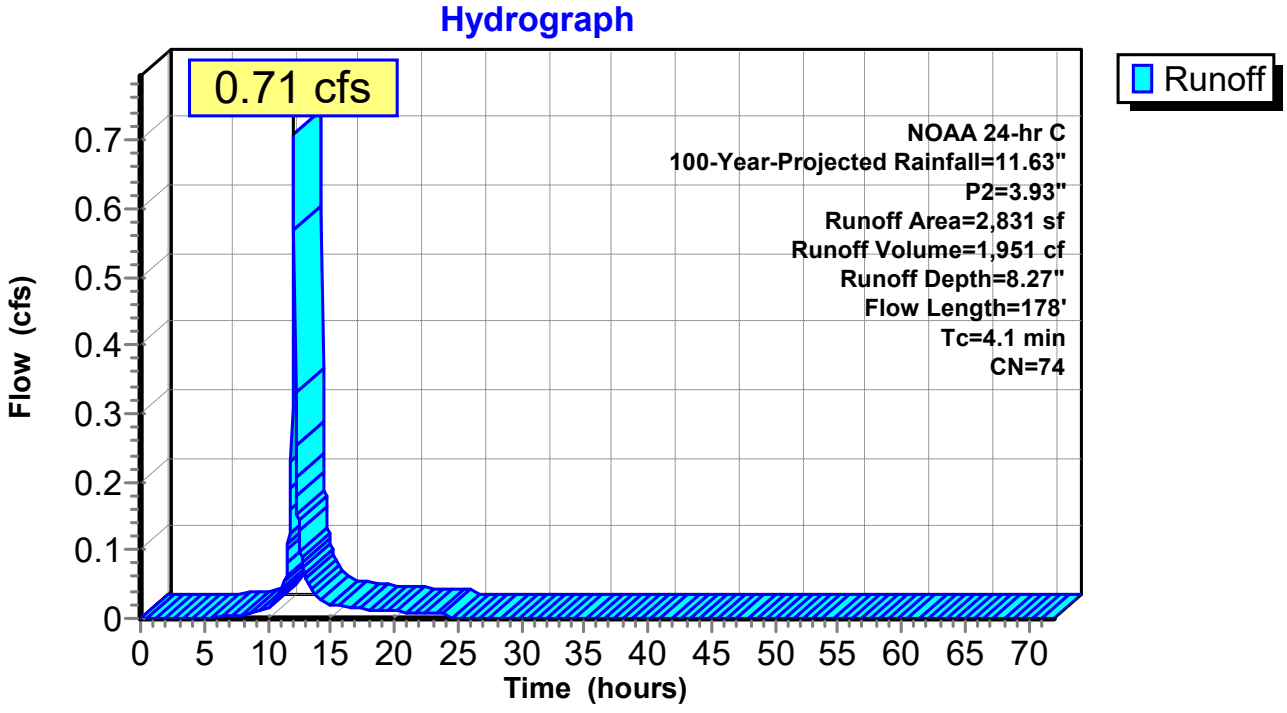
Runoff = 0.71 cfs @ 12.10 hrs, Volume= 1,951 cf, Depth= 8.27"
Routed to Link PDA2C : PROP DETAINED PDA-2C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year-Projected Rainfall=11.63", P2=3.93"

Area (sf)	CN	Description
2,831	74	>75% Grass cover, Good, HSG C
2,831		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	8	0.0060	0.07		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.93"
0.6	42	0.0150	1.14		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.93"
0.7	50	0.0160	1.21		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.93"
0.4	48	0.0090	1.93		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
0.5	30	0.0023	0.97		**Shallow Concentrated Flow, CD** Paved Kv= 20.3 fps
4.1	178	Total			

Subcatchment PDA2CP: PDA-2C PERV.



Summary for Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

Inflow Area = 16,437 sf, 91.88% Impervious, Inflow Depth = 11.14" for 100-Year-Projected event
Inflow = 4.90 cfs @ 12.08 hrs, Volume= 15,252 cf
Outflow = 3.22 cfs @ 12.15 hrs, Volume= 14,851 cf, Atten= 34%, Lag= 4.0 min
Primary = 3.22 cfs @ 12.15 hrs, Volume= 14,851 cf
Routed to Link PDA2 : PROP DETAINED PDA-2

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 88.93' @ 12.15 hrs Surf.Area= 3,147 sf Storage= 5,086 cf

Plug-Flow detention time= 184.0 min calculated for 14,841 cf (97% of inflow)
Center-of-Mass det. time= 168.5 min (907.1 - 738.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	86.99'	1,331 cf	**35.50'W x 88.65'L x 2.76'H Field A** 8,696 cf Overall - 6,035 cf Embedded = 2,661 cf x 50.0% Voids
#2A	87.24'	5,733 cf	**Ferguson R-Tank UD 2** x 688 Inside #1 Inside= 23.6"W x 27.2"H => 4.23 sf x 1.97'L = 8.3 cf Outside= 23.6"W x 27.2"H => 4.46 sf x 1.97'L = 8.8 cf 688 Chambers in 16 Rows
		7,064 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	87.24'	**15.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 87.24' / 87.19' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	87.24'	**2.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	88.20'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.21 cfs @ 12.15 hrs HW=88.93' (Free Discharge)
└**1=Culvert** (Passes 3.21 cfs of 5.24 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.21 cfs @ 6.06 fps)
  └**3=Orifice/Grate** (Orifice Controls 3.01 cfs @ 2.74 fps)

Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK - Chamber Wizard Field A

Chamber Model = Ferguson R-Tank UD 2 (Ferguson R-Tank UD)
Inside= 23.6"W x 27.2"H => 4.23 sf x 1.97'L = 8.3 cf
Outside= 23.6"W x 27.2"H => 4.46 sf x 1.97'L = 8.8 cf

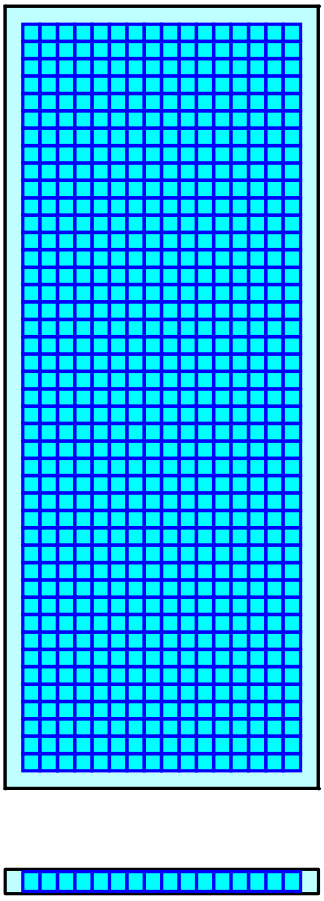
43 Chambers/Row x 1.97' Long = 84.65' Row Length +24.0" End Stone x 2 = 88.65' Base Length
16 Rows x 23.6" Wide + 24.0" Side Stone x 2 = 35.50' Base Width
3.0" Stone Base + 27.2" Chamber Height + 3.0" Stone Cover = 2.76' Field Height

688 Chambers x 8.3 cf = 5,733.5 cf Chamber Storage
688 Chambers x 8.8 cf = 6,035.2 cf Displacement

8,696.4 cf Field - 6,035.2 cf Chambers = 2,661.2 cf Stone x 50.0% Voids = 1,330.6 cf Stone Storage

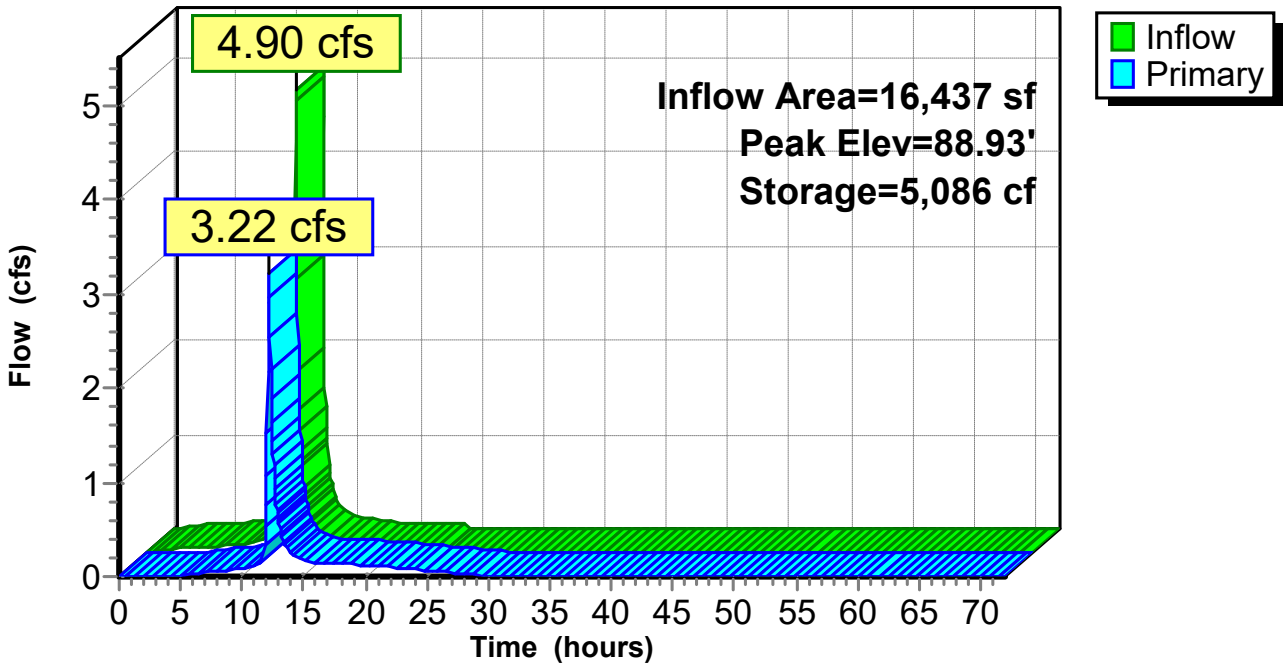
Chamber Storage + Stone Storage = 7,064.1 cf = 0.162 af
Overall Storage Efficiency = 81.2%
Overall System Size = 88.65' x 35.50' x 2.76'

688 Chambers
322.1 cy Field
98.6 cy Stone



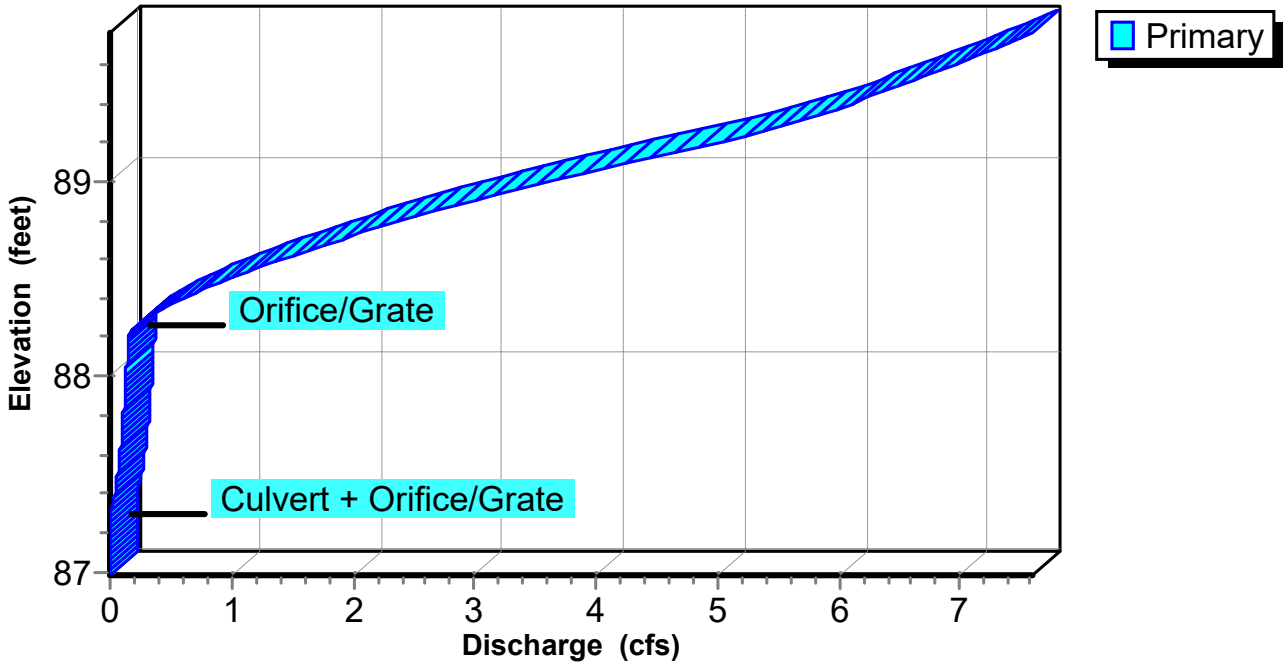
Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

Hydrograph

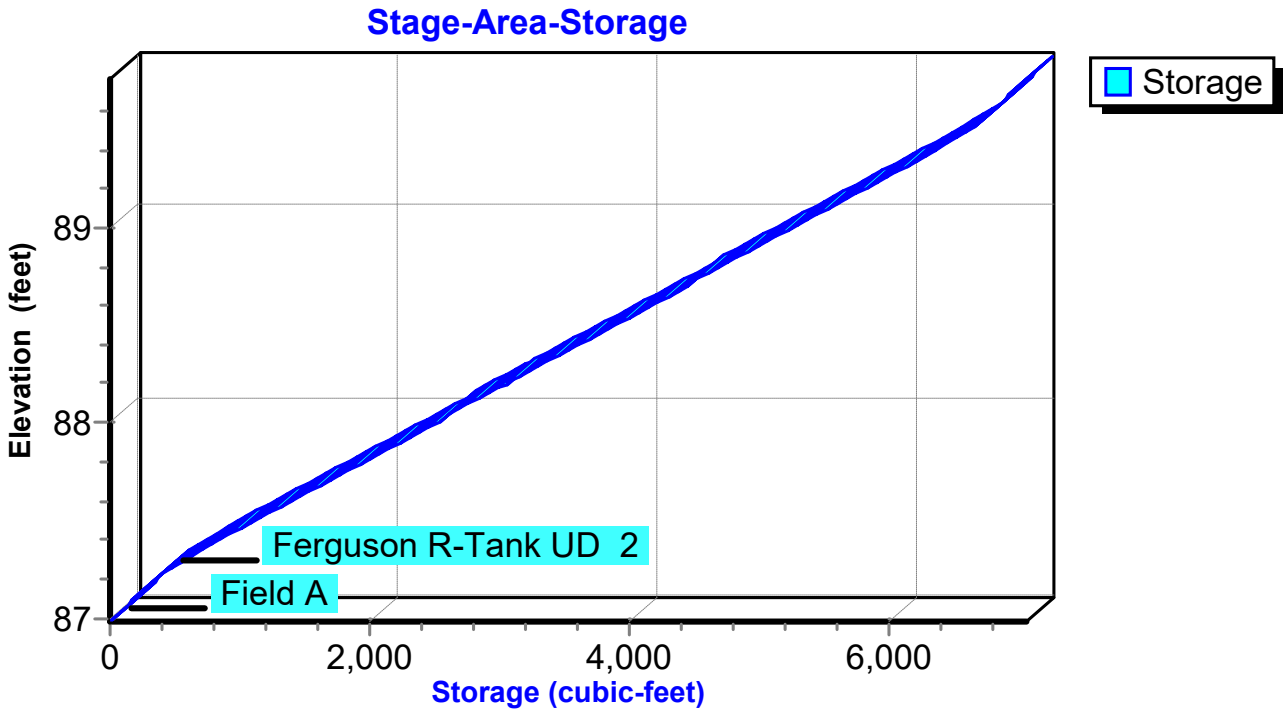


Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

Stage-Discharge



Pond 9P: PERVIOUS PAVEMENT W/ UD2 R-TANK

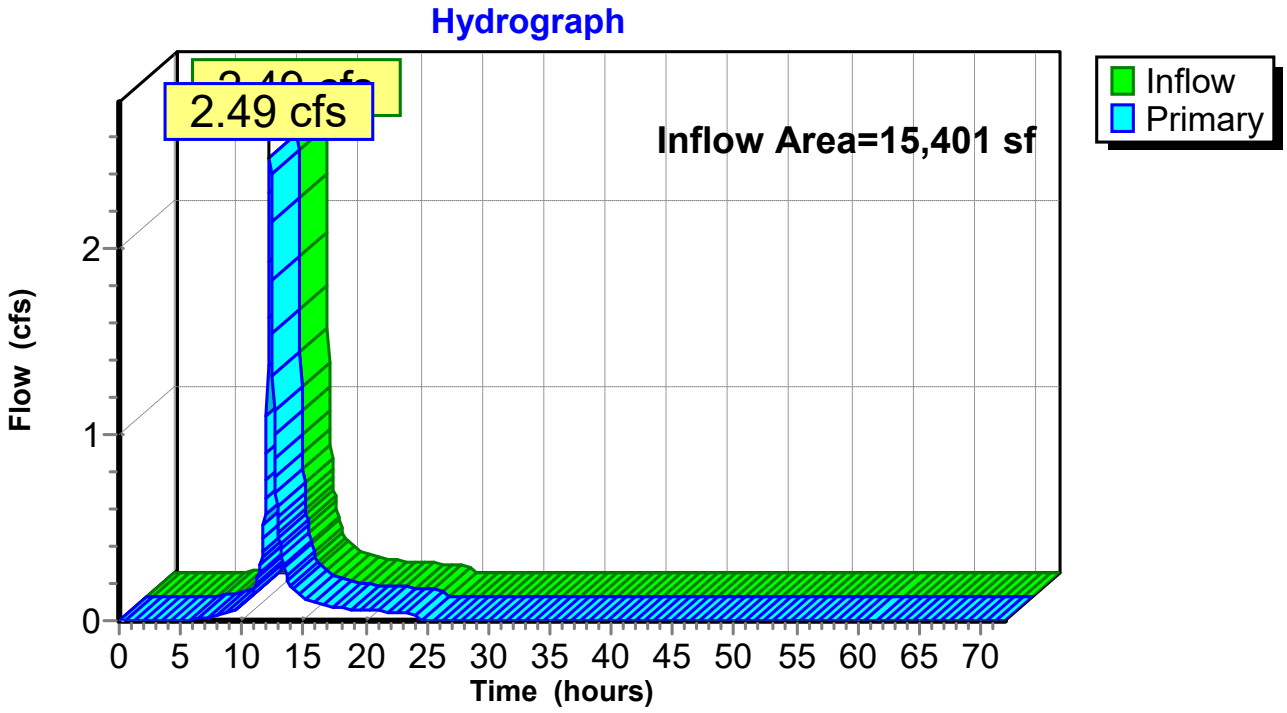


Summary for Link EDA1: EXISTING UNDETAINED EDA-1

Inflow Area = 15,401 sf, 5.21% Impervious, Inflow Depth = 8.43" for 100-Year-Projected event
Inflow = 2.49 cfs @ 12.26 hrs, Volume= 10,821 cf
Primary = 2.49 cfs @ 12.26 hrs, Volume= 10,821 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 3L

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

Link EDA1: EXISTING UNDETAINED EDA-1

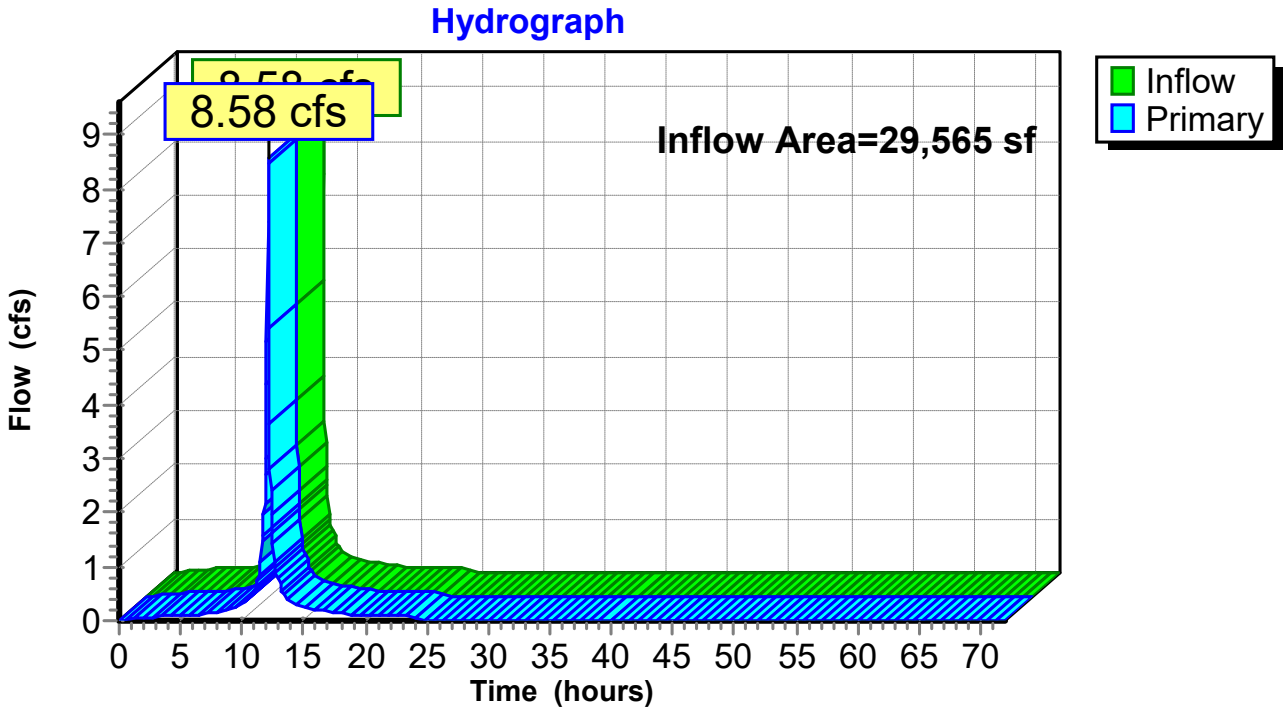


Summary for Link EDA2: EXISTING DETAINED EDA-2

Inflow Area = 29,565 sf, 79.87% Impervious, Inflow Depth = 10.76" for 100-Year-Projected event
Inflow = 8.58 cfs @ 12.09 hrs, Volume= 26,512 cf
Primary = 8.58 cfs @ 12.09 hrs, Volume= 26,512 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node BDA2

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

Link EDA2: EXISTING DETAINED EDA-2

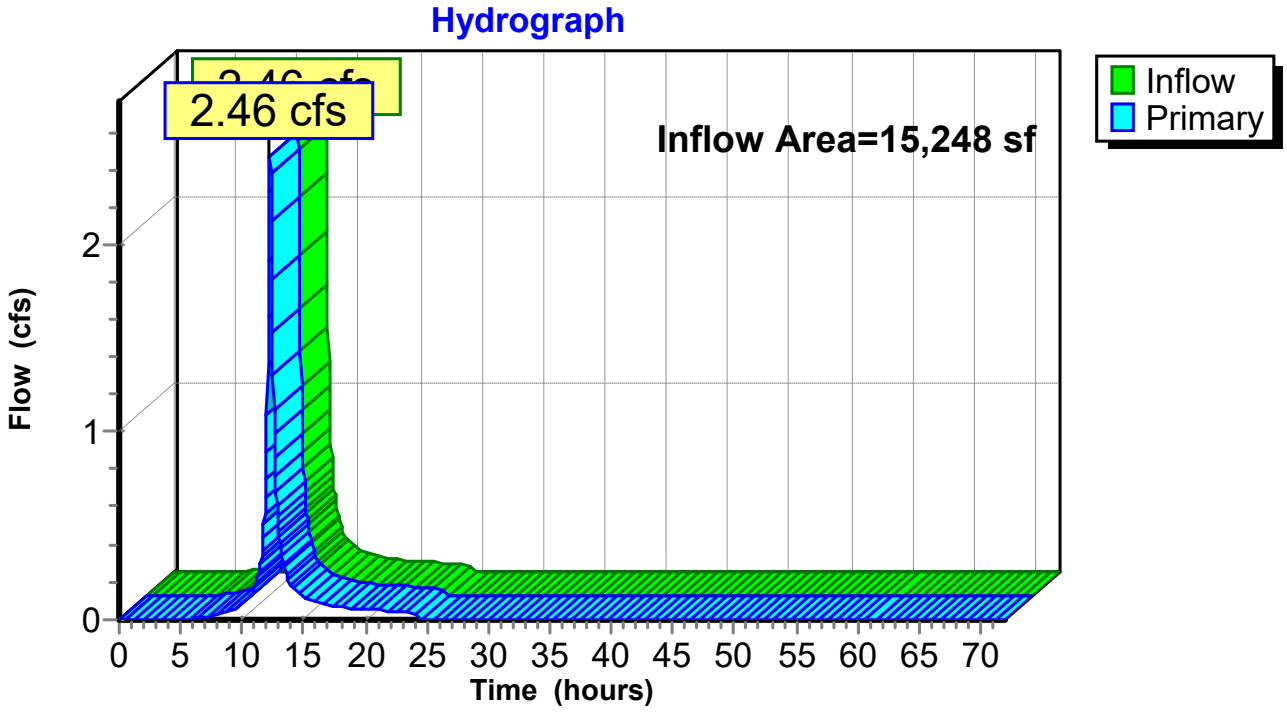


Summary for Link PDA1: PROP UNDETAINED PDA-1

Inflow Area = 15,248 sf, 5.21% Impervious, Inflow Depth = 8.43" for 100-Year-Projected event
Inflow = 2.46 cfs @ 12.26 hrs, Volume= 10,713 cf
Primary = 2.46 cfs @ 12.26 hrs, Volume= 10,713 cf, Atten= 0%, Lag= 0.0 min

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

Link PDA1: PROP UNDETAINED PDA-1

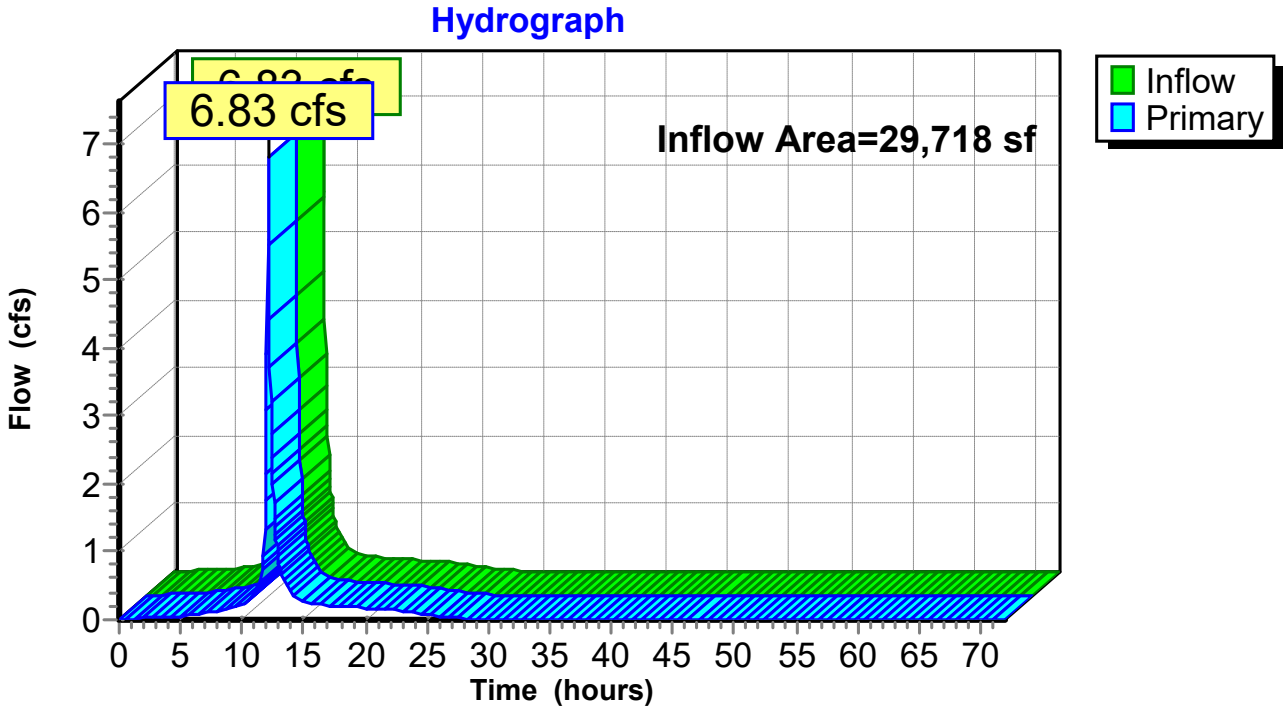


Summary for Link PDA2: PROP DETAINED PDA-2

Inflow Area = 29,718 sf, 85.98% Impervious, Inflow Depth = 10.79" for 100-Year-Projected event
Inflow = 6.83 cfs @ 12.10 hrs, Volume= 26,720 cf
Primary = 6.83 cfs @ 12.10 hrs, Volume= 26,720 cf, Atten= 0%, Lag= 0.0 min

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

Link PDA2: PROP DETAINED PDA-2

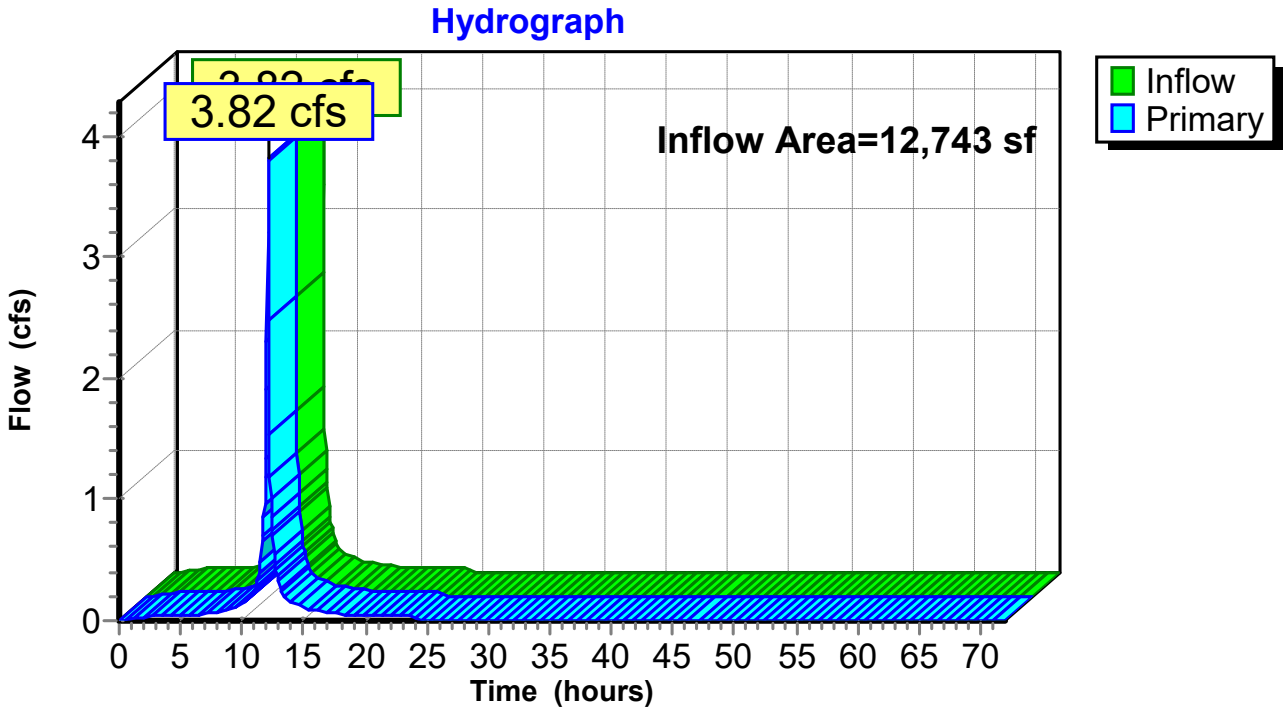


Summary for Link PDA2A: PROP DETAINED PDA-2A

Inflow Area = 12,743 sf, 89.52% Impervious, Inflow Depth = 11.06" for 100-Year-Projected event
Inflow = 3.82 cfs @ 12.09 hrs, Volume= 11,747 cf
Primary = 3.82 cfs @ 12.09 hrs, Volume= 11,747 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 9P : PERVIOUS PAVEMENT W/ UD2 R-TANK

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

Link PDA2A: PROP DETAINED PDA-2A

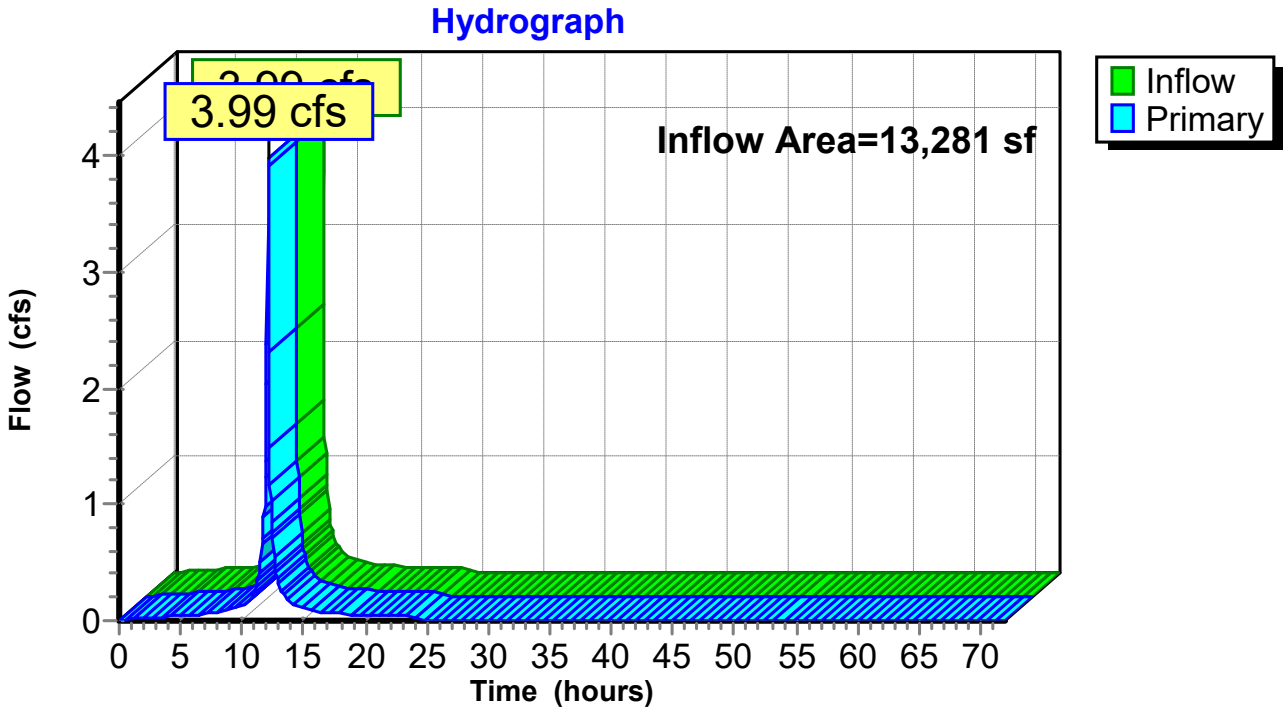


Summary for Link PDA2C: PROP DETAINED PDA-2C

Inflow Area = 13,281 sf, 78.68% Impervious, Inflow Depth = 10.72" for 100-Year-Projected event
Inflow = 3.99 cfs @ 12.09 hrs, Volume= 11,868 cf
Primary = 3.99 cfs @ 12.09 hrs, Volume= 11,868 cf, Atten= 0%, Lag= 0.0 min
Routed to Link PDA2 : PROP DETAINED PDA-2

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

Link PDA2C: PROP DETAINED PDA-2C



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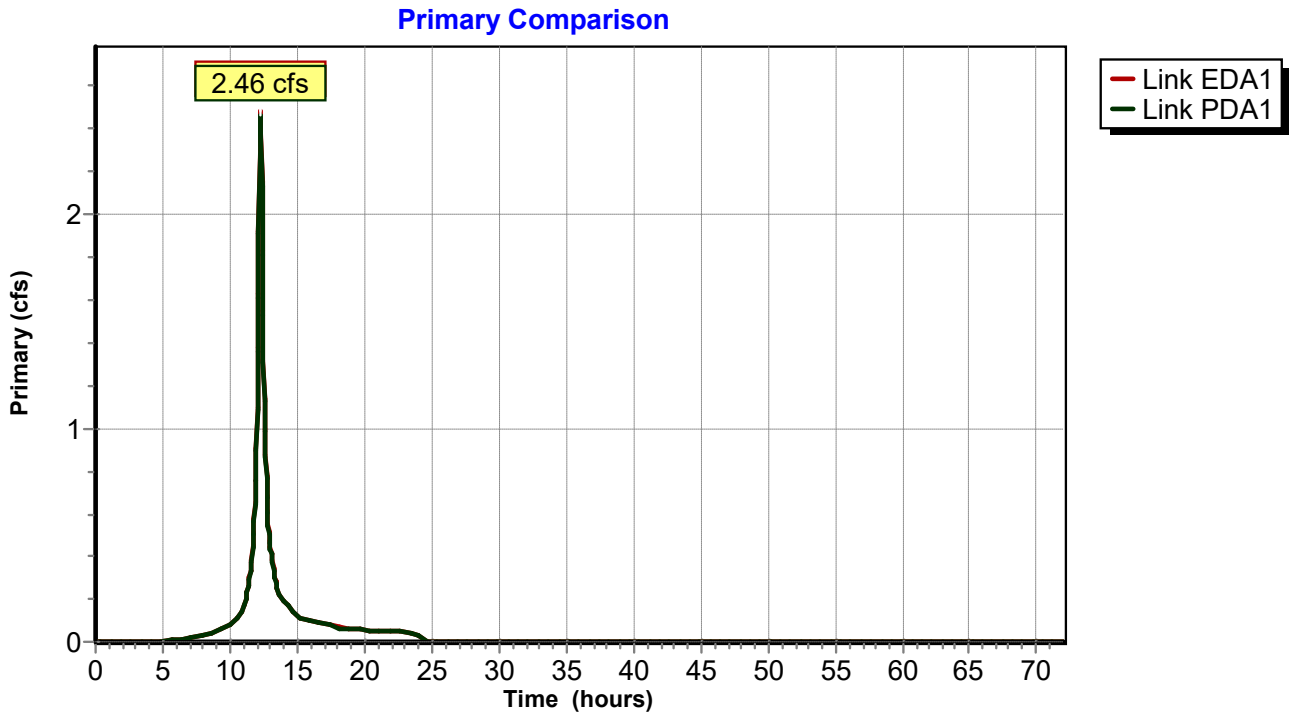

Primary Comparison
2.46 cfs
Link EDA1
Link PDA1
Primary (cfs)
0
1
2
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Time (hours)

Primary Comparison

Time (hours)	Link EDA1 (cfs)	Link PDA1 (cfs)	Time (hours)	Link EDA1 (cfs)	Link PDA1 (cfs)	Time (hours)	Link EDA1 (cfs)	Link PDA1 (cfs)
0.00	0.00	0.00	26.00	0.00	0.00	52.00	0.00	0.00
0.50	0.00	0.00	26.50	0.00	0.00	52.50	0.00	0.00
1.00	0.00	0.00	27.00	0.00	0.00	53.00	0.00	0.00
1.50	0.00	0.00	27.50	0.00	0.00	53.50	0.00	0.00
2.00	0.00	0.00	28.00	0.00	0.00	54.00	0.00	0.00
2.50	0.00	0.00	28.50	0.00	0.00	54.50	0.00	0.00
3.00	0.00	0.00	29.00	0.00	0.00	55.00	0.00	0.00
3.50	0.00	0.00	29.50	0.00	0.00	55.50	0.00	0.00
4.00	0.00	0.00	30.00	0.00	0.00	56.00	0.00	0.00
4.50	0.00	0.00	30.50	0.00	0.00	56.50	0.00	0.00
5.00	0.00	0.00	31.00	0.00	0.00	57.00	0.00	0.00
5.50	0.01	0.01	31.50	0.00	0.00	57.50	0.00	0.00
6.00	0.01	0.01	32.00	0.00	0.00	58.00	0.00	0.00
6.50	0.01	0.01	32.50	0.00	0.00	58.50	0.00	0.00
7.00	0.02	0.02	33.00	0.00	0.00	59.00	0.00	0.00
7.50	0.02	0.02	33.50	0.00	0.00	59.50	0.00	0.00
8.00	0.03	0.03	34.00	0.00	0.00	60.00	0.00	0.00
8.50	0.04	0.04	34.50	0.00	0.00	60.50	0.00	0.00
9.00	0.05	0.05	35.00	0.00	0.00	61.00	0.00	0.00
9.50	0.06	0.06	35.50	0.00	0.00	61.50	0.00	0.00
10.00	0.08	0.08	36.00	0.00	0.00	62.00	0.00	0.00
10.50	0.11	0.11	36.50	0.00	0.00	62.50	0.00	0.00
11.00	0.17	0.17	37.00	0.00	0.00	63.00	0.00	0.00
11.50	0.31	0.31	37.50	0.00	0.00	63.50	0.00	0.00
12.00	**1.09**	**1.08**	38.00	0.00	0.00	64.00	0.00	0.00
12.50	**1.32**	**1.30**	38.50	0.00	0.00	64.50	0.00	0.00
13.00	0.44	0.44	39.00	0.00	0.00	65.00	0.00	0.00
13.50	0.26	0.26	39.50	0.00	0.00	65.50	0.00	0.00
14.00	0.18	0.18	40.00	0.00	0.00	66.00	0.00	0.00
14.50	0.15	0.15	40.50	0.00	0.00	66.50	0.00	0.00
15.00	0.13	0.12	41.00	0.00	0.00	67.00	0.00	0.00
15.50	0.11	0.10	41.50	0.00	0.00	67.50	0.00	0.00
16.00	0.10	0.10	42.00	0.00	0.00	68.00	0.00	0.00
16.50	0.09	0.09	42.50	0.00	0.00	68.50	0.00	0.00
17.00	0.08	0.08	43.00	0.00	0.00	69.00	0.00	0.00
17.50	0.07	0.07	43.50	0.00	0.00	69.50	0.00	0.00
18.00	0.07	0.07	44.00	0.00	0.00	70.00	0.00	0.00
18.50	0.06	0.06	44.50	0.00	0.00	70.50	0.00	0.00
19.00	0.06	0.06	45.00	0.00	0.00	71.00	0.00	0.00
19.50	0.06	0.06	45.50	0.00	0.00	71.50	0.00	0.00
20.00	0.06	0.06	46.00	0.00	0.00	72.00	0.00	0.00
20.50	0.05	0.05	46.50	0.00	0.00			
21.00	0.05	0.05	47.00	0.00	0.00			
21.50	0.05	0.05	47.50	0.00	0.00			
22.00	0.05	0.05	48.00	0.00	0.00			
22.50	0.05	0.05	48.50	0.00	0.00			
23.00	0.04	0.04	49.00	0.00	0.00			
23.50	0.04	0.04	49.50	0.00	0.00			
24.00	0.04	0.04	50.00	0.00	0.00			
24.50	0.00	0.00	50.50	0.00	0.00			
25.00	0.00	0.00	51.00	0.00	0.00			
25.50	0.00	0.00	51.50	0.00	0.00			

NEW JERSEY GROUNDWATER RECHARGE CALCULATIONS (NJGRS)

New Jersey Groundwater Recharge Spreadsheet Version 2.0 November 2003

Annual Groundwater Recharge Analysis (based on GSR-32)

Select Township ↓	Average Annual P (in)	Climatic Factor
BURLINGTON CO., EVESHAM TWP	45.0	1.42

Project Name:	**Proposed McD**
Description:	**741 NJ 73, Evesham Twp. NJ**
Analysis Date:	**05/09/25**

Pre-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	0.56	Impervious areas	Nixonton	0.0	-
2	0.3055	Open space	Nixonton	12.9	14,275
3	0.1645	Open space	Barclay	10.6	6,328
4					
5					
6					
7	0				
8	0				
9	0				
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	1.0			Total Annual Recharge (in)	Total Annual Recharge (cu-ft)
				5.5	20,603

Post-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	0.6	Impervious areas	Nixonton	0.0	-
2	0.2795	Open space	Nixonton	12.9	13,061
3	0.1505	Open space	Barclay	10.6	5,789
4					
5	0				
6	0				
7	0				
8	0				
9	0				
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	1.0			Total Annual Recharge (in)	Total Annual Recharge (cu.ft)
				5.0	18,850

Annual Recharge Requirements Calculation ↓

% of Pre-Developed Annual Recharge to Preserve =	100%	Total Impervious Area (sq.ft)
		26,136
Post-Development Annual Recharge Deficit=	***1,753***	(cubic feet)

Recharge Efficiency Parameters Calculations (area averages)

RWC=	5.04	(in)	DRWC=	0.25	(in)
ERWC =	1.46	(in)	EDRWC=	0.07	(in)

Procedure to fill the Pre-Development and Post-Development Conditions Tables

For each land segment, first enter the area, then select TR-55 Land Cover, then select Soil. Start from the top of the table and proceed downward. Don't leave blank rows (with A=0) in between your segment entries. Rows with A=0 will not be displayed or used in calculations. For impervious areas outside of standard lots select "Impervious Areas" as the Land Cover. Soil type for impervious areas are only required if an infiltration facility will be built within these areas.

Project Name	Description	Analysis Date	BMP or LID Type
Proposed McD	741 NJ 73, Evesham Twp. NJ	05/09/25	Drywell

Recharge BMP Input Parameters

Parameter	Symbol	Value	Unit
BMP Area	ABMP	20.0	sq.ft
BMP Effective Depth, this is the design variable	dBMP	24.0	in
Upper level of the BMP surface (negative if above ground)	dBMPu	24.0	in
Depth of lower surface of BMP, must be>=dBMPu	dEXC	48.0	in
Post-development Land Segment Location of BMP , Input Zero if Location is distributed or undetermined	SegBMP	1	unitless

Root Zone Water capacity Calculated Parameters

Parameter	Symbol	Value	Unit
Empty Portion of RWC under Post-D Natural Recharge	ERWC	1.27	in
ERWC Modified to consider dEXC	EDRWC	0.00	in
Empty Portion of RWC under Infilt. BMP	RERWC	0.00	in

Recharge Design Parameters

Parameter	Symbol	Value	Unit
Inches of Runoff to capture	Qdesign	0.04	in
Inches of Rainfall to capture	Pdesign	0.09	in
Recharge Provided Avg. over Imp. Area		1.5	in
Runoff Captured Avg. over imp. Area		1.5	in

BMP Calculated Size Parameters

ABMP/Aimp	Aratio	0.00	unitless
BMP Volume	VBMP	40	cu.ft

CALCULATION CHECK MESSAGES

Volume Balance-> Solve Problem to satisfy Annual Recharge
dBMP Check---> OK
dEXC Check---> OK
BMP Location---> OK

Parameters from Annual Recharge Worksheet

Post-D Deficit Recharge (or desired recharge volume)	Vdef	1,753	cu.ft
Post-D Impervious Area (or target Impervious Area)	Aimp	26,136	sq.ft
Root Zone Water Capacity	RWC	4.38	in
RWC Modified to consider dEXC	DRWC	0.00	in
Climatic Factor	C-factor	1.42	no units
Average Annual P	Pavg	45.0	in
Recharge Requirement over Imp. Area	dr	0.8	in

System Performance Calculated Parameters

Annual BMP Recharge Volume		3,160	cu.ft
Avg BMP Recharge Efficiency		100.0%	Represents % Infiltration Recharged
%Rainfall became Runoff		77.8%	%
%Runoff Infiltrated		4.1%	%
%Runoff Recharged		4.1%	%
%Rainfall Recharged		3.2%	%

OTHER NOTES

Pdesign is accurate only after BMP dimensions are updated to make rech volume= deficit volume. The portion of BMP infiltration prior to filling and the area occupied by BMP are ignored in these calculations. Results are sensetive to dBMP, make sure dBMP selected is small enough for BMP to empty in less than 3 days. For land Segment Location of BMP if you select "impervious areas" RWC will be minimal but not zero as determined by the soil type and a shallow root zone for this Land Cover allowing consideration of lateral flow and other losses.

How to solve for different recharge volumes: By default the spreadsheet assigns the values of total deficit recharge volume "Vdef" and total proposed impervious area "Aimp" from the "Annual Recharge" sheet to "Vdef" and "Aimp" on this page. This allows solution for a single BMP to handle the entire recharge requirement assuming the runoff from entire impervious area is available to the BMP.
To solve for a smaller BMP or a LID-IMP to recharge only part of the recharge requirement, set Vdef to your target value and Aimp to impervious area directly connected to your infiltration facility and then solve for ABMP or dBMP. To go back to the default configuration clik the "Default Vdef & Aimp" button.

STORMWATER COLLECTION SYSTEM CALCULATIONS (PIPE SIZING)

DYNAMIC ENGINEERING

Inlet Area Summary and Average Coefficient (C) Calculations

Project: McDonald's Evesham
Job #: 0114-23-01590
Location: Evesham Township, NJ

Computed By: JA/CS
Checked By: JZ/TD
Date: 5/16/2025

Drainage Area	Impervious Area (sf)	Coefficient (C) Used	Open Space/Woods Area for Soil Group B (SF)	Coefficient (C) Used	Average Coefficient (C) Used	Total Area (SF)	Total Area (acres)
INLET AREA 1	11408	0.95	1335	0.35	0.89	12743	0.29
INLET AREA 2	3694	0.95	0	0.35	0.95	3694	0.08
INLET AREA 3	8569	0.95	1072	0.35	0.88	9641	0.22

DYNAMIC ENGINEERING

Stormwater Collection System Calculations

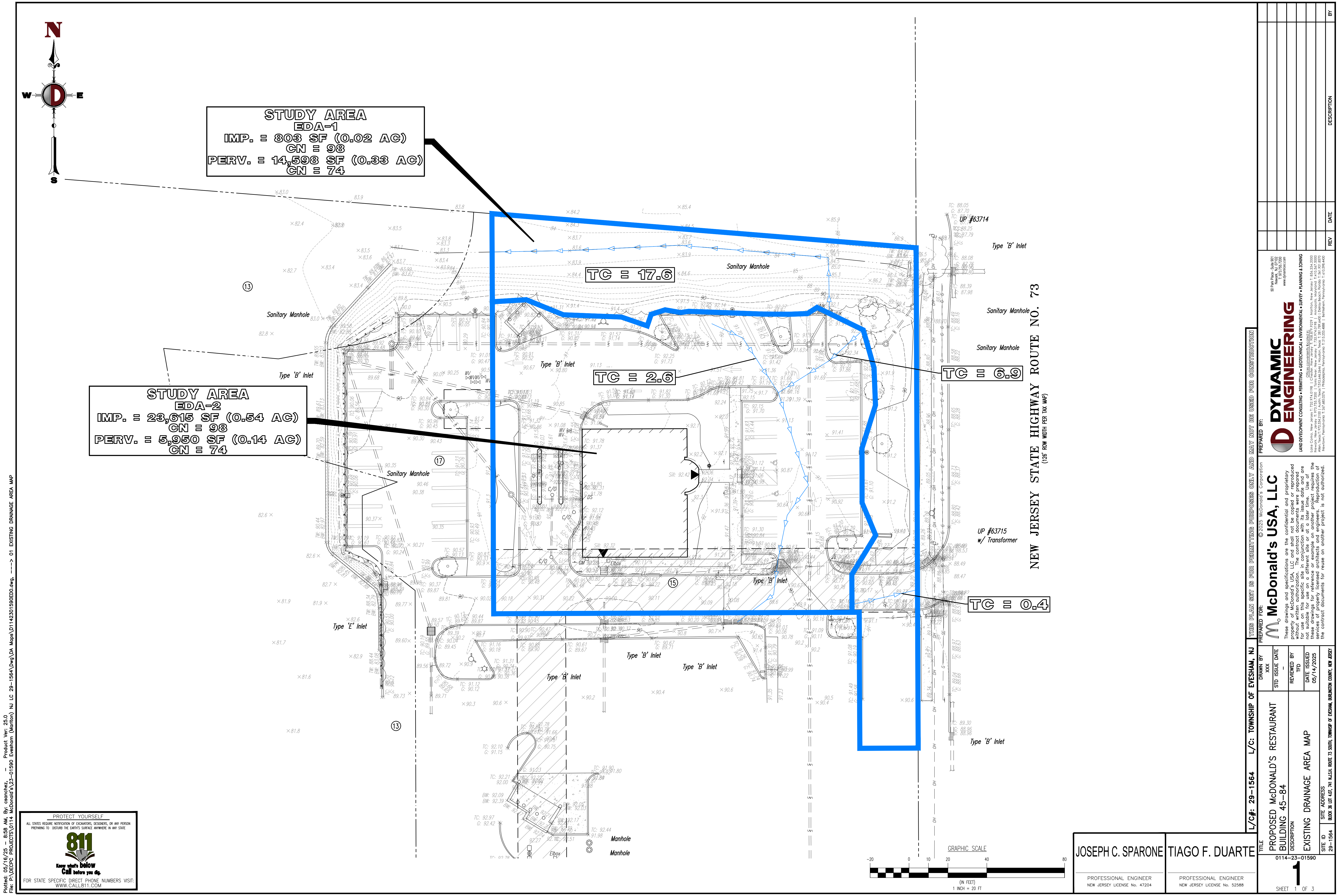
Project: McDonald's Evesham
Job #: 0114-23-01590
Location: 741 NJSH Route 73 South
Evesham, NJ

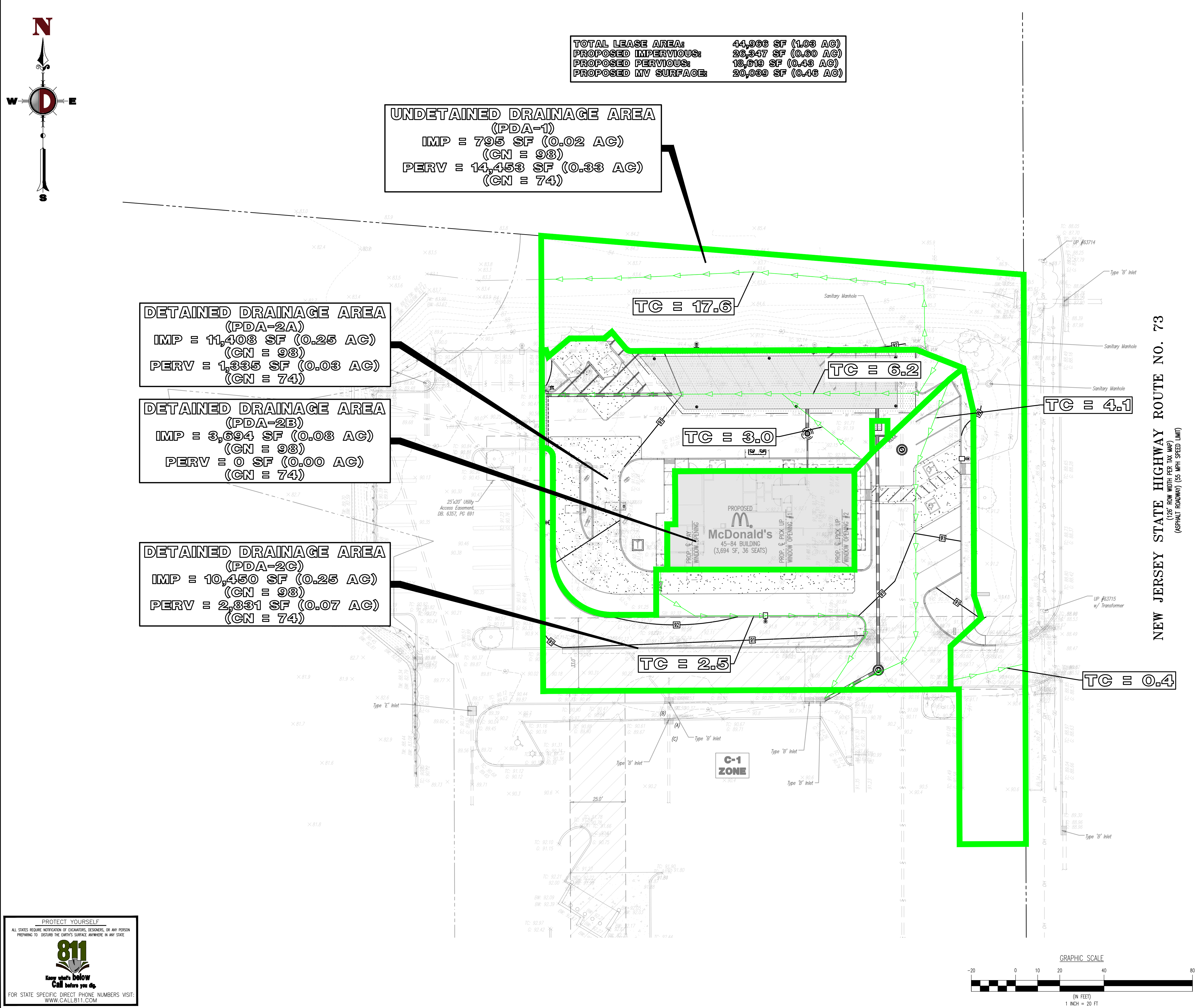
Computed By: JA/CS
Checked By: JZ/TFD
Date: 5/16/2025

NOTES:
1) Design method used is Rational Method
2) Refer to Weighted Runoff Coefficient table for calculation of incremental areas and C values
3) Designed for 100 year storm

PIPE SECTION		SUBCATCHMENT AREA	INCREMENTAL		CUMULATIVE	TIME OF CONCENTRATION			I	PEAK RUNOFF		PIPING INPUT			PIPING DATA			
FROM	TO	Area (Acres)	"C"	A x C Ac	A x C (acres)	Tc to Inlet (min)	Tc in Pipe (min.)	Final Tc (min)	(In/Hr)	Q to Inlet (CFS)	Q cum. for Pipe (CFS)	Dia. (In)	Length (Ft)	Man. "n"	Slope (ft/ft)	Pipe Capacity (cfs)	Full Pipe Velocity (fps)	Actual Pipe Velocity (fps)
ROOF	DRYWELL	0.08	0.95	0.08	0.08	10.00	0.07	10.00	8.00	0.64	0.64	8	17.0	0.012	0.0108	1.36	3.90	3.80
DRYWELL	R TANK	0.00	0.00	0.00	0.08	10.00	0.04	10.07	8.00	0.00	0.64	15	11.0	0.012	0.0071	5.89	4.80	2.05
TRENCH	R TANK	0.29	0.89	0.26	0.26	10.00	0.24	10.00	8.00	2.08	2.08	15	57.0	0.012	0.0050	4.95	4.04	3.74
R TANK	MH #101	0.00	0.00	0.00	0.34	10.00	0.45	10.24	8.00	0.00	2.72	15	110.0	0.012	0.0050	4.95	4.04	4.20
MH #101	INLET B	0.00	0.00	0.00	0.34	10.00	0.12	10.69	7.88	0.00	2.68	15	28.0	0.012	0.0050	4.95	4.04	4.17
INLET B	INLET B2	0.22	0.88	0.19	0.53	10.00	0.23	10.81	7.88	1.50	4.18	15	63.5	0.012	0.0066	5.68	4.63	5.25

DRAINAGE & INLET AREA MAPS


STUDY AREA
EDA-1
IMP. = 803 SF (0.02 AC)
CN = 98
PERV. = 14,598 SF (0.33 AC)
CN = 74
STUDY AREA
EDA-2
IMP. = 23,615 SF (0.54 AC)
CN = 98
PERV. = 5,950 SF (0.14 AC)
CN = 74
TC = 17.6
TC = 2.6
TC = 6.9
TC = 0.4
NEW JERSEY STATE HIGHWAY ROUTE NO. 73
(126' ROW WIDTH PER TAX MAP)
Sanitary Manhole
Type 'B' Inlet
Type 'E' Inlet
UP #63714
UP #63715 w/ Transformer
Manhole
GRAPHIC SCALE
(IN FEET)
1 INCH = 20 FT
PROTECT YOURSELF
811
Know what's below. Call before you dig.
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM
JOSEPH C. SPARONE
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE No. 47204
TIAGO F. DUARTE
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE No. 52588
THIS PLAN SET IS FOR PERMITTING PURPOSES ONLY AND MAY NOT BE USED FOR CONSTRUCTION
PREPARED FOR:
McDonald's USA, LLC
PREPARED BY:
DYNAMIC ENGINEERING
L/C#: 29-1564
L/C: TOWNSHIP OF EVESHAM, NJ
PROPOSED McDONALD'S RESTAURANT
BUILDING 45-84
EXISTING DRAINAGE AREA MAP
DATE ISSUED 05/14/2025
0114-23-01590
1
SHEET 1 OF 3



PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
811 Know what's below. Call before you dig.
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Plotted: 05/16/25 – 8:56 AM, By: csanchez, – Product Ver: 25.0
File: P:\DECPC PROJECTS\0114 McDonald's\23-01590 Evesham (Marlton) NJ LC 29-1564\Dwg\DA Maps\D114230159OPD0.dwg, ---> 02 PROPOSED DRAINAGE AREA MAP

JOSEPH C. SPARONE
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE No. 47204

TIAGO F. DUARTE
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE No. 52588

THIS PLAN SET IS FOR PERMITTING PURPOSES ONLY AND MAY NOT BE USED FOR CONSTRUCTION

L/C#: 29-1564 L/C: TOWNSHIP OF EVESHAM, NJ

PREPARED FOR:
McDonald's USA, LLC

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PREPARED BY:
DYNAMIC ENGINEERING
LAND DEVELOPMENT CONSULTING • PERMITTING • GEOTECHNICAL • ENVIRONMENTAL • SURVEY • PLANNING & ZONING

DRAWN BY	XXX
STD ISSUE DATE	–
REVIEWED BY	TFD
DATE ISSUED	05/14/2025

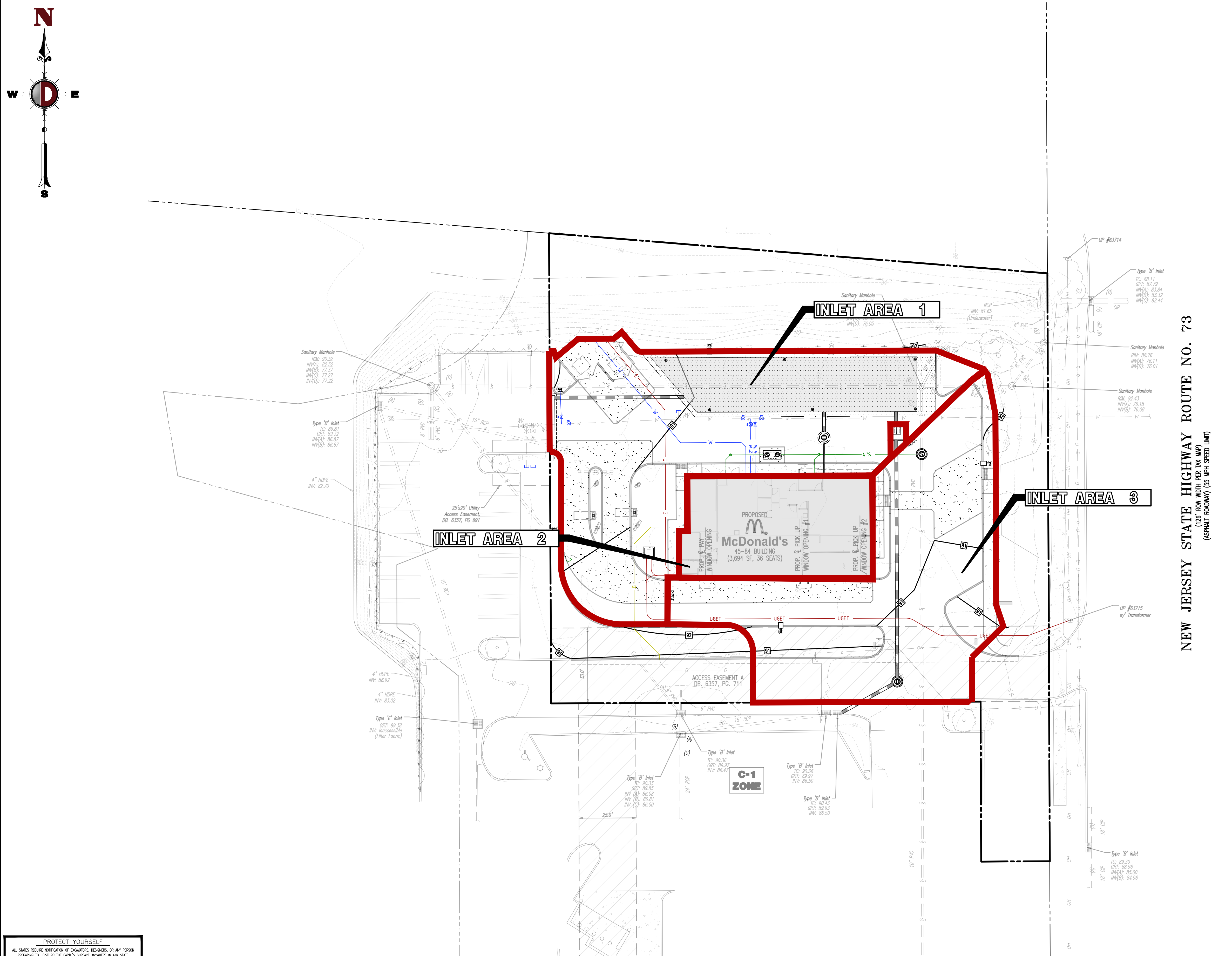
TITLE
PROPOSED McDONALD'S RESTAURANT BUILDING 45-84

DESCRIPTION
PROPOSED DRAINAGE AREA MAP

SITE ID 29-1564
SITE ADDRESS BLOCK 36 LOT 4.07, 741 N.J.S.H. ROUTE 73 SOUTH, TOWNSHIP OF EVESHAM, BURLINGTON COUNTY, NEW JERSEY

0114-23-01590
2
SHEET 2 OF 3

REV	DATE	DESCRIPTION	BY



GRAPHIC SCALE

-20 0 10 20 40 80

(IN FEET)
1 INCH = 20 FT

PROTECT YOURSELF

ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

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File: P:\DECPC PROJECTS\0114 McDonald's\23-01590 Evesham (Marlton) NJ LC 29-1564\Dwg\DA Maps\0114230159000.dwg, ---> 03 INLET AREA MAP

JOSEPH C. SPARONE	TIAGO F. DUARTE
PROFESSIONAL ENGINEER	PROFESSIONAL ENGINEER
NEW JERSEY LICENSE No. 47204	NEW JERSEY LICENSE No. 52588

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L/C#: 29-1564 L/C: TOWNSHIP OF EVESHAM, NJ

PREPARED FOR:

McDonald's USA, LLC

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PREPARED BY:

DYNAMIC ENGINEERING

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Allen, Texas T: 972.534.2100 | Austin, Texas T: 512.646.2646 | Houston, Texas T: 281.789.6400 | Delray Beach, Florida T: 561.266.0500
Newtown, Pennsylvania T: 267.685.0276 | Philadelphia, Pennsylvania T: 215.253.4888 | Bethlehem, Pennsylvania T: 610.598.4400

50 Park Place, Suite 901
Newark, NJ 07102
T: 973.755.7200
www.dynamicec.com

REV	DATE	DESCRIPTION	BY

DRAWN BY	STD ISSUE DATE	REVIEWED BY	DATE ISSUED
XXX	–	TFD	05/14/2025

TITLE
PROPOSED McDONALD'S RESTAURANT BUILDING 45-84

DESCRIPTION
INLET AREA MAP

SITE ID
29-1564

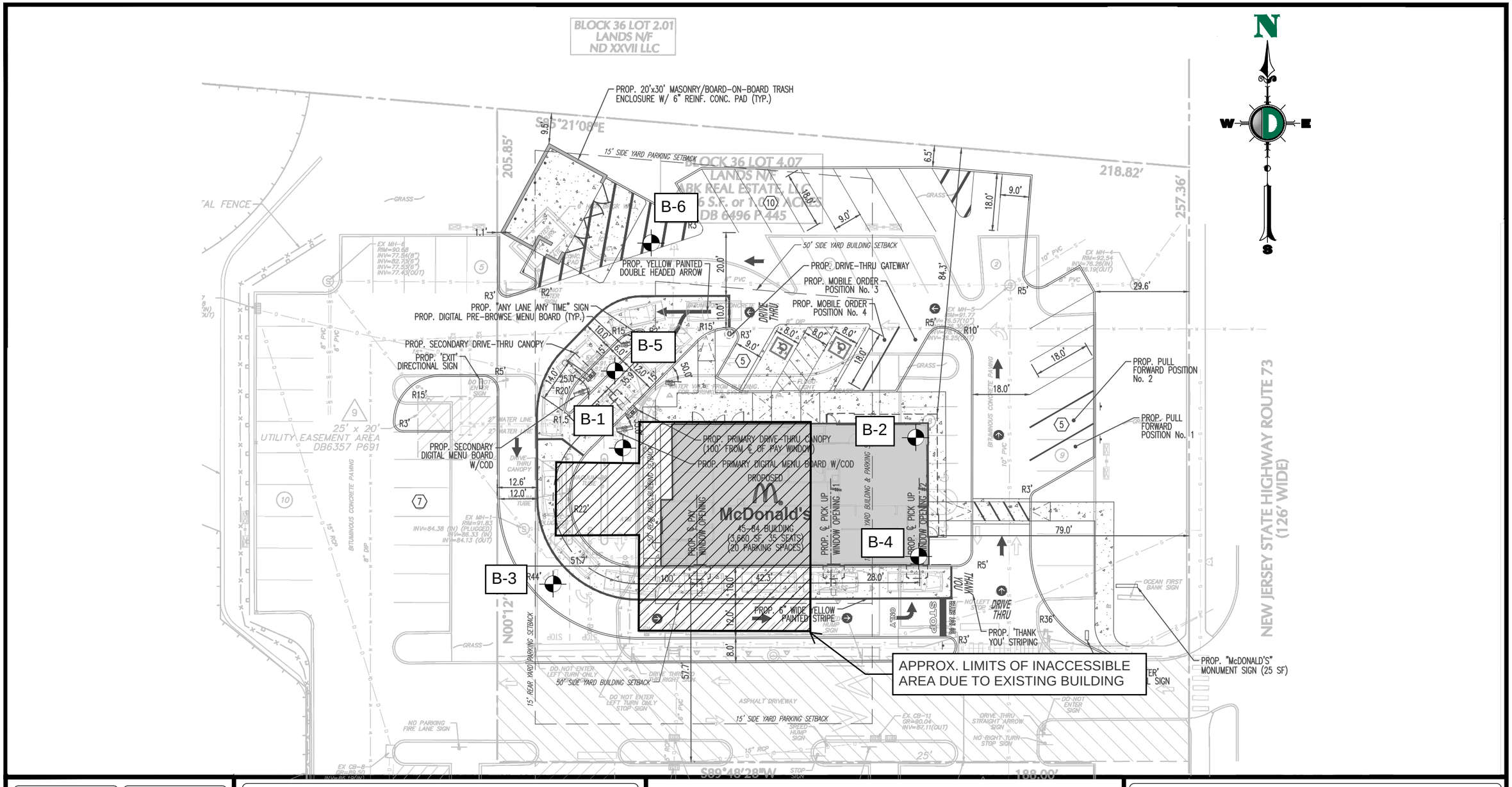
SITE ADDRESS
BLOCK 36 LOT 4.07, 741 N.J.S.H. ROUTE 73 SOUTH, TOWNHSIP OF EVESHAM, BURLINGTON COUNTY, NEW JERSEY

0114-23-01590

3

SHEET 3 OF 3

BORING LOCATION PLAN



SCALE: N.T.S.	JOB No: 0114-23-02695
SHEET No: 1 OF 1	DRAWN BY: KH DESIGNED BY: - CHECKED BY: KH DATE: 8/29/2023

TITLE:

BORING LOCATION PLAN

PROJECT: **MCDONALD'S USA, LLC**
Proposed McDonald's Restaurant #29-1564
741 Route 73 South
Block 36, Lot 4.07
Township of Evesham, Burlington County, New Jersey

Rev. # 0 | DEC Client Code: 0114

LEGEND:

B-X — APPROXIMATE LOCATION OF SOIL BORING

NOTES:
1. THIS PLAN IS NOT FOR CONSTRUCTION AND WAS PREPARED TO ILLUSTRATE TEST LOCATIONS ONLY AND MAY NOT REFLECT THE MOST CURRENT REVISION OF THE BASE PLAN.
2. BASE PLAN OBTAINED FROM A LATEST REVISED AUGUST 15, 2023 *CONCEPT PLAN 'A'* PREPARED BY DYNAMIC ENGINEERING CONSULTANTS, P.C.

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