STONEFIELD

STORMWATER MANAGEMENT REPORT
VILLANI REALTY GROUP

PROPOSED RESIDENTIAL DEVELOPMENT
BLOCK 110, LOTS 2.02 TO 2.13
430 GROVE STREET
NORTH PLAINFIELD
SOMERSET, NEW JERSEY

PREPARED FOR:
PROPOSED RESIDENTIAL DEVELOPMENT

PREPARED BY:
STONEFIELD ENGINEERING & DESIGN, LLC
92 PARK AVENUE
RUTHERFORD, NEW JERSEY

REPORT DATE:
MARCH 18, 2024

LAST REVISED:
MARCH 18, 2024

JOSHUA H. KLINE, PE
NJ PE LICENSE #54347

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED IN THIS DOCUMENT AND ALL ATTACHMENTS AND THAT, BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING AND PREPARING THE INFORMATION, I BELIEVE THAT THE INFORMATION IS TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR KNOWINGLY SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

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REPORT CONTENTS

APPENDICES

1.0 PROJECT DESCRIPTION

Villani Realty Group is proposing to develop Block 110/Lots 2.02 to 2.13, commonly known as 430 Grove Street located along the northern side of Grove Street approximately 350 feet from the intersection with U.S Route 22 (herein referred to as the "project site") to accommodate eight (8) proposed two-family attached housing containing a total of 32 dwelling units. The development will contain 63 parking spaces inclusive of three ADA spaces and nine electric vehicle make-ready parking spaces. Additional improvements include landscaping, utility services, site lighting and stormwater management measures.

The property is located within the Villa Maria Redevelopment Plan. The proposed development has residential uses to the north, west and south and is undeveloped to the east. Access to the site will be provided via one (1) ingress driveway along Grove Street and one (1) egress driveway along Grove Street. Refer to **APPENDIX A** for project maps of the project site.

The project site is 90,048 SF (2.07 acres), the extent of land disturbance is 105,492 SF (2.42 acres), and 59,996 SF (1.38 acres) of new impervious surfaces will be created by the project. In addition, the project proposes the addition of 28,143 SF (0.65 acres) of new motor vehicle surface. The overall drainage area was modeled as 90,048 SF (2.07 acres).

This Report has been prepared to analyze the potential stormwater runoff impacts of the proposed project site and outline proposed measures to conform to the stormwater management regulations set forth by the Borough of North Plainfield, Somerset Union Soil Conservation District, the New Jersey Department of Transportation (NJDOT), the New Jersey Administrative Code NJAC), and the New Jersey Department of Environmental Protection (NJDEP).

2.0 EXISTING CONDITIONS

EXISTING SITE DEVELOPMENT

The project site fronts Grove Street. The project site has been historically developed with a nursing facility including eight (2) two-story buildings and additional improvements such as a full movement driveway, off-street parking lot and walkways that have been removed since July 2020. The existing development on site currently consists of areas with asphalt pavement in poor condition located throughout the property. The project site will be cleared entirely as part of the proposed redevelopment. An Aerial Map depicting the existing site conditions can be found in **APPENDIX A**.

EXISTING TOPOGRAPHY

The high points of the project site are located along the northern property line. General high points range between 168 FT and 162 FT along the northern property line. The low points of the project site are located along the southeastern property line ranging from 122 FT and 119 FT. The overall elevation change across the site is approximately 48.0 FT. Sheet flow within Grove Street drains to the southeast, discharging into the U.S Route 22 stormwater system, which ultimately discharges to Stony Brook. On-site topography slopes to the southeast towards the adjacent undeveloped open space. Grades on site generally range from 3% to 13% within the paved and open space areas.

PROJECT SITE SOILS

Soil mapping was obtained from the National Resource Conservation Service (NRCS) for the project site and immediate area. Generally, the project site is underlain with one major soil group: Dunellen sandy loam. Overall, the soil drains well, and runoff flows overland directly to the adjacent property along the southeast. The table below provides a summary of soils for the project site:

TABLE 1: NRCS SOIL MAPPING RESULTS

Soil Unit Code	Soil Description	Approximate Project Coverage	Drainage Class	Hydrologic Soil Group
DunC	Dunellen Sandy Loam 8% to 15% Slopes	100.0%	Well drained	A

Additional information regarding the NRCS soil mapping can be found in **APPENDIX B**.

A Test Pit Investigation report was performed by Johson Soils Company (report dated October 17, 2023), which consisted of four soil test pits being performed onsite. The soils onsite primarily consisted of topsoil and roots from depths of 0.0 to 2.0 feet below grade. Beneath the surface and fill materials, the native soils generally consisted of red brown silt with some fine sand clay to a depth of 10.0 feet below grade. No ground water was encountered, and no seasonal high-water table was encountered. The table below provides a summary of the tested infiltration rates of the soils for the project site:

TABLE 2: INFILTRATION/PERMEABILITY TEST SUMMARY

Test Pits	USDA Classification @ Test	Depth of Test (fbgs)	In-Situ Rate @ Test (in/hour)
TP-1	Silt	8.5'	0.09
TP-2	Fill	7.5'	0.1
TP-3	Fill	8.0'	0.4
TP-4	Fill	8.0'	0.2

Based on the investigation, no signs of seasonal high groundwater were encountered on site. Due to the tested infiltration rates onsite, it was determined that infiltration practices would not be practical for this site. Refer to **APPENDIX B** for the full Geotechnical Investigation.

WATERSHED / RECEIVING WATERS – TMDL DESIGNATION

Under existing conditions, the site drains overland towards the southeastern property line. The watershed for the development is part of the Lower Raritan, South River and Lawrence Watershed (Region 2, Area 09) as defined by the United States Environmental Protection Agency for Community Waterway Mapping.

EXISTING ENVIRONMENTAL INVENTORY

Based on the effective FEMA flood insurance rate mapping (FEMA Map #34035C0089E issued September 28, 2007), the entirety of the site is not located within the 100-year flood plain. The site is located within Zone X and has a design flood elevation of 116.00 feet. The FEMA Map can be found in **APPENDIX A** of this Report.

There are no federal (US Army Corps of Engineers) and/or state (NJDEP) regulated freshwater wetlands within 900 feet of the project site. Impacts to nearby freshwater wetlands are not anticipated with the proposed development. No records of endangered or threatened species sightings / suitable habitats are located within the vicinity of the proposed improvements.

3.0 PROPOSED CONDITIONS

PROPOSED SITE DEVELOPMENT

The proposed development will consist of eight (8) two-family attached residential buildings (32 units total), 63 off-street parking spaces inclusive of three ADA spaces and nine electric vehicle make-ready parking spaces. Additional improvements include an off-street parking area, pedestrian walkways, lighting, landscaping, utility services, and stormwater conveyance systems. The site will be accessed via one (1) ingress driveway from Grove Street and one (1) egress driveway to Grove Street. Refer to **APPENDIX A** for a half-size Overall Site Plan depicting the proposed project improvements.

PROPOSED TOPOGRAPHY

Project site topography and drainage patterns will generally remain similar to existing conditions; however, due to the need for more residentially friendly, ADA compliant grades (1.0% to 4.5%), raising building finish floors, various retaining walls, ramps and steps will be implemented through the project to make up for the changes in grades.

ANTICIPATED ENVIRONMENTAL INVENTORY IMPACTS

The proposed development will not disturb land within environmentally regulated areas (buffer areas, floodplains, sand dunes areas, floodways, and special flood zones). As such, permits for floodplain development and riparian zone disturbances, freshwater wetland development and transition area disturbance will not be sought from the NJDEP to perform work within these areas.

4.0 STORMWATER MANAGEMENT METHODOLOGY & PARAMETERS

HYDROLOGIC METHODOLOGY

The analysis program "HydroCAD" Version 10.20-3g by HydroCAD Software Solutions was utilized to calculate and plot the runoff hydrographs. The program incorporates the time of concentration, C values, rainfall data, and project drainage areas to calculate the runoff characteristics. The existing and proposed drainage areas have been analyzed utilizing Intensity-Duration-Frequency data obtained from NOAA for the project area; specifics of the rainfall distribution can be found in **APPENDIX C.** Additional key variables utilized in the analysis include:

TABLE 2: HYDROCAD DESIGN VARIABLES

Variable	Input	Variable	Input
Runoff Calculation Method	SCS TR-20	NRCS Rainfall Frequency Data Set	Somerset
Pervious/Impervious CN Calculations	Separate	Storm Intervals (Year Events)	2, 10, 100
Stage-Storage Relationship	Dynamic	Storm Duration	24 Hours
Minimum time of concentration	6 minutes	Storm Curve	NOAA D

Additional information regarding the hydrologic calculations can be found in **APPENDIX C**.

HYDRAULIC METHODOLOGY

The analysis program "HydraFlow Storm Sewers" Version 2020 by Autodesk was utilized to generate hydraulic grade lines through the proposed conveyance system model based on various pipe / junction losses and the runoff tributary to each inlet or discharge structure. Additional key variables utilized in the analysis include:

TABLE 3: HYDRAFLOW DESIGN VARIABLES

Variable	Input	Variable	Input
Runoff Calculation Method	Rational	Pipe Conveyance Method	Std. Step
C-value for impervious surfaces	0.95	Initial Hydraulic Grade Line	Normalized
C-value for pervious surfaces	0.35	Inlet Drainage Area Delineation	Surveyed
Minimum time of concentration	6 minutes	Inlet Geometry & Capacity	NJDOT Std.

Additional information regarding the hydrologic calculations can be found in **APPENDIX C**.

5.0 STORMWATER ANALYSIS

EXISTING DRAINAGE AREAS

Under existing conditions, the site has one (1) ultimate point of interest (POI-1) which is taken as Stony Brook located to the southeast of the project site. This POI was chosen as all existing areas within the property sheet flow towards the southeastern property line which ultimately discharges to Stony Brook. See below for a short summary of this area:

TABLE 4: SUMMARY OF EXISTING DRAINAGE AREAS

Drainage Area	Description	Area Extents	Impervious Area	Time of Concentration
E-1	Existing Drainage Sheet flow to Stony Brook	90,048 SF	13,217 SF	7 Minutes*
POI (E-1)	Ultimate Point of Interest: Stony Brook	**90,048 SF**	**13,217 SF**	N/A

***The minimum time of concentration was utilized due to the high level of impervious coverage and proximity to the corresponding POI (the calculated TOC values were 7.0 minutes (E-1).**

All existing drainage areas were delineated based on field surveying data, a final major subdivision map obtained from the Borough of North Plainfield engineering department, stormwater mapping obtained from the Borough of North Plainfield engineering department, and LiDAR mapping of Grove Street obtained through the National Oceanic and Atmospheric Administration. Hydrologic calculations and parameters for each drainage area can be found in **APPENDIX C**; specific drainage area delineations and land cover can be found in **APPENDIX E.**

PROPOSED DRAINAGE AREAS

Under proposed conditions, the general drainage patterns and ultimate point of interest will be maintained. The intent behind the proposed delineations is to reduce the amount of direct runoff to Grove Street which discharges to the DOT stormwater conveyance system which eventually discharges to Stony Brook within U.S Route 22. The diverted land from these drainage areas is proposed to be sent to various stormwater management features (in P-1A, P-1B, P-1C, P-ID, P-IE, P-IF, P-IG and P-1H) to meet the New Jersey Department of Environmental Protection Stormwater Design Regulations as outlined in the next Report section. See below for a short summary of each area:

TABLE 5: SUMMARY OF PROPOSED DRAINAGE AREAS

Drainage Area	Description	Area Extents	Impervious Area	Time of Concentration
P-1A	Proposed Drainage Direct to Porous Asphalt (PV-8)	10,079 SF	6,231 SF	1.5 Minutes*
P-1B	Proposed Drainage Direct t to Porous Asphalt (PV-7)	10,079 SF	9,136 SF	1.5 Minutes
P-1C	Proposed Drainage Direct to Porous Asphalt (PV-6)	9,669 SF	6,578 SF	1.5 Minutes
P-1D	Proposed Drainage Direct to Porous Asphalt (PV-5)	8,530 SF	6,225 SF	1.5 Minutes
P-1E	Proposed Drainage Direct to Porous Asphalt (PV-4)	9,057 SF	6,533 SF	1.5 Minutes
P-1F	Proposed Drainage Direct to Porous Asphalt (PV-3)	6,983 SF	6,047 SF	1.5 Minutes
P-1G	Proposed Drainage Direct to Porous Asphalt (PV-2)	7,377 SF	6,093 SF	1.5 Minutes
P-1H	Proposed Drainage Direct to Porous Asphalt (PV-1)	13,074 SF	6,894 SF	1.5 Minutes
P-11	Proposed Drainage Direct to Grove Street	15,200 SF	6,259 SF	1.5 Minutes
POI (P-1)	Ultimate Point of Interest: Stony Brook	**90,048 SF**	**59,996 SF**	N/A

***The minimum time of concentration was utilized due to the high level of impervious coverage / land disturbance and proximity to existing and proposed stormwater pipe conveyance systems.**

All proposed drainage areas were delineated based on the proposed grading design overlain on field survey data, a final major subdivision map obtained from the Borough of North Plainfield engineering department, stormwater mapping obtained from the Borough of North Plainfield engineering department, and LiDAR mapping of Grove Street obtained through the National Oceanic and Atmospheric Administration. Hydrologic calculations and parameters for each drainage area can be found in **APPENDIX C**; specific drainage area delineations and land cover can be found in **APPENDIX E.**

STORMWATER MANAGEMENT DESIGN PARAMETERS

The extent of development proposes to disturb more than one acre of land and add more than one-quarter acre of new impervious surfaces, new motor vehicle surfaces, or a combination thereof; as such, the project is considered a Major Development as defined in the Borough of North Plainfield Ordinance and NJAC 7:8-1.2. A Major Development is subject to stormwater quantity, quality, and groundwater recharge requirements. See below for a summary of each design parameter and compliance requirements:

TABLE 6: STORMWATER MANAGEMENT DESIGN TARGET SUMMARY TABLE

Design Parameter	Design Target for Compliance
Stormwater Runoff Quantity	Design stormwater management measures so that the post-construction peak runoff rates for the 2-, 10-, and 100-year storm events are 50, 75 and 80 percent, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed.
Stormwater Runoff Quality	Stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff generated from the water quality storm by 80% of the anticipated load from the developed site, expressed as an annual average.
Groundwater Recharge	The project is **exempt** from groundwater recharge requirements as the project site is located within State Planning Area PA-1 (Metropolitan). Similarly, the project is **exempt** from groundwater recharge requirements as the project site has soils onsite which are deemed unsuitable for infiltration.

STORMWATER RUNOFF QUANTITY

A permeable asphalt system (PV-1) is proposed in the southeastern corner of the proposed parking lot area to attenuate peak stormwater runoff rates to the mandated regulatory levels. Pervious pavement system PV-1 has a surface area of 3,360 SF, an approximate depth stone storage of 8 FT and six rows of embedded Cultec 902HD Recharger chambers with a total height of 48 inches. In The tables below summarize the various drainage areas in relation to flow rates and runoff volume during regulatory storm events:

TABLE 7: SUMMARY OF EXISTING DRAINAGE AREA FLOW RATES

Drainage Area	2-Year Flow Rate	10-Year Flow Rate	100-Year Flow Rate
E-1	4.40 CFS	8.32 CFS	16.77 CFS
POI (E-1)	4.40 CFS	8.32 CFS	16.77 CFS

TABLE 8: SUMMARY OF PROPOSED DRAINAGE AREA FLOW RATES

Drainage Area	2-Year Flow Rate	10-Year Flow Rate	100-Year Flow Rate
P-1A	0.68 CFS	1.13 CFS	2.09 CFS
P-1B	0.78 CFS	1.24 CFS	2.18 CFS
P-1C	0.67 CFS	1.11 CFS	2.03 CFS
P-1D	0.61 CFS	0.99 CFS	1.80 CFS
P-1E	0.64 CFS	1.05 CFS	1.91 CFS
P-1F	0.53 CFS	0.85 CFS	1.50 CFS
P-1G	0.55 CFS	0.88 CFS	1.58 CFS
P-1H	0.84 CFS	1.43 CFS	2.68 CFS
P-1I	0.92 CFS	1.60 CFS	3.06 CFS
POI (P-1)	2.10 CFS	5.09 CFS	10.60 CFS

Under post-development conditions the runoff flow rates and volumes have been reduced from existing conditions for all drainage areas that flow through the development area. The diverted runoff from these areas is collected in the on-site stormwater management system for runoff attenuation and water quality treatment. The table below outlines the regulatory compliance parameters for runoff quantity on the project site:

TABLE 9: STORMWATER RUNOFF QUANTITY COMPLIANCE SUMMARY (E-1 / P-1)

Rainfall Event	Existing Flow Rate	Required % Reduction	Proposed Flow Rate	Proposed % Reduction
2-Year Storm	4.40 CFS	50%	2.10 CFS	52.27%
10-Year Storm	8.32 CFS	25%	5.09 CFS	38.82%
100-Year Storm	16.77 CFS	20%	10.60 CFS	36.79%

The proposed pervious pavement system (PV-1) provides sufficient flow rate attenuation to ensure that no adverse impacts are anticipated downstream of the project site. Detailed hydrologic calculations for each drainage area can be found in **APPENDIX C**.

STORMWATER RUNOFF QUALITY

As a Major Development, all proposed motor vehicle surfaces are subject to stormwater runoff quality requirements. More specifically, proposed motor vehicle surfaces developed over existing vehicular travel surfaces may meet or exceed the existing treatment rates of the existing vehicular travel surfaces and all new motor vehicle surfaces shall be required to remove 80% of total suspended solids. Non-vehicular travel surfaces (building roofs, plaza/amenity areas, sidewalks, etc.) are not subject to runoff quality regulations.

The proposed permeable pavement systems (PV-1, PV-2, PV-3, PV-4, PV-5, PV-6, PV-7 and PV-8) will provide water quality treatment for motor vehicle surfaces. As outlined in the New Jersey Stormwater Best Management Practices Manual, permeable pavement may quality for TSS removal rates up to 80% as long as the additional inflow of the contributory drainage area to surface area of the permeable pavement is a maximum ratio of 3:1 and all motor vehicle surfaces enter the system through the surface course. The systems convey the entirety of the water quality design storm (WQDS) through the stone storage prior to conveyance through underdrain to proposed outlet structure discharging into the proposed stormwater main extension within Grover Stret. The systems conform to the requirements for the loading ratio set forth in Chapter 9.6 – Pervious Paver Systems of the New Jersey Stormwater Best Management Practices (NJDEP BMP) Manual as shown in the following table:

TABLE 10: PERVIOUS PAVEMENT TSS REMOVAL EFFICIENCIES

Stormwater BMP Facility	NJDEP Certified Removal Efficiency	Amount of Porous Pavement Area (SF)	Drainage Area to be Treated (SF)	Loading Ratio
Pervious Pavement System (PV-1, PV-2, PV-3, PV-4, PV-5, PV-6, PV-7, PV-8)	80%	21,000	74,848	1.71:1

The proposed permeable pavement systems (PV-1, PV-2, PV-3, PV-4, PV-5, PV-6, PV-7 and PV-8) have been designed in accordance with NJDEP BMP regulations and has been designed with a 3" underdrain due to the lack of infiltration onsite caused by poor soil conditions. The proposed permeable pavement systems are designed to retain the water quality design storm and therefore meets NJDEP requirements for 80% TSS treatment.

The proposed treatment design will exceed the regulatory requirements for stormwater runoff quality and ensure that runoff discharged into the unnamed tributary will not have any adverse effects on downstream waterways and environs. The Water Quality Weighted Average Map can be found in **APPENDIX E.**

GROUNDWATER RECHARGE

As indicated in the Borough of North Plainfield Ordinances and NJAC 7:8-5.4, the project site is **exempt** from groundwater recharge requirements as the site is located within the Metropolitan Planning Area (PA-1) per the State Plan Policy Map and thus qualifies as an Urban Redevelopment Area (which is exempt from groundwater recharge requirements).

STORMWATER PIPE CONVEYANCE SYSTEM

The on-site stormwater conveyance system has been sized for the 25-year storm event and is able to safely convey runoff to the proposed stormwater management facilities without overflow or bypass. Detailed hydraulic calculations for the conveyance system can be found in **APPENDIX C**. See below for a table summarizing the various drainage areas during the 25-year storm event:

TABLE 13: SUMMARY OF 25-YEAR STORM (FOR DRAINAGE DIRECT TO PUBLIC ROW OR TRIBUTARY)

Tributary Area	Existing Flow Rate	Proposed Flow Rate	Flow Rate Difference	Existing Volume	Proposed Volume	Volume Difference
Drainage Direct to Grove Street (E-1 / P-1)	10.52 CFS	6.86 CFS	3.66 CFS	31,589 CF	39,365 CF	7,776 CF
Overall Drainage to Point of Interest (E-1/P-1)	**10.52 CFS**	**6.86 CFS**	**3.66 CFS**	**31,589 CF**	**39,365 CF**	**7,776 CF**

Additionally, while the volume of stormwater runoff is increased overall to the ultimate point of interest (due to the increase in impervious coverage on-site) the flow rates are significantly reduced and the proposed stormwater management system and soil erosion features ensure that runoff entering the unnamed tributary is safely conveyed so as to not cause any adverse impacts further downstream.

6.0 STORMWATER FACILITY OPERATIONS & MAINTENANCE

A Stormwater Operations & Maintenance Manual has been submitted for review to the Borough and will be forwarded to the relevant jurisdictional agencies prior to obtaining final land use approvals and permits. Any necessary easements or covenants associated with the stormwater improvements will be recorded prior to the start of construction.

7.0 EROSION & SEDIMENT CONTROL

A Soil Erosion & Sediment Control Plan has been prepared in accordance with the latest edition of the Standards for Soil Erosion and Sediment Control in New Jersey. This plan can be found within the Preliminary & Final Major Site Plans prepared by Stonefield in conjunction with this Report. Proposed temporary measures during construction include silt fencing, stabilized construction entrances, inlet filters, hay bales, and temporary seeding for soil stabilization. No land disturbance will occur until certification and permits have been obtained from the Somerset-Union Soil Conservation District.

8.0 CONCLUSIONS

As demonstrated in this Report, the increase in runoff flow rate and volume generated by the proposed development will be satisfactorily mitigated by the introduction of permeable pavement systems (PV-8) and on-site stormwater conveyance system. Runoff water quality will be impacted by the increase in impervious surfaces and motor vehicle surfaces and permeable pavement systems (PV-1, PV-2, PV-3, PV-4, PV-5, PV-6, PV-7 and PV-8) will provide treatment to remove total suspended solids to a satisfactory regulatory level. The on-site stormwater conveyance system has been designed to suitable convey runoff to all proposed management features and outfall locations.

The proposed project complies with all applicable stormwater management regulations and standards. As such, the project is not anticipated to have any adverse drainage impacts on neighboring properties, downstream watercourses, or adjoining conveyance systems.

9.0 REFERENCES

1. New Jersey Administrative Code Title 7, Chapter 8 Stormwater Management, last amended March 2, 2020

   https://www.nj.gov/dep/rules/rules/njac7_8.pdf

2. New Jersey Stormwater Best Management Practices Manual, last revised March 2, 2020

   https://www.njstormwater.org/bmp_manual2.htm

3. NJDEP Stormwater Manufactured Treatment Device Certification Database

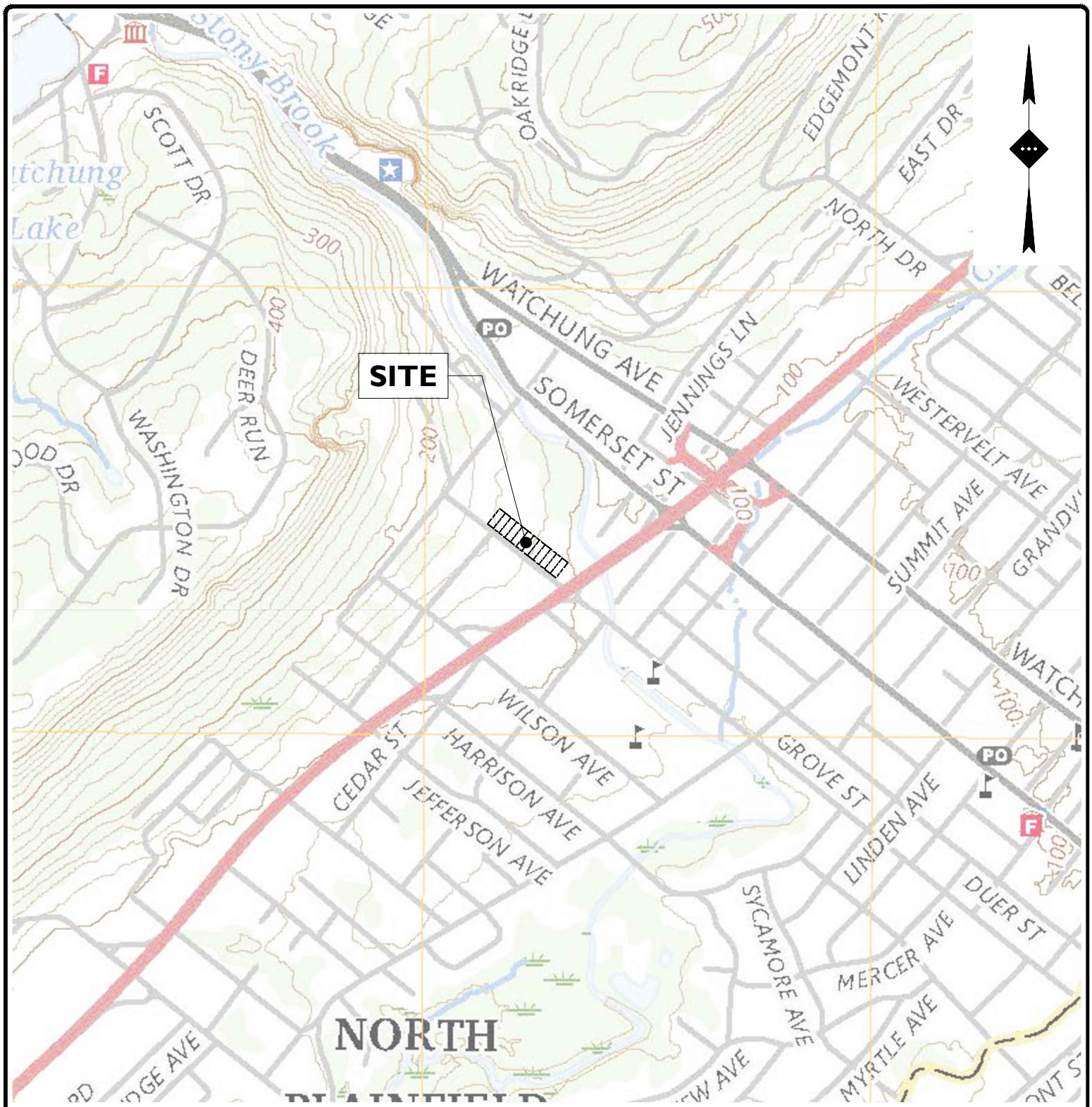
   https://www.nj.gov/dep/stormwater/treatment.html

4. Borough of North Plainfield Land Use Ordinance, adapted on November 27, 2023, along with any amendments made thereto

   https://ecode360.com/35427576#35427576.html

APPENDIX A
PROJECT FIGURES

INVENTORY



USGS QUADRANGLE MAP

1000' 0' 1000' 2000'

GRAPHIC SCALE IN FEET

1"= 1000'

SOURCE: USGS QUADRANGLE MAP, 7.5 MINUTE SERIES, CHATHAM, NJ, DATED 2023 & USGS QUADRANGLE MAP, 7.5 MINUTE SERIES, PLAINFEILD, NJ, DATED 2023

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DATE:	02/26/2024
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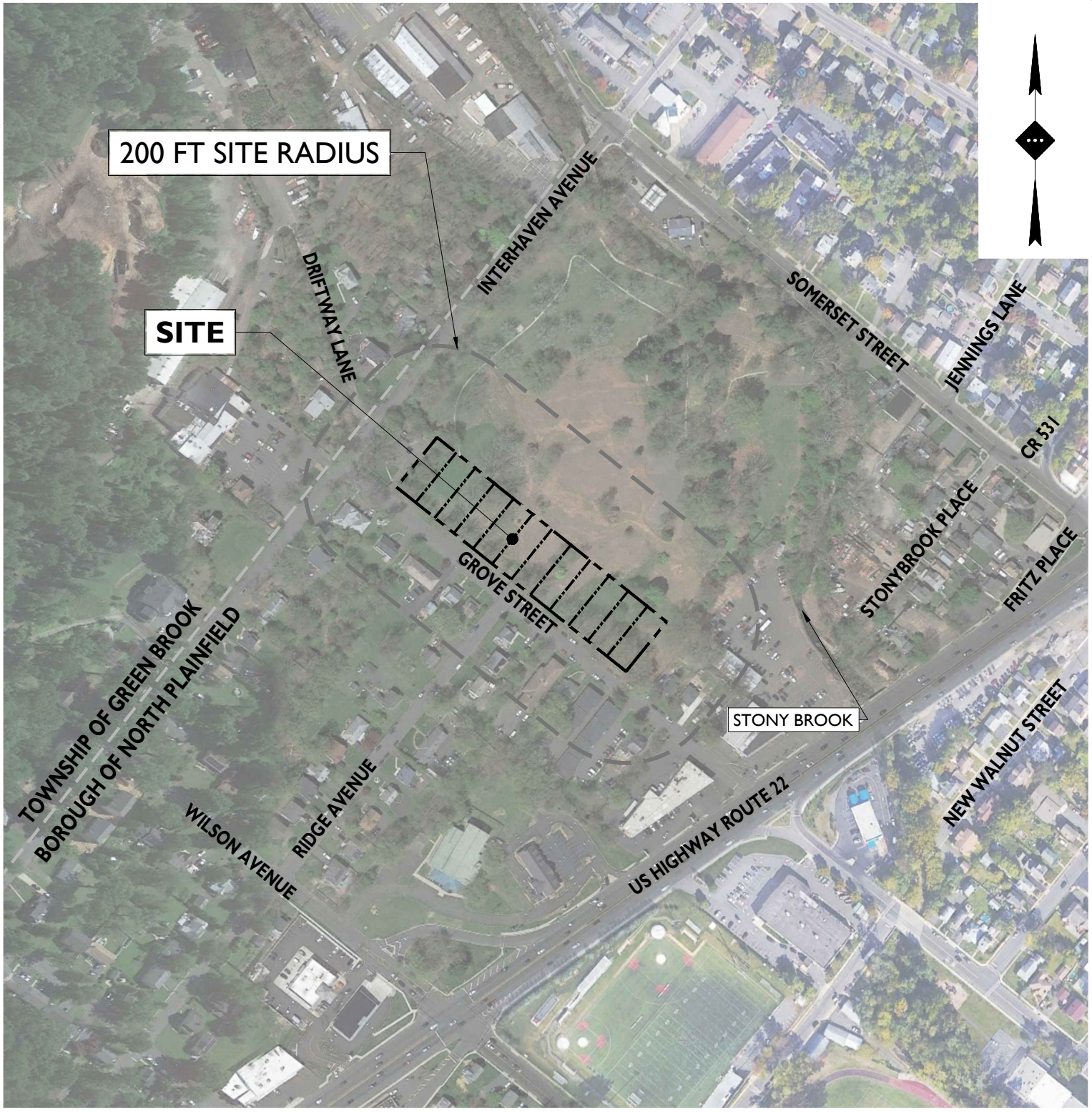

AERIAL MAP

300' 0' 300' 600'

GRAPHIC SCALE IN FEET

1"= 300'

SOURCE: GOOGLE EARTH PRO, IMAGE DATED 06/05/2022, RETRIEVED 10/09/2023

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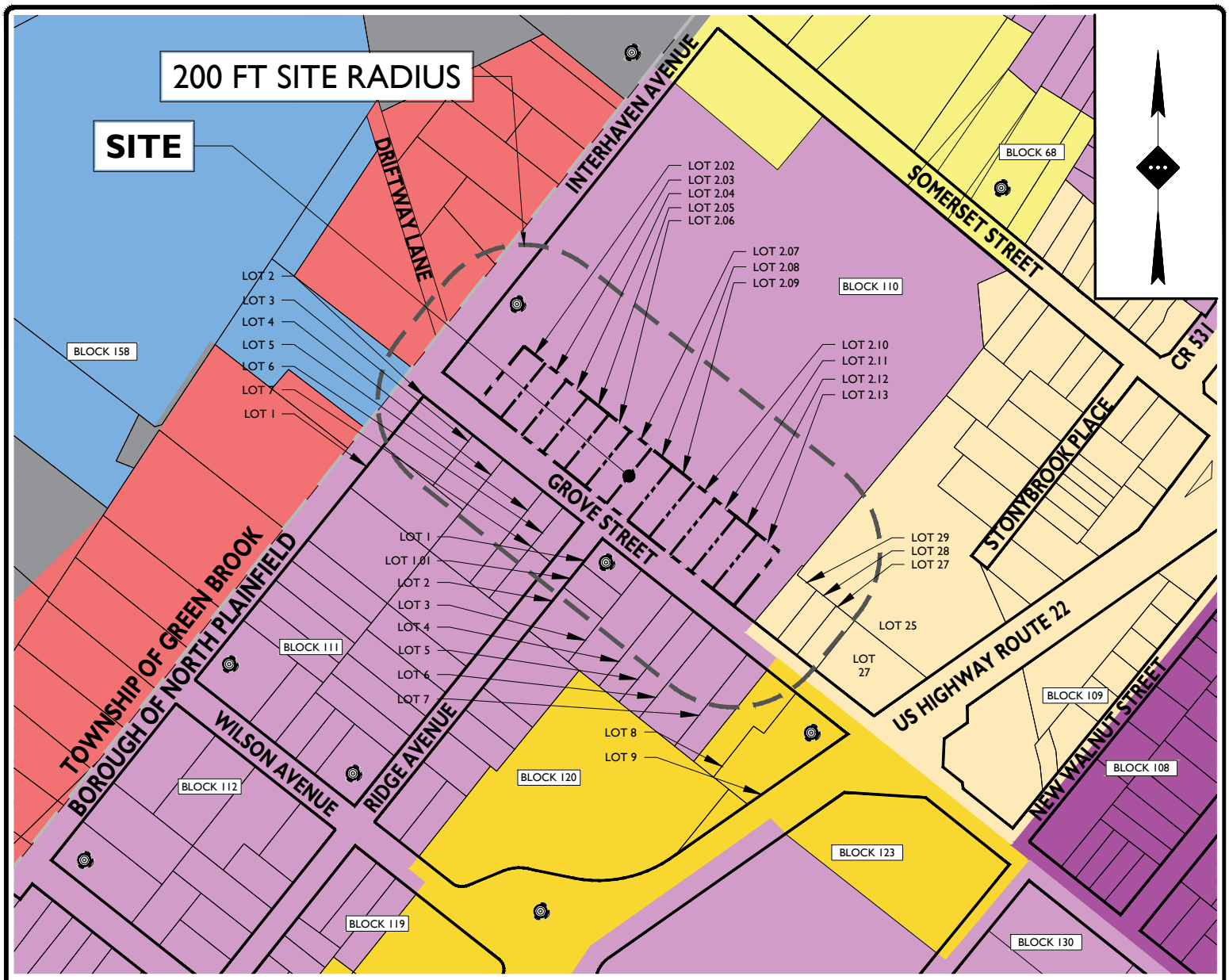

ZONING LEGEND

BOROUGH OF NORTH PLAINFIELD:

- (R-2) RESIDENTIAL ZONE TWO
- (R-3) RESIDENTIAL ZONE THREE
- (B-2A) BUSINESS ZONE TWO A
- (B-2) BUSINESS ZONE TWO
- (B-3) BUSINESS ZONE THREE
- (B-6) BUSINESS ZONE SIX

TOWNSHIP OF GREEN BROOK:

- (AHD-2) AFFORDABLE HOUSING DISTRICT TWO
- (MP) MOUNTAIN PRESERVATION
- (SMD) SPECIAL MOUNTAINSIDE DISTRICT

TAX & ZONING MAP

300' 0' 300' 600'

GRAPHIC SCALE IN FEET

1"= 300'

SOURCE: BOROUGH OF NORTH PLAINFIELD TAX MAP, DATED JANUARY 2007, BOROUGH OF NORTH PLAINFIELD ZONING MAP, DATED JANUARY 2012, TOWNSHIP OF GREEN BROOK TAX MAP, DATED NOVEMBER 2019 & TOWNSHIP OF GREEN BROOK ZONING MAP, DATED JUNE 2019

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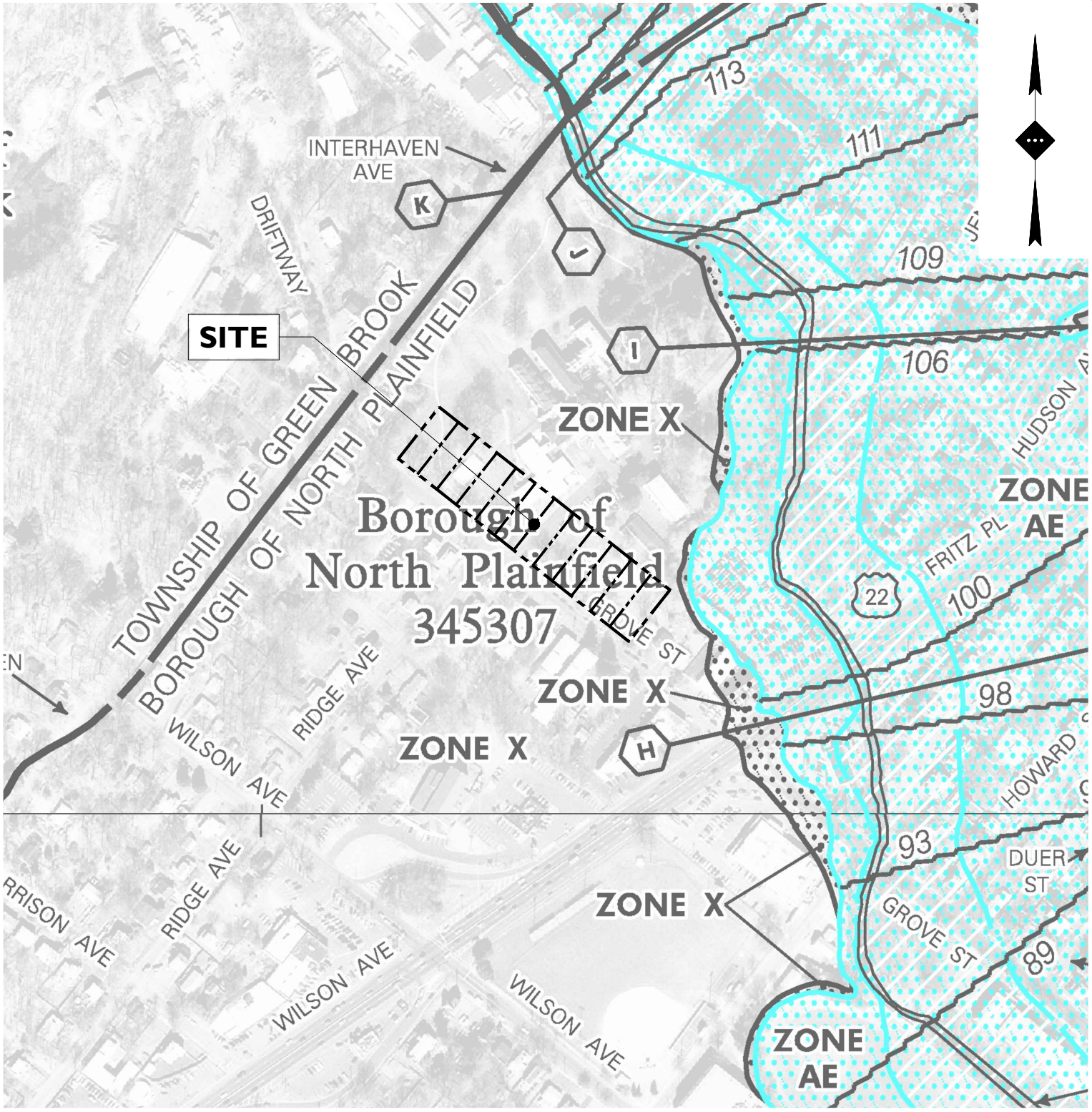


FEMA MAP

300' 0' 300' 600'

GRAPHIC SCALE IN FEET

1"= 300'

SOURCE: FEMA FLOOD INSURANCE MAP, SOMERSET COUNTY, NEW JERSEY, PANEL NUMBERS 34035C0089E AND 34035C0177E MAPS, DATED 09/28/2007

VILLANI REALTY GROUP

PROPOSED RESIDENTIAL DEVELOPMENT

BLOCK 110, LOTS 2.02 TO 2.13
430 GROVE STREET
BOROUGH OF NORTH PLAINFIELD, SOMERSET COUNTY, NEW JERSEY

DRAWN BY:	AMR
CHECKED BY:	SZ
DATE:	02/26/2024
SCALE:	1" = 300'
PROJECT ID:	PRI-230101

STONEFIELD engineering & design

Rutherford, NJ · New York, NY · Boston, MA
Princeton, NJ · Tampa, FL · Detroit, MI
www.stonefieldeng.com

Headquarters: 92 Park Avenue, Rutherford, NJ 07070
Phone 201.340.4468 · Fax 201.340.4472

Z:\Princeton\PRI\2023\PRI-230101 Taylor Architecture - 430 Grove Street, North Plainfield, NJ\CADD\Exhibits\Project Maps\Project Maps.dwg

LAND USE AND ZONING

BLOCK 110, LOTS 2.02 - 2.13

VILLA MARIA REDEVELOPMENT PLAN

PROPOSED USE

MULTIFAMILY DEVELOMENT — PERMITTED USE

ZONING REQUIREMENT	REQUIRED	EXISTING	PROPOSED
MINIMUM LOT AREA	9,000 SF (0.21 AC)	90,048 SF (2.067 AC)	90,048 SF (2.067 AC)
MINIMUM LOT WIDTH	65 FT	140 FT	643.2 FT
MAXIMUM BUILDING HEIGHT	35 FT / 2.5 STORIES(*)(*)	0 FT	BUILDING 1: 30.9 FT / 2 STORIES BUILDING 2: 30.7 FT / 2 STORIES BUILDING 3: 32.0 FT / 2 STORIES BUILDING 4: 31.6 FT / 2 STORIES BUILDING 5: 31.6 FT / 2 STORIES BUILDING 6: 34.2 FT / 2 STORIES BUILDING 7: 34.3 FT / 2 STORIES BUILDING 8: 31.2 FT / 2 STORIES
MINIMUM FRONT YARD SETBACK	20 FT	N/A	BUILDING: 20.0 FT(**)
MINIMUM REAR YARD SETBACK	25 FT	N/A	BUILDING: 68.9 FT
MINIMUM SIDE YARD SETBACK	10 FT	N/A	BUILDING: 33.6 FT
MAXIMUM BUILDING COVERAGE	40% (36,019 SF)	0% (0 SF)	22.0% (19,844 SF)
MAXIMUM DWELLING UNITS	32 DU	N/A	32 DU
MINIMUM AFFORDABLE DWELLING UNITS	13 DU	N/A	13 DU
MAXIMUM IMPERVIOUS COVERAGE	75% (67,536 SF)	1.3% (1,184 SF)	66.6% (59,996 SF)

(*) PER §22-3 - VERTICAL DISTANCE MEASURED, IN THE CASE OF FLAT ROOFS, FROM THE CURB LEVEL TO THE HIGHEST POINT OF THE ROOF BEAMS, ADJACENT TO THE STREET WALL, AND IN THE CASE OF PITCHED ROOFS, FROM THE CURB LEVEL TO THE AVERAGEHEIGHT OF THE GRADE

(**) PER §22-115.22.A, THE PROJECTION OF STAIRS AND PORCHES ARE PERMITTED IN THE FRONT YARD AS LONG AS THE PORCH IS ONE STORY IN HEIGHT AND NOT PROJECTING GREATER THAN FIVE FEET

(*) PER § VILLA MARIA REDEV PLAN 4.B.1A - A MAXIMUM OF THREE STORIES SHALL BE PERMITTED WHERE THE THIRD STORY IS UTILIZED FOR THE SECOND STORY OF A DWELLING UNIT THAT IS CONNECTED BY A STAIRWAY IN THE INTERIOR OF THE UNIT (I.E. A DUPLEX APARTMENT)

N/A NOT-APPLICABLE

SIGNAGE REQUIREMENTS

CODE SECTION	REQUIRED	PROPOSED
§ 22-119.5.A	MAXIMUM AMOUNT OF FREESTANDING/WALL SIGN (WHICHEVER IS LESS SF): 1 SIGN	1 SIGN
§ 22-79.A	APPROPRIATE STREET SIGNS: LOCATION: ALL STREET INTERSECTIONS	4 SIGNS
§ 22-119.3.F	WALL SIGN LIMITS: EXTENSION: MUST BE BELOW ROOF AND PARAPET WALL LIMITS PROJECTION MAXIMUM: 8 INCHES	COMPLIES 8 INCHES
§ 22-119.5.C	WALL SIGN REQUIREMENTS: MAXIMUM SURFACE AREA: 1 SF FOR EACH FOOT OF WALL LENGTH OR 150 SF ONE DIMENSION OF THE SIGN, HORIZONTAL OR VERTICAL, SHALL EXCEED 2 FT	30 SF 2.1 FT
§ 22-119.5.B	FREESTANDING SIGN REQUIREMENTS: MAXIMUM SURFACE AREA:12 SF MINIMUM SETBACK: 10 FT FROM PROPERTY LINE MAXIMUM FREESTANDING SIGN HEIGHT: 42 IN	12 SF 10 FT 24 INCHES

FENCING STANDARDS

CODE SECTION	REQUIRED	PROPOSED
§ 25-3	FENCING LIMITATIONS: CANNOT ENCROACH ON PUBLIC RIGHT OF WAY OR WATERCOURSE	COMPLIES
	GATE SWING: MUST SWING INTO INTERIOR OF PROPERTY	COMPLIES
§ 25-4.1	FENCING HEIGHTS ABOVE ADJACENT GROUND ELEVATION: PARALLEL TO FRONT OF PROPERTY LINE MAXIMUM: 3 FT PARALLEL TO SIDE, FROM FRONT PROPERTY LINE TO FRONT YARD SETBACK: 4 FT PARALLEL TO SIDE, FROM FRONT YARD SETBACK TO REAR PROPERTY LINE: 6 FT PARALLEL TO REAR OF PROPERTY LINE MAXIMUM: 6 FT	8.0 FT (W) 9.0 FT (W) 14.5 FT (W) 14.0 FT (W)

TBD TO BE DETERMINED

OFF-STREET PARKING REQUIREMENTS

CODE SECTION	REQUIRED	PROPOSED
§ RSIS 5:21-4.14.G.4	TWO FAMILY (DUPLEX) REQUIRED PARKING SPACES: ONE BEDROOM: 1.8 SPACES REQUIRED (11 ONE BEDROOM UNITS)(1.8 SPACES) = 19.8 SPACES TWO BEDROOM: 2.0 SPACES REQUIRED (18 TWO BEDROOM UNITS)(2.0 SPACES) = 36 SPACES THREE BEDROOM: 2.1 SPACES REQUIRED (3 THREE BEDROOM UNITS)(2.1 SPACES) = 6.3 SPACES	58 SPACES 4 SPACES (EV BONUS)
	TOTAL: 19.8 SPACES + 36 SPACES + 6.3 SPACES = 62.1 SPACES = 62 SPACES	TOTAL: 62 SPACES
SENATE BILL S3223	MINIMUM REQUIRED EV MAKE-READY SPACES: 15% OF PROPOSED OFF-STREET PARKING: 58 SPACES X 0.15 = 8.7 = 9 TOTAL EV MAKE-READY SPACES	9 EV MAKE-READY SPACES
	MINIMUM REQUIRED ACCESSIBLE MAKE-READY EV SPACES: 5% OF TOTAL MAKE-READY SPACES: (9 MAKE-READY SPACES)(0.05) = 0.5 = 1 ACCESSIBLE MAKE-READY SPACE	1 ACCESSIBLE MAKE READY SPACES
	ADJUSTED PARKING SUPPLY CREDIT: MAXIMUM CREDIT OF 10% OF THE PARKING REQUIREMENT SHALL BE COUNTED TOWARDS TOTAL PARKING COUNT (62 SPACES)(0.1) = 6.2 SPACES	4 SPACES
§ 22-117.4.D	DRIVEWAY WIDTH: MINIMUM: 8 FT MAXIMUM: 18 FT	18 FT
§ 22-117.5.L	PARKING SPACE DIMENSION REQUIREMENTS: MINIMUM LENGTH = 18 FT MINIMUM WIDTH = 9 FT	18 FT 9 FT
§ 22-117.5.J	MINIMUM DRIVE AISLE WIDTH: (90 DEGREE): 24 FT	24 FT
§ VILLA MARIA REDEV PLAN 4.C.1.B	ACCESS POINT REQUIREMENTS: MAXIMUM: 2 FROM GROVE STREET	ONE ACCESS POINTS
§ VILLA MARIA REDEV PLAN 4.C.1.B	LOCATION FOR PARKING AREAS: REAR YARD	REAR YARD

ACCESSORY STRUCTURE STANDARDS

CODE SECTION	REQUIRED	PROPOSED
§ 22-115.3	MAXIMUM HEIGHT: 16 FT	COMPLIES
	MINIMUM ACCESSORY STRUCTURE SETBACKS: FRONT: 20 FT SIDE: 10 FT	87.0 FT 12.5 FT
	MINIMUM SETBACK FOR ACCESSORY STRUCTURE LOCATED IN REAR YARD: REAR PROPERTY LINE: 4 FT SIDE PROPERTY LINE: 4 FT	8.8 FT 12.5 FT
	MINIMUM DISTANCE FROM PRINCIPAL BUILDING: 20 FT	21.1 FT
	MAXIMUM AREA OCCUPANCY OF REAR YARD: 30%	0.5% (222 SF)
	CANNOT BE USED AS DWELLING	COMPLIES

DESIGN STANDARDS

CODE SECTION	REQUIRED	PROPOSED
§ 22-79.B	CONCRETE SIDEWALK REQUIREMENTS: WIDTH: 4 FT MINIMUM SETBACK FROM ROADWAY: 3 FT	5.0 FT 3.0 FT
§ 22-79.K	SHADE TREE REQUIREMENTS: MINIMUM: 2 TREES PER LOT MINIMUM DIAMETER: 2 INCHES MINIMUM HEIGHT: 8 FT	2 TREES COMPLIES COMPLIES
§ VILLA MARIA REDEV PLAN 4.B.2.A	MULTIPLE BUILDINGS ON SINGLE LOT: MULTIPLE BUILDINGS / DWELLING TYPES ARE PERMITTED ON A SINGLE LOT	COMPLIES
§ VILLA MARIA REDEV PLAN 4.B.2.B	MINIMUM BUILDING SEPARATION DISTANCE: 10 FT	12.0 FT
§ VILLA MARIA REDEV PLAN 4.C.2.A	MULTIFAMILY BUILDING APPEARANCE: COMPATIBLE WITH ONE OR TWO-FAMILY HOME	COMPLIES
§ VILLA MARIA REDEV PLAN 4.C.2.B	MULTIFAMILY DWELLING BUILDING SEPARATION(*): SIDE BY SIDE, STACKED OR BOTH	COMPLIES

(*) BUILDING MUST COMPLY WITH BULK STANDARDS

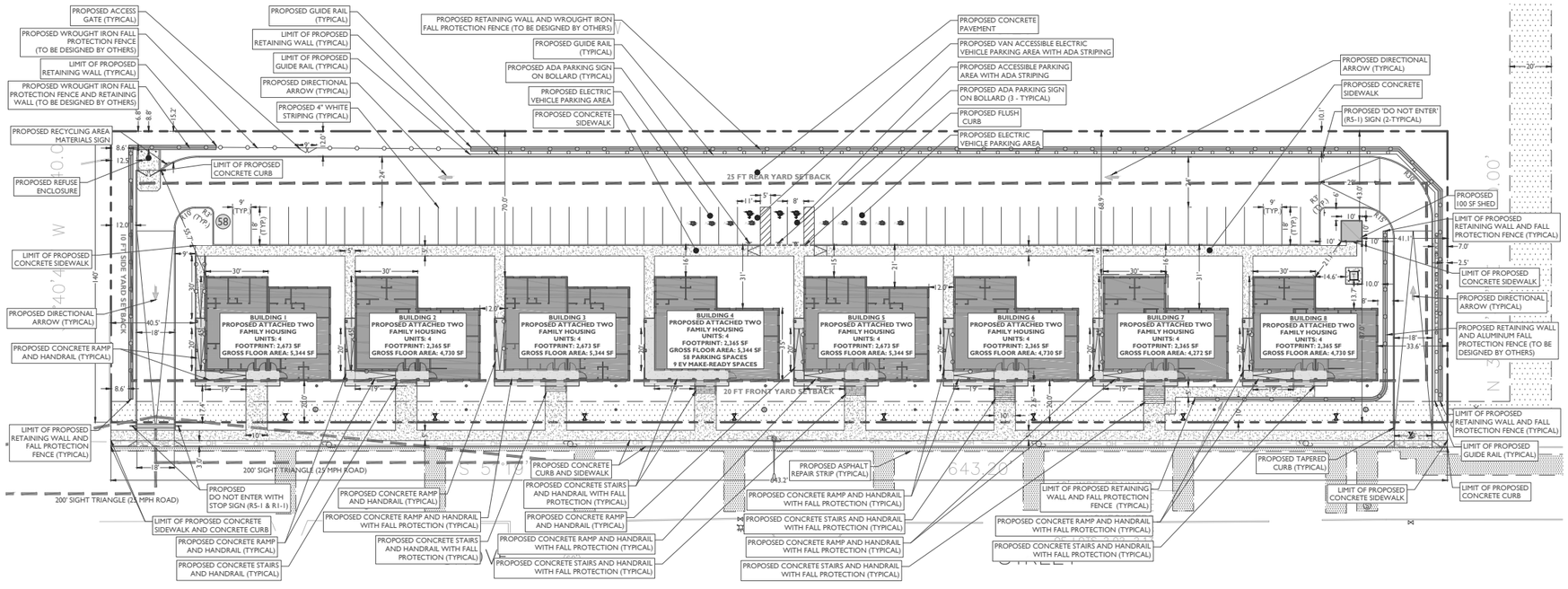
REFUSE/RECYCLING REQUIREMENTS

CODE SECTION	REQUIRED	PROPOSED
§ 22-82.5	RECYCLING CONTAINER DESIGN: MUST BE COVERED AS TO PROTECT MATERIALS AGAINST ADVERSE ENVIRONMENTAL CONDITIONS	COMPLIES
§ 22-82.6	RECYCLING SIGNAGE: SIGNS REQUIRED AT ACCESS POINTS TO THE RECYCLING AREA TO IDENTIFY THE RESPECTIVE MATERIALS ACCEPTED THEREIN	COMPLIES
§ 22-82.7	RECYCLING SCREENING: APPROPRIATE LANDSCAPING AND/OR FENCING MUST FORM AROUND RECYCLING AREA	COMPLIES
§ 22-115.30	REFUSE SCREENING: APPROPRIATE FENCING IS REQUIRED ALONG ALL SIDES OF OUTDOOR STORAGE OF SOLID WASTE/GARBAGE CONTAINERS REFUSE SECURITY: REFUSE MUST BE SECURED FROM GROUND ENTRY VIA DOOR OR GATE	COMPLIES COMPLIES

TBD TO BE DETERMINED

SYMBOL / DESCRIPTION

- PROPERTY LINE
- SETBACK LINE
- PROPOSED SIGNS / BOLLARDS
- PROPOSED CURB
- PROPOSED DEPRESSED CURB
- PROPOSED FLUSH CURB
- PROPOSED BUILDING
- PROPOSED BUILDING OVERHANG
- PROPOSED CONCRETE
- PROPOSED RETAINING WALL
- PROPOSED CHAINLINK FENCE
- PROPOSED HAND RAIL
- PROPOSED FALL PROTECTION FENCE
- PROPOSED RETAINING WALL



GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY AND FAMILIARIZE THEMSELVES WITH THE EXISTING SITE CONDITIONS AND THE PROPOSED SCOPE OF WORK (INCLUDING DIMENSIONS, LAYOUT, ETC.) PRIOR TO INITIATING THE IMPROVEMENTS IDENTIFIED WITHIN THESE DOCUMENTS. SHOULD ANY DISCREPANCY BE FOUND BETWEEN THE EXISTING SITE CONDITIONS AND THE PROPOSED WORK THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC PRIOR TO THE START OF CONSTRUCTION.
2. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ENSURE THAT ALL REQUIRED APPROVALS HAVE BEEN OBTAINED PRIOR TO THE START OF CONSTRUCTION. COPIES OF ALL REQUIRED PERMITS AND APPROVALS SHALL BE KEPT ON SITE AT ALL TIMES DURING CONSTRUCTION.
3. ALL CONTRACTORS WILL, TO THE FULLEST EXTENT PERMITTED BY LAW, INDEMNIFY AND HOLD HARMLESS STONEFIELD ENGINEERING & DESIGN, LLC, AND IT'S SUB-CONSULTANTS FROM AND AGAINST ANY DAMAGES AND LIABILITIES INCLUDING ATTORNEY'S FEES ARISING OUT OF CLAIMS BY EMPLOYEES OF THE CONTRACTOR IN ADDITION TO CLAIMS CONNECTED TO THE PROJECT AS A RESULT OF NOT CARRYING THE PROPER INSURANCE FOR WORKERS COMPENSATION, LIABILITY INSURANCE, AND LIMITS OF COMMERCIAL GENERAL LIABILITY INSURANCE.
4. THE CONTRACTOR SHALL NOT DEVIATE FROM THE PROPOSED IMPROVEMENTS IDENTIFIED WITHIN THIS PLAN SET UNLESS APPROVAL IS PROVIDED IN WRITING BY STONEFIELD ENGINEERING & DESIGN, LLC.
5. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE MEANS AND METHODS OF CONSTRUCTION.
6. THE CONTRACTOR SHALL NOT PERFORM ANY WORK OR CAUSE DISTURBANCE ON A PRIVATE PROPERTY NOT CONTROLLED BY THE PERSON OR ENTITY WHO HAS AUTHORIZED THE WORK WITHOUT PRIOR WRITTEN CONSENT FROM THE OWNER OF THE PRIVATE PROPERTY.
7. THE CONTRACTOR IS RESPONSIBLE TO RESTORE ANY DAMAGED OR UNDERMINED STRUCTURE OR SITE FEATURE THAT IS IDENTIFIED TO REMAIN ON THE PLAN SET. ALL REPAIRS SHALL USE NEW MATERIALS TO RESTORE THE FEATURE TO ITS EXISTING CONDITION AT THE CONTRACTORS EXPENSE.
8. CONTRACTOR IS RESPONSIBLE TO PROVIDE THE APPROPRIATE SHOP DRAWINGS, PRODUCT DATA, AND OTHER REQUIRED SUBMITTALS FOR REVIEW. STONEFIELD ENGINEERING & DESIGN, LLC. WILL REVIEW THE SUBMITTALS IN ACCORDANCE WITH THE DESIGN INTENT AS REFLECTED WITHIN THE PLAN SET.
9. THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL IN ACCORDANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
10. THE CONTRACTOR IS REQUIRED TO PERFORM ALL WORK IN THE PUBLIC RIGHT-OF-WAY IN ACCORDANCE WITH THE APPROPRIATE GOVERNING AUTHORITY AND SHALL BE RESPONSIBLE FOR THE PROCUREMENT OF STREET OPENING PERMITS.
11. THE CONTRACTOR IS REQUIRED TO RETAIN AN OSHA CERTIFIED SAFETY INSPECTOR TO BE PRESENT ON SITE AT ALL TIMES DURING CONSTRUCTION & DEMOLITION ACTIVITIES.
12. SHOULD AN EMPLOYEE OF STONEFIELD ENGINEERING & DESIGN, LLC. BE PRESENT ON SITE AT ANY TIME DURING CONSTRUCTION, IT DOES NOT RELIEVE THE CONTRACTOR OF ANY OF THE RESPONSIBILITIES AND REQUIREMENTS LISTED IN THE NOTES WITHIN THIS PLAN SET.

30' 0' 30' 60'

GRAPHIC SCALE IN FEET
1" = 30'

ISSUE	DATE	BY	DESCRIPTION
1	03/18/2024	EGB	FOR MUNICIPAL SUBMISSION

NOT APPROVED FOR CONSTRUCTION

STONEFIELD engineering & design
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Phone 201.340.4468 · Fax 201.340.4472

PRELIMINARY & FINAL MAJOR SITE PLAN

VILLANI REALTY GROUP

PROPOSED RESIDENTIAL DEVELOPMENT

BLOCK 110, LOT 2.02 TO 2.13
430 GROVE STREET
SOMERSET COUNTY, NORTH PLAINFIELD
SOMERSET COUNTY, NEW JERSEY

JOSHUA H. KLINE, P.E.
NEW JERSEY LICENSE No. 54347
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: 1" = 30' | PROJECT ID: PRI-230101

TITLE: SITE PLAN

DRAWING: C-4

Z:\PROJECTS\PRI\2023\PRI-230101 TAYLOR, ARCHITECTURE - 430 GROVE STREET, NORTH PLAINFIELD, NJ\CAD\PLOT\PLOT-04-SITE.DWG

APPENDIX B
PROJECT SOILS

INVENTORY

B-1: NRCS SOILS REPORT

B-2: JOHNSON SOILS COMPANY TEST PIT INVESTIGATION REPORT

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Somerset County, New Jersey

October 20, 2023

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,320 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DunC	Dunellen sandy loam, 8 to 15 percent slopes	2.1	100.0%
Totals for Area of Interest		**2.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Somerset County, New Jersey

DunC—Dunellen sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: ldqk
Elevation: 50 to 2,000 feet
Mean annual precipitation: 30 to 64 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 131 to 178 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Dunellen and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dunellen

Setting

Landform: Outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy outwash derived from sandstone

Typical profile

A1 - 0 to 8 inches: sandy loam
A2 - 8 to 14 inches: sandy loam
BA - 14 to 20 inches: sandy loam
Bt - 20 to 31 inches: sandy loam
C - 31 to 42 inches: sandy loam
2C - 42 to 70 inches: loamy sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Tunkhannock

Percent of map unit: 10 percent
Landform: Outwash terraces, kames, deltas

Landform position (three-dimensional): Riser, rise
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Udorthents, dunellen substratum

Percent of map unit: 5 percent
Landform: Outwash plains
Landform position (three-dimensional): Lower third of mountainflank
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Custom Soil Resource Report
Map—Hydrologic Soil Group

Map Scale: 1:1,320 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

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

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
DunC	Dunellen sandy loam, 8 to 15 percent slopes	A	2.1	100.0%
Totals for Area of Interest			**2.1**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

JOHNSON SOILS COMPANY

66 Glen Avenue
Glen Rock, NJ 07452
Telephone: 201-301-1045
Fax: 201-857-8002
Email: info@johnsonsoils.com

October 17, 2023

VILLANI BUILDERS
376 North Avenue, Suite A
Dunellen, NJ 08812

Attn: Joe Villani

Re: Grove Street & Ridge Avenue
North Plainfield, NJ
JSC Job #23-722

Dear Mr. Villani :

The following test pits were inspected on October 10, 2023 at the proposed stormwater management locations. The test pits were dug with an excavator provided by others.

The test pit log is as follows:

TP-1

0" – 8"	Topsoil & Roots.
8"-10'	Red brown SILT, some fine Sand & Clay, trace Gravel (ML)

No Ground Water Encountered
No Seasonal High Water Table Encountered
The percolation rate at a depth of 8'6" is 0.09 in/hr.

TP-2

0" – 1'8"	FILL - Topsoil & Roots, Sand, Gravel, Silt
1'8"-4'6"	Red brown SILT, some fine Sand & Clay, trace Gravel (ML)
4'6"-10'	Yellow brown SILT, some fine Sand & Clay, trace Gravel (ML)

No Ground Water Encountered
No Seasonal High Water Table Encountered
The percolation rate at a depth of 7'6" is 0.1 in/hr.

Grove Street & Ridge Avenue
North Plainfield, NJ
JSC Job #23-722

TP-3

0" – 6"	FILL - Topsoil & Roots, Sand, Gravel, Silt
6"-3'8"	Brown fine to coarse Sand, little Silt and Gravel (SM)
3'8"-4'	Dark Brown fine Sand & Silt, trace Gravel (SM-ML)
4'-10'	Brown fine Sand & Silt, some Clay, some fine Sand & Clay, trace Gravel (SM-ML)

No Ground Water Encountered
No Seasonal High Water Table Encountered
The percolation rate at a depth of 8' is 0.4 in/hr.

TP-4

0" – 10"	FILL - Topsoil & Roots, Sand, Gravel, Silt
10"-5'	Red brown Sand, little Silt, some Clay (SM)
5'-5'8"	Gray fine Sand & Silt, little clay (SM-ML)
5'8"-10'	Red brown SILT, some fine Sand & Clay, trace Gravel (ML)

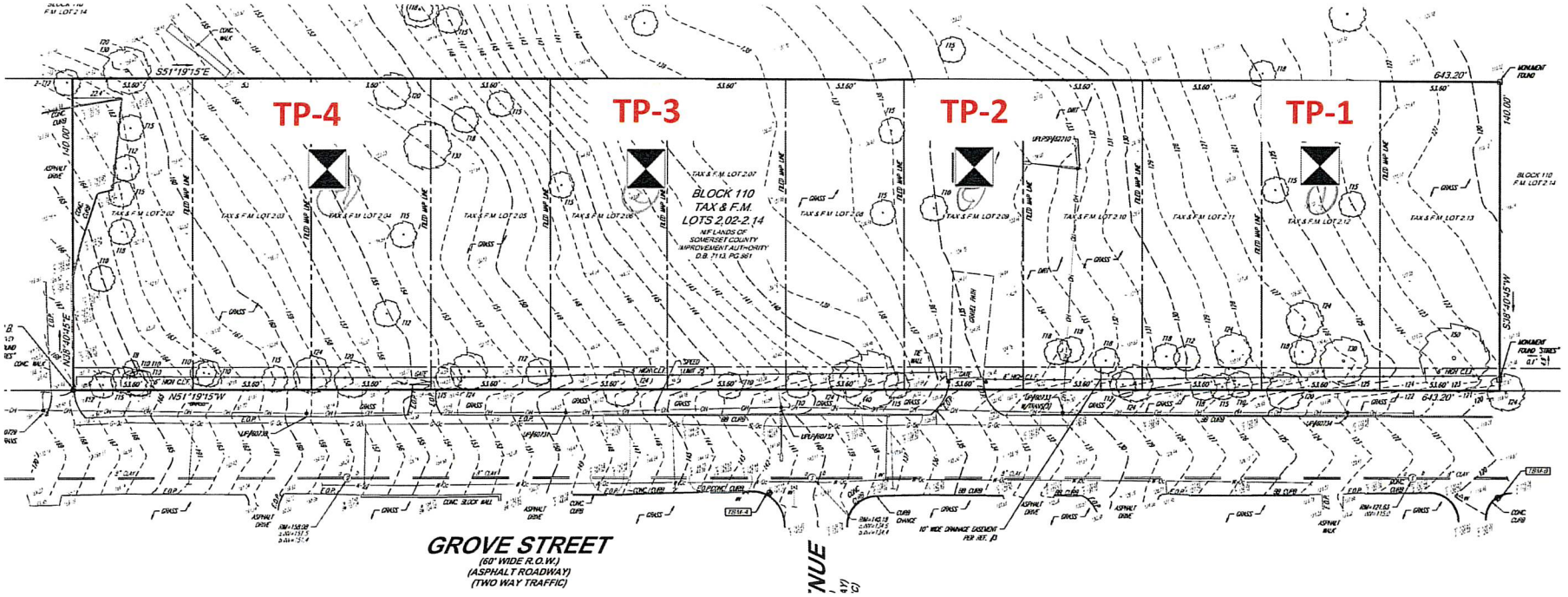
No Ground Water Encountered
No Seasonal High Water Table Encountered
The percolation rate at a depth of 8' is 0.2 in/hr.

If you have any questions please call.

Very truly yours,

Lisa V. Mahle-Greco, PE
Engineering Manager
NJ Lic. # 43197

DD/JG

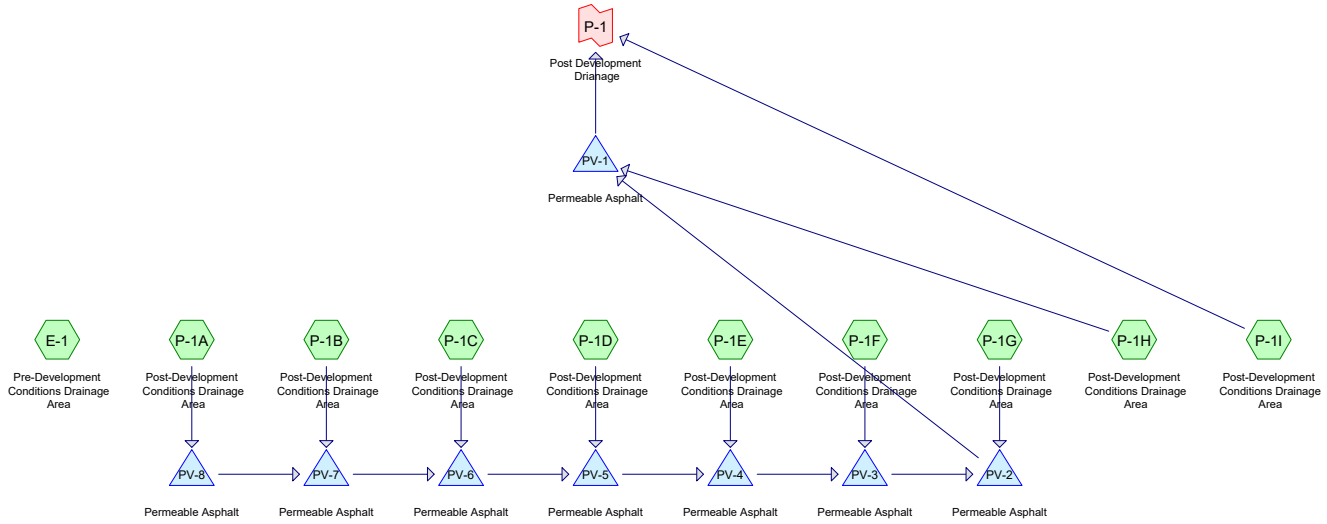


Scale: N.T.S.

JOHNSON SOILS COMPANY	**Test Pit Location Plan**	JSC #23-722
	Grove Street & Ridge Avenue North Plainfield, NJ	PLATE 2

APPENDIX C
HYDROLOGIC & HYDRAULIC CALCULATIONS

INVENTORY



Subcat Reach Pond Link

Routing Diagram for 2024-02-27 Plainfield Hydrocad - Water Quality
Prepared by Stonefield Engineering & Design, Printed 3/18/2024

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	WQ	NJ DEP 2-hr		Default	2.00	1	1.25	2	3.34

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	Sub Num
0	0	0	106,883	0	106,883	>75% Grass cover, Good	
0	0	0	0	35,957	35,957	Impervious Surfaces	
0	0	0	0	37,256	37,256	MVS	
0	**0**	**0**	**106,883**	**73,213**	**180,096**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: Pre-Development Runoff Area=90,048 sf 14.68% Impervious Runoff Depth=0.30"
Flow Length=669' Tc=7.1 min CN=80/98 Runoff=1.61 cfs 2,248 cf

Subcatchment P-1A: Post-Development Runoff Area=10,079 sf 61.82% Impervious Runoff Depth=0.71"
Flow Length=189' Tc=6.0 min CN=80/98 Runoff=0.46 cfs 593 cf

Subcatchment P-1B: Post-Development Runoff Area=10,079 sf 90.64% Impervious Runoff Depth=0.95"
Tc=6.0 min CN=80/98 Runoff=0.62 cfs 801 cf

Subcatchment P-1C: Post-Development Runoff Area=9,669 sf 68.03% Impervious Runoff Depth=0.76"
Tc=6.0 min CN=80/98 Runoff=0.47 cfs 612 cf

Subcatchment P-1D: Post-Development Runoff Area=8,530 sf 72.98% Impervious Runoff Depth=0.80"
Tc=6.0 min CN=80/98 Runoff=0.44 cfs 570 cf

Subcatchment P-1E: Post-Development Runoff Area=9,057 sf 72.13% Impervious Runoff Depth=0.79"
Tc=6.0 min CN=80/98 Runoff=0.46 cfs 600 cf

Subcatchment P-1F: Post-Development Runoff Area=6,983 sf 86.60% Impervious Runoff Depth=0.92"
Tc=6.0 min CN=80/98 Runoff=0.41 cfs 535 cf

Subcatchment P-1G: Post-Development Runoff Area=7,377 sf 82.59% Impervious Runoff Depth=0.88"
Tc=6.0 min CN=80/98 Runoff=0.42 cfs 544 cf

Subcatchment P-1H: Post-Development Runoff Area=13,074 sf 52.73% Impervious Runoff Depth=0.63"
Tc=6.0 min CN=80/98 Runoff=0.52 cfs 683 cf

Subcatchment P-1I: Post-Development Runoff Area=15,200 sf 41.18% Impervious Runoff Depth=0.53"
Tc=6.0 min CN=80/98 Runoff=0.51 cfs 669 cf

Pond PV-1: Permeable Asphalt Peak Elev=125.28' Storage=116 cf Inflow=0.52 cfs 683 cf
Outflow=0.32 cfs 686 cf

Pond PV-2: Permeable Asphalt Peak Elev=136.59' Storage=544 cf Inflow=0.42 cfs 544 cf
Outflow=0.00 cfs 0 cf

Pond PV-3: Permeable Asphalt Peak Elev=139.58' Storage=535 cf Inflow=0.41 cfs 535 cf
Outflow=0.00 cfs 0 cf

Pond PV-4: Permeable Asphalt Peak Elev=142.44' Storage=600 cf Inflow=0.46 cfs 600 cf
Outflow=0.00 cfs 0 cf

Pond PV-5: Permeable Asphalt Peak Elev=144.12' Storage=570 cf Inflow=0.44 cfs 570 cf
Outflow=0.00 cfs 0 cf

Pond PV-6: Permeable Asphalt Peak Elev=146.83' Storage=612 cf Inflow=0.47 cfs 612 cf
Outflow=0.00 cfs 0 cf

Pond PV-7: Permeable Asphalt Peak Elev=149.90' Storage=801 cf Inflow=0.62 cfs 801 cf
Outflow=0.00 cfs 0 cf

Pond PV-8: Permeable Asphalt Peak Elev=152.44' Storage=593 cf Inflow=0.46 cfs 593 cf
Outflow=0.00 cfs 0 cf

Link P-1: Post Development Drianage Inflow=0.80 cfs 1,354 cf
Primary=0.80 cfs 1,354 cf

Total Runoff Area = 180,096 sf Runoff Volume = 7,854 cf Average Runoff Depth = 0.52"
59.35% Pervious = 106,883 sf 40.65% Impervious = 73,213 sf

Summary for Subcatchment E-1: Pre-Development Conditions Drainage Area

Runoff = 1.61 cfs @ 1.14 hrs, Volume= 2,248 cf, Depth= 0.30"
Routed to nonexistent node 4L

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.34"

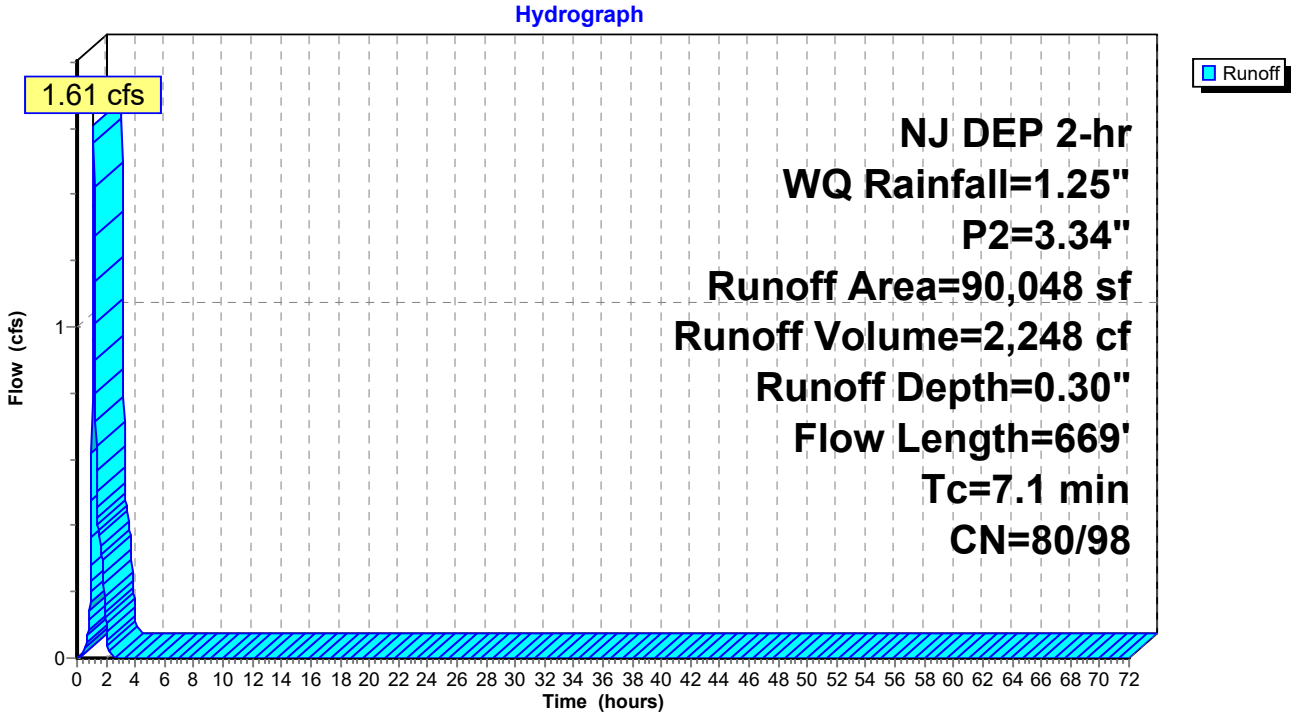
	Area (sf)	CN	Description
*	4,104	98	Impervious Surfaces
	76,831	80	>75% Grass cover, Good, HSG D
*	9,113	98	MVS
	90,048	83	Weighted Average
	76,831	80	85.32% Pervious Area
	13,217	98	14.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	10	0.0982	0.21		**Sheet Flow, 1-2** Grass: Short n= 0.150 P2= 3.34"
0.1	17	0.1150	2.37		**Shallow Concentrated Flow, 2-3** Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0800	1.98		**Shallow Concentrated Flow, 3-4** Short Grass Pasture Kv= 7.0 fps
0.1	18	0.1100	2.32		**Shallow Concentrated Flow, 4-5** Short Grass Pasture Kv= 7.0 fps
0.3	28	0.0700	1.85		**Shallow Concentrated Flow, 5-6** Short Grass Pasture Kv= 7.0 fps
0.1	15	0.0680	1.83		**Shallow Concentrated Flow, 6-7** Short Grass Pasture Kv= 7.0 fps
0.3	42	0.0960	2.17		**Shallow Concentrated Flow, 7-8** Short Grass Pasture Kv= 7.0 fps
0.5	34	0.0295	1.20		**Shallow Concentrated Flow, 8-9** Short Grass Pasture Kv= 7.0 fps
0.6	40	0.0250	1.11		**Shallow Concentrated Flow, 9-10** Short Grass Pasture Kv= 7.0 fps
0.3	43	0.1400	2.62		**Shallow Concentrated Flow, 10-11** Short Grass Pasture Kv= 7.0 fps
0.1	8	0.1300	2.52		**Shallow Concentrated Flow, 11-12** Short Grass Pasture Kv= 7.0 fps
0.4	46	0.0865	2.06		**Shallow Concentrated Flow, 12-13** Short Grass Pasture Kv= 7.0 fps
0.2	19	0.0515	1.59		**Shallow Concentrated Flow, 13-14** Short Grass Pasture Kv= 7.0 fps
0.1	8	0.0250	1.11		**Shallow Concentrated Flow, 14-15** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0250	3.21		**Shallow Concentrated Flow, 15-16** Paved Kv= 20.3 fps
0.2	15	0.0250	1.11		**Shallow Concentrated Flow, 16-17** Short Grass Pasture Kv= 7.0 fps
0.4	37	0.0540	1.63		**Shallow Concentrated Flow, 17-18** Short Grass Pasture Kv= 7.0 fps
0.2	14	0.0230	1.06		**Shallow Concentrated Flow, 18-19** Short Grass Pasture Kv= 7.0 fps
0.2	30	0.0230	3.08		**Shallow Concentrated Flow, 19-20** Paved Kv= 20.3 fps
0.1	23	0.0430	4.21		**Shallow Concentrated Flow, 20-21** Paved Kv= 20.3 fps
0.2	30	0.1340	2.56		**Shallow Concentrated Flow, 21-22** Short Grass Pasture Kv= 7.0 fps
0.3	38	0.0795	1.97		**Shallow Concentrated Flow, 22-23** Short Grass Pasture Kv= 7.0 fps
0.3	31	0.0645	1.78		**Shallow Concentrated Flow, 23-24** Short Grass Pasture Kv= 7.0 fps
0.5	47	0.0425	1.44		**Shallow Concentrated Flow, 24-25** Short Grass Pasture Kv= 7.0 fps
0.5	35	0.0290	1.19		**Shallow Concentrated Flow, 25-26** Short Grass Pasture Kv= 7.0 fps
0.1	13	0.0770	1.94		**Shallow Concentrated Flow, 26-27**

Short Grass Pasture Kv= 7.0 fps

7.1	669	Total

Subcatchment E-1: Pre-Development Conditions Drainage Area



Summary for Subcatchment P-1A: Post-Development Conditions Drainage Area

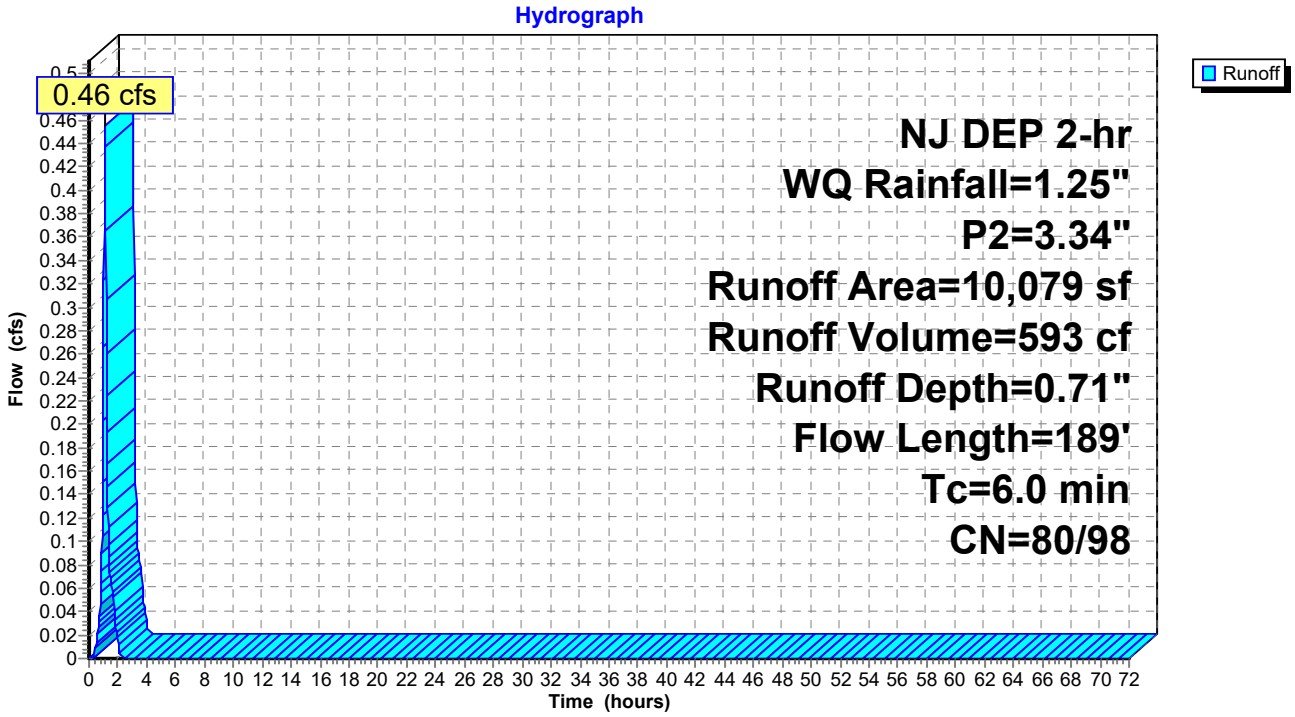
Runoff = 0.46 cfs @ 1.11 hrs, Volume= 593 cf, Depth= 0.71"
Routed to Pond PV-8 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.34"

	Area (sf)	CN	Description
*	933	98	Impervious Surfaces
*	5,298	98	MVS
	3,848	80	>75% Grass cover, Good, HSG D
	10,079	91	Weighted Average
	3,848	80	38.18% Pervious Area
	6,231	98	61.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	14	0.1050	0.23		**Sheet Flow, 1-2** Grass: Short n= 0.150 P2= 3.34"
0.2	89	0.1000	6.42		**Shallow Concentrated Flow, 2-3** Paved Kv= 20.3 fps
0.1	18	0.0275	3.37		**Shallow Concentrated Flow, 3-4** Paved Kv= 20.3 fps
0.3	68	0.0445	4.28		**Shallow Concentrated Flow, 4-5** Paved Kv= 20.3 fps
1.6	189	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1A: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1B: Post-Development Conditions Drainage Area

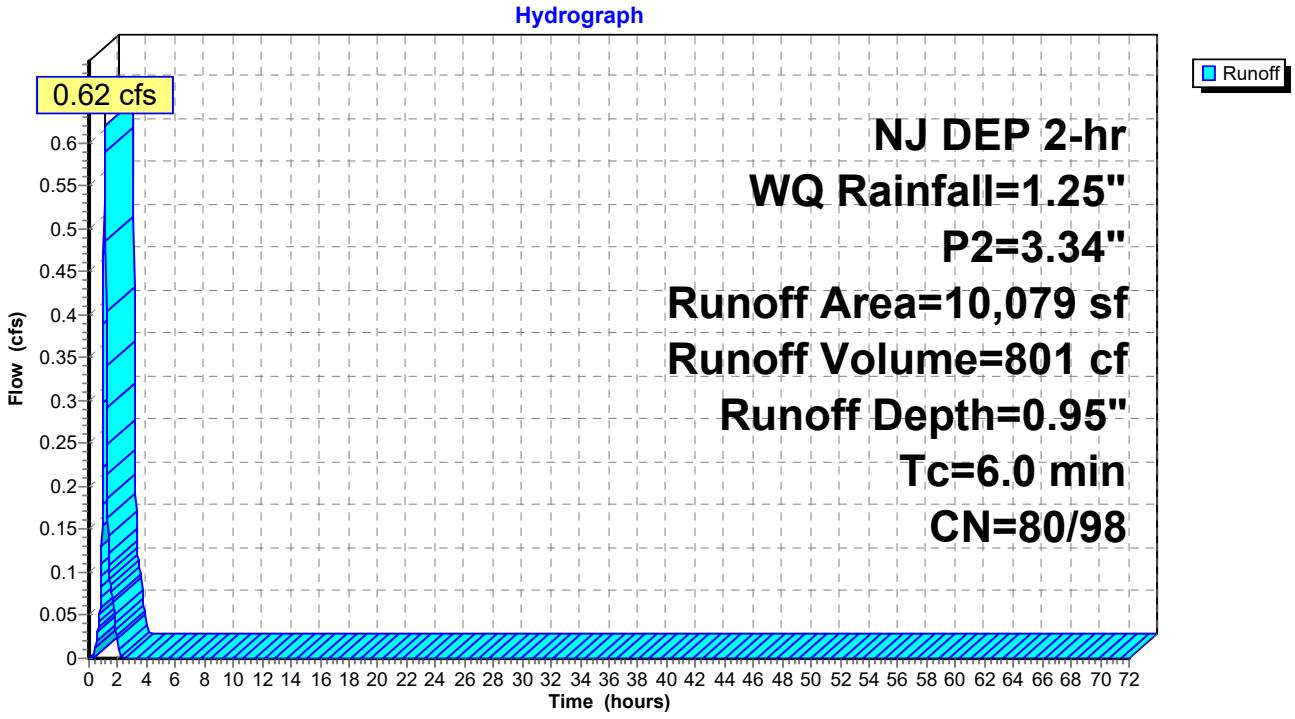
Runoff = 0.62 cfs @ 1.11 hrs, Volume= 801 cf, Depth= 0.95"
Routed to Pond PV-7 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.34"

	Area (sf)	CN	Description
*	6,427	98	Impervious Surfaces
*	2,709	98	MVS
	943	80	>75% Grass cover, Good, HSG D
	10,079	96	Weighted Average
	943	80	9.36% Pervious Area
	9,136	98	90.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1B: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1C: Post-Development Conditions Drainage Area

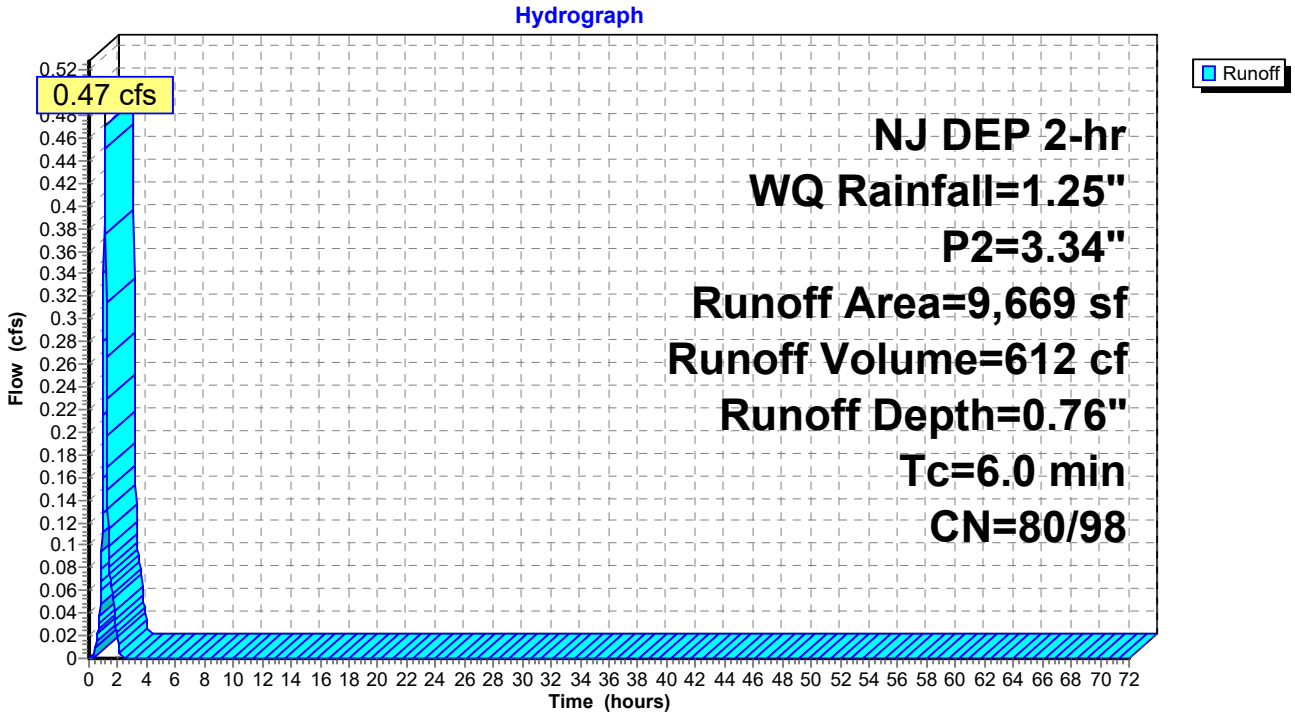
Runoff = 0.47 cfs @ 1.11 hrs, Volume= 612 cf, Depth= 0.76"
Routed to Pond PV-6 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.34"

	Area (sf)	CN	Description
*	3,869	98	Impervious Surfaces
*	2,709	98	MVS
	3,091	80	>75% Grass cover, Good, HSG D
	9,669	92	Weighted Average
	3,091	80	31.97% Pervious Area
	6,578	98	68.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1C: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1D: Post-Development Conditions Drainage Area

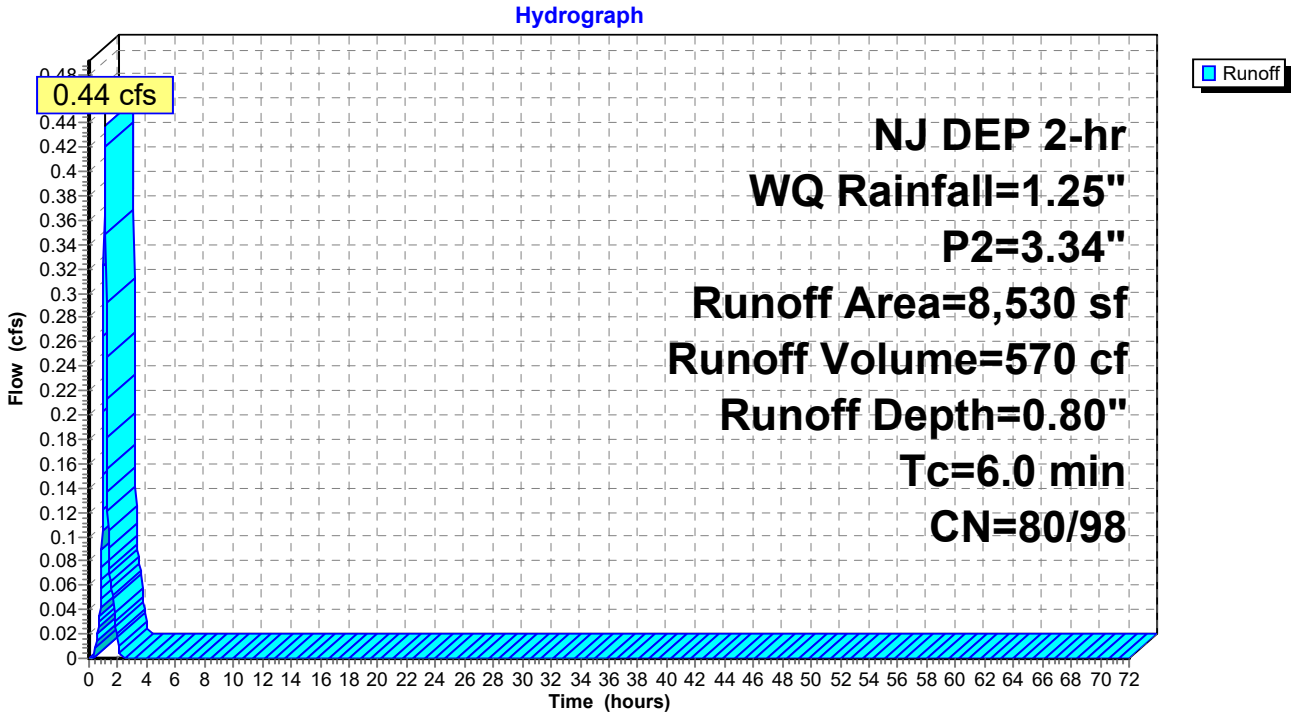
Runoff = 0.44 cfs @ 1.11 hrs, Volume= 570 cf, Depth= 0.80"
Routed to Pond PV-5 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.34"

	Area (sf)	CN	Description
*	3,516	98	Impervious Surfaces
*	2,709	98	MVS
	2,305	80	>75% Grass cover, Good, HSG D
	8,530	93	Weighted Average
	2,305	80	27.02% Pervious Area
	6,225	98	72.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1D: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1E: Post-Development Conditions Drainage Area

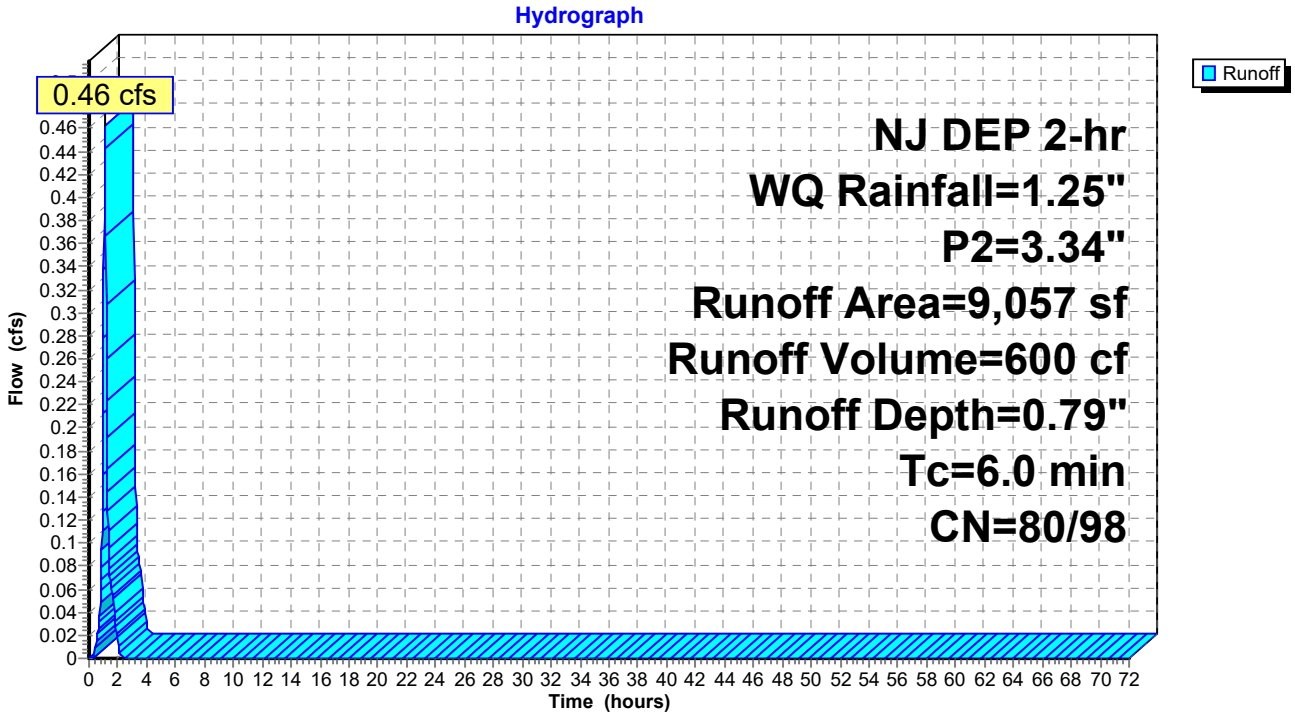
Runoff = 0.46 cfs @ 1.11 hrs, Volume= 600 cf, Depth= 0.79"
Routed to Pond PV-4 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.34"

	Area (sf)	CN	Description
*	3,824	98	Impervious Surfaces
*	2,709	98	MVS
	2,524	80	>75% Grass cover, Good, HSG D
	9,057	93	Weighted Average
	2,524	80	27.87% Pervious Area
	6,533	98	72.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1E: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1F: Post-Development Conditions Drainage Area

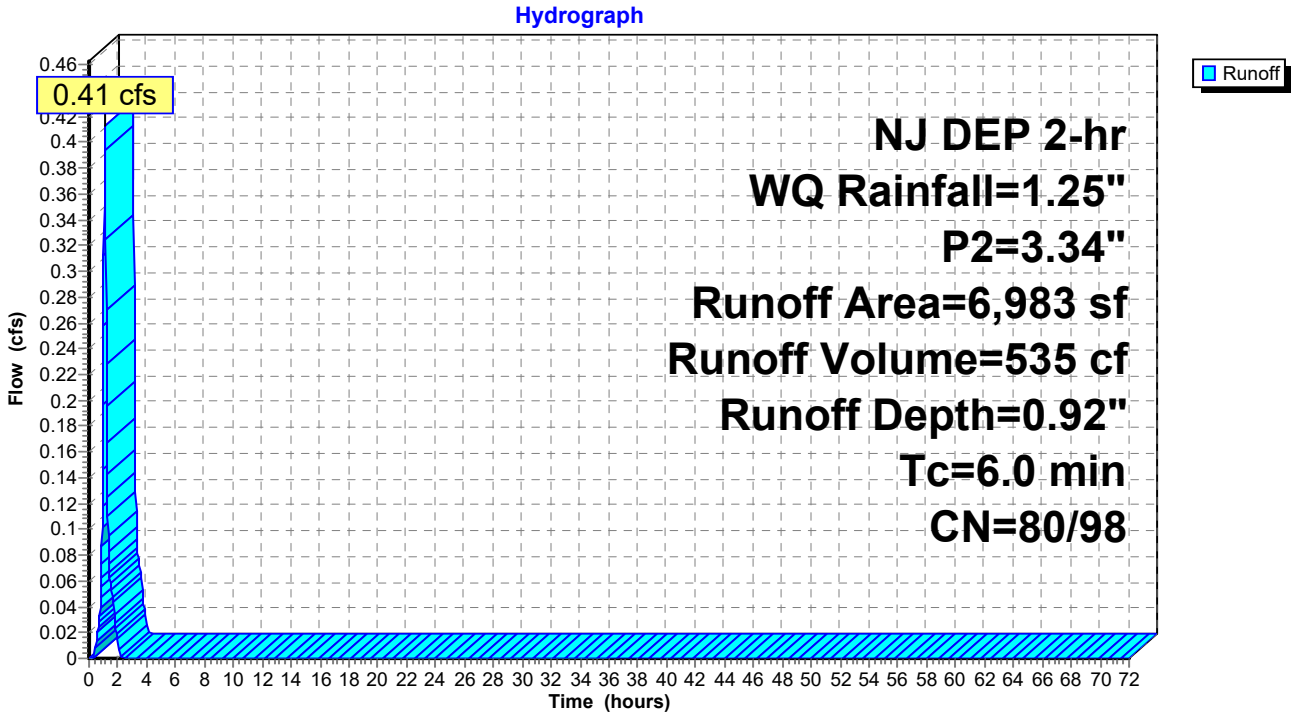
Runoff = 0.41 cfs @ 1.11 hrs, Volume= 535 cf, Depth= 0.92"
Routed to Pond PV-3 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.34"

	Area (sf)	CN	Description
*	3,338	98	Impervious Surfaces
*	2,709	98	MVS
	936	80	>75% Grass cover, Good, HSG D
	6,983	96	Weighted Average
	936	80	13.40% Pervious Area
	6,047	98	86.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1F: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1G: Post-Development Conditions Drainage Area

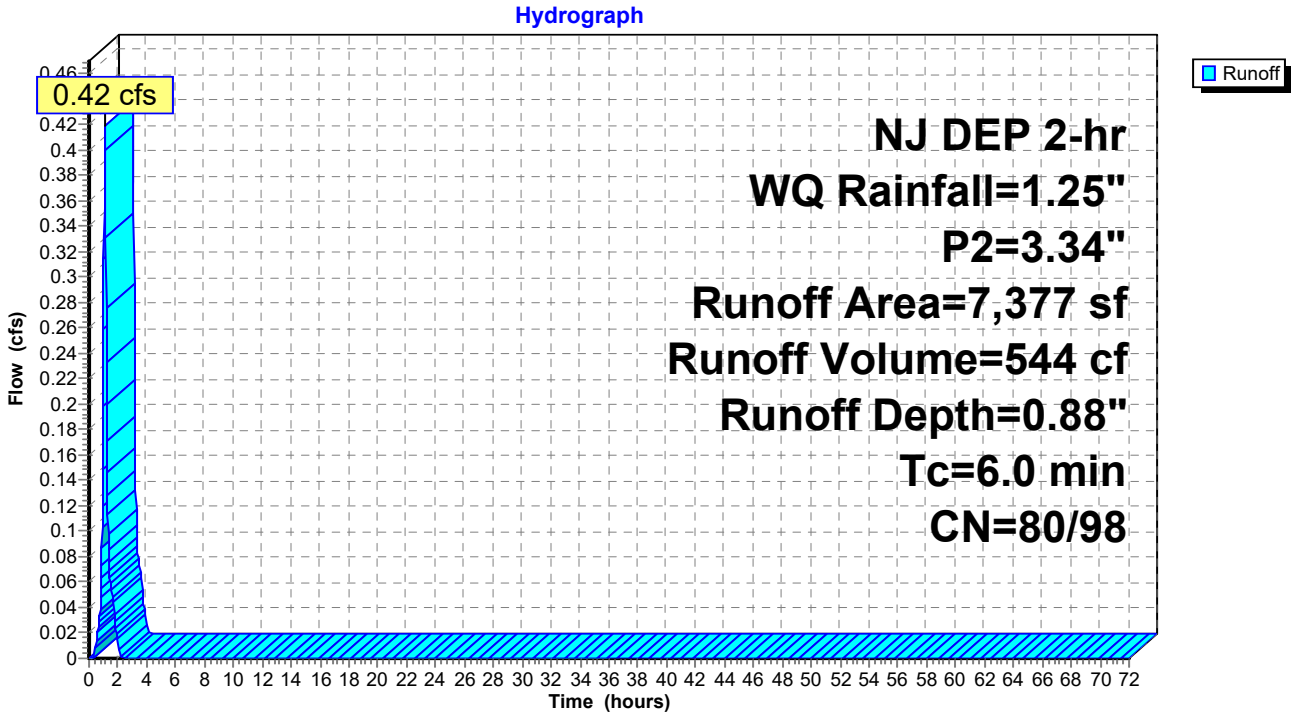
Runoff = 0.42 cfs @ 1.11 hrs, Volume= 544 cf, Depth= 0.88"
Routed to Pond PV-2 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.34"

	Area (sf)	CN	Description
*	3,384	98	Impervious Surfaces
*	2,709	98	MVS
	1,284	80	>75% Grass cover, Good, HSG D
	7,377	95	Weighted Average
	1,284	80	17.41% Pervious Area
	6,093	98	82.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1G: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1H: Post-Development Conditions Drainage Area

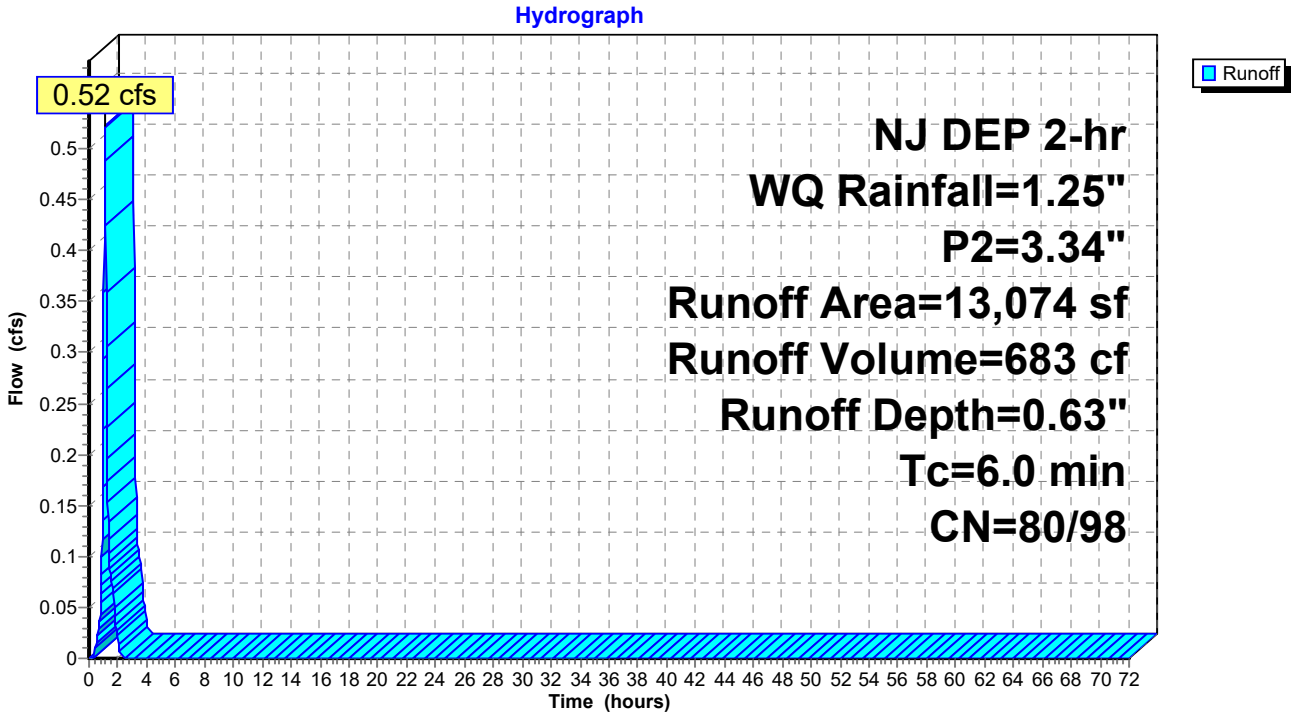
Runoff = 0.52 cfs @ 1.11 hrs, Volume= 683 cf, Depth= 0.63"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.34"

	Area (sf)	CN	Description
*	3,345	98	Impervious Surfaces
*	3,549	98	MVS
	6,180	80	>75% Grass cover, Good, HSG D
	13,074	89	Weighted Average
	6,180	80	47.27% Pervious Area
	6,894	98	52.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1H: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1I: Post-Development Conditions Drainage Area

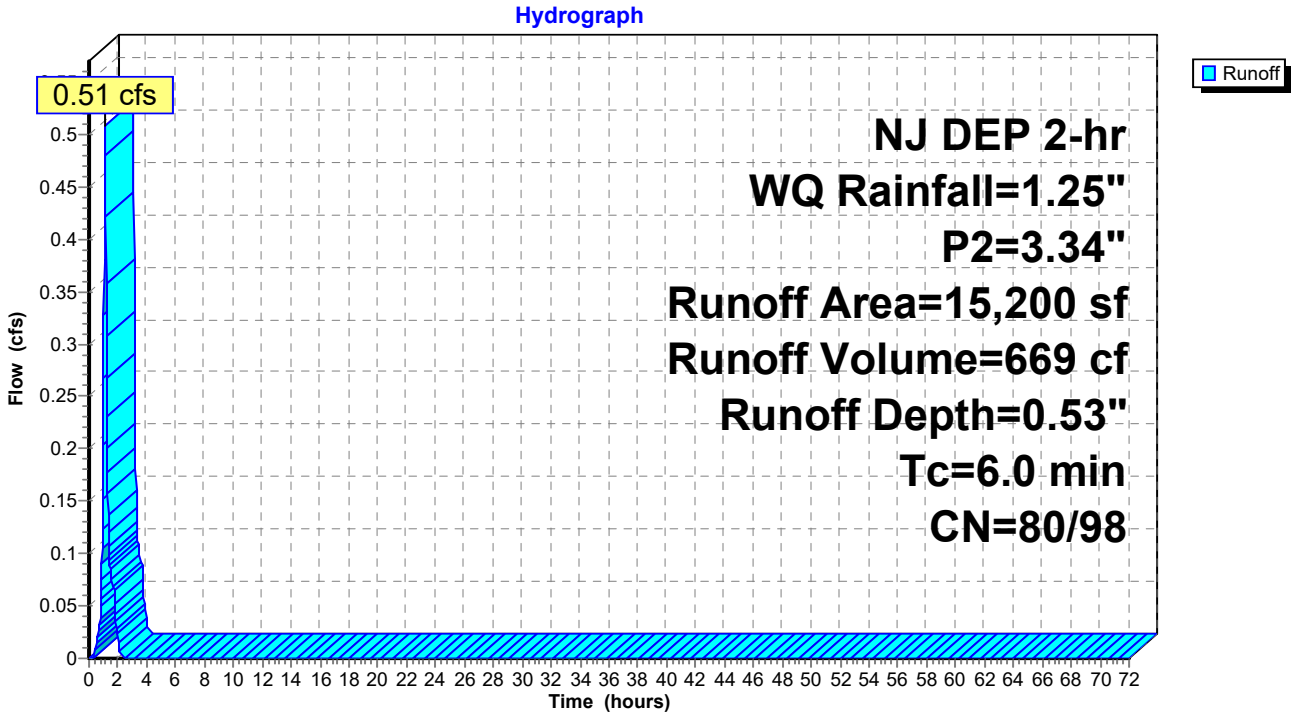
Runoff = 0.51 cfs @ 1.12 hrs, Volume= 669 cf, Depth= 0.53"
Routed to Link P-1 : Post Development Drianage

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=3.34"

	Area (sf)	CN	Description
*	3,217	98	Impervious Surfaces
*	3,042	98	MVS
	8,941	80	>75% Grass cover, Good, HSG D
	15,200	87	Weighted Average
	8,941	80	58.82% Pervious Area
	6,259	98	41.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1I: Post-Development Conditions Drainage Area



Summary for Pond PV-1: Permeable Asphalt

[44] Hint: Outlet device #2 is below defined storage
[44] Hint: Outlet device #3 is below defined storage
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=16)

Inflow Area = 74,848 sf, 71.79% Impervious, Inflow Depth = 0.11" for WQ event
Inflow = 0.52 cfs @ 1.11 hrs, Volume= 683 cf
Outflow = 0.32 cfs @ 1.19 hrs, Volume= 686 cf, Atten= 38%, Lag= 4.8 min
Primary = 0.32 cfs @ 1.19 hrs, Volume= 686 cf
Routed to Link P-1 : Post Development Drianage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 125.28' @ 1.19 hrs Surf.Area= 3,360 sf Storage= 116 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 2.7 min (74.6 - 71.9)

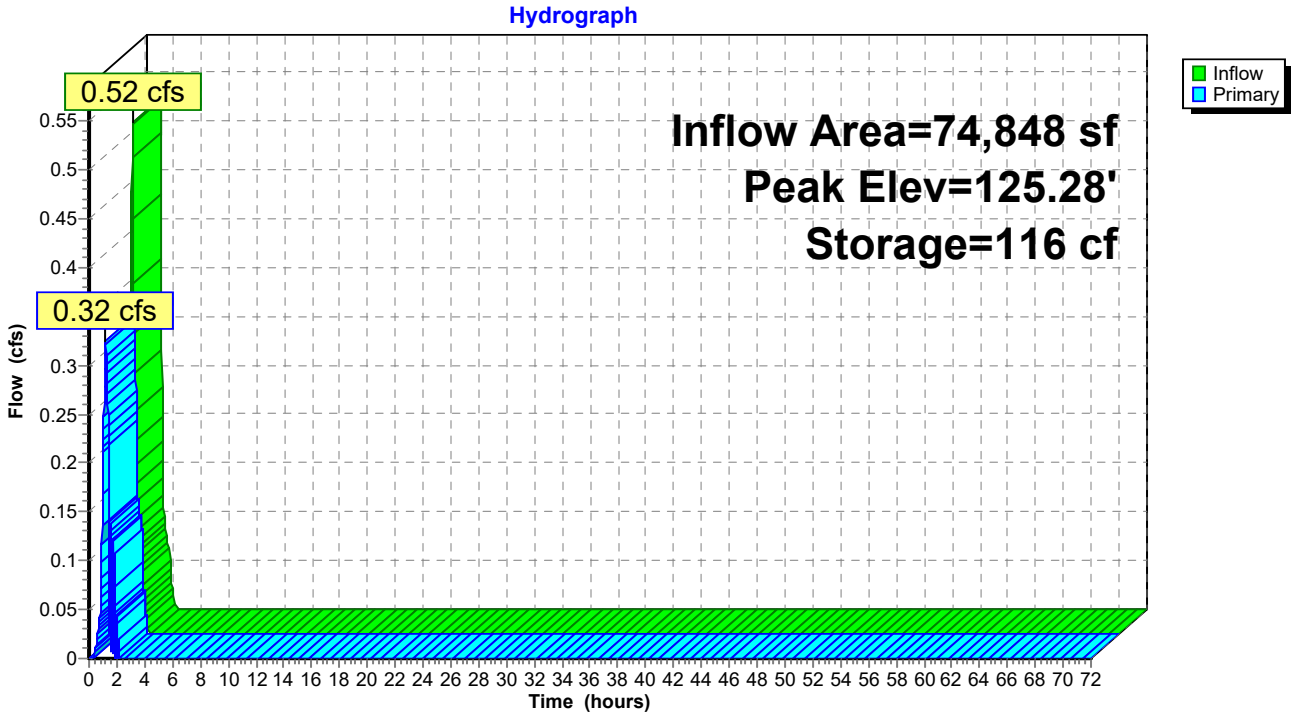
Volume	Invert	Avail.Storage	Storage Description
#1	125.19'	7,073 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 26,846 cf Overall - 9,163 cf Embedded = 17,683 cf x 40.0% Voids
#2	127.18'	8,008 cf	**78.0"W x 48.0"H x 77.00'L Parabolic Arch** x 6 Inside #1 9,163 cf Overall - 3.0" Wall Thickness = 8,008 cf
		15,081 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
125.19	3,360	244.0	0	0	3,360
133.18	3,360	244.0	26,846	26,846	5,310

Device	Routing	Invert	Outlet Devices
#1	Primary	124.93'	**15.0" Round Culvert** L= 54.0' Ke= 0.500 Inlet / Outlet Invert= 124.93' / 124.39' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	124.93'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	124.93'	**6.0" W x 4.0" H Vert. Control Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 1	127.85'	**22.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	132.17'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.32 cfs @ 1.19 hrs HW=125.28' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.32 cfs of 0.54 cfs potential flow)
  - **2=Underdrain** (Controls 0.00 cfs)
  - **3=Control Orifice** (Orifice Controls 0.32 cfs @ 1.94 fps)
  - **4=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PV-1: Permeable Asphalt



Summary for Pond PV-2: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow Area = 61,774 sf, 75.83% Impervious, Inflow Depth = 0.11" for WQ event
Inflow = 0.42 cfs @ 1.11 hrs, Volume= 544 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-1 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 136.59' @ 2.36 hrs Surf.Area= 2,520 sf Storage= 544 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

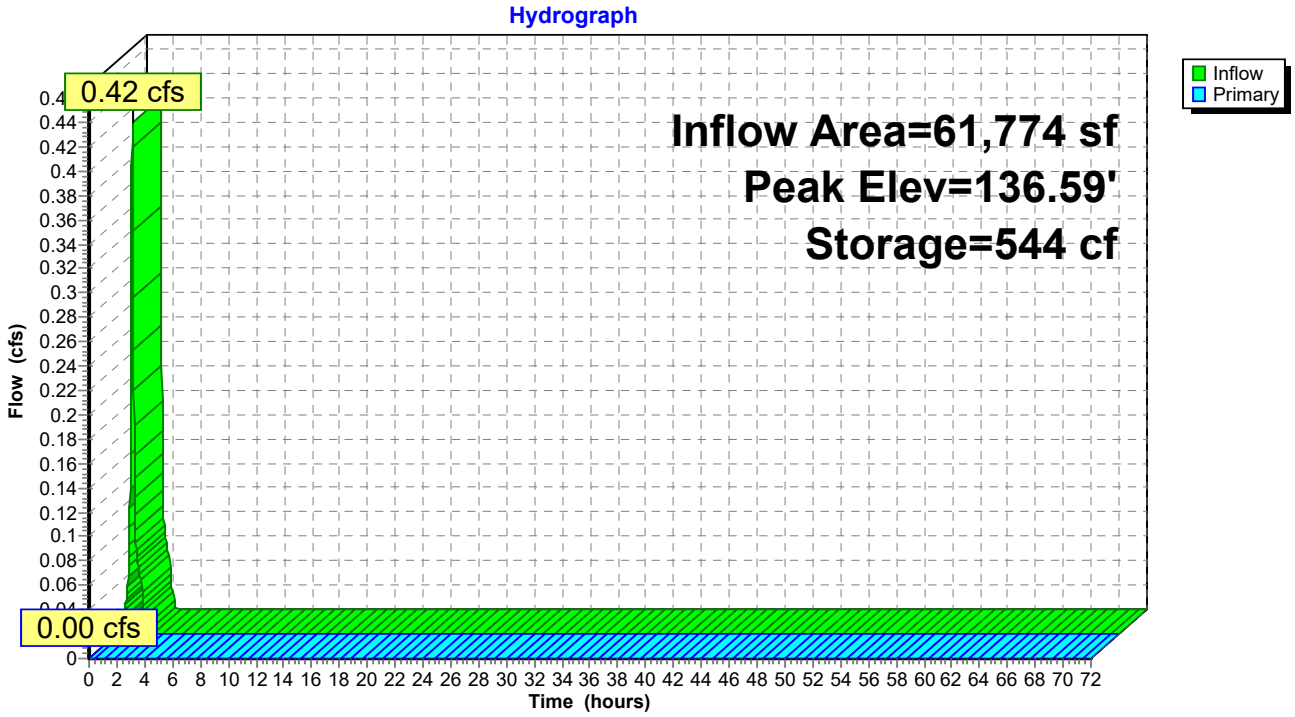
Volume	Invert	Avail.Storage	Storage Description
#1	135.80'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
135.80	2,520	204.0	0.0	0	0	2,520
136.05	2,520	204.0	0.0	0	0	2,571
136.06	2,520	204.0	40.0	10	10	2,573
137.00	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	131.68'	**18.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	135.80'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	137.00'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=135.80' TW=125.19' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 15.62 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-2: Permeable Asphalt



Summary for Pond PV-3: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow Area = 54,397 sf, 74.91% Impervious, Inflow Depth = 0.12" for WQ event
Inflow = 0.41 cfs @ 1.11 hrs, Volume= 535 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-2 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 139.58' @ 2.36 hrs Surf.Area= 2,520 sf Storage= 535 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

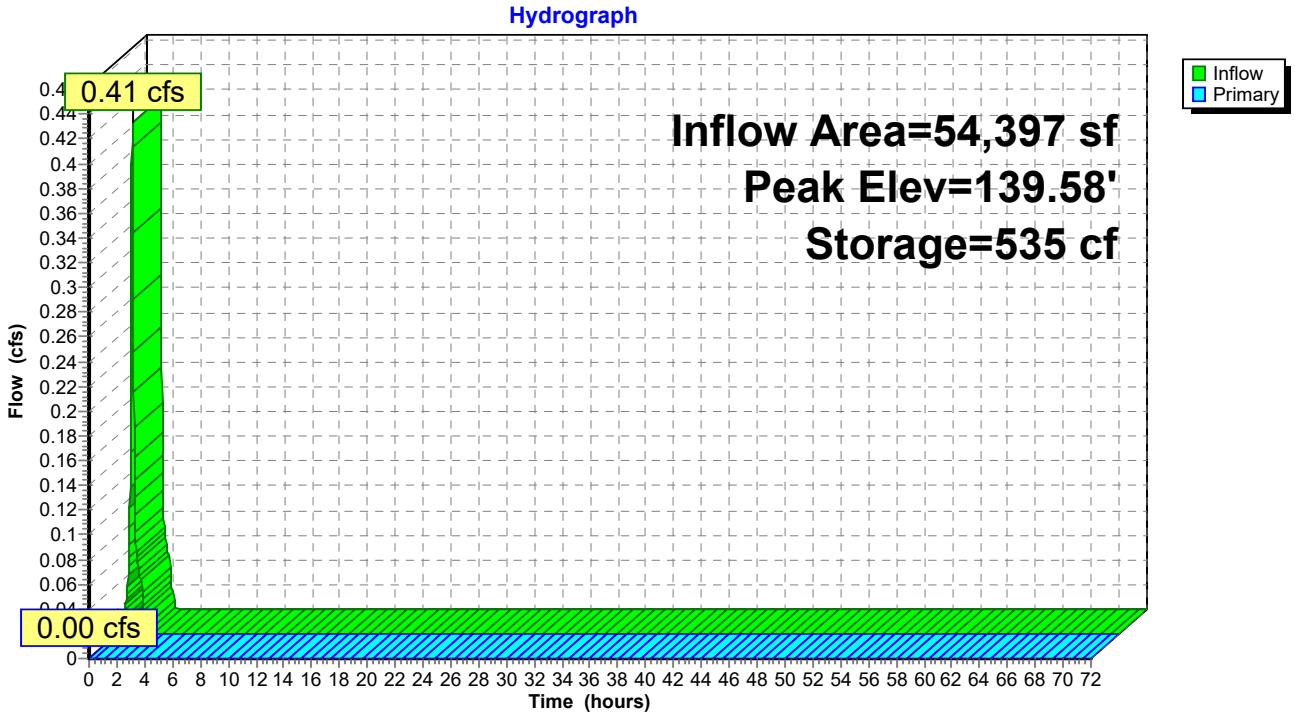
Volume	Invert	Avail.Storage	Storage Description
#1	138.80'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
138.80	2,520	204.0	0.0	0	0	2,520
139.05	2,520	204.0	0.0	0	0	2,571
139.06	2,520	204.0	40.0	10	10	2,573
140.00	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	135.60'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	138.80'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	140.00'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.80' TW=135.80' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.48 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-3: Permeable Asphalt



Summary for Pond PV-4: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow Area = 47,414 sf, 73.19% Impervious, Inflow Depth = 0.15" for WQ event
Inflow = 0.46 cfs @ 1.11 hrs, Volume= 600 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-3 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 142.44' @ 2.36 hrs Surf.Area= 2,520 sf Storage= 600 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

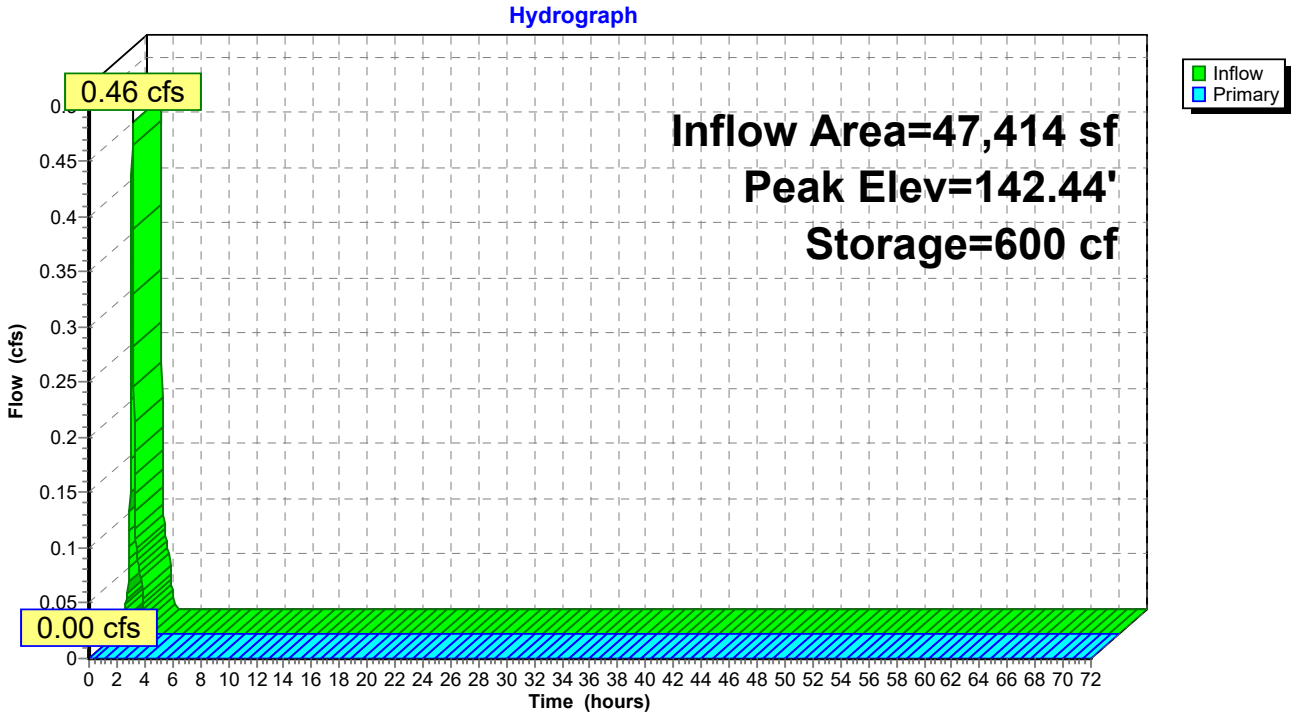
Volume	Invert	Avail.Storage	Storage Description
#1	141.60'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
141.60	2,520	204.0	0.0	0	0	2,520
141.85	2,520	204.0	0.0	0	0	2,571
141.86	2,520	204.0	40.0	10	10	2,573
142.80	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	138.60'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	141.60'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	142.80'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=141.60' TW=138.80' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.11 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-4: Permeable Asphalt



Summary for Pond PV-5: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow Area = 38,357 sf, 73.44% Impervious, Inflow Depth = 0.18" for WQ event
Inflow = 0.44 cfs @ 1.11 hrs, Volume= 570 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-4 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 144.12' @ 2.36 hrs Surf.Area= 2,520 sf Storage= 570 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

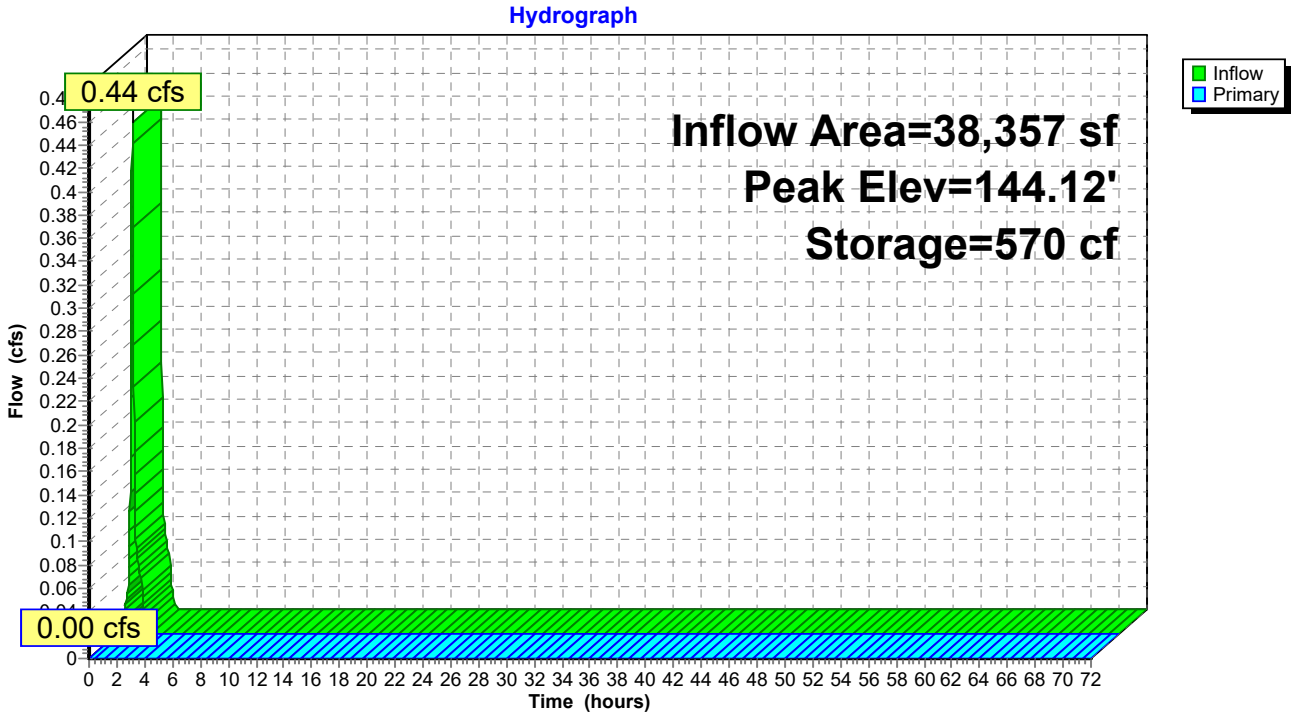
Volume	Invert	Avail.Storage	Storage Description
#1	143.30'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
143.30	2,520	204.0	0.0	0	0	2,520
143.55	2,520	204.0	0.0	0	0	2,571
143.56	2,520	204.0	40.0	10	10	2,573
144.50	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	141.39'	**12.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	143.30'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	144.50'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=143.30' TW=141.60' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 4.49 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-5: Permeable Asphalt



Summary for Pond PV-6: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow Area = 29,827 sf, 73.57% Impervious, Inflow Depth = 0.25" for WQ event
Inflow = 0.47 cfs @ 1.11 hrs, Volume= 612 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-5 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 146.83' @ 2.36 hrs Surf.Area= 2,520 sf Storage= 612 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

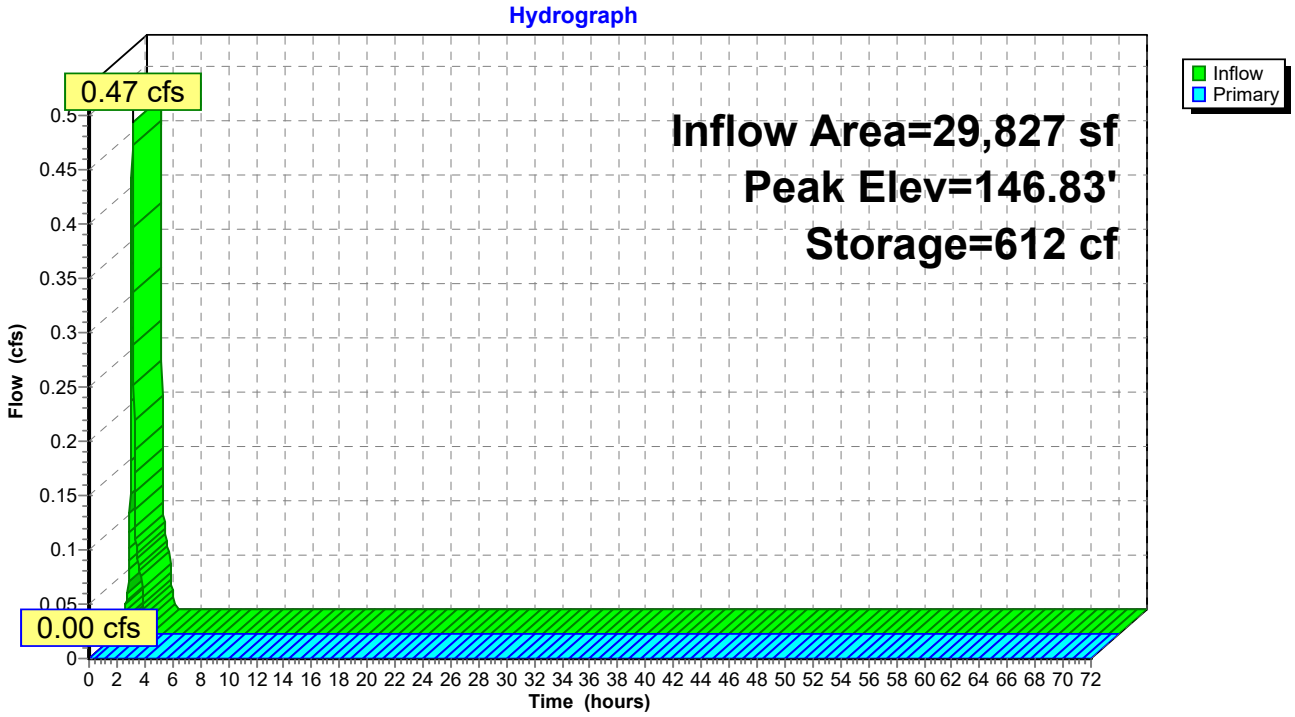
Volume	Invert	Avail.Storage	Storage Description
#1	145.97'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
145.97	2,520	204.0	0.0	0	0	2,520
146.22	2,520	204.0	0.0	0	0	2,571
146.23	2,520	204.0	40.0	10	10	2,573
147.17	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	144.09'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	145.97'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	147.17'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=145.97' TW=143.30' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 6.62 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-6: Permeable Asphalt



Summary for Pond PV-7: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow Area = 20,158 sf, 76.23% Impervious, Inflow Depth = 0.48" for WQ event
Inflow = 0.62 cfs @ 1.11 hrs, Volume= 801 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-6 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 149.90' @ 2.36 hrs Surf.Area= 2,520 sf Storage= 801 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

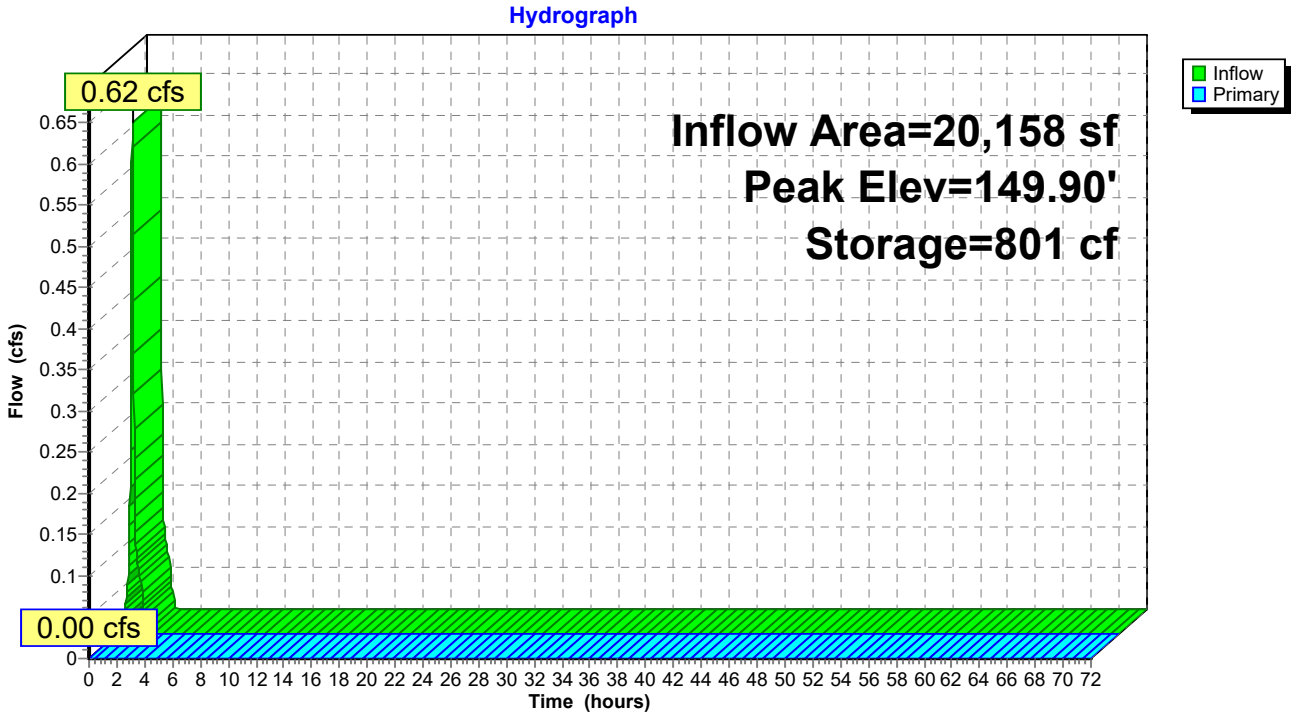
Volume	Invert	Avail.Storage	Storage Description
#1	148.86'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.86	2,520	204.0	0.0	0	0	2,520
149.11	2,520	204.0	0.0	0	0	2,571
149.12	2,520	204.0	40.0	10	10	2,573
150.06	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	145.76'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	148.86'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	150.06'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=148.86' TW=145.97' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.30 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-7: Permeable Asphalt



Summary for Pond PV-8: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow Area = 10,079 sf, 61.82% Impervious, Inflow Depth = 0.71" for WQ event
Inflow = 0.46 cfs @ 1.11 hrs, Volume= 593 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-7 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 152.44' @ 2.36 hrs Surf.Area= 2,520 sf Storage= 593 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

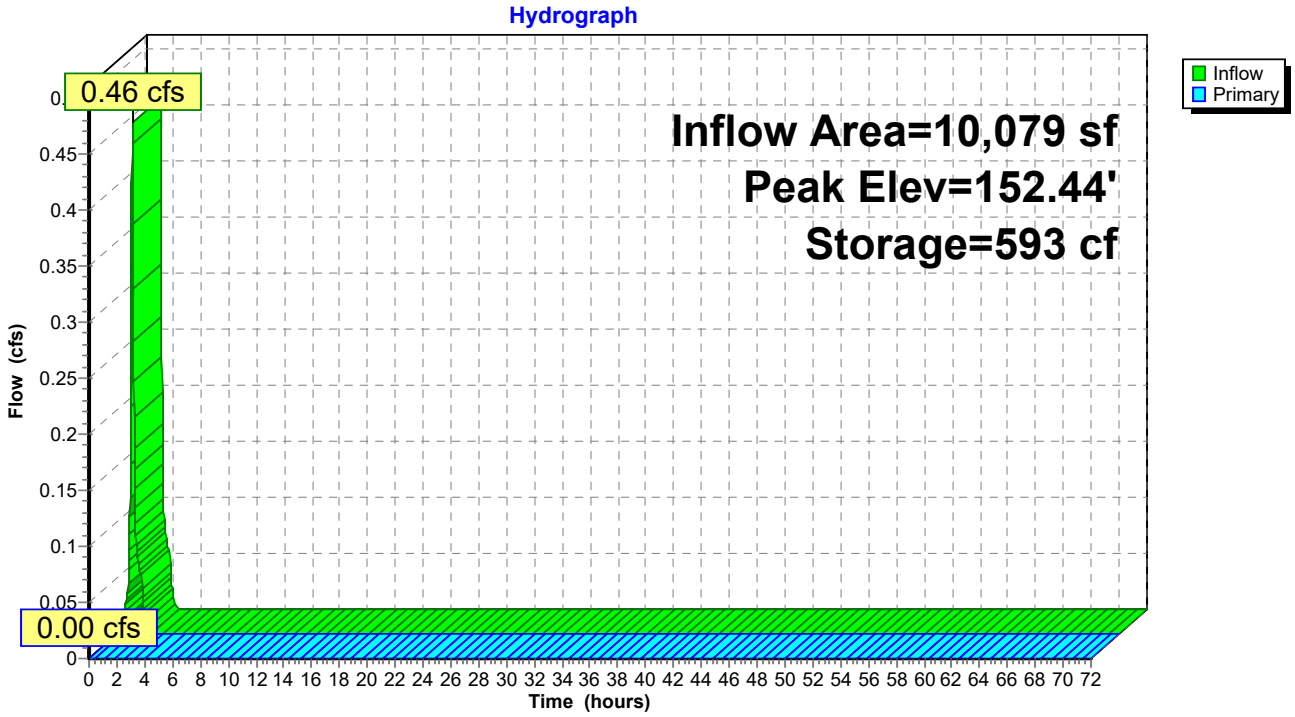
Volume	Invert	Avail.Storage	Storage Description
#1	151.60'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
151.60	2,520	204.0	0.0	0	0	2,520
151.85	2,520	204.0	0.0	0	0	2,571
151.86	2,520	204.0	40.0	10	10	2,573
152.80	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	148.90'	**12.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	151.60'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	152.80'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=151.60' TW=148.86' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 5.61 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-8: Permeable Asphalt

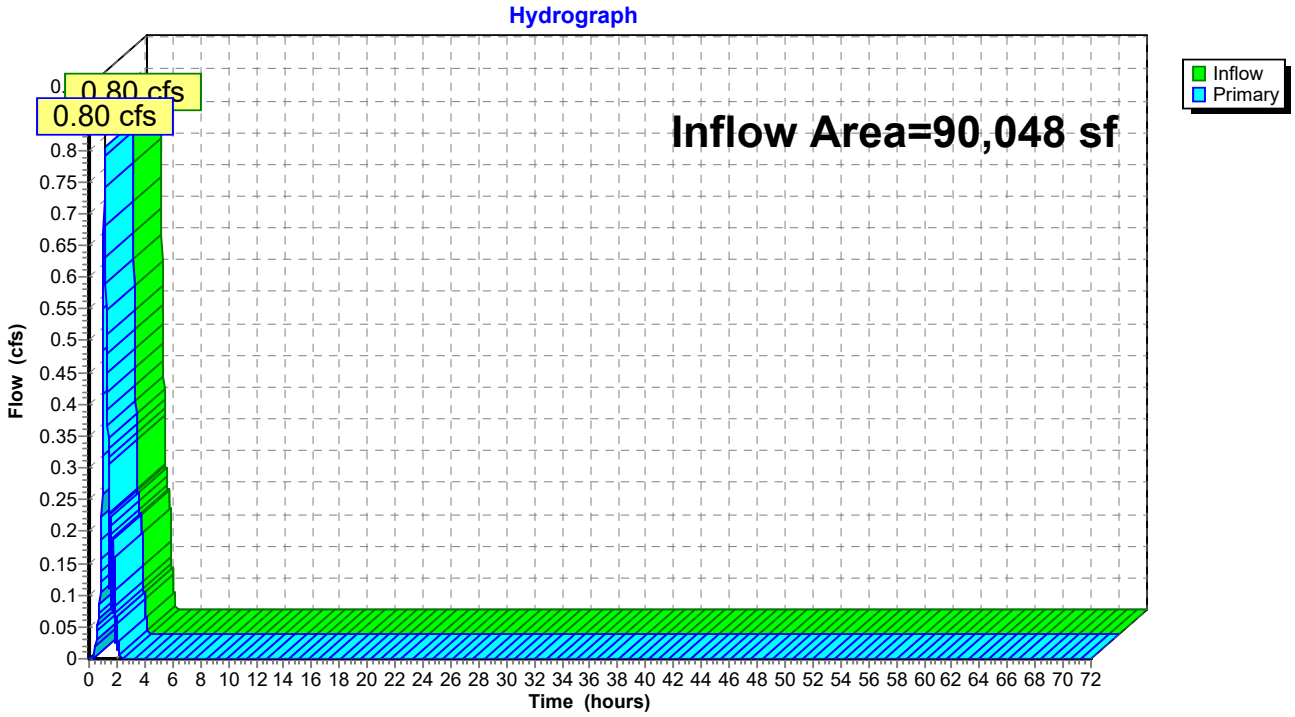


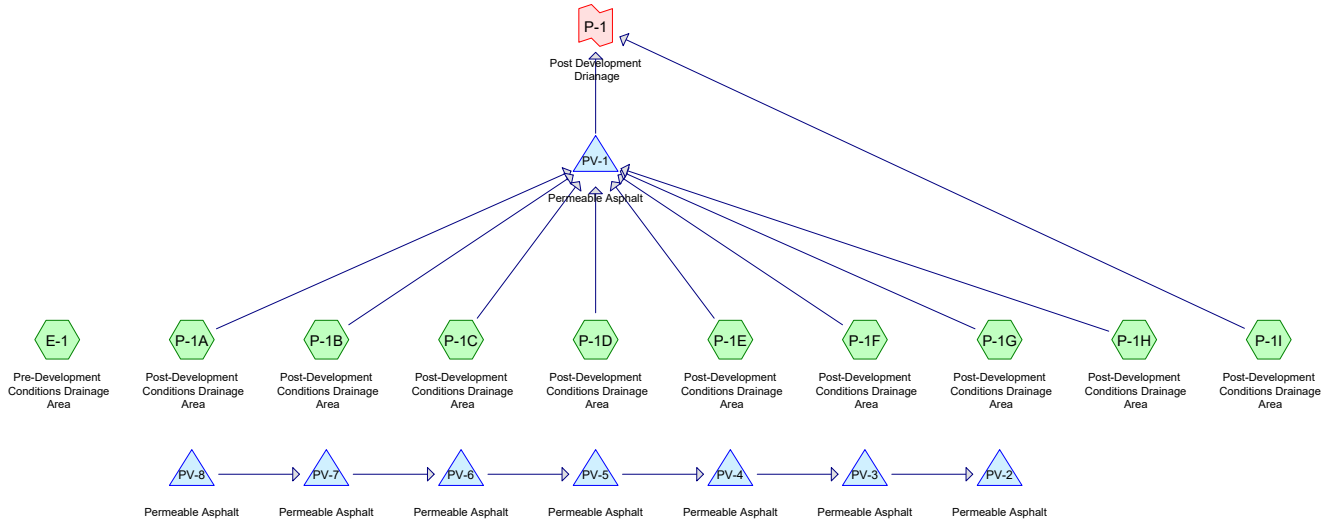
Summary for Link P-1: Post Development Drianage

Inflow Area = 90,048 sf, 66.63% Impervious, Inflow Depth = 0.18" for WQ event
Inflow = 0.80 cfs @ 1.12 hrs, Volume= 1,354 cf
Primary = 0.80 cfs @ 1.12 hrs, Volume= 1,354 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link P-1: Post Development Drianage





Subcat Reach Pond Link

Routing Diagram for 2024-02-27 Plainfield Hydrocad - with cultec pipes

Prepared by Stonefield Engineering & Design, Printed 3/18/2024

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	C2-Year	NOAA 24-hr	C	Default	24.00	1	3.34	2	3.34
2	C10-Year	NOAA 24-hr	C	Default	24.00	1	5.16	2	3.34
3	C100-Year	NOAA 24-hr	C	Default	24.00	1	8.95	2	3.34
4	F2-Year	NOAA 24-hr	C	Default	24.00	1	3.97	2	3.97
5	F10-Year	NOAA 24-hr	C	Default	24.00	1	6.21	2	3.97
6	F100-Year	NOAA 24-hr	C	Default	24.00	1	12.15	2	3.97

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	Sub Num
0	0	0	106,883	0	106,883	>75% Grass cover, Good	
0	0	0	0	35,957	35,957	Impervious Surfaces	
0	0	0	0	37,256	37,256	MVS	
0	**0**	**0**	**106,883**	**73,213**	**180,096**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: Pre-Development Runoff Area=90,048 sf 14.68% Impervious Runoff Depth=1.74"
Flow Length=669' Tc=7.1 min CN=80/98 Runoff=4.40 cfs 13,093 cf

Subcatchment P-1A: Post-Development Runoff Area=10,079 sf 61.82% Impervious Runoff Depth=2.50"
Flow Length=189' Tc=6.0 min CN=80/98 Runoff=0.68 cfs 2,098 cf

Subcatchment P-1B: Post-Development Runoff Area=10,079 sf 90.64% Impervious Runoff Depth=2.96"
Tc=6.0 min CN=80/98 Runoff=0.78 cfs 2,484 cf

Subcatchment P-1C: Post-Development Runoff Area=9,669 sf 68.03% Impervious Runoff Depth=2.60"
Tc=6.0 min CN=80/98 Runoff=0.67 cfs 2,092 cf

Subcatchment P-1D: Post-Development Runoff Area=8,530 sf 72.98% Impervious Runoff Depth=2.68"
Tc=6.0 min CN=80/98 Runoff=0.61 cfs 1,902 cf

Subcatchment P-1E: Post-Development Runoff Area=9,057 sf 72.13% Impervious Runoff Depth=2.66"
Tc=6.0 min CN=80/98 Runoff=0.64 cfs 2,009 cf

Subcatchment P-1F: Post-Development Runoff Area=6,983 sf 86.60% Impervious Runoff Depth=2.89"
Tc=6.0 min CN=80/98 Runoff=0.53 cfs 1,683 cf

Subcatchment P-1G: Post-Development Runoff Area=7,377 sf 82.59% Impervious Runoff Depth=2.83"
Tc=6.0 min CN=80/98 Runoff=0.55 cfs 1,739 cf

Subcatchment P-1H: Post-Development Runoff Area=13,074 sf 52.73% Impervious Runoff Depth=2.35"
Tc=6.0 min CN=80/98 Runoff=0.84 cfs 2,563 cf

Subcatchment P-1I: Post-Development Runoff Area=15,200 sf 41.18% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=80/98 Runoff=0.92 cfs 2,746 cf

Pond PV-1: Permeable Asphalt Peak Elev=127.69' Storage=4,193 cf Inflow=5.31 cfs 16,571 cf
Outflow=1.29 cfs 16,571 cf

Pond PV-2: Permeable Asphalt Peak Elev=136.05' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-3: Permeable Asphalt Peak Elev=139.05' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-4: Permeable Asphalt Peak Elev=141.85' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-5: Permeable Asphalt Peak Elev=143.55' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-6: Permeable Asphalt Peak Elev=146.22' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-7: Permeable Asphalt Peak Elev=149.11' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-8: Permeable Asphalt Peak Elev=0.00' Storage=0 cf
Primary=0.00 cfs 0 cf

Link P-1: Post Development Drianage Inflow=2.10 cfs 19,317 cf
Primary=2.10 cfs 19,317 cf

Total Runoff Area = 180,096 sf Runoff Volume = 32,409 cf Average Runoff Depth = 2.16"
59.35% Pervious = 106,883 sf 40.65% Impervious = 73,213 sf

Summary for Subcatchment E-1: Pre-Development Conditions Drainage Area

Runoff = 4.40 cfs @ 12.14 hrs, Volume= 13,093 cf, Depth= 1.74"
Routed to nonexistent node 4L

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C2-Year Rainfall=3.34", P2=3.34"

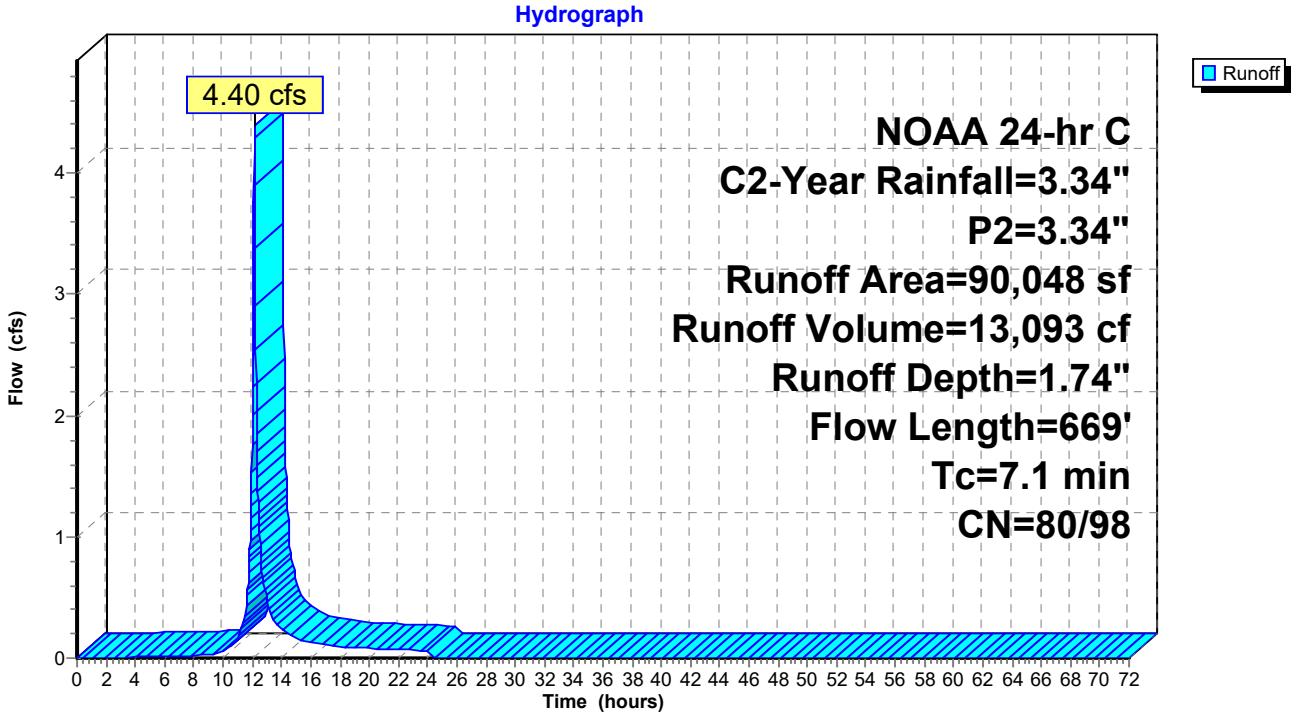
	Area (sf)	CN	Description
*	4,104	98	Impervious Surfaces
	76,831	80	>75% Grass cover, Good, HSG D
*	9,113	98	MVS
	90,048	83	Weighted Average
	76,831	80	85.32% Pervious Area
	13,217	98	14.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	10	0.0982	0.21		**Sheet Flow, 1-2** Grass: Short n= 0.150 P2= 3.34"
0.1	17	0.1150	2.37		**Shallow Concentrated Flow, 2-3** Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0800	1.98		**Shallow Concentrated Flow, 3-4** Short Grass Pasture Kv= 7.0 fps
0.1	18	0.1100	2.32		**Shallow Concentrated Flow, 4-5** Short Grass Pasture Kv= 7.0 fps
0.3	28	0.0700	1.85		**Shallow Concentrated Flow, 5-6** Short Grass Pasture Kv= 7.0 fps
0.1	15	0.0680	1.83		**Shallow Concentrated Flow, 6-7** Short Grass Pasture Kv= 7.0 fps
0.3	42	0.0960	2.17		**Shallow Concentrated Flow, 7-8** Short Grass Pasture Kv= 7.0 fps
0.5	34	0.0295	1.20		**Shallow Concentrated Flow, 8-9** Short Grass Pasture Kv= 7.0 fps
0.6	40	0.0250	1.11		**Shallow Concentrated Flow, 9-10** Short Grass Pasture Kv= 7.0 fps
0.3	43	0.1400	2.62		**Shallow Concentrated Flow, 10-11** Short Grass Pasture Kv= 7.0 fps
0.1	8	0.1300	2.52		**Shallow Concentrated Flow, 11-12** Short Grass Pasture Kv= 7.0 fps
0.4	46	0.0865	2.06		**Shallow Concentrated Flow, 12-13** Short Grass Pasture Kv= 7.0 fps
0.2	19	0.0515	1.59		**Shallow Concentrated Flow, 13-14** Short Grass Pasture Kv= 7.0 fps
0.1	8	0.0250	1.11		**Shallow Concentrated Flow, 14-15** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0250	3.21		**Shallow Concentrated Flow, 15-16** Paved Kv= 20.3 fps
0.2	15	0.0250	1.11		**Shallow Concentrated Flow, 16-17** Short Grass Pasture Kv= 7.0 fps
0.4	37	0.0540	1.63		**Shallow Concentrated Flow, 17-18** Short Grass Pasture Kv= 7.0 fps
0.2	14	0.0230	1.06		**Shallow Concentrated Flow, 18-19** Short Grass Pasture Kv= 7.0 fps
0.2	30	0.0230	3.08		**Shallow Concentrated Flow, 19-20** Paved Kv= 20.3 fps
0.1	23	0.0430	4.21		**Shallow Concentrated Flow, 20-21** Paved Kv= 20.3 fps
0.2	30	0.1340	2.56		**Shallow Concentrated Flow, 21-22** Short Grass Pasture Kv= 7.0 fps
0.3	38	0.0795	1.97		**Shallow Concentrated Flow, 22-23** Short Grass Pasture Kv= 7.0 fps
0.3	31	0.0645	1.78		**Shallow Concentrated Flow, 23-24** Short Grass Pasture Kv= 7.0 fps
0.5	47	0.0425	1.44		**Shallow Concentrated Flow, 24-25** Short Grass Pasture Kv= 7.0 fps
0.5	35	0.0290	1.19		**Shallow Concentrated Flow, 25-26** Short Grass Pasture Kv= 7.0 fps
0.1	13	0.0770	1.94		**Shallow Concentrated Flow, 26-27**

Short Grass Pasture Kv= 7.0 fps

7.1	669	Total

Subcatchment E-1: Pre-Development Conditions Drainage Area



Summary for Subcatchment P-1A: Post-Development Conditions Drainage Area

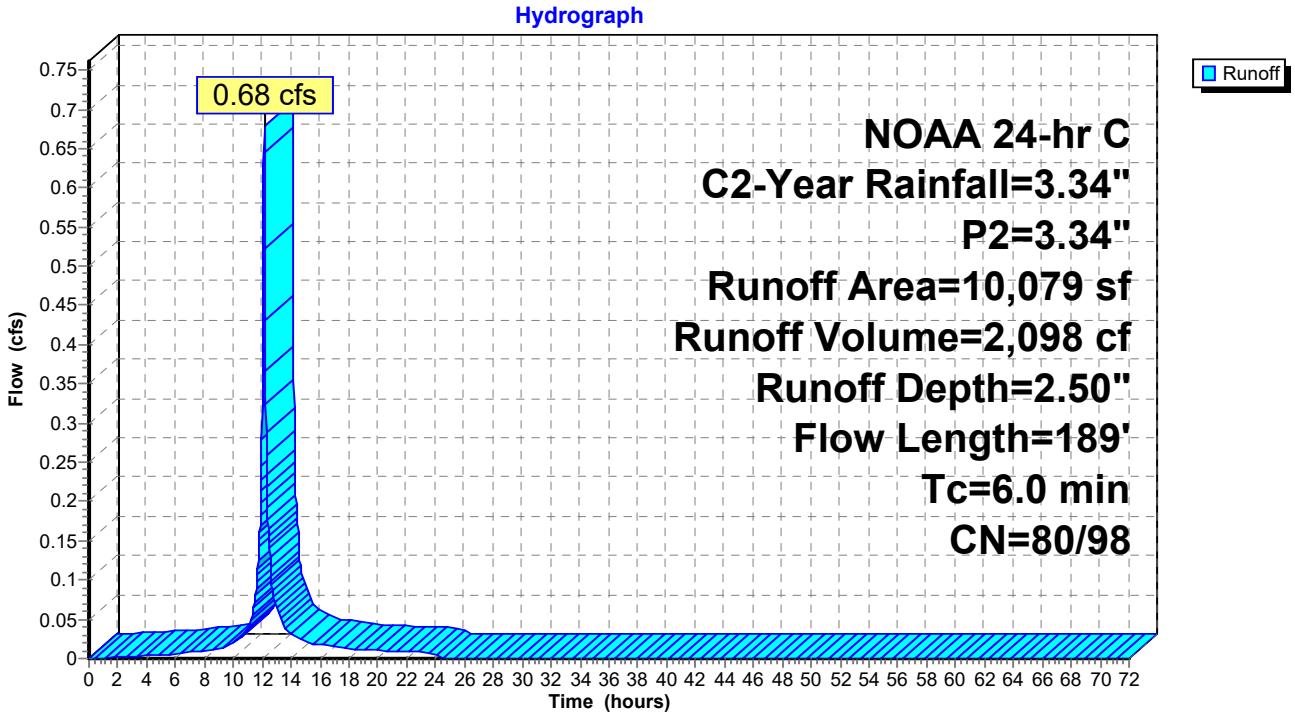
Runoff = 0.68 cfs @ 12.13 hrs, Volume= 2,098 cf, Depth= 2.50"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C2-Year Rainfall=3.34", P2=3.34"

	Area (sf)	CN	Description
*	933	98	Impervious Surfaces
*	5,298	98	MVS
	3,848	80	>75% Grass cover, Good, HSG D
	10,079	91	Weighted Average
	3,848	80	38.18% Pervious Area
	6,231	98	61.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	14	0.1050	0.23		**Sheet Flow, 1-2** Grass: Short n= 0.150 P2= 3.34"
0.2	89	0.1000	6.42		**Shallow Concentrated Flow, 2-3** Paved Kv= 20.3 fps
0.1	18	0.0275	3.37		**Shallow Concentrated Flow, 3-4** Paved Kv= 20.3 fps
0.3	68	0.0445	4.28		**Shallow Concentrated Flow, 4-5** Paved Kv= 20.3 fps
1.6	189	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1A: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1B: Post-Development Conditions Drainage Area

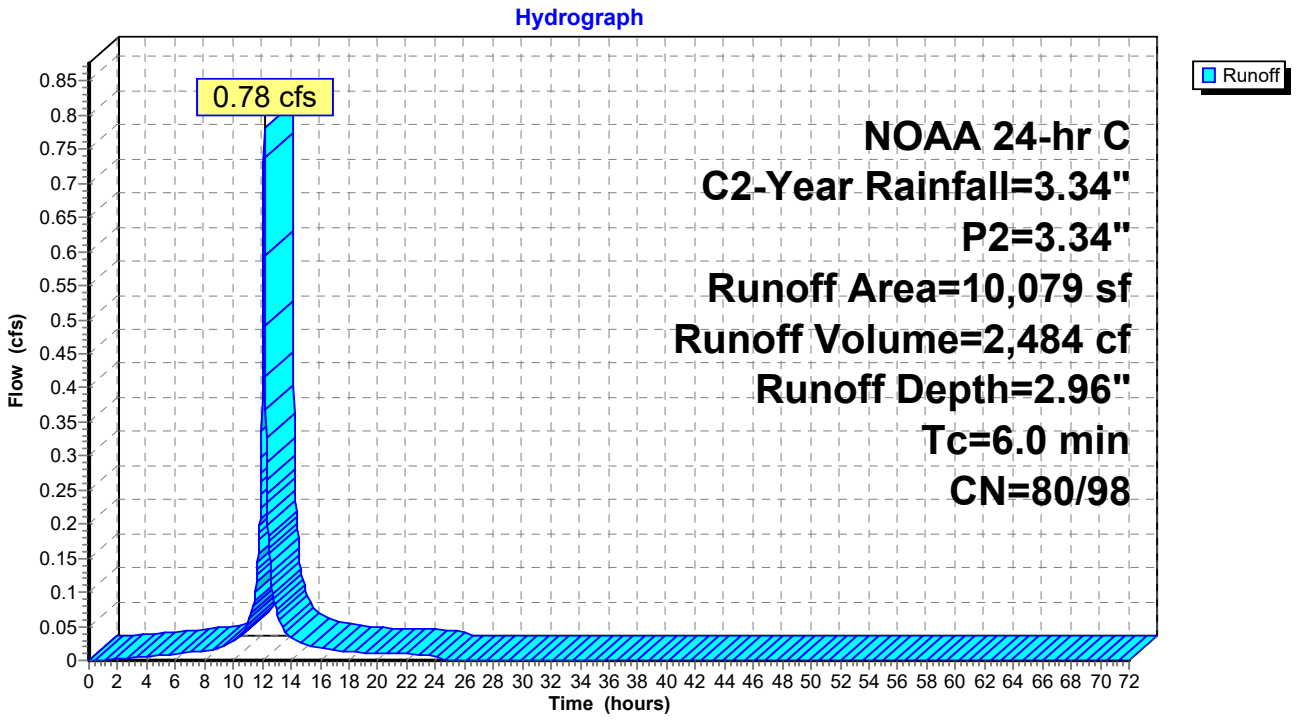
Runoff = 0.78 cfs @ 12.13 hrs, Volume= 2,484 cf, Depth= 2.96"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C2-Year Rainfall=3.34", P2=3.34"

	Area (sf)	CN	Description
*	6,427	98	Impervious Surfaces
*	2,709	98	MVS
	943	80	>75% Grass cover, Good, HSG D
	10,079	96	Weighted Average
	943	80	9.36% Pervious Area
	9,136	98	90.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1B: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1C: Post-Development Conditions Drainage Area

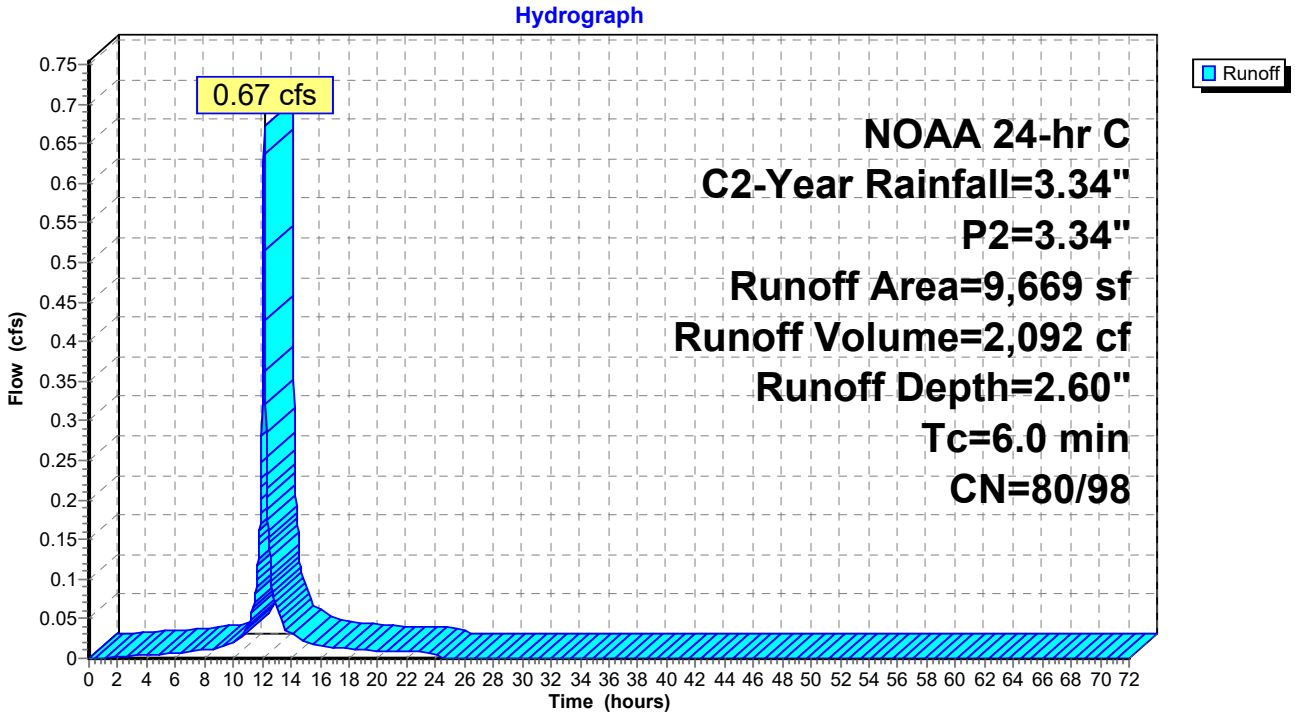
Runoff = 0.67 cfs @ 12.13 hrs, Volume= 2,092 cf, Depth= 2.60"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C2-Year Rainfall=3.34", P2=3.34"

	Area (sf)	CN	Description
*	3,869	98	Impervious Surfaces
*	2,709	98	MVS
	3,091	80	>75% Grass cover, Good, HSG D
	9,669	92	Weighted Average
	3,091	80	31.97% Pervious Area
	6,578	98	68.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1C: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1D: Post-Development Conditions Drainage Area

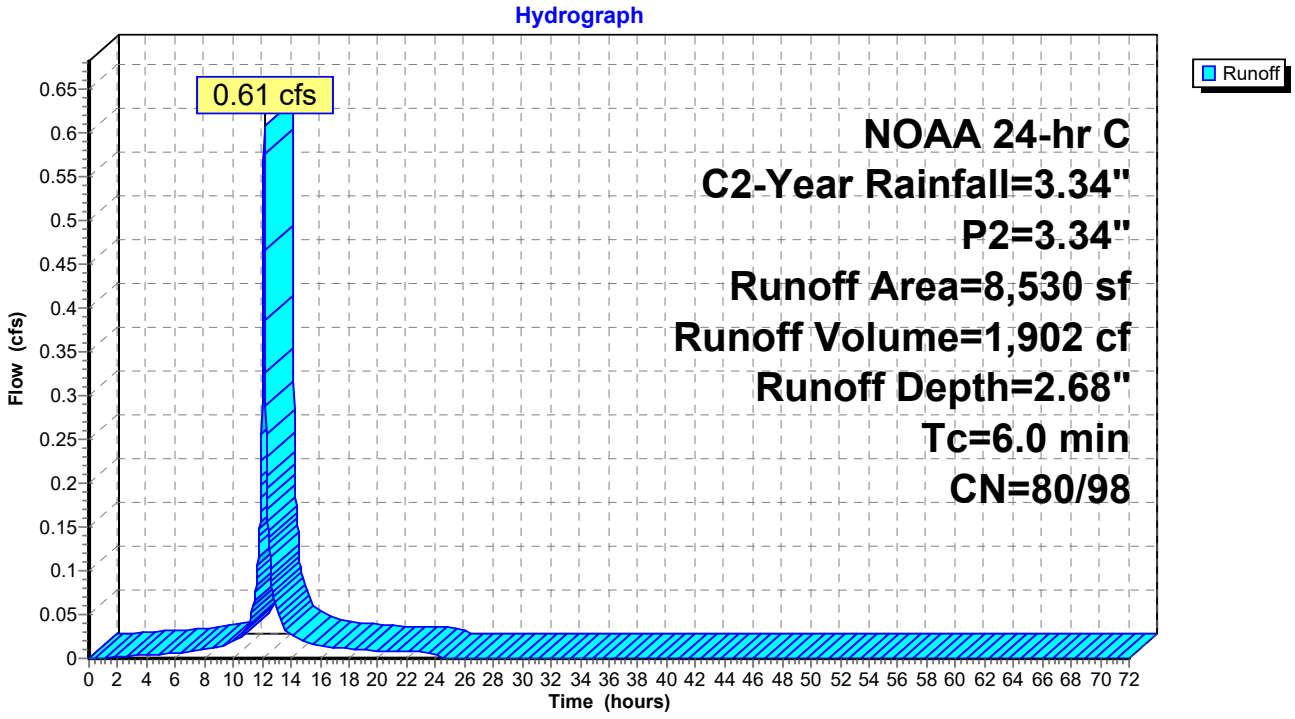
Runoff = 0.61 cfs @ 12.13 hrs, Volume= 1,902 cf, Depth= 2.68"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C2-Year Rainfall=3.34", P2=3.34"

	Area (sf)	CN	Description
*	3,516	98	Impervious Surfaces
*	2,709	98	MVS
	2,305	80	>75% Grass cover, Good, HSG D
	8,530	93	Weighted Average
	2,305	80	27.02% Pervious Area
	6,225	98	72.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1D: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1E: Post-Development Conditions Drainage Area

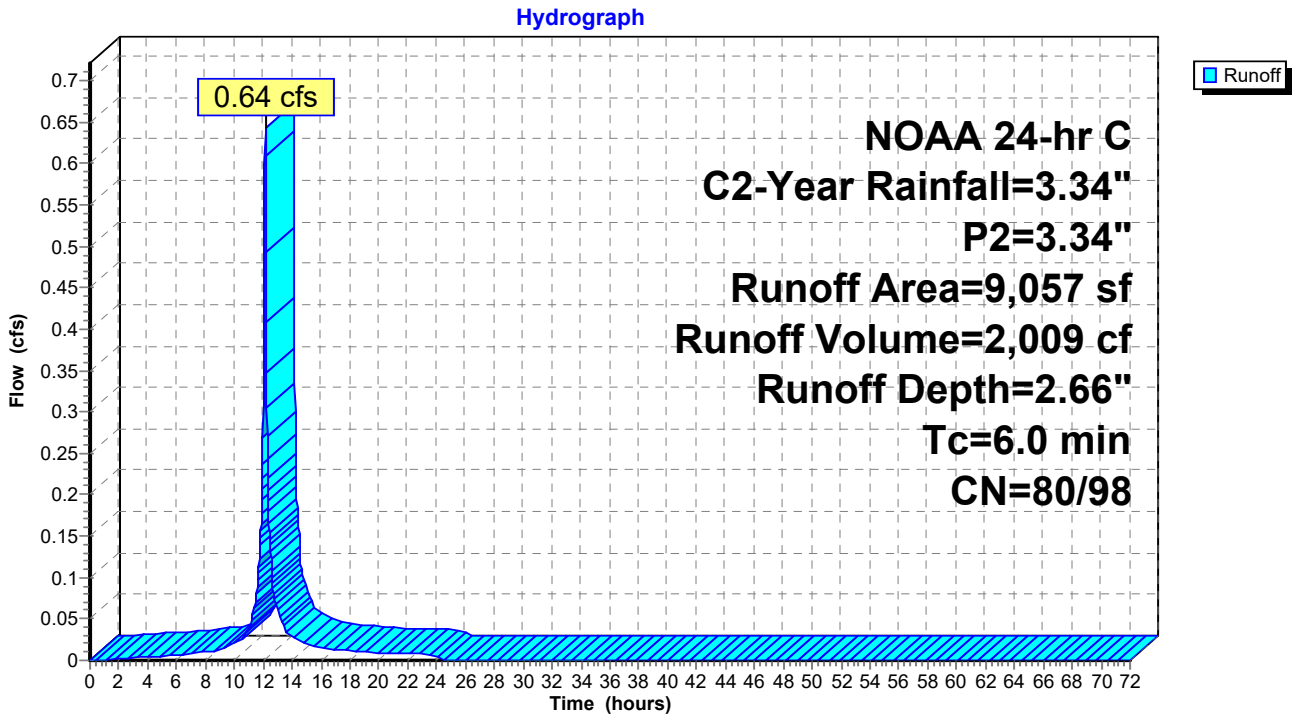
Runoff = 0.64 cfs @ 12.13 hrs, Volume= 2,009 cf, Depth= 2.66"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C2-Year Rainfall=3.34", P2=3.34"

	Area (sf)	CN	Description
*	3,824	98	Impervious Surfaces
*	2,709	98	MVS
	2,524	80	>75% Grass cover, Good, HSG D
	9,057	93	Weighted Average
	2,524	80	27.87% Pervious Area
	6,533	98	72.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1E: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1F: Post-Development Conditions Drainage Area

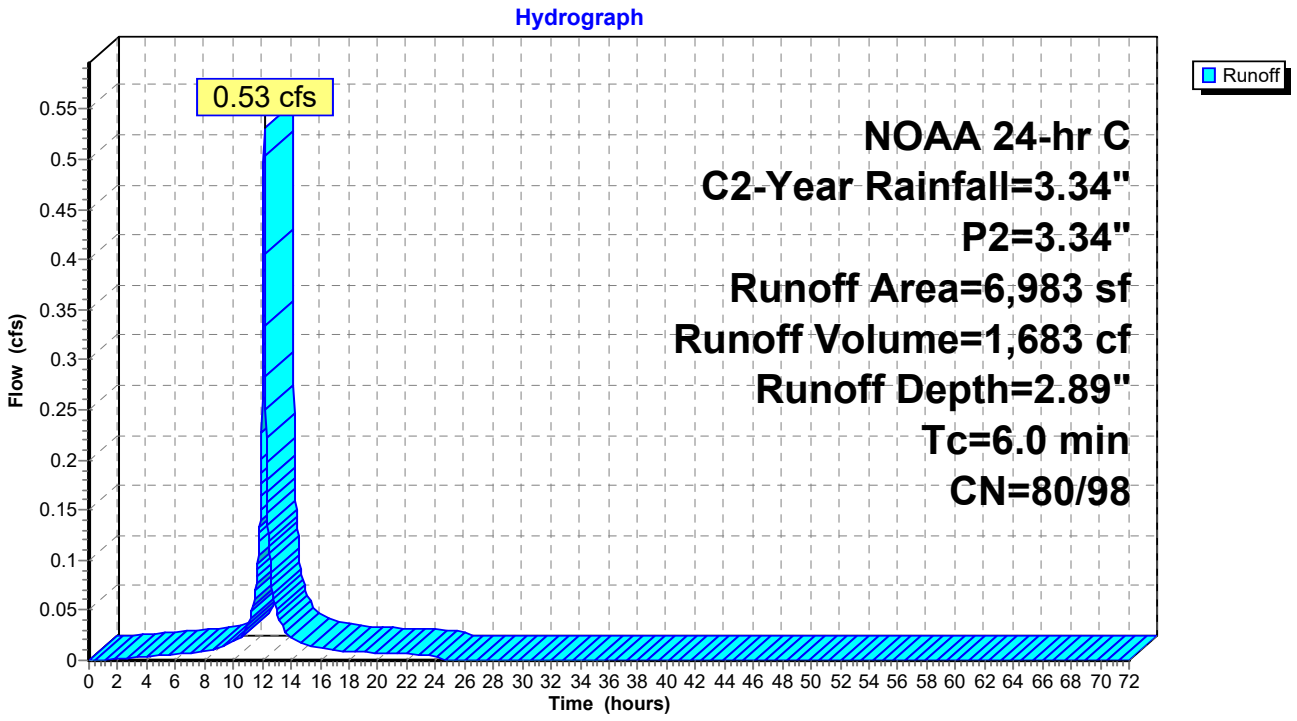
Runoff = 0.53 cfs @ 12.13 hrs, Volume= 1,683 cf, Depth= 2.89"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C2-Year Rainfall=3.34", P2=3.34"

	Area (sf)	CN	Description
*	3,338	98	Impervious Surfaces
*	2,709	98	MVS
	936	80	>75% Grass cover, Good, HSG D
	6,983	96	Weighted Average
	936	80	13.40% Pervious Area
	6,047	98	86.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1F: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1G: Post-Development Conditions Drainage Area

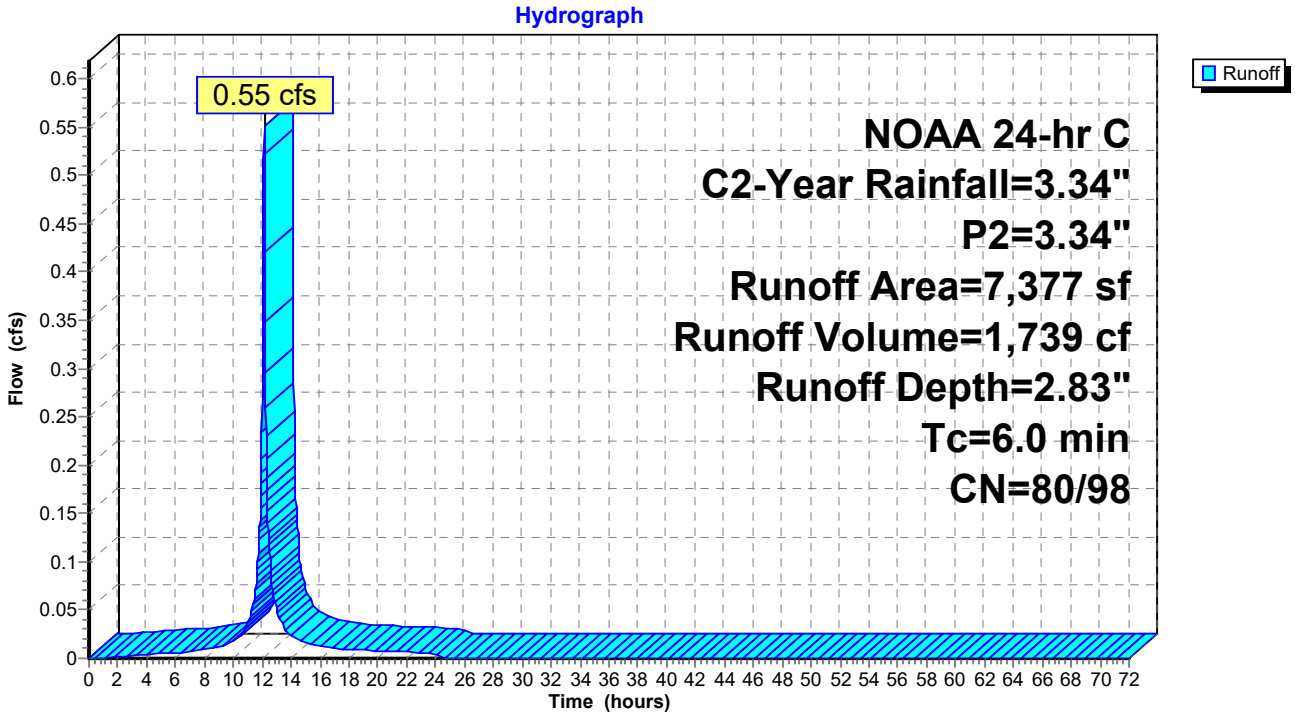
Runoff = 0.55 cfs @ 12.13 hrs, Volume= 1,739 cf, Depth= 2.83"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C2-Year Rainfall=3.34", P2=3.34"

	Area (sf)	CN	Description
*	3,384	98	Impervious Surfaces
*	2,709	98	MVS
	1,284	80	>75% Grass cover, Good, HSG D
	7,377	95	Weighted Average
	1,284	80	17.41% Pervious Area
	6,093	98	82.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1G: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1H: Post-Development Conditions Drainage Area

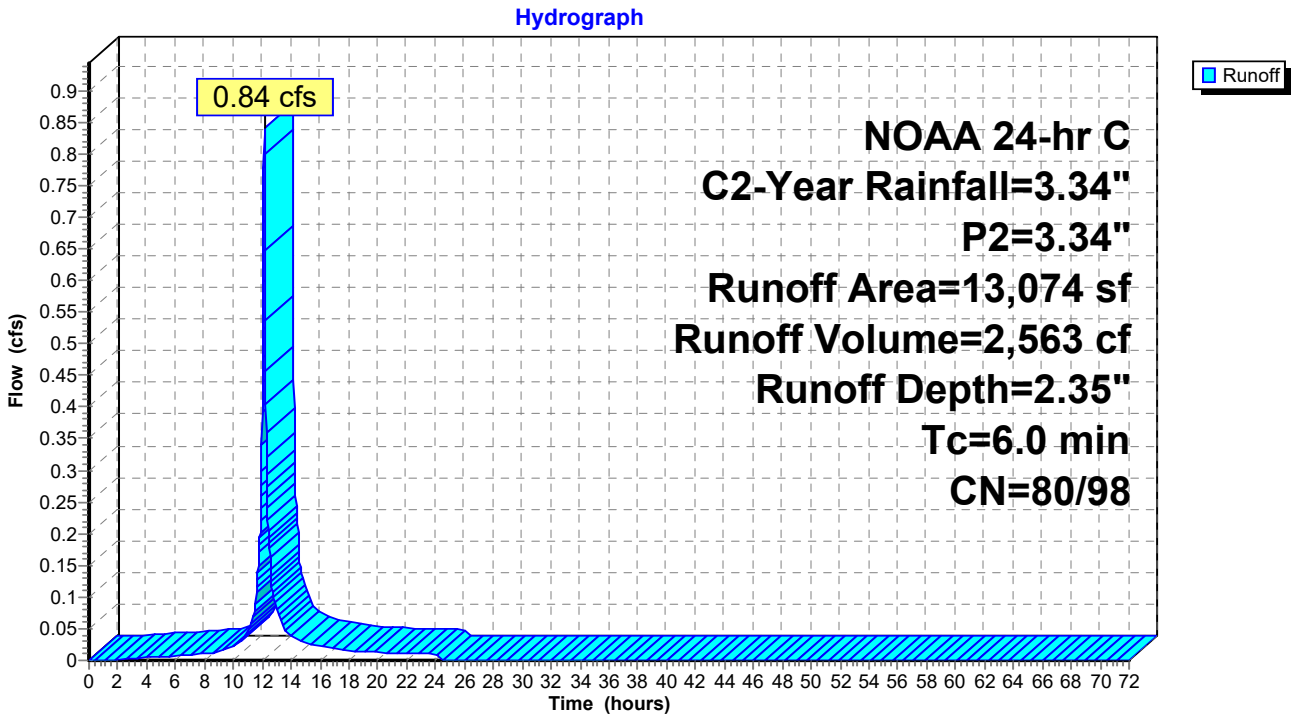
Runoff = 0.84 cfs @ 12.13 hrs, Volume= 2,563 cf, Depth= 2.35"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C2-Year Rainfall=3.34", P2=3.34"

	Area (sf)	CN	Description
*	3,345	98	Impervious Surfaces
*	3,549	98	MVS
	6,180	80	>75% Grass cover, Good, HSG D
	13,074	89	Weighted Average
	6,180	80	47.27% Pervious Area
	6,894	98	52.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1H: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1I: Post-Development Conditions Drainage Area

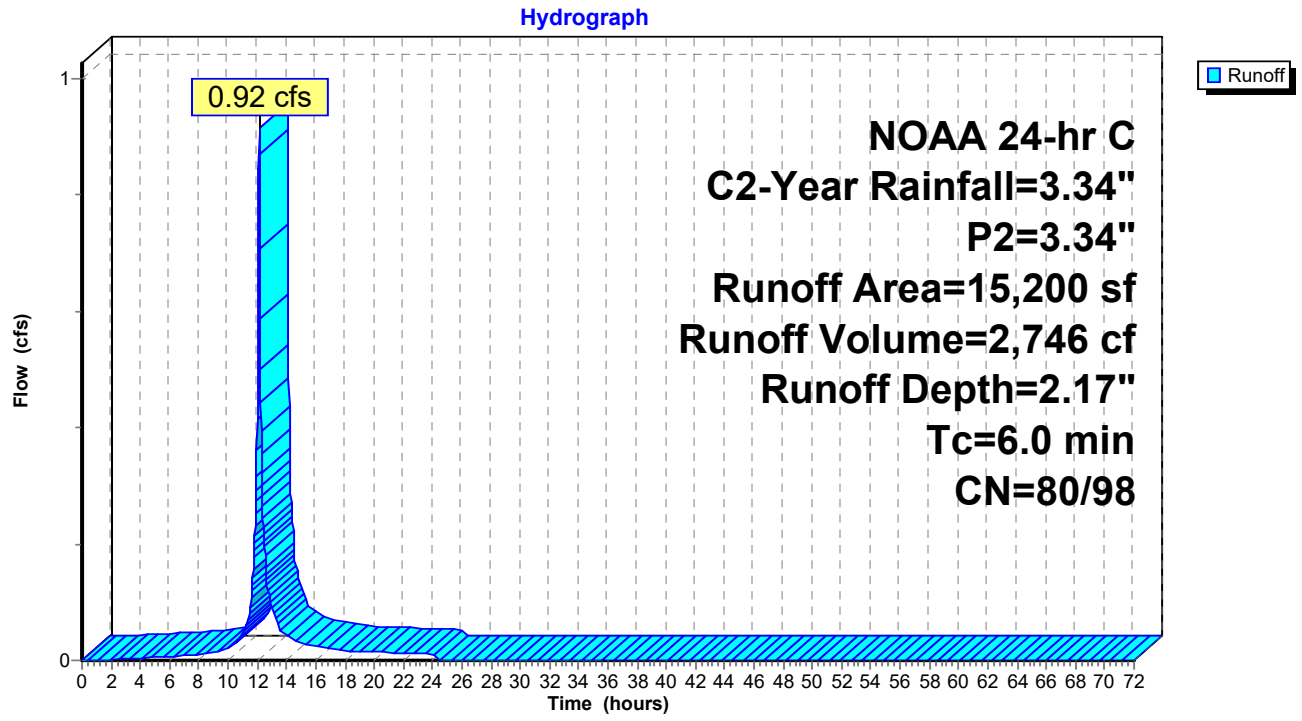
Runoff = 0.92 cfs @ 12.13 hrs, Volume= 2,746 cf, Depth= 2.17"
Routed to Link P-1 : Post Development Drianage

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C2-Year Rainfall=3.34", P2=3.34"

	Area (sf)	CN	Description
*	3,217	98	Impervious Surfaces
*	3,042	98	MVS
	8,941	80	>75% Grass cover, Good, HSG D
	15,200	87	Weighted Average
	8,941	80	58.82% Pervious Area
	6,259	98	41.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1I: Post-Development Conditions Drainage Area



Summary for Pond PV-1: Permeable Asphalt

[44] Hint: Outlet device #2 is below defined storage
[44] Hint: Outlet device #3 is below defined storage
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=224)

Inflow Area = 74,848 sf, 71.79% Impervious, Inflow Depth = 2.66" for C2-Year event
Inflow = 5.31 cfs @ 12.13 hrs, Volume= 16,571 cf
Outflow = 1.29 cfs @ 12.40 hrs, Volume= 16,571 cf, Atten= 76%, Lag= 16.1 min
Primary = 1.29 cfs @ 12.40 hrs, Volume= 16,571 cf
Routed to Link P-1 : Post Development Drianage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 127.69' @ 12.40 hrs Surf.Area= 3,360 sf Storage= 4,193 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 22.4 min (793.0 - 770.6)

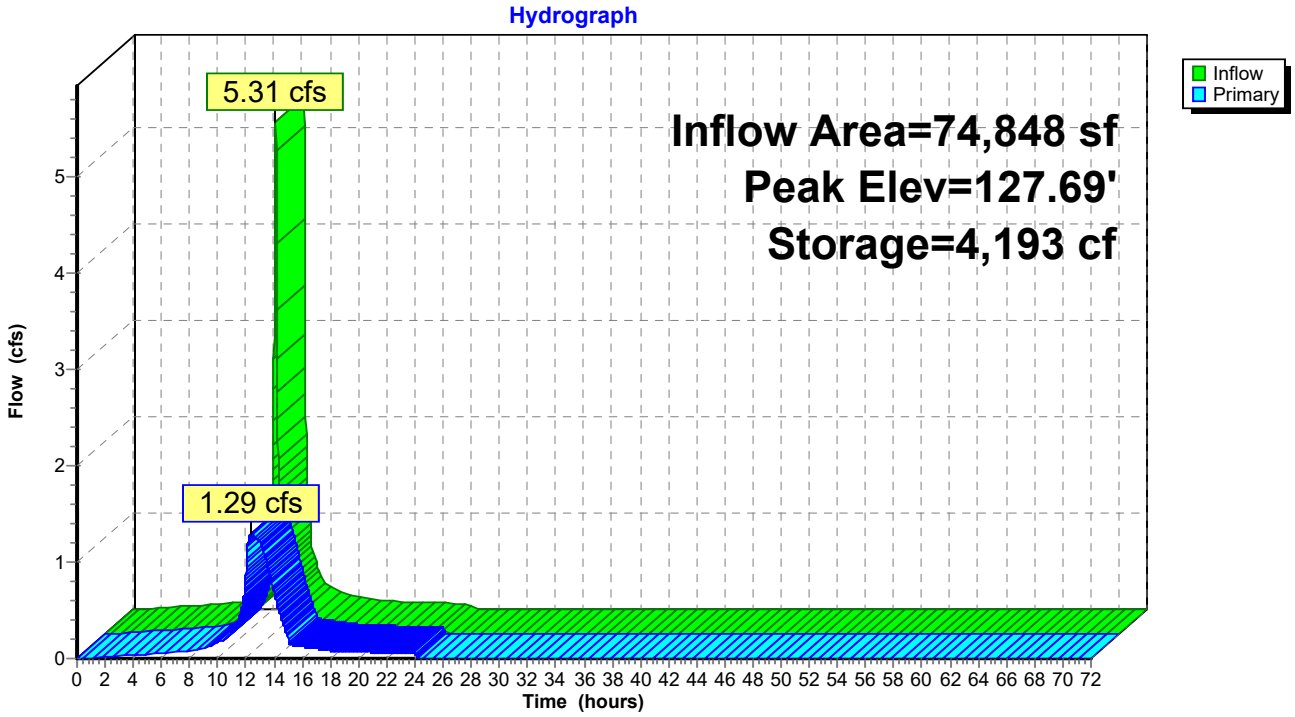
Volume	Invert	Avail.Storage	Storage Description
#1	125.19'	7,073 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 26,846 cf Overall - 9,163 cf Embedded = 17,683 cf x 40.0% Voids
#2	127.18'	8,008 cf	**78.0"W x 48.0"H x 77.00'L Parabolic Arch** x 6 Inside #1 9,163 cf Overall - 3.0" Wall Thickness = 8,008 cf
		15,081 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
125.19	3,360	244.0	0	0	3,360
133.18	3,360	244.0	26,846	26,846	5,310

Device	Routing	Invert	Outlet Devices
#1	Primary	124.93'	**15.0" Round Culvert** L= 54.0' Ke= 0.500 Inlet / Outlet Invert= 124.93' / 124.39' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	124.93'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	124.93'	**6.0" W x 4.0" H Vert. Control Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 1	127.85'	**22.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	132.17'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.29 cfs @ 12.40 hrs HW=127.69' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.29 cfs of 8.48 cfs potential flow)
  - **2=Underdrain** (Controls 0.00 cfs)
  - **3=Control Orifice** (Orifice Controls 1.29 cfs @ 7.75 fps)
  - **4=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PV-1: Permeable Asphalt



Summary for Pond PV-2: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow	=	0.00 cfs @	0.00 hrs, Volume=	0 cf
Outflow	=	0.00 cfs @	0.00 hrs, Volume=	0 cf, Atten= 0%, Lag= 0.0 min
Primary	=	0.00 cfs @	0.00 hrs, Volume=	0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 136.05' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

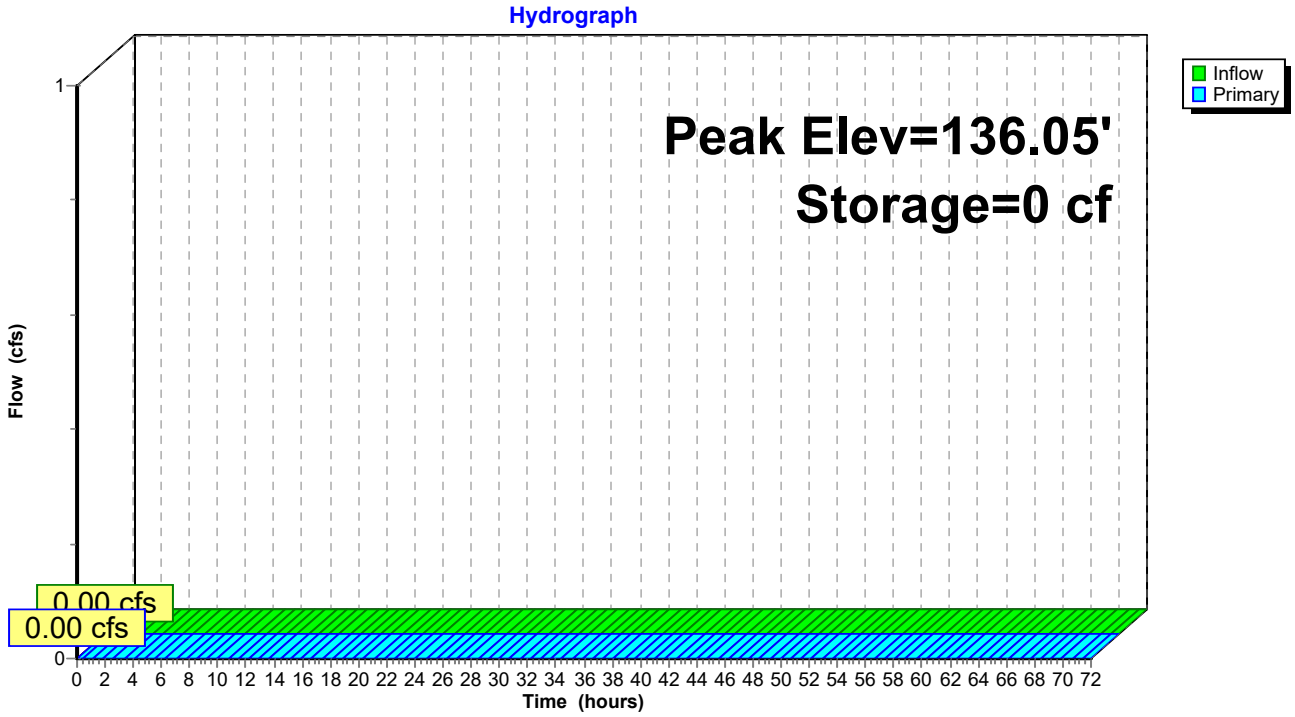
Volume	Invert	Avail.Storage	Storage Description
#1	135.80'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
135.80	2,520	204.0	0.0	0	0	2,520
136.05	2,520	204.0	0.0	0	0	2,571
136.06	2,520	204.0	40.0	10	10	2,573
137.00	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	131.68'	**18.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	135.80'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	137.00'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=135.80' (Free Discharge)
└**1=Culvert Out** (Passes 0.00 cfs of 15.62 cfs potential flow)
  └**2=Underdrain** (Controls 0.00 cfs)
  └**3=WQDS** (Controls 0.00 cfs)

Pond PV-2: Permeable Asphalt



Summary for Pond PV-3: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-2 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 139.05' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

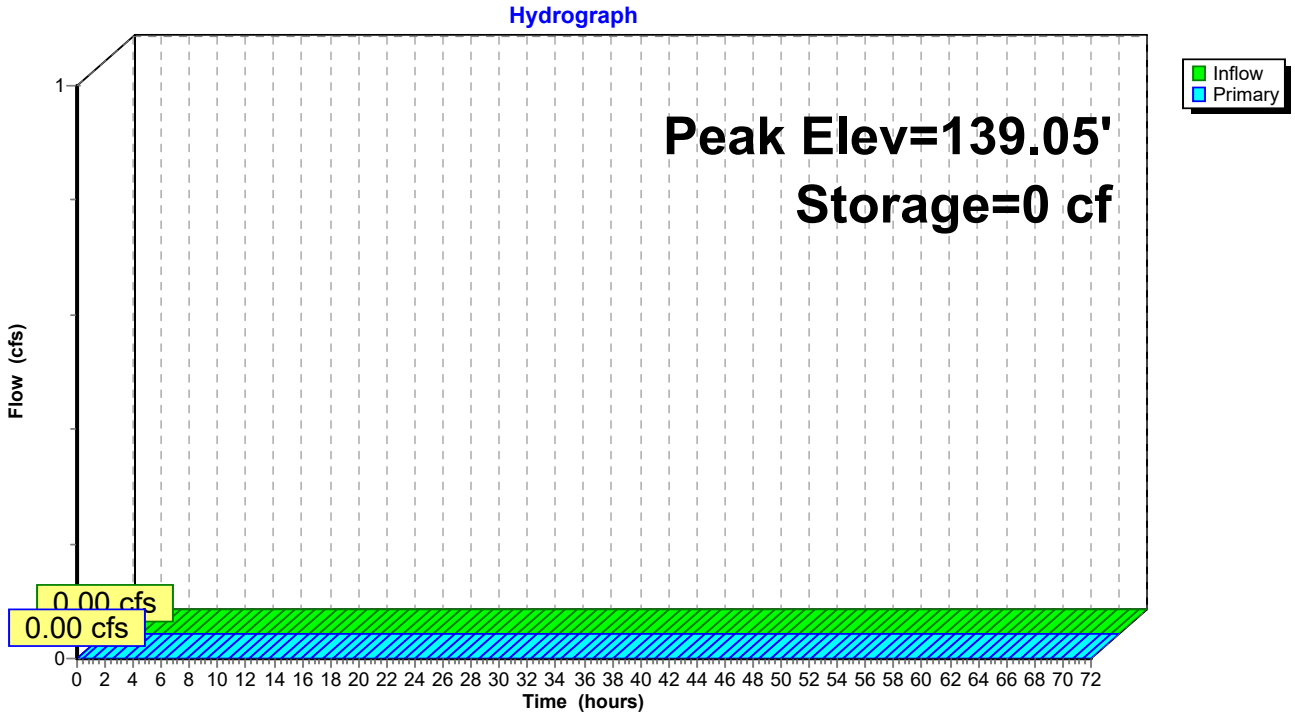
Volume	Invert	Avail.Storage	Storage Description
#1	138.80'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
138.80	2,520	204.0	0.0	0	0	2,520
139.05	2,520	204.0	0.0	0	0	2,571
139.06	2,520	204.0	40.0	10	10	2,573
140.00	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	135.60'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	138.80'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	140.00'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.80' TW=135.80' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.48 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-3: Permeable Asphalt



Summary for Pond PV-4: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-3 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 141.85' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

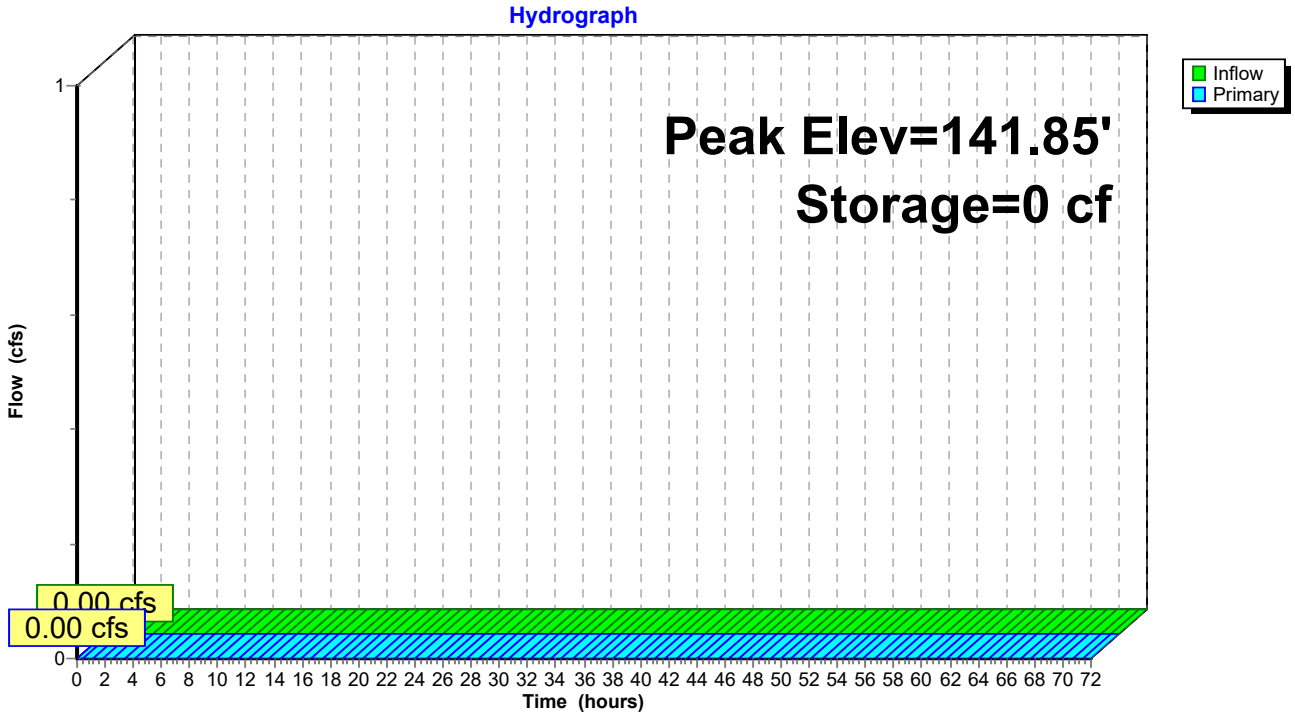
Volume	Invert	Avail.Storage	Storage Description
#1	141.60'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
141.60	2,520	204.0	0.0	0	0	2,520
141.85	2,520	204.0	0.0	0	0	2,571
141.86	2,520	204.0	40.0	10	10	2,573
142.80	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	138.60'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	141.60'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	142.80'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=141.60' TW=138.80' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.11 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-4: Permeable Asphalt



Summary for Pond PV-5: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-4 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 143.55' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

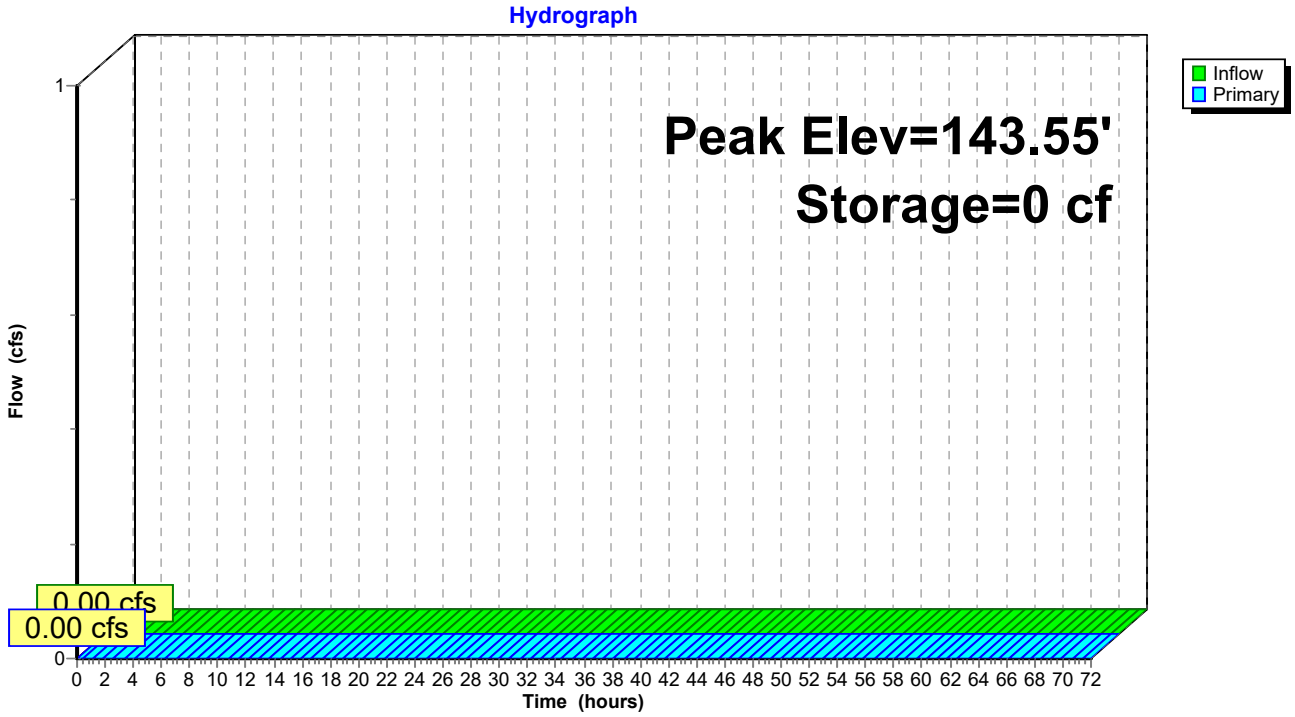
Volume	Invert	Avail.Storage	Storage Description
#1	143.30'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
143.30	2,520	204.0	0.0	0	0	2,520
143.55	2,520	204.0	0.0	0	0	2,571
143.56	2,520	204.0	40.0	10	10	2,573
144.50	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	141.39'	**12.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	143.30'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	144.50'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=143.30' TW=141.60' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 4.49 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-5: Permeable Asphalt



Summary for Pond PV-6: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-5 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 146.22' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

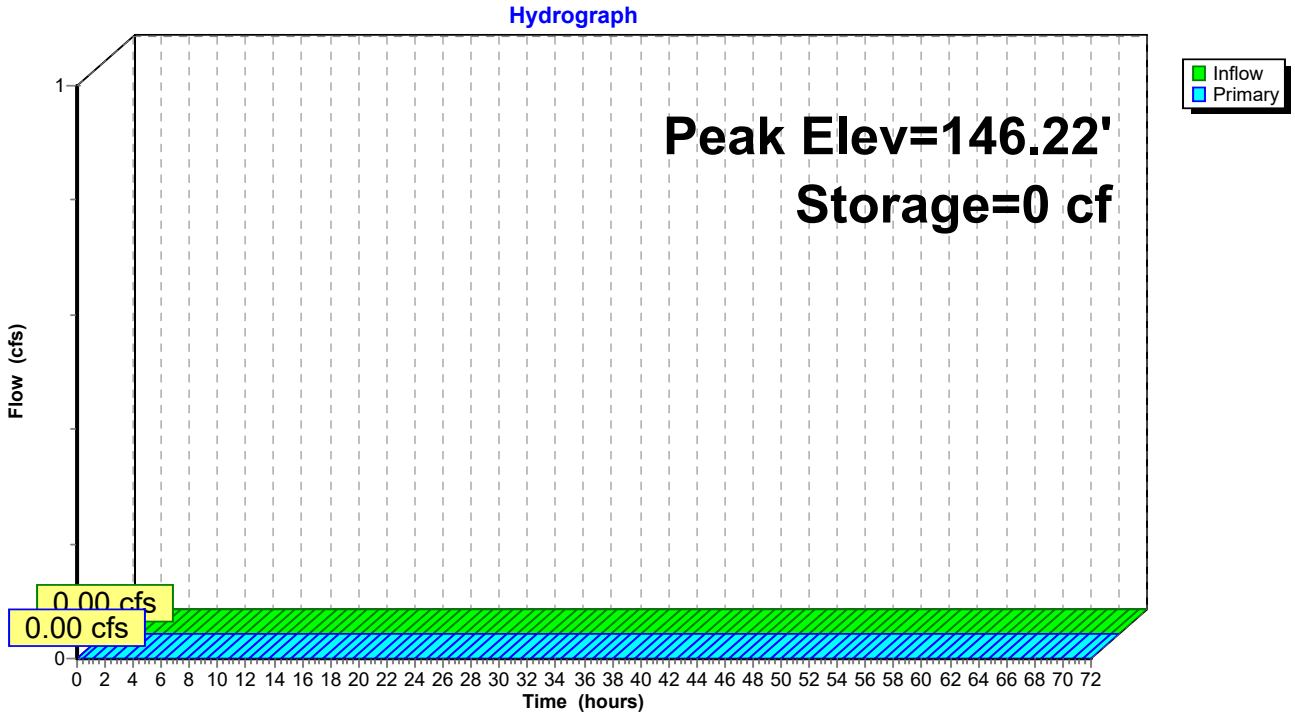
Volume	Invert	Avail.Storage	Storage Description
#1	145.97'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
145.97	2,520	204.0	0.0	0	0	2,520
146.22	2,520	204.0	0.0	0	0	2,571
146.23	2,520	204.0	40.0	10	10	2,573
147.17	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	144.09'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	145.97'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	147.17'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=145.97' TW=143.30' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 6.62 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-6: Permeable Asphalt



Summary for Pond PV-7: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-6 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 149.11' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

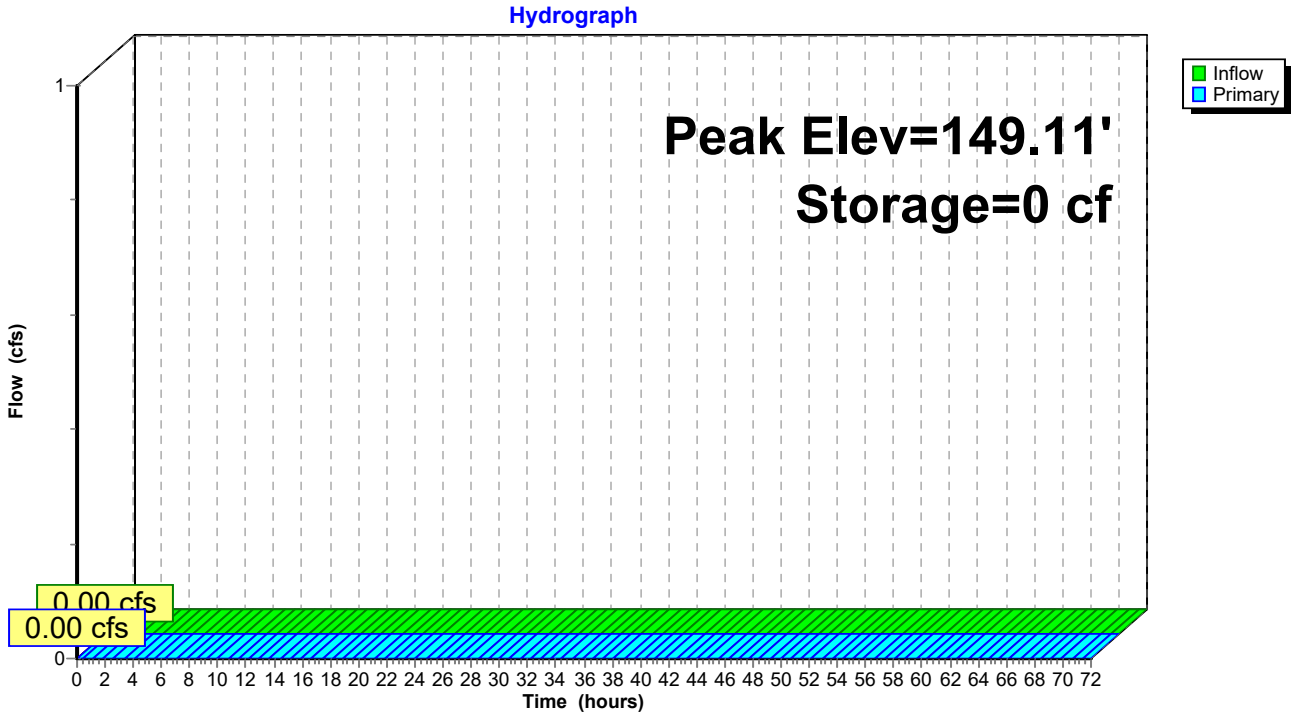
Volume	Invert	Avail.Storage	Storage Description
#1	148.86'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.86	2,520	204.0	0.0	0	0	2,520
149.11	2,520	204.0	0.0	0	0	2,571
149.12	2,520	204.0	40.0	10	10	2,573
150.06	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	145.76'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	148.86'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	150.06'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=148.86' TW=145.97' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.30 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-7: Permeable Asphalt



Summary for Pond PV-8: Permeable Asphalt

[43] Hint: Has no inflow (Outflow=Zero)

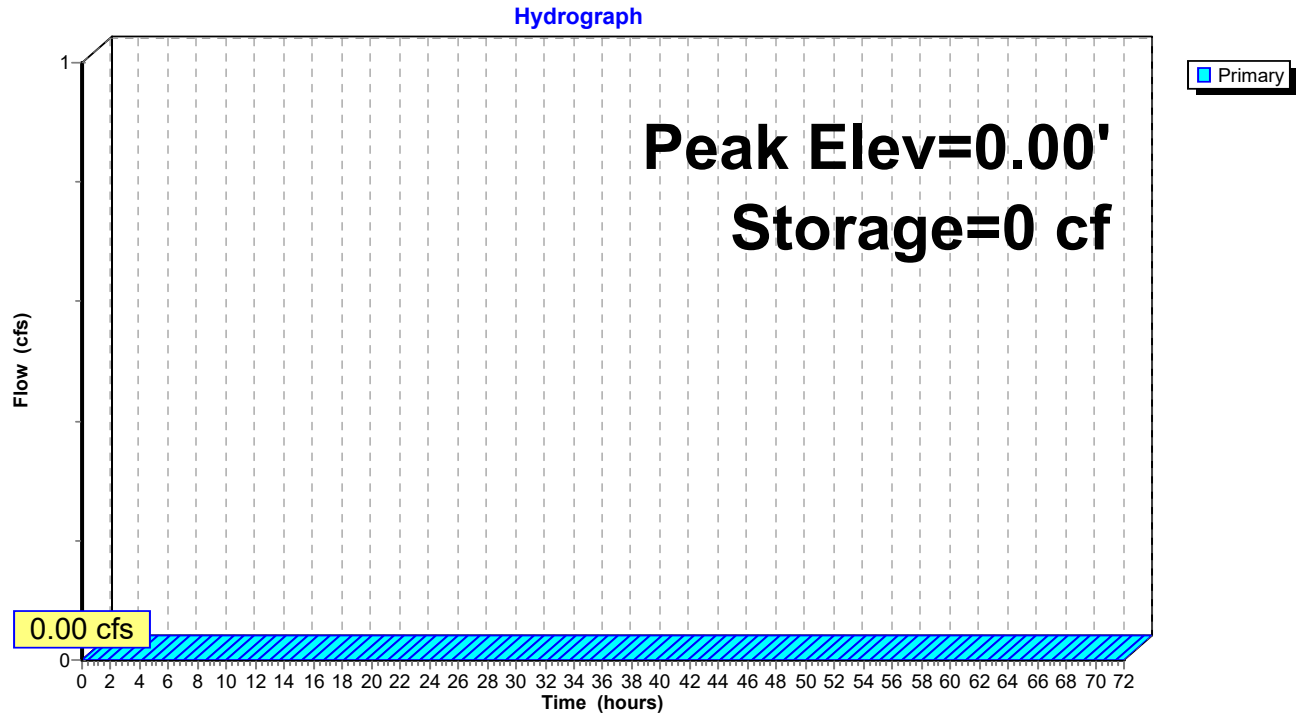
Volume	Invert	Avail.Storage	Storage Description
#1	151.60'	958 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
151.60	2,520	204.0	0.0	0	0	2,520
151.85	2,520	204.0	0.0	0	0	2,571
151.86	2,520	204.0	40.0	10	10	2,573
152.80	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	148.90'	**12.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	151.60'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	152.80'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' TW=148.86' (Dynamic Tailwater)
└─**1=Culvert Out** (Controls 0.00 cfs)
  └─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-8: Permeable Asphalt

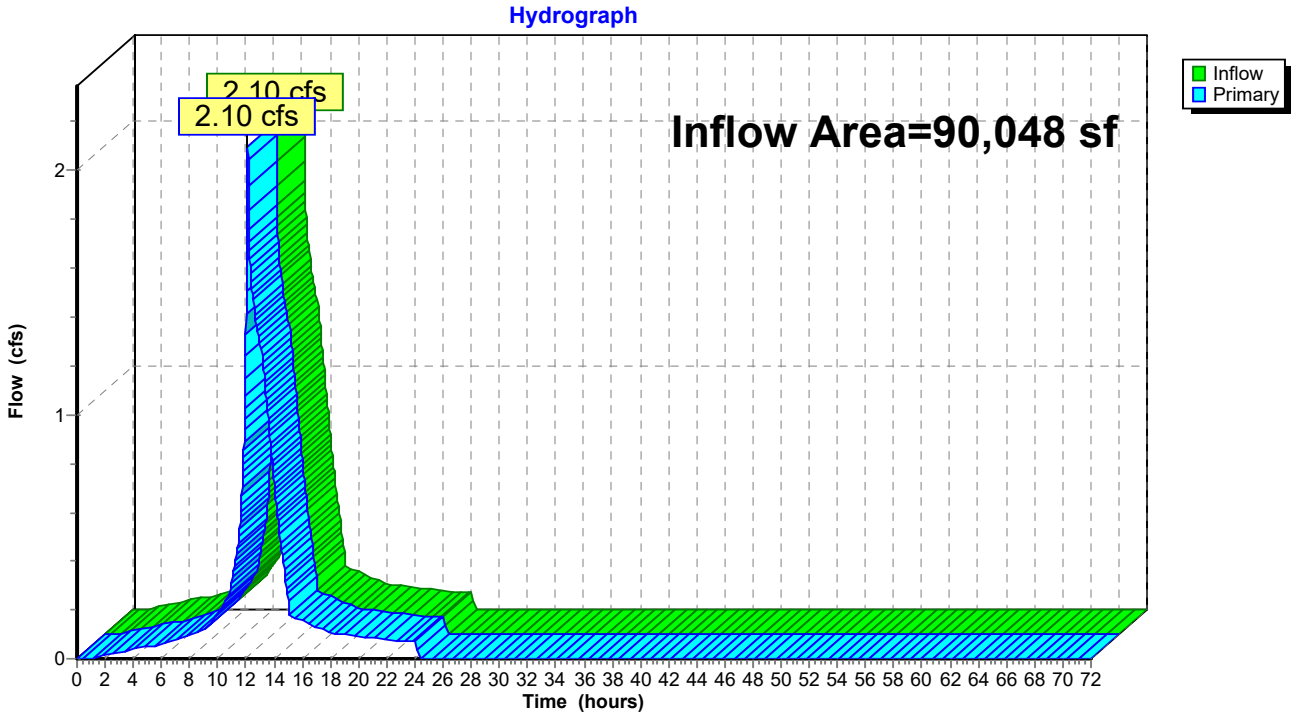


Summary for Link P-1: Post Development Drianage

Inflow Area = 90,048 sf, 66.63% Impervious, Inflow Depth = 2.57" for C2-Year event
Inflow = 2.10 cfs @ 12.14 hrs, Volume= 19,317 cf
Primary = 2.10 cfs @ 12.14 hrs, Volume= 19,317 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link P-1: Post Development Drianage



Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: Pre-Development Runoff Area=90,048 sf 14.68% Impervious Runoff Depth=3.31"
Flow Length=669' Tc=7.1 min CN=80/98 Runoff=8.32 cfs 24,841 cf

Subcatchment P-1A: Post-Development Runoff Area=10,079 sf 61.82% Impervious Runoff Depth=4.20"
Flow Length=189' Tc=6.0 min CN=80/98 Runoff=1.13 cfs 3,529 cf

Subcatchment P-1B: Post-Development Runoff Area=10,079 sf 90.64% Impervious Runoff Depth=4.75"
Tc=6.0 min CN=80/98 Runoff=1.24 cfs 3,986 cf

Subcatchment P-1C: Post-Development Runoff Area=9,669 sf 68.03% Impervious Runoff Depth=4.32"
Tc=6.0 min CN=80/98 Runoff=1.11 cfs 3,480 cf

Subcatchment P-1D: Post-Development Runoff Area=8,530 sf 72.98% Impervious Runoff Depth=4.41"
Tc=6.0 min CN=80/98 Runoff=0.99 cfs 3,136 cf

Subcatchment P-1E: Post-Development Runoff Area=9,057 sf 72.13% Impervious Runoff Depth=4.40"
Tc=6.0 min CN=80/98 Runoff=1.05 cfs 3,318 cf

Subcatchment P-1F: Post-Development Runoff Area=6,983 sf 86.60% Impervious Runoff Depth=4.67"
Tc=6.0 min CN=80/98 Runoff=0.85 cfs 2,717 cf

Subcatchment P-1G: Post-Development Runoff Area=7,377 sf 82.59% Impervious Runoff Depth=4.59"
Tc=6.0 min CN=80/98 Runoff=0.88 cfs 2,824 cf

Subcatchment P-1H: Post-Development Runoff Area=13,074 sf 52.73% Impervious Runoff Depth=4.03"
Tc=6.0 min CN=80/98 Runoff=1.43 cfs 4,390 cf

Subcatchment P-1I: Post-Development Runoff Area=15,200 sf 41.18% Impervious Runoff Depth=3.81"
Tc=6.0 min CN=80/98 Runoff=1.60 cfs 4,827 cf

Pond PV-1: Permeable Asphalt Peak Elev=128.49' Storage=6,477 cf Inflow=8.68 cfs 27,381 cf
Outflow=4.19 cfs 27,381 cf

Pond PV-2: Permeable Asphalt Peak Elev=136.05' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-3: Permeable Asphalt Peak Elev=139.05' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-4: Permeable Asphalt Peak Elev=141.85' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-5: Permeable Asphalt Peak Elev=143.55' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-6: Permeable Asphalt Peak Elev=146.22' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-7: Permeable Asphalt Peak Elev=149.11' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-8: Permeable Asphalt Peak Elev=0.00' Storage=0 cf
Primary=0.00 cfs 0 cf

Link P-1: Post Development Drianage Inflow=5.09 cfs 32,208 cf
Primary=5.09 cfs 32,208 cf

Total Runoff Area = 180,096 sf Runoff Volume = 57,049 cf Average Runoff Depth = 3.80"
59.35% Pervious = 106,883 sf 40.65% Impervious = 73,213 sf

Summary for Subcatchment E-1: Pre-Development Conditions Drainage Area

Runoff = 8.32 cfs @ 12.14 hrs, Volume= 24,841 cf, Depth= 3.31"
Routed to nonexistent node 4L

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C10-Year Rainfall=5.16", P2=3.34"

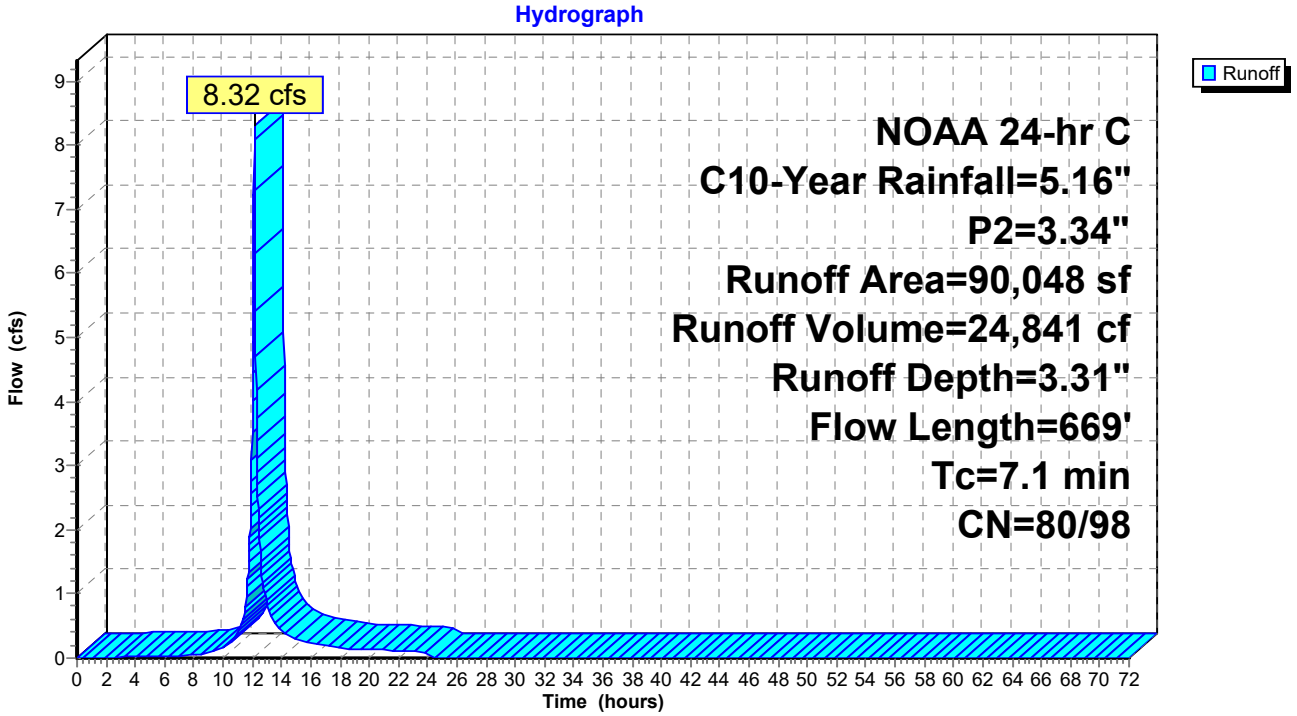
	Area (sf)	CN	Description
*	4,104	98	Impervious Surfaces
	76,831	80	>75% Grass cover, Good, HSG D
*	9,113	98	MVS
	90,048	83	Weighted Average
	76,831	80	85.32% Pervious Area
	13,217	98	14.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	10	0.0982	0.21		**Sheet Flow, 1-2** Grass: Short n= 0.150 P2= 3.34"
0.1	17	0.1150	2.37		**Shallow Concentrated Flow, 2-3** Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0800	1.98		**Shallow Concentrated Flow, 3-4** Short Grass Pasture Kv= 7.0 fps
0.1	18	0.1100	2.32		**Shallow Concentrated Flow, 4-5** Short Grass Pasture Kv= 7.0 fps
0.3	28	0.0700	1.85		**Shallow Concentrated Flow, 5-6** Short Grass Pasture Kv= 7.0 fps
0.1	15	0.0680	1.83		**Shallow Concentrated Flow, 6-7** Short Grass Pasture Kv= 7.0 fps
0.3	42	0.0960	2.17		**Shallow Concentrated Flow, 7-8** Short Grass Pasture Kv= 7.0 fps
0.5	34	0.0295	1.20		**Shallow Concentrated Flow, 8-9** Short Grass Pasture Kv= 7.0 fps
0.6	40	0.0250	1.11		**Shallow Concentrated Flow, 9-10** Short Grass Pasture Kv= 7.0 fps
0.3	43	0.1400	2.62		**Shallow Concentrated Flow, 10-11** Short Grass Pasture Kv= 7.0 fps
0.1	8	0.1300	2.52		**Shallow Concentrated Flow, 11-12** Short Grass Pasture Kv= 7.0 fps
0.4	46	0.0865	2.06		**Shallow Concentrated Flow, 12-13** Short Grass Pasture Kv= 7.0 fps
0.2	19	0.0515	1.59		**Shallow Concentrated Flow, 13-14** Short Grass Pasture Kv= 7.0 fps
0.1	8	0.0250	1.11		**Shallow Concentrated Flow, 14-15** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0250	3.21		**Shallow Concentrated Flow, 15-16** Paved Kv= 20.3 fps
0.2	15	0.0250	1.11		**Shallow Concentrated Flow, 16-17** Short Grass Pasture Kv= 7.0 fps
0.4	37	0.0540	1.63		**Shallow Concentrated Flow, 17-18** Short Grass Pasture Kv= 7.0 fps
0.2	14	0.0230	1.06		**Shallow Concentrated Flow, 18-19** Short Grass Pasture Kv= 7.0 fps
0.2	30	0.0230	3.08		**Shallow Concentrated Flow, 19-20** Paved Kv= 20.3 fps
0.1	23	0.0430	4.21		**Shallow Concentrated Flow, 20-21** Paved Kv= 20.3 fps
0.2	30	0.1340	2.56		**Shallow Concentrated Flow, 21-22** Short Grass Pasture Kv= 7.0 fps
0.3	38	0.0795	1.97		**Shallow Concentrated Flow, 22-23** Short Grass Pasture Kv= 7.0 fps
0.3	31	0.0645	1.78		**Shallow Concentrated Flow, 23-24** Short Grass Pasture Kv= 7.0 fps
0.5	47	0.0425	1.44		**Shallow Concentrated Flow, 24-25** Short Grass Pasture Kv= 7.0 fps
0.5	35	0.0290	1.19		**Shallow Concentrated Flow, 25-26** Short Grass Pasture Kv= 7.0 fps
0.1	13	0.0770	1.94		**Shallow Concentrated Flow, 26-27**

Short Grass Pasture Kv= 7.0 fps

7.1	669	Total

Subcatchment E-1: Pre-Development Conditions Drainage Area



Summary for Subcatchment P-1A: Post-Development Conditions Drainage Area

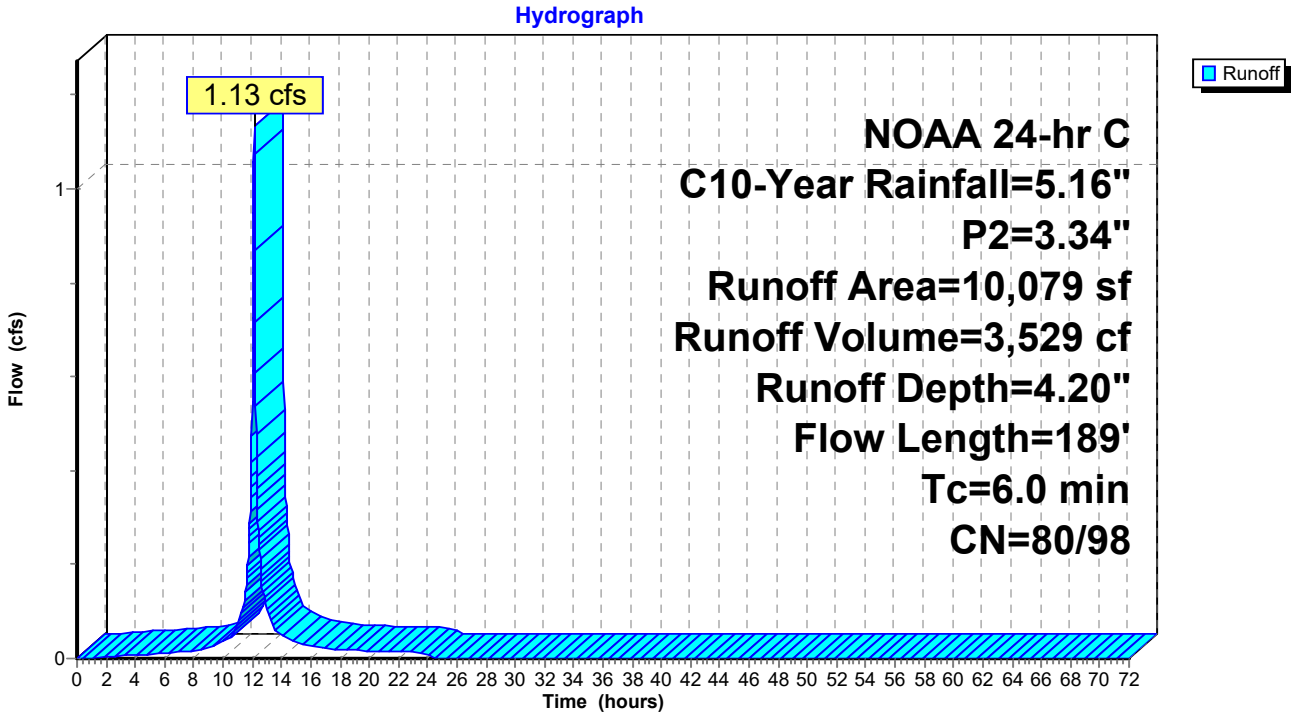
Runoff = 1.13 cfs @ 12.13 hrs, Volume= 3,529 cf, Depth= 4.20"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C10-Year Rainfall=5.16", P2=3.34"

	Area (sf)	CN	Description
*	933	98	Impervious Surfaces
*	5,298	98	MVS
	3,848	80	>75% Grass cover, Good, HSG D
	10,079	91	Weighted Average
	3,848	80	38.18% Pervious Area
	6,231	98	61.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	14	0.1050	0.23		**Sheet Flow, 1-2** Grass: Short n= 0.150 P2= 3.34"
0.2	89	0.1000	6.42		**Shallow Concentrated Flow, 2-3** Paved Kv= 20.3 fps
0.1	18	0.0275	3.37		**Shallow Concentrated Flow, 3-4** Paved Kv= 20.3 fps
0.3	68	0.0445	4.28		**Shallow Concentrated Flow, 4-5** Paved Kv= 20.3 fps
1.6	189	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1A: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1B: Post-Development Conditions Drainage Area

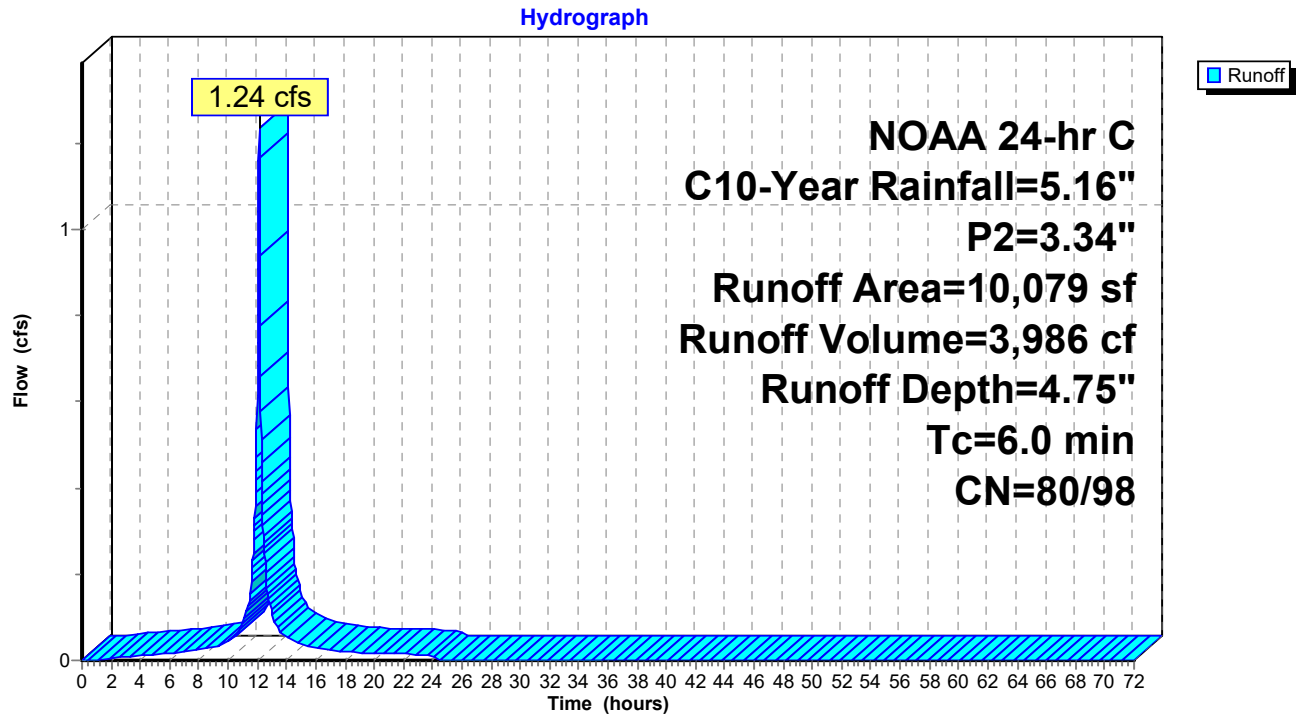
Runoff = 1.24 cfs @ 12.13 hrs, Volume= 3,986 cf, Depth= 4.75"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C10-Year Rainfall=5.16", P2=3.34"

	Area (sf)	CN	Description
*	6,427	98	Impervious Surfaces
*	2,709	98	MVS
	943	80	>75% Grass cover, Good, HSG D
	10,079	96	Weighted Average
	943	80	9.36% Pervious Area
	9,136	98	90.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1B: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1C: Post-Development Conditions Drainage Area

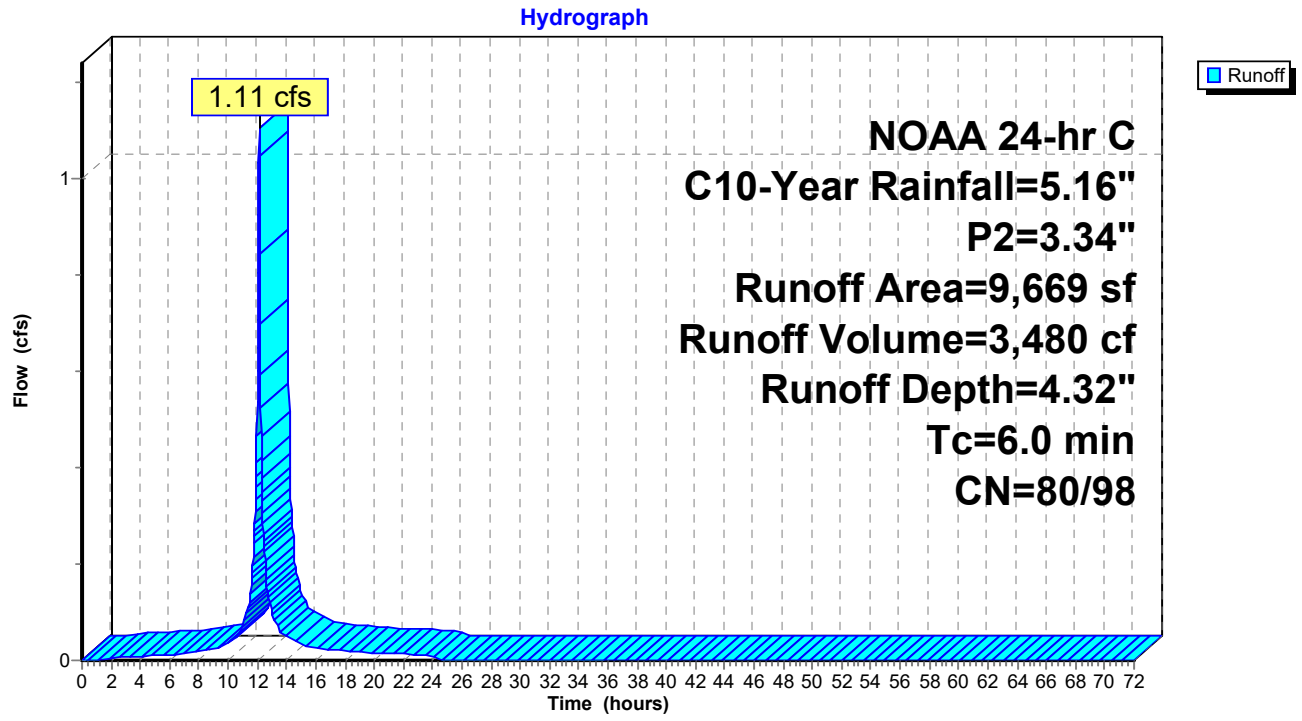
Runoff = 1.11 cfs @ 12.13 hrs, Volume= 3,480 cf, Depth= 4.32"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C10-Year Rainfall=5.16", P2=3.34"

	Area (sf)	CN	Description
*	3,869	98	Impervious Surfaces
*	2,709	98	MVS
	3,091	80	>75% Grass cover, Good, HSG D
	9,669	92	Weighted Average
	3,091	80	31.97% Pervious Area
	6,578	98	68.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1C: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1D: Post-Development Conditions Drainage Area

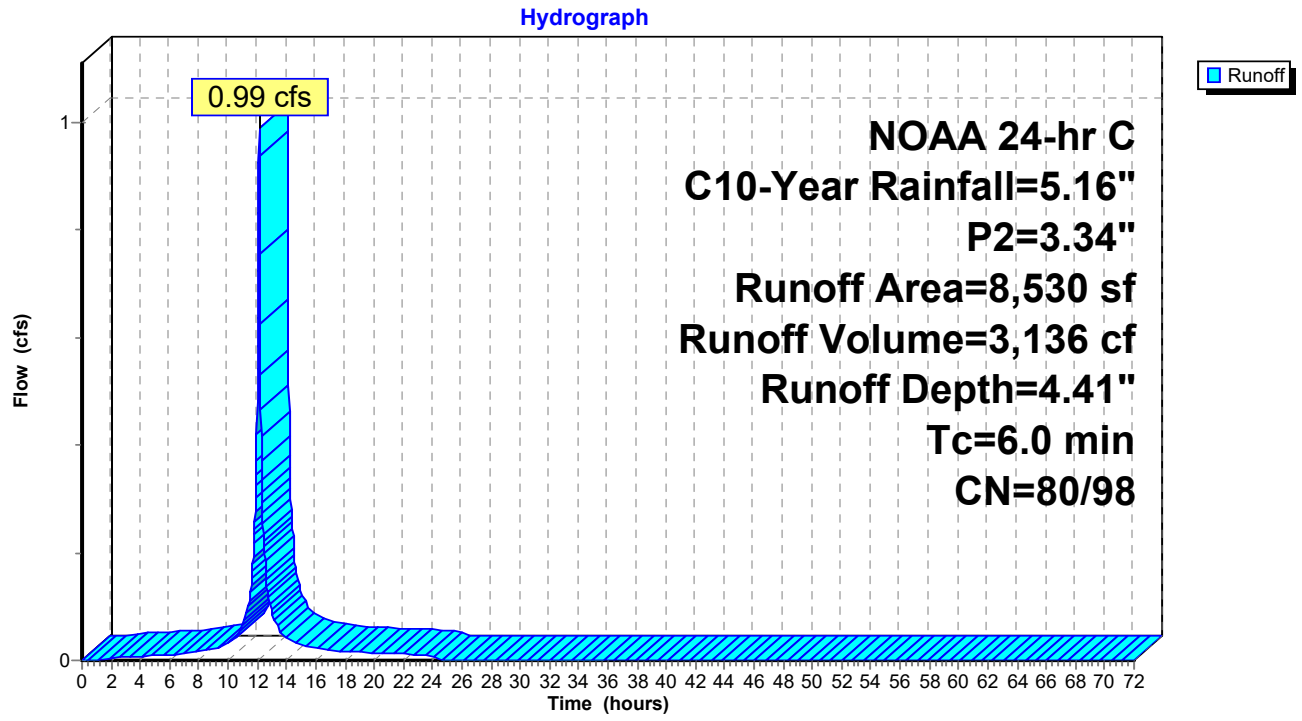
Runoff = 0.99 cfs @ 12.13 hrs, Volume= 3,136 cf, Depth= 4.41"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C10-Year Rainfall=5.16", P2=3.34"

	Area (sf)	CN	Description
*	3,516	98	Impervious Surfaces
*	2,709	98	MVS
	2,305	80	>75% Grass cover, Good, HSG D
	8,530	93	Weighted Average
	2,305	80	27.02% Pervious Area
	6,225	98	72.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1D: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1E: Post-Development Conditions Drainage Area

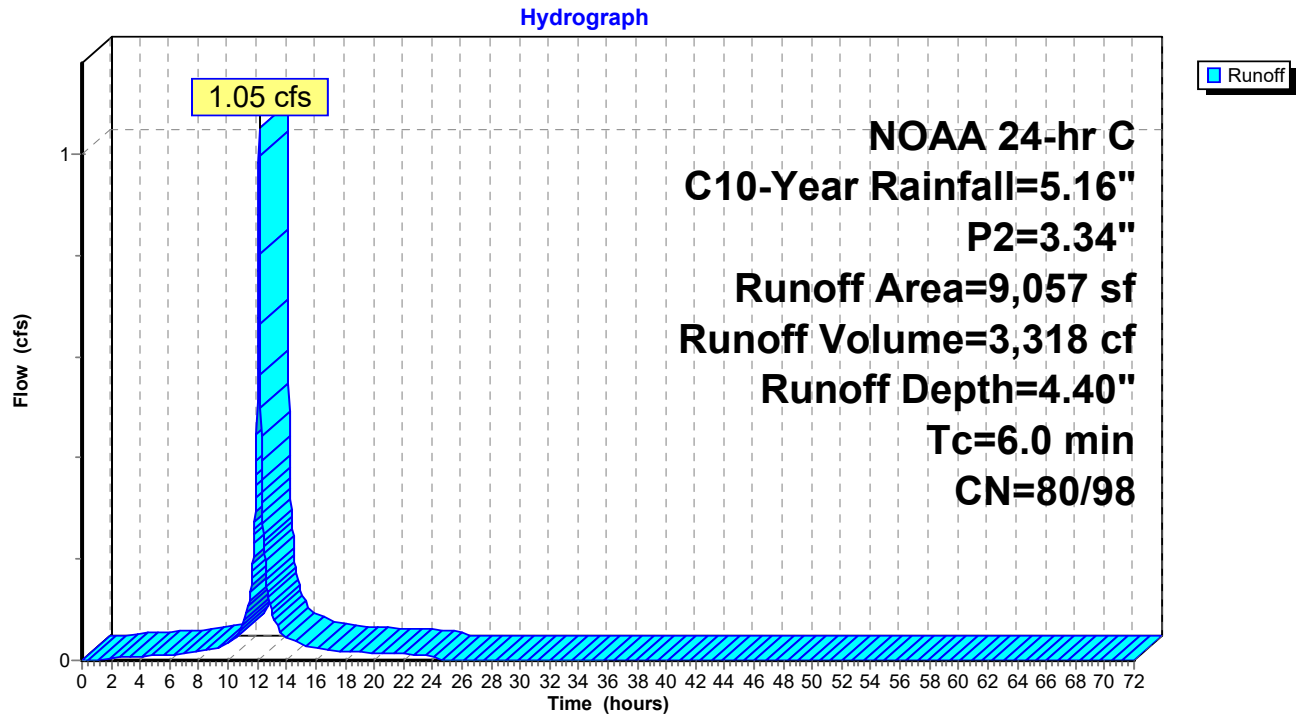
Runoff = 1.05 cfs @ 12.13 hrs, Volume= 3,318 cf, Depth= 4.40"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C10-Year Rainfall=5.16", P2=3.34"

	Area (sf)	CN	Description
*	3,824	98	Impervious Surfaces
*	2,709	98	MVS
	2,524	80	>75% Grass cover, Good, HSG D
	9,057	93	Weighted Average
	2,524	80	27.87% Pervious Area
	6,533	98	72.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1E: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1F: Post-Development Conditions Drainage Area

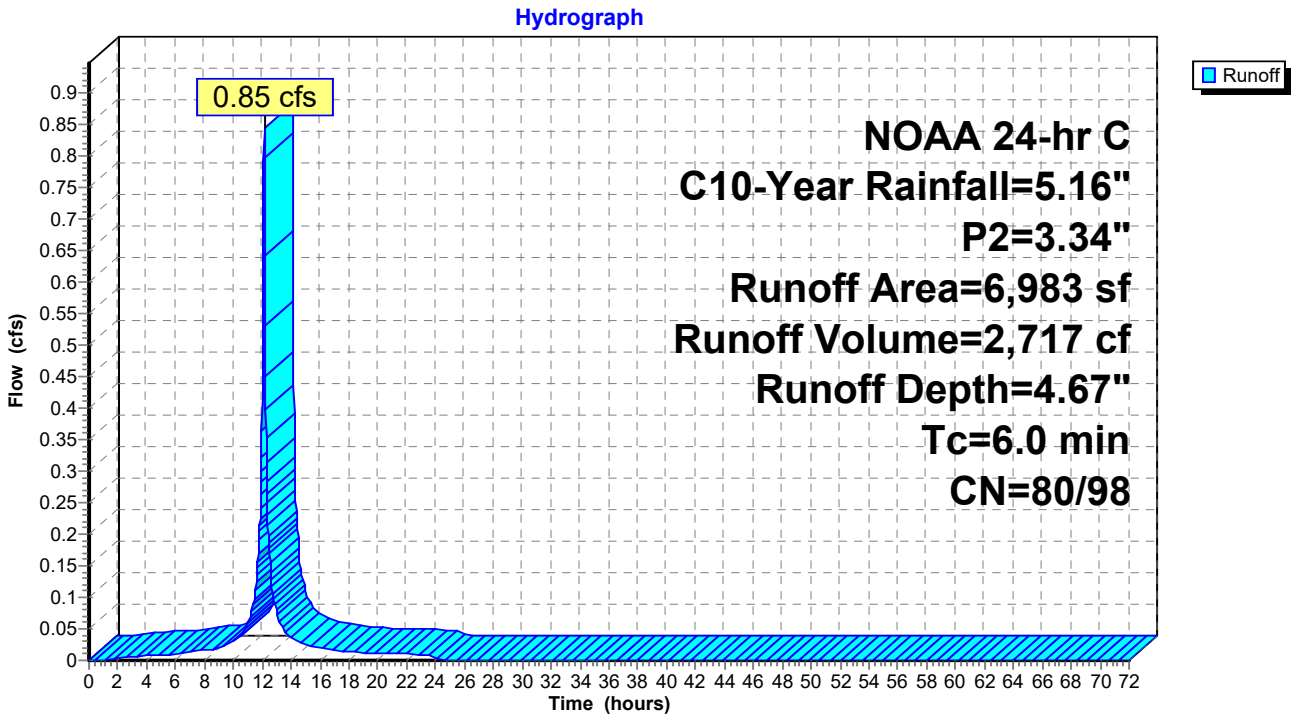
Runoff = 0.85 cfs @ 12.13 hrs, Volume= 2,717 cf, Depth= 4.67"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C10-Year Rainfall=5.16", P2=3.34"

	Area (sf)	CN	Description
*	3,338	98	Impervious Surfaces
*	2,709	98	MVS
	936	80	>75% Grass cover, Good, HSG D
	6,983	96	Weighted Average
	936	80	13.40% Pervious Area
	6,047	98	86.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1F: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1G: Post-Development Conditions Drainage Area

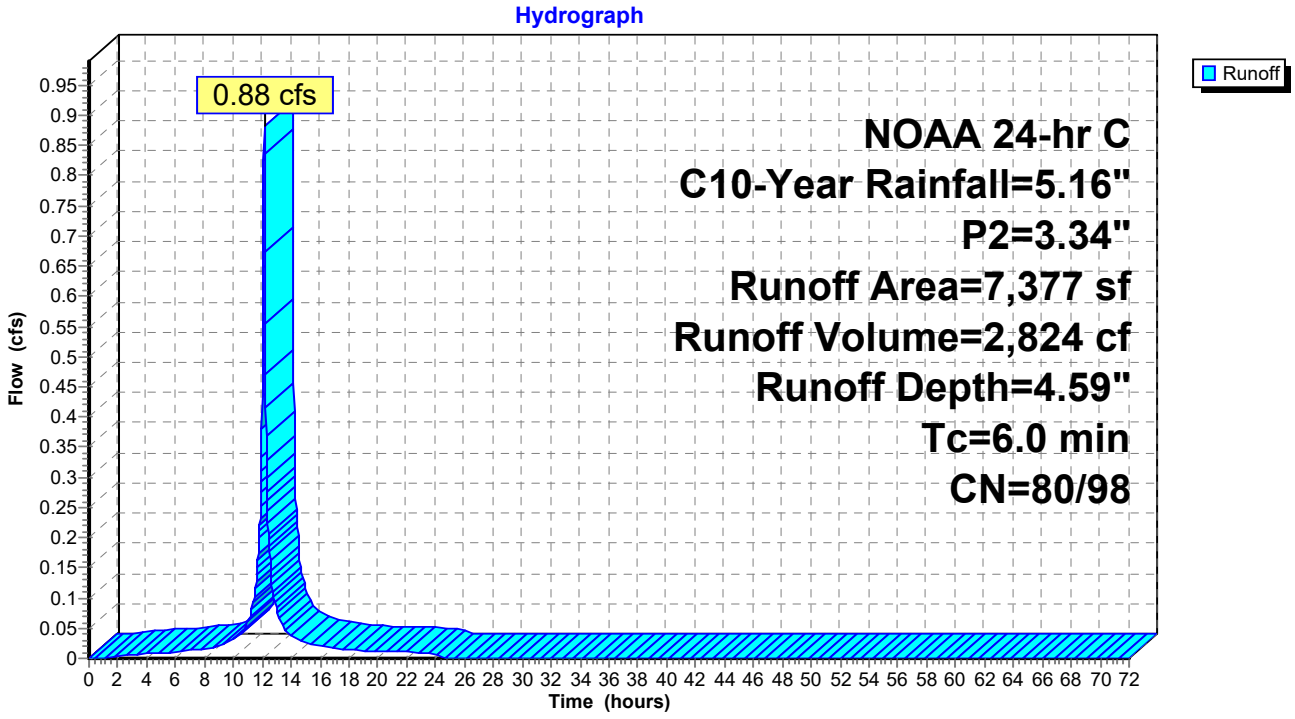
Runoff = 0.88 cfs @ 12.13 hrs, Volume= 2,824 cf, Depth= 4.59"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C10-Year Rainfall=5.16", P2=3.34"

	Area (sf)	CN	Description
*	3,384	98	Impervious Surfaces
*	2,709	98	MVS
	1,284	80	>75% Grass cover, Good, HSG D
	7,377	95	Weighted Average
	1,284	80	17.41% Pervious Area
	6,093	98	82.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1G: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1H: Post-Development Conditions Drainage Area

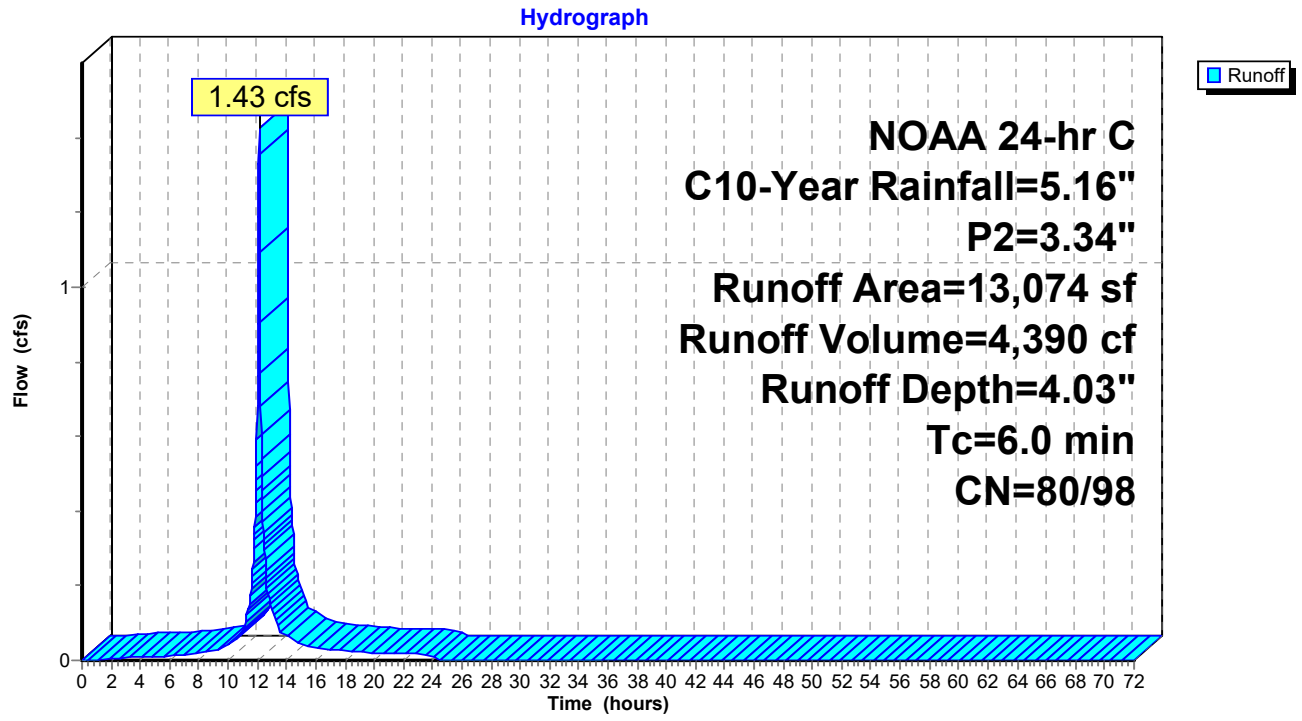
Runoff = 1.43 cfs @ 12.13 hrs, Volume= 4,390 cf, Depth= 4.03"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C10-Year Rainfall=5.16", P2=3.34"

	Area (sf)	CN	Description
*	3,345	98	Impervious Surfaces
*	3,549	98	MVS
	6,180	80	>75% Grass cover, Good, HSG D
	13,074	89	Weighted Average
	6,180	80	47.27% Pervious Area
	6,894	98	52.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1H: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1I: Post-Development Conditions Drainage Area

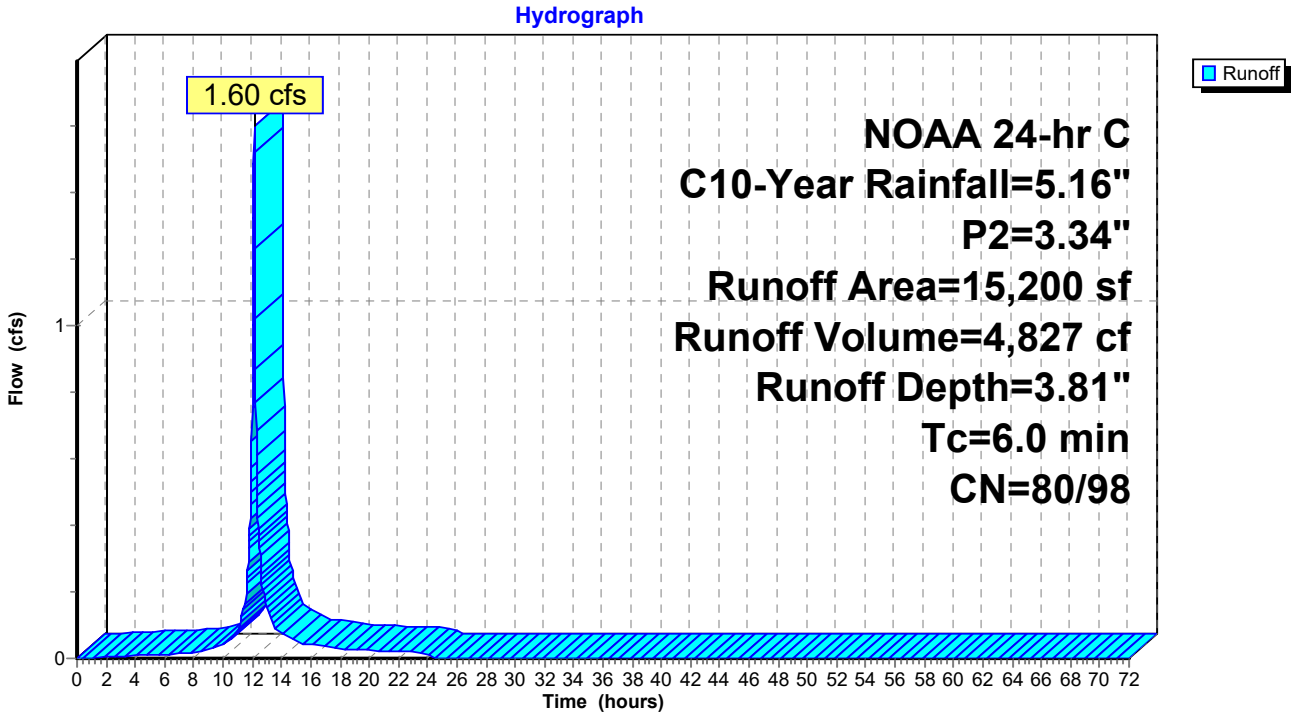
Runoff = 1.60 cfs @ 12.13 hrs, Volume= 4,827 cf, Depth= 3.81"
Routed to Link P-1 : Post Development Drianage

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C10-Year Rainfall=5.16", P2=3.34"

	Area (sf)	CN	Description
*	3,217	98	Impervious Surfaces
*	3,042	98	MVS
	8,941	80	>75% Grass cover, Good, HSG D
	15,200	87	Weighted Average
	8,941	80	58.82% Pervious Area
	6,259	98	41.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1I: Post-Development Conditions Drainage Area



Summary for Pond PV-1: Permeable Asphalt

[44] Hint: Outlet device #2 is below defined storage
[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 74,848 sf, 71.79% Impervious, Inflow Depth = 4.39" for C10-Year event
Inflow = 8.68 cfs @ 12.13 hrs, Volume= 27,381 cf
Outflow = 4.19 cfs @ 12.24 hrs, Volume= 27,381 cf, Atten= 52%, Lag= 6.5 min
Primary = 4.19 cfs @ 12.24 hrs, Volume= 27,381 cf
Routed to Link P-1 : Post Development Drianage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 128.49' @ 12.24 hrs Surf.Area= 3,360 sf Storage= 6,477 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 24.2 min (787.2 - 763.0)

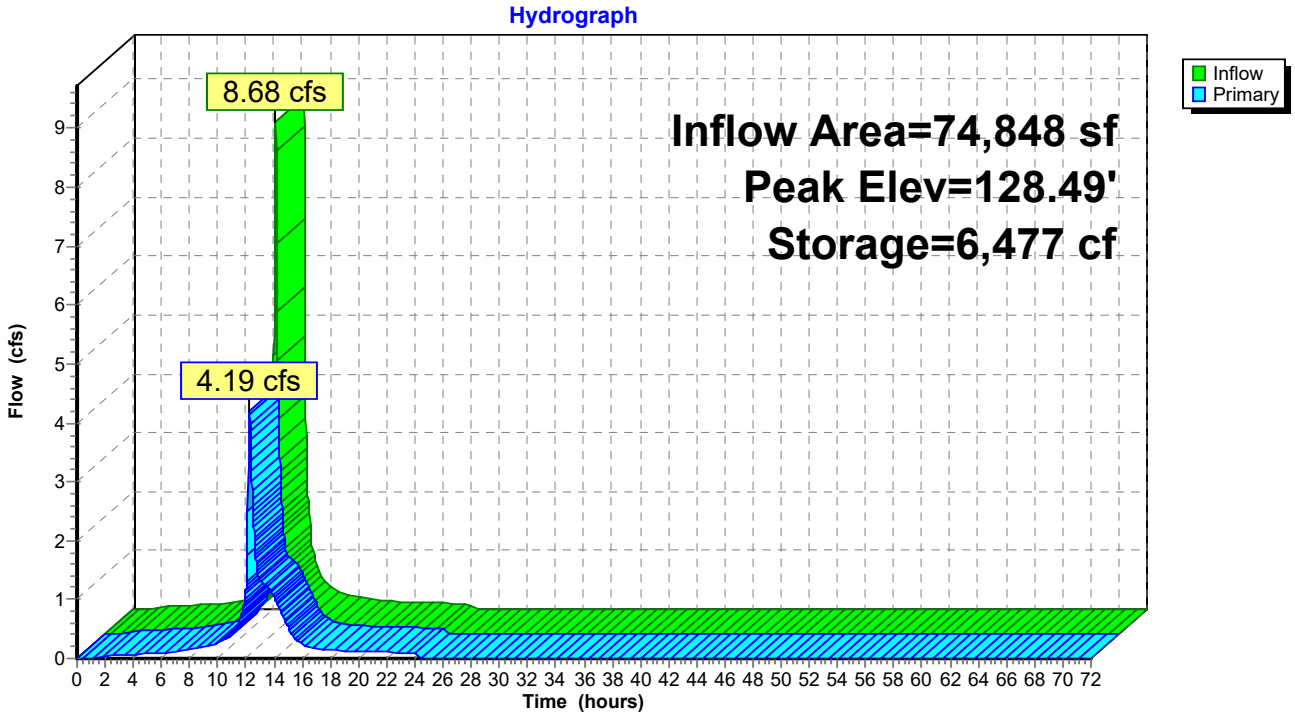
Volume	Invert	Avail.Storage	Storage Description
#1	125.19'	7,073 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) 26,846 cf Overall - 9,163 cf Embedded = 17,683 cf x 40.0% Voids
#2	127.18'	8,008 cf	**78.0"W x 48.0"H x 77.00'L Parabolic Arch** x 6 Inside #1 9,163 cf Overall - 3.0" Wall Thickness = 8,008 cf
		15,081 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
125.19	3,360	244.0	0	0	3,360
133.18	3,360	244.0	26,846	26,846	5,310

Device	Routing	Invert	Outlet Devices
#1	Primary	124.93'	**15.0" Round Culvert** L= 54.0' Ke= 0.500 Inlet / Outlet Invert= 124.93' / 124.39' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	124.93'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	124.93'	**6.0" W x 4.0" H Vert. Control Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 1	127.85'	**22.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	132.17'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.19 cfs @ 12.24 hrs HW=128.49' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 4.19 cfs of 10.01 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  ├─**3=Control Orifice** (Orifice Controls 1.48 cfs @ 8.87 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 2.71 cfs @ 2.96 fps)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PV-1: Permeable Asphalt



Summary for Pond PV-2: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow	=	0.00 cfs @	0.00 hrs, Volume=	0 cf
Outflow	=	0.00 cfs @	0.00 hrs, Volume=	0 cf, Atten= 0%, Lag= 0.0 min
Primary	=	0.00 cfs @	0.00 hrs, Volume=	0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 136.05' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

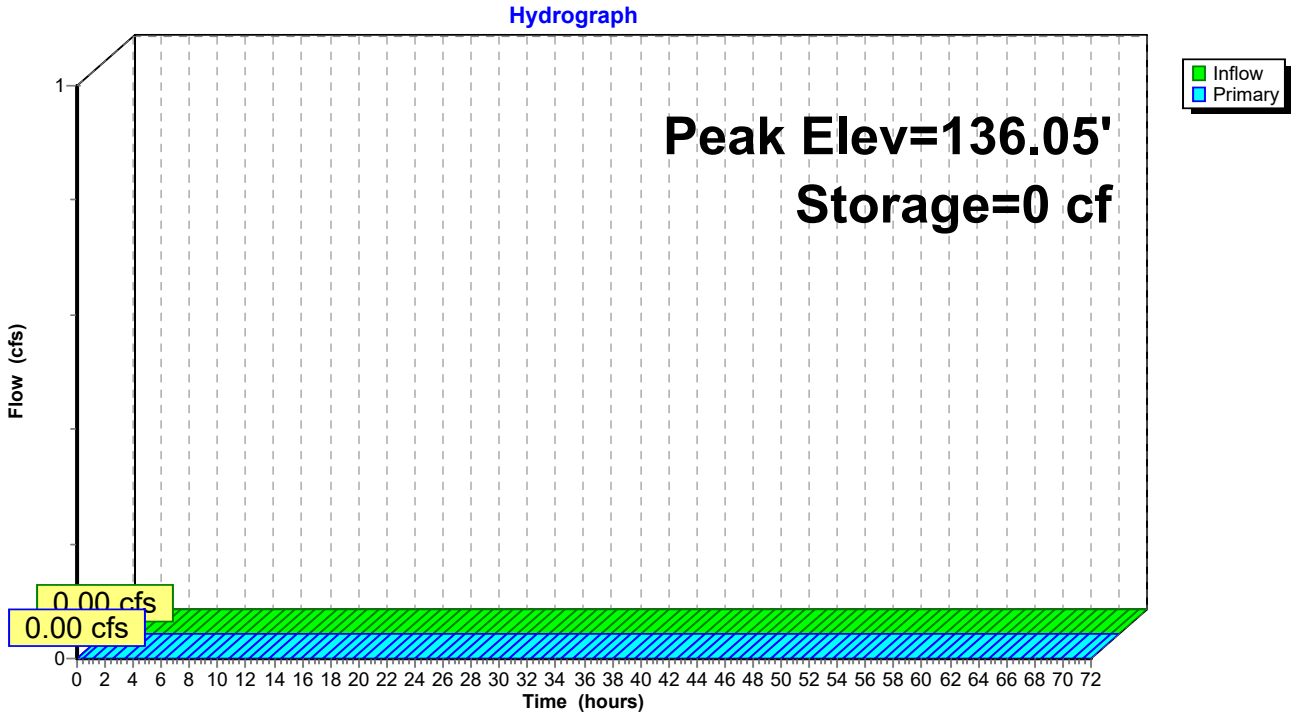
Volume	Invert	Avail.Storage	Storage Description
#1	135.80'	958 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
135.80	2,520	204.0	0.0	0	0	2,520
136.05	2,520	204.0	0.0	0	0	2,571
136.06	2,520	204.0	40.0	10	10	2,573
137.00	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	131.68'	**18.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	135.80'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	137.00'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=135.80' (Free Discharge)
└**1=Culvert Out** (Passes 0.00 cfs of 15.62 cfs potential flow)
  └**2=Underdrain** (Controls 0.00 cfs)
  └**3=WQDS** (Controls 0.00 cfs)

Pond PV-2: Permeable Asphalt



Summary for Pond PV-3: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-2 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 139.05' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

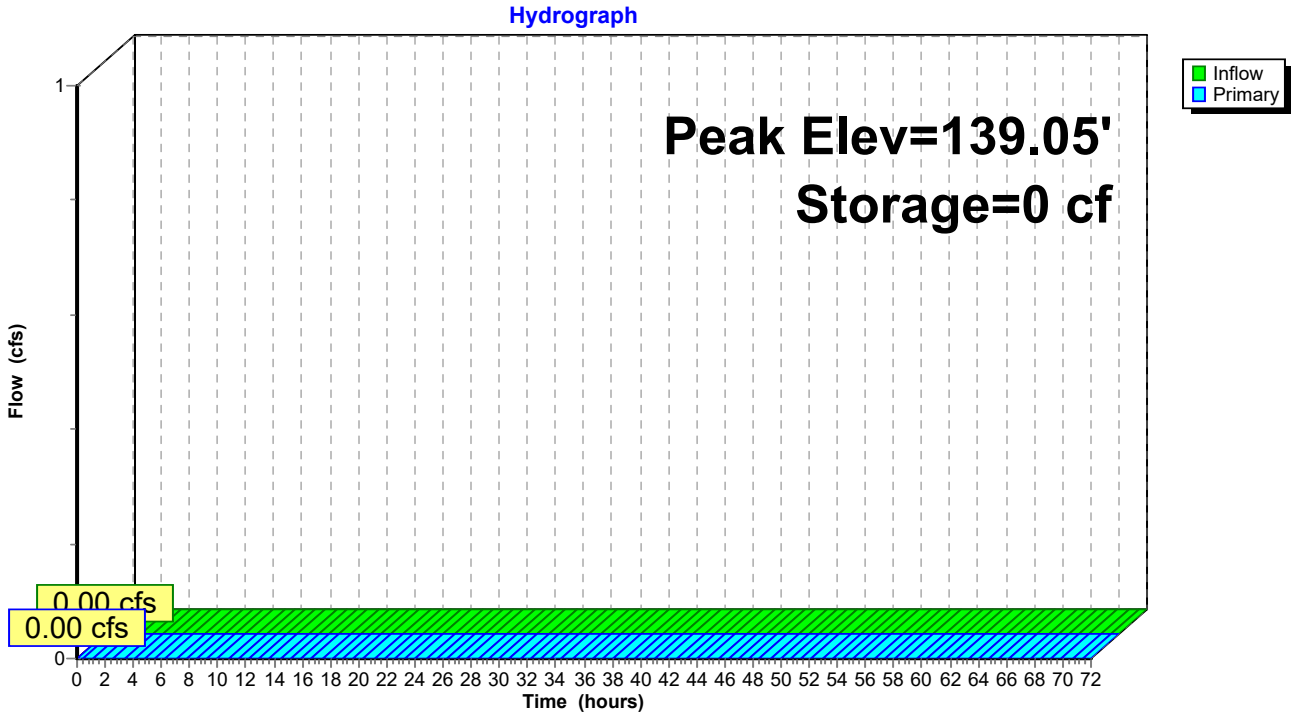
Volume	Invert	Avail.Storage	Storage Description
#1	138.80'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
138.80	2,520	204.0	0.0	0	0	2,520
139.05	2,520	204.0	0.0	0	0	2,571
139.06	2,520	204.0	40.0	10	10	2,573
140.00	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	135.60'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	138.80'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	140.00'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.80' TW=135.80' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.48 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-3: Permeable Asphalt



Summary for Pond PV-4: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-3 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 141.85' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

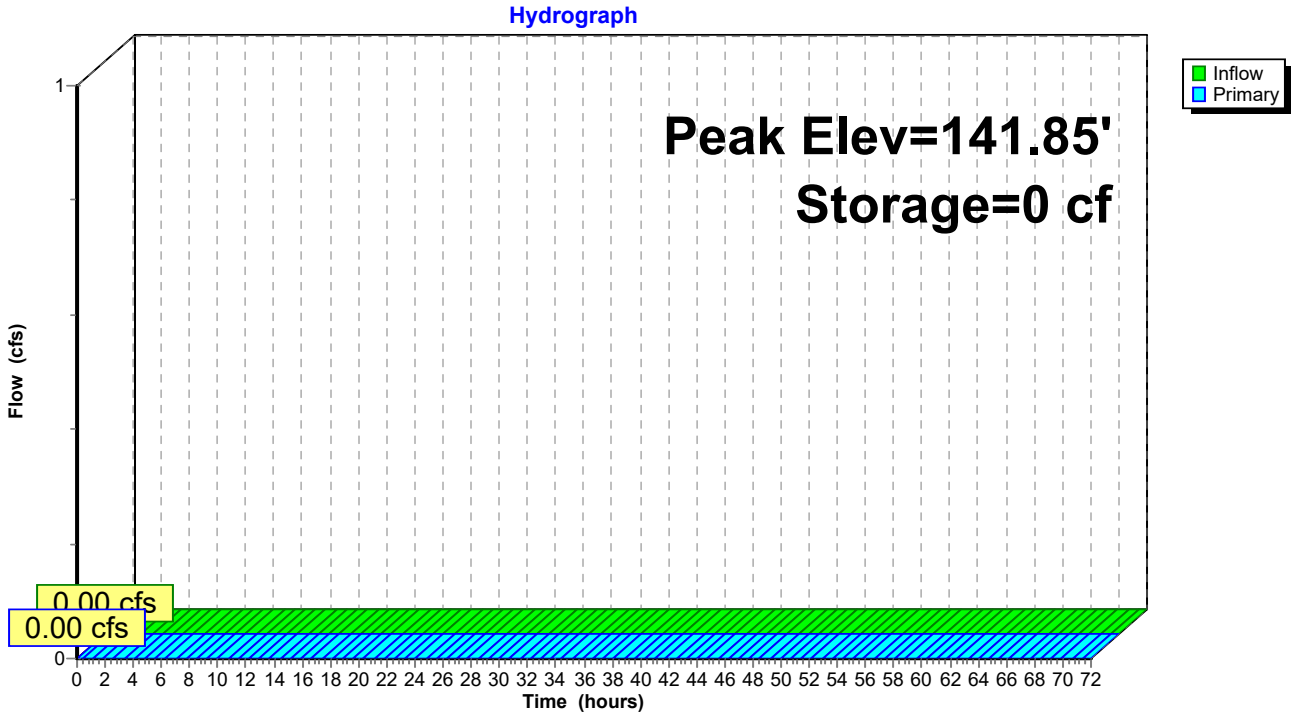
Volume	Invert	Avail.Storage	Storage Description
#1	141.60'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
141.60	2,520	204.0	0.0	0	0	2,520
141.85	2,520	204.0	0.0	0	0	2,571
141.86	2,520	204.0	40.0	10	10	2,573
142.80	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	138.60'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	141.60'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	142.80'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=141.60' TW=138.80' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.11 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-4: Permeable Asphalt



Summary for Pond PV-5: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-4 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 143.55' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

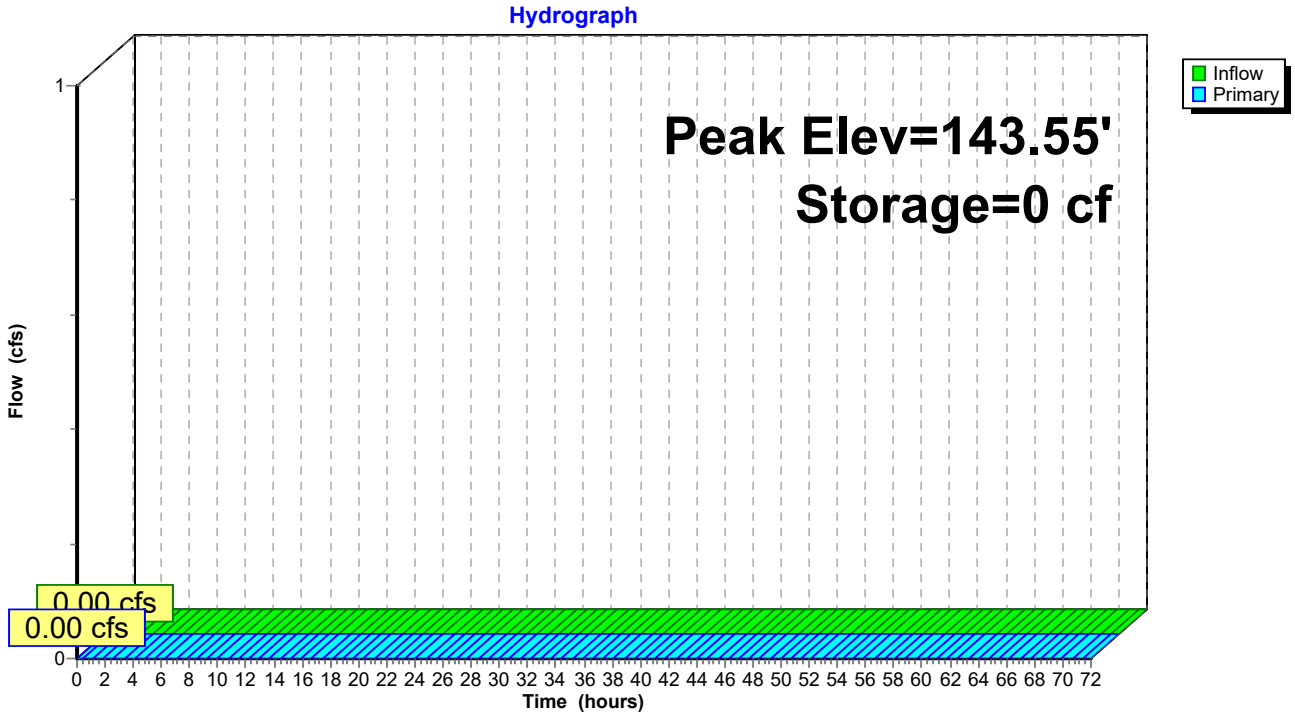
Volume	Invert	Avail.Storage	Storage Description
#1	143.30'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
143.30	2,520	204.0	0.0	0	0	2,520
143.55	2,520	204.0	0.0	0	0	2,571
143.56	2,520	204.0	40.0	10	10	2,573
144.50	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	141.39'	**12.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	143.30'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	144.50'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=143.30' TW=141.60' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 4.49 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-5: Permeable Asphalt



Summary for Pond PV-6: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-5 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 146.22' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

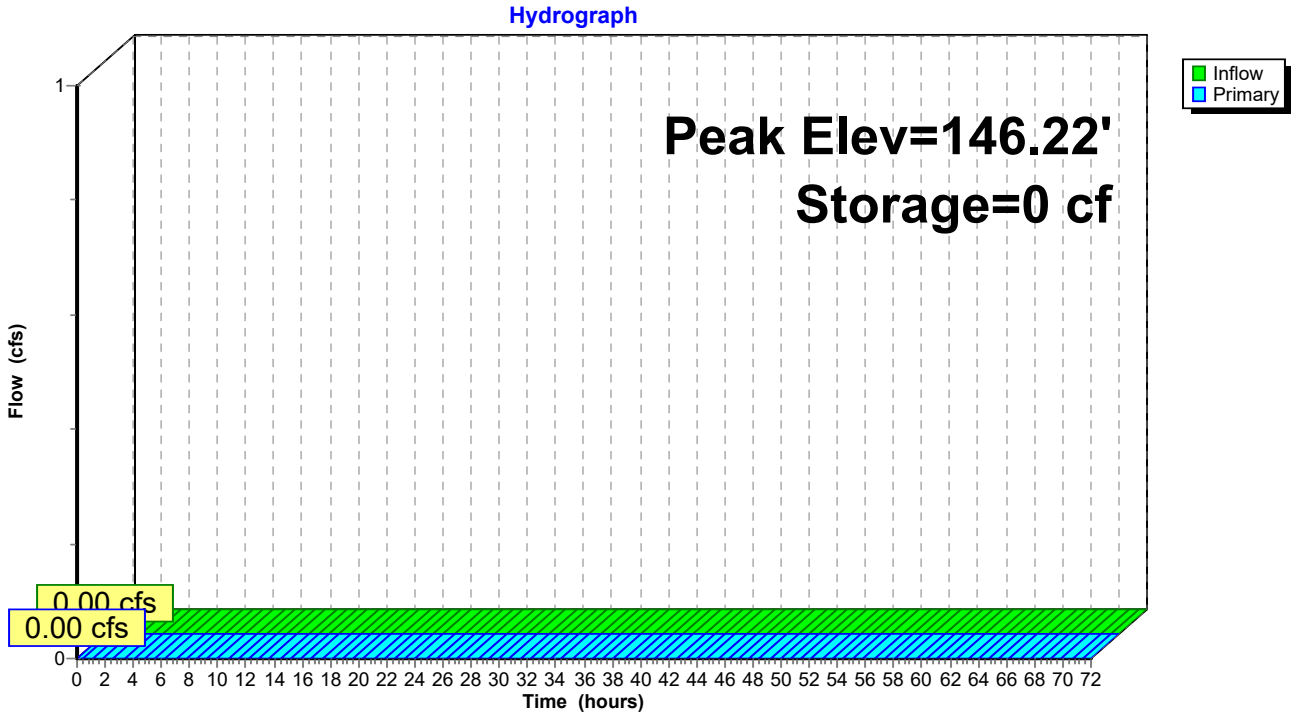
Volume	Invert	Avail.Storage	Storage Description
#1	145.97'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
145.97	2,520	204.0	0.0	0	0	2,520
146.22	2,520	204.0	0.0	0	0	2,571
146.23	2,520	204.0	40.0	10	10	2,573
147.17	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	144.09'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	145.97'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	147.17'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=145.97' TW=143.30' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 6.62 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-6: Permeable Asphalt



Summary for Pond PV-7: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-6 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 149.11' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

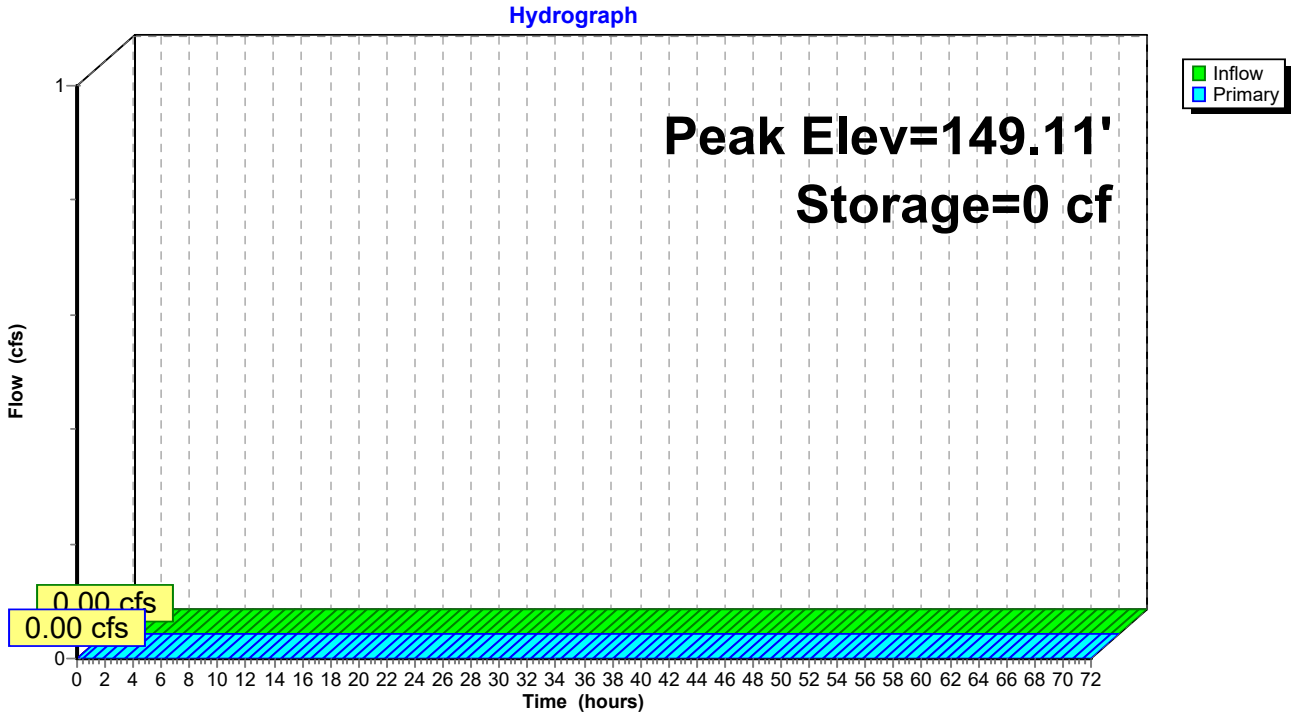
Volume	Invert	Avail.Storage	Storage Description
#1	148.86'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.86	2,520	204.0	0.0	0	0	2,520
149.11	2,520	204.0	0.0	0	0	2,571
149.12	2,520	204.0	40.0	10	10	2,573
150.06	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	145.76'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	148.86'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	150.06'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=148.86' TW=145.97' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.30 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-7: Permeable Asphalt



Summary for Pond PV-8: Permeable Asphalt

[43] Hint: Has no inflow (Outflow=Zero)

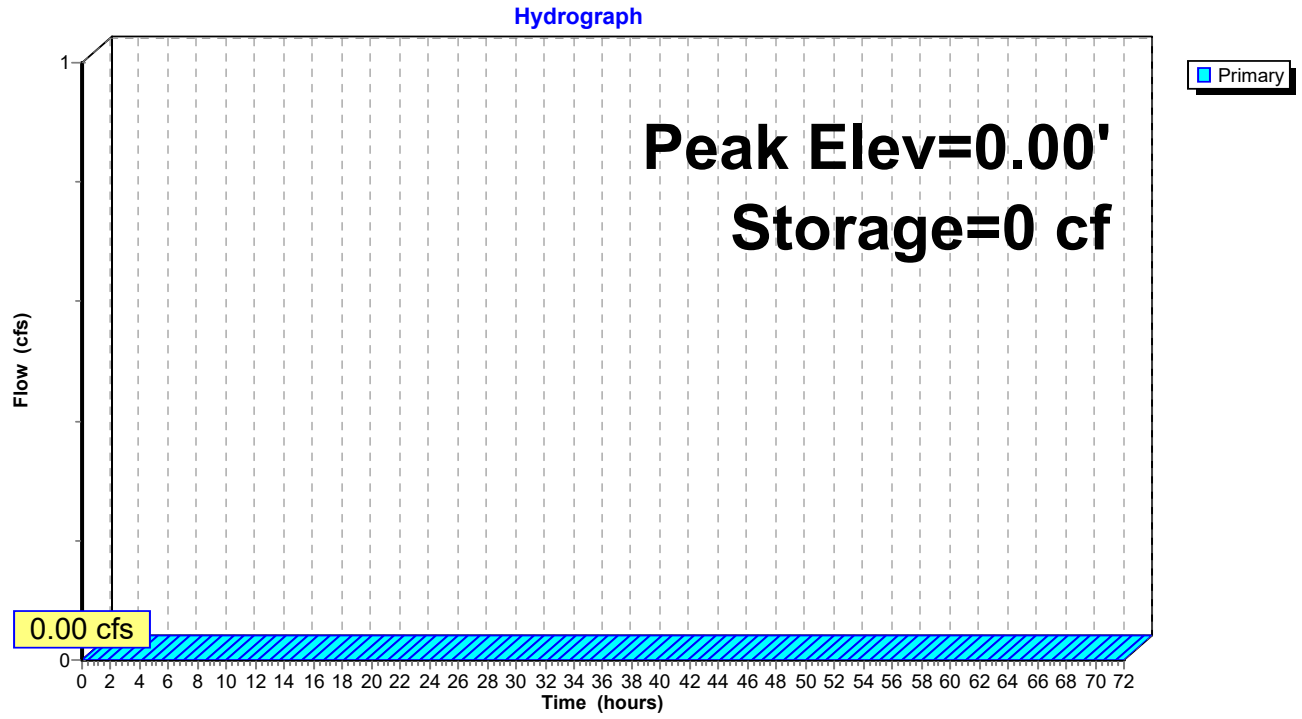
Volume	Invert	Avail.Storage	Storage Description
#1	151.60'	958 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
151.60	2,520	204.0	0.0	0	0	2,520
151.85	2,520	204.0	0.0	0	0	2,571
151.86	2,520	204.0	40.0	10	10	2,573
152.80	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	148.90'	**12.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	151.60'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	152.80'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' TW=148.86' (Dynamic Tailwater)
└─**1=Culvert Out** (Controls 0.00 cfs)
  └─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-8: Permeable Asphalt

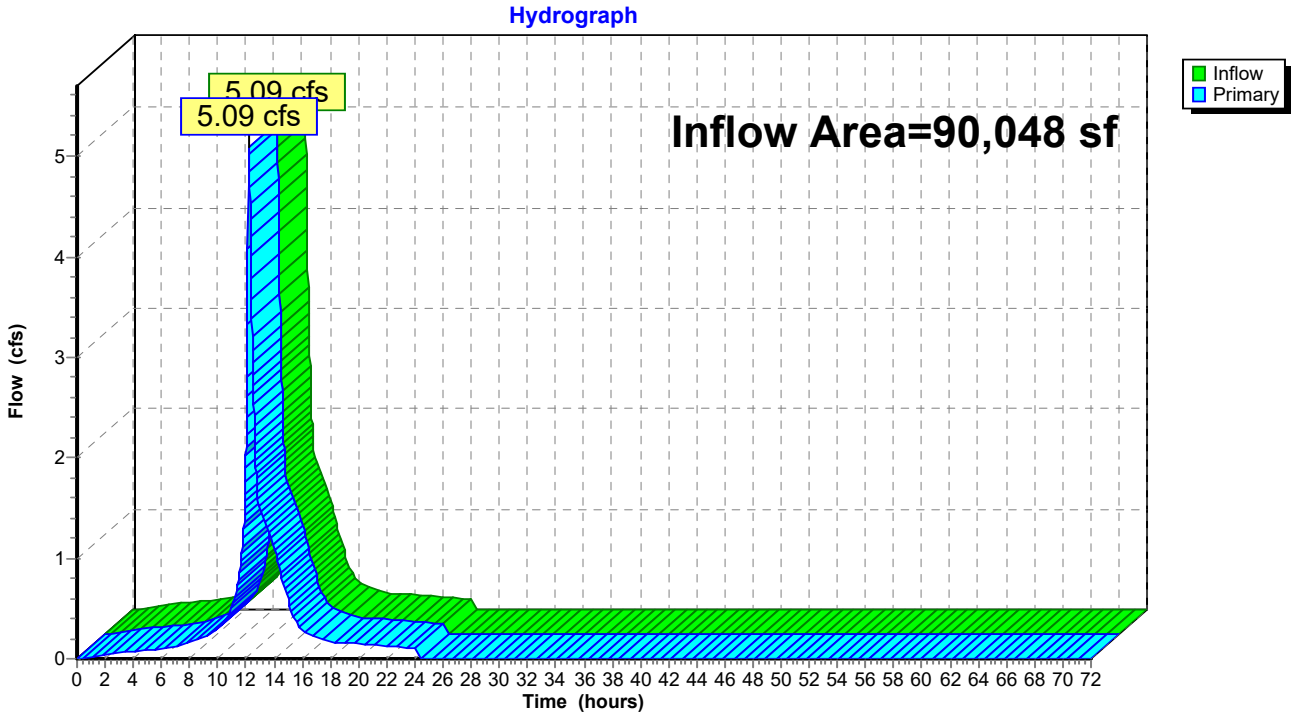


Summary for Link P-1: Post Development Drianage

Inflow Area = 90,048 sf, 66.63% Impervious, Inflow Depth = 4.29" for C10-Year event
Inflow = 5.09 cfs @ 12.20 hrs, Volume= 32,208 cf
Primary = 5.09 cfs @ 12.20 hrs, Volume= 32,208 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link P-1: Post Development Drianage



Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: Pre-Development Runoff Area=90,048 sf 14.68% Impervious Runoff Depth=6.84"
Flow Length=669' Tc=7.1 min CN=80/98 Runoff=16.77 cfs 51,343 cf

Subcatchment P-1A: Post-Development Runoff Area=10,079 sf 61.82% Impervious Runoff Depth=7.87"
Flow Length=189' Tc=6.0 min CN=80/98 Runoff=2.09 cfs 6,613 cf

Subcatchment P-1B: Post-Development Runoff Area=10,079 sf 90.64% Impervious Runoff Depth=8.50"
Tc=6.0 min CN=80/98 Runoff=2.18 cfs 7,143 cf

Subcatchment P-1C: Post-Development Runoff Area=9,669 sf 68.03% Impervious Runoff Depth=8.01"
Tc=6.0 min CN=80/98 Runoff=2.03 cfs 6,454 cf

Subcatchment P-1D: Post-Development Runoff Area=8,530 sf 72.98% Impervious Runoff Depth=8.12"
Tc=6.0 min CN=80/98 Runoff=1.80 cfs 5,771 cf

Subcatchment P-1E: Post-Development Runoff Area=9,057 sf 72.13% Impervious Runoff Depth=8.10"
Tc=6.0 min CN=80/98 Runoff=1.91 cfs 6,113 cf

Subcatchment P-1F: Post-Development Runoff Area=6,983 sf 86.60% Impervious Runoff Depth=8.42"
Tc=6.0 min CN=80/98 Runoff=1.50 cfs 4,898 cf

Subcatchment P-1G: Post-Development Runoff Area=7,377 sf 82.59% Impervious Runoff Depth=8.33"
Tc=6.0 min CN=80/98 Runoff=1.58 cfs 5,120 cf

Subcatchment P-1H: Post-Development Runoff Area=13,074 sf 52.73% Impervious Runoff Depth=7.67"
Tc=6.0 min CN=80/98 Runoff=2.68 cfs 8,362 cf

Subcatchment P-1I: Post-Development Runoff Area=15,200 sf 41.18% Impervious Runoff Depth=7.42"
Tc=6.0 min CN=80/98 Runoff=3.06 cfs 9,401 cf

Pond PV-1: Permeable Asphalt Peak Elev=130.28' Storage=10,847 cf Inflow=15.76 cfs 50,474 cf
Outflow=8.34 cfs 50,474 cf

Pond PV-2: Permeable Asphalt Peak Elev=136.05' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-3: Permeable Asphalt Peak Elev=139.05' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-4: Permeable Asphalt Peak Elev=141.85' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-5: Permeable Asphalt Peak Elev=143.55' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-6: Permeable Asphalt Peak Elev=146.22' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-7: Permeable Asphalt Peak Elev=149.11' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-8: Permeable Asphalt Peak Elev=0.00' Storage=0 cf
Primary=0.00 cfs 0 cf

Link P-1: Post Development Drianage Inflow=10.60 cfs 59,875 cf
Primary=10.60 cfs 59,875 cf

Total Runoff Area = 180,096 sf Runoff Volume = 111,218 cf Average Runoff Depth = 7.41"
59.35% Pervious = 106,883 sf 40.65% Impervious = 73,213 sf

Summary for Subcatchment E-1: Pre-Development Conditions Drainage Area

Runoff = 16.77 cfs @ 12.14 hrs, Volume= 51,343 cf, Depth= 6.84"
Routed to nonexistent node 4L

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C100-Year Rainfall=8.95", P2=3.34"

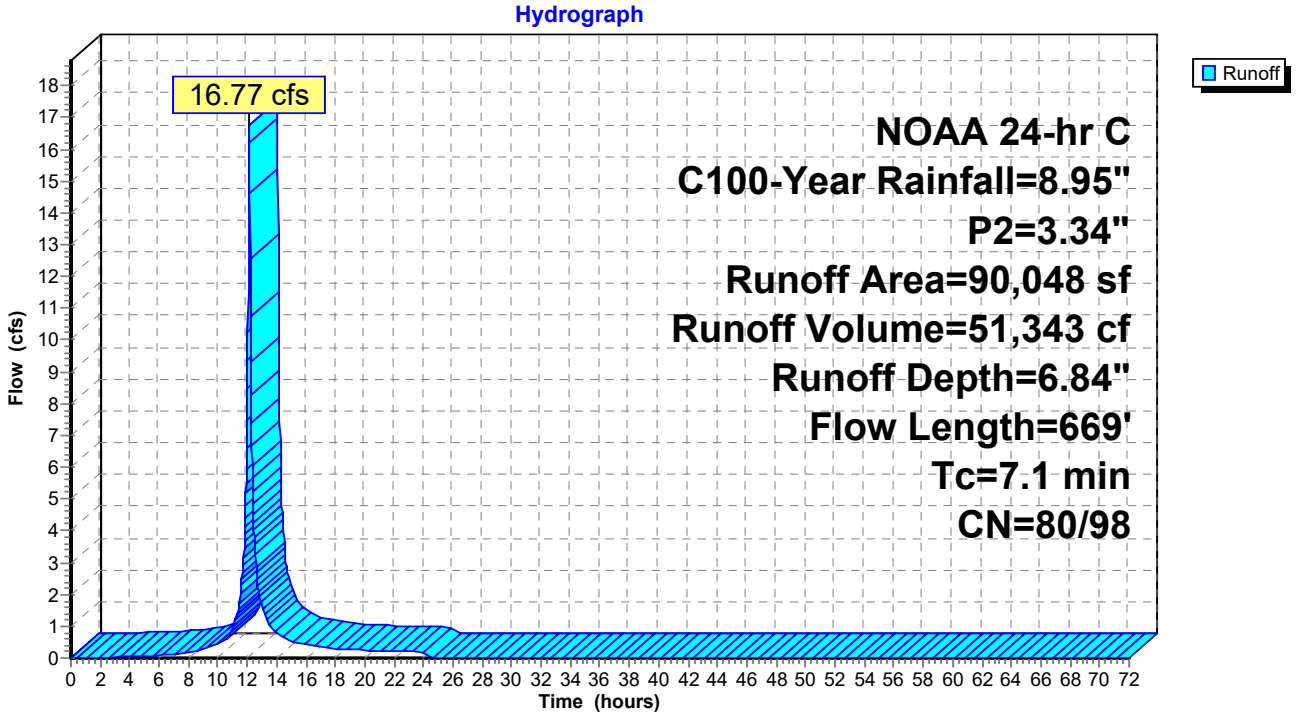
	Area (sf)	CN	Description
*	4,104	98	Impervious Surfaces
	76,831	80	>75% Grass cover, Good, HSG D
*	9,113	98	MVS
	90,048	83	Weighted Average
	76,831	80	85.32% Pervious Area
	13,217	98	14.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	10	0.0982	0.21		**Sheet Flow, 1-2** Grass: Short n= 0.150 P2= 3.34"
0.1	17	0.1150	2.37		**Shallow Concentrated Flow, 2-3** Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0800	1.98		**Shallow Concentrated Flow, 3-4** Short Grass Pasture Kv= 7.0 fps
0.1	18	0.1100	2.32		**Shallow Concentrated Flow, 4-5** Short Grass Pasture Kv= 7.0 fps
0.3	28	0.0700	1.85		**Shallow Concentrated Flow, 5-6** Short Grass Pasture Kv= 7.0 fps
0.1	15	0.0680	1.83		**Shallow Concentrated Flow, 6-7** Short Grass Pasture Kv= 7.0 fps
0.3	42	0.0960	2.17		**Shallow Concentrated Flow, 7-8** Short Grass Pasture Kv= 7.0 fps
0.5	34	0.0295	1.20		**Shallow Concentrated Flow, 8-9** Short Grass Pasture Kv= 7.0 fps
0.6	40	0.0250	1.11		**Shallow Concentrated Flow, 9-10** Short Grass Pasture Kv= 7.0 fps
0.3	43	0.1400	2.62		**Shallow Concentrated Flow, 10-11** Short Grass Pasture Kv= 7.0 fps
0.1	8	0.1300	2.52		**Shallow Concentrated Flow, 11-12** Short Grass Pasture Kv= 7.0 fps
0.4	46	0.0865	2.06		**Shallow Concentrated Flow, 12-13** Short Grass Pasture Kv= 7.0 fps
0.2	19	0.0515	1.59		**Shallow Concentrated Flow, 13-14** Short Grass Pasture Kv= 7.0 fps
0.1	8	0.0250	1.11		**Shallow Concentrated Flow, 14-15** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0250	3.21		**Shallow Concentrated Flow, 15-16** Paved Kv= 20.3 fps
0.2	15	0.0250	1.11		**Shallow Concentrated Flow, 16-17** Short Grass Pasture Kv= 7.0 fps
0.4	37	0.0540	1.63		**Shallow Concentrated Flow, 17-18** Short Grass Pasture Kv= 7.0 fps
0.2	14	0.0230	1.06		**Shallow Concentrated Flow, 18-19** Short Grass Pasture Kv= 7.0 fps
0.2	30	0.0230	3.08		**Shallow Concentrated Flow, 19-20** Paved Kv= 20.3 fps
0.1	23	0.0430	4.21		**Shallow Concentrated Flow, 20-21** Paved Kv= 20.3 fps
0.2	30	0.1340	2.56		**Shallow Concentrated Flow, 21-22** Short Grass Pasture Kv= 7.0 fps
0.3	38	0.0795	1.97		**Shallow Concentrated Flow, 22-23** Short Grass Pasture Kv= 7.0 fps
0.3	31	0.0645	1.78		**Shallow Concentrated Flow, 23-24** Short Grass Pasture Kv= 7.0 fps
0.5	47	0.0425	1.44		**Shallow Concentrated Flow, 24-25** Short Grass Pasture Kv= 7.0 fps
0.5	35	0.0290	1.19		**Shallow Concentrated Flow, 25-26** Short Grass Pasture Kv= 7.0 fps
0.1	13	0.0770	1.94		**Shallow Concentrated Flow, 26-27**

Short Grass Pasture Kv= 7.0 fps

7.1	669	Total

Subcatchment E-1: Pre-Development Conditions Drainage Area



Summary for Subcatchment P-1A: Post-Development Conditions Drainage Area

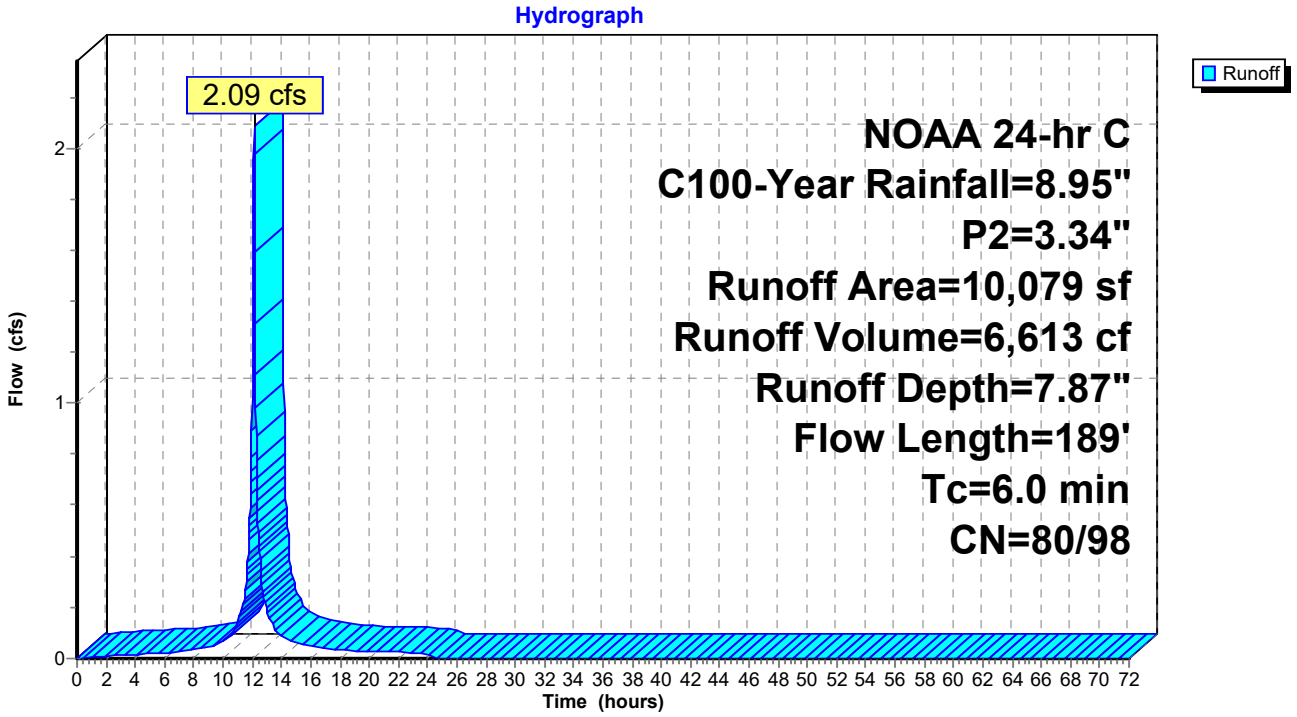
Runoff = 2.09 cfs @ 12.13 hrs, Volume= 6,613 cf, Depth= 7.87"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C100-Year Rainfall=8.95", P2=3.34"

	Area (sf)	CN	Description
*	933	98	Impervious Surfaces
*	5,298	98	MVS
	3,848	80	>75% Grass cover, Good, HSG D
	10,079	91	Weighted Average
	3,848	80	38.18% Pervious Area
	6,231	98	61.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	14	0.1050	0.23		**Sheet Flow, 1-2** Grass: Short n= 0.150 P2= 3.34"
0.2	89	0.1000	6.42		**Shallow Concentrated Flow, 2-3** Paved Kv= 20.3 fps
0.1	18	0.0275	3.37		**Shallow Concentrated Flow, 3-4** Paved Kv= 20.3 fps
0.3	68	0.0445	4.28		**Shallow Concentrated Flow, 4-5** Paved Kv= 20.3 fps
1.6	189	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1A: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1B: Post-Development Conditions Drainage Area

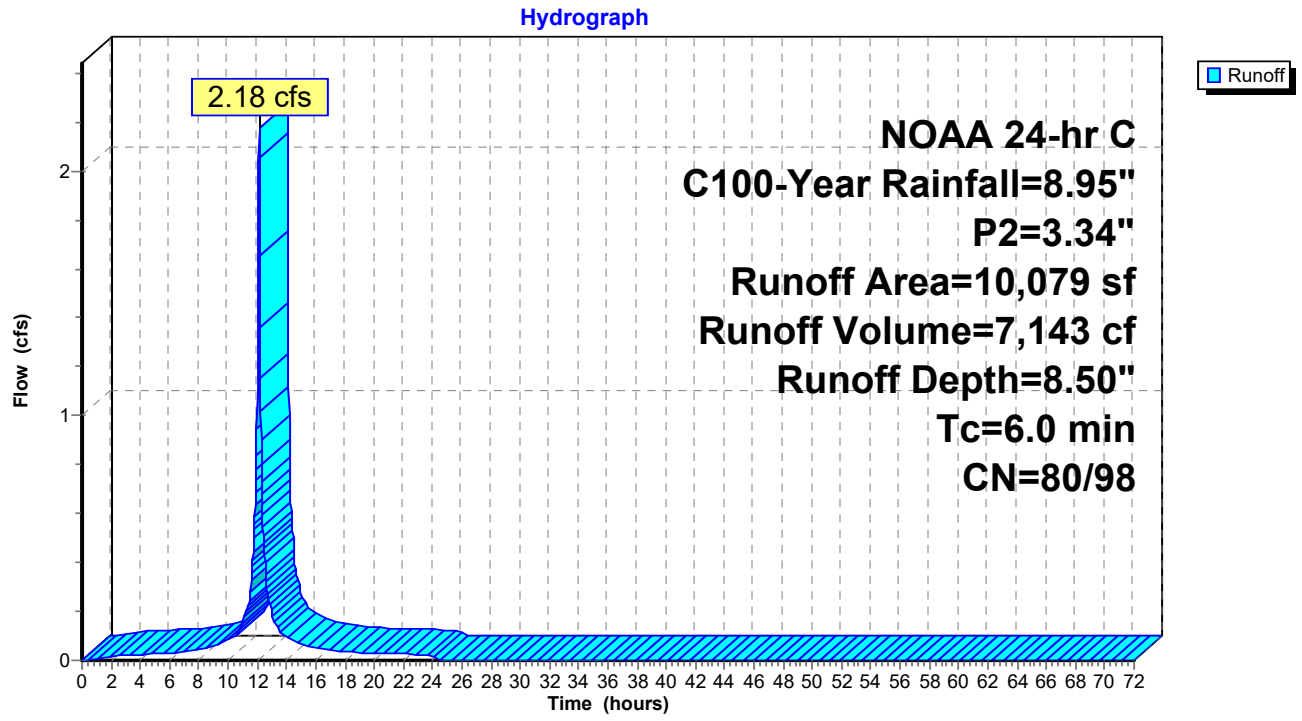
Runoff = 2.18 cfs @ 12.13 hrs, Volume= 7,143 cf, Depth= 8.50"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C100-Year Rainfall=8.95", P2=3.34"

	Area (sf)	CN	Description
*	6,427	98	Impervious Surfaces
*	2,709	98	MVS
	943	80	>75% Grass cover, Good, HSG D
	10,079	96	Weighted Average
	943	80	9.36% Pervious Area
	9,136	98	90.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1B: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1C: Post-Development Conditions Drainage Area

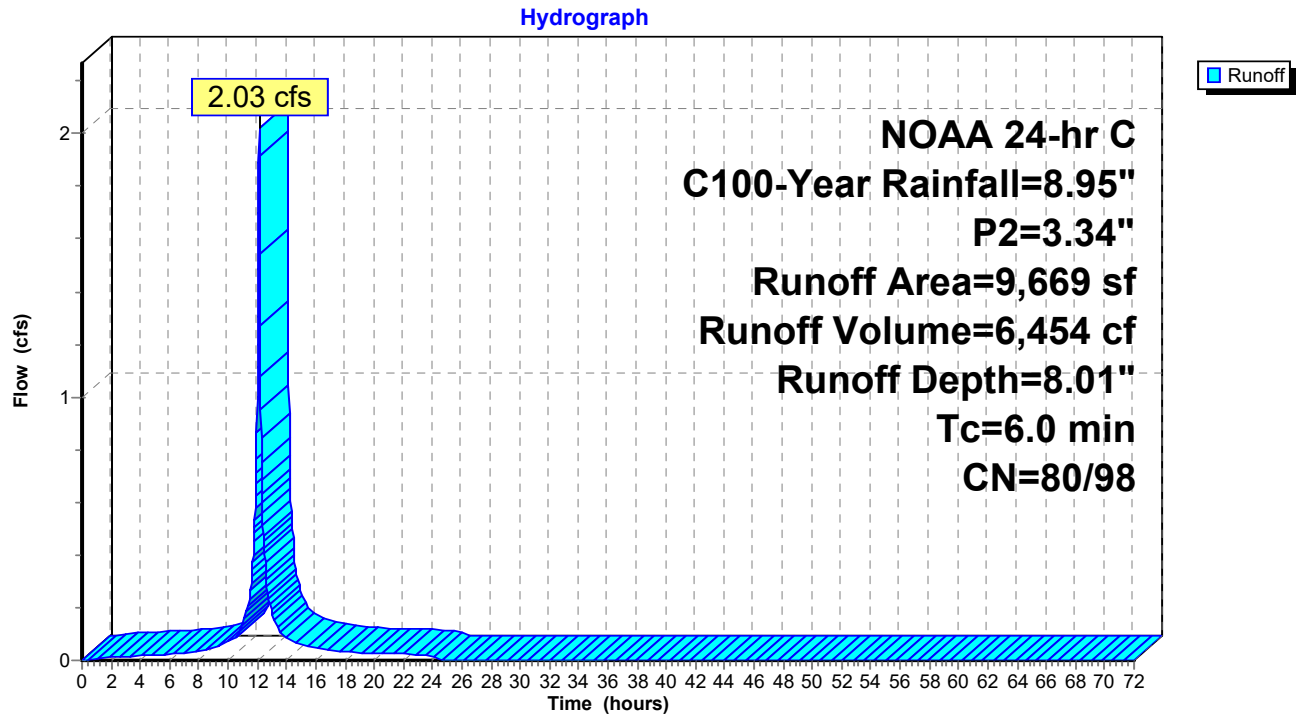
Runoff = 2.03 cfs @ 12.13 hrs, Volume= 6,454 cf, Depth= 8.01"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C100-Year Rainfall=8.95", P2=3.34"

	Area (sf)	CN	Description
*	3,869	98	Impervious Surfaces
*	2,709	98	MVS
	3,091	80	>75% Grass cover, Good, HSG D
	9,669	92	Weighted Average
	3,091	80	31.97% Pervious Area
	6,578	98	68.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1C: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1D: Post-Development Conditions Drainage Area

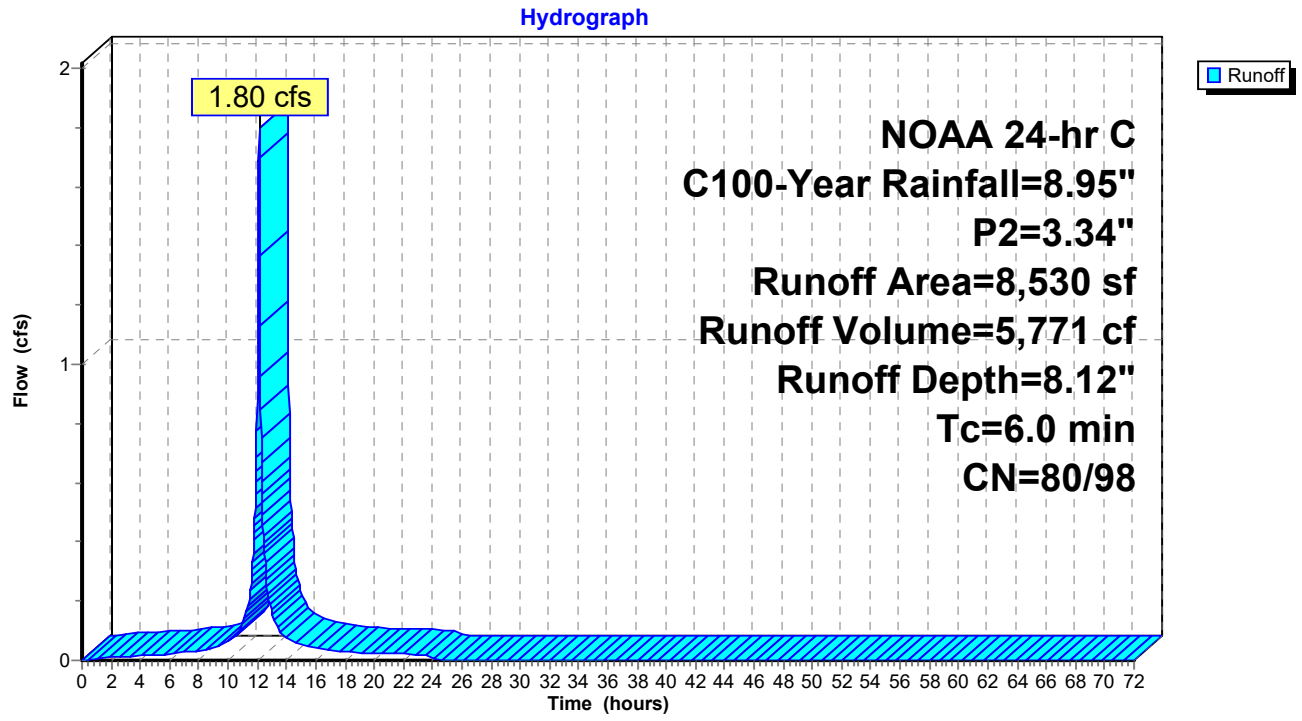
Runoff = 1.80 cfs @ 12.13 hrs, Volume= 5,771 cf, Depth= 8.12"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C100-Year Rainfall=8.95", P2=3.34"

	Area (sf)	CN	Description
*	3,516	98	Impervious Surfaces
*	2,709	98	MVS
	2,305	80	>75% Grass cover, Good, HSG D
	8,530	93	Weighted Average
	2,305	80	27.02% Pervious Area
	6,225	98	72.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1D: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1E: Post-Development Conditions Drainage Area

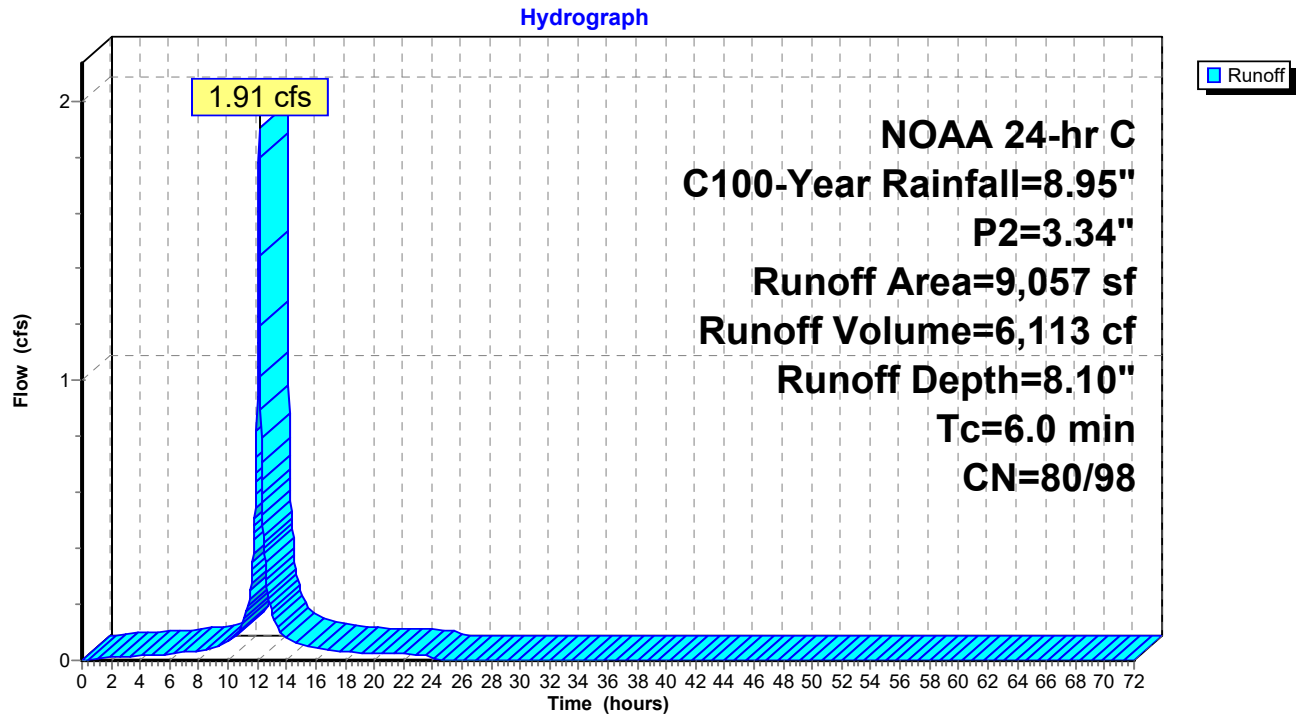
Runoff = 1.91 cfs @ 12.13 hrs, Volume= 6,113 cf, Depth= 8.10"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C100-Year Rainfall=8.95", P2=3.34"

	Area (sf)	CN	Description
*	3,824	98	Impervious Surfaces
*	2,709	98	MVS
	2,524	80	>75% Grass cover, Good, HSG D
	9,057	93	Weighted Average
	2,524	80	27.87% Pervious Area
	6,533	98	72.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1E: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1F: Post-Development Conditions Drainage Area

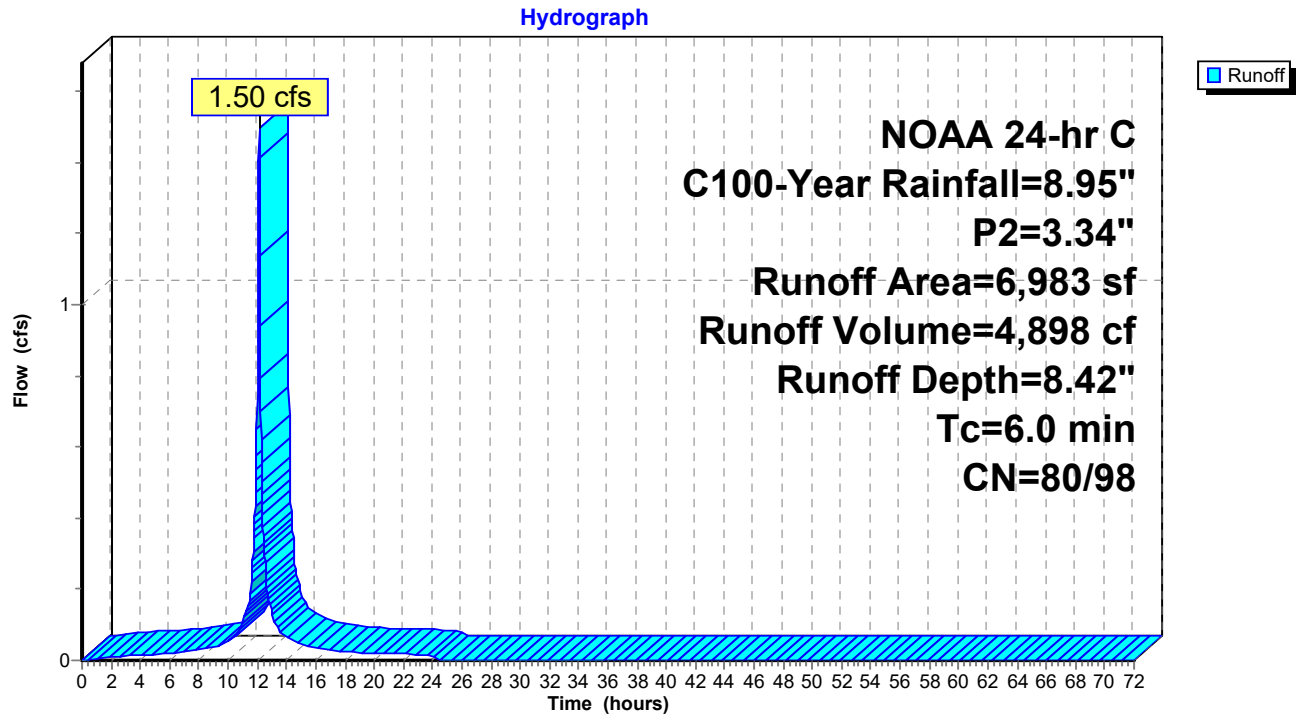
Runoff = 1.50 cfs @ 12.13 hrs, Volume= 4,898 cf, Depth= 8.42"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C100-Year Rainfall=8.95", P2=3.34"

	Area (sf)	CN	Description
*	3,338	98	Impervious Surfaces
*	2,709	98	MVS
	936	80	>75% Grass cover, Good, HSG D
	6,983	96	Weighted Average
	936	80	13.40% Pervious Area
	6,047	98	86.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1F: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1G: Post-Development Conditions Drainage Area

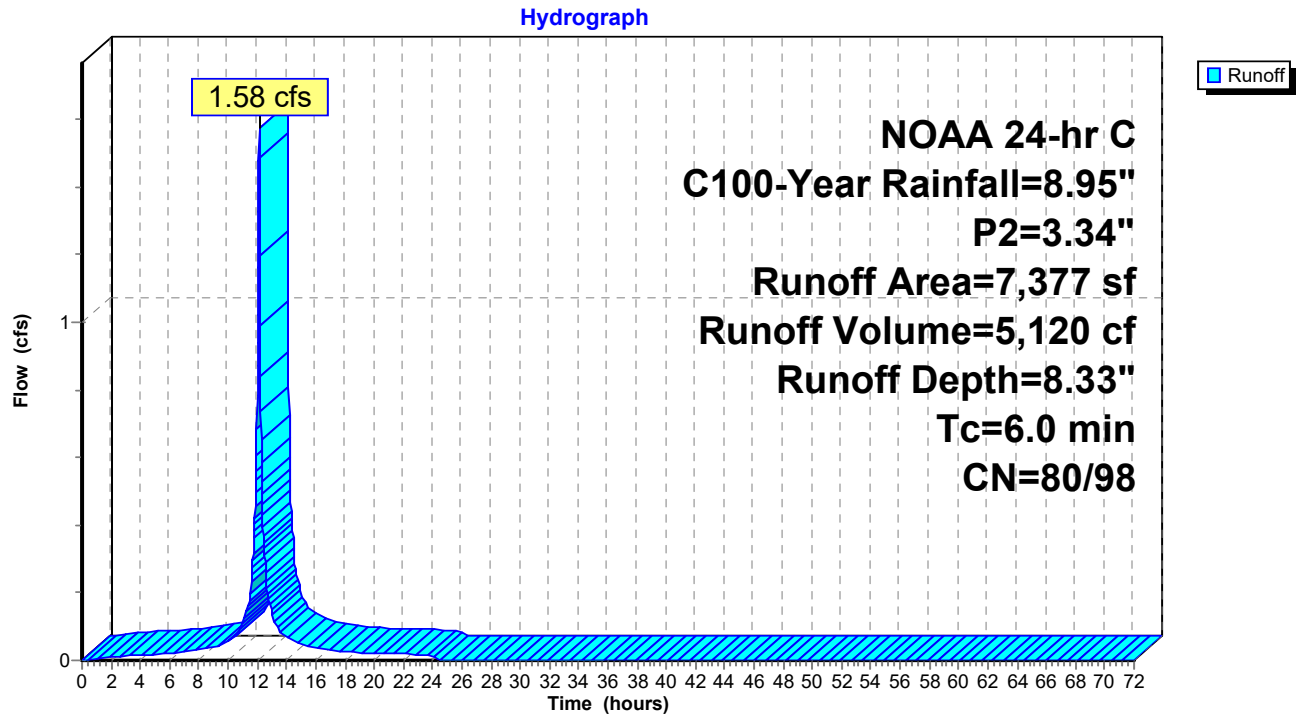
Runoff = 1.58 cfs @ 12.13 hrs, Volume= 5,120 cf, Depth= 8.33"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C100-Year Rainfall=8.95", P2=3.34"

	Area (sf)	CN	Description
*	3,384	98	Impervious Surfaces
*	2,709	98	MVS
	1,284	80	>75% Grass cover, Good, HSG D
	7,377	95	Weighted Average
	1,284	80	17.41% Pervious Area
	6,093	98	82.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1G: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1H: Post-Development Conditions Drainage Area

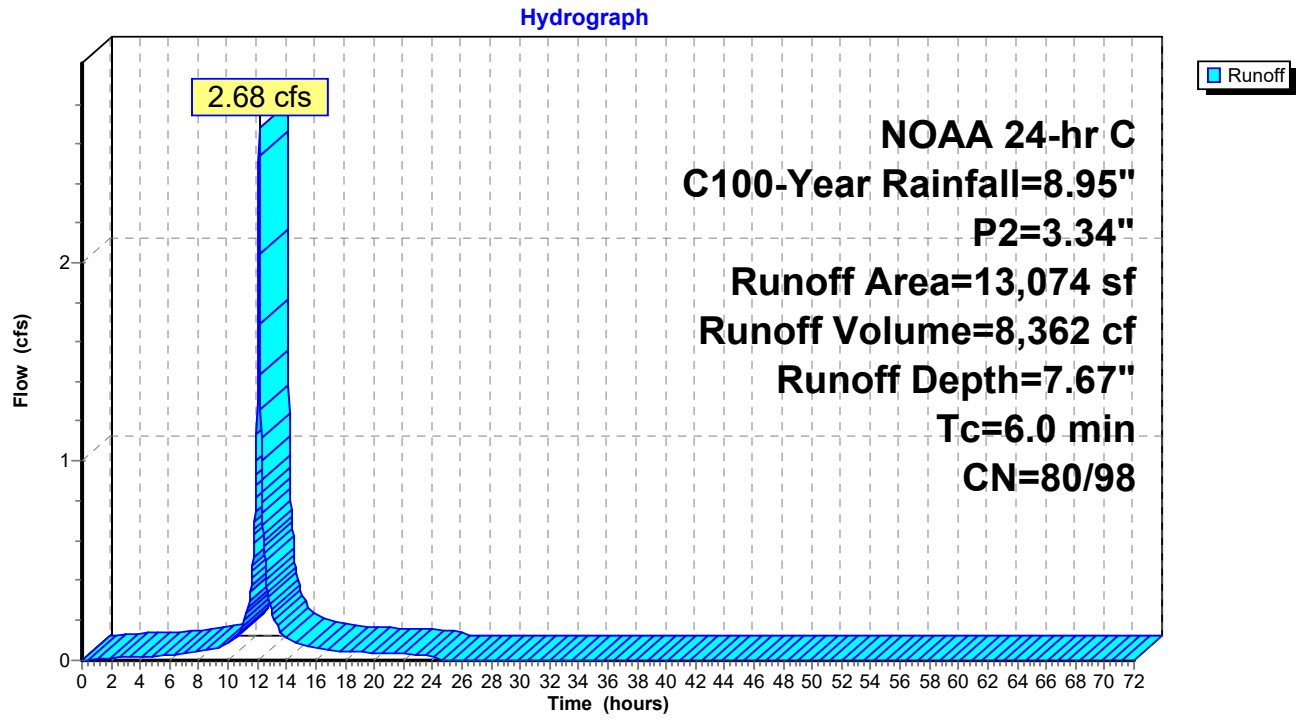
Runoff = 2.68 cfs @ 12.13 hrs, Volume= 8,362 cf, Depth= 7.67"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C100-Year Rainfall=8.95", P2=3.34"

	Area (sf)	CN	Description
*	3,345	98	Impervious Surfaces
*	3,549	98	MVS
	6,180	80	>75% Grass cover, Good, HSG D
	13,074	89	Weighted Average
	6,180	80	47.27% Pervious Area
	6,894	98	52.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1H: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1I: Post-Development Conditions Drainage Area

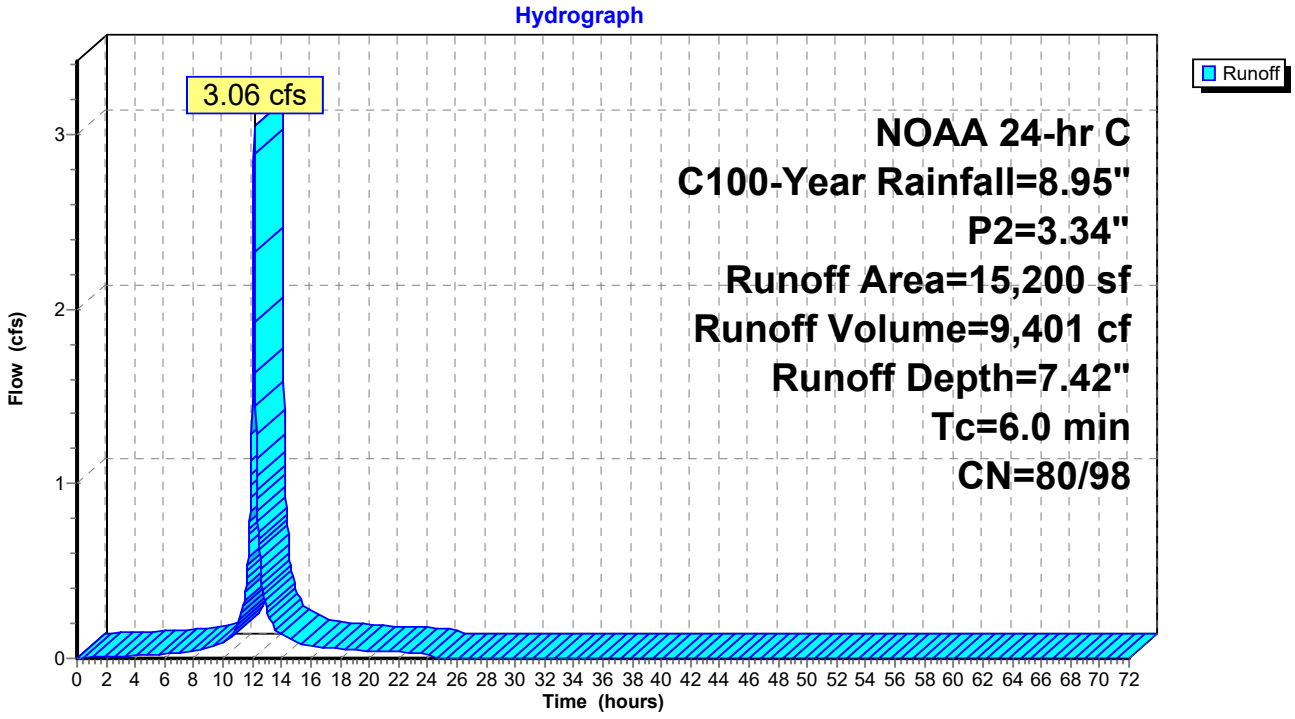
Runoff = 3.06 cfs @ 12.13 hrs, Volume= 9,401 cf, Depth= 7.42"
Routed to Link P-1 : Post Development Drianage

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C C100-Year Rainfall=8.95", P2=3.34"

	Area (sf)	CN	Description
*	3,217	98	Impervious Surfaces
*	3,042	98	MVS
	8,941	80	>75% Grass cover, Good, HSG D
	15,200	87	Weighted Average
	8,941	80	58.82% Pervious Area
	6,259	98	41.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1I: Post-Development Conditions Drainage Area



Summary for Pond PV-1: Permeable Asphalt

[44] Hint: Outlet device #2 is below defined storage
[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 74,848 sf, 71.79% Impervious, Inflow Depth = 8.09" for C100-Year event
Inflow = 15.76 cfs @ 12.13 hrs, Volume= 50,474 cf
Outflow = 8.34 cfs @ 12.22 hrs, Volume= 50,474 cf, Atten= 47%, Lag= 5.7 min
Primary = 8.34 cfs @ 12.22 hrs, Volume= 50,474 cf
Routed to Link P-1 : Post Development Drianage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 130.28' @ 12.22 hrs Surf.Area= 3,360 sf Storage= 10,847 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 23.4 min (777.7 - 754.3)

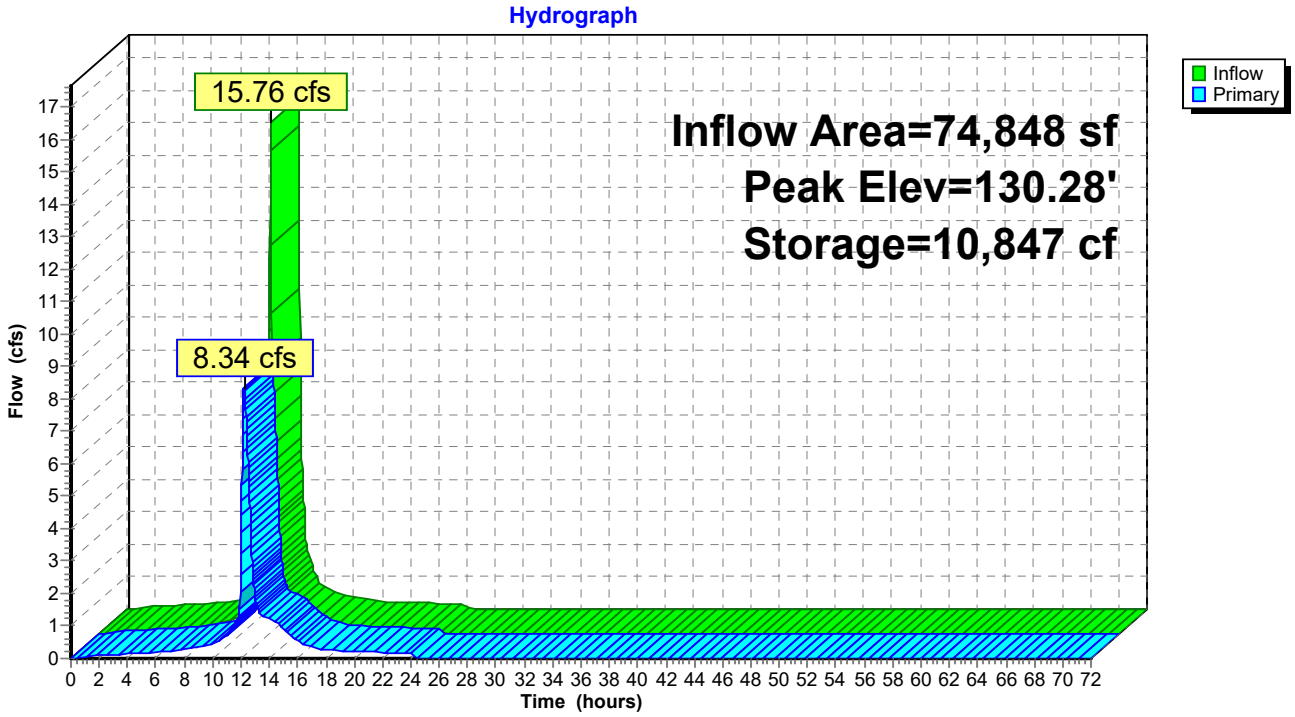
Volume	Invert	Avail.Storage	Storage Description
#1	125.19'	7,073 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) 26,846 cf Overall - 9,163 cf Embedded = 17,683 cf x 40.0% Voids
#2	127.18'	8,008 cf	**78.0"W x 48.0"H x 77.00'L Parabolic Arch** x 6 Inside #1 9,163 cf Overall - 3.0" Wall Thickness = 8,008 cf
		15,081 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
125.19	3,360	244.0	0	0	3,360
133.18	3,360	244.0	26,846	26,846	5,310

Device	Routing	Invert	Outlet Devices
#1	Primary	124.93'	**15.0" Round Culvert** L= 54.0' Ke= 0.500 Inlet / Outlet Invert= 124.93' / 124.39' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	124.93'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	124.93'	**6.0" W x 4.0" H Vert. Control Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 1	127.85'	**22.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	132.17'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=8.34 cfs @ 12.22 hrs HW=130.28' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 8.34 cfs of 12.77 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  ├─**3=Control Orifice** (Orifice Controls 1.83 cfs @ 10.96 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 6.51 cfs @ 7.10 fps)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PV-1: Permeable Asphalt



Summary for Pond PV-2: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow	=	0.00 cfs @	0.00 hrs, Volume=	0 cf
Outflow	=	0.00 cfs @	0.00 hrs, Volume=	0 cf, Atten= 0%, Lag= 0.0 min
Primary	=	0.00 cfs @	0.00 hrs, Volume=	0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 136.05' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

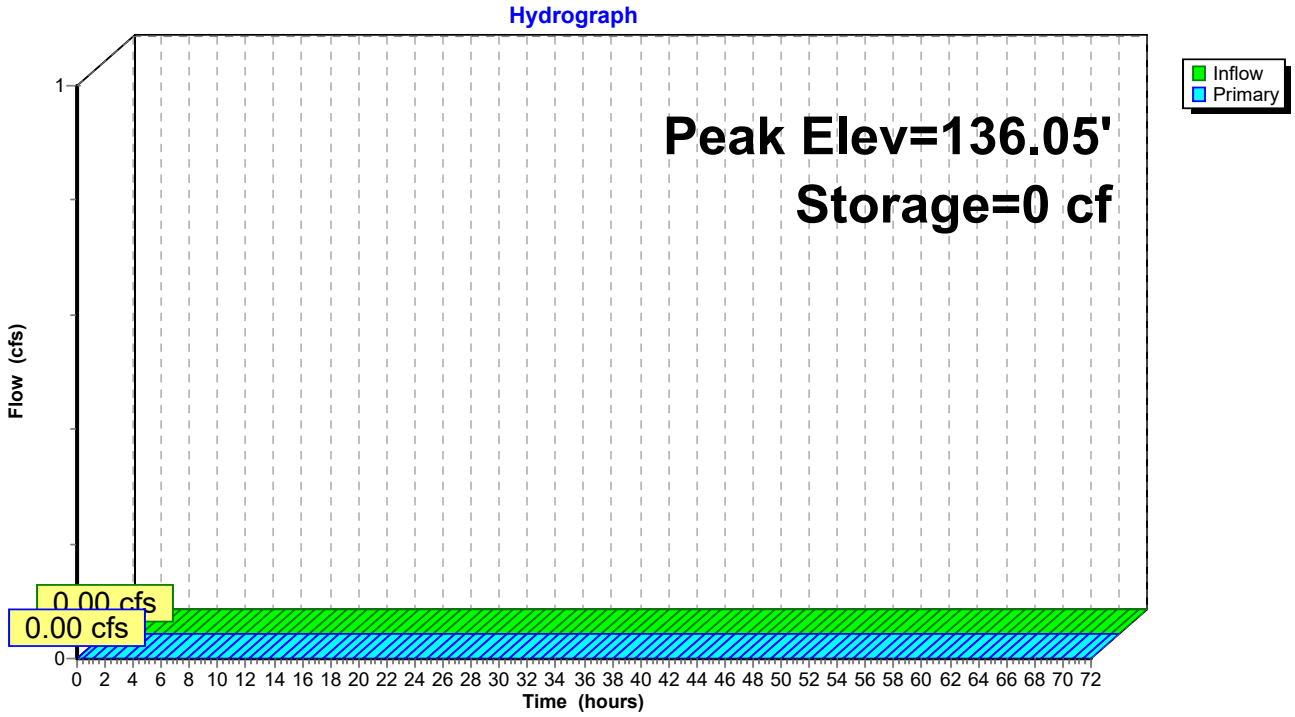
Volume	Invert	Avail.Storage	Storage Description
#1	135.80'	958 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
135.80	2,520	204.0	0.0	0	0	2,520
136.05	2,520	204.0	0.0	0	0	2,571
136.06	2,520	204.0	40.0	10	10	2,573
137.00	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	131.68'	**18.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	135.80'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	137.00'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=135.80' (Free Discharge)
└**1=Culvert Out** (Passes 0.00 cfs of 15.62 cfs potential flow)
  └**2=Underdrain** (Controls 0.00 cfs)
  └**3=WQDS** (Controls 0.00 cfs)

Pond PV-2: Permeable Asphalt



Summary for Pond PV-3: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-2 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 139.05' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

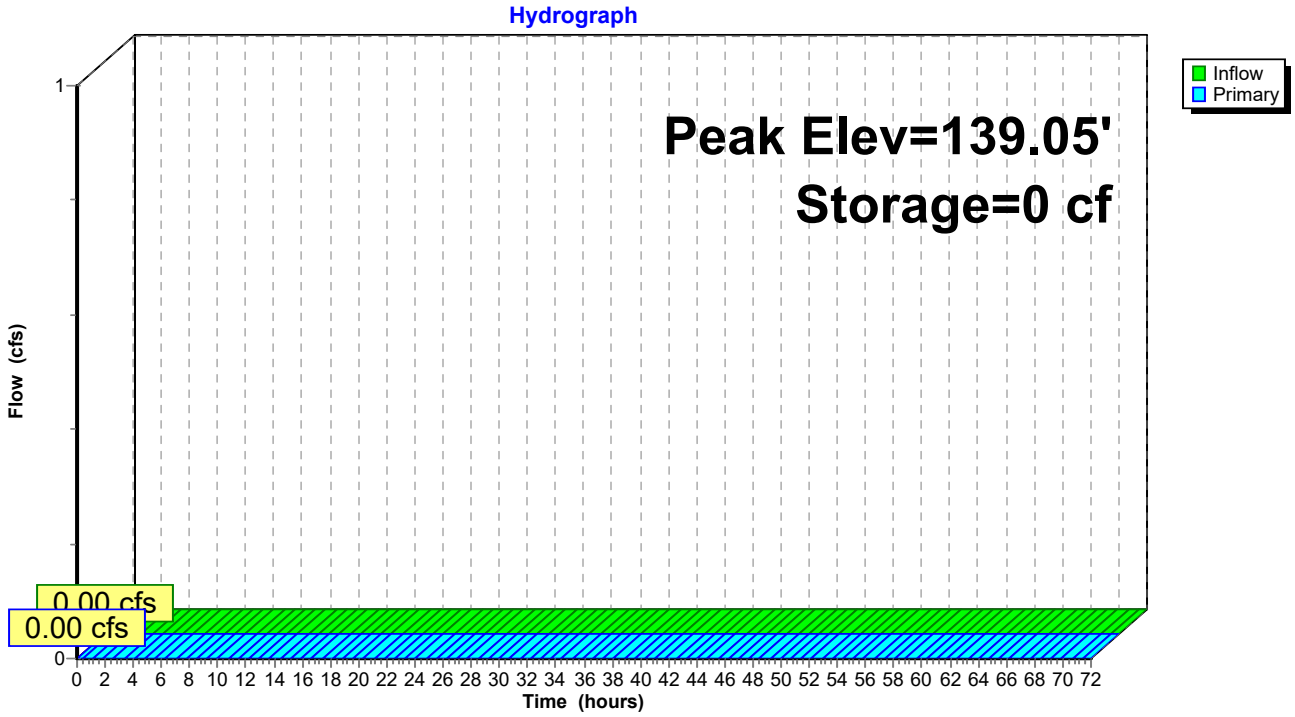
Volume	Invert	Avail.Storage	Storage Description
#1	138.80'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
138.80	2,520	204.0	0.0	0	0	2,520
139.05	2,520	204.0	0.0	0	0	2,571
139.06	2,520	204.0	40.0	10	10	2,573
140.00	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	135.60'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	138.80'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	140.00'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.80' TW=135.80' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.48 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-3: Permeable Asphalt



Summary for Pond PV-4: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-3 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 141.85' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

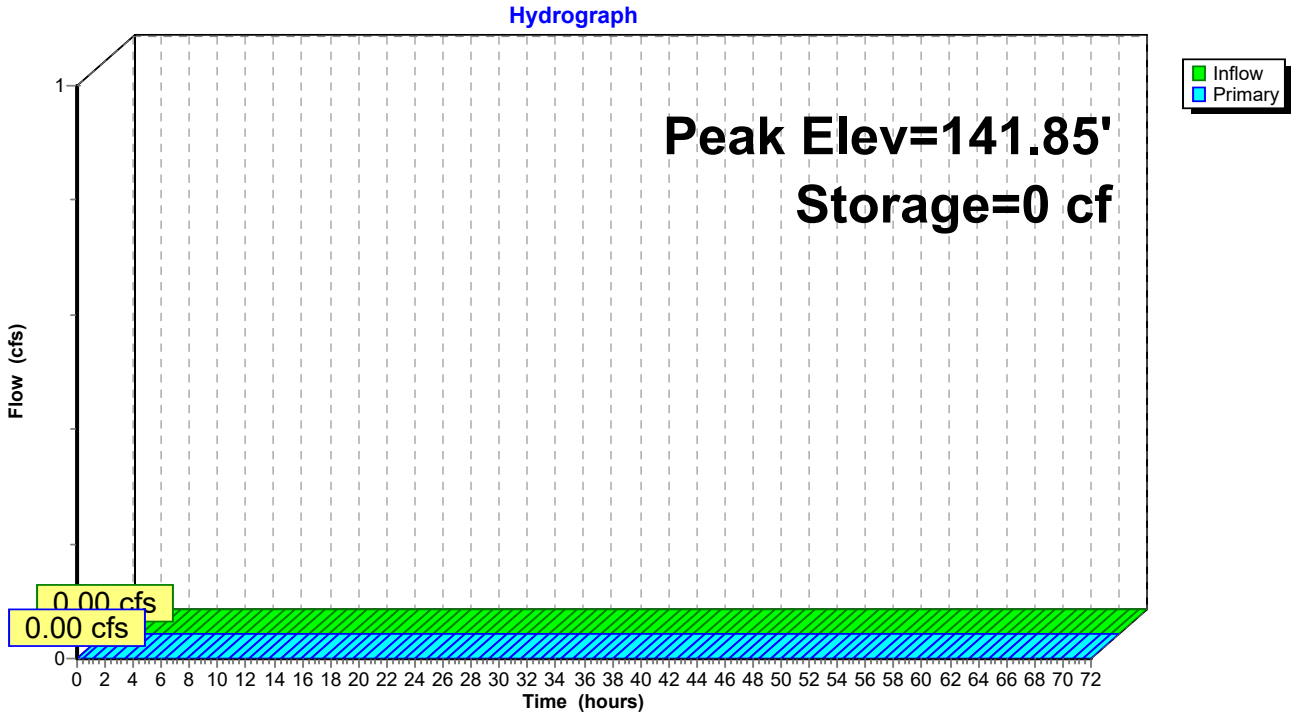
Volume	Invert	Avail.Storage	Storage Description
#1	141.60'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
141.60	2,520	204.0	0.0	0	0	2,520
141.85	2,520	204.0	0.0	0	0	2,571
141.86	2,520	204.0	40.0	10	10	2,573
142.80	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	138.60'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	141.60'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	142.80'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=141.60' TW=138.80' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.11 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-4: Permeable Asphalt



Summary for Pond PV-5: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-4 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 143.55' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

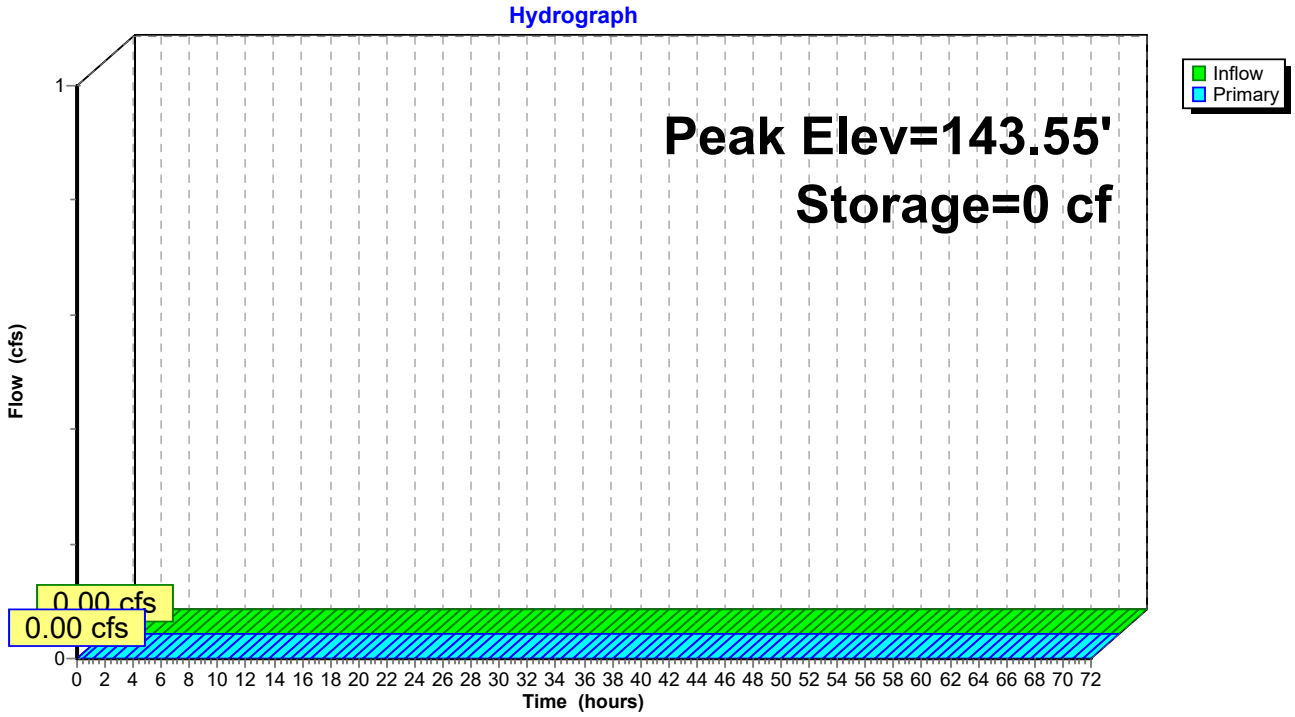
Volume	Invert	Avail.Storage	Storage Description
#1	143.30'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
143.30	2,520	204.0	0.0	0	0	2,520
143.55	2,520	204.0	0.0	0	0	2,571
143.56	2,520	204.0	40.0	10	10	2,573
144.50	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	141.39'	**12.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	143.30'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	144.50'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=143.30' TW=141.60' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 4.49 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-5: Permeable Asphalt



Summary for Pond PV-6: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-5 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 146.22' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

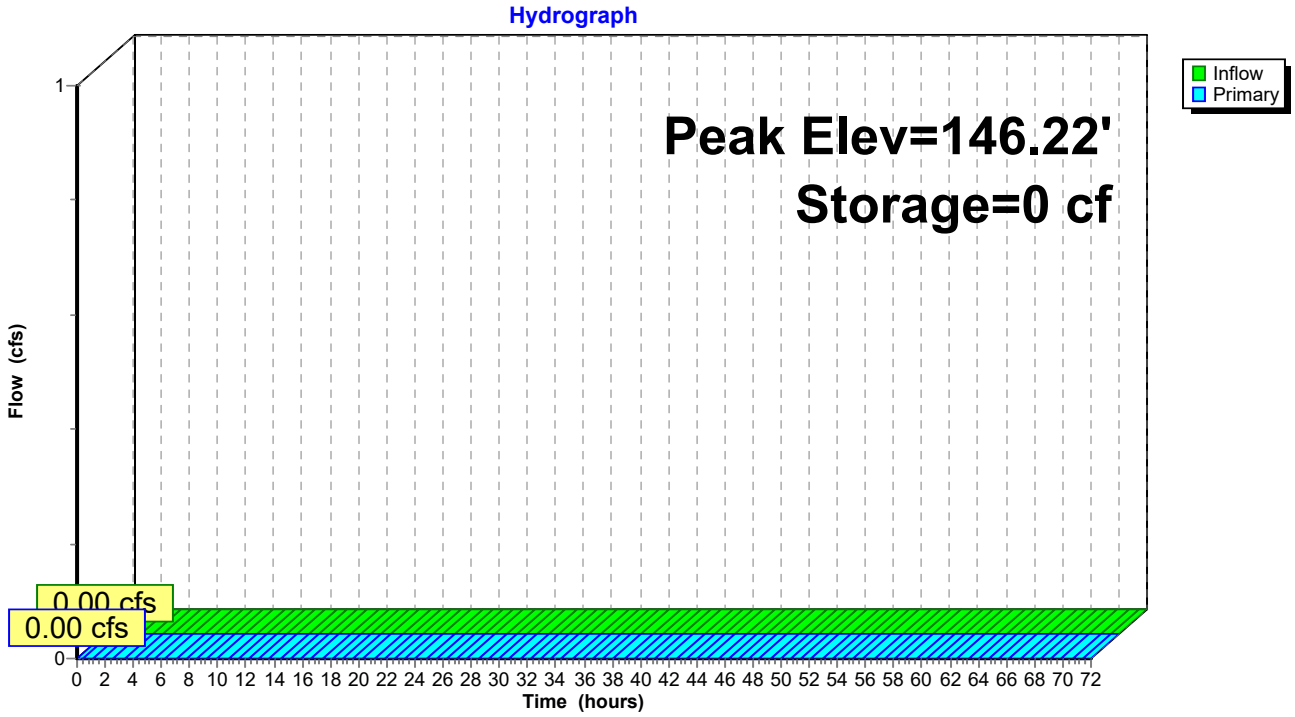
Volume	Invert	Avail.Storage	Storage Description
#1	145.97'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
145.97	2,520	204.0	0.0	0	0	2,520
146.22	2,520	204.0	0.0	0	0	2,571
146.23	2,520	204.0	40.0	10	10	2,573
147.17	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	144.09'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	145.97'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	147.17'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=145.97' TW=143.30' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 6.62 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-6: Permeable Asphalt



Summary for Pond PV-7: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-6 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 149.11' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

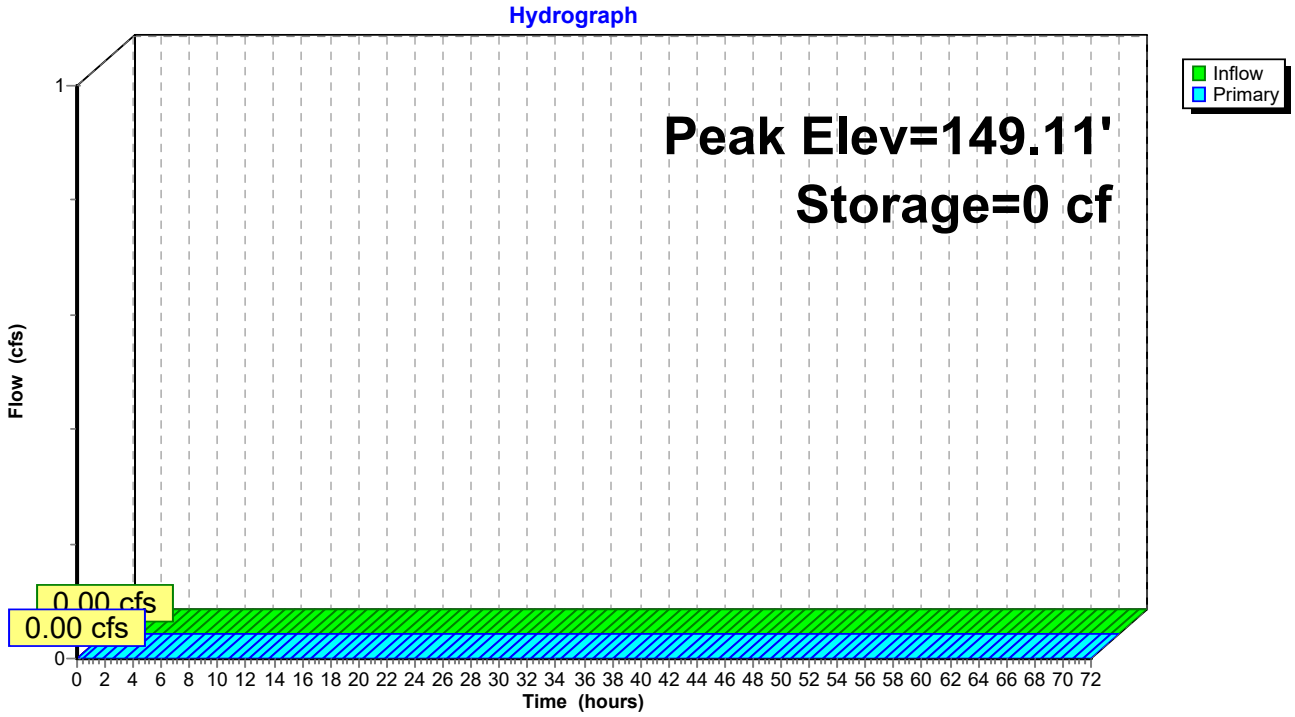
Volume	Invert	Avail.Storage	Storage Description
#1	148.86'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.86	2,520	204.0	0.0	0	0	2,520
149.11	2,520	204.0	0.0	0	0	2,571
149.12	2,520	204.0	40.0	10	10	2,573
150.06	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	145.76'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	148.86'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	150.06'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=148.86' TW=145.97' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.30 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-7: Permeable Asphalt



Summary for Pond PV-8: Permeable Asphalt

[43] Hint: Has no inflow (Outflow=Zero)

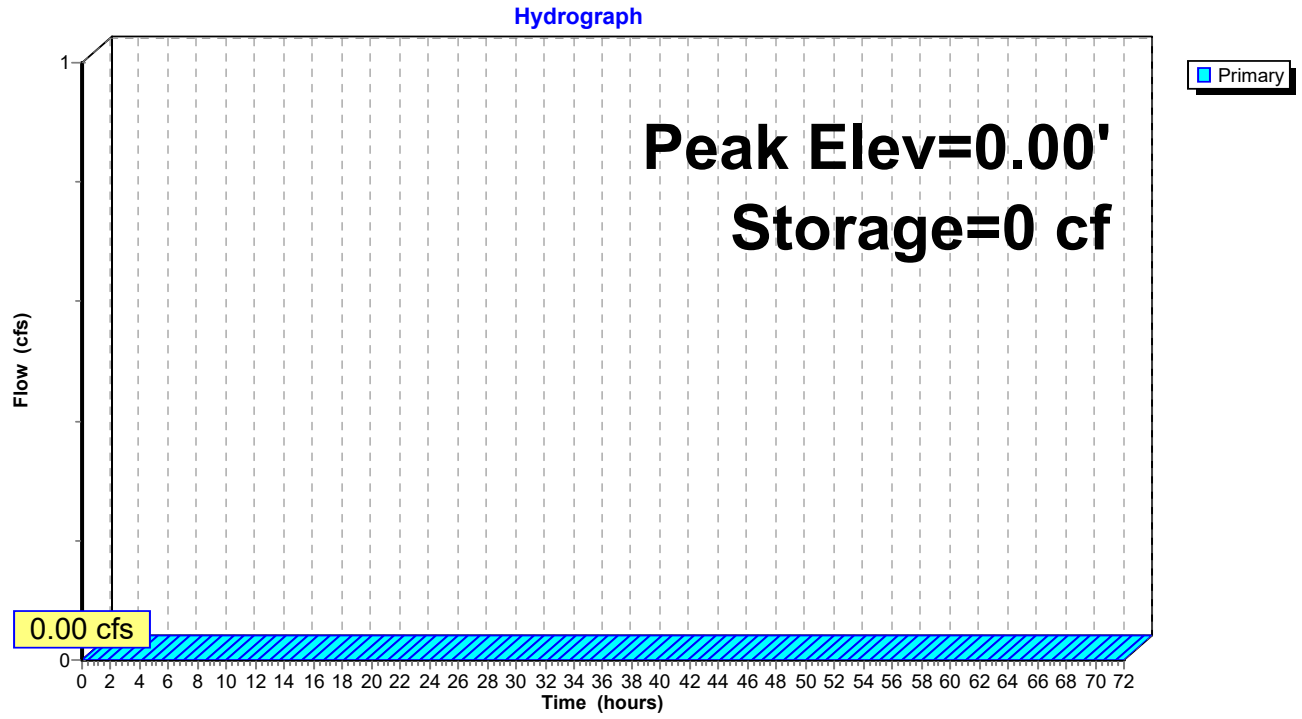
Volume	Invert	Avail.Storage	Storage Description
#1	151.60'	958 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
151.60	2,520	204.0	0.0	0	0	2,520
151.85	2,520	204.0	0.0	0	0	2,571
151.86	2,520	204.0	40.0	10	10	2,573
152.80	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	148.90'	**12.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	151.60'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	152.80'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' TW=148.86' (Dynamic Tailwater)
└─**1=Culvert Out** (Controls 0.00 cfs)
  └─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-8: Permeable Asphalt

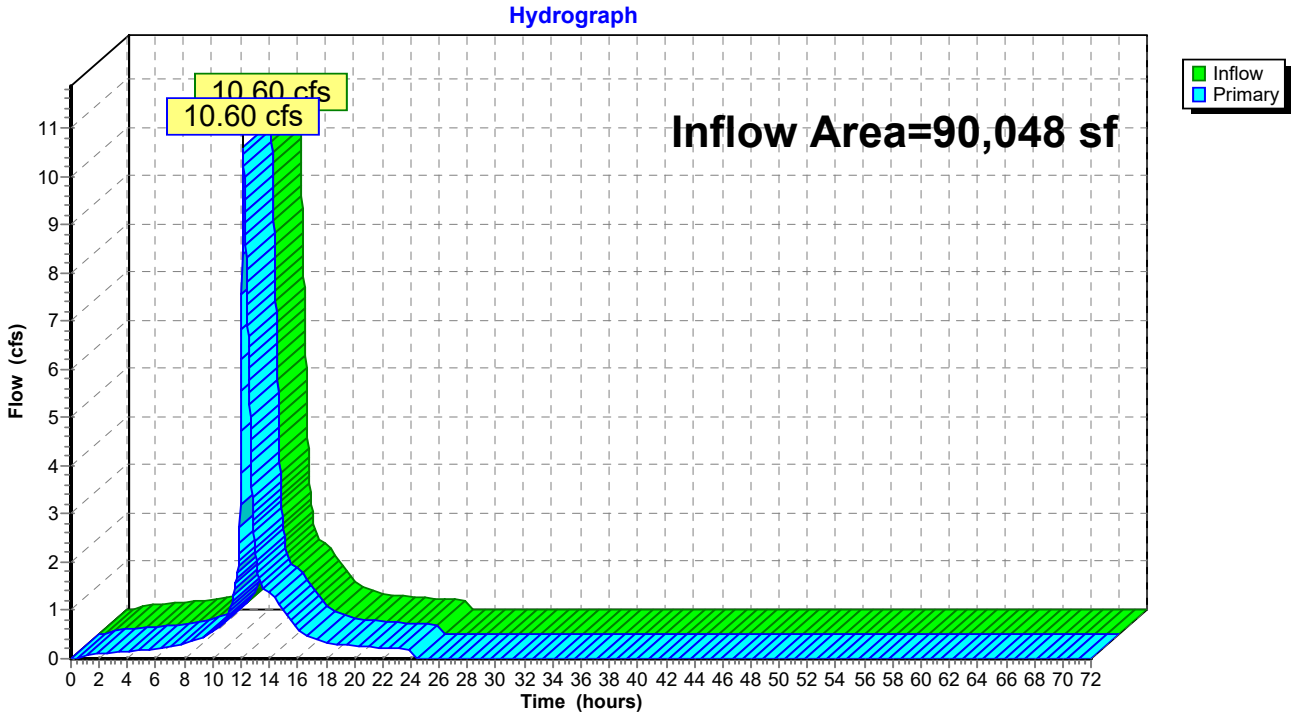


Summary for Link P-1: Post Development Drianage

Inflow Area = 90,048 sf, 66.63% Impervious, Inflow Depth = 7.98" for C100-Year event
Inflow = 10.60 cfs @ 12.16 hrs, Volume= 59,875 cf
Primary = 10.60 cfs @ 12.16 hrs, Volume= 59,875 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link P-1: Post Development Drianage



Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: Pre-Development Runoff Area=90,048 sf 14.68% Impervious Runoff Depth=2.27"
Flow Length=669' Tc=7.0 min CN=80/98 Runoff=5.75 cfs 17,027 cf

Subcatchment P-1A: Post-Development Runoff Area=10,079 sf 61.82% Impervious Runoff Depth=3.08"
Flow Length=189' Tc=6.0 min CN=80/98 Runoff=0.84 cfs 2,586 cf

Subcatchment P-1B: Post-Development Runoff Area=10,079 sf 90.64% Impervious Runoff Depth=3.57"
Tc=6.0 min CN=80/98 Runoff=0.94 cfs 3,002 cf

Subcatchment P-1C: Post-Development Runoff Area=9,669 sf 68.03% Impervious Runoff Depth=3.19"
Tc=6.0 min CN=80/98 Runoff=0.82 cfs 2,567 cf

Subcatchment P-1D: Post-Development Runoff Area=8,530 sf 72.98% Impervious Runoff Depth=3.27"
Tc=6.0 min CN=80/98 Runoff=0.74 cfs 2,325 cf

Subcatchment P-1E: Post-Development Runoff Area=9,057 sf 72.13% Impervious Runoff Depth=3.26"
Tc=6.0 min CN=80/98 Runoff=0.78 cfs 2,458 cf

Subcatchment P-1F: Post-Development Runoff Area=6,983 sf 86.60% Impervious Runoff Depth=3.50"
Tc=6.0 min CN=80/98 Runoff=0.64 cfs 2,040 cf

Subcatchment P-1G: Post-Development Runoff Area=7,377 sf 82.59% Impervious Runoff Depth=3.44"
Tc=6.0 min CN=80/98 Runoff=0.67 cfs 2,112 cf

Subcatchment P-1H: Post-Development Runoff Area=13,074 sf 52.73% Impervious Runoff Depth=2.92"
Tc=6.0 min CN=80/98 Runoff=1.04 cfs 3,185 cf

Subcatchment P-1I: Post-Development Runoff Area=15,200 sf 41.18% Impervious Runoff Depth=2.72"
Tc=6.0 min CN=80/98 Runoff=1.15 cfs 3,451 cf

Pond PV-1: Permeable Asphalt Peak Elev=128.05' Storage=5,242 cf Inflow=6.47 cfs 20,275 cf
Outflow=1.90 cfs 20,275 cf

Pond PV-2: Permeable Asphalt Peak Elev=136.05' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-3: Permeable Asphalt Peak Elev=139.05' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-4: Permeable Asphalt Peak Elev=141.85' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-5: Permeable Asphalt Peak Elev=143.55' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-6: Permeable Asphalt Peak Elev=146.22' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-7: Permeable Asphalt Peak Elev=149.11' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-8: Permeable Asphalt Peak Elev=0.00' Storage=0 cf
Primary=0.00 cfs 0 cf

Link P-1: Post Development Drianage Inflow=2.41 cfs 23,726 cf
Primary=2.41 cfs 23,726 cf

Total Runoff Area = 180,096 sf Runoff Volume = 40,753 cf Average Runoff Depth = 2.72"
59.35% Pervious = 106,883 sf 40.65% Impervious = 73,213 sf

Summary for Subcatchment E-1: Pre-Development Conditions Drainage Area

Runoff = 5.75 cfs @ 12.14 hrs, Volume= 17,027 cf, Depth= 2.27"
Routed to nonexistent node 4L

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F2-Year Rainfall=3.97", P2=3.97"

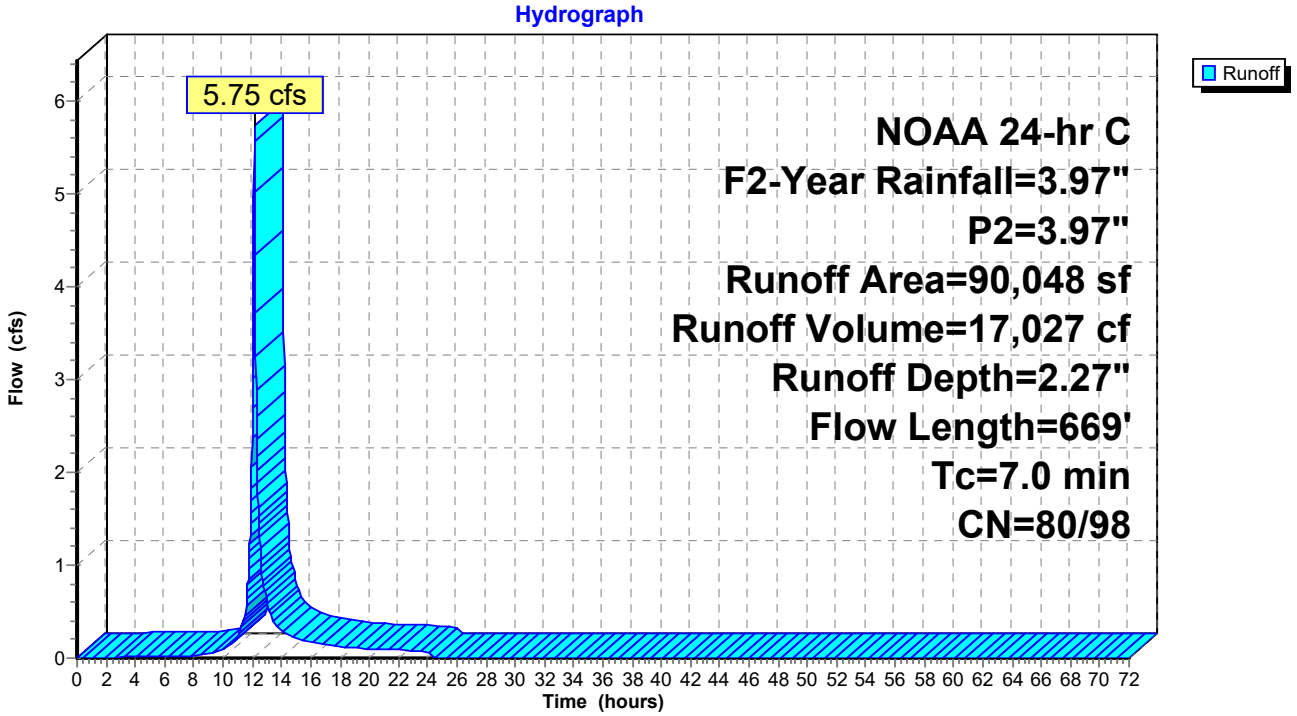
	Area (sf)	CN	Description
*	4,104	98	Impervious Surfaces
	76,831	80	>75% Grass cover, Good, HSG D
*	9,113	98	MVS
	90,048	83	Weighted Average
	76,831	80	85.32% Pervious Area
	13,217	98	14.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	10	0.0982	0.23		**Sheet Flow, 1-2** Grass: Short n= 0.150 P2= 3.97"
0.1	17	0.1150	2.37		**Shallow Concentrated Flow, 2-3** Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0800	1.98		**Shallow Concentrated Flow, 3-4** Short Grass Pasture Kv= 7.0 fps
0.1	18	0.1100	2.32		**Shallow Concentrated Flow, 4-5** Short Grass Pasture Kv= 7.0 fps
0.3	28	0.0700	1.85		**Shallow Concentrated Flow, 5-6** Short Grass Pasture Kv= 7.0 fps
0.1	15	0.0680	1.83		**Shallow Concentrated Flow, 6-7** Short Grass Pasture Kv= 7.0 fps
0.3	42	0.0960	2.17		**Shallow Concentrated Flow, 7-8** Short Grass Pasture Kv= 7.0 fps
0.5	34	0.0295	1.20		**Shallow Concentrated Flow, 8-9** Short Grass Pasture Kv= 7.0 fps
0.6	40	0.0250	1.11		**Shallow Concentrated Flow, 9-10** Short Grass Pasture Kv= 7.0 fps
0.3	43	0.1400	2.62		**Shallow Concentrated Flow, 10-11** Short Grass Pasture Kv= 7.0 fps
0.1	8	0.1300	2.52		**Shallow Concentrated Flow, 11-12** Short Grass Pasture Kv= 7.0 fps
0.4	46	0.0865	2.06		**Shallow Concentrated Flow, 12-13** Short Grass Pasture Kv= 7.0 fps
0.2	19	0.0515	1.59		**Shallow Concentrated Flow, 13-14** Short Grass Pasture Kv= 7.0 fps
0.1	8	0.0250	1.11		**Shallow Concentrated Flow, 14-15** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0250	3.21		**Shallow Concentrated Flow, 15-16** Paved Kv= 20.3 fps
0.2	15	0.0250	1.11		**Shallow Concentrated Flow, 16-17** Short Grass Pasture Kv= 7.0 fps
0.4	37	0.0540	1.63		**Shallow Concentrated Flow, 17-18** Short Grass Pasture Kv= 7.0 fps
0.2	14	0.0230	1.06		**Shallow Concentrated Flow, 18-19** Short Grass Pasture Kv= 7.0 fps
0.2	30	0.0230	3.08		**Shallow Concentrated Flow, 19-20** Paved Kv= 20.3 fps
0.1	23	0.0430	4.21		**Shallow Concentrated Flow, 20-21** Paved Kv= 20.3 fps
0.2	30	0.1340	2.56		**Shallow Concentrated Flow, 21-22** Short Grass Pasture Kv= 7.0 fps
0.3	38	0.0795	1.97		**Shallow Concentrated Flow, 22-23** Short Grass Pasture Kv= 7.0 fps
0.3	31	0.0645	1.78		**Shallow Concentrated Flow, 23-24** Short Grass Pasture Kv= 7.0 fps
0.5	47	0.0425	1.44		**Shallow Concentrated Flow, 24-25** Short Grass Pasture Kv= 7.0 fps
0.5	35	0.0290	1.19		**Shallow Concentrated Flow, 25-26** Short Grass Pasture Kv= 7.0 fps
0.1	13	0.0770	1.94		**Shallow Concentrated Flow, 26-27**

Short Grass Pasture Kv= 7.0 fps

7.0	669	Total

Subcatchment E-1: Pre-Development Conditions Drainage Area



Summary for Subcatchment P-1A: Post-Development Conditions Drainage Area

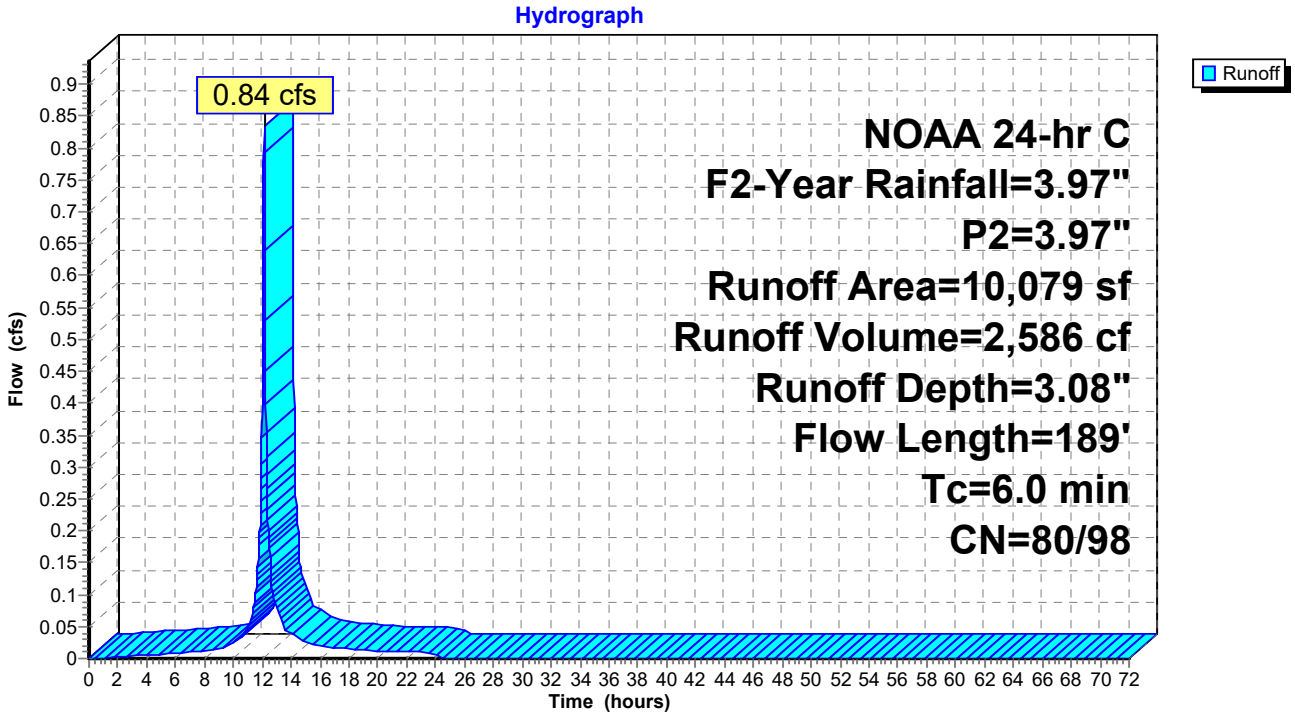
Runoff = 0.84 cfs @ 12.13 hrs, Volume= 2,586 cf, Depth= 3.08"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F2-Year Rainfall=3.97", P2=3.97"

	Area (sf)	CN	Description
*	933	98	Impervious Surfaces
*	5,298	98	MVS
	3,848	80	>75% Grass cover, Good, HSG D
	10,079	91	Weighted Average
	3,848	80	38.18% Pervious Area
	6,231	98	61.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	14	0.1050	0.25		**Sheet Flow, 1-2** Grass: Short n= 0.150 P2= 3.97"
0.2	89	0.1000	6.42		**Shallow Concentrated Flow, 2-3** Paved Kv= 20.3 fps
0.1	18	0.0275	3.37		**Shallow Concentrated Flow, 3-4** Paved Kv= 20.3 fps
0.3	68	0.0445	4.28		**Shallow Concentrated Flow, 4-5** Paved Kv= 20.3 fps
1.5	189	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1A: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1B: Post-Development Conditions Drainage Area

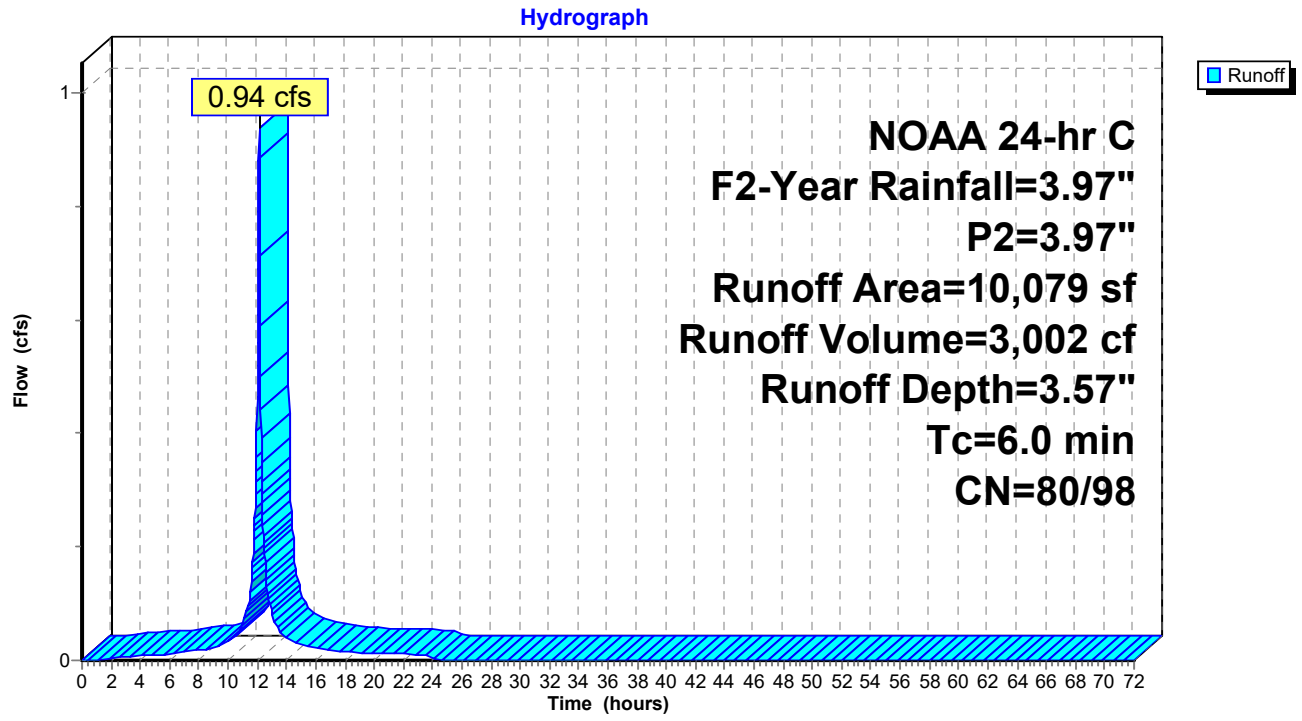
Runoff = 0.94 cfs @ 12.13 hrs, Volume= 3,002 cf, Depth= 3.57"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F2-Year Rainfall=3.97", P2=3.97"

	Area (sf)	CN	Description
*	6,427	98	Impervious Surfaces
*	2,709	98	MVS
	943	80	>75% Grass cover, Good, HSG D
	10,079	96	Weighted Average
	943	80	9.36% Pervious Area
	9,136	98	90.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1B: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1C: Post-Development Conditions Drainage Area

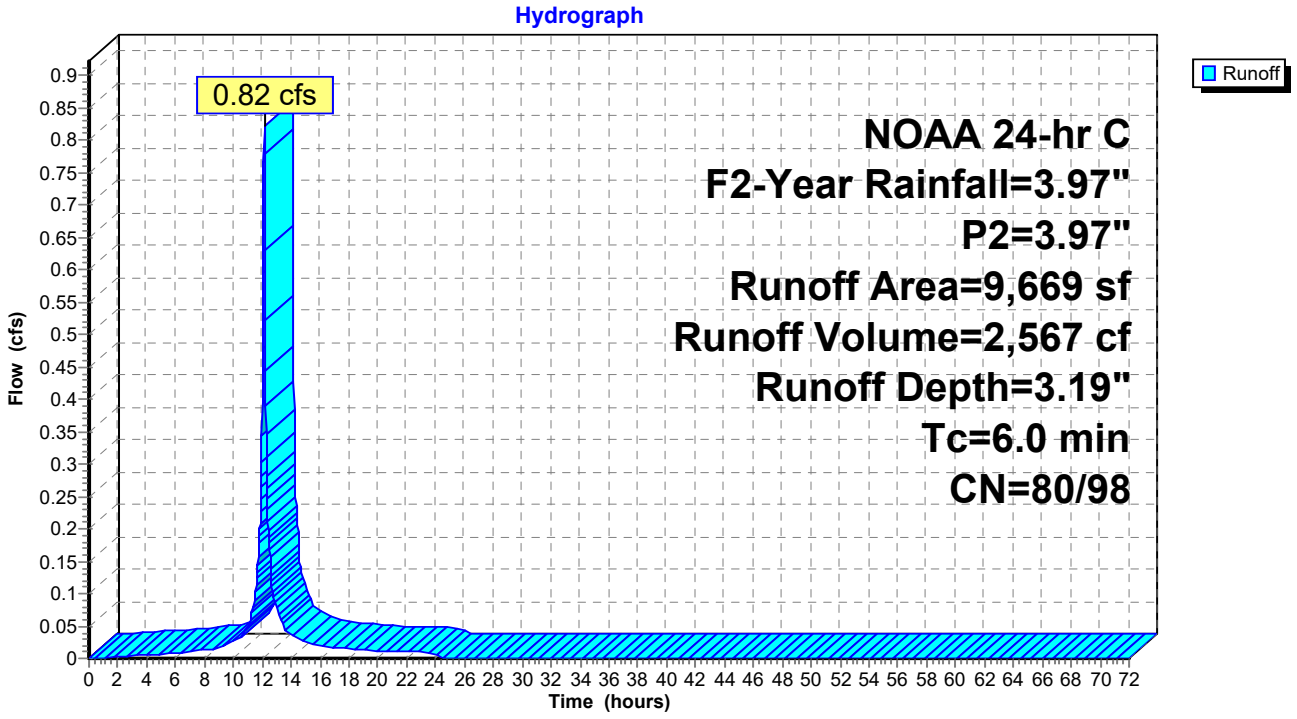
Runoff = 0.82 cfs @ 12.13 hrs, Volume= 2,567 cf, Depth= 3.19"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F2-Year Rainfall=3.97", P2=3.97"

	Area (sf)	CN	Description
*	3,869	98	Impervious Surfaces
*	2,709	98	MVS
	3,091	80	>75% Grass cover, Good, HSG D
	9,669	92	Weighted Average
	3,091	80	31.97% Pervious Area
	6,578	98	68.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1C: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1D: Post-Development Conditions Drainage Area

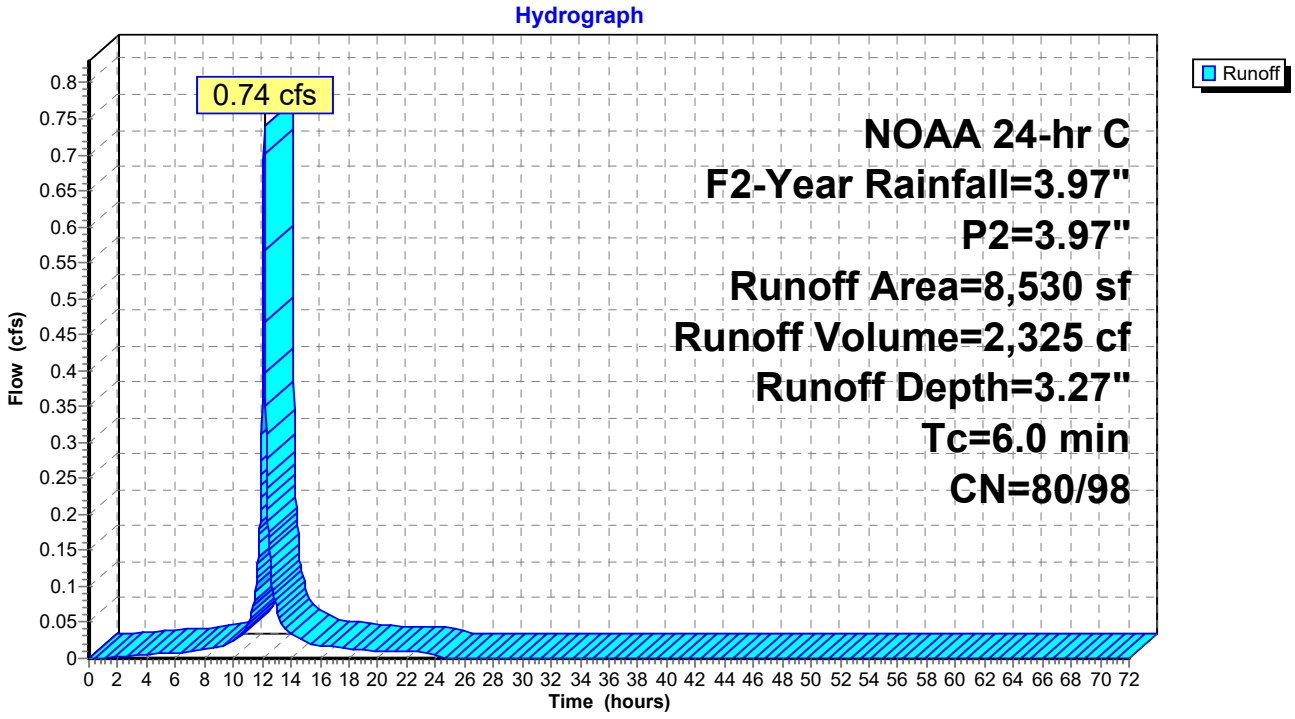
Runoff = 0.74 cfs @ 12.13 hrs, Volume= 2,325 cf, Depth= 3.27"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F2-Year Rainfall=3.97", P2=3.97"

	Area (sf)	CN	Description
*	3,516	98	Impervious Surfaces
*	2,709	98	MVS
	2,305	80	>75% Grass cover, Good, HSG D
	8,530	93	Weighted Average
	2,305	80	27.02% Pervious Area
	6,225	98	72.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1D: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1E: Post-Development Conditions Drainage Area

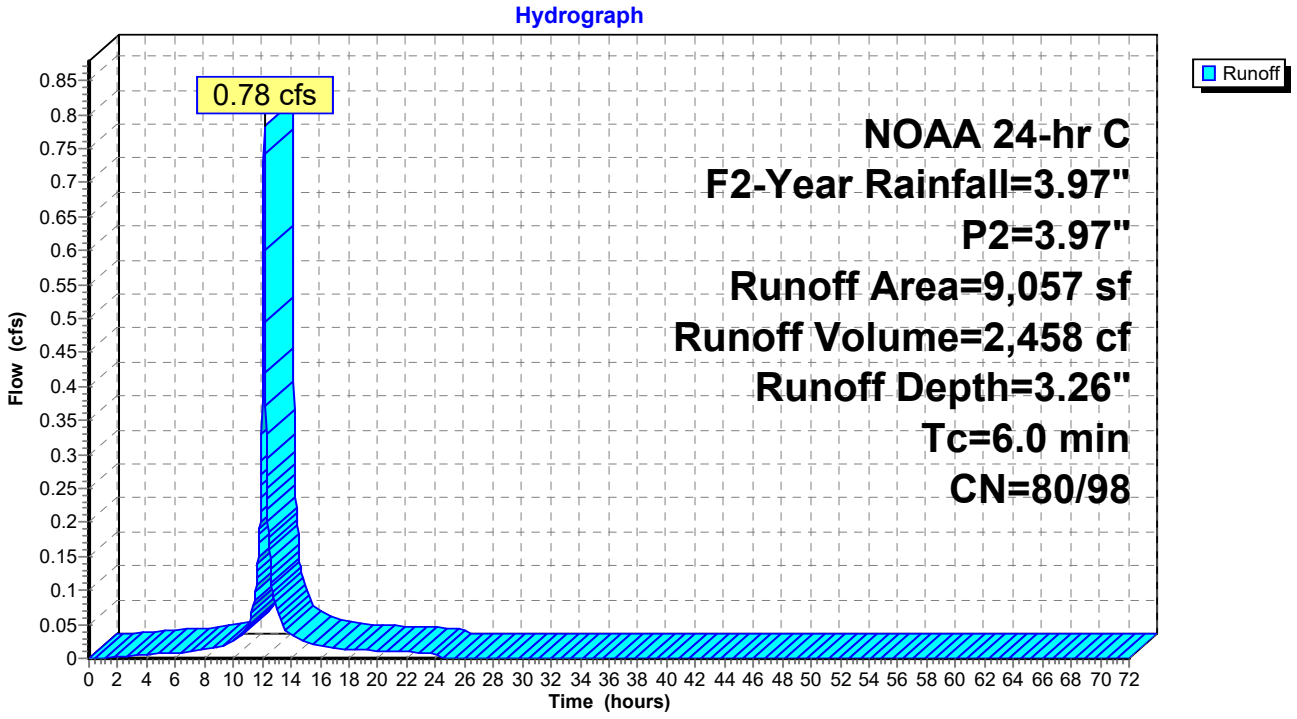
Runoff = 0.78 cfs @ 12.13 hrs, Volume= 2,458 cf, Depth= 3.26"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F2-Year Rainfall=3.97", P2=3.97"

	Area (sf)	CN	Description
*	3,824	98	Impervious Surfaces
*	2,709	98	MVS
	2,524	80	>75% Grass cover, Good, HSG D
	9,057	93	Weighted Average
	2,524	80	27.87% Pervious Area
	6,533	98	72.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1E: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1F: Post-Development Conditions Drainage Area

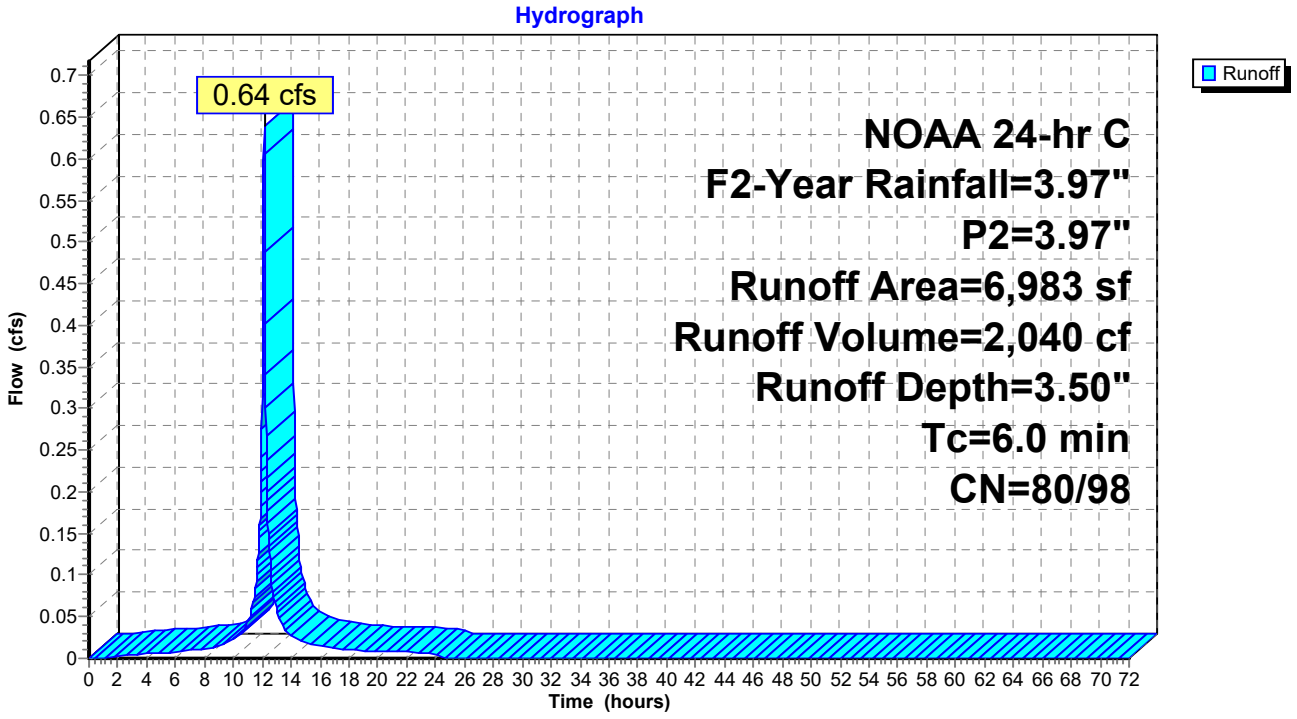
Runoff = 0.64 cfs @ 12.13 hrs, Volume= 2,040 cf, Depth= 3.50"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F2-Year Rainfall=3.97", P2=3.97"

	Area (sf)	CN	Description
*	3,338	98	Impervious Surfaces
*	2,709	98	MVS
	936	80	>75% Grass cover, Good, HSG D
	6,983	96	Weighted Average
	936	80	13.40% Pervious Area
	6,047	98	86.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1F: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1G: Post-Development Conditions Drainage Area

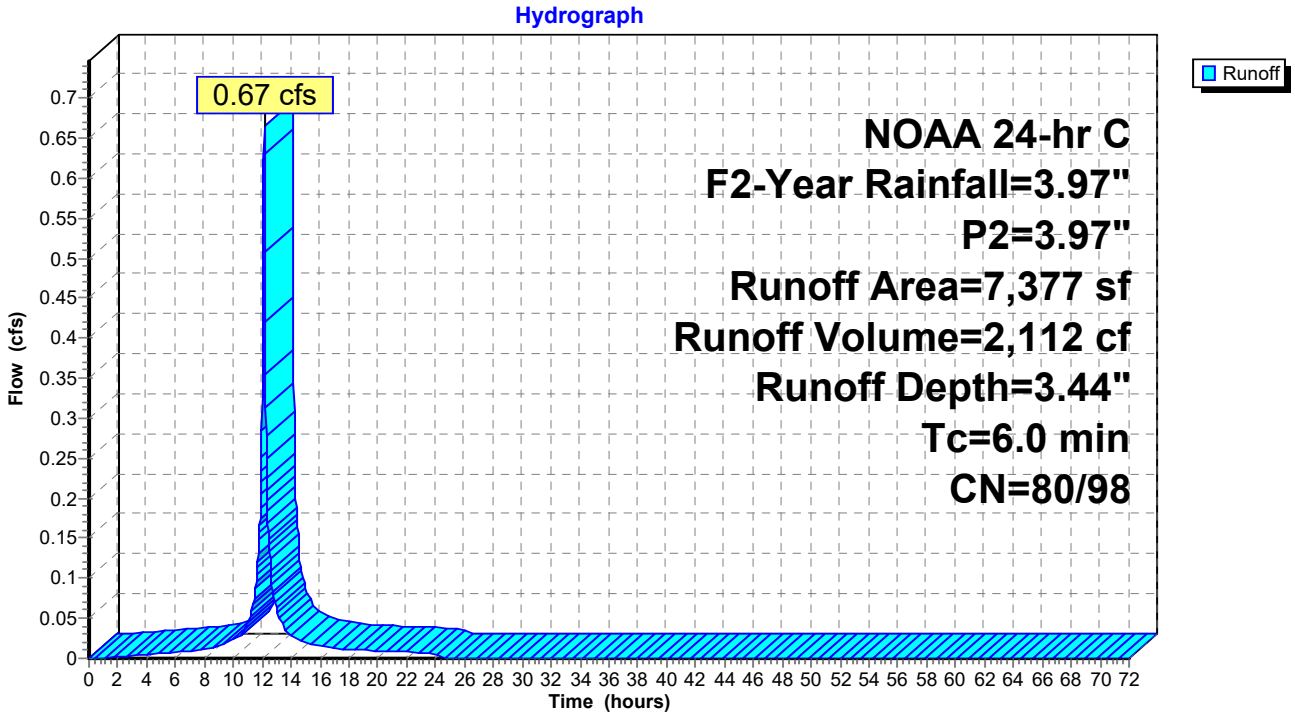
Runoff = 0.67 cfs @ 12.13 hrs, Volume= 2,112 cf, Depth= 3.44"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F2-Year Rainfall=3.97", P2=3.97"

	Area (sf)	CN	Description
*	3,384	98	Impervious Surfaces
*	2,709	98	MVS
	1,284	80	>75% Grass cover, Good, HSG D
	7,377	95	Weighted Average
	1,284	80	17.41% Pervious Area
	6,093	98	82.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1G: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1H: Post-Development Conditions Drainage Area

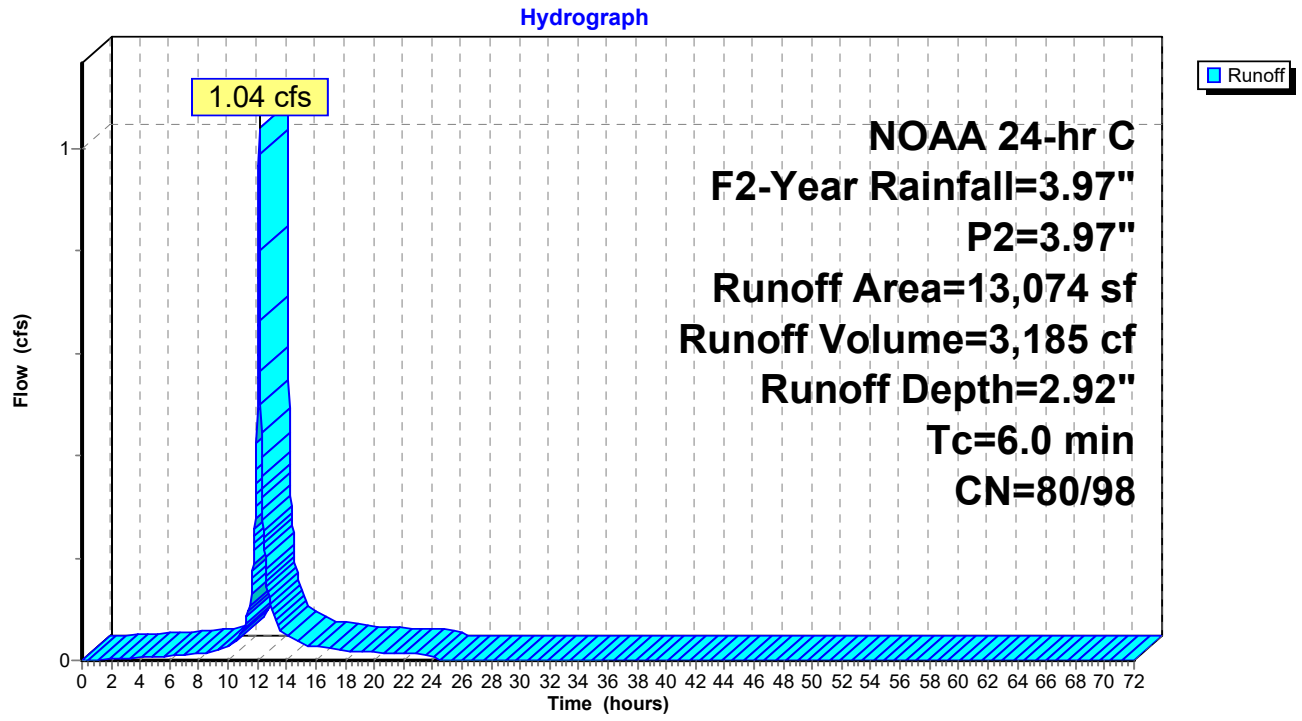
Runoff = 1.04 cfs @ 12.13 hrs, Volume= 3,185 cf, Depth= 2.92"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F2-Year Rainfall=3.97", P2=3.97"

	Area (sf)	CN	Description
*	3,345	98	Impervious Surfaces
*	3,549	98	MVS
	6,180	80	>75% Grass cover, Good, HSG D
	13,074	89	Weighted Average
	6,180	80	47.27% Pervious Area
	6,894	98	52.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1H: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1I: Post-Development Conditions Drainage Area

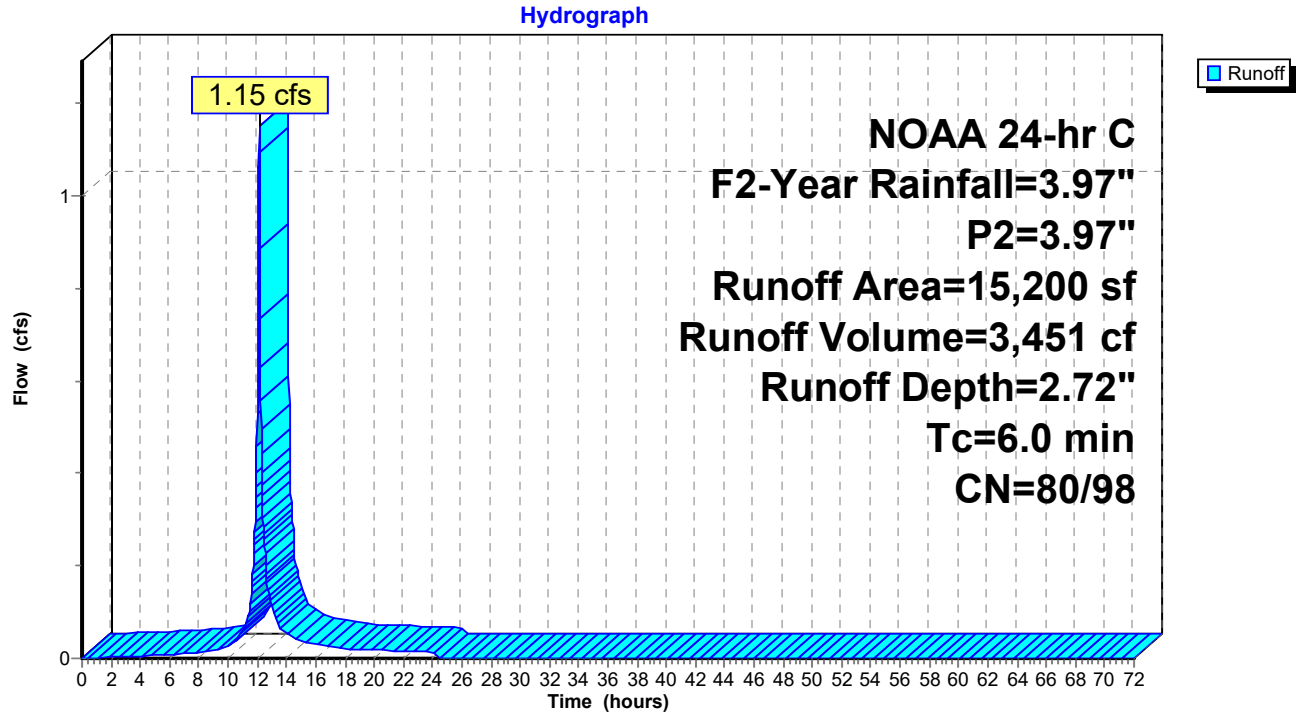
Runoff = 1.15 cfs @ 12.13 hrs, Volume= 3,451 cf, Depth= 2.72"
Routed to Link P-1 : Post Development Drianage

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F2-Year Rainfall=3.97", P2=3.97"

	Area (sf)	CN	Description
*	3,217	98	Impervious Surfaces
*	3,042	98	MVS
	8,941	80	>75% Grass cover, Good, HSG D
	15,200	87	Weighted Average
	8,941	80	58.82% Pervious Area
	6,259	98	41.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1I: Post-Development Conditions Drainage Area



Summary for Pond PV-1: Permeable Asphalt

[44] Hint: Outlet device #2 is below defined storage
[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 74,848 sf, 71.79% Impervious, Inflow Depth = 3.25" for F2-Year event
Inflow = 6.47 cfs @ 12.13 hrs, Volume= 20,275 cf
Outflow = 1.90 cfs @ 12.34 hrs, Volume= 20,275 cf, Atten= 71%, Lag= 12.9 min
Primary = 1.90 cfs @ 12.34 hrs, Volume= 20,275 cf
Routed to Link P-1 : Post Development Drianage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 128.05' @ 12.34 hrs Surf.Area= 3,360 sf Storage= 5,242 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 25.3 min (792.8 - 767.5)

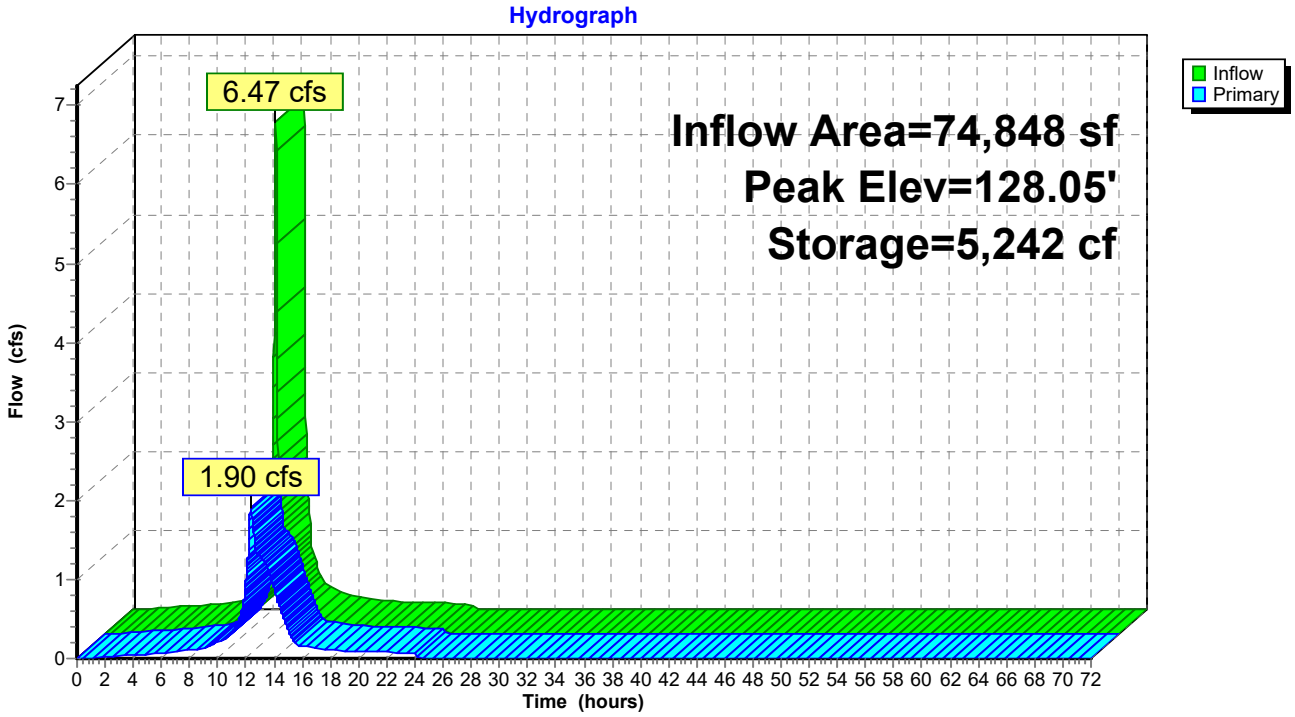
Volume	Invert	Avail.Storage	Storage Description
#1	125.19'	7,073 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) 26,846 cf Overall - 9,163 cf Embedded = 17,683 cf x 40.0% Voids
#2	127.18'	8,008 cf	**78.0"W x 48.0"H x 77.00'L Parabolic Arch** x 6 Inside #1 9,163 cf Overall - 3.0" Wall Thickness = 8,008 cf
		15,081 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
125.19	3,360	244.0	0	0	3,360
133.18	3,360	244.0	26,846	26,846	5,310

Device	Routing	Invert	Outlet Devices
#1	Primary	124.93'	**15.0" Round Culvert** L= 54.0' Ke= 0.500 Inlet / Outlet Invert= 124.93' / 124.39' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	124.93'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	124.93'	**6.0" W x 4.0" H Vert. Control Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 1	127.85'	**22.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	132.17'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.90 cfs @ 12.34 hrs HW=128.05' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.90 cfs of 9.20 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  ├─**3=Control Orifice** (Orifice Controls 1.38 cfs @ 8.27 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 0.52 cfs @ 1.43 fps)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PV-1: Permeable Asphalt



Summary for Pond PV-2: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow	=	0.00 cfs @	0.00 hrs, Volume=	0 cf
Outflow	=	0.00 cfs @	0.00 hrs, Volume=	0 cf, Atten= 0%, Lag= 0.0 min
Primary	=	0.00 cfs @	0.00 hrs, Volume=	0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 136.05' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

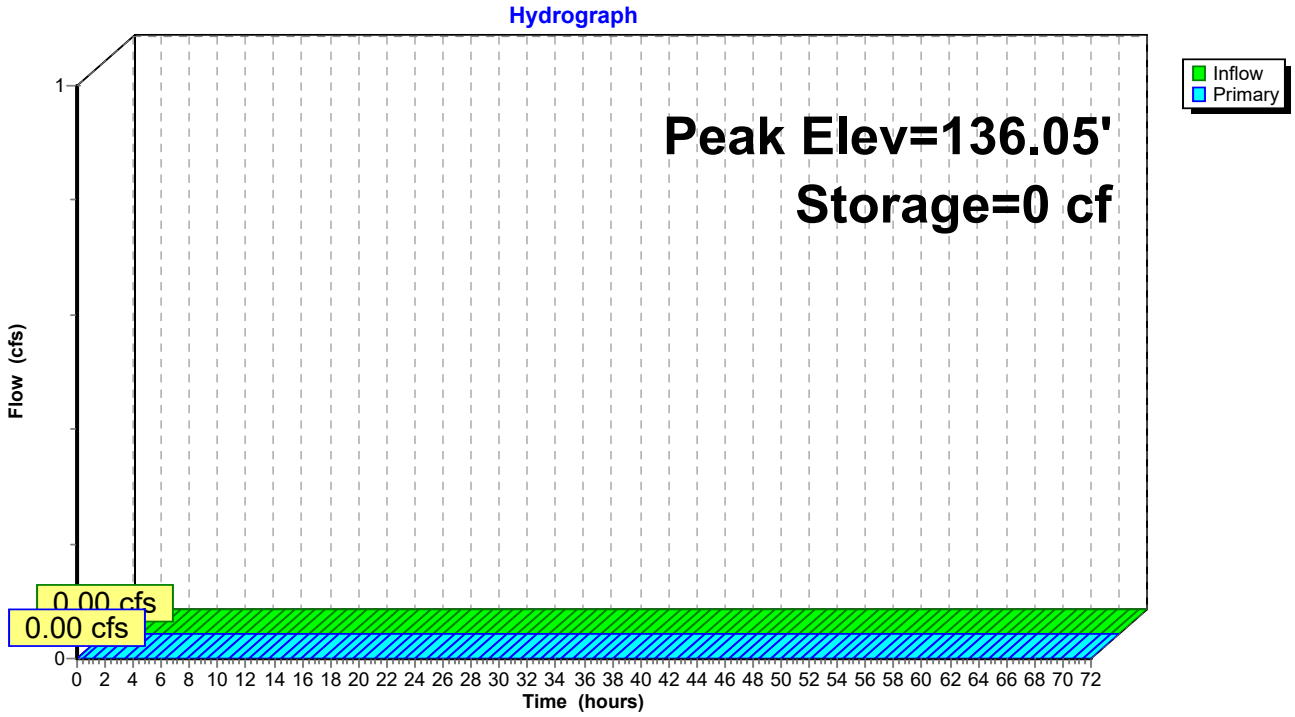
Volume	Invert	Avail.Storage	Storage Description
#1	135.80'	958 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
135.80	2,520	204.0	0.0	0	0	2,520
136.05	2,520	204.0	0.0	0	0	2,571
136.06	2,520	204.0	40.0	10	10	2,573
137.00	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	131.68'	**18.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	135.80'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	137.00'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=135.80' (Free Discharge)
└**1=Culvert Out** (Passes 0.00 cfs of 15.62 cfs potential flow)
  └**2=Underdrain** (Controls 0.00 cfs)
  └**3=WQDS** (Controls 0.00 cfs)

Pond PV-2: Permeable Asphalt



Summary for Pond PV-3: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-2 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 139.05' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

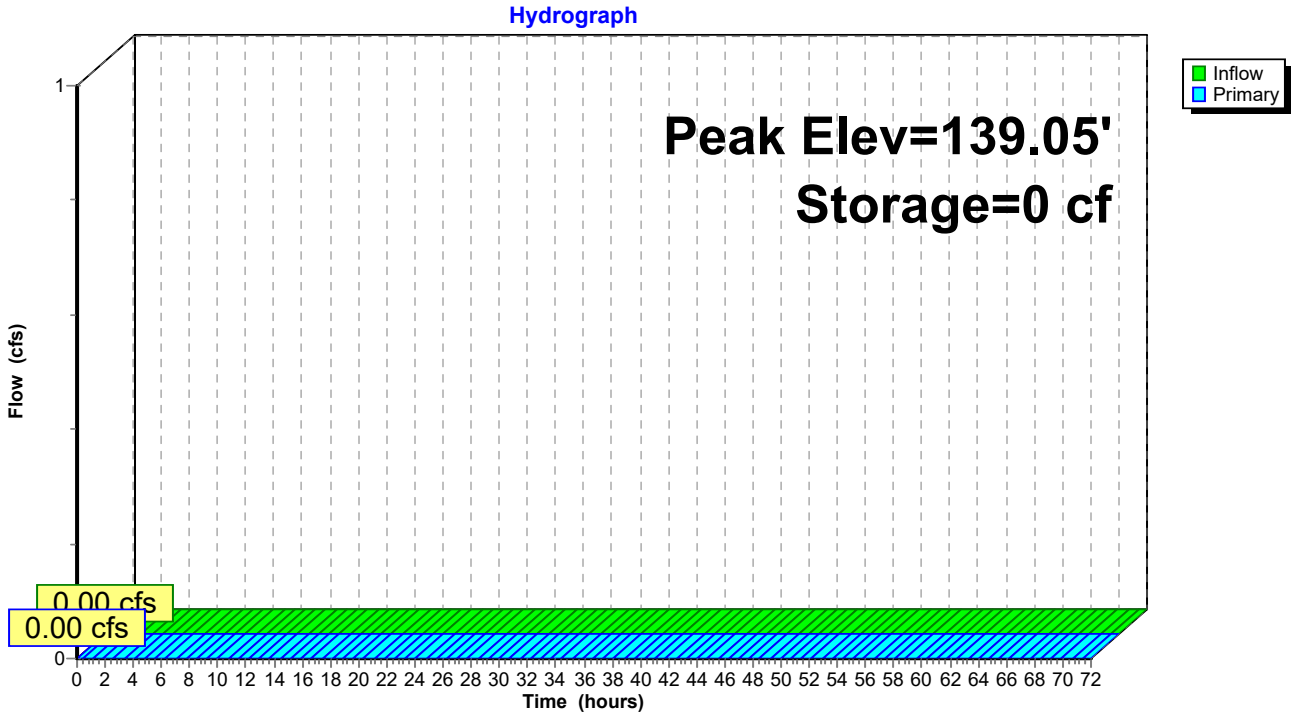
Volume	Invert	Avail.Storage	Storage Description
#1	138.80'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
138.80	2,520	204.0	0.0	0	0	2,520
139.05	2,520	204.0	0.0	0	0	2,571
139.06	2,520	204.0	40.0	10	10	2,573
140.00	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	135.60'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	138.80'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	140.00'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.80' TW=135.80' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.48 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-3: Permeable Asphalt



Summary for Pond PV-4: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-3 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 141.85' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

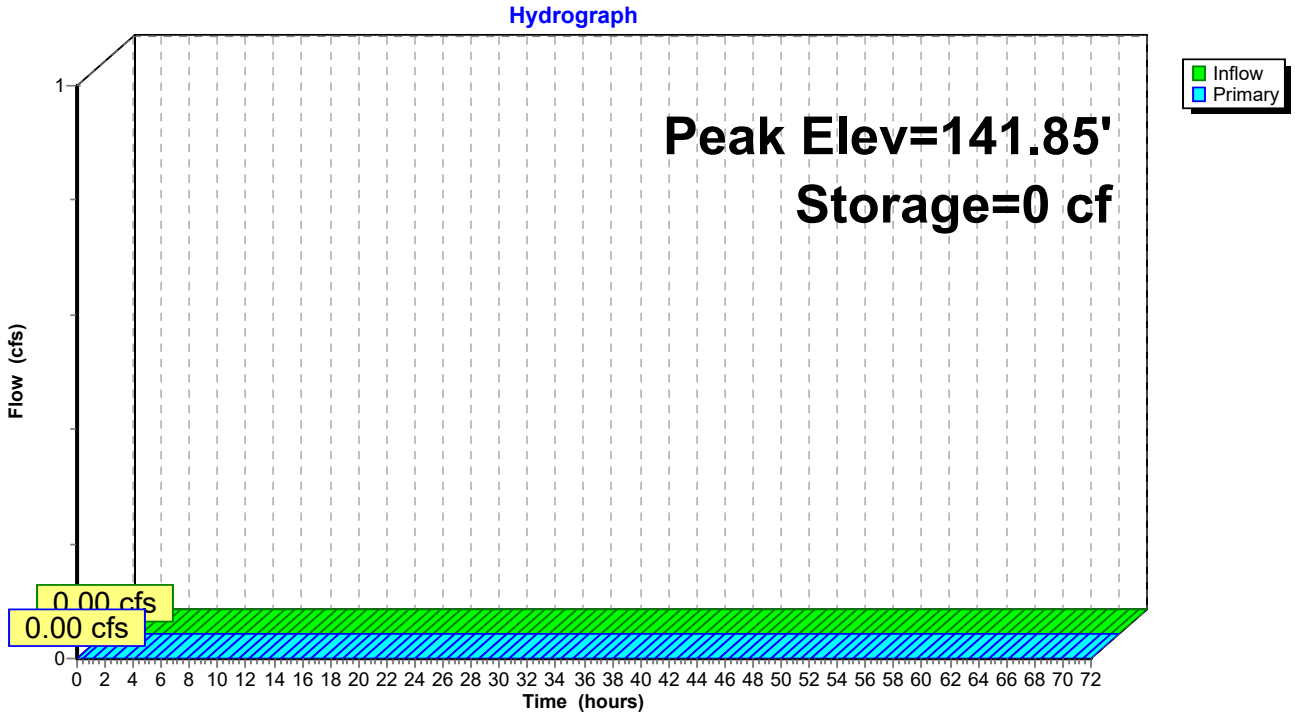
Volume	Invert	Avail.Storage	Storage Description
#1	141.60'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
141.60	2,520	204.0	0.0	0	0	2,520
141.85	2,520	204.0	0.0	0	0	2,571
141.86	2,520	204.0	40.0	10	10	2,573
142.80	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	138.60'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	141.60'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	142.80'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=141.60' TW=138.80' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.11 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-4: Permeable Asphalt



Summary for Pond PV-5: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-4 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 143.55' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

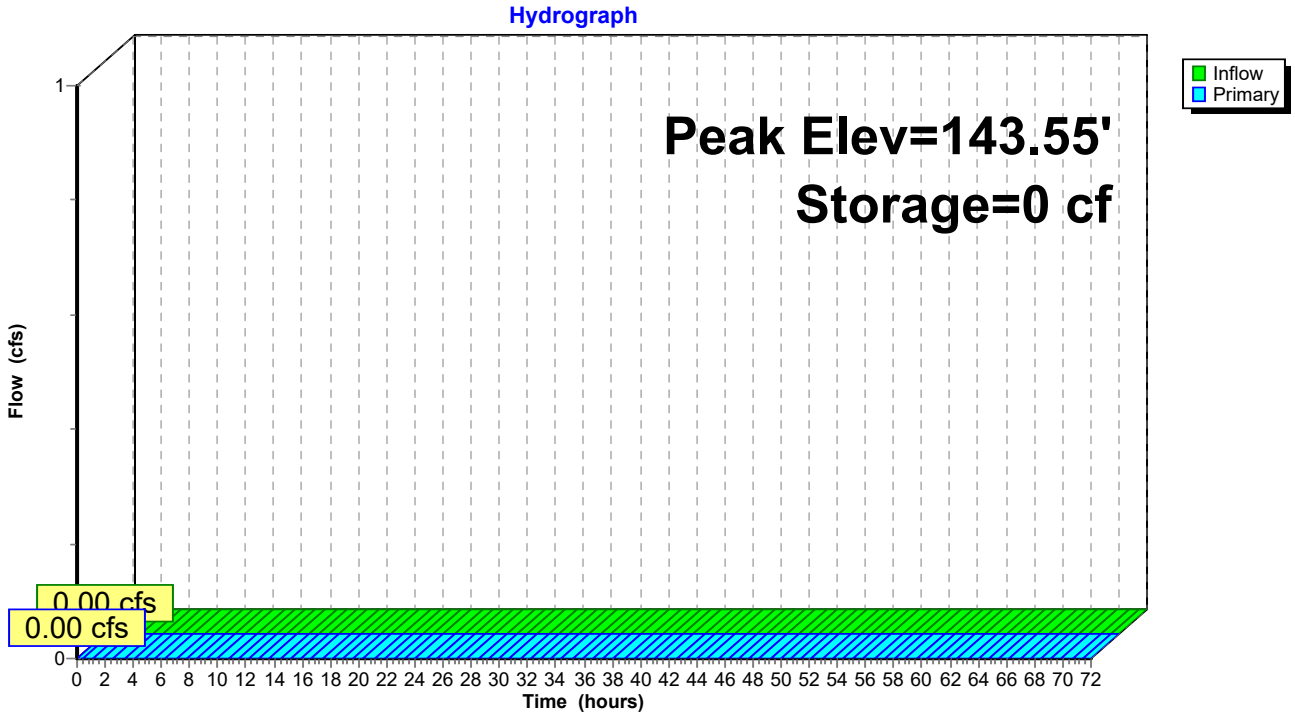
Volume	Invert	Avail.Storage	Storage Description
#1	143.30'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
143.30	2,520	204.0	0.0	0	0	2,520
143.55	2,520	204.0	0.0	0	0	2,571
143.56	2,520	204.0	40.0	10	10	2,573
144.50	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	141.39'	**12.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	143.30'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	144.50'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=143.30' TW=141.60' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 4.49 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-5: Permeable Asphalt



Summary for Pond PV-6: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-5 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 146.22' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

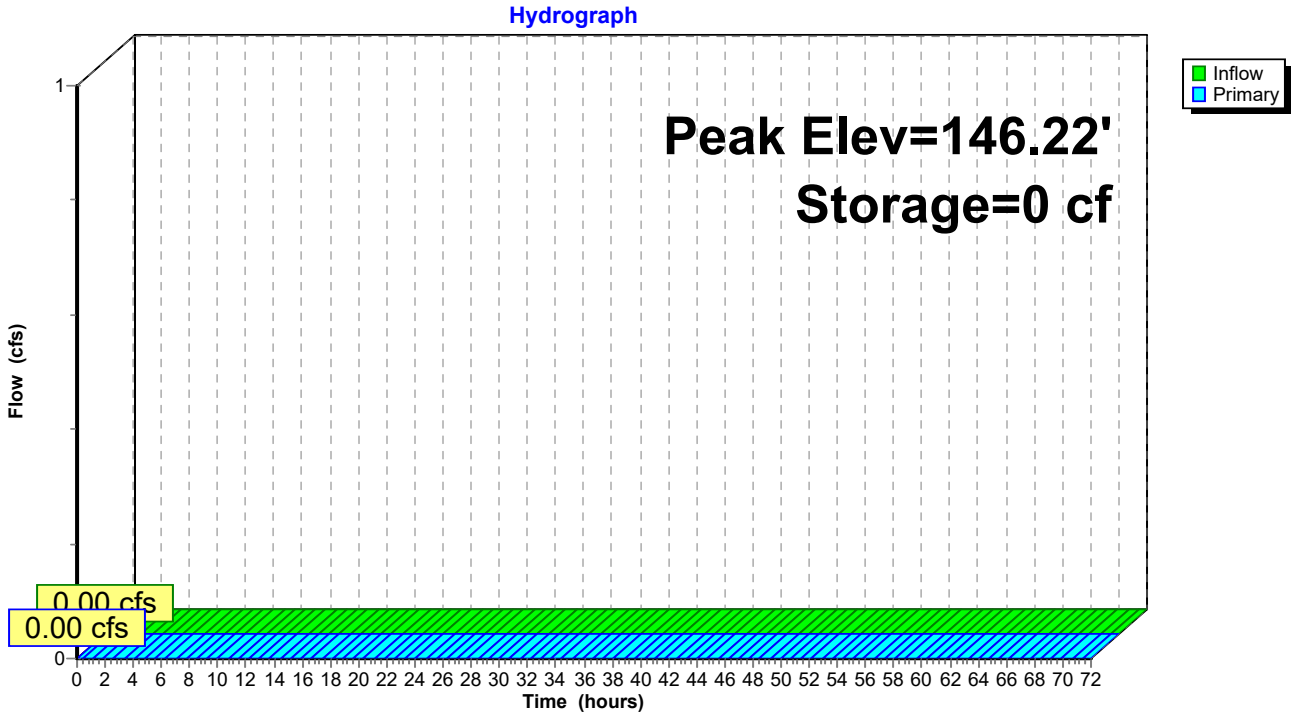
Volume	Invert	Avail.Storage	Storage Description
#1	145.97'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
145.97	2,520	204.0	0.0	0	0	2,520
146.22	2,520	204.0	0.0	0	0	2,571
146.23	2,520	204.0	40.0	10	10	2,573
147.17	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	144.09'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	145.97'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	147.17'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=145.97' TW=143.30' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 6.62 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-6: Permeable Asphalt



Summary for Pond PV-7: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-6 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 149.11' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

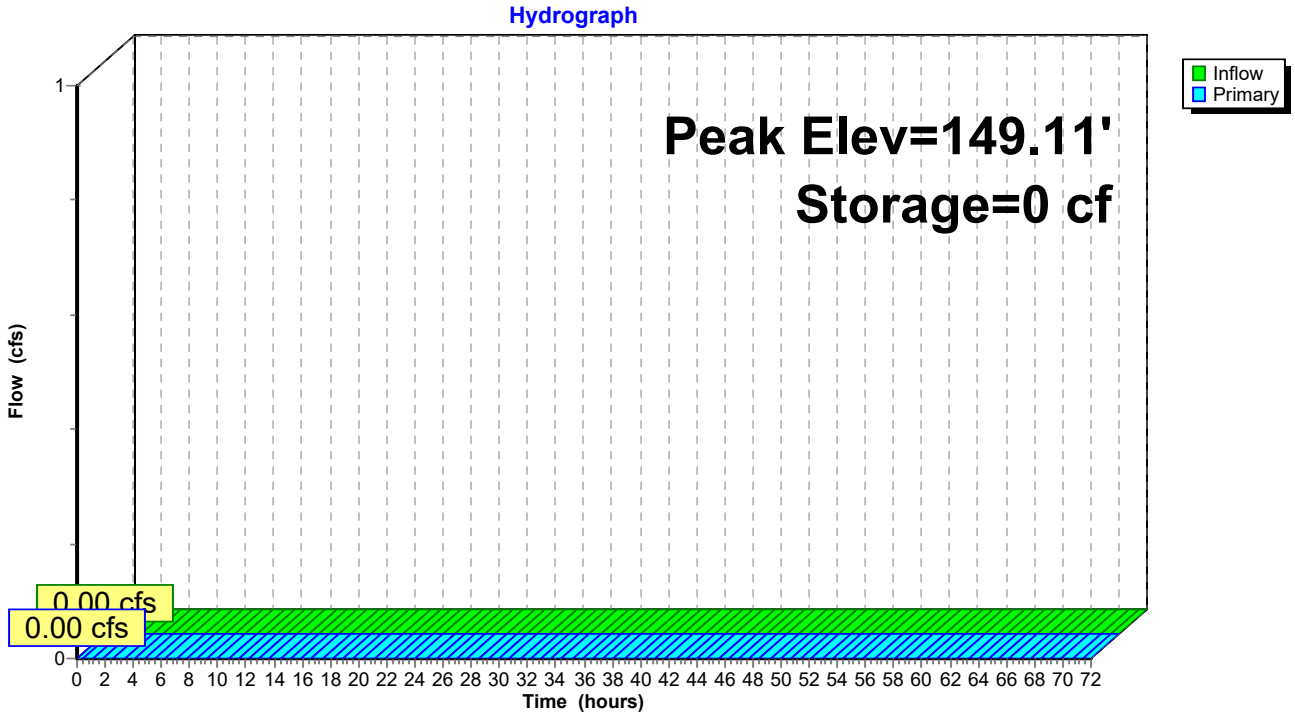
Volume	Invert	Avail.Storage	Storage Description
#1	148.86'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.86	2,520	204.0	0.0	0	0	2,520
149.11	2,520	204.0	0.0	0	0	2,571
149.12	2,520	204.0	40.0	10	10	2,573
150.06	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	145.76'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	148.86'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	150.06'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=148.86' TW=145.97' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.30 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-7: Permeable Asphalt



Summary for Pond PV-8: Permeable Asphalt

[43] Hint: Has no inflow (Outflow=Zero)

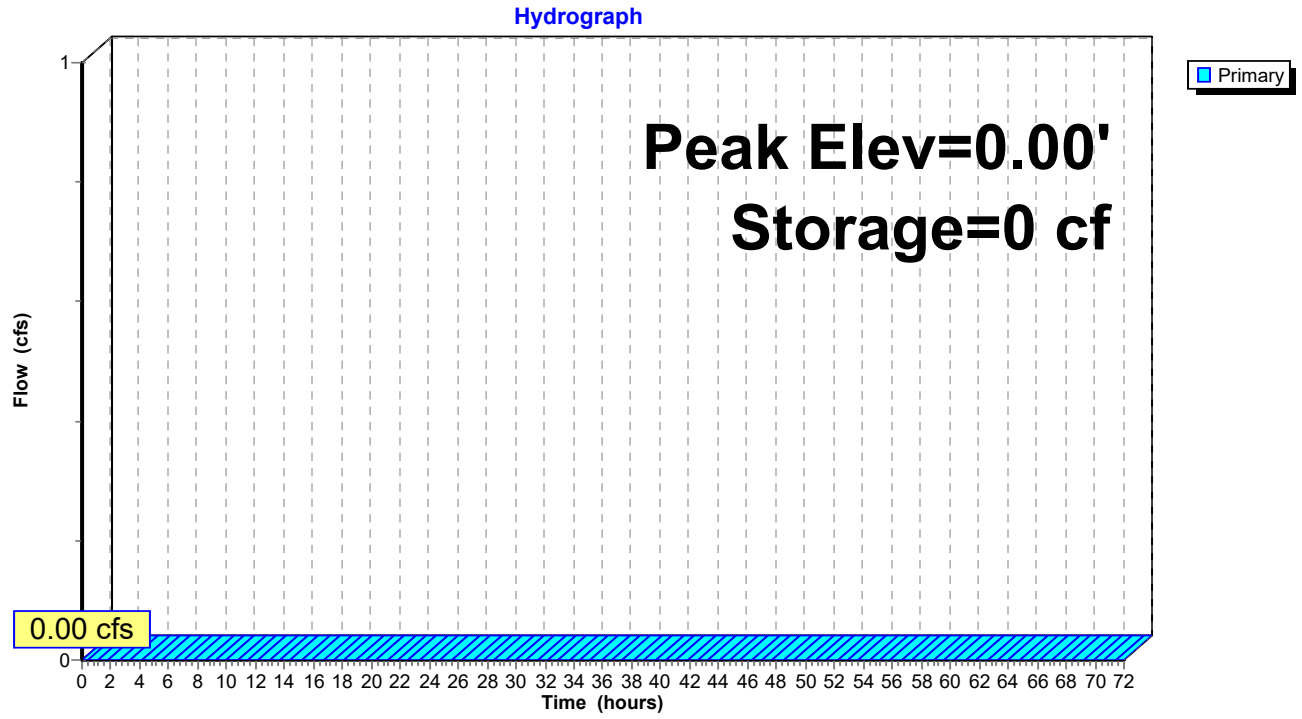
Volume	Invert	Avail.Storage	Storage Description
#1	151.60'	958 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
151.60	2,520	204.0	0.0	0	0	2,520
151.85	2,520	204.0	0.0	0	0	2,571
151.86	2,520	204.0	40.0	10	10	2,573
152.80	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	148.90'	**12.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	151.60'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	152.80'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' TW=148.86' (Dynamic Tailwater)
└─**1=Culvert Out** (Controls 0.00 cfs)
└─**2=Underdrain** (Controls 0.00 cfs)
└─**3=WQDS** (Controls 0.00 cfs)

Pond PV-8: Permeable Asphalt

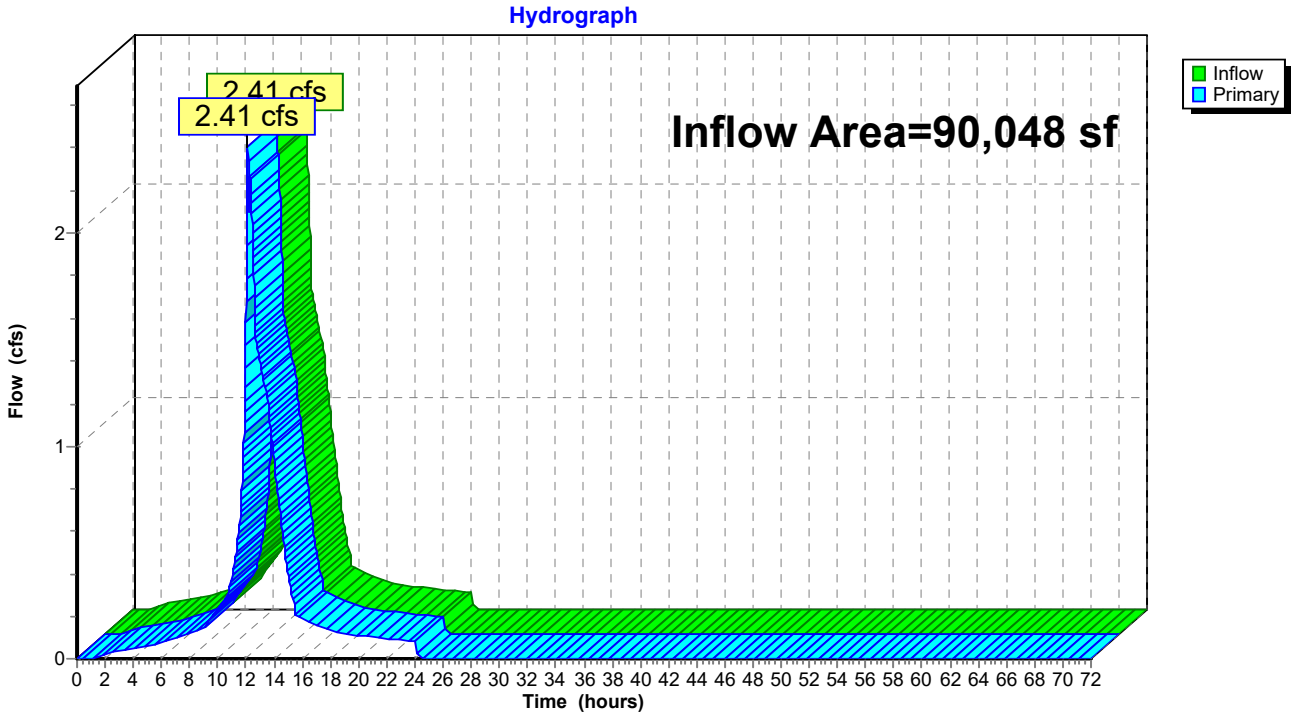


Summary for Link P-1: Post Development Drianage

Inflow Area = 90,048 sf, 66.63% Impervious, Inflow Depth = 3.16" for F2-Year event
Inflow = 2.41 cfs @ 12.14 hrs, Volume= 23,726 cf
Primary = 2.41 cfs @ 12.14 hrs, Volume= 23,726 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link P-1: Post Development Drianage



Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: Pre-Development Runoff Area=90,048 sf 14.68% Impervious Runoff Depth=4.26"
Flow Length=669' Tc=7.0 min CN=80/98 Runoff=10.69 cfs 32,004 cf

Subcatchment P-1A: Post-Development Runoff Area=10,079 sf 61.82% Impervious Runoff Depth=5.21"
Flow Length=189' Tc=6.0 min CN=80/98 Runoff=1.40 cfs 4,374 cf

Subcatchment P-1B: Post-Development Runoff Area=10,079 sf 90.64% Impervious Runoff Depth=5.78"
Tc=6.0 min CN=80/98 Runoff=1.50 cfs 4,858 cf

Subcatchment P-1C: Post-Development Runoff Area=9,669 sf 68.03% Impervious Runoff Depth=5.33"
Tc=6.0 min CN=80/98 Runoff=1.36 cfs 4,296 cf

Subcatchment P-1D: Post-Development Runoff Area=8,530 sf 72.98% Impervious Runoff Depth=5.43"
Tc=6.0 min CN=80/98 Runoff=1.22 cfs 3,861 cf

Subcatchment P-1E: Post-Development Runoff Area=9,057 sf 72.13% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=80/98 Runoff=1.29 cfs 4,086 cf

Subcatchment P-1F: Post-Development Runoff Area=6,983 sf 86.60% Impervious Runoff Depth=5.70"
Tc=6.0 min CN=80/98 Runoff=1.03 cfs 3,319 cf

Subcatchment P-1G: Post-Development Runoff Area=7,377 sf 82.59% Impervious Runoff Depth=5.62"
Tc=6.0 min CN=80/98 Runoff=1.08 cfs 3,457 cf

Subcatchment P-1H: Post-Development Runoff Area=13,074 sf 52.73% Impervious Runoff Depth=5.03"
Tc=6.0 min CN=80/98 Runoff=1.77 cfs 5,476 cf

Subcatchment P-1I: Post-Development Runoff Area=15,200 sf 41.18% Impervious Runoff Depth=4.79"
Tc=6.0 min CN=80/98 Runoff=2.00 cfs 6,074 cf

Pond PV-1: Permeable Asphalt Peak Elev=128.94' Storage=7,663 cf Inflow=10.64 cfs 33,728 cf
Outflow=5.60 cfs 33,728 cf

Pond PV-2: Permeable Asphalt Peak Elev=136.05' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-3: Permeable Asphalt Peak Elev=139.05' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-4: Permeable Asphalt Peak Elev=141.85' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-5: Permeable Asphalt Peak Elev=143.55' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-6: Permeable Asphalt Peak Elev=146.22' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-7: Permeable Asphalt Peak Elev=149.11' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-8: Permeable Asphalt Peak Elev=0.00' Storage=0 cf
Primary=0.00 cfs 0 cf

Link P-1: Post Development Drianage Inflow=6.95 cfs 39,801 cf
Primary=6.95 cfs 39,801 cf

Total Runoff Area = 180,096 sf Runoff Volume = 71,805 cf Average Runoff Depth = 4.78"
59.35% Pervious = 106,883 sf 40.65% Impervious = 73,213 sf

Summary for Subcatchment E-1: Pre-Development Conditions Drainage Area

Runoff = 10.69 cfs @ 12.14 hrs, Volume= 32,004 cf, Depth= 4.26"
Routed to nonexistent node 4L

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F10-Year Rainfall=6.21", P2=3.97"

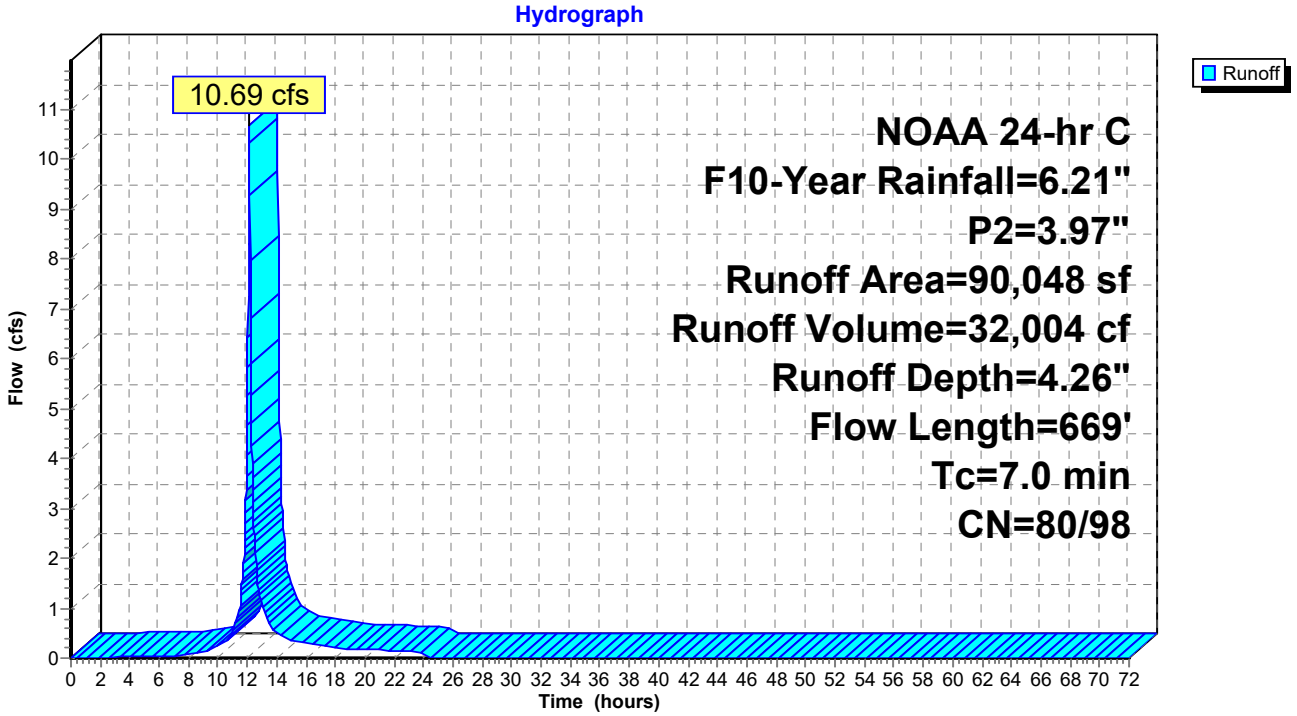
	Area (sf)	CN	Description
*	4,104	98	Impervious Surfaces
	76,831	80	>75% Grass cover, Good, HSG D
*	9,113	98	MVS
	90,048	83	Weighted Average
	76,831	80	85.32% Pervious Area
	13,217	98	14.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	10	0.0982	0.23		**Sheet Flow, 1-2** Grass: Short n= 0.150 P2= 3.97"
0.1	17	0.1150	2.37		**Shallow Concentrated Flow, 2-3** Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0800	1.98		**Shallow Concentrated Flow, 3-4** Short Grass Pasture Kv= 7.0 fps
0.1	18	0.1100	2.32		**Shallow Concentrated Flow, 4-5** Short Grass Pasture Kv= 7.0 fps
0.3	28	0.0700	1.85		**Shallow Concentrated Flow, 5-6** Short Grass Pasture Kv= 7.0 fps
0.1	15	0.0680	1.83		**Shallow Concentrated Flow, 6-7** Short Grass Pasture Kv= 7.0 fps
0.3	42	0.0960	2.17		**Shallow Concentrated Flow, 7-8** Short Grass Pasture Kv= 7.0 fps
0.5	34	0.0295	1.20		**Shallow Concentrated Flow, 8-9** Short Grass Pasture Kv= 7.0 fps
0.6	40	0.0250	1.11		**Shallow Concentrated Flow, 9-10** Short Grass Pasture Kv= 7.0 fps
0.3	43	0.1400	2.62		**Shallow Concentrated Flow, 10-11** Short Grass Pasture Kv= 7.0 fps
0.1	8	0.1300	2.52		**Shallow Concentrated Flow, 11-12** Short Grass Pasture Kv= 7.0 fps
0.4	46	0.0865	2.06		**Shallow Concentrated Flow, 12-13** Short Grass Pasture Kv= 7.0 fps
0.2	19	0.0515	1.59		**Shallow Concentrated Flow, 13-14** Short Grass Pasture Kv= 7.0 fps
0.1	8	0.0250	1.11		**Shallow Concentrated Flow, 14-15** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0250	3.21		**Shallow Concentrated Flow, 15-16** Paved Kv= 20.3 fps
0.2	15	0.0250	1.11		**Shallow Concentrated Flow, 16-17** Short Grass Pasture Kv= 7.0 fps
0.4	37	0.0540	1.63		**Shallow Concentrated Flow, 17-18** Short Grass Pasture Kv= 7.0 fps
0.2	14	0.0230	1.06		**Shallow Concentrated Flow, 18-19** Short Grass Pasture Kv= 7.0 fps
0.2	30	0.0230	3.08		**Shallow Concentrated Flow, 19-20** Paved Kv= 20.3 fps
0.1	23	0.0430	4.21		**Shallow Concentrated Flow, 20-21** Paved Kv= 20.3 fps
0.2	30	0.1340	2.56		**Shallow Concentrated Flow, 21-22** Short Grass Pasture Kv= 7.0 fps
0.3	38	0.0795	1.97		**Shallow Concentrated Flow, 22-23** Short Grass Pasture Kv= 7.0 fps
0.3	31	0.0645	1.78		**Shallow Concentrated Flow, 23-24** Short Grass Pasture Kv= 7.0 fps
0.5	47	0.0425	1.44		**Shallow Concentrated Flow, 24-25** Short Grass Pasture Kv= 7.0 fps
0.5	35	0.0290	1.19		**Shallow Concentrated Flow, 25-26** Short Grass Pasture Kv= 7.0 fps
0.1	13	0.0770	1.94		**Shallow Concentrated Flow, 26-27**

Short Grass Pasture Kv= 7.0 fps

7.0	669	Total

Subcatchment E-1: Pre-Development Conditions Drainage Area



Summary for Subcatchment P-1A: Post-Development Conditions Drainage Area

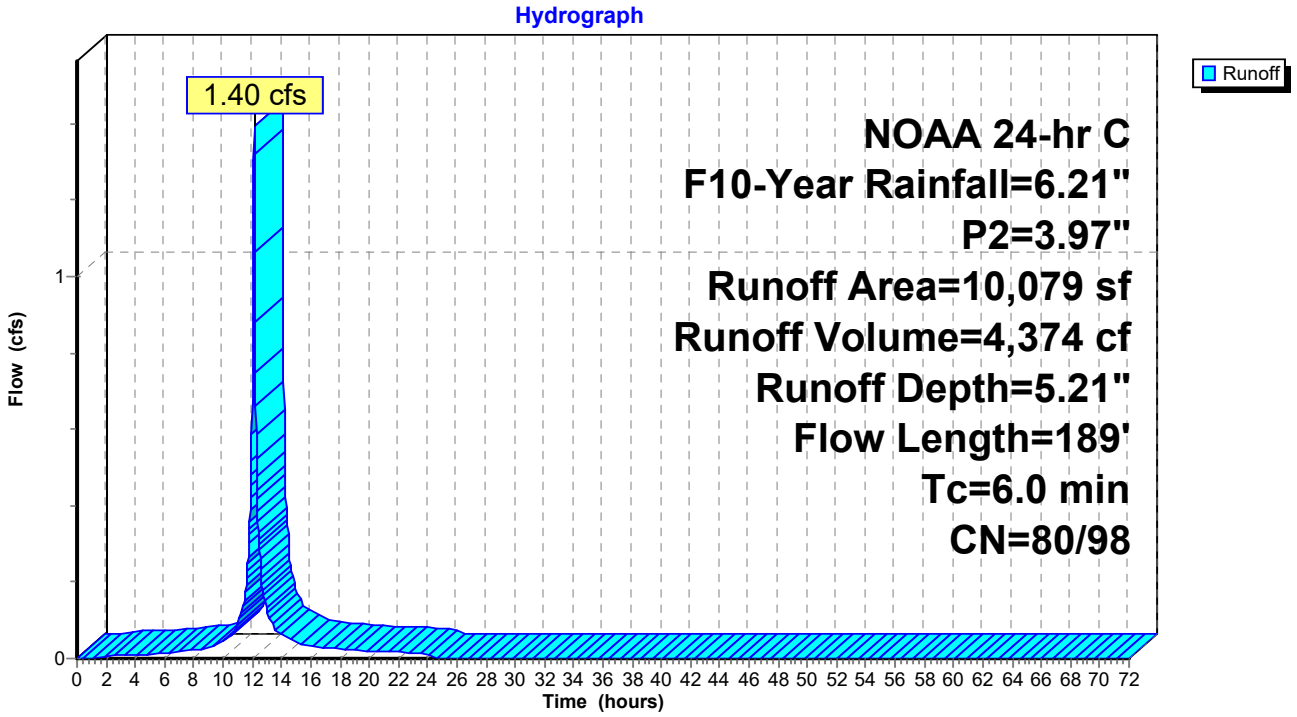
Runoff = 1.40 cfs @ 12.13 hrs, Volume= 4,374 cf, Depth= 5.21"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F10-Year Rainfall=6.21", P2=3.97"

	Area (sf)	CN	Description
*	933	98	Impervious Surfaces
*	5,298	98	MVS
	3,848	80	>75% Grass cover, Good, HSG D
	10,079	91	Weighted Average
	3,848	80	38.18% Pervious Area
	6,231	98	61.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	14	0.1050	0.25		**Sheet Flow, 1-2** Grass: Short n= 0.150 P2= 3.97"
0.2	89	0.1000	6.42		**Shallow Concentrated Flow, 2-3** Paved Kv= 20.3 fps
0.1	18	0.0275	3.37		**Shallow Concentrated Flow, 3-4** Paved Kv= 20.3 fps
0.3	68	0.0445	4.28		**Shallow Concentrated Flow, 4-5** Paved Kv= 20.3 fps
1.5	189	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1A: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1B: Post-Development Conditions Drainage Area

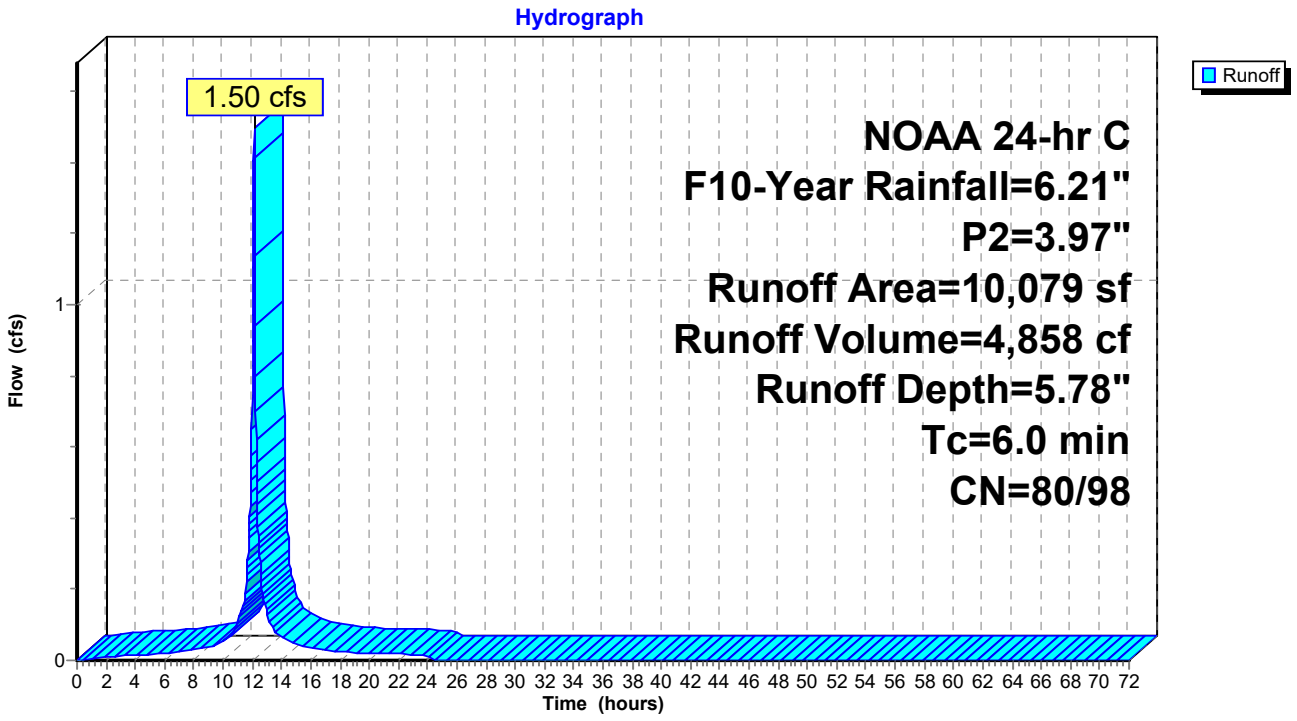
Runoff = 1.50 cfs @ 12.13 hrs, Volume= 4,858 cf, Depth= 5.78"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F10-Year Rainfall=6.21", P2=3.97"

	Area (sf)	CN	Description
*	6,427	98	Impervious Surfaces
*	2,709	98	MVS
	943	80	>75% Grass cover, Good, HSG D
	10,079	96	Weighted Average
	943	80	9.36% Pervious Area
	9,136	98	90.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1B: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1C: Post-Development Conditions Drainage Area

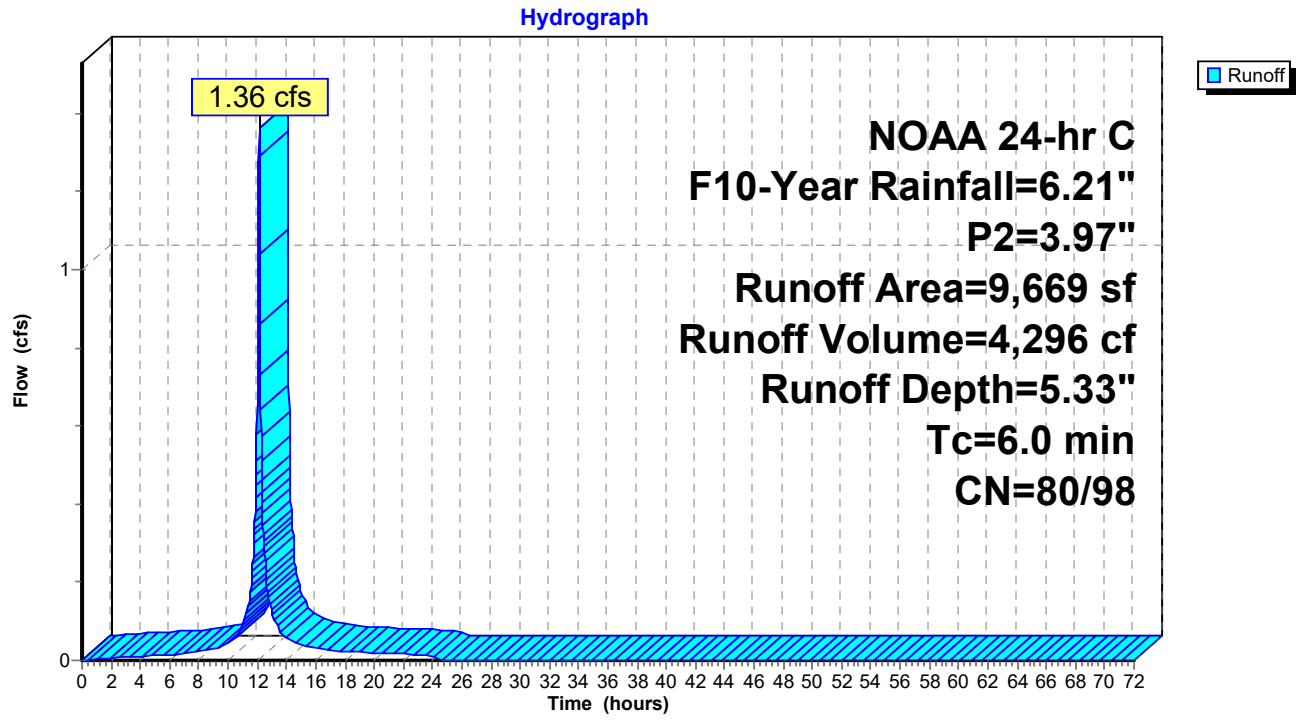
Runoff = 1.36 cfs @ 12.13 hrs, Volume= 4,296 cf, Depth= 5.33"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F10-Year Rainfall=6.21", P2=3.97"

	Area (sf)	CN	Description
*	3,869	98	Impervious Surfaces
*	2,709	98	MVS
	3,091	80	>75% Grass cover, Good, HSG D
	9,669	92	Weighted Average
	3,091	80	31.97% Pervious Area
	6,578	98	68.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1C: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1D: Post-Development Conditions Drainage Area

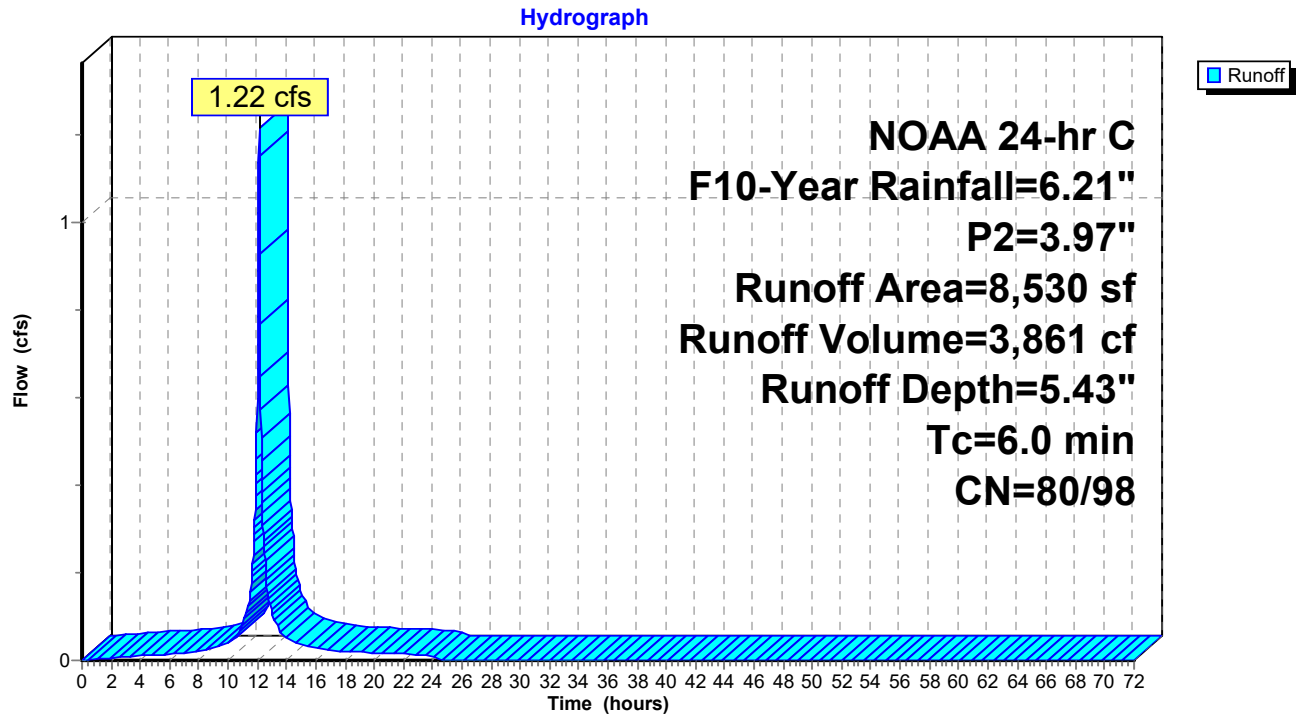
Runoff = 1.22 cfs @ 12.13 hrs, Volume= 3,861 cf, Depth= 5.43"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F10-Year Rainfall=6.21", P2=3.97"

	Area (sf)	CN	Description
*	3,516	98	Impervious Surfaces
*	2,709	98	MVS
	2,305	80	>75% Grass cover, Good, HSG D
	8,530	93	Weighted Average
	2,305	80	27.02% Pervious Area
	6,225	98	72.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1D: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1E: Post-Development Conditions Drainage Area

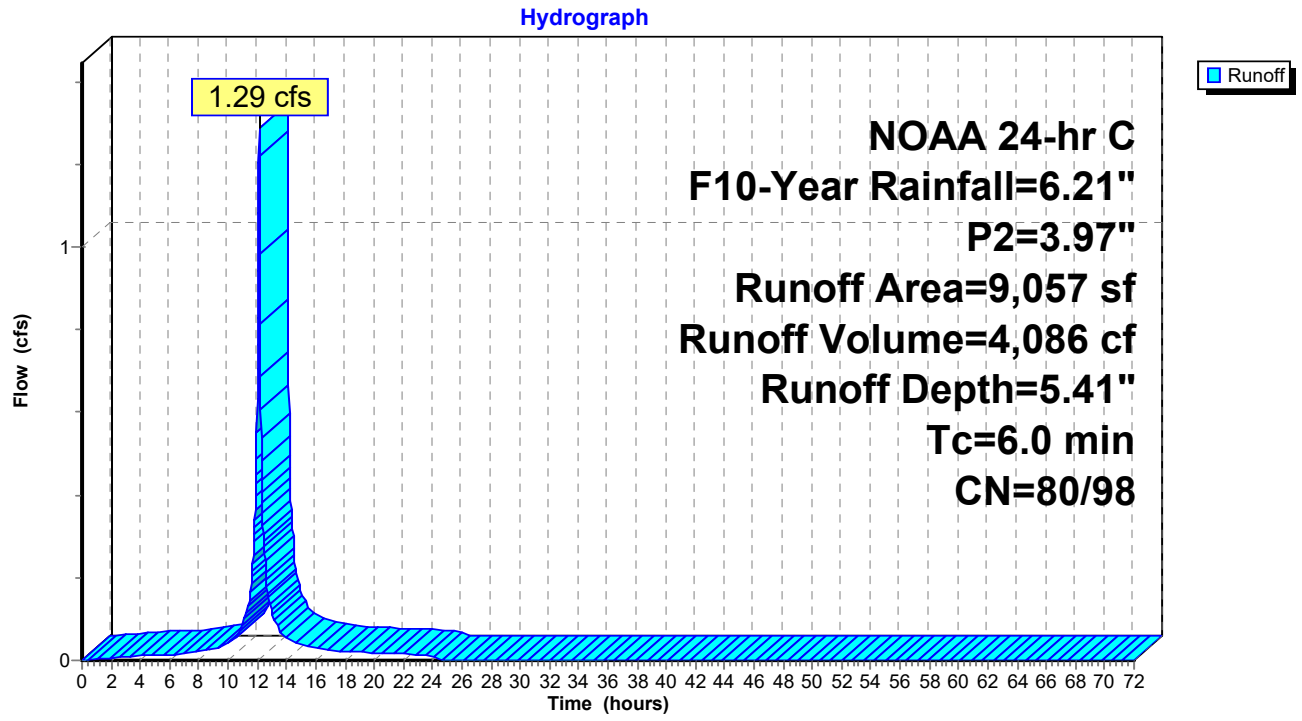
Runoff = 1.29 cfs @ 12.13 hrs, Volume= 4,086 cf, Depth= 5.41"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F10-Year Rainfall=6.21", P2=3.97"

	Area (sf)	CN	Description
*	3,824	98	Impervious Surfaces
*	2,709	98	MVS
	2,524	80	>75% Grass cover, Good, HSG D
	9,057	93	Weighted Average
	2,524	80	27.87% Pervious Area
	6,533	98	72.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1E: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1F: Post-Development Conditions Drainage Area

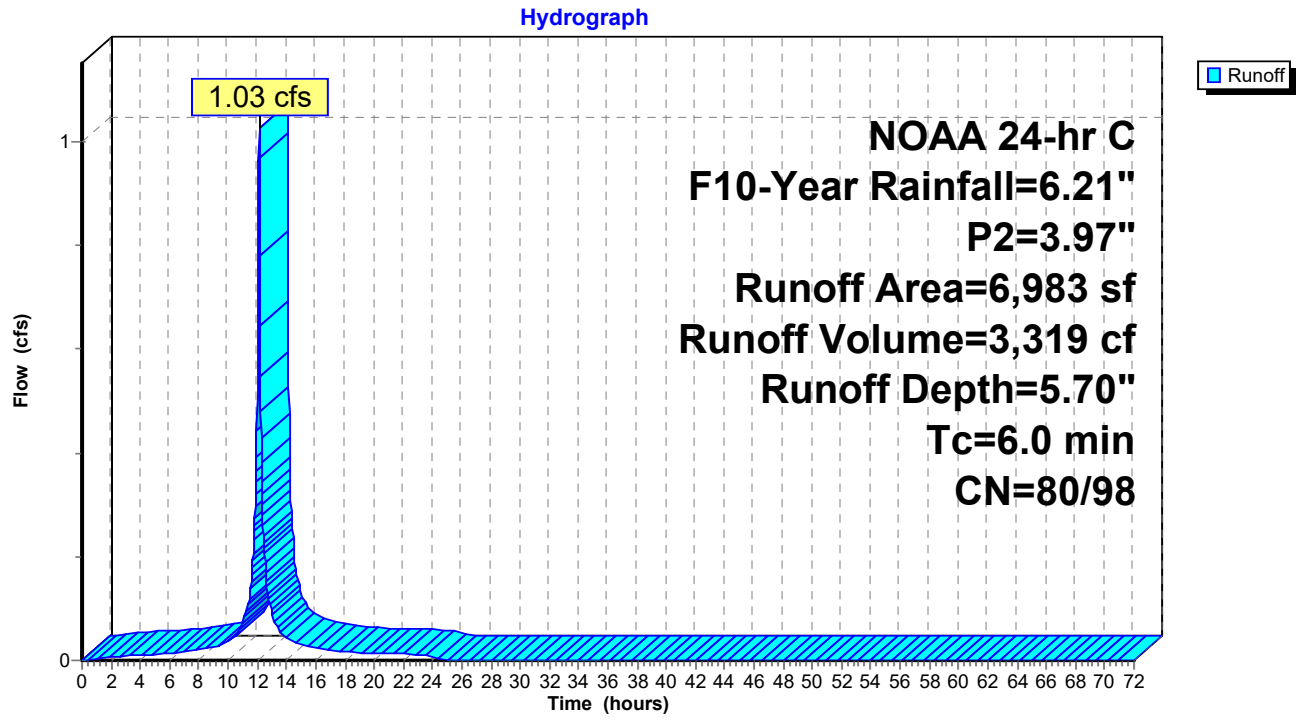
Runoff = 1.03 cfs @ 12.13 hrs, Volume= 3,319 cf, Depth= 5.70"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F10-Year Rainfall=6.21", P2=3.97"

	Area (sf)	CN	Description
*	3,338	98	Impervious Surfaces
*	2,709	98	MVS
	936	80	>75% Grass cover, Good, HSG D
	6,983	96	Weighted Average
	936	80	13.40% Pervious Area
	6,047	98	86.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1F: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1G: Post-Development Conditions Drainage Area

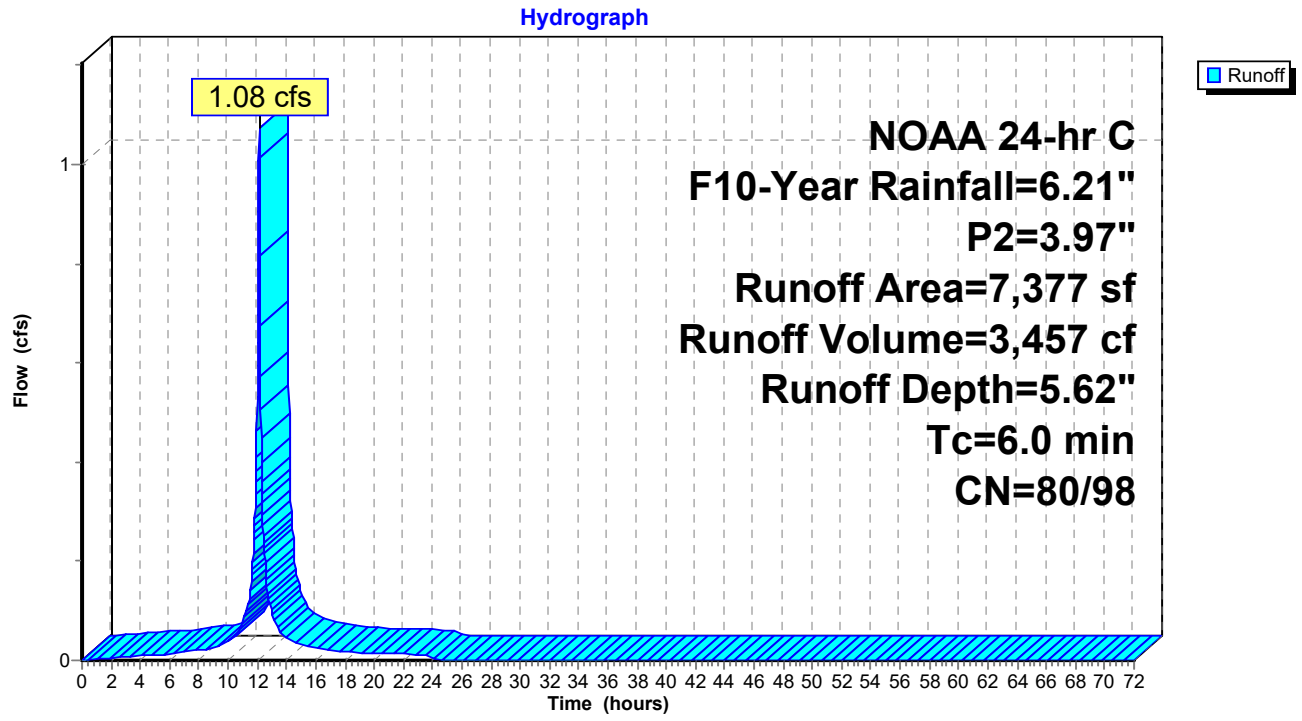
Runoff = 1.08 cfs @ 12.13 hrs, Volume= 3,457 cf, Depth= 5.62"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F10-Year Rainfall=6.21", P2=3.97"

	Area (sf)	CN	Description
*	3,384	98	Impervious Surfaces
*	2,709	98	MVS
	1,284	80	>75% Grass cover, Good, HSG D
	7,377	95	Weighted Average
	1,284	80	17.41% Pervious Area
	6,093	98	82.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1G: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1H: Post-Development Conditions Drainage Area

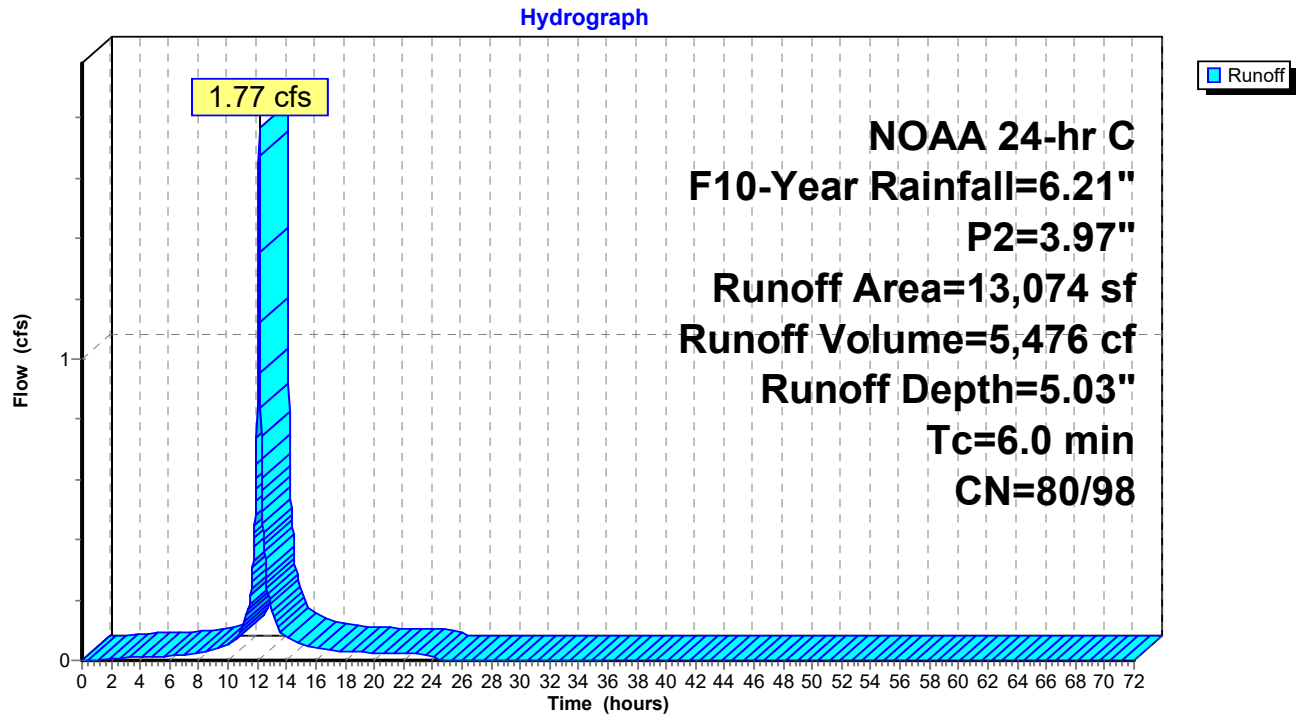
Runoff = 1.77 cfs @ 12.13 hrs, Volume= 5,476 cf, Depth= 5.03"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F10-Year Rainfall=6.21", P2=3.97"

	Area (sf)	CN	Description
*	3,345	98	Impervious Surfaces
*	3,549	98	MVS
	6,180	80	>75% Grass cover, Good, HSG D
	13,074	89	Weighted Average
	6,180	80	47.27% Pervious Area
	6,894	98	52.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1H: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1I: Post-Development Conditions Drainage Area

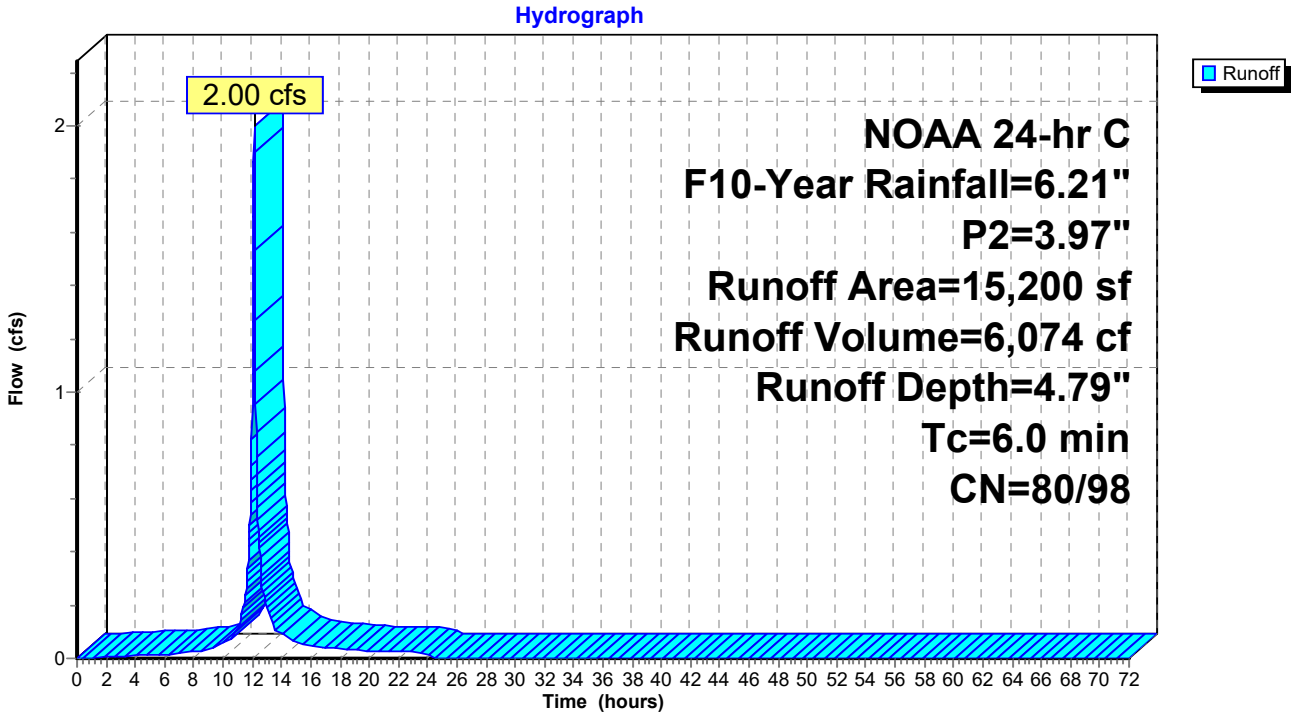
Runoff = 2.00 cfs @ 12.13 hrs, Volume= 6,074 cf, Depth= 4.79"
Routed to Link P-1 : Post Development Drianage

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F10-Year Rainfall=6.21", P2=3.97"

	Area (sf)	CN	Description
*	3,217	98	Impervious Surfaces
*	3,042	98	MVS
	8,941	80	>75% Grass cover, Good, HSG D
	15,200	87	Weighted Average
	8,941	80	58.82% Pervious Area
	6,259	98	41.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1I: Post-Development Conditions Drainage Area



Summary for Pond PV-1: Permeable Asphalt

[44] Hint: Outlet device #2 is below defined storage
[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 74,848 sf, 71.79% Impervious, Inflow Depth = 5.41" for F10-Year event
Inflow = 10.64 cfs @ 12.13 hrs, Volume= 33,728 cf
Outflow = 5.60 cfs @ 12.22 hrs, Volume= 33,728 cf, Atten= 47%, Lag= 5.8 min
Primary = 5.60 cfs @ 12.22 hrs, Volume= 33,728 cf
Routed to Link P-1 : Post Development Drianage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 128.94' @ 12.22 hrs Surf.Area= 3,360 sf Storage= 7,663 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 23.6 min (783.5 - 759.9)

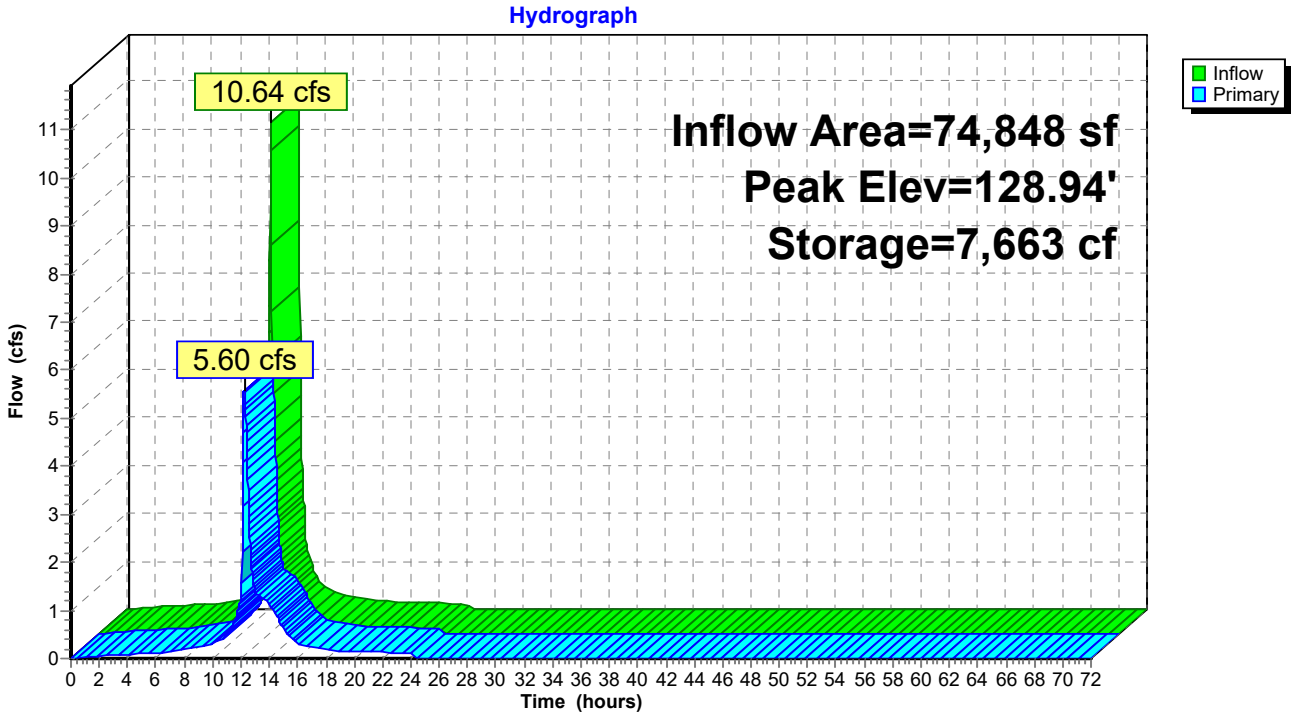
Volume	Invert	Avail.Storage	Storage Description
#1	125.19'	7,073 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 26,846 cf Overall - 9,163 cf Embedded = 17,683 cf x 40.0% Voids
#2	127.18'	8,008 cf	**78.0"W x 48.0"H x 77.00'L Parabolic Arch** x 6 Inside #1 9,163 cf Overall - 3.0" Wall Thickness = 8,008 cf
		15,081 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
125.19	3,360	244.0	0	0	3,360
133.18	3,360	244.0	26,846	26,846	5,310

Device	Routing	Invert	Outlet Devices
#1	Primary	124.93'	**15.0" Round Culvert** L= 54.0' Ke= 0.500 Inlet / Outlet Invert= 124.93' / 124.39' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	124.93'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	124.93'	**6.0" W x 4.0" H Vert. Control Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 1	127.85'	**22.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	132.17'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.59 cfs @ 12.22 hrs HW=128.94' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 5.59 cfs of 10.76 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  ├─**3=Control Orifice** (Orifice Controls 1.57 cfs @ 9.43 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 4.02 cfs @ 4.38 fps)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PV-1: Permeable Asphalt



Summary for Pond PV-2: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow	=	0.00 cfs @	0.00 hrs, Volume=	0 cf
Outflow	=	0.00 cfs @	0.00 hrs, Volume=	0 cf, Atten= 0%, Lag= 0.0 min
Primary	=	0.00 cfs @	0.00 hrs, Volume=	0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 136.05' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

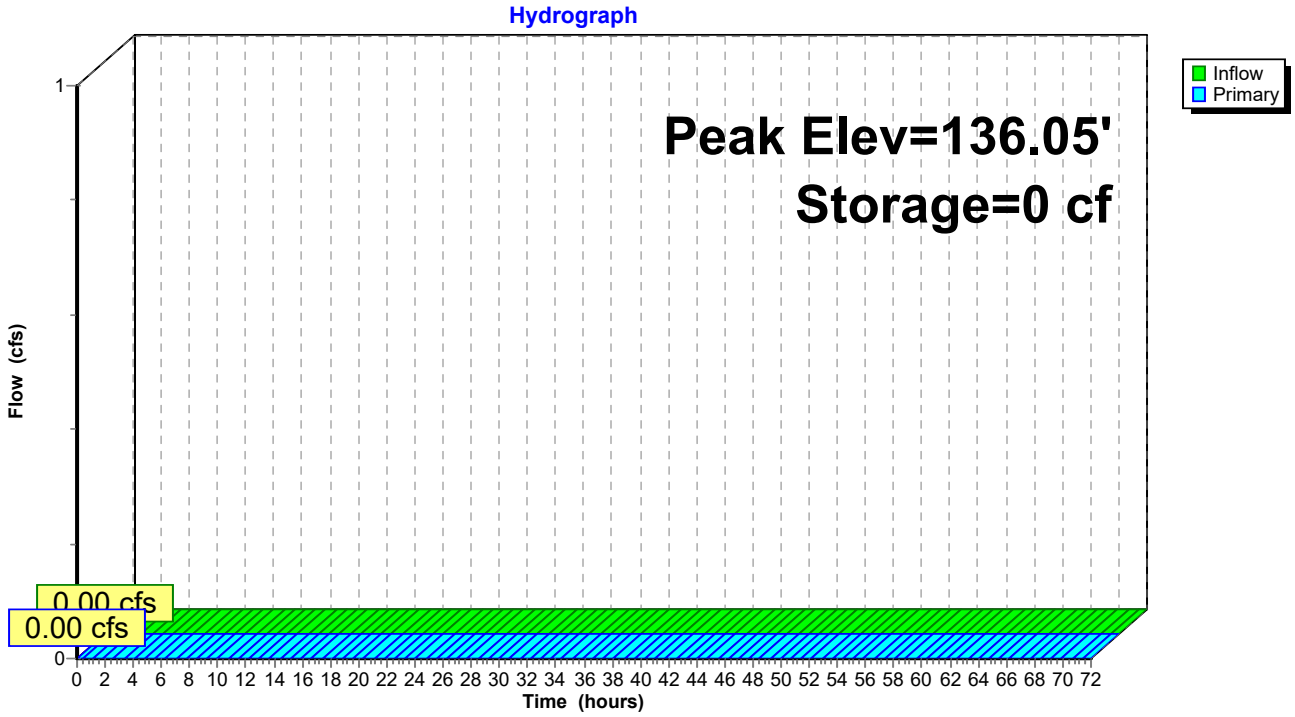
Volume	Invert	Avail.Storage	Storage Description
#1	135.80'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
135.80	2,520	204.0	0.0	0	0	2,520
136.05	2,520	204.0	0.0	0	0	2,571
136.06	2,520	204.0	40.0	10	10	2,573
137.00	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	131.68'	**18.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	135.80'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	137.00'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=135.80' (Free Discharge)
└**1=Culvert Out** (Passes 0.00 cfs of 15.62 cfs potential flow)
  └**2=Underdrain** (Controls 0.00 cfs)
  └**3=WQDS** (Controls 0.00 cfs)

Pond PV-2: Permeable Asphalt



Summary for Pond PV-3: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-2 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 139.05' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

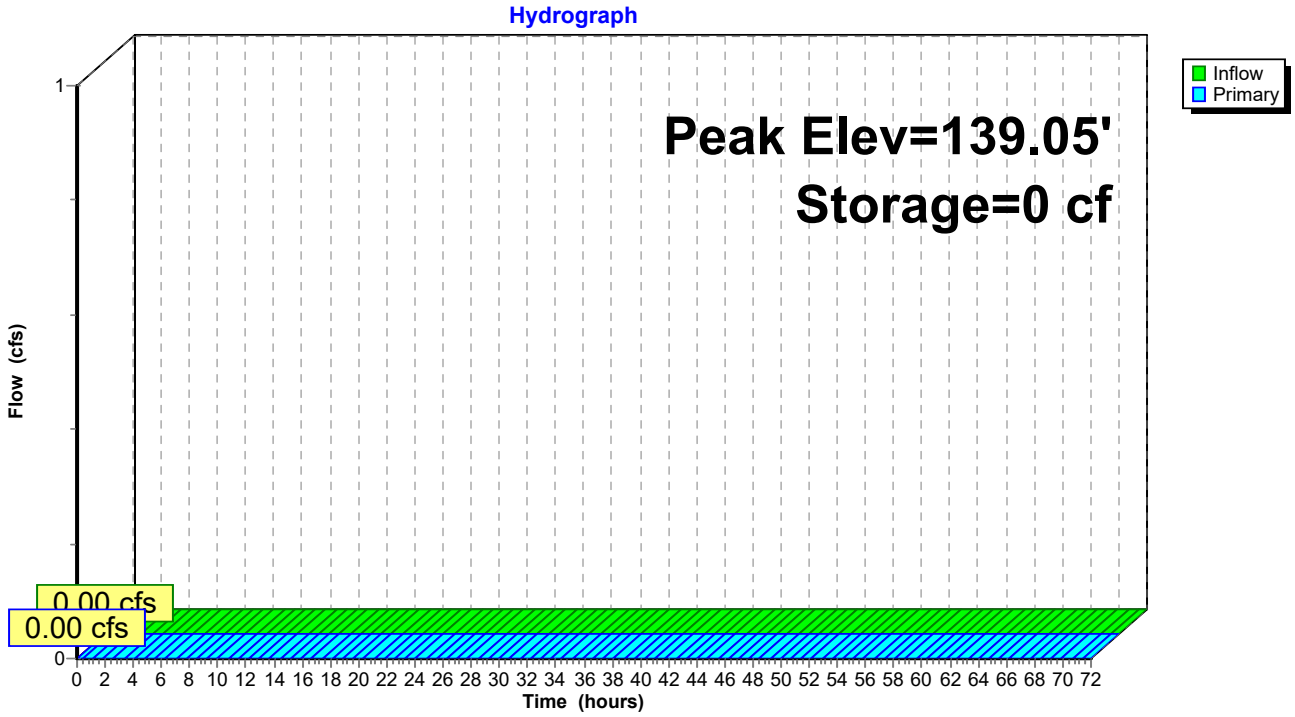
Volume	Invert	Avail.Storage	Storage Description
#1	138.80'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
138.80	2,520	204.0	0.0	0	0	2,520
139.05	2,520	204.0	0.0	0	0	2,571
139.06	2,520	204.0	40.0	10	10	2,573
140.00	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	135.60'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	138.80'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	140.00'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.80' TW=135.80' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.48 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-3: Permeable Asphalt



Summary for Pond PV-4: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-3 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 141.85' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

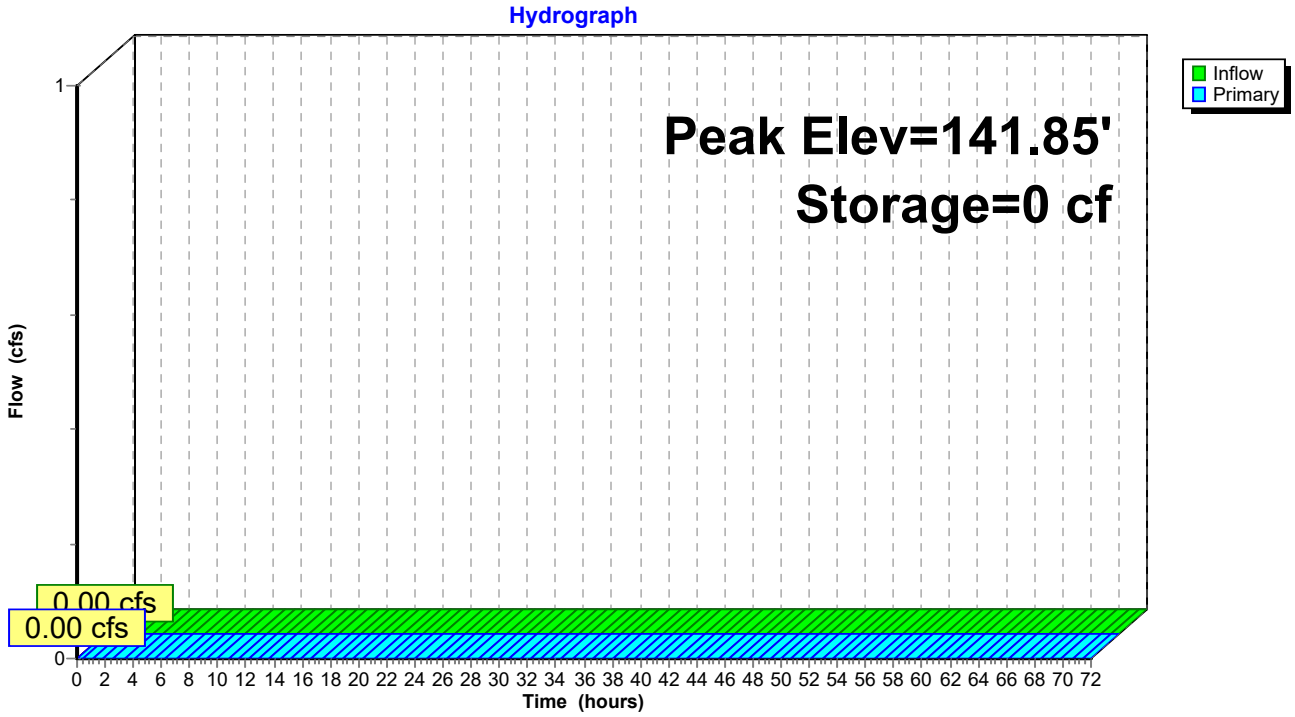
Volume	Invert	Avail.Storage	Storage Description
#1	141.60'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
141.60	2,520	204.0	0.0	0	0	2,520
141.85	2,520	204.0	0.0	0	0	2,571
141.86	2,520	204.0	40.0	10	10	2,573
142.80	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	138.60'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	141.60'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	142.80'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=141.60' TW=138.80' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.11 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-4: Permeable Asphalt



Summary for Pond PV-5: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-4 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 143.55' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

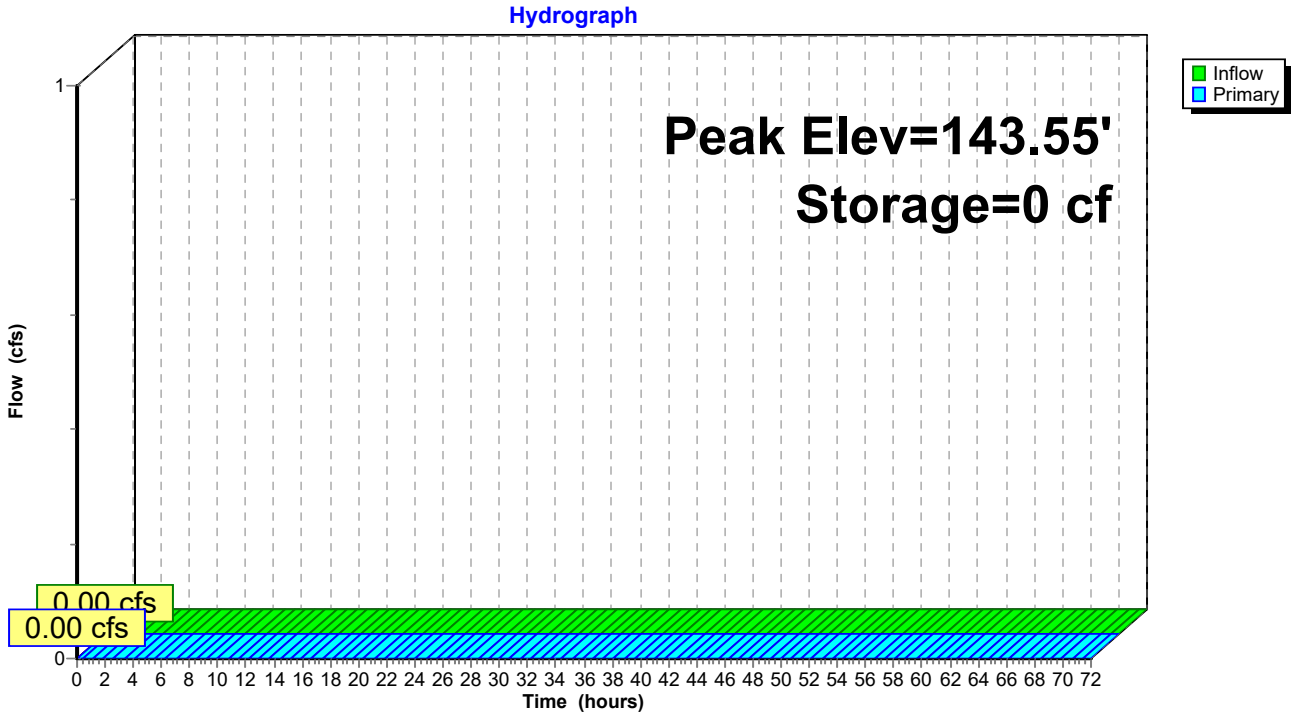
Volume	Invert	Avail.Storage	Storage Description
#1	143.30'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
143.30	2,520	204.0	0.0	0	0	2,520
143.55	2,520	204.0	0.0	0	0	2,571
143.56	2,520	204.0	40.0	10	10	2,573
144.50	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	141.39'	**12.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	143.30'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	144.50'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=143.30' TW=141.60' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 4.49 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-5: Permeable Asphalt



Summary for Pond PV-6: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-5 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 146.22' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

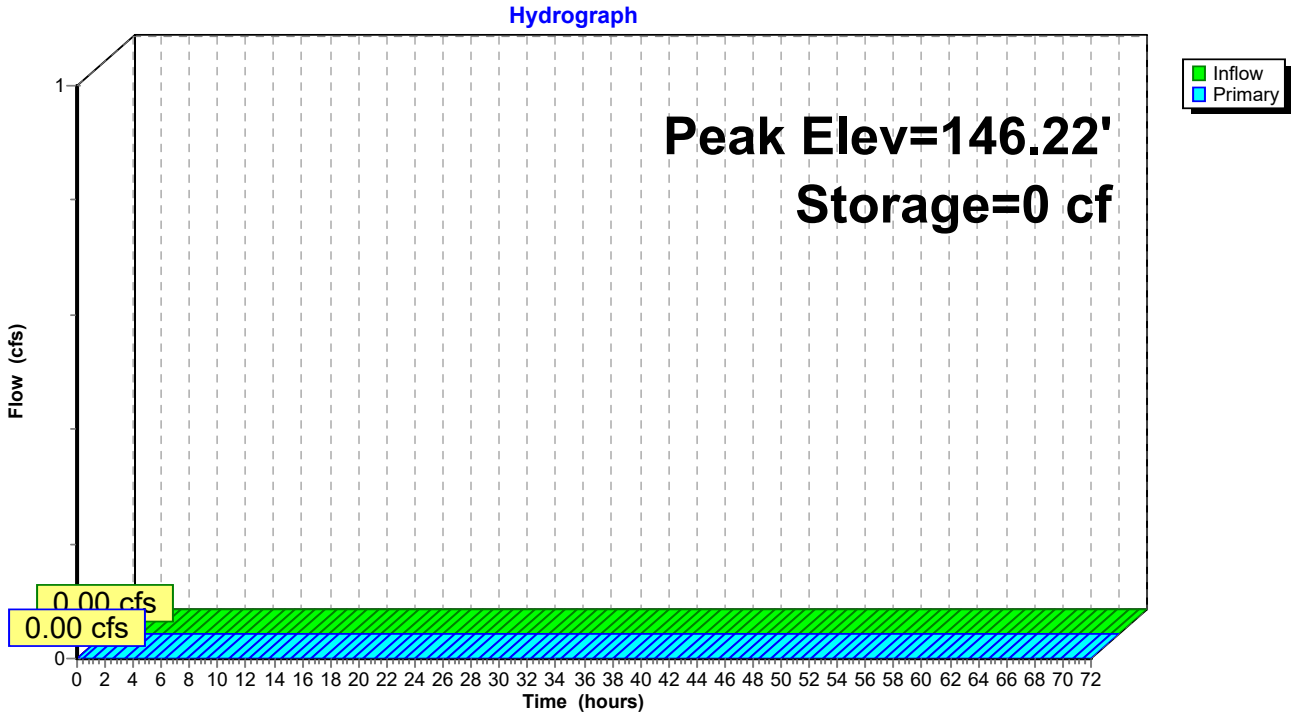
Volume	Invert	Avail.Storage	Storage Description
#1	145.97'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
145.97	2,520	204.0	0.0	0	0	2,520
146.22	2,520	204.0	0.0	0	0	2,571
146.23	2,520	204.0	40.0	10	10	2,573
147.17	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	144.09'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	145.97'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	147.17'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=145.97' TW=143.30' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 6.62 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-6: Permeable Asphalt



Summary for Pond PV-7: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-6 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 149.11' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

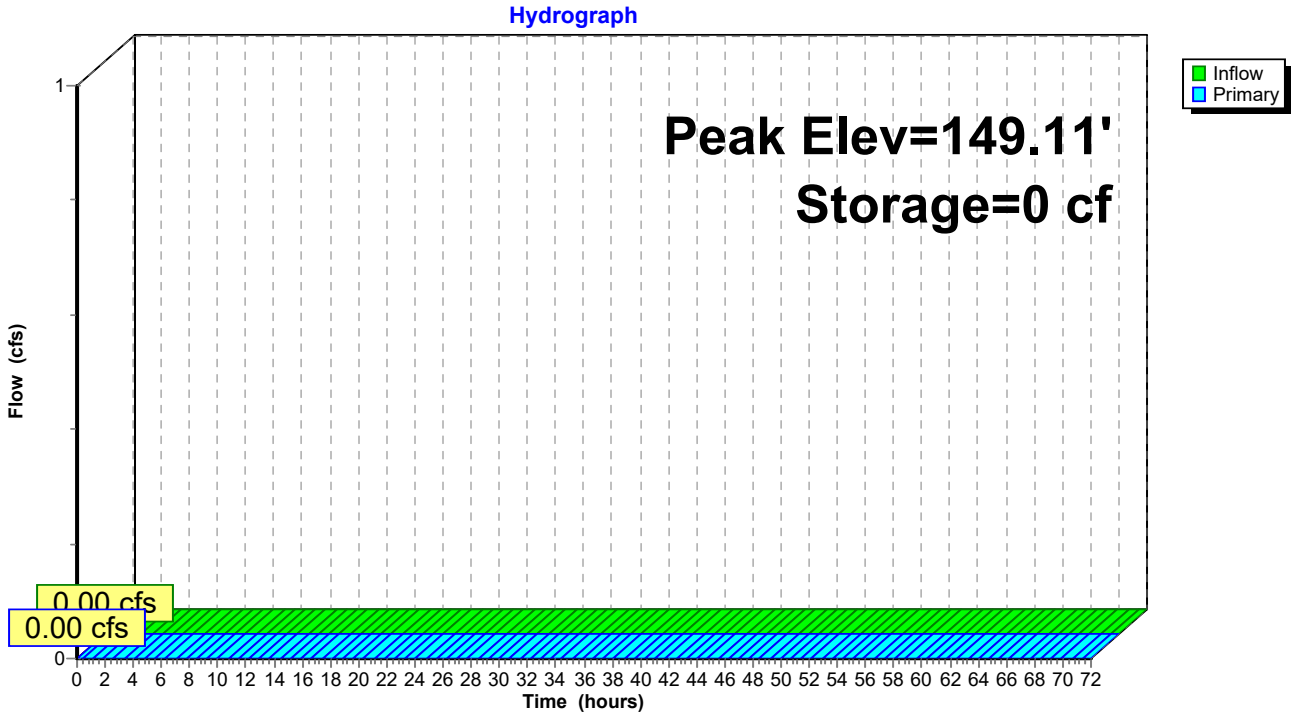
Volume	Invert	Avail.Storage	Storage Description
#1	148.86'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.86	2,520	204.0	0.0	0	0	2,520
149.11	2,520	204.0	0.0	0	0	2,571
149.12	2,520	204.0	40.0	10	10	2,573
150.06	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	145.76'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	148.86'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	150.06'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=148.86' TW=145.97' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.30 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-7: Permeable Asphalt



Summary for Pond PV-8: Permeable Asphalt

[43] Hint: Has no inflow (Outflow=Zero)

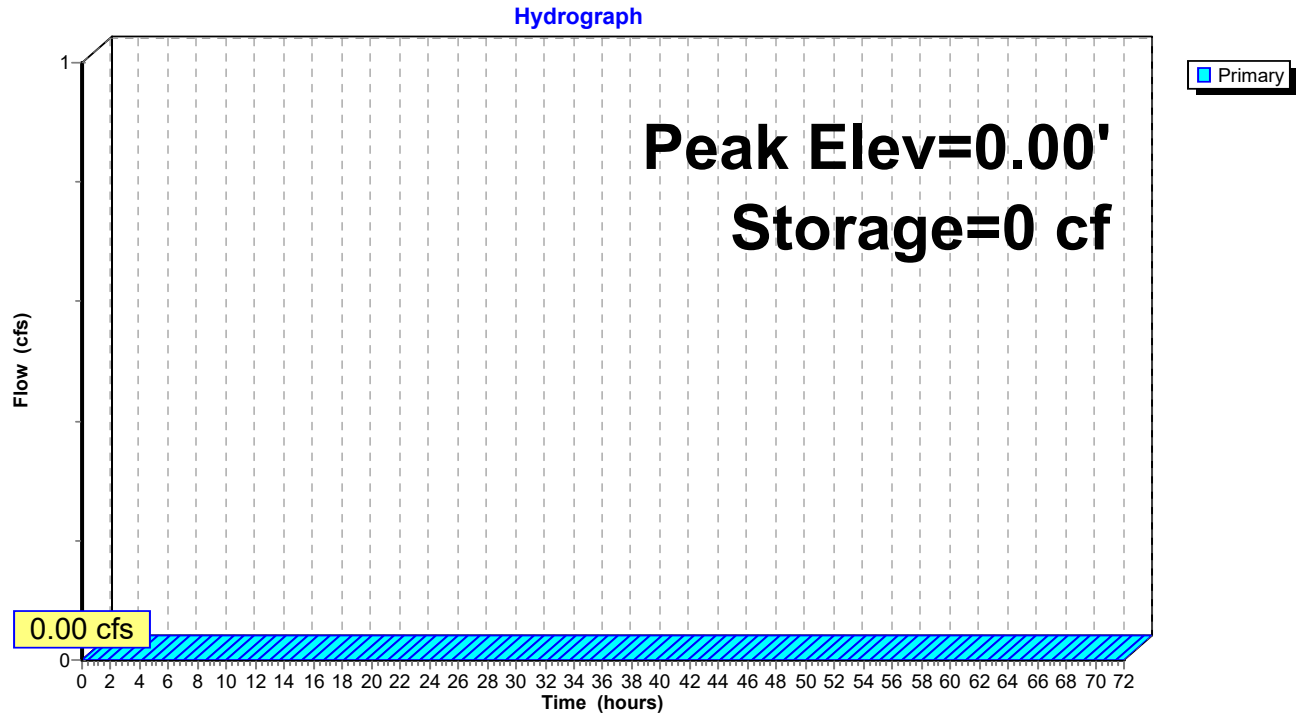
Volume	Invert	Avail.Storage	Storage Description
#1	151.60'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
151.60	2,520	204.0	0.0	0	0	2,520
151.85	2,520	204.0	0.0	0	0	2,571
151.86	2,520	204.0	40.0	10	10	2,573
152.80	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	148.90'	**12.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	151.60'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	152.80'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' TW=148.86' (Dynamic Tailwater)
└─**1=Culvert Out** (Controls 0.00 cfs)
  └─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-8: Permeable Asphalt

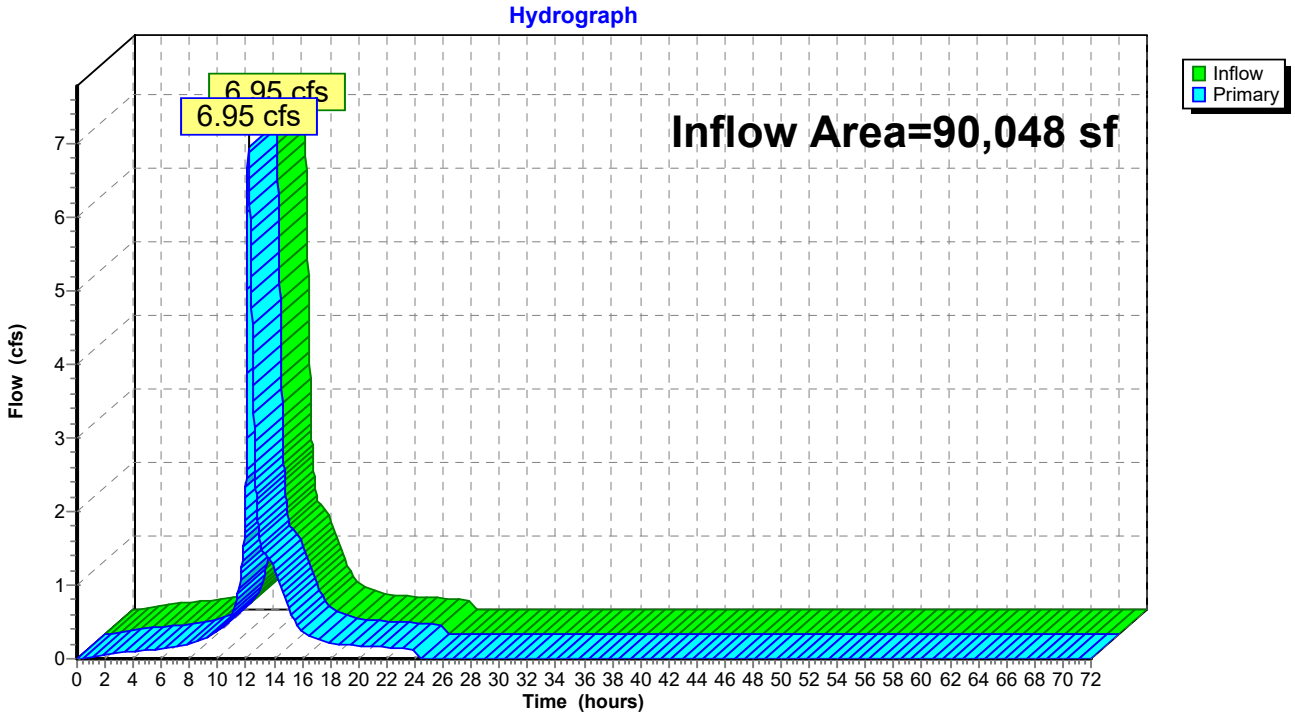


Summary for Link P-1: Post Development Drianage

Inflow Area = 90,048 sf, 66.63% Impervious, Inflow Depth = 5.30" for F10-Year event
Inflow = 6.95 cfs @ 12.17 hrs, Volume= 39,801 cf
Primary = 6.95 cfs @ 12.17 hrs, Volume= 39,801 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link P-1: Post Development Drianage



Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: Pre-Development Runoff Area=90,048 sf 14.68% Impervious Runoff Depth=9.93"
Flow Length=669' Tc=7.0 min CN=80/98 Runoff=23.97 cfs 74,528 cf

Subcatchment P-1A: Post-Development Runoff Area=10,079 sf 61.82% Impervious Runoff Depth=11.02"
Flow Length=189' Tc=6.0 min CN=80/98 Runoff=2.90 cfs 9,259 cf

Subcatchment P-1B: Post-Development Runoff Area=10,079 sf 90.64% Impervious Runoff Depth=11.69"
Tc=6.0 min CN=80/98 Runoff=2.98 cfs 9,820 cf

Subcatchment P-1C: Post-Development Runoff Area=9,669 sf 68.03% Impervious Runoff Depth=11.17"
Tc=6.0 min CN=80/98 Runoff=2.80 cfs 8,998 cf

Subcatchment P-1D: Post-Development Runoff Area=8,530 sf 72.98% Impervious Runoff Depth=11.28"
Tc=6.0 min CN=80/98 Runoff=2.48 cfs 8,020 cf

Subcatchment P-1E: Post-Development Runoff Area=9,057 sf 72.13% Impervious Runoff Depth=11.26"
Tc=6.0 min CN=80/98 Runoff=2.63 cfs 8,501 cf

Subcatchment P-1F: Post-Development Runoff Area=6,983 sf 86.60% Impervious Runoff Depth=11.60"
Tc=6.0 min CN=80/98 Runoff=2.05 cfs 6,749 cf

Subcatchment P-1G: Post-Development Runoff Area=7,377 sf 82.59% Impervious Runoff Depth=11.51"
Tc=6.0 min CN=80/98 Runoff=2.16 cfs 7,073 cf

Subcatchment P-1H: Post-Development Runoff Area=13,074 sf 52.73% Impervious Runoff Depth=10.81"
Tc=6.0 min CN=80/98 Runoff=3.73 cfs 11,781 cf

Subcatchment P-1I: Post-Development Runoff Area=15,200 sf 41.18% Impervious Runoff Depth=10.55"
Tc=6.0 min CN=80/98 Runoff=4.29 cfs 13,358 cf

Pond PV-1: Permeable Asphalt Peak Elev=132.45' Storage=14,106 cf Inflow=21.73 cfs 70,201 cf
Outflow=13.97 cfs 70,201 cf

Pond PV-2: Permeable Asphalt Peak Elev=136.05' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-3: Permeable Asphalt Peak Elev=139.05' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-4: Permeable Asphalt Peak Elev=141.85' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-5: Permeable Asphalt Peak Elev=143.55' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-6: Permeable Asphalt Peak Elev=146.22' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-7: Permeable Asphalt Peak Elev=149.11' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond PV-8: Permeable Asphalt Peak Elev=0.00' Storage=0 cf
Primary=0.00 cfs 0 cf

Link P-1: Post Development Drianage Inflow=16.66 cfs 83,559 cf
Primary=16.66 cfs 83,559 cf

Total Runoff Area = 180,096 sf Runoff Volume = 158,087 cf Average Runoff Depth = 10.53"
59.35% Pervious = 106,883 sf 40.65% Impervious = 73,213 sf

Summary for Subcatchment E-1: Pre-Development Conditions Drainage Area

Runoff = 23.97 cfs @ 12.14 hrs, Volume= 74,528 cf, Depth= 9.93"
Routed to nonexistent node 4L

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F100-Year Rainfall=12.15", P2=3.97"

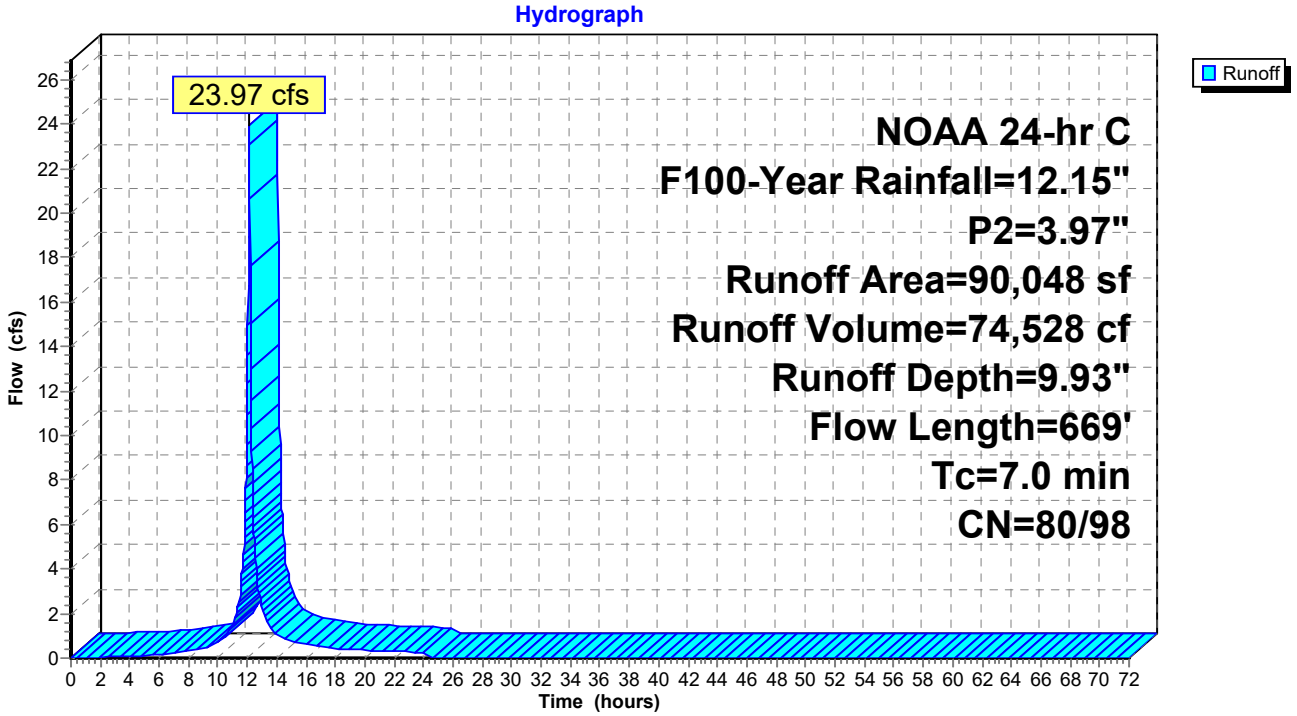
	Area (sf)	CN	Description
*	4,104	98	Impervious Surfaces
	76,831	80	>75% Grass cover, Good, HSG D
*	9,113	98	MVS
	90,048	83	Weighted Average
	76,831	80	85.32% Pervious Area
	13,217	98	14.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	10	0.0982	0.23		**Sheet Flow, 1-2**
					Grass: Short n= 0.150 P2= 3.97"
0.1	17	0.1150	2.37		**Shallow Concentrated Flow, 2-3**
					Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0800	1.98		**Shallow Concentrated Flow, 3-4**
					Short Grass Pasture Kv= 7.0 fps
0.1	18	0.1100	2.32		**Shallow Concentrated Flow, 4-5**
					Short Grass Pasture Kv= 7.0 fps
0.3	28	0.0700	1.85		**Shallow Concentrated Flow, 5-6**
					Short Grass Pasture Kv= 7.0 fps
0.1	15	0.0680	1.83		**Shallow Concentrated Flow, 6-7**
					Short Grass Pasture Kv= 7.0 fps
0.3	42	0.0960	2.17		**Shallow Concentrated Flow, 7-8**
					Short Grass Pasture Kv= 7.0 fps
0.5	34	0.0295	1.20		**Shallow Concentrated Flow, 8-9**
					Short Grass Pasture Kv= 7.0 fps
0.6	40	0.0250	1.11		**Shallow Concentrated Flow, 9-10**
					Short Grass Pasture Kv= 7.0 fps
0.3	43	0.1400	2.62		**Shallow Concentrated Flow, 10-11**
					Short Grass Pasture Kv= 7.0 fps
0.1	8	0.1300	2.52		**Shallow Concentrated Flow, 11-12**
					Short Grass Pasture Kv= 7.0 fps
0.4	46	0.0865	2.06		**Shallow Concentrated Flow, 12-13**
					Short Grass Pasture Kv= 7.0 fps
0.2	19	0.0515	1.59		**Shallow Concentrated Flow, 13-14**
					Short Grass Pasture Kv= 7.0 fps
0.1	8	0.0250	1.11		**Shallow Concentrated Flow, 14-15**
					Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0250	3.21		**Shallow Concentrated Flow, 15-16**
					Paved Kv= 20.3 fps
0.2	15	0.0250	1.11		**Shallow Concentrated Flow, 16-17**
					Short Grass Pasture Kv= 7.0 fps
0.4	37	0.0540	1.63		**Shallow Concentrated Flow, 17-18**
					Short Grass Pasture Kv= 7.0 fps
0.2	14	0.0230	1.06		**Shallow Concentrated Flow, 18-19**
					Short Grass Pasture Kv= 7.0 fps
0.2	30	0.0230	3.08		**Shallow Concentrated Flow, 19-20**
					Paved Kv= 20.3 fps
0.1	23	0.0430	4.21		**Shallow Concentrated Flow, 20-21**
					Paved Kv= 20.3 fps
0.2	30	0.1340	2.56		**Shallow Concentrated Flow, 21-22**
					Short Grass Pasture Kv= 7.0 fps
0.3	38	0.0795	1.97		**Shallow Concentrated Flow, 22-23**
					Short Grass Pasture Kv= 7.0 fps
0.3	31	0.0645	1.78		**Shallow Concentrated Flow, 23-24**
					Short Grass Pasture Kv= 7.0 fps
0.5	47	0.0425	1.44		**Shallow Concentrated Flow, 24-25**
					Short Grass Pasture Kv= 7.0 fps
0.5	35	0.0290	1.19		**Shallow Concentrated Flow, 25-26**
					Short Grass Pasture Kv= 7.0 fps
0.1	13	0.0770	1.94		**Shallow Concentrated Flow, 26-27**

Short Grass Pasture Kv= 7.0 fps

7.0	669	Total

Subcatchment E-1: Pre-Development Conditions Drainage Area



Summary for Subcatchment P-1A: Post-Development Conditions Drainage Area

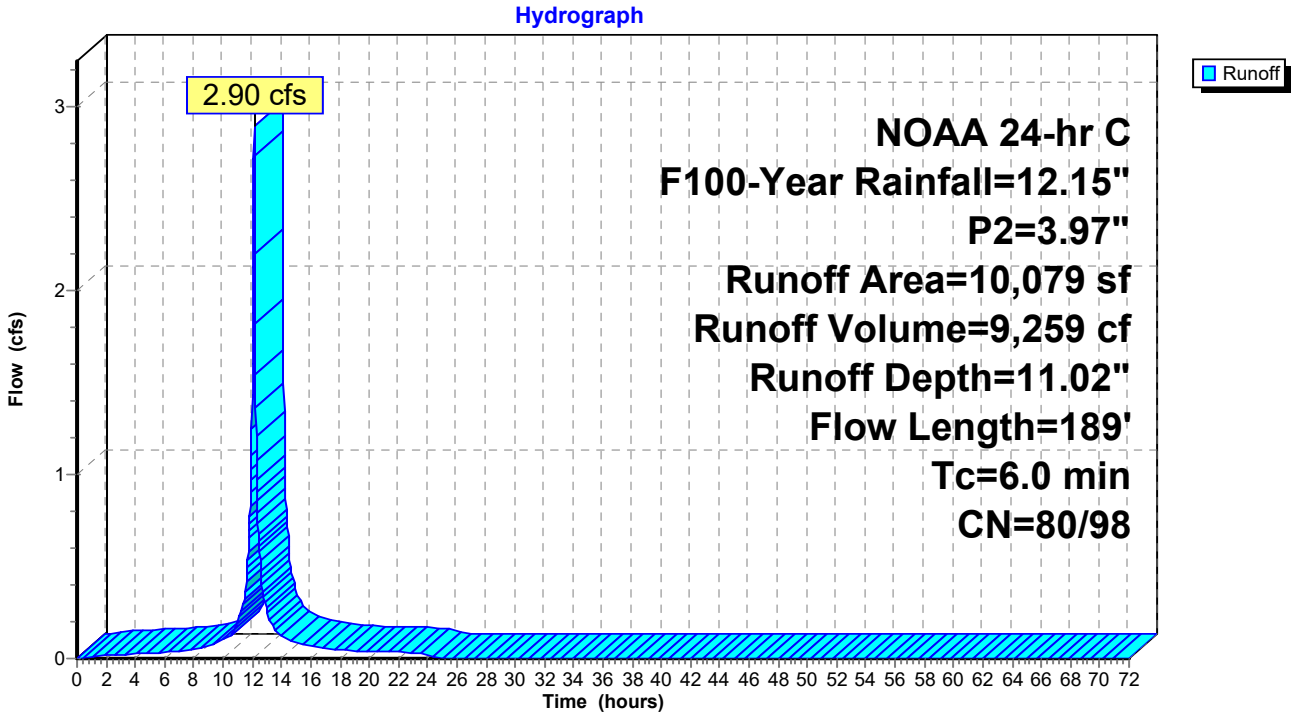
Runoff = 2.90 cfs @ 12.13 hrs, Volume= 9,259 cf, Depth=11.02"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F100-Year Rainfall=12.15", P2=3.97"

	Area (sf)	CN	Description
*	933	98	Impervious Surfaces
*	5,298	98	MVS
	3,848	80	>75% Grass cover, Good, HSG D
	10,079	91	Weighted Average
	3,848	80	38.18% Pervious Area
	6,231	98	61.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	14	0.1050	0.25		**Sheet Flow, 1-2** Grass: Short n= 0.150 P2= 3.97"
0.2	89	0.1000	6.42		**Shallow Concentrated Flow, 2-3** Paved Kv= 20.3 fps
0.1	18	0.0275	3.37		**Shallow Concentrated Flow, 3-4** Paved Kv= 20.3 fps
0.3	68	0.0445	4.28		**Shallow Concentrated Flow, 4-5** Paved Kv= 20.3 fps
1.5	189	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1A: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1B: Post-Development Conditions Drainage Area

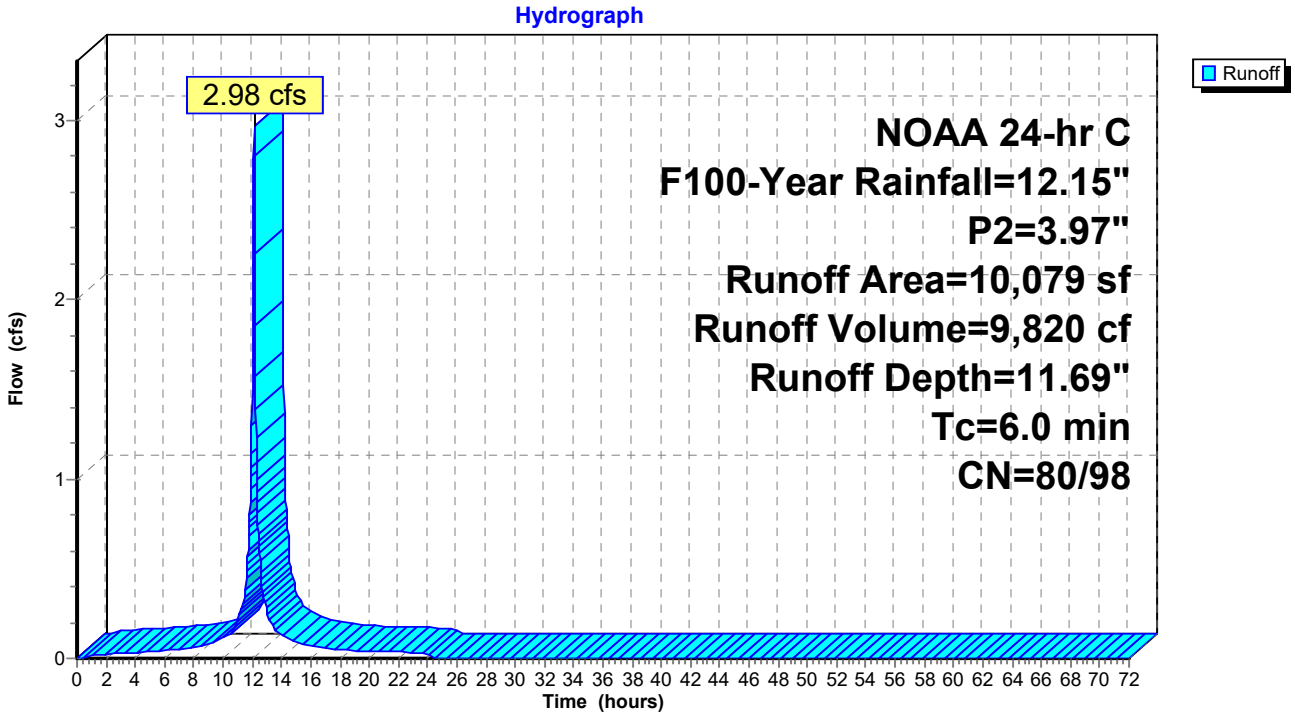
Runoff = 2.98 cfs @ 12.13 hrs, Volume= 9,820 cf, Depth=11.69"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F100-Year Rainfall=12.15", P2=3.97"

	Area (sf)	CN	Description
*	6,427	98	Impervious Surfaces
*	2,709	98	MVS
	943	80	>75% Grass cover, Good, HSG D
	10,079	96	Weighted Average
	943	80	9.36% Pervious Area
	9,136	98	90.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1B: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1C: Post-Development Conditions Drainage Area

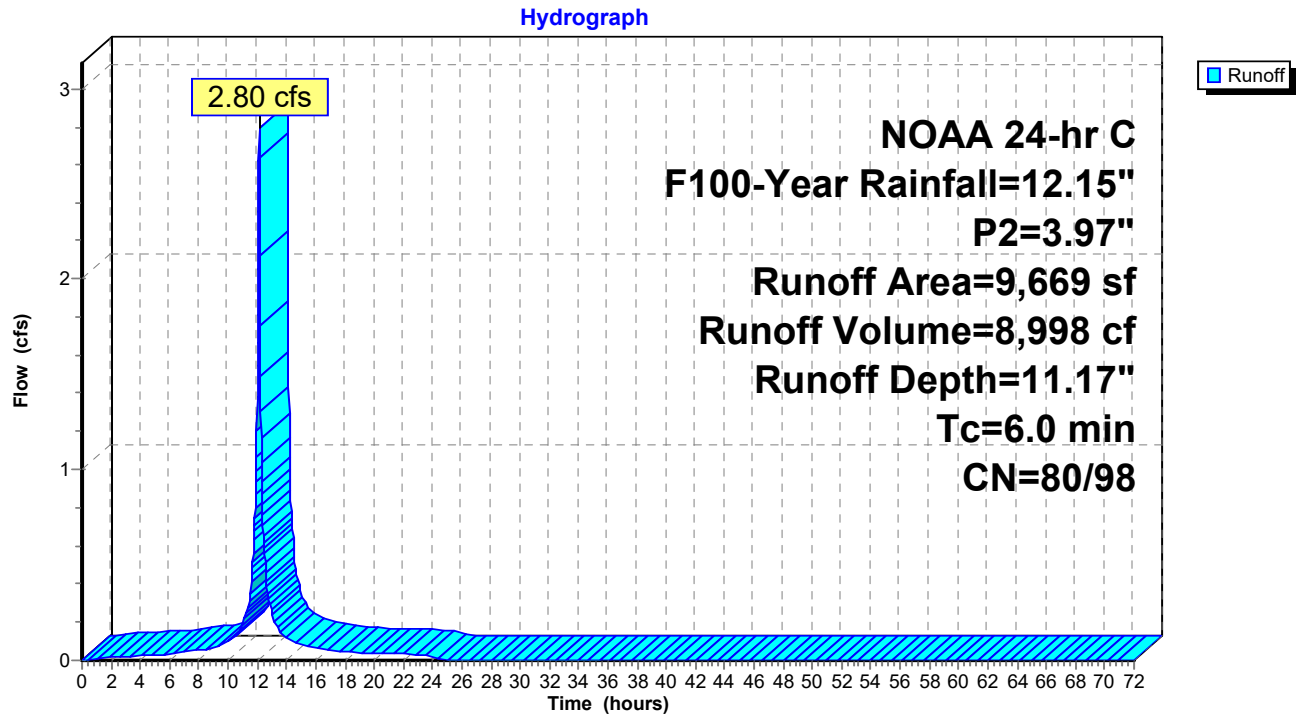
Runoff = 2.80 cfs @ 12.13 hrs, Volume= 8,998 cf, Depth=11.17"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F100-Year Rainfall=12.15", P2=3.97"

	Area (sf)	CN	Description
*	3,869	98	Impervious Surfaces
*	2,709	98	MVS
	3,091	80	>75% Grass cover, Good, HSG D
	9,669	92	Weighted Average
	3,091	80	31.97% Pervious Area
	6,578	98	68.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1C: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1D: Post-Development Conditions Drainage Area

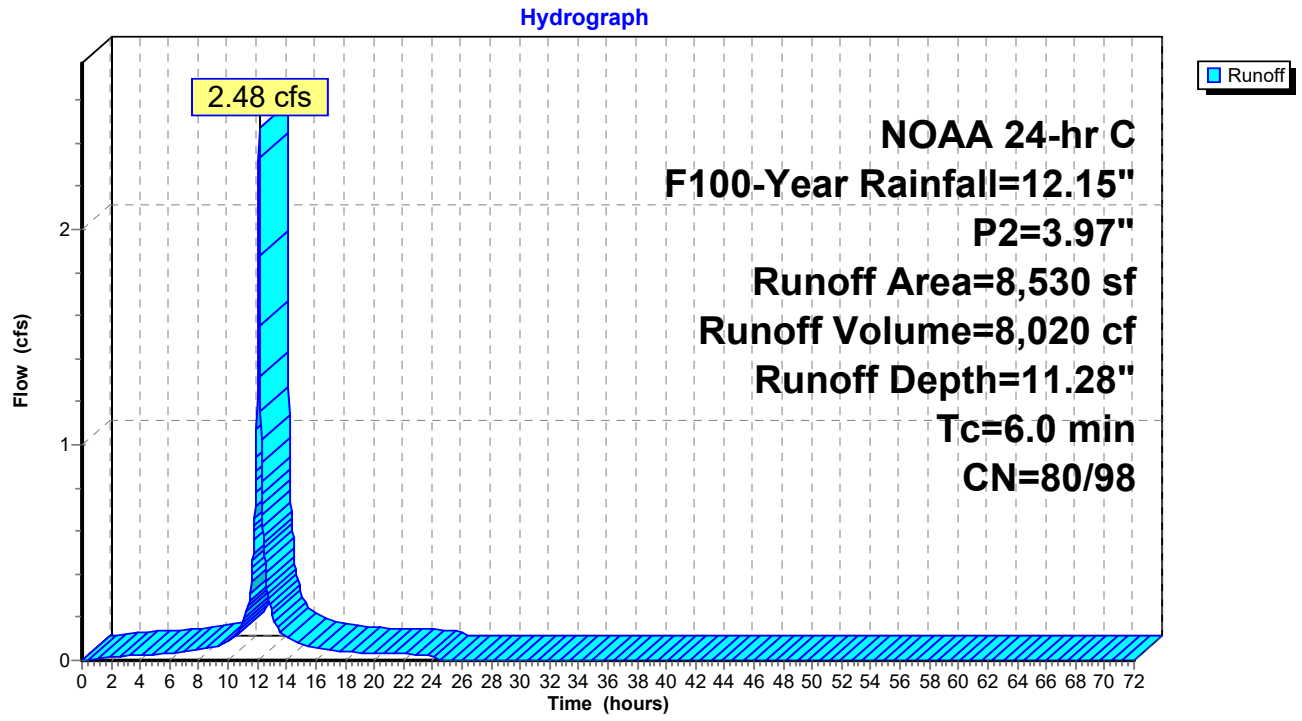
Runoff = 2.48 cfs @ 12.13 hrs, Volume= 8,020 cf, Depth=11.28"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F100-Year Rainfall=12.15", P2=3.97"

	Area (sf)	CN	Description
*	3,516	98	Impervious Surfaces
*	2,709	98	MVS
	2,305	80	>75% Grass cover, Good, HSG D
	8,530	93	Weighted Average
	2,305	80	27.02% Pervious Area
	6,225	98	72.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1D: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1E: Post-Development Conditions Drainage Area

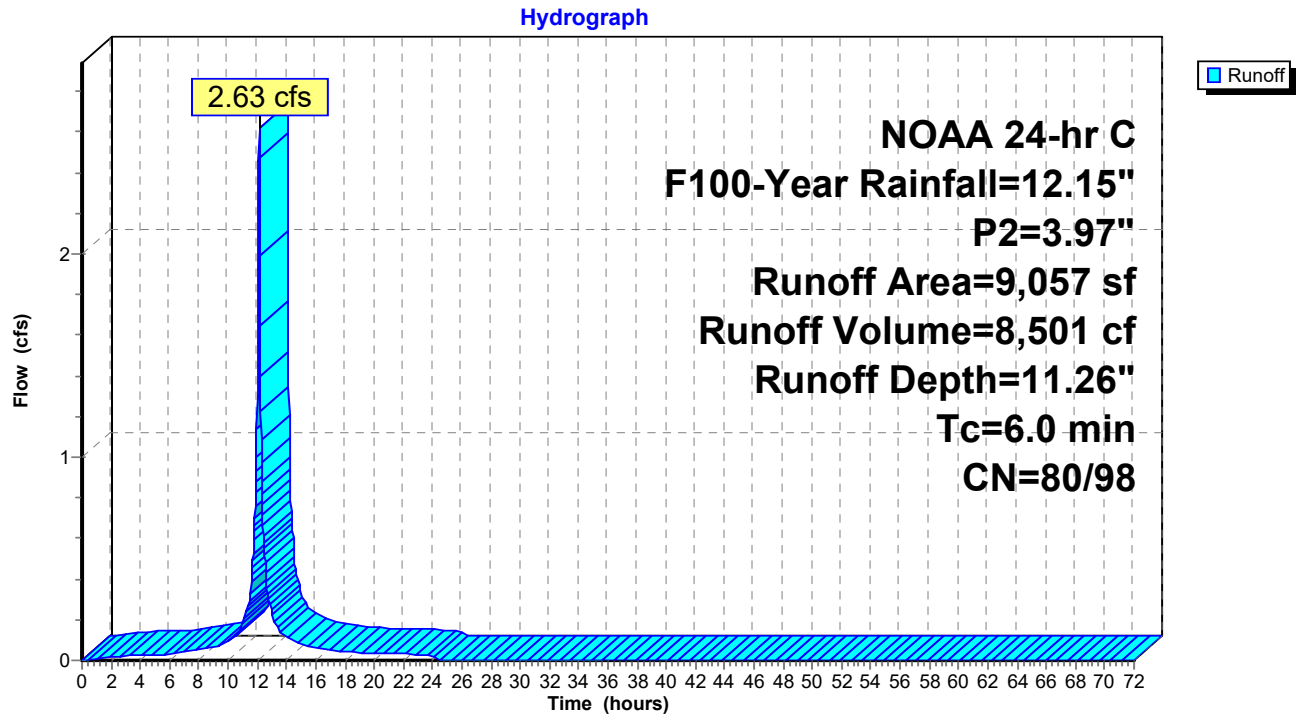
Runoff = 2.63 cfs @ 12.13 hrs, Volume= 8,501 cf, Depth=11.26"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F100-Year Rainfall=12.15", P2=3.97"

	Area (sf)	CN	Description
*	3,824	98	Impervious Surfaces
*	2,709	98	MVS
	2,524	80	>75% Grass cover, Good, HSG D
	9,057	93	Weighted Average
	2,524	80	27.87% Pervious Area
	6,533	98	72.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1E: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1F: Post-Development Conditions Drainage Area

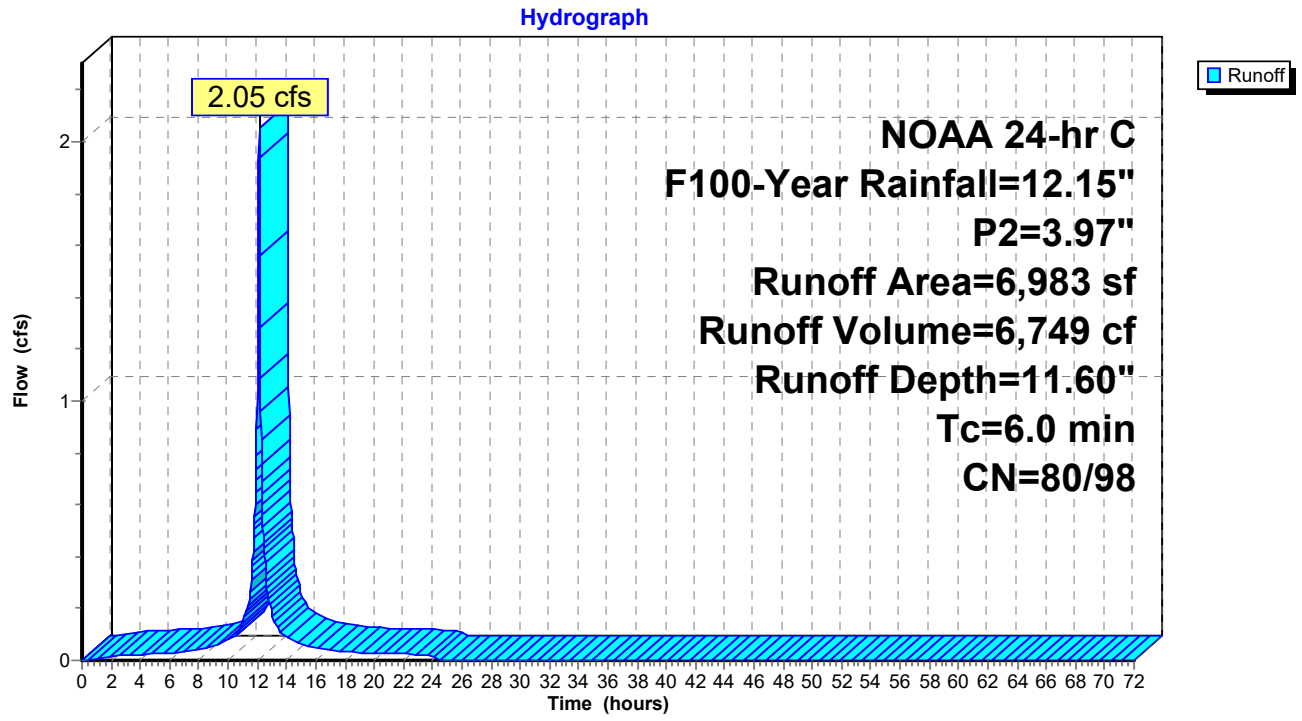
Runoff = 2.05 cfs @ 12.13 hrs, Volume= 6,749 cf, Depth=11.60"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F100-Year Rainfall=12.15", P2=3.97"

	Area (sf)	CN	Description
*	3,338	98	Impervious Surfaces
*	2,709	98	MVS
	936	80	>75% Grass cover, Good, HSG D
	6,983	96	Weighted Average
	936	80	13.40% Pervious Area
	6,047	98	86.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1F: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1G: Post-Development Conditions Drainage Area

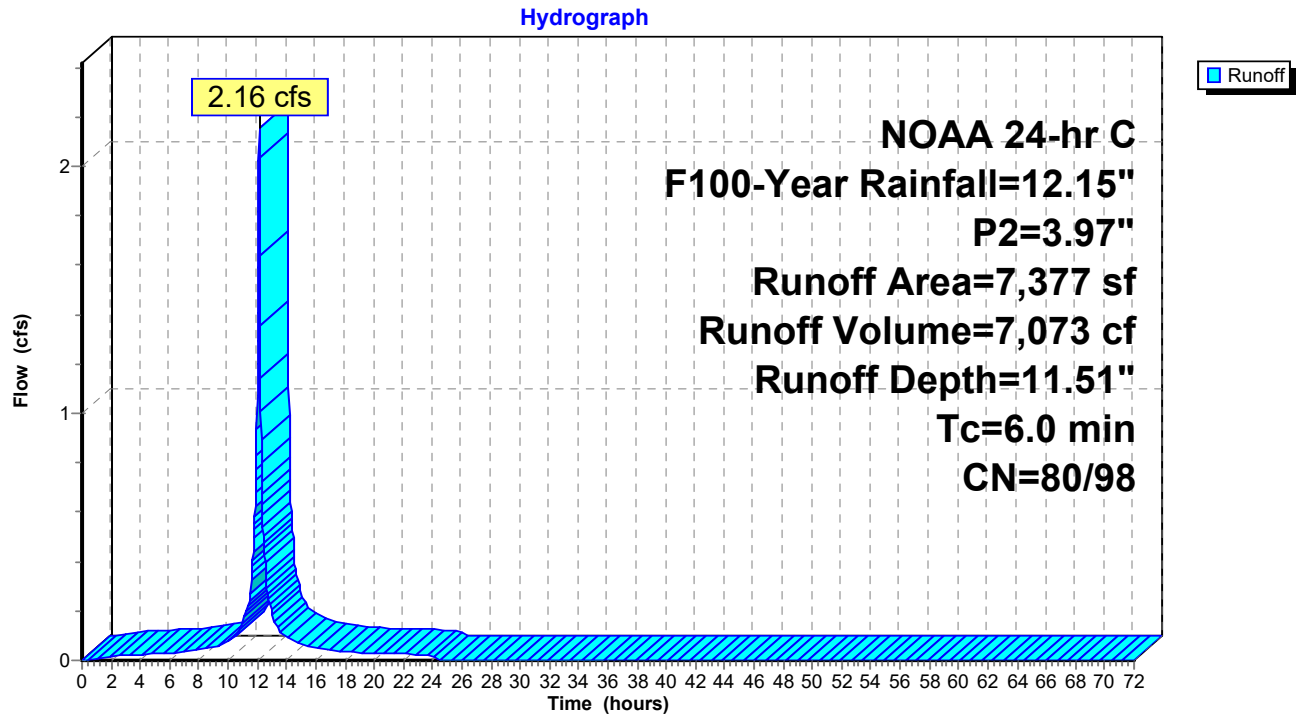
Runoff = 2.16 cfs @ 12.13 hrs, Volume= 7,073 cf, Depth=11.51"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F100-Year Rainfall=12.15", P2=3.97"

	Area (sf)	CN	Description
*	3,384	98	Impervious Surfaces
*	2,709	98	MVS
	1,284	80	>75% Grass cover, Good, HSG D
	7,377	95	Weighted Average
	1,284	80	17.41% Pervious Area
	6,093	98	82.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1G: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1H: Post-Development Conditions Drainage Area

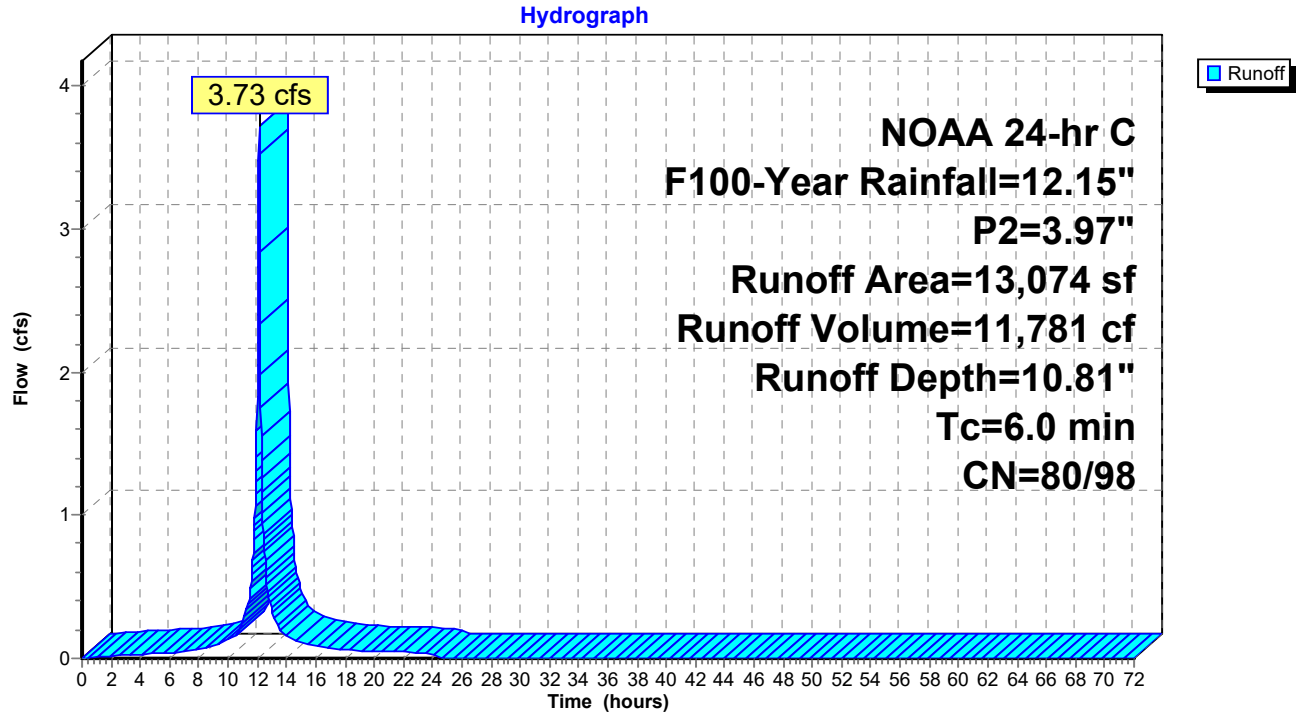
Runoff = 3.73 cfs @ 12.13 hrs, Volume= 11,781 cf, Depth=10.81"
Routed to Pond PV-1 : Permeable Asphalt

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F100-Year Rainfall=12.15", P2=3.97"

	Area (sf)	CN	Description
*	3,345	98	Impervious Surfaces
*	3,549	98	MVS
	6,180	80	>75% Grass cover, Good, HSG D
	13,074	89	Weighted Average
	6,180	80	47.27% Pervious Area
	6,894	98	52.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1H: Post-Development Conditions Drainage Area



Summary for Subcatchment P-1I: Post-Development Conditions Drainage Area

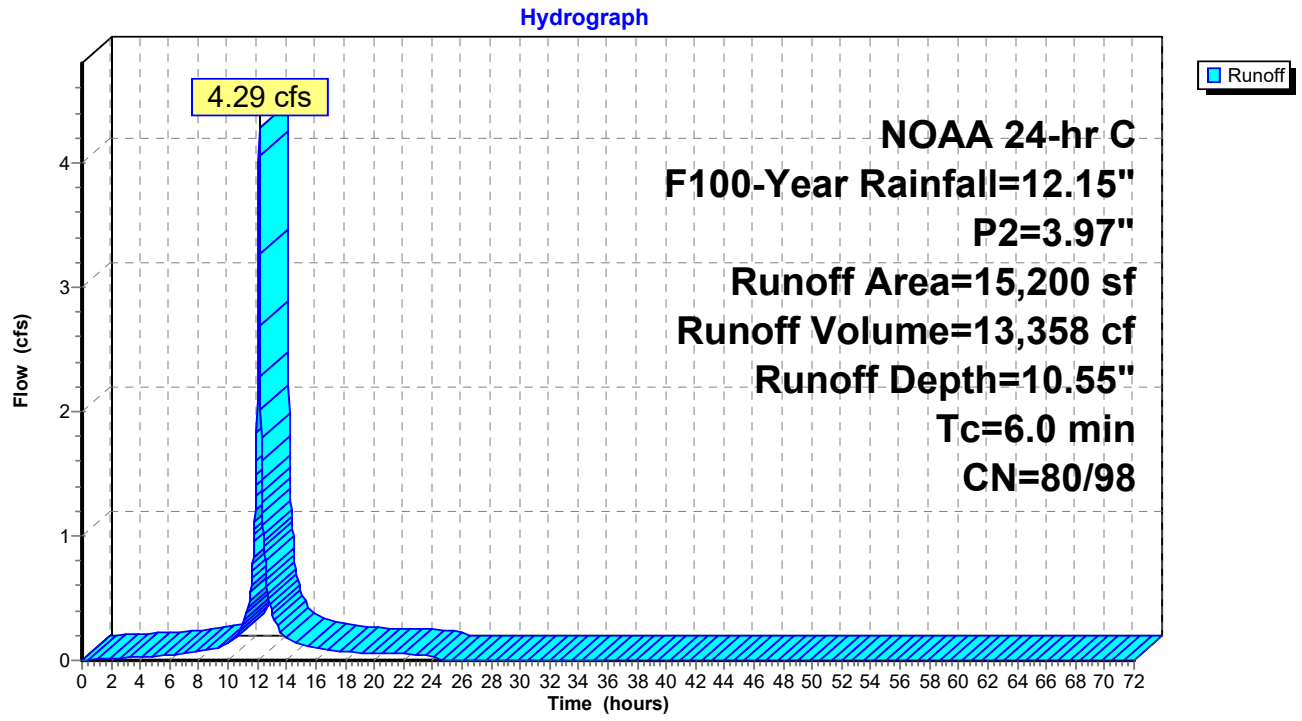
Runoff = 4.29 cfs @ 12.13 hrs, Volume= 13,358 cf, Depth=10.55"
Routed to Link P-1 : Post Development Drianage

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
NOAA 24-hr C F100-Year Rainfall=12.15", P2=3.97"

	Area (sf)	CN	Description
*	3,217	98	Impervious Surfaces
*	3,042	98	MVS
	8,941	80	>75% Grass cover, Good, HSG D
	15,200	87	Weighted Average
	8,941	80	58.82% Pervious Area
	6,259	98	41.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5					**Direct Entry, ToC**
1.5	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment P-1I: Post-Development Conditions Drainage Area



Summary for Pond PV-1: Permeable Asphalt

[44] Hint: Outlet device #2 is below defined storage
[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 74,848 sf, 71.79% Impervious, Inflow Depth = 11.26" for F100-Year event
Inflow = 21.73 cfs @ 12.13 hrs, Volume= 70,201 cf
Outflow = 13.97 cfs @ 12.20 hrs, Volume= 70,201 cf, Atten= 36%, Lag= 4.5 min
Primary = 13.97 cfs @ 12.20 hrs, Volume= 70,201 cf
Routed to Link P-1 : Post Development Drianage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 132.45' @ 12.20 hrs Surf.Area= 3,360 sf Storage= 14,106 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 23.9 min (773.8 - 750.0)

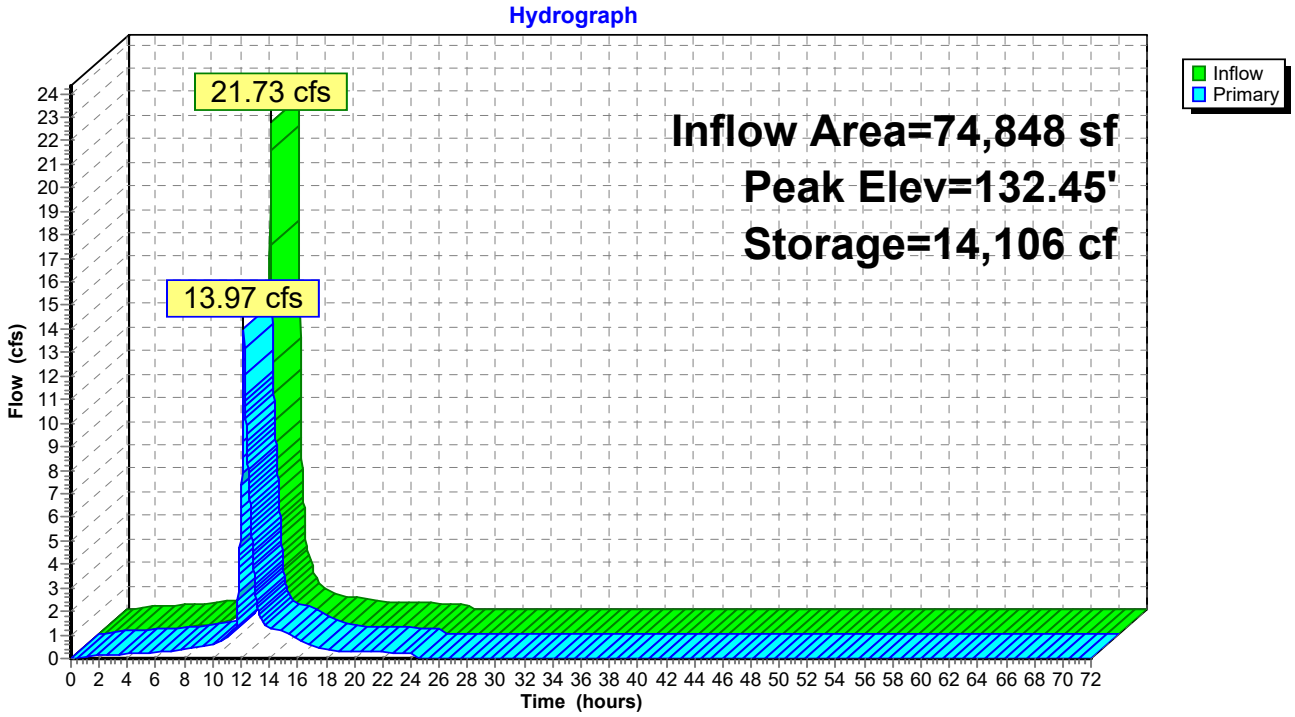
Volume	Invert	Avail.Storage	Storage Description
#1	125.19'	7,073 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) 26,846 cf Overall - 9,163 cf Embedded = 17,683 cf x 40.0% Voids
#2	127.18'	8,008 cf	**78.0"W x 48.0"H x 77.00'L Parabolic Arch** x 6 Inside #1 9,163 cf Overall - 3.0" Wall Thickness = 8,008 cf
		15,081 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
125.19	3,360	244.0	0	0	3,360
133.18	3,360	244.0	26,846	26,846	5,310

Device	Routing	Invert	Outlet Devices
#1	Primary	124.93'	**15.0" Round Culvert** L= 54.0' Ke= 0.500 Inlet / Outlet Invert= 124.93' / 124.39' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	124.93'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	124.93'	**6.0" W x 4.0" H Vert. Control Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 1	127.85'	**22.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	132.17'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=13.85 cfs @ 12.20 hrs HW=132.45' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 13.85 cfs of 15.47 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  ├─**3=Control Orifice** (Orifice Controls 2.18 cfs @ 13.05 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 9.20 cfs @ 10.04 fps)
  └─**5=Broad-Crested Rectangular Weir** (Weir Controls 2.47 cfs @ 1.49 fps)

Pond PV-1: Permeable Asphalt



Summary for Pond PV-2: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow	=	0.00 cfs @	0.00 hrs, Volume=	0 cf
Outflow	=	0.00 cfs @	0.00 hrs, Volume=	0 cf, Atten= 0%, Lag= 0.0 min
Primary	=	0.00 cfs @	0.00 hrs, Volume=	0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 136.05' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

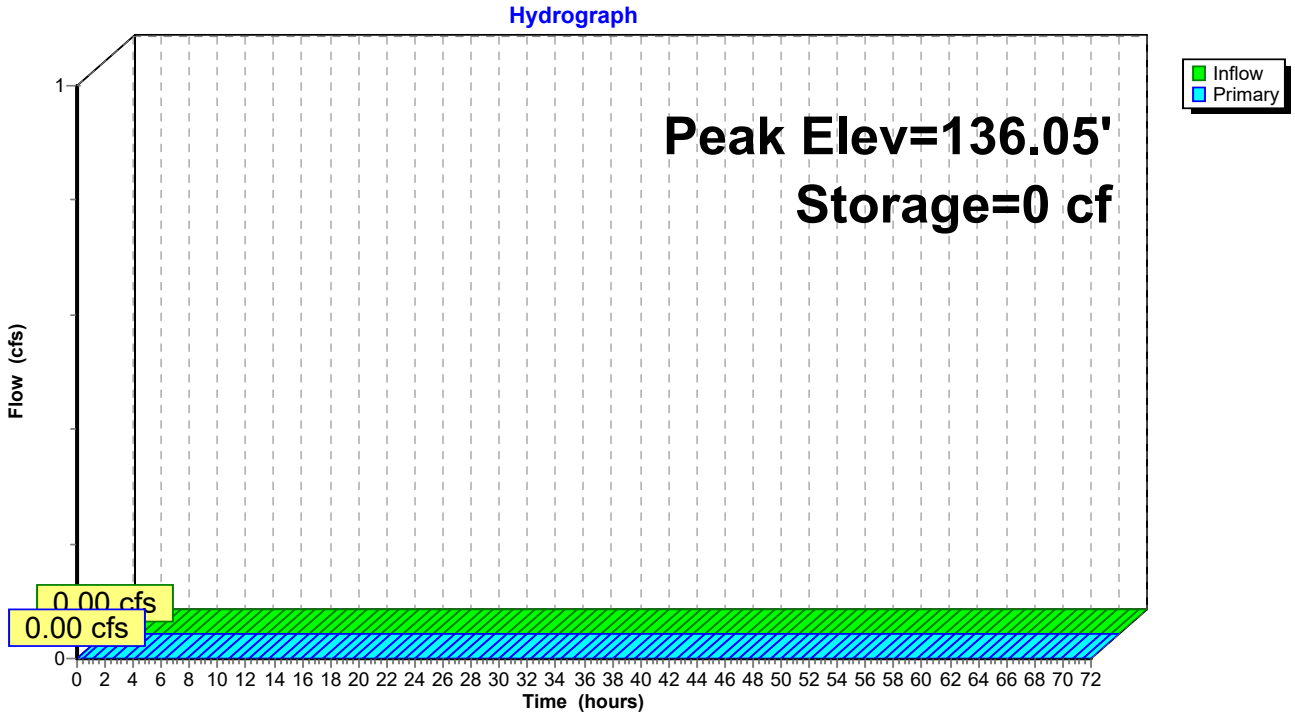
Volume	Invert	Avail.Storage	Storage Description
#1	135.80'	958 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
135.80	2,520	204.0	0.0	0	0	2,520
136.05	2,520	204.0	0.0	0	0	2,571
136.06	2,520	204.0	40.0	10	10	2,573
137.00	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	131.68'	**18.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	135.80'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	137.00'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=135.80' (Free Discharge)
└**1=Culvert Out** (Passes 0.00 cfs of 15.62 cfs potential flow)
  └**2=Underdrain** (Controls 0.00 cfs)
  └**3=WQDS** (Controls 0.00 cfs)

Pond PV-2: Permeable Asphalt



Summary for Pond PV-3: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-2 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 139.05' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

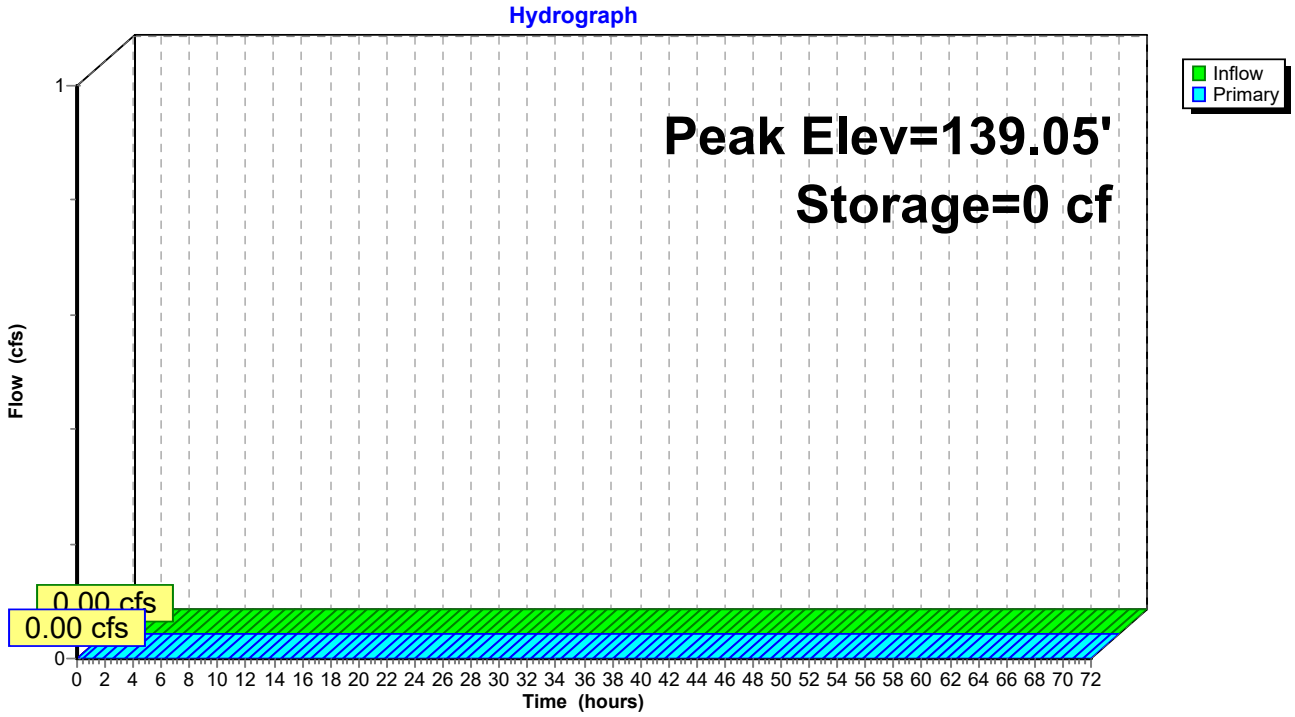
Volume	Invert	Avail.Storage	Storage Description
#1	138.80'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
138.80	2,520	204.0	0.0	0	0	2,520
139.05	2,520	204.0	0.0	0	0	2,571
139.06	2,520	204.0	40.0	10	10	2,573
140.00	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	135.60'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	138.80'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	140.00'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.80' TW=135.80' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.48 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-3: Permeable Asphalt



Summary for Pond PV-4: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-3 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 141.85' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

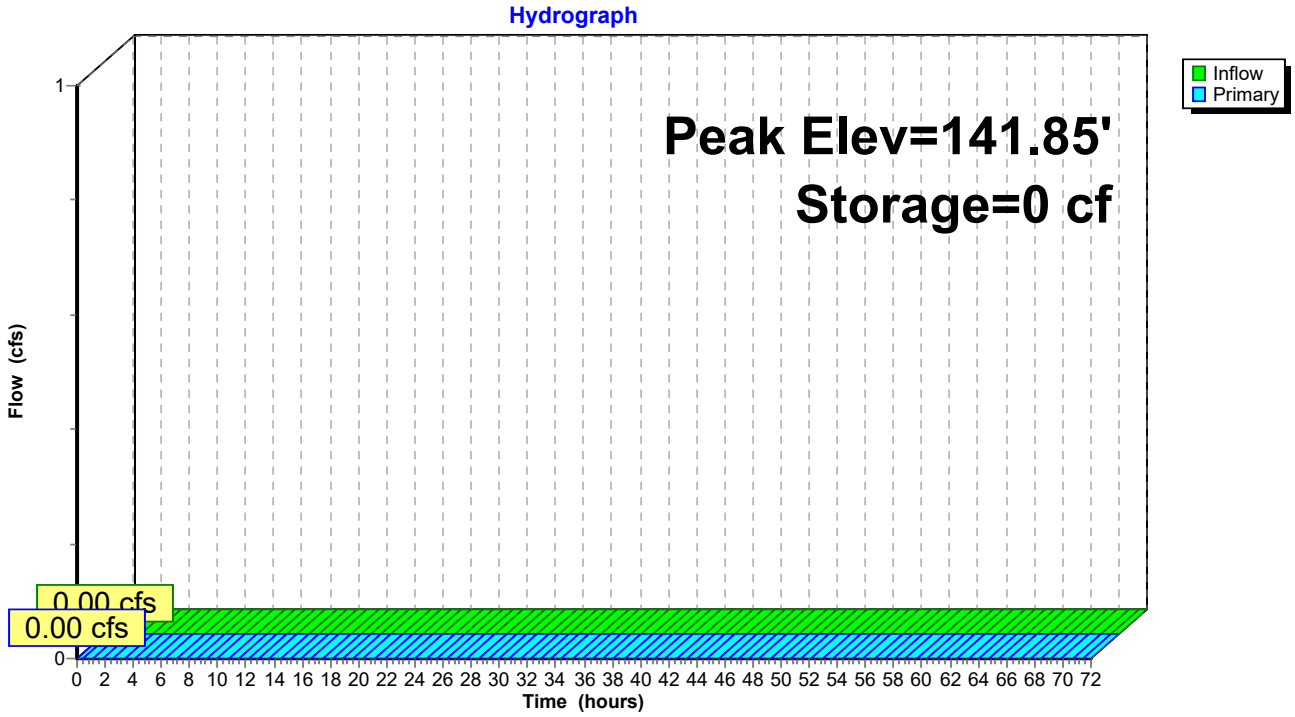
Volume	Invert	Avail.Storage	Storage Description
#1	141.60'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
141.60	2,520	204.0	0.0	0	0	2,520
141.85	2,520	204.0	0.0	0	0	2,571
141.86	2,520	204.0	40.0	10	10	2,573
142.80	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	138.60'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	141.60'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	142.80'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=141.60' TW=138.80' (Dynamic Tailwater)
- **1=Culvert Out** (Passes 0.00 cfs of 9.11 cfs potential flow)
  - **2=Underdrain** (Controls 0.00 cfs)
  - **3=WQDS** (Controls 0.00 cfs)

Pond PV-4: Permeable Asphalt



Summary for Pond PV-5: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-4 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 143.55' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

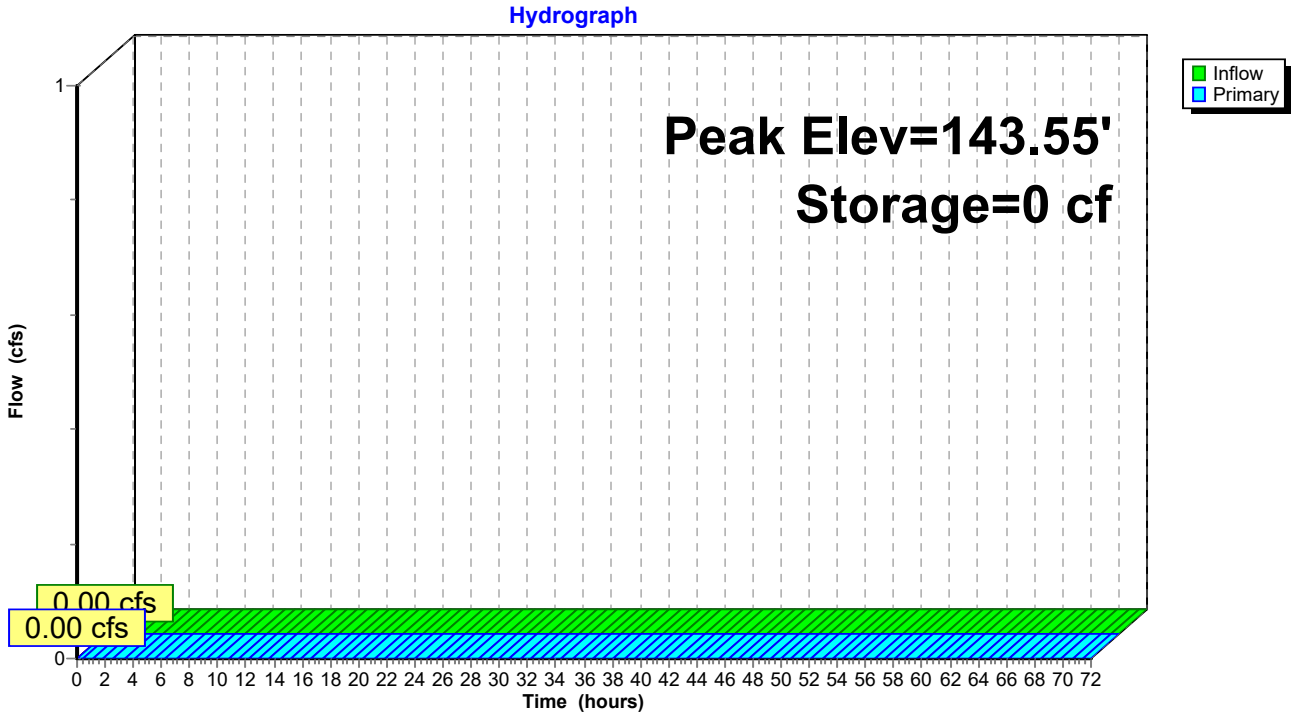
Volume	Invert	Avail.Storage	Storage Description
#1	143.30'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
143.30	2,520	204.0	0.0	0	0	2,520
143.55	2,520	204.0	0.0	0	0	2,571
143.56	2,520	204.0	40.0	10	10	2,573
144.50	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	141.39'	**12.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	143.30'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	144.50'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=143.30' TW=141.60' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 4.49 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-5: Permeable Asphalt



Summary for Pond PV-6: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-5 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 146.22' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

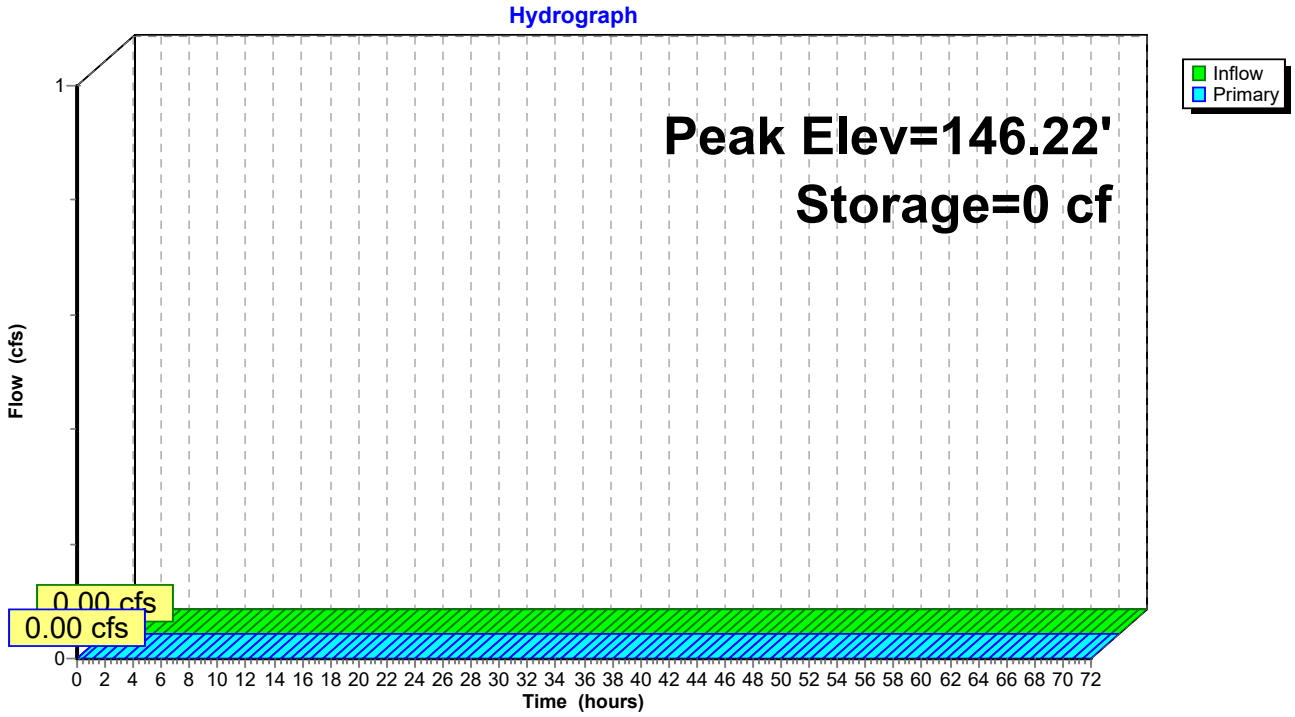
Volume	Invert	Avail.Storage	Storage Description
#1	145.97'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
145.97	2,520	204.0	0.0	0	0	2,520
146.22	2,520	204.0	0.0	0	0	2,571
146.23	2,520	204.0	40.0	10	10	2,573
147.17	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	144.09'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	145.97'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	147.17'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=145.97' TW=143.30' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 6.62 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-6: Permeable Asphalt



Summary for Pond PV-7: Permeable Asphalt

[92] Warning: Device #3 is above defined storage

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond PV-6 : Permeable Asphalt

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs
Peak Elev= 149.11' @ 0.32 hrs Surf.Area= 2,520 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

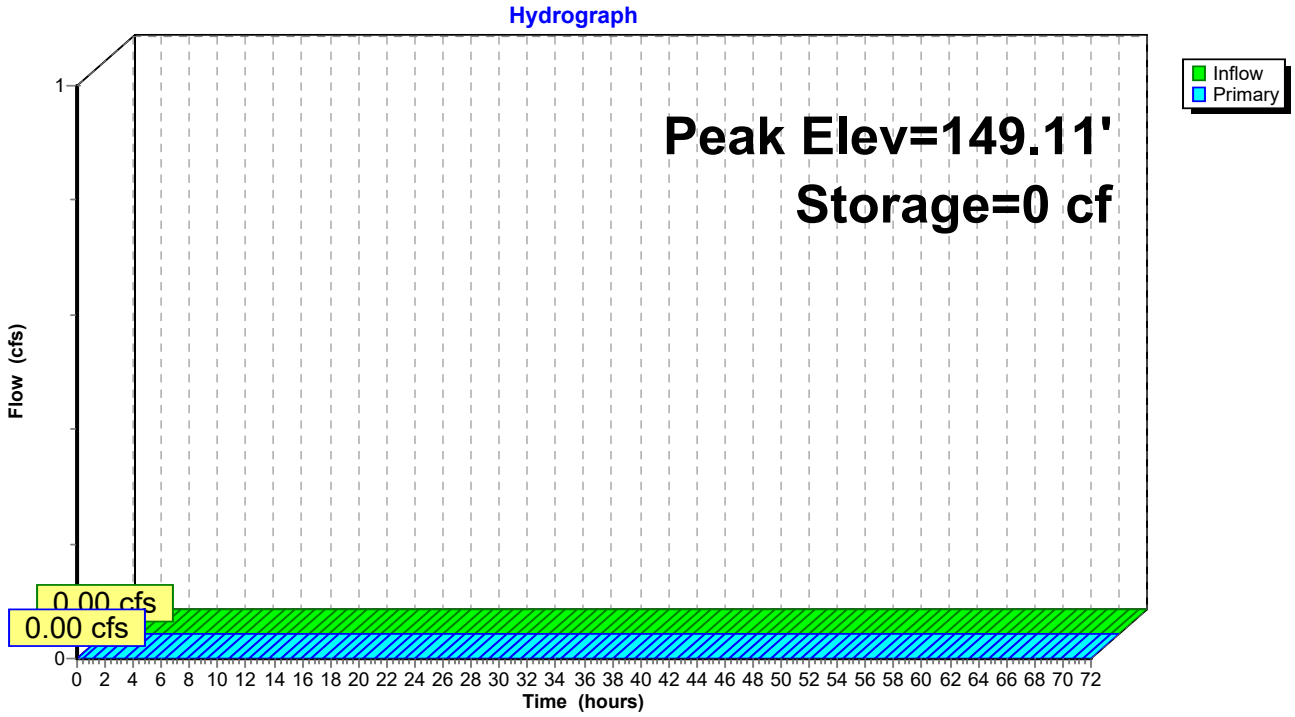
Volume	Invert	Avail.Storage	Storage Description
#1	148.86'	958 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.86	2,520	204.0	0.0	0	0	2,520
149.11	2,520	204.0	0.0	0	0	2,571
149.12	2,520	204.0	40.0	10	10	2,573
150.06	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	145.76'	**15.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	148.86'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	150.06'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=148.86' TW=145.97' (Dynamic Tailwater)
└─**1=Culvert Out** (Passes 0.00 cfs of 9.30 cfs potential flow)
  ├─**2=Underdrain** (Controls 0.00 cfs)
  └─**3=WQDS** (Controls 0.00 cfs)

Pond PV-7: Permeable Asphalt



Summary for Pond PV-8: Permeable Asphalt

[43] Hint: Has no inflow (Outflow=Zero)

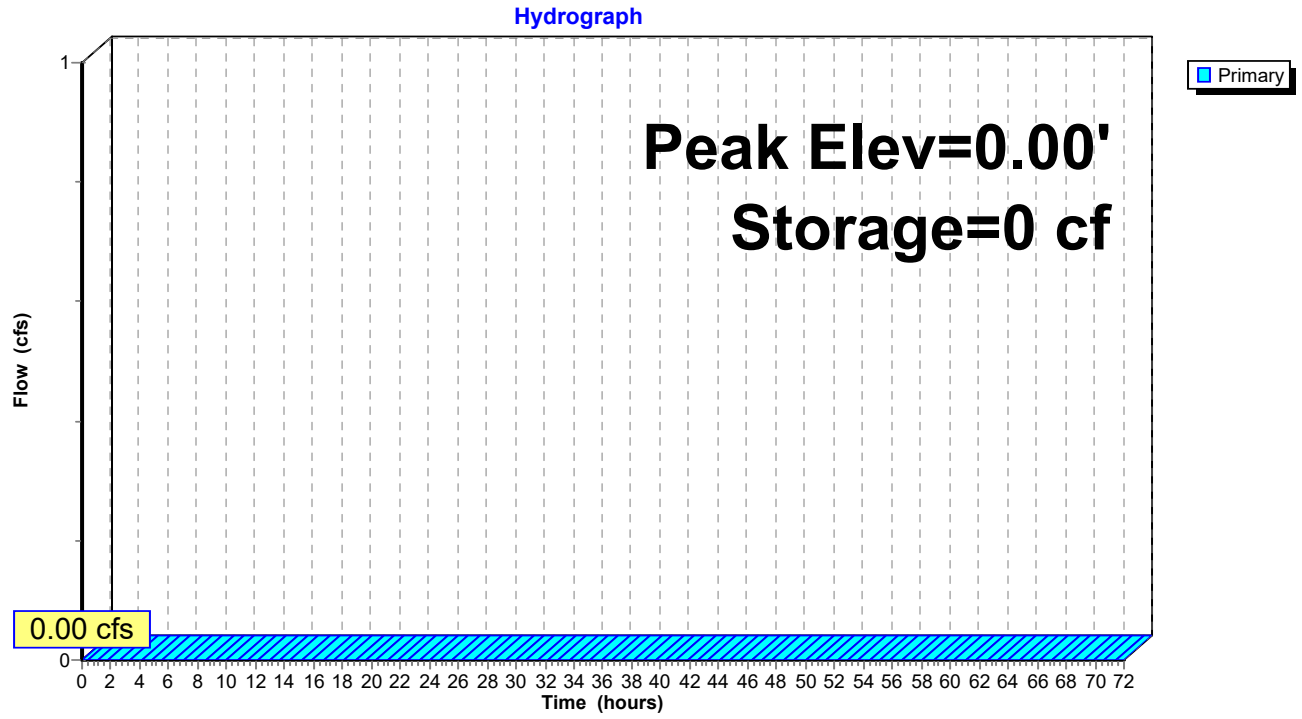
Volume	Invert	Avail.Storage	Storage Description
#1	151.60'	958 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
151.60	2,520	204.0	0.0	0	0	2,520
151.85	2,520	204.0	0.0	0	0	2,571
151.86	2,520	204.0	40.0	10	10	2,573
152.80	2,520	204.0	40.0	948	958	2,765

Device	Routing	Invert	Outlet Devices
#1	Primary	148.90'	**12.0" Vert. Culvert Out** C= 0.600 Limited to weir flow at low heads
#2	Device 1	151.60'	**3.0" Vert. Underdrain X 0.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	152.80'	**12.0" W x 4.5" H Vert. WQDS** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' TW=148.86' (Dynamic Tailwater)
└─**1=Culvert Out** (Controls 0.00 cfs)
└─**2=Underdrain** (Controls 0.00 cfs)
└─**3=WQDS** (Controls 0.00 cfs)

Pond PV-8: Permeable Asphalt

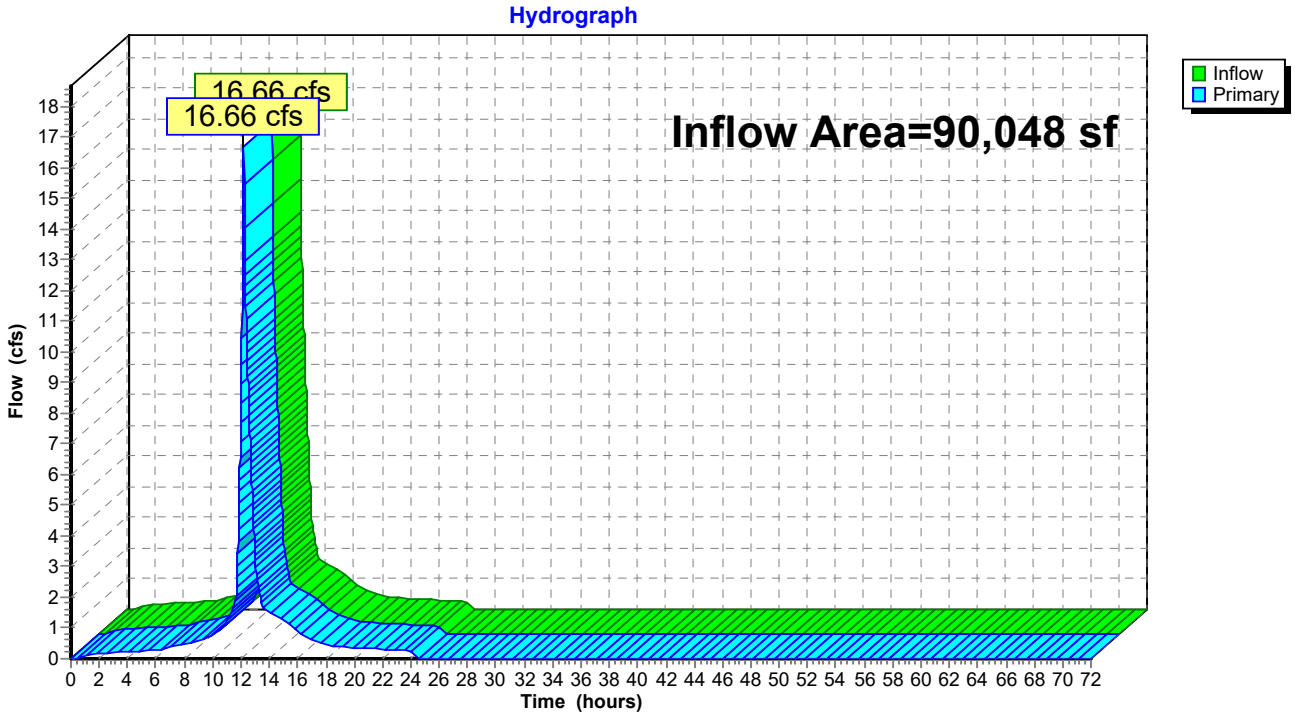


Summary for Link P-1: Post Development Drianage

Inflow Area = 90,048 sf, 66.63% Impervious, Inflow Depth = 11.14" for F100-Year event
Inflow = 16.66 cfs @ 12.20 hrs, Volume= 83,559 cf
Primary = 16.66 cfs @ 12.20 hrs, Volume= 83,559 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.02 hrs

Link P-1: Post Development Drianage



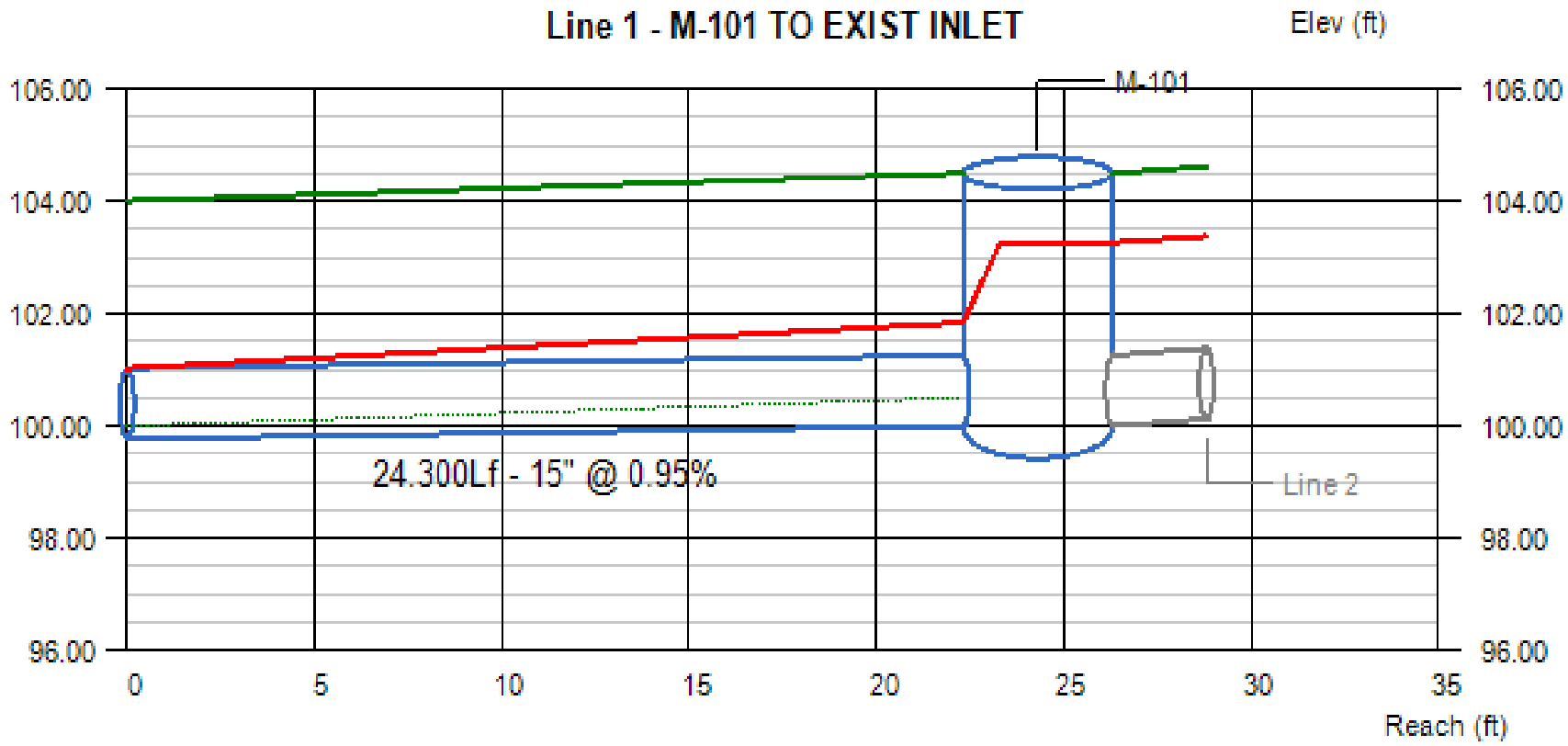
APPENDIX D
STORM CONVEYANCE PIPE ANALYSIS

INVENTORY

D-1: HYDRAFLOW PIPE NETWORK SUMMARY CHART

D-2: HYDRAFLOW HYDRAULIC PIPE ANALYSIS

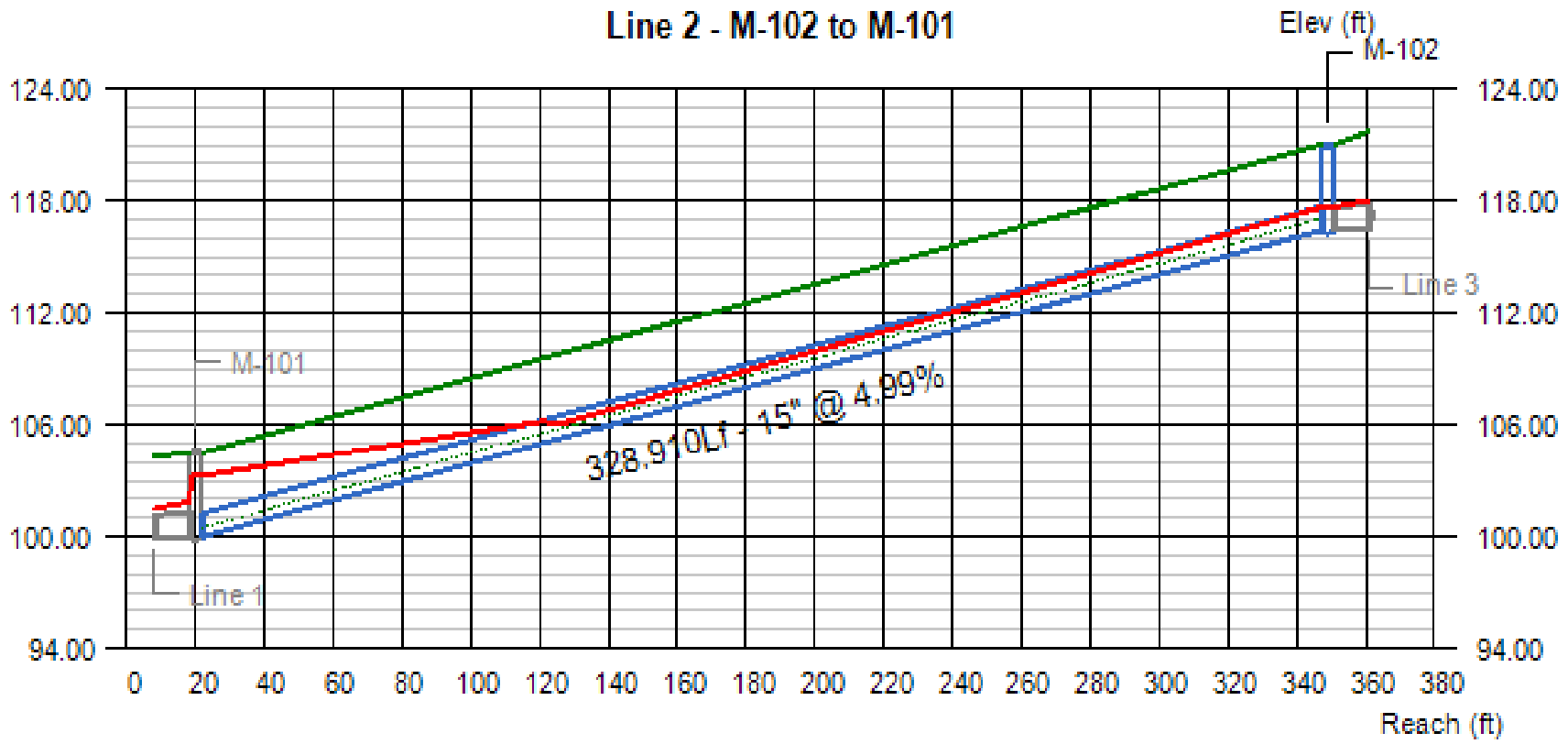
Line Profile (Line 1) - M-101 TO EXIST INLET



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
1	11.78	99.77	100.00	1.25	1.25	3.26	101.02	101.83	103.26	9.60	9.60	2.98	3.25

Project File: | No. Lines: 17 | Run Date: 2/28/2024

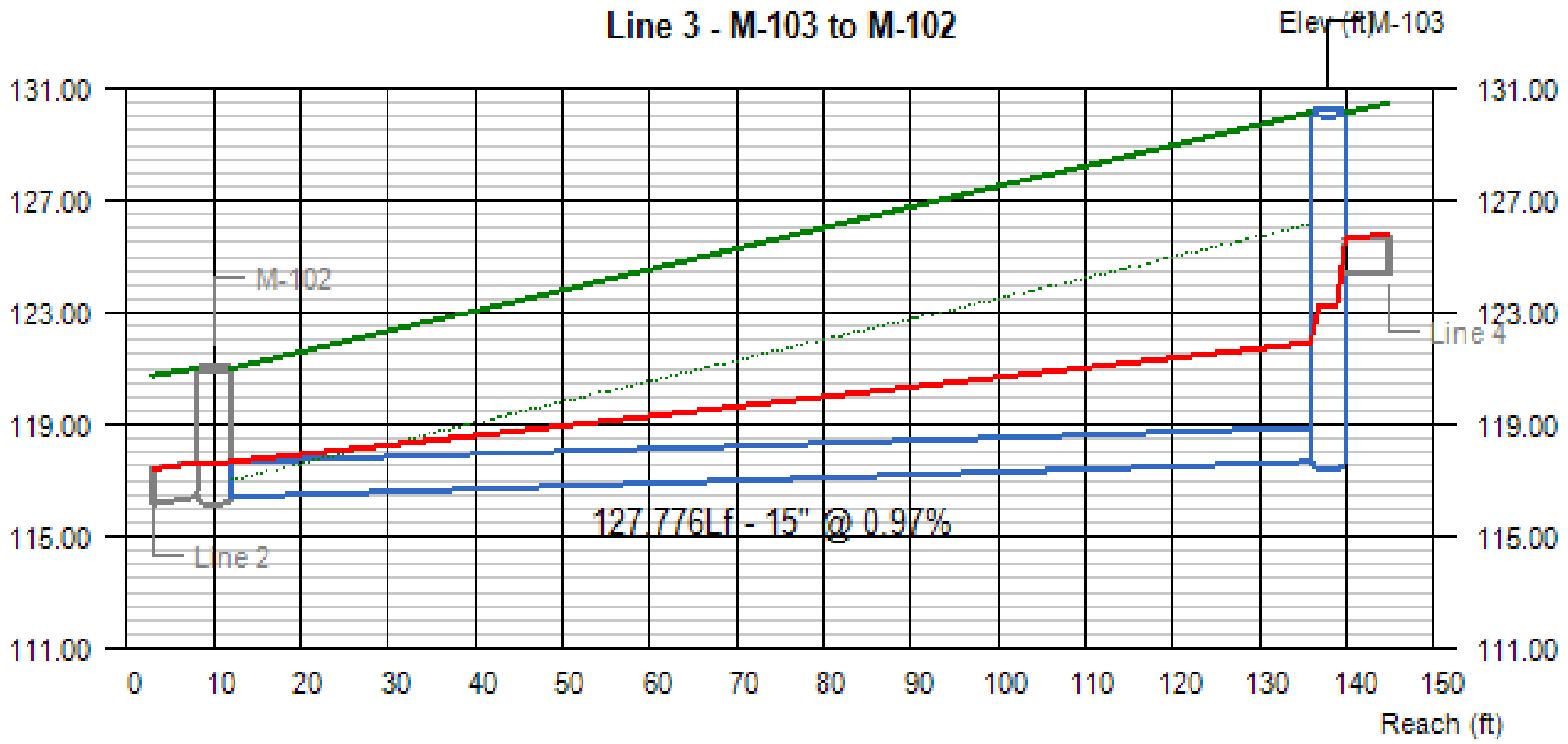
Line Profile (Line 2) - M-102 to M-101



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
2	11.78	100.00	116.40	1.25	1.21	1.21	103.26	117.61 j	117.61	9.60	9.68	3.25	3.35

Project File: | No. Lines: 17 | Run Date: 2/28/2024

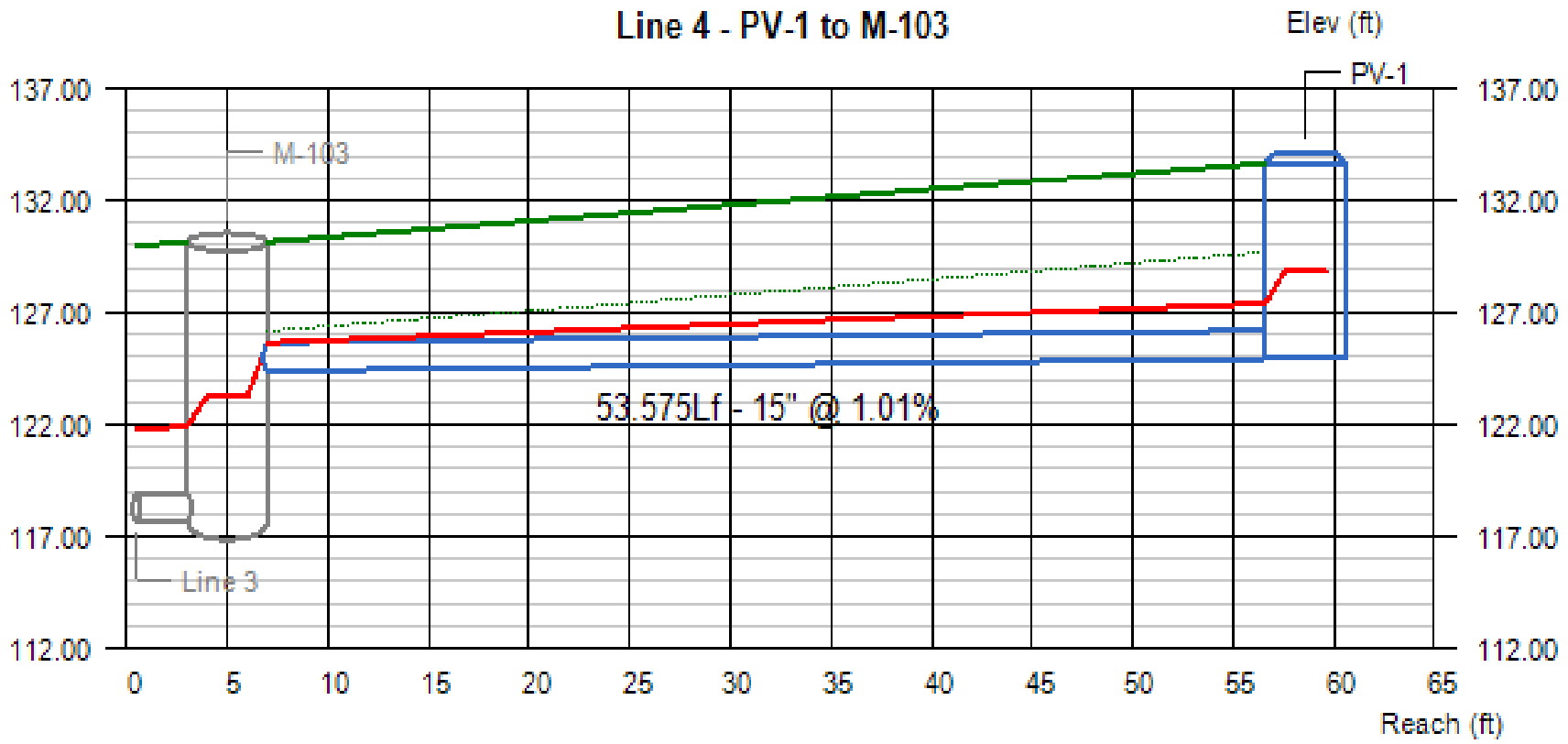
Line Profile (Line 3) - M-103 to M-102



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
3	11.78	116.41	117.65	1.25	1.25	5.62	117.66	121.91	123.27	9.60	9.60	3.34	11.25

Project File: | No. Lines: 17 | Run Date: 2/28/2024

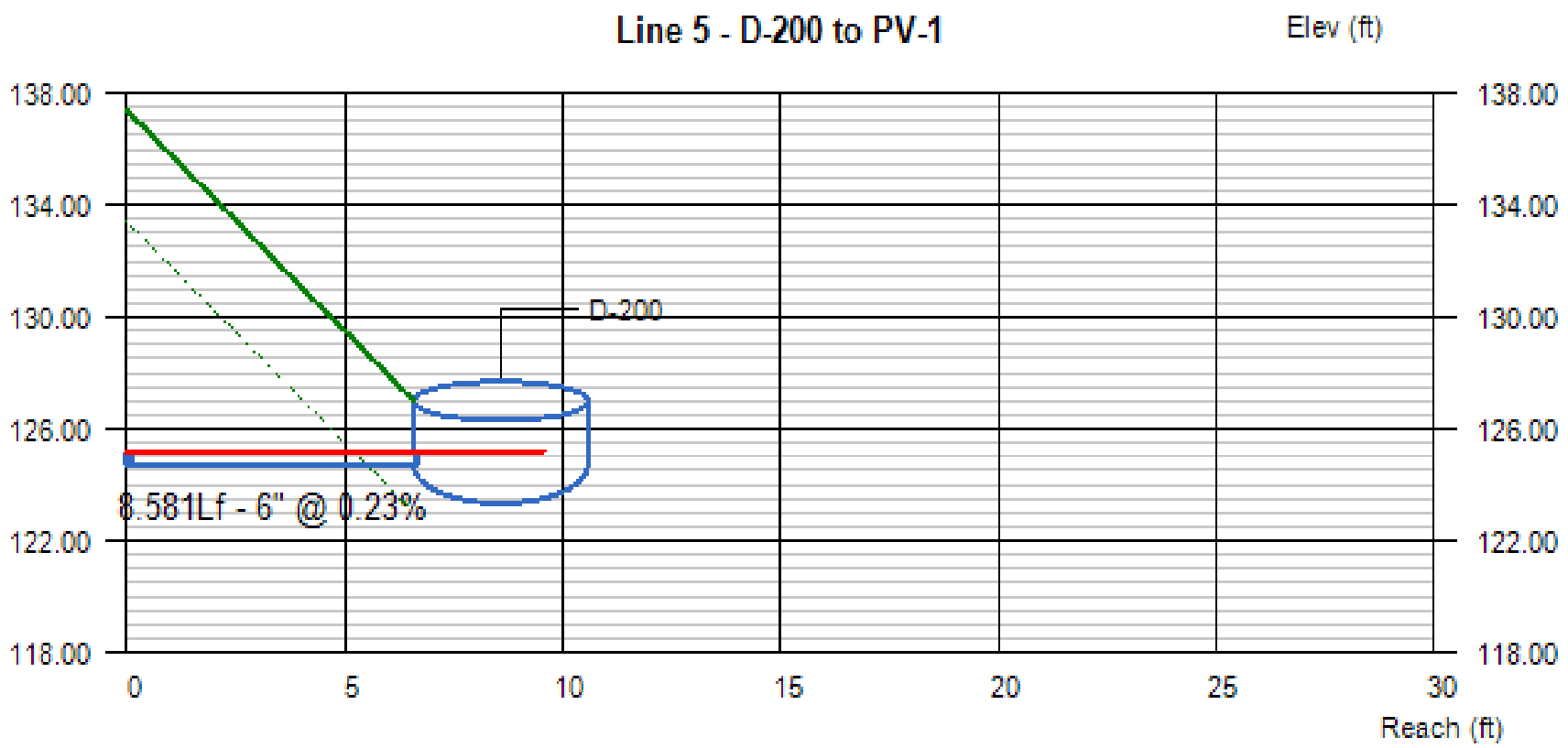
Line Profile (Line 4) - PV-1 to M-103



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
4	11.78	124.39	124.93	1.25	1.25	3.93	125.64	127.42	128.86	9.60	9.60	4.51	7.50

Project File: | No. Lines: 17 | Run Date: 2/28/2024

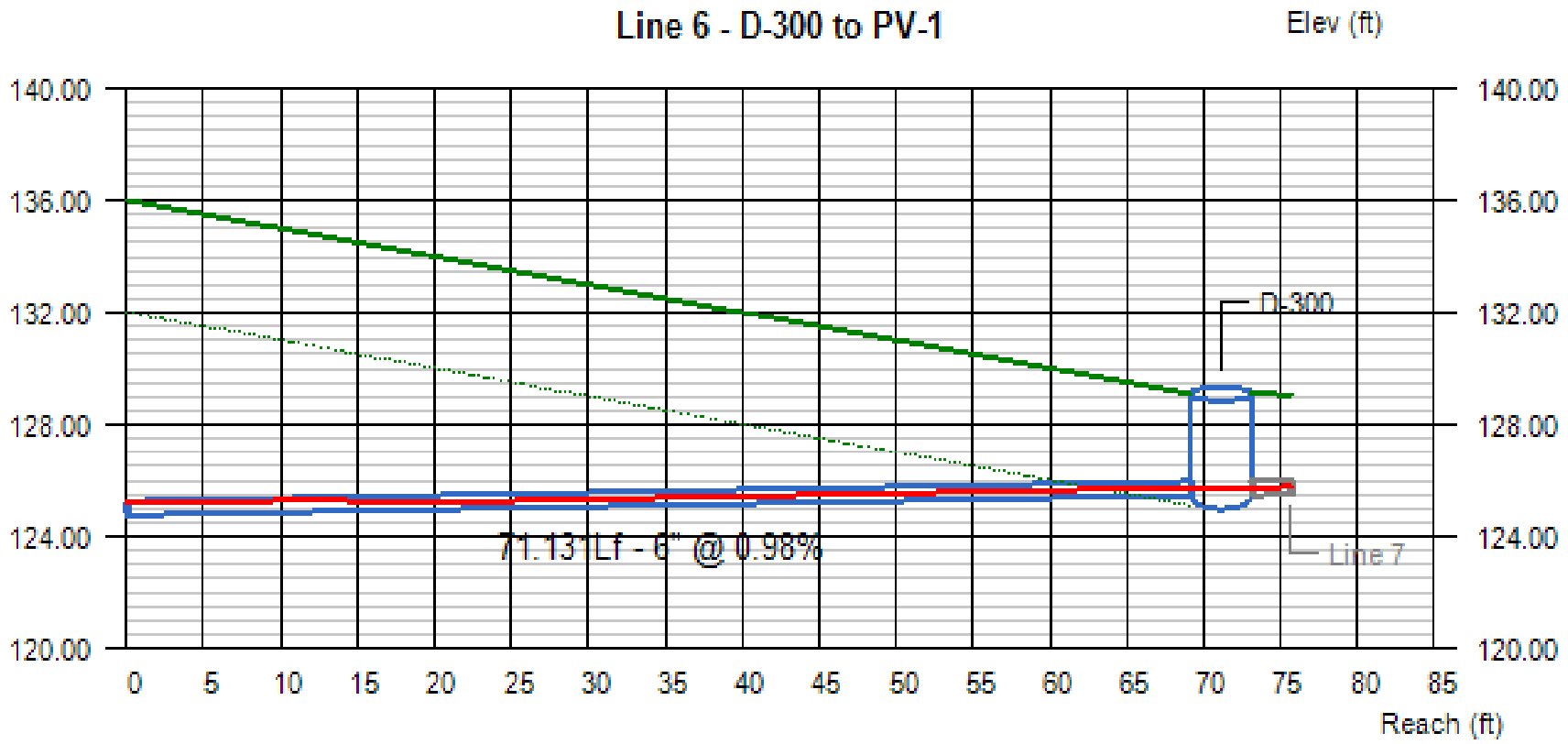
Line Profile (Line 5) - D-200 to PV-1



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
5	0.25	124.68	124.70	0.50	0.49	0.52	125.18	125.19	125.22	1.30	1.30	12.22	1.80

Project File: | No. Lines: 17 | Run Date: 2/28/2024

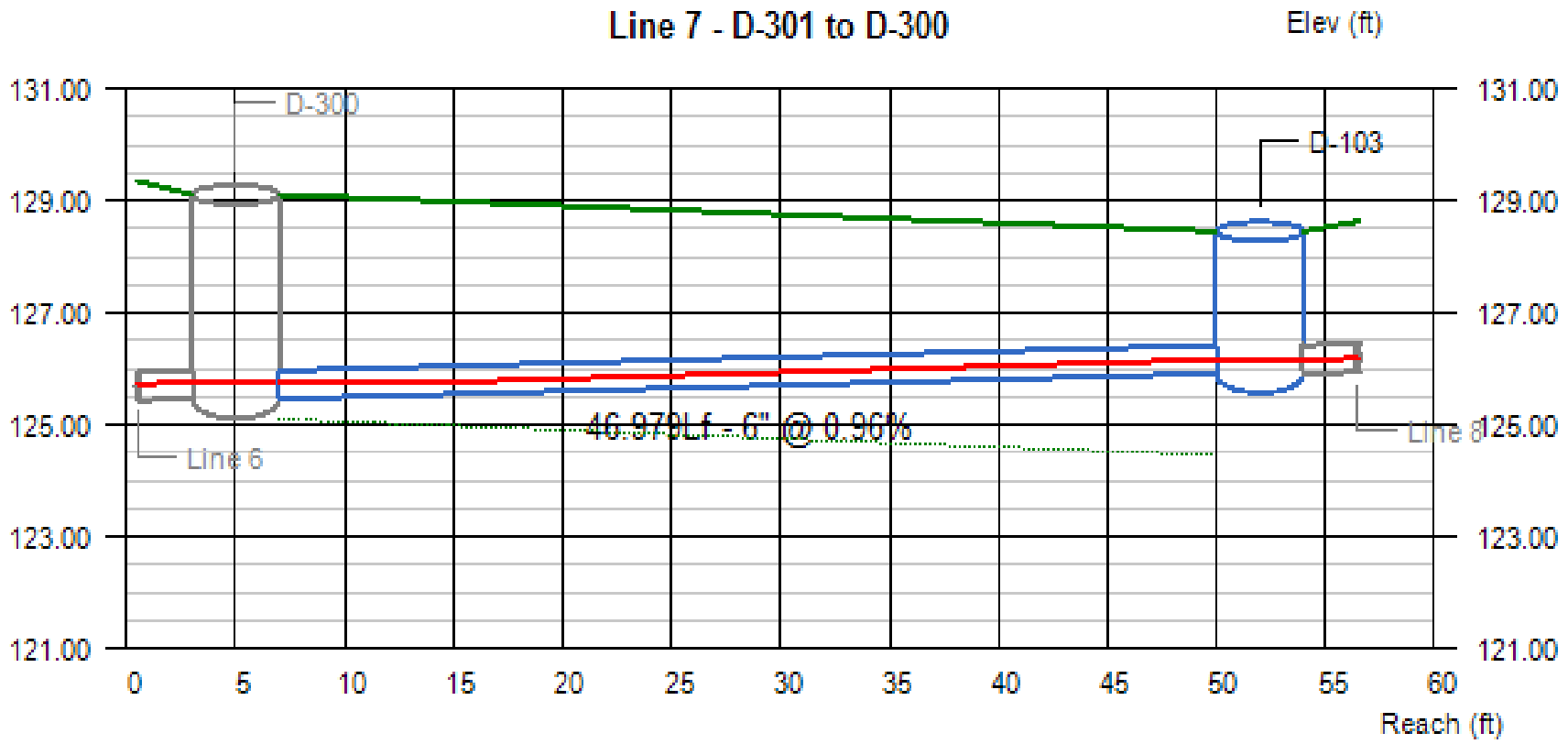
Line Profile (Line 6) - D-300 to PV-1



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
6	0.32	124.76	125.46	0.50	0.29	0.29	125.26	125.75 j	125.75	1.62	2.75	10.74	3.14

Project File: | No. Lines: 17 | Run Date: 2/28/2024

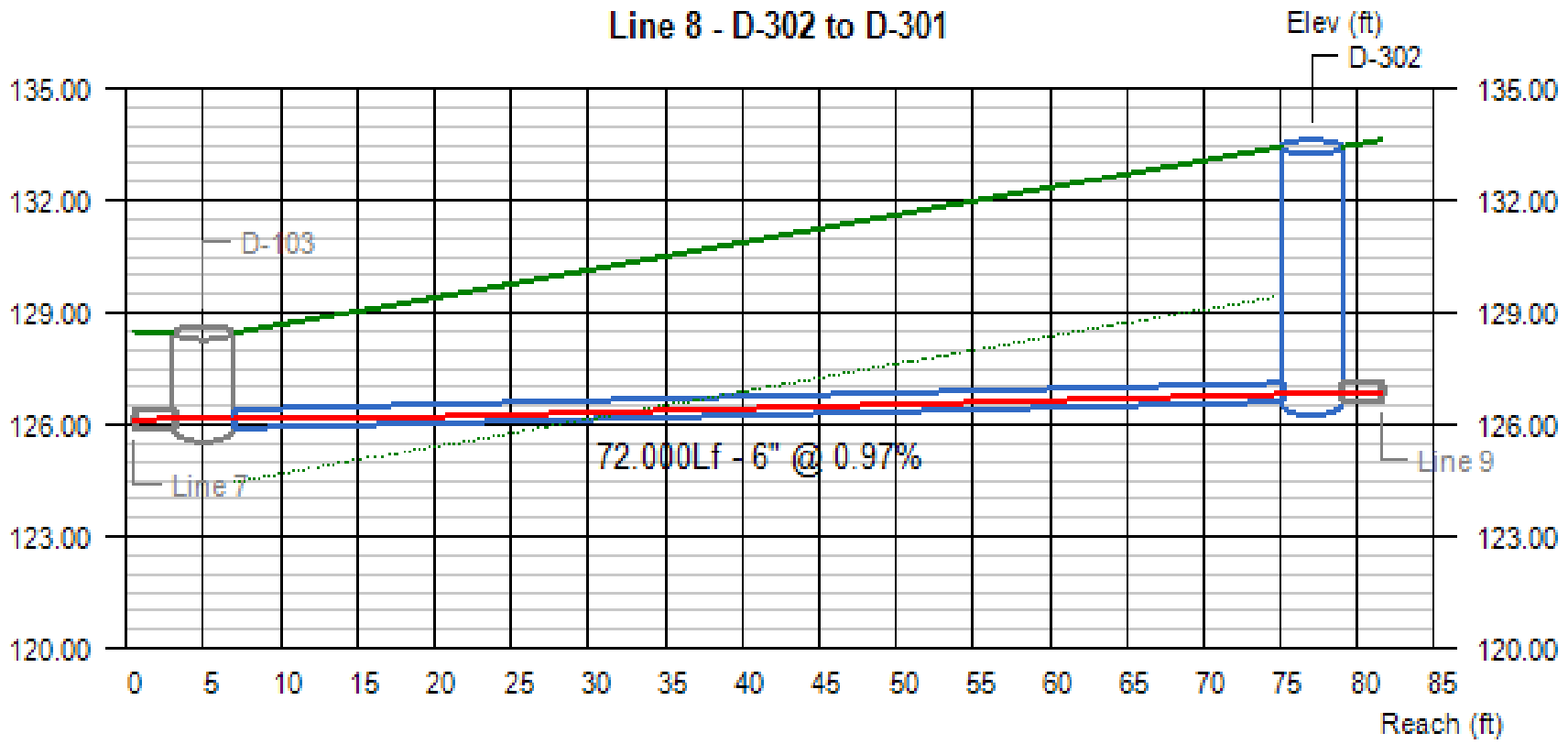
Line Profile (Line 7) - D-301 to D-300



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
7	0.24	125.46	125.91	0.29	0.25	0.25	125.75	126.16 j	126.16	2.10	2.50	3.14	2.04

Project File: | No. Lines: 17 | Run Date: 2/28/2024

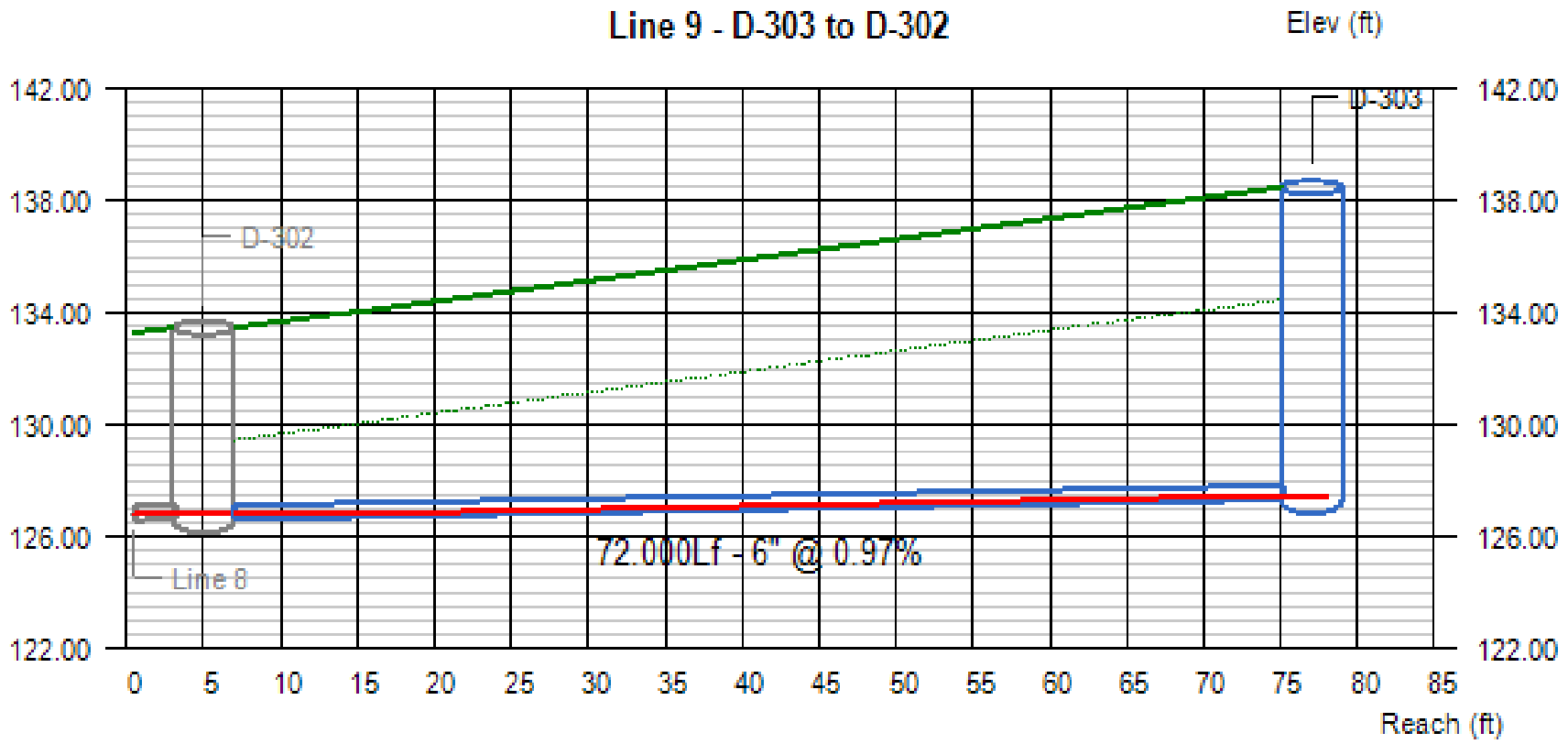
Line Profile (Line 8) - D-302 to D-301



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
8	0.17	125.91	126.61	0.25	0.20	0.20	126.16	126.81 j	126.81	1.71	2.22	2.04	6.34

Project File: | No. Lines: 17 | Run Date: 2/28/2024

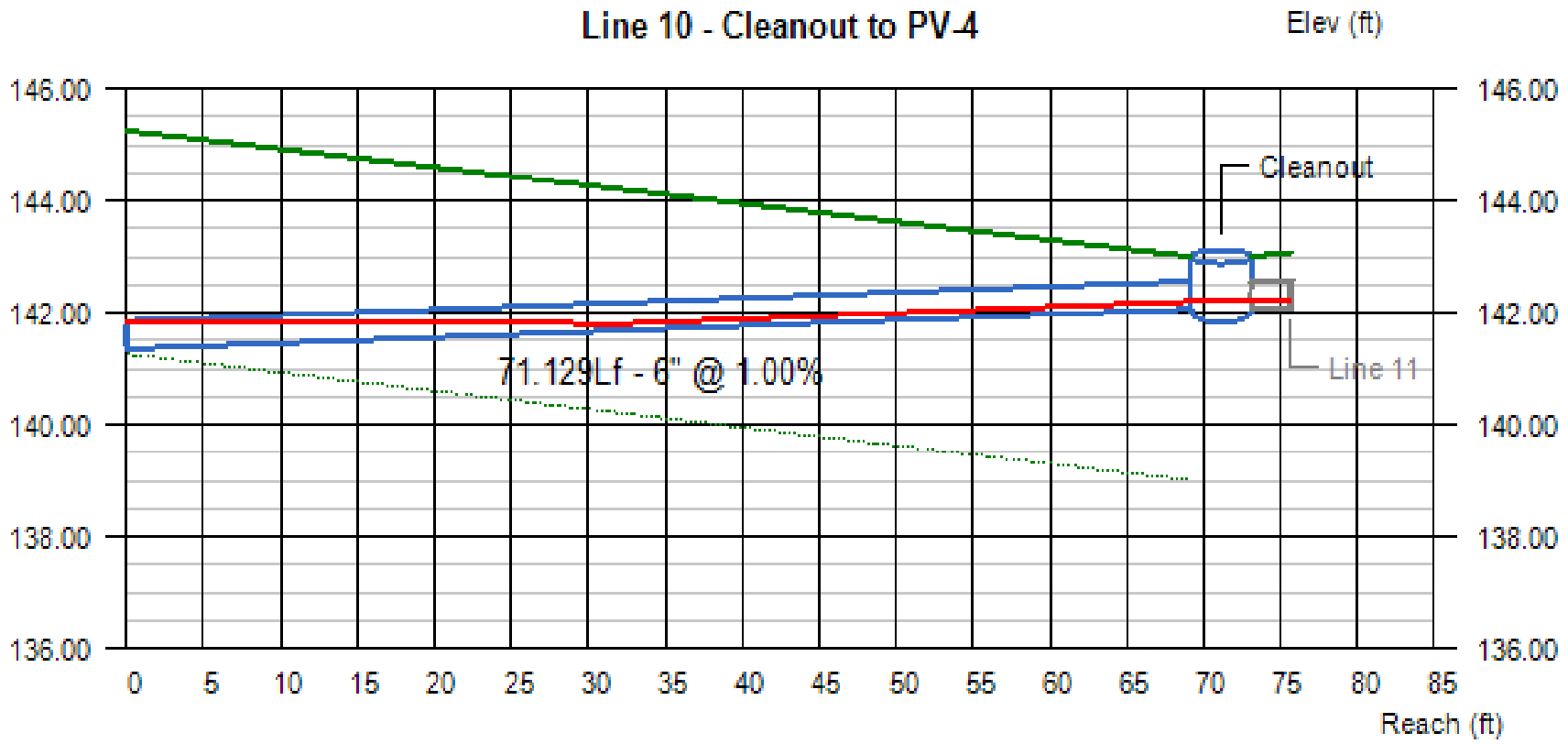
Line Profile (Line 9) - D-303 to D-302



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
9	0.09	126.61	127.31	0.20	0.14	0.14	126.81	127.45 j	127.45	1.16	1.83	6.34	10.65

Project File:	No. Lines: 17	Run Date: 2/28/2024

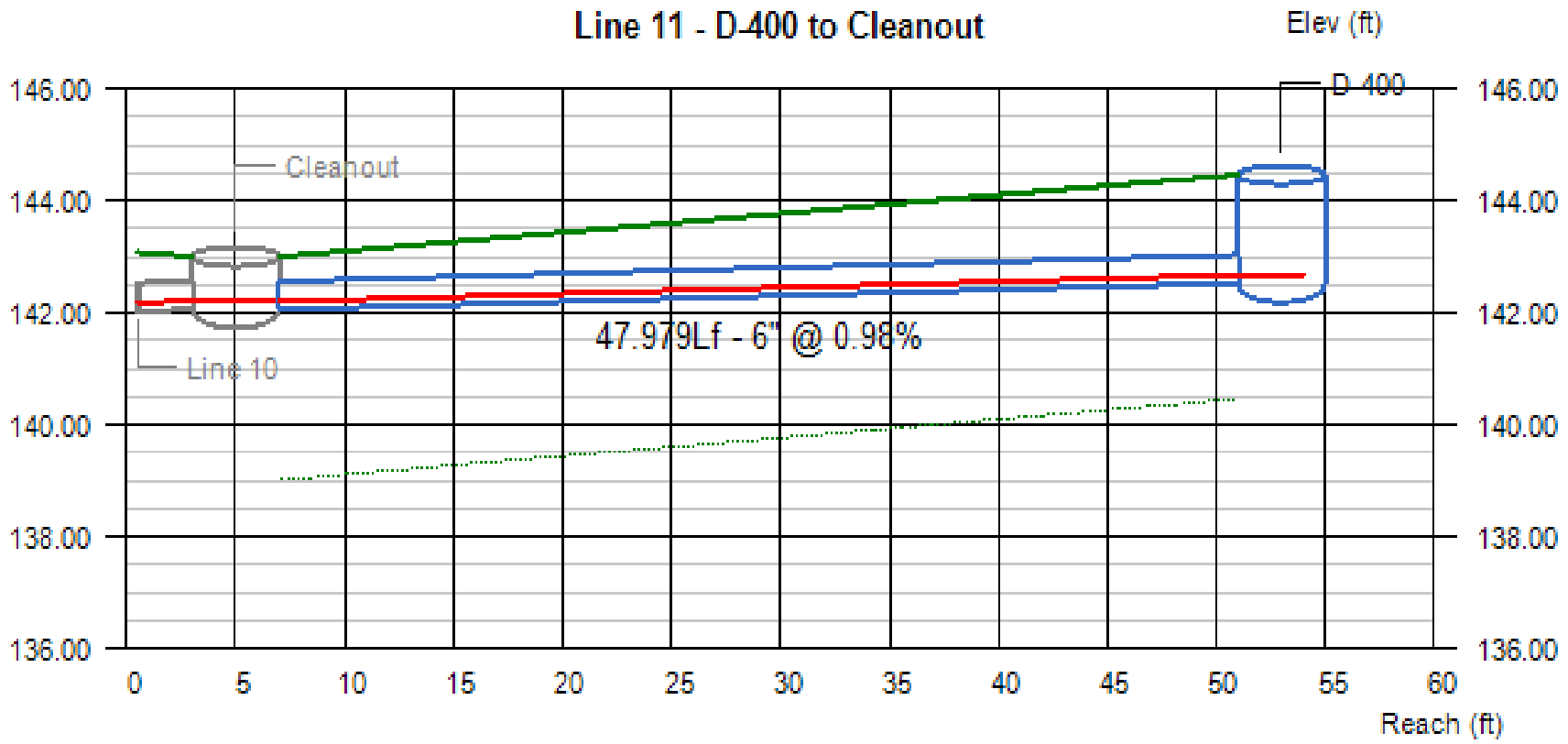
Line Profile (Line 10) - Cleanout to PV-4



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
10	0.09	141.35	142.06	0.50	0.14	0.14	141.85	142.20 j	142.20	0.43	1.83	3.40	0.44

Project File: | No. Lines: 17 | Run Date: 2/28/2024

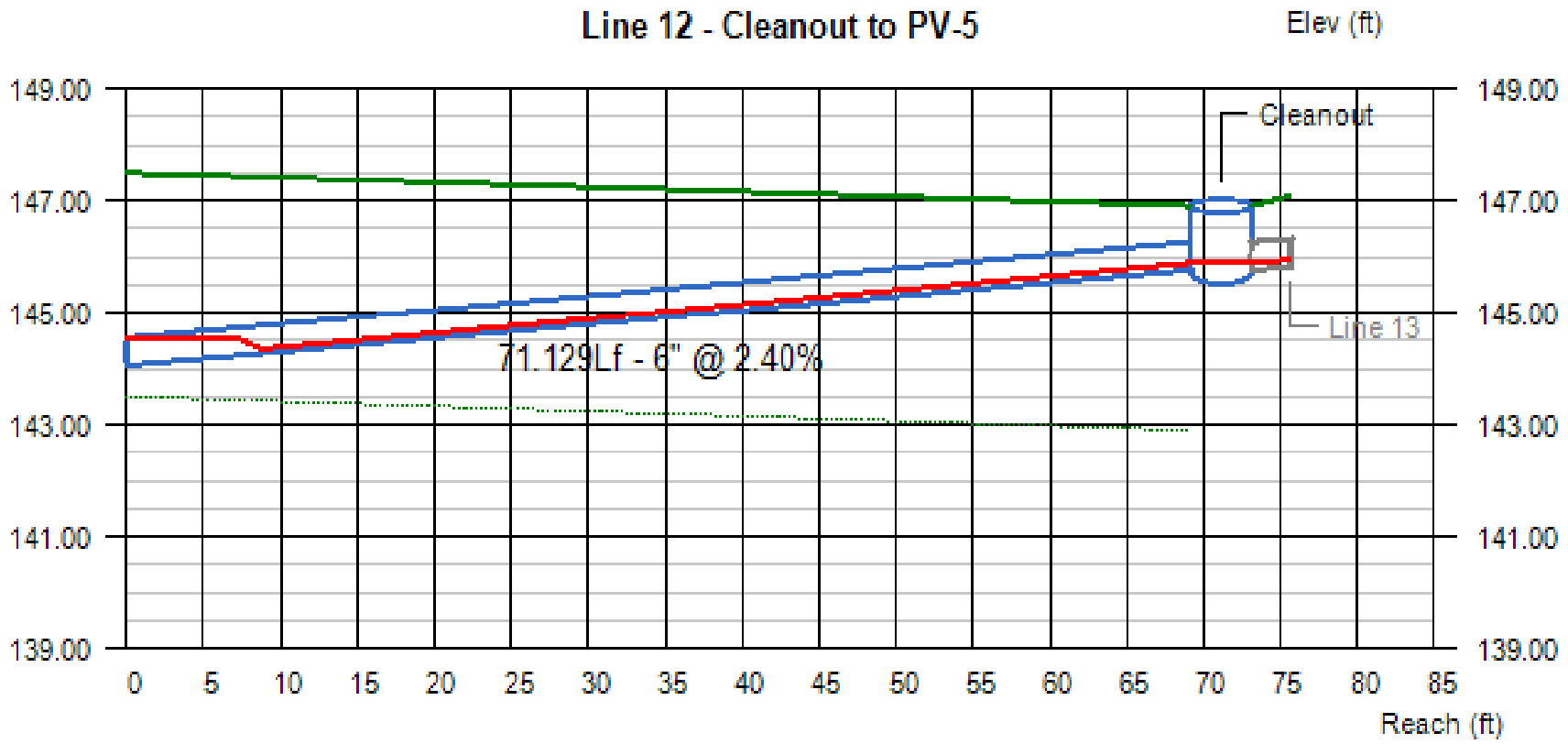
Line Profile (Line 11) - D-400 to Cleanout



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
11	0.09	142.06	142.53	0.14	0.14	0.14	142.20	142.67	142.67	1.85	1.83	0.44	1.43

Project File: | No. Lines: 17 | Run Date: 2/28/2024

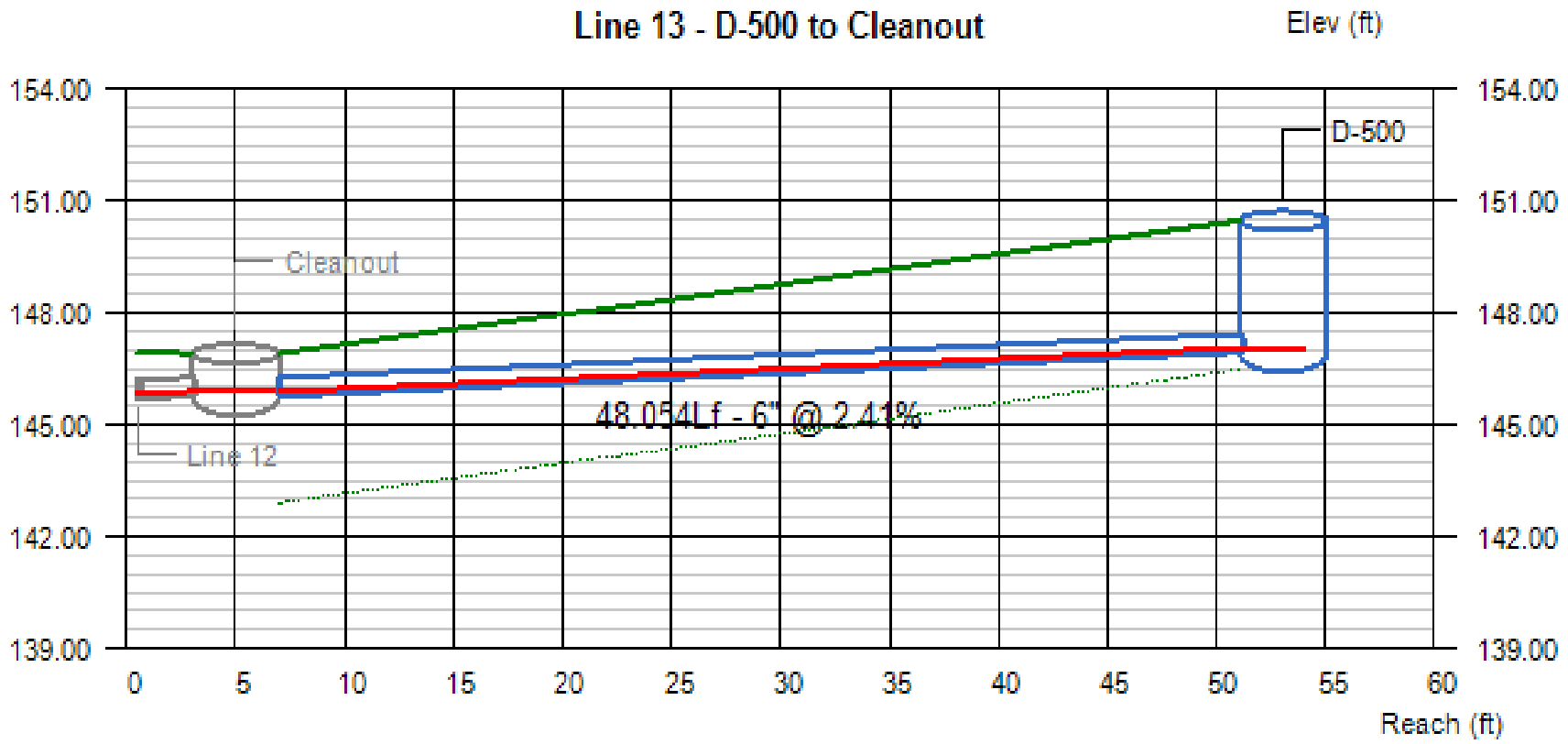
Line Profile (Line 12) - Cleanout to PV-5



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
12	0.07	144.05	145.76	0.50	0.13	0.13	144.55	145.89 j	145.89	0.33	1.70	2.95	0.64

Project File: | No. Lines: 17 | Run Date: 2/28/2024

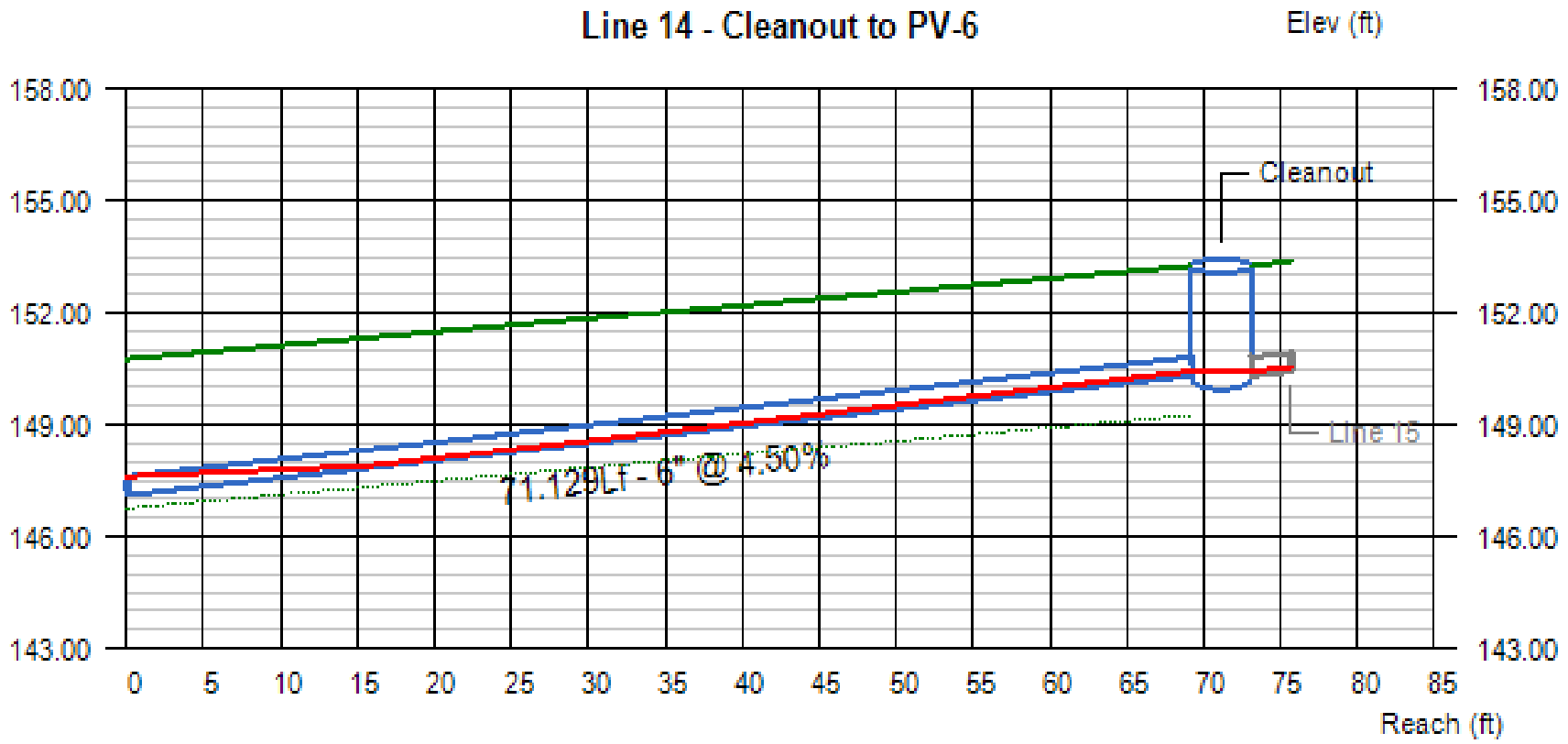
Line Profile (Line 13) - D-500 to Cleanout



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
13	0.07	145.76	146.92	0.13	0.13	0.13	145.89	147.05	147.05	1.72	1.71	0.64	3.04

Project File: | No. Lines: 17 | Run Date: 2/28/2024

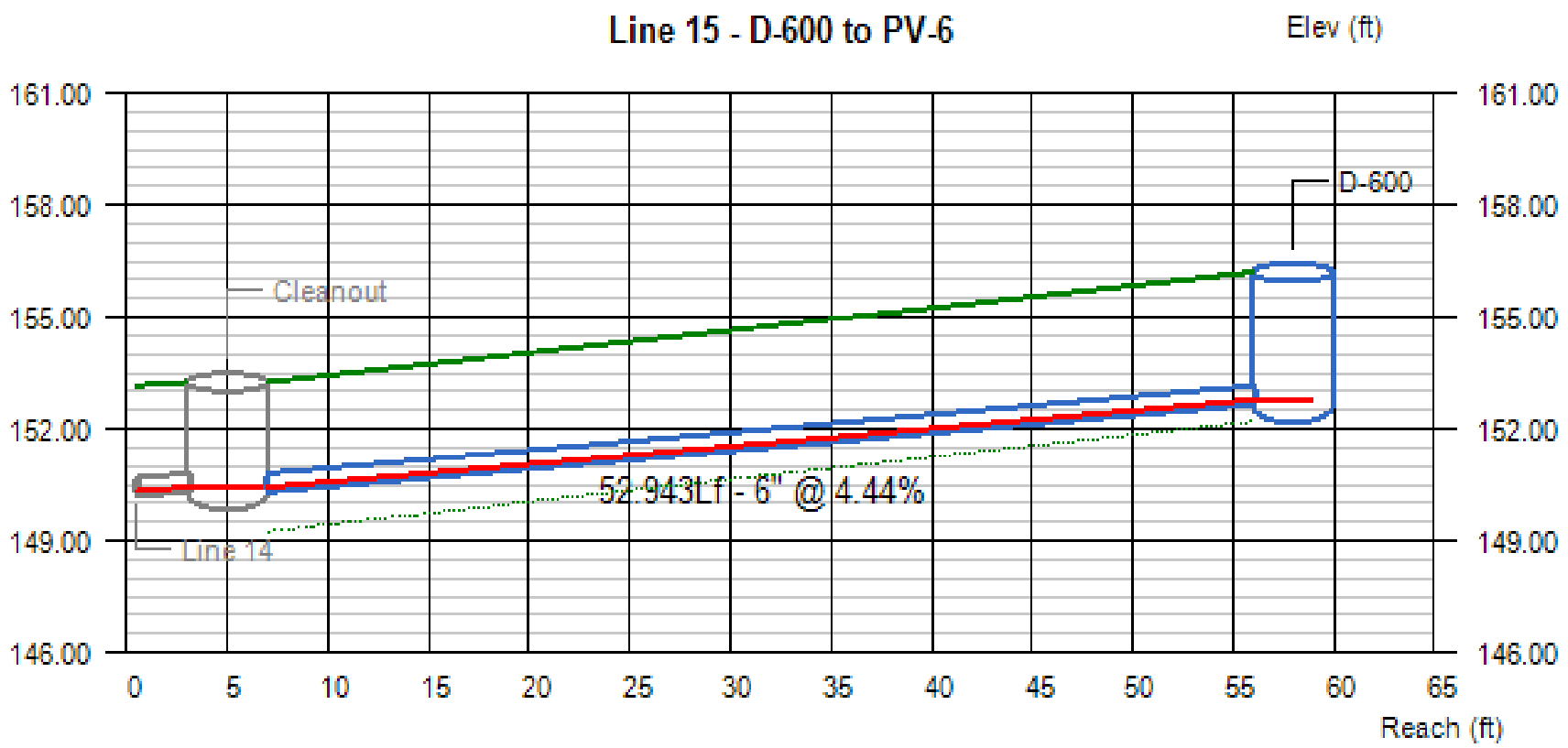
Line Profile (Line 14) - Cleanout to PV-6



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
14	0.07	147.10	150.30	0.50	0.13	0.13	147.60	150.43 j	150.43	0.33	1.70	3.15	2.45

Project File: | No. Lines: 17 | Run Date: 2/28/2024

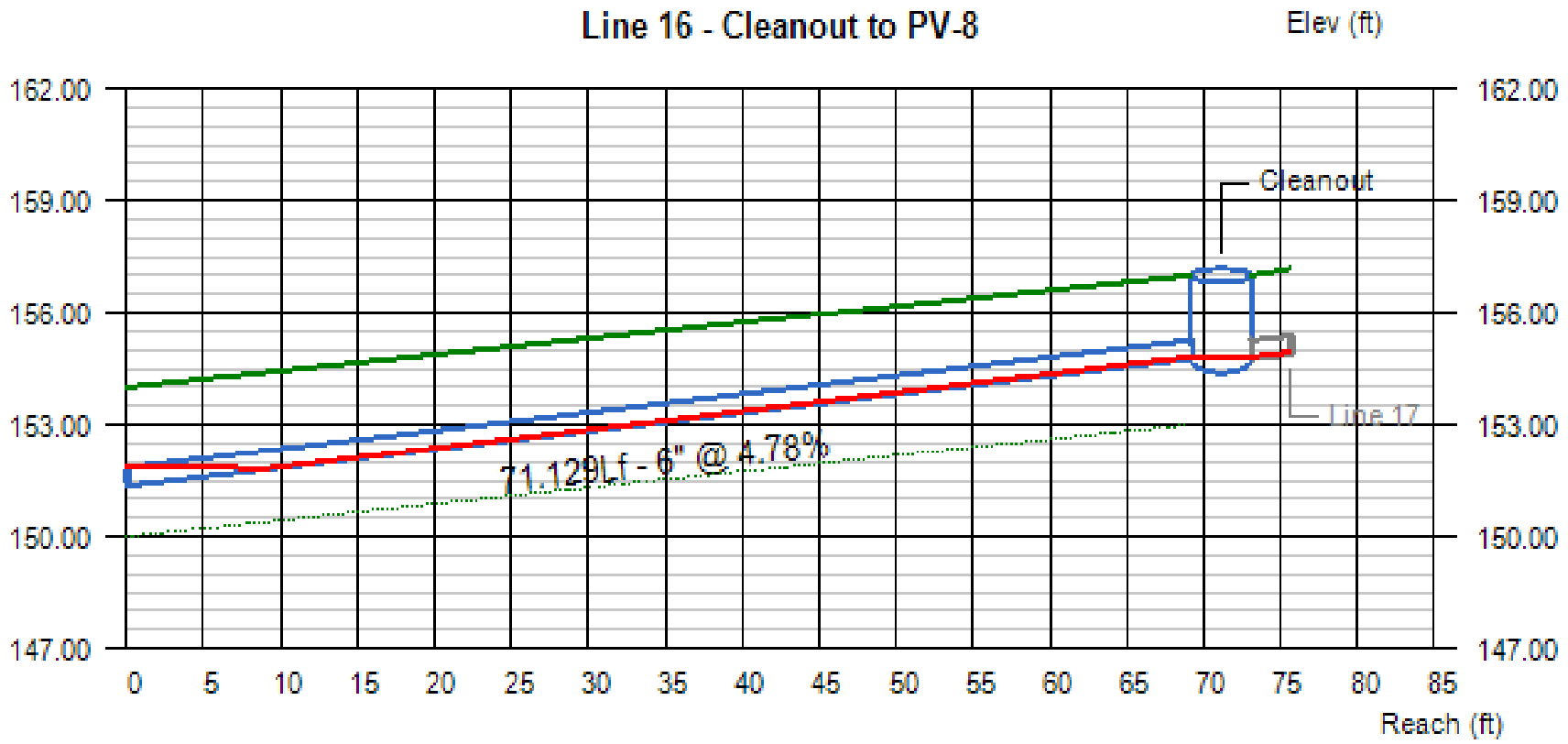
Line Profile (Line 15) - D-600 to PV-6



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
15	0.07	150.30	152.65	0.13	0.13	0.13	150.43	152.78	152.78	1.73	1.71	2.45	3.05

Project File: | No. Lines: 17 | Run Date: 2/28/2024

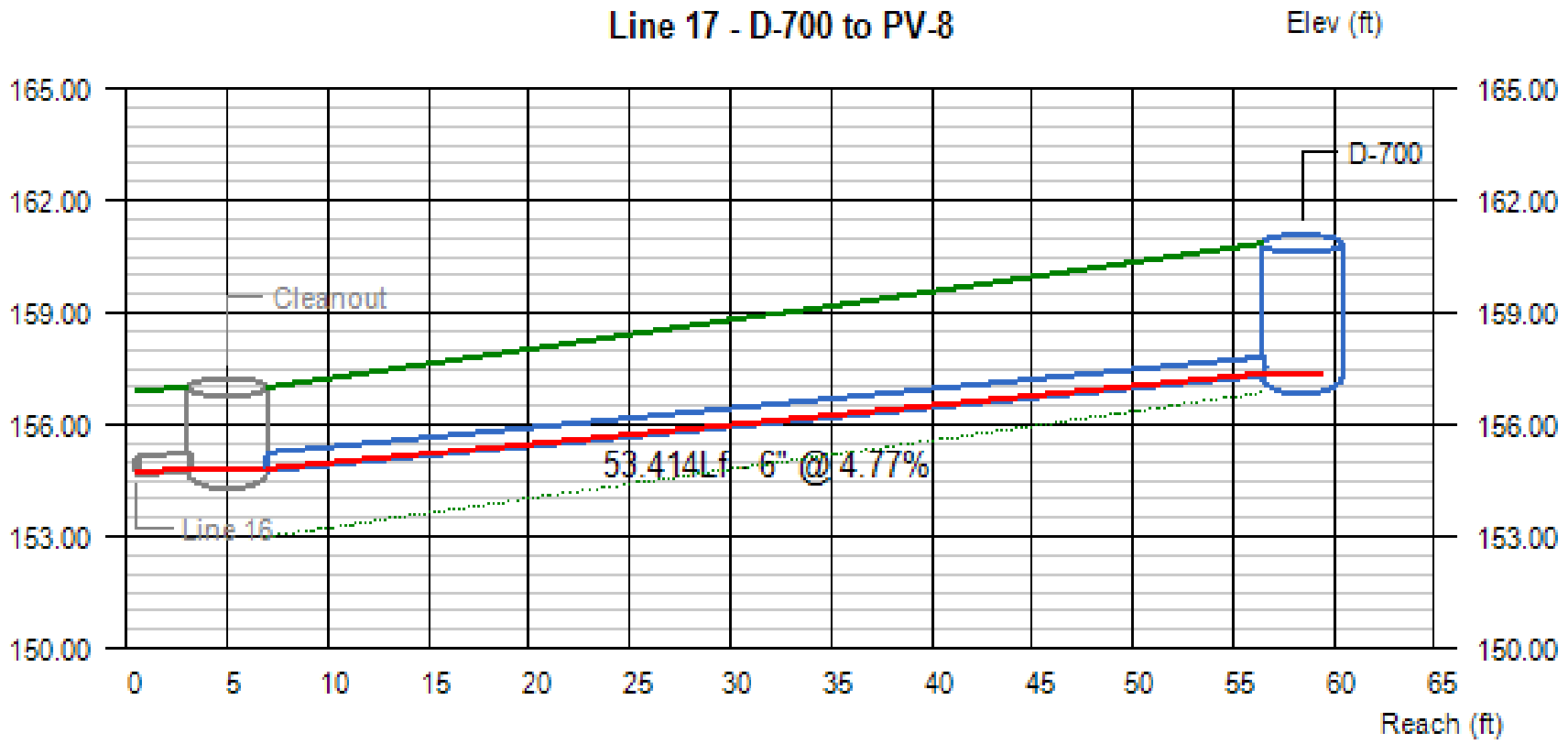
Line Profile (Line 16) - Cleanout to PV-8



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
16	0.02	151.35	154.75	0.50	0.06	0.06	151.85	154.81 j	154.81	0.08	1.15	2.15	1.75

Project File: | No. Lines: 17 | Run Date: 2/28/2024

Line Profile (Line 17) - D-700 to PV-8



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
17	0.02	154.75	157.30	0.06	0.06	0.06	154.81	157.36	157.36	1.18	1.16	1.75	3.05

Project File: | No. Lines: 17 | Run Date: 2/28/2024

INLET DRAINAGE AREAS

Area P-11 D-200

Cover	Area (SF)	Area (acres)	% of Total	C	Weighted C
Impervious	0	0.000	0.0%	0.99	0.00
Lawns	7,108	0.163	100.0%	0.25	0.25
Total Area	7,108	0.163			0.25

Area P-IH D-300

Cover	Area (SF)	Area (acres)	% of Total	C	Weighted C
Impervious	529	0.012	53.9%	0.99	0.53
Lawns	452	0.010	46.1%	0.25	0.12
Total Area	981	0.023			0.65

Area P-IH D-301

Cover	Area (SF)	Area (acres)	% of Total	C	Weighted C
Impervious	180	0.004	11.2%	0.99	0.11
Lawns	1,427	0.033	88.8%	0.25	0.22
Total Area	1,607	0.037			0.33

Area P-IH D-302

Cover	Area (SF)	Area (acres)	% of Total	C	Weighted C
Impervious	180	0.004	10.8%	0.99	0.11
Lawns	1,479	0.034	89.2%	0.25	0.22
Total Area	1,659	0.038			0.33

Area P-IH D-303

Cover	Area (SF)	Area (acres)	% of Total	C	Weighted C
Impervious	180	0.004	11.7%	0.99	0.12
Lawns	1,364	0.031	88.3%	0.25	0.22
Total Area	1,544	0.035			0.34

Area P-IE D-400

Cover	Area (SF)	Area (acres)	% of Total	C	Weighted C
Impervious	180	0.004	11.7%	0.99	0.12
Lawns	1,364	0.031	88.3%	0.25	0.22
Total Area	1,544	0.035			0.34

Area P-ID D-500

Cover	Area (SF)	Area (acres)	% of Total	C	Weighted C
Impervious	180	0.004	13.2%	0.99	0.13
Lawns	1,180	0.027	86.8%	0.25	0.22
Total Area	1,360	0.031			0.35

Area P-IC D-600

Cover	Area (SF)	Area (acres)	% of Total	C	Weighted C
Impervious	179	0.004	12.9%	0.99	0.13
Lawns	1,208	0.028	87.1%	0.25	0.22
Total Area	1,387	0.032			0.35

Area P-IA D-700

Cover	0.0.037	Area (acres)	% of Total	C	Weighted C
Impervious	0	0.000	0.0%	0.99	0.00
Lawns	492	0.011	100.0%	0.25	0.25
Total Area	492	0.011			0.25

APPENDIX E
DRAINAGE AREA MAPS

INVENTORY

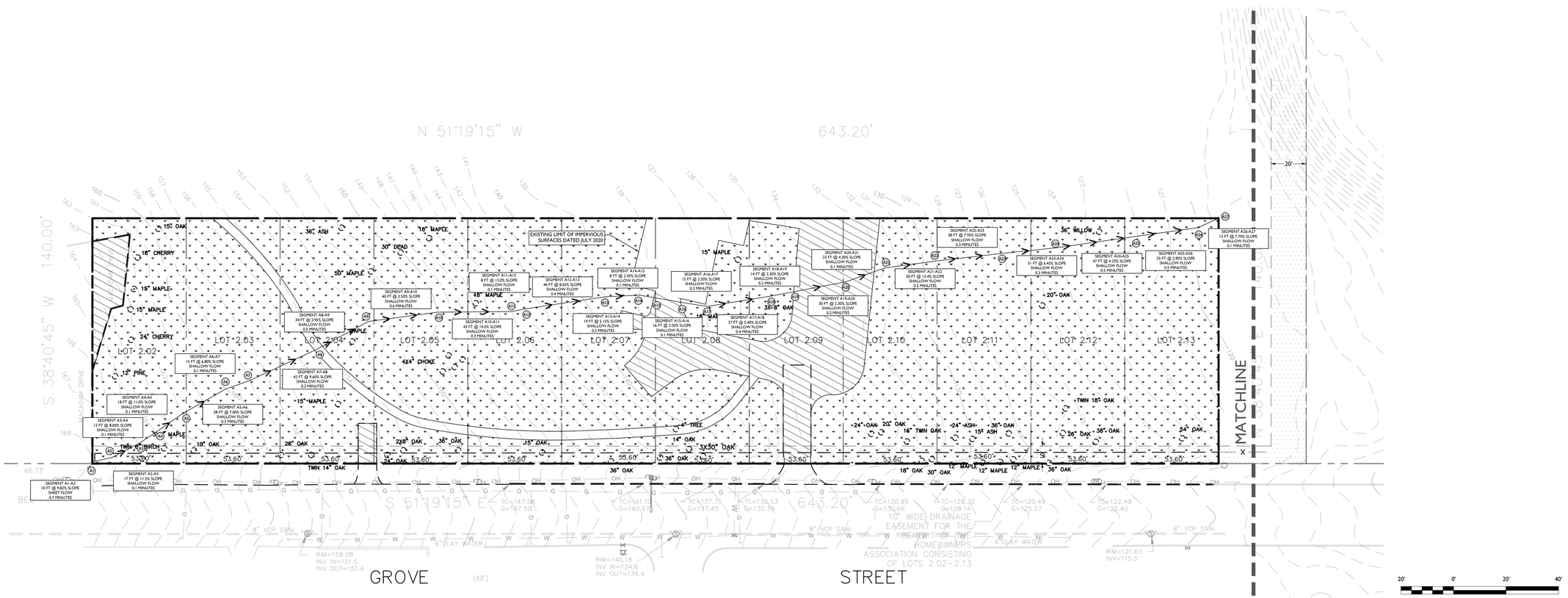
SHEET 1 OF 4: EXISTING DRAINAGE AREA MAP

SHEET 2 OF 4: PROPOSED DRAINAGE AREA MAP

SHEET 3 OF 4: WATER QUALITY DRAINAGE AREA MAP

SHEET 4 OF 4: INLET DRAINAGE AREA MAP

SYMBOL	DESCRIPTION
	EXISTING DRAINAGE AREA
	EXISTING PERVIOUS AREA
	EXISTING MOTOR VEHICLE SURFACE
	EXISTING TIME OF CONCENTRATION PATH



ISSUE	DATE	BY	DESCRIPTION
01	03/18/2024	SZ	FINAL MAJOR SITE PLAN SUBMISSION

NOT APPROVED FOR CONSTRUCTION

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Phone 201.340.4468 · Fax 201.340.4472

DRAINAGE AREA MAPS

VILLANI BUILDERS
PROPOSED RESIDENTIAL DEVELOPMENT

BLOCK 110, LOTS 2.02 TO 2.13
430 GROVE STREET, NORTH PLAINFIELD
CITY OF NORTH PLAINFIELD
SOMERSET COUNTY, NEW JERSEY

JOSHUA H. KLINE, P.E.
NEW JERSEY LICENSE No. 54347
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: 1" = 40' | PROJECT ID: RUT-230102

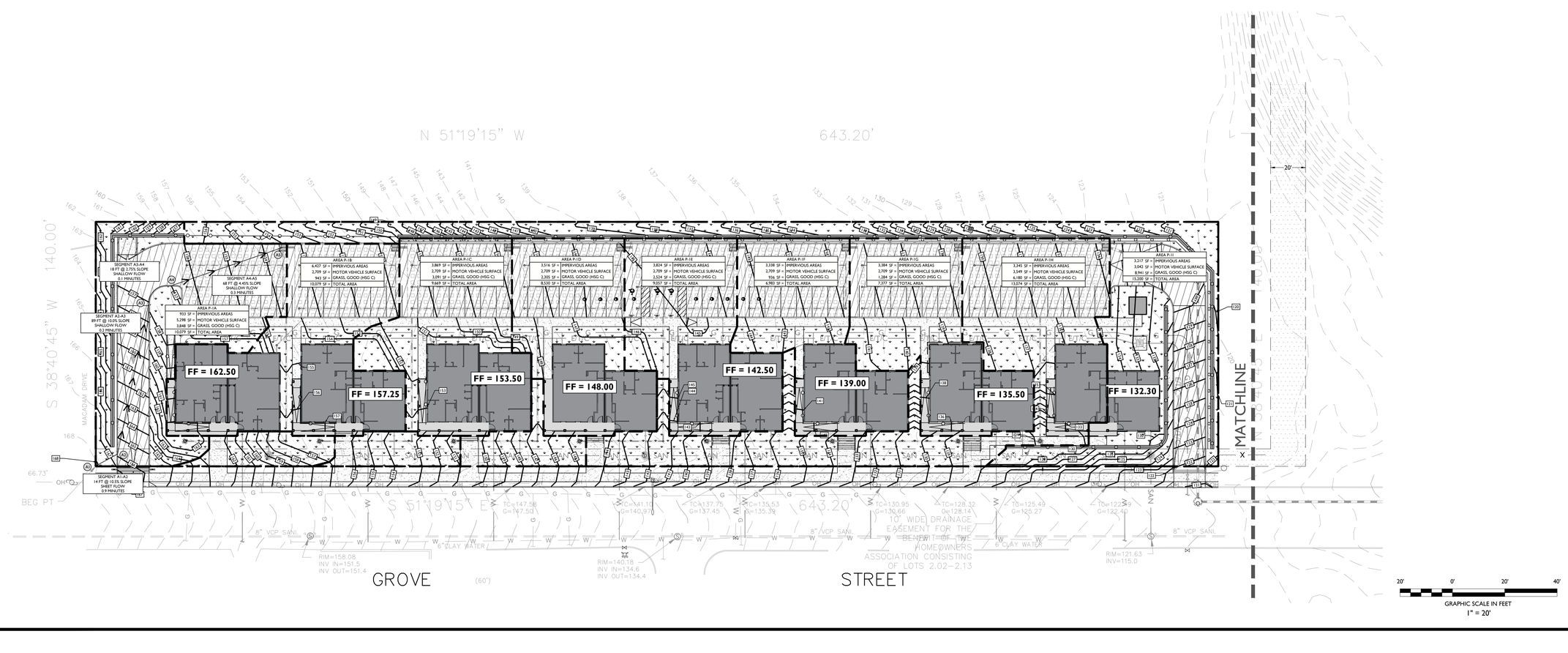
TITLE:

EXISTING DRAINAGE AREA MAP

DRAWING:

1 OF 4

SYMBOL	DESCRIPTION
	PROPOSED DRAINAGE AREA
	PROPOSED PERVIOUS AREA
	NEW MOTOR VEHICLE SURFACE
	PROPOSED TIME OF CONCENTRATION PATH



ISSUE	DATE	BY	DESCRIPTION
01	03/18/2024	SZ	FINAL MAJOR SITE PLAN SUBMISSION

NOT APPROVED FOR CONSTRUCTION

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Phone 201.340.4468 · Fax 201.340.4472

DRAINAGE AREA MAPS

VILLANI BUILDERS
PROPOSED RESIDENTIAL DEVELOPMENT

BLOCK 110, LOTS 2.02 TO 2.13
430 GROVE STREET & 1 NORTH PLAINFIELD
AVENUE, CITY OF NORTH PLAINFIELD
SOMERSET COUNTY, NEW JERSEY

JOSHUA H. KLINE, P.E.
NEW JERSEY LICENSE No. 54347
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: 1" = 40' | PROJECT ID: RUT-230101

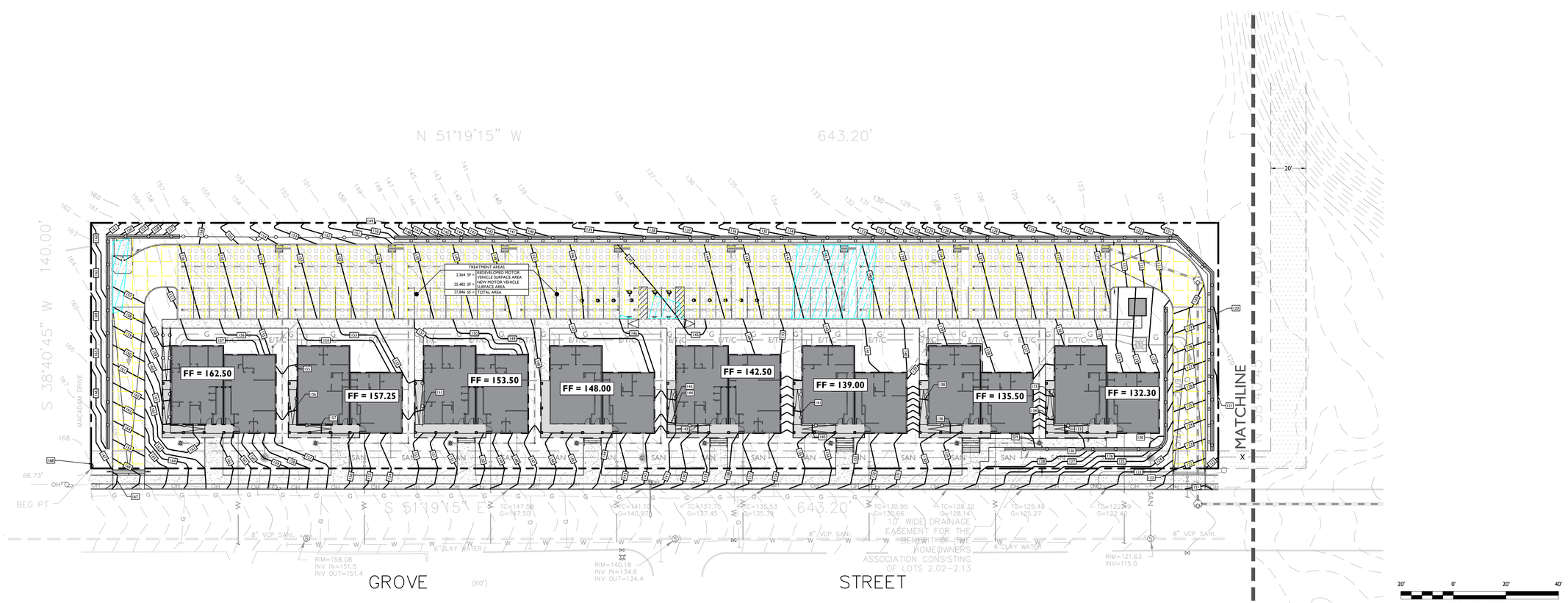
TITLE:

PROPOSED DRAINAGE AREA MAP

DRAWING:

2 OF 4

SYMBOL	DESCRIPTION
	PROPOSED DRAINAGE AREA
	ADJACENT PROPERTY LINE
	REDEVELOPED MOTOR VEHICLE SURFACE
	NEW MOTOR VEHICLE SURFACE



ISSUE	DATE	BY	DESCRIPTION
01	03/18/2024	SZ	FINAL MAJOR SITE PLAN SUBMISSION

NOT APPROVED FOR CONSTRUCTION

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Phone 201.340.4468 · Fax 201.340.4472

DRAINAGE AREA MAPS

VILLANI BUILDERS
PROPOSED RESIDENTIAL DEVELOPMENT

BLOCK 110, LOTS 2.02 TO 2.13
430 GROVE STREET NORTH PLAINFIELD
TOWNSHIP OF NORTH PLAINFIELD
SOMERSET COUNTY, NEW JERSEY

JOSHUA H. KLINE, P.E.
NEW JERSEY LICENSE No. 54347
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: 1" = 40' | PROJECT ID: RUT-230101

TITLE:

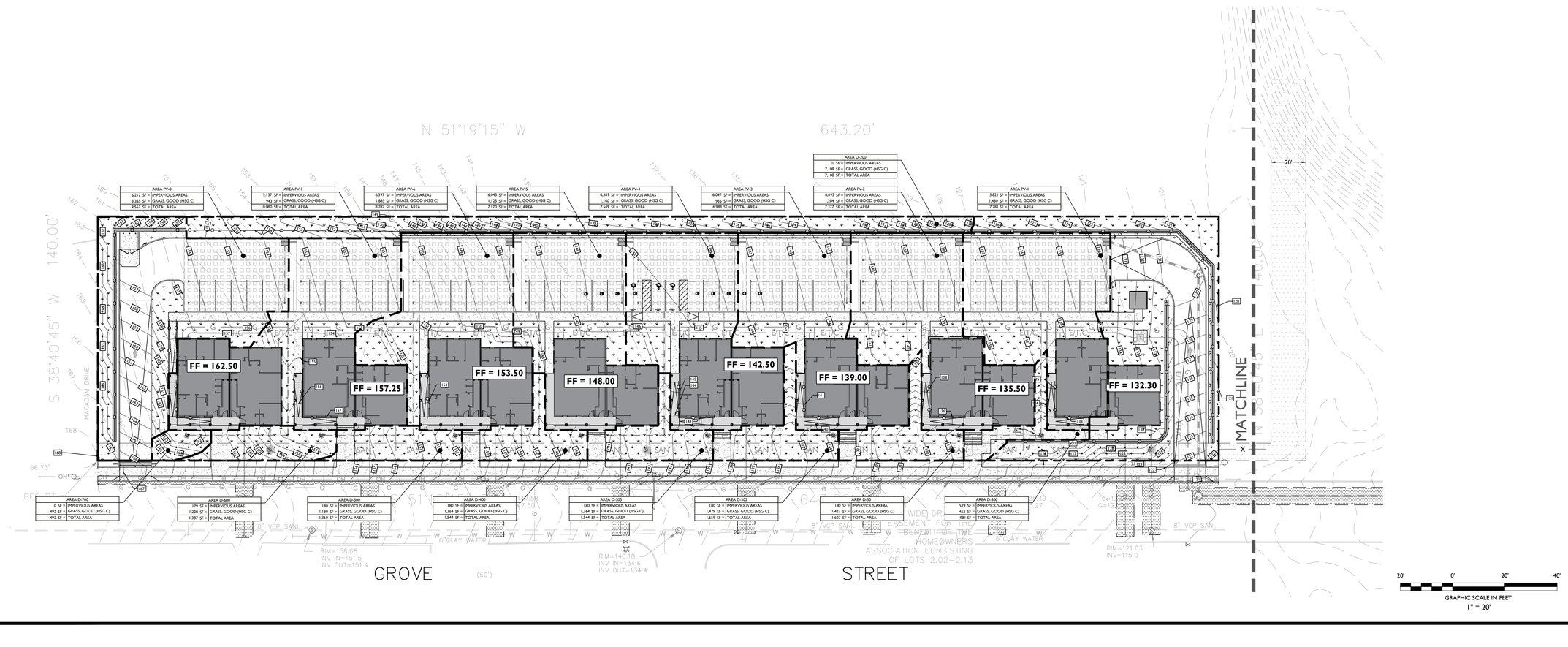
STORMWATER QUALITY MAP

DRAWING:

3 OF 4

Z:\PROJECTS\PROJECTS\2023\PN-230101 TAYLOR ARCHITECTURE - 430 GROVE STREET, NORTH PLAINFIELD, NJ\CAD\DESIGN\STORMWATER\DRAINAGE AREA MAPS\2024-03-28_DRAINAGE AREA MAPS.DWG

SYMBOL	DESCRIPTION
	PROPOSED INLET DRAINAGE AREA
	PROPOSED PERVIOUS AREA



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DRAINAGE AREA MAPS

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SCALE: 1" = 40' | PROJECT ID: RUT-230101

TITLE:

INLET DRAINAGE AREA MAP

DRAWING:

4 OF 4

Z:\PROJECTS\PROJECTS\2023\RUT-230101 TAYLOR ARCHITECTURE - 430 GROVE STREET, NORTH PLAINFIELD, NJ\CAD\DESIGN\TECH\DRAINAGE AREA MAPS\2024-03-28_DRAINAGE AREA MAPS.DWG