Project Narrative and Drainage Analysis Report

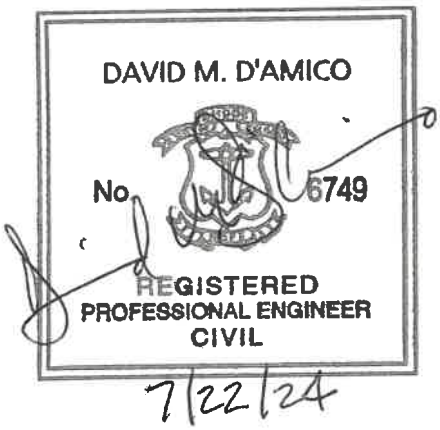
For The

New Mary E. Fogarty Elementary School

199 Oxford Street
A.P. 48, Lots 2 and 481
Providence, Rhode Island

Prepared for:

Providence School Department
717 Westminster Street
Providence, RI 02903



Prepared by:

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July 22, 2024

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1 INTRODUCTION

D'Amico Engineering Technology, Inc. (DEtec) has prepared the following project narrative and drainage analysis as required to provide information associated with the New Mary E. Fogarty Elementary School on A.P. 48, Lots 2 and 481, located at 199 Oxford Street in Providence, RI. DEtec has conducted a review of existing site conditions, site design requirements, and permit requirements with the City and State. DEtec has also visited the site and reviewed available information from the School Department and City records.

The proposed improvements to the property include the demolition of the existing school building, parking lots, walkways and playground area and construction of a new Mary E. Fogarty Elementary School in its place within the same site. A new 46,055 S,F (footprint only) elementary school building will be constructed on Lot 2 primarily within the footprint of the existing structure proper, notwithstanding the different shape. The main entrance to the school will be on the Oxford Street side with access from Ocean and Sayles Streets. Numerous playground areas are located on the site strategically located to coordinate with classroom assignments which utilize Lot 481. These playgrounds will be fenced off and landscaping will be installed throughout the school property.

An off-street parking lot is proposed for the east side of the building off Ocean Street, which will service the school along with the community rooms located in the northeast side of the building. On street parking spaces area are also provided on Ocean and Oxford Streets which abut the school property. Bus drop off/pickup will be conducted on Sayles Street with nine (9) dedicated parking spaces for bus vehicles. Parent drop off/pickup will be conducted along Oxford Street with eighteen (18) new on-street parking spaces. The building service access is located off the Sayles Street and will include a loading area with an area for a dumpster enclosure. The site will include a subsurface drainage system on the west side of the building and the new parking lot will be a permeable pavement system. The building will be serviced by all public utilities that are located in the abutting roadways with the primary connections in the Salyes Street area. It should be noted that the new school complex will reduce the impervious area over the property by 26%.

2 SITE LOCATION AND PHYSICAL DESCRIPTION

The subject property is located at 199 Oxford Street (See Figure 1 – Locus Map) in Providence, RI. The property fronts on Oxford, Ocean and Sayles Streets. The school property fronts on three (3) sides of the property. All roadways are residential streets and lead to main roadways within the City to travel in all directions. The parcels have been identified on the City's assessors map as A.P. 48, Lots 2 and 481. A class I topographic survey has been performed on the parcels and it was determined that the total area of the lots is 196,267 s.f. +/- or 4.506 acres. Lot 2 has 101,930 +/- or 2.34 acres and Lot 481 has 94,326 +/- or 2.17 acres

Figure 1 - Locus Map

2.1 Existing Conditions

The following is a general description of current site conditions and current occupancy of the property. The property is utilized as an elementary school within the City of Providence School system and is at its serviceable life. The lot consists of primarily the school building along with surrounding parking lots and a small playground on the Salyes Street side. The site is currently over 90% impervious area.

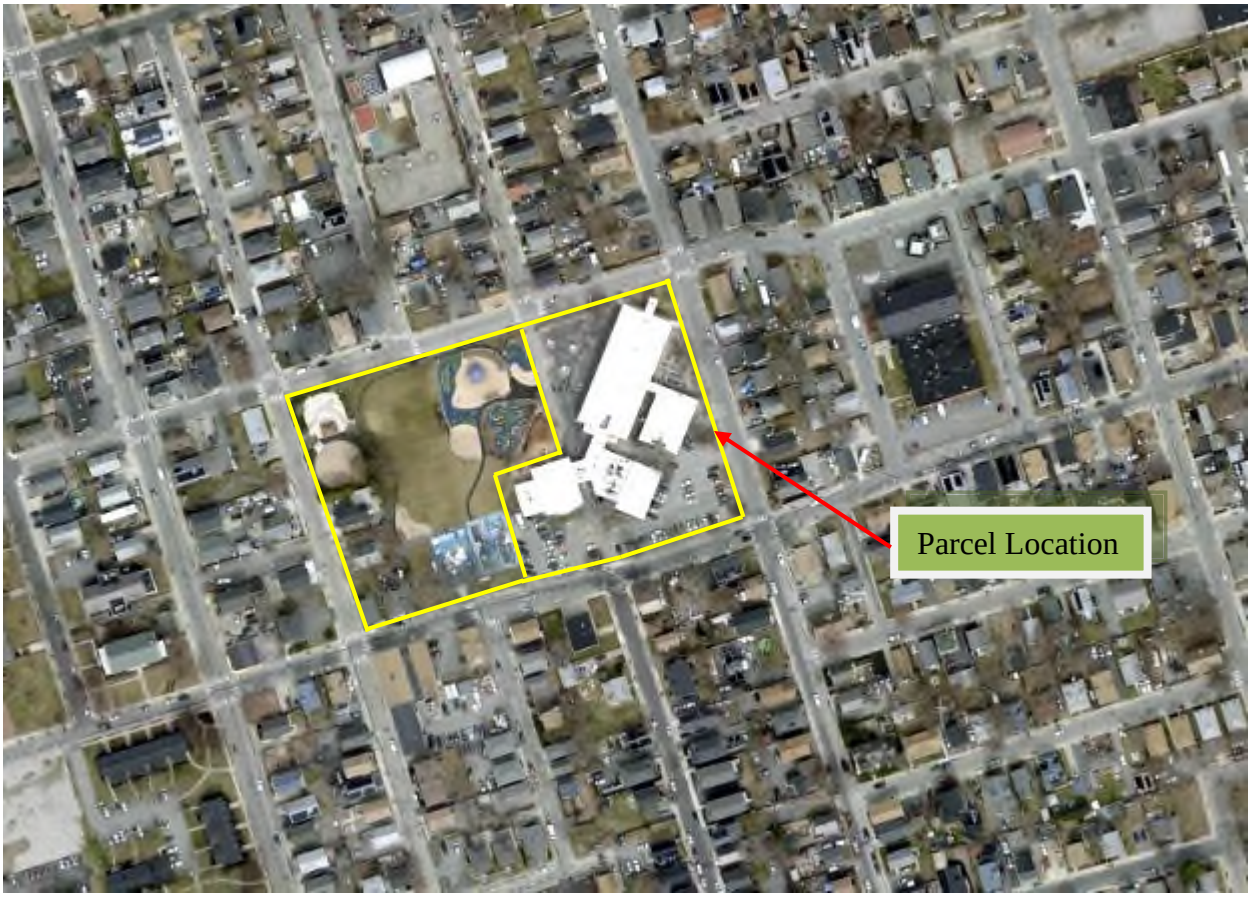


Figure 2 – Aerial photograph

Utilities

2.1.1 Water

The property is serviced by the public water system owned by the Providence Water Supply Board.

2.1.2 Sewer

The property is connected to the City's and Narragansett Bay Commission's sewer system within the lots boarders and in Oxford Street.

2.1.3 Electric

The electric and communication services are located off Sayles and Oxford Streets.

2.1.4 Gas

The property is serviced by a natural gas service main off Oxford Street.

2.1.5 Drainage

The existing property has a limited drainage system that collects the runoff from the sites southern parking lots. The frontage of the building is void of drainage and stormwater runoff flows to the combined sewer/drainage system in the surrounding road.

2.2 Zoning

According to the City of Providence zoning maps, the site is currently zoned Public Space District (PS). As defined in the City's Zoning Ordinance, the zoning uses are consistent with the proposed use of the elementary school on the site.

The following are the dimensional requirements for current zoning classification for a PS District (other permitted uses):

Requirement	**PS**
Minimum Lot Area	None
Minimum Lot Frontage	None
Minimum Front Yard	10 Feet
Minimum Side Yard	6 Feet
Minimum Corner Side Yard	10 Feet*
Minimum Rear Yard	25 Feet
Maximum Lot Coverage	None
Maximum Structure Height	50 Feet

The project received a corner side yard setback variance of 6.3'* from the Providence City Planning commission on May 21, 2024.

2.3 Soil Classification

According to the *Soil Survey of Rhode Island*, prepared by the US Department of Agriculture, Soil Conservation Service, soils in the area of elementary school consist of Udorthents-Urban Land Complex (UD). The Udorthents series consists of very deep, somewhat excessively drained soils formed in outwash. They are nearly level through very steep soils on outwash terraces and plains and other glaciofluvial landforms. Slope ranges from 0 through 35 percent. Saturated hydraulic conductivity is high or very high. The UD is in the hydrologic A group with well drained soils characteristics.

Soil borings were conducted for the building and are included in the appendix. Groundwater depths were provided in the soil borings.

2.4 Wetland Resources

The existing site is fully developed and no freshwater wetlands are present on or in the vicinity of the property.

2.5 Flood Zone Classification

The site is located on the Flood Insurance Rate Map for the City of Providence; Community–Panel Number 44007C0304J dated October 2, 2015. The property lies inside Zone X and outside of any designated flood zones. No base flood elevations or depths are shown.

3 PERMIT REQUIREMENTS

3.1 Local Permit Requirements

3.1.1 Zoning

This project will not require approval from the City's Zoning Commission.

3.1.2 Planning

The project will require Preliminary Plan approval from the City's Planning Commission.

3.1.3 Building Permit

A review and approval from the local building official is required to obtain a Building Permit for the proposed construction. As part of this review process the City Engineer will require a review of the Site Plans pertaining to utility and drainage requirements.

3.2 State Permit Requirements

3.2.1 Rhode Island Department of Environmental Management

The Project will require a General Construction RIPDES permit by the contractor.

3.2.2 Rhode Island Department of Transportation

This project will not require a RIDOT Physical Alteration Permit Application.

4 DRAINAGE ANALYSIS

4.1. METHODOLOGY

Hydrological analysis was performed using the Technical Release 20 (TR-20) and the peak runoff rate for the water quality volume (WQv or 3-month), 2, 10, 25 and 100-year storm event was modeled for a 24-hour, Type III storm as required by Narragansett Bay Commission (NBC) stormwater management regulations. The peak runoff rates for the mentioned year storm events and routing of the storm events through the proposed drainage facilities was modeled utilizing the HydroCad® 10.20-2g, 2023 by HydroCad Software Solutions LLC.

Hydrological and Hydraulic analyses were performed in conformance with the current State of Rhode Island, Stormwater Design and Installation Standards Manual Amended 2015.

It should be noted that the project does not increase the impermeable surface by over 10,000 sf, in fact, the project reduces the impervious area of the site by 26% and the project does not exceed the 1 ace of full depth disturbance area to require a RIPDES permit from RIDEM. With the total project pre-construction impermeable surface greater than 10,000 sf the project must follow the above-mentioned stormwater standards along with NBC requirements.

4.2. EXISTING CONDITIONS

The existing watershed for the site consists of two (2) sub-watershed areas and are designated as 1-EW and 2-EW on the watershed map in Appendix C. 1-EW sub-watershed consists of the site runoff outside the building envelope that includes paved parking areas, walkways and some

landscape area. This sub-watershed flows to Oxford Street (DP 1) and the closed drainage system within the Sayles, Ocean and Oxford Street. In the 2-EW sub-watershed consists of a of the existing building roof runoff. All runoff from the existing roof system flow to a closed drainage system that passes through the site and connects to Oxford Street drain lines (DP 2). The soil type is Udorthents-Urban Land Complex (UD) – course gravely sand series in hydrologic group A. The pre-development peak runoff rates are tabulated below for reference and the calculations can be found in Appendix A.

Pre-Developed Peak Runoff Rates:

Watershed Area ID	*Area (sf)*	*Rainfall (in)*	*2-year (cfs)*	*10-year (cfs)*	*25-year (cfs)*	*100-year (cfs)*	*3-month (cfs)*
1-EW	94,303	3.3/4.8/5.8/8.7/1.2	5.08	8.44	10.69	17.17	1.50
2-EW	96,876	3.3/4.8/5.8/8.7/1.2	2.40	3.51	4.25	6.39	1.12

4.3. PROPOSED CONDITIONS

In the proposed condition the site drainage will collect in four (4) sub-watershed areas as seen on the proposed watershed map in Appendix C. Sub-watershed area 4-PW which collects the runoff in the area of the new parking lot on the east side of the building and west of Ocean Street. This area will be directed to a permeable pavement system (5-PP). Sub-watershed 6-PW is the new roof runoff area for the entire site. The roof runoff will be collected on the roof and via internal piping system transported to SMS-1 (8-IS).

Sub-watershed area 7-PW which contains the rear of the proposed building on the west side flows to a new sump catch basin and to the proposed subsurface stormwater management system (SMS-2) (8-IS). Sub-watershed 9-PW consists of landscaping, walkways and playgrounds around the perimeter of the building. This sub-watershed flow directly to the street which they abut. It is not practical to collect this runoff because it is primarily made up of pervious surfaces and landscape areas. It is intended that collecting 95% of the runoff from the sites impervious areas will reduce the runoff to the abutting streets along with providing water quality of the full volume. The post-development runoff rates are shown in the following tables and for reference and the calculations can be found in Appendix A.

Post-Developed Peak Runoff Rates:

Watershed Area ID	*Area (sf)*	*Rainfall (in)*	*2-year (cfs)*	*10-year (cfs)*	*25-year (cfs)*	*100-year (cfs)*	*3-month (cfs)*
4-PW	18,350	3.3/4.8/5.8/8.7/1.2	0.26	0.71	1.06	2.21	0.00
6-PW	46,055	3.3/4.8/5.8/8.7/1.2	3.39	4.96	6.01	9.03	1.16
7-PW	16,789	3.3/4.8/5.8/8.7/1.2	0.06	0.34	0.60	1.50	0.00
9-PW	43,239	3.3/4.8/5.8/8.7/1.2	1.71	3.17	4.18	7.17	0.32

4.4. OVERBANK FLOOD PROTECTION

The site layout of the proposed conditions strived to reduce the overall impervious surfaces on the school property and was successful by reducing it by 26%. To reduce stormwater runoff to older drainage system, provided water quality and groundwater recharge best management practices (BMP) Subsurface Stormwater Management Systems (SMS-1) and a pervious pavement system have been proposed to collect runoff from the major impervious areas on the site. The roof and rear area runoff will collect in a sump catch basin and transported to SMS-1 which is in the western section and rear of the property. The pervious pavement system will collect the runoff from the new parking area on Ocean Street. These locations match the pre-construction watershed divide.

The post-development runoff will enter the SMS-1 in the WQv pre-treatment area which is the isolator row type Subsurface Water Quality Volume BMP. A deep sump CB along with wrapped chambers will provide more than the required 25% WQv pre-treatment and the isolator rows will treat 100% of the WQv from the impervious roof and playground as a total (see Section 4.5).

From the pre-treatment and isolator row sections of ten (10) Cultec 902HD chambers in SMS-1, the treated stormwater runoff will flow into the recharge area. This recharge section of the BMP is made up of fifty (50) Cultec 902HD chambers in SMS-1 embedded in washed crushed stone with filter wrap around the entire system for site recharge and overbank protection.

Pre verses Post-Development Peak Runoff Rates to The Roadways and Drainage System (DP 1):

Development Condition	*2-year (cfs)*	*10-year (cfs)*	*25-year (cfs)*	*100-year (cfs)*	*3-month (cfs)*
Pre Devel (3DP)	7.47	11.95	14.94	23.56	2.62
Post Devel (10-DP)	3.20	5.60	7.12	11.46	0.34
Total Reduction	-4.27	-6.35	-7.82	-12.10	-2.28
Percent Reduction	57%	53%	52%	51%	87%

Utilizing the infiltration rate of 8.27 in/hr based on the soil strata the systems will be located in (gravelly sand), the SMS and pervious pavement system will attenuate the proposed peak runoff to much less than the pre-development runoff as shown in the calculations in the Appendix A. It should be noted that portions of the new site layout will be allowed to flow without interception due to the proposed grades and the impracticality of providing surface catchment but these areas are mostly pervious. The subsurface drainage system and previous pavement is designed to offset this action for both runoff and water quality along with removing stormwater from the drainage system. This design approach will provide for additional sustainability for the older drainage system in the area and resiliency for the neighborhood against flooding.

4.5. WATER QUALITY VOLUMES (WQv)

With the configuration of the SMS-1 and pervious pavement system, 100% treatment of the total WQv can be provided in the pre-treatment area or sand filter. This is accomplished by installing

the deep sump CB and isolator rows. Only 25% WQv is generally required for these BMP types, but all runoff flow at the WQv flow level will enter the isolator row before infiltrating into the recharge areas and thru the pervious pavement system. In accordance with the Rhode Island Stormwater Design and Installations Standards Manual 2010, Amended 2015, the water quality volume has been calculated using the following equation:

Water Quality Volume (WQv) (6, 7 and 9-PW) = 79,857 sf or 1.83 acres x 43,560 ft^2/acres x 1" x 1'/12" = **6,654.75 ft^3**

25% Pre-treatment of WQv = 6,654.75 ft^3 x 0.25 = **1,663.69** ft^3

WQv pre-treatment will be provided as follows:
SMS-1 Isolator row of ten (10) Cultec 902HD Chambers w/stone = 10 x 101.69 ft^3 = 1,016.9 ft^3
WQv provided in pervious pavement system = 11,503 sf x 9" x .33% = 2,847 ft^3
4' dia. CB w/4' sump = πr^2 x h = 3.141 x 2^2 = 12.56 ft^3

Total Pre-treatment provided = **3,876.46 ft^3**

4.6. GROUNDWATER RECHARGE (REv)

The project provides exceptional groundwater recharge by utilizing pervious pavement for all driveways and parking areas on site. This was chosen due to the relative shallow depth of the seasonal high groundwater elevation and the proximity to freshwater wetland resources along the border of the development where surface treatment is not practical.

Required REv = 1" x 0.6 x 1.83 ac/12 = 0.0915 ac-ft.

Provided at the 1.2" Runoff Event (WQv) REv: Pervious Pavement Area = 0.013 ac-ft.
SMS-1 = 0.087 ac-ft.

Total = Provided 0.10 ac-ft. > Required 0.0915 ac-ft.

4.7. CONVEYANCE AND NATURAL CHANNEL PROTECTION

The following is a capacity check for the critical pipes that will convey the storm water runoff to and from the storm water management system:

DMH-1 to Tie in DMH – 12" ADS HDPE Pipe, S=0.010 '/, n=0.011 Q_{100} = 5.43 cfs
Q_{max} = 5.53 cfs > Q_{100}

4.8. DRAINAGE STUDY CONCLUSIONS

This drainage report in combination with the plan set provides a design that conforms to the new State of Rhode Island Stormwater Design and Installation Standards Manual 2010, Amended 2015, as well as the Rhode Island Soil Erosion and Sedimentation Control Handbook. The project has been designed in order to avoid any increase in peak runoff rates. The new design now provides for recharge to the groundwater in two separate areas along with pre-treatment and

treatment of 100% of the WQv for the new pavement areas. The proposed new parking area will all be directed to a pervious pavement system and the roof runoff will be directed to a new subsurface storm water management system to provide infiltration and storage for all frequency storms events.

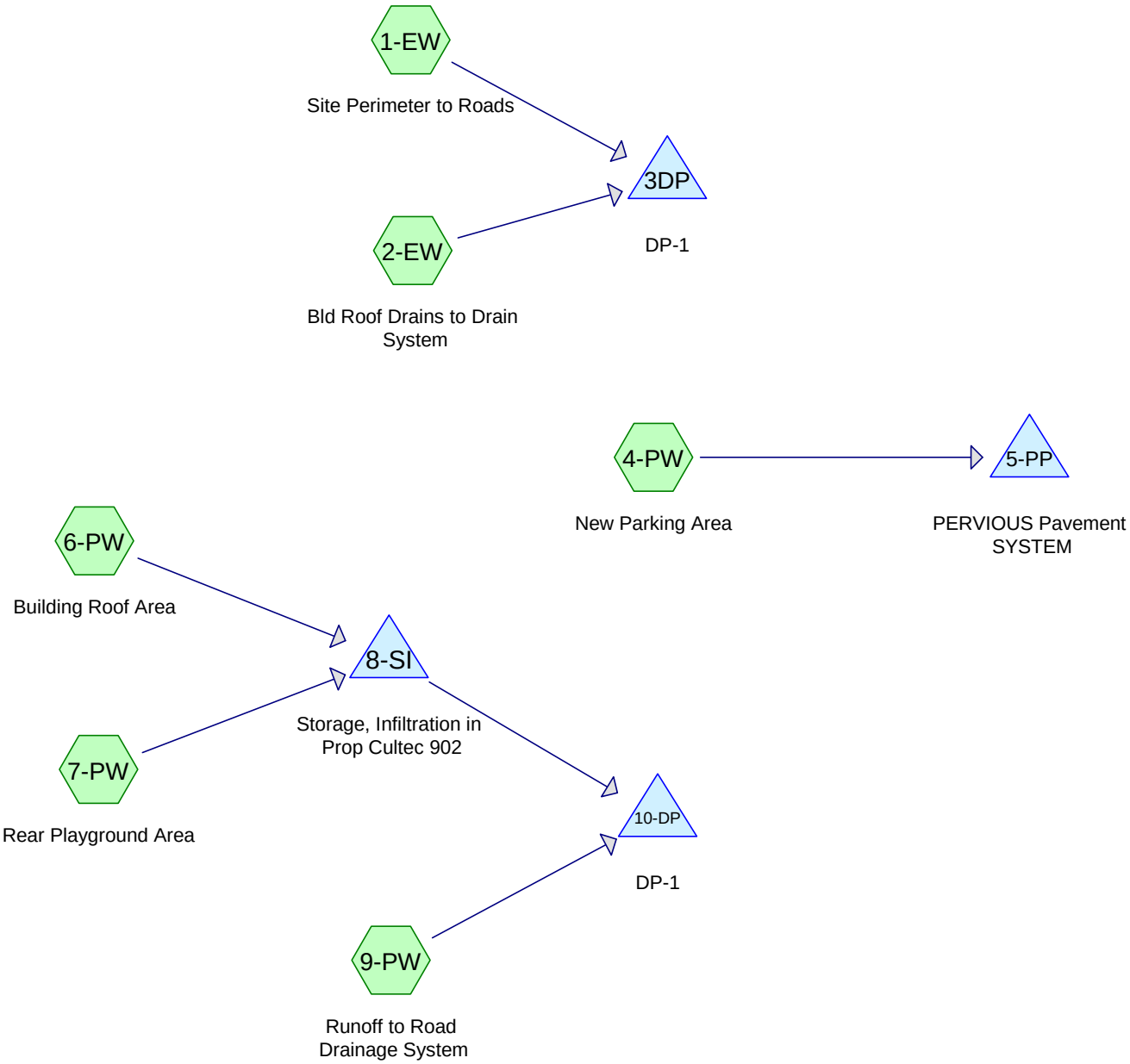
5 SOIL EROSION AND SEDIMENTATION CONTROLS

Soil Erosion and Sedimentation Control Practices will be included to avoid and minimize impacts to water quality. Detailed notes will be included in the plans to ensure effective implementation of erosion and sedimentation controls. The soil erosion and sedimentation control measures will be installed prior to the initiation of construction activities and maintained throughout construction. Silt fence and/or hay bales are proposed along the perimeter of the site. Once established, these measures will be monitored daily until construction activities are complete. All referenced soil erosion and sedimentation controls including materials used and the installation procedures will be performed per the "Rhode Island Erosion and Sedimentation Handbook" Issued 1989 (revised 2014).

6 CONCLUSIONS

As illustrated in the above tables and appendices, the proposed site activities for the new Mary E. Fogarty Elementary School have been designed in order to avoid any increase in peak runoff rates, incorporate water quality pre-treatment and provide re-charge to the groundwater in the area. The analysis shows that in all practicality runoff from the site will not change the current runoff characteristics of the area and in fact will improve the capacity of the roadway drainage catchment and the perimeter closed drainage system during the required stormwater events. The design provides for additional sustainability for the older drainage system in the area and resiliency for the neighborhood against future flooding events. Final construction of the project is anticipated in the early Fall of 202.

APPENDIX A



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D'AMICO ENGINEERING TECHNOLOGY, INC.

Subcat Reach Pond Link

Routing Diagram for Mary Fogarty ES New Drainage SYSTEM Cultec
Prepared by D'Amico Engineering Tech Inc, Printed 7/22/2024

Summary for Subcatchment 1-EW: Site Perimeter to Roads

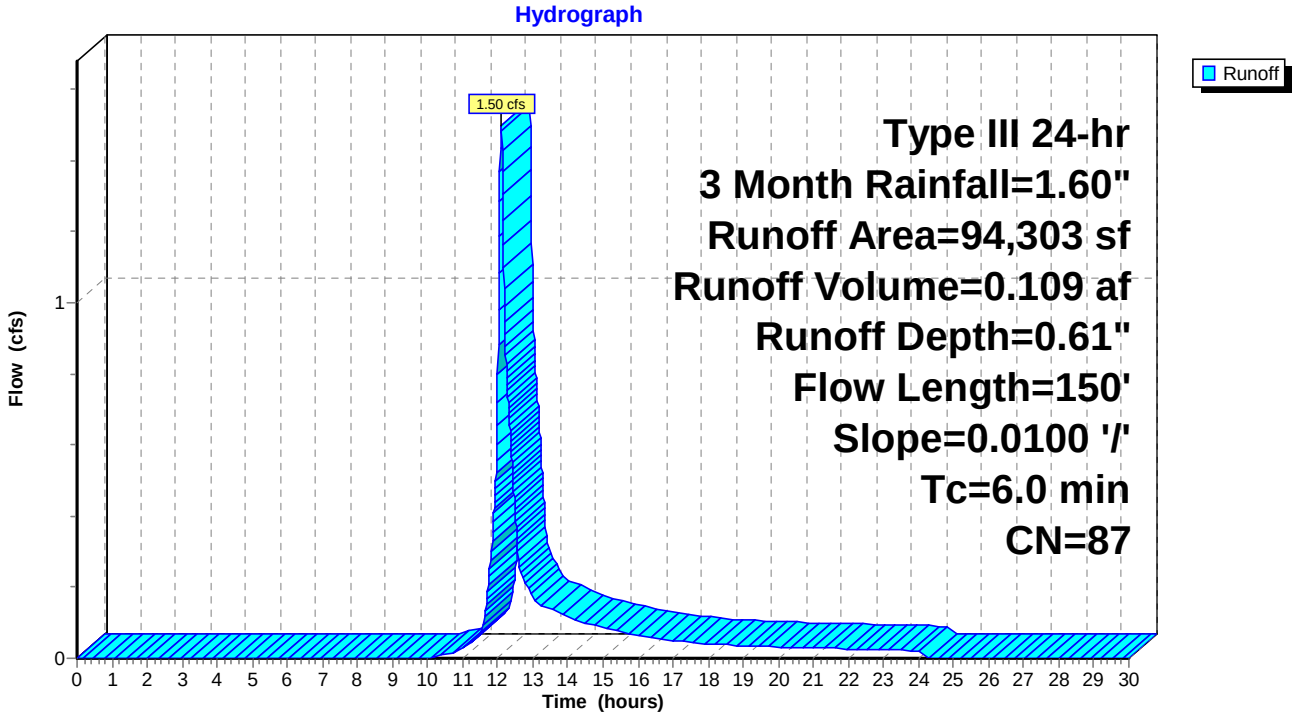
Runoff = 1.50 cfs @ 12.09 hrs, Volume= 0.109 af, Depth= 0.61"
Routed to Pond 3DP : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 3 Month Rainfall=1.60"

Area (sf)	CN	Description
76,472	98	Paved parking, HSG A
17,831	39	>75% Grass cover, Good, HSG A
94,303	87	Weighted Average
17,831	39	18.91% Pervious Area
76,472	98	81.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Parking Area Sheet Flow** Smooth surfaces n= 0.011 P2= 3.30"
2.2	150	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1-EW: Site Perimeter to Roads



Summary for Subcatchment 2-EW: Bld Roof Drains to Drain System

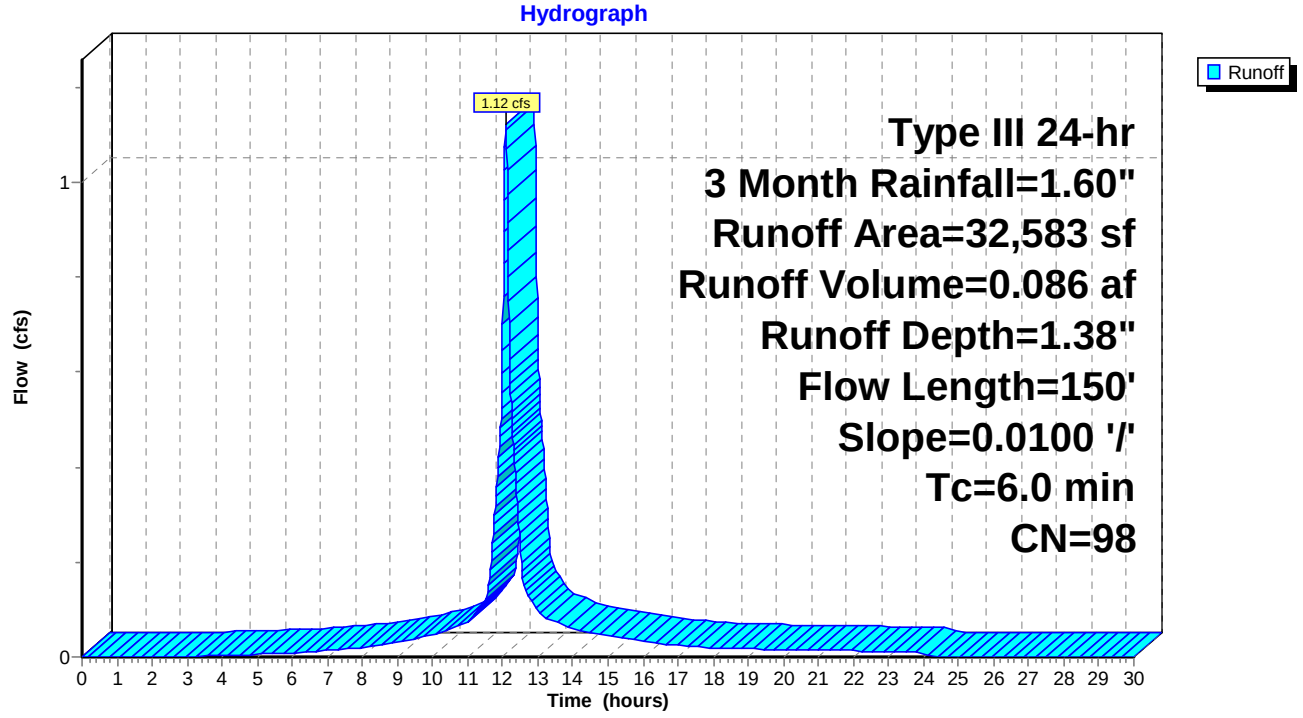
Runoff = 1.12 cfs @ 12.08 hrs, Volume= 0.086 af, Depth= 1.38"
Routed to Pond 3DP : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 3 Month Rainfall=1.60"

Area (sf)	CN	Description
32,583	98	Roofs, HSG A
32,583	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Roof Drains** Smooth surfaces n= 0.011 P2= 3.30"
2.2	150	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2-EW: Bld Roof Drains to Drain System

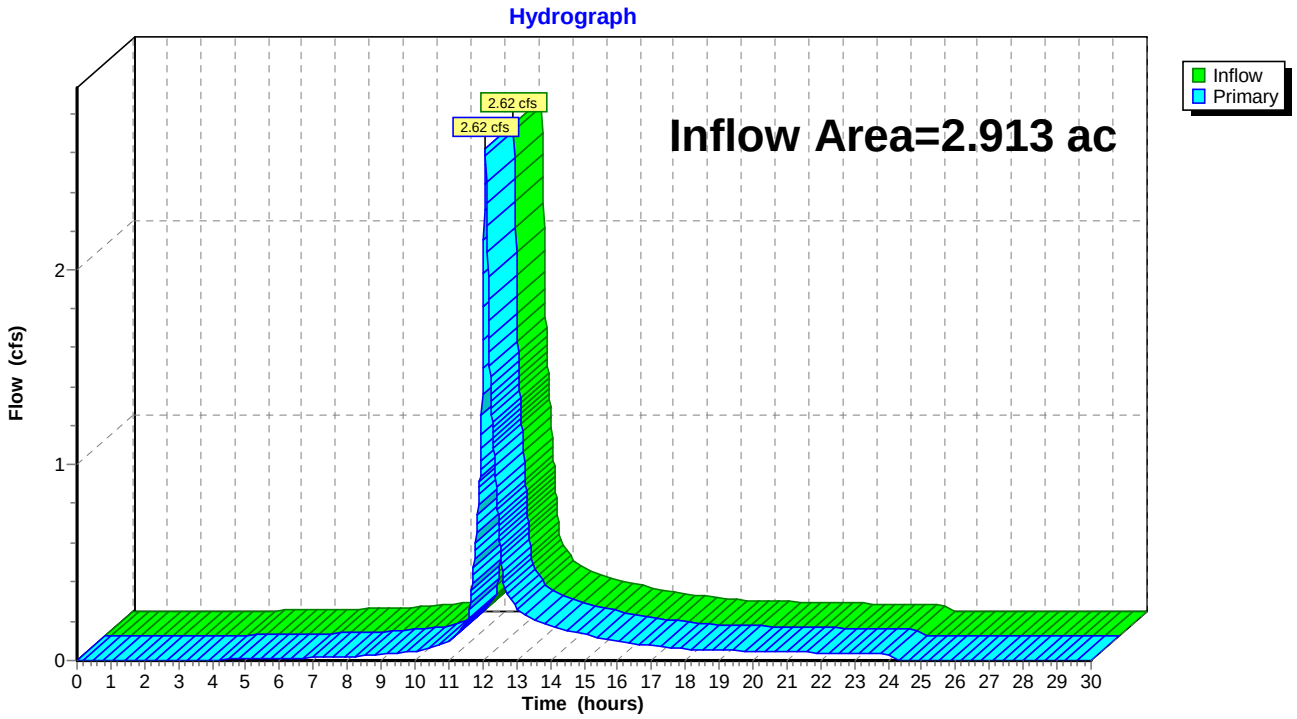


Summary for Pond 3DP: DP-1

Inflow Area = 2.913 ac, 85.95% Impervious, Inflow Depth = 0.80" for 3 Month event
Inflow = 2.62 cfs @ 12.09 hrs, Volume= 0.195 af
Primary = 2.62 cfs @ 12.09 hrs, Volume= 0.195 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2

Pond 3DP: DP-1



Summary for Subcatchment 4-PW: New Parking Area

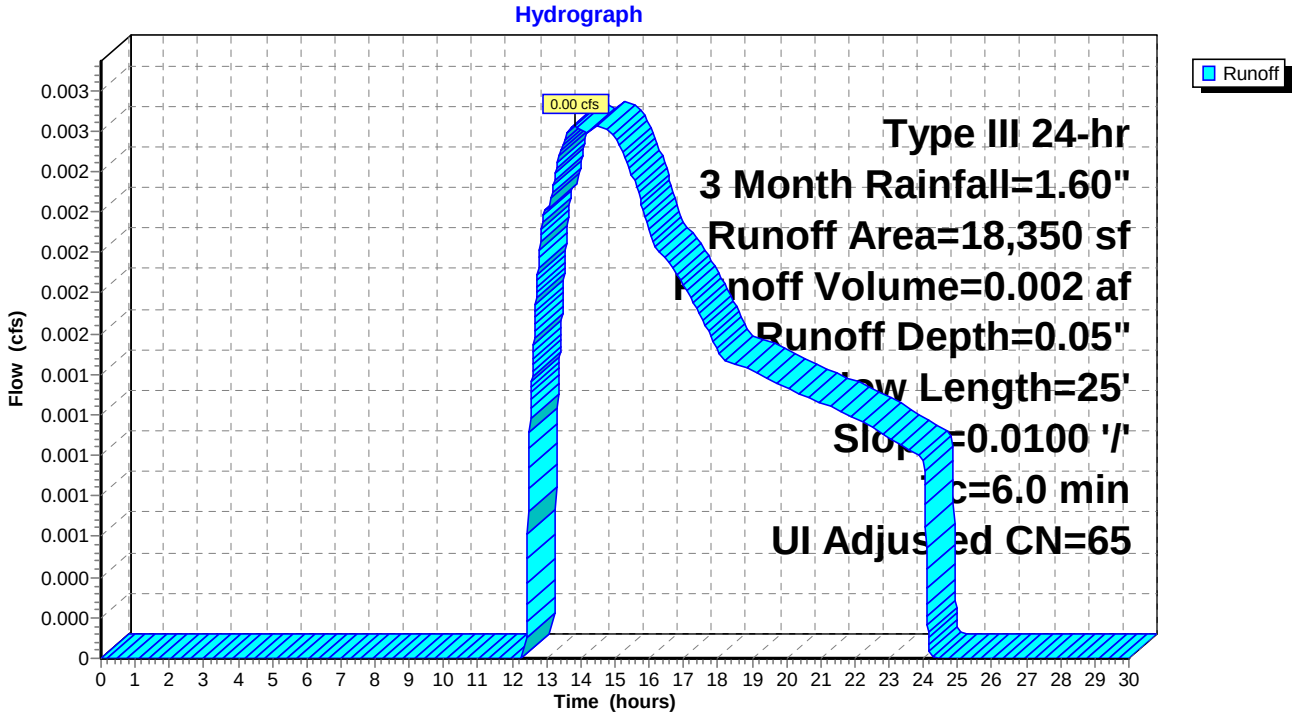
Runoff = 0.00 cfs @ 13.82 hrs, Volume= 0.002 af, Depth= 0.05"
Routed to Pond 5-PP : PERVIOUS Pavement SYSTEM

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 3 Month Rainfall=1.60"

	Area (sf)	CN	Adj	Description
*	11,503	76		Pervious Pavement - Table 5-5
	1,222	98		Unconnected pavement, HSG A
	5,625	39		>75% Grass cover, Good, HSG A
	18,350	66	65	Weighted Average, UI Adjusted
	17,128	64	64	93.34% Pervious Area
	1,222	98	98	6.66% Impervious Area
	1,222			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	25	0.0100	0.80		**Sheet Flow, Walkway to Parking Area** Smooth surfaces n= 0.011 P2= 3.30"
0.5	25	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 4-PW: New Parking Area



Summary for Pond 5-PP: PERVIOUS Pavement SYSTEM

Inflow Area = 0.421 ac, 6.66% Impervious, Inflow Depth = 0.05" for 3 Month event
Inflow = 0.00 cfs @ 13.82 hrs, Volume= 0.002 af
Outflow = 0.00 cfs @ 13.83 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.7 min
Primary = 0.00 cfs @ 13.83 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 62.55' @ 13.83 hrs Surf.Area= 11,502 sf Storage= 0 cf

Plug-Flow detention time= 1.4 min calculated for 0.002 af (100% of inflow)
Center-of-Mass det. time= 1.4 min (1,040.4 - 1,039.0)

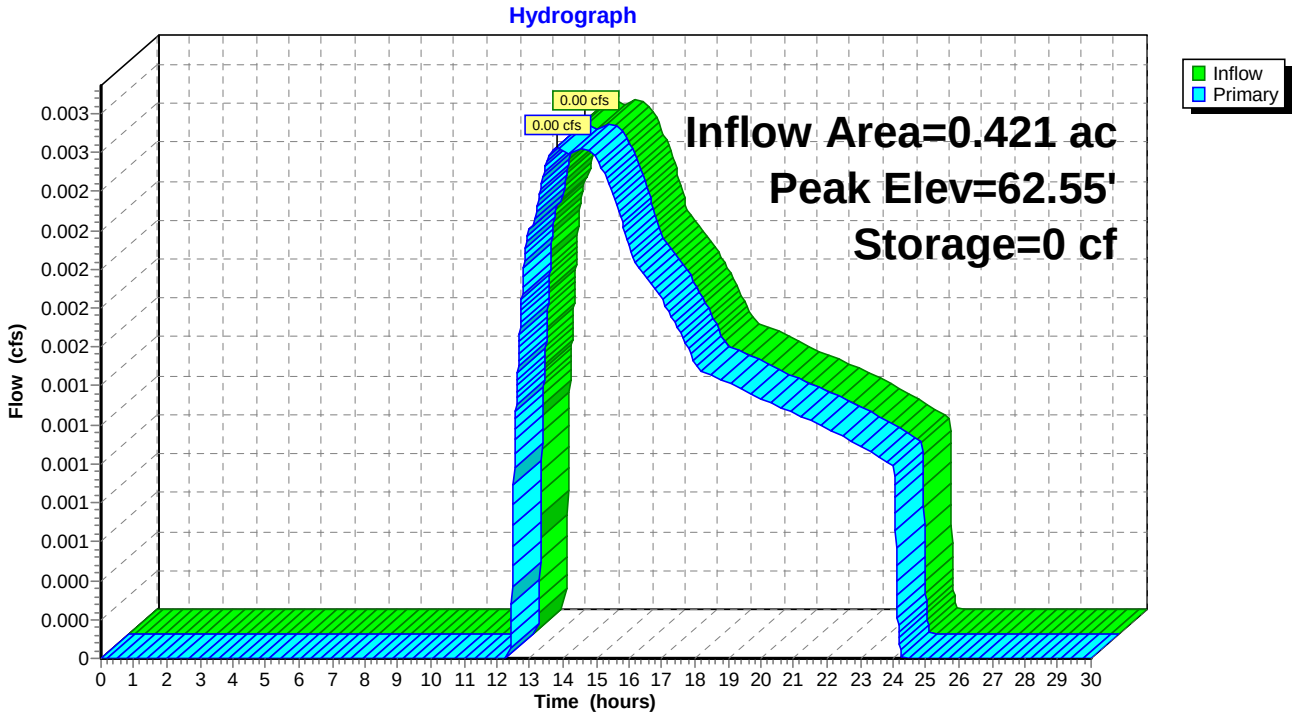
Volume	Invert	Avail.Storage	Storage Description
#1	62.55'	1,423 cf	**Stone Reservior (Prismatic)** Listed below (Recalc) 4,314 cf Overall x 33.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
62.55	11,503	0	0
63.30	0	4,314	4,314

Device	Routing	Invert	Outlet Devices
#1	Primary	62.55'	**8.270 in/hr Exfiltration over Horizontal area** Phase-In= 0.05'

Primary OutFlow Max=0.00 cfs @ 13.83 hrs HW=62.55' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.00 cfs)

Pond 5-PP: PERVIOUS Pavement SYSTEM



Summary for Subcatchment 6-PW: Building Roof Area

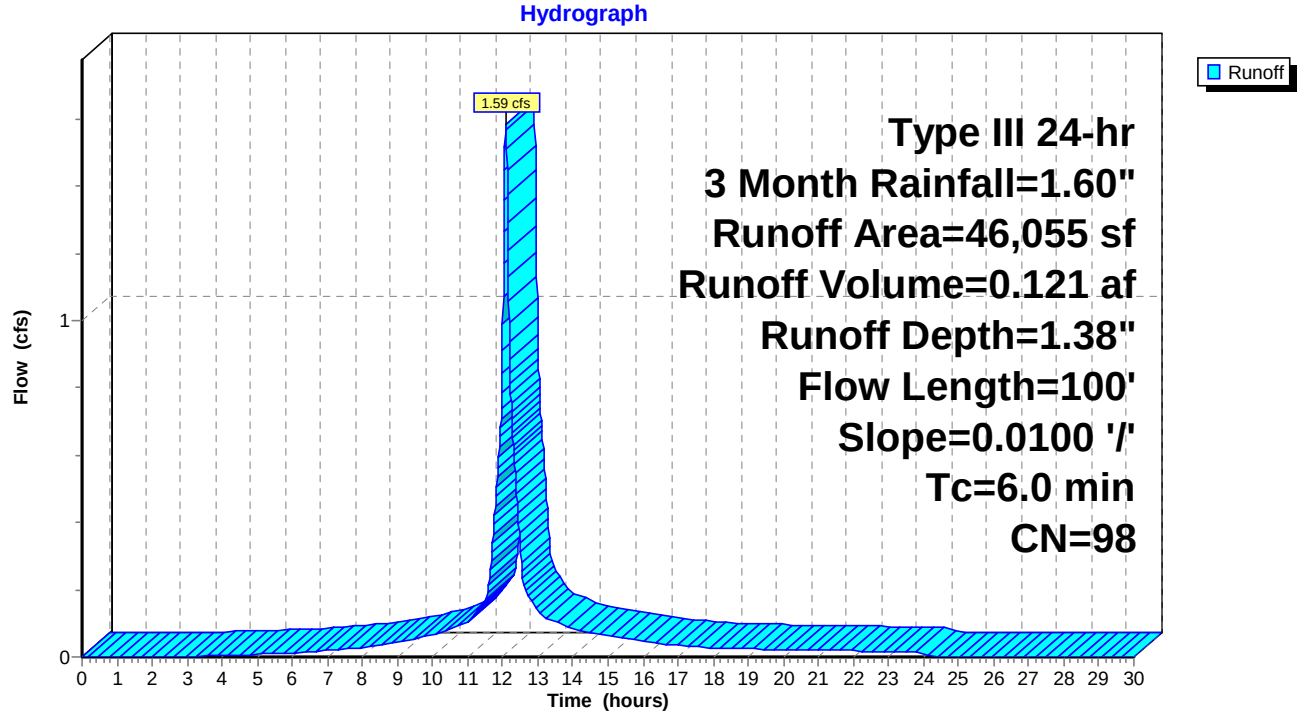
Runoff = 1.59 cfs @ 12.08 hrs, Volume= 0.121 af, Depth= 1.38"
Routed to Pond 8-SI : Storage, Infiltration in Prop Cultec 902

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 3 Month Rainfall=1.60"

Area (sf)	CN	Description
46,055	98	Roofs, HSG A
46,055	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.06		**Sheet Flow, Roof Drain System** Smooth surfaces n= 0.011 P2= 3.30"
1.6	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 6-PW: Building Roof Area



Summary for Subcatchment 7-PW: Rear Playground Area

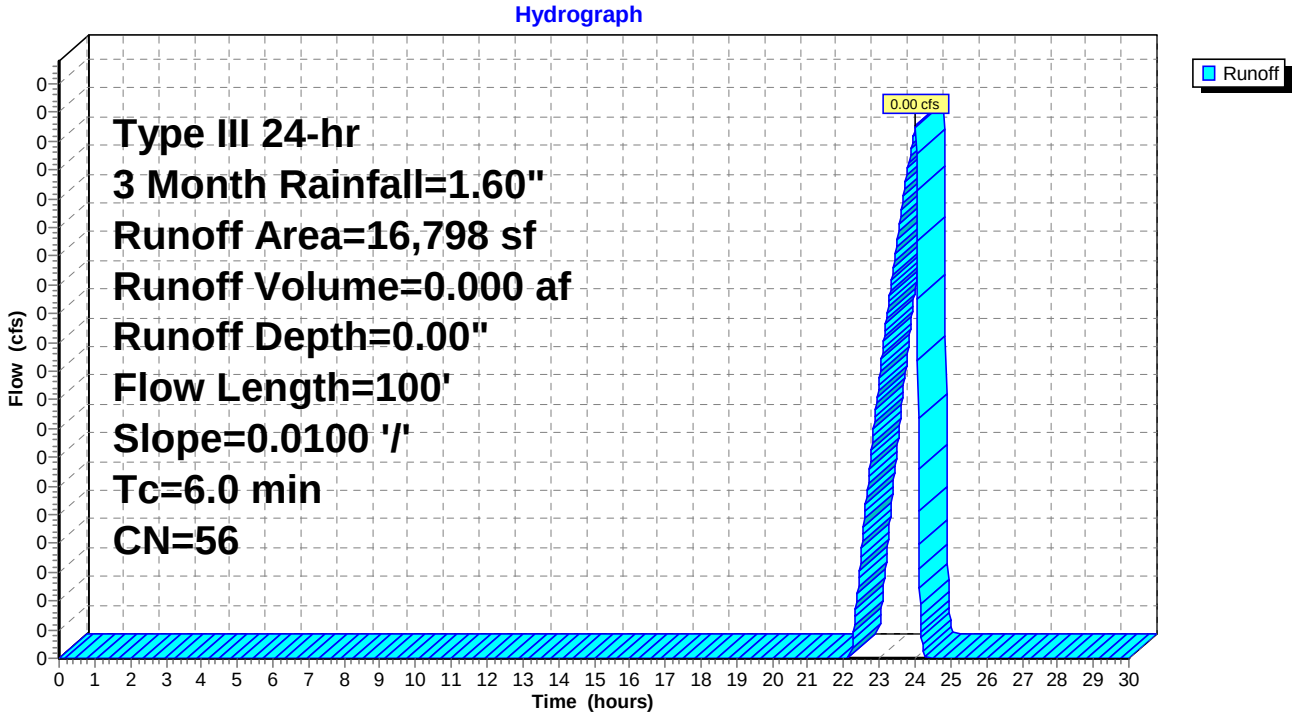
Runoff = 0.00 cfs @ 24.01 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Pond 8-SI : Storage, Infiltration in Prop Cultec 902

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 3 Month Rainfall=1.60"

Area (sf)	CN	Description
2,425	98	Paved parking, HSG A
14,373	49	50-75% Grass cover, Fair, HSG A
16,798	56	Weighted Average
14,373	49	85.56% Pervious Area
2,425	98	14.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.06		**Sheet Flow, Rear Area Flow to CBs** Smooth surfaces n= 0.011 P2= 3.30"
1.6	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7-PW: Rear Playground Area



Summary for Pond 8-SI: Storage, Infiltration in Prop Cultec 902

Inflow Area = 1.443 ac, 77.13% Impervious, Inflow Depth = 1.01" for 3 Month event
Inflow = 1.59 cfs @ 12.08 hrs, Volume= 0.121 af
Outflow = 0.51 cfs @ 12.38 hrs, Volume= 0.121 af, Atten= 68%, Lag= 17.7 min
Discarded = 0.34 cfs @ 11.79 hrs, Volume= 0.116 af
Primary = 0.17 cfs @ 12.38 hrs, Volume= 0.005 af
Routed to Pond 10-DP : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 58.71' @ 12.38 hrs Surf.Area= 1,777 sf Storage= 1,104 cf

Plug-Flow detention time= 15.8 min calculated for 0.121 af (100% of inflow)
Center-of-Mass det. time= 15.7 min (789.2 - 773.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	57.50'	2,078 cf	**44.75'W x 39.70'L x 5.75'H Field A** 10,215 cf Overall - 3,917 cf Embedded = 6,298 cf x 33.0% Voids
#2A	58.25'	3,917 cf	**Cultec R-902HD** x 60 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 60 Chambers in 6 Rows Cap Storage= 2.8 cf x 2 x 6 rows = 33.1 cf
		5,996 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	57.50'	**8.270 in/hr Exfiltration over Horizontal area** Phase-In= 0.10'
#2	Primary	58.50'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.34 cfs @ 11.79 hrs HW=57.62' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=0.17 cfs @ 12.38 hrs HW=58.71' TW=0.00' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Orifice Controls 0.17 cfs @ 1.56 fps)

Pond 8-SI: Storage, Infiltration in Prop Cultec 902 - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= 2.8 cf x 2 x 6 rows = 33.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

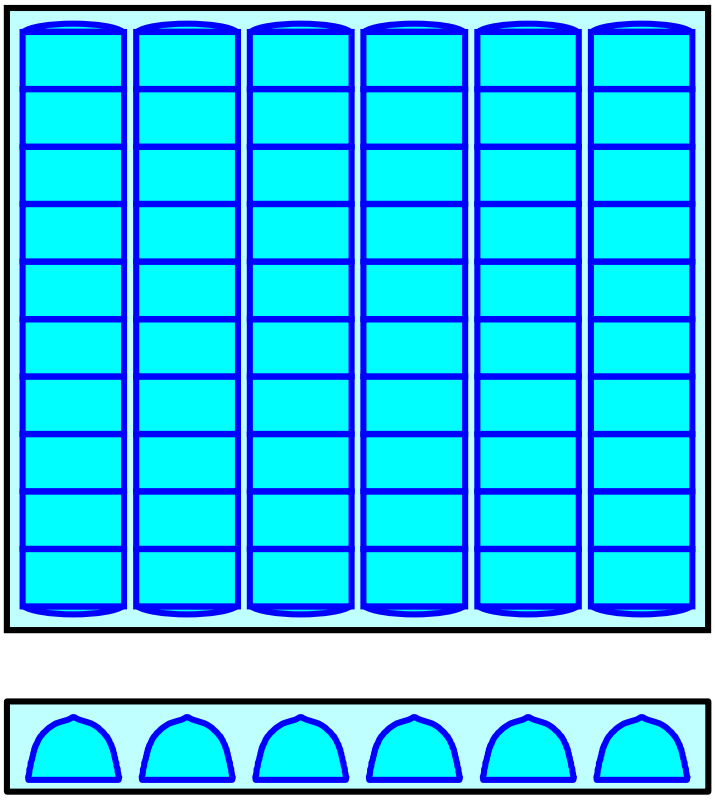
10 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 37.70' Row Length +12.0" End Stone x 2 = 39.70' Base Length
6 Rows x 78.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 44.75' Base Width
9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

60 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 6 Rows = 3,917.2 cf Chamber Storage

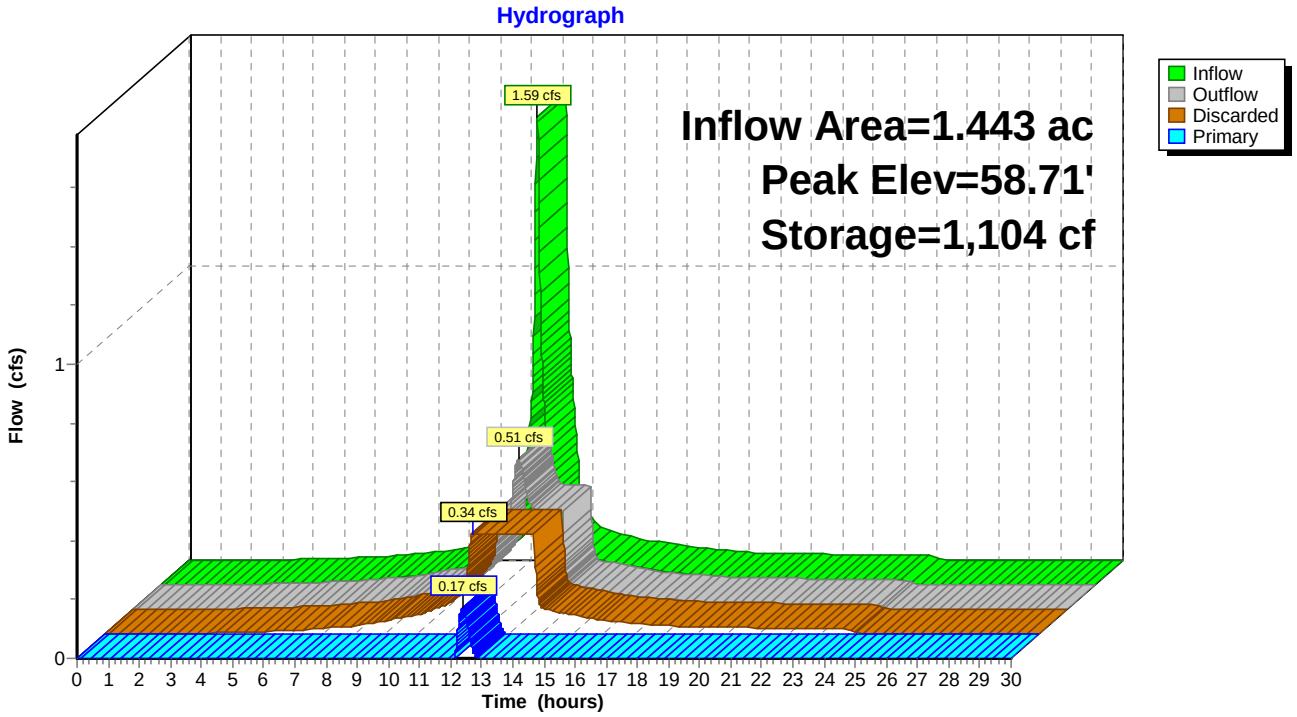
10,215.3 cf Field - 3,917.2 cf Chambers = 6,298.1 cf Stone x 33.0% Voids = 2,078.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,995.6 cf = 0.138 af
Overall Storage Efficiency = 58.7%
Overall System Size = 39.70' x 44.75' x 5.75'

60 Chambers
378.3 cy Field
233.3 cy Stone



Pond 8-SI: Storage, Infiltration in Prop Cultec 902



Summary for Subcatchment 9-PW: Runoff to Road Drainage System

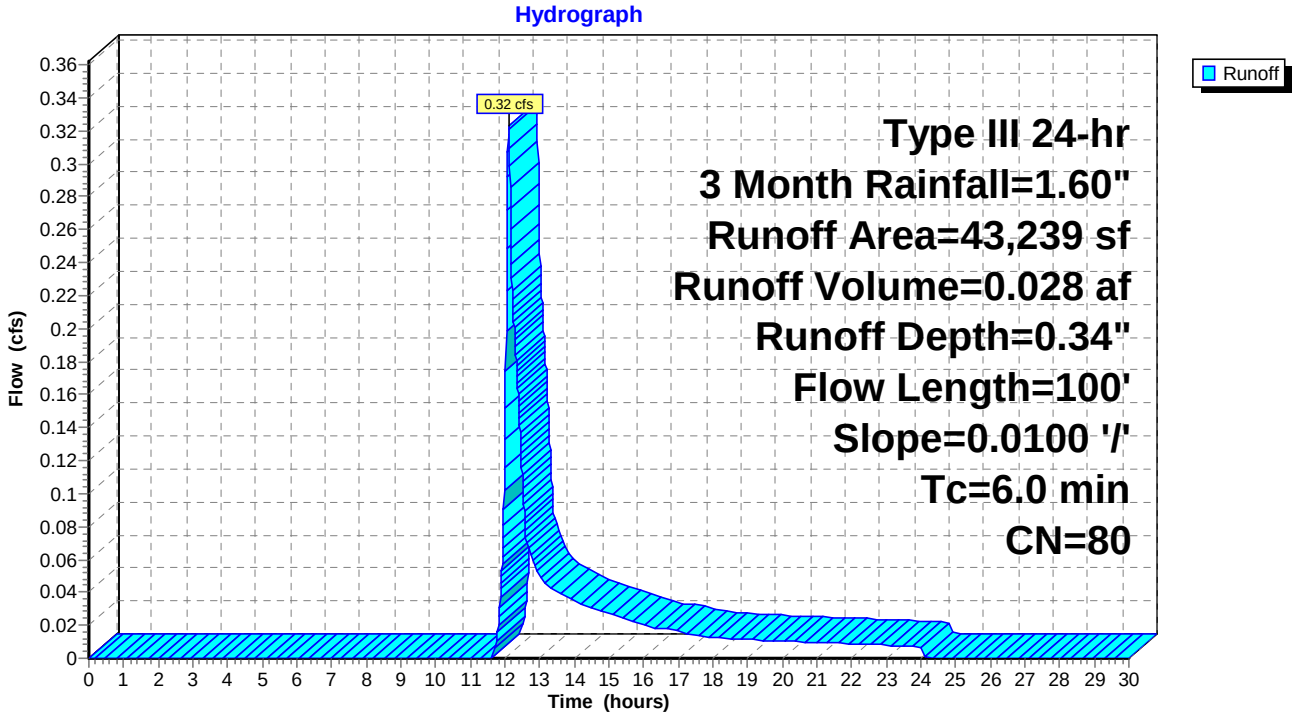
Runoff = 0.32 cfs @ 12.10 hrs, Volume= 0.028 af, Depth= 0.34"
Routed to Pond 10-DP : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 3 Month Rainfall=1.60"

Area (sf)	CN	Description
30,155	98	Paved parking, HSG A
13,084	39	>75% Grass cover, Good, HSG A
43,239	80	Weighted Average
13,084	39	30.26% Pervious Area
30,155	98	69.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.06		**Sheet Flow, Parking Area Flow to CBs** Smooth surfaces n= 0.011 P2= 3.30"
1.6	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 9-PW: Runoff to Road Drainage System

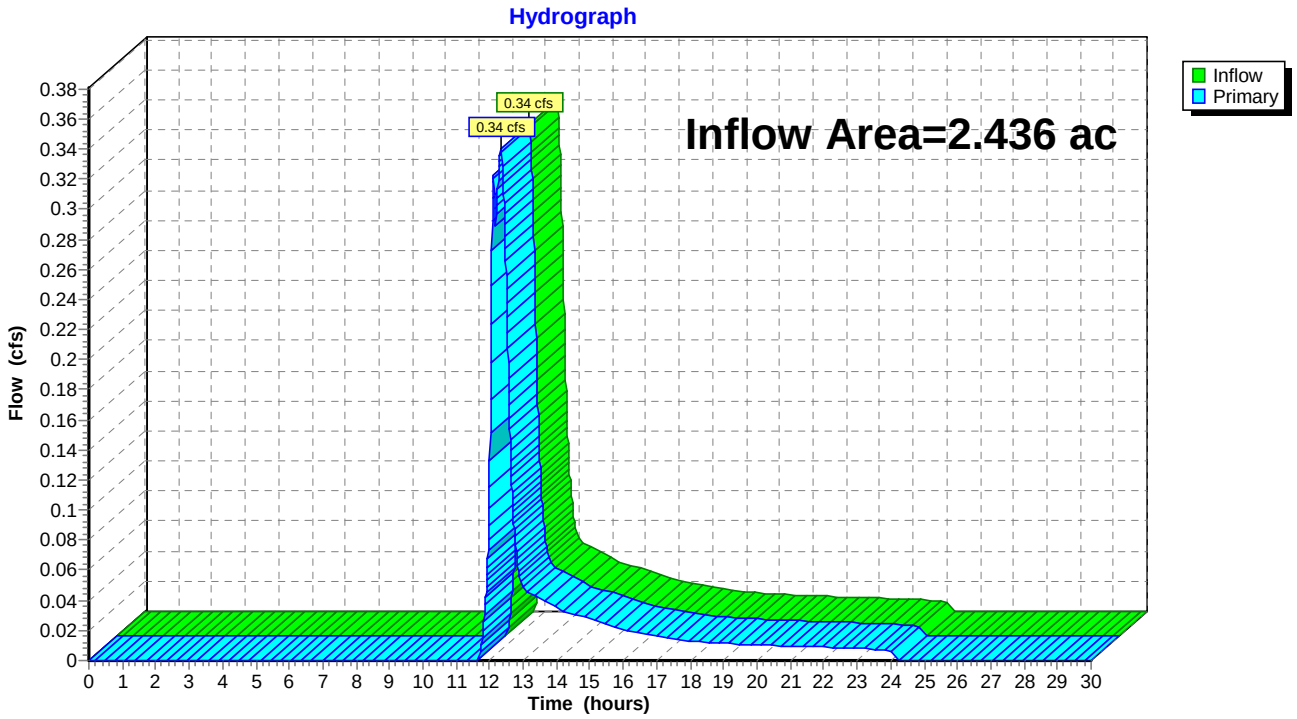


Summary for Pond 10-DP: DP-1

Inflow Area = 2.436 ac, 74.12% Impervious, Inflow Depth = 0.16" for 3 Month event
Inflow = 0.34 cfs @ 12.33 hrs, Volume= 0.033 af
Primary = 0.34 cfs @ 12.33 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2

Pond 10-DP: DP-1



Summary for Subcatchment 1-EW: Site Perimeter to Roads

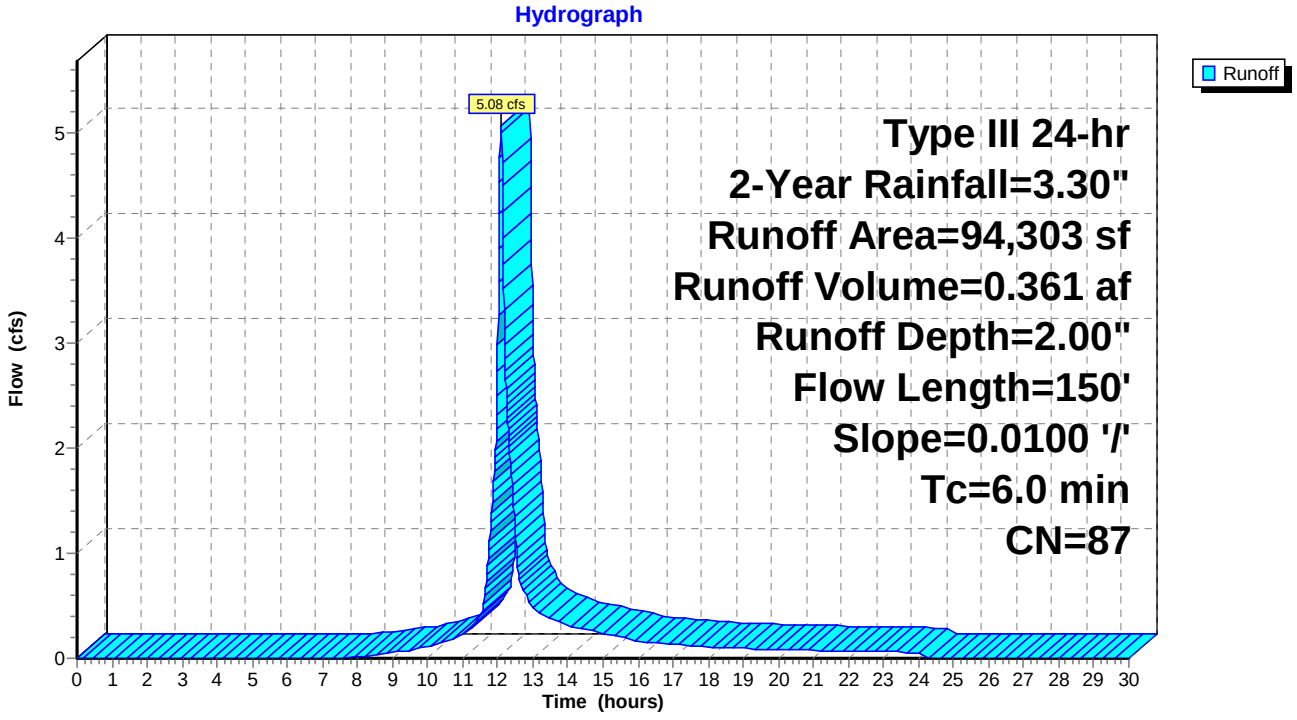
Runoff = 5.08 cfs @ 12.09 hrs, Volume= 0.361 af, Depth= 2.00"
Routed to Pond 3DP : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
76,472	98	Paved parking, HSG A
17,831	39	>75% Grass cover, Good, HSG A
94,303	87	Weighted Average
17,831	39	18.91% Pervious Area
76,472	98	81.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Parking Area Sheet Flow** Smooth surfaces n= 0.011 P2= 3.30"
2.2	150	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1-EW: Site Perimeter to Roads



Summary for Subcatchment 2-EW: Bld Roof Drains to Drain System

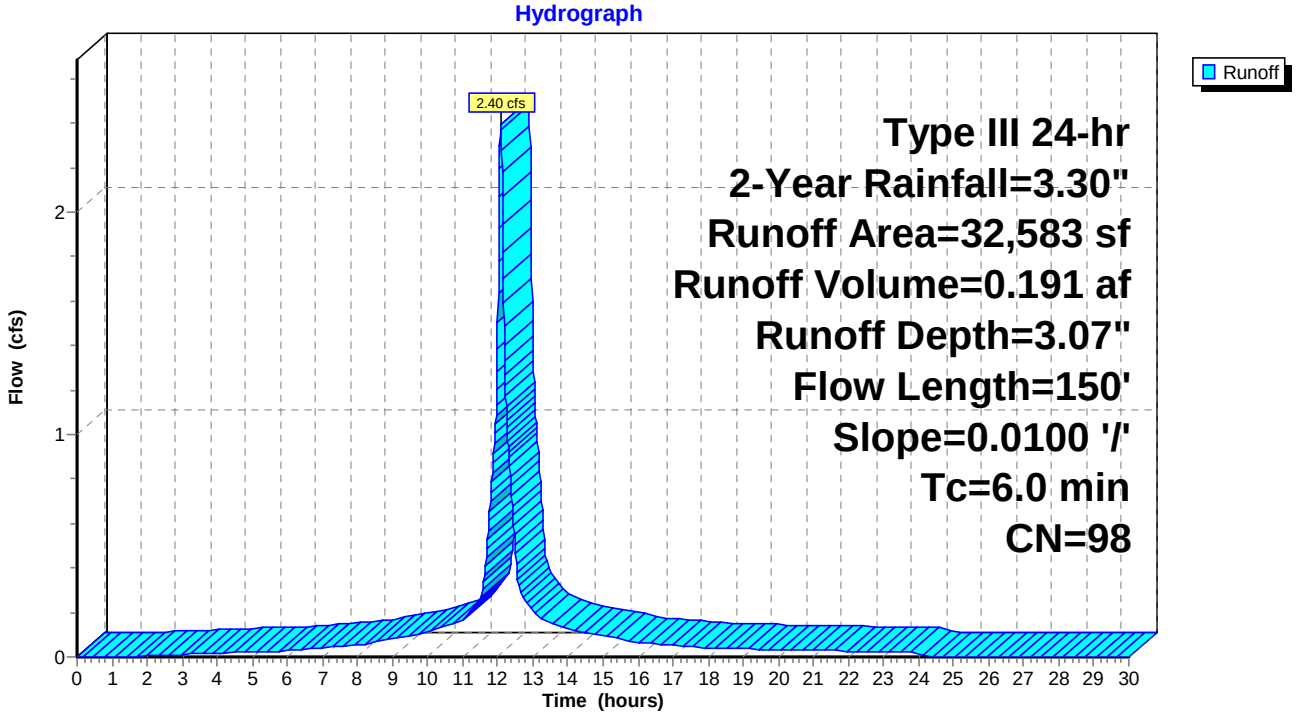
Runoff = 2.40 cfs @ 12.08 hrs, Volume= 0.191 af, Depth= 3.07"
Routed to Pond 3DP : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
32,583	98	Roofs, HSG A
32,583	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Roof Drains** Smooth surfaces n= 0.011 P2= 3.30"
2.2	150	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2-EW: Bld Roof Drains to Drain System

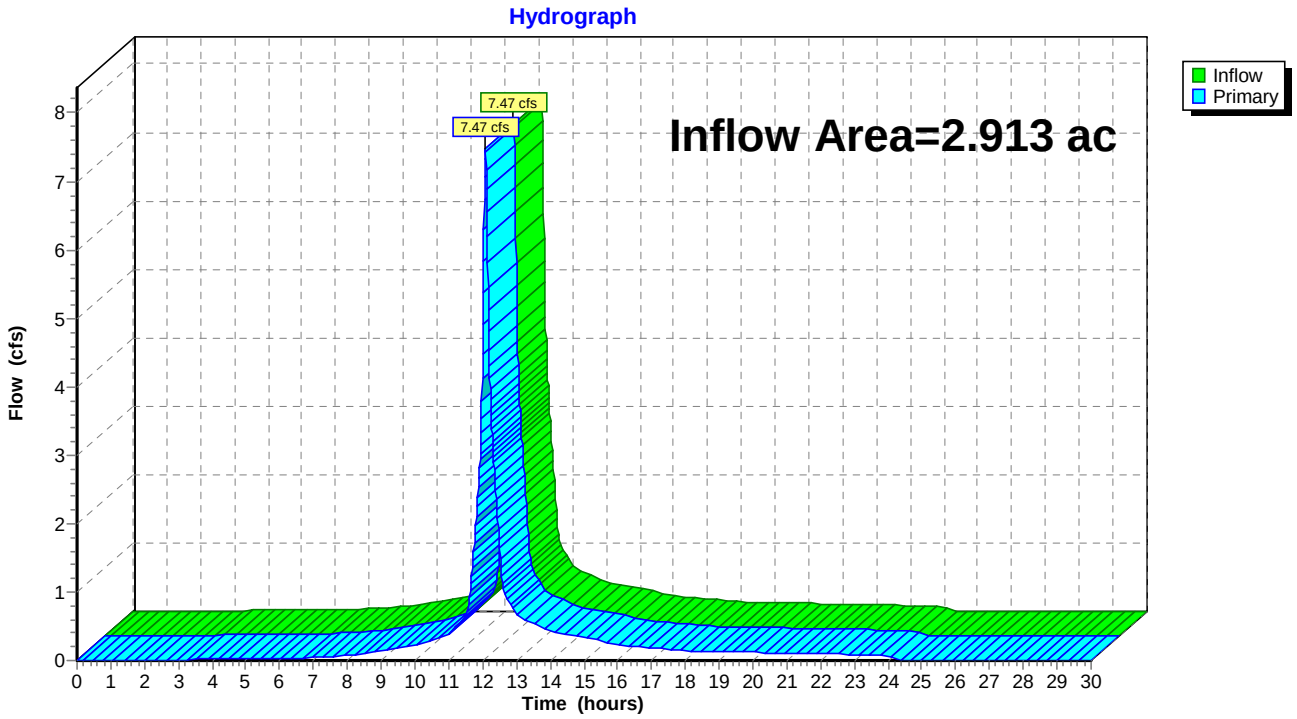


Summary for Pond 3DP: DP-1

Inflow Area = 2.913 ac, 85.95% Impervious, Inflow Depth = 2.28" for 2-Year event
Inflow = 7.47 cfs @ 12.09 hrs, Volume= 0.553 af
Primary = 7.47 cfs @ 12.09 hrs, Volume= 0.553 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2

Pond 3DP: DP-1



Summary for Subcatchment 4-PW: New Parking Area

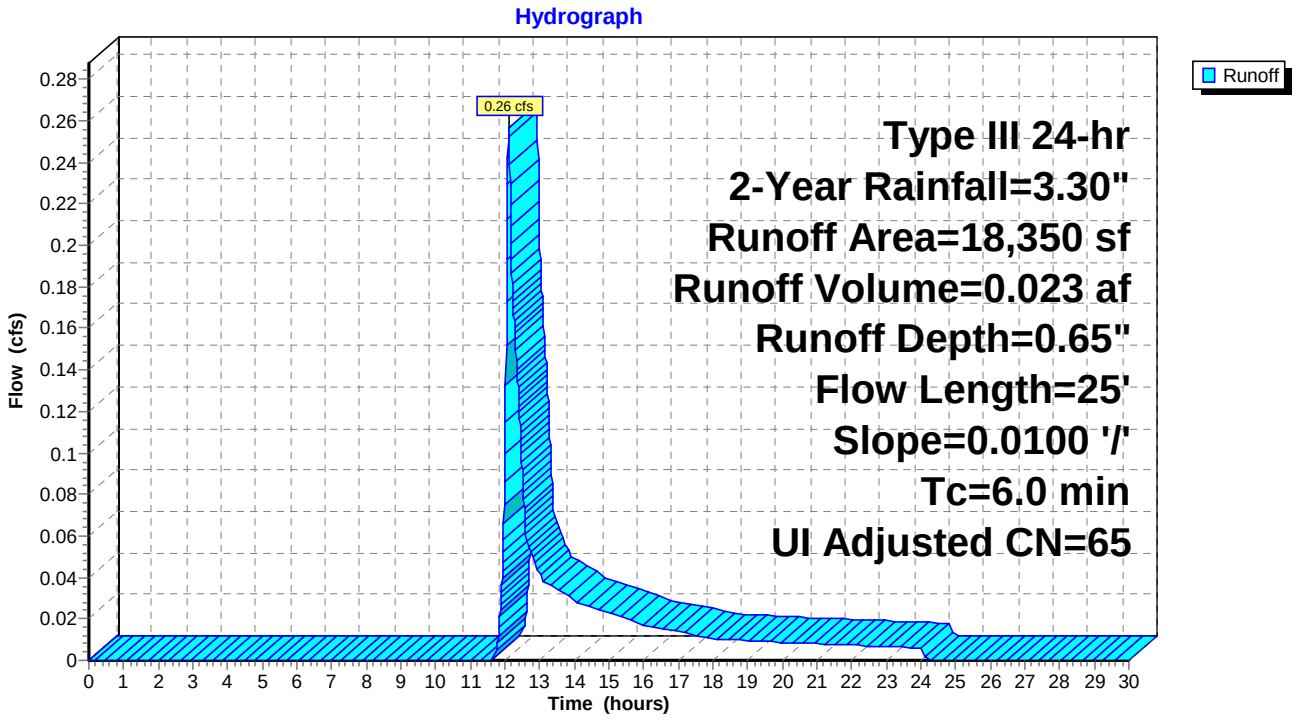
Runoff = 0.26 cfs @ 12.11 hrs, Volume= 0.023 af, Depth= 0.65"
Routed to Pond 5-PP : PERVIOUS Pavement SYSTEM

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.30"

	Area (sf)	CN	Adj	Description
*	11,503	76		Pervious Pavement - Table 5-5
	1,222	98		Unconnected pavement, HSG A
	5,625	39		>75% Grass cover, Good, HSG A
	18,350	66	65	Weighted Average, UI Adjusted
	17,128	64	64	93.34% Pervious Area
	1,222	98	98	6.66% Impervious Area
	1,222			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	25	0.0100	0.80		**Sheet Flow, Walkway to Parking Area** Smooth surfaces n= 0.011 P2= 3.30"
0.5	25	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 4-PW: New Parking Area



Summary for Pond 5-PP: PERVIOUS Pavement SYSTEM

Inflow Area = 0.421 ac, 6.66% Impervious, Inflow Depth = 0.65" for 2-Year event
Inflow = 0.26 cfs @ 12.11 hrs, Volume= 0.023 af
Outflow = 0.25 cfs @ 12.13 hrs, Volume= 0.023 af, Atten= 4%, Lag= 1.5 min
Primary = 0.25 cfs @ 12.13 hrs, Volume= 0.023 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 62.56' @ 12.13 hrs Surf.Area= 11,417 sf Storage= 21 cf

Plug-Flow detention time= 1.4 min calculated for 0.023 af (100% of inflow)
Center-of-Mass det. time= 1.4 min (893.8 - 892.4)

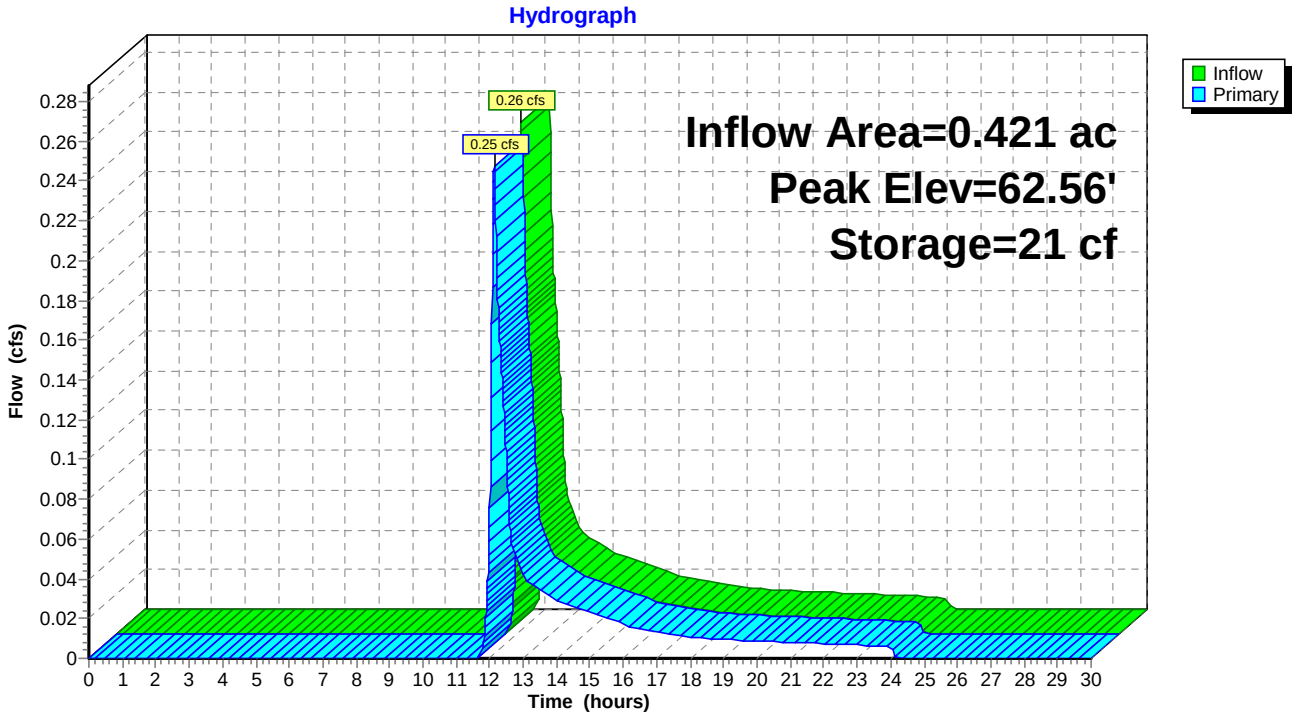
Volume	Invert	Avail.Storage	Storage Description
#1	62.55'	1,423 cf	**Stone Reservior (Prismatic)** Listed below (Recalc) 4,314 cf Overall x 33.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
62.55	11,503	0	0
63.30	0	4,314	4,314

Device	Routing	Invert	Outlet Devices
#1	Primary	62.55'	**8.270 in/hr Exfiltration over Horizontal area** Phase-In= 0.05'

Primary OutFlow Max=0.25 cfs @ 12.13 hrs HW=62.56' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.25 cfs)

Pond 5-PP: PERVIOUS Pavement SYSTEM



Summary for Subcatchment 6-PW: Building Roof Area

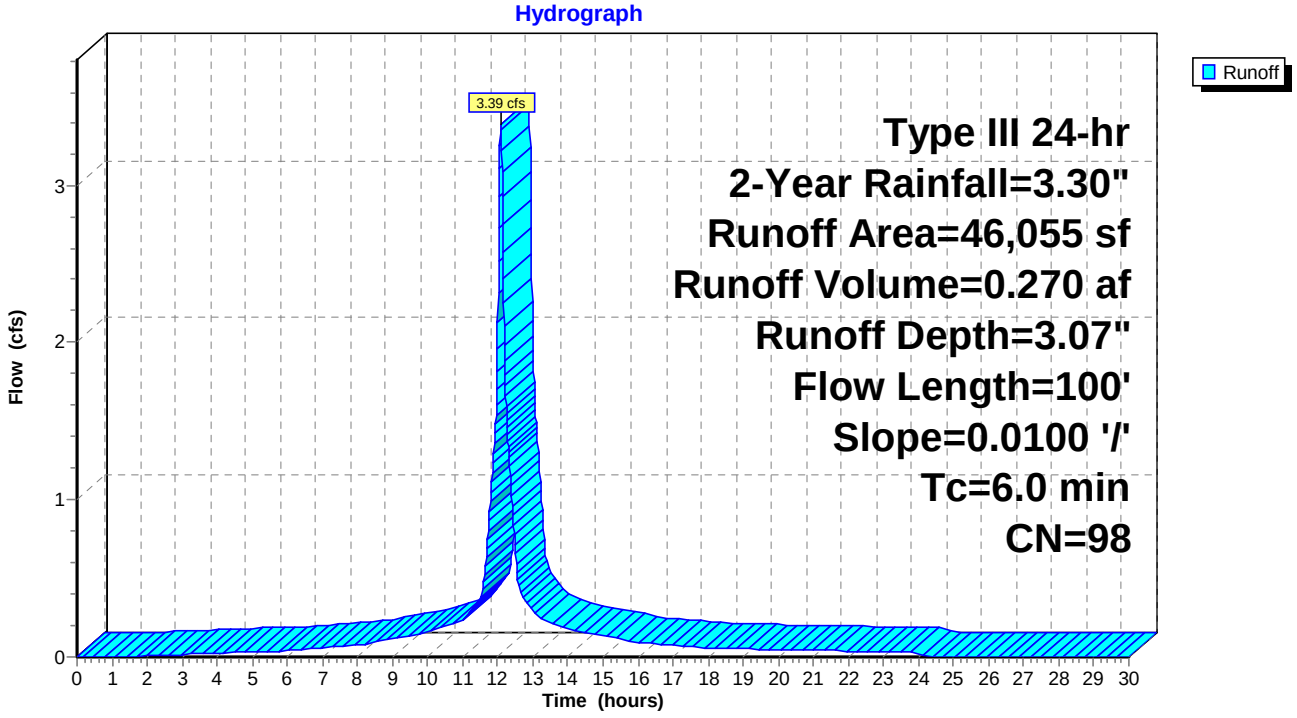
Runoff = 3.39 cfs @ 12.08 hrs, Volume= 0.270 af, Depth= 3.07"
Routed to Pond 8-SI : Storage, Infiltration in Prop Cultec 902

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
46,055	98	Roofs, HSG A
46,055	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.06		**Sheet Flow, Roof Drain System** Smooth surfaces n= 0.011 P2= 3.30"
1.6	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 6-PW: Building Roof Area



Summary for Subcatchment 7-PW: Rear Playground Area

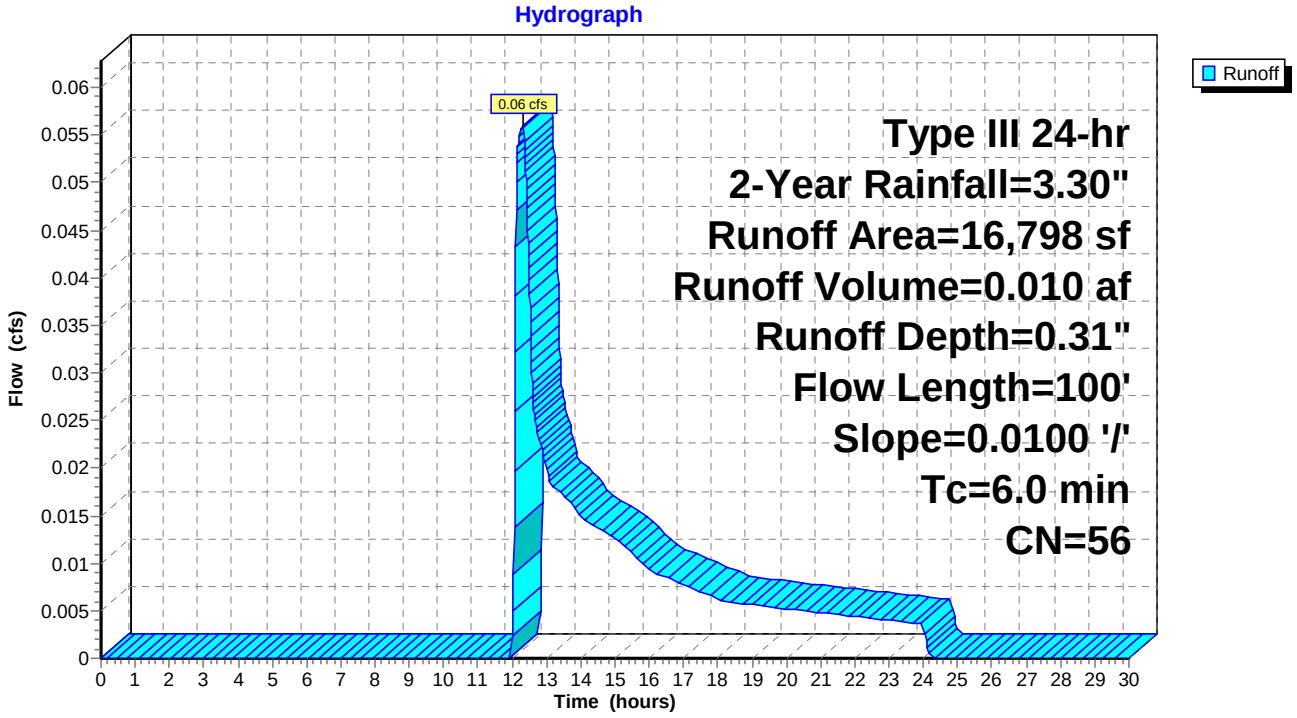
Runoff = 0.06 cfs @ 12.29 hrs, Volume= 0.010 af, Depth= 0.31"
Routed to Pond 8-SI : Storage, Infiltration in Prop Cultec 902

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
2,425	98	Paved parking, HSG A
14,373	49	50-75% Grass cover, Fair, HSG A
16,798	56	Weighted Average
14,373	49	85.56% Pervious Area
2,425	98	14.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.06		**Sheet Flow, Rear Area Flow to CBs** Smooth surfaces n= 0.011 P2= 3.30"
1.6	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7-PW: Rear Playground Area



Summary for Pond 8-SI: Storage, Infiltration in Prop Cultec 902

Inflow Area = 1.443 ac, 77.13% Impervious, Inflow Depth = 2.33" for 2-Year event
Inflow = 3.42 cfs @ 12.08 hrs, Volume= 0.280 af
Outflow = 2.11 cfs @ 12.18 hrs, Volume= 0.280 af, Atten= 38%, Lag= 6.0 min
Discarded = 0.34 cfs @ 11.53 hrs, Volume= 0.210 af
Primary = 1.77 cfs @ 12.18 hrs, Volume= 0.070 af
Routed to Pond 10-DP : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 59.37' @ 12.18 hrs Surf.Area= 1,777 sf Storage= 2,032 cf

Plug-Flow detention time= 15.1 min calculated for 0.280 af (100% of inflow)
Center-of-Mass det. time= 15.0 min (777.4 - 762.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	57.50'	2,078 cf	**44.75'W x 39.70'L x 5.75'H Field A** 10,215 cf Overall - 3,917 cf Embedded = 6,298 cf x 33.0% Voids
#2A	58.25'	3,917 cf	**Cultec R-902HD** x 60 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 60 Chambers in 6 Rows Cap Storage= 2.8 cf x 2 x 6 rows = 33.1 cf
		5,996 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	57.50'	**8.270 in/hr Exfiltration over Horizontal area** Phase-In= 0.10'
#2	Primary	58.50'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.34 cfs @ 11.53 hrs HW=57.62' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=1.76 cfs @ 12.18 hrs HW=59.37' TW=0.00' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Orifice Controls 1.76 cfs @ 3.24 fps)

Pond 8-SI: Storage, Infiltration in Prop Cultec 902 - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= 2.8 cf x 2 x 6 rows = 33.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

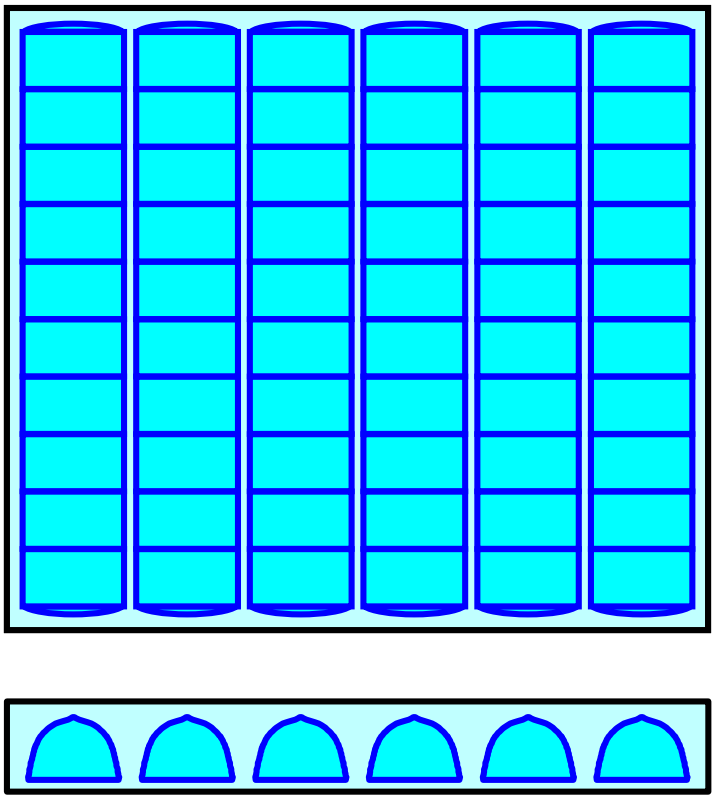
10 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 37.70' Row Length +12.0" End Stone x 2 = 39.70' Base Length
6 Rows x 78.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 44.75' Base Width
9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

60 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 6 Rows = 3,917.2 cf Chamber Storage

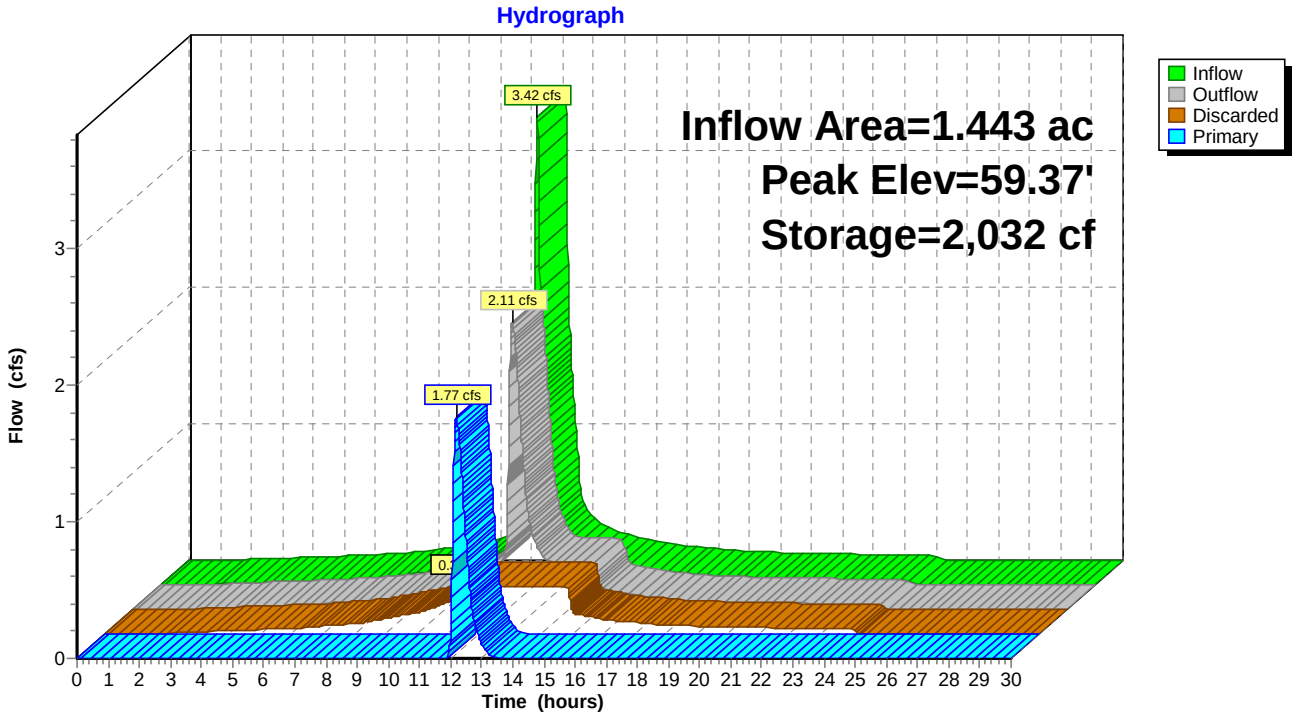
10,215.3 cf Field - 3,917.2 cf Chambers = 6,298.1 cf Stone x 33.0% Voids = 2,078.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,995.6 cf = 0.138 af
Overall Storage Efficiency = 58.7%
Overall System Size = 39.70' x 44.75' x 5.75'

60 Chambers
378.3 cy Field
233.3 cy Stone



Pond 8-SI: Storage, Infiltration in Prop Cultec 902



Summary for Subcatchment 9-PW: Runoff to Road Drainage System

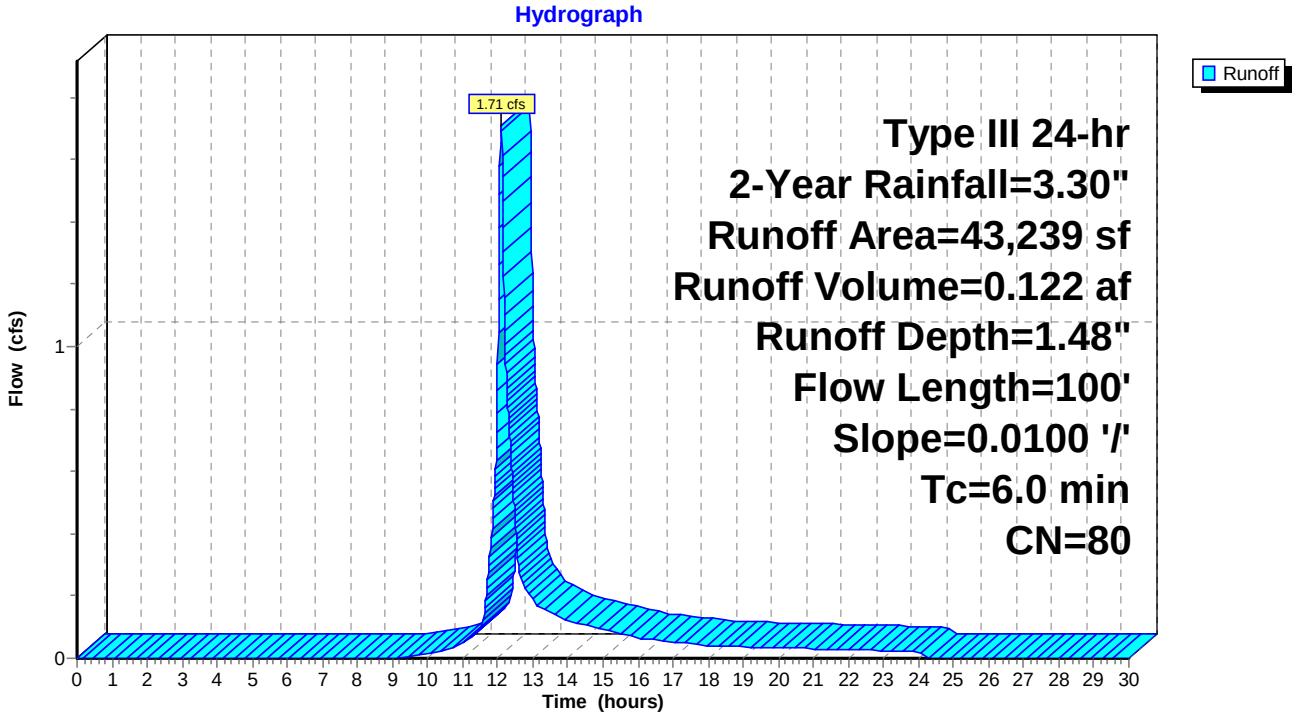
Runoff = 1.71 cfs @ 12.09 hrs, Volume= 0.122 af, Depth= 1.48"
Routed to Pond 10-DP : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
30,155	98	Paved parking, HSG A
13,084	39	>75% Grass cover, Good, HSG A
43,239	80	Weighted Average
13,084	39	30.26% Pervious Area
30,155	98	69.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.06		**Sheet Flow, Parking Area Flow to CBs** Smooth surfaces n= 0.011 P2= 3.30"
1.6	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 9-PW: Runoff to Road Drainage System

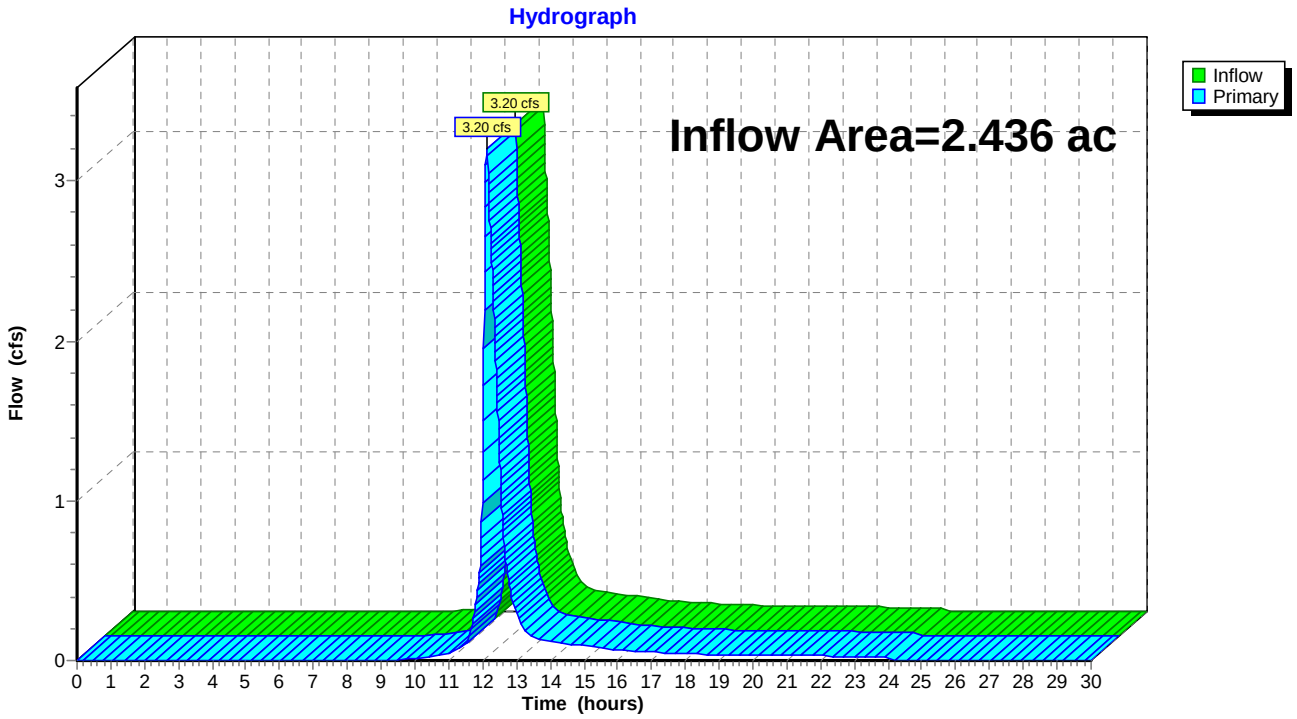


Summary for Pond 10-DP: DP-1

Inflow Area = 2.436 ac, 74.12% Impervious, Inflow Depth = 0.95" for 2-Year event
Inflow = 3.20 cfs @ 12.12 hrs, Volume= 0.193 af
Primary = 3.20 cfs @ 12.12 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2

Pond 10-DP: DP-1



Summary for Subcatchment 1-EW: Site Perimeter to Roads

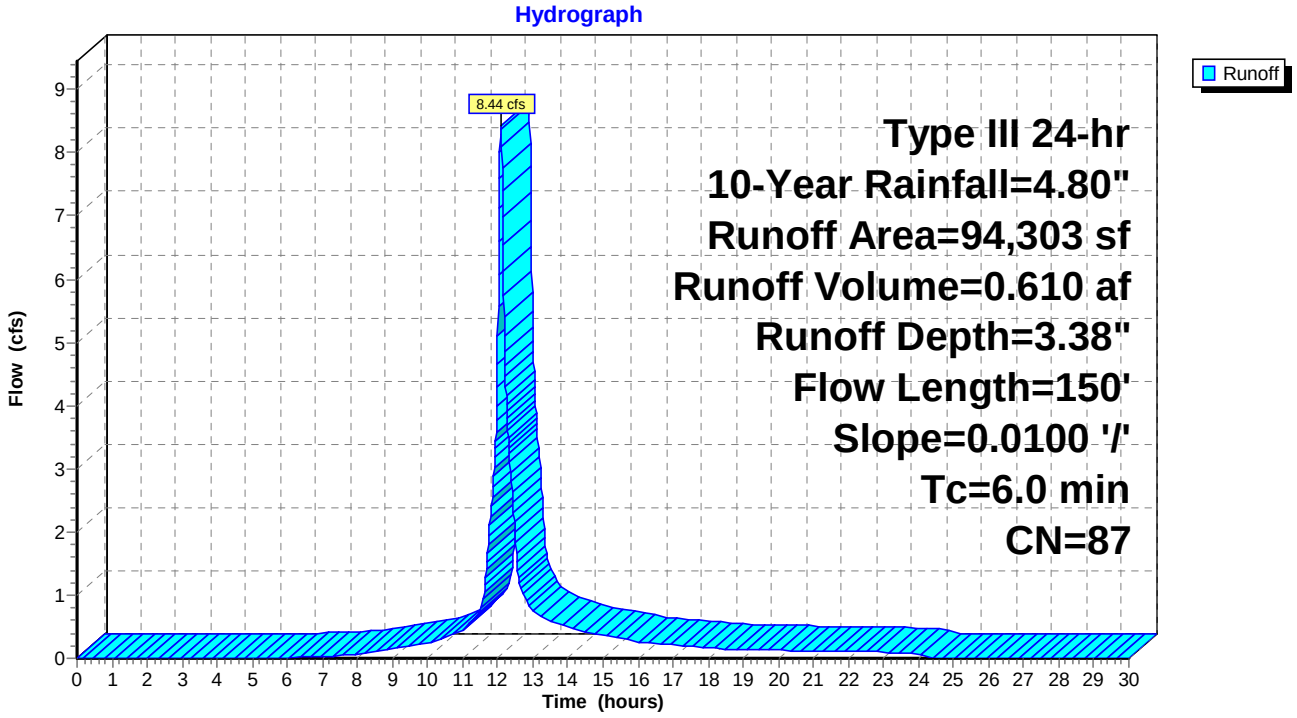
Runoff = 8.44 cfs @ 12.09 hrs, Volume= 0.610 af, Depth= 3.38"
Routed to Pond 3DP : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
76,472	98	Paved parking, HSG A
17,831	39	>75% Grass cover, Good, HSG A
94,303	87	Weighted Average
17,831	39	18.91% Pervious Area
76,472	98	81.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Parking Area Sheet Flow** Smooth surfaces n= 0.011 P2= 3.30"
2.2	150	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1-EW: Site Perimeter to Roads



Summary for Subcatchment 2-EW: Bld Roof Drains to Drain System

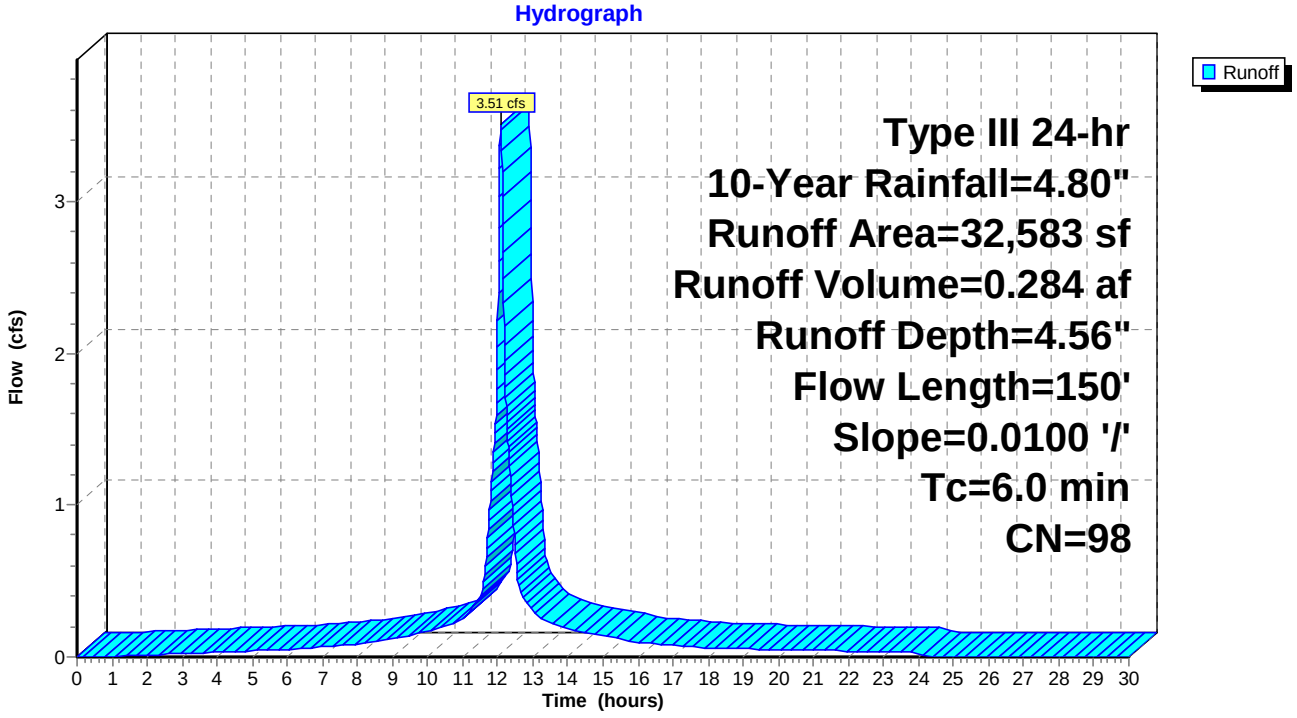
Runoff = 3.51 cfs @ 12.08 hrs, Volume= 0.284 af, Depth= 4.56"
Routed to Pond 3DP : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
32,583	98	Roofs, HSG A
32,583	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Roof Drains** Smooth surfaces n= 0.011 P2= 3.30"
2.2	150	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2-EW: Bld Roof Drains to Drain System

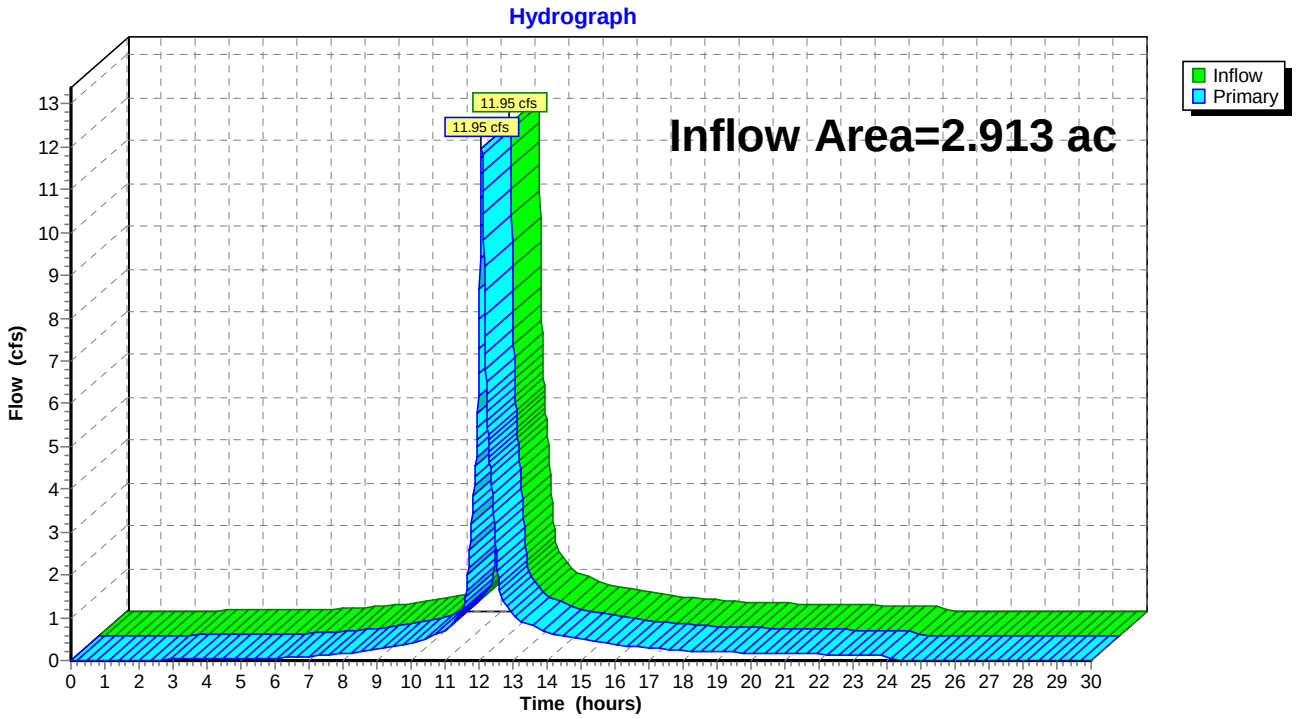


Summary for Pond 3DP: DP-1

Inflow Area = 2.913 ac, 85.95% Impervious, Inflow Depth = 3.68" for 10-Year event
Inflow = 11.95 cfs @ 12.09 hrs, Volume= 0.894 af
Primary = 11.95 cfs @ 12.09 hrs, Volume= 0.894 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2

Pond 3DP: DP-1



Summary for Subcatchment 4-PW: New Parking Area

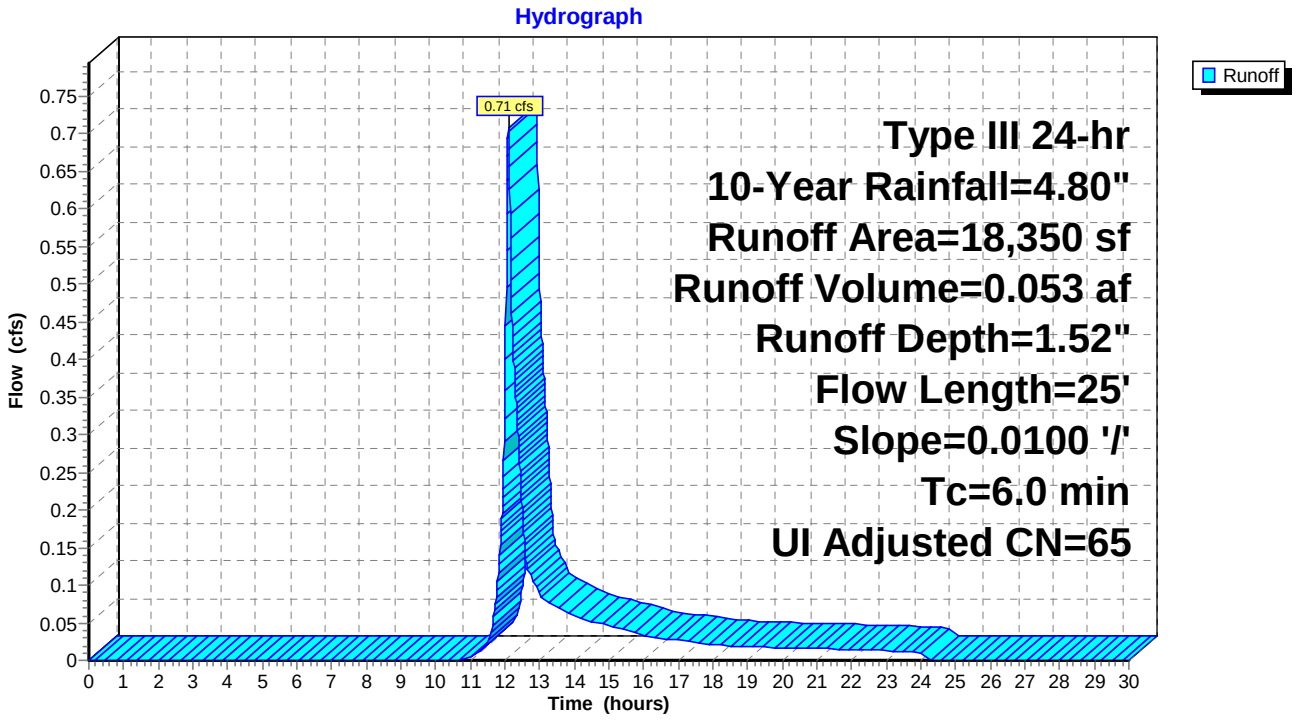
Runoff = 0.71 cfs @ 12.10 hrs, Volume= 0.053 af, Depth= 1.52"
Routed to Pond 5-PP : PERVIOUS Pavement SYSTEM

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Adj	Description
*	11,503	76		Pervious Pavement - Table 5-5
	1,222	98		Unconnected pavement, HSG A
	5,625	39		>75% Grass cover, Good, HSG A
	18,350	66	65	Weighted Average, UI Adjusted
	17,128	64	64	93.34% Pervious Area
	1,222	98	98	6.66% Impervious Area
	1,222			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	25	0.0100	0.80		**Sheet Flow, Walkway to Parking Area** Smooth surfaces n= 0.011 P2= 3.30"
0.5	25	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 4-PW: New Parking Area



Summary for Pond 5-PP: PERVIOUS Pavement SYSTEM

Inflow Area = 0.421 ac, 6.66% Impervious, Inflow Depth = 1.52" for 10-Year event
Inflow = 0.71 cfs @ 12.10 hrs, Volume= 0.053 af
Outflow = 0.68 cfs @ 12.12 hrs, Volume= 0.053 af, Atten= 4%, Lag= 1.4 min
Primary = 0.68 cfs @ 12.12 hrs, Volume= 0.053 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 62.57' @ 12.12 hrs Surf.Area= 11,265 sf Storage= 58 cf

Plug-Flow detention time= 1.4 min calculated for 0.053 af (100% of inflow)
Center-of-Mass det. time= 1.4 min (864.9 - 863.4)

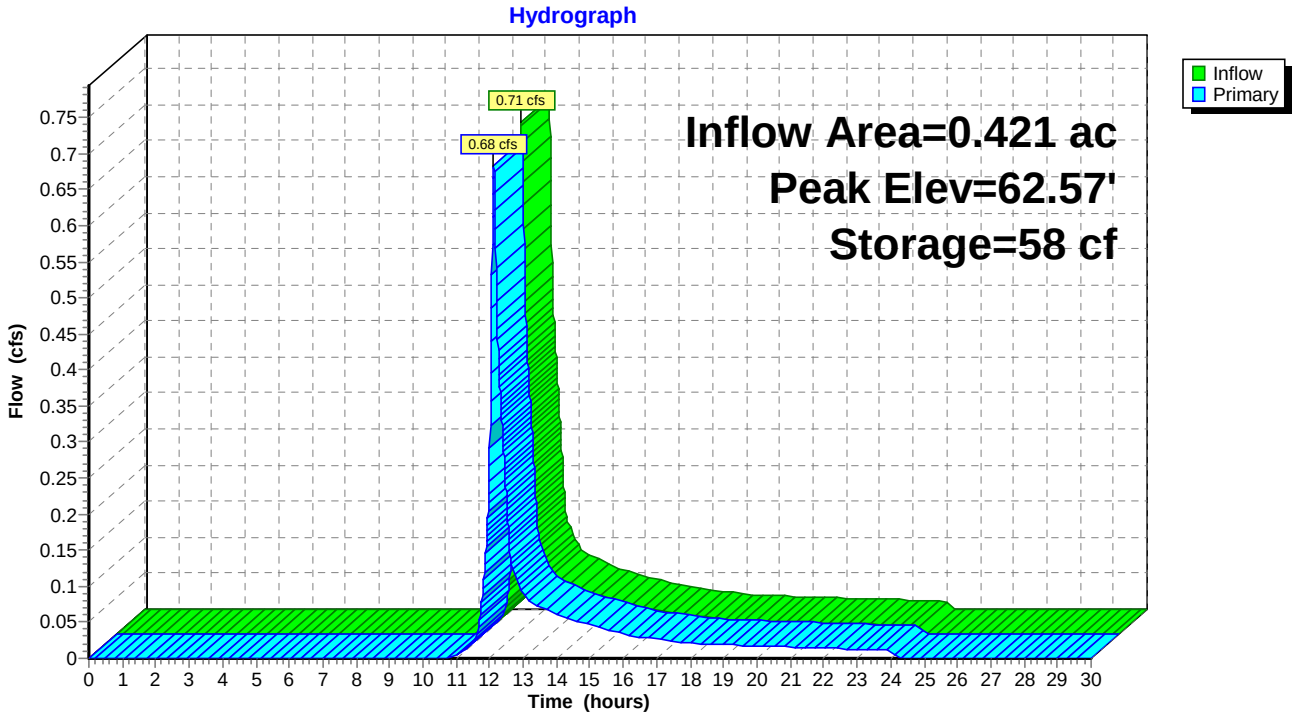
Volume	Invert	Avail.Storage	Storage Description
#1	62.55'	1,423 cf	**Stone Reservior (Prismatic)** Listed below (Recalc) 4,314 cf Overall x 33.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
62.55	11,503	0	0
63.30	0	4,314	4,314

Device	Routing	Invert	Outlet Devices
#1	Primary	62.55'	**8.270 in/hr Exfiltration over Horizontal area** Phase-In= 0.05'

Primary OutFlow Max=0.68 cfs @ 12.12 hrs HW=62.57' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.68 cfs)

Pond 5-PP: PERVIOUS Pavement SYSTEM



Summary for Subcatchment 6-PW: Building Roof Area

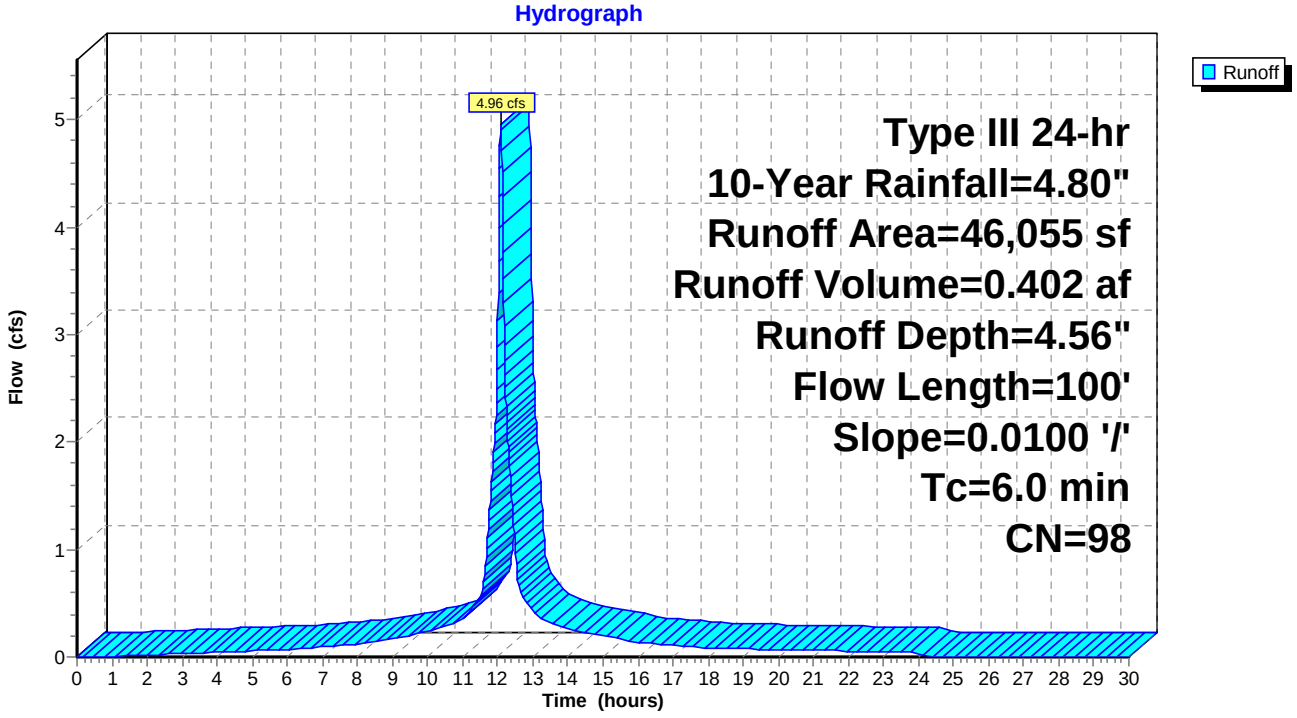
Runoff = 4.96 cfs @ 12.08 hrs, Volume= 0.402 af, Depth= 4.56"
Routed to Pond 8-SI : Storage, Infiltration in Prop Cultec 902

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
46,055	98	Roofs, HSG A
46,055	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.06		**Sheet Flow, Roof Drain System** Smooth surfaces n= 0.011 P2= 3.30"
1.6	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 6-PW: Building Roof Area



Summary for Subcatchment 7-PW: Rear Playground Area

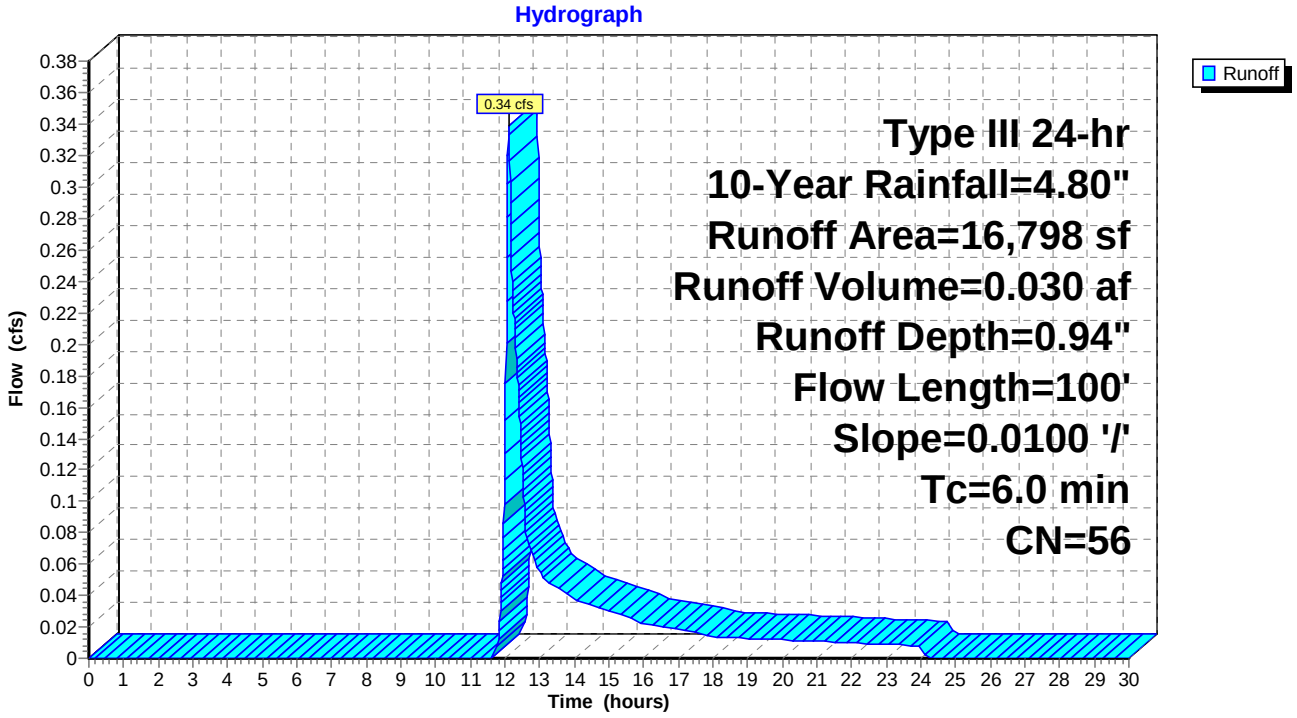
Runoff = 0.34 cfs @ 12.11 hrs, Volume= 0.030 af, Depth= 0.94"
Routed to Pond 8-SI : Storage, Infiltration in Prop Cultec 902

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
2,425	98	Paved parking, HSG A
14,373	49	50-75% Grass cover, Fair, HSG A
16,798	56	Weighted Average
14,373	49	85.56% Pervious Area
2,425	98	14.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.06		**Sheet Flow, Rear Area Flow to CBs** Smooth surfaces n= 0.011 P2= 3.30"
1.6	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7-PW: Rear Playground Area



Summary for Pond 8-SI: Storage, Infiltration in Prop Cultec 902

Inflow Area = 1.443 ac, 77.13% Impervious, Inflow Depth = 3.60" for 10-Year event
Inflow = 5.29 cfs @ 12.08 hrs, Volume= 0.432 af
Outflow = 3.16 cfs @ 12.19 hrs, Volume= 0.432 af, Atten= 40%, Lag= 6.3 min
Discarded = 0.34 cfs @ 11.10 hrs, Volume= 0.283 af
Primary = 2.82 cfs @ 12.19 hrs, Volume= 0.149 af
Routed to Pond 10-DP : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 60.07' @ 12.19 hrs Surf.Area= 1,777 sf Storage= 2,985 cf

Plug-Flow detention time= 15.8 min calculated for 0.432 af (100% of inflow)
Center-of-Mass det. time= 15.8 min (774.6 - 758.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	57.50'	2,078 cf	**44.75'W x 39.70'L x 5.75'H Field A** 10,215 cf Overall - 3,917 cf Embedded = 6,298 cf x 33.0% Voids
#2A	58.25'	3,917 cf	**Cultec R-902HD** x 60 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 60 Chambers in 6 Rows Cap Storage= 2.8 cf x 2 x 6 rows = 33.1 cf
		5,996 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	57.50'	**8.270 in/hr Exfiltration over Horizontal area** Phase-In= 0.10'
#2	Primary	58.50'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.34 cfs @ 11.10 hrs HW=57.62' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=2.82 cfs @ 12.19 hrs HW=60.07' TW=0.00' (Dynamic Tailwater)
↑**2=Orifice/Grate** (Orifice Controls 2.82 cfs @ 5.16 fps)

Pond 8-SI: Storage, Infiltration in Prop Cultec 902 - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= 2.8 cf x 2 x 6 rows = 33.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

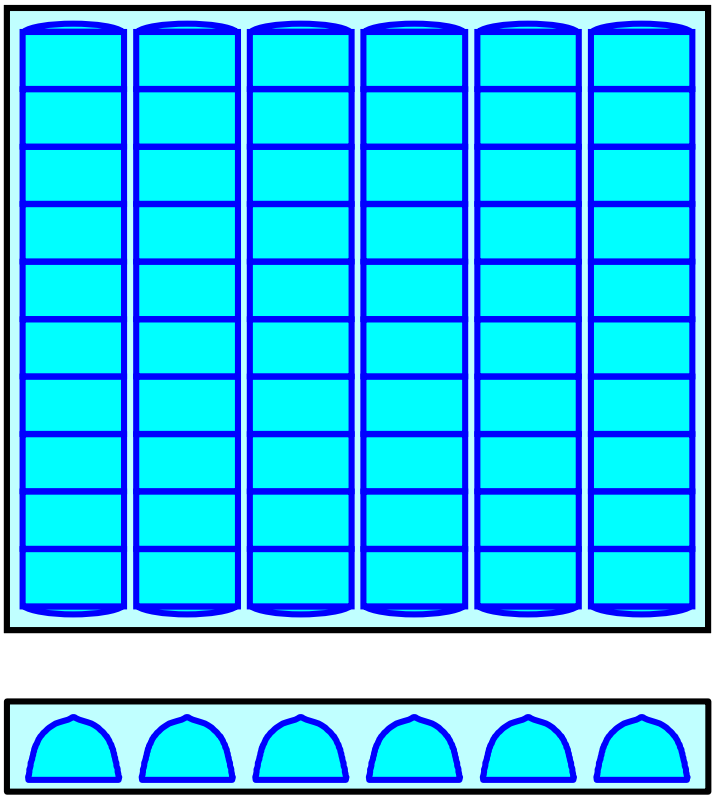
10 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 37.70' Row Length +12.0" End Stone x 2 = 39.70' Base Length
6 Rows x 78.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 44.75' Base Width
9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

60 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 6 Rows = 3,917.2 cf Chamber Storage

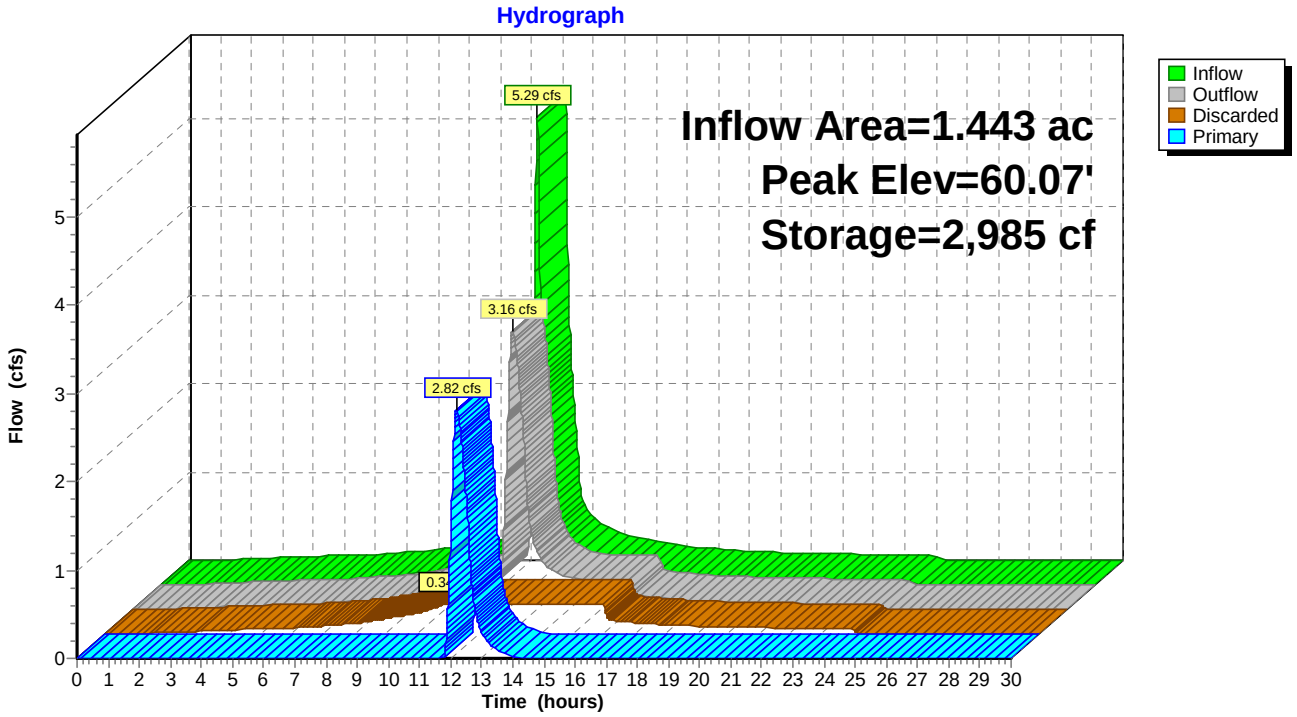
10,215.3 cf Field - 3,917.2 cf Chambers = 6,298.1 cf Stone x 33.0% Voids = 2,078.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,995.6 cf = 0.138 af
Overall Storage Efficiency = 58.7%
Overall System Size = 39.70' x 44.75' x 5.75'

60 Chambers
378.3 cy Field
233.3 cy Stone



Pond 8-SI: Storage, Infiltration in Prop Cultec 902



Summary for Subcatchment 9-PW: Runoff to Road Drainage System

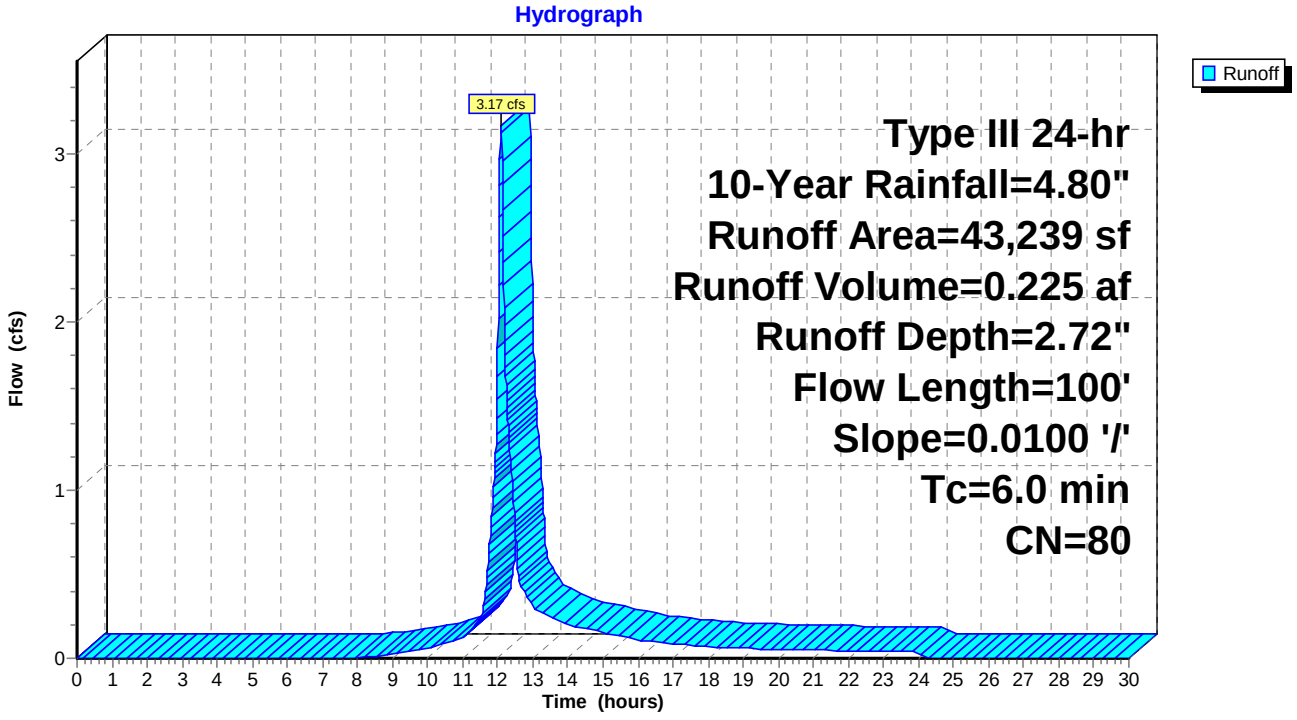
Runoff = 3.17 cfs @ 12.09 hrs, Volume= 0.225 af, Depth= 2.72"
Routed to Pond 10-DP : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
30,155	98	Paved parking, HSG A
13,084	39	>75% Grass cover, Good, HSG A
43,239	80	Weighted Average
13,084	39	30.26% Pervious Area
30,155	98	69.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.06		**Sheet Flow, Parking Area Flow to CBs** Smooth surfaces n= 0.011 P2= 3.30"
1.6	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 9-PW: Runoff to Road Drainage System

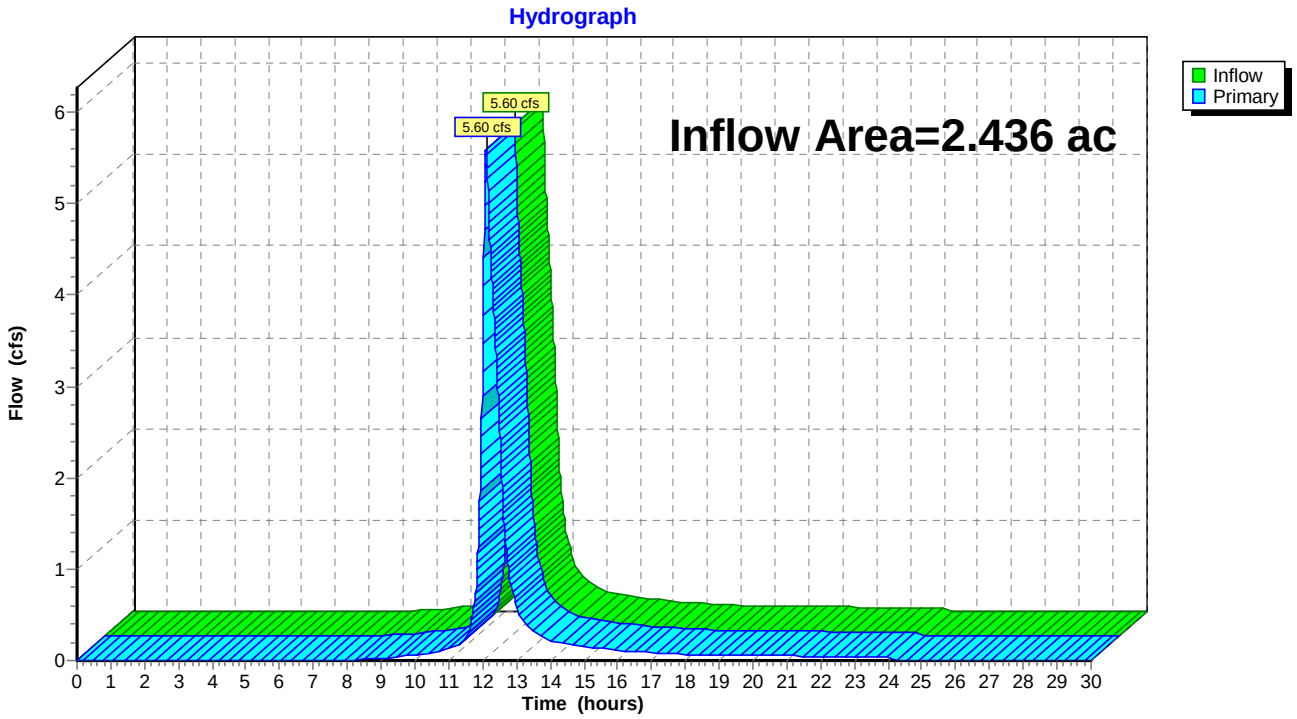


Summary for Pond 10-DP: DP-1

Inflow Area = 2.436 ac, 74.12% Impervious, Inflow Depth = 1.84" for 10-Year event
Inflow = 5.60 cfs @ 12.11 hrs, Volume= 0.374 af
Primary = 5.60 cfs @ 12.11 hrs, Volume= 0.374 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2

Pond 10-DP: DP-1



Summary for Subcatchment 1-EW: Site Perimeter to Roads

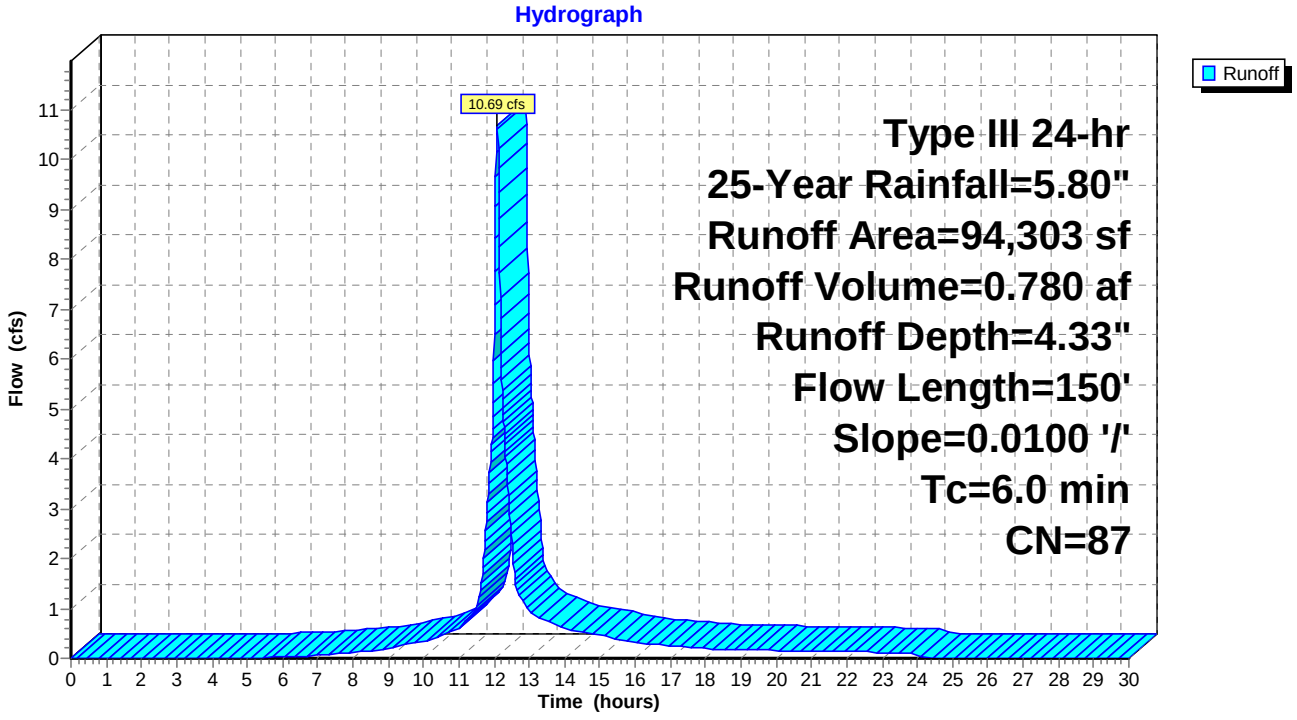
Runoff = 10.69 cfs @ 12.09 hrs, Volume= 0.780 af, Depth= 4.33"
Routed to Pond 3DP : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.80"

Area (sf)	CN	Description
76,472	98	Paved parking, HSG A
17,831	39	>75% Grass cover, Good, HSG A
94,303	87	Weighted Average
17,831	39	18.91% Pervious Area
76,472	98	81.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Parking Area Sheet Flow** Smooth surfaces n= 0.011 P2= 3.30"
2.2	150	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1-EW: Site Perimeter to Roads



Summary for Subcatchment 2-EW: Bld Roof Drains to Drain System

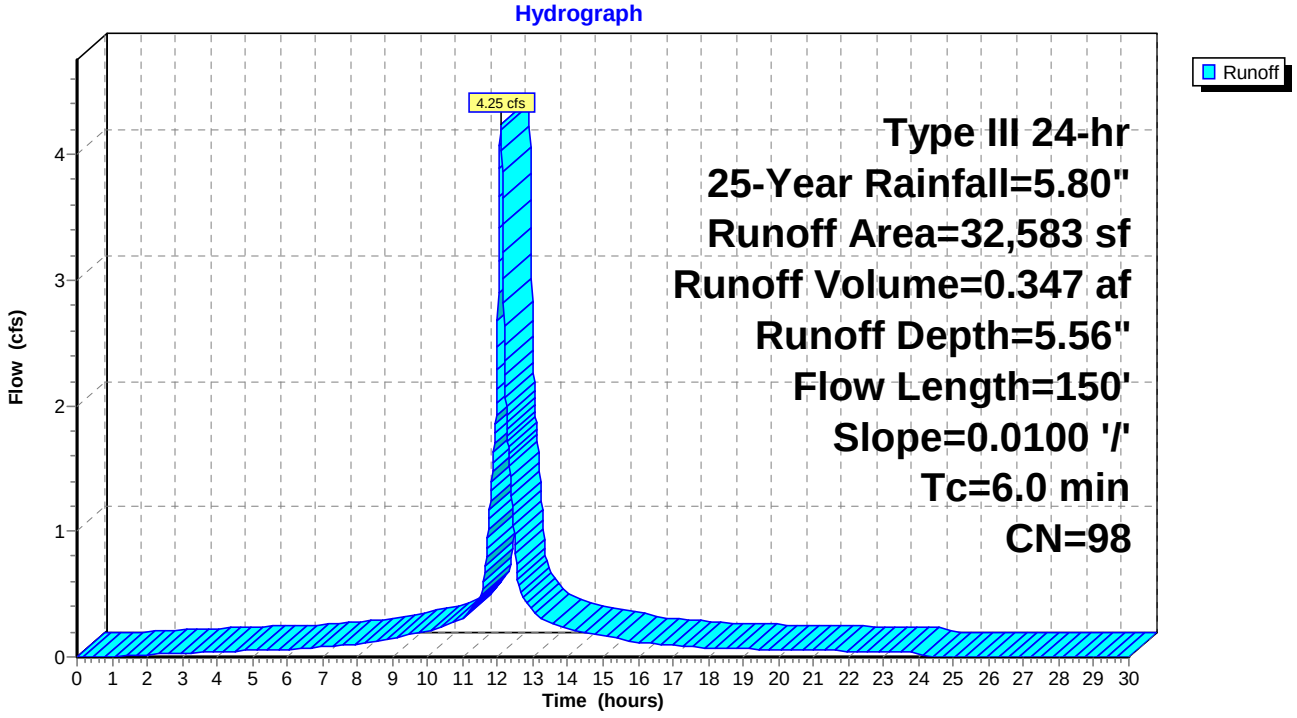
Runoff = 4.25 cfs @ 12.08 hrs, Volume= 0.347 af, Depth= 5.56"
Routed to Pond 3DP : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.80"

Area (sf)	CN	Description
32,583	98	Roofs, HSG A
32,583	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Roof Drains** Smooth surfaces n= 0.011 P2= 3.30"
2.2	150	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2-EW: Bld Roof Drains to Drain System

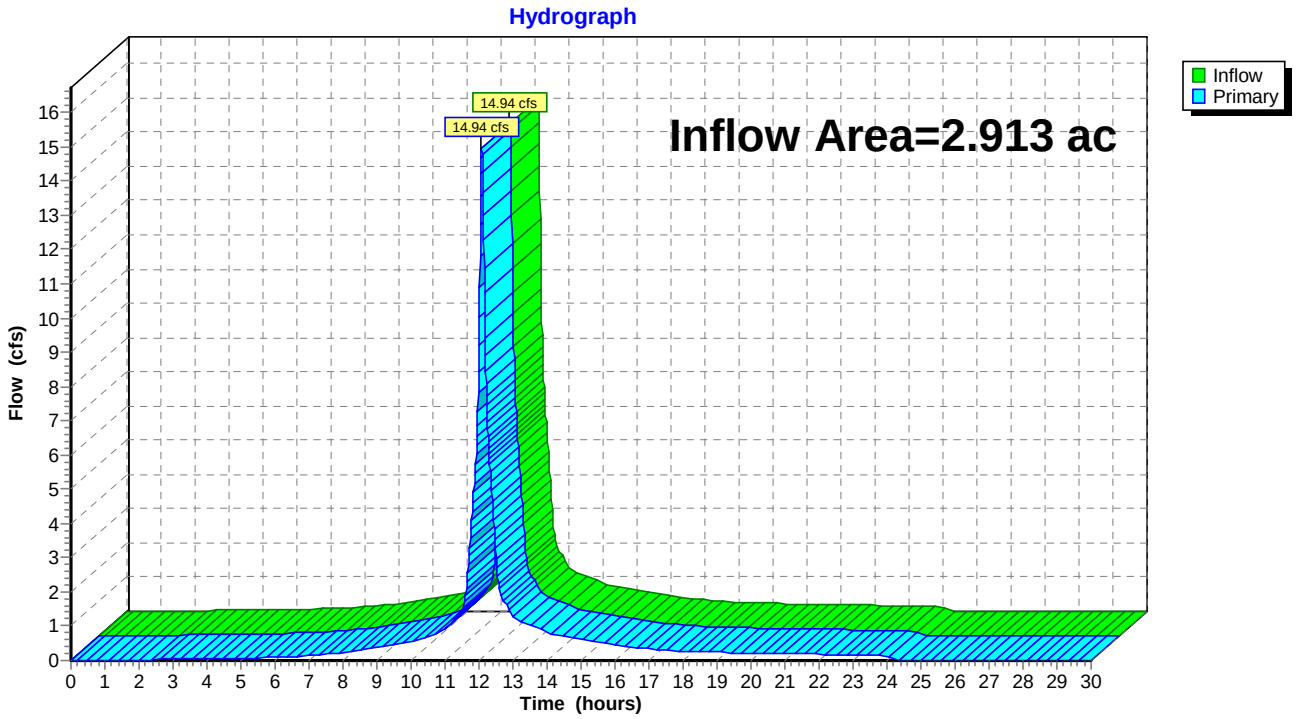


Summary for Pond 3DP: DP-1

Inflow Area = 2.913 ac, 85.95% Impervious, Inflow Depth = 4.64" for 25-Year event
Inflow = 14.94 cfs @ 12.08 hrs, Volume= 1.127 af
Primary = 14.94 cfs @ 12.08 hrs, Volume= 1.127 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2

Pond 3DP: DP-1



Summary for Subcatchment 4-PW: New Parking Area

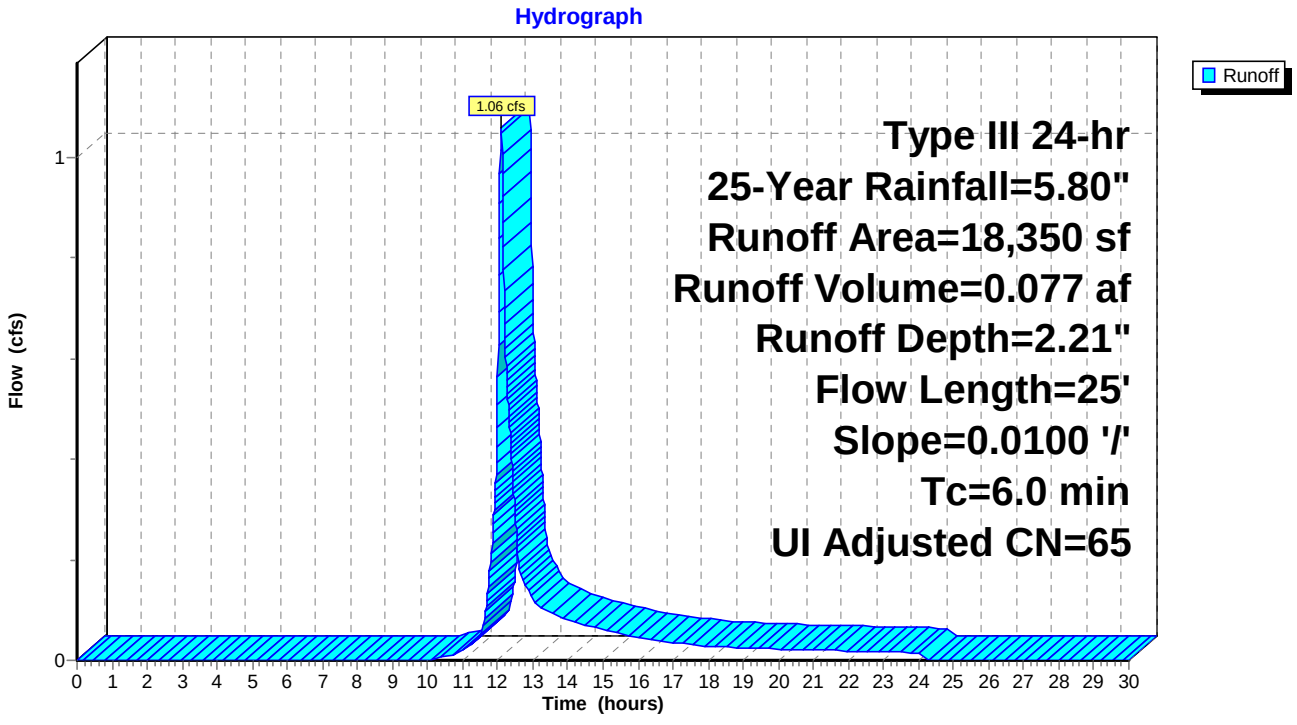
Runoff = 1.06 cfs @ 12.09 hrs, Volume= 0.077 af, Depth= 2.21"
Routed to Pond 5-PP : PERVIOUS Pavement SYSTEM

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.80"

	Area (sf)	CN	Adj	Description
*	11,503	76		Pervious Pavement - Table 5-5
	1,222	98		Unconnected pavement, HSG A
	5,625	39		>75% Grass cover, Good, HSG A
	18,350	66	65	Weighted Average, UI Adjusted
	17,128	64	64	93.34% Pervious Area
	1,222	98	98	6.66% Impervious Area
	1,222			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	25	0.0100	0.80		**Sheet Flow, Walkway to Parking Area** Smooth surfaces n= 0.011 P2= 3.30"
0.5	25	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 4-PW: New Parking Area



Summary for Pond 5-PP: PERVIOUS Pavement SYSTEM

Inflow Area = 0.421 ac, 6.66% Impervious, Inflow Depth = 2.21" for 25-Year event
Inflow = 1.06 cfs @ 12.09 hrs, Volume= 0.077 af
Outflow = 1.02 cfs @ 12.12 hrs, Volume= 0.077 af, Atten= 4%, Lag= 1.4 min
Primary = 1.02 cfs @ 12.12 hrs, Volume= 0.077 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 62.57' @ 12.12 hrs Surf.Area= 11,147 sf Storage= 87 cf

Plug-Flow detention time= 1.4 min calculated for 0.077 af (100% of inflow)
Center-of-Mass det. time= 1.4 min (853.5 - 852.1)

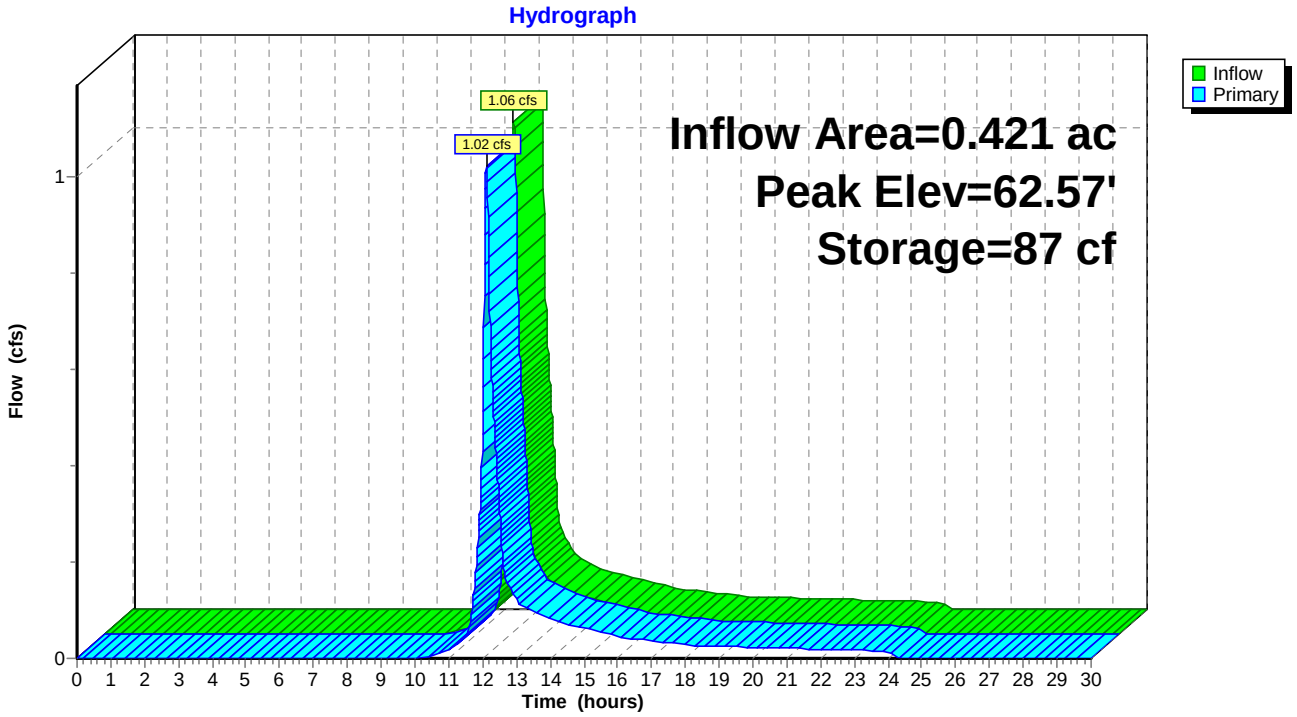
Volume	Invert	Avail.Storage	Storage Description
#1	62.55'	1,423 cf	**Stone Reservior (Prismatic)** Listed below (Recalc) 4,314 cf Overall x 33.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
62.55	11,503	0	0
63.30	0	4,314	4,314

Device	Routing	Invert	Outlet Devices
#1	Primary	62.55'	**8.270 in/hr Exfiltration over Horizontal area** Phase-In= 0.05'

Primary OutFlow Max=1.02 cfs @ 12.12 hrs HW=62.57' (Free Discharge)
1=Exfiltration (Exfiltration Controls 1.02 cfs)

Pond 5-PP: PERVIOUS Pavement SYSTEM



Summary for Subcatchment 6-PW: Building Roof Area

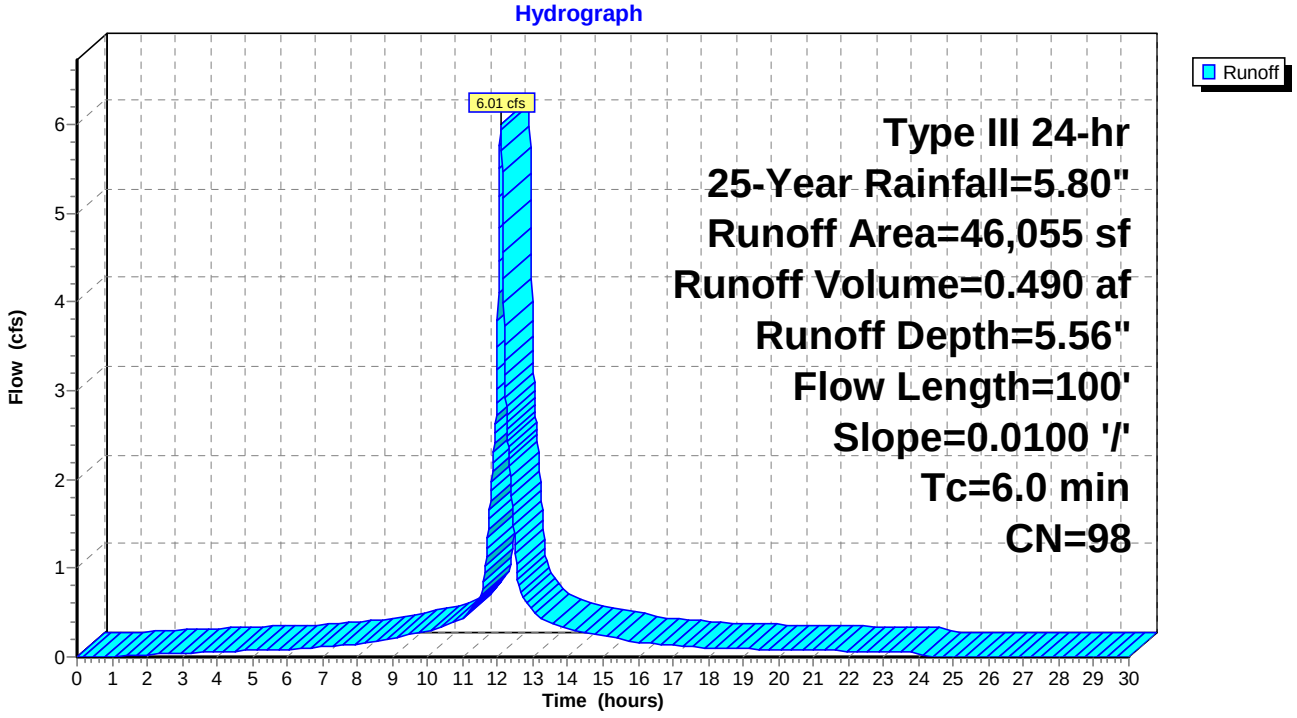
Runoff = 6.01 cfs @ 12.08 hrs, Volume= 0.490 af, Depth= 5.56"
Routed to Pond 8-SI : Storage, Infiltration in Prop Cultec 902

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.80"

Area (sf)	CN	Description
46,055	98	Roofs, HSG A
46,055	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.06		**Sheet Flow, Roof Drain System** Smooth surfaces n= 0.011 P2= 3.30"
1.6	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 6-PW: Building Roof Area



Summary for Subcatchment 7-PW: Rear Playground Area

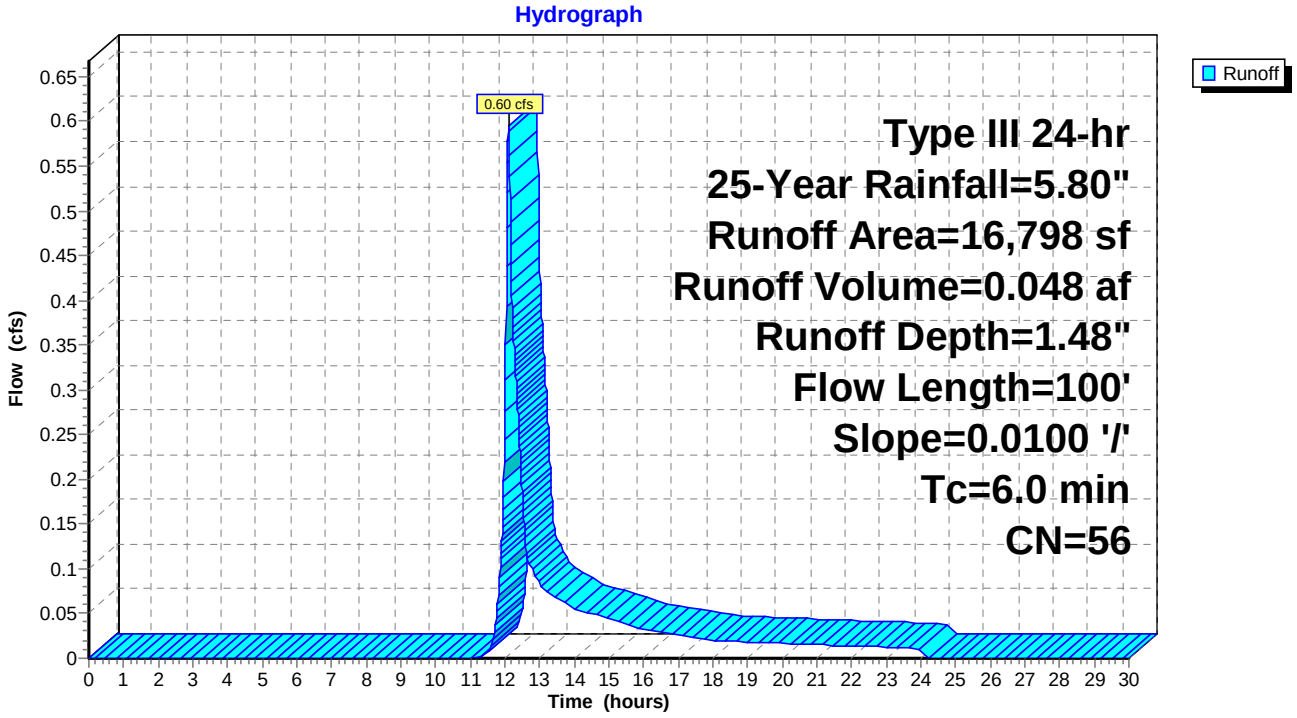
Runoff = 0.60 cfs @ 12.10 hrs, Volume= 0.048 af, Depth= 1.48"
Routed to Pond 8-SI : Storage, Infiltration in Prop Cultec 902

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.80"

Area (sf)	CN	Description
2,425	98	Paved parking, HSG A
14,373	49	50-75% Grass cover, Fair, HSG A
16,798	56	Weighted Average
14,373	49	85.56% Pervious Area
2,425	98	14.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.06		**Sheet Flow, Rear Area Flow to CBs** Smooth surfaces n= 0.011 P2= 3.30"
1.6	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7-PW: Rear Playground Area



Summary for Pond 8-SI: Storage, Infiltration in Prop Cultec 902

Inflow Area = 1.443 ac, 77.13% Impervious, Inflow Depth = 4.47" for 25-Year event
Inflow = 6.59 cfs @ 12.08 hrs, Volume= 0.538 af
Outflow = 3.76 cfs @ 12.20 hrs, Volume= 0.538 af, Atten= 43%, Lag= 6.8 min
Discarded = 0.34 cfs @ 10.59 hrs, Volume= 0.324 af
Primary = 3.42 cfs @ 12.20 hrs, Volume= 0.213 af
Routed to Pond 10-DP : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 60.62' @ 12.20 hrs Surf.Area= 1,777 sf Storage= 3,707 cf

Plug-Flow detention time= 16.6 min calculated for 0.537 af (100% of inflow)
Center-of-Mass det. time= 16.6 min (773.9 - 757.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	57.50'	2,078 cf	**44.75'W x 39.70'L x 5.75'H Field A** 10,215 cf Overall - 3,917 cf Embedded = 6,298 cf x 33.0% Voids
#2A	58.25'	3,917 cf	**Cultec R-902HD** x 60 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 60 Chambers in 6 Rows Cap Storage= 2.8 cf x 2 x 6 rows = 33.1 cf
		5,996 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	57.50'	**8.270 in/hr Exfiltration over Horizontal area** Phase-In= 0.10'
#2	Primary	58.50'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.34 cfs @ 10.59 hrs HW=57.62' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=3.42 cfs @ 12.20 hrs HW=60.62' TW=0.00' (Dynamic Tailwater)
↑**2=Orifice/Grate** (Orifice Controls 3.42 cfs @ 6.28 fps)

Pond 8-SI: Storage, Infiltration in Prop Cultec 902 - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= 2.8 cf x 2 x 6 rows = 33.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

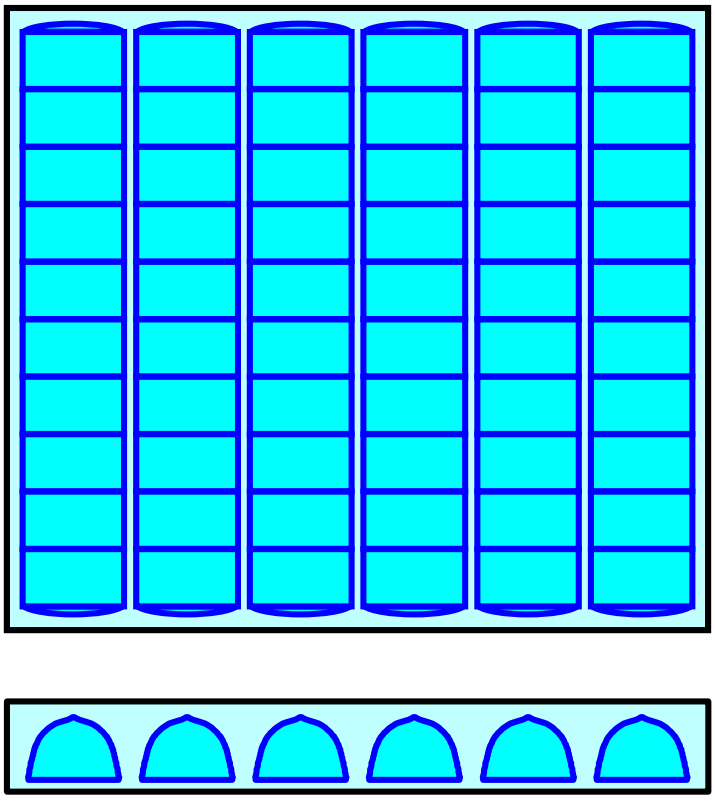
10 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 37.70' Row Length +12.0" End Stone x 2 = 39.70' Base Length
6 Rows x 78.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 44.75' Base Width
9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

60 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 6 Rows = 3,917.2 cf Chamber Storage

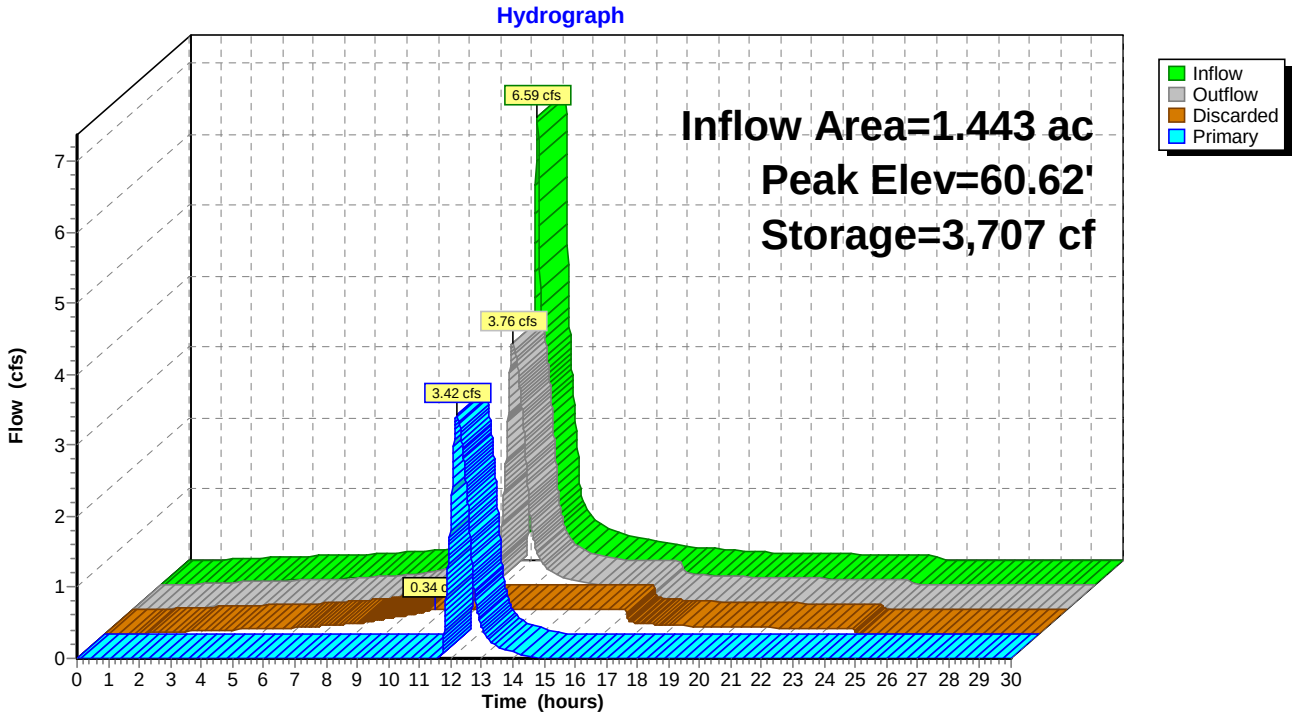
10,215.3 cf Field - 3,917.2 cf Chambers = 6,298.1 cf Stone x 33.0% Voids = 2,078.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,995.6 cf = 0.138 af
Overall Storage Efficiency = 58.7%
Overall System Size = 39.70' x 44.75' x 5.75'

60 Chambers
378.3 cy Field
233.3 cy Stone



Pond 8-SI: Storage, Infiltration in Prop Cultec 902



Summary for Subcatchment 9-PW: Runoff to Road Drainage System

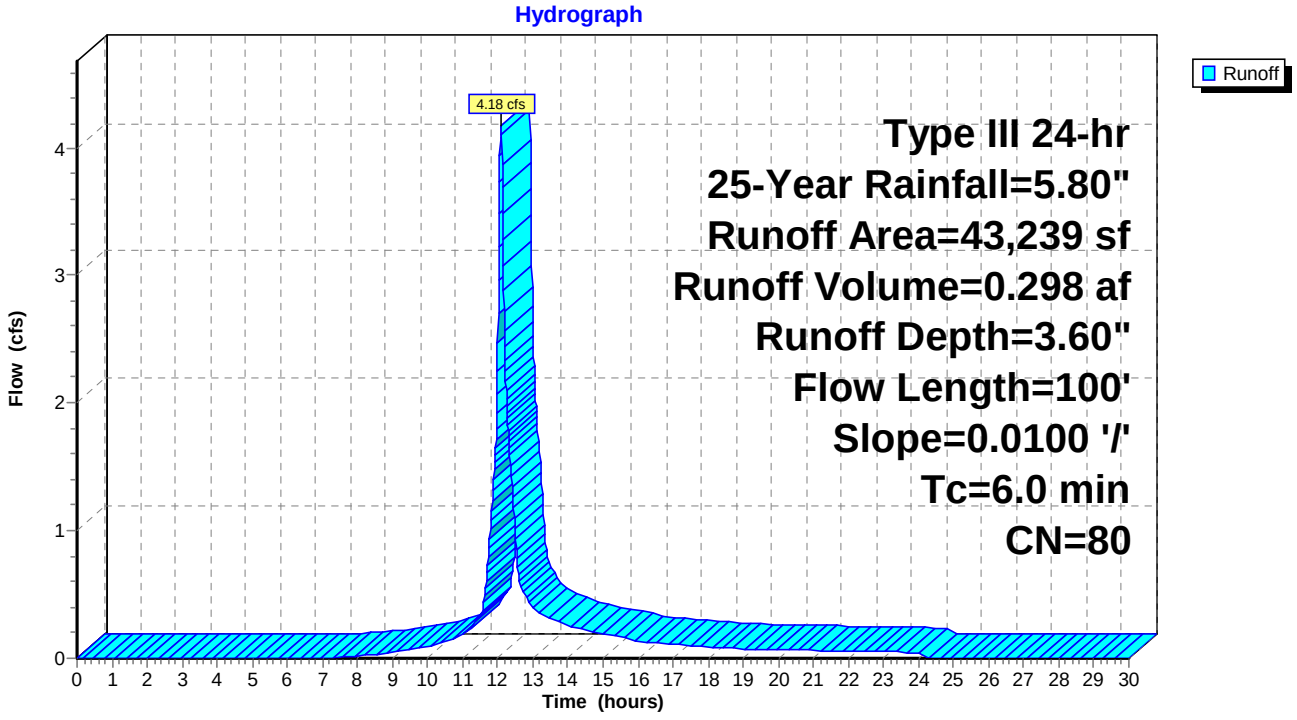
Runoff = 4.18 cfs @ 12.09 hrs, Volume= 0.298 af, Depth= 3.60"
Routed to Pond 10-DP : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.80"

Area (sf)	CN	Description
30,155	98	Paved parking, HSG A
13,084	39	>75% Grass cover, Good, HSG A
43,239	80	Weighted Average
13,084	39	30.26% Pervious Area
30,155	98	69.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.06		**Sheet Flow, Parking Area Flow to CBs** Smooth surfaces n= 0.011 P2= 3.30"
1.6	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 9-PW: Runoff to Road Drainage System

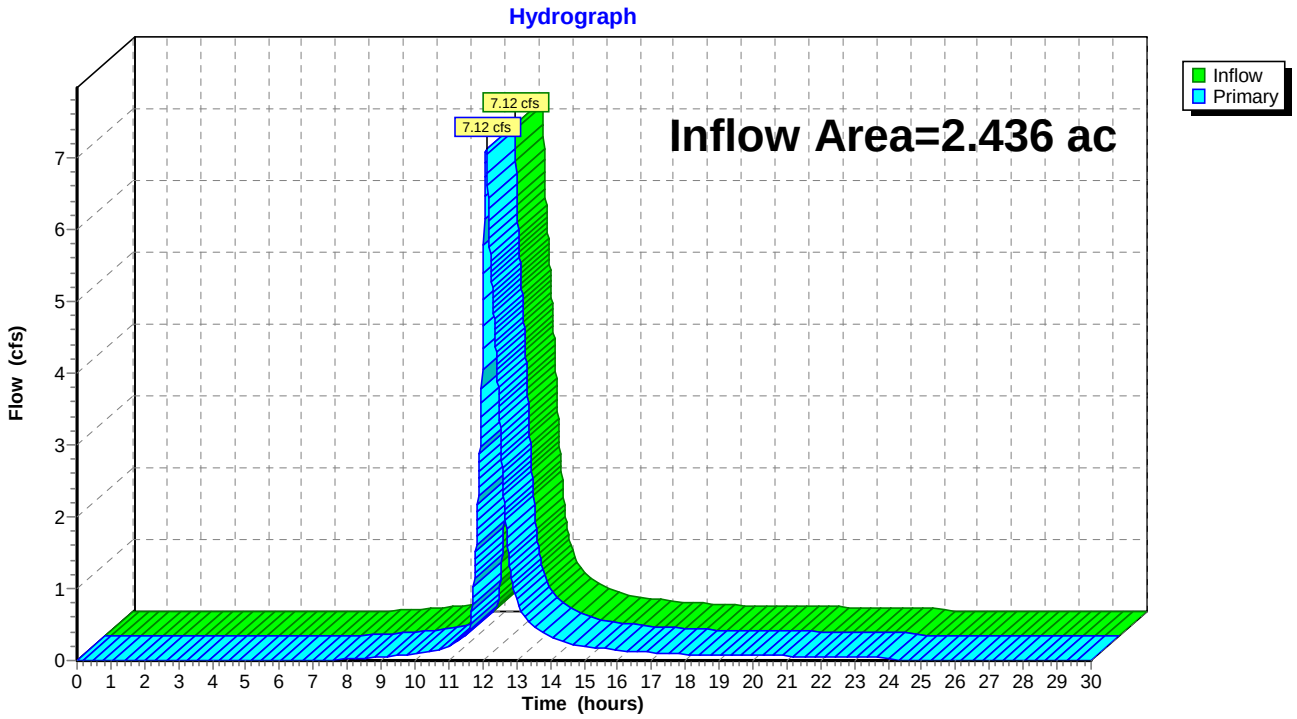


Summary for Pond 10-DP: DP-1

Inflow Area = 2.436 ac, 74.12% Impervious, Inflow Depth = 2.52" for 25-Year event
Inflow = 7.12 cfs @ 12.10 hrs, Volume= 0.511 af
Primary = 7.12 cfs @ 12.10 hrs, Volume= 0.511 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2

Pond 10-DP: DP-1



Summary for Subcatchment 1-EW: Site Perimeter to Roads

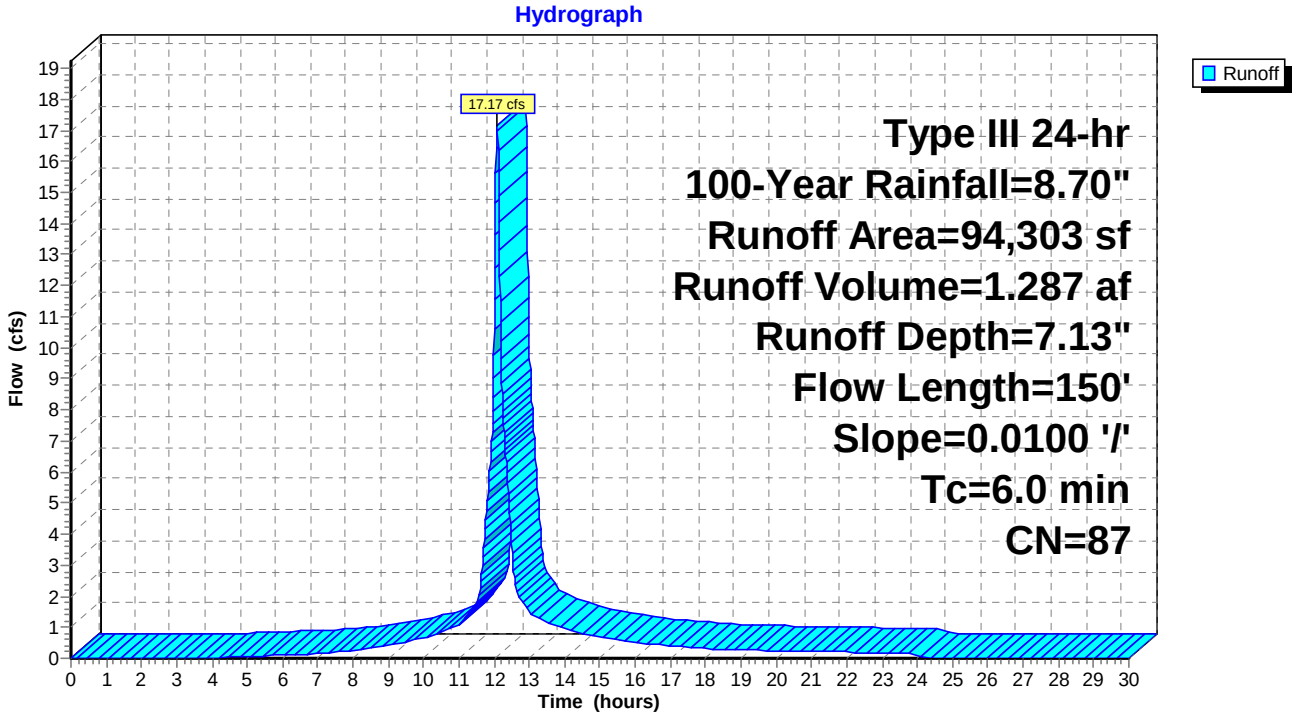
Runoff = 17.17 cfs @ 12.08 hrs, Volume= 1.287 af, Depth= 7.13"
Routed to Pond 3DP : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.70"

Area (sf)	CN	Description
76,472	98	Paved parking, HSG A
17,831	39	>75% Grass cover, Good, HSG A
94,303	87	Weighted Average
17,831	39	18.91% Pervious Area
76,472	98	81.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Parking Area Sheet Flow** Smooth surfaces n= 0.011 P2= 3.30"
2.2	150	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1-EW: Site Perimeter to Roads



Summary for Subcatchment 2-EW: Bld Roof Drains to Drain System

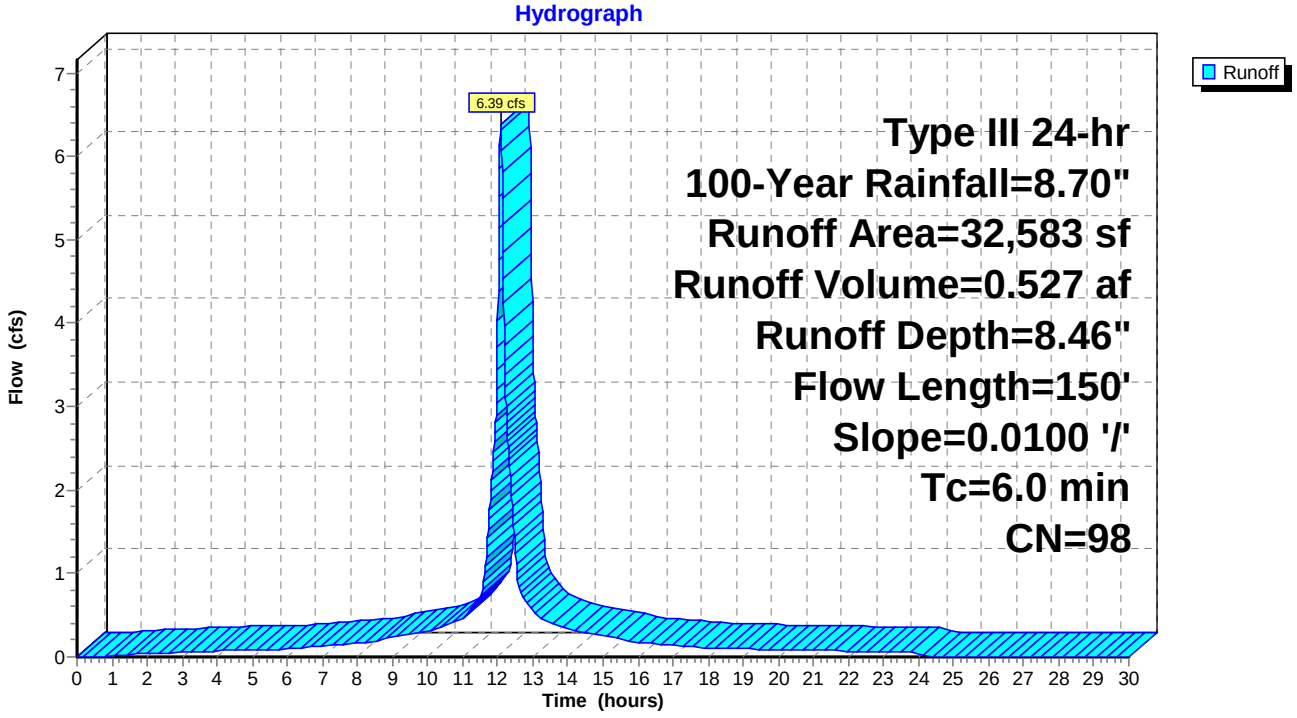
Runoff = 6.39 cfs @ 12.08 hrs, Volume= 0.527 af, Depth= 8.46"
Routed to Pond 3DP : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.70"

Area (sf)	CN	Description
32,583	98	Roofs, HSG A
32,583	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Roof Drains** Smooth surfaces n= 0.011 P2= 3.30"
2.2	150	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2-EW: Bld Roof Drains to Drain System

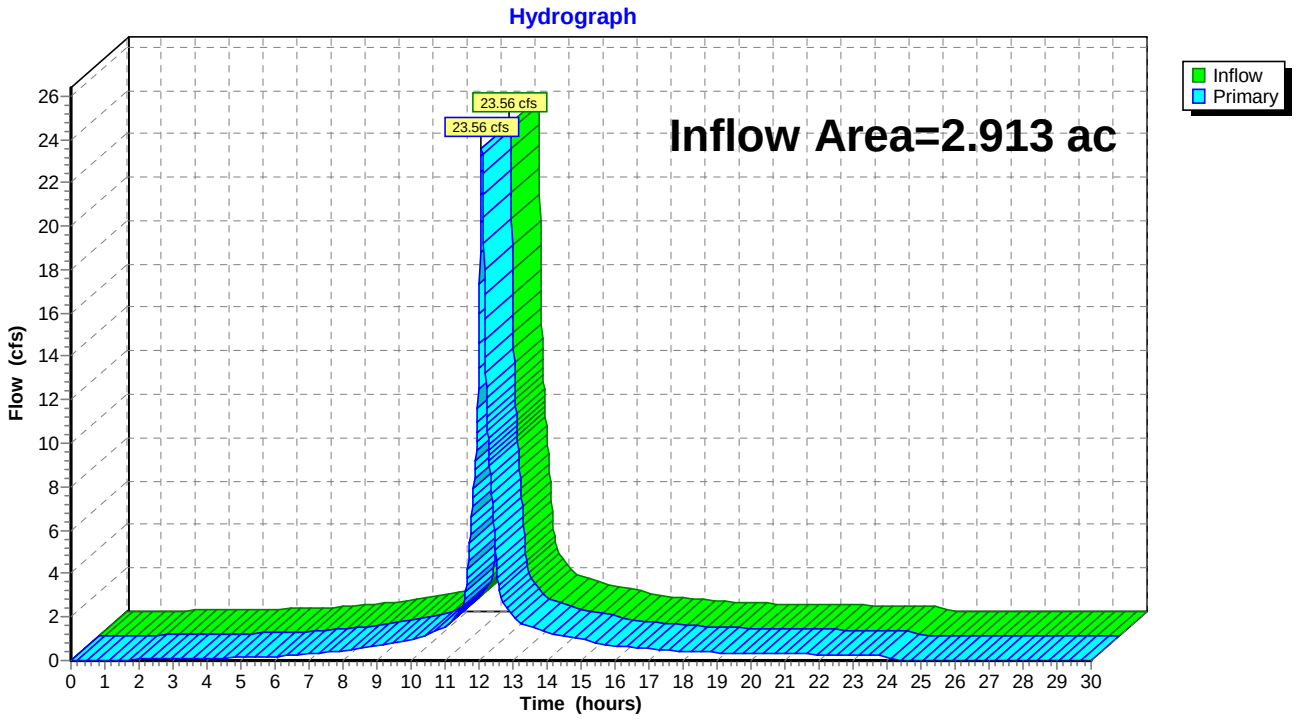


Summary for Pond 3DP: DP-1

Inflow Area = 2.913 ac, 85.95% Impervious, Inflow Depth = 7.47" for 100-Year event
Inflow = 23.56 cfs @ 12.08 hrs, Volume= 1.814 af
Primary = 23.56 cfs @ 12.08 hrs, Volume= 1.814 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2

Pond 3DP: DP-1



Summary for Subcatchment 4-PW: New Parking Area

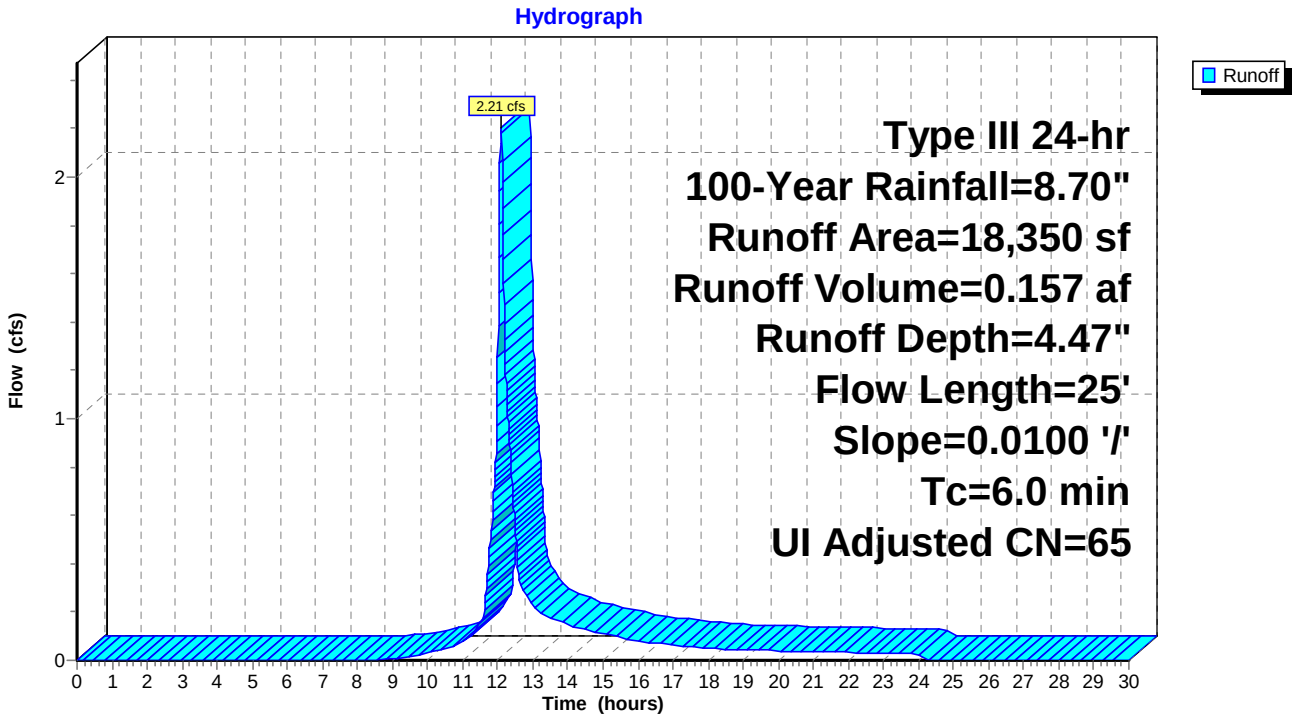
Runoff = 2.21 cfs @ 12.09 hrs, Volume= 0.157 af, Depth= 4.47"
Routed to Pond 5-PP : PERVIOUS Pavement SYSTEM

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.70"

	Area (sf)	CN	Adj	Description
*	11,503	76		Pervious Pavement - Table 5-5
	1,222	98		Unconnected pavement, HSG A
	5,625	39		>75% Grass cover, Good, HSG A
	18,350	66	65	Weighted Average, UI Adjusted
	17,128	64	64	93.34% Pervious Area
	1,222	98	98	6.66% Impervious Area
	1,222			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	25	0.0100	0.80		**Sheet Flow, Walkway to Parking Area** Smooth surfaces n= 0.011 P2= 3.30"
0.5	25	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 4-PW: New Parking Area



Summary for Pond 5-PP: PERVIOUS Pavement SYSTEM

Inflow Area = 0.421 ac, 6.66% Impervious, Inflow Depth = 4.47" for 100-Year event
Inflow = 2.21 cfs @ 12.09 hrs, Volume= 0.157 af
Outflow = 2.13 cfs @ 12.11 hrs, Volume= 0.157 af, Atten= 3%, Lag= 1.3 min
Primary = 2.13 cfs @ 12.11 hrs, Volume= 0.157 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 62.60' @ 12.11 hrs Surf.Area= 10,761 sf Storage= 178 cf

Plug-Flow detention time= 1.4 min calculated for 0.157 af (100% of inflow)
Center-of-Mass det. time= 1.4 min (832.8 - 831.4)

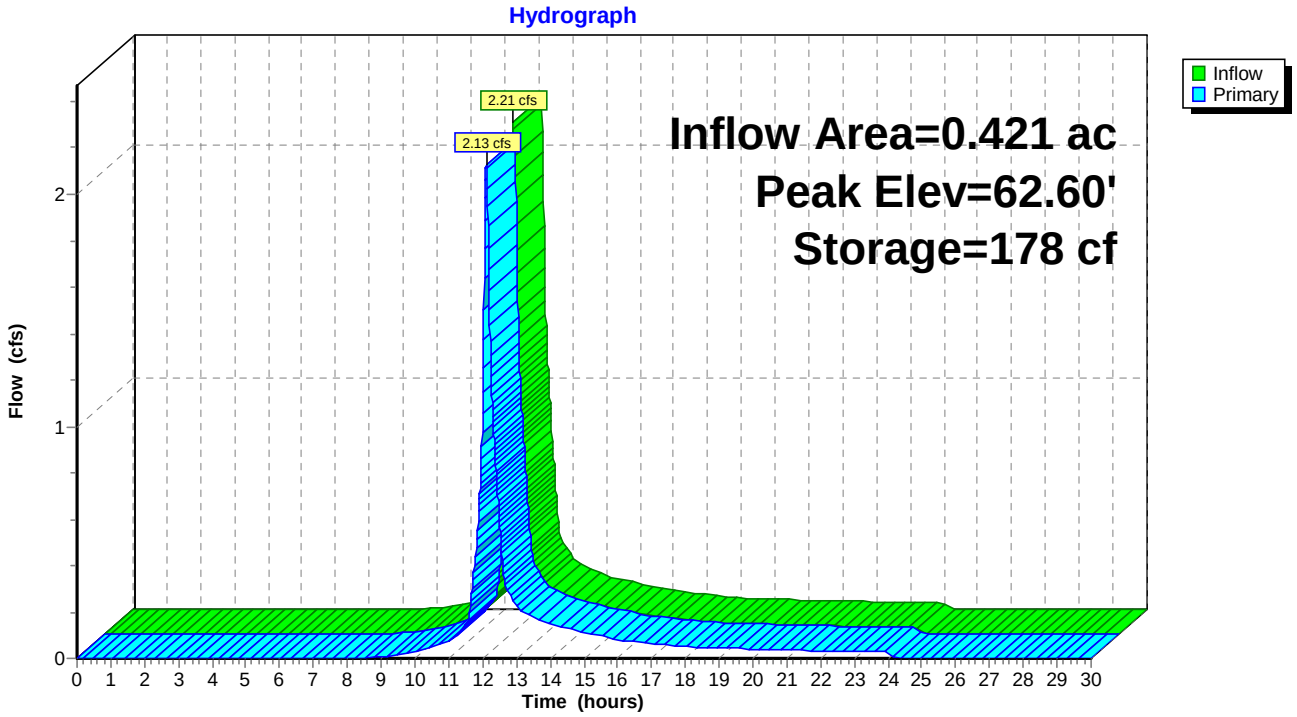
Volume	Invert	Avail.Storage	Storage Description
#1	62.55'	1,423 cf	**Stone Reservior (Prismatic)** Listed below (Recalc) 4,314 cf Overall x 33.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
62.55	11,503	0	0
63.30	0	4,314	4,314

Device	Routing	Invert	Outlet Devices
#1	Primary	62.55'	**8.270 in/hr Exfiltration over Horizontal area** Phase-In= 0.05'

Primary OutFlow Max=2.13 cfs @ 12.11 hrs HW=62.60' (Free Discharge)
1=Exfiltration (Exfiltration Controls 2.13 cfs)

Pond 5-PP: PERVIOUS Pavement SYSTEM



Summary for Subcatchment 6-PW: Building Roof Area

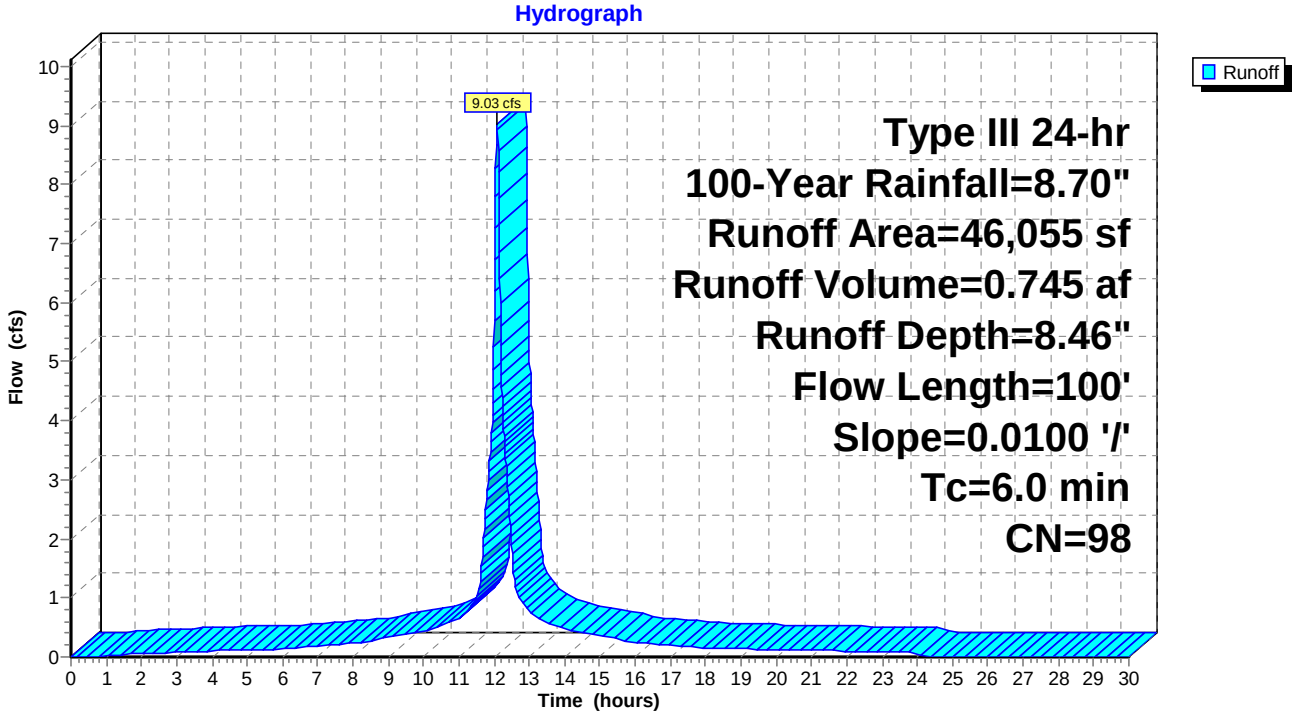
Runoff = 9.03 cfs @ 12.08 hrs, Volume= 0.745 af, Depth= 8.46"
Routed to Pond 8-SI : Storage, Infiltration in Prop Cultec 902

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.70"

Area (sf)	CN	Description
46,055	98	Roofs, HSG A
46,055	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.06		**Sheet Flow, Roof Drain System** Smooth surfaces n= 0.011 P2= 3.30"
1.6	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 6-PW: Building Roof Area



Summary for Subcatchment 7-PW: Rear Playground Area

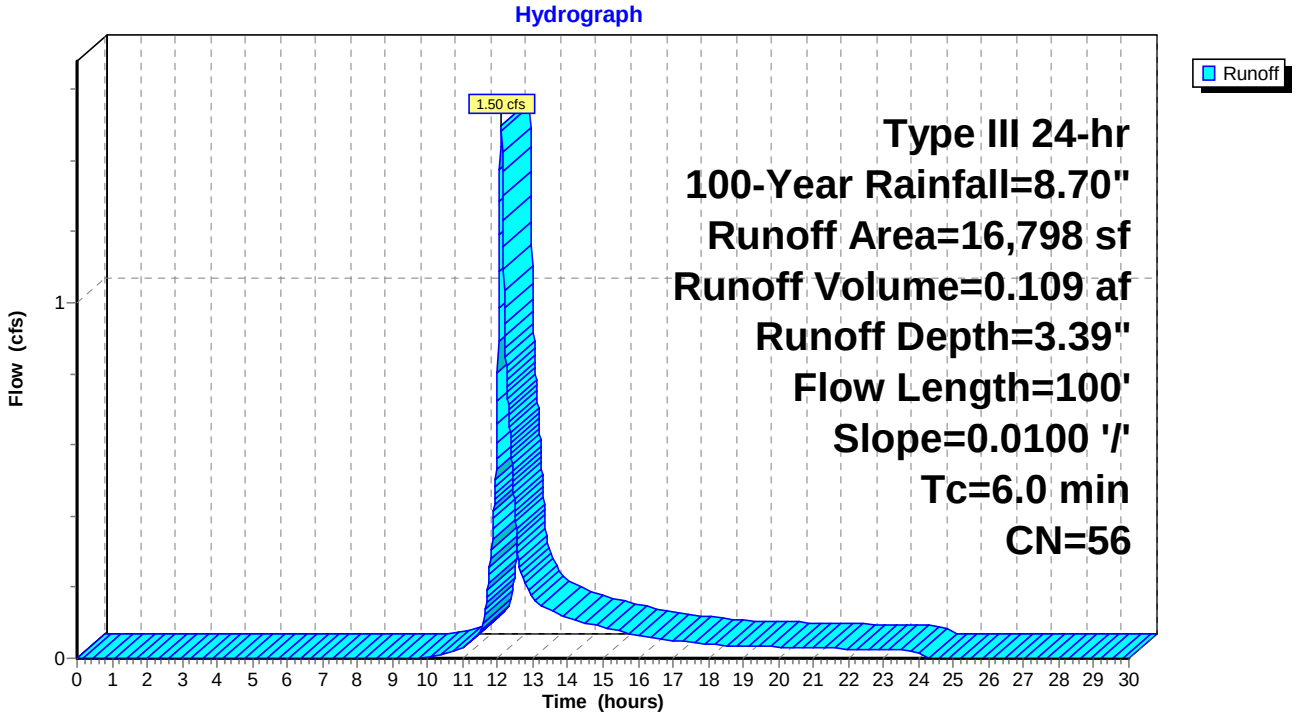
Runoff = 1.50 cfs @ 12.09 hrs, Volume= 0.109 af, Depth= 3.39"
Routed to Pond 8-SI : Storage, Infiltration in Prop Cultec 902

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.70"

Area (sf)	CN	Description
2,425	98	Paved parking, HSG A
14,373	49	50-75% Grass cover, Fair, HSG A
16,798	56	Weighted Average
14,373	49	85.56% Pervious Area
2,425	98	14.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.06		**Sheet Flow, Rear Area Flow to CBs** Smooth surfaces n= 0.011 P2= 3.30"
1.6	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7-PW: Rear Playground Area



Summary for Pond 8-SI: Storage, Infiltration in Prop Cultec 902

Inflow Area = 1.443 ac, 77.13% Impervious, Inflow Depth = 7.11" for 100-Year event
Inflow = 10.52 cfs @ 12.08 hrs, Volume= 0.854 af
Outflow = 5.77 cfs @ 12.21 hrs, Volume= 0.854 af, Atten= 45%, Lag= 7.3 min
Discarded = 0.34 cfs @ 9.31 hrs, Volume= 0.418 af
Primary = 5.43 cfs @ 12.21 hrs, Volume= 0.436 af
Routed to Pond 10-DP : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 63.20' @ 12.21 hrs Surf.Area= 1,777 sf Storage= 5,964 cf

Plug-Flow detention time= 18.3 min calculated for 0.854 af (100% of inflow)
Center-of-Mass det. time= 18.3 min (772.5 - 754.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	57.50'	2,078 cf	**44.75'W x 39.70'L x 5.75'H Field A** 10,215 cf Overall - 3,917 cf Embedded = 6,298 cf x 33.0% Voids
#2A	58.25'	3,917 cf	**Cultec R-902HD** x 60 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 60 Chambers in 6 Rows Cap Storage= 2.8 cf x 2 x 6 rows = 33.1 cf
		5,996 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	57.50'	**8.270 in/hr Exfiltration over Horizontal area** Phase-In= 0.10'
#2	Primary	58.50'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.34 cfs @ 9.31 hrs HW=57.62' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=5.43 cfs @ 12.21 hrs HW=63.20' TW=0.00' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Orifice Controls 5.43 cfs @ 9.96 fps)

Pond 8-SI: Storage, Infiltration in Prop Cultec 902 - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= 2.8 cf x 2 x 6 rows = 33.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

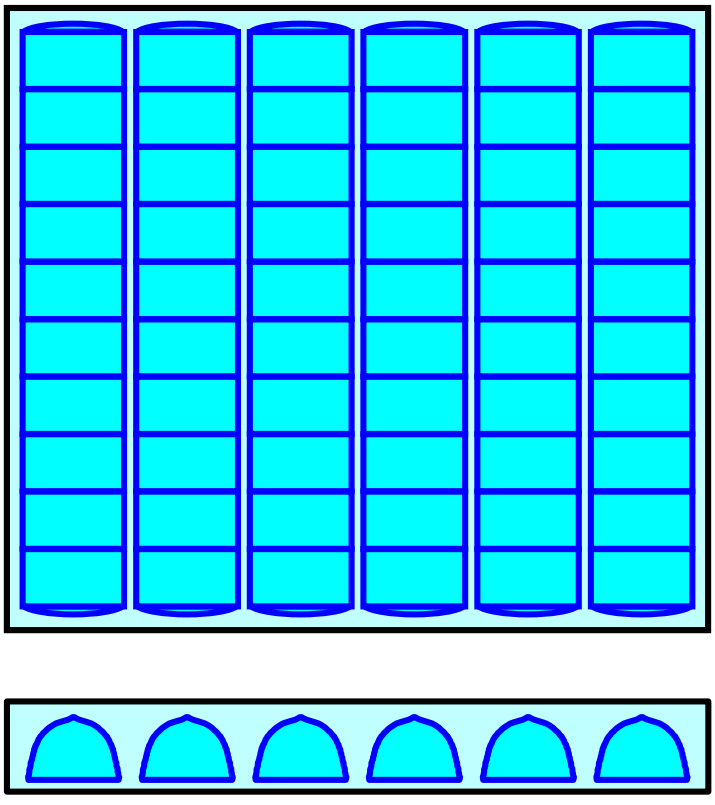
10 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 37.70' Row Length +12.0" End Stone x 2 = 39.70' Base Length
6 Rows x 78.0" Wide + 9.0" Spacing x 5 + 12.0" Side Stone x 2 = 44.75' Base Width
9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

60 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 6 Rows = 3,917.2 cf Chamber Storage

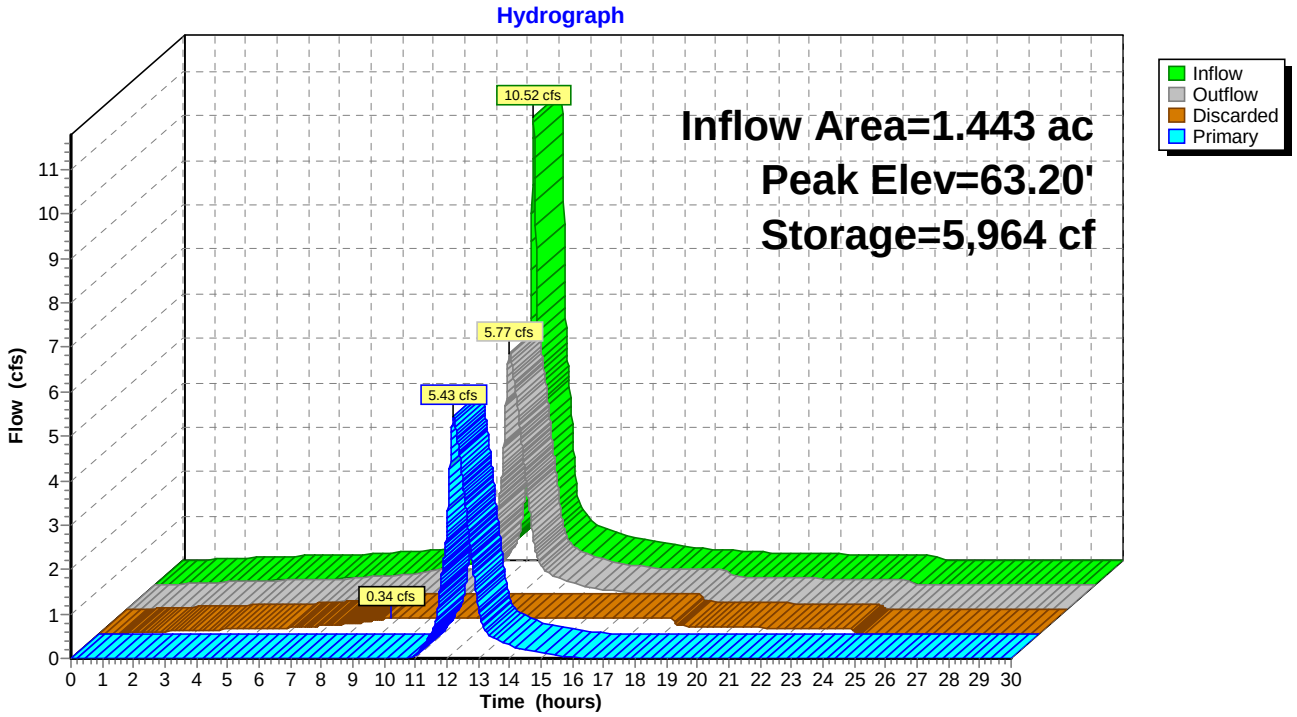
10,215.3 cf Field - 3,917.2 cf Chambers = 6,298.1 cf Stone x 33.0% Voids = 2,078.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,995.6 cf = 0.138 af
Overall Storage Efficiency = 58.7%
Overall System Size = 39.70' x 44.75' x 5.75'

60 Chambers
378.3 cy Field
233.3 cy Stone



Pond 8-SI: Storage, Infiltration in Prop Cultec 902



Summary for Subcatchment 9-PW: Runoff to Road Drainage System

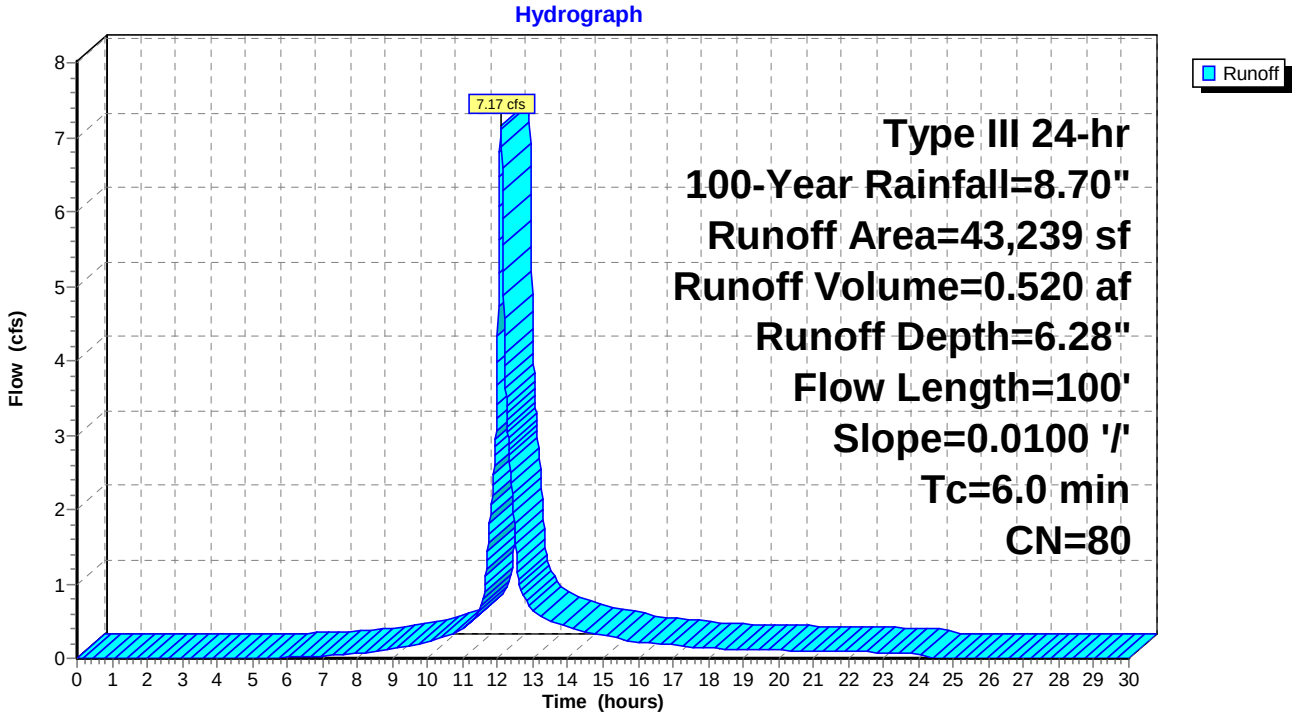
Runoff = 7.17 cfs @ 12.09 hrs, Volume= 0.520 af, Depth= 6.28"
Routed to Pond 10-DP : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.70"

Area (sf)	CN	Description
30,155	98	Paved parking, HSG A
13,084	39	>75% Grass cover, Good, HSG A
43,239	80	Weighted Average
13,084	39	30.26% Pervious Area
30,155	98	69.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.06		**Sheet Flow, Parking Area Flow to CBs** Smooth surfaces n= 0.011 P2= 3.30"
1.6	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 9-PW: Runoff to Road Drainage System

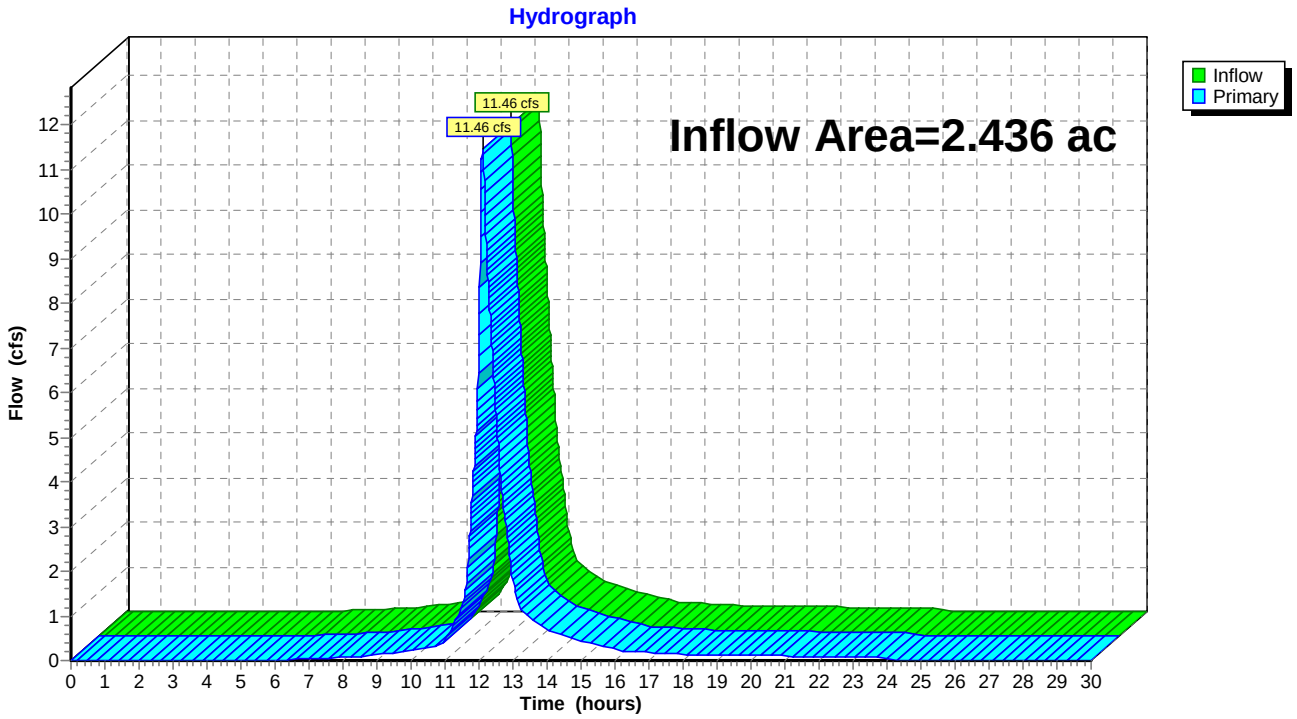


Summary for Pond 10-DP: DP-1

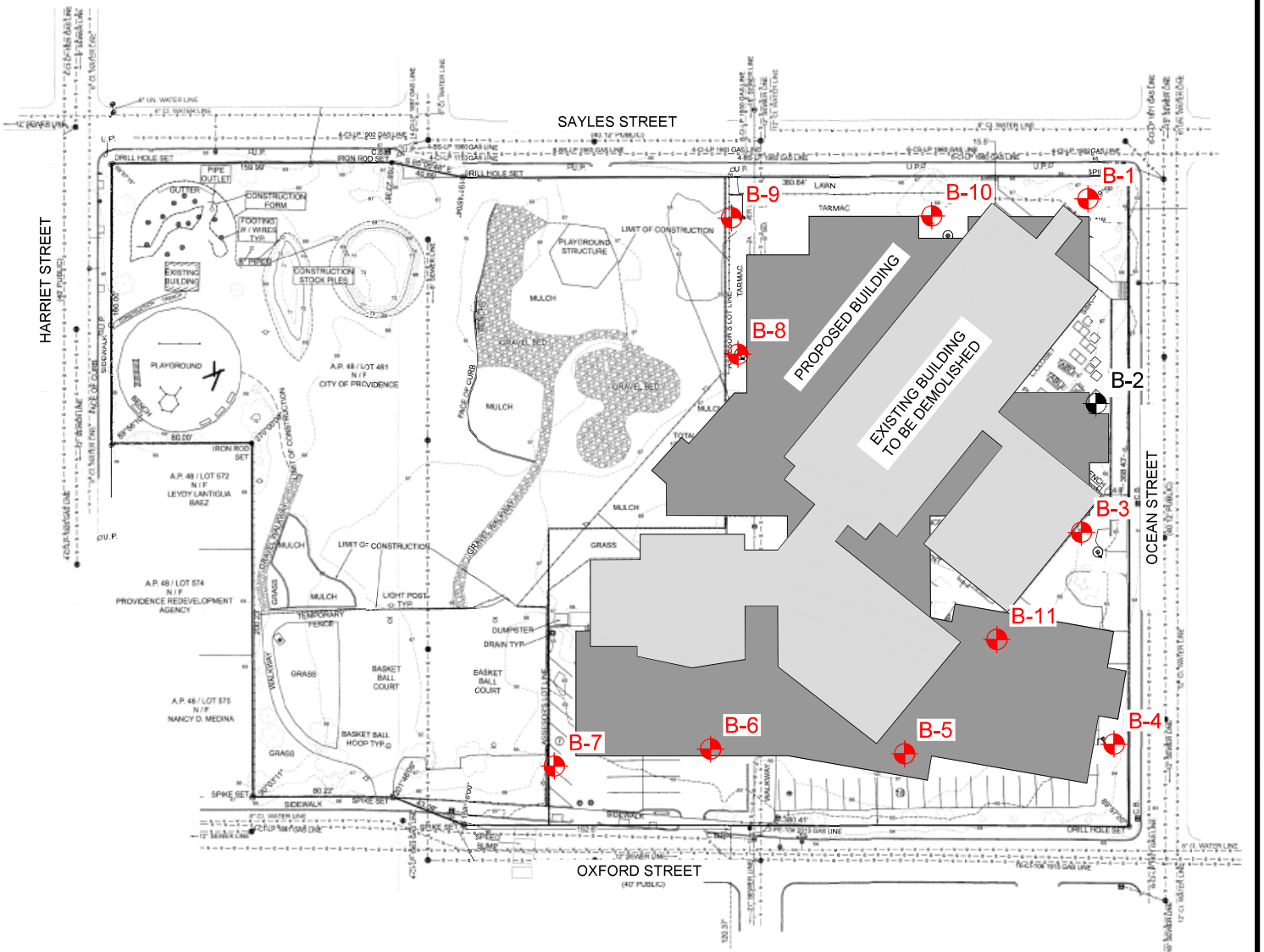
Inflow Area = 2.436 ac, 74.12% Impervious, Inflow Depth = 4.71" for 100-Year event
Inflow = 11.46 cfs @ 12.10 hrs, Volume= 0.956 af
Primary = 11.46 cfs @ 12.10 hrs, Volume= 0.956 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2

Pond 10-DP: DP-1



APPENDIX B



Weston & Sampson

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Reading, MA 01867
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www.westonandsampson.com

NOTES

1. THIS PLAN IS BASED ON AN EXISTING CONDITIONS SURVEY PREPARED BY D'AMICO ENGINEERING TECHNOLOGY, INC. DATED JULY 19, 2023.
2. BORINGS WERE COMPLETED BY GEOSEARCH INC. OF STERLING, MA BETWEEN DECEMBER 27, 2023 AND JANUARY 2, 2024.
3. ALL BORINGS WERE OBSERVED BY A WESTON & SAMPSON ENGINEER.
4. BORING LOCATIONS SHOWN ARE APPROXIMATE AND BASED ON FIELD MEASUREMENTS RELATIVE TO EXISTING SITE FEATURES.

LEGEND

B-X — DESIGNATION AND APPROXIMATE LOCATION OF PROPOSED BORING

B-X — DESIGNATION AND APPROXIMATE LOCATION OF COMPLETED BORING

GRAPHIC SCALE

60 30 0 60 120

SCALE: 1"=60'

ORIENTATION

TITLE

SITE PLAN

PROJECT

MARY E. FOGARTY ELEMENTARY SCHOOL

199 OXFORD ST PROVIDENCE, RI 02905

DATE	02/2024
DRWN BY	AJC
CHKD BY	STS
PRJ. NO.	ENG23-3088
REV. NO.	-

FIGURE

FIGURE 2

\\wse03.local\WSE_Projects_Private\Tarrado Architects\Mary Fogarty Elementary - Providence RI\CAD\Site Plan.dwg

Weston & Sampson

WSE Project: ENG23-3088

Mary E. Fogarty Elementary School
199 Oxford St, Providence, RI

BORING ID: B-1

CONTRACTOR:	Geosearch, Inc.	BORING LOCATION:	See Attached Figure	DATE START:	December 29, 2023
FOREMAN:	Shawn Preston	ADVANCE METHOD:	Vacuum to Hollow-Stem Auger	DATE FINISH:	December 29, 2023
LOGGED BY:	K. Lennon	AUGER DIAMETER:	4-1/4" ID (Stem), 7-5/8" OD (Flights)	GROUND EL:	67.5 ± (NAVD88)
CHECKED BY:	R. Larmouth, PE	SUPPORT CASING:	Driven Flush-Joint Casing (3" ID)	FINAL DEPTH:	27.0 ft.
EQUIPMENT:	CME 75, Truck Mounted	CORING METHOD:	N/A	GRID COORDS:	N:262314.2040 / E:352404.0500
SPT HAMMER:	Automatic (140-lb.)	BACKFILL MATERIAL:	Monitoring Well Installed	GRID SYSTEM:	NAD83 State Plane (RI)

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]	SPT BLOWS / 6 IN. (OR) CORE RATE / 12 IN. [MIN.]	GEOTECHNICAL TEST DATA (N-Value, Raw (bpf); Organic Content (%); Moisture Content (%); Plastic Limit, PL (%); Liquid Limit, LL (%))	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
						Surface: Grass area.		Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.
						Topsoil- 6 inches thick.		[0.0 - 5.2] Vacuum excavation.
	G	G-1				**Poorly graded sand with silt (SP-SM)** - Brown; moist; mostly fine to medium SAND, few non plastic fines, trace coarse gravel. **[FILL]**		
	G	G-2				**Poorly graded sand (SP)** - Medium dense; tan; moist; mostly fine to medium SAND, few fine gravel, trace non plastic fines.	63	
5		S-1 16/24	3 4 13 11	17				
		S-2 17/24	17 10 11 10	21		*Change to trace gravel*		[8.0] GC: 1%, SC: 94%, FC: 4%
10		S-3 17/24	5 5 8 6	13		*Change to medium to coarse SAND, iron oxide staining*	58	
		S-4 23/24	11 9 9 8	18		*Change to fine SAND*		Water level measured at 12.9 ft. on 01/02/24 (well reading).
15		S-5 22/24	8 9 15 12	24			53	
20		S-6 24/24	7 9 12 11	21			48	
25		S-7 21/24	10 9 14 13	23			43	**Exploration ended at 27.0 ft.**

Refer to the attached index sheets for important information about this log including general notes, legends, and guidance on description methods and procedures.

Weston & Sampson

WSE Project: ENG23-3088

Mary E. Fogarty Elementary School
199 Oxford St, Providence, RI

BORING ID: B-3

CONTRACTOR:	Geosearch, Inc.	BORING LOCATION:	See Attached Figure	DATE START:	December 29, 2023
FOREMAN:	Shawn Preston	ADVANCE METHOD:	Vacuum to Hollow-Stem Auger	DATE FINISH:	December 29, 2023
LOGGED BY:	K. Lennon	AUGER DIAMETER:	4-1/4" ID (Stem), 7-5/8" OD (Flights)	GROUND EL:	65.0 ± (NAVD88)
CHECKED BY:	R. Larmouth, PE	SUPPORT CASING:	N/A	FINAL DEPTH:	27.0 ft.
EQUIPMENT:	CME 75, Truck Mounted	CORING METHOD:	N/A	GRID COORDS:	N:262132.0620 / E:352458.7700
SPT HAMMER:	Automatic (140-lb.)	BACKFILL MATERIAL:	Drill Cuttings and Asphalt Patch	GRID SYSTEM:	NAD83 State Plane (RI)

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]	SPT BLOWS / 6 IN. (OR) CORE RATE / 12 IN. [MIN.]	GEOTECHNICAL TEST DATA (N-Value, Raw (bpf); Organic Content (%); Moisture Content (%); Plastic Limit, PL (%); Liquid Limit, LL (%))	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
						Surface: Asphalt concrete pavement.		Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.
						Asphalt- 5 inches thick.		[0.0 - 5.0] Vacuum excavation.
	G	G-1				**Silty sand with gravel (SM)** - Brown; moist; mostly fine to medium SAND, little fine to coarse gravel, little non plastic fines; common debris (cobbles, brick, slate), trace roots. **[FILL]**		
	G	G-2				**Poorly graded sand (SP)** - Loose to medium dense; tan; moist; mostly fine to medium SAND, trace fine gravel, trace non plastic fines.		
5		S-1 20/24	2 4 7 6	11			60	
		S-2 20/24	9 7 8 7	15				
		S-3 20/24	4 3 4 4	7				
10		S-4 17/24	8 6 4 6	10		*Iron oxide staining at 11'*	55	
15		S-5 21/24	2 4 7 8	11		**Silty sand (SM)** - Medium dense to dense; gray; wet; mostly fine SAND, little non plastic fines; iron oxide.	50	[17.4] Water level measured on 12/29/23 (end of drilling).
20		S-6 24/24	4 9 13 14	22			45	
25		S-7 24/24	10 12 19 15	31			40	**Exploration ended at 27.0 ft.**

Refer to the attached index sheets for important information about this log including general notes, legends, and guidance on description methods and procedures.

Weston & Sampson

WSE Project: ENG23-3088

Mary E. Fogarty Elementary School
199 Oxford St, Providence, RI

BORING ID: B-8

CONTRACTOR:	Geosearch, Inc.	BORING LOCATION:	See Attached Figure	DATE START:	January 2, 2024
FOREMAN:	Shawn Preston	ADVANCE METHOD:	Vacuum to Rotary Wash	DATE FINISH:	January 2, 2024
LOGGED BY:	K. Lennon	AUGER DIAMETER:	N/A	GROUND EL:	66.5 ± (NAVD88)
CHECKED BY:	R. Larmouth, PE	SUPPORT CASING:	Driven Flush-Joint Casing (3" ID)	FINAL DEPTH:	26.0 ft.
EQUIPMENT:	CME 75, Truck Mounted	CORING METHOD:	N/A	GRID COORDS:	N:262168.8000 / E:352241.3130
SPT HAMMER:	Automatic (140-lb.)	BACKFILL MATERIAL:	Drill Cuttings and Asphalt Patch	GRID SYSTEM:	NAD83 State Plane (RI)

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]	SPT BLOWS / 6 IN. (OR) CORE RATE / 12 IN. [MIN.]	GEOTECHNICAL TEST DATA: N-Value, Raw (bpf) / Organic Content (%)	GEOTECHNICAL TEST DATA: Moisture Content (%) / Plastic Limit, PL (%) / Liquid Limit, LL (%)	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
				10 20 30 40	25 50 75 100		Surface: Asphalt concrete pavement.		Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.
	G	G-1					Asphalt- 3 inches thick.		[0.0 - 5.8] Vacuum excavation.
							Silty sand with gravel (SM) - Brown; moist; mostly fine to medium SAND, some non plastic fines, little fine to coarse gravel; trace asphalt debris. **[FILL]**		
	G	G-2					**Silty sand with gravel (SM)** - Moist; mostly fine to medium SAND, little fine to coarse gravel, little non plastic fines. **[FILL]**		
							Concrete- 8 inches thick.		
	G	G-3					**Silty sand with gravel (SM)** - Brown; moist; mostly fine to medium SAND, little fine to coarse gravel, little non plastic fines. **[FILL]**	62	
5		S-1 20/24	3 3 7 7	10			**Poorly graded sand (SP)** - Medium dense; tan; moist to wet; mostly fine to medium SAND, trace fine gravel, trace non plastic fines.		
		S-2 20/24	10 8 8 8	16					
		S-3 9/24	6 6 9 8	15			*Change to no gravel*	57	
10		S-4 17/24	10 7 9 8	16					[13.0] GC: 0%, SC: 94%, FC: 6%
		S-5 11/24	5 5 8 7	13			*Change to fine SAND*	52	
15									
		S-6 12/24	6 6 11 11	17				47	
20									
		S-7 17/24	15 15 19 24	34			**Silty sand (SM)** - Dense; gray; wet; mostly fine SAND, little non plastic fines.	42	
25									**Exploration ended at 26.0 ft.**

Refer to the attached index sheets for important information about this log including general notes, legends, and guidance on description methods and procedures.

APPENDIX C

LEGEND

EXISTING PROPERTY LINE

EXISTING WATERSHED AREA

DRAINAGE FLOW PATH

SOIL TYPE DELINEATION LINE

1-EW WATERSHED SUBAREA ID

1-EW

2-EW

DP 1

Tc

UD - Udorthents -Urban Land Complex (Group A)

MU - Merrimac -Urban Land Complex (Group A)

SAYLES STREET (40.12' PUBLIC)

HARRIET STREET (40' PUBLIC)

OCEAN STREET (40.12' PUBLIC)

OXFORD STREET (40' PUBLIC)

MINER STREET

BURNSIDE STREET

BUF ST

A.P. 48 / LOT 481
N / F
CITY OF PROVIDENCE
94,326 SQ. FT.
2.16 AC.

A.P. 48 / LOT 572
N / F
LEYDY LANTIGUA BAEZ

A.P. 48 / LOT 574
N / F
PROVIDENCE REDEVELOPMENT AGENCY

A.P. 48 / LOT 575
N / F
NANCY D. MEDINA

A.P. 48 / LOT 2
N / F
PROVIDENCE PUBLIC BUILDINGS AUTHORITY
101,930.4 SQ. FT.
2.34 AC.

EXISTING SCHOOL BUILDING
199 OXFORD STREET

SCALE (FEET)

0 25 50 100 200

1 INCH =50 FT

DEtec.
D'AMICO ENGINEERING TECHNOLOGY, INC.
Civil - Transportation - Land Use
2080 Mineral Spring Ave., North Providence, RI 02911
(401) 822-1470 (401) 353-1180 fax www.dengineering.com

PROPOSED ELEMENTARY SCHOOL
MARY E. FOGARTY ES
199 OXFORD STREET
PROVIDENCE, RHODE ISLAND
AP 48, LOTS 2 AND 481

REVISIONS:
NO. DATE. DESCRIPTION

DESIGNED BY: DMD
DRAWN BY:
CHECKED BY: DMD
DATE: JULY., 2024
PROJECT NO: 08-0022-24-04

PERMIT PLAN, NOT FOR CONSTRUCTION

EXISTING WATERSHED MAP

SHEET 1 OF 2

LEGEND

EXISTING PROPERTY LINE

PROPOSED WATERSHED AREA

DRAINAGE FLOW PATH

SOIL TYPE DELINEATION LINE

1-PW WATERSHED SUBAREA ID

SAYLES STREET (40.12' PUBLIC)

OCEAN STREET (40.12' PUBLIC)

OXFORD STREET (40' PUBLIC)

MINER STREET

BURNSIDE STREET

PROPOSED MARY E. FOGARTY ELEMENTARY SCHOOL

FINISH FLOOR ELEV. = 66.0

6-PW

5-PP

4-PW

7-PW

9-PW

8-IS

UD - Udorthents -Urban Land Complex (Group A)

MU - Merrimac -Urban Land Complex (Group A)

Tc

DP 1

A.P. 48 / LOT 481
N / F
CITY OF PROVIDENCE
94,326 SQ. FT.
2.16 AC.

A.P. 48 / LOT 572
N / F
LEYDY LANTIGUA
BAEZ

A.P. 48 / LOT 574
N / F
PROVIDENCE REDEVELOPMENT AGENCY

A.P. 48 / LOT 575
N / F
NANCY D. MEDINA

A.P. 48 / LOT 2
N / F
PROVIDENCE PUBLIC BUILDINGS AUTHORITY
101,930.4 SQ. FT.
2.34 AC.

ZONING SETBACK LINE (TYP.)

LIMIT OF CONSTRUCTION

ASSESSOR'S LOT LINE

SCALE (FEET)

0 25 50 100 200

1 INCH = 50 FT

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PROPOSED ELEMENTARY SCHOOL
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PROVIDENCE, RHODE ISLAND
AP 48, LOTS 2 AND 481

REVISIONS:

NO.	DATE.	DESCRIPTION

DESIGNED BY:	DMD
DRAWN BY:	
CHECKED BY:	DMD
DATE:	JULY., 2024
PROJECT NO:	08-0022-24-04

PERMIT PLAN, NOT FOR CONSTRUCTION

PROPOSED WATERSHED MAP

SHEET 2 OF 2