HYDRAULIC / HYDROLOGIC CALCULATIONS

Site Plan
Main Street
Upton, Massachusetts

Lobisser Construction

Prepared By:

D&L Design Group, Inc.
115 Water Street
Milford, Ma 01757

September 5, 2023
Revised 1/8/24
Revised 2/20/24

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DRAINAGE SUMMARY

D&L Design Group Inc. is pleased to provide the following Hydraulic / Hydrologic analysis for the proposed site plan for Lobisser Construction. The proposed project is located at 0 Main Street, between 51 and 45 Main Street Upton Massachusetts. The existing site consists of 6.75 acres of undisturbed wooded area. The hydrologic conditions were analyzed using TR-55 and HydroCAD® for the 2, 10, 25 and 100 year storm events utilizing Technical Paper 40, 24 hour Rainfall events.
Project site consists of the constructing 4 story apartment building, driveway to access Main Street and parking areas around the proposed building. The project will also consist of the construction of three parking garages as shown on the site plan. The installation of proposed sewer main and pump station and an 8" water main loop to service the apartment building. The project will consist of proposed grading the site so all runoff generated from the proposed development can be collected and treated and mitigated before discharging the runoff toward the existing wetlands located on the site or before it leaves the parcel. The project as designed conforms to the Massachusetts DEP Stormwater Management Policy.

EXISTING CONDITIONS:

The project is located on Main Street between 51 and 45 Main Street in Upton Ma. The parcel is 6.75 acres in size. The site wooded and has not been disturbed. There is an existing wetland that is located in the middle of the site as well as in the east portion of the site closest to School Street. The parcel slopes from the north to the east and the south.

For the purpose of the analysis of the effect on the parcel toward the existing wetlands to the south and the property line to the east toward School Street. The site was analyzed as two watersheds. In the Pre-Development Condition, Subcatchment 1 represents the tributary area of the property that flows to the south property line toward Main Street and the wetlands located there. Subcatchment 2 represents the tributary area of the property that flows to the east property line toward School Street and the wetlands located there.

According to the online USGS soil survey, the analyzed area consists of soils with "C" hydrologic ratings. Per the soil testing performed on the site for the proposed project the soil classification and characteristics of the soil has been confirmed. All soil testing was witnessed by the Upton Conservation Agent.

PROPOSED CONDITIONS:

The proposed condition of the site will consist of a grass area around the driveway and parking areas as well as the proposed apartment building and parking garages as shown on the plans. The area left undisturbed will be woodland area adjacent to the wetlands and the middle of the site. The proposed drainage system will consist of catch basins and drain manholes located within the project to collect and direct the runoff into a forebays and infiltration basins. The infiltration basins will then discharge into a small settling basin with a level spreaders that will create a sheet flow and discharge into the 30 foot no disturb area. The site will also use proposed recharge at the propose building location that will collect and direct the runoff into underground basin.

In order to analyze the surface water flows, the site was divided into multiple Subcatchents, Pond and a Reaches

In summary, the peak rates of runoff were compared under pre-development and post-development conditions for analysis of the 2 year, 10 year, 25 year and 100 year storm events. The following is a **Peak Discharge Summary Table**:

Design Point Analysis:

Watershed		Design Event			
		2 Year	10 Year	25 Year	100 Year
Pre-Development	IP#1E	4.43/0.321	10.19/0.710	14.16/0.985	20.54/1.435
	IP#2E	4.30/0.341	10.14/0.766	14.21/1.069	20.77/1.567
	IP#3E	0.49/0.035	1.18/0.080	1.67/0.113	2.46/0.166
Post Development	IP#1P	2.89/0.288	8.51/0.702	12.39/0.982	20.11/1.435
	IP#2P	1.83/0.322	4.85/0.76976	6.79/1.069	16.29/1.567
	IP#3P	0.45/0.031	0.78/0.055	0.99/0.070	1.31/0.094

DEP Stormwater Management Standards:

Standard #1: The proposed changes will not cause erosion in adjacent water of the Commonwealth, as BMP measures are proposed in accordance with the design requirements of the Stormwater Management handbook. The Erosion & Sedimentation Control Plan provides for the installation of siltation barriers, temporary basins, temporary construction entrances and outlines intermediary measures to control runoff during construction and after construction.

Standard #2: The proposed development peak discharge rates for the total off-site flow are less than or equal to pre-development discharge rates for the 2 year, 10 year, 25 year, and 100 year storm events for the design points analyzed. Attached calculations show how the site mitigates the increased flow rates due to surface changes from the site development.

Standard #3: The proposed project proposes all roof runoff to be infiltrated into the ground. Recharge will also be accomplished along the grass swale located along the driveway. The existing settling basin will be monitored throughout the construction to ensure that the runoff depths are designed to drain in under 72 hours as required by the Policy.

STANDARD #3 –LOSS OF ANNUAL RECHARGE

The site is developed. Recharge Basins at Duplexes are constructed for recharge following the Stormwater Regulations. Soils were found to be Class A permeability.

The table below shows the required and provided recharge volumes for the project. As shown, the proposed condition exceeds the minimum requirement for the additional impervious areas.

Recharge Volume Summary

Soil Type	Recharge Factor (in. runoff)	Existing Impervious Area (sf)	Additional Impervious Area (sf)	Min. Req. Recharge Volume (cf)
A	0.60	0	0	0
B	0.35	0	0	0
C	0.25	0	86,790	1,808
D	0.10	0	0	0
Total Required				**1,808**

Standard #3 Only Applies to Additional Impervious

Provided Recharge Volume (cf)			
Basin 1	2,605		
Basin 2	1,176		
Basin 3	0		
Basin 4	7,840		
Total Provided			**16,137**

Rechage Volume Calculation:

Rv = F x I
Rv = Required Recharge Volume
F = Recharge Factor
I = Total Impervious Area (Proposed)
Rv = (0.25")/(1'/12") x 86,790 s.f. = 1,808 cf (Required)

Provided Infiltration is 16,137cf taken from Stage Storage Worksheet

STAGE-STORAGE WORKSHEET

	DATE:	2/19/2024		CLIENT:	lobisser
PROJECT NUMBER:		J-10	6	ALCULATED BY:	PML
BASIN NUMBER:		1		CHECKED BY:	
	LOCATION:	Basin 3			

		AVERAGE	VERTICAL	VOLUME	VOLUME
ELEVATION	AREA	AREA	INTERVAL	INCREMENTAL	CUMULATIVE
(FEET)	(FT^2)	(FT^2)	(FT)	(FT^3)	(FT^3)
324.0	3312	offset			0
325.0	3312	3312	1	3312	3312

STAGE-STORAGE WORKSHEET

	DATE:	2/19/2024		CLIENT:	lobisser
PROJECT NUMBER:		J-10	6	ALCULATED BY:	PML
BASIN NUMBER:		1		CHECKED BY:	
	LOCATION:	Basin 3			

		AVERAGE	VERTICAL	VOLUME	VOLUME
ELEVATION	AREA	AREA	INTERVAL	INCREMENTAL	CUMULATIVE
(FEET)	(FT^2)	(FT^2)	(FT)	(FT^3)	(FT^3)
330.0	725	offset			0
332.0	1099	912	2	1824	1824

STAGE-STORAGE WORKSHEET

	DATE:	2/19/2024		CLIENT:	lobisser
PROJECT NUMBER:		J-10	6	ALCULATED BY:	PML
BASIN NUMBER:		1		CHECKED BY:	
	LOCATION:	Basin2			

		AVERAGE	VERTICAL	VOLUME	VOLUME
ELEVATION	AREA	AREA	INTERVAL	INCREMENTAL	CUMULATIVE
(FEET)	(FT^2)	(FT^2)	(FT)	(FT^3)	(FT^3)
324.0	895				0
325.0	1456	1176	1	1176	1176

STAGE-STORAGE WORKSHEET

	DATE:	2/19/2024		CLIENT:	lobisser
PROJECT NUMBER:		J-10	6	ALCULATED BY:	PML
BASIN NUMBER:		1		CHECKED BY:	
	LOCATION:	Basin 1			

		AVERAGE	VERTICAL	VOLUME	VOLUME
ELEVATION	AREA	AREA	INTERVAL	INCREMENTAL	CUMULATIVE
(FEET)	(FT^2)	(FT^2)	(FT)	(FT^3)	(FT^3)
322.0	551				0
324.5	1533	1042	3	2605	2605

Drawdown Calculation:

Pond #1

$$Time_{drawdown} = \frac{Rv}{(K)(Bottom\ Area)}$$

Rv = Storage Volume (2605 s.f.)(volume below invert)

K = Saturated (0.27 in/hour)

Bottom Area = Bottom Area of Recharge Structure (1,184 s.f.)

2605 c.f./ (0.27 in/hour)(1inch/12foot)(1533 s.f.) = 21 hours

Pond #2

$$Time_{drawdown} = \frac{Rv}{(K)(Bottom\ Area)}$$

Rv = Storage Volume (1176 s.f.)(volume below invert)

K = Saturated 0.27 in/hour)

Bottom Area = Bottom Area of Recharge Structure (1456 s.f.)

1176 c.f./ (0.27 in/hour)(1inch/12foot)(1,456 s.f.) =36 hours

Pond #3

$$Time_{drawdown} = \frac{Rv}{(K)(Bottom\ Area)}$$

Rv = Storage Volume (1,824 s.f.)(volume below invert)

K = Saturated 0.27 in/hour)

Bottom Area = Bottom Area of Recharge structure (1,250 s.f.) = 39 hours

1,824 c.f./ (0.27 in/hour)(1inch/12foot)(1,250 s.f.) =65 hours

Pond #4

$$Time_{drawdown} = \frac{Rv}{(K)(Bottom\ Area)}$$

Where:

Rv = Storage Volume (3,312 s.f.)(below invert)

K = Saturated 0.27in/hour)

3,312 c.f./ (0.27 in/hour)(1inch/12foot)(3,312 s.f.) = 44 hours

STANDARD #4- 80% TSS REMOVAL

REQUIRED WATER QUALITY VOLUME:
ESTIMATED PROPOSED NEW IMPERVOUS AREA= 86,790 S.F.

Water Quality Volume		
Required Treatment Volume	1.0	Inches Over Impervious Areas
Watershed Series	Paved Area	Water Quality Volume
P-1 (pavement)	32,428	2,703
P-2	27,755	2,303
P-3	4,207	350
P-4	22,700	7,840

The design of the drainage system is such that the site is routed through a series of treatment BMP's meeting the Standard. The attached TSS worksheets how the water treatment prior to the existing basin located on. No bypass is designed of the BMP's reducing the WQV.

Water Quality Volume Calculation:

P-1 (Basin 1)
Wv = F x I
Wv = Required Water Quality Volume
F = Water Factor
I = Total Impervious Area
Rv = (1")/(1'/12") x 32,428 s.f. = 2,703 cf (Required)
Provided 2,826 c.f.
P-2(Basin 2)
Wv = F x I
Wv = Required Water Quality Volume
F = Water Factor
Rv = (1")/(1'/12") x 27,755 s.f. = 2,303 cf (Required)
Provided 2,330 c.f.
P-3(Basin 3)
Wv = F x I
Wv = Required Water Quality Volume
F = Water Factor
Rv = (1")/(1'/12") x 4,207 s.f. = 350 cf (Required)
Provided 2,228 c.f.
P-4(Basin 4)
Wv = F x I
Wv = Required Water Quality Volume
F = Water Factor
Rv = (1")/(1'/12") x 22,700 s.f. = 1,891 cf (Required) Provided 7,840 c.f.

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: basin1

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	0.25	1.00	0.25	0.75
Sediment Forebay	0.25	0.75	0.19	0.56
Infiltration Basin	0.80	0.56	0.45	0.11
Sediment Forebay	0.25	0.11	0.03	0.08
	0.00	0.08	0.00	0.08

Total TSS Removal = 92%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: [illegible]16
Prepared By: pml
Date: 1/8/2024

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: basin2

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	0.25	1.00	0.25	0.75
Sediment Forebay	0.25	0.75	0.19	0.56
Infiltration Basin	0.80	0.56	0.45	0.11
Sediment Forebay	0.25	0.11	0.03	0.08
	0.00	0.08	0.00	0.08

Total TSS Removal = 92%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: [illegible]
Prepared By: pml
Date: 1/8/2024

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Basin3 Entrance

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Stormceptor 900	**0.80**	**0.75**	**0.60**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**

Total TSS Removal = **85%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: j-16
Prepared By: pml
Date: 2/19/2024

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Basin 4 (Roof Only)

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Roof Runoff only	0.00	1.00	0.00	1.00
	0.00	1.00	0.00	1.00
	0.00	1.00	0.00	1.00
	0.00	1.00	0.00	1.00
	0.00	1.00	0.00	1.00

Total TSS Removal = 0%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: j-16
Prepared By: pml
Date: 2/19/2024

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

Standard #4: Over 80% TSS shall occur based on the BMP measurements provided. The treatment train varies for each section. TSS worksheets are provided in the report for each treatment train in the site.
Standard #5: The proposed development will not generate higher potential pollutant loads and therefore will not require additional BMP practices.

Standard #6: The proposed project is not near a critical area.

Standard #7: The proposed project is not a redevelopment project.

Standard #8: Erosion and sediment control measures are proposed as part of the proposed project.

Standard #9: An Operation & Maintenance plan is provided within this document

Standard #10: This project does not propose any illicit discharges.

STANDARD #9- OPERATION & MAINTENANCE

OPERATION & MAINTENANCE PLAN:

CURRENT OWNER & RESPONSIBLE PARTY:

Lobisser & Ferreira Construction (Contractor shall be responsible during construction)

FUTURE OWNER & RESPONSIBLE PARTY:

Lobisser & Ferreira Construction

DURING CONSTRUCTION:

***SILT FENCE BARRIER*:**

The silt fence barrier shall be installed prior to construction.

During construction the contractor shall inspect the silt fence barrier on a weekly basis and after any significant rainstorm resulting in greater than 0.5" of rainfall. The barrier shall be inspected for any breaches or disturbed silt fence and repaired immediately.

After construction the barrier shall be maintained as stated above until all new areas are vegetated.

After construction these duties shall transfer to the property owner.

***CONSTRUCTION ENTRANCE APRONS*:**

Construction aprons shall be installed to protect Tractor Supply Parking Lot and Route 9. The construction entrance apron shall be installed prior to commencement of construction and shall be inspected weekly. The construction entrance apron shall be replaced when debris becomes noticeable on the existing pavement surfaces leading to and from the construction site.

***SLOPE STABILIZATION*:**

The slope stabilization controls shall be installed immediately upon obtaining final grades as shown on the project plans. Slopes in the swale area shall be stabilized according to the details provided. All 3:1 slopes established on-site shall be loamed and seeded as soon as weather

permits. Any 2:1 slopes established shall be covered with slope stabilization fabric, then loamed and seeded as soon as weather permits. Areas in failure shall be re-graded to final grade and stabilized as necessary.

***TEMPORARY BASINS*:**

The temporary basins shall be inspected immediately after storm events and cleaned to remove sediment build-up. Outfalls shall be inspected for erosion or scouring. Additional rip rap shall be added as required to minimize erosion.

***OUTLET CONTROL STRUCTURE*:**

Outlet control structures at basins have temporary stone or other filtration device installed around inlet to prevent sediment deposits. Sediment shall be removed when accumulation exceeds 1" depth on paved surfaces.

***CHECK DAMS*:**

Check Dams shall be inspected weekly and after rainfall in excess of 0.5". Accumulated sediment shall be removed when depth exceeds 3" on the upstream sided of the dam. Stone or fabric shall be replaced when evidence of clogging is present.

***CONSTRUCTION COMPLETION*:**

The entire stormwater management system shall be inspected upon completion of construction. Portions of the system containing sediment shall be cleaned and all sediment properly removed.

AFTER CONSTRUCTION:

SEDIMENT BASIN:

Sediment Basins shall be visually inspected monthly for accumulation of debris, slope failure, or stone displacement. Slopes shall be mowed quarterly. Bottom shall be swept, vacuumed of accumulated debris semi-annually.

CATCH BASIN & DROP INLET:

At a minimum, the catch basins shall be inspected and cleaned on a quarterly basis. It is preferred that collection of accumulated sediment shall be accomplished by means of vacuum pumping and not by means of a clamshell bucket. Disposal of accumulated sediment shall be performed in accordance with applicable local, state, and federal guidelines and regulations.

GRASS SWALES & INFILTRATION BASIN:

Inspect infiltration basin after major storm events (>3.0 inches) to verify stabilization and infiltration. Mow slopes, berms quarterly. Removed accumulated clippings from infiltration stone. Inspect basin semi-annually for the following:

- Signs of differential settlement
- Cracking
- Erosion
- Leakage in embankments
- Tree growth on embankments
- Condition of rip rap
- Sediment accumulation
- Turf health.

LONG TERM POLLUTION PREVENTION PLAN

The following are the material management practices that shall be used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff.

Good Housekeeping: The following good housekeeping practices will be followed on site during the construction project and continued upon completion of the construction activities.

1. A concerted effort shall be made to store only enough product required to complete a particular task.
2. All materials stored on site shall be stored in a neat and orderly fashion in their appropriate containers and, if possible, under a roof or other secure enclosure.
3. Products shall be kept in their original containers with the original manufacture's label.
4. Substances shall not be mixed with one another unless recommended by the manufacturer.
5. Whenever possible, all of a product shall be used up before disposing of the container.
6. Manufacture's recommendations for proper use and disposal shall be followed.
7. The site superintendent shall inspect daily to ensure proper use and disposal of materials on site.

Hazardous Products: The following practices are intended to reduce the risks associated with hazardous materials.

1. Products shall be kept in original containers unless they are not re-sealable.
2. Where feasible, the original label and material safety data shall be retained, whereas they contain important product information.
3. If surplus product must be disposed of, follow manufacturers or local and State recommended methods for proper disposal.

Product Specific Practices: The following product-specific practices shall be followed on site:
Petroleum Products:

1. All on site vehicles shall be monitored for leaks and receive regular preventative maintenance to reduce the risk of leakage.
2. Petroleum products shall be stored in tightly sealed containers which are clearly labeled.
3. Petroleum Products shall be stored in compliance with Fire Marshall regulations.

Bituminous Concrete:
Any bituminous concrete or asphalt substances used on site shall be applied according to the manufacturer's recommendations.

Fertilizers:
Fertilizers shall be applied in the minimum amounts recommended by the manufacturer. Once applied, fertilizers shall be worked into the soil to limit exposure to stormwater. Storage shall be in a covered shed or trailer. The contents of any partially-used bags of fertilizer shall be transferred to a sealable plastic bag or bin to avoid spills

Paints:
1. All containers shall be tightly sealed and stored when not required for use.
2. Excess paint shall not be discharged into any catch basin, drain manhole or any portion of the stormwater management system.
3. Excess paint shall be properly disposed of according to manufacturer's recommendations or State and local regulations.

Concrete Trucks:
Concrete trucks shall not be allowed to wash out or discharge surplus concrete or drum wash water on site.

SPILL CONTROL PRACTICES
In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices shall be followed for spill prevention and cleanup:
1. Manufacturer's recommended methods for cleanup shall be readily available at the onsite trailer, and site personnel shall be made aware of the procedures and the location of the information.
2. Materials and equipment necessary for spill clean up shall be kept in the material storage area on site. Equipment and materials shall include, but not be limited to, brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust and plastic and metal trash containers specifically for this purpose.
3. All spills shall be cleaned up immediately after discovery.
4. The spill area shall be kept well ventilated, and personnel shall wear appropriate protective clothing to prevent injury from contact with hazardous substance.
5. Spills of toxic or hazardous material shall be reported to the appropriate State and/or local authority in accordance with local and/or State regulations.
6. The spill prevention plan shall be adjusted to include measures to prevent a particular type of spill from reoccurring and instructions on how to clean up the spill if there is another occurrence. A description of the spill, what caused it, and the clean up measures shall also be included.
7. The "Manager" shall be the spill prevention and cleanup coordinator. The "Manager" shall designate at least three other site personnel who will be trained in the spill control practices identified above.

ILLICIT DISCHARGE COMPLIANCE STATEMENT

SITE ADDRESS:	47 Main Street, Upton Massachusetts
OWNER:	Lobbiser Building Corp.
PLAN REFERENCE:	DRAINAGE & UTILITIES PLAN PREPARED BY D&L Design Group, Inc.
DATE:	December 29, 2023

As required by Standard 10 of the Massachusetts Stormwater Standards, I, the undersigned, being the authorized owner/responsible party of the above referenced property do hereby certify that no illicit discharges exist on the site and that the stormwater management system, as shown on the above referenced plan, does not contain or permit any illicit discharges to enter the stormwater management system. Furthermore discharges from interior building drains or plumbing within the buildings are prohibited. Illicit discharges do not include discharges from the following activities or facilities: firefighting, water line flushing, landscape irrigation, uncontaminated groundwater, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated water from swimming pools, water used for street washing and water used to clean residential buildings without detergents.

The pollution prevention plan measures to implements in this project to prevent illicit discharges to the stormwater management system, including wastewater discharges and discharges of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease, include:

1. Identifying the responsible personnel for the implementation of an effective Illicit Discharge Detection and Elimination [IDDE] program.
2. Identify potential sources of Illicit Discharges.
3. Implement the Spill Prevention and Control Plan contained in the property Stormwater Pollution Prevention Plan [SWPPP].

Further, I certify that the stormwater management system ass shown on the referenced plan will be maintained in accordance with the conditions of the Long Term Pollution Prevention Plan.

NAME:	Kevin Lobbiser
SIGNED:	
DATE:	December 29, 2023

STORMWATER MANAGEMENT CHECKLIST

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Signature and Date 9-12-23

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☐ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☒ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☒ Grass Channel
- ☐ Green Roof
- ☐ Other (describe):

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☒ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☐ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

☐ Site is comprised solely of C and D soils and/or bedrock at the land surface

☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000

☐ Solid Waste Landfill pursuant to 310 CMR 19.000

☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☒ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☒ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☒ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☒ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted *prior to* the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does *not* cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has *not* been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☒ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

APPENDICES:

Soil Logs and Soil Map Information

Inspection & Maintenance Logs During Construction

Inspection & Maintenance Logs After Construction

Hydrocad Files

Pre-Development Watershed Map

Post-Developoment Watershed Map

Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Lobisser Building Corp
Owner Name

47 Main Street
Street Address

Upton
City

MA
State

Map/Lot #
01568
Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade ☐ Repair

2. Soil Survey Available? ☒ Yes ☐ No If yes: NRCS (Source) 315B (Soil Map Unit)

Scituate
Soil Name

Soil Limitations

Glacial Till
Soil Parent material

Ridge
Landform

3. Surficial Geological Report Available? ☐ Yes ☒ No If yes:

Year Published/Source

Map Unit

Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No If yes, MassGIS Wetland Data Layer:

Wetland Type

7. Current Water Resource Conditions (USGS): August 2023 (Month/Day/Year) Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed:

Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number: 10-11 (Hole #) | 8/3/23 (Date) | 10 am (Time) | Clear 78 (Weather) | Latitude | Longitude:

1. **Land Use** woodland (e.g., woodland, agricultural field, vacant lot, etc.) | wooded (Vegetation) | some (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 4 (Slope (%))

Description of Location:

2. **Soil Parent Material:** Glaical Till | Ridge (Landform) | Front of Parcel (Position on Landscape (SU, SH, BS, FS, TS))

3. **Distances from:** Open Water Body n/a feet | Drainage Way n/a feet | Wetlands 50 feet | Property Line 70 feet | Drinking Water Well n/a feet | Other _____ feet

4. **Unsuitable Materials Present:** ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. **Groundwater Observed:** ☒ Yes ☐ No If yes: 0/60 Depth Weeping from Pit | 0/72 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	S.L.	10YR4/4	N/A			N/A				Dth#10
12-21	B	S.L.	10YR4/6	N/A			N/A				
21-72	C	C.S.	2.5Y5/4	N/A			N/A	30			
0-10	A	S.L.	10YR4/4	N/A							Dth#11
10-20	B	S.L.	10YR4/6	N/A							
20-72	C	C.S.	2.5Y5/4	N/A				35			

Additional Notes:

Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number: 9 (Hole #) 8/3/23 (Date) 10 (Time) CLEAR 78 (Weather) _____ (Latitude) _____ (Longitude:)

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) Wooded (Vegetation) some (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 4 (Slope (%))

Description of Location: _____

2. Soil Parent Material: Glacial Till _____ Ridge (Landform) _____ (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body n/a feet; Drainage Way n/a feet; Wetlands 30 feet; Property Line 40 feet; Drinking Water Well n/a feet; Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: _____ Depth Weeping from Pit _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-10	A	S.L.	10YR4/4	N/A							Dth#9
10-34	B	S.L.	10YR4/6	N/A							
34-54	C1	M.S.	10YR5/8	N/A			25				
54-84	C2	L.S.	2.5Y5/4	N/A			35				

Additional Notes: _____

Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole #9	Obs. Hole #10/11
☒ Depth observed standing water in observation hole	_ inches	0/72 inches
☒ Depth weeping from side of observation hole	_ inches	0/60 inches
☐ Depth to soil redoximorphic features (mottles)	_____ inches	_____ inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

Index Well Number _____ Reading Date _____

$S_h = S_e - [S_r \times (OW_e - OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_e _____ S_r _____ OW_e _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 30 inches Lower boundary: 72+ inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Signature of Soil Evaluator

8/3/23
Date

Peter Lavole SE#1332
Typed or Printed Name of Soil Evaluator / License #

2025
Expiration Date of License

Mary Overholt
Name of Approving Authority Witness

Upton Conservation Agent
Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Lobisser Building Corp
Owner Name

47 Main Street
Street Address

Upton
City

MA
State

Map/Lot #

01568
Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade ☐ Repair

2. Soil Survey Available? ☒ Yes ☐ No If yes: NRCS Source 315B Soil Map Unit

Scituate
Soil Name

Soil Limitations

Glacial Till
Soil Parent material

Ridge
Landform

3. Surficial Geological Report Available? ☐ Yes ☒ No If yes:

Year Published/Source

Map Unit

Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No If yes, MassGIS Wetland Data Layer:

Wetland Type

7. Current Water Resource Conditions (USGS): August 2023 Month/Day/ Year Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed:

Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number: 586-2023 (Hole #) | 8/3/23 (Date) | 10 am (Time) | Clear 78 (Weather) | Latitude | Longitude:

1. **Land Use:** woodland (e.g., woodland, agricultural field, vacant lot, etc.) | wooded (Vegetation) | some (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 4 (Slope (%))

Description of Location:

2. **Soil Parent Material:** Glaical Till | Ridge (Landform) | Front of Parcel (Position on Landscape (SU, SH, BS, FS, TS))

3. **Distances from:** Open Water Body n/a feet | Drainage Way n/a feet | Wetlands 50 feet | Property Line 70 feet | Drinking Water Well n/a feet | Other ____ feet

4. **Unsuitable Materials Present:** ☐ Yes ☒ No — If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. **Groundwater Observed:** ☒ Yes ☐ No — If yes: 48/0 Depth Weeping from Pit ____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-(Moist (Munsell)	Redoximorphic Features			Course Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-20	A	S.L.	10YR4/4	N/A			N/A				Dth#5
20-30	B	S.L.	10YR4/6	N/A			N/A				
30-60	C	L.S.	2.5Y5/4	30"	10YR5/8	25	25				
0-10	A	S.L.	10YR4/4	N/A							Dth#6
10-32	B	S.L.	10YR4/6	N/A							
32-52	C	L.S.	2.5Y5/4	N/A							

Additional Notes:

Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number: 7&8-2023 | 8/3/23 Date | 10 Time | CLEAR 78 Weather | Latitude | Longitude:

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Wooded Vegetation | some Surface Stones (e.g., cobbles, stones, boulders, etc.) | 4 Slope (%)

Description of Location:

2. Soil Parent Material: Glacial Till | Ride Landform | Position on Landscape (SU, SH, BS, FS, TS)

3. Distances from: Open Water Body n/a feet | Drainage Way n/a feet | Wetlands 70 feet | Property Line 40 feet | Drinking Water Well n/a feet | Other ____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 52/46 Depth Weeping from Pit 52/46 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-10	A	S.L.	10YR4/4	N/A							Dth#7
10-32	B	S.L.	10YR4/6	N/A							
32-60	C	L.S.	5Y7/2	41"	10YR5/8	25					
0-10	A	S.L.	10YR4/4	N/A							Dth#8
10-32	B	S.L.	10YR4/6	N/A							
32-70	C1	L.S.	5Y7/2	39	10YR5/8	25					

Additional Notes:

Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole #5/6	Obs. Hole #7/8
☒ Depth observed standing water in observation hole	48/0 Inches	52/46 Inches
☒ Depth weeping from side of observation hole	48/0 Inches	52/46 inches
☒ Depth to soil redoximorphic features (mottles)	30/0 Inches	41/39 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ Inches	_____ Inches

_____ Index Well Number _____ Reading Date

$S_h = S_c - [S_r \times (OW_c - OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ Inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)?	Upper boundary:	30 Inches	Lower boundary:	72+ Inches
c. If no, at what depth was impervious material observed?	Upper boundary:	_____ Inches	Lower boundary:	_____ Inches

Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Signature of Soil Evaluator

8/3/23
Date

Peter Lavole SE#1332
Typed or Printed Name of Soil Evaluator / License #

2025
Expiration Date of License

Mary Overholt
Name of Approving Authority Witness

Upton Conservation Agent
Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Loblaser Building Corp
Owner Name

47 Main Street
Street Address

Upton
City

MA
State

Map/Lot #
01568
Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade ☐ Repair

2. Soil Survey Available? ☒ Yes ☐ No If yes: NRCS Source 315B Soil Map Unit

Scituate
Soil Name

Soil Limitations

Glacial Till
Soil Parent material

Ridge
Landform

3. Surficial Geological Report Available? ☐ Yes ☒ No If yes:

Year Published/Source

Map Unit

Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No If yes, MassGIS Wetland Data Layer:

Wetland Type

7. Current Water Resource Conditions (USGS): August 2023 Month/Day/Year Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed:

Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number: 1&2-2023 (Hole #) 8/3/23 (Date) 10 am (Time) Clear 78 (Weather) _____ (Latitude) _____ (Longitude:)

1. **Land Use** woodland (e.g., woodland, agricultural field, vacant lot, etc.) wooded (Vegetation) some (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 4 (Slope (%))

Description of Location: _____

2. **Soil Parent Material:** Glaical Till Ridge (Landform) Front of Parcel (Position on Landscape (SU, SH, BS, FS, TS))

3. **Distances from:** Open Water Body n/a feet; Drainage Way n/a feet; Wetlands 50 feet; Property Line 70 feet; Drinking Water Well n/a feet; Other _____ feet

4. **Unsuitable Materials Present:** ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. **Groundwater Observed:** ☒ Yes ☐ No If yes: 36"/28" Depth Weeping from Pit _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-10	A	S.L.	10YR4/4	N/A			N/A				Dth#1
10-28	B	S.L.	10YR4/6	N/A			N/A				
28-60	C	L.S.	2.5Y5/4	36"	10YR5/8	25	25				
0-12	A	S.L.	10YR4/4	N/A							Dth#2
12-28	B	S.L.	10YR4/6	28"	10YR5/8	25	N/A				
28-72	C	L.S.	2.5Y5/4	N/A							

Additional Notes:

Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number: 3&4-2023 | 8/3/23 Date | 10 Time | CLEAR 78 Weather | Latitude | Longitude:

1. **Land Use:** Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Wooded Vegetation | some Surface Stones (e.g., cobbles, stones, boulders, etc.) | 4 Slope (%)

Description of Location: –

2. **Soil Parent Material:** Glacial Till | Ride Landform | Position on Landscape (SU, SH, BS, FS, TS)

3. **Distances from:** Open Water Body n/a feet | Drainage Way n/a feet | Wetlands 70 feet | Property Line 40 feet | Drinking Water Well n/a feet | Other _____ feet

4. **Unsuitable Materials Present:** ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. **Groundwater Observed:** ☒ Yes ☐ No If yes: 36"/48" Depth Weeping from Pit _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	S.L.	10YR4/4	N/A							Dth#3
12-28	B	S.L.	10YR4/6	24"	10YR5/8	25					
28-72	C	L.S.	2.5Y5/4	N/A							
0-10	A	S.L.	10YR4/4	N/A							Dth#4
10-21	B	S.L.	10YR4/6	N/A							
21-41	C1	L.S.	5Y6/2	28	10YR5/8	25					
41-65	C2	M.S.	2.5Y5/4								

Additional Notes:

Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole #1/2	Obs. Hole #3/4
☐ Depth observed standing water in observation hole	___ inches	_____ inches
☒ Depth weeping from side of observation hole	36/28 inches	24/28 inches
☒ Depth to soil redoximorphic features (mottles)	26/28 inches	24/28 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

Index Well Number _____ Reading Date _____

$S_h = S_o - [S_r \times (OW_o - OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_o _____ S_r _____ OW_o _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: _____ inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 24 inches Lower boundary: 72+ inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Signature of Soil Evaluator

8/3/23
Date

Peter Lavole SE#1332
Typed or Printed Name of Soil Evaluator / License #

2025
Expiration Date of License

Mary Overholt
Name of Approving Authority Witness

Upton Conservation Agent
Approving Authority

Notes: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

Soil Map—Worcester County, Massachusetts, Southern Part
(MAIN STREET - PROJECT)

Map Scale: 1:3,700 if printed on A landscape (11" x 8.5") sheet.

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

Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

7/13/2022
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

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

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

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

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

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

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

Soil Survey Area: Worcester County, Massachusetts, Southern Part
Survey Area Data: Version 18, Sep 9, 2022

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

Date(s) aerial images were photographed: May 28, 2020—Jun 6, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
73A	Whitman fine sandy loam, 0 to 3 percent slopes, extremely stony	3.9	7.1%
300B	Montauk fine sandy loam, 3 to 8 percent slopes	5.1	9.2%
300C	Montauk fine sandy loam, 8 to 15 percent slopes	3.2	5.8%
302B	Montauk fine sandy loam, 0 to 8 percent slopes, extremely stony	17.1	31.0%
315B	Scituate fine sandy loam, 3 to 8 percent slopes	12.1	22.1%
317B	Scituate fine sandy loam, 3 to 8 percent slopes, extremely stony	1.2	2.2%
420B	Canton fine sandy loam, 3 to 8 percent slopes	10.9	19.9%
420C	Canton fine sandy loam, 8 to 15 percent slopes	0.3	0.5%
422C	Canton fine sandy loam, 8 to 15 percent slopes, extremely stony	1.1	2.1%
Totals for Area of Interest		55.0	100.0%

Worcester County, Massachusetts, Southern Part

302B—Montauk fine sandy loam, 0 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2w80t
Elevation: 30 to 1,120 feet
Mean annual precipitation: 38 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Montauk, Extremely Stony

Setting

Landform: Ground moraines, drumlins, recessional moraines, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 8 inches: fine sandy loam
Bw1 - 8 to 28 inches: fine sandy loam
Bw2 - 28 to 36 inches: sandy loam
2Cd - 36 to 74 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 20 to 43 inches to densic material
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 1.42 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Scituate, extremely stony

Percent of map unit: 8 percent
Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Canton, extremely stony

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury, extremely stony

Percent of map unit: 2 percent
Landform: Depressions, ground moraines, hills, drainageways
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Worcester County, Massachusetts, Southern Part
Survey Area Data: Version 15, Sep 8, 2022

Worcester County, Massachusetts, Southern Part

315B—Scituate fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9bc9
Elevation: 200 to 950 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Scituate and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scituate

Setting

Landform: Hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 4 inches: sandy loam
H2 - 4 to 16 inches: gravelly sandy loam
H3 - 16 to 30 inches: loamy sand
H4 - 30 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 30 inches to dense material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 17 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F144AY037MA - Moist Dense Till Uplands

Hydric soil rating: No

Minor Components

Montauk

Percent of map unit: 15 percent
Hydric soil rating: No

Ridgebury

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Worcester County, Massachusetts, Southern Part
Survey Area Data: Version 15, Sep 9, 2022

Hydrocad Files

WEEKLY
Inspection and Maintenance Log **FOR: Main St.**
DURING CONSTRUCTION **& After 1.0" Rain**

Components	Date
Erosion Control – Weekly	
Comments during insp.	
Note corrective measures performed & Date	
On Site Pavement Sweeping – as Needed	
Comments during insp.	
Note corrective measures performed & date	
Silt Fence & Composite Sock– Monthly	
Comments during insp.	
Note corrective measures performed & date	
Temporary Basin Area as Needed	
Comments during insp.	
Note corrective measures performed & date	
Construction Entrance as Needed	
Comments during insp.	
Note corrective measures performed & date	

Inspector Title Date

Address Tel#

WEEKLY
Inspection and Maintenance Log **FOR: Main St.**
DURING CONSTRUCTION **& After 1.0" Rain**

Components	Date
Notify Cons. Comm. Issues effecting Resource Areas	
Comments during insp.	
Note corrective measures performed & date	
Silt of Public (Charlton Road) Streets – Daily	
Comments during insp.	
Note corrective measures performed & date	
Stockpile Materials Ring with Composite Sock – Weekly	
Comments during insp.	
Note corrective measures performed & date	
Any Spill Fuel, Chemical- Daily	
Comments during insp.	
Note corrective measures performed & date	
Temporary Ground Cover Area – Weekly	
Comments during insp.	
Note corrective measures performed & date	
Temporary Stone at Access Drive as Needed	
Comments during insp.	
Note corrective measures performed & date	

Inspector **Title** **Date**

Address **Tel#**

WEEKLY
Inspection and Maintenance Log FOR: Main St.
DURING CONSTRUCTION & After 1.0" Rain

Components	Date
Lawn Area / Mulch Area Erosion, **Washouts**	
Comments during insp.	
Note corrective measures performed & date	
Stone Aprons at Outfalls Exit **as Needed**	
Comments during insp.	
Note corrective measures performed & date	
Forebay **as Needed**	
Comments during insp.	
Note corrective measures performed & date	
Illicit Drainage **Discharge**	
Comments during insp.	
Note corrective measures performed & date	
Comments during insp.	
Note corrective measures performed & date	
Inspector Title Date	
Address Tel#	

J-016

Inspection and Maintenance Log **FOR: Main Street**
AFTER CONSTRUCTION **& After 3.0" Rain**

Components	Date
Basin#1 **– twice a year**	
Comments during insp.	
Note corrective measures performed & Date	
Basin#2 **-twice a year**	
Comments during insp.	
Note corrective measures performed & date	
Forebay#1 **-twice a year**	
Comments during insp.	
Note corrective measures performed & date	
Forebay#2 **-twice a year**	
Comments during insp.	
Note corrective measures performed & date	
Catch Basins **– 8 inches of sediment or twice a year**	
Comments during insp.	
Note corrective measures performed & date	
Inspector Title Date	
Address Tel#	

J-016

Inspection and Maintenance Log **FOR: Main Street**
AFTER CONSTRUCTION **& After 3.0" Rain**

Components	Date
Outlet Oontrol Structure#1 **-8 inches of sediment or twice a year**	
Comments during insp.	
Note corrective measures performed & date	
Outlet Control Structure #2 **Twice a year**	
Comments during insp.	
Note corrective measures performed & date	
Basin#3 **-four times a year**	
Comments during insp.	
Note corrective measures performed & date	
Level Spreader Basin 1 **-Twice a year**	
Comments during insp.	
Note corrective measures performed & date	
Level Spreader Basin 2 **-Twice a year**	
Comments during insp.	
Note corrective measures performed & date	
All Flared end sections and rip rap aprons **– twice a year**	
Comments during insp.	
Note corrective measures performed & date	
Inspector Title Date	
Components	Date

47 Main Street, Uoton Ma Project# J-016

Riprap Stone Sizing – Drainage Outfalls

Method – ARS Rock Chutes (Slopes 2%-40%)

Reference: National Engineering Handbook, TS14C-8

#1–Rock Apron- Basin#1 (HydroCAD)

Slope = 0.02 ft/ft

q (100-yr) = 5.62 cfs

$D_{50} = 12(1.923qS^{1.5})^{0.529}$

$= D_{50} = 12(1.923x2.18x2.0^{1.5})^{0.529}$

D_{50} =3" required

D_{50} =8" provided

$L= (1.8 (Q-5)/D^{1.5}+10) =$

$=(1.8 (5.56-5)/2.0^{1.5}+10)$ 10.0 feet

W1=3D = 3(1.25')=3.75 feet

W2= 3D+0.7L= 3(1.25)+0.7(10) = 12 feet

#2–Rock Apron- Basin#2 (HydroCAD)

Slope = 0.029 ft/ft

q (100-yr) 4.56 cfs

$D_{50} = 12(1.923qS^{1.5})^{0.529}$

$= D_{50} = 12(1.923x4.54x0.029^{1.5})^{0.529}$

D_{50} =4" required

D_{50} =8" provided

$L= (1.8 (Q-5)/D^{1.5}+10) =$

$=(1.8 (4.56-5)/1.25^{1.5}+10)$ 10 feet

W1=3D = 3(1.25')=3.75 feet

W2= 3D+0.7L= 3(1.25)+0.7(10) =12 feet

#3–Rock Apron- Basin#3

Slope = 0.01 ft/ft

q (100-yr) 4.92 cfs

$D_{50} = 12(1.923qS^{1.5})^{0.529}$

$= D_{50} = 12(1.923x11.25x0.029^{1.5})^{0.529}$

D_{50} =4" required

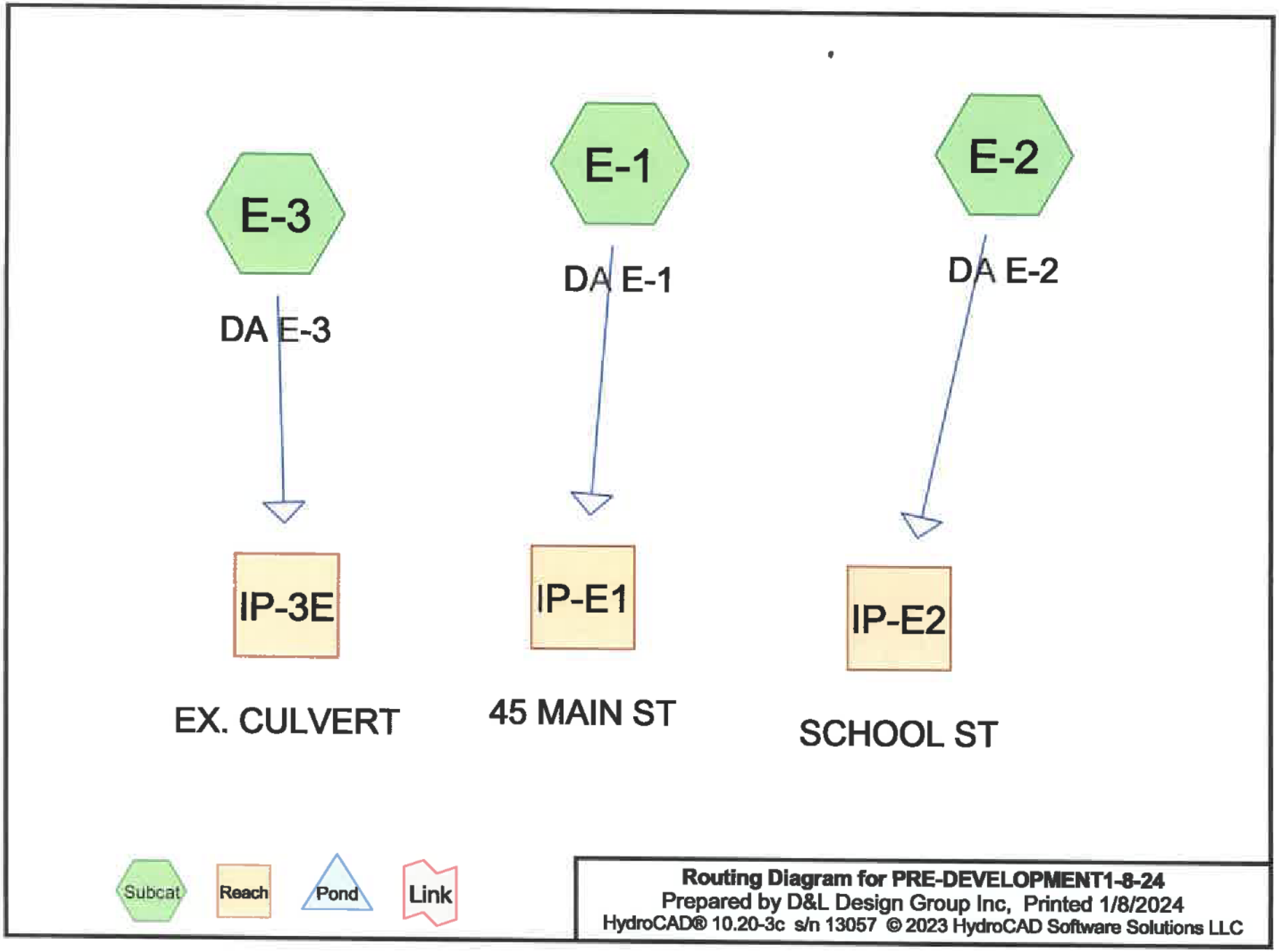
D_{50} =8" provided

$L= (1.8 (Q-5)/D^{1.5}+10) =$

$=(1.8 (4.92-5)/1^{1.5}+10) =10$ feet

W1=3D = 3(1')=3 feet

W2= 3D+0.7L= 3(1)+0.7(10) 10.0 feet



Routing Diagram for PRE-DEVELOPMENT1-8-24
Prepared by D&L Design Group Inc, Printed 1/8/2024

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2YR	Type III 24-hr		Default	24.00	1	3.39	2
2	10YR	Type III 24-hr		Default	24.00	1	5.11	2
3	25YR	Type III 24-hr		Default	24.00	1	6.19	2
4	100YR	Type III 24-hr		Default	24.00	1	7.85	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.530	74	>75% Grass cover, Good, HSG C (E-1, E-2)
0.278	98	Paved parking, HSG C (E-1, E-2)
7.258	70	Woods, Good, HSG C (E-1, E-2, E-3)
9.067	**72**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
9.067	HSG C	E-1, E-2, E-3
0.000	HSG D	
0.000	Other	
9.067		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	1.530	0.000	0.000	1.530	>75% Grass cover, Good	E-1, E-2
0.000	0.000	0.278	0.000	0.000	0.278	Paved parking	E-1, E-2
0.000	0.000	7.258	0.000	0.000	7.258	Woods, Good	E-1, E-2, E-3
0.000	**0.000**	**9.067**	**0.000**	**0.000**	**9.067**	**TOTAL AREA**	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-1: DA E-1
Runoff Area=175,987 sf 4.02% Impervious Runoff Depth>0.95"
Flow Length=560' Tc=7.1 min CN=72 Runoff=4.43 cfs 0.321 af

Subcatchment E-2: DA E-2
Runoff Area=197,469 sf 2.56% Impervious Runoff Depth>0.90"
Flow Length=470' Tc=9.3 min CN=71 Runoff=4.30 cfs 0.341 af

Subcatchment E-3: DA E-3
Runoff Area=21,482 sf 0.00% Impervious Runoff Depth>0.85"
Tc=6.0 min CN=70 Runoff=0.49 cfs 0.035 af

Reach IP-3E: EX. CULVERT
Inflow=0.49 cfs 0.035 af
Outflow=0.49 cfs 0.035 af

Reach IP-E1: 45 MAIN ST
Inflow=4.43 cfs 0.321 af
Outflow=4.43 cfs 0.321 af

Reach IP-E2: SCHOOL ST
Inflow=4.30 cfs 0.341 af
Outflow=4.30 cfs 0.341 af

Total Runoff Area = 9.067 ac Runoff Volume = 0.697 af Average Runoff Depth = 0.92"
96.93% Pervious = 8.788 ac 3.07% Impervious = 0.278 ac

Summary for Subcatchment E-1: DA E-1

Runoff = 4.43 cfs @ 12.11 hrs, Volume= 0.321 af, Depth> 0.95"
Routed to Reach IP-E1 : 45 MAIN ST

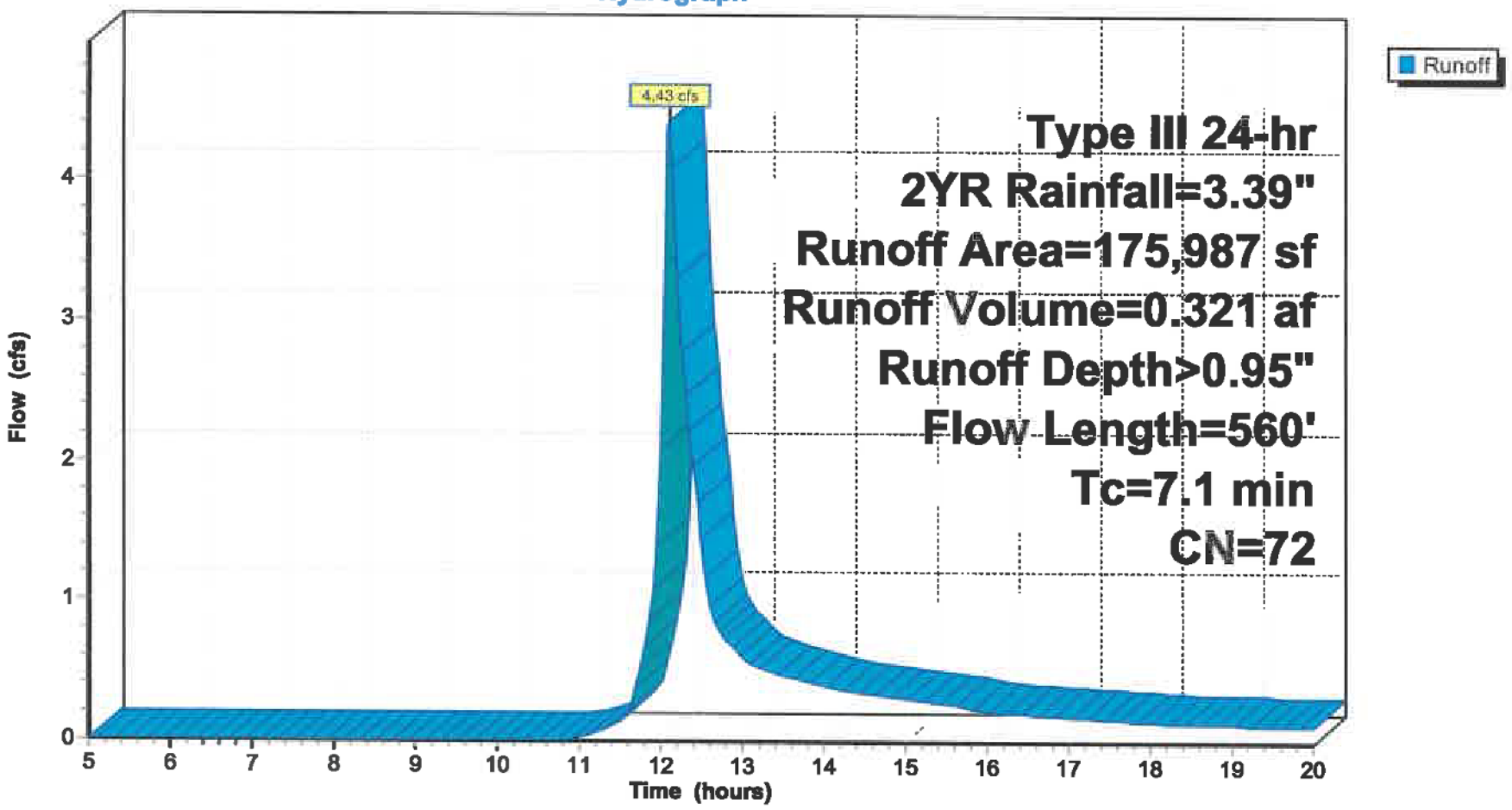
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2YR Rainfall=3.39"

Area (sf)	CN	Description
7,074	98	Paved parking, HSG C
35,876	74	>75% Grass cover, Good, HSG C
133,037	70	Woods, Good, HSG C
175,987	72	Weighted Average
168,913		95.98% Pervious Area
7,074		4.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	40	0.0550	3.78		**Shallow Concentrated Flow, TRAVEL PATH A TO B** Unpaved Kv= 16.1 fps
0.5	110	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
6.4	410	0.0450	1.06		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
7.1	560	Total			

Subcatchment E-1: DA E-1

Hydrograph



Summary for Subcatchment E-2: DA E-2

Runoff = 4.30 cfs @ 12.15 hrs, Volume= 0.341 af, Depth> 0.90"
Routed to Reach IP-E2 : SCHOOL ST

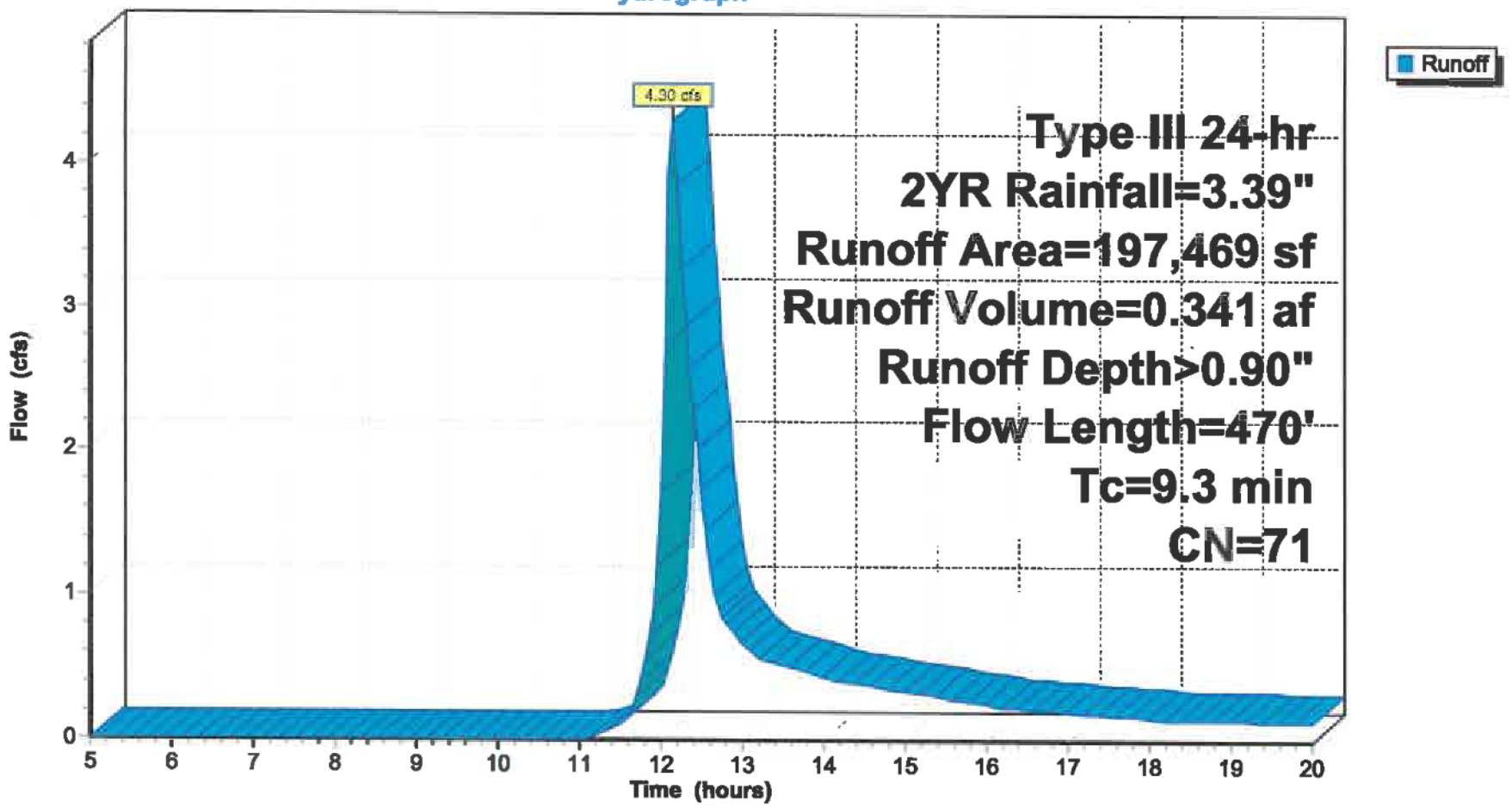
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2YR Rainfall=3.39"

Area (sf)	CN	Description
5,057	98	Paved parking, HSG C
30,786	74	>75% Grass cover, Good, HSG C
161,626	70	Woods, Good, HSG C
197,469	71	Weighted Average
192,412		97.44% Pervious Area
5,057		2.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	40	0.0450	0.20		**Sheet Flow, TRAVEL PATH A TO B** Grass: Short n= 0.150 P2= 3.20"
0.4	80	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
2.9	225	0.0650	1.27		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
2.6	125	0.0250	0.79		**Shallow Concentrated Flow, TARVEL PATH D TO E** Woodland Kv= 5.0 fps
9.3	470	Total			

Subcatchment E-2: DA E-2

Hydrograph



Summary for Subcatchment E-3: DA E-3

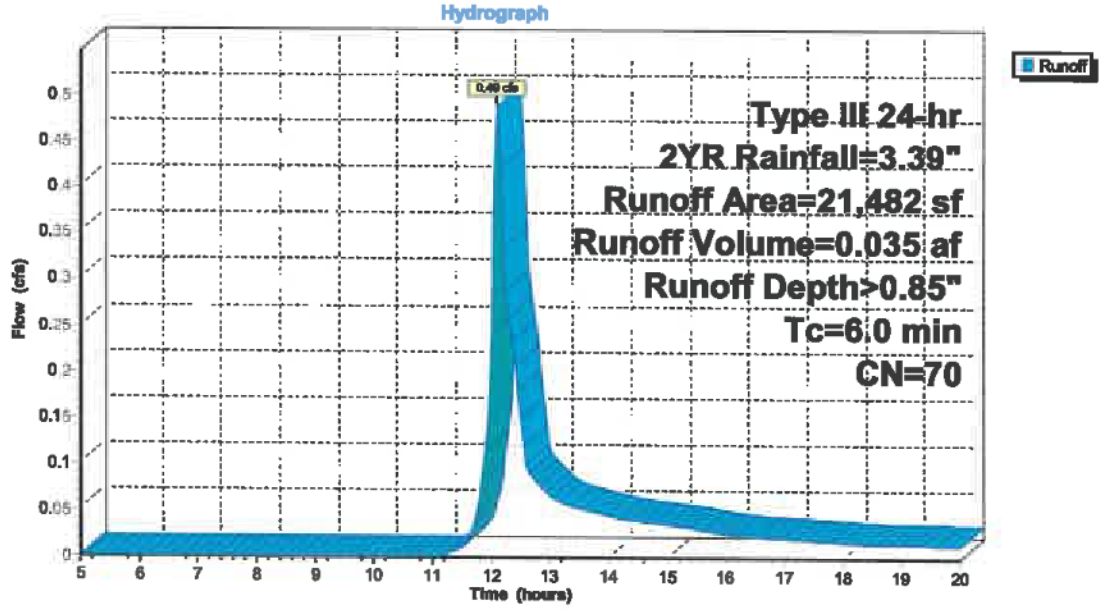
Runoff = 0.49 cfs @ 12.10 hrs, Volume= 0.035 af, Depth> 0.85"
Routed to Reach IP-3E : EX. CULVERT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2YR Rainfall=3.39"

Area (sf)	CN	Description
21,482	70	Woods, Good, HSG C
21,482		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TRAVEL TIME

Subcatchment E-3: DA E-3

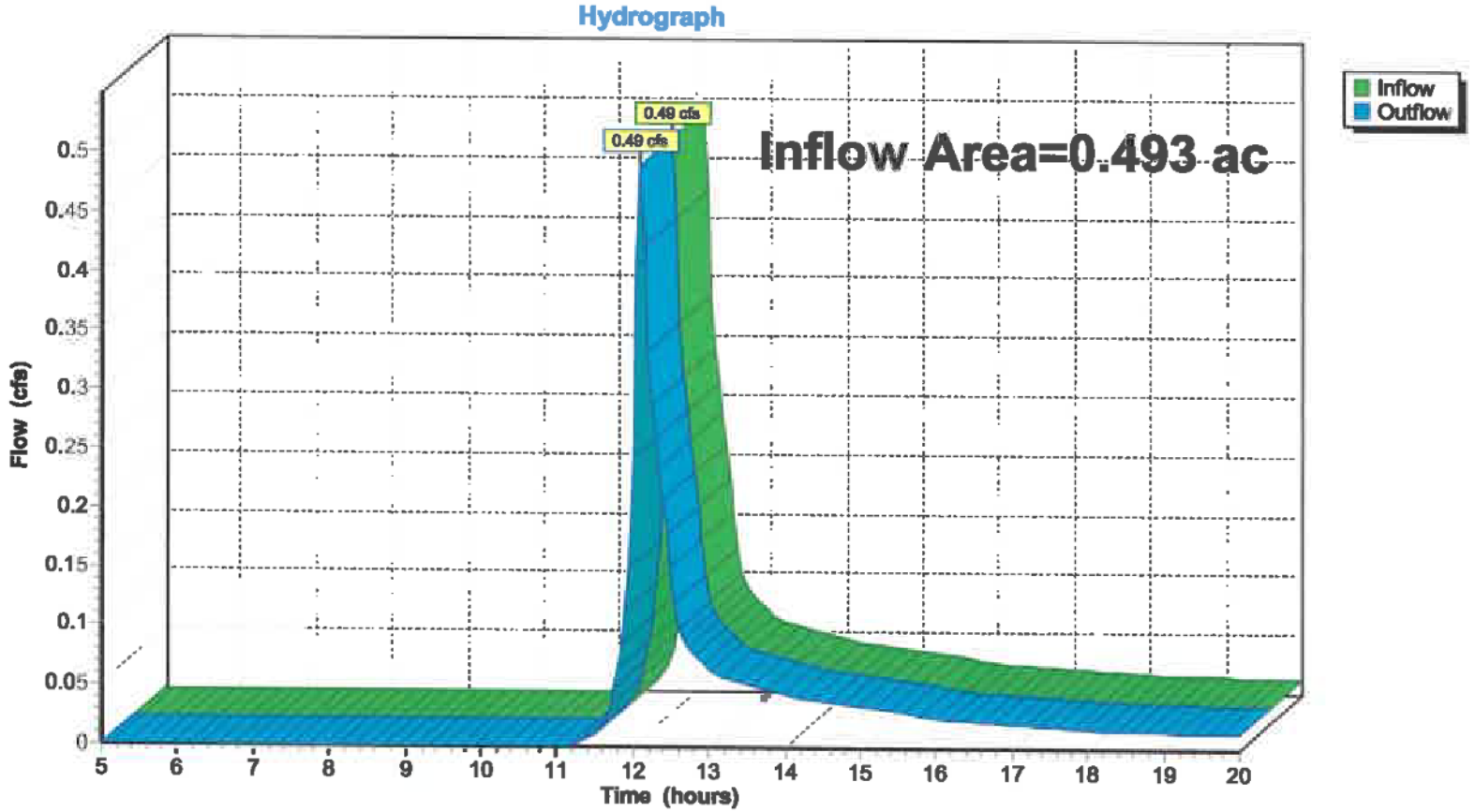


Summary for Reach IP-3E: EX. CULVERT

Inflow Area = 0.493 ac, 0.00% Impervious, Inflow Depth > 0.85" for 2YR event
Inflow = 0.49 cfs @ 12.10 hrs, Volume= 0.035 af
Outflow = 0.49 cfs @ 12.10 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-3E: EX. CULVERT

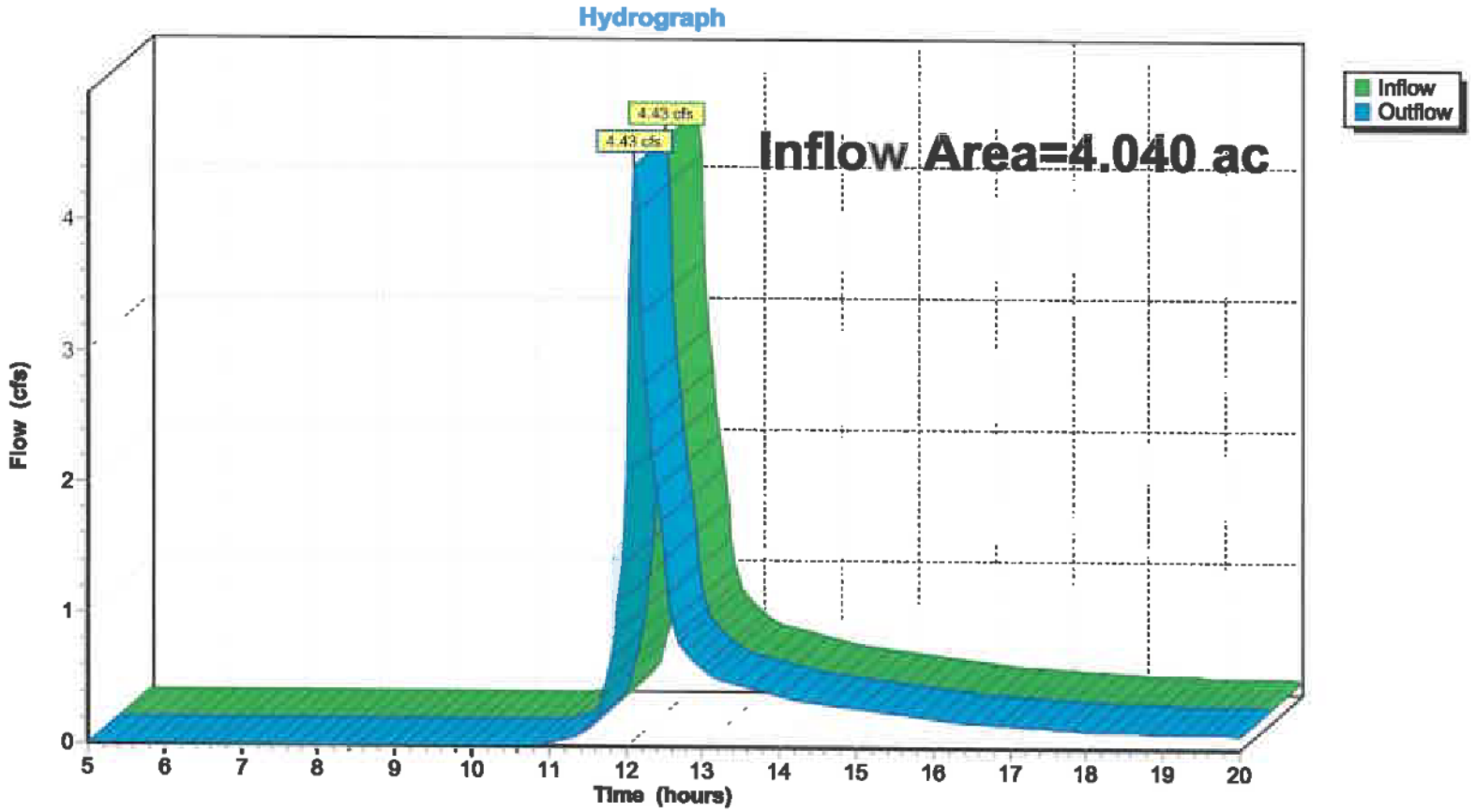


Summary for Reach IP-E1: 45 MAIN ST

Inflow Area = 4.040 ac, 4.02% Impervious, Inflow Depth > 0.95" for 2YR event
Inflow = 4.43 cfs @ 12.11 hrs, Volume= 0.321 af
Outflow = 4.43 cfs @ 12.11 hrs, Volume= 0.321 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-E1: 45 MAIN ST

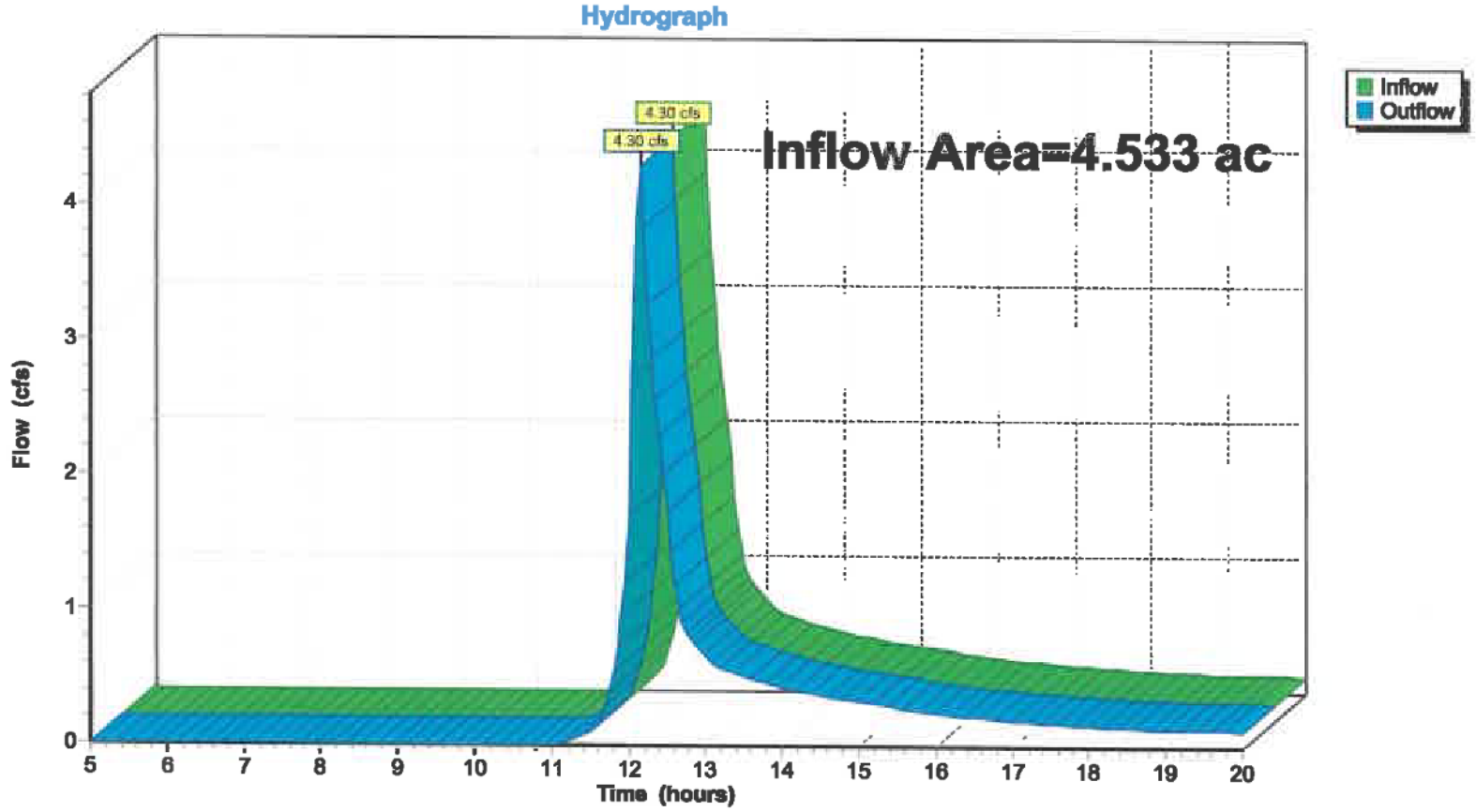


Summary for Reach IP-E2: SCHOOL ST

Inflow Area = 4.533 ac, 2.56% Impervious, Inflow Depth > 0.90" for 2YR event
Inflow = 4.30 cfs @ 12.15 hrs, Volume= 0.341 af
Outflow = 4.30 cfs @ 12.15 hrs, Volume= 0.341 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-E2: SCHOOL ST



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-1: DA E-1
Runoff Area=175,987 sf 4.02% Impervious Runoff Depth>2.11"
Flow Length=560' Tc=7.1 min CN=72 Runoff=10.19 cfs 0.710 af

Subcatchment E-2: DA E-2
Runoff Area=197,469 sf 2.56% Impervious Runoff Depth>2.03"
Flow Length=470' Tc=9.3 min CN=71 Runoff=10.14 cfs 0.766 af

Subcatchment E-3: DA E-3
Runoff Area=21,482 sf 0.00% Impervious Runoff Depth>1.95"
Tc=6.0 min CN=70 Runoff=1.18 cfs 0.080 af

Reach IP-3E: EX. CULVERT
Inflow=1.18 cfs 0.080 af
Outflow=1.18 cfs 0.080 af

Reach IP-E1: 45 MAIN ST
Inflow=10.19 cfs 0.710 af
Outflow=10.19 cfs 0.710 af

Reach IP-E2: SCHOOL ST
Inflow=10.14 cfs 0.766 af
Outflow=10.14 cfs 0.766 af

Total Runoff Area = 9.067 ac Runoff Volume = 1.556 af Average Runoff Depth = 2.06"
96.93% Pervious = 8.788 ac 3.07% Impervious = 0.278 ac

Summary for Subcatchment E-1: DA E-1

Runoff = 10.19 cfs @ 12.11 hrs, Volume= 0.710 af, Depth> 2.11"
Routed to Reach IP-E1 : 45 MAIN ST

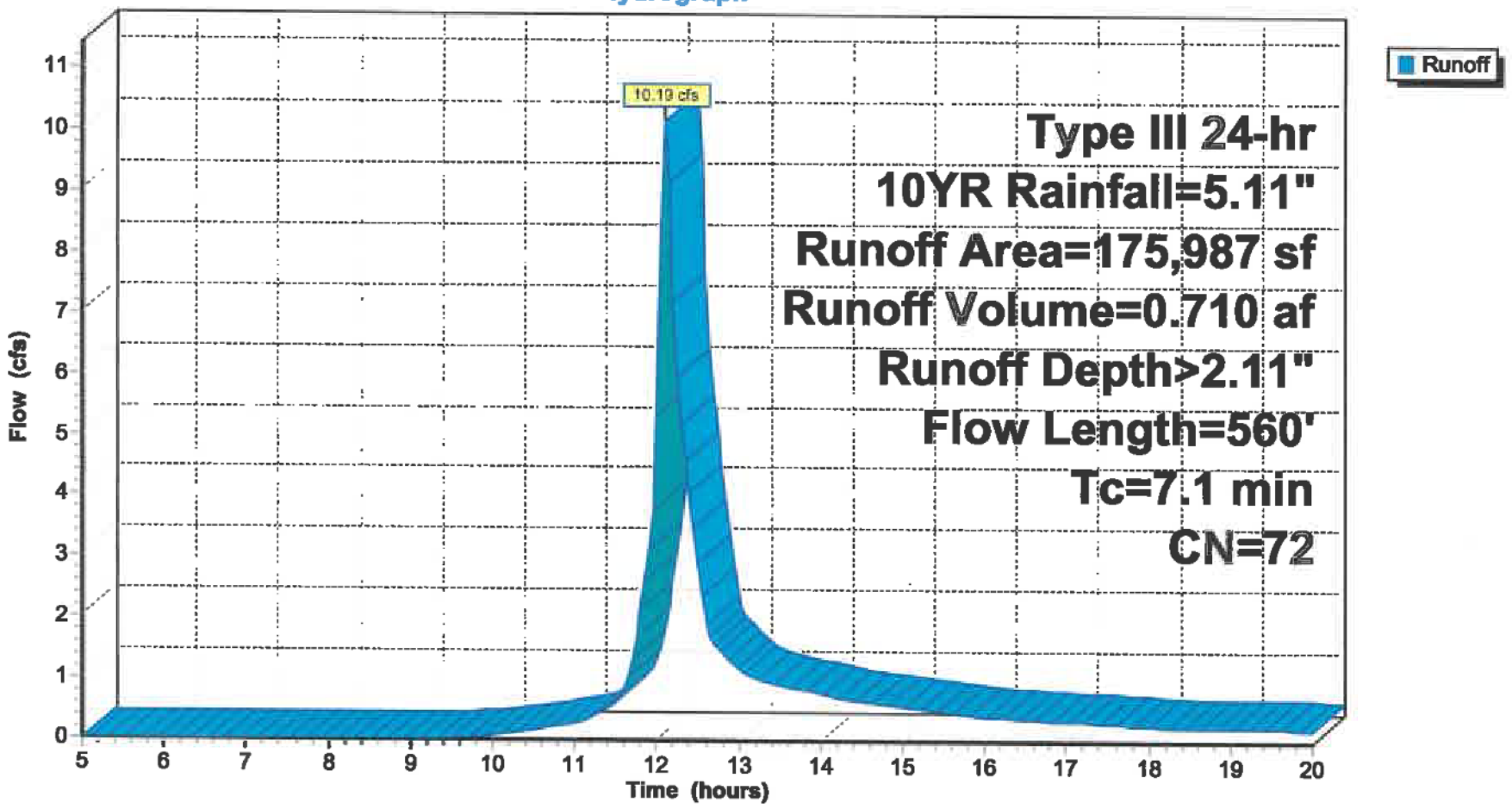
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=5.11"

Area (sf)	CN	Description
7,074	98	Paved parking, HSG C
35,876	74	>75% Grass cover, Good, HSG C
133,037	70	Woods, Good, HSG C
175,987	72	Weighted Average
168,913		95.98% Pervious Area
7,074		4.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	40	0.0550	3.78		**Shallow Concentrated Flow, TRAVEL PATH A TO B** Unpaved Kv= 16.1 fps
0.5	110	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
6.4	410	0.0450	1.06		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
7.1	560	Total			

Subcatchment E-1: DA E-1

Hydrograph



Summary for Subcatchment E-2: DA E-2

Runoff = 10.14 cfs @ 12.14 hrs, Volume= 0.766 af, Depth> 2.03"
Routed to Reach IP-E2 : SCHOOL ST

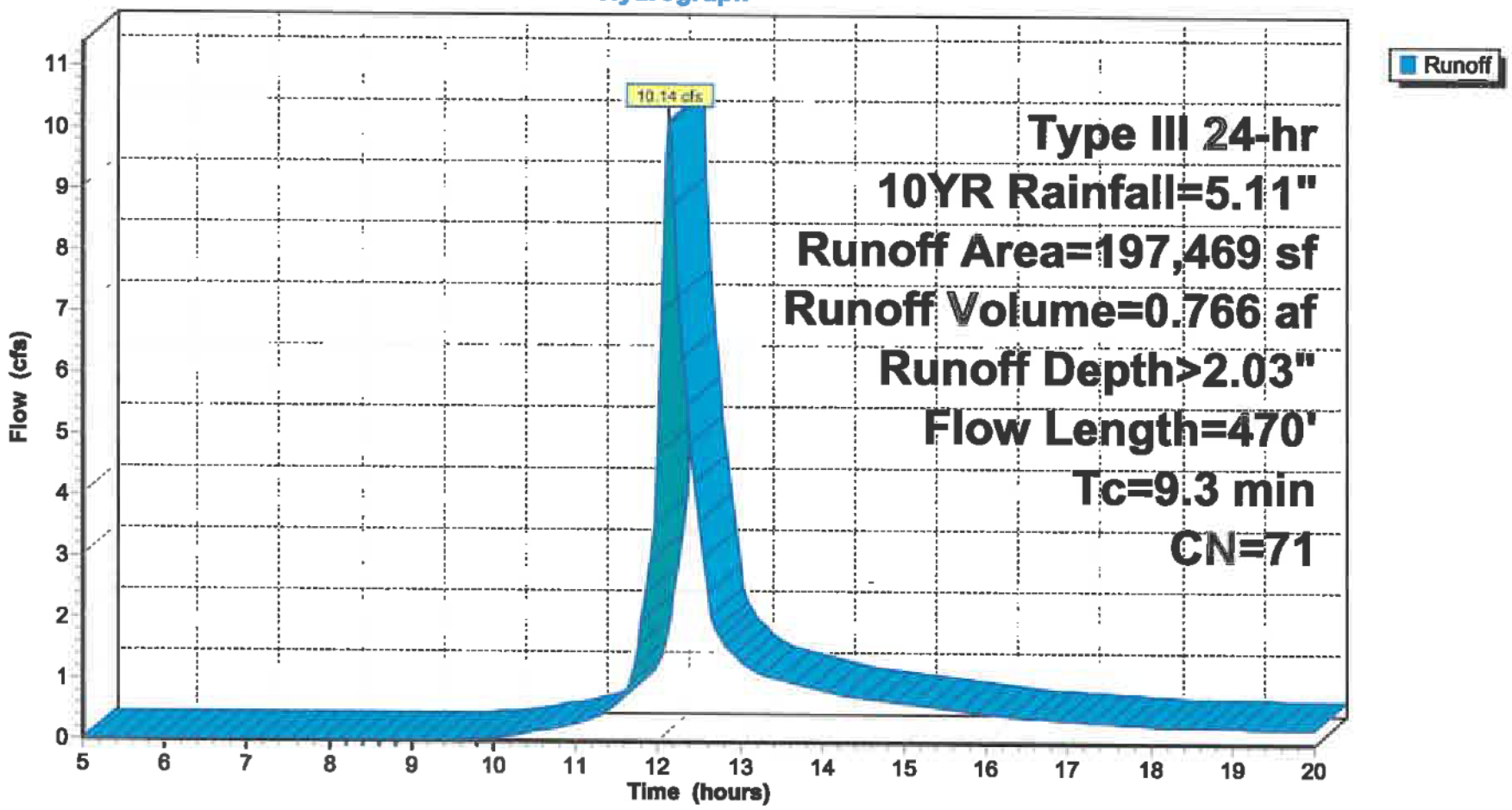
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=5.11"

Area (sf)	CN	Description
5,057	98	Paved parking, HSG C
30,786	74	>75% Grass cover, Good, HSG C
161,626	70	Woods, Good, HSG C
197,469	71	Weighted Average
192,412		97.44% Pervious Area
5,057		2.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	40	0.0450	0.20		**Sheet Flow, TRAVEL PATH A TO B** Grass: Short n= 0.150 P2= 3.20"
0.4	80	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
2.9	225	0.0650	1.27		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
2.6	125	0.0250	0.79		**Shallow Concentrated Flow, TARVEL PATH D TO E** Woodland Kv= 5.0 fps
9.3	470	Total			

Subcatchment E-2: DA E-2

Hydrograph



Summary for Subcatchment E-3: DA E-3

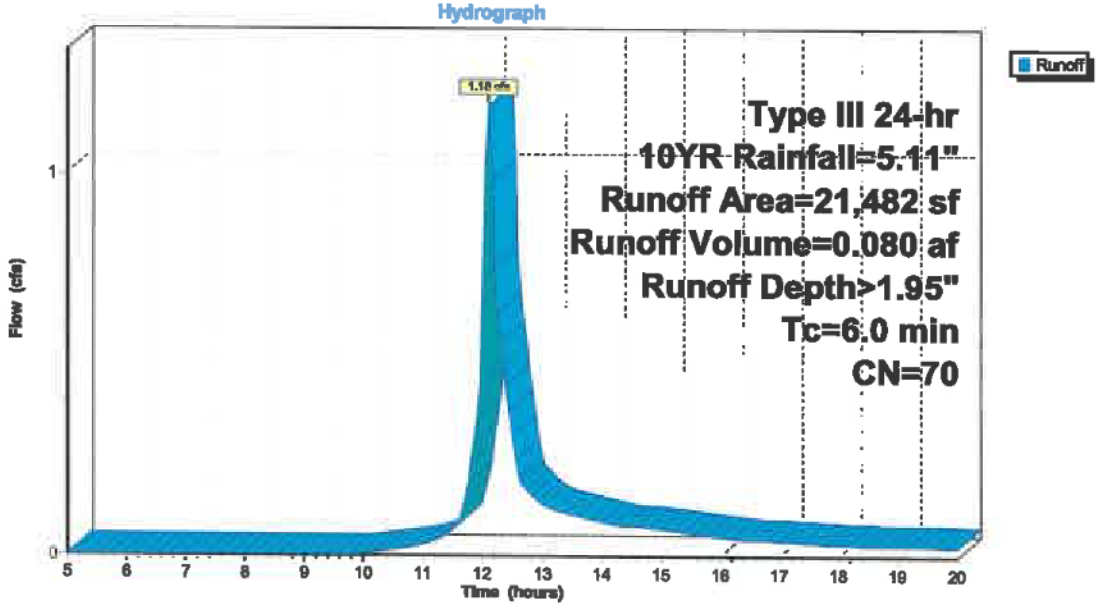
Runoff = 1.18 cfs @ 12.10 hrs, Volume= 0.080 af, Depth> 1.95"
Routed to Reach IP-3E : EX. CULVERT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=5.11"

Area (sf)	CN	Description
21,482	70	Woods, Good, HSG C
21,482		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TRAVEL TIME

Subcatchment E-3: DA E-3

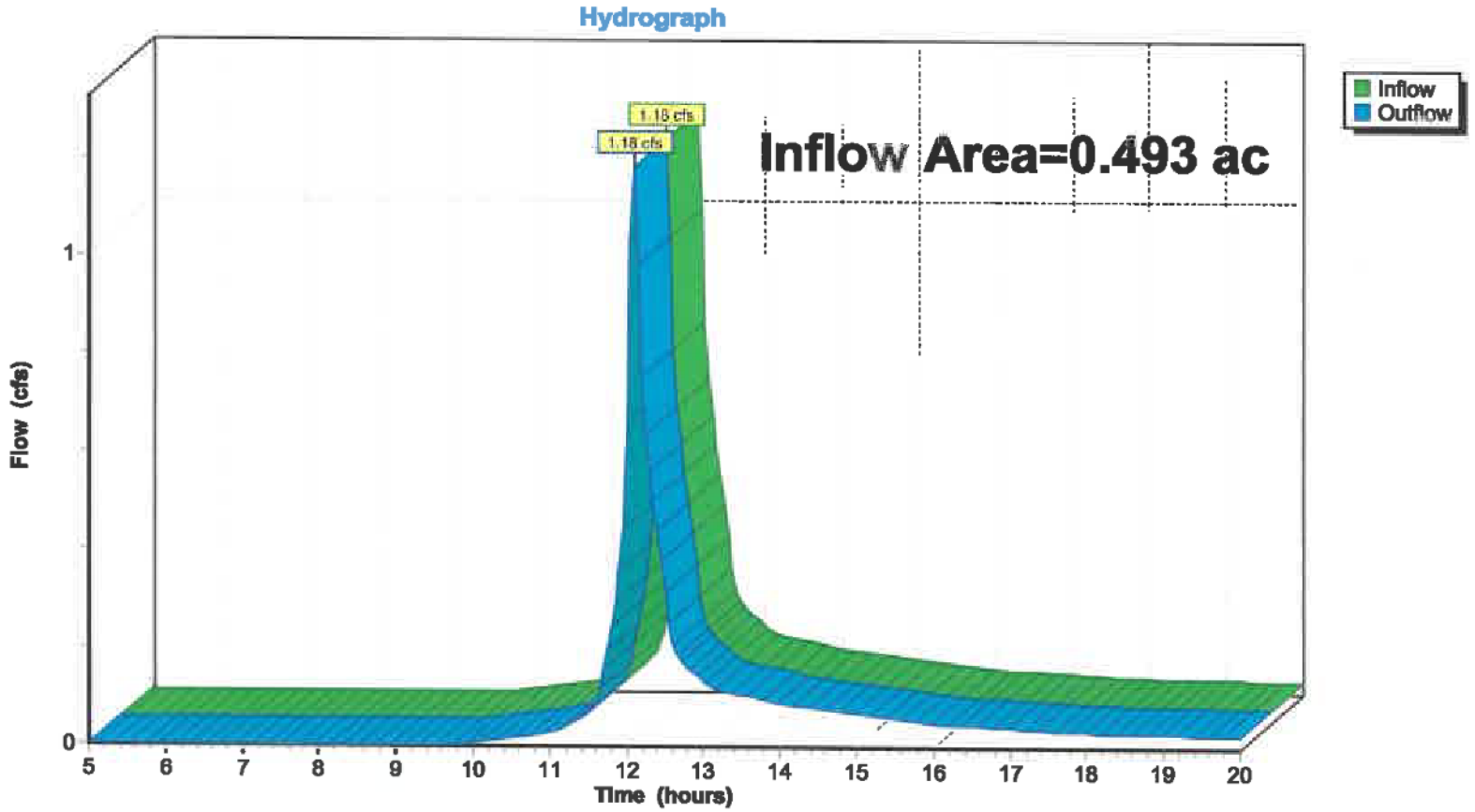


Summary for Reach IP-3E: EX. CULVERT

Inflow Area = 0.493 ac, 0.00% Impervious, Inflow Depth > 1.95" for 10YR event
Inflow = 1.18 cfs @ 12.10 hrs, Volume= 0.080 af
Outflow = 1.18 cfs @ 12.10 hrs, Volume= 0.080 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-3E: EX. CULVERT

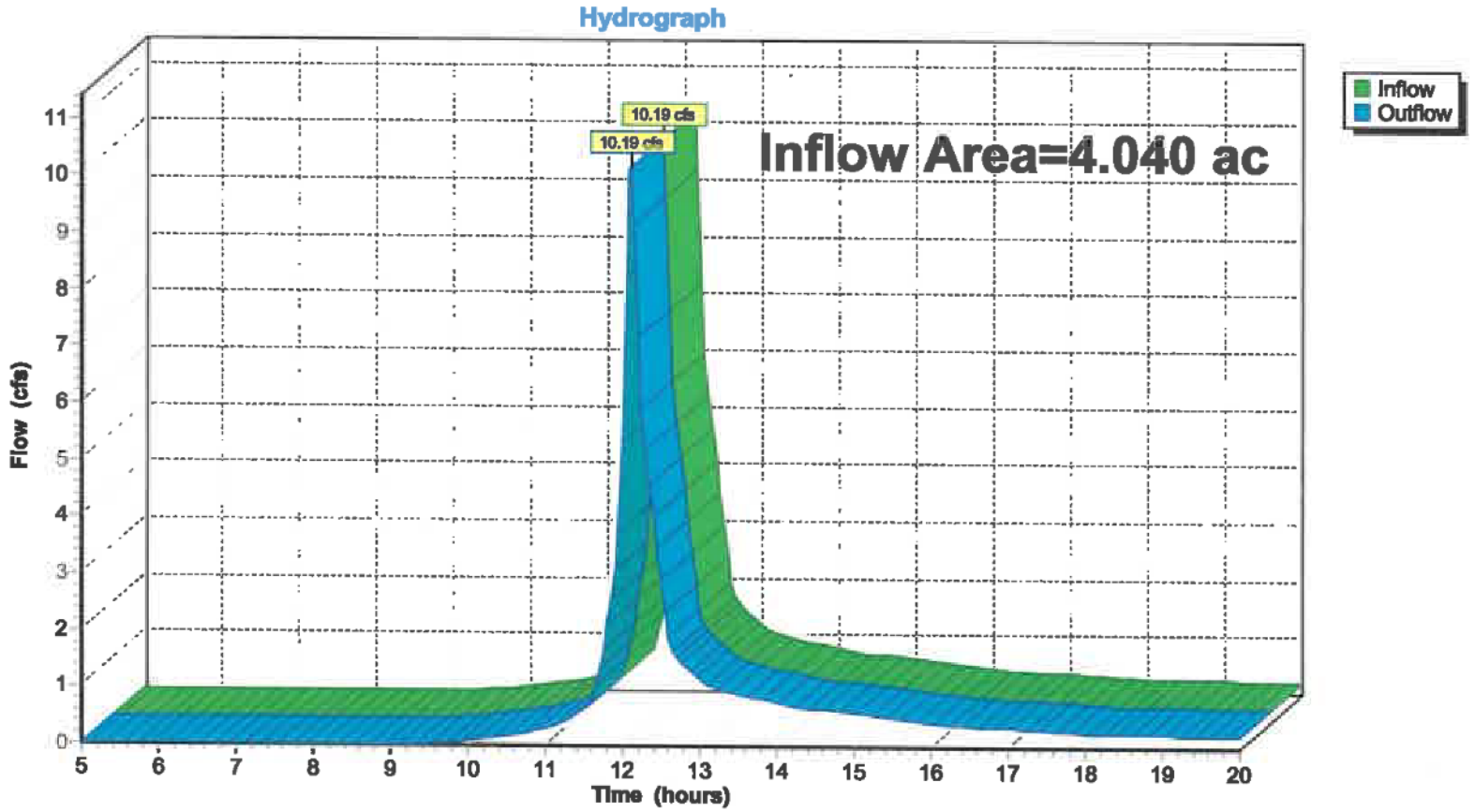


Summary for Reach IP-E1: 45 MAIN ST

Inflow Area = 4.040 ac, 4.02% Impervious, Inflow Depth > 2.11" for 10YR event
Inflow = 10.19 cfs @ 12.11 hrs, Volume= 0.710 af
Outflow = 10.19 cfs @ 12.11 hrs, Volume= 0.710 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-E1: 45 MAIN ST

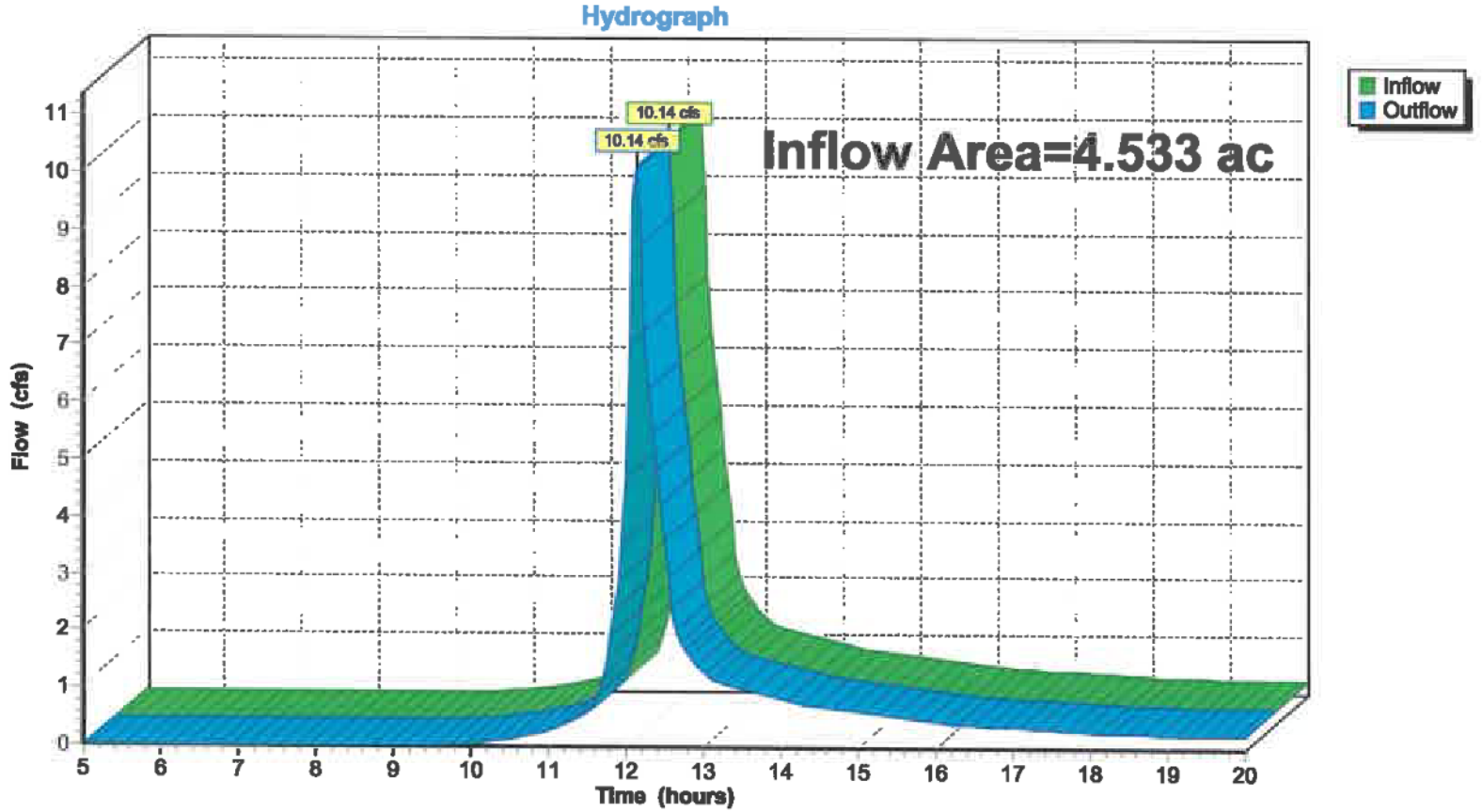


Summary for Reach IP-E2: SCHOOL ST

Inflow Area = 4.533 ac, 2.56% Impervious, Inflow Depth > 2.03" for 10YR event
Inflow = 10.14 cfs @ 12.14 hrs, Volume= 0.766 af
Outflow = 10.14 cfs @ 12.14 hrs, Volume= 0.766 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-E2: SCHOOL ST



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-1: DA E-1
Runoff Area=175,987 sf 4.02% Impervious Runoff Depth>2.93"
Flow Length=560' Tc=7.1 min CN=72 Runoff=14.16 cfs 0.985 af

Subcatchment E-2: DA E-2
Runoff Area=197,469 sf 2.56% Impervious Runoff Depth>2.83"
Flow Length=470' Tc=9.3 min CN=71 Runoff=14.21 cfs 1.069 af

Subcatchment E-3: DA E-3
Runoff Area=21,482 sf 0.00% Impervious Runoff Depth>2.74"
Tc=6.0 min CN=70 Runoff=1.67 cfs 0.113 af

Reach IP-3E: EX. CULVERT
Inflow=1.67 cfs 0.113 af
Outflow=1.67 cfs 0.113 af

Reach IP-E1: 45 MAIN ST
Inflow=14.16 cfs 0.985 af
Outflow=14.16 cfs 0.985 af

Reach IP-E2: SCHOOL ST
Inflow=14.21 cfs 1.069 af
Outflow=14.21 cfs 1.069 af

Total Runoff Area = 9.067 ac Runoff Volume = 2.167 af Average Runoff Depth = 2.87"
96.93% Pervious = 8.788 ac 3.07% Impervious = 0.278 ac

Summary for Subcatchment E-1: DA E-1

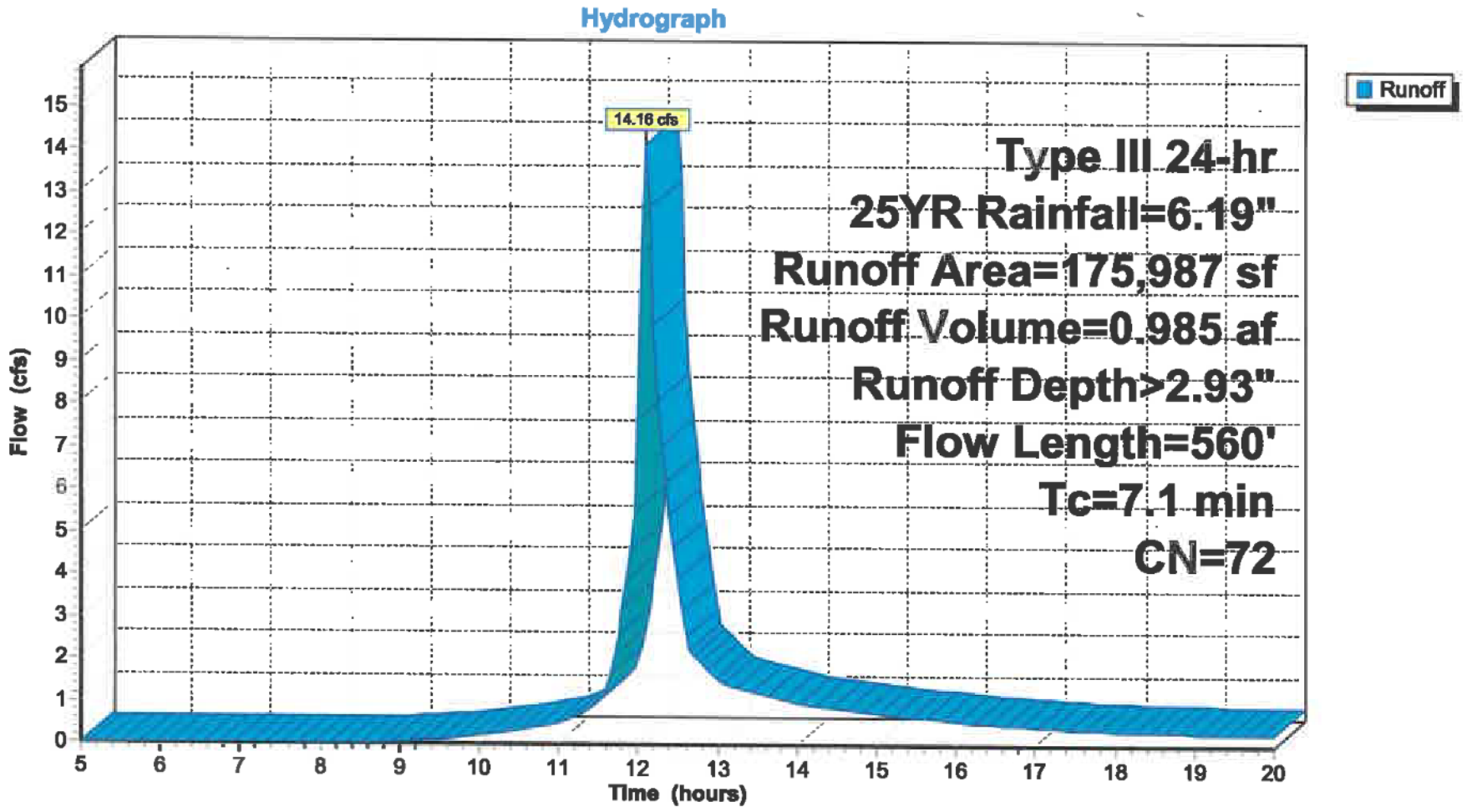
Runoff = 14.16 cfs @ 12.11 hrs, Volume= 0.985 af, Depth> 2.93"
Routed to Reach IP-E1 : 45 MAIN ST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=6.19"

Area (sf)	CN	Description
7,074	98	Paved parking, HSG C
35,876	74	>75% Grass cover, Good, HSG C
133,037	70	Woods, Good, HSG C
175,987	72	Weighted Average
168,913		95.98% Pervious Area
7,074		4.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	40	0.0550	3.78		**Shallow Concentrated Flow, TRAVEL PATH A TO B** Unpaved Kv= 16.1 fps
0.5	110	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
6.4	410	0.0450	1.06		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
7.1	560	Total			

Subcatchment E-1: DA E-1



Summary for Subcatchment E-2: DA E-2

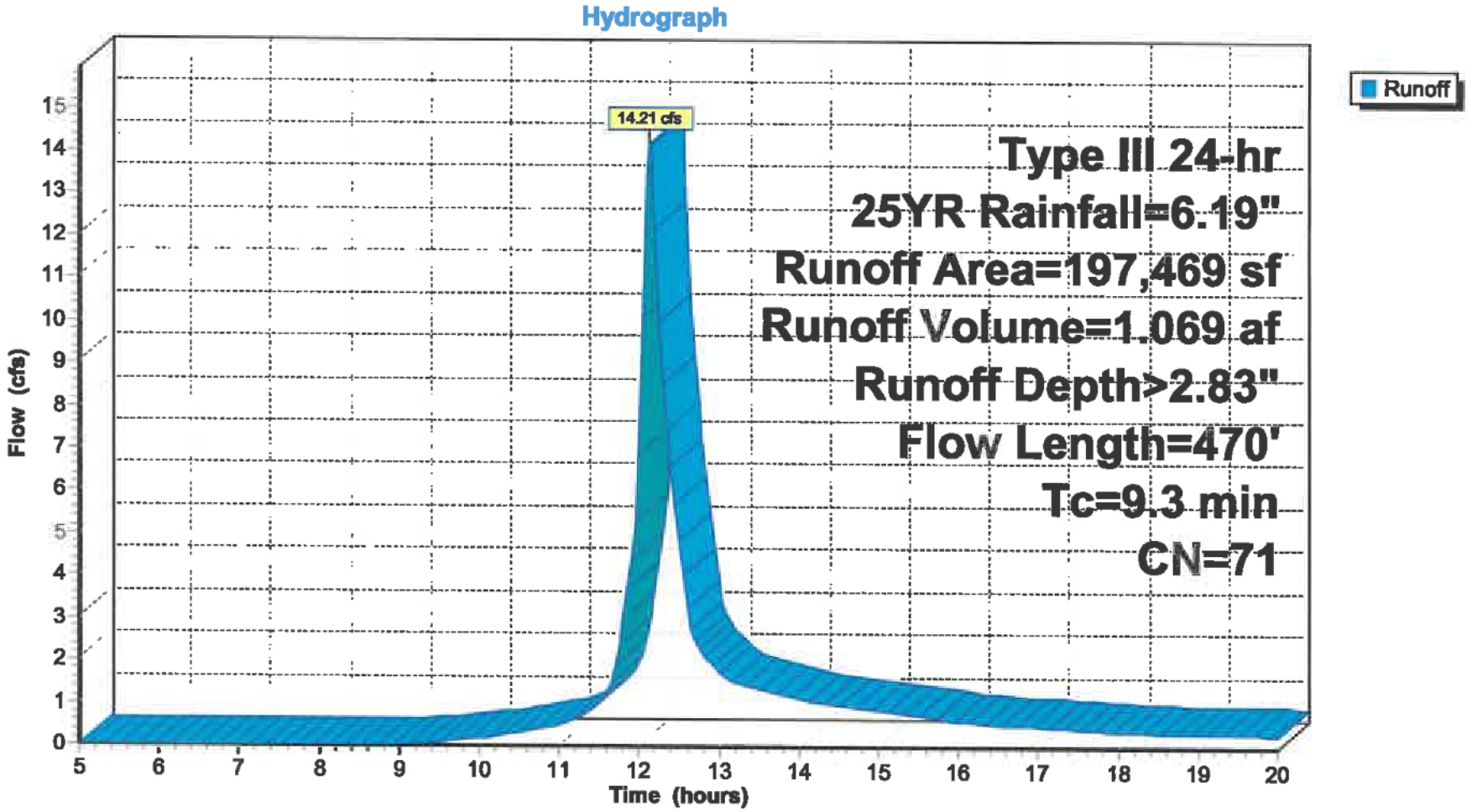
Runoff = 14.21 cfs @ 12.14 hrs, Volume= 1.069 af, Depth> 2.83"
Routed to Reach IP-E2 : SCHOOL ST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=6.19"

Area (sf)	CN	Description
5,057	98	Paved parking, HSG C
30,786	74	>75% Grass cover, Good, HSG C
161,626	70	Woods, Good, HSG C
197,469	71	Weighted Average
192,412		97.44% Pervious Area
5,057		2.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	40	0.0450	0.20		**Sheet Flow, TRAVEL PATH A TO B** Grass: Short n= 0.150 P2= 3.20"
0.4	80	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
2.9	225	0.0650	1.27		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
2.6	125	0.0250	0.79		**Shallow Concentrated Flow, TARVEL PATH D TO E** Woodland Kv= 5.0 fps
9.3	470	Total			

Subcatchment E-2: DA E-2



Summary for Subcatchment E-3: DA E-3

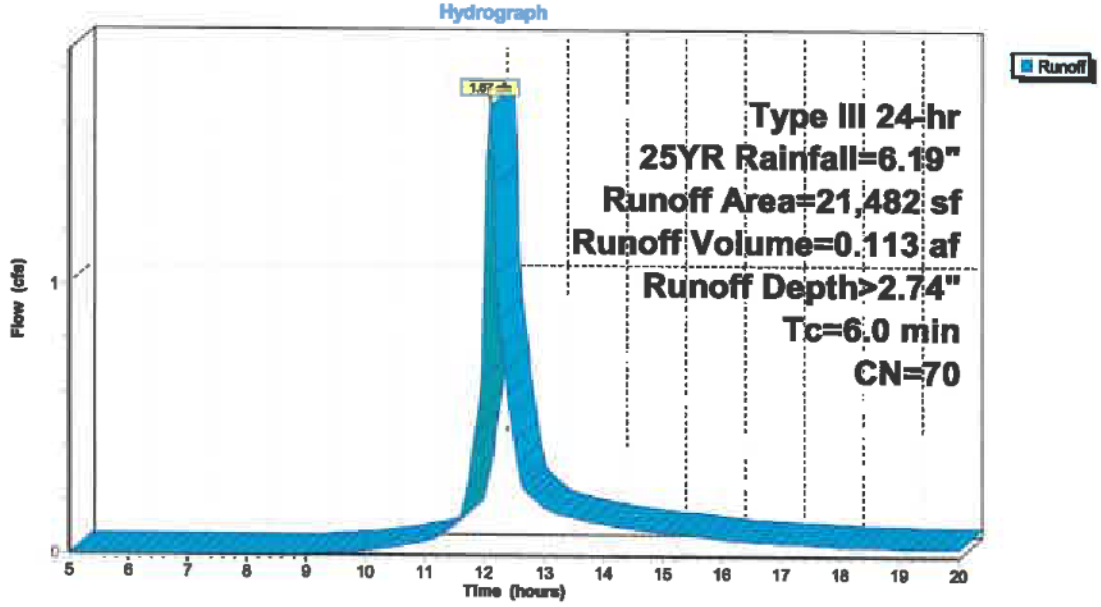
Runoff = 1.67 cfs @ 12.09 hrs, Volume= 0.113 af, Depth> 2.74"
Routed to Reach IP-3E : EX. CULVERT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=6.19"

Area (sf)	CN	Description
21,482	70	Woods, Good, HSG C
21,482		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TRAVEL TIME

Subcatchment E-3: DA E-3

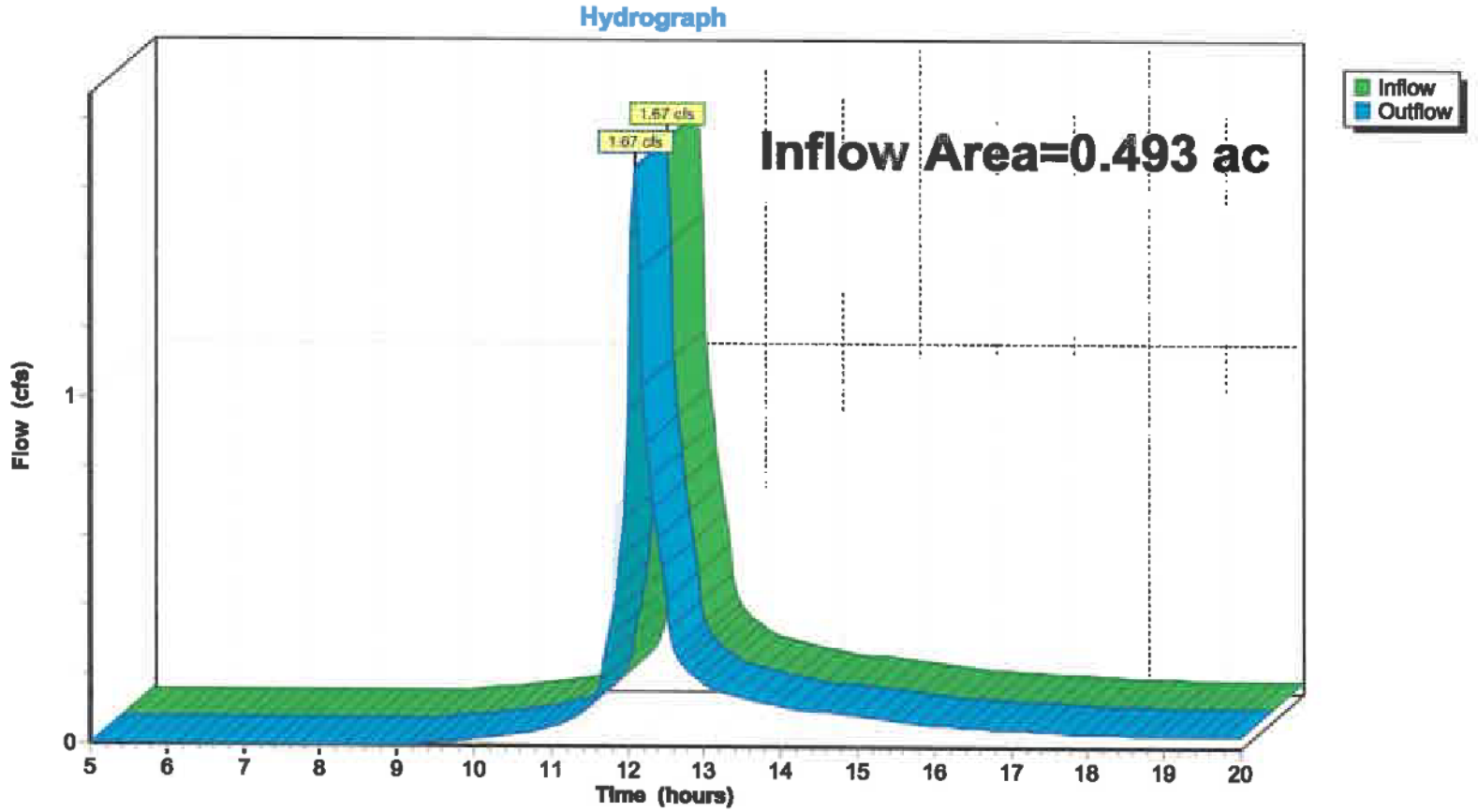


Summary for Reach IP-3E: EX. CULVERT

Inflow Area = 0.493 ac, 0.00% Impervious, Inflow Depth > 2.74" for 25YR event
Inflow = 1.67 cfs @ 12.09 hrs, Volume= 0.113 af
Outflow = 1.67 cfs @ 12.09 hrs, Volume= 0.113 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-3E: EX. CULVERT

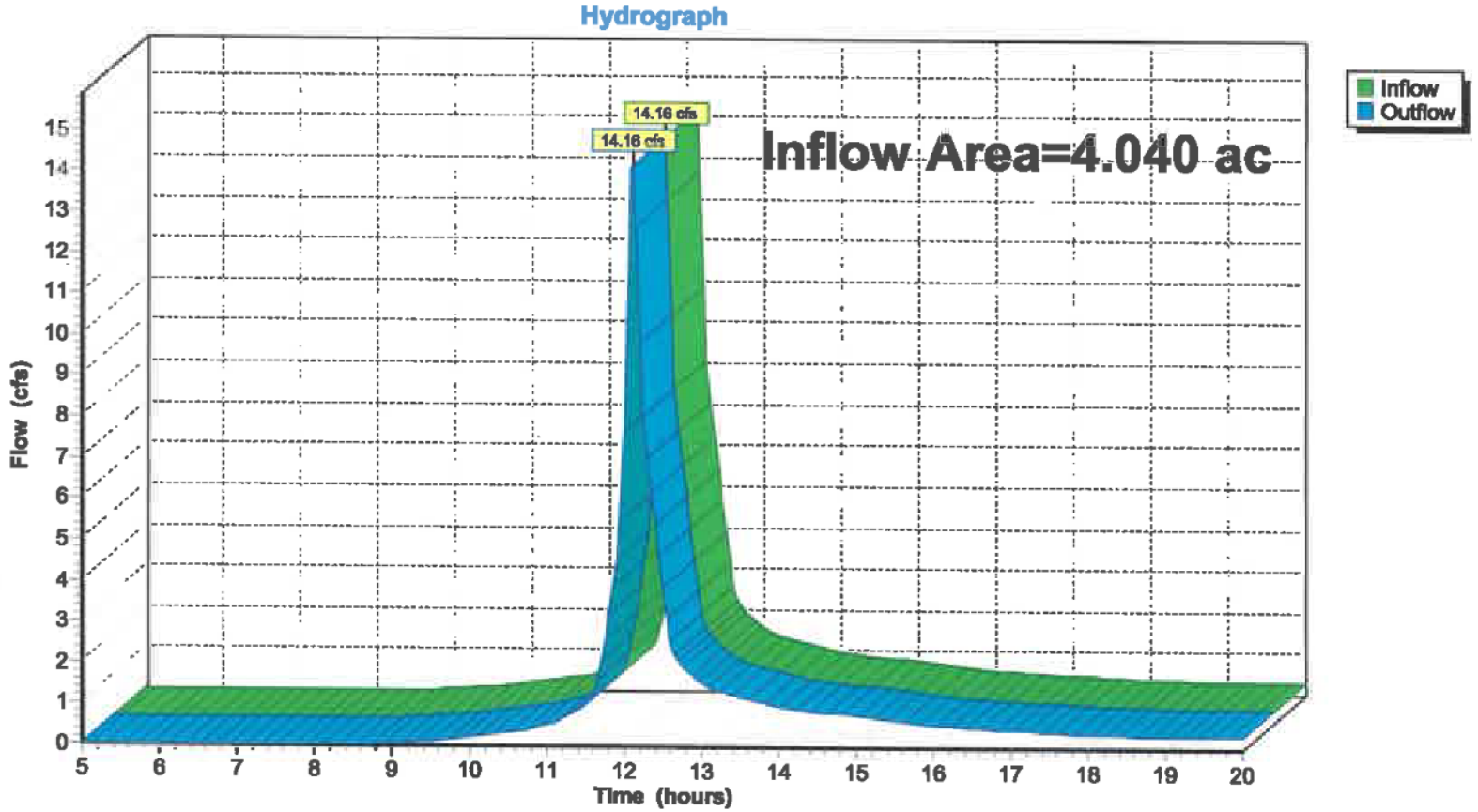


Summary for Reach IP-E1: 45 MAIN ST

Inflow Area = 4.040 ac, 4.02% Impervious, Inflow Depth > 2.93" for 25YR event
Inflow = 14.16 cfs @ 12.11 hrs, Volume= 0.985 af
Outflow = 14.16 cfs @ 12.11 hrs, Volume= 0.985 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-E1: 45 MAIN ST

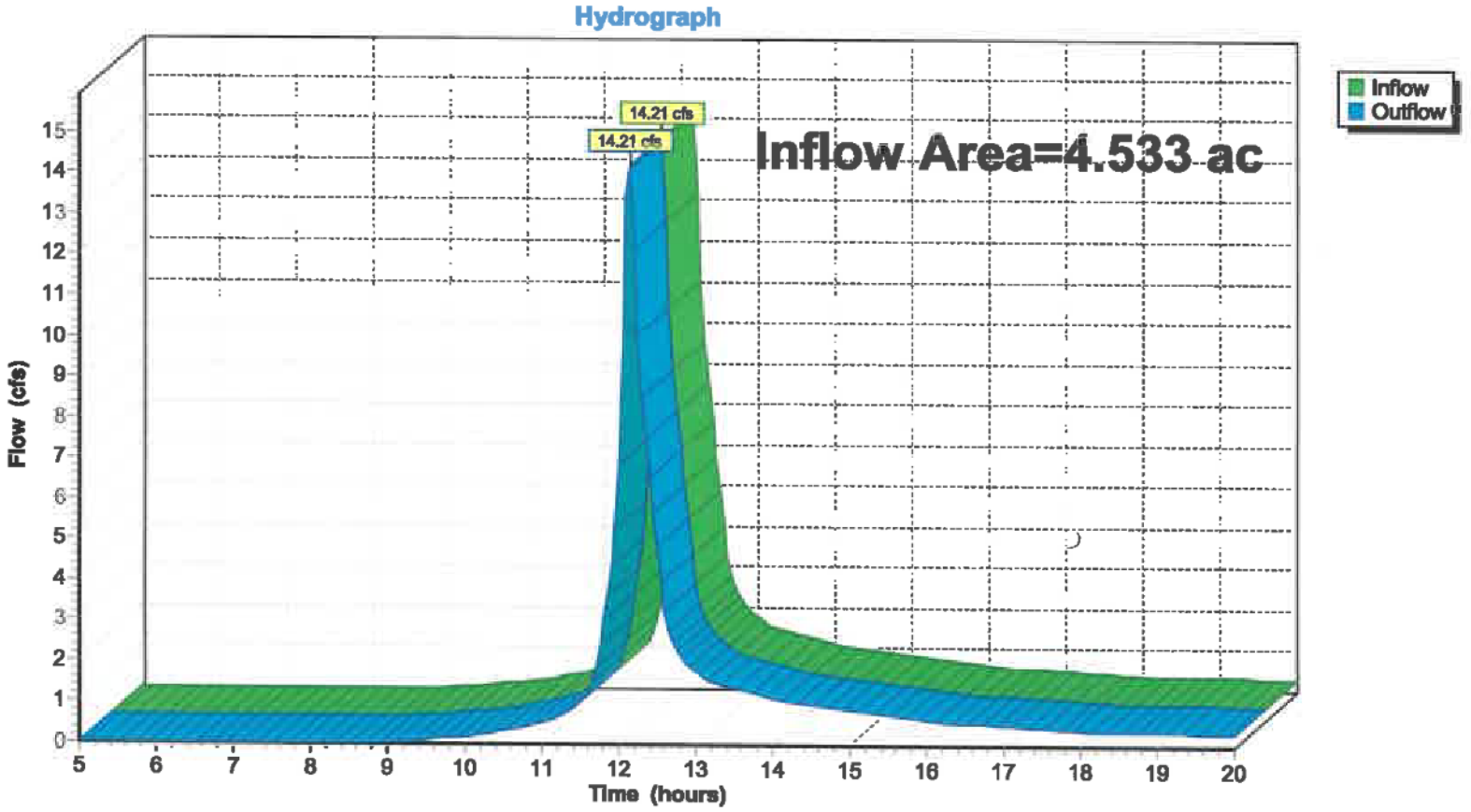


Summary for Reach IP-E2: SCHOOL ST

Inflow Area = 4.533 ac, 2.56% Impervious, Inflow Depth > 2.83" for 25YR event
Inflow = 14.21 cfs @ 12.14 hrs, Volume= 1.069 af
Outflow = 14.21 cfs @ 12.14 hrs, Volume= 1.069 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-E2: SCHOOL ST



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-1: DA E-1
Runoff Area=175,987 sf 4.02% Impervious Runoff Depth>4.26"
Flow Length=560' Tc=7.1 min CN=72 Runoff=20.54 cfs 1.435 af

Subcatchment E-2: DA E-2
Runoff Area=197,469 sf 2.56% Impervious Runoff Depth>4.15"
Flow Length=470' Tc=9.3 min CN=71 Runoff=20.77 cfs 1.567 af

Subcatchment E-3: DA E-3
Runoff Area=21,482 sf 0.00% Impervious Runoff Depth>4.04"
Tc=6.0 min CN=70 Runoff=2.46 cfs 0.166 af

Reach IP-3E: EX. CULVERT
Inflow=2.46 cfs 0.166 af
Outflow=2.46 cfs 0.166 af

Reach IP-E1: 45 MAIN ST
Inflow=20.54 cfs 1.435 af
Outflow=20.54 cfs 1.435 af

Reach IP-E2: SCHOOL ST
Inflow=20.77 cfs 1.567 af
Outflow=20.77 cfs 1.567 af

Total Runoff Area = 9.067 ac Runoff Volume = 3.168 af Average Runoff Depth = 4.19"
96.93% Pervious = 8.788 ac 3.07% Impervious = 0.278 ac

Summary for Subcatchment E-1: DA E-1

Runoff = 20.54 cfs @ 12.10 hrs, Volume= 1.435 af, Depth> 4.26"
Routed to Reach IP-E1 : 45 MAIN ST

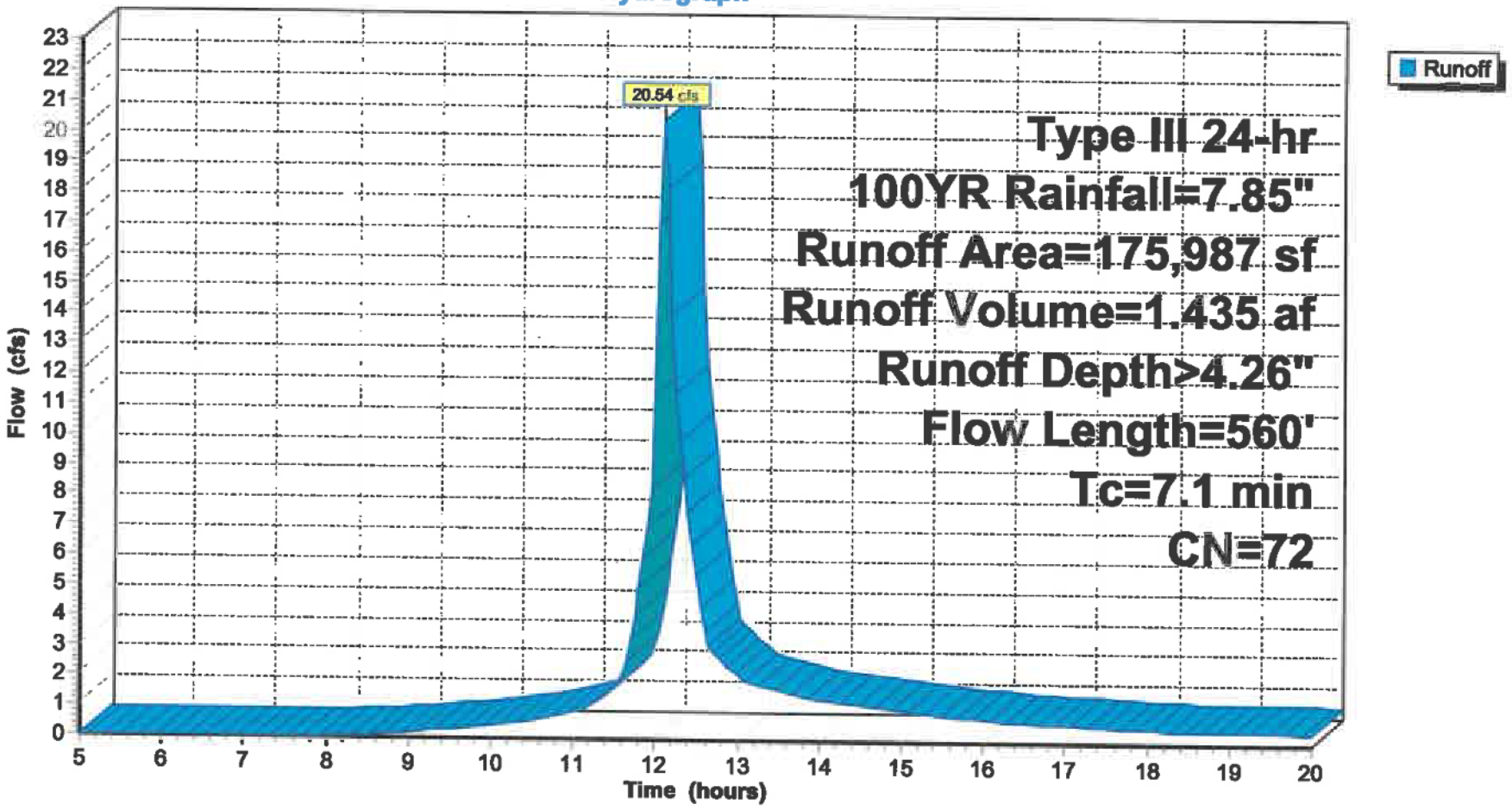
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100YR Rainfall=7.85"

Area (sf)	CN	Description
7,074	98	Paved parking, HSG C
35,876	74	>75% Grass cover, Good, HSG C
133,037	70	Woods, Good, HSG C
175,987	72	Weighted Average
168,913		95.98% Pervious Area
7,074		4.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	40	0.0550	3.78		**Shallow Concentrated Flow, TRAVEL PATH A TO B** Unpaved Kv= 16.1 fps
0.5	110	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
6.4	410	0.0450	1.06		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
7.1	560	Total			

Subcatchment E-1: DA E-1

Hydrograph



Summary for Subcatchment E-2: DA E-2

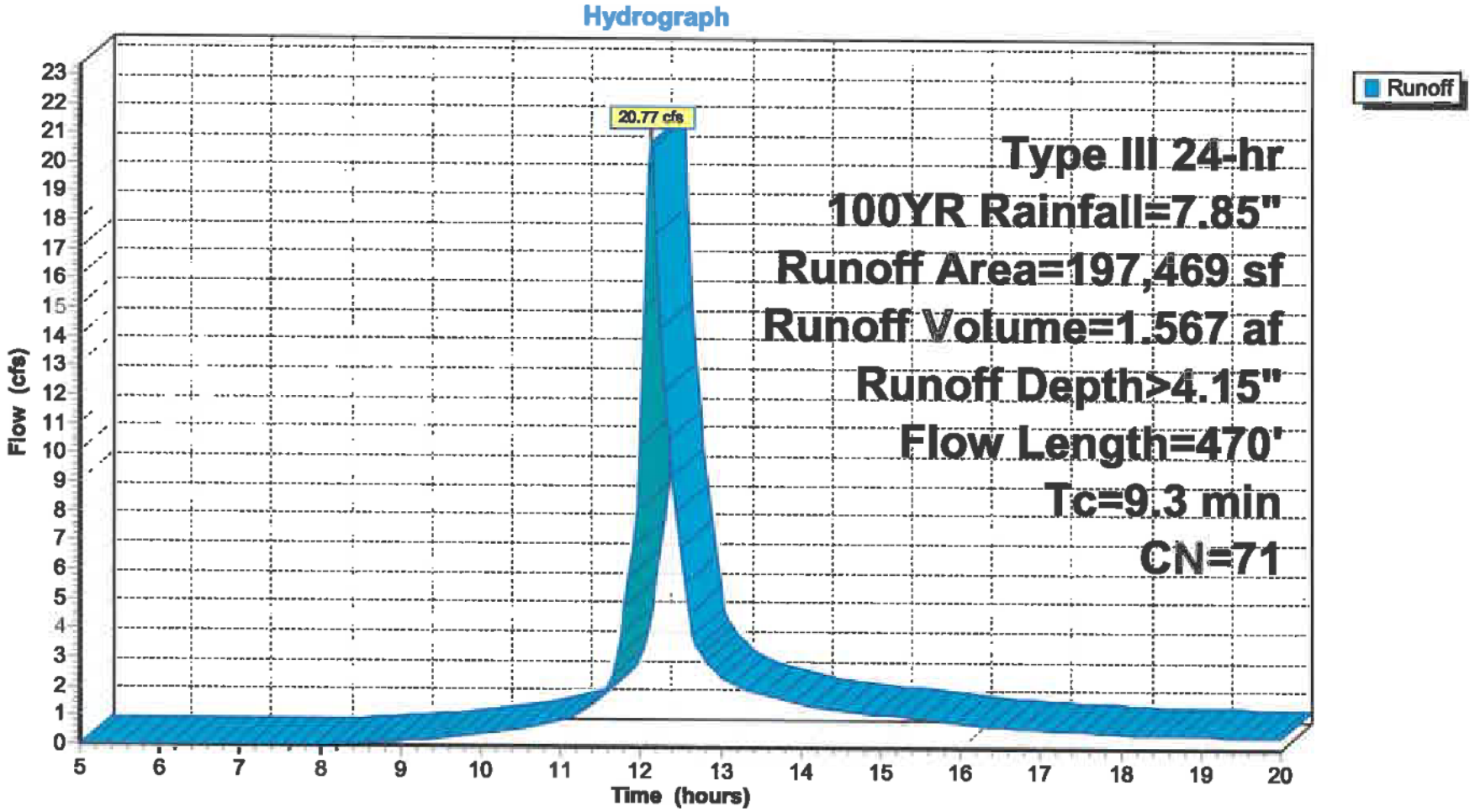
Runoff = 20.77 cfs @ 12.13 hrs, Volume= 1.567 af, Depth> 4.15"
Routed to Reach IP-E2 : SCHOOL ST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100YR Rainfall=7.85"

Area (sf)	CN	Description
5,057	98	Paved parking, HSG C
30,786	74	>75% Grass cover, Good, HSG C
161,626	70	Woods, Good, HSG C
197,469	71	Weighted Average
192,412		97.44% Pervious Area
5,057		2.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	40	0.0450	0.20		**Sheet Flow, TRAVEL PATH A TO B** Grass: Short n= 0.150 P2= 3.20"
0.4	80	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
2.9	225	0.0650	1.27		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
2.6	125	0.0250	0.79		**Shallow Concentrated Flow, TARVEL PATH D TO E** Woodland Kv= 5.0 fps
9.3	470	Total			

Subcatchment E-2: DA E-2



Summary for Subcatchment E-3: DA E-3

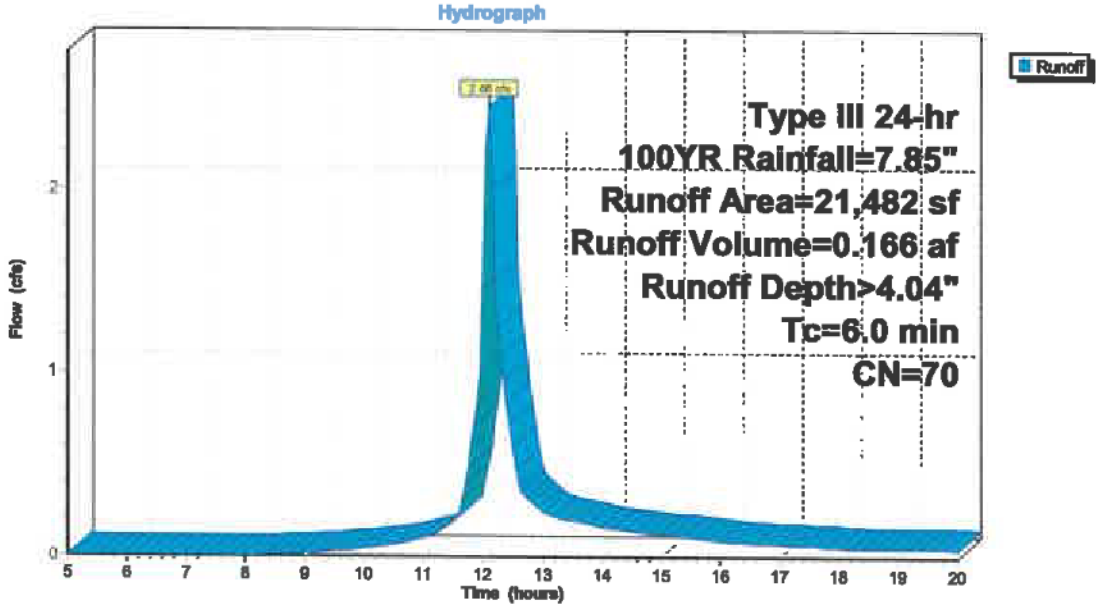
Runoff = 2.46 cfs @ 12.09 hrs, Volume= 0.166 af, Depth> 4.04"
Routed to Reach IP-3E : EX. CULVERT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100YR Rainfall=7.85"

Area (sf)	CN	Description
21,482	70	Woods, Good, HSG C
21,482		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TRAVEL TIME

Subcatchment E-3: DA E-3

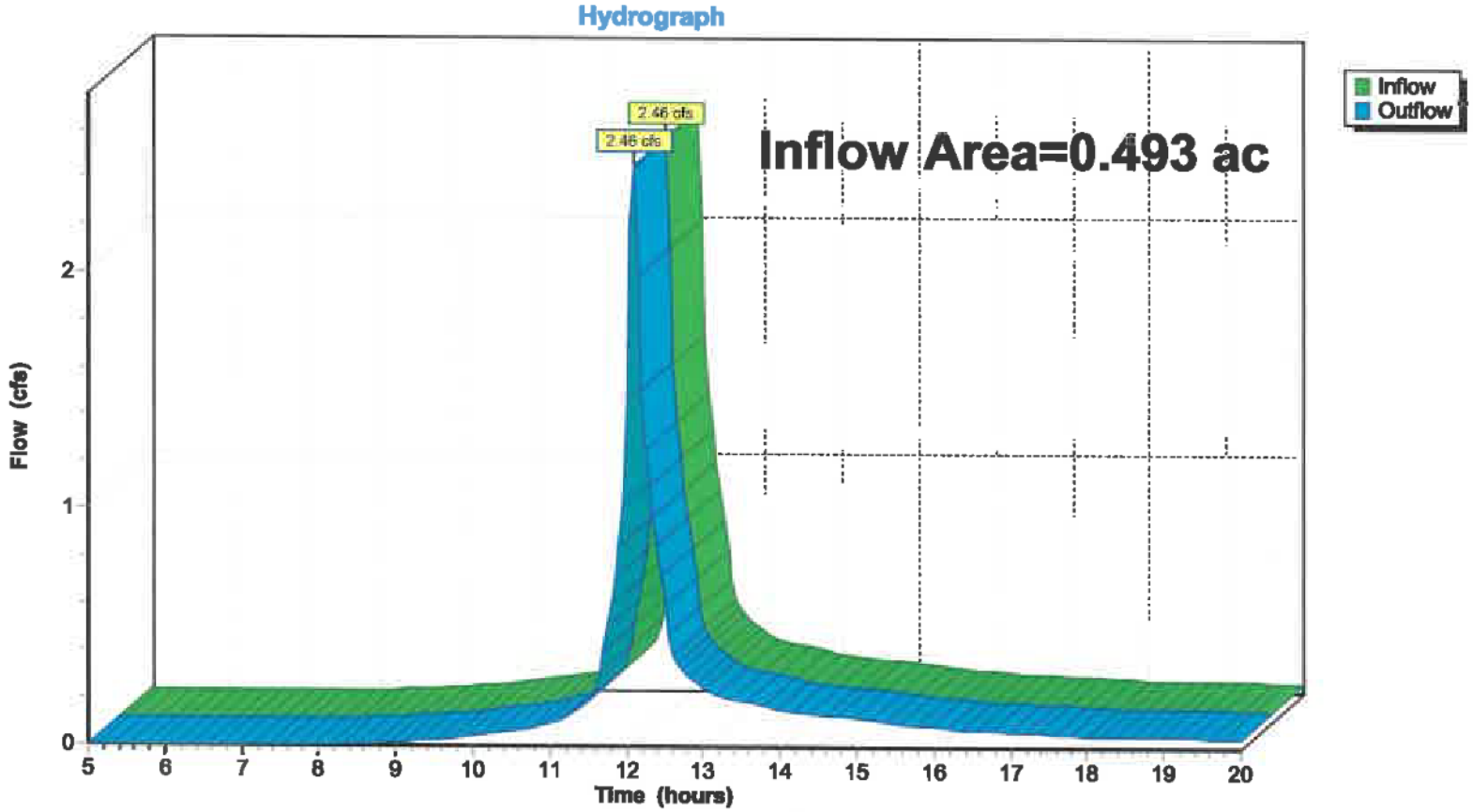


Summary for Reach IP-3E: EX. CULVERT

Inflow Area = 0.493 ac, 0.00% Impervious, Inflow Depth > 4.04" for 100YR event
Inflow = 2.46 cfs @ 12.09 hrs, Volume= 0.166 af
Outflow = 2.46 cfs @ 12.09 hrs, Volume= 0.166 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-3E: EX. CULVERT

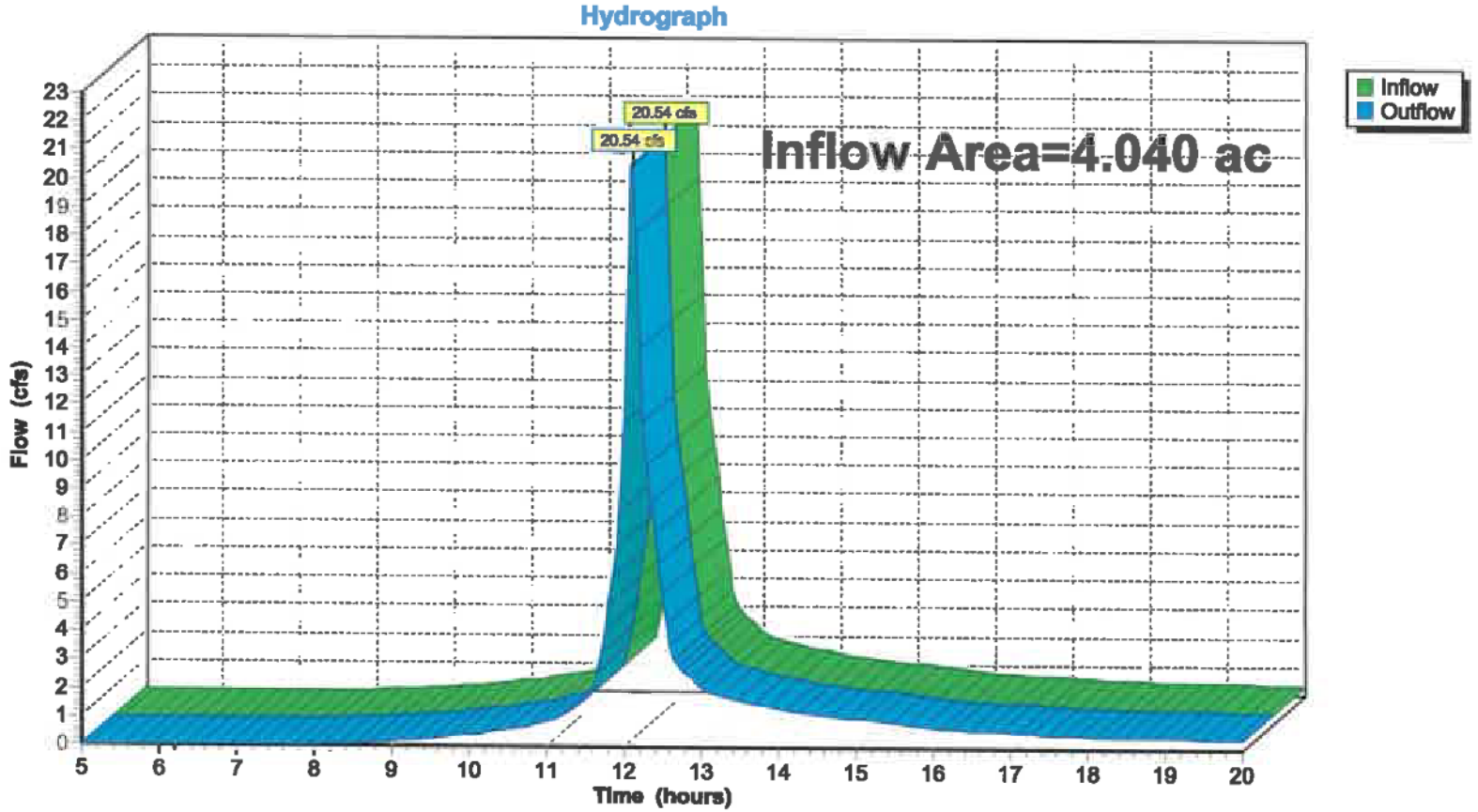


Summary for Reach IP-E1: 45 MAIN ST

Inflow Area = 4.040 ac, 4.02% Impervious, Inflow Depth > 4.26" for 100YR event
Inflow = 20.54 cfs @ 12.10 hrs, Volume= 1.435 af
Outflow = 20.54 cfs @ 12.10 hrs, Volume= 1.435 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-E1: 45 MAIN ST

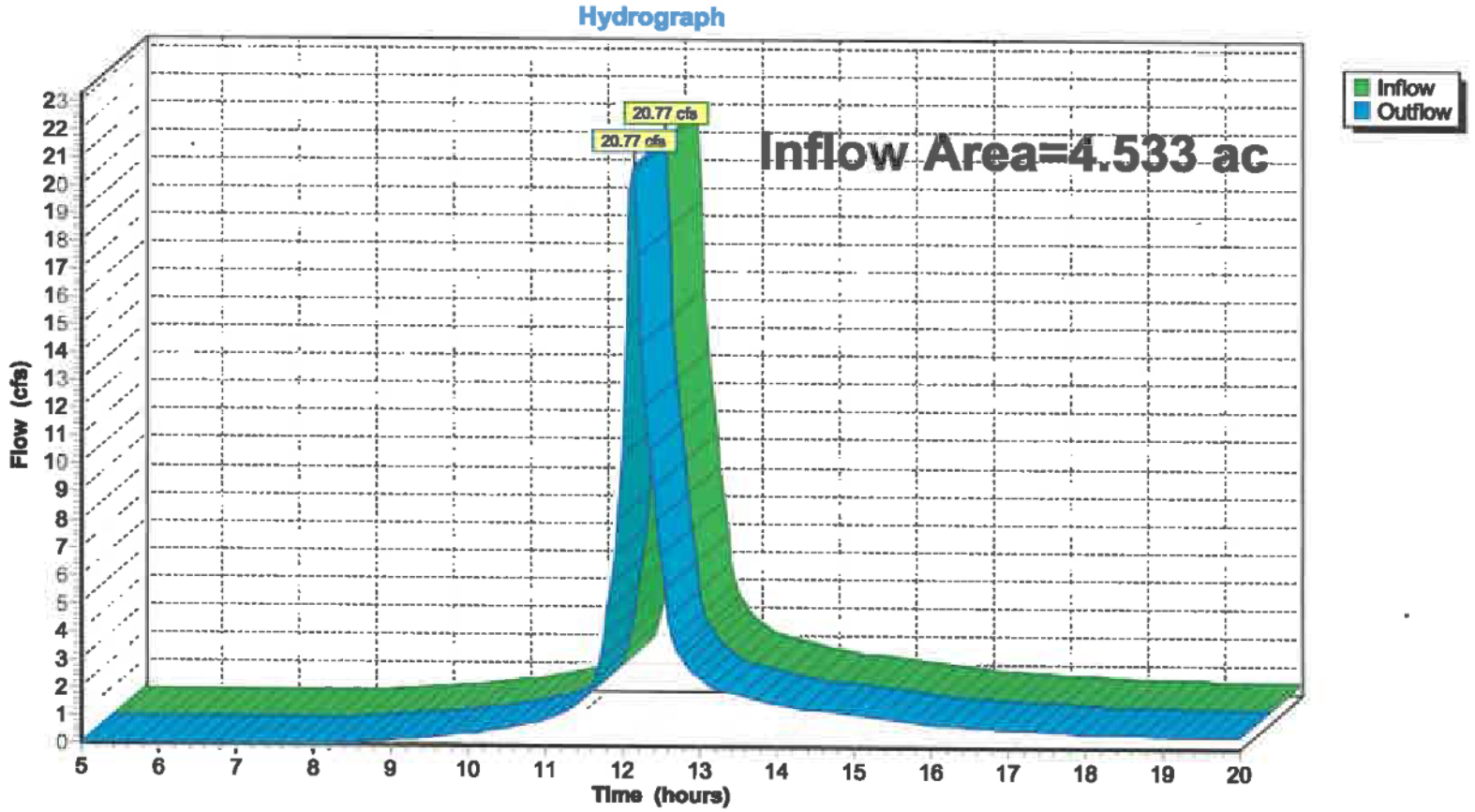


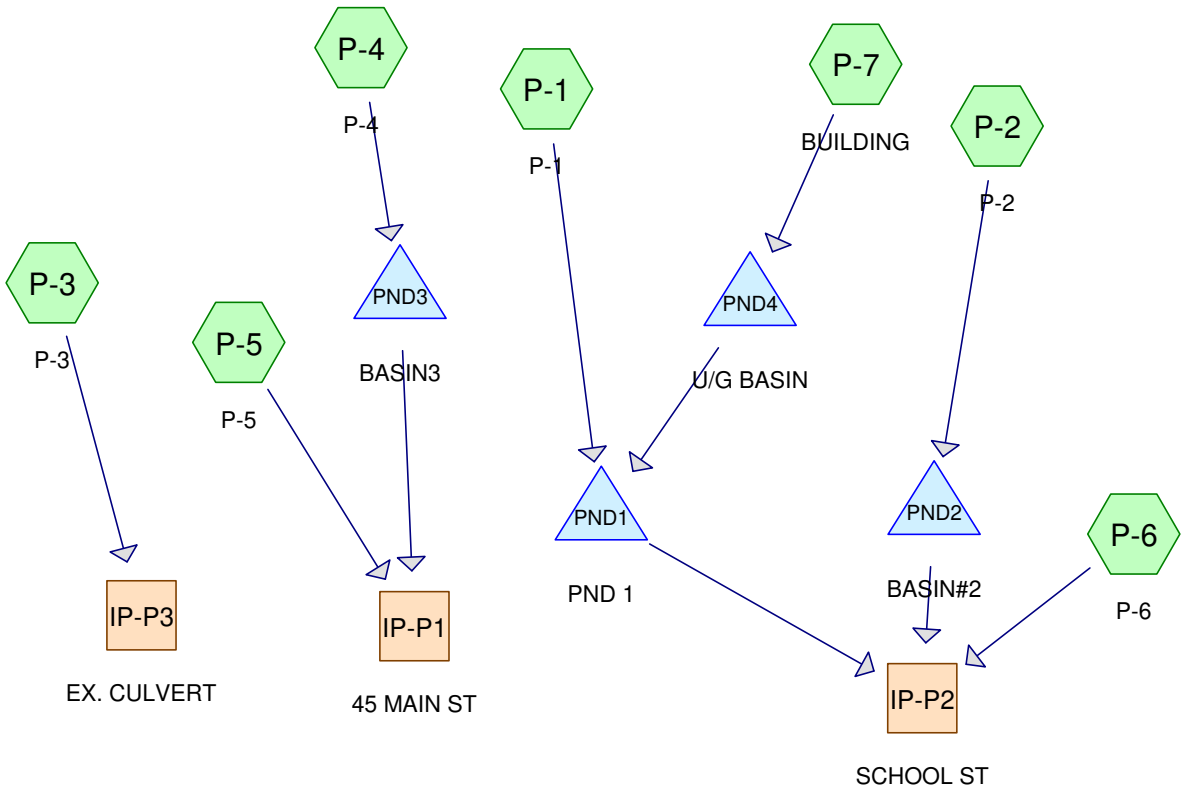
Summary for Reach IP-E2: SCHOOL ST

Inflow Area = 4.533 ac, 2.56% Impervious, Inflow Depth > 4.15" for 100YR event
Inflow = 20.77 cfs @ 12.13 hrs, Volume= 1.567 af
Outflow = 20.77 cfs @ 12.13 hrs, Volume= 1.567 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-E2: SCHOOL ST





Subcat Reach Pond Link

Routing Diagram for POST DEVELOPMENT2-19-24
Prepared by D&L Design Group Inc, Printed 2/19/2024

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2YR	Type III 24-hr		Default	24.00	1	3.39	2
2	10YR	Type III 24-hr		Default	24.00	1	5.11	2
3	25YR	Type III 24-hr		Default	24.00	1	6.19	2
4	100YR	Type III 24-hr		Default	24.00	1	7.85	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.297	74	>75% Grass cover, Good, HSG C (P-1, P-2, P-3, P-4, P-6)
1.581	98	Paved parking, HSG C (P-1, P-2, P-3, P-4)
0.514	98	Roofs, HSG C (P-7)
6.584	70	Woods, Good, HSG C (P-1, P-2, P-4, P-5, P-6)
10.978	**76**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
10.978	HSG C	P-1, P-2, P-3, P-4, P-5, P-6, P-7
0.000	HSG D	
0.000	Other	
10.978		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	2.297	0.000	0.000	2.297	>75% Grass cover, Good	P-1, P-2, P-3, P-4, P-6
0.000	0.000	1.581	0.000	0.000	1.581	Paved parking	P-1, P-2, P-3, P-4
0.000	0.000	0.514	0.000	0.000	0.514	Roofs	P-7
0.000	0.000	6.584	0.000	0.000	6.584	Woods, Good	P-1, P-2, P-4, P-5, P-6
0.000	**0.000**	**10.978**	**0.000**	**0.000**	**10.978**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	P-1	0.00	0.00	288.0	0.0250	0.010	0.0	18.0	0.0	
2	P-4	0.00	0.00	250.0	0.0250	0.010	0.0	15.0	0.0	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1: P-1 Runoff Area=81,268 sf 39.90% Impervious Runoff Depth>1.57"
Flow Length=618' Tc=7.1 min CN=82 Runoff=3.51 cfs 0.244 af

Subcatchment P-2: P-2 Runoff Area=82,391 sf 33.69% Impervious Runoff Depth>1.50"
Flow Length=330' Tc=7.1 min CN=81 Runoff=3.40 cfs 0.237 af

Subcatchment P-3: P-3 Runoff Area=8,272 sf 54.38% Impervious Runoff Depth>1.95"
Tc=6.0 min CN=87 Runoff=0.45 cfs 0.031 af

Subcatchment P-4: P-4 Runoff Area=56,906 sf 7.39% Impervious Runoff Depth>1.06"
Flow Length=505' Tc=5.9 min CN=74 Runoff=1.69 cfs 0.116 af

Subcatchment P-5: P-5 Runoff Area=145,259 sf 0.00% Impervious Runoff Depth>0.85"
Tc=10.0 min CN=70 Runoff=2.89 cfs 0.236 af

Subcatchment P-6: P-6 Runoff Area=81,691 sf 0.00% Impervious Runoff Depth>0.90"
Flow Length=429' Slope=0.0450 '/' Tc=8.1 min CN=71 Runoff=1.83 cfs 0.141 af

Subcatchment P-7: BUILDING Runoff Area=22,400 sf 100.00% Impervious Runoff Depth>2.95"
Tc=6.0 min CN=98 Runoff=1.65 cfs 0.126 af

Reach IP-P1: 45 MAIN ST Inflow=2.89 cfs 0.288 af
Outflow=2.89 cfs 0.288 af

Reach IP-P2: SCHOOL ST Inflow=1.83 cfs 0.322 af
Outflow=1.83 cfs 0.322 af

Reach IP-P3: EX. CULVERT Inflow=0.45 cfs 0.031 af
Outflow=0.45 cfs 0.031 af

Pond PND1: PND 1 Peak Elev=325.16' Storage=6,110 cf Inflow=3.51 cfs 0.244 af
Discarded=0.02 cfs 0.013 af Primary=0.29 cfs 0.122 af Outflow=0.31 cfs 0.135 af

Pond PND2: BASIN#2 Peak Elev=325.95' Storage=7,304 cf Inflow=3.40 cfs 0.237 af
Discarded=0.03 cfs 0.020 af Primary=0.10 cfs 0.059 af Outflow=0.12 cfs 0.079 af

Pond PND3: BASIN3 Peak Elev=332.41' Storage=2,727 cf Inflow=1.69 cfs 0.116 af
Discarded=0.01 cfs 0.006 af Primary=0.18 cfs 0.051 af Outflow=0.18 cfs 0.057 af

Pond PND4: U/G BASIN Peak Elev=326.31' Storage=4,374 cf Inflow=1.65 cfs 0.126 af
Discarded=0.02 cfs 0.026 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.026 af

Total Runoff Area = 10.978 ac Runoff Volume = 1.131 af Average Runoff Depth = 1.24"
80.91% Pervious = 8.882 ac 19.09% Impervious = 2.096 ac

Summary for Subcatchment P-1: P-1

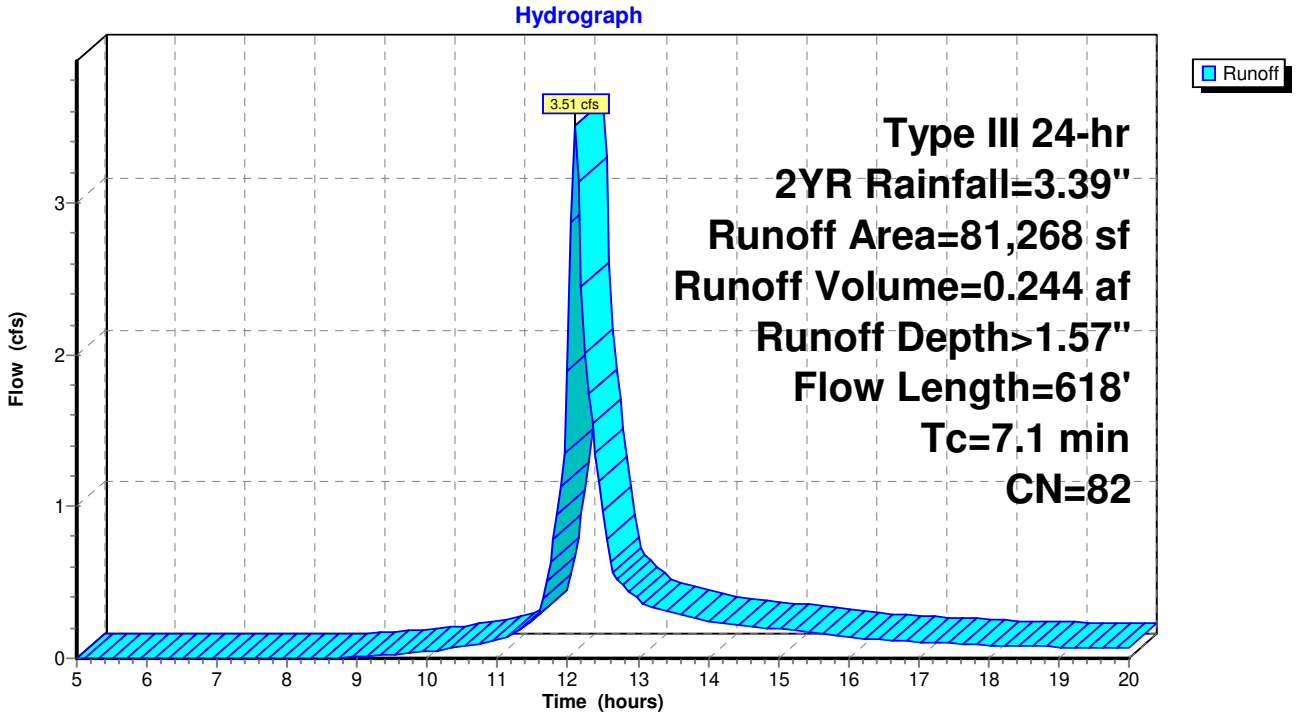
Runoff = 3.51 cfs @ 12.11 hrs, Volume= 0.244 af, Depth> 1.57"
Routed to Pond PND1 : PND 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2YR Rainfall=3.39"

Area (sf)	CN	Description
32,428	98	Paved parking, HSG C
26,882	74	>75% Grass cover, Good, HSG C
21,958	70	Woods, Good, HSG C
81,268	82	Weighted Average
48,840		60.10% Pervious Area
32,428		39.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0450	0.20		**Sheet Flow, TRAVEL PATH A TO B** Grass: Short n= 0.150 P2= 3.20"
0.4	80	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
1.6	100	0.0450	1.06		**Shallow Concentrated Flow, TARVEL PATH C TO D** Woodland Kv= 5.0 fps
0.6	100	0.0200	2.87		**Shallow Concentrated Flow, TARVEL PATH D TO E** Paved Kv= 20.3 fps
0.4	288	0.0250	12.22	21.59	**Pipe Channel, TARVEL PATH E TO F** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010
7.1	618	Total			

Subcatchment P-1: P-1



Summary for Subcatchment P-2: P-2

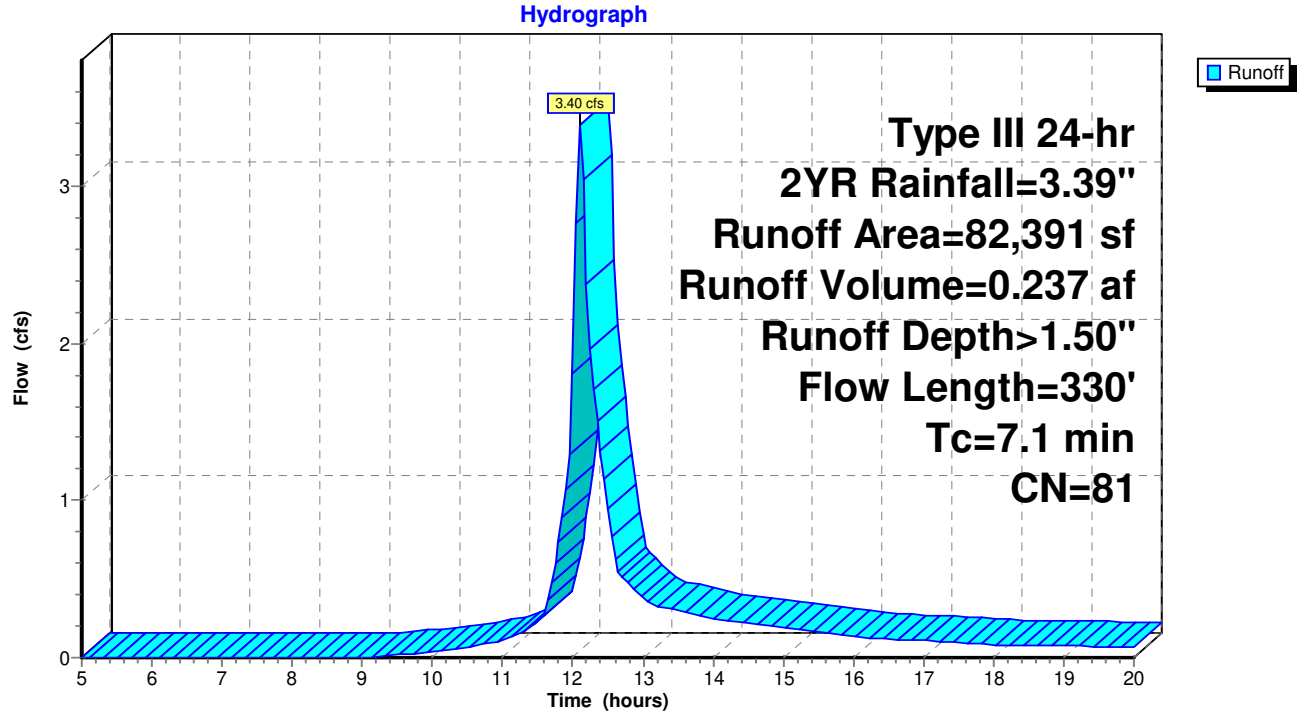
Runoff = 3.40 cfs @ 12.11 hrs, Volume= 0.237 af, Depth> 1.50"
Routed to Pond PND2 : BASIN#2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2YR Rainfall=3.39"

Area (sf)	CN	Description
27,755	98	Paved parking, HSG C
34,256	74	>75% Grass cover, Good, HSG C
20,380	70	Woods, Good, HSG C
82,391	81	Weighted Average
54,636		66.31% Pervious Area
27,755		33.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0450	0.19		**Sheet Flow, TRAVEL PATH A TO B** Cultivated: Residue>20% n= 0.170 P2= 3.20"
0.7	135	0.0450	3.42		**Shallow Concentrated Flow, TARVEL PATH B TO C** Unpaved Kv= 16.1 fps
1.9	145	0.0650	1.27		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
7.1	330	Total			

Subcatchment P-2: P-2



Summary for Subcatchment P-3: P-3

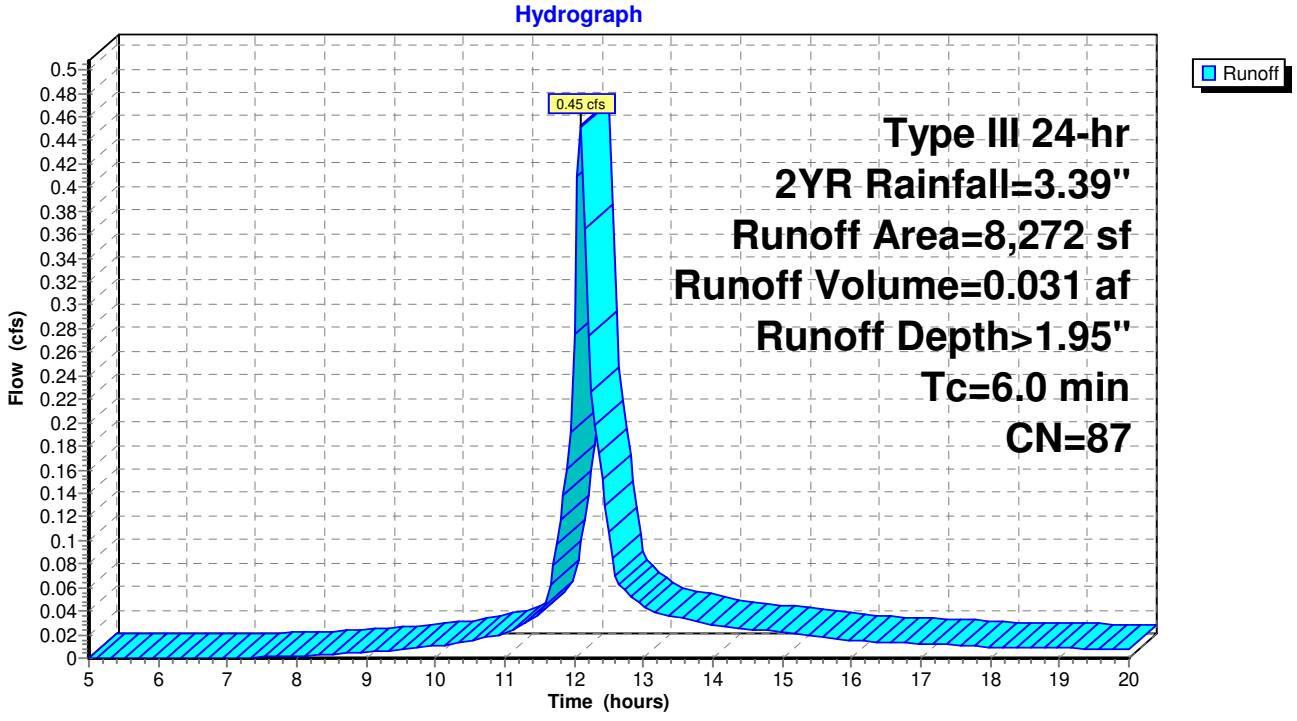
Runoff = 0.45 cfs @ 12.09 hrs, Volume= 0.031 af, Depth> 1.95"
Routed to Reach IP-P3 : EX. CULVERT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2YR Rainfall=3.39"

Area (sf)	CN	Description
4,498	98	Paved parking, HSG C
3,774	74	>75% Grass cover, Good, HSG C
8,272	87	Weighted Average
3,774		45.62% Pervious Area
4,498		54.38% Impervious Area

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

Subcatchment P-3: P-3



Summary for Subcatchment P-4: P-4

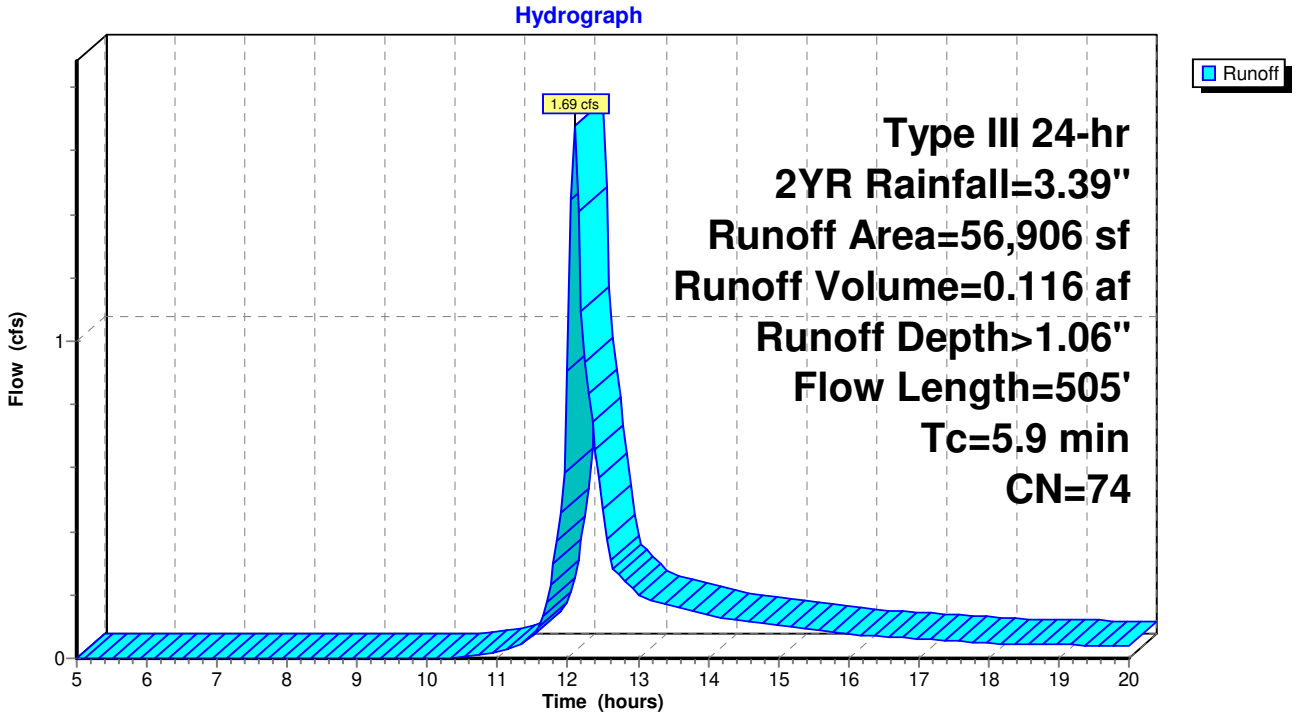
Runoff = 1.69 cfs @ 12.10 hrs, Volume= 0.116 af, Depth> 1.06"
Routed to Pond PND3 : BASIN3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2YR Rainfall=3.39"

Area (sf)	CN	Description
4,207	98	Paved parking, HSG C
22,144	74	>75% Grass cover, Good, HSG C
30,555	70	Woods, Good, HSG C
56,906	74	Weighted Average
52,699		92.61% Pervious Area
4,207		7.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0350	0.19		**Sheet Flow, TRAVEL PATHA TO B** Grass: Short n= 0.150 P2= 3.20"
0.4	80	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
0.5	100	0.4500	3.35		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
0.1	25	0.0250	3.21		**Shallow Concentrated Flow, TARVEL PATH D TO E** Paved Kv= 20.3 fps
0.4	250	0.0250	10.82	13.28	**Pipe Channel, TRAVEL PATH F TO E** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
5.9	505	Total			

Subcatchment P-4: P-4



Summary for Subcatchment P-5: P-5

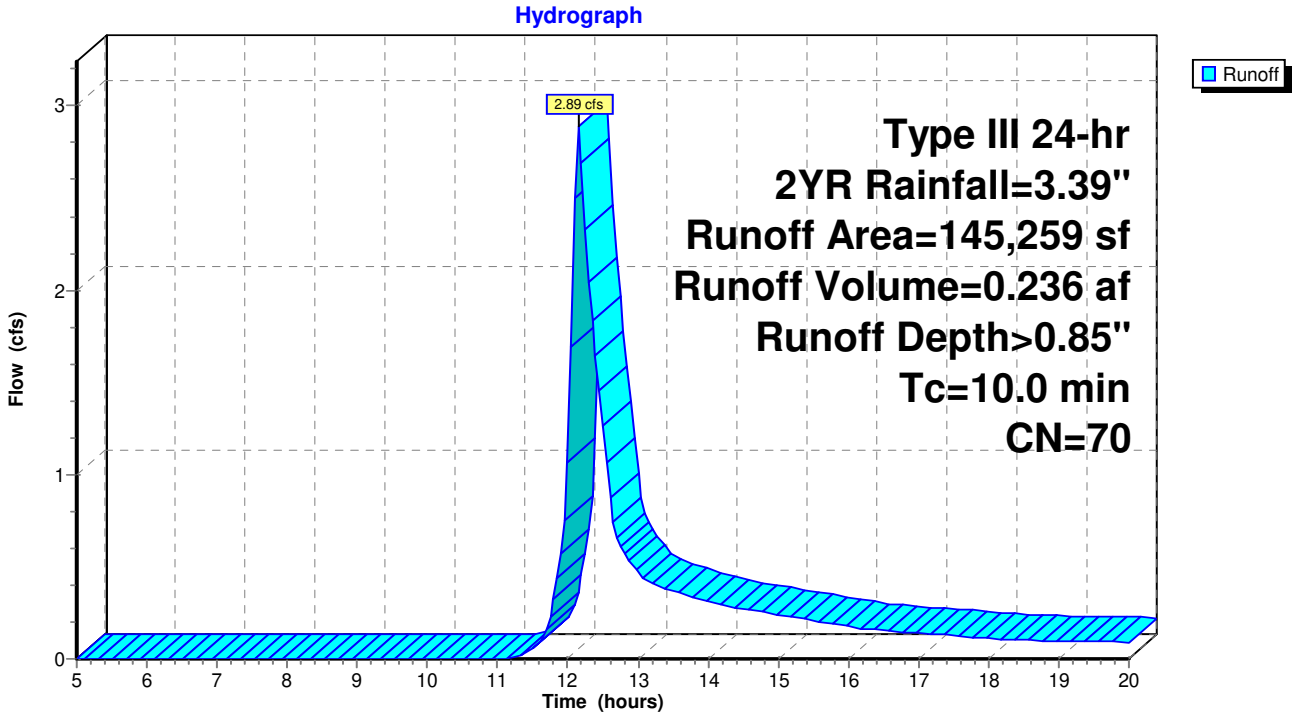
Runoff = 2.89 cfs @ 12.16 hrs, Volume= 0.236 af, Depth> 0.85"
Routed to Reach IP-P1 : 45 MAIN ST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2YR Rainfall=3.39"

Area (sf)	CN	Description
145,259	70	Woods, Good, HSG C
145,259		100.00% Pervious Area

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

Subcatchment P-5: P-5



Summary for Subcatchment P-6: P-6

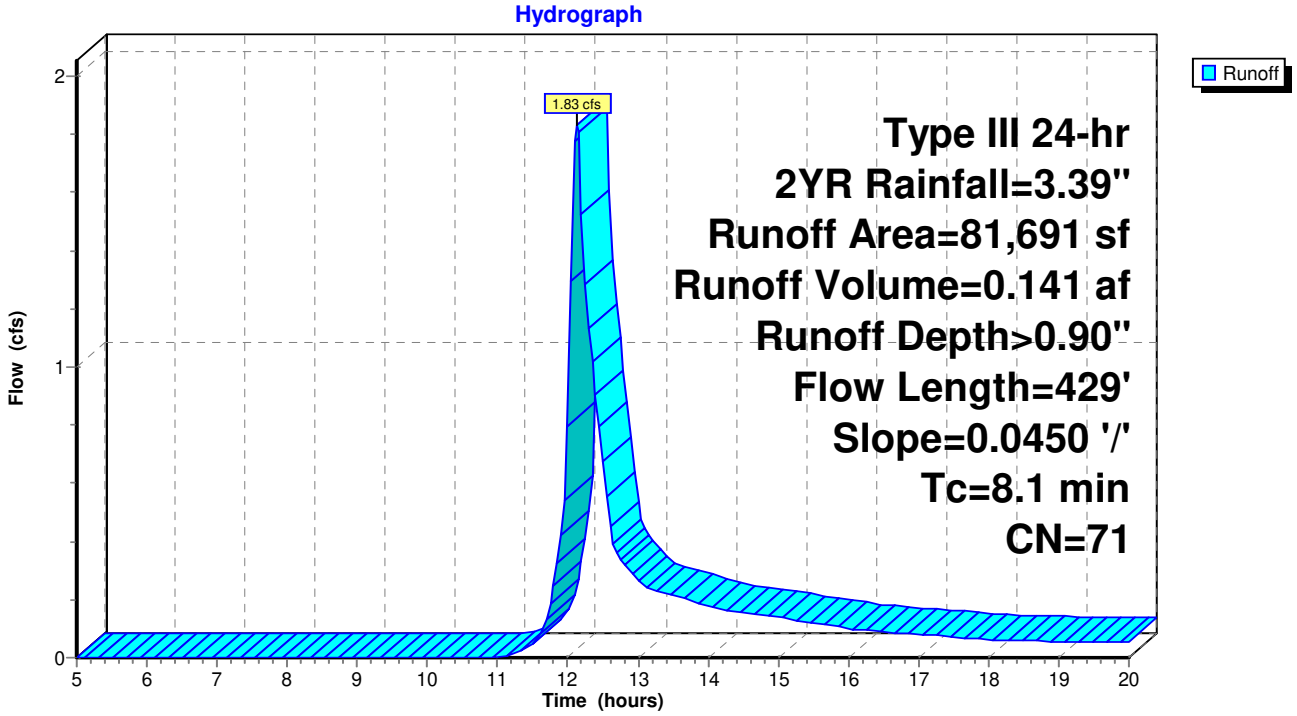
Runoff = 1.83 cfs @ 12.13 hrs, Volume= 0.141 af, Depth> 0.90"
Routed to Reach IP-P2 : SCHOOL ST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2YR Rainfall=3.39"

Area (sf)	CN	Description
13,023	74	>75% Grass cover, Good, HSG C
68,668	70	Woods, Good, HSG C
81,691	71	Weighted Average
81,691		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0450	0.20		**Sheet Flow, TRAVEL PATH A TO B** Grass: Short n= 0.150 P2= 3.20"
0.9	184	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
3.1	195	0.0450	1.06		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
8.1	429	Total			

Subcatchment P-6: P-6



Summary for Subcatchment P-7: BUILDING

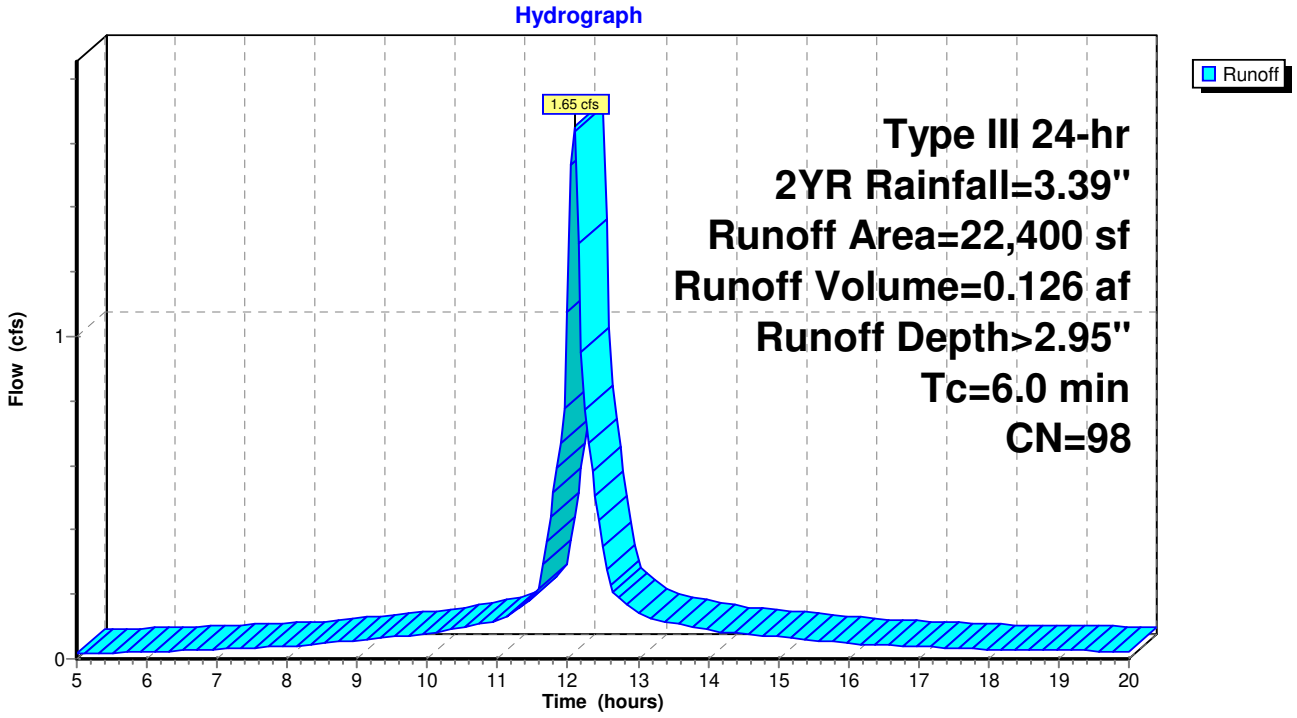
Runoff = 1.65 cfs @ 12.09 hrs, Volume= 0.126 af, Depth> 2.95"
Routed to Pond PND4 : U/G BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2YR Rainfall=3.39"

Area (sf)	CN	Description
22,400	98	Roofs, HSG C
22,400		100.00% Impervious Area

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

Subcatchment P-7: BUILDING

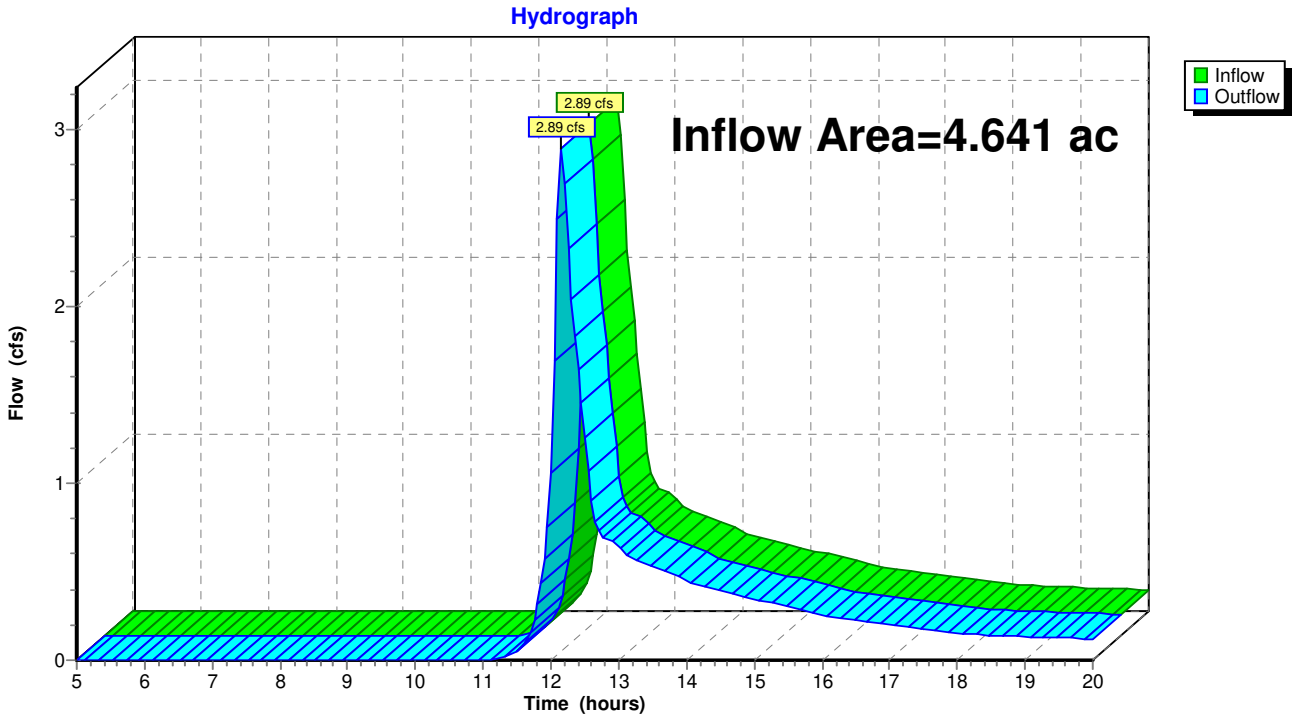


Summary for Reach IP-P1: 45 MAIN ST

Inflow Area = 4.641 ac, 2.08% Impervious, Inflow Depth > 0.74" for 2YR event
Inflow = 2.89 cfs @ 12.16 hrs, Volume= 0.288 af
Outflow = 2.89 cfs @ 12.16 hrs, Volume= 0.288 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-P1: 45 MAIN ST

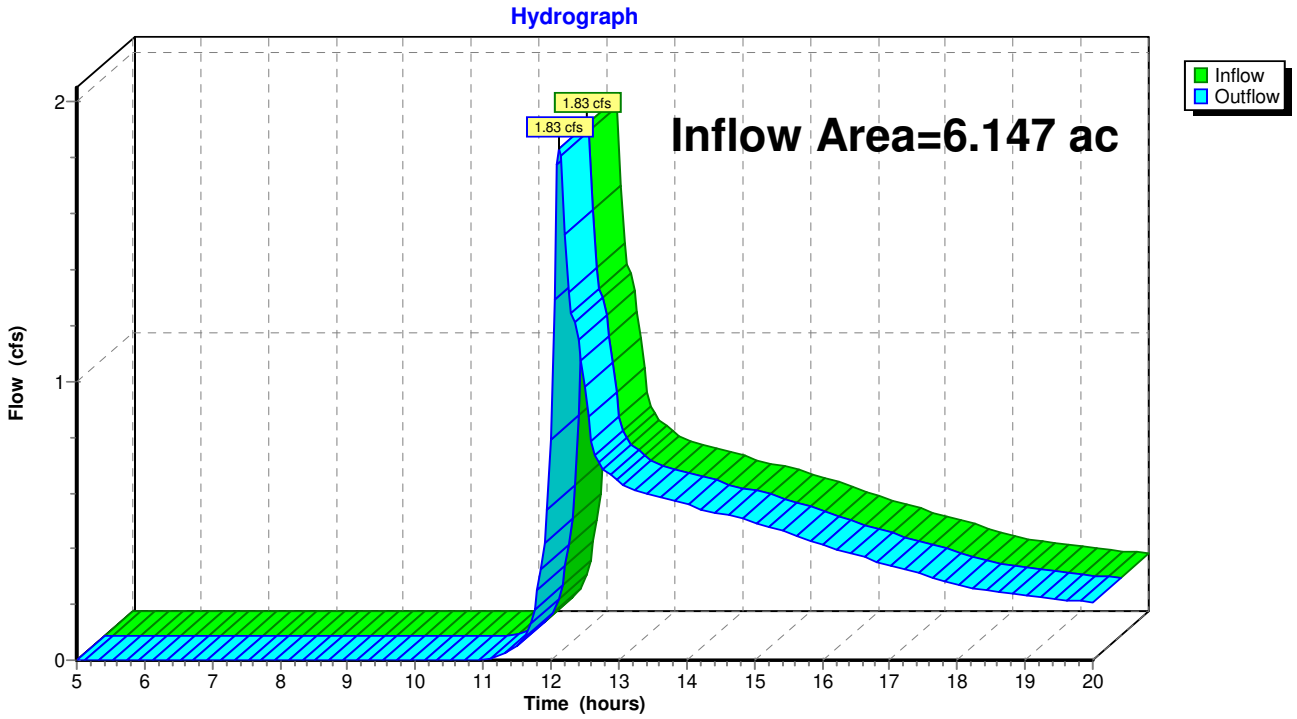


Summary for Reach IP-P2: SCHOOL ST

Inflow Area = 6.147 ac, 30.84% Impervious, Inflow Depth > 0.63" for 2YR event
Inflow = 1.83 cfs @ 12.13 hrs, Volume= 0.322 af
Outflow = 1.83 cfs @ 12.13 hrs, Volume= 0.322 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-P2: SCHOOL ST

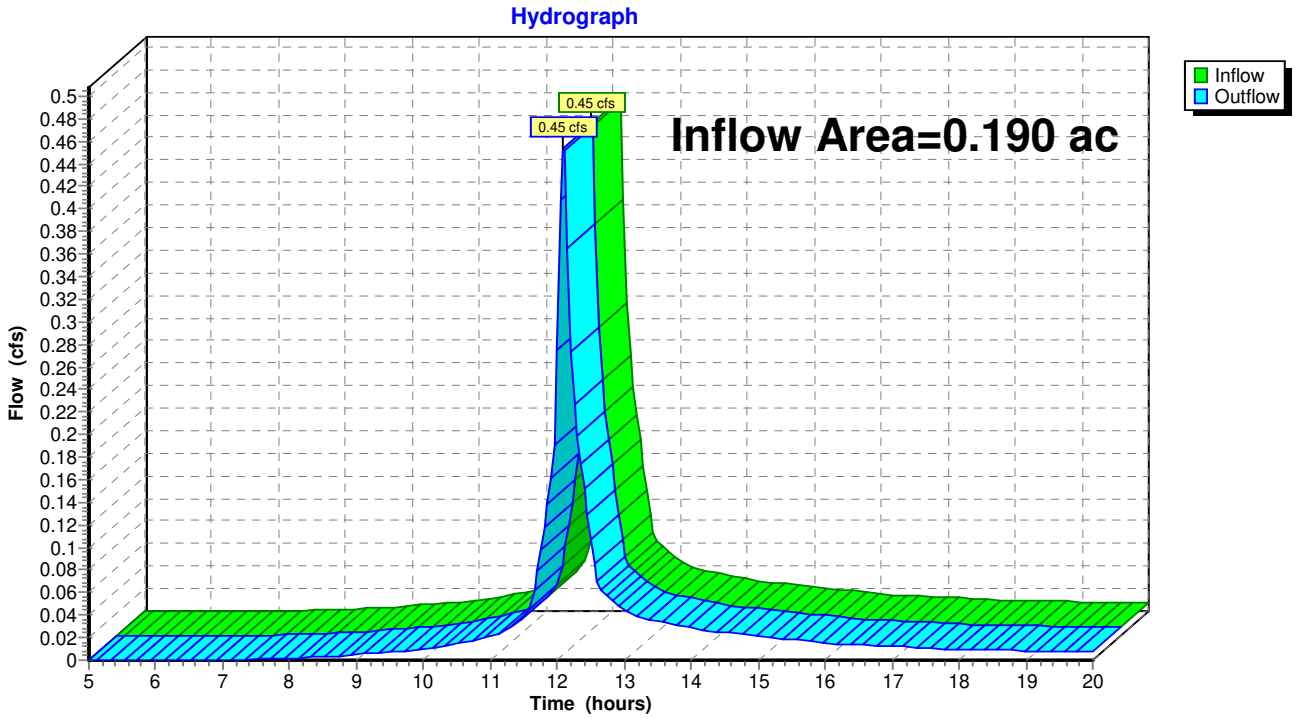


Summary for Reach IP-P3: EX. CULVERT

Inflow Area = 0.190 ac, 54.38% Impervious, Inflow Depth > 1.95" for 2YR event
Inflow = 0.45 cfs @ 12.09 hrs, Volume= 0.031 af
Outflow = 0.45 cfs @ 12.09 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-P3: EX. CULVERT



Summary for Pond PND1: PND 1

Inflow Area = 2.380 ac, 52.89% Impervious, Inflow Depth > 1.23" for 2YR event
Inflow = 3.51 cfs @ 12.11 hrs, Volume= 0.244 af
Outflow = 0.31 cfs @ 13.42 hrs, Volume= 0.135 af, Atten= 91%, Lag= 78.6 min
Discarded = 0.02 cfs @ 13.42 hrs, Volume= 0.013 af
Primary = 0.29 cfs @ 13.42 hrs, Volume= 0.122 af
Routed to Reach IP-P2 : SCHOOL ST

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 325.16' @ 13.42 hrs Surf.Area= 2,979 sf Storage= 6,110 cf

Plug-Flow detention time= 199.4 min calculated for 0.135 af (55% of inflow)
Center-of-Mass det. time= 120.1 min (917.4 - 797.3)

Volume	Invert	Avail.Storage	Storage Description
#1	322.00'	23,430 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

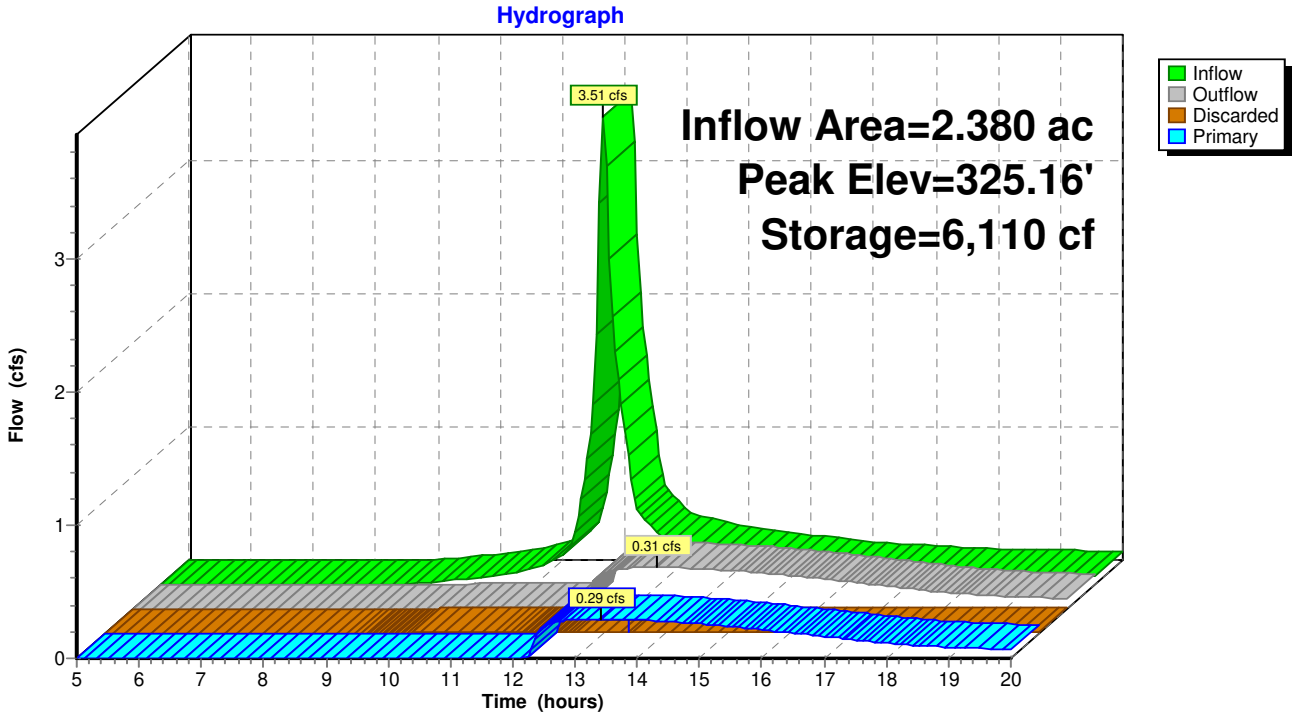
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
322.00	1,030	0	0
324.00	2,125	3,155	3,155
326.00	3,600	5,725	8,880
328.00	5,300	8,900	17,780
329.00	6,000	5,650	23,430

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	324.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	326.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	327.50'	**15.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.02 cfs @ 13.42 hrs HW=325.16' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.29 cfs @ 13.42 hrs HW=325.16' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 0.29 cfs @ 3.37 fps)
├**3=Orifice/Grate** (Controls 0.00 cfs)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PND1: PND 1



Summary for Pond PND2: BASIN#2

Inflow Area = 1.891 ac, 33.69% Impervious, Inflow Depth > 1.50" for 2YR event
Inflow = 3.40 cfs @ 12.11 hrs, Volume= 0.237 af
Outflow = 0.12 cfs @ 16.34 hrs, Volume= 0.079 af, Atten= 96%, Lag= 254.0 min
Discarded = 0.03 cfs @ 16.34 hrs, Volume= 0.020 af
Primary = 0.10 cfs @ 16.34 hrs, Volume= 0.059 af
Routed to Reach IP-P2 : SCHOOL ST

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 325.95' @ 16.34 hrs Surf.Area= 4,188 sf Storage= 7,304 cf

Plug-Flow detention time= 253.5 min calculated for 0.079 af (33% of inflow)
Center-of-Mass det. time= 160.7 min (960.5 - 799.8)

Volume	Invert	Avail.Storage	Storage Description
#1	324.00'	20,173 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 21,436 cf Overall - 1,263 cf Embedded = 20,173 cf
#2	324.00'	1,263 cf	**Cultec R-330XLHD** x 24 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
		21,436 cf	Total Available Storage

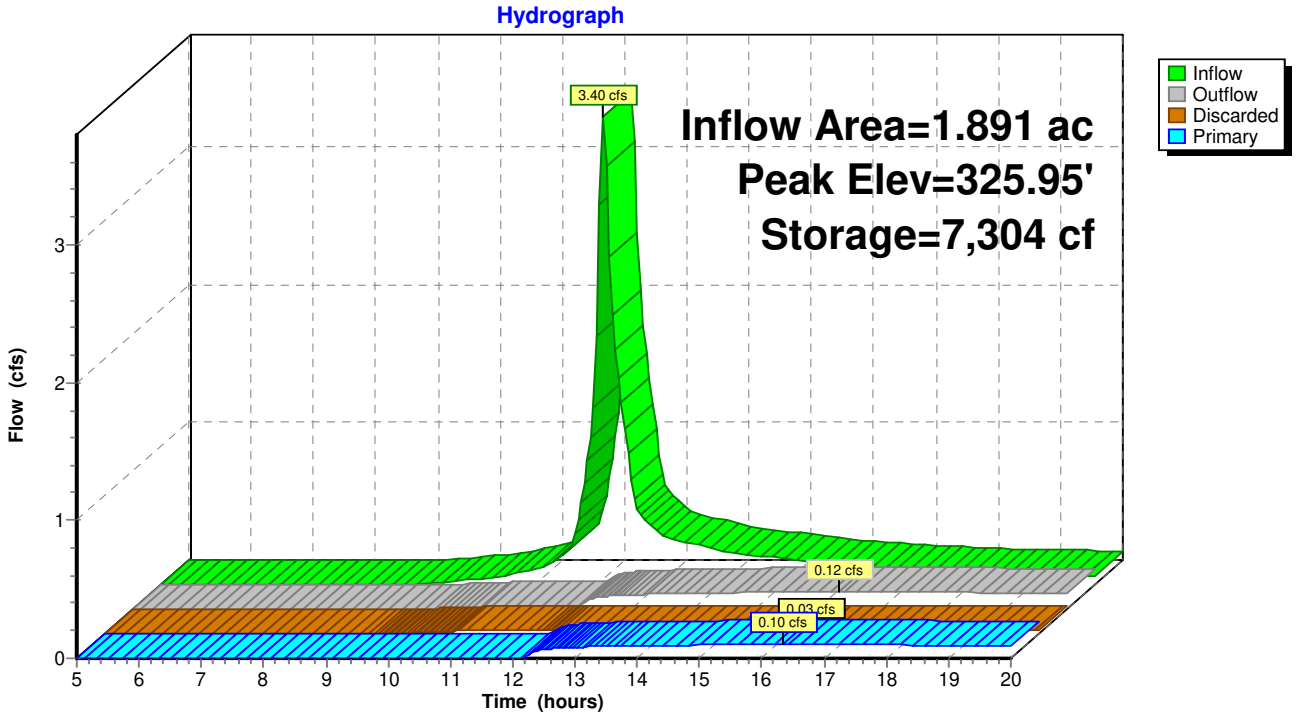
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
324.00	3,312	0	0
326.00	4,212	7,524	7,524
328.00	4,700	8,912	16,436
329.00	5,300	5,000	21,436

Device	Routing	Invert	Outlet Devices
#1	Discarded	324.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	325.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	327.30'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	328.00'	**15.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 16.34 hrs HW=325.95' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.10 cfs @ 16.34 hrs HW=325.95' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 0.10 cfs @ 4.48 fps)
├**3=Orifice/Grate** (Controls 0.00 cfs)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PND2: BASIN#2



Summary for Pond PND3: BASIN3

Inflow Area = 1.306 ac, 7.39% Impervious, Inflow Depth > 1.06" for 2YR event
Inflow = 1.69 cfs @ 12.10 hrs, Volume= 0.116 af
Outflow = 0.18 cfs @ 13.15 hrs, Volume= 0.057 af, Atten= 89%, Lag= 63.0 min
Discarded = 0.01 cfs @ 13.15 hrs, Volume= 0.006 af
Primary = 0.18 cfs @ 13.15 hrs, Volume= 0.051 af
Routed to Reach IP-P1 : 45 MAIN ST

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 332.41' @ 13.15 hrs Surf.Area= 1,420 sf Storage= 2,727 cf

Plug-Flow detention time= 191.8 min calculated for 0.057 af (49% of inflow)
Center-of-Mass det. time= 103.0 min (918.6 - 815.6)

Volume	Invert	Avail.Storage	Storage Description
#1	330.00'	7,937 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

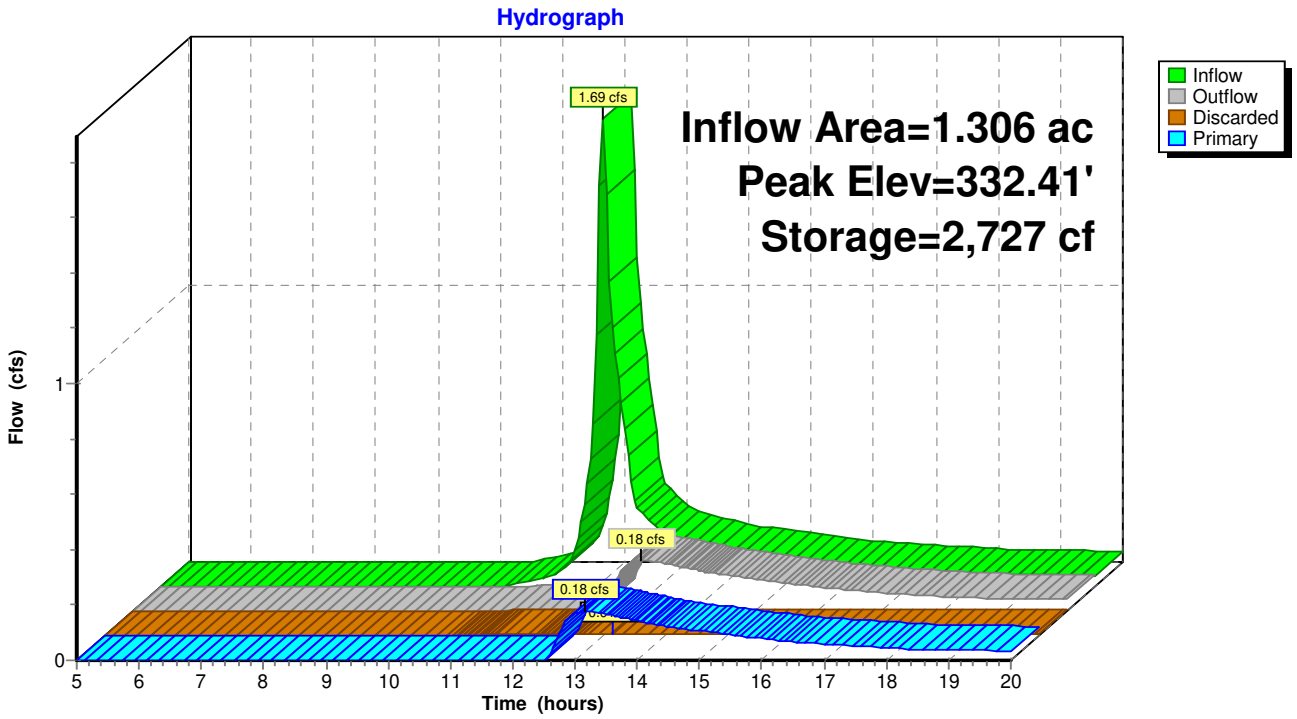
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
330.00	925	0	0
332.00	1,250	2,175	2,175
334.00	2,070	3,320	5,495
335.00	2,814	2,442	7,937

Device	Routing	Invert	Outlet Devices
#1	Discarded	330.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	332.20'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	334.00'	**20.0' 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

Discarded OutFlow Max=0.01 cfs @ 13.15 hrs HW=332.41' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.17 cfs @ 13.15 hrs HW=332.41' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 0.17 cfs @ 1.57 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PND3: BASIN3



Summary for Pond PND4: U/G BASIN

Inflow Area = 0.514 ac,100.00% Impervious, Inflow Depth > 2.95" for 2YR event
Inflow = 1.65 cfs @ 12.09 hrs, Volume= 0.126 af
Outflow = 0.02 cfs @ 7.70 hrs, Volume= 0.026 af, Atten= 99%, Lag= 0.0 min
Discarded = 0.02 cfs @ 7.70 hrs, Volume= 0.026 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Pond PND1 : PND 1

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 326.31' @ 20.00 hrs Surf.Area= 3,637 sf Storage= 4,374 cf

Plug-Flow detention time= 241.4 min calculated for 0.026 af (20% of inflow)
Center-of-Mass det. time= 48.9 min (786.9 - 738.0)

Volume	Invert	Avail.Storage	Storage Description
#1	325.00'	2,587 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 12,739 cf Overall - 6,270 cf Embedded = 6,468 cf x 40.0% Voids
#2	325.00'	6,270 cf	**Cultec R-330XLHD** x 120 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
		8,857 cf	Total Available Storage

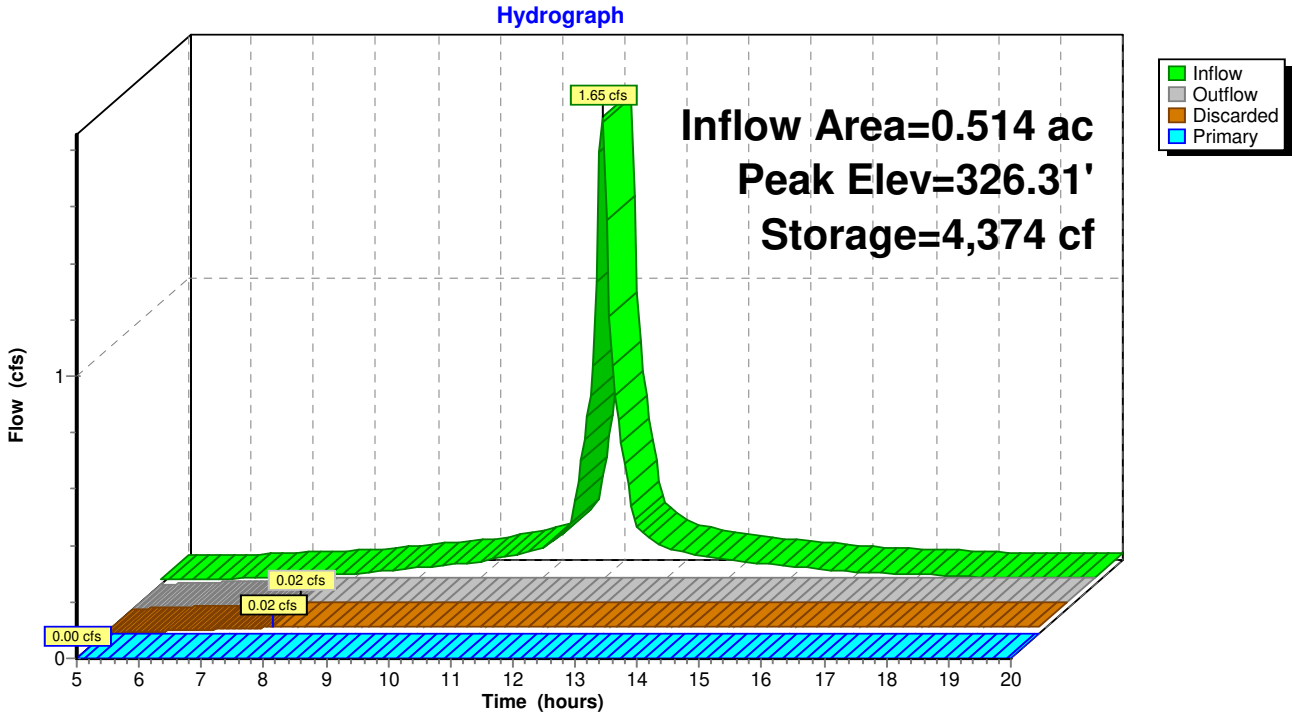
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
325.00	3,673	0	0
325.50	3,637	1,828	1,828
328.00	3,637	9,093	10,920
328.50	3,637	1,819	12,739

Device	Routing	Invert	Outlet Devices
#1	Discarded	325.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	326.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 7.70 hrs HW=325.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=325.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond PND4: U/G BASIN



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1: P-1 Runoff Area=81,268 sf 39.90% Impervious Runoff Depth>2.98"
Flow Length=618' Tc=7.1 min CN=82 Runoff=6.59 cfs 0.463 af

Subcatchment P-2: P-2 Runoff Area=82,391 sf 33.69% Impervious Runoff Depth>2.88"
Flow Length=330' Tc=7.1 min CN=81 Runoff=6.49 cfs 0.455 af

Subcatchment P-3: P-3 Runoff Area=8,272 sf 54.38% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=87 Runoff=0.78 cfs 0.055 af

Subcatchment P-4: P-4 Runoff Area=56,906 sf 7.39% Impervious Runoff Depth>2.27"
Flow Length=505' Tc=5.9 min CN=74 Runoff=3.68 cfs 0.248 af

Subcatchment P-5: P-5 Runoff Area=145,259 sf 0.00% Impervious Runoff Depth>1.95"
Tc=10.0 min CN=70 Runoff=7.03 cfs 0.542 af

Subcatchment P-6: P-6 Runoff Area=81,691 sf 0.00% Impervious Runoff Depth>2.03"
Flow Length=429' Slope=0.0450 '/' Tc=8.1 min CN=71 Runoff=4.38 cfs 0.317 af

Subcatchment P-7: BUILDING Runoff Area=22,400 sf 100.00% Impervious Runoff Depth>4.52"
Tc=6.0 min CN=98 Runoff=2.51 cfs 0.194 af

Reach IP-P1: 45 MAIN ST Inflow=8.51 cfs 0.702 af
Outflow=8.51 cfs 0.702 af

Reach IP-P2: SCHOOL ST Inflow=4.85 cfs 0.769 af
Outflow=4.85 cfs 0.769 af

Reach IP-P3: EX. CULVERT Inflow=0.78 cfs 0.055 af
Outflow=0.78 cfs 0.055 af

Pond PND1: PND 1 Peak Elev=326.71' Storage=11,647 cf Inflow=6.59 cfs 0.509 af
Discarded=0.03 cfs 0.018 af Primary=0.69 cfs 0.345 af Outflow=0.72 cfs 0.363 af

Pond PND2: BASIN#2 Peak Elev=327.51' Storage=14,172 cf Inflow=6.49 cfs 0.455 af
Discarded=0.03 cfs 0.025 af Primary=0.26 cfs 0.127 af Outflow=0.28 cfs 0.152 af

Pond PND3: BASIN3 Peak Elev=333.07' Storage=3,744 cf Inflow=3.68 cfs 0.248 af
Discarded=0.01 cfs 0.007 af Primary=1.76 cfs 0.181 af Outflow=1.77 cfs 0.188 af

Pond PND4: U/G BASIN Peak Elev=326.76' Storage=5,738 cf Inflow=2.51 cfs 0.194 af
Discarded=0.02 cfs 0.027 af Primary=0.13 cfs 0.046 af Outflow=0.15 cfs 0.073 af

Total Runoff Area = 10.978 ac Runoff Volume = 2.272 af Average Runoff Depth = 2.48"
80.91% Pervious = 8.882 ac 19.09% Impervious = 2.096 ac

Summary for Subcatchment P-1: P-1

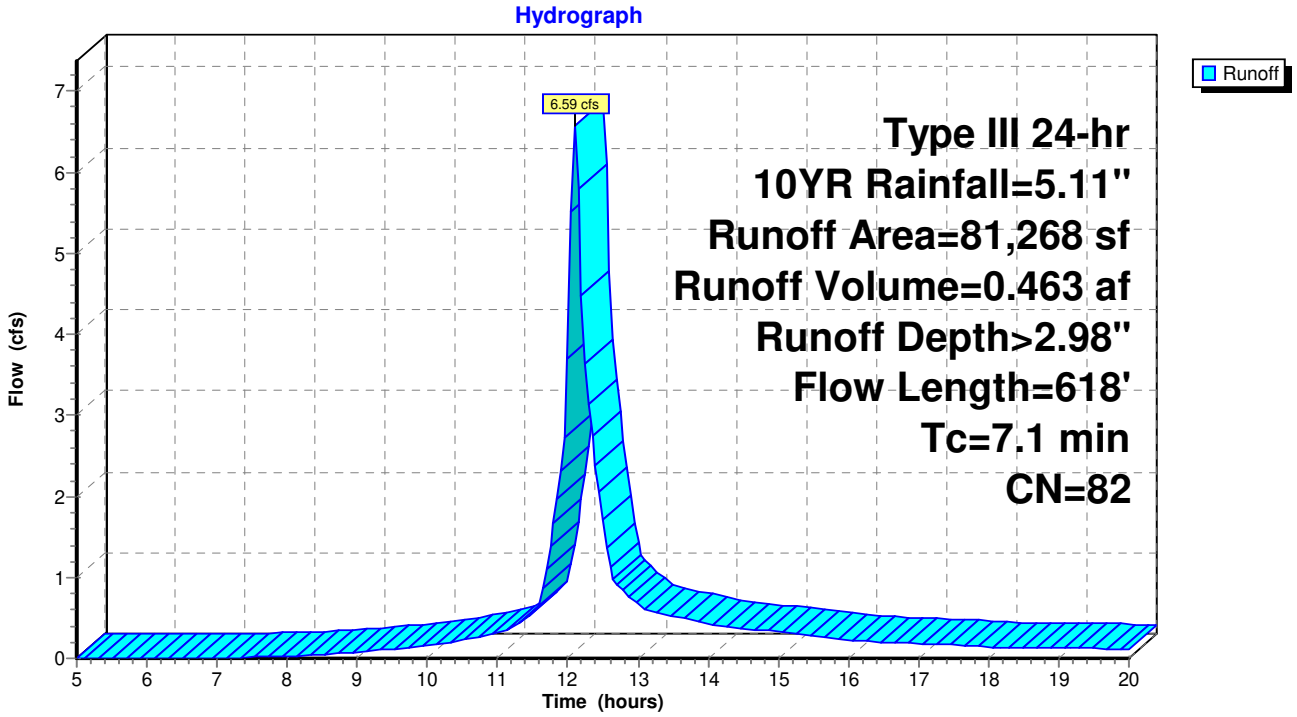
Runoff = 6.59 cfs @ 12.10 hrs, Volume= 0.463 af, Depth> 2.98"
Routed to Pond PND1 : PND 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=5.11"

Area (sf)	CN	Description
32,428	98	Paved parking, HSG C
26,882	74	>75% Grass cover, Good, HSG C
21,958	70	Woods, Good, HSG C
81,268	82	Weighted Average
48,840		60.10% Pervious Area
32,428		39.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0450	0.20		**Sheet Flow, TRAVEL PATH A TO B** Grass: Short n= 0.150 P2= 3.20"
0.4	80	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
1.6	100	0.0450	1.06		**Shallow Concentrated Flow, TARVEL PATH C TO D** Woodland Kv= 5.0 fps
0.6	100	0.0200	2.87		**Shallow Concentrated Flow, TARVEL PATH D TO E** Paved Kv= 20.3 fps
0.4	288	0.0250	12.22	21.59	**Pipe Channel, TARVEL PATH E TO F** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010
7.1	618	Total			

Subcatchment P-1: P-1



Summary for Subcatchment P-2: P-2

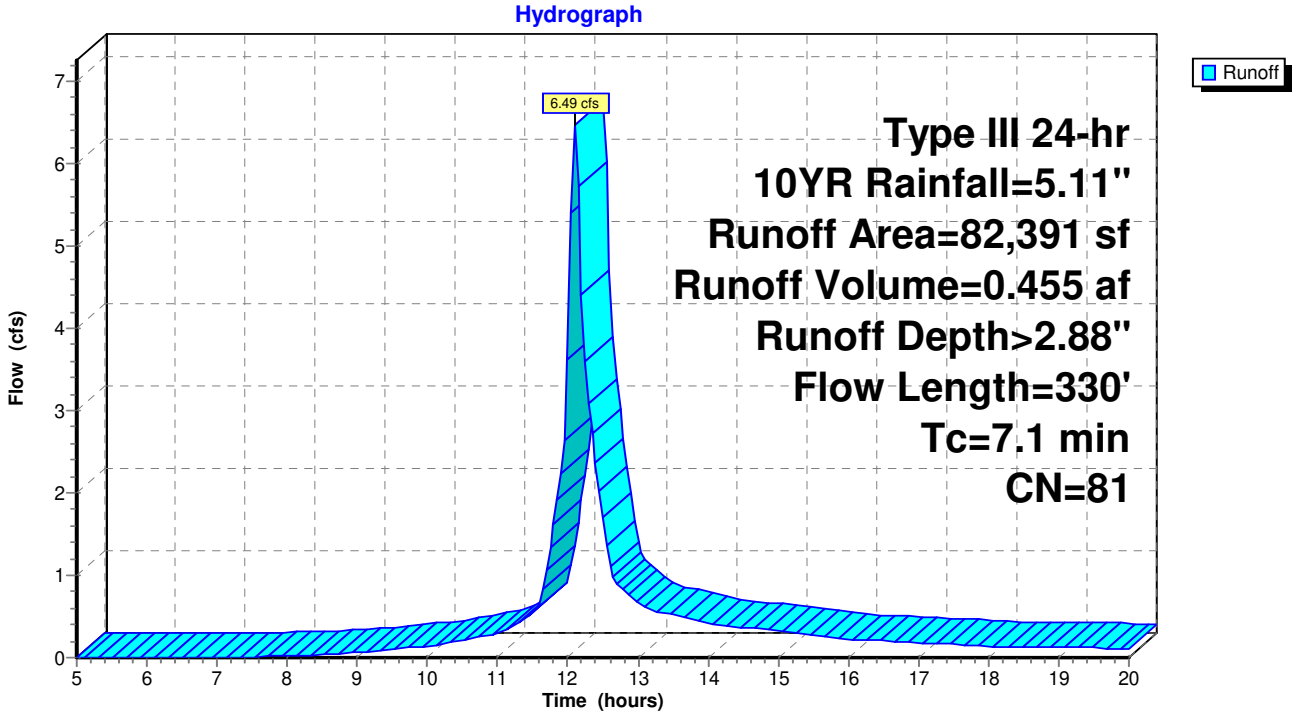
Runoff = 6.49 cfs @ 12.10 hrs, Volume= 0.455 af, Depth> 2.88"
Routed to Pond PND2 : BASIN#2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=5.11"

Area (sf)	CN	Description
27,755	98	Paved parking, HSG C
34,256	74	>75% Grass cover, Good, HSG C
20,380	70	Woods, Good, HSG C
82,391	81	Weighted Average
54,636		66.31% Pervious Area
27,755		33.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0450	0.19		**Sheet Flow, TRAVEL PATH A TO B** Cultivated: Residue>20% n= 0.170 P2= 3.20"
0.7	135	0.0450	3.42		**Shallow Concentrated Flow, TARVEL PATH B TO C** Unpaved Kv= 16.1 fps
1.9	145	0.0650	1.27		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
7.1	330	Total			

Subcatchment P-2: P-2



Summary for Subcatchment P-3: P-3

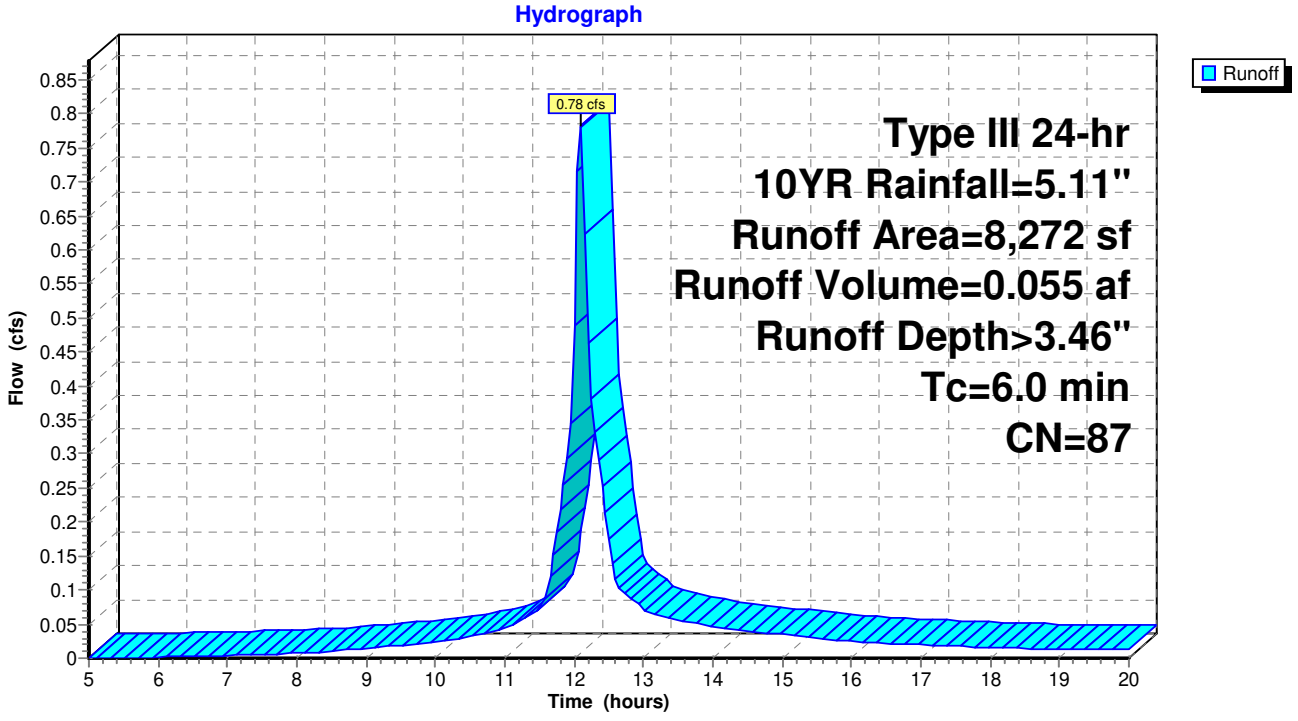
Runoff = 0.78 cfs @ 12.09 hrs, Volume= 0.055 af, Depth> 3.46"
Routed to Reach IP-P3 : EX. CULVERT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=5.11"

Area (sf)	CN	Description
4,498	98	Paved parking, HSG C
3,774	74	>75% Grass cover, Good, HSG C
8,272	87	Weighted Average
3,774		45.62% Pervious Area
4,498		54.38% Impervious Area

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

Subcatchment P-3: P-3



Summary for Subcatchment P-4: P-4

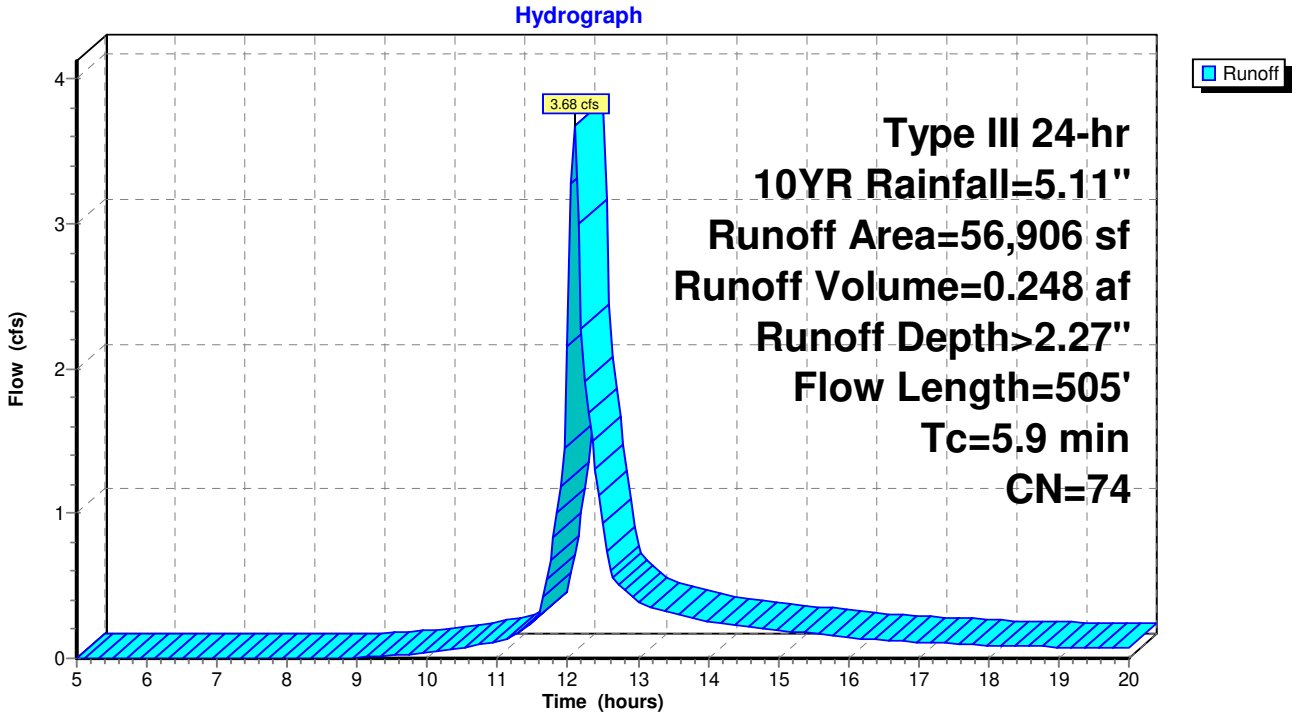
Runoff = 3.68 cfs @ 12.09 hrs, Volume= 0.248 af, Depth> 2.27"
Routed to Pond PND3 : BASIN3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=5.11"

Area (sf)	CN	Description
4,207	98	Paved parking, HSG C
22,144	74	>75% Grass cover, Good, HSG C
30,555	70	Woods, Good, HSG C
56,906	74	Weighted Average
52,699		92.61% Pervious Area
4,207		7.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0350	0.19		**Sheet Flow, TRAVEL PATHA TO B** Grass: Short n= 0.150 P2= 3.20"
0.4	80	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
0.5	100	0.4500	3.35		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
0.1	25	0.0250	3.21		**Shallow Concentrated Flow, TARVEL PATH D TO E** Paved Kv= 20.3 fps
0.4	250	0.0250	10.82	13.28	**Pipe Channel, TRAVEL PATH F TO E** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
5.9	505	Total			

Subcatchment P-4: P-4



Summary for Subcatchment P-5: P-5

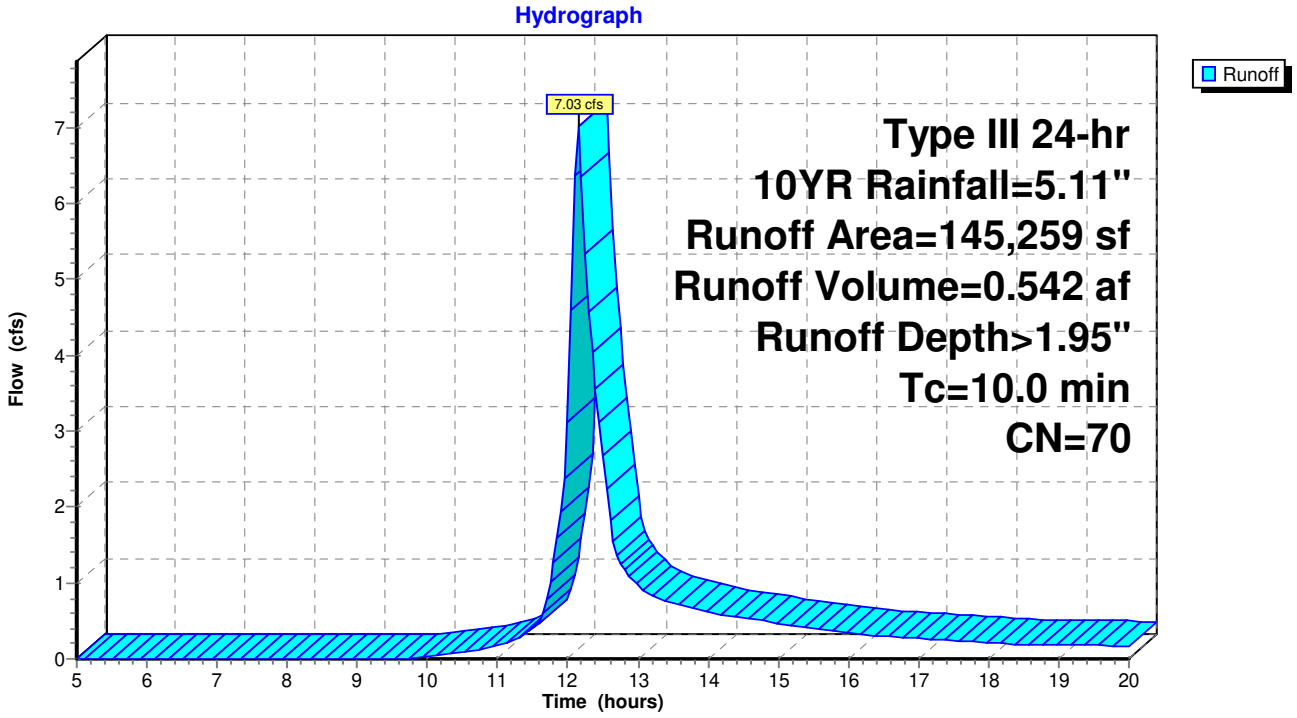
Runoff = 7.03 cfs @ 12.15 hrs, Volume= 0.542 af, Depth> 1.95"
Routed to Reach IP-P1 : 45 MAIN ST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=5.11"

Area (sf)	CN	Description
145,259	70	Woods, Good, HSG C
145,259		100.00% Pervious Area

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

Subcatchment P-5: P-5



Summary for Subcatchment P-6: P-6

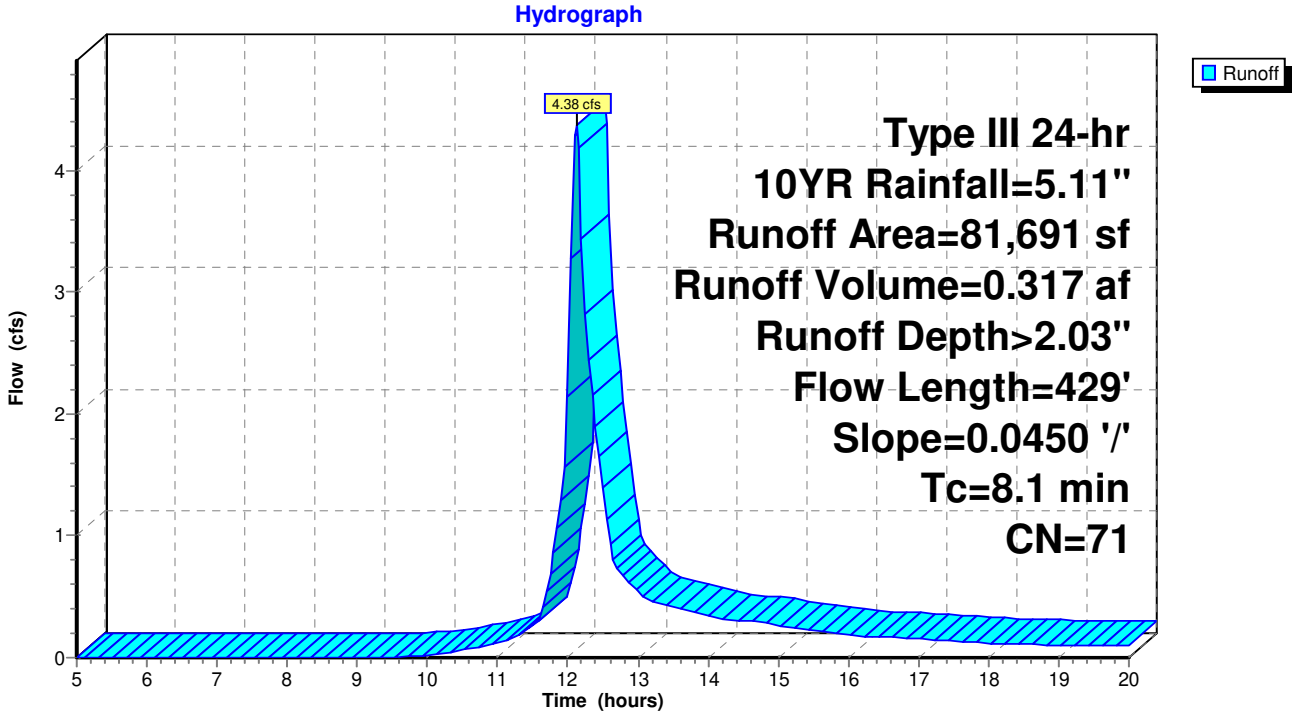
Runoff = 4.38 cfs @ 12.12 hrs, Volume= 0.317 af, Depth> 2.03"
Routed to Reach IP-P2 : SCHOOL ST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=5.11"

Area (sf)	CN	Description
13,023	74	>75% Grass cover, Good, HSG C
68,668	70	Woods, Good, HSG C
81,691	71	Weighted Average
81,691		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0450	0.20		**Sheet Flow, TRAVEL PATH A TO B** Grass: Short n= 0.150 P2= 3.20"
0.9	184	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
3.1	195	0.0450	1.06		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
8.1	429	Total			

Subcatchment P-6: P-6



Summary for Subcatchment P-7: BUILDING

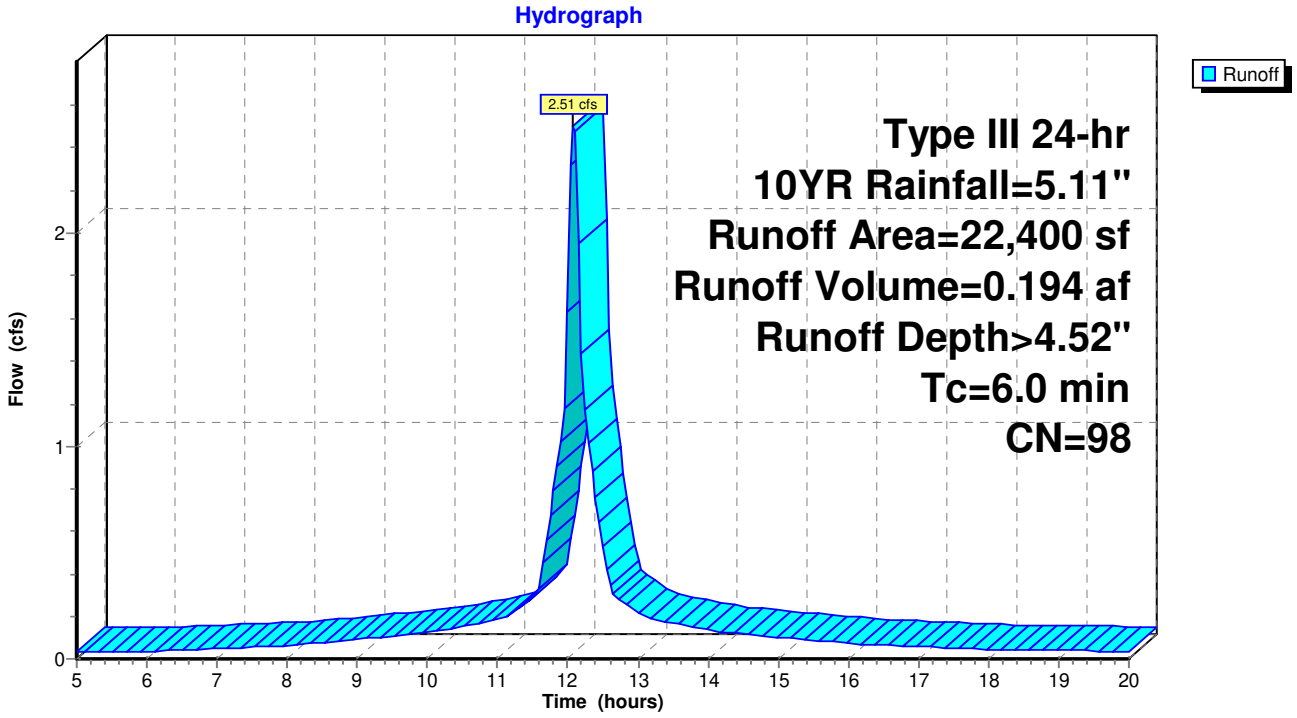
Runoff = 2.51 cfs @ 12.09 hrs, Volume= 0.194 af, Depth> 4.52"
Routed to Pond PND4 : U/G BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=5.11"

Area (sf)	CN	Description
22,400	98	Roofs, HSG C
22,400		100.00% Impervious Area

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

Subcatchment P-7: BUILDING

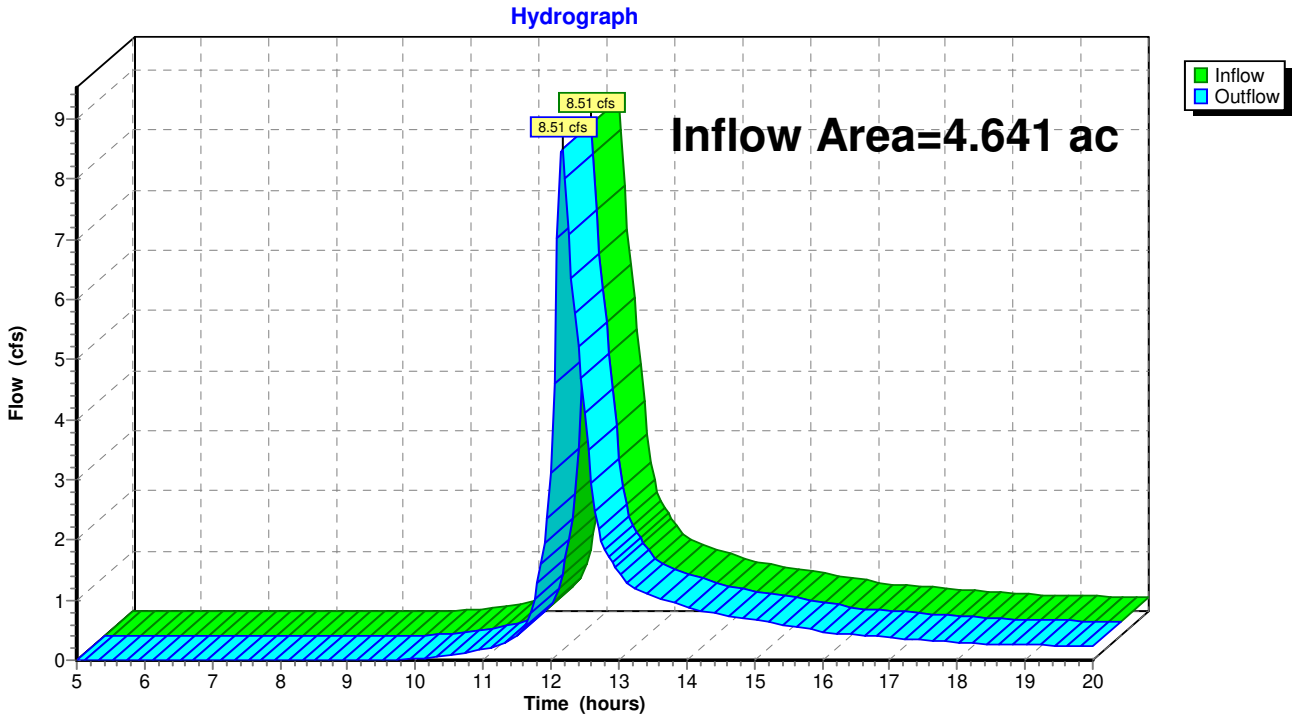


Summary for Reach IP-P1: 45 MAIN ST

Inflow Area = 4.641 ac, 2.08% Impervious, Inflow Depth > 1.87" for 10YR event
Inflow = 8.51 cfs @ 12.16 hrs, Volume= 0.702 af
Outflow = 8.51 cfs @ 12.16 hrs, Volume= 0.702 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-P1: 45 MAIN ST

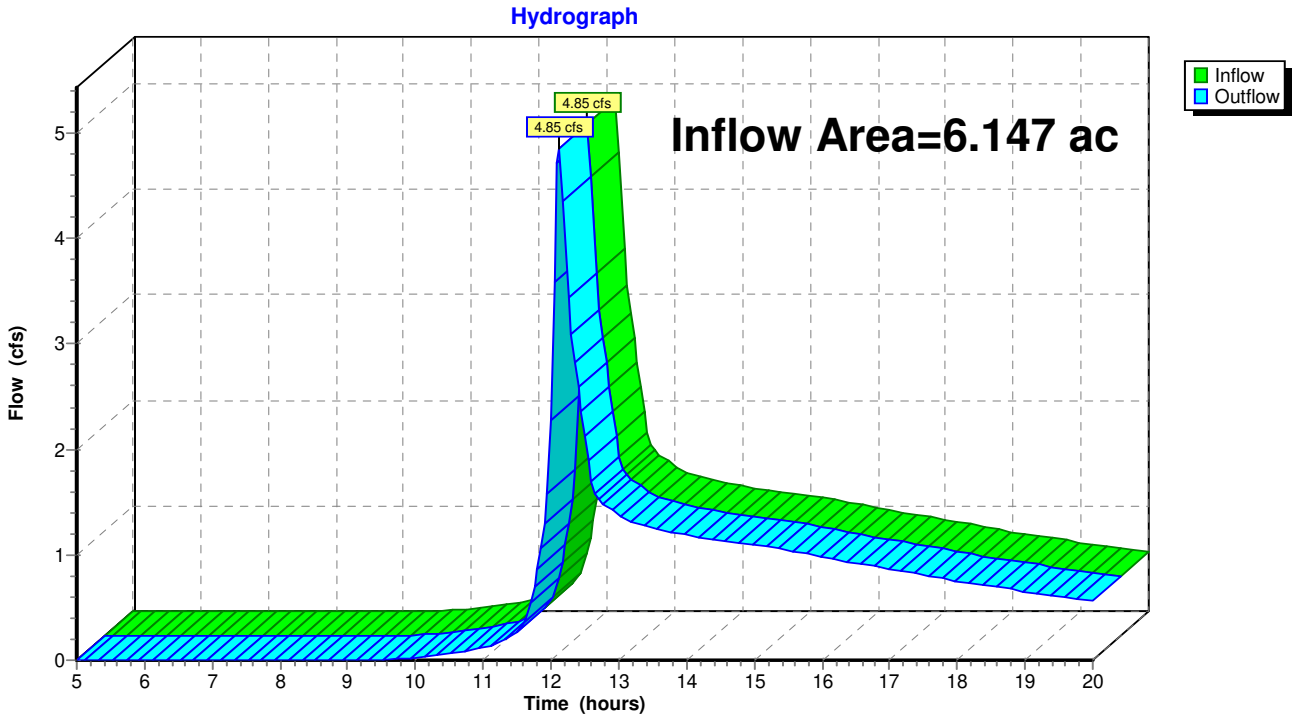


Summary for Reach IP-P2: SCHOOL ST

Inflow Area = 6.147 ac, 30.84% Impervious, Inflow Depth > 1.54" for 10YR event
Inflow = 4.85 cfs @ 12.12 hrs, Volume= 0.769 af
Outflow = 4.85 cfs @ 12.12 hrs, Volume= 0.769 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-P2: SCHOOL ST

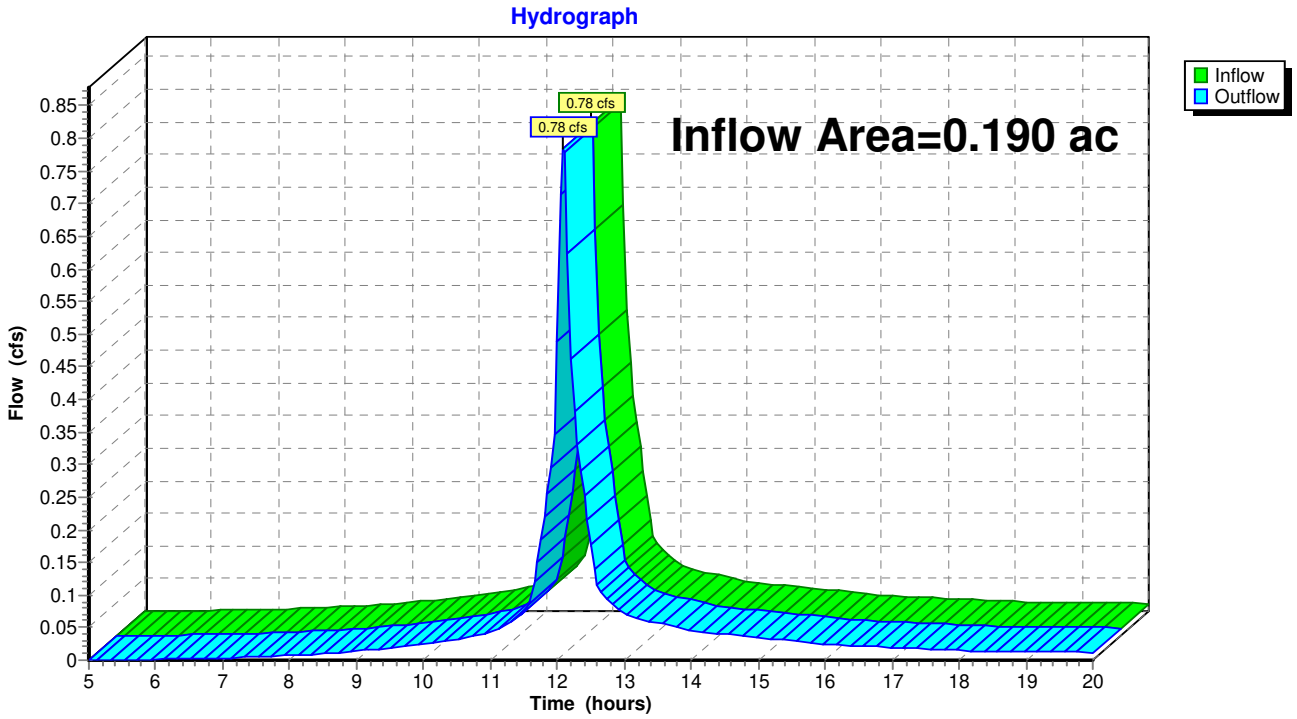


Summary for Reach IP-P3: EX. CULVERT

Inflow Area = 0.190 ac, 54.38% Impervious, Inflow Depth > 3.46" for 10YR event
Inflow = 0.78 cfs @ 12.09 hrs, Volume= 0.055 af
Outflow = 0.78 cfs @ 12.09 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-P3: EX. CULVERT



Summary for Pond PND1: PND 1

Inflow Area = 2.380 ac, 52.89% Impervious, Inflow Depth > 2.56" for 10YR event
Inflow = 6.59 cfs @ 12.10 hrs, Volume= 0.509 af
Outflow = 0.72 cfs @ 13.12 hrs, Volume= 0.363 af, Atten= 89%, Lag= 61.2 min
Discarded = 0.03 cfs @ 13.12 hrs, Volume= 0.018 af
Primary = 0.69 cfs @ 13.12 hrs, Volume= 0.345 af
Routed to Reach IP-P2 : SCHOOL ST

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 326.71' @ 13.12 hrs Surf.Area= 4,203 sf Storage= 11,647 cf

Plug-Flow detention time= 209.1 min calculated for 0.362 af (71% of inflow)
Center-of-Mass det. time= 140.5 min (935.4 - 794.9)

Volume	Invert	Avail.Storage	Storage Description
#1	322.00'	23,430 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

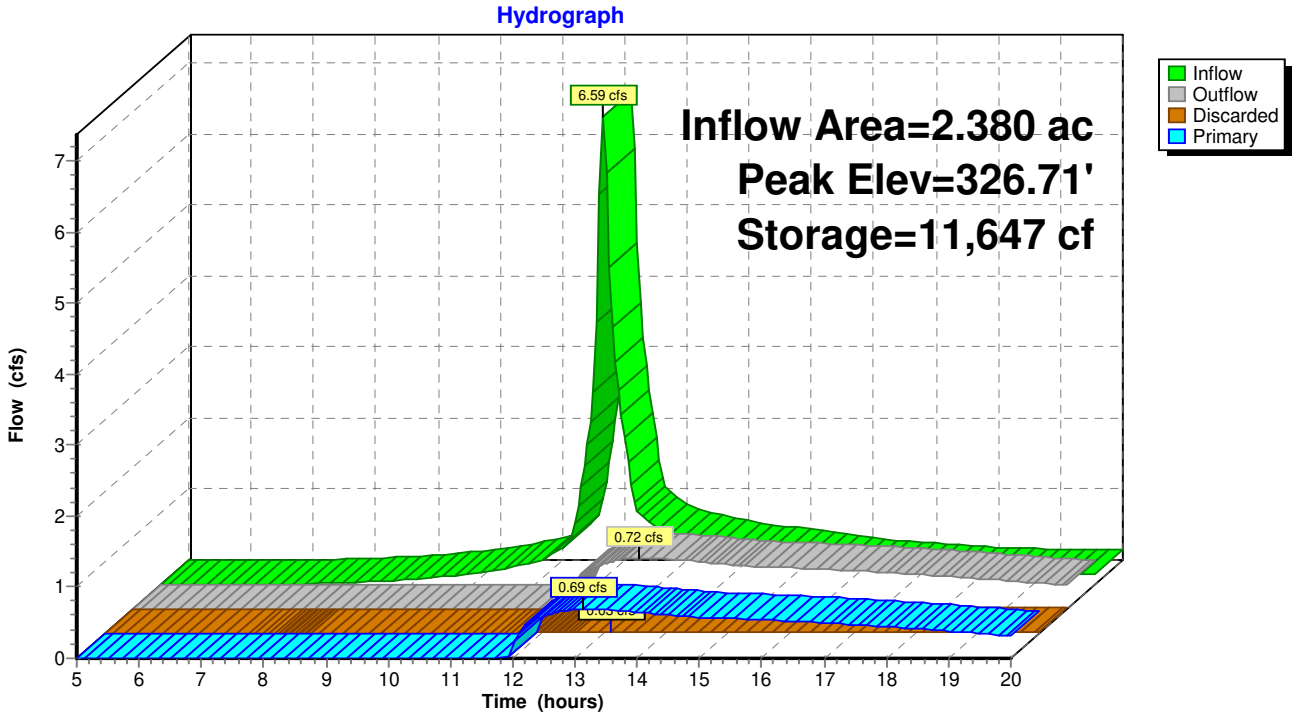
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
322.00	1,030	0	0
324.00	2,125	3,155	3,155
326.00	3,600	5,725	8,880
328.00	5,300	8,900	17,780
329.00	6,000	5,650	23,430

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	324.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	326.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	327.50'	**15.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 13.12 hrs HW=326.71' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.69 cfs @ 13.12 hrs HW=326.71' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 0.60 cfs @ 6.88 fps)
├**3=Orifice/Grate** (Orifice Controls 0.09 cfs @ 1.56 fps)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PND1: PND 1



Summary for Pond PND2: BASIN#2

Inflow Area = 1.891 ac, 33.69% Impervious, Inflow Depth > 2.88" for 10YR event
Inflow = 6.49 cfs @ 12.10 hrs, Volume= 0.455 af
Outflow = 0.28 cfs @ 15.43 hrs, Volume= 0.152 af, Atten= 96%, Lag= 199.3 min
Discarded = 0.03 cfs @ 15.43 hrs, Volume= 0.025 af
Primary = 0.26 cfs @ 15.43 hrs, Volume= 0.127 af
Routed to Reach IP-P2 : SCHOOL ST

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 327.51' @ 15.43 hrs Surf.Area= 4,581 sf Storage= 14,172 cf

Plug-Flow detention time= 260.7 min calculated for 0.152 af (33% of inflow)
Center-of-Mass det. time= 165.1 min (950.0 - 784.9)

Volume	Invert	Avail.Storage	Storage Description
#1	324.00'	20,173 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 21,436 cf Overall - 1,263 cf Embedded = 20,173 cf
#2	324.00'	1,263 cf	**Cultec R-330XLHD** x 24 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
		21,436 cf	Total Available Storage

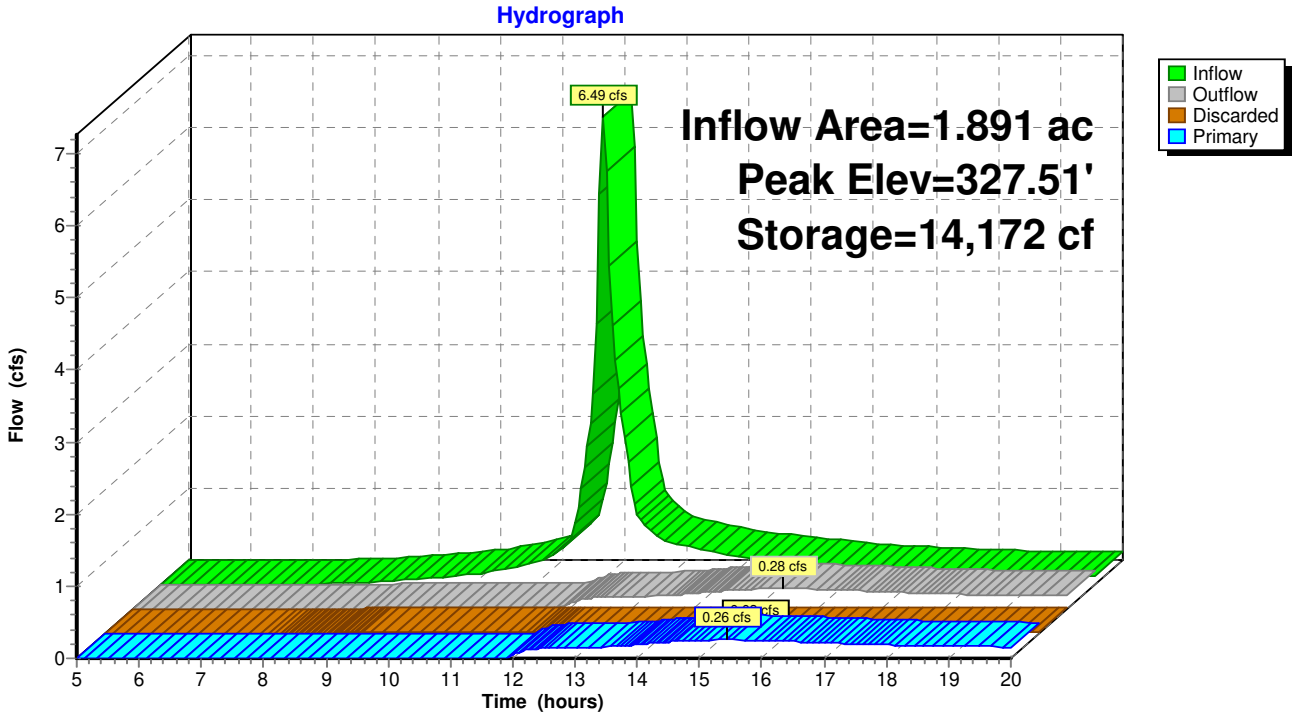
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
324.00	3,312	0	0
326.00	4,212	7,524	7,524
328.00	4,700	8,912	16,436
329.00	5,300	5,000	21,436

Device	Routing	Invert	Outlet Devices
#1	Discarded	324.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	325.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	327.30'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	328.00'	**15.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 15.43 hrs HW=327.51' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.26 cfs @ 15.43 hrs HW=327.51' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 0.16 cfs @ 7.50 fps)
├**3=Orifice/Grate** (Orifice Controls 0.09 cfs @ 1.57 fps)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PND2: BASIN#2



Summary for Pond PND3: BASIN3

Inflow Area = 1.306 ac, 7.39% Impervious, Inflow Depth > 2.27" for 10YR event
Inflow = 3.68 cfs @ 12.09 hrs, Volume= 0.248 af
Outflow = 1.77 cfs @ 12.28 hrs, Volume= 0.188 af, Atten= 52%, Lag= 11.4 min
Discarded = 0.01 cfs @ 12.28 hrs, Volume= 0.007 af
Primary = 1.76 cfs @ 12.28 hrs, Volume= 0.181 af
Routed to Reach IP-P1 : 45 MAIN ST

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 333.07' @ 12.28 hrs Surf.Area= 1,688 sf Storage= 3,744 cf

Plug-Flow detention time= 101.6 min calculated for 0.187 af (76% of inflow)
Center-of-Mass det. time= 42.0 min (840.6 - 798.6)

Volume	Invert	Avail.Storage	Storage Description
#1	330.00'	7,937 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

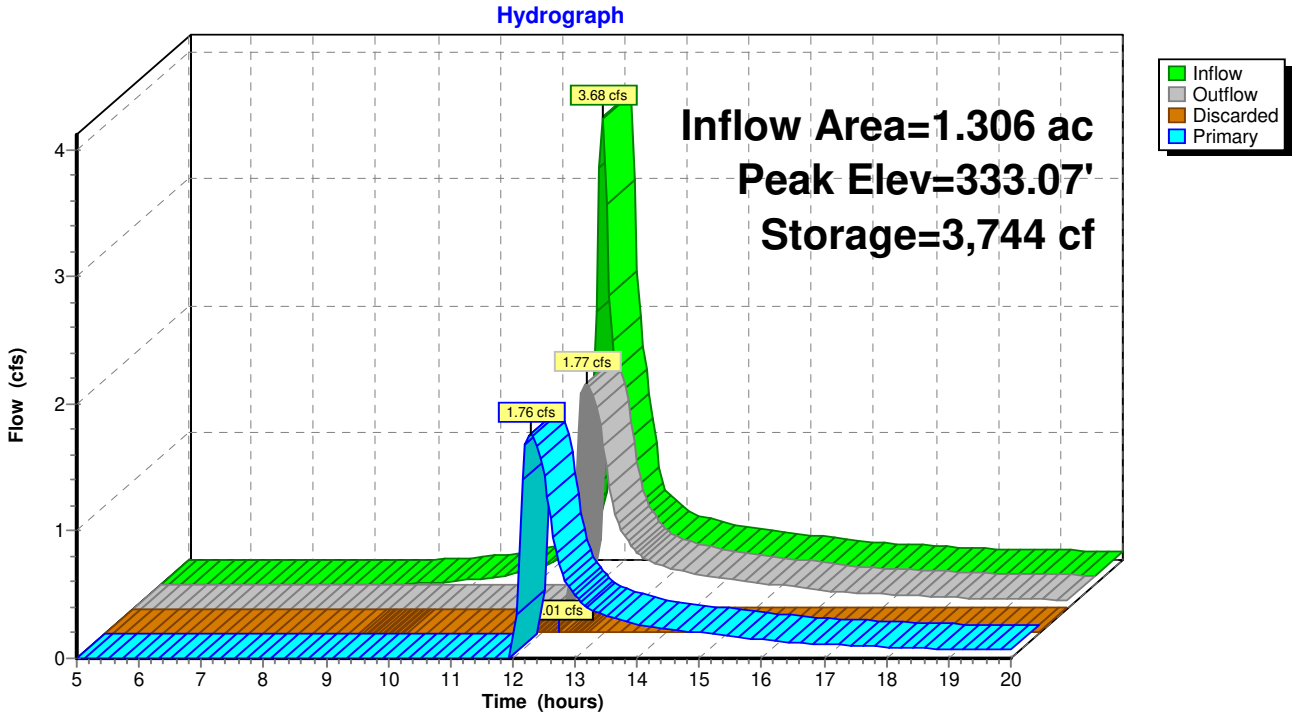
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
330.00	925	0	0
332.00	1,250	2,175	2,175
334.00	2,070	3,320	5,495
335.00	2,814	2,442	7,937

Device	Routing	Invert	Outlet Devices
#1	Discarded	330.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	332.20'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	334.00'	**20.0' 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

Discarded OutFlow Max=0.01 cfs @ 12.28 hrs HW=333.07' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.76 cfs @ 12.28 hrs HW=333.07' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 1.76 cfs @ 3.23 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PND3: BASIN3



Summary for Pond PND4: U/G BASIN

Inflow Area = 0.514 ac,100.00% Impervious, Inflow Depth > 4.52" for 10YR event
Inflow = 2.51 cfs @ 12.09 hrs, Volume= 0.194 af
Outflow = 0.15 cfs @ 13.73 hrs, Volume= 0.073 af, Atten= 94%, Lag= 98.8 min
Discarded = 0.02 cfs @ 6.55 hrs, Volume= 0.027 af
Primary = 0.13 cfs @ 13.73 hrs, Volume= 0.046 af
Routed to Pond PND1 : PND 1

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 326.76' @ 13.73 hrs Surf.Area= 3,637 sf Storage= 5,738 cf

Plug-Flow detention time= 251.7 min calculated for 0.073 af (38% of inflow)
Center-of-Mass det. time= 128.5 min (863.5 - 735.0)

Volume	Invert	Avail.Storage	Storage Description
#1	325.00'	2,587 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 12,739 cf Overall - 6,270 cf Embedded = 6,468 cf x 40.0% Voids
#2	325.00'	6,270 cf	**Cultec R-330XLHD** x 120 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
		8,857 cf	Total Available Storage

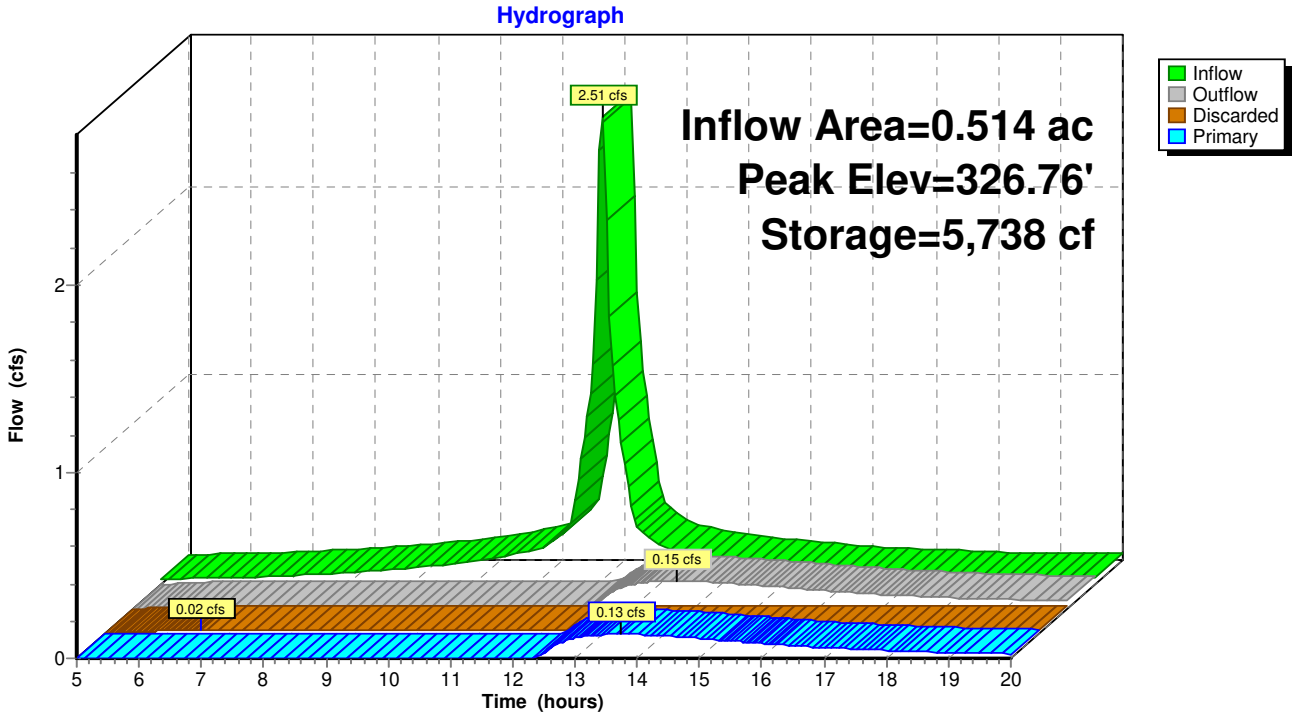
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
325.00	3,673	0	0
325.50	3,637	1,828	1,828
328.00	3,637	9,093	10,920
328.50	3,637	1,819	12,739

Device	Routing	Invert	Outlet Devices
#1	Discarded	325.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	326.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 6.55 hrs HW=325.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.13 cfs @ 13.73 hrs HW=326.76' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 0.13 cfs @ 1.75 fps)

Pond PND4: U/G BASIN



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1: P-1 Runoff Area=81,268 sf 39.90% Impervious Runoff Depth>3.91"
Flow Length=618' Tc=7.1 min CN=82 Runoff=8.57 cfs 0.608 af

Subcatchment P-2: P-2 Runoff Area=82,391 sf 33.69% Impervious Runoff Depth>3.81"
Flow Length=330' Tc=7.1 min CN=81 Runoff=8.49 cfs 0.600 af

Subcatchment P-3: P-3 Runoff Area=8,272 sf 54.38% Impervious Runoff Depth>4.44"
Tc=6.0 min CN=87 Runoff=0.99 cfs 0.070 af

Subcatchment P-4: P-4 Runoff Area=56,906 sf 7.39% Impervious Runoff Depth>3.12"
Flow Length=505' Tc=5.9 min CN=74 Runoff=5.04 cfs 0.339 af

Subcatchment P-5: P-5 Runoff Area=145,259 sf 0.00% Impervious Runoff Depth>2.74"
Tc=10.0 min CN=70 Runoff=9.93 cfs 0.760 af

Subcatchment P-6: P-6 Runoff Area=81,691 sf 0.00% Impervious Runoff Depth>2.83"
Flow Length=429' Slope=0.0450 '/' Tc=8.1 min CN=71 Runoff=6.14 cfs 0.442 af

Subcatchment P-7: BUILDING Runoff Area=22,400 sf 100.00% Impervious Runoff Depth>5.50"
Tc=6.0 min CN=98 Runoff=3.05 cfs 0.236 af

Reach IP-P1: 45 MAIN ST Inflow=12.39 cfs 0.982 af
Outflow=12.39 cfs 0.982 af

Reach IP-P2: SCHOOL ST Inflow=6.79 cfs 1.069 af
Outflow=6.79 cfs 1.069 af

Reach IP-P3: EX. CULVERT Inflow=0.99 cfs 0.070 af
Outflow=0.99 cfs 0.070 af

Pond PND1: PND 1 Peak Elev=327.51' Storage=15,275 cf Inflow=8.57 cfs 0.695 af
Discarded=0.03 cfs 0.021 af Primary=1.15 cfs 0.499 af Outflow=1.18 cfs 0.520 af

Pond PND2: BASIN#2 Peak Elev=328.02' Storage=16,530 cf Inflow=8.49 cfs 0.600 af
Discarded=0.03 cfs 0.027 af Primary=0.67 cfs 0.259 af Outflow=0.70 cfs 0.286 af

Pond PND3: BASIN3 Peak Elev=333.61' Storage=4,715 cf Inflow=5.04 cfs 0.339 af
Discarded=0.01 cfs 0.008 af Primary=2.61 cfs 0.271 af Outflow=2.63 cfs 0.279 af

Pond PND4: U/G BASIN Peak Elev=327.06' Storage=6,531 cf Inflow=3.05 cfs 0.236 af
Discarded=0.02 cfs 0.027 af Primary=0.26 cfs 0.086 af Outflow=0.29 cfs 0.114 af

Total Runoff Area = 10.978 ac Runoff Volume = 3.056 af Average Runoff Depth = 3.34"
80.91% Pervious = 8.882 ac 19.09% Impervious = 2.096 ac

Summary for Subcatchment P-1: P-1

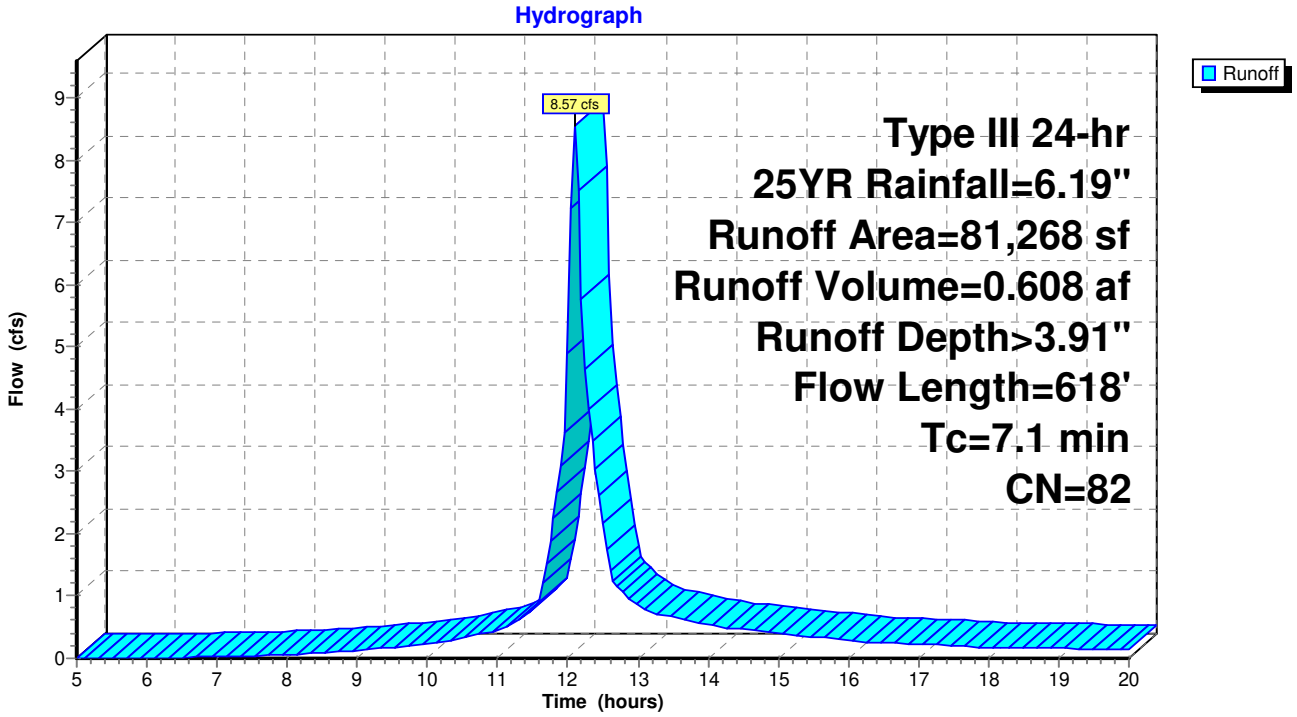
Runoff = 8.57 cfs @ 12.10 hrs, Volume= 0.608 af, Depth> 3.91"
Routed to Pond PND1 : PND 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=6.19"

Area (sf)	CN	Description
32,428	98	Paved parking, HSG C
26,882	74	>75% Grass cover, Good, HSG C
21,958	70	Woods, Good, HSG C
81,268	82	Weighted Average
48,840		60.10% Pervious Area
32,428		39.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0450	0.20		**Sheet Flow, TRAVEL PATH A TO B** Grass: Short n= 0.150 P2= 3.20"
0.4	80	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
1.6	100	0.0450	1.06		**Shallow Concentrated Flow, TARVEL PATH C TO D** Woodland Kv= 5.0 fps
0.6	100	0.0200	2.87		**Shallow Concentrated Flow, TARVEL PATH D TO E** Paved Kv= 20.3 fps
0.4	288	0.0250	12.22	21.59	**Pipe Channel, TARVEL PATH E TO F** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010
7.1	618	Total			

Subcatchment P-1: P-1



Summary for Subcatchment P-2: P-2

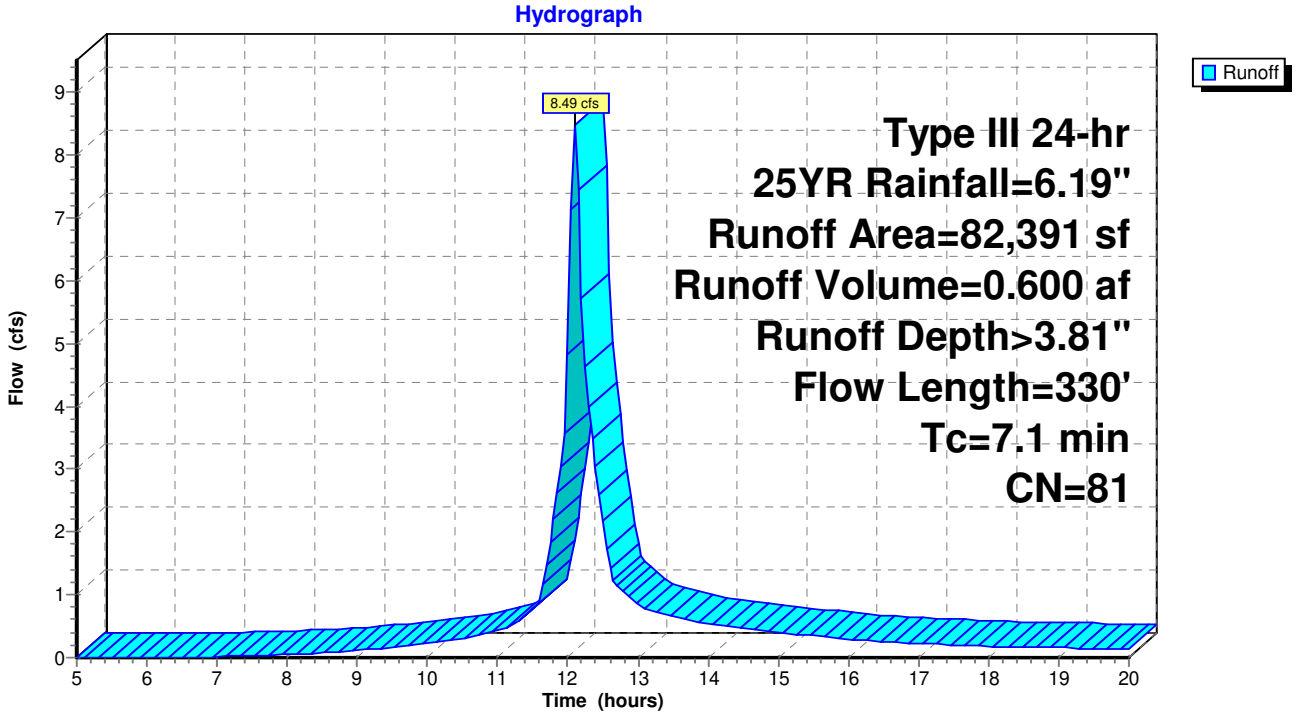
Runoff = 8.49 cfs @ 12.10 hrs, Volume= 0.600 af, Depth> 3.81"
Routed to Pond PND2 : BASIN#2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=6.19"

Area (sf)	CN	Description
27,755	98	Paved parking, HSG C
34,256	74	>75% Grass cover, Good, HSG C
20,380	70	Woods, Good, HSG C
82,391	81	Weighted Average
54,636		66.31% Pervious Area
27,755		33.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0450	0.19		**Sheet Flow, TRAVEL PATH A TO B** Cultivated: Residue>20% n= 0.170 P2= 3.20"
0.7	135	0.0450	3.42		**Shallow Concentrated Flow, TARVEL PATH B TO C** Unpaved Kv= 16.1 fps
1.9	145	0.0650	1.27		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
7.1	330	Total			

Subcatchment P-2: P-2



Summary for Subcatchment P-3: P-3

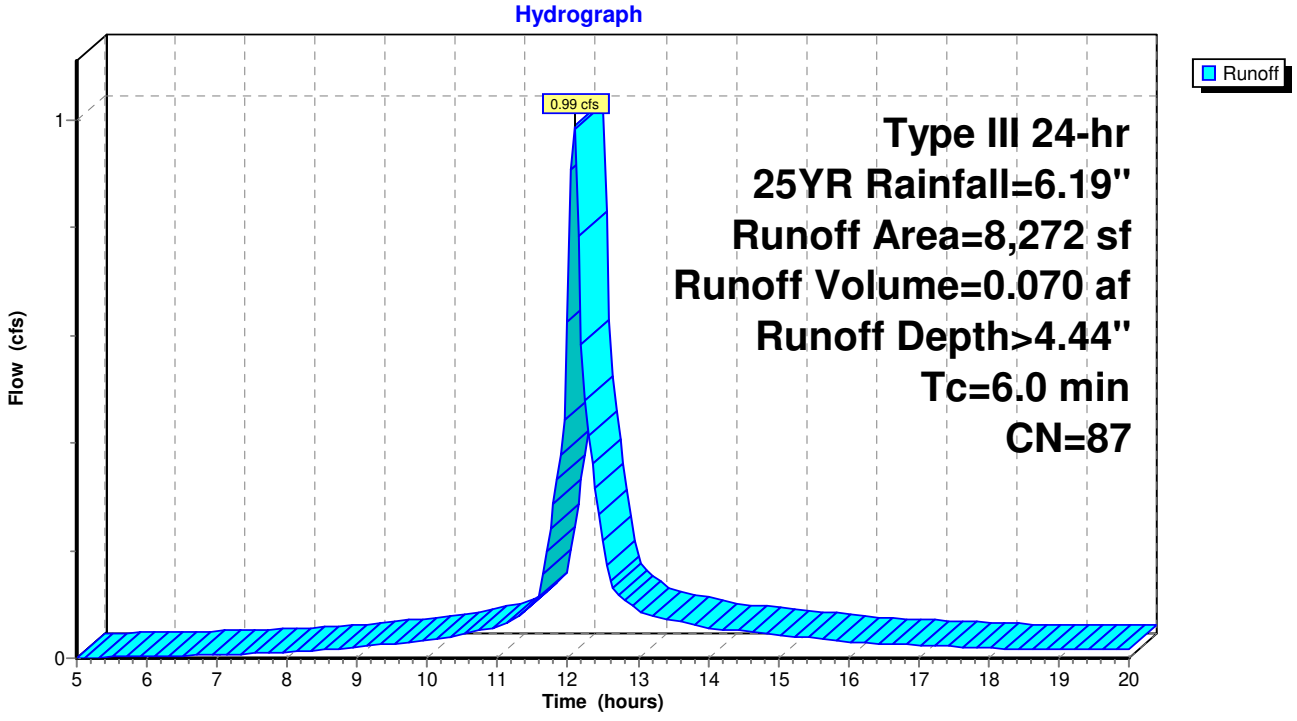
Runoff = 0.99 cfs @ 12.09 hrs, Volume= 0.070 af, Depth> 4.44"
Routed to Reach IP-P3 : EX. CULVERT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=6.19"

Area (sf)	CN	Description
4,498	98	Paved parking, HSG C
3,774	74	>75% Grass cover, Good, HSG C
8,272	87	Weighted Average
3,774		45.62% Pervious Area
4,498		54.38% Impervious Area

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

Subcatchment P-3: P-3



Summary for Subcatchment P-4: P-4

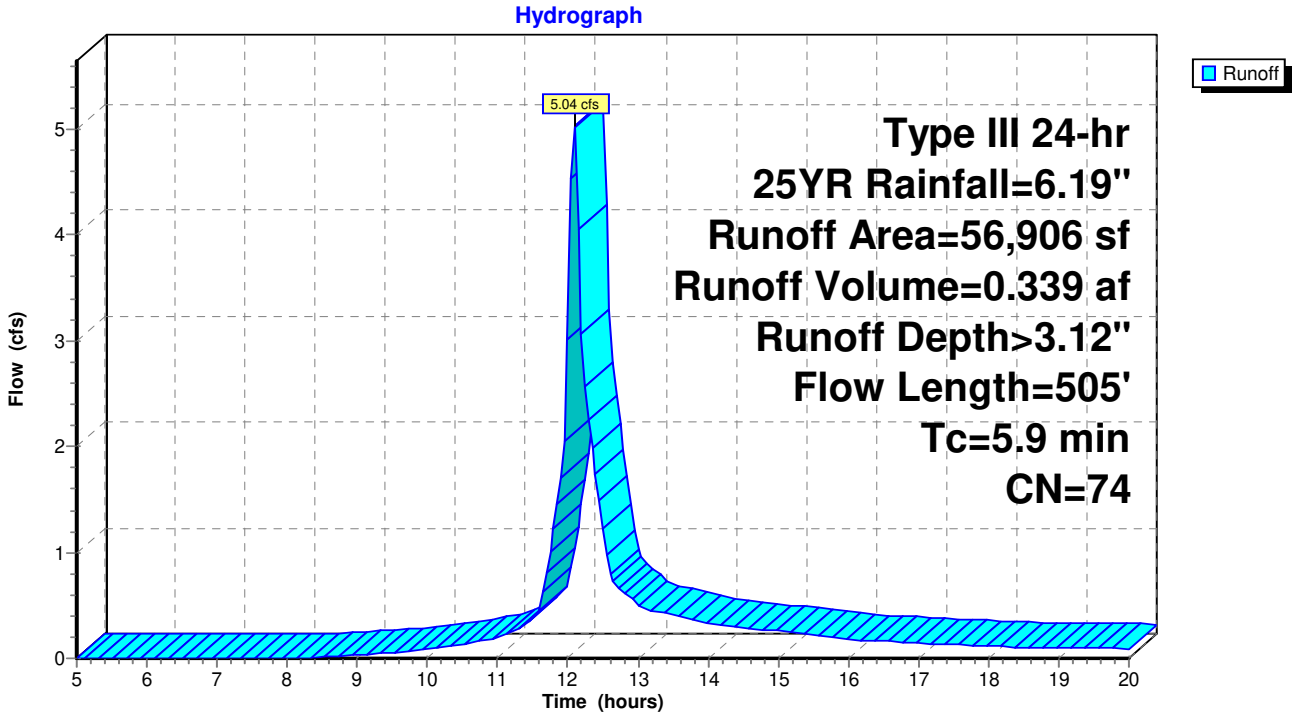
Runoff = 5.04 cfs @ 12.09 hrs, Volume= 0.339 af, Depth> 3.12"
Routed to Pond PND3 : BASIN3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=6.19"

Area (sf)	CN	Description
4,207	98	Paved parking, HSG C
22,144	74	>75% Grass cover, Good, HSG C
30,555	70	Woods, Good, HSG C
56,906	74	Weighted Average
52,699		92.61% Pervious Area
4,207		7.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0350	0.19		**Sheet Flow, TRAVEL PATHA TO B** Grass: Short n= 0.150 P2= 3.20"
0.4	80	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
0.5	100	0.4500	3.35		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
0.1	25	0.0250	3.21		**Shallow Concentrated Flow, TARVEL PATH D TO E** Paved Kv= 20.3 fps
0.4	250	0.0250	10.82	13.28	**Pipe Channel, TRAVEL PATH F TO E** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
5.9	505	Total			

Subcatchment P-4: P-4



Summary for Subcatchment P-5: P-5

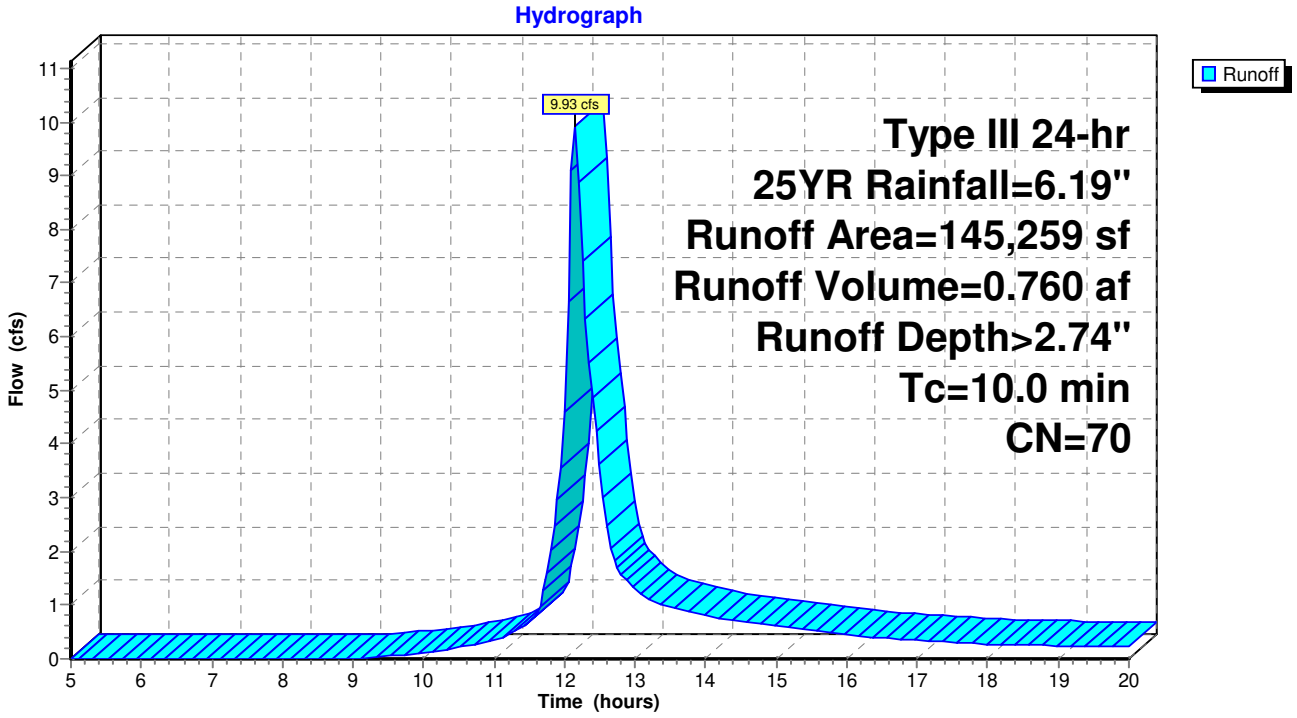
Runoff = 9.93 cfs @ 12.15 hrs, Volume= 0.760 af, Depth> 2.74"
Routed to Reach IP-P1 : 45 MAIN ST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=6.19"

Area (sf)	CN	Description
145,259	70	Woods, Good, HSG C
145,259		100.00% Pervious Area

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

Subcatchment P-5: P-5



Summary for Subcatchment P-6: P-6

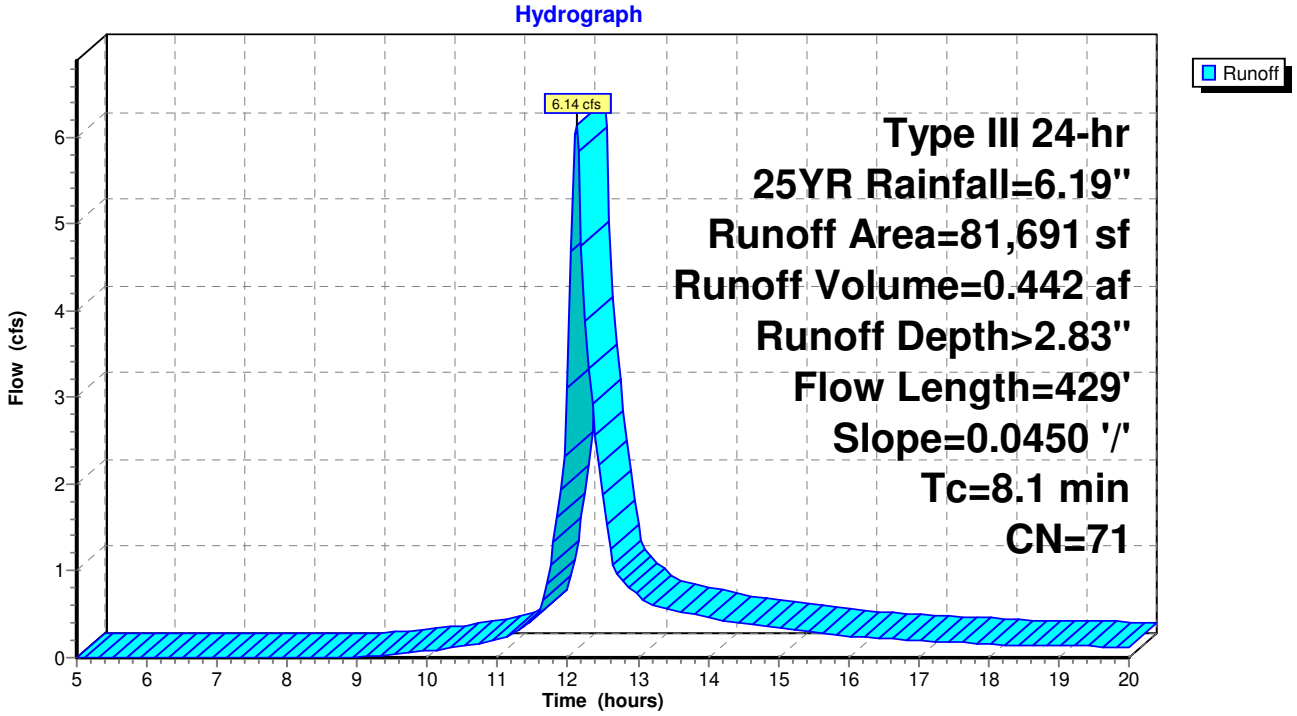
Runoff = 6.14 cfs @ 12.12 hrs, Volume= 0.442 af, Depth> 2.83"
Routed to Reach IP-P2 : SCHOOL ST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=6.19"

Area (sf)	CN	Description
13,023	74	>75% Grass cover, Good, HSG C
68,668	70	Woods, Good, HSG C
81,691	71	Weighted Average
81,691		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0450	0.20		**Sheet Flow, TRAVEL PATH A TO B** Grass: Short n= 0.150 P2= 3.20"
0.9	184	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
3.1	195	0.0450	1.06		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
8.1	429	Total			

Subcatchment P-6: P-6



Summary for Subcatchment P-7: BUILDING

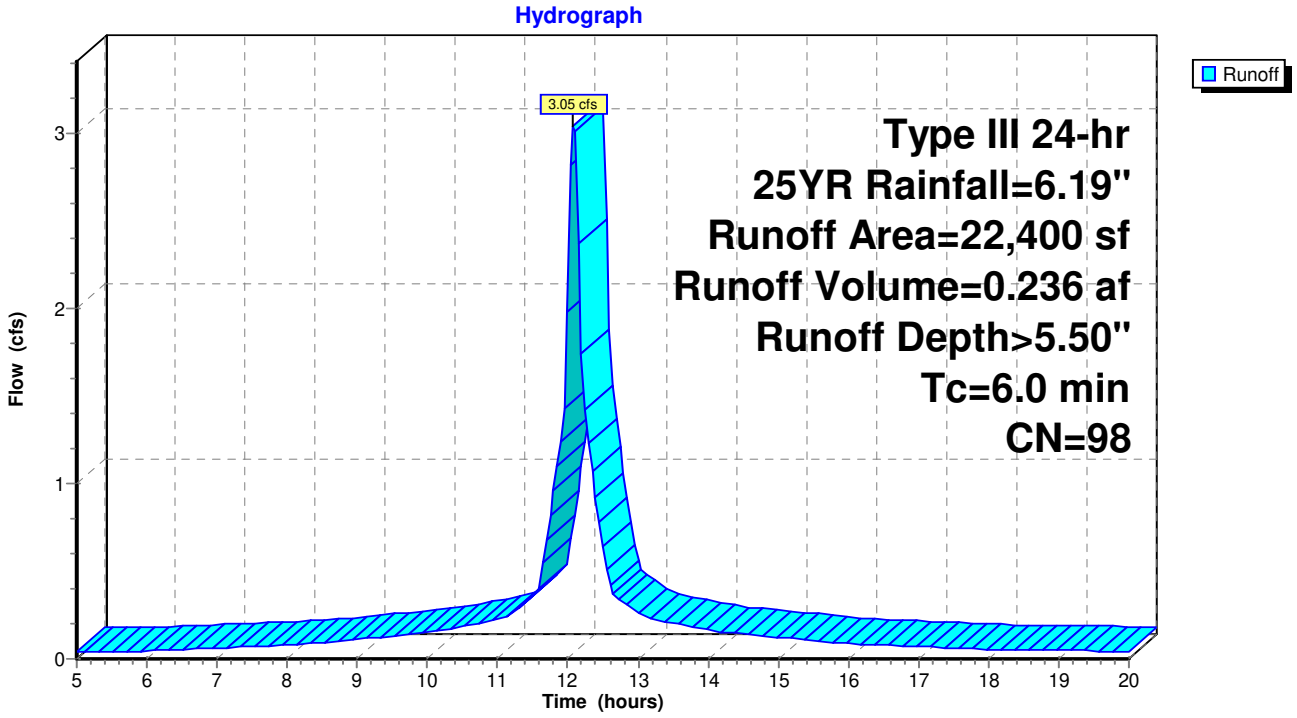
Runoff = 3.05 cfs @ 12.09 hrs, Volume= 0.236 af, Depth> 5.50"
Routed to Pond PND4 : U/G BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=6.19"

Area (sf)	CN	Description
22,400	98	Roofs, HSG C
22,400		100.00% Impervious Area

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

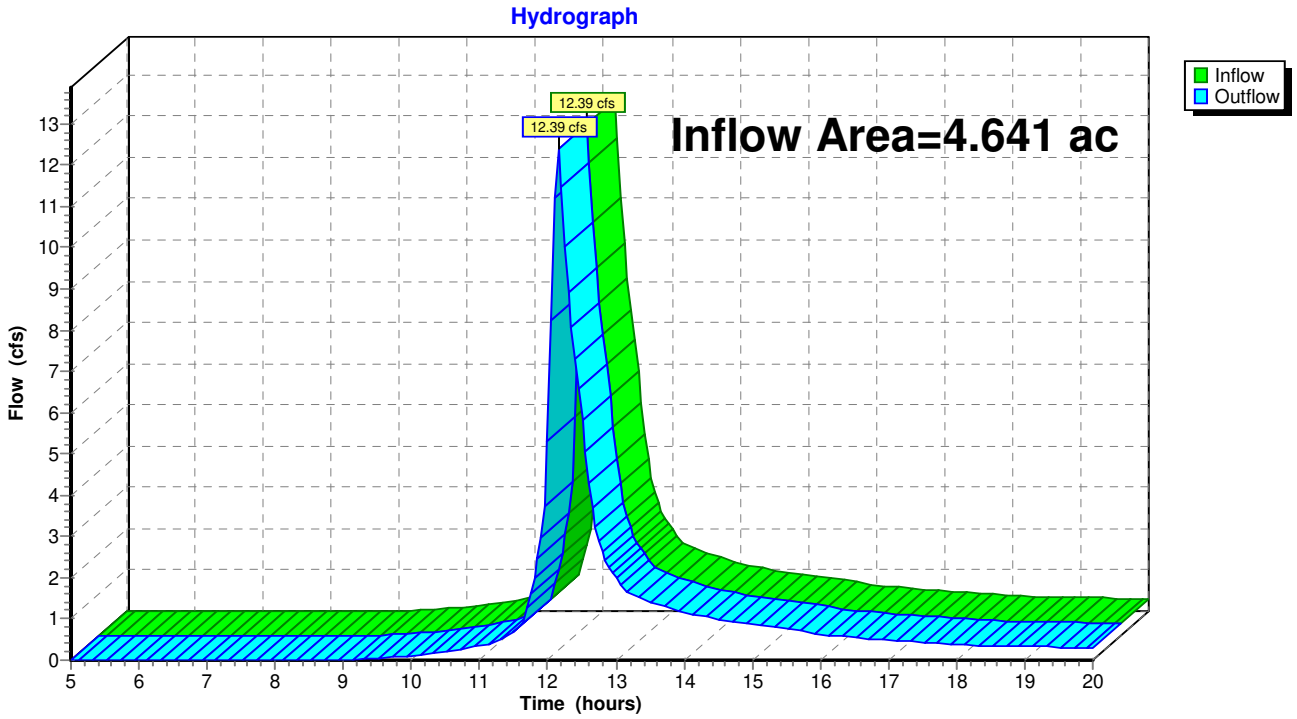
Subcatchment P-7: BUILDING



Summary for Reach IP-P1: 45 MAIN ST

Inflow Area = 4.641 ac, 2.08% Impervious, Inflow Depth > 2.67" for 25YR event
Inflow = 12.39 cfs @ 12.15 hrs, Volume= 0.982 af
Outflow = 12.39 cfs @ 12.15 hrs, Volume= 0.982 af, Atten= 0%, Lag= 0.0 min
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-P1: 45 MAIN ST

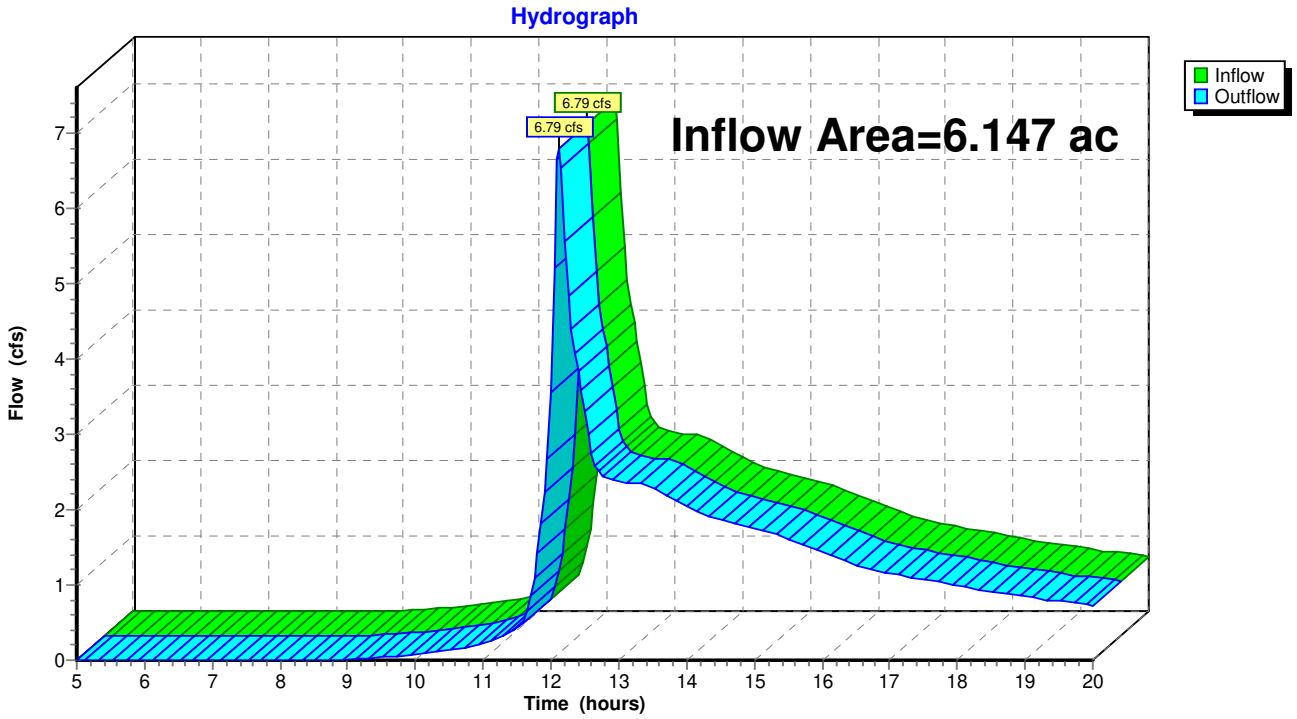


Summary for Reach IP-P2: SCHOOL ST

Inflow Area = 6.147 ac, 30.84% Impervious, Inflow Depth > 2.34" for 25YR event
Inflow = 6.79 cfs @ 12.12 hrs, Volume= 1.069 af
Outflow = 6.79 cfs @ 12.12 hrs, Volume= 1.069 af, Atten= 0%, Lag= 0.0

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-P2: SCHOOL ST

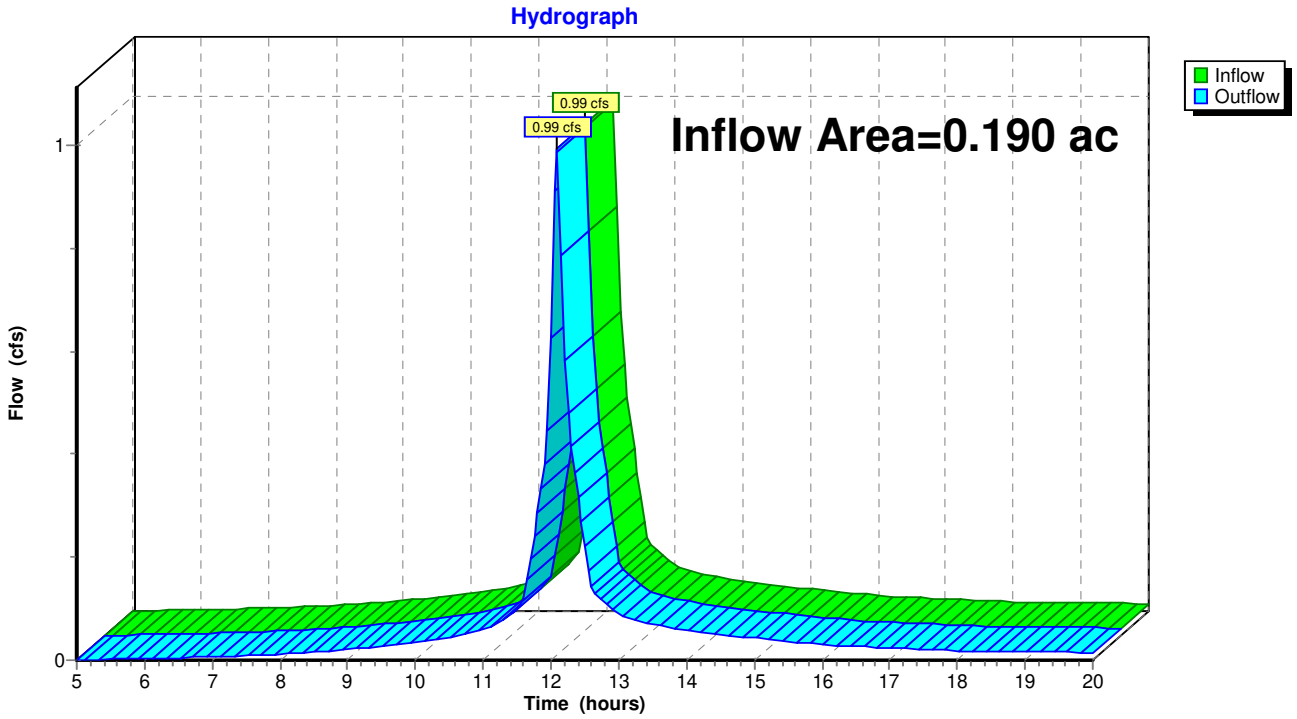


Summary for Reach IP-P3: EX. CULVERT

Inflow Area = 0.190 ac, 54.38% Impervious, Inflow Depth > 4.44" for 25YR event
Inflow = 0.99 cfs @ 12.09 hrs, Volume= 0.070 af
Outflow = 0.99 cfs @ 12.09 hrs, Volume= 0.070 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-P3: EX. CULVERT



Summary for Pond PND1: PND 1

Inflow Area = 2.380 ac, 52.89% Impervious, Inflow Depth > 3.50" for 25YR event
Inflow = 8.57 cfs @ 12.10 hrs, Volume= 0.695 af
Outflow = 1.18 cfs @ 12.93 hrs, Volume= 0.520 af, Atten= 86%, Lag= 49.8 min
Discarded = 0.03 cfs @ 12.93 hrs, Volume= 0.021 af
Primary = 1.15 cfs @ 12.93 hrs, Volume= 0.499 af
Routed to Reach IP-P2 : SCHOOL ST

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 327.51' @ 12.93 hrs Surf.Area= 4,882 sf Storage= 15,275 cf

Plug-Flow detention time= 190.7 min calculated for 0.518 af (75% of inflow)
Center-of-Mass det. time= 128.2 min (918.3 - 790.2)

Volume	Invert	Avail.Storage	Storage Description
#1	322.00'	23,430 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

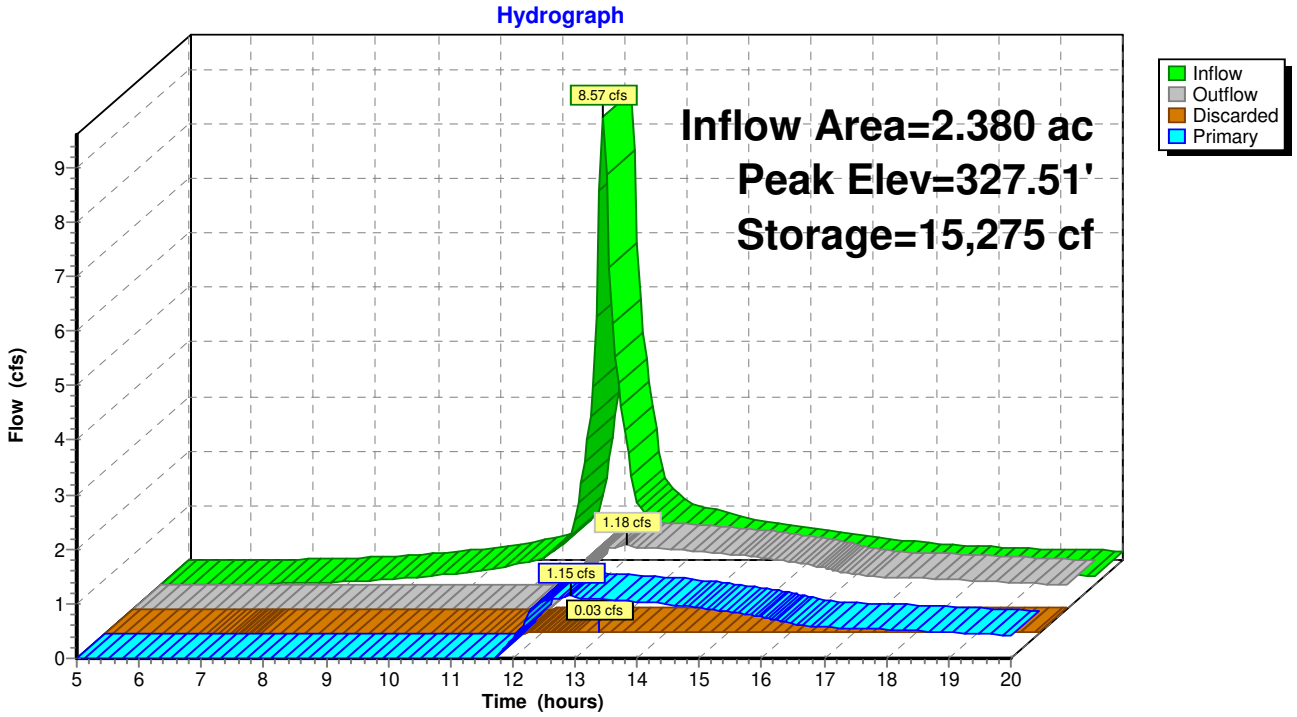
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
322.00	1,030	0	0
324.00	2,125	3,155	3,155
326.00	3,600	5,725	8,880
328.00	5,300	8,900	17,780
329.00	6,000	5,650	23,430

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	324.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	326.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	327.50'	**15.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 12.93 hrs HW=327.51' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=1.12 cfs @ 12.93 hrs HW=327.51' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 0.71 cfs @ 8.12 fps)
├**3=Orifice/Grate** (Orifice Controls 0.39 cfs @ 4.42 fps)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 0.03 cfs @ 0.24 fps)

Pond PND1: PND 1



Summary for Pond PND2: BASIN#2

Inflow Area = 1.891 ac, 33.69% Impervious, Inflow Depth > 3.81" for 25YR event
Inflow = 8.49 cfs @ 12.10 hrs, Volume= 0.600 af
Outflow = 0.70 cfs @ 13.32 hrs, Volume= 0.286 af, Atten= 92%, Lag= 72.9 min
Discarded = 0.03 cfs @ 13.32 hrs, Volume= 0.027 af
Primary = 0.67 cfs @ 13.32 hrs, Volume= 0.259 af
Routed to Reach IP-P2 : SCHOOL ST

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 328.02' @ 13.32 hrs Surf.Area= 4,712 sf Storage= 16,530 cf

Plug-Flow detention time= 230.1 min calculated for 0.286 af (48% of inflow)
Center-of-Mass det. time= 145.6 min (924.0 - 778.4)

Volume	Invert	Avail.Storage	Storage Description
#1	324.00'	20,173 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 21,436 cf Overall - 1,263 cf Embedded = 20,173 cf
#2	324.00'	1,263 cf	**Cultec R-330XLHD** x 24 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
		21,436 cf	Total Available Storage

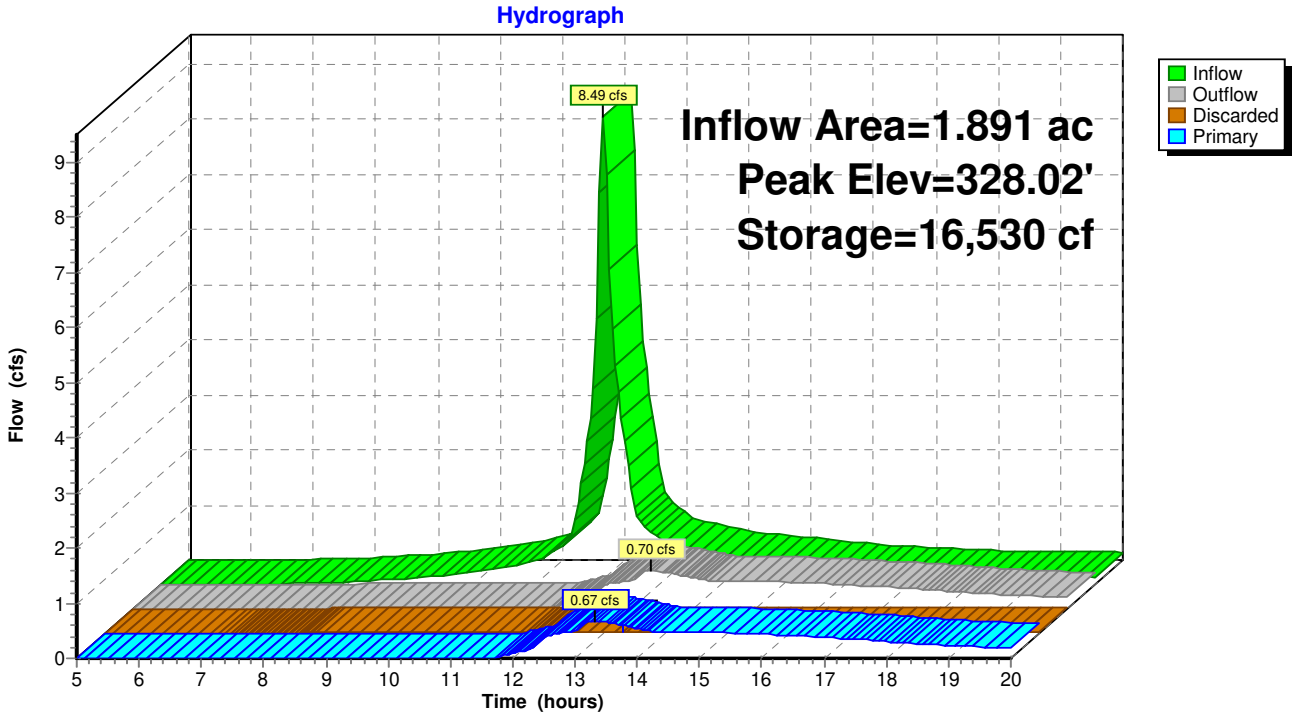
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
324.00	3,312	0	0
326.00	4,212	7,524	7,524
328.00	4,700	8,912	16,436
329.00	5,300	5,000	21,436

Device	Routing	Invert	Outlet Devices
#1	Discarded	324.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	325.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	327.30'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	328.00'	**15.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 13.32 hrs HW=328.02' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.61 cfs @ 13.32 hrs HW=328.02' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 0.18 cfs @ 8.25 fps)
├**3=Orifice/Grate** (Orifice Controls 0.31 cfs @ 3.58 fps)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 0.11 cfs @ 0.38 fps)

Pond PND2: BASIN#2



Summary for Pond PND3: BASIN3

Inflow Area = 1.306 ac, 7.39% Impervious, Inflow Depth > 3.12" for 25YR event
Inflow = 5.04 cfs @ 12.09 hrs, Volume= 0.339 af
Outflow = 2.63 cfs @ 12.25 hrs, Volume= 0.279 af, Atten= 48%, Lag= 9.4 min
Discarded = 0.01 cfs @ 12.25 hrs, Volume= 0.008 af
Primary = 2.61 cfs @ 12.25 hrs, Volume= 0.271 af
Routed to Reach IP-P1 : 45 MAIN ST

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 333.61' @ 12.25 hrs Surf.Area= 1,909 sf Storage= 4,715 cf

Plug-Flow detention time= 83.6 min calculated for 0.278 af (82% of inflow)
Center-of-Mass det. time= 34.9 min (826.4 - 791.5)

Volume	Invert	Avail.Storage	Storage Description
#1	330.00'	7,937 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

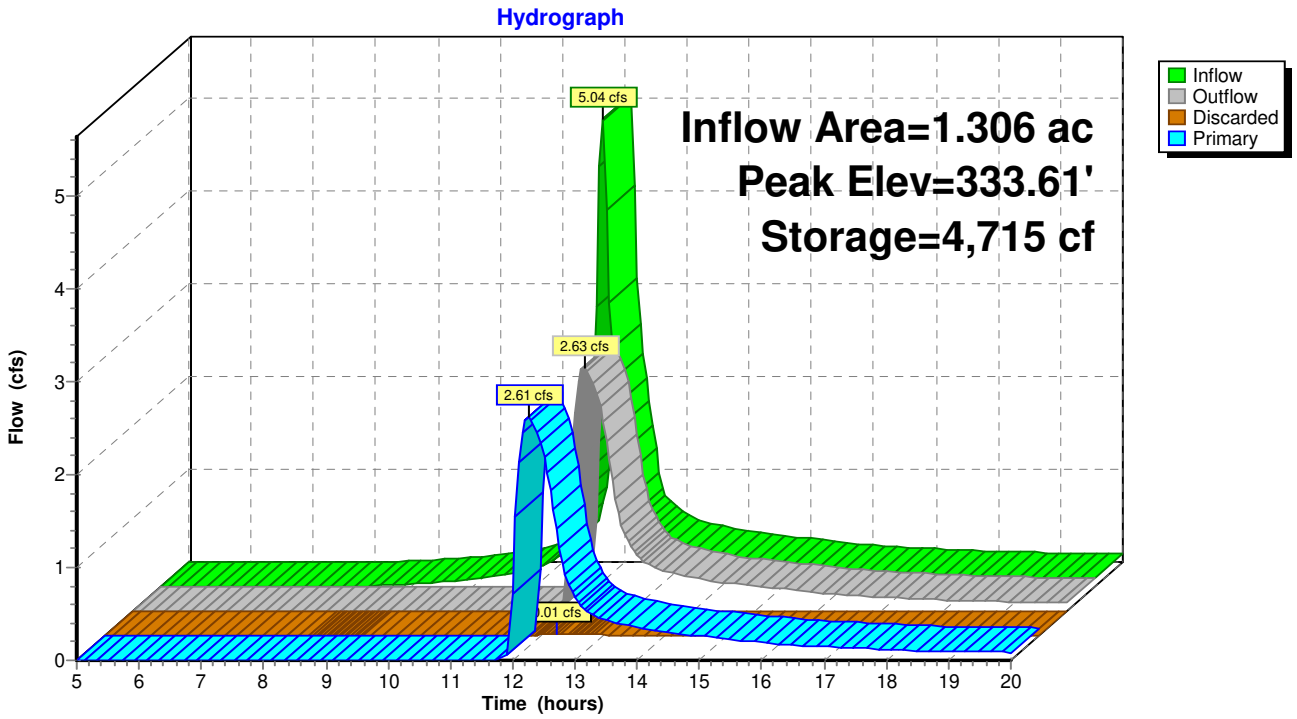
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
330.00	925	0	0
332.00	1,250	2,175	2,175
334.00	2,070	3,320	5,495
335.00	2,814	2,442	7,937

Device	Routing	Invert	Outlet Devices
#1	Discarded	330.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	332.20'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	334.00'	**20.0' 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

Discarded OutFlow Max=0.01 cfs @ 12.25 hrs HW=333.61' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=2.61 cfs @ 12.25 hrs HW=333.61' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 2.61 cfs @ 4.79 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PND3: BASIN3



Summary for Pond PND4: U/G BASIN

Inflow Area = 0.514 ac,100.00% Impervious, Inflow Depth > 5.50" for 25YR event
Inflow = 3.05 cfs @ 12.09 hrs, Volume= 0.236 af
Outflow = 0.29 cfs @ 12.91 hrs, Volume= 0.114 af, Atten= 91%, Lag= 49.6 min
Discarded = 0.02 cfs @ 6.15 hrs, Volume= 0.027 af
Primary = 0.26 cfs @ 12.91 hrs, Volume= 0.086 af
Routed to Pond PND1 : PND 1

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 327.06' @ 12.91 hrs Surf.Area= 3,637 sf Storage= 6,531 cf

Plug-Flow detention time= 225.0 min calculated for 0.114 af (48% of inflow)
Center-of-Mass det. time= 124.9 min (858.9 - 734.0)

Volume	Invert	Avail.Storage	Storage Description
#1	325.00'	2,587 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 12,739 cf Overall - 6,270 cf Embedded = 6,468 cf x 40.0% Voids
#2	325.00'	6,270 cf	**Cultec R-330XLHD** x 120 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
		8,857 cf	Total Available Storage

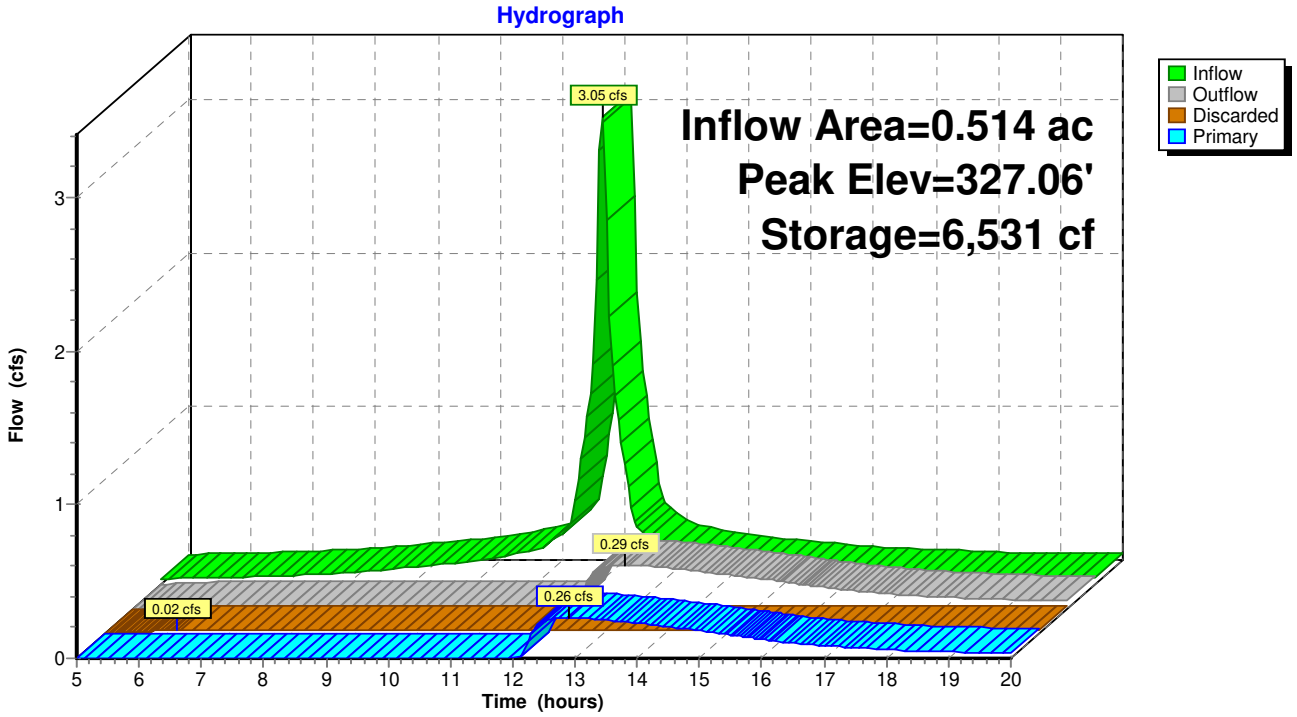
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
325.00	3,673	0	0
325.50	3,637	1,828	1,828
328.00	3,637	9,093	10,920
328.50	3,637	1,819	12,739

Device	Routing	Invert	Outlet Devices
#1	Discarded	325.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	326.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 6.15 hrs HW=325.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.26 cfs @ 12.91 hrs HW=327.06' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 0.26 cfs @ 3.03 fps)

Pond PND4: U/G BASIN



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1: P-1 Runoff Area=81,268 sf 39.90% Impervious Runoff Depth>5.39"
Flow Length=618' Tc=7.1 min CN=82 Runoff=11.63 cfs 0.838 af

Subcatchment P-2: P-2 Runoff Area=82,391 sf 33.69% Impervious Runoff Depth>5.28"
Flow Length=330' Tc=7.1 min CN=81 Runoff=11.59 cfs 0.832 af

Subcatchment P-3: P-3 Runoff Area=8,272 sf 54.38% Impervious Runoff Depth>5.96"
Tc=6.0 min CN=87 Runoff=1.31 cfs 0.094 af

Subcatchment P-4: P-4 Runoff Area=56,906 sf 7.39% Impervious Runoff Depth>4.49"
Flow Length=505' Tc=5.9 min CN=74 Runoff=7.19 cfs 0.488 af

Subcatchment P-5: P-5 Runoff Area=145,259 sf 0.00% Impervious Runoff Depth>4.04"
Tc=10.0 min CN=70 Runoff=14.64 cfs 1.122 af

Subcatchment P-6: P-6 Runoff Area=81,691 sf 0.00% Impervious Runoff Depth>4.15"
Flow Length=429' Slope=0.0450 '/' Tc=8.1 min CN=71 Runoff=8.98 cfs 0.649 af

Subcatchment P-7: BUILDING Runoff Area=22,400 sf 100.00% Impervious Runoff Depth>7.01"
Tc=6.0 min CN=98 Runoff=3.87 cfs 0.300 af

Reach IP-P1: 45 MAIN ST Inflow=20.11 cfs 1.435 af
Outflow=20.11 cfs 1.435 af

Reach IP-P2: SCHOOL ST Inflow=16.29 cfs 1.567 af
Outflow=16.29 cfs 1.567 af

Reach IP-P3: EX. CULVERT Inflow=1.31 cfs 0.094 af
Outflow=1.31 cfs 0.094 af

Pond PND1: PND 1 Peak Elev=327.76' Storage=16,522 cf Inflow=11.81 cfs 0.987 af
Discarded=0.03 cfs 0.024 af Primary=6.47 cfs 0.760 af Outflow=6.50 cfs 0.783 af

Pond PND2: BASIN#2 Peak Elev=328.24' Storage=17,589 cf Inflow=11.59 cfs 0.832 af
Discarded=0.03 cfs 0.029 af Primary=5.37 cfs 0.478 af Outflow=5.40 cfs 0.508 af

Pond PND3: BASIN3 Peak Elev=334.13' Storage=5,778 cf Inflow=7.19 cfs 0.488 af
Discarded=0.01 cfs 0.009 af Primary=5.60 cfs 0.419 af Outflow=5.62 cfs 0.427 af

Pond PND4: U/G BASIN Peak Elev=327.94' Storage=8,045 cf Inflow=3.87 cfs 0.300 af
Discarded=0.02 cfs 0.028 af Primary=0.47 cfs 0.149 af Outflow=0.50 cfs 0.177 af

Total Runoff Area = 10.978 ac Runoff Volume = 4.323 af Average Runoff Depth = 4.73"
80.91% Pervious = 8.882 ac 19.09% Impervious = 2.096 ac

Summary for Subcatchment P-1: P-1

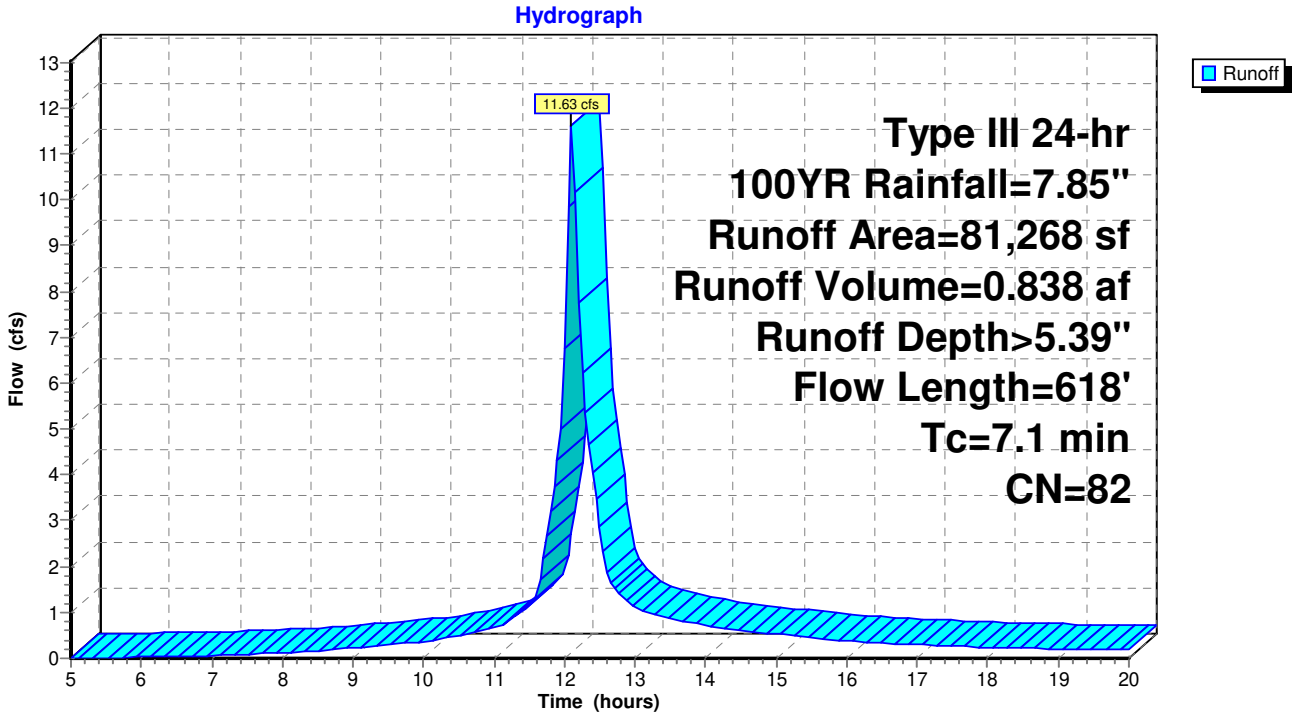
Runoff = 11.63 cfs @ 12.10 hrs, Volume= 0.838 af, Depth> 5.39"
Routed to Pond PND1 : PND 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100YR Rainfall=7.85"

Area (sf)	CN	Description
32,428	98	Paved parking, HSG C
26,882	74	>75% Grass cover, Good, HSG C
21,958	70	Woods, Good, HSG C
81,268	82	Weighted Average
48,840		60.10% Pervious Area
32,428		39.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0450	0.20		**Sheet Flow, TRAVEL PATH A TO B** Grass: Short n= 0.150 P2= 3.20"
0.4	80	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
1.6	100	0.0450	1.06		**Shallow Concentrated Flow, TARVEL PATH C TO D** Woodland Kv= 5.0 fps
0.6	100	0.0200	2.87		**Shallow Concentrated Flow, TARVEL PATH D TO E** Paved Kv= 20.3 fps
0.4	288	0.0250	12.22	21.59	**Pipe Channel, TARVEL PATH E TO F** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010
7.1	618	Total			

Subcatchment P-1: P-1



Summary for Subcatchment P-2: P-2

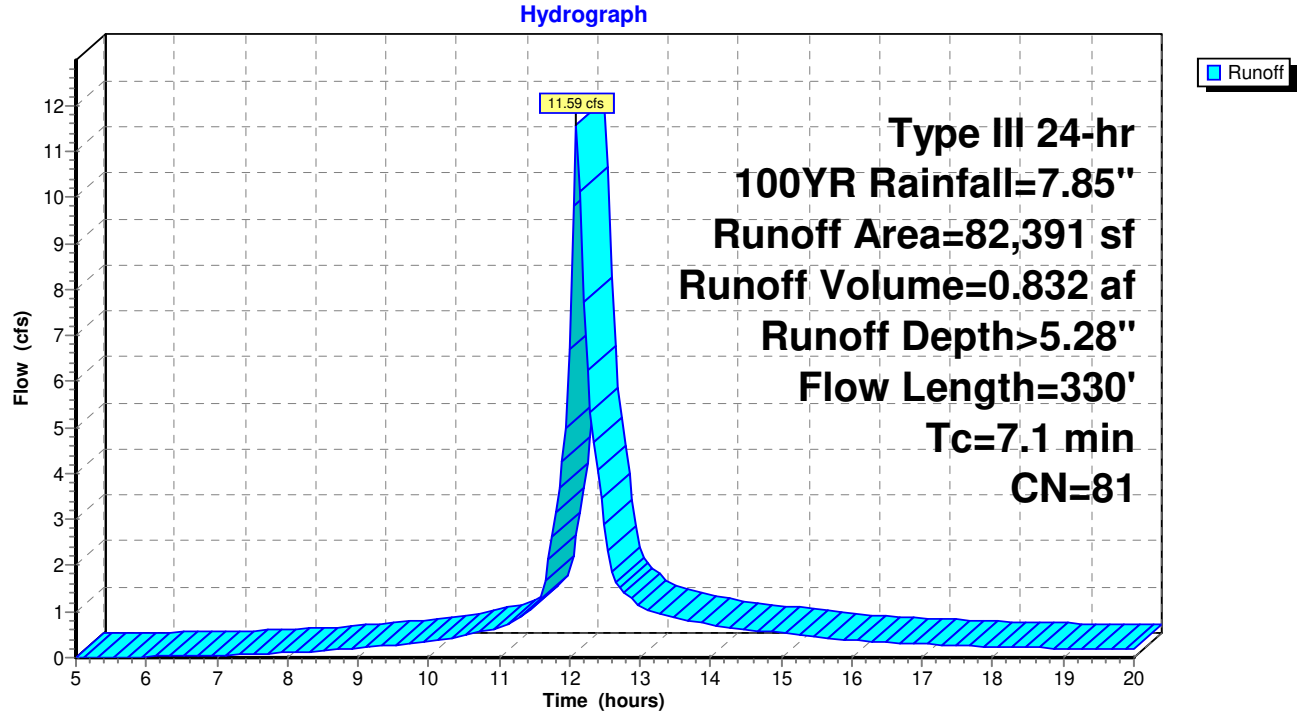
Runoff = 11.59 cfs @ 12.10 hrs, Volume= 0.832 af, Depth> 5.28"
Routed to Pond PND2 : BASIN#2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100YR Rainfall=7.85"

Area (sf)	CN	Description
27,755	98	Paved parking, HSG C
34,256	74	>75% Grass cover, Good, HSG C
20,380	70	Woods, Good, HSG C
82,391	81	Weighted Average
54,636		66.31% Pervious Area
27,755		33.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0450	0.19		**Sheet Flow, TRAVEL PATH A TO B** Cultivated: Residue>20% n= 0.170 P2= 3.20"
0.7	135	0.0450	3.42		**Shallow Concentrated Flow, TARVEL PATH B TO C** Unpaved Kv= 16.1 fps
1.9	145	0.0650	1.27		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
7.1	330	Total			

Subcatchment P-2: P-2



Summary for Subcatchment P-3: P-3

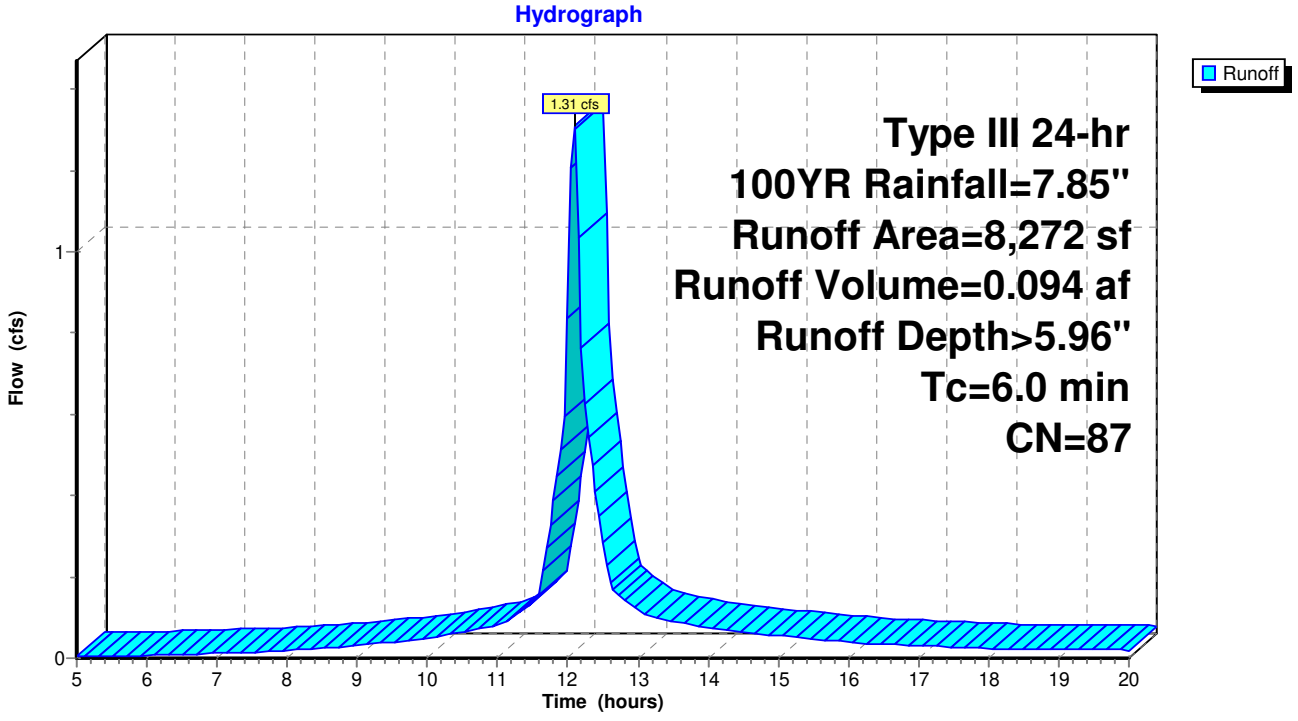
Runoff = 1.31 cfs @ 12.09 hrs, Volume= 0.094 af, Depth> 5.96"
Routed to Reach IP-P3 : EX. CULVERT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100YR Rainfall=7.85"

Area (sf)	CN	Description
4,498	98	Paved parking, HSG C
3,774	74	>75% Grass cover, Good, HSG C
8,272	87	Weighted Average
3,774		45.62% Pervious Area
4,498		54.38% Impervious Area

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

Subcatchment P-3: P-3



Summary for Subcatchment P-4: P-4

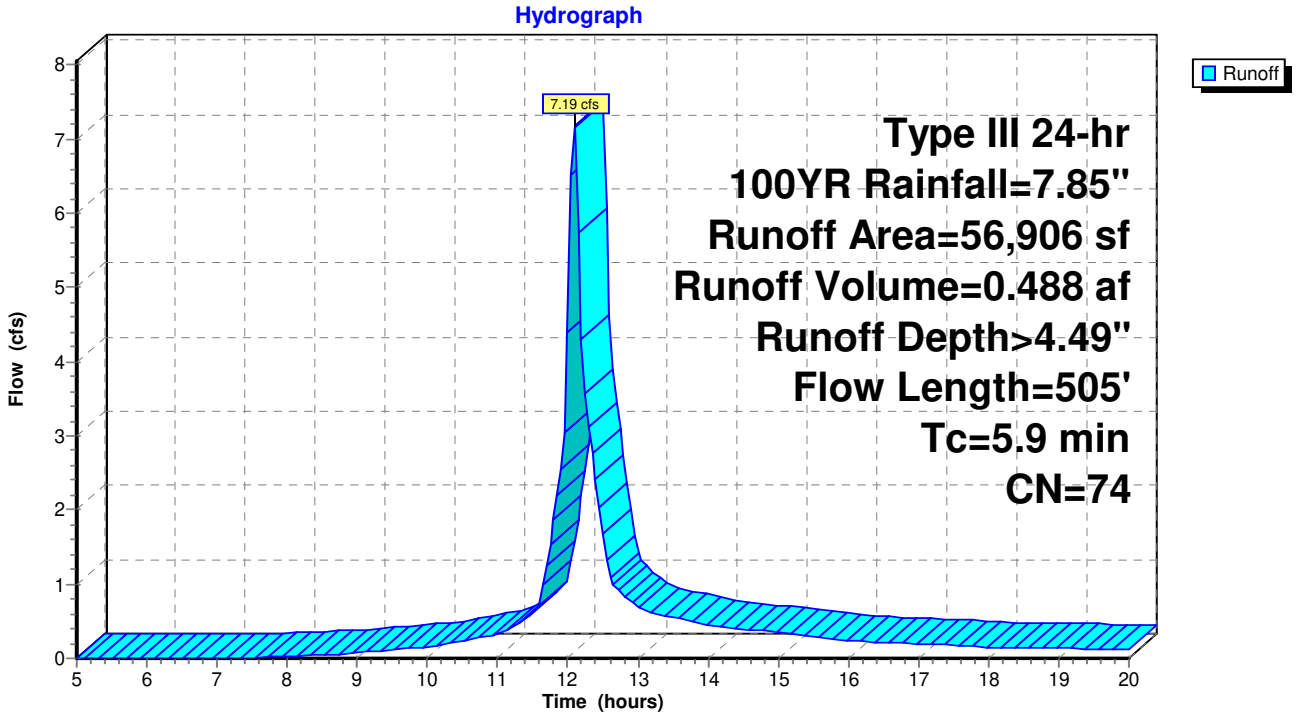
Runoff = 7.19 cfs @ 12.09 hrs, Volume= 0.488 af, Depth> 4.49"
Routed to Pond PND3 : BASIN3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100YR Rainfall=7.85"

Area (sf)	CN	Description
4,207	98	Paved parking, HSG C
22,144	74	>75% Grass cover, Good, HSG C
30,555	70	Woods, Good, HSG C
56,906	74	Weighted Average
52,699		92.61% Pervious Area
4,207		7.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0350	0.19		**Sheet Flow, TRAVEL PATHA TO B** Grass: Short n= 0.150 P2= 3.20"
0.4	80	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
0.5	100	0.4500	3.35		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
0.1	25	0.0250	3.21		**Shallow Concentrated Flow, TARVEL PATH D TO E** Paved Kv= 20.3 fps
0.4	250	0.0250	10.82	13.28	**Pipe Channel, TRAVEL PATH F TO E** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
5.9	505	Total			

Subcatchment P-4: P-4



Summary for Subcatchment P-5: P-5

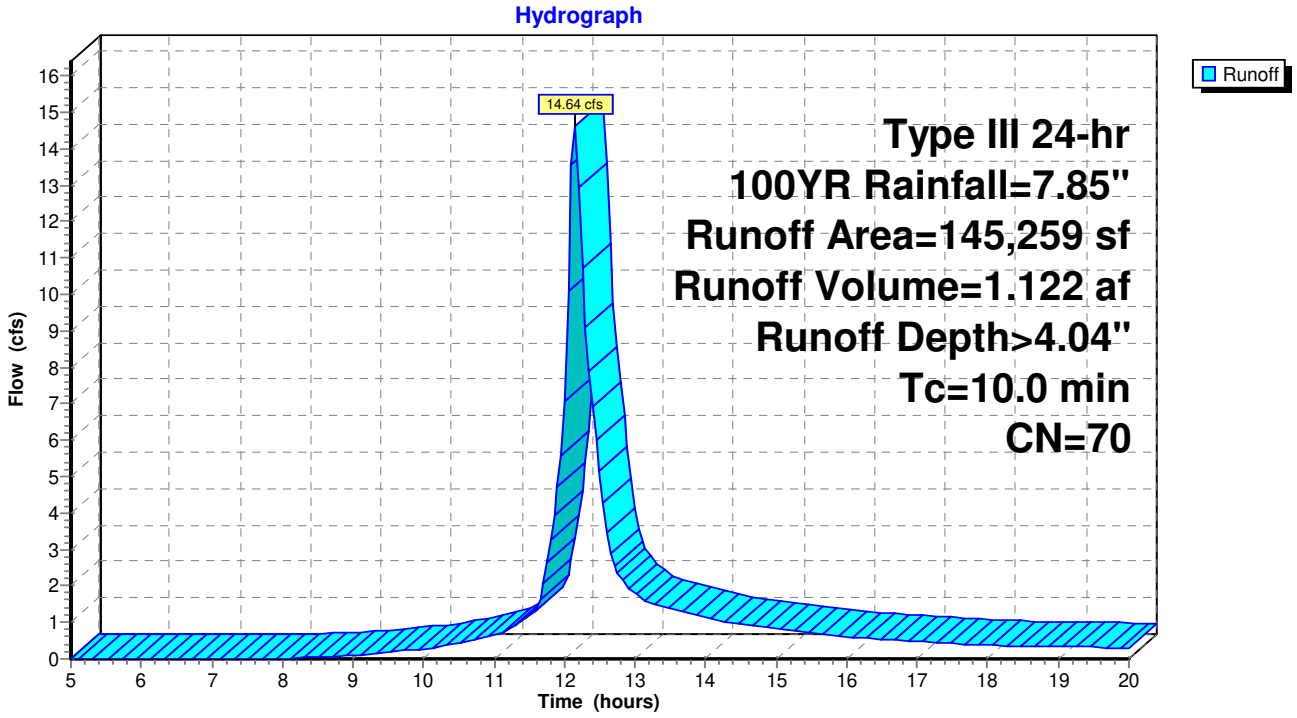
Runoff = 14.64 cfs @ 12.14 hrs, Volume= 1.122 af, Depth> 4.04"
Routed to Reach IP-P1 : 45 MAIN ST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100YR Rainfall=7.85"

Area (sf)	CN	Description
145,259	70	Woods, Good, HSG C
145,259		100.00% Pervious Area

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

Subcatchment P-5: P-5



Summary for Subcatchment P-6: P-6

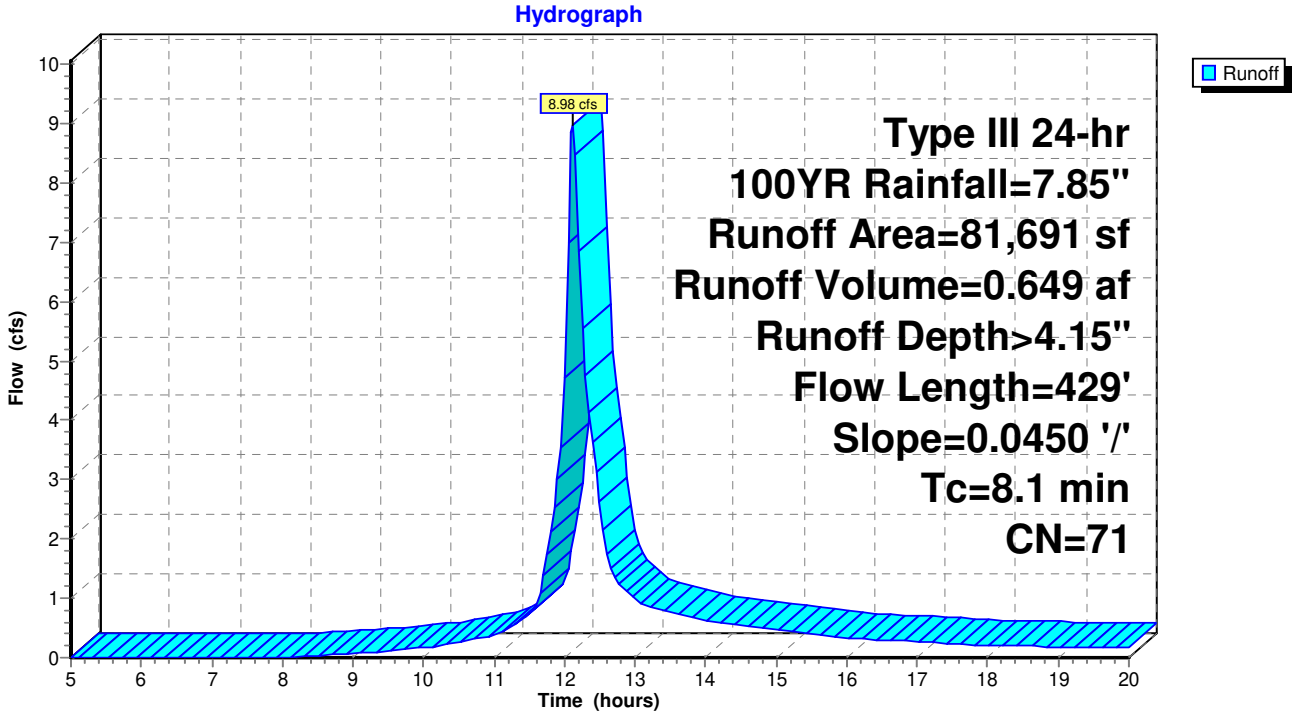
Runoff = 8.98 cfs @ 12.12 hrs, Volume= 0.649 af, Depth> 4.15"
Routed to Reach IP-P2 : SCHOOL ST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100YR Rainfall=7.85"

Area (sf)	CN	Description
13,023	74	>75% Grass cover, Good, HSG C
68,668	70	Woods, Good, HSG C
81,691	71	Weighted Average
81,691		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0450	0.20		**Sheet Flow, TRAVEL PATH A TO B** Grass: Short n= 0.150 P2= 3.20"
0.9	184	0.0450	3.42		**Shallow Concentrated Flow, TRAVEL PATH B TO C** Unpaved Kv= 16.1 fps
3.1	195	0.0450	1.06		**Shallow Concentrated Flow, TRAVEL PATH C TO D** Woodland Kv= 5.0 fps
8.1	429	Total			

Subcatchment P-6: P-6



Summary for Subcatchment P-7: BUILDING

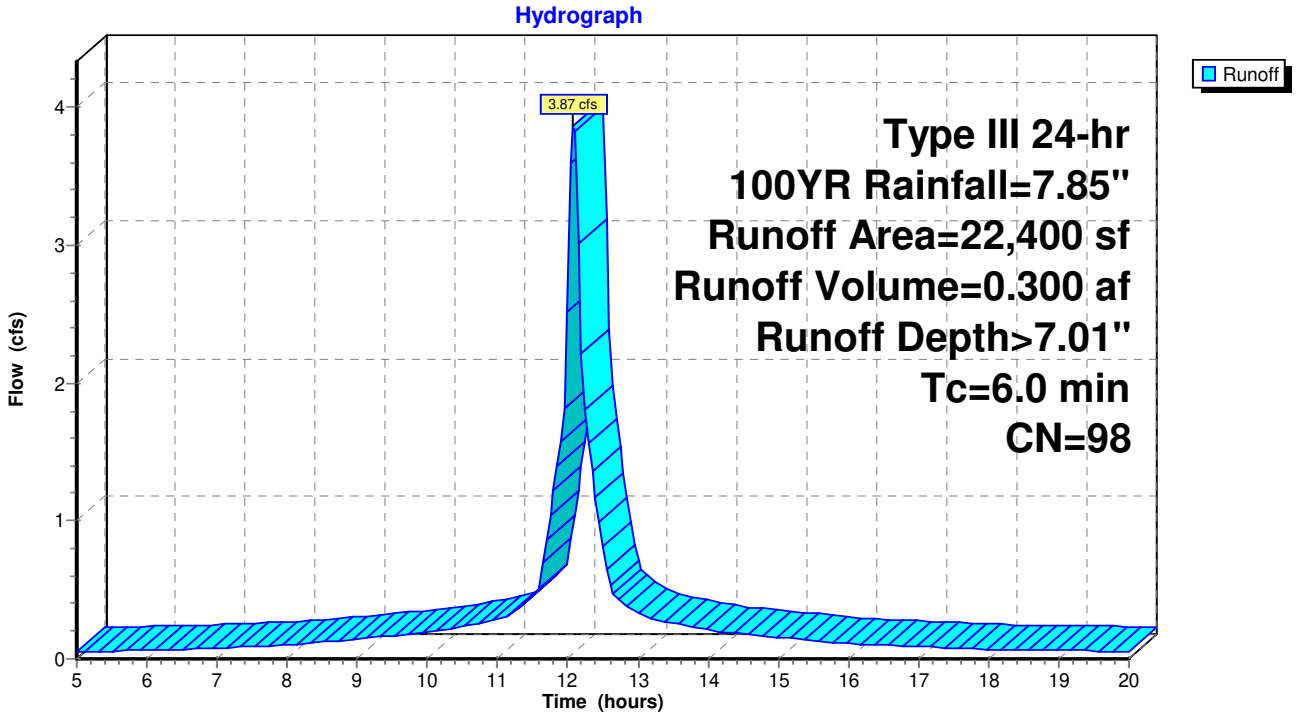
Runoff = 3.87 cfs @ 12.09 hrs, Volume= 0.300 af, Depth> 7.01"
Routed to Pond PND4 : U/G BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100YR Rainfall=7.85"

Area (sf)	CN	Description
22,400	98	Roofs, HSG C
22,400		100.00% Impervious Area

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

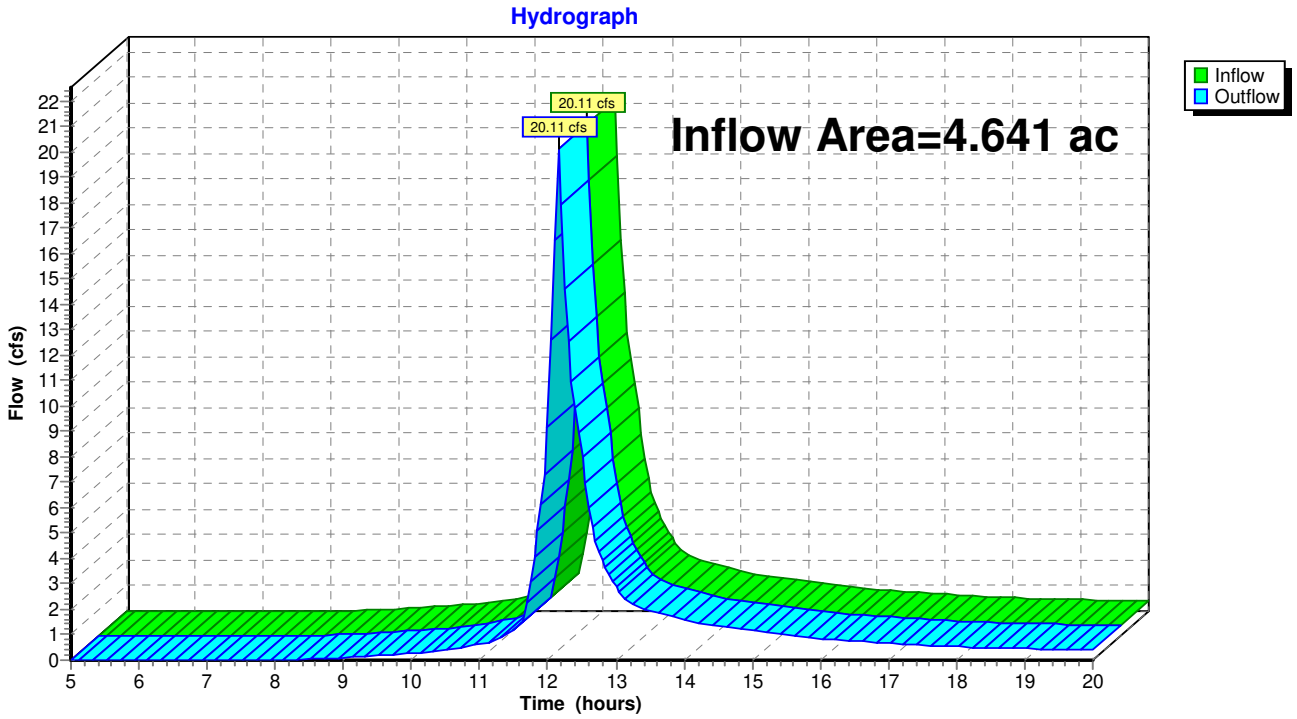
Subcatchment P-7: BUILDING



Summary for Reach IP-P1: 45 MAIN ST

Inflow Area = 4.641 ac, 2.08% Impervious, Inflow Depth > 3.98" for 100YR event
Inflow = 20.11 cfs @ 12.16 hrs, Volume= 1.435 af
Outflow = 20.11 cfs @ 12.16 hrs, Volume= 1.435 af, Atten= 0%, Lag= 0.0 min
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-P1: 45 MAIN ST

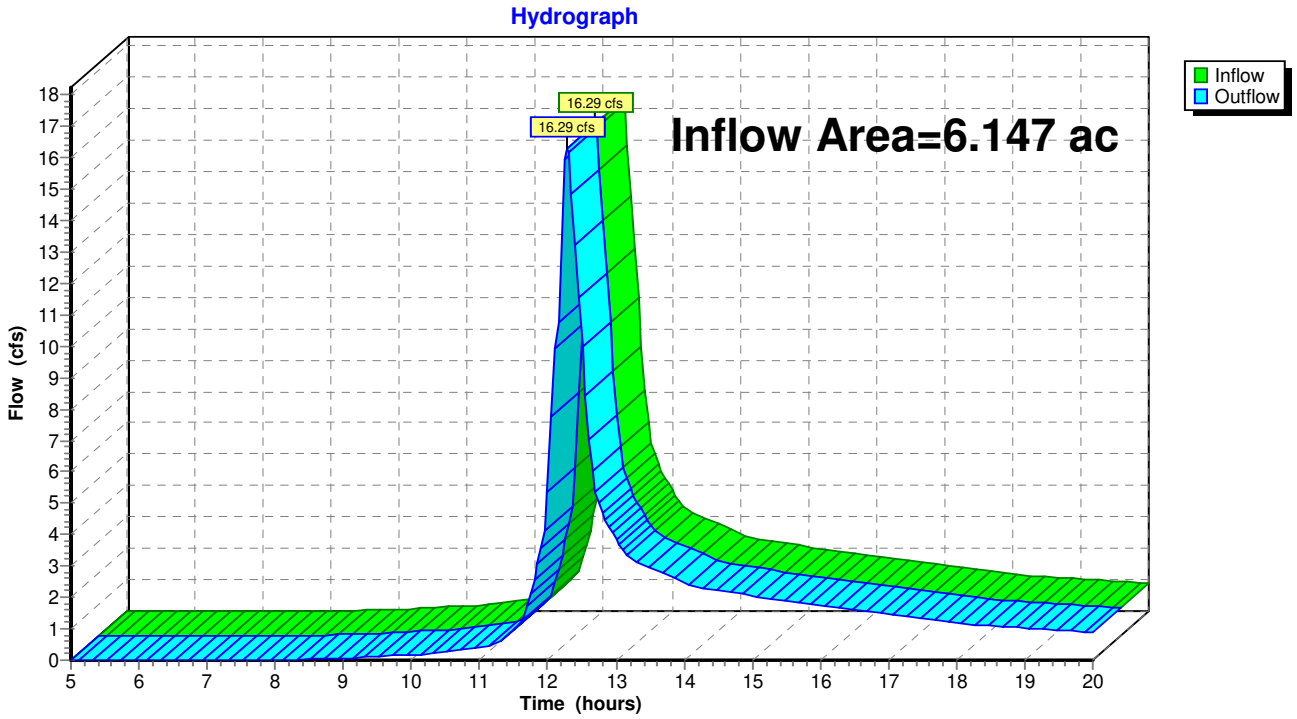


Summary for Reach IP-P2: SCHOOL ST

Inflow Area = 6.147 ac, 30.84% Impervious, Inflow Depth > 3.68" for 100YR event
Inflow = 16.29 cfs @ 12.28 hrs, Volume= 1.567 af
Outflow = 16.29 cfs @ 12.28 hrs, Volume= 1.567 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-P2: SCHOOL ST

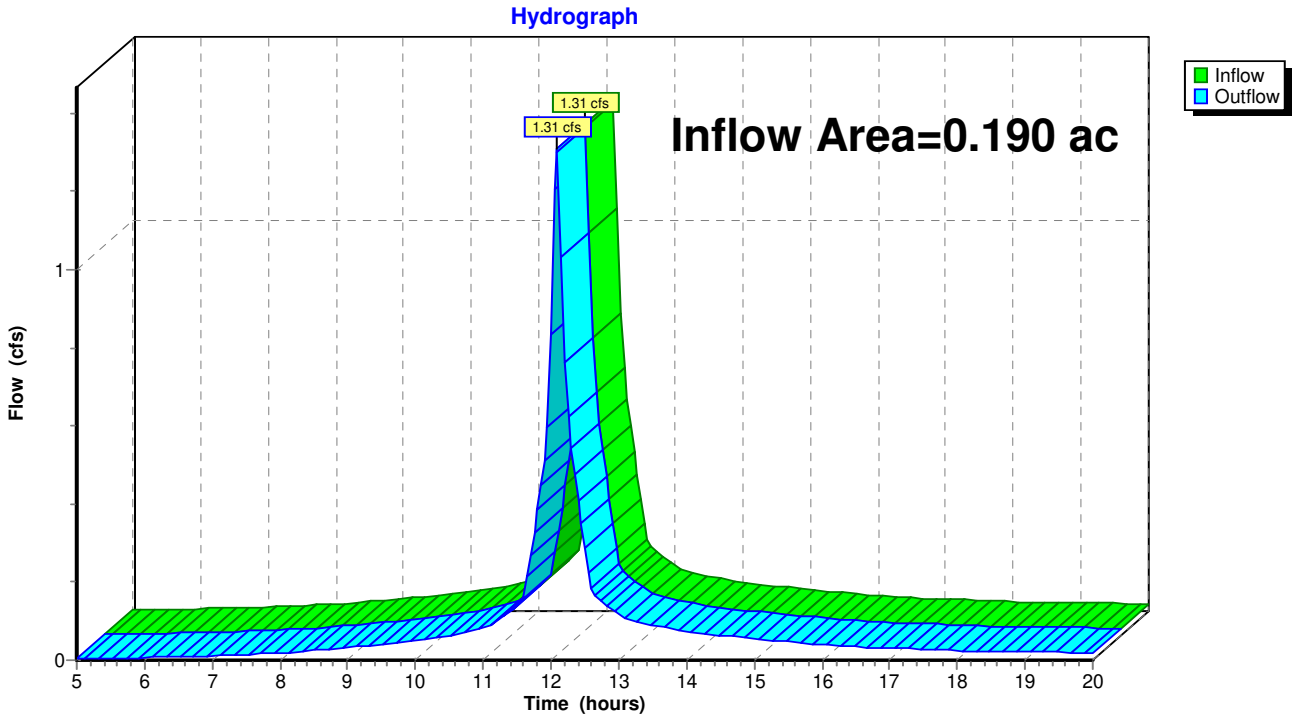


Summary for Reach IP-P3: EX. CULVERT

Inflow Area = 0.190 ac, 54.38% Impervious, Inflow Depth > 5.96" for 100YR event
Inflow = 1.31 cfs @ 12.09 hrs, Volume= 0.094 af
Outflow = 1.31 cfs @ 12.09 hrs, Volume= 0.094 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-P3: EX. CULVERT



Summary for Pond PND1: PND 1

Inflow Area = 2.380 ac, 52.89% Impervious, Inflow Depth > 4.98" for 100YR event
Inflow = 11.81 cfs @ 12.10 hrs, Volume= 0.987 af
Outflow = 6.50 cfs @ 12.27 hrs, Volume= 0.783 af, Atten= 45%, Lag= 10.2 min
Discarded = 0.03 cfs @ 12.27 hrs, Volume= 0.024 af
Primary = 6.47 cfs @ 12.27 hrs, Volume= 0.760 af
Routed to Reach IP-P2 : SCHOOL ST

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 327.76' @ 12.27 hrs Surf.Area= 5,094 sf Storage= 16,522 cf

Plug-Flow detention time= 149.6 min calculated for 0.781 af (79% of inflow)
Center-of-Mass det. time= 94.4 min (879.9 - 785.5)

Volume	Invert	Avail.Storage	Storage Description
#1	322.00'	23,430 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

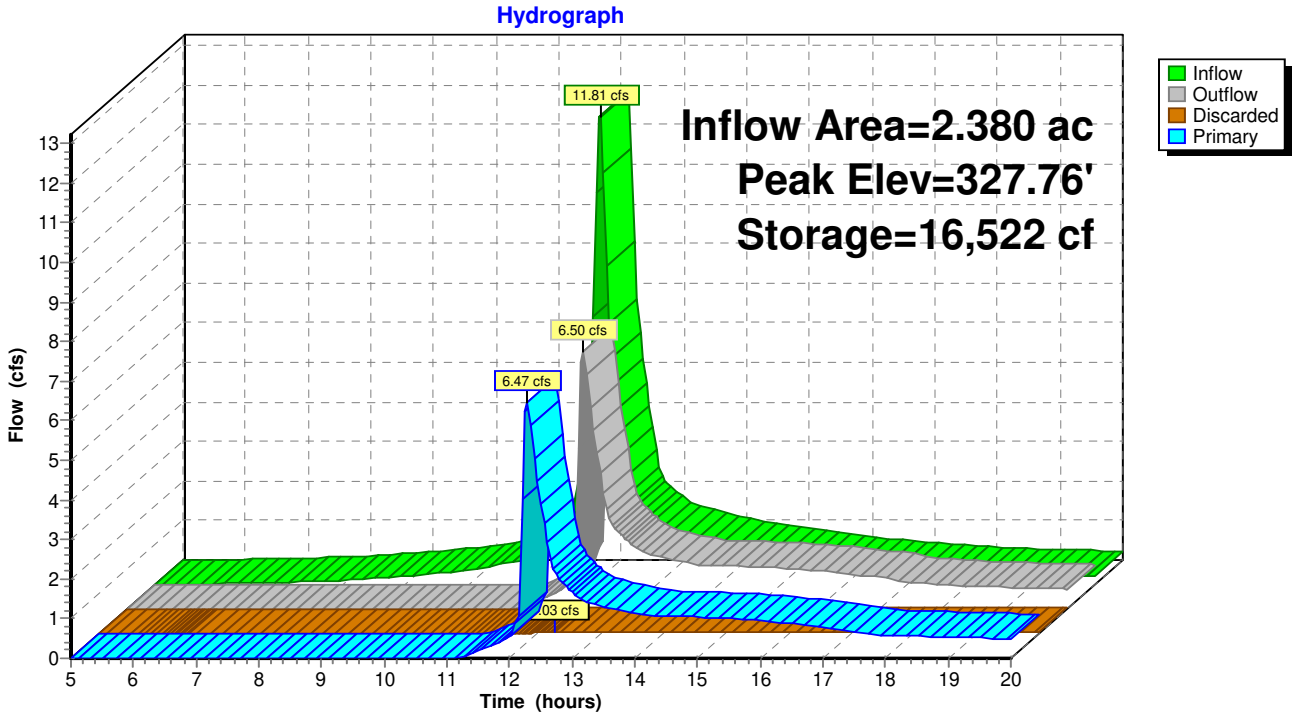
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
322.00	1,030	0	0
324.00	2,125	3,155	3,155
326.00	3,600	5,725	8,880
328.00	5,300	8,900	17,780
329.00	6,000	5,650	23,430

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	324.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	326.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	327.50'	**15.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 12.27 hrs HW=327.75' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=6.17 cfs @ 12.27 hrs HW=327.75' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 0.74 cfs @ 8.45 fps)
├**3=Orifice/Grate** (Orifice Controls 0.44 cfs @ 5.01 fps)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 5.00 cfs @ 1.34 fps)

Pond PND1: PND 1



Summary for Pond PND2: BASIN#2

Inflow Area = 1.891 ac, 33.69% Impervious, Inflow Depth > 5.28" for 100YR event
Inflow = 11.59 cfs @ 12.10 hrs, Volume= 0.832 af
Outflow = 5.40 cfs @ 12.32 hrs, Volume= 0.508 af, Atten= 53%, Lag= 12.8 min
Discarded = 0.03 cfs @ 12.32 hrs, Volume= 0.029 af
Primary = 5.37 cfs @ 12.32 hrs, Volume= 0.478 af
Routed to Reach IP-P2 : SCHOOL ST

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 328.24' @ 12.32 hrs Surf.Area= 4,845 sf Storage= 17,589 cf

Plug-Flow detention time= 169.4 min calculated for 0.508 af (61% of inflow)
Center-of-Mass det. time= 95.2 min (865.8 - 770.6)

Volume	Invert	Avail.Storage	Storage Description
#1	324.00'	20,173 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 21,436 cf Overall - 1,263 cf Embedded = 20,173 cf
#2	324.00'	1,263 cf	**Cultec R-330XLHD** x 24 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
		21,436 cf	Total Available Storage

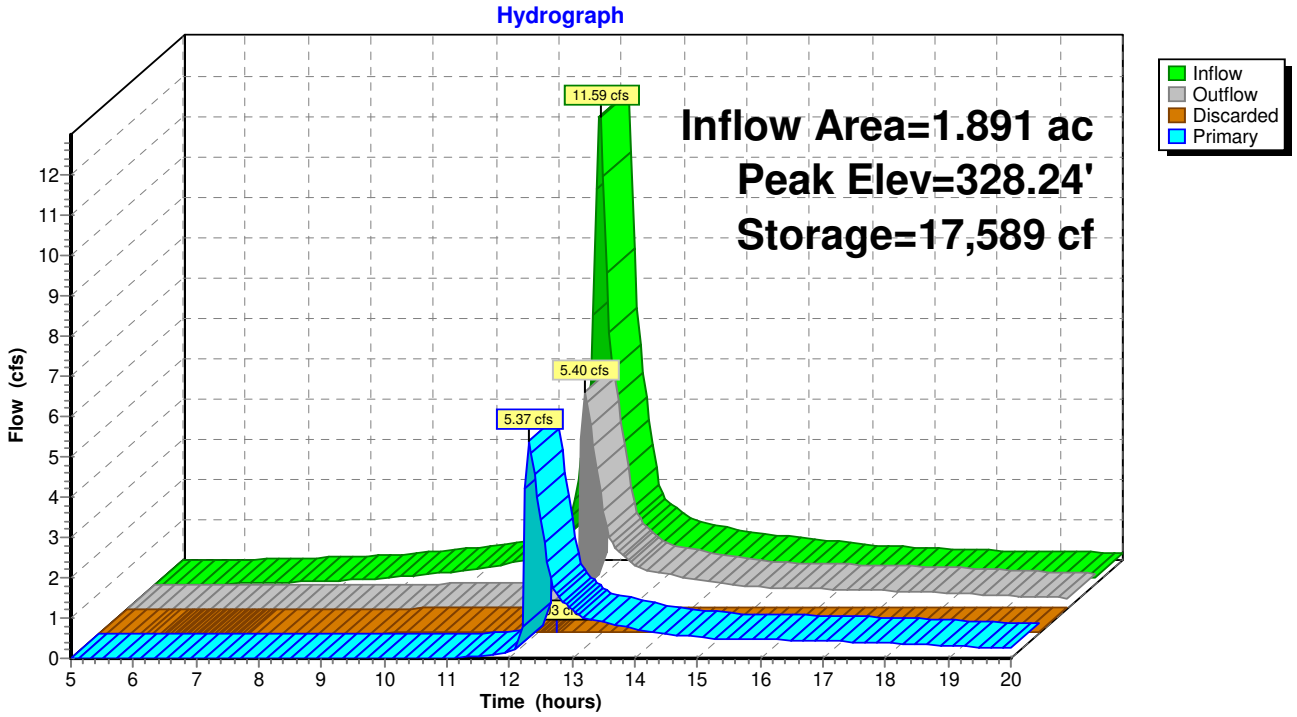
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
324.00	3,312	0	0
326.00	4,212	7,524	7,524
328.00	4,700	8,912	16,436
329.00	5,300	5,000	21,436

Device	Routing	Invert	Outlet Devices
#1	Discarded	324.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	325.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	327.30'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	328.00'	**15.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 12.32 hrs HW=328.24' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=5.21 cfs @ 12.32 hrs HW=328.24' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 0.19 cfs @ 8.55 fps)
├**3=Orifice/Grate** (Orifice Controls 0.37 cfs @ 4.22 fps)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 4.65 cfs @ 1.31 fps)

Pond PND2: BASIN#2



Summary for Pond PND3: BASIN3

Inflow Area = 1.306 ac, 7.39% Impervious, Inflow Depth > 4.49" for 100YR event
Inflow = 7.19 cfs @ 12.09 hrs, Volume= 0.488 af
Outflow = 5.62 cfs @ 12.17 hrs, Volume= 0.427 af, Atten= 22%, Lag= 4.6 min
Discarded = 0.01 cfs @ 12.17 hrs, Volume= 0.009 af
Primary = 5.60 cfs @ 12.17 hrs, Volume= 0.419 af
Routed to Reach IP-P1 : 45 MAIN ST

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 334.13' @ 12.17 hrs Surf.Area= 2,169 sf Storage= 5,778 cf

Plug-Flow detention time= 69.3 min calculated for 0.427 af (87% of inflow)
Center-of-Mass det. time= 30.7 min (813.8 - 783.1)

Volume	Invert	Avail.Storage	Storage Description
#1	330.00'	7,937 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

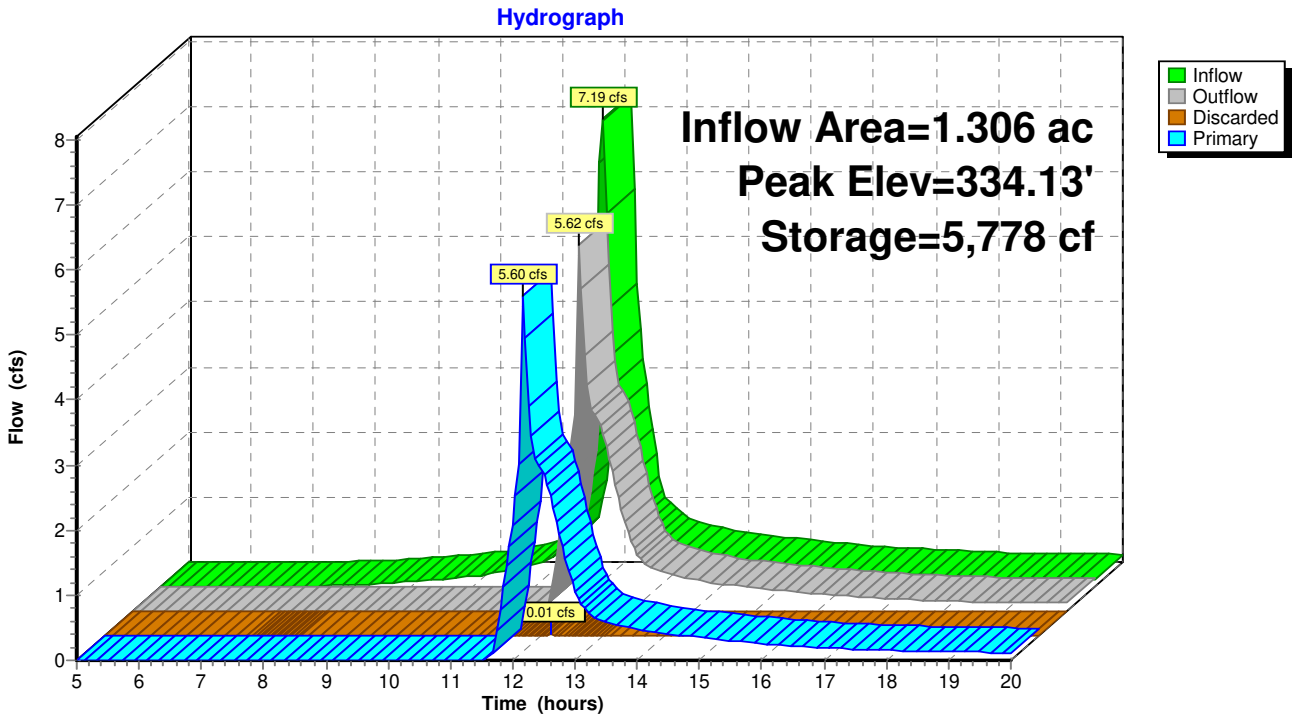
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
330.00	925	0	0
332.00	1,250	2,175	2,175
334.00	2,070	3,320	5,495
335.00	2,814	2,442	7,937

Device	Routing	Invert	Outlet Devices
#1	Discarded	330.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	332.20'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	334.00'	**20.0' 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

Discarded OutFlow Max=0.01 cfs @ 12.17 hrs HW=334.11' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=5.25 cfs @ 12.17 hrs HW=334.11' (Free Discharge)
├**2=Orifice/Grate** (Orifice Controls 3.21 cfs @ 5.88 fps)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 2.04 cfs @ 0.93 fps)

Pond PND3: BASIN3



Summary for Pond PND4: U/G BASIN

Inflow Area = 0.514 ac,100.00% Impervious, Inflow Depth > 7.01" for 100YR event
Inflow = 3.87 cfs @ 12.09 hrs, Volume= 0.300 af
Outflow = 0.50 cfs @ 12.63 hrs, Volume= 0.177 af, Atten= 87%, Lag= 32.7 min
Discarded = 0.02 cfs @ 5.80 hrs, Volume= 0.028 af
Primary = 0.47 cfs @ 12.63 hrs, Volume= 0.149 af
Routed to Pond PND1 : PND 1

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 327.94' @ 12.63 hrs Surf.Area= 3,637 sf Storage= 8,045 cf

Plug-Flow detention time= 212.5 min calculated for 0.176 af (59% of inflow)
Center-of-Mass det. time= 129.0 min (862.1 - 733.1)

Volume	Invert	Avail.Storage	Storage Description
#1	325.00'	2,587 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 12,739 cf Overall - 6,270 cf Embedded = 6,468 cf x 40.0% Voids
#2	325.00'	6,270 cf	**Cultec R-330XLHD** x 120 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
		8,857 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
325.00	3,673	0	0
325.50	3,637	1,828	1,828
328.00	3,637	9,093	10,920
328.50	3,637	1,819	12,739

Device	Routing	Invert	Outlet Devices
#1	Discarded	325.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	326.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 5.80 hrs HW=325.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.47 cfs @ 12.63 hrs HW=327.94' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 0.47 cfs @ 5.44 fps)

Pond PND4: U/G BASIN