

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
Revised 3/25/24
Revised 5/21/24**

DRAINAGE SUMMARY

D&L Design Group Inc. is pleased to provide the following Hydraulic / Hydrologic analysis for the proposed site plan for Lobisier 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 Subcatchments, 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	0.52/0.037	1.23/0.089	1.73/0.116	2.52/0.171
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	0.52/0.037	1.12/0.076	1.52/0.103	2.14/0.146

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

Recharge Volume Calculation:

$$Rv = F \times I$$

Rv = Required Recharge Volume

F = Recharge Factor

I = Total Impervious Area (Proposed)

$$Rv = (0.25") / (1' / 12") \times 86,790 \text{ s.f.} = 1,808 \text{ cf (Required)}$$

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

STAGE-STORAGE WORKSHEET

DATE: 2/19/2024
 PROJECT NUMBER: J-10
 BASIN NUMBER: 1
 LOCATION: Basin 3

CLIENT: Jobsear
 CALCULATED BY: PML
 CHECKED BY:

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

STAGE-STORAGE WORKSHEET

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

ELEVATION (FEET)	AREA (FT ²)	AVERAGE AREA (FT ²)	VERTICAL INTERVAL (FT)	VOLUME INCREMENTAL (FT ³)	VOLUME CUMULATIVE (FT ³)
330.0	725				0
332.0	1089	912	2	1824	1824

STAGE-STORAGE WORKSHEET

DATE: 2/18/2024
PROJECT NUMBER: J-10
BASIN NUMBER: 1
LOCATION: Basin 2

CLIENT: Jobber
CALCULATED BY: PML
CHECKED BY:

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

STAGE-STORAGE WORKSHEET

DATE: 2/19/2024		CLIENT: Iobleser	
PROJECT NUMBER: J-10		CALCULATED BY: PML	
BASIN NUMBER: 1		CHECKED BY:	
LOCATION: Basin 1			

ELEVATION	AREA	AVERAGE AREA	VERTICAL INTERVAL	VOLUME INCREMENTAL	VOLUME CUMULATIVE
(FEET)	(FT ²)	(FT ²)	(FT)	(FT ³)	(FT ³)
322.0	551				0
324.5	1538	1042	3	2605	2605

Drawdown Calculation:

Pond #1

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

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)(1,184 s.f.) = 21 hours

Pond #2

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

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

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

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

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

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 show 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)

$$Wv = F \times I$$

Wv = Required Water Quality Volume

F = Water Factor

I = Total Impervious Area

$$Rv = (1") / (1' / 12") \times 32,428 \text{ s.f.} = 2,703 \text{ cf (Required)}$$

Provided 2,826 c.f.

P-2(Basin 2)

$$Wv = F \times I$$

Wv = Required Water Quality Volume

F = Water Factor

$$Rv = (1") / (1' / 12") \times 27,755 \text{ s.f.} = 2,303 \text{ cf (Required)}$$

Provided 2,330 c.f.

P-3(Basin 3)

$$Wv = F \times I$$

Wv = Required Water Quality Volume

F = Water Factor

$$Rv = (1") / (1' / 12") \times 4,207 \text{ s.f.} = 350 \text{ cf (Required)}$$

Provided 2,228 c.f.

P-4(Basin 4)

$$Wv = F \times I$$

Wv = Required Water Quality Volume

F = Water Factor

$$Rv = (1") / (1' / 12") \times 22,700 \text{ s.f.} = 1,891 \text{ cf (Required) Provided 7,840 c.f.}$$

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.

Location:

B	C	D	E	F
BMP ¹	TSS Removal Rate ¹	Starting TSS Load ²	Amount Removed (C*D)	Remaining Load (D-E)
Drop Sump and Hurdled Catch Basin	0.25	1.50	0.25	0.75
Sediment Forebay	0.25	0.75	0.19	0.56
Infiltration Basin	0.50	0.50	0.48	0.11
Sediment Forebay	0.25	0.11	0.03	0.08
	0.00	0.00	0.00	0.00

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

Total TSS Removal =

Project:

Prepared By:

Date:

¹Equals remaining load from previous BMP (F) which enters the BMP

Non-saturated TSS Calculation Sheet
must be used if Precipitous BMP Proposed

1. From Manual BMP Stormwater Handbook Vol. 1

Mass. Dept. of Environmental Protection

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 entered, TSS Removal and other Columns are automatically completed.

Version 1, AutoCalculated Mar. 4, 2008

Location:

B	C	D	E	F
BMP ¹	TSS Removal Rate ¹	Starting TSS Load ²	Amount Removed (C*D)	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	0.00	0.50	0.46	0.11
Sediment Forebay	0.25	0.11	0.03	0.08
	0.00	0.06	0.00	0.06

TSS Removal Calculation Worksheet

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

Total TSS Removal =

Project:
Prepared By:
Date:

¹Equals 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

Mass. Dept. of Environmental Protection

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.

Location: Basin3 Entrance

B	C	D	E	F
BMP ¹	TSS Removal Rate ¹	Starting TSS Load*	Amount Removed (C*D)	Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	0.25	1.00	0.25	0.75
Infiltration Basin	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

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

Total TSS Removal =

85%

Project: -16

Prepared By: pmi

Date: 2/19/2024

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

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:

B	C	D	E	F
BMP ¹	TSS Removal Rate ¹	Starting TSS Load*	Amount Removed (C*D)	Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	0.25	1.00	0.25	0.75
Infiltration Basin	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

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

Total TSS Removal =

Project:
Prepared By:
Date:

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

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)

B BMP ¹	C TSS Removal Rate ¹	D Starting TSS Load ²	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

**TSS Removal
Calculation Worksheet**

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

Total TSS Removal =

Project:	File
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

Mass. Dept. of Environmental Protection

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:

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

FUTURE OWNER & RESPONSIBLE PARTY:

Lobleser & 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. Outlets 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 side 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. Remove 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, where 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 implement 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 as 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 ILLD 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] 4-12-23
Registered Professional Engineer

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



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

Checklist for Stormwater Report

Checklist (continued)

LID Requirement: 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)**
- ☐ **Maintaining distances 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**
- ☐ **Retention Cells (includes Rain Gardens)**
- ☐ **Constructed Stormwater Wetlands (includes Grassed Wetlands designs)**
- ☐ **Treebox Filter**
- ☐ **Water Quality Swale**
- ☒ **Grass Channel**
- ☐ **Green Roof**
- ☐ **Other (describe):**

Standard 1a: 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 4 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 flooding 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.
- ☐ Using the infiltration, BMPs is based on the following method: Check the method used.
 - ☐ Static
 - ☐ Simple Dynamic
 - ☐ Dynamic Field¹
- ☐ Runoff from all impervious areas at the site is 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 composed solely of C and D soils and/or bedrock at the land surface
 - ☐ M.G.L. c. 21E site pursuant to §10 GMR 40.0000
 - ☐ Solid Waste Landfill pursuant to §10 GMR 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.

¹ 602.700 removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



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

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Runoff (continued)

- ☒ The Infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 15-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;
 - Proper disposal and piling 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 offsetting the water quality volume are included, and discharges:
- ☐ Is within the Zone I or Interim Wetland 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 aka 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.



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

Checklist for Stormwater Report

Checklist (continued)

Standard 6: Water Quality (continued)

- ☒ The BMP to sized (and calculations provided) based on:
 - ☒ The 1" 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 proprietary BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STP 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 8: 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-constructed 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 9: 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 detailed in the Stormwater Report.



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

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: 8-9 single family houses or 8-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - ☐ Small Residential Projects: 8-4 single family houses or 8-4 units in a multi-family development with a discharge to a critical area
 - ☐ Marina and/or boathar provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - ☐ Site Path and/or Foot Path
 - ☐ Redevelopment Project
 - ☐ Redevelopment portion of mix of new and redevelopment.
- ☐ Certain standards are not fully met (Standard No. 1, 2, 3, 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 Plantings;
- 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.



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

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 has 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 owner;
 - ☒ 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 subelements:
 - ☐ 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 agreement deed that assigns 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-Development Watershed Map



Commonwealth of Massachusetts
City/Town of Upton

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

A. Facility Information

Leisure Building Corp.
Owner Name
47 Main Street
Street/Address
Upton
City

MA
State

01505
Zip Code

B. Site Information

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

2. Best Est. Year Available? ☒ Yes ☐ No Year

Schedule
and Name

Glacial Till

Soil Present on Site?

3. Best Estimate Geological Report Available? ☐ Yes ☒ No

Rock Literature
Public
Locations
Yes

Year of Literature/Source

Map Use

ARC/INFO
Software

GIS
Data Map Use

Investigation Details Report

4. Flood Plain Insurance Map ☐ Yes ☒ No ☐ Regularly Insured? ☐ Yes ☒ No

5. Within a wetland/water? ☐ Yes ☒ No

6. Within a Mapred Wetland Area? ☐ Yes ☒ No ☐ Yes, Where? Wetland Data Layer

7. Current Water Resources Conditions (Source)

August 2022
Water Dept. Vrs.

Report ☒ Above Ground?

Wetland Type

☐ Wetland ☐ Wetland

8. Other references provided:



Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal F. Certification

I hereby certify that currently approved by the Department of Environmental Protection pursuant to 310 CMR 16.017 to conduct soil evaluations and that the
soil analysis has been performed by an individual with the required training, experience and experience described in 310 CMR 16.017. 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 16.100 through
16.107.

Signature of Soil Evaluator	8/20/23
Robert L. Smith	Date
Typed or Printed Name of Soil Evaluator / License #	2005
Mary O'Connell	Evaluation Date of License
Signature/Typed Name of Upton	Upton Conservation Agent
Approving Authority	

Notes in accordance with 310 CMR 16.100 this form must be submitted to the appropriate authority within 60 days of the date of soil testing, and to the designer and the
property owner with [Upton Conservation Agent](#)

Field Diagrams: Use this area for field diagrams:



City of Upton
Department of Public Works

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

1. Method Used:

- ☒ Depth observed during water in observation hole
- ☒ Depth varying from side of observation hole
- ☒ Depth to soil hydrophobicity boundary (pressure)
- ☐ Depth to estimated maximum high groundwater (PA) (10000 hydrophobicity)

Water Table Number

Water Table

Soil - S - B - C - M - O - N - Y - O - N - G

Obs. Hydrophobicity

S

S

Obs. Hydrophobicity

Obs. Hydrophobicity

Obs. Hydrophobicity

S

2. Estimated Depth to High Groundwater: _____ inches

3. Depth of Previous Estimated _____

1. Depth of Previous Observed Previous Estimated

- a. Does or have been found or suitably existing previous estimated water table depth observed during this time proposed for this use? ☒ Yes ☐ No

Obs. Hydrophobicity

S

S

Obs. Hydrophobicity

Obs. Hydrophobicity

Obs. Hydrophobicity

S

- b. If yes, at what depth was it observed (provide A and O Hydrophobicity)

Upper boundary:

Lower boundary:

Obs. Hydrophobicity

S

- c. If no, at what depth was it observed (provide A and O Hydrophobicity)

Upper boundary:

Lower boundary:

Obs. Hydrophobicity

S



Commonwealth of Massachusetts
City/Town of Upton

Form 11 - Self 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 evaluation and that the above analysis has been performed by me or pursuant to the required training, inspection and certification 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 _____ Date _____
Peter Lavada SE91332
Typed or Printed Name of Soil Evaluator / License #
Title: Overholt
Name of Approving Authority: William
Block: In accordance with 310 CMR 15.01(2) this form must be submitted to the approving authority within 60 days of the date of testing, and to the designer and the property owner with _____

Field Discrepancies: 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

Letelier Building Corp
One Main
47 Main Street
Upton
MA

MA
01530

Maple City
01530
Zip Code

B. Site Information

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

2. Soil Survey Available? ☒ Yes ☐ No If yes:

Schedule
Soil Name

Gravelly
Soil Profile

Soil Limitations

Region
Location

NRCS
Bureau

340
10/23/82

3. Sewerage Disposal Report Available? ☐ Yes ☒ No If yes:

Year Published

May 1982

Description of On-Site Sewage Use:

4. Planned Future Improvements? ☐ Within 10 years ☐ No ☒ Yes ☒ No

5. Whether a veterinary practice? ☐ Yes ☒ No

6. Whether a hazardous waste site? ☐ Yes ☒ No If yes, identify hazardous waste layer:

7. Current Water Resources Conditions? ☒ Good ☐ Fair ☐ Poor ☐ Very Poor

8. Other restrictions or information: ☐ None ☐ Other ☐ Other



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

1. Background

- | _____ Unit | Obs. Hole #112 | Obs. Hole #945 |
|--|-----------------------|-----------------------|
| ☐ Depth estimated above by reader in other section hole | _____ inches | _____ inches |
| ☒ Depth ranging from edge of observation hole | 20200 inches | 24000 inches |
| ☒ Depth to seal restriction/pile fracture (possible) | 20200 inches | 24000 inches |
| ☐ Depth to estimated occurrence high groundwater (m)
(Uncos. interpretation) | _____ inches | _____ inches |

2. Estimated Depth to High Correlation

Depth of Personnel Minded

1. Dayton's Notebook Contains Possible Material

- | | Yes | No | Upper boundary: | 24 | Lower boundary: | 72+ |
|--|-----|----|-----------------|----|-----------------|-----|
| a. Do you intend to work in a field of study that is not related to your current field of study? | | | | | | |
| b. If yes, at what depth does it extend from A to C? | | | | | | |
| c. If no, at what depth does it extend from A to C? | | | | | | |



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, experience 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 Evaluator	8/30/25
Peter Lynds SEP1352	Date
Typed or Printed Name of Soil Evaluator / License #	2025
Mary Overholt	Expiration Date of License
Name of Approving Authority	Upton Conservation / Upton
	Approving Authority

Notes: In accordance with 310 CMR 15.01(2) this form must be submitted to the approving authority within 60 days of the date of soil testing, and to the clerk or and the property owner with [Form 11](#).

Field Diagrams: Use this area for field diagrams.

Soil Map - County of Santa Barbara, Southern Part
 2000 Edition - (P. 10.000)



Soil Survey
 Conservation District

Soil Survey
 National Cooperative Soil Survey

Call Us—Toll-Free 1-800-4-A-RENTAL • **Hours:** 8:00 a.m. to 5:00 p.m. (EST)
Fax: 1-800-4-A-RENTAL • **Website:** www.4arental.com

MAP 1

- [illegible]

MAP INFORMATION

The left wingtips that comprise part A25 were scrapped at \$400,000.

Findings that sleep may not be solid at 64h needs

Deliverment of maps beyond the scope of mapping will ensure
recovery of the cost of mapping and ensuring of and
the government. The maps do not show the exact areas of
containing water but could have been shown at a more detailed
scale.

Please rely on the keywords as search clues for your manuscript.

Name of Ship: **Michael S. Hansen** **Commodore** **Orlando**
 Vtd Dist: **Europe** **1992**
 Command: **Squad** **Vtd Atlantic** **previously**

Images from the Web 2.0 Survey are housed on the Web 2.0 Institute properties, which promotes discussion and change but Google disavows and owns. A problem that people are facing, such as the threat against their privacy, is that it is used to find a more accurate evaluation of a website or even be exposed.

This product is generated from the L2004-040200 weather data as of the weather station listed below.

Bill Harvey, Jr. - Worcester County, Massachusetts, Eastern
Part
Survey Area Date: Version 1.0, Day 8, 2002

Full size photos are located for spaces about 10 cm wide, tall, full or large.

Editorial Board *Journal of Management Education* May 01, 2002—Jan 01, 2003

The atmosphere of other towns from which the old boys were recruited and destined probably differs from the background imagery displayed on their maps. In a word, some other setting of easy and knowledge may be ardent.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Area in Acre	Percent of Acre
704	Whitcomb fine sandy loam, 0 to 3 percent slopes, extremely stony	0.9	7.1%
8025	Marblehead fine sandy loam, 3 to 8 percent slopes	0.1	0.8%
8026	Marblehead fine sandy loam, 8 to 15 percent slopes	0.3	2.0%
8027	Marblehead fine sandy loam, 0 to 3 percent slopes, extremely stony	17.1	11.8%
8182	Bedford fine sandy loam, 3 to 8 percent slopes	21.1	20.1%
8175	Bedford fine sandy loam, 3 to 8 percent slopes, extremely stony	1.2	2.2%
4028	Condon fine sandy loam, 3 to 6 percent slopes	10.3	10.3%
4029	Condon fine sandy loam, 3 to 15 percent slopes	3.8	0.2%
4030	Condon fine sandy loam, 3 to 15 percent slopes, extremely stony	1.1	0.1%
Totals for Area of Interest		63.9	100.0%

Worcester County, Massachusetts, Southern Part

3629B—Hentauk fine sandy loam, 0 to 5 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2w02
 Elevation: 80 to 1,180 feet
 Mean annual precipitation: 36 to 71 inches
 Mean annual air temperature: 50 to 63 degrees F
 Frost-free period: 140 to 240 days
 Farmland classification: Not prime farmland

Map Unit Composition

Hentauk, extremely stony, and similar soils: 85 percent
 Other components: 15 percent
 Estimates are based on observations, descriptions, and inferences of the mapmaker.

Description of Hentauk, Extremely Stony

Soils:

Landform: Ground moraine, drumlins, recessional moraine, till
 Landform position (two-dimensional): Summit, shoulder, backslope
 Landform position (three-dimensional): Side-slope, crest
 Drainage slope shape: Convex, linear
 Aspect slope shape: Convex
 Parent material: Granitic to gneiss with sandy bedrock derived from granite, gneiss, and/or schist

Typical profile

O - 0 to 2 inches: moderately decomposed plant material
 A - 2 to 4 inches: fine sandy loam
 B₁ - 4 to 10 inches: fine sandy loam
 B₂ - 10 to 20 inches: sandy loam
 B₃ - 20 to 74 inches: gravelly heavy sand

Properties and qualities

Slope: 0 to 5 percent
 Surface: Not covered with cobbles, stones or boulders: 5.0 percent
 Depth to restrictive feature: 10 to 40 inches to dense material
 Drainage class: Well drained
 Runoff class: Low
 Capacity of the most limiting layer to transmit water (K_{sat}): Very low to moderately high (0.00 to 1.48 in/hr)
 Depth to water table: About 10 to 67 inches
 Frequency of flooding: None
 Frequency of ponding: None
 Medium salinity: Moderate (0.0 to 1.0 mmhos/cm)
 Available water supply: 0 to 20 inches: Low (about 1.0 inches)

Map Unit Description: Hatched for every town, 0 to 5 percent slope, extremely stony--
Worcester County, Massachusetts, Southern Part

MAIN STREET - SOIL DPO-1

Interpretive groups:

Land capability classification (project): None specified

Land capability classification (parent): 7c

Hydrologic Soil Group: C

Biological site: P144AYB2TCT - Well Drained Dune & Till Uplands

Hydro soil rating: No

Minor Components:

Colluvial, extremely stony

Percent of map unit: 3 percent

Landform: Ground moraine, hills, dunes

Landform position (two-dimensional): Summit, backslope, footslope

Landform position (three-dimensional): Side slope, crest

Down-slope shape: Convex, linear

Across-slope shape: Convex

Hydro soil rating: No

Gravel, extremely stony

Percent of map unit: 3 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

Hydro soil rating: No

Side-sbury, extremely stony

Percent of map unit: 2 percent

Landform: Depressions, ground moraine, hills, drainageways

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Head slope, base slope

Down-slope shape: Concave

Across-slope shape: Concave

Hydro soil rating: Yes

Data Source Information

Soil Survey Area: Worcester County, Massachusetts, Southern Part

Survey Area Date: Version 18, Sep 8, 2012

Worcester County, Massachusetts, Southern Part

316B—Soils of fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 63a0

Elevation: 200 to 300 feet

Mean annual precipitation: 52 to 58 inches

Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 145 to 243 days

Farm land classification: All areas are prime farmland

Map Unit Composition

Substrata and other soils: 10 percent

Other components: 90 percent

Estimates are based on observations, descriptions, and in some cases
map inferences.

Description of Soils

Setting

Landform: Hills

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base of

Down-slope slope: Linear

Across-slope slope: Concave

Parent material: Possible coarse-textured sedimentary deposits over dense
sandy bedrock (all derived from granite and gneiss)

Typical profile

H1 - 0 to 4 inches: sandy loam

H2 - 4 to 10 inches: gravelly sandy loam

H3 - 10 to 50 inches: loamy sand

H4 - 50 to 60 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

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

Depth to water table: About 17 to 26 inches

Frequency of flooding: None

Frequency of ponding: None

Available water capacity: 0 to 50 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3B

Hydrologic Soil Group: C

Ecological site: P144AYG0716A - Moist Dense Till Uplands

Map Unit Description: **Barren: Dry, Sandy, 0 to 2 percent slopes—Worcester County, Massachusetts, Southern Part**

MAIN STREET - 005. 0104

Hydric soil rating: No

Water Components

Barren:

Percent of map unit: 10 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 Date: Version 15, Sep 9, 2022

Hydrocad Files

J-10

WEEKLY
Inspection and Maintenance Log
DURING CONSTRUCTION

FOR: **Mula St.**
& After 1.5" Rain

Components
Brush Control - Weekly
Comments during insp.

Date

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 Phone

J-10

WEEKLY
Inspection and Maintenance Log
DURING CONSTRUCTION

FOR: Main St.
& After 1.0" Rain

Comments

Notify Conn. Comm. Insp.
effecting: Resurvey Areas
Comments during insp.

Note corrective measures
performed & date

Site of Public (Christian Road)

Street - Dull
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-
Dull
Comments during insp.

Note corrective measures
performed & date

Temporary Ground
Cover Area - Weekly
Comments during insp.

Note corrective measures
performed & date

Temporary Signs at
Access Drive as Needed
Comments during insp.

Note corrective measures
performed & date

Inspector: _____ Title: _____ Date: _____

Address: _____ Title: _____

I-10

**WEEKLY
Inspection and Maintenance Log
DURING CONSTRUCTION**

**FOR: Main St.
& After 1.0" Rain**

Comments	Date
Lower Area / Middle Area Erosion. Washed Comments during insp.	
Note corrective measures performed & date Storm Aprons at Onfalls Exit as Needed Comments during insp.	
Note corrective measures performed & date Pave-bay as Needed Comments during insp.	
Note corrective measures performed & date Inlet Drainage Discharge Comments during insp.	
Note corrective measures performed & date 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
AFTER CONSTRUCTION**

**FOR: Main Street
& After 3.0" Rain**

Comments _____

Barbary#1

-twice a year

Comments during insp.

Date _____

**Note corrective measures
performed & Date**

Barbary#2

-twice a year

Comments during insp.

**Note corrective measures
performed & date**

Barbary#1

-twice a year

Comments during insp.

**Note corrective measures
performed & date**

Barbary#2

-twice a year

Comments during insp.

**Note corrective measures
performed & date**

Catch Basins

- 4 basins of sediment or twice a year

Comments during insp.

**Note corrective measures
performed & date**

Inspector _____

Title _____ **Date** _____

Address _____

Test _____

I-016

Inspection and Maintenance Log
AFTER CONSTRUCTION

FOR: Main Street
& After 3.0" Rain

Components

Outlet Control Structure #1

- 8 inches of sediment or twice a year
Comments during insp.

Date

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

Comments

Date

47 Main Street, Uxton, MA Project L-016

Rising Stone Spring - Drainage Outfalls

Method - ARS Rock Chart (Slopes 2%-40%)

Reference: National Engineering Handbook, TB14C-8

#1 - Rock Apron - Basin #1 (HydroCAD)

Slope = 0.02 ft/ft

q (100-yr) = 3.62 cfs

$$D_m = 12(1.923qS^{1.49})^{0.385}$$

$$= D_m = 12(1.923 \times 2.18 \times 2.0^{1.49})^{0.385}$$

D_m = 3" required

D_m = 8" provided

$$L = (1.8 (Q-5)/D^{1.4} + 10) =$$

$$= (1.8 (3.56-5)/2.0^{1.4} + 10) 10.0 \text{ feet}$$

$$W1 = 3D = 3(1.25) = 3.75 \text{ feet}$$

$$W2 = 3D + 0.7L = 3(1.25) + 0.7(10) = 12 \text{ feet}$$

#2 - Rock Apron - Basin #2 (HydroCAD)

Slope = 0.029 ft/ft

q (100-yr) 4.56 cfs

$$D_m = 12(1.923qS^{1.49})^{0.385}$$

$$= D_m = 12(1.923 \times 4.54 \times 0.029^{1.49})^{0.385}$$

D_m = 4" required

D_m = 8" provided

$$L = (1.8 (Q-5)/D^{1.4} + 10) =$$

$$= (1.8 (4.56-5)/1.25^{1.4} + 10) 10 \text{ feet}$$

$$W1 = 3D = 3(1.25) = 3.75 \text{ feet}$$

$$W2 = 3D + 0.7L = 3(1.25) + 0.7(10) = 12 \text{ feet}$$

#3 - Rock Apron - Basin #3

Slope = 0.01 ft/ft

q (100-yr) 4.92 cfs

$$D_m = 12(1.923qS^{1.49})^{0.385}$$

$$= D_m = 12(1.923 \times 11.25 \times 0.029^{1.49})^{0.385}$$

D_m = 4" required

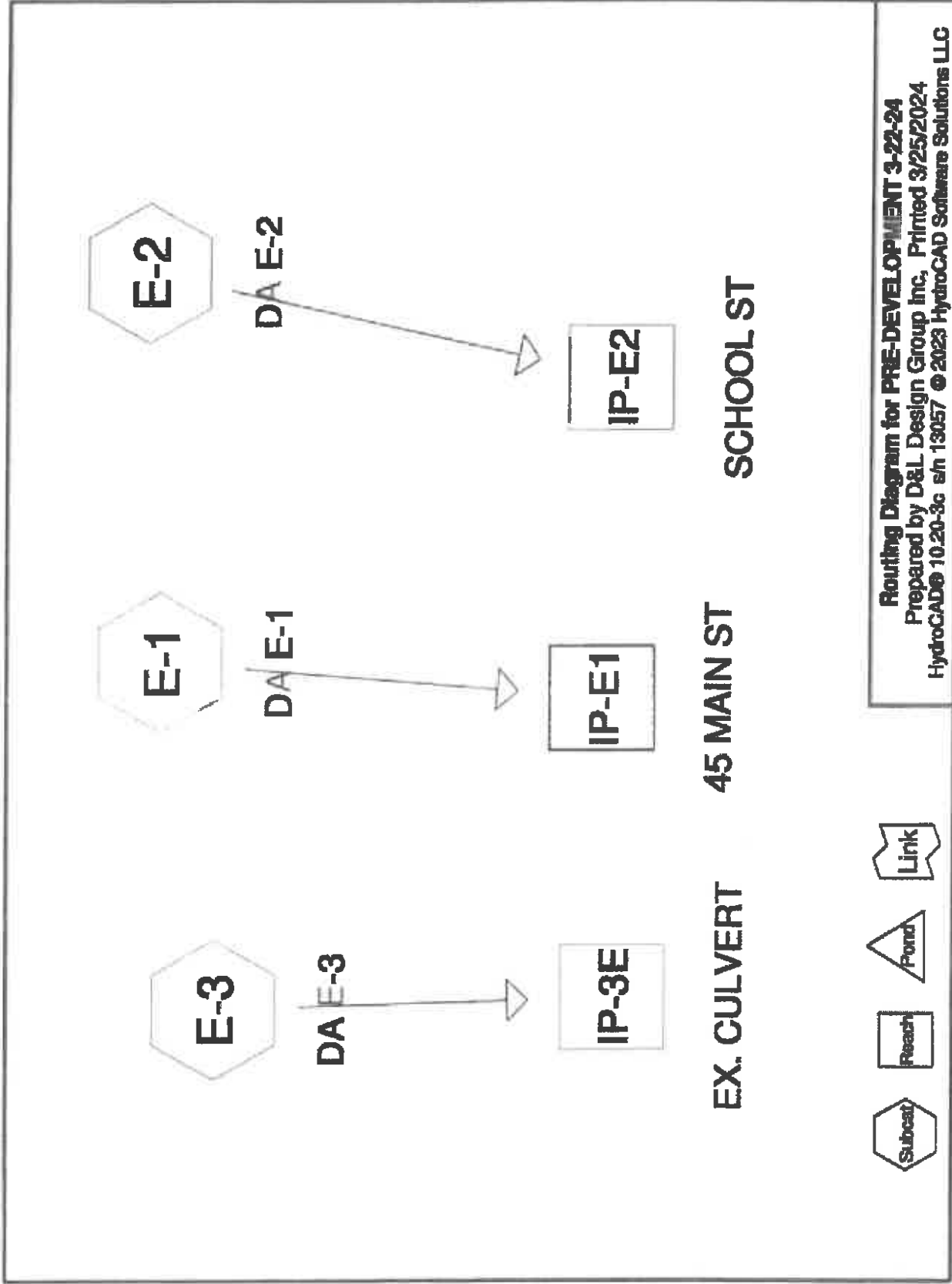
D_m = 8" provided

$$L = (1.8 (Q-5)/D^{1.4} + 10) =$$

$$= (1.8 (4.92-5)/1^{1.4} + 10) = 10 \text{ feet}$$

$$W1 = 3D = 3(1) = 3 \text{ feet}$$

$$W2 = 3D + 0.7L = 3(1) + 0.7(10) 10.0 \text{ feet}$$



Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/F	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

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.680	74	>75% Grass cover, Good, HSG C (E-1, E-2, E-3)
0.278	98	Paved parking, HSG C (E-1, E-2)
7.128	70	Woods, Good, HSG C (E-1, E-2, E-3)
9.087	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

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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	1.660	0.000	0.000	1.660	>75% Grass cover, Good	E-1, E-2, E-3
0.000	0.000	0.278	0.000	0.000	0.278	Paved parking	E-1, E-2
0.000	0.000	7.128	0.000	0.000	7.128	Woods, Good	E-1, E-2, E-3
0.000	0.000	9.067	0.000	0.000	9.067	TOTAL AREA	

PRE-DEVELOPMENT 3-22-24

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Type III 24-hr 2YR Rainfall=3.39"

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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>0.90"
Flow Length=580' 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>0.90"
Tc=6.0 min CN=71 Runoff=0.52 cfs 0.037 af

Reach IP-3E: EX. CULVERT

Inflow=0.52 cfs 0.037 af
Outflow=0.52 cfs 0.037 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 = 9.657 ac Runoff Volume = 0.599 af Average Runoff Depth = 0.93"
\$8.93% Pervious = 8.768 ac 3.07% Impervious = 0.278 ac

PRE-DEVELOPMENT 3-22-24

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Type III 24-hr 2YR Rainfall=3.39"

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

PRE-DEVELOPMENT 3-22-24

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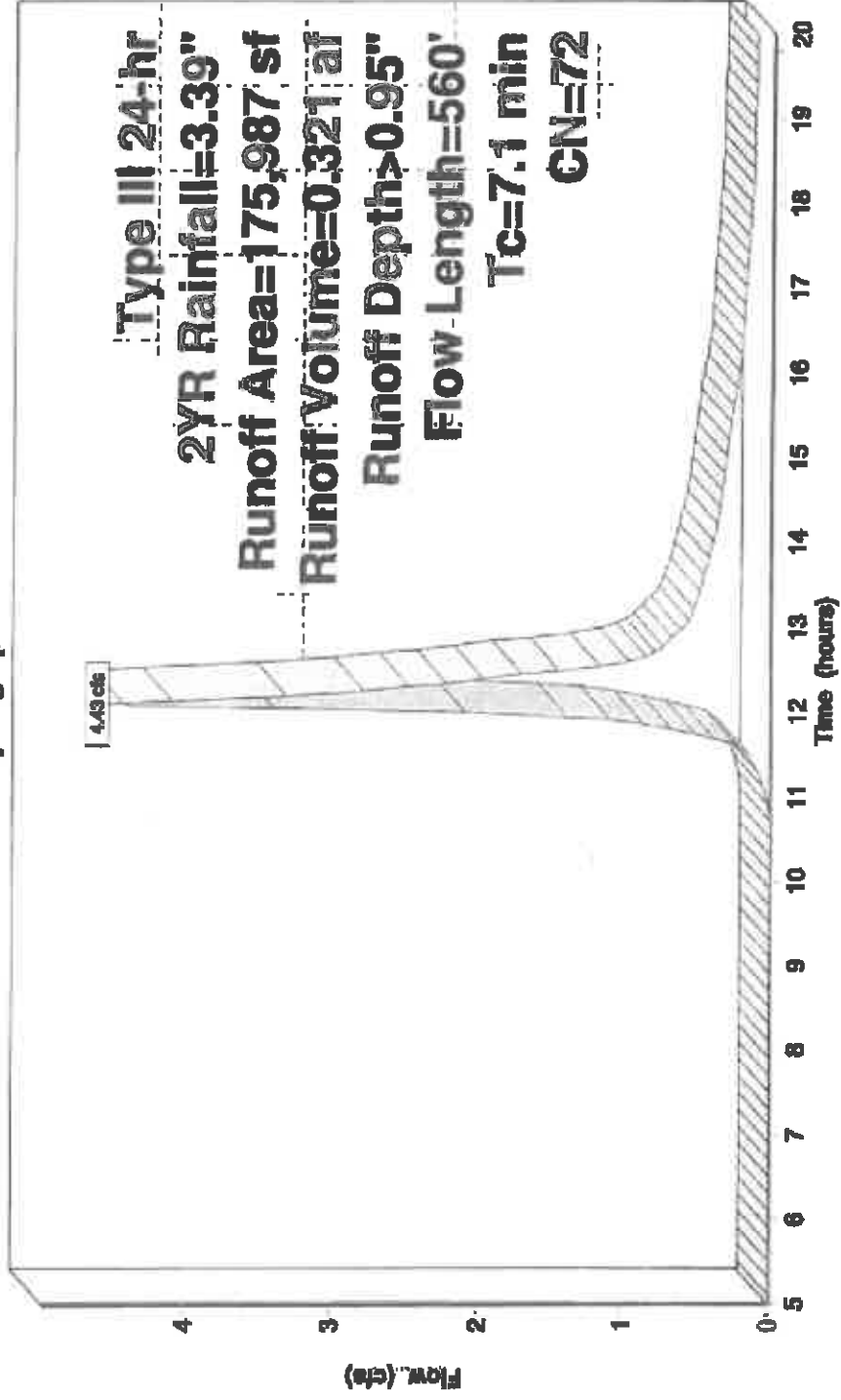
Type III 24-hr 2YR Rainfall=3.39"

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Subcatchment E-1: DA E-1

Hydrograph



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Type III 24-hr 2YR Rainfall=3.39"

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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

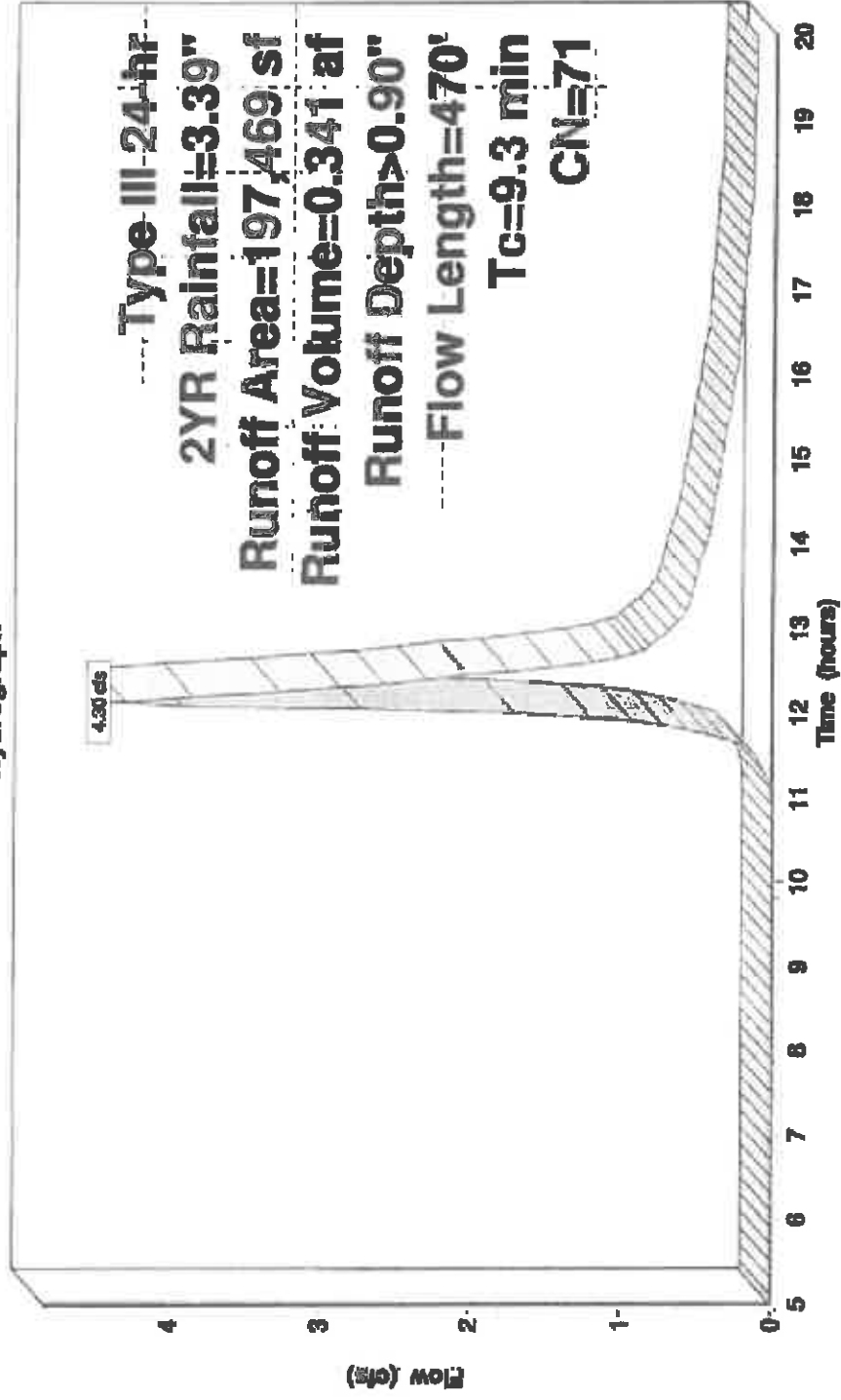
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2YR Rainfall=3.39"

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, TRAVEL 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 = 0.52 cfs @ 12.10 hrs, Volume= 0.037 af, Depth> 0.90"
 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"

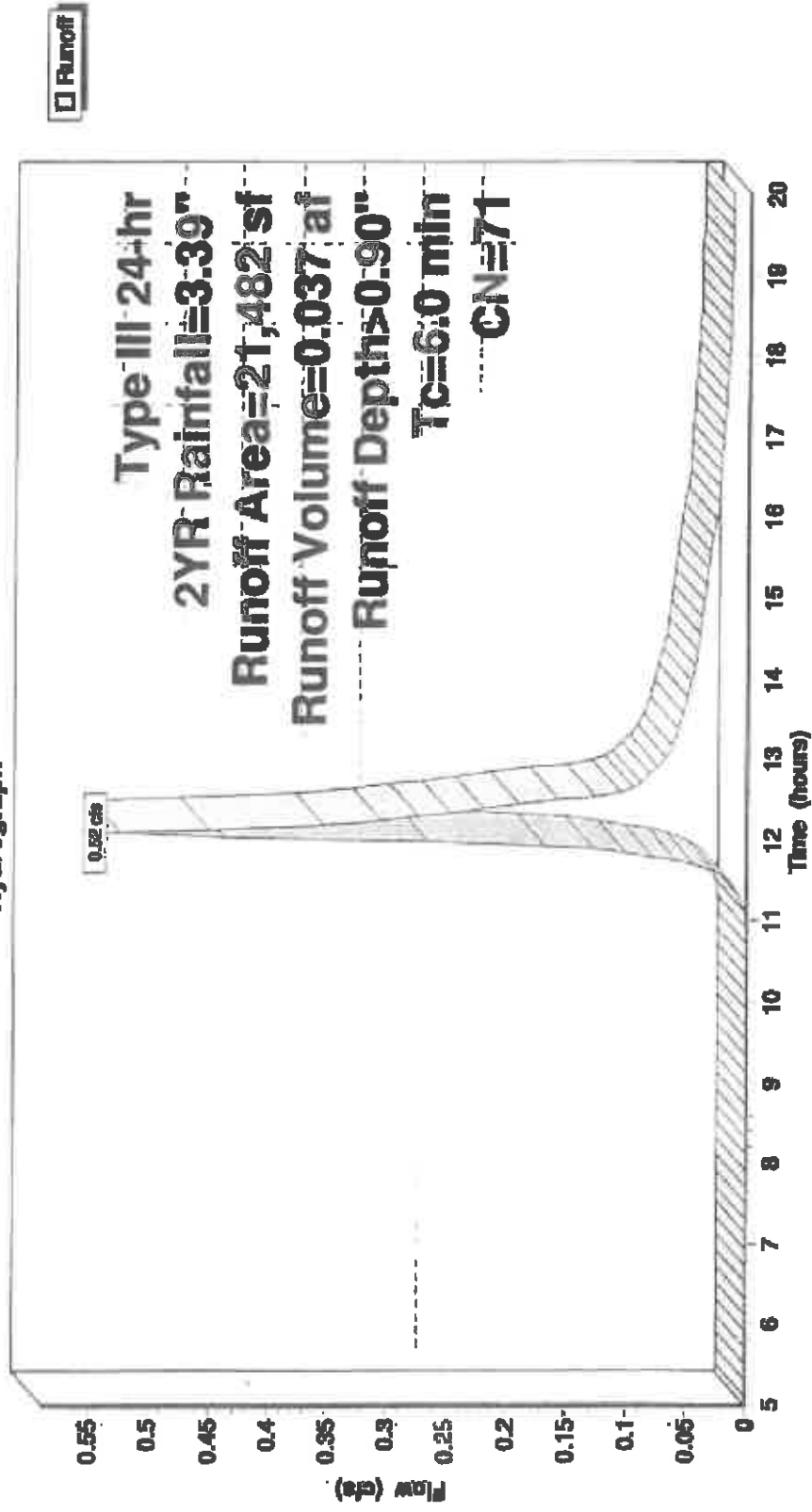
Area (af)	CN	Description
15,851	70	Woods, Good, HSG C
5,631	74	>75% Grass cover, Good, HSG C
21,482	71	Weighted Average
21,482		100.00% Pervious Area

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

Hydrograph



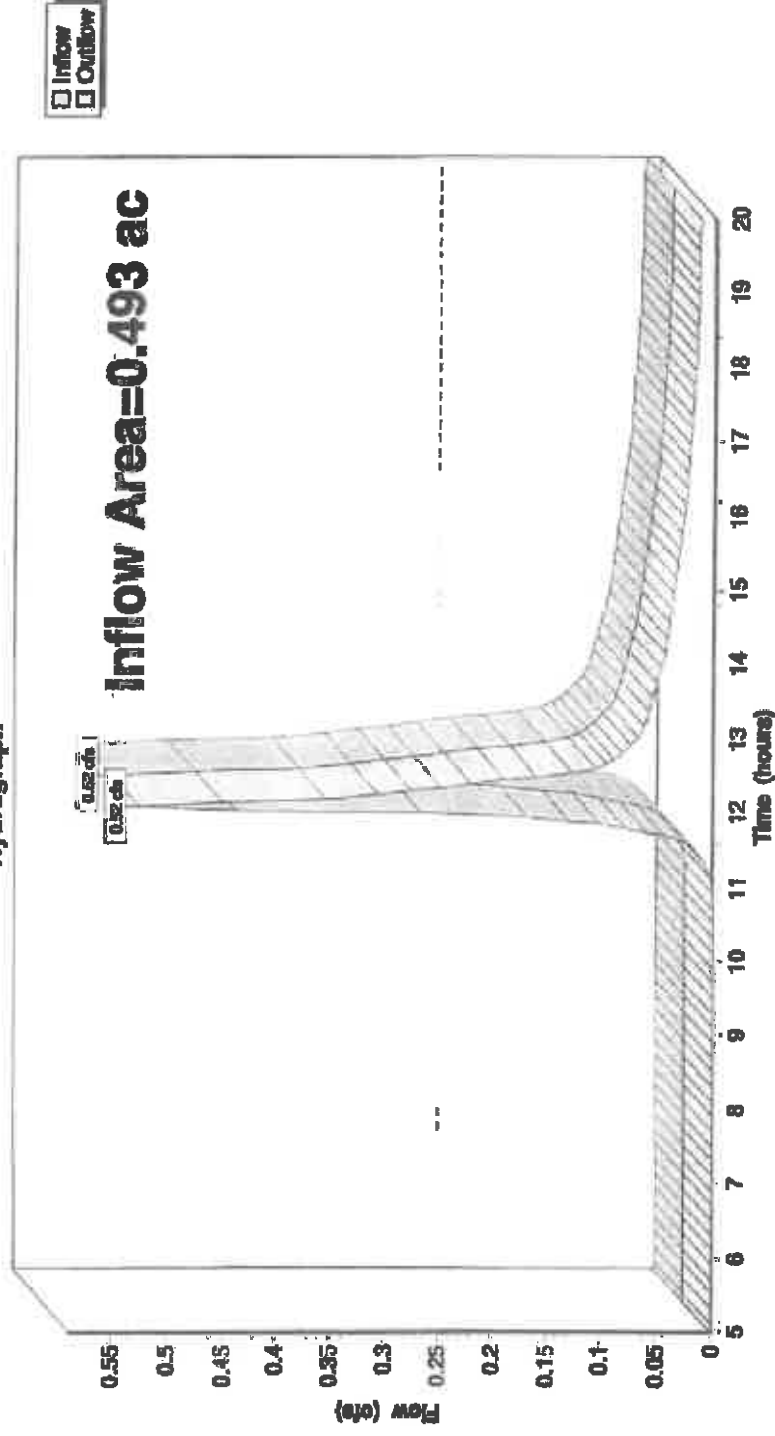
Summary for Reach IP-3E: EX. CULVERT

Inflow Area = 0.493 ac, 0.00% Impervious, Inflow Depth > 0.90" for 2YR event
Inflow = 0.52 cfs @ 12.10 hrs, Volume= 0.037 af
Outflow = 0.52 cfs @ 12.10 hrs, Volume= 0.037 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

Hydrograph



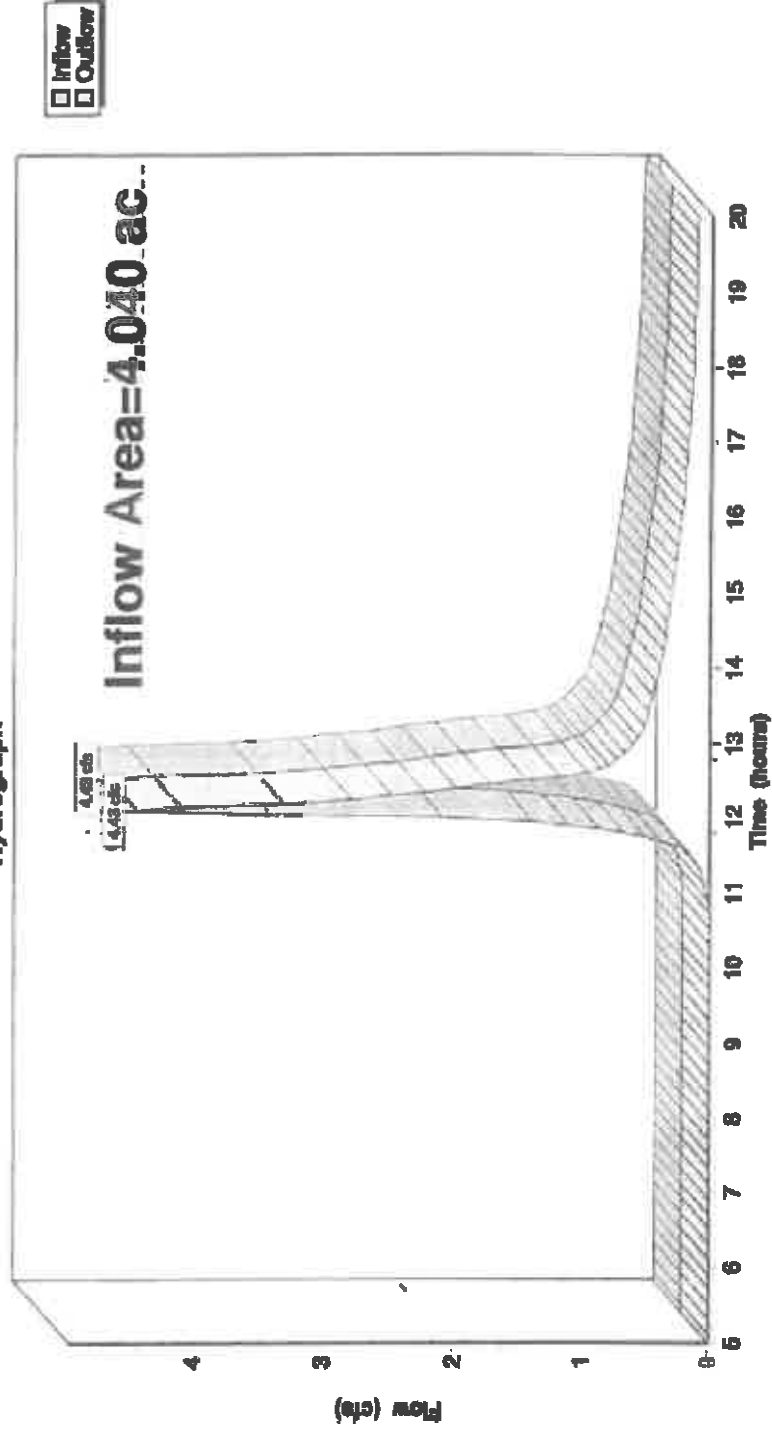
Summary for Reach IP-E1: 45 MAIN ST

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

Hydrograph



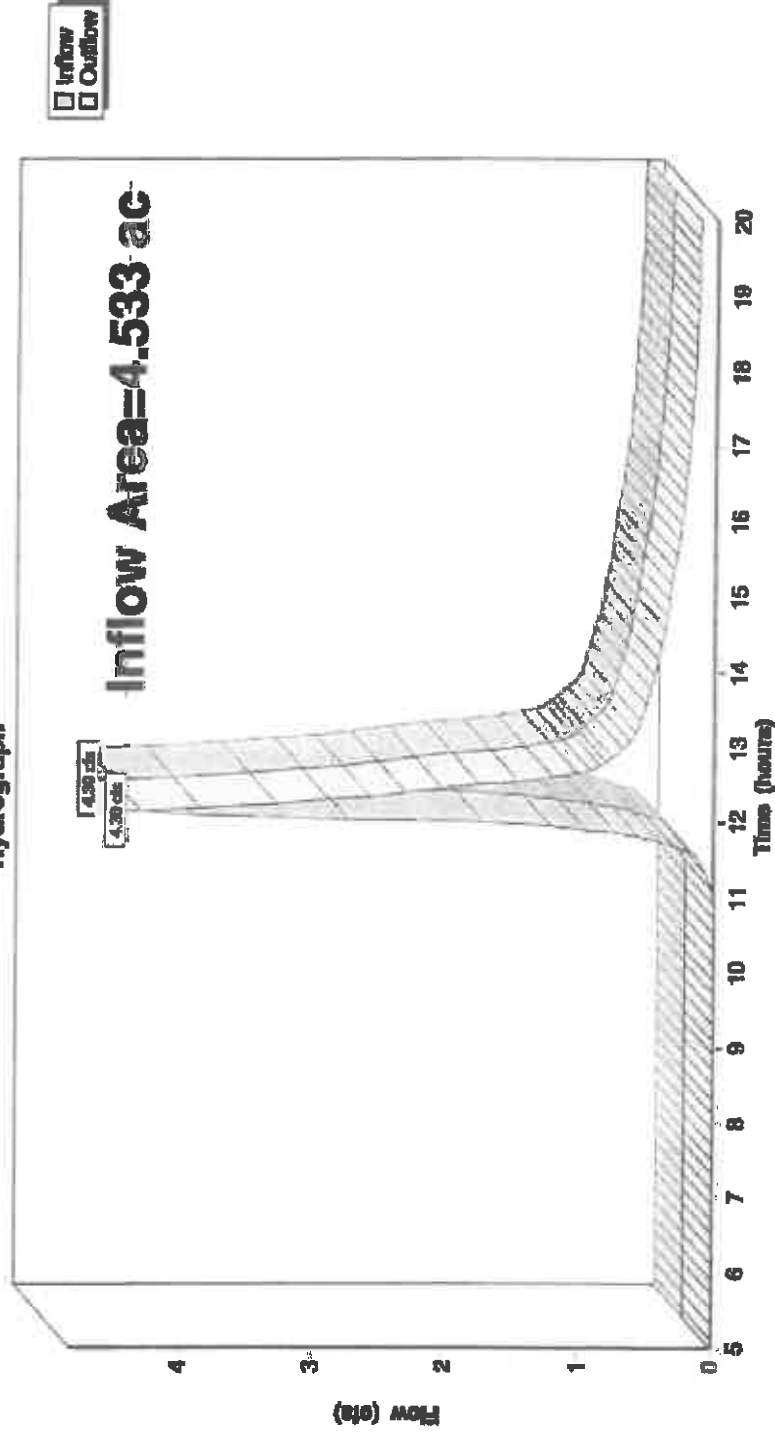
Summary for Reach IP-E2: SCHOOL ST

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

Hydrograph



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, LH=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=197,489 sf 2.58% 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>2.03"
Tc=6.0 min CN=71 Runoff=1.23 cfs 0.083 af

Reach IP-3E: EX CULVERT

Inflow=1.23 cfs 0.083 af
Outflow=1.23 cfs 0.083 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 = 1.560 af Average Runoff Depth = 2.06"
93.93% Pervious = 8.788 ac 3.07% Impervious = 0.278 ac

PRE-DEVELOPMENT 3-22-24

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Type III 24-hr 10YR Rainfall=5.11"

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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

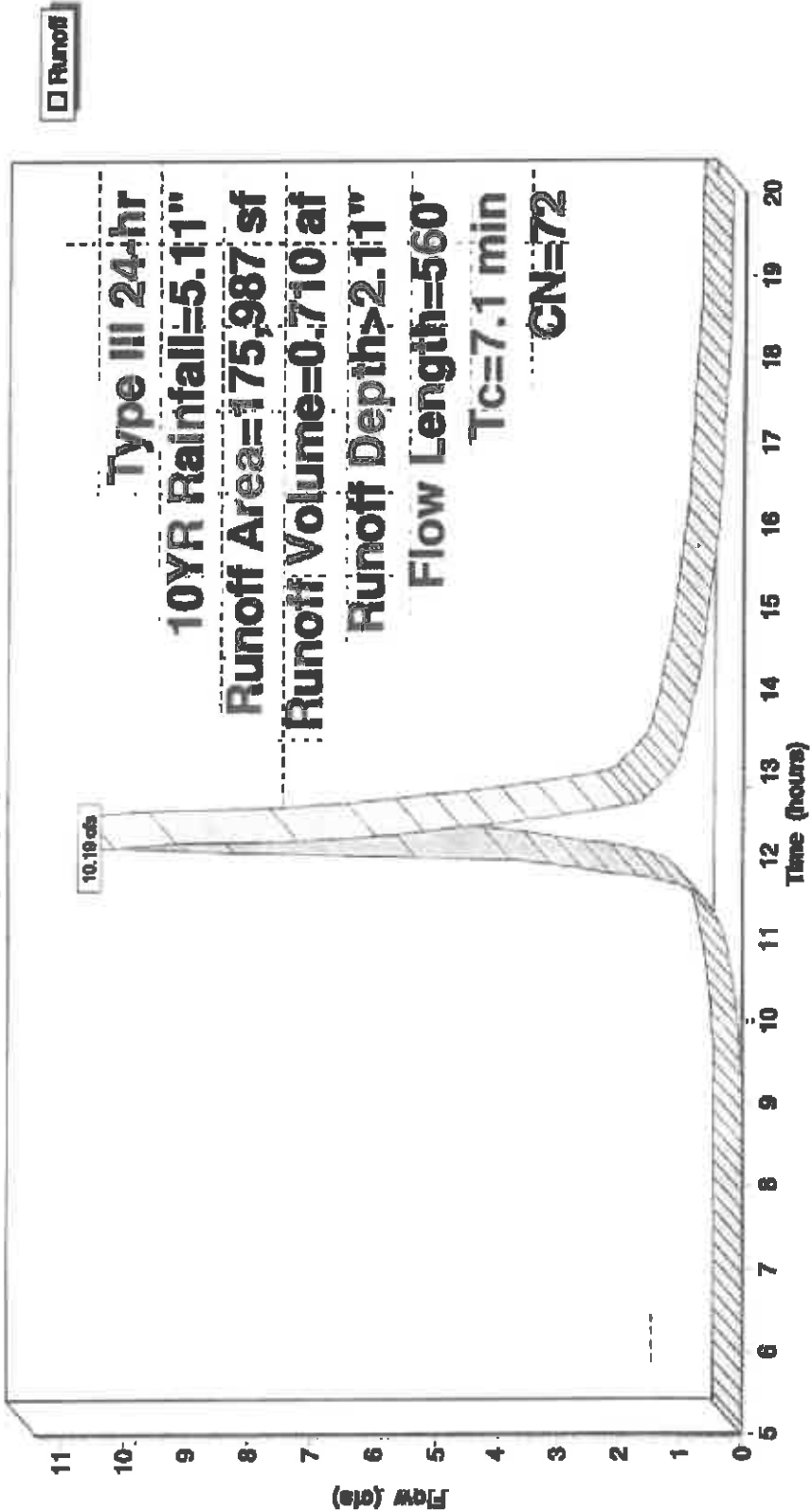
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10YR Rainfall=5.11"

Area (sf)	CN	Description
7,074	96	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



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Type III 24-hr 10YR Rainfall=5.11"

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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

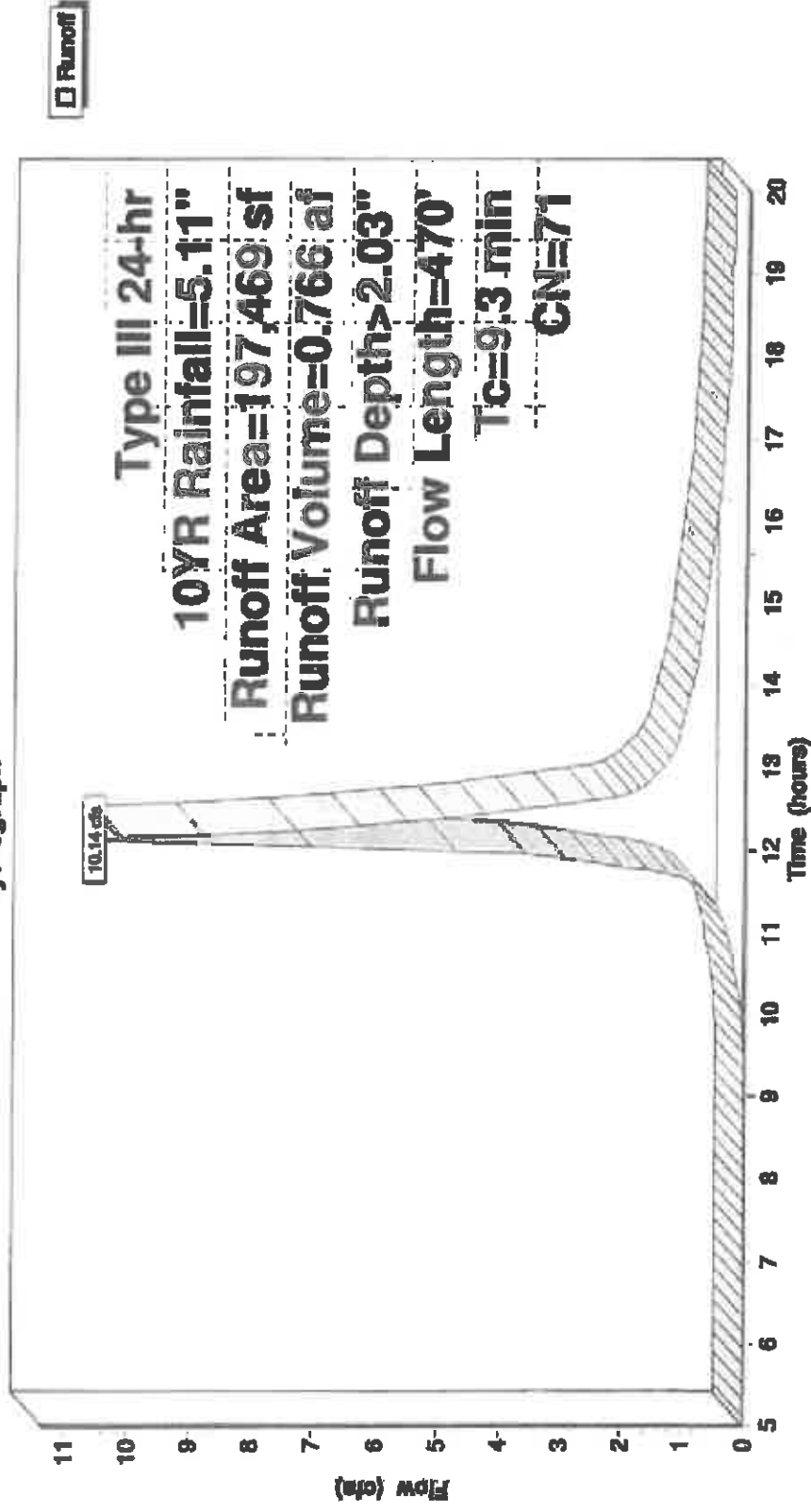
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=5.11"

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, TRAVEL PATH D TO E Woodland Kv= 5.0 fps
9.3	470	Total			

Subcatchment E-2: DA E-2

Hydrograph



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Type III 24-hr 10YR Rainfall=5.11"

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Summary for Subcatchment E-3: DA E-3

Runoff = 1.23 cfs @ 12.10 hrs, Volume= 0.083 af, Depth= 2.03"
Routed to Reach IP-3E : EX CULVERT

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

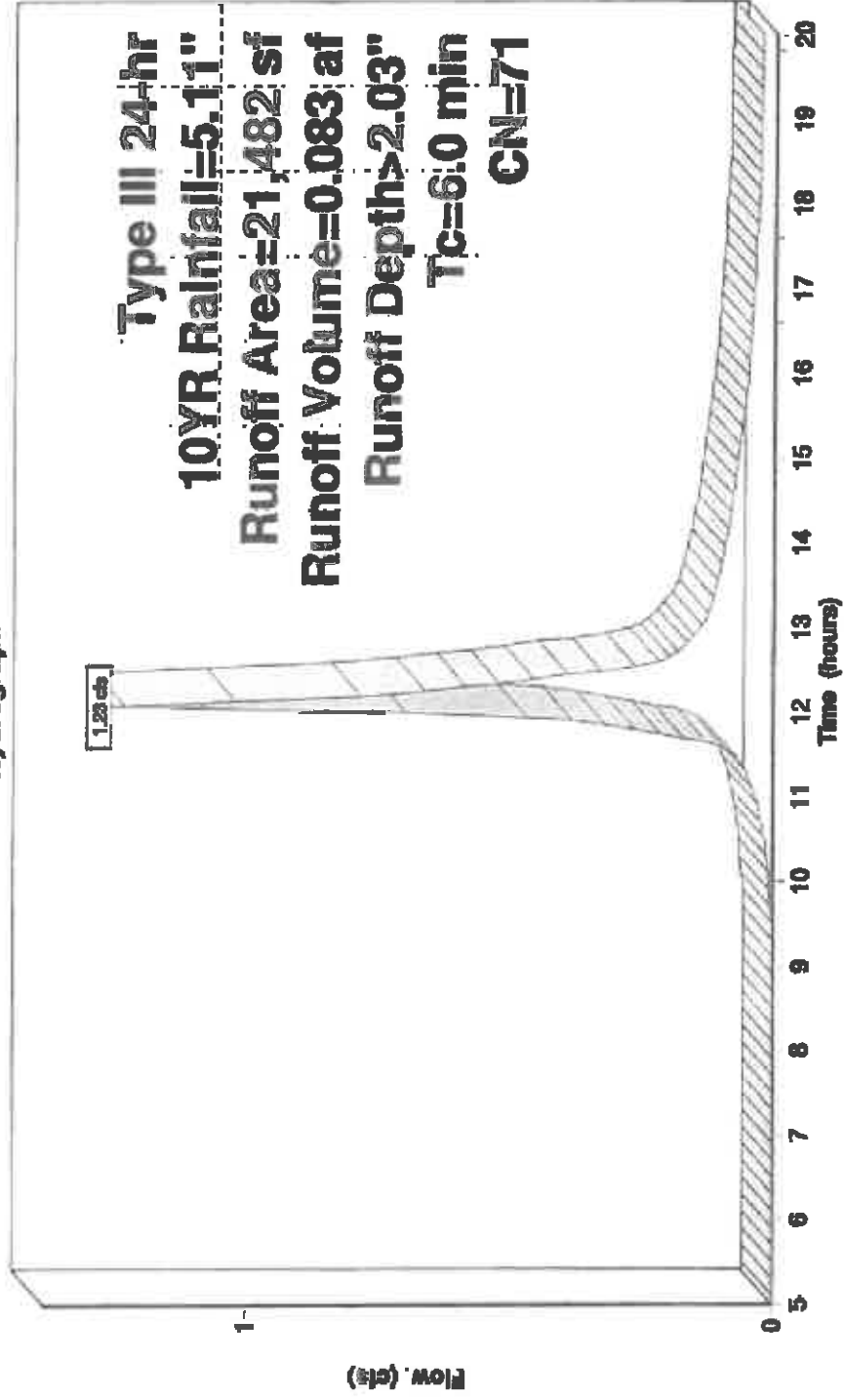
Area (sf)	CN	Description
15,951	70	Woods, Good, HSG C
5,631	74	>75% Grass cover, Good, HSG C
21,482	71	Weighted Average
21,482		100.00% Pervious Area

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

Subcatchment E-3: DA E-3

Hydrograph



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Type III 24-hr 10YR Rainfall=5.11"

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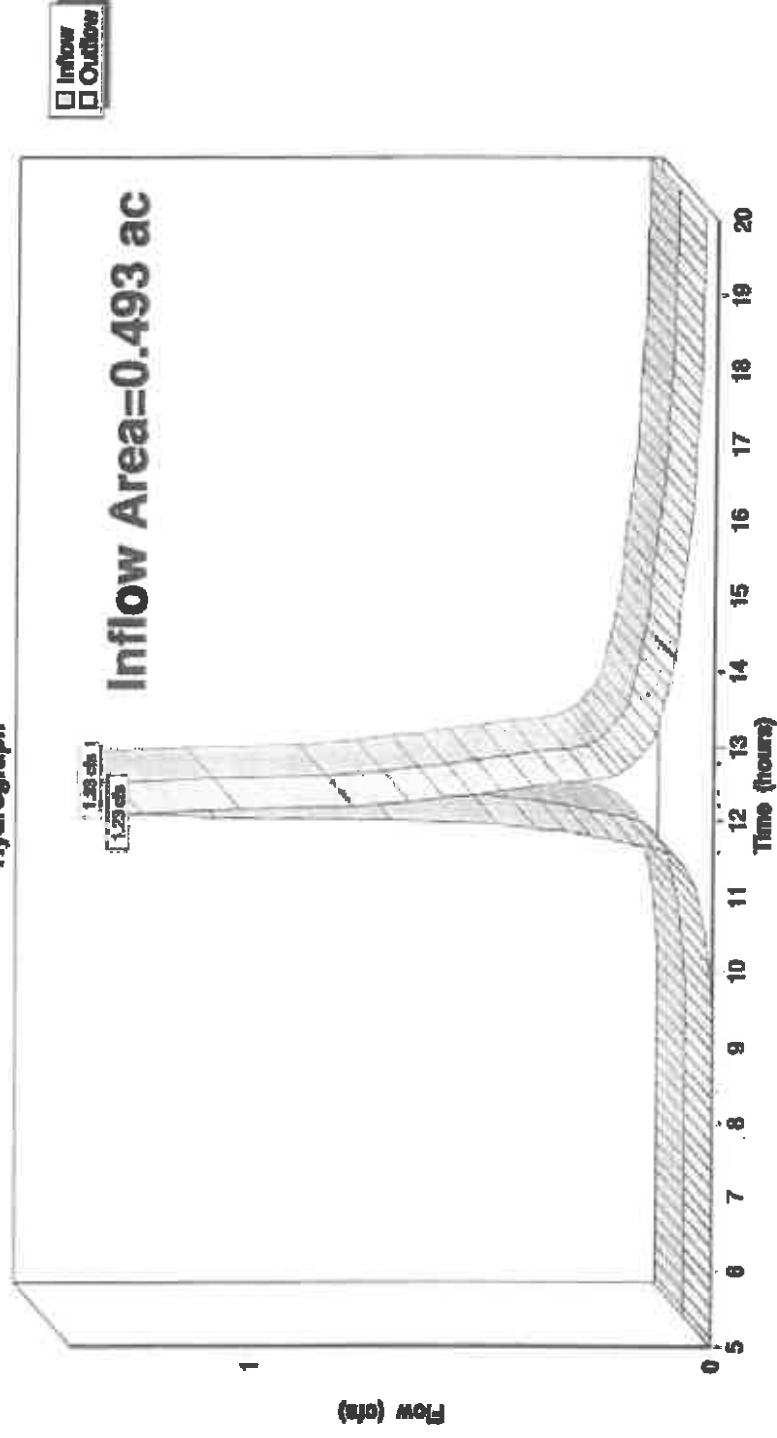
Summary for Reach IP-3E: EX. CULVERT

Inflow Area = 0.493 ac, 0.00% Impervious, Inflow Depth > 2.03" for 10YR event
Inflow = 1.23 cfs @ 12.10 hrs, Volume= 0.083 af
Outflow = 1.23 cfs @ 12.10 hrs, Volume= 0.083 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

Hydrograph



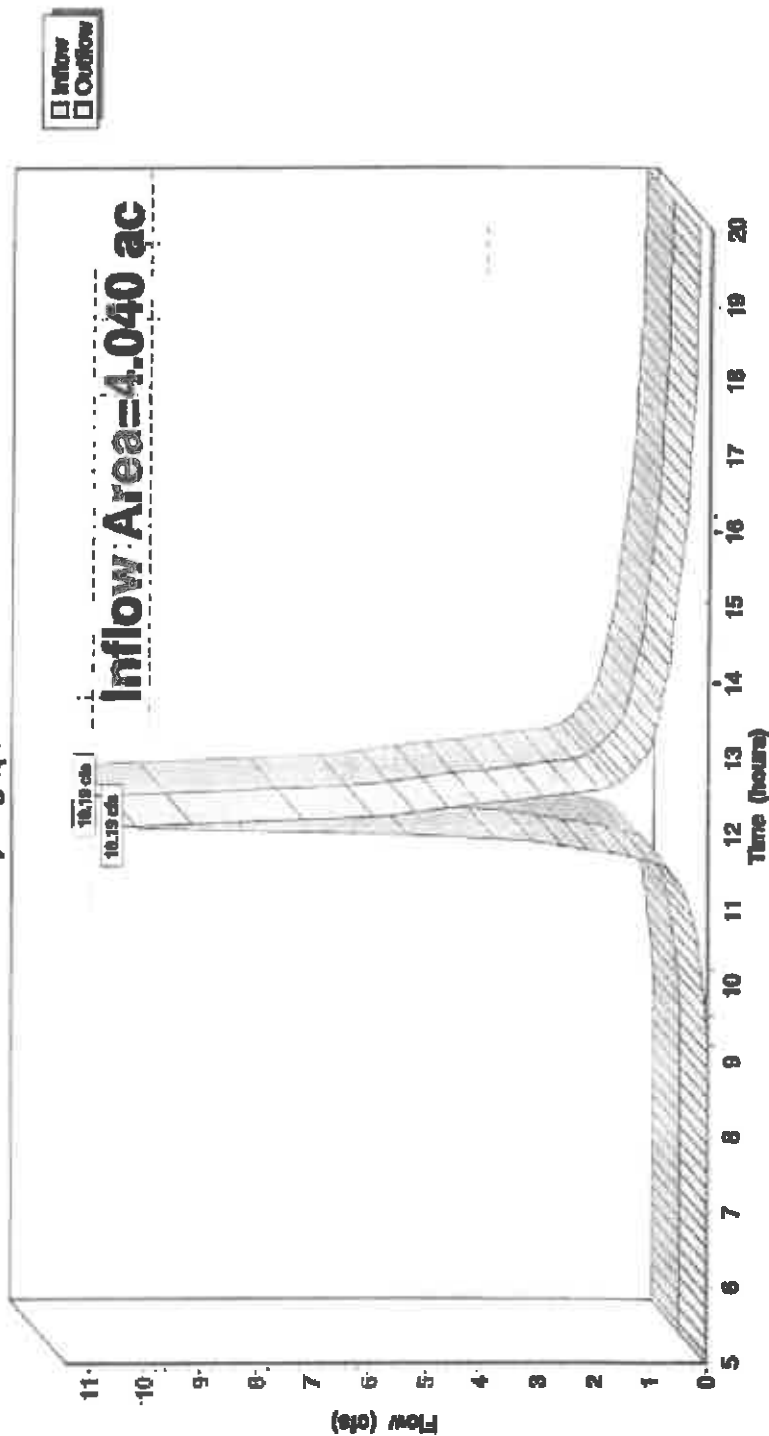
Summary for Reach IP-E1: 45 MAIN ST

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

Hydrograph



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Type III 24-hr 10YR Rainfall=5.11"

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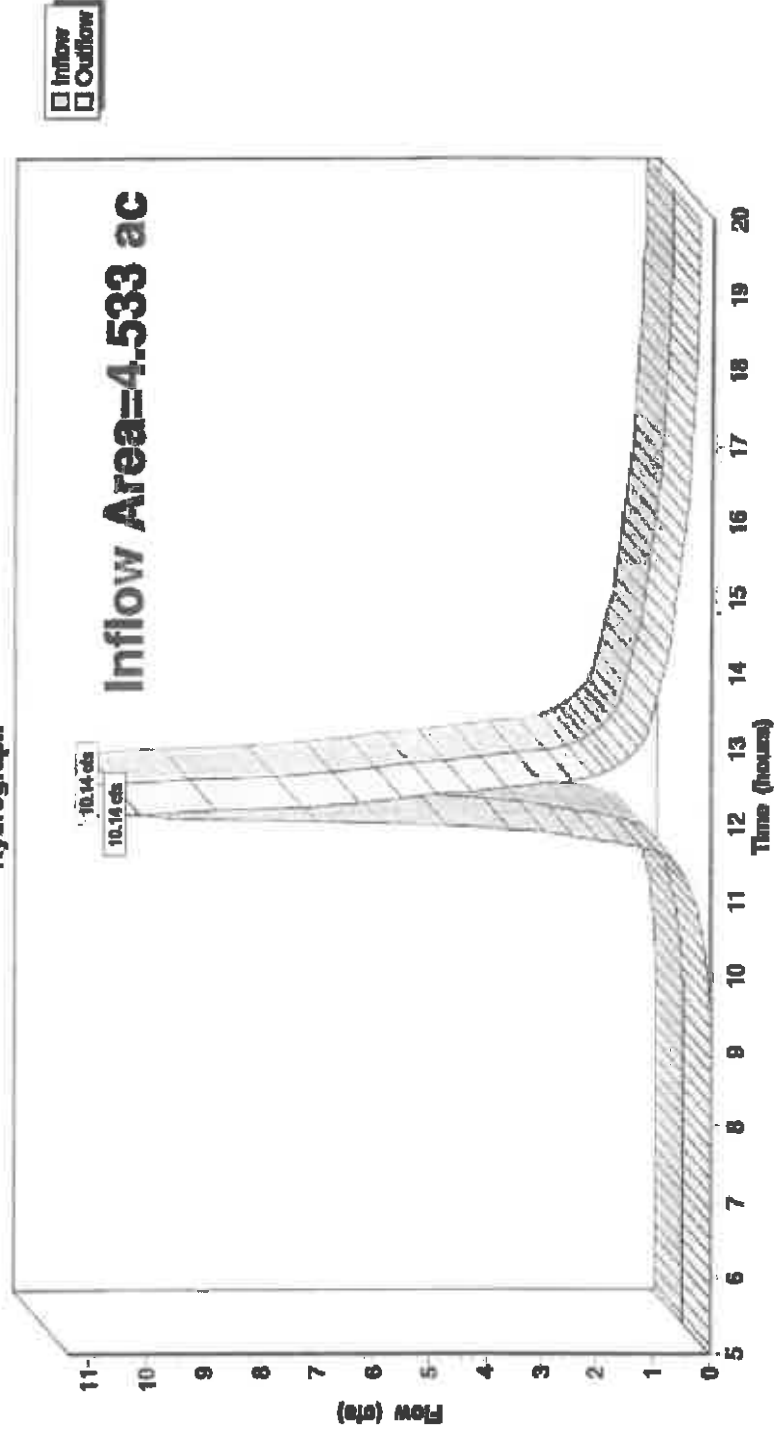
Summary for Reach IP-E2: SCHOOL ST

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 Spar= 5.00-20.00 hrs, dt= 0.05 hrs

Reach IP-E2: SCHOOL ST

Hydrograph



PRE-DEVELOPMENT 3-22-24

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Type III 24-hr 25YR Rainfall=6.19"

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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=197,489 sf 2.56% Impervious Runoff Depth=2.83"
Flow Length=470' Tc=8.3 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=2.83"
Tc=6.0 min CN=71 Runoff=1.73 cfs 0.116 af

Reach IP-3E: EX. CULVERT

Inflow=1.73 cfs 0.116 af
Outflow=1.73 cfs 0.116 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 = 2.170 af Average Runoff Depth = 2.87"
98.93% Pervious = 8.788 ac 3.07% Impervious = 0.278 ac**

PRE-DEVELOPMENT 3-22-24

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Type III 24-hr 25YR Rainfall=6.19"

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Summary for Subcatchment E-1: DA E-1

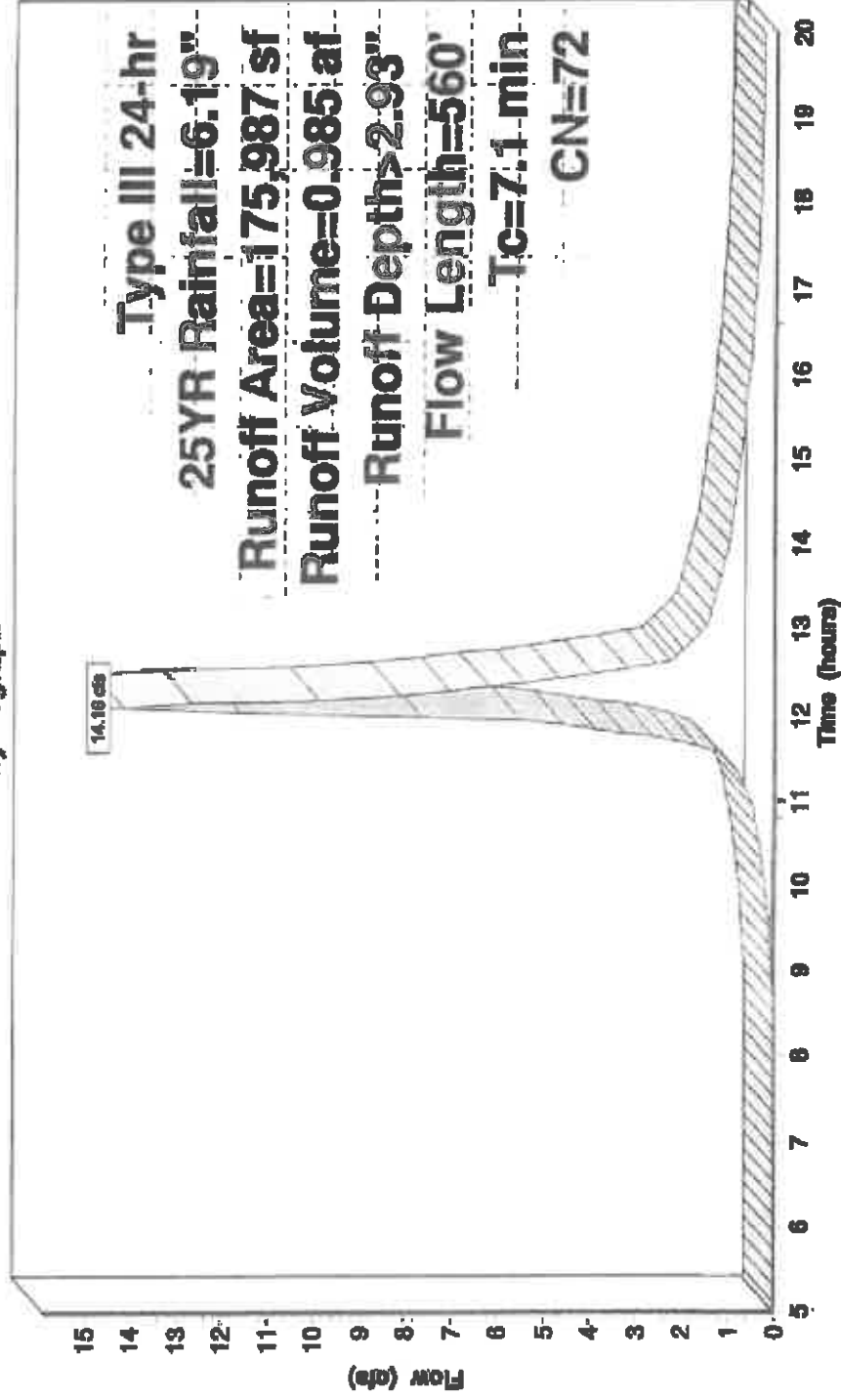
Runoff = 14.16 cfs @ 12.11 hrs, Volume= 0.985 af, Depth= 2.93"
Routed to Reach IP-E1 : 45 MAIN ST

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 (s)	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 f _{us}
7.1	560	Total			

Subcatchment E-1: DA E-1

Hydrograph



PRE-DEVELOPMENT 3-22-24

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Type III 24-hr 25YR Rainfall=6.19"

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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, di= 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, TRAVEL PATH D TO E
					Woodland Kv= 5.0 fps
9.3	470	Total			

PRE-DEVELOPMENT 3-22-24

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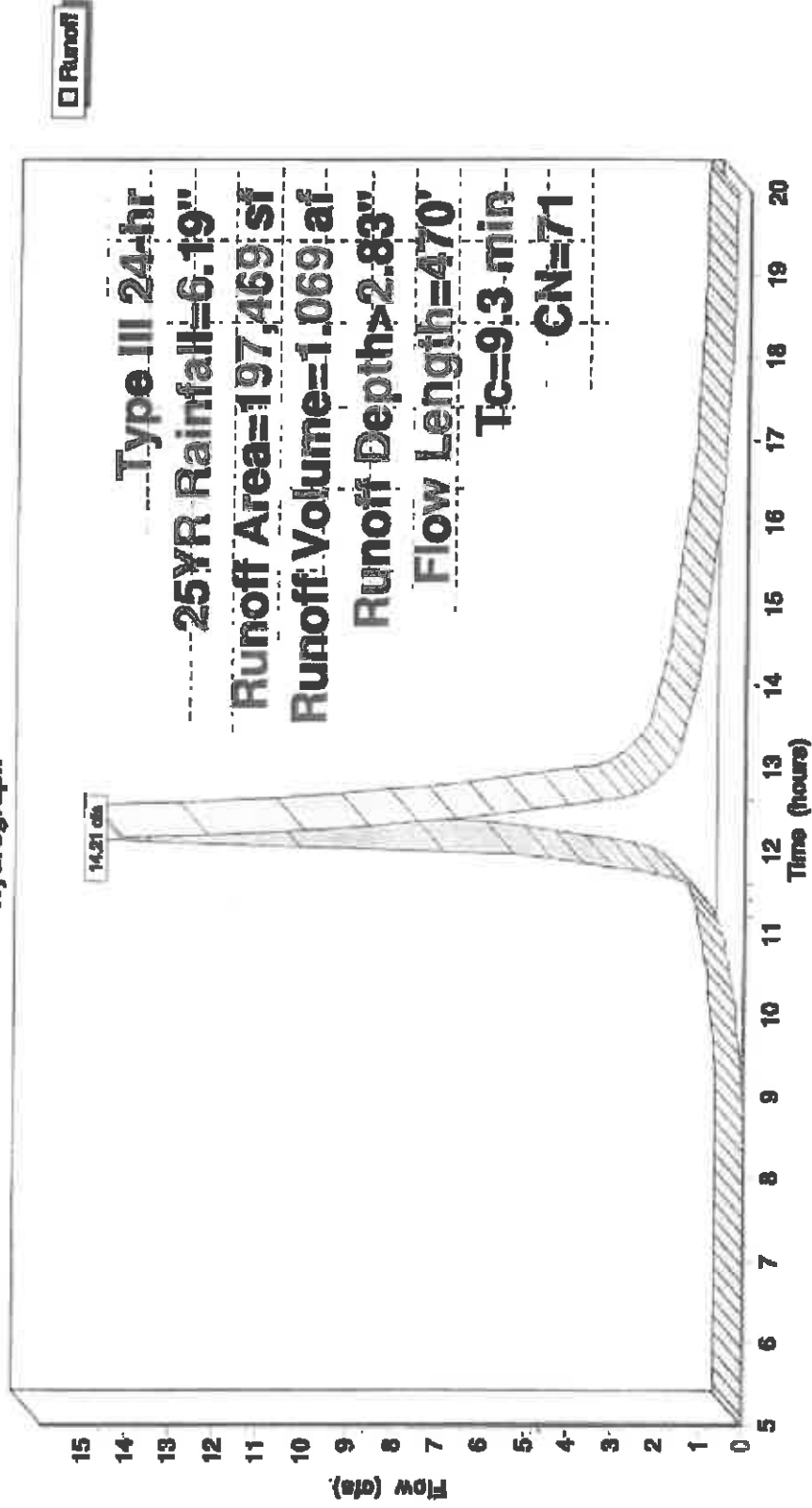
Type III 24-hr 25YR Rainfall=6.19"

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Subcatchment E-2: DA E-2

Hydrograph



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Type III 24-hr 25YR Rainfall=6.19"

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Summary for Subcatchment E-3: DA E-3

Runoff = 1.73 cfs @ 12.09 hrs, Volume= 0.116 af, Depth= 2.83"
Routed to Reach IP-3E : EX. CULVERT

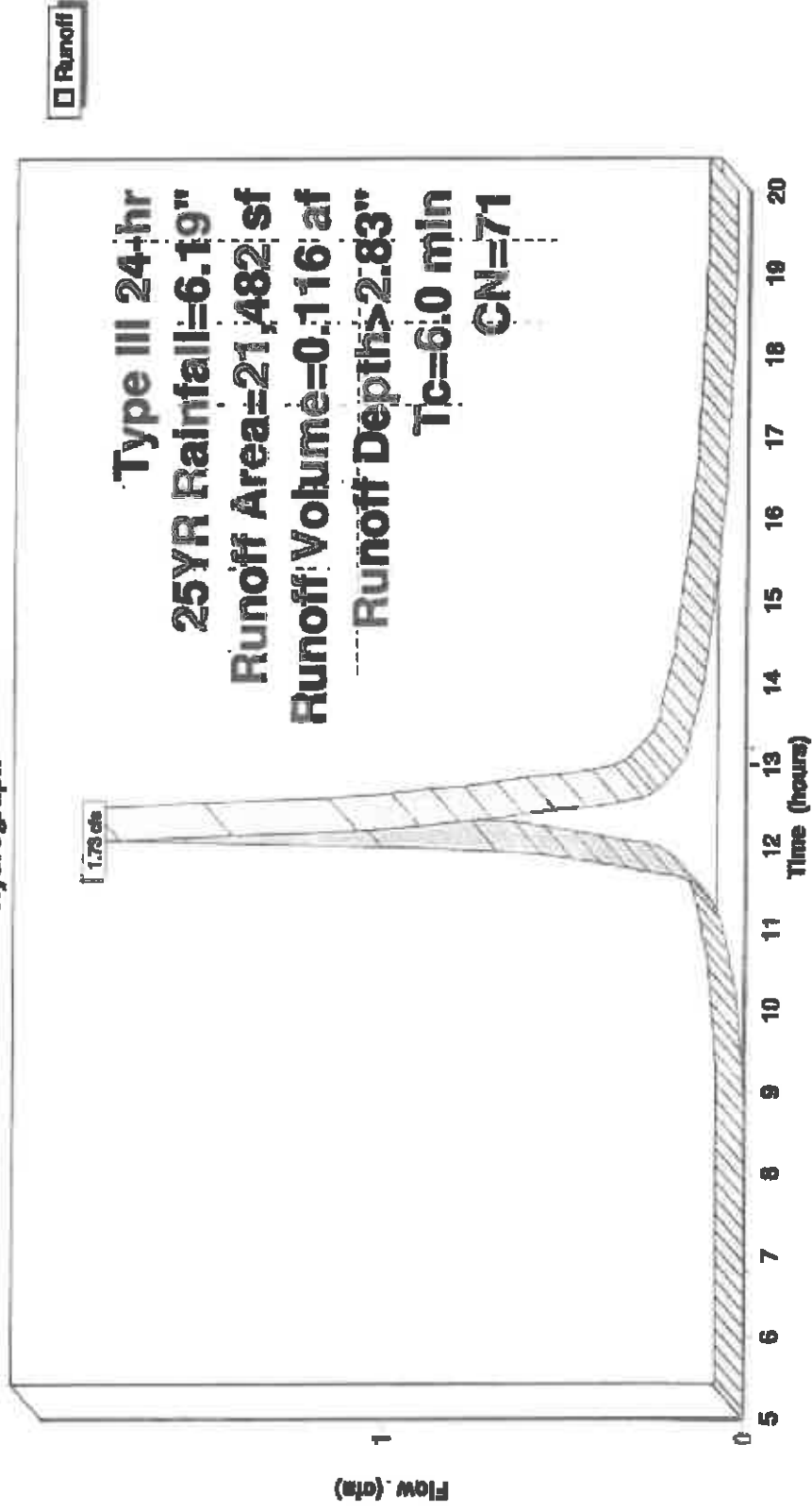
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=6.19"

Area (sf)	CN	Description
15,851	70	Woods, Good, HSG C
5,631	74	>75% Grass cover Good, HSG C
21,482	71	Weighted Average
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

Hydrograph



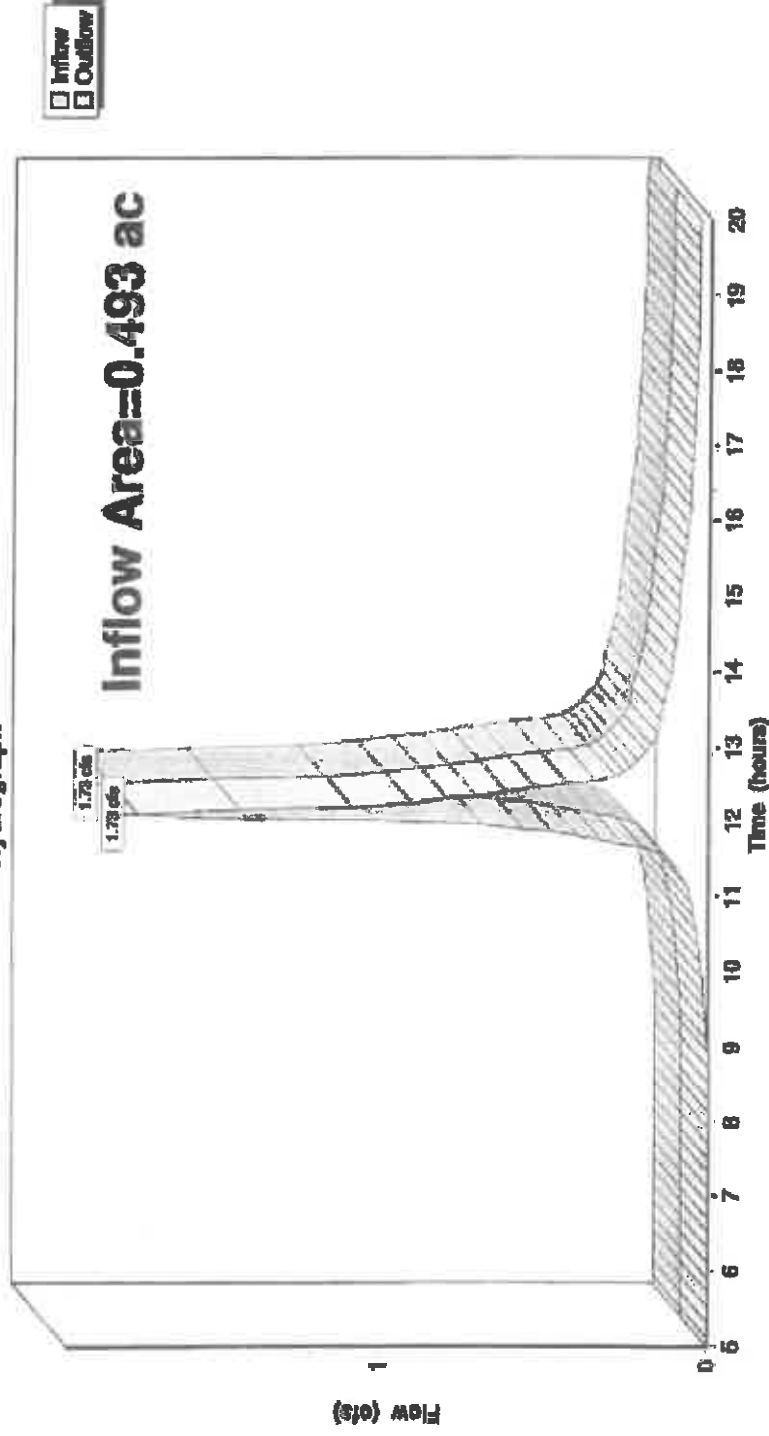
Summary for Reach IP-3E: EX. CULVERT

Inflow Area = 0.493 ac, 0.00% Impervious, Inflow Depth > 2.83" for 25YR event
Inflow = 1.73 cfs @ 12.09 hrs, Volume= 0.116 af
Outflow = 1.73 cfs @ 12.09 hrs, Volume= 0.116 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

Hydrograph



PRE-DEVELOPMENT 3-22-24

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Type III 24-hr 25YR Rainfall=6.19"

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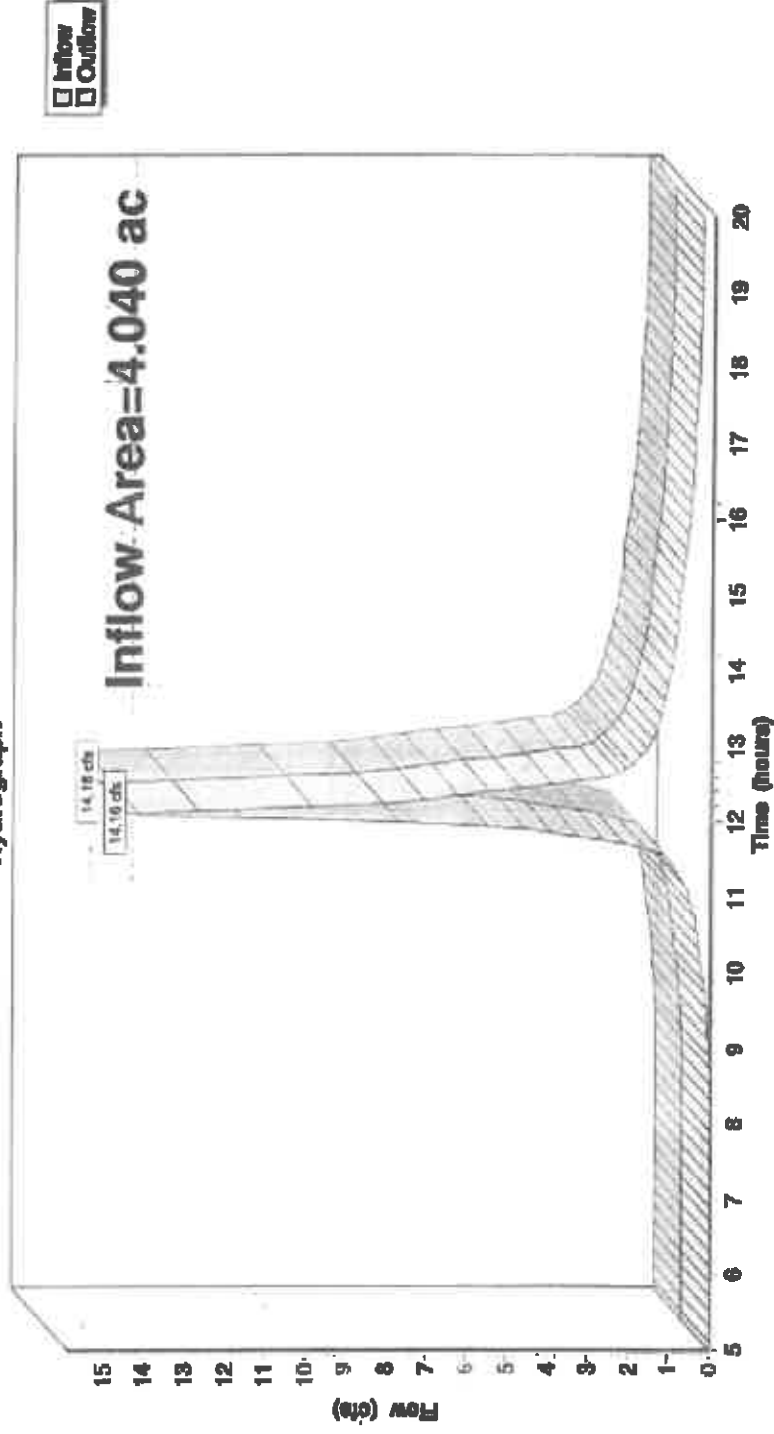
Summary for Reach IP-E1: 45 MAIN ST

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

Hydrograph



PRE-DEVELOPMENT 3-22-24

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Type III 24-hr 25YR Rainfall=6.19"

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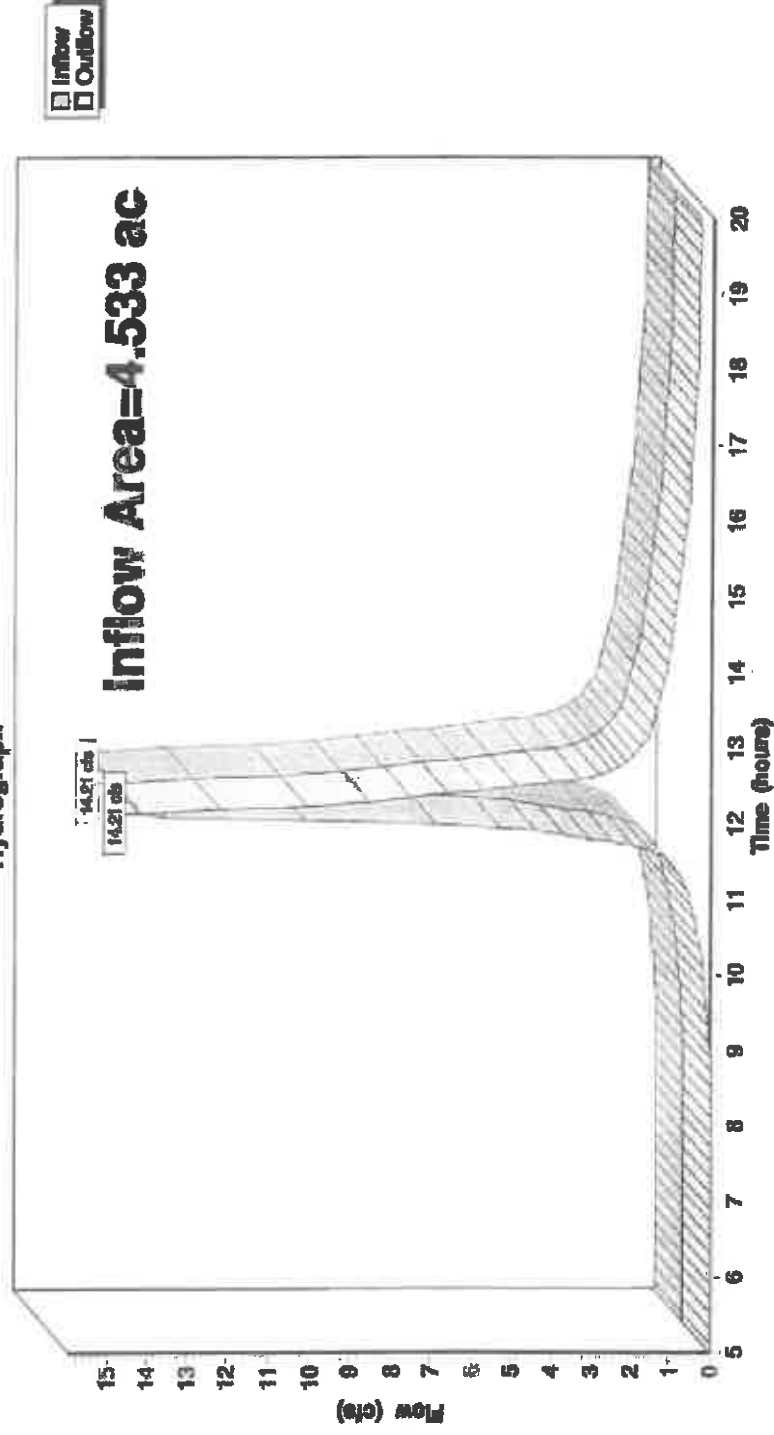
Summary for Reach IP-E2: SCHOOL ST

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

Hydrograph



PRE-DEVELOPMENT 3-22-24

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Type III 24-hr 100YR Rainfall=7.85"

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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=4.28"
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 1.587 af

Subcatchment E-3: DA E-3

Runoff Area=21,482 af 0.00% Impervious Runoff Depth=4.15"
Tc=6.0 min CN=71 Runoff=2.52 cfs 0.171 af

Reach IP-3E: EX CULVERT

Inflow=2.52 cfs 0.171 af
Outflow=2.52 cfs 0.171 af

Reach IP-E1: 46 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 1.587 af
Outflow=20.77 cfs 1.587 af

Total Runoff Area = 9.667 ac Runoff Volume = 3.173 af Average Runoff Depth = 4.20"
96.93% Pervious = 8.788 ac 3.07% Impervious = 0.278 ac

PRE-DEVELOPMENT 3-22-24

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Type III 24-hr 100YR Rainfall=7.85"

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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 JP-E1 : 45 MAIN ST

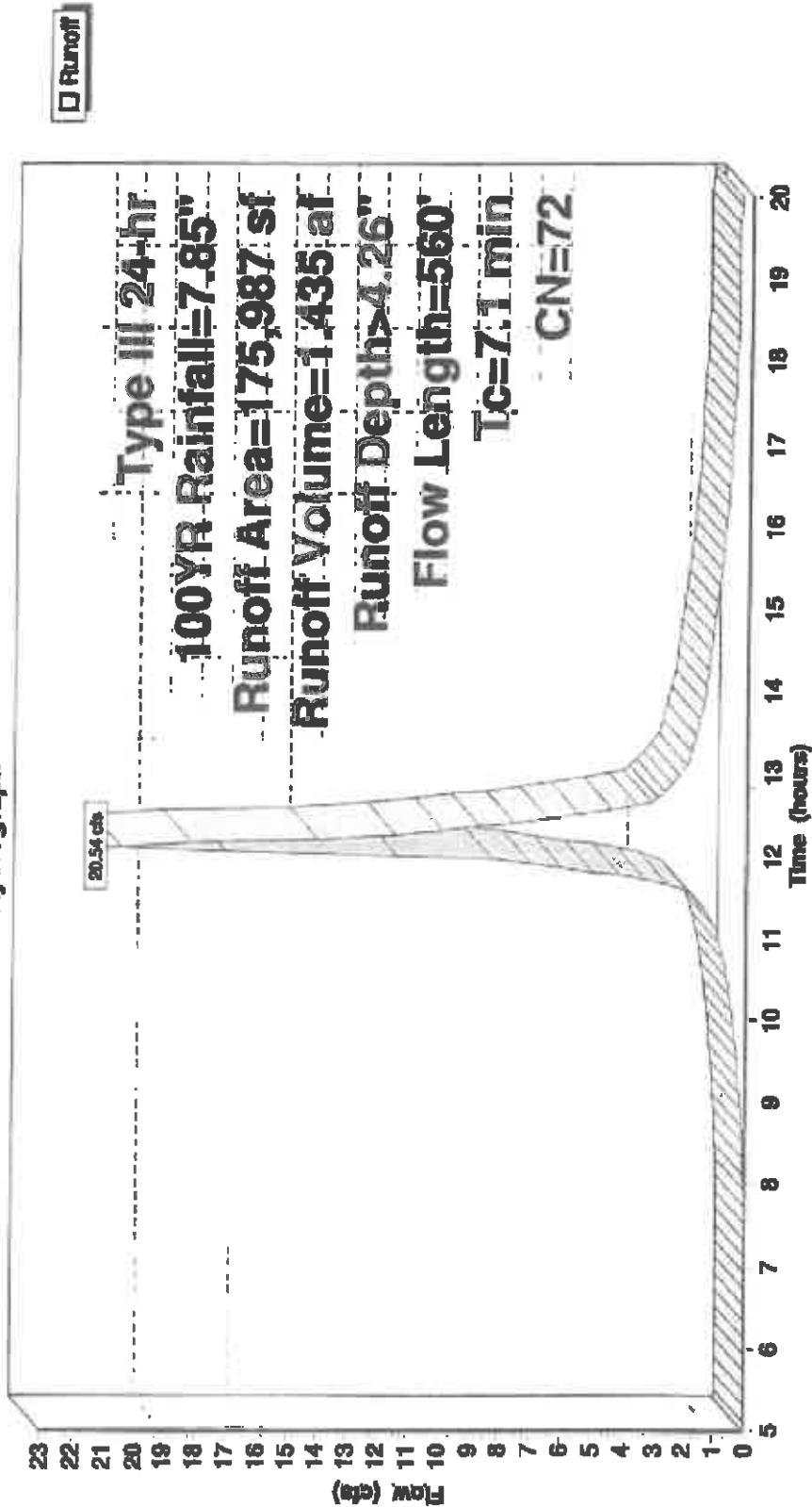
Runoff by SCS TR-20 method, LH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100YR Rainfall=7.85"

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



PRE-DEVELOPMENT 3-22-24

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Type III 24-hr 100YR Rainfall=7.85"

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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

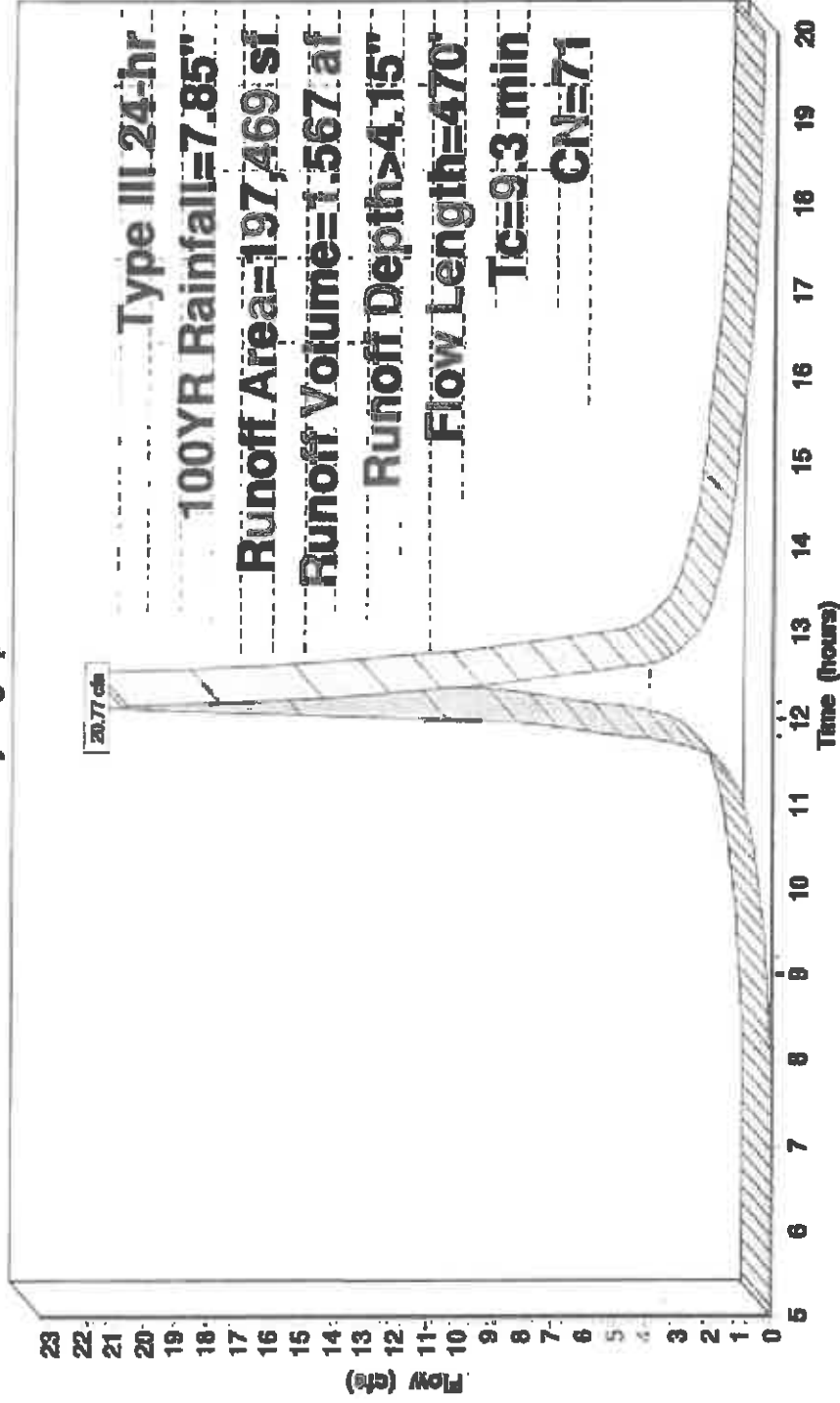
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100YR Rainfall=7.85"

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, TRAVEL 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 = 2.52 cfs @ 12.09 hrs, Volume= 0.171 af, Depth= 4.15"
Routed to Reach IP-3E : EX. CULVERT

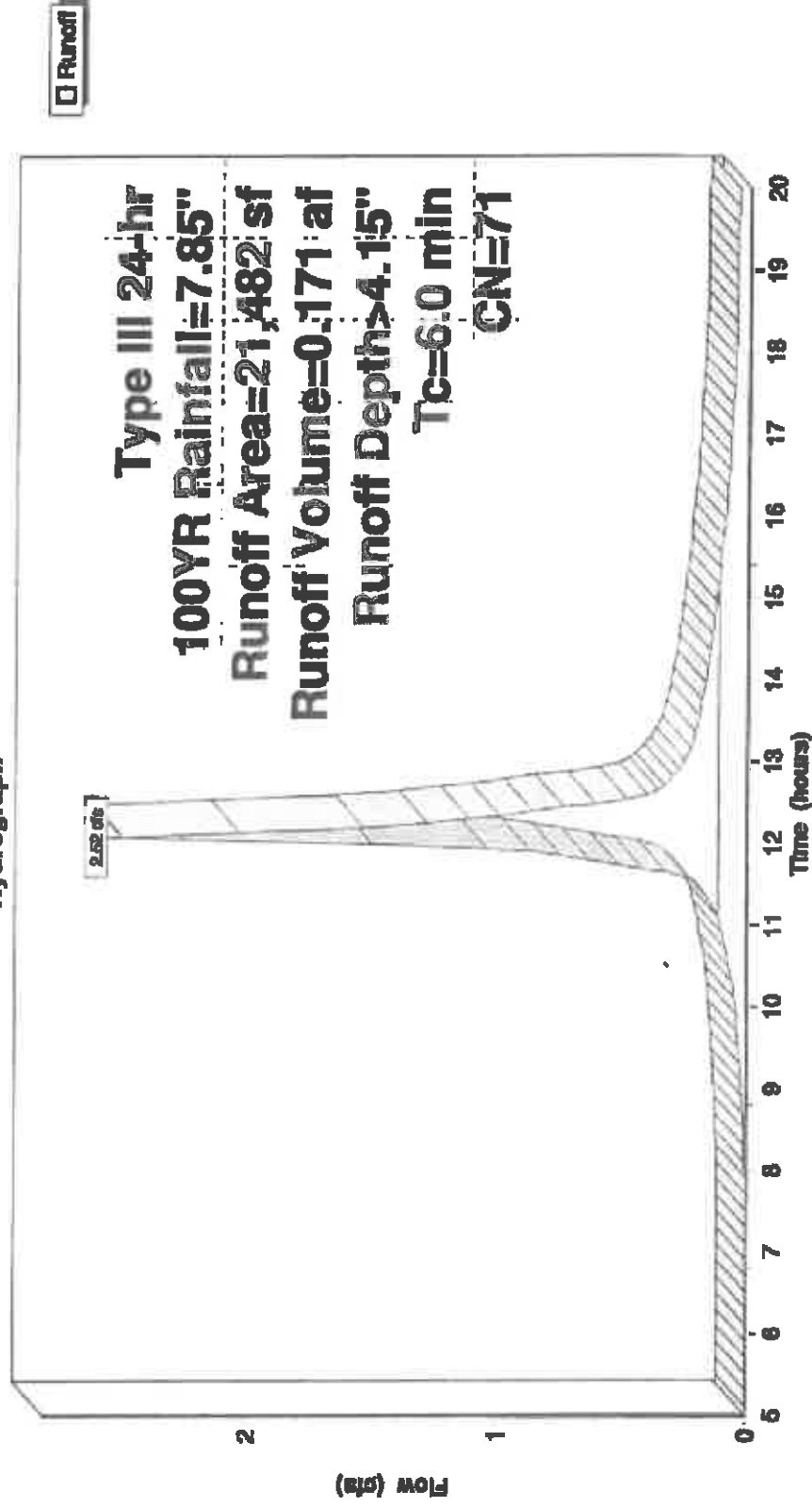
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100YR Rainfall=7.85"

Area (sf)	CN	Description
15,851	70	Woods, Good, HSG C
5,631	74	>75% Grass cover, Good HSG C
21,482	71	Weighted Average
21,482		100.00% Pervious Area
Tc Length (min)	Slope (ft/ft)	Velocity (ft/sec)
6.0		Capacity (cfs)
		Description

Direct Entry, TRAVEL TIME

Subcatchment E-3: DA E-3

Hydrograph



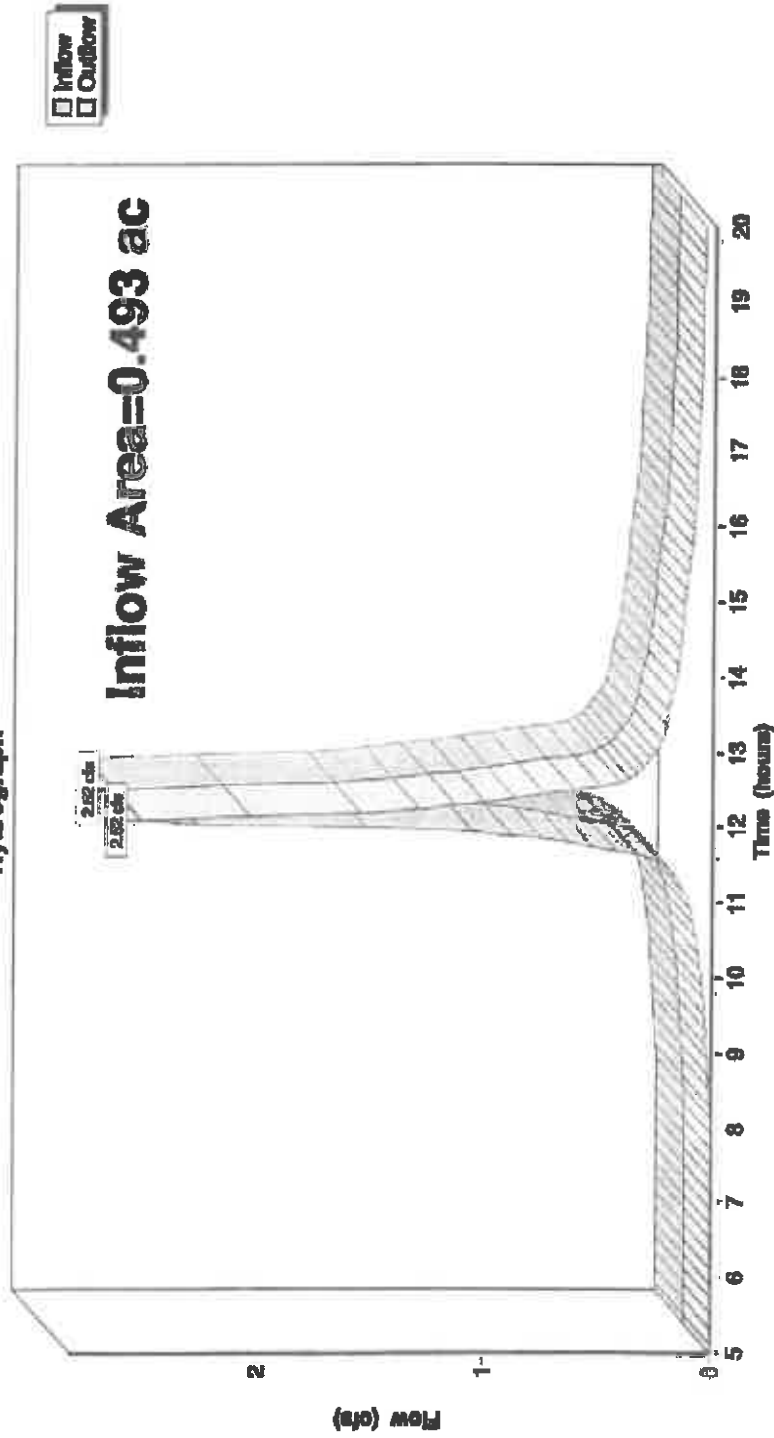
Summary for Reach IP-3E: EX. CULVERT

Inflow Area = 0.493 ac, 0.00% Impervious, Inflow Depth > 4.15" for 100YR event
Inflow = 2.52 cfs @ 12.09 hrs, Volume= 0.171 af
Outflow = 2.52 cfs @ 12.09 hrs, Volume= 0.171 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

Hydrograph



PRE-DEVELOPMENT 3-22-24

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Type III 24-hr 100YR Rainfall=7.85"

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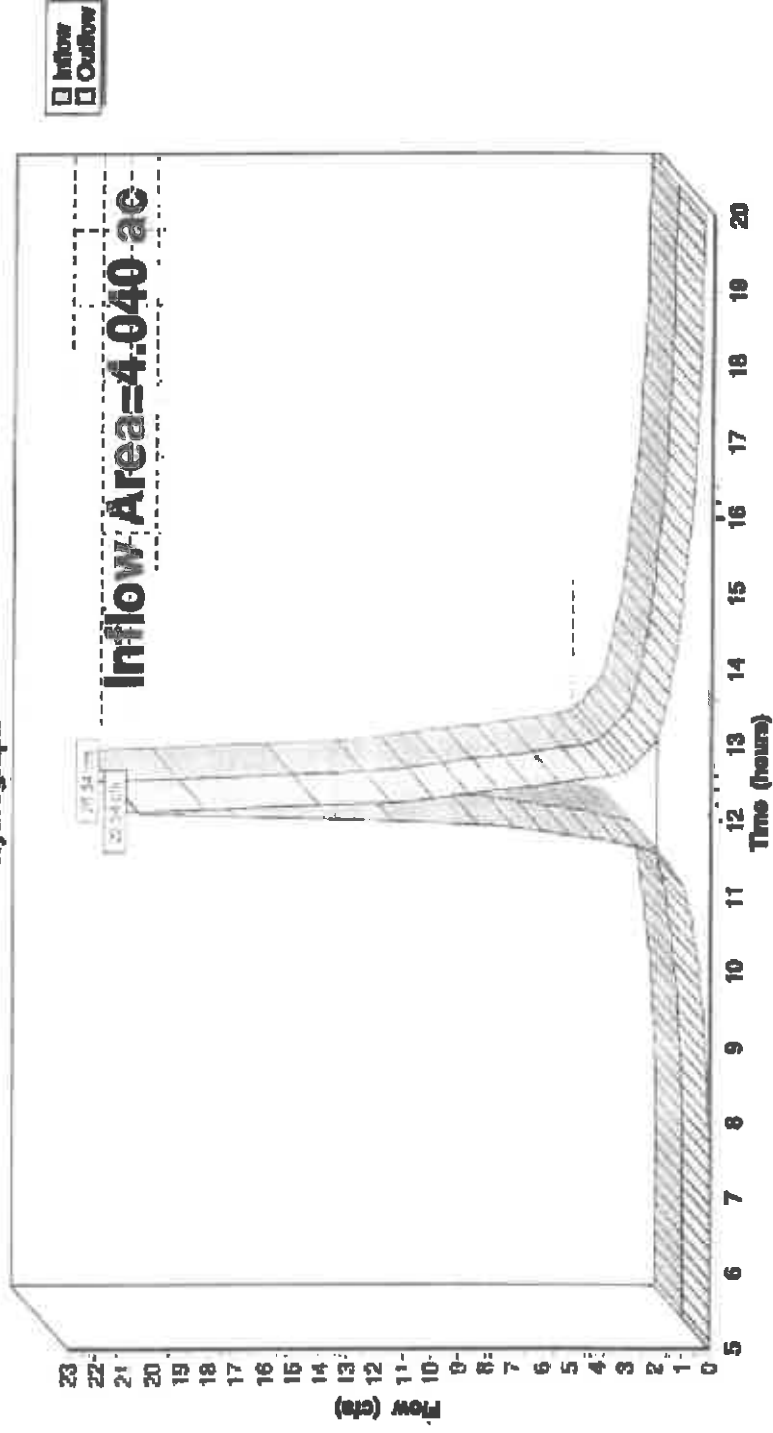
Summary for Reach IP-E1: 45 MAIN ST

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

Hydrograph



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Type III 24-hr 100YR Rainfall=7.85"

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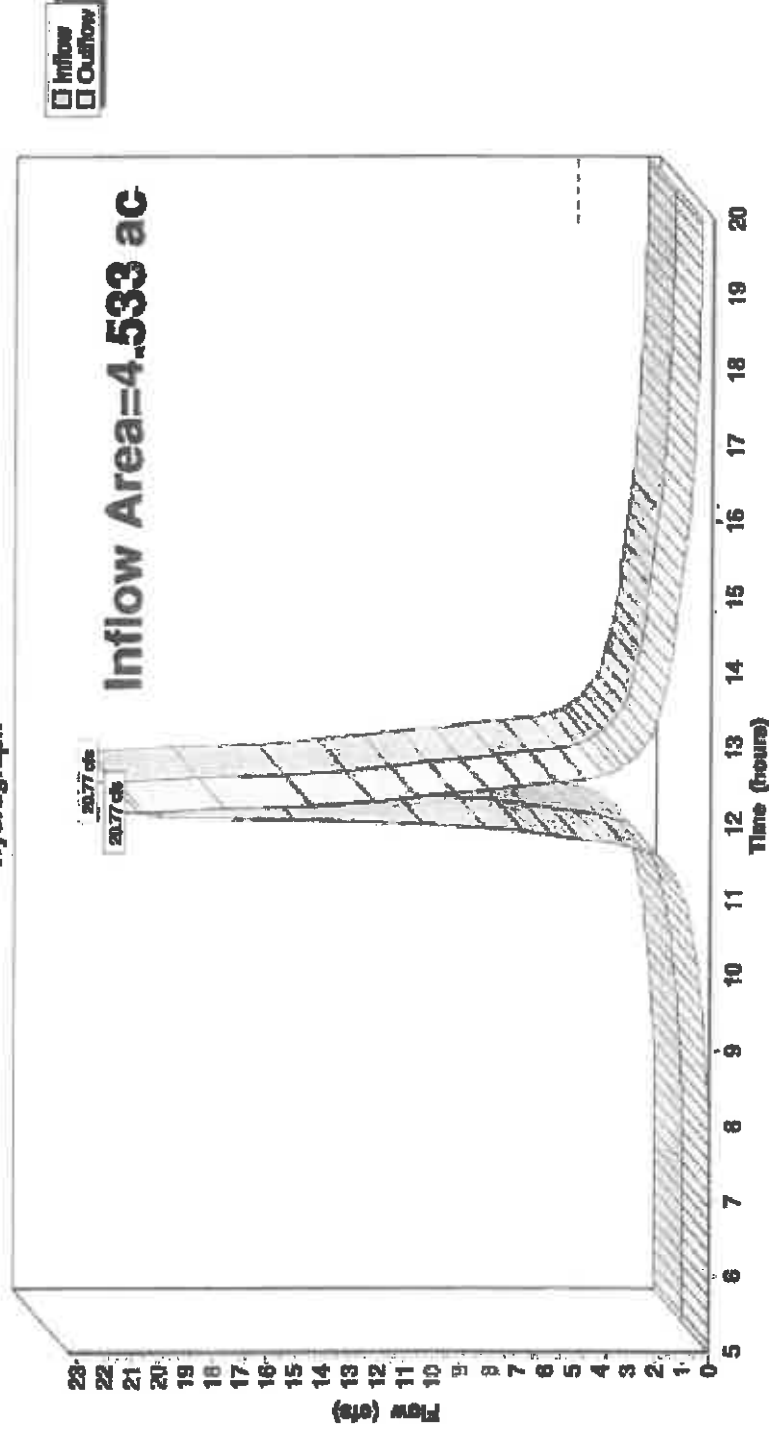
Summary for Reach IP-E2: SCHOOL ST

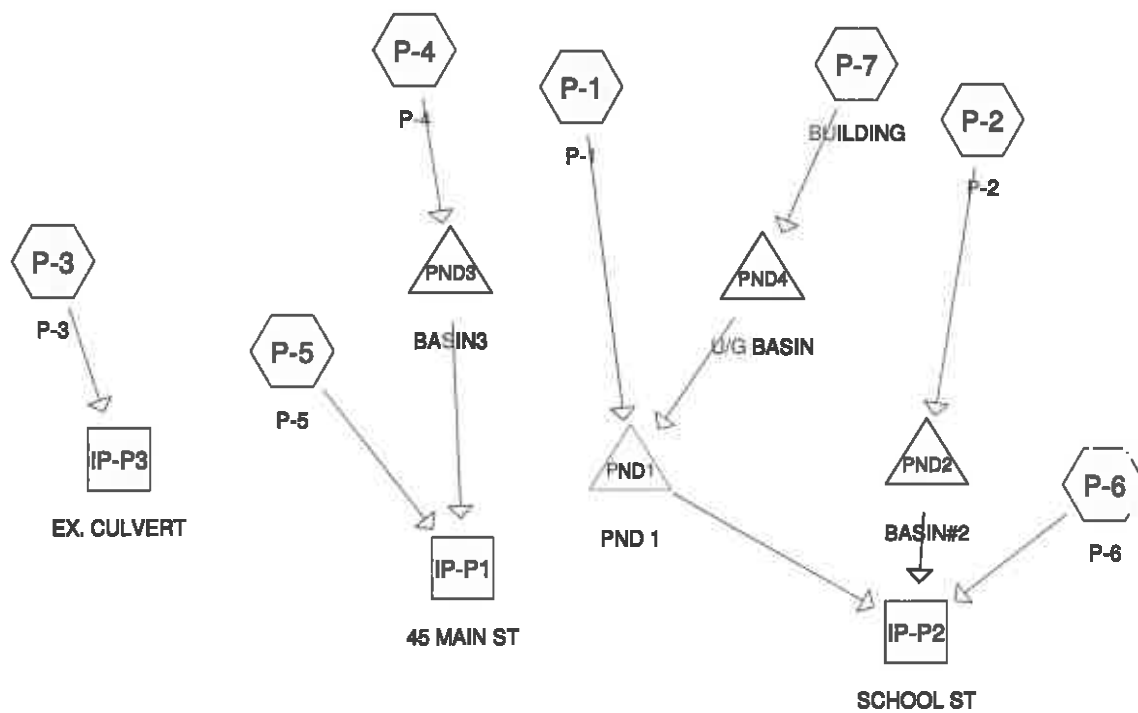
Inflow Area = 4.533 ac, 2.56% Impervious, Inflow Depth > 4.15" for 100YR event
Inflow = 20.77 cfs @ 12.13 hrs, Volume= 1.567 af
Outflow = 20.77 cfs @ 12.13 hrs, Volume= 1.567 af, Atten= 0%, Lag= 0.0 min

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

Reach IP-E2: SCHOOL ST

Hydrograph





Routing Diagram for POST DEVELOPMENT 3-22-24
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POST DEVELOPMENT 3-22-24

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Rainfall Events Listing (selected events)

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

POST DEVELOPMENT 3-22-24

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.341	74	>75% Grass cover, Good, HSG C (P-1, P-2, P-3, P-4, P-6)
1.540	98	Paved parking, HSG C (P-1, P-2, P-3, P-4)
0.514	98	Roofs, HSG C (P-7)
6.766	70	Woods, Good, HSG C (P-1, P-2, P-3, P-4, P-5, P-6)
11.160	76	TOTAL AREA

POST DEVELOPMENT 3-22-24

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Soil Listing (all nodes)

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

POST DEVELOPMENT 3-22-24

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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	2.341	0.000	0.000	2.341	>75% Grass cover, Good	P-1, P-2, P-3, P-4, P-6
0.000	0.000	1.540	0.000	0.000	1.540	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	6.766	0.000	0.000	6.766	Woods, Good	P-1, P-2, P-3, P-4, P-5, P-6
0.000	0.000	11.160	0.000	0.000	11.160	TOTAL AREA	

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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	

POST DEVELOPMENT 3-22-24

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Type III 24-hr 2YR Rainfall=3.39"

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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=16,235 sf 16.61% Impervious Runoff Depth>1.18" Tc=6.0 min CN=76 Runoff=0.52 cfs 0.037 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=0.52 cfs 0.037 af Outflow=0.52 cfs 0.037 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 = 11.160 ac Runoff Volume = 1.137 af Average Runoff Depth = 1.22" 81.59% Pervious = 9.106 ac 18.41% Impervious = 2.054 ac	

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Type III 24-hr 2YR Rainfall=3.39"

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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, TRAVEL PATH C TO D Woodland Kv= 5.0 fps
0.6	100	0.0200	2.87		Shallow Concentrated Flow, TRAVEL PATH D TO E Paved Kv= 20.3 fps
0.4	288	0.0250	12.22	21.59	Pipe Channel, TRAVEL PATH E TO F 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010
7.1	618	Total			

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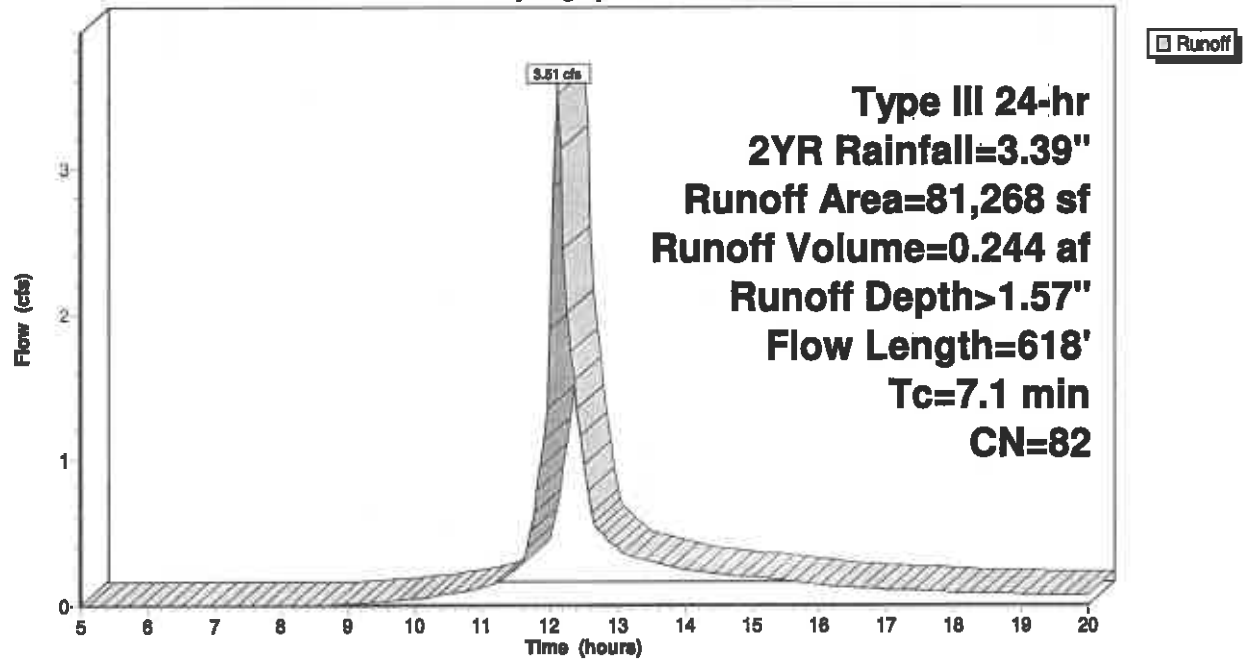
Type III 24-hr 2YR Rainfall=3.39"

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Subcatchment P-1: P-1

Hydrograph



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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

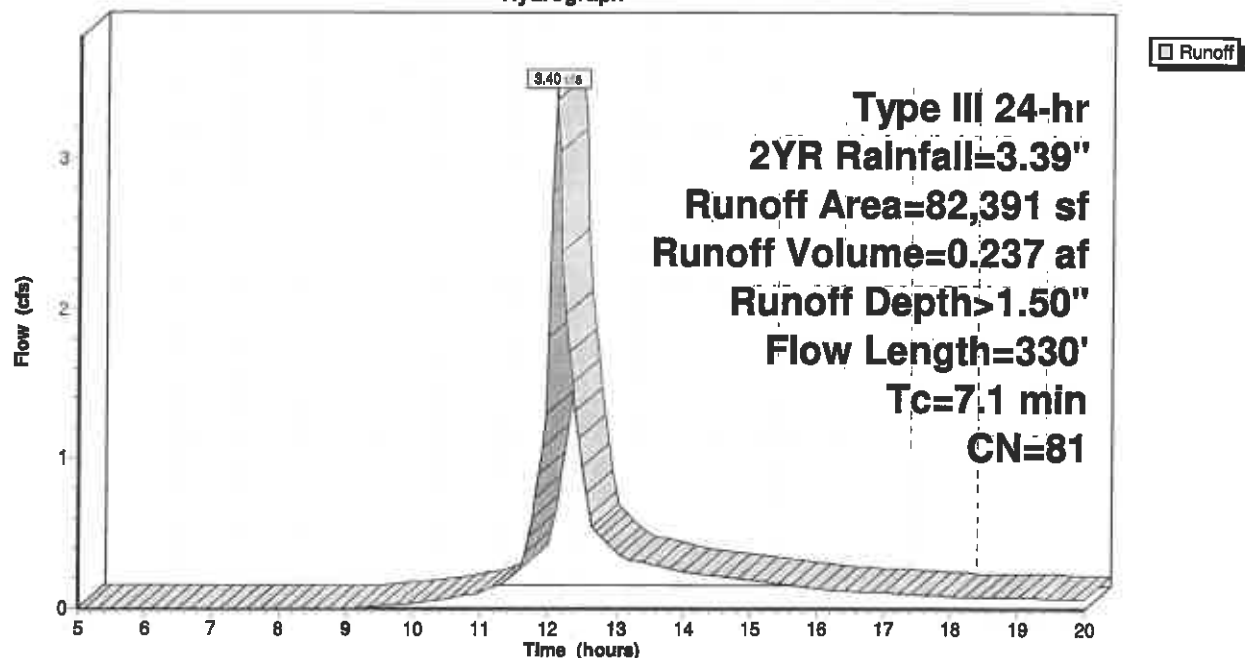
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2YR Rainfall=3.39"

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, TRAVEL 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

Hydrograph



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Type III 24-hr 2YR Rainfall=3.39"

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Summary for Subcatchment P-3: P-3

Runoff = 0.52 cfs @ 12.11 hrs, Volume= 0.037 af, Depth> 1.18"
Routed to Reach IP-P3 : EX. CULVERT

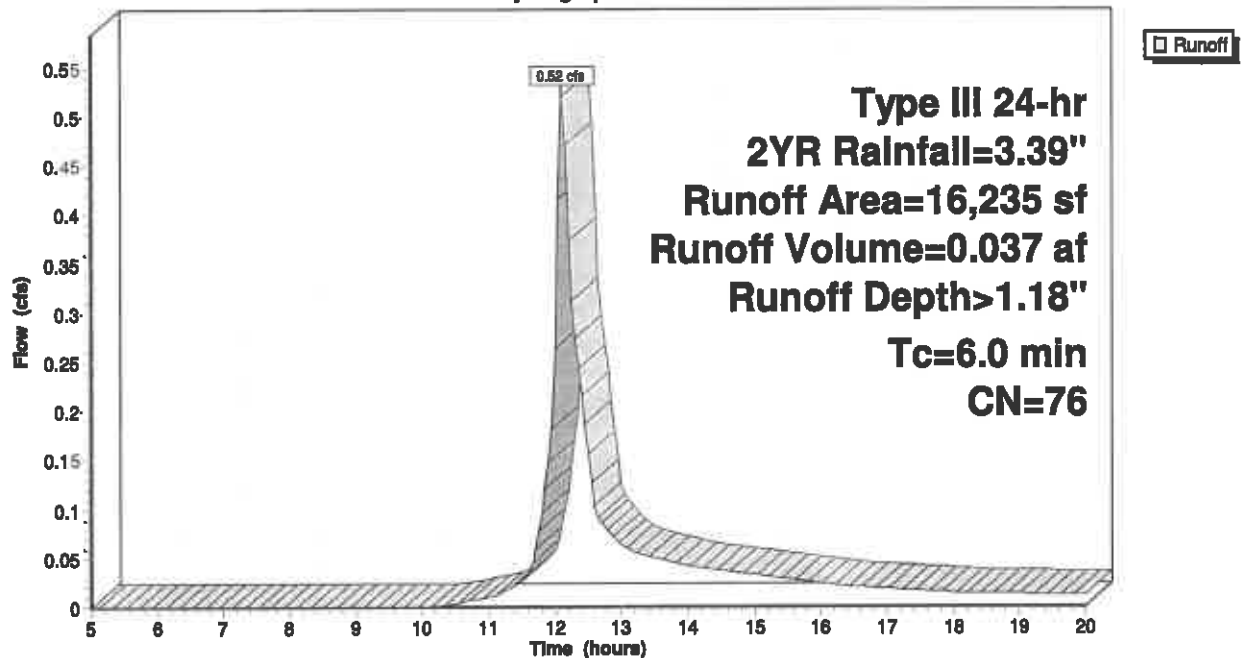
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2YR Rainfall=3.39"

Area (sf)	CN	Description
2,696	98	Paved parking, HSG C
5,650	74	>75% Grass cover, Good, HSG C
7,889	70	Woods, Good, HSG C
16,235	76	Weighted Average
13,539		83.39% Pervious Area
2,696		16.61% 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

Hydrograph



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Type III 24-hr 2YR Rainfall=3.39"

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Summary for Subcatchment P-4: P-4

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

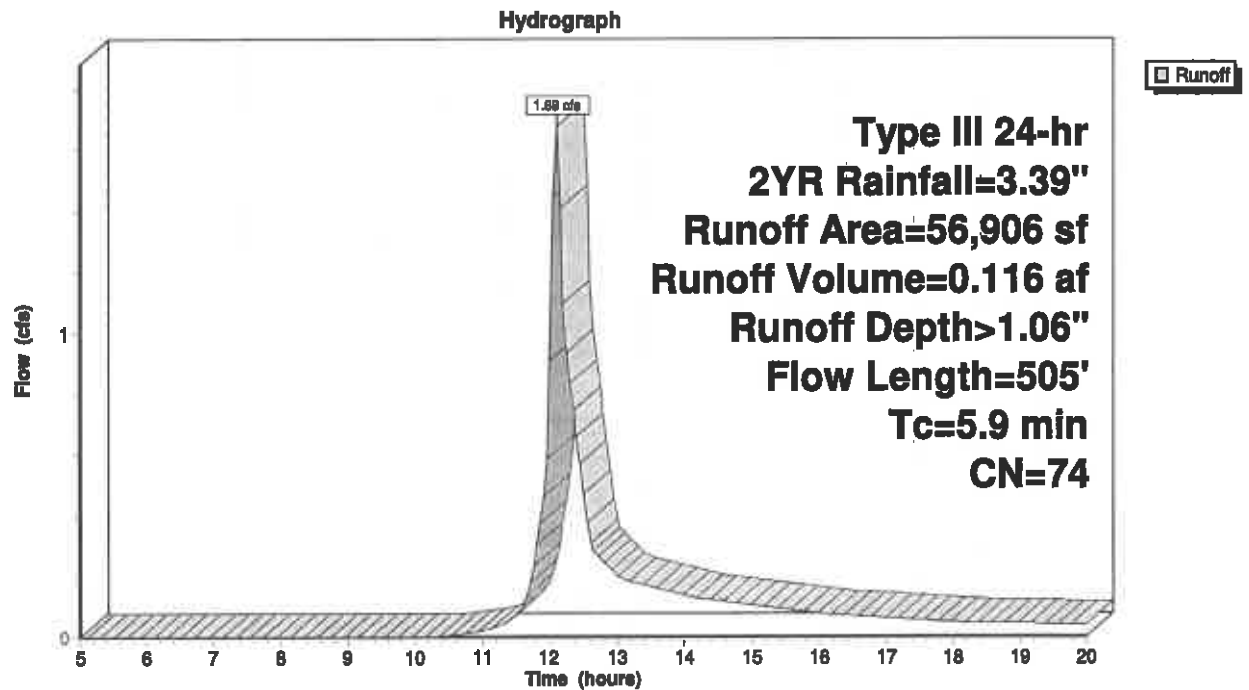
Runoff = 1.69 cfs @ 12.10 hrs, Volume= 0.116 af, Depth> 1.06"
 Routed to Pond PND3 : BASIN3

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 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
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



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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

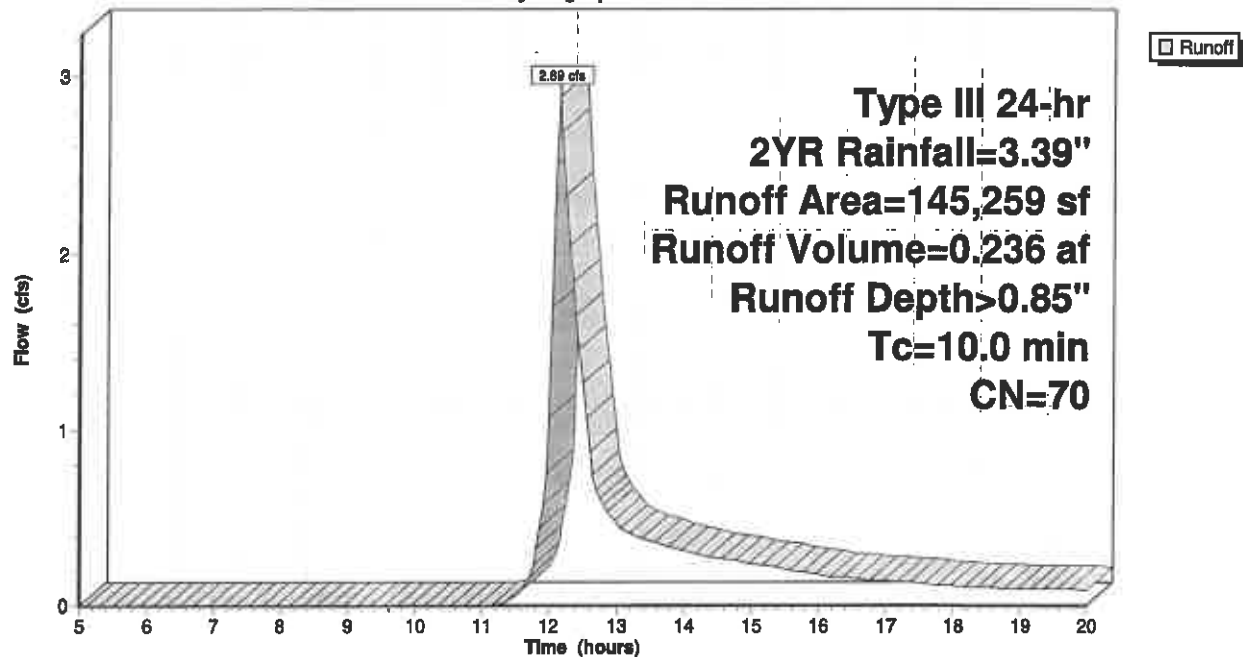
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2YR Rainfall=3.39"

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

Hydrograph



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Type III 24-hr 2YR Rainfall=3.39"

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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

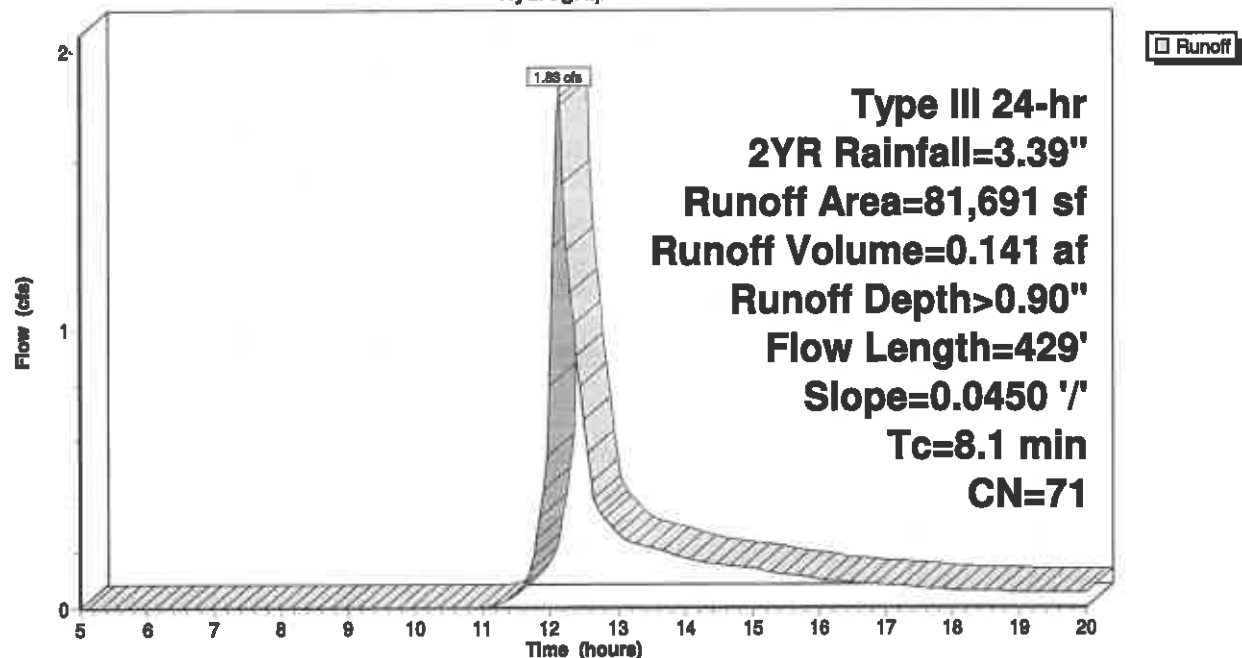
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2YR Rainfall=3.39"

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

Hydrograph



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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

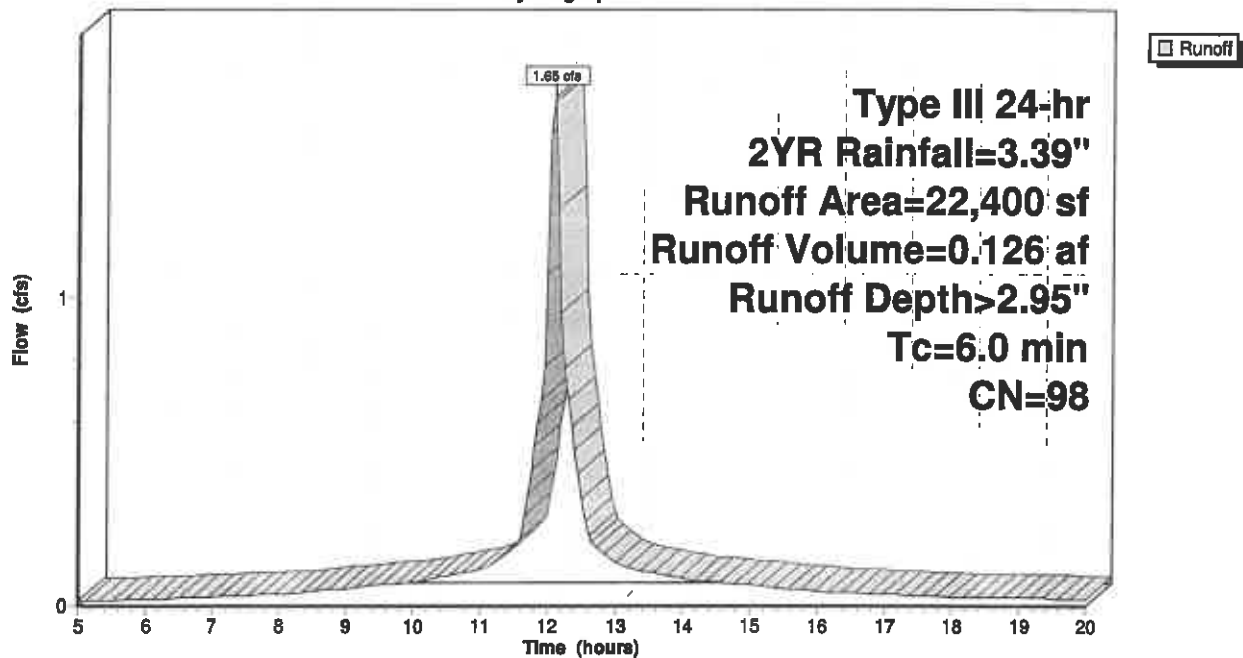
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2YR Rainfall=3.39"

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

Hydrograph



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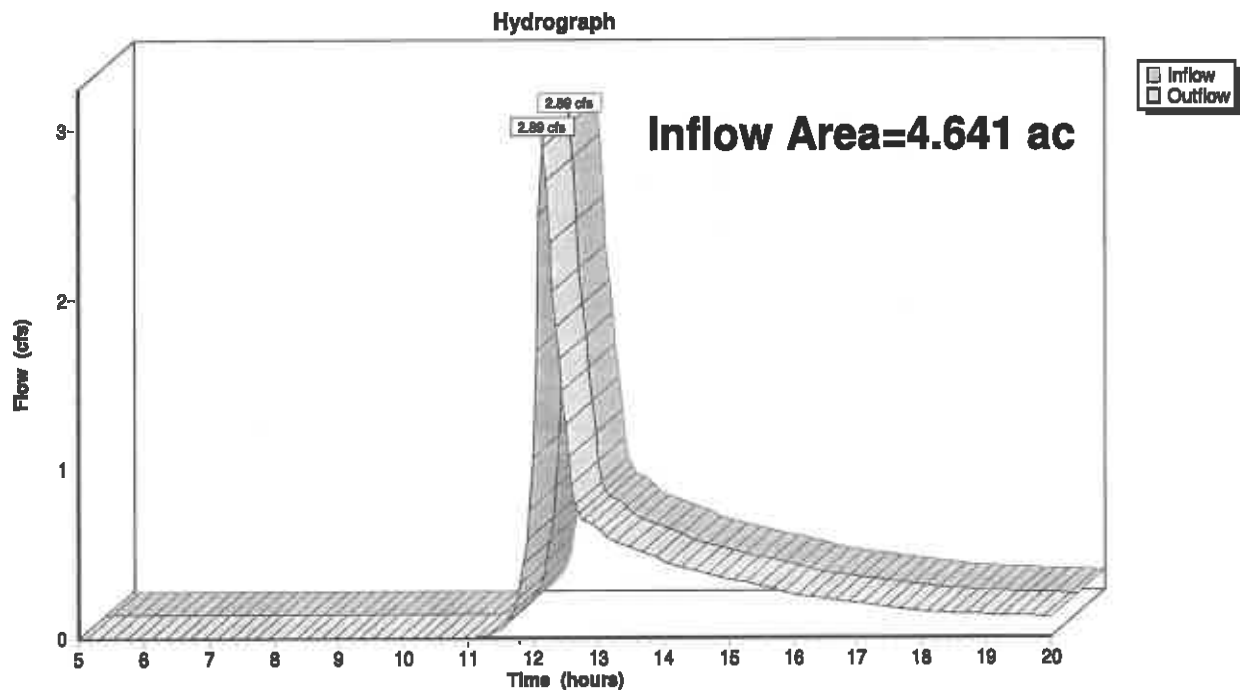
Summary for Reach IP-P1: 45 MAIN ST

[40] Hint: Not Described (Outflow=Inflow)

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



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Summary for Reach IP-P2: SCHOOL ST

[40] Hint: Not Described (Outflow=Inflow)

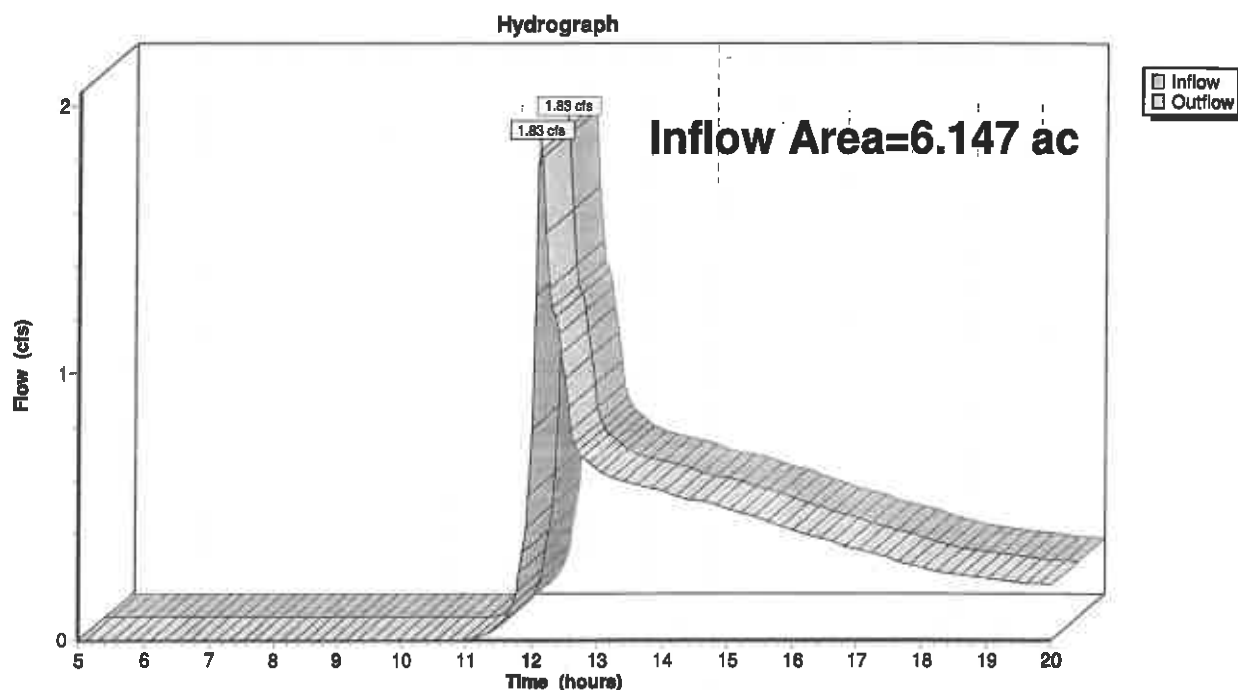
Inflow Area = 6.147 ac, 30.84% Impervious, Inflow Depth > 0.63" for 2YR event

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



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Summary for Reach IP-P3: EX. CULVERT

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.373 ac, 16.61% Impervious, Inflow Depth > 1.18" for 2YR event

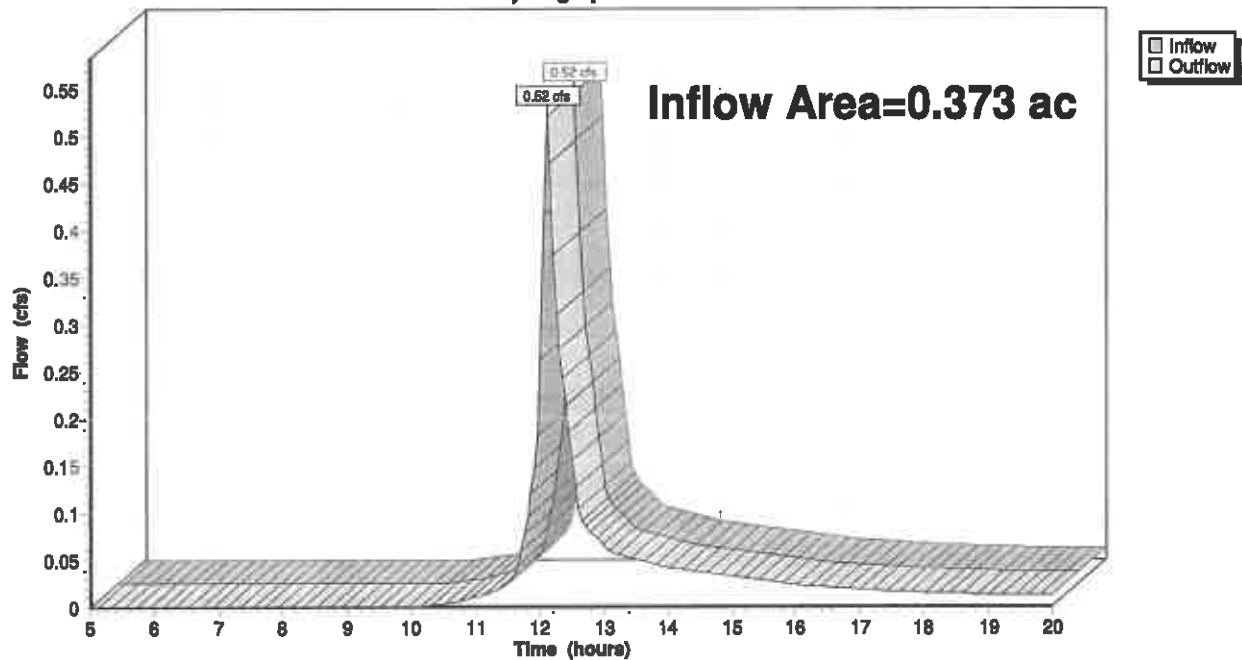
Inflow = 0.52 cfs @ 12.11 hrs, Volume= 0.037 af

Outflow = 0.52 cfs @ 12.11 hrs, Volume= 0.037 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

Hydrograph



POST DEVELOPMENT 3-22-24

Type III 24-hr 2YR Rainfall=3.39"

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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)

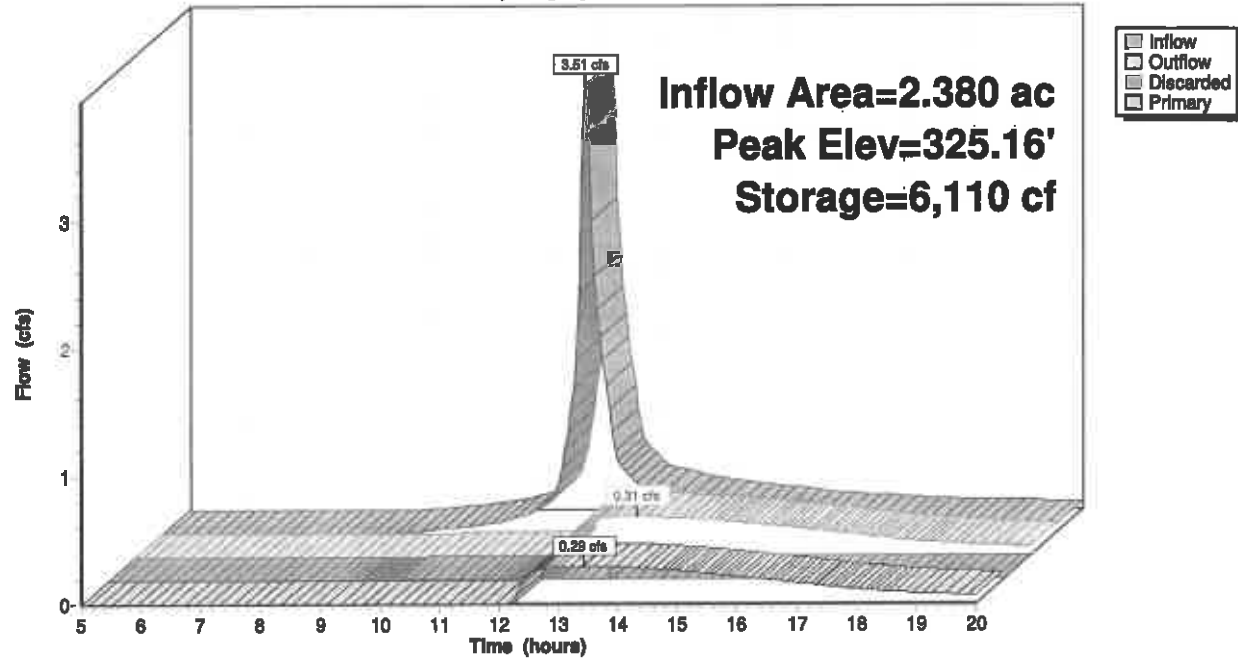
2=Orifice/Grate (Orifice Controls 0.29 cfs @ 3.37 fps)

3=Orifice/Grate (Controls 0.00 cfs)

4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond PND1: PND 1

Hydrograph



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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)

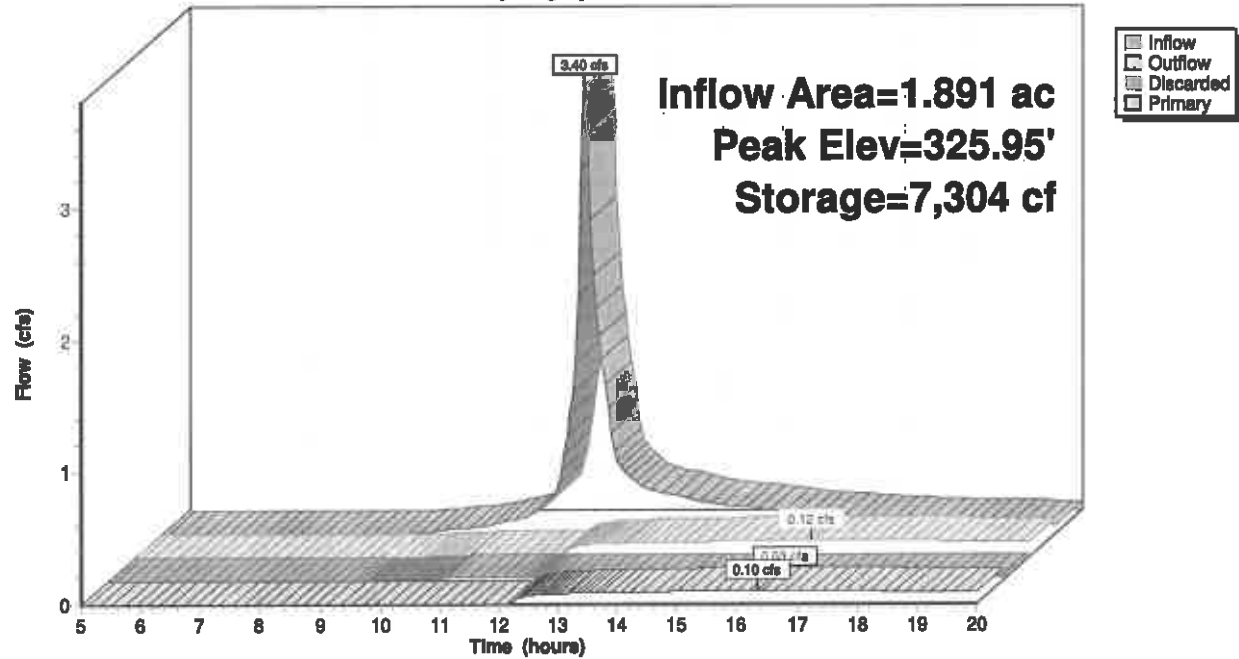
↑ **2=Orifice/Grate** (Orifice Controls 0.10 cfs @ 4.48 fps)

↑ **3=Orifice/Grate** (Controls 0.00 cfs)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PND2: BASIN#2

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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

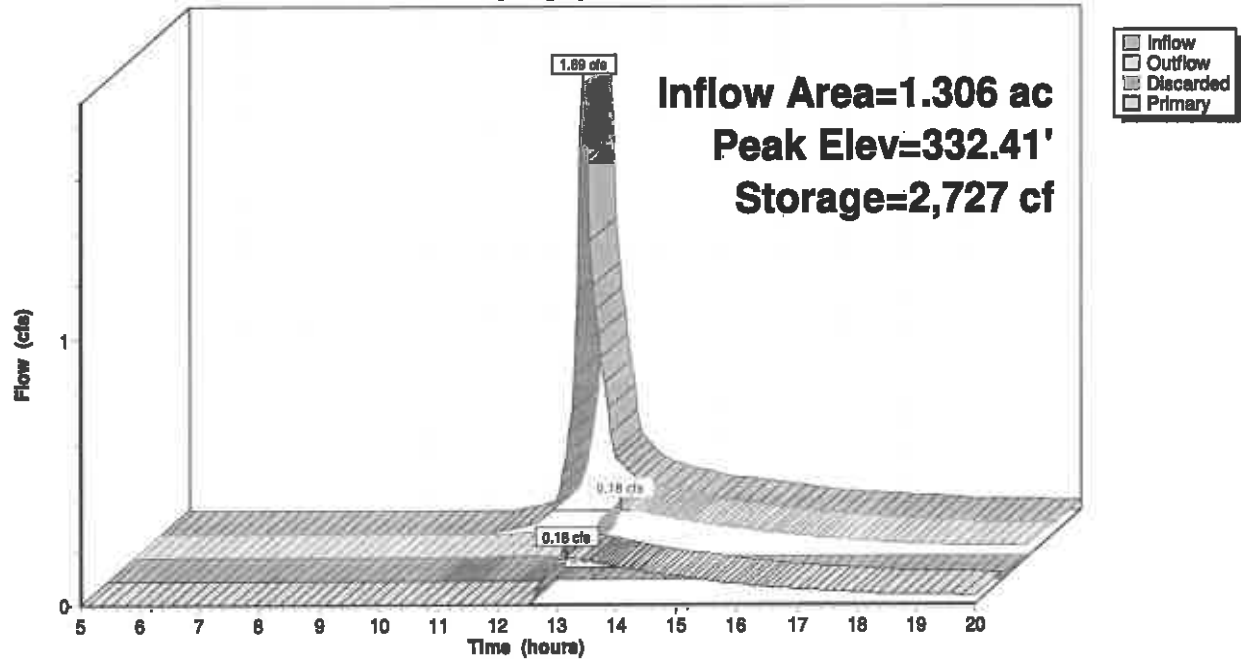
Device	Routing	Invert	Outlet Devices
#1	Discarded	330.00'	0.270 in/hr Exfiltration over Surface area
#2	Primary	332.20'	10.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	334.00'	20.0' long x 0.5' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00			
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

Hydrograph



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Type III 24-hr 2YR Rainfall=3.39"

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Summary for Pond PND4: U/G BASIN

[82] Warning: Early inflow requires earlier time span

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)

POST DEVELOPMENT 3-22-24

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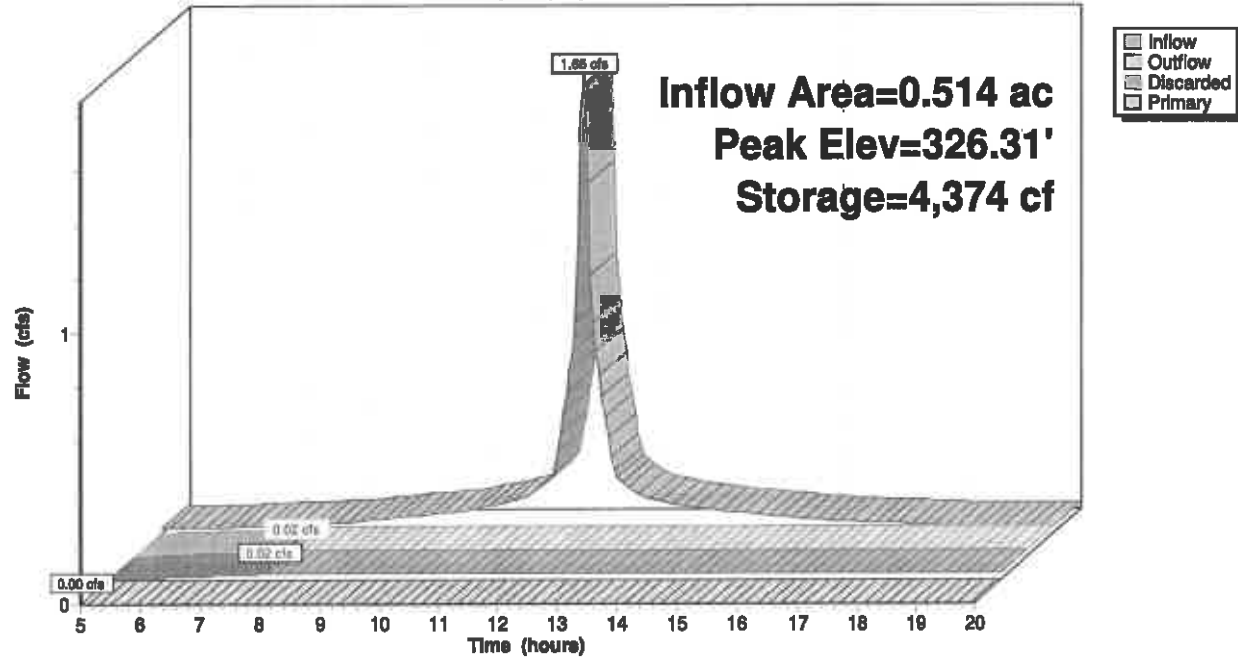
Type III 24-hr 2YR Rainfall=3.39"

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Pond PND4: U/G BASIN

Hydrograph



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Type III 24-hr 10YR Rainfall=5.11"

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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 38.90% Impervious Runoff Depth>2.98"
Flow Length=818' Tc=7.1 min CN=82 Runoff=6.59 cfs 0.463 af

Subcatchment P-2: P-2

Runoff Area=82,391 sf 33.89% 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=18,235 sf 16.61% Impervious Runoff Depth>2.44"
Tc=6.0 min CN=76 Runoff=1.12 cfs 0.076 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=7.63 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 0.722 af
Outflow=8.51 cfs 0.722 af

Reach IP-P2: SCHOOL ST

Inflow=4.85 cfs 0.766 af
Outflow=4.85 cfs 0.766 af

Reach IP-P3: EX. CULVERT

Inflow=1.12 cfs 0.076 af
Outflow=1.12 cfs 0.076 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

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Type III 24-hr 10YR Rainfall=5.11"

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Pond PND2: BASIN#2

Discarded=0.03 cfs 0.025 af Primary=0.26 cfs 0.127 af Inflow=6.49 cfs 0.455 af
Peak Elev=327.51' Storage=14,172 cf Outflow=0.26 cfs 0.152 af

Pond PND3: BASIN3

Discarded=0.01 cfs 0.007 af Primary=1.76 cfs 0.181 af Inflow=3.68 cfs 0.249 af
Peak Elev=333.07' Storage=3,744 cf Outflow=1.77 cfs 0.188 af

Pond PND4: U/G BASIN

Discarded=0.02 cfs 0.027 af Primary=0.13 cfs 0.046 af Inflow=2.51 cfs 0.194 af
Peak Elev=326.76' Storage=5,738 cf Outflow=0.15 cfs 0.073 af

Total Runoff Area = 11.160 ac Runoff Volume = 2,293 af Average Runoff Depth = 2.47"
81.50% Pervious = 9.166 ac 18.41% Impervious = 2.054 ac

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Type III 24-hr 10YR Rainfall=5.11"

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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
1.6	100	0.0450	1.06		Unpaved Kv= 16.1 fps
					Shallow Concentrated Flow, TRAVEL PATH C TO D
0.6	100	0.0200	2.87		Woodland Kv= 5.0 fps
					Shallow Concentrated Flow, TRAVEL PATH D TO E
0.4	288	0.0250	12.22	21.59	Paved Kv= 20.3 fps
					Pipe Channel, TRAVEL PATH E TO F
					18.0" Round Area= 1.8 sf Perim= 4.7' n= 0.38'
					n= 0.010
7.1	618	Total			

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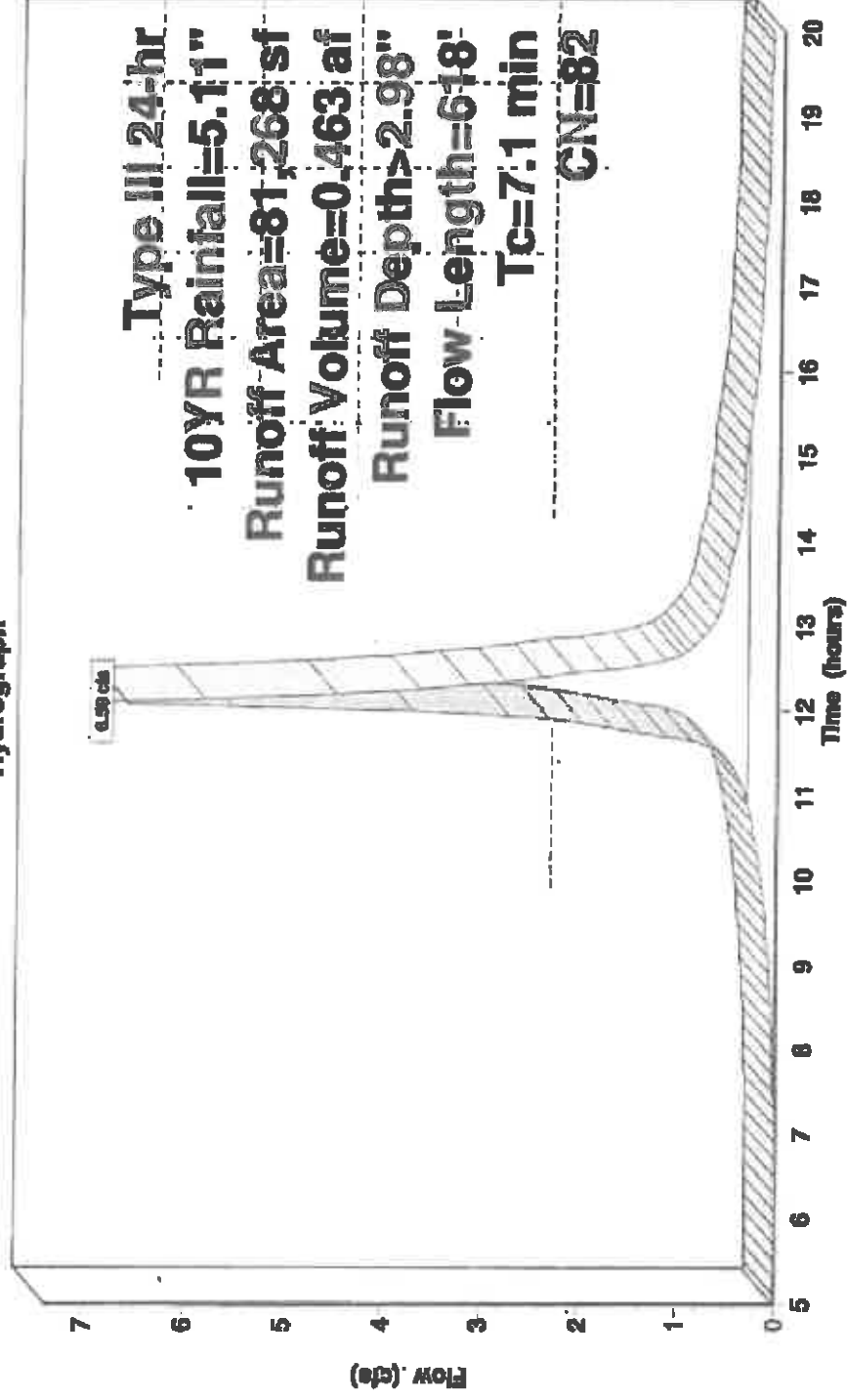
Type III 24-hr 10YR Rainfall=5.11"

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Subcatchment P-1: P-1

Hydrograph



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Type III 24-hr 10YR Rainfall=5.11"

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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

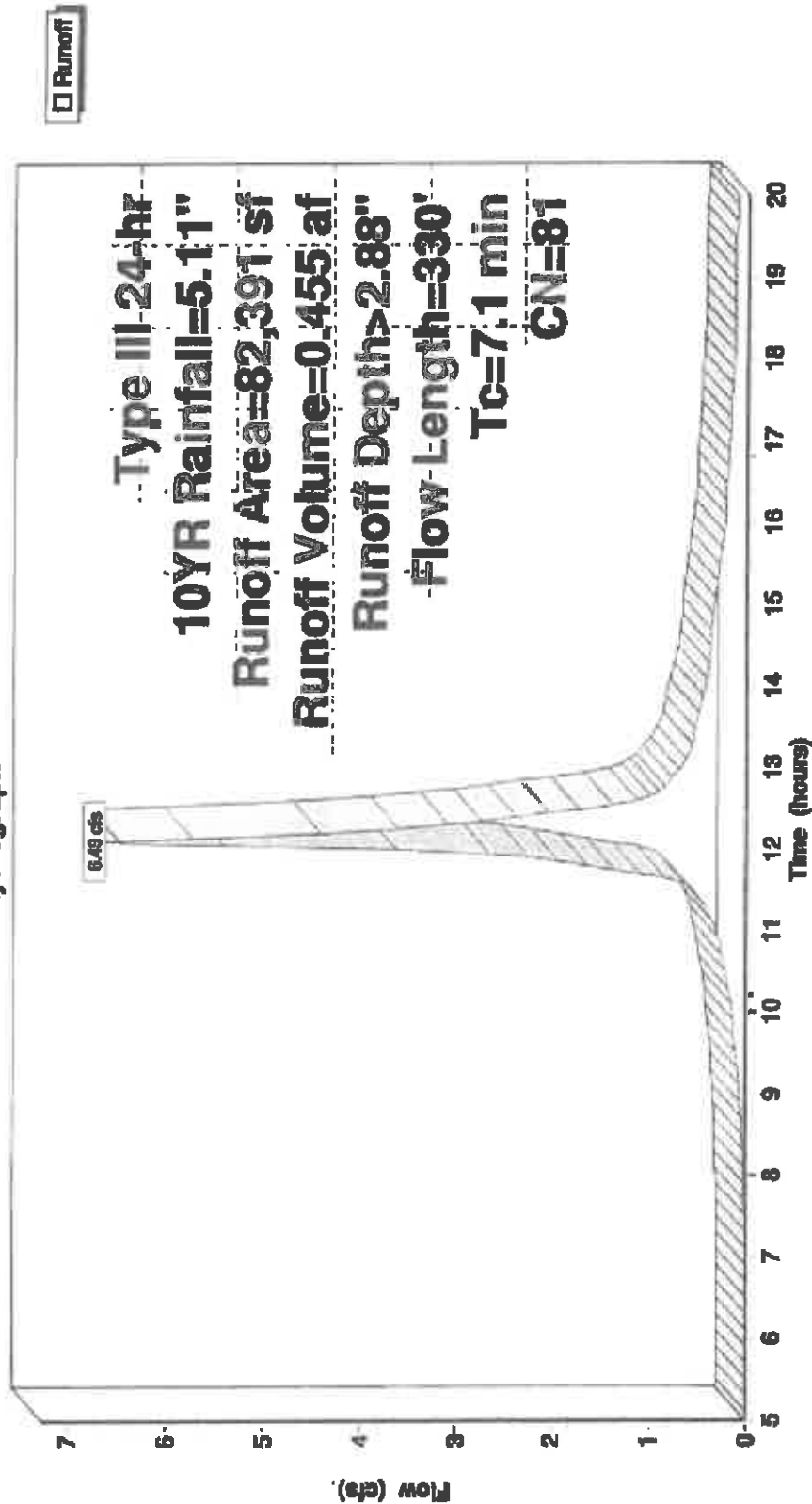
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10YR Rainfall=5.11"

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, TRAVEL 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 f/s
7.1	330	Total			

Subcatchment P-2: P-2

Hydrograph



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Type III 24-hr 10YR Rainfall=5.11"

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Summary for Subcatchment P-3: P-3

Runoff = 1.12 cfs @ 12.09 hrs, Volume= 0.076 af, Depth= 2.44"
Routed to Reach IP-P3 : EX. CULVERT

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

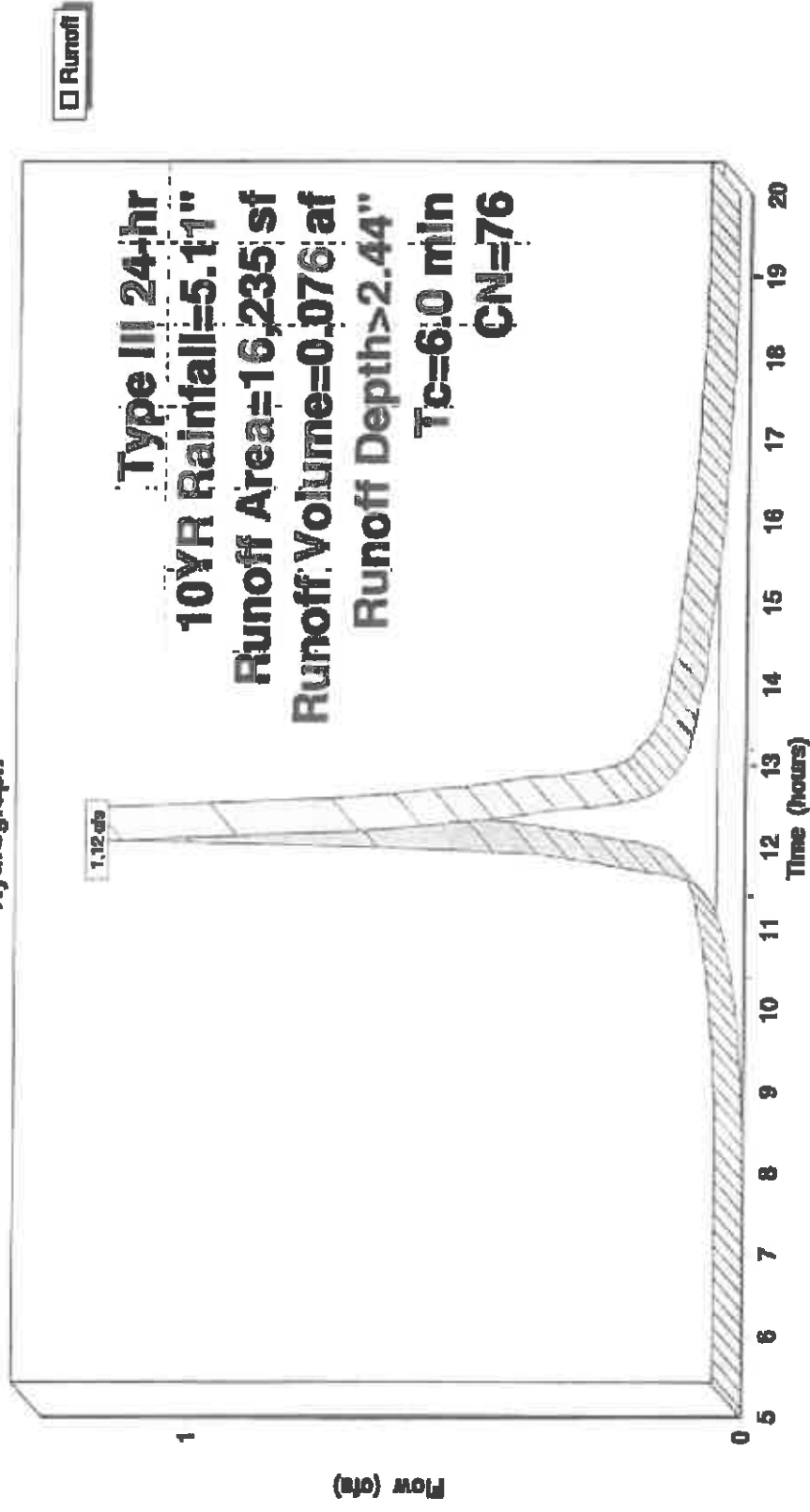
Area (sf)	CN	Description
2,696	98	Paved parking, HSG C
5,650	74	>75% Grass cover, Good, HSG C
7,889	70	Woods, Good, HSG C
16,235	76	Weighted Average
13,539		83.39% Pervious Area
2,696		16.61% Impervious Area
Tc	Length	Slope
(min)	(feet)	(ft/ft)
	Velocity	Capacity
	(ft/sec)	(cfs)
		Description

Direct Entry, TRAVEL PATH

6.0

Subcatchment P-3: P-3

Hydrograph



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Type III 24-hr 10YR Rainfall=5.11"

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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
56,908	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 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
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, TRAVEL 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' n= 0.31' n= 0.010
5.9	505	Total			

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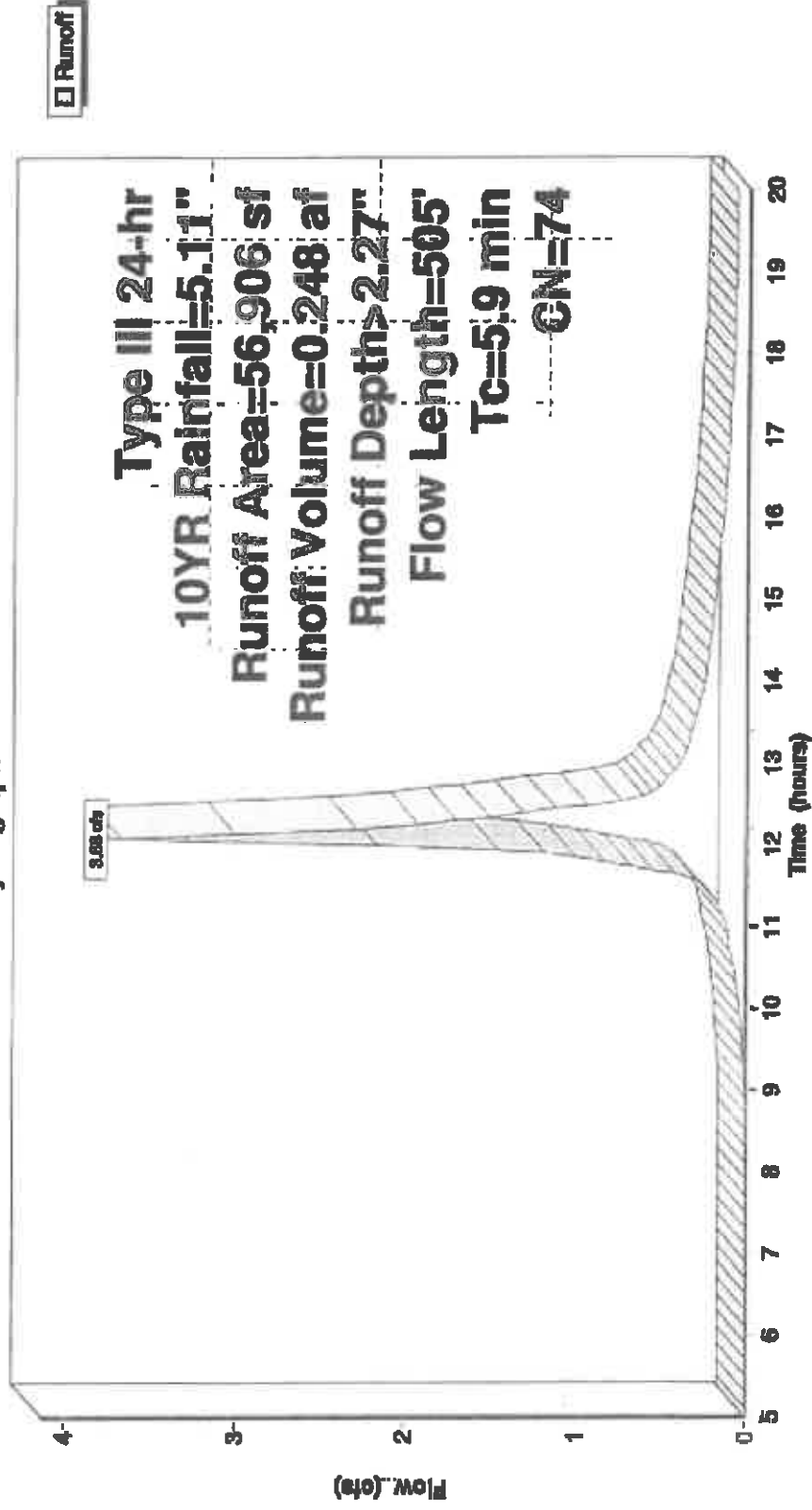
Type III 24-hr 10YR Rainfall=5.11"

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Subcatchment P-4: P-4

Hydrograph



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Type III 24-hr 10YR Rainfall=5.11"

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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

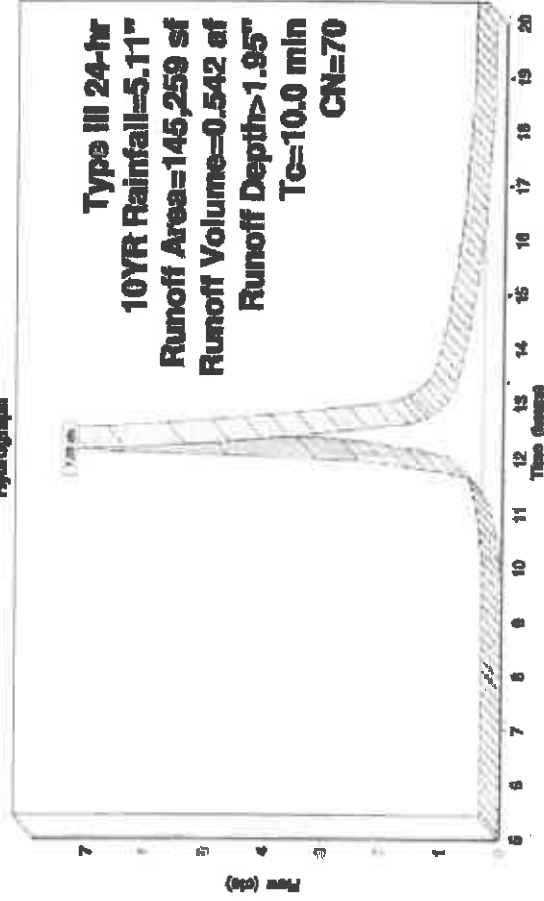
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=5.11"

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

Hydrograph



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-GN, 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			

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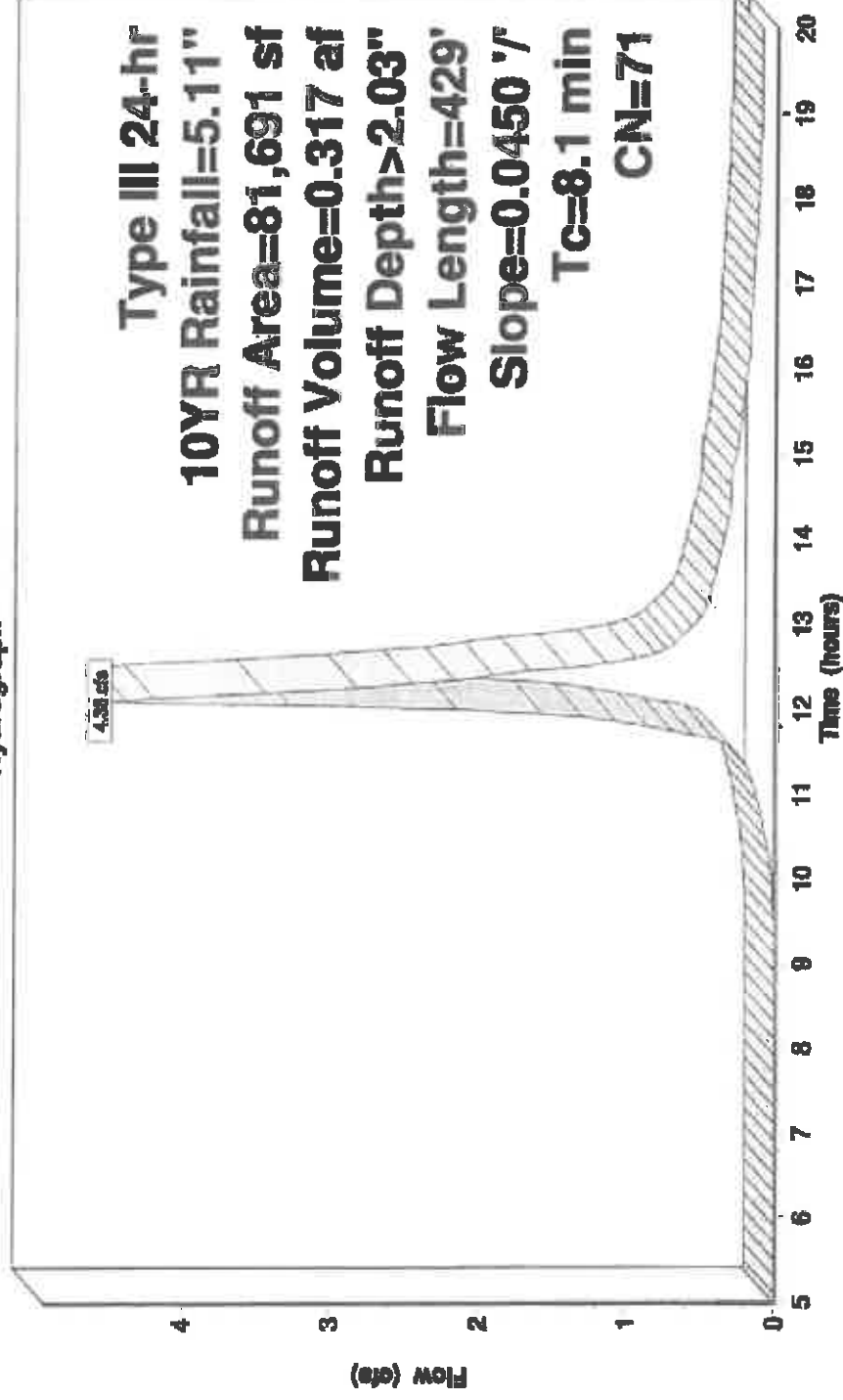
Type III 24-hr 10YR Rainfall=5.11"

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Subcatchment P-6: P-6

Hydrograph



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Type III 24-hr 10YR Rainfall=5.11"

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Page 9.45

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

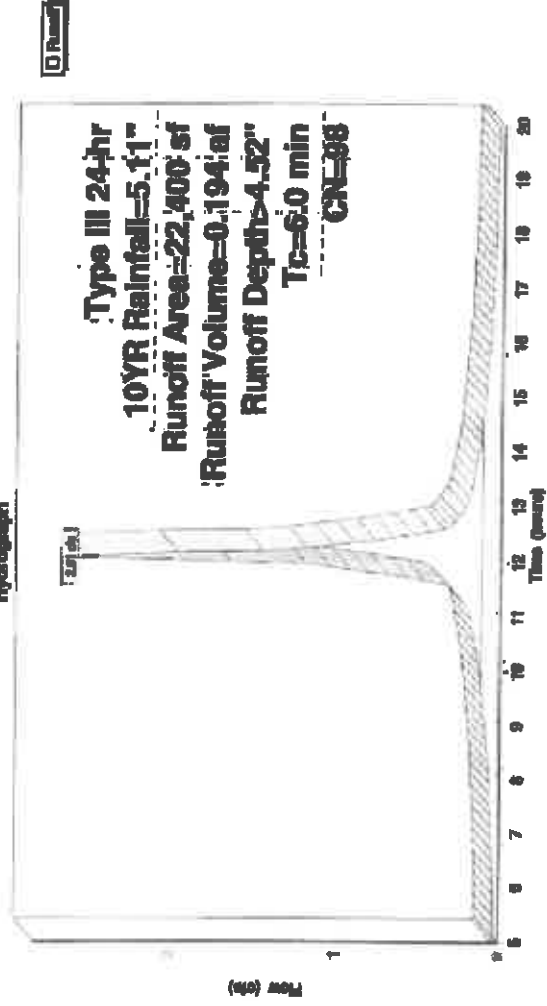
To Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)

6.0

Direct Entry, TRAVEL PATH

Subcatchment P-7: BUILDING

Hydrograph



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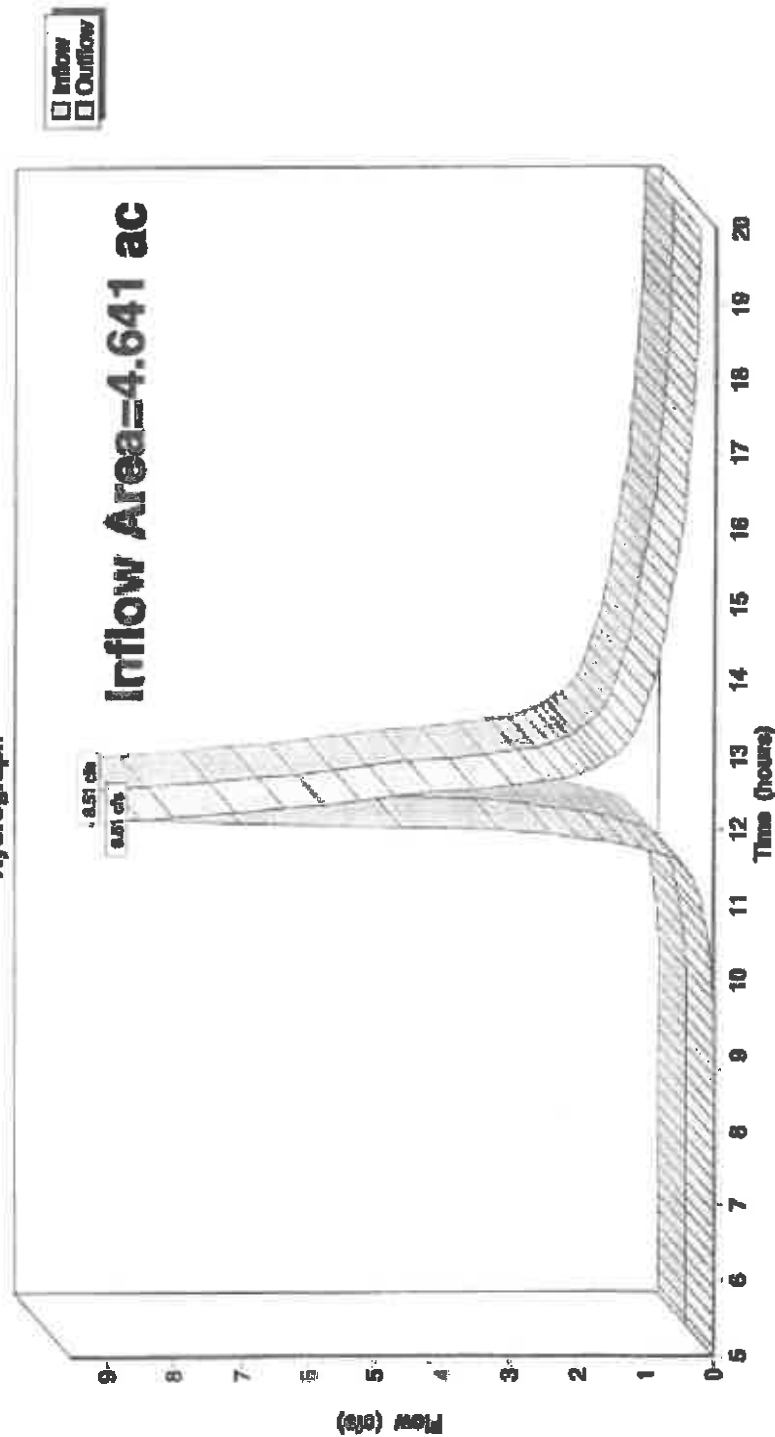
Summary for Reach IP-P1: 45 MAIN ST

Inflow Area = 4.641 ac, 2.08% Impervious, Inflow Depth > 1.87" for 10YR event
Inflow = 8.51 cfs @ 12.16 hrs, Volume= 0.722 af
Outflow = 8.51 cfs @ 12.16 hrs, Volume= 0.722 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

Hydrograph



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Summary for Reach IP-P2: SCHOOL ST

Inflow Area = 6.147 ac, 30.84% Impervious, Inflow Depth > 1.54" for 10YR event

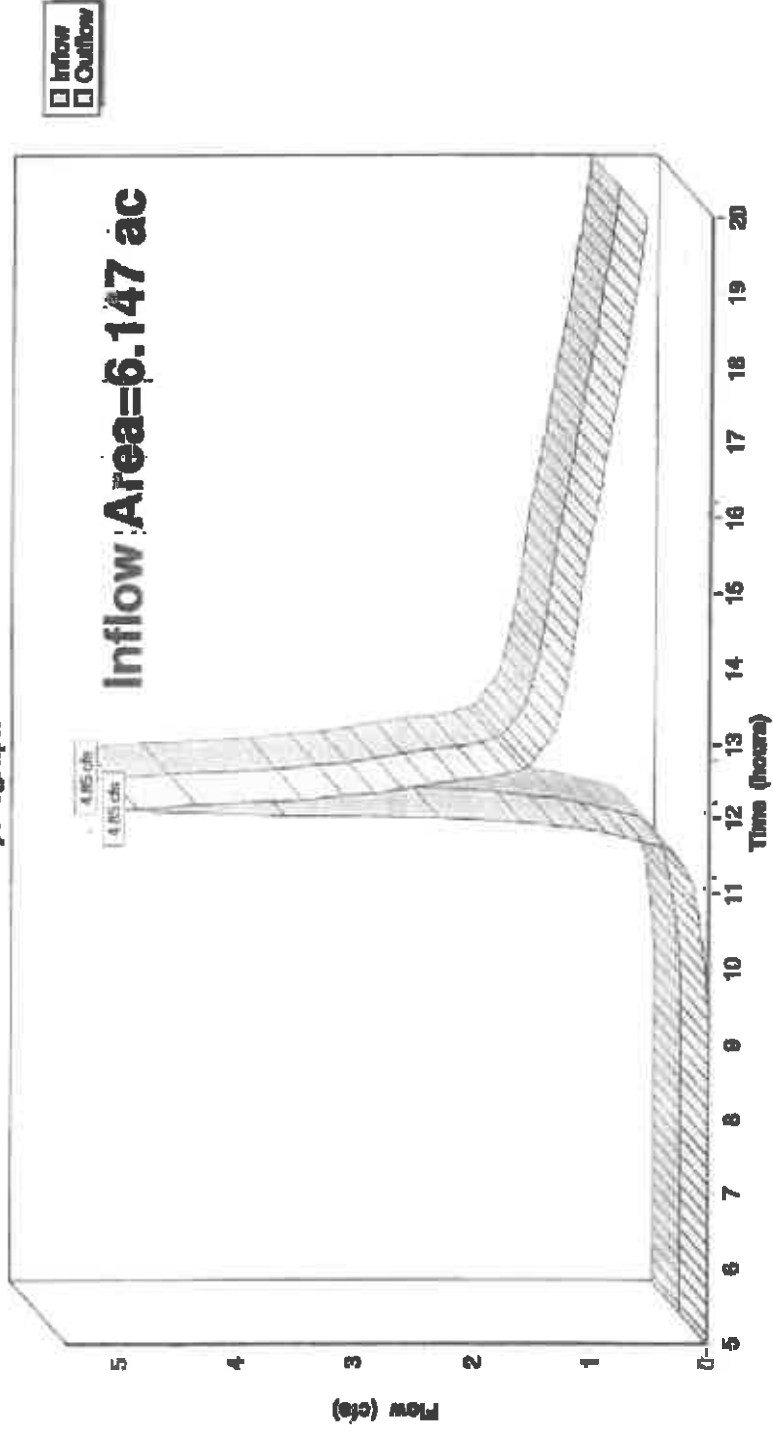
Inflow = 4.85 cfs @ 12.12 hrs, Volume= 0.766 af

Outflow = 4.85 cfs @ 12.12 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-P2: SCHOOL ST

Hydrograph



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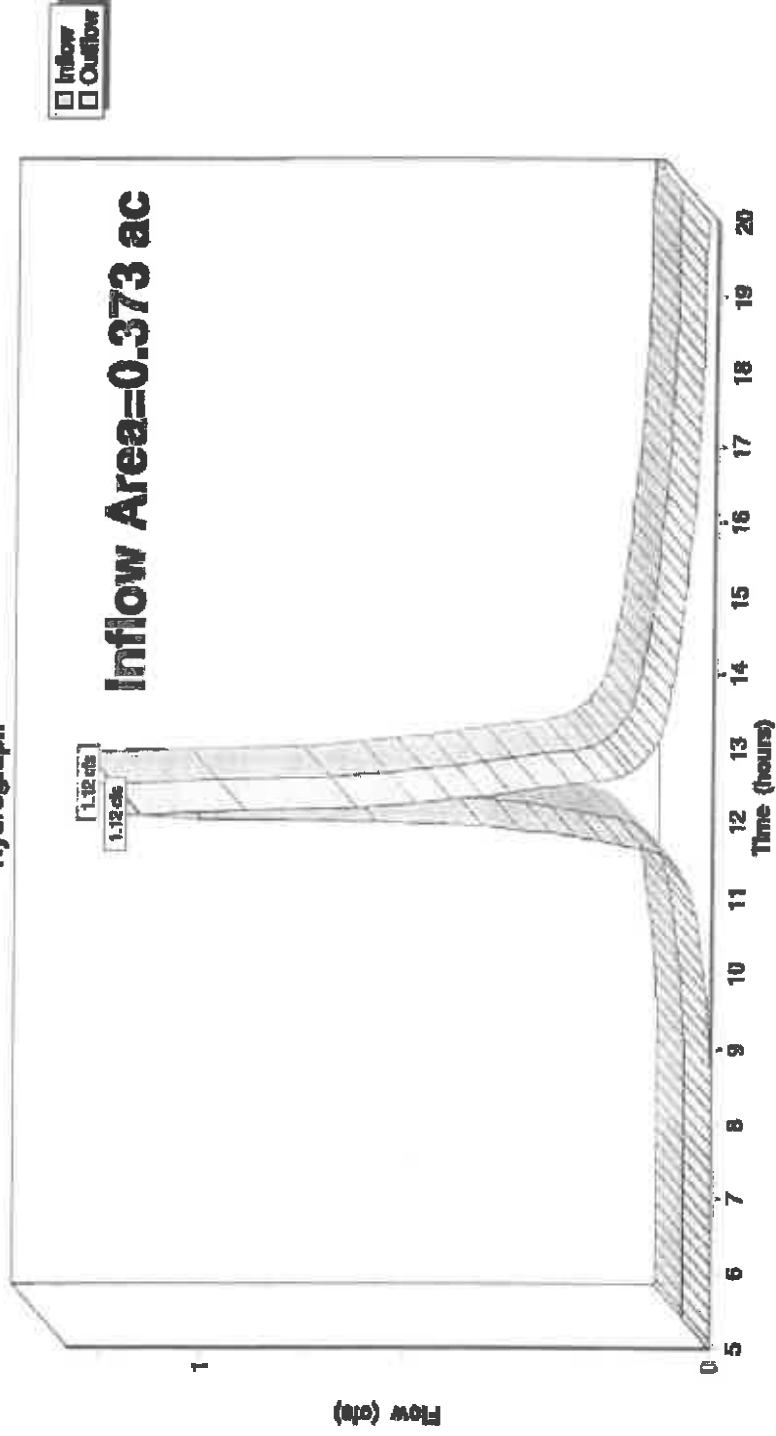
Summary for Reach IP-P3: EX. CULVERT

Inflow Area = 0.373 ac, 16.61% Impervious, Inflow Depth > 2.44" for 10YR event
Inflow = 1.12 cfs @ 12.09 hrs, Volume= 0.076 af
Outflow = 1.12 cfs @ 12.09 hrs, Volume= 0.076 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

Hydrograph



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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= 328.71' @ 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

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Type III 24-hr 10YR Rainfall=5.11"

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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)

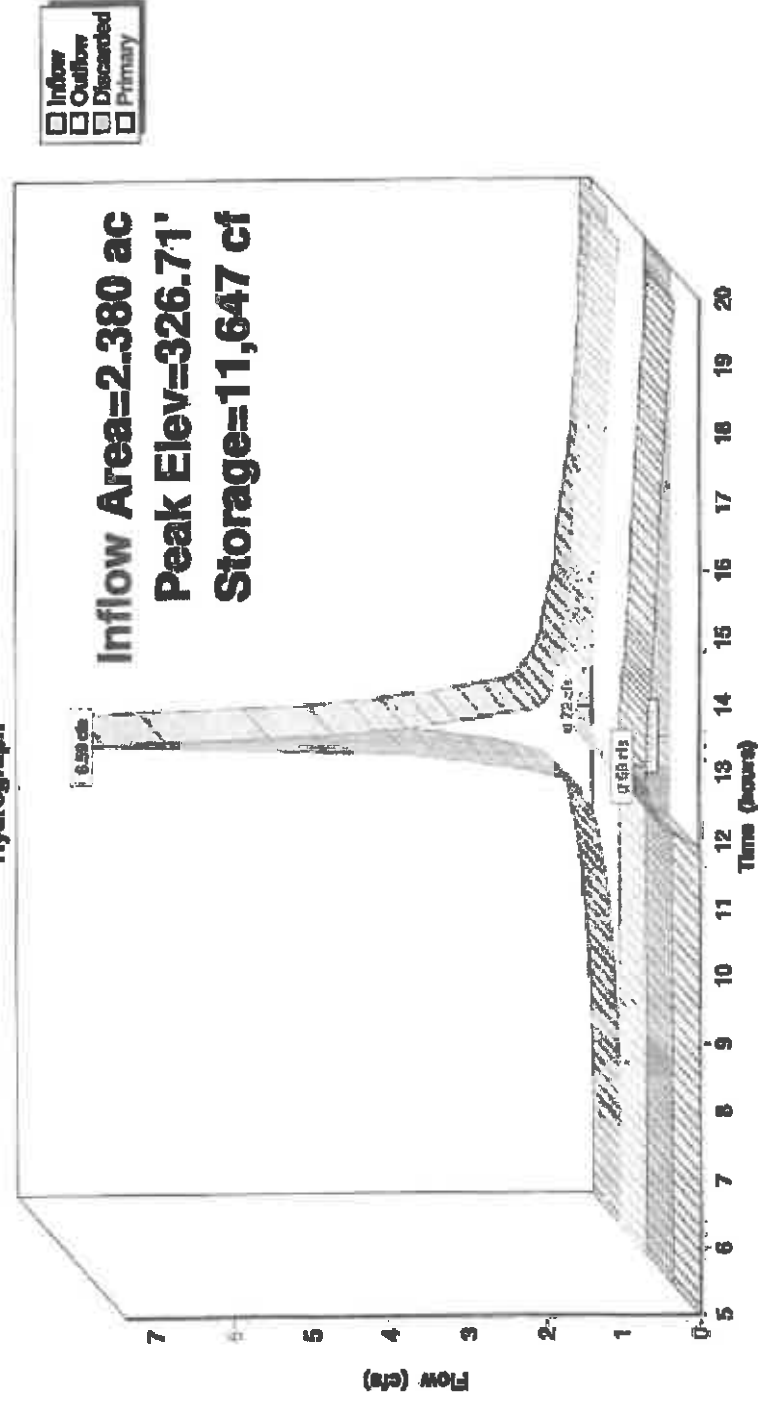
2=Orifice/Grate (Orifice Controls 0.60 cfs @ 6.88 fps)

3=Orifice/Grate (Orifice Controls 0.09 cfs @ 1.56 fps)

4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond PND1: PND 1

Hydrograph



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Summary for Pond PND2: BASIN#2

Inflow Area = 1.891 ac, 33.89% 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, Attain= 98%, 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. Orifices/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	327.30'	4.0" Vert. Orifices/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

POST DEVELOPMENT 3-22-24

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Type III 24-hr 10YR Rainfall=5.11"

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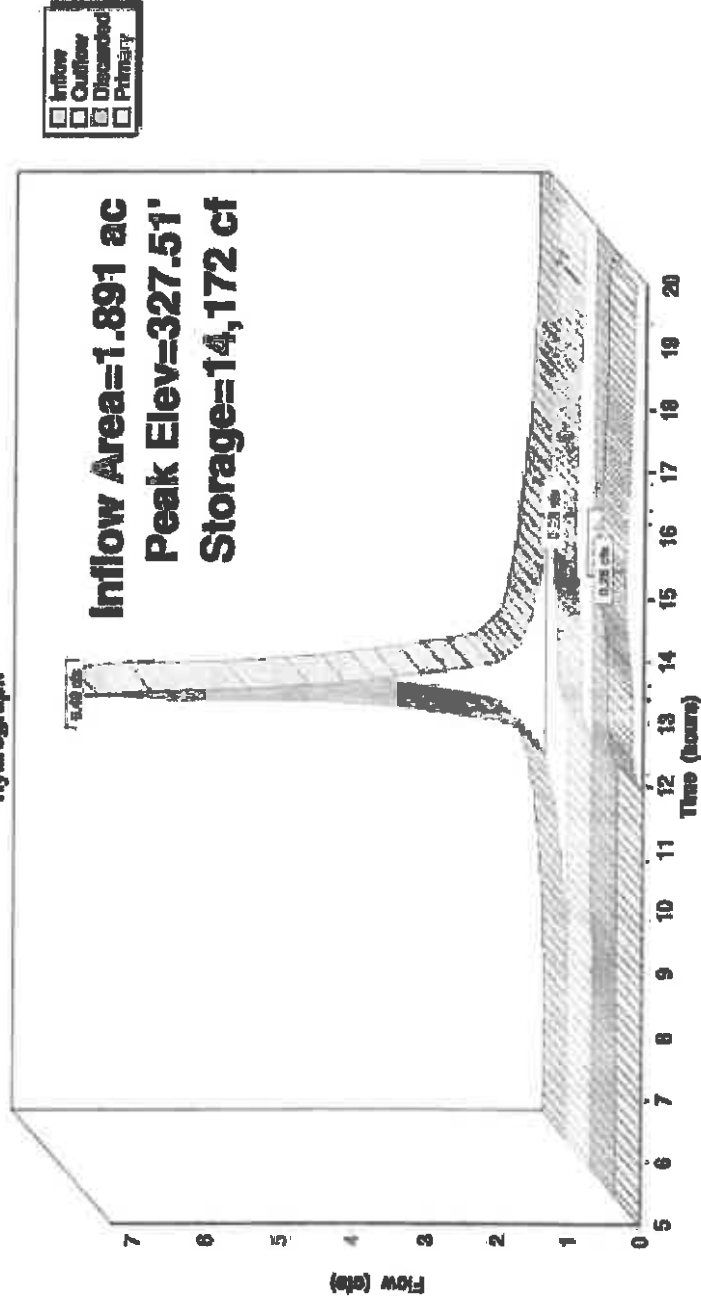
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00
Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

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

Hydrograph



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Type III 24-hr 10YR Rainfall=5.11"

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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, dI= 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 3.06 3.30 3.32

POST DEVELOPMENT 3-22-24

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Type III 24-hr 10YR Rainfall=5.11"

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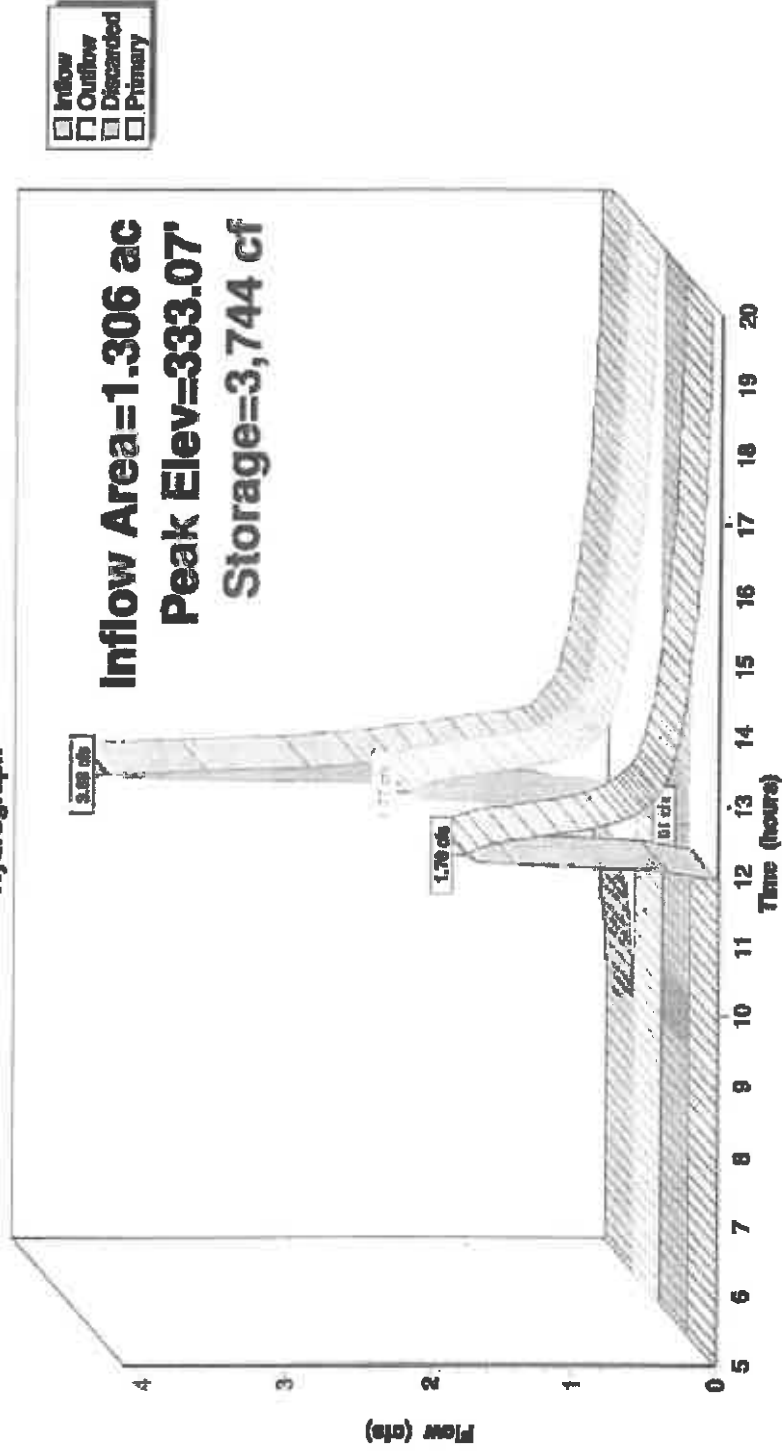
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Discarded OutFlow Max=0.01 cfs @ 12.28 hrs HW=333.07' (Free Discharge)
1-Exfiltration (Exfiltration Controls 0.01 cfs)

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

Hydrograph



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Type III 24-hr 10YR Rainfall=5.11"

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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 Culvac 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
#2	325.00'	6,270 cf	
		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

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Type III 24-hr 10YR Rainfall=5.11"

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Discarded OutFlow Max=0.02 cfs @ 6.55 hrs HW=325.04' (Free Discharge)

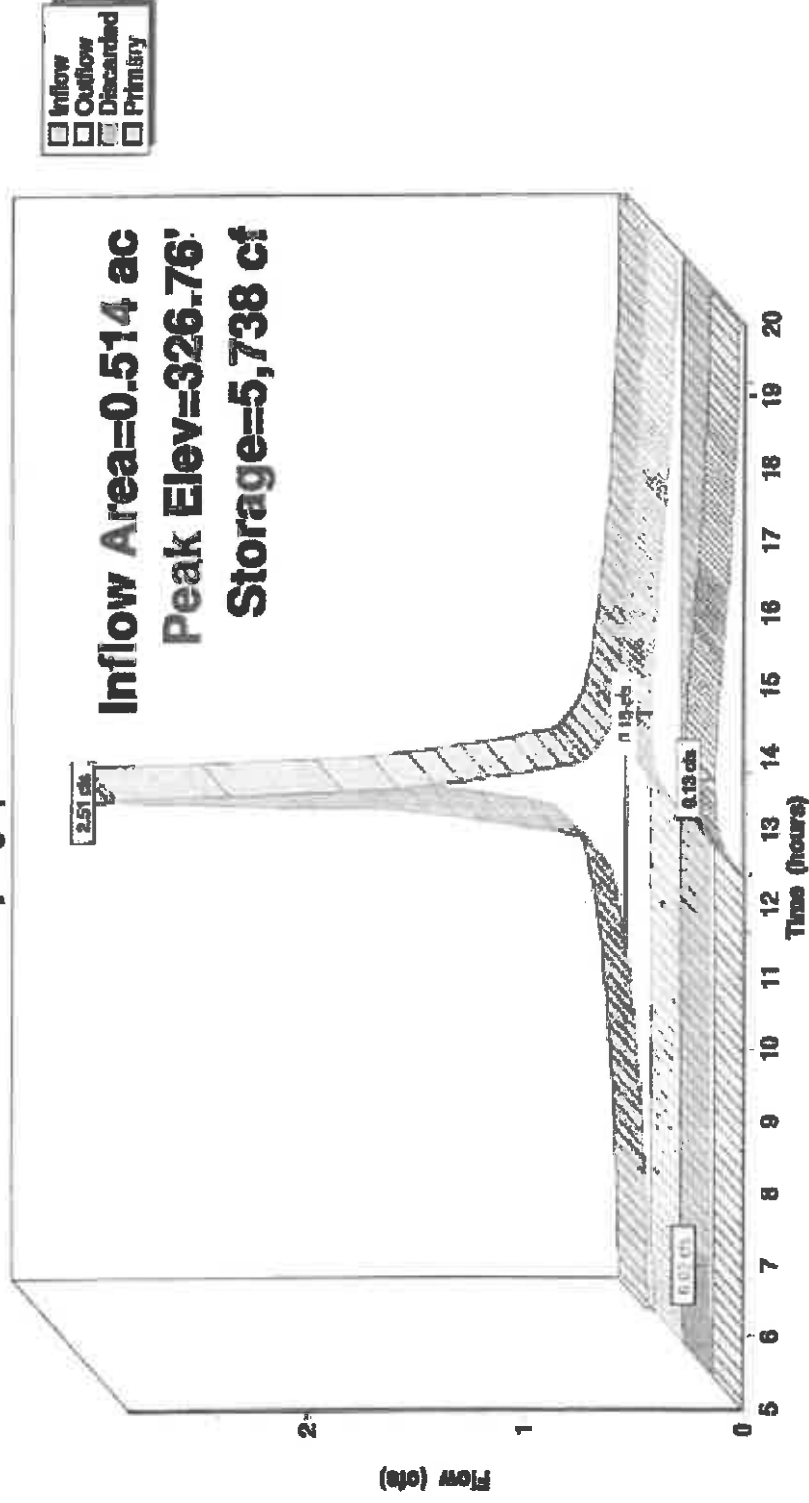
1-Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.13 cfs @ 13.73 hrs HW=326.76' (Free Discharge)

2-Office/Grate (Office Controls 0.13 cfs @ 1.75 fps)

Pond PND4: U/G BASIN

Hydrograph



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Type III 24-hr 25YR Rainfall=6.19"

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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=61,268 sf 39.90% Impervious Runoff Depth>3.81"
Flow Length=618' Tc=7.1 min CN=82 Runoff=8.67 cfs 0.608 af

Subcatchment P-2: P-2

Runoff Area=82,381 sf 33.68% 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=16,235 sf 16.61% Impervious Runoff Depth>3.31"
Tc=6.0 min CN=76 Runoff=1.52 cfs 0.103 af

Subcatchment P-4: P-4

Runoff Area=56,908 sf 7.38% 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=81,891 sf 0.00% Impervious Runoff Depth>2.83"
Flow Length=429' Slope=0.0450' Tc=8.1 min CN=71 Runoff=8.14 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 1.068 af
Outflow=6.79 cfs 1.068 af

Reach IP-P3: EX CULVERT

Inflow=1.52 cfs 0.103 af
Outflow=1.52 cfs 0.103 af

Pond PND1: PND 1

Peak Elev=327.51' Storage=15,275 cf Inflow=8.57 cfs 0.685 af
Discarded=0.03 cfs 0.021 af Primary=1.15 cfs 0.489 af Outflow=1.18 cfs 0.520 af

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Type III 24-hr 25YR Rainfall=6.19"

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Pond PND2: BASIN#2

Discarded=0.03 cfs 0.027 af Primary=0.57 cfs 0.259 af Inflow=8.49 cfs 0.600 af
Outflow=0.70 cfs 0.286 af

Pond PND3: BASIN#3

Discarded=0.01 cfs 0.008 af Primary=2.61 cfs 0.271 af Inflow=5.04 cfs 0.339 af
Outflow=2.63 cfs 0.279 af

Pond PND4: UG BASIN

Discarded=0.02 cfs 0.027 af Primary=0.26 cfs 0.086 af Inflow=3.05 cfs 0.236 af
Outflow=0.29 cfs 0.114 af

Total Runoff Area = 11.160 ac Runoff Volume = 3.089 af Average Runoff Depth = 3.32"
81.59% Pervious = 9.106 ac 18.41% Impervious = 2.054 ac

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Type III 24-hr 25YR Rainfall=6.19"

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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

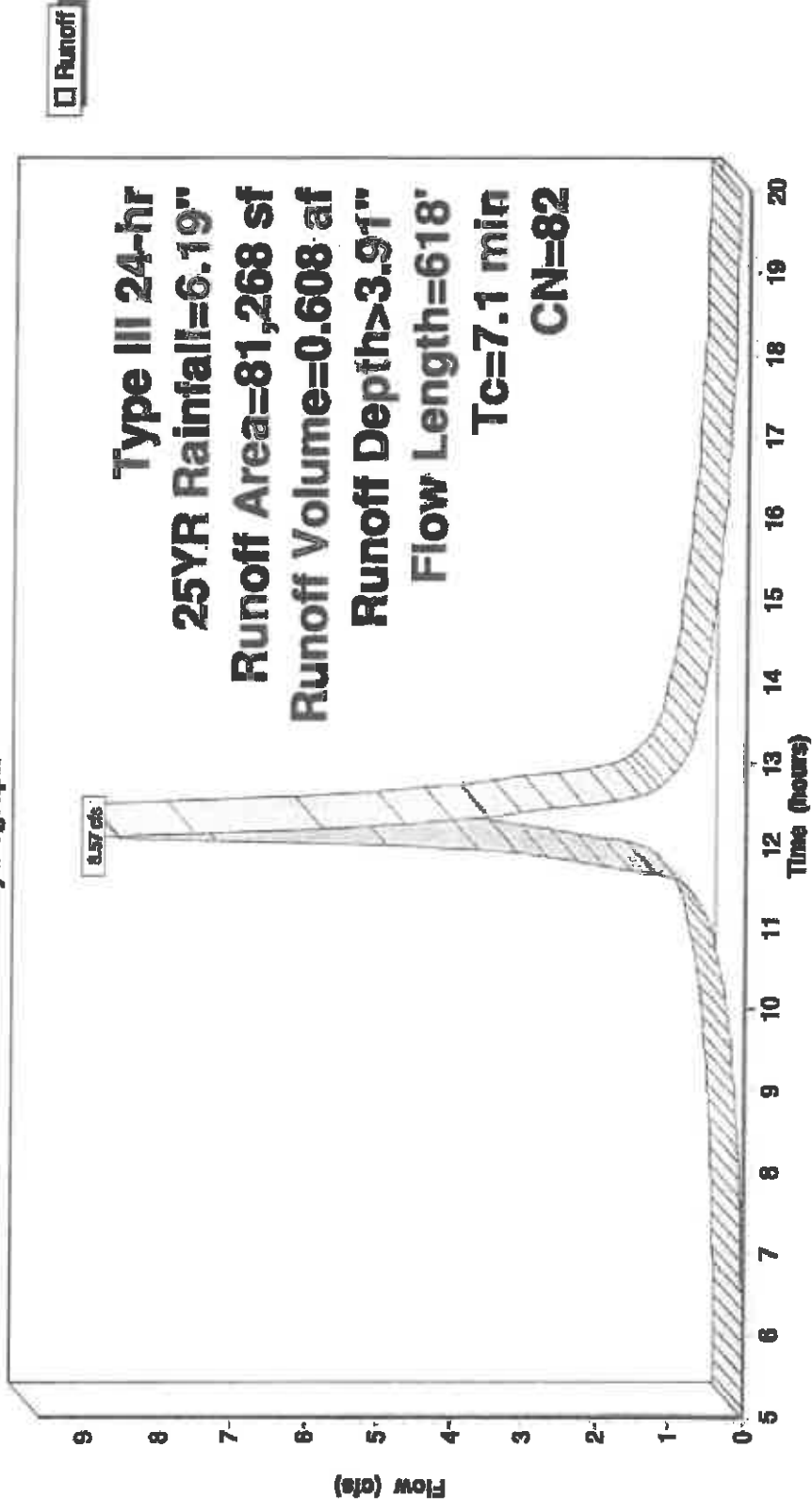
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type-III 24-hr 25YR Rainfall=6.19"

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

t _c (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, TRAVEL PATH C TO D Woodland Kv= 5.0 fps
0.6	100	0.0200	2.87		Shallow Concentrated Flow, TRAVEL PATH D TO E Paved Kv= 20.3 fps
0.4	288	0.0250	12.22	21.59	Pipe Channel, TRAVEL 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

Hydrograph



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		Street Flow, TRAVEL PATH A TO B
0.7	135	0.0450	3.42		Cultivated: Residue>20% n= 0.170 P2= 3.20" Shallow Concentrated Flow, TRAVEL PATH B TO C
1.9	145	0.0650	1.27		Unpaved Kv= 16.1 fps Shallow Concentrated Flow, TRAVEL PATH C TO D
2.1	330	Total			Woodland Kv= 5.0 f/s

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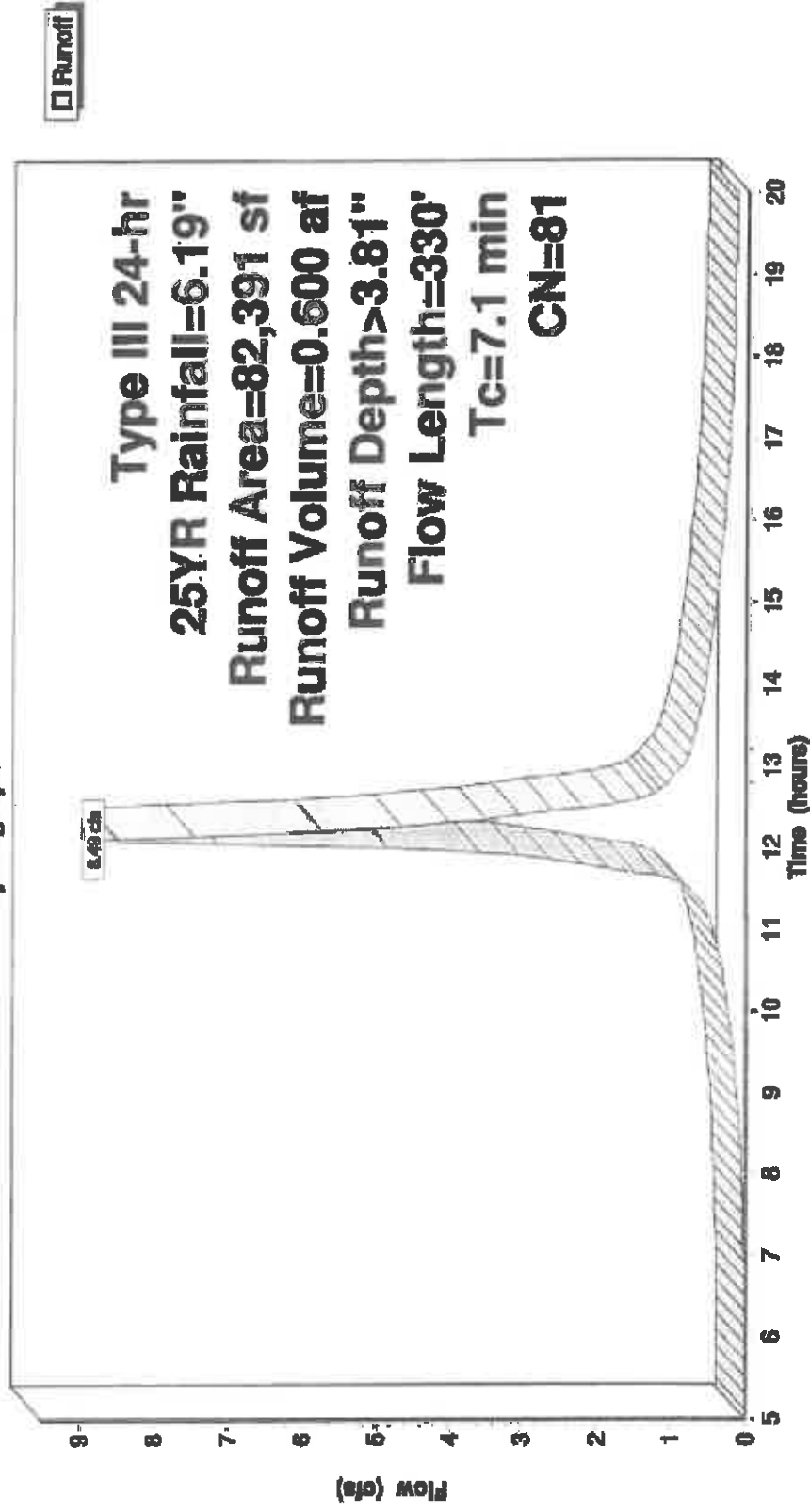
Type III 24-hr 25YR Rainfall=6.19"

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Subcatchment P-2: P-2

Hydrograph



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Type III 24-hr 25YR Rainfall=6.19"

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Summary for Subcatchment P-3: P-3

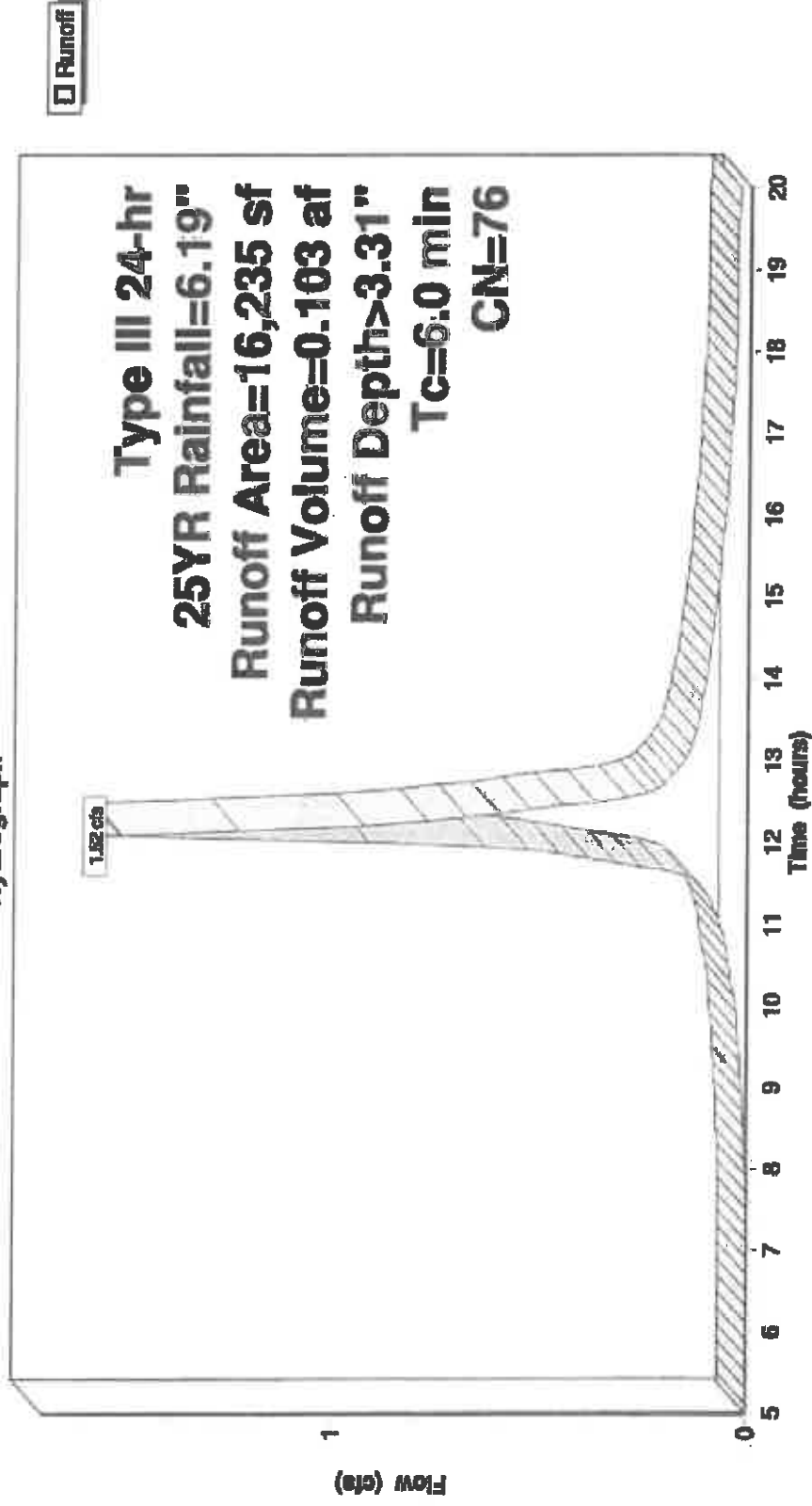
Runoff = 1.52 cfs @ 12.09 hrs, Volume= 0.103 af, Depth= 3.31"
Routed to Reach IP-P3 : EX. CULVERT

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
2,696	98	Paved parking, HSG C
5,650	74	>75% Grass cover, Good, HSG C
7,889	70	Woods, Good, HSG C
16,235	76	Weighted Average
13,539		83.39% Pervious Area
2,696		16.61% Impervious Area
Tc	Length	Slope
min	(feet)	(ft/ft)
6.0		
Velocity	Capacity	Description
(ft/sec)	(cfs)	
		Direct Entry, TRAVEL PATH

Subcatchment P-3: P-3

Hydrograph



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Type III 24-hr 25YR Rainfall=6.19"

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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

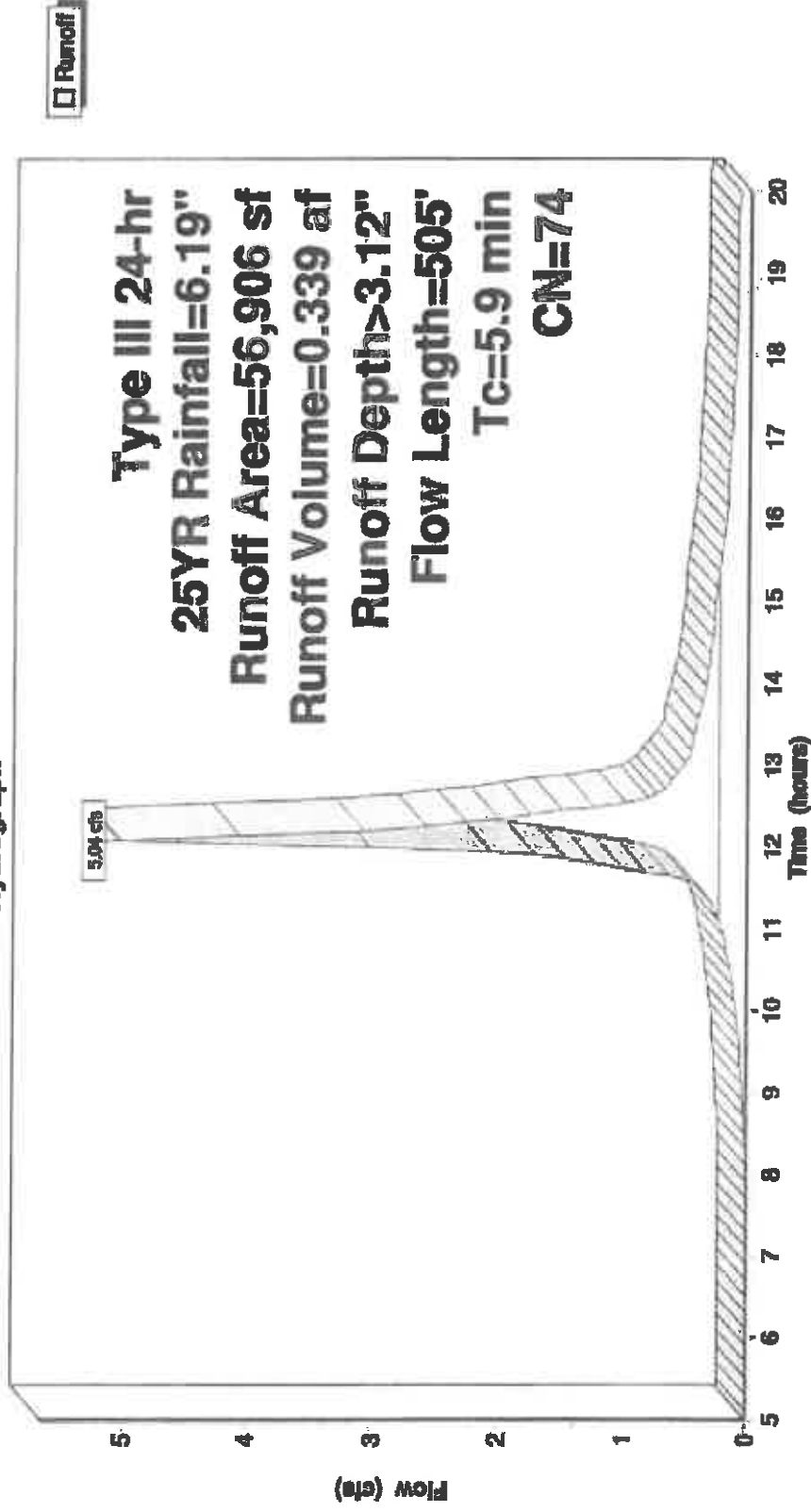
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type:III 24-hr 25YR Rainfall=6.19"

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
52,689		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 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
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, TRAVEL 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

Hydrograph



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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 Length Slope Velocity Capacity Description

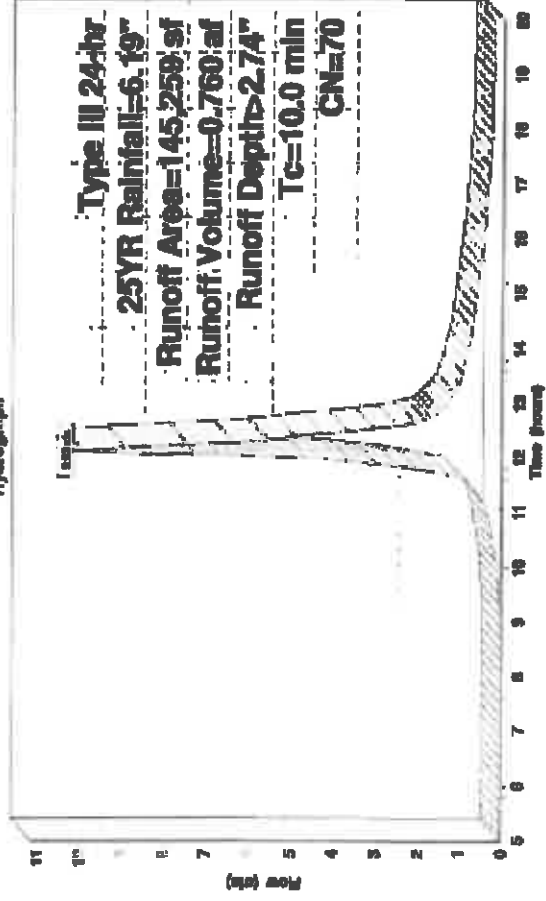
(min) (feet) (ft/ft) (ft/sec) (cfs)

10.0

Direct Entry, TRAVEL PATH

Subcatchment P-5: P-5

Hydrograph



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Type III 24-hr 25YR Rainfall=6.19"

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Summary for Subcatchment P-6: P-6

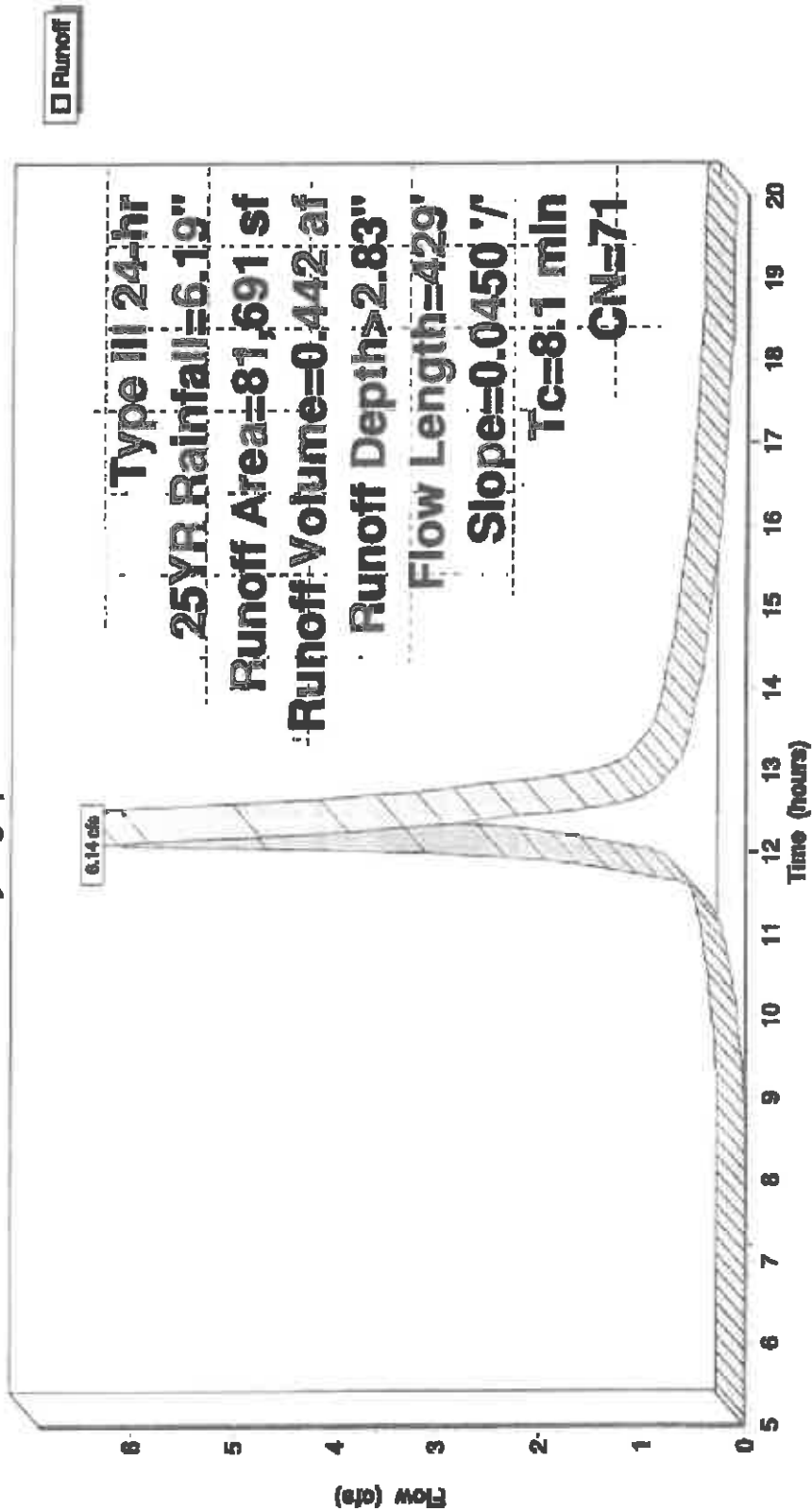
Runoff = 6.14 cfs @ 12.12 hrs, Volume= 0.442 af, Depth= 2.83"
Routed to Reach IP-P2 : SCHOOL ST

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

Hydrograph



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

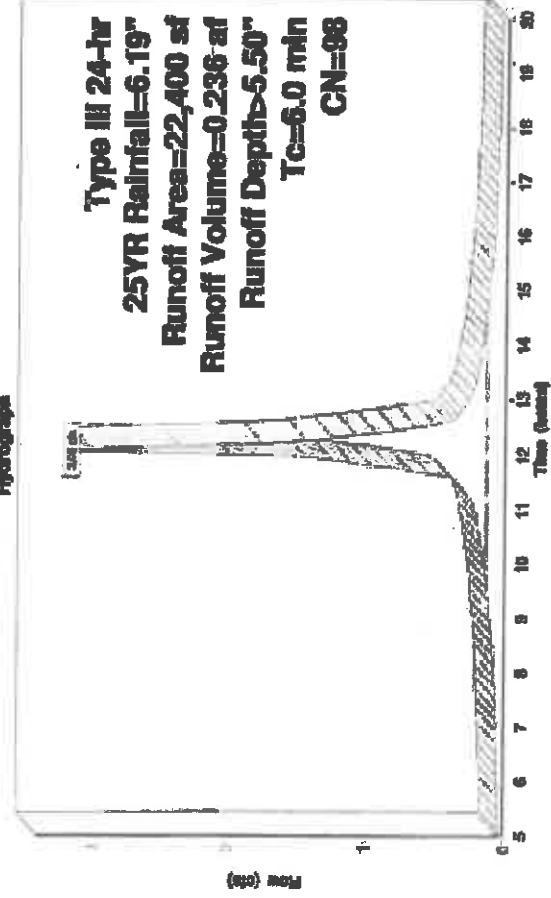
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Spn= 5.00-20.00 hrs, cf= 0.05 hrs
 Type III 24-hr 25YR Rainfall=6.19"

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

Hydrograph

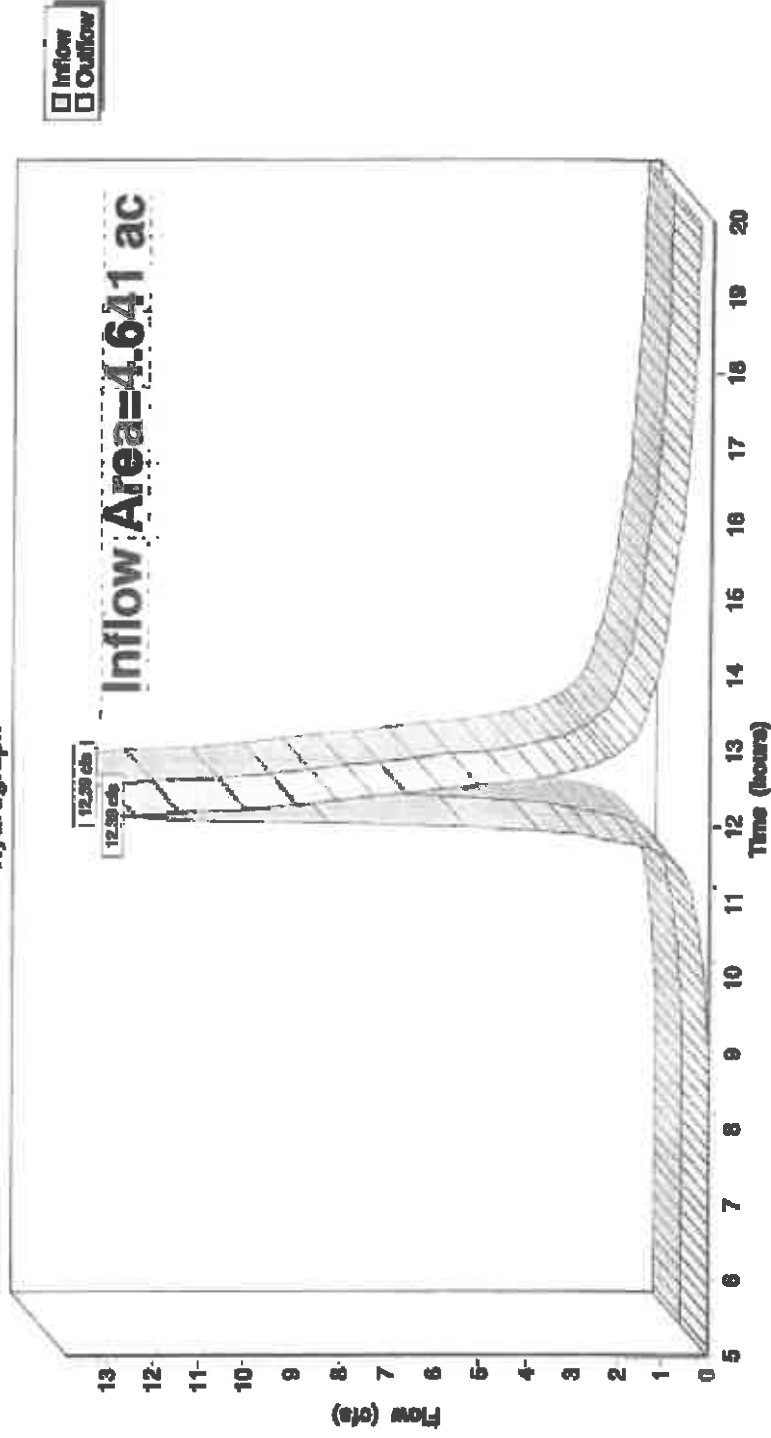


Summary for Reach IP-P1: 45 MAIN ST

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

Reach IP-P1: 45 MAIN ST

Hydrograph



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Type III 24-hr 25YR Rainfall=6.19"

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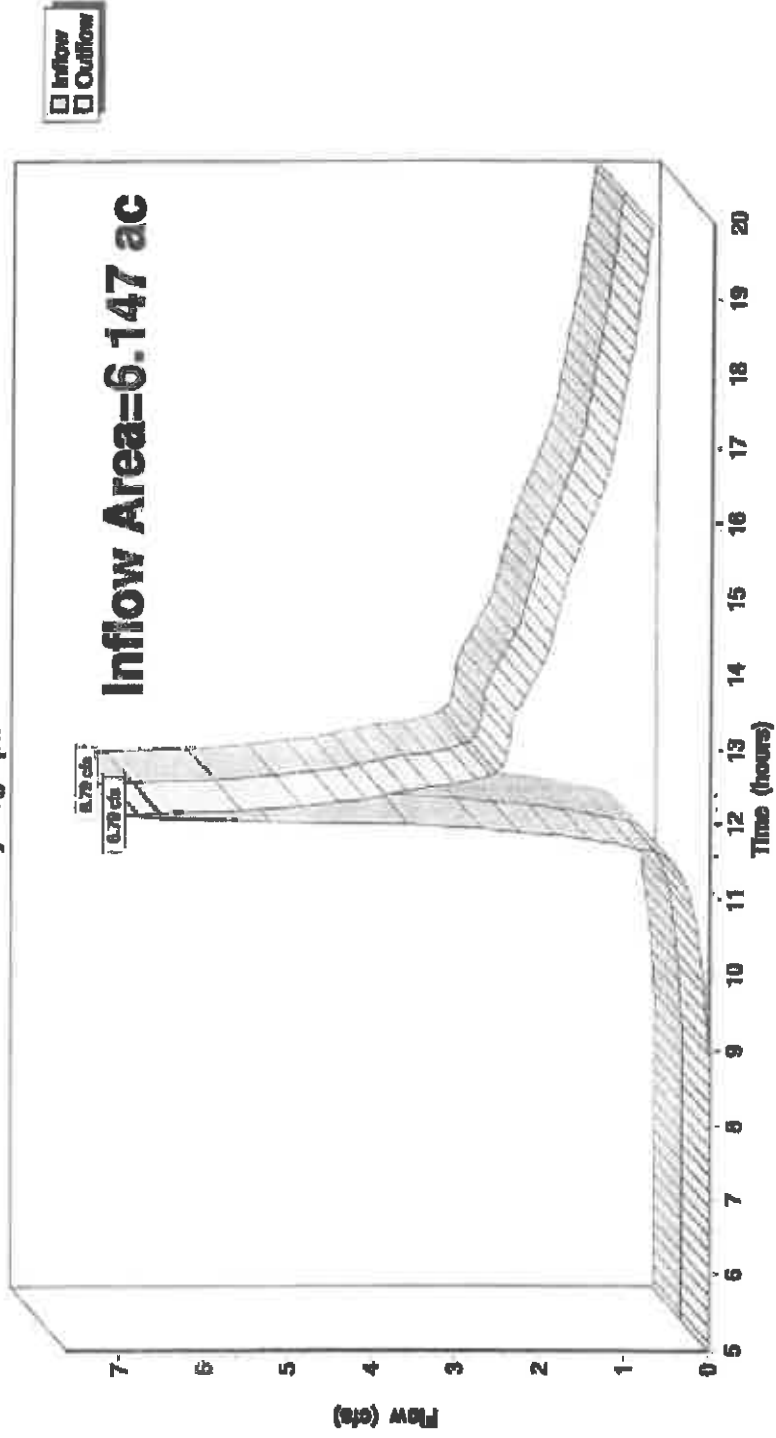
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Summary for Reach IP-P2: SCHOOL ST

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

Reach IP-P2: SCHOOL ST

Hydrograph



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Type III 24-hr 25YR Rainfall=6.19"

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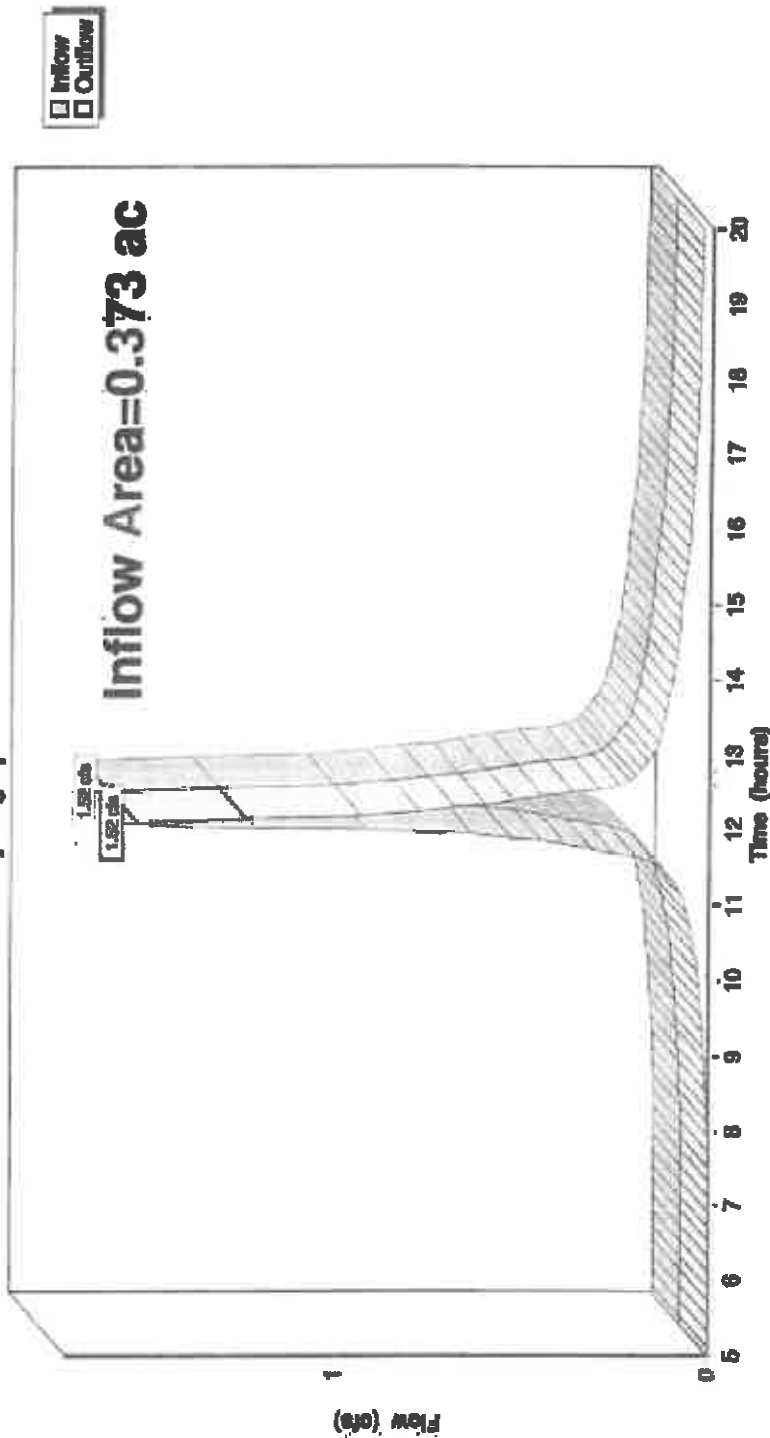
Summary for Reach IP-P3: EX. CULVERT

Inflow Area = 0.373 ac, 16.61% Impervious, Inflow Depth > 3.31" for 25YR event
Inflow = 1.52 cfs @ 12.09 hrs, Volume= 0.103 af
Outflow = 1.52 cfs @ 12.09 hrs, Volume= 0.103 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

Hydrograph



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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 #1 322.00' Avail.Storage 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 Infr	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 3.32

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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)

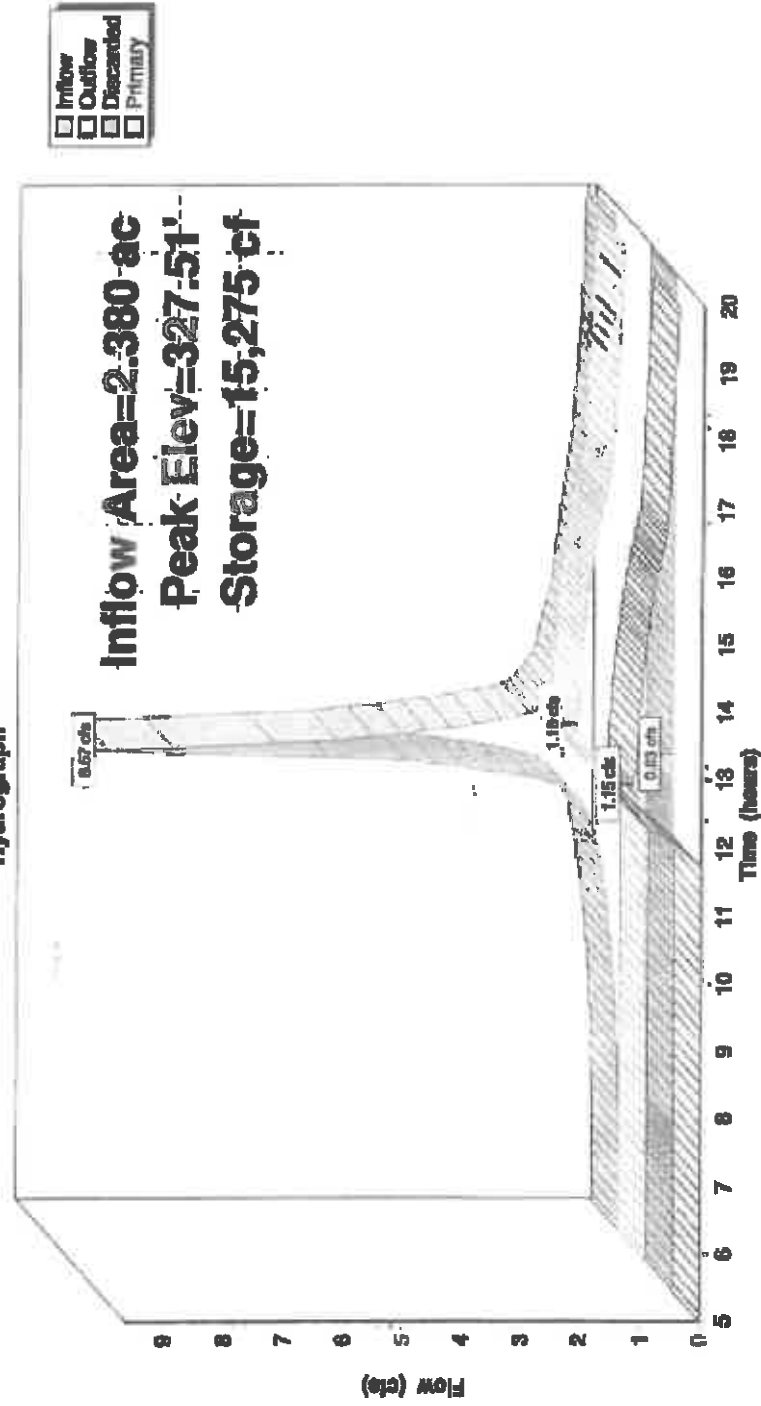
2-Orifice/Grate (Orifice Controls 0.71 cfs @ 8.12 fps)

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

Hydrograph



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Type III 24-hr 25YR Rainfall=6.19"

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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 (Phtamatic) 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 Flow 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

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Type III 24-hr 25YR Rainfall=6.19"

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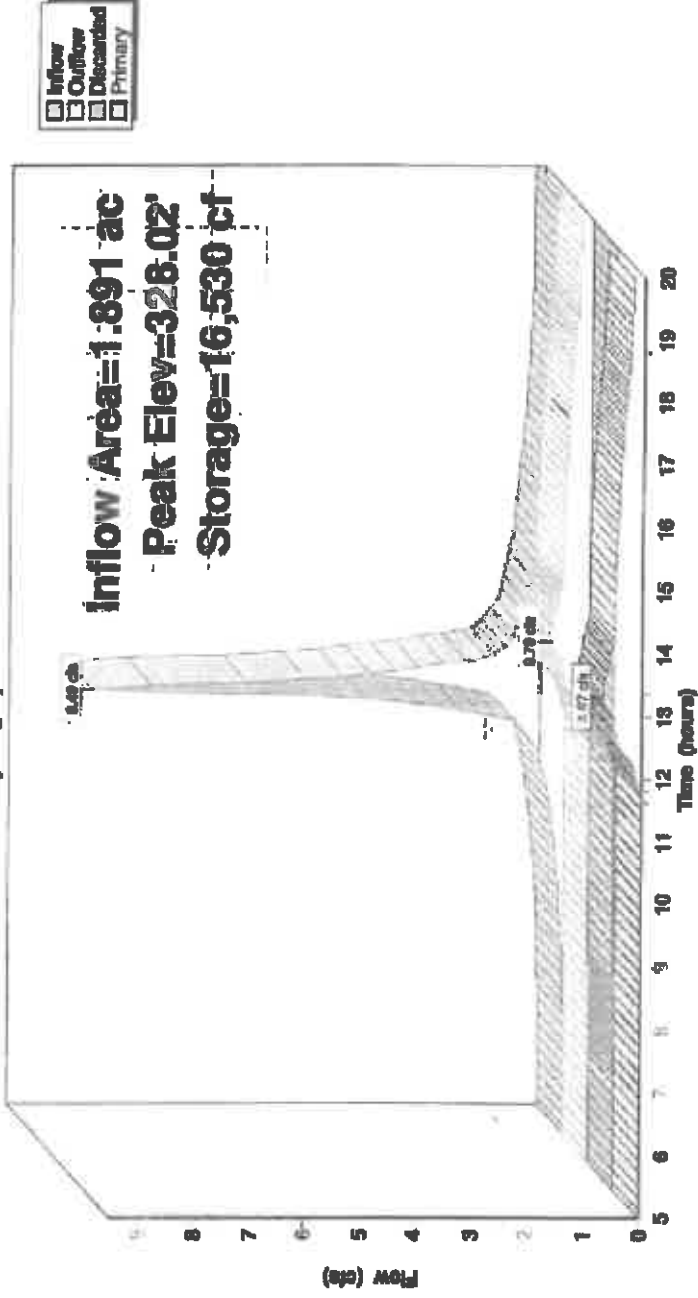
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00
 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

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

Hydrograph



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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-lrd 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 (828.4 - 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) 2.60 2.92 3.08 3.30 3.32

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Type III 24-hr 25YR Rainfall=6.19"

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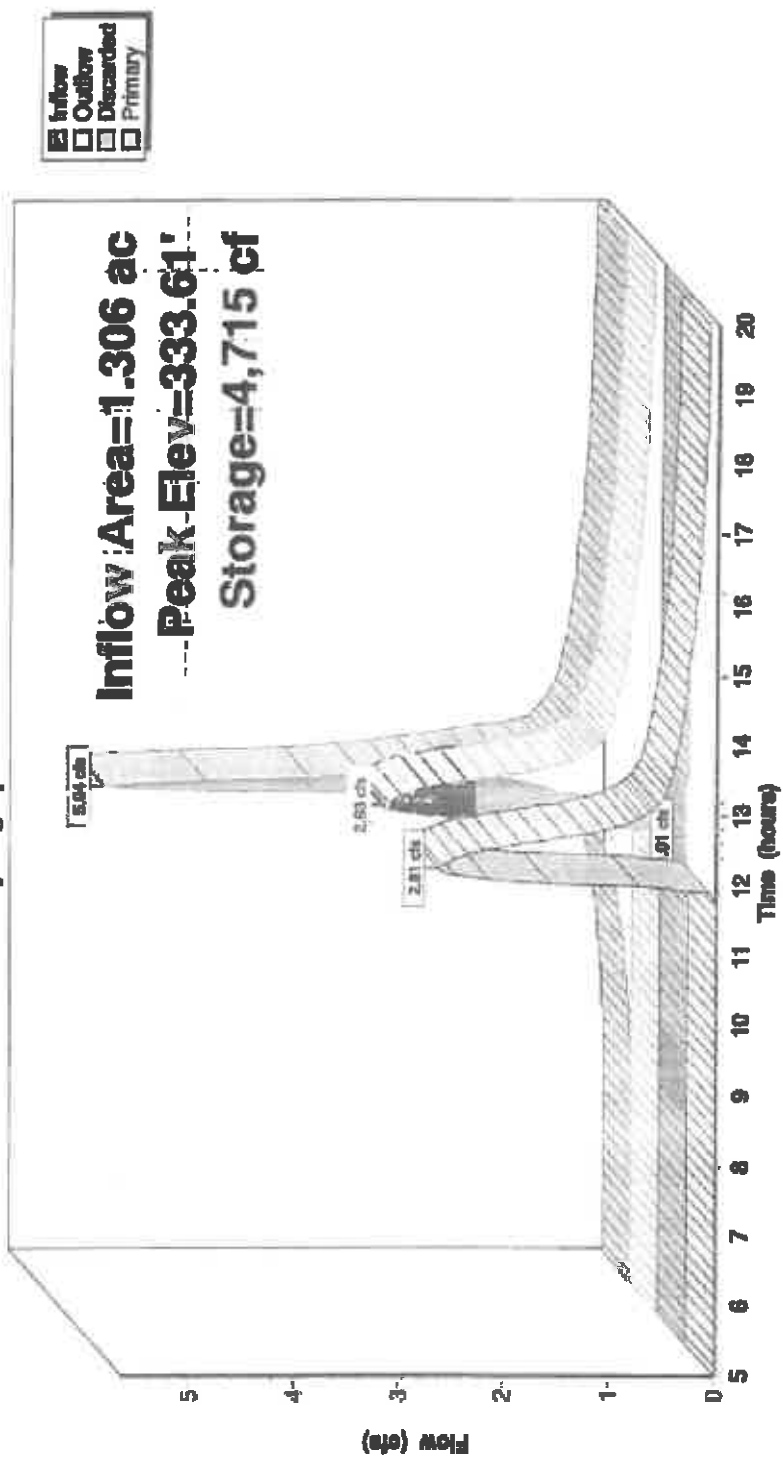
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Discarded OutFlow Max=0.01 cfs @ 12.25 hrs HW=333.61' (Free Discharge)
1-Exfiltration (Exfiltration Controls 0.01 cfs)

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-Created Rectangular Weir (Controls 0.00 cfs)

Pond PND3: BASIN3

Hydrograph



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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= 0.238 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	Culhec R-330X1HD 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 Flow 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	328.50'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

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Type III 24-hr 25YR Rainfall=8.19"

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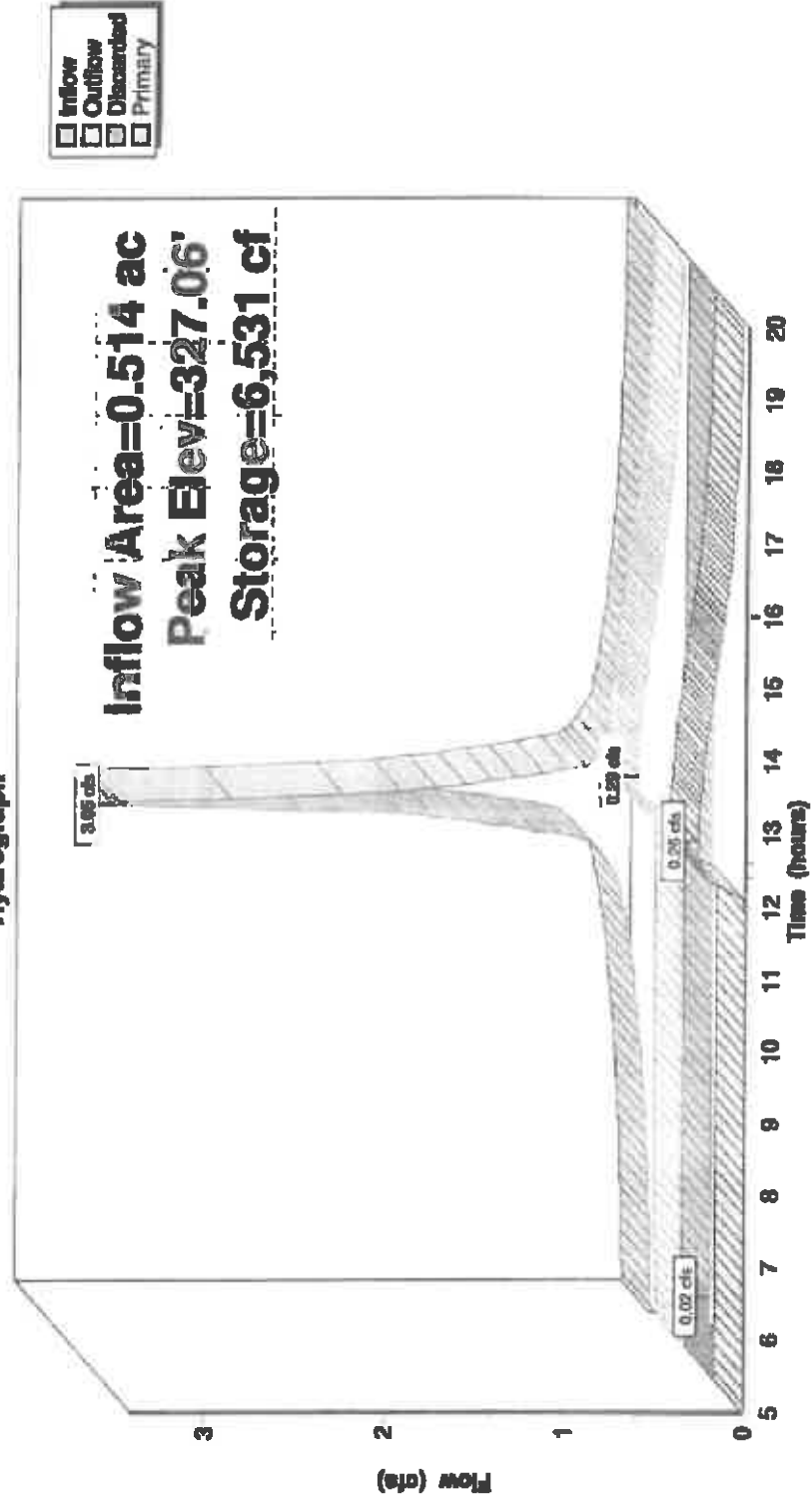
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Discarded OutFlow Max=0.02 cfs @ 6.15 hrs HW=325.04' (Free Discharge)
1-1=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.26 cfs @ 12.91 hrs HW=327.06' (Free Discharge)
2-2=Office/Grate (Office Controls 0.26 cfs @ 3.03 fps)

Pond PND4: U/G BASIN

Hydrograph



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Type III 24-hr 100YR Rainfall=7.85"

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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=81,288 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=16,235 sf 16.61% Impervious Runoff Depth=4.71"
Tc=6.0 min CN=76 Runoff=2.14 cfs 0.146 af

Subcatchment P-4: P-4

Runoff Area=56,908 sf 7.39% Impervious Runoff Depth=4.48"
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=81,891 sf 0.00% Impervious Runoff Depth=4.16"
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=8.0 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=18.29 cfs 1.567 af
Outflow=18.29 cfs 1.567 af

Reach IP-P3: EX CULVERT

Inflow=2.14 cfs 0.146 af
Outflow=2.14 cfs 0.146 af

Pond PND1: PND 1

Peak Elev=927.76' Storage=18,522 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 0.763 af

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Type III 24-hr 100YR Rainfall=7.85"

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Pond PWD2: BASIN#2

Peak Elev=328.24' Storage=17,589 cf Inflow=11.59 cfs 0.832 af
Discarded=0.03 cfs 0.023 af Primary=5.37 cfs 0.478 af Outflow=5.40 cfs 0.508 af

Pond PWD3: BASIN#3

Peak Elev=334.13' Storage=5,778 cf Inflow=7.19 cfs 0.488 af
Discarded=0.01 cfs 0.008 af Primary=5.60 cfs 0.419 af Outflow=5.62 cfs 0.427 af

Pond PWD4: UFG 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 = 11.160 ac Runoff Volume = 4.375 af Average Runoff Depth = 4.70"
81.50% Pervious = 9.106 ac 18.41% Impervious = 2.054 ac

Summary for Subcatchment P-1: P-1

Runoff = 11.63 cfs @ 12.10 hrs, Volume= 0.838 ac, 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, di= 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, TRAVEL PATH C TO D Woodland Kv= 5.0 fps
0.6	100	0.0200	2.87		Shallow Concentrated Flow, TRAVEL PATH D TO E Paved Kv= 20.3 fps
0.4	288	0.0250	12.22	21.59	Pipe Channel, TRAVEL PATH E TO F 18.0" Round Area= 1.8 sf Perim= 4.7' n= 0.38' n= 0.010
7.1	618	Total			

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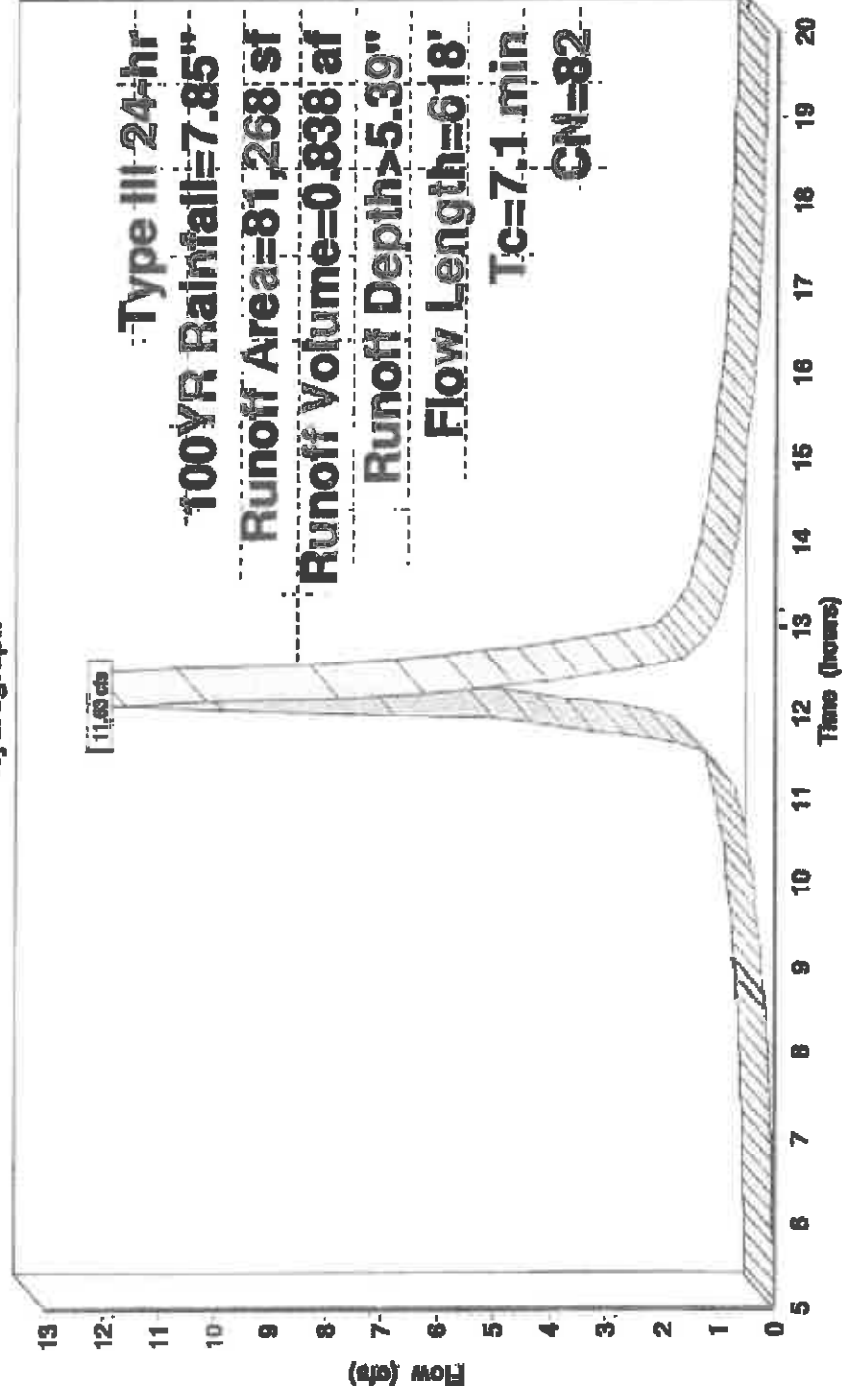
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Subcatchment P-1: P-1

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Type III 24-hr 100YR Rainfall=7.85"

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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, di= 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
0.7	135	0.0450	3.42		Cultivated: Residue>20% n= 0.170 P2= 3.20"
1.9	145	0.0650	1.27		Shallow Concentrated Flow, TRAVEL PATH B TO C
					Unpaved Kv= 16.1 fps
					Shallow Concentrated Flow, TRAVEL PATH C TO D
					Woodland Kv= 5.0 fps
7.1	330	Total			

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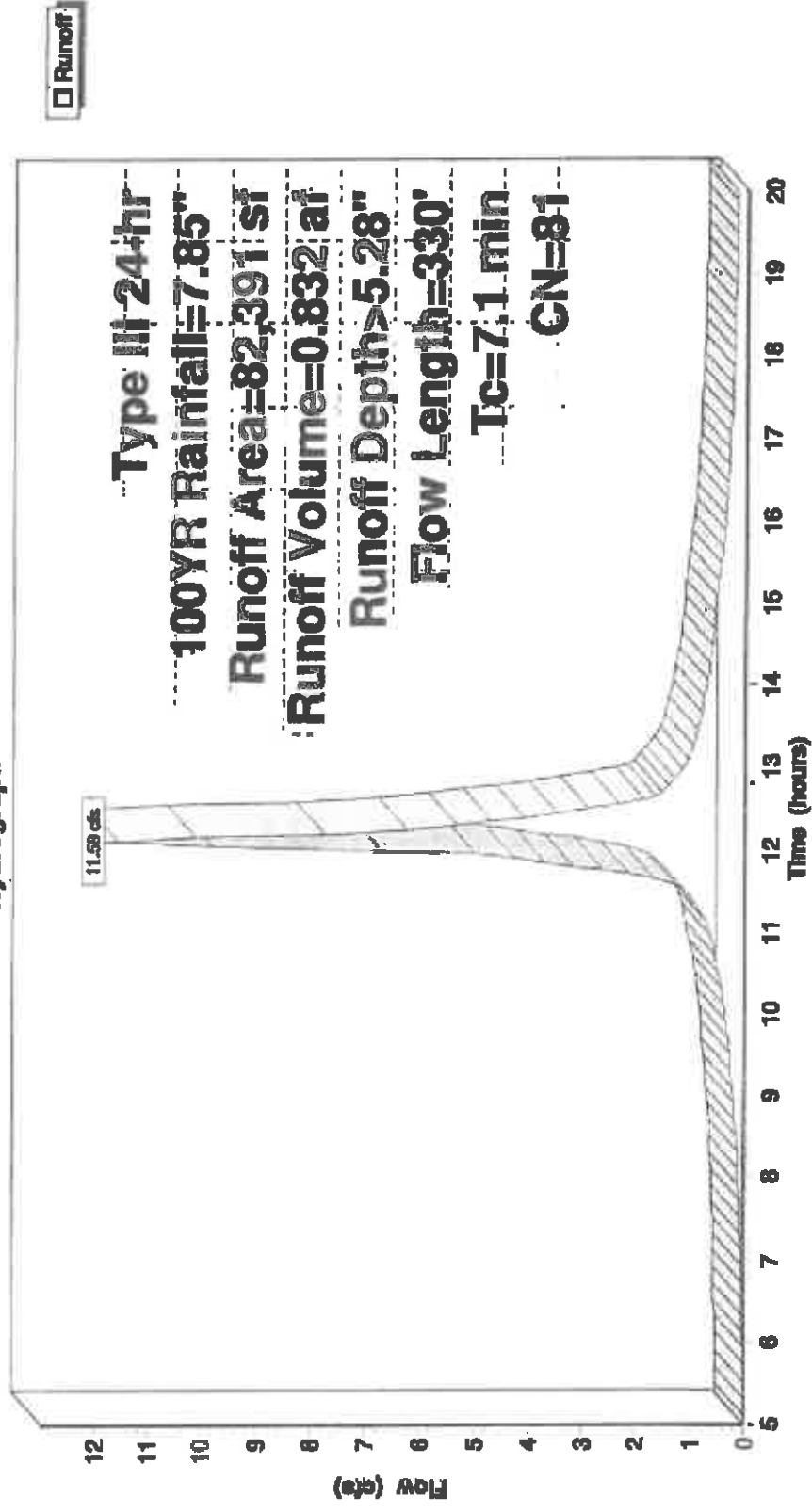
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Subcatchment P-2: P-2

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Type III 24-hr 100YR Rainfall=7.85"

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Summary for Subcatchment P-3: P-3

Runoff = 2.14 cfs @ 12.09 hrs, Volume= 0.146 af, Depth= 4.71"
Routed to Reach IP-P3 : EX CULVERT

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

Area (sf)	CN	Description			
2,696	98	Paved parking, HSG C			
5,650	74	>75% Grass cover, Good, HSG C			
7,889	70	Woods Good, HSG C			
16,235	76	Weighted Average			
13,539		83.39% Pervious Area			
2,696		16.61% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description			
6.0					Direct Entry, TRAVEL PATH

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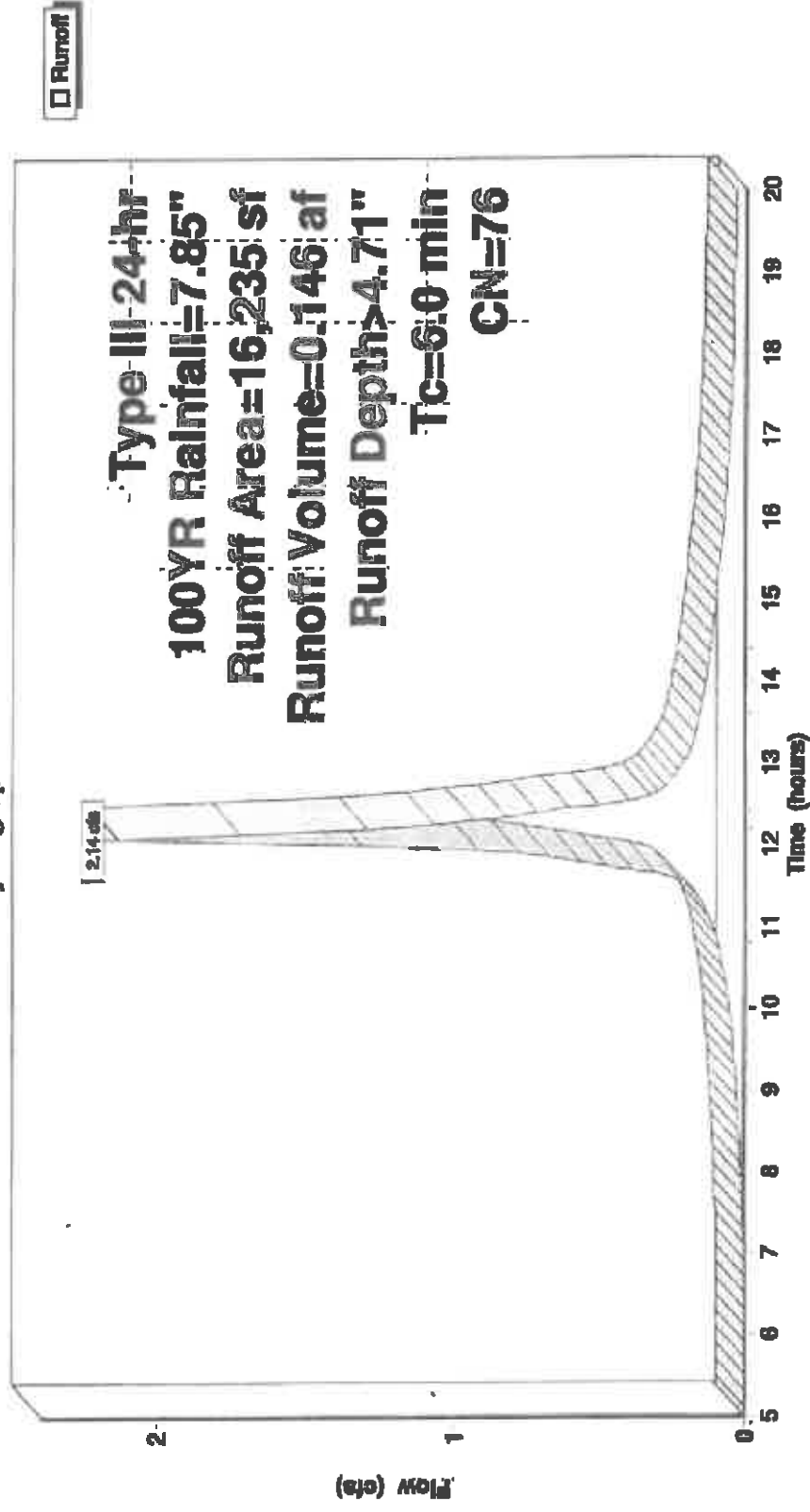
Type III 24-hr 100YR Rainfall=7.85"

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Subcatchment P-3: P-3

Hydrograph



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

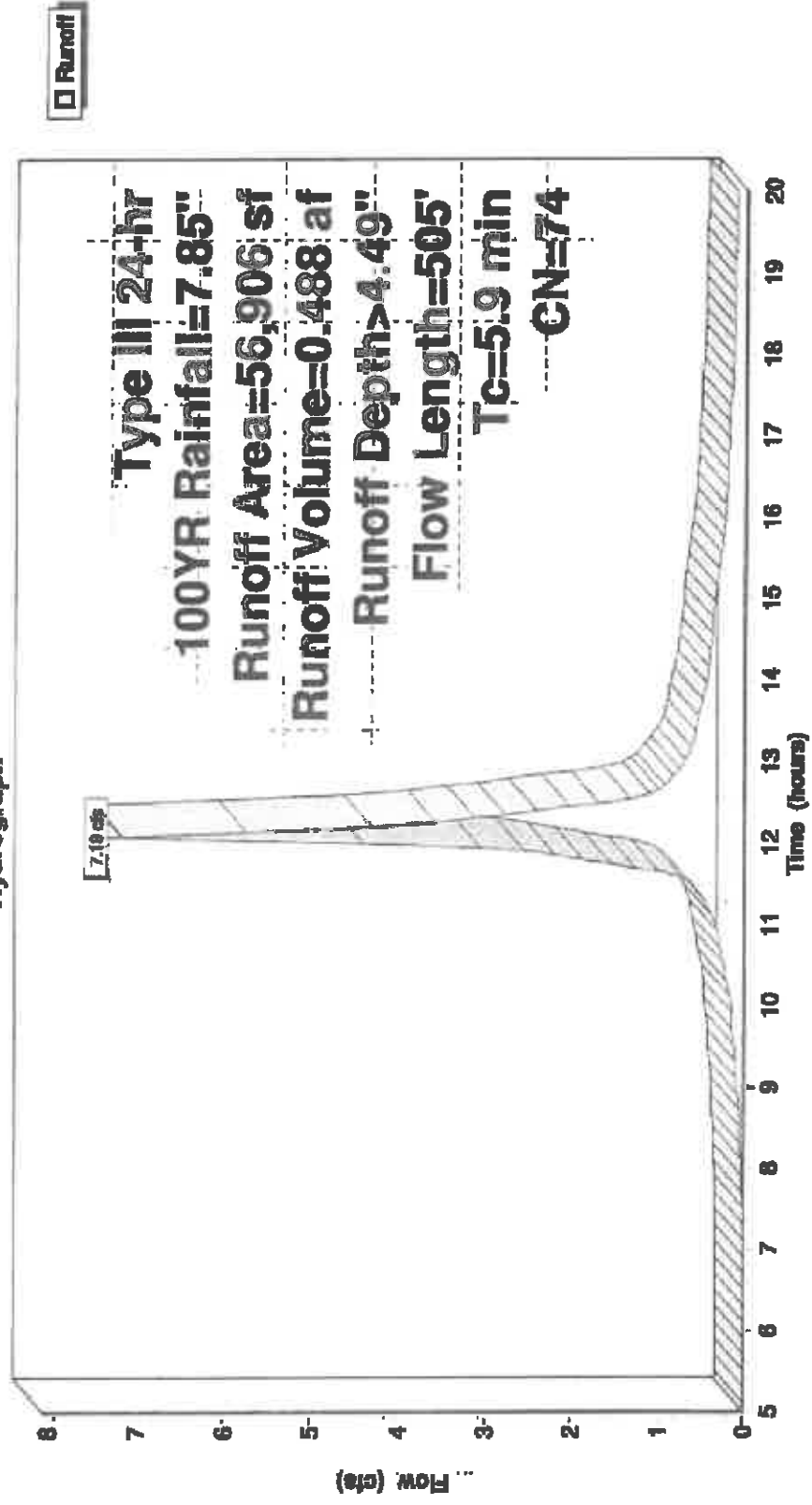
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100YR Rainfall=7.85"

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 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
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, TRAVEL 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

Hydrograph



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Type III 24-hr 100YR Rainfall=7.85"

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Summary for Subcatchment P-5: P-5

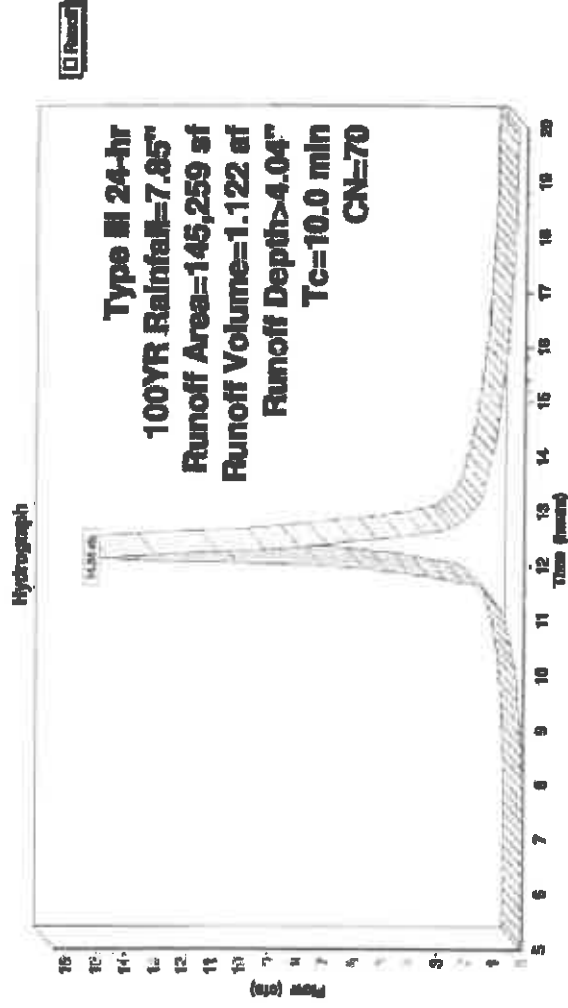
Runoff = 14.64 cfs @ 12.14 hrs, Volume= 1.122 af, Depth> 4.04"
Routed to Reach IP-P1 : 45 MAIN ST

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



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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
68,688	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
0.9	184	0.0450	3.42		Grass: Short n= 0.150 P2= 3.20"
3.1	195	0.0450	1.06		Shallow Concentrated Flow, TRAVEL PATH B TO C
					Unpaved Kv= 16.1 fps
					Shallow Concentrated Flow, TRAVEL PATH C TO D
					Woodland Kv= 5.0 fps
8.1	429	Total			

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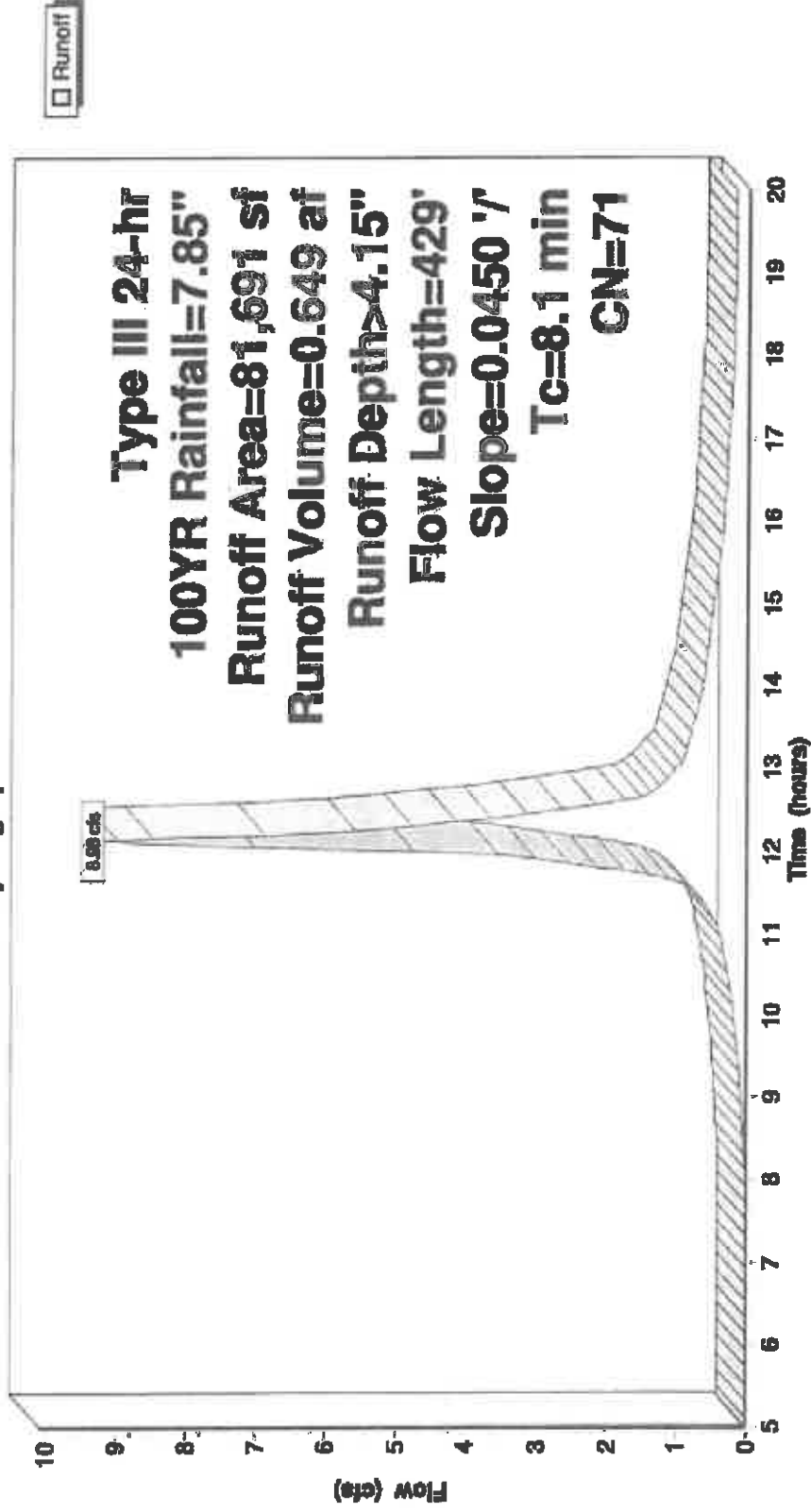
Type III 24-hr 100YR Rainfall=7.85"

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Subcatchment P-6: P-6

Hydrograph



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Summary for Subcatchment P-7: BUILDING

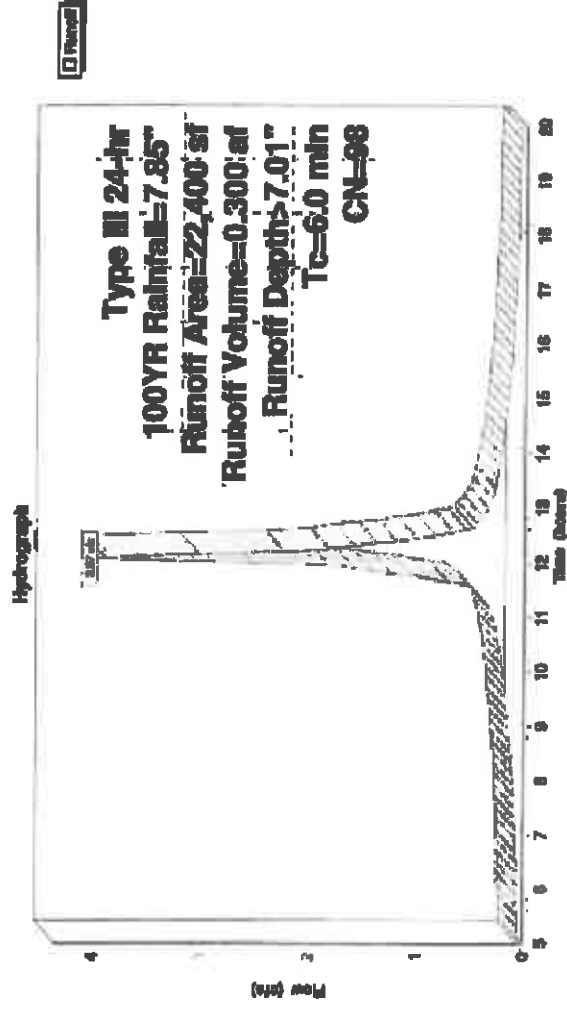
Runoff = 3.87 cfs @ 12.09 hrs, Volume= 0.300 af, Depth= 7.01"
Routed to Pond PND4 : U/G BASIN

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 (sq)	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
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Subcatchment P-7: BUILDING



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Summary for Reach IP-P1: 45 MAIN ST

Inflow Area = 4.641 ac, 2.08% Impervious, Inflow Depth > 3.98" for 100YR event

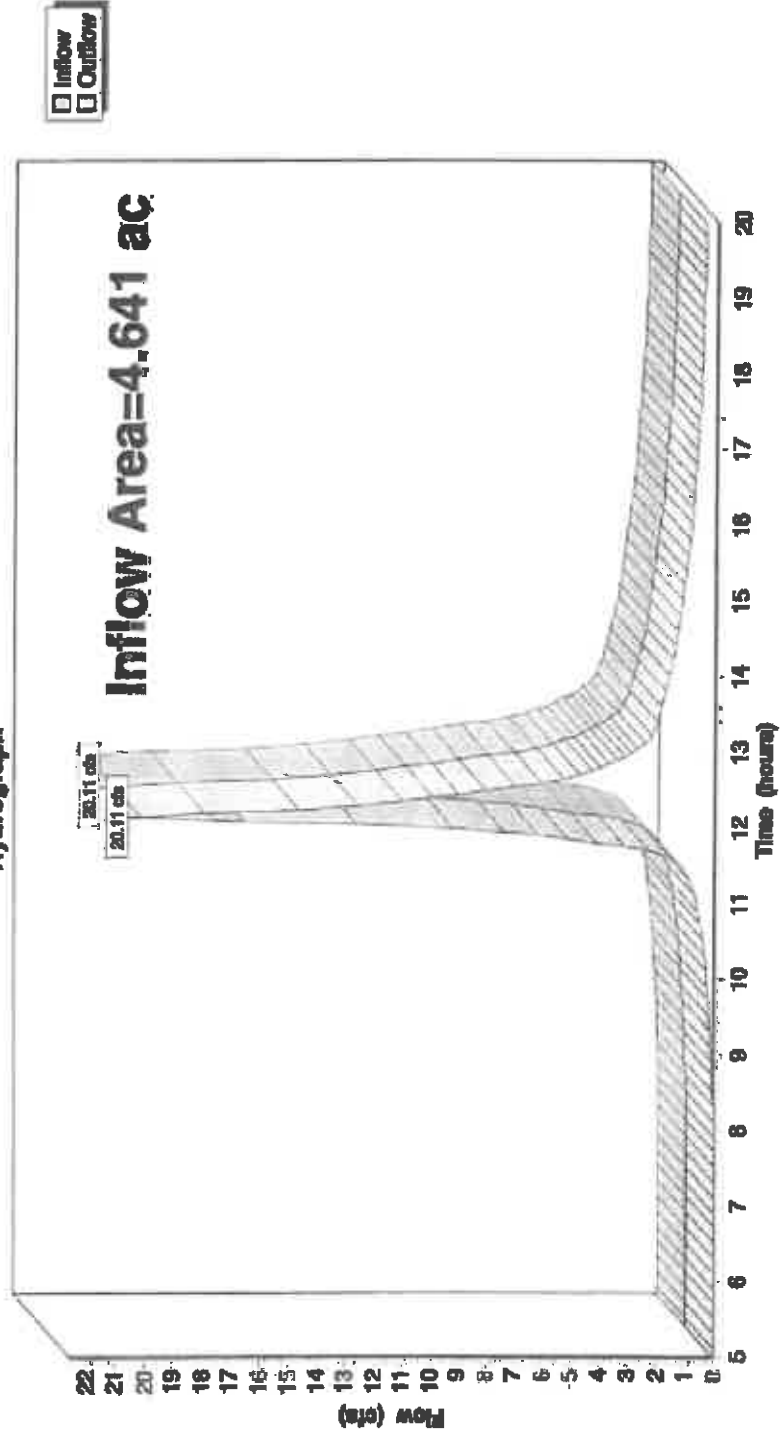
Inflow = 20.11 cfs @ 12.16 hrs, Volume= 1.435 af

Outflow = 20.11 cfs @ 12.16 hrs, Volume= 1.435 af, Atten= 0%, Lag= 0.0

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

Reach IP-P1: 45 MAIN ST

Hydrograph

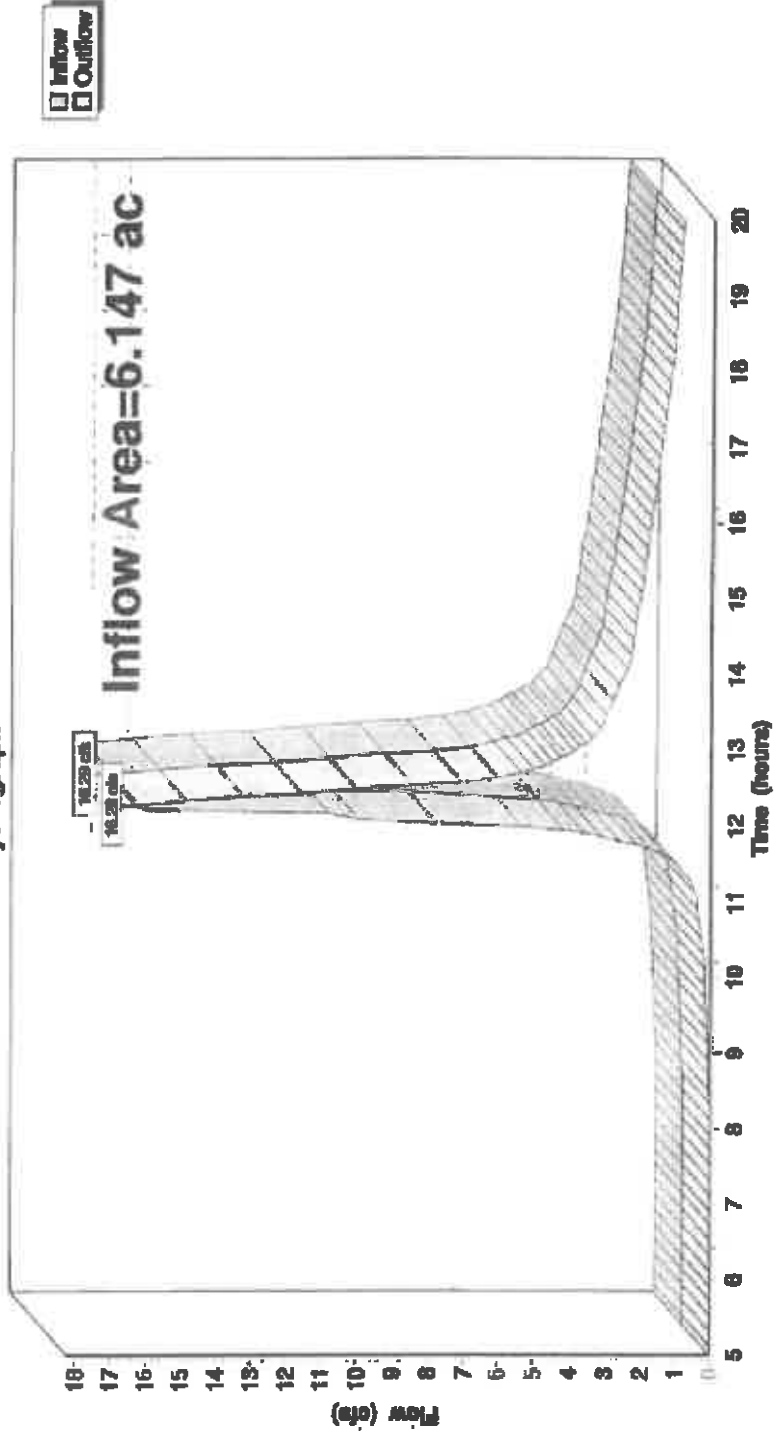


Summary for Reach IP-P2: SCHOOL ST

Inflow Area = 6.147 ac, 30.94% 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

Hydrograph



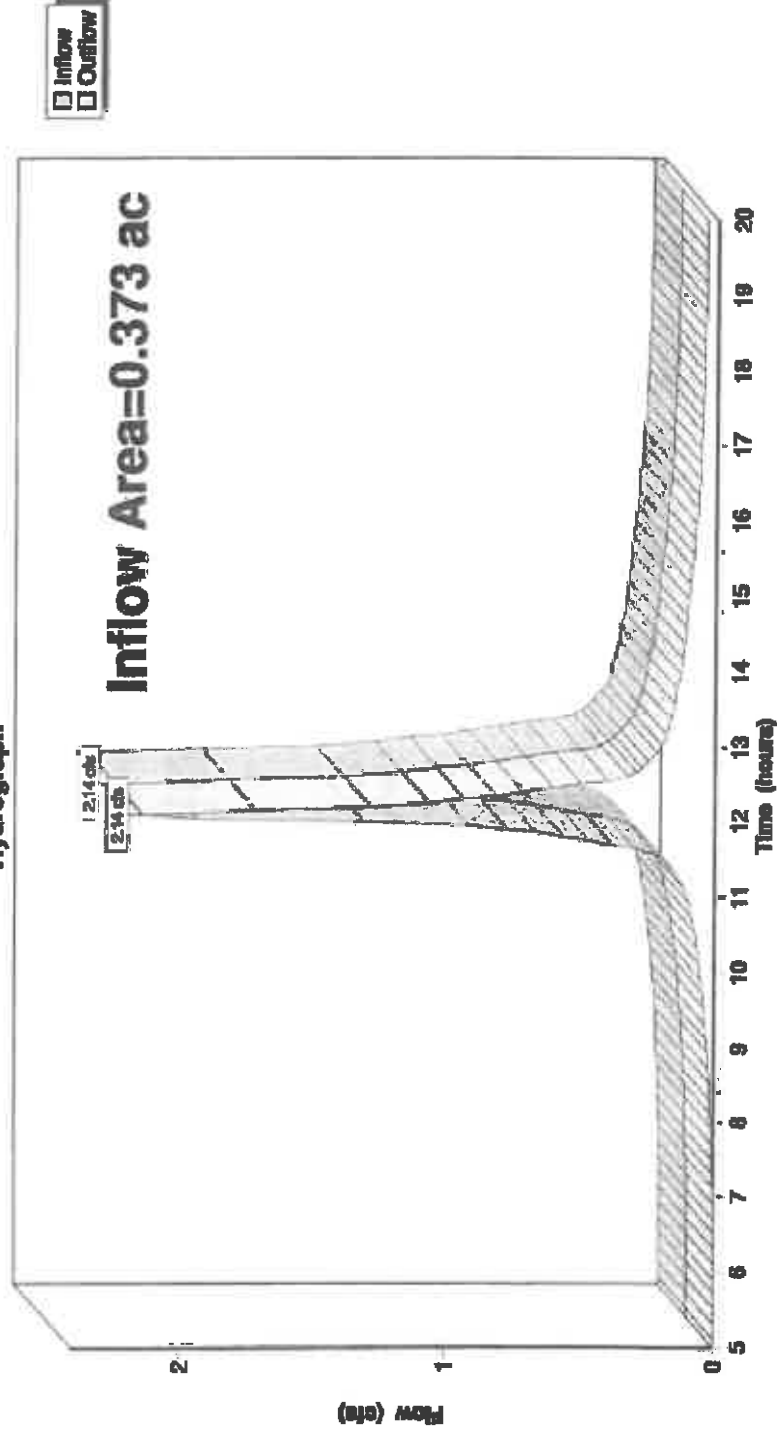
Summary for Reach IP-P3: EX CULVERT

Inflow Area = 0.373 ac, 16.61% Impervious, Inflow Depth > 4.71" for 100YR event
Inflow = 2.14 cfs @ 12.09 hrs, Volume= 0.146 af
Outflow = 2.14 cfs @ 12.09 hrs, Volume= 0.146 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

Hydrograph



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Summary for Pond PND1: PND 1

Inflow Area = 2.380 ac, 52.89% Impervious, Inflow Depth > 4.96" 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 af Storage= 16,522 cf

Plug-Flow detention time= 149.6 min calculated for 0.781 af (78% of inflow)
Center-of-Mass det. time= 94.4 min (879.9 - 785.5)

Volume #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 3.26 3.31 3.30 3.31 3.32

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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)

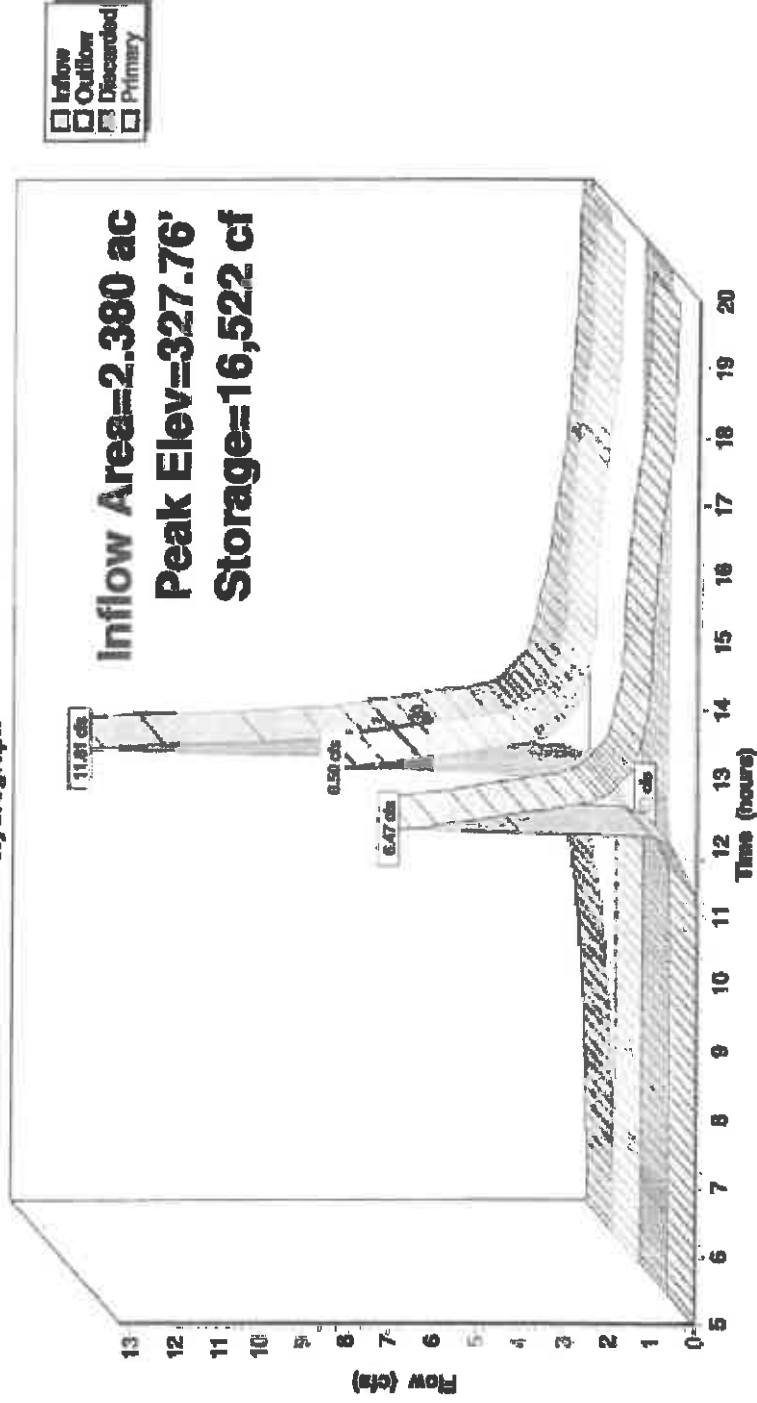
2=Orifice/Grate (Orifice Controls 0.74 cfs @ 8.45 fps)

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

Hydrograph



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Type III 24-hr 100YR Rainfall=7.85"

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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, Attan= 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	Cuttec 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

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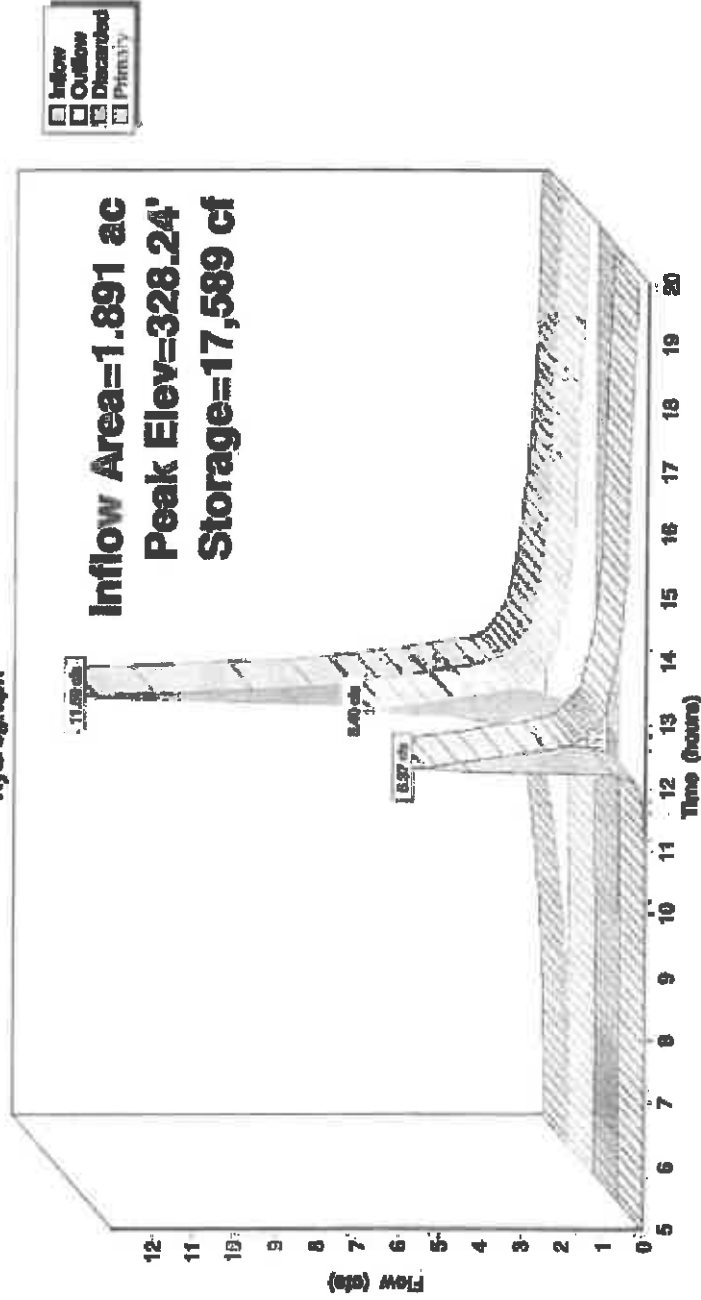
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00
Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

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

Hydrograph



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Summary for Pond PND3: BASIN3

Inflow Area = 1.206 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-1 : 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 #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

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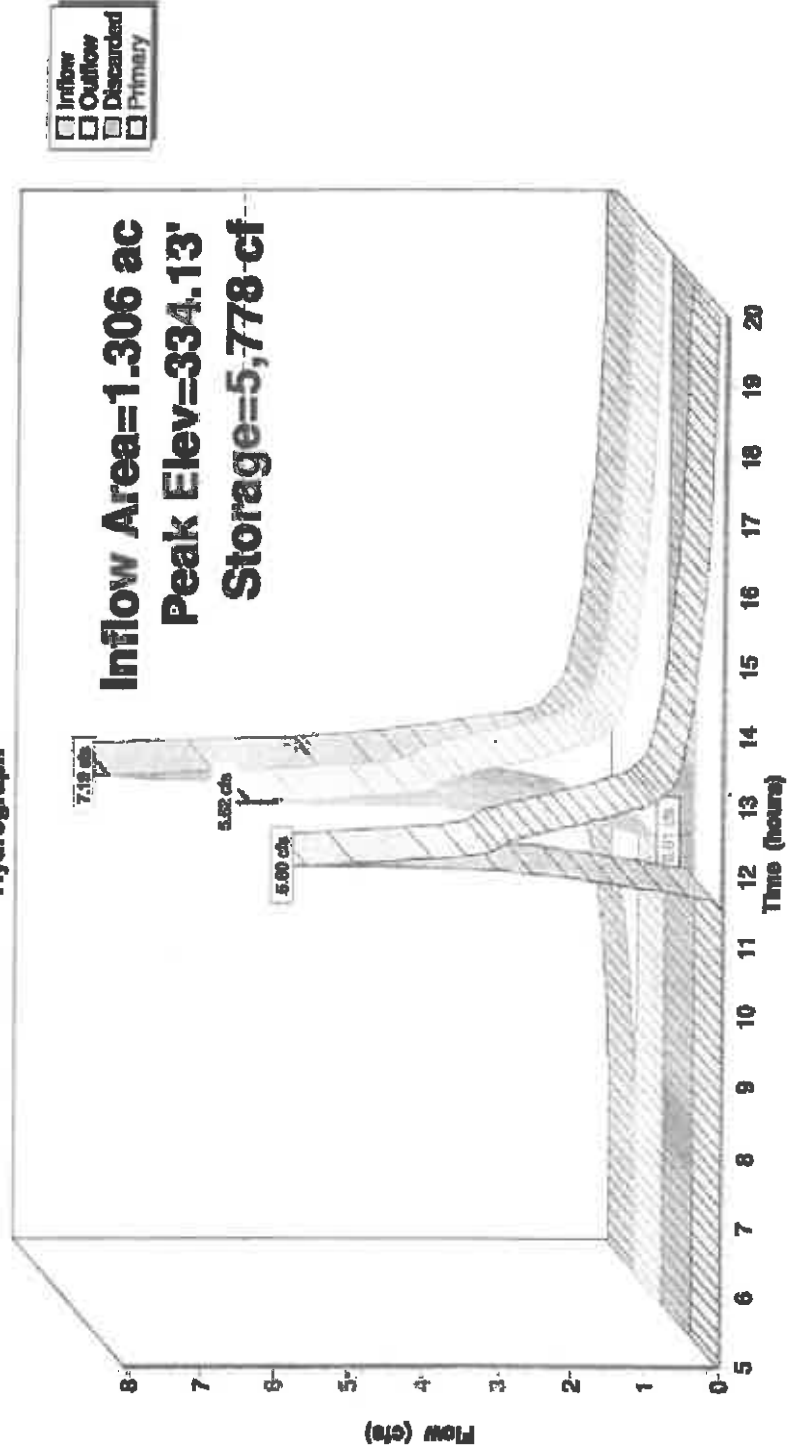
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Discarded OutFlow Max=0.01 cfs @ 12.17 hrs HW=334.11' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.01 cfs)

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

Hydrograph



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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 (Pneumatic) Listed below (Recalc) 12,739 cf Overall - 6,270 cf Embaddid = 6,468 cf x 40.0% Voids
#2	325.00'	6,270 cf	Cutbac R-330XLD 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
326.00	3,637	9,093	10,920
326.50	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

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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

Hydrograph

