DOANE ENGINEERING
CIVIL ENGINEERING AND LAND SURVEYING
P.O. BOX 113 CENTERBROOK, CONNECTICUT 06409
TEL: (860)767-0138, FAX: (860)767-9104

Engineering Report

November 3, 2022

Prepared For

Piage Management Corp
49 Plains Road
Essex, Connecticut 06426

Prepared By

Doane Engineering
P. O. Box 113
Centerbrook, Connecticut 06409

Table of Contents

Appendices

1.0 Introduction:

This Engineering Report has been prepared on behalf of Piage Management Corp who is seeking approval for the development of an approximately 2.0 acre parcel located in the central portion of Essex. The parcel is located at 49 Plains Road (Conn. Route 153) in the Town of Essex, Connecticut. Please see Figure 1 for a location map.

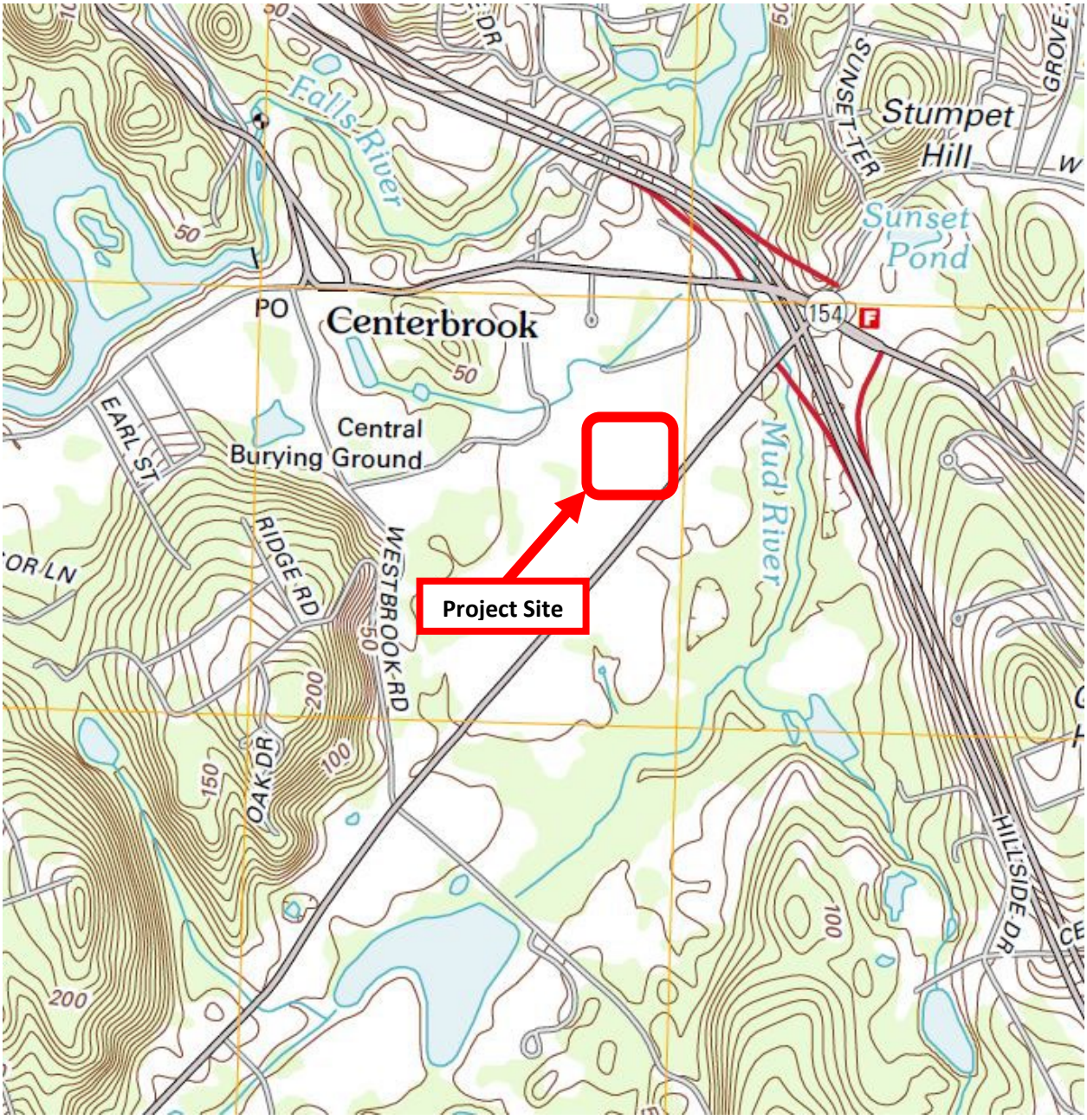


Figure 1. Project location
U.S.G.S Essex Connecticut Quadrangle

The planned development proposal consists of the construction of a new 10,125 sf. warehouse to the rear of the existing 4,750 sf warehouse. Additional site improvements include driveways, parking areas, utility services, on-site wastewater system, landscaping, and stormwater management facilities.

The project site is located primarily within the Limited Industrial (LI) zoning district. The access way to the site is in the Business District (B). The existing land used adjacent to and in the vicinity of the site is residential and commercial. The property is currently used as a warehouse that is occupied by Cross Island Provisions.

The site is served by the Connecticut Water Company public water system, public communication, and electric utilities located within the Plains Road Right of Way.

Surface runoff from the site currently drains to a small wetland located in the southeast corner of the site. This wetland discharges to a swale towards Plains Road and an 18" pipe crossing Plains Road. The runoff ultimately discharges to the Mud River.

Surface runoff from the developed site will be collected by an on-site drainage system and detained in above ground and underground storage onsite. The proposed stormwater management system will continue to direct stormwater to the on-site wetland.

The site is not located within a flood zone per FIRM Community Panel Number 090065 0331 G map effective date 08-28-2008.

The site is located with the Water Resource Protection Area.

The site is not located within Aquifer Protection Area or identified Connecticut Department of Energy and Environmental Protection Diversity Database Area.

The Natural Resources Conservation Service Soil Survey of the State of Connecticut indicates that the uplands surficial soil type on the site is classified as Ninigret-Urban Land Complex 0%-5% Slopes (221A)

The site contains 0.06 acres of inland wetlands and 0.5 acres of upland review area.

The total area of land disturbance associated with the completed project construction activities is approximately 1.7 acres. The approximate area of disturbance within the upland review area is 0.4 acres.

2.0 Hydrologic Model Development:

The site stormwater management system has been designed in accordance with standard hydrologic and hydraulic engineering practices HydroCAD Version 10.10 (Hydrologic Modeling Software 9 HydroCAD Software Solutions, LLC) was used to create the Hydrologic models and estimates of peak rates of discharge and volumes of runoff. The U.S. Department of Agriculture Soil Conservation Service (now Natural Resources Conservations Service) Technical Release 20 Computer Program for Project Formulation Hydrology Methodology was used within the HydroCAD software program. TR-20 is a single event, lumped parameter surface water hydrologic model that simulates the precipitation-runoff relationships of a drainage area. The model used the Soil Conservation Service Curve Number and Unit-Hydrograph methods to represent infiltration losses and to transform excess precipitation into runoff, and the Modified Plus (Storage-Indication) Method to preform reservoir routing.

NOAA Precipitation Frequency Atlas 14 for the Northeastern States 24-hour rainfall depths in the project site vicinity shown in Table 1 were accessed from the NOAA precipitation frequency data server and entered into the model.

Table 1

24-Hour Rainfall Depths for the Project Site Vicinity

Recurrence Interval Year	Rainfall Depth Inches
2	3.44
10	5.20
25	6.31
50	7.13
100	8.01

Partial duration series precipitation frequency data was also accessed from the NOAA precipitation frequency data server and entered into the models to create a synthetic rainfall distribution specific to the project site vicinity.

Catchment area boundaries where delineated using the existing conditions mapping for the site. The delineations were checked and adjusted based on a field inspection.

Antecedent Moisture Condition II was used to represent the soil moisture condition in the catchment areas prior to the modeled rainfall events.

3.0 Stormwater Management System:

The site stormwater management system consists of an underground stormwater detention area, 2 above ground detention areas and the associated collection system. The system has been designed to reduce the peak discharge for the site.

The storm drainage pipes have been sized to accommodate the 25-year storm. All discharges from the stormwater detention basins have been sized to accommodate the 100 year storm.

The above ground stormwater basins have been designed to meet the water quality volume and annual groundwater recharge volume requirements of the Connecticut Department of Energy and Environmental Protection Stormwater Quality Manual for the developed site and to provide a level of attenuation of the rates of peak discharge of stormwater runoff from the developed site. Additional all catch basins will have 4' sumps to help with debris collection and water quality.

A Summary of the rates of peak discharge and the reservoir elevations is shown below.

Table 2

Peak Discharge and Reservoir Elevations

Storm Event	Existing (cfs)	Proposed (cfs)	Change (cfs)	Basin 21S Elevation	Basin 22SA Elevation	Underground 22SB Elevation
1 Year	1.78	1.09	-0.69	34.65'	37.44'	35.07'
2 Year	2.37	2.04	-0.33	34.71'	37.45'	35.33'
5 Year	3.43	3.24	-0.19	34.76'	37.46'	35.78'
10 Year	4.35	4.29	-0.06	34.80'	37.47'	35.98'
25 Year	5.63	5.43	-0.2	34.84'	37.48'	36.31'
50 Year	6.6	6.39	-0.21	34.87'	37.49'	36.65'
100 Year	7.63	7.58	-0.05	34.90'	37.50'	37.04'

4.0 Sanitary System Design Information:

The sanitary system has been designed based on actual water usage data provided by the Connecticut Water Company. Water data was collected from June of 2019 though September of 2022. The calculated daily use of the existing warehouse business is 144 gallons per day. This is calculated excluding 2 outlying data points of 3/7/2022 and 3/9/2022. It is assumed that a leak caused this data to not be in line with the other water data collected.

Cross Island Provisions currently has 15 employees with 8 being officer staff and 7 being on the road making deliveries. Upon completion of the new warehouse building, it is estimated that the business will have 30 employees. Based on the average daily water usage of 144 gallons and the current number of employees 15 its estimated that 10 gpd are generated by each employee.

144 gallons / 15 employees = 10 gallons per day per employee

A safety factor of 1.5 can then be applied bringing the 10 gpd to the estimated design flow of 15 gpd per employee .

10 Gallons per day per employee X 1.5 Safety Factor= 15 gallons per day per employee

It is estimated that once construction is completed Cross Island provisions will occupy both the warehouse spaces and have 30 employees. Therefore, the total design flow can be calculated at 450 gallons per day.

15 gallons per day per employee X 30 Employees = 450 gallons per day

Below is the full sanitary system design calculation.

DESIGN FLOW = 450 GPD (BASED ON WATER USAGE DATA)
PERCOLATION RATE = 1.0-10.0 MIN/IN
APPLICATION RATE = 1.5 GAL/SF/DAY
REQUIRED EFFECTIVE LEACHING AREA = 450/1.5 = 300 SF
PROVIDED 1 - 60 LF ROWS OF GST 6212
EFFECTIVE LEACHING AREA PROVIDED =
1 X 60 LF X 12.0 LF/SF = 720 SF
MINIMUM LEACHING SYSTEM SPREAD (MLSS)
DEPTH TO RESTRICTIVE LAYER = 38 INCHES
(BASED ON GROUND WATER MONITORING TP-10)
SLOPE= 1.0 %
HF= 36
FF= 450/300 = 1.5
PF= 1
MLSS REQUIRED = 36 X 1.5 X 1 = 54 LF
MLSS PROVIDED = 1 ROW X 60 = 60 LF

Appendix A
Design Computations

Water Quality Volume

WQV, Water Quality Volume (AC-FT)
RCV, Runoff Capture Volume (AC-FT)
R, Volumetric Runoff Coefficient
I, Precent Impervious Cover
A, Site Area (AC)

I= 78.8
R= 0.05+0.009(79) = 0.759
A= 1.84

$$WQV = \frac{1" \text{ X } R \text{ X } A}{12} = \frac{1 \quad 0.76 \quad 1.84}{12} = 0.1164 \text{ AC-FT}$$

$$= 5070.8 \text{ CF}$$

WQV=4776.9 CF

Groundwater Recharge

GVR=Groundwater Rechage Volume (ac-ft)
D=Depth of Runoff to be Recharged (inches) (Table 7-4)
A=Site Area (acres)
I=Post Development Imapervious (decimal)
net inches increase in site impervious for redevelopment

$$GRV = \frac{(D)\ (A)\ (I)}{12}$$

Table 7-4 Groundwater Recharge Depth		
NCRS Hydrologic Soil Groups	Average Annual Recharge	Groundwater Recharge Depth (D)
A	18 inches/year	0.4 inches
B	12 inches/year	0.25 inches
C	6 inches/year	0.1 inches
D	3 inches/year	0 inces (waived)

Exisitng Inpoervious	0.67
Propsoed Impervious	1.45
Change In Impervious	0.78

$$GRV = \frac{0.25\ \ 1.84\ \ 0.78}{12}$$

GRV=	**0.0299**	**ac-ft**
	1302.4	**cf**

Appendix B
Hydrologic Model Input Data and Results

Watershed Area's

Existing Water Shed WS 10		
	SF	AC
Woods	9004	0.21
Grass	1578	0.04
Gravel	19319	0.44
Impervious	9899	0.23
Total	39800	0.91

Existing Water Shed WS 11		
	SF	AC
Woods	30534	0.7
Grass	5285	0.12
Impervious	4481	0.1
Total	40300	0.93

Proposed Water Shed WS 20		
	SF	AC
Woods	3450	0.08
Grass	1830	0.04
Total	5280	0.12

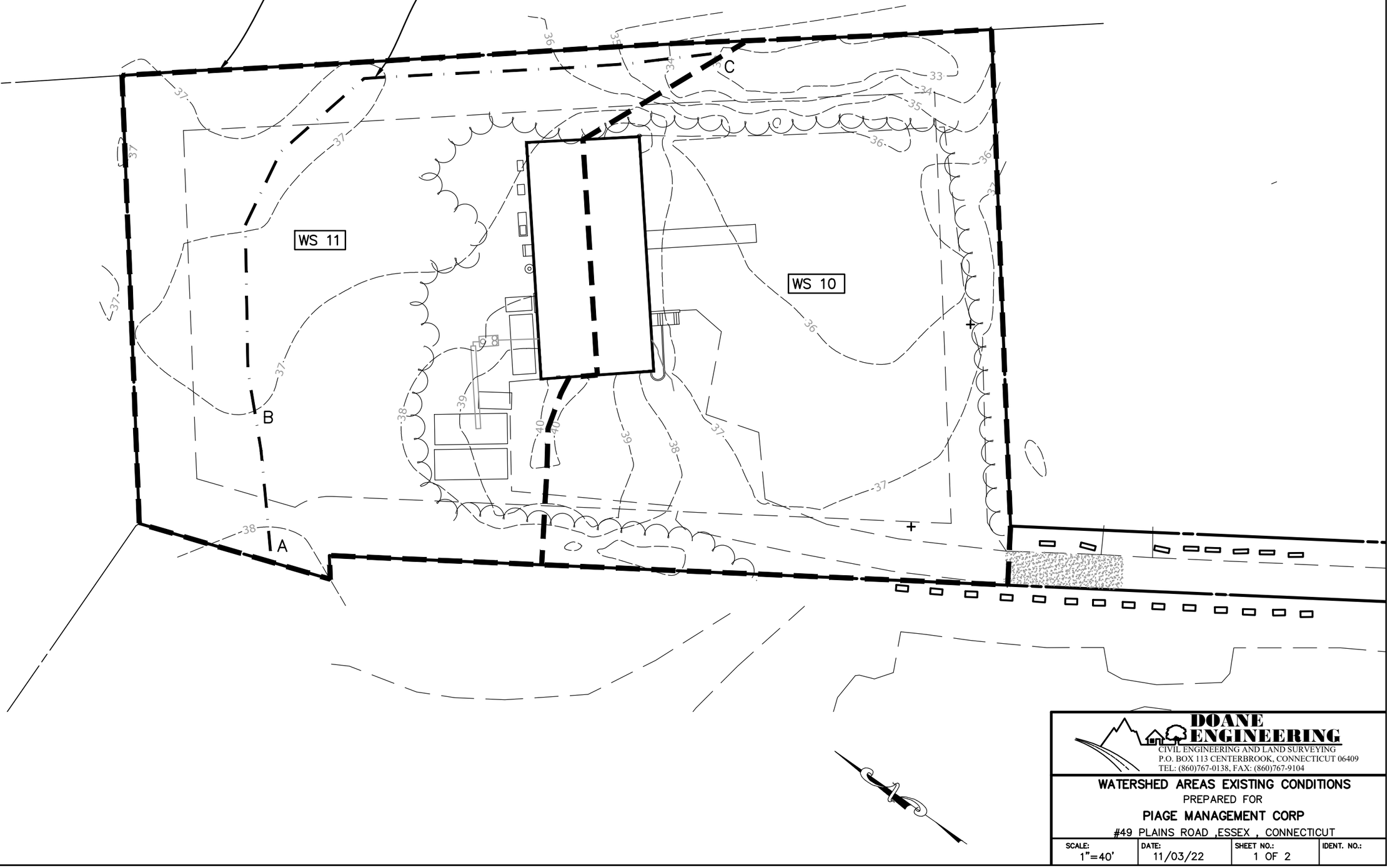
Proposed Water Shed WS 21		
		AC
Grass	5902	0.14
Impervious (Bituminous)	28970	0.67
Impervious (Building)	2353	0.05
Total	37225	0.85

Proposed Water Shed WS 22		
	SF	AC
Grass	5867	0.13
Impervious (Bituminous)	19250	0.44
Impervious (Building)	12478	0.29
Total	37595	0.86

DATE	REVISION	CK.

EXISTING WATERSHED BOUNDARY

EXISTING TIME OF CONCENTRATION FLOW PATH



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WATERSHED AREAS EXISTING CONDITIONS

PREPARED FOR

PIAGE MANAGEMENT CORP

#49 PLAINS ROAD ,ESSEX , CONNECTICUT

SCALE:	DATE:	SHEET NO.:	IDENT. NO.:
1"=40'	11/03/22	1 OF 2	

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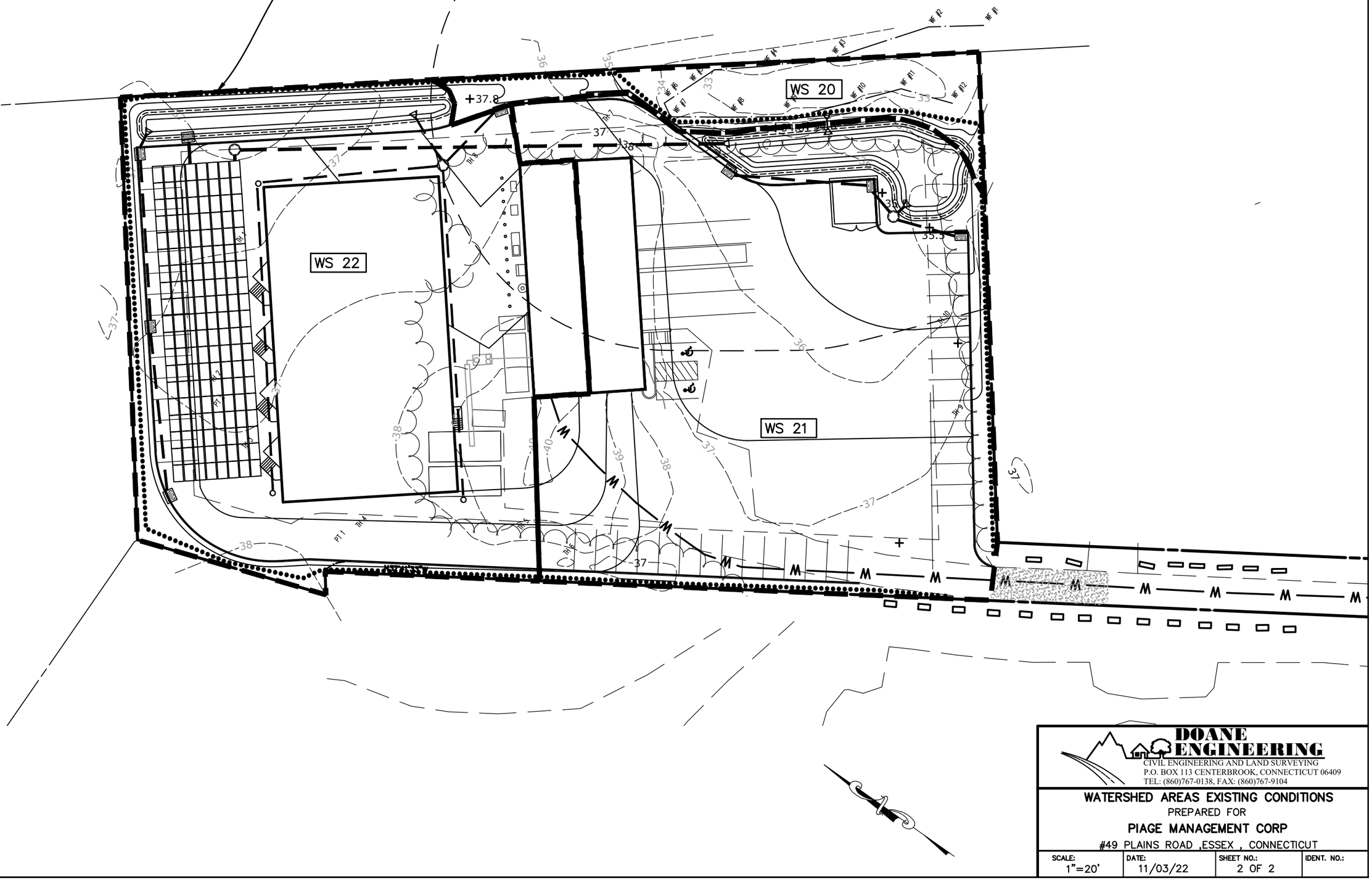
DATE	REVISION	CK.

PROPOSED WATERSHED BOUNDARY

WS 20

WS 22

WS 21



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WATERSHED AREAS EXISTING CONDITIONS

PREPARED FOR

PIAGE MANAGEMENT CORP

#49 PLAINS ROAD ,ESSEX , CONNECTICUT

SCALE:	DATE:	SHEET NO.:	IDENT. NO.:
1"=20'	11/03/22	2 OF 2	

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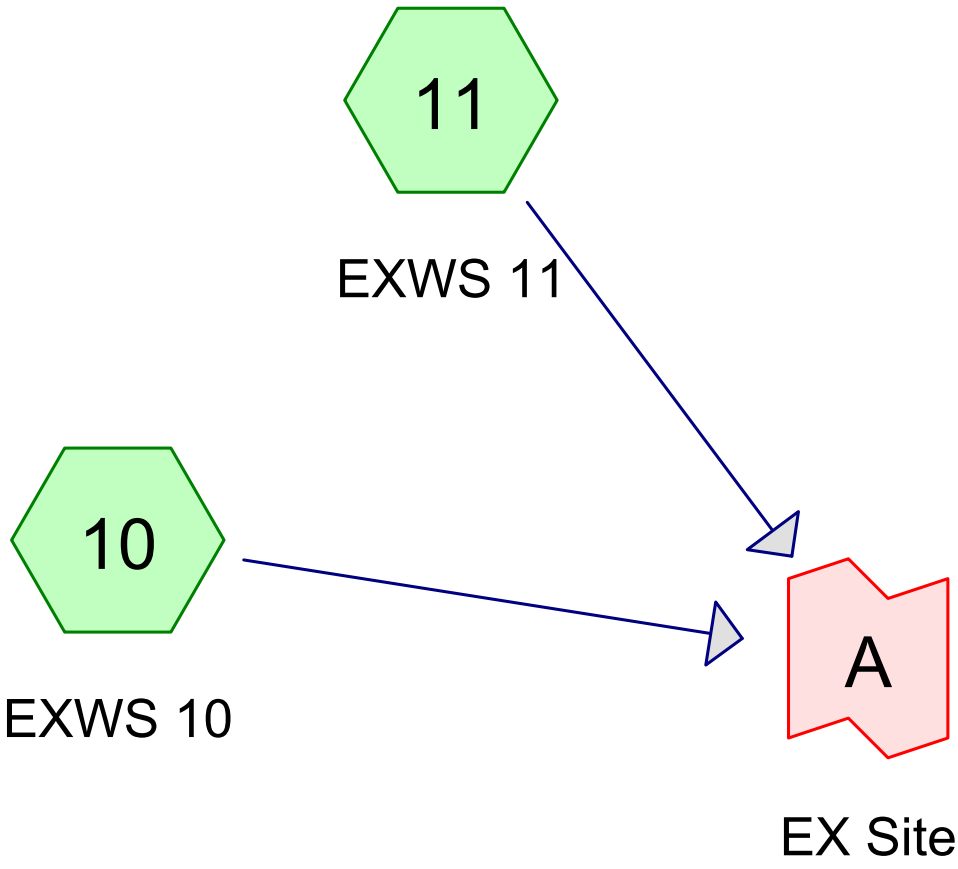


Subcat Reach Pond Link

Routing Diagram for 49 Plains Road Existing
Prepared by Doane Enginnering, Printed 11/3/2022

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	CT-49 Plains Road Essex 24-hr S1	1-yr	Default	24.00	1	2.85	2
2	2-yr	CT-49 Plains Road Essex 24-hr S1	2-yr	Default	24.00	1	3.44	2
3	5-yr	CT-49 Plains Road Essex 24-hr S1	5-yr	Default	24.00	1	4.40	2
4	10-yr	CT-49 Plains Road Essex 24-hr S1	10-yr	Default	24.00	1	5.20	2
5	25-yr	CT-49 Plains Road Essex 24-hr S1	25-yr	Default	24.00	1	6.31	2
6	50-yr	CT-49 Plains Road Essex 24-hr S1	50-yr	Default	24.00	1	7.13	2
7	100-yr	CT-49 Plains Road Essex 24-hr S1	100-yr	Default	24.00	1	8.01	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.158	61	>75% Grass cover, Good, HSG B (10, 11)
0.444	96	Gravel surface, HSG B (10)
0.330	98	Impervious (10, 11)
0.908	55	Woods, Good, HSG B (10, 11)
1.839	**73**	**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.158	0.000	0.000	0.000	0.158	>75% Grass cover, Good	10, 11
0.000	0.444	0.000	0.000	0.000	0.444	Gravel surface	10
0.000	0.000	0.000	0.000	0.330	0.330	Impervious	10, 11
0.000	0.908	0.000	0.000	0.000	0.908	Woods, Good	10, 11
0.000	**1.509**	**0.000**	**0.000**	**0.330**	**1.839**	**TOTAL AREA**	

Time span=0.00-24.10 hrs, dt=0.05 hrs, 483 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10: EXWS 10 Runoff Area=39,800 sf 24.87% Impervious Runoff Depth>1.53"
Tc=6.0 min CN=86 Runoff=1.77 cfs 0.117 af

Subcatchment 11: EXWS 11 Runoff Area=40,300 sf 11.12% Impervious Runoff Depth>0.31"
Flow Length=366' Slope=0.0100 '/' Tc=26.2 min CN=61 Runoff=0.09 cfs 0.024 af

Link A: EX Site Inflow=1.78 cfs 0.140 af
Primary=1.78 cfs 0.140 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.140 af Average Runoff Depth = 0.92"
82.05% Pervious = 1.509 ac 17.95% Impervious = 0.330 ac

Summary for Subcatchment 10: EXWS 10

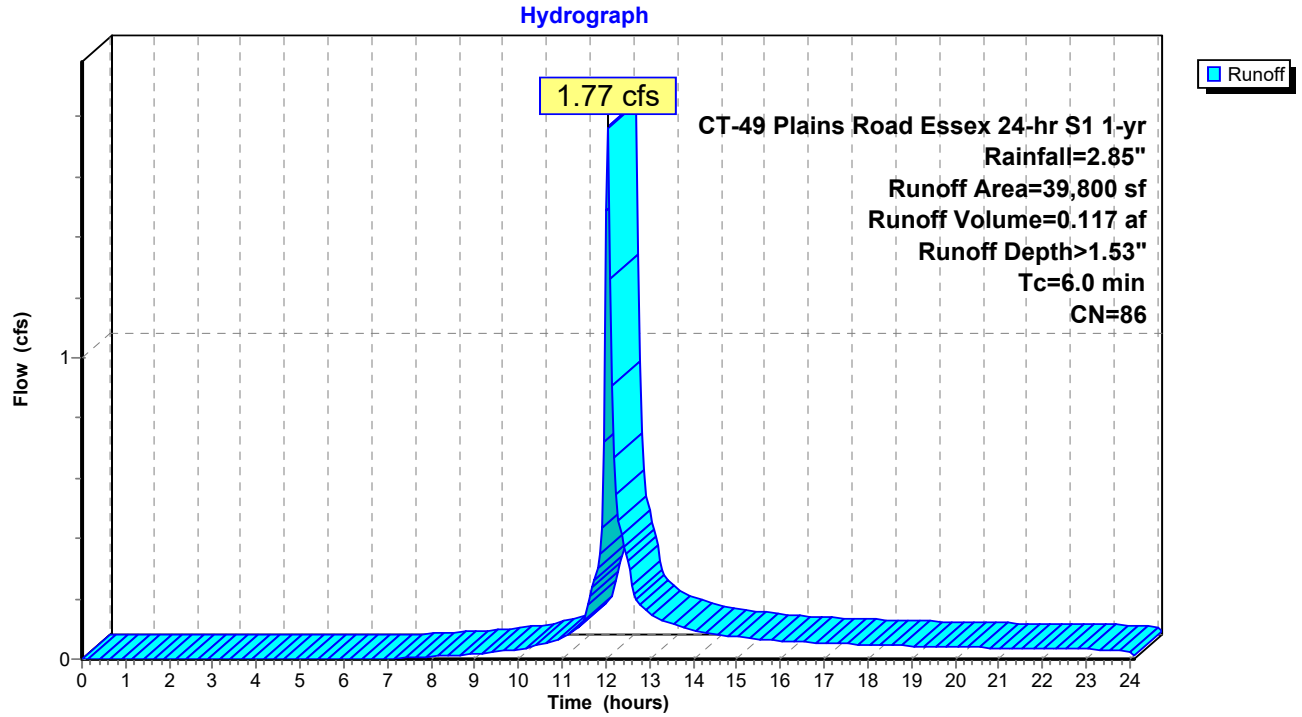
Runoff = 1.77 cfs @ 12.04 hrs, Volume= 0.117 af, Depth> 1.53"
Routed to Link A : EX Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

	Area (sf)	CN	Description
	9,004	55	Woods, Good, HSG B
	1,578	61	>75% Grass cover, Good, HSG B
	19,319	96	Gravel surface, HSG B
*	9,899	98	Impervious
	39,800	86	Weighted Average
	29,901		75.13% Pervious Area
	9,899		24.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TR-55 TC 6.0 MIN**

Subcatchment 10: EXWS 10



Summary for Subcatchment 11: EXWS 11

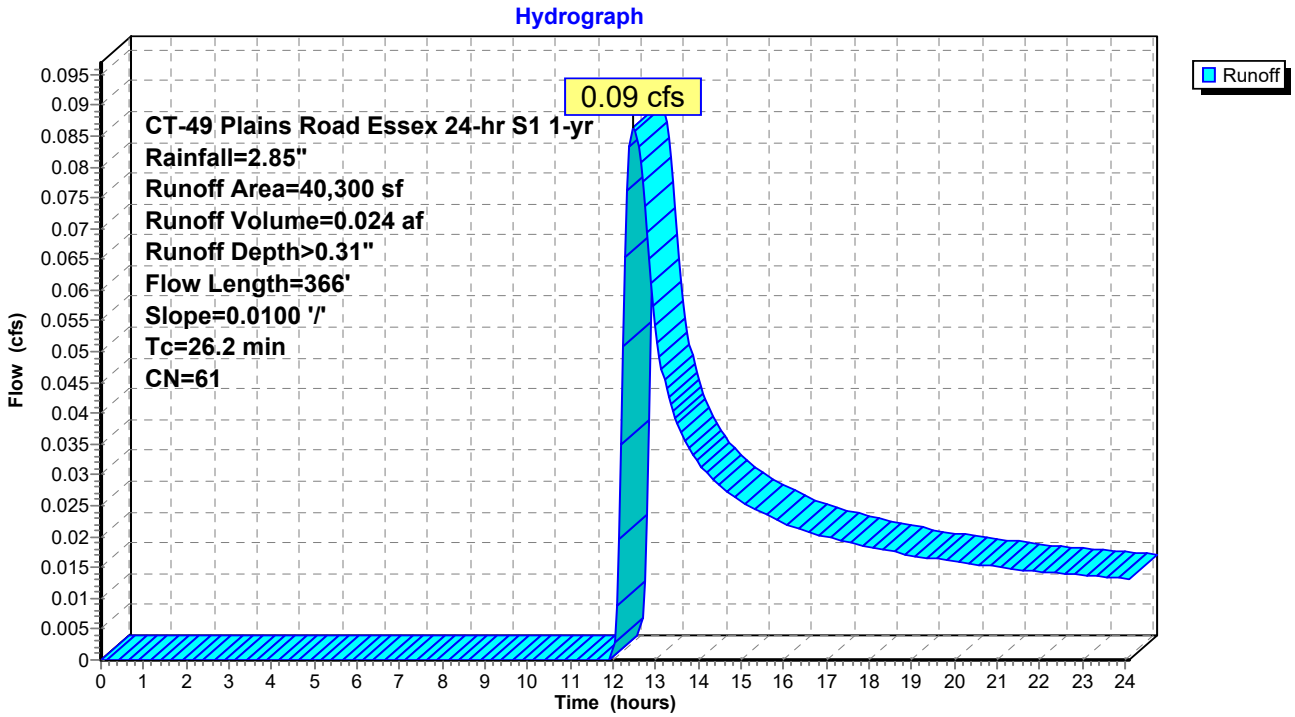
Runoff = 0.09 cfs @ 12.48 hrs, Volume= 0.024 af, Depth> 0.31"
Routed to Link A : EX Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

	Area (sf)	CN	Description
	30,534	55	Woods, Good, HSG B
	5,285	61	>75% Grass cover, Good, HSG B
*	4,481	98	Impervious
	40,300	61	Weighted Average
	35,819		88.88% Pervious Area
	4,481		11.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	50	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.44"
10.5	316	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.2	366	Total			

Subcatchment 11: EXWS 11

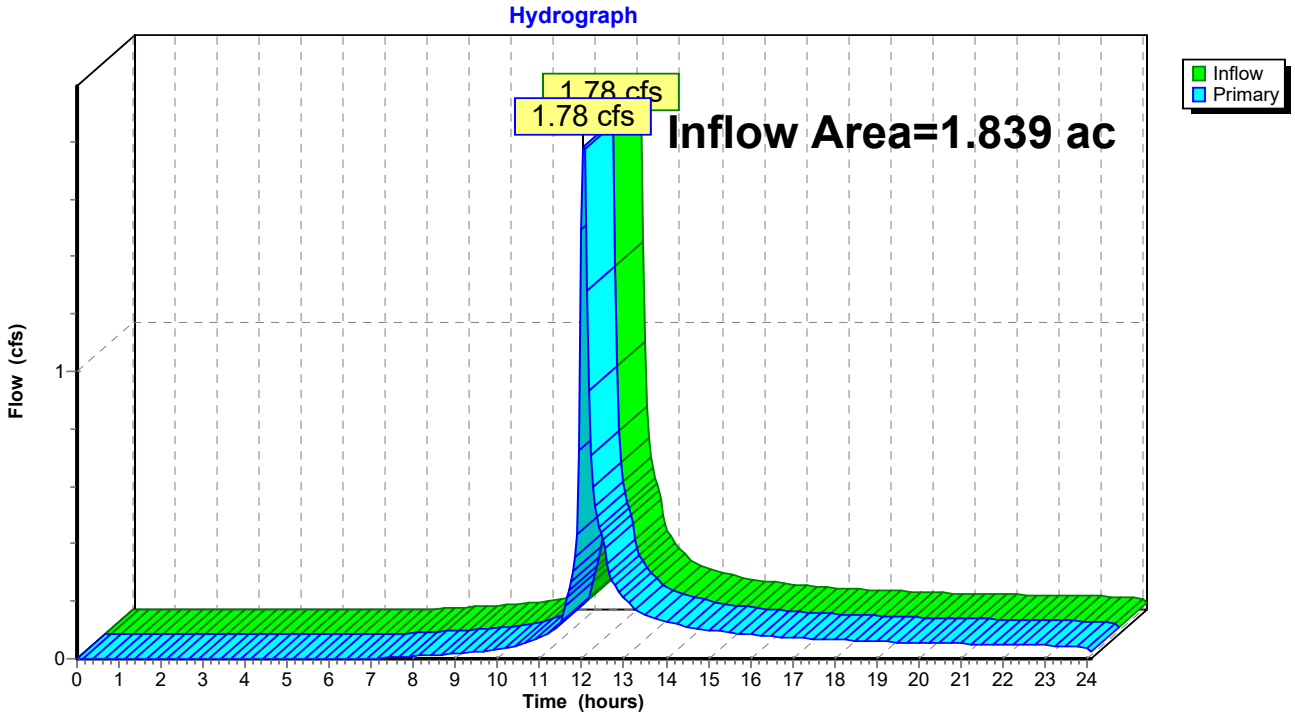


Summary for Link A: EX Site

Inflow Area = 1.839 ac, 17.95% Impervious, Inflow Depth > 0.92" for 1-yr event
Inflow = 1.78 cfs @ 12.04 hrs, Volume= 0.140 af
Primary = 1.78 cfs @ 12.04 hrs, Volume= 0.140 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs

Link A: EX Site



Time span=0.00-24.10 hrs, dt=0.05 hrs, 483 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10: EXWS 10 Runoff Area=39,800 sf 24.87% Impervious Runoff Depth>2.05"
Tc=6.0 min CN=86 Runoff=2.35 cfs 0.156 af

Subcatchment 11: EXWS 11 Runoff Area=40,300 sf 11.12% Impervious Runoff Depth>0.54"
Flow Length=366' Slope=0.0100 '/' Tc=26.2 min CN=61 Runoff=0.22 cfs 0.042 af

Link A: EX Site Inflow=2.37 cfs 0.197 af
Primary=2.37 cfs 0.197 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.197 af Average Runoff Depth = 1.29"
82.05% Pervious = 1.509 ac 17.95% Impervious = 0.330 ac

Summary for Subcatchment 10: EXWS 10

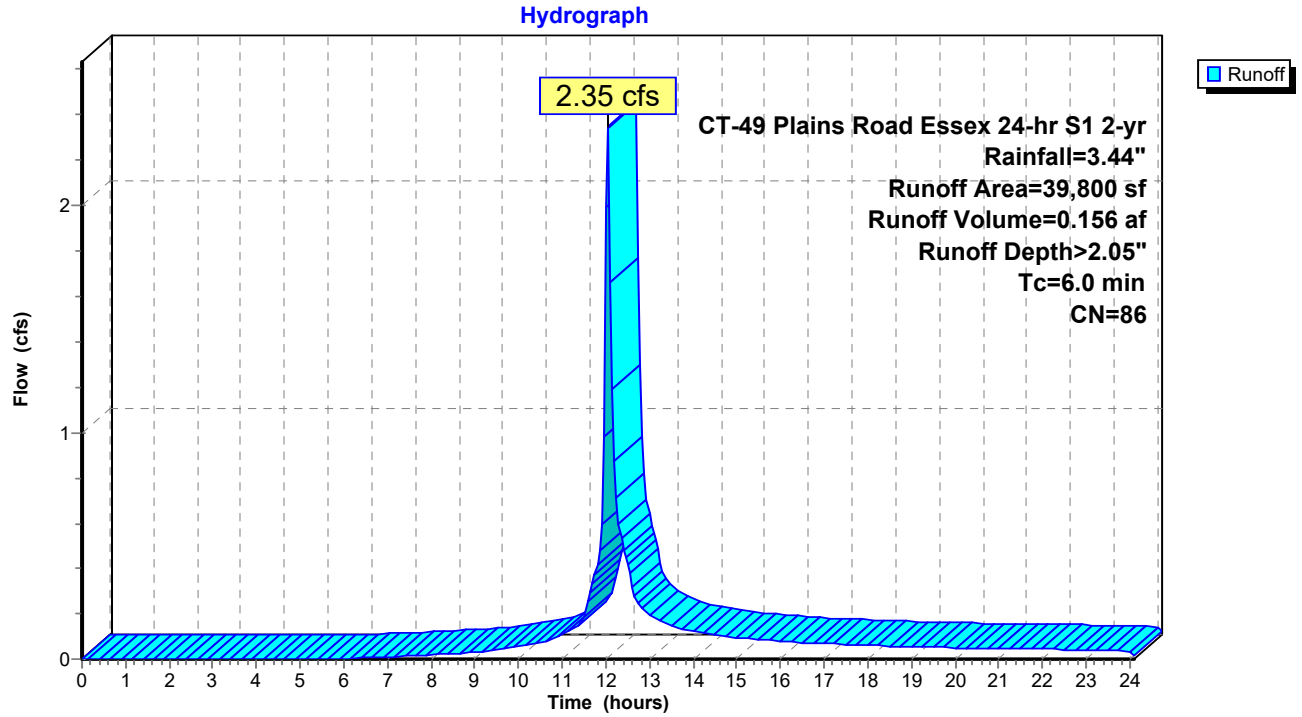
Runoff = 2.35 cfs @ 12.04 hrs, Volume= 0.156 af, Depth> 2.05"
Routed to Link A : EX Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

	Area (sf)	CN	Description
	9,004	55	Woods, Good, HSG B
	1,578	61	>75% Grass cover, Good, HSG B
	19,319	96	Gravel surface, HSG B
*	9,899	98	Impervious
	39,800	86	Weighted Average
	29,901		75.13% Pervious Area
	9,899		24.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TR-55 TC 6.0 MIN**

Subcatchment 10: EXWS 10



Summary for Subcatchment 11: EXWS 11

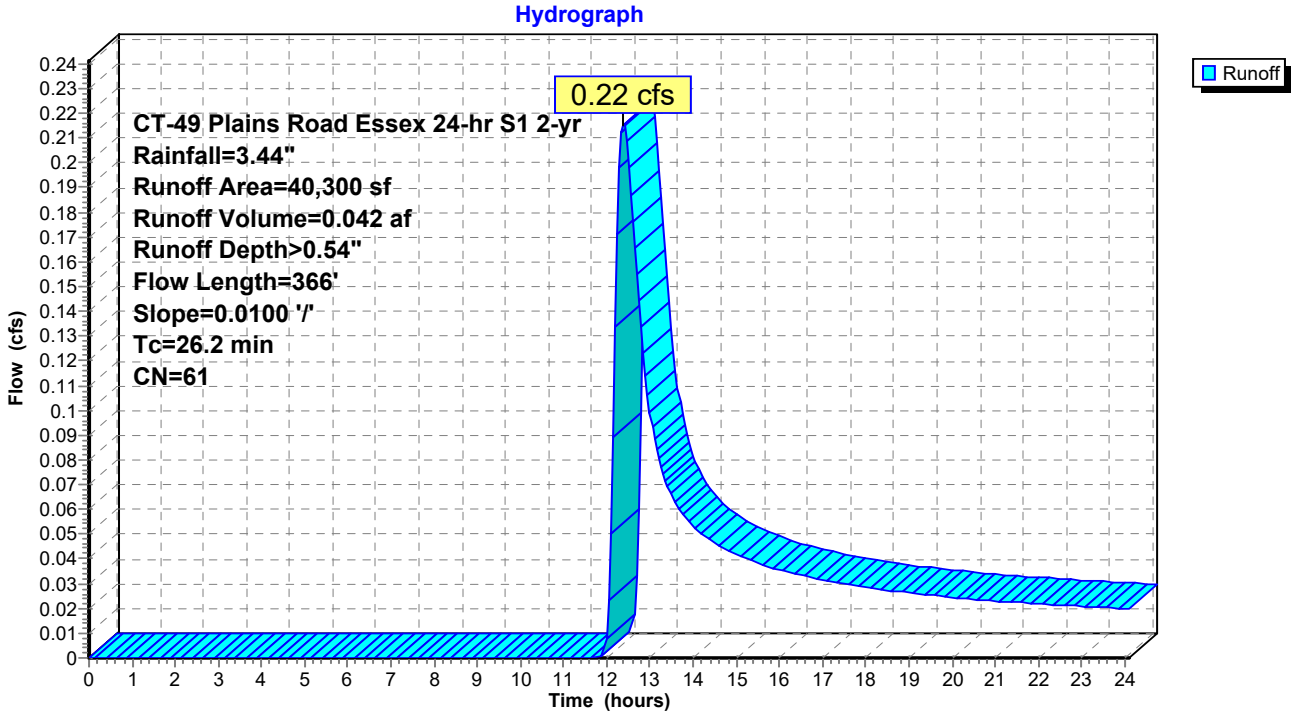
Runoff = 0.22 cfs @ 12.39 hrs, Volume= 0.042 af, Depth> 0.54"
Routed to Link A : EX Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

	Area (sf)	CN	Description
	30,534	55	Woods, Good, HSG B
	5,285	61	>75% Grass cover, Good, HSG B
*	4,481	98	Impervious
	40,300	61	Weighted Average
	35,819		88.88% Pervious Area
	4,481		11.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	50	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.44"
10.5	316	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.2	366	Total			

Subcatchment 11: EXWS 11

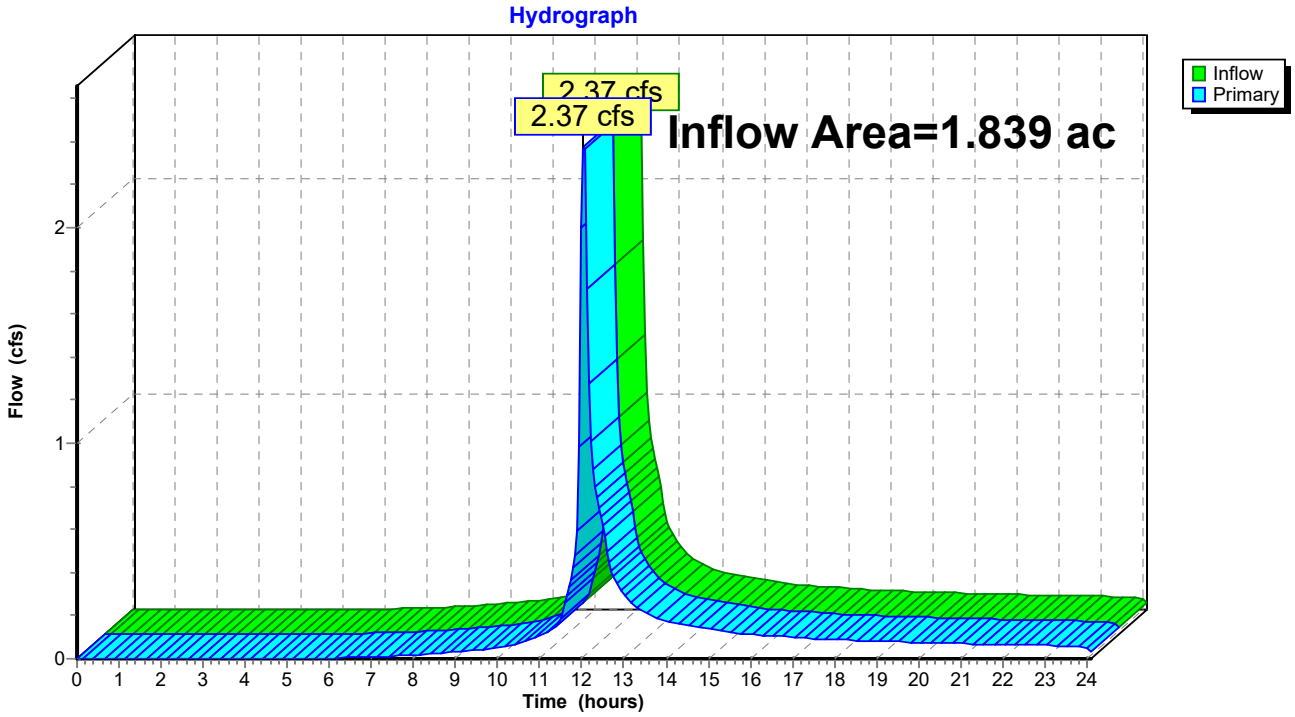


Summary for Link A: EX Site

Inflow Area = 1.839 ac, 17.95% Impervious, Inflow Depth > 1.29" for 2-yr event
Inflow = 2.37 cfs @ 12.04 hrs, Volume= 0.197 af
Primary = 2.37 cfs @ 12.04 hrs, Volume= 0.197 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs

Link A: EX Site



Time span=0.00-24.10 hrs, dt=0.05 hrs, 483 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10: EXWS 10 Runoff Area=39,800 sf 24.87% Impervious Runoff Depth>2.91"
Tc=6.0 min CN=86 Runoff=3.32 cfs 0.222 af

Subcatchment 11: EXWS 11 Runoff Area=40,300 sf 11.12% Impervious Runoff Depth>1.01"
Flow Length=366' Slope=0.0100 '/' Tc=26.2 min CN=61 Runoff=0.51 cfs 0.078 af

Link A: EX Site Inflow=3.43 cfs 0.300 af
Primary=3.43 cfs 0.300 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.300 af Average Runoff Depth = 1.96"
82.05% Pervious = 1.509 ac 17.95% Impervious = 0.330 ac

Summary for Subcatchment 10: EXWS 10

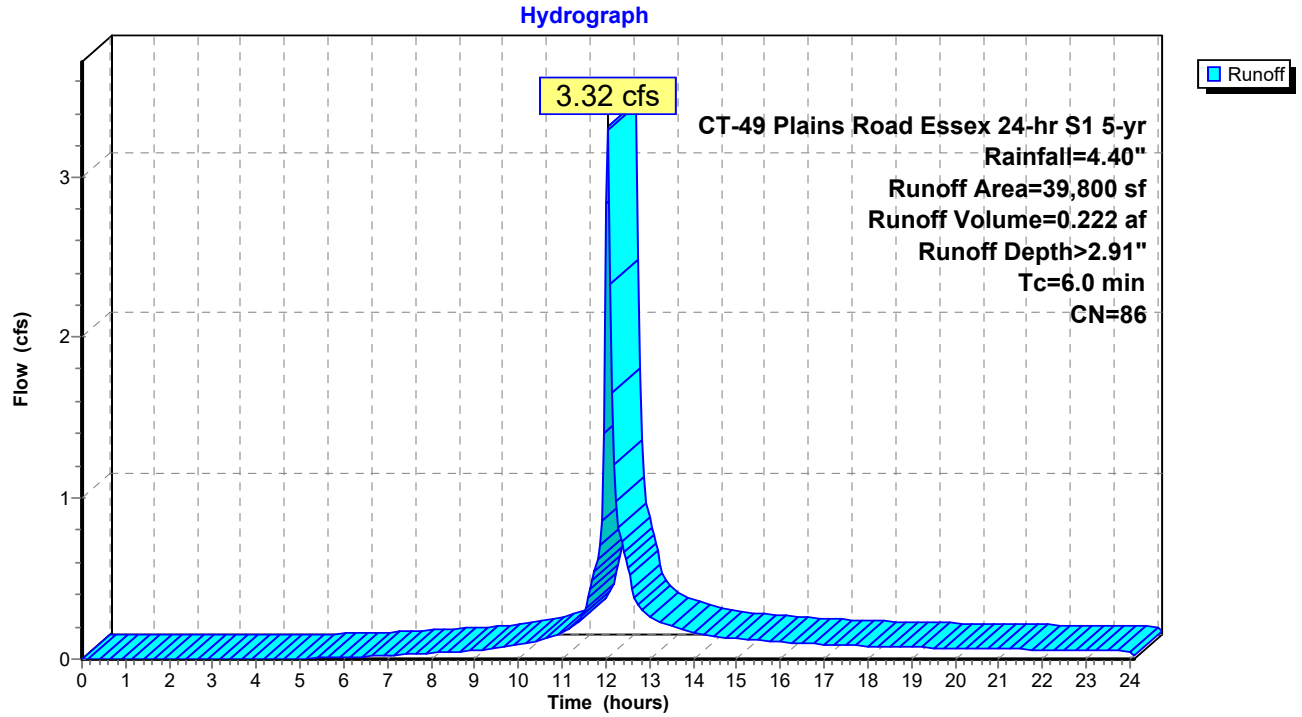
Runoff = 3.32 cfs @ 12.04 hrs, Volume= 0.222 af, Depth> 2.91"
Routed to Link A : EX Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"

	Area (sf)	CN	Description
	9,004	55	Woods, Good, HSG B
	1,578	61	>75% Grass cover, Good, HSG B
	19,319	96	Gravel surface, HSG B
*	9,899	98	Impervious
	39,800	86	Weighted Average
	29,901		75.13% Pervious Area
	9,899		24.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TR-55 TC 6.0 MIN**

Subcatchment 10: EXWS 10



Summary for Subcatchment 11: EXWS 11

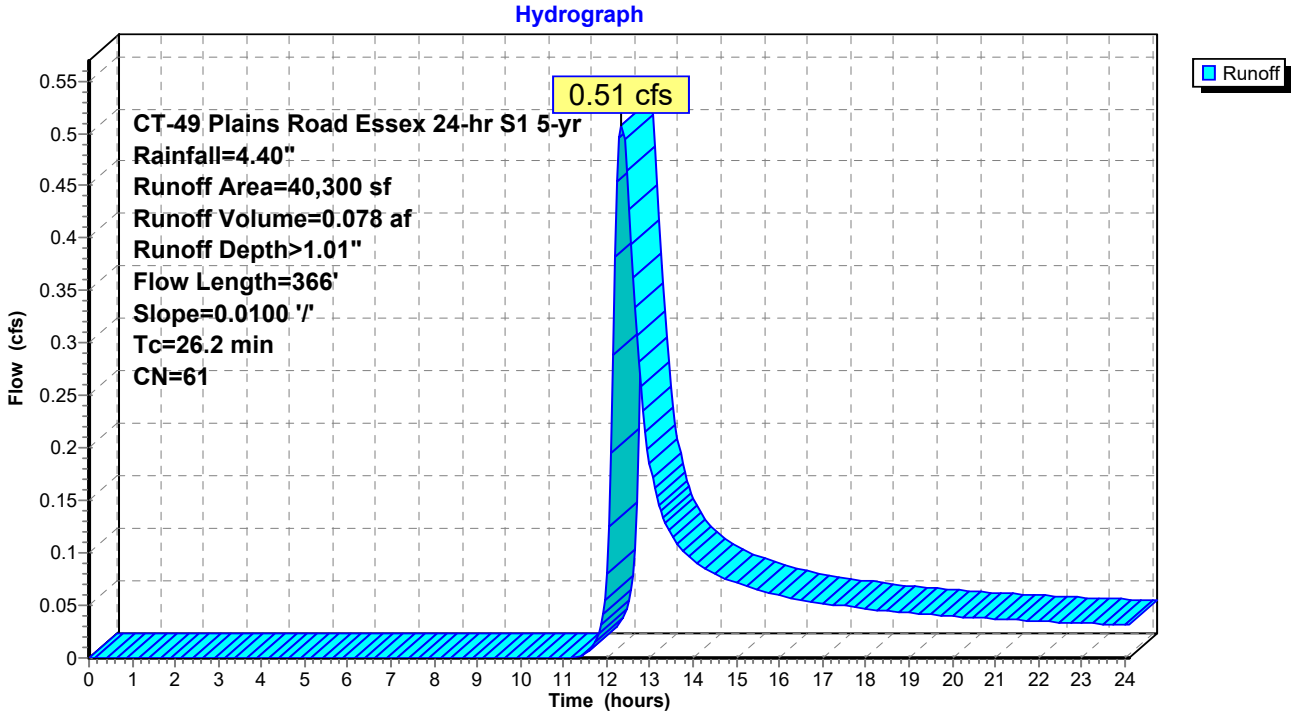
Runoff = 0.51 cfs @ 12.35 hrs, Volume= 0.078 af, Depth> 1.01"
Routed to Link A : EX Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"

	Area (sf)	CN	Description
	30,534	55	Woods, Good, HSG B
	5,285	61	>75% Grass cover, Good, HSG B
*	4,481	98	Impervious
	40,300	61	Weighted Average
	35,819		88.88% Pervious Area
	4,481		11.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	50	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.44"
10.5	316	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.2	366	Total			

Subcatchment 11: EXWS 11

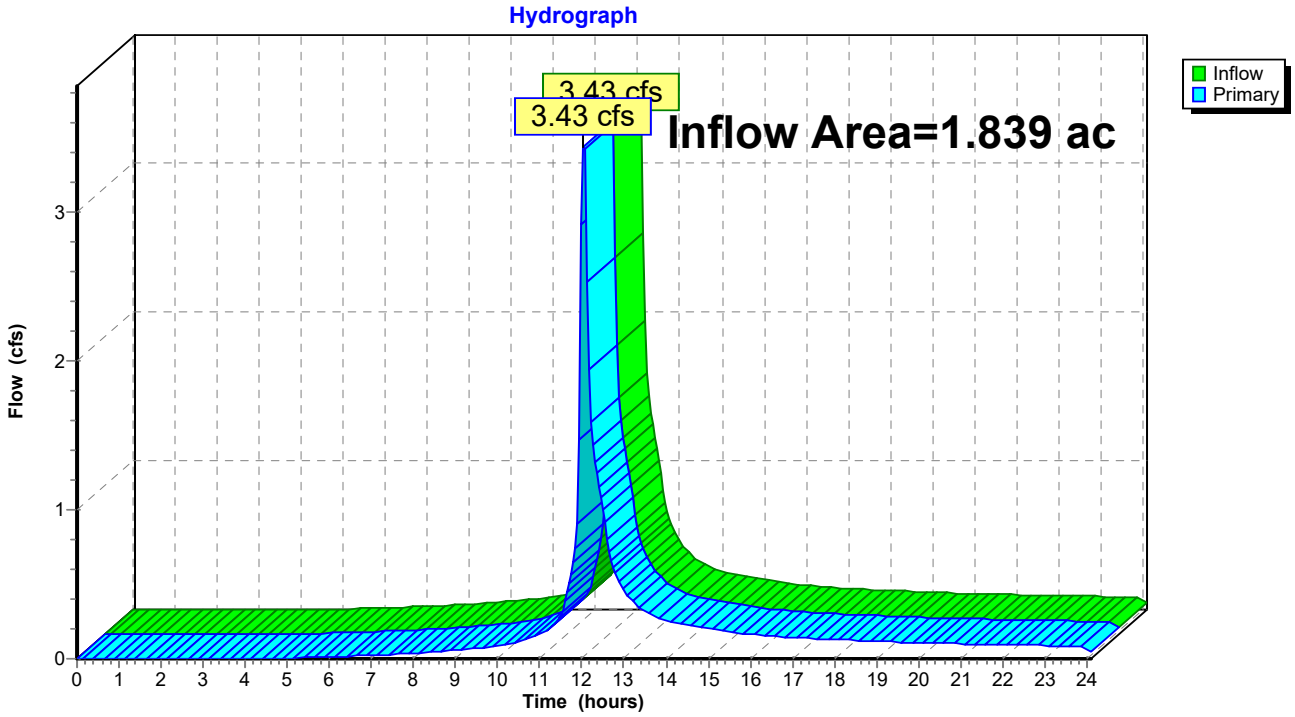


Summary for Link A: EX Site

Inflow Area = 1.839 ac, 17.95% Impervious, Inflow Depth > 1.96" for 5-yr event
Inflow = 3.43 cfs @ 12.04 hrs, Volume= 0.300 af
Primary = 3.43 cfs @ 12.04 hrs, Volume= 0.300 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs

Link A: EX Site



Time span=0.00-24.10 hrs, dt=0.05 hrs, 483 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10: EXWS 10 Runoff Area=39,800 sf 24.87% Impervious Runoff Depth>3.65"
Tc=6.0 min CN=86 Runoff=4.12 cfs 0.278 af

Subcatchment 11: EXWS 11 Runoff Area=40,300 sf 11.12% Impervious Runoff Depth>1.48"
Flow Length=366' Slope=0.0100 '/' Tc=26.2 min CN=61 Runoff=0.80 cfs 0.114 af

Link A: EX Site Inflow=4.35 cfs 0.392 af
Primary=4.35 cfs 0.392 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.392 af Average Runoff Depth = 2.56"
82.05% Pervious = 1.509 ac 17.95% Impervious = 0.330 ac

Summary for Subcatchment 10: EXWS 10

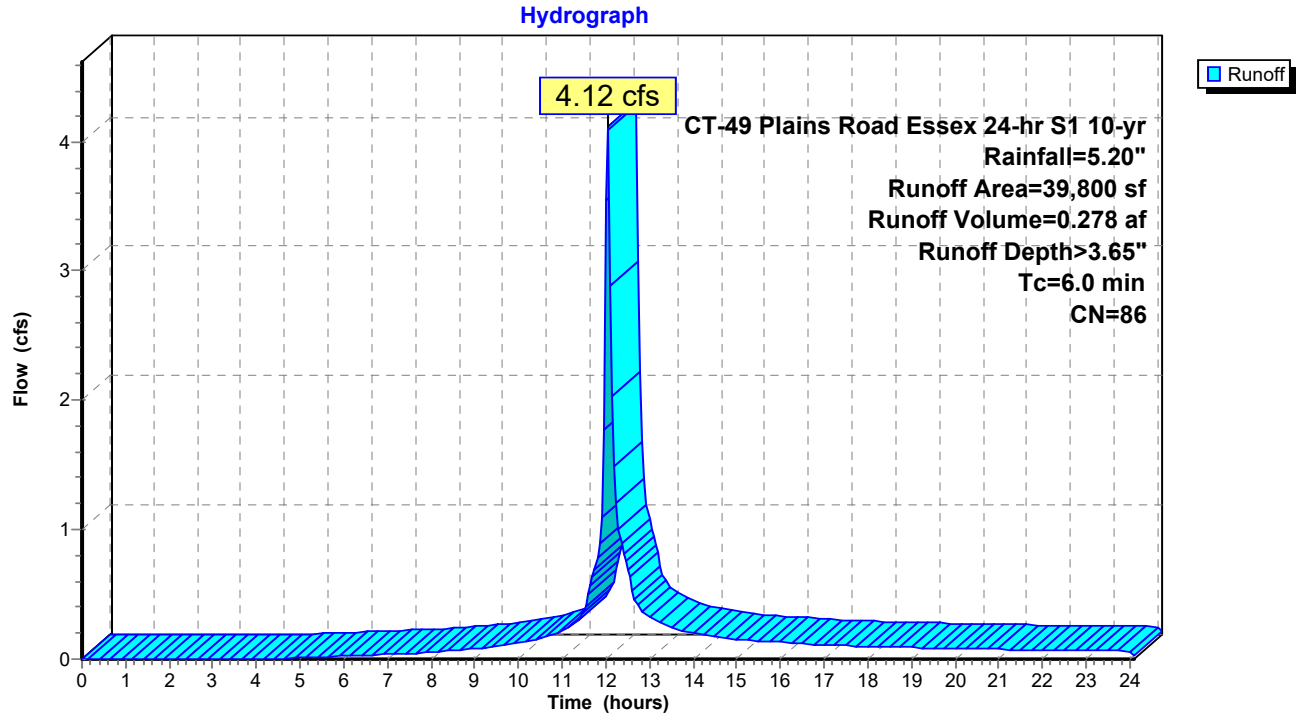
Runoff = 4.12 cfs @ 12.04 hrs, Volume= 0.278 af, Depth> 3.65"
Routed to Link A : EX Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"

	Area (sf)	CN	Description
	9,004	55	Woods, Good, HSG B
	1,578	61	>75% Grass cover, Good, HSG B
	19,319	96	Gravel surface, HSG B
*	9,899	98	Impervious
	39,800	86	Weighted Average
	29,901		75.13% Pervious Area
	9,899		24.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TR-55 TC 6.0 MIN**

Subcatchment 10: EXWS 10



Summary for Subcatchment 11: EXWS 11

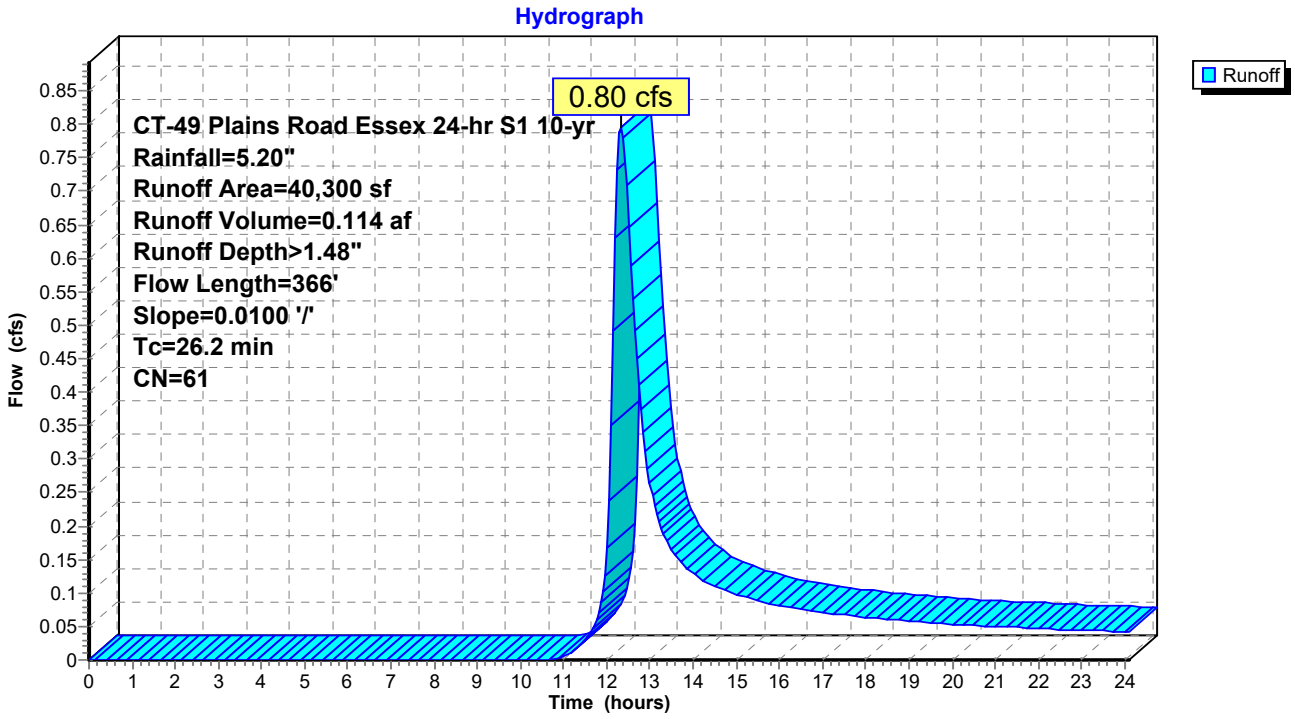
Runoff = 0.80 cfs @ 12.33 hrs, Volume= 0.114 af, Depth> 1.48"
Routed to Link A : EX Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"

	Area (sf)	CN	Description
	30,534	55	Woods, Good, HSG B
	5,285	61	>75% Grass cover, Good, HSG B
*	4,481	98	Impervious
	40,300	61	Weighted Average
	35,819		88.88% Pervious Area
	4,481		11.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	50	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.44"
10.5	316	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.2	366	Total			

Subcatchment 11: EXWS 11

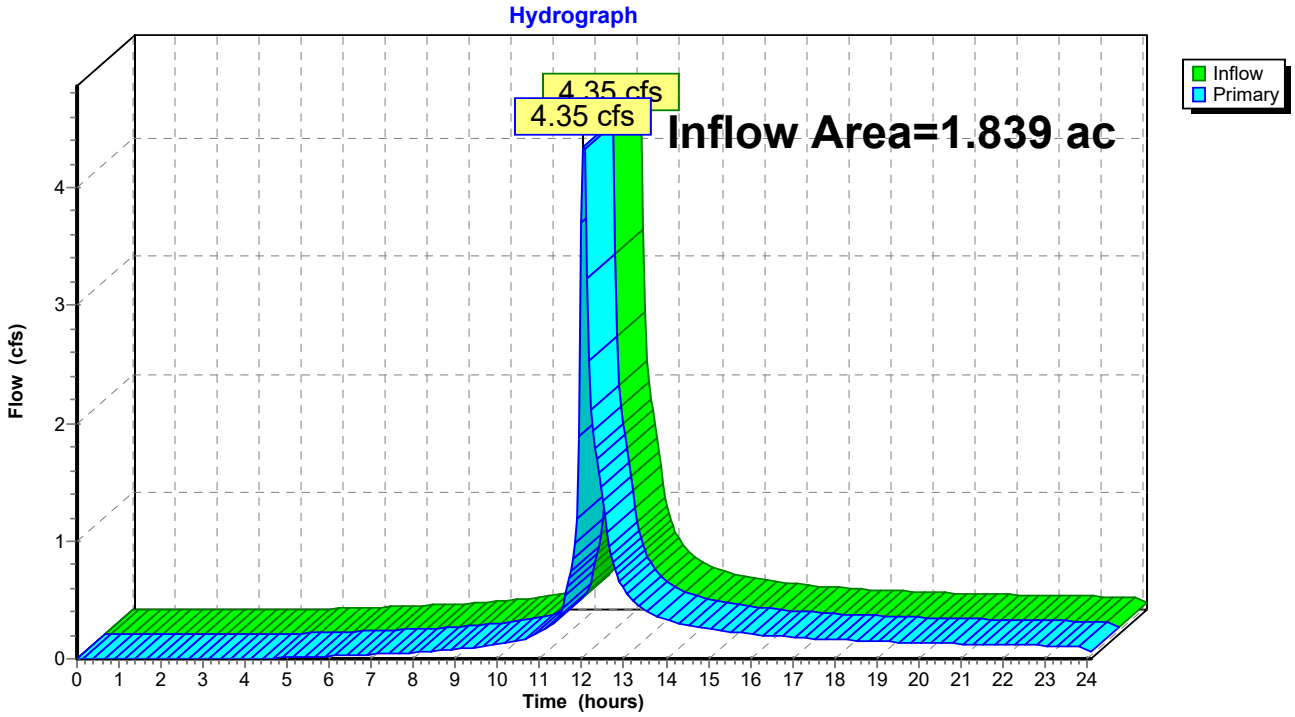


Summary for Link A: EX Site

Inflow Area = 1.839 ac, 17.95% Impervious, Inflow Depth > 2.56" for 10-yr event
Inflow = 4.35 cfs @ 12.04 hrs, Volume= 0.392 af
Primary = 4.35 cfs @ 12.04 hrs, Volume= 0.392 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs

Link A: EX Site



Time span=0.00-24.10 hrs, dt=0.05 hrs, 483 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10: EXWS 10 Runoff Area=39,800 sf 24.87% Impervious Runoff Depth>4.70"
Tc=6.0 min CN=86 Runoff=5.23 cfs 0.358 af

Subcatchment 11: EXWS 11 Runoff Area=40,300 sf 11.12% Impervious Runoff Depth>2.20"
Flow Length=366' Slope=0.0100 '/' Tc=26.2 min CN=61 Runoff=1.24 cfs 0.170 af

Link A: EX Site Inflow=5.63 cfs 0.528 af
Primary=5.63 cfs 0.528 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.528 af Average Runoff Depth = 3.44"
82.05% Pervious = 1.509 ac 17.95% Impervious = 0.330 ac

Summary for Subcatchment 10: EXWS 10

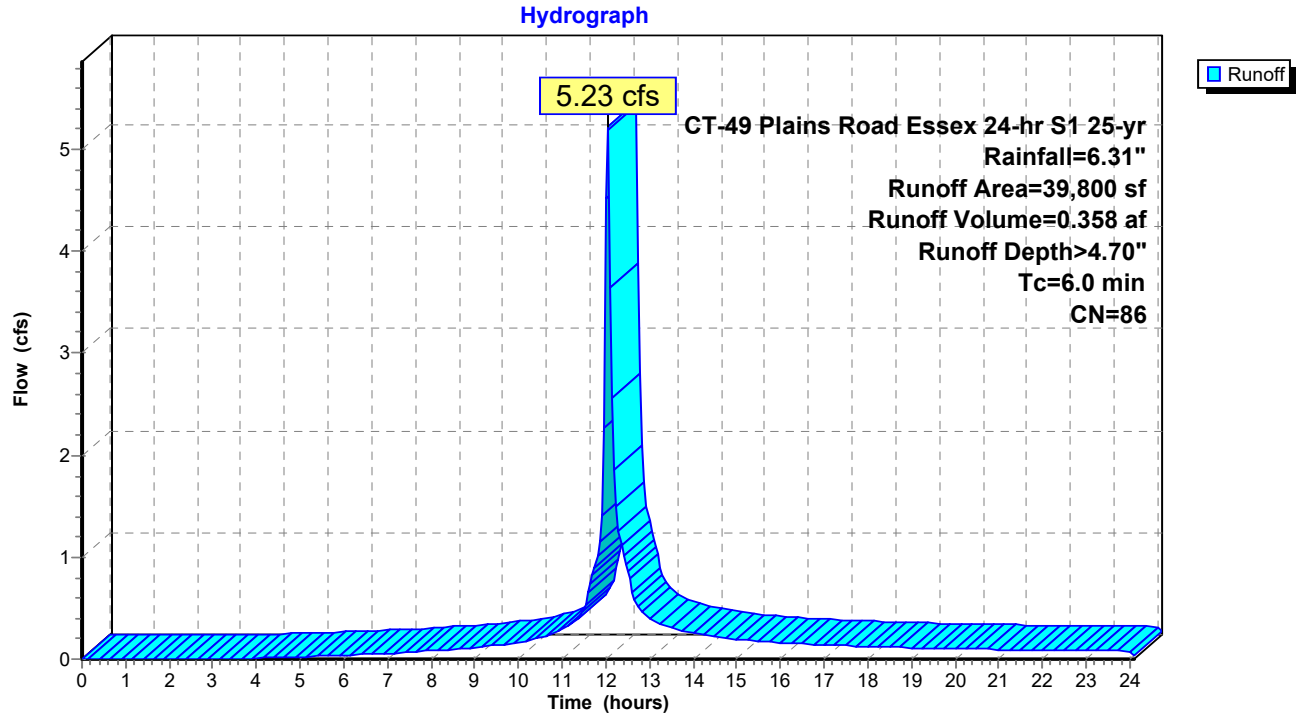
Runoff = 5.23 cfs @ 12.04 hrs, Volume= 0.358 af, Depth> 4.70"
Routed to Link A : EX Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"

	Area (sf)	CN	Description
	9,004	55	Woods, Good, HSG B
	1,578	61	>75% Grass cover, Good, HSG B
	19,319	96	Gravel surface, HSG B
*	9,899	98	Impervious
	39,800	86	Weighted Average
	29,901		75.13% Pervious Area
	9,899		24.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TR-55 TC 6.0 MIN**

Subcatchment 10: EXWS 10



Summary for Subcatchment 11: EXWS 11

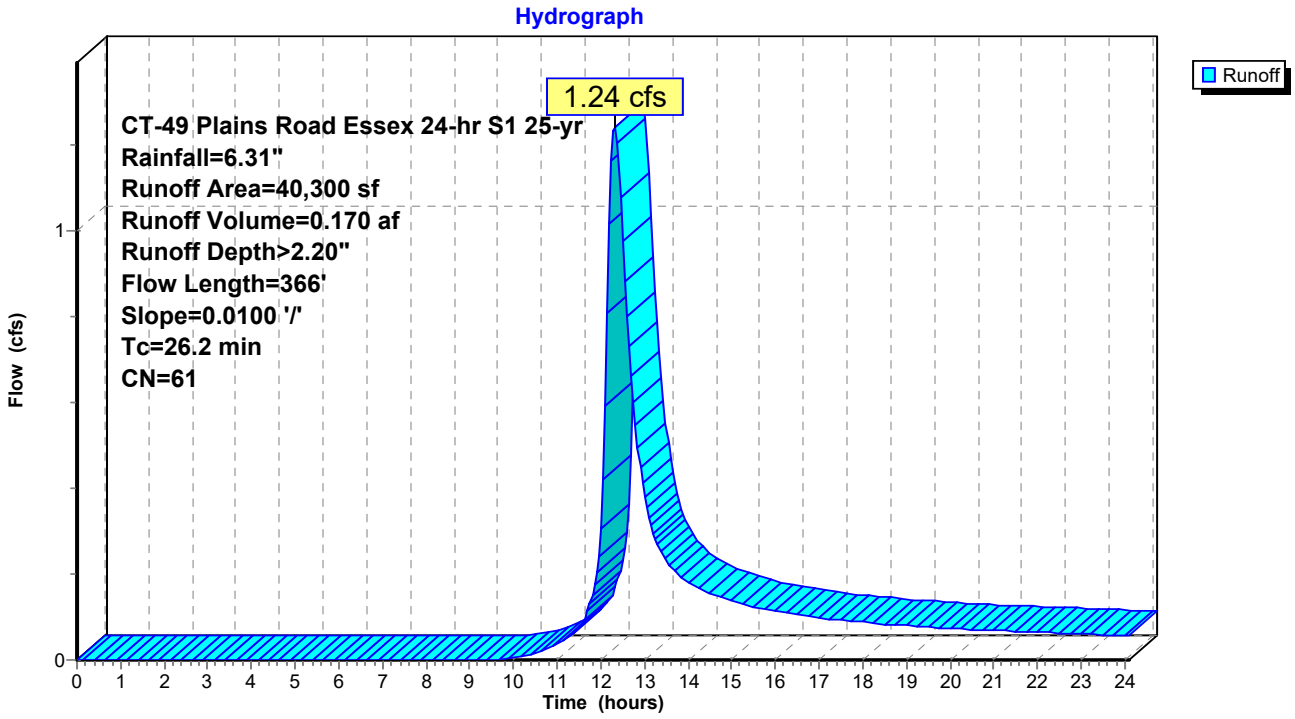
Runoff = 1.24 cfs @ 12.32 hrs, Volume= 0.170 af, Depth> 2.20"
Routed to Link A : EX Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"

	Area (sf)	CN	Description
	30,534	55	Woods, Good, HSG B
	5,285	61	>75% Grass cover, Good, HSG B
*	4,481	98	Impervious
	40,300	61	Weighted Average
	35,819		88.88% Pervious Area
	4,481		11.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	50	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.44"
10.5	316	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.2	366	Total			

Subcatchment 11: EXWS 11

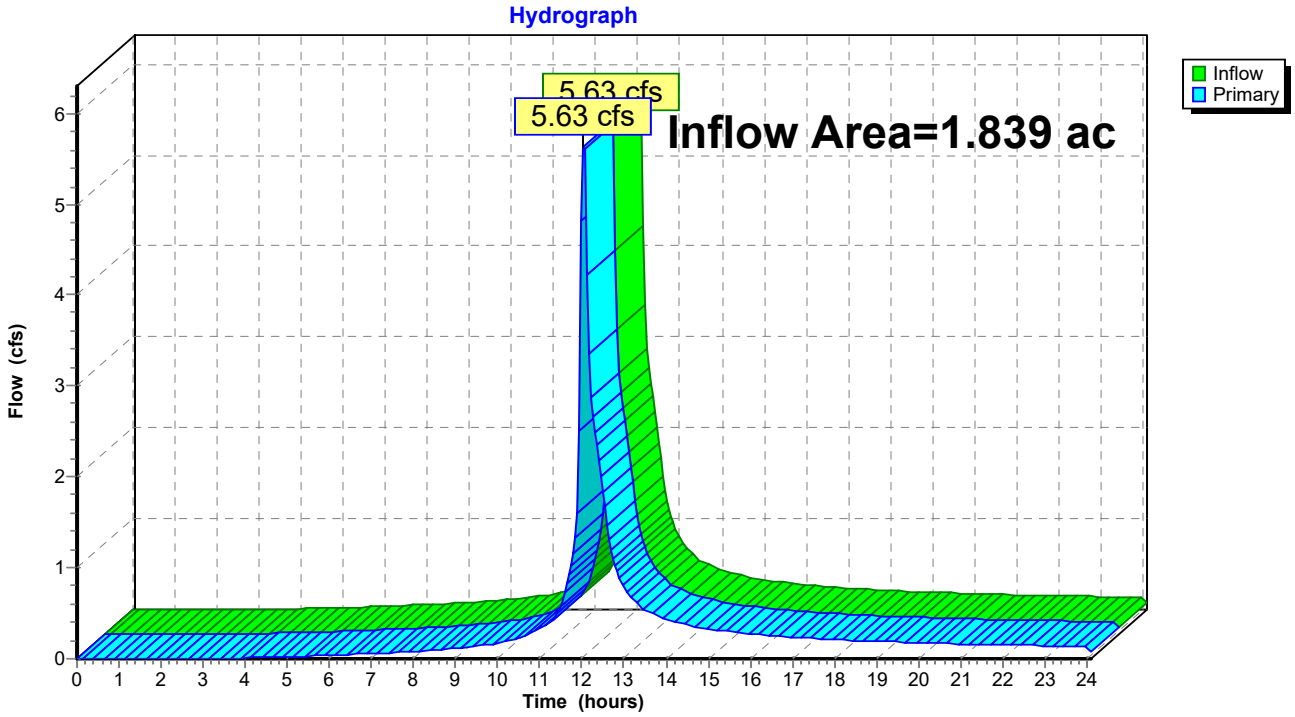


Summary for Link A: EX Site

Inflow Area = 1.839 ac, 17.95% Impervious, Inflow Depth > 3.44" for 25-yr event
Inflow = 5.63 cfs @ 12.04 hrs, Volume= 0.528 af
Primary = 5.63 cfs @ 12.04 hrs, Volume= 0.528 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs

Link A: EX Site



Time span=0.00-24.10 hrs, dt=0.05 hrs, 483 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10: EXWS 10 Runoff Area=39,800 sf 24.87% Impervious Runoff Depth>5.49"
Tc=6.0 min CN=86 Runoff=6.06 cfs 0.418 af

Subcatchment 11: EXWS 11 Runoff Area=40,300 sf 11.12% Impervious Runoff Depth>2.78"
Flow Length=366' Slope=0.0100 '/' Tc=26.2 min CN=61 Runoff=1.60 cfs 0.214 af

Link A: EX Site Inflow=6.60 cfs 0.632 af
Primary=6.60 cfs 0.632 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.632 af Average Runoff Depth = 4.12"
82.05% Pervious = 1.509 ac 17.95% Impervious = 0.330 ac

Summary for Subcatchment 10: EXWS 10

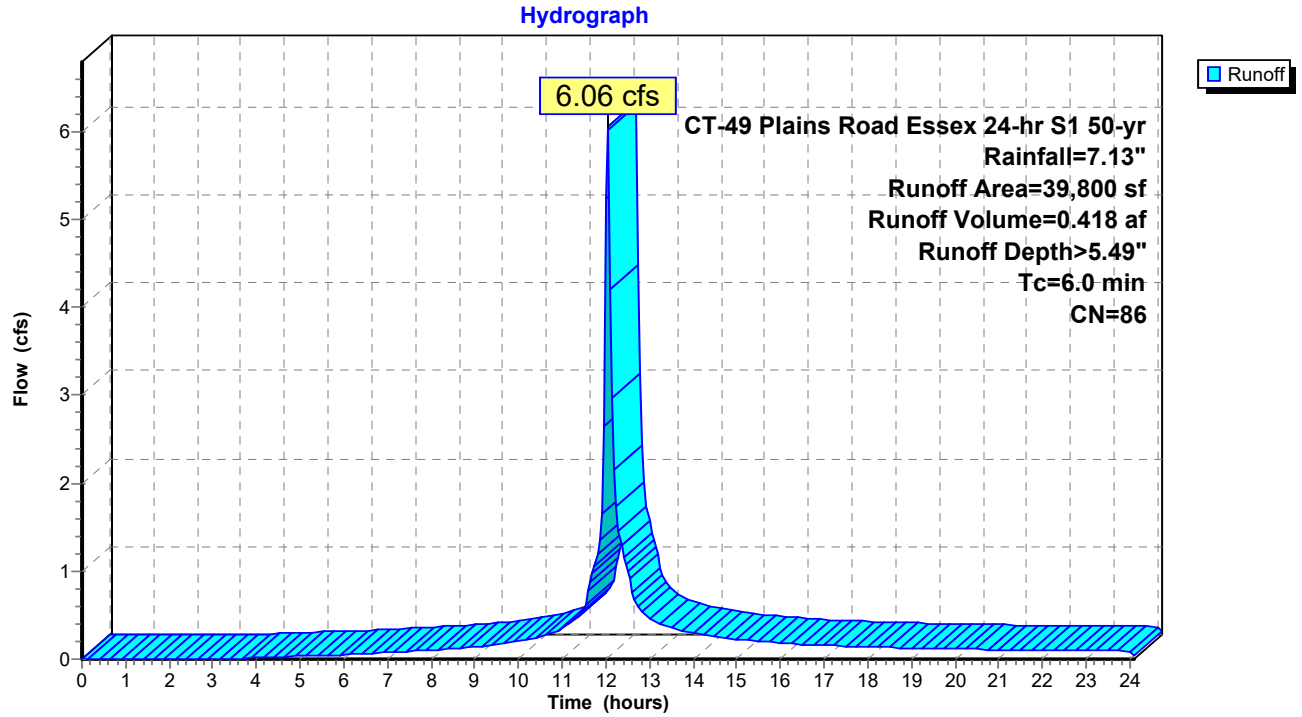
Runoff = 6.06 cfs @ 12.04 hrs, Volume= 0.418 af, Depth> 5.49"
Routed to Link A : EX Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"

	Area (sf)	CN	Description
	9,004	55	Woods, Good, HSG B
	1,578	61	>75% Grass cover, Good, HSG B
	19,319	96	Gravel surface, HSG B
*	9,899	98	Impervious
	39,800	86	Weighted Average
	29,901		75.13% Pervious Area
	9,899		24.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TR-55 TC 6.0 MIN**

Subcatchment 10: EXWS 10



Summary for Subcatchment 11: EXWS 11

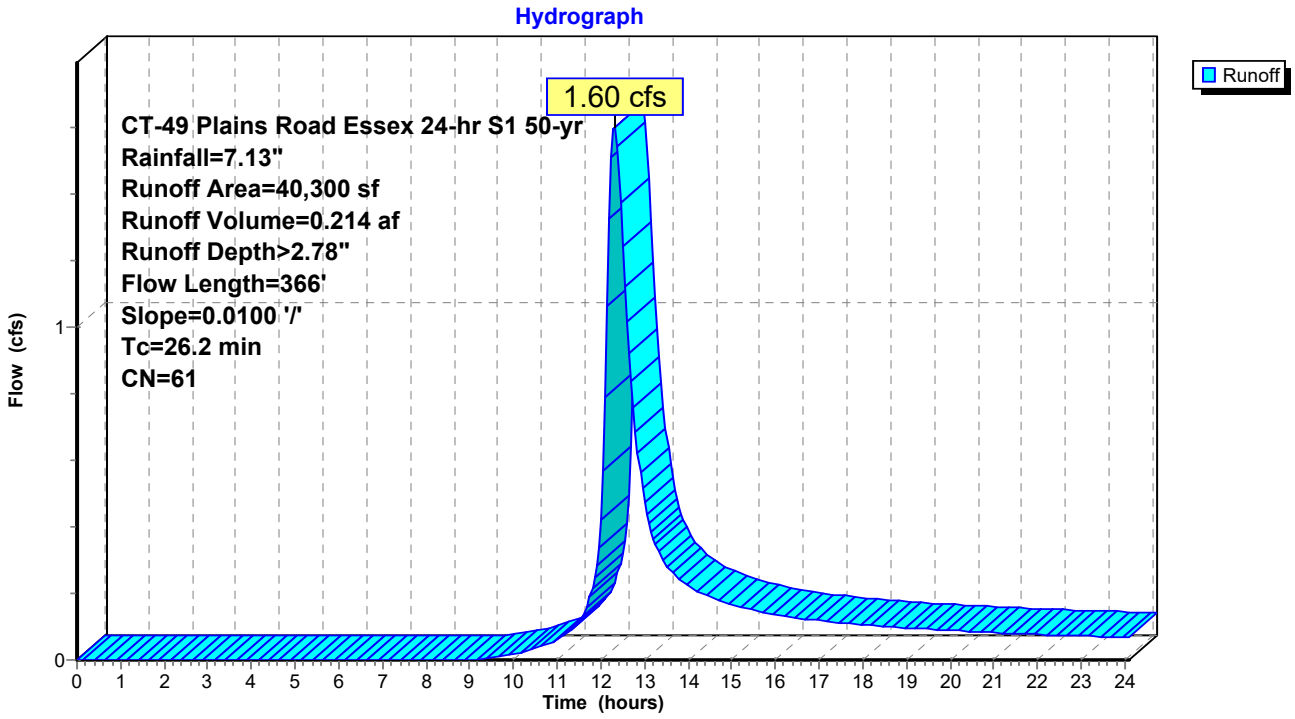
Runoff = 1.60 cfs @ 12.32 hrs, Volume= 0.214 af, Depth> 2.78"
Routed to Link A : EX Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"

	Area (sf)	CN	Description
	30,534	55	Woods, Good, HSG B
	5,285	61	>75% Grass cover, Good, HSG B
*	4,481	98	Impervious
	40,300	61	Weighted Average
	35,819		88.88% Pervious Area
	4,481		11.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	50	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.44"
10.5	316	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.2	366	Total			

Subcatchment 11: EXWS 11

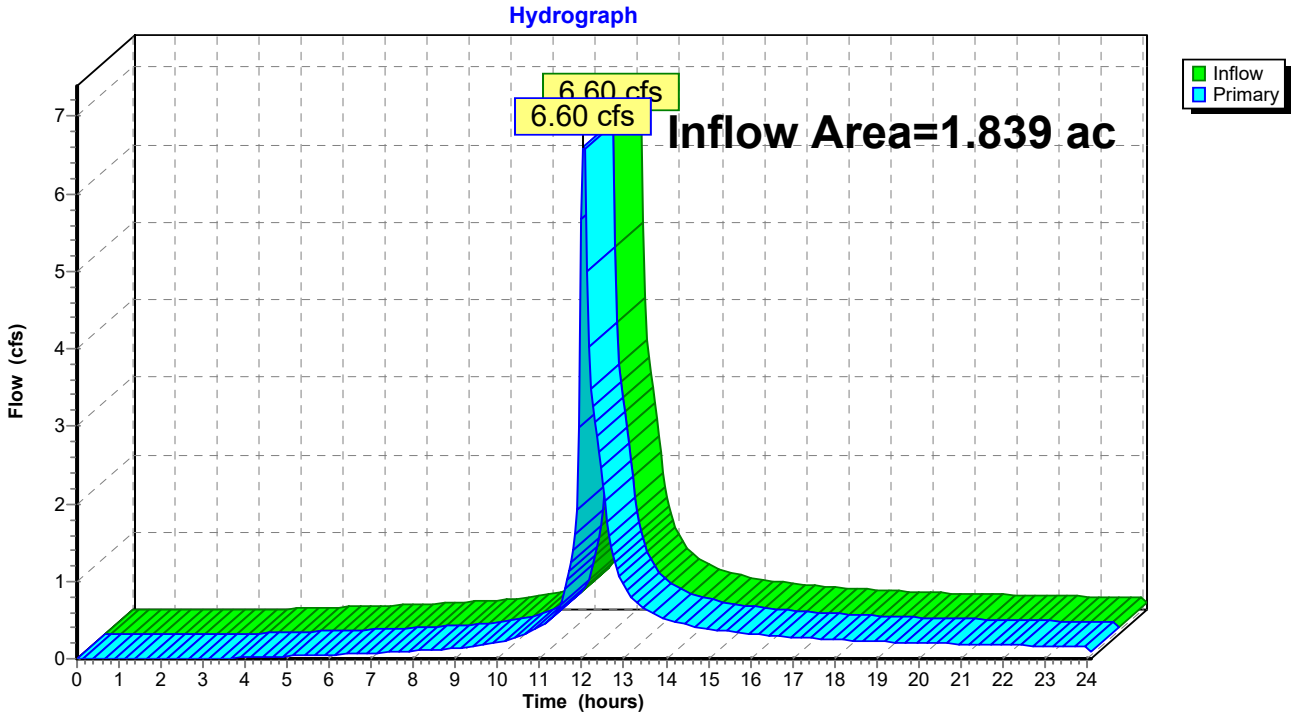


Summary for Link A: EX Site

Inflow Area = 1.839 ac, 17.95% Impervious, Inflow Depth > 4.12" for 50-yr event
Inflow = 6.60 cfs @ 12.04 hrs, Volume= 0.632 af
Primary = 6.60 cfs @ 12.04 hrs, Volume= 0.632 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs

Link A: EX Site



Time span=0.00-24.10 hrs, dt=0.05 hrs, 483 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10: EXWS 10 Runoff Area=39,800 sf 24.87% Impervious Runoff Depth>6.34"
Tc=6.0 min CN=86 Runoff=6.93 cfs 0.483 af

Subcatchment 11: EXWS 11 Runoff Area=40,300 sf 11.12% Impervious Runoff Depth>3.43"
Flow Length=366' Slope=0.0100 '/' Tc=26.2 min CN=61 Runoff=2.00 cfs 0.264 af

Link A: EX Site Inflow=7.63 cfs 0.747 af
Primary=7.63 cfs 0.747 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.747 af Average Runoff Depth = 4.88"
82.05% Pervious = 1.509 ac 17.95% Impervious = 0.330 ac

Summary for Subcatchment 10: EXWS 10

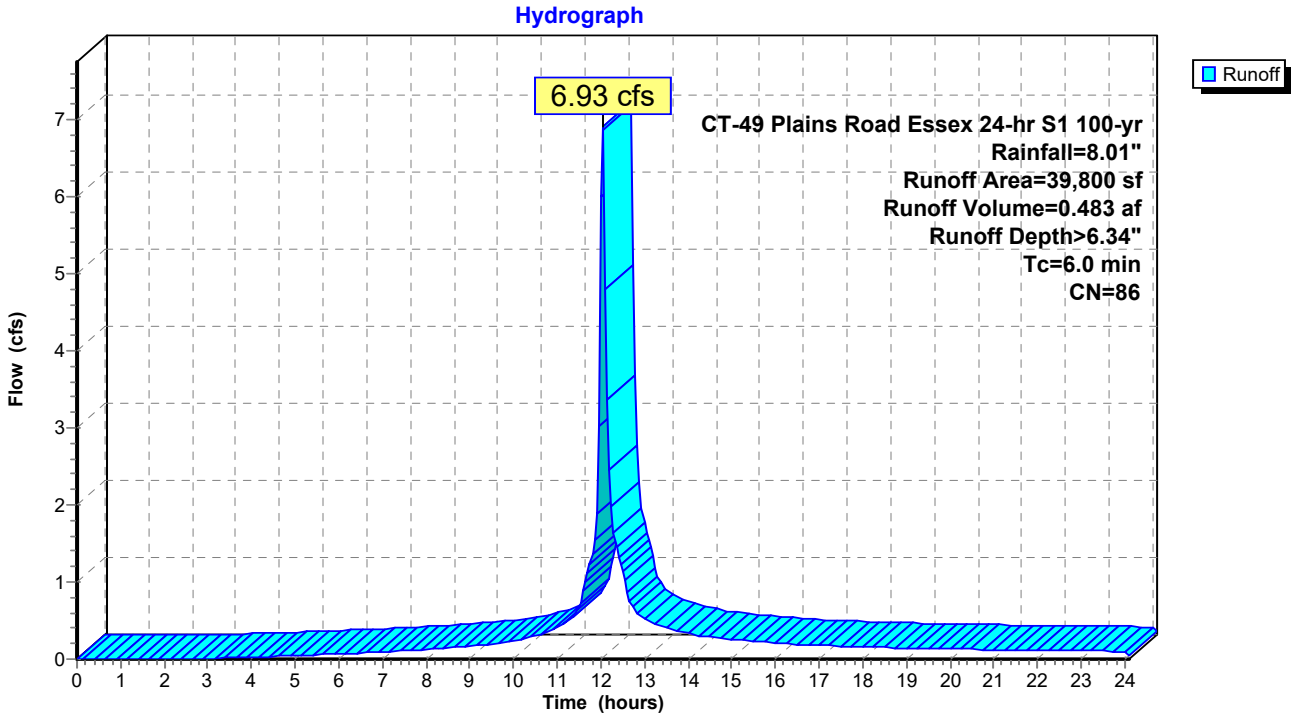
Runoff = 6.93 cfs @ 12.04 hrs, Volume= 0.483 af, Depth> 6.34"
Routed to Link A : EX Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"

	Area (sf)	CN	Description
	9,004	55	Woods, Good, HSG B
	1,578	61	>75% Grass cover, Good, HSG B
	19,319	96	Gravel surface, HSG B
*	9,899	98	Impervious
	39,800	86	Weighted Average
	29,901		75.13% Pervious Area
	9,899		24.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN TR-55 TC 6.0 MIN**

Subcatchment 10: EXWS 10



Summary for Subcatchment 11: EXWS 11

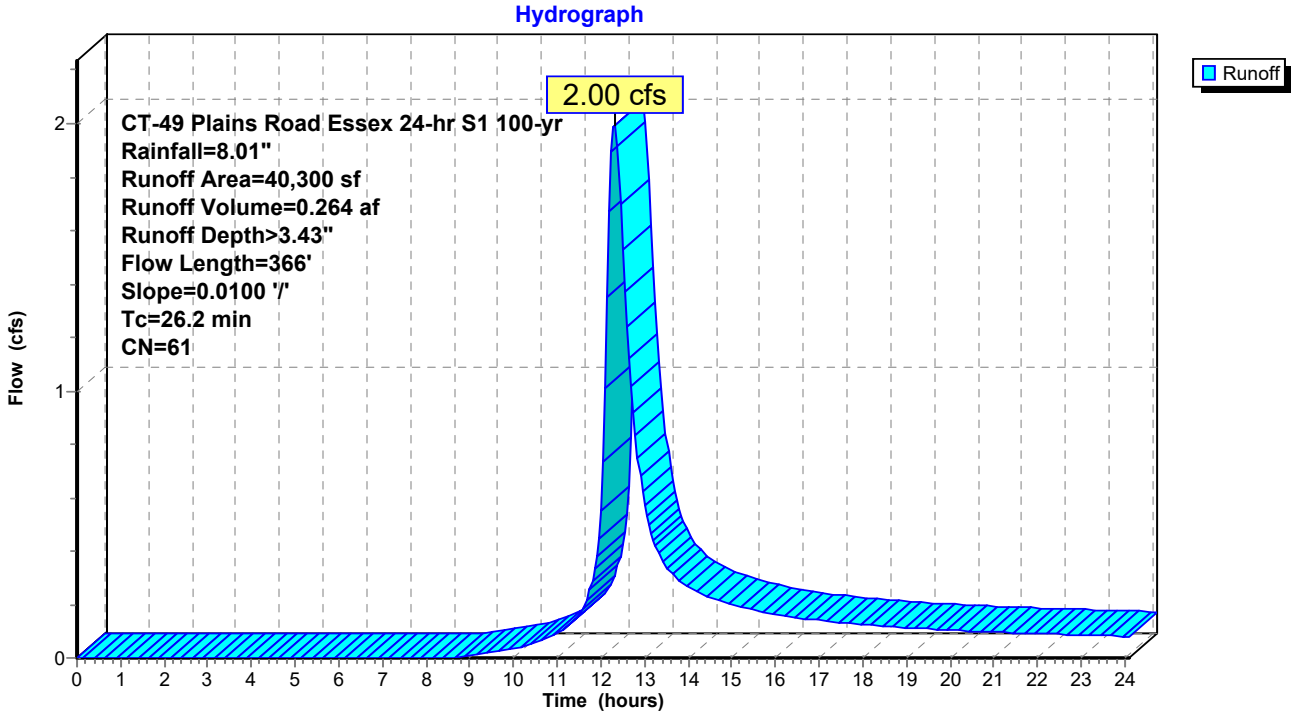
Runoff = 2.00 cfs @ 12.32 hrs, Volume= 0.264 af, Depth> 3.43"
Routed to Link A : EX Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"

	Area (sf)	CN	Description
	30,534	55	Woods, Good, HSG B
	5,285	61	>75% Grass cover, Good, HSG B
*	4,481	98	Impervious
	40,300	61	Weighted Average
	35,819		88.88% Pervious Area
	4,481		11.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	50	0.0100	0.05		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.44"
10.5	316	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.2	366	Total			

Subcatchment 11: EXWS 11

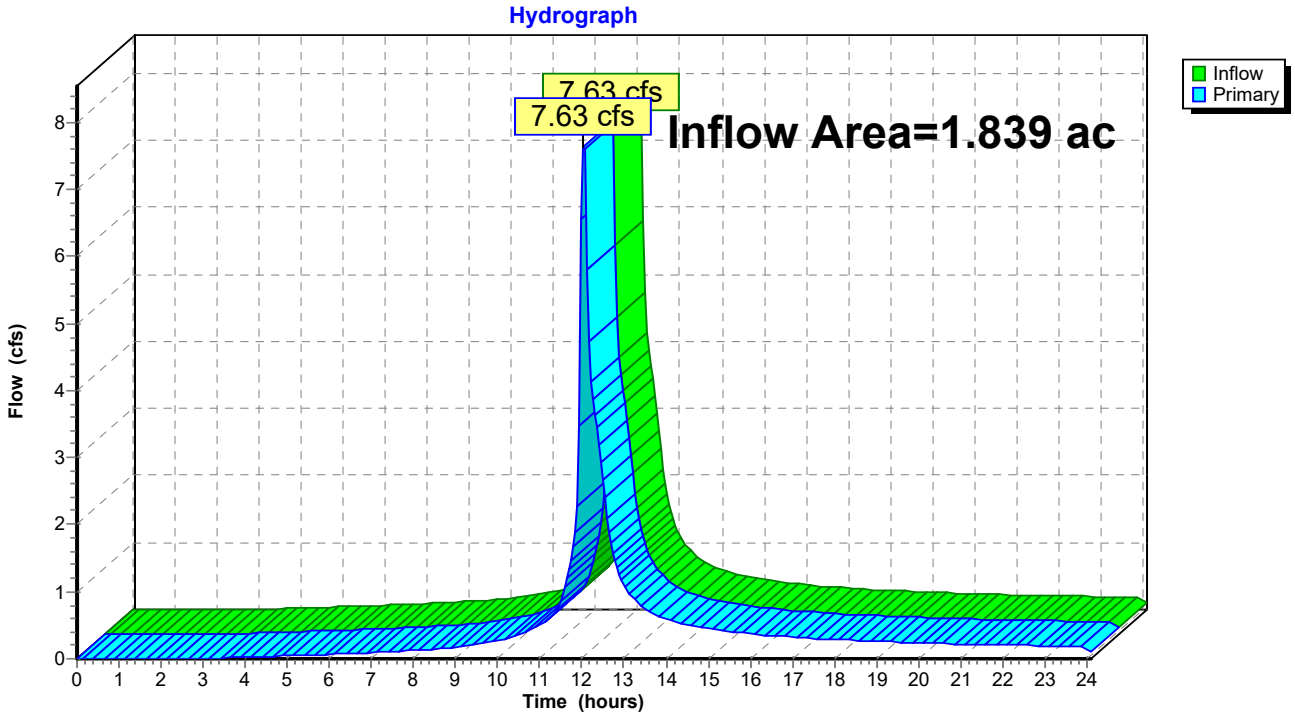


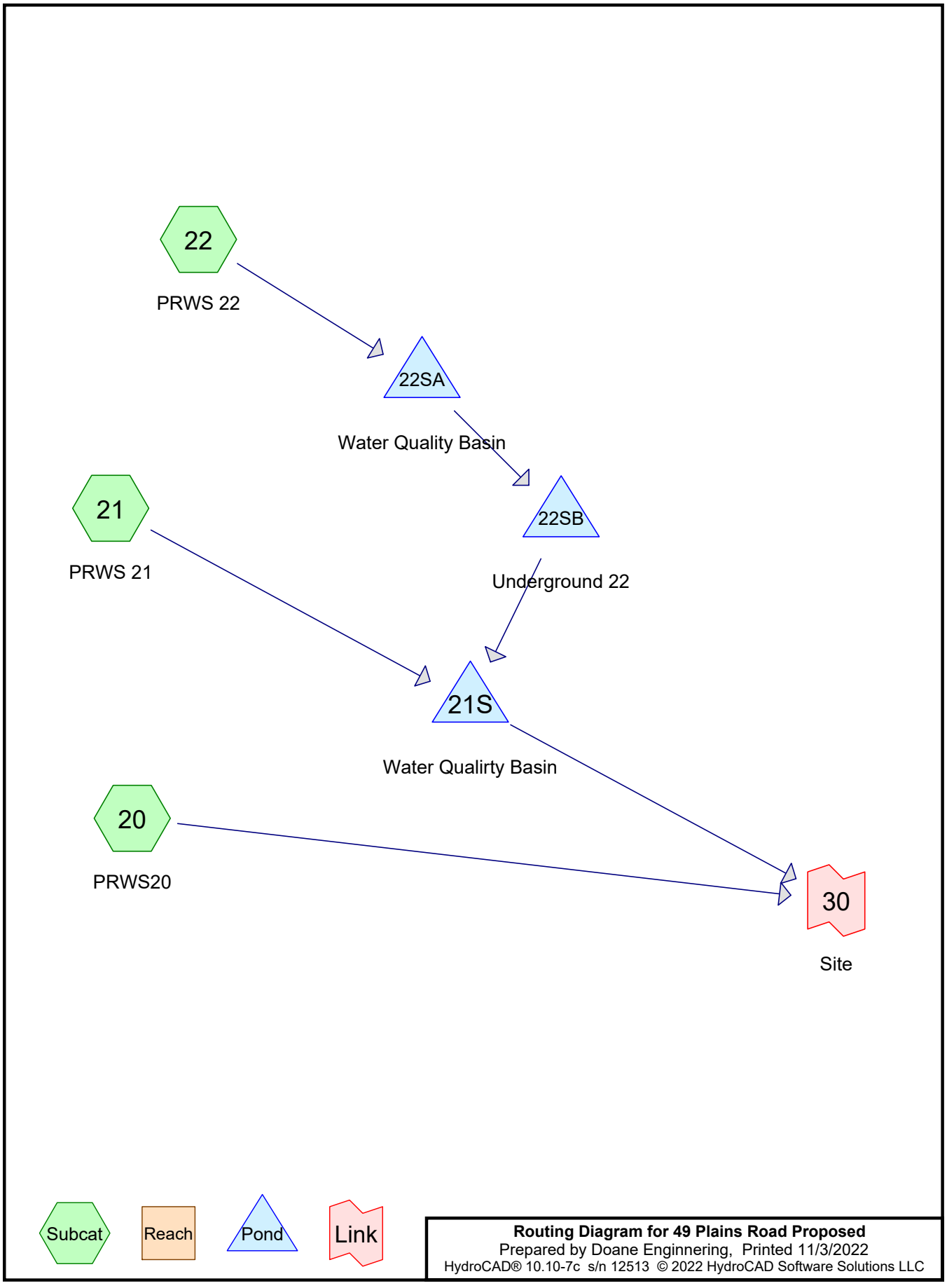
Summary for Link A: EX Site

Inflow Area = 1.839 ac, 17.95% Impervious, Inflow Depth > 4.88" for 100-yr event
Inflow = 7.63 cfs @ 12.04 hrs, Volume= 0.747 af
Primary = 7.63 cfs @ 12.04 hrs, Volume= 0.747 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs

Link A: EX Site





Routing Diagram for 49 Plains Road Proposed
Prepared by Doane Enginnering, Printed 11/3/2022

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	CT-49 Plains Road Essex 24-hr S1	1-yr	Default	24.00	1	2.85	2
2	2-yr	CT-49 Plains Road Essex 24-hr S1	2-yr	Default	24.00	1	3.44	2
3	5-yr	CT-49 Plains Road Essex 24-hr S1	5-yr	Default	24.00	1	4.40	2
4	10-yr	CT-49 Plains Road Essex 24-hr S1	10-yr	Default	24.00	1	5.20	2
5	25-yr	CT-49 Plains Road Essex 24-hr S1	25-yr	Default	24.00	1	6.31	2
6	50-yr	CT-49 Plains Road Essex 24-hr S1	50-yr	Default	24.00	1	7.13	2
7	100-yr	CT-49 Plains Road Essex 24-hr S1	100-yr	Default	24.00	1	8.01	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.312	61	>75% Grass cover, Good, HSG B (20, 21, 22)
1.107	98	Paved parking, HSG B (21, 22)
0.340	98	Roofs, HSG B (21, 22)
0.079	55	Woods, Good, HSG B (20)
1.839	**90**	**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.312	0.000	0.000	0.000	0.312	>75% Grass cover, Good	20, 21, 22
0.000	1.107	0.000	0.000	0.000	1.107	Paved parking	21, 22
0.000	0.340	0.000	0.000	0.000	0.340	Roofs	21, 22
0.000	0.079	0.000	0.000	0.000	0.079	Woods, Good	20
0.000	**1.839**	**0.000**	**0.000**	**0.000**	**1.839**	**TOTAL AREA**	

Time span=0.00-24.10 hrs, dt=0.05 hrs, 483 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 20: PRWS20 Runoff Area=5,280 sf 0.00% Impervious Runoff Depth>0.20"
Tc=6.0 min CN=57 Runoff=0.01 cfs 0.002 af

Subcatchment 21: PRWS 21 Runoff Area=37,225 sf 84.15% Impervious Runoff Depth>2.02"
Tc=6.0 min CN=92 Runoff=2.16 cfs 0.144 af

Subcatchment 22: PRWS 22 Runoff Area=37,595 sf 84.39% Impervious Runoff Depth>2.02"
Tc=6.0 min CN=92 Runoff=2.18 cfs 0.145 af

Pond 21S: Water Qualirty Basin Peak Elev=34.65' Storage=4,565 cf Inflow=2.24 cfs 0.253 af
Outflow=1.09 cfs 0.230 af

Pond 22SA: Water Quality Basin Peak Elev=37.44' Storage=2,674 cf Inflow=2.18 cfs 0.145 af
Outflow=2.19 cfs 0.145 af

Pond 22SB: Underground 22 Peak Elev=35.07' Storage=0.073 af Inflow=2.19 cfs 0.145 af
Outflow=0.10 cfs 0.109 af

Link 30: Site Inflow=1.09 cfs 0.232 af
Primary=1.09 cfs 0.232 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.291 af Average Runoff Depth = 1.90"
21.28% Pervious = 0.391 ac 78.72% Impervious = 1.447 ac

Summary for Subcatchment 20: PRWS20

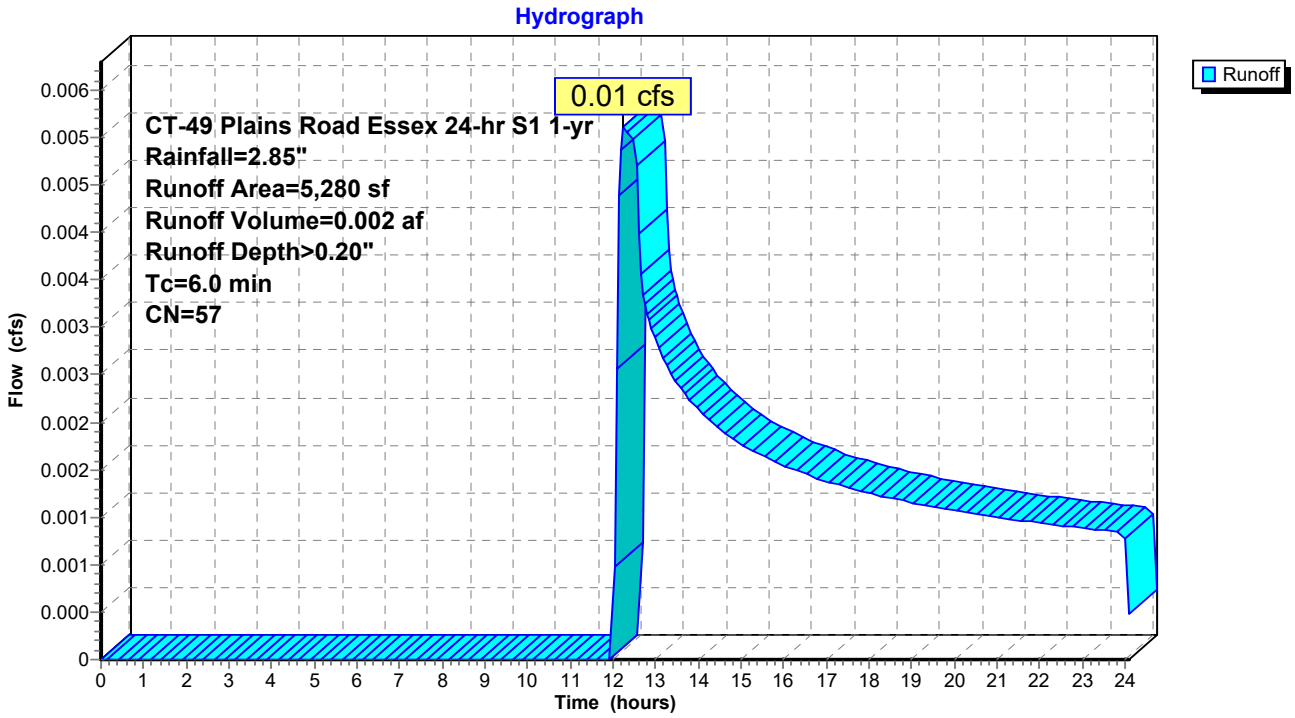
Runoff = 0.01 cfs @ 12.25 hrs, Volume= 0.002 af, Depth> 0.20"
Routed to Link 30 : Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

Area (sf)	CN	Description
3,450	55	Woods, Good, HSG B
1,830	61	>75% Grass cover, Good, HSG B
5,280	57	Weighted Average
5,280		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 20: PRWS20



Summary for Subcatchment 21: PRWS 21

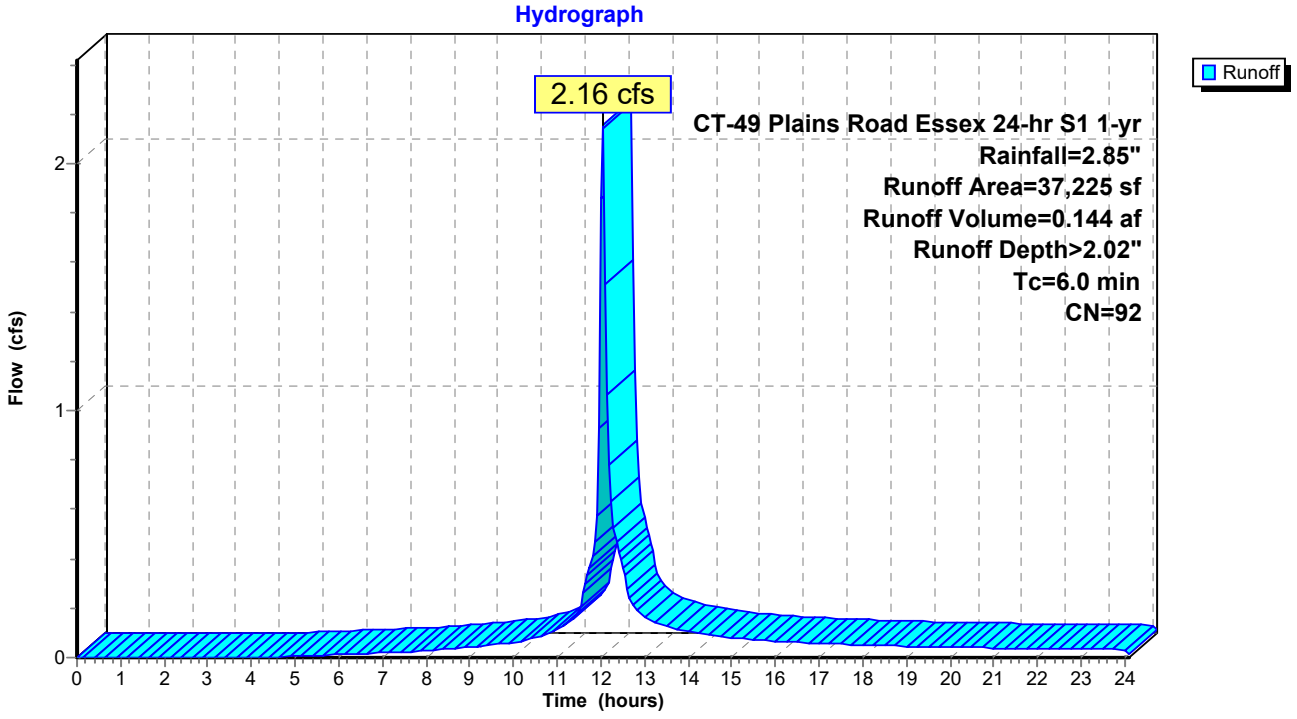
Runoff = 2.16 cfs @ 12.04 hrs, Volume= 0.144 af, Depth> 2.02"
Routed to Pond 21S : Water Qualirty Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

Area (sf)	CN	Description
5,902	61	>75% Grass cover, Good, HSG B
28,970	98	Paved parking, HSG B
2,353	98	Roofs, HSG B
37,225	92	Weighted Average
5,902		15.85% Pervious Area
31,323		84.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 21: PRWS 21



Summary for Subcatchment 22: PRWS 22

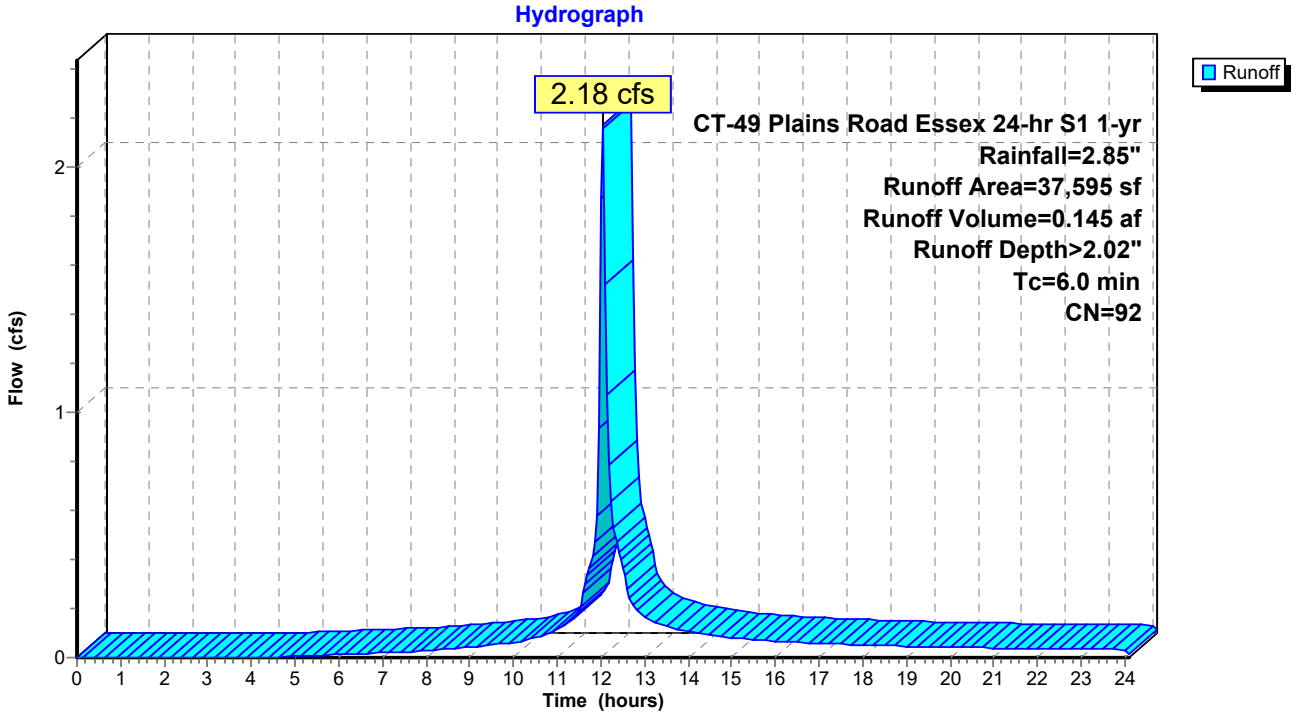
Runoff = 2.18 cfs @ 12.04 hrs, Volume= 0.145 af, Depth> 2.02"
Routed to Pond 22SA : Water Quality Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

Area (sf)	CN	Description
5,867	61	>75% Grass cover, Good, HSG B
19,250	98	Paved parking, HSG B
12,478	98	Roofs, HSG B
37,595	92	Weighted Average
5,867		15.61% Pervious Area
31,728		84.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 22: PRWS 22



Summary for Pond 21S: Water Qualirty Basin

Inflow Area = 1.718 ac, 84.27% Impervious, Inflow Depth > 1.77" for 1-yr event
Inflow = 2.24 cfs @ 12.04 hrs, Volume= 0.253 af
Outflow = 1.09 cfs @ 12.17 hrs, Volume= 0.230 af, Atten= 51%, Lag= 7.9 min
Primary = 1.09 cfs @ 12.17 hrs, Volume= 0.230 af
Routed to Link 30 : Site

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Starting Elev= 33.60' Surf.Area= 1,848 sf Storage= 2,330 cf
Peak Elev= 34.65' @ 12.17 hrs Surf.Area= 2,405 sf Storage= 4,565 cf (2,235 cf above start)

Plug-Flow detention time= 260.1 min calculated for 0.176 af (70% of inflow)
Center-of-Mass det. time= 49.2 min (951.8 - 902.6)

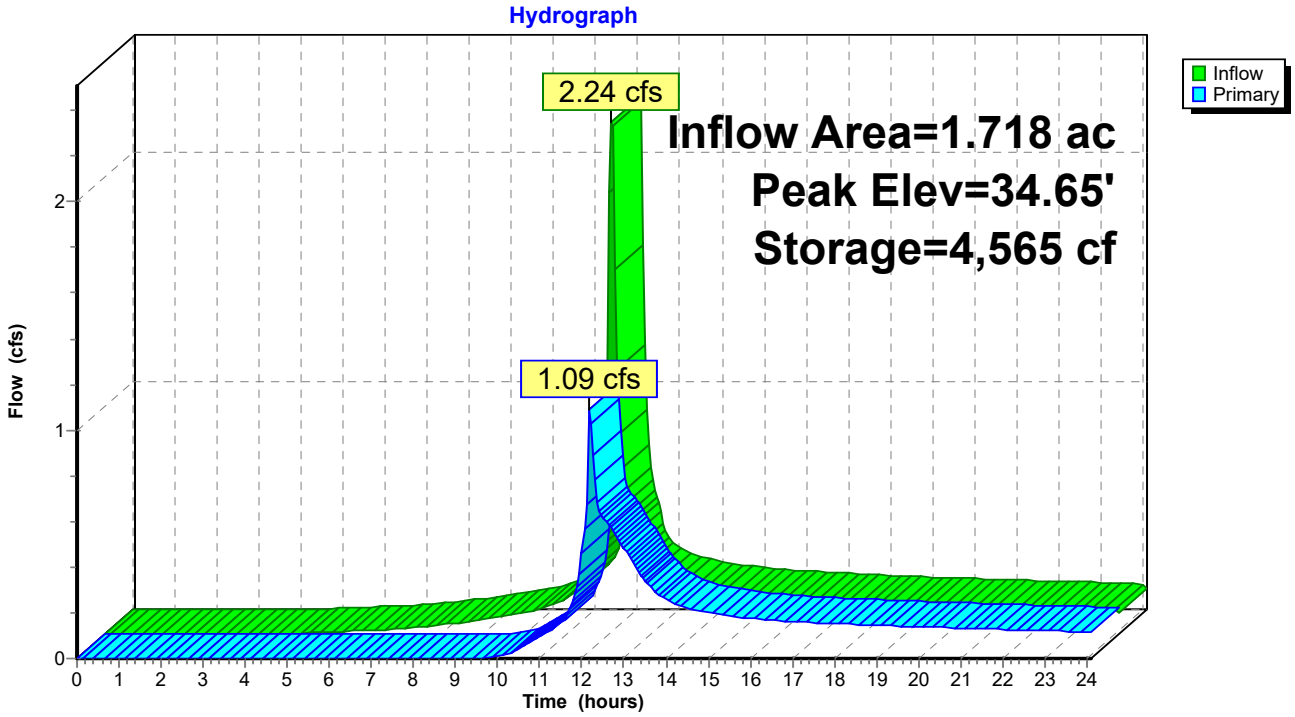
Volume	Invert	Avail.Storage	Storage Description
#1	32.00'	5,437 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
32.00	1,085	220.0	0	0	1,085
33.00	1,552	239.0	1,312	1,312	1,816
34.00	2,060	263.0	1,800	3,112	2,807
34.50	2,326	270.0	1,096	4,207	3,132
35.00	2,593	277.0	1,229	5,437	3,466

Device	Routing	Invert	Outlet Devices
#1	Primary	33.90'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	34.60'	**15.0' long + 0.5 '/' SideZ x 3.0' 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 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=1.03 cfs @ 12.17 hrs HW=34.65' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.67 cfs @ 3.39 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 0.36 cfs @ 0.52 fps)

Pond 21S: Water Qualirty Basin



Summary for Pond 22SA: Water Quality Basin

Inflow Area = 0.863 ac, 84.39% Impervious, Inflow Depth > 2.02" for 1-yr event
Inflow = 2.18 cfs @ 12.04 hrs, Volume= 0.145 af
Outflow = 2.19 cfs @ 12.05 hrs, Volume= 0.145 af, Atten= 0%, Lag= 0.4 min
Primary = 2.19 cfs @ 12.05 hrs, Volume= 0.145 af
Routed to Pond 22SB : Underground 22

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Starting Elev= 37.40' Surf.Area= 1,393 sf Storage= 2,616 cf
Peak Elev= 37.44' @ 12.05 hrs Surf.Area= 1,401 sf Storage= 2,674 cf (58 cf above start)

Plug-Flow detention time= 241.4 min calculated for 0.085 af (59% of inflow)
Center-of-Mass det. time= 0.5 min (816.3 - 815.7)

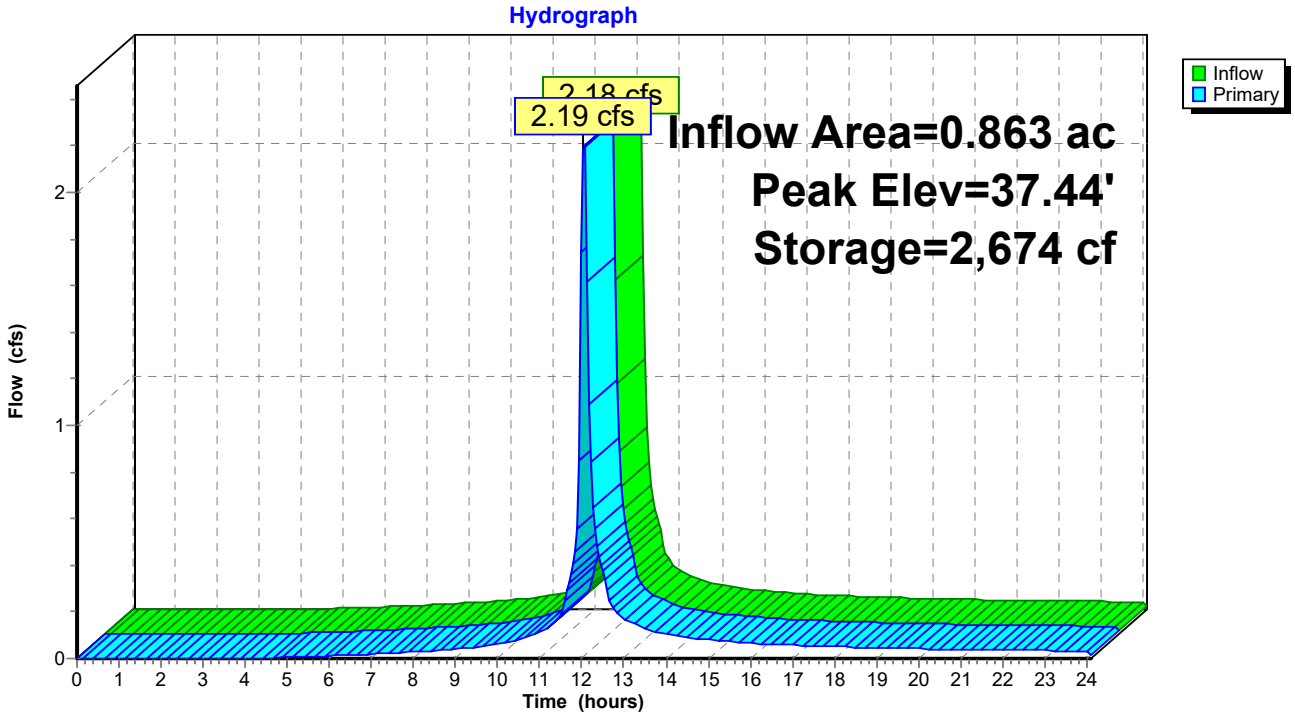
Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	2,756 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
35.00	596	262.0	0	0	596
36.00	1,134	275.0	851	851	1,213
37.50	1,412	281.0	1,906	2,756	1,707

Device	Routing	Invert	Outlet Devices
#1	Primary	37.40'	**2.4" x 4.0" Horiz. Orifice/Grate X 8.00 columns** X 9 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.09 cfs @ 12.05 hrs HW=37.44' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 2.09 cfs @ 0.66 fps)

Pond 22SA: Water Quality Basin



Summary for Pond 22SB: Underground 22

Inflow Area = 0.863 ac, 84.39% Impervious, Inflow Depth > 2.02" for 1-yr event
Inflow = 2.19 cfs @ 12.05 hrs, Volume= 0.145 af
Outflow = 0.10 cfs @ 14.04 hrs, Volume= 0.109 af, Atten= 95%, Lag= 119.4 min
Primary = 0.10 cfs @ 14.04 hrs, Volume= 0.109 af
Routed to Pond 21S : Water Qualirty Basin

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Peak Elev= 35.07' @ 14.04 hrs Surf.Area= 0.119 ac Storage= 0.073 af

Plug-Flow detention time= 304.1 min calculated for 0.109 af (75% of inflow)
Center-of-Mass det. time= 201.1 min (1,017.4 - 816.3)

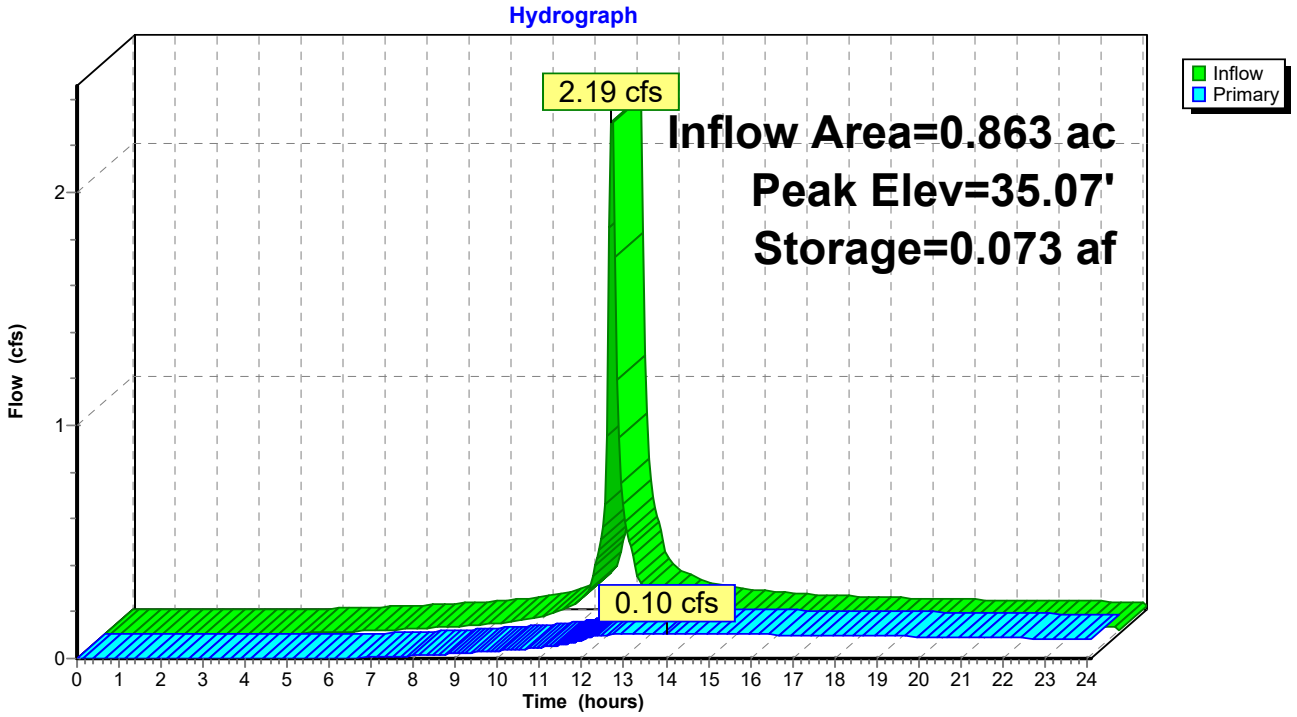
Volume	Invert	Avail.Storage	Storage Description
#1A	34.00'	0.080 af	**39.50'W x 131.78'L x 3.50'H Field A** 0.418 af Overall - 0.152 af Embedded = 0.266 af x 30.0% Voids
#2A	34.50'	0.152 af	**ADS_StormTech SC-740 +Cap** x 144 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 144 Chambers in 8 Rows
		0.232 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	35.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	36.90'	**4.0' long + 1.0 '/' SideZ 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

Primary OutFlow Max=0.10 cfs @ 14.04 hrs HW=35.07' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.10 cfs @ 4.79 fps)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 22SB: Underground 22

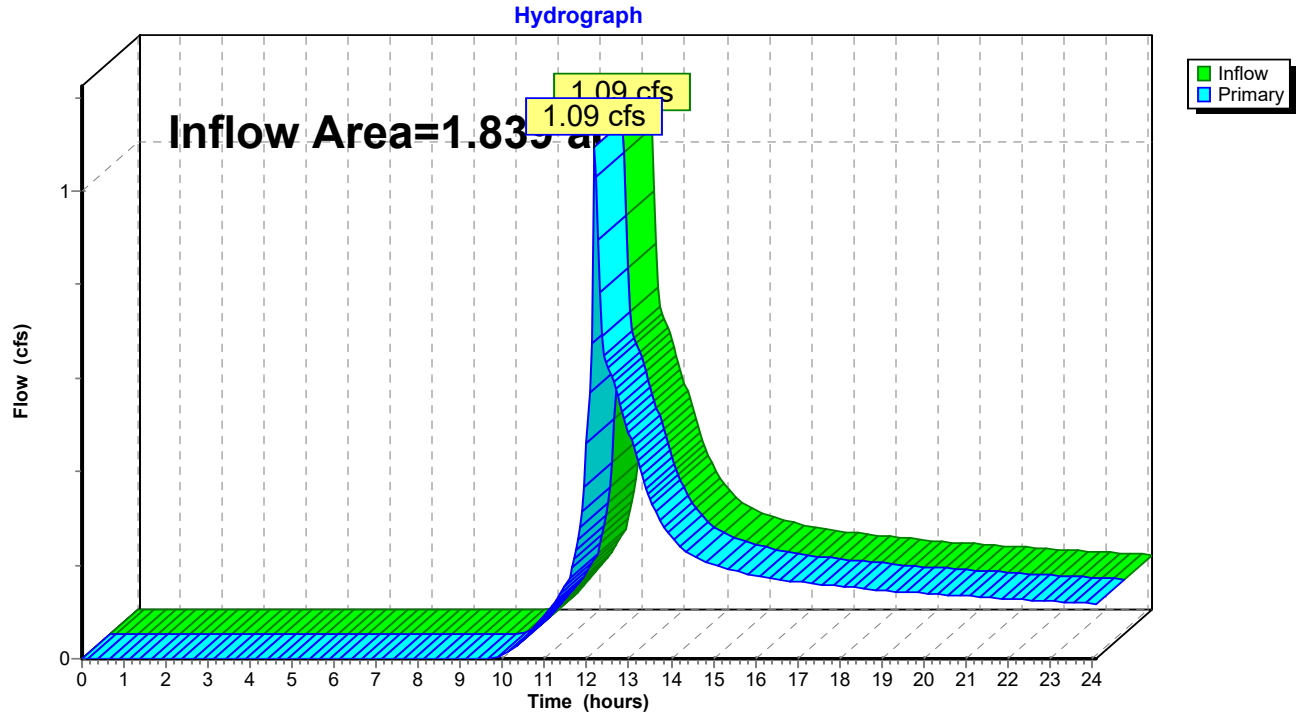


Summary for Link 30: Site

Inflow Area = 1.839 ac, 78.72% Impervious, Inflow Depth > 1.51" for 1-yr event
Inflow = 1.09 cfs @ 12.17 hrs, Volume= 0.232 af
Primary = 1.09 cfs @ 12.17 hrs, Volume= 0.232 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs

Link 30: Site



Time span=0.00-24.10 hrs, dt=0.05 hrs, 483 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 20: PRWS20 Runoff Area=5,280 sf 0.00% Impervious Runoff Depth>0.39"
Tc=6.0 min CN=57 Runoff=0.02 cfs 0.004 af

Subcatchment 21: PRWS 21 Runoff Area=37,225 sf 84.15% Impervious Runoff Depth>2.58"
Tc=6.0 min CN=92 Runoff=2.71 cfs 0.184 af

Subcatchment 22: PRWS 22 Runoff Area=37,595 sf 84.39% Impervious Runoff Depth>2.58"
Tc=6.0 min CN=92 Runoff=2.74 cfs 0.185 af

Pond 21S: Water Qualirty Basin Peak Elev=34.71' Storage=4,707 cf Inflow=2.80 cfs 0.311 af
Outflow=2.02 cfs 0.287 af

Pond 22SA: Water Quality Basin Peak Elev=37.45' Storage=2,685 cf Inflow=2.74 cfs 0.185 af
Outflow=2.75 cfs 0.185 af

Pond 22SB: Underground 22 Peak Elev=35.33' Storage=0.096 af Inflow=2.75 cfs 0.185 af
Outflow=0.12 cfs 0.127 af

Link 30: Site Inflow=2.04 cfs 0.291 af
Primary=2.04 cfs 0.291 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.373 af Average Runoff Depth = 2.43"
21.28% Pervious = 0.391 ac 78.72% Impervious = 1.447 ac

Summary for Subcatchment 20: PRWS20

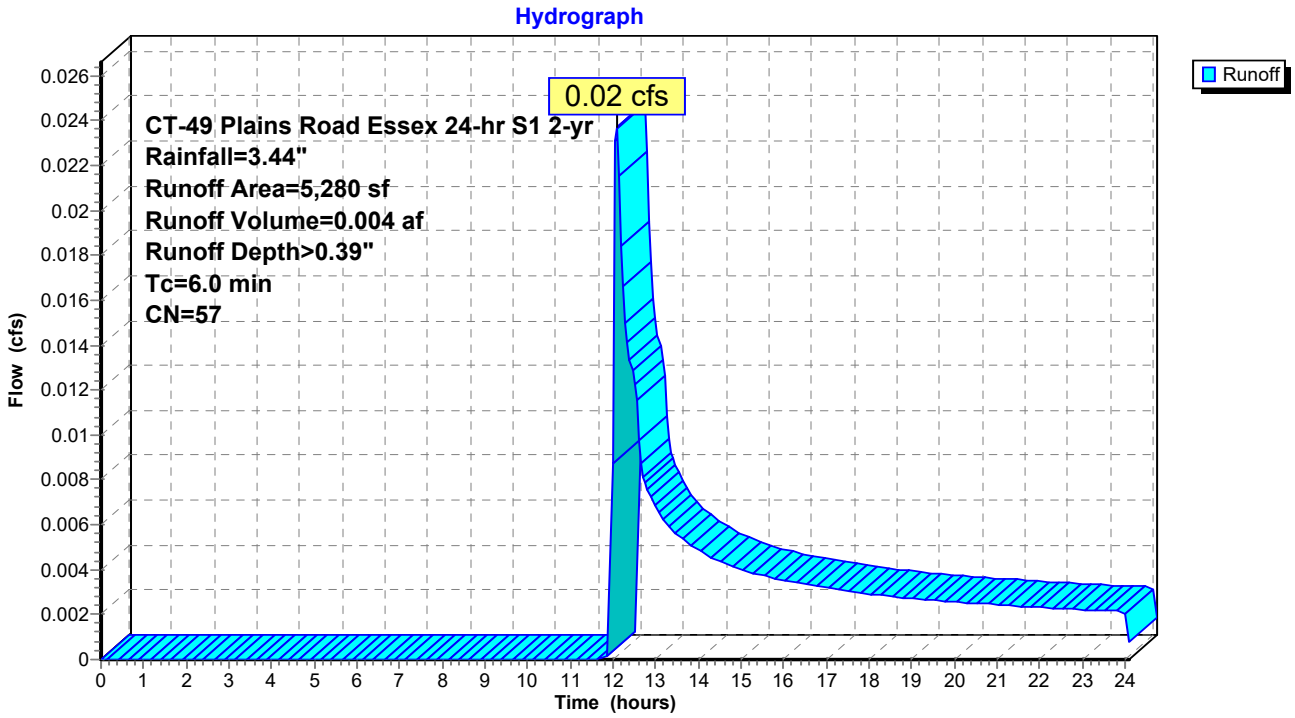
Runoff = 0.02 cfs @ 12.09 hrs, Volume= 0.004 af, Depth> 0.39"
Routed to Link 30 : Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

Area (sf)	CN	Description
3,450	55	Woods, Good, HSG B
1,830	61	>75% Grass cover, Good, HSG B
5,280	57	Weighted Average
5,280		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 20: PRWS20



Summary for Subcatchment 21: PRWS 21

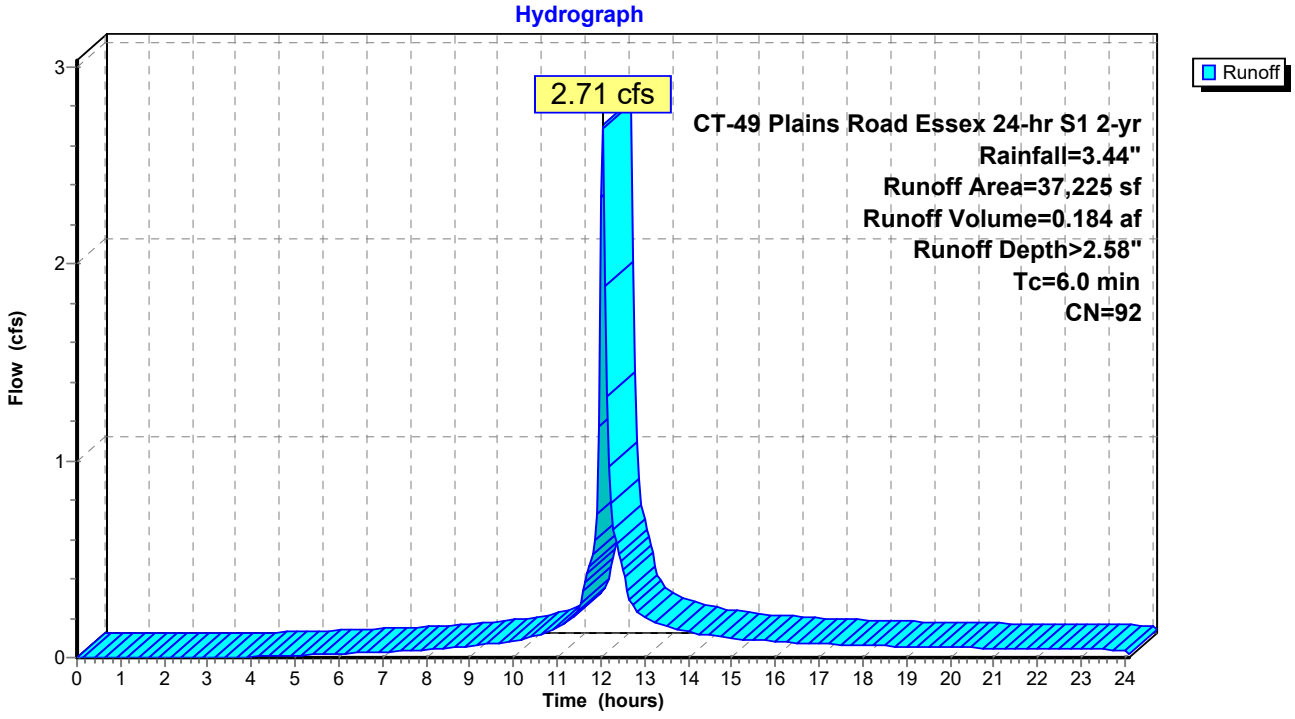
Runoff = 2.71 cfs @ 12.04 hrs, Volume= 0.184 af, Depth> 2.58"
Routed to Pond 21S : Water Qualirty Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

Area (sf)	CN	Description
5,902	61	>75% Grass cover, Good, HSG B
28,970	98	Paved parking, HSG B
2,353	98	Roofs, HSG B
37,225	92	Weighted Average
5,902		15.85% Pervious Area
31,323		84.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 21: PRWS 21



Summary for Subcatchment 22: PRWS 22

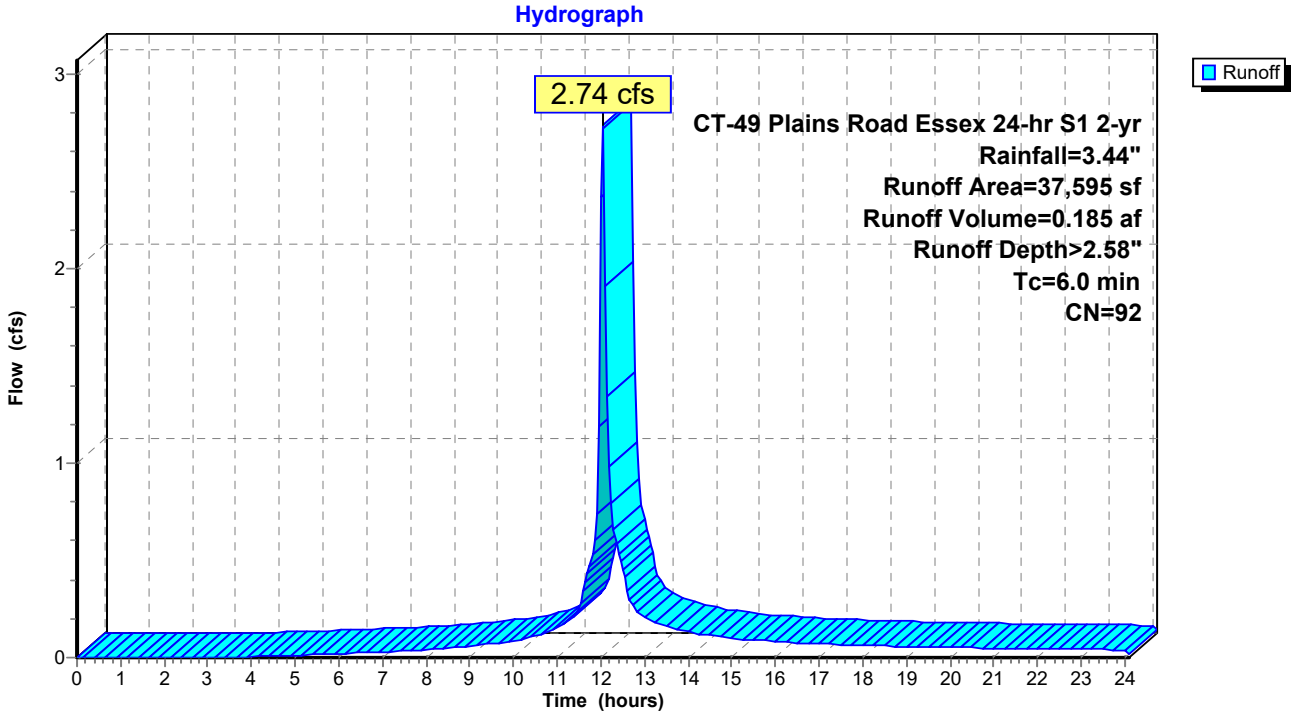
Runoff = 2.74 cfs @ 12.04 hrs, Volume= 0.185 af, Depth> 2.58"
Routed to Pond 22SA : Water Quality Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

Area (sf)	CN	Description
5,867	61	>75% Grass cover, Good, HSG B
19,250	98	Paved parking, HSG B
12,478	98	Roofs, HSG B
37,595	92	Weighted Average
5,867		15.61% Pervious Area
31,728		84.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 22: PRWS 22



Summary for Pond 21S: Water Qualirty Basin

Inflow Area = 1.718 ac, 84.27% Impervious, Inflow Depth > 2.17" for 2-yr event
Inflow = 2.80 cfs @ 12.04 hrs, Volume= 0.311 af
Outflow = 2.02 cfs @ 12.12 hrs, Volume= 0.287 af, Atten= 28%, Lag= 4.6 min
Primary = 2.02 cfs @ 12.12 hrs, Volume= 0.287 af
Routed to Link 30 : Site

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Starting Elev= 33.60' Surf.Area= 1,848 sf Storage= 2,330 cf
Peak Elev= 34.71' @ 12.12 hrs Surf.Area= 2,436 sf Storage= 4,707 cf (2,377 cf above start)

Plug-Flow detention time= 222.6 min calculated for 0.233 af (75% of inflow)
Center-of-Mass det. time= 45.0 min (934.3 - 889.3)

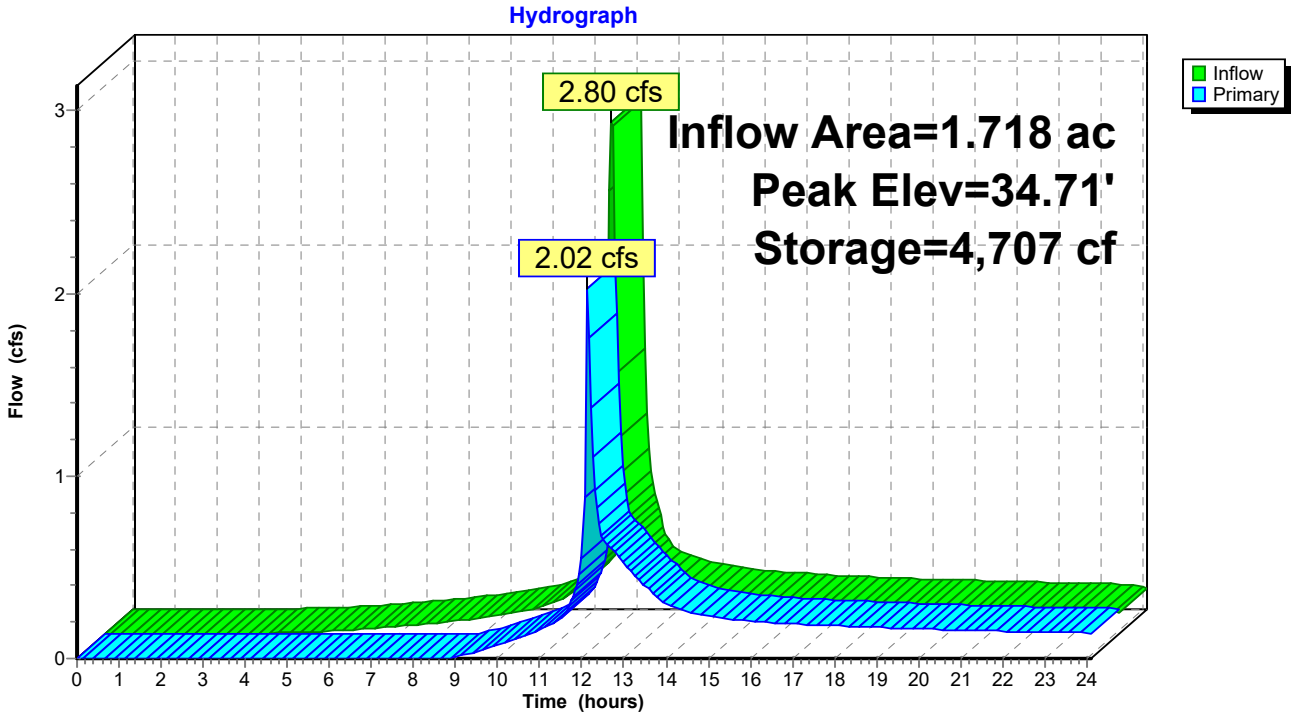
Volume	Invert	Avail.Storage	Storage Description
#1	32.00'	5,437 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
32.00	1,085	220.0	0	0	1,085
33.00	1,552	239.0	1,312	1,312	1,816
34.00	2,060	263.0	1,800	3,112	2,807
34.50	2,326	270.0	1,096	4,207	3,132
35.00	2,593	277.0	1,229	5,437	3,466

Device	Routing	Invert	Outlet Devices
#1	Primary	33.90'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	34.60'	**15.0' long + 0.5 '/' SideZ x 3.0' 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 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=1.87 cfs @ 12.12 hrs HW=34.70' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.70 cfs @ 3.57 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 1.17 cfs @ 0.77 fps)

Pond 21S: Water Qualirty Basin



Summary for Pond 22SA: Water Quality Basin

Inflow Area = 0.863 ac, 84.39% Impervious, Inflow Depth > 2.58" for 2-yr event
Inflow = 2.74 cfs @ 12.04 hrs, Volume= 0.185 af
Outflow = 2.75 cfs @ 12.05 hrs, Volume= 0.185 af, Atten= 0%, Lag= 0.4 min
Primary = 2.75 cfs @ 12.05 hrs, Volume= 0.185 af
Routed to Pond 22SB : Underground 22

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Starting Elev= 37.40' Surf.Area= 1,393 sf Storage= 2,616 cf
Peak Elev= 37.45' @ 12.05 hrs Surf.Area= 1,402 sf Storage= 2,685 cf (69 cf above start)

Plug-Flow detention time= 204.6 min calculated for 0.125 af (68% of inflow)
Center-of-Mass det. time= 0.5 min (807.8 - 807.2)

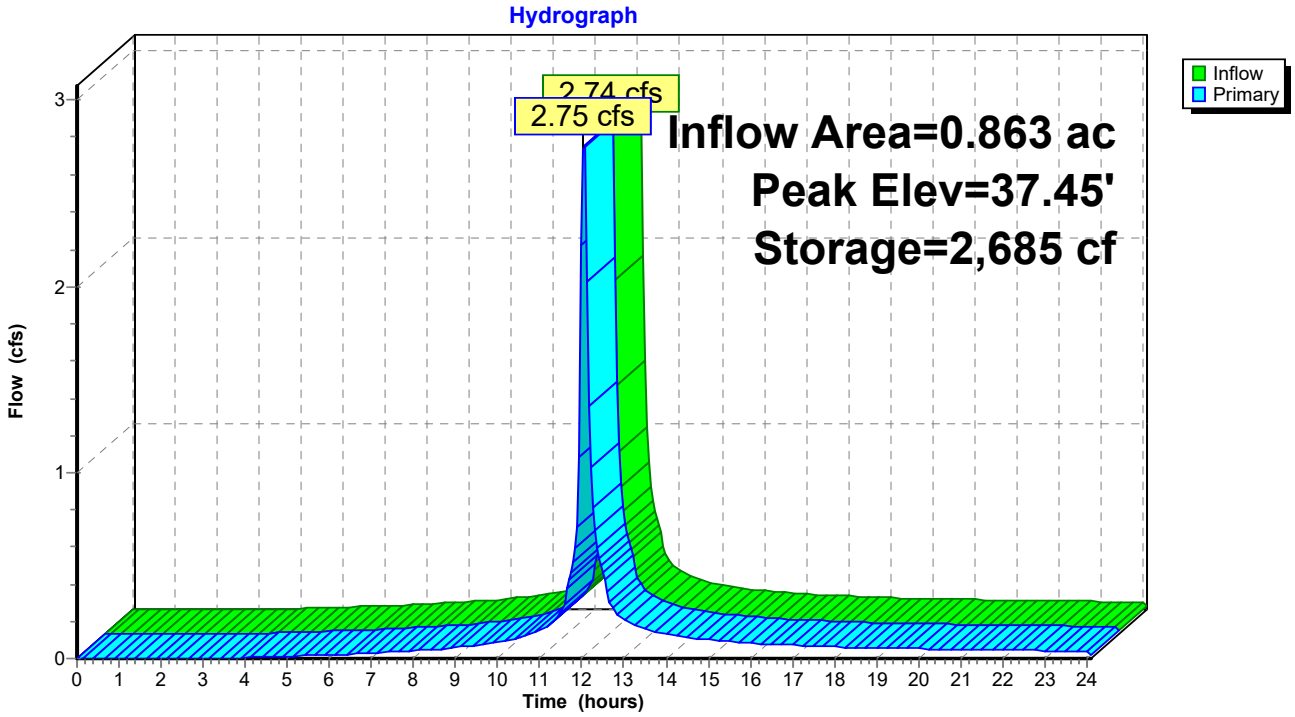
Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	2,756 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
35.00	596	262.0	0	0	596
36.00	1,134	275.0	851	851	1,213
37.50	1,412	281.0	1,906	2,756	1,707

Device	Routing	Invert	Outlet Devices
#1	Primary	37.40'	**2.4" x 4.0" Horiz. Orifice/Grate X 8.00 columns** X 9 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.69 cfs @ 12.05 hrs HW=37.45' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 2.69 cfs @ 0.72 fps)

Pond 22SA: Water Quality Basin



Summary for Pond 22SB: Underground 22

Inflow Area = 0.863 ac, 84.39% Impervious, Inflow Depth > 2.58" for 2-yr event
Inflow = 2.75 cfs @ 12.05 hrs, Volume= 0.185 af
Outflow = 0.12 cfs @ 14.36 hrs, Volume= 0.127 af, Atten= 96%, Lag= 138.8 min
Primary = 0.12 cfs @ 14.36 hrs, Volume= 0.127 af
Routed to Pond 21S : Water Qualirty Basin

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Peak Elev= 35.33' @ 14.36 hrs Surf.Area= 0.119 ac Storage= 0.096 af

Plug-Flow detention time= 316.4 min calculated for 0.127 af (68% of inflow)
Center-of-Mass det. time= 200.0 min (1,007.8 - 807.8)

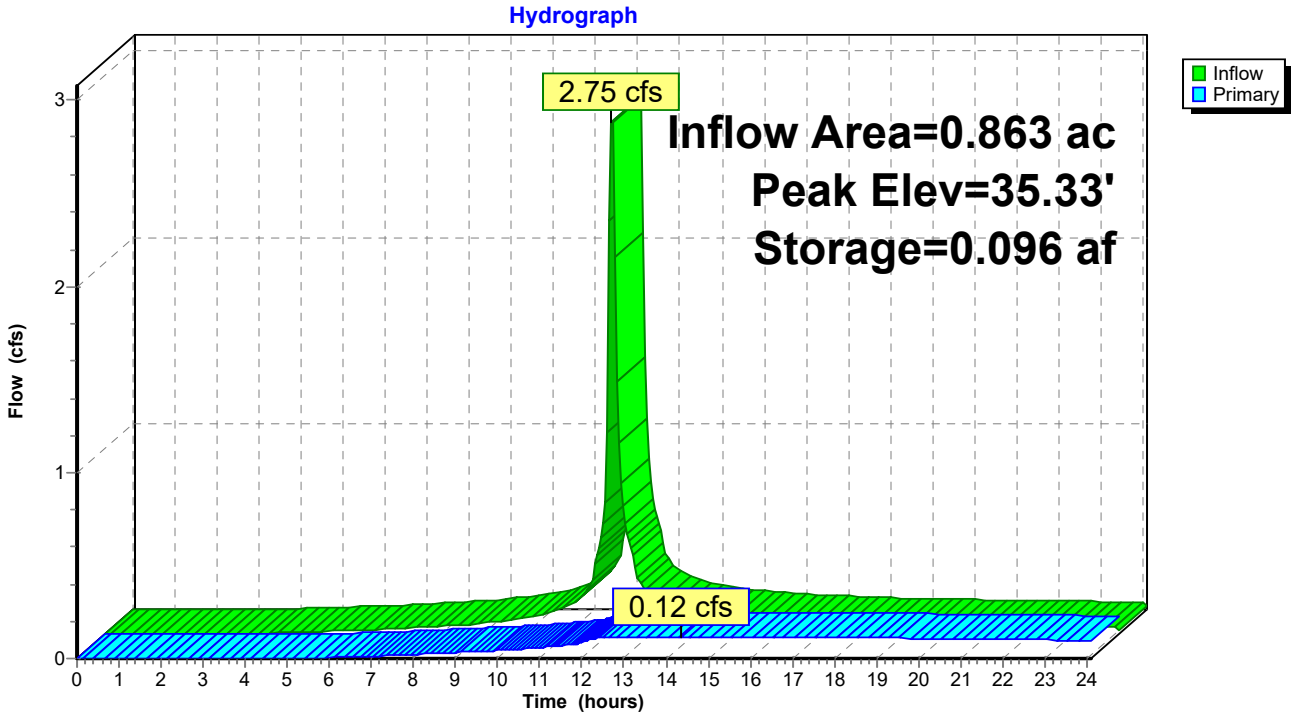
Volume	Invert	Avail.Storage	Storage Description
#1A	34.00'	0.080 af	**39.50'W x 131.78'L x 3.50'H Field A** 0.418 af Overall - 0.152 af Embedded = 0.266 af x 30.0% Voids
#2A	34.50'	0.152 af	**ADS_StormTech SC-740 +Cap** x 144 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 144 Chambers in 8 Rows
		0.232 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	35.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	36.90'	**4.0' long + 1.0 '/' SideZ 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

Primary OutFlow Max=0.12 cfs @ 14.36 hrs HW=35.33' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.12 cfs @ 5.38 fps)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 22SB: Underground 22

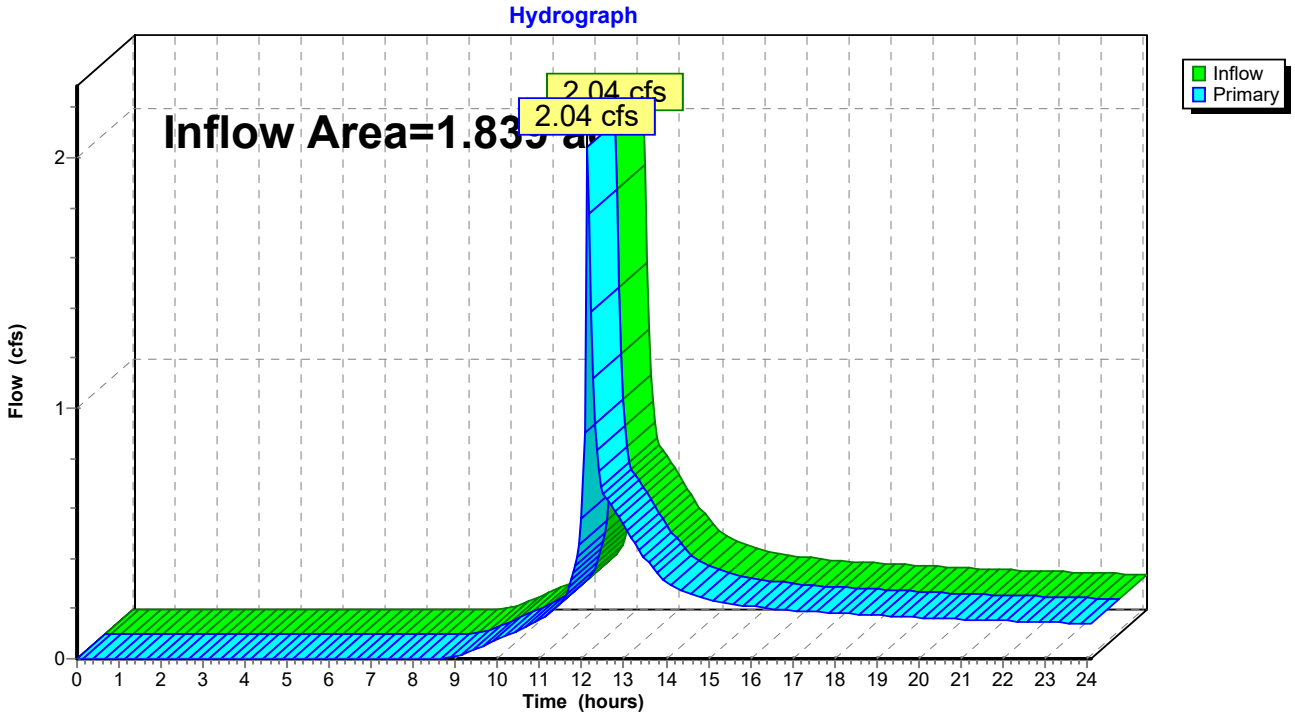


Summary for Link 30: Site

Inflow Area = 1.839 ac, 78.72% Impervious, Inflow Depth > 1.90" for 2-yr event
Inflow = 2.04 cfs @ 12.12 hrs, Volume= 0.291 af
Primary = 2.04 cfs @ 12.12 hrs, Volume= 0.291 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs

Link 30: Site



Time span=0.00-24.10 hrs, dt=0.05 hrs, 483 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 20: PRWS20 Runoff Area=5,280 sf 0.00% Impervious Runoff Depth>0.80"
Tc=6.0 min CN=57 Runoff=0.09 cfs 0.008 af

Subcatchment 21: PRWS 21 Runoff Area=37,225 sf 84.15% Impervious Runoff Depth>3.50"
Tc=6.0 min CN=92 Runoff=3.62 cfs 0.250 af

Subcatchment 22: PRWS 22 Runoff Area=37,595 sf 84.39% Impervious Runoff Depth>3.50"
Tc=6.0 min CN=92 Runoff=3.65 cfs 0.252 af

Pond 21S: Water Qualirty Basin Peak Elev=34.76' Storage=4,838 cf Inflow=3.72 cfs 0.407 af
Outflow=3.16 cfs 0.382 af

Pond 22SA: Water Quality Basin Peak Elev=37.46' Storage=2,700 cf Inflow=3.65 cfs 0.252 af
Outflow=3.72 cfs 0.252 af

Pond 22SB: Underground 22 Peak Elev=35.78' Storage=0.135 af Inflow=3.72 cfs 0.252 af
Outflow=0.16 cfs 0.158 af

Link 30: Site Inflow=3.24 cfs 0.390 af
Primary=3.24 cfs 0.390 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.510 af Average Runoff Depth = 3.33"
21.28% Pervious = 0.391 ac 78.72% Impervious = 1.447 ac

Summary for Subcatchment 20: PRWS20

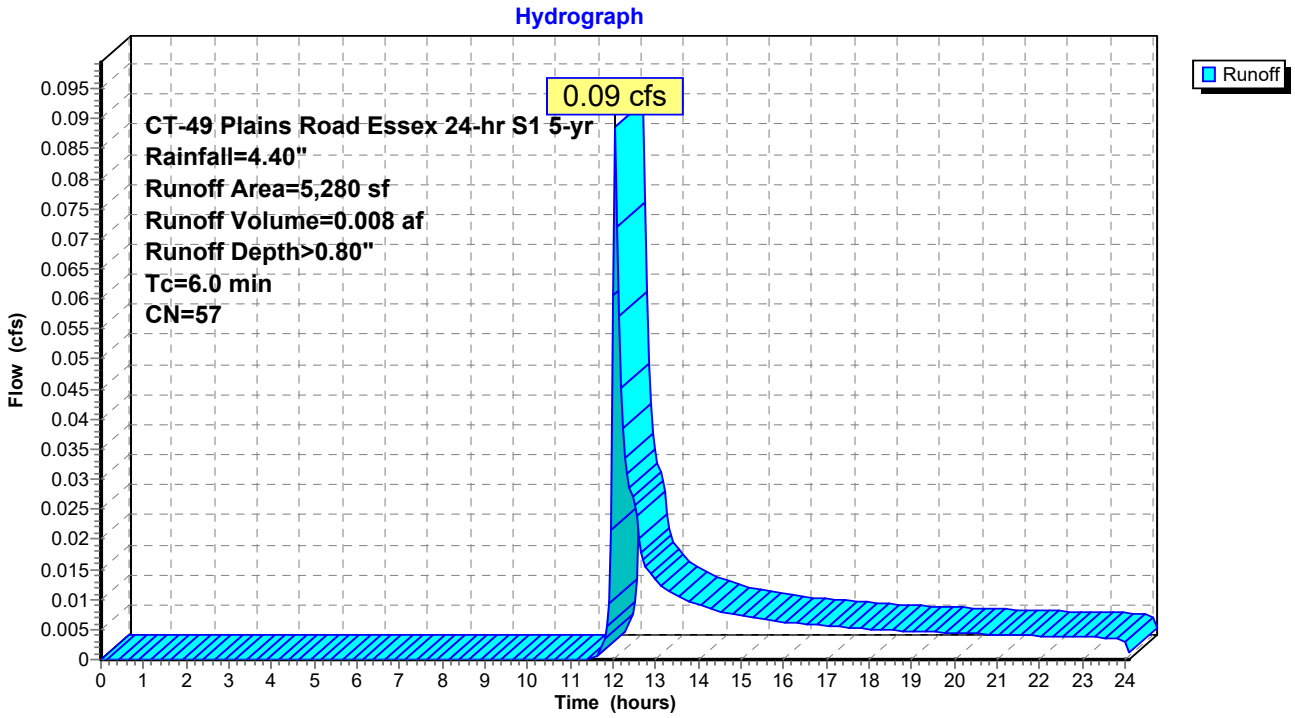
Runoff = 0.09 cfs @ 12.06 hrs, Volume= 0.008 af, Depth> 0.80"
Routed to Link 30 : Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"

Area (sf)	CN	Description
3,450	55	Woods, Good, HSG B
1,830	61	>75% Grass cover, Good, HSG B
5,280	57	Weighted Average
5,280		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 20: PRWS20



Summary for Subcatchment 21: PRWS 21

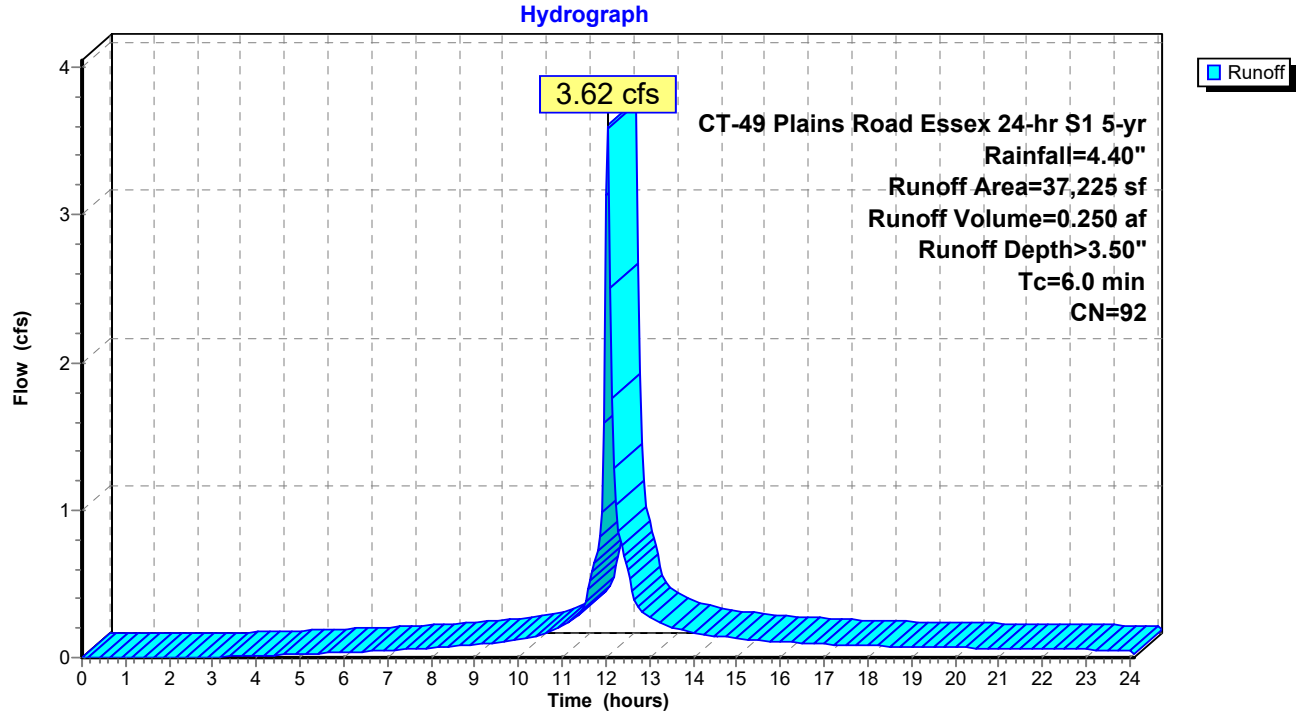
Runoff = 3.62 cfs @ 12.04 hrs, Volume= 0.250 af, Depth> 3.50"
Routed to Pond 21S : Water Qualirty Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"

Area (sf)	CN	Description
5,902	61	>75% Grass cover, Good, HSG B
28,970	98	Paved parking, HSG B
2,353	98	Roofs, HSG B
37,225	92	Weighted Average
5,902		15.85% Pervious Area
31,323		84.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 21: PRWS 21



Summary for Subcatchment 22: PRWS 22

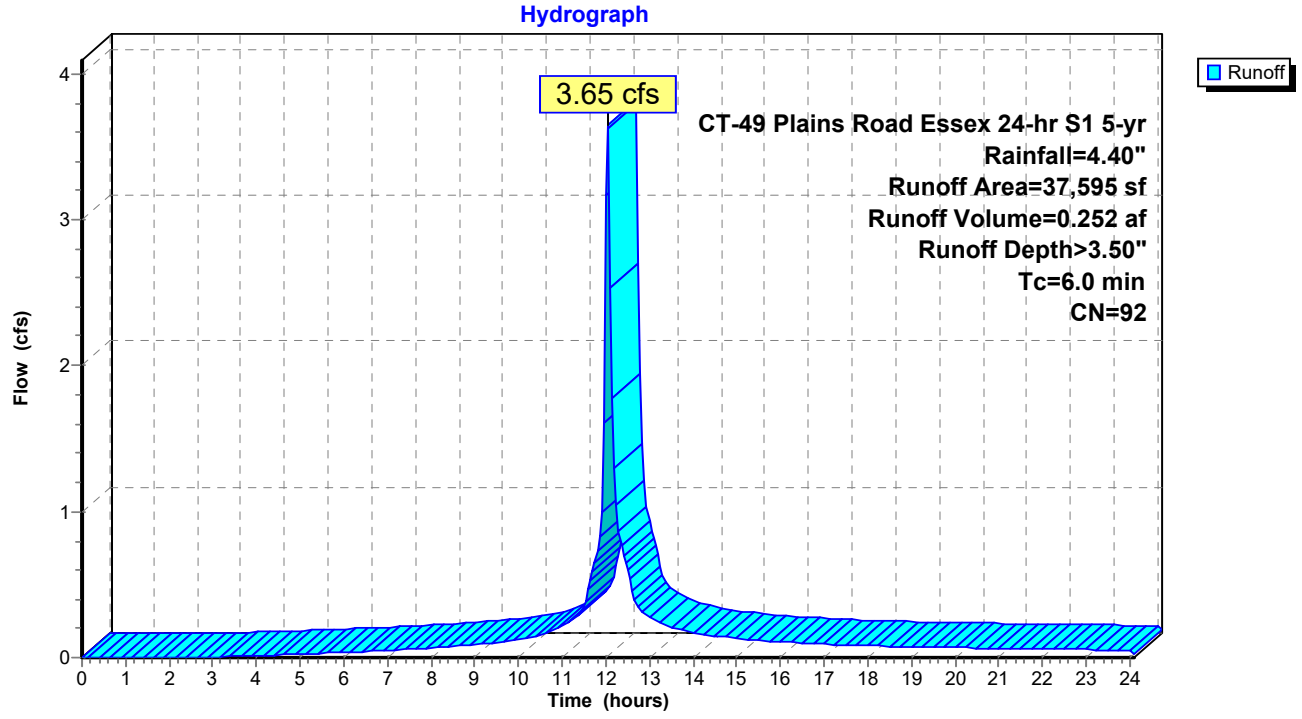
Runoff = 3.65 cfs @ 12.04 hrs, Volume= 0.252 af, Depth> 3.50"
Routed to Pond 22SA : Water Quality Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"

Area (sf)	CN	Description
5,867	61	>75% Grass cover, Good, HSG B
19,250	98	Paved parking, HSG B
12,478	98	Roofs, HSG B
37,595	92	Weighted Average
5,867		15.61% Pervious Area
31,728		84.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 22: PRWS 22



Summary for Pond 21S: Water Qualirty Basin

Inflow Area = 1.718 ac, 84.27% Impervious, Inflow Depth > 2.85" for 5-yr event
Inflow = 3.72 cfs @ 12.04 hrs, Volume= 0.407 af
Outflow = 3.16 cfs @ 12.09 hrs, Volume= 0.382 af, Atten= 15%, Lag= 2.8 min
Primary = 3.16 cfs @ 12.09 hrs, Volume= 0.382 af
Routed to Link 30 : Site

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Starting Elev= 33.60' Surf.Area= 1,848 sf Storage= 2,330 cf
Peak Elev= 34.76' @ 12.09 hrs Surf.Area= 2,465 sf Storage= 4,838 cf (2,508 cf above start)

Plug-Flow detention time= 184.7 min calculated for 0.328 af (81% of inflow)
Center-of-Mass det. time= 40.0 min (912.2 - 872.2)

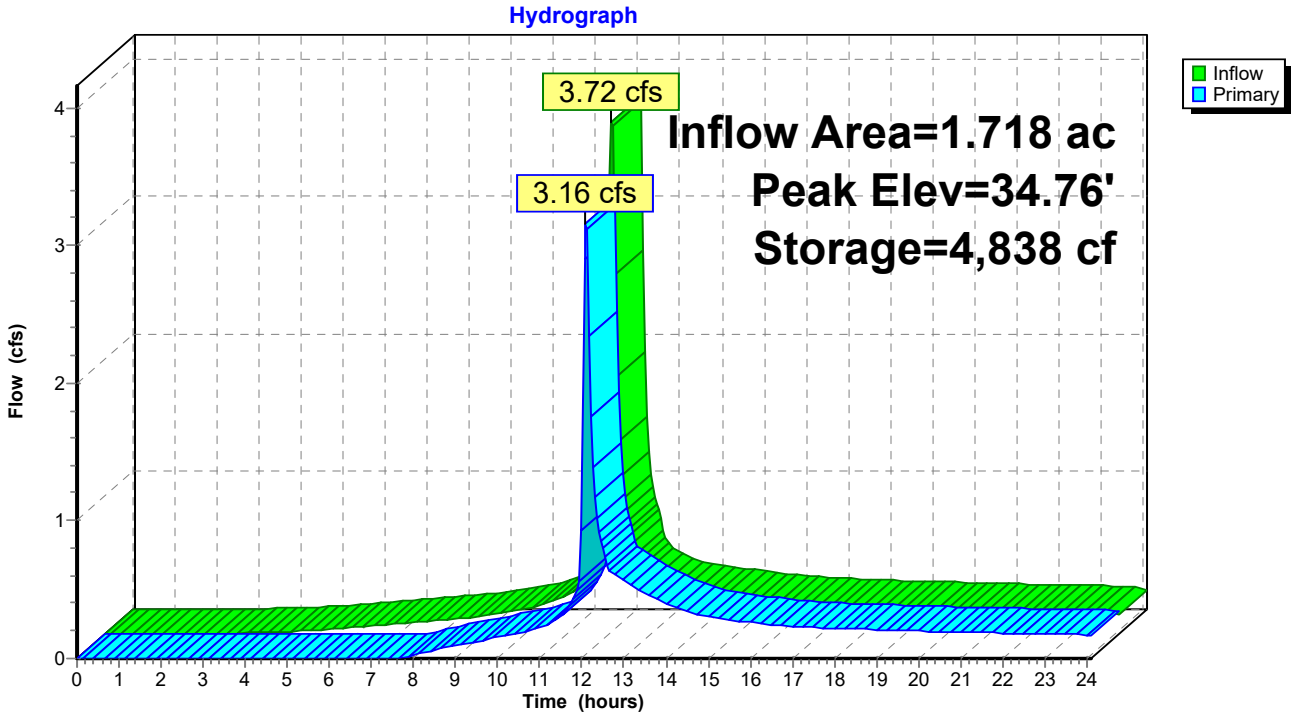
Volume	Invert	Avail.Storage	Storage Description
#1	32.00'	5,437 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
32.00	1,085	220.0	0	0	1,085
33.00	1,552	239.0	1,312	1,312	1,816
34.00	2,060	263.0	1,800	3,112	2,807
34.50	2,326	270.0	1,096	4,207	3,132
35.00	2,593	277.0	1,229	5,437	3,466

Device	Routing	Invert	Outlet Devices
#1	Primary	33.90'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	34.60'	**15.0' long + 0.5 '/' SideZ x 3.0' 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 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=3.06 cfs @ 12.09 hrs HW=34.76' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.74 cfs @ 3.76 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 2.32 cfs @ 0.97 fps)

Pond 21S: Water Qualirty Basin



Summary for Pond 22SA: Water Quality Basin

Inflow Area = 0.863 ac, 84.39% Impervious, Inflow Depth > 3.50" for 5-yr event
Inflow = 3.65 cfs @ 12.04 hrs, Volume= 0.252 af
Outflow = 3.72 cfs @ 12.05 hrs, Volume= 0.252 af, Atten= 0%, Lag= 0.4 min
Primary = 3.72 cfs @ 12.05 hrs, Volume= 0.252 af
Routed to Pond 22SB : Underground 22

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Starting Elev= 37.40' Surf.Area= 1,393 sf Storage= 2,616 cf
Peak Elev= 37.46' @ 12.04 hrs Surf.Area= 1,404 sf Storage= 2,700 cf (83 cf above start)

Plug-Flow detention time= 171.5 min calculated for 0.192 af (76% of inflow)
Center-of-Mass det. time= 0.5 min (797.2 - 796.6)

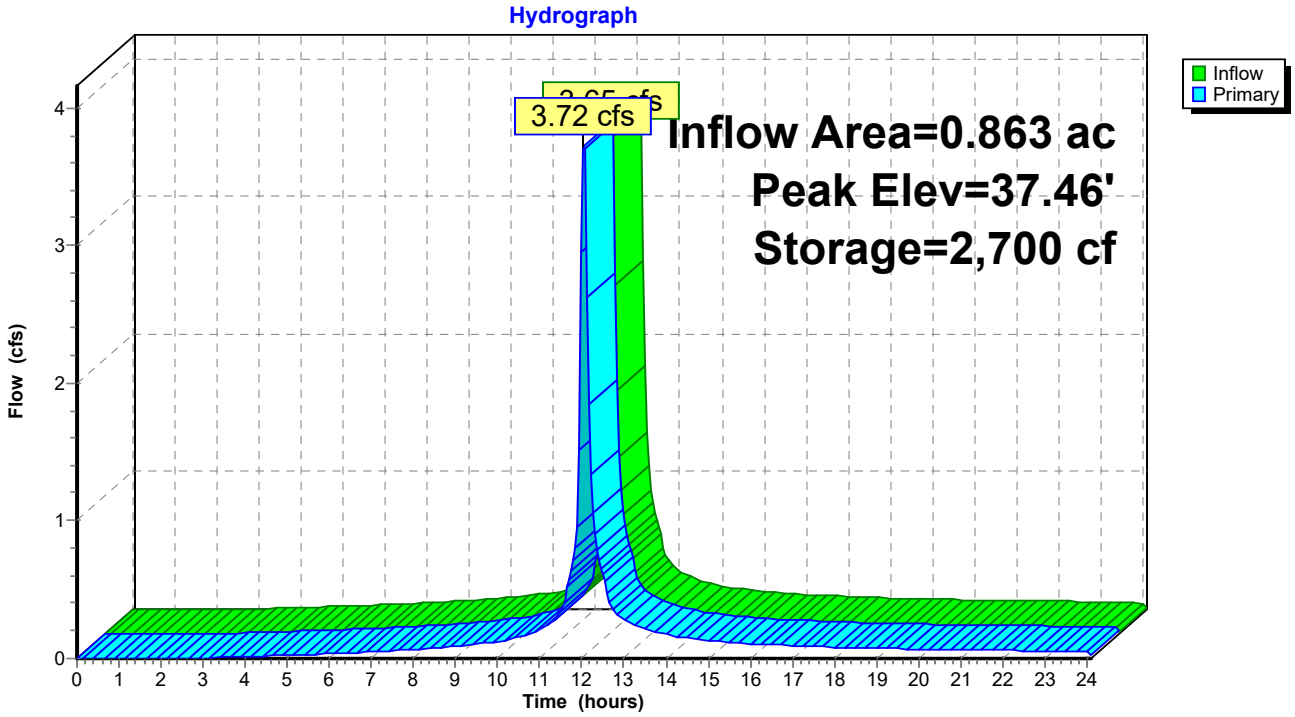
Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	2,756 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
35.00	596	262.0	0	0	596
36.00	1,134	275.0	851	851	1,213
37.50	1,412	281.0	1,906	2,756	1,707

Device	Routing	Invert	Outlet Devices
#1	Primary	37.40'	**2.4" x 4.0" Horiz. Orifice/Grate X 8.00 columns** X 9 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.59 cfs @ 12.05 hrs HW=37.46' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 3.59 cfs @ 0.79 fps)

Pond 22SA: Water Quality Basin



Summary for Pond 22SB: Underground 22

Inflow Area = 0.863 ac, 84.39% Impervious, Inflow Depth > 3.50" for 5-yr event
Inflow = 3.72 cfs @ 12.05 hrs, Volume= 0.252 af
Outflow = 0.16 cfs @ 14.31 hrs, Volume= 0.158 af, Atten= 96%, Lag= 136.0 min
Primary = 0.16 cfs @ 14.31 hrs, Volume= 0.158 af
Routed to Pond 21S : Water Qualirty Basin

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Peak Elev= 35.78' @ 14.31 hrs Surf.Area= 0.119 ac Storage= 0.135 af

Plug-Flow detention time= 321.9 min calculated for 0.158 af (63% of inflow)
Center-of-Mass det. time= 194.7 min (991.9 - 797.2)

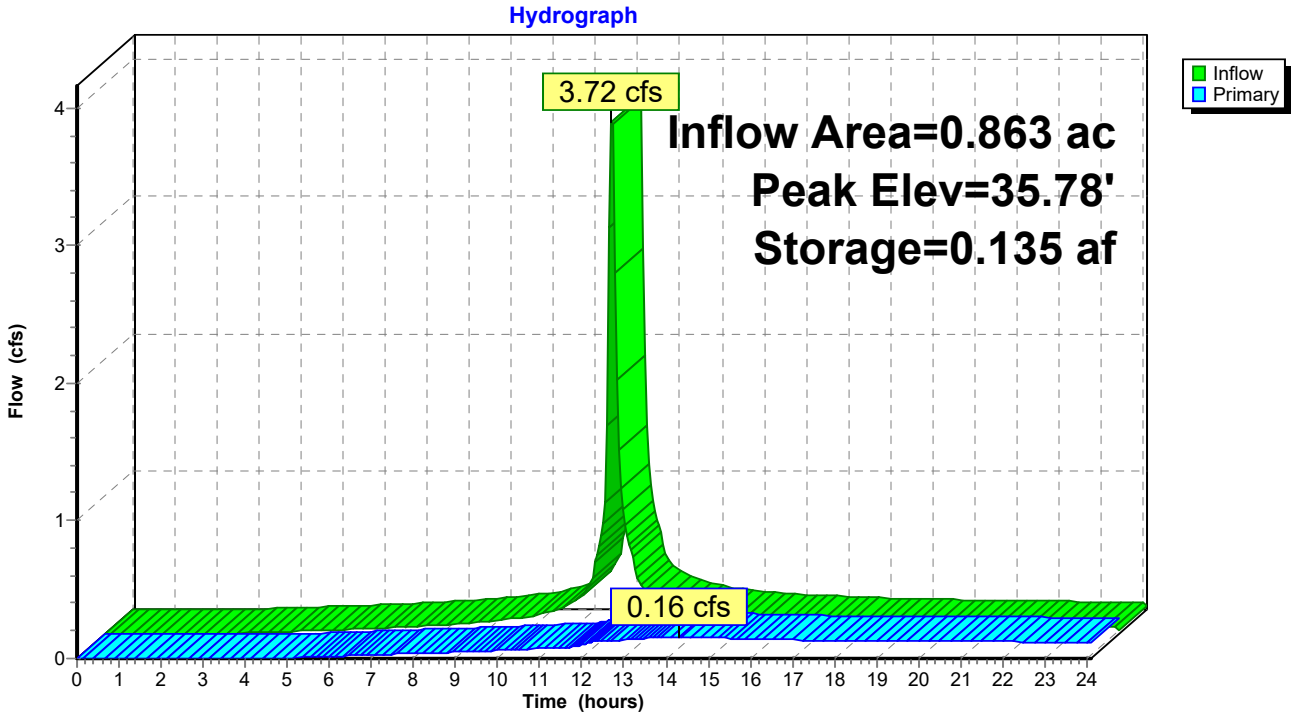
Volume	Invert	Avail.Storage	Storage Description
#1A	34.00'	0.080 af	**39.50'W x 131.78'L x 3.50'H Field A** 0.418 af Overall - 0.152 af Embedded = 0.266 af x 30.0% Voids
#2A	34.50'	0.152 af	**ADS_StormTech SC-740 +Cap** x 144 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 144 Chambers in 8 Rows
		0.232 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	35.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	36.90'	**4.0' long + 1.0 '/' SideZ 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

Primary OutFlow Max=0.16 cfs @ 14.31 hrs HW=35.78' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.14 cfs @ 6.27 fps)
- **2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 0.95 fps)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 22SB: Underground 22

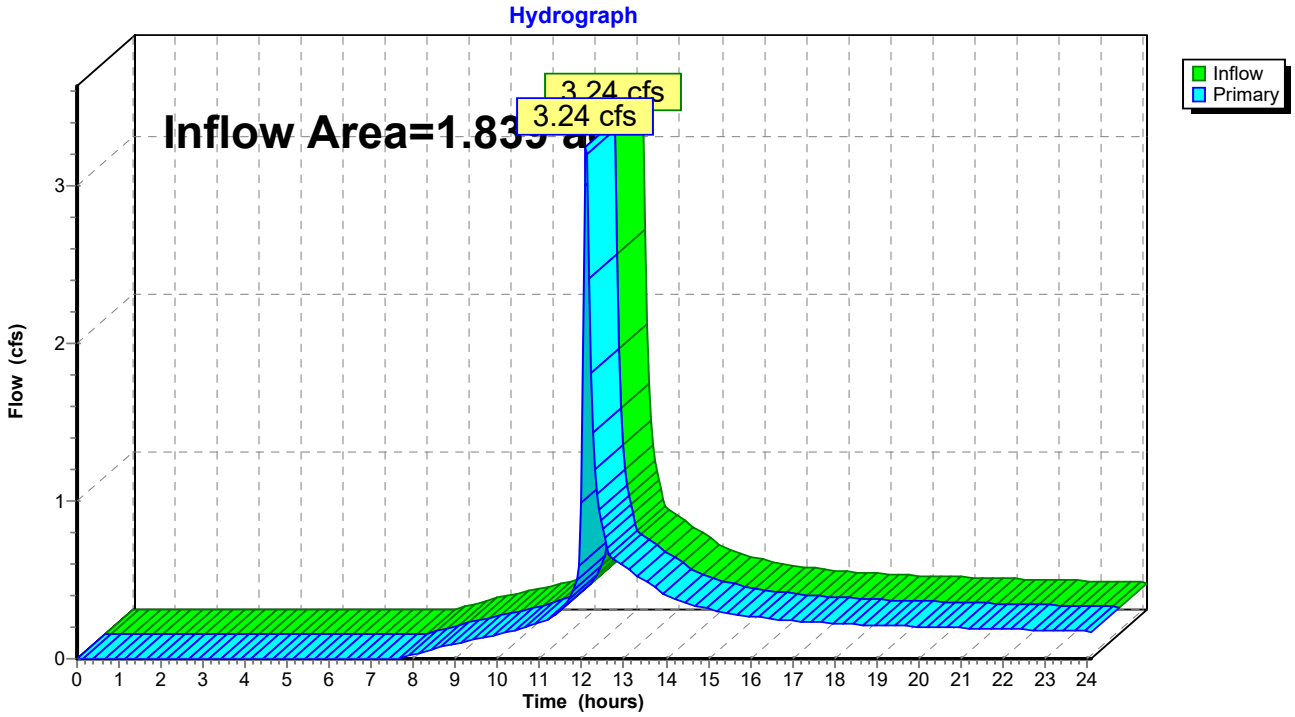


Summary for Link 30: Site

Inflow Area = 1.839 ac, 78.72% Impervious, Inflow Depth > 2.55" for 5-yr event
Inflow = 3.24 cfs @ 12.09 hrs, Volume= 0.390 af
Primary = 3.24 cfs @ 12.09 hrs, Volume= 0.390 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs

Link 30: Site



Time span=0.00-24.10 hrs, dt=0.05 hrs, 483 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 20: PRWS20 Runoff Area=5,280 sf 0.00% Impervious Runoff Depth>1.21"
Tc=6.0 min CN=57 Runoff=0.15 cfs 0.012 af

Subcatchment 21: PRWS 21 Runoff Area=37,225 sf 84.15% Impervious Runoff Depth>4.28"
Tc=6.0 min CN=92 Runoff=4.36 cfs 0.305 af

Subcatchment 22: PRWS 22 Runoff Area=37,595 sf 84.39% Impervious Runoff Depth>4.28"
Tc=6.0 min CN=92 Runoff=4.40 cfs 0.308 af

Pond 21S: Water Qualirty Basin Peak Elev=34.80' Storage=4,939 cf Inflow=4.47 cfs 0.509 af
Outflow=4.14 cfs 0.483 af

Pond 22SA: Water Quality Basin Peak Elev=37.47' Storage=2,711 cf Inflow=4.40 cfs 0.308 af
Outflow=4.46 cfs 0.308 af

Pond 22SB: Underground 22 Peak Elev=35.98' Storage=0.152 af Inflow=4.46 cfs 0.308 af
Outflow=0.35 cfs 0.204 af

Link 30: Site Inflow=4.29 cfs 0.496 af
Primary=4.29 cfs 0.496 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.625 af Average Runoff Depth = 4.08"
21.28% Pervious = 0.391 ac 78.72% Impervious = 1.447 ac

Summary for Subcatchment 20: PRWS20

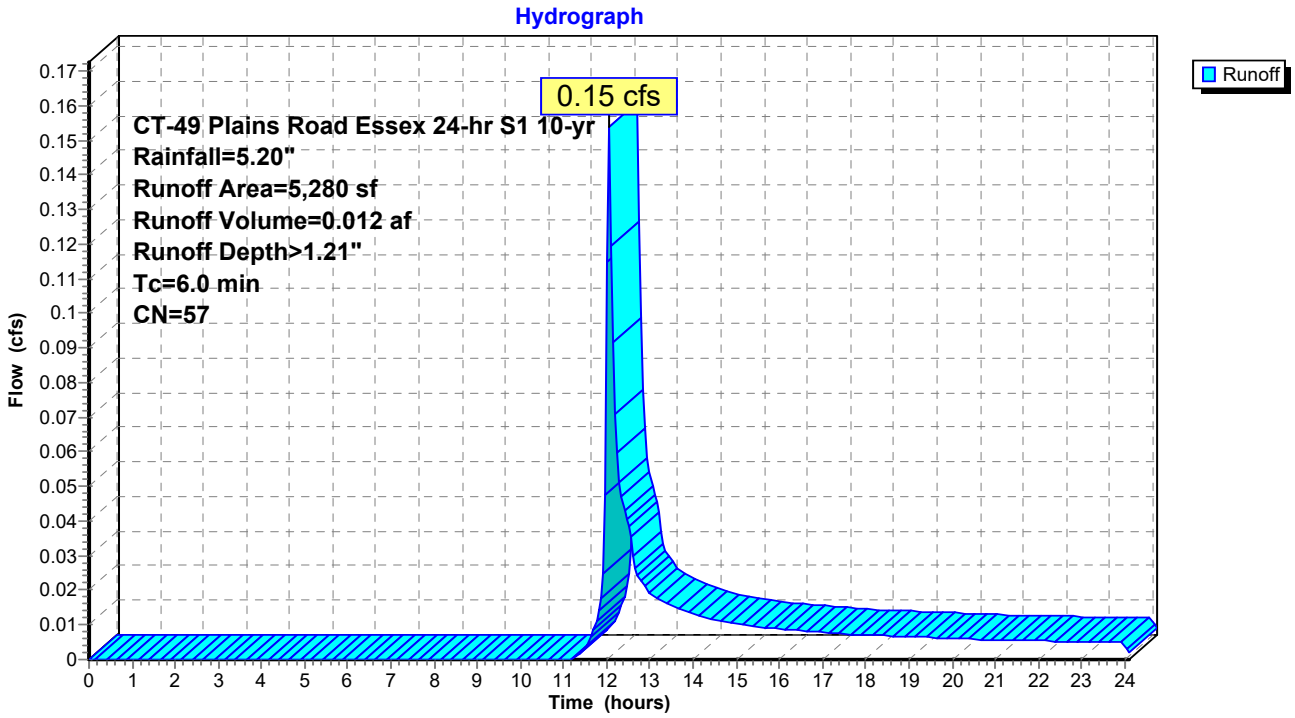
Runoff = 0.15 cfs @ 12.05 hrs, Volume= 0.012 af, Depth> 1.21"
Routed to Link 30 : Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"

Area (sf)	CN	Description
3,450	55	Woods, Good, HSG B
1,830	61	>75% Grass cover, Good, HSG B
5,280	57	Weighted Average
5,280		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Mln. TR-55 TC**

Subcatchment 20: PRWS20



Summary for Subcatchment 21: PRWS 21

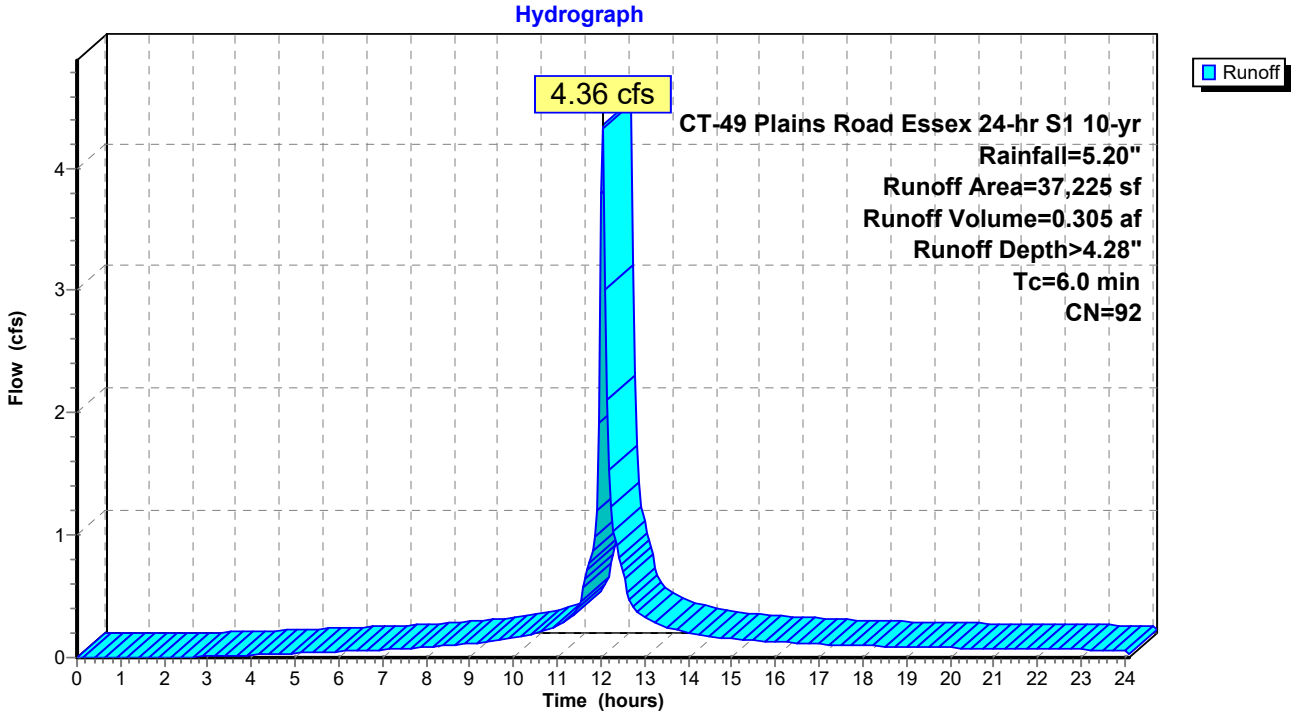
Runoff = 4.36 cfs @ 12.04 hrs, Volume= 0.305 af, Depth> 4.28"
Routed to Pond 21S : Water Qualirty Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"

Area (sf)	CN	Description
5,902	61	>75% Grass cover, Good, HSG B
28,970	98	Paved parking, HSG B
2,353	98	Roofs, HSG B
37,225	92	Weighted Average
5,902		15.85% Pervious Area
31,323		84.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 21: PRWS 21



Summary for Subcatchment 22: PRWS 22

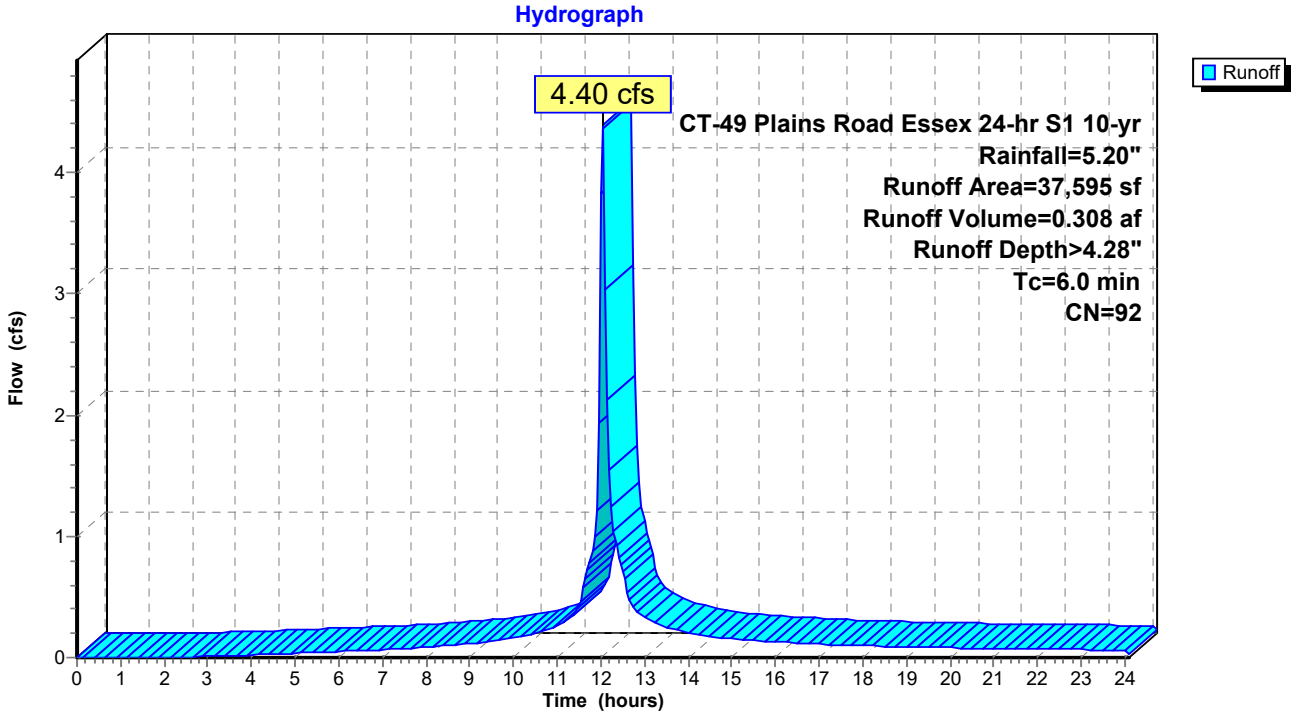
Runoff = 4.40 cfs @ 12.04 hrs, Volume= 0.308 af, Depth> 4.28"
Routed to Pond 22SA : Water Quality Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"

Area (sf)	CN	Description
5,867	61	>75% Grass cover, Good, HSG B
19,250	98	Paved parking, HSG B
12,478	98	Roofs, HSG B
37,595	92	Weighted Average
5,867		15.61% Pervious Area
31,728		84.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 22: PRWS 22



Summary for Pond 21S: Water Qualirty Basin

Inflow Area = 1.718 ac, 84.27% Impervious, Inflow Depth > 3.56" for 10-yr event
Inflow = 4.47 cfs @ 12.04 hrs, Volume= 0.509 af
Outflow = 4.14 cfs @ 12.07 hrs, Volume= 0.483 af, Atten= 8%, Lag= 1.8 min
Primary = 4.14 cfs @ 12.07 hrs, Volume= 0.483 af
Routed to Link 30 : Site

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Starting Elev= 33.60' Surf.Area= 1,848 sf Storage= 2,330 cf
Peak Elev= 34.80' @ 12.07 hrs Surf.Area= 2,487 sf Storage= 4,939 cf (2,608 cf above start)

Plug-Flow detention time= 157.2 min calculated for 0.430 af (84% of inflow)
Center-of-Mass det. time= 36.9 min (891.1 - 854.2)

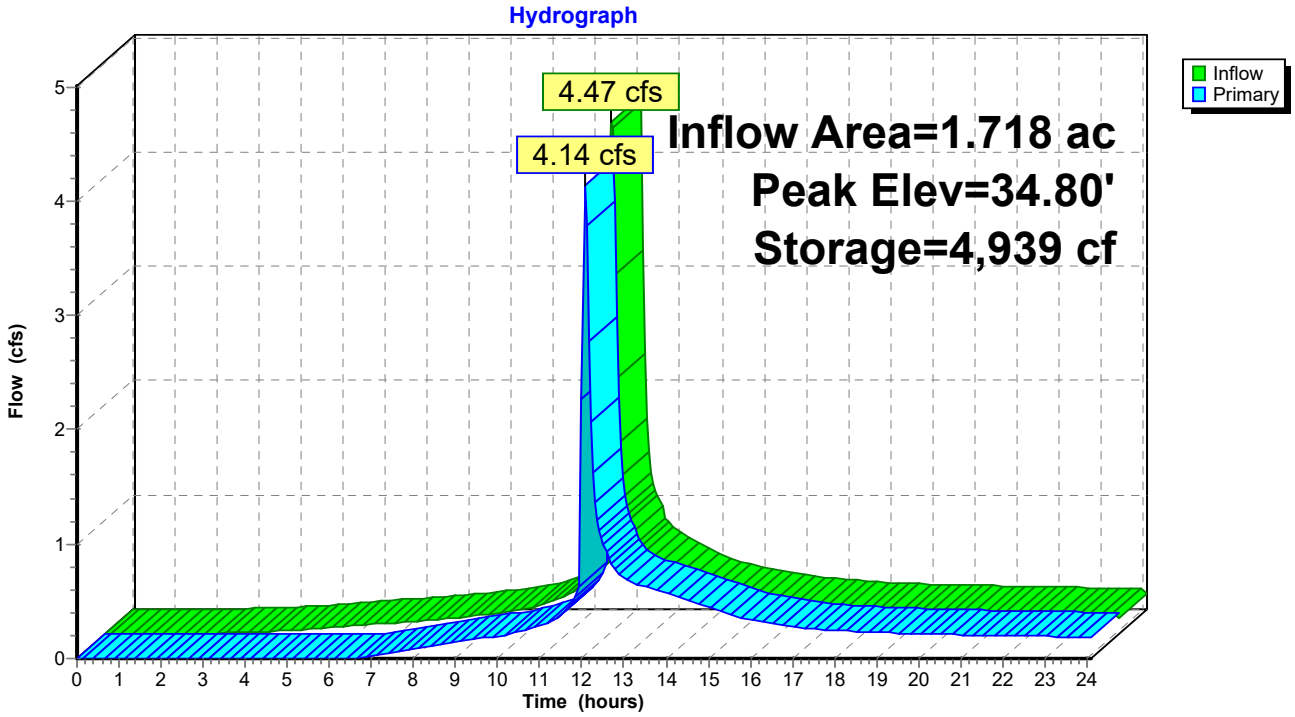
Volume	Invert	Avail.Storage	Storage Description
#1	32.00'	5,437 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
32.00	1,085	220.0	0	0	1,085
33.00	1,552	239.0	1,312	1,312	1,816
34.00	2,060	263.0	1,800	3,112	2,807
34.50	2,326	270.0	1,096	4,207	3,132
35.00	2,593	277.0	1,229	5,437	3,466

Device	Routing	Invert	Outlet Devices
#1	Primary	33.90'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	34.60'	**15.0' long + 0.5 '/' SideZ x 3.0' 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 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=3.90 cfs @ 12.07 hrs HW=34.79' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.76 cfs @ 3.86 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 3.14 cfs @ 1.07 fps)

Pond 21S: Water Qualirty Basin



Summary for Pond 22SA: Water Quality Basin

Inflow Area = 0.863 ac, 84.39% Impervious, Inflow Depth > 4.28" for 10-yr event
Inflow = 4.40 cfs @ 12.04 hrs, Volume= 0.308 af
Outflow = 4.46 cfs @ 12.04 hrs, Volume= 0.308 af, Atten= 0%, Lag= 0.3 min
Primary = 4.46 cfs @ 12.04 hrs, Volume= 0.308 af
Routed to Pond 22SB : Underground 22

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Starting Elev= 37.40' Surf.Area= 1,393 sf Storage= 2,616 cf
Peak Elev= 37.47' @ 12.04 hrs Surf.Area= 1,406 sf Storage= 2,711 cf (95 cf above start)

Plug-Flow detention time= 153.1 min calculated for 0.248 af (80% of inflow)
Center-of-Mass det. time= 0.5 min (790.5 - 790.0)

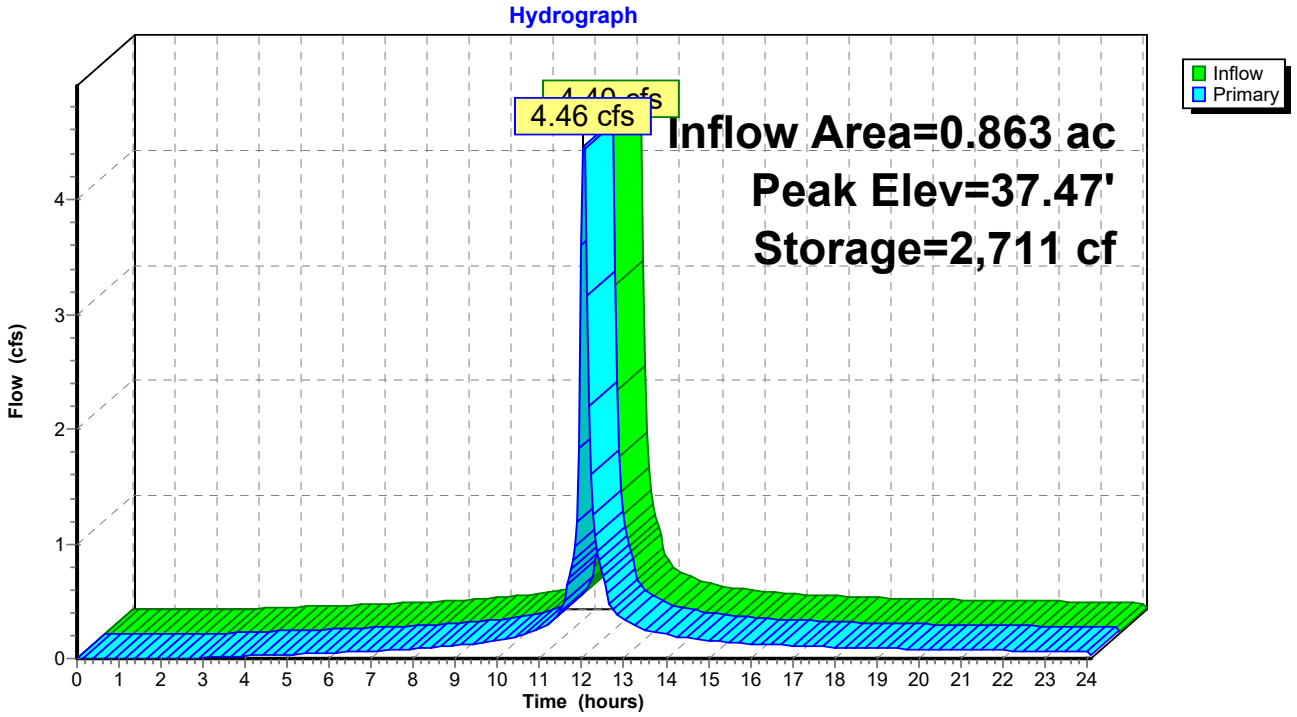
Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	2,756 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
35.00	596	262.0	0	0	596
36.00	1,134	275.0	851	851	1,213
37.50	1,412	281.0	1,906	2,756	1,707

Device	Routing	Invert	Outlet Devices
#1	Primary	37.40'	**2.4" x 4.0" Horiz. Orifice/Grate X 8.00 columns** X 9 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.31 cfs @ 12.04 hrs HW=37.47' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 4.31 cfs @ 0.84 fps)

Pond 22SA: Water Quality Basin



Summary for Pond 22SB: Underground 22

Inflow Area = 0.863 ac, 84.39% Impervious, Inflow Depth > 4.28" for 10-yr event
Inflow = 4.46 cfs @ 12.04 hrs, Volume= 0.308 af
Outflow = 0.35 cfs @ 12.93 hrs, Volume= 0.204 af, Atten= 92%, Lag= 52.9 min
Primary = 0.35 cfs @ 12.93 hrs, Volume= 0.204 af
Routed to Pond 21S : Water Qualirty Basin

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Peak Elev= 35.98' @ 12.93 hrs Surf.Area= 0.119 ac Storage= 0.152 af

Plug-Flow detention time= 281.9 min calculated for 0.204 af (66% of inflow)
Center-of-Mass det. time= 159.7 min (950.3 - 790.5)

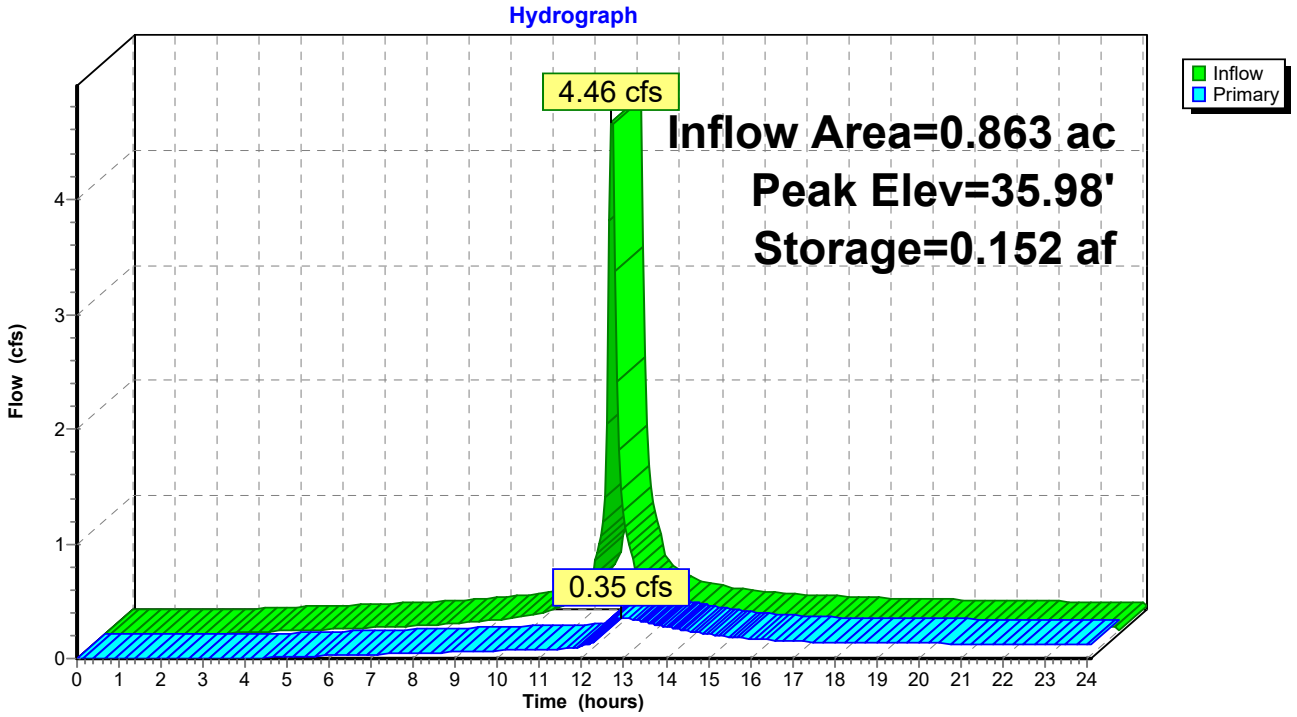
Volume	Invert	Avail.Storage	Storage Description
#1A	34.00'	0.080 af	**39.50'W x 131.78'L x 3.50'H Field A** 0.418 af Overall - 0.152 af Embedded = 0.266 af x 30.0% Voids
#2A	34.50'	0.152 af	**ADS_StormTech SC-740 +Cap** x 144 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 144 Chambers in 8 Rows
		0.232 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	35.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	36.90'	**4.0' long + 1.0 '/' SideZ 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

Primary OutFlow Max=0.35 cfs @ 12.93 hrs HW=35.98' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.14 cfs @ 6.64 fps)
—**2=Orifice/Grate** (Orifice Controls 0.21 cfs @ 1.81 fps)
—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 22SB: Underground 22

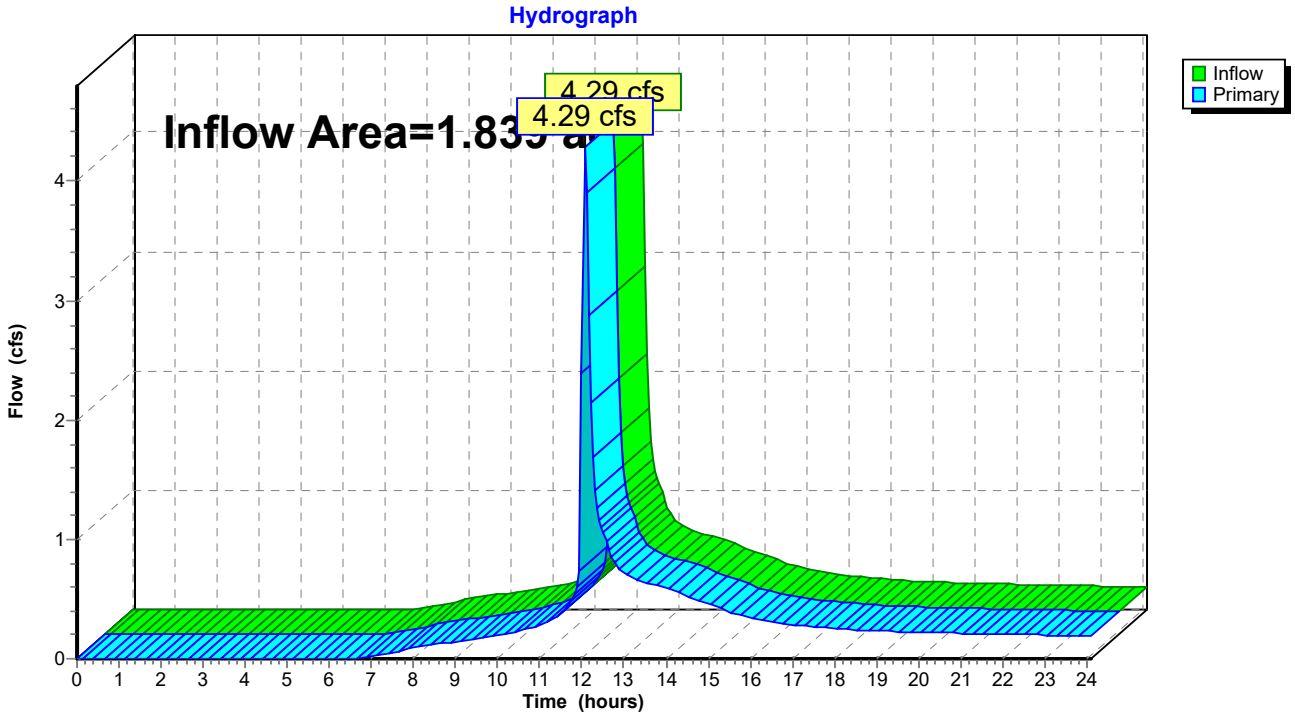


Summary for Link 30: Site

Inflow Area = 1.839 ac, 78.72% Impervious, Inflow Depth > 3.23" for 10-yr event
Inflow = 4.29 cfs @ 12.07 hrs, Volume= 0.496 af
Primary = 4.29 cfs @ 12.07 hrs, Volume= 0.496 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs

Link 30: Site



Time span=0.00-24.10 hrs, dt=0.05 hrs, 483 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 20: PRWS20 Runoff Area=5,280 sf 0.00% Impervious Runoff Depth>1.87"
Tc=6.0 min CN=57 Runoff=0.26 cfs 0.019 af

Subcatchment 21: PRWS 21 Runoff Area=37,225 sf 84.15% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=92 Runoff=5.37 cfs 0.383 af

Subcatchment 22: PRWS 22 Runoff Area=37,595 sf 84.39% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=92 Runoff=5.43 cfs 0.386 af

Pond 21S: Water Qualirty Basin Peak Elev=34.84' Storage=5,031 cf Inflow=5.50 cfs 0.655 af
Outflow=5.18 cfs 0.629 af

Pond 22SA: Water Quality Basin Peak Elev=37.48' Storage=2,726 cf Inflow=5.43 cfs 0.386 af
Outflow=5.48 cfs 0.386 af

Pond 22SB: Underground 22 Peak Elev=36.31' Storage=0.177 af Inflow=5.48 cfs 0.386 af
Outflow=0.72 cfs 0.272 af

Link 30: Site Inflow=5.43 cfs 0.648 af
Primary=5.43 cfs 0.648 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.788 af Average Runoff Depth = 5.14"
21.28% Pervious = 0.391 ac 78.72% Impervious = 1.447 ac

Summary for Subcatchment 20: PRWS20

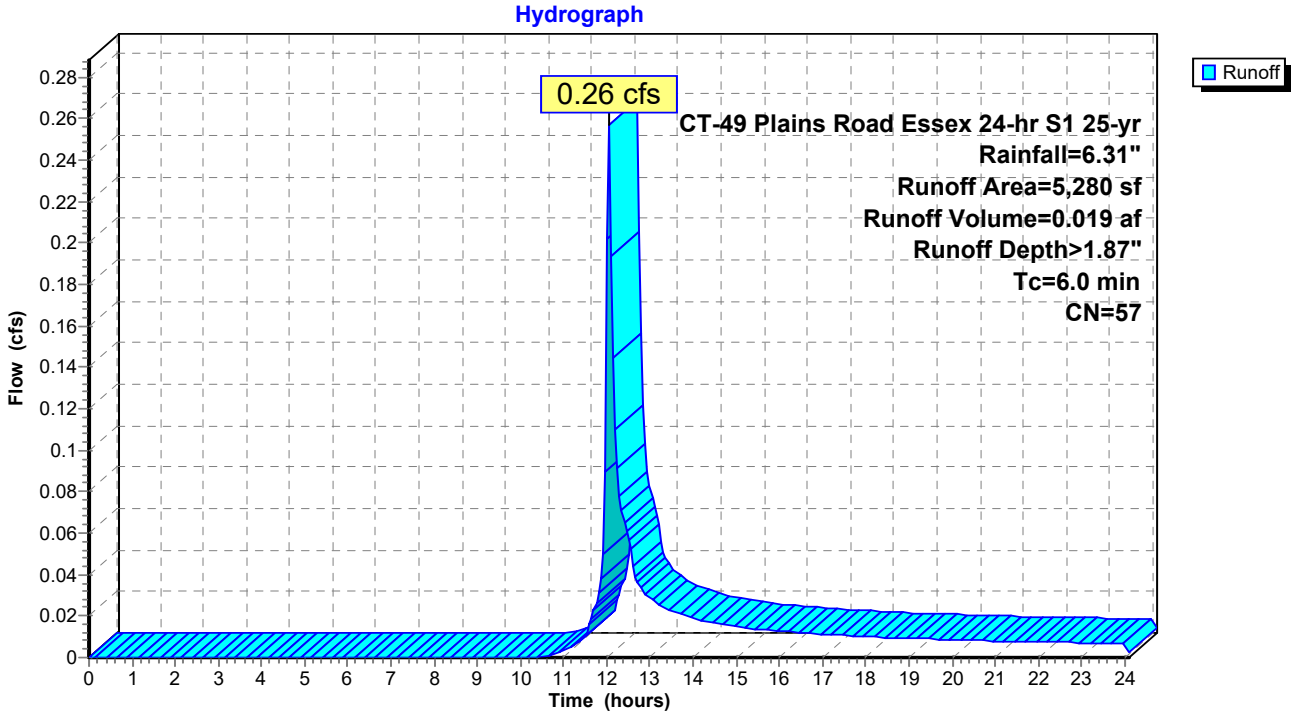
Runoff = 0.26 cfs @ 12.05 hrs, Volume= 0.019 af, Depth> 1.87"
Routed to Link 30 : Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"

Area (sf)	CN	Description
3,450	55	Woods, Good, HSG B
1,830	61	>75% Grass cover, Good, HSG B
5,280	57	Weighted Average
5,280		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 20: PRWS20



Summary for Subcatchment 21: PRWS 21

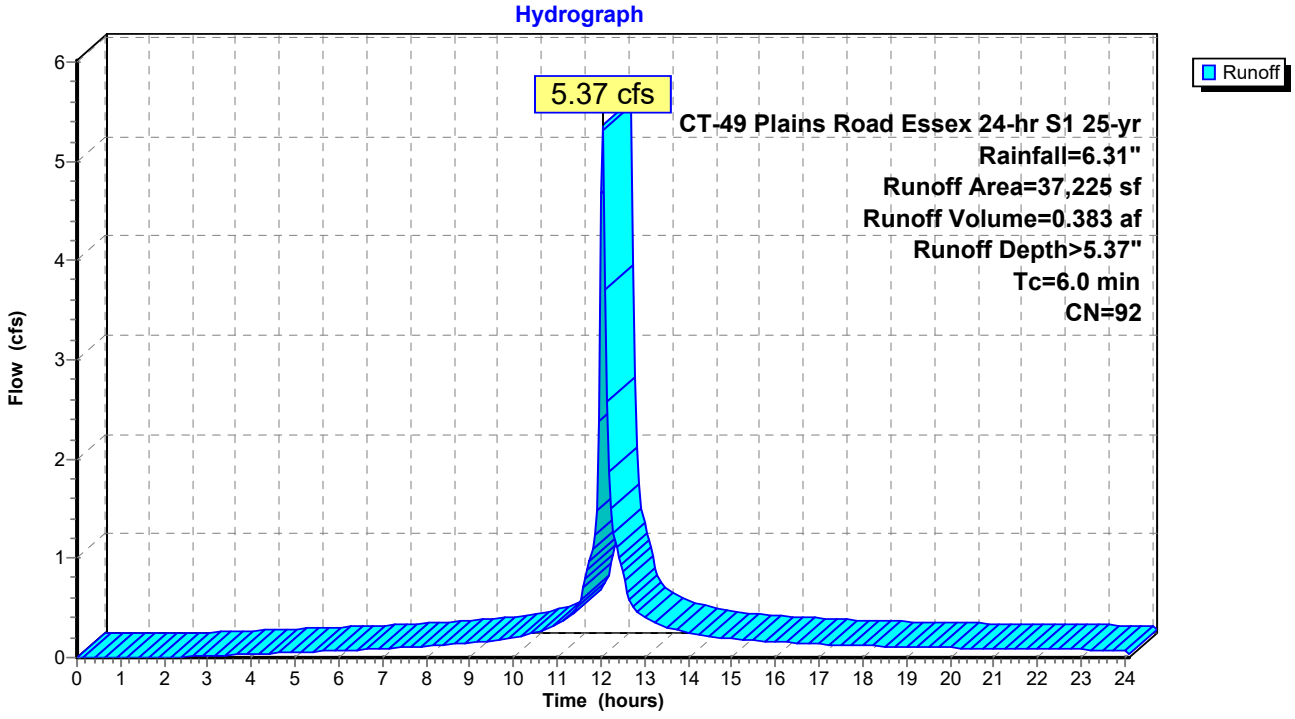
Runoff = 5.37 cfs @ 12.04 hrs, Volume= 0.383 af, Depth> 5.37"
Routed to Pond 21S : Water Qualirty Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"

Area (sf)	CN	Description
5,902	61	>75% Grass cover, Good, HSG B
28,970	98	Paved parking, HSG B
2,353	98	Roofs, HSG B
37,225	92	Weighted Average
5,902		15.85% Pervious Area
31,323		84.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 21: PRWS 21



Summary for Subcatchment 22: PRWS 22

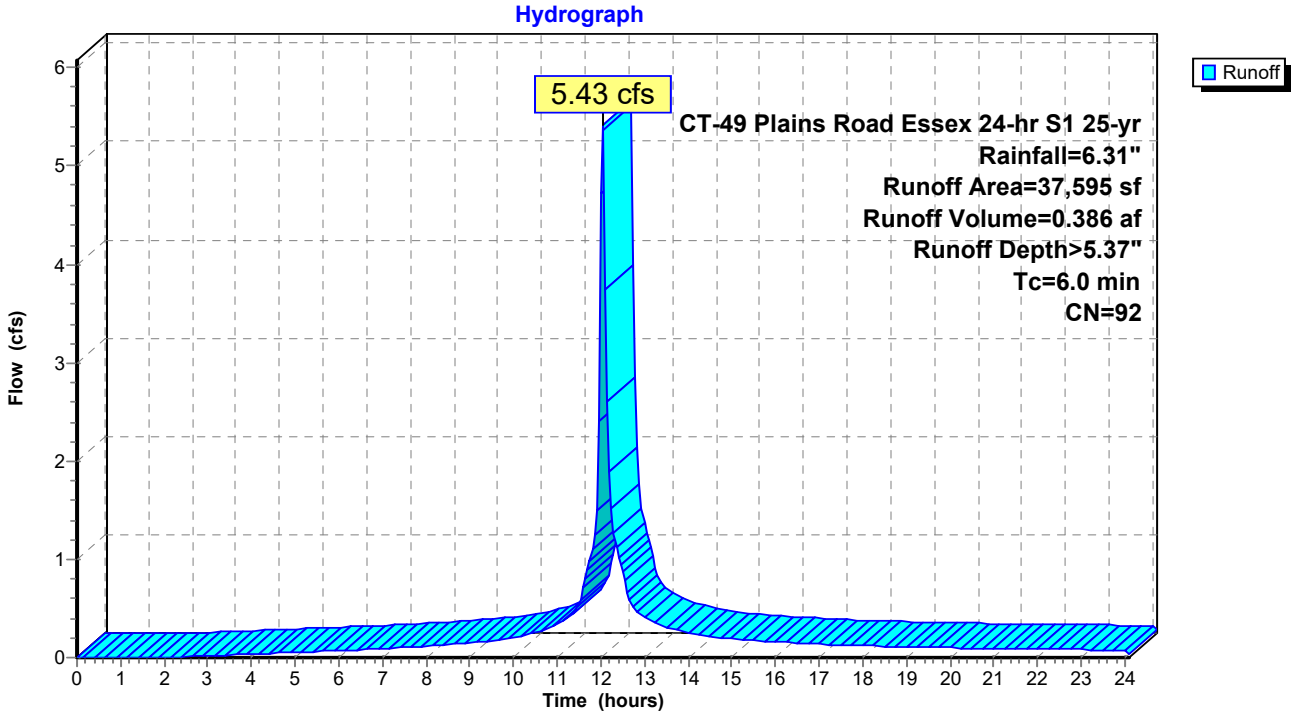
Runoff = 5.43 cfs @ 12.04 hrs, Volume= 0.386 af, Depth> 5.37"
Routed to Pond 22SA : Water Quality Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"

Area (sf)	CN	Description
5,867	61	>75% Grass cover, Good, HSG B
19,250	98	Paved parking, HSG B
12,478	98	Roofs, HSG B
37,595	92	Weighted Average
5,867		15.61% Pervious Area
31,728		84.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 22: PRWS 22



Summary for Pond 21S: Water Qualirty Basin

Inflow Area = 1.718 ac, 84.27% Impervious, Inflow Depth > 4.58" for 25-yr event
Inflow = 5.50 cfs @ 12.04 hrs, Volume= 0.655 af
Outflow = 5.18 cfs @ 12.07 hrs, Volume= 0.629 af, Atten= 6%, Lag= 1.5 min
Primary = 5.18 cfs @ 12.07 hrs, Volume= 0.629 af
Routed to Link 30 : Site

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Starting Elev= 33.60' Surf.Area= 1,848 sf Storage= 2,330 cf
Peak Elev= 34.84' @ 12.07 hrs Surf.Area= 2,506 sf Storage= 5,031 cf (2,701 cf above start)

Plug-Flow detention time= 130.1 min calculated for 0.574 af (88% of inflow)
Center-of-Mass det. time= 32.3 min (867.6 - 835.3)

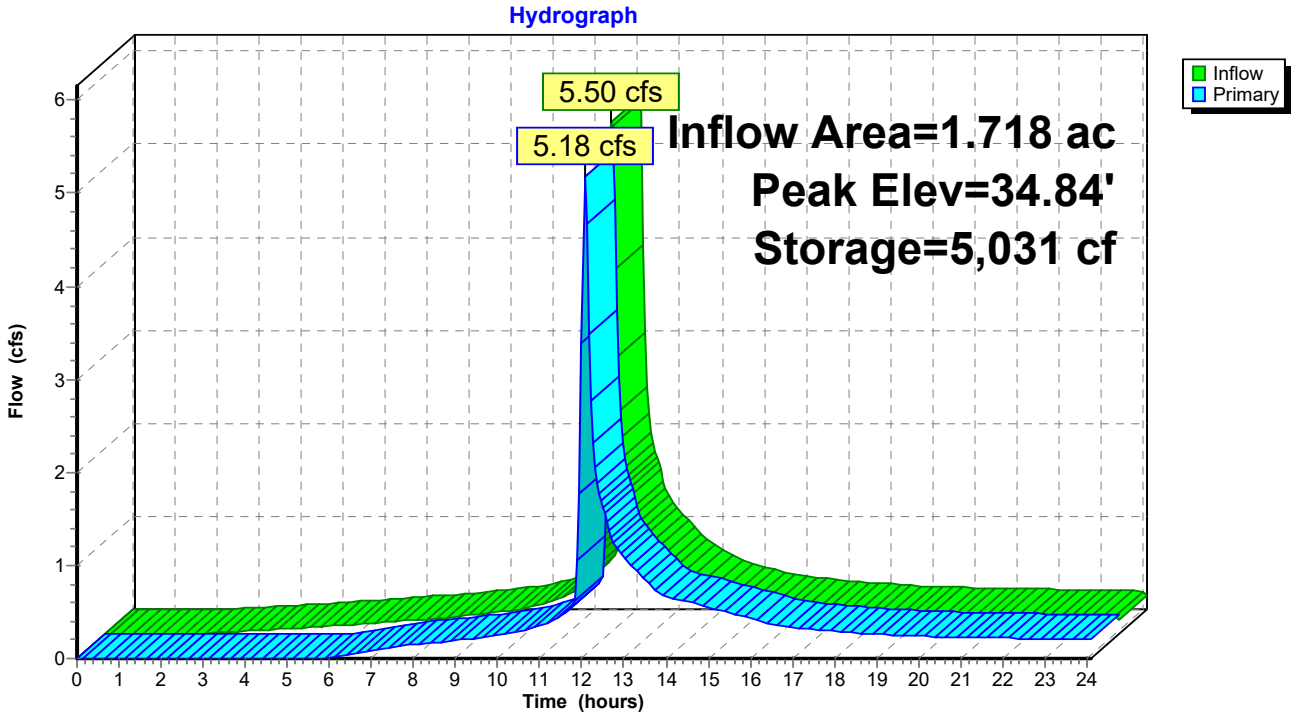
Volume	Invert	Avail.Storage	Storage Description
#1	32.00'	5,437 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
32.00	1,085	220.0	0	0	1,085
33.00	1,552	239.0	1,312	1,312	1,816
34.00	2,060	263.0	1,800	3,112	2,807
34.50	2,326	270.0	1,096	4,207	3,132
35.00	2,593	277.0	1,229	5,437	3,466

Device	Routing	Invert	Outlet Devices
#1	Primary	33.90'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	34.60'	**15.0' long + 0.5 '/' SideZ x 3.0' 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 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=4.95 cfs @ 12.07 hrs HW=34.83' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.78 cfs @ 3.98 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 4.17 cfs @ 1.19 fps)

Pond 21S: Water Qualirty Basin



Summary for Pond 22SA: Water Quality Basin

Inflow Area = 0.863 ac, 84.39% Impervious, Inflow Depth > 5.37" for 25-yr event
Inflow = 5.43 cfs @ 12.04 hrs, Volume= 0.386 af
Outflow = 5.48 cfs @ 12.04 hrs, Volume= 0.386 af, Atten= 0%, Lag= 0.3 min
Primary = 5.48 cfs @ 12.04 hrs, Volume= 0.386 af
Routed to Pond 22SB : Underground 22

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Starting Elev= 37.40' Surf.Area= 1,393 sf Storage= 2,616 cf
Peak Elev= 37.48' @ 12.04 hrs Surf.Area= 1,408 sf Storage= 2,726 cf (110 cf above start)

Plug-Flow detention time= 134.7 min calculated for 0.326 af (84% of inflow)
Center-of-Mass det. time= 0.5 min (783.3 - 782.8)

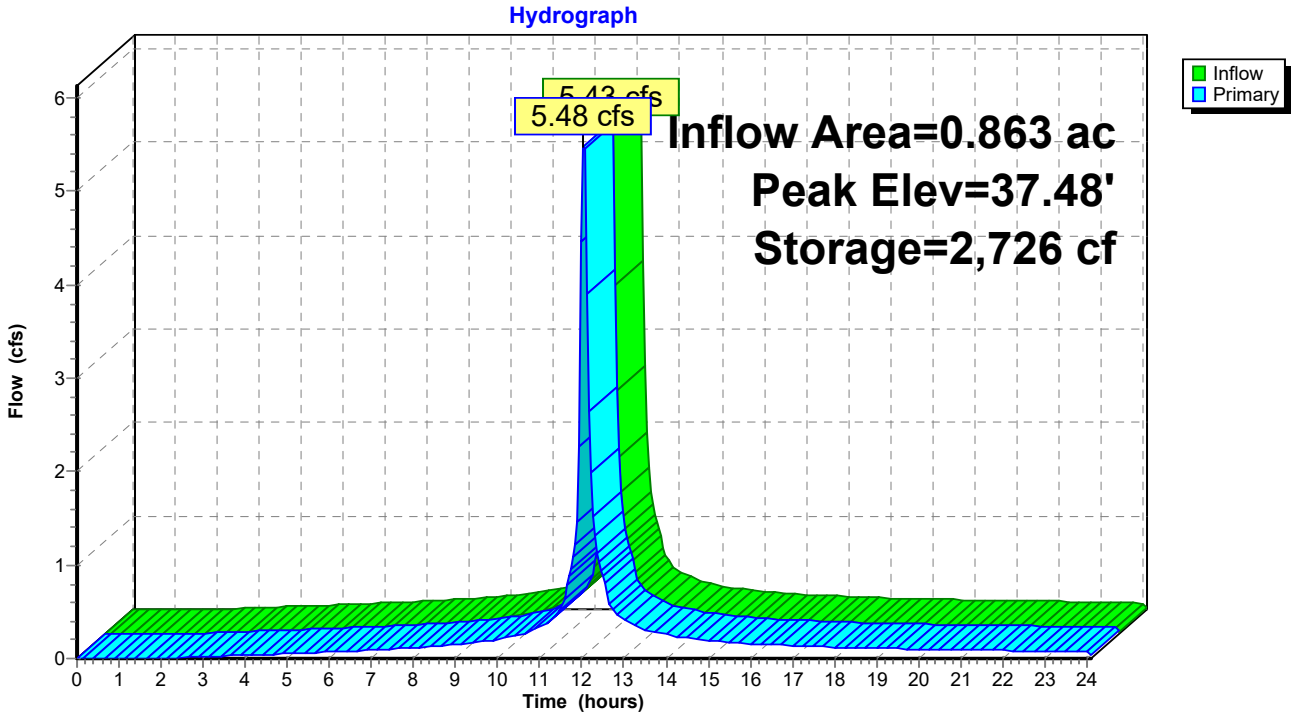
Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	2,756 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
35.00	596	262.0	0	0	596
36.00	1,134	275.0	851	851	1,213
37.50	1,412	281.0	1,906	2,756	1,707

Device	Routing	Invert	Outlet Devices
#1	Primary	37.40'	**2.4" x 4.0" Horiz. Orifice/Grate X 8.00 columns** X 9 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.40 cfs @ 12.04 hrs HW=37.48' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 5.40 cfs @ 0.91 fps)

Pond 22SA: Water Quality Basin



Summary for Pond 22SB: Underground 22

Inflow Area = 0.863 ac, 84.39% Impervious, Inflow Depth > 5.37" for 25-yr event
Inflow = 5.48 cfs @ 12.04 hrs, Volume= 0.386 af
Outflow = 0.72 cfs @ 12.59 hrs, Volume= 0.272 af, Atten= 87%, Lag= 32.5 min
Primary = 0.72 cfs @ 12.59 hrs, Volume= 0.272 af
Routed to Pond 21S : Water Qualirty Basin

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Peak Elev= 36.31' @ 12.59 hrs Surf.Area= 0.119 ac Storage= 0.177 af

Plug-Flow detention time= 240.0 min calculated for 0.272 af (70% of inflow)
Center-of-Mass det. time= 125.7 min (909.0 - 783.3)

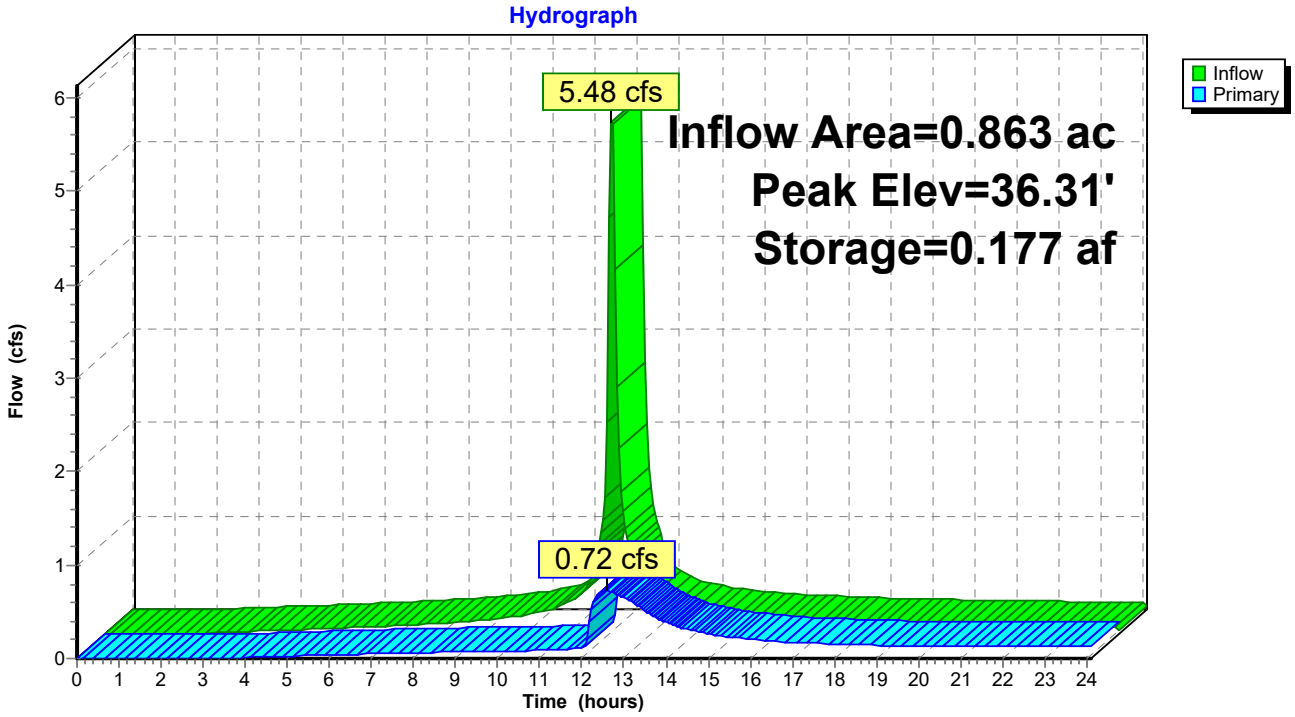
Volume	Invert	Avail.Storage	Storage Description
#1A	34.00'	0.080 af	**39.50'W x 131.78'L x 3.50'H Field A** 0.418 af Overall - 0.152 af Embedded = 0.266 af x 30.0% Voids
#2A	34.50'	0.152 af	**ADS_StormTech SC-740 +Cap** x 144 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 144 Chambers in 8 Rows
		0.232 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	35.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	36.90'	**4.0' long + 1.0 '/' SideZ 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

Primary OutFlow Max=0.72 cfs @ 12.59 hrs HW=36.31' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.16 cfs @ 7.19 fps)
- **2=Orifice/Grate** (Orifice Controls 0.57 cfs @ 2.89 fps)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 22SB: Underground 22

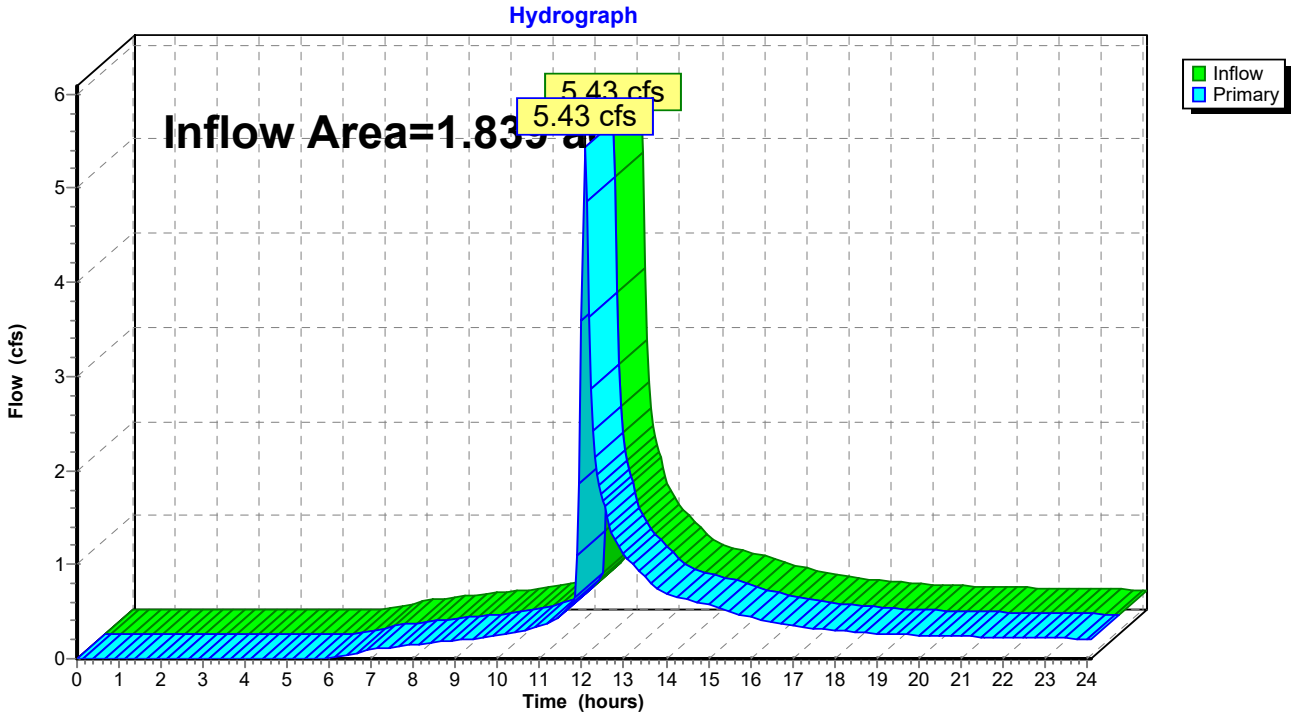


Summary for Link 30: Site

Inflow Area = 1.839 ac, 78.72% Impervious, Inflow Depth > 4.23" for 25-yr event
Inflow = 5.43 cfs @ 12.06 hrs, Volume= 0.648 af
Primary = 5.43 cfs @ 12.06 hrs, Volume= 0.648 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs

Link 30: Site



Time span=0.00-24.10 hrs, dt=0.05 hrs, 483 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 20: PRWS20 Runoff Area=5,280 sf 0.00% Impervious Runoff Depth>2.40"
Tc=6.0 min CN=57 Runoff=0.34 cfs 0.024 af

Subcatchment 21: PRWS 21 Runoff Area=37,225 sf 84.15% Impervious Runoff Depth>6.18"
Tc=6.0 min CN=92 Runoff=6.13 cfs 0.440 af

Subcatchment 22: PRWS 22 Runoff Area=37,595 sf 84.39% Impervious Runoff Depth>6.18"
Tc=6.0 min CN=92 Runoff=6.19 cfs 0.445 af

Pond 21S: Water Qualirty Basin Peak Elev=34.87' Storage=5,104 cf Inflow=6.35 cfs 0.765 af
Outflow=6.06 cfs 0.738 af

Pond 22SA: Water Quality Basin Peak Elev=37.49' Storage=2,739 cf Inflow=6.19 cfs 0.445 af
Outflow=6.23 cfs 0.445 af

Pond 22SB: Underground 22 Peak Elev=36.65' Storage=0.198 af Inflow=6.23 cfs 0.445 af
Outflow=0.96 cfs 0.325 af

Link 30: Site Inflow=6.39 cfs 0.763 af
Primary=6.39 cfs 0.763 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.909 af Average Runoff Depth = 5.93"
21.28% Pervious = 0.391 ac 78.72% Impervious = 1.447 ac

Summary for Subcatchment 20: PRWS20

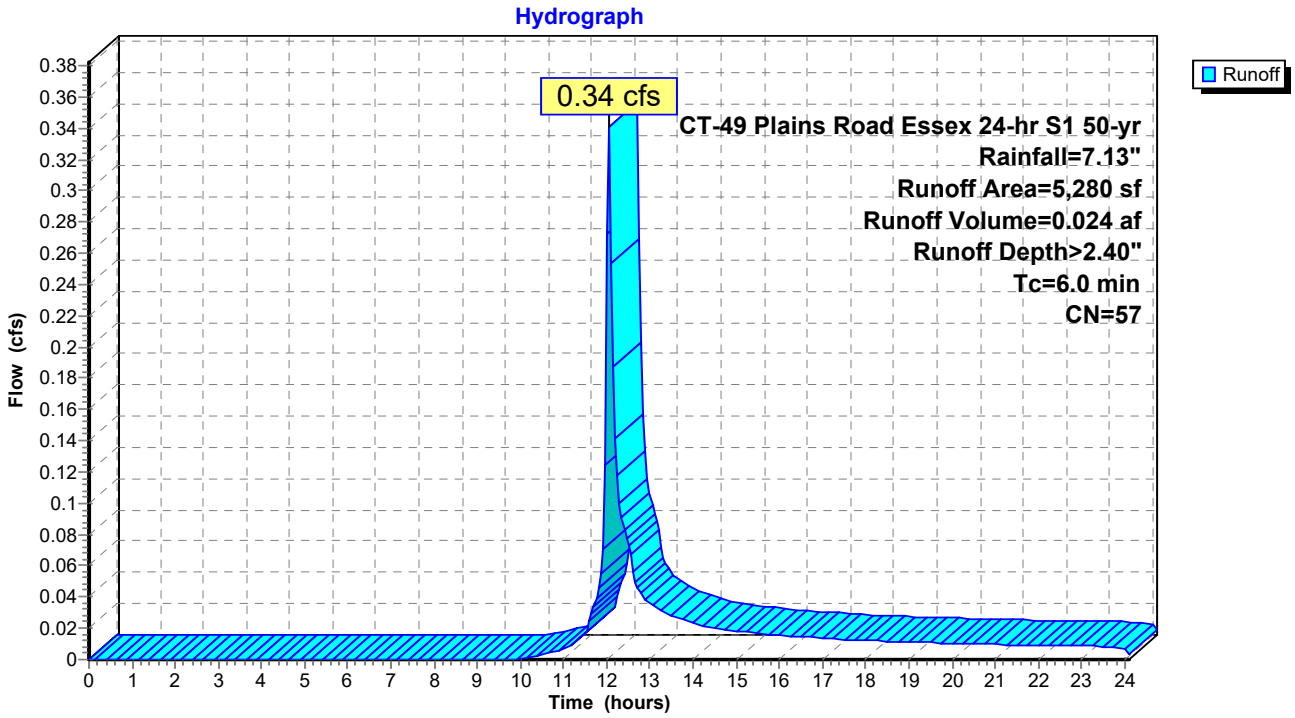
Runoff = 0.34 cfs @ 12.05 hrs, Volume= 0.024 af, Depth> 2.40"
Routed to Link 30 : Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"

Area (sf)	CN	Description
3,450	55	Woods, Good, HSG B
1,830	61	>75% Grass cover, Good, HSG B
5,280	57	Weighted Average
5,280		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 20: PRWS20



Summary for Subcatchment 21: PRWS 21

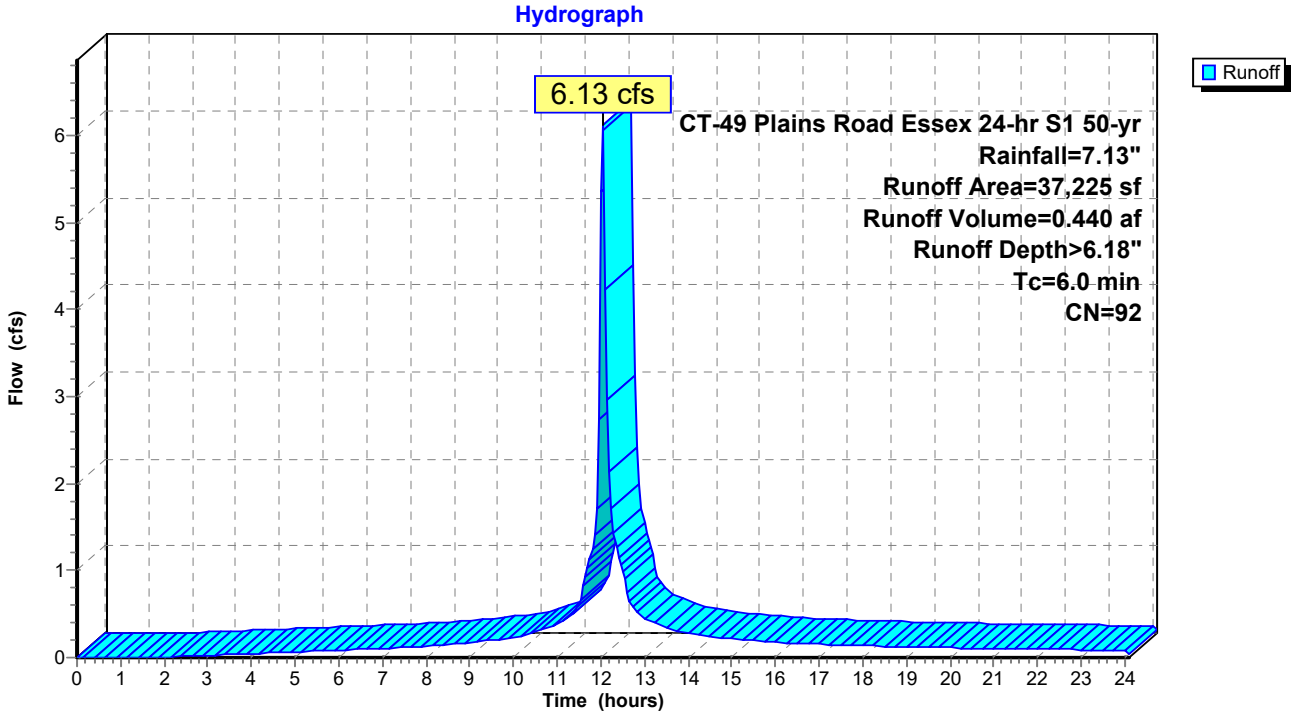
Runoff = 6.13 cfs @ 12.04 hrs, Volume= 0.440 af, Depth> 6.18"
Routed to Pond 21S : Water Qualirty Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"

Area (sf)	CN	Description
5,902	61	>75% Grass cover, Good, HSG B
28,970	98	Paved parking, HSG B
2,353	98	Roofs, HSG B
37,225	92	Weighted Average
5,902		15.85% Pervious Area
31,323		84.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 21: PRWS 21



Summary for Subcatchment 22: PRWS 22

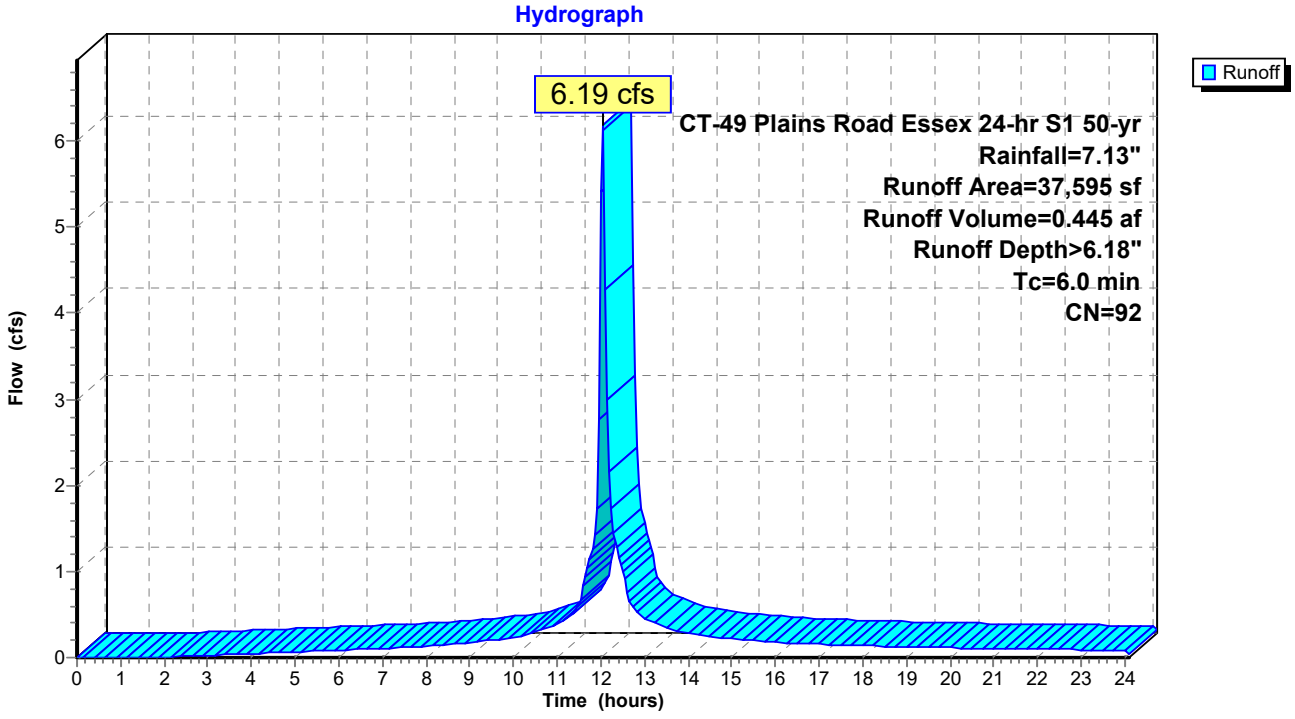
Runoff = 6.19 cfs @ 12.04 hrs, Volume= 0.445 af, Depth> 6.18"
Routed to Pond 22SA : Water Quality Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"

Area (sf)	CN	Description
5,867	61	>75% Grass cover, Good, HSG B
19,250	98	Paved parking, HSG B
12,478	98	Roofs, HSG B
37,595	92	Weighted Average
5,867		15.61% Pervious Area
31,728		84.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 22: PRWS 22



Summary for Pond 21S: Water Qualirty Basin

Inflow Area = 1.718 ac, 84.27% Impervious, Inflow Depth > 5.35" for 50-yr event
Inflow = 6.35 cfs @ 12.04 hrs, Volume= 0.765 af
Outflow = 6.06 cfs @ 12.07 hrs, Volume= 0.738 af, Atten= 5%, Lag= 1.4 min
Primary = 6.06 cfs @ 12.07 hrs, Volume= 0.738 af
Routed to Link 30 : Site

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Starting Elev= 33.60' Surf.Area= 1,848 sf Storage= 2,330 cf
Peak Elev= 34.87' @ 12.07 hrs Surf.Area= 2,522 sf Storage= 5,104 cf (2,774 cf above start)

Plug-Flow detention time= 116.1 min calculated for 0.685 af (89% of inflow)
Center-of-Mass det. time= 29.7 min (855.9 - 826.3)

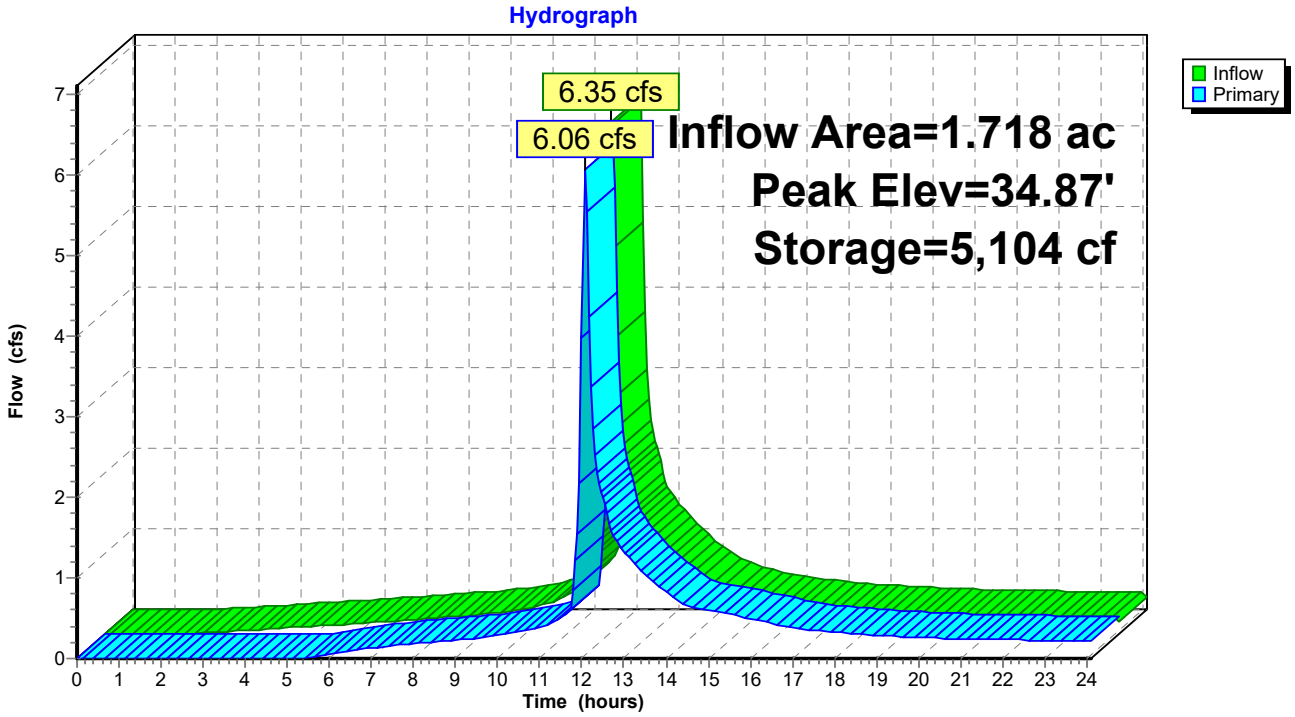
Volume	Invert	Avail.Storage	Storage Description
#1	32.00'	5,437 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
32.00	1,085	220.0	0	0	1,085
33.00	1,552	239.0	1,312	1,312	1,816
34.00	2,060	263.0	1,800	3,112	2,807
34.50	2,326	270.0	1,096	4,207	3,132
35.00	2,593	277.0	1,229	5,437	3,466

Device	Routing	Invert	Outlet Devices
#1	Primary	33.90'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	34.60'	**15.0' long + 0.5 '/' SideZ x 3.0' 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 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=5.80 cfs @ 12.07 hrs HW=34.86' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.80 cfs @ 4.06 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 5.00 cfs @ 1.27 fps)

Pond 21S: Water Qualirty Basin



Summary for Pond 22SA: Water Quality Basin

Inflow Area = 0.863 ac, 84.39% Impervious, Inflow Depth > 6.18" for 50-yr event
Inflow = 6.19 cfs @ 12.04 hrs, Volume= 0.445 af
Outflow = 6.23 cfs @ 12.04 hrs, Volume= 0.445 af, Atten= 0%, Lag= 0.3 min
Primary = 6.23 cfs @ 12.04 hrs, Volume= 0.445 af
Routed to Pond 22SB : Underground 22

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Starting Elev= 37.40' Surf.Area= 1,393 sf Storage= 2,616 cf
Peak Elev= 37.49' @ 12.04 hrs Surf.Area= 1,410 sf Storage= 2,739 cf (122 cf above start)

Plug-Flow detention time= 123.5 min calculated for 0.384 af (86% of inflow)
Center-of-Mass det. time= 0.5 min (778.9 - 778.4)

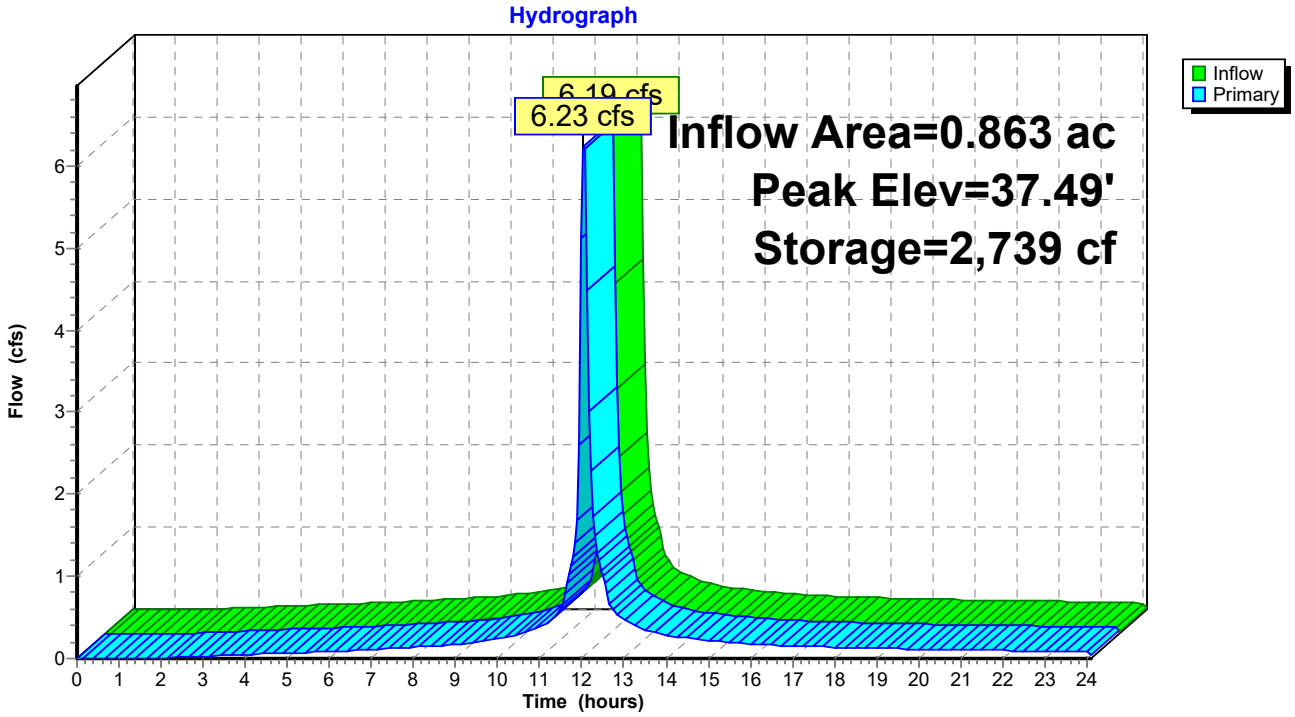
Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	2,756 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
35.00	596	262.0	0	0	596
36.00	1,134	275.0	851	851	1,213
37.50	1,412	281.0	1,906	2,756	1,707

Device	Routing	Invert	Outlet Devices
#1	Primary	37.40'	**2.4" x 4.0" Horiz. Orifice/Grate X 8.00 columns** X 9 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.31 cfs @ 12.04 hrs HW=37.49' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 6.31 cfs @ 0.96 fps)

Pond 22SA: Water Quality Basin



Summary for Pond 22SB: Underground 22

Inflow Area = 0.863 ac, 84.39% Impervious, Inflow Depth > 6.18" for 50-yr event
Inflow = 6.23 cfs @ 12.04 hrs, Volume= 0.445 af
Outflow = 0.96 cfs @ 12.53 hrs, Volume= 0.325 af, Atten= 85%, Lag= 29.0 min
Primary = 0.96 cfs @ 12.53 hrs, Volume= 0.325 af
Routed to Pond 21S : Water Qualirty Basin

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Peak Elev= 36.65' @ 12.53 hrs Surf.Area= 0.119 ac Storage= 0.198 af

Plug-Flow detention time= 221.1 min calculated for 0.324 af (73% of inflow)
Center-of-Mass det. time= 112.1 min (891.1 - 778.9)

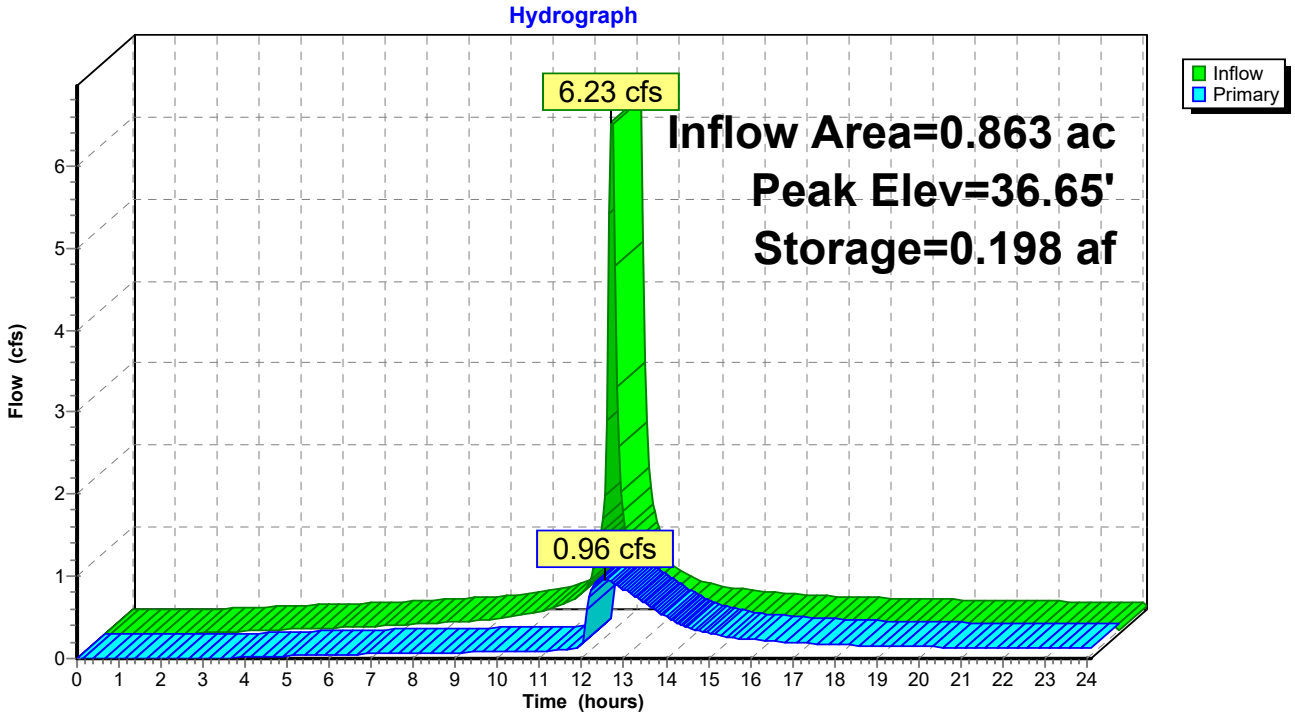
Volume	Invert	Avail.Storage	Storage Description
#1A	34.00'	0.080 af	**39.50'W x 131.78'L x 3.50'H Field A** 0.418 af Overall - 0.152 af Embedded = 0.266 af x 30.0% Voids
#2A	34.50'	0.152 af	**ADS_StormTech SC-740 +Cap** x 144 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 144 Chambers in 8 Rows
		0.232 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	35.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	36.90'	**4.0' long + 1.0 '/' SideZ 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

Primary OutFlow Max=0.96 cfs @ 12.53 hrs HW=36.65' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.17 cfs @ 7.71 fps)
- **2=Orifice/Grate** (Orifice Controls 0.79 cfs @ 4.02 fps)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 22SB: Underground 22

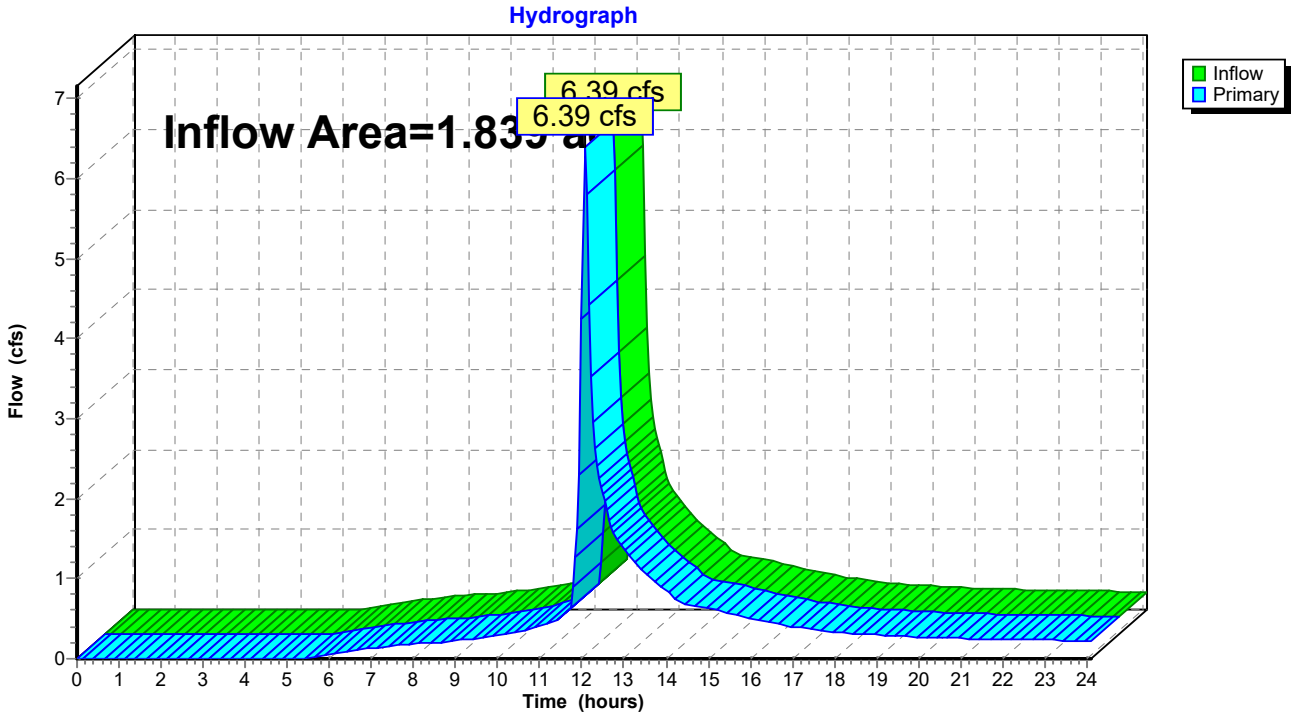


Summary for Link 30: Site

Inflow Area = 1.839 ac, 78.72% Impervious, Inflow Depth > 4.98" for 50-yr event
Inflow = 6.39 cfs @ 12.07 hrs, Volume= 0.763 af
Primary = 6.39 cfs @ 12.07 hrs, Volume= 0.763 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs

Link 30: Site



Time span=0.00-24.10 hrs, dt=0.05 hrs, 483 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 20: PRWS20 Runoff Area=5,280 sf 0.00% Impervious Runoff Depth>3.01"
Tc=6.0 min CN=57 Runoff=0.44 cfs 0.030 af

Subcatchment 21: PRWS 21 Runoff Area=37,225 sf 84.15% Impervious Runoff Depth>7.05"
Tc=6.0 min CN=92 Runoff=6.92 cfs 0.502 af

Subcatchment 22: PRWS 22 Runoff Area=37,595 sf 84.39% Impervious Runoff Depth>7.05"
Tc=6.0 min CN=92 Runoff=6.99 cfs 0.507 af

Pond 21S: Water Qualirty Basin Peak Elev=34.90' Storage=5,189 cf Inflow=7.50 cfs 0.885 af
Outflow=7.16 cfs 0.857 af

Pond 22SA: Water Quality Basin Peak Elev=37.50' Storage=2,752 cf Inflow=6.99 cfs 0.507 af
Outflow=7.03 cfs 0.507 af

Pond 22SB: Underground 22 Peak Elev=37.04' Storage=0.215 af Inflow=7.03 cfs 0.507 af
Outflow=1.78 cfs 0.382 af

Link 30: Site Inflow=7.58 cfs 0.888 af
Primary=7.58 cfs 0.888 af

Total Runoff Area = 1.839 ac Runoff Volume = 1.040 af Average Runoff Depth = 6.79"
21.28% Pervious = 0.391 ac 78.72% Impervious = 1.447 ac

Summary for Subcatchment 20: PRWS20

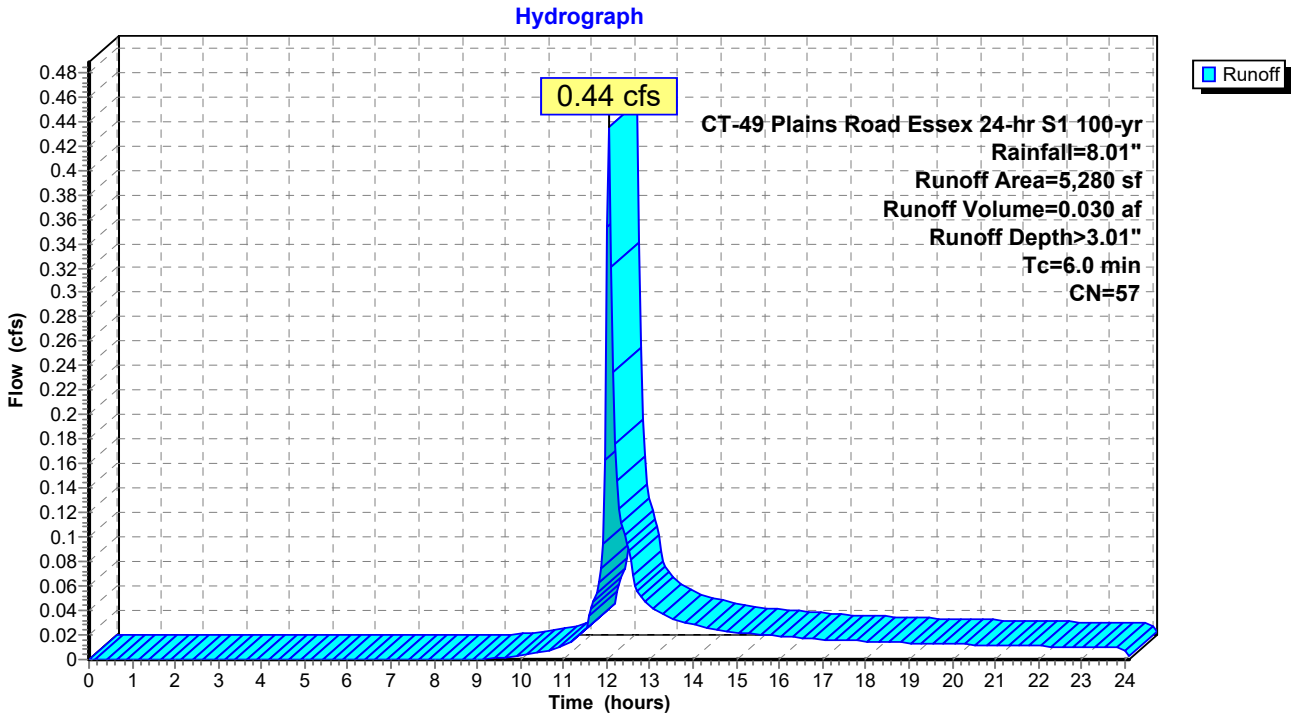
Runoff = 0.44 cfs @ 12.05 hrs, Volume= 0.030 af, Depth> 3.01"
Routed to Link 30 : Site

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"

Area (sf)	CN	Description
3,450	55	Woods, Good, HSG B
1,830	61	>75% Grass cover, Good, HSG B
5,280	57	Weighted Average
5,280		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 20: PRWS20



Summary for Subcatchment 21: PRWS 21

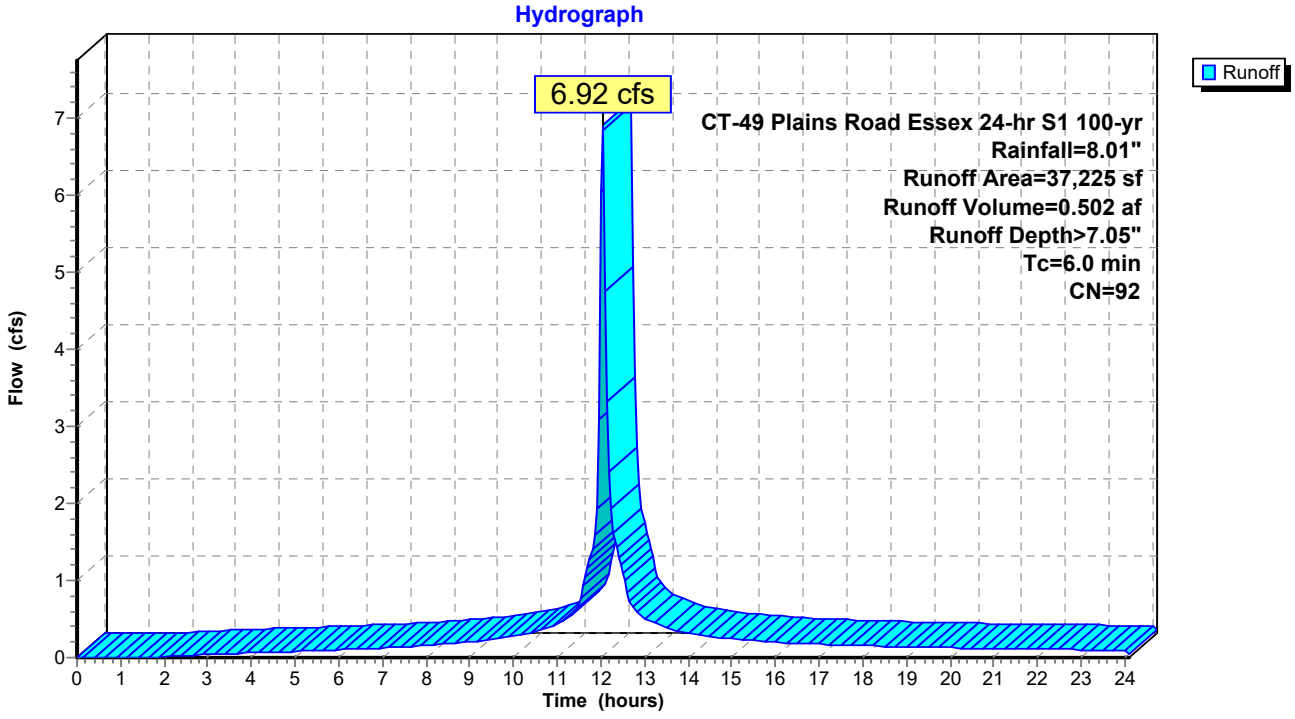
Runoff = 6.92 cfs @ 12.04 hrs, Volume= 0.502 af, Depth> 7.05"
Routed to Pond 21S : Water Qualirty Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"

Area (sf)	CN	Description
5,902	61	>75% Grass cover, Good, HSG B
28,970	98	Paved parking, HSG B
2,353	98	Roofs, HSG B
37,225	92	Weighted Average
5,902		15.85% Pervious Area
31,323		84.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 21: PRWS 21



Summary for Subcatchment 22: PRWS 22

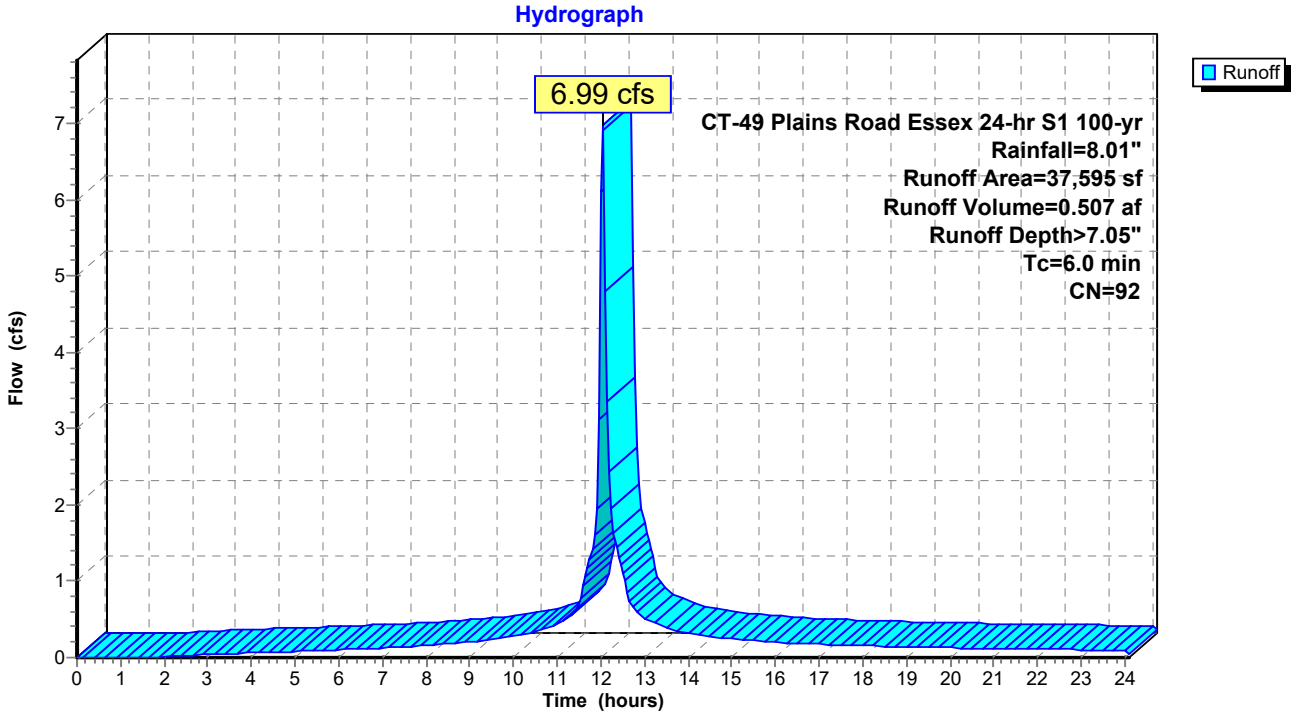
Runoff = 6.99 cfs @ 12.04 hrs, Volume= 0.507 af, Depth> 7.05"
Routed to Pond 22SA : Water Quality Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"

Area (sf)	CN	Description
5,867	61	>75% Grass cover, Good, HSG B
19,250	98	Paved parking, HSG B
12,478	98	Roofs, HSG B
37,595	92	Weighted Average
5,867		15.61% Pervious Area
31,728		84.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TR-55 TC**

Subcatchment 22: PRWS 22



Summary for Pond 21S: Water Qualirty Basin

Inflow Area = 1.718 ac, 84.27% Impervious, Inflow Depth > 6.18" for 100-yr event
Inflow = 7.50 cfs @ 12.04 hrs, Volume= 0.885 af
Outflow = 7.16 cfs @ 12.07 hrs, Volume= 0.857 af, Atten= 5%, Lag= 1.3 min
Primary = 7.16 cfs @ 12.07 hrs, Volume= 0.857 af
Routed to Link 30 : Site

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Starting Elev= 33.60' Surf.Area= 1,848 sf Storage= 2,330 cf
Peak Elev= 34.90' @ 12.07 hrs Surf.Area= 2,540 sf Storage= 5,189 cf (2,859 cf above start)

Plug-Flow detention time= 104.5 min calculated for 0.804 af (91% of inflow)
Center-of-Mass det. time= 27.4 min (846.2 - 818.7)

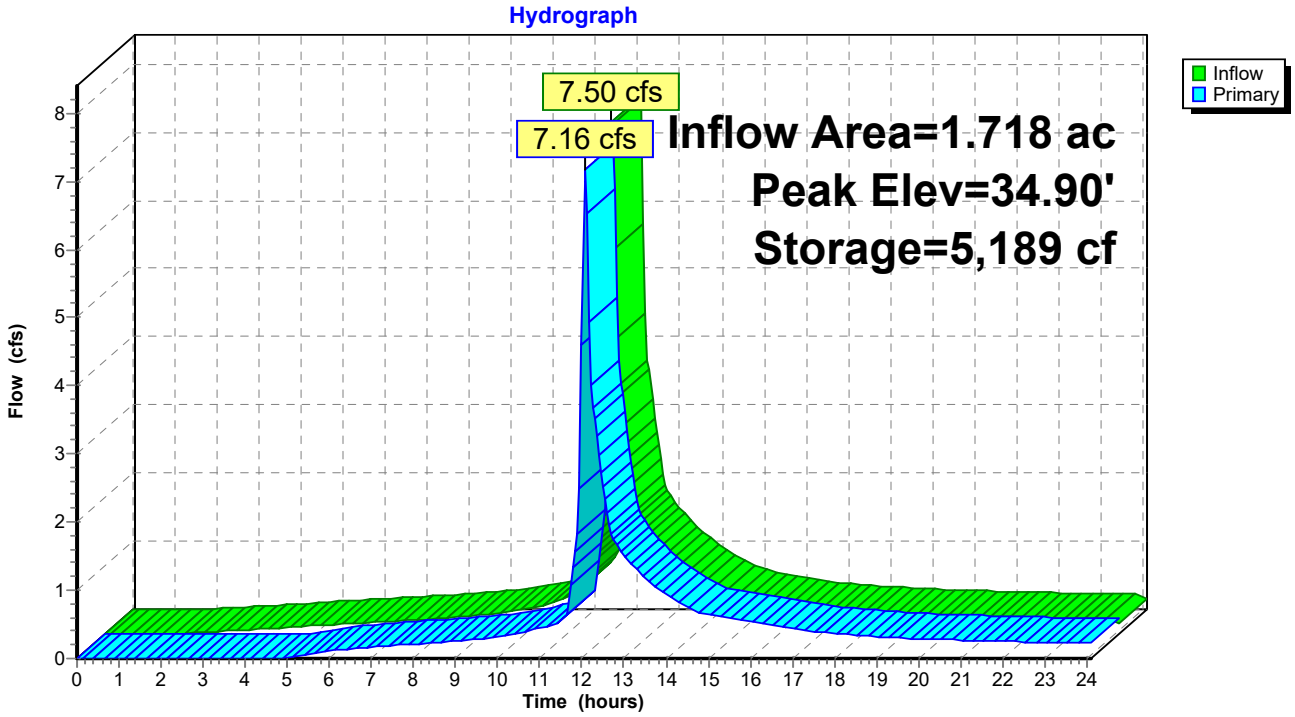
Volume	Invert	Avail.Storage	Storage Description
#1	32.00'	5,437 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
32.00	1,085	220.0	0	0	1,085
33.00	1,552	239.0	1,312	1,312	1,816
34.00	2,060	263.0	1,800	3,112	2,807
34.50	2,326	270.0	1,096	4,207	3,132
35.00	2,593	277.0	1,229	5,437	3,466

Device	Routing	Invert	Outlet Devices
#1	Primary	33.90'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	34.60'	**15.0' long + 0.5 '/' SideZ x 3.0' 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 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=6.83 cfs @ 12.07 hrs HW=34.89' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.82 cfs @ 4.15 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 6.02 cfs @ 1.35 fps)

Pond 21S: Water Qualirty Basin



Summary for Pond 22SA: Water Quality Basin

Inflow Area = 0.863 ac, 84.39% Impervious, Inflow Depth > 7.05" for 100-yr event
Inflow = 6.99 cfs @ 12.04 hrs, Volume= 0.507 af
Outflow = 7.03 cfs @ 12.04 hrs, Volume= 0.507 af, Atten= 0%, Lag= 0.3 min
Primary = 7.03 cfs @ 12.04 hrs, Volume= 0.507 af
Routed to Pond 22SB : Underground 22

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Starting Elev= 37.40' Surf.Area= 1,393 sf Storage= 2,616 cf
Peak Elev= 37.50' @ 12.04 hrs Surf.Area= 1,411 sf Storage= 2,752 cf (136 cf above start)

Plug-Flow detention time= 113.7 min calculated for 0.446 af (88% of inflow)
Center-of-Mass det. time= 0.5 min (775.1 - 774.6)

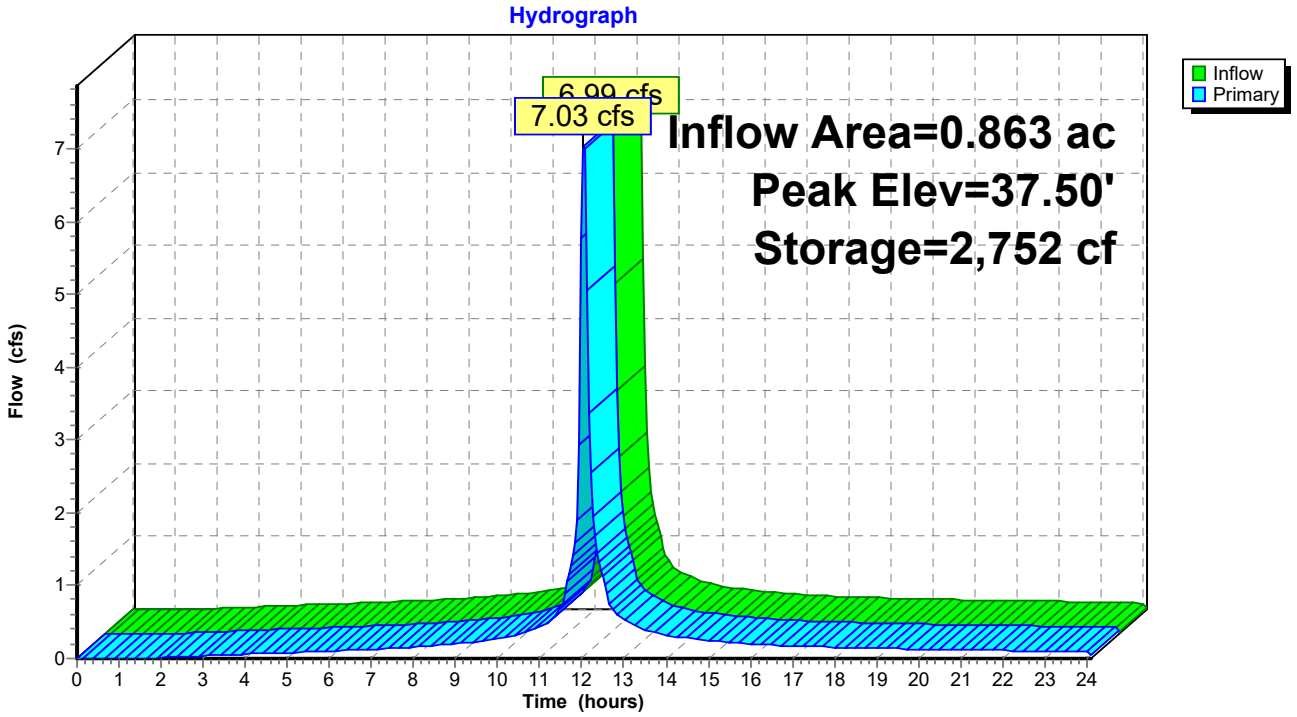
Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	2,756 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
35.00	596	262.0	0	0	596
36.00	1,134	275.0	851	851	1,213
37.50	1,412	281.0	1,906	2,756	1,707

Device	Routing	Invert	Outlet Devices
#1	Primary	37.40'	**2.4" x 4.0" Horiz. Orifice/Grate X 8.00 columns** X 9 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=7.12 cfs @ 12.04 hrs HW=37.49' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 7.12 cfs @ 1.48 fps)

Pond 22SA: Water Quality Basin



Summary for Pond 22SB: Underground 22

Inflow Area = 0.863 ac, 84.39% Impervious, Inflow Depth > 7.05" for 100-yr event
Inflow = 7.03 cfs @ 12.04 hrs, Volume= 0.507 af
Outflow = 1.78 cfs @ 12.29 hrs, Volume= 0.382 af, Atten= 75%, Lag= 14.7 min
Primary = 1.78 cfs @ 12.29 hrs, Volume= 0.382 af
Routed to Pond 21S : Water Qualirty Basin

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
Peak Elev= 37.04' @ 12.29 hrs Surf.Area= 0.119 ac Storage= 0.215 af

Plug-Flow detention time= 206.6 min calculated for 0.382 af (75% of inflow)
Center-of-Mass det. time= 101.6 min (876.7 - 775.1)

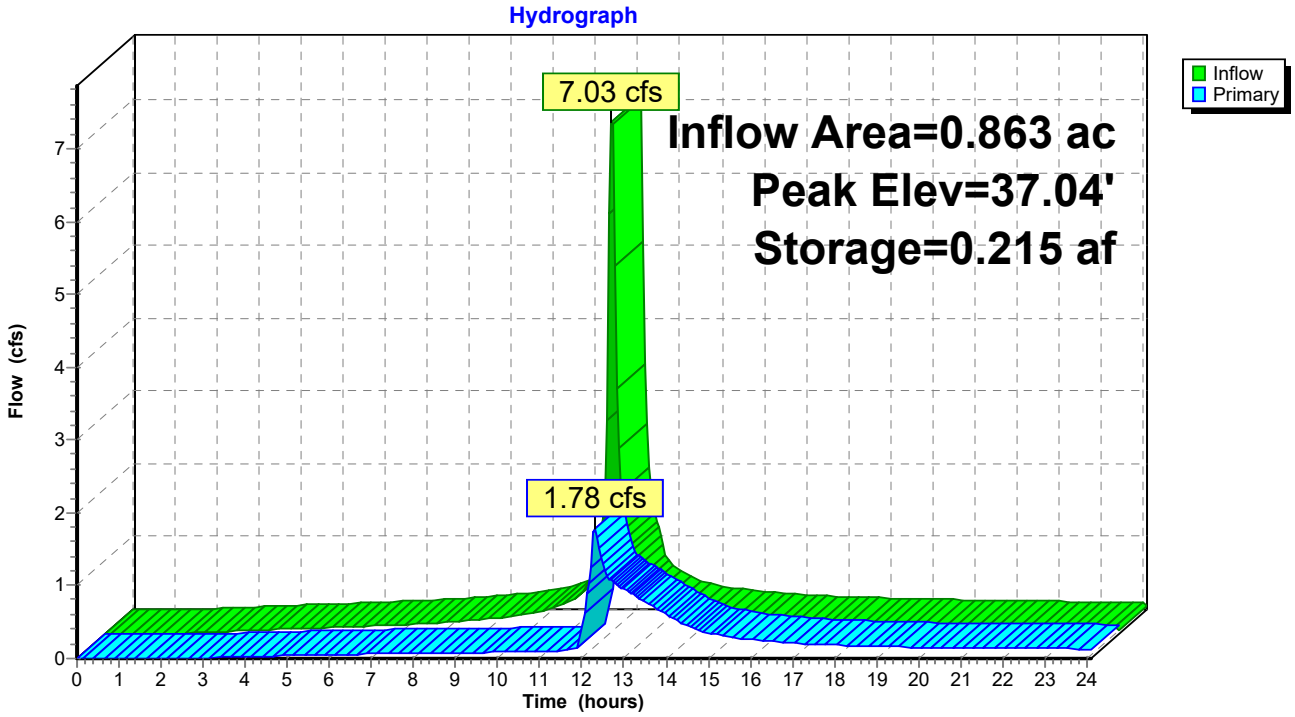
Volume	Invert	Avail.Storage	Storage Description
#1A	34.00'	0.080 af	**39.50'W x 131.78'L x 3.50'H Field A** 0.418 af Overall - 0.152 af Embedded = 0.266 af x 30.0% Voids
#2A	34.50'	0.152 af	**ADS_StormTech SC-740 +Cap** x 144 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 144 Chambers in 8 Rows
		0.232 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	35.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	36.90'	**4.0' long + 1.0 '/' SideZ 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

Primary OutFlow Max=1.77 cfs @ 12.29 hrs HW=37.04' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.18 cfs @ 8.28 fps)
- **2=Orifice/Grate** (Orifice Controls 0.99 cfs @ 5.03 fps)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 0.60 cfs @ 1.01 fps)

Pond 22SB: Underground 22

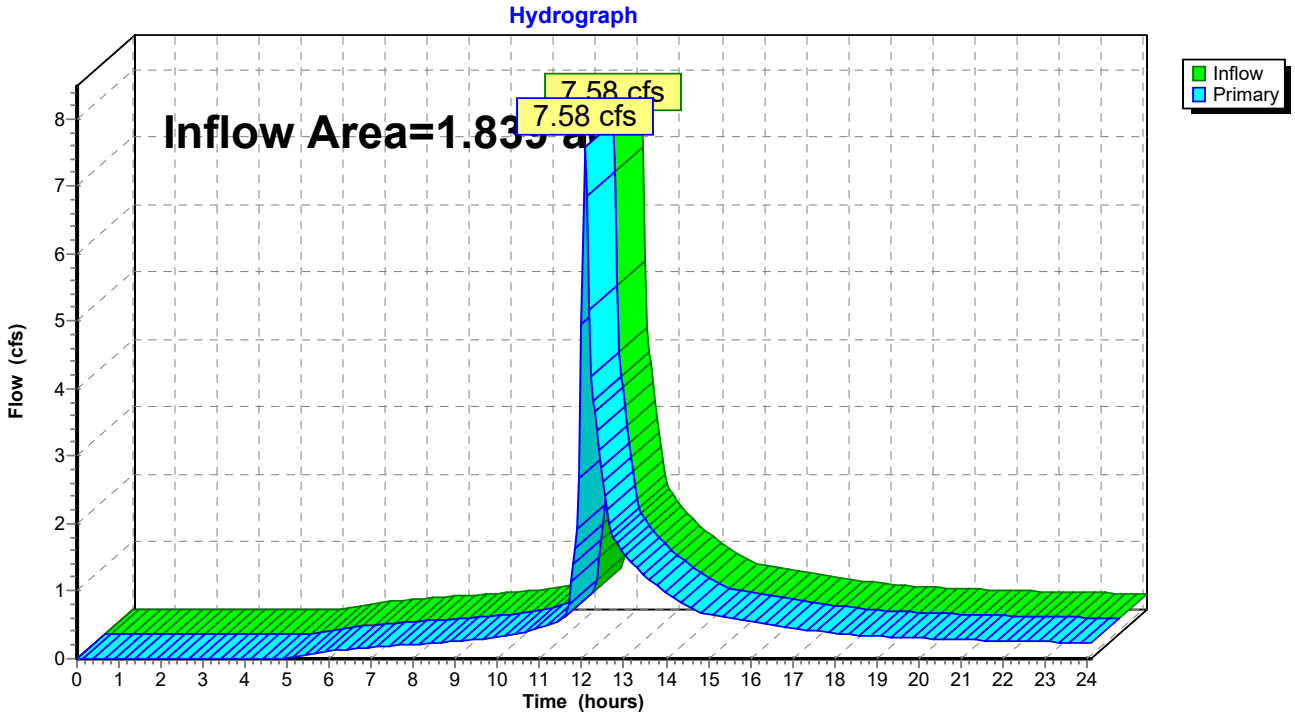


Summary for Link 30: Site

Inflow Area = 1.839 ac, 78.72% Impervious, Inflow Depth > 5.79" for 100-yr event
Inflow = 7.58 cfs @ 12.07 hrs, Volume= 0.888 af
Primary = 7.58 cfs @ 12.07 hrs, Volume= 0.888 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs

Link 30: Site



Appendix C
Pipe Capacity Calculations

Rational Method Individual Basin Calculations

Catch Basin and Area Drain Runoff Coefficients

Basin Name	Impervious Area C=0.9 (sf)	Grassed Area C=0.3 (sf)	Wooded Area C=0.2 (sf)	Total Area (sf)	Total Area (ac)	Weighted C	Tc to Inlet (min)
CCB 3	11,090	0	0	11,090	0.25	0.90	5.0
CCB 4	2,860	0	0	2,860	0.07	0.90	5.0
CCB 5	15,477	0	0	15,477	0.36	0.90	5.0
CCB 13	7,869	0	0	7,869	0.18	0.90	5.0
CCB 15	2,207	0	0	2,207	0.05	0.90	5.0
CCB 16	7,088	0	0	7,088	0.16	0.90	5.0
CCB 17	4,463	0	0	4,463	0.10	0.90	5.0

Roof Drainage Pipe Calculations

Q = C x I x A, Where:
C = Runoff Coefficient
I = Rainfall Intensity (in/hr)
A = Area (acres)
Q = Flow (cfs)

	MH 9	MH 10	MH 11	MH 12
C	0.90	0.90	0.90	0.90
I	8.83	8.83	8.83	8.83
A	0.06	0.06	0.06	0.06
Q	0.48	0.48	0.48	0.48

System 20

Project File: System 20.stm	Number of lines: 1	Date: 11/3/2022

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	207.000	179.538	MH	1.78	0.00	0.00	0.0	32.50	0.72	34.00	15	Cir	0.013	1.00	38.80	OCS19-FES 20

System 20 | Number of lines: 1 | Date: 11/3/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	207.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.78	5.50	3.60	15	0.72	32.50	34.00	33.03	34.53	33.80	38.80	OCS19-FES 20

System 20 | Number of lines: 1 | Run Date: 11/3/2022

NOTES:Intensity = 50.44 / (Inlet time + 3.60) ^ 0.70; Return period =Yrs. 100 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	OCS 19	1.78*	0.00	0.00	1.78	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	Off

System 20 | Number of lines: 1 | Run Date: 11/3/2022

NOTES: Inlet N-Values = 0.016; Intensity = 50.44 / (Inlet time + 3.60) ^ 0.70; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

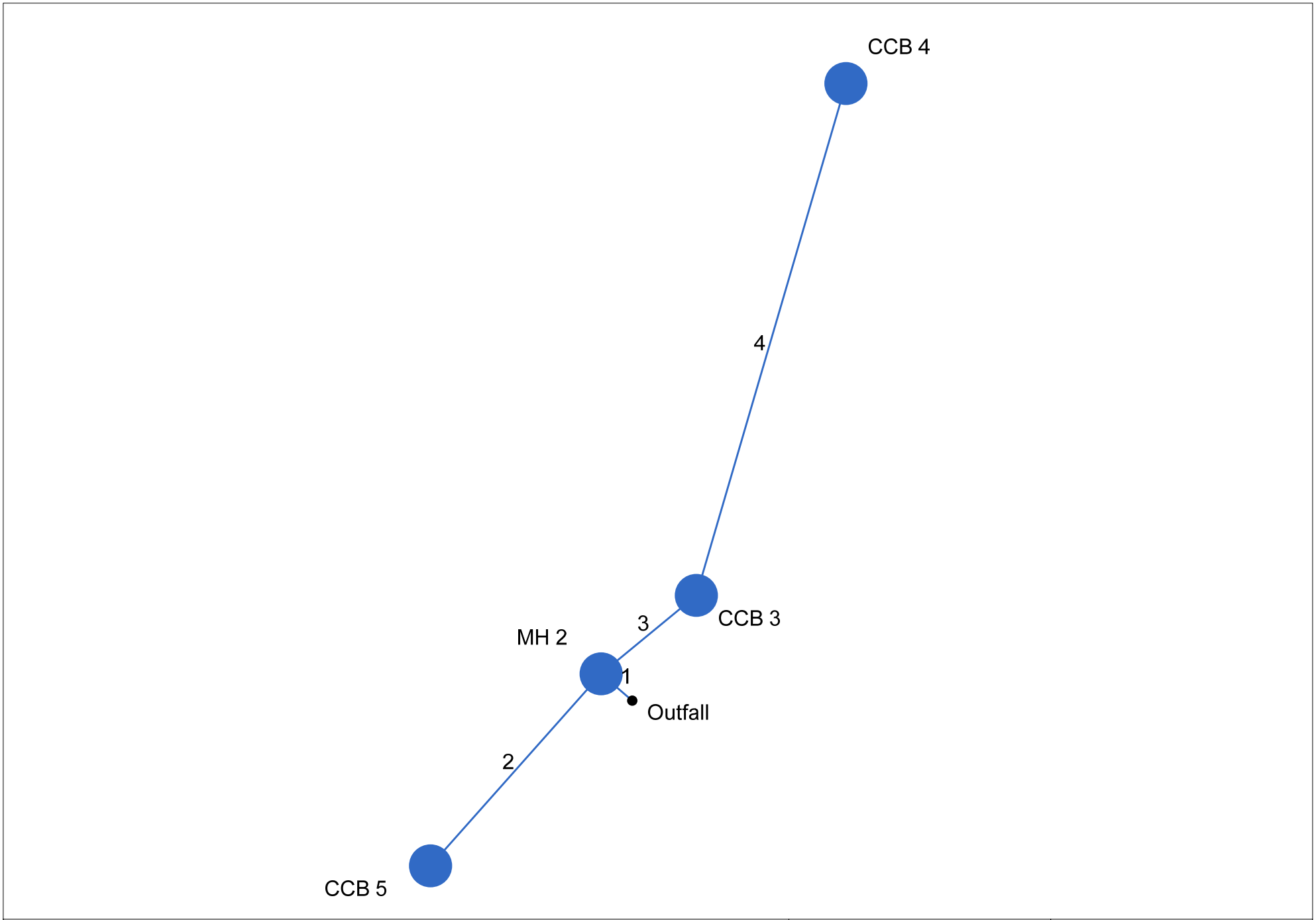
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	15	1.78	32.50	33.03	0.53	0.49	3.60	0.20	33.23	0.000	207.000	34.00	34.53	0.53**	0.49	3.60	0.20	34.73	0.000	0.000	n/a	1.00	n/a

System 20 | Number of lines: 1 | Run Date: 11/3/2022

Notes: ; ** Critical depth. ; c = cir e = ellip b = box

System 21



Project File: System 21.stm	Number of lines: 4	Date: 11/3/2022

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	4.000	-139.128	MH	0.00	0.00	0.00	0.0	32.40	2.50	32.50	12	Cir	0.013	1.00	35.50	MH 2- FES 1
2	1	25.000	-89.376	Comb	0.00	0.36	0.90	5.0	32.50	0.80	32.70	12	Cir	0.013	1.00	35.40	CCB 5- MH 2
3	1	12.000	99.517	Comb	0.00	0.25	0.90	5.0	32.50	1.67	32.70	12	Cir	0.013	0.92	35.40	CCB 3- MH 2
4	3	52.000	-34.164	Comb	0.00	0.07	0.90	5.0	32.70	2.31	33.90	12	Cir	0.013	1.00	36.10	CCB 4- CCB 3

System 21 | Number of lines: 4 | Date: 11/3/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	4.000	0.00	0.68	0.00	0.00	0.61	0.0	6.3	8.0	4.89	5.63	6.22	12	2.50	32.40	32.50	34.84	34.92	0.00	35.50	MH 2- FES 1
2	1	25.000	0.36	0.36	0.90	0.32	0.32	5.0	5.0	8.8	2.85	3.19	3.63	12	0.80	32.50	32.70	35.52	35.68	35.50	35.40	CCB 5- MH 2
3	1	12.000	0.25	0.32	0.90	0.23	0.29	5.0	6.2	8.0	2.31	4.60	2.94	12	1.67	32.50	32.70	35.52	35.57	35.50	35.40	CCB 3- MH 2
4	3	52.000	0.07	0.07	0.90	0.06	0.06	5.0	5.0	8.8	0.55	5.41	0.71	12	2.31	32.70	33.90	35.69	35.71	35.40	36.10	CCB 4- CCB 3

System 21 | Number of lines: 4 | Run Date: 11/3/2022

NOTES:Intensity = 40.94 / (Inlet time + 3.80) ^ 0.71; Return period =Yrs. 25 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	MH 2	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
2	CCB 5	2.85	0.00	2.85	0.00	Comb	4.0	2.73	3.12	2.31	1.35	Sag	2.53	0.010	0.010	0.000	0.32	32.46	0.32	32.46	0.0	Off
3	CCB 3	1.98	0.29	2.27	0.00	Comb	4.0	2.73	3.12	2.31	1.35	Sag	2.53	0.010	0.010	0.000	0.28	28.03	0.28	28.03	0.0	Off
4	CCB 4	0.55	0.00	0.27	0.29	Comb	4.0	2.73	0.00	2.31	1.35	0.010	2.53	0.010	0.010	0.013	0.08	8.25	0.06	6.44	0.0	3

System 21 | Number of lines: 4 | Run Date: 11/3/2022

NOTES: Inlet N-Values = 0.016; Intensity = 40.94 / (Inlet time + 3.80) ^ 0.71; Return period = 25 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

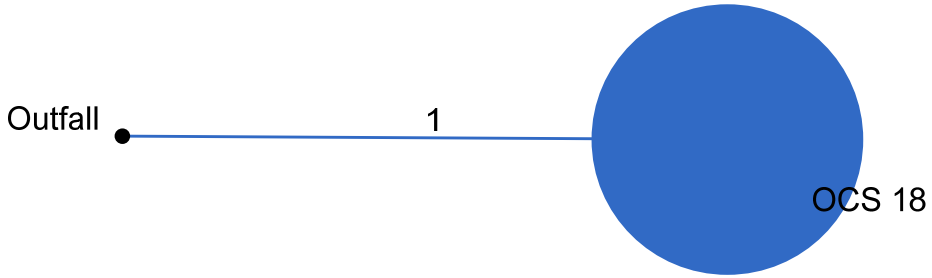
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	12	4.89	32.40	34.84	1.00	0.79	6.23	0.60	35.44	1.885	4.000	32.50	34.92	1.00	0.79	6.22	0.60	35.52	1.884	1.885	0.075	1.00	0.60
2	12	2.85	32.50	35.52	1.00	0.79	3.63	0.21	35.72	0.642	25.000	32.70	35.68	1.00	0.79	3.63	0.20	35.88	0.641	0.641	0.160	1.00	0.20
3	12	2.31	32.50	35.52	1.00	0.79	2.94	0.13	35.65	0.421	12.000	32.70	35.57	1.00	0.79	2.94	0.13	35.70	0.421	0.421	0.051	0.92	0.12
4	12	0.55	32.70	35.69	1.00	0.79	0.71	0.01	35.70	0.024	52.000	33.90	35.71	1.00	0.79	0.71	0.01	35.71	0.024	0.024	0.013	1.00	0.01

System 21 | Number of lines: 4 | Run Date: 11/3/2022

; c = cir e = ellip b = box

System OCS 18



Project File: System 22 Water Quality.stm	Number of lines: 1	Date: 11/3/2022

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	9.000	0.324	MH	7.03	0.00	0.00	0.0	35.00	2.22	35.20	15	Cir	0.013	1.00	37.40	OCS 18-UG22

System OCS 18 | Number of lines: 1 | Date: 11/3/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	9.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	7.03	9.63	6.57	15	2.22	35.00	35.20	35.98	36.26	0.00	37.40	OCS 18-UG22

System OCS 18 | Number of lines: 1 | Run Date: 11/3/2022

NOTES:Intensity = 50.44 / (Inlet time + 3.60) ^ 0.70; Return period =Yrs. 100 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	OCS 18	7.03*	0.00	0.00	7.03	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	Off

System OCS 18 | Number of lines: 1 | Run Date: 11/3/2022

NOTES: Inlet N-Values = 0.016; Intensity = 50.44 / (Inlet time + 3.60) ^ 0.70; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

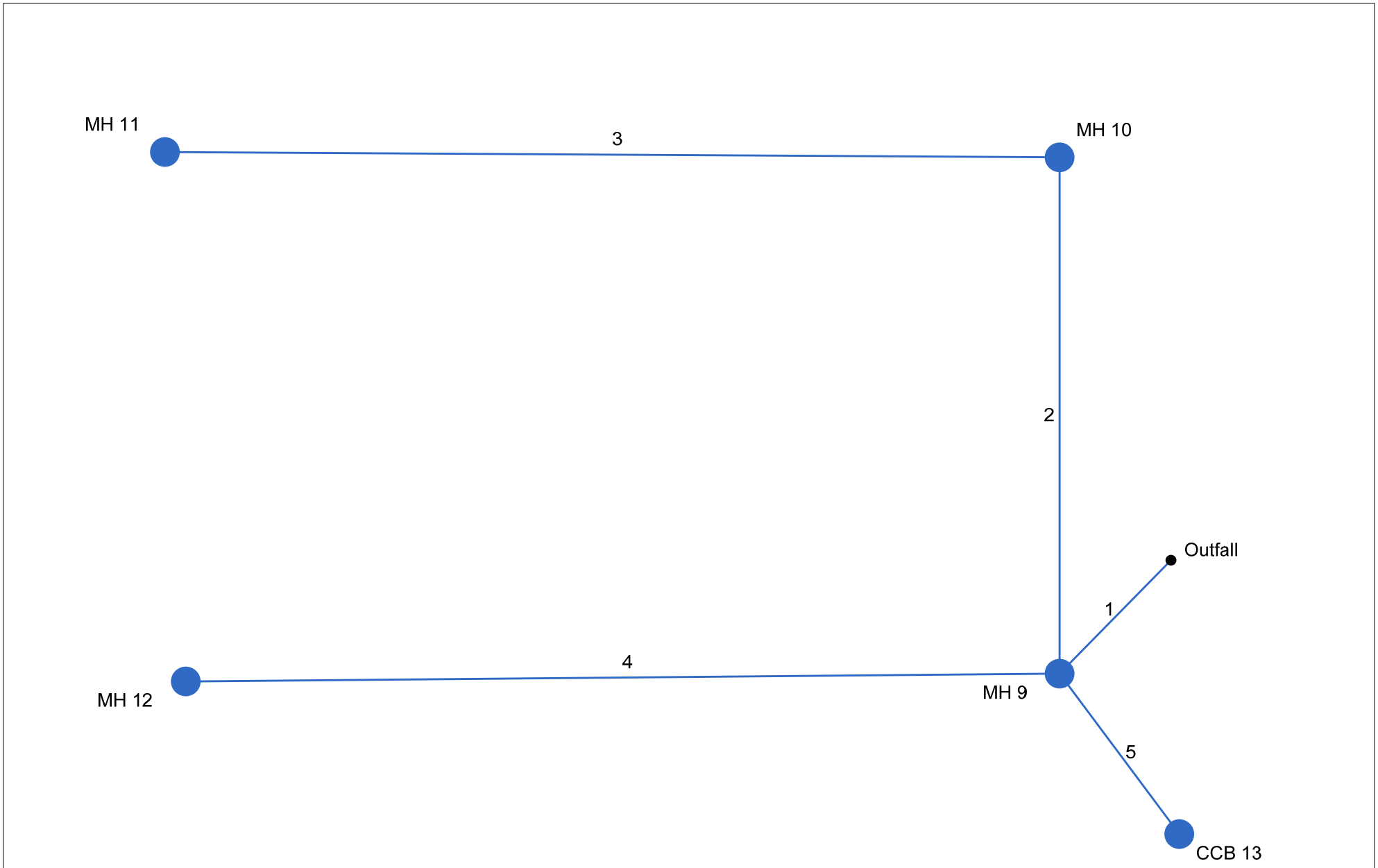
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	15	7.03	35.00	35.98	0.98	1.03	6.81	0.62	36.60	0.000	9.000	35.20	36.26	1.06**	1.11	6.33	0.62	36.88	0.000	0.000	n/a	1.00	n/a

System OCS 18 | Number of lines: 1 | Run Date: 11/3/2022

Notes: ; ** Critical depth. ; c = cir e = ellip b = box

System 22A



Project File: System 22A.stm	Number of lines: 5	Date: 11/3/2022

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	23.000	134.266	MH	0.48	0.00	0.00	0.0	35.20	0.87	35.40	12	Cir	0.013	1.00	38.00	MH 9- FES 8
2	1	75.000	135.735	MH	0.48	0.00	0.00	0.0	35.40	0.80	36.00	8	Cir	0.011	1.00	40.00	CO 10-MH 9
3	2	129.000	-89.660	MH	0.48	0.00	0.00	0.0	36.00	0.78	37.00	8	Cir	0.011	1.00	40.00	CO 11- CO 10
4	1	126.000	45.217	MH	0.48	0.00	0.00	0.0	35.40	1.27	37.00	8	Cir	0.011	1.00	40.00	CO 12-MH 9
5	1	29.000	-80.781	Comb	0.00	0.18	0.90	5.0	35.40	0.69	35.60	12	Cir	0.013	1.00	37.80	CCB 13-MH 9

System 22A | Number of lines: 5 | Date: 11/3/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	23.000	0.00	0.18	0.00	0.00	0.16	0.0	5.3	8.6	3.32	3.32	4.22	12	0.87	35.20	35.40	37.48	37.68	36.20	38.00	MH 9- FES 8
2	1	75.000	0.00	0.00	0.00	0.00	0.00	0.0	1.6	0.0	0.96	1.28	2.75	8	0.80	35.40	36.00	37.96	38.30	38.00	40.00	CO 10-MH 9
3	2	129.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.48	1.26	1.38	8	0.78	36.00	37.00	38.41	38.56	40.00	40.00	CO 11- CO 10
4	1	126.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.48	1.61	1.38	8	1.27	35.40	37.00	37.96	38.10	38.00	40.00	CO 12-MH 9
5	1	29.000	0.18	0.18	0.90	0.16	0.16	5.0	5.0	8.8	1.43	2.96	1.82	12	0.69	35.40	35.60	37.96	38.00	38.00	37.80	CCB 13-MH 9

System 22A | Number of lines: 5 | Run Date: 11/3/2022

NOTES:Intensity = 40.94 / (Inlet time + 3.80) ^ 0.71; Return period =Yrs. 25 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	MH 9	0.48*	0.00	0.00	0.48	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
2	MH 10	0.48*	0.00	0.00	0.48	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
3	MH 11	0.48*	0.00	0.00	0.48	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
4	MH 12	0.48*	0.00	0.00	0.48	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
5	CCB 13	1.43	0.00	1.43	0.00	Comb	4.0	3.12	0.00	231.00	1.35	0.010	2.53	0.010	0.010	0.013	0.12	11.75	0.00	0.44	0.0	1

System 22A | Number of lines: 5 | Run Date: 11/3/2022

NOTES: Inlet N-Values = 0.016; Intensity = 40.94 / (Inlet time + 3.80) ^ 0.71; Return period = 25 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

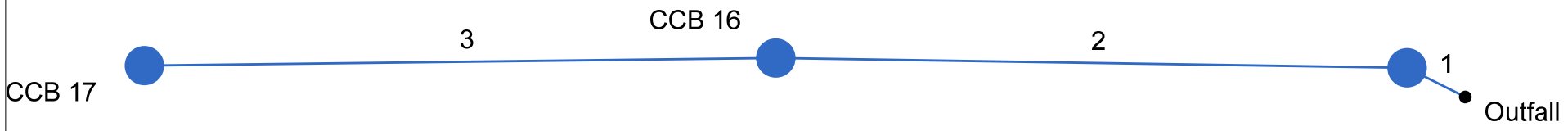
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	12	3.32	35.20	37.48	1.00	0.79	4.22	0.28	37.76	0.867	23.000	35.40	37.68	1.00	0.79	4.22	0.28	37.96	0.867	0.867	0.199	1.00	0.28
2	8	0.96	35.40	37.96	0.67	0.35	2.75	0.12	38.07	0.453	75.000	36.00	38.30	0.67	0.35	2.75	0.12	38.41	0.452	0.452	0.339	1.00	0.12
3	8	0.48	36.00	38.41	0.67	0.35	1.38	0.03	38.44	0.113	129.000	37.00	38.56	0.67	0.35	1.38	0.03	38.59	0.113	0.113	0.146	1.00	0.03
4	8	0.48	35.40	37.96	0.67	0.35	1.38	0.03	37.99	0.113	126.000	37.00	38.10	0.67	0.35	1.38	0.03	38.13	0.113	0.113	0.143	1.00	0.03
5	12	1.43	35.40	37.96	1.00	0.79	1.82	0.05	38.01	0.160	29.000	35.60	38.00	1.00	0.79	1.82	0.05	38.05	0.160	0.160	0.047	1.00	0.05

System 22A | Number of lines: 5 | Run Date: 11/3/2022

; c = cir e = ellip b = box

System 22B



Project File: System 22B.stm	Number of lines: 3	Date: 11/3/2022

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	7.000	-153.538	MH	0.00	0.05	0.90	5.0	35.10	1.43	35.20	12	Cir	0.013	0.49	38.40	CCB 15-FES 14
2	1	68.000	-25.581	Comb	0.00	0.16	0.90	5.0	35.20	0.59	35.60	12	Cir	0.013	0.50	38.40	CCB 16-CCB 15
3	2	68.000	-1.565	Comb	0.00	0.10	0.90	5.0	35.60	0.59	36.00	12	Cir	0.013	1.00	38.40	CCB 17-CCB 16

System 22B | Number of lines: 3 | Date: 11/3/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	7.000	0.05	0.31	0.90	0.05	0.28	5.0	6.6	7.8	2.18	4.26	2.78	12	1.43	35.10	35.20	37.48	37.51	36.10	38.40	CCB 15-FES 14
2	1	68.000	0.16	0.26	0.90	0.14	0.23	5.0	6.1	8.1	1.89	2.73	2.41	12	0.59	35.20	35.60	37.57	37.76	38.40	38.40	CCB 16-CCB 15
3	2	68.000	0.10	0.10	0.90	0.09	0.09	5.0	5.0	8.8	0.79	2.73	1.01	12	0.59	35.60	36.00	37.80	37.84	38.40	38.40	CCB 17-CCB 16

System 22B | Number of lines: 3 | Run Date: 11/3/2022

NOTES:Intensity = 40.94 / (Inlet time + 3.80) ^ 0.71; Return period =Yrs. 25 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1		0.40	0.00	0.00	0.40	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
2	CCB 16	1.27	0.00	1.27	0.00	Comb	4.0	2.73	3.12	2.31	1.35	Sag	2.00	0.028	0.028	0.000	0.21	7.43	0.21	7.43	0.0	Off
3	CCB 17	0.79	0.00	0.79	0.00	Comb	4.0	2.73	3.12	2.31	1.35	Sag	2.00	0.028	0.028	0.000	0.16	5.68	0.16	5.68	0.0	Off

System 22B | Number of lines: 3 | Run Date: 11/3/2022

NOTES: Inlet N-Values = 0.016; Intensity = 40.94 / (Inlet time + 3.80) ^ 0.71; Return period = 25 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

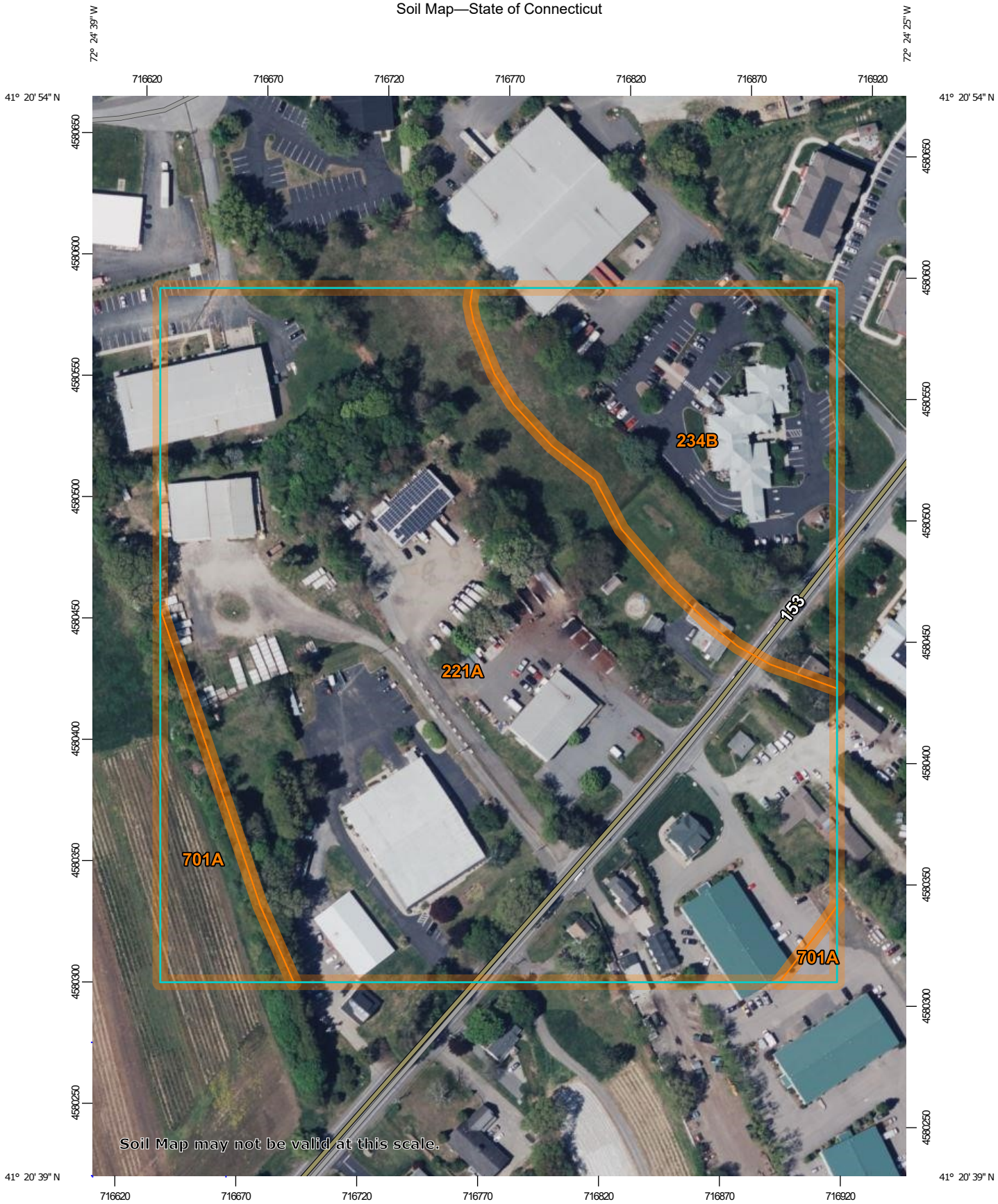
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	12	2.18	35.10	37.48	1.00	0.79	2.78	0.12	37.60	0.376	7.000	35.20	37.51	1.00	0.79	2.78	0.12	37.63	0.376	0.376	0.026	0.49	0.06
2	12	1.89	35.20	37.57	1.00	0.79	2.41	0.09	37.66	0.282	68.000	35.60	37.76	1.00	0.79	2.41	0.09	37.85	0.282	0.282	0.192	0.50	0.05
3	12	0.79	35.60	37.80	1.00	0.79	1.01	0.02	37.82	0.050	68.000	36.00	37.84	1.00	0.79	1.01	0.02	37.85	0.049	0.049	0.034	1.00	0.02

System 22B | Number of lines: 3 | Run Date: 11/3/2022

; c = cir e = ellip b = box

Appendix D
NCRS Soils Information



Map Scale: 1:2,170 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

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

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

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

Special Point Features

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

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

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 22, Sep 12, 2022

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

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

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
221A	Ninigret-Urban land complex, 0 to 5 percent slopes	14.7	74.3%
234B	Merrimac-Urban land complex, 0 to 8 percent slopes	4.0	20.2%
701A	Ninigret fine sandy loam, 0 to 3 percent slopes	1.1	5.5%
Totals for Area of Interest		**19.9**	**100.0%**

Appendix E
NOAA Atlas 14 Precipitation Information

NOAA Atlas 14, Volume 10, Version 3
Location name: Essex, Connecticut, USA*
Latitude: 41.3468°, Longitude: -72.4094°
Elevation: 35.92 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**4.06** (3.11-5.20)	**4.87** (3.72-6.24)	**6.20** (4.73-7.98)	**7.31** (5.54-9.44)	**8.83** (6.50-11.8)	**9.97** (7.22-13.6)	**11.2** (7.87-15.7)	**12.5** (8.40-17.8)	**14.5** (9.35-21.1)	**16.0** (10.2-23.8)
10-min	**2.87** (2.20-3.68)	**3.45** (2.64-4.42)	**4.40** (3.35-5.66)	**5.18** (3.93-6.69)	**6.25** (4.61-8.36)	**7.06** (5.11-9.61)	**7.91** (5.58-11.1)	**8.87** (5.95-12.6)	**10.2** (6.63-15.0)	**11.4** (7.19-16.9)
15-min	**2.25** (1.72-2.89)	**2.70** (2.07-3.47)	**3.44** (2.63-4.43)	**4.06** (3.08-5.24)	**4.90** (3.62-6.56)	**5.54** (4.01-7.54)	**6.21** (4.38-8.70)	**6.96** (4.66-9.89)	**8.04** (5.20-11.7)	**8.92** (5.64-13.2)
30-min	**1.56** (1.20-2.00)	**1.88** (1.44-2.41)	**2.39** (1.82-3.08)	**2.81** (2.14-3.64)	**3.40** (2.51-4.55)	**3.84** (2.78-5.22)	**4.30** (3.03-6.03)	**4.82** (3.23-6.85)	**5.56** (3.60-8.13)	**6.17** (3.91-9.16)
60-min	**1.00** (0.766-1.28)	**1.20** (0.919-1.54)	**1.53** (1.17-1.97)	**1.80** (1.37-2.32)	**2.17** (1.60-2.91)	**2.46** (1.78-3.34)	**2.75** (1.94-3.85)	**3.08** (2.07-4.38)	**3.56** (2.30-5.19)	**3.94** (2.50-5.85)
2-hr	**0.656** (0.506-0.835)	**0.786** (0.606-1.00)	**0.999** (0.767-1.28)	**1.18** (0.898-1.51)	**1.42** (1.05-1.89)	**1.60** (1.17-2.17)	**1.80** (1.28-2.51)	**2.02** (1.36-2.85)	**2.35** (1.53-3.41)	**2.63** (1.67-3.87)
3-hr	**0.507** (0.393-0.644)	**0.608** (0.470-0.772)	**0.773** (0.595-0.983)	**0.909** (0.697-1.16)	**1.10** (0.818-1.46)	**1.24** (0.905-1.67)	**1.39** (0.991-1.93)	**1.56** (1.05-2.19)	**1.83** (1.19-2.63)	**2.05** (1.30-3.00)
6-hr	**0.325** (0.253-0.410)	**0.389** (0.303-0.491)	**0.494** (0.383-0.624)	**0.581** (0.448-0.737)	**0.700** (0.525-0.922)	**0.789** (0.581-1.06)	**0.885** (0.636-1.22)	**0.998** (0.676-1.39)	**1.17** (0.761-1.67)	**1.31** (0.835-1.90)
12-hr	**0.201** (0.158-0.252)	**0.241** (0.189-0.302)	**0.306** (0.239-0.384)	**0.360** (0.280-0.454)	**0.435** (0.328-0.568)	**0.490** (0.363-0.651)	**0.549** (0.396-0.753)	**0.619** (0.421-0.855)	**0.722** (0.473-1.02)	**0.809** (0.518-1.17)
24-hr	**0.119** (0.094-0.147)	**0.143** (0.113-0.178)	**0.183** (0.144-0.229)	**0.217** (0.170-0.271)	**0.263** (0.200-0.341)	**0.297** (0.221-0.392)	**0.334** (0.242-0.455)	**0.377** (0.258-0.518)	**0.444** (0.291-0.624)	**0.500** (0.321-0.713)
2-day	**0.066** (0.053-0.082)	**0.081** (0.064-0.100)	**0.105** (0.083-0.130)	**0.125** (0.098-0.155)	**0.153** (0.117-0.197)	**0.173** (0.130-0.228)	**0.195** (0.143-0.266)	**0.222** (0.152-0.303)	**0.265** (0.175-0.370)	**0.302** (0.195-0.427)
3-day	**0.048** (0.038-0.059)	**0.058** (0.047-0.072)	**0.076** (0.060-0.094)	**0.090** (0.071-0.112)	**0.110** (0.085-0.142)	**0.125** (0.094-0.164)	**0.141** (0.104-0.191)	**0.161** (0.110-0.218)	**0.192** (0.127-0.266)	**0.219** (0.141-0.308)
4-day	**0.039** (0.031-0.047)	**0.047** (0.038-0.058)	**0.061** (0.048-0.074)	**0.072** (0.057-0.089)	**0.088** (0.067-0.112)	**0.099** (0.075-0.130)	**0.112** (0.082-0.151)	**0.127** (0.088-0.172)	**0.152** (0.100-0.210)	**0.172** (0.112-0.242)
7-day	**0.026** (0.021-0.032)	**0.031** (0.025-0.038)	**0.040** (0.032-0.049)	**0.047** (0.037-0.058)	**0.057** (0.044-0.072)	**0.064** (0.048-0.083)	**0.072** (0.053-0.096)	**0.081** (0.056-0.109)	**0.095** (0.063-0.131)	**0.108** (0.070-0.150)
10-day	**0.021** (0.017-0.026)	**0.025** (0.020-0.031)	**0.031** (0.025-0.038)	**0.037** (0.029-0.045)	**0.044** (0.034-0.055)	**0.049** (0.037-0.063)	**0.055** (0.040-0.072)	**0.061** (0.042-0.082)	**0.071** (0.047-0.097)	**0.080** (0.052-0.110)
20-day	**0.015** (0.012-0.018)	**0.017** (0.014-0.021)	**0.021** (0.017-0.025)	**0.023** (0.019-0.028)	**0.027** (0.021-0.034)	**0.030** (0.023-0.038)	**0.033** (0.024-0.043)	**0.036** (0.025-0.048)	**0.041** (0.027-0.056)	**0.045** (0.029-0.062)
30-day	**0.013** (0.010-0.015)	**0.014** (0.011-0.017)	**0.016** (0.013-0.020)	**0.018** (0.015-0.022)	**0.021** (0.016-0.026)	**0.023** (0.018-0.029)	**0.025** (0.018-0.032)	**0.027** (0.019-0.036)	**0.030** (0.020-0.041)	**0.032** (0.021-0.044)
45-day	**0.010** (0.009-0.013)	**0.011** (0.009-0.014)	**0.013** (0.011-0.016)	**0.014** (0.012-0.017)	**0.016** (0.013-0.020)	**0.018** (0.014-0.022)	**0.019** (0.014-0.024)	**0.021** (0.014-0.027)	**0.022** (0.015-0.030)	**0.024** (0.015-0.032)
60-day	**0.009** (0.008-0.011)	**0.010** (0.008-0.012)	**0.011** (0.009-0.013)	**0.012** (0.010-0.015)	**0.014** (0.011-0.017)	**0.015** (0.011-0.018)	**0.016** (0.012-0.020)	**0.017** (0.012-0.022)	**0.018** (0.012-0.024)	**0.019** (0.012-0.026)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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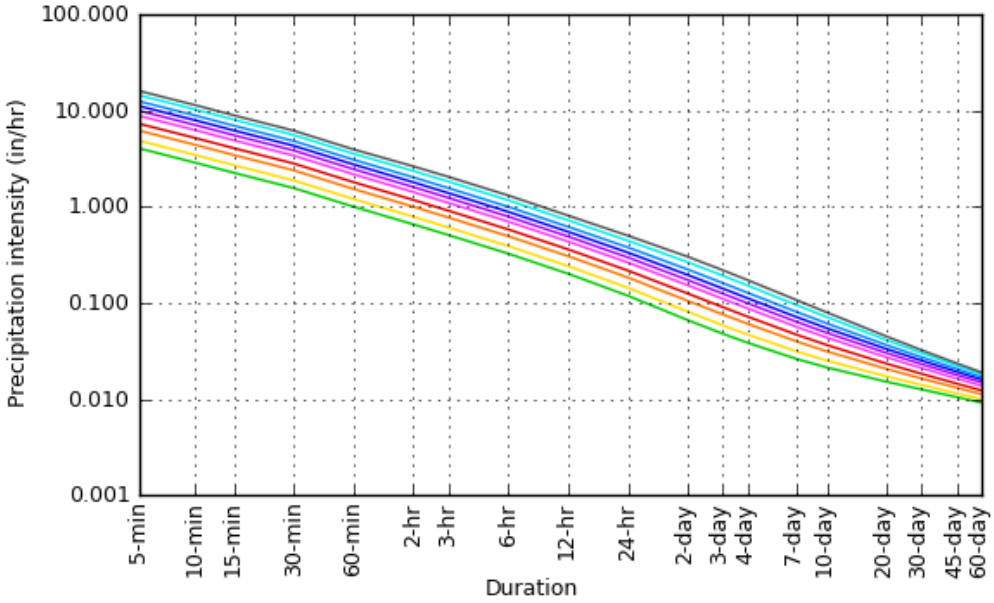
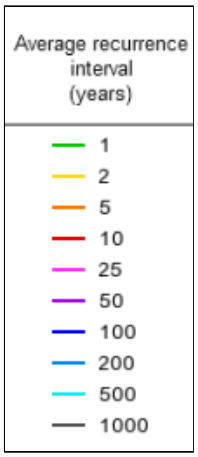
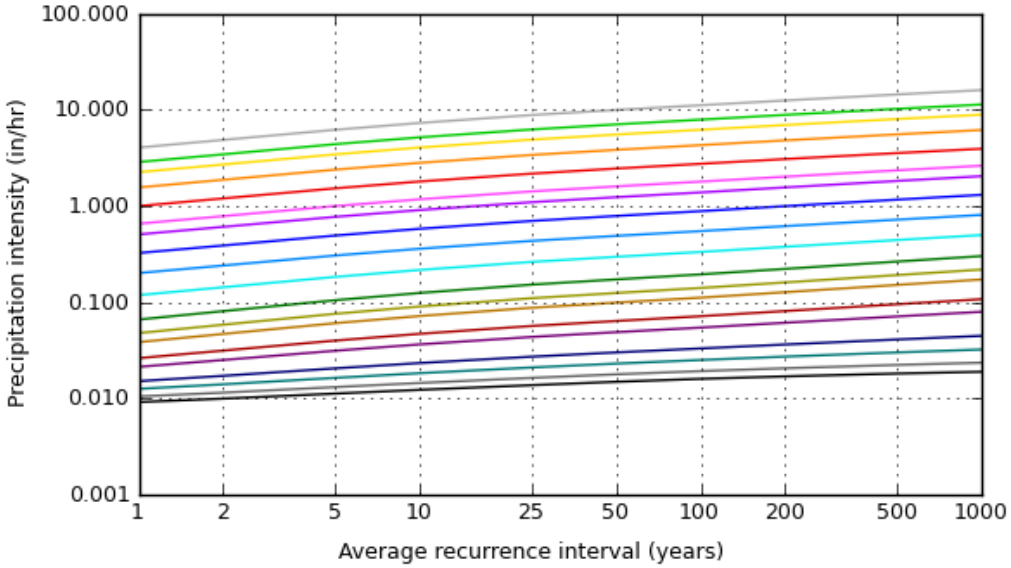
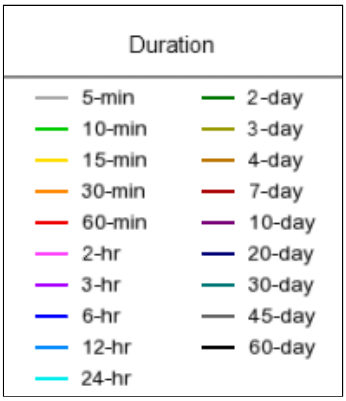
PF graphical

PDS-based intensity-duration-frequency (IDF) curves
Latitude: 41.3468°, Longitude: -72.4094°









NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Fri Apr 15 18:55:23 2022

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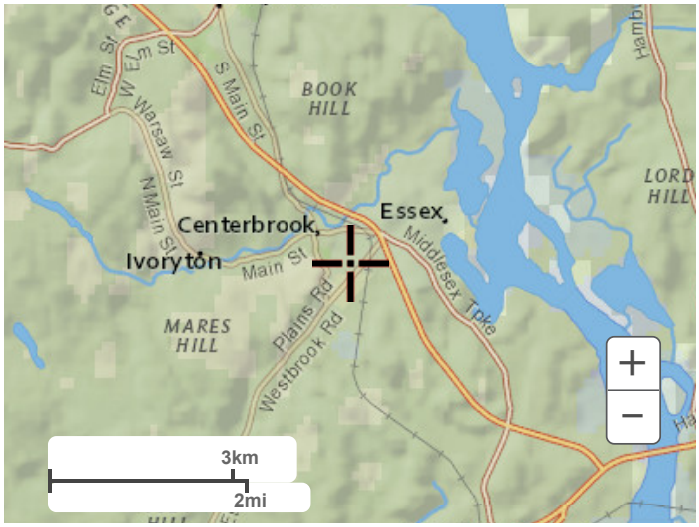
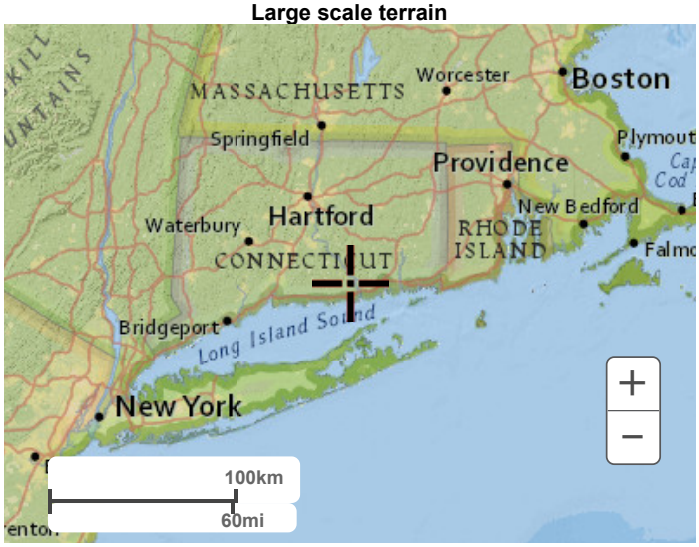
Maps & aerials

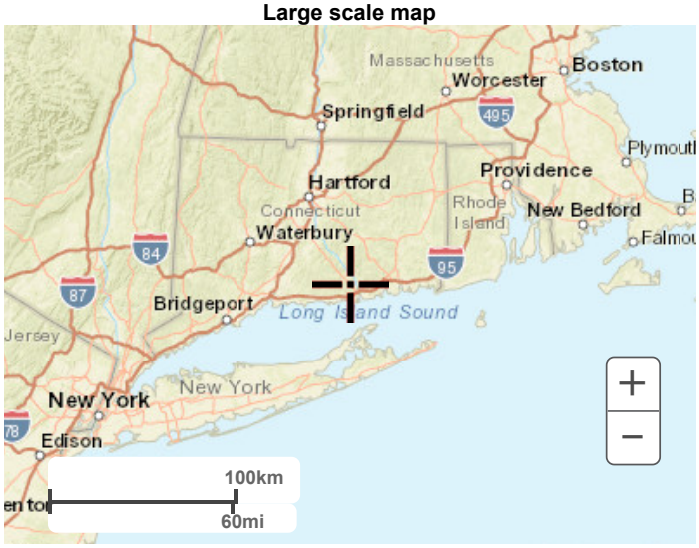
Small scale terrain



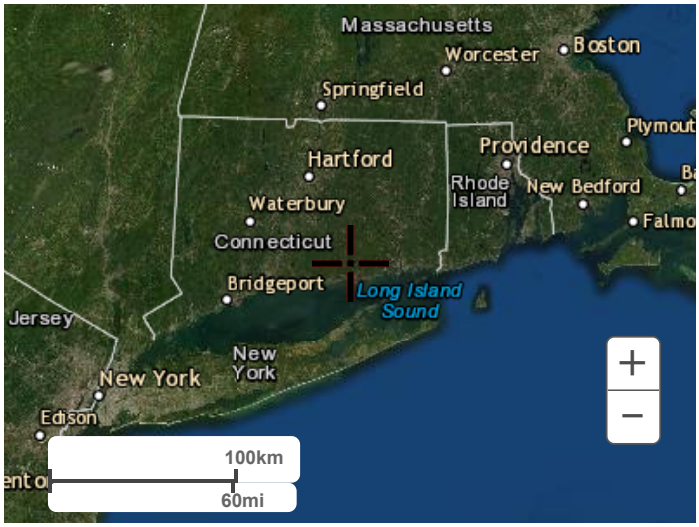
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

NOAA Atlas 14, Volume 10, Version 3
Location name: Essex, Connecticut, USA*
Latitude: 41.3468°, Longitude: -72.4094°
Elevation: 35.92 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.338** (0.259-0.433)	**0.406** (0.310-0.520)	**0.517** (0.394-0.665)	**0.609** (0.462-0.787)	**0.736** (0.542-0.984)	**0.831** (0.602-1.13)	**0.931** (0.656-1.31)	**1.04** (0.700-1.48)	**1.21** (0.779-1.76)	**1.34** (0.846-1.98)
10-min	**0.478** (0.366-0.613)	**0.575** (0.440-0.737)	**0.733** (0.558-0.943)	**0.863** (0.655-1.12)	**1.04** (0.768-1.39)	**1.18** (0.851-1.60)	**1.32** (0.930-1.85)	**1.48** (0.991-2.10)	**1.71** (1.11-2.49)	**1.90** (1.20-2.81)
15-min	**0.563** (0.431-0.722)	**0.676** (0.517-0.867)	**0.861** (0.657-1.11)	**1.01** (0.770-1.31)	**1.23** (0.904-1.64)	**1.39** (1.00-1.88)	**1.55** (1.09-2.17)	**1.74** (1.17-2.47)	**2.01** (1.30-2.93)	**2.23** (1.41-3.31)
30-min	**0.781** (0.599-1.00)	**0.938** (0.718-1.20)	**1.20** (0.911-1.54)	**1.41** (1.07-1.82)	**1.70** (1.25-2.27)	**1.92** (1.39-2.61)	**2.15** (1.52-3.01)	**2.41** (1.62-3.43)	**2.78** (1.80-4.06)	**3.09** (1.95-4.58)
60-min	**1.00** (0.766-1.28)	**1.20** (0.919-1.54)	**1.53** (1.17-1.97)	**1.80** (1.37-2.32)	**2.17** (1.60-2.91)	**2.46** (1.78-3.34)	**2.75** (1.94-3.85)	**3.08** (2.07-4.38)	**3.56** (2.30-5.19)	**3.94** (2.50-5.85)
2-hr	**1.31** (1.01-1.67)	**1.57** (1.21-2.00)	**2.00** (1.53-2.56)	**2.35** (1.80-3.02)	**2.84** (2.11-3.78)	**3.20** (2.34-4.34)	**3.59** (2.55-5.01)	**4.04** (2.72-5.70)	**4.70** (3.05-6.81)	**5.26** (3.34-7.73)
3-hr	**1.52** (1.18-1.93)	**1.83** (1.41-2.32)	**2.32** (1.79-2.95)	**2.73** (2.09-3.49)	**3.29** (2.46-4.37)	**3.71** (2.72-5.01)	**4.16** (2.98-5.80)	**4.69** (3.17-6.59)	**5.48** (3.56-7.90)	**6.14** (3.91-9.00)
6-hr	**1.95** (1.52-2.45)	**2.33** (1.81-2.94)	**2.96** (2.29-3.74)	**3.48** (2.68-4.41)	**4.19** (3.15-5.52)	**4.73** (3.48-6.34)	**5.30** (3.81-7.33)	**5.98** (4.05-8.32)	**6.99** (4.56-9.99)	**7.84** (5.00-11.4)
12-hr	**2.42** (1.90-3.03)	**2.90** (2.28-3.64)	**3.69** (2.88-4.63)	**4.34** (3.37-5.47)	**5.24** (3.95-6.84)	**5.90** (4.37-7.85)	**6.62** (4.77-9.07)	**7.45** (5.07-10.3)	**8.70** (5.70-12.3)	**9.75** (6.24-14.0)
24-hr	**2.85** (2.25-3.54)	**3.44** (2.71-4.28)	**4.40** (3.46-5.49)	**5.20** (4.07-6.51)	**6.31** (4.79-8.19)	**7.13** (5.31-9.42)	**8.01** (5.82-10.9)	**9.06** (6.18-12.4)	**10.6** (7.00-15.0)	**12.0** (7.71-17.1)
2-day	**3.18** (2.53-3.92)	**3.88** (3.09-4.80)	**5.04** (3.99-6.24)	**6.00** (4.72-7.46)	**7.32** (5.60-9.47)	**8.30** (6.24-10.9)	**9.36** (6.87-12.8)	**10.7** (7.32-14.5)	**12.7** (8.39-17.8)	**14.5** (9.34-20.5)
3-day	**3.44** (2.75-4.23)	**4.21** (3.36-5.18)	**5.46** (4.34-6.74)	**6.50** (5.14-8.05)	**7.94** (6.10-10.2)	**8.99** (6.78-11.8)	**10.1** (7.47-13.8)	**11.6** (7.95-15.7)	**13.8** (9.12-19.2)	**15.8** (10.2-22.2)
4-day	**3.70** (2.96-4.53)	**4.50** (3.60-5.52)	**5.82** (4.64-7.15)	**6.91** (5.47-8.53)	**8.41** (6.47-10.8)	**9.52** (7.19-12.4)	**10.7** (7.91-14.5)	**12.2** (8.41-16.5)	**14.5** (9.62-20.1)	**16.6** (10.7-23.2)
7-day	**4.41** (3.55-5.38)	**5.29** (4.25-6.45)	**6.71** (5.38-8.21)	**7.90** (6.29-9.69)	**9.53** (7.36-12.1)	**10.7** (8.13-13.9)	**12.0** (8.89-16.1)	**13.6** (9.41-18.2)	**16.0** (10.6-22.0)	**18.1** (11.7-25.2)
10-day	**5.12** (4.14-6.21)	**6.03** (4.87-7.33)	**7.52** (6.05-9.16)	**8.76** (7.01-10.7)	**10.5** (8.11-13.2)	**11.7** (8.90-15.1)	**13.1** (9.66-17.4)	**14.7** (10.2-19.6)	**17.1** (11.4-23.4)	**19.1** (12.4-26.5)
20-day	**7.27** (5.92-8.76)	**8.26** (6.71-9.96)	**9.87** (8.00-11.9)	**11.2** (9.03-13.6)	**13.1** (10.2-16.3)	**14.5** (11.0-18.3)	**15.9** (11.7-20.7)	**17.5** (12.2-23.1)	**19.7** (13.2-26.7)	**21.5** (14.0-29.5)
30-day	**9.08** (7.42-10.9)	**10.1** (8.26-12.1)	**11.8** (9.60-14.2)	**13.2** (10.7-16.0)	**15.1** (11.8-18.7)	**16.6** (12.6-20.9)	**18.1** (13.3-23.2)	**19.6** (13.7-25.8)	**21.7** (14.6-29.2)	**23.3** (15.2-31.8)
45-day	**11.3** (9.31-13.5)	**12.4** (10.2-14.9)	**14.2** (11.6-17.0)	**15.7** (12.7-18.8)	**17.7** (13.8-21.8)	**19.3** (14.7-24.0)	**20.8** (15.2-26.4)	**22.3** (15.6-29.1)	**24.1** (16.2-32.3)	**25.4** (16.6-34.6)
60-day	**13.2** (10.9-15.8)	**14.4** (11.8-17.1)	**16.2** (13.3-19.3)	**17.7** (14.4-21.2)	**19.8** (15.5-24.3)	**21.5** (16.4-26.6)	**23.0** (16.9-29.0)	**24.5** (17.2-31.8)	**26.2** (17.7-34.9)	**27.3** (17.9-37.0)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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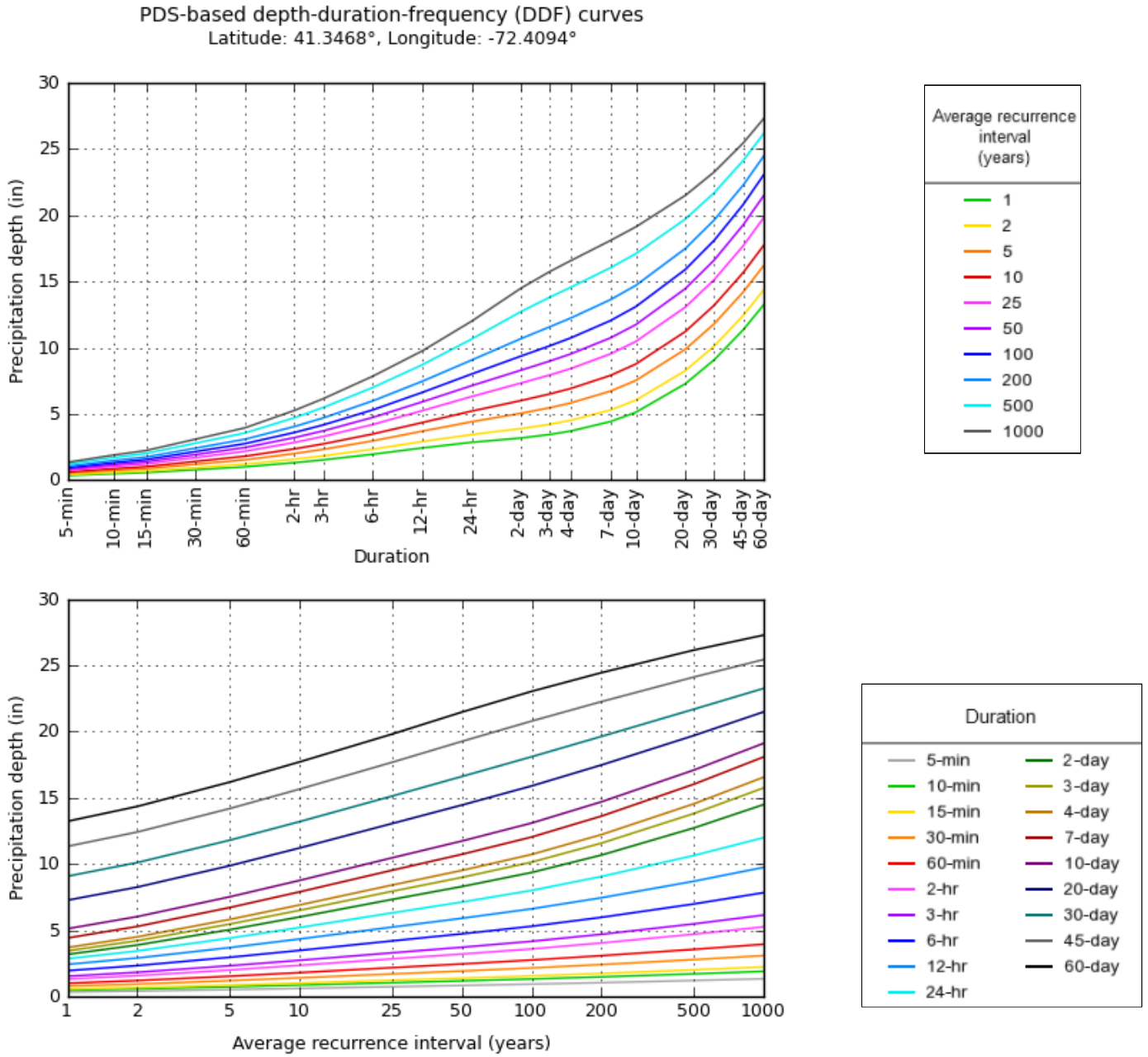
PF graphical



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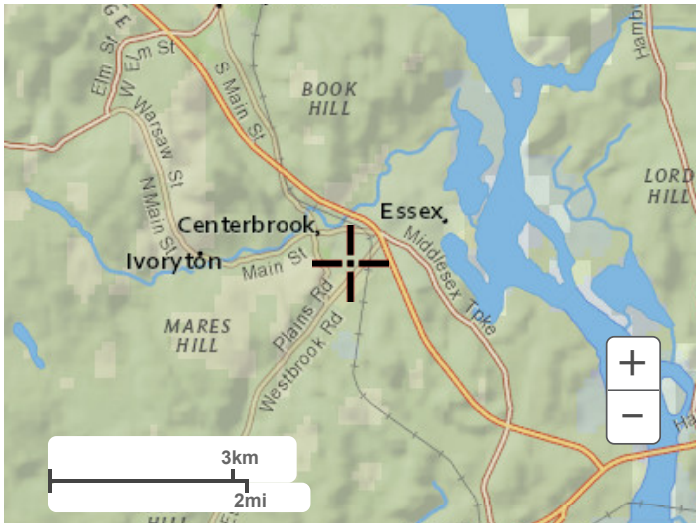
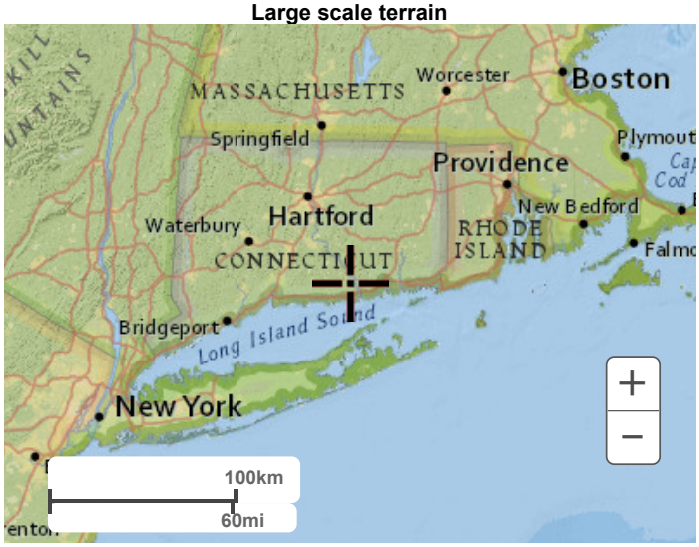
Maps & aerials

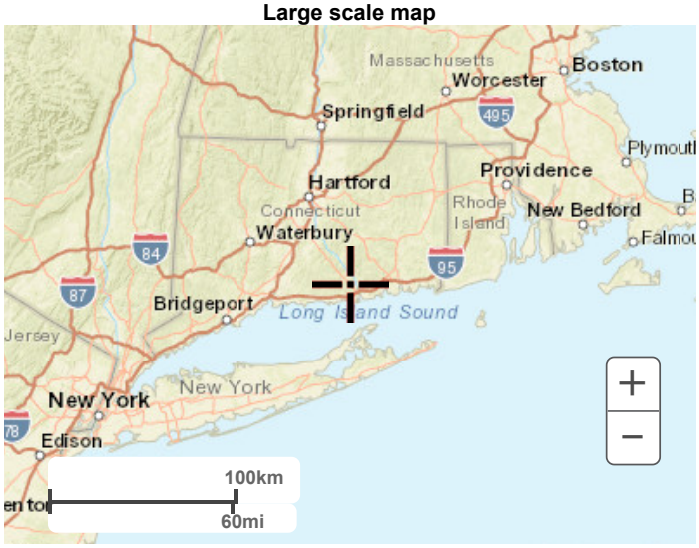
Small scale terrain



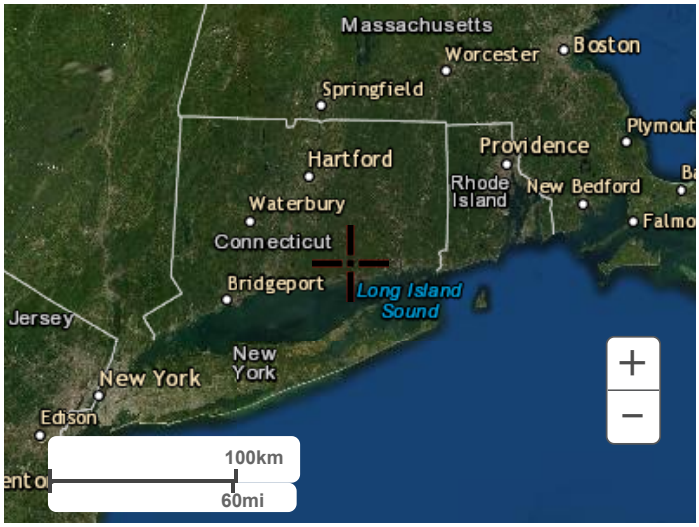
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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Appendix F
Domestic Water Usage Data

Water Data Usage 49 Plains Road

Date	Meter Reading Gallons Used	Number of Days	Gallons Per Day
6/6/2019	7000	97	72
9/6/2019	13000	92	141
10/23/2019	5000	47	106
12/6/2019	3000	44	68
3/4/2020	7000	89	79
6/2/2020	8000	90	89
9/4/2020	11000	94	117
12/8/2020	10000	95	105
3/4/2021	13000	86	151
6/4/2021	44000	92	478
9/9/2021	40000	97	412
12/9/2021	7000	91	77
3/7/2022	157000	88	1784
3/9/2022	4000	2	2000
6/7/2022	29000	90	322
9/7/2022	8000	92	87
Average Gallons Per Day			144