

DOANE ENGINEERING

CIVIL ENGINEERING AND LAND SURVEYING

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Engineering Report

November 3, 2022

Revised December 12, 2022

Prepared For

Piage Management Corp

49 Plains Road

Essex, Connecticut 06426

Prepared By

Doane Engineering

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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.

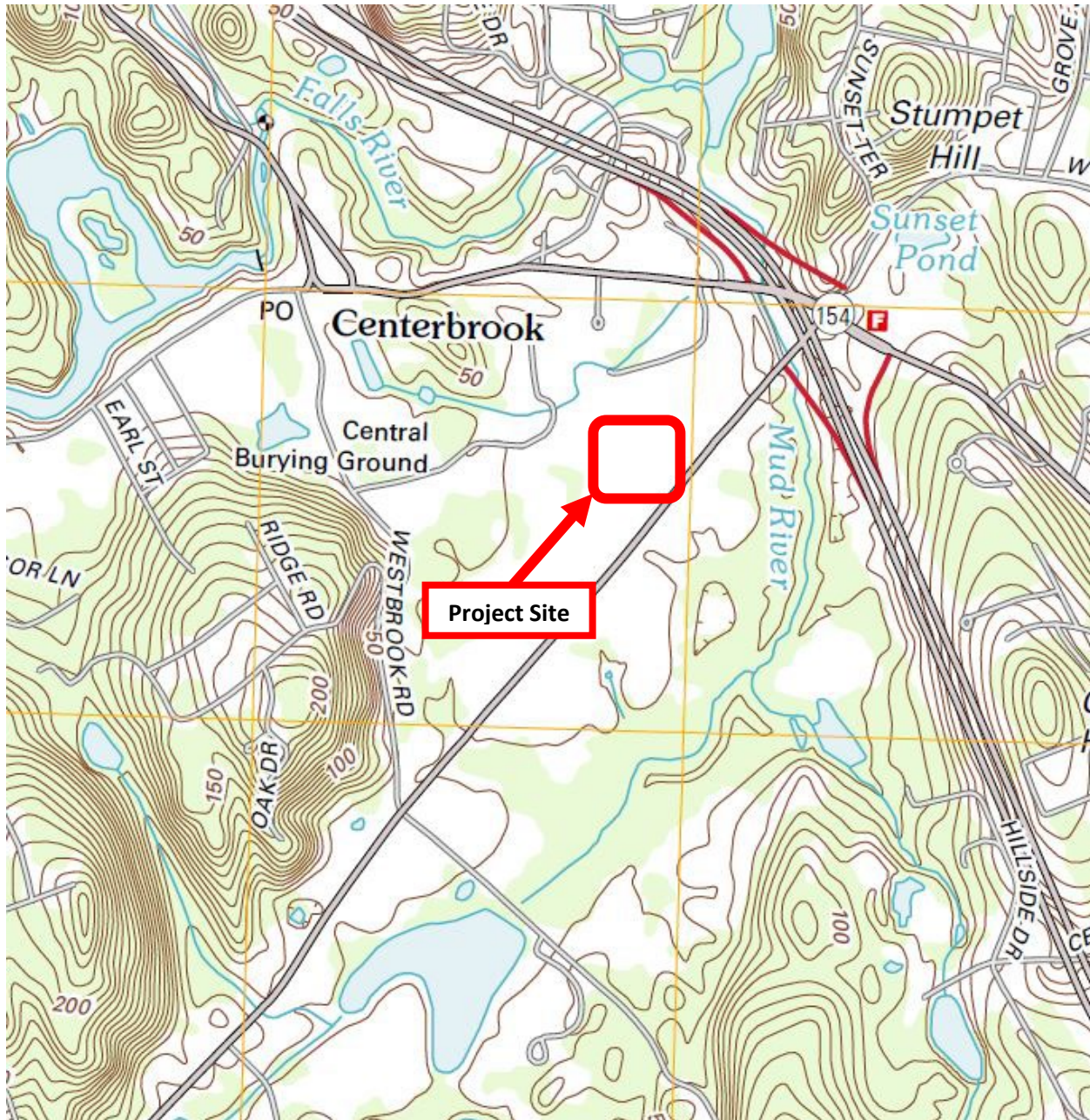


Figure 1. Project location
U.S.G.S Essex Connecticut Quadrangle

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. Additionally 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	Existing (cfs)	Proposed (cfs)	Change (cfs)	Basin 21S Elevation	Basin 22SA Elevation	Underground 22SB Elevation
1 Year	1.77	0.72	-1.05	34.51'	37.43'	34.84'
2 Year	2.39	1.32	-1.07	34.66'	37.44'	35.05'
5 Year	3.51	3.12	-0.39	34.75'	37.45'	35.80'
10 Year	4.48	4.18	-0.3	34.80'	37.46'	35.98'
25 Year	5.86	5.83	-0.03	34.85'	37.47'	36.38'
50 Year	6.89	6.78	-0.11	34.88'	37.48'	36.93'
100 Year	8	7.77	-0.23	34.91	37.48'	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 through 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.

$$144 \text{ gallons} / 15 \text{ employees} = 10 \text{ gallons per day per employee}$$

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

$$10 \text{ Gallons per day per employee} \times 1.5 \text{ Safety Factor} = 15 \text{ gallons per day per employee}$$

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.

$$15 \text{ gallons per day per employee} \times 30 \text{ Employees} = 450 \text{ gallons per day}$$

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 =

$1 \times 60 \text{ LF} \times 10.0 \text{ LF/SF} = 600 \text{ SF}$

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

$MLSS \text{ REQUIRED} = 36 \times 1.5 \times 1 = 54 \text{ LF}$

$MLSS \text{ PROVIDED} = 1 \text{ ROW} \times 60 = 60 \text{ LF}$

Appendix A
Design Computations

Water Quality Volume

WQV, Water Quality Volume (AC-FT)

RCV, Runoff Capture Volume (AC-FT)

R, Volumetric Runoff Coefficient

I, Percent Impervious Cover

A, Site Area (AC)

$$I = 69.02$$

$$R = 0.05 + 0.009(69) = 0.671$$

$$A = 1.84$$

$$\begin{aligned} \text{WQV} &= \frac{1" \times R \times A}{12} = \frac{1 \times 0.67 \times 1.84}{12} = 0.1029 \text{ AC-FT} \\ &= 4482.9 \text{ CF} \end{aligned}$$

WQV=4776.9 CF

Groundwater Recharge

GVR=Groundwater Recharge Volume (ac-ft)

D=Depth of Runoff to be Recharged (inches) (Table 7-4)

A=Site Area (acres)

I=Post Development Impervious (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 inches (waived)

Existing Impervious	0.67
Proposed Impervious	1.27
Change In Impervious	0.6

$$GRV = \frac{0.25 \quad 1.84 \quad 0.6}{12}$$

GRV=	0.023	ac-ft
	1001.9	cf

Appendix B

Hydrologic Model Input Data and Results

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Circle one: **Present** Developed
 Circle one: **T_c** T_t

Watershed: EX WS10
 Subwatershed: _____

Sheet flow (applicable to T_c only)

- Surface description (Table 3-1)
- Manning's roughness coeff. for sheet flow, n (Table 3-1)
- Flow Length, L (< 300ft)
- Two-year 24-hr rainfall, P₂
- Land slope, s
- $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$

Segment ID	A-B
	BIT
	0.010
ft.	65.0
in.	3.44
ft./ft.	0.040
hr.	0.010

= 0.010

Shallow concentrated flow (assume hyd. radius = depth of flow)

- Surface description
- Manning's roughness coeff., n
- Paved or unpaved
- Depth of flow, d (default values: d=.4 unpaved, d=.2 paved) ft.
- Flow Length, L
- Watercourse slope, s
- Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$
- $T_t = \frac{L}{3600 * V}$

Segment ID	B-C	C-D		
	BIT	WOODS		
	0.015	0.100		
	UNPVD	UNPVD		
	0.40	0.40		
ft.	160.0	25.0		
ft./ft.	0.005	0.100		
fps.	3.81	2.56		
hr.	0.012	0.003		

+ 0.014

Channel flow

- Channel Bottom width, b
- Horizontal side slope component, z (z horiz:1 vert) ft.
- Depth of flow, d
- Cross sectional flow area, A (assume trapazoidal) ft.²
- Wetted perimeter, P_w
- Hydraulic Radius, $R = \frac{A}{P_w}$
- Channel slope, s
- Manning's roughness coeff., n
- $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$
- Flow length, L
- $T_t = \frac{L}{3600 * V}$
- Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)

Segment ID				
ft.				
ft.				
ft. ²				
ft.				
ft.				
ft./ft.				
fps.				
ft.				
hr.				

= 0.000
 0.024

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Circle one: **Present** Developed
 Circle one: **I_c** T_t

Watershed: **EX WS11**
 Subwatershed: _____

Sheet flow (applicable to T_c only)

- Surface description (Table 3-1)
- Manning's roughness coeff. for sheet flow, n (Table 3-1)
- Flow Length, L (< 300ft)
- Two-year 24-hr rainfall, P₂
- Land slope, s
- $T_t = \frac{0.007 (nL)^{0.8}}{P_2^{0.5} (s^{0.4})}$

Segment ID	A-B
	WOODS
	0.400
ft.	50.0
in.	3.44
ft./ft.	0.020
hr.	0.198
	= 0.198

Shallow concentrated flow (assume hyd. radius = depth of flow)

- Surface description
- Manning's roughness coeff., n
- Paved or unpaved
- Depth of flow, d (default values: d=.4 unpaved, d=.2 paved) ft.
- Flow Length, L
- Watercourse slope, s
- Average velocity, $V = \frac{1.49}{n} (d^{2/3}) (s^{1/2})$
- $T_t = \frac{L}{3600 * V}$

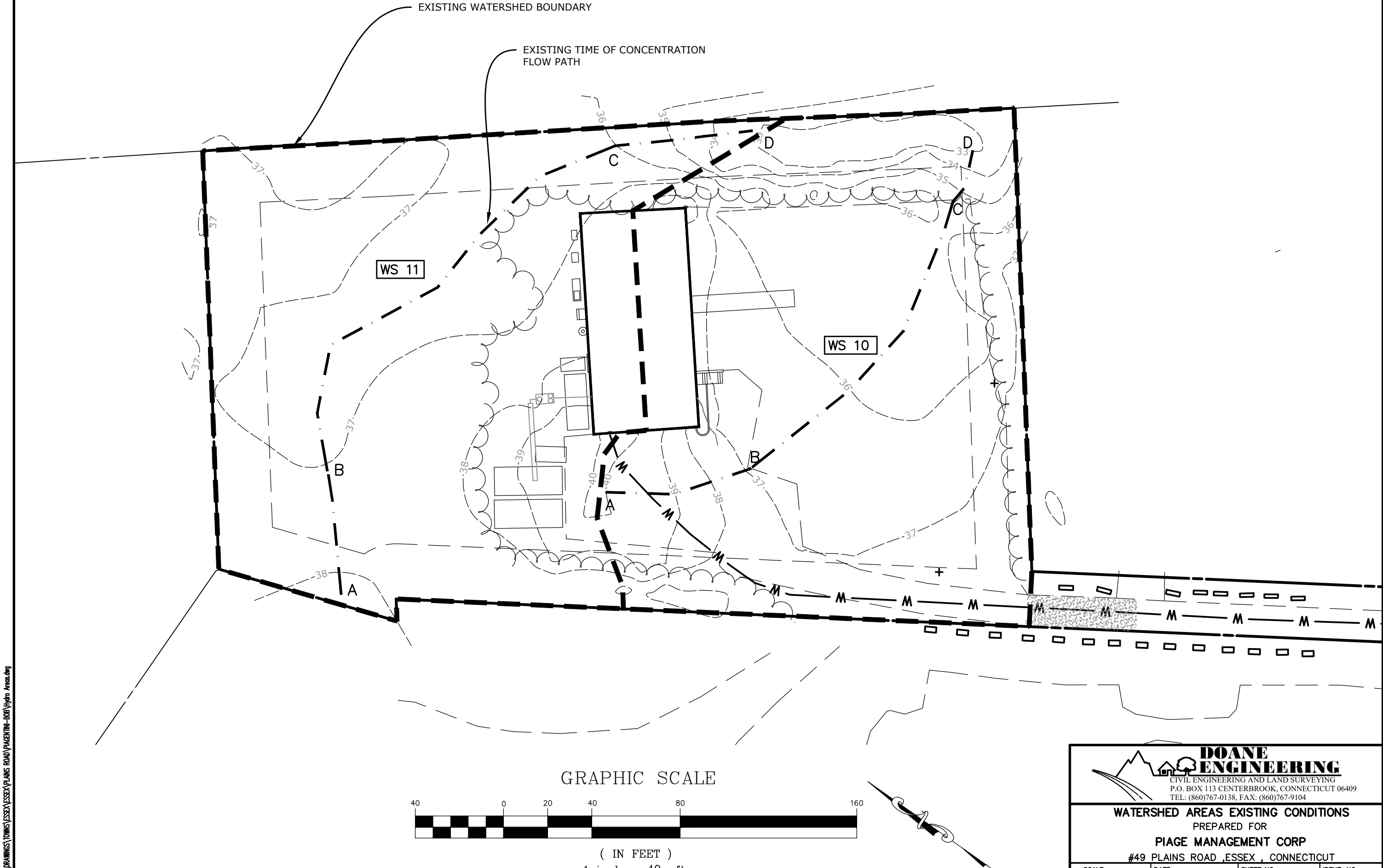
Segment ID	B-C	C-D		
	WOODS	WOODS		
	0.100	0.100		
	UNPVD	UNPVD		
	0.40	0.40		
ft.	218.0	60.0		
ft./ft.	0.005	0.050		
fps.	0.57	1.81		
hr.	0.106	0.009		
				= 0.115

Channel flow

- Channel Bottom width, b
- Horizontal side slope component, z (z horiz:1 vert) ft.
- Depth of flow, d
- Cross sectional flow area, A (assume trapazoidal) ft.²
- Wetted perimeter, P_w
- Hydraulic Radius, $R = \frac{A}{P_w}$
- Channel slope, s
- Manning's roughness coeff., n
- $V = \frac{1.49}{n} (R^{2/3}) (s^{1/2})$
- Flow length, L
- $T_t = \frac{L}{3600 * V}$
- Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)

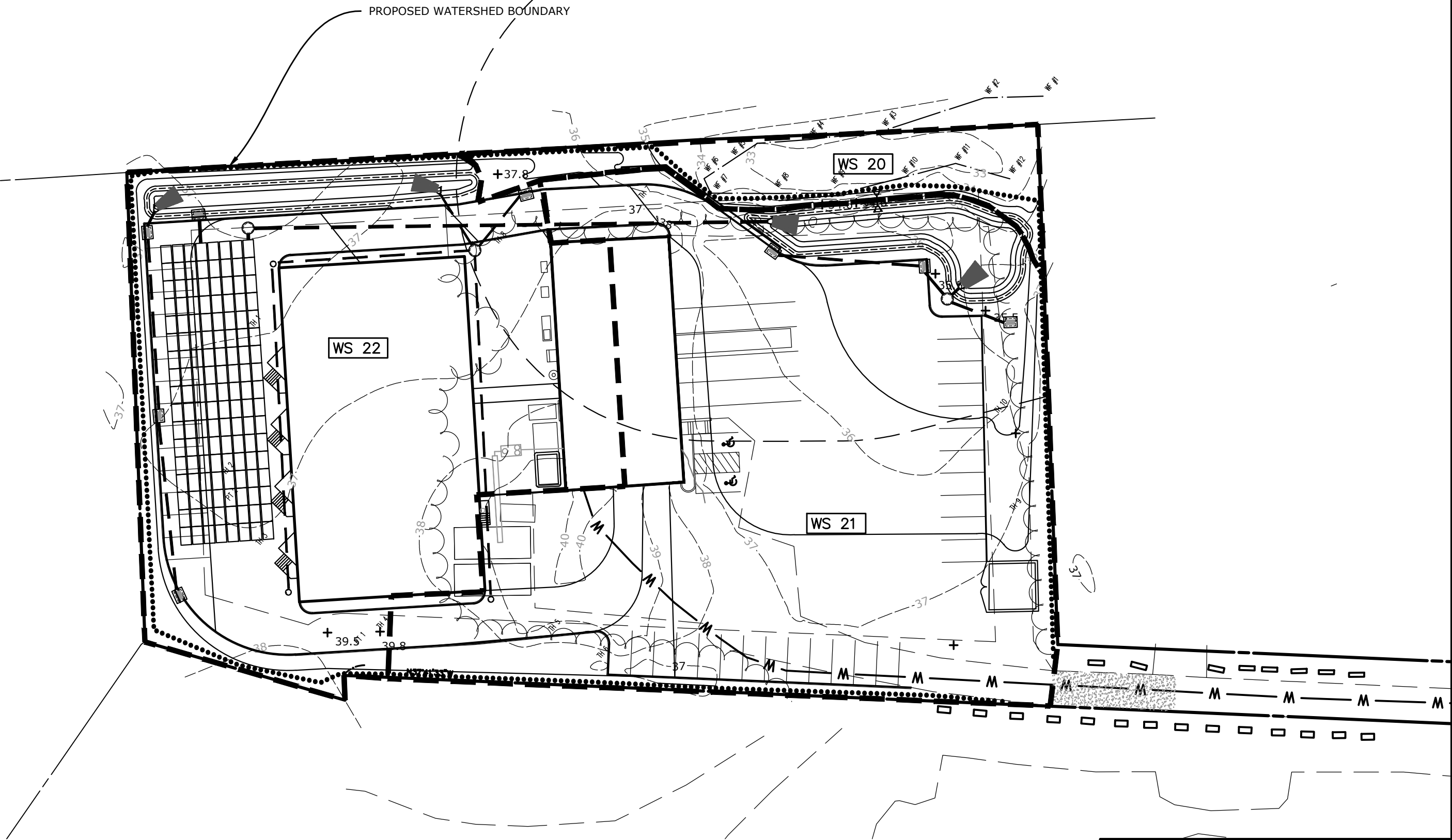
Segment ID				
ft.				
ft.				
ft. ²				
ft.				
ft.				
ft./ft.				
fps.				
ft.				
hr.				
				= 0.000
				0.313

DATE	REVISION	CK.
11/29/22	REVISION	
12/12/22	TOWN COMMENTS	



FILE: R:\DRAWINGS\TOWNS\ESSEX\PLAINS ROAD\PIAGENTIN-808\Hydro Areas.dwg

DATE	REVISION	CK.
11/29/22	REVISION	
12/12/22	TOWN COMMENTS	



GRAPHIC SCALE



(IN FEET)
1 inch = 40 ft.

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WATERSHED AREAS EXISTING CONDITIONS
PREPARED FOR
PIAGE MANAGEMENT CORP
#49 PLAINS ROAD , ESSEX , CONNECTICUT

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

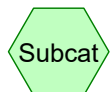
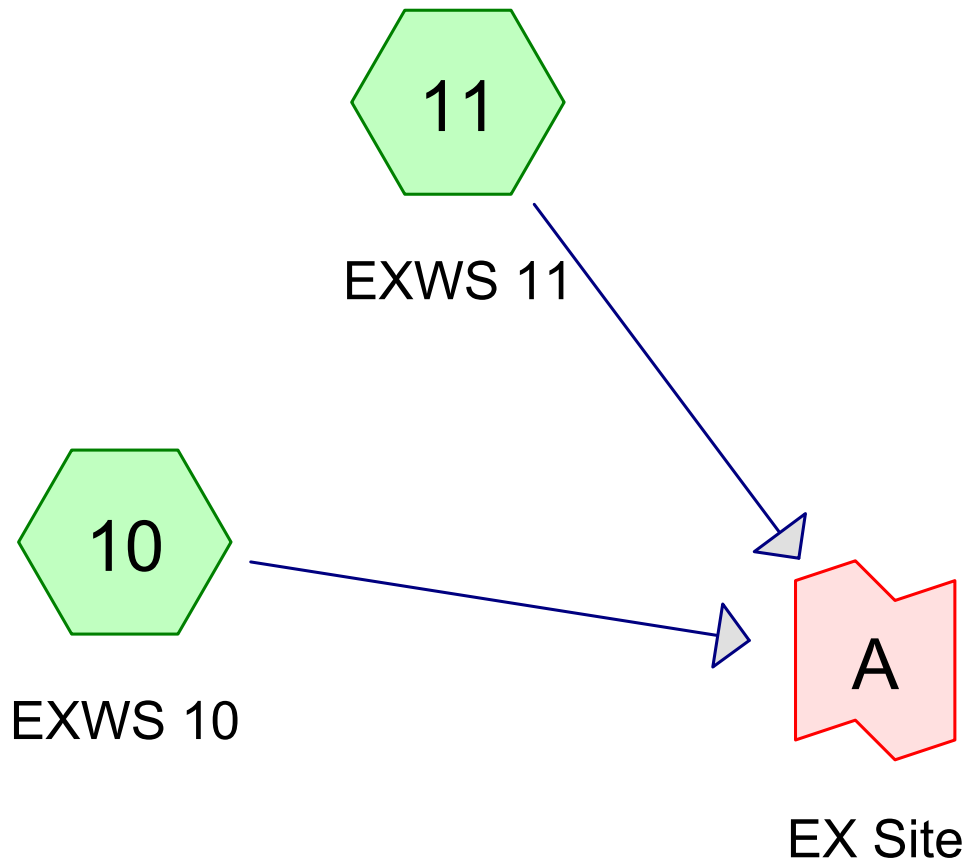
Existing Watershed WS 10		
	SF	AC
Woods	9000	0.21
Grass	1200	0.03
Gravel	19300	0.44
Impervious	10000	0.23
Total	39500	0.91

Existing Watershed WS 11		
	SF	AC
Woods	30500	0.7
Grass	5600	0.13
Impervious	4500	0.1
Total	40600	0.93

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

Proposed Watershed WS 21		
		AC
Grass	9475	0.22
Impervious (Bituminous)	29400	0.67
Impervious (Building)	2375	0.05
Total	41250	0.95

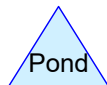
Proposed Water Shed WS 22		
	SF	AC
Grass	9870	0.23
Impervious (Bituminous)	11200	0.26
Impervious (Building)	12500	0.29
Total	33570	0.77



Subcat



Reach



Pond



Link

Routing Diagram for 49 Plains Road Existing
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49 Plains Road Existing

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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

49 Plains Road Existing

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.156	61	>75% Grass cover, Good, HSG B (10, 11)
0.443	96	Gravel surface, HSG B (10)
0.333	98	Impervious (10, 11)
0.907	55	Woods, Good, HSG B (10, 11)
1.839	73	TOTAL AREA

49 Plains Road Existing

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.156	0.000	0.000	0.000	0.156	>75% Grass cover, Good	10, 11
0.000	0.443	0.000	0.000	0.000	0.443	Gravel surface	10
0.000	0.000	0.000	0.000	0.333	0.333	Impervious	10, 11
0.000	0.907	0.000	0.000	0.000	0.907	Woods, Good	10, 11
0.000	1.506	0.000	0.000	0.333	1.839	TOTAL AREA	

49 Plains Road Existing

CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

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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=39,500 sf 25.32% Impervious Runoff Depth>1.53"

Tc=6.0 min CN=86 Runoff=1.76 cfs 0.116 af

Subcatchment 11: EXWS 11

Runoff Area=40,600 sf 11.08% Impervious Runoff Depth>0.31"

Tc=18.8 min CN=61 Runoff=0.10 cfs 0.024 af

Link A: EX Site

Inflow=1.77 cfs 0.140 af

Primary=1.77 cfs 0.140 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.140 af Average Runoff Depth = 0.91"
81.90% Pervious = 1.506 ac 18.10% Impervious = 0.333 ac

49 Plains Road Existing

CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

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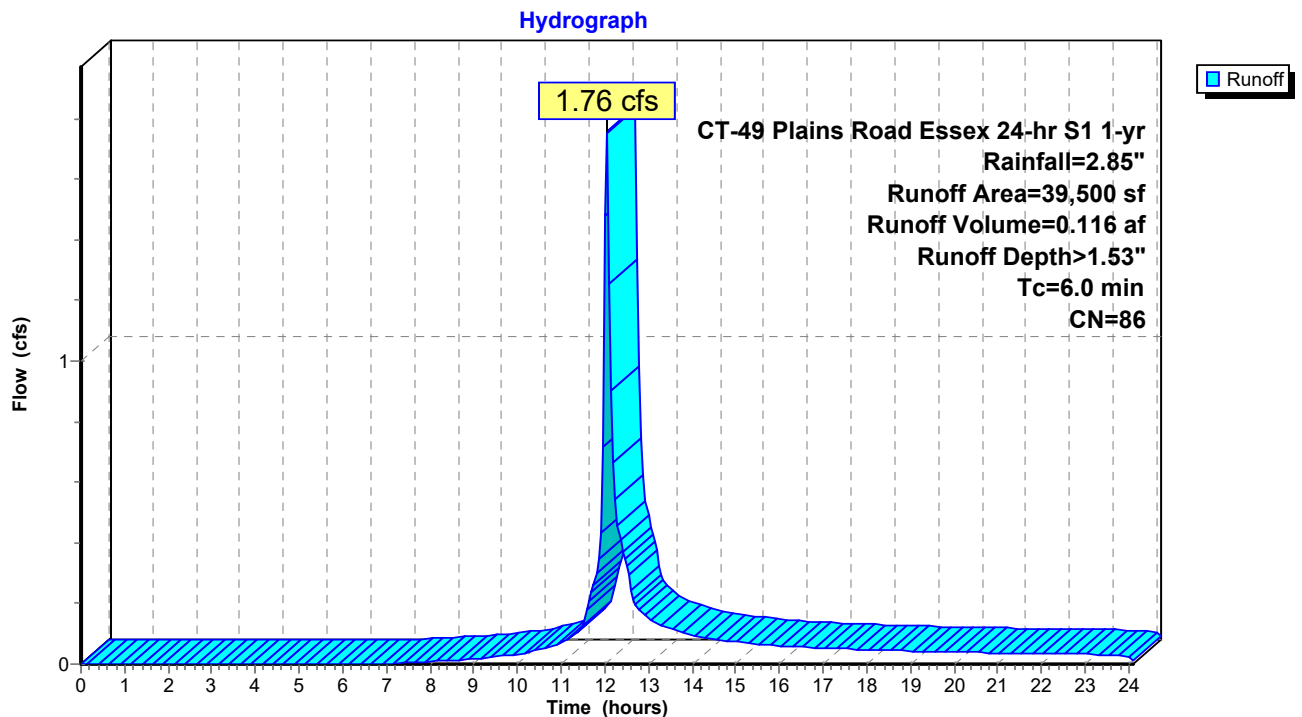
Summary for Subcatchment 10: EXWS 10

Runoff = 1.76 cfs @ 12.04 hrs, Volume= 0.116 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
9,000	55	Woods, Good, HSG B
1,200	61	>75% Grass cover, Good, HSG B
19,300	96	Gravel surface, HSG B
* 10,000	98	Impervious
39,500	86	Weighted Average
29,500		74.68% Pervious Area
10,000		25.32% 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

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CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

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Summary for Subcatchment 11: EXWS 11

Runoff = 0.10 cfs @ 12.34 hrs, Volume= 0.024 af, Depth> 0.31"
Routed to Link A : EX Site

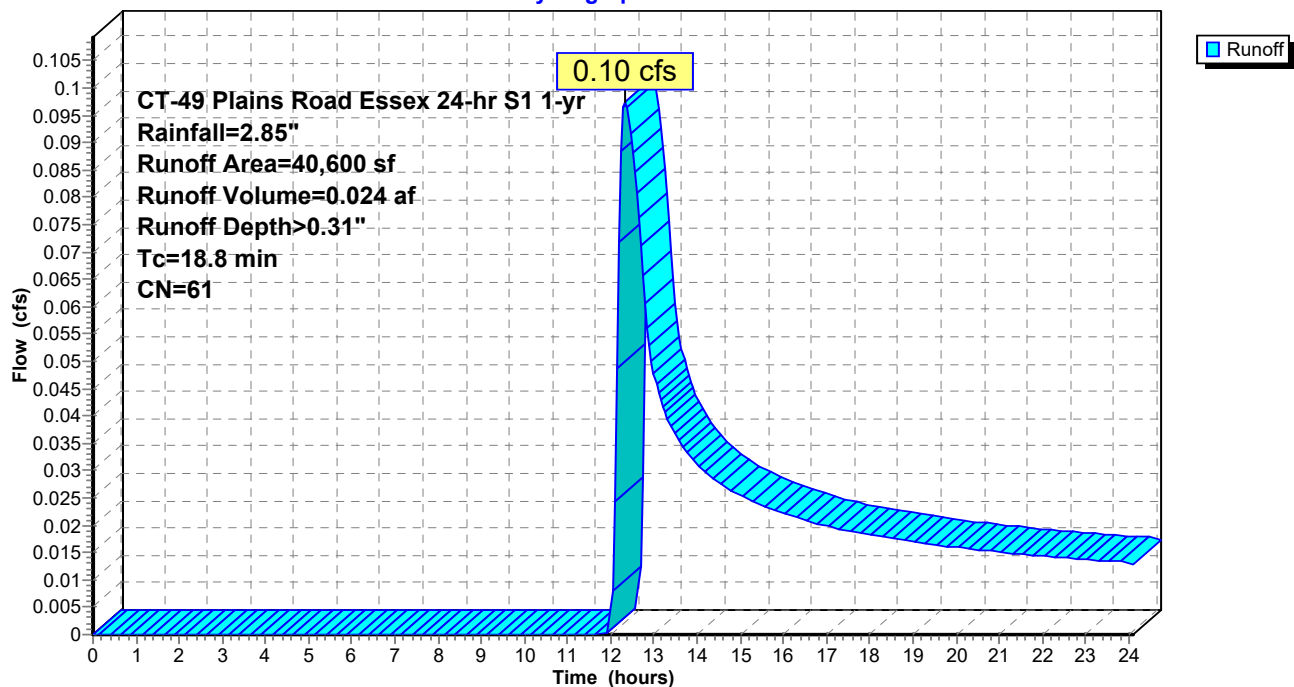
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

Area (sf)	CN	Description
30,500	55	Woods, Good, HSG B
5,600	61	>75% Grass cover, Good, HSG B
* 4,500	98	Impervious
40,600	61	Weighted Average
36,100		88.92% Pervious Area
4,500		11.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8					Direct Entry, See Worksheet

Subcatchment 11: EXWS 11

Hydrograph



49 Plains Road Existing

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CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

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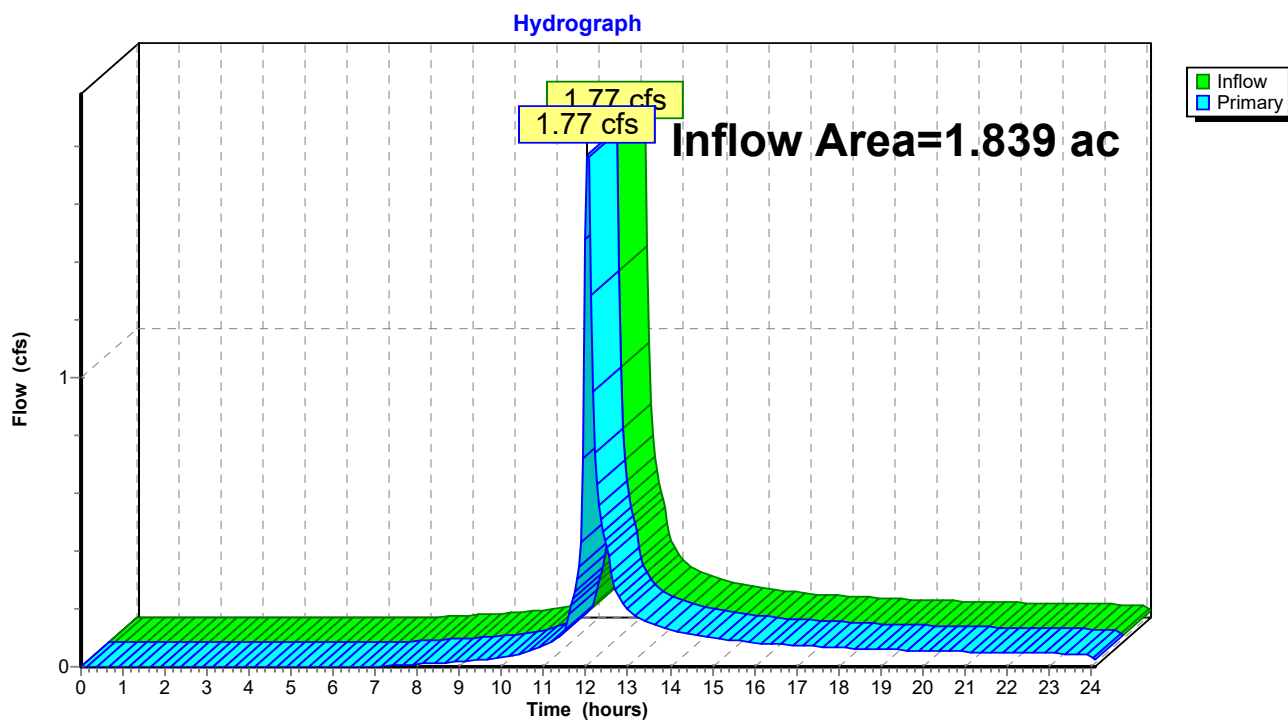
Page 8

Summary for Link A: EX Site

Inflow Area = 1.839 ac, 18.10% Impervious, Inflow Depth > 0.91" for 1-yr event
Inflow = 1.77 cfs @ 12.04 hrs, Volume= 0.140 af
Primary = 1.77 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



49 Plains Road Existing*CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"*

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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=39,500 sf 25.32% Impervious Runoff Depth>2.05"

Tc=6.0 min CN=86 Runoff=2.34 cfs 0.155 af

Subcatchment 11: EXWS 11

Runoff Area=40,600 sf 11.08% Impervious Runoff Depth>0.54"

Tc=18.8 min CN=61 Runoff=0.26 cfs 0.042 af

Link A: EX Site

Inflow=2.39 cfs 0.197 af

Primary=2.39 cfs 0.197 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.197 af Average Runoff Depth = 1.28"
81.90% Pervious = 1.506 ac 18.10% Impervious = 0.333 ac

49 Plains Road Existing

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CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

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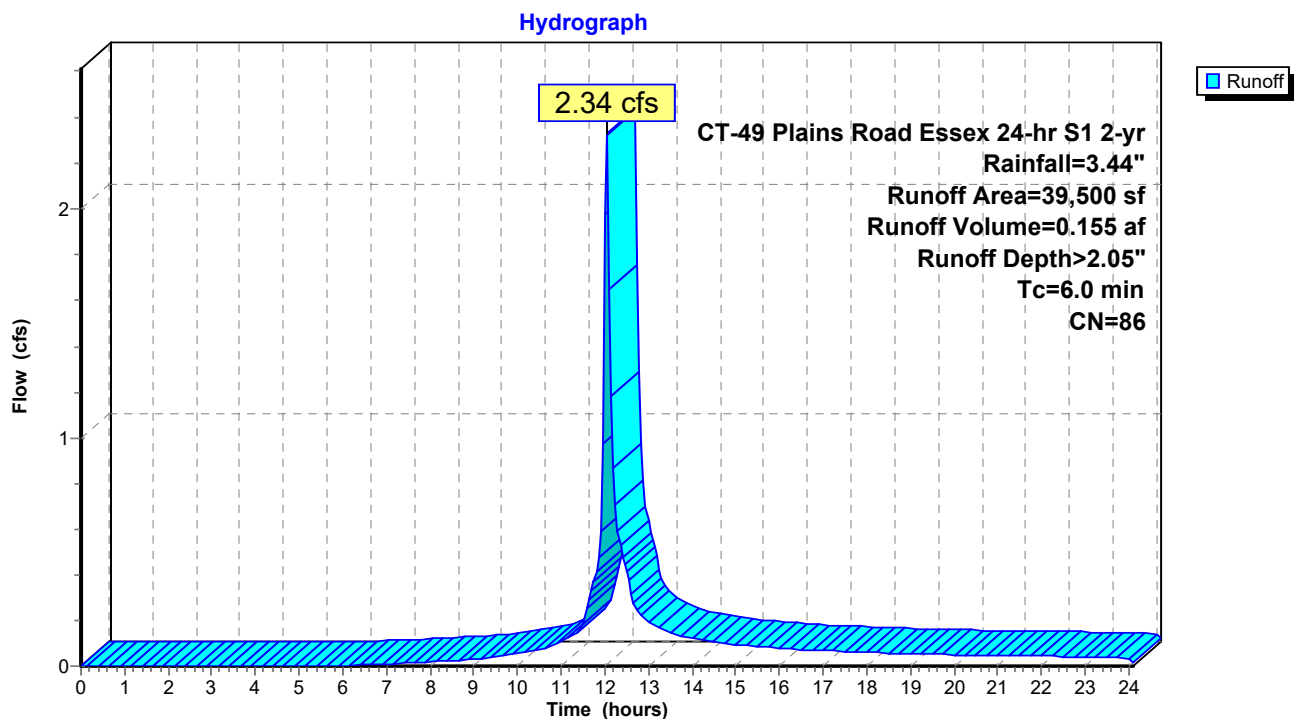
Summary for Subcatchment 10: EXWS 10

Runoff = 2.34 cfs @ 12.04 hrs, Volume= 0.155 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
9,000	55	Woods, Good, HSG B
1,200	61	>75% Grass cover, Good, HSG B
19,300	96	Gravel surface, HSG B
* 10,000	98	Impervious
39,500	86	Weighted Average
29,500		74.68% Pervious Area
10,000		25.32% 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

49 Plains Road Existing

CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

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Summary for Subcatchment 11: EXWS 11

Runoff = 0.26 cfs @ 12.27 hrs, Volume= 0.042 af, Depth> 0.54"
 Routed to Link A : EX Site

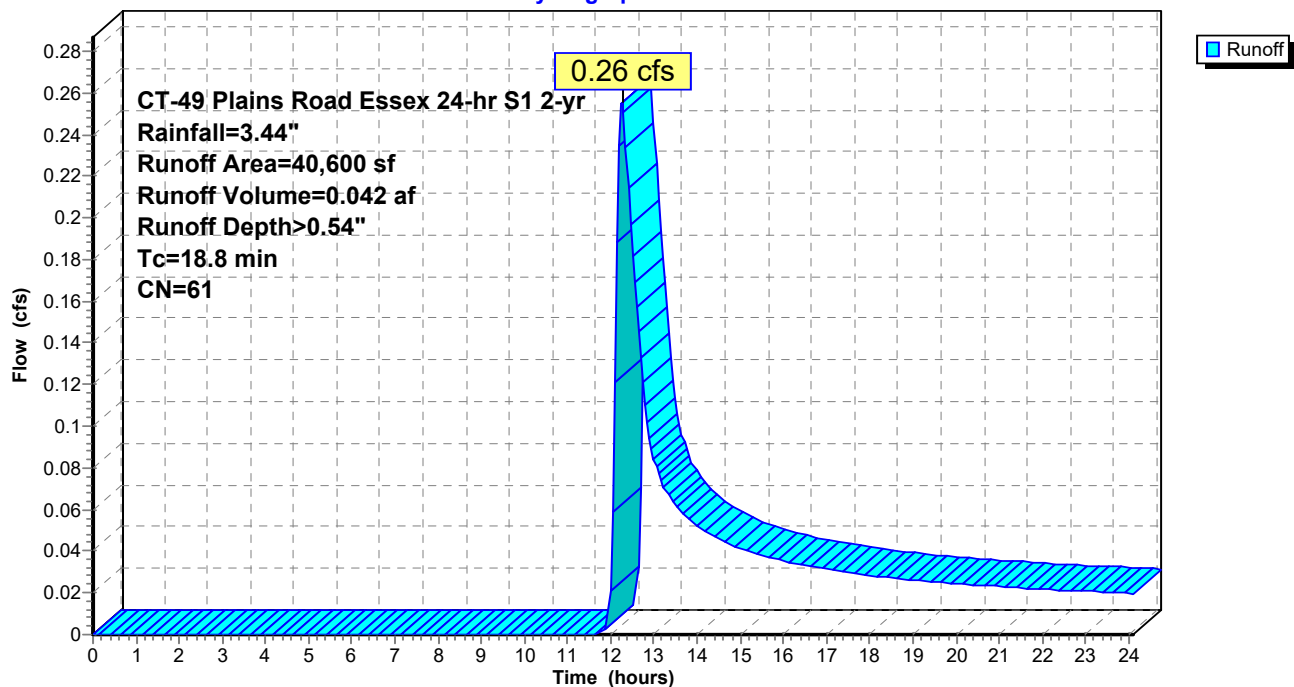
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
 CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

Area (sf)	CN	Description
30,500	55	Woods, Good, HSG B
5,600	61	>75% Grass cover, Good, HSG B
* 4,500	98	Impervious
40,600	61	Weighted Average
36,100		88.92% Pervious Area
4,500		11.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8					Direct Entry, See Worksheet

Subcatchment 11: EXWS 11

Hydrograph



49 Plains Road Existing

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CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

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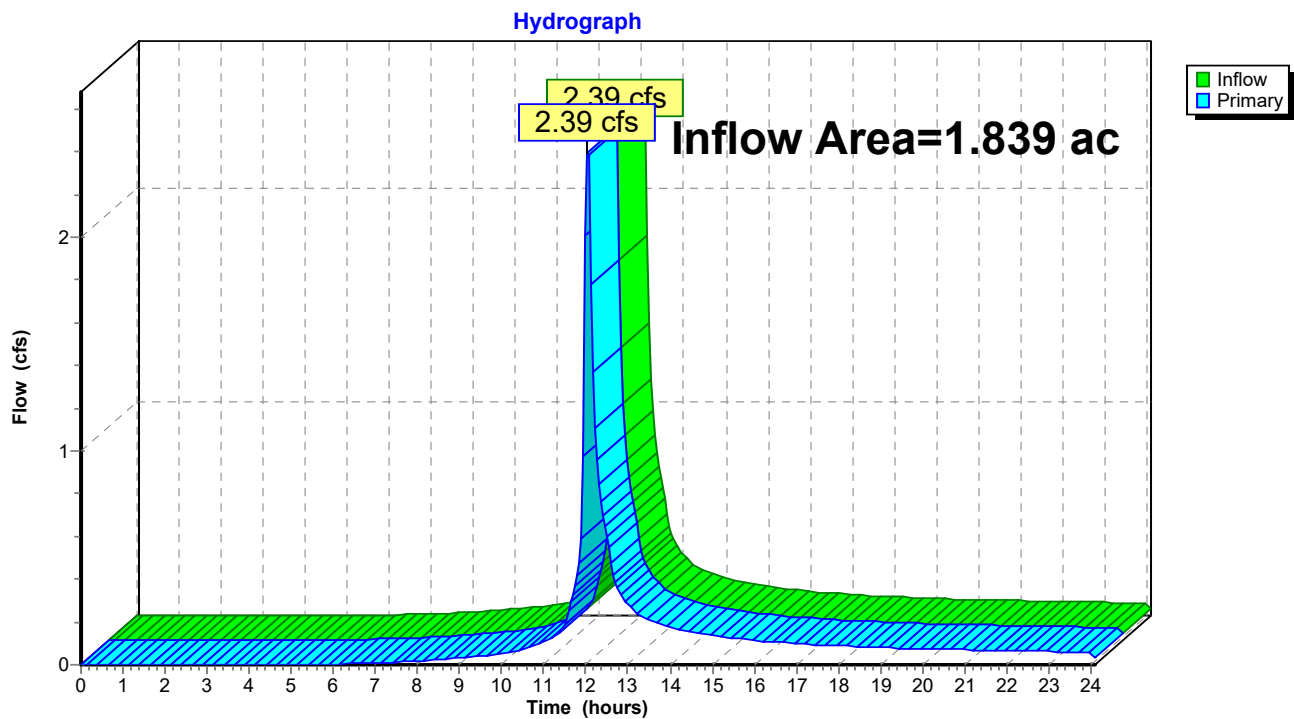
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Summary for Link A: EX Site

Inflow Area = 1.839 ac, 18.10% Impervious, Inflow Depth > 1.28" for 2-yr event
Inflow = 2.39 cfs @ 12.04 hrs, Volume= 0.197 af
Primary = 2.39 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



49 Plains Road Existing

CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"

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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=39,500 sf 25.32% Impervious Runoff Depth>2.91"

Tc=6.0 min CN=86 Runoff=3.29 cfs 0.220 af

Subcatchment 11: EXWS 11

Runoff Area=40,600 sf 11.08% Impervious Runoff Depth>1.02"

Tc=18.8 min CN=61 Runoff=0.61 cfs 0.079 af

Link A: EX Site

Inflow=3.51 cfs 0.299 af

Primary=3.51 cfs 0.299 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.299 af Average Runoff Depth = 1.95"
81.90% Pervious = 1.506 ac 18.10% Impervious = 0.333 ac

49 Plains Road Existing

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CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"

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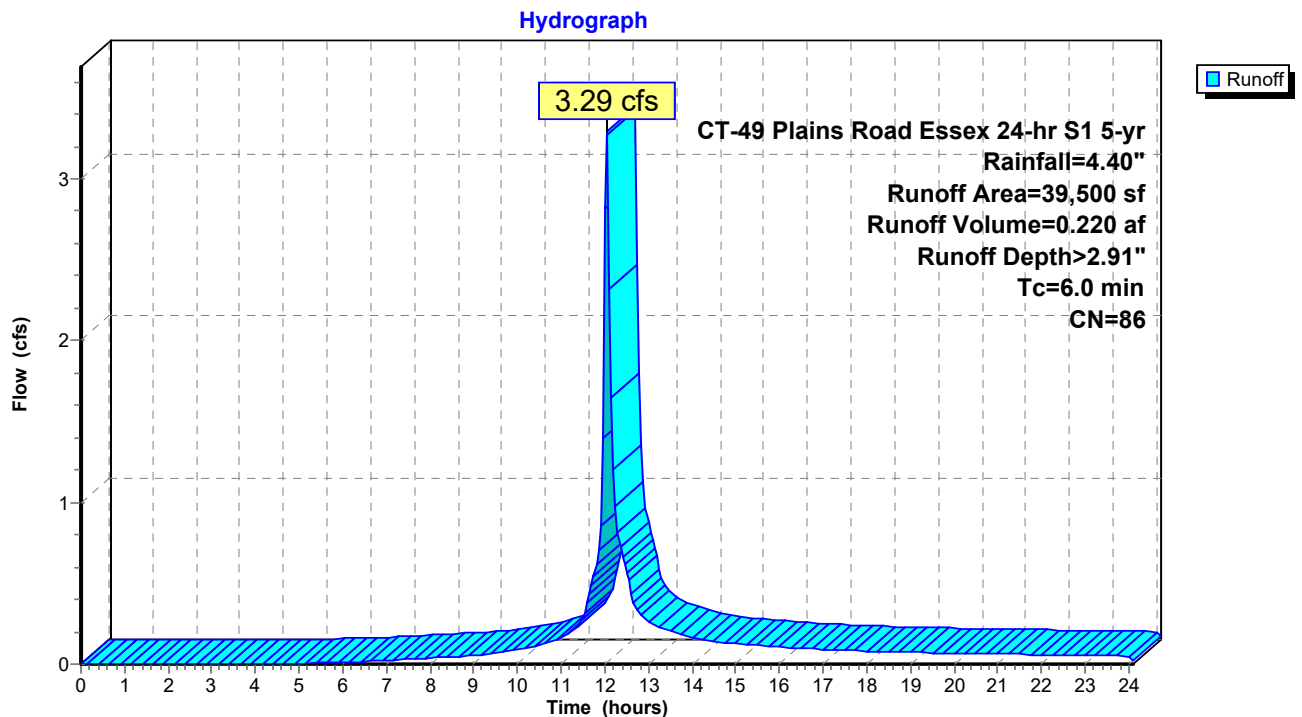
Summary for Subcatchment 10: EXWS 10

Runoff = 3.29 cfs @ 12.04 hrs, Volume= 0.220 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
9,000	55	Woods, Good, HSG B
1,200	61	>75% Grass cover, Good, HSG B
19,300	96	Gravel surface, HSG B
* 10,000	98	Impervious
39,500	86	Weighted Average
29,500		74.68% Pervious Area
10,000		25.32% 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

49 Plains Road Existing

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CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"

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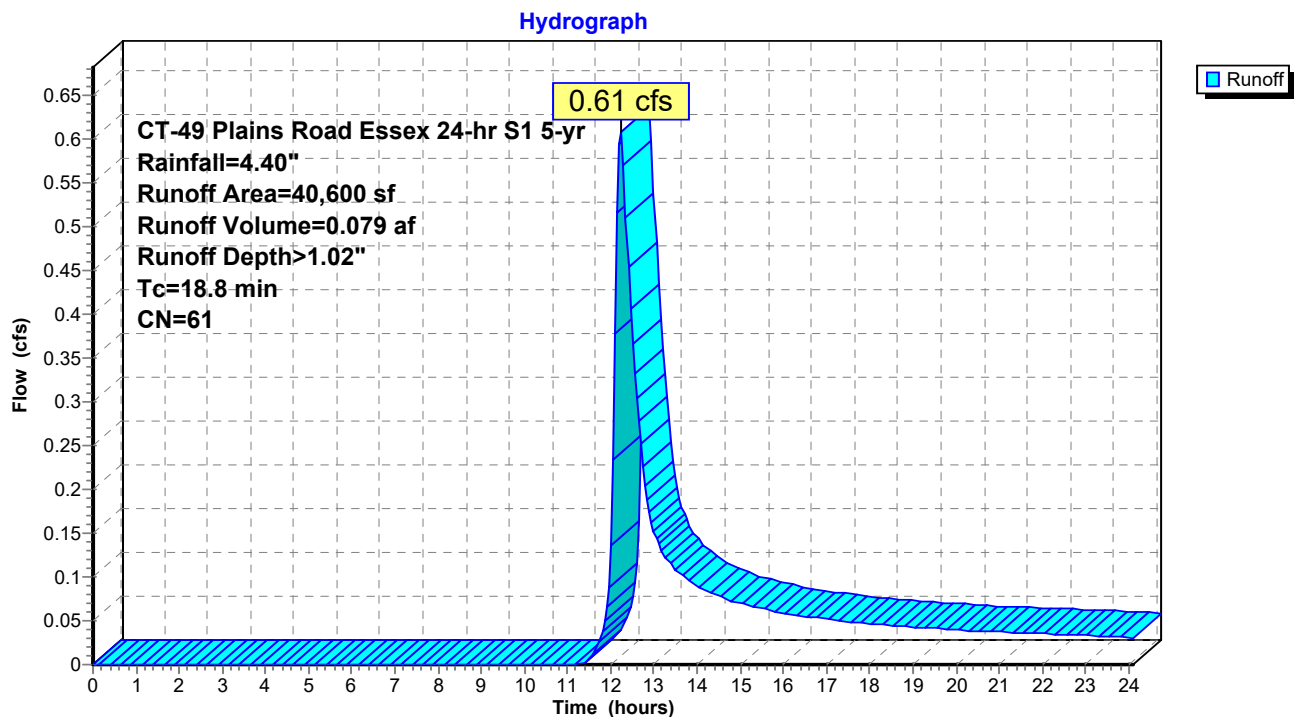
Summary for Subcatchment 11: EXWS 11

Runoff = 0.61 cfs @ 12.24 hrs, Volume= 0.079 af, Depth> 1.02"
 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
30,500	55	Woods, Good, HSG B
5,600	61	>75% Grass cover, Good, HSG B
* 4,500	98	Impervious
40,600	61	Weighted Average
36,100		88.92% Pervious Area
4,500		11.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8					Direct Entry, See Worksheet

Subcatchment 11: EXWS 11

49 Plains Road Existing

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CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"

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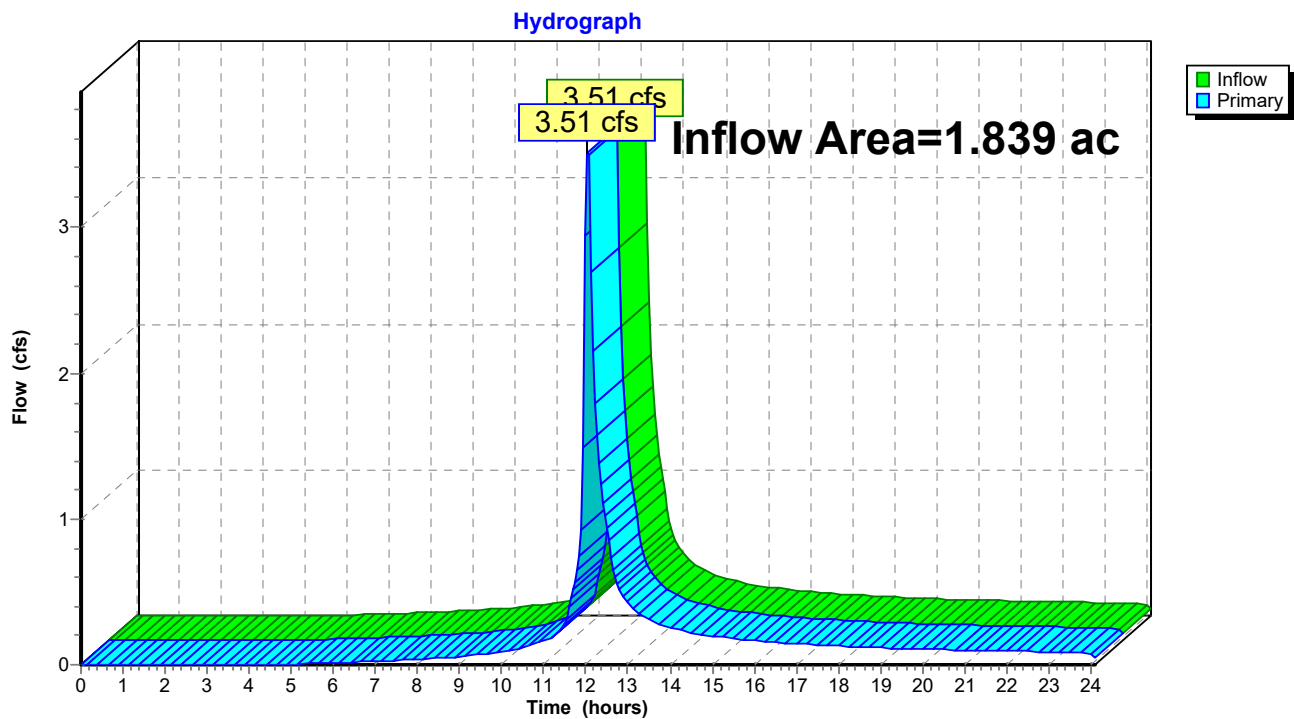
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Summary for Link A: EX Site

Inflow Area = 1.839 ac, 18.10% Impervious, Inflow Depth > 1.95" for 5-yr event
Inflow = 3.51 cfs @ 12.05 hrs, Volume= 0.299 af
Primary = 3.51 cfs @ 12.05 hrs, Volume= 0.299 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



49 Plains Road Existing*CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"*

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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=39,500 sf 25.32% Impervious Runoff Depth>3.65"

Tc=6.0 min CN=86 Runoff=4.09 cfs 0.276 af

Subcatchment 11: EXWS 11

Runoff Area=40,600 sf 11.08% Impervious Runoff Depth>1.48"

Tc=18.8 min CN=61 Runoff=0.96 cfs 0.115 af

Link A: EX Site

Inflow=4.48 cfs 0.391 af

Primary=4.48 cfs 0.391 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.391 af Average Runoff Depth = 2.55"
81.90% Pervious = 1.506 ac 18.10% Impervious = 0.333 ac

49 Plains Road Existing

CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"

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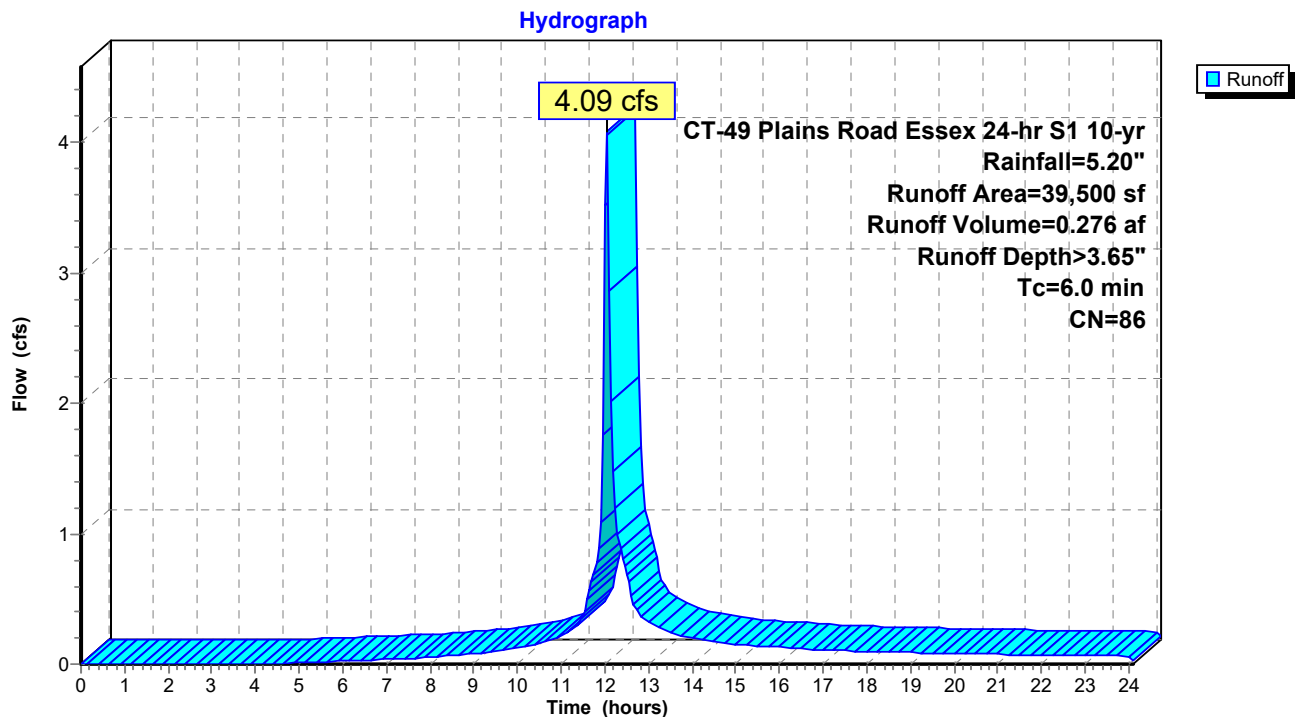
Summary for Subcatchment 10: EXWS 10

Runoff = 4.09 cfs @ 12.04 hrs, Volume= 0.276 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
9,000	55	Woods, Good, HSG B
1,200	61	>75% Grass cover, Good, HSG B
19,300	96	Gravel surface, HSG B
* 10,000	98	Impervious
39,500	86	Weighted Average
29,500		74.68% Pervious Area
10,000		25.32% 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

49 Plains Road Existing

CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"

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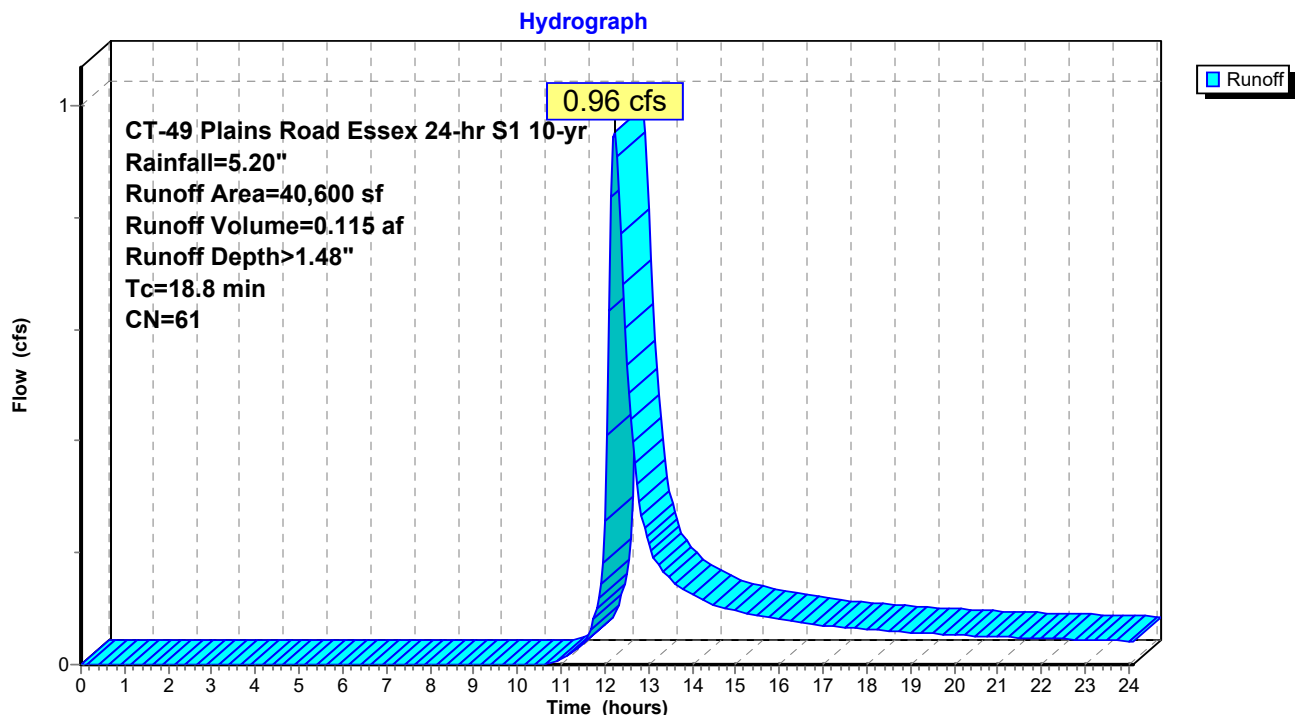
Summary for Subcatchment 11: EXWS 11

Runoff = 0.96 cfs @ 12.23 hrs, Volume= 0.115 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
30,500	55	Woods, Good, HSG B
5,600	61	>75% Grass cover, Good, HSG B
* 4,500	98	Impervious
40,600	61	Weighted Average
36,100		88.92% Pervious Area
4,500		11.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8					Direct Entry, See Worksheet

Subcatchment 11: EXWS 11

49 Plains Road Existing

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CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"

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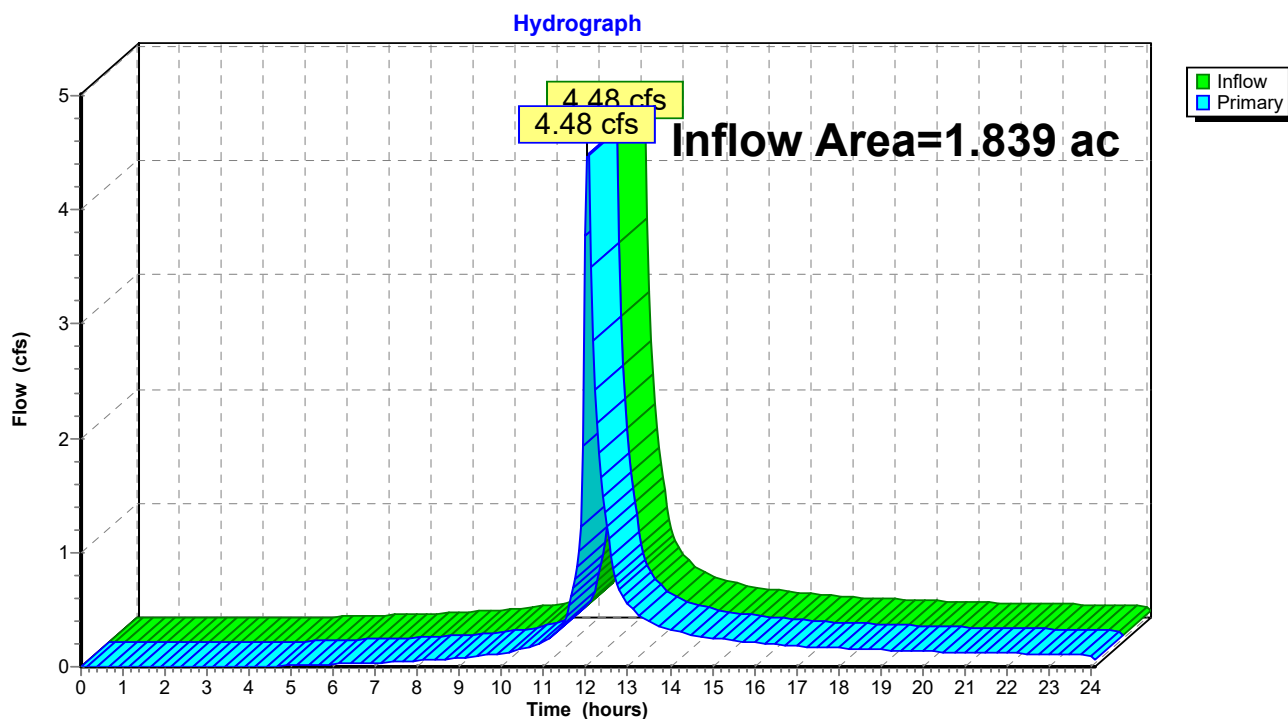
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Summary for Link A: EX Site

Inflow Area = 1.839 ac, 18.10% Impervious, Inflow Depth > 2.55" for 10-yr event
Inflow = 4.48 cfs @ 12.05 hrs, Volume= 0.391 af
Primary = 4.48 cfs @ 12.05 hrs, Volume= 0.391 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



49 Plains Road Existing*CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"*

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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=39,500 sf 25.32% Impervious Runoff Depth>4.70"

Tc=6.0 min CN=86 Runoff=5.19 cfs 0.355 af

Subcatchment 11: EXWS 11

Runoff Area=40,600 sf 11.08% Impervious Runoff Depth>2.21"

Tc=18.8 min CN=61 Runoff=1.50 cfs 0.171 af

Link A: EX Site

Inflow=5.85 cfs 0.527 af

Primary=5.85 cfs 0.527 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.527 af Average Runoff Depth = 3.44"
81.90% Pervious = 1.506 ac 18.10% Impervious = 0.333 ac

49 Plains Road Existing

CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"

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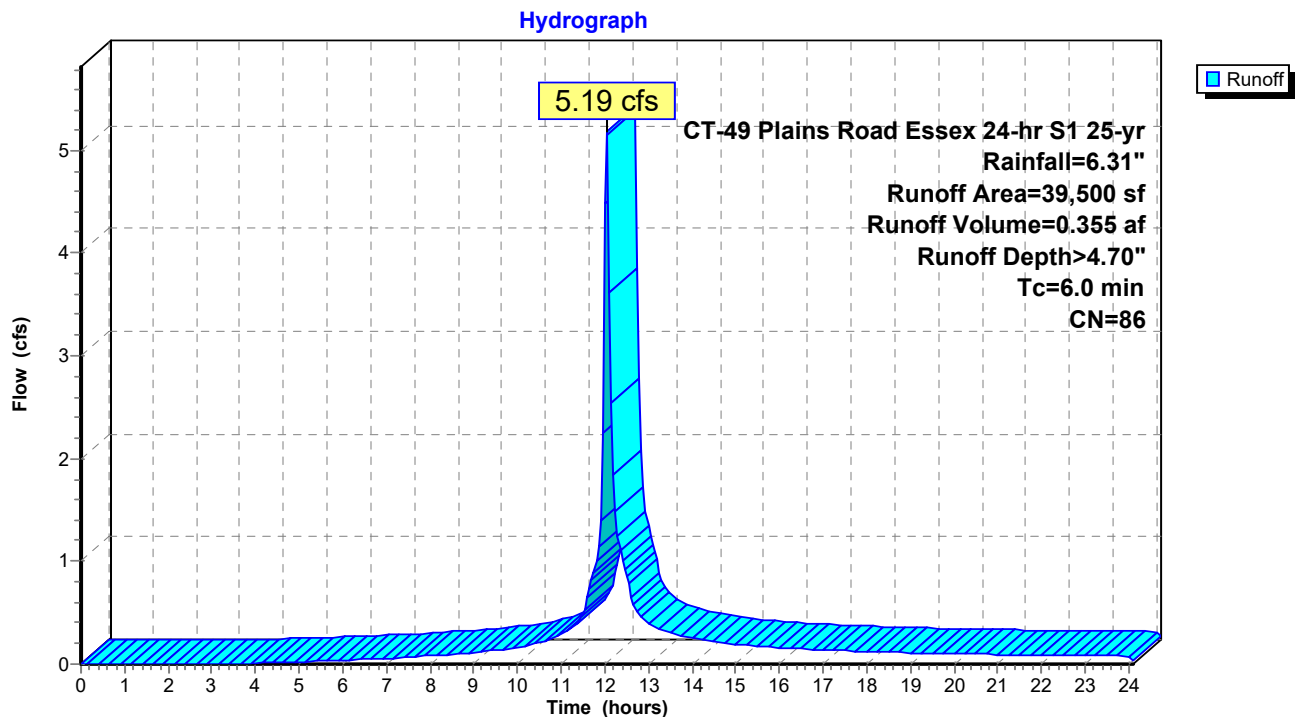
Summary for Subcatchment 10: EXWS 10

Runoff = 5.19 cfs @ 12.04 hrs, Volume= 0.355 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
9,000	55	Woods, Good, HSG B
1,200	61	>75% Grass cover, Good, HSG B
19,300	96	Gravel surface, HSG B
* 10,000	98	Impervious
39,500	86	Weighted Average
29,500		74.68% Pervious Area
10,000		25.32% 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

49 Plains Road Existing

CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"

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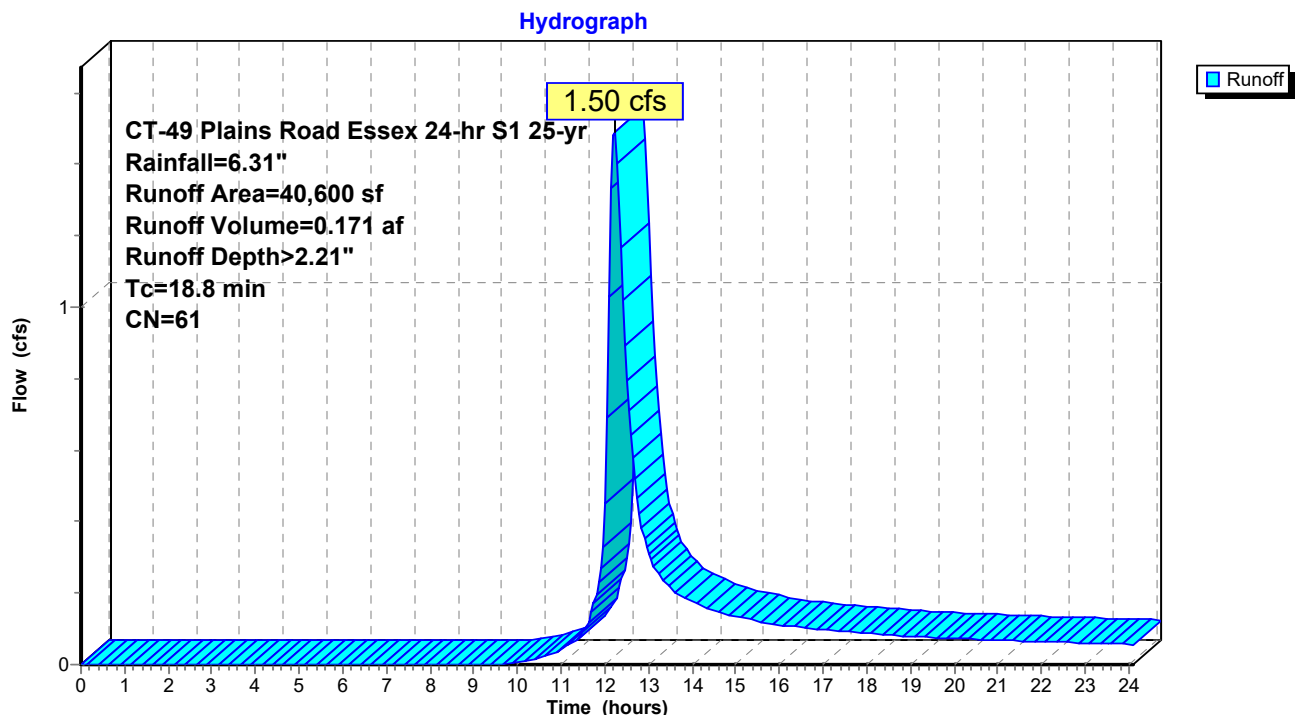
Summary for Subcatchment 11: EXWS 11

Runoff = 1.50 cfs @ 12.22 hrs, Volume= 0.171 af, Depth> 2.21"
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
30,500	55	Woods, Good, HSG B
5,600	61	>75% Grass cover, Good, HSG B
* 4,500	98	Impervious
40,600	61	Weighted Average
36,100		88.92% Pervious Area
4,500		11.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8					Direct Entry, See Worksheet

Subcatchment 11: EXWS 11

49 Plains Road Existing

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CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"

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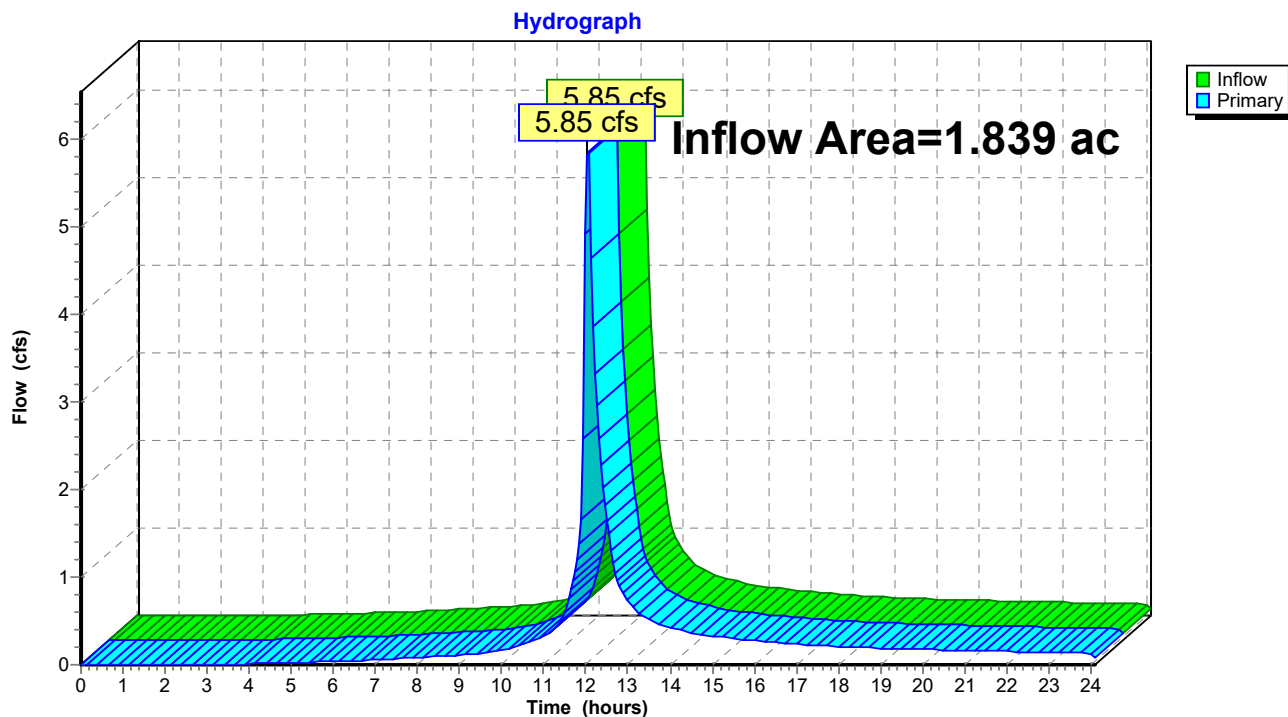
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Summary for Link A: EX Site

Inflow Area = 1.839 ac, 18.10% Impervious, Inflow Depth > 3.44" for 25-yr event
Inflow = 5.85 cfs @ 12.05 hrs, Volume= 0.527 af
Primary = 5.85 cfs @ 12.05 hrs, Volume= 0.527 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



49 Plains Road Existing*CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"*

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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=39,500 sf 25.32% Impervious Runoff Depth>5.49"

Tc=6.0 min CN=86 Runoff=6.02 cfs 0.415 af

Subcatchment 11: EXWS 11

Runoff Area=40,600 sf 11.08% Impervious Runoff Depth>2.78"

Tc=18.8 min CN=61 Runoff=1.93 cfs 0.216 af

Link A: EX Site

Inflow=6.89 cfs 0.631 af

Primary=6.89 cfs 0.631 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.631 af Average Runoff Depth = 4.12"
81.90% Pervious = 1.506 ac 18.10% Impervious = 0.333 ac

49 Plains Road Existing

CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"

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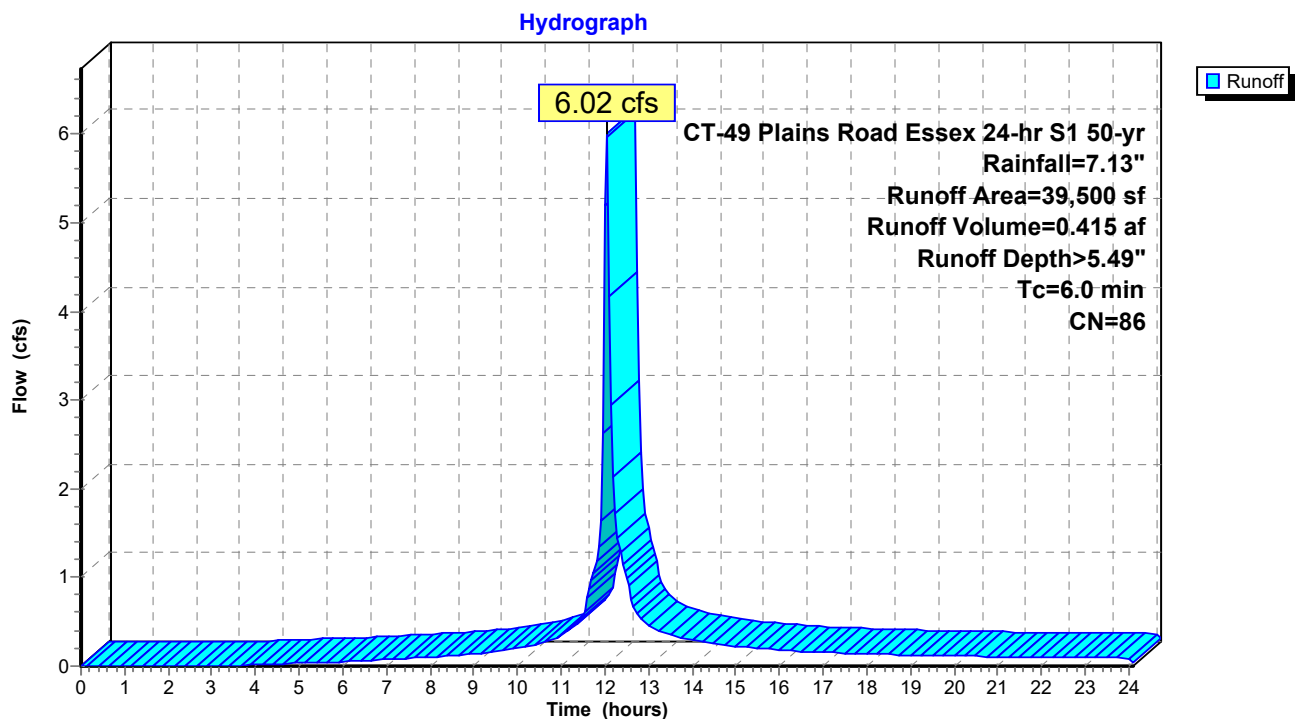
Summary for Subcatchment 10: EXWS 10

Runoff = 6.02 cfs @ 12.04 hrs, Volume= 0.415 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
9,000	55	Woods, Good, HSG B
1,200	61	>75% Grass cover, Good, HSG B
19,300	96	Gravel surface, HSG B
* 10,000	98	Impervious
39,500	86	Weighted Average
29,500		74.68% Pervious Area
10,000		25.32% 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

49 Plains Road Existing

CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"

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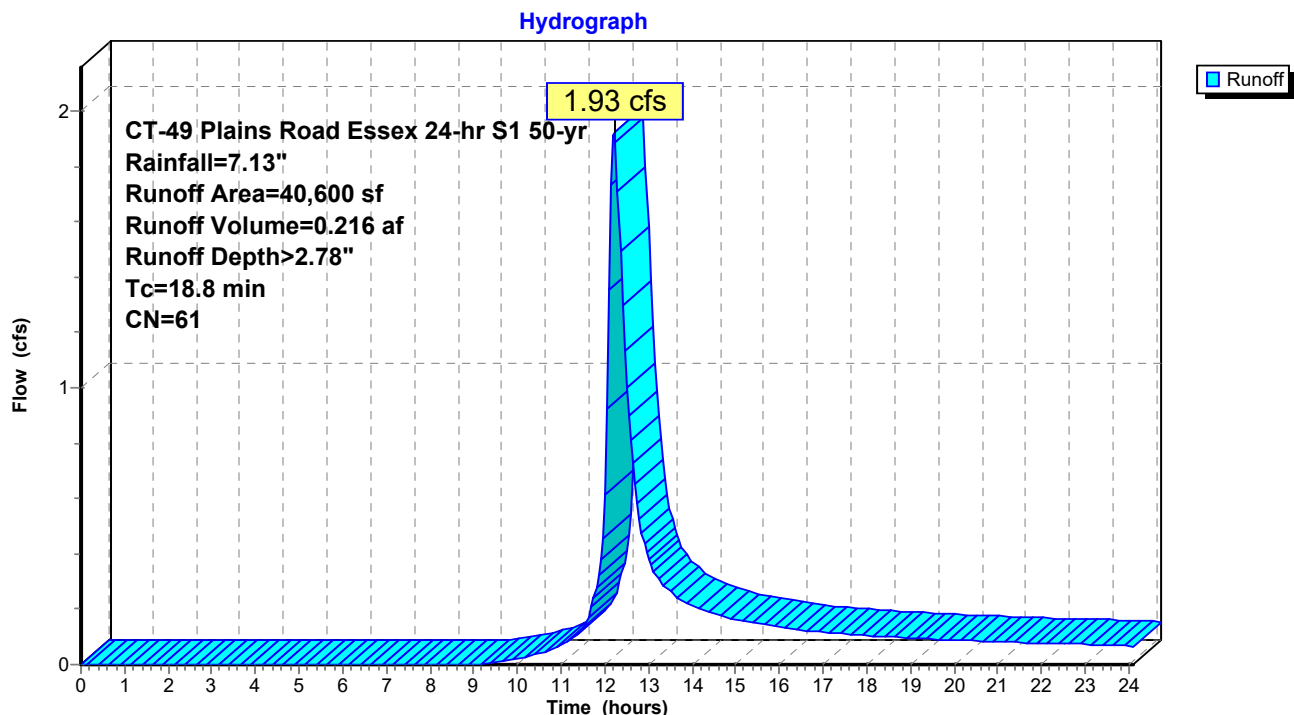
Summary for Subcatchment 11: EXWS 11

Runoff = 1.93 cfs @ 12.22 hrs, Volume= 0.216 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
30,500	55	Woods, Good, HSG B
5,600	61	>75% Grass cover, Good, HSG B
* 4,500	98	Impervious
40,600	61	Weighted Average
36,100		88.92% Pervious Area
4,500		11.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8					Direct Entry, See Worksheet

Subcatchment 11: EXWS 11

49 Plains Road Existing

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CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"

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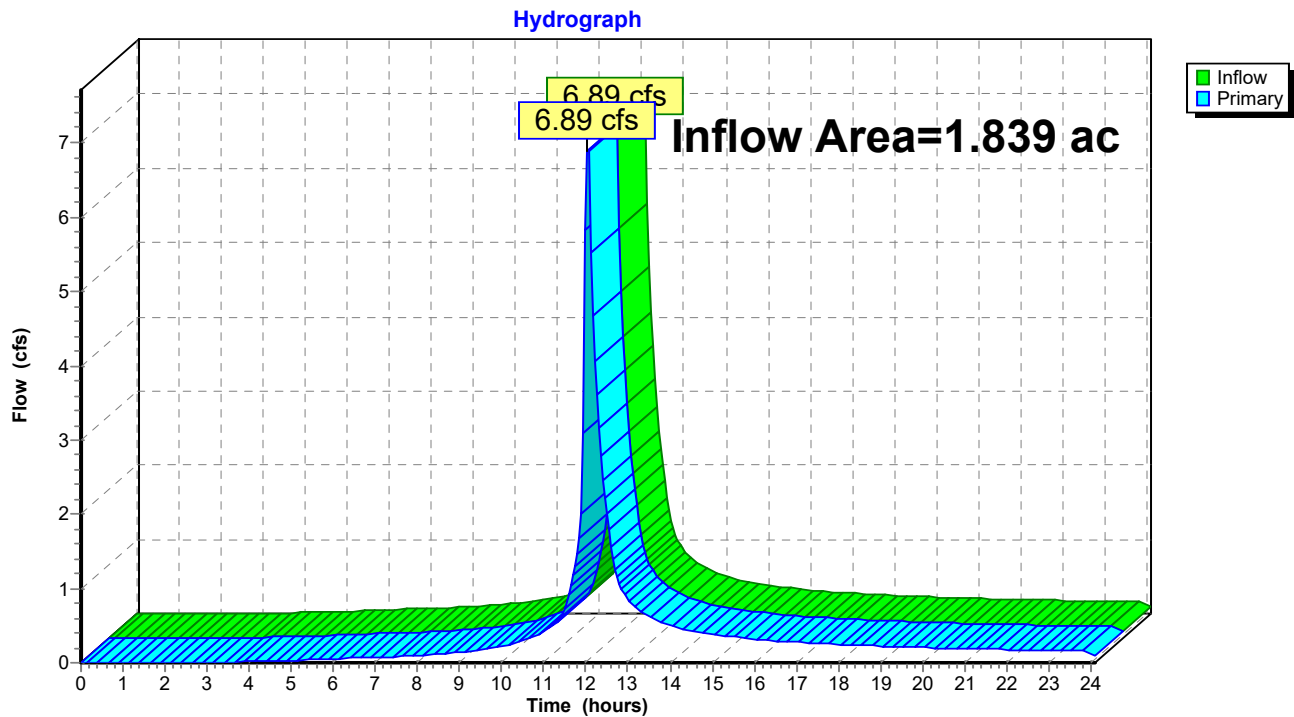
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Summary for Link A: EX Site

Inflow Area = 1.839 ac, 18.10% Impervious, Inflow Depth > 4.12" for 50-yr event
Inflow = 6.89 cfs @ 12.05 hrs, Volume= 0.631 af
Primary = 6.89 cfs @ 12.05 hrs, Volume= 0.631 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



49 Plains Road Existing*CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"*

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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=39,500 sf 25.32% Impervious Runoff Depth>6.34"

Tc=6.0 min CN=86 Runoff=6.88 cfs 0.479 af

Subcatchment 11: EXWS 11

Runoff Area=40,600 sf 11.08% Impervious Runoff Depth>3.44"

Tc=18.8 min CN=61 Runoff=2.41 cfs 0.267 af

Link A: EX Site

Inflow=8.00 cfs 0.746 af

Primary=8.00 cfs 0.746 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.746 af Average Runoff Depth = 4.87"
81.90% Pervious = 1.506 ac 18.10% Impervious = 0.333 ac

49 Plains Road Existing

CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"

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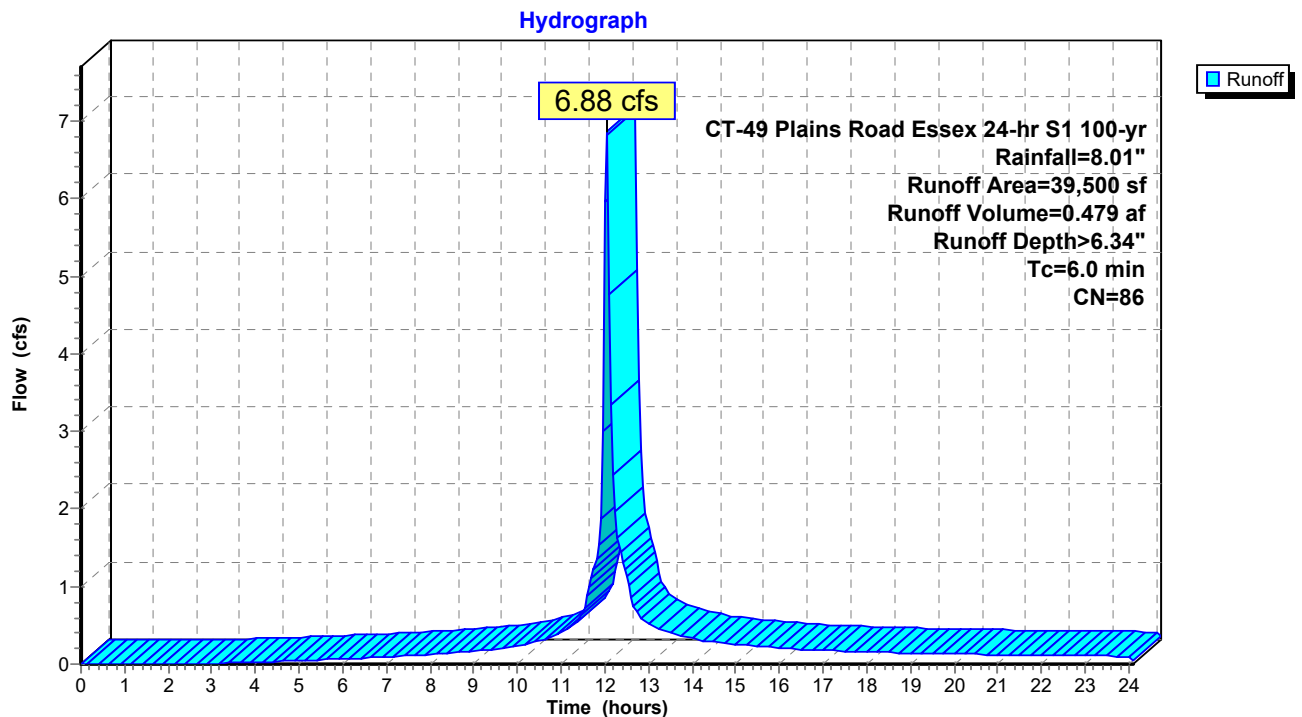
Summary for Subcatchment 10: EXWS 10

Runoff = 6.88 cfs @ 12.04 hrs, Volume= 0.479 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
9,000	55	Woods, Good, HSG B
1,200	61	>75% Grass cover, Good, HSG B
19,300	96	Gravel surface, HSG B
* 10,000	98	Impervious
39,500	86	Weighted Average
29,500		74.68% Pervious Area
10,000		25.32% 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

49 Plains Road Existing

CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"

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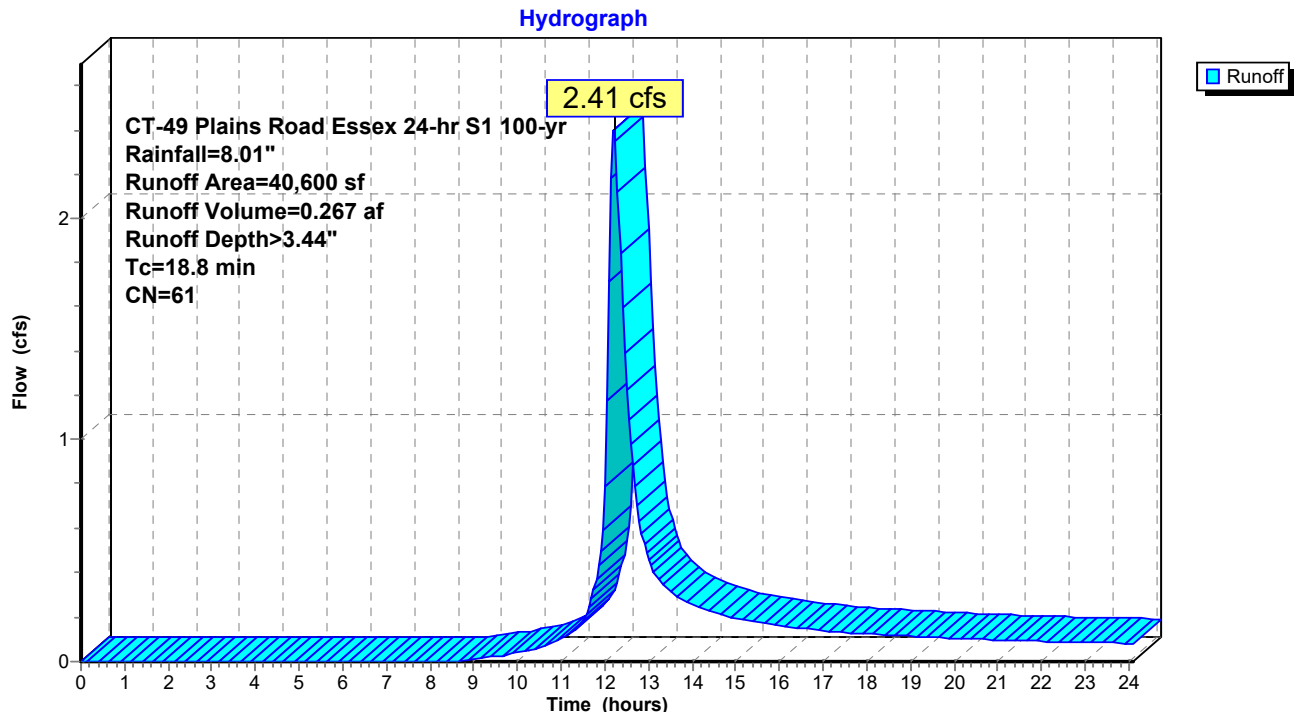
Summary for Subcatchment 11: EXWS 11

Runoff = 2.41 cfs @ 12.22 hrs, Volume= 0.267 af, Depth> 3.44"
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
30,500	55	Woods, Good, HSG B
5,600	61	>75% Grass cover, Good, HSG B
* 4,500	98	Impervious
40,600	61	Weighted Average
36,100		88.92% Pervious Area
4,500		11.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8					Direct Entry, See Worksheet

Subcatchment 11: EXWS 11

49 Plains Road Existing

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CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"

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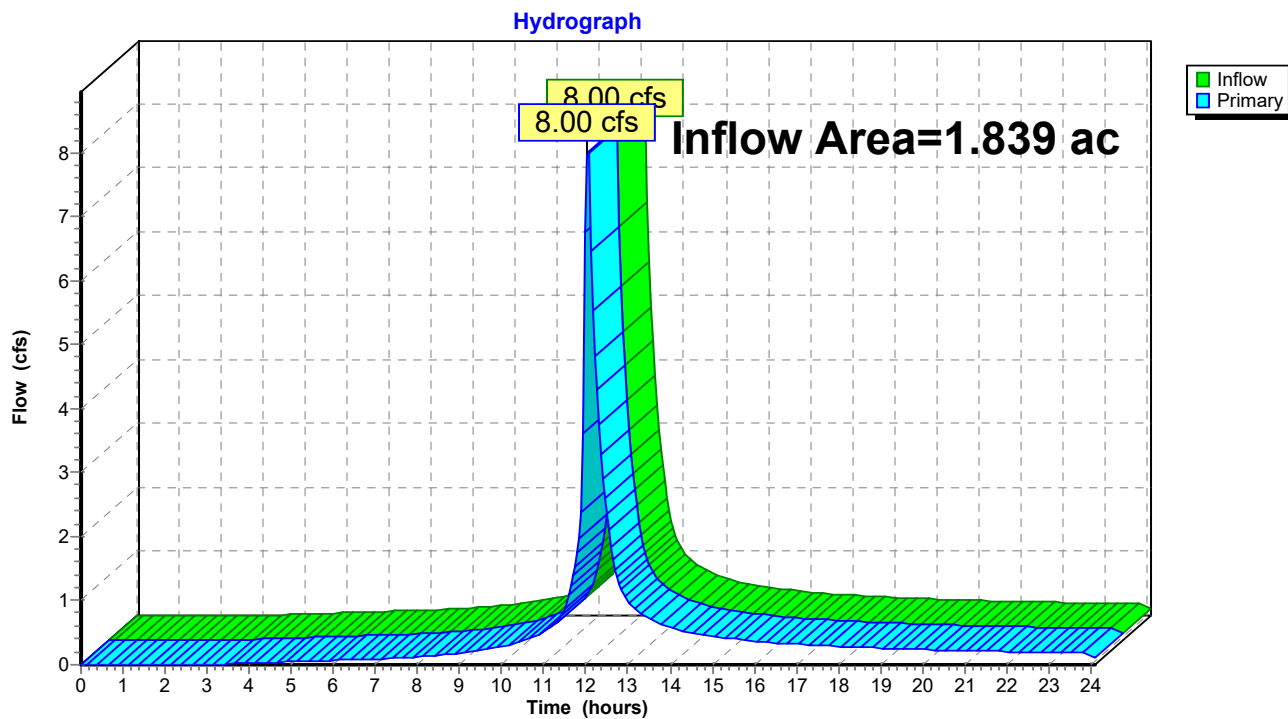
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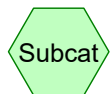
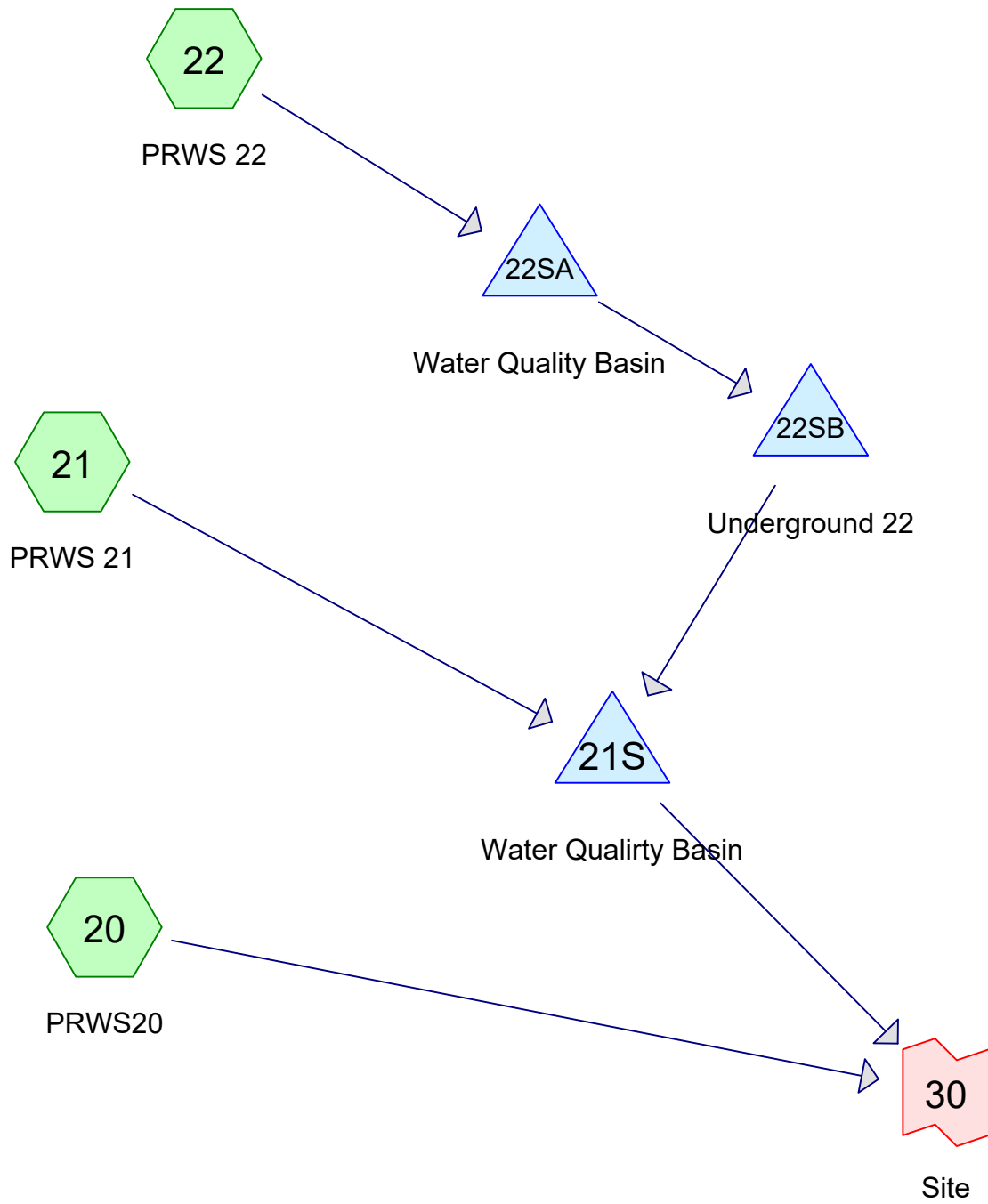
Summary for Link A: EX Site

Inflow Area = 1.839 ac, 18.10% Impervious, Inflow Depth > 4.87" for 100-yr event
Inflow = 8.00 cfs @ 12.05 hrs, Volume= 0.746 af
Primary = 8.00 cfs @ 12.05 hrs, Volume= 0.746 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

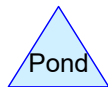




Subcat



Reach



Pond



Link

Routing Diagram for 49 Plains Road Proposed
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49 Plains Road Proposed

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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

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.486	61	>75% Grass cover, Good, HSG B (20, 21, 22)
0.932	98	Paved parking, HSG B (21, 22)
0.341	98	Roofs, HSG B (21, 22)
0.079	55	Woods, Good, HSG B (20)
1.839	86	TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.486	0.000	0.000	0.000	0.486	>75% Grass cover, Good	20, 21, 22
0.000	0.932	0.000	0.000	0.000	0.932	Paved parking	21, 22
0.000	0.341	0.000	0.000	0.000	0.341	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	

49 Plains Road Proposed*CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"*

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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

Subcatchment20: 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

Subcatchment21: PRWS 21

Runoff Area=41,250 sf 77.03% Impervious Runoff Depth>1.85"
Tc=6.0 min CN=90 Runoff=2.21 cfs 0.146 af

Subcatchment22: PRWS 22

Runoff Area=33,570 sf 70.60% Impervious Runoff Depth>1.61"
Tc=6.0 min CN=87 Runoff=1.57 cfs 0.103 af

Pond 21S: Water Qualirty Basin

Peak Elev=34.51' Storage=4,240 cf Inflow=2.28 cfs 0.234 af
Outflow=0.71 cfs 0.221 af

Pond 22SA: Water Quality Basin

Peak Elev=37.43' Storage=2,663 cf Inflow=1.57 cfs 0.103 af
Outflow=1.61 cfs 0.103 af

Pond 22SB: Underground 22

Peak Elev=34.84' Storage=0.048 af Inflow=1.61 cfs 0.103 af
Outflow=0.09 cfs 0.088 af

Link 30: Site

Inflow=0.72 cfs 0.223 af
Primary=0.72 cfs 0.223 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.251 af Average Runoff Depth = 1.64"
30.74% Pervious = 0.565 ac 69.26% Impervious = 1.274 ac

49 Plains Road Proposed

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CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

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Summary for Subcatchment 20: PRWS20

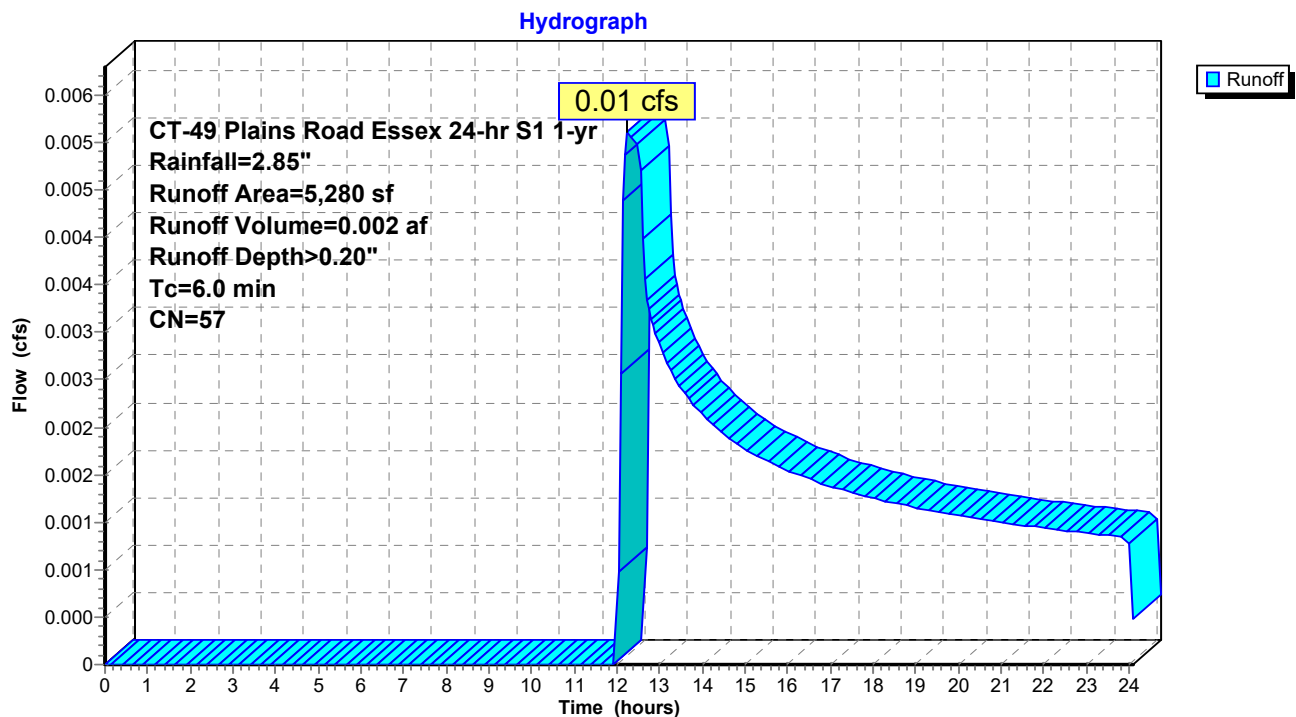
Runoff = 0.01 cfs @ 12.25 hrs, Volume= 0.002 af, Depth> 0.20"
Routed to Link 30 : Site

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



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CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

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Summary for Subcatchment 21: PRWS 21

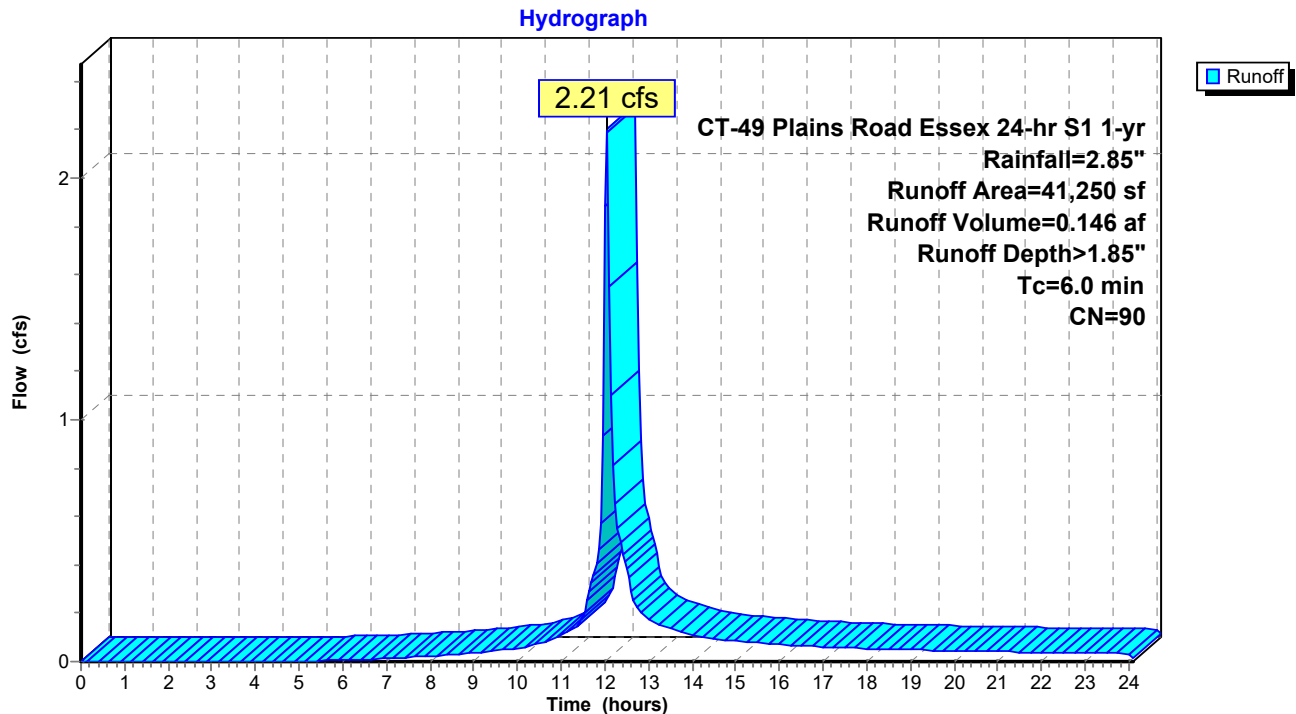
Runoff = 2.21 cfs @ 12.04 hrs, Volume= 0.146 af, Depth> 1.85"
Routed to Pond 21S : Water Quality Basin

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
9,475	61	>75% Grass cover, Good, HSG B
29,400	98	Paved parking, HSG B
2,375	98	Roofs, HSG B
41,250	90	Weighted Average
9,475		22.97% Pervious Area
31,775		77.03% 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



49 Plains Road Proposed

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CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

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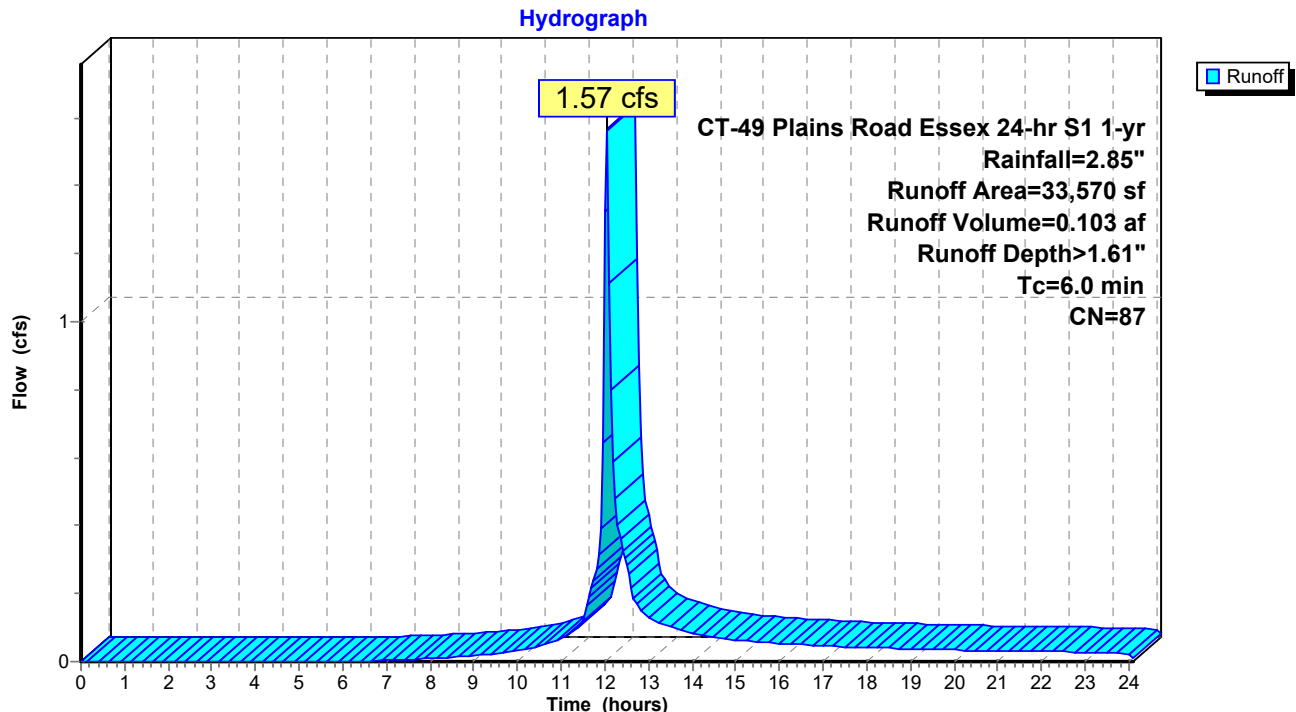
Summary for Subcatchment 22: PRWS 22

Runoff = 1.57 cfs @ 12.04 hrs, Volume= 0.103 af, Depth> 1.61"
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
9,870	61	>75% Grass cover, Good, HSG B
11,200	98	Paved parking, HSG B
12,500	98	Roofs, HSG B
33,570	87	Weighted Average
9,870		29.40% Pervious Area
23,700		70.60% 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

49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

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Summary for Pond 21S: Water Qualirty Basin

Inflow Area = 1.718 ac, 74.14% Impervious, Inflow Depth > 1.63" for 1-yr event
 Inflow = 2.28 cfs @ 12.04 hrs, Volume= 0.234 af
 Outflow = 0.71 cfs @ 12.27 hrs, Volume= 0.221 af, Atten= 69%, Lag= 13.5 min
 Primary = 0.71 cfs @ 12.27 hrs, Volume= 0.221 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= 34.51' @ 12.27 hrs Surf.Area= 2,333 sf Storage= 4,240 cf (1,909 cf above start)

Plug-Flow detention time= 237.3 min calculated for 0.167 af (71% of inflow)
 Center-of-Mass det. time= 35.9 min (943.0 - 907.1)

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

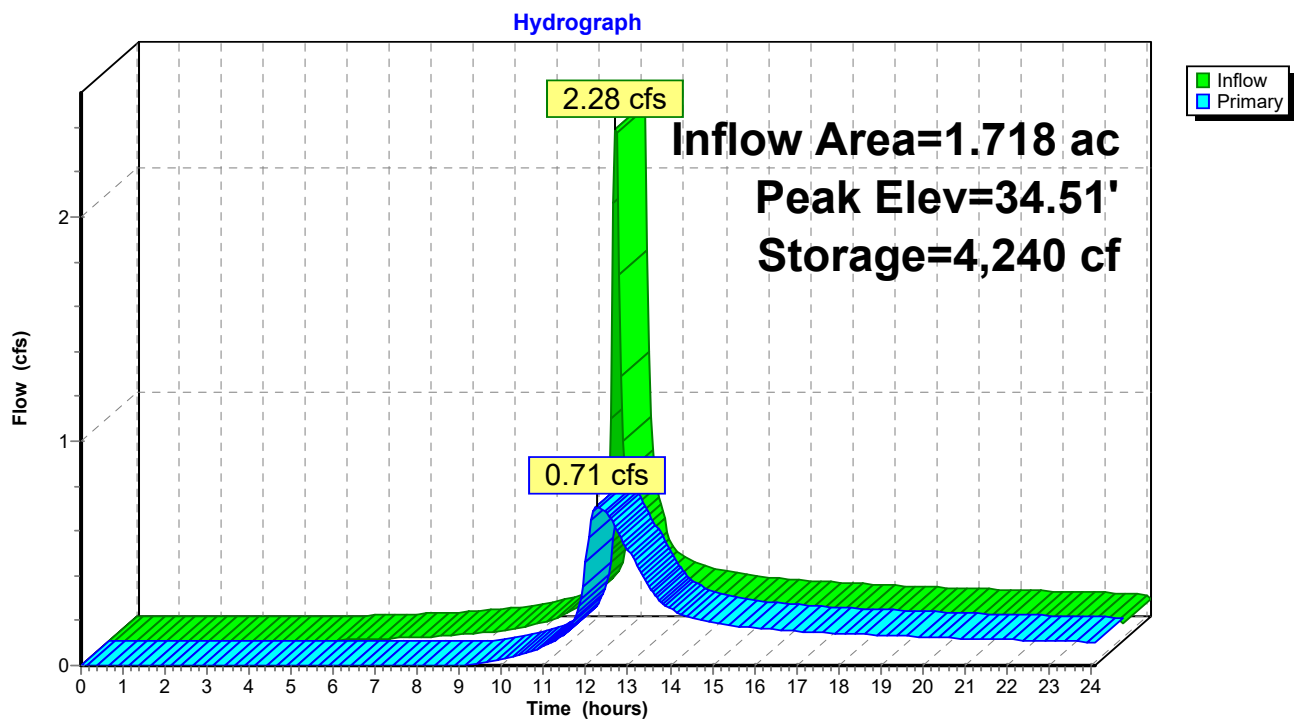
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
32.00	1,085	220.0	0	0	1,085
33.00	1,552	239.0	1,312	1,312	1,816
34.00	2,060	263.0	1,800	3,112	2,807
34.50	2,326	270.0	1,096	4,207	3,132
35.00	2,593	277.0	1,229	5,437	3,466

Device	Routing	Invert	Outlet Devices
#1	Primary	33.70'	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=0.71 cfs @ 12.27 hrs HW=34.51' (Free Discharge)

↑ **1=Orifice/Grate** (Orifice Controls 0.71 cfs @ 3.61 fps)
 ↓ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 21S: Water Qualirty Basin



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

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Summary for Pond 22SA: Water Quality Basin

Inflow Area = 0.771 ac, 70.60% Impervious, Inflow Depth > 1.61" for 1-yr event
 Inflow = 1.57 cfs @ 12.04 hrs, Volume= 0.103 af
 Outflow = 1.61 cfs @ 12.05 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.4 min
 Primary = 1.61 cfs @ 12.05 hrs, Volume= 0.103 af
 Routed to Pond 22SB : Underground 22

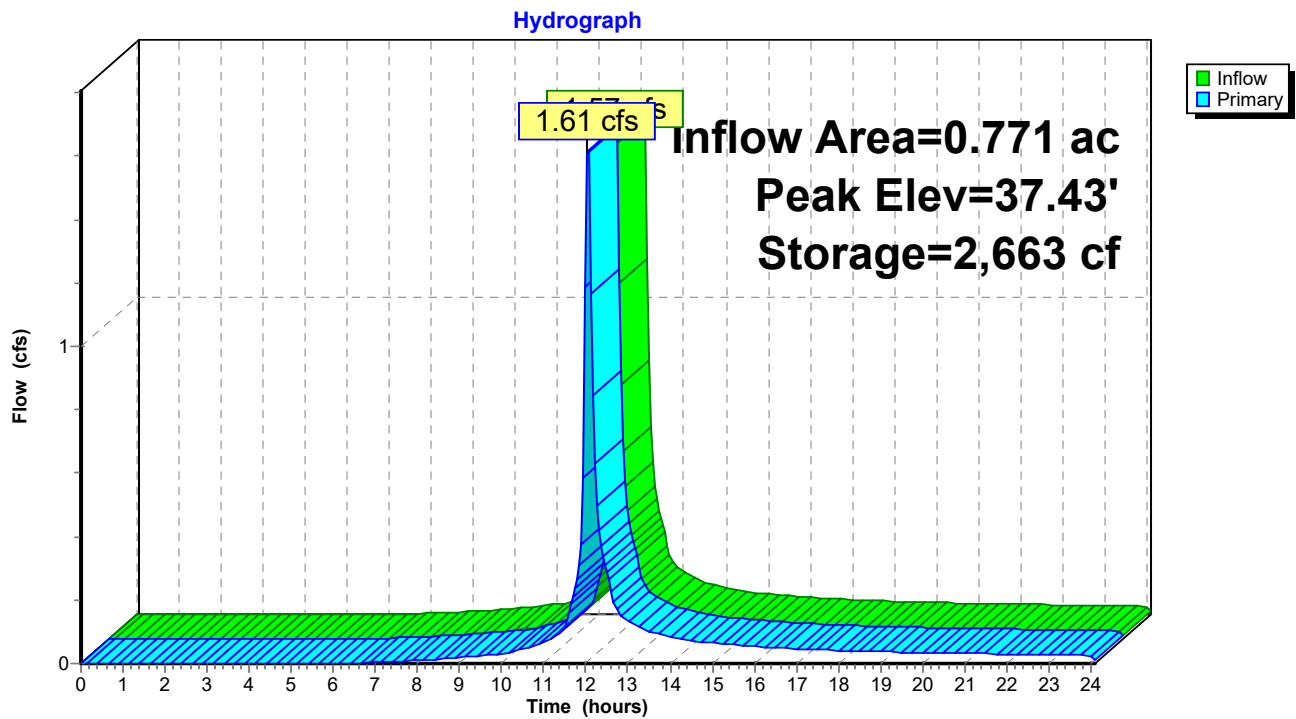
Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
 Starting Elev= 37.40' Surf.Area= 1,393 sf Storage= 2,616 cf
 Peak Elev= 37.43' @ 12.05 hrs Surf.Area= 1,399 sf Storage= 2,663 cf (47 cf above start)

Plug-Flow detention time= 340.9 min calculated for 0.043 af (42% of inflow)
 Center-of-Mass det. time= 0.6 min (844.3 - 843.8)

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=1.53 cfs @ 12.05 hrs HW=37.43' (Free Discharge)
 ↑1=Orifice/Grate (Weir Controls 1.53 cfs @ 0.60 fps)

Pond 22SA: Water Quality Basin



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

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Summary for Pond 22SB: Underground 22

Inflow Area = 0.771 ac, 70.60% Impervious, Inflow Depth > 1.61" for 1-yr event
 Inflow = 1.61 cfs @ 12.05 hrs, Volume= 0.103 af
 Outflow = 0.09 cfs @ 13.75 hrs, Volume= 0.088 af, Atten= 94%, Lag= 102.1 min
 Primary = 0.09 cfs @ 13.75 hrs, Volume= 0.088 af
 Routed to Pond 21S : Water Quality Basin

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
 Peak Elev= 34.84' @ 13.75 hrs Surf.Area= 0.113 ac Storage= 0.048 af

Plug-Flow detention time= 266.8 min calculated for 0.088 af (85% of inflow)
 Center-of-Mass det. time= 194.3 min (1,038.6 - 844.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	34.00'	0.076 af	39.50'W x 124.66'L x 3.50'H Field A 0.396 af Overall - 0.143 af Embedded = 0.252 af x 30.0% Voids
#2A	34.50'	0.143 af	ADS_StormTech SC-740 +Cap x 136 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 136 Chambers in 8 Rows
		0.219 af	Total Available Storage

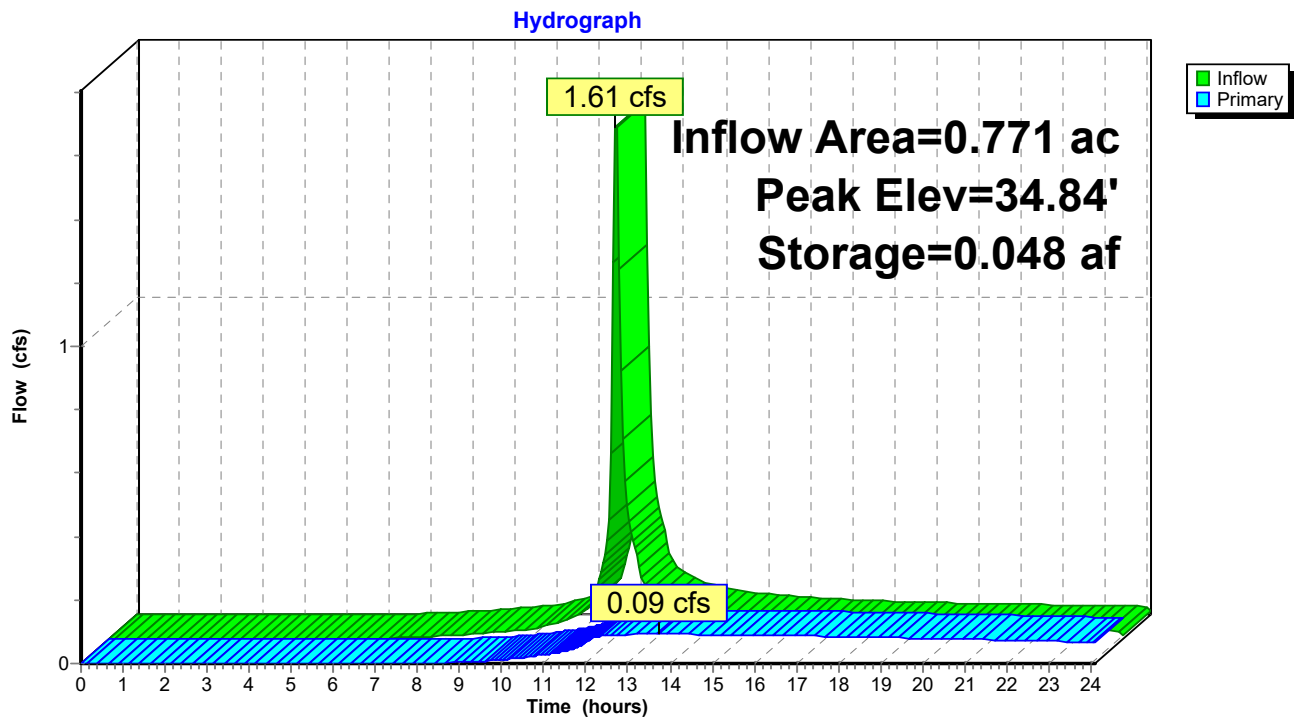
Storage Group A created with Chamber Wizard

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	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=0.09 cfs @ 13.75 hrs HW=34.84' (Free Discharge)

- ↑ 1=Orifice/Grate (Orifice Controls 0.09 cfs @ 4.20 fps)
 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 22SB: Underground 22



49 Plains Road Proposed

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CT-49 Plains Road Essex 24-hr S1 1-yr Rainfall=2.85"

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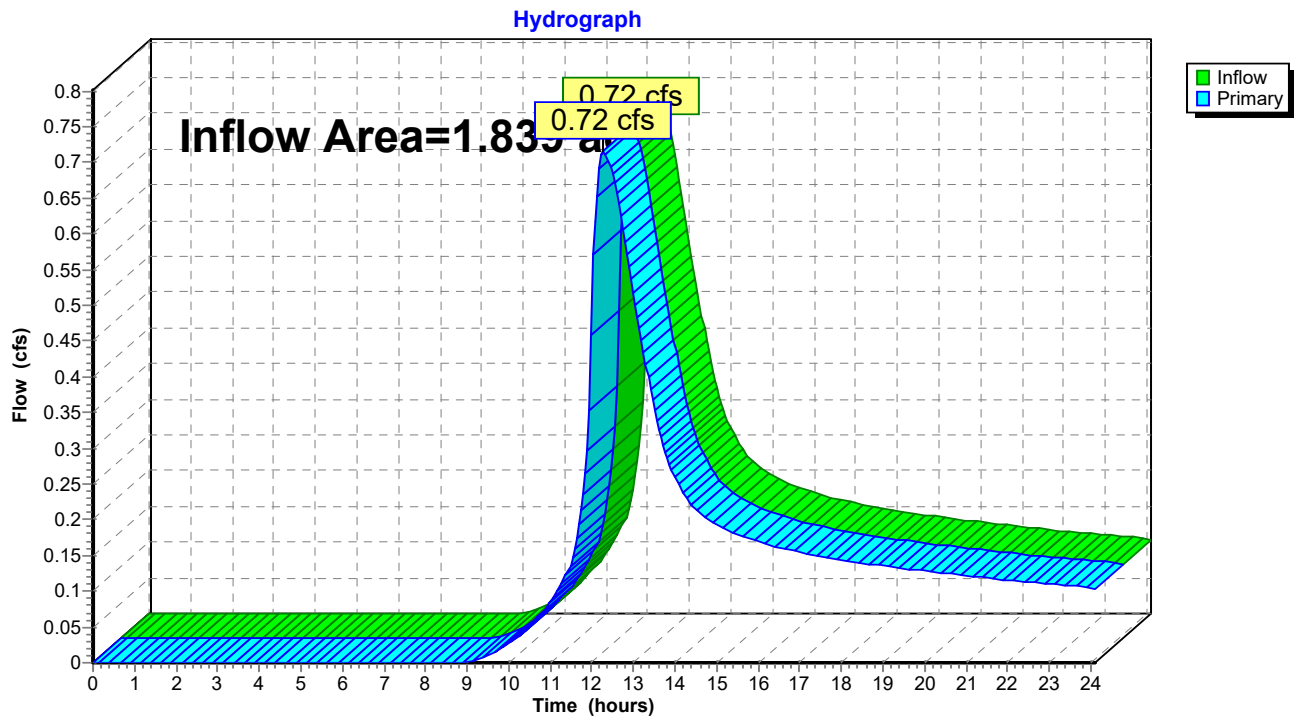
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Summary for Link 30: Site

Inflow Area = 1.839 ac, 69.26% Impervious, Inflow Depth > 1.45" for 1-yr event
Inflow = 0.72 cfs @ 12.27 hrs, Volume= 0.223 af
Primary = 0.72 cfs @ 12.27 hrs, Volume= 0.223 af, Atten= 0%, Lag= 0.0 min

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

Link 30: Site



49 Plains Road Proposed*CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"*

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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

Subcatchment20: 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

Subcatchment21: PRWS 21

Runoff Area=41,250 sf 77.03% Impervious Runoff Depth>2.39"
Tc=6.0 min CN=90 Runoff=2.82 cfs 0.189 af

Subcatchment22: PRWS 22

Runoff Area=33,570 sf 70.60% Impervious Runoff Depth>2.13"
Tc=6.0 min CN=87 Runoff=2.06 cfs 0.137 af

Pond 21S: Water Qualirty Basin

Peak Elev=34.66' Storage=4,577 cf Inflow=2.90 cfs 0.293 af
Outflow=1.30 cfs 0.279 af

Pond 22SA: Water Quality Basin

Peak Elev=37.44' Storage=2,672 cf Inflow=2.06 cfs 0.137 af
Outflow=2.09 cfs 0.137 af

Pond 22SB: Underground 22

Peak Elev=35.05' Storage=0.067 af Inflow=2.09 cfs 0.137 af
Outflow=0.10 cfs 0.104 af

Link 30: Site

Inflow=1.32 cfs 0.283 af
Primary=1.32 cfs 0.283 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.329 af Average Runoff Depth = 2.15"
30.74% Pervious = 0.565 ac 69.26% Impervious = 1.274 ac

49 Plains Road Proposed

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CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

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Summary for Subcatchment 20: PRWS20

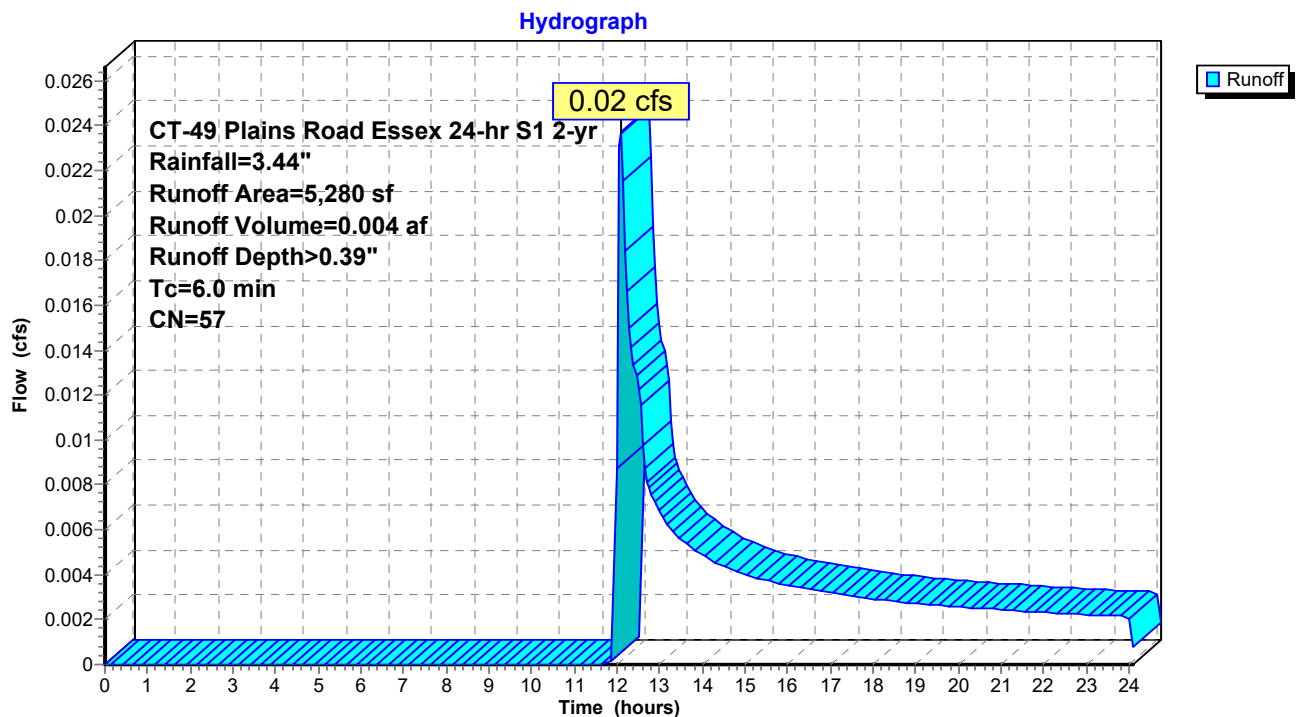
Runoff = 0.02 cfs @ 12.09 hrs, Volume= 0.004 af, Depth> 0.39"
Routed to Link 30 : Site

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



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CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

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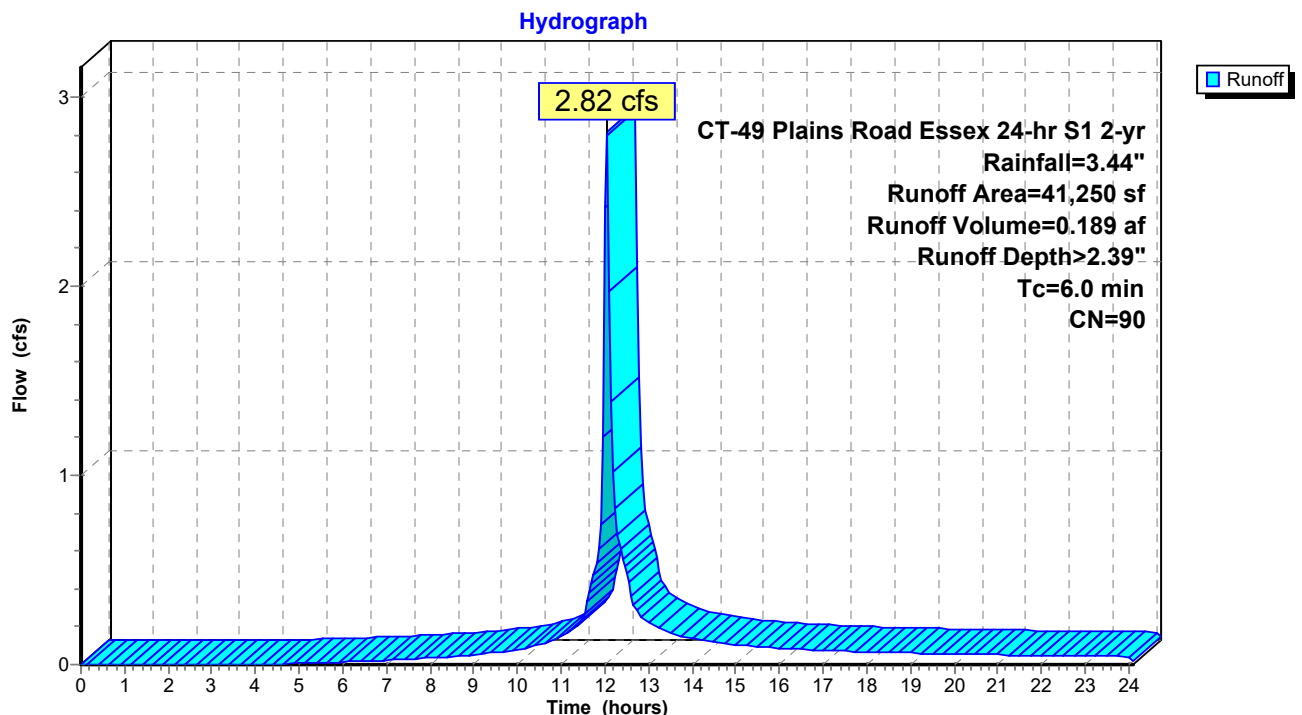
Summary for Subcatchment 21: PRWS 21

Runoff = 2.82 cfs @ 12.04 hrs, Volume= 0.189 af, Depth> 2.39"
Routed to Pond 21S : 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
9,475	61	>75% Grass cover, Good, HSG B
29,400	98	Paved parking, HSG B
2,375	98	Roofs, HSG B
41,250	90	Weighted Average
9,475		22.97% Pervious Area
31,775		77.03% 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

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CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

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Summary for Subcatchment 22: PRWS 22

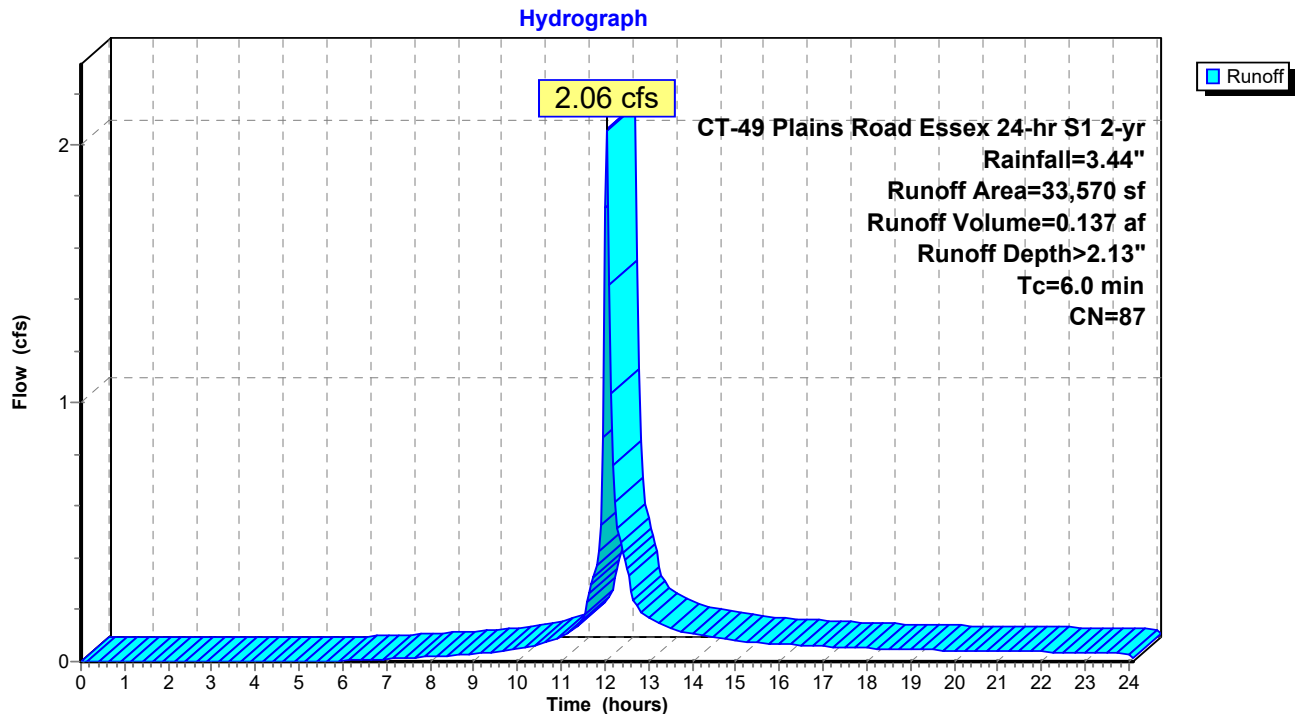
Runoff = 2.06 cfs @ 12.04 hrs, Volume= 0.137 af, Depth> 2.13"
Routed to Pond 22SA : Water Quality Basin

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
9,870	61	>75% Grass cover, Good, HSG B
11,200	98	Paved parking, HSG B
12,500	98	Roofs, HSG B
33,570	87	Weighted Average
9,870		29.40% Pervious Area
23,700		70.60% 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



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

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Summary for Pond 21S: Water Qualirty Basin

Inflow Area = 1.718 ac, 74.14% Impervious, Inflow Depth > 2.05" for 2-yr event
 Inflow = 2.90 cfs @ 12.04 hrs, Volume= 0.293 af
 Outflow = 1.30 cfs @ 12.18 hrs, Volume= 0.279 af, Atten= 55%, Lag= 8.4 min
 Primary = 1.30 cfs @ 12.18 hrs, Volume= 0.279 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= 34.66' @ 12.18 hrs Surf.Area= 2,408 sf Storage= 4,577 cf (2,247 cf above start)

Plug-Flow detention time= 201.3 min calculated for 0.225 af (77% of inflow)
 Center-of-Mass det. time= 33.9 min (928.5 - 894.6)

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

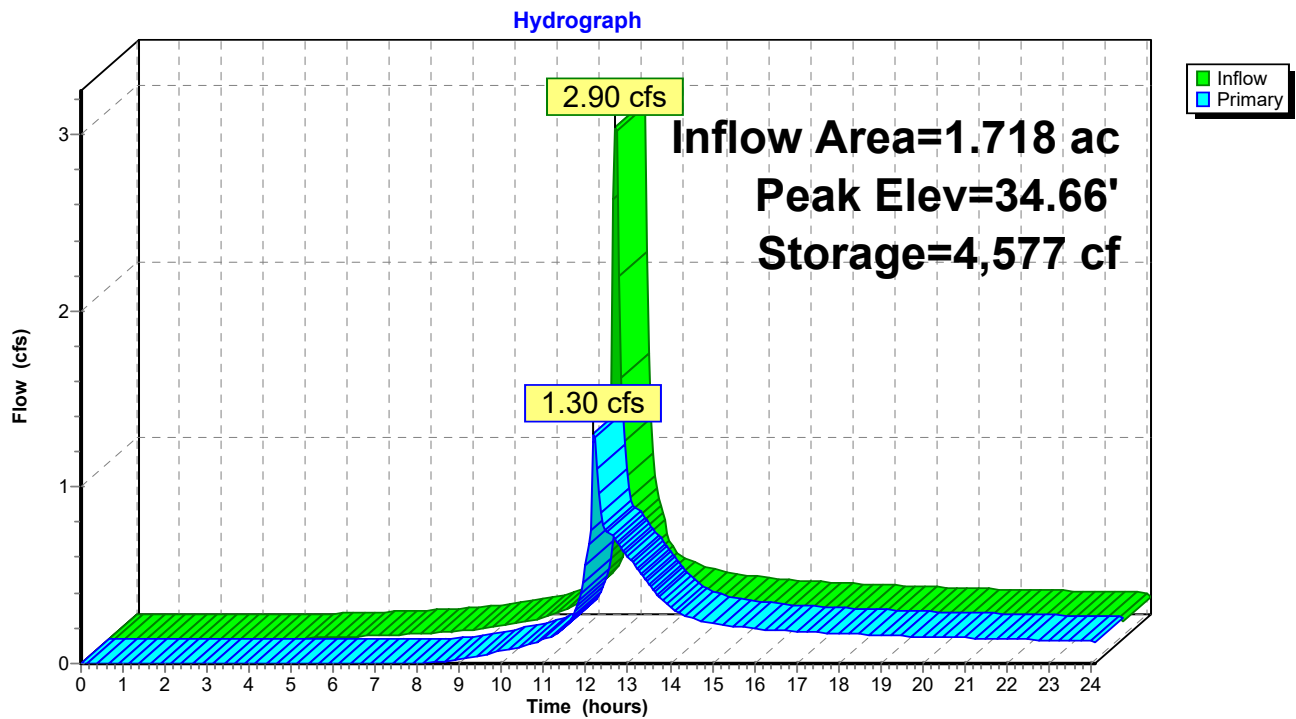
Device	Routing	Invert	Outlet Devices
#1	Primary	33.70'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	34.60'	15.0' long + 0.5 ' / SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 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=1.26 cfs @ 12.18 hrs HW=34.65' (Free Discharge)

↑ **1=Orifice/Grate** (Orifice Controls 0.79 cfs @ 4.04 fps)

└ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.47 cfs @ 0.57 fps)

Pond 21S: Water Qualirty Basin



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

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Summary for Pond 22SA: Water Quality Basin

Inflow Area = 0.771 ac, 70.60% Impervious, Inflow Depth > 2.13" for 2-yr event
 Inflow = 2.06 cfs @ 12.04 hrs, Volume= 0.137 af
 Outflow = 2.09 cfs @ 12.05 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.4 min
 Primary = 2.09 cfs @ 12.05 hrs, Volume= 0.137 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= 1,400 sf Storage= 2,672 cf (56 cf above start)

Plug-Flow detention time= 255.6 min calculated for 0.077 af (56% of inflow)
 Center-of-Mass det. time= 0.5 min (834.4 - 833.9)

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=1.99 cfs @ 12.05 hrs HW=37.44' (Free Discharge)
 ↑1=Orifice/Grate (Weir Controls 1.99 cfs @ 0.65 fps)

49 Plains Road Proposed

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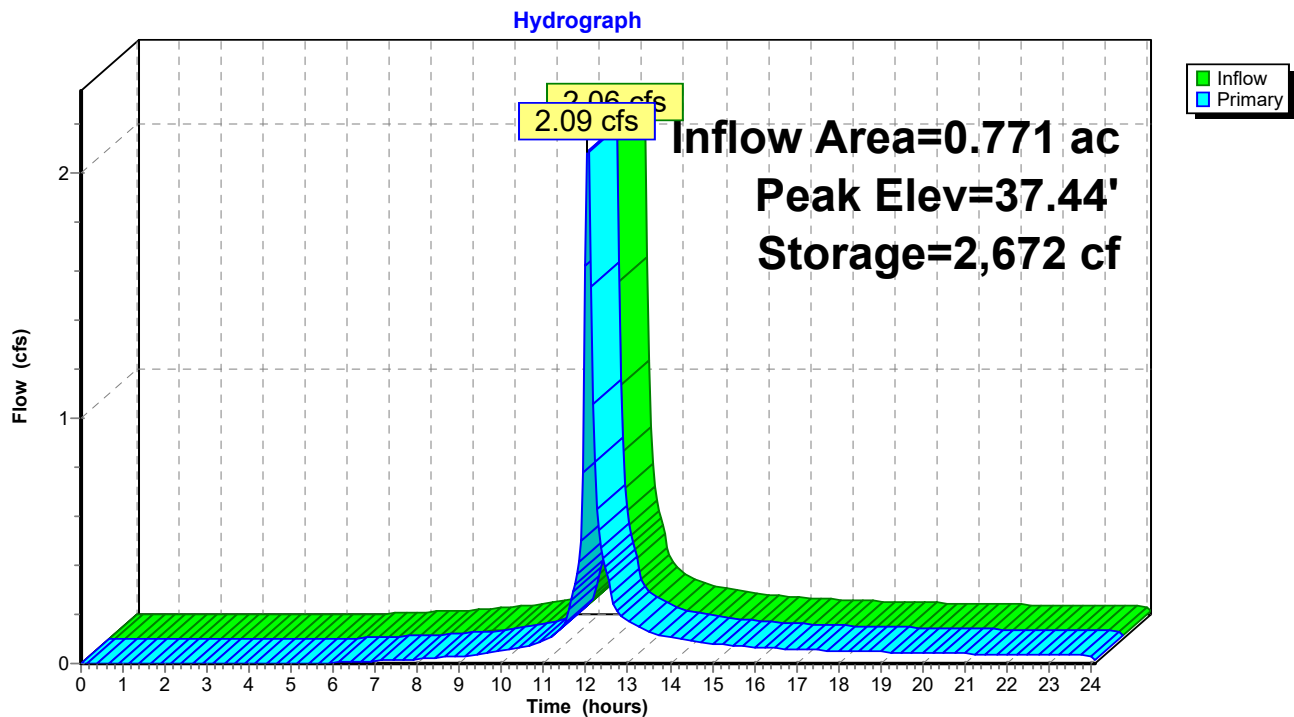
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CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

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Pond 22SA: Water Quality Basin



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

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Summary for Pond 22SB: Underground 22

Inflow Area = 0.771 ac, 70.60% Impervious, Inflow Depth > 2.13" for 2-yr event
 Inflow = 2.09 cfs @ 12.05 hrs, Volume= 0.137 af
 Outflow = 0.10 cfs @ 14.10 hrs, Volume= 0.104 af, Atten= 95%, Lag= 122.9 min
 Primary = 0.10 cfs @ 14.10 hrs, Volume= 0.104 af
 Routed to Pond 21S : Water Quality Basin

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
 Peak Elev= 35.05' @ 14.10 hrs Surf.Area= 0.113 ac Storage= 0.067 af

Plug-Flow detention time= 298.4 min calculated for 0.104 af (76% of inflow)
 Center-of-Mass det. time= 197.5 min (1,031.9 - 834.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	34.00'	0.076 af	39.50'W x 124.66'L x 3.50'H Field A 0.396 af Overall - 0.143 af Embedded = 0.252 af x 30.0% Voids
#2A	34.50'	0.143 af	ADS_StormTech SC-740 +Cap x 136 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 136 Chambers in 8 Rows
		0.219 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	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 @ 14.10 hrs HW=35.05' (Free Discharge)

- ↑ 1=Orifice/Grate (Orifice Controls 0.10 cfs @ 4.74 fps)
 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

49 Plains Road Proposed

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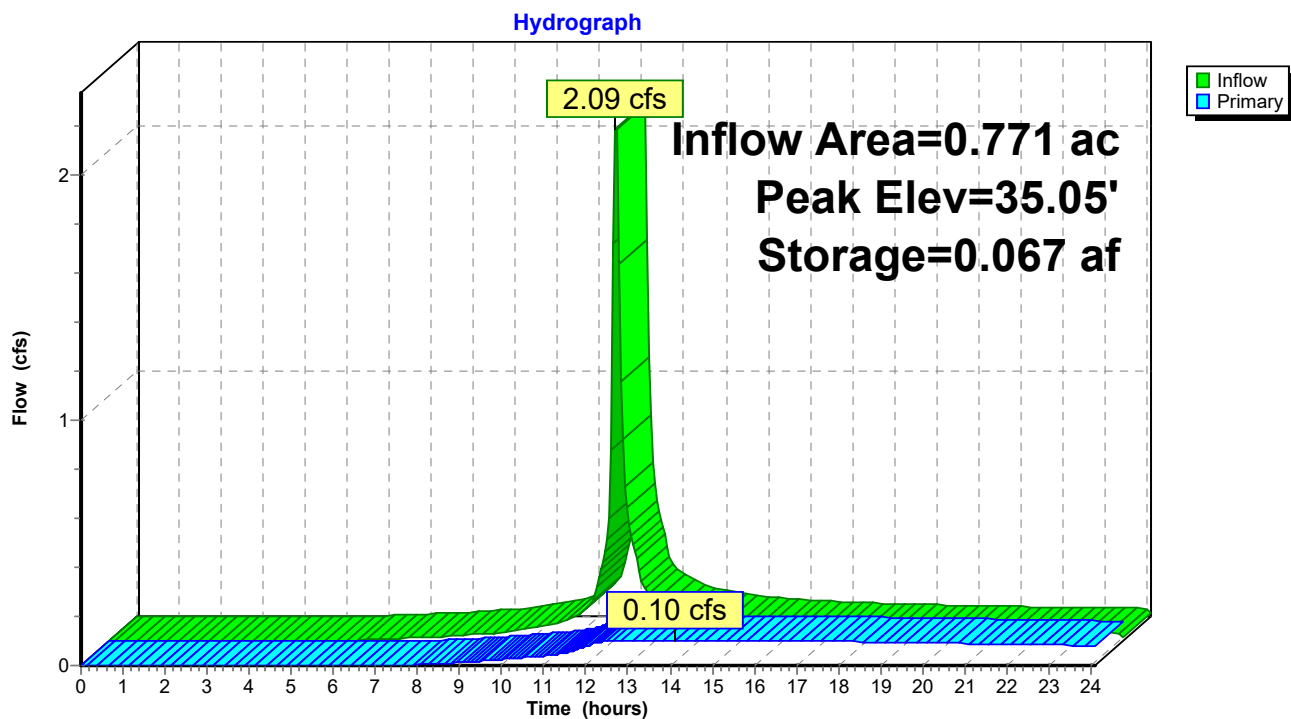
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CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

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Pond 22SB: Underground 22



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CT-49 Plains Road Essex 24-hr S1 2-yr Rainfall=3.44"

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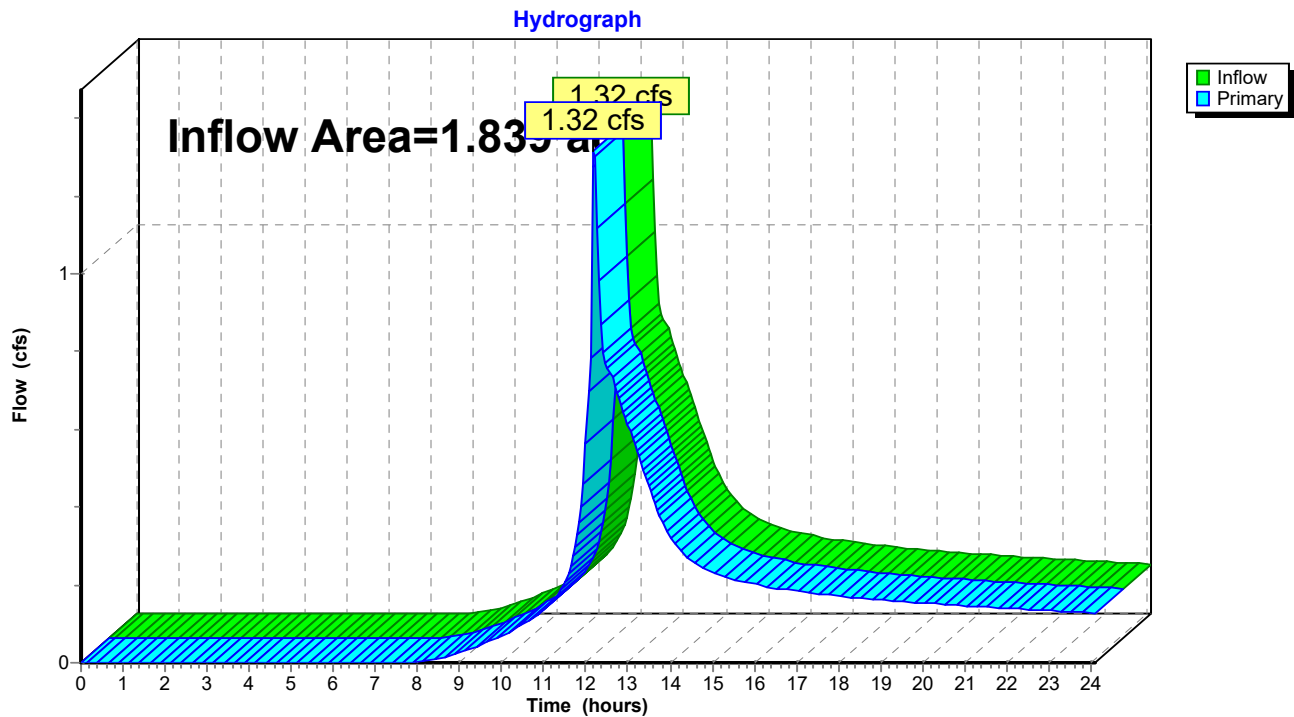
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Summary for Link 30: Site

Inflow Area = 1.839 ac, 69.26% Impervious, Inflow Depth > 1.85" for 2-yr event
Inflow = 1.32 cfs @ 12.18 hrs, Volume= 0.283 af
Primary = 1.32 cfs @ 12.18 hrs, Volume= 0.283 af, Atten= 0%, Lag= 0.0 min

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

Link 30: Site



49 Plains Road Proposed*CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"*

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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

Subcatchment20: 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

Subcatchment21: PRWS 21

Runoff Area=41,250 sf 77.03% Impervious Runoff Depth>3.30"
Tc=6.0 min CN=90 Runoff=3.83 cfs 0.260 af

Subcatchment22: PRWS 22

Runoff Area=33,570 sf 70.60% Impervious Runoff Depth>3.01"
Tc=6.0 min CN=87 Runoff=2.88 cfs 0.193 af

Pond 21S: Water Qualirty Basin

Peak Elev=34.75' Storage=4,815 cf Inflow=3.92 cfs 0.390 af
Outflow=3.06 cfs 0.375 af

Pond 22SA: Water Quality Basin

Peak Elev=37.45' Storage=2,687 cf Inflow=2.88 cfs 0.193 af
Outflow=2.90 cfs 0.193 af

Pond 22SB: Underground 22

Peak Elev=35.44' Storage=0.100 af Inflow=2.90 cfs 0.193 af
Outflow=0.12 cfs 0.130 af

Link 30: Site

Inflow=3.12 cfs 0.383 af
Primary=3.12 cfs 0.383 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.461 af Average Runoff Depth = 3.01"
30.74% Pervious = 0.565 ac 69.26% Impervious = 1.274 ac

49 Plains Road Proposed

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CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"

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Summary for Subcatchment 20: PRWS20

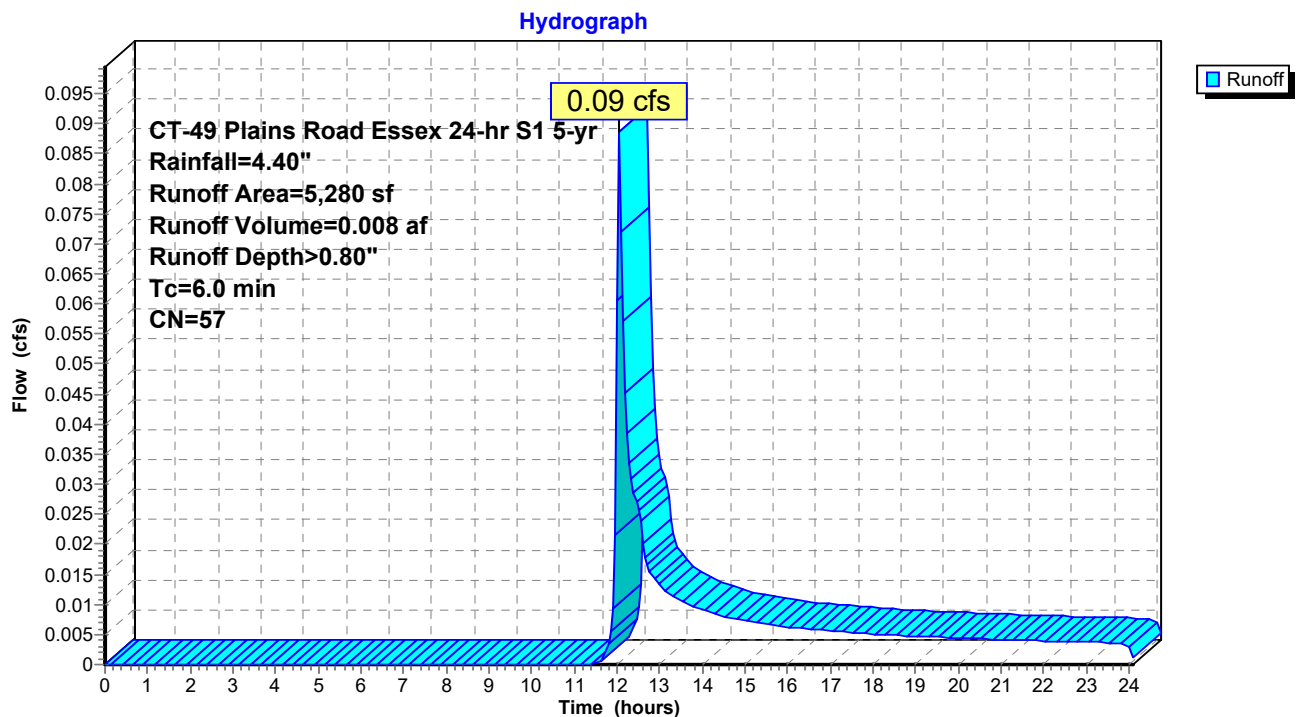
Runoff = 0.09 cfs @ 12.06 hrs, Volume= 0.008 af, Depth> 0.80"
Routed to Link 30 : Site

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



49 Plains Road Proposed

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CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"

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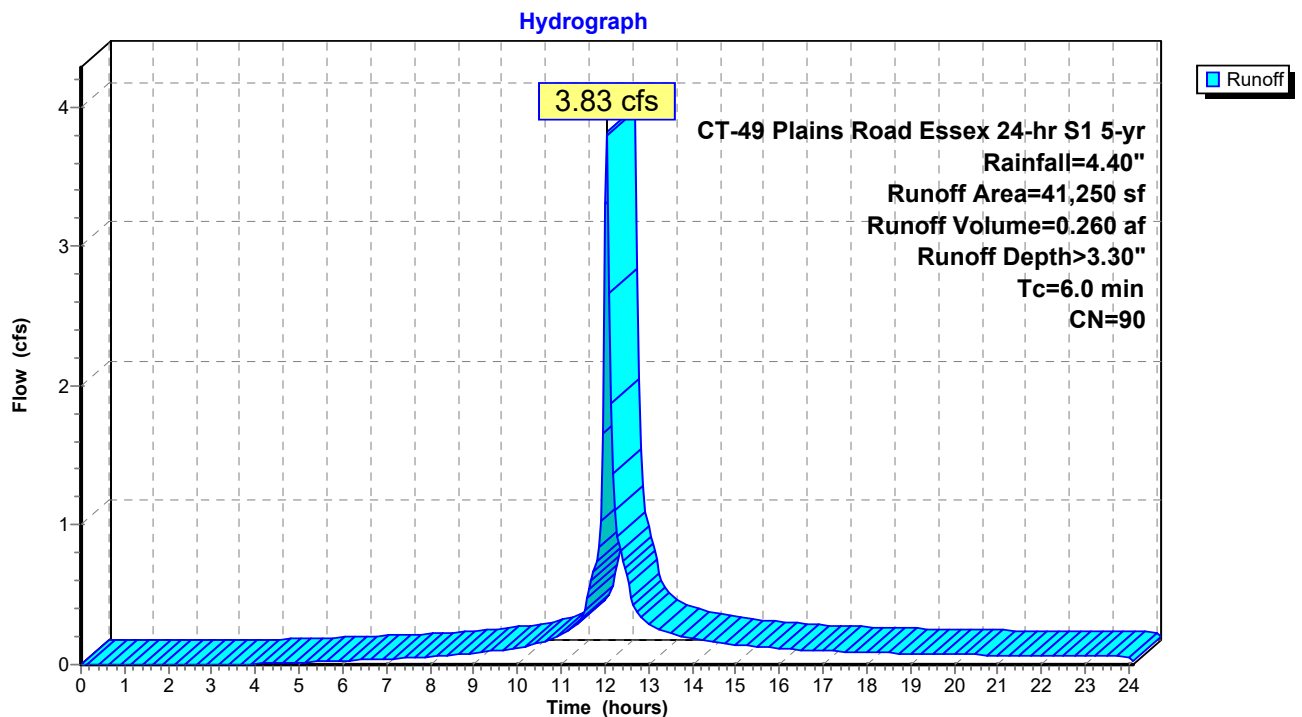
Summary for Subcatchment 21: PRWS 21

Runoff = 3.83 cfs @ 12.04 hrs, Volume= 0.260 af, Depth> 3.30"
Routed to Pond 21S : 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
9,475	61	>75% Grass cover, Good, HSG B
29,400	98	Paved parking, HSG B
2,375	98	Roofs, HSG B
41,250	90	Weighted Average
9,475		22.97% Pervious Area
31,775		77.03% 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

49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"

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Summary for Subcatchment 22: PRWS 22

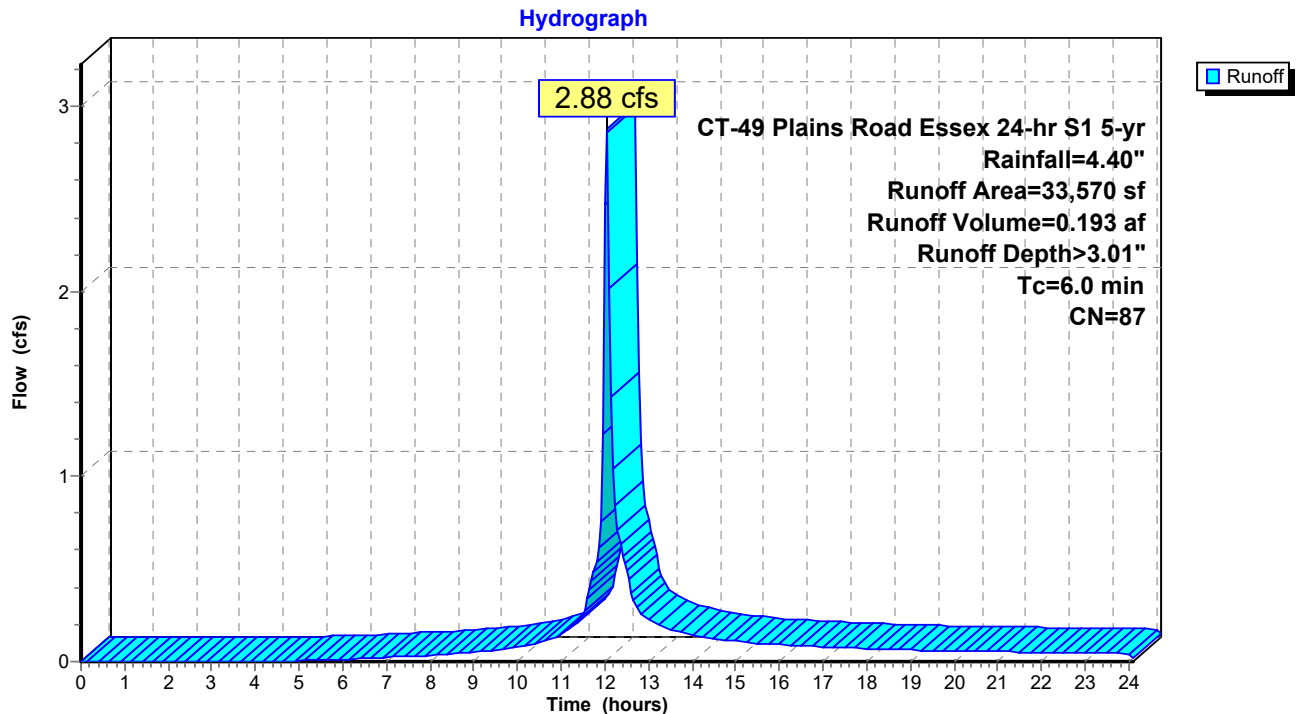
Runoff = 2.88 cfs @ 12.04 hrs, Volume= 0.193 af, Depth> 3.01"

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
9,870	61	>75% Grass cover, Good, HSG B
11,200	98	Paved parking, HSG B
12,500	98	Roofs, HSG B
33,570	87	Weighted Average
9,870		29.40% Pervious Area
23,700		70.60% 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

49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"

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Summary for Pond 21S: Water Qualirty Basin

Inflow Area = 1.718 ac, 74.14% Impervious, Inflow Depth > 2.73" for 5-yr event
 Inflow = 3.92 cfs @ 12.04 hrs, Volume= 0.390 af
 Outflow = 3.06 cfs @ 12.11 hrs, Volume= 0.375 af, Atten= 22%, Lag= 4.3 min
 Primary = 3.06 cfs @ 12.11 hrs, Volume= 0.375 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= 34.75' @ 12.11 hrs Surf.Area= 2,460 sf Storage= 4,815 cf (2,485 cf above start)

Plug-Flow detention time= 165.5 min calculated for 0.321 af (82% of inflow)
 Center-of-Mass det. time= 30.3 min (908.6 - 878.3)

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

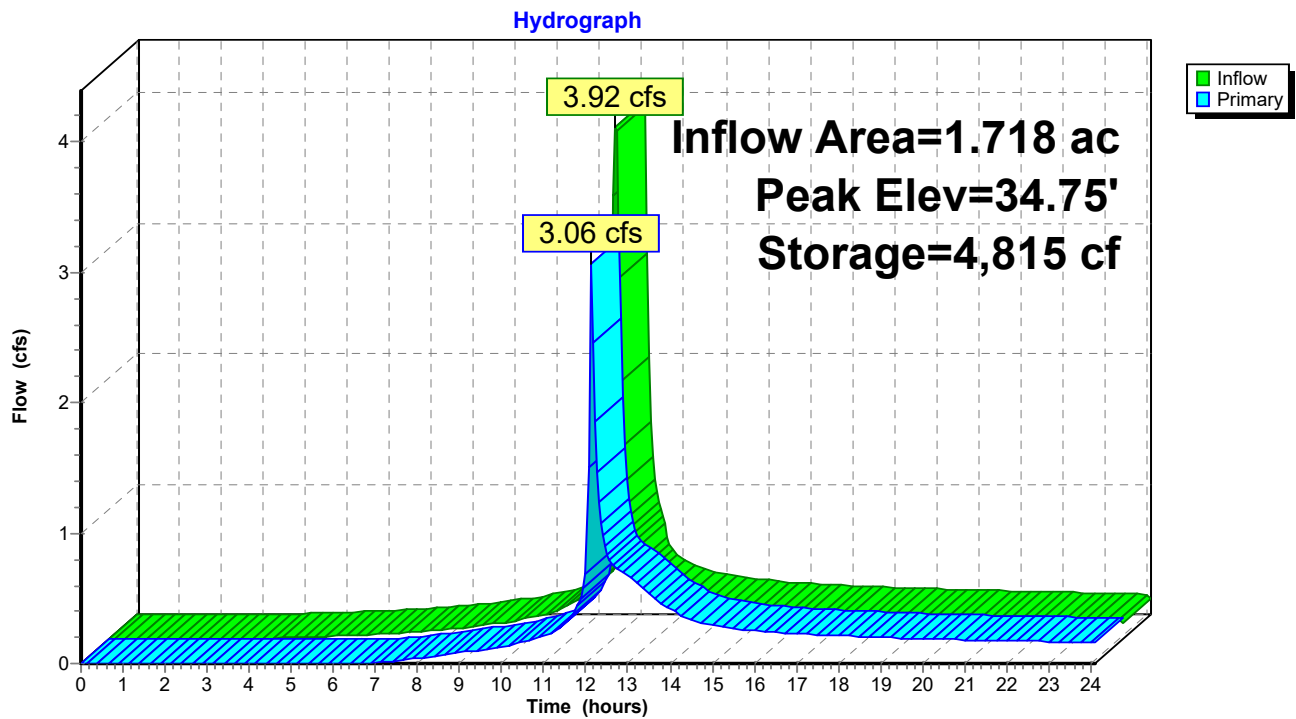
Device	Routing	Invert	Outlet Devices
#1	Primary	33.70'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	34.60'	15.0' long + 0.5 ' / SideZ x 3.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50 4.00 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=2.86 cfs @ 12.11 hrs HW=34.74' (Free Discharge)

↑ **1=Orifice/Grate** (Orifice Controls 0.84 cfs @ 4.29 fps)

└ **2=Broad-Crested Rectangular Weir** (Weir Controls 2.02 cfs @ 0.93 fps)

Pond 21S: Water Qualirty Basin



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"

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Summary for Pond 22SA: Water Quality Basin

Inflow Area = 0.771 ac, 70.60% Impervious, Inflow Depth > 3.01" for 5-yr event
 Inflow = 2.88 cfs @ 12.04 hrs, Volume= 0.193 af
 Outflow = 2.90 cfs @ 12.05 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.4 min
 Primary = 2.90 cfs @ 12.05 hrs, Volume= 0.193 af
 Routed to Pond 22SB : Underground 22

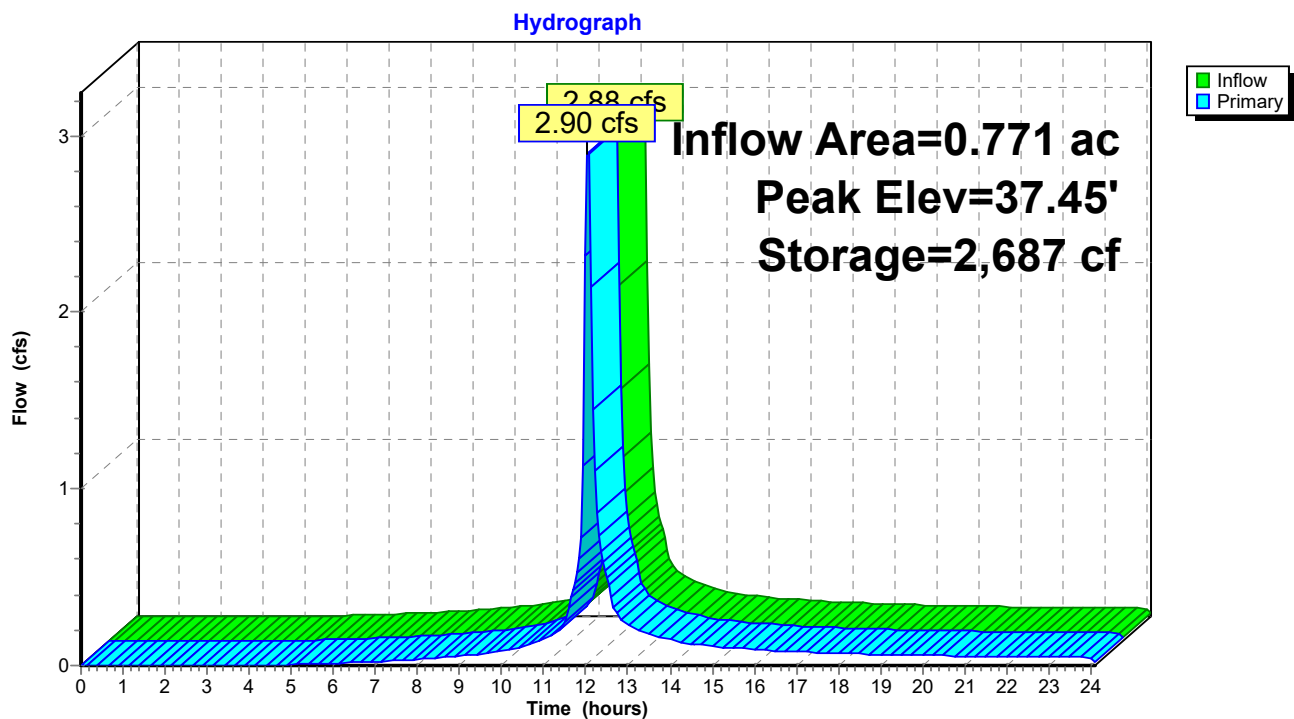
Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
 Starting Elev= 37.40' Surf.Area= 1,393 sf Storage= 2,616 cf
 Peak Elev= 37.45' @ 12.05 hrs Surf.Area= 1,402 sf Storage= 2,687 cf (71 cf above start)

Plug-Flow detention time= 196.3 min calculated for 0.133 af (69% of inflow)
 Center-of-Mass det. time= 0.5 min (821.9 - 821.4)

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=2.84 cfs @ 12.05 hrs HW=37.45' (Free Discharge)
 ↑1=Orifice/Grate (Weir Controls 2.84 cfs @ 0.73 fps)

Pond 22SA: Water Quality Basin



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"

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Summary for Pond 22SB: Underground 22

Inflow Area = 0.771 ac, 70.60% Impervious, Inflow Depth > 3.01" for 5-yr event
 Inflow = 2.90 cfs @ 12.05 hrs, Volume= 0.193 af
 Outflow = 0.12 cfs @ 14.55 hrs, Volume= 0.130 af, Atten= 96%, Lag= 150.1 min
 Primary = 0.12 cfs @ 14.55 hrs, Volume= 0.130 af
 Routed to Pond 21S : Water Quality Basin

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
 Peak Elev= 35.44' @ 14.55 hrs Surf.Area= 0.113 ac Storage= 0.100 af

Plug-Flow detention time= 318.3 min calculated for 0.130 af (67% of inflow)
 Center-of-Mass det. time= 198.8 min (1,020.7 - 821.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	34.00'	0.076 af	39.50'W x 124.66'L x 3.50'H Field A 0.396 af Overall - 0.143 af Embedded = 0.252 af x 30.0% Voids
#2A	34.50'	0.143 af	ADS_StormTech SC-740 +Cap x 136 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 136 Chambers in 8 Rows
		0.219 af	Total Available Storage

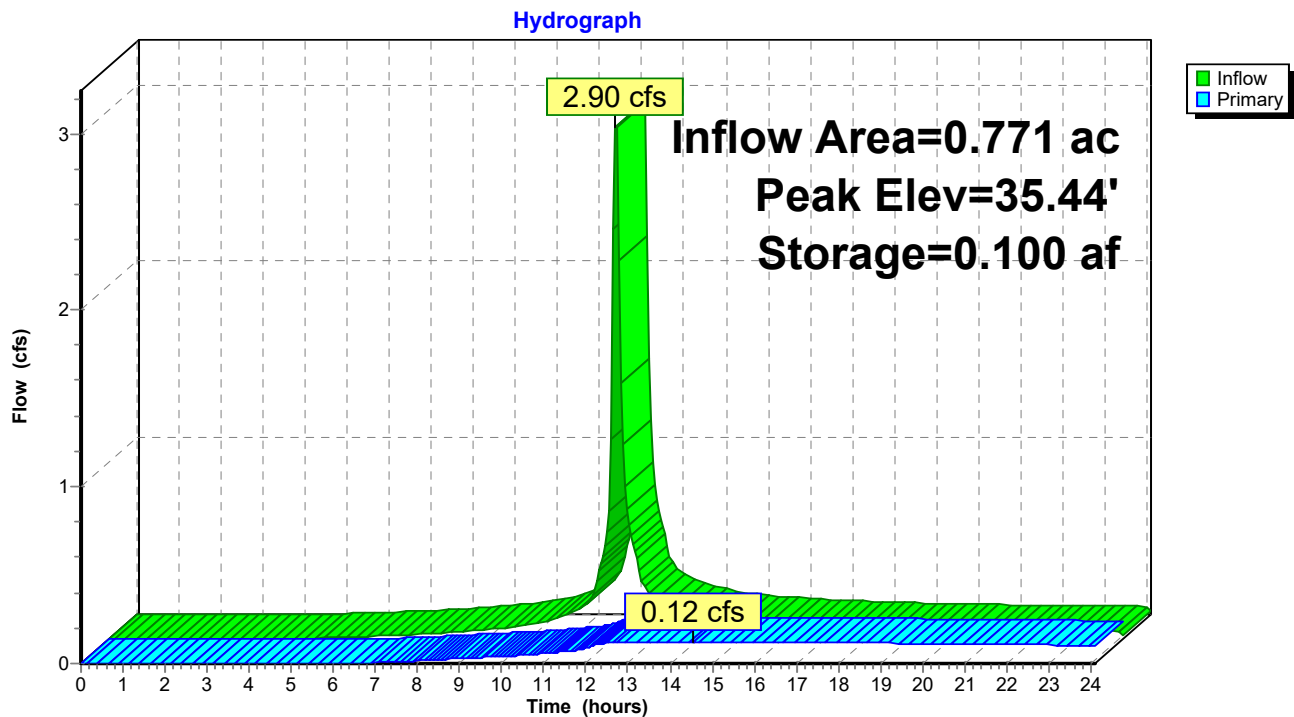
Storage Group A created with Chamber Wizard

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	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 @ 14.55 hrs HW=35.44' (Free Discharge)

- ↑ 1=Orifice/Grate (Orifice Controls 0.12 cfs @ 5.60 fps)
 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 22SB: Underground 22



49 Plains Road Proposed

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CT-49 Plains Road Essex 24-hr S1 5-yr Rainfall=4.40"

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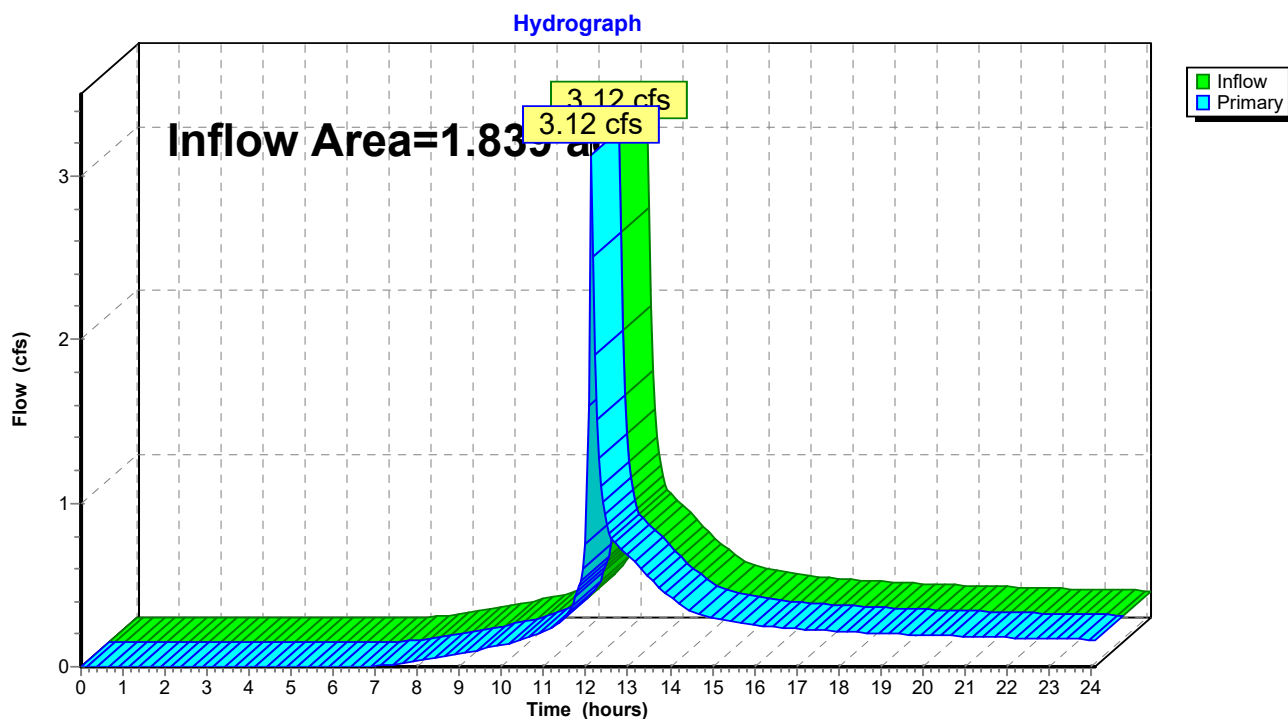
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Summary for Link 30: Site

Inflow Area = 1.839 ac, 69.26% Impervious, Inflow Depth > 2.50" for 5-yr event
Inflow = 3.12 cfs @ 12.11 hrs, Volume= 0.383 af
Primary = 3.12 cfs @ 12.11 hrs, Volume= 0.383 af, Atten= 0%, Lag= 0.0 min

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

Link 30: Site



49 Plains Road Proposed*CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"*

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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

Subcatchment20: 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

Subcatchment21: PRWS 21

Runoff Area=41,250 sf 77.03% Impervious Runoff Depth>4.07"
Tc=6.0 min CN=90 Runoff=4.66 cfs 0.321 af

Subcatchment22: PRWS 22

Runoff Area=33,570 sf 70.60% Impervious Runoff Depth>3.76"
Tc=6.0 min CN=87 Runoff=3.56 cfs 0.241 af

Pond 21S: Water Qualirty Basin

Peak Elev=34.80' Storage=4,918 cf Inflow=4.76 cfs 0.472 af
Outflow=4.05 cfs 0.455 af

Pond 22SA: Water Quality Basin

Peak Elev=37.46' Storage=2,698 cf Inflow=3.56 cfs 0.241 af
Outflow=3.62 cfs 0.241 af

Pond 22SB: Underground 22

Peak Elev=35.80' Storage=0.129 af Inflow=3.62 cfs 0.241 af
Outflow=0.14 cfs 0.150 af

Link 30: Site

Inflow=4.18 cfs 0.468 af
Primary=4.18 cfs 0.468 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.575 af Average Runoff Depth = 3.75"
30.74% Pervious = 0.565 ac 69.26% Impervious = 1.274 ac

49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"

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Summary for Subcatchment 20: PRWS20

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

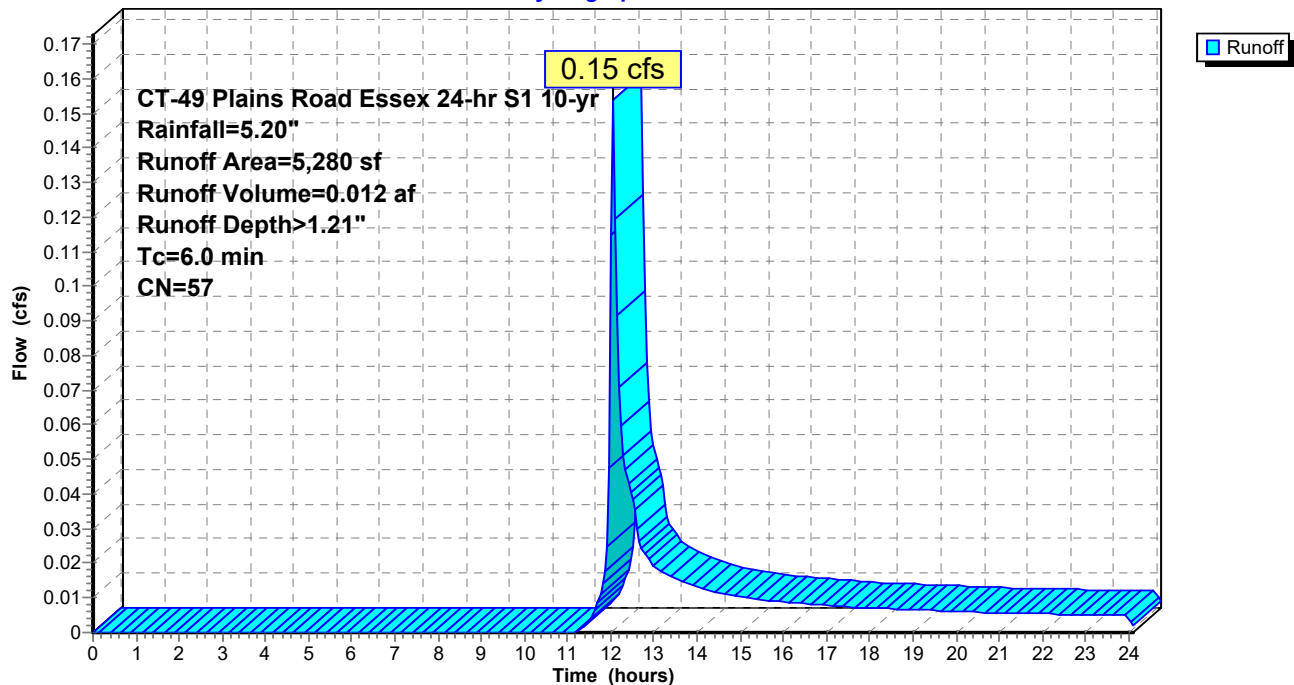
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"

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, Min. TR-55 TC

Subcatchment 20: PRWS20

Hydrograph



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"

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Summary for Subcatchment 21: PRWS 21

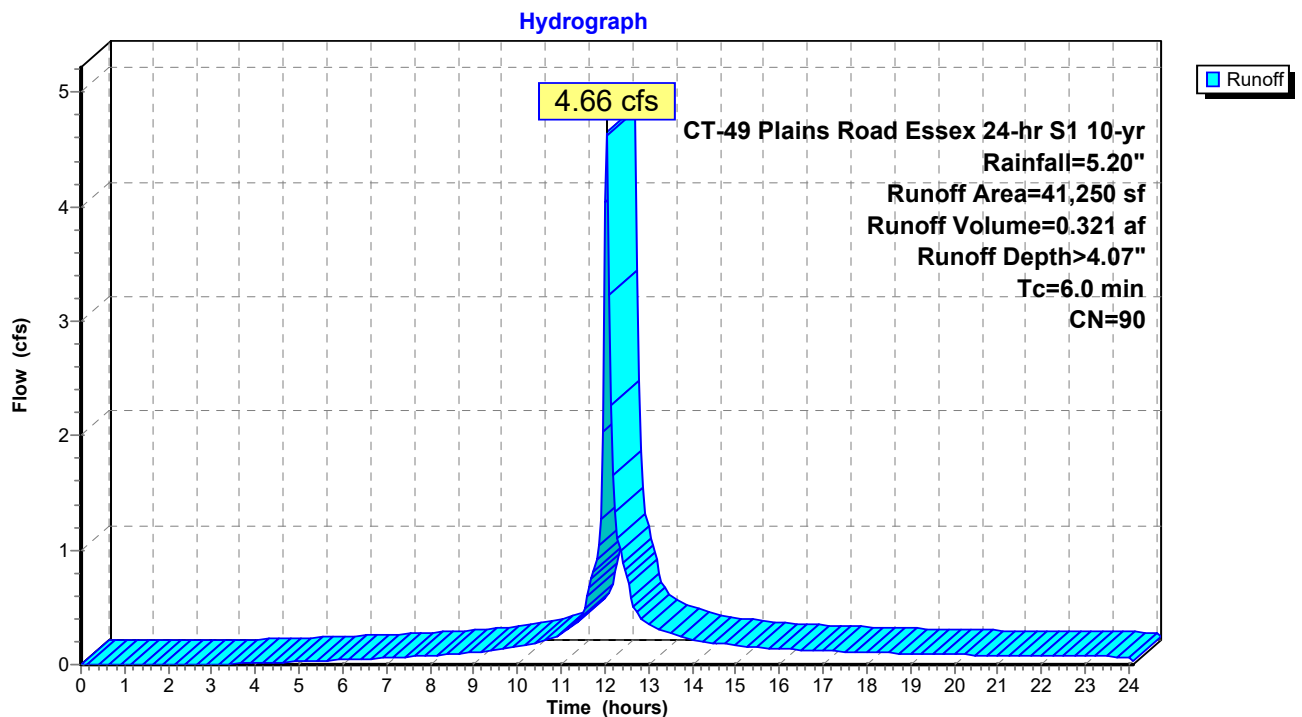
Runoff = 4.66 cfs @ 12.04 hrs, Volume= 0.321 af, Depth> 4.07"

Routed to Pond 21S : 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
9,475	61	>75% Grass cover, Good, HSG B
29,400	98	Paved parking, HSG B
2,375	98	Roofs, HSG B
41,250	90	Weighted Average
9,475		22.97% Pervious Area
31,775		77.03% 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

49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"

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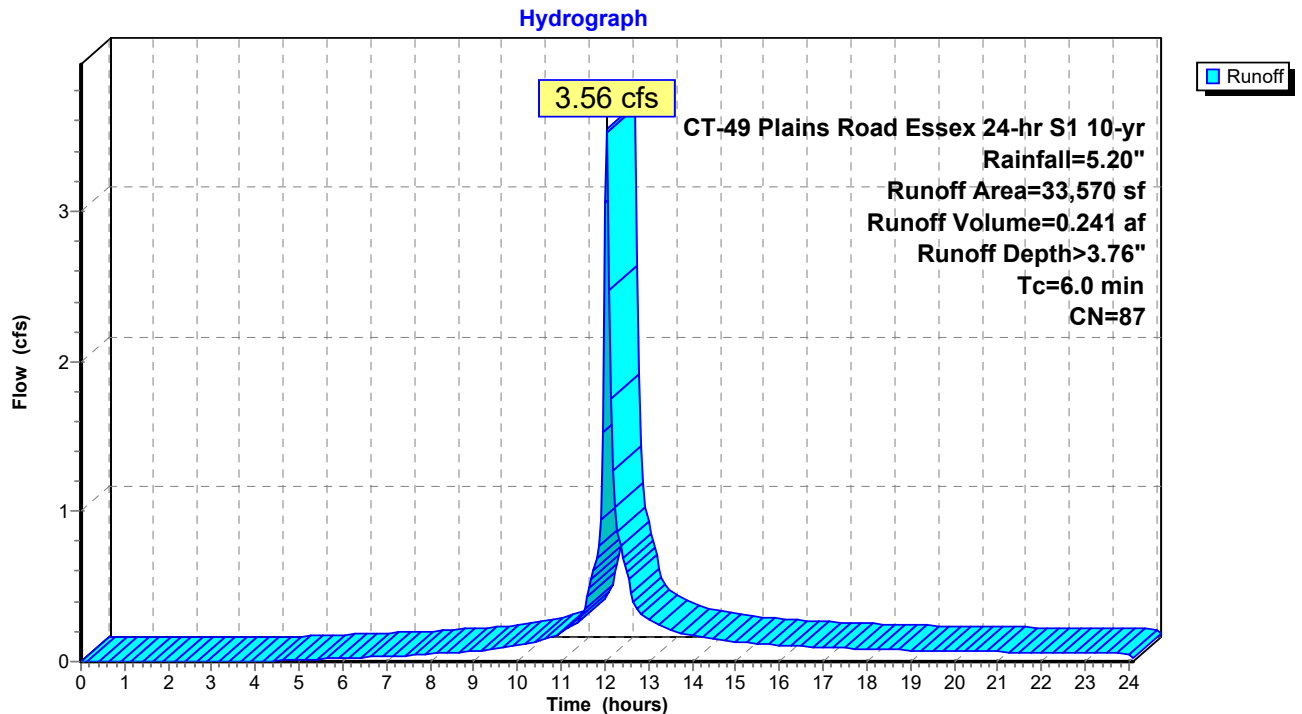
Summary for Subcatchment 22: PRWS 22

Runoff = 3.56 cfs @ 12.04 hrs, Volume= 0.241 af, Depth> 3.76"
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
9,870	61	>75% Grass cover, Good, HSG B
11,200	98	Paved parking, HSG B
12,500	98	Roofs, HSG B
33,570	87	Weighted Average
9,870		29.40% Pervious Area
23,700		70.60% 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

49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"

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Summary for Pond 21S: Water Qualirty Basin

Inflow Area = 1.718 ac, 74.14% Impervious, Inflow Depth > 3.29" for 10-yr event
 Inflow = 4.76 cfs @ 12.04 hrs, Volume= 0.472 af
 Outflow = 4.05 cfs @ 12.09 hrs, Volume= 0.455 af, Atten= 15%, Lag= 2.8 min
 Primary = 4.05 cfs @ 12.09 hrs, Volume= 0.455 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' @ 12.09 hrs Surf.Area= 2,482 sf Storage= 4,918 cf (2,588 cf above start)

Plug-Flow detention time= 147.2 min calculated for 0.401 af (85% of inflow)
 Center-of-Mass det. time= 28.1 min (896.0 - 867.8)

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

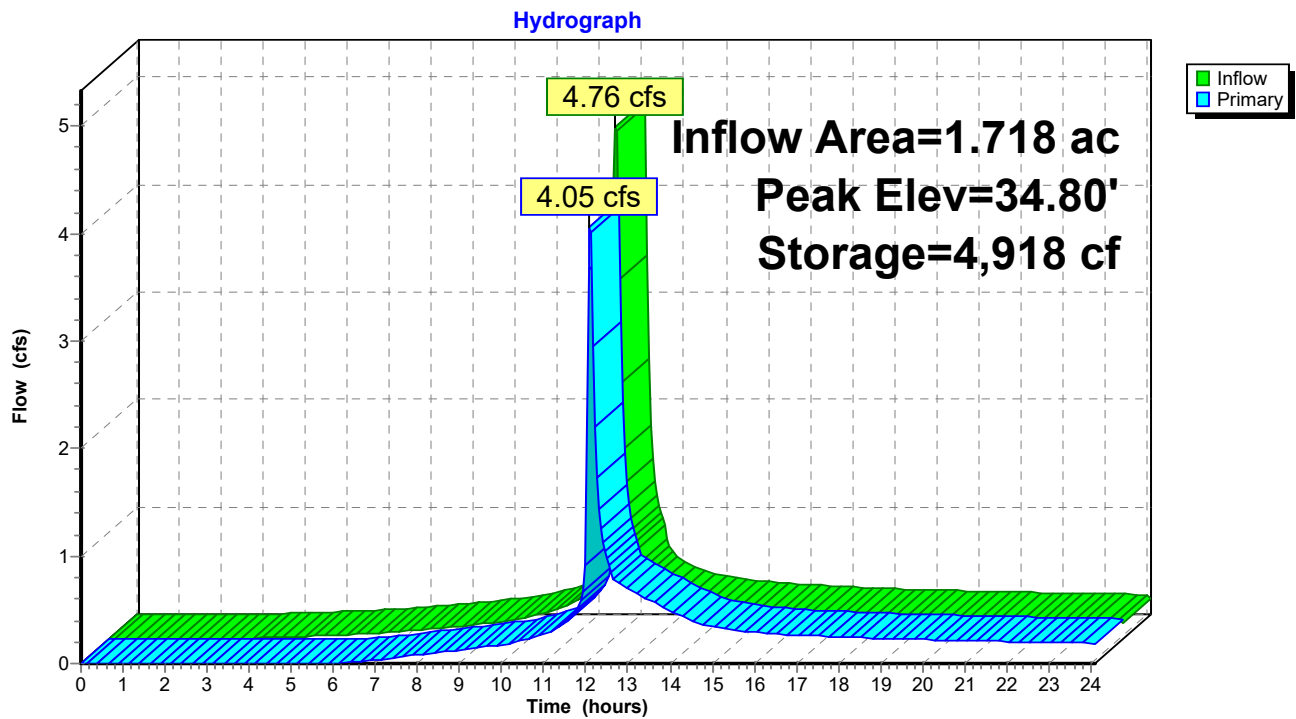
Device	Routing	Invert	Outlet Devices
#1	Primary	33.70'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	34.60'	15.0' long + 0.5 ' / SideZ x 3.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50 4.00 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=3.91 cfs @ 12.09 hrs HW=34.79' (Free Discharge)

↑ **1=Orifice/Grate** (Orifice Controls 0.87 cfs @ 4.41 fps)

└ **2=Broad-Crested Rectangular Weir** (Weir Controls 3.05 cfs @ 1.06 fps)

Pond 21S: Water Qualirty Basin



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"

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Summary for Pond 22SA: Water Quality Basin

Inflow Area = 0.771 ac, 70.60% Impervious, Inflow Depth > 3.76" for 10-yr event
 Inflow = 3.56 cfs @ 12.04 hrs, Volume= 0.241 af
 Outflow = 3.62 cfs @ 12.05 hrs, Volume= 0.241 af, Atten= 0%, Lag= 0.3 min
 Primary = 3.62 cfs @ 12.05 hrs, Volume= 0.241 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' @ 12.05 hrs Surf.Area= 1,404 sf Storage= 2,698 cf (82 cf above start)

Plug-Flow detention time= 169.9 min calculated for 0.181 af (75% of inflow)
 Center-of-Mass det. time= 0.5 min (814.0 - 813.5)

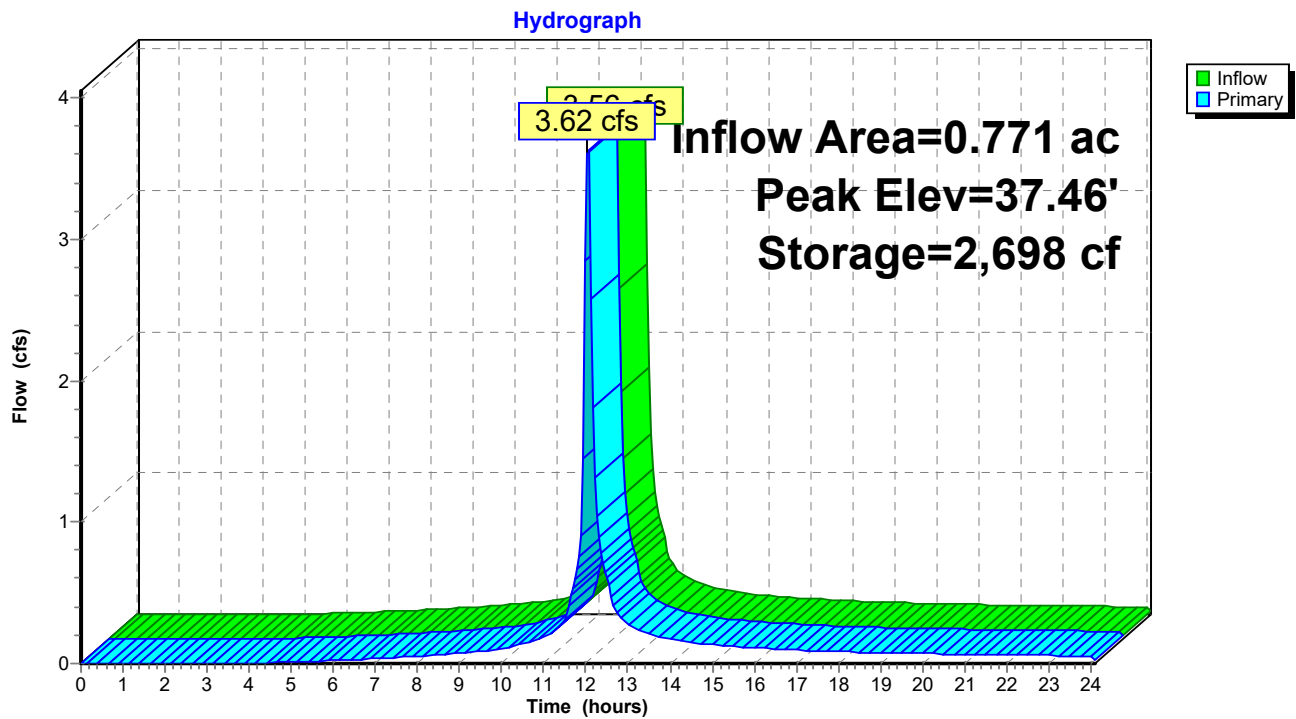
Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	2,756 cf	Custom Stage Data (Irregular) Listed below (Recalc)

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=3.50 cfs @ 12.05 hrs HW=37.46' (Free Discharge)
 ↑1=Orifice/Grate (Weir Controls 3.50 cfs @ 0.79 fps)

Pond 22SA: Water Quality Basin



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"

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Summary for Pond 22SB: Underground 22

Inflow Area = 0.771 ac, 70.60% Impervious, Inflow Depth > 3.76" for 10-yr event
 Inflow = 3.62 cfs @ 12.05 hrs, Volume= 0.241 af
 Outflow = 0.14 cfs @ 14.86 hrs, Volume= 0.150 af, Atten= 96%, Lag= 168.6 min
 Primary = 0.14 cfs @ 14.86 hrs, Volume= 0.150 af
 Routed to Pond 21S : Water Quality Basin

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
 Peak Elev= 35.80' @ 14.86 hrs Surf.Area= 0.113 ac Storage= 0.129 af

Plug-Flow detention time= 326.4 min calculated for 0.150 af (62% of inflow)
 Center-of-Mass det. time= 198.5 min (1,012.5 - 814.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	34.00'	0.076 af	39.50'W x 124.66'L x 3.50'H Field A 0.396 af Overall - 0.143 af Embedded = 0.252 af x 30.0% Voids
#2A	34.50'	0.143 af	ADS_StormTech SC-740 +Cap x 136 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 136 Chambers in 8 Rows
		0.219 af	Total Available Storage

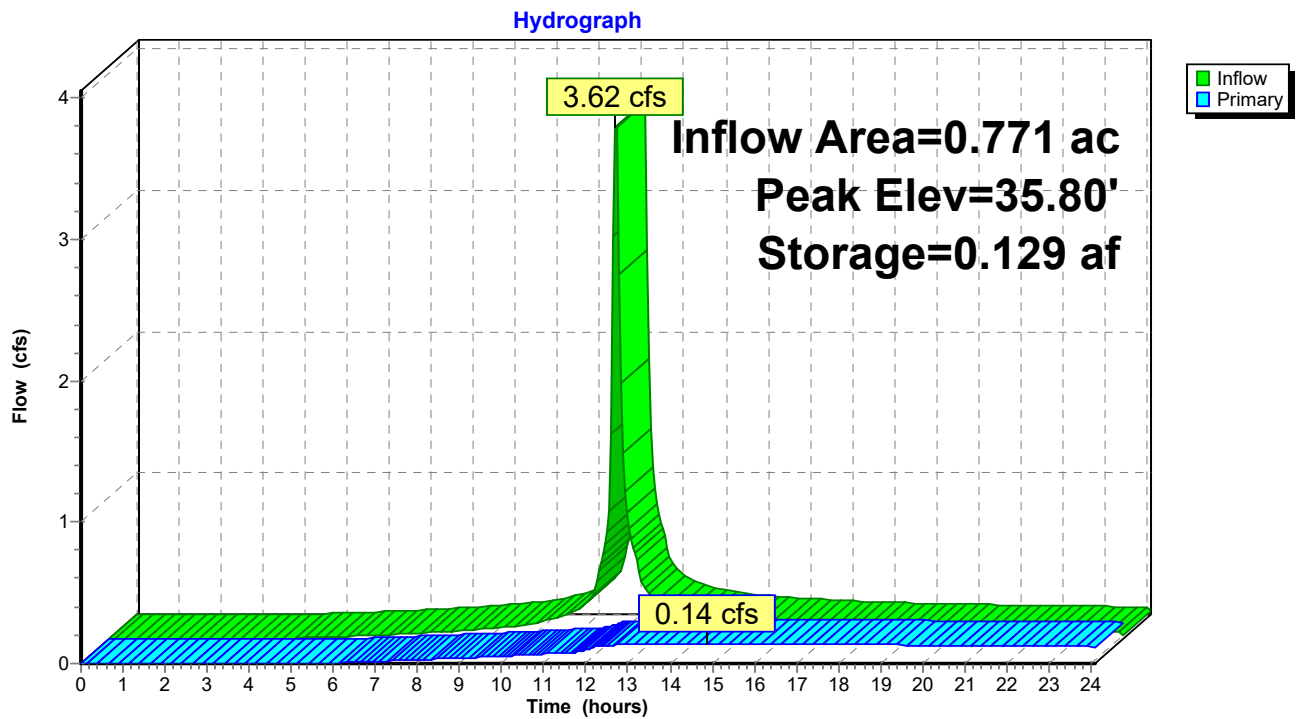
Storage Group A created with Chamber Wizard

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	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=0.14 cfs @ 14.86 hrs HW=35.80' (Free Discharge)

- ↑ 1=Orifice/Grate (Orifice Controls 0.14 cfs @ 6.31 fps)
 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 22SB: Underground 22



49 Plains Road Proposed

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CT-49 Plains Road Essex 24-hr S1 10-yr Rainfall=5.20"

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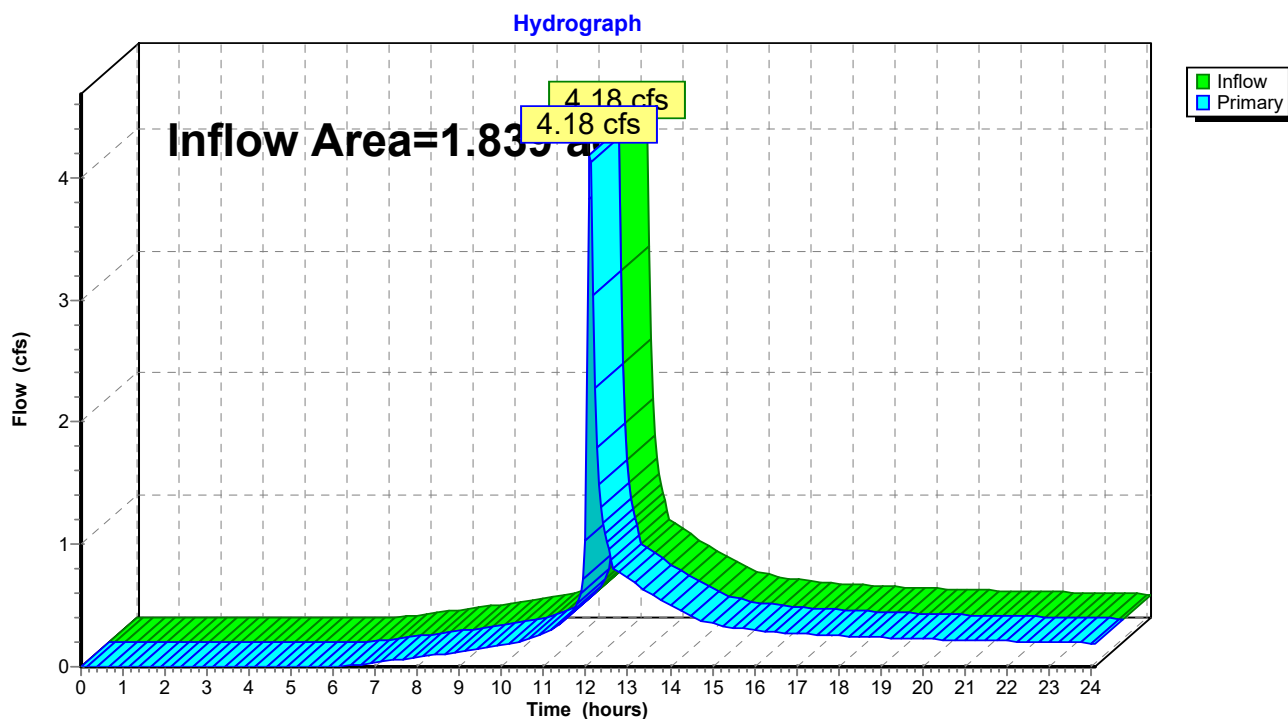
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Summary for Link 30: Site

Inflow Area = 1.839 ac, 69.26% Impervious, Inflow Depth > 3.05" for 10-yr event
Inflow = 4.18 cfs @ 12.09 hrs, Volume= 0.468 af
Primary = 4.18 cfs @ 12.09 hrs, Volume= 0.468 af, Atten= 0%, Lag= 0.0 min

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

Link 30: Site



49 Plains Road Proposed*CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"*

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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

Subcatchment20: 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

Subcatchment21: PRWS 21

Runoff Area=41,250 sf 77.03% Impervious Runoff Depth>5.15"
Tc=6.0 min CN=90 Runoff=5.80 cfs 0.406 af

Subcatchment22: PRWS 22

Runoff Area=33,570 sf 70.60% Impervious Runoff Depth>4.81"
Tc=6.0 min CN=87 Runoff=4.49 cfs 0.309 af

Pond 21S: Water Qualirty Basin

Peak Elev=34.85' Storage=5,058 cf Inflow=5.91 cfs 0.585 af
Outflow=5.58 cfs 0.567 af

Pond 22SA: Water Quality Basin

Peak Elev=37.47' Storage=2,712 cf Inflow=4.49 cfs 0.309 af
Outflow=4.55 cfs 0.309 af

Pond 22SB: Underground 22

Peak Elev=36.38' Storage=0.172 af Inflow=4.55 cfs 0.309 af
Outflow=0.16 cfs 0.178 af

Link 30: Site

Inflow=5.83 cfs 0.586 af
Primary=5.83 cfs 0.586 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.734 af Average Runoff Depth = 4.79"
30.74% Pervious = 0.565 ac 69.26% Impervious = 1.274 ac

49 Plains Road Proposed

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CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"

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Summary for Subcatchment 20: PRWS20

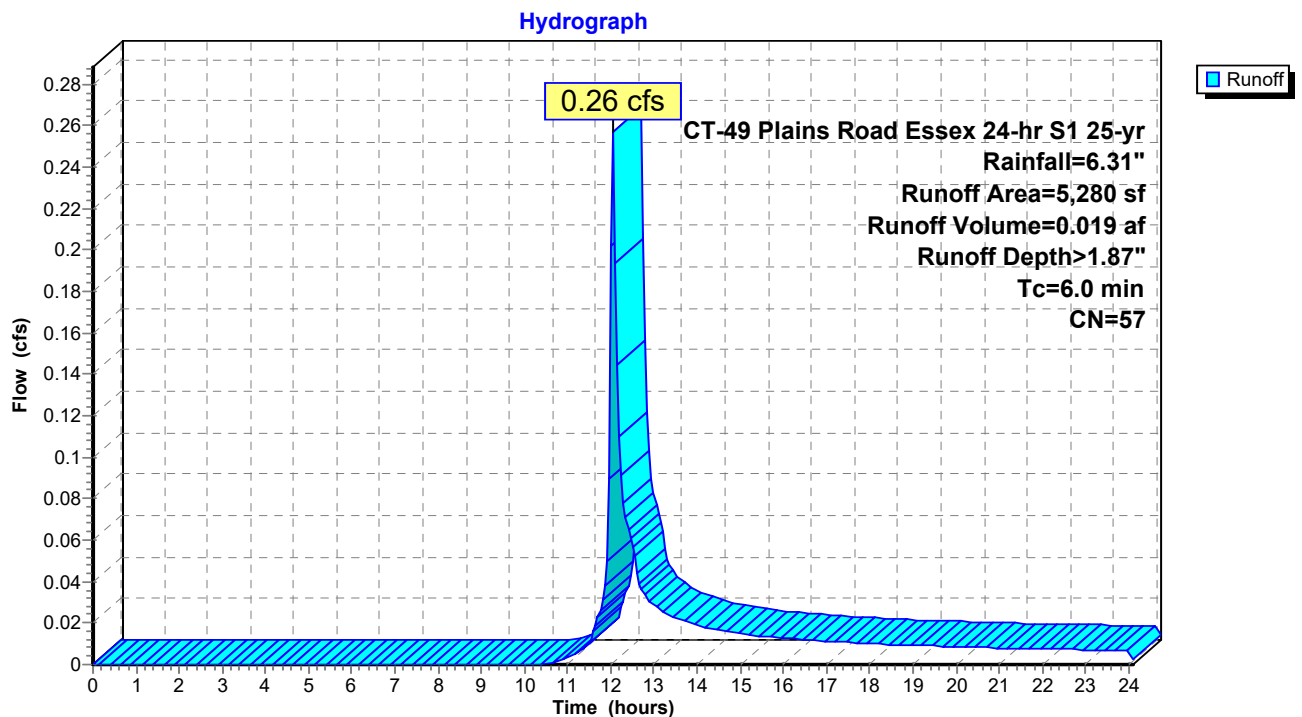
Runoff = 0.26 cfs @ 12.05 hrs, Volume= 0.019 af, Depth> 1.87"
Routed to Link 30 : Site

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



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"

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Summary for Subcatchment 21: PRWS 21

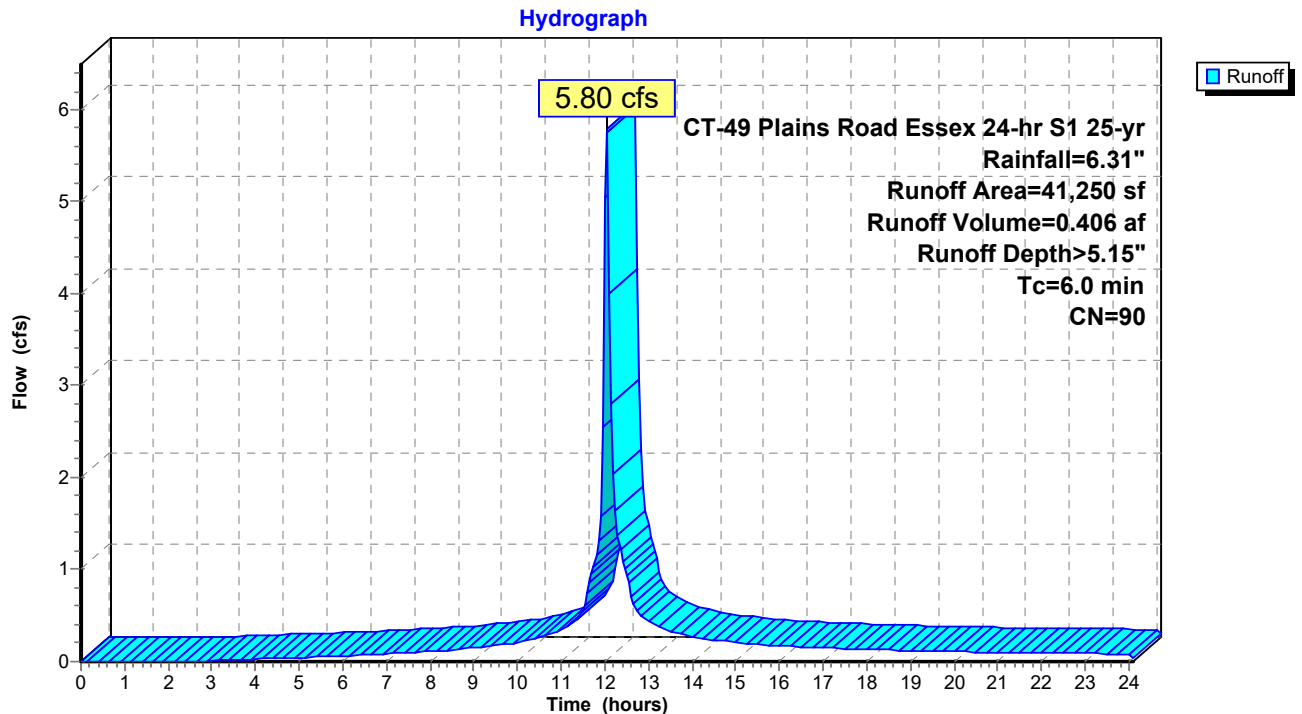
Runoff = 5.80 cfs @ 12.04 hrs, Volume= 0.406 af, Depth> 5.15"

Routed to Pond 21S : 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
9,475	61	>75% Grass cover, Good, HSG B
29,400	98	Paved parking, HSG B
2,375	98	Roofs, HSG B
41,250	90	Weighted Average
9,475		22.97% Pervious Area
31,775		77.03% 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

49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"

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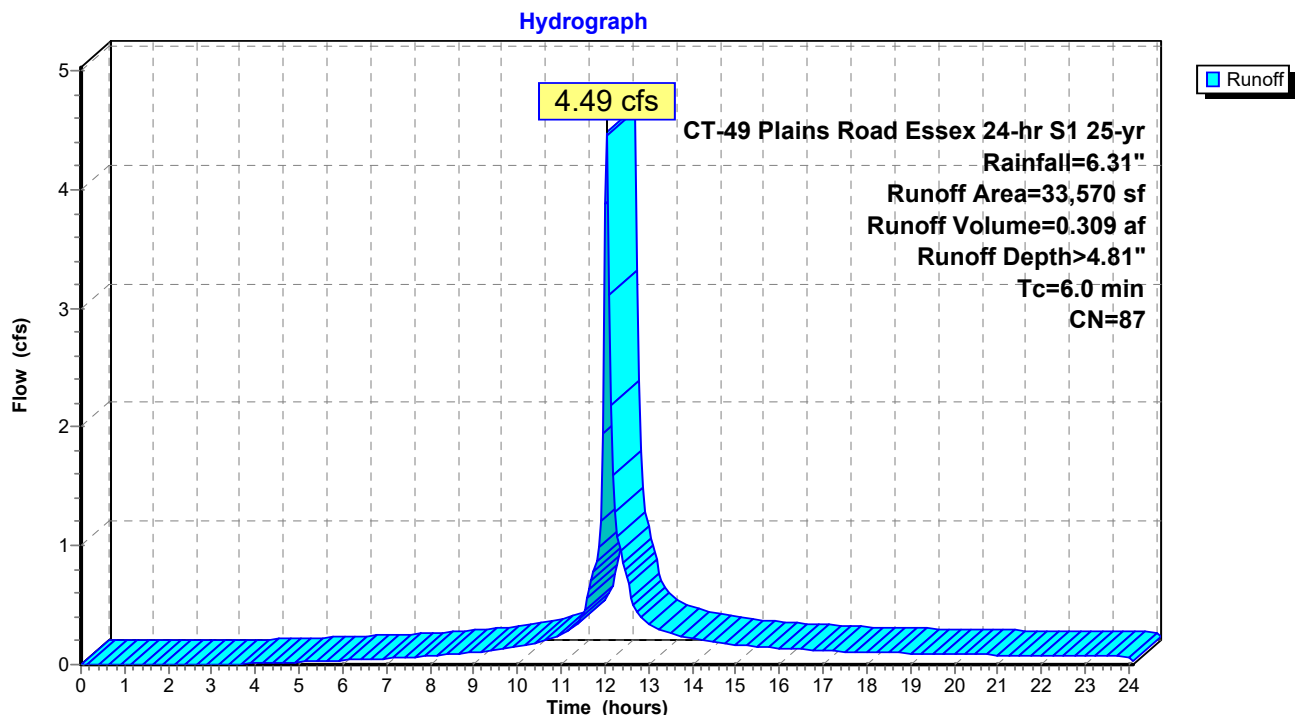
Summary for Subcatchment 22: PRWS 22

Runoff = 4.49 cfs @ 12.04 hrs, Volume= 0.309 af, Depth> 4.81"
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
9,870	61	>75% Grass cover, Good, HSG B
11,200	98	Paved parking, HSG B
12,500	98	Roofs, HSG B
33,570	87	Weighted Average
9,870		29.40% Pervious Area
23,700		70.60% 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

49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"

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Summary for Pond 21S: Water Qualirty Basin

Inflow Area = 1.718 ac, 74.14% Impervious, Inflow Depth > 4.08" for 25-yr event
 Inflow = 5.91 cfs @ 12.04 hrs, Volume= 0.585 af
 Outflow = 5.58 cfs @ 12.07 hrs, Volume= 0.567 af, Atten= 6%, Lag= 1.7 min
 Primary = 5.58 cfs @ 12.07 hrs, Volume= 0.567 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= 34.85' @ 12.07 hrs Surf.Area= 2,512 sf Storage= 5,058 cf (2,727 cf above start)

Plug-Flow detention time= 129.4 min calculated for 0.512 af (88% of inflow)
 Center-of-Mass det. time= 26.0 min (882.6 - 856.6)

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

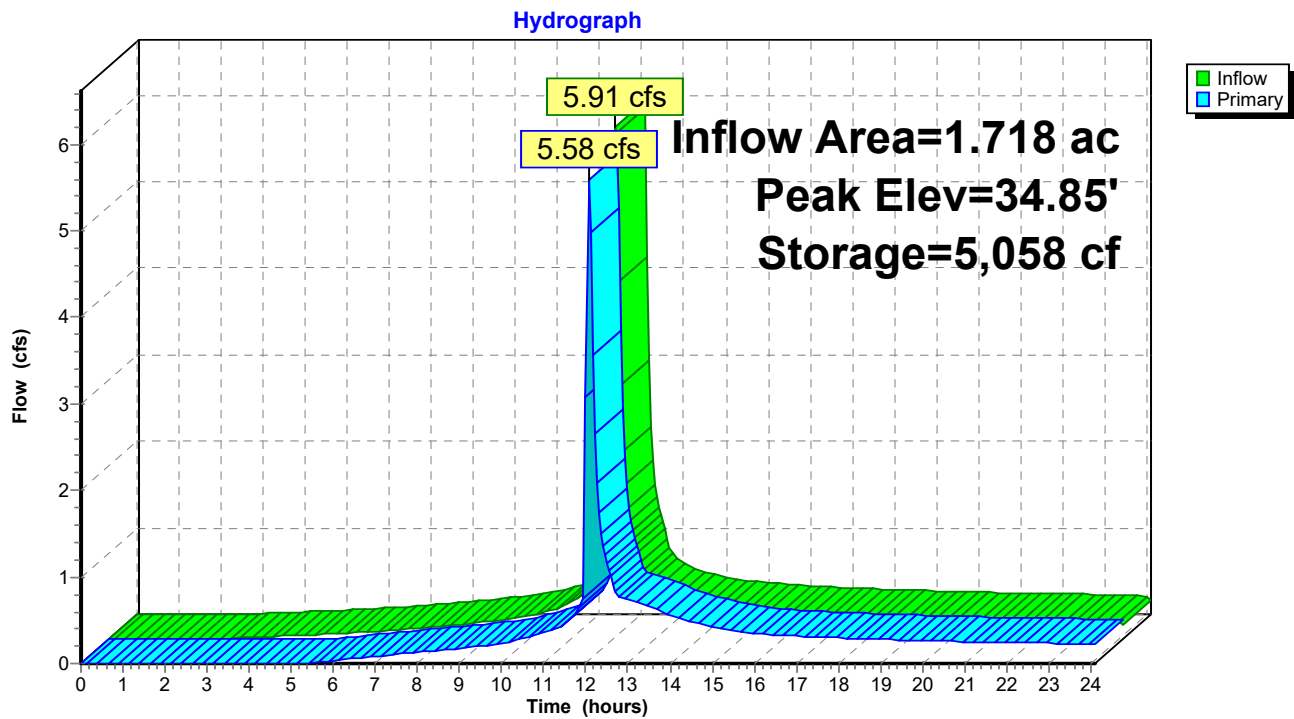
Device	Routing	Invert	Outlet Devices
#1	Primary	33.70'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	34.60'	15.0' long + 0.5 ' / SideZ x 3.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50 4.00 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=5.26 cfs @ 12.07 hrs HW=34.84' (Free Discharge)

↑ **1=Orifice/Grate** (Orifice Controls 0.89 cfs @ 4.54 fps)

└ **2=Broad-Crested Rectangular Weir** (Weir Controls 4.37 cfs @ 1.21 fps)

Pond 21S: Water Qualirty Basin



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"

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Summary for Pond 22SA: Water Quality Basin

Inflow Area = 0.771 ac, 70.60% Impervious, Inflow Depth > 4.81" for 25-yr event
 Inflow = 4.49 cfs @ 12.04 hrs, Volume= 0.309 af
 Outflow = 4.55 cfs @ 12.05 hrs, Volume= 0.309 af, Atten= 0%, Lag= 0.3 min
 Primary = 4.55 cfs @ 12.05 hrs, Volume= 0.309 af
 Routed to Pond 22SB : Underground 22

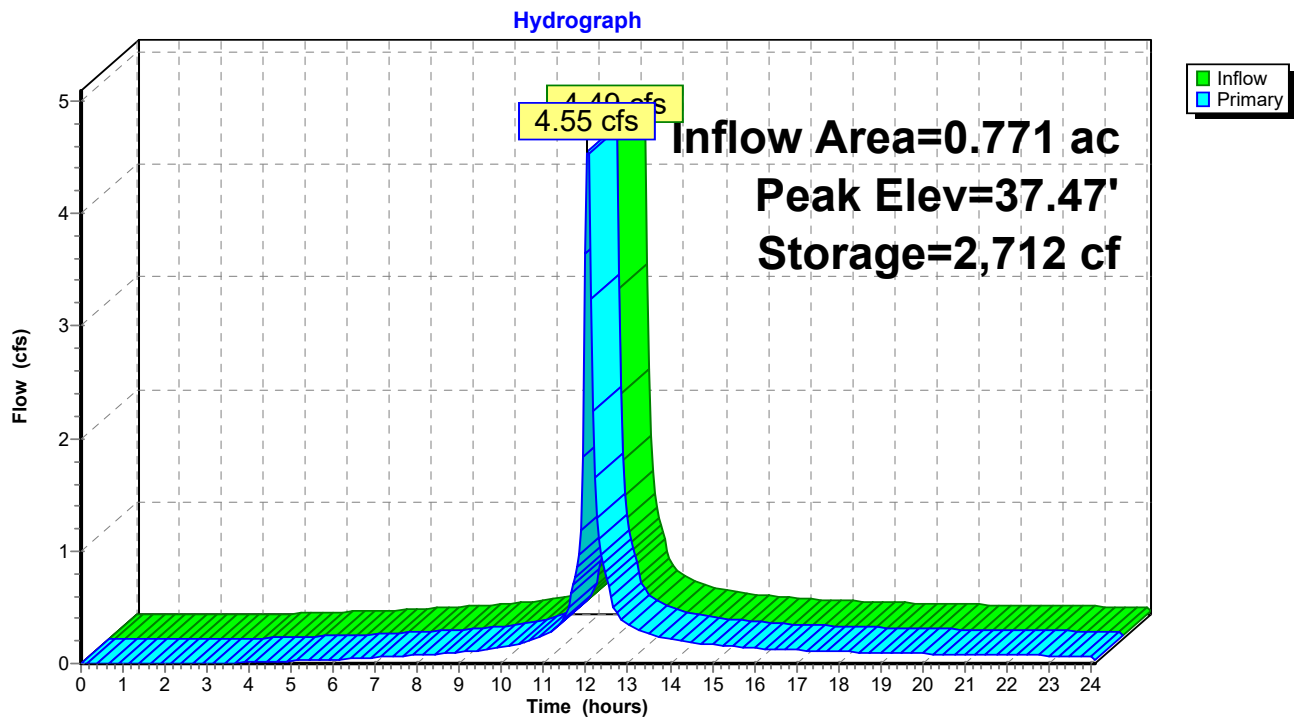
Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
 Starting Elev= 37.40' Surf.Area= 1,393 sf Storage= 2,616 cf
 Peak Elev= 37.47' @ 12.05 hrs Surf.Area= 1,406 sf Storage= 2,712 cf (96 cf above start)

Plug-Flow detention time= 147.1 min calculated for 0.249 af (80% of inflow)
 Center-of-Mass det. time= 0.5 min (805.3 - 804.8)

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=4.41 cfs @ 12.05 hrs HW=37.47' (Free Discharge)
 ↑1=Orifice/Grate (Weir Controls 4.41 cfs @ 0.85 fps)

Pond 22SA: Water Quality Basin



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"

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Summary for Pond 22SB: Underground 22

Inflow Area = 0.771 ac, 70.60% Impervious, Inflow Depth > 4.81" for 25-yr event
 Inflow = 4.55 cfs @ 12.05 hrs, Volume= 0.309 af
 Outflow = 0.16 cfs @ 15.18 hrs, Volume= 0.178 af, Atten= 96%, Lag= 187.9 min
 Primary = 0.16 cfs @ 15.18 hrs, Volume= 0.178 af
 Routed to Pond 21S : Water Quality Basin

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
 Peak Elev= 36.38' @ 15.18 hrs Surf.Area= 0.113 ac Storage= 0.172 af

Plug-Flow detention time= 332.0 min calculated for 0.178 af (58% of inflow)
 Center-of-Mass det. time= 197.8 min (1,003.1 - 805.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	34.00'	0.076 af	39.50'W x 124.66'L x 3.50'H Field A 0.396 af Overall - 0.143 af Embedded = 0.252 af x 30.0% Voids
#2A	34.50'	0.143 af	ADS_StormTech SC-740 +Cap x 136 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 136 Chambers in 8 Rows
		0.219 af	Total Available Storage

Storage Group A created with Chamber Wizard

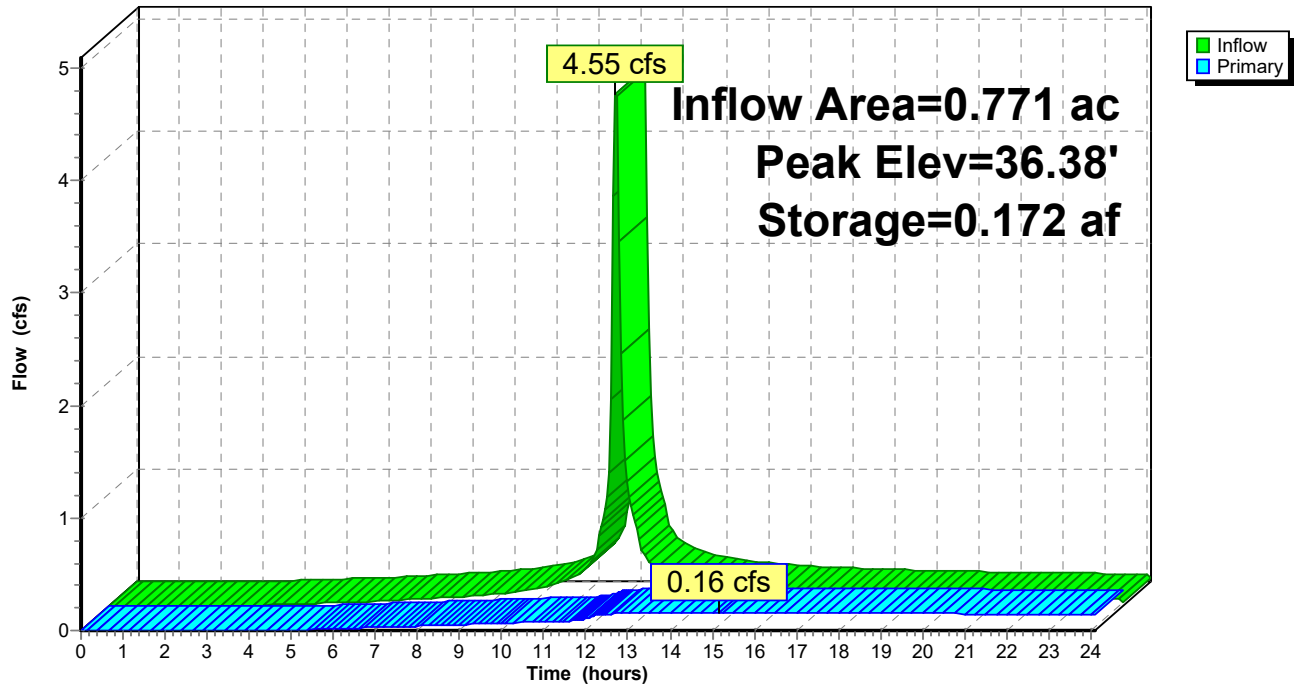
Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	2.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	36.90'	4.0' long + 1.0 ' SideZ x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 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 @ 15.18 hrs HW=36.38' (Free Discharge)

- ↑ 1=Orifice/Grate (Orifice Controls 0.16 cfs @ 7.30 fps)
 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 22SB: Underground 22

Hydrograph



49 Plains Road Proposed

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CT-49 Plains Road Essex 24-hr S1 25-yr Rainfall=6.31"

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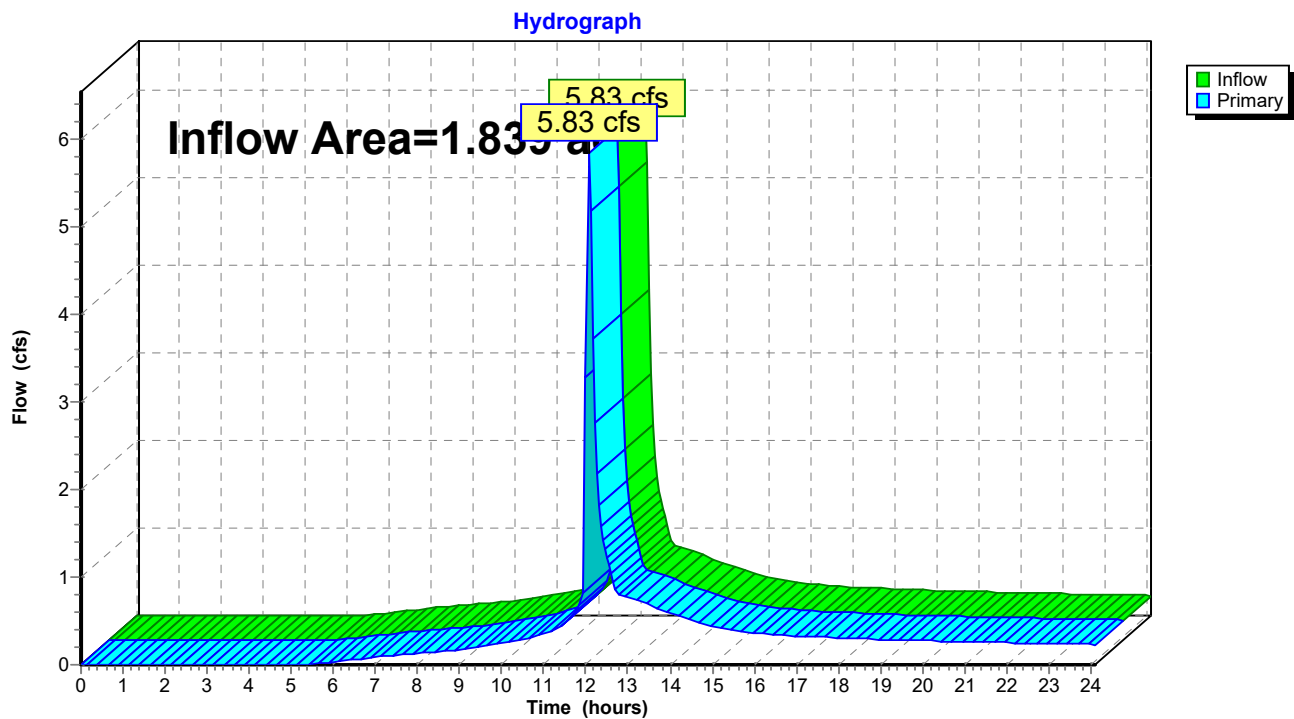
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Summary for Link 30: Site

Inflow Area = 1.839 ac, 69.26% Impervious, Inflow Depth > 3.82" for 25-yr event
Inflow = 5.83 cfs @ 12.07 hrs, Volume= 0.586 af
Primary = 5.83 cfs @ 12.07 hrs, Volume= 0.586 af, Atten= 0%, Lag= 0.0 min

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

Link 30: Site



49 Plains Road Proposed*CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"*

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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

Subcatchment20: 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

Subcatchment21: PRWS 21

Runoff Area=41,250 sf 77.03% Impervious Runoff Depth>5.95"
Tc=6.0 min CN=90 Runoff=6.65 cfs 0.470 af

Subcatchment22: PRWS 22

Runoff Area=33,570 sf 70.60% Impervious Runoff Depth>5.60"
Tc=6.0 min CN=87 Runoff=5.19 cfs 0.360 af

Pond 21S: Water Qualirty Basin

Peak Elev=34.88' Storage=5,126 cf Inflow=6.77 cfs 0.673 af
Outflow=6.44 cfs 0.654 af

Pond 22SA: Water Quality Basin

Peak Elev=37.48' Storage=2,723 cf Inflow=5.19 cfs 0.360 af
Outflow=5.25 cfs 0.360 af

Pond 22SB: Underground 22

Peak Elev=36.93' Storage=0.200 af Inflow=5.25 cfs 0.360 af
Outflow=0.24 cfs 0.203 af

Link 30: Site

Inflow=6.78 cfs 0.679 af
Primary=6.78 cfs 0.679 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.854 af Average Runoff Depth = 5.57"
30.74% Pervious = 0.565 ac 69.26% Impervious = 1.274 ac

49 Plains Road Proposed

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CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"

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Summary for Subcatchment 20: PRWS20

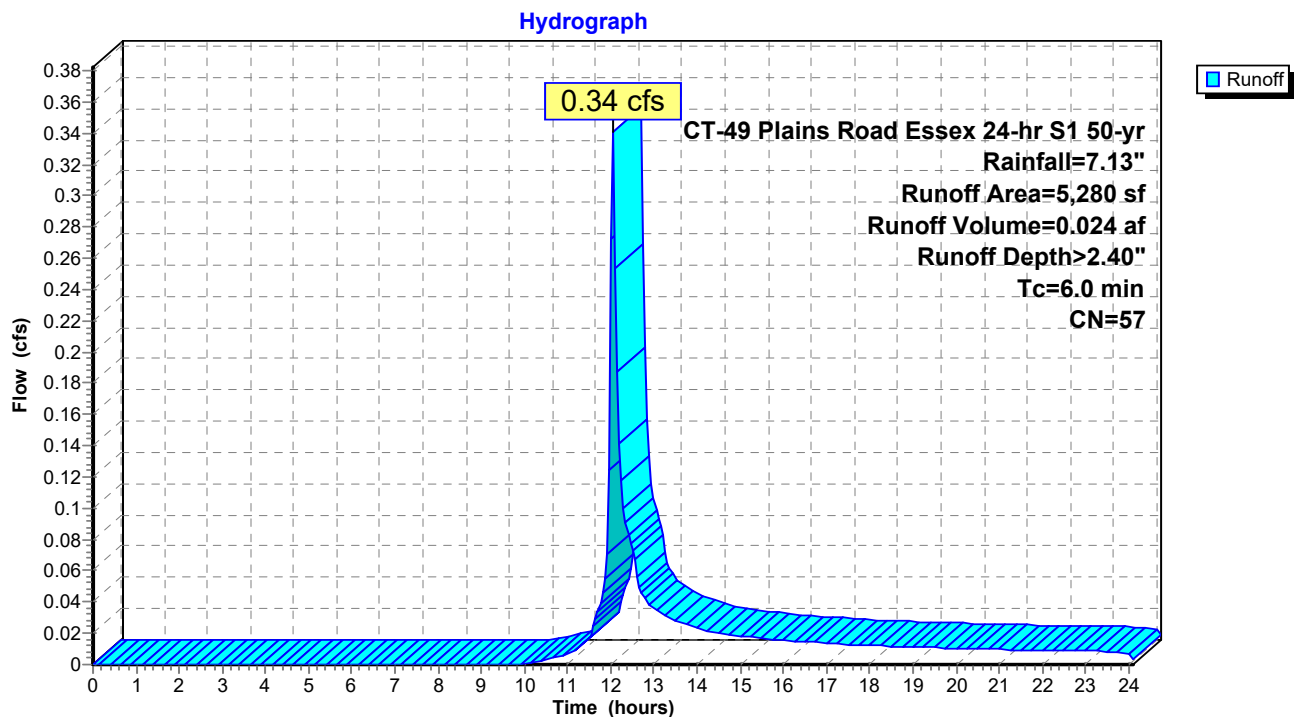
Runoff = 0.34 cfs @ 12.05 hrs, Volume= 0.024 af, Depth> 2.40"
Routed to Link 30 : Site

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



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"

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Summary for Subcatchment 21: PRWS 21

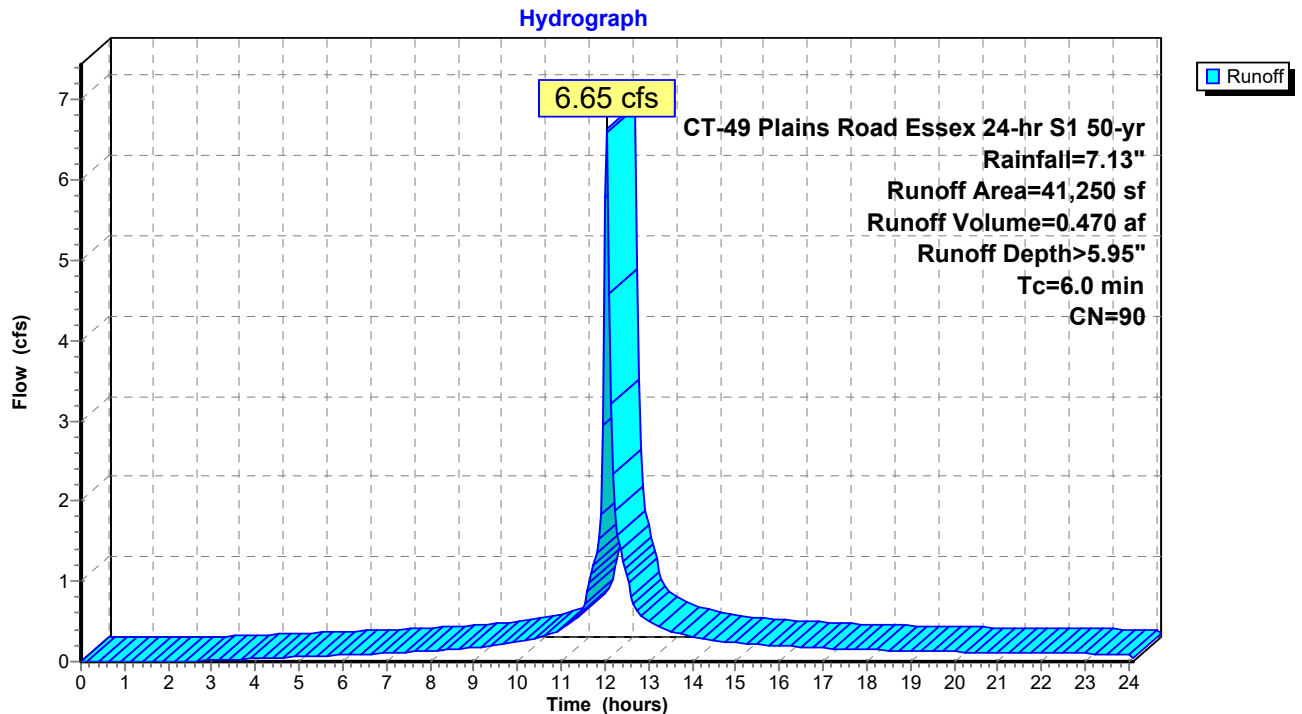
Runoff = 6.65 cfs @ 12.04 hrs, Volume= 0.470 af, Depth> 5.95"

Routed to Pond 21S : 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
9,475	61	>75% Grass cover, Good, HSG B
29,400	98	Paved parking, HSG B
2,375	98	Roofs, HSG B
41,250	90	Weighted Average
9,475		22.97% Pervious Area
31,775		77.03% 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

49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"

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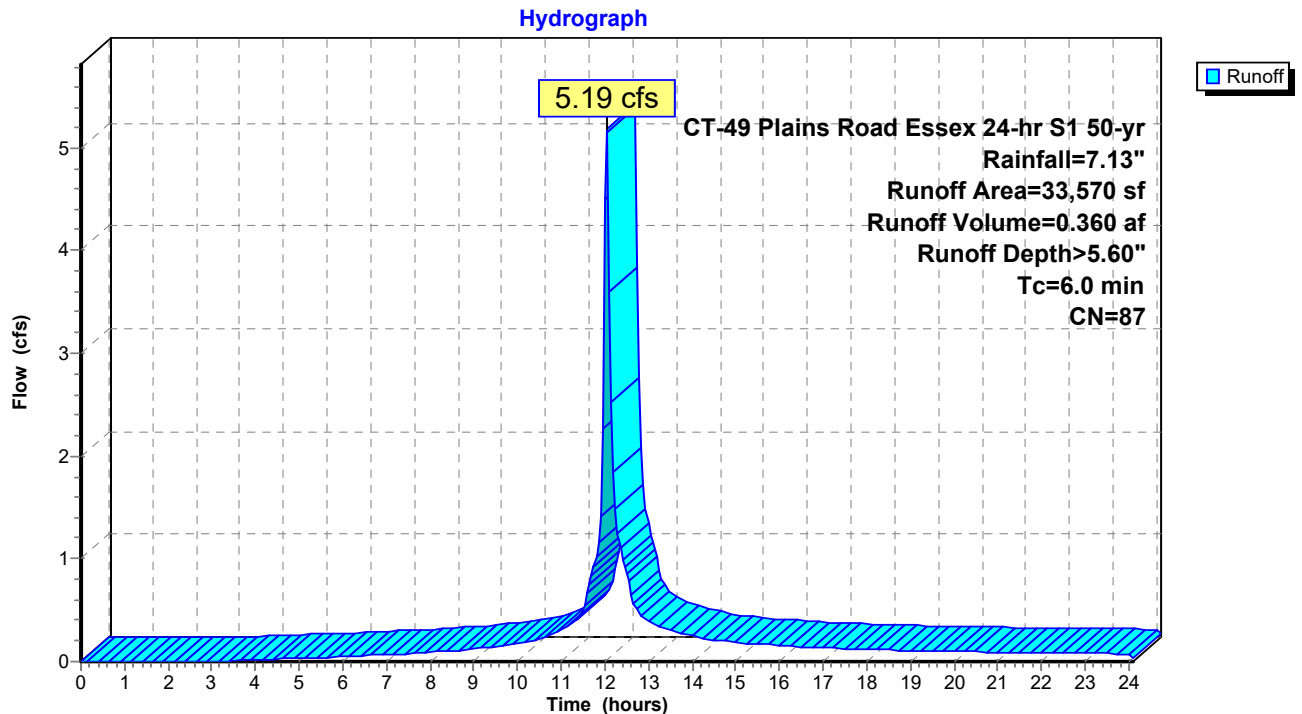
Summary for Subcatchment 22: PRWS 22

Runoff = 5.19 cfs @ 12.04 hrs, Volume= 0.360 af, Depth> 5.60"
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
9,870	61	>75% Grass cover, Good, HSG B
11,200	98	Paved parking, HSG B
12,500	98	Roofs, HSG B
33,570	87	Weighted Average
9,870		29.40% Pervious Area
23,700		70.60% 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

49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"

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Summary for Pond 21S: Water Qualirty Basin

Inflow Area = 1.718 ac, 74.14% Impervious, Inflow Depth > 4.70" for 50-yr event
 Inflow = 6.77 cfs @ 12.04 hrs, Volume= 0.673 af
 Outflow = 6.44 cfs @ 12.06 hrs, Volume= 0.654 af, Atten= 5%, Lag= 1.4 min
 Primary = 6.44 cfs @ 12.06 hrs, Volume= 0.654 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= 34.88' @ 12.06 hrs Surf.Area= 2,527 sf Storage= 5,126 cf (2,796 cf above start)

Plug-Flow detention time= 118.7 min calculated for 0.601 af (89% of inflow)
 Center-of-Mass det. time= 25.1 min (874.6 - 849.6)

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

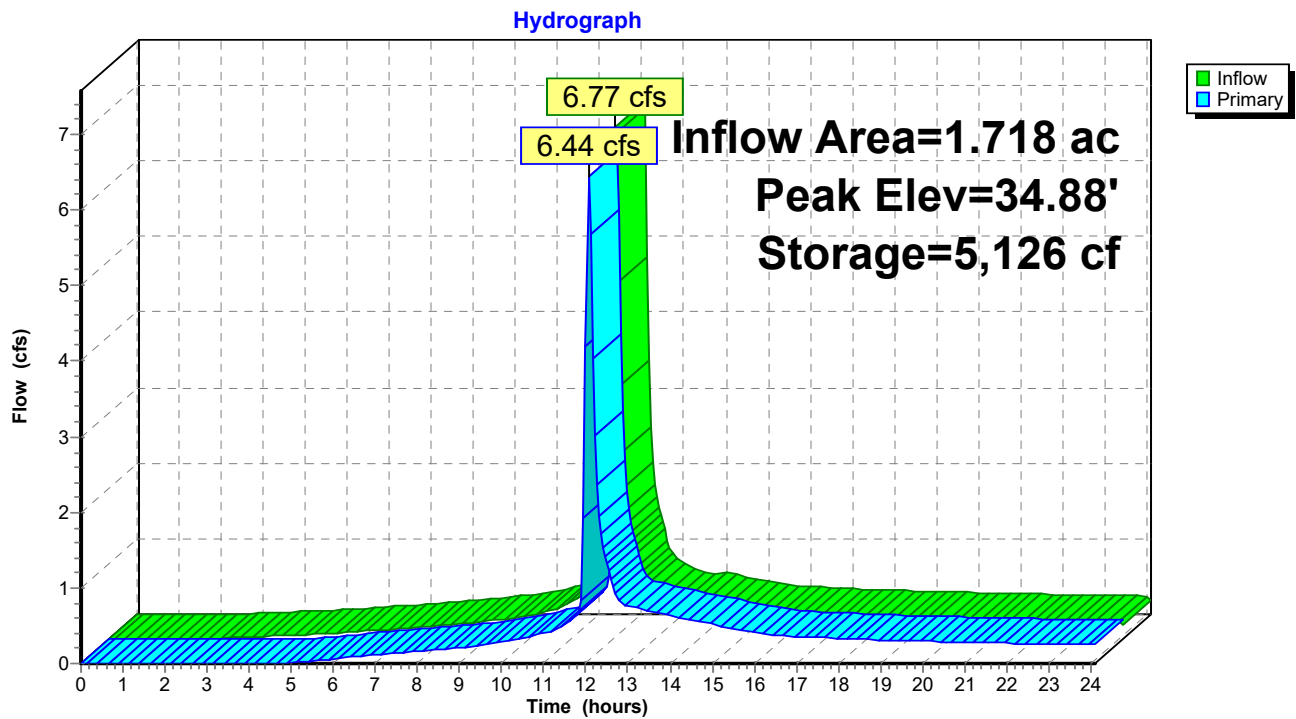
Device	Routing	Invert	Outlet Devices
#1	Primary	33.70'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	34.60'	15.0' long + 0.5 ' / SideZ x 3.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50 4.00 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=6.16 cfs @ 12.06 hrs HW=34.87' (Free Discharge)

↑ **1=Orifice/Grate** (Orifice Controls 0.91 cfs @ 4.62 fps)

└ **2=Broad-Crested Rectangular Weir** (Weir Controls 5.26 cfs @ 1.29 fps)

Pond 21S: Water Qualirty Basin



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"

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Summary for Pond 22SA: Water Quality Basin

Inflow Area = 0.771 ac, 70.60% Impervious, Inflow Depth > 5.60" for 50-yr event
 Inflow = 5.19 cfs @ 12.04 hrs, Volume= 0.360 af
 Outflow = 5.25 cfs @ 12.05 hrs, Volume= 0.360 af, Atten= 0%, Lag= 0.3 min
 Primary = 5.25 cfs @ 12.05 hrs, Volume= 0.360 af
 Routed to Pond 22SB : Underground 22

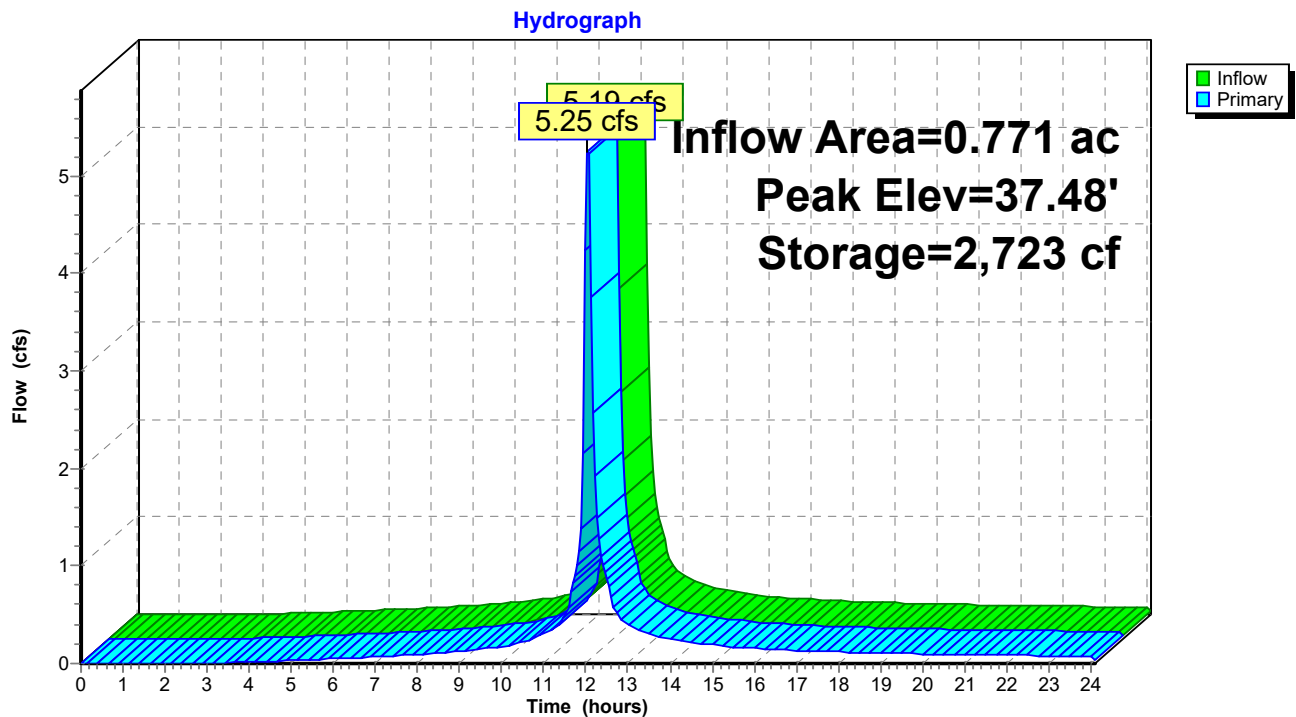
Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
 Starting Elev= 37.40' Surf.Area= 1,393 sf Storage= 2,616 cf
 Peak Elev= 37.48' @ 12.05 hrs Surf.Area= 1,407 sf Storage= 2,723 cf (106 cf above start)

Plug-Flow detention time= 134.9 min calculated for 0.300 af (83% of inflow)
 Center-of-Mass det. time= 0.5 min (799.9 - 799.4)

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=5.14 cfs @ 12.05 hrs HW=37.47' (Free Discharge)
 ↑1=Orifice/Grate (Weir Controls 5.14 cfs @ 0.89 fps)

Pond 22SA: Water Quality Basin



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"

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Summary for Pond 22SB: Underground 22

Inflow Area = 0.771 ac, 70.60% Impervious, Inflow Depth > 5.60" for 50-yr event
 Inflow = 5.25 cfs @ 12.05 hrs, Volume= 0.360 af
 Outflow = 0.24 cfs @ 14.09 hrs, Volume= 0.203 af, Atten= 95%, Lag= 122.7 min
 Primary = 0.24 cfs @ 14.09 hrs, Volume= 0.203 af
 Routed to Pond 21S : Water Quality Basin

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
 Peak Elev= 36.93' @ 14.09 hrs Surf.Area= 0.113 ac Storage= 0.200 af

Plug-Flow detention time= 329.3 min calculated for 0.203 af (56% of inflow)
 Center-of-Mass det. time= 193.5 min (993.4 - 799.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	34.00'	0.076 af	39.50'W x 124.66'L x 3.50'H Field A 0.396 af Overall - 0.143 af Embedded = 0.252 af x 30.0% Voids
#2A	34.50'	0.143 af	ADS_StormTech SC-740 +Cap x 136 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 136 Chambers in 8 Rows
		0.219 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	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

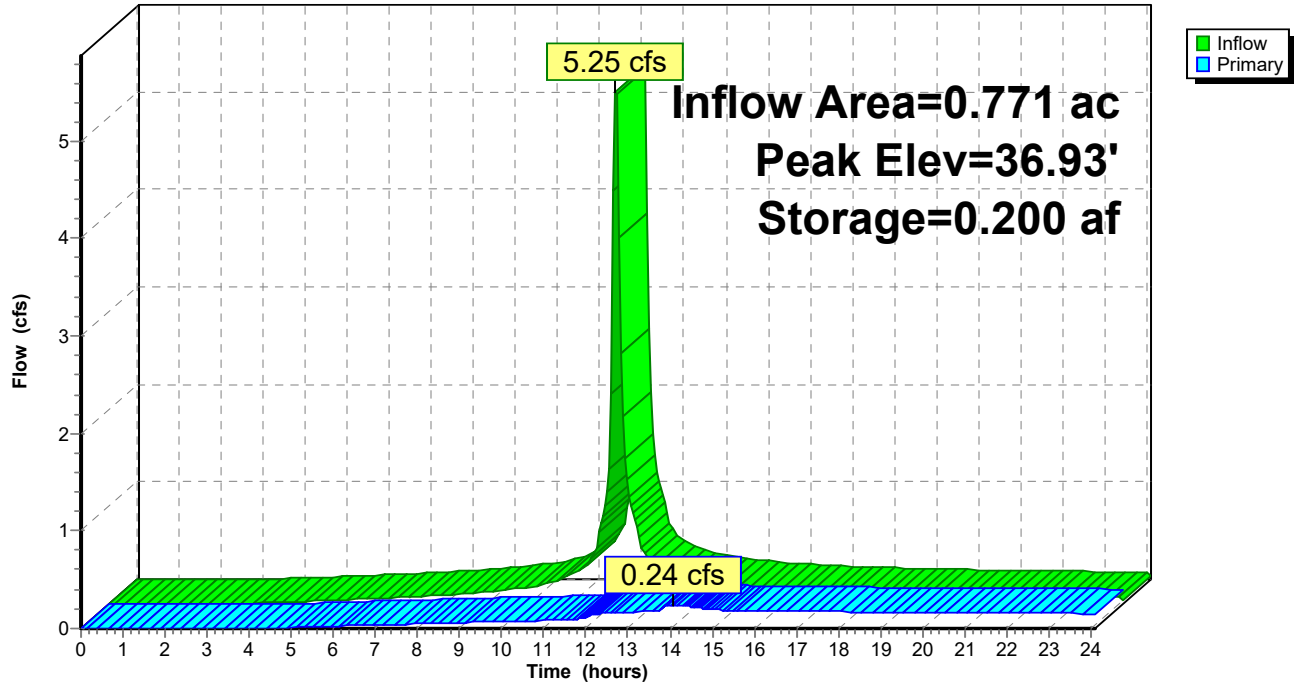
Primary OutFlow Max=0.24 cfs @ 14.09 hrs HW=36.93' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.18 cfs @ 8.13 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 0.06 cfs @ 0.48 fps)

Pond 22SB: Underground 22

Hydrograph



49 Plains Road Proposed

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CT-49 Plains Road Essex 24-hr S1 50-yr Rainfall=7.13"

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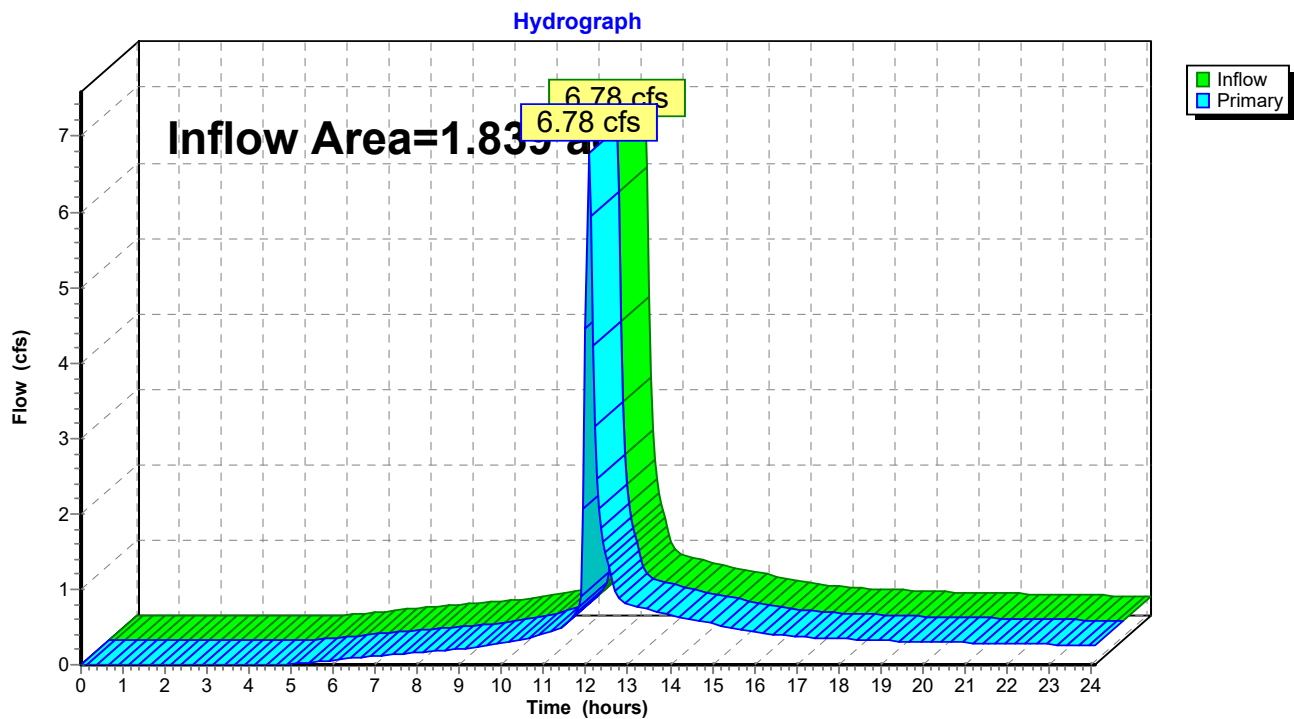
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Summary for Link 30: Site

Inflow Area = 1.839 ac, 69.26% Impervious, Inflow Depth > 4.43" for 50-yr event
Inflow = 6.78 cfs @ 12.06 hrs, Volume= 0.679 af
Primary = 6.78 cfs @ 12.06 hrs, Volume= 0.679 af, Atten= 0%, Lag= 0.0 min

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

Link 30: Site



49 Plains Road Proposed*CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"*

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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

Subcatchment20: 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

Subcatchment21: PRWS 21

Runoff Area=41,250 sf 77.03% Impervious Runoff Depth>6.81"
Tc=6.0 min CN=90 Runoff=7.53 cfs 0.538 af

Subcatchment22: PRWS 22

Runoff Area=33,570 sf 70.60% Impervious Runoff Depth>6.46"
Tc=6.0 min CN=87 Runoff=5.92 cfs 0.415 af

Pond 21S: Water Qualirty Basin

Peak Elev=34.91' Storage=5,194 cf Inflow=7.67 cfs 0.788 af
Outflow=7.34 cfs 0.769 af

Pond 22SA: Water Quality Basin

Peak Elev=37.48' Storage=2,734 cf Inflow=5.92 cfs 0.415 af
Outflow=5.96 cfs 0.415 af

Pond 22SB: Underground 22

Peak Elev=37.04' Storage=0.204 af Inflow=5.96 cfs 0.415 af
Outflow=0.79 cfs 0.250 af

Link 30: Site

Inflow=7.77 cfs 0.799 af
Primary=7.77 cfs 0.799 af

Total Runoff Area = 1.839 ac Runoff Volume = 0.983 af Average Runoff Depth = 6.41"
30.74% Pervious = 0.565 ac 69.26% Impervious = 1.274 ac

49 Plains Road Proposed

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CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"

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Summary for Subcatchment 20: PRWS20

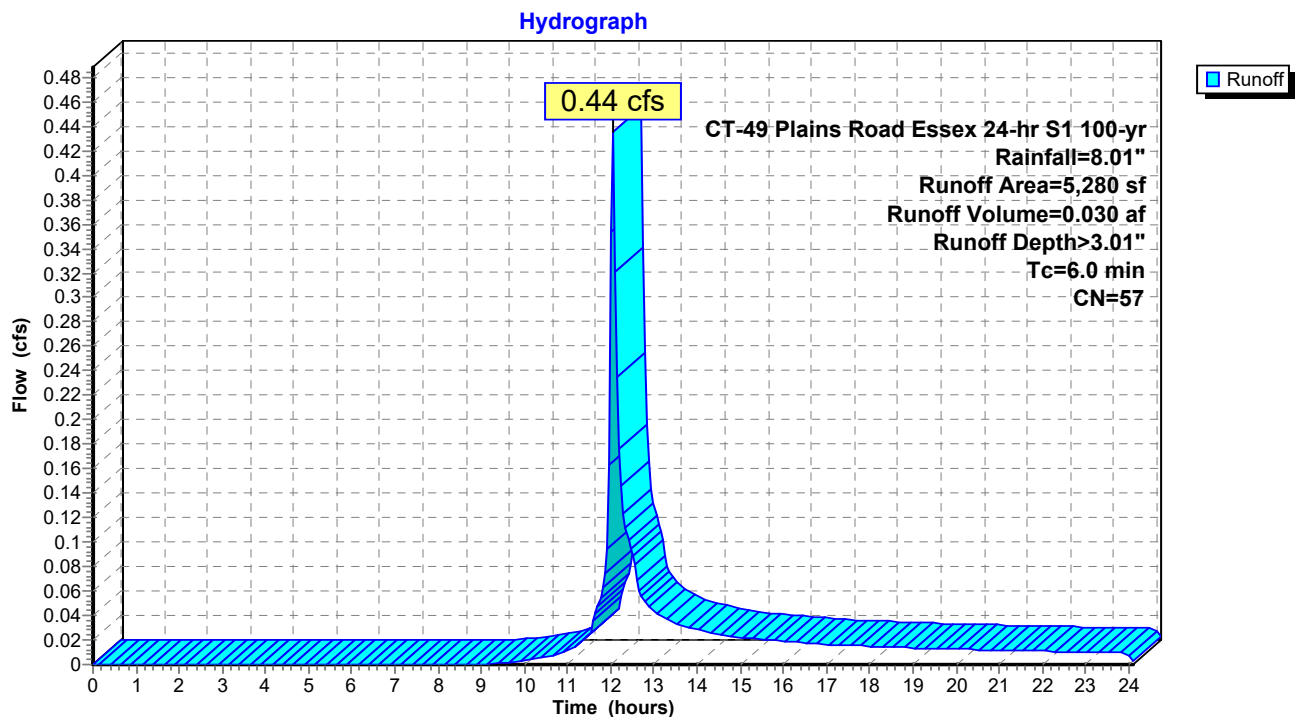
Runoff = 0.44 cfs @ 12.05 hrs, Volume= 0.030 af, Depth> 3.01"
Routed to Link 30 : Site

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



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"

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Summary for Subcatchment 21: PRWS 21

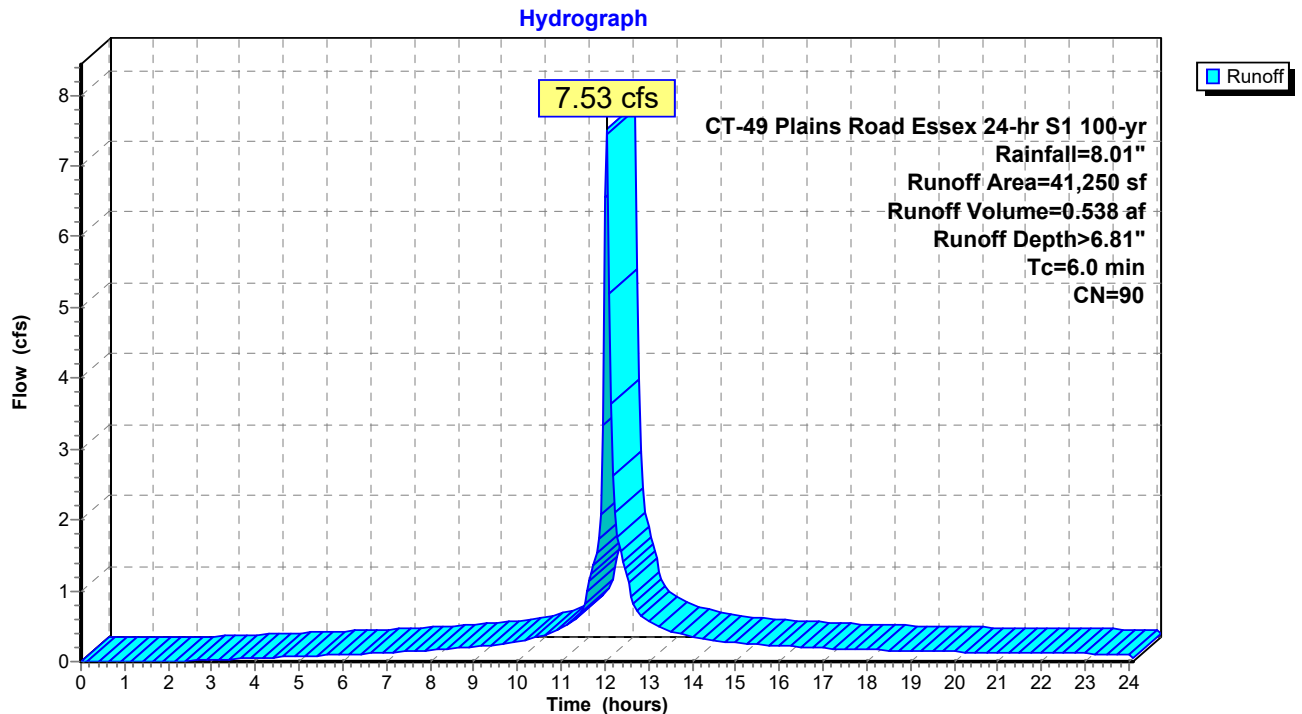
Runoff = 7.53 cfs @ 12.04 hrs, Volume= 0.538 af, Depth> 6.81"

Routed to Pond 21S : 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
9,475	61	>75% Grass cover, Good, HSG B
29,400	98	Paved parking, HSG B
2,375	98	Roofs, HSG B
41,250	90	Weighted Average
9,475		22.97% Pervious Area
31,775		77.03% 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

49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"

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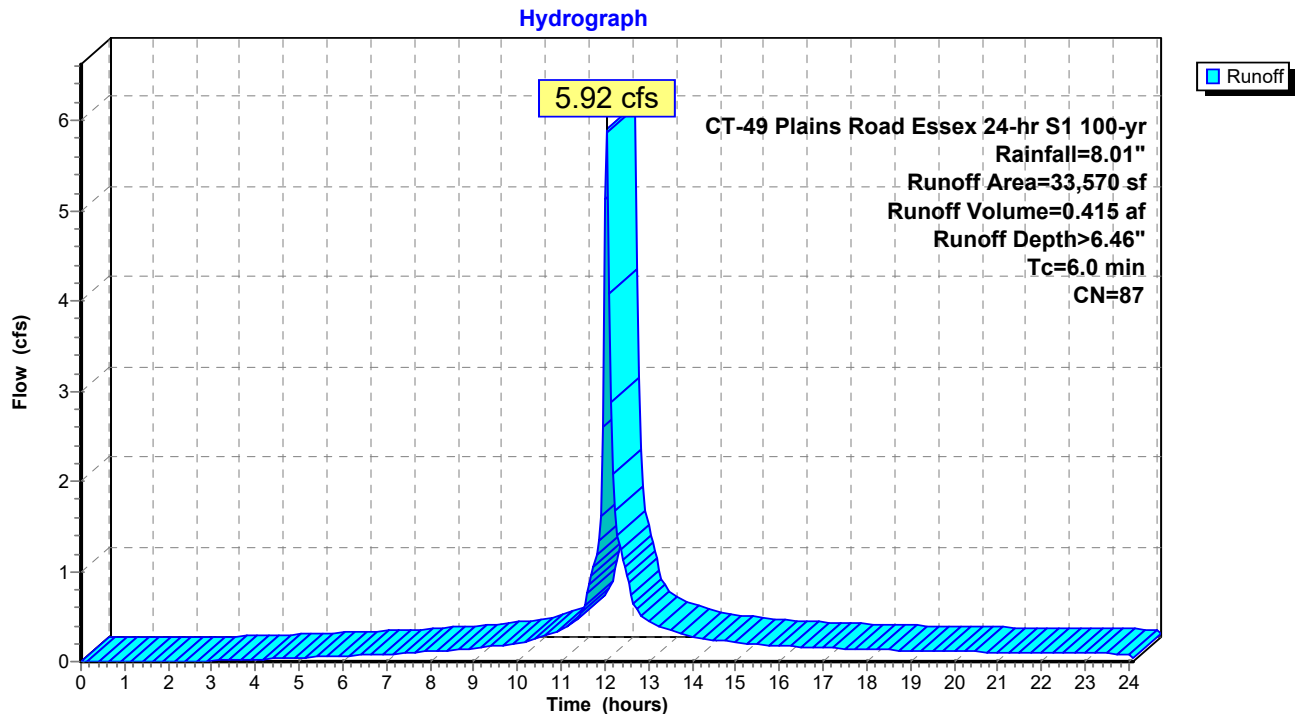
Summary for Subcatchment 22: PRWS 22

Runoff = 5.92 cfs @ 12.04 hrs, Volume= 0.415 af, Depth> 6.46"
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
9,870	61	>75% Grass cover, Good, HSG B
11,200	98	Paved parking, HSG B
12,500	98	Roofs, HSG B
33,570	87	Weighted Average
9,870		29.40% Pervious Area
23,700		70.60% 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

49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"

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Summary for Pond 21S: Water Qualirty Basin

Inflow Area = 1.718 ac, 74.14% Impervious, Inflow Depth > 5.50" for 100-yr event
 Inflow = 7.67 cfs @ 12.04 hrs, Volume= 0.788 af
 Outflow = 7.34 cfs @ 12.06 hrs, Volume= 0.769 af, Atten= 4%, Lag= 1.3 min
 Primary = 7.34 cfs @ 12.06 hrs, Volume= 0.769 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= 34.91' @ 12.06 hrs Surf.Area= 2,542 sf Storage= 5,194 cf (2,864 cf above start)

Plug-Flow detention time= 106.3 min calculated for 0.714 af (91% of inflow)
 Center-of-Mass det. time= 24.0 min (861.1 - 837.1)

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

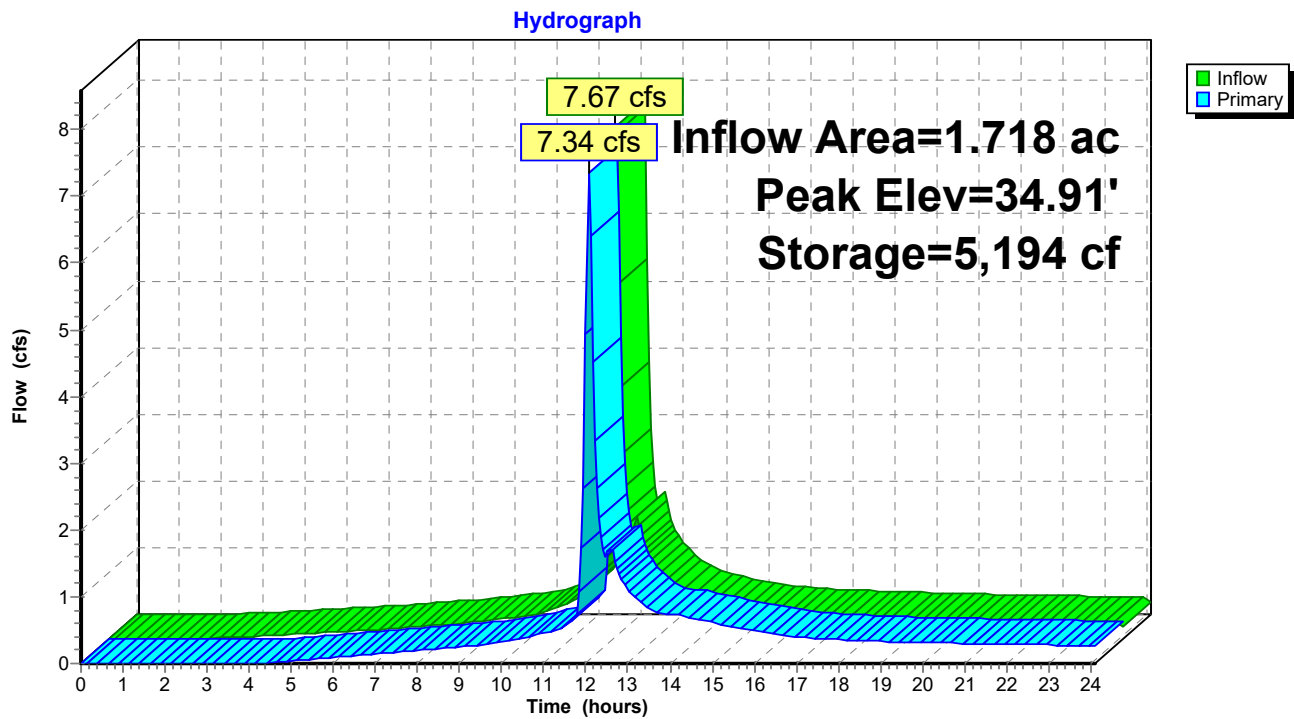
Device	Routing	Invert	Outlet Devices
#1	Primary	33.70'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	34.60'	15.0' long + 0.5 ' / SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 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=7.05 cfs @ 12.06 hrs HW=34.90' (Free Discharge)

↑ **1=Orifice/Grate** (Orifice Controls 0.92 cfs @ 4.68 fps)

└ **2=Broad-Crested Rectangular Weir** (Weir Controls 6.13 cfs @ 1.36 fps)

Pond 21S: Water Qualirty Basin



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"

Prepared by Doane Engineering

Printed 12/9/2022

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Summary for Pond 22SA: Water Quality Basin

Inflow Area = 0.771 ac, 70.60% Impervious, Inflow Depth > 6.46" for 100-yr event
 Inflow = 5.92 cfs @ 12.04 hrs, Volume= 0.415 af
 Outflow = 5.96 cfs @ 12.04 hrs, Volume= 0.415 af, Atten= 0%, Lag= 0.3 min
 Primary = 5.96 cfs @ 12.04 hrs, Volume= 0.415 af
 Routed to Pond 22SB : Underground 22

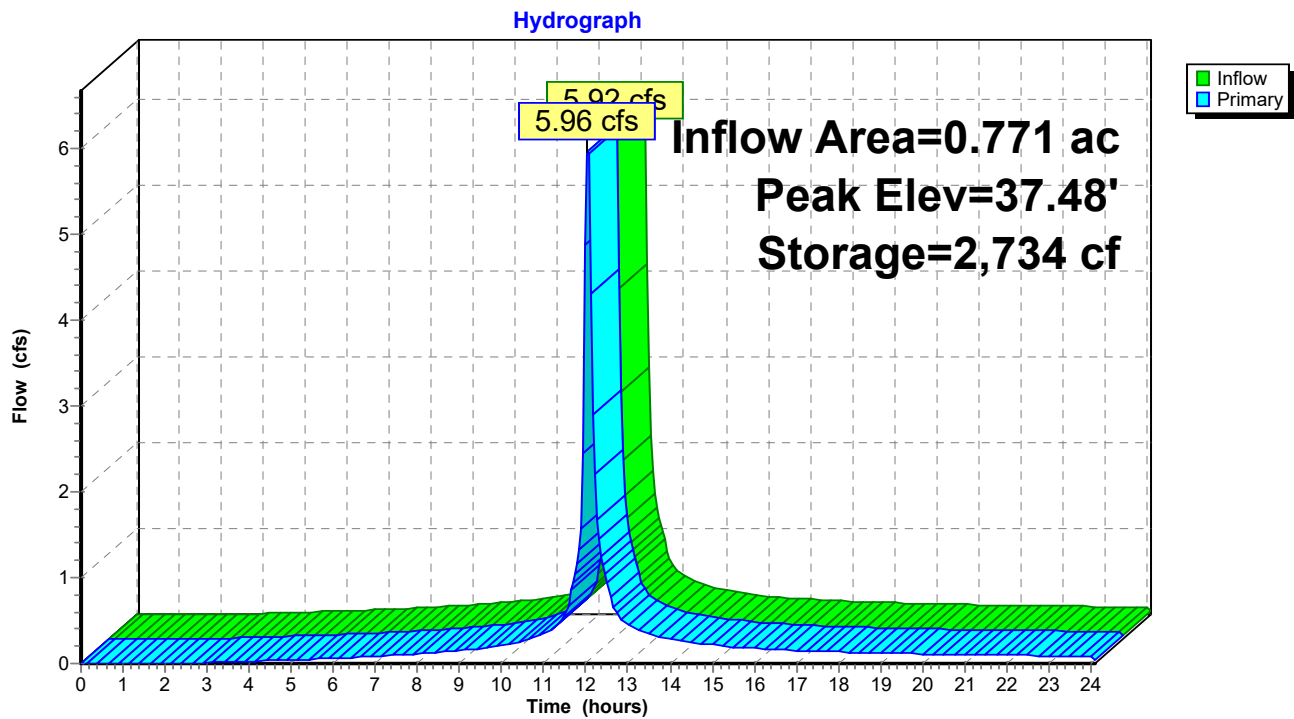
Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
 Starting Elev= 37.40' Surf.Area= 1,393 sf Storage= 2,616 cf
 Peak Elev= 37.48' @ 12.05 hrs Surf.Area= 1,409 sf Storage= 2,734 cf (118 cf above start)

Plug-Flow detention time= 123.5 min calculated for 0.354 af (85% of inflow)
 Center-of-Mass det. time= 0.5 min (795.1 - 794.6)

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=5.99 cfs @ 12.04 hrs HW=37.48' (Free Discharge)
 ↑1=Orifice/Grate (Weir Controls 5.99 cfs @ 0.94 fps)

Pond 22SA: Water Quality Basin



49 Plains Road Proposed

CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"

Prepared by Doane Engineering

Printed 12/9/2022

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Summary for Pond 22SB: Underground 22

Inflow Area = 0.771 ac, 70.60% Impervious, Inflow Depth > 6.46" for 100-yr event
 Inflow = 5.96 cfs @ 12.04 hrs, Volume= 0.415 af
 Outflow = 0.79 cfs @ 12.60 hrs, Volume= 0.250 af, Atten= 87%, Lag= 33.5 min
 Primary = 0.79 cfs @ 12.60 hrs, Volume= 0.250 af
 Routed to Pond 21S : Water Quality Basin

Routing by Stor-Ind method, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs
 Peak Elev= 37.04' @ 12.60 hrs Surf.Area= 0.113 ac Storage= 0.204 af

Plug-Flow detention time= 289.1 min calculated for 0.250 af (60% of inflow)
 Center-of-Mass det. time= 158.1 min (953.2 - 795.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	34.00'	0.076 af	39.50'W x 124.66'L x 3.50'H Field A 0.396 af Overall - 0.143 af Embedded = 0.252 af x 30.0% Voids
#2A	34.50'	0.143 af	ADS_StormTech SC-740 +Cap x 136 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 136 Chambers in 8 Rows
		0.219 af	Total Available Storage

Storage Group A created with Chamber Wizard

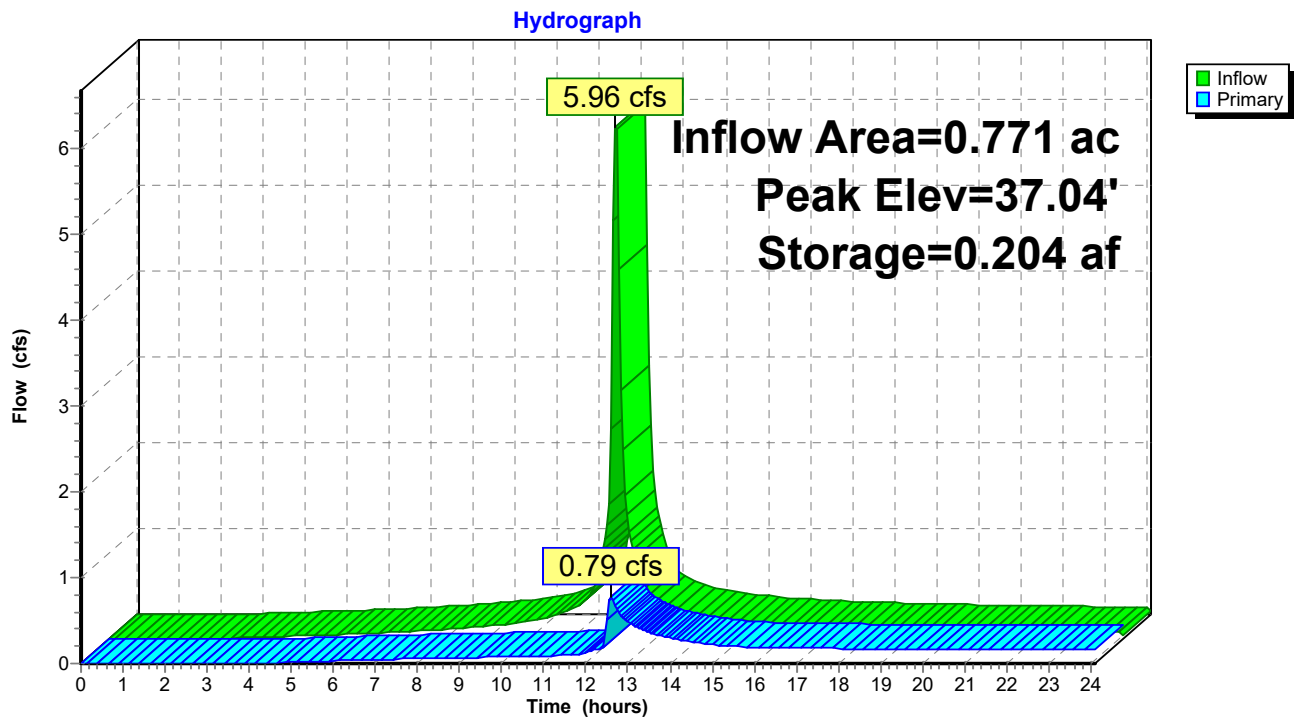
Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	2.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	36.90'	4.0' long + 1.0 ' SideZ x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 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=0.78 cfs @ 12.60 hrs HW=37.04' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.18 cfs @ 8.28 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 0.60 cfs @ 1.01 fps)

Pond 22SB: Underground 22



49 Plains Road Proposed

Prepared by Doane Engineering

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CT-49 Plains Road Essex 24-hr S1 100-yr Rainfall=8.01"

Printed 12/9/2022

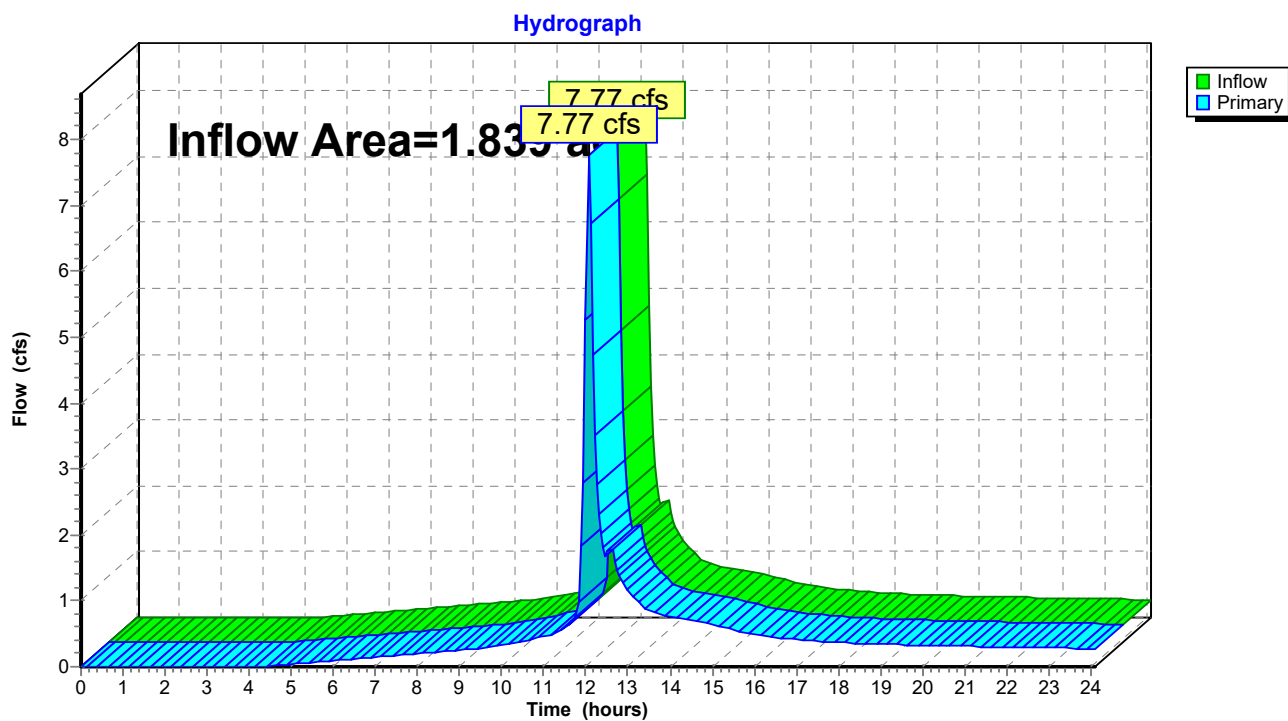
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Summary for Link 30: Site

Inflow Area = 1.839 ac, 69.26% Impervious, Inflow Depth > 5.22" for 100-yr event
Inflow = 7.77 cfs @ 12.06 hrs, Volume= 0.799 af
Primary = 7.77 cfs @ 12.06 hrs, Volume= 0.799 af, Atten= 0%, Lag= 0.0 min

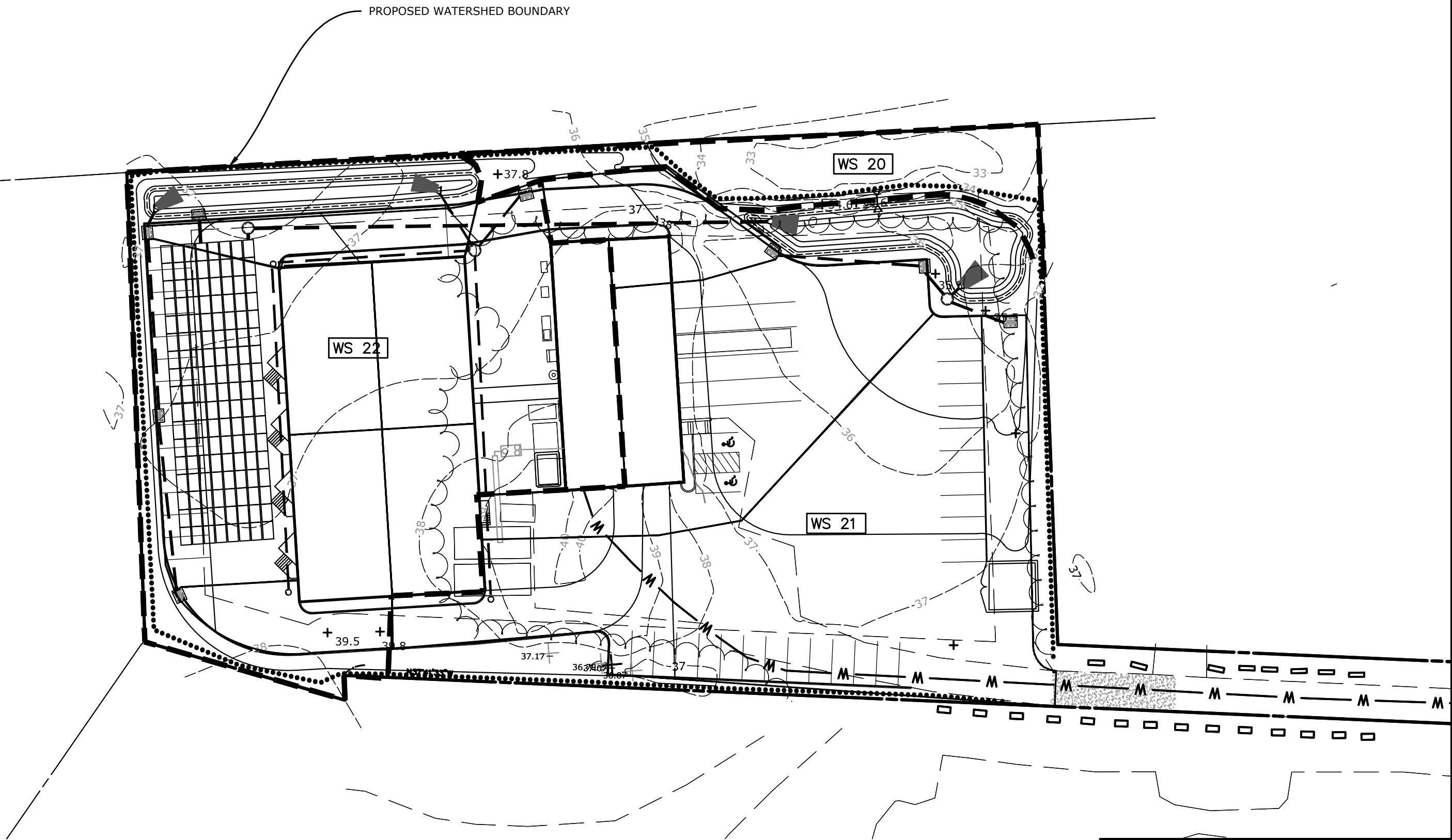
Primary outflow = Inflow, Time Span= 0.00-24.10 hrs, dt= 0.05 hrs

Link 30: Site



Appendix C
Pipe Capacity Calculations

DATE	REVISION	CK.
12/12/22	TOWN COMMENTS	



GRAPHIC SCALE



(IN FEET)
1 inch = 40 ft.



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CATCH BASIN CATCHMENT AREAS
PREPARED FOR
PIAGE MANAGEMENT CORP
#49 PLAINS ROAD , ESSEX , CONNECTICUT

SCALE: 1"=40'	DATE: 11/29/22	SHEET NO.: 1 OF 1	IDENT. NO.:
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Rational Method Individual Basin Calculations

Catch Basin and Area Drain Runoff Coefficients

Basin Name	Impervious Area C=0.9 (sf)	Grass 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	9,950	0	0	9,950	0.23	0.90	5.0
CCB 4	2,560	300	0	2,860	0.07	0.84	5.0
CLCB 5	18,910	1800	0	20,710	0.48	0.85	5.0
CCB 13	2,900	3600	0	6,500	0.15	0.57	5.0
CCB 15	1,857	350	0	2,207	0.05	0.80	5.0
CCB 16	7,088	0	0	7,088	0.16	0.90	5.0
CCB 17	1,473	370	0	1,843	0.04	0.78	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 20 100 YR



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	0.79	0.00	0.00	0.0	32.50	0.72	34.00	15	Cir	0.013	1.00	38.80	OCS19-FES 20
System 20 100 YR												Number of lines: 1			Date: 12/9/2022		

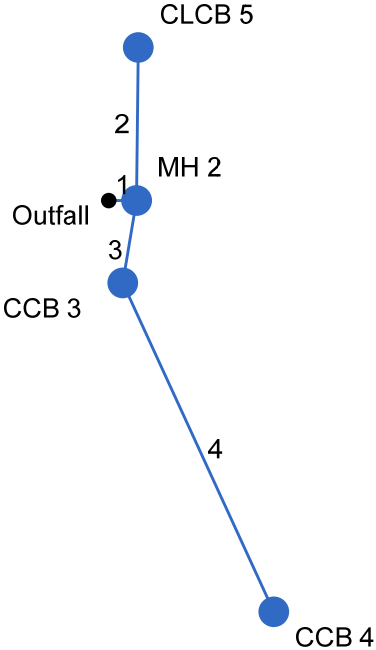
Storm Sewer Tabulation

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		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	207.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.79	5.50	0.72	15	0.72	32.50	34.00	34.91	34.94	33.80	38.80	OCS19-FES 20
System 20 100 YR																Number of lines: 1				Run Date: 12/9/2022		
NOTES:Intensity = 50.44 / (Inlet time + 3.60) ^ 0.70; Return period =Yrs. 100 ; c = cir e = ellip b = box																						

Hydraulic Grade Line Computations

Line	Size (in)	Q (cfs)	Downstream								Len (ft)	Upstream								Check		JL coeff (K)	Minor loss (ft)
			Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)		Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)		
1	15	0.79	32.50	34.91	1.25	1.23	0.64	0.01	34.92	0.015	207.00	34.00	34.94	0.94	0.99	0.80	0.01	34.95	0.018	0.016	0.034	1.00	0.01
System 20 100 YR														Number of lines: 1					Run Date: 12/9/2022				
; c = cir e = ellip b = box																							

System 21 25 YR



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	0.000	MH	0.00	0.00	0.00	0.0	32.40	2.50	32.50	15	Cir	0.013	1.00	35.80	MH 2- FES 1
2	1	22.000	-89.376	Grate	0.00	0.48	0.85	5.0	32.50	0.91	32.70	15	Cir	0.013	1.00	35.40	CLCB 5- MH 2
3	1	12.000	99.517	Comb	0.00	0.23	0.90	5.0	32.50	1.67	32.70	15	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	2.12	33.80	15	Cir	0.013	1.00	36.10	CCB 4- CCB 3
System 21 25 YR												Number of lines: 4				Date: 12/9/2022	

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (l)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	4.000	0.00	0.78	0.00	0.00	0.68	0.0	7.0	7.6	5.15	10.21	4.20	15	2.50	32.40	32.50	34.85	34.88	33.00	35.80	MH 2- FES 1
2	1	22.000	0.48	0.48	0.85	0.41	0.41	5.0	5.0	8.8	3.59	6.16	2.93	15	0.91	32.50	32.70	35.15	35.22	35.80	35.40	CLCB 5- MH 2
3	1	12.000	0.23	0.30	0.90	0.21	0.27	5.0	6.9	7.7	2.07	8.34	1.68	15	1.67	32.50	32.70	35.15	35.16	35.80	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	9.39	0.45	15	2.12	32.70	33.80	35.20	35.21	35.40	36.10	CCB 4- CCB 3
System 21 25 YR																Number of lines: 4				Run Date: 12/9/2022		
NOTES:Intensity = 40.94 / (Inlet time + 3.80) ^ 0.71; Return period =Yrs. 25 ; c = cir e = ellip b = box																						

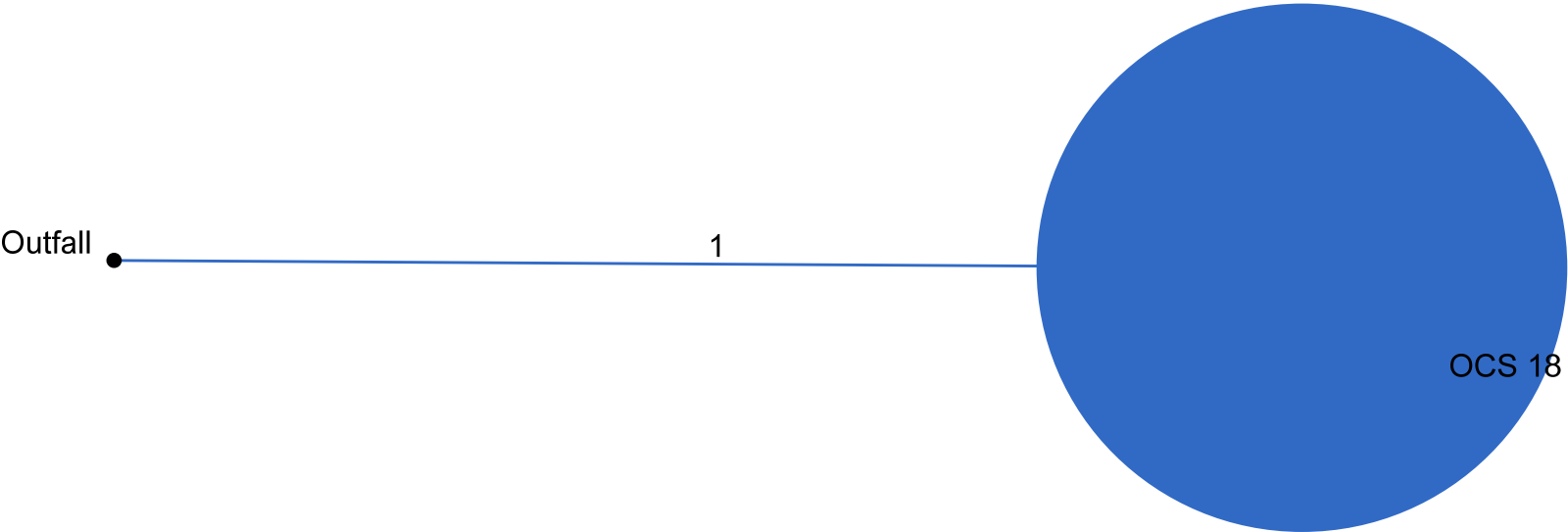
Inlet Report

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	0.013	0.00	0.00	0.00	0.00	0.0	Off
2	CLCB 5	3.59	0.00	3.59	0.00	Grate	0.0	0.00	3.12	2.31	1.35	Sag	2.53	0.010	0.010	0.000	0.39	39.16	0.39	39.16	0.0	Off
3	CCB 3	1.82	0.29	2.11	0.00	Comb	4.0	2.73	3.12	2.31	1.35	Sag	2.53	0.010	0.010	0.000	0.27	26.76	0.27	26.76	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 25 YR														Number of lines: 4				Run Date: 12/9/2022				
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 (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)		Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)		
(in)	(cfs)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)	
1	15	5.15	32.40	34.85	1.25	1.23	4.20	0.27	35.12	0.637	4.000	32.50	34.88	1.25	1.23	4.20	0.27	35.15	0.636	0.636	0.025	1.00	0.27
2	15	3.59	32.50	35.15	1.25	1.23	2.93	0.13	35.28	0.309	22.000	32.70	35.22	1.25	1.23	2.93	0.13	35.35	0.309	0.309	0.068	1.00	0.13
3	15	2.07	32.50	35.15	1.25	1.23	1.68	0.04	35.19	0.103	12.000	32.70	35.16	1.25	1.23	1.68	0.04	35.21	0.103	0.103	0.012	0.92	0.04
4	15	0.55	32.70	35.20	1.25	1.23	0.45	0.00	35.21	0.007	52.000	33.80	35.21	1.25	1.23	0.45	0.00	35.21	0.007	0.007	0.004	1.00	0.00

System OCS 18 100 YR



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	5.96	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 18 100 YR												Number of lines: 1			Date: 12/9/2022		

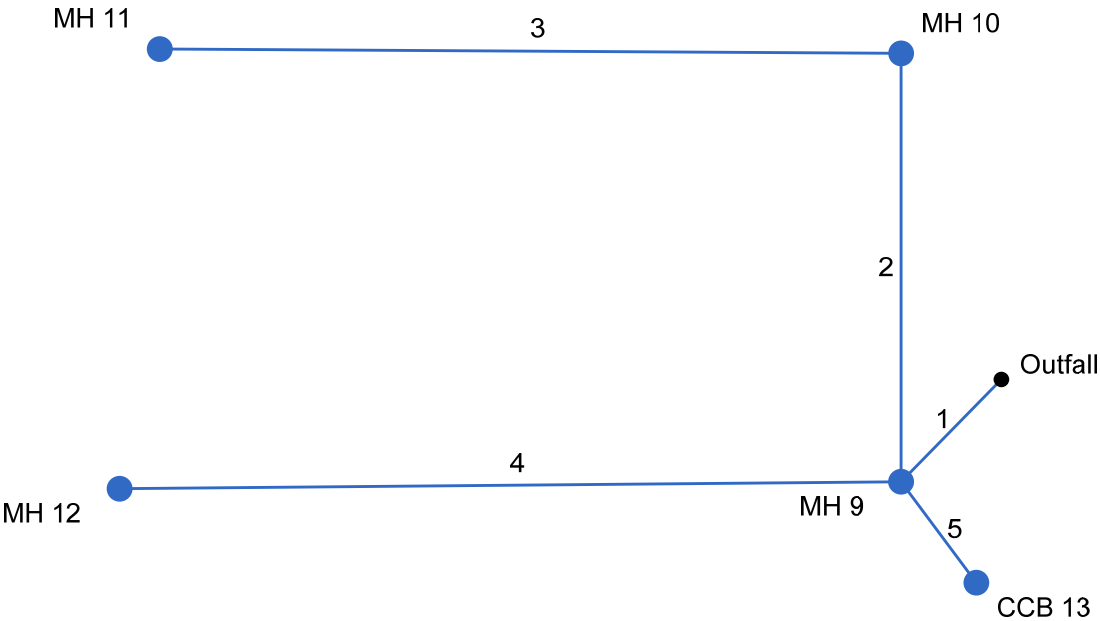
Storm Sewer Tabulation

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		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	9.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	5.96	9.63	4.86	15	2.22	35.00	35.20	37.04	37.12	0.00	37.40	OCS 18-UG22
System OCS 18 100 YR																Number of lines: 1			Run Date: 12/9/2022			
NOTES:Intensity = 50.44 / (Inlet time + 3.60) ^ 0.70; Return period =Yrs. 100 ; c = cir e = ellip b = box																						

Hydraulic Grade Line Computations

Line	Size (in)	Q (cfs)	Downstream								Len (ft)	Upstream								Check		JL coeff (K)	Minor loss (ft)
			Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)		Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)		
1	15	5.96	35.00	37.04	1.25	1.23	4.86	0.37	37.41	0.852	9.000	35.20	37.12	1.25	1.23	4.86	0.37	37.48	0.852	0.852	0.077	1.00	0.37
System OCS 18 100 YR														Number of lines: 1					Run Date: 12/9/2022				
; c = cir e = ellip b = box																							

System 22A 25 YR



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	25.000	134.266	MH	0.48	0.00	0.00	0.0	35.20	0.80	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	136.000	45.217	MH	0.48	0.00	0.00	0.0	35.40	1.18	37.00	8	Cir	0.011	1.00	40.00	CO 12-MH 9
5	1	22.000	-80.781	Comb	0.00	0.15	0.57	5.0	35.40	0.91	35.60	12	Cir	0.013	1.00	37.80	CCB 13-MH 9
System 22A 25 YR												Number of lines: 5				Date: 12/11/2022	

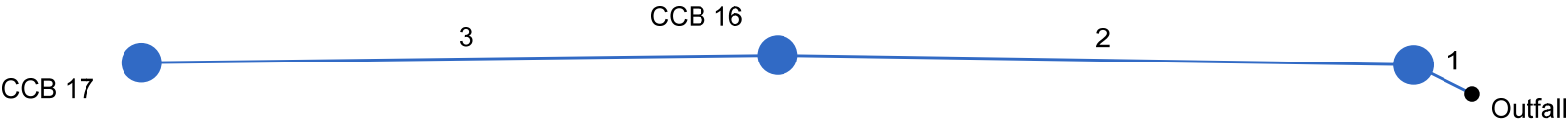
Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (l)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	25.000	0.00	0.15	0.00	0.00	0.09	0.0	5.4	8.5	2.65	3.19	3.37	12	0.80	35.20	35.40	37.47	37.61	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	37.79	38.13	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	38.24	38.39	40.00	40.00	CO 11- CO 10
4	1	136.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.48	1.55	1.38	8	1.18	35.40	37.00	37.79	37.94	38.00	40.00	CO 12-MH 9
5	1	22.000	0.15	0.15	0.57	0.09	0.09	5.0	5.0	8.8	0.75	3.40	0.96	12	0.91	35.40	35.60	37.79	37.80	38.00	37.80	CCB 13-MH 9
System 22A 25 YR																Number of lines: 5				Run Date: 12/11/2022		
NOTES:Intensity = 40.94 / (Inlet time + 3.80) ^ 0.71; Return period =Yrs. 25 ; c = cir e = ellip b = box																						

Hydraulic Grade Line Computations

Line	Size (in)	Q (cfs)	Downstream								Len (ft)	Upstream									Check		JL coeff (K)	Minor loss (ft)
			Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)		Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)			
1	12	2.65	35.20	37.47	1.00	0.79	3.38	0.18	37.65	0.554	25.000	35.40	37.61	1.00	0.79	3.37	0.18	37.79	0.554	0.554	0.138	1.00	0.18	
2	8	0.96	35.40	37.79	0.67	0.35	2.75	0.12	37.90	0.453	75.000	36.00	38.13	0.67	0.35	2.75	0.12	38.24	0.452	0.452	0.339	1.00	0.12	
3	8	0.48	36.00	38.24	0.67	0.35	1.38	0.03	38.27	0.113	129.000	37.00	38.39	0.67	0.35	1.38	0.03	38.42	0.113	0.113	0.146	1.00	0.03	
4	8	0.48	35.40	37.79	0.67	0.35	1.38	0.03	37.81	0.113	136.000	37.00	37.94	0.67	0.35	1.38	0.03	37.97	0.113	0.113	0.154	1.00	0.03	
5	12	0.75	35.40	37.79	1.00	0.79	0.96	0.01	37.80	0.045	22.000	35.60	37.80	1.00	0.79	0.96	0.01	37.81	0.045	0.045	0.010	1.00	0.01	
System 22A 25 YR														Number of lines: 5					Run Date: 12/11/2022					
; c = cir e = ellip b = box																								

System 22B 25 YR



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	0.80	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	0.04	0.78	5.0	35.60	0.59	36.00	12	Cir	0.013	1.00	38.40	CCB 17-CCB 16
System 22B 25 YR												Number of lines: 3				Date: 12/9/2022	

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (l)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	7.000	0.05	0.25	0.80	0.04	0.22	5.0	6.2	8.1	1.74	4.26	3.84	12	1.43	35.10	35.20	35.66	35.76	36.10	38.40	CCB 15-FES 14
2	1	68.000	0.16	0.20	0.90	0.14	0.18	5.0	5.8	8.3	1.45	2.73	3.39	12	0.59	35.20	35.60	35.76	36.11	38.40	38.40	CCB 16-CCB 15
3	2	68.000	0.04	0.04	0.78	0.03	0.03	5.0	5.0	8.8	0.27	2.73	1.38	12	0.59	35.60	36.00	36.21	36.22	38.40	38.40	CCB 17-CCB 16

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	CCB 16	0.35	0.00	0.00	0.35	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	0.00	0.0	Off
2		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		0.27	0.00	0.27	0.00	Comb	4.0	2.73	3.12	2.31	1.35	Sag	2.00	0.028	0.028	0.000	0.09	3.26	0.09	3.26	0.0	Off	
System 22B 25 YR														Number of lines: 3					Run Date: 12/9/2022				
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 (in)	Q (cfs)	Downstream								Len (ft)	Upstream									Check		JL coeff (K)	Minor loss (ft)
			Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)		Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)			
1	12	1.74	35.10	35.66	0.56	0.45	3.84	0.23	35.89	0.000	7.000	35.20	35.76	0.56**	0.45	3.84	0.23	35.99	0.000	0.000	n/a	0.49	n/a	
2	12	1.45	35.20	35.76	0.56	0.40	3.20	0.16	35.92	0.455	68.000	35.60	36.11	0.51**	0.40	3.58	0.20	36.31	0.612	0.533	0.363	0.50	0.10	
3	12	0.27	35.60	36.21	0.61	0.12	0.55	0.08	36.29	0.000	68.000	36.00	36.22	0.22**	0.12	2.21	0.08	36.29	0.000	0.000	n/a	1.00	n/a	

Outlet Protection Calculations

Outlet I.D. **FES 1**

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

FES 1

Design Criteria (100-yr Storm Event):

Q (cfs) = 5.15	R _p (ft) = 1.25
D (in) = 15	S _p (ft) = 1.25
V (fps) = 2.7	T _w (ft) = 2.85

Q= Flow rate at discharge point in cubic feet per second (cfs)

D= Outlet pipe diameter (in)

V= Flow velocity at discharge point (ft/s)

R_p= Maximum inside pipe rise (ft)

S_p= inside diameters for circular sections of maximum inside pipe span for non-circular sections (ft)

T_w= Tailwater depth (ft)

Based on **Table 11-13.1** use Type 'B' ----> TW ≥ 0.5 R_p

Rip Rap Stone Size:

<u>Velocity</u>	<u>Rip Rap Specification</u>	<u>D₅₀ Stone Size</u>
0-8 fps	Modified	5 inches

Preformed Scour Hole Dimensions:

F(ft)=0.5(R _p)	=	n/a
C(ft)=3.0(S _p)+6.0(F)	=	n/a
B(ft)=2.0(S _p)+6.0(F)	=	n/a

Rip Rap Splash Pad Dimensions:

L _a	=	10	ft
W1 = 3.0(S _p) min.	=	4	ft
W2 = 3.0(S _p)+0.4(L _a) min.	=	8	ft
d (Depth of Stone)	=	12	inches

Outlet Protection Calculations

Outlet I.D. **FES 8**

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

FES 8

Design Criteria (100-yr Storm Event):

Q (cfs) = 2.65 R_p (ft) = 1
D (in) = 12 S_p (ft) = 1
V (fps) = 2.7 T_w (ft) = 2.27

Q= Flow rate at discharge point in cubic feet per second (cfs)

D= Outlet pipe diameter (in)

V= Flow velocity at discharge point (ft/s)

R_p = Maximum inside pipe rise (ft)

S_p = inside diameters for circular sections of maximum inside pipe span for non-circular sections (ft)

T_w = Tailwater depth (ft)

Based on **Table 11-13.1** use Type 'B' ----> $TW \geq 0.5 R_p$

Rip Rap Stone Size:

<u>Velocity</u>	<u>Rip Rap Specification</u>	<u>D₅₀ Stone Size</u>
0-8 fps	Modified	5 inches

Preformed Scour Hole Dimensions:

$F(\text{ft}) = 0.5(R_p)$	=	n/a
$C(\text{ft}) = 3.0(S_p) + 6.0(F)$	=	n/a
$B(\text{ft}) = 2.0(S_p) + 6.0(F)$	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	10	ft
$W1 = 3.0(S_p)$ min.	=	3	ft
$W2 = 3.0(S_p) + 0.4(L_a)$ min.	=	7	ft
d (Depth of Stone)	=	12	inches

Outlet Protection Calculations

Outlet I.D. **FES 14**

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

FES 14

Design Criteria (100-yr Storm Event):

Q (cfs) = 1.74 R_p (ft) = 1
D (in) = 12 S_p (ft) = 1
V (fps) = 2.7 T_w (ft) = 2.37

Q= Flow rate at discharge point in cubic feet per second (cfs)

D= Outlet pipe diameter (in)

V= Flow velocity at discharge point (ft/s)

R_p = Maximum inside pipe rise (ft)

S_p = inside diameters for circular sections of maximum inside pipe span for non-circular sections (ft)

T_w = Tailwater depth (ft)

Based on **Table 11-13.1** use Type 'B' ----> $TW \geq 0.5 R_p$

Rip Rap Stone Size:

<u>Velocity</u>	<u>Rip Rap Specification</u>	<u>D₅₀ Stone Size</u>
0-8 fps	Modified	5 inches

Preformed Scour Hole Dimensions:

$F(\text{ft}) = 0.5(R_p)$	=	n/a
$C(\text{ft}) = 3.0(S_p) + 6.0(F)$	=	n/a
$B(\text{ft}) = 2.0(S_p) + 6.0(F)$	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	10	ft
$W1 = 3.0(S_p) \text{ min.}$	=	3	ft
$W2 = 3.0(S_p) + 0.4(L_a) \text{ min.}$	=	7	ft
d (Depth of Stone)	=	12	inches

Outlet Protection Calculations

Outlet I.D. **FES 20**

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

FES 20

Design Criteria (100-yr Storm Event):

Q (cfs) = 0.79 R_p (ft) = 1.25
D (in) = 15 S_p (ft) = 1.25
V (fps) = 2.7 T_w (ft) = 2.35

Q= Flow rate at discharge point in cubic feet per second (cfs)

D= Outlet pipe diameter (in)

V= Flow velocity at discharge point (ft/s)

R_p = Maximum inside pipe rise (ft)

S_p = inside diameters for circular sections of maximum inside pipe span for non-circular sections (ft)

T_w = Tailwater depth (ft)

Based on **Table 11-13.1** use Type 'B' ---> $TW \geq 0.5 R_p$

Rip Rap Stone Size:

<u>Velocity</u>	<u>Rip Rap Specification</u>	<u>D₅₀ Stone Size</u>
0-8 fps	Modified	5 inches

Preformed Scour Hole Dimensions:

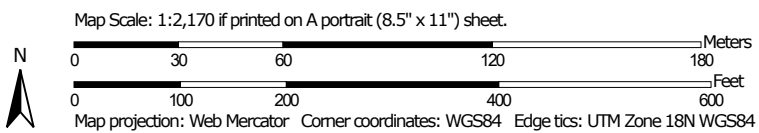
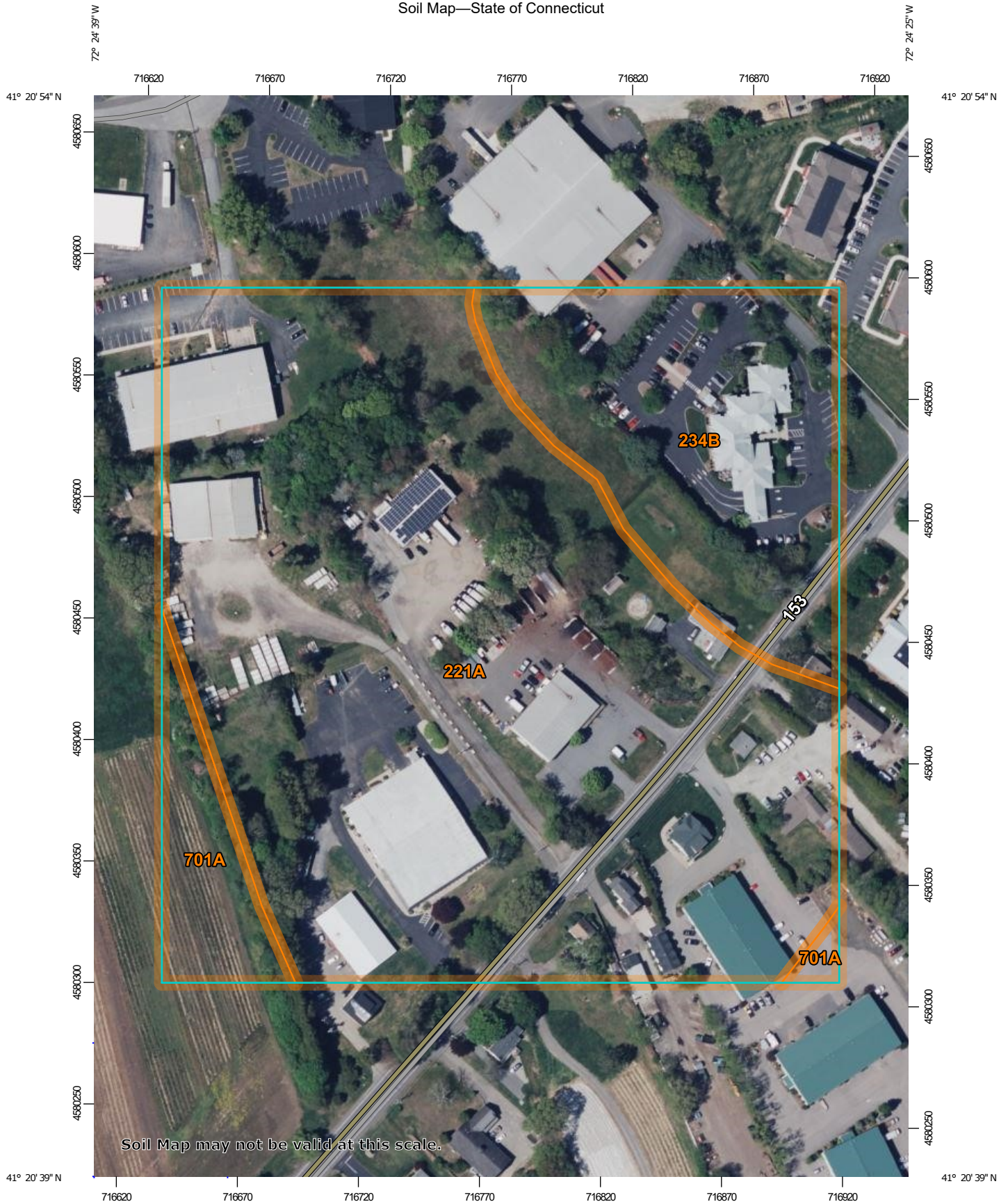
$F(\text{ft}) = 0.5(R_p)$	=	n/a
$C(\text{ft}) = 3.0(S_p) + 6.0(F)$	=	n/a
$B(\text{ft}) = 2.0(S_p) + 6.0(F)$	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	10	ft
$W1 = 3.0(S_p)$ min.	=	4	ft
$W2 = 3.0(S_p) + 0.4(L_a)$ min.	=	8	ft
d (Depth of Stone)	=	12	inches

Appendix D
NCRS Soils Information

Soil Map—State of Connecticut



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

11/2/2022
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

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

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 & aerals](#)

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.

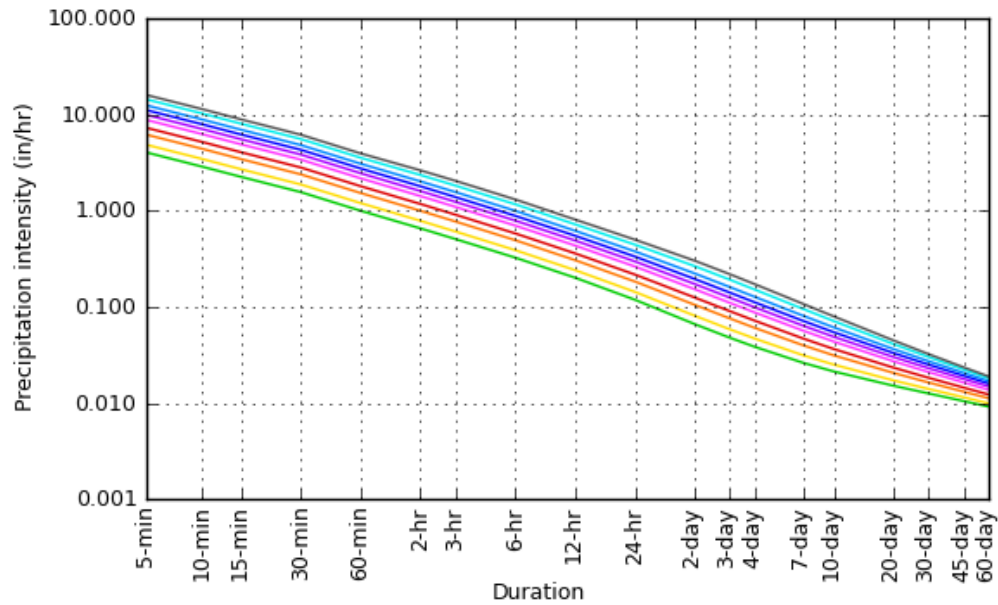
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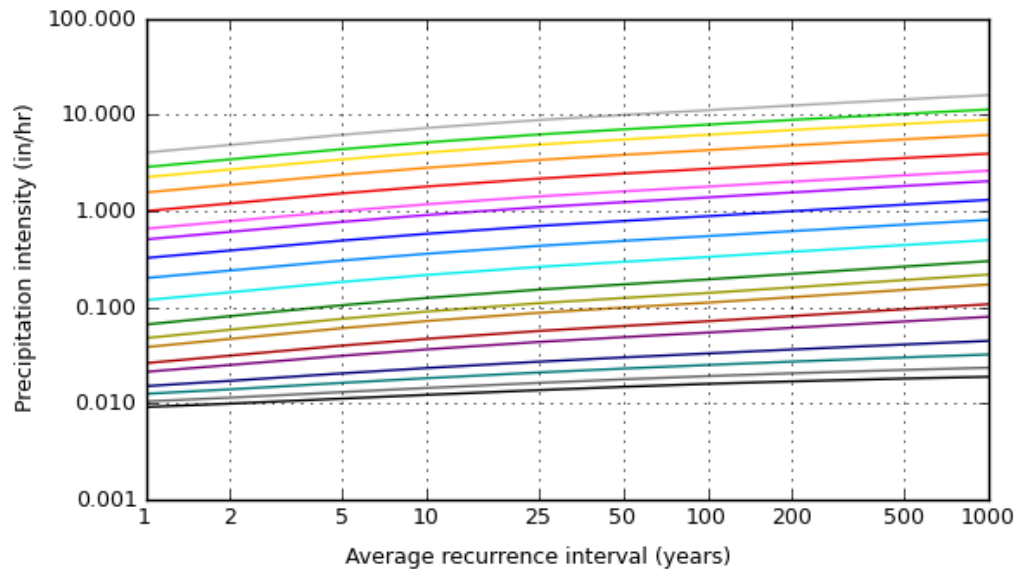
PF graphical

PDS-based intensity-duration-frequency (IDF) curves

Latitude: 41.3468°, Longitude: -72.4094°



Average recurrence interval (years)
1
2
5
10
25
50
100
200
500
1000



Duration
5-min
10-min
15-min
30-min
60-min
2-hr
3-hr
6-hr
12-hr
24-hr
2-day
3-day
4-day
7-day
10-day
20-day
30-day
45-day
60-day

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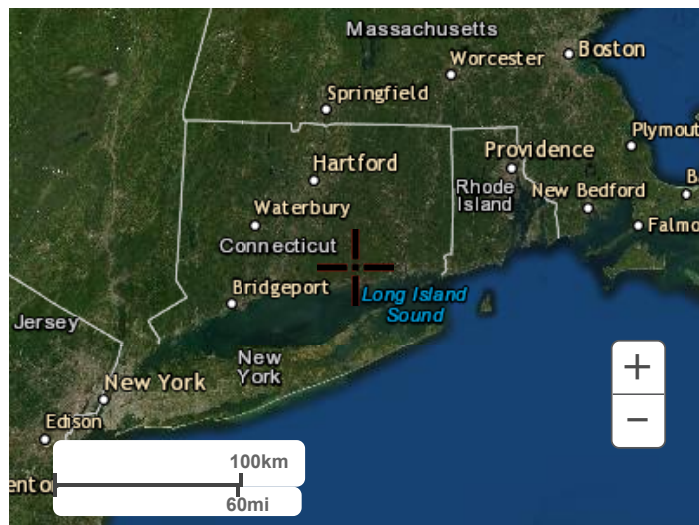
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Large scale map



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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 & aerals](#)

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)

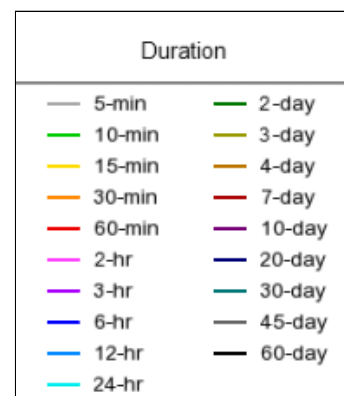
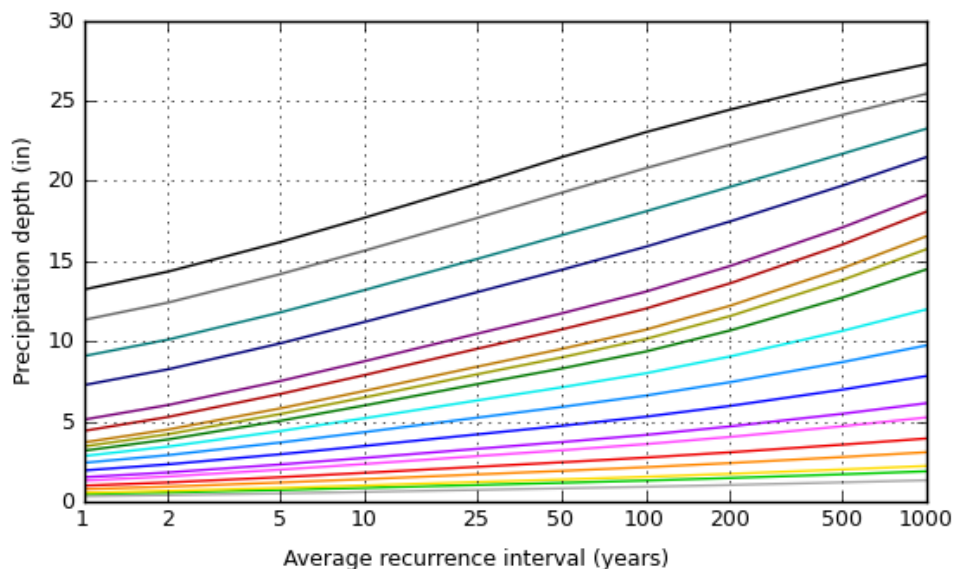
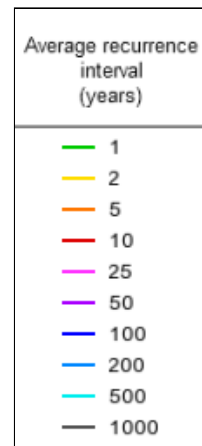
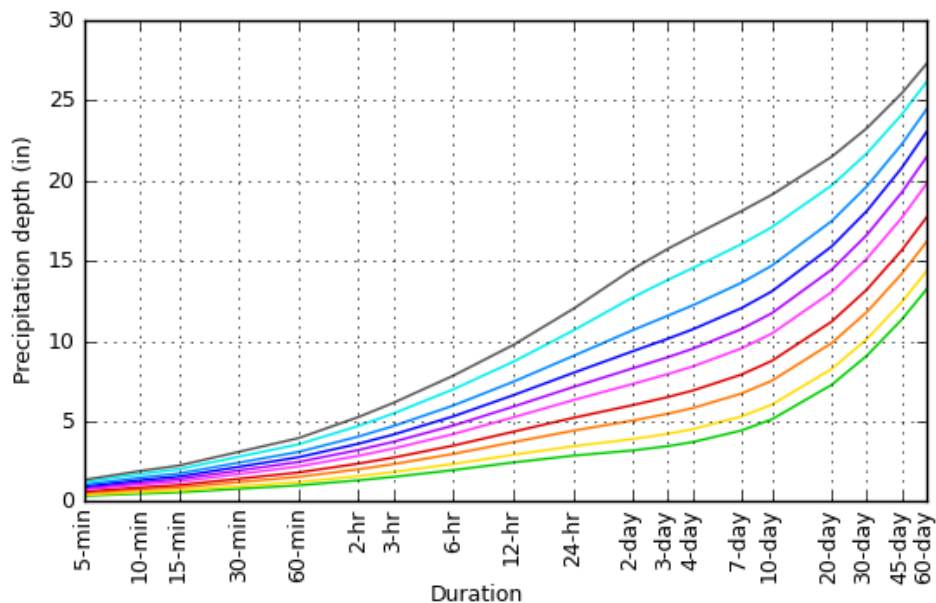
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).
 Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and 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.
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PF graphical

PDS-based depth-duration-frequency (DDF) curves

Latitude: 41.3468°, Longitude: -72.4094°



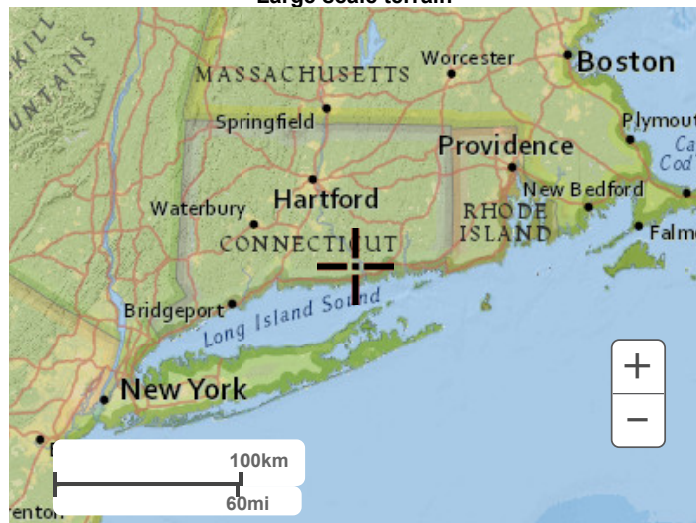
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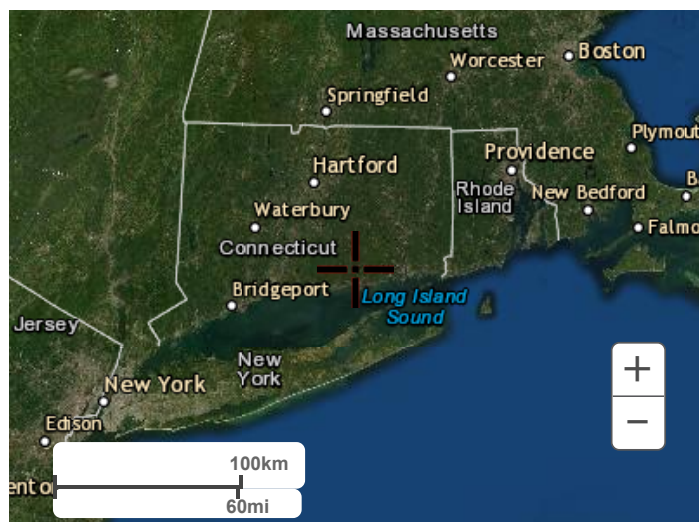
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Large scale map



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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