Stormwater Management Report

For the Proposed:

EdAdvance School Building

Located at:

95-104 Grove Street
Torrington, Connecticut

Prepared for Submission to:

City of Torrington, Connecticut

March 31, 2023

Prepared for:

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BL Project Number: 2202472

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Executive Summary

This report has been prepared in support of a Permit Application by A. Secondino & Son, Inc. to the City of Torrington for the proposed EdAdvance school building development and redevelopment of the existing Sacred Heart Church properties at 95 Grove Street (Lot 1) and 104 Grove Street (Lot 2). The existing Lot 1 is approximately 1.29 acres in size and is currently developed with an existing convent building and was the previous location of a school building demolished within the past decade. The existing Lot 2 is approximately 0.97 acres in size and is currently developed with the Sacred Heart Church building and rectory. The proposed EdAdvance school development is to be constructed on Lot 1, while work on Lot 2 consists of reconfiguration of existing parking areas. The properties are situated with Lot 1 on the western side of Grove Street and Lot 2 on the eastern side. Lot 2 is also bordered by Brook Street to the east. The parcels are bordered by residential properties on all sides. The East Branch Naugatuck River runs from north to south off of Lot 1's western boundary. A portion of the 75' wetland buffer area from alluvial wetland soils associated with the river exists on Lot 1. No existing stormwater management systems exist on either site, all stormwater runoff is discharged offsite, untreated, by overland surface flow.

The project parcels are located at a high point in elevation of Grove Street. In general, the existing topography Grove Street slopes from high point down to the north and south from approximately elevation 591' at the high point to 519' at the northern extent and 583' in the southern extent. Slopes on Lot 1 vary from approximately 2-3% along Grove Street to approximately 25% at the embankment drop-off to the west. Slopes on Lot 2 vary from 2-6% along Grove Street to approximately 67% at the embankment drop-off to Brook Street in the east. Several retaining walls exist on Lot 2 along the boundary with Brook Street supporting Lot 2 above Brook Street elevation.

Proposed site improvements will include a ±10,300 square foot school building with paved parking areas and driveways, landscaped areas, pedestrian sidewalks, site utilities and lighting, and stormwater management system upgrades. The proposed stormwater management system is designed to be in compliance with the 2002 State of Connecticut Guidelines for Soil Erosion and Sediment Control, and the 2004 State of Connecticut Stormwater Quality Manual.

A HydroCAD model, using TR-55 methodology, was developed to evaluate the existing and proposed drainage conditions of the property. The results of the analysis demonstrate that there will not be an increase in peak stormwater runoff rates for the 2-, 5-, 10-, 25-, 50-, and 100-year storm events. The proposed stormwater management system has been designed to attenuate the increased flows generated by the proposed development.

Stormwater quality is being addressed by a formalized street sweeping program, deep sump and hooded outlet catch basins, hydrodynamic separator, sediment isolator row, and an underground infiltration system. These features will provide the minimum required 80% TSS removal as required in the CT Stormwater Quality Manual.

Existing Site Conditions and Hydrologic Conditions

General Site Information

The site soil identified by the United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) is Hinckley-Urban Land Complex, 3 to 15 percent slopes. Per the USDA, the NRCS Hydrologic Soil Group rating for soil within the project area is A. A copy of the USDA NRCS Hydrologic Soil Group Map is included in Appendix A for reference.

Per the FEMA Flood Insurance Rate Map Number 0950810007B for the City of Torrington, Connecticut in Litchfield County, map revised date: April 4, 1983, the site resides in FEMA Flood Hazard Area C (unshaded). Zone C (unshaded) is defined as "areas determined to be outside the 500-year floodplain". A copy of the FEMA Flood insurance rate Map is included in Appendix A for reference.

Existing Hydrologic Conditions

The existing site drainage area that was analyzed totals 2.81 acres and is approximately 58.2% impervious. The existing hydrologic model includes impervious areas associated with the previously constructed and recently demolished school building that was located on Lot 1. The hydrologic model analyzes peak flows to five main design points, DP-1 through DP-5. In the existing condition, the majority of stormwater runoff from Lot 1 sheet flows from west to east and eventually conveyed into the Grove Street gutter system untreated, which is then split between flow to the south gutter (DP-2) and the north gutter (DP-3) by the local roadway high point. A small portion of Lot 1 discharges stormwater to the west toward riverine wetland areas (DP-1). The majority of stormwater runoff from Lot 2 sheet flows from west to east and eventually conveyed into the Brook Street gutter system untreated, which is then also split between flow to the south gutter (DP-4) and flow to the north gutter (DP-5) by a local roadway high point. Water runoff currently flows over the retaining walls located on the boundary with Brook Street. The peak total offsite flow is also being analyzed (DP-6).

The following is a brief analysis of the existing design points as shown on the enclosed Existing Drainage Map (ED-1) Map, in Appendix E.

Existing Drainage Area 10 (EDA-10): This drainage area consists of the portions of Lot 1 from which stormwater runoff sheet flows directly to the riverine wetland systems to the west of Lot 1 (DP-1). It is 0.28 acres and is approximately 12.8% impervious. EDA-10 consists mainly of lawn areas with a smaller contributing areas of impervious roof and paved driveway ground cover.

Existing Drainage Area 20 (EDA-20): This drainage area consists of the portions of Lots 1 and 2 from which stormwater runoff sheet flows directly into the Grove Street gutter system flowing south (DP-2). It is 1.54 acres and is approximately 81.2% impervious. EDA-20 consists of impervious paved parking, drive aisle, roadway, and roof areas located on both sides of Grove Street and including impervious areas associated with the previously demolished school building. Lawn cover contributes runoff from smaller pervious areas.

Existing Drainage Area 30 (EDA-30): This drainage area consists of the portions of Lots 1 and 2 from which stormwater runoff sheet flows directly into the Grove Street gutter system flowing north (DP-3). It is 0.21 acres and is approximately 55.1% impervious. EDA-30 consists of impervious paved parking, drive aisle, roadway, and roof areas located west of Grove Street associated with the existing convent building and rectory. Lawn cover contributes runoff from smaller pervious areas.

Existing Drainage Area 40 (EDA-40): This drainage area consists of the portions of Lot 2 from which stormwater runoff sheet flows directly into the Brook Street gutter system flowing south (DP-4). It is 0.51 acres and is approximately 36.6% impervious. EDA-40 consists of impervious paved parking, drive aisle, roadway, and roof areas located east of Grove Street associated with the existing church and rectory building. Lawn cover contributes runoff from pervious areas.

Existing Drainage Area 50 (EDA-50): This drainage area consists of the portions of Lot 2 from which stormwater runoff sheet flows directly into the Brook Street gutter system flowing north (DP-5). It is 0.26 acres and is approximately 17.3% impervious. EDA-50 consists of impervious paved parking, drive aisle, roadway, and roof areas located east of Grove Street associated with the existing church and rectory building. Lawn cover contributes runoff from pervious areas.

Table 1 – Pre-Development Drainage Characteristics

Drainage Area	Area (square feet)	Composite Curve Number	Impervious Cover (%)	Time of Concentration (minutes)
EDA-10 (Area Draining Offsite West)	12,270	55	12.8	5.0
EDA-20 (Area to Grove Street South)	67,225	89	81.2	7.1
EDA-30 (Area to Grove Street North)	9,035	76	55.1	6.1
EDA-40 (Area to Brook Street South)	22,400	67	36.3	5.0
EDA-50 (Area to Brook Street North)	11,465	57	17.3	5.0

Table 2 – Pre-Development Conditions Peak Flows

Analysis Point	Peak Flow (cfs)						
	1"	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Design Point 1 (Offsite Flow West)	0.00	0.04	0.23	0.42	0.71	0.95	1.21
Design Point 2 (Grove Street South)	0.46	4.59	6.29	7.68	9.52	10.91	12.34
Design Point 3 (Grove Street North)	0.00	0.37	0.60	0.79	1.06	1.26	1.47
Design Point 4 (Brook Street South)	0.00	0.54	1.05	1.51	2.16	2.67	3.21
Design Point 5 (Brook Street North)	0.00	0.07	0.26	0.45	0.74	0.96	1.22
Design Point 6 (Total Offsite Flow)	0.46	5.59	8.37	10.75	14.04	16.57	19.22

Developed Site Conditions and Hydrologic Conditions

In the proposed condition, stormwater collection and conveyance systems will be installed on site and will be supplemented with an underground stormwater detention system installed to mitigate the increase in peak flow from the site as a result of increased impervious cover in the water quality storm event. The underground detention system will also serve to detain and infiltrate the required water quality volume. The proposed stormwater system will also provide water quality improvements through the implementation of a formalized street sweeping program for the impervious surfaces and the installation of deep sump and hooded outlet catch basins, a sediment isolator row, and the underground infiltration system. These measures will treat the stormwater quality flow through structural means to provide water quality treatment in conformance with the State of Connecticut Water Quality Manual.

The proposed site drainage area totals 2.81 acres and is approximately 60.2% impervious. For the hydrologic analysis, the developed site retained the same Design Points as the existing model. The following sub-drainage areas were developed to model the proposed site improvements.

Proposed Drainage Area 100 (PDA-100): This drainage area consists of the portions of Lot 1 from which stormwater runoff will continue to sheet flow directly to the riverine wetland systems to the west of Lot 1 (DP-1), bypassing stormwater collection systems. It is 0.43 acres and is approximately 7.1% impervious. PDA-100 consists mainly of lawn areas with smaller contributing areas of impervious roof from the existing convent building and concrete pads.

Proposed Drainage Area 110 (PDA-110): This drainage area consists of the proposed paved parking area located south of the proposed school building on Lot 1. Stormwater runoff from this area is collected in catch basin inlets and conveyed through subsurface piping into the underground detention system (UDS). The UDS will be outfitted with a sediment isolator row for water quality treatment prior to discharge into the water quality volume and peak flow mitigation portion of the UDS. The UDS will discharge to a level spreader system for velocity dissipation prior to ultimately discharging to the riverine wetland systems to the west of Lot 1 (DP-1). It is 0.25 acres and is approximately 81.9% impervious. PDA-110 consists mainly of paved parking and drive aisle areas with smaller portions of lawn and landscaped surface cover.

Proposed Drainage Area 120 (PDA-120): This drainage area consists of the proposed EdAdvance school building roof. Stormwater runoff from the roof will be conveyed through subsurface piping into the underground detention system (UDS). The UDS will discharge to a level spreader system for velocity dissipation prior to ultimately discharging to the riverine wetland systems to the west of Lot 1 (DP-1). It is 0.24 acres and is entirely impervious.

Proposed Drainage Area 130 (PDA-130): This drainage area consists of the proposed paved parking area located south of the existing church building on Lot 2. Stormwater runoff from this area is collected in catch basin inlets and conveyed through subsurface piping into the underground detention system (UDS) on Lot 1. The UDS will be outfitted with a sediment isolator row for water quality treatment prior to discharge into the water quality volume and peak flow mitigation portion of the UDS. The UDS will discharge to a level spreader system for velocity dissipation prior to ultimately discharging to the riverine wetland systems to the west of Lot 1 (DP-1). It is 0.19 acres and is approximately 84.6% impervious. PDA-130 consists mainly of paved parking and drive aisle areas with smaller portions of lawn and landscaped surface cover.

Proposed Drainage Area 140 (PDA-140): This drainage area consists of the proposed paved parking area located to the north, east, and south of the existing rectory building on Lot 2. Stormwater runoff from this area is collected in catch basin inlets and conveyed through subsurface piping into the underground detention system (UDS) on Lot 1. The UDS will be outfitted with a sediment isolator row for water quality treatment prior to discharge into the water quality volume and peak flow mitigation portion of the UDS. The UDS will discharge to a level spreader system

for velocity dissipation prior to ultimately discharging to the riverine wetland systems to the west of Lot 1 (DP-1). It is 0.27 acres and is approximately 74.4% impervious. PDA-140 consists mainly of paved parking and drive aisle areas with smaller portions of lawn and landscaped surface cover. The rear half of the existing rectory building also drains to this area.

Proposed Drainage Area 200 (PDA-200): This drainage area consists of the portions of Lots 1 and 2 from which stormwater runoff will continue to sheet flow directly into the Grove Street gutter system flowing south (DP-2). It is 0.89 acres and is approximately 73.0% impervious. PDA-200 consists of impervious paved parking, drive aisle, and roadway areas located on both sides of Grove Street and including roof areas from the existing church and convent buildings on the east side of the street that will continue to drain as they do in existing condition. Lawn cover contributes runoff from smaller pervious areas.

Proposed Drainage Area 300 (PDA-300): This drainage area consists of the portions of Lots 1 and 2 from which stormwater runoff will continue to sheet flow directly into the Grove Street gutter system flowing north (DP-3). It is 0.20 acres and is approximately 56.2% impervious. PDA-300 consists of impervious paved parking, drive aisle, roadway, and roof areas located on both sides of Grove Street associated with the existing convent building and rectory. Lawn cover contributes runoff from smaller pervious areas.

Proposed Drainage Area 400 (PDA-400): This drainage area consists of the portions of Lot 2 from which stormwater runoff will continue to sheet flow directly into the Brook Street gutter system flowing south (DP-4). It is 0.25 acres and is approximately 36.3% impervious. PDA-400 consists of impervious paved parking, drive aisle, roadway, and roof areas located east of Grove Street associated with the existing church and rectory building. Lawn cover contributes runoff from pervious areas.

Proposed Drainage Area 500 (PDA-500): This drainage area consists of the portions of Lot 2 from which stormwater runoff will continue to sheet flow directly into the Brook Street gutter system flowing north (DP-5). It is 0.09 acres and is approximately 1.1% impervious. PDA-500 consists of impervious paved parking, drive aisle, roadway, and roof areas located east of Grove Street associated with the existing church and rectory building. Lawn cover contributes runoff from pervious areas.

Table 3 – Post-Development Drainage Characteristics

Drainage Area	Area (square feet)	Composite Curve Number	Impervious Cover (%)	Time of Concentration (minutes)
PDA-100 (Area Draining Offsite West)	18,565	43	7.1	5.0
PDA-110 (School Parking Area to UDS)	10,885	87	81.9	5.5
PDA-120 (School Roof Area to UDS)	10,425	98	100.0	5.0
PDA-130 (Church Parking Area to UDS)	8,295	89	84.6	5.0
PDA-140 (Rectory Parking Area to UDS)	11,585	83	74.4	5.0
PDA-200 (Area to Grove Street South)	38,890	82	73.0	7.6
PDA-300 (Area to Grove Street North)	8,855	72	56.2	6.1
PDA-400 (Area to Brook Street South)	10,875	60	36.3	5.0
PDA-500 (Area to Brook Street North)	4,020	40	1.1	5.0

Table 4 – Post-Development Conditions Peak Flows

Analysis Point	Peak Flow (cfs)						
	1”	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Design Point 1 (Offsite Flow West)	0.36	3.10	4.23	5.24	6.79	7.99	9.27
Design Point 2 (Grove Street South)	0.06	1.96	2.91	3.71	4.78	5.58	6.41
Design Point 3 (Grove Street North)	0.00	0.29	0.50	0.68	0.93	1.13	1.34
Design Point 4 (Brook Street South)	0.00	0.12	0.33	0.52	0.86	1.03	1.28
Design Point 5 (Brook Street North)	0.00	0.00	0.00	0.01	0.05	0.10	0.16
Design Point 6 (Total Offsite Flow)	0.39	5.32	7.78	9.92	13.07	15.50	18.08

Table 5 – Existing vs Proposed Peak Rates of Runoff

	Peak Flow Rate in Cubic Feet per Second (cfs)						
Drainage Area	**1"**	**2-yr**	**5-yr**	**10-yr**	**25-yr**	**50-yr**	**100-yr**
Design Point 1							
Existing	0.00	0.04	0.23	0.42	0.71	0.95	1.21
Proposed	0.00	0.03	0.43	1.81	5.87	7.47	8.72
Change	-0.00	-0.01	+0.20	+1.39	+5.16	+6.52	+7.51
Design Point 2							
Existing	0.46	4.59	6.29	7.68	9.52	10.91	12.34
Proposed	0.06	1.96	2.91	3.71	4.78	5.58	6.41
Change	-0.40	-2.63	-3.38	-3.97	-4.74	-5.33	-5.93
Design Point 3							
Existing	0.00	0.37	0.60	0.79	1.06	1.26	1.47
Proposed	0.00	0.29	0.50	0.68	0.93	1.13	1.34
Change	0.00	-0.08	-0.10	-0.11	-0.13	-0.13	-0.13
Design Point 4							
Existing	0.00	0.54	1.05	1.51	2.16	2.67	3.21
Proposed	0.00	0.12	0.33	0.52	0.86	1.03	1.28
Change	0.00	-0.42	-0.72	-0.99	-1.30	-1.64	-1.93
Design Point 5							
Existing	0.00	0.07	0.26	0.45	0.74	0.96	1.22
Proposed	0.00	0.00	0.00	0.01	0.05	0.10	0.16
Change	0.00	-0.07	-0.26	-0.44	-0.69	-0.86	-1.06
Design Point 6							
Existing	0.46	5.59	8.37	10.75	14.04	16.57	19.22
Proposed	0.06	2.35	3.70	4.95	12.33	15.20	17.76
Change	-0.40	-3.24	-4.67	-5.80	-1.71	-1.37	-1.46

Stormwater Management

Hydrologic Modeling of the Entire Site

The hydrologic analysis to determine peak stormwater discharge rates was performed using the HydroCAD stormwater modeling system computer program, version 10.00 developed by HydroCAD Software Solutions, LLC. Hydrographs for each watershed were developed using the SCS Synthetic Unit Hydrograph Method. Rainfall depths and distribution per the NOAA Atlas 14 for Torrington, CT were used for the calculation of peak flow rates and are listed in Table 6. The drainage areas, or subcatchments as labeled by the program, are depicted by hexagons on the

attached drainage diagrams. Pre-development HydroCAD output can be found in Appendix B and Post-development HydroCAD output can be found in Appendix C.

Table 6 – Rainfall Depths per NOAA Atlas 14

Return Period	24-hour Rainfall Depth
1" depth	1.00"
2-year	3.52"
5-year	4.72"
10-year	5.71"
25-year	7.07"
50-year	8.07"
100-year	9.18"

Stormwater Quality

Along with the reduction of the overall total peak stormwater discharge rate, an important element of the proposed drainage system is to improve the quality of stormwater leaving the property. Per the DEEP 2004 Stormwater Quality Manual "The pollutant reduction criterion is designed to improve the water quality of stormwater discharges by treating a prescribed water quality volume or associated peak flow, referred to as the water quality flow. Most treatment practices described in this Manual use a volume-based sizing criterion. The exceptions are grass drainage channels, proprietary stormwater treatment devices, and flow diversion structures, where a peak flow rate is utilized." To adhere to the pollution reduction criteria of the manual, numerous Best Management Practices (BMPs) have been implemented in this design. The most basic preventive measure of the stormwater treatment train is to implement regular sweeping of the paved areas and annual cleaning of the catch basin sumps, underground detention system, and sediment isolator row, which allows continuous proper function of stormwater systems and prevents sediment from reaching outlet locations. The operation and maintenance manual for the application will have a standard required pavement sweeping schedule.

A variety of stormwater collection and treatment systems will be implemented in the proposed project. Water quality improvements will be installed through utilization of a sediment isolator row for removal of total suspended solids (TSS) as well as hydrocarbons including gasoline and oil. Regular maintenance, including removing the existing debris and sediment within each of the existing catch basins and proposed catch basins on site, shall be implemented to improve the overall removal of TSS and hydrocarbons within the existing system. Runoff from the proposed

development area will be piped to the sediment isolator row for treatment prior to discharge into underground stormwater detention systems for infiltration and ultimately conveyed offsite to the western wetland area. The underground detention system will also provide stormwater settling potential for further TSS and oil capture potential, to be removed offsite with proper maintenance. As a result of the various treatment systems, significant stormwater quality improvements are being provided for the site which currently operates with no treatment devices installed. The sediment isolator row works in conjunction with a flow splitter manhole to divert the 1" depth water quality flow into the isolation chambers.

All catch basins in new parking and/or paved areas will have a minimum of four-foot-deep sumps to collect sediment carried in the runoff. Catch basins in grassed areas will also have four-foot-deep sumps. The standard sump required by the CTDOT drainage manual is 2 feet. The additional 2 feet of sump depth will help to remove more sediment from the stormwater runoff. All catch basin outlets will be fitted with 'hoods' which remove floating debris and petroleum based contaminates as they float to the surface in the individual catch basin and are impounded in the structure so they can be properly removed during regular maintenance.

In addition to the WQF, the required sitewide water quality volume (WQV) will also be detained and infiltrated on site. The proposed underground detention system will detain and infiltrate the required water quality volume for the site per the DEEP 2004 Stormwater Quality Manual as shown in the Water Quality Volume Calculations found in Appendix D. Water Quality Flow calculations can also be found in Appendix D.

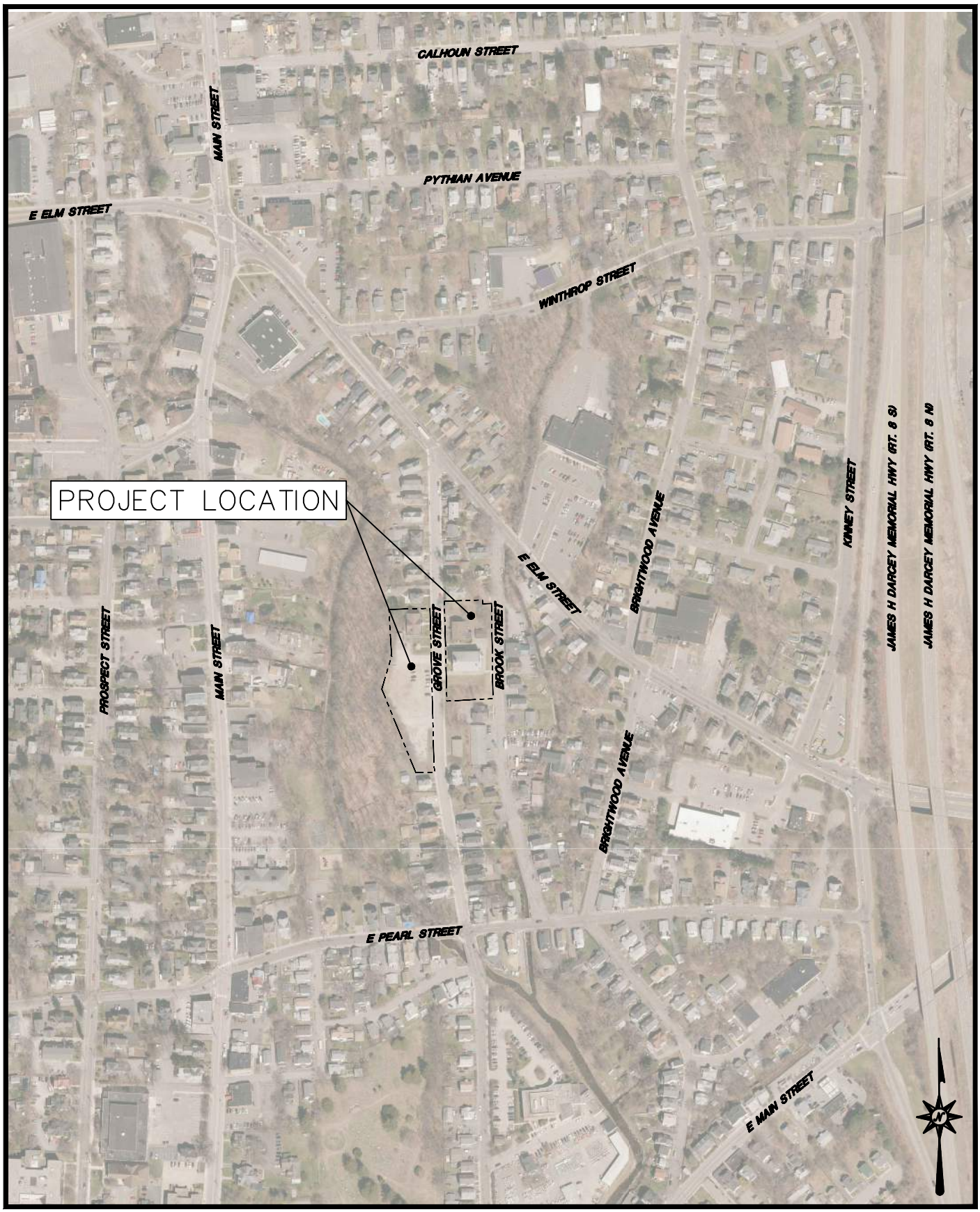
Summary

The post-development total peak discharge rate for the total developed site has been decreased for all storm events. The proposed underground stormwater detention system has been designed to attenuate peak flows for the 1" depth water quality and 2-year storm events for flows directed toward the western wetland area. Stormwater quality is being addressed by a formalized street sweeping program, deep sump and hooded outlet catch basins, hydrodynamic separator, sediment isolator row, and an underground infiltration system. These features will provide the minimum required 80% TSS removal as required in the CT Stormwater Manual. The proposed stormwater management system will meet the stormwater quality requirements of the State of Connecticut.

APPENDIX A

LOCATION MAPS

Figure 1: Aerial Location Map
Figure 2: USGS Location Map
Figure 3: NRCS Soil Survey Report
Figure 4: FEMA Federal Insurance Rate Map
Figure 5: NOAA Atlas 14 Storm Data



ARCHITECTURE
ENGINEERING
ENVIRONMENTAL
LAND SURVEYING

BL Companies

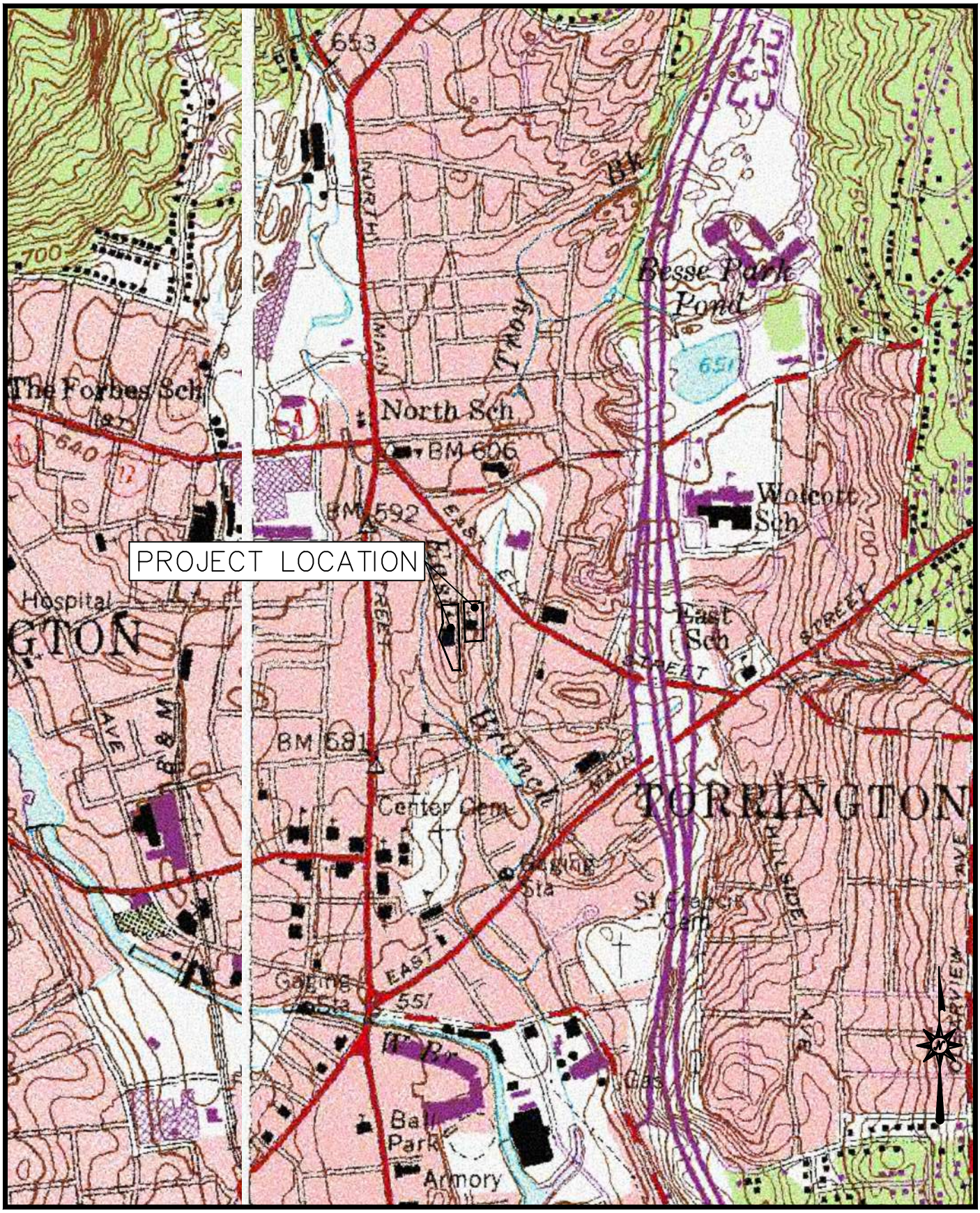
PROPOSED HEADSTART BUILDING

95–104 GROVE STREET
TORRINGTON, CONNECTICUT

Designed	M.A.G.
Drawn	M.A.G.
Checked	M.A.G.
Approved	
Scale	1"=400'
Project No.	2202472
Date	02/09/2023
CAD File	LOC220247201

FIGURE 1

AERIAL LOCATION MAP



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PROPOSED
HEADSTART BUILDING
95–104 GROVE STREET
TORRINGTON, CONNECTICUT

Designed	M.A.G.
Drawn	M.A.G.
Checked	M.A.G.
Approved	
Scale	1"=400'
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Date	02/09/2023
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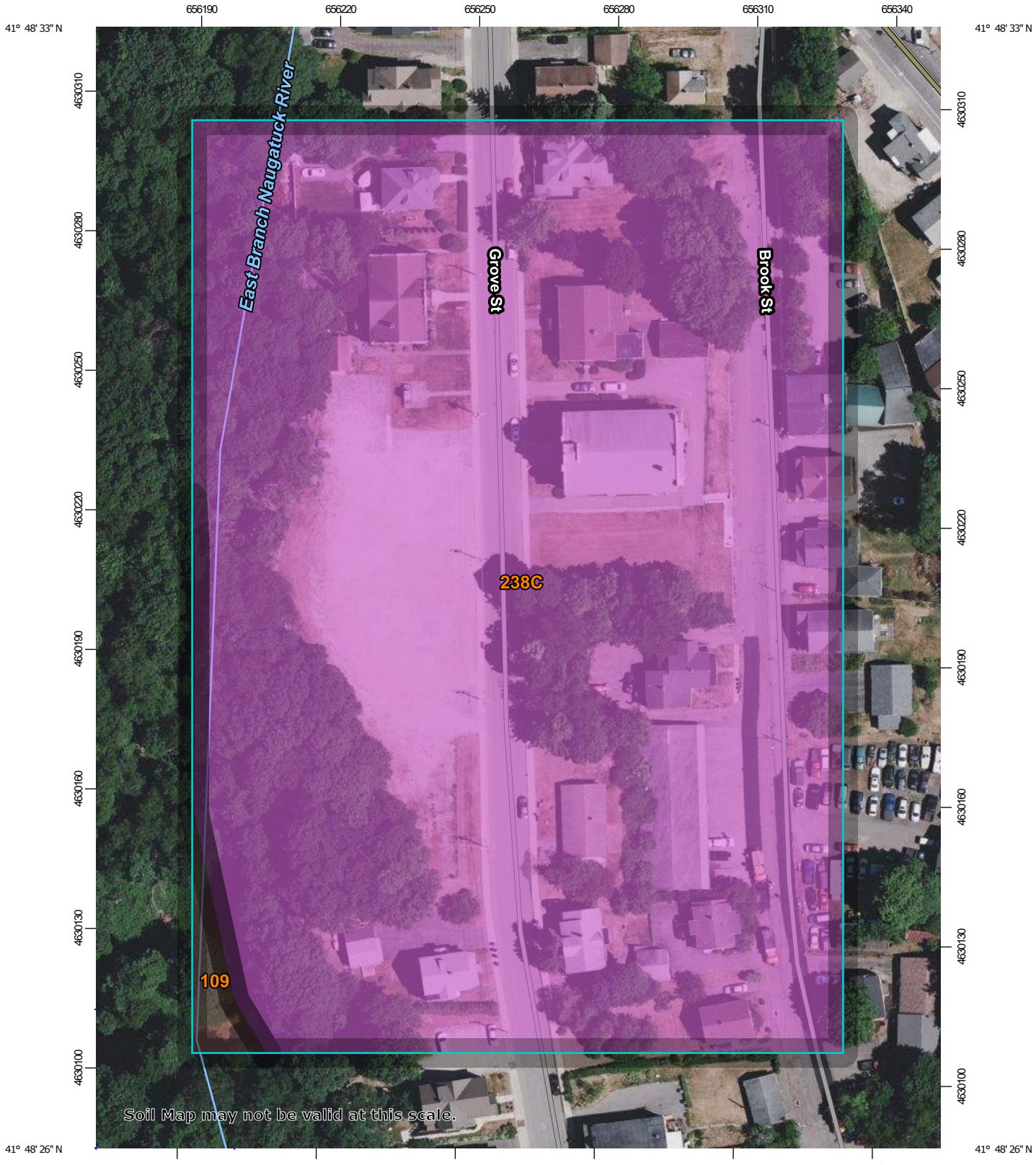
FIGURE 2
USGS LOCATION MAP

Hydrologic Soil Group—State of Connecticut
(95-104 Grove Street - Torrington, CT)



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

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

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: Jun 12, 2020—Sep 15, 2020

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
109	Fluvaquents-Udifluvents complex, frequently flooded	B/D	0.1	1.3%
238C	Hinckley-Urban land complex, 3 to 15 percent slopes	A	6.9	98.7%
Totals for Area of Interest			**7.0**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

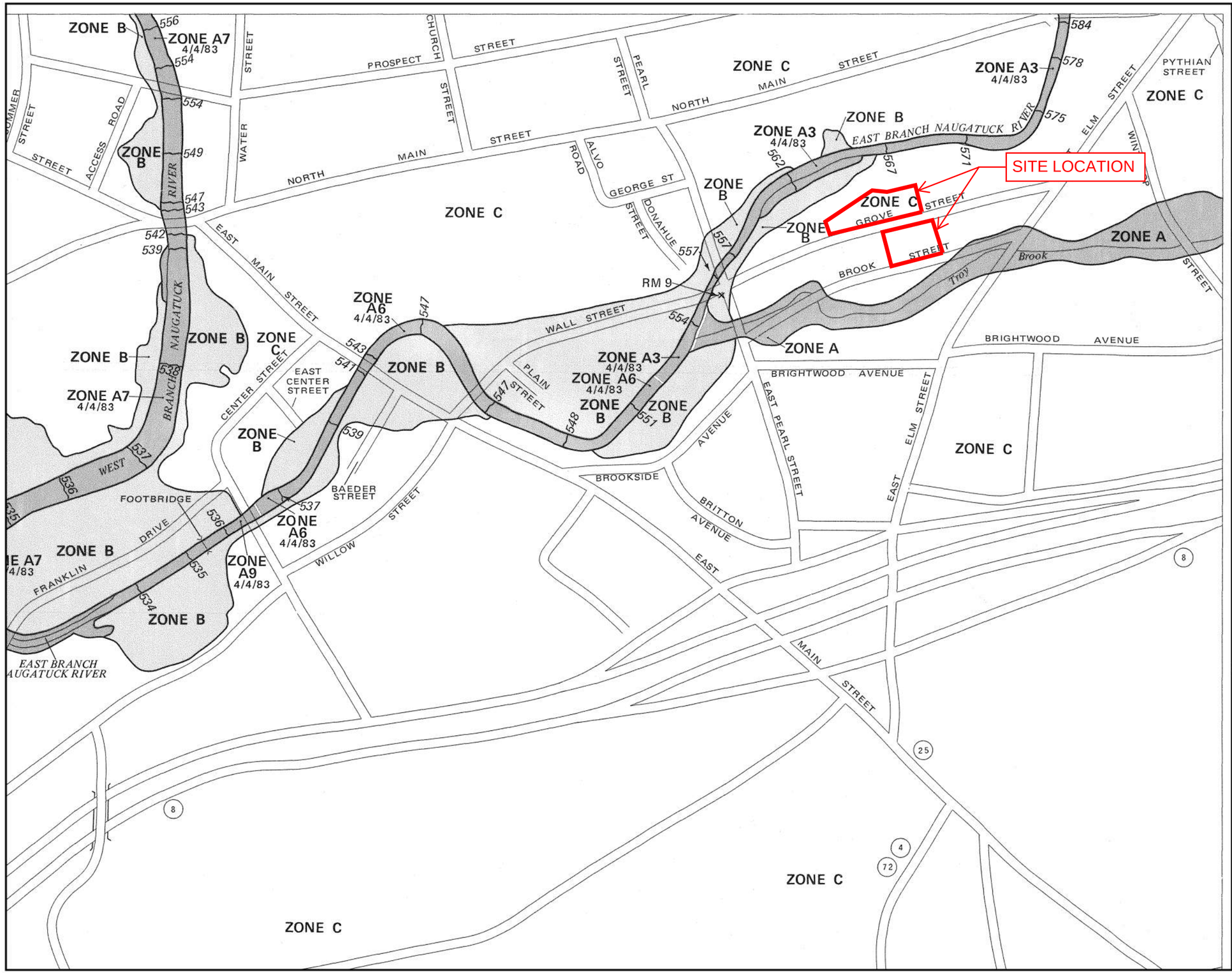
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CITY OF
TORRINGTON,
CONNECTICUT
LITCHFIELD COUNTY

PANEL 7 OF 14
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
095081 0007 B

MAP REVISED:
APRIL 4, 1983

Federal Emergency Management Agency

NOAA Atlas 14, Volume 10, Version 3
Location name: Torrington, Connecticut, USA*
Latitude: 41.8084°, Longitude: -73.1192°
Elevation: m/ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.358** (0.272-0.468)	**0.427** (0.323-0.558)	**0.539** (0.408-0.707)	**0.632** (0.475-0.834)	**0.759** (0.554-1.04)	**0.856** (0.614-1.20)	**0.955** (0.666-1.39)	**1.06** (0.709-1.58)	**1.20** (0.778-1.86)	**1.32** (0.833-2.08)
10-min	**0.508** (0.385-0.663)	**0.605** (0.458-0.790)	**0.763** (0.576-1.00)	**0.895** (0.672-1.18)	**1.08** (0.784-1.48)	**1.21** (0.868-1.70)	**1.35** (0.943-1.96)	**1.50** (1.00-2.24)	**1.71** (1.10-2.64)	**1.87** (1.18-2.95)
15-min	**0.597** (0.453-0.780)	**0.711** (0.539-0.930)	**0.897** (0.678-1.18)	**1.05** (0.790-1.39)	**1.26** (0.923-1.74)	**1.43** (1.02-2.00)	**1.59** (1.11-2.31)	**1.77** (1.18-2.64)	**2.01** (1.30-3.11)	**2.19** (1.39-3.47)
30-min	**0.814** (0.618-1.06)	**0.970** (0.735-1.27)	**1.22** (0.924-1.61)	**1.43** (1.08-1.89)	**1.72** (1.26-2.37)	**1.95** (1.39-2.73)	**2.17** (1.51-3.15)	**2.41** (1.61-3.60)	**2.74** (1.77-4.23)	**2.99** (1.89-4.73)
60-min	**1.03** (0.782-1.35)	**1.23** (0.930-1.61)	**1.55** (1.17-2.03)	**1.82** (1.37-2.40)	**2.18** (1.59-3.00)	**2.46** (1.77-3.45)	**2.75** (1.92-3.99)	**3.05** (2.04-4.56)	**3.47** (2.24-5.36)	**3.79** (2.40-5.99)
2-hr	**1.36** (1.04-1.77)	**1.60** (1.22-2.07)	**1.98** (1.50-2.58)	**2.30** (1.74-3.01)	**2.73** (2.01-3.74)	**3.06** (2.21-4.28)	**3.41** (2.40-4.94)	**3.79** (2.54-5.64)	**4.33** (2.81-6.68)	**4.78** (3.03-7.52)
3-hr	**1.58** (1.21-2.04)	**1.85** (1.41-2.39)	**2.29** (1.75-2.98)	**2.66** (2.02-3.47)	**3.16** (2.34-4.32)	**3.54** (2.57-4.95)	**3.94** (2.79-5.73)	**4.40** (2.96-6.54)	**5.08** (3.30-7.82)	**5.64** (3.59-8.87)
6-hr	**1.98** (1.53-2.55)	**2.36** (1.81-3.03)	**2.97** (2.28-3.84)	**3.48** (2.66-4.52)	**4.18** (3.11-5.71)	**4.70** (3.44-6.58)	**5.27** (3.77-7.70)	**5.95** (4.01-8.82)	**7.01** (4.56-10.8)	**7.91** (5.05-12.4)
12-hr	**2.40** (1.86-3.06)	**2.95** (2.28-3.77)	**3.84** (2.96-4.92)	**4.58** (3.51-5.90)	**5.60** (4.20-7.63)	**6.34** (4.68-8.88)	**7.17** (5.19-10.5)	**8.21** (5.55-12.1)	**9.86** (6.44-15.1)	**11.3** (7.24-17.7)
24-hr	**2.79** (2.17-3.53)	**3.52** (2.74-4.46)	**4.72** (3.66-6.00)	**5.71** (4.40-7.31)	**7.07** (5.34-9.63)	**8.07** (6.00-11.3)	**9.18** (6.73-13.5)	**10.6** (7.21-15.7)	**13.0** (8.52-19.9)	**15.1** (9.71-23.6)
2-day	**3.14** (2.46-3.95)	**4.03** (3.15-5.08)	**5.48** (4.28-6.94)	**6.69** (5.19-8.52)	**8.35** (6.35-11.3)	**9.55** (7.17-13.4)	**10.9** (8.09-16.2)	**12.8** (8.68-18.7)	**15.9** (10.4-24.2)	**18.6** (12.0-29.0)
3-day	**3.42** (2.69-4.29)	**4.40** (3.46-5.52)	**6.00** (4.70-7.56)	**7.33** (5.70-9.29)	**9.15** (6.99-12.4)	**10.5** (7.89-14.6)	**12.0** (8.91-17.7)	**14.0** (9.56-20.6)	**17.5** (11.5-26.6)	**20.6** (13.3-32.0)
4-day	**3.68** (2.90-4.60)	**4.73** (3.72-5.91)	**6.43** (5.05-8.08)	**7.85** (6.13-9.93)	**9.80** (7.50-13.3)	**11.2** (8.46-15.6)	**12.8** (9.55-18.9)	**15.0** (10.2-21.9)	**18.7** (12.3-28.4)	**22.1** (14.3-34.2)
7-day	**4.40** (3.48-5.47)	**5.58** (4.41-6.94)	**7.50** (5.92-9.38)	**9.10** (7.14-11.4)	**11.3** (8.68-15.2)	**12.9** (9.76-17.9)	**14.7** (11.0-21.5)	**17.1** (11.7-25.0)	**21.2** (14.0-32.1)	**24.9** (16.1-38.4)
10-day	**5.13** (4.07-6.35)	**6.37** (5.06-7.90)	**8.40** (6.65-10.5)	**10.1** (7.94-12.6)	**12.4** (9.54-16.6)	**14.1** (10.7-19.4)	**16.0** (11.9-23.3)	**18.5** (12.7-26.9)	**22.7** (15.0-34.3)	**26.5** (17.2-40.8)
20-day	**7.45** (5.95-9.16)	**8.74** (6.97-10.8)	**10.8** (8.62-13.4)	**12.6** (9.96-15.7)	**15.0** (11.6-19.8)	**16.7** (12.7-22.7)	**18.7** (13.9-26.7)	**21.2** (14.6-30.6)	**25.2** (16.8-37.9)	**28.7** (18.7-44.2)
30-day	**9.38** (7.52-11.5)	**10.7** (8.56-13.1)	**12.8** (10.2-15.8)	**14.6** (11.6-18.1)	**17.0** (13.1-22.2)	**18.8** (14.2-25.2)	**20.7** (15.3-29.2)	**23.1** (16.0-33.2)	**26.8** (17.8-40.1)	**29.9** (19.5-45.9)
45-day	**11.7** (9.45-14.3)	**13.1** (10.5-16.0)	**15.2** (12.2-18.7)	**17.0** (13.6-21.1)	**19.5** (15.1-25.3)	**21.4** (16.2-28.4)	**23.3** (17.1-32.4)	**25.6** (17.8-36.6)	**28.7** (19.2-42.9)	**31.3** (20.4-47.9)
60-day	**13.7** (11.0-16.6)	**15.1** (12.1-18.3)	**17.3** (13.9-21.2)	**19.2** (15.3-23.6)	**21.8** (16.8-28.0)	**23.7** (17.9-31.3)	**25.7** (18.7-35.2)	**27.8** (19.4-39.6)	**30.5** (20.5-45.4)	**32.6** (21.3-49.8)

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

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

Please refer to NOAA Atlas 14 document for more information.

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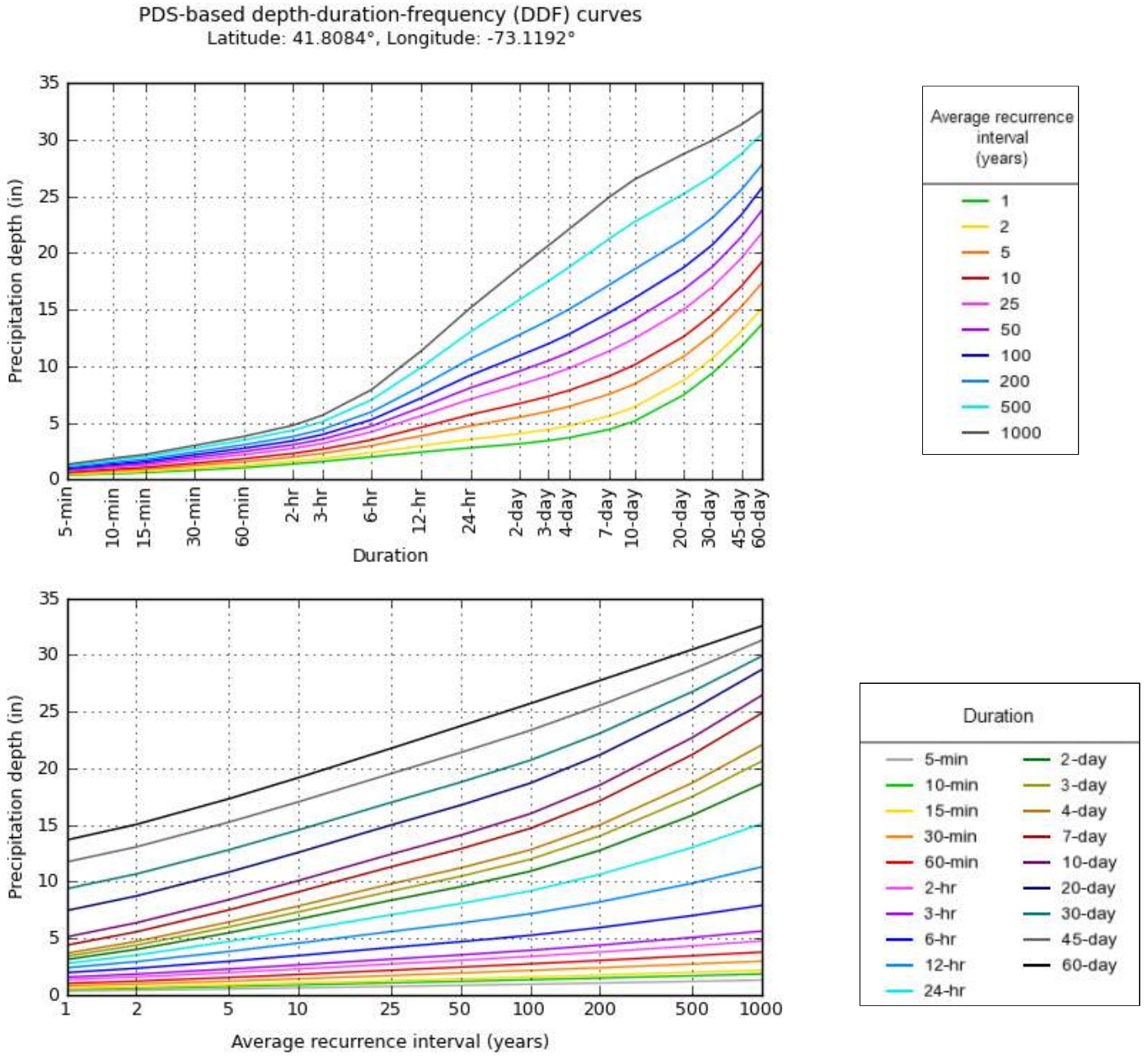
PF graphical



NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Wed Mar 8 14:20:05 2023

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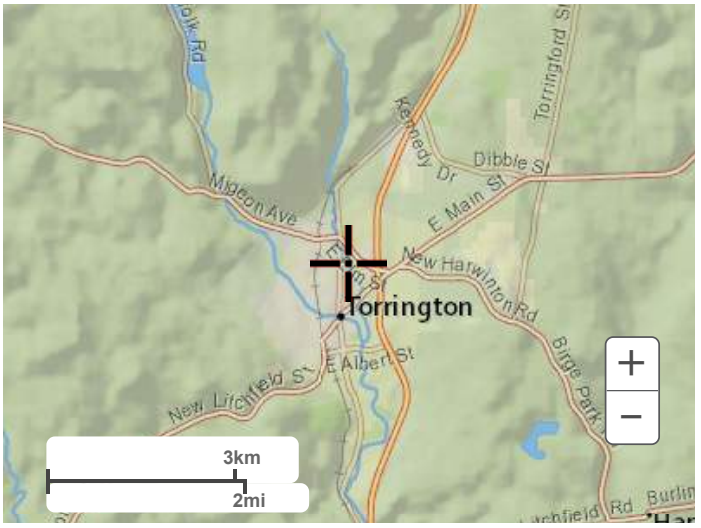
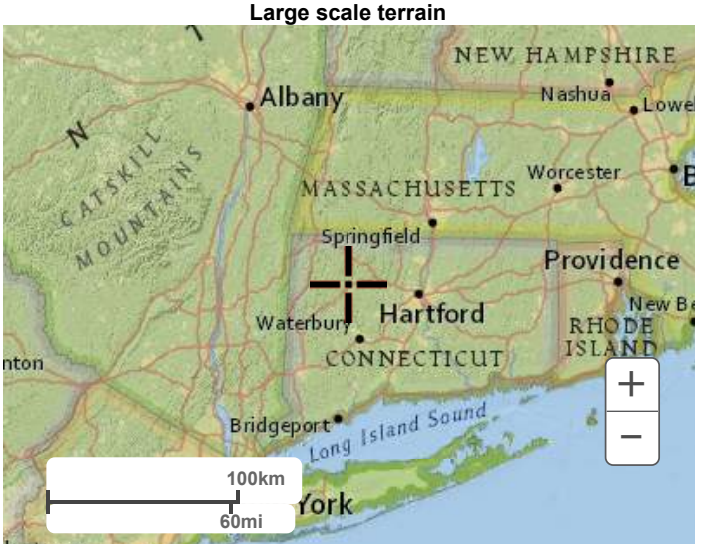
Maps & aerials

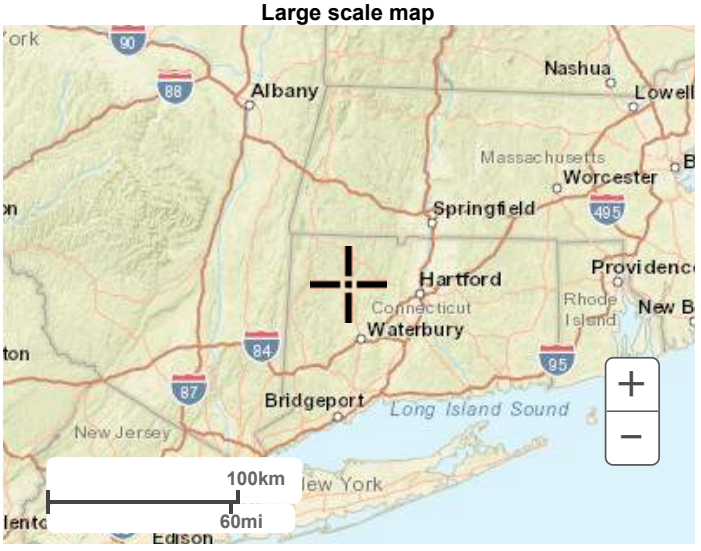
Small scale terrain



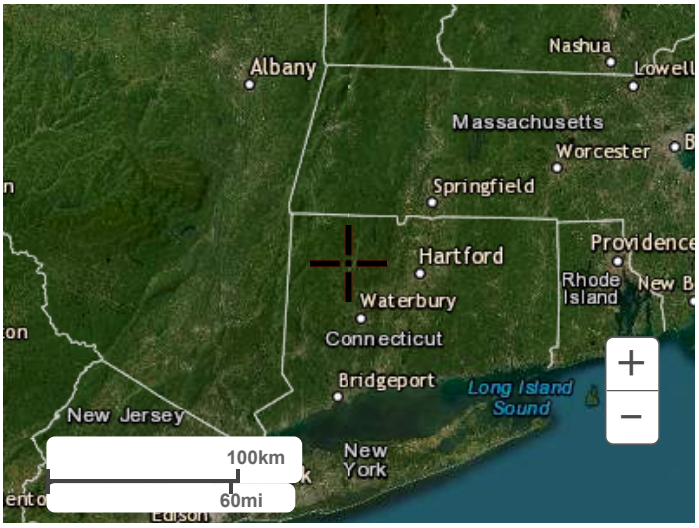
Large scale terrain



Large scale map



Large scale aerial



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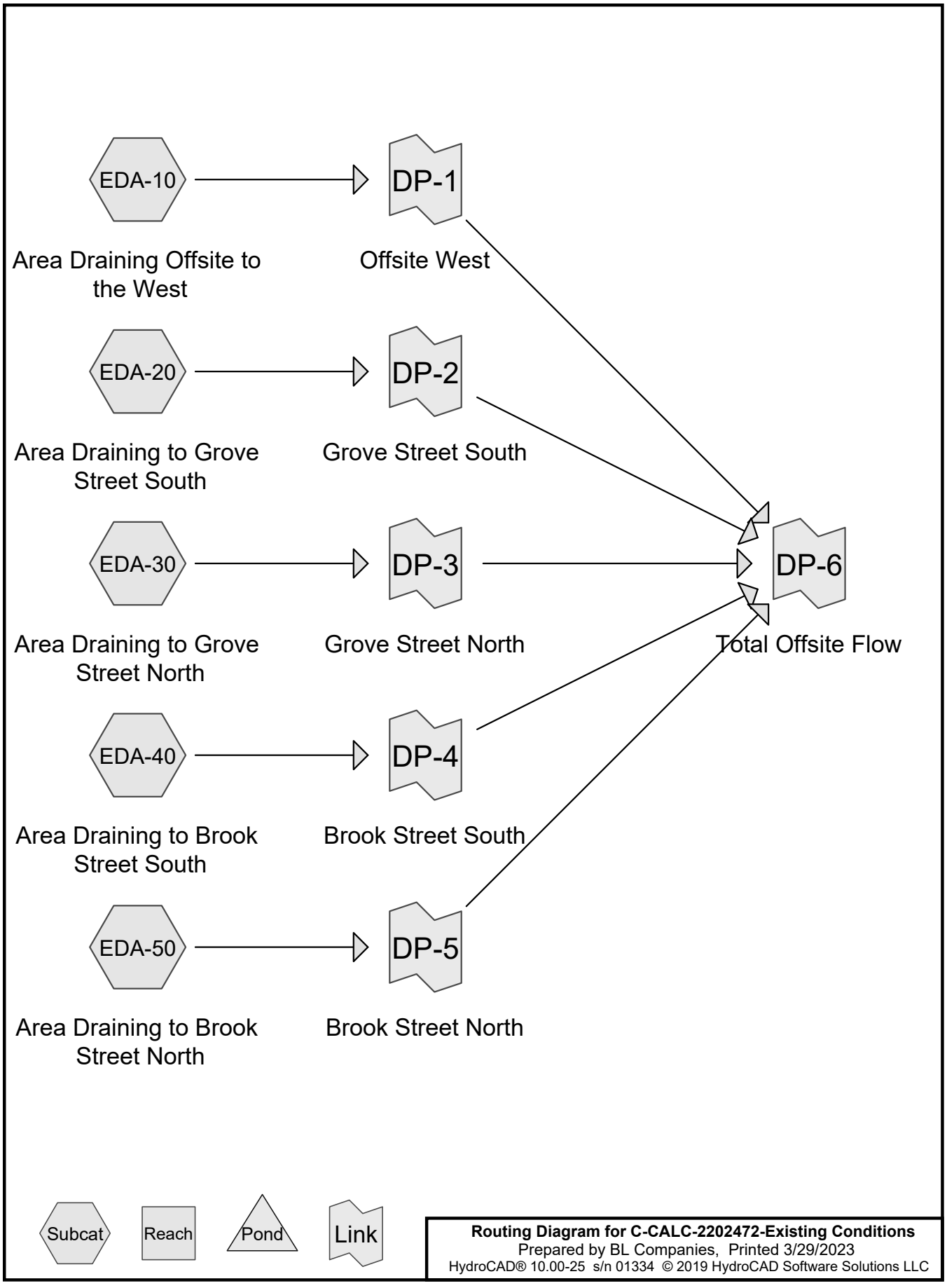
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

APPENDIX B

PRE-DEVELOPMENT HYDROLOGY



Routing Diagram for C-CALC-2202472-Existing Conditions
Prepared by BL Companies, Printed 3/29/2023

Time span=0.00-28.00 hrs, dt=0.01 hrs, 2801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-10: Area Draining Runoff Area=12,270 sf 12.84% Impervious Runoff Depth=0.00"
Flow Length=50' Slope=0.0300 '/' Tc=5.0 min CN=55 Runoff=0.00 cfs 0 cf

Subcatchment EDA-20: Area Draining to Runoff Area=67,225 sf 81.17% Impervious Runoff Depth=0.28"
Flow Length=436' Tc=7.1 min CN=89 Runoff=0.46 cfs 1,596 cf

Subcatchment EDA-30: Area Draining to Runoff Area=9,035 sf 55.12% Impervious Runoff Depth=0.04"
Flow Length=93' Tc=6.1 min CN=76 Runoff=0.00 cfs 29 cf

Subcatchment EDA-40: Area Draining to Runoff Area=22,400 sf 36.29% Impervious Runoff Depth=0.00"
Flow Length=96' Tc=5.0 min CN=67 Runoff=0.00 cfs 0 cf

Subcatchment EDA-50: Area Draining to Runoff Area=11,465 sf 17.31% Impervious Runoff Depth=0.00"
Flow Length=73' Tc=5.0 min CN=57 Runoff=0.00 cfs 0 cf

Link DP-1: Offsite West Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link DP-2: Grove Street South Inflow=0.46 cfs 1,596 cf
Primary=0.46 cfs 1,596 cf

Link DP-3: Grove Street North Inflow=0.00 cfs 29 cf
Primary=0.00 cfs 29 cf

Link DP-4: Brook Street South Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link DP-5: Brook Street North Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link DP-6: Total Offsite Flow Inflow=0.46 cfs 1,625 cf
Primary=0.46 cfs 1,625 cf

Total Runoff Area = 122,395 sf Runoff Volume = 1,625 cf Average Runoff Depth = 0.16"
41.80% Pervious = 51,160 sf 58.20% Impervious = 71,235 sf

Summary for Subcatchment EDA-10: Area Draining Offsite to the West

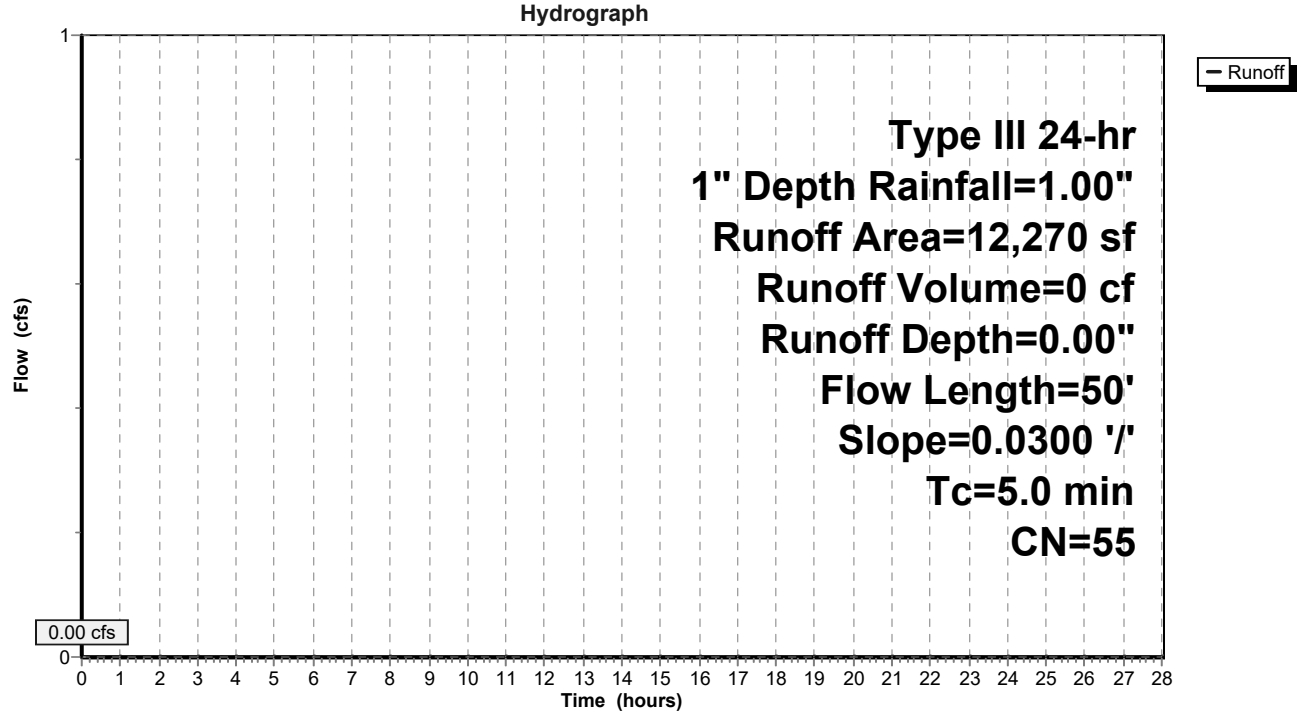
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Depth Rainfall=1.00"

	Area (sf)	CN	Description
*	1,575	98	Impervious, HSG A
	10,695	49	50-75% Grass cover, Fair, HSG A
	12,270	55	Weighted Average
	10,695		87.16% Pervious Area
	1,575		12.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
4.6	50	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-10: Area Draining Offsite to the West



Summary for Subcatchment EDA-20: Area Draining to Grove Street South

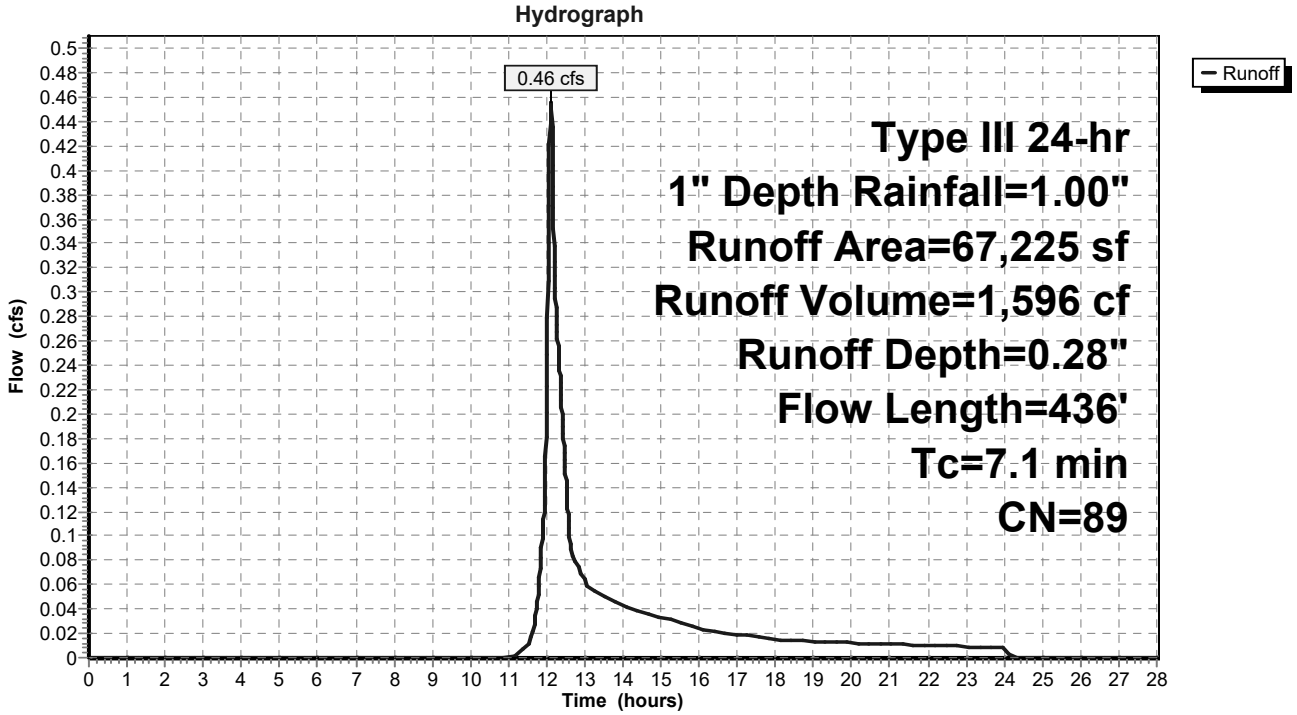
Runoff = 0.46 cfs @ 12.11 hrs, Volume= 1,596 cf, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Depth Rainfall=1.00"

	Area (sf)	CN	Description
*	54,565	98	Impervious, HSG A
	12,660	49	50-75% Grass cover, Fair, HSG A
	67,225	89	Weighted Average
	12,660		18.83% Pervious Area
	54,565		81.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	25	0.0200	1.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.1	361	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.1	436	Total			

Subcatchment EDA-20: Area Draining to Grove Street South



Summary for Subcatchment EDA-30: Area Draining to Grove Street North

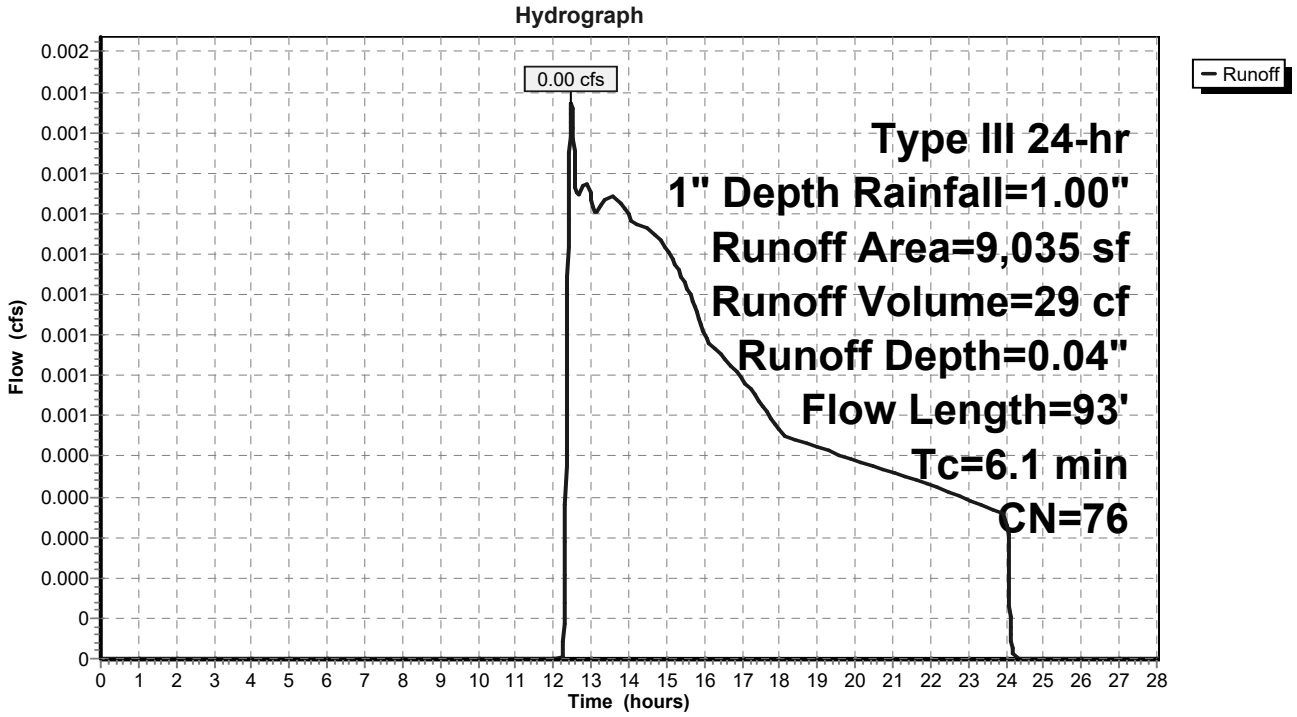
Runoff = 0.00 cfs @ 12.49 hrs, Volume= 29 cf, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Depth Rainfall=1.00"

	Area (sf)	CN	Description
*	4,980	98	Impervious, HSG A
	4,055	49	50-75% Grass cover, Fair, HSG A
	9,035	76	Weighted Average
	4,055		44.88% Pervious Area
	4,980		55.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	66	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	27	0.0200	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
6.1	93	Total			

Subcatchment EDA-30: Area Draining to Grove Street North



Summary for Subcatchment EDA-40: Area Draining to Brook Street South

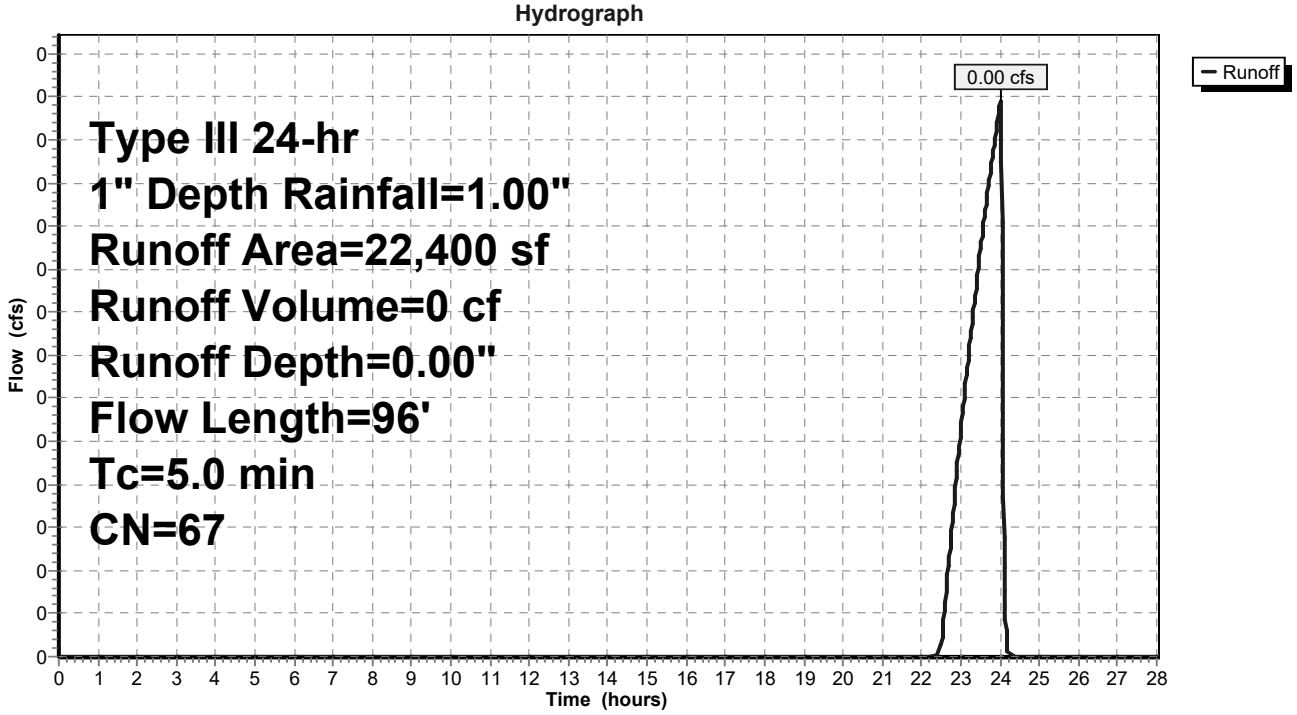
Runoff = 0.00 cfs @ 24.01 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Depth Rainfall=1.00"

	Area (sf)	CN	Description
*	8,130	98	Impervious, HSG A
	14,270	49	50-75% Grass cover, Fair, HSG A
	22,400	67	Weighted Average
	14,270		63.71% Pervious Area
	8,130		36.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	70	0.0600	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	26	0.4000	3.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
4.6	96	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-40: Area Draining to Brook Street South



Summary for Subcatchment EDA-50: Area Draining to Brook Street North

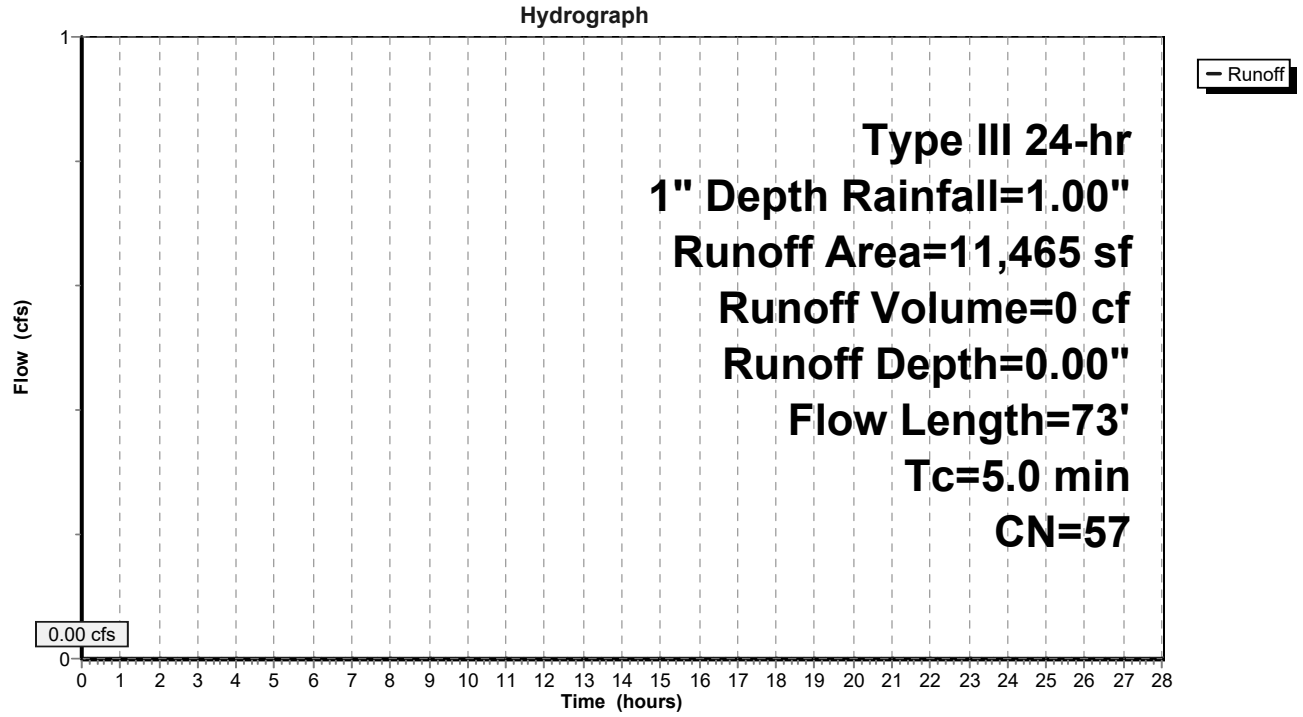
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Depth Rainfall=1.00"

	Area (sf)	CN	Description
*	1,985	98	Impervious, HSG A
	9,480	49	50-75% Grass cover, Fair, HSG A
	11,465	57	Weighted Average
	9,480		82.69% Pervious Area
	1,985		17.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	55	0.0500	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	18	0.6000	3.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
4.1	73	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-50: Area Draining to Brook Street North

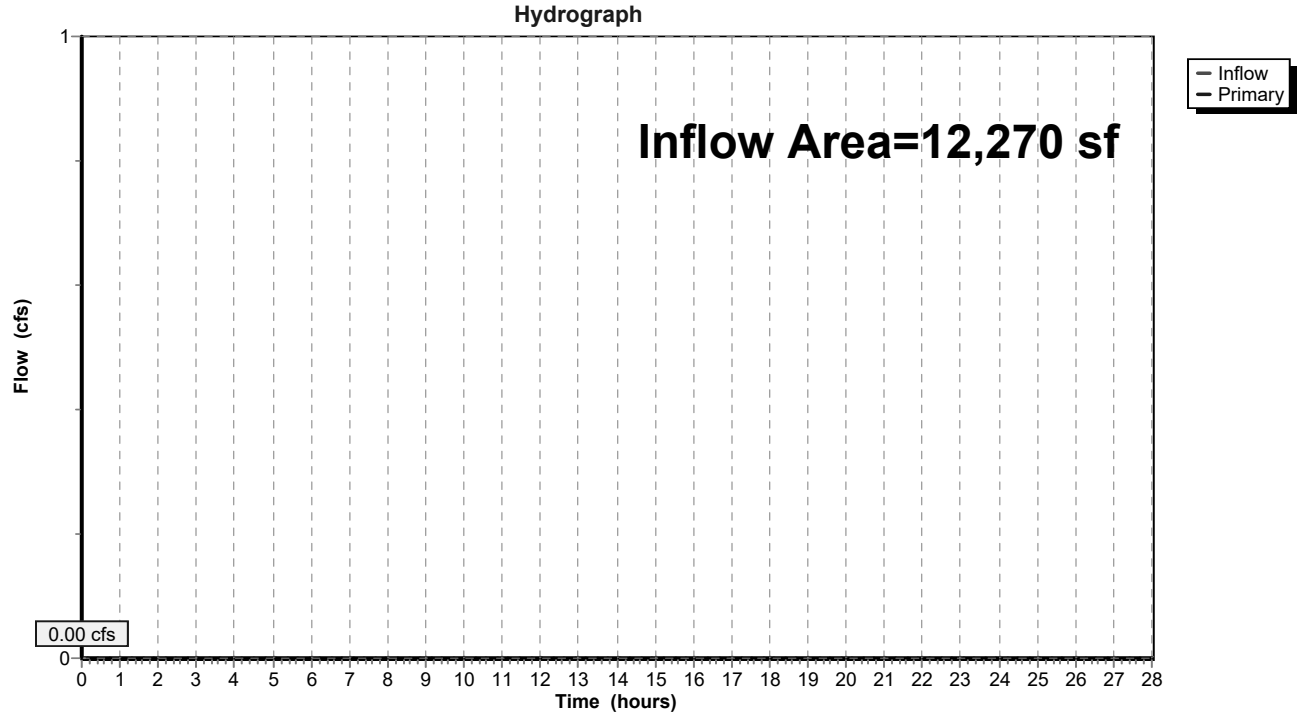


Summary for Link DP-1: Offsite West

Inflow Area = 12,270 sf, 12.84% Impervious, Inflow Depth = 0.00" for 1" Depth event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-1: Offsite West

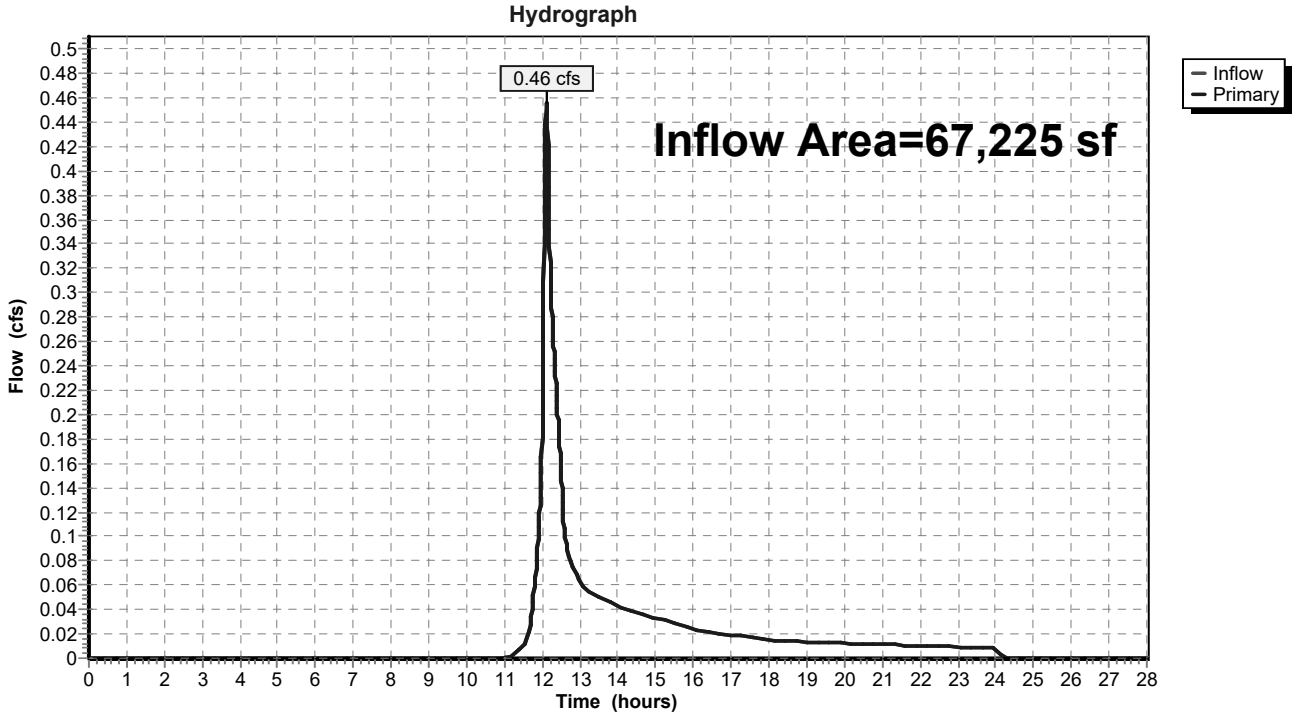


Summary for Link DP-2: Grove Street South

Inflow Area = 67,225 sf, 81.17% Impervious, Inflow Depth = 0.28" for 1" Depth event
Inflow = 0.46 cfs @ 12.11 hrs, Volume= 1,596 cf
Primary = 0.46 cfs @ 12.11 hrs, Volume= 1,596 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-2: Grove Street South

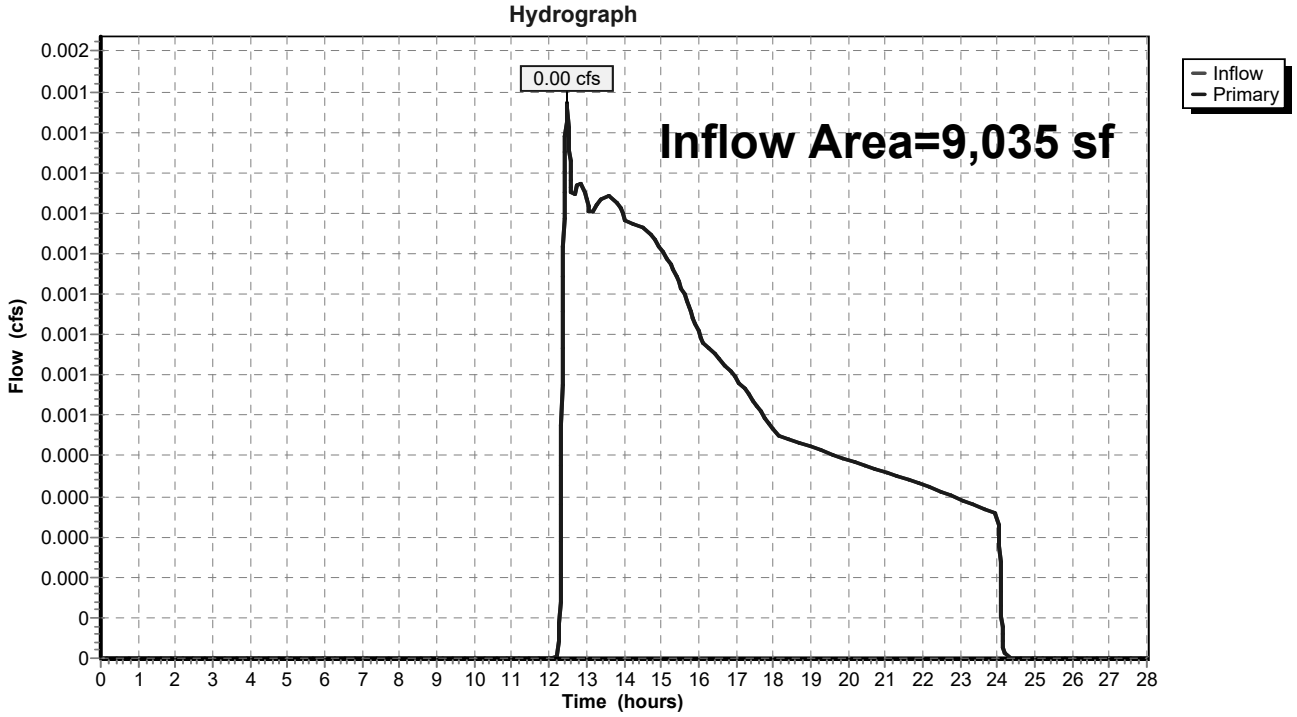


Summary for Link DP-3: Grove Street North

Inflow Area = 9,035 sf, 55.12% Impervious, Inflow Depth = 0.04" for 1" Depth event
Inflow = 0.00 cfs @ 12.49 hrs, Volume= 29 cf
Primary = 0.00 cfs @ 12.49 hrs, Volume= 29 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-3: Grove Street North

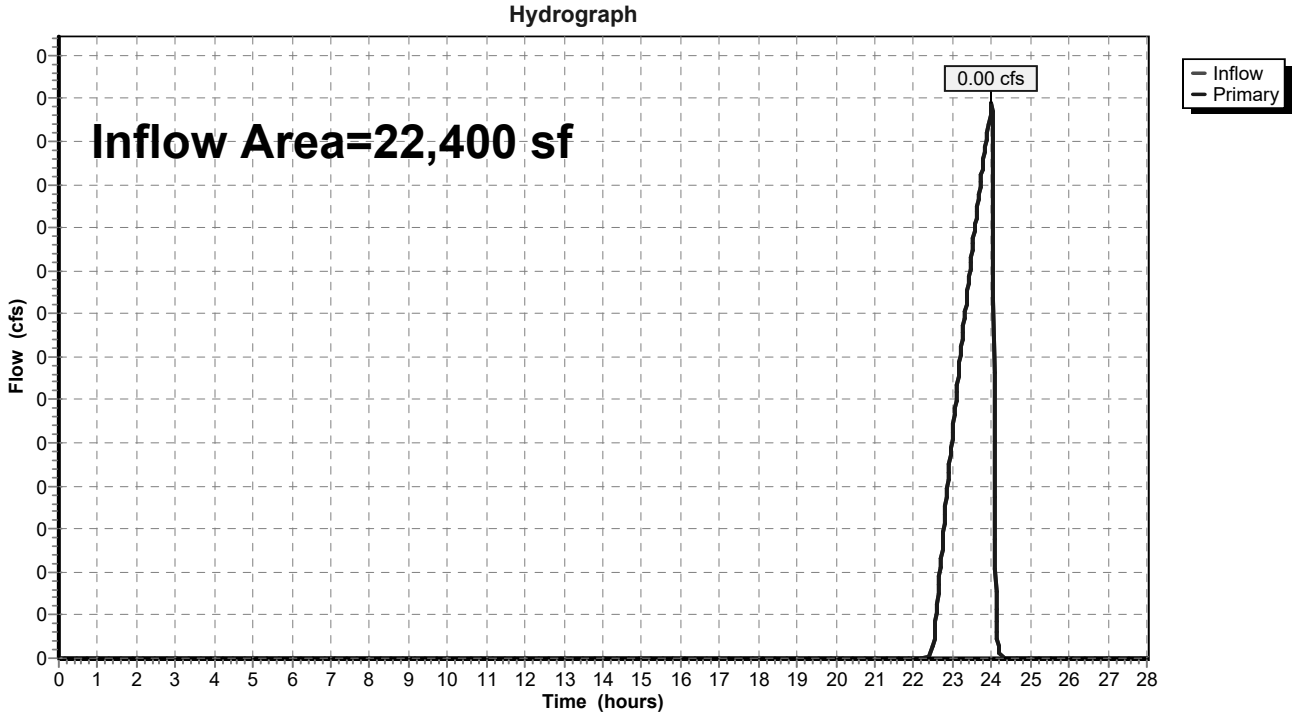


Summary for Link DP-4: Brook Street South

Inflow Area = 22,400 sf, 36.29% Impervious, Inflow Depth = 0.00" for 1" Depth event
Inflow = 0.00 cfs @ 24.01 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 24.01 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-4: Brook Street South

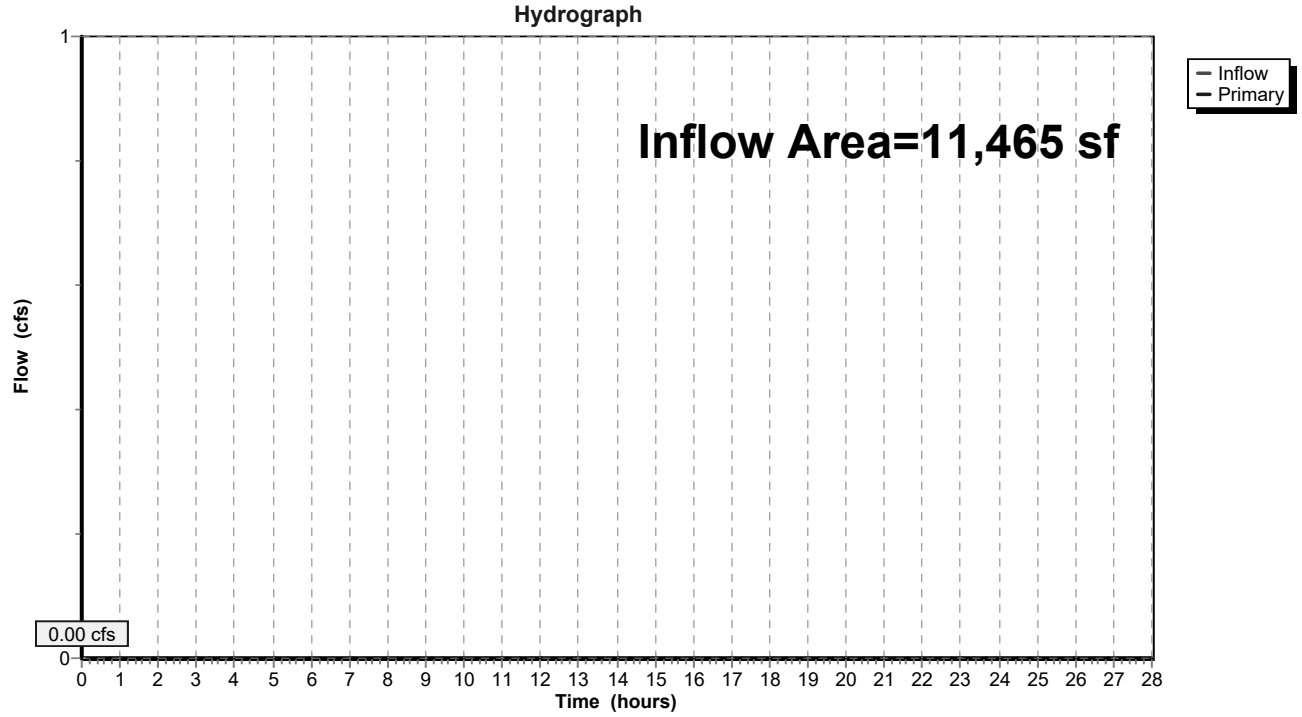


Summary for Link DP-5: Brook Street North

Inflow Area = 11,465 sf, 17.31% Impervious, Inflow Depth = 0.00" for 1" Depth event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-5: Brook Street North

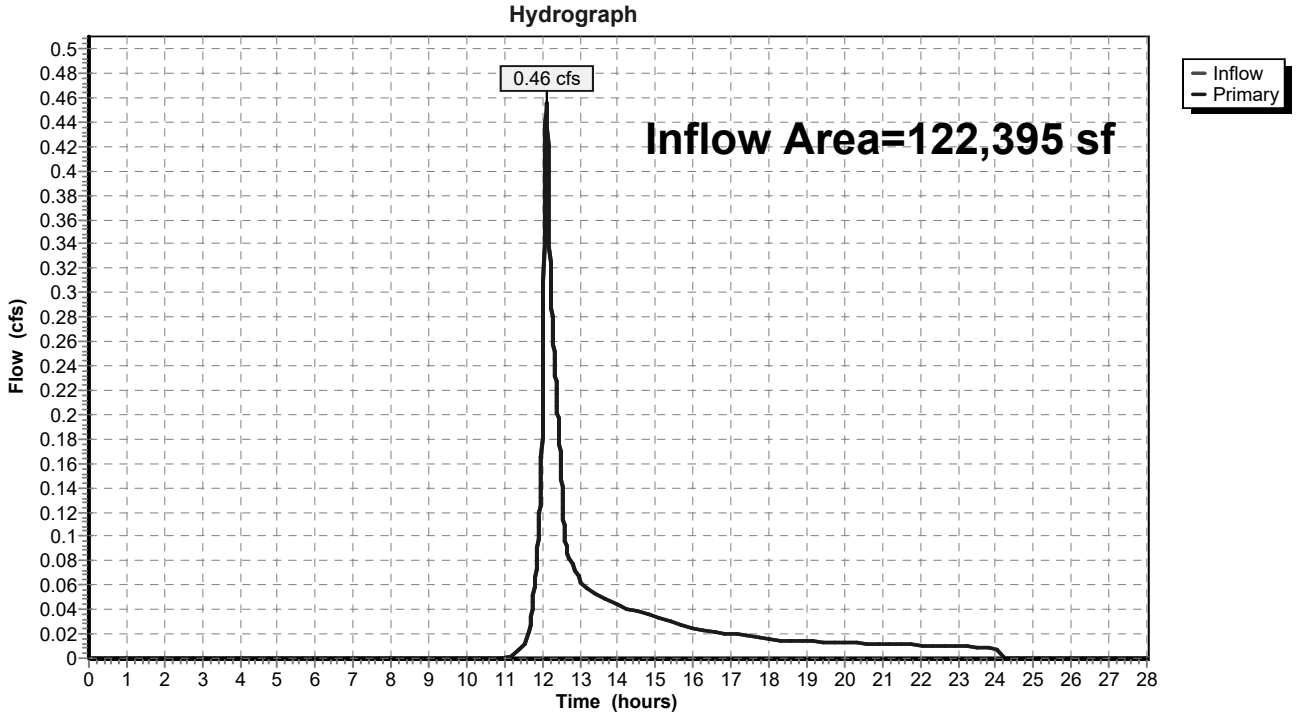


Summary for Link DP-6: Total Offsite Flow

Inflow Area = 122,395 sf, 58.20% Impervious, Inflow Depth = 0.16" for 1" Depth event
Inflow = 0.46 cfs @ 12.11 hrs, Volume= 1,625 cf
Primary = 0.46 cfs @ 12.11 hrs, Volume= 1,625 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-6: Total Offsite Flow



Time span=0.00-28.00 hrs, dt=0.01 hrs, 2801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-10: Area Draining Runoff Area=12,270 sf 12.84% Impervious Runoff Depth=0.35"
Flow Length=50' Slope=0.0300 '/' Tc=5.0 min CN=55 Runoff=0.04 cfs 360 cf

Subcatchment EDA-20: Area Draining to Runoff Area=67,225 sf 81.17% Impervious Runoff Depth=2.38"
Flow Length=436' Tc=7.1 min CN=89 Runoff=4.59 cfs 13,309 cf

Subcatchment EDA-30: Area Draining to Runoff Area=9,035 sf 55.12% Impervious Runoff Depth=1.38"
Flow Length=93' Tc=6.1 min CN=76 Runoff=0.37 cfs 1,039 cf

Subcatchment EDA-40: Area Draining to Runoff Area=22,400 sf 36.29% Impervious Runoff Depth=0.86"
Flow Length=96' Tc=5.0 min CN=67 Runoff=0.54 cfs 1,608 cf

Subcatchment EDA-50: Area Draining to Runoff Area=11,465 sf 17.31% Impervious Runoff Depth=0.42"
Flow Length=73' Tc=5.0 min CN=57 Runoff=0.07 cfs 404 cf

Link DP-1: Offsite West Inflow=0.04 cfs 360 cf
Primary=0.04 cfs 360 cf

Link DP-2: Grove Street South Inflow=4.59 cfs 13,309 cf
Primary=4.59 cfs 13,309 cf

Link DP-3: Grove Street North Inflow=0.37 cfs 1,039 cf
Primary=0.37 cfs 1,039 cf

Link DP-4: Brook Street South Inflow=0.54 cfs 1,608 cf
Primary=0.54 cfs 1,608 cf

Link DP-5: Brook Street North Inflow=0.07 cfs 404 cf
Primary=0.07 cfs 404 cf

Link DP-6: Total Offsite Flow Inflow=5.59 cfs 16,720 cf
Primary=5.59 cfs 16,720 cf

Total Runoff Area = 122,395 sf Runoff Volume = 16,720 cf Average Runoff Depth = 1.64"
41.80% Pervious = 51,160 sf 58.20% Impervious = 71,235 sf

Summary for Subcatchment EDA-10: Area Draining Offsite to the West

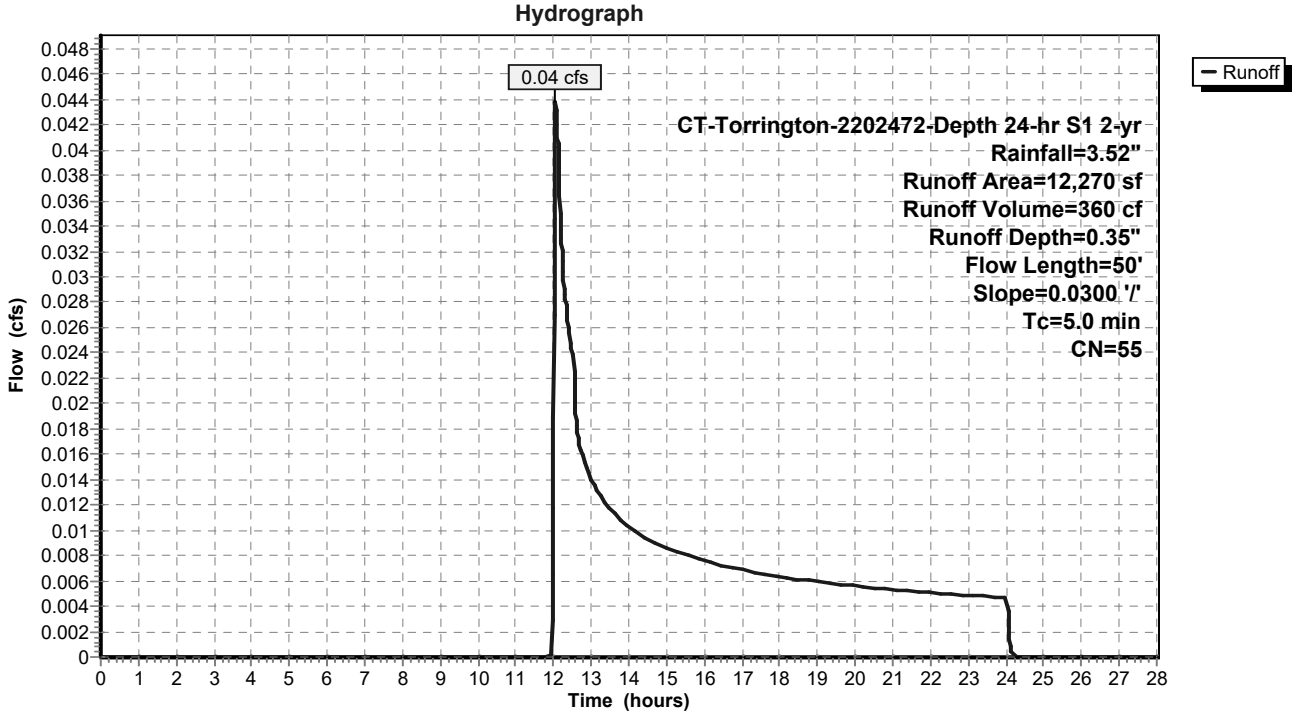
Runoff = 0.04 cfs @ 12.06 hrs, Volume= 360 cf, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 2-yr Rainfall=3.52"

	Area (sf)	CN	Description
*	1,575	98	Impervious, HSG A
	10,695	49	50-75% Grass cover, Fair, HSG A
	12,270	55	Weighted Average
	10,695		87.16% Pervious Area
	1,575		12.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
4.6	50	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-10: Area Draining Offsite to the West



Summary for Subcatchment EDA-20: Area Draining to Grove Street South

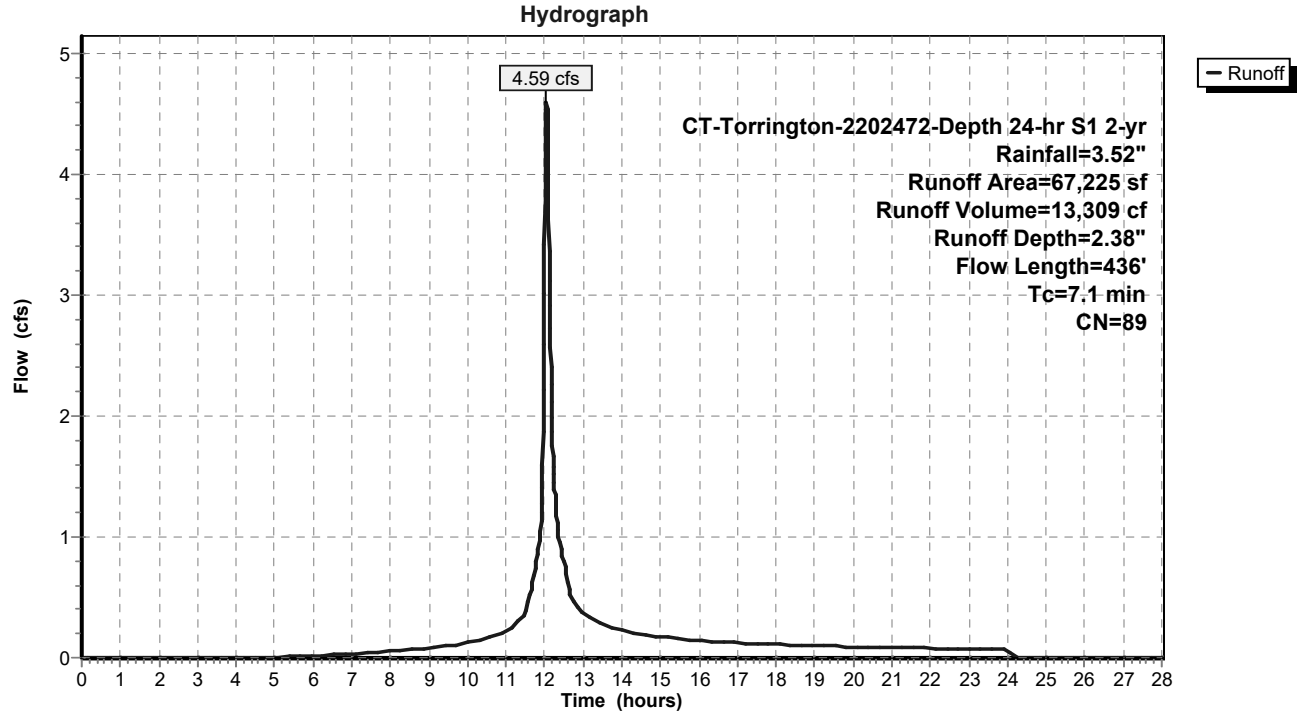
Runoff = 4.59 cfs @ 12.05 hrs, Volume= 13,309 cf, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 2-yr Rainfall=3.52"

	Area (sf)	CN	Description
*	54,565	98	Impervious, HSG A
	12,660	49	50-75% Grass cover, Fair, HSG A
	67,225	89	Weighted Average
	12,660		18.83% Pervious Area
	54,565		81.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	25	0.0200	1.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.1	361	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.1	436	Total			

Subcatchment EDA-20: Area Draining to Grove Street South



Summary for Subcatchment EDA-30: Area Draining to Grove Street North

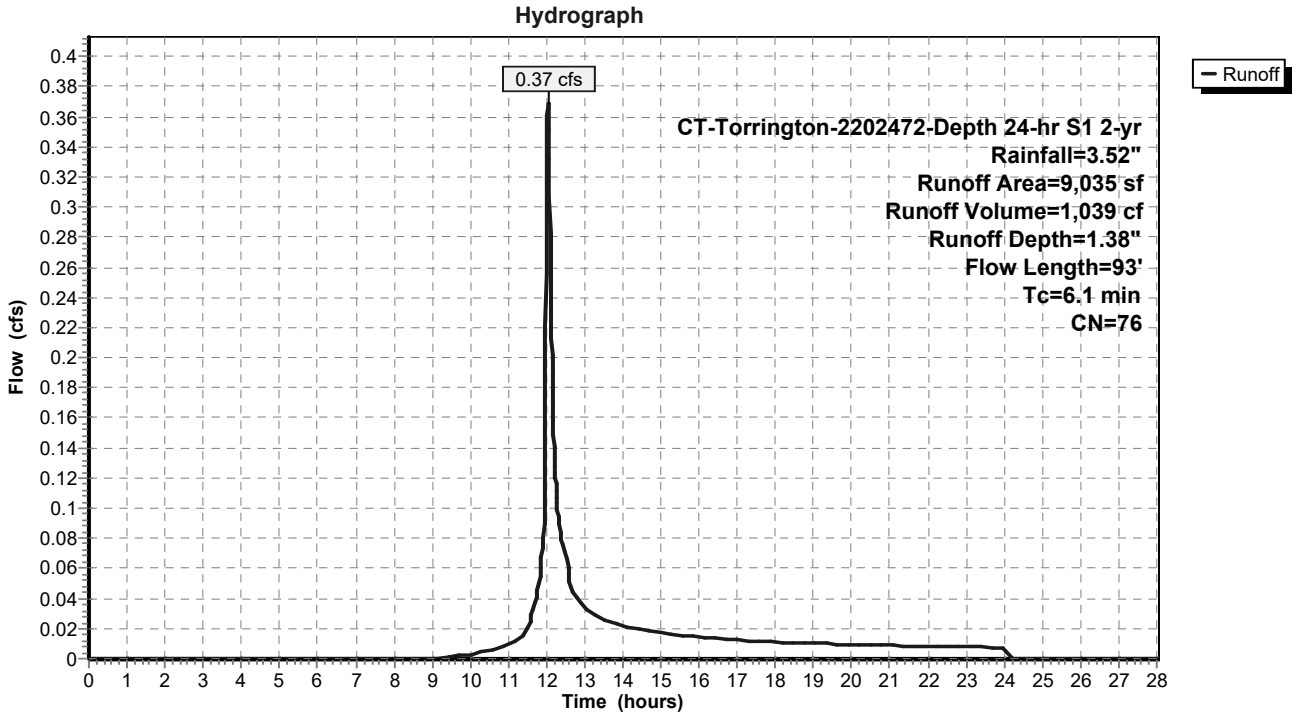
Runoff = 0.37 cfs @ 12.04 hrs, Volume= 1,039 cf, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 2-yr Rainfall=3.52"

	Area (sf)	CN	Description
*	4,980	98	Impervious, HSG A
	4,055	49	50-75% Grass cover, Fair, HSG A
	9,035	76	Weighted Average
	4,055		44.88% Pervious Area
	4,980		55.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	66	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	27	0.0200	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
6.1	93	Total			

Subcatchment EDA-30: Area Draining to Grove Street North



Summary for Subcatchment EDA-40: Area Draining to Brook Street South

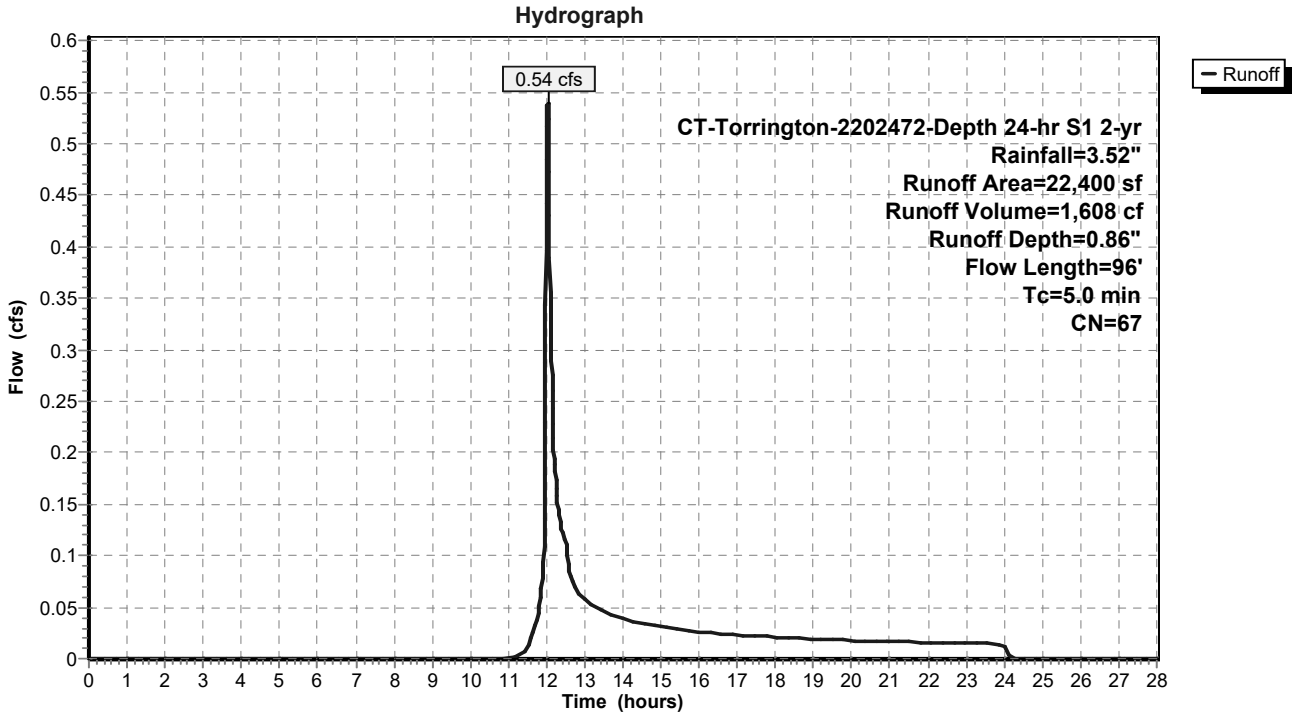
Runoff = 0.54 cfs @ 12.03 hrs, Volume= 1,608 cf, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 2-yr Rainfall=3.52"

	Area (sf)	CN	Description
*	8,130	98	Impervious, HSG A
	14,270	49	50-75% Grass cover, Fair, HSG A
	22,400	67	Weighted Average
	14,270		63.71% Pervious Area
	8,130		36.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	70	0.0600	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	26	0.4000	3.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
4.6	96	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-40: Area Draining to Brook Street South



Summary for Subcatchment EDA-50: Area Draining to Brook Street North

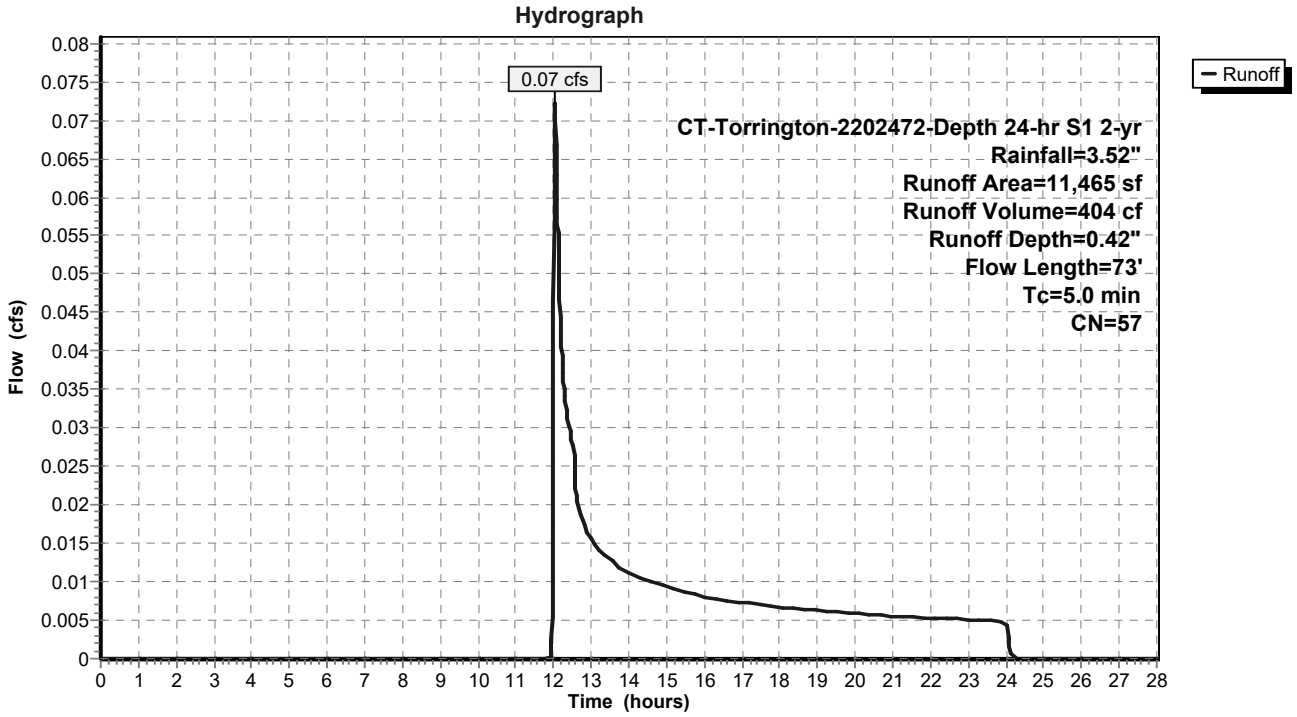
Runoff = 0.07 cfs @ 12.05 hrs, Volume= 404 cf, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 2-yr Rainfall=3.52"

	Area (sf)	CN	Description
*	1,985	98	Impervious, HSG A
	9,480	49	50-75% Grass cover, Fair, HSG A
	11,465	57	Weighted Average
	9,480		82.69% Pervious Area
	1,985		17.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	55	0.0500	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	18	0.6000	3.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
4.1	73	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-50: Area Draining to Brook Street North

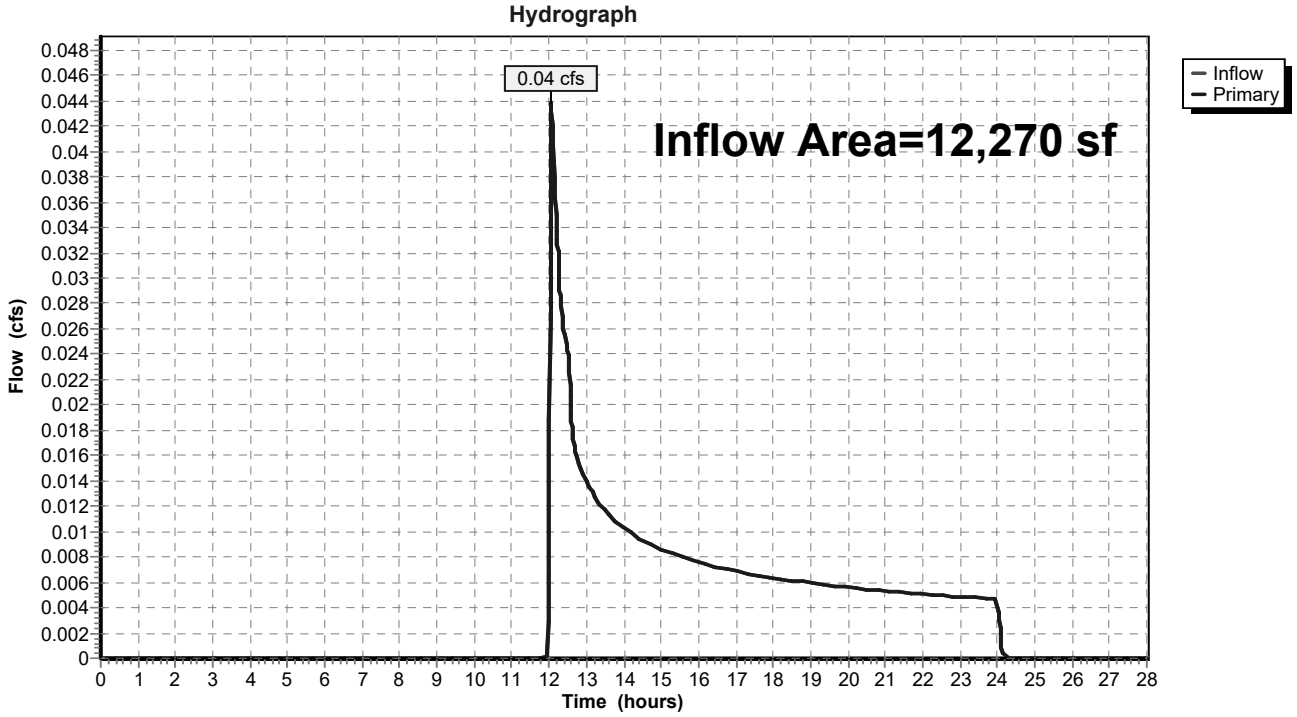


Summary for Link DP-1: Offsite West

Inflow Area = 12,270 sf, 12.84% Impervious, Inflow Depth = 0.35" for 2-yr event
Inflow = 0.04 cfs @ 12.06 hrs, Volume= 360 cf
Primary = 0.04 cfs @ 12.06 hrs, Volume= 360 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-1: Offsite West

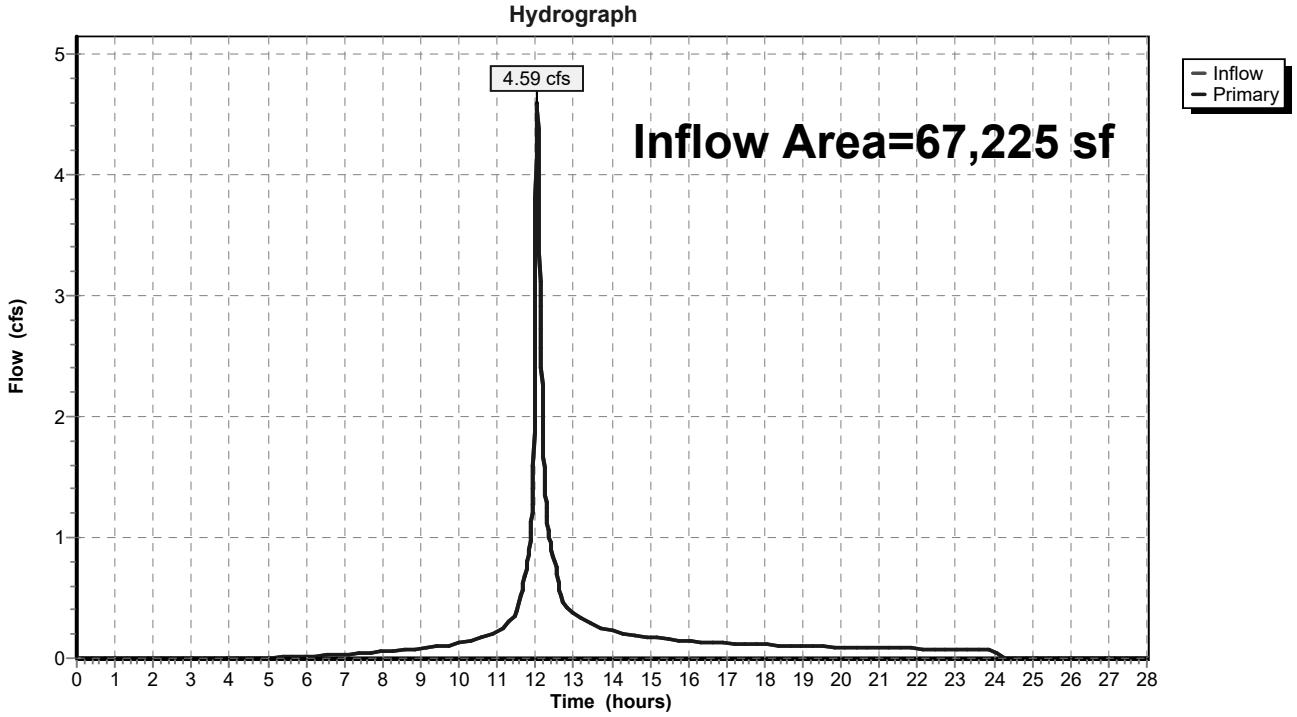


Summary for Link DP-2: Grove Street South

Inflow Area = 67,225 sf, 81.17% Impervious, Inflow Depth = 2.38" for 2-yr event
Inflow = 4.59 cfs @ 12.05 hrs, Volume= 13,309 cf
Primary = 4.59 cfs @ 12.05 hrs, Volume= 13,309 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-2: Grove Street South

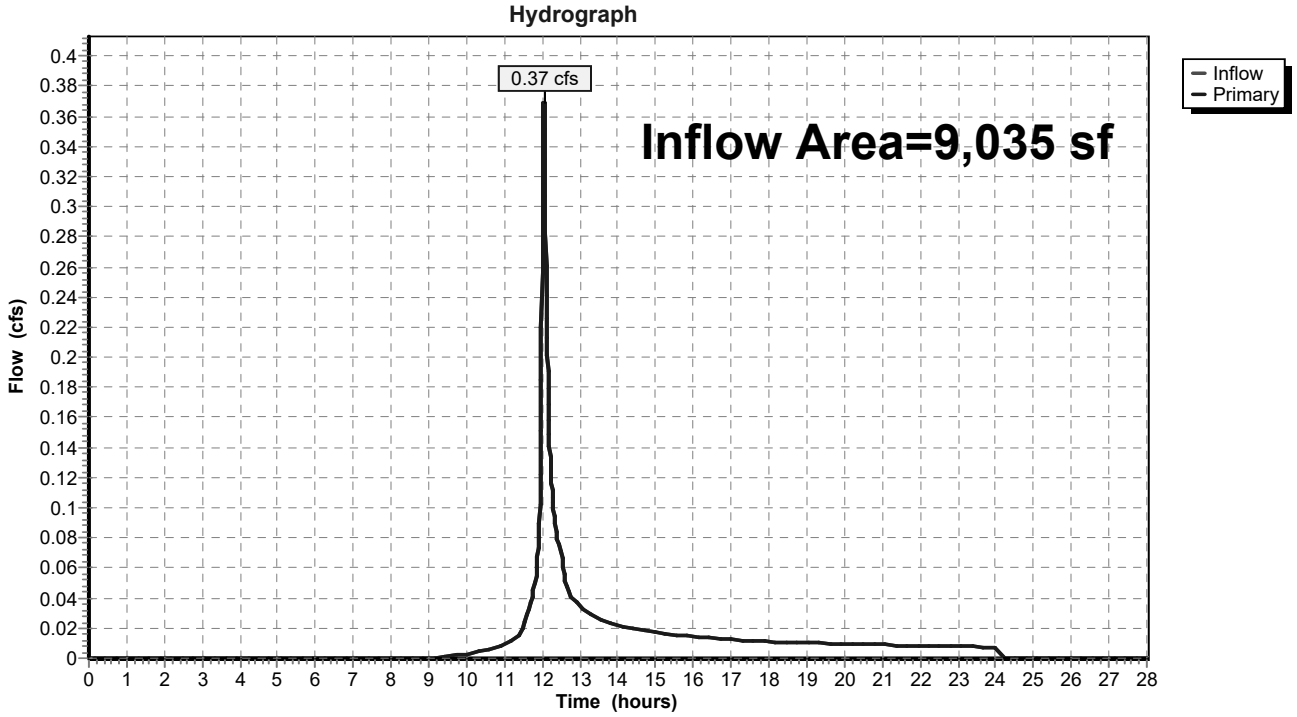


Summary for Link DP-3: Grove Street North

Inflow Area = 9,035 sf, 55.12% Impervious, Inflow Depth = 1.38" for 2-yr event
Inflow = 0.37 cfs @ 12.04 hrs, Volume= 1,039 cf
Primary = 0.37 cfs @ 12.04 hrs, Volume= 1,039 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-3: Grove Street North

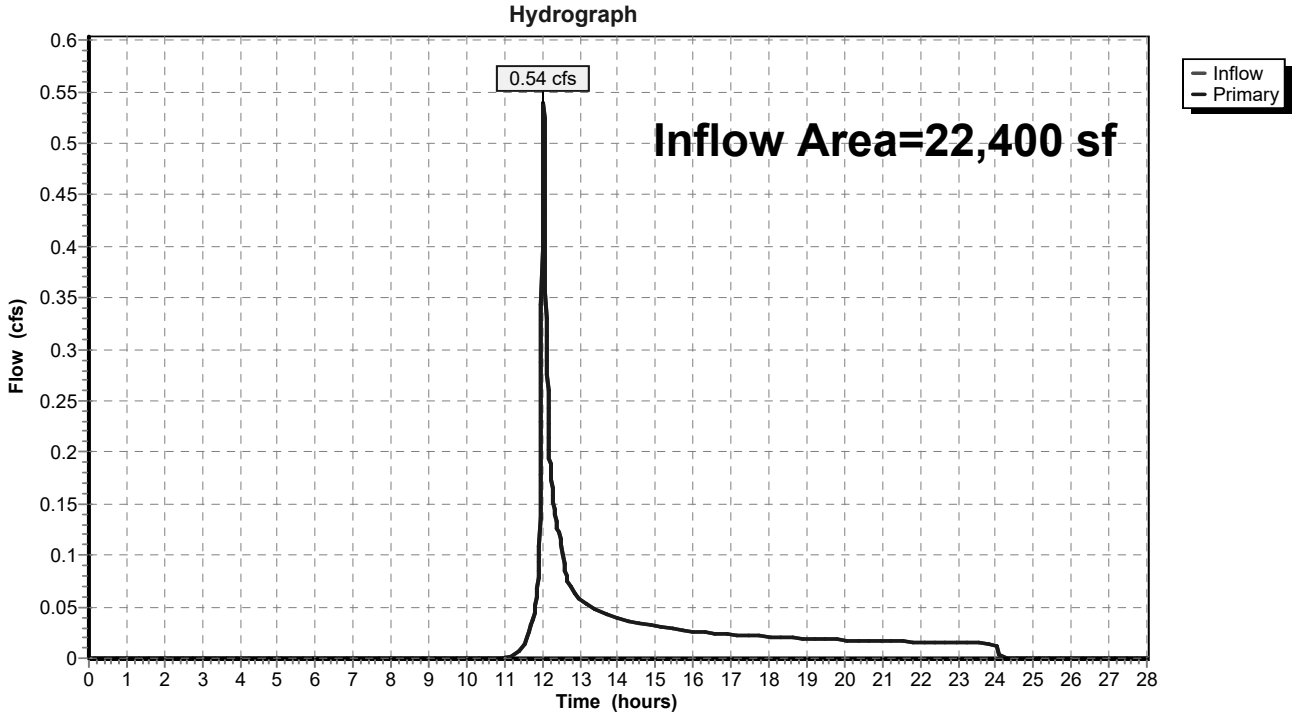


Summary for Link DP-4: Brook Street South

Inflow Area = 22,400 sf, 36.29% Impervious, Inflow Depth = 0.86" for 2-yr event
Inflow = 0.54 cfs @ 12.03 hrs, Volume= 1,608 cf
Primary = 0.54 cfs @ 12.03 hrs, Volume= 1,608 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-4: Brook Street South

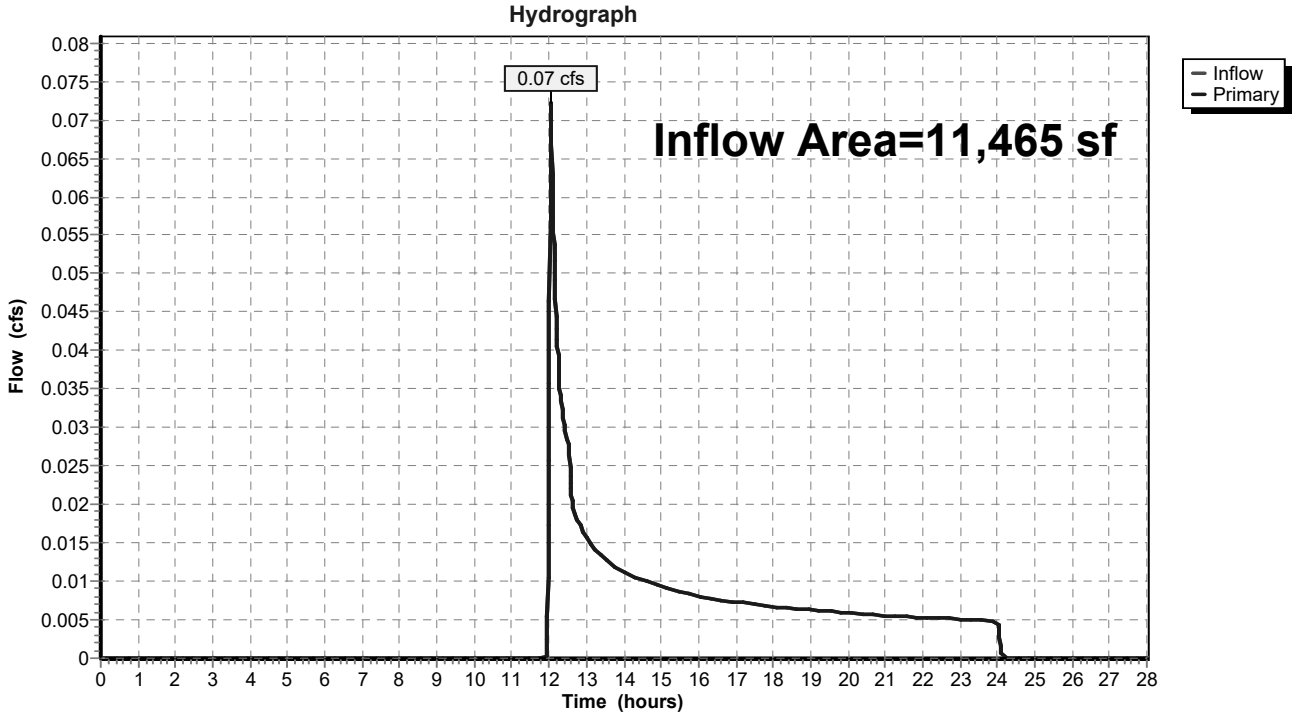


Summary for Link DP-5: Brook Street North

Inflow Area = 11,465 sf, 17.31% Impervious, Inflow Depth = 0.42" for 2-yr event
Inflow = 0.07 cfs @ 12.05 hrs, Volume= 404 cf
Primary = 0.07 cfs @ 12.05 hrs, Volume= 404 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-5: Brook Street North

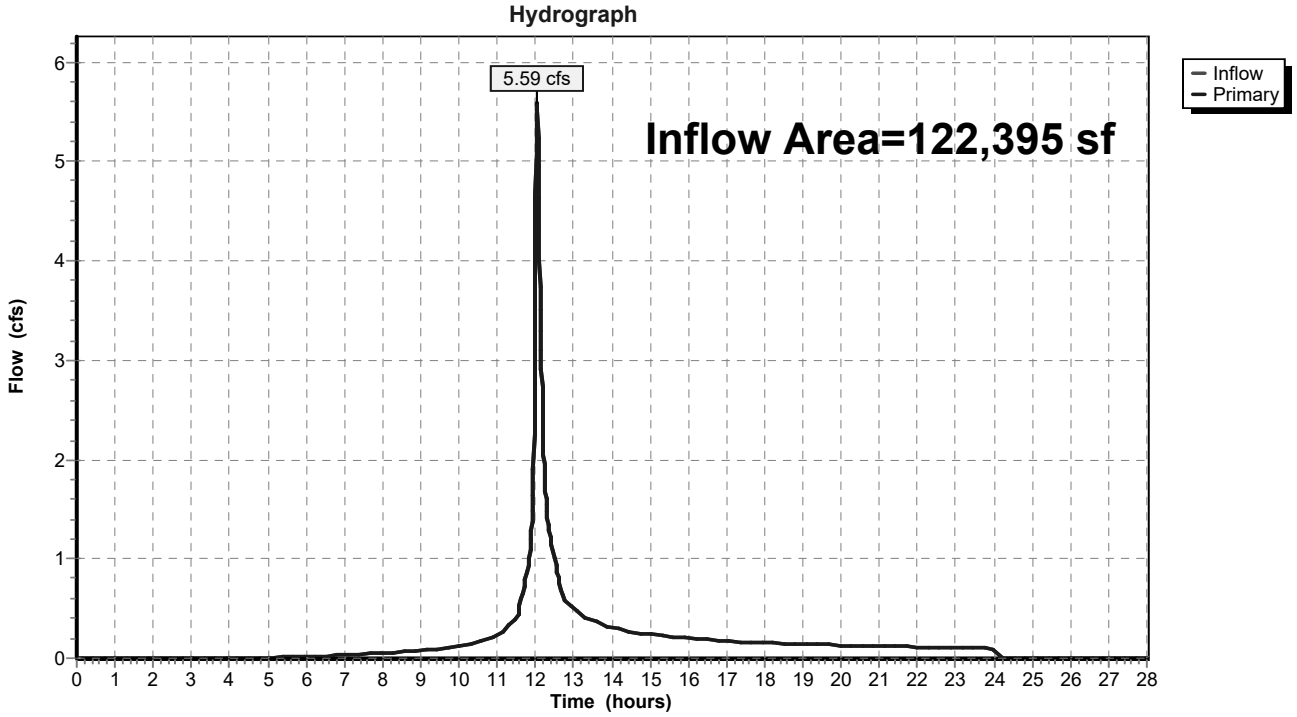


Summary for Link DP-6: Total Offsite Flow

Inflow Area = 122,395 sf, 58.20% Impervious, Inflow Depth = 1.64" for 2-yr event
Inflow = 5.59 cfs @ 12.05 hrs, Volume= 16,720 cf
Primary = 5.59 cfs @ 12.05 hrs, Volume= 16,720 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-6: Total Offsite Flow



Time span=0.00-28.00 hrs, dt=0.01 hrs, 2801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-10: Area Draining Runoff Area=12,270 sf 12.84% Impervious Runoff Depth=0.84"
Flow Length=50' Slope=0.0300 '/' Tc=5.0 min CN=55 Runoff=0.23 cfs 863 cf

Subcatchment EDA-20: Area Draining to Runoff Area=67,225 sf 81.17% Impervious Runoff Depth=3.50"
Flow Length=436' Tc=7.1 min CN=89 Runoff=6.29 cfs 19,632 cf

Subcatchment EDA-30: Area Draining to Runoff Area=9,035 sf 55.12% Impervious Runoff Depth=2.31"
Flow Length=93' Tc=6.1 min CN=76 Runoff=0.60 cfs 1,737 cf

Subcatchment EDA-40: Area Draining to Runoff Area=22,400 sf 36.29% Impervious Runoff Depth=1.61"
Flow Length=96' Tc=5.0 min CN=67 Runoff=1.05 cfs 3,007 cf

Subcatchment EDA-50: Area Draining to Runoff Area=11,465 sf 17.31% Impervious Runoff Depth=0.96"
Flow Length=73' Tc=5.0 min CN=57 Runoff=0.26 cfs 916 cf

Link DP-1: Offsite West Inflow=0.23 cfs 863 cf
Primary=0.23 cfs 863 cf

Link DP-2: Grove Street South Inflow=6.29 cfs 19,632 cf
Primary=6.29 cfs 19,632 cf

Link DP-3: Grove Street North Inflow=0.60 cfs 1,737 cf
Primary=0.60 cfs 1,737 cf

Link DP-4: Brook Street South Inflow=1.05 cfs 3,007 cf
Primary=1.05 cfs 3,007 cf

Link DP-5: Brook Street North Inflow=0.26 cfs 916 cf
Primary=0.26 cfs 916 cf

Link DP-6: Total Offsite Flow Inflow=8.37 cfs 26,155 cf
Primary=8.37 cfs 26,155 cf

Total Runoff Area = 122,395 sf Runoff Volume = 26,155 cf Average Runoff Depth = 2.56"
41.80% Pervious = 51,160 sf 58.20% Impervious = 71,235 sf

Summary for Subcatchment EDA-10: Area Draining Offsite to the West

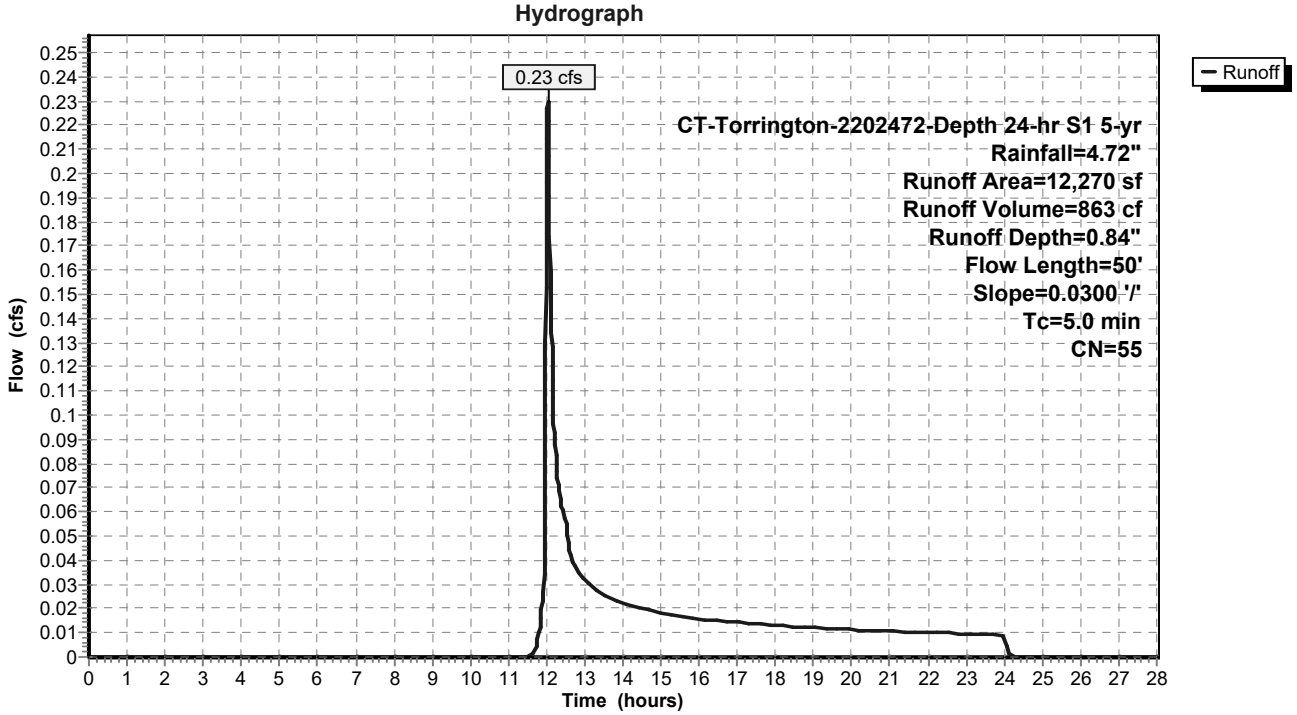
Runoff = 0.23 cfs @ 12.04 hrs, Volume= 863 cf, Depth= 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 5-yr Rainfall=4.72"

	Area (sf)	CN	Description
*	1,575	98	Impervious, HSG A
	10,695	49	50-75% Grass cover, Fair, HSG A
	12,270	55	Weighted Average
	10,695		87.16% Pervious Area
	1,575		12.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
4.6	50	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-10: Area Draining Offsite to the West



Summary for Subcatchment EDA-20: Area Draining to Grove Street South

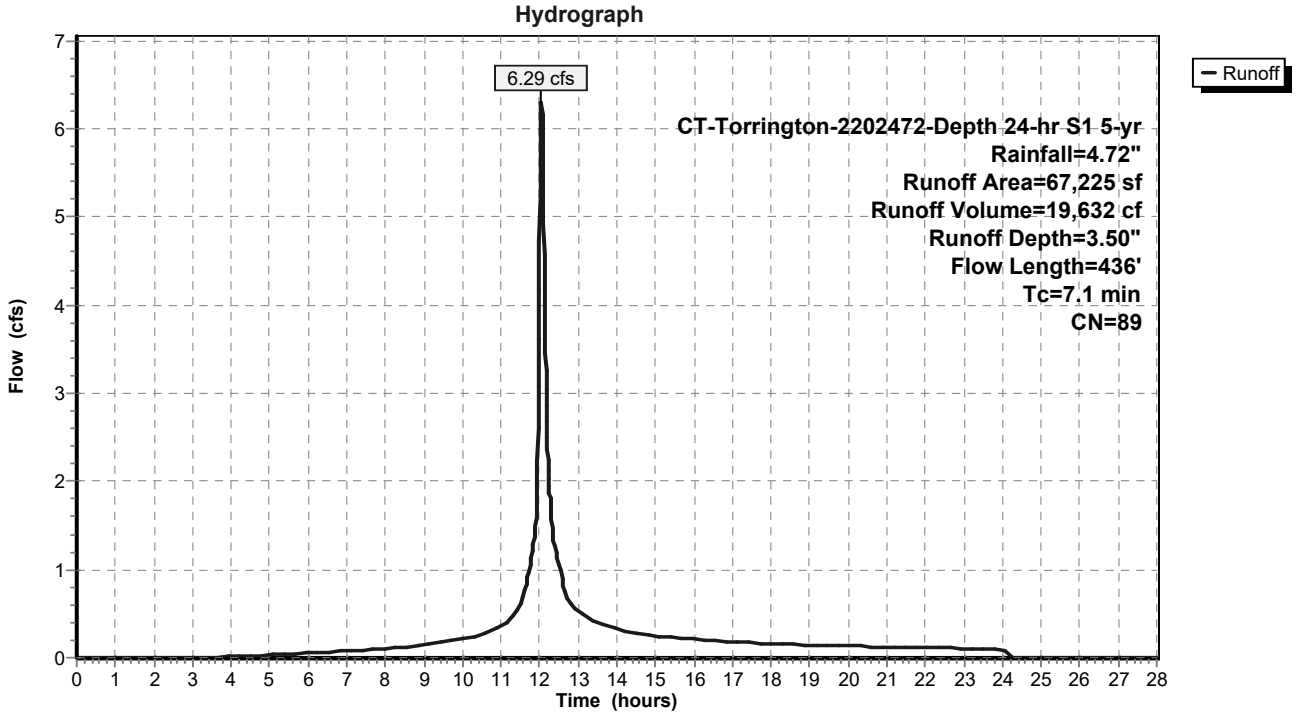
Runoff = 6.29 cfs @ 12.05 hrs, Volume= 19,632 cf, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 5-yr Rainfall=4.72"

	Area (sf)	CN	Description
*	54,565	98	Impervious, HSG A
	12,660	49	50-75% Grass cover, Fair, HSG A
	67,225	89	Weighted Average
	12,660		18.83% Pervious Area
	54,565		81.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	25	0.0200	1.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.1	361	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.1	436	Total			

Subcatchment EDA-20: Area Draining to Grove Street South



Summary for Subcatchment EDA-30: Area Draining to Grove Street North

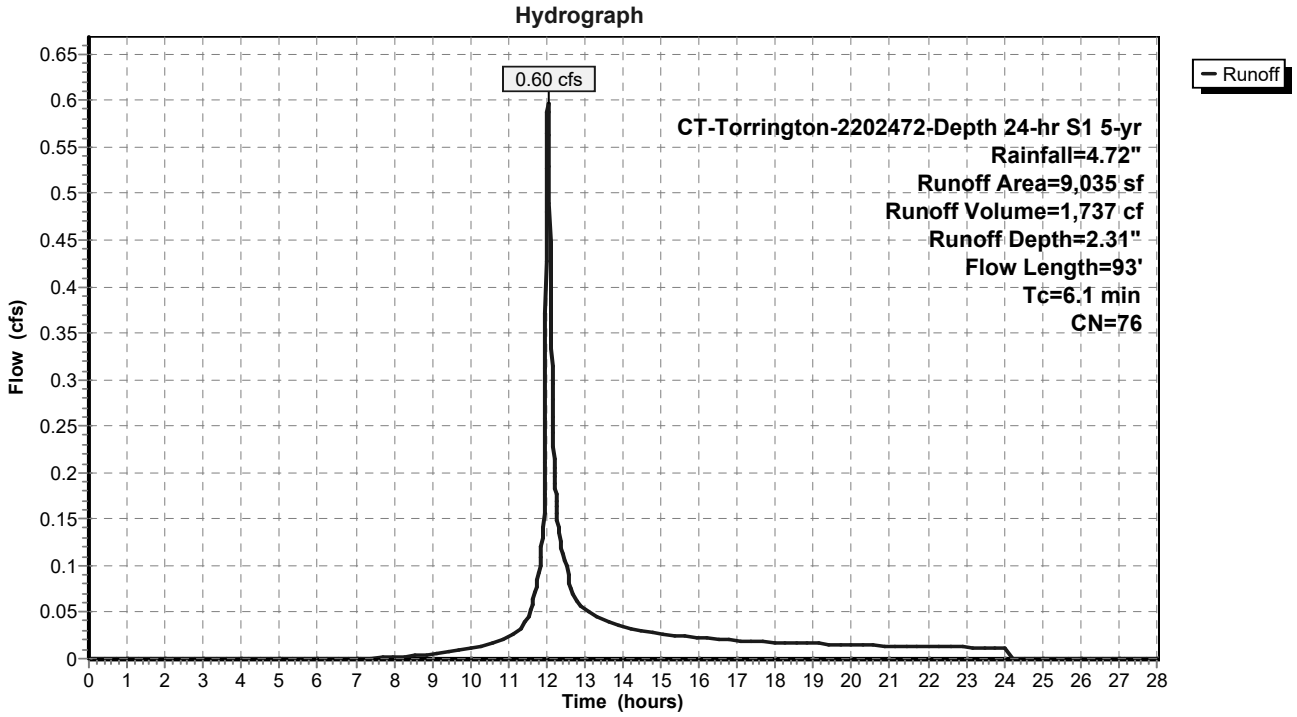
Runoff = 0.60 cfs @ 12.04 hrs, Volume= 1,737 cf, Depth= 2.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 5-yr Rainfall=4.72"

	Area (sf)	CN	Description
*	4,980	98	Impervious, HSG A
	4,055	49	50-75% Grass cover, Fair, HSG A
	9,035	76	Weighted Average
	4,055		44.88% Pervious Area
	4,980		55.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	66	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	27	0.0200	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
6.1	93	Total			

Subcatchment EDA-30: Area Draining to Grove Street North



Summary for Subcatchment EDA-40: Area Draining to Brook Street South

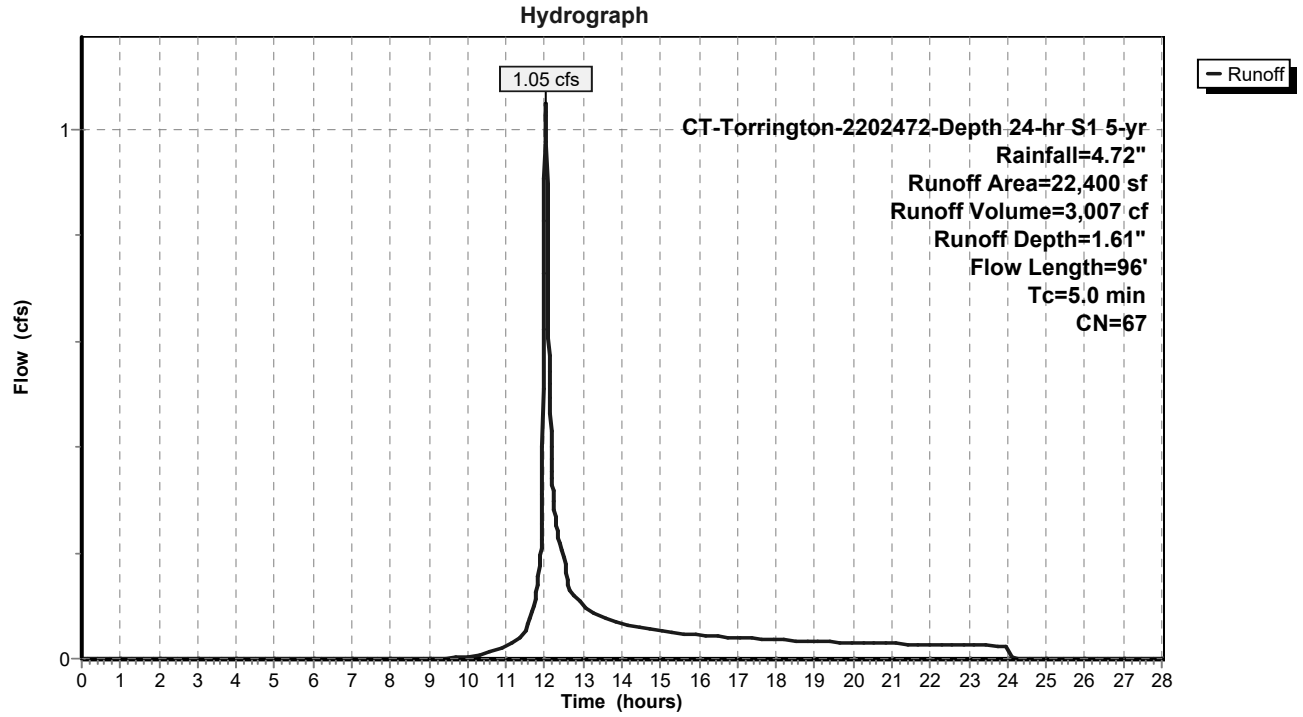
Runoff = 1.05 cfs @ 12.03 hrs, Volume= 3,007 cf, Depth= 1.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 5-yr Rainfall=4.72"

	Area (sf)	CN	Description
*	8,130	98	Impervious, HSG A
	14,270	49	50-75% Grass cover, Fair, HSG A
	22,400	67	Weighted Average
	14,270		63.71% Pervious Area
	8,130		36.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	70	0.0600	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	26	0.4000	3.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
4.6	96	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-40: Area Draining to Brook Street South



Summary for Subcatchment EDA-50: Area Draining to Brook Street North

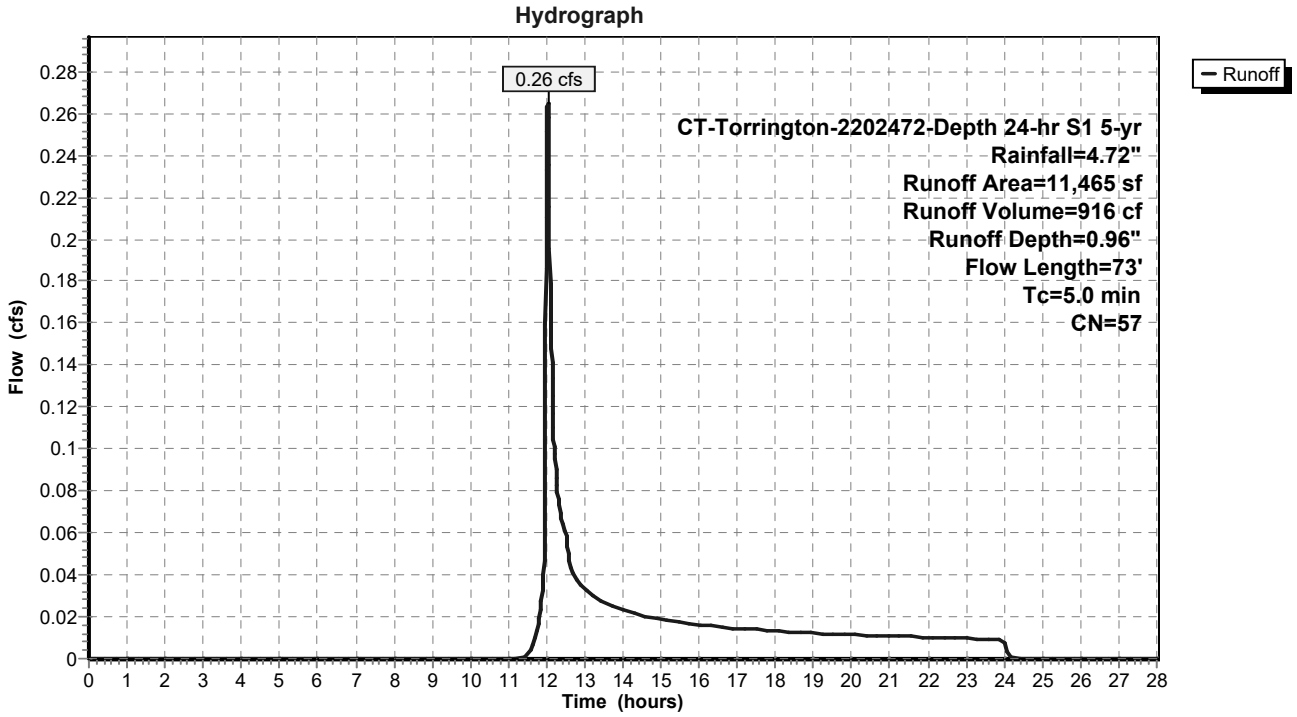
Runoff = 0.26 cfs @ 12.04 hrs, Volume= 916 cf, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 5-yr Rainfall=4.72"

	Area (sf)	CN	Description
*	1,985	98	Impervious, HSG A
	9,480	49	50-75% Grass cover, Fair, HSG A
	11,465	57	Weighted Average
	9,480		82.69% Pervious Area
	1,985		17.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	55	0.0500	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	18	0.6000	3.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
4.1	73	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-50: Area Draining to Brook Street North

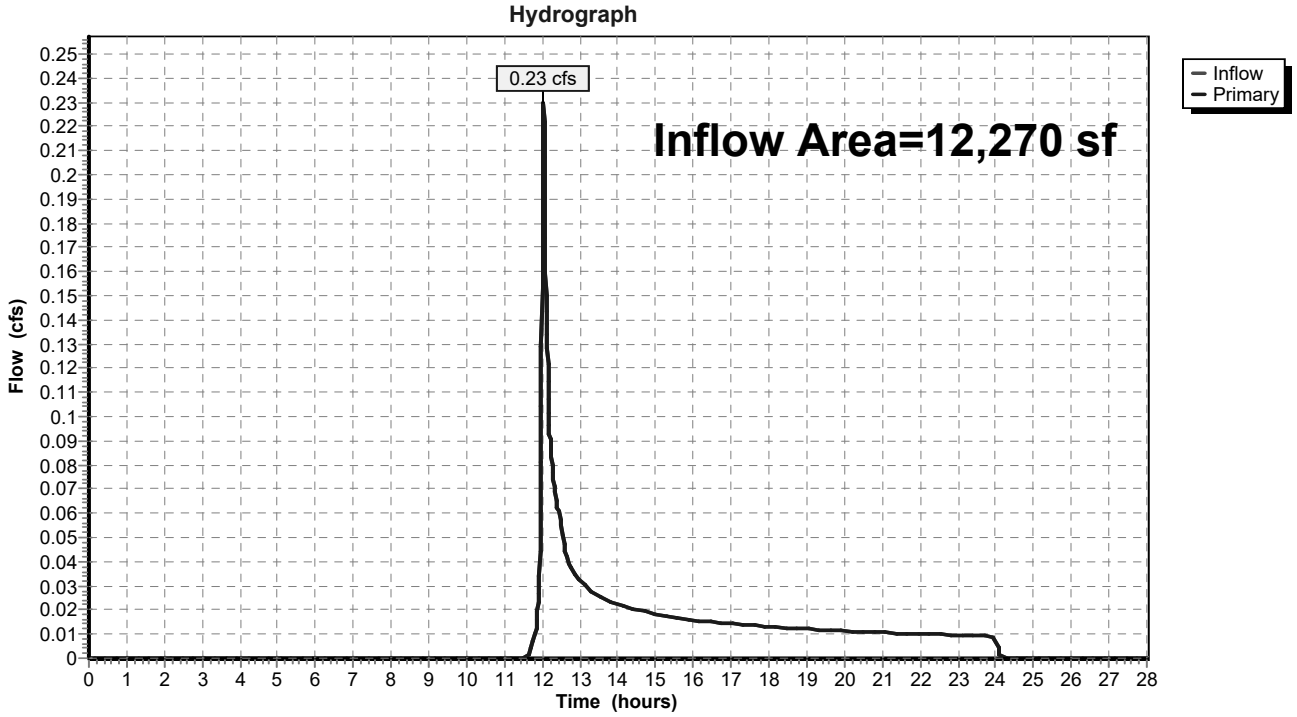


Summary for Link DP-1: Offsite West

Inflow Area = 12,270 sf, 12.84% Impervious, Inflow Depth = 0.84" for 5-yr event
Inflow = 0.23 cfs @ 12.04 hrs, Volume= 863 cf
Primary = 0.23 cfs @ 12.04 hrs, Volume= 863 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-1: Offsite West

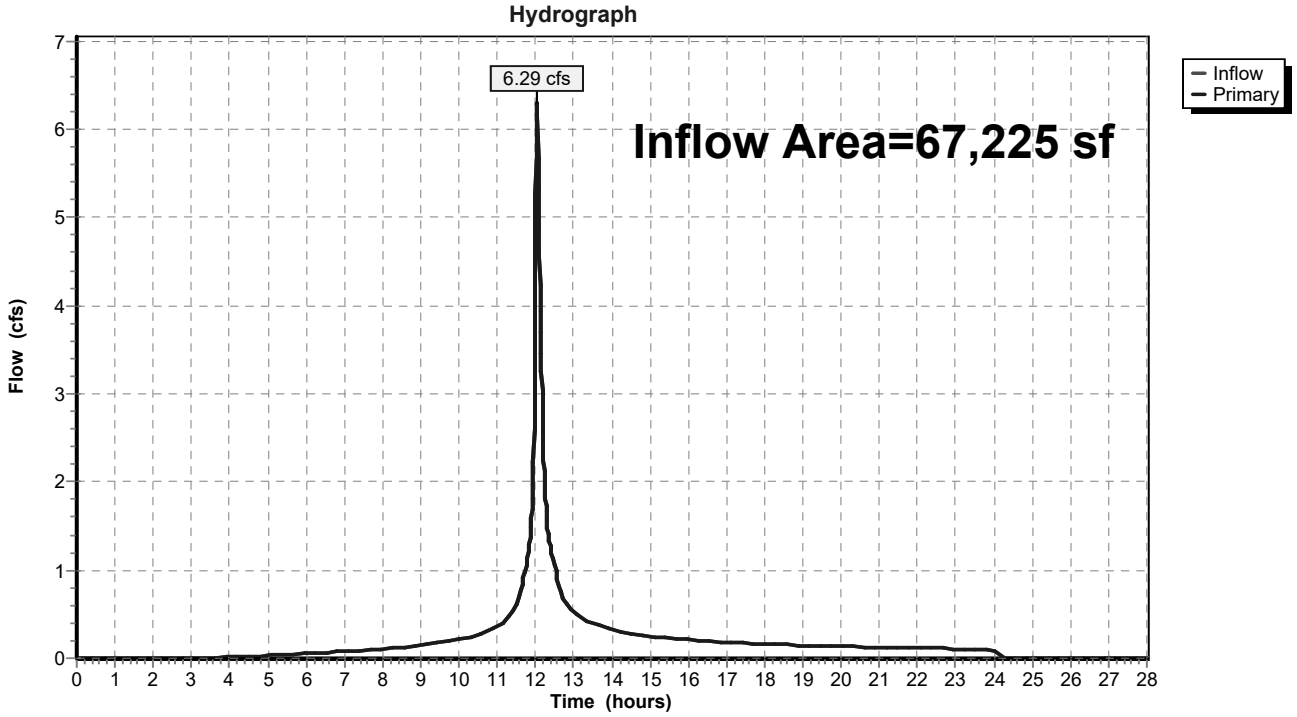


Summary for Link DP-2: Grove Street South

Inflow Area = 67,225 sf, 81.17% Impervious, Inflow Depth = 3.50" for 5-yr event
Inflow = 6.29 cfs @ 12.05 hrs, Volume= 19,632 cf
Primary = 6.29 cfs @ 12.05 hrs, Volume= 19,632 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-2: Grove Street South

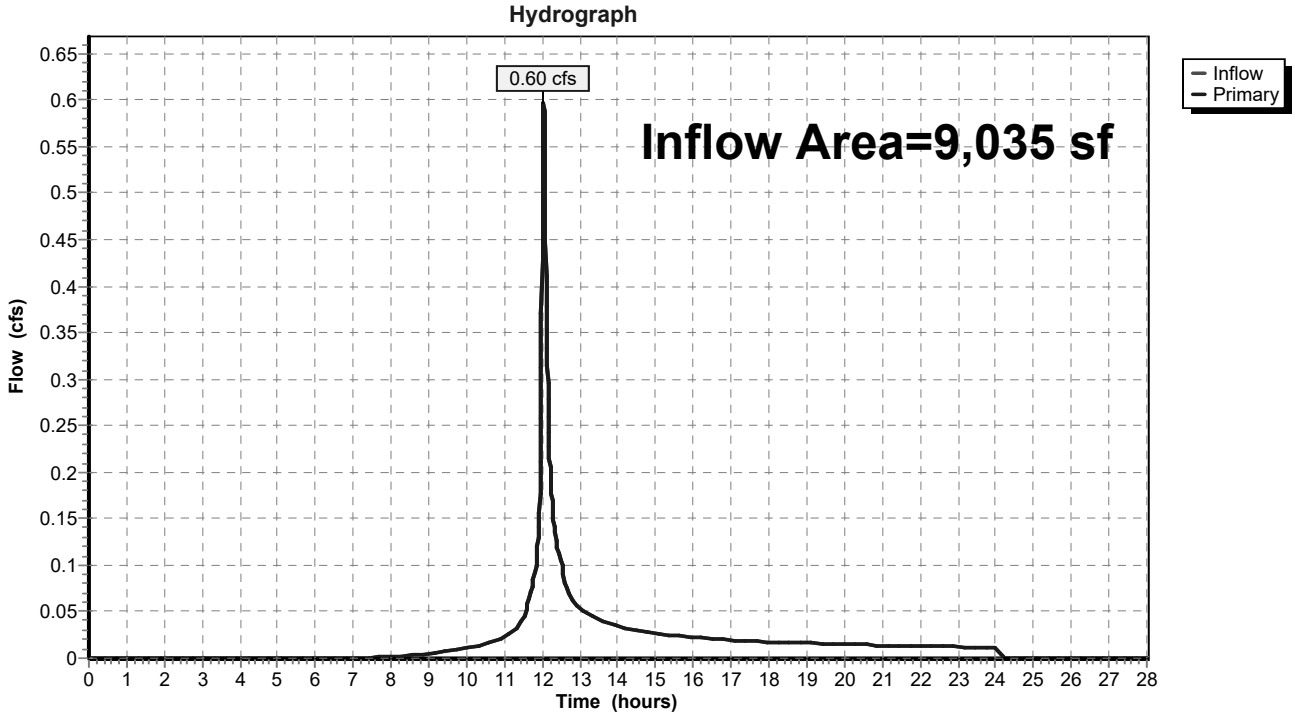


Summary for Link DP-3: Grove Street North

Inflow Area = 9,035 sf, 55.12% Impervious, Inflow Depth = 2.31" for 5-yr event
Inflow = 0.60 cfs @ 12.04 hrs, Volume= 1,737 cf
Primary = 0.60 cfs @ 12.04 hrs, Volume= 1,737 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-3: Grove Street North

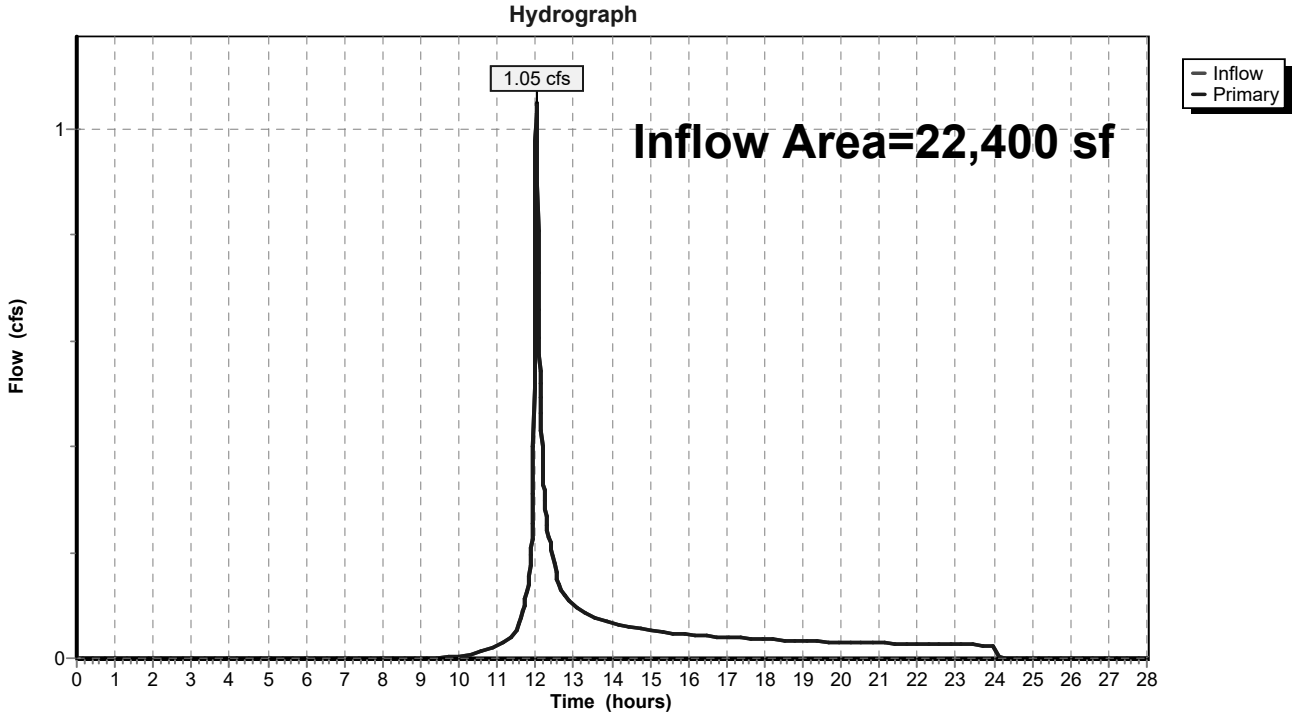


Summary for Link DP-4: Brook Street South

Inflow Area = 22,400 sf, 36.29% Impervious, Inflow Depth = 1.61" for 5-yr event
Inflow = 1.05 cfs @ 12.03 hrs, Volume= 3,007 cf
Primary = 1.05 cfs @ 12.03 hrs, Volume= 3,007 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-4: Brook Street South

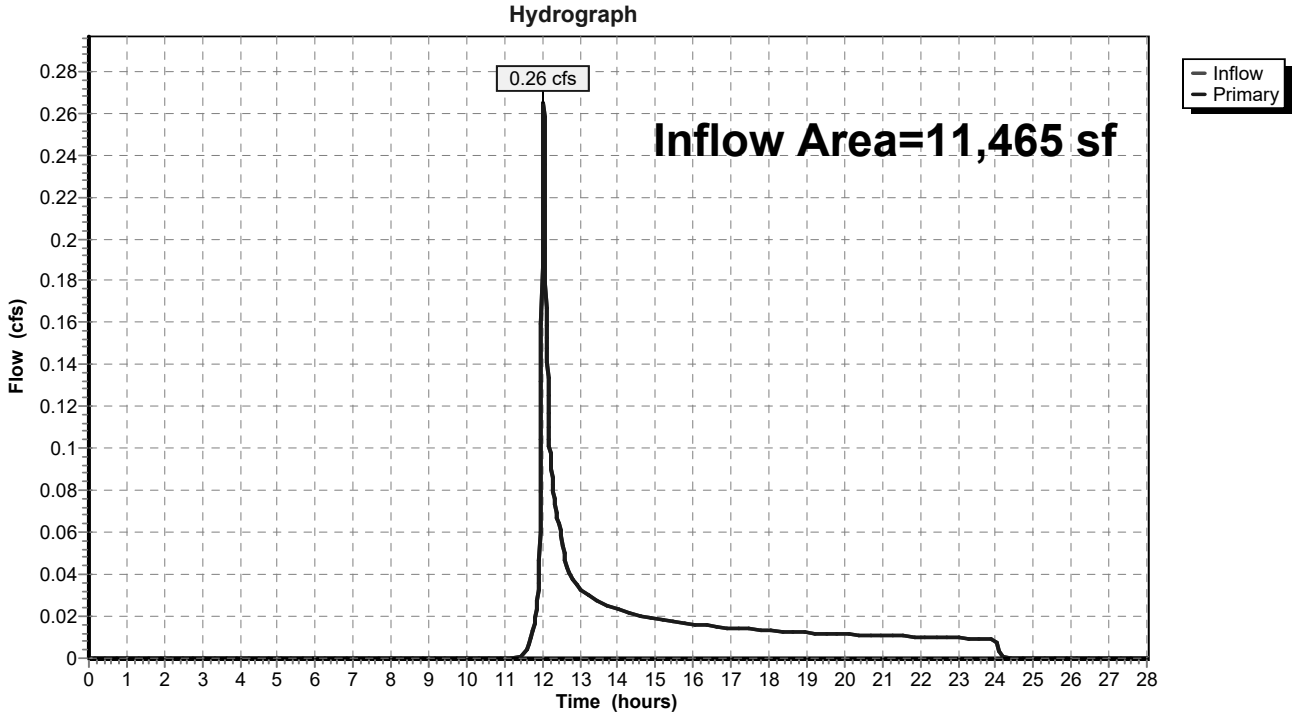


Summary for Link DP-5: Brook Street North

Inflow Area = 11,465 sf, 17.31% Impervious, Inflow Depth = 0.96" for 5-yr event
Inflow = 0.26 cfs @ 12.04 hrs, Volume= 916 cf
Primary = 0.26 cfs @ 12.04 hrs, Volume= 916 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-5: Brook Street North

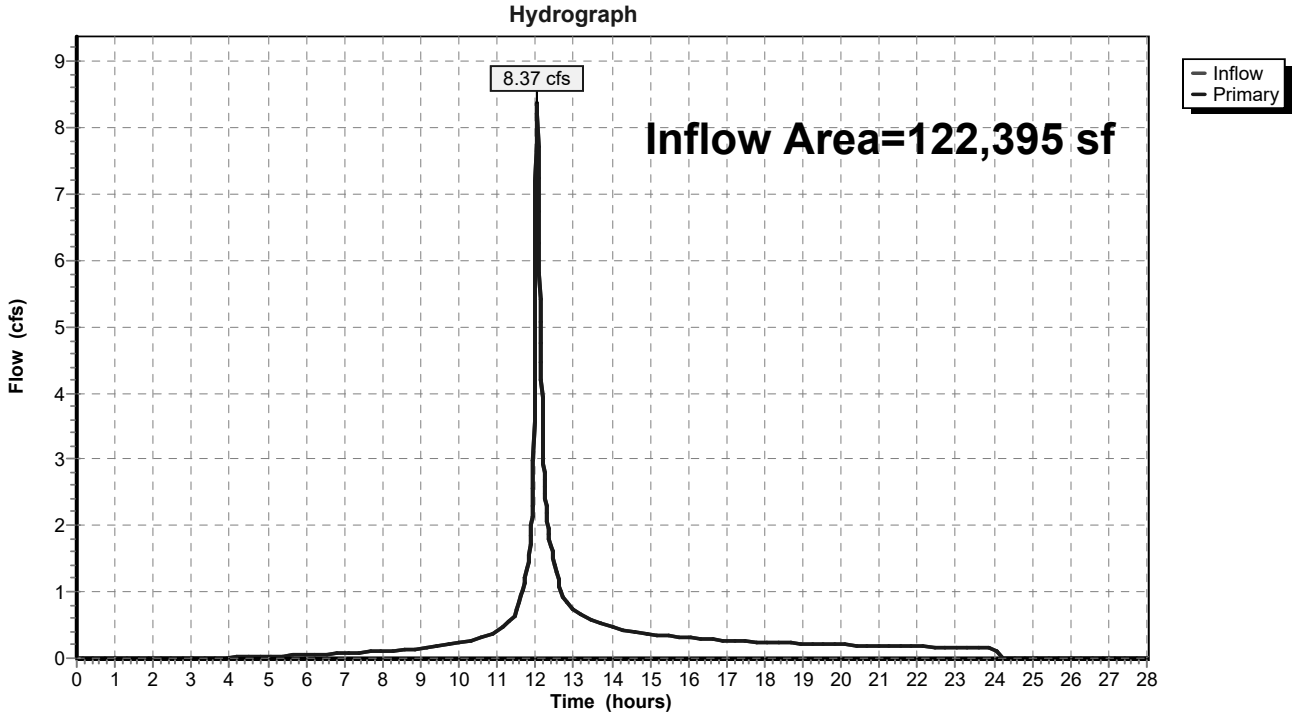


Summary for Link DP-6: Total Offsite Flow

Inflow Area = 122,395 sf, 58.20% Impervious, Inflow Depth = 2.56" for 5-yr event
Inflow = 8.37 cfs @ 12.04 hrs, Volume= 26,155 cf
Primary = 8.37 cfs @ 12.04 hrs, Volume= 26,155 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-6: Total Offsite Flow



Time span=0.00-28.00 hrs, dt=0.01 hrs, 2801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-10: Area Draining Runoff Area=12,270 sf 12.84% Impervious Runoff Depth=1.35"
Flow Length=50' Slope=0.0300 '/' Tc=5.0 min CN=55 Runoff=0.42 cfs 1,385 cf

Subcatchment EDA-20: Area Draining to Runoff Area=67,225 sf 81.17% Impervious Runoff Depth=4.45"
Flow Length=436' Tc=7.1 min CN=89 Runoff=7.68 cfs 24,957 cf

Subcatchment EDA-30: Area Draining to Runoff Area=9,035 sf 55.12% Impervious Runoff Depth=3.13"
Flow Length=93' Tc=6.1 min CN=76 Runoff=0.79 cfs 2,358 cf

Subcatchment EDA-40: Area Draining to Runoff Area=22,400 sf 36.29% Impervious Runoff Depth=2.31"
Flow Length=96' Tc=5.0 min CN=67 Runoff=1.51 cfs 4,318 cf

Subcatchment EDA-50: Area Draining to Runoff Area=11,465 sf 17.31% Impervious Runoff Depth=1.50"
Flow Length=73' Tc=5.0 min CN=57 Runoff=0.45 cfs 1,436 cf

Link DP-1: Offsite West Inflow=0.42 cfs 1,385 cf
Primary=0.42 cfs 1,385 cf

Link DP-2: Grove Street South Inflow=7.68 cfs 24,957 cf
Primary=7.68 cfs 24,957 cf

Link DP-3: Grove Street North Inflow=0.79 cfs 2,358 cf
Primary=0.79 cfs 2,358 cf

Link DP-4: Brook Street South Inflow=1.51 cfs 4,318 cf
Primary=1.51 cfs 4,318 cf

Link DP-5: Brook Street North Inflow=0.45 cfs 1,436 cf
Primary=0.45 cfs 1,436 cf

Link DP-6: Total Offsite Flow Inflow=10.75 cfs 34,453 cf
Primary=10.75 cfs 34,453 cf

Total Runoff Area = 122,395 sf Runoff Volume = 34,453 cf Average Runoff Depth = 3.38"
41.80% Pervious = 51,160 sf 58.20% Impervious = 71,235 sf

Summary for Subcatchment EDA-10: Area Draining Offsite to the West

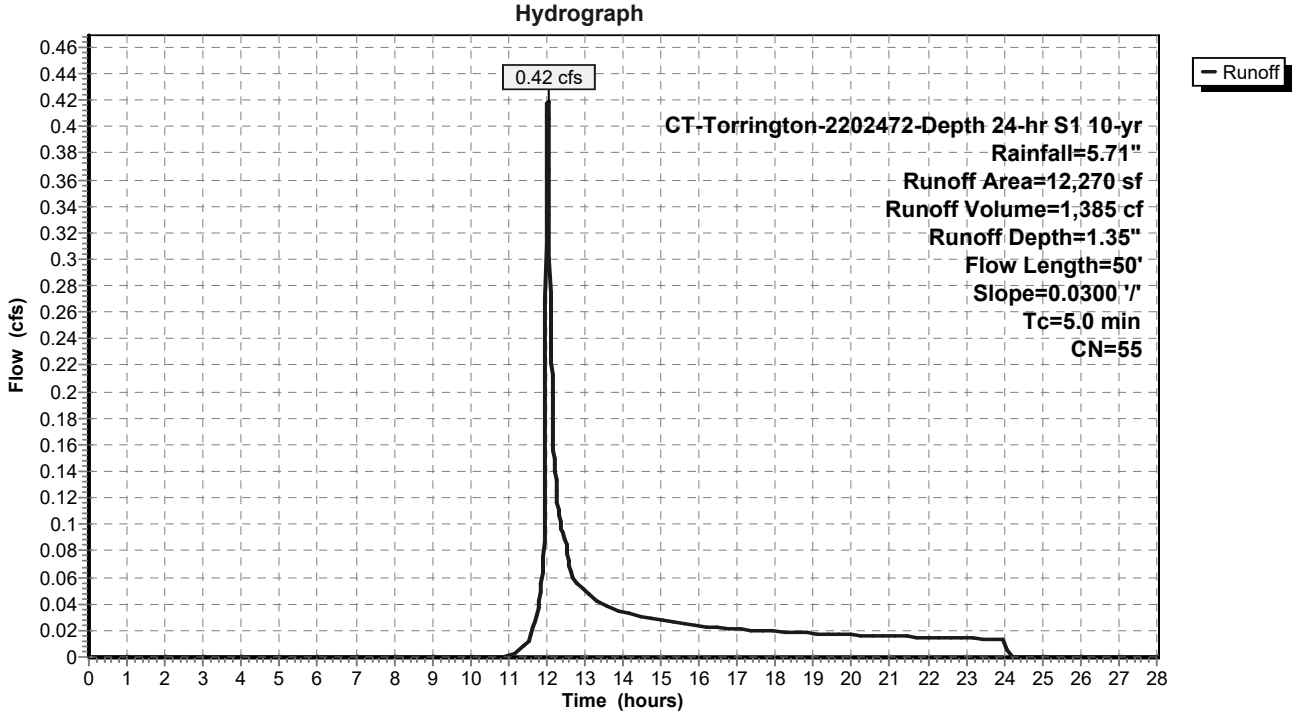
Runoff = 0.42 cfs @ 12.03 hrs, Volume= 1,385 cf, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 10-yr Rainfall=5.71"

	Area (sf)	CN	Description
*	1,575	98	Impervious, HSG A
	10,695	49	50-75% Grass cover, Fair, HSG A
	12,270	55	Weighted Average
	10,695		87.16% Pervious Area
	1,575		12.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
4.6	50	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-10: Area Draining Offsite to the West



Summary for Subcatchment EDA-20: Area Draining to Grove Street South

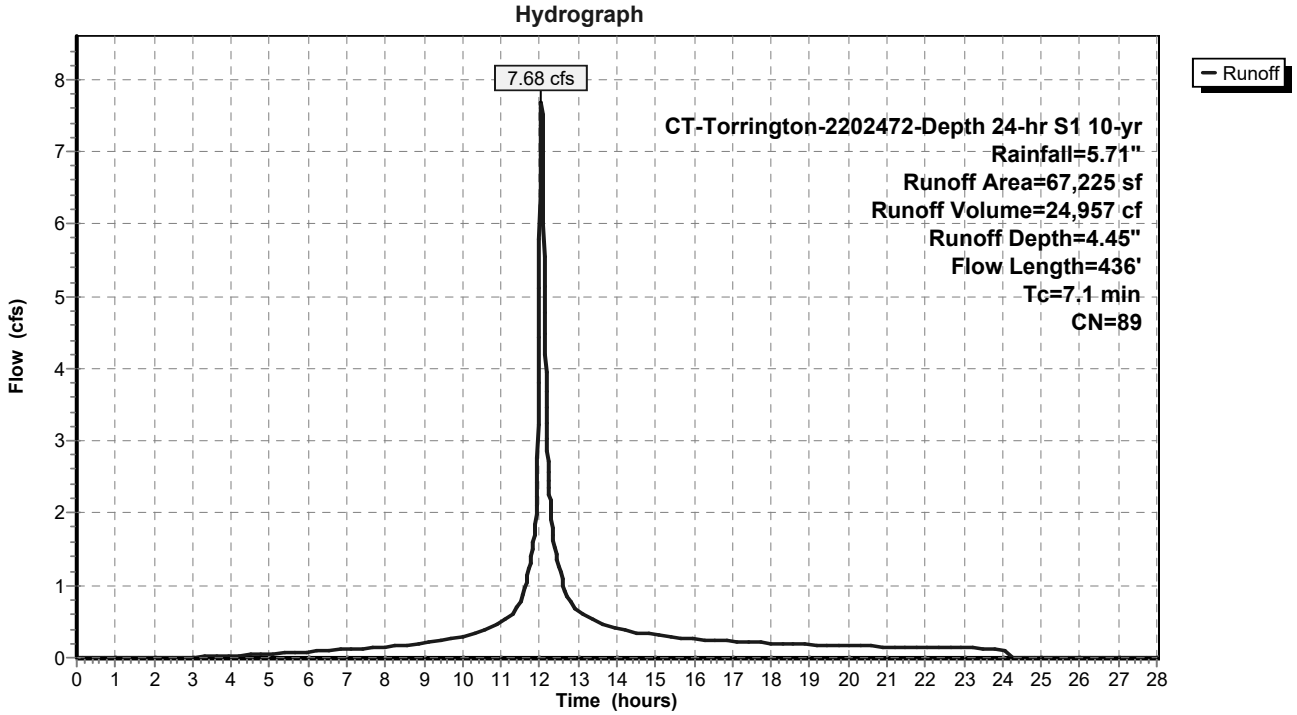
Runoff = 7.68 cfs @ 12.05 hrs, Volume= 24,957 cf, Depth= 4.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 10-yr Rainfall=5.71"

	Area (sf)	CN	Description
*	54,565	98	Impervious, HSG A
	12,660	49	50-75% Grass cover, Fair, HSG A
	67,225	89	Weighted Average
	12,660		18.83% Pervious Area
	54,565		81.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	25	0.0200	1.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.1	361	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.1	436	Total			

Subcatchment EDA-20: Area Draining to Grove Street South



Summary for Subcatchment EDA-30: Area Draining to Grove Street North

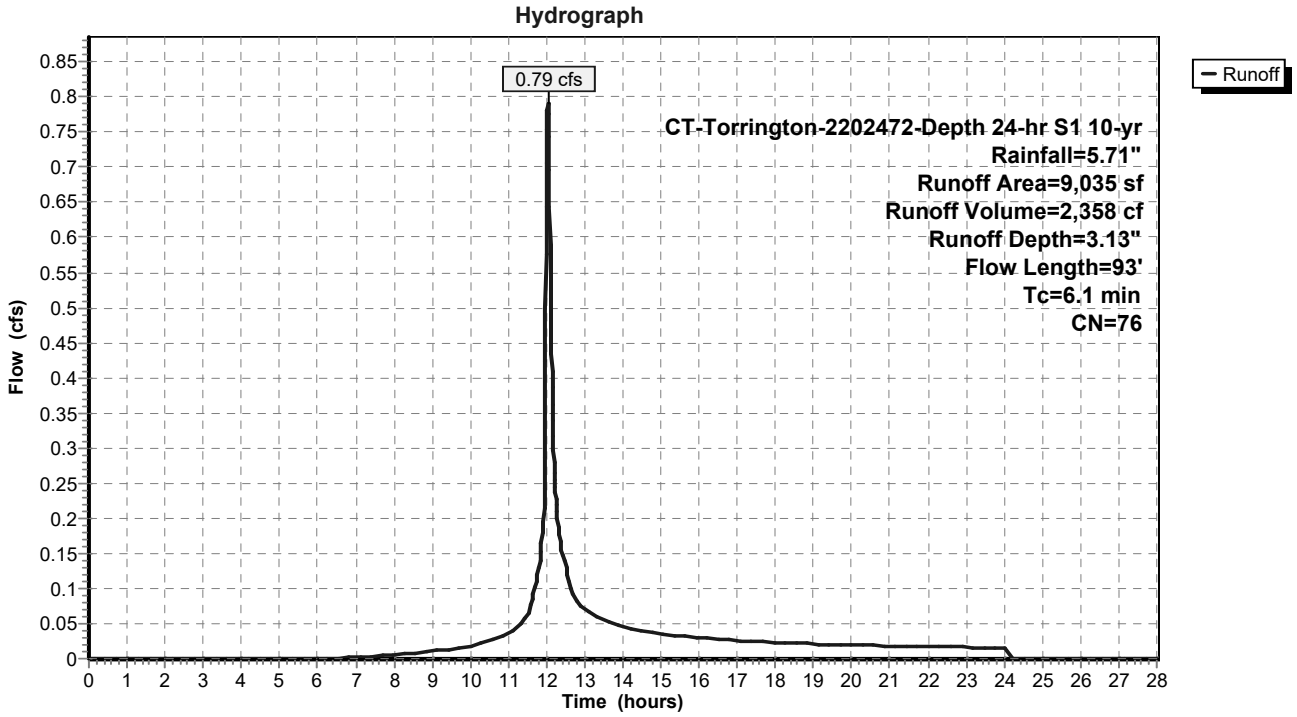
Runoff = 0.79 cfs @ 12.04 hrs, Volume= 2,358 cf, Depth= 3.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 10-yr Rainfall=5.71"

	Area (sf)	CN	Description
*	4,980	98	Impervious, HSG A
	4,055	49	50-75% Grass cover, Fair, HSG A
	9,035	76	Weighted Average
	4,055		44.88% Pervious Area
	4,980		55.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	66	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	27	0.0200	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
6.1	93	Total			

Subcatchment EDA-30: Area Draining to Grove Street North



Summary for Subcatchment EDA-40: Area Draining to Brook Street South

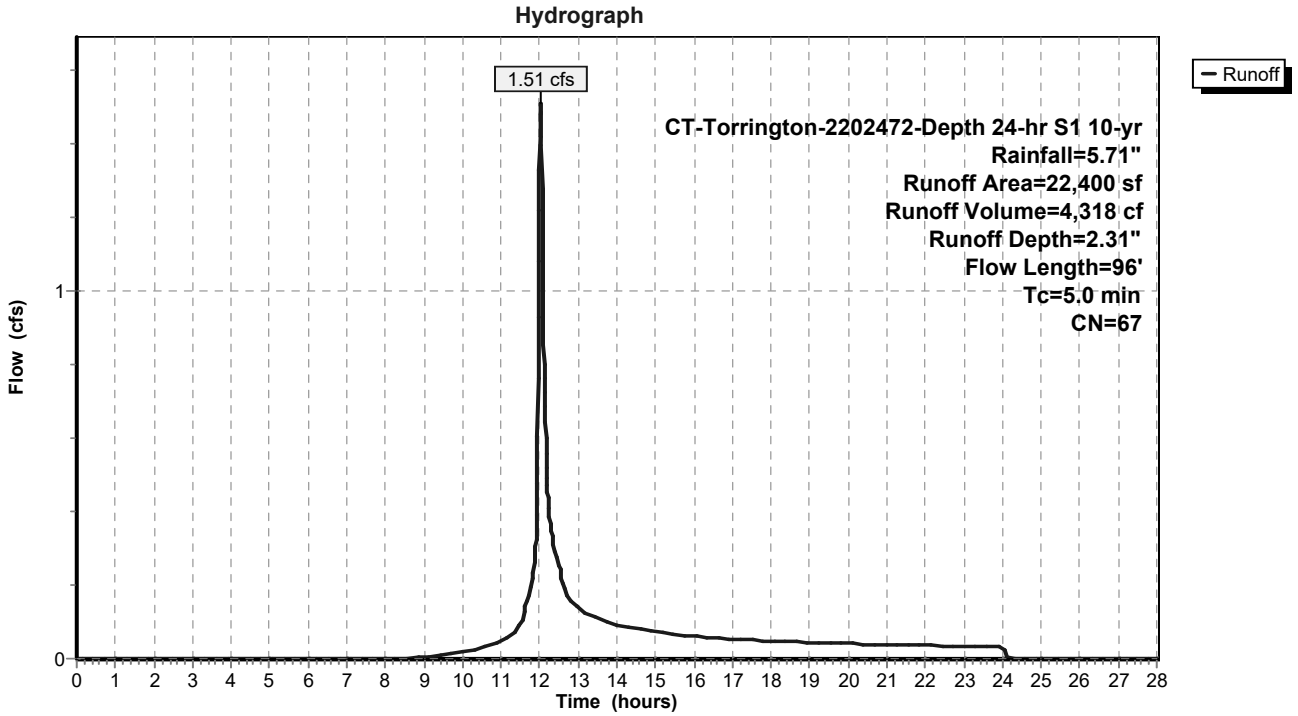
Runoff = 1.51 cfs @ 12.03 hrs, Volume= 4,318 cf, Depth= 2.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 10-yr Rainfall=5.71"

	Area (sf)	CN	Description
*	8,130	98	Impervious, HSG A
	14,270	49	50-75% Grass cover, Fair, HSG A
	22,400	67	Weighted Average
	14,270		63.71% Pervious Area
	8,130		36.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	70	0.0600	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	26	0.4000	3.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
4.6	96	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-40: Area Draining to Brook Street South



Summary for Subcatchment EDA-50: Area Draining to Brook Street North

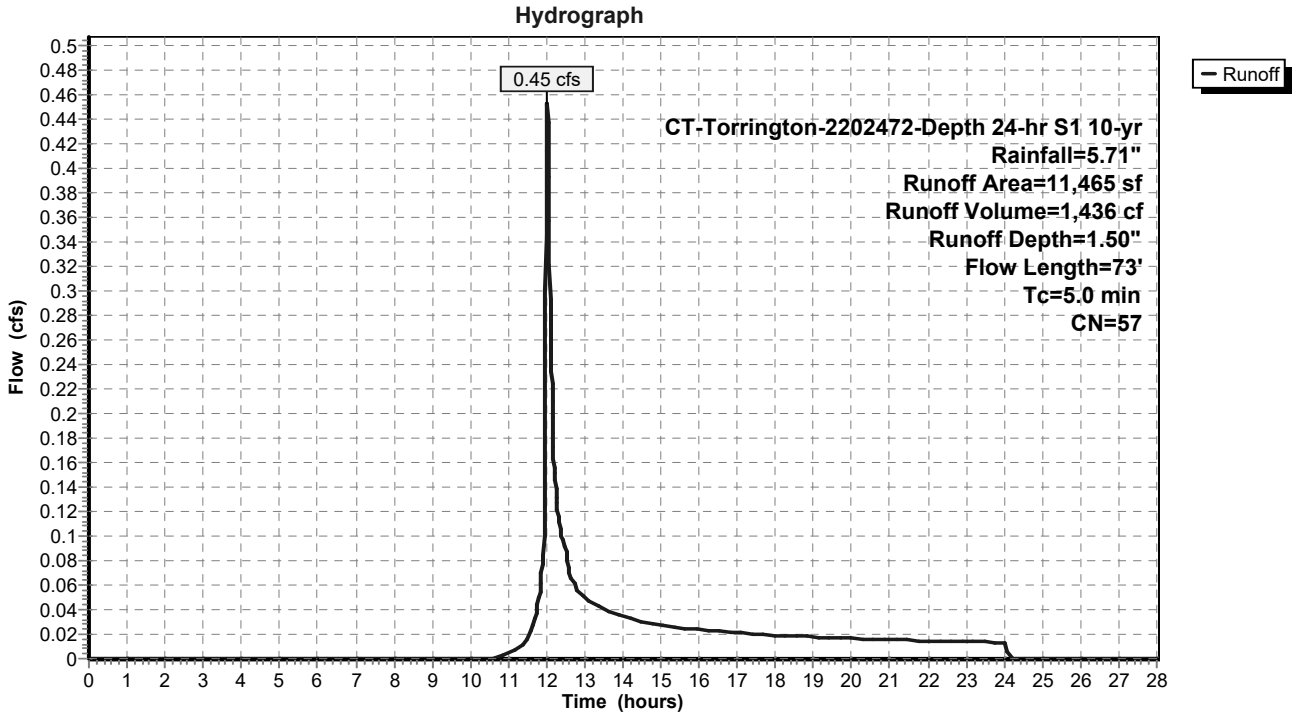
Runoff = 0.45 cfs @ 12.03 hrs, Volume= 1,436 cf, Depth= 1.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 10-yr Rainfall=5.71"

	Area (sf)	CN	Description
*	1,985	98	Impervious, HSG A
	9,480	49	50-75% Grass cover, Fair, HSG A
	11,465	57	Weighted Average
	9,480		82.69% Pervious Area
	1,985		17.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	55	0.0500	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	18	0.6000	3.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
4.1	73	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-50: Area Draining to Brook Street North

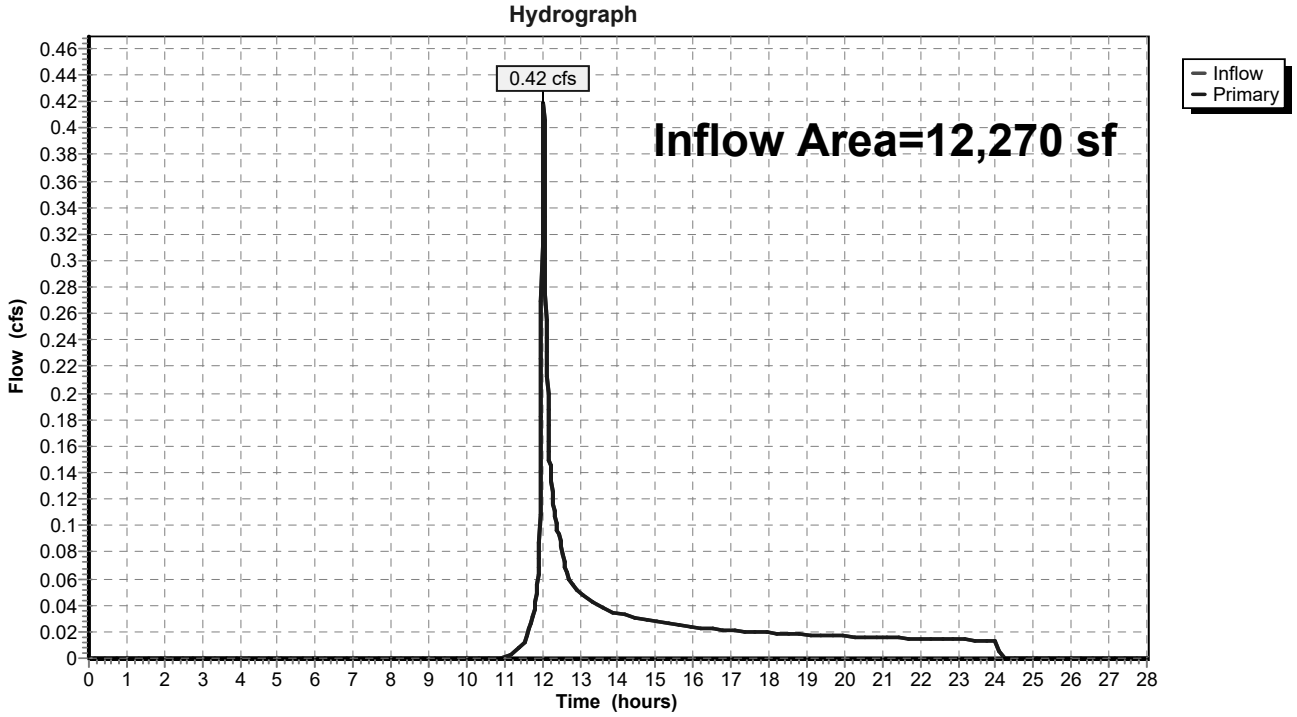


Summary for Link DP-1: Offsite West

Inflow Area = 12,270 sf, 12.84% Impervious, Inflow Depth = 1.35" for 10-yr event
Inflow = 0.42 cfs @ 12.03 hrs, Volume= 1,385 cf
Primary = 0.42 cfs @ 12.03 hrs, Volume= 1,385 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-1: Offsite West

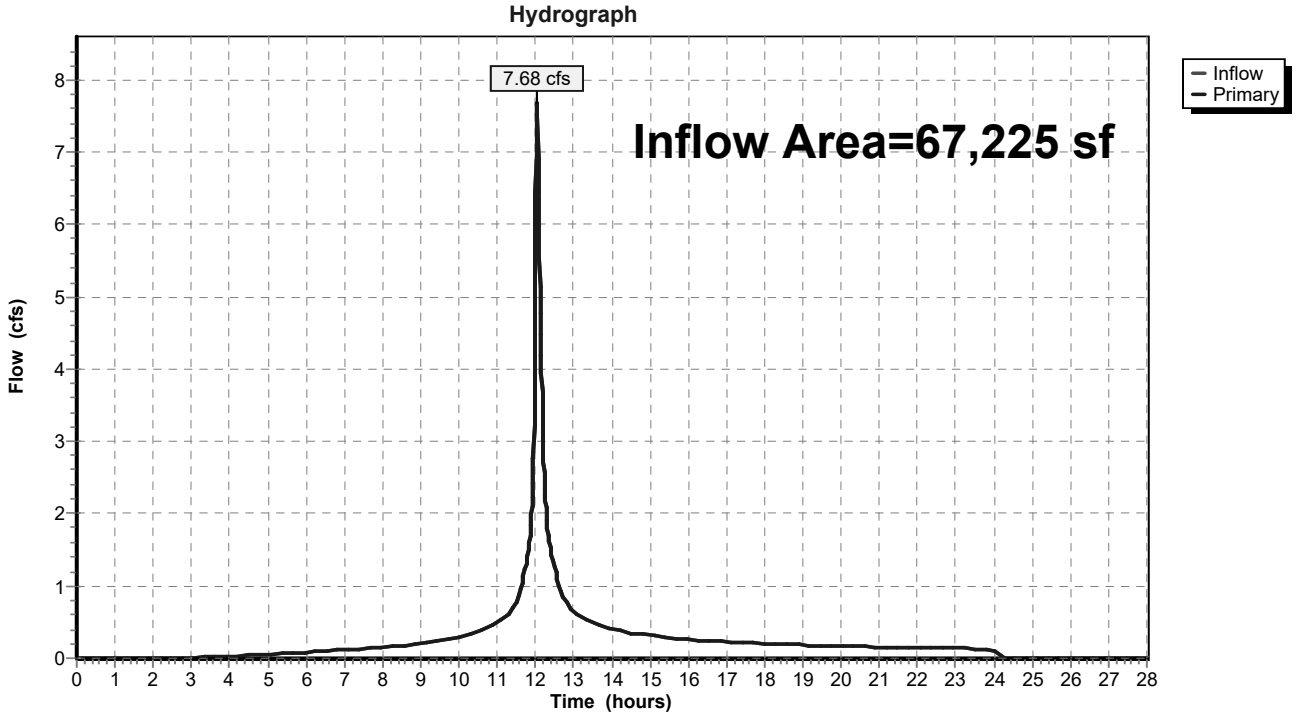


Summary for Link DP-2: Grove Street South

Inflow Area = 67,225 sf, 81.17% Impervious, Inflow Depth = 4.45" for 10-yr event
Inflow = 7.68 cfs @ 12.05 hrs, Volume= 24,957 cf
Primary = 7.68 cfs @ 12.05 hrs, Volume= 24,957 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-2: Grove Street South

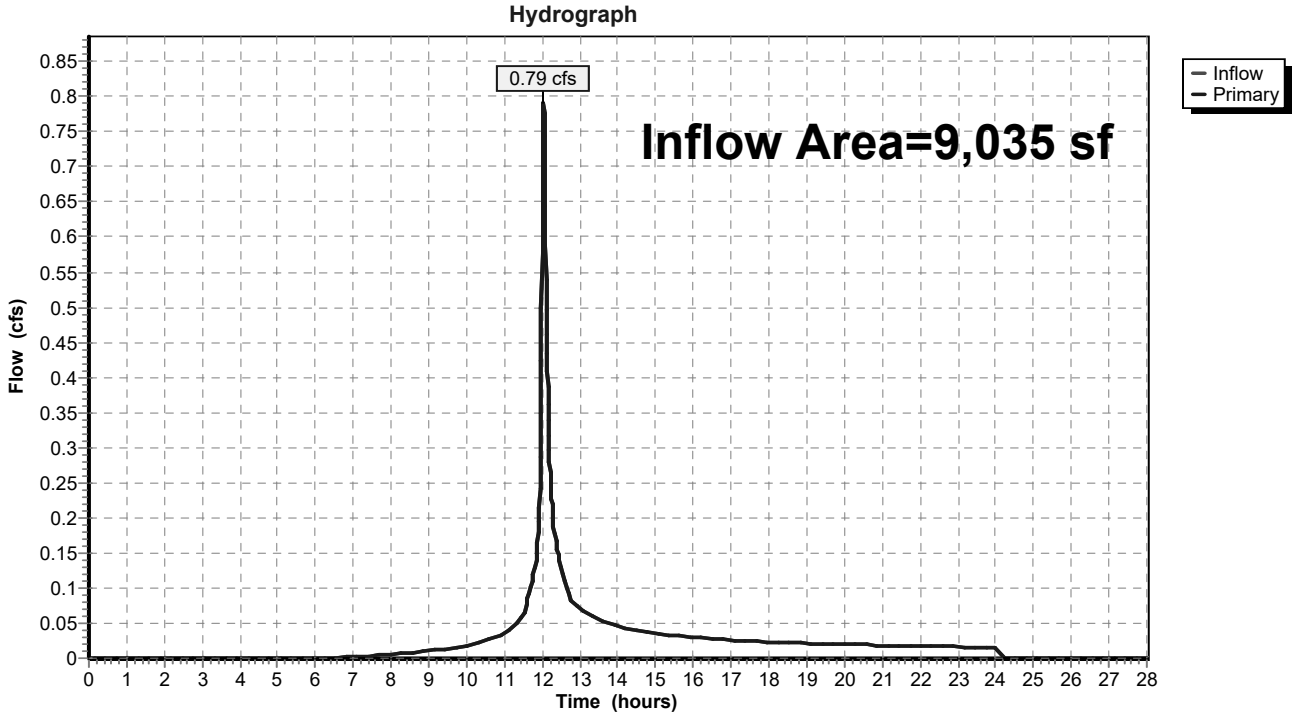


Summary for Link DP-3: Grove Street North

Inflow Area = 9,035 sf, 55.12% Impervious, Inflow Depth = 3.13" for 10-yr event
Inflow = 0.79 cfs @ 12.04 hrs, Volume= 2,358 cf
Primary = 0.79 cfs @ 12.04 hrs, Volume= 2,358 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-3: Grove Street North

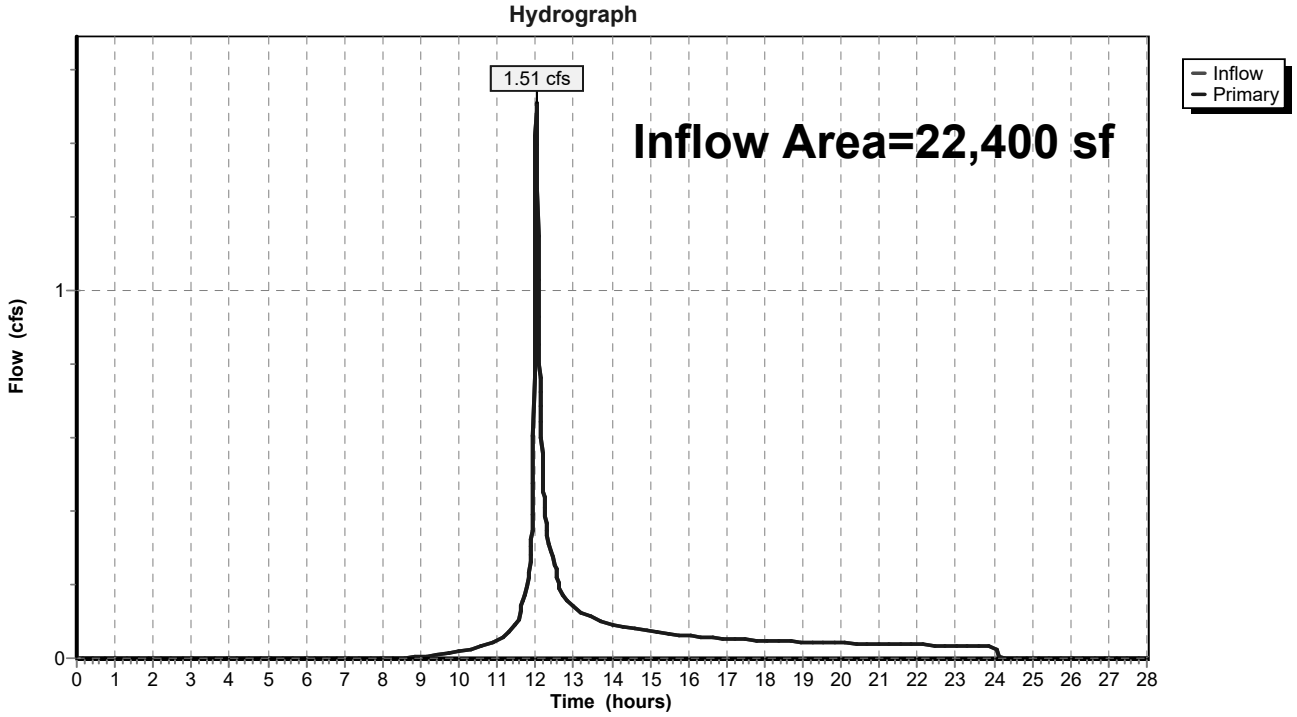


Summary for Link DP-4: Brook Street South

Inflow Area = 22,400 sf, 36.29% Impervious, Inflow Depth = 2.31" for 10-yr event
Inflow = 1.51 cfs @ 12.03 hrs, Volume= 4,318 cf
Primary = 1.51 cfs @ 12.03 hrs, Volume= 4,318 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-4: Brook Street South

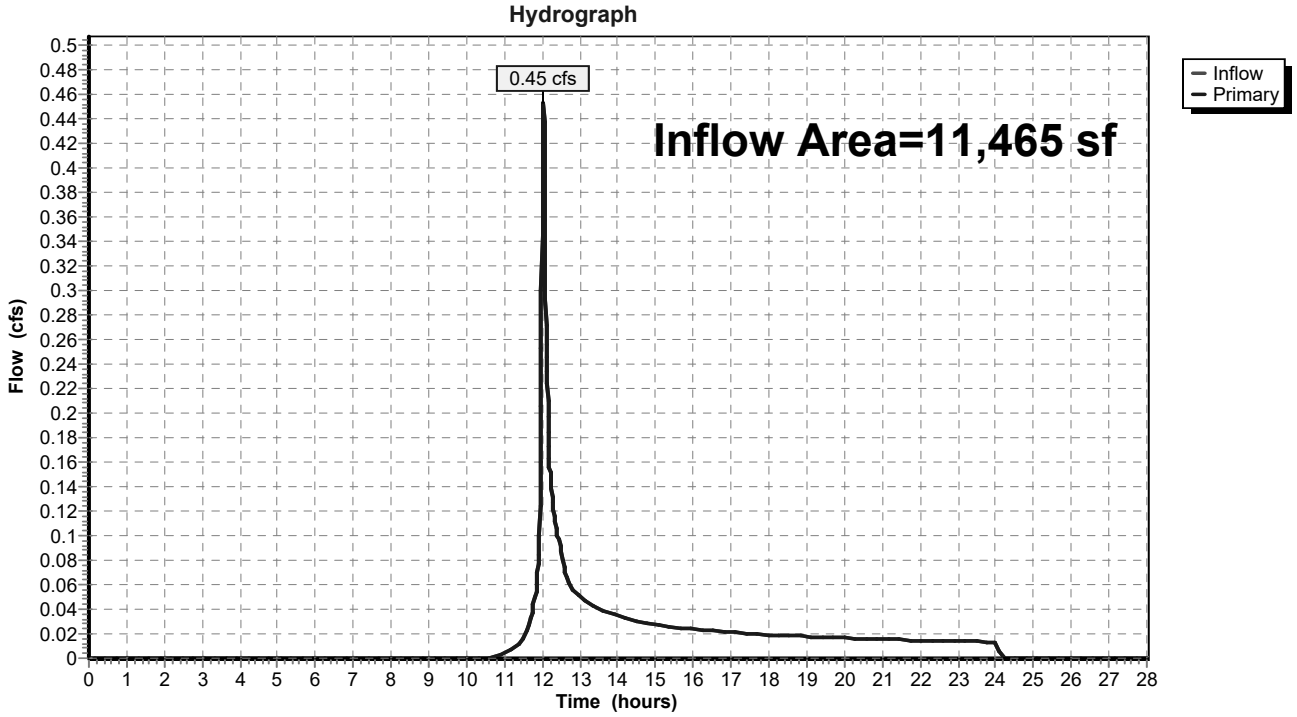


Summary for Link DP-5: Brook Street North

Inflow Area = 11,465 sf, 17.31% Impervious, Inflow Depth = 1.50" for 10-yr event
Inflow = 0.45 cfs @ 12.03 hrs, Volume= 1,436 cf
Primary = 0.45 cfs @ 12.03 hrs, Volume= 1,436 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-5: Brook Street North

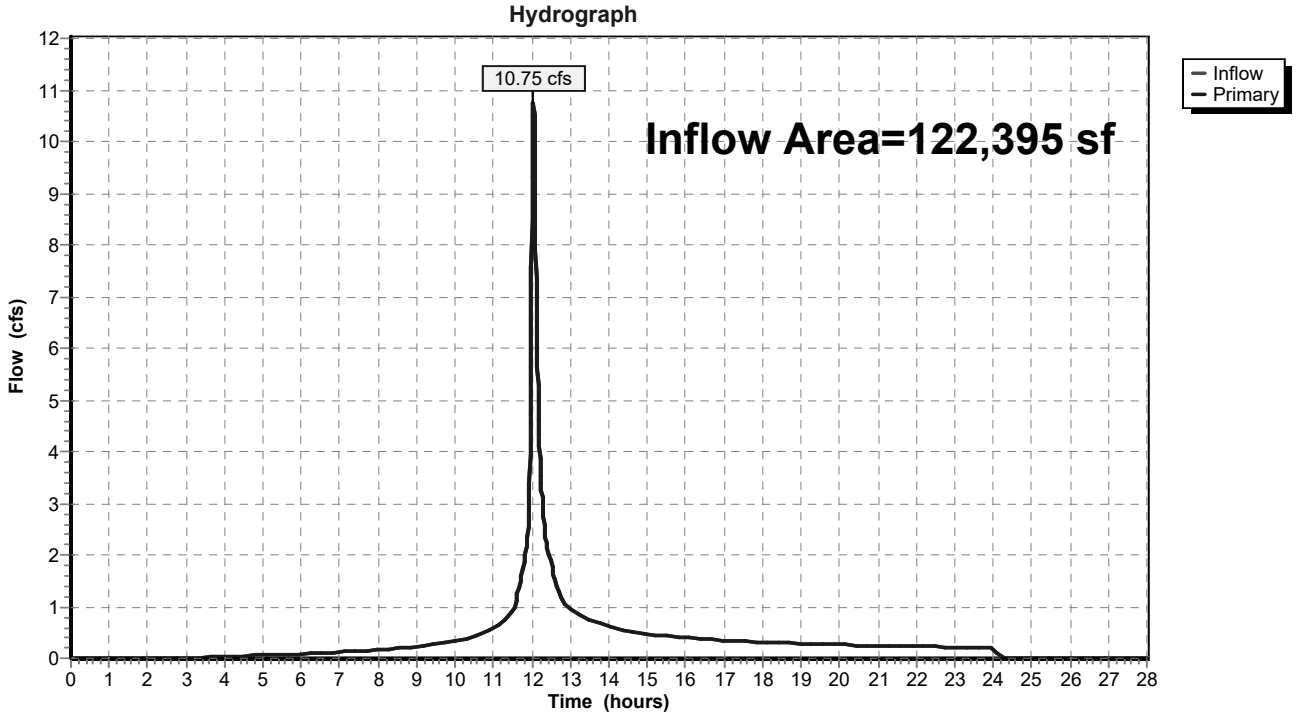


Summary for Link DP-6: Total Offsite Flow

Inflow Area = 122,395 sf, 58.20% Impervious, Inflow Depth = 3.38" for 10-yr event
Inflow = 10.75 cfs @ 12.04 hrs, Volume= 34,453 cf
Primary = 10.75 cfs @ 12.04 hrs, Volume= 34,453 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-6: Total Offsite Flow



Time span=0.00-28.00 hrs, dt=0.01 hrs, 2801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-10: Area Draining Runoff Area=12,270 sf 12.84% Impervious Runoff Depth=2.17"
Flow Length=50' Slope=0.0300 '/' Tc=5.0 min CN=55 Runoff=0.71 cfs 2,217 cf

Subcatchment EDA-20: Area Draining to Runoff Area=67,225 sf 81.17% Impervious Runoff Depth=5.78"
Flow Length=436' Tc=7.1 min CN=89 Runoff=9.52 cfs 32,360 cf

Subcatchment EDA-30: Area Draining to Runoff Area=9,035 sf 55.12% Impervious Runoff Depth=4.32"
Flow Length=93' Tc=6.1 min CN=76 Runoff=1.06 cfs 3,252 cf

Subcatchment EDA-40: Area Draining to Runoff Area=22,400 sf 36.29% Impervious Runoff Depth=3.36"
Flow Length=96' Tc=5.0 min CN=67 Runoff=2.16 cfs 6,277 cf

Subcatchment EDA-50: Area Draining to Runoff Area=11,465 sf 17.31% Impervious Runoff Depth=2.36"
Flow Length=73' Tc=5.0 min CN=57 Runoff=0.74 cfs 2,255 cf

Link DP-1: Offsite West Inflow=0.71 cfs 2,217 cf
Primary=0.71 cfs 2,217 cf

Link DP-2: Grove Street South Inflow=9.52 cfs 32,360 cf
Primary=9.52 cfs 32,360 cf

Link DP-3: Grove Street North Inflow=1.06 cfs 3,252 cf
Primary=1.06 cfs 3,252 cf

Link DP-4: Brook Street South Inflow=2.16 cfs 6,277 cf
Primary=2.16 cfs 6,277 cf

Link DP-5: Brook Street North Inflow=0.74 cfs 2,255 cf
Primary=0.74 cfs 2,255 cf

Link DP-6: Total Offsite Flow Inflow=14.04 cfs 46,362 cf
Primary=14.04 cfs 46,362 cf

Total Runoff Area = 122,395 sf Runoff Volume = 46,362 cf Average Runoff Depth = 4.55"
41.80% Pervious = 51,160 sf 58.20% Impervious = 71,235 sf

Summary for Subcatchment EDA-10: Area Draining Offsite to the West

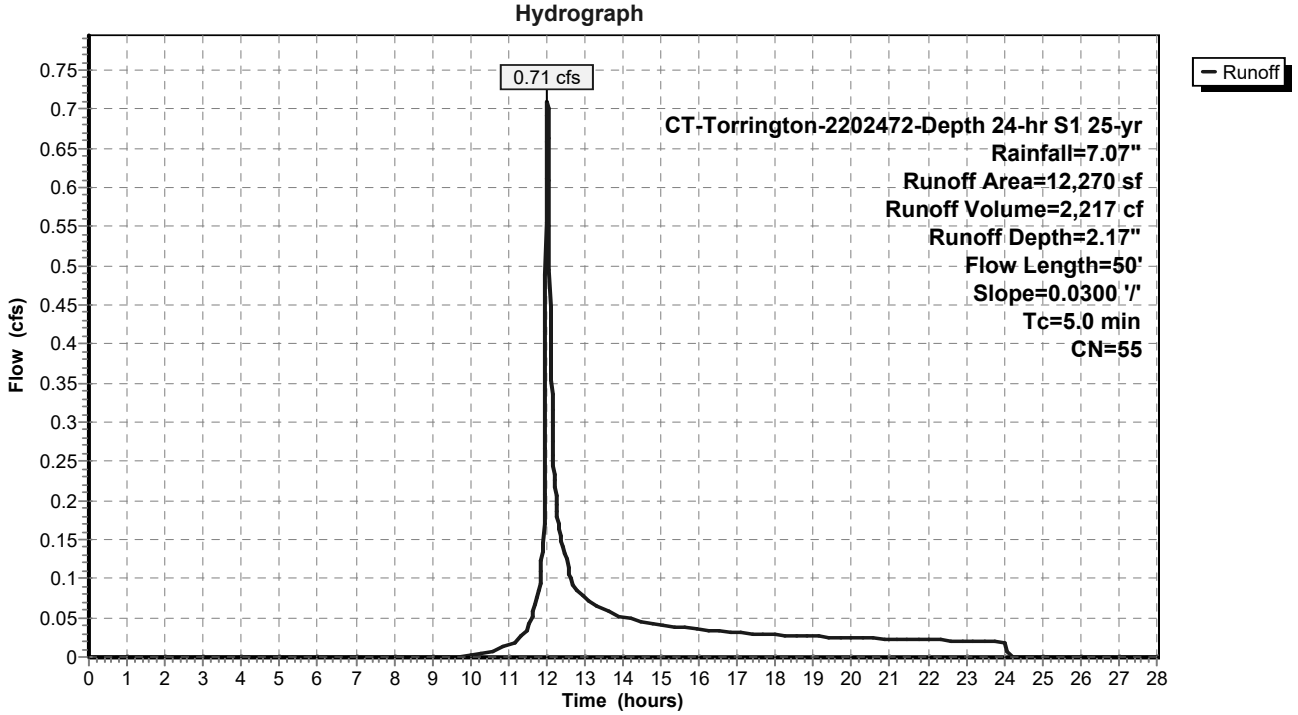
Runoff = 0.71 cfs @ 12.03 hrs, Volume= 2,217 cf, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 25-yr Rainfall=7.07"

	Area (sf)	CN	Description
*	1,575	98	Impervious, HSG A
	10,695	49	50-75% Grass cover, Fair, HSG A
	12,270	55	Weighted Average
	10,695		87.16% Pervious Area
	1,575		12.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
4.6	50	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-10: Area Draining Offsite to the West



Summary for Subcatchment EDA-20: Area Draining to Grove Street South

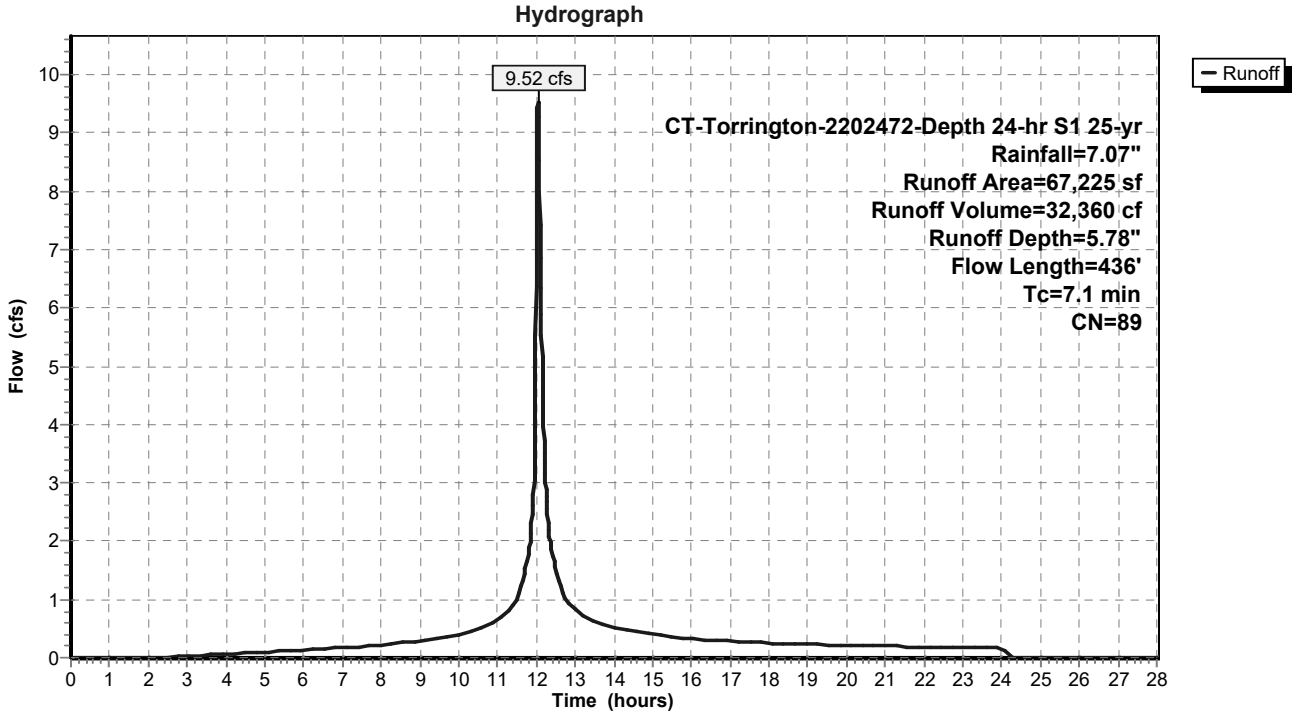
Runoff = 9.52 cfs @ 12.05 hrs, Volume= 32,360 cf, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 25-yr Rainfall=7.07"

	Area (sf)	CN	Description
*	54,565	98	Impervious, HSG A
	12,660	49	50-75% Grass cover, Fair, HSG A
	67,225	89	Weighted Average
	12,660		18.83% Pervious Area
	54,565		81.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	25	0.0200	1.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.1	361	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.1	436	Total			

Subcatchment EDA-20: Area Draining to Grove Street South



Summary for Subcatchment EDA-30: Area Draining to Grove Street North

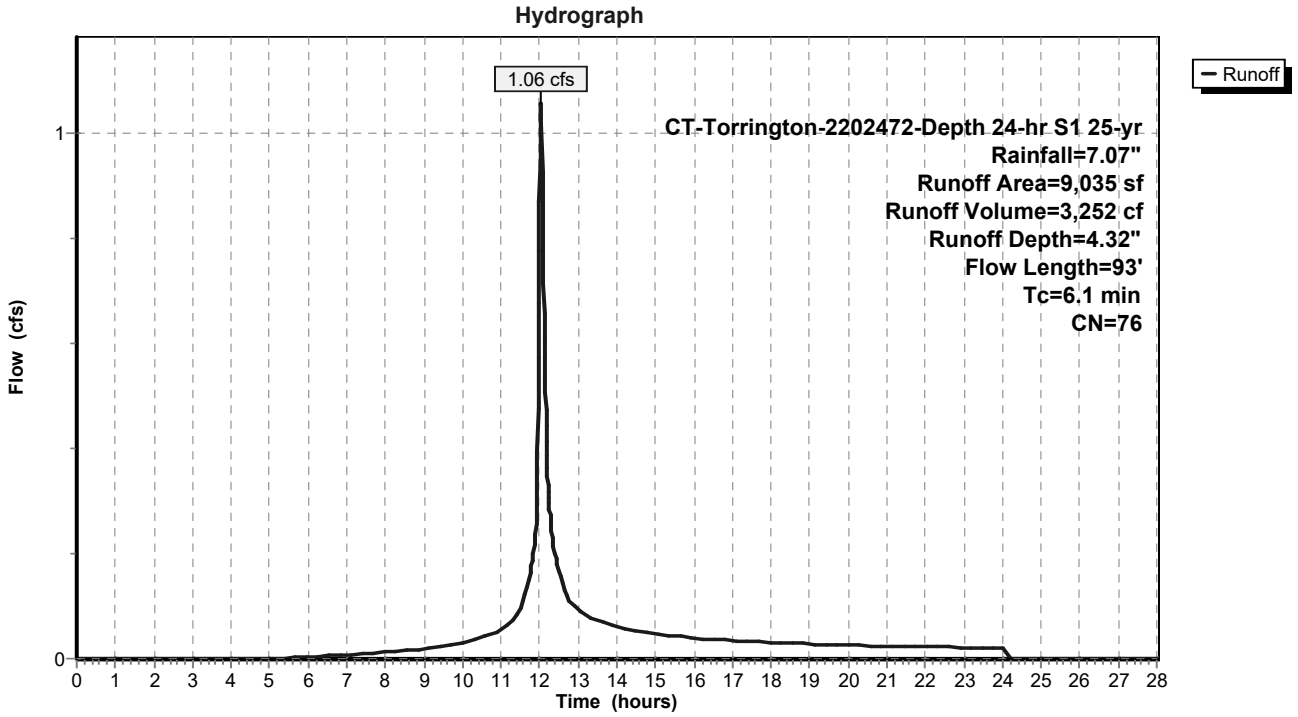
Runoff = 1.06 cfs @ 12.04 hrs, Volume= 3,252 cf, Depth= 4.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 25-yr Rainfall=7.07"

	Area (sf)	CN	Description
*	4,980	98	Impervious, HSG A
	4,055	49	50-75% Grass cover, Fair, HSG A
	9,035	76	Weighted Average
	4,055		44.88% Pervious Area
	4,980		55.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	66	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	27	0.0200	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
6.1	93	Total			

Subcatchment EDA-30: Area Draining to Grove Street North



Summary for Subcatchment EDA-40: Area Draining to Brook Street South

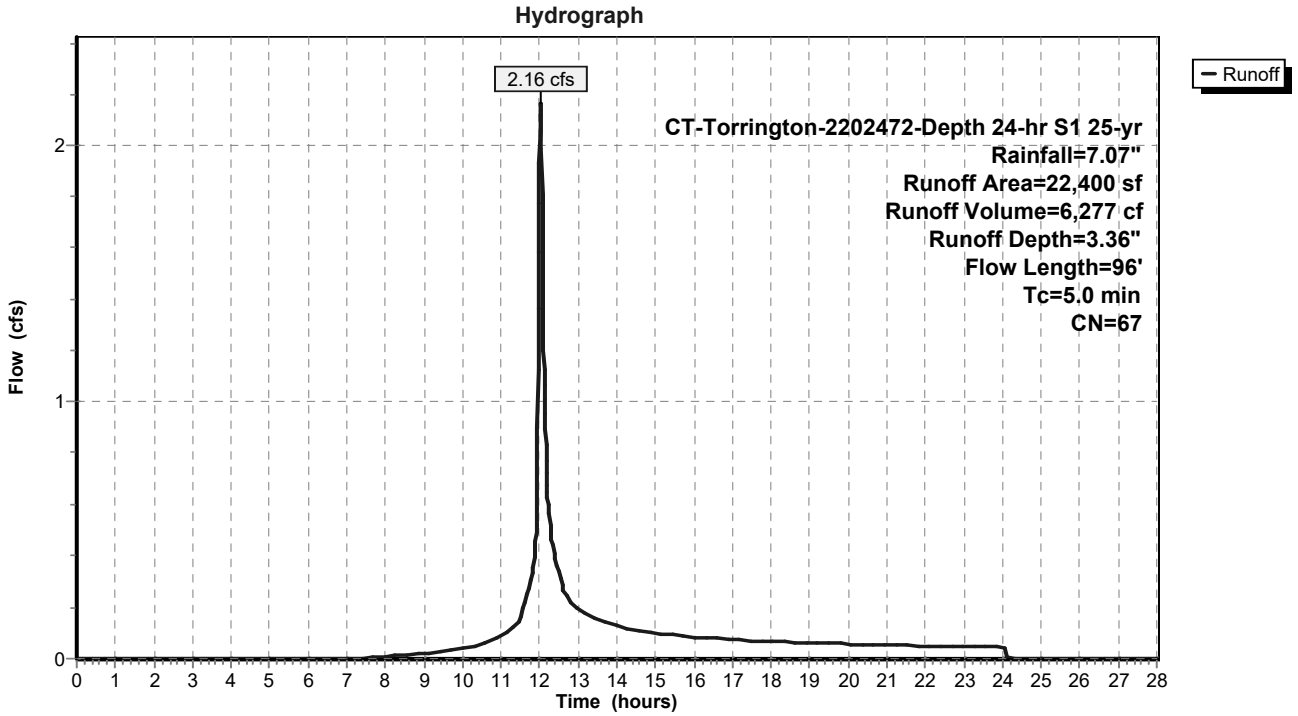
Runoff = 2.16 cfs @ 12.03 hrs, Volume= 6,277 cf, Depth= 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 25-yr Rainfall=7.07"

	Area (sf)	CN	Description
*	8,130	98	Impervious, HSG A
	14,270	49	50-75% Grass cover, Fair, HSG A
	22,400	67	Weighted Average
	14,270		63.71% Pervious Area
	8,130		36.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	70	0.0600	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	26	0.4000	3.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
4.6	96	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-40: Area Draining to Brook Street South



Summary for Subcatchment EDA-50: Area Draining to Brook Street North

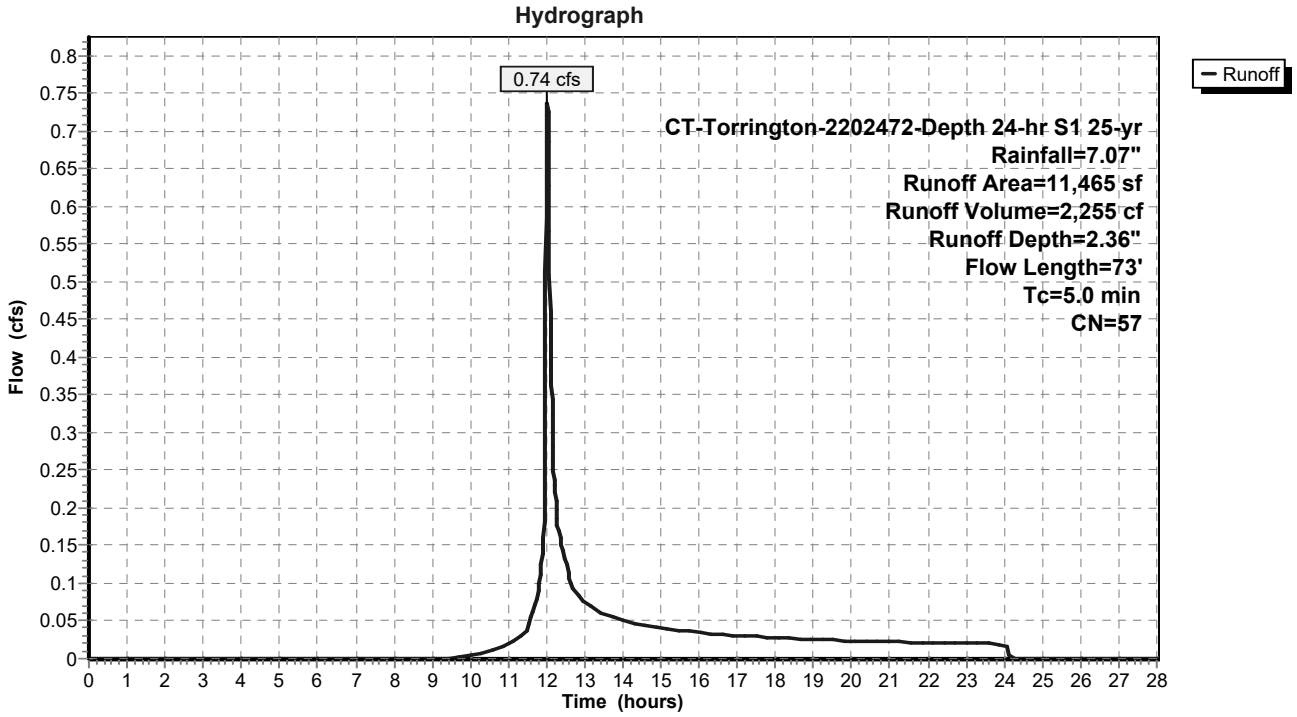
Runoff = 0.74 cfs @ 12.03 hrs, Volume= 2,255 cf, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 25-yr Rainfall=7.07"

	Area (sf)	CN	Description
*	1,985	98	Impervious, HSG A
	9,480	49	50-75% Grass cover, Fair, HSG A
	11,465	57	Weighted Average
	9,480		82.69% Pervious Area
	1,985		17.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	55	0.0500	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	18	0.6000	3.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
4.1	73	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-50: Area Draining to Brook Street North

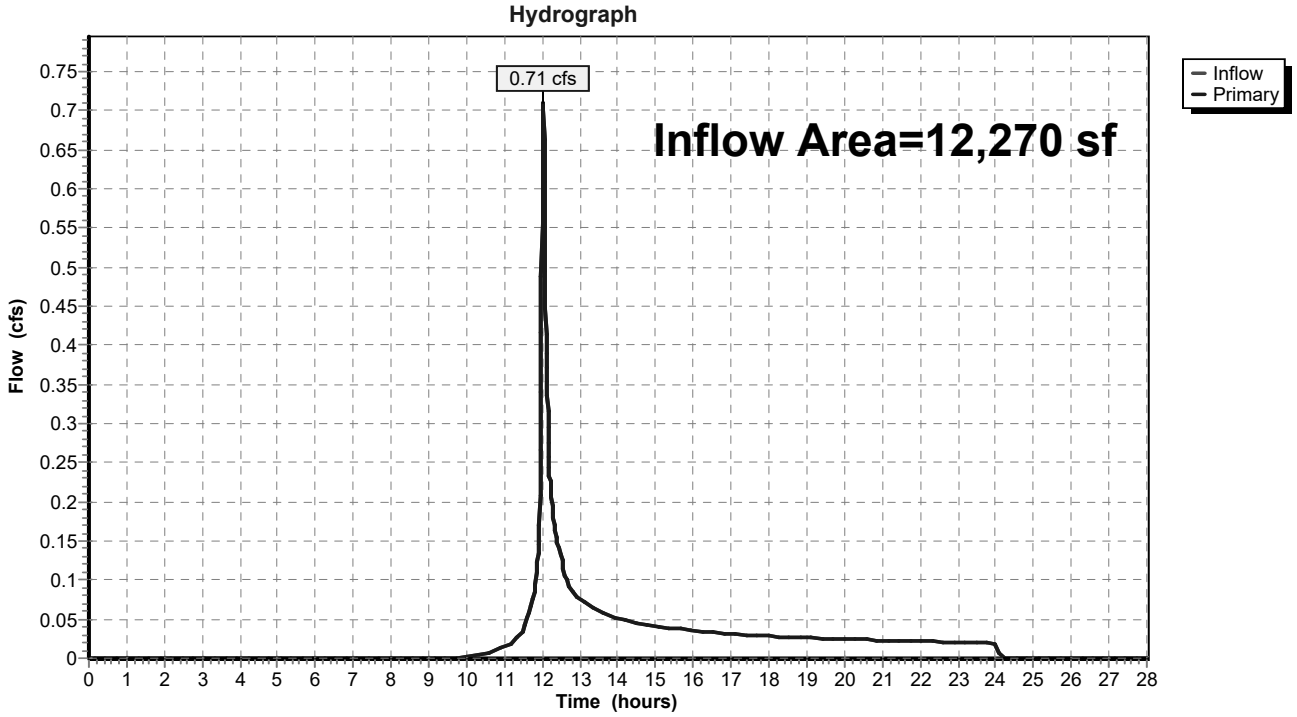


Summary for Link DP-1: Offsite West

Inflow Area = 12,270 sf, 12.84% Impervious, Inflow Depth = 2.17" for 25-yr event
Inflow = 0.71 cfs @ 12.03 hrs, Volume= 2,217 cf
Primary = 0.71 cfs @ 12.03 hrs, Volume= 2,217 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-1: Offsite West

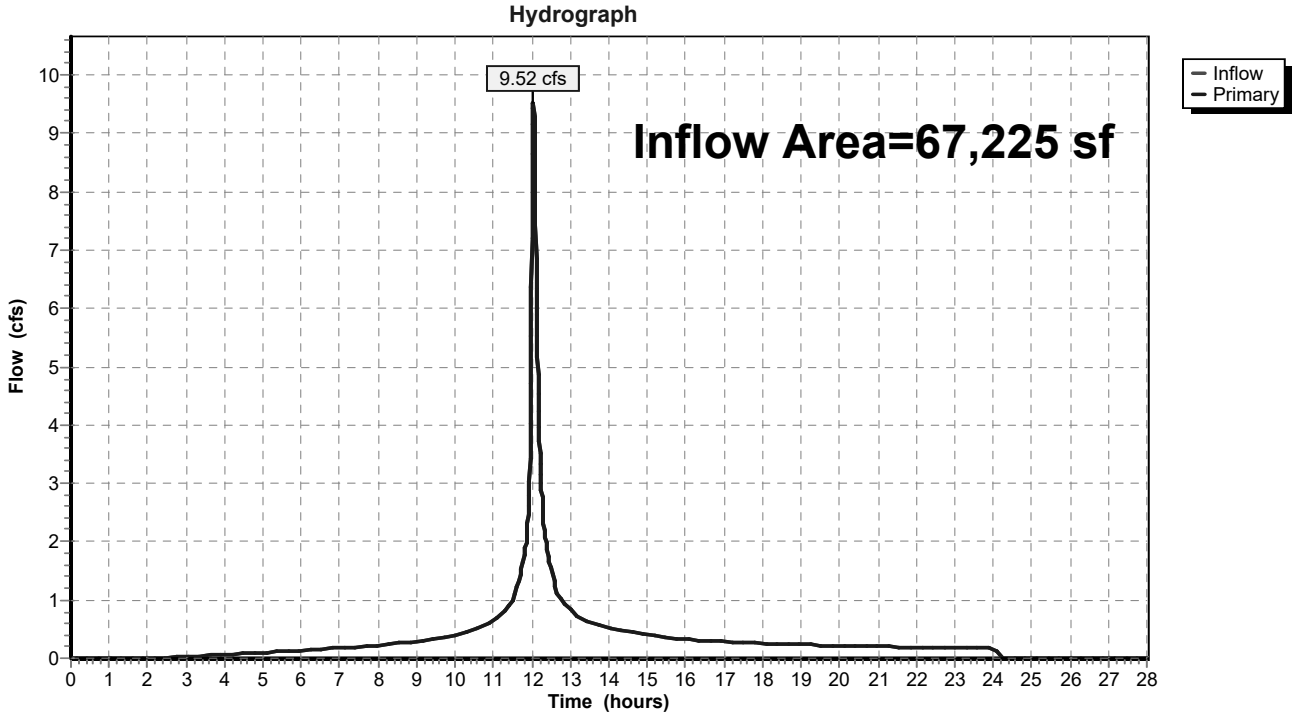


Summary for Link DP-2: Grove Street South

Inflow Area = 67,225 sf, 81.17% Impervious, Inflow Depth = 5.78" for 25-yr event
Inflow = 9.52 cfs @ 12.05 hrs, Volume= 32,360 cf
Primary = 9.52 cfs @ 12.05 hrs, Volume= 32,360 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-2: Grove Street South

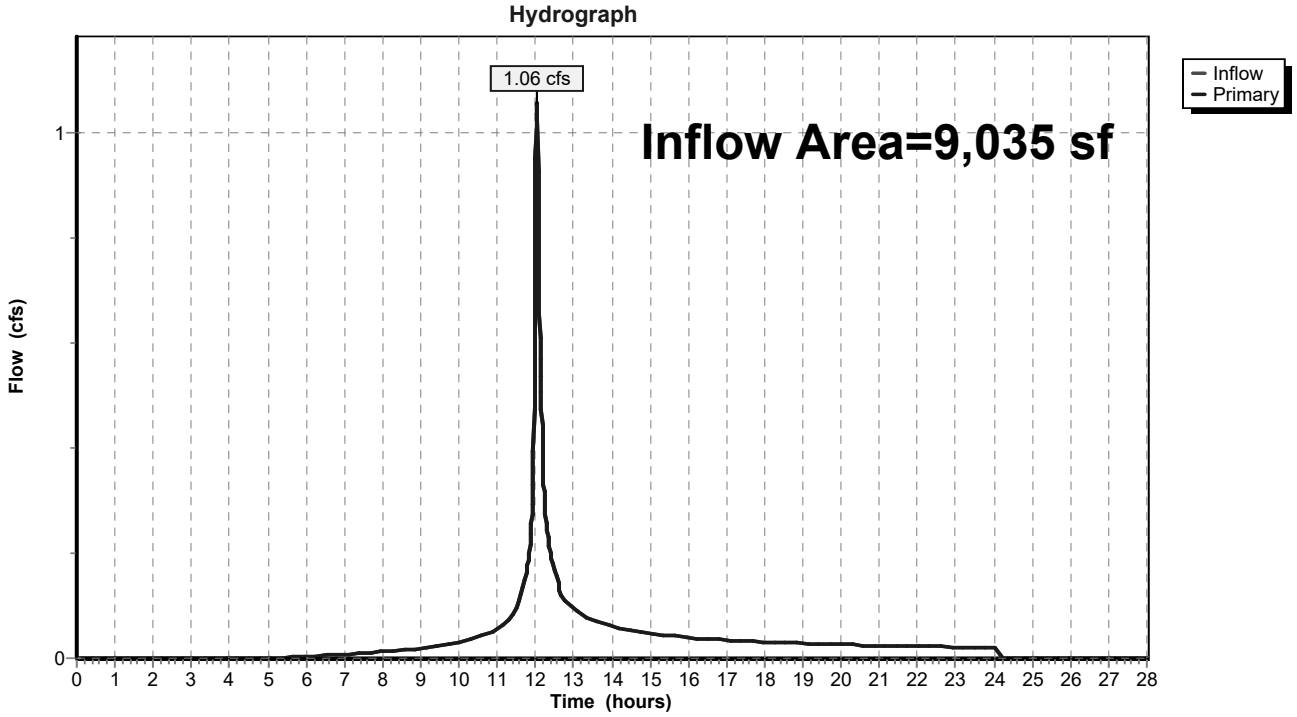


Summary for Link DP-3: Grove Street North

Inflow Area = 9,035 sf, 55.12% Impervious, Inflow Depth = 4.32" for 25-yr event
Inflow = 1.06 cfs @ 12.04 hrs, Volume= 3,252 cf
Primary = 1.06 cfs @ 12.04 hrs, Volume= 3,252 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-3: Grove Street North

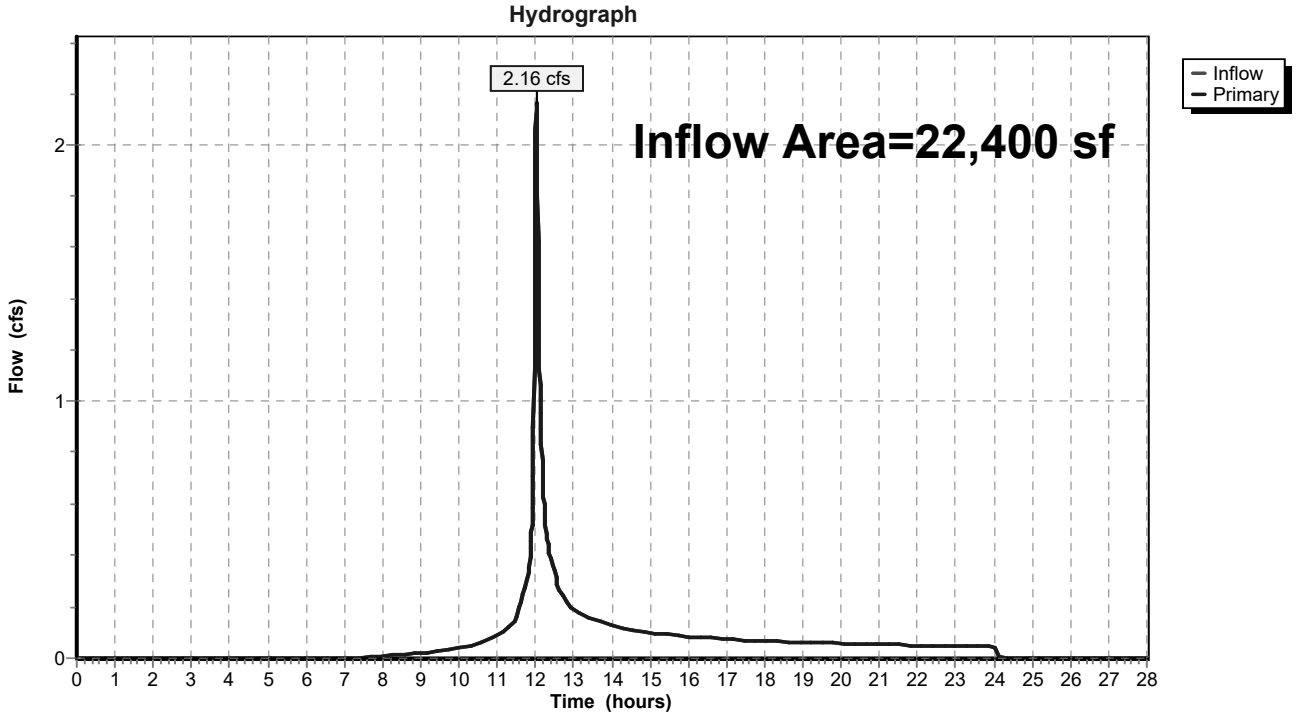


Summary for Link DP-4: Brook Street South

Inflow Area = 22,400 sf, 36.29% Impervious, Inflow Depth = 3.36" for 25-yr event
Inflow = 2.16 cfs @ 12.03 hrs, Volume= 6,277 cf
Primary = 2.16 cfs @ 12.03 hrs, Volume= 6,277 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-4: Brook Street South

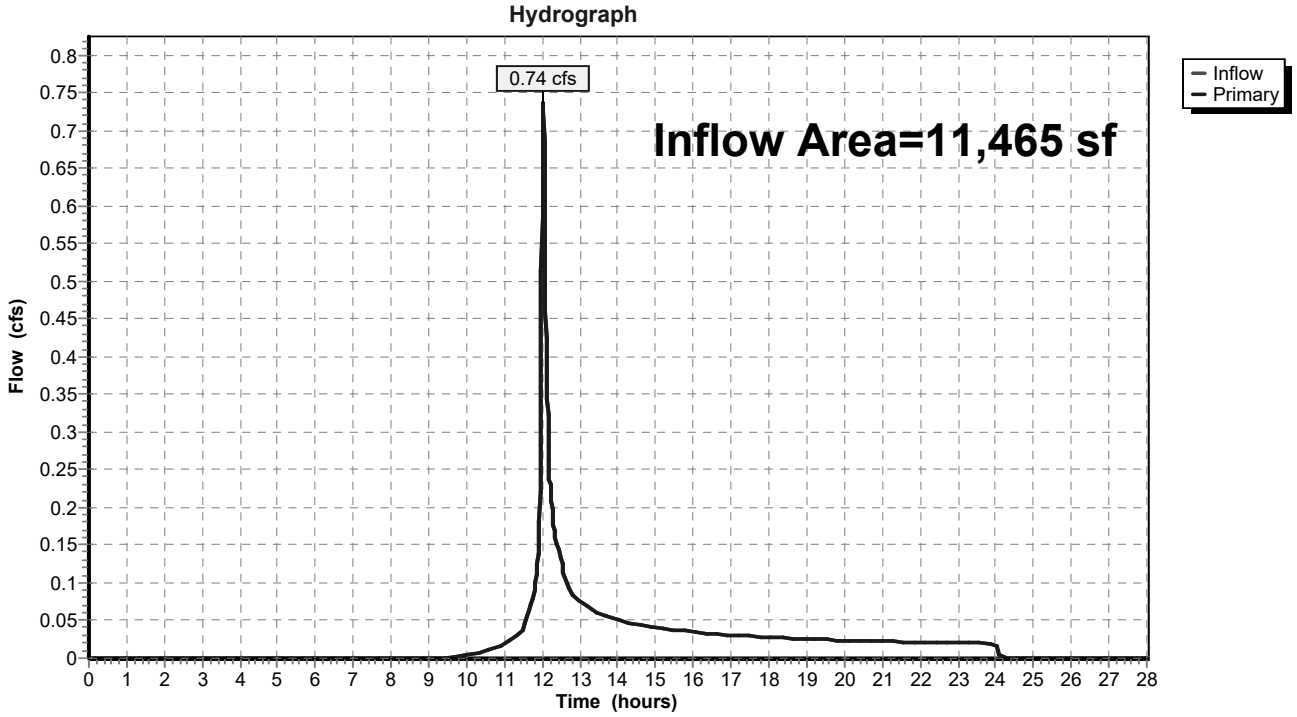


Summary for Link DP-5: Brook Street North

Inflow Area = 11,465 sf, 17.31% Impervious, Inflow Depth = 2.36" for 25-yr event
Inflow = 0.74 cfs @ 12.03 hrs, Volume= 2,255 cf
Primary = 0.74 cfs @ 12.03 hrs, Volume= 2,255 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-5: Brook Street North

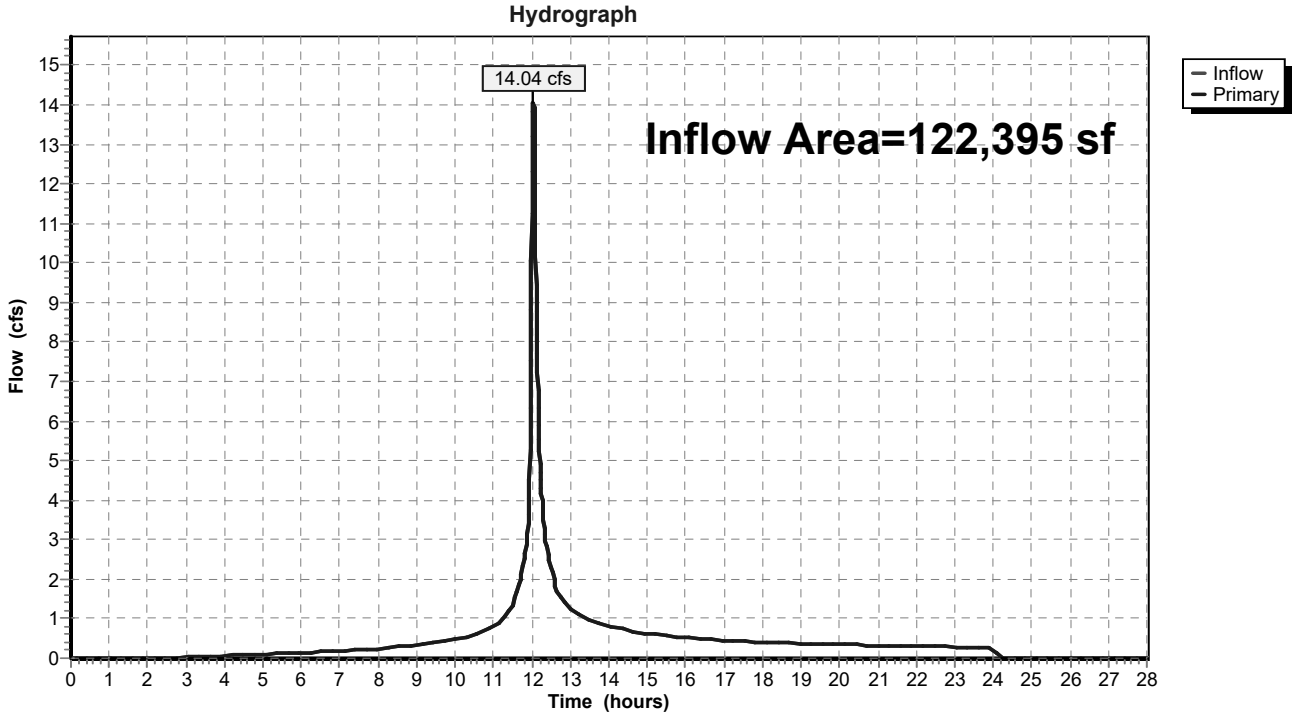


Summary for Link DP-6: Total Offsite Flow

Inflow Area = 122,395 sf, 58.20% Impervious, Inflow Depth = 4.55" for 25-yr event
Inflow = 14.04 cfs @ 12.04 hrs, Volume= 46,362 cf
Primary = 14.04 cfs @ 12.04 hrs, Volume= 46,362 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-6: Total Offsite Flow



Time span=0.00-28.00 hrs, dt=0.01 hrs, 2801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-10: Area Draining Runoff Area=12,270 sf 12.84% Impervious Runoff Depth=2.83"
Flow Length=50' Slope=0.0300 '/' Tc=5.0 min CN=55 Runoff=0.95 cfs 2,896 cf

Subcatchment EDA-20: Area Draining to Runoff Area=67,225 sf 81.17% Impervious Runoff Depth=6.76"
Flow Length=436' Tc=7.1 min CN=89 Runoff=10.91 cfs 37,845 cf

Subcatchment EDA-30: Area Draining to Runoff Area=9,035 sf 55.12% Impervious Runoff Depth=5.22"
Flow Length=93' Tc=6.1 min CN=76 Runoff=1.26 cfs 3,931 cf

Subcatchment EDA-40: Area Draining to Runoff Area=22,400 sf 36.29% Impervious Runoff Depth=4.18"
Flow Length=96' Tc=5.0 min CN=67 Runoff=2.67 cfs 7,802 cf

Subcatchment EDA-50: Area Draining to Runoff Area=11,465 sf 17.31% Impervious Runoff Depth=3.05"
Flow Length=73' Tc=5.0 min CN=57 Runoff=0.96 cfs 2,916 cf

Link DP-1: Offsite West Inflow=0.95 cfs 2,896 cf
Primary=0.95 cfs 2,896 cf

Link DP-2: Grove Street South Inflow=10.91 cfs 37,845 cf
Primary=10.91 cfs 37,845 cf

Link DP-3: Grove Street North Inflow=1.26 cfs 3,931 cf
Primary=1.26 cfs 3,931 cf

Link DP-4: Brook Street South Inflow=2.67 cfs 7,802 cf
Primary=2.67 cfs 7,802 cf

Link DP-5: Brook Street North Inflow=0.96 cfs 2,916 cf
Primary=0.96 cfs 2,916 cf

Link DP-6: Total Offsite Flow Inflow=16.57 cfs 55,390 cf
Primary=16.57 cfs 55,390 cf

Total Runoff Area = 122,395 sf Runoff Volume = 55,390 cf Average Runoff Depth = 5.43"
41.80% Pervious = 51,160 sf 58.20% Impervious = 71,235 sf

Summary for Subcatchment EDA-10: Area Draining Offsite to the West

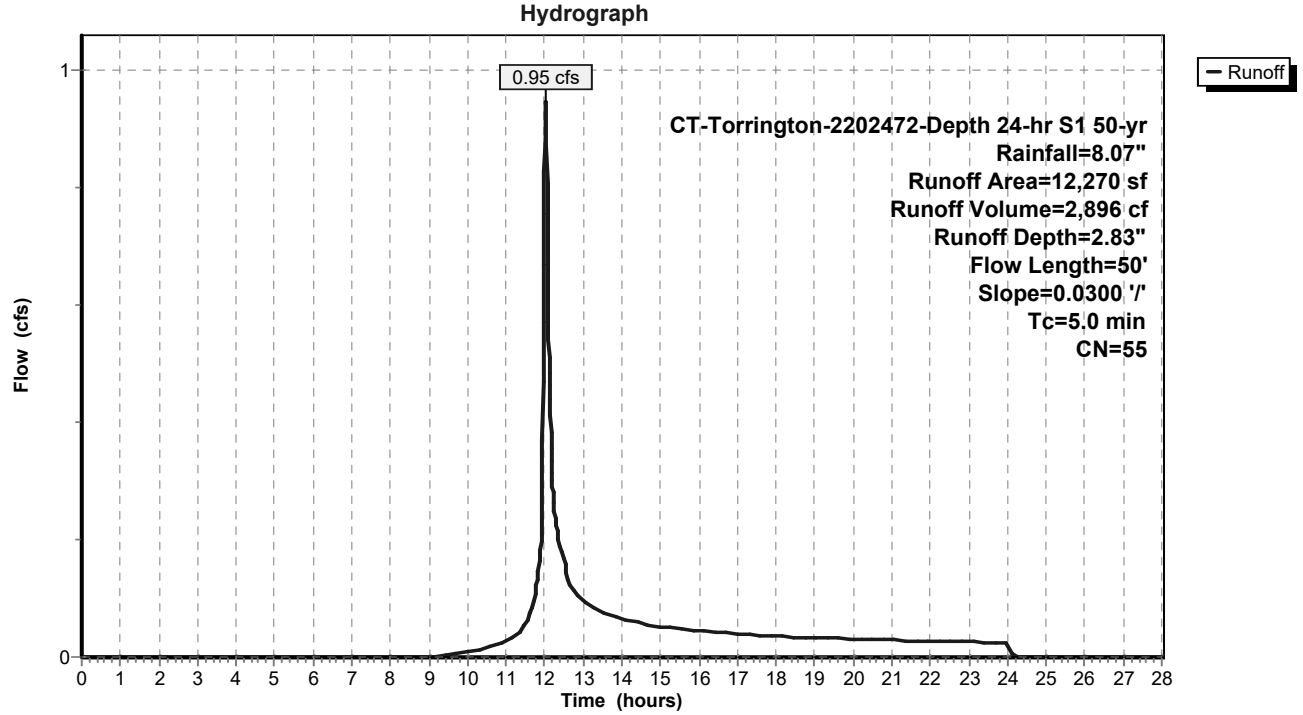
Runoff = 0.95 cfs @ 12.03 hrs, Volume= 2,896 cf, Depth= 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 50-yr Rainfall=8.07"

	Area (sf)	CN	Description
*	1,575	98	Impervious, HSG A
	10,695	49	50-75% Grass cover, Fair, HSG A
	12,270	55	Weighted Average
	10,695		87.16% Pervious Area
	1,575		12.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
4.6	50	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-10: Area Draining Offsite to the West



Summary for Subcatchment EDA-20: Area Draining to Grove Street South

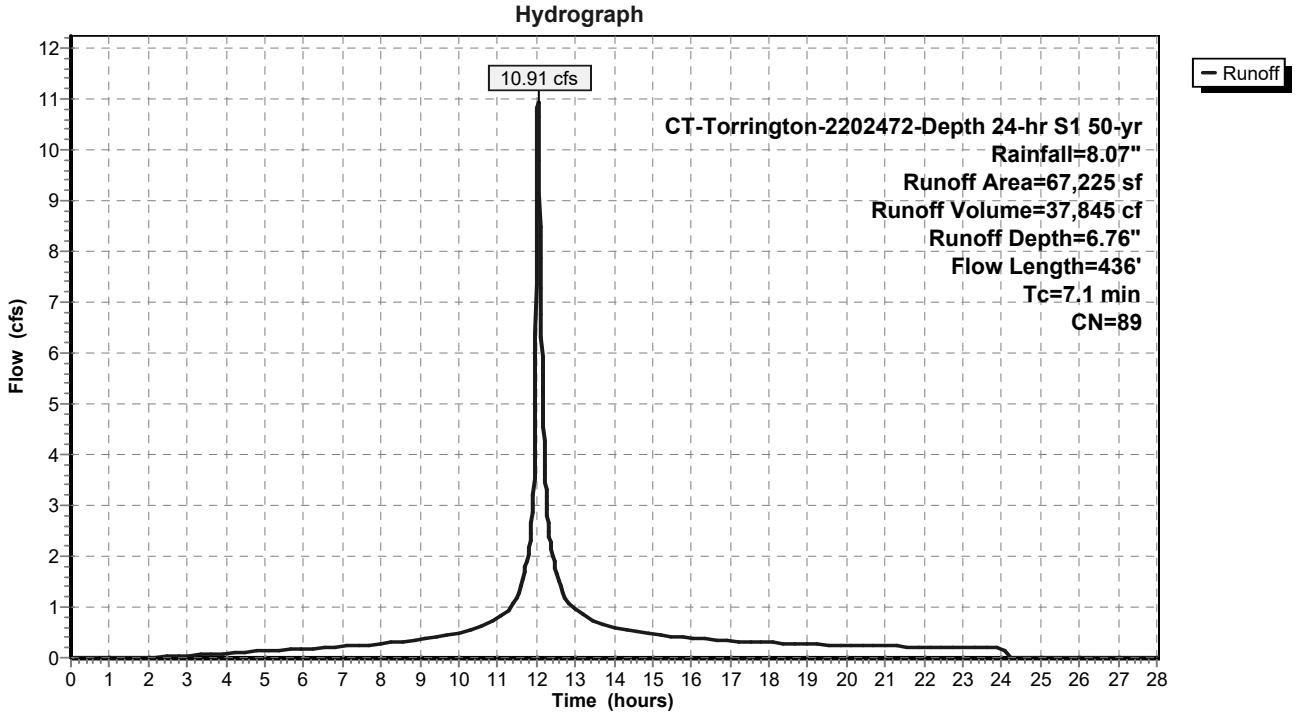
Runoff = 10.91 cfs @ 12.05 hrs, Volume= 37,845 cf, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 50-yr Rainfall=8.07"

	Area (sf)	CN	Description
*	54,565	98	Impervious, HSG A
	12,660	49	50-75% Grass cover, Fair, HSG A
	67,225	89	Weighted Average
	12,660		18.83% Pervious Area
	54,565		81.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	25	0.0200	1.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.1	361	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.1	436	Total			

Subcatchment EDA-20: Area Draining to Grove Street South



Summary for Subcatchment EDA-30: Area Draining to Grove Street North

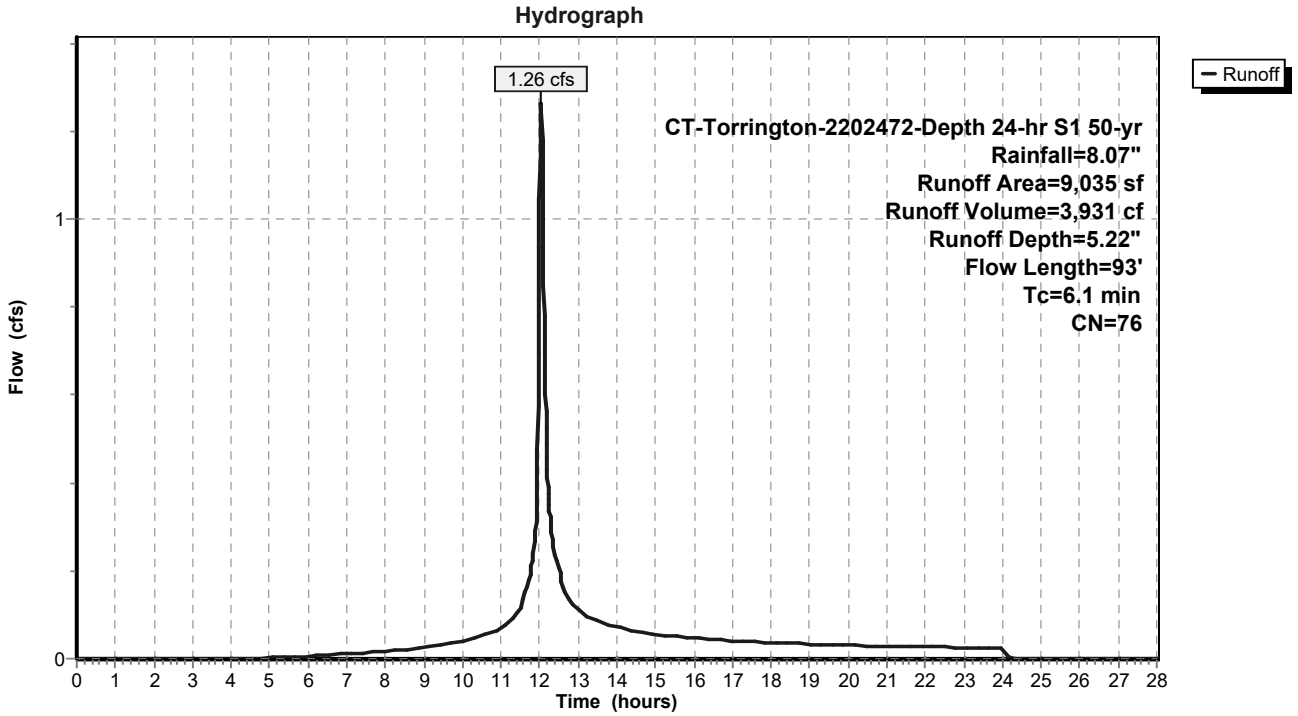
Runoff = 1.26 cfs @ 12.04 hrs, Volume= 3,931 cf, Depth= 5.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 50-yr Rainfall=8.07"

	Area (sf)	CN	Description
*	4,980	98	Impervious, HSG A
	4,055	49	50-75% Grass cover, Fair, HSG A
	9,035	76	Weighted Average
	4,055		44.88% Pervious Area
	4,980		55.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	66	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	27	0.0200	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
6.1	93	Total			

Subcatchment EDA-30: Area Draining to Grove Street North



Summary for Subcatchment EDA-40: Area Draining to Brook Street South

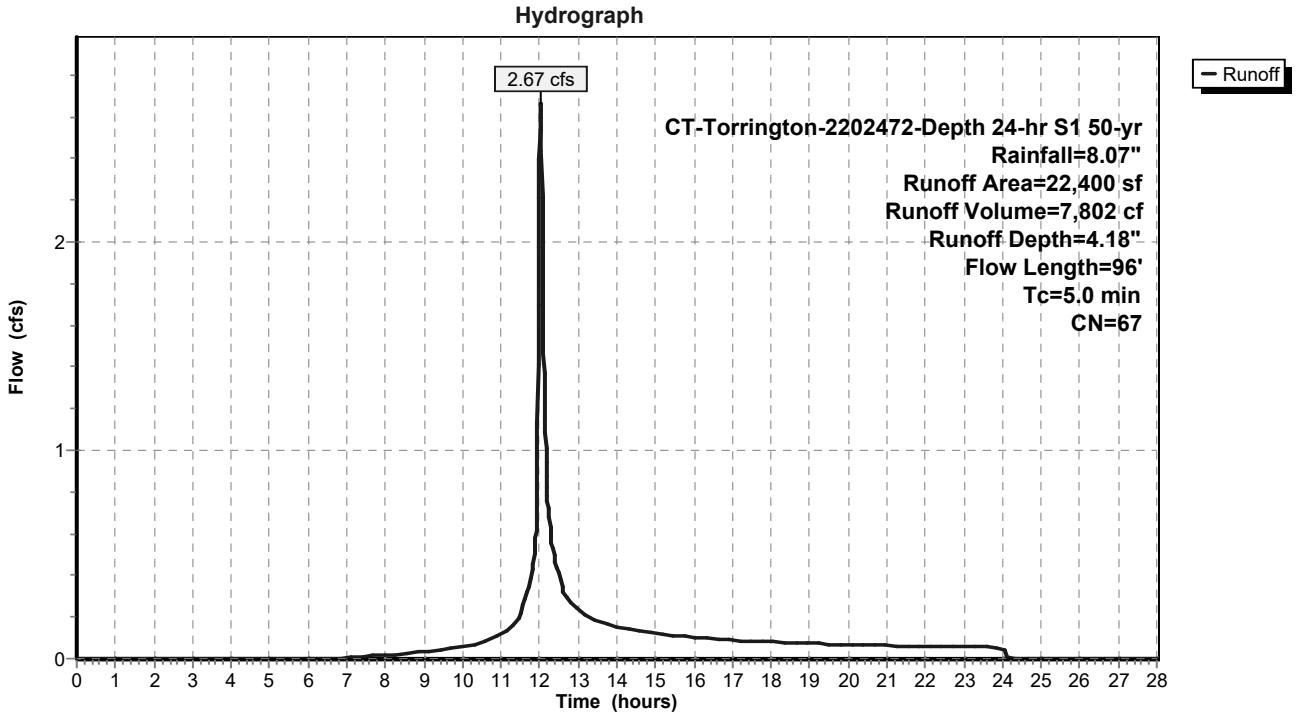
Runoff = 2.67 cfs @ 12.03 hrs, Volume= 7,802 cf, Depth= 4.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 50-yr Rainfall=8.07"

	Area (sf)	CN	Description
*	8,130	98	Impervious, HSG A
	14,270	49	50-75% Grass cover, Fair, HSG A
	22,400	67	Weighted Average
	14,270		63.71% Pervious Area
	8,130		36.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	70	0.0600	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	26	0.4000	3.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
4.6	96	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-40: Area Draining to Brook Street South



Summary for Subcatchment EDA-50: Area Draining to Brook Street North

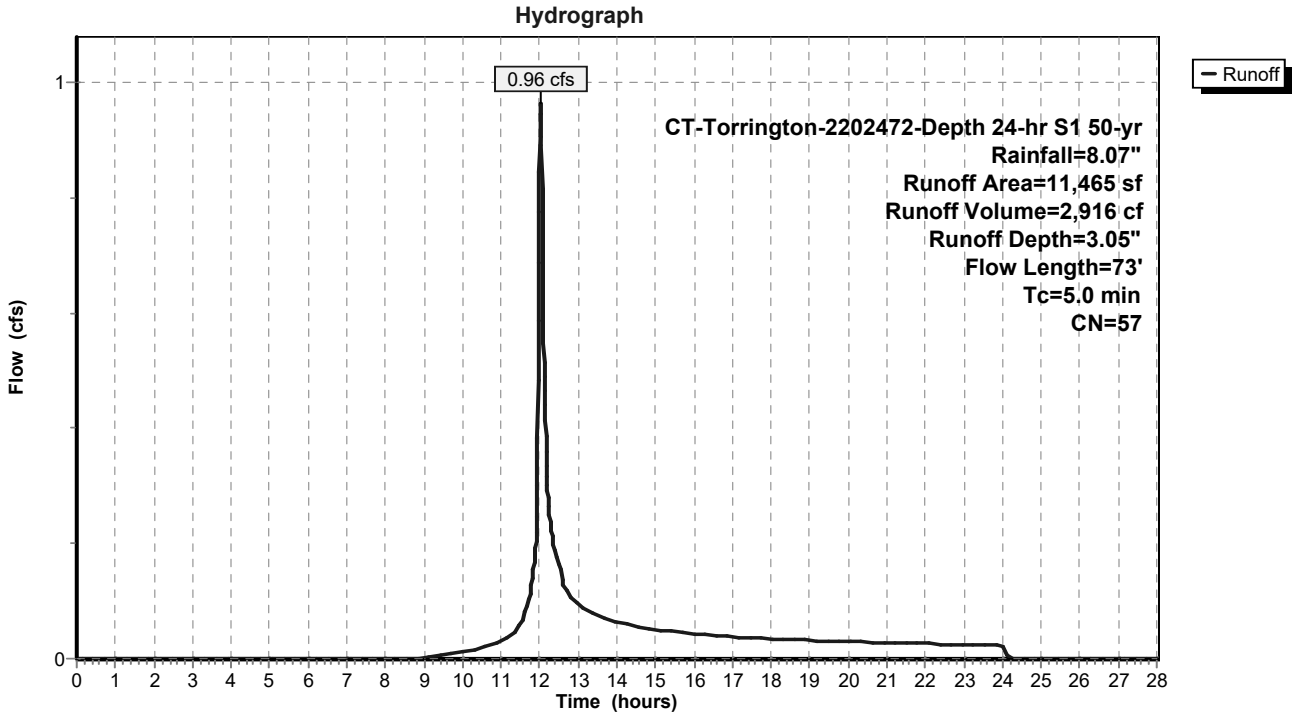
Runoff = 0.96 cfs @ 12.03 hrs, Volume= 2,916 cf, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 50-yr Rainfall=8.07"

	Area (sf)	CN	Description
*	1,985	98	Impervious, HSG A
	9,480	49	50-75% Grass cover, Fair, HSG A
	11,465	57	Weighted Average
	9,480		82.69% Pervious Area
	1,985		17.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	55	0.0500	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	18	0.6000	3.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
4.1	73	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-50: Area Draining to Brook Street North

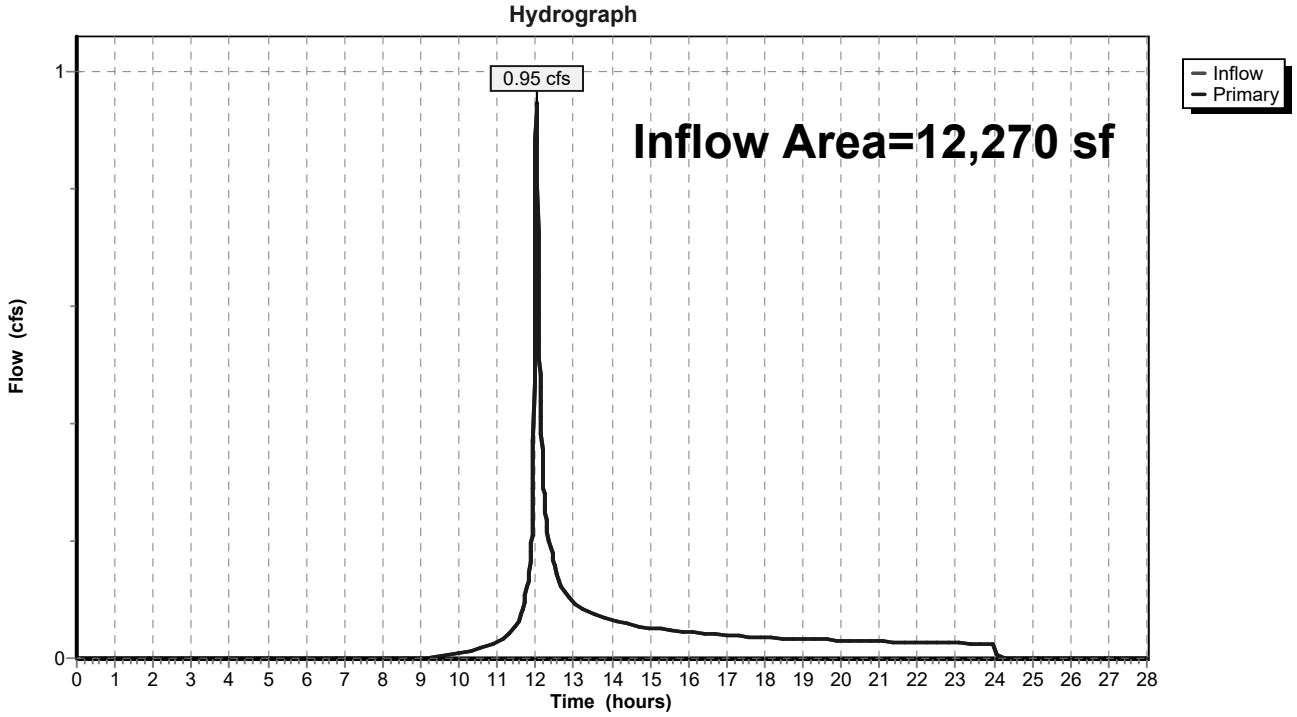


Summary for Link DP-1: Offsite West

Inflow Area = 12,270 sf, 12.84% Impervious, Inflow Depth = 2.83" for 50-yr event
Inflow = 0.95 cfs @ 12.03 hrs, Volume= 2,896 cf
Primary = 0.95 cfs @ 12.03 hrs, Volume= 2,896 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-1: Offsite West

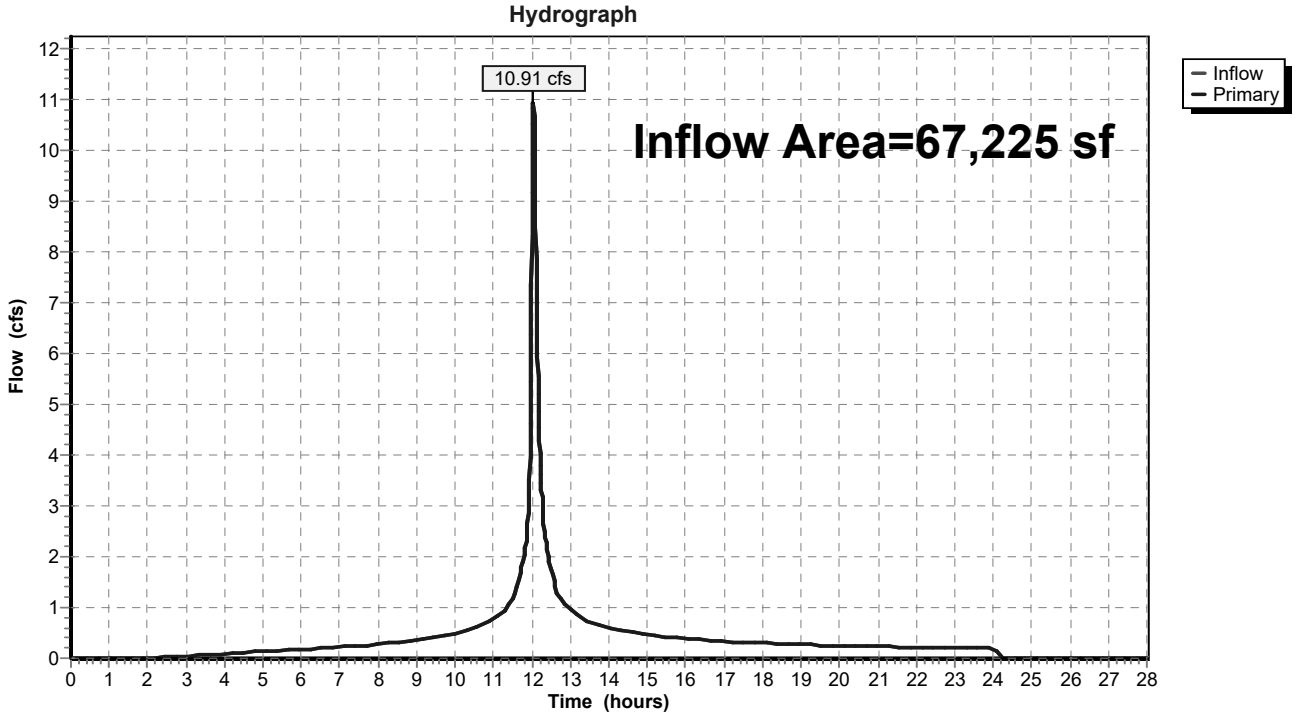


Summary for Link DP-2: Grove Street South

Inflow Area = 67,225 sf, 81.17% Impervious, Inflow Depth = 6.76" for 50-yr event
Inflow = 10.91 cfs @ 12.05 hrs, Volume= 37,845 cf
Primary = 10.91 cfs @ 12.05 hrs, Volume= 37,845 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-2: Grove Street South

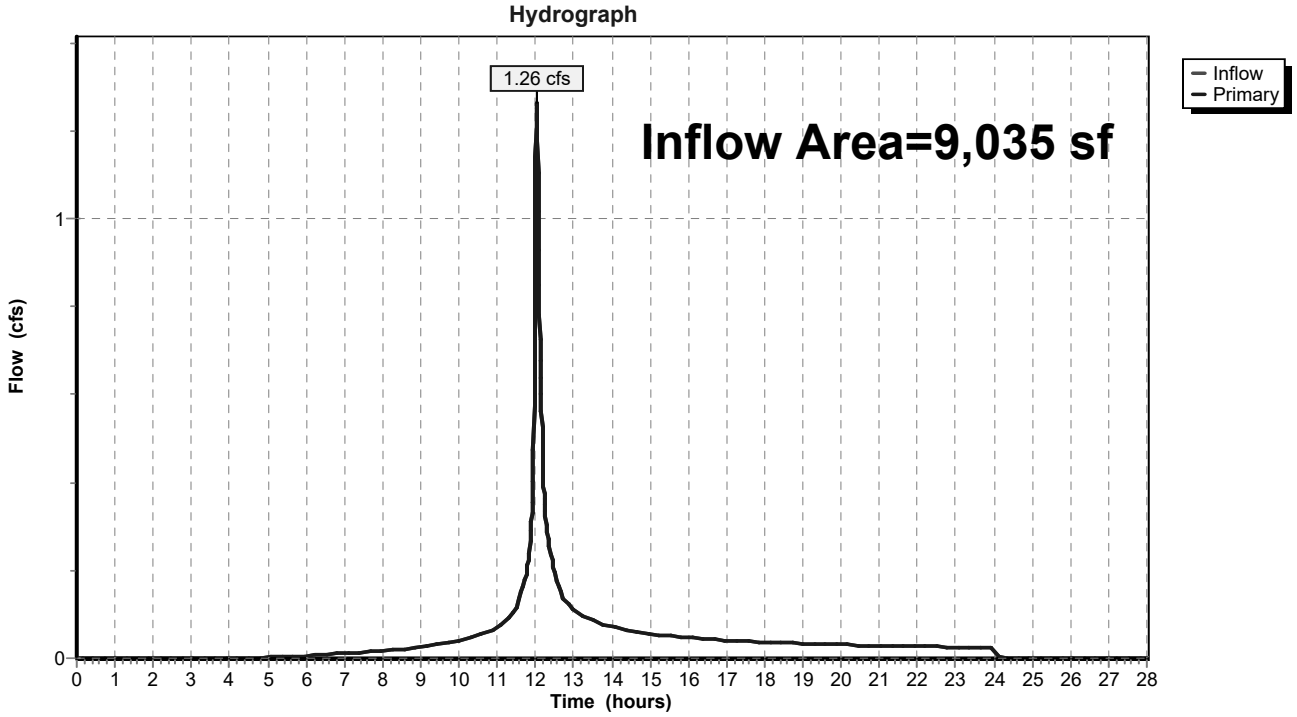


Summary for Link DP-3: Grove Street North

Inflow Area = 9,035 sf, 55.12% Impervious, Inflow Depth = 5.22" for 50-yr event
Inflow = 1.26 cfs @ 12.04 hrs, Volume= 3,931 cf
Primary = 1.26 cfs @ 12.04 hrs, Volume= 3,931 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-3: Grove Street North

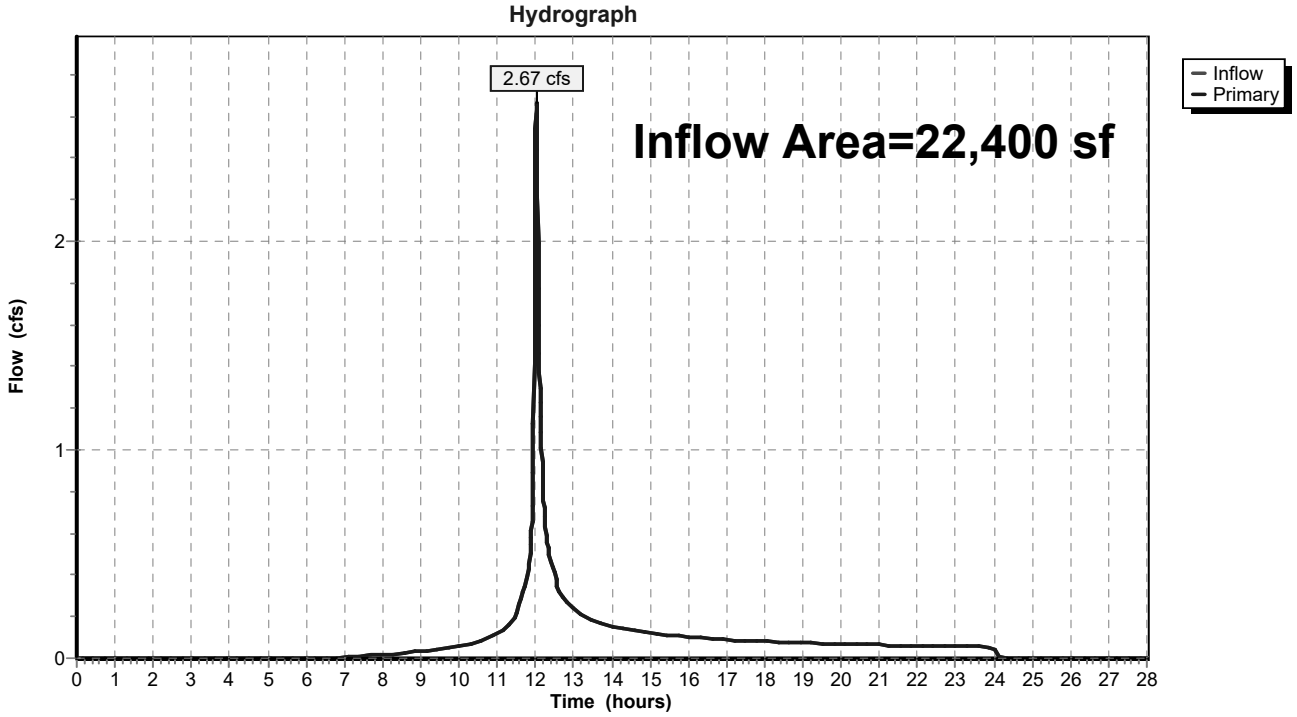


Summary for Link DP-4: Brook Street South

Inflow Area = 22,400 sf, 36.29% Impervious, Inflow Depth = 4.18" for 50-yr event
Inflow = 2.67 cfs @ 12.03 hrs, Volume= 7,802 cf
Primary = 2.67 cfs @ 12.03 hrs, Volume= 7,802 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-4: Brook Street South

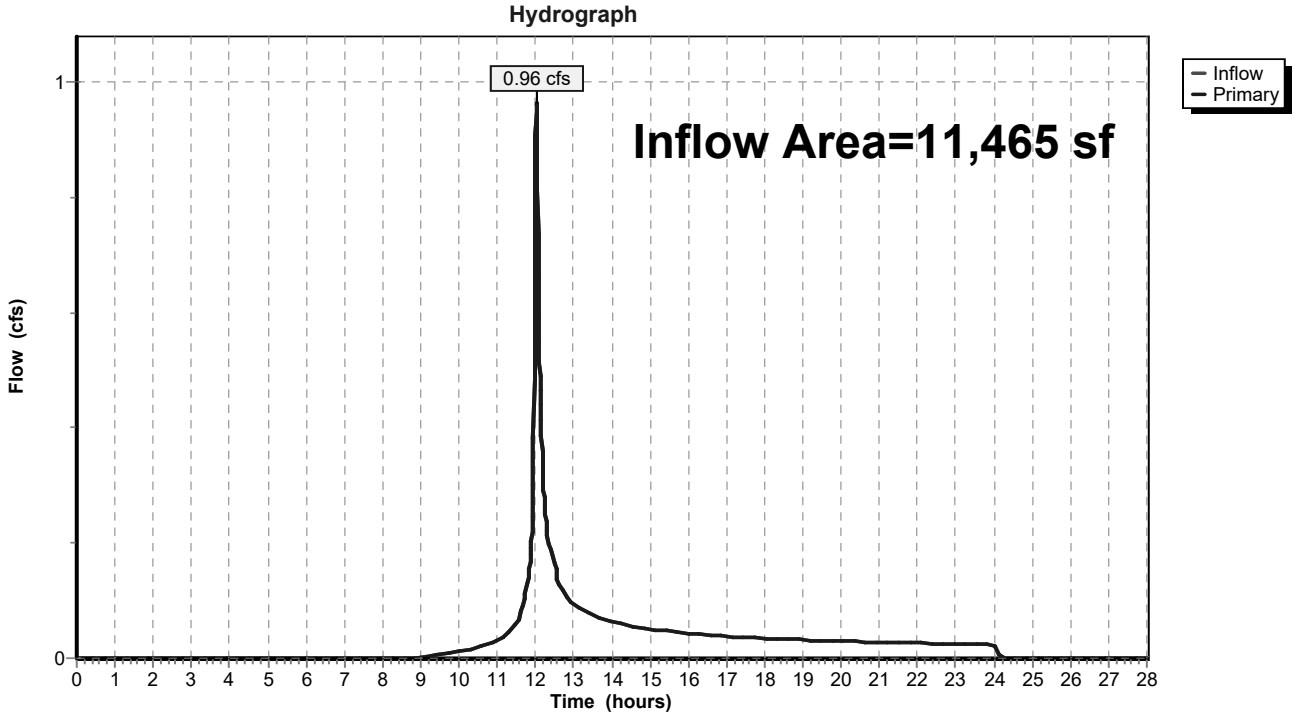


Summary for Link DP-5: Brook Street North

Inflow Area = 11,465 sf, 17.31% Impervious, Inflow Depth = 3.05" for 50-yr event
Inflow = 0.96 cfs @ 12.03 hrs, Volume= 2,916 cf
Primary = 0.96 cfs @ 12.03 hrs, Volume= 2,916 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-5: Brook Street North

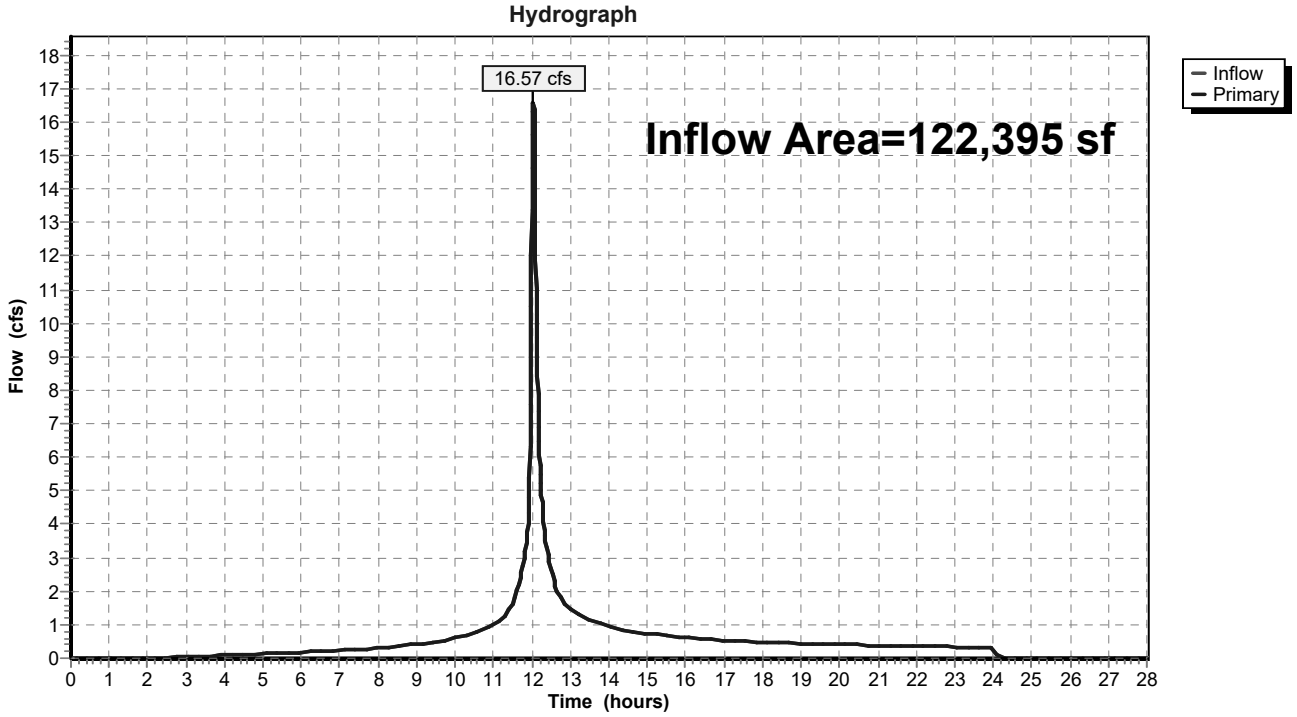


Summary for Link DP-6: Total Offsite Flow

Inflow Area = 122,395 sf, 58.20% Impervious, Inflow Depth = 5.43" for 50-yr event
Inflow = 16.57 cfs @ 12.04 hrs, Volume= 55,390 cf
Primary = 16.57 cfs @ 12.04 hrs, Volume= 55,390 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-6: Total Offsite Flow



Time span=0.00-28.00 hrs, dt=0.01 hrs, 2801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-10: Area Draining Runoff Area=12,270 sf 12.84% Impervious Runoff Depth=3.62"
Flow Length=50' Slope=0.0300 '/' Tc=5.0 min CN=55 Runoff=1.21 cfs 3,700 cf

Subcatchment EDA-20: Area Draining to Runoff Area=67,225 sf 81.17% Impervious Runoff Depth=7.85"
Flow Length=436' Tc=7.1 min CN=89 Runoff=12.34 cfs 43,960 cf

Subcatchment EDA-30: Area Draining to Runoff Area=9,035 sf 55.12% Impervious Runoff Depth=6.24"
Flow Length=93' Tc=6.1 min CN=76 Runoff=1.47 cfs 4,700 cf

Subcatchment EDA-40: Area Draining to Runoff Area=22,400 sf 36.29% Impervious Runoff Depth=5.12"
Flow Length=96' Tc=5.0 min CN=67 Runoff=3.21 cfs 9,555 cf

Subcatchment EDA-50: Area Draining to Runoff Area=11,465 sf 17.31% Impervious Runoff Depth=3.87"
Flow Length=73' Tc=5.0 min CN=57 Runoff=1.22 cfs 3,695 cf

Link DP-1: Offsite West Inflow=1.21 cfs 3,700 cf
Primary=1.21 cfs 3,700 cf

Link DP-2: Grove Street South Inflow=12.34 cfs 43,960 cf
Primary=12.34 cfs 43,960 cf

Link DP-3: Grove Street North Inflow=1.47 cfs 4,700 cf
Primary=1.47 cfs 4,700 cf

Link DP-4: Brook Street South Inflow=3.21 cfs 9,555 cf
Primary=3.21 cfs 9,555 cf

Link DP-5: Brook Street North Inflow=1.22 cfs 3,695 cf
Primary=1.22 cfs 3,695 cf

Link DP-6: Total Offsite Flow Inflow=19.22 cfs 65,610 cf
Primary=19.22 cfs 65,610 cf

Total Runoff Area = 122,395 sf Runoff Volume = 65,610 cf Average Runoff Depth = 6.43"
41.80% Pervious = 51,160 sf 58.20% Impervious = 71,235 sf

Summary for Subcatchment EDA-10: Area Draining Offsite to the West

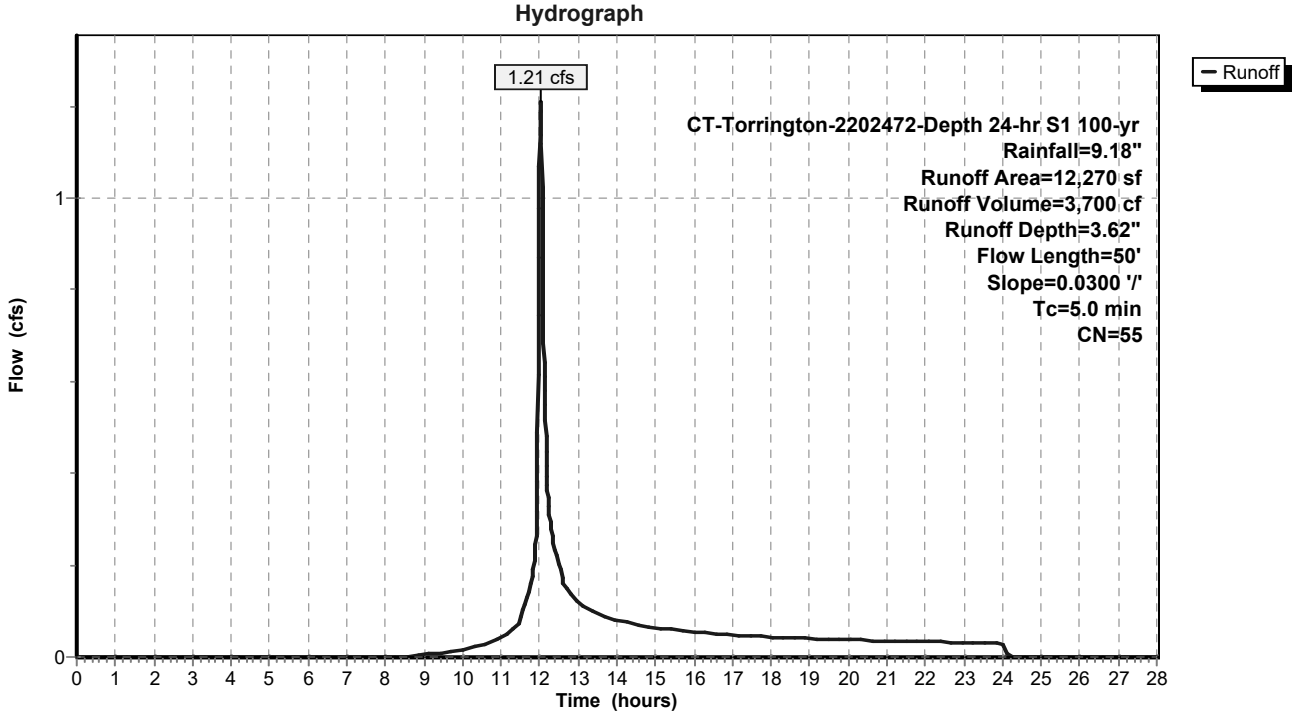
Runoff = 1.21 cfs @ 12.03 hrs, Volume= 3,700 cf, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 100-yr Rainfall=9.18"

	Area (sf)	CN	Description
*	1,575	98	Impervious, HSG A
	10,695	49	50-75% Grass cover, Fair, HSG A
	12,270	55	Weighted Average
	10,695		87.16% Pervious Area
	1,575		12.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
4.6	50	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-10: Area Draining Offsite to the West



Summary for Subcatchment EDA-20: Area Draining to Grove Street South

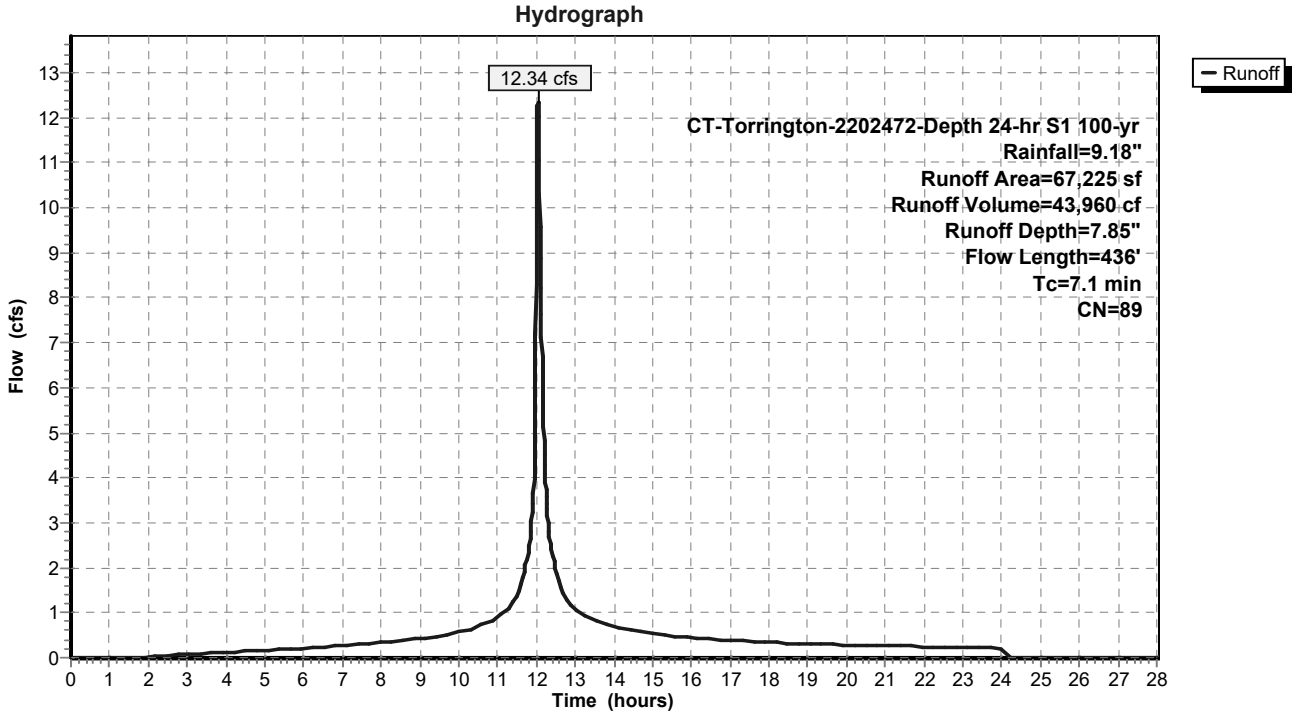
Runoff = 12.34 cfs @ 12.05 hrs, Volume= 43,960 cf, Depth= 7.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 100-yr Rainfall=9.18"

	Area (sf)	CN	Description
*	54,565	98	Impervious, HSG A
	12,660	49	50-75% Grass cover, Fair, HSG A
	67,225	89	Weighted Average
	12,660		18.83% Pervious Area
	54,565		81.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	25	0.0200	1.09		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.1	361	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.1	436	Total			

Subcatchment EDA-20: Area Draining to Grove Street South



Summary for Subcatchment EDA-30: Area Draining to Grove Street North

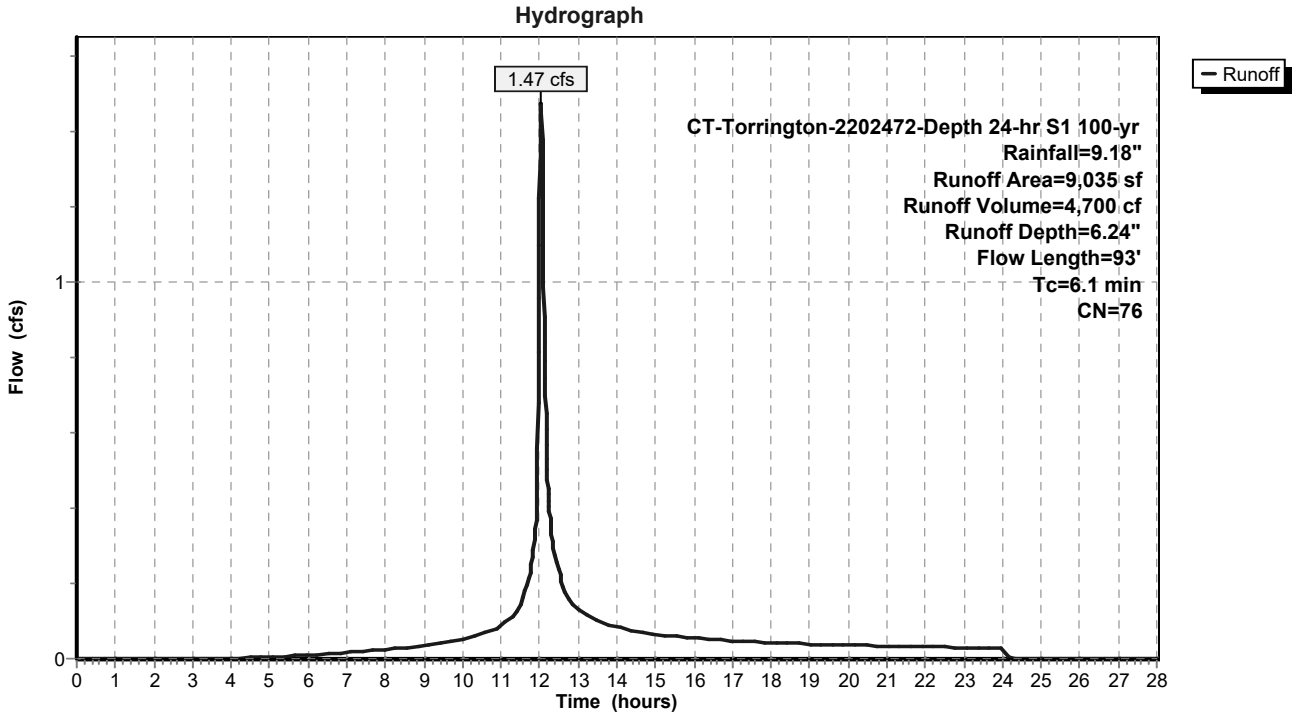
Runoff = 1.47 cfs @ 12.04 hrs, Volume= 4,700 cf, Depth= 6.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 100-yr Rainfall=9.18"

	Area (sf)	CN	Description
*	4,980	98	Impervious, HSG A
	4,055	49	50-75% Grass cover, Fair, HSG A
	9,035	76	Weighted Average
	4,055		44.88% Pervious Area
	4,980		55.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	66	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	27	0.0200	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
6.1	93	Total			

Subcatchment EDA-30: Area Draining to Grove Street North



Summary for Subcatchment EDA-40: Area Draining to Brook Street South

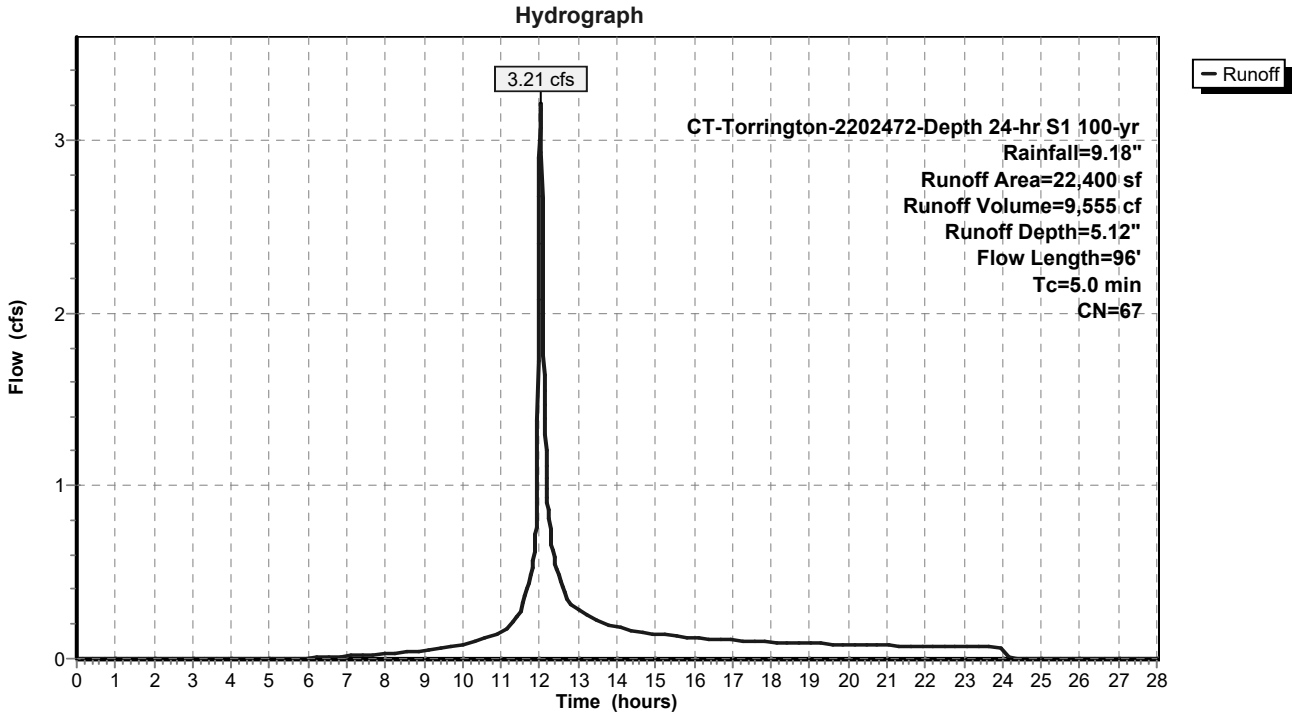
Runoff = 3.21 cfs @ 12.03 hrs, Volume= 9,555 cf, Depth= 5.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 100-yr Rainfall=9.18"

	Area (sf)	CN	Description
*	8,130	98	Impervious, HSG A
	14,270	49	50-75% Grass cover, Fair, HSG A
	22,400	67	Weighted Average
	14,270		63.71% Pervious Area
	8,130		36.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	70	0.0600	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	26	0.4000	3.65		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
4.6	96	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-40: Area Draining to Brook Street South



Summary for Subcatchment EDA-50: Area Draining to Brook Street North

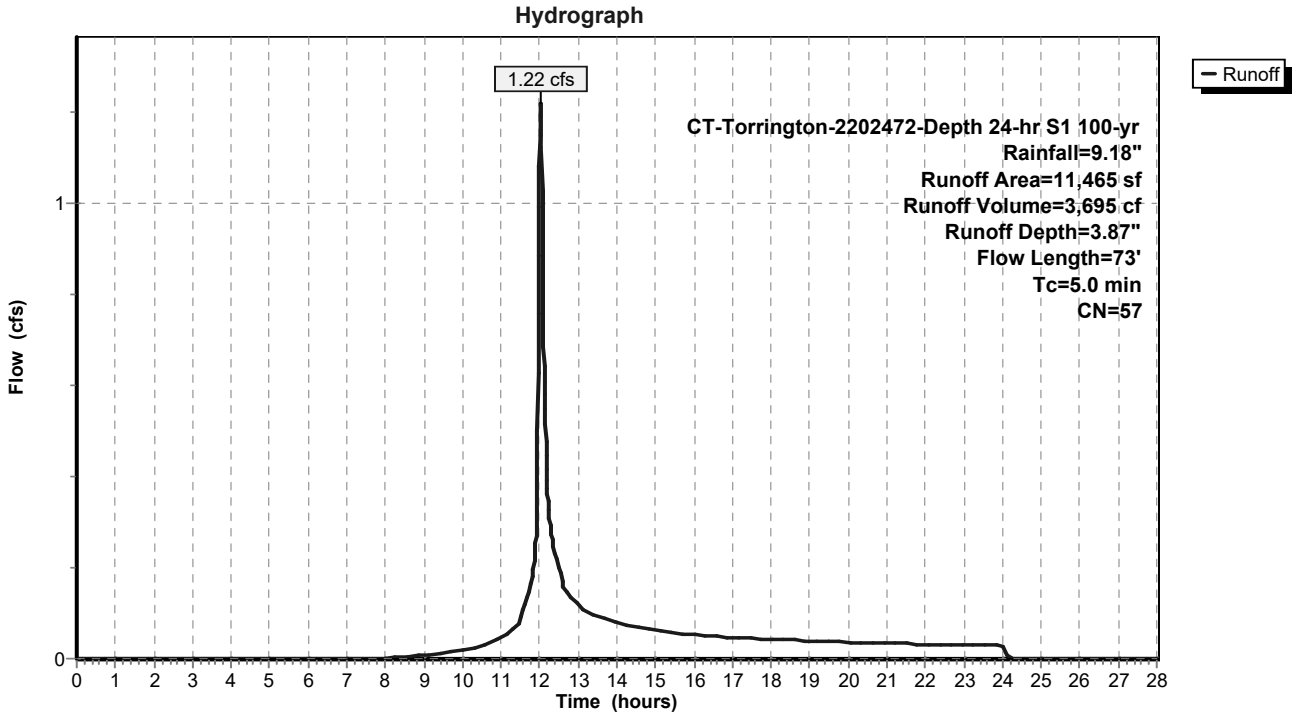
Runoff = 1.22 cfs @ 12.03 hrs, Volume= 3,695 cf, Depth= 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 100-yr Rainfall=9.18"

	Area (sf)	CN	Description
*	1,985	98	Impervious, HSG A
	9,480	49	50-75% Grass cover, Fair, HSG A
	11,465	57	Weighted Average
	9,480		82.69% Pervious Area
	1,985		17.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	55	0.0500	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	18	0.6000	3.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
4.1	73	Total, Increased to minimum Tc = 5.0 min			

Subcatchment EDA-50: Area Draining to Brook Street North

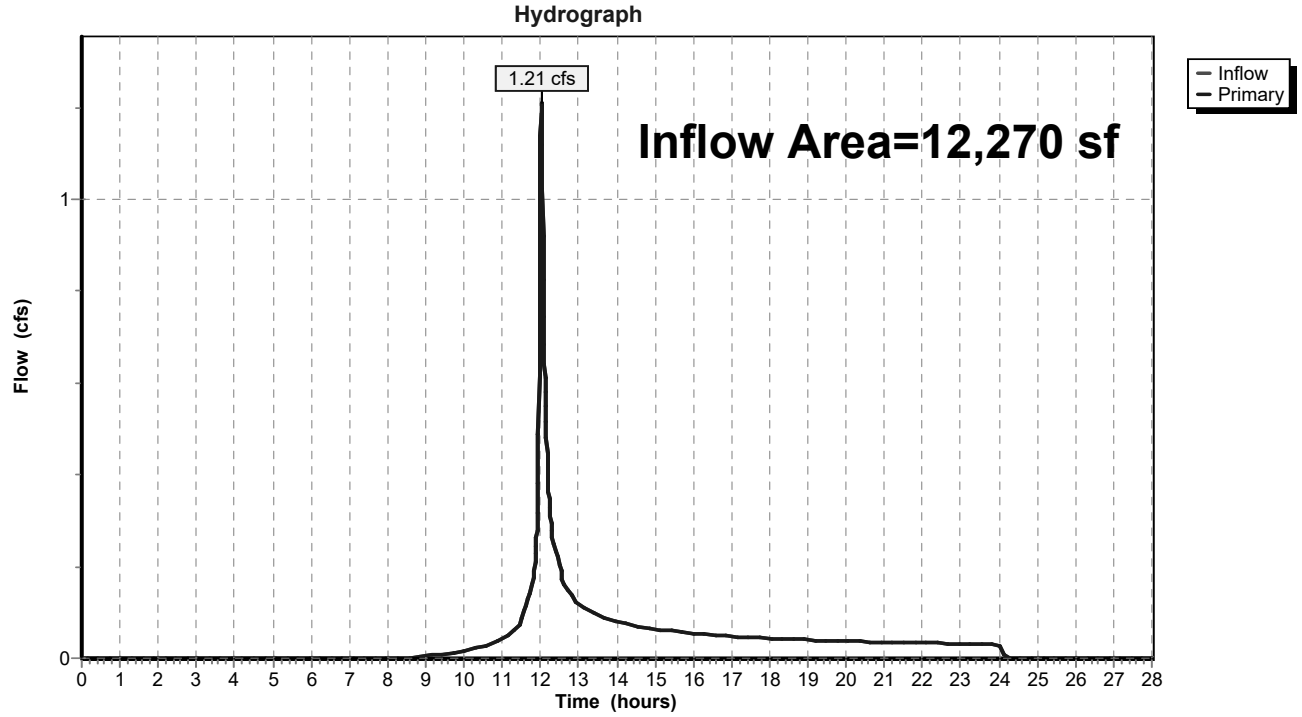


Summary for Link DP-1: Offsite West

Inflow Area = 12,270 sf, 12.84% Impervious, Inflow Depth = 3.62" for 100-yr event
Inflow = 1.21 cfs @ 12.03 hrs, Volume= 3,700 cf
Primary = 1.21 cfs @ 12.03 hrs, Volume= 3,700 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-1: Offsite West

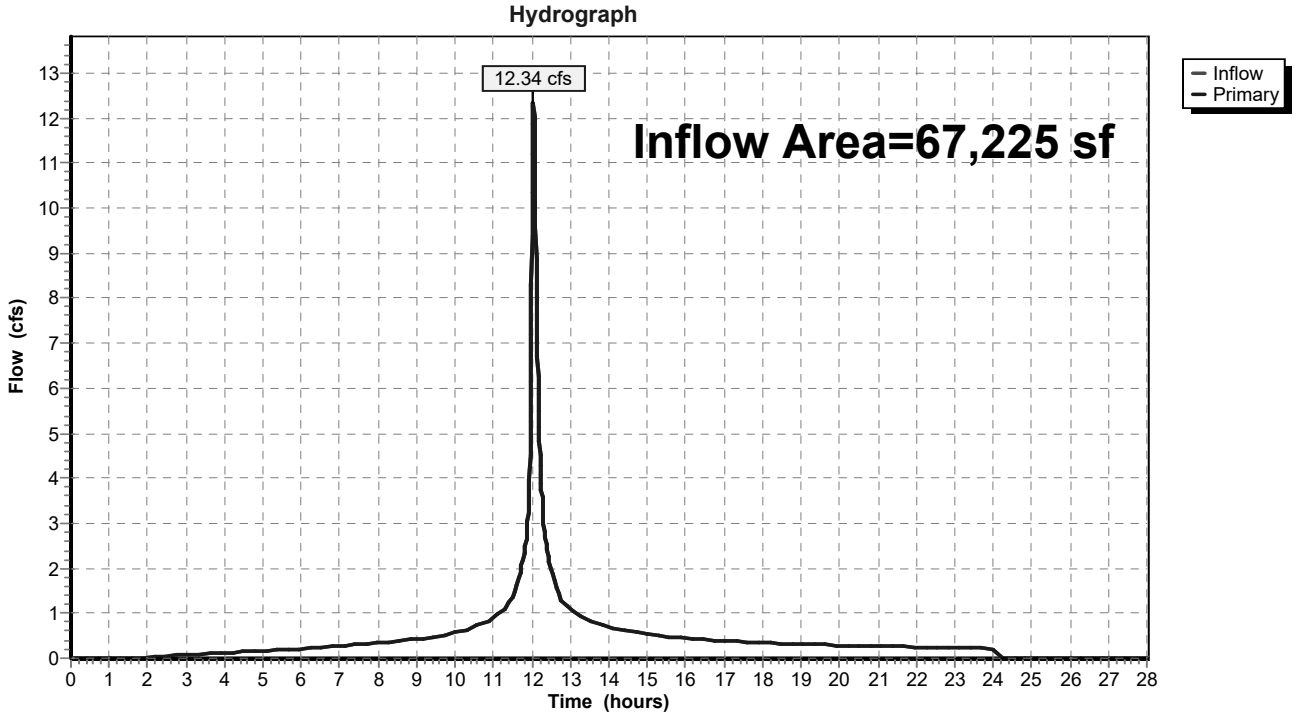


Summary for Link DP-2: Grove Street South

Inflow Area = 67,225 sf, 81.17% Impervious, Inflow Depth = 7.85" for 100-yr event
Inflow = 12.34 cfs @ 12.05 hrs, Volume= 43,960 cf
Primary = 12.34 cfs @ 12.05 hrs, Volume= 43,960 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-2: Grove Street South

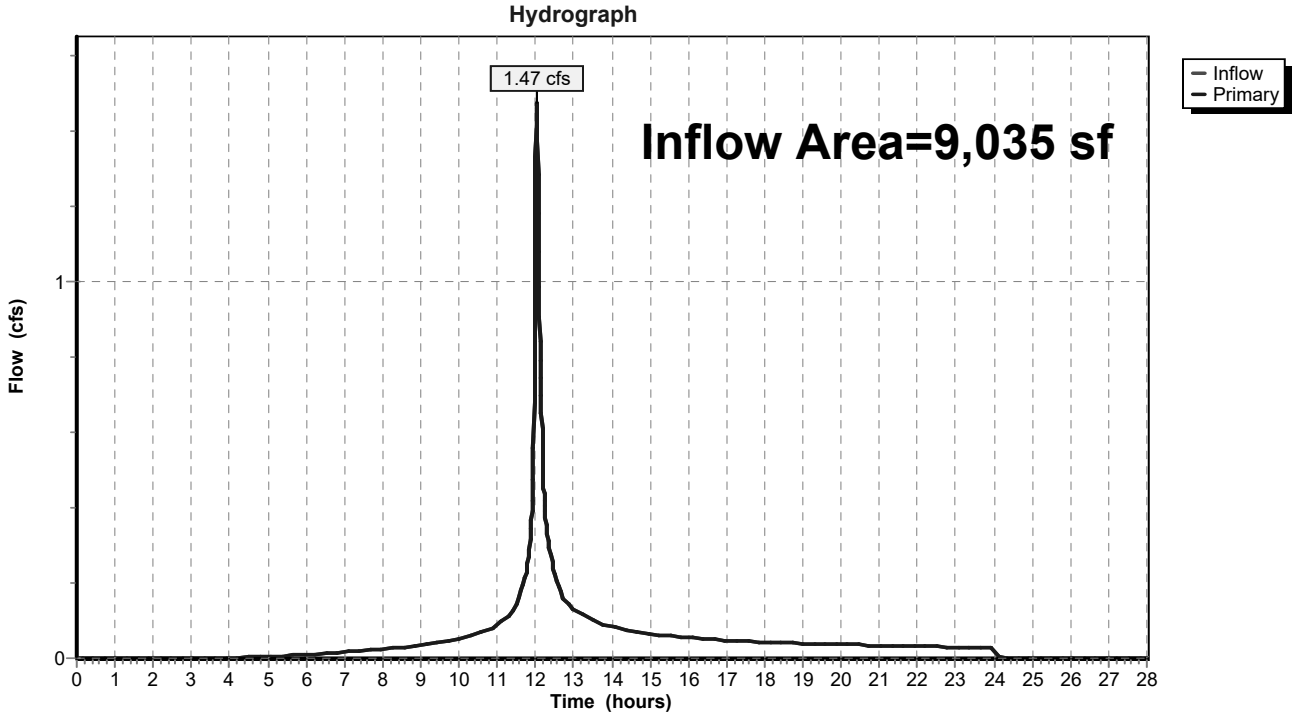


Summary for Link DP-3: Grove Street North

Inflow Area = 9,035 sf, 55.12% Impervious, Inflow Depth = 6.24" for 100-yr event
Inflow = 1.47 cfs @ 12.04 hrs, Volume= 4,700 cf
Primary = 1.47 cfs @ 12.04 hrs, Volume= 4,700 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-3: Grove Street North

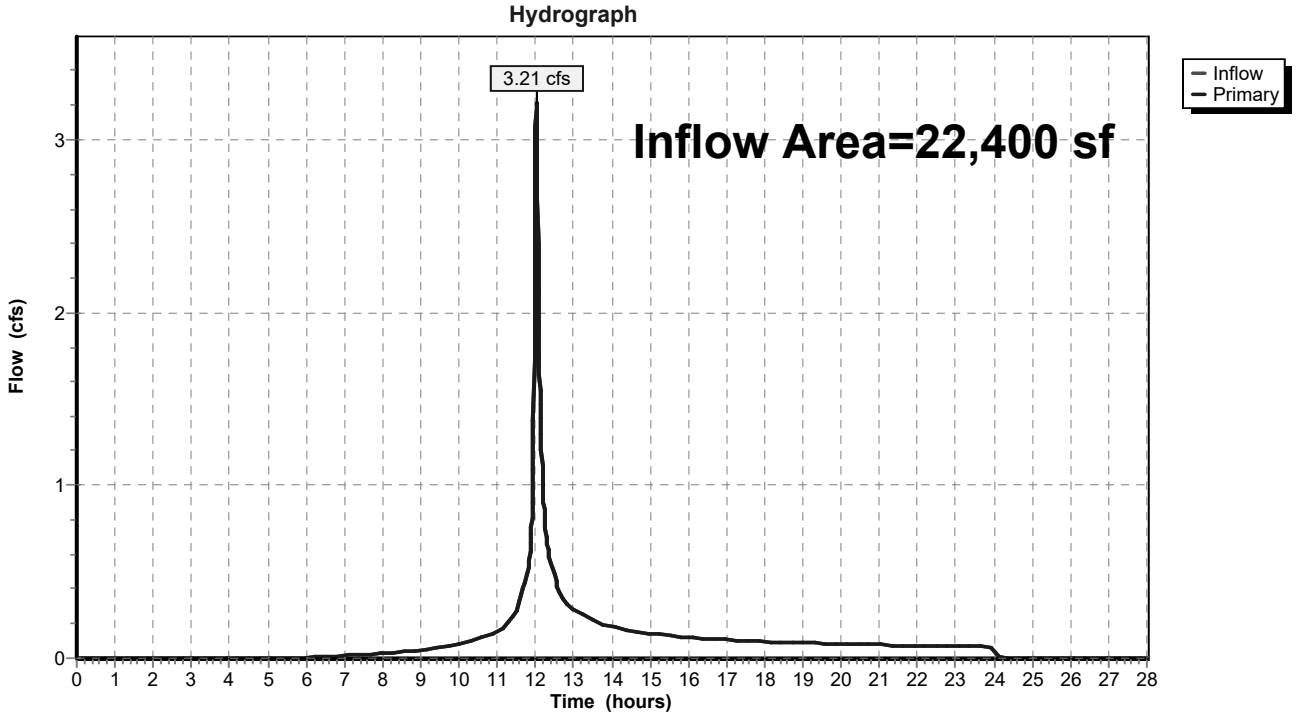


Summary for Link DP-4: Brook Street South

Inflow Area = 22,400 sf, 36.29% Impervious, Inflow Depth = 5.12" for 100-yr event
Inflow = 3.21 cfs @ 12.03 hrs, Volume= 9,555 cf
Primary = 3.21 cfs @ 12.03 hrs, Volume= 9,555 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-4: Brook Street South

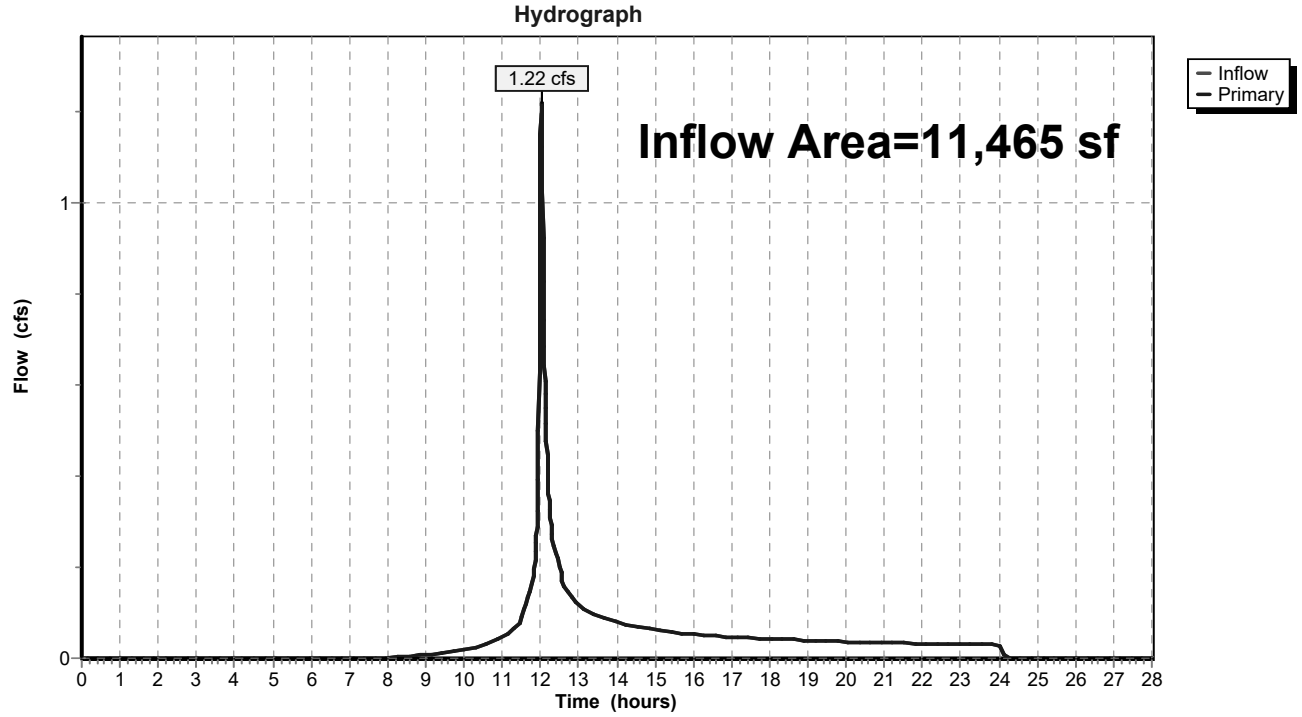


Summary for Link DP-5: Brook Street North

Inflow Area = 11,465 sf, 17.31% Impervious, Inflow Depth = 3.87" for 100-yr event
Inflow = 1.22 cfs @ 12.03 hrs, Volume= 3,695 cf
Primary = 1.22 cfs @ 12.03 hrs, Volume= 3,695 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-5: Brook Street North

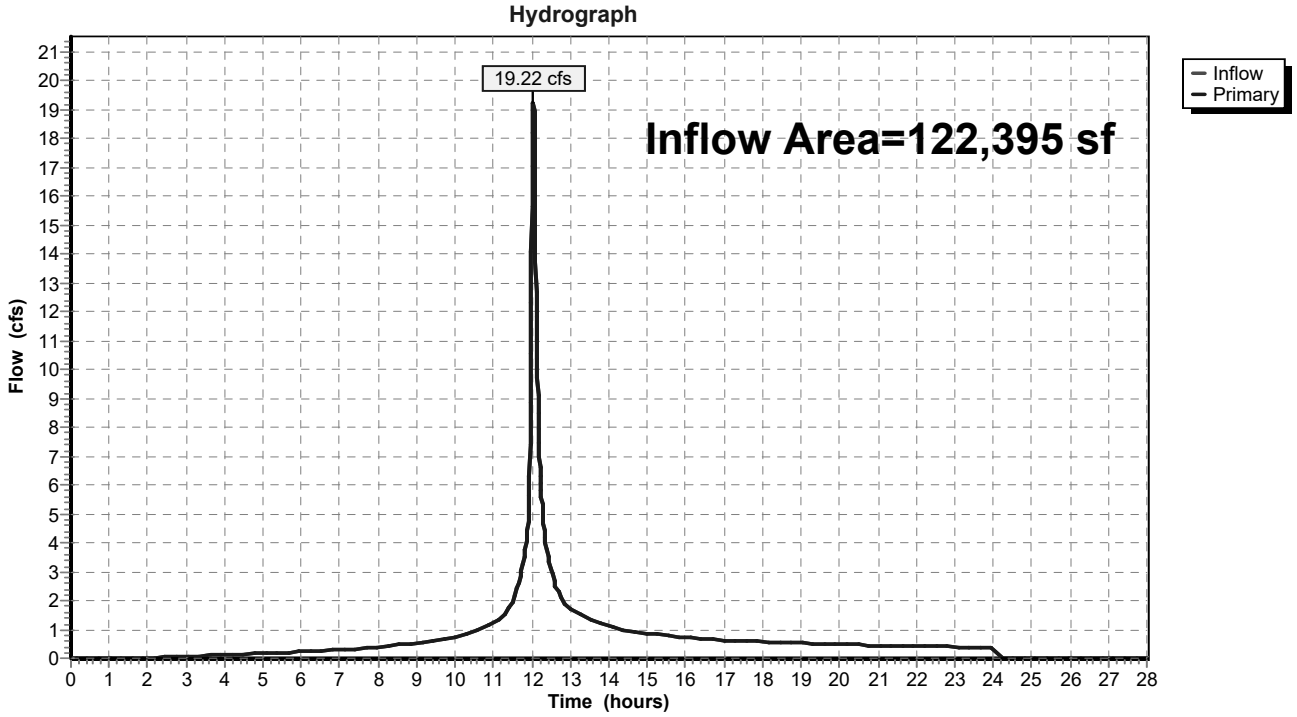


Summary for Link DP-6: Total Offsite Flow

Inflow Area = 122,395 sf, 58.20% Impervious, Inflow Depth = 6.43" for 100-yr event
Inflow = 19.22 cfs @ 12.04 hrs, Volume= 65,610 cf
Primary = 19.22 cfs @ 12.04 hrs, Volume= 65,610 cf, Atten= 0%, Lag= 0.0 min

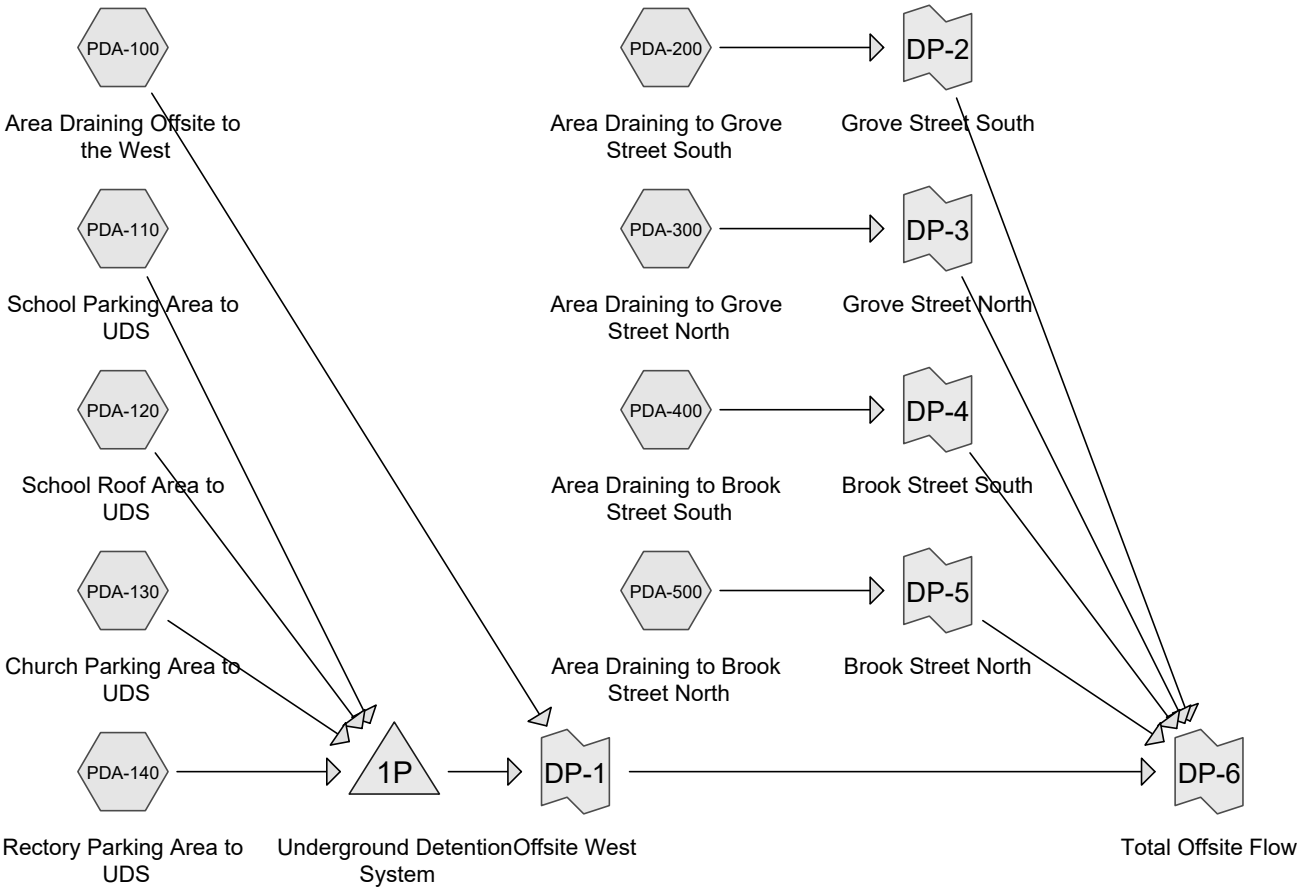
Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-6: Total Offsite Flow



APPENDIX C

POST-DEVELOPMENT HYDROLOGY



Subcat Reach Pond Link

Routing Diagram for C-CALC-2202472-Proposed Conditions
Prepared by BL Companies, Printed 3/29/2023

Time span=0.00-28.00 hrs, dt=0.01 hrs, 2801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-100: Area Draining Runoff Area=18,565 sf 7.11% Impervious Runoff Depth=0.00"
Flow Length=50' Slope=0.0300 '/' Tc=5.0 min CN=43 Runoff=0.00 cfs 0 cf

Subcatchment PDA-110: School Parking Runoff Area=10,885 sf 81.90% Impervious Runoff Depth=0.22"
Flow Length=181' Slope=0.0200 '/' Tc=5.5 min CN=87 Runoff=0.06 cfs 203 cf

Subcatchment PDA-120: School Roof Runoff Area=10,425 sf 100.00% Impervious Runoff Depth=0.79"
Tc=5.0 min CN=98 Runoff=0.22 cfs 687 cf

Subcatchment PDA-130: Church Parking Runoff Area=8,295 sf 84.63% Impervious Runoff Depth=0.28"
Flow Length=151' Tc=5.0 min CN=89 Runoff=0.06 cfs 197 cf

Subcatchment PDA-140: Rectory Parking Runoff Area=11,585 sf 74.36% Impervious Runoff Depth=0.13"
Flow Length=64' Slope=0.0300 '/' Tc=5.0 min CN=83 Runoff=0.03 cfs 128 cf

Subcatchment PDA-200: Area Draining to Runoff Area=38,890 sf 72.96% Impervious Runoff Depth=0.11"
Flow Length=447' Tc=7.6 min CN=82 Runoff=0.06 cfs 370 cf

Subcatchment PDA-300: Area Draining to Runoff Area=8,855 sf 56.24% Impervious Runoff Depth=0.01"
Flow Length=93' Tc=6.1 min CN=72 Runoff=0.00 cfs 9 cf

Subcatchment PDA-400: Area Draining to Runoff Area=10,875 sf 36.28% Impervious Runoff Depth=0.00"
Flow Length=62' Tc=5.0 min CN=60 Runoff=0.00 cfs 0 cf

Subcatchment PDA-500: Area Draining to Runoff Area=4,020 sf 1.12% Impervious Runoff Depth=0.00"
Flow Length=53' Tc=5.0 min CN=40 Runoff=0.00 cfs 0 cf

Pond 1P: Underground Detention System Peak Elev=97.57' Storage=485 cf Inflow=0.36 cfs 1,215 cf
Discarded=0.03 cfs 1,215 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 1,215 cf

Link DP-1: Offsite West Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link DP-2: Grove Street South Inflow=0.06 cfs 370 cf
Primary=0.06 cfs 370 cf

Link DP-3: Grove Street North Inflow=0.00 cfs 9 cf
Primary=0.00 cfs 9 cf

Link DP-4: Brook Street South Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link DP-5: Brook Street North Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link DP-6: Total Offsite Flow Inflow=0.06 cfs 379 cf
Primary=0.06 cfs 379 cf

Total Runoff Area = 122,395 sf Runoff Volume = 1,594 cf Average Runoff Depth = 0.16"
39.83% Pervious = 48,755 sf 60.17% Impervious = 73,640 sf

Summary for Subcatchment PDA-100: Area Draining Offsite to the West

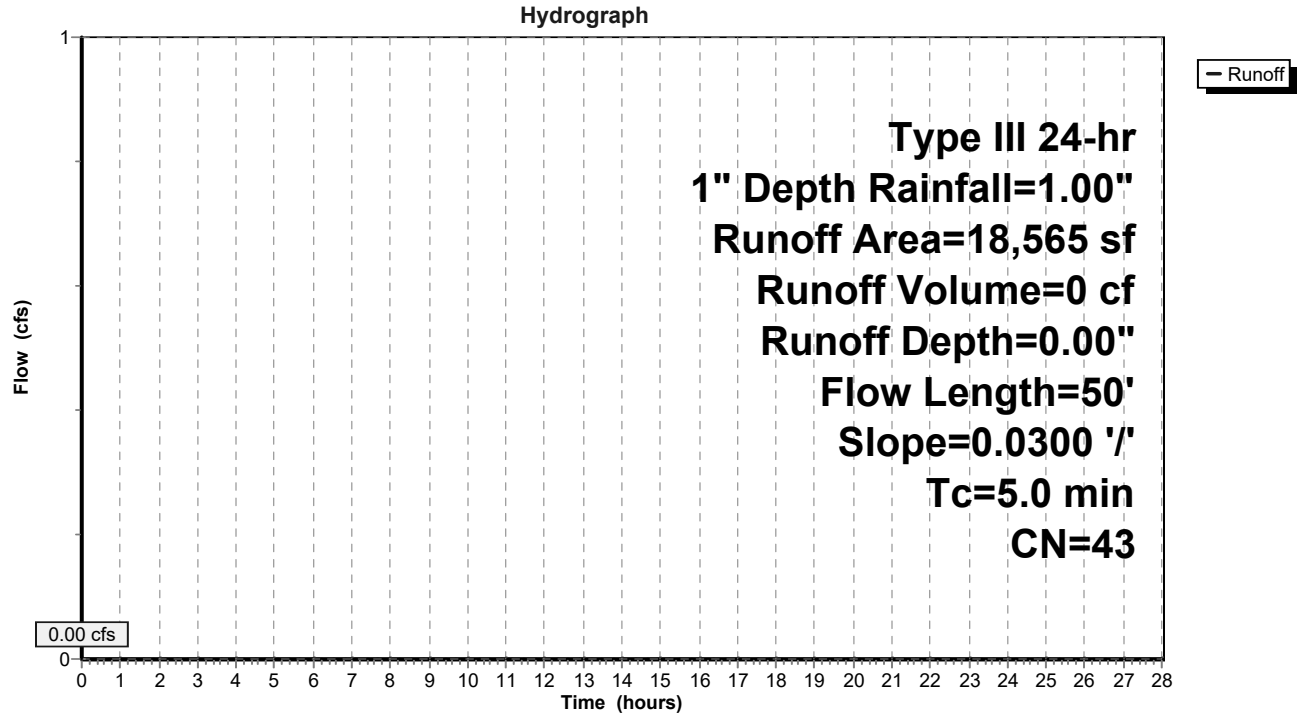
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Depth Rainfall=1.00"

	Area (sf)	CN	Description
*	1,320	98	Impervious, HSG A
	17,245	39	>75% Grass cover, Good, HSG A
	18,565	43	Weighted Average
	17,245		92.89% Pervious Area
	1,320		7.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
4.6	50	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-100: Area Draining Offsite to the West



Summary for Subcatchment PDA-110: School Parking Area to UDS

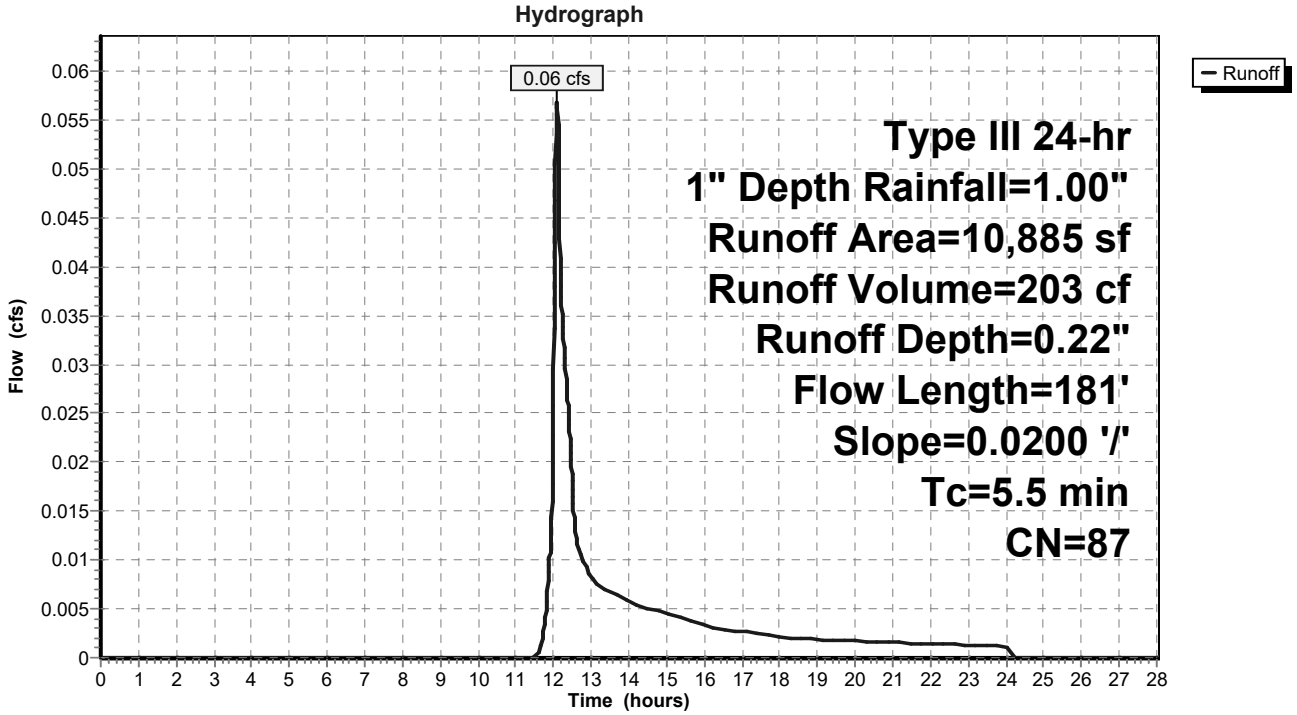
Runoff = 0.06 cfs @ 12.10 hrs, Volume= 203 cf, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Depth Rainfall=1.00"

	Area (sf)	CN	Description
*	8,915	98	Impervious, HSG A
	1,970	39	>75% Grass cover, Good, HSG A
	10,885	87	Weighted Average
	1,970		18.10% Pervious Area
	8,915		81.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	37	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.8	63	0.0200	1.32		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
0.5	81	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	181	Total			

Subcatchment PDA-110: School Parking Area to UDS



Summary for Subcatchment PDA-120: School Roof Area to UDS

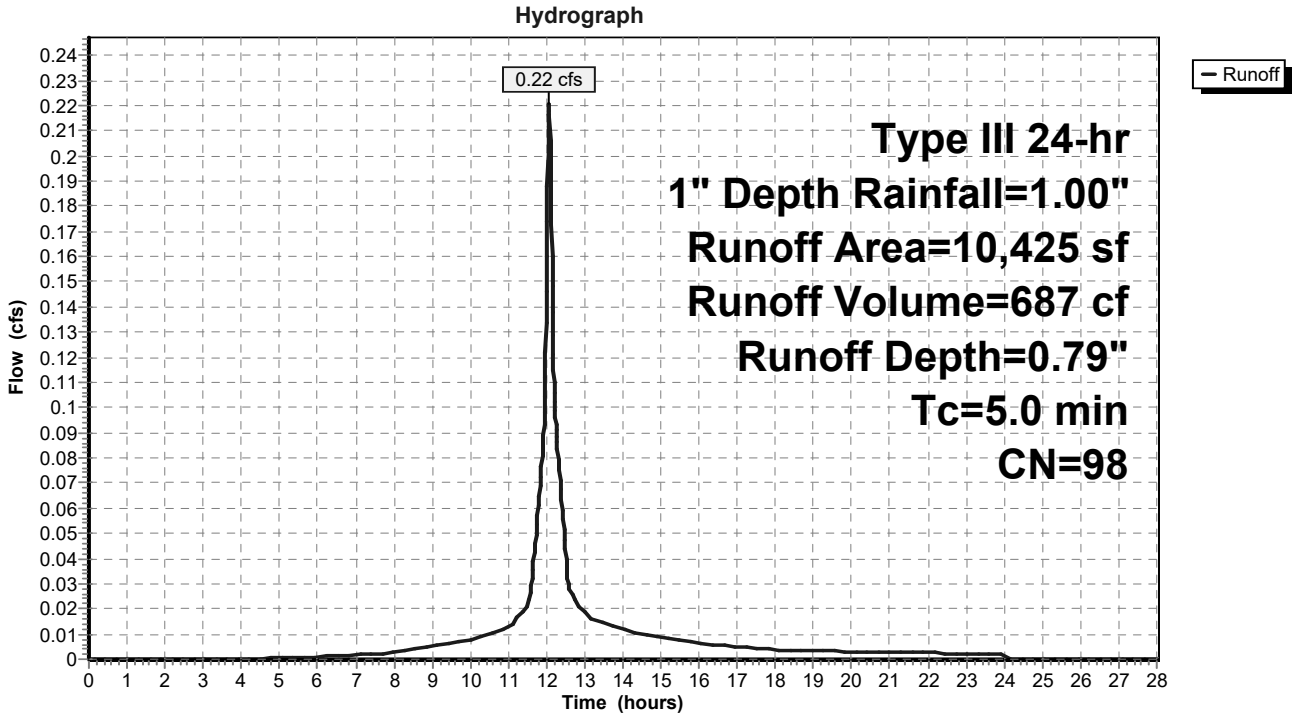
Runoff = 0.22 cfs @ 12.07 hrs, Volume= 687 cf, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Depth Rainfall=1.00"

	Area (sf)	CN	Description
*	10,425	98	Impervious, HSG A
	10,425		100.00% Impervious Area

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

Subcatchment PDA-120: School Roof Area to UDS



Summary for Subcatchment PDA-130: Church Parking Area to UDS

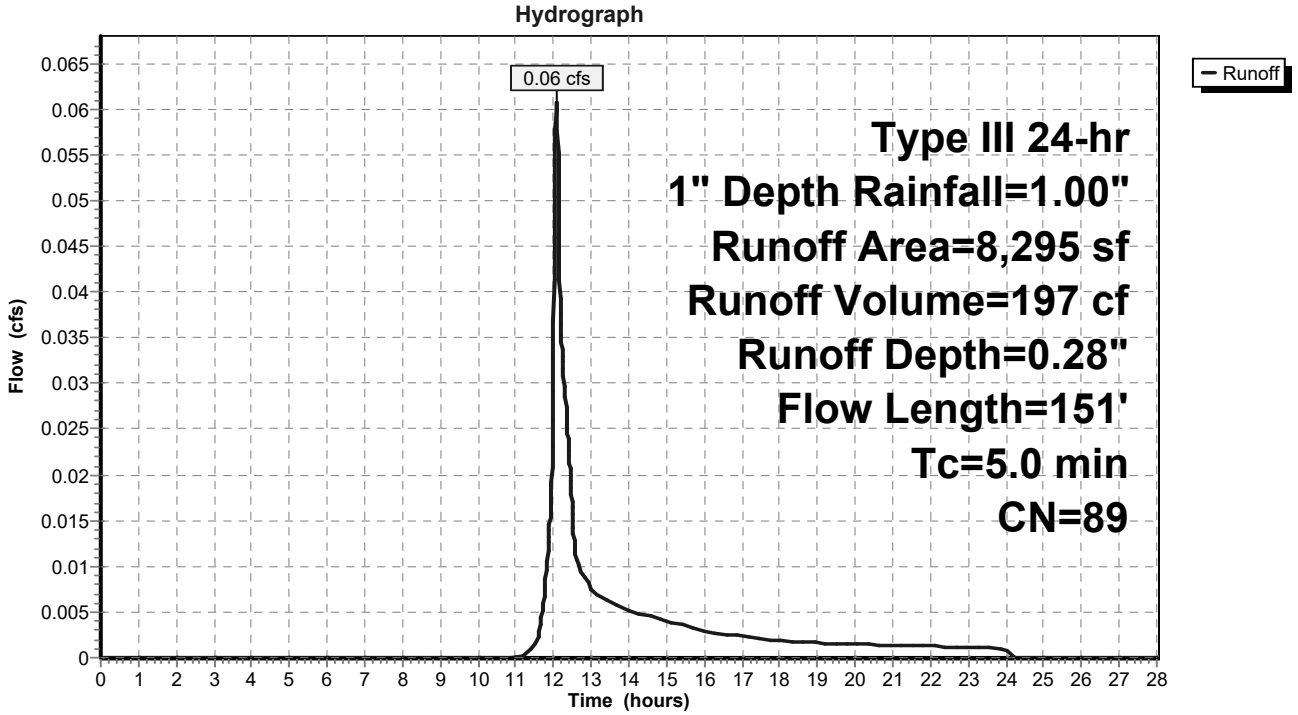
Runoff = 0.06 cfs @ 12.08 hrs, Volume= 197 cf, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Depth Rainfall=1.00"

	Area (sf)	CN	Description
*	7,020	98	Impervious, HSG A
	1,275	39	>75% Grass cover, Good, HSG A
	8,295	89	Weighted Average
	1,275		15.37% Pervious Area
	7,020		84.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	22	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.8	78	0.0350	1.72		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
0.2	51	0.0350	3.80		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.7	151	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-130: Church Parking Area to UDS



Summary for Subcatchment PDA-140: Rectory Parking Area to UDS

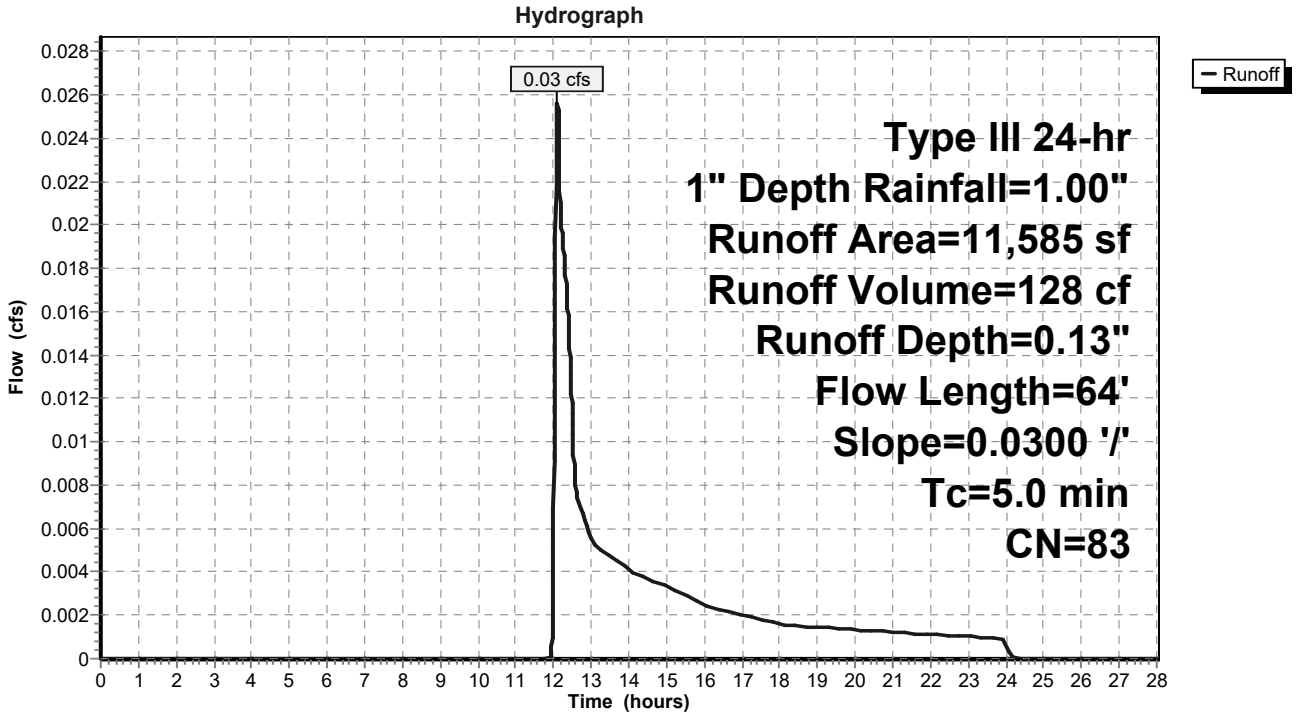
Runoff = 0.03 cfs @ 12.11 hrs, Volume= 128 cf, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Depth Rainfall=1.00"

	Area (sf)	CN	Description
*	8,615	98	Impervious, HSG A
	2,970	39	>75% Grass cover, Good, HSG A
	11,585	83	Weighted Average
	2,970		25.64% Pervious Area
	8,615		74.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	16	0.0300	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.5	48	0.0300	1.47		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.3	64	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-140: Rectory Parking Area to UDS



Summary for Subcatchment PDA-200: Area Draining to Grove Street South

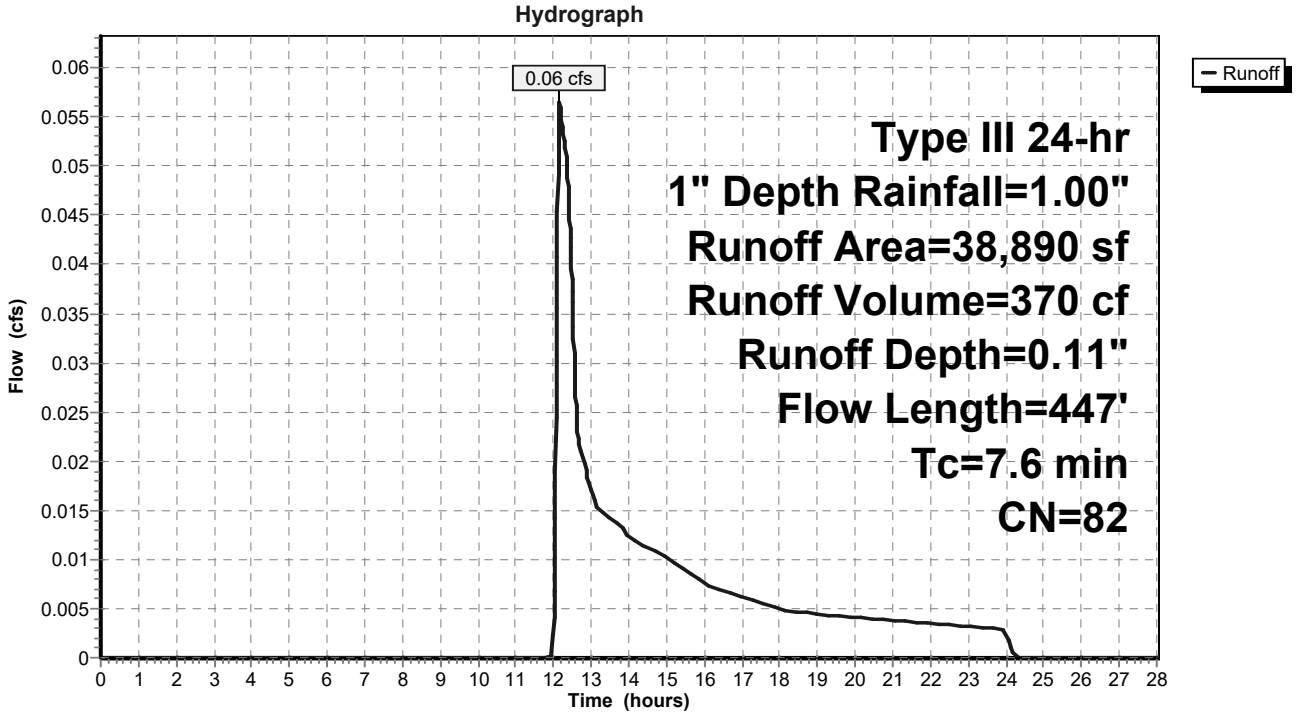
Runoff = 0.06 cfs @ 12.17 hrs, Volume= 370 cf, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Depth Rainfall=1.00"

	Area (sf)	CN	Description
*	28,375	98	Impervious, HSG A
	10,515	39	>75% Grass cover, Good, HSG A
	38,890	82	Weighted Average
	10,515		27.04% Pervious Area
	28,375		72.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	30	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.9	70	0.0200	1.34		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.0	347	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.6	447	Total			

Subcatchment PDA-200: Area Draining to Grove Street South



Summary for Subcatchment PDA-300: Area Draining to Grove Street North

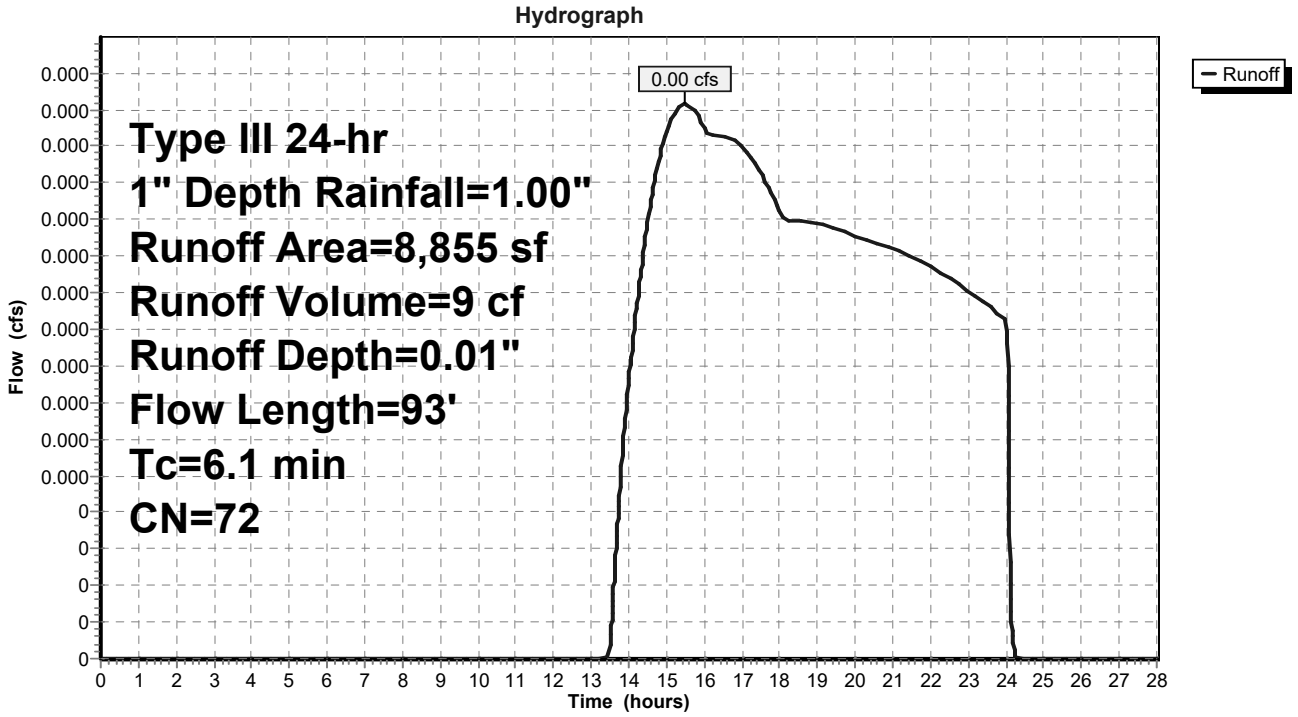
Runoff = 0.00 cfs @ 15.50 hrs, Volume= 9 cf, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Depth Rainfall=1.00"

	Area (sf)	CN	Description
*	4,980	98	Impervious, HSG A
	3,875	39	>75% Grass cover, Good, HSG A
	8,855	72	Weighted Average
	3,875		43.76% Pervious Area
	4,980		56.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	66	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	27	0.0200	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
6.1	93	Total			

Subcatchment PDA-300: Area Draining to Grove Street North



Summary for Subcatchment PDA-400: Area Draining to Brook Street South

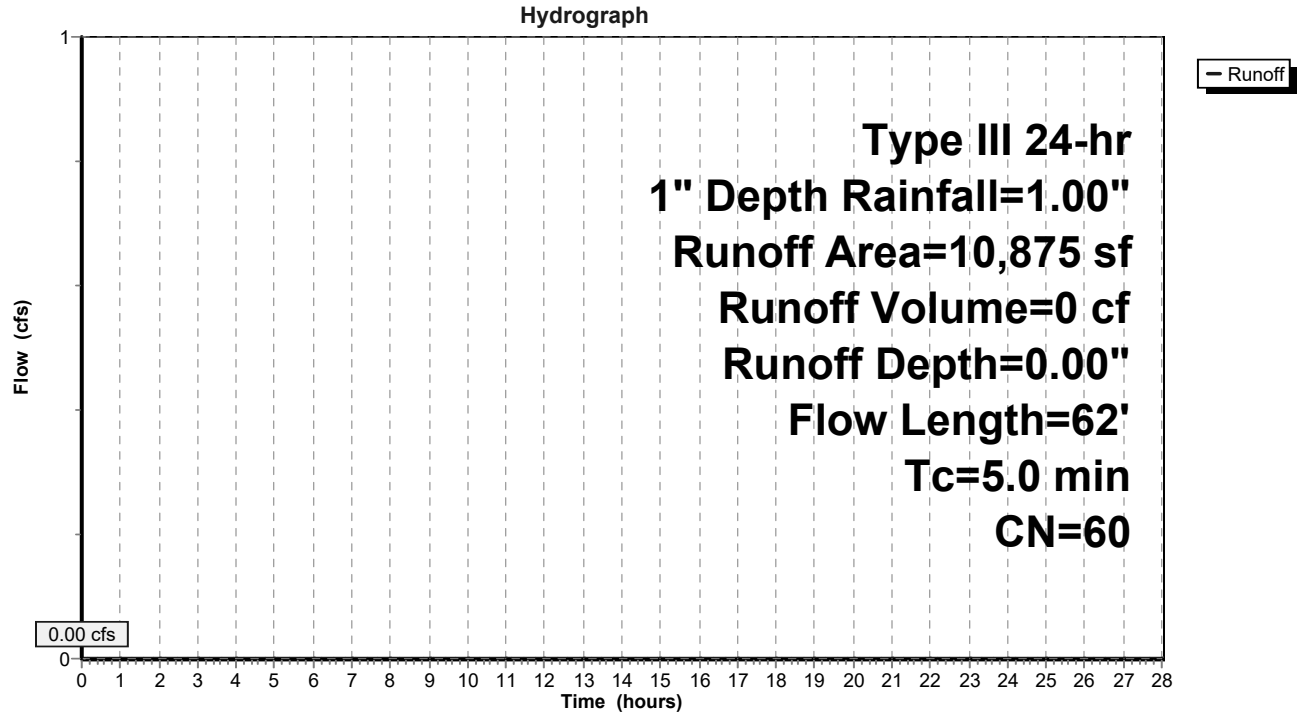
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Depth Rainfall=1.00"

	Area (sf)	CN	Description
*	3,945	98	Impervious, HSG A
	6,930	39	>75% Grass cover, Good, HSG A
	10,875	60	Weighted Average
	6,930		63.72% Pervious Area
	3,945		36.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	37	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	25	0.4000	3.62		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
3.7	62	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-400: Area Draining to Brook Street South



Summary for Subcatchment PDA-500: Area Draining to Brook Street North

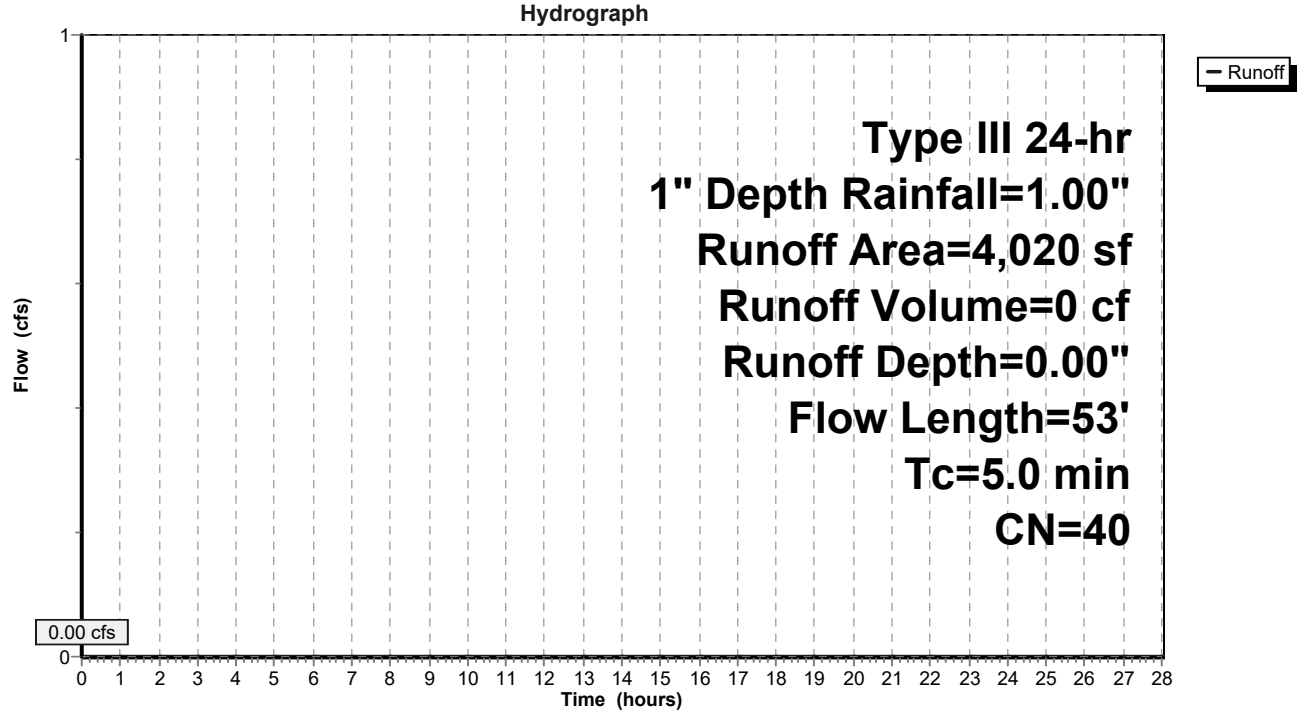
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Depth Rainfall=1.00"

	Area (sf)	CN	Description
*	45	98	Impervious, HSG A
	3,975	39	>75% Grass cover, Good, HSG A
	4,020	40	Weighted Average
	3,975		98.88% Pervious Area
	45		1.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	35	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	18	0.6000	3.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
3.5	53	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-500: Area Draining to Brook Street North



Summary for Pond 1P: Underground Detention System

Inflow Area = 41,190 sf, 84.91% Impervious, Inflow Depth = 0.35" for 1" Depth event
Inflow = 0.36 cfs @ 12.08 hrs, Volume= 1,215 cf
Outflow = 0.03 cfs @ 11.79 hrs, Volume= 1,215 cf, Atten= 92%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.79 hrs, Volume= 1,215 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Peak Elev= 97.57' @ 13.82 hrs Surf.Area= 3,095 sf Storage= 485 cf

Plug-Flow detention time= 161.6 min calculated for 1,215 cf (100% of inflow)
Center-of-Mass det. time= 161.6 min (991.8 - 830.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	97.18'	3,408 cf	**34.75'W x 89.06'L x 4.00'H Field A** 12,379 cf Overall - 3,859 cf Embedded = 8,520 cf x 40.0% Voids
#2A	98.18'	3,859 cf	**ADS_StormTech SC-740 +Cap** x 84 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 84 Chambers in 7 Rows
		7,267 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	98.60'	**18.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 98.60' / 98.50' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	100.18'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Discarded	97.18'	**0.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.79 hrs HW=97.22' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=97.18' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Underground Detention System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
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

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

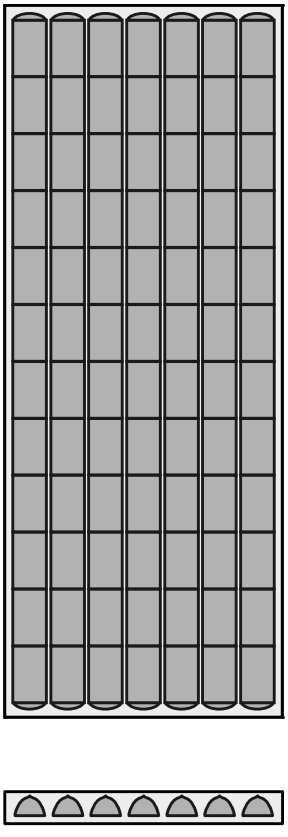
12 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 87.06' Row Length +12.0" End Stone x 2 = 89.06' Base Length
7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width
12.0" Base + 30.0" Chamber Height + 6.0" Cover = 4.00' Field Height

84 Chambers x 45.9 cf = 3,859.0 cf Chamber Storage

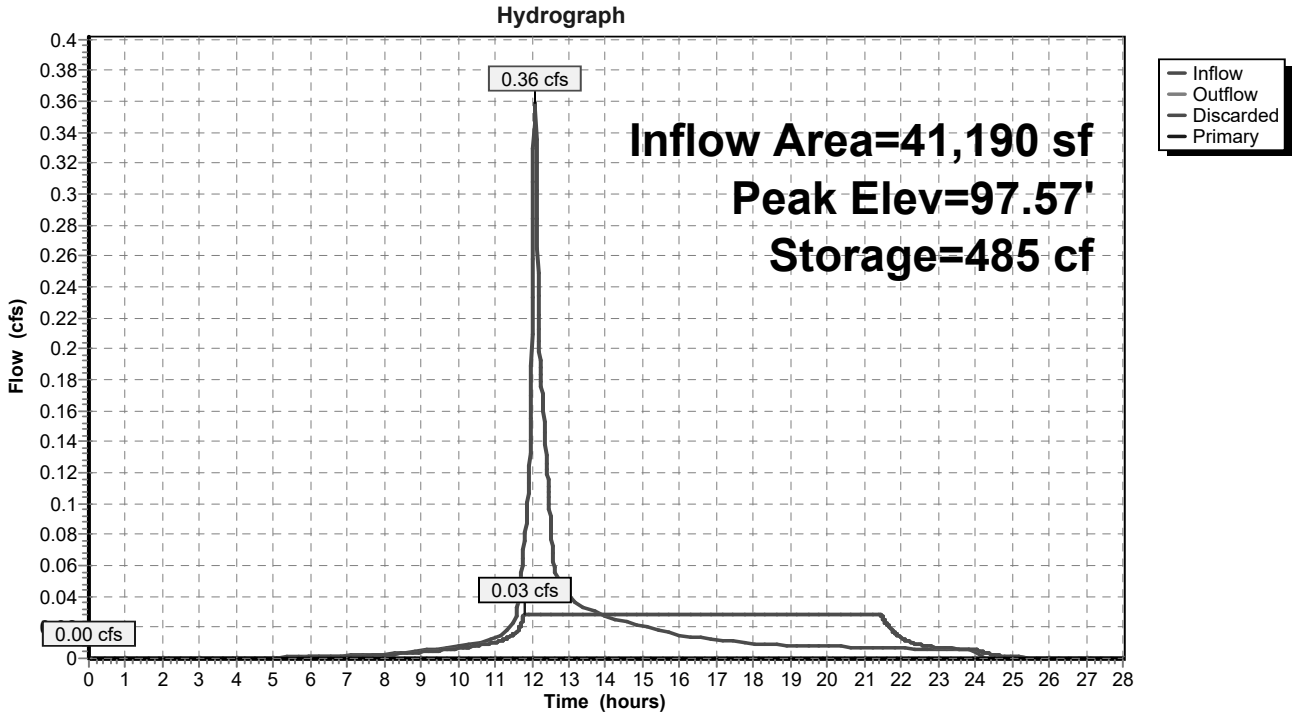
12,378.9 cf Field - 3,859.0 cf Chambers = 8,519.9 cf Stone x 40.0% Voids = 3,408.0 cf Stone Storage

Chamber Storage + Stone Storage = 7,266.9 cf = 0.167 af
Overall Storage Efficiency = 58.7%
Overall System Size = 89.06' x 34.75' x 4.00'

84 Chambers
458.5 cy Field
315.6 cy Stone



Pond 1P: Underground Detention System

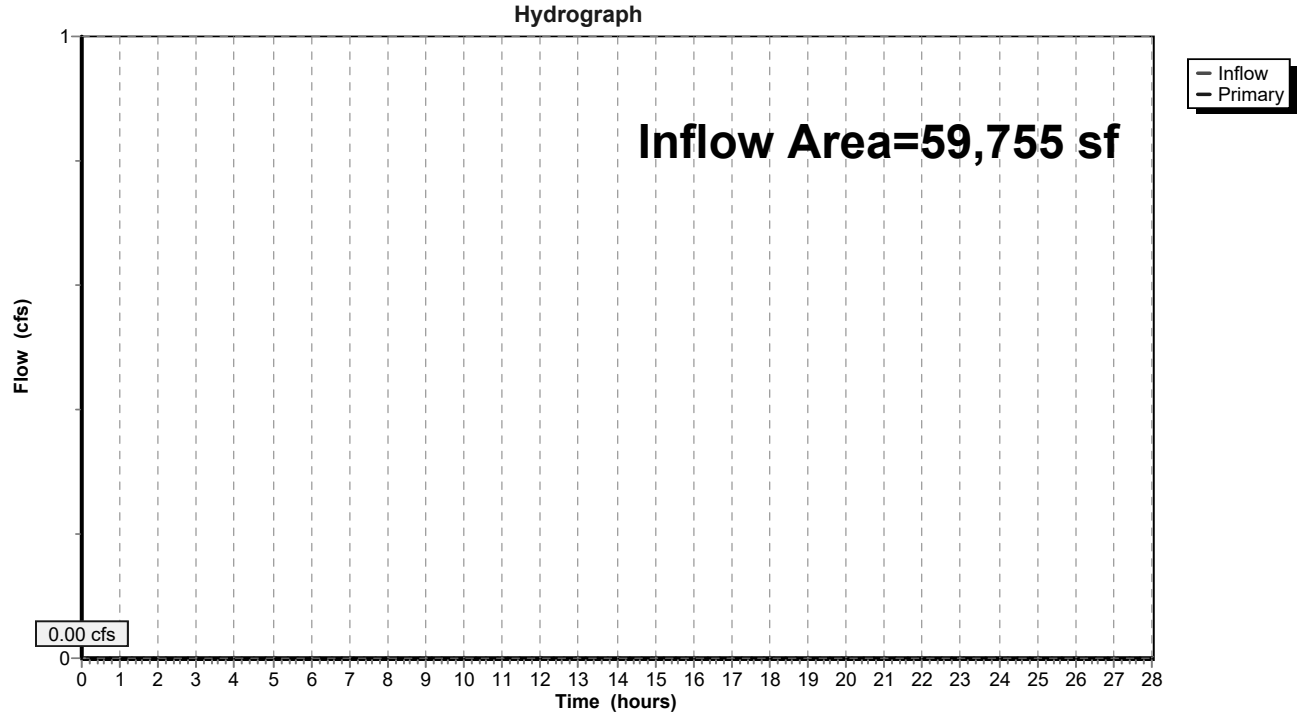


Summary for Link DP-1: Offsite West

Inflow Area = 59,755 sf, 60.74% Impervious, Inflow Depth = 0.00" for 1" Depth event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-1: Offsite West

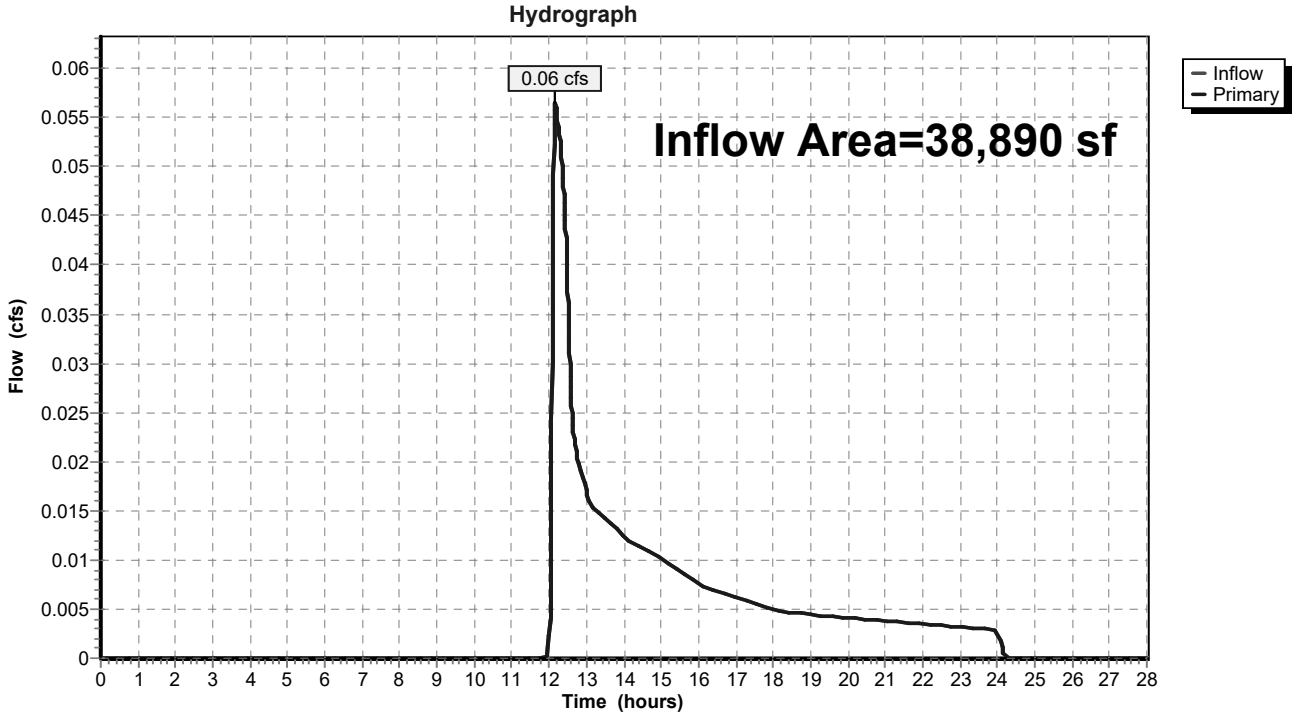


Summary for Link DP-2: Grove Street South

Inflow Area = 38,890 sf, 72.96% Impervious, Inflow Depth = 0.11" for 1" Depth event
Inflow = 0.06 cfs @ 12.17 hrs, Volume= 370 cf
Primary = 0.06 cfs @ 12.17 hrs, Volume= 370 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-2: Grove Street South

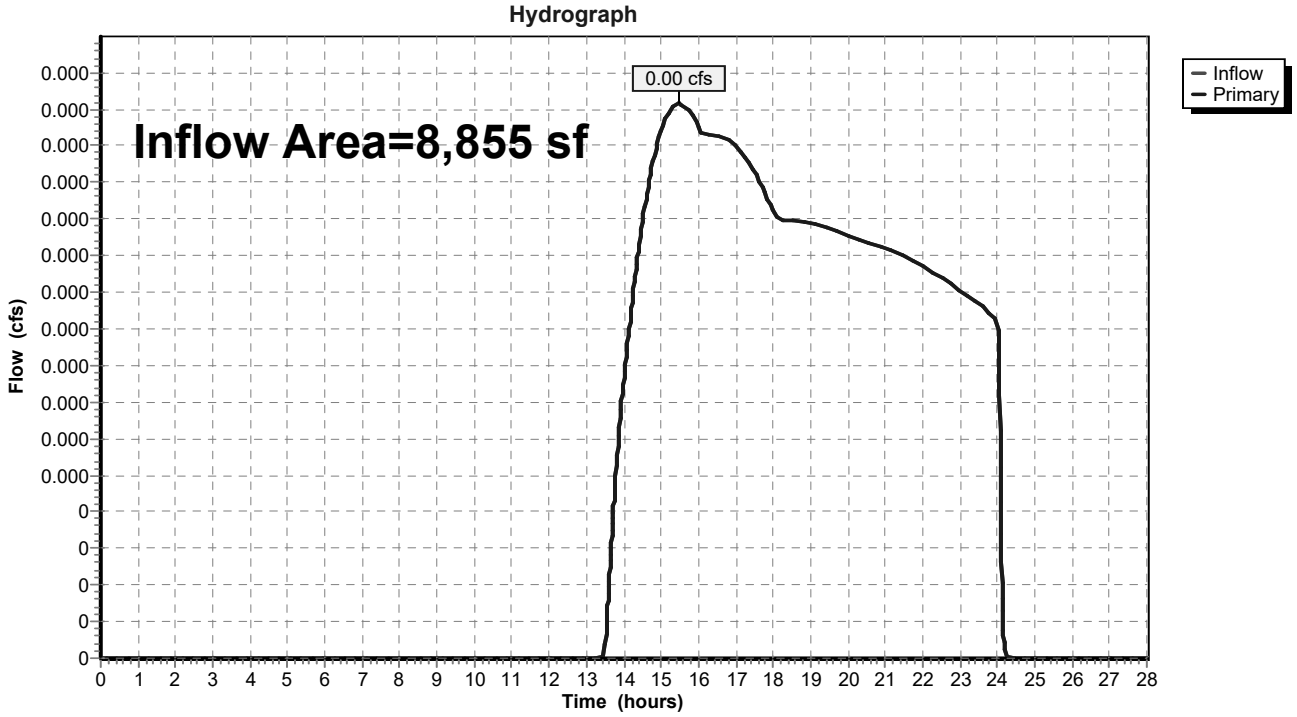


Summary for Link DP-3: Grove Street North

Inflow Area = 8,855 sf, 56.24% Impervious, Inflow Depth = 0.01" for 1" Depth event
Inflow = 0.00 cfs @ 15.50 hrs, Volume= 9 cf
Primary = 0.00 cfs @ 15.50 hrs, Volume= 9 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-3: Grove Street North

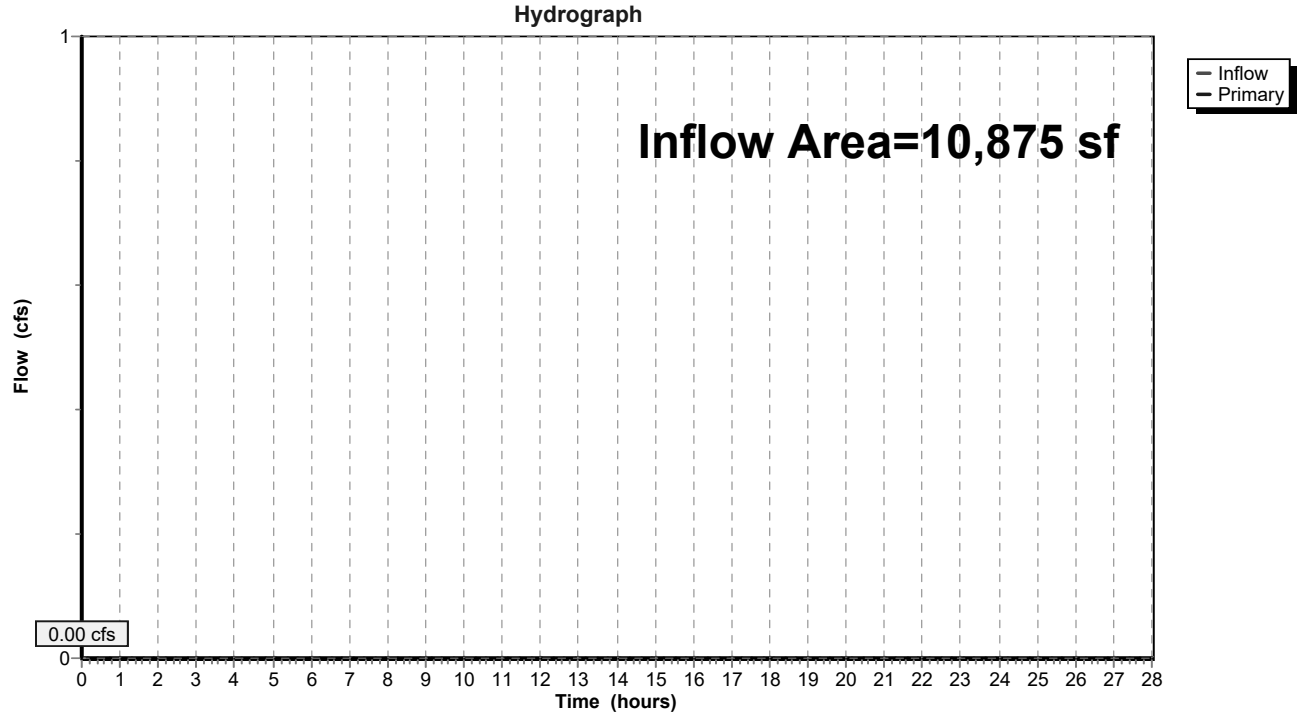


Summary for Link DP-4: Brook Street South

Inflow Area = 10,875 sf, 36.28% Impervious, Inflow Depth = 0.00" for 1" Depth event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-4: Brook Street South

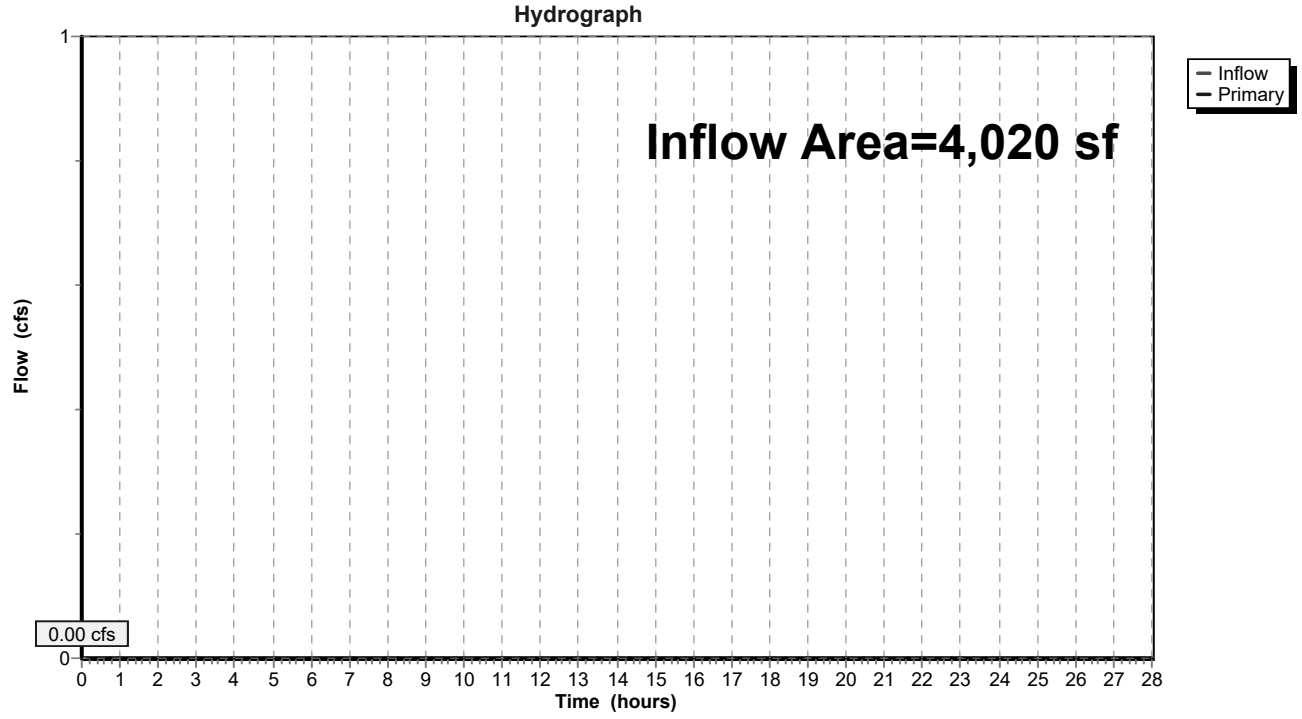


Summary for Link DP-5: Brook Street North

Inflow Area = 4,020 sf, 1.12% Impervious, Inflow Depth = 0.00" for 1" Depth event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-5: Brook Street North

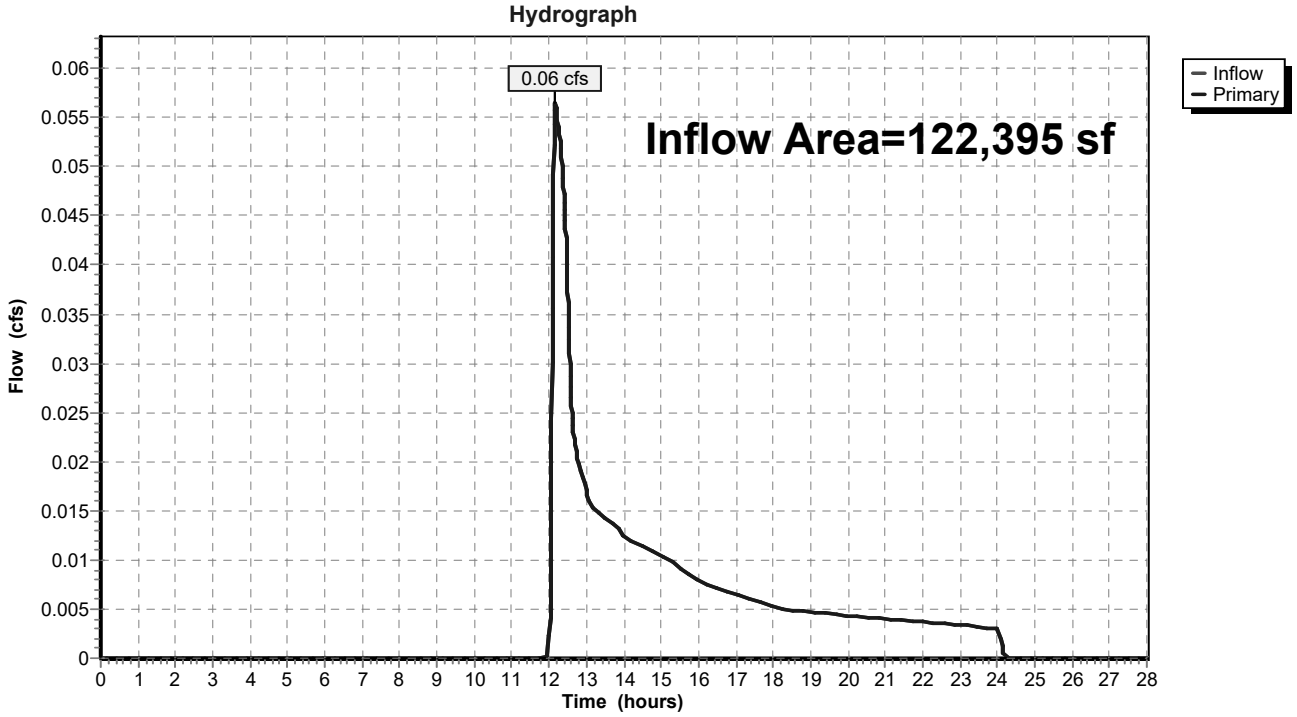


Summary for Link DP-6: Total Offsite Flow

Inflow Area = 122,395 sf, 60.17% Impervious, Inflow Depth = 0.04" for 1" Depth event
Inflow = 0.06 cfs @ 12.17 hrs, Volume= 379 cf
Primary = 0.06 cfs @ 12.17 hrs, Volume= 379 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-6: Total Offsite Flow



Time span=0.00-28.00 hrs, dt=0.01 hrs, 2801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-100: Area Draining Runoff Area=18,565 sf 7.11% Impervious Runoff Depth=0.05"
Flow Length=50' Slope=0.0300 '/' Tc=5.0 min CN=43 Runoff=0.00 cfs 83 cf

Subcatchment PDA-110: School Parking Runoff Area=10,885 sf 81.90% Impervious Runoff Depth=2.20"
Flow Length=181' Slope=0.0200 '/' Tc=5.5 min CN=87 Runoff=0.76 cfs 1,996 cf

Subcatchment PDA-120: School Roof Runoff Area=10,425 sf 100.00% Impervious Runoff Depth=3.29"
Tc=5.0 min CN=98 Runoff=1.00 cfs 2,855 cf

Subcatchment PDA-130: Church Parking Runoff Area=8,295 sf 84.63% Impervious Runoff Depth=2.38"
Flow Length=151' Tc=5.0 min CN=89 Runoff=0.64 cfs 1,642 cf

Subcatchment PDA-140: Rectory Parking Runoff Area=11,585 sf 74.36% Impervious Runoff Depth=1.88"
Flow Length=64' Slope=0.0300 '/' Tc=5.0 min CN=83 Runoff=0.71 cfs 1,811 cf

Subcatchment PDA-200: Area Draining to Runoff Area=38,890 sf 72.96% Impervious Runoff Depth=1.80"
Flow Length=447' Tc=7.6 min CN=82 Runoff=1.96 cfs 5,831 cf

Subcatchment PDA-300: Area Draining to Runoff Area=8,855 sf 56.24% Impervious Runoff Depth=1.13"
Flow Length=93' Tc=6.1 min CN=72 Runoff=0.29 cfs 837 cf

Subcatchment PDA-400: Area Draining to Runoff Area=10,875 sf 36.28% Impervious Runoff Depth=0.54"
Flow Length=62' Tc=5.0 min CN=60 Runoff=0.12 cfs 489 cf

Subcatchment PDA-500: Area Draining to Runoff Area=4,020 sf 1.12% Impervious Runoff Depth=0.02"
Flow Length=53' Tc=5.0 min CN=40 Runoff=0.00 cfs 6 cf

Pond 1P: Underground Detention System Peak Elev=100.19' Storage=5,906 cf Inflow=3.10 cfs 8,304 cf
Discarded=0.03 cfs 2,376 cf Primary=0.03 cfs 440 cf Outflow=0.06 cfs 2,816 cf

Link DP-1: Offsite West Inflow=0.03 cfs 523 cf
Primary=0.03 cfs 523 cf

Link DP-2: Grove Street South Inflow=1.96 cfs 5,831 cf
Primary=1.96 cfs 5,831 cf

Link DP-3: Grove Street North Inflow=0.29 cfs 837 cf
Primary=0.29 cfs 837 cf

Link DP-4: Brook Street South Inflow=0.12 cfs 489 cf
Primary=0.12 cfs 489 cf

Link DP-5: Brook Street North Inflow=0.00 cfs 6 cf
Primary=0.00 cfs 6 cf

Link DP-6: Total Offsite Flow Inflow=2.35 cfs 7,686 cf
Primary=2.35 cfs 7,686 cf

Total Runoff Area = 122,395 sf Runoff Volume = 15,549 cf Average Runoff Depth = 1.52"
39.83% Pervious = 48,755 sf 60.17% Impervious = 73,640 sf

Summary for Subcatchment PDA-100: Area Draining Offsite to the West

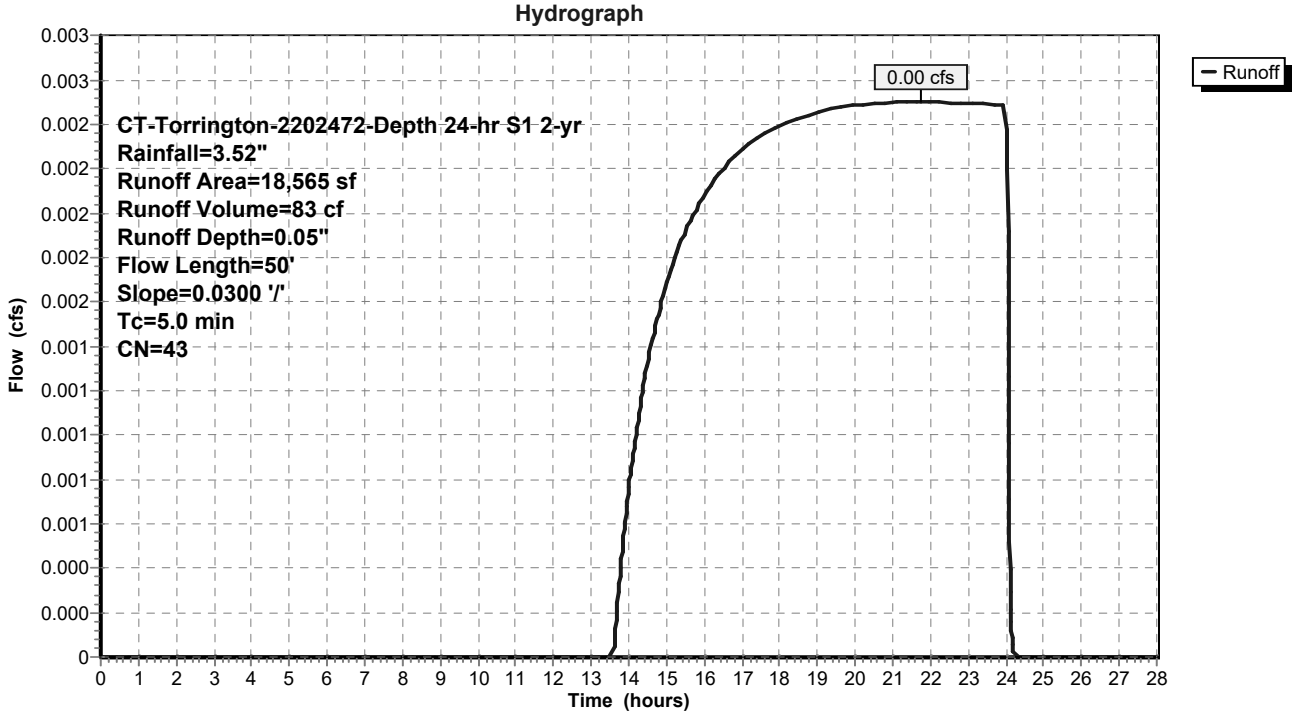
Runoff = 0.00 cfs @ 21.74 hrs, Volume= 83 cf, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 2-yr Rainfall=3.52"

	Area (sf)	CN	Description
*	1,320	98	Impervious, HSG A
	17,245	39	>75% Grass cover, Good, HSG A
	18,565	43	Weighted Average
	17,245		92.89% Pervious Area
	1,320		7.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
4.6	50	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-100: Area Draining Offsite to the West



Summary for Subcatchment PDA-110: School Parking Area to UDS

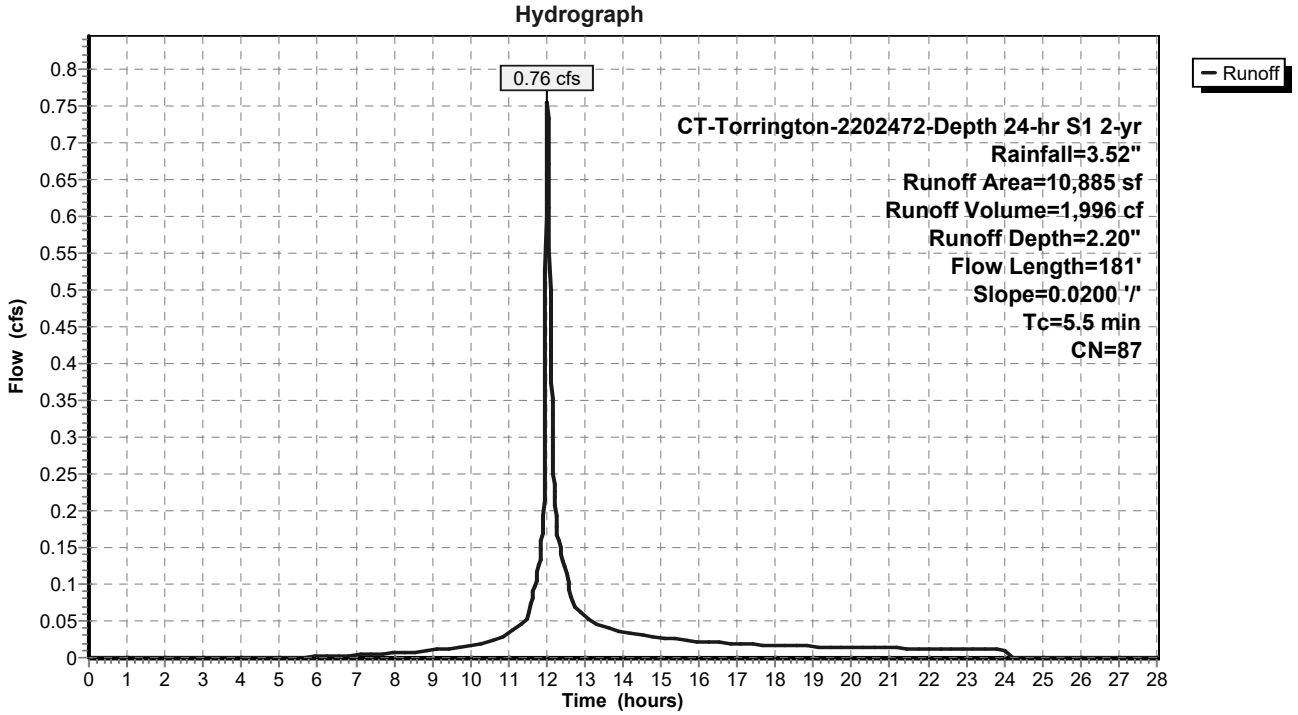
Runoff = 0.76 cfs @ 12.03 hrs, Volume= 1,996 cf, Depth= 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 2-yr Rainfall=3.52"

	Area (sf)	CN	Description
*	8,915	98	Impervious, HSG A
	1,970	39	>75% Grass cover, Good, HSG A
	10,885	87	Weighted Average
	1,970		18.10% Pervious Area
	8,915		81.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	37	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.8	63	0.0200	1.32		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
0.5	81	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	181	Total			

Subcatchment PDA-110: School Parking Area to UDS



Summary for Subcatchment PDA-120: School Roof Area to UDS

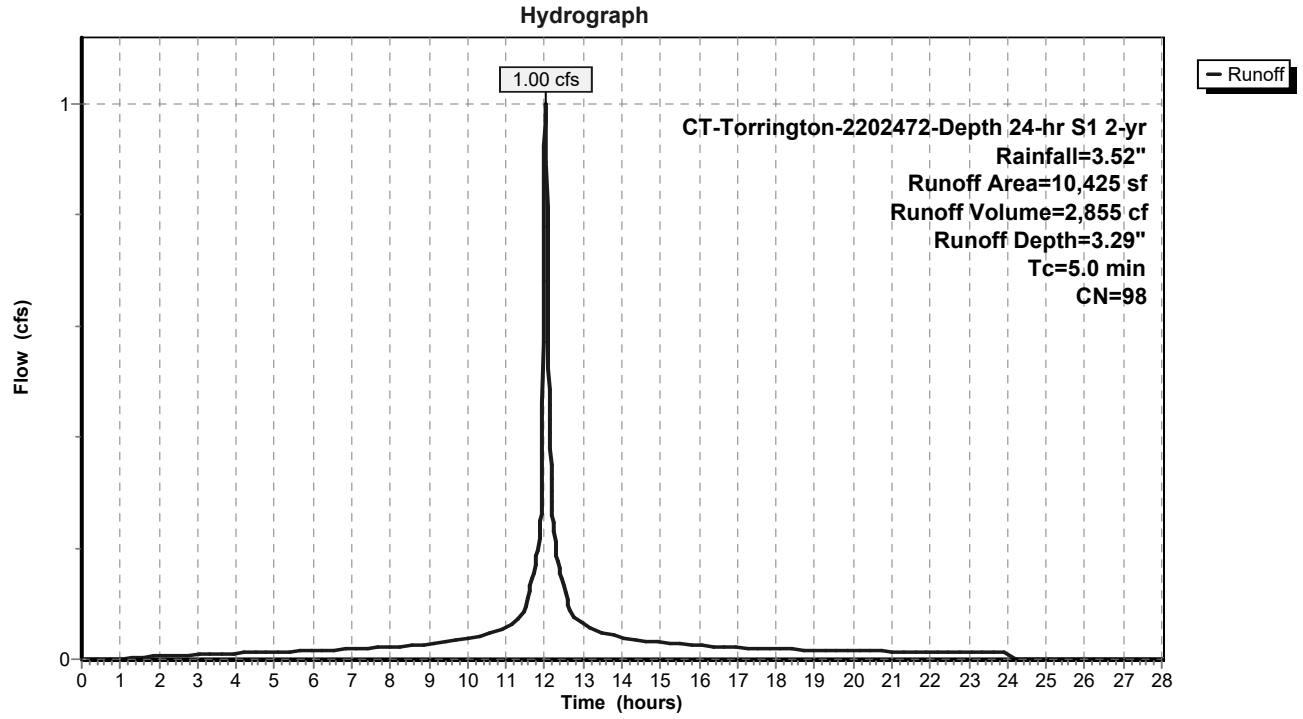
Runoff = 1.00 cfs @ 12.03 hrs, Volume= 2,855 cf, Depth= 3.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 2-yr Rainfall=3.52"

	Area (sf)	CN	Description
*	10,425	98	Impervious, HSG A
	10,425		100.00% Impervious Area

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

Subcatchment PDA-120: School Roof Area to UDS



Summary for Subcatchment PDA-130: Church Parking Area to UDS

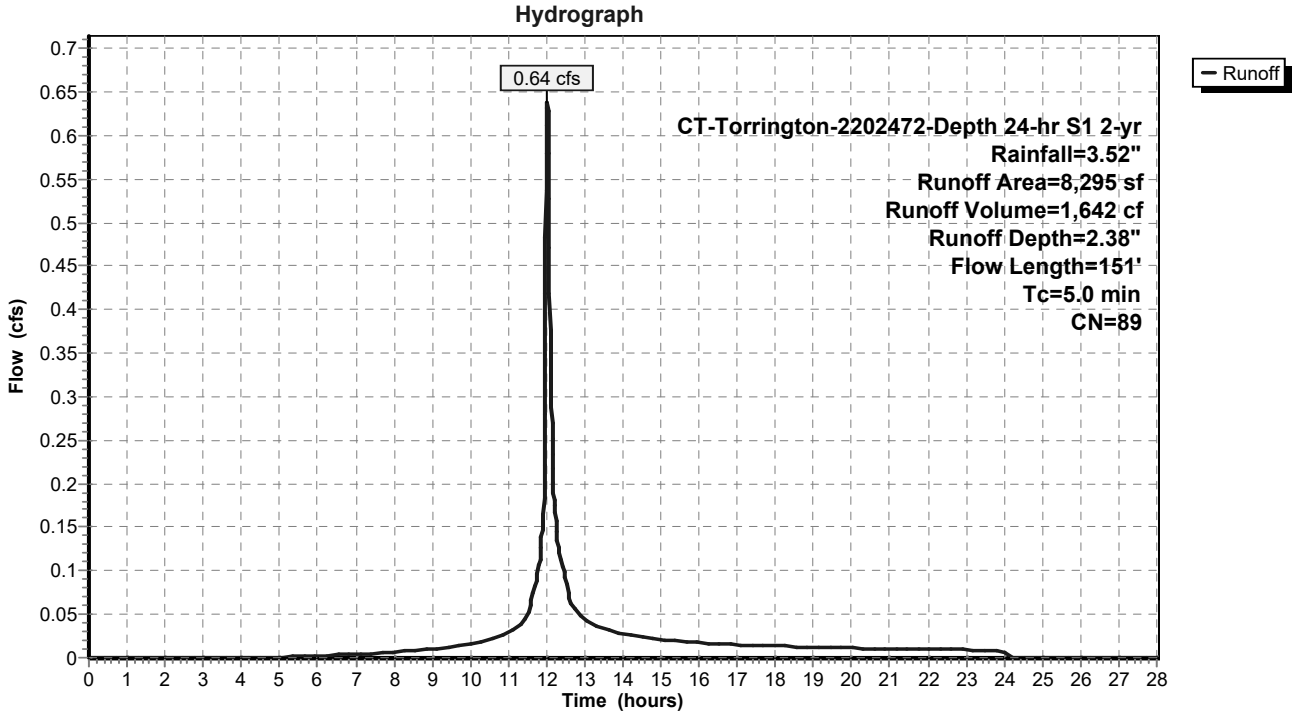
Runoff = 0.64 cfs @ 12.03 hrs, Volume= 1,642 cf, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 2-yr Rainfall=3.52"

	Area (sf)	CN	Description
*	7,020	98	Impervious, HSG A
	1,275	39	>75% Grass cover, Good, HSG A
	8,295	89	Weighted Average
	1,275		15.37% Pervious Area
	7,020		84.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	22	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.8	78	0.0350	1.72		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
0.2	51	0.0350	3.80		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.7	151	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-130: Church Parking Area to UDS



Summary for Subcatchment PDA-140: Rectory Parking Area to UDS

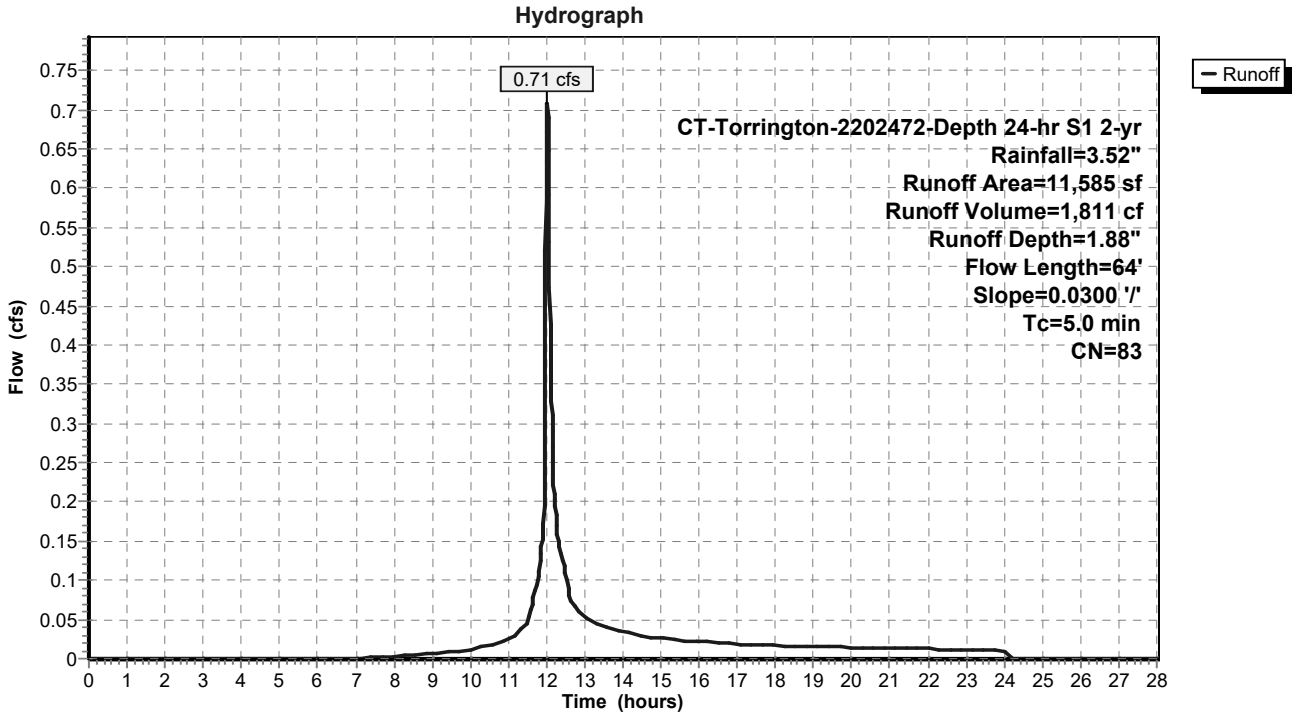
Runoff = 0.71 cfs @ 12.03 hrs, Volume= 1,811 cf, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 2-yr Rainfall=3.52"

	Area (sf)	CN	Description
*	8,615	98	Impervious, HSG A
	2,970	39	>75% Grass cover, Good, HSG A
	11,585	83	Weighted Average
	2,970		25.64% Pervious Area
	8,615		74.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	16	0.0300	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.5	48	0.0300	1.47		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.3	64	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-140: Rectory Parking Area to UDS



Summary for Subcatchment PDA-200: Area Draining to Grove Street South

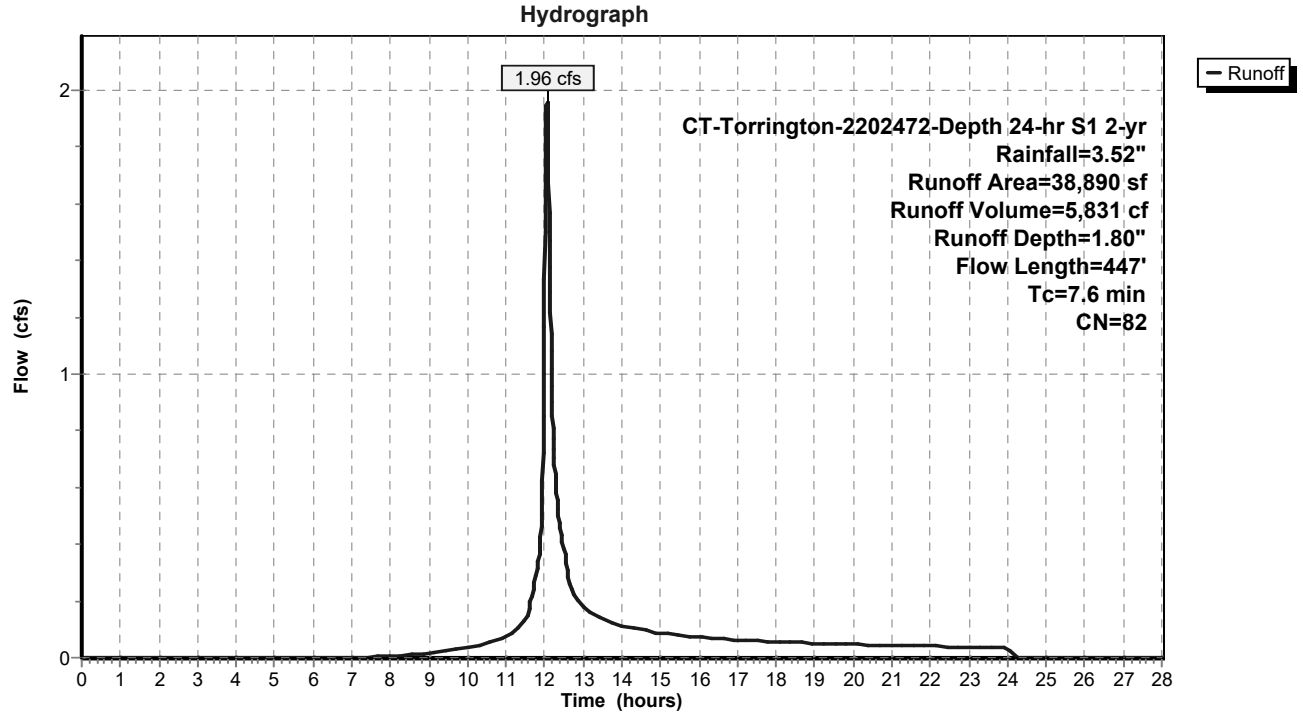
Runoff = 1.96 cfs @ 12.06 hrs, Volume= 5,831 cf, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 2-yr Rainfall=3.52"

	Area (sf)	CN	Description
*	28,375	98	Impervious, HSG A
	10,515	39	>75% Grass cover, Good, HSG A
	38,890	82	Weighted Average
	10,515		27.04% Pervious Area
	28,375		72.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	30	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.9	70	0.0200	1.34		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.0	347	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.6	447	Total			

Subcatchment PDA-200: Area Draining to Grove Street South



Summary for Subcatchment PDA-300: Area Draining to Grove Street North

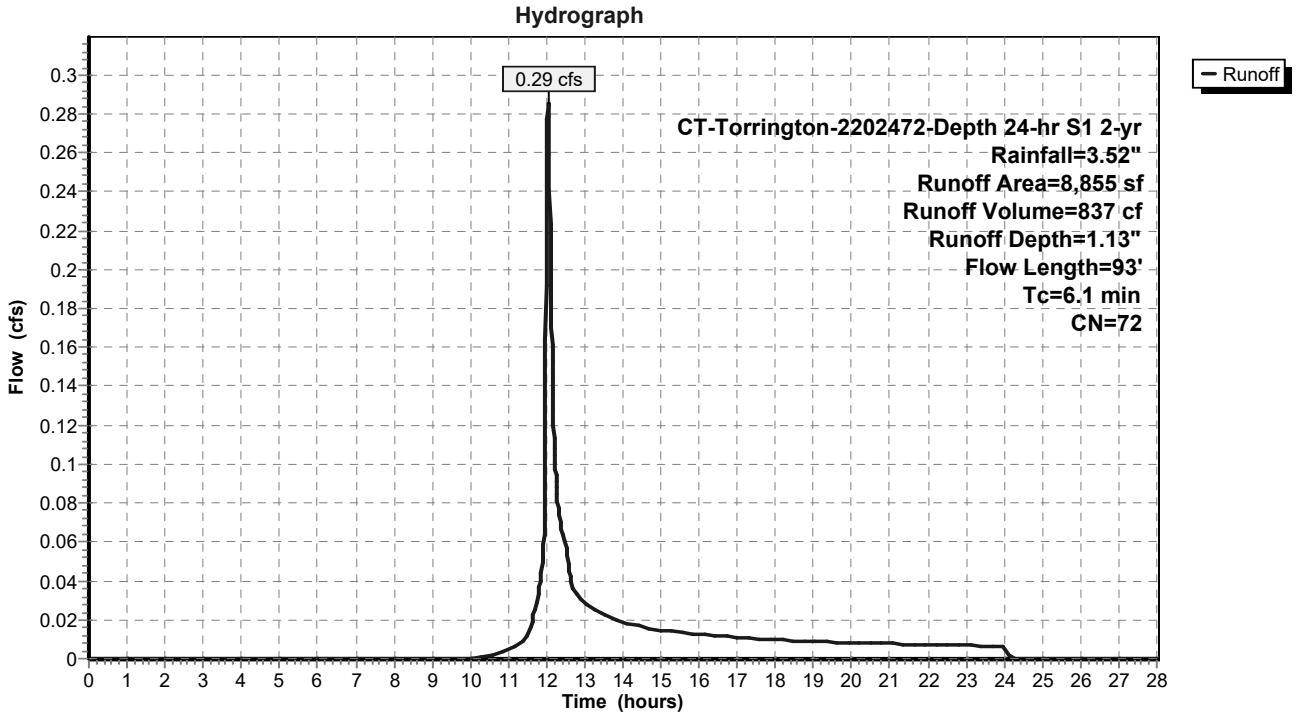
Runoff = 0.29 cfs @ 12.04 hrs, Volume= 837 cf, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 2-yr Rainfall=3.52"

	Area (sf)	CN	Description
*	4,980	98	Impervious, HSG A
	3,875	39	>75% Grass cover, Good, HSG A
	8,855	72	Weighted Average
	3,875		43.76% Pervious Area
	4,980		56.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	66	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	27	0.0200	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
6.1	93	Total			

Subcatchment PDA-300: Area Draining to Grove Street North



Summary for Subcatchment PDA-400: Area Draining to Brook Street South

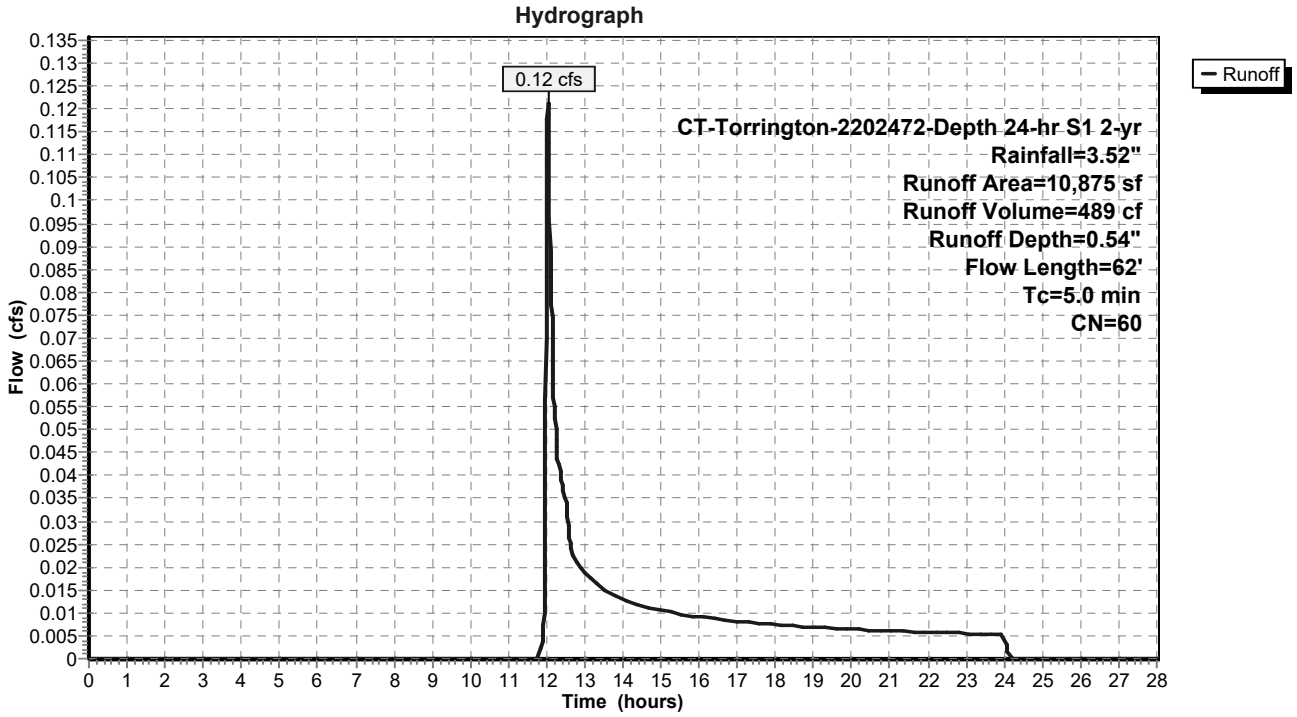
Runoff = 0.12 cfs @ 12.04 hrs, Volume= 489 cf, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 2-yr Rainfall=3.52"

	Area (sf)	CN	Description
*	3,945	98	Impervious, HSG A
	6,930	39	>75% Grass cover, Good, HSG A
	10,875	60	Weighted Average
	6,930		63.72% Pervious Area
	3,945		36.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	37	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	25	0.4000	3.62		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
3.7	62	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-400: Area Draining to Brook Street South



Summary for Subcatchment PDA-500: Area Draining to Brook Street North

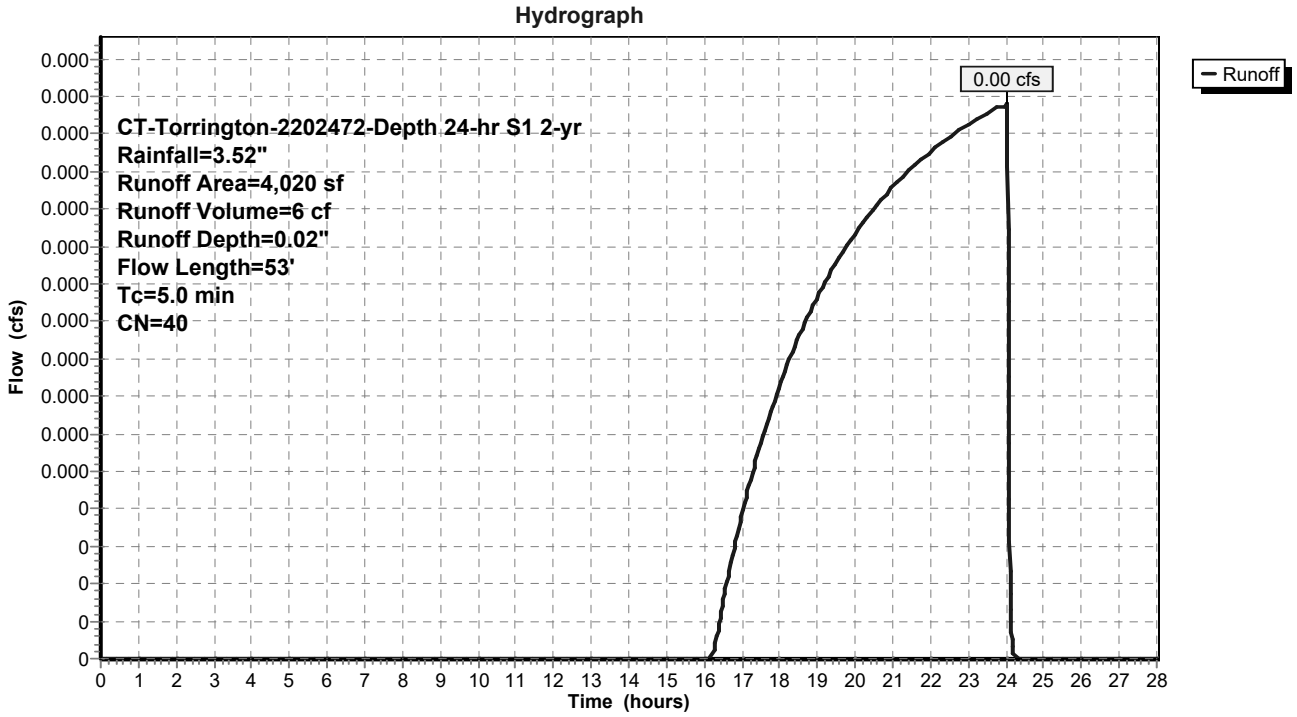
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 6 cf, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 2-yr Rainfall=3.52"

	Area (sf)	CN	Description
*	45	98	Impervious, HSG A
	3,975	39	>75% Grass cover, Good, HSG A
	4,020	40	Weighted Average
	3,975		98.88% Pervious Area
	45		1.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	35	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	18	0.6000	3.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
3.5	53	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-500: Area Draining to Brook Street North



Summary for Pond 1P: Underground Detention System

Inflow Area = 41,190 sf, 84.91% Impervious, Inflow Depth = 2.42" for 2-yr event
Inflow = 3.10 cfs @ 12.03 hrs, Volume= 8,304 cf
Outflow = 0.06 cfs @ 19.16 hrs, Volume= 2,816 cf, Atten= 98%, Lag= 428.0 min
Discarded = 0.03 cfs @ 7.64 hrs, Volume= 2,376 cf
Primary = 0.03 cfs @ 19.16 hrs, Volume= 440 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Peak Elev= 100.19' @ 19.16 hrs Surf.Area= 3,095 sf Storage= 5,906 cf

Plug-Flow detention time= 402.0 min calculated for 2,816 cf (34% of inflow)
Center-of-Mass det. time= 219.5 min (1,027.1 - 807.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	97.18'	3,408 cf	**34.75'W x 89.06'L x 4.00'H Field A** 12,379 cf Overall - 3,859 cf Embedded = 8,520 cf x 40.0% Voids
#2A	98.18'	3,859 cf	**ADS_StormTech SC-740 +Cap** x 84 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 84 Chambers in 7 Rows
		7,267 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	98.60'	**18.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 98.60' / 98.50' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	100.18'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Discarded	97.18'	**0.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 7.64 hrs HW=97.22' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.02 cfs @ 19.16 hrs HW=100.19' (Free Discharge)
└**1=Culvert** (Passes 0.02 cfs of 6.40 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.02 cfs @ 0.35 fps)

Pond 1P: Underground Detention System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
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

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

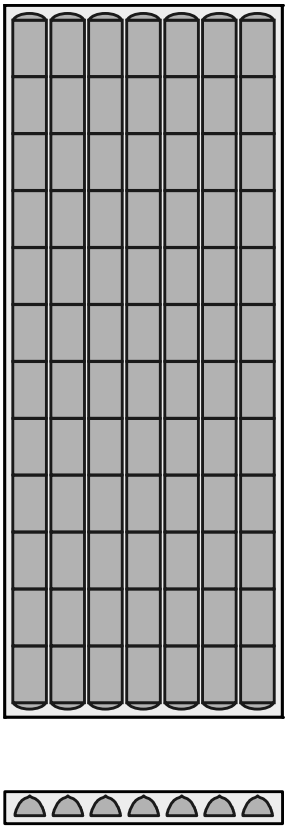
12 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 87.06' Row Length +12.0" End Stone x 2 = 89.06' Base Length
7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width
12.0" Base + 30.0" Chamber Height + 6.0" Cover = 4.00' Field Height

84 Chambers x 45.9 cf = 3,859.0 cf Chamber Storage

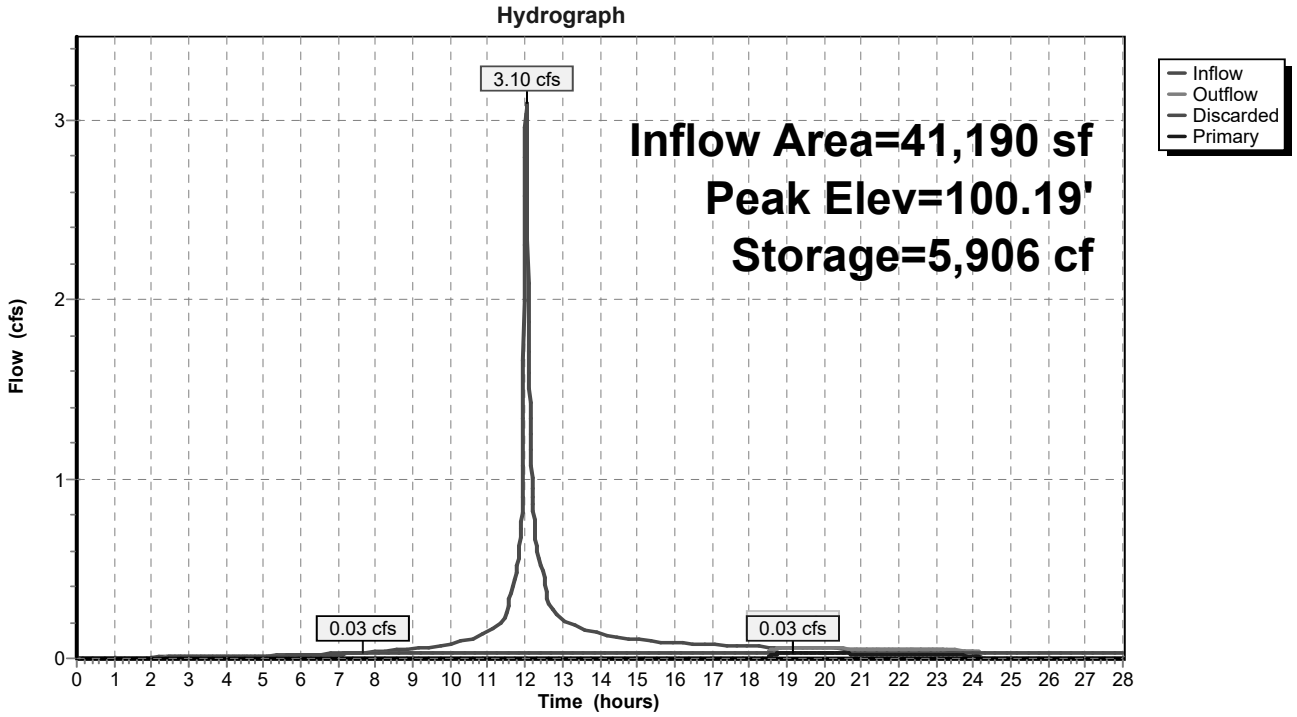
12,378.9 cf Field - 3,859.0 cf Chambers = 8,519.9 cf Stone x 40.0% Voids = 3,408.0 cf Stone Storage

Chamber Storage + Stone Storage = 7,266.9 cf = 0.167 af
Overall Storage Efficiency = 58.7%
Overall System Size = 89.06' x 34.75' x 4.00'

84 Chambers
458.5 cy Field
315.6 cy Stone



Pond 1P: Underground Detention System

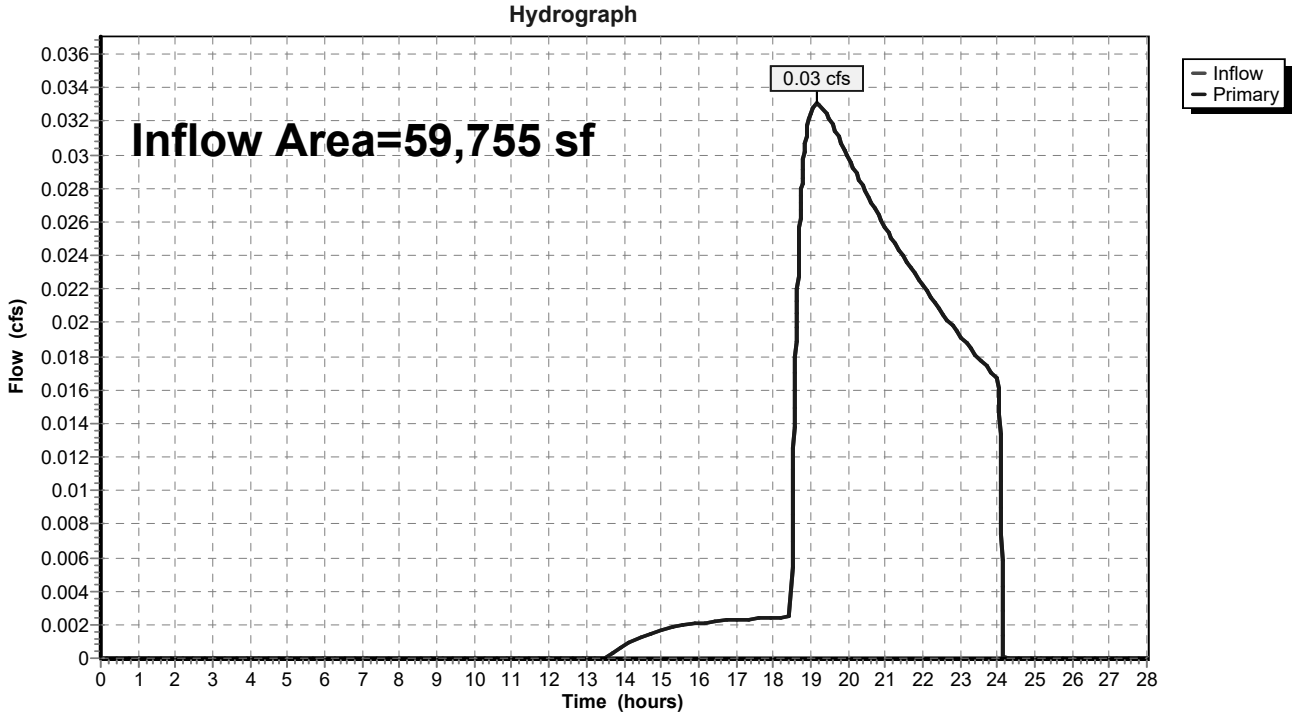


Summary for Link DP-1: Offsite West

Inflow Area = 59,755 sf, 60.74% Impervious, Inflow Depth = 0.11" for 2-yr event
Inflow = 0.03 cfs @ 19.16 hrs, Volume= 523 cf
Primary = 0.03 cfs @ 19.16 hrs, Volume= 523 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-1: Offsite West

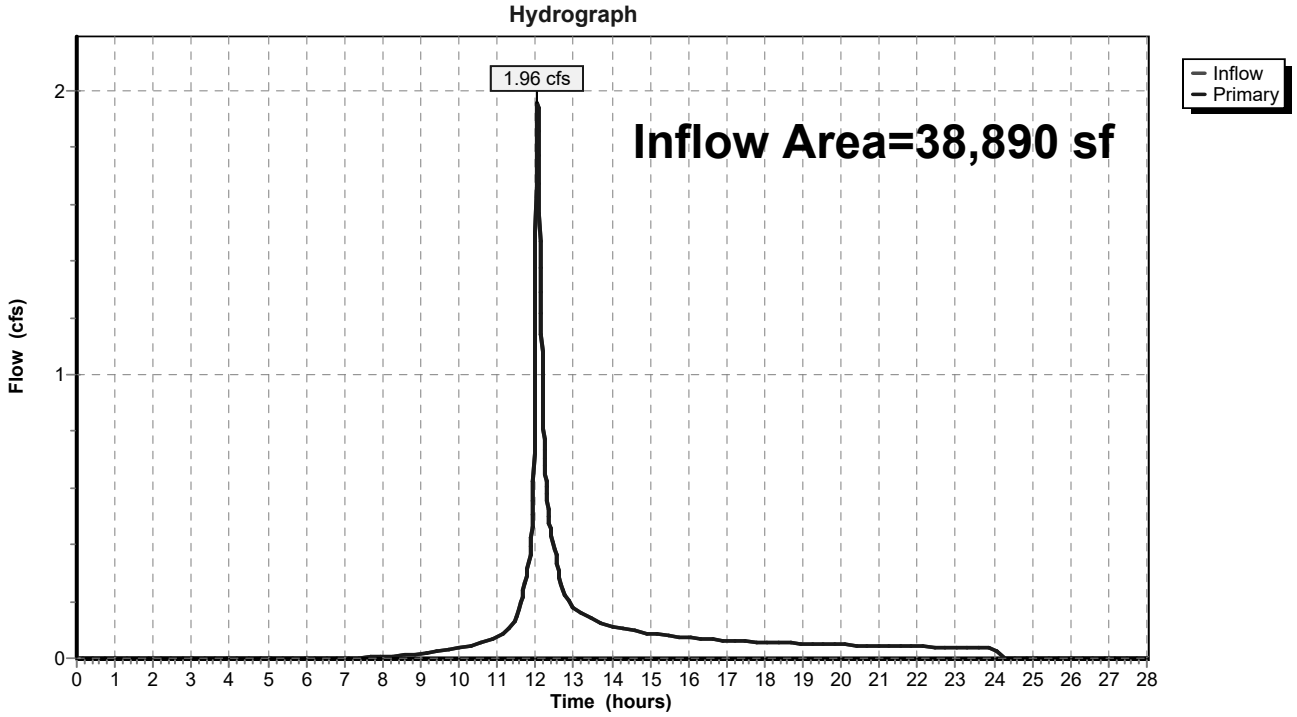


Summary for Link DP-2: Grove Street South

Inflow Area = 38,890 sf, 72.96% Impervious, Inflow Depth = 1.80" for 2-yr event
Inflow = 1.96 cfs @ 12.06 hrs, Volume= 5,831 cf
Primary = 1.96 cfs @ 12.06 hrs, Volume= 5,831 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-2: Grove Street South

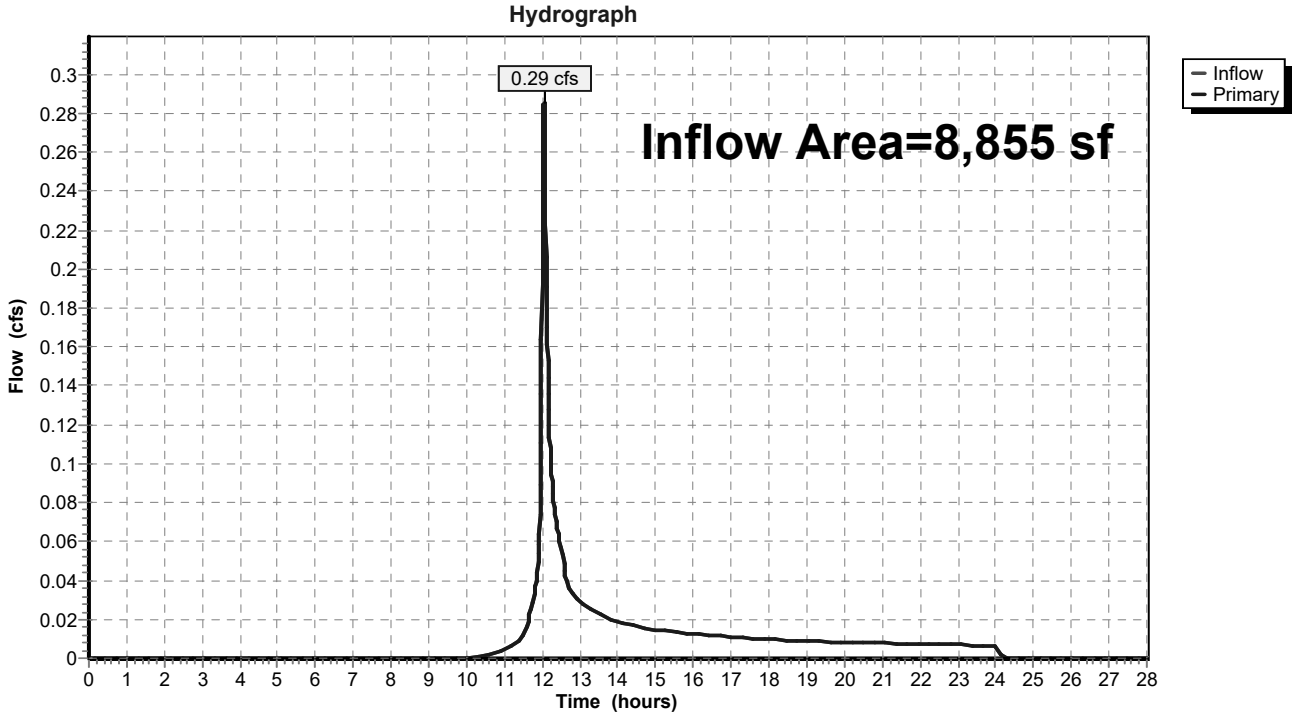


Summary for Link DP-3: Grove Street North

Inflow Area = 8,855 sf, 56.24% Impervious, Inflow Depth = 1.13" for 2-yr event
Inflow = 0.29 cfs @ 12.04 hrs, Volume= 837 cf
Primary = 0.29 cfs @ 12.04 hrs, Volume= 837 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-3: Grove Street North

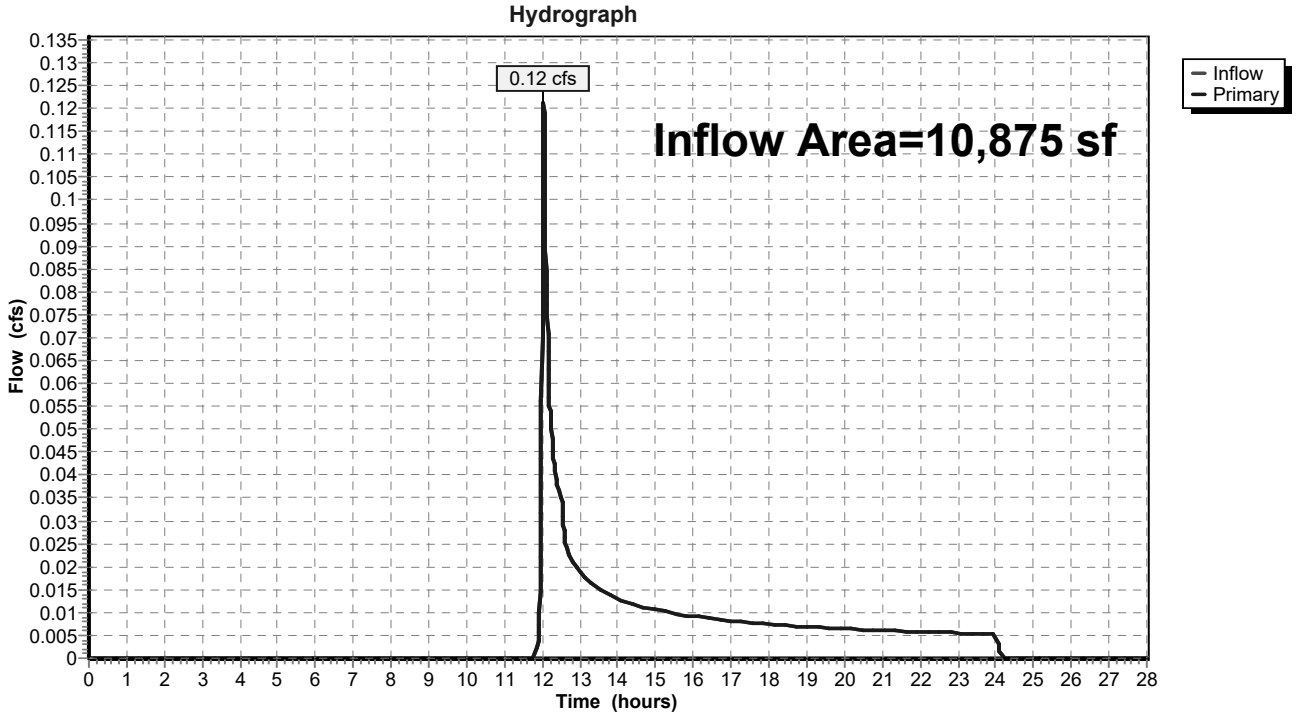


Summary for Link DP-4: Brook Street South

Inflow Area = 10,875 sf, 36.28% Impervious, Inflow Depth = 0.54" for 2-yr event
Inflow = 0.12 cfs @ 12.04 hrs, Volume= 489 cf
Primary = 0.12 cfs @ 12.04 hrs, Volume= 489 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-4: Brook Street South

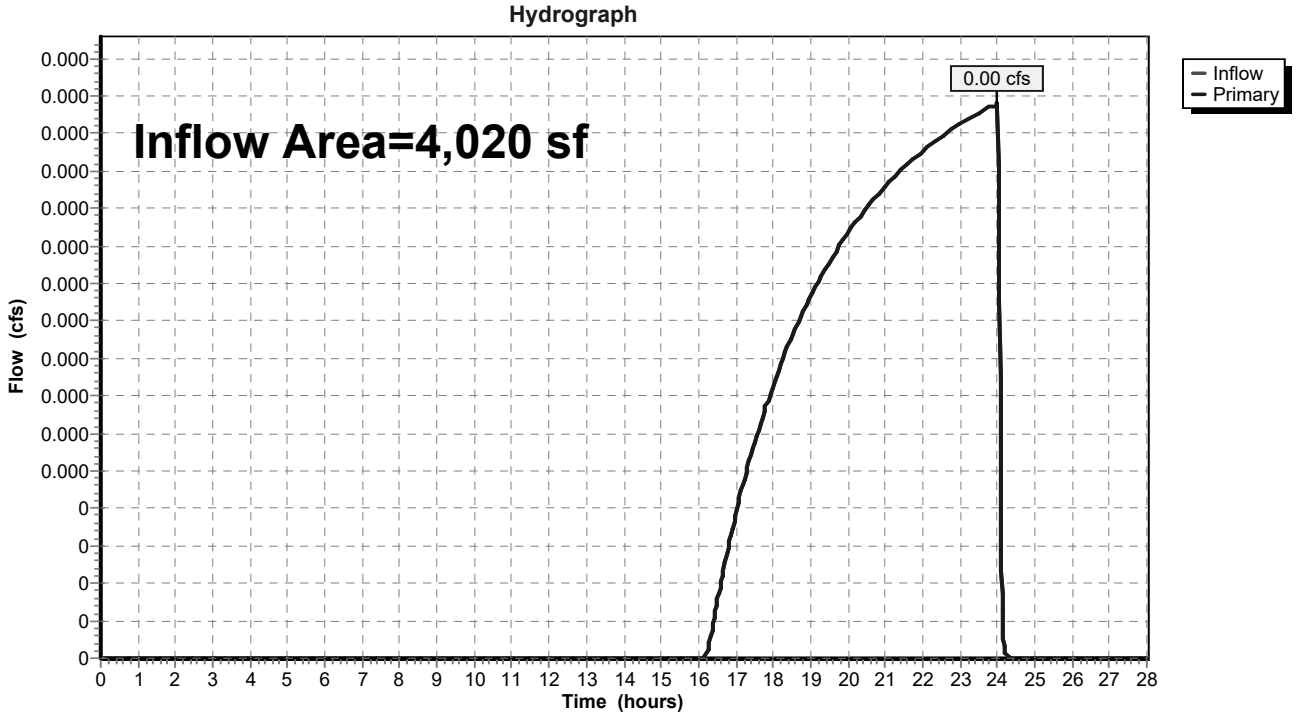


Summary for Link DP-5: Brook Street North

Inflow Area = 4,020 sf, 1.12% Impervious, Inflow Depth = 0.02" for 2-yr event
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 6 cf
Primary = 0.00 cfs @ 24.00 hrs, Volume= 6 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-5: Brook Street North

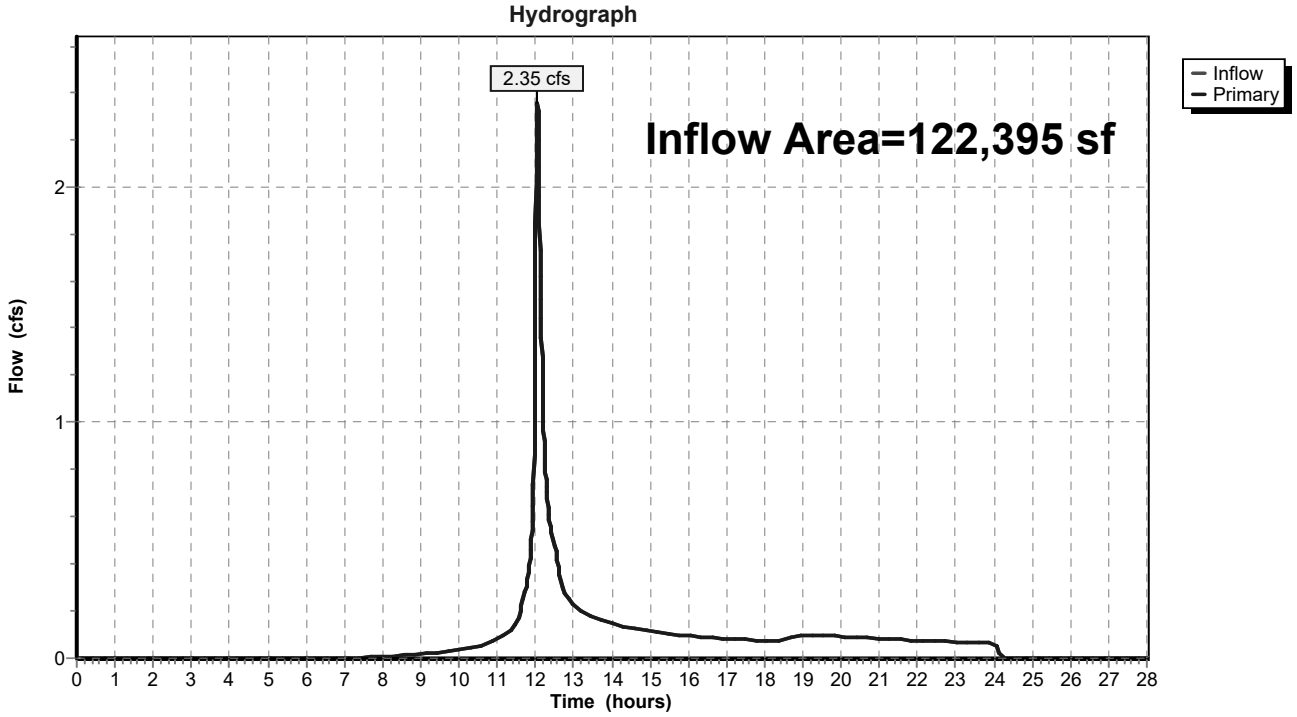


Summary for Link DP-6: Total Offsite Flow

Inflow Area = 122,395 sf, 60.17% Impervious, Inflow Depth = 0.75" for 2-yr event
Inflow = 2.35 cfs @ 12.05 hrs, Volume= 7,686 cf
Primary = 2.35 cfs @ 12.05 hrs, Volume= 7,686 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-6: Total Offsite Flow



Time span=0.00-28.00 hrs, dt=0.01 hrs, 2801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-100: Area Draining Runoff Area=18,565 sf 7.11% Impervious Runoff Depth=0.28"
Flow Length=50' Slope=0.0300 '/' Tc=5.0 min CN=43 Runoff=0.02 cfs 432 cf

Subcatchment PDA-110: School Parking Runoff Area=10,885 sf 81.90% Impervious Runoff Depth=3.30"
Flow Length=181' Slope=0.0200 '/' Tc=5.5 min CN=87 Runoff=1.06 cfs 2,997 cf

Subcatchment PDA-120: School Roof Runoff Area=10,425 sf 100.00% Impervious Runoff Depth=4.48"
Tc=5.0 min CN=98 Runoff=1.27 cfs 3,895 cf

Subcatchment PDA-130: Church Parking Runoff Area=8,295 sf 84.63% Impervious Runoff Depth=3.50"
Flow Length=151' Tc=5.0 min CN=89 Runoff=0.87 cfs 2,422 cf

Subcatchment PDA-140: Rectory Parking Runoff Area=11,585 sf 74.36% Impervious Runoff Depth=2.92"
Flow Length=64' Slope=0.0300 '/' Tc=5.0 min CN=83 Runoff=1.04 cfs 2,821 cf

Subcatchment PDA-200: Area Draining to Runoff Area=38,890 sf 72.96% Impervious Runoff Depth=2.83"
Flow Length=447' Tc=7.6 min CN=82 Runoff=2.91 cfs 9,171 cf

Subcatchment PDA-300: Area Draining to Runoff Area=8,855 sf 56.24% Impervious Runoff Depth=1.98"
Flow Length=93' Tc=6.1 min CN=72 Runoff=0.50 cfs 1,464 cf

Subcatchment PDA-400: Area Draining to Runoff Area=10,875 sf 36.28% Impervious Runoff Depth=1.14"
Flow Length=62' Tc=5.0 min CN=60 Runoff=0.33 cfs 1,034 cf

Subcatchment PDA-500: Area Draining to Runoff Area=4,020 sf 1.12% Impervious Runoff Depth=0.18"
Flow Length=53' Tc=5.0 min CN=40 Runoff=0.00 cfs 59 cf

Pond 1P: Underground Detention System Peak Elev=100.28' Storage=6,065 cf Inflow=4.23 cfs 12,136 cf
Discarded=0.03 cfs 2,543 cf Primary=0.42 cfs 4,098 cf Outflow=0.45 cfs 6,640 cf

Link DP-1: Offsite West Inflow=0.43 cfs 4,530 cf
Primary=0.43 cfs 4,530 cf

Link DP-2: Grove Street South Inflow=2.91 cfs 9,171 cf
Primary=2.91 cfs 9,171 cf

Link DP-3: Grove Street North Inflow=0.50 cfs 1,464 cf
Primary=0.50 cfs 1,464 cf

Link DP-4: Brook Street South Inflow=0.33 cfs 1,034 cf
Primary=0.33 cfs 1,034 cf

Link DP-5: Brook Street North Inflow=0.00 cfs 59 cf
Primary=0.00 cfs 59 cf

Link DP-6: Total Offsite Flow Inflow=3.70 cfs 16,259 cf
Primary=3.70 cfs 16,259 cf

Total Runoff Area = 122,395 sf Runoff Volume = 24,297 cf Average Runoff Depth = 2.38"
39.83% Pervious = 48,755 sf 60.17% Impervious = 73,640 sf

Summary for Subcatchment PDA-100: Area Draining Offsite to the West

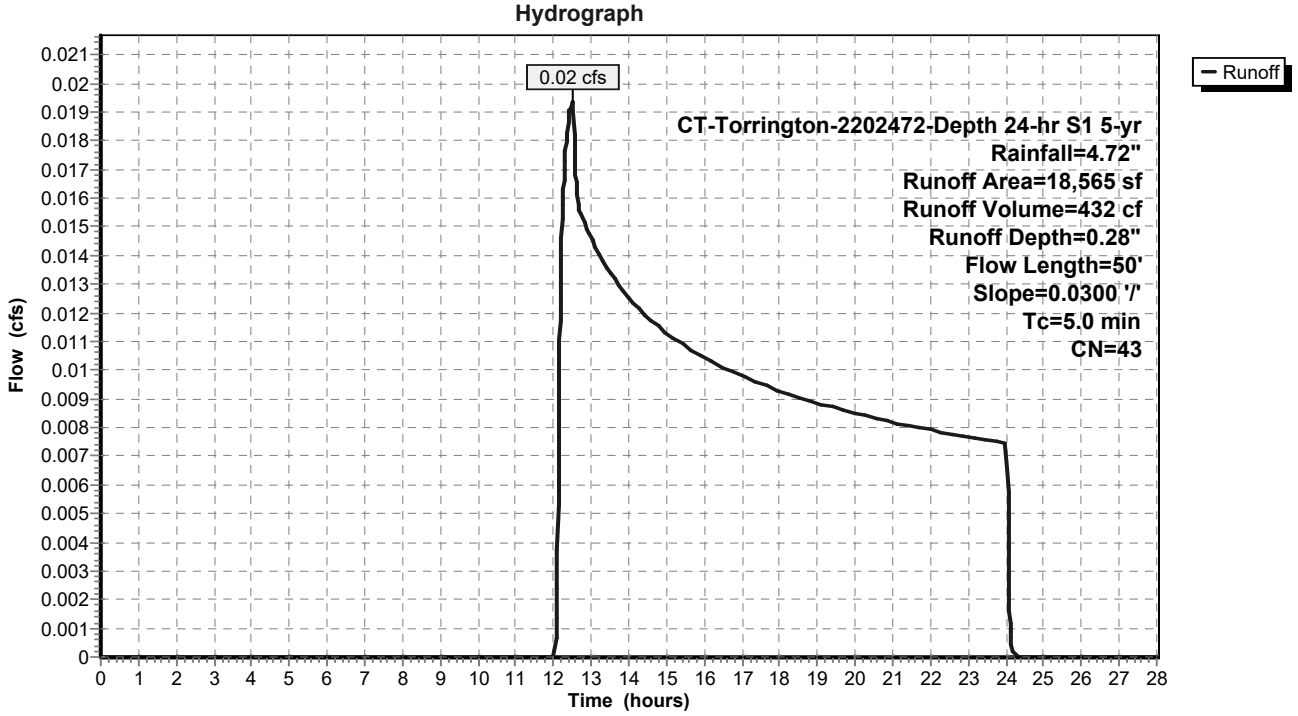
Runoff = 0.02 cfs @ 12.53 hrs, Volume= 432 cf, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 5-yr Rainfall=4.72"

	Area (sf)	CN	Description
*	1,320	98	Impervious, HSG A
	17,245	39	>75% Grass cover, Good, HSG A
	18,565	43	Weighted Average
	17,245		92.89% Pervious Area
	1,320		7.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
4.6	50	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-100: Area Draining Offsite to the West



Summary for Subcatchment PDA-110: School Parking Area to UDS

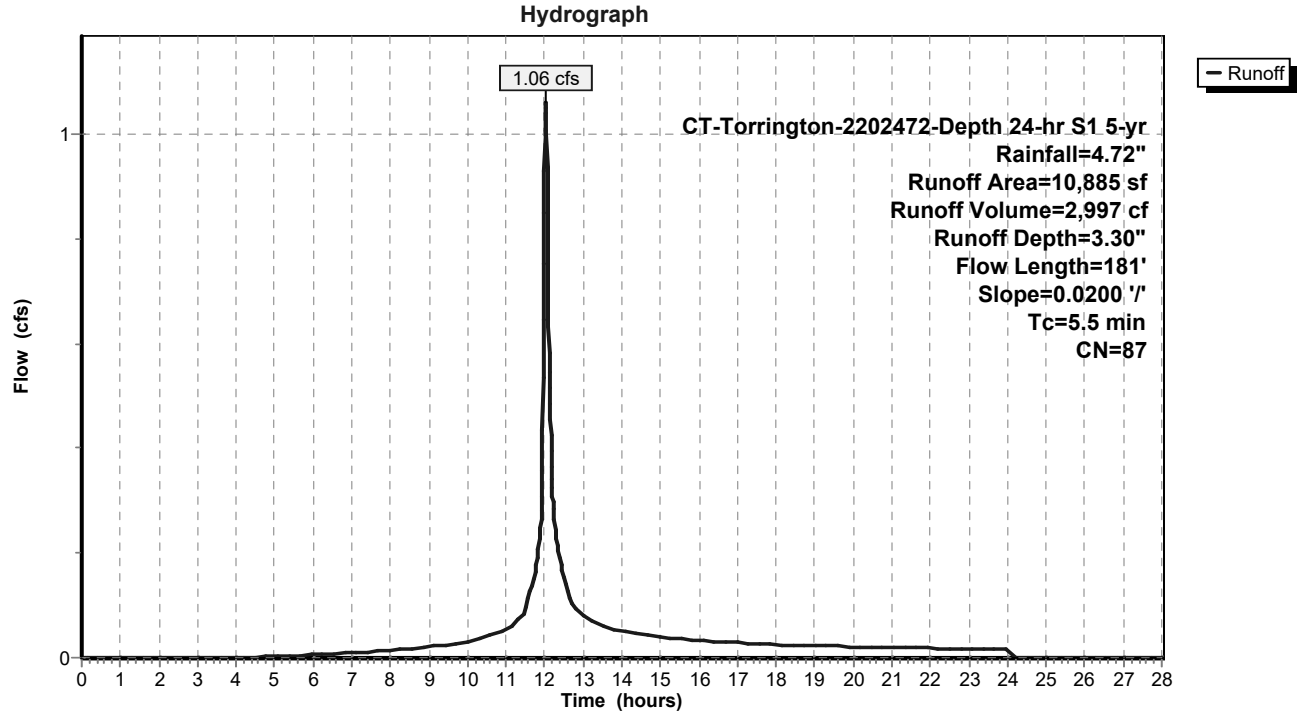
Runoff = 1.06 cfs @ 12.03 hrs, Volume= 2,997 cf, Depth= 3.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 5-yr Rainfall=4.72"

	Area (sf)	CN	Description
*	8,915	98	Impervious, HSG A
	1,970	39	>75% Grass cover, Good, HSG A
	10,885	87	Weighted Average
	1,970		18.10% Pervious Area
	8,915		81.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	37	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.8	63	0.0200	1.32		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
0.5	81	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	181	Total			

Subcatchment PDA-110: School Parking Area to UDS



Summary for Subcatchment PDA-120: School Roof Area to UDS

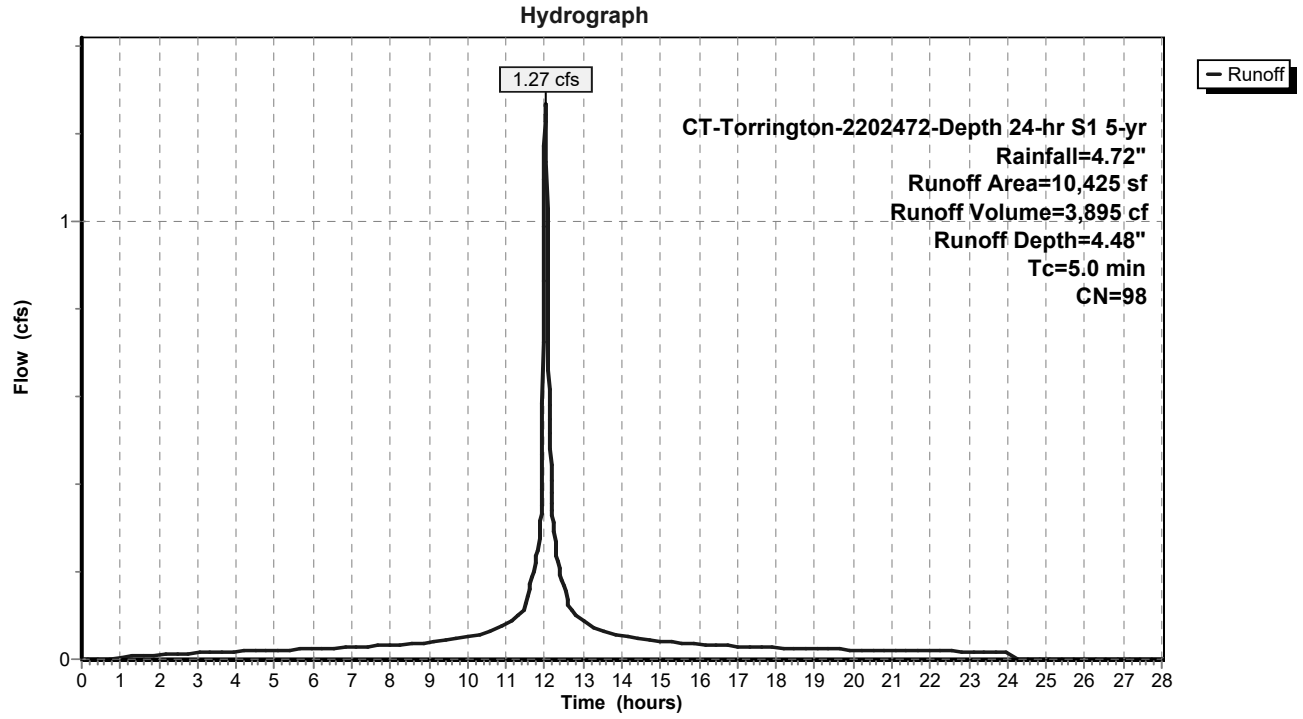
Runoff = 1.27 cfs @ 12.03 hrs, Volume= 3,895 cf, Depth= 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 5-yr Rainfall=4.72"

	Area (sf)	CN	Description
*	10,425	98	Impervious, HSG A
	10,425		100.00% Impervious Area

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

Subcatchment PDA-120: School Roof Area to UDS



Summary for Subcatchment PDA-130: Church Parking Area to UDS

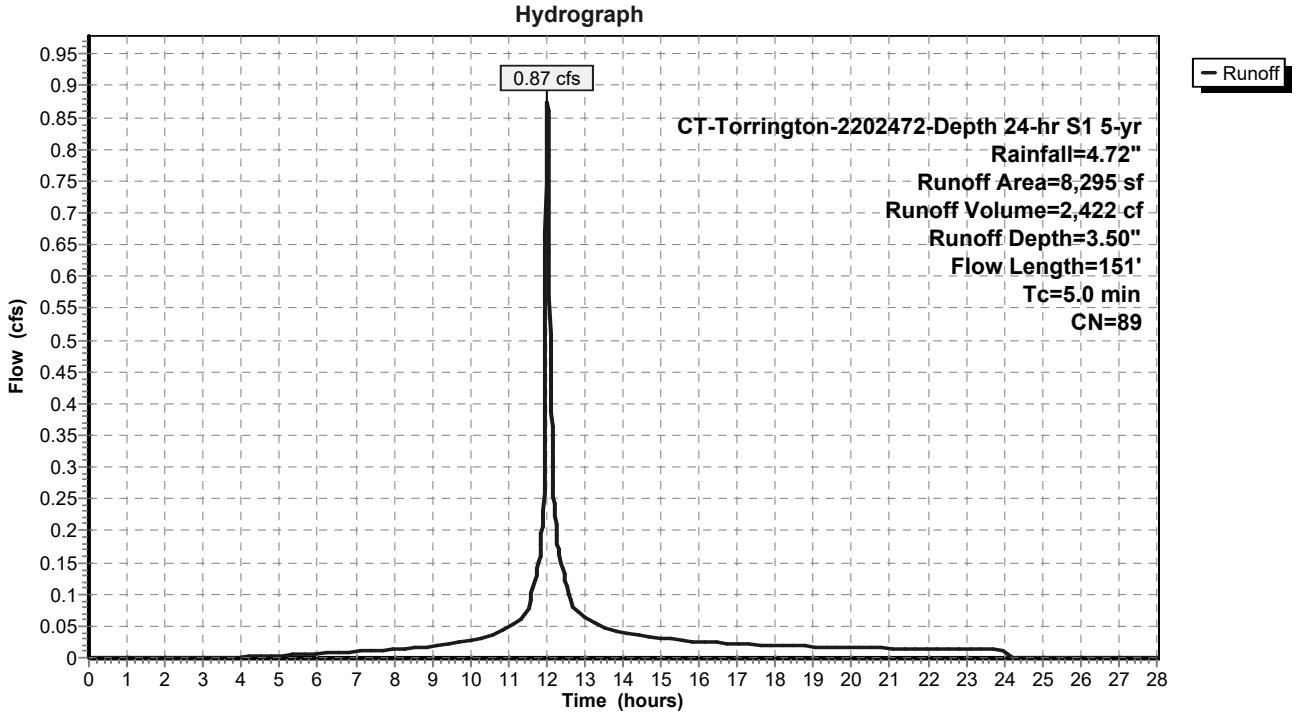
Runoff = 0.87 cfs @ 12.03 hrs, Volume= 2,422 cf, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 5-yr Rainfall=4.72"

	Area (sf)	CN	Description
*	7,020	98	Impervious, HSG A
	1,275	39	>75% Grass cover, Good, HSG A
	8,295	89	Weighted Average
	1,275		15.37% Pervious Area
	7,020		84.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	22	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.8	78	0.0350	1.72		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
0.2	51	0.0350	3.80		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.7	151	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-130: Church Parking Area to UDS



Summary for Subcatchment PDA-140: Rectory Parking Area to UDS

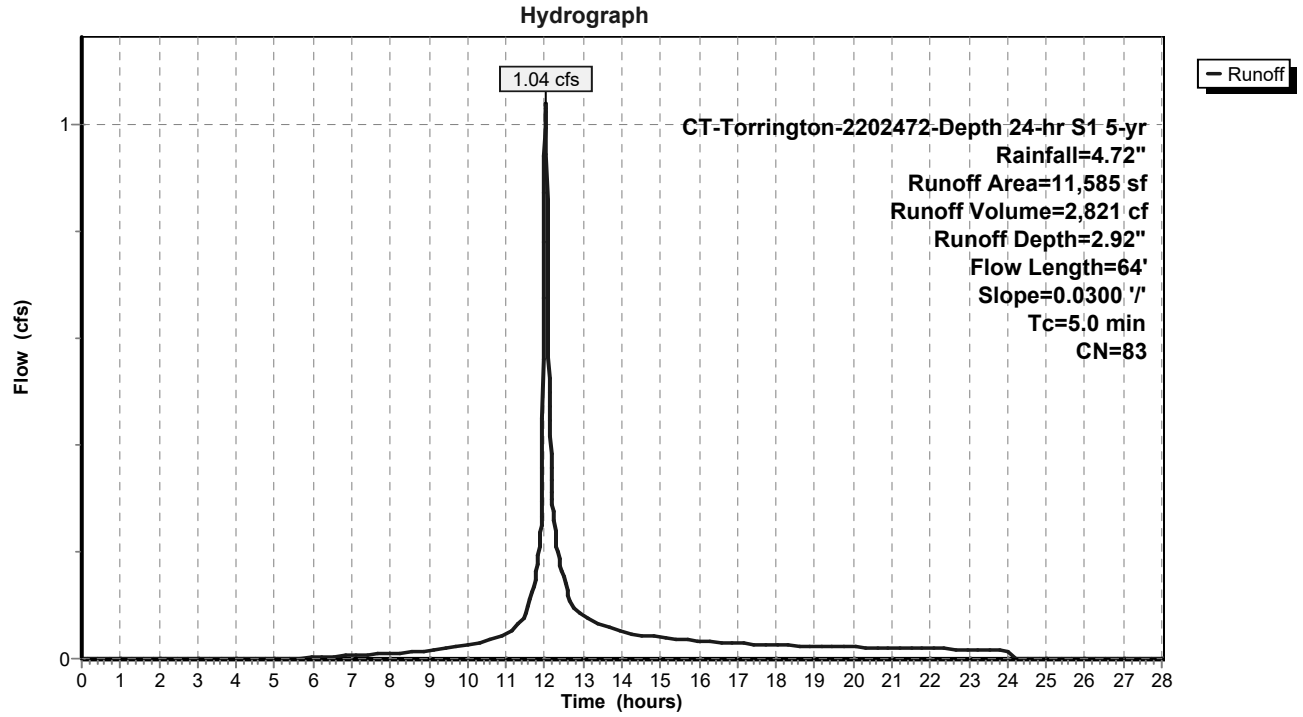
Runoff = 1.04 cfs @ 12.03 hrs, Volume= 2,821 cf, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 5-yr Rainfall=4.72"

	Area (sf)	CN	Description
*	8,615	98	Impervious, HSG A
	2,970	39	>75% Grass cover, Good, HSG A
	11,585	83	Weighted Average
	2,970		25.64% Pervious Area
	8,615		74.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	16	0.0300	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.5	48	0.0300	1.47		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.3	64	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-140: Rectory Parking Area to UDS



Summary for Subcatchment PDA-200: Area Draining to Grove Street South

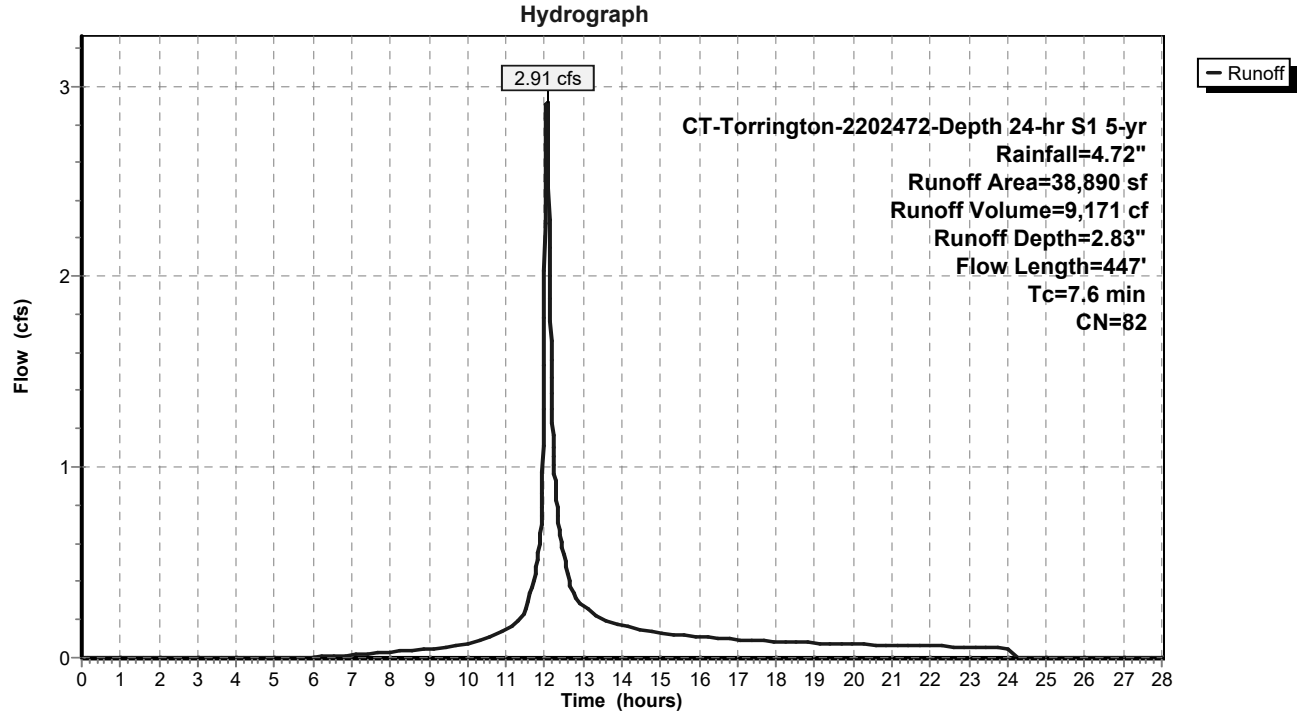
Runoff = 2.91 cfs @ 12.06 hrs, Volume= 9,171 cf, Depth= 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 5-yr Rainfall=4.72"

	Area (sf)	CN	Description
*	28,375	98	Impervious, HSG A
	10,515	39	>75% Grass cover, Good, HSG A
	38,890	82	Weighted Average
	10,515		27.04% Pervious Area
	28,375		72.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	30	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.9	70	0.0200	1.34		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.0	347	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.6	447	Total			

Subcatchment PDA-200: Area Draining to Grove Street South



Summary for Subcatchment PDA-300: Area Draining to Grove Street North

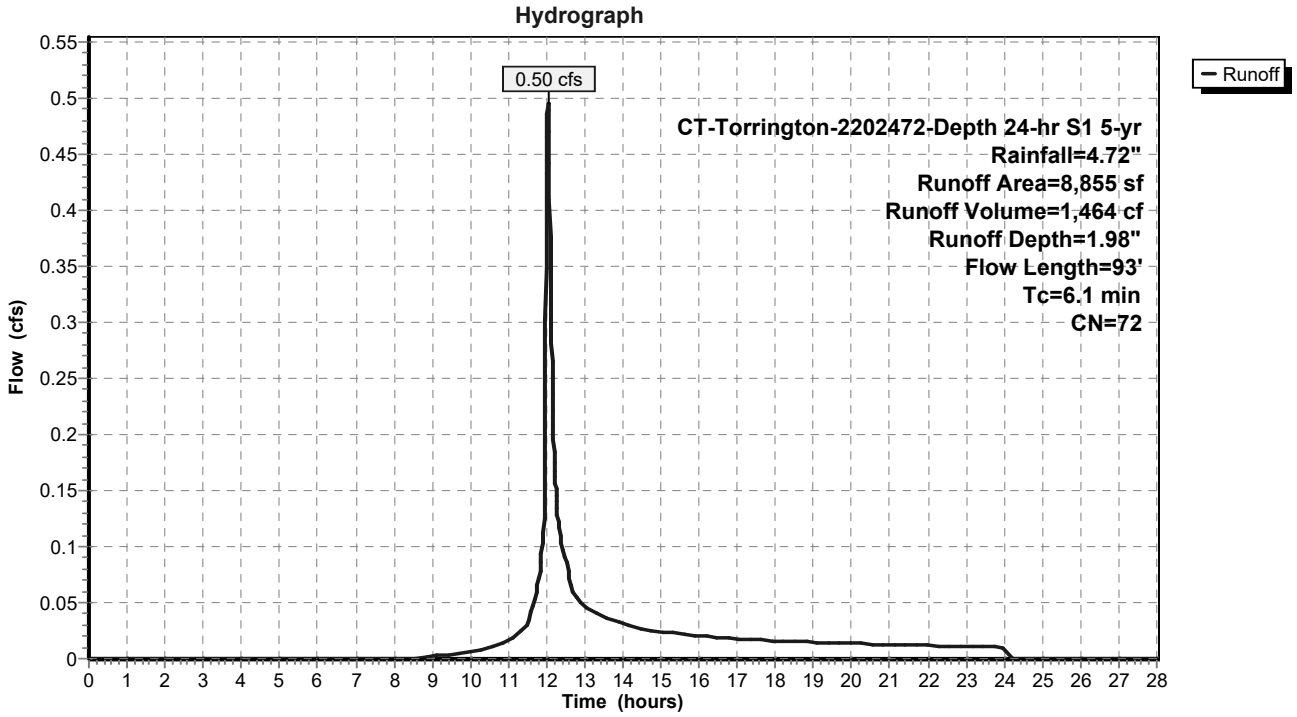
Runoff = 0.50 cfs @ 12.04 hrs, Volume= 1,464 cf, Depth= 1.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 5-yr Rainfall=4.72"

	Area (sf)	CN	Description
*	4,980	98	Impervious, HSG A
	3,875	39	>75% Grass cover, Good, HSG A
	8,855	72	Weighted Average
	3,875		43.76% Pervious Area
	4,980		56.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	66	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	27	0.0200	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
6.1	93	Total			

Subcatchment PDA-300: Area Draining to Grove Street North



Summary for Subcatchment PDA-400: Area Draining to Brook Street South

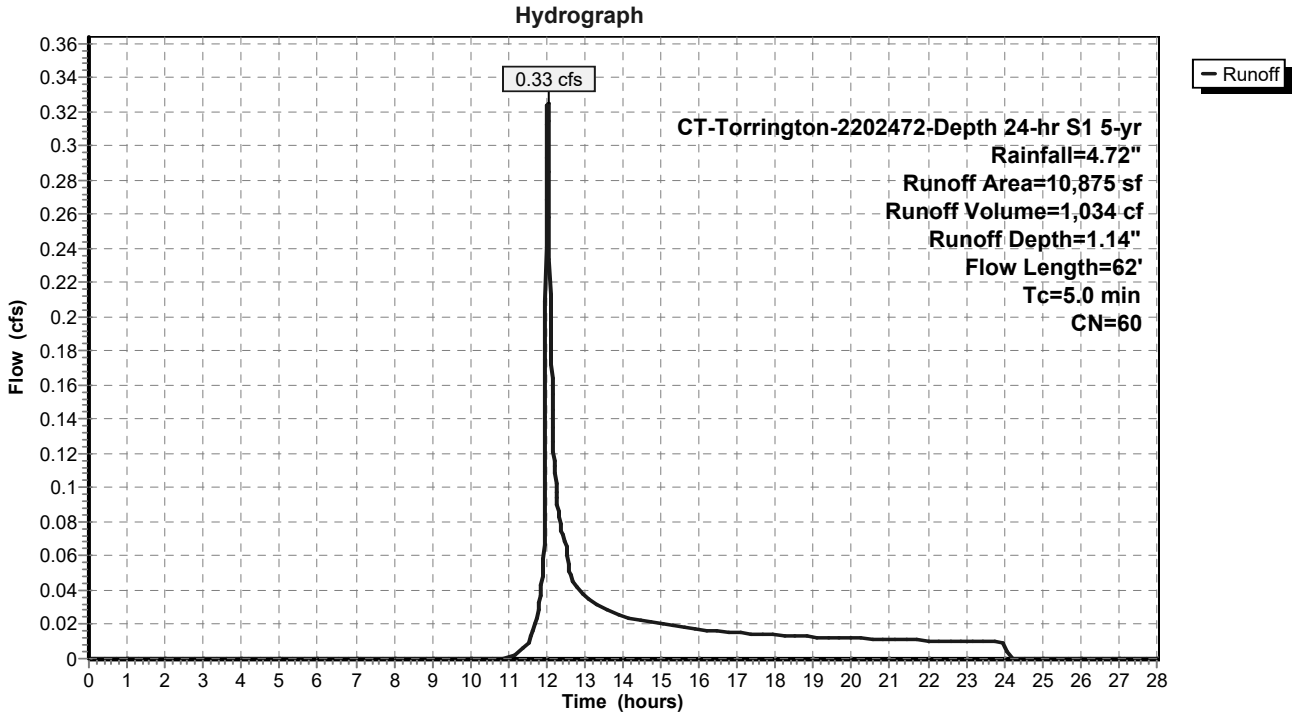
Runoff = 0.33 cfs @ 12.03 hrs, Volume= 1,034 cf, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 5-yr Rainfall=4.72"

	Area (sf)	CN	Description
*	3,945	98	Impervious, HSG A
	6,930	39	>75% Grass cover, Good, HSG A
	10,875	60	Weighted Average
	6,930		63.72% Pervious Area
	3,945		36.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	37	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	25	0.4000	3.62		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
3.7	62	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-400: Area Draining to Brook Street South



Summary for Subcatchment PDA-500: Area Draining to Brook Street North

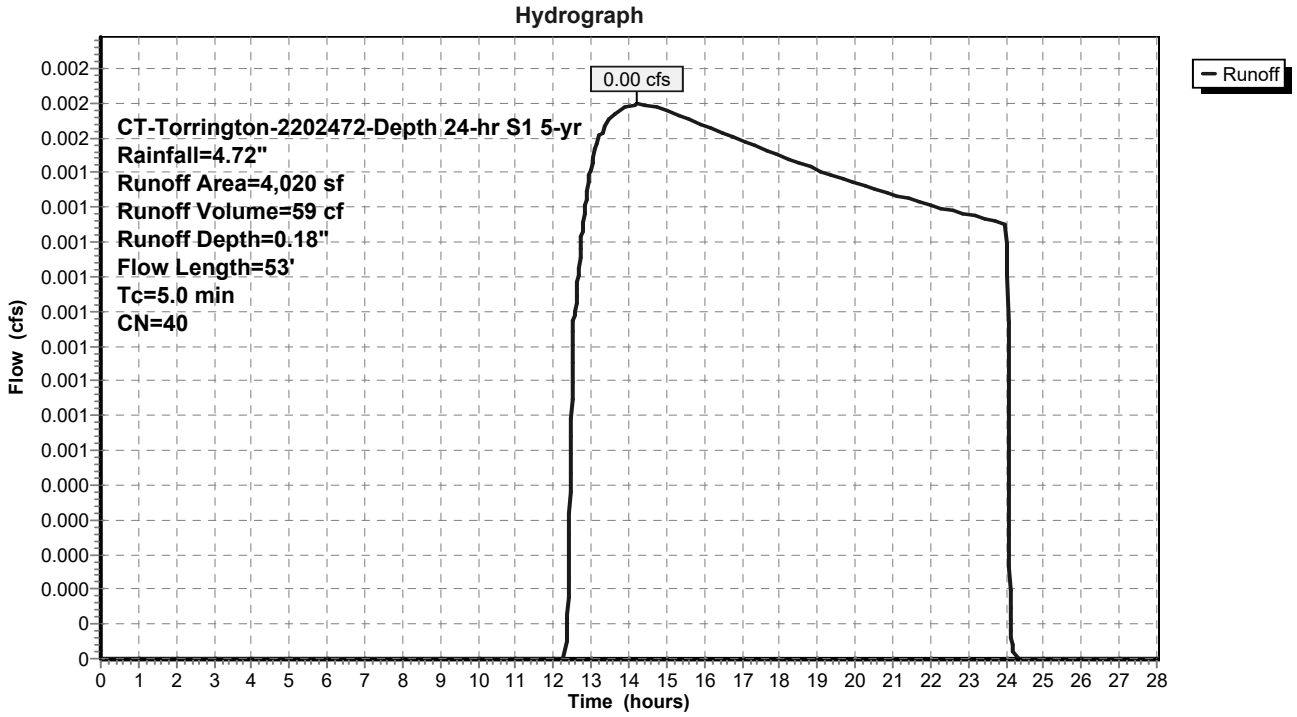
Runoff = 0.00 cfs @ 14.24 hrs, Volume= 59 cf, Depth= 0.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 5-yr Rainfall=4.72"

	Area (sf)	CN	Description
*	45	98	Impervious, HSG A
	3,975	39	>75% Grass cover, Good, HSG A
	4,020	40	Weighted Average
	3,975		98.88% Pervious Area
	45		1.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	35	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	18	0.6000	3.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
3.5	53	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-500: Area Draining to Brook Street North



Summary for Pond 1P: Underground Detention System

Inflow Area = 41,190 sf, 84.91% Impervious, Inflow Depth = 3.54" for 5-yr event
Inflow = 4.23 cfs @ 12.03 hrs, Volume= 12,136 cf
Outflow = 0.45 cfs @ 12.62 hrs, Volume= 6,640 cf, Atten= 89%, Lag= 35.5 min
Discarded = 0.03 cfs @ 5.59 hrs, Volume= 2,543 cf
Primary = 0.42 cfs @ 12.62 hrs, Volume= 4,098 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Peak Elev= 100.28' @ 12.62 hrs Surf.Area= 3,095 sf Storage= 6,065 cf

Plug-Flow detention time= 303.9 min calculated for 6,638 cf (55% of inflow)
Center-of-Mass det. time= 155.0 min (954.3 - 799.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	97.18'	3,408 cf	**34.75'W x 89.06'L x 4.00'H Field A** 12,379 cf Overall - 3,859 cf Embedded = 8,520 cf x 40.0% Voids
#2A	98.18'	3,859 cf	**ADS_StormTech SC-740 +Cap** x 84 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 84 Chambers in 7 Rows
		7,267 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	98.60'	**18.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 98.60' / 98.50' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	100.18'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Discarded	97.18'	**0.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 5.59 hrs HW=97.22' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.41 cfs @ 12.62 hrs HW=100.28' (Free Discharge)
└**1=Culvert** (Passes 0.41 cfs of 6.87 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.41 cfs @ 1.03 fps)

Pond 1P: Underground Detention System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
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

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

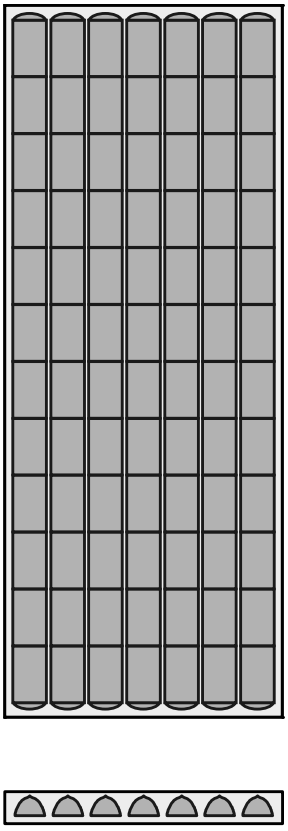
12 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 87.06' Row Length +12.0" End Stone x 2 = 89.06' Base Length
7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width
12.0" Base + 30.0" Chamber Height + 6.0" Cover = 4.00' Field Height

84 Chambers x 45.9 cf = 3,859.0 cf Chamber Storage

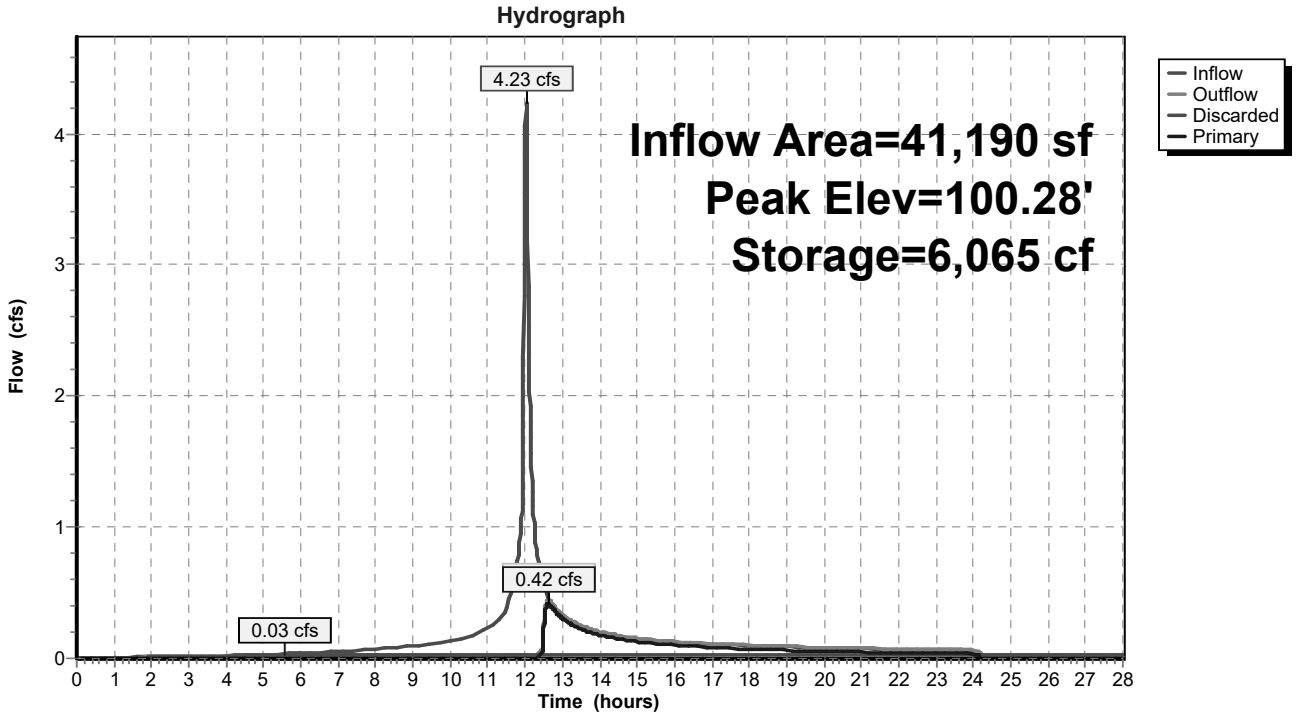
12,378.9 cf Field - 3,859.0 cf Chambers = 8,519.9 cf Stone x 40.0% Voids = 3,408.0 cf Stone Storage

Chamber Storage + Stone Storage = 7,266.9 cf = 0.167 af
Overall Storage Efficiency = 58.7%
Overall System Size = 89.06' x 34.75' x 4.00'

84 Chambers
458.5 cy Field
315.6 cy Stone



Pond 1P: Underground Detention System

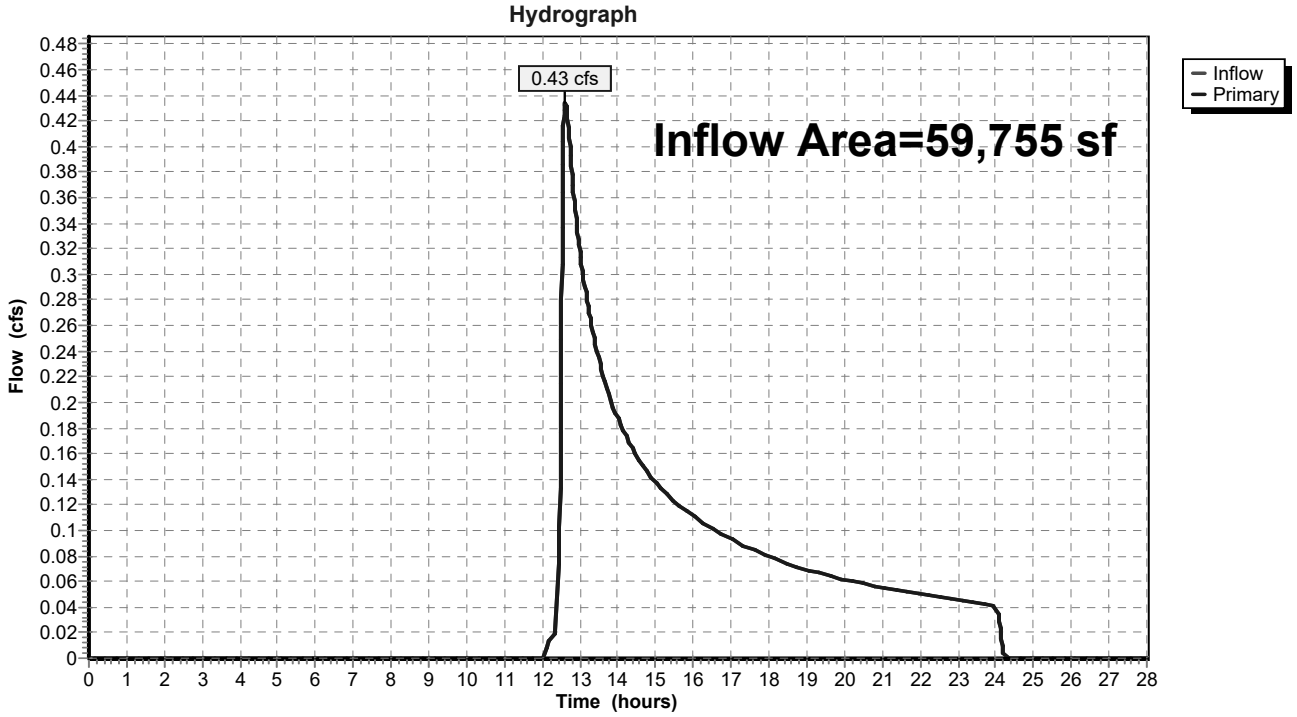


Summary for Link DP-1: Offsite West

Inflow Area = 59,755 sf, 60.74% Impervious, Inflow Depth = 0.91" for 5-yr event
Inflow = 0.43 cfs @ 12.62 hrs, Volume= 4,530 cf
Primary = 0.43 cfs @ 12.62 hrs, Volume= 4,530 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-1: Offsite West

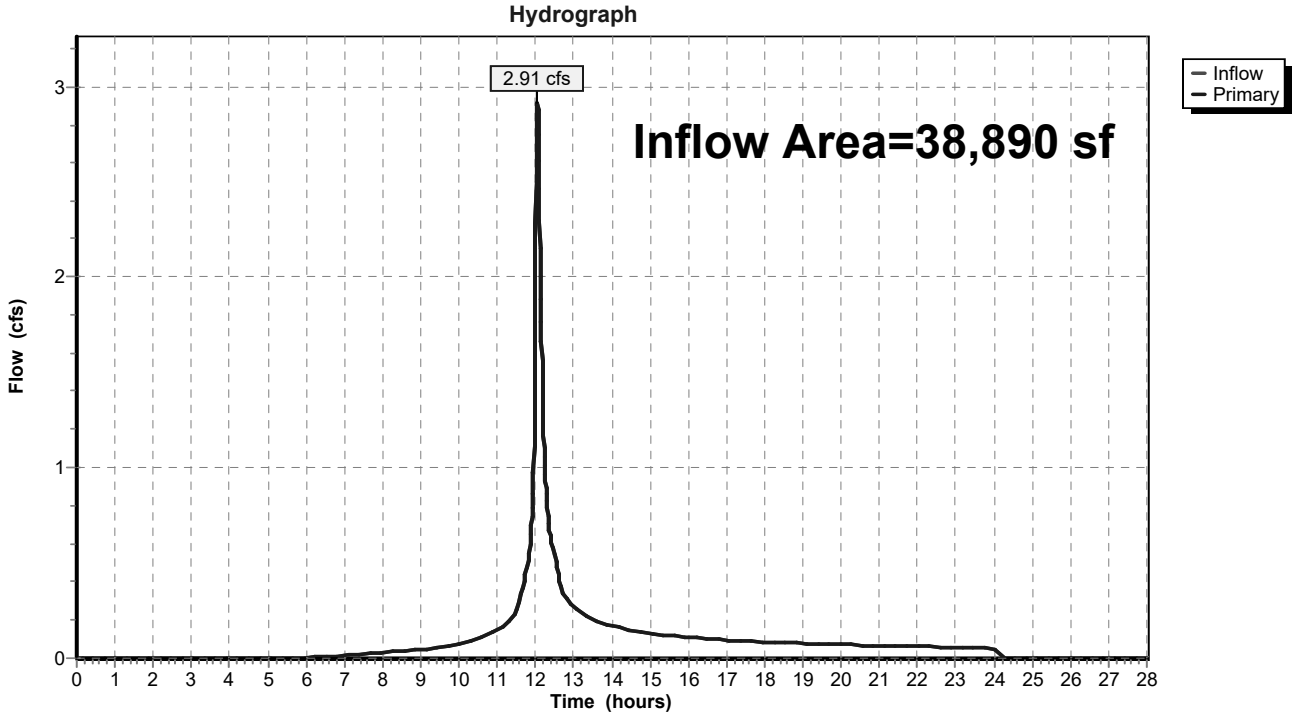


Summary for Link DP-2: Grove Street South

Inflow Area = 38,890 sf, 72.96% Impervious, Inflow Depth = 2.83" for 5-yr event
Inflow = 2.91 cfs @ 12.06 hrs, Volume= 9,171 cf
Primary = 2.91 cfs @ 12.06 hrs, Volume= 9,171 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-2: Grove Street South

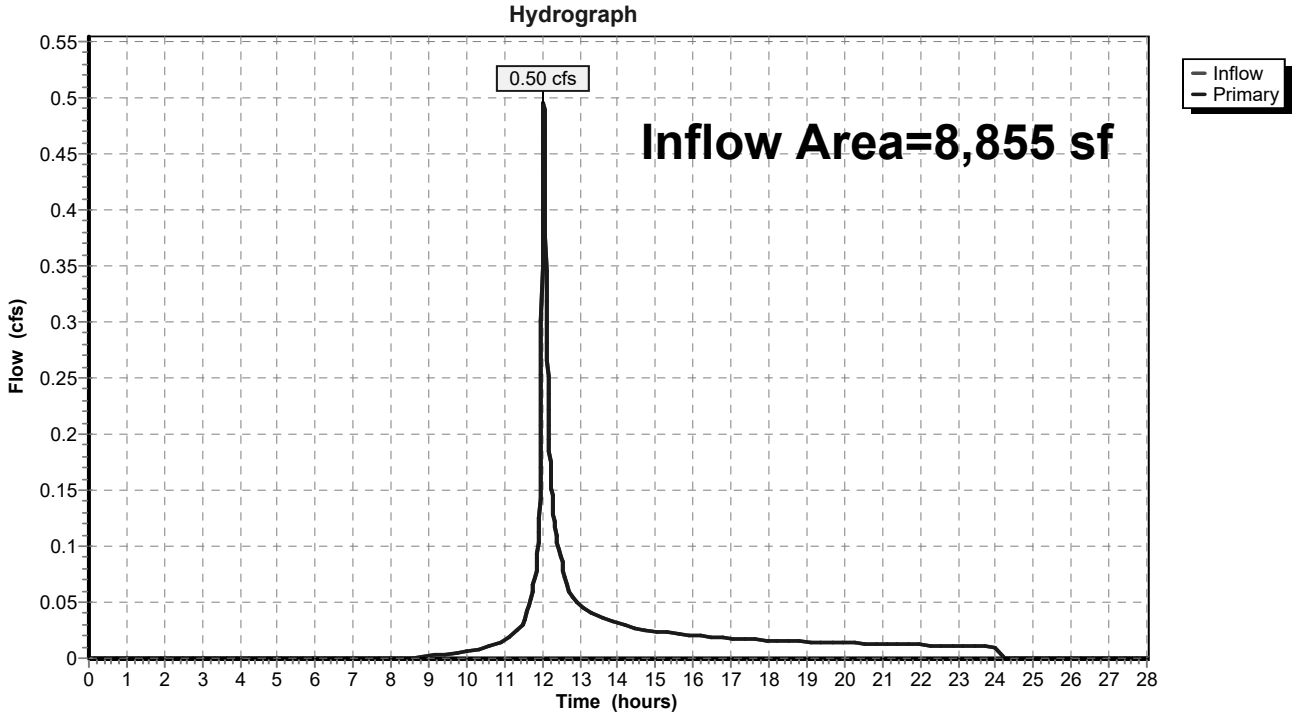


Summary for Link DP-3: Grove Street North

Inflow Area = 8,855 sf, 56.24% Impervious, Inflow Depth = 1.98" for 5-yr event
Inflow = 0.50 cfs @ 12.04 hrs, Volume= 1,464 cf
Primary = 0.50 cfs @ 12.04 hrs, Volume= 1,464 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-3: Grove Street North

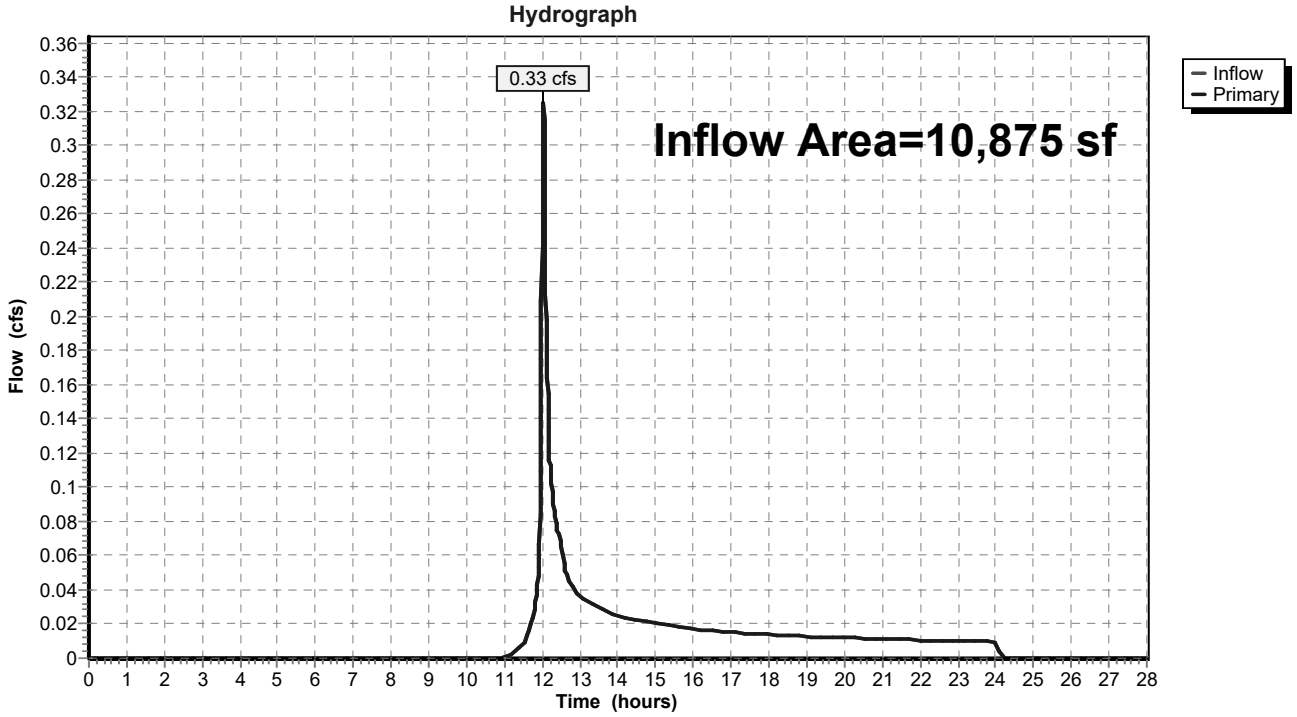


Summary for Link DP-4: Brook Street South

Inflow Area = 10,875 sf, 36.28% Impervious, Inflow Depth = 1.14" for 5-yr event
Inflow = 0.33 cfs @ 12.03 hrs, Volume= 1,034 cf
Primary = 0.33 cfs @ 12.03 hrs, Volume= 1,034 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-4: Brook Street South

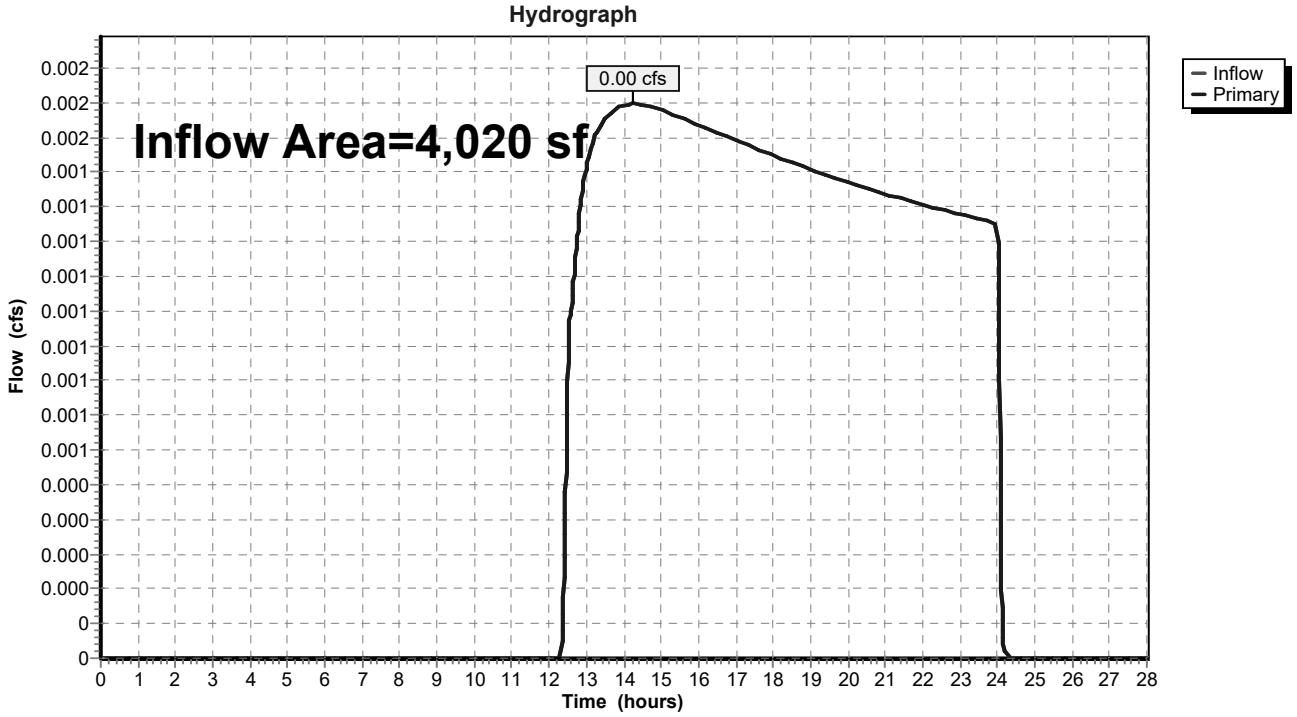


Summary for Link DP-5: Brook Street North

Inflow Area = 4,020 sf, 1.12% Impervious, Inflow Depth = 0.18" for 5-yr event
Inflow = 0.00 cfs @ 14.24 hrs, Volume= 59 cf
Primary = 0.00 cfs @ 14.24 hrs, Volume= 59 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-5: Brook Street North

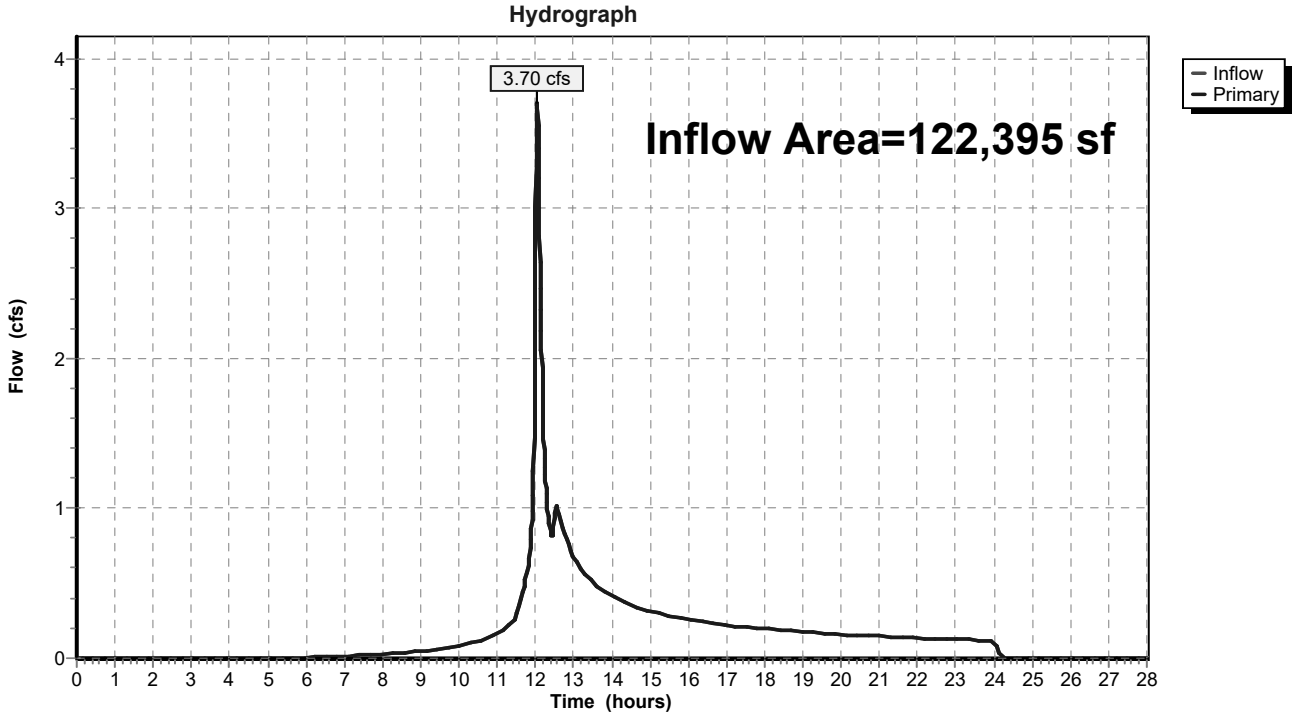


Summary for Link DP-6: Total Offsite Flow

Inflow Area = 122,395 sf, 60.17% Impervious, Inflow Depth = 1.59" for 5-yr event
Inflow = 3.70 cfs @ 12.05 hrs, Volume= 16,259 cf
Primary = 3.70 cfs @ 12.05 hrs, Volume= 16,259 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-6: Total Offsite Flow



Time span=0.00-28.00 hrs, dt=0.01 hrs, 2801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-100: Area Draining Runoff Area=18,565 sf 7.11% Impervious Runoff Depth=0.57"
Flow Length=50' Slope=0.0300 '/' Tc=5.0 min CN=43 Runoff=0.10 cfs 887 cf

Subcatchment PDA-110: School Parking Runoff Area=10,885 sf 81.90% Impervious Runoff Depth=4.24"
Flow Length=181' Slope=0.0200 '/' Tc=5.5 min CN=87 Runoff=1.30 cfs 3,846 cf

Subcatchment PDA-120: School Roof Runoff Area=10,425 sf 100.00% Impervious Runoff Depth=5.47"
Tc=5.0 min CN=98 Runoff=1.49 cfs 4,754 cf

Subcatchment PDA-130: Church Parking Runoff Area=8,295 sf 84.63% Impervious Runoff Depth=4.45"
Flow Length=151' Tc=5.0 min CN=89 Runoff=1.06 cfs 3,079 cf

Subcatchment PDA-140: Rectory Parking Runoff Area=11,585 sf 74.36% Impervious Runoff Depth=3.82"
Flow Length=64' Slope=0.0300 '/' Tc=5.0 min CN=83 Runoff=1.31 cfs 3,691 cf

Subcatchment PDA-200: Area Draining to Runoff Area=38,890 sf 72.96% Impervious Runoff Depth=3.72"
Flow Length=447' Tc=7.6 min CN=82 Runoff=3.71 cfs 12,060 cf

Subcatchment PDA-300: Area Draining to Runoff Area=8,855 sf 56.24% Impervious Runoff Depth=2.76"
Flow Length=93' Tc=6.1 min CN=72 Runoff=0.68 cfs 2,035 cf

Subcatchment PDA-400: Area Draining to Runoff Area=10,875 sf 36.28% Impervious Runoff Depth=1.73"
Flow Length=62' Tc=5.0 min CN=60 Runoff=0.52 cfs 1,572 cf

Subcatchment PDA-500: Area Draining to Runoff Area=4,020 sf 1.12% Impervious Runoff Depth=0.41"
Flow Length=53' Tc=5.0 min CN=40 Runoff=0.01 cfs 139 cf

Pond 1P: Underground Detention System Peak Elev=100.44' Storage=6,329 cf Inflow=5.17 cfs 15,370 cf
Discarded=0.03 cfs 2,627 cf Primary=1.74 cfs 7,244 cf Outflow=1.77 cfs 9,870 cf

Link DP-1: Offsite West Inflow=1.81 cfs 8,131 cf
Primary=1.81 cfs 8,131 cf

Link DP-2: Grove Street South Inflow=3.71 cfs 12,060 cf
Primary=3.71 cfs 12,060 cf

Link DP-3: Grove Street North Inflow=0.68 cfs 2,035 cf
Primary=0.68 cfs 2,035 cf

Link DP-4: Brook Street South Inflow=0.52 cfs 1,572 cf
Primary=0.52 cfs 1,572 cf

Link DP-5: Brook Street North Inflow=0.01 cfs 139 cf
Primary=0.01 cfs 139 cf

Link DP-6: Total Offsite Flow Inflow=4.95 cfs 23,937 cf
Primary=4.95 cfs 23,937 cf

Total Runoff Area = 122,395 sf Runoff Volume = 32,064 cf Average Runoff Depth = 3.14"
39.83% Pervious = 48,755 sf 60.17% Impervious = 73,640 sf

Summary for Subcatchment PDA-100: Area Draining Offsite to the West

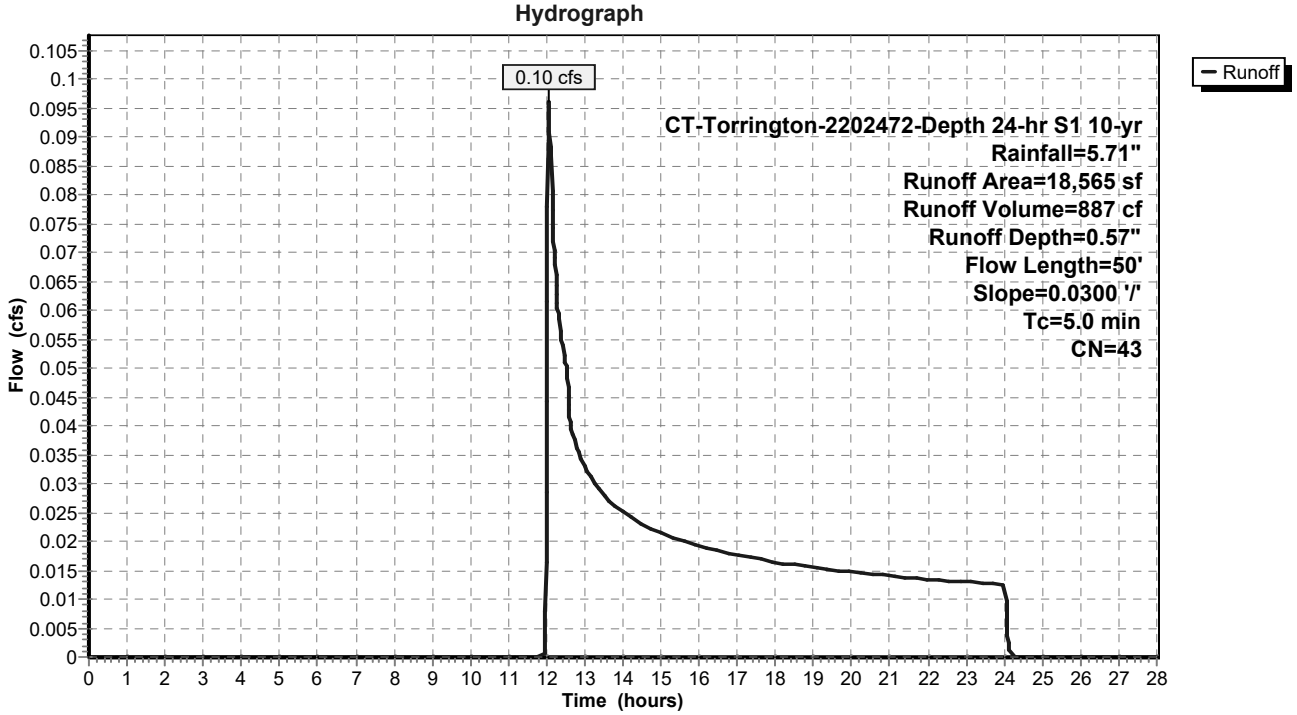
Runoff = 0.10 cfs @ 12.06 hrs, Volume= 887 cf, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 10-yr Rainfall=5.71"

	Area (sf)	CN	Description
*	1,320	98	Impervious, HSG A
	17,245	39	>75% Grass cover, Good, HSG A
	18,565	43	Weighted Average
	17,245		92.89% Pervious Area
	1,320		7.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
4.6	50	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-100: Area Draining Offsite to the West



Summary for Subcatchment PDA-110: School Parking Area to UDS

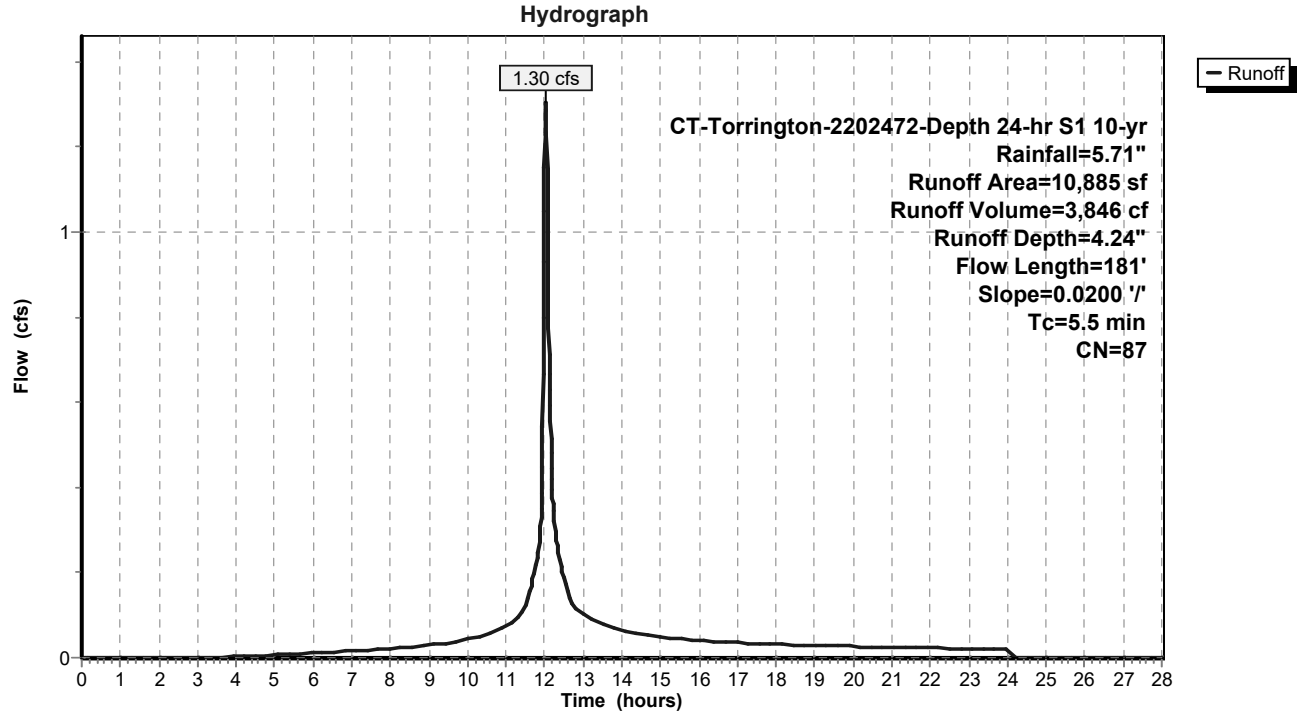
Runoff = 1.30 cfs @ 12.03 hrs, Volume= 3,846 cf, Depth= 4.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 10-yr Rainfall=5.71"

	Area (sf)	CN	Description
*	8,915	98	Impervious, HSG A
	1,970	39	>75% Grass cover, Good, HSG A
	10,885	87	Weighted Average
	1,970		18.10% Pervious Area
	8,915		81.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	37	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.8	63	0.0200	1.32		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
0.5	81	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	181	Total			

Subcatchment PDA-110: School Parking Area to UDS



Summary for Subcatchment PDA-120: School Roof Area to UDS

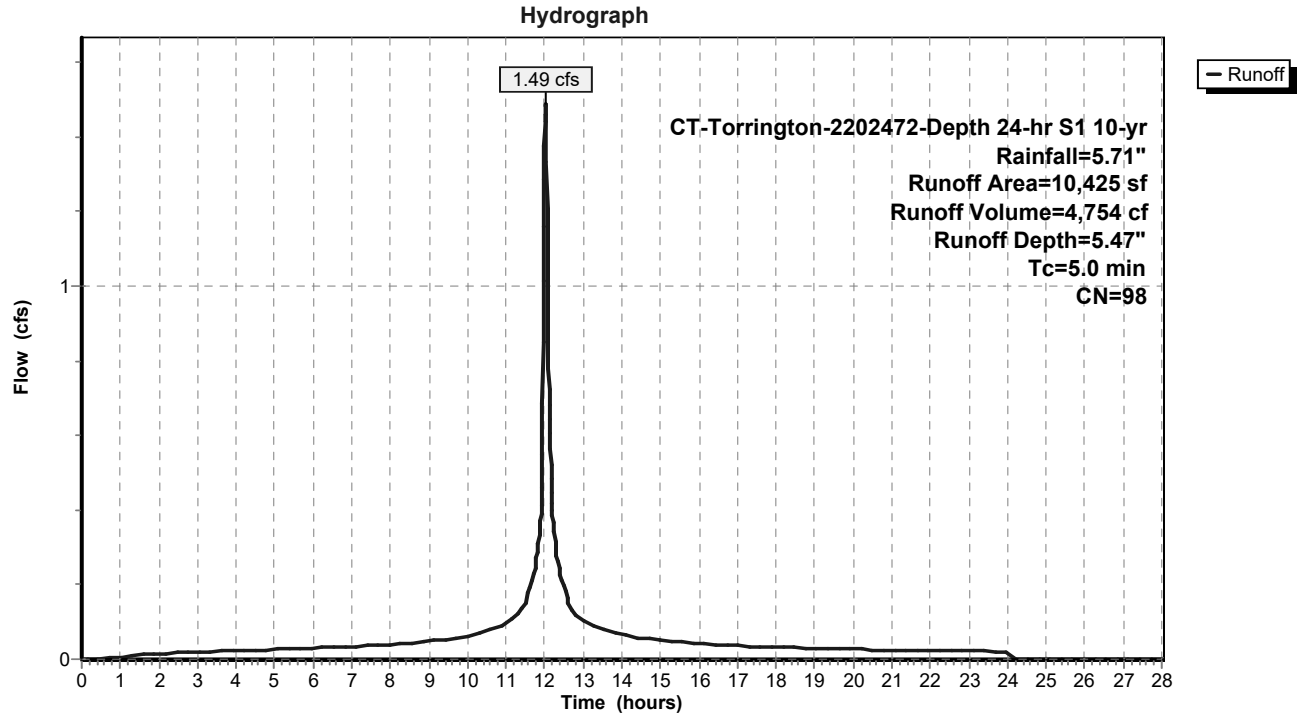
Runoff = 1.49 cfs @ 12.03 hrs, Volume= 4,754 cf, Depth= 5.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 10-yr Rainfall=5.71"

	Area (sf)	CN	Description
*	10,425	98	Impervious, HSG A
	10,425		100.00% Impervious Area

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

Subcatchment PDA-120: School Roof Area to UDS



Summary for Subcatchment PDA-130: Church Parking Area to UDS

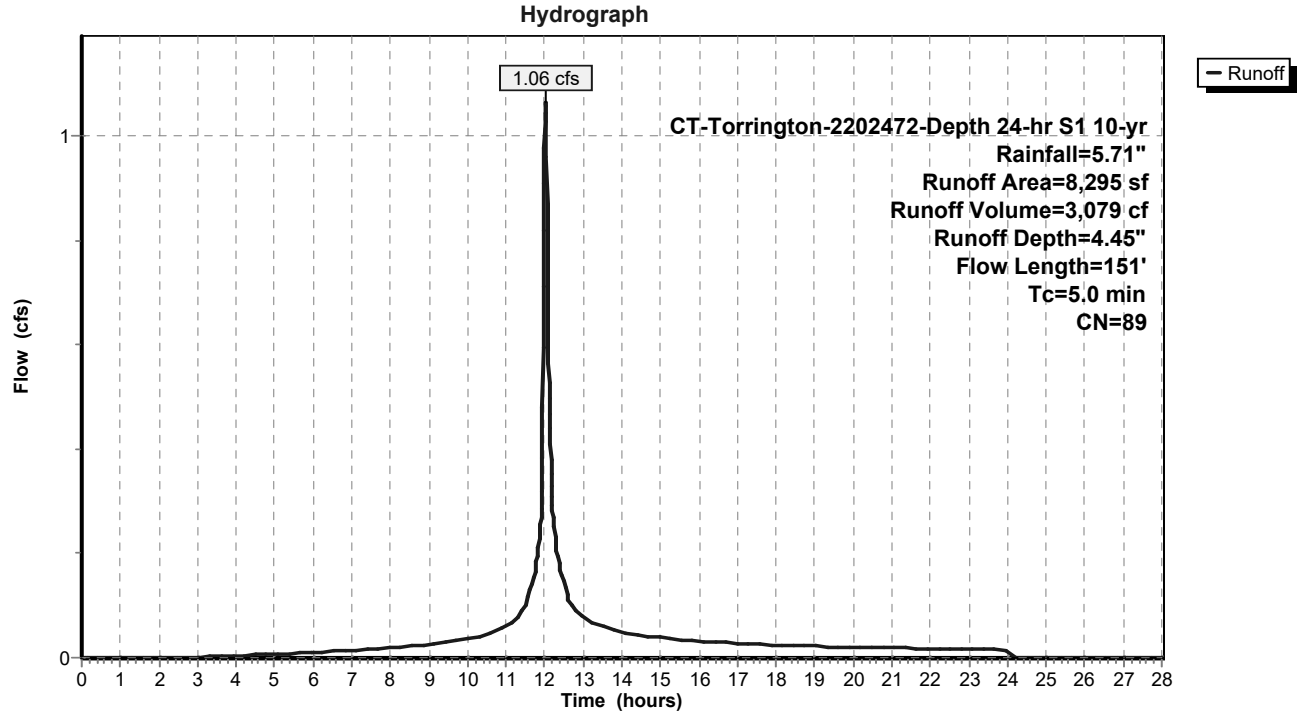
Runoff = 1.06 cfs @ 12.03 hrs, Volume= 3,079 cf, Depth= 4.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 10-yr Rainfall=5.71"

	Area (sf)	CN	Description
*	7,020	98	Impervious, HSG A
	1,275	39	>75% Grass cover, Good, HSG A
	8,295	89	Weighted Average
	1,275		15.37% Pervious Area
	7,020		84.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	22	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.8	78	0.0350	1.72		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
0.2	51	0.0350	3.80		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.7	151	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-130: Church Parking Area to UDS



Summary for Subcatchment PDA-140: Rectory Parking Area to UDS

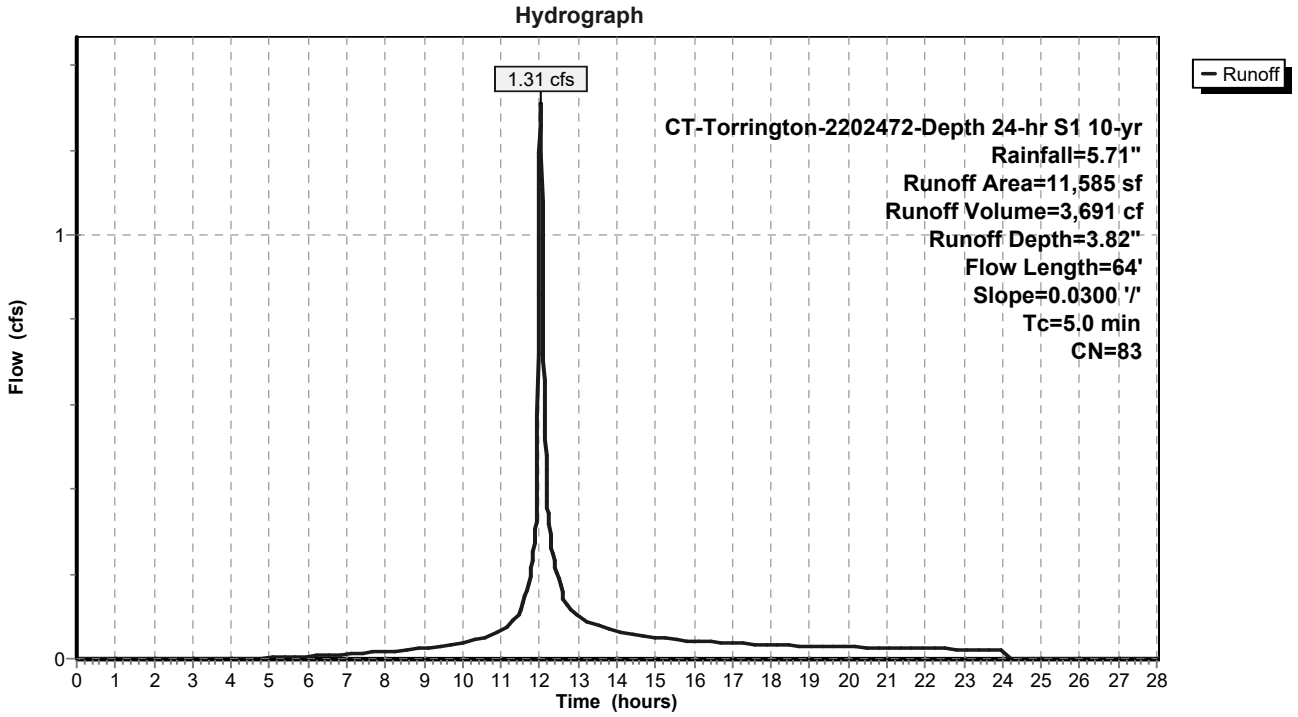
Runoff = 1.31 cfs @ 12.03 hrs, Volume= 3,691 cf, Depth= 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 10-yr Rainfall=5.71"

	Area (sf)	CN	Description
*	8,615	98	Impervious, HSG A
	2,970	39	>75% Grass cover, Good, HSG A
	11,585	83	Weighted Average
	2,970		25.64% Pervious Area
	8,615		74.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	16	0.0300	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.5	48	0.0300	1.47		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.3	64	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-140: Rectory Parking Area to UDS



Summary for Subcatchment PDA-200: Area Draining to Grove Street South

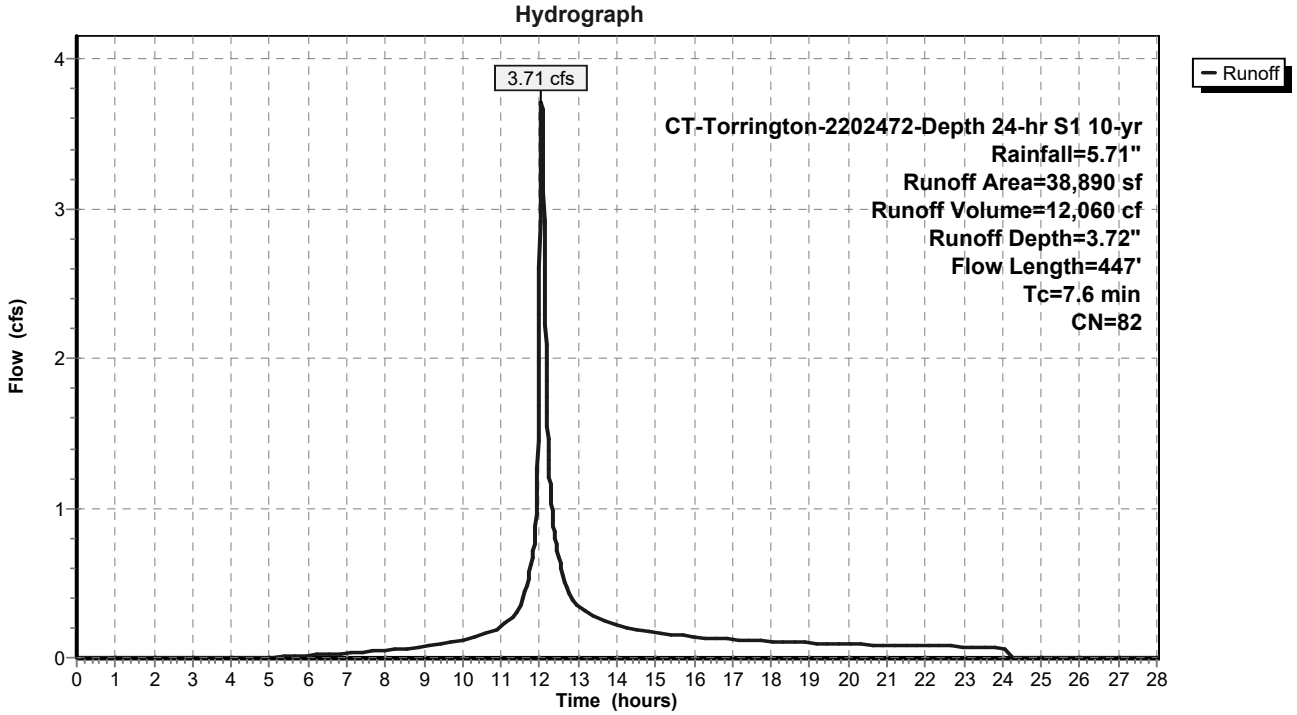
Runoff = 3.71 cfs @ 12.05 hrs, Volume= 12,060 cf, Depth= 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 10-yr Rainfall=5.71"

	Area (sf)	CN	Description
*	28,375	98	Impervious, HSG A
	10,515	39	>75% Grass cover, Good, HSG A
	38,890	82	Weighted Average
	10,515		27.04% Pervious Area
	28,375		72.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	30	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.9	70	0.0200	1.34		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.0	347	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.6	447	Total			

Subcatchment PDA-200: Area Draining to Grove Street South



Summary for Subcatchment PDA-300: Area Draining to Grove Street North

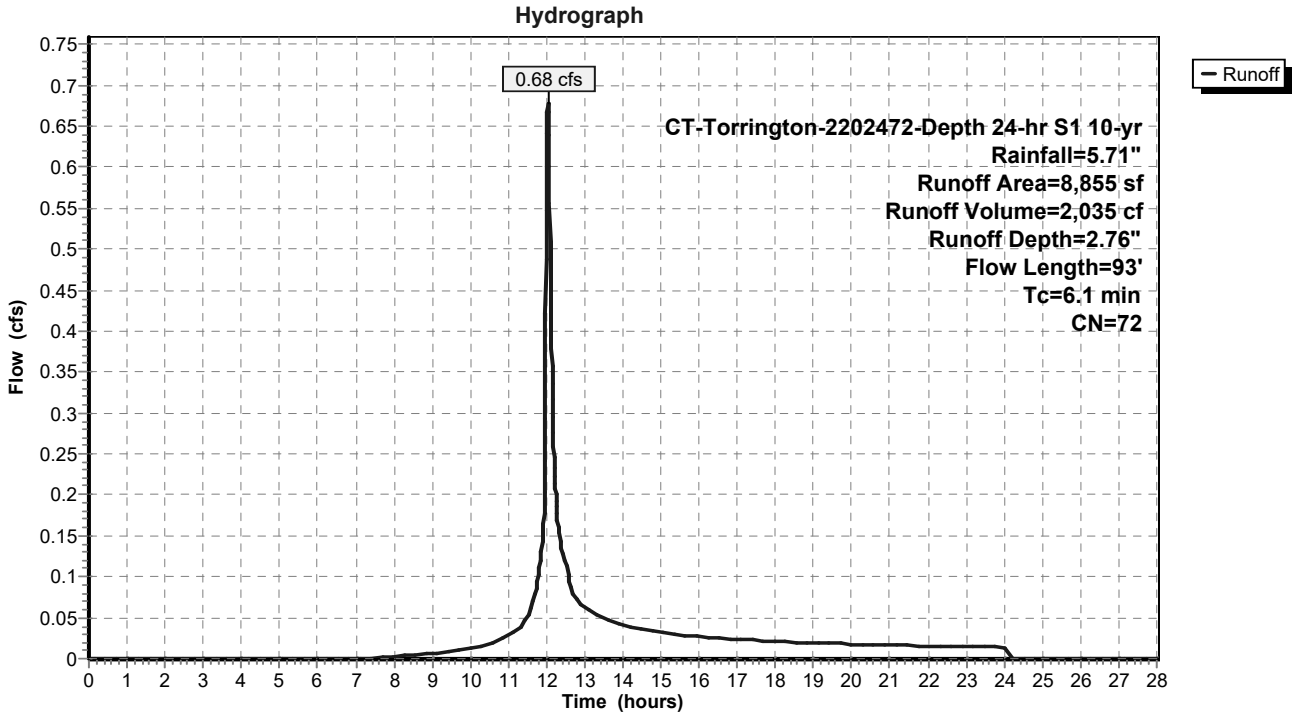
Runoff = 0.68 cfs @ 12.04 hrs, Volume= 2,035 cf, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 10-yr Rainfall=5.71"

	Area (sf)	CN	Description
*	4,980	98	Impervious, HSG A
	3,875	39	>75% Grass cover, Good, HSG A
	8,855	72	Weighted Average
	3,875		43.76% Pervious Area
	4,980		56.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	66	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	27	0.0200	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
6.1	93	Total			

Subcatchment PDA-300: Area Draining to Grove Street North



Summary for Subcatchment PDA-400: Area Draining to Brook Street South

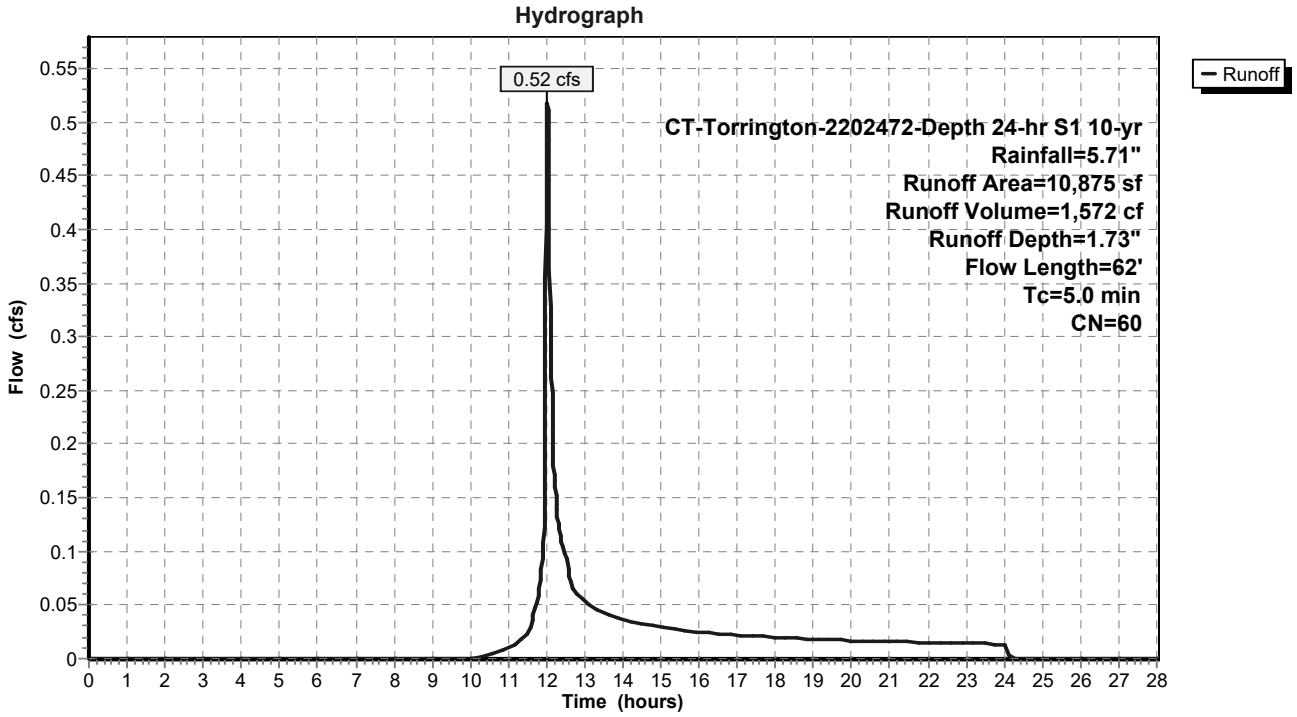
Runoff = 0.52 cfs @ 12.03 hrs, Volume= 1,572 cf, Depth= 1.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 10-yr Rainfall=5.71"

	Area (sf)	CN	Description
*	3,945	98	Impervious, HSG A
	6,930	39	>75% Grass cover, Good, HSG A
	10,875	60	Weighted Average
	6,930		63.72% Pervious Area
	3,945		36.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	37	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	25	0.4000	3.62		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
3.7	62	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-400: Area Draining to Brook Street South



Summary for Subcatchment PDA-500: Area Draining to Brook Street North

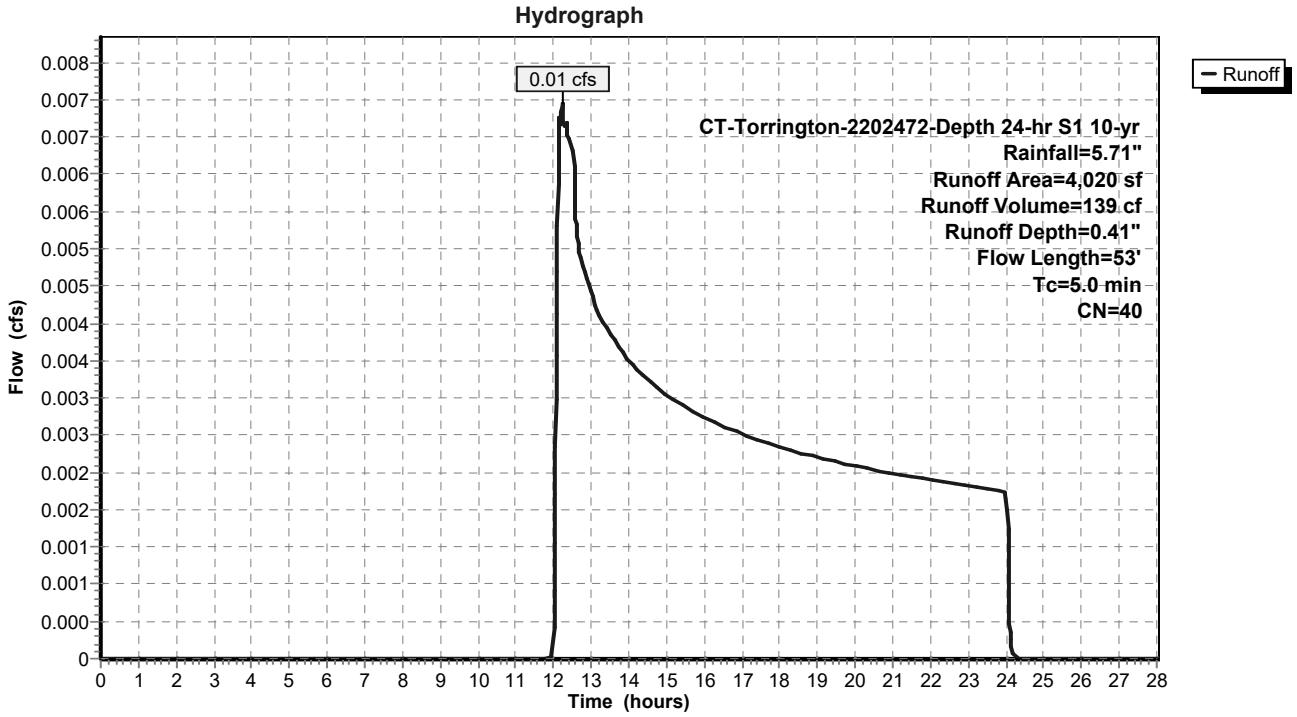
Runoff = 0.01 cfs @ 12.24 hrs, Volume= 139 cf, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 10-yr Rainfall=5.71"

	Area (sf)	CN	Description
*	45	98	Impervious, HSG A
	3,975	39	>75% Grass cover, Good, HSG A
	4,020	40	Weighted Average
	3,975		98.88% Pervious Area
	45		1.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	35	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	18	0.6000	3.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
3.5	53	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-500: Area Draining to Brook Street North



Summary for Pond 1P: Underground Detention System

Inflow Area = 41,190 sf, 84.91% Impervious, Inflow Depth = 4.48" for 10-yr event
Inflow = 5.17 cfs @ 12.03 hrs, Volume= 15,370 cf
Outflow = 1.77 cfs @ 12.17 hrs, Volume= 9,870 cf, Atten= 66%, Lag= 8.6 min
Discarded = 0.03 cfs @ 4.38 hrs, Volume= 2,627 cf
Primary = 1.74 cfs @ 12.17 hrs, Volume= 7,244 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Peak Elev= 100.44' @ 12.17 hrs Surf.Area= 3,095 sf Storage= 6,329 cf

Plug-Flow detention time= 255.9 min calculated for 9,870 cf (64% of inflow)
Center-of-Mass det. time= 120.7 min (914.2 - 793.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	97.18'	3,408 cf	**34.75'W x 89.06'L x 4.00'H Field A** 12,379 cf Overall - 3,859 cf Embedded = 8,520 cf x 40.0% Voids
#2A	98.18'	3,859 cf	**ADS_StormTech SC-740 +Cap** x 84 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 84 Chambers in 7 Rows
		7,267 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	98.60'	**18.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 98.60' / 98.50' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	100.18'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Discarded	97.18'	**0.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 4.38 hrs HW=97.22' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=1.74 cfs @ 12.17 hrs HW=100.44' (Free Discharge)
└**1=Culvert** (Passes 1.74 cfs of 7.64 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 1.74 cfs @ 1.68 fps)

Pond 1P: Underground Detention System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
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

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

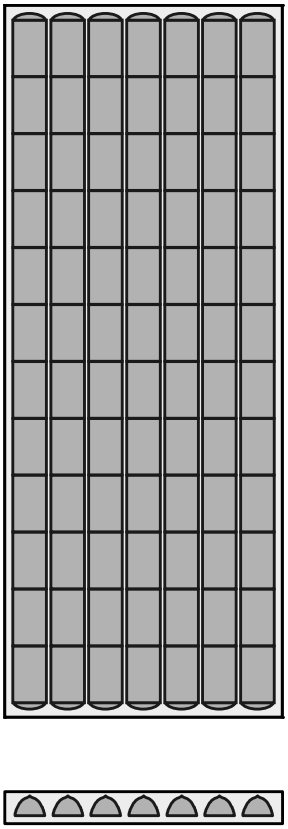
12 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 87.06' Row Length +12.0" End Stone x 2 = 89.06' Base Length
7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width
12.0" Base + 30.0" Chamber Height + 6.0" Cover = 4.00' Field Height

84 Chambers x 45.9 cf = 3,859.0 cf Chamber Storage

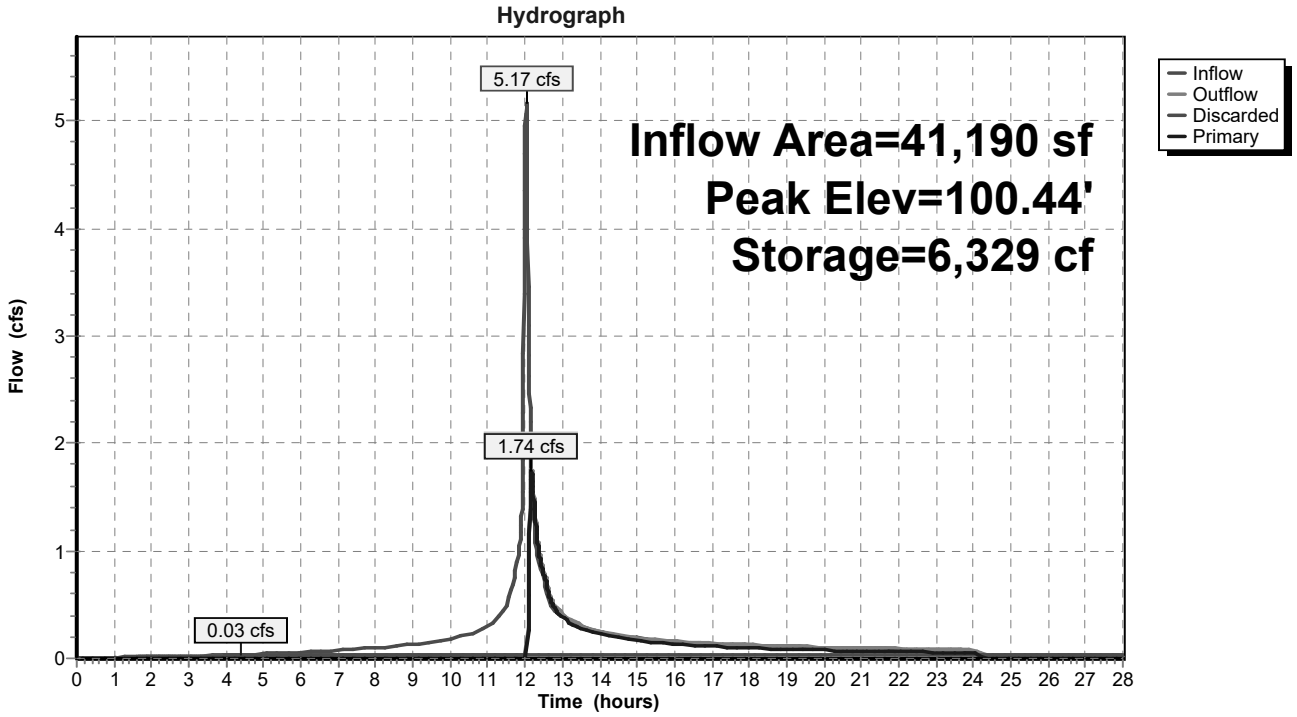
12,378.9 cf Field - 3,859.0 cf Chambers = 8,519.9 cf Stone x 40.0% Voids = 3,408.0 cf Stone Storage

Chamber Storage + Stone Storage = 7,266.9 cf = 0.167 af
Overall Storage Efficiency = 58.7%
Overall System Size = 89.06' x 34.75' x 4.00'

84 Chambers
458.5 cy Field
315.6 cy Stone



Pond 1P: Underground Detention System

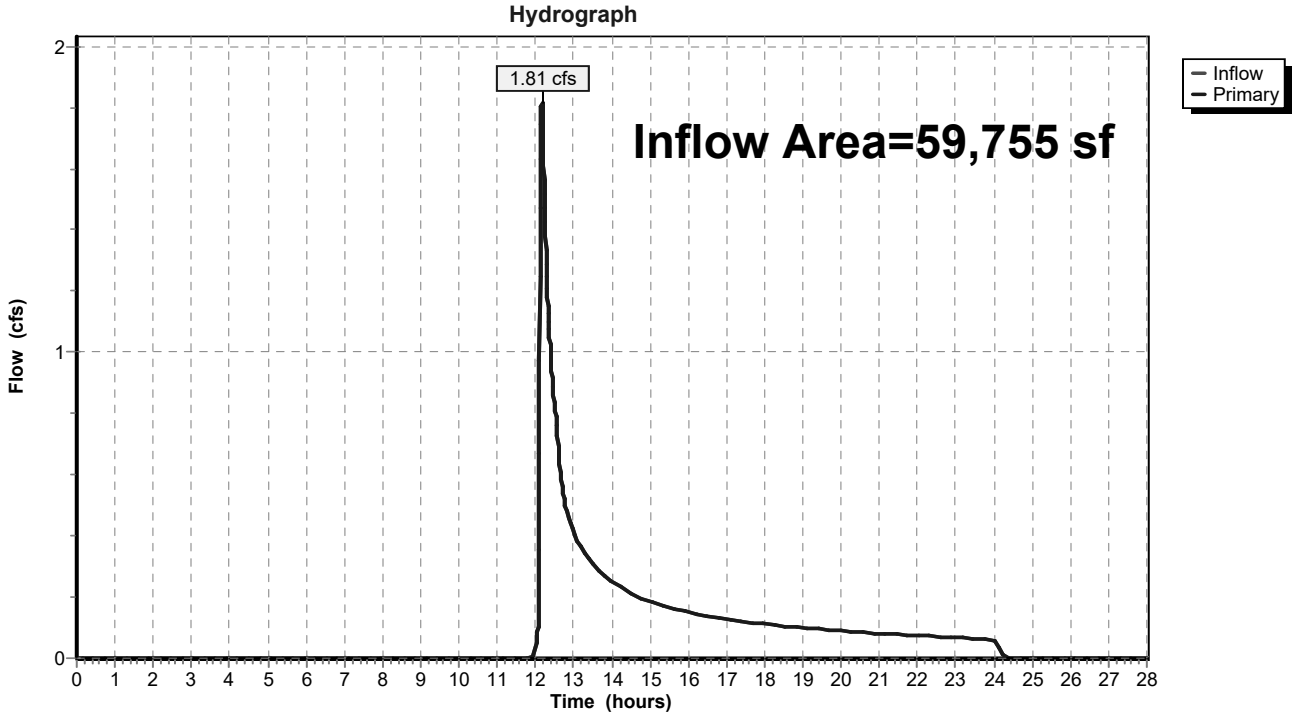


Summary for Link DP-1: Offsite West

Inflow Area = 59,755 sf, 60.74% Impervious, Inflow Depth = 1.63" for 10-yr event
Inflow = 1.81 cfs @ 12.17 hrs, Volume= 8,131 cf
Primary = 1.81 cfs @ 12.17 hrs, Volume= 8,131 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-1: Offsite West

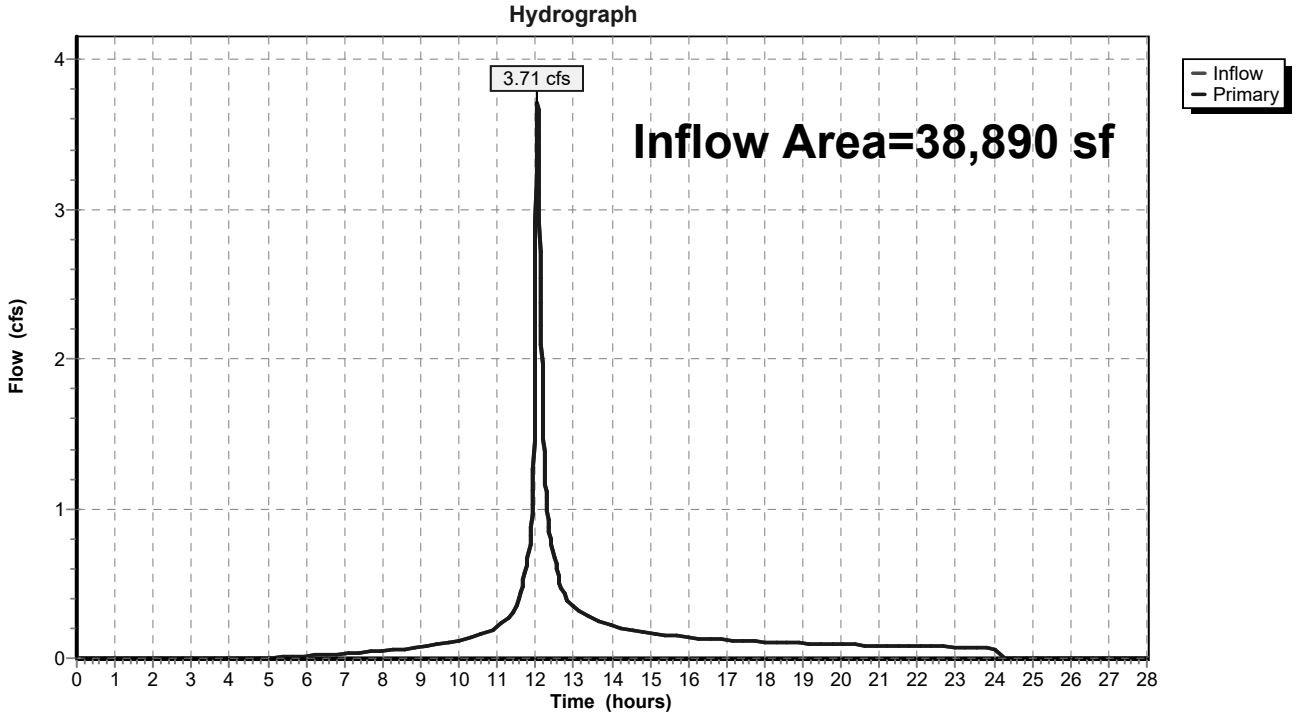


Summary for Link DP-2: Grove Street South

Inflow Area = 38,890 sf, 72.96% Impervious, Inflow Depth = 3.72" for 10-yr event
Inflow = 3.71 cfs @ 12.05 hrs, Volume= 12,060 cf
Primary = 3.71 cfs @ 12.05 hrs, Volume= 12,060 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-2: Grove Street South

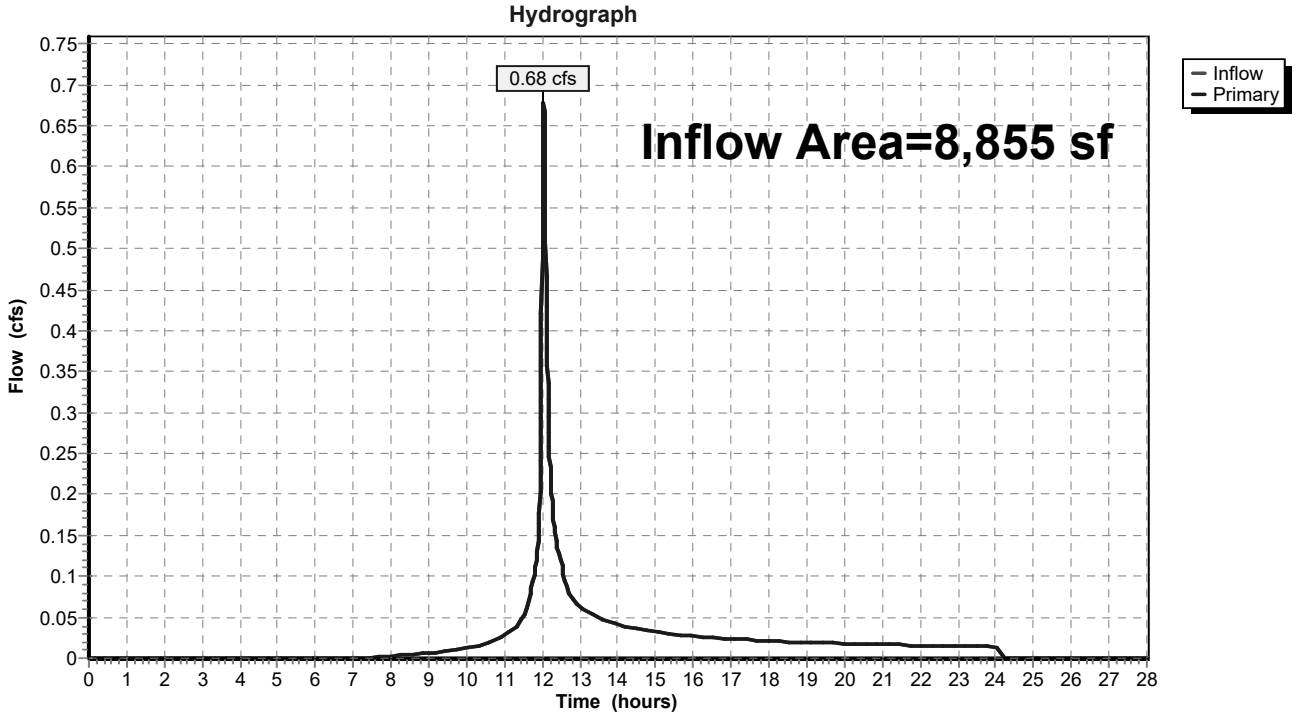


Summary for Link DP-3: Grove Street North

Inflow Area = 8,855 sf, 56.24% Impervious, Inflow Depth = 2.76" for 10-yr event
Inflow = 0.68 cfs @ 12.04 hrs, Volume= 2,035 cf
Primary = 0.68 cfs @ 12.04 hrs, Volume= 2,035 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-3: Grove Street North

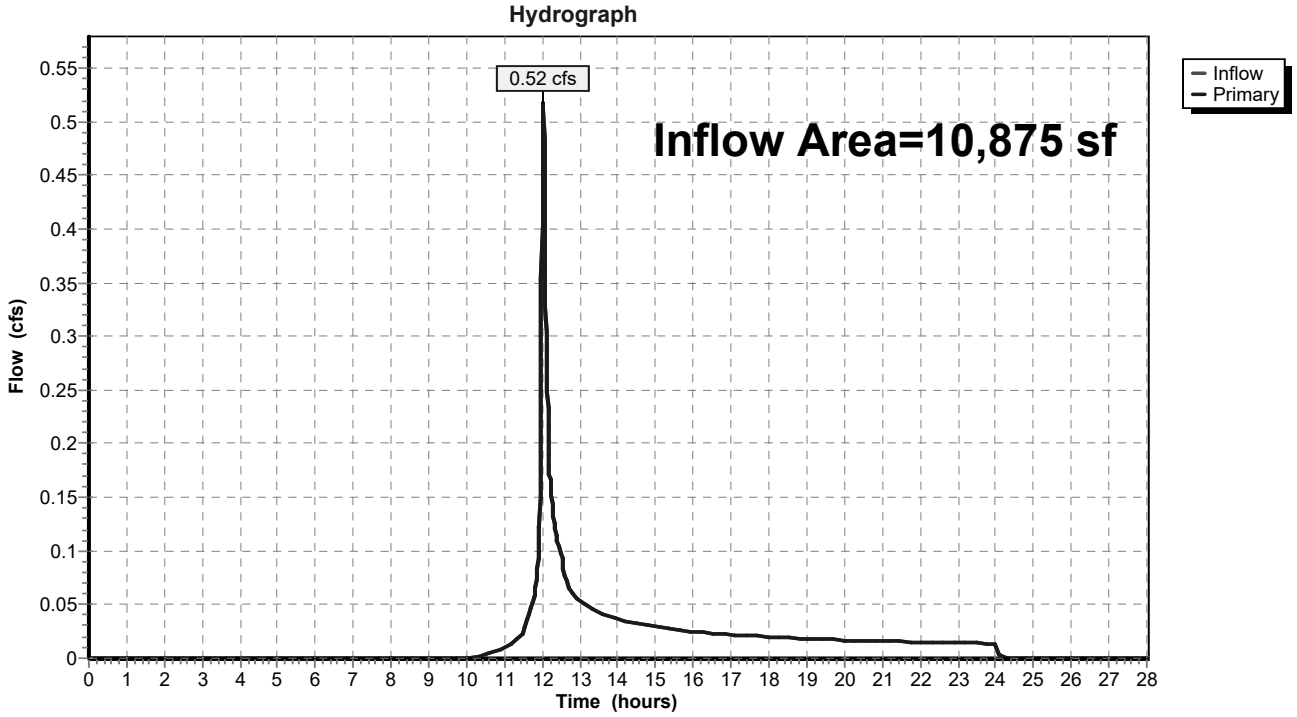


Summary for Link DP-4: Brook Street South

Inflow Area = 10,875 sf, 36.28% Impervious, Inflow Depth = 1.73" for 10-yr event
Inflow = 0.52 cfs @ 12.03 hrs, Volume= 1,572 cf
Primary = 0.52 cfs @ 12.03 hrs, Volume= 1,572 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-4: Brook Street South

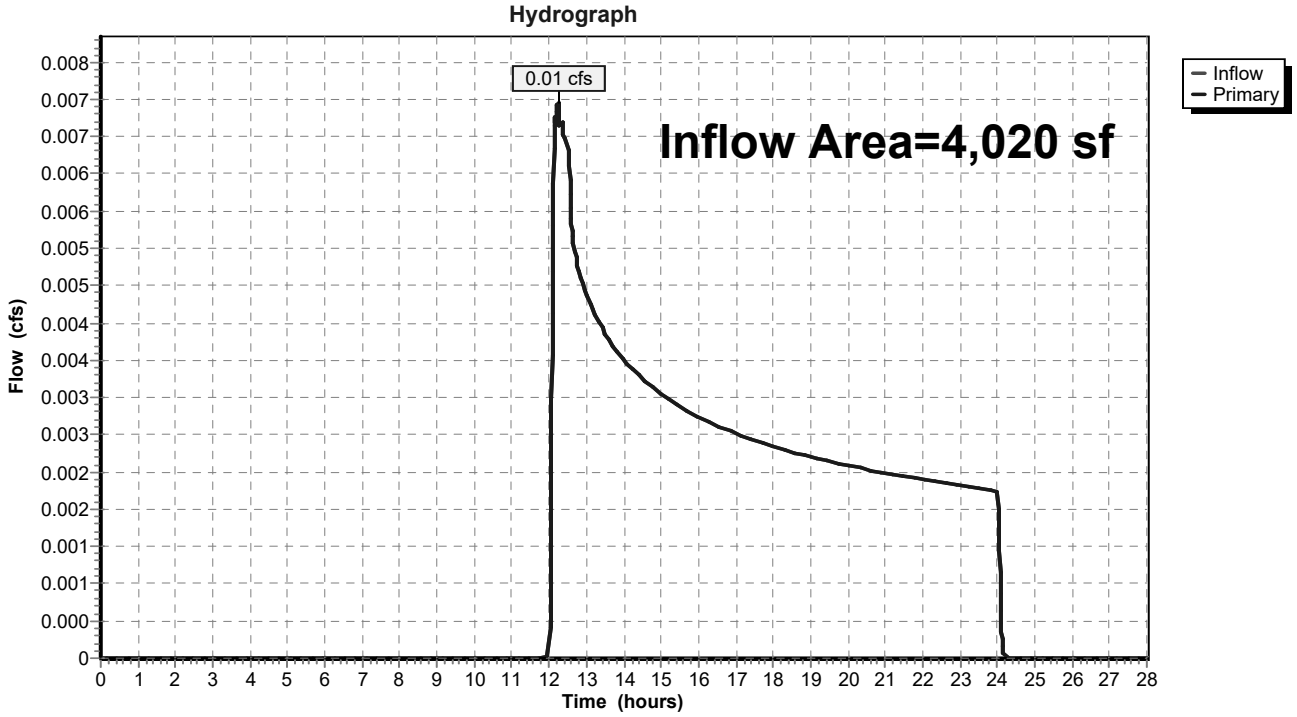


Summary for Link DP-5: Brook Street North

Inflow Area = 4,020 sf, 1.12% Impervious, Inflow Depth = 0.41" for 10-yr event
Inflow = 0.01 cfs @ 12.24 hrs, Volume= 139 cf
Primary = 0.01 cfs @ 12.24 hrs, Volume= 139 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-5: Brook Street North

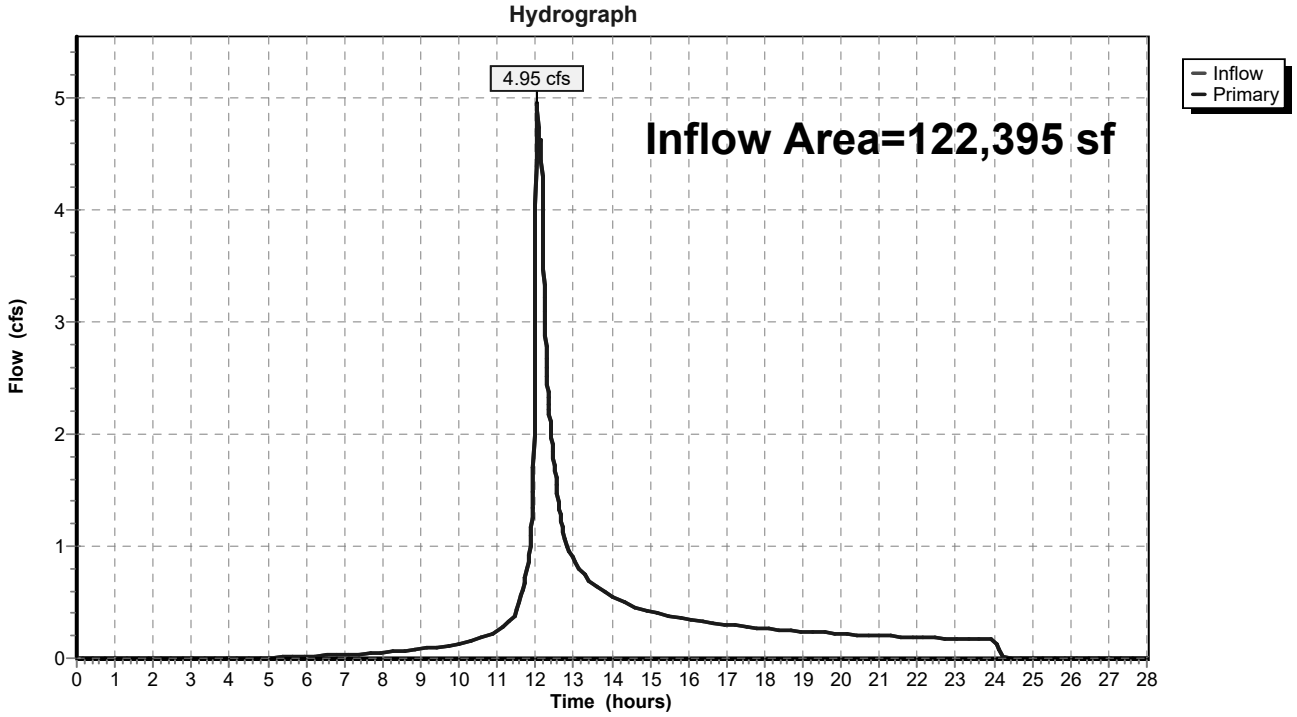


Summary for Link DP-6: Total Offsite Flow

Inflow Area = 122,395 sf, 60.17% Impervious, Inflow Depth = 2.35" for 10-yr event
Inflow = 4.95 cfs @ 12.05 hrs, Volume= 23,937 cf
Primary = 4.95 cfs @ 12.05 hrs, Volume= 23,937 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-6: Total Offsite Flow



Time span=0.00-28.00 hrs, dt=0.01 hrs, 2801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-100: Area Draining Runoff Area=18,565 sf 7.11% Impervious Runoff Depth=1.10"
Flow Length=50' Slope=0.0300 '/' Tc=5.0 min CN=43 Runoff=0.38 cfs 1,709 cf

Subcatchment PDA-110: School Parking Runoff Area=10,885 sf 81.90% Impervious Runoff Depth=5.55"
Flow Length=181' Slope=0.0200 '/' Tc=5.5 min CN=87 Runoff=1.63 cfs 5,032 cf

Subcatchment PDA-120: School Roof Runoff Area=10,425 sf 100.00% Impervious Runoff Depth=6.83"
Tc=5.0 min CN=98 Runoff=1.79 cfs 5,934 cf

Subcatchment PDA-130: Church Parking Runoff Area=8,295 sf 84.63% Impervious Runoff Depth=5.78"
Flow Length=151' Tc=5.0 min CN=89 Runoff=1.32 cfs 3,993 cf

Subcatchment PDA-140: Rectory Parking Runoff Area=11,585 sf 74.36% Impervious Runoff Depth=5.09"
Flow Length=64' Slope=0.0300 '/' Tc=5.0 min CN=83 Runoff=1.68 cfs 4,918 cf

Subcatchment PDA-200: Area Draining to Runoff Area=38,890 sf 72.96% Impervious Runoff Depth=4.98"
Flow Length=447' Tc=7.6 min CN=82 Runoff=4.78 cfs 16,145 cf

Subcatchment PDA-300: Area Draining to Runoff Area=8,855 sf 56.24% Impervious Runoff Depth=3.89"
Flow Length=93' Tc=6.1 min CN=72 Runoff=0.93 cfs 2,870 cf

Subcatchment PDA-400: Area Draining to Runoff Area=10,875 sf 36.28% Impervious Runoff Depth=2.65"
Flow Length=62' Tc=5.0 min CN=60 Runoff=0.80 cfs 2,405 cf

Subcatchment PDA-500: Area Draining to Runoff Area=4,020 sf 1.12% Impervious Runoff Depth=0.87"
Flow Length=53' Tc=5.0 min CN=40 Runoff=0.05 cfs 291 cf

Pond 1P: Underground Detention System Peak Elev=100.75' Storage=6,738 cf Inflow=6.42 cfs 19,877 cf
Discarded=0.03 cfs 2,700 cf Primary=5.51 cfs 11,672 cf Outflow=5.54 cfs 14,371 cf

Link DP-1: Offsite West Inflow=5.87 cfs 13,381 cf
Primary=5.87 cfs 13,381 cf

Link DP-2: Grove Street South Inflow=4.78 cfs 16,145 cf
Primary=4.78 cfs 16,145 cf

Link DP-3: Grove Street North Inflow=0.93 cfs 2,870 cf
Primary=0.93 cfs 2,870 cf

Link DP-4: Brook Street South Inflow=0.80 cfs 2,405 cf
Primary=0.80 cfs 2,405 cf

Link DP-5: Brook Street North Inflow=0.05 cfs 291 cf
Primary=0.05 cfs 291 cf

Link DP-6: Total Offsite Flow Inflow=12.33 cfs 35,091 cf
Primary=12.33 cfs 35,091 cf

Total Runoff Area = 122,395 sf Runoff Volume = 43,296 cf Average Runoff Depth = 4.24"
39.83% Pervious = 48,755 sf 60.17% Impervious = 73,640 sf

Summary for Subcatchment PDA-100: Area Draining Offsite to the West

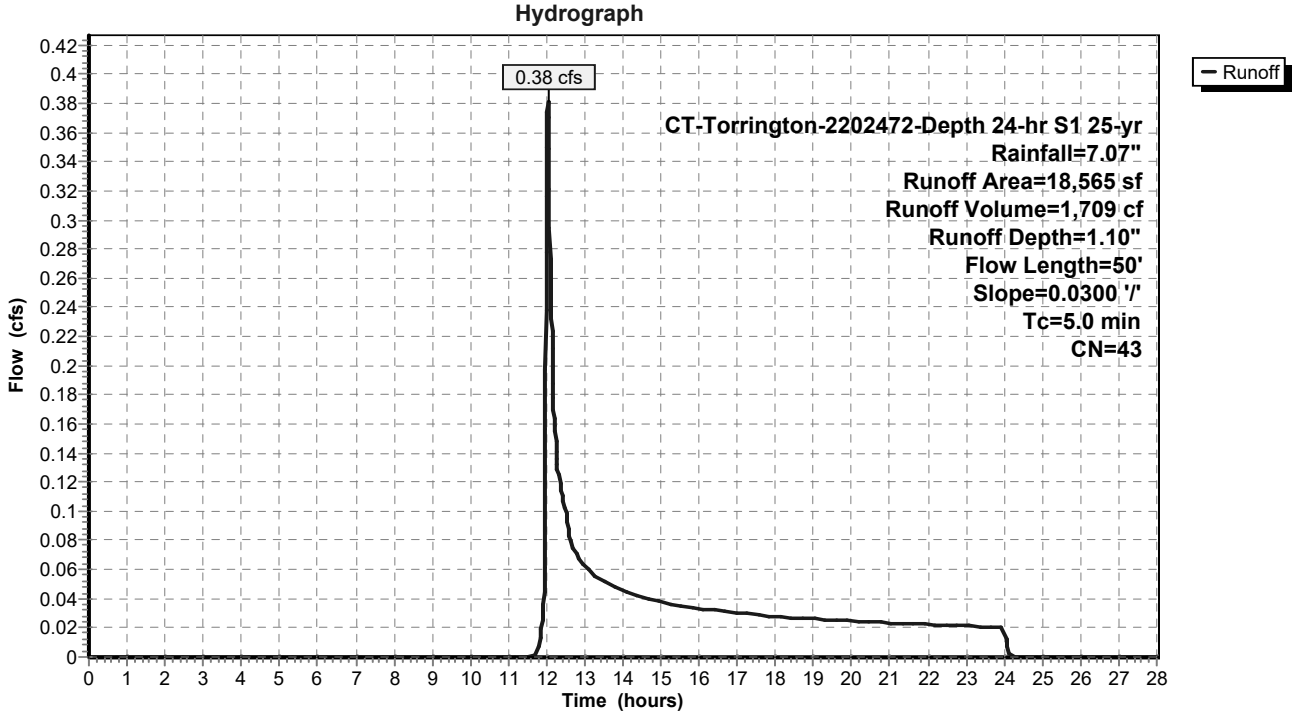
Runoff = 0.38 cfs @ 12.04 hrs, Volume= 1,709 cf, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 25-yr Rainfall=7.07"

	Area (sf)	CN	Description
*	1,320	98	Impervious, HSG A
	17,245	39	>75% Grass cover, Good, HSG A
	18,565	43	Weighted Average
	17,245		92.89% Pervious Area
	1,320		7.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
4.6	50	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-100: Area Draining Offsite to the West



Summary for Subcatchment PDA-110: School Parking Area to UDS

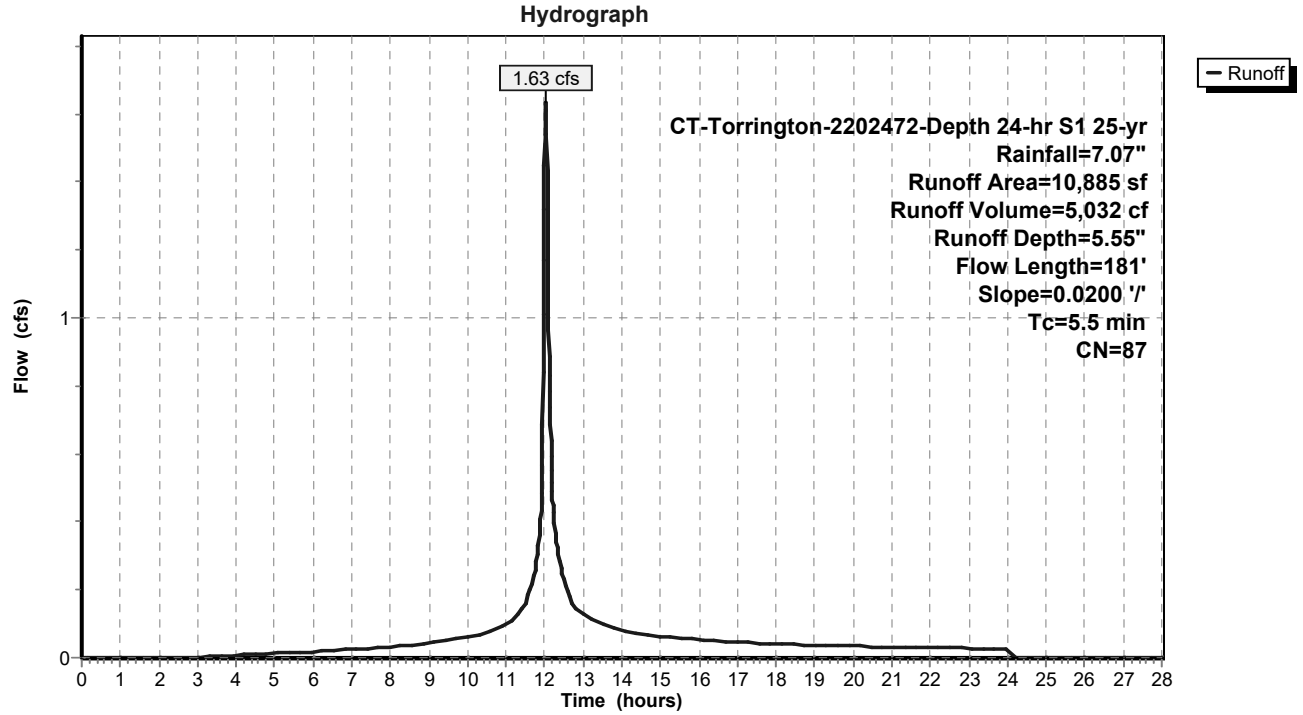
Runoff = 1.63 cfs @ 12.03 hrs, Volume= 5,032 cf, Depth= 5.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 25-yr Rainfall=7.07"

	Area (sf)	CN	Description
*	8,915	98	Impervious, HSG A
	1,970	39	>75% Grass cover, Good, HSG A
	10,885	87	Weighted Average
	1,970		18.10% Pervious Area
	8,915		81.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	37	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.8	63	0.0200	1.32		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
0.5	81	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	181	Total			

Subcatchment PDA-110: School Parking Area to UDS



Summary for Subcatchment PDA-120: School Roof Area to UDS

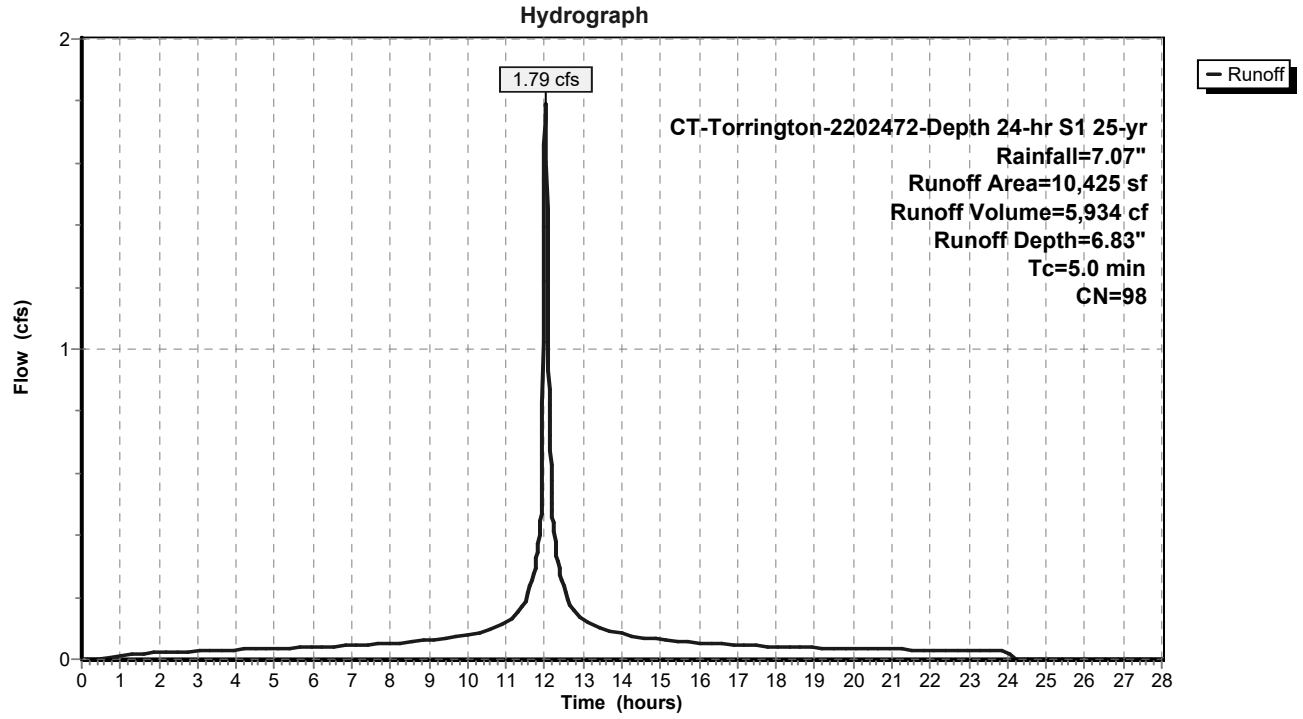
Runoff = 1.79 cfs @ 12.03 hrs, Volume= 5,934 cf, Depth= 6.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 25-yr Rainfall=7.07"

	Area (sf)	CN	Description
*	10,425	98	Impervious, HSG A
	10,425		100.00% Impervious Area

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

Subcatchment PDA-120: School Roof Area to UDS



Summary for Subcatchment PDA-130: Church Parking Area to UDS

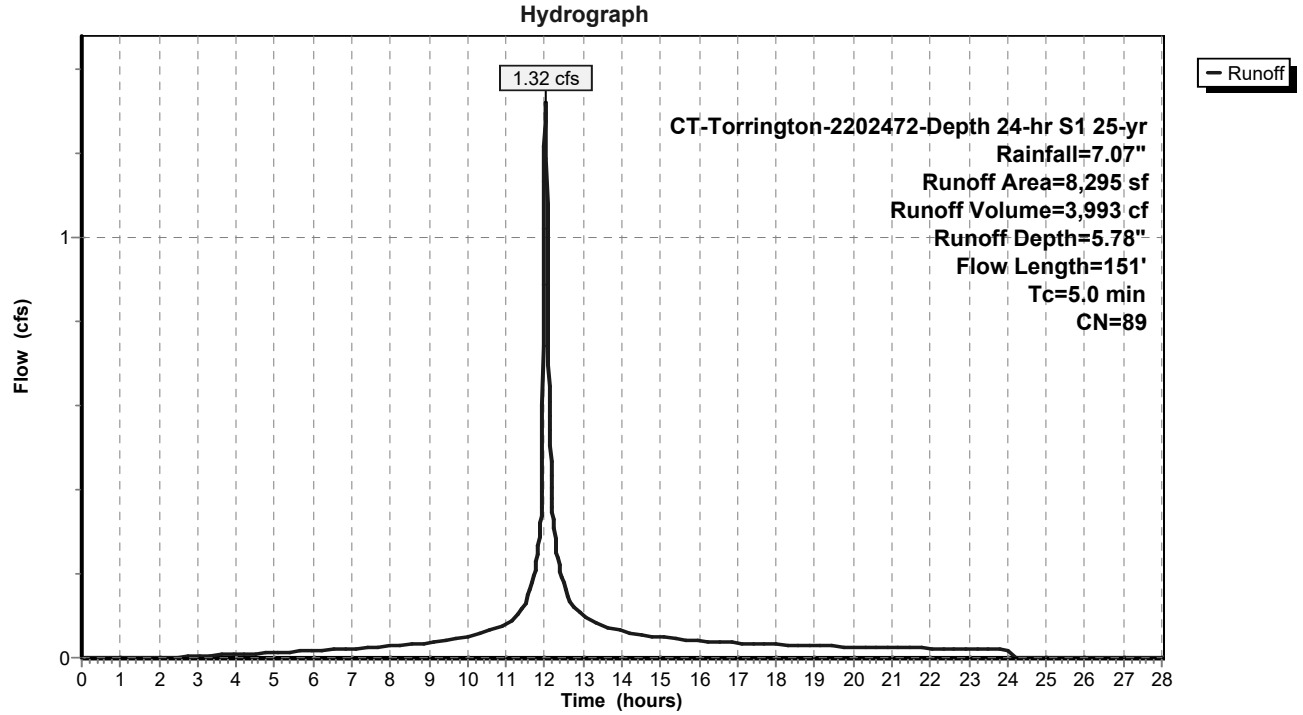
Runoff = 1.32 cfs @ 12.03 hrs, Volume= 3,993 cf, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 25-yr Rainfall=7.07"

	Area (sf)	CN	Description
*	7,020	98	Impervious, HSG A
	1,275	39	>75% Grass cover, Good, HSG A
	8,295	89	Weighted Average
	1,275		15.37% Pervious Area
	7,020		84.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	22	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.8	78	0.0350	1.72		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
0.2	51	0.0350	3.80		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.7	151	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-130: Church Parking Area to UDS



Summary for Subcatchment PDA-140: Rectory Parking Area to UDS

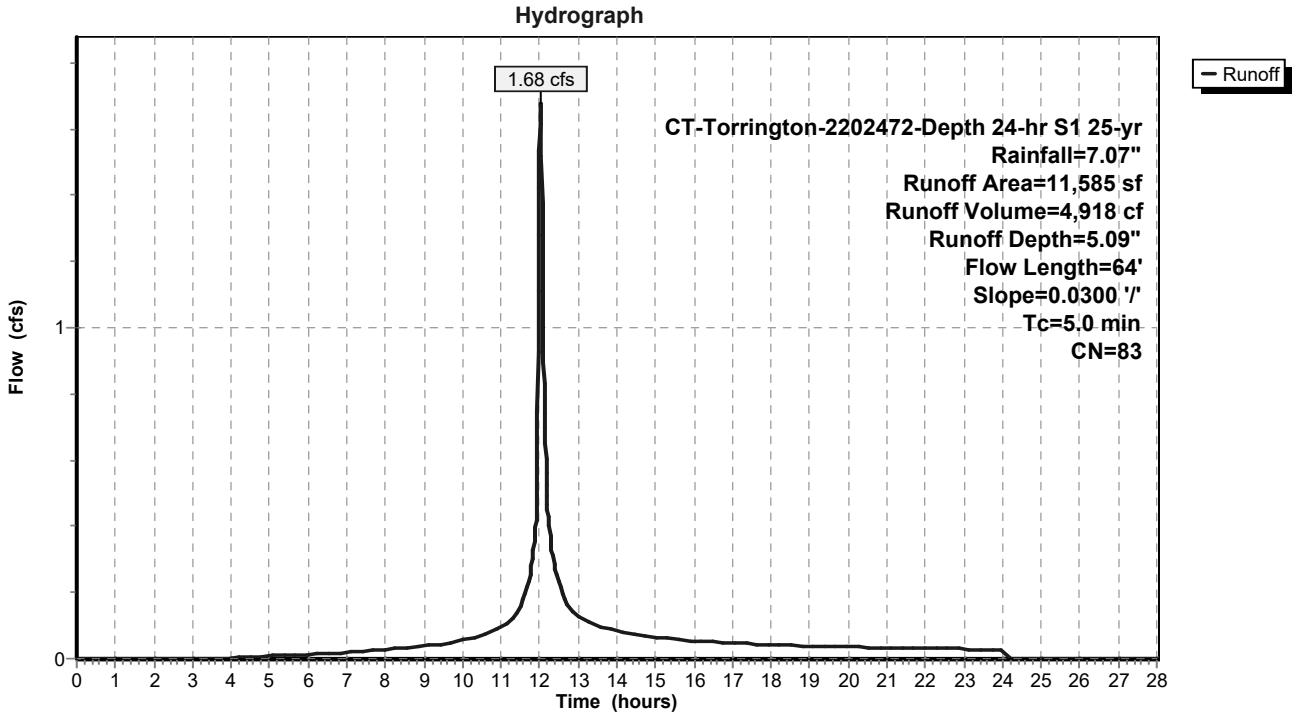
Runoff = 1.68 cfs @ 12.03 hrs, Volume= 4,918 cf, Depth= 5.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 25-yr Rainfall=7.07"

	Area (sf)	CN	Description
*	8,615	98	Impervious, HSG A
	2,970	39	>75% Grass cover, Good, HSG A
	11,585	83	Weighted Average
	2,970		25.64% Pervious Area
	8,615		74.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	16	0.0300	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.5	48	0.0300	1.47		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.3	64	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-140: Rectory Parking Area to UDS



Summary for Subcatchment PDA-200: Area Draining to Grove Street South

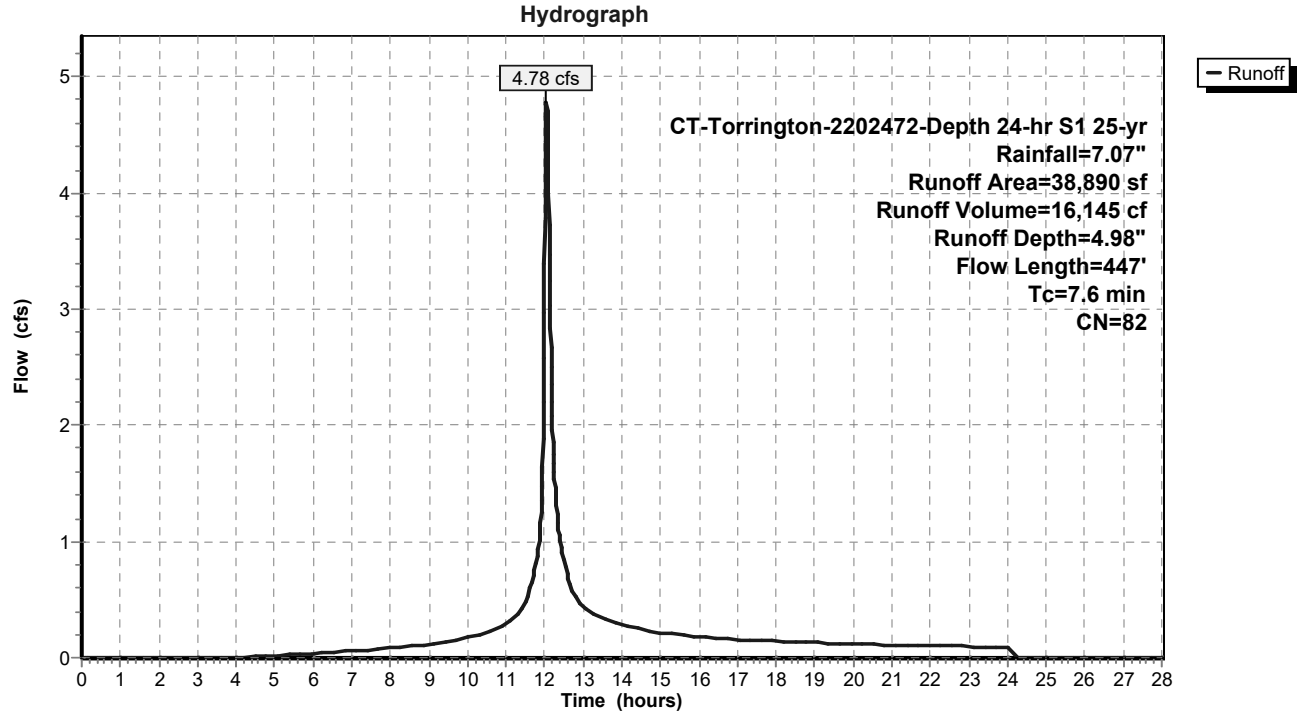
Runoff = 4.78 cfs @ 12.05 hrs, Volume= 16,145 cf, Depth= 4.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 25-yr Rainfall=7.07"

	Area (sf)	CN	Description
*	28,375	98	Impervious, HSG A
	10,515	39	>75% Grass cover, Good, HSG A
	38,890	82	Weighted Average
	10,515		27.04% Pervious Area
	28,375		72.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	30	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.9	70	0.0200	1.34		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.0	347	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.6	447	Total			

Subcatchment PDA-200: Area Draining to Grove Street South



Summary for Subcatchment PDA-300: Area Draining to Grove Street North

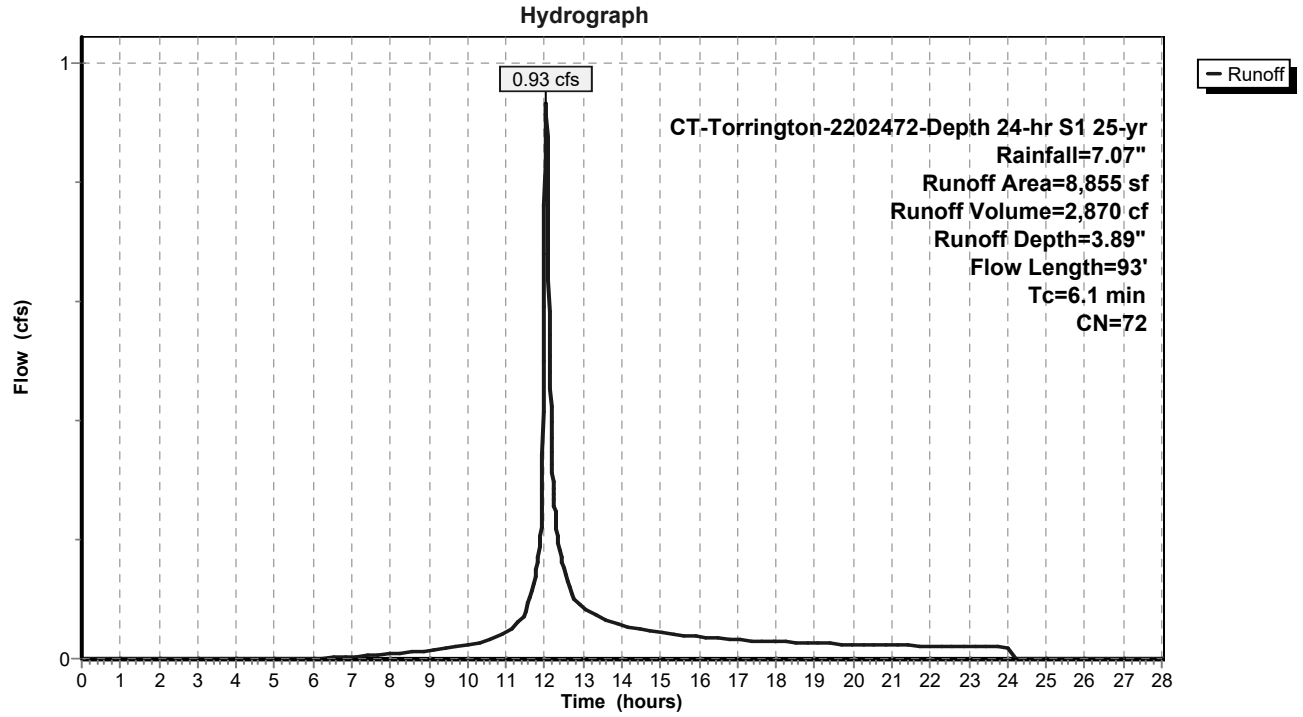
Runoff = 0.93 cfs @ 12.04 hrs, Volume= 2,870 cf, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 25-yr Rainfall=7.07"

	Area (sf)	CN	Description
*	4,980	98	Impervious, HSG A
	3,875	39	>75% Grass cover, Good, HSG A
	8,855	72	Weighted Average
	3,875		43.76% Pervious Area
	4,980		56.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	66	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	27	0.0200	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
6.1	93	Total			

Subcatchment PDA-300: Area Draining to Grove Street North



Summary for Subcatchment PDA-400: Area Draining to Brook Street South

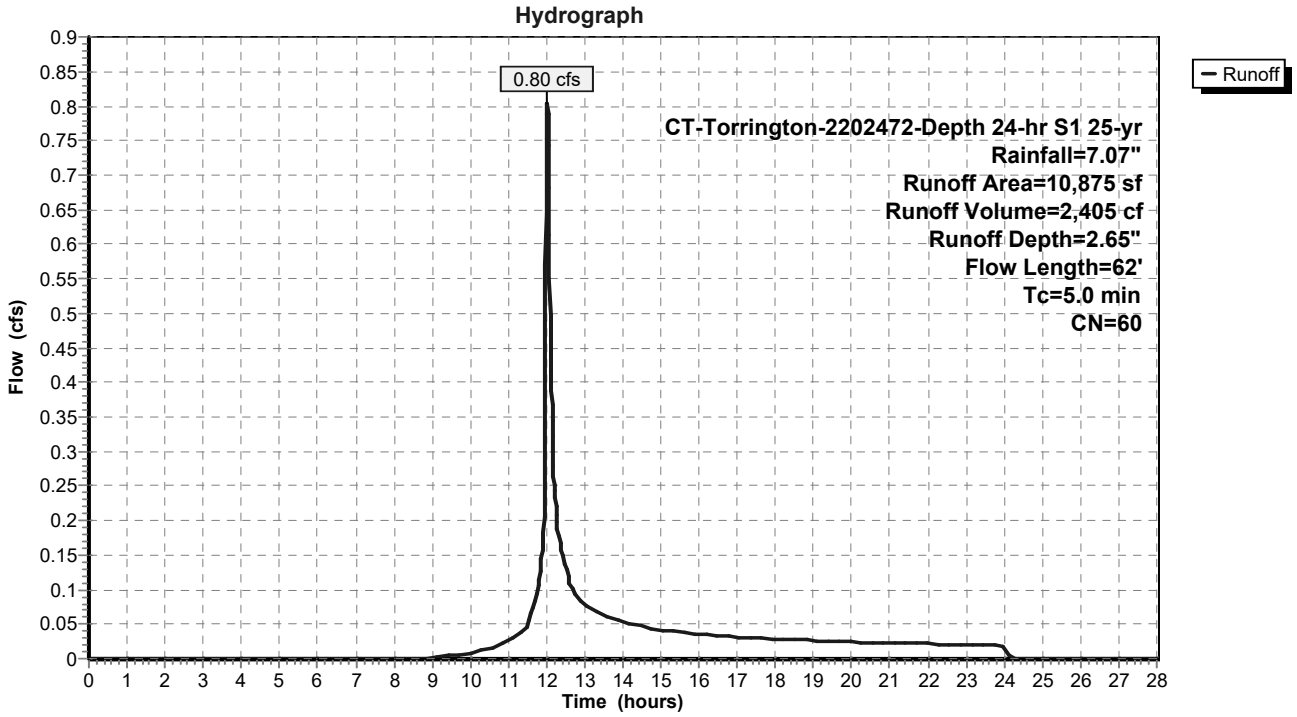
Runoff = 0.80 cfs @ 12.03 hrs, Volume= 2,405 cf, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 25-yr Rainfall=7.07"

	Area (sf)	CN	Description
*	3,945	98	Impervious, HSG A
	6,930	39	>75% Grass cover, Good, HSG A
	10,875	60	Weighted Average
	6,930		63.72% Pervious Area
	3,945		36.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	37	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	25	0.4000	3.62		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
3.7	62	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-400: Area Draining to Brook Street South



Summary for Subcatchment PDA-500: Area Draining to Brook Street North

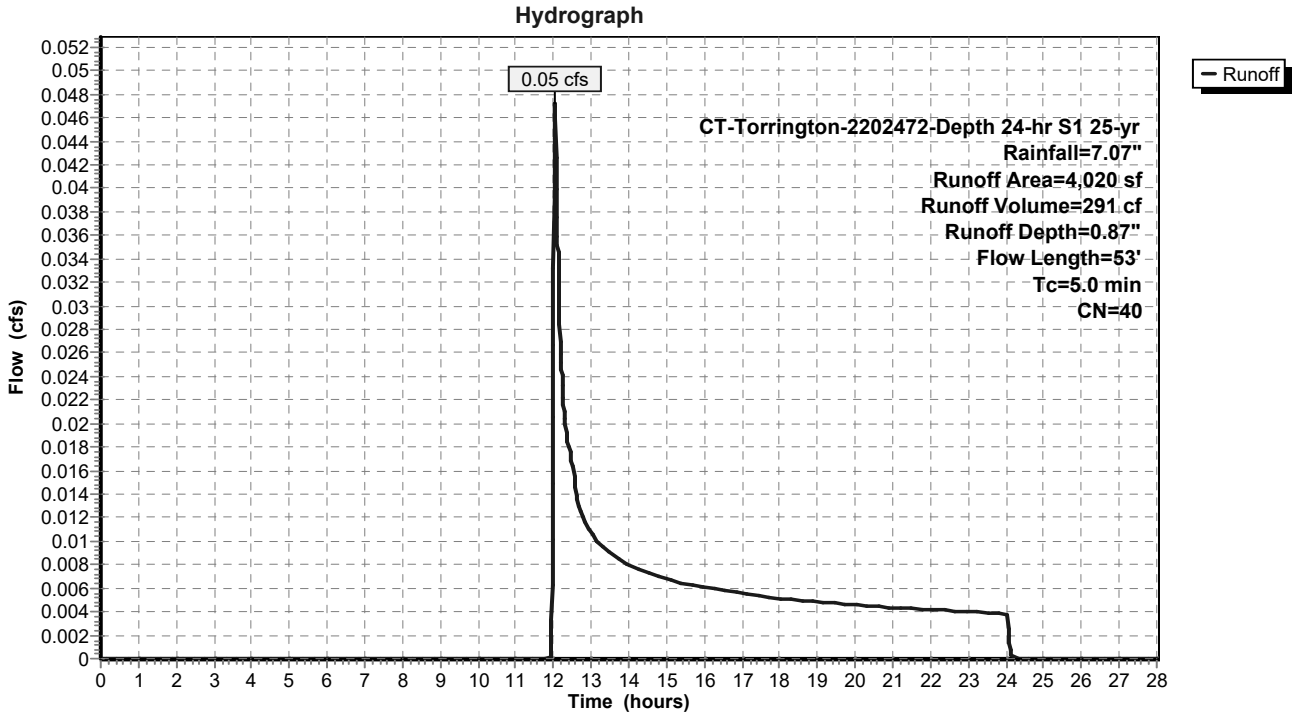
Runoff = 0.05 cfs @ 12.05 hrs, Volume= 291 cf, Depth= 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 25-yr Rainfall=7.07"

	Area (sf)	CN	Description
*	45	98	Impervious, HSG A
	3,975	39	>75% Grass cover, Good, HSG A
	4,020	40	Weighted Average
	3,975		98.88% Pervious Area
	45		1.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	35	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	18	0.6000	3.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
3.5	53	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-500: Area Draining to Brook Street North



Summary for Pond 1P: Underground Detention System

Inflow Area = 41,190 sf, 84.91% Impervious, Inflow Depth = 5.79" for 25-yr event
Inflow = 6.42 cfs @ 12.03 hrs, Volume= 19,877 cf
Outflow = 5.54 cfs @ 12.06 hrs, Volume= 14,371 cf, Atten= 14%, Lag= 1.8 min
Discarded = 0.03 cfs @ 3.20 hrs, Volume= 2,700 cf
Primary = 5.51 cfs @ 12.06 hrs, Volume= 11,672 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Peak Elev= 100.75' @ 12.06 hrs Surf.Area= 3,095 sf Storage= 6,738 cf

Plug-Flow detention time= 220.1 min calculated for 14,366 cf (72% of inflow)
Center-of-Mass det. time= 100.7 min (887.5 - 786.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	97.18'	3,408 cf	**34.75'W x 89.06'L x 4.00'H Field A** 12,379 cf Overall - 3,859 cf Embedded = 8,520 cf x 40.0% Voids
#2A	98.18'	3,859 cf	**ADS_StormTech SC-740 +Cap** x 84 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 84 Chambers in 7 Rows
		7,267 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	98.60'	**18.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 98.60' / 98.50' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	100.18'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Discarded	97.18'	**0.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 3.20 hrs HW=97.22' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=5.49 cfs @ 12.06 hrs HW=100.75' (Free Discharge)
└**1=Culvert** (Passes 5.49 cfs of 9.00 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 5.49 cfs @ 2.47 fps)

Pond 1P: Underground Detention System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
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

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

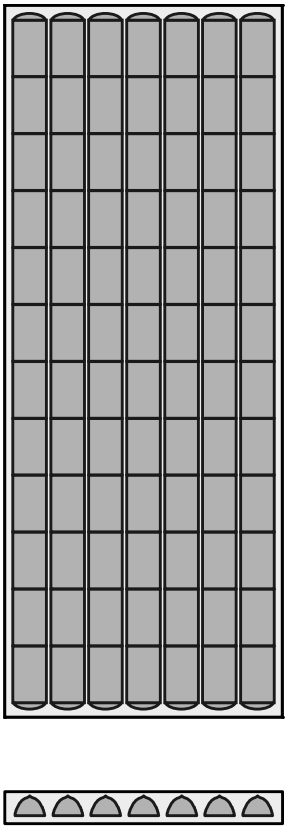
12 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 87.06' Row Length +12.0" End Stone x 2 = 89.06' Base Length
7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width
12.0" Base + 30.0" Chamber Height + 6.0" Cover = 4.00' Field Height

84 Chambers x 45.9 cf = 3,859.0 cf Chamber Storage

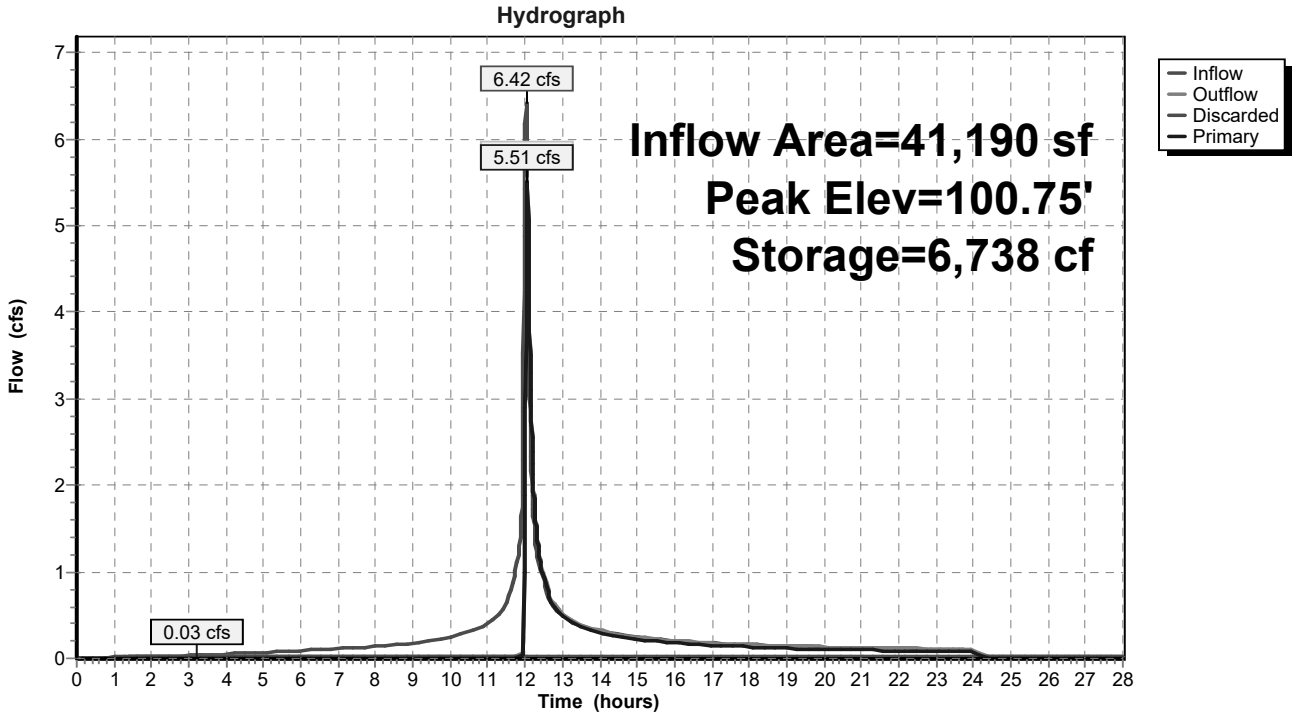
12,378.9 cf Field - 3,859.0 cf Chambers = 8,519.9 cf Stone x 40.0% Voids = 3,408.0 cf Stone Storage

Chamber Storage + Stone Storage = 7,266.9 cf = 0.167 af
Overall Storage Efficiency = 58.7%
Overall System Size = 89.06' x 34.75' x 4.00'

84 Chambers
458.5 cy Field
315.6 cy Stone



Pond 1P: Underground Detention System

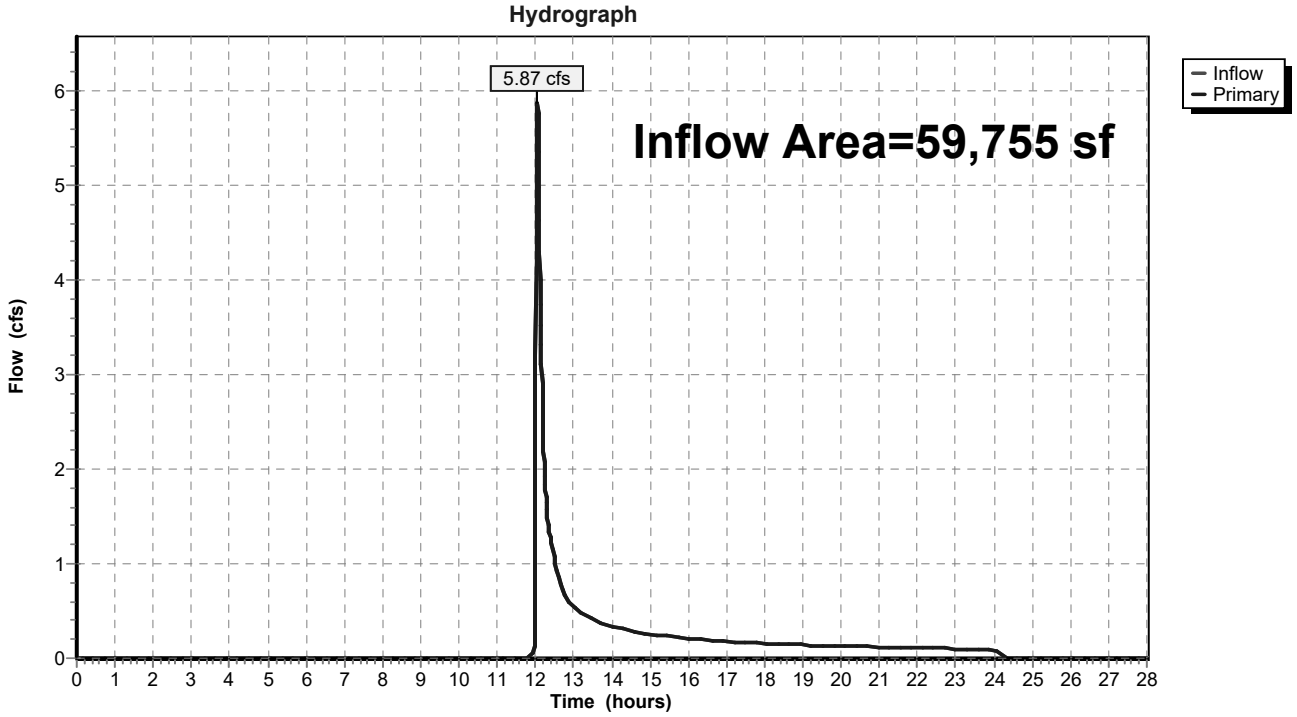


Summary for Link DP-1: Offsite West

Inflow Area = 59,755 sf, 60.74% Impervious, Inflow Depth = 2.69" for 25-yr event
Inflow = 5.87 cfs @ 12.06 hrs, Volume= 13,381 cf
Primary = 5.87 cfs @ 12.06 hrs, Volume= 13,381 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-1: Offsite West

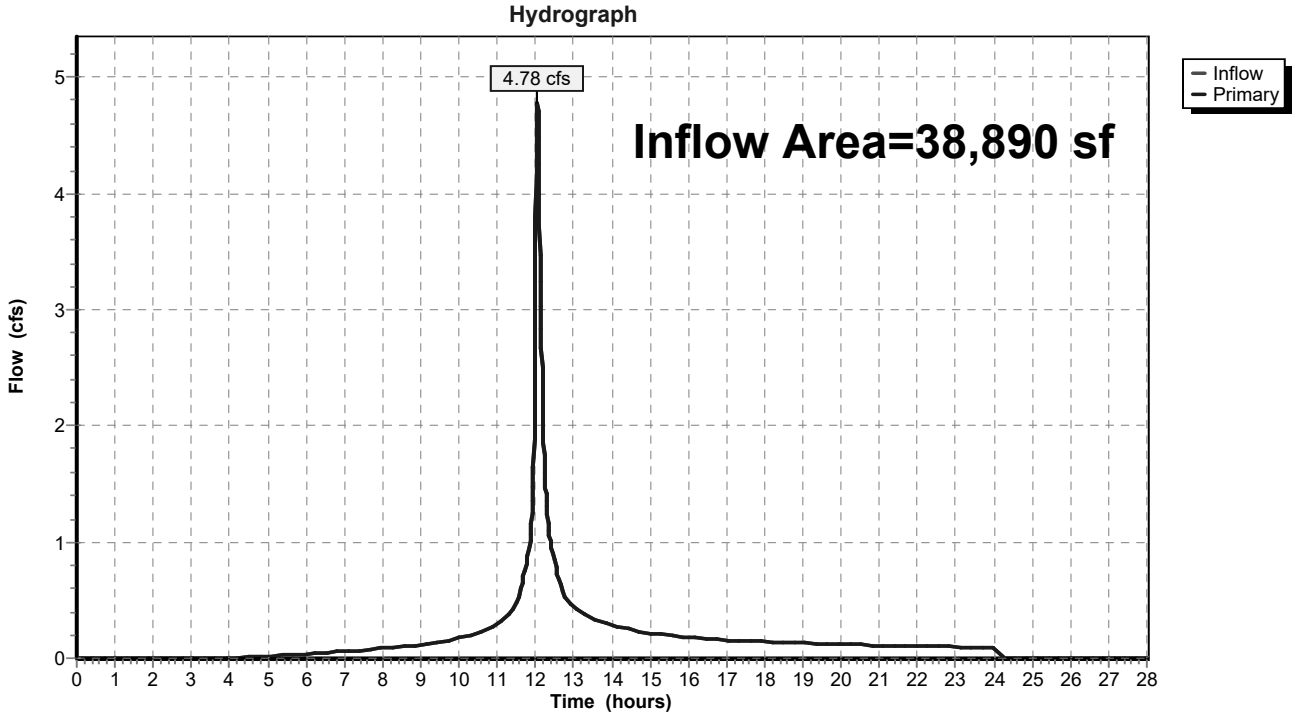


Summary for Link DP-2: Grove Street South

Inflow Area = 38,890 sf, 72.96% Impervious, Inflow Depth = 4.98" for 25-yr event
Inflow = 4.78 cfs @ 12.05 hrs, Volume= 16,145 cf
Primary = 4.78 cfs @ 12.05 hrs, Volume= 16,145 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-2: Grove Street South

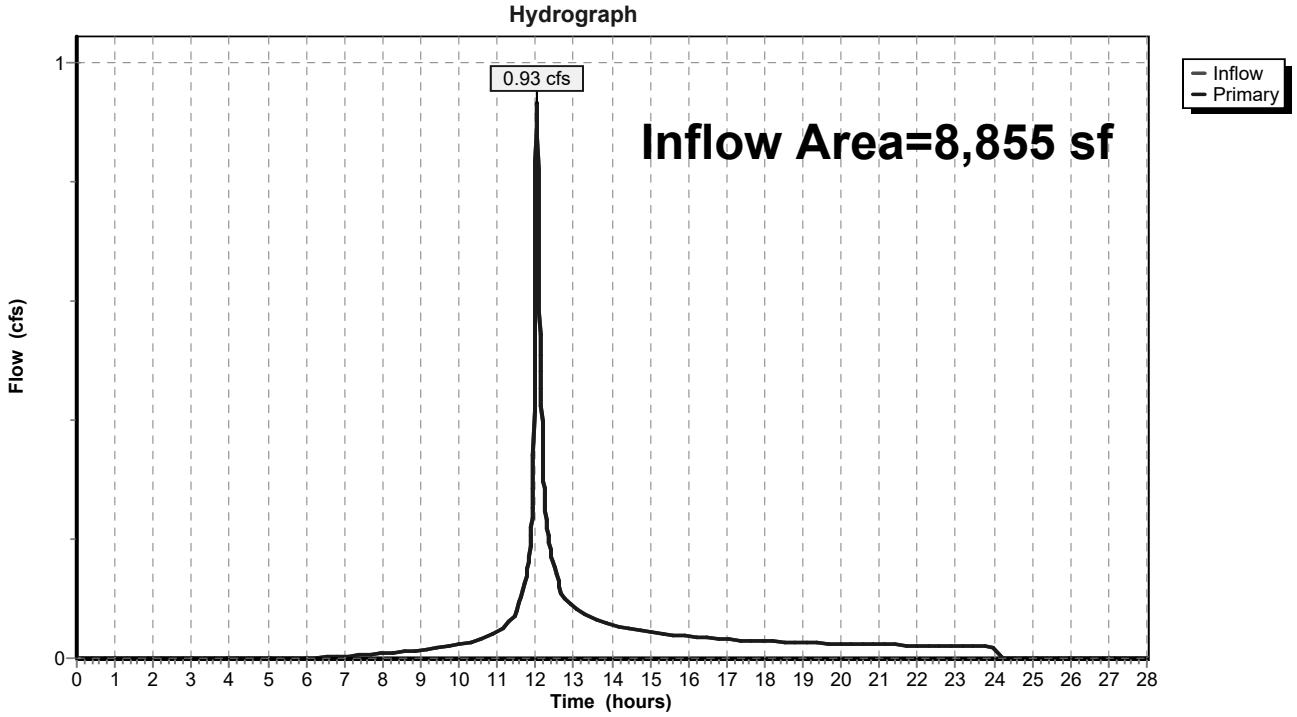


Summary for Link DP-3: Grove Street North

Inflow Area = 8,855 sf, 56.24% Impervious, Inflow Depth = 3.89" for 25-yr event
Inflow = 0.93 cfs @ 12.04 hrs, Volume= 2,870 cf
Primary = 0.93 cfs @ 12.04 hrs, Volume= 2,870 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-3: Grove Street North

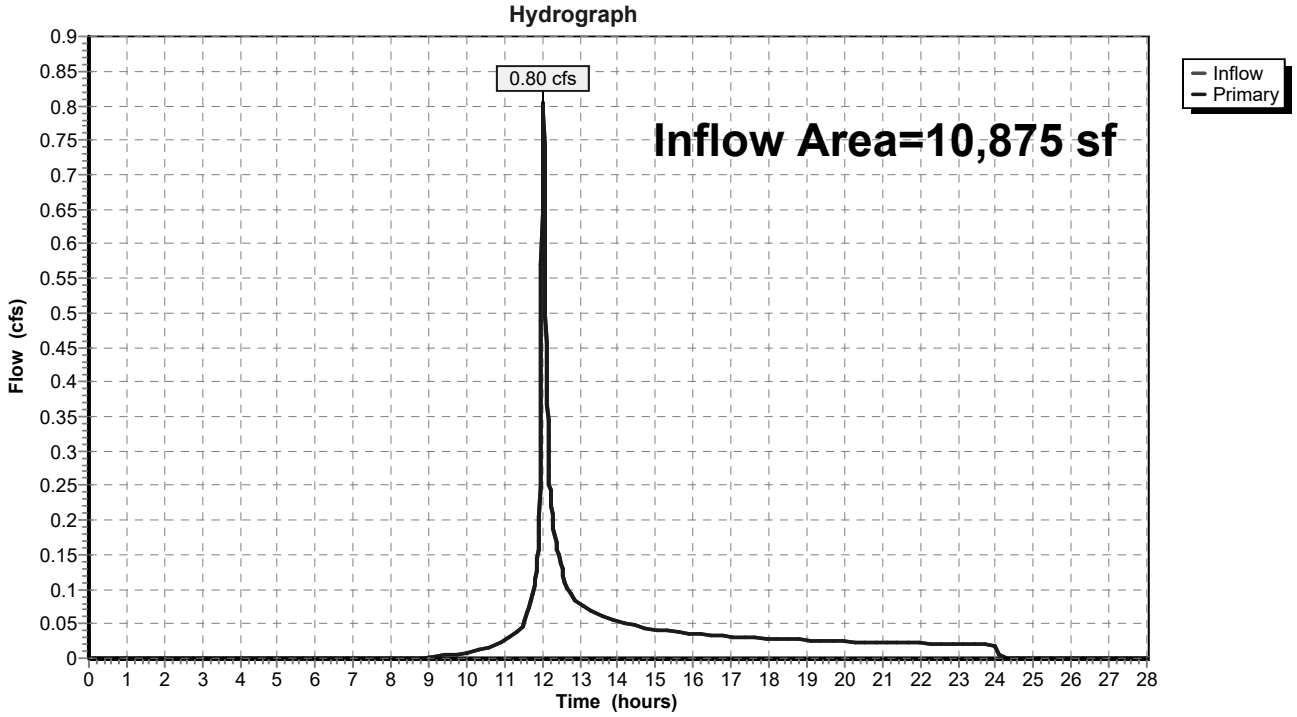


Summary for Link DP-4: Brook Street South

Inflow Area = 10,875 sf, 36.28% Impervious, Inflow Depth = 2.65" for 25-yr event
Inflow = 0.80 cfs @ 12.03 hrs, Volume= 2,405 cf
Primary = 0.80 cfs @ 12.03 hrs, Volume= 2,405 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-4: Brook Street South

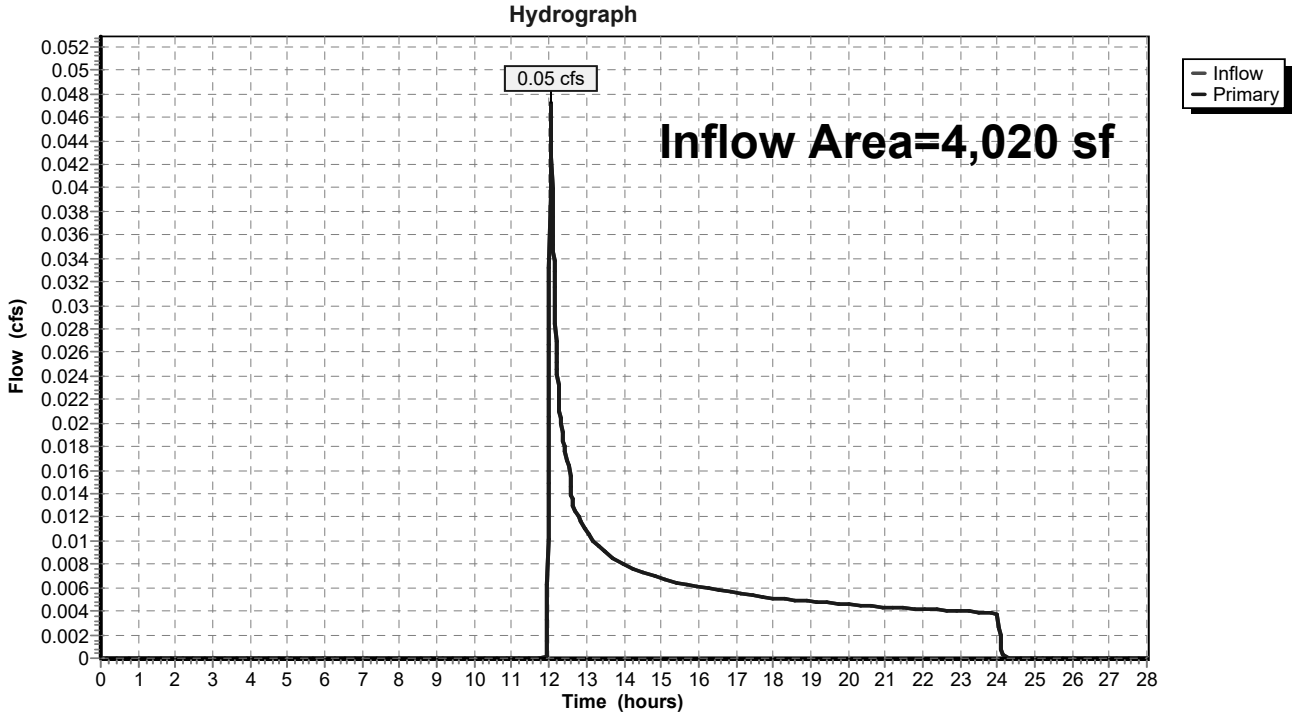


Summary for Link DP-5: Brook Street North

Inflow Area = 4,020 sf, 1.12% Impervious, Inflow Depth = 0.87" for 25-yr event
Inflow = 0.05 cfs @ 12.05 hrs, Volume= 291 cf
Primary = 0.05 cfs @ 12.05 hrs, Volume= 291 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-5: Brook Street North

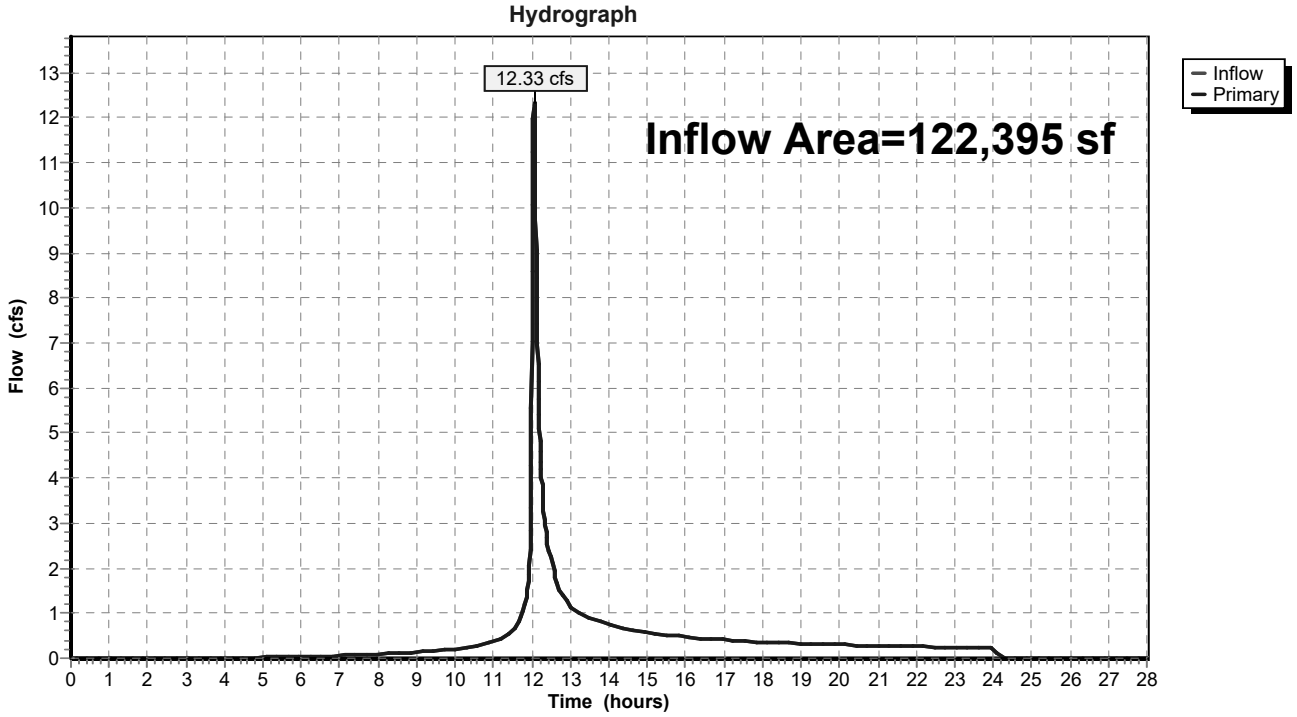


Summary for Link DP-6: Total Offsite Flow

Inflow Area = 122,395 sf, 60.17% Impervious, Inflow Depth = 3.44" for 25-yr event
Inflow = 12.33 cfs @ 12.05 hrs, Volume= 35,091 cf
Primary = 12.33 cfs @ 12.05 hrs, Volume= 35,091 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-6: Total Offsite Flow



Time span=0.00-28.00 hrs, dt=0.01 hrs, 2801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-100: Area Draining Runoff Area=18,565 sf 7.11% Impervious Runoff Depth=1.57"
Flow Length=50' Slope=0.0300 '/' Tc=5.0 min CN=43 Runoff=0.64 cfs 2,433 cf

Subcatchment PDA-110: School Parking Runoff Area=10,885 sf 81.90% Impervious Runoff Depth=6.52"
Flow Length=181' Slope=0.0200 '/' Tc=5.5 min CN=87 Runoff=1.88 cfs 5,912 cf

Subcatchment PDA-120: School Roof Runoff Area=10,425 sf 100.00% Impervious Runoff Depth=7.83"
Tc=5.0 min CN=98 Runoff=2.02 cfs 6,802 cf

Subcatchment PDA-130: Church Parking Runoff Area=8,295 sf 84.63% Impervious Runoff Depth=6.76"
Flow Length=151' Tc=5.0 min CN=89 Runoff=1.51 cfs 4,670 cf

Subcatchment PDA-140: Rectory Parking Runoff Area=11,585 sf 74.36% Impervious Runoff Depth=6.04"
Flow Length=64' Slope=0.0300 '/' Tc=5.0 min CN=83 Runoff=1.95 cfs 5,835 cf

Subcatchment PDA-200: Area Draining to Runoff Area=38,890 sf 72.96% Impervious Runoff Depth=5.93"
Flow Length=447' Tc=7.6 min CN=82 Runoff=5.58 cfs 19,206 cf

Subcatchment PDA-300: Area Draining to Runoff Area=8,855 sf 56.24% Impervious Runoff Depth=4.76"
Flow Length=93' Tc=6.1 min CN=72 Runoff=1.13 cfs 3,509 cf

Subcatchment PDA-400: Area Draining to Runoff Area=10,875 sf 36.28% Impervious Runoff Depth=3.39"
Flow Length=62' Tc=5.0 min CN=60 Runoff=1.03 cfs 3,068 cf

Subcatchment PDA-500: Area Draining to Runoff Area=4,020 sf 1.12% Impervious Runoff Depth=1.28"
Flow Length=53' Tc=5.0 min CN=40 Runoff=0.10 cfs 429 cf

Pond 1P: Underground Detention System Peak Elev=100.84' Storage=6,851 cf Inflow=7.36 cfs 23,220 cf
Discarded=0.03 cfs 2,733 cf Primary=6.85 cfs 14,979 cf Outflow=6.88 cfs 17,711 cf

Link DP-1: Offsite West Inflow=7.47 cfs 17,411 cf
Primary=7.47 cfs 17,411 cf

Link DP-2: Grove Street South Inflow=5.58 cfs 19,206 cf
Primary=5.58 cfs 19,206 cf

Link DP-3: Grove Street North Inflow=1.13 cfs 3,509 cf
Primary=1.13 cfs 3,509 cf

Link DP-4: Brook Street South Inflow=1.03 cfs 3,068 cf
Primary=1.03 cfs 3,068 cf

Link DP-5: Brook Street North Inflow=0.10 cfs 429 cf
Primary=0.10 cfs 429 cf

Link DP-6: Total Offsite Flow Inflow=15.20 cfs 43,624 cf
Primary=15.20 cfs 43,624 cf

Total Runoff Area = 122,395 sf Runoff Volume = 51,865 cf Average Runoff Depth = 5.09"
39.83% Pervious = 48,755 sf 60.17% Impervious = 73,640 sf

Summary for Subcatchment PDA-100: Area Draining Offsite to the West

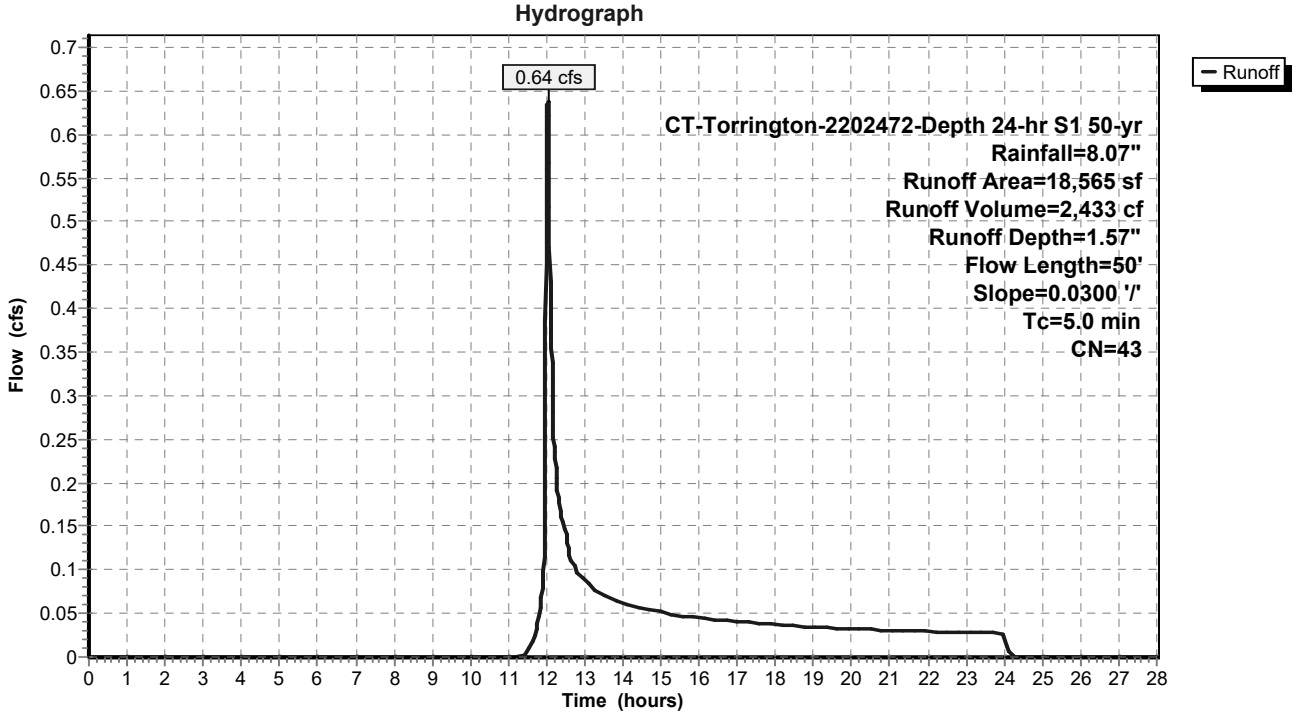
Runoff = 0.64 cfs @ 12.04 hrs, Volume= 2,433 cf, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 50-yr Rainfall=8.07"

	Area (sf)	CN	Description
*	1,320	98	Impervious, HSG A
	17,245	39	>75% Grass cover, Good, HSG A
	18,565	43	Weighted Average
	17,245		92.89% Pervious Area
	1,320		7.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
4.6	50	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-100: Area Draining Offsite to the West



Summary for Subcatchment PDA-110: School Parking Area to UDS

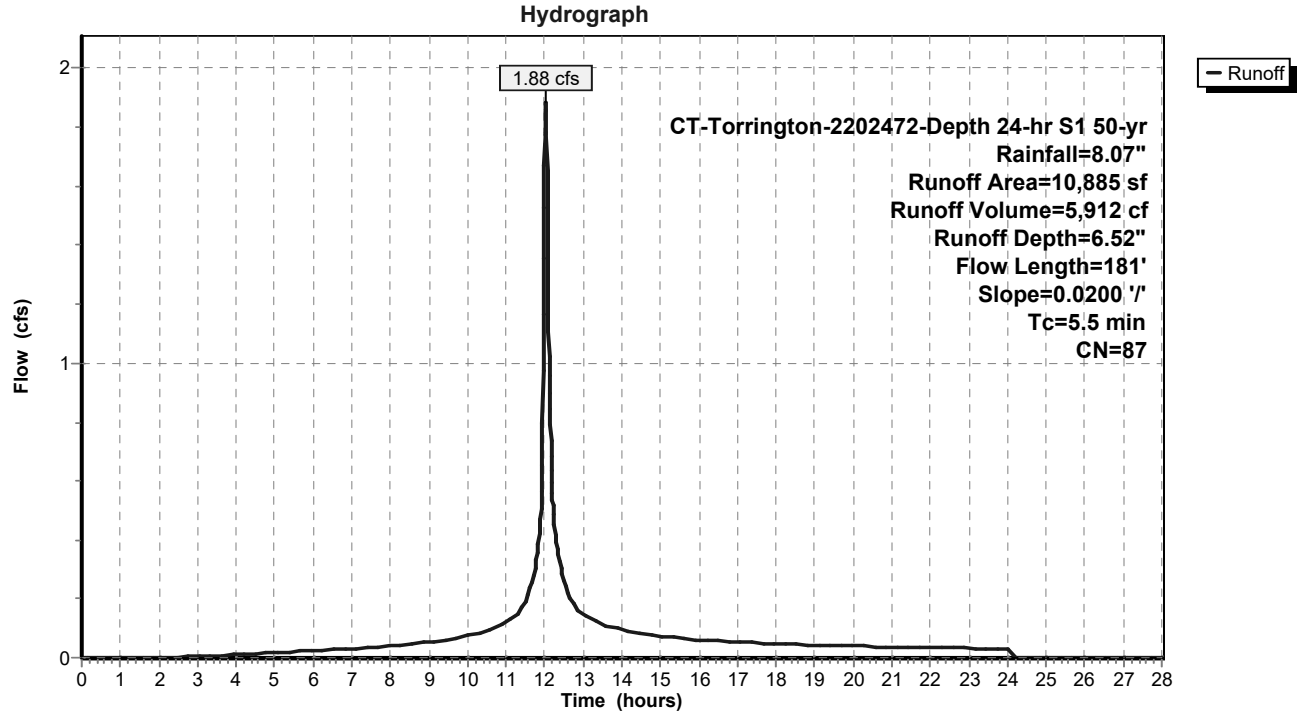
Runoff = 1.88 cfs @ 12.03 hrs, Volume= 5,912 cf, Depth= 6.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 50-yr Rainfall=8.07"

	Area (sf)	CN	Description
*	8,915	98	Impervious, HSG A
	1,970	39	>75% Grass cover, Good, HSG A
	10,885	87	Weighted Average
	1,970		18.10% Pervious Area
	8,915		81.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	37	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.8	63	0.0200	1.32		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
0.5	81	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	181	Total			

Subcatchment PDA-110: School Parking Area to UDS



Summary for Subcatchment PDA-120: School Roof Area to UDS

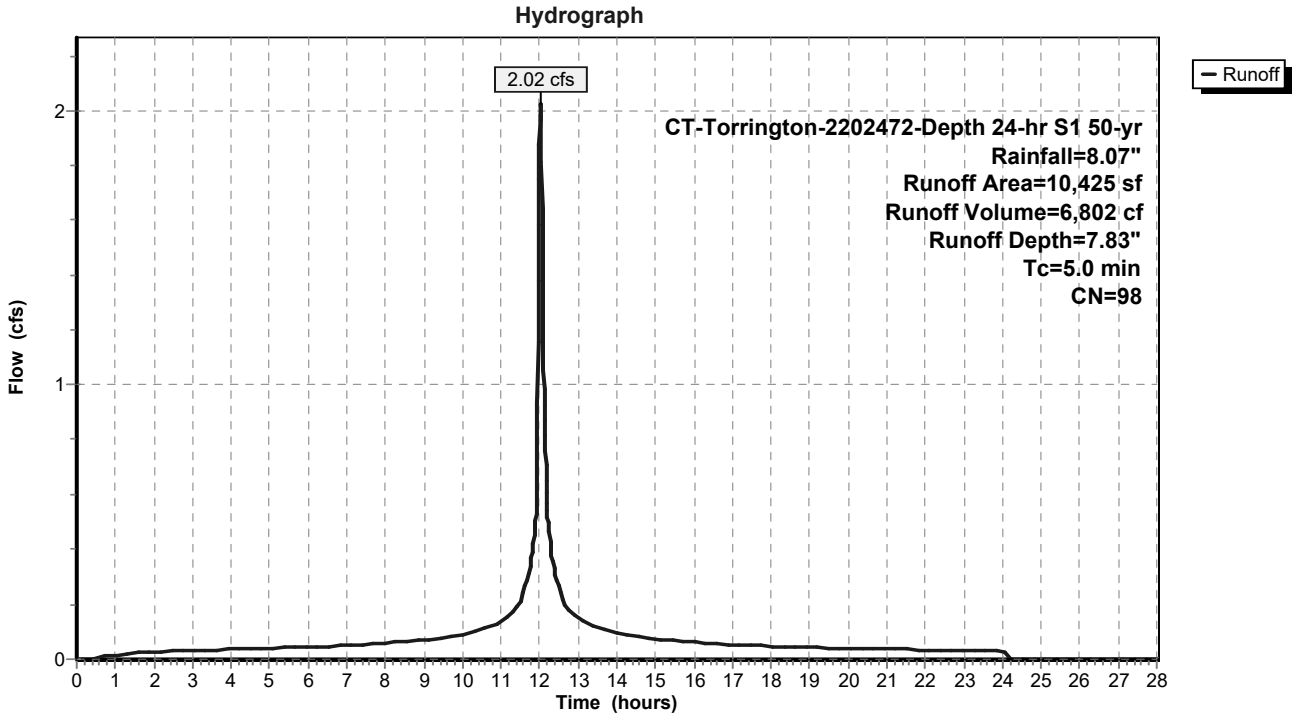
Runoff = 2.02 cfs @ 12.03 hrs, Volume= 6,802 cf, Depth= 7.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 50-yr Rainfall=8.07"

	Area (sf)	CN	Description
*	10,425	98	Impervious, HSG A
	10,425		100.00% Impervious Area

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

Subcatchment PDA-120: School Roof Area to UDS



Summary for Subcatchment PDA-130: Church Parking Area to UDS

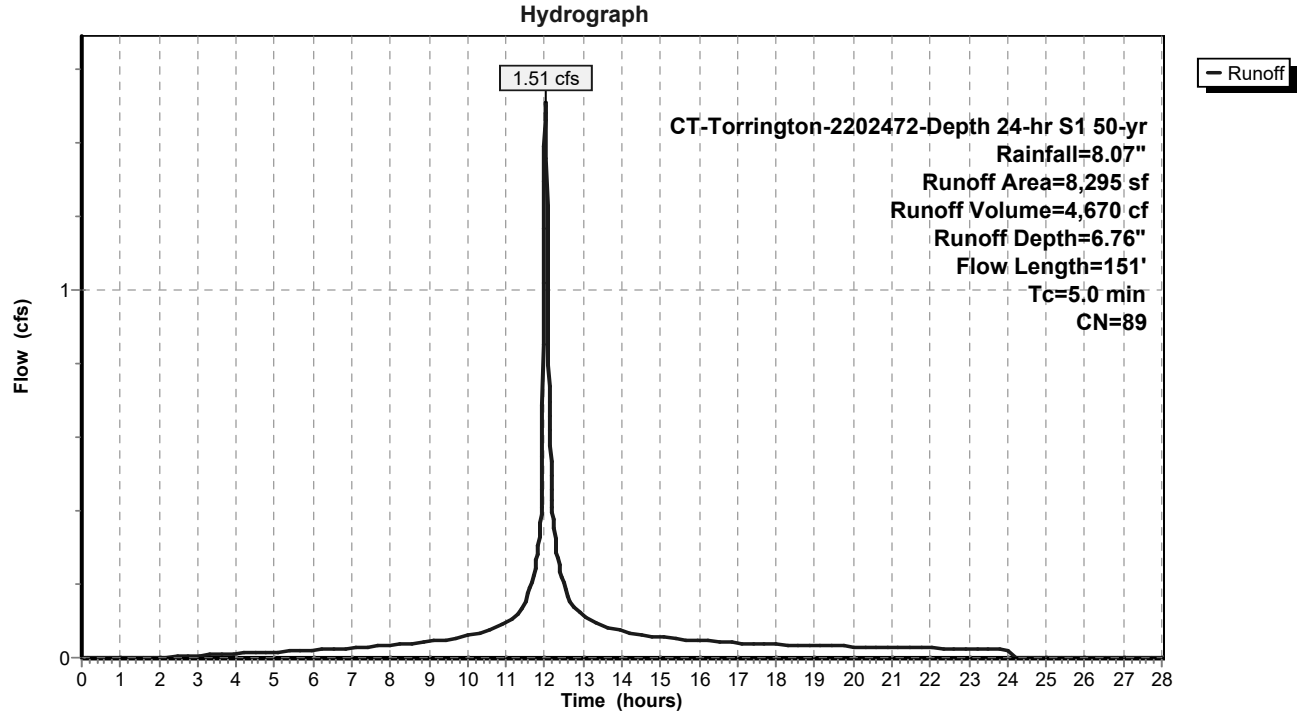
Runoff = 1.51 cfs @ 12.03 hrs, Volume= 4,670 cf, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 50-yr Rainfall=8.07"

	Area (sf)	CN	Description
*	7,020	98	Impervious, HSG A
	1,275	39	>75% Grass cover, Good, HSG A
	8,295	89	Weighted Average
	1,275		15.37% Pervious Area
	7,020		84.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	22	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.8	78	0.0350	1.72		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
0.2	51	0.0350	3.80		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.7	151	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-130: Church Parking Area to UDS



Summary for Subcatchment PDA-140: Rectory Parking Area to UDS

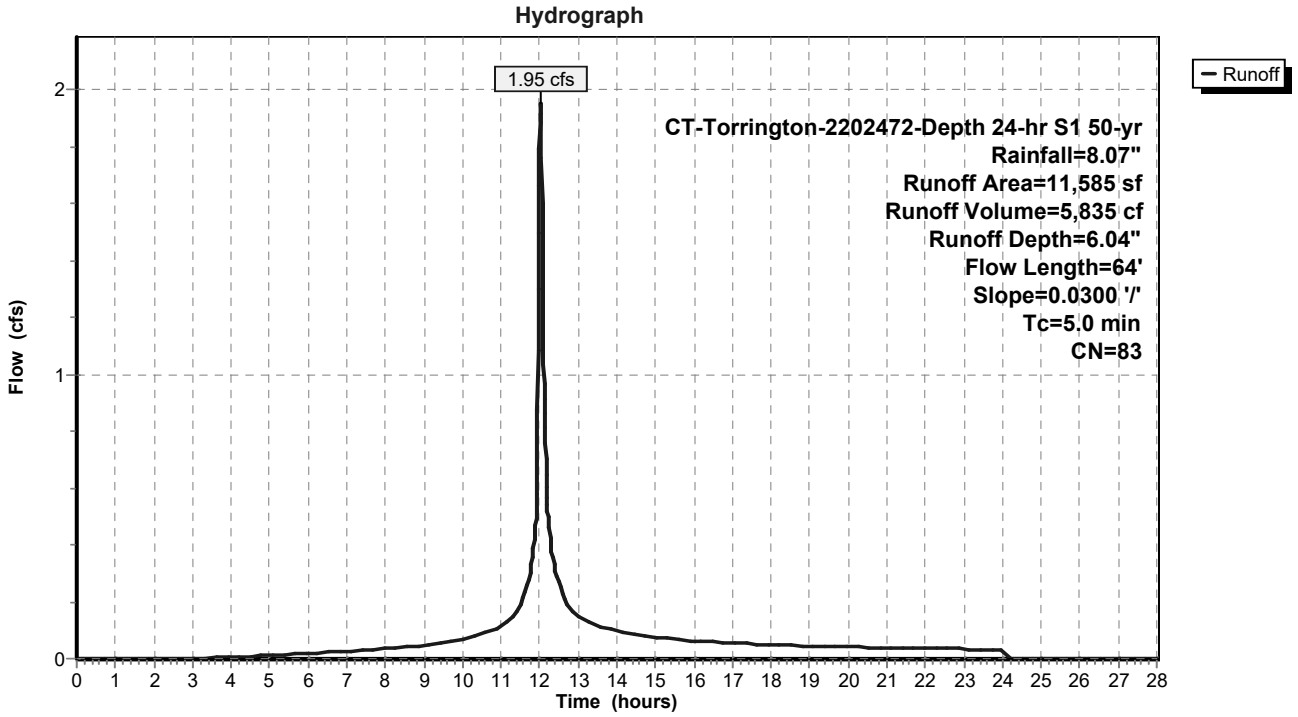
Runoff = 1.95 cfs @ 12.03 hrs, Volume= 5,835 cf, Depth= 6.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 50-yr Rainfall=8.07"

	Area (sf)	CN	Description
*	8,615	98	Impervious, HSG A
	2,970	39	>75% Grass cover, Good, HSG A
	11,585	83	Weighted Average
	2,970		25.64% Pervious Area
	8,615		74.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	16	0.0300	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.5	48	0.0300	1.47		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.3	64	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-140: Rectory Parking Area to UDS



Summary for Subcatchment PDA-200: Area Draining to Grove Street South

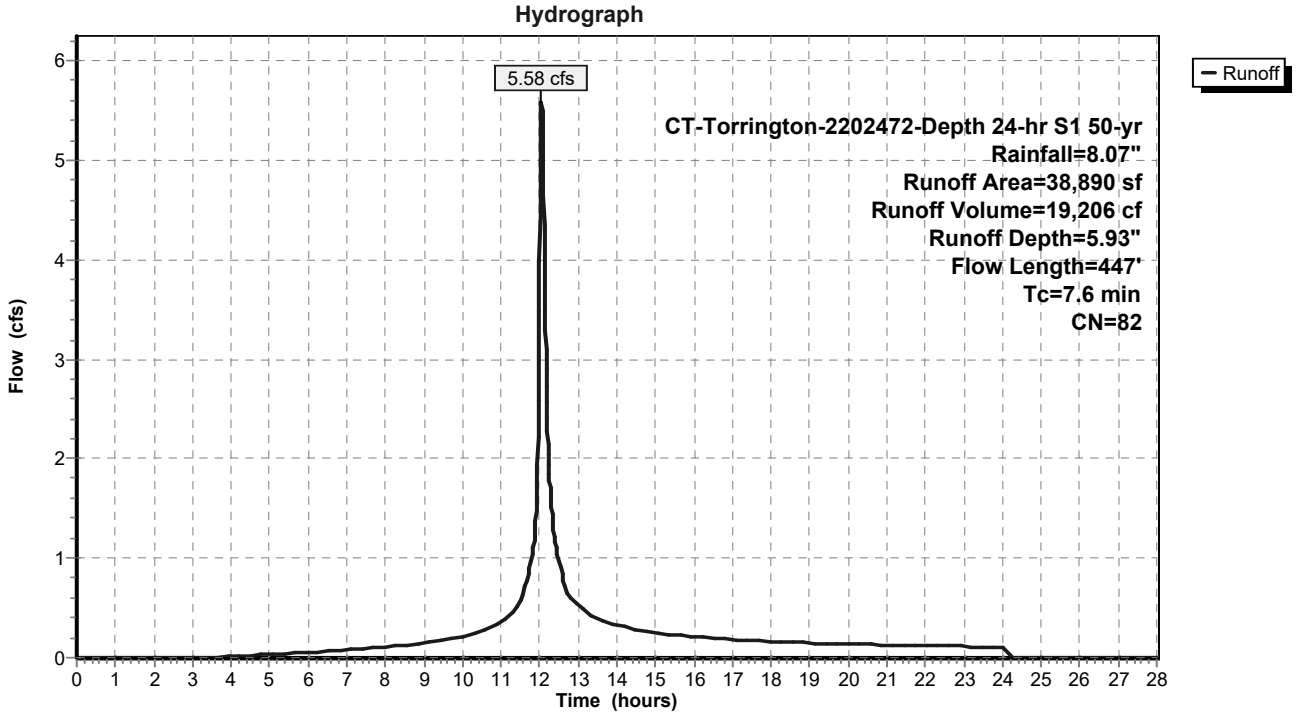
Runoff = 5.58 cfs @ 12.05 hrs, Volume= 19,206 cf, Depth= 5.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 50-yr Rainfall=8.07"

	Area (sf)	CN	Description
*	28,375	98	Impervious, HSG A
	10,515	39	>75% Grass cover, Good, HSG A
	38,890	82	Weighted Average
	10,515		27.04% Pervious Area
	28,375		72.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	30	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.9	70	0.0200	1.34		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.0	347	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.6	447	Total			

Subcatchment PDA-200: Area Draining to Grove Street South



Summary for Subcatchment PDA-300: Area Draining to Grove Street North

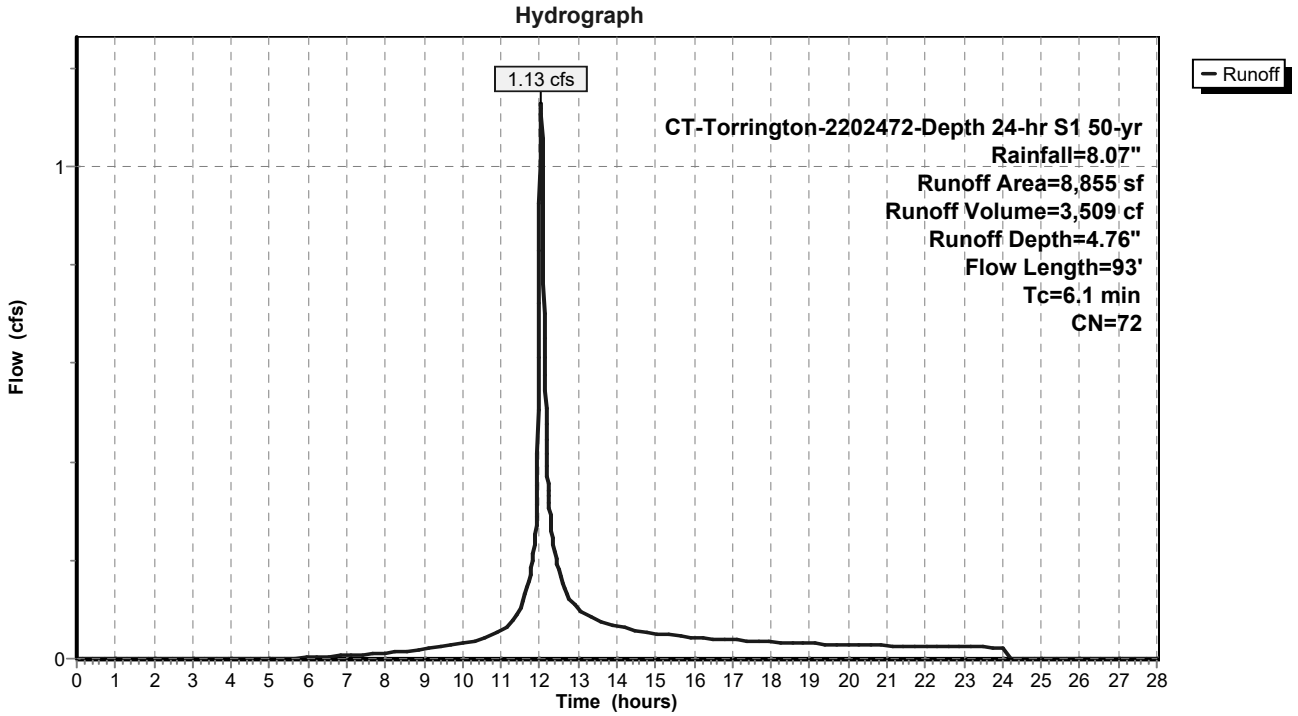
Runoff = 1.13 cfs @ 12.04 hrs, Volume= 3,509 cf, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 50-yr Rainfall=8.07"

	Area (sf)	CN	Description
*	4,980	98	Impervious, HSG A
	3,875	39	>75% Grass cover, Good, HSG A
	8,855	72	Weighted Average
	3,875		43.76% Pervious Area
	4,980		56.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	66	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	27	0.0200	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
6.1	93	Total			

Subcatchment PDA-300: Area Draining to Grove Street North



Summary for Subcatchment PDA-400: Area Draining to Brook Street South

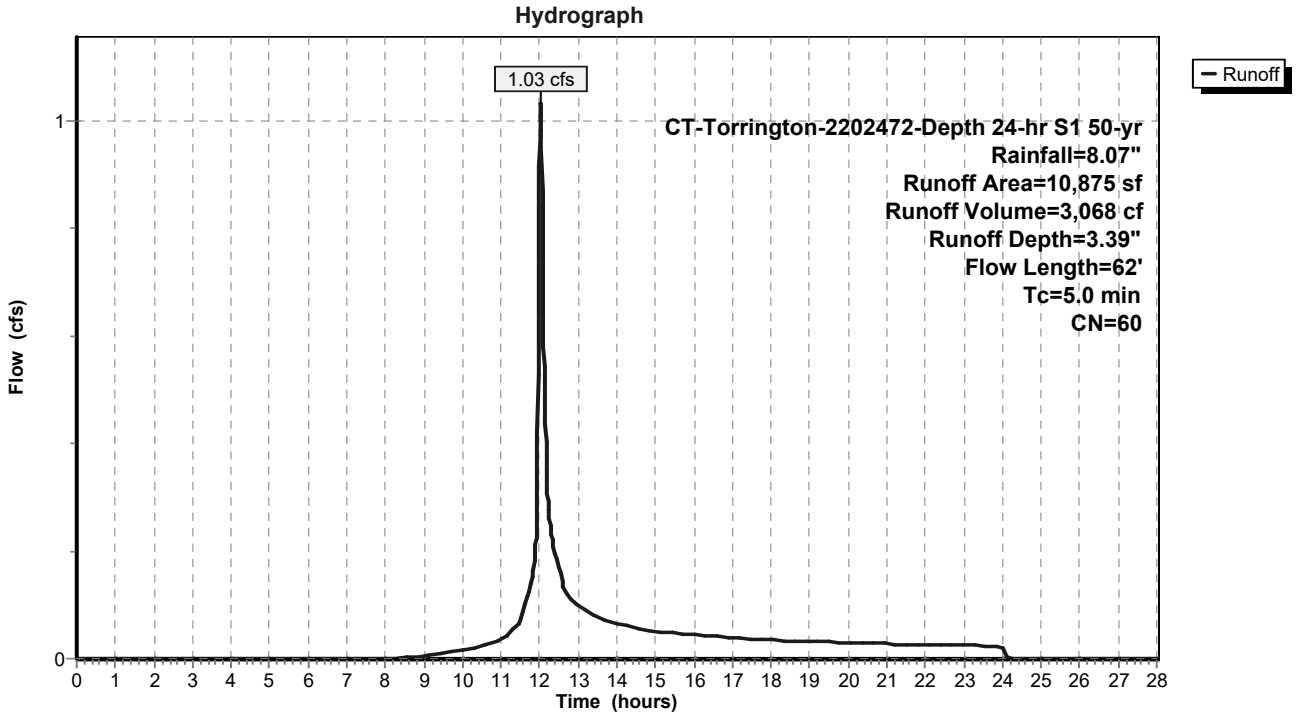
Runoff = 1.03 cfs @ 12.03 hrs, Volume= 3,068 cf, Depth= 3.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 50-yr Rainfall=8.07"

	Area (sf)	CN	Description
*	3,945	98	Impervious, HSG A
	6,930	39	>75% Grass cover, Good, HSG A
	10,875	60	Weighted Average
	6,930		63.72% Pervious Area
	3,945		36.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	37	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	25	0.4000	3.62		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
3.7	62	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-400: Area Draining to Brook Street South



Summary for Subcatchment PDA-500: Area Draining to Brook Street North

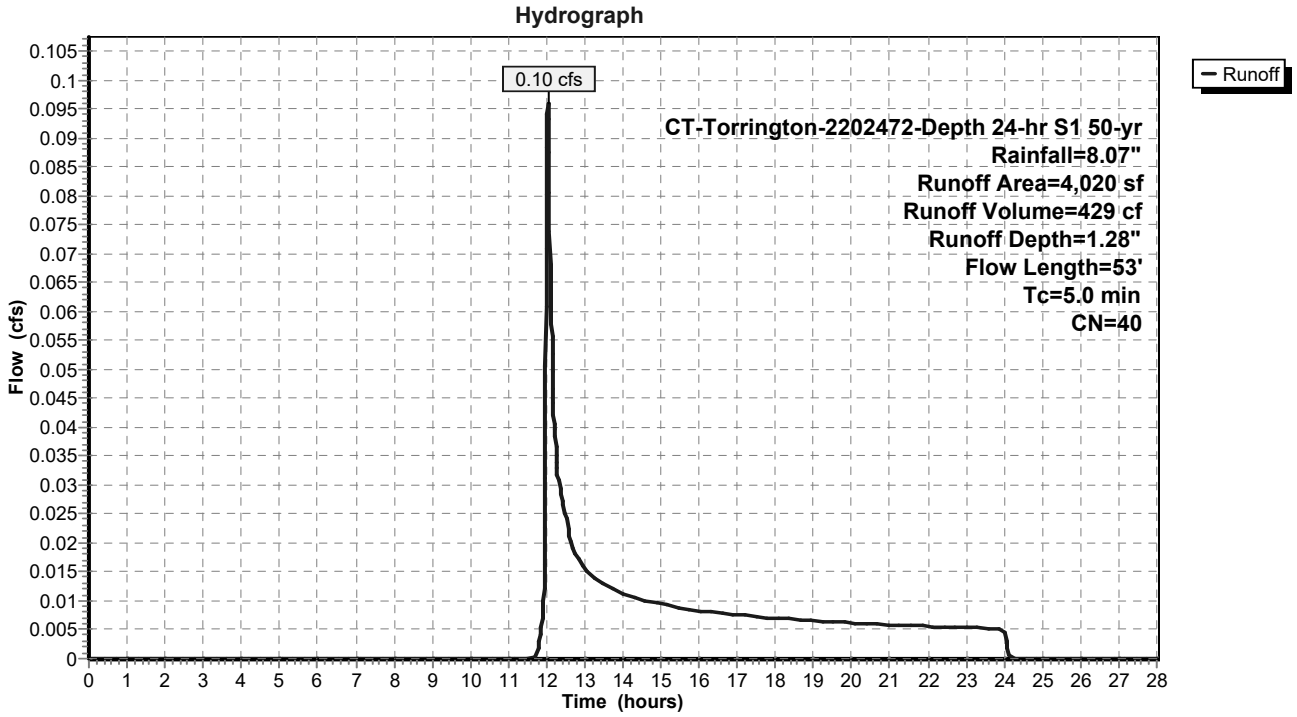
Runoff = 0.10 cfs @ 12.04 hrs, Volume= 429 cf, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 50-yr Rainfall=8.07"

	Area (sf)	CN	Description
*	45	98	Impervious, HSG A
	3,975	39	>75% Grass cover, Good, HSG A
	4,020	40	Weighted Average
	3,975		98.88% Pervious Area
	45		1.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	35	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	18	0.6000	3.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
3.5	53	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-500: Area Draining to Brook Street North



Summary for Pond 1P: Underground Detention System

Inflow Area = 41,190 sf, 84.91% Impervious, Inflow Depth = 6.76" for 50-yr event
Inflow = 7.36 cfs @ 12.03 hrs, Volume= 23,220 cf
Outflow = 6.88 cfs @ 12.05 hrs, Volume= 17,711 cf, Atten= 7%, Lag= 1.2 min
Discarded = 0.03 cfs @ 2.63 hrs, Volume= 2,733 cf
Primary = 6.85 cfs @ 12.05 hrs, Volume= 14,979 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Peak Elev= 100.84' @ 12.05 hrs Surf.Area= 3,095 sf Storage= 6,851 cf

Plug-Flow detention time= 202.6 min calculated for 17,711 cf (76% of inflow)
Center-of-Mass det. time= 93.2 min (875.7 - 782.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	97.18'	3,408 cf	**34.75'W x 89.06'L x 4.00'H Field A** 12,379 cf Overall - 3,859 cf Embedded = 8,520 cf x 40.0% Voids
#2A	98.18'	3,859 cf	**ADS_StormTech SC-740 +Cap** x 84 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 84 Chambers in 7 Rows
		7,267 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	98.60'	**18.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 98.60' / 98.50' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	100.18'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Discarded	97.18'	**0.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 2.63 hrs HW=97.22' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=6.83 cfs @ 12.05 hrs HW=100.84' (Free Discharge)
└**1=Culvert** (Passes 6.83 cfs of 9.53 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 6.83 cfs @ 2.66 fps)

Pond 1P: Underground Detention System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
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

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

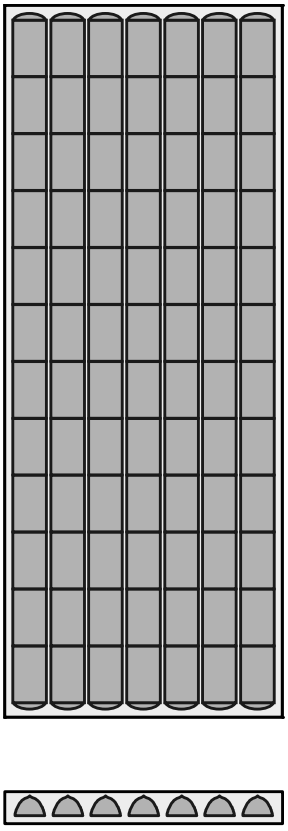
12 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 87.06' Row Length +12.0" End Stone x 2 = 89.06' Base Length
7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width
12.0" Base + 30.0" Chamber Height + 6.0" Cover = 4.00' Field Height

84 Chambers x 45.9 cf = 3,859.0 cf Chamber Storage

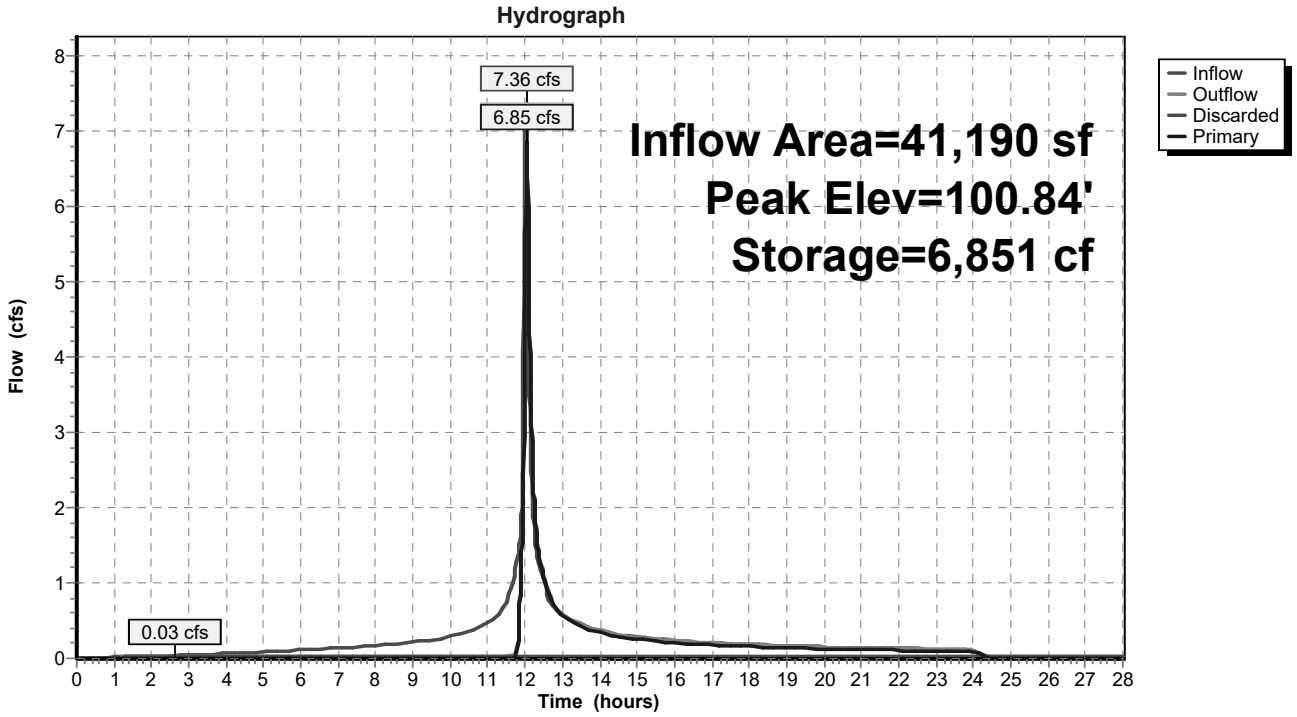
12,378.9 cf Field - 3,859.0 cf Chambers = 8,519.9 cf Stone x 40.0% Voids = 3,408.0 cf Stone Storage

Chamber Storage + Stone Storage = 7,266.9 cf = 0.167 af
Overall Storage Efficiency = 58.7%
Overall System Size = 89.06' x 34.75' x 4.00'

84 Chambers
458.5 cy Field
315.6 cy Stone



Pond 1P: Underground Detention System

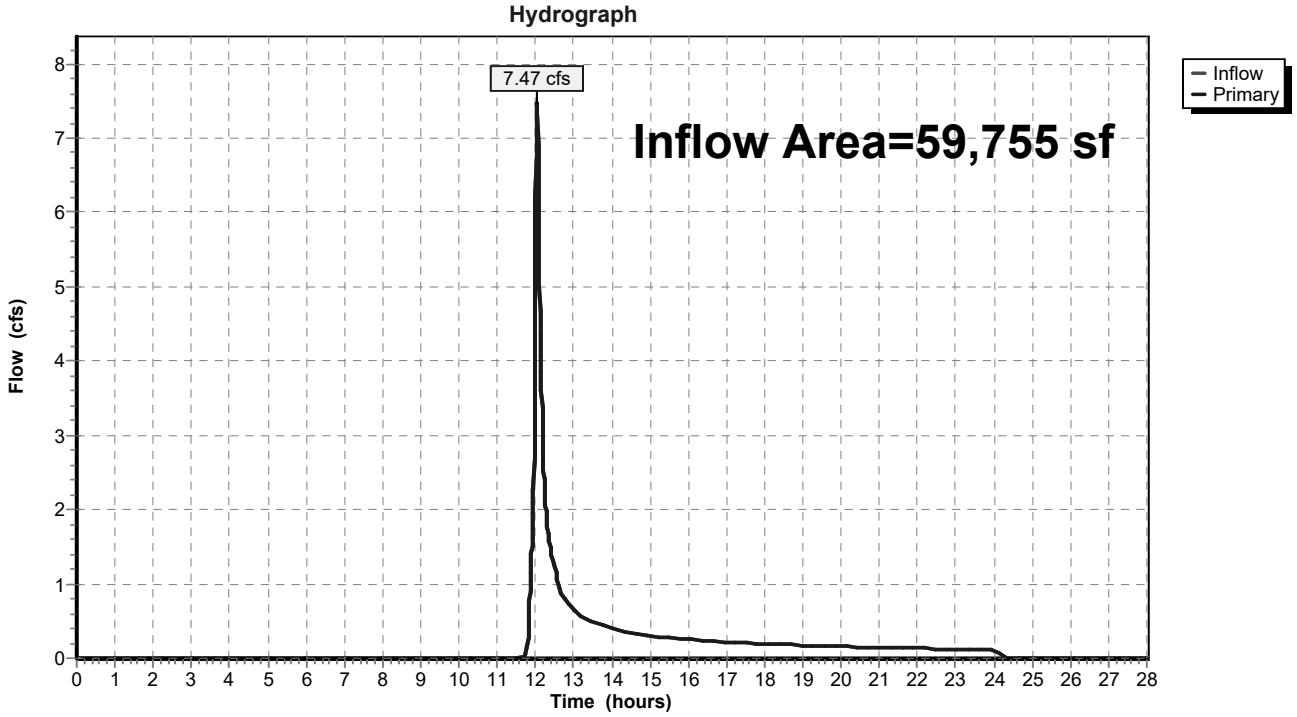


Summary for Link DP-1: Offsite West

Inflow Area = 59,755 sf, 60.74% Impervious, Inflow Depth = 3.50" for 50-yr event
Inflow = 7.47 cfs @ 12.05 hrs, Volume= 17,411 cf
Primary = 7.47 cfs @ 12.05 hrs, Volume= 17,411 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-1: Offsite West

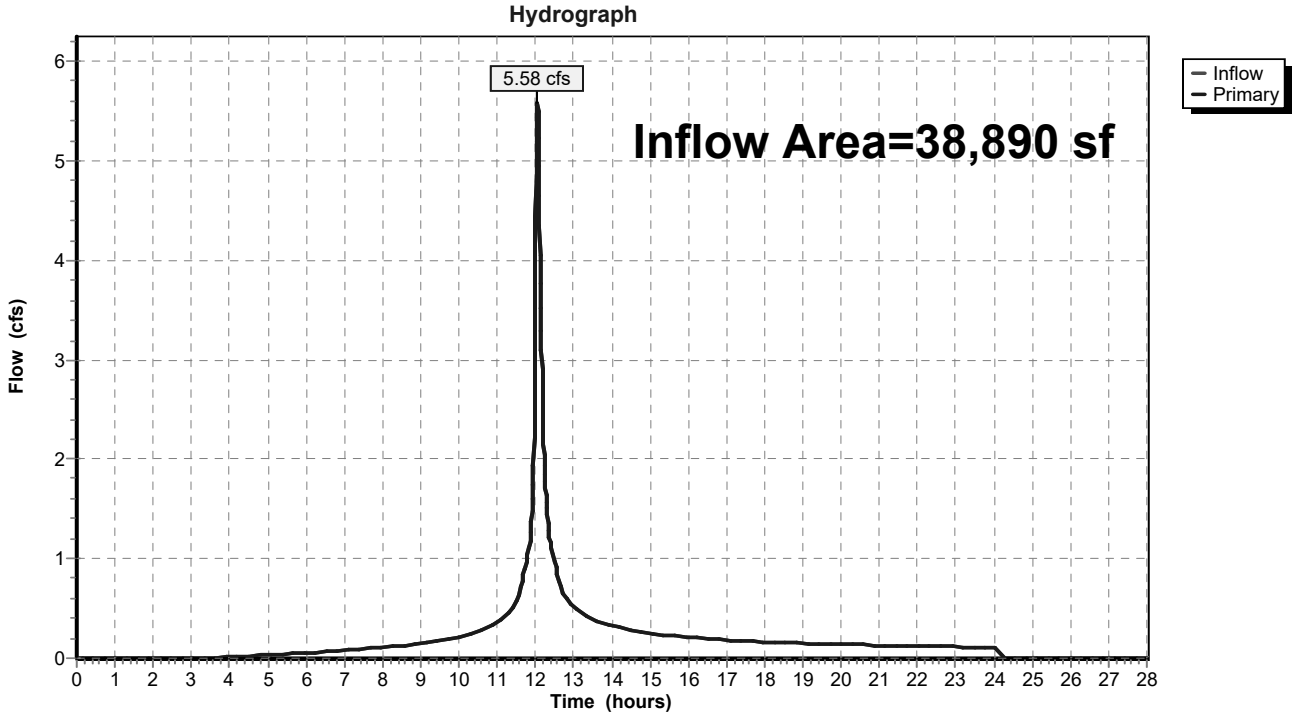


Summary for Link DP-2: Grove Street South

Inflow Area = 38,890 sf, 72.96% Impervious, Inflow Depth = 5.93" for 50-yr event
Inflow = 5.58 cfs @ 12.05 hrs, Volume= 19,206 cf
Primary = 5.58 cfs @ 12.05 hrs, Volume= 19,206 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-2: Grove Street South

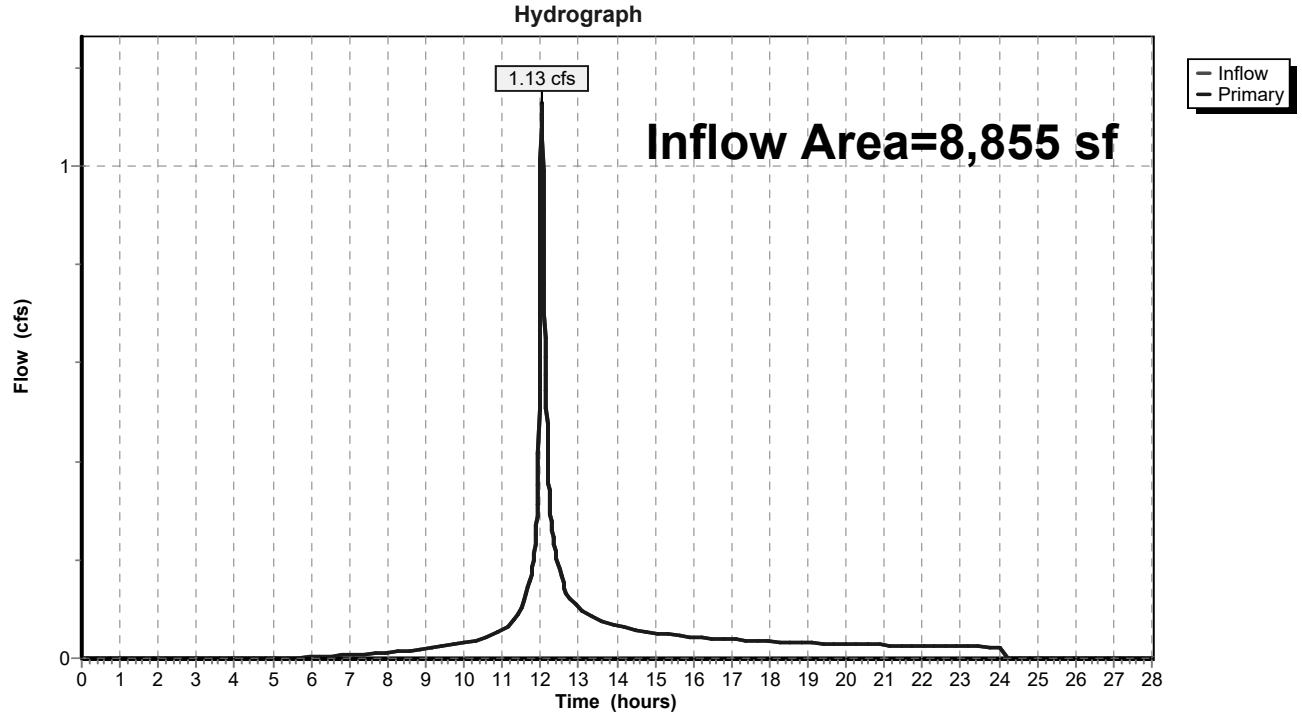


Summary for Link DP-3: Grove Street North

Inflow Area = 8,855 sf, 56.24% Impervious, Inflow Depth = 4.76" for 50-yr event
Inflow = 1.13 cfs @ 12.04 hrs, Volume= 3,509 cf
Primary = 1.13 cfs @ 12.04 hrs, Volume= 3,509 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-3: Grove Street North

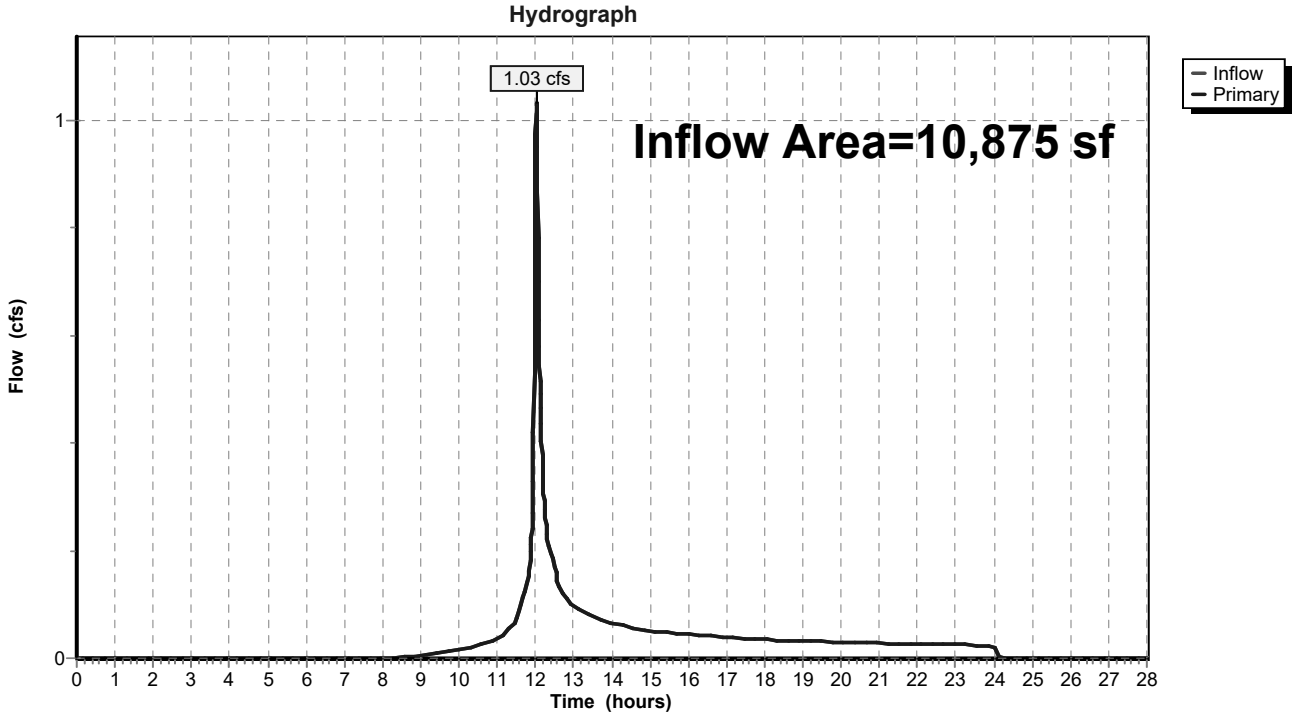


Summary for Link DP-4: Brook Street South

Inflow Area = 10,875 sf, 36.28% Impervious, Inflow Depth = 3.39" for 50-yr event
Inflow = 1.03 cfs @ 12.03 hrs, Volume= 3,068 cf
Primary = 1.03 cfs @ 12.03 hrs, Volume= 3,068 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-4: Brook Street South

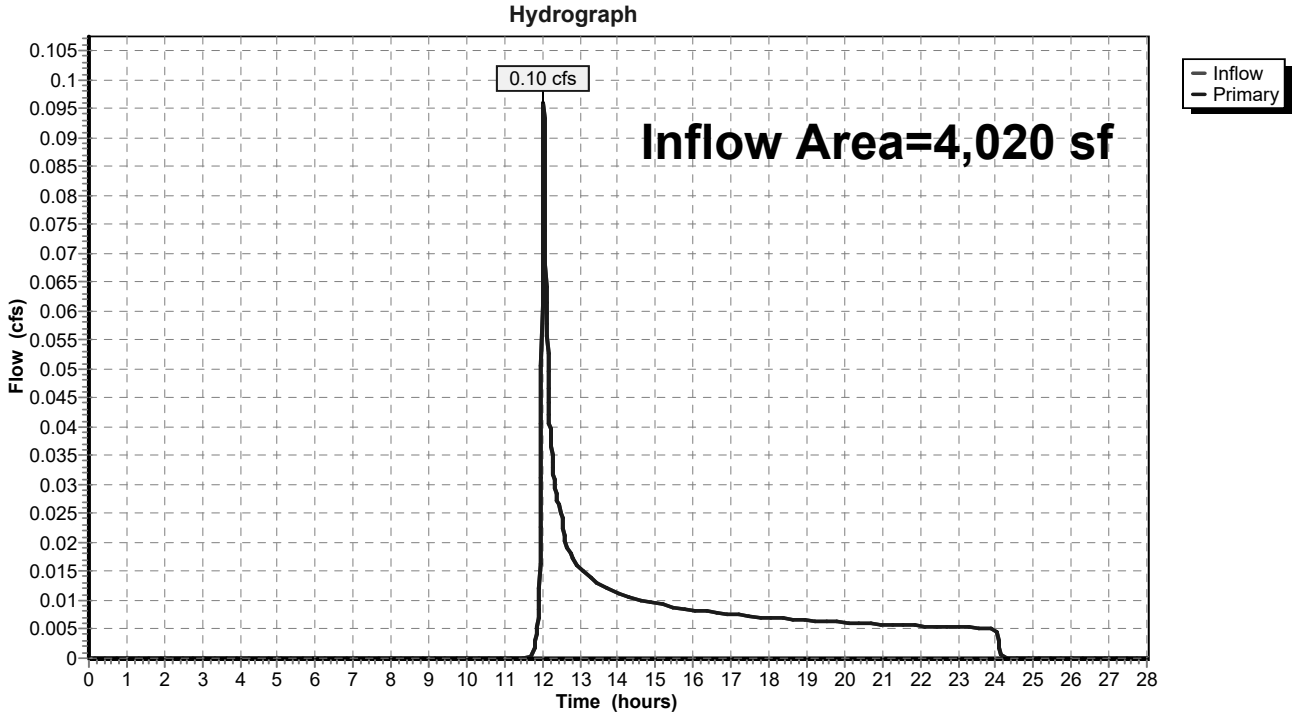


Summary for Link DP-5: Brook Street North

Inflow Area = 4,020 sf, 1.12% Impervious, Inflow Depth = 1.28" for 50-yr event
Inflow = 0.10 cfs @ 12.04 hrs, Volume= 429 cf
Primary = 0.10 cfs @ 12.04 hrs, Volume= 429 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-5: Brook Street North

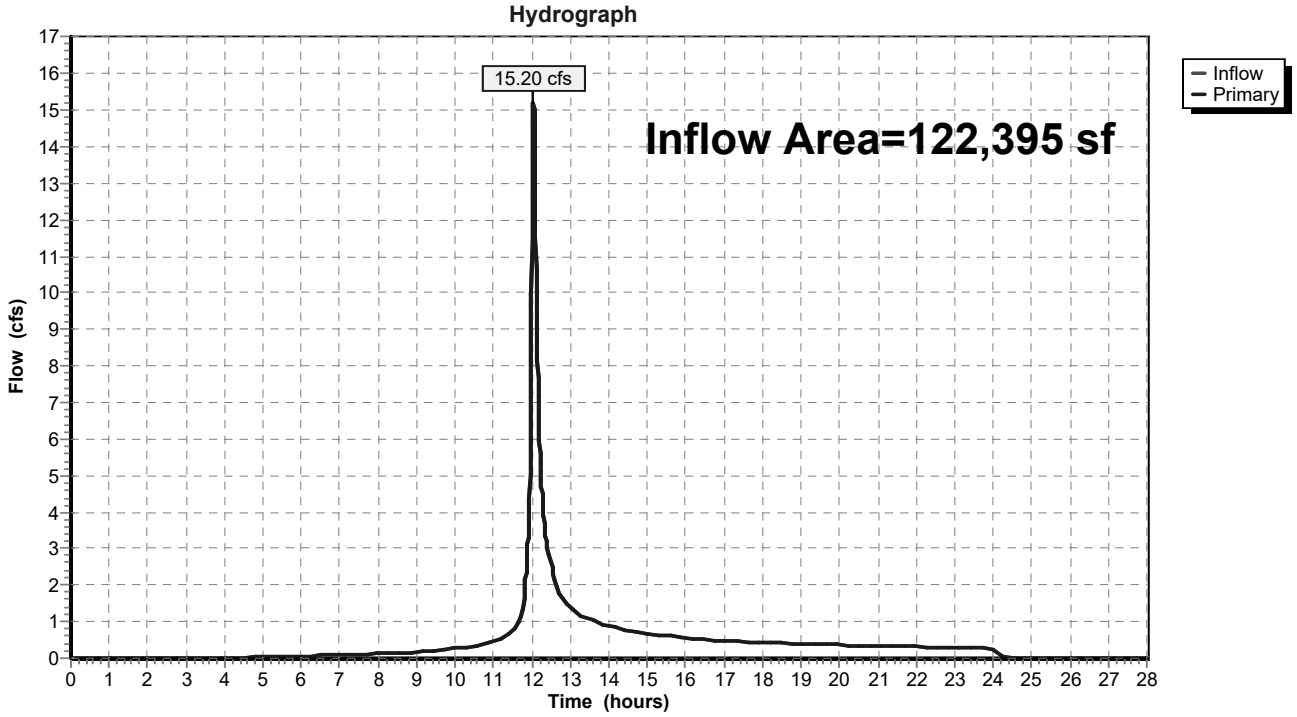


Summary for Link DP-6: Total Offsite Flow

Inflow Area = 122,395 sf, 60.17% Impervious, Inflow Depth = 4.28" for 50-yr event
Inflow = 15.20 cfs @ 12.05 hrs, Volume= 43,624 cf
Primary = 15.20 cfs @ 12.05 hrs, Volume= 43,624 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-6: Total Offsite Flow



Time span=0.00-28.00 hrs, dt=0.01 hrs, 2801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-100: Area Draining Runoff Area=18,565 sf 7.11% Impervious Runoff Depth=2.15"
Flow Length=50' Slope=0.0300 '/' Tc=5.0 min CN=43 Runoff=0.94 cfs 3,333 cf

Subcatchment PDA-110: School Parking Runoff Area=10,885 sf 81.90% Impervious Runoff Depth=7.60"
Flow Length=181' Slope=0.0200 '/' Tc=5.5 min CN=87 Runoff=2.14 cfs 6,896 cf

Subcatchment PDA-120: School Roof Runoff Area=10,425 sf 100.00% Impervious Runoff Depth=8.94"
Tc=5.0 min CN=98 Runoff=2.26 cfs 7,766 cf

Subcatchment PDA-130: Church Parking Runoff Area=8,295 sf 84.63% Impervious Runoff Depth=7.85"
Flow Length=151' Tc=5.0 min CN=89 Runoff=1.71 cfs 5,424 cf

Subcatchment PDA-140: Rectory Parking Runoff Area=11,585 sf 74.36% Impervious Runoff Depth=7.11"
Flow Length=64' Slope=0.0300 '/' Tc=5.0 min CN=83 Runoff=2.23 cfs 6,864 cf

Subcatchment PDA-200: Area Draining to Runoff Area=38,890 sf 72.96% Impervious Runoff Depth=6.99"
Flow Length=447' Tc=7.6 min CN=82 Runoff=6.41 cfs 22,642 cf

Subcatchment PDA-300: Area Draining to Runoff Area=8,855 sf 56.24% Impervious Runoff Depth=5.74"
Flow Length=93' Tc=6.1 min CN=72 Runoff=1.34 cfs 4,238 cf

Subcatchment PDA-400: Area Draining to Runoff Area=10,875 sf 36.28% Impervious Runoff Depth=4.24"
Flow Length=62' Tc=5.0 min CN=60 Runoff=1.28 cfs 3,845 cf

Subcatchment PDA-500: Area Draining to Runoff Area=4,020 sf 1.12% Impervious Runoff Depth=1.80"
Flow Length=53' Tc=5.0 min CN=40 Runoff=0.16 cfs 604 cf

Pond 1P: Underground Detention System Peak Elev=100.91' Storage=6,928 cf Inflow=8.33 cfs 26,950 cf
Discarded=0.03 cfs 2,760 cf Primary=7.80 cfs 18,680 cf Outflow=7.83 cfs 21,439 cf

Link DP-1: Offsite West Inflow=8.72 cfs 22,013 cf
Primary=8.72 cfs 22,013 cf

Link DP-2: Grove Street South Inflow=6.41 cfs 22,642 cf
Primary=6.41 cfs 22,642 cf

Link DP-3: Grove Street North Inflow=1.34 cfs 4,238 cf
Primary=1.34 cfs 4,238 cf

Link DP-4: Brook Street South Inflow=1.28 cfs 3,845 cf
Primary=1.28 cfs 3,845 cf

Link DP-5: Brook Street North Inflow=0.16 cfs 604 cf
Primary=0.16 cfs 604 cf

Link DP-6: Total Offsite Flow Inflow=17.76 cfs 53,342 cf
Primary=17.76 cfs 53,342 cf

Total Runoff Area = 122,395 sf Runoff Volume = 61,613 cf Average Runoff Depth = 6.04"
39.83% Pervious = 48,755 sf 60.17% Impervious = 73,640 sf

Summary for Subcatchment PDA-100: Area Draining Offsite to the West

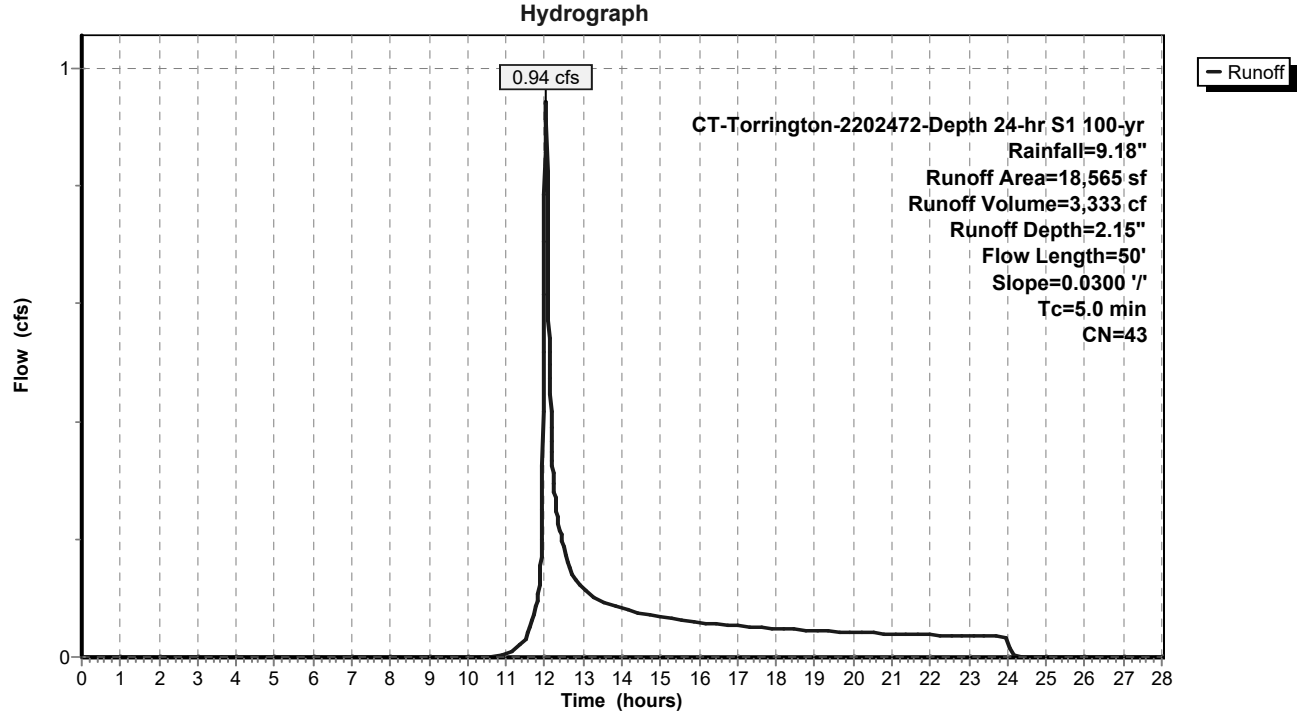
Runoff = 0.94 cfs @ 12.03 hrs, Volume= 3,333 cf, Depth= 2.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 100-yr Rainfall=9.18"

	Area (sf)	CN	Description
*	1,320	98	Impervious, HSG A
	17,245	39	>75% Grass cover, Good, HSG A
	18,565	43	Weighted Average
	17,245		92.89% Pervious Area
	1,320		7.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
4.6	50	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-100: Area Draining Offsite to the West



Summary for Subcatchment PDA-110: School Parking Area to UDS

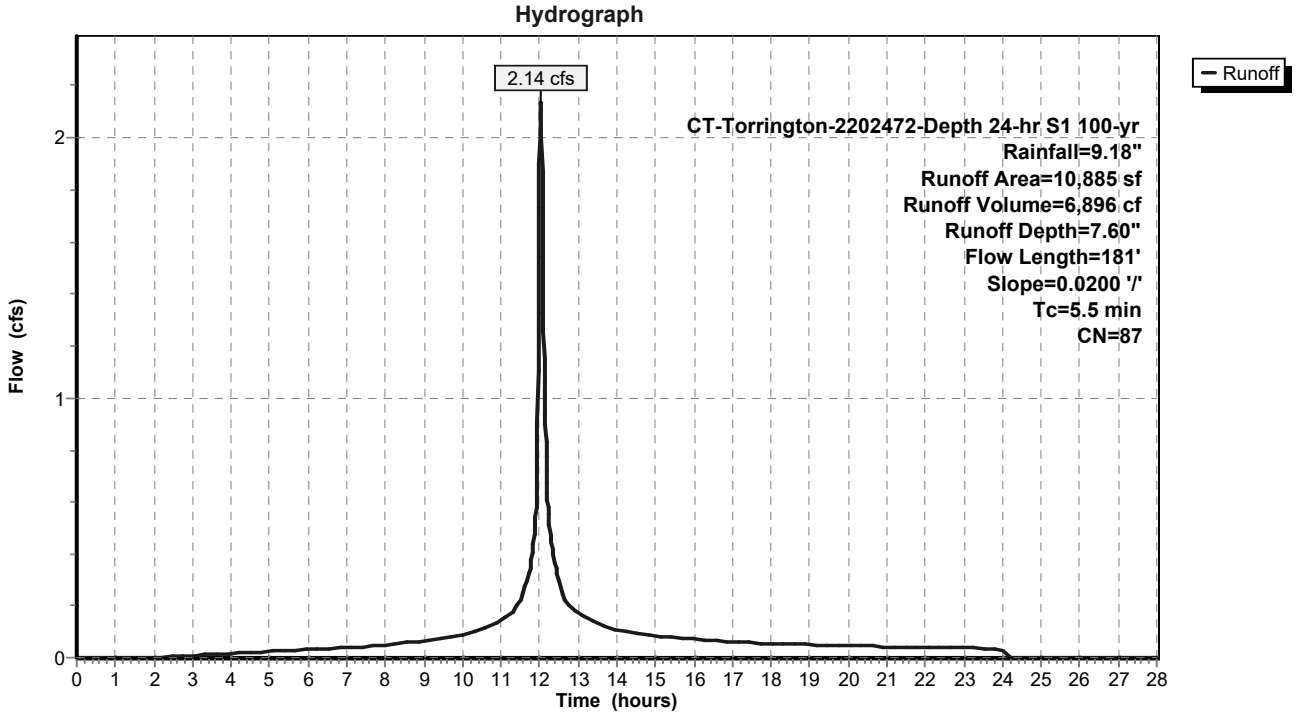
Runoff = 2.14 cfs @ 12.03 hrs, Volume= 6,896 cf, Depth= 7.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 100-yr Rainfall=9.18"

	Area (sf)	CN	Description
*	8,915	98	Impervious, HSG A
	1,970	39	>75% Grass cover, Good, HSG A
	10,885	87	Weighted Average
	1,970		18.10% Pervious Area
	8,915		81.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	37	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.8	63	0.0200	1.32		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
0.5	81	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	181	Total			

Subcatchment PDA-110: School Parking Area to UDS



Summary for Subcatchment PDA-120: School Roof Area to UDS

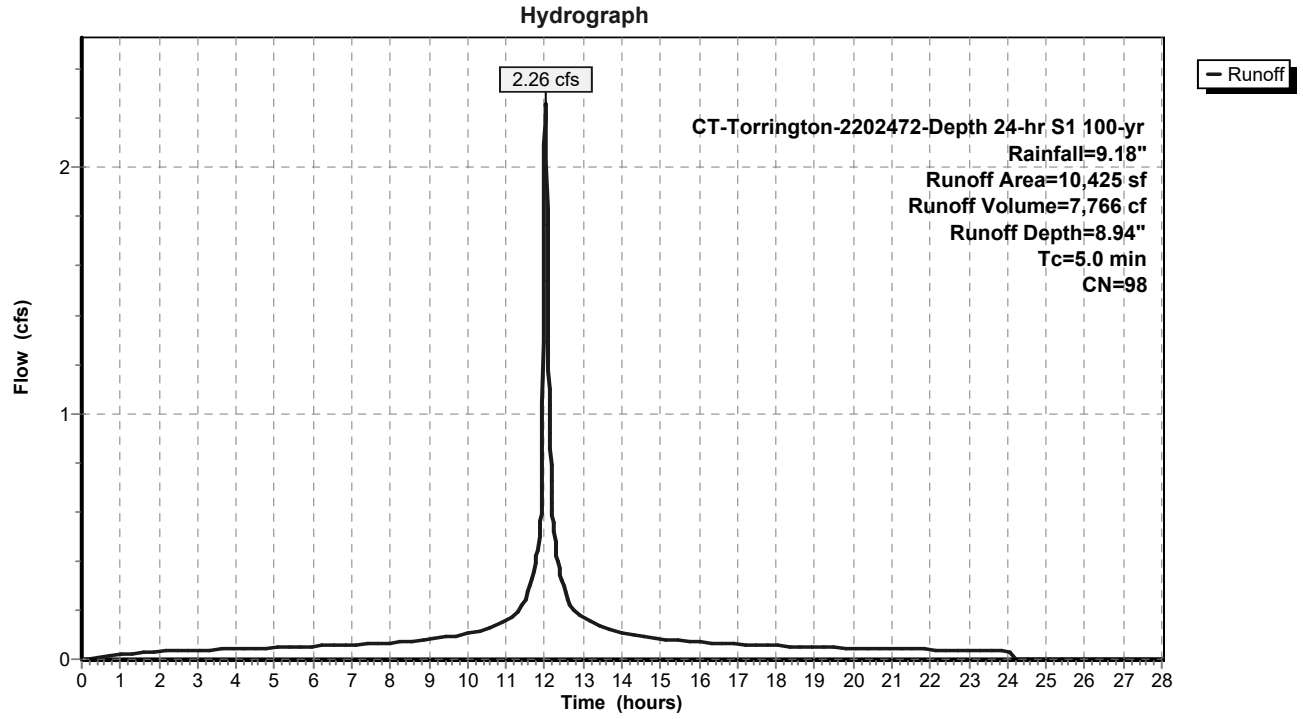
Runoff = 2.26 cfs @ 12.03 hrs, Volume= 7,766 cf, Depth= 8.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 100-yr Rainfall=9.18"

	Area (sf)	CN	Description
*	10,425	98	Impervious, HSG A
	10,425		100.00% Impervious Area

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

Subcatchment PDA-120: School Roof Area to UDS



Summary for Subcatchment PDA-130: Church Parking Area to UDS

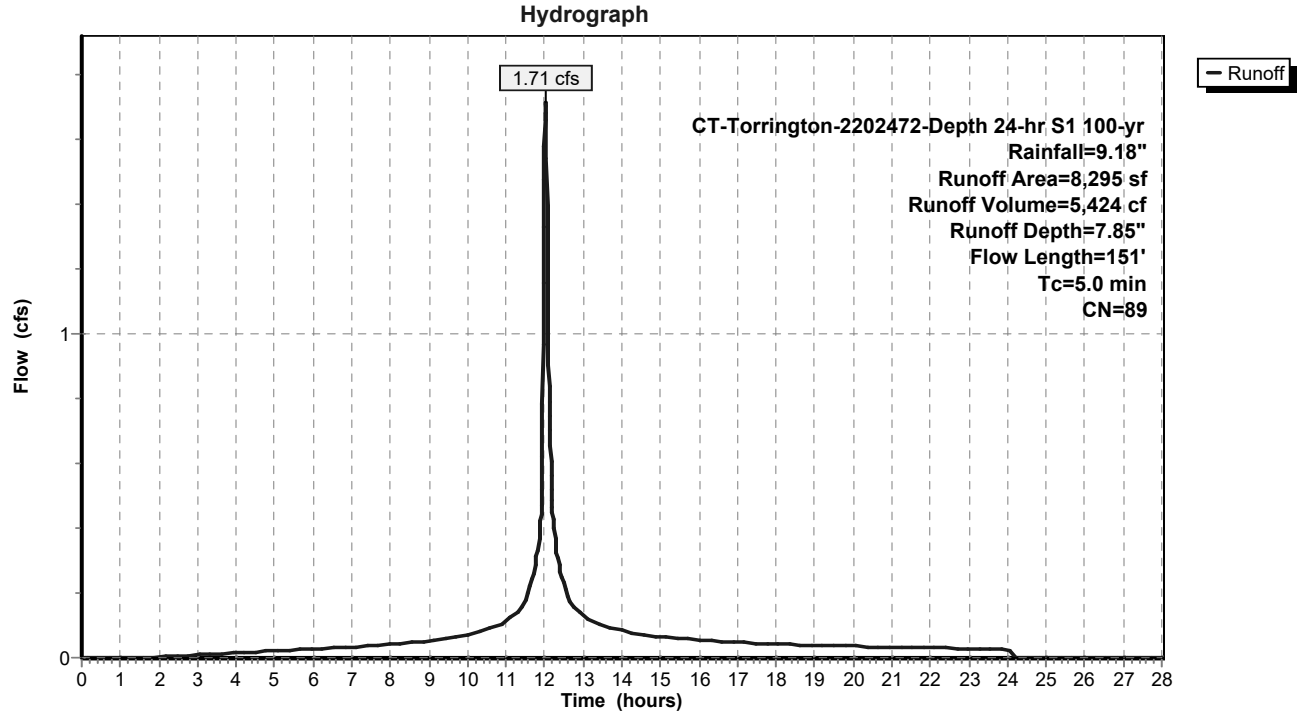
Runoff = 1.71 cfs @ 12.03 hrs, Volume= 5,424 cf, Depth= 7.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 100-yr Rainfall=9.18"

	Area (sf)	CN	Description
*	7,020	98	Impervious, HSG A
	1,275	39	>75% Grass cover, Good, HSG A
	8,295	89	Weighted Average
	1,275		15.37% Pervious Area
	7,020		84.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	22	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.8	78	0.0350	1.72		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
0.2	51	0.0350	3.80		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.7	151	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-130: Church Parking Area to UDS



Summary for Subcatchment PDA-140: Rectory Parking Area to UDS

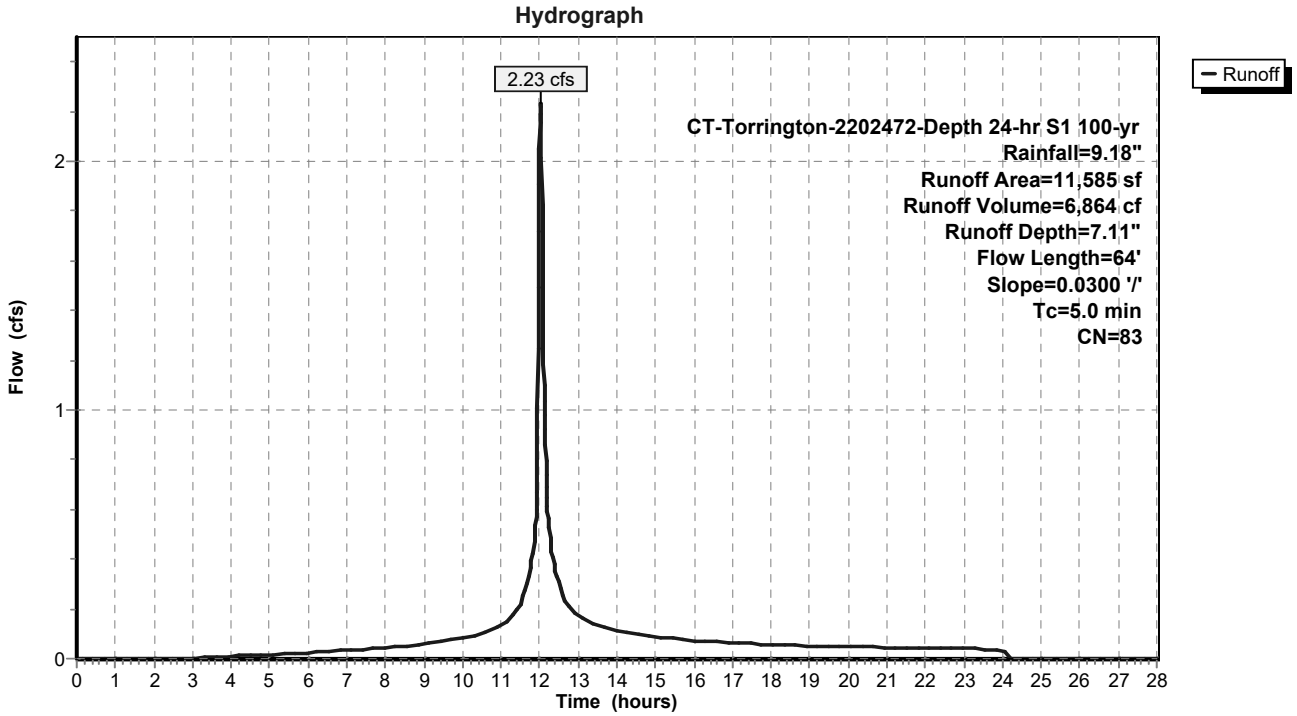
Runoff = 2.23 cfs @ 12.03 hrs, Volume= 6,864 cf, Depth= 7.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 100-yr Rainfall=9.18"

	Area (sf)	CN	Description
*	8,615	98	Impervious, HSG A
	2,970	39	>75% Grass cover, Good, HSG A
	11,585	83	Weighted Average
	2,970		25.64% Pervious Area
	8,615		74.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	16	0.0300	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.5	48	0.0300	1.47		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.3	64	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-140: Rectory Parking Area to UDS



Summary for Subcatchment PDA-200: Area Draining to Grove Street South

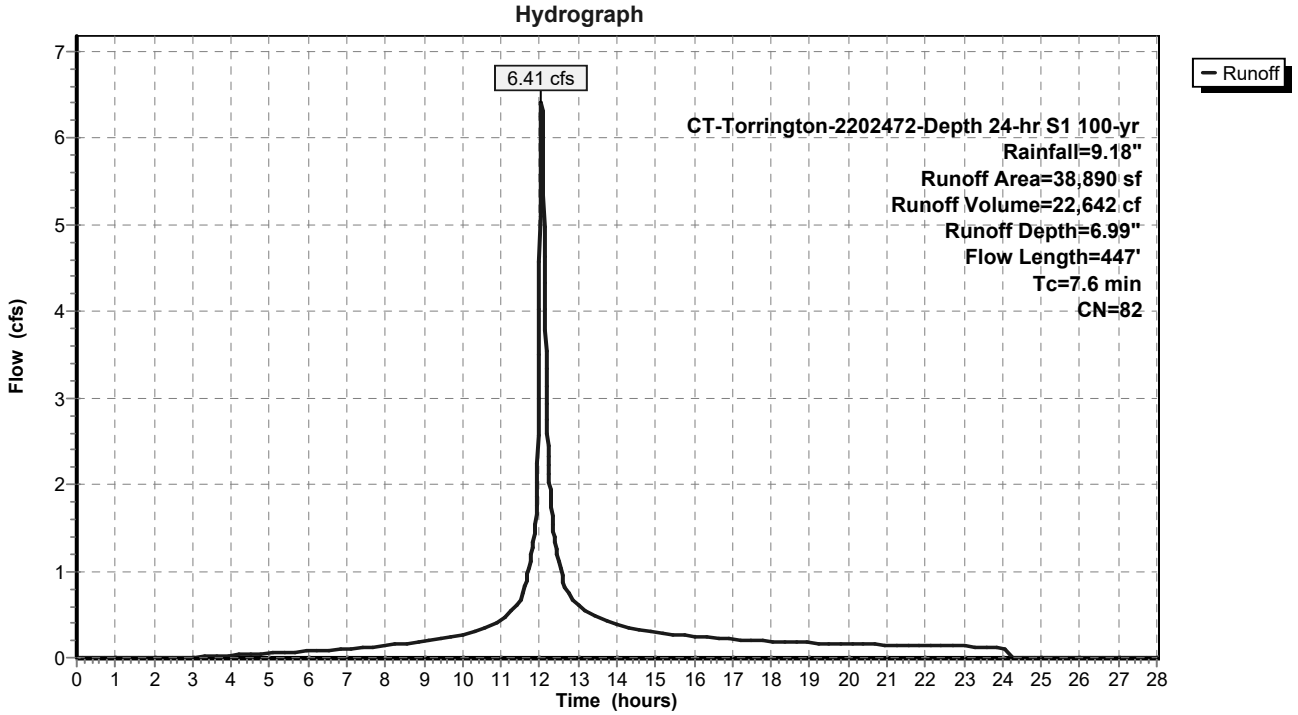
Runoff = 6.41 cfs @ 12.05 hrs, Volume= 22,642 cf, Depth= 6.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 100-yr Rainfall=9.18"

	Area (sf)	CN	Description
*	28,375	98	Impervious, HSG A
	10,515	39	>75% Grass cover, Good, HSG A
	38,890	82	Weighted Average
	10,515		27.04% Pervious Area
	28,375		72.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	30	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.9	70	0.0200	1.34		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
2.0	347	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.6	447	Total			

Subcatchment PDA-200: Area Draining to Grove Street South



Summary for Subcatchment PDA-300: Area Draining to Grove Street North

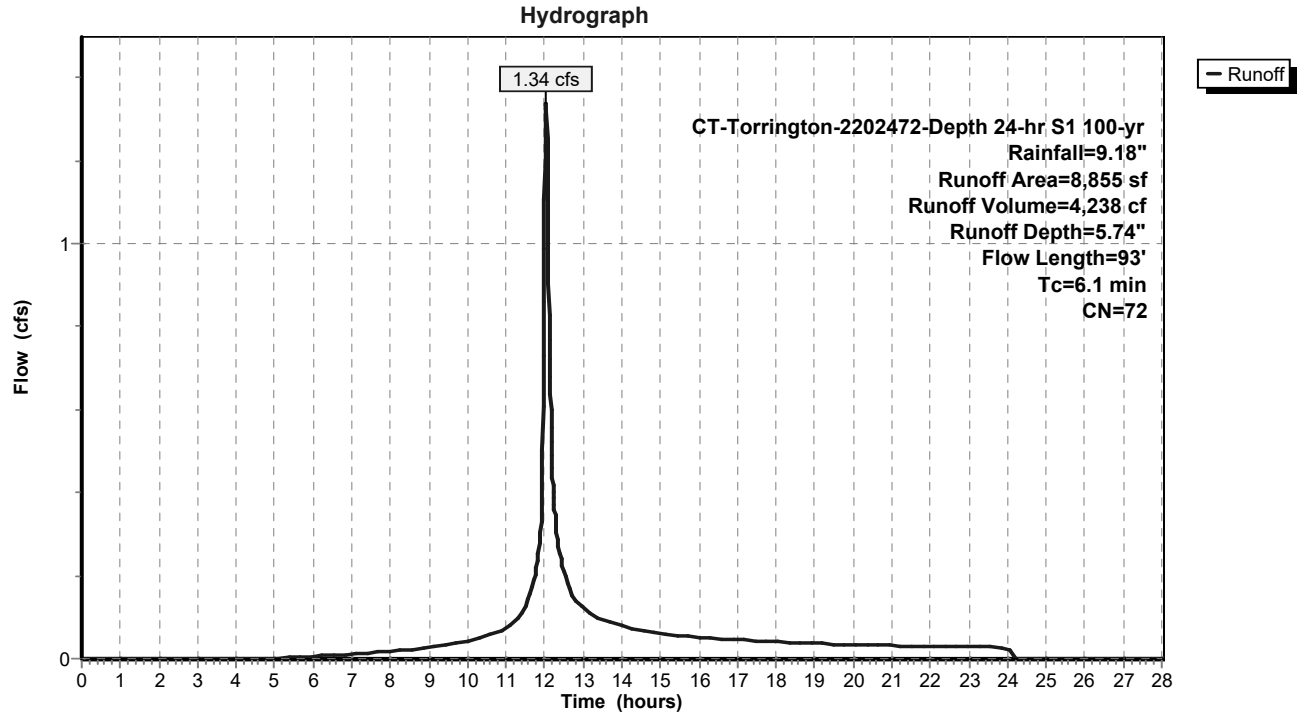
Runoff = 1.34 cfs @ 12.04 hrs, Volume= 4,238 cf, Depth= 5.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 100-yr Rainfall=9.18"

	Area (sf)	CN	Description
*	4,980	98	Impervious, HSG A
	3,875	39	>75% Grass cover, Good, HSG A
	8,855	72	Weighted Average
	3,875		43.76% Pervious Area
	4,980		56.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	66	0.0300	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.4	27	0.0200	1.11		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
6.1	93	Total			

Subcatchment PDA-300: Area Draining to Grove Street North



Summary for Subcatchment PDA-400: Area Draining to Brook Street South

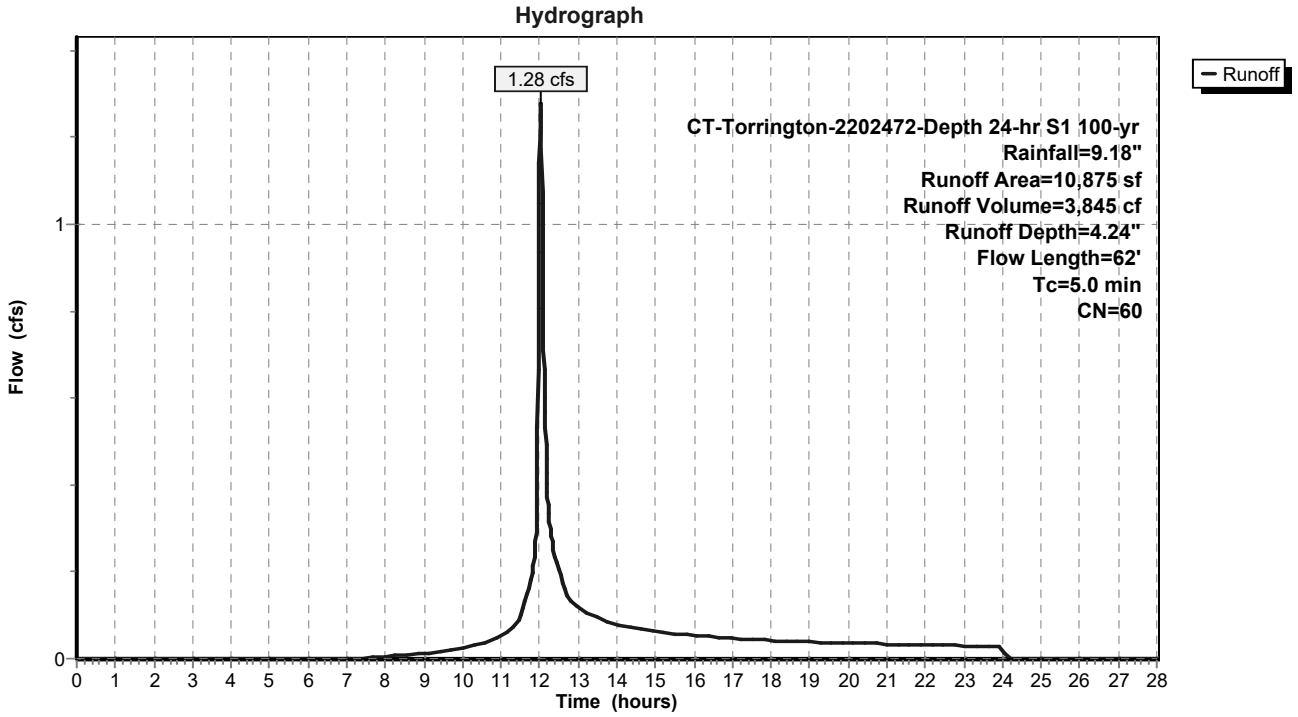
Runoff = 1.28 cfs @ 12.03 hrs, Volume= 3,845 cf, Depth= 4.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 100-yr Rainfall=9.18"

	Area (sf)	CN	Description
*	3,945	98	Impervious, HSG A
	6,930	39	>75% Grass cover, Good, HSG A
	10,875	60	Weighted Average
	6,930		63.72% Pervious Area
	3,945		36.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	37	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	25	0.4000	3.62		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
3.7	62	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-400: Area Draining to Brook Street South



Summary for Subcatchment PDA-500: Area Draining to Brook Street North

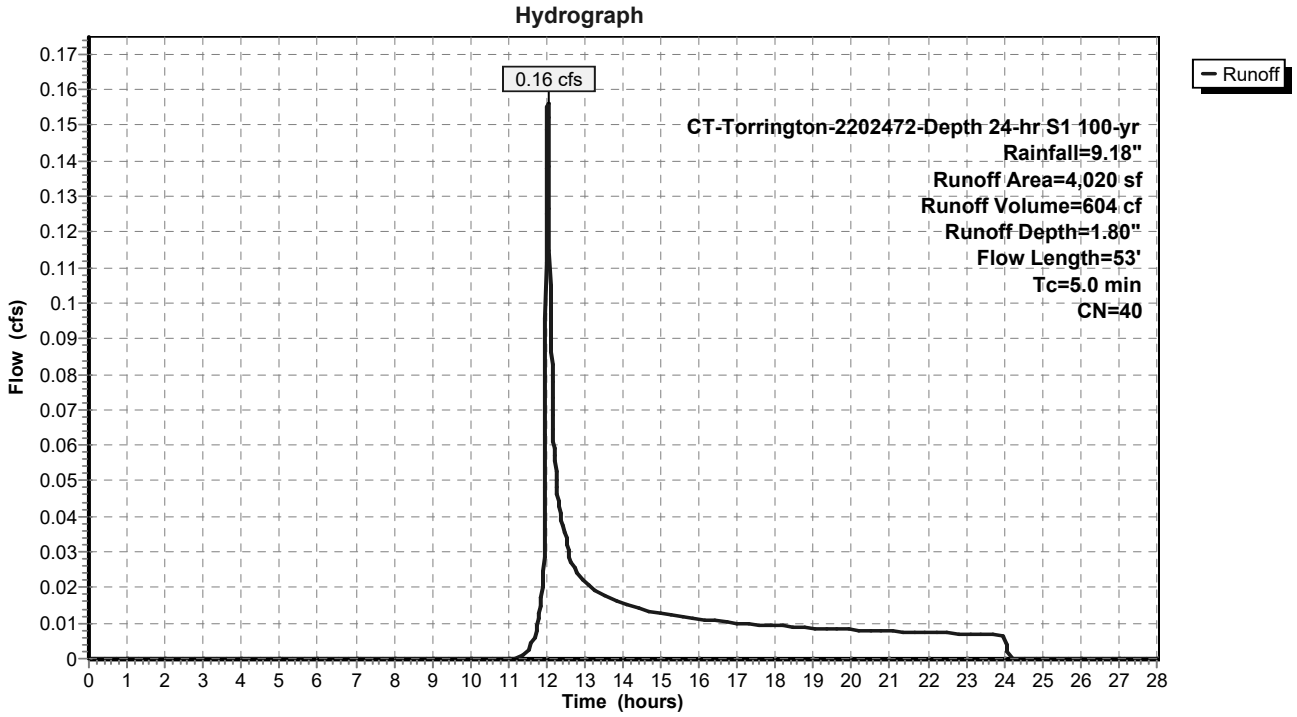
Runoff = 0.16 cfs @ 12.04 hrs, Volume= 604 cf, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
CT-Torrington-2202472-Depth 24-hr S1 100-yr Rainfall=9.18"

	Area (sf)	CN	Description
*	45	98	Impervious, HSG A
	3,975	39	>75% Grass cover, Good, HSG A
	4,020	40	Weighted Average
	3,975		98.88% Pervious Area
	45		1.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	35	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.52"
0.1	18	0.6000	3.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.52"
3.5	53	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PDA-500: Area Draining to Brook Street North



Summary for Pond 1P: Underground Detention System

Inflow Area = 41,190 sf, 84.91% Impervious, Inflow Depth = 7.85" for 100-yr event
Inflow = 8.33 cfs @ 12.03 hrs, Volume= 26,950 cf
Outflow = 7.83 cfs @ 12.05 hrs, Volume= 21,439 cf, Atten= 6%, Lag= 1.2 min
Discarded = 0.03 cfs @ 2.14 hrs, Volume= 2,760 cf
Primary = 7.80 cfs @ 12.05 hrs, Volume= 18,680 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Peak Elev= 100.91' @ 12.05 hrs Surf.Area= 3,095 sf Storage= 6,928 cf

Plug-Flow detention time= 188.0 min calculated for 21,439 cf (80% of inflow)
Center-of-Mass det. time= 88.0 min (866.7 - 778.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	97.18'	3,408 cf	**34.75'W x 89.06'L x 4.00'H Field A** 12,379 cf Overall - 3,859 cf Embedded = 8,520 cf x 40.0% Voids
#2A	98.18'	3,859 cf	**ADS_StormTech SC-740 +Cap** x 84 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 84 Chambers in 7 Rows
		7,267 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	98.60'	**18.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 98.60' / 98.50' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	100.18'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Discarded	97.18'	**0.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 2.14 hrs HW=97.22' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=7.77 cfs @ 12.05 hrs HW=100.90' (Free Discharge)
└**1=Culvert** (Passes 7.77 cfs of 9.87 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 7.77 cfs @ 2.78 fps)

Pond 1P: Underground Detention System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
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

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

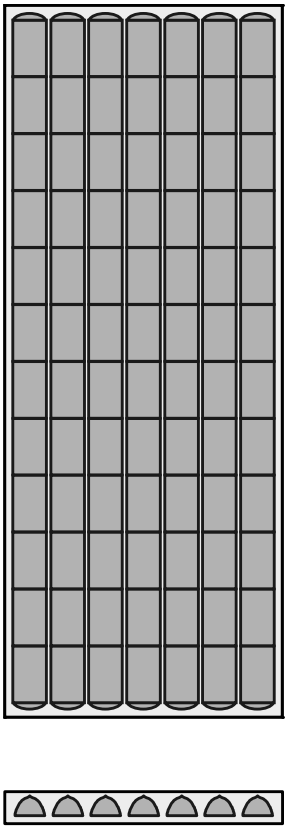
12 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 87.06' Row Length +12.0" End Stone x 2 = 89.06' Base Length
7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width
12.0" Base + 30.0" Chamber Height + 6.0" Cover = 4.00' Field Height

84 Chambers x 45.9 cf = 3,859.0 cf Chamber Storage

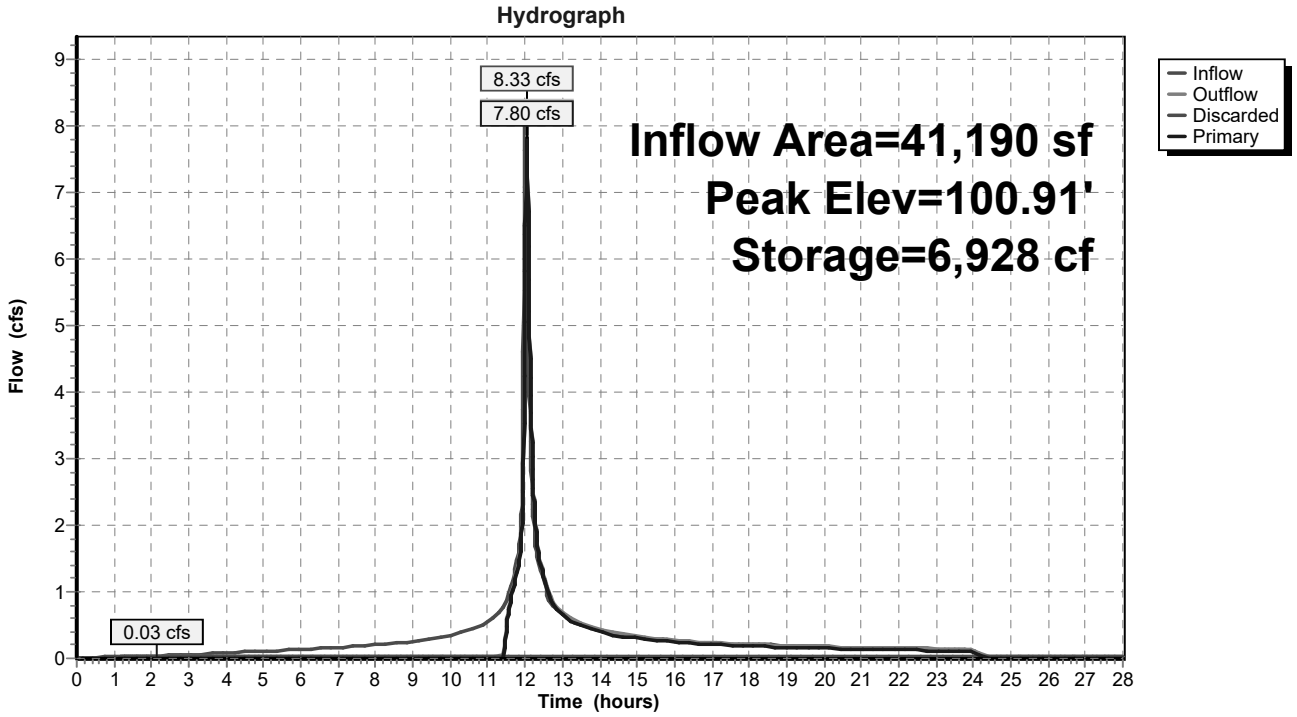
12,378.9 cf Field - 3,859.0 cf Chambers = 8,519.9 cf Stone x 40.0% Voids = 3,408.0 cf Stone Storage

Chamber Storage + Stone Storage = 7,266.9 cf = 0.167 af
Overall Storage Efficiency = 58.7%
Overall System Size = 89.06' x 34.75' x 4.00'

84 Chambers
458.5 cy Field
315.6 cy Stone



Pond 1P: Underground Detention System

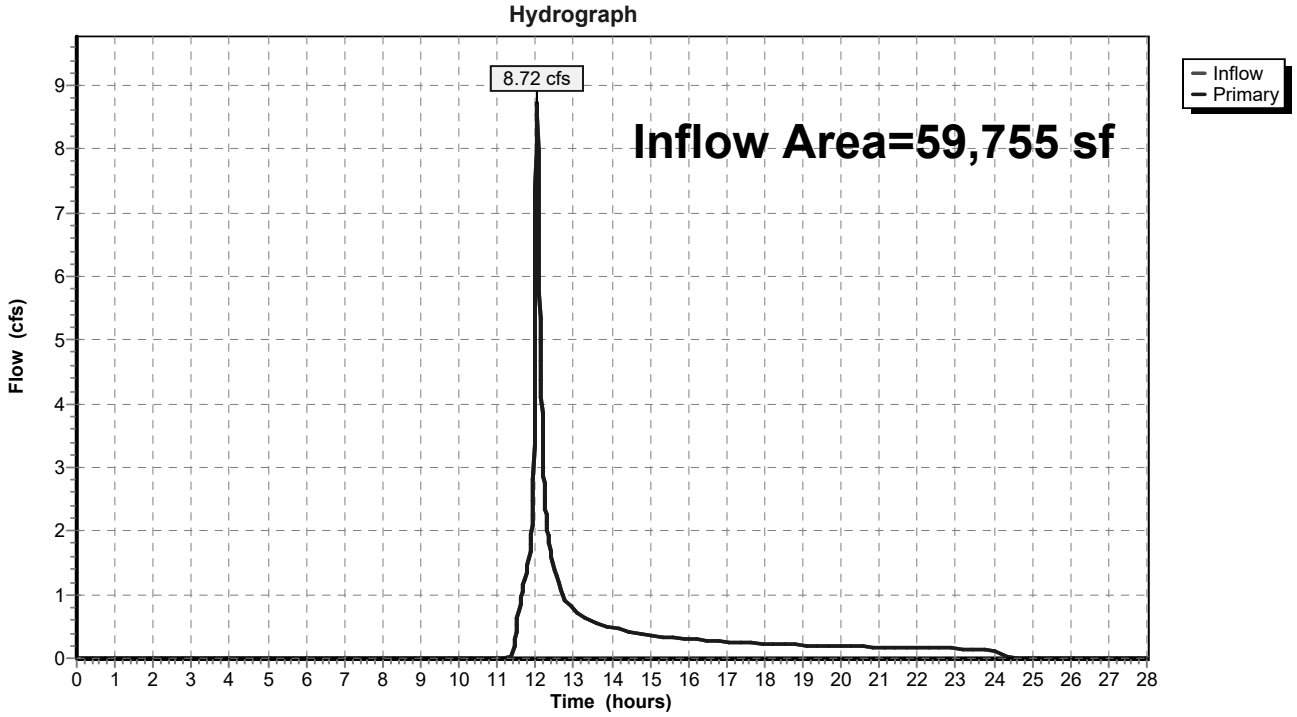


Summary for Link DP-1: Offsite West

Inflow Area = 59,755 sf, 60.74% Impervious, Inflow Depth = 4.42" for 100-yr event
Inflow = 8.72 cfs @ 12.04 hrs, Volume= 22,013 cf
Primary = 8.72 cfs @ 12.04 hrs, Volume= 22,013 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-1: Offsite West

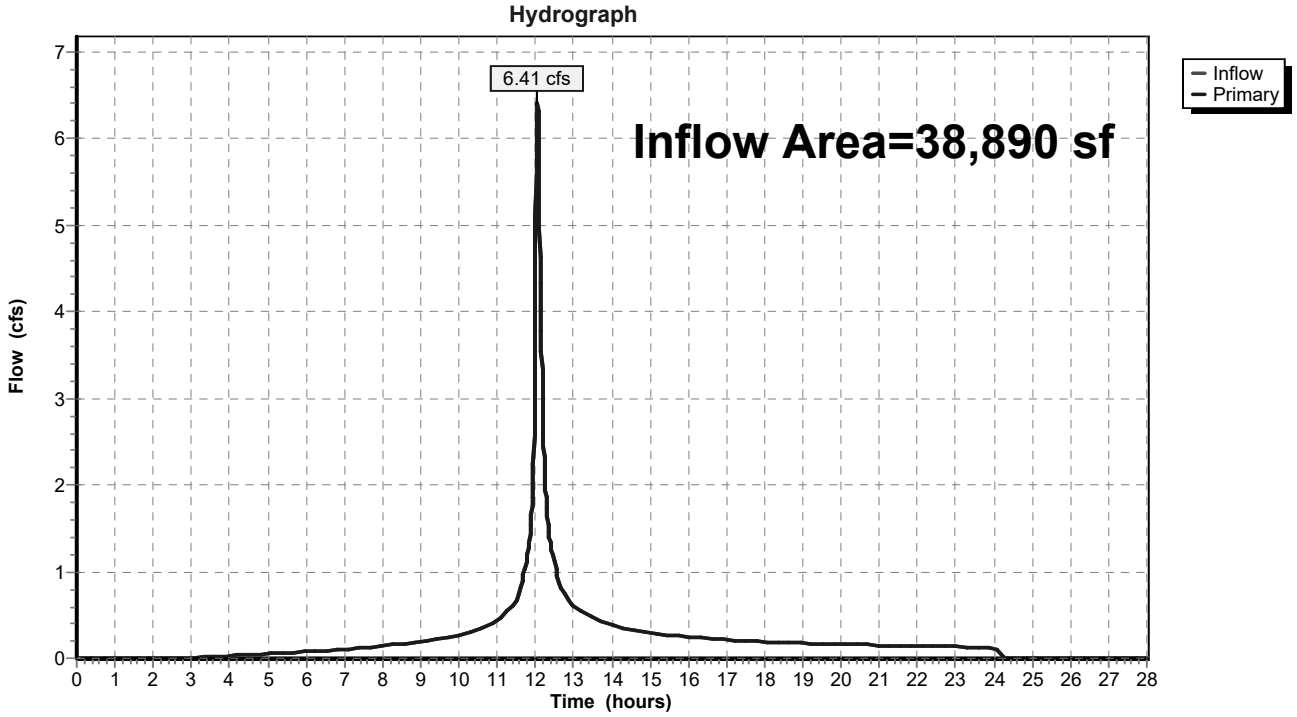


Summary for Link DP-2: Grove Street South

Inflow Area = 38,890 sf, 72.96% Impervious, Inflow Depth = 6.99" for 100-yr event
Inflow = 6.41 cfs @ 12.05 hrs, Volume= 22,642 cf
Primary = 6.41 cfs @ 12.05 hrs, Volume= 22,642 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-2: Grove Street South

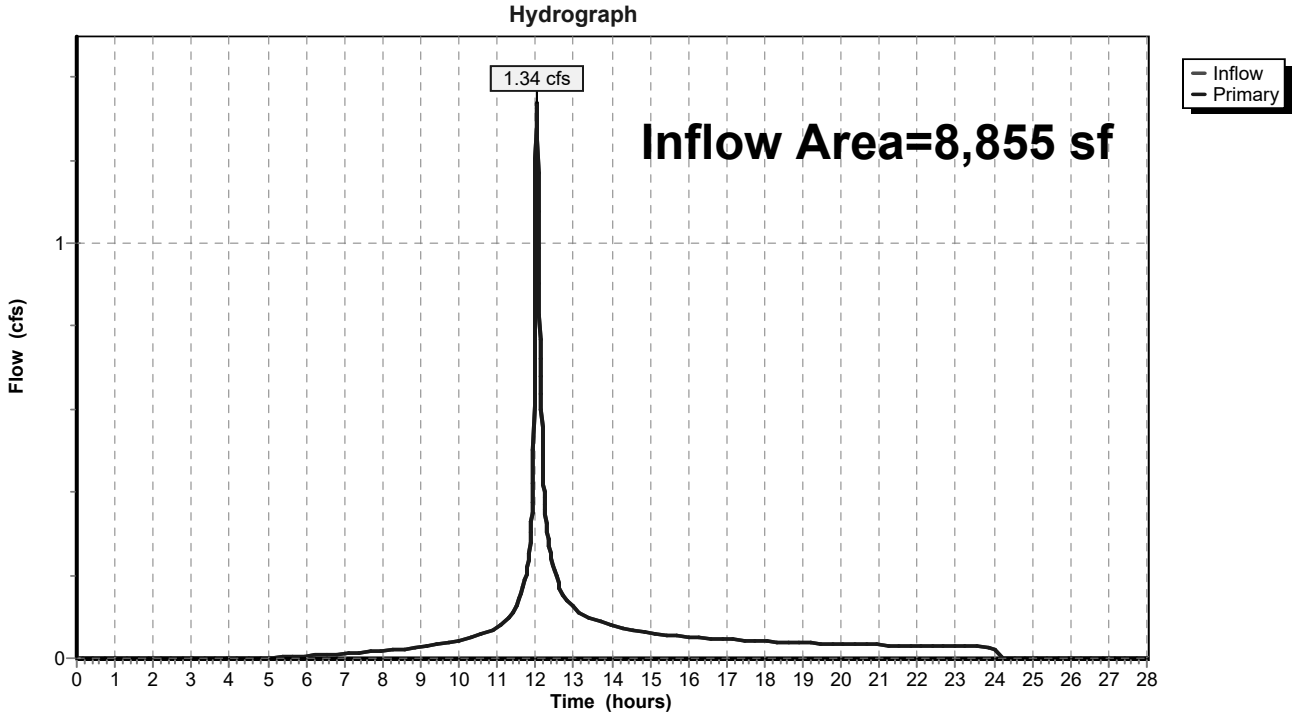


Summary for Link DP-3: Grove Street North

Inflow Area = 8,855 sf, 56.24% Impervious, Inflow Depth = 5.74" for 100-yr event
Inflow = 1.34 cfs @ 12.04 hrs, Volume= 4,238 cf
Primary = 1.34 cfs @ 12.04 hrs, Volume= 4,238 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-3: Grove Street North

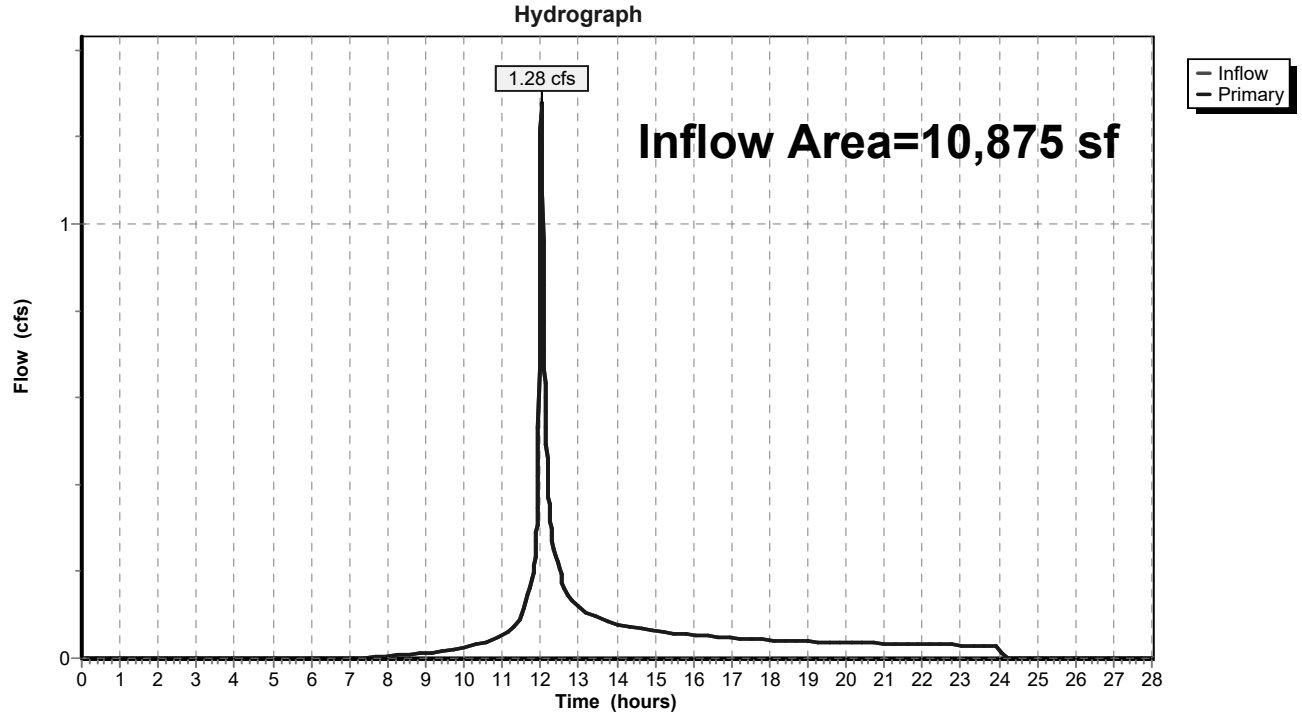


Summary for Link DP-4: Brook Street South

Inflow Area = 10,875 sf, 36.28% Impervious, Inflow Depth = 4.24" for 100-yr event
Inflow = 1.28 cfs @ 12.03 hrs, Volume= 3,845 cf
Primary = 1.28 cfs @ 12.03 hrs, Volume= 3,845 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-4: Brook Street South

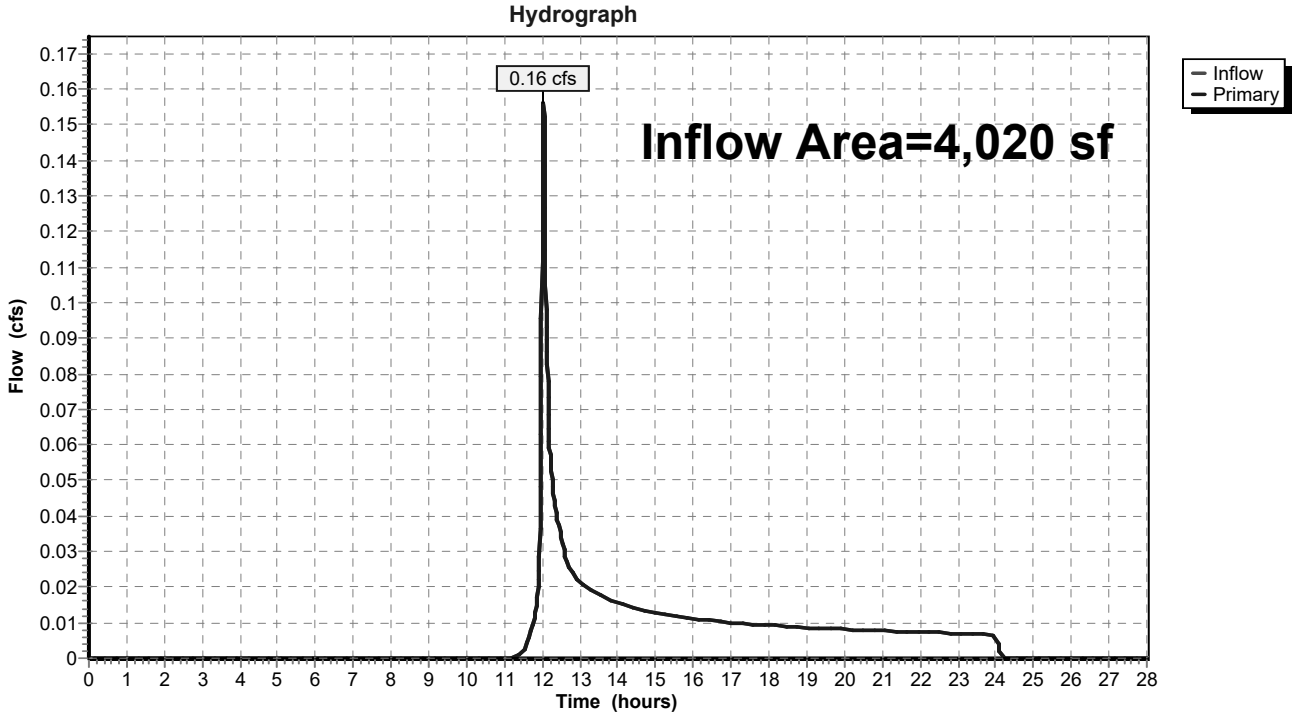


Summary for Link DP-5: Brook Street North

Inflow Area = 4,020 sf, 1.12% Impervious, Inflow Depth = 1.80" for 100-yr event
Inflow = 0.16 cfs @ 12.04 hrs, Volume= 604 cf
Primary = 0.16 cfs @ 12.04 hrs, Volume= 604 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-5: Brook Street North

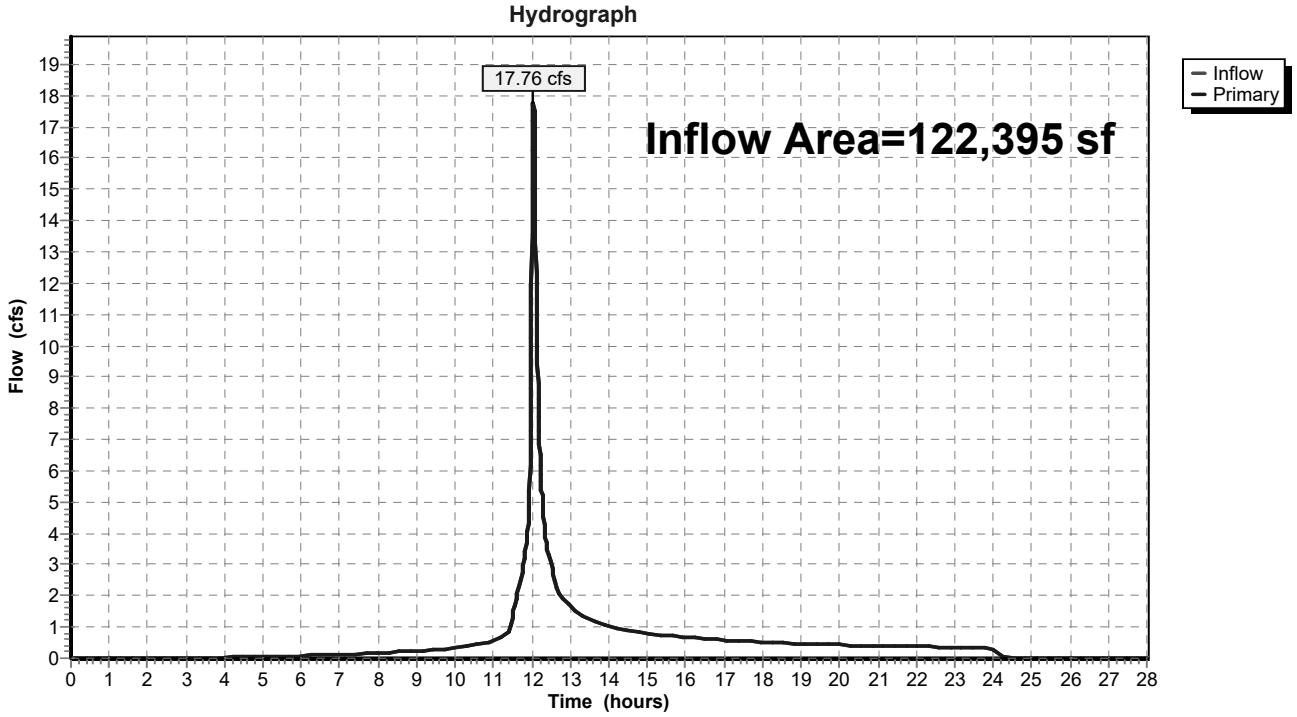


Summary for Link DP-6: Total Offsite Flow

Inflow Area = 122,395 sf, 60.17% Impervious, Inflow Depth = 5.23" for 100-yr event
Inflow = 17.76 cfs @ 12.05 hrs, Volume= 53,342 cf
Primary = 17.76 cfs @ 12.05 hrs, Volume= 53,342 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Link DP-6: Total Offsite Flow



APPENDIX D

WATER QUALITY CALCULATIONS

CTDEEP Water Quality Volume Calculations
CTDEEP Water Quality Flow Calculations
CTDEEP Groundwater Recharge Calculations
HydroCAD WQV Stage Volume Table
CTDOT Hydrodynamic Separator Sizing
Treatment Train Efficiency Worksheet

Water Quality Calculations

Determine Water Quality Volume

From CT 2004 Stormwater Quality Manual, Section 7.4.1:

$$WQV = \frac{(1")(R)(A)}{12}$$

$$R = 0.05 + 0.009(I)$$

WQV = water quality volume (ac-ft)
R = volumetric runoff coefficient
I = percent impervious cover
A = site area in acres

Area	Total Area		Impervious Area		Impervious Cover	Volumetric Runoff Coefficient	Water Quality Volume (WQV)		Water Quality Volume Provided
ID	ac	ft^2	ac	ft^2	%	R	acre-feet	ft^3	ft^3
Site Area	2.323	101,208	1.227	53,450	52.82	0.525	0.102	4,443	5,884

Note: The provided Water Quality Volume for the Underground detention System was derived from the Stage Volume tables in HydroCAD as the volume below the first orifice elevation from Pond 1P: Underground Stormwater Detention System (100.18').

Water Quality Calculations

Determine Water Quality Flow

From CT 2004 Stormwater Quality Manual:

$$CN = \frac{1000}{\left[10 + 5P + 10Q - 10\left(Q^2 + 1.25QP\right)^{\frac{1}{2}}\right]}$$

$$Q = \frac{[WQV\,(acre-feet)\times[12(inches/foot)]]}{DrainageArea(acres)}$$

$$WQF = (q_u)(A)(Q)$$

CN = Runoff Curve Number
P = design preciptation, inches, (1" for water quality storm)
Q = runoff depth (in watershed inches)
T_c = time of concentration
I_a = Initial abstraction, inches, from Table 4-1, Chapter 4, TR-55
q_u = unit peak discharge,
WQF = water quality flow (cfs)

Structure		Total Area			Imp Area		Imp Cover	R	WQV	Q	P	CN	T_c		I_a	I_a/P	q_u *	WQF
		ft^2	ac	mi^2	ft^2	ac	%	-	acre-feet	in	in	-	mins	hours	in	-	$cfs/mi^2/in$	cfs
Isolator Row	Underground Detention System	30,765	0.706	0.0011	24,550	0.564	79.80	0.768	0.045	0.76	1.00	98	5.0	0.08	0.041	0.041	650	0.54
CB-10	Inlet Hydrodynamic separator	8,300	0.191	0.0003	6,400	0.147	77.11	0.744	0.012	0.75	1.00	98	5.0	0.08	0.041	0.041	650	0.15

* From Exhibit 4-III: Unit peak discharge (qu) for SCS type III rainfall distribution, Urban Hydrology for Small Watersheds (TR-55), USDS< SCS, June 1986.

Groundwater Recharge Volume Calculations

Groundwater Recharge Volume

From CT 2004 Stormwater Quality Manual:

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

GRV Groundwater Recharge Volume (ac-ft)
D = Depth of Runoff to be Recharged (table 7-4)
A = site area in acres
I = impervious cover (decimal)

A I

Total Site Area (AC)	Site Area by NRCS Hydrologic Soil Group				Impervious Cover by NRCS Hydrologic Soil Group				Site Imperviousness (Decimel) by NRCS Hydrologic Soil Group				GRV Required		Potential Recharge Pond Volumes Proposed	
	A	B	C	D	A	B	C	D	A	B	C	D	(ac-ft)	(cu ft)	(ac-ft)	(cu ft)
2.32	2.323	0.000	0.000	0.000	1.229	0.000	0.000	0.000	0.53	0.00	0.00	0.00	0.061	2,677	0.135	5,884

Table from 2004 Connecticut Stormwater Quality Manual

Table 7-4
Groundwater Recharge Depth

NRCS Hydrologic Soil Group	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	0.10 inches
D	3 inches/year	0 inches (waived)

Source: MADEP, 1997.
NRCS – Natural Resources Conservation Service

More Conservative Groundwater Recharge Amounts used in Calculations

NRCS Hydrologic Soil	Groundwater Recharge
A	0.60
B	0.40
C	0.25
D	0.00

Stage-Area-Storage for Pond 1P: Underground Detention System

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
97.18	**3,095**	0
97.23	3,095	62
97.28	3,095	124
97.33	3,095	186
97.38	3,095	248
97.43	3,095	309
97.48	3,095	371
97.53	3,095	433
97.58	3,095	495
97.63	3,095	557
97.68	3,095	619
97.73	3,095	681
97.78	3,095	743
97.83	3,095	805
97.88	3,095	867
97.93	3,095	928
97.98	3,095	990
98.03	3,095	1,052
98.08	3,095	1,114
98.13	3,095	1,176
98.18	3,095	1,238
98.23	3,095	1,366
98.28	3,095	1,495
98.33	3,095	1,623
98.38	3,095	1,751
98.43	3,095	1,879
98.48	3,095	2,006
98.53	3,095	2,133
98.58	3,095	2,259
98.63	3,095	2,385
98.68	3,095	2,511
98.73	3,095	2,635
98.78	3,095	2,760
98.83	3,095	2,883
98.88	3,095	3,006
98.93	3,095	3,129
98.98	3,095	3,250
99.03	3,095	3,371
99.08	3,095	3,492
99.13	3,095	3,612
99.18	3,095	3,731
99.23	3,095	3,849
99.28	3,095	3,966
99.33	3,095	4,083
99.38	3,095	4,198
99.43	3,095	4,313
99.48	3,095	4,426
99.53	3,095	4,539
99.58	3,095	4,650
99.63	3,095	4,761
99.68	3,095	4,870
99.73	3,095	4,979
99.78	3,095	5,086
99.83	3,095	5,191
99.88	3,095	5,295
99.93	3,095	5,398
99.98	3,095	5,498
100.03	3,095	5,598
100.08	3,095	5,695
100.13	3,095	5,791
100.18	3,095	5,884
100.23	3,095	5,976
100.28	3,095	6,064
100.33	3,095	6,150
100.38	3,095	6,233
100.43	3,095	6,310
100.48	3,095	6,384
100.53	3,095	6,453
100.58	3,095	6,520
100.63	3,095	6,585
100.68	3,095	6,648
100.73	3,095	6,710
100.78	3,095	6,772
100.83	3,095	6,834
100.88	3,095	6,896
100.93	3,095	6,957
100.98	3,095	7,019
101.03	3,095	7,081
101.08	3,095	7,143
101.13	3,095	7,205
101.18	3,095	**7,267**

WQV PROVIDED
5,884 CF

Exhibit 4-III Unit peal discharge (q_u) for NRCS (SCS) type III rainfall distribution

Isolator Row
& HDS CB-110
650

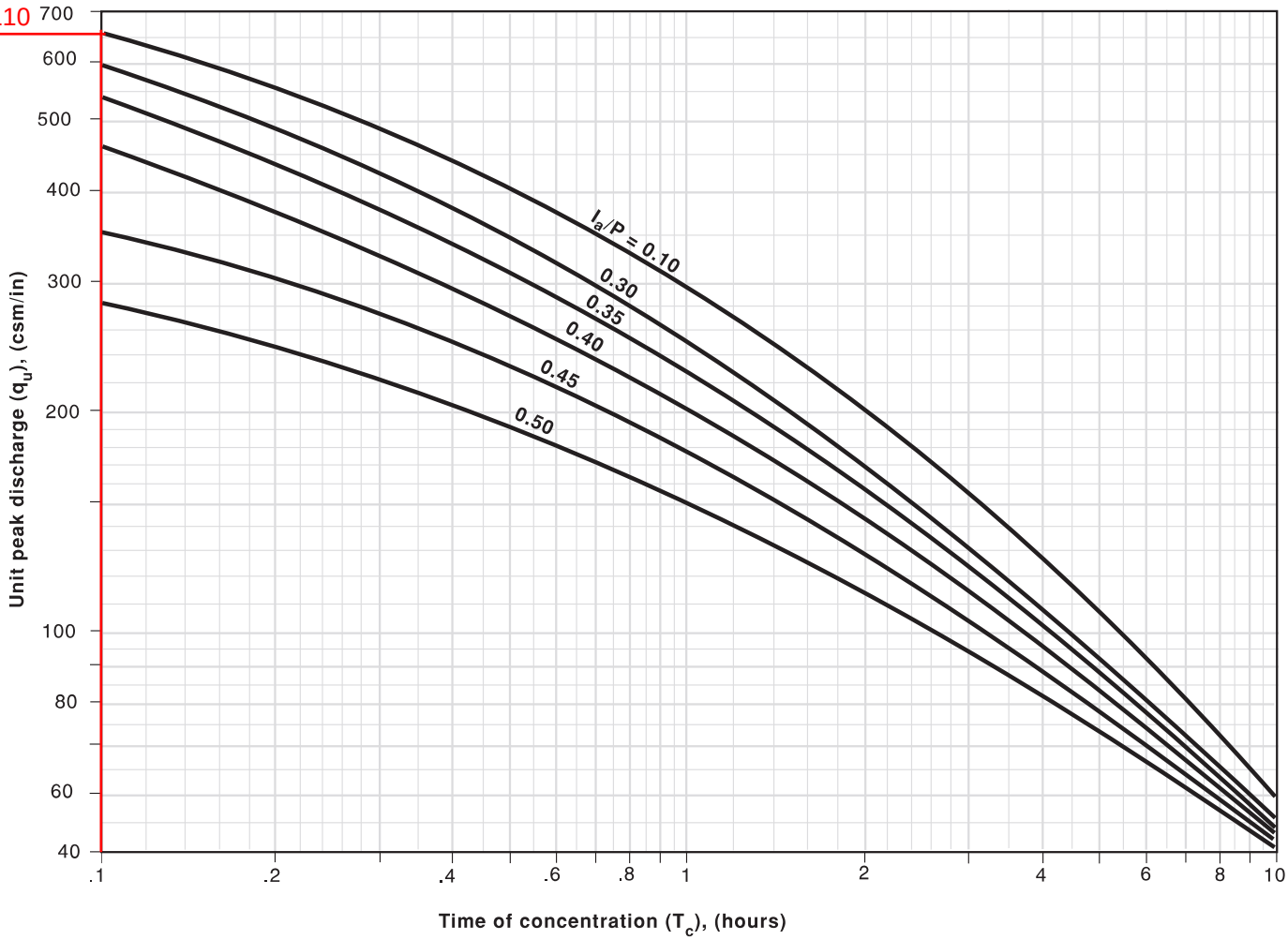


TABLE 2 - PERFORMANCE MATRIX FOR CONNDOT APPROVED HYDRODYNAMIC SEPARATORS

Maximum WQF (cfs)	Product Model								
	Downstream Defender	*Flogard*	*High Eff. CDS*	*Hydroguard*	*Stormceptor OSR*	*Stormceptor STC*	*Vortechs*	*Vortsentry*	*V2B1*
HDS CB-10 0.4	4-ft	DVS-36	2015-4G; 2015-4	HG 4	065	450	1000	VS30	2
0.5	4-ft	DVS-36	2015-4G; 2015-4	HG 4	065	900	1000	VS30	2
0.6	4-ft	DVS-36	2015-4G; 2015-4	HG 4	065	900	1000	VS40	2
0.7	4-ft	DVS-48	2015-4G; 2015-4	HG 4	140	900	1000	VS40	2
0.8	4-ft	DVS-48	2015-4G; 2015-4	HG 4	140	900	1000	VS40	2
0.9	4-ft	DVS-48	2015-4G; 2015-4	HG 4	140	1200	1000	VS40	3
1.0	4-ft	DVS-48	2015-4G; 2015-4	HG 4	140	1800	1000	VS40	3
1.1	4-ft	DVS-48	2015-4G; 2015-4	HG 4	140	1800	1000	VS40	4
1.2	6-ft	DVS-48	2015	HG 5	140	2400	1000	VS50	4
1.3	6-ft	DVS-60	2015	HG 5	140	2400	1000	VS50	4
1.4	6-ft	DVS-60	2015	HG 5	140	2400	2000	VS50	4
1.5	6-ft	DVS-60	2020	HG 5	140	2400	2000	VS50	6
1.6	6-ft	DVS-60	2020	HG 5	140	2400	2000	VS50	6
1.7	6-ft	DVS-60	2020	HG 5	250	2400	2000	VS50	6
1.8	6-ft	DVS-60	2020	HG 6	250	2400	2000	VS50	7
1.9	6-ft	DVS-60	2020	HG 6	250	3600	2000	VS60	7
2.0	6-ft	DVS-60	2020	HG 6	250	3600	2000	VS60	7
2.1	6-ft	DVS-60	2020	HG 6	250	3600	2000	VS60	9
2.2	6-ft	DVS-72	2025	HG 6	250	3600	2000	VS60	8
2.3	6-ft	DVS-72	3020, 3020-D	HG 6	250	3600	2000	VS60	8
2.4	6-ft	DVS-72	3035; 3035-D	HG 6	250	4800	2000	VS60	8
2.5	6-ft	DVS-72	3035; 3035-D	HG 6	250	4800	3000	VS60	10
2.6	6-ft	DVS-72	3035; 3035-D	HG 6	250	4800	3000	VS60	11
2.7	6-ft	DVS-72	3035; 3035-D	HG 7	250	4800	3000	VS60	11
2.8	6-ft	DVS-72	3035; 3035-D	HG 7	250	4800	3000	VS70	11
2.9	6-ft	DVS-72	3035; 3035-D	HG 7	250	4800	3000	VS70	12
3.0	6-ft	DVS-72	3035; 3035-D	HG 7	390	4800	3000	VS70	12

Best Management Practice (BMP) Treatment Train Efficiency Worksheet

Prepared for:
Sacred Heart EdAdvance
95-104 Grove Streeet
Torrington, Connecticut

Prepared by:
BL Companies
355 Research Parkway
Meriden, CT

Date prepared:
March 27, 2023

Overall Site Treatment Train Efficiency to Underground Detention System (Isolator Row)

Et=[1-(1-E1)(1-E2)(1-E3)(1-E4)(1-E?)]*100

BMP	BMP Description	Type pf Treatment	Efficiency Rate %
E1	Impervious Surface Sweeping***	secondary (conventional)	10
E2	Deep Sump and Hooded Catch Basin	secondary (conventional)	25
E3	Isolator Row**	Primary	80

Overall Treatment Train Efficiency (Et)= **87 % Total Suspended Solids (TSS) Remova**

* 80% required per CT DEEP
** Manufacturer Claims 80% TSS Removal
*** Schueler 1996 & EPA 1993

BMP	*Type pf Treatment*	*TSS Removal Rate*	*Starting TSS Load*	*Amount Removed*	*Remaining Load*
Impervious Surface Sweeping***	secondary (conventional)	0.10	1.00	0.10	0.90
Deep Sump and Hooded Catch Basin	secondary (conventional)	0.25	0.90	0.23	0.68
Isolator Row**	Primary	0.80	0.68	0.54	0.14

Overall Treatment Train Efficiency (% **87**

TSS Removal Rates (adapted from Schueler, 1996, & EPA, 1993)

BMP List	Design Rate	Range of Average TSS Removal Rates	Brief Design Requirements
Extended Detention Pond	70%	60-80%	Sediment forebay
Wet Pond (a)	70%	60-80%	Sediment forebay
Constructed Wetland (b)	80%	65-80%	Designed to infiltrate or retain
Water Quality Swale	70%	60-80%	Designed to infiltrate or retain
Infiltration Trench	80%	75-80%	Pretreatment critical
Infiltration Basin	80%	75-80% (predicted)	Pretreatment critical
Dry Well	80%	80% (predicted)	Rooftop runoff
			(uncontaminated only)
Sand Filter (c)	80%	80%	Pretreatment
Organic Filter (d)	80%	80%+	Pretreatment
Water Quality Inlet	25%	15-35% w/ cleanout	Off-line only; 0.1" minimum Water Quality Volume (WQV) storage
Sediment Trap (Forebay)	25%	25% w/ cleanout	Storm flows for 2-year event must not cause erosion; 0.1" minimum WQV storage
Drainage Channel	25%	25%	Check dams; non-erosive for 2-yr.
Deep Sump and Hooded Catch Basin	25%	25% w/ cleanout	Deep sump general rule = 4 x pipe diameter or 4.0' for pipes 18" or less
Street Sweeping	10%	10%	Discretionary non-structural credit, must be part of approved plan

Best Management Practice (BMP) Treatment Train Efficiency Worksheet

Prepared for:
Sacred Heart EdAdvance
95-104 Grove Streeet
Torrington, Connecticut

Prepared by:
BL Companies
355 Research Parkway
Meriden, CT

Date prepared:
March 27, 2023

Overall Site Treatment Train Efficiency to Underground Detention System (HDS)

Et=[1-(1-E1)(1-E2)(1-E3)(1-E4)(1-E?)]*100

BMP	BMP Description	Type pf Treatment	Efficiency Rate %
E1	Impervious Surface Sweeping***	secondary (conventional)	10
E2	Deep Sump and Hooded Catch Basin	secondary (conventional)	25
E3	Hydrodynamic Separator**	Primary	80

Overall Treatment Train Efficiency (Et)= **87 % Total Suspended Solids (TSS) Remova**

* 80% required per CT DEEP
** Manufacturer Claims 80% TSS Removal
*** Schueler 1996 & EPA 1993

BMP	*Type pf Treatment*	*TSS Removal Rate*	*Starting TSS Load*	*Amount Removed*	*Remaining Load*
Impervious Surface Sweeping***	secondary (conventional)	0.10	1.00	0.10	0.90
Deep Sump and Hooded Catch Basin	secondary (conventional)	0.25	0.90	0.23	0.68
Hydrodynamic Separator**	Primary	0.80	0.68	0.54	0.14

Overall Treatment Train Efficiency (% **87**

TSS Removal Rates (adapted from Schueler, 1996, & EPA, 1993)

BMP List	Design Rate	Range of Average TSS Removal Rates	Brief Design Requirements
Extended Detention Pond	70%	60-80%	Sediment forebay
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Infiltration Trench	80%	75-80%	Pretreatment critical
Infiltration Basin	80%	75-80% (predicted)	Pretreatment critical
Dry Well	80%	80% (predicted)	Rooftop runoff
			(uncontaminated only)
Sand Filter (c)	80%	80%	Pretreatment
Organic Filter (d)	80%	80%+	Pretreatment
Water Quality Inlet	25%	15-35% w/ cleanout	Off-line only; 0.1" minimum Water Quality Volume (WQV) storage
Sediment Trap (Forebay)	25%	25% w/ cleanout	Storm flows for 2-year event must not cause erosion; 0.1" minimum WQV storage
Drainage Channel	25%	25%	Check dams; non-erosive for 2-yr.
Deep Sump and Hooded Catch Basin	25%	25% w/ cleanout	Deep sump general rule = 4 x pipe diameter or 4.0' for pipes 18" or less
Street Sweeping	10%	10%	Discretionary non-structural credit, must be part of approved plan

APPENDIX E

DRAINAGE MAPS

ED-1 – Existing Drainage Map
PD-1 – Proposed Drainage Map
GD-1 – Grading and Drainage Plan

EXISTING HYDROLOGY INFORMATION

DRAINAGE AREA	TOTAL AREA (S.F.)	IMPERVIOUS AREA (S.F.)	PERVIOUS AREA (S.F.)	PERCENT IMPERVIOUS (%)	CN	TIME OF CONCETRATION (MIN.)
EDA-10	12,270	1,575	10,695	12.8%	55	5.0
EDA-20	67,225	54,565	12,660	81.2%	89	7.1
EDA-30	9,035	4,980	4,055	55.1%	76	6.1
EDA-40	22,400	8,130	14,270	36.3%	67	5.0
EDA-50	11,465	1,985	9,480	17.3%	57	5.0

HYDROLOGY LEGEND

PROPERTY LINE

DRAINAGE AREA BOUNDARY

TIME OF CONCENTRATION ROUTE

DESIGN POINT

DP-X

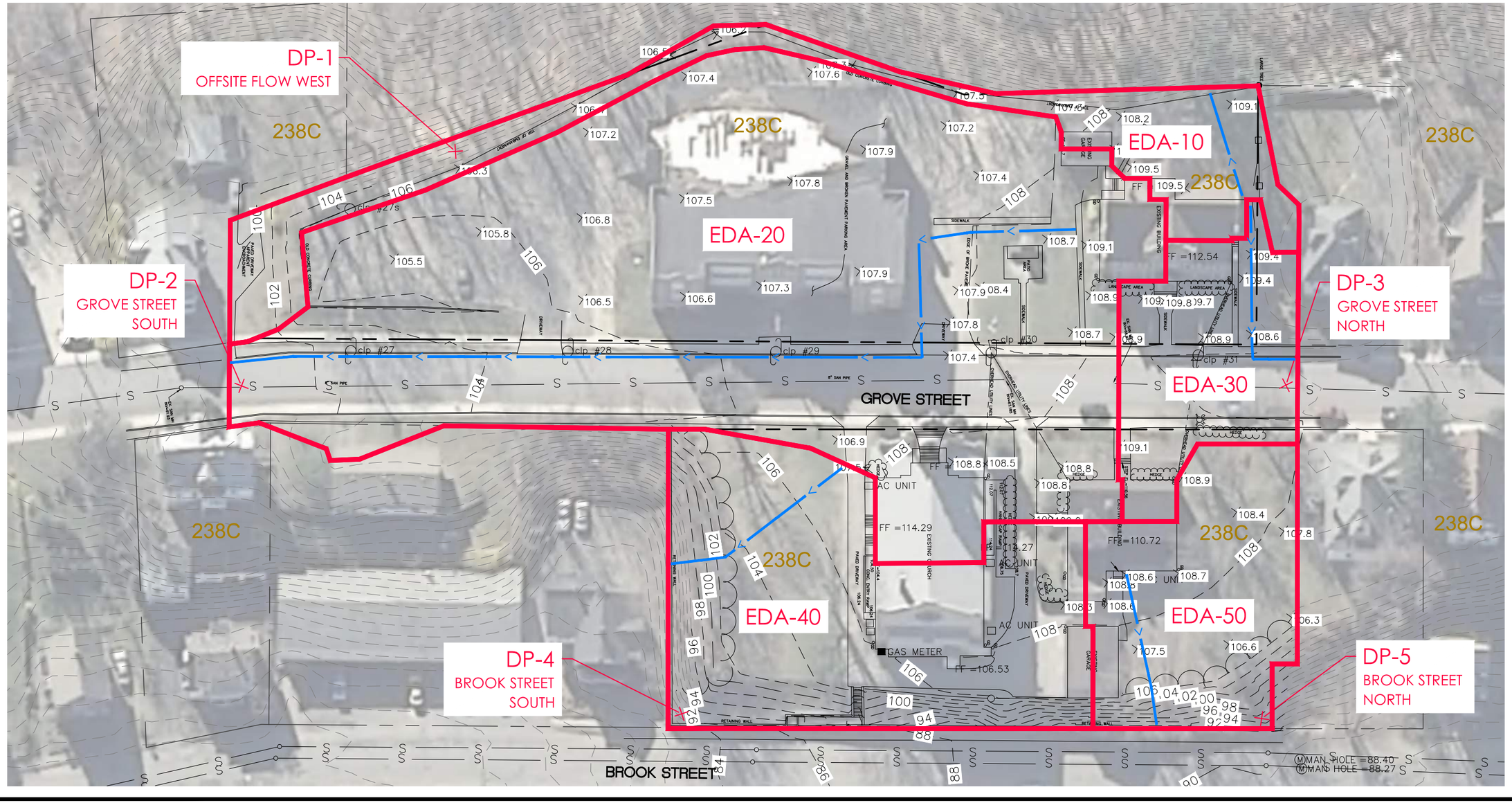
HINCKLEY–URBAN LAND COMPLEX SOIL, 3 TO 15 PERCENT SLOPES

238C

GRAPHIC SCALE

50 25 0 50

SCALE IN FEET



PROPOSED EDADVANCE BUILDING
95–104 GROVE STREET
TORRINGTON, CONNECTICUT

Designed	C.J.L.
Drawn	C.J.L.
Reviewed	R.M.R.
Scale	1"=50'
Project	2202472
Date	03/31/2023

EXISTING DRAINAGE MAPPING

ED-1

PROPOSED HYDROLOGY INFORMATION

DRAINAGE AREA	TOTAL AREA (S.F.)	IMPERVIOUS AREA (S.F.)	PERVIOUS AREA (S.F.)	PERCENT IMPERVIOUS (%)	CN	TIME OF CONCETRATION (MIN.)
PDA-100	18,565	1,320	17,245	7.1%	43	5.0
PDA-110	10,885	8,915	1,970	81.9%	87	5.5
PDA-120	10,425	10,425	0	100.0%	98	5.0
PDA-130	8,295	7,020	1,275	84.6%	89	5.0
PDA-140	11,585	8,615	2,970	74.4%	83	5.0
PDA-200	38,890	28,375	10,515	73.0%	82	7.6
PDA-300	8,855	4,980	3,875	56.2%	72	6.1
PDA-400	10,875	3,945	6,930	36.3%	60	5.0
PDA-500	4,020	45	3,975	1.1%	40	5.0

HYDROLOGY LEGEND

PROPERTY LINE

DRAINAGE AREA BOUNDARY

TIME OF CONCENTRATION ROUTE

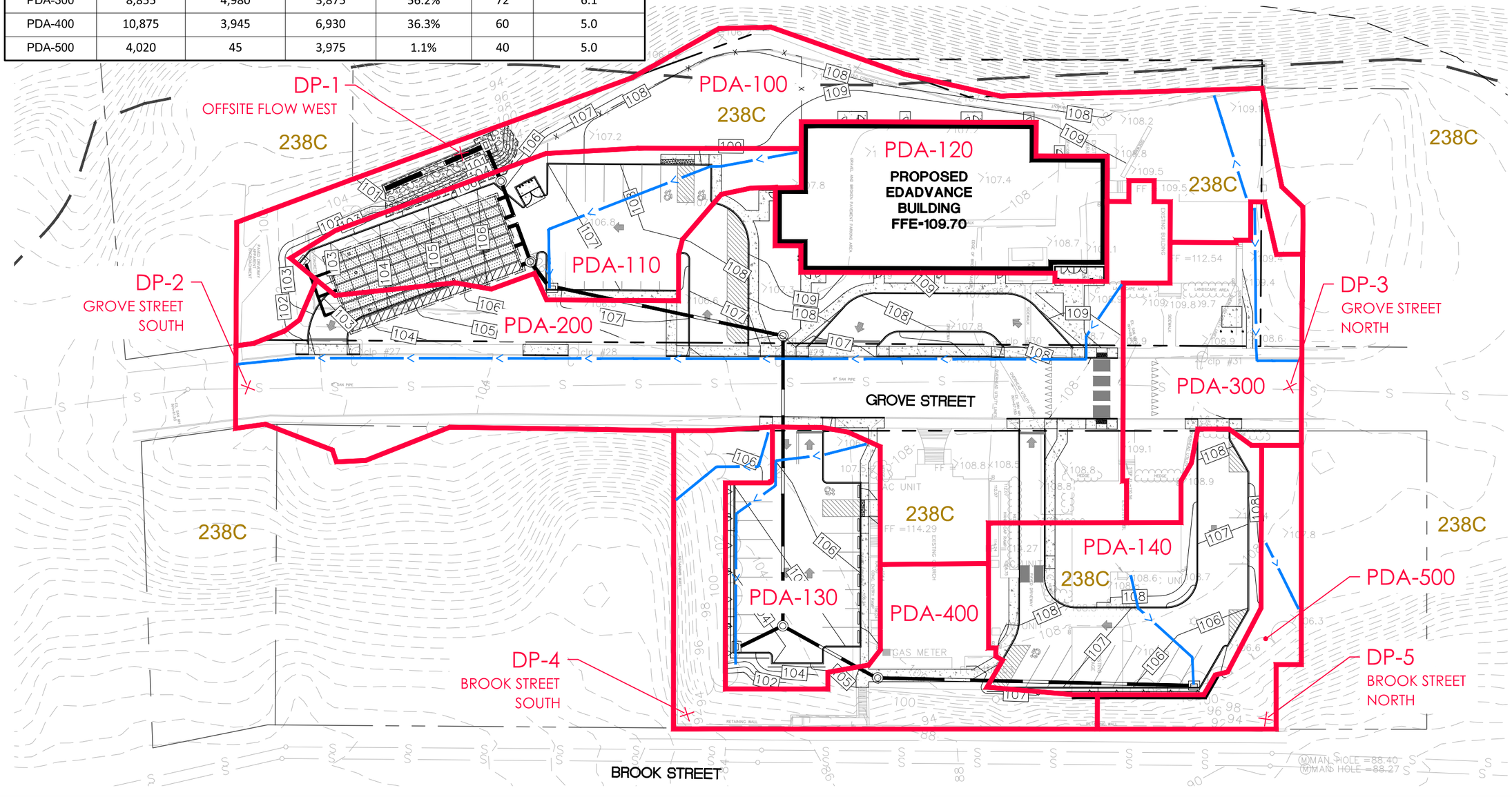
DESIGN POINT — DP-X

HINCKLEY–URBAN LAND COMPLEX SOIL, 3 TO 15 PERCENT SLOPES — 238C

GRAPHIC SCALE

50 25 0 50

SCALE IN FEET



BL Companies

PROPOSED EDADVANCE BUILDING
95–104 GROVE STREET
TORRINGTON, CONNECTICUT

Designed	C.J.L.
Drawn	C.J.L.
Reviewed	R.M.R.
Scale	1"=50'
Project	2202472
Date	03/31/2023

PROPOSED DRAINAGE MAPPING

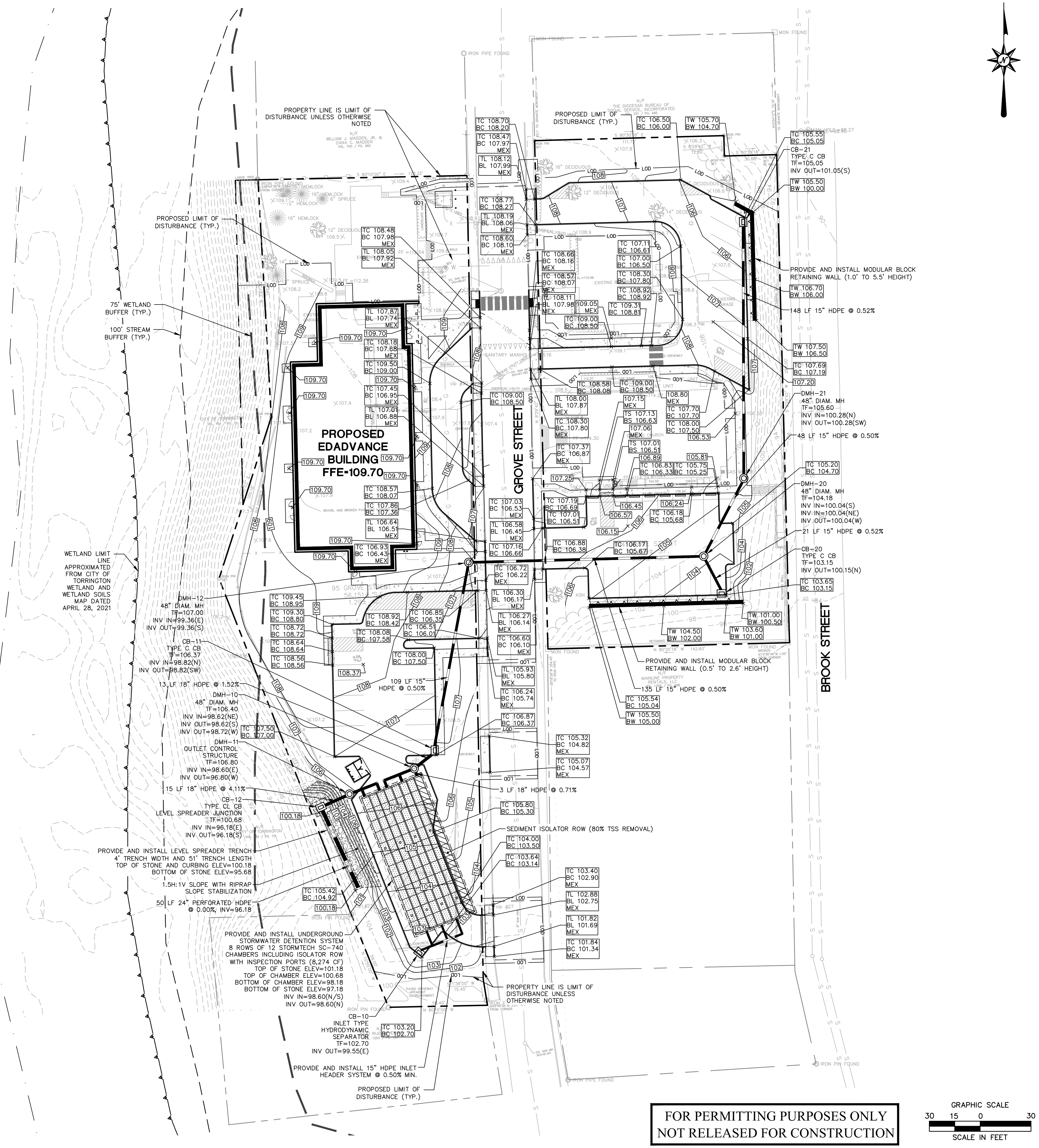
PD-1

GRADING AND DRAINAGE LEGEND

(line symbol)	PROPERTY LINE
LOD	PROPOSED LIMIT OF DISTURBANCE LINE AND CONTRACT LIMIT LINE
(line symbol)	PROPOSED SAWCUT LINE
(line symbol)	PROVIDE AND INSTALL STORM PIPE
106	PROPOSED ELEVATION CONTOUR (1' INTERVAL)
106	EXISTING ELEVATION CONTOUR (2' INTERVAL)
(symbol)	PROVIDE AND INSTALL CURBLESS TYPE CATCH BASIN (TYPE C-L)
(symbol)	PROVIDE AND INSTALL CURB TYPE CATCH BASIN (TYPE C)
(symbol)	PROVIDE AND INSTALL YARD DRAIN
(symbol)	PROVIDE AND INSTALL DRAINAGE MANHOLE
×106.00	PROPOSED SPOT GRADE
(hatch)	PROVIDE AND INSTALL RIPRAP OR CRUSHED STONE

SPOT GRADE ABBREVIATIONS

BC	BOTTOM OF CURB
TC	TOP OF CURB
BS	BOTTOM OF STEP
TS	TOP OF STEP
BL	BOTTOM OF LIP
TL	TOP OF LIP
BW	BOTTOM OF WALL
TW	TOP OF WALL
MEX	MEET EXISTING CONDITION



FOR PERMITTING PURPOSES ONLY
NOT RELEASED FOR CONSTRUCTION

Architecture
Engineering
Environmental
Land Surveying

BL Companies

355 Research Parkway
Meriden, CT 06450
(203) 630-1406

PROPOSED EDADVANCE BUILDING

95-104 GROVE STREET
TORRINGTON, CONNECTICUT

REVISIONS

No.	Date	Desc.
1.	3/23/2023	REVISED PER CITY STAFF COMMENTS

Designed	C.J.L.
Drawn	C.J.L.
Reviewed	
Scale	1"=30'
Project No.	2202472
Date	03/10/2023
CAD File:	GD220247201

Title
GRADING AND DRAINAGE PLAN

Sheet No.
GD-1

APPENDIX F

STORMWATER SYSTEM
OPERATION AND MAINTENANCE MANUAL

Appendix F:

Stormwater System Operations and Maintenance Plan

For the Proposed:

EdAdvance Building

Located at:

95-104 Grove Street
Torrington, Connecticut

Prepared for Submission to:

City of Torrington, Connecticut

March 31, 2023

Prepared for:

A. Secondino & Son, Inc.
PO Box 622 / 21 Acorn Road
Branford, CT 06405

Prepared by:

BL Companies
100 Constitution Plaza, 10th Floor
Hartford, Connecticut 06103
Phone: (860) 249-2200
Fax: (860) 249-2400

BL Project Number: 2202472

Table of Contents

General Overview

The project parcel, located at 95-104 Grove Street, is approximately 1.29 acres in size and is currently developed with an existing convent building and was the previous location of a school building demolished within the past decade. The existing Lot 2 is approximately 0.97 acres in size and is currently developed with the Sacred Heart Church building and rectory. The proposed EdAdvance school development is to be constructed on Lot 1, while work on Lot 2 consists of reconfiguration of existing parking areas. The properties are situated with Lot 1 on the western side of Grove Street and Lot 2 on the eastern side. Lot 2 is also bordered by Brook Street to the east. The parcels are bordered by residential properties on all sides. The East Branch Naugatuck River runs from north to south off Lot 1's western boundary.

The project parcels are located at a high point in elevation of Grove Street. In general, the existing topography Grove Street slopes from high point down to the north and south from approximately elevation 591' at the high point to 519' at the northern extent and 583' in the southern extent. Slopes on Lot 1 vary from approximately 2-3% along Grove Street to approximately 25% at the embankment drop-off to the west. Slopes on Lot 2 vary from 2-6% along Grove Street to approximately 67% at the embankment drop-off to Brook Street in the east. Several retaining walls exist on Lot 2 along the boundary with Brook Street supporting Lot 2 above Brook Street elevation.

Proposed site improvements include a ±10,300 square foot school building with paved parking areas and driveways, landscaped areas, pedestrian sidewalks, site utilities and lighting, and stormwater management system upgrades. The proposed stormwater management system is designed to be in compliance with the 2002 State of Connecticut Guidelines for Soil Erosion and Sediment Control, and the 2004 State of Connecticut Stormwater Quality Manual.

The following Operations and Maintenance Plan was prepared specifically for this proposed development in the City of Torrington, Connecticut. The Plan was developed to satisfy the requirements of the Connecticut Department of Energy and Environmental Protection's 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

Purpose & Goals

The purpose of this Manual is to ensure that the stormwater management components are operated in accordance with all approvals and permits. The primary goal is to inform all the property managers about how the system operates and what maintenance items are necessary to protect downstream wetlands and watercourses. The secondary goal is to provide a practical, efficient means of maintenance planning and record keeping to verify permit compliance.

Responsible Parties

The Property Owner will be responsible for implementing the Plan on the property.

Maintenance inspections shall be performed by a qualified professional.

Some utilities located on the site will be owned and maintained by various utility companies in accordance with their standards. The property owner may maintain the service connections.

List of Permits & Special Conditions

The project will receive several permits, which may contain special conditions that require compliance by the property owner and maintenance contractors. This permit may include the following:

- City of Torrington – Wetlands Permit, Site Plan Permit, Demolition Permit, and Building Permit

Maintenance Logs and Checklists

The property owner will keep a record of all maintenance procedures performed, date of inspection/ cleanings, etc. Copies of inspection reports and maintenance records shall be kept on-site.

Forms

The following forms will be developed for annual maintenance. Copies of the forms will be kept on-site as part of the Storm Water Management Plan.

- Annual Checklist
- Quarterly Checklist
- Monthly Checklist

Employee Training

The property owner will have an employee-training program, with annual up-dates, to ensure that the qualified employees charged with maintaining the buildings and grounds do so in accordance with the approved permit conditions. All employees that have maintenance duties will be adequately informed of their responsibilities.

Spill Control

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and clean-up:

- Manufacturer's recommended methods for spill clean-up will be clearly posted and site personnel will be made aware of the procedures and the location of the information and clean-up supplies.

- Materials and equipment necessary for spill clean-up will be kept in the material storage area on-site. Equipment and materials will include but not be limited to: absorbent booms or mats, brooms, dust pans, mops, rags, gloves, goggles, sand, and plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned immediately after discovery.
- The spill area will be kept well-ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with hazardous substance.
- Spills of toxic or hazardous material, regardless of size, will be reported to the appropriate State or local government agency.
- If a spill occurs, this plan will be adjusted to include measures to prevent this type of spill from reoccurring and how to clean the spill if there is another one. A description of the spill, the cause, and the remediation measures will also be included.

A spill report shall be prepared by the property owner following each occurrence. The spill report shall present a description of the release, including quantity and type of material, date of spill, circumstances leading to the release, location of spill, response actions and personnel, documentation of notifications and corrective measures implemented to prevent reoccurrence.

The property owner shall identify an appropriately qualified and trained site employee involved with day-to-day site operations to be the spill prevention and clean-up coordinator. The name(s) of responsible spill personnel shall be posted on-site. Each employee shall be instructed that all spills are to be reported to the spill prevention and clean-up coordinator.

Storm Water Management

System Components

The storm water management system has several components that are shown on the Grading and Drainage Plan (GD-1), that performs various functions in treating storm water runoff:

Catch Basins and Manholes

The property owner is responsible for cleaning the catch basins and manholes on the property. A Connecticut Licensed hauler shall clean the sumps and dispose of removed sand legally. The road sand may be reused for winter sanding but may not be stored on-site. As part of the hauling contract, the hauler shall notify the property owner in writing where the material is being disposed.

Each catch basin shall be inspected every four months, with one inspection occurring during the month of April. Any debris occurring within one foot from the bottom of each sump shall be removed by Vacuum "Vactor" type of maintenance equipment.

During the inspection of each of the catch basin sumps, the hoods (where provided) on each of the outlet pipes shall also be observed for trash accumulation as well as overall condition. In the event that a hood is damaged or off the hanger, it shall be reset or repaired.

Isolator Row and Underground Detention System

The underground detention system and Isolator Row shall be inspected every six months in the months of April and September. Each of the inspection ports provided shall be opened and visually checked from the surface. Observation of grit inside of the detention system shall be noted and any deposits found to be 2 inches or more, as measured from the invert of pipe, shall be cleaned and removed. The underground detention system qualifies as a Confined Space under OSHA regulations, and any maintenance involving entry into the pipes should comply with OSHA Confined Space Entry Regulations.

Hydrodynamic Separator (or Approved Equal)

The hydrodynamic separator shall be cleaned periodically during construction, with one cleaning and inspection occurring at the end of construction after landscaped areas are fully stabilized.

For the first year of operation following construction, inspect each structure once each month during January, February, March, and April, and once every four months thereafter. A graduated measuring device (stadia rod) shall be inserted into each grit chamber and measurements of any accumulations shall be recorded. Any debris, which has accumulated to within one foot of the water surface inside the grit chamber portion of each tank, shall be removed by vacuum "Vactor" type equipment.

After the first year of operation, each structure shall be inspected at a minimum, three times yearly with one inspection occurring in the month of April in the same manner as described above for the first season of operation. Any accumulations found to be occurring within one foot of the water surface shall be removed from the structure and properly disposed off-site. Also, any floating material discovered during inspections shall be removed from the tank.

Level Spreader

Catch basins draining to the level spreader, including the level spreader junction catch basin, level spreader stone trench and curbing, and the area downstream from the level spreader shall be inspected for clogging, density of vegetation, damage by foot or vehicular traffic, excessive accumulations, and channelization. Inspections shall be made on a quarterly basis for the first two years following installation, and then on a semiannual basis thereafter. Inspections shall be performed after every storm event greater than 1-inch.

Catch basins draining to level spreaders shall be cleaned when sediment accumulation reaches a depth of 1', or on a minimum annual basis. Sediment and debris shall be removed from downstream areas on a minimum semiannual basis or whenever buildup is observed. Regrading and reseeding may be necessary to perform the maintenance procedure.

Site Maintenance

Parking Lots

Parking lots and sidewalks shall be swept as necessary by the property owner, or at least once per year, to clean sediment, trash, and other debris. The property owner will sweep parking lots on the property in the spring to remove winter accumulations of road sand.

Landscaping

The management company retained by the property owner will maintain landscaped areas. Normally the landscaping maintenance will consist of pruning, mulching, planting, mowing lawns, raking leaves, etc. Use of fertilizers and pesticides will be controlled and limited to minimal amounts necessary for healthy landscape maintenance.

The lawn areas, once established, will be maintained at a typical height of 3 ½". This will allow the grass to be maintained with minimal impact from weeds and/or pests. The low-maintenance areas will be maintained as a meadow or allowed to revert back to natural conditions. Topsoil, brush, leaves, clippings, woodchips, mulch, equipment, and other material shall be stored off site.

Outdoor Storage

There will be no outdoor storage of hazardous chemicals, de-icing agents, fertilizer, pesticides, or herbicides anywhere around the buildings.

Deicing and Snow Removal & Storage

The use of clean sand may be used to aid traction in conjunction with salt and/or chemicals for deicing, snow melting and other related winter weather management. Snow shall be shoveled and plowed from sidewalk and parking areas as soon as practical during and after winter storms. Sand accumulation shall be removed from the site at the end of the winter season or appropriate time when seasonal snow has melted. Alternative deicing methods must be submitted prior to use onsite for review to the City of Torrington for approval.

MAINTENANCE SCHEDULE

During the First Year of Operation:		
Task:	Completion Date:	Manager's Initials:
JANUARY:		
Employee Training Program with Spill Program		
*Catch Basin Inspection		
*Isolator Row and Subsurface Stormwater Detention		
*Hydrodynamic Separator Inspection		
Level Spreader Inspection		
FEBRUARY:		
*Isolator Row and Subsurface Stormwater Detention		
*Hydrodynamic Separator Inspection		
MARCH:		
*Isolator Row and Subsurface Stormwater Detention		
*Hydrodynamic Separator Inspection		
APRIL:		
*Catch Basin Inspection		
*Isolator Row and Subsurface Stormwater Detention		
*Hydrodynamic Separator Inspection		
Level Spreader Inspection		
Sweeping of Paved Surfaces		
Shrub Fertilization		
Lawn Liming (if necessary)		
JUNE:		
*Catch Basin Inspection		
Sweeping of Paved Surfaces		
SEPTEMBER:		
*Isolator Row and Subsurface Stormwater Detention		
Level Spreader Inspection		
Sweeping of Paved Surfaces		
Tree and Lawn Fertilization		
DECEMBER:		
*Catch Basin Inspection		
*Isolator Row and Subsurface Stormwater Detention		
Level Spreader Inspection		
Sweeping of Paved Surfaces		

*NOTE: Use appropriate worksheet found in this plan to conduct the inspection.

After the First Year of Operation:			
FOR YEAR_____			
Task:		Completion Date:	Manager's Initials:
JANUARY:			
Employee Training Program with Spill Program			
APRIL:			
*Catch Basin Inspection			
*Isolator Row and Subsurface Stormwater Detention			
*Hydrodynamic Separator Inspection			
Level Spreader Inspection			
Sweeping of Paved Surfaces			
Shrub Fertilization			
Lawn Liming (if necessary)			
JUNE:			
*Catch Basin Inspection			
Sweeping of Paved Surfaces			
SEPTEMBER:			
*Isolator Row and Subsurface Stormwater Detention			
*Hydrodynamic Separator Inspection			
Level Spreader Inspection			
Sweeping of Paved Surfaces			
Tree and Lawn Fertilization			
DECEMBER:			
*Catch Basin Inspection			
*Hydrodynamic Separator Inspection			
Sweeping of Paved Surfaces			

*NOTE: Use appropriate worksheet found in this plan to conduct the inspection.

CATCH BASIN / CATCH BASIN INSERT / HDS INSPECTION LOG

Name of Inspector: Date:

Catch Basin ID	Condition (circle one)		Debris above 1’ within sump? (If yes then catch basin is to be cleaned)		Date of Catch Basin/Cleaning (if debris is greater than 1’)		Condition of Hood (if applicable, remove trash/debris if necessary)	Comments:
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							

On-site Procedures for Inspection and Maintenance of Catch Basin Inserts

- Secure traffic and pedestrian traffic with cones, barrels, etc.
- Clean surface area around each catch basin.
- Remove grates and set aside
- Clean grates, remove litter and debris that may be trapped within the grate
- Visually inspect condition of outlet hood and remove trash and debris from hood if necessary.
- Remove by vactor hose the debris that has been trapped in the trough area. Dispose of in accordance with local, state and federal regulatory agency requirements. Most debris that is captured in the trough or sump area will fall into the non-hazardous waste category.
- Visually inspect and check the condition of the trough area.
- Replace grate and lockdown as needed.
- Un-secure traffic control area.
- Complete service report and submit to facility owner.

SUBSURFACE STROWMATER DETENTION SYSTEM AND ISOLATOR ROW INSPECTION LOG

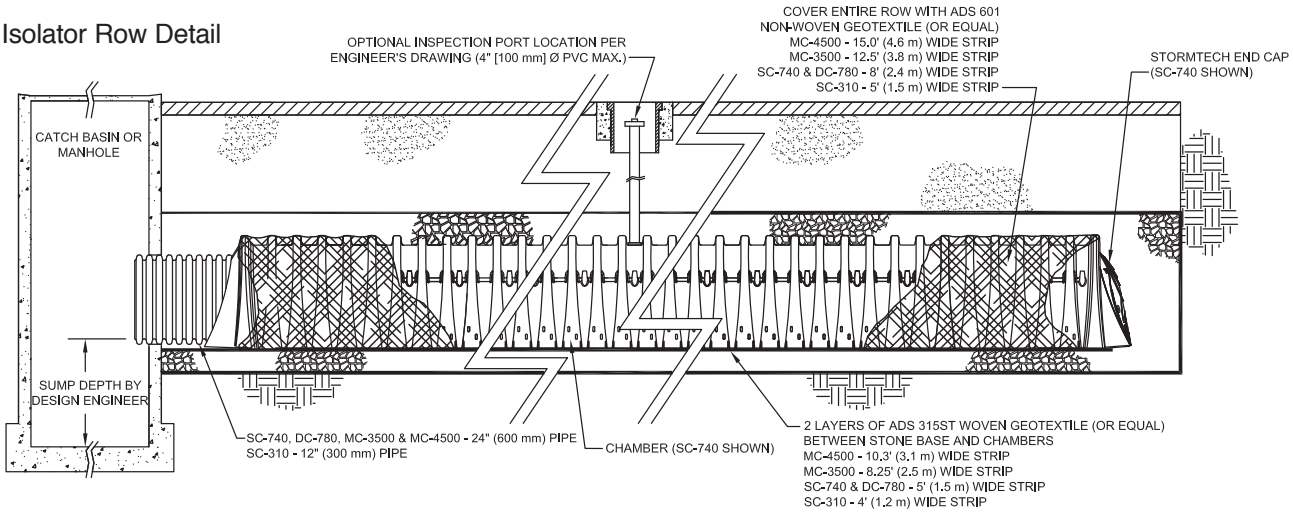
Name of Inspector:							Date:					
Basin ID	Overall condition of Inlet Pipe (circle one)			Condition of Facility (circle one)			Debris and Sediment Removed from Basin?[1]		Inlets and Outlets are Clear and Functioning?		Date of Cleaning Performed	Comments
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		
	Excellent	Fair	Poor	Excellent	Fair	Poor	Yes	No	Yes	No		

1 – Sediment deposits shall be removed from the subsurface detention basin when the deposited material reaches a height of 2” measured from the top of the stone bedding.

StormTech and Stormwater Quality

StormTech's patented Isolator™ Row is a row of chambers wrapped in a geotextile which filters the stormwater trapping pollutants in the row. The Isolator Row provides a way to inspect and maintain the system.

Isolator Row Detail



Note: For many applications, the non-woven geotextile over the DC-780, MC-3500 and MC-4500 Isolator Row chambers can be eliminated or substituted with the AASHTO Class 1 woven geotextile. Contact your StormTech representative for assistance.

Isolator Row Field Verification Testing at the University of New Hampshire Stormwater Center

- Field testing (TARP tier II protocol) of the Isolator Row has been ongoing since December 2006.
- Removal efficiencies for TSS have improved as the filter cake has built up on the bottom fabric of the Isolator Row.
- Current data shows a TSS removal efficiency which exceeds 80%.

Removal Efficiency Results:

- Total Suspended Solids = 80%
- Phosphorous = 49%
- Total Petroleum Hydrocarbons = 90%
- Zinc = 53%

This system achieves a removal efficiency of 80% for TSS which meets most municipal recommended levels for water quality treatment.

Inspection and Maintenance

The Isolator Row can be inspected through the upstream manhole or optional inspection port.

Maintenance is easily accomplished with the JetVac process.

The frequency of inspection and maintenance varies by location. Contact StormTech for assistance with inspection and maintenance scheduling.

StormTech®
Detention • Retention • Water Quality
An ADS company

Isolator® Row O&M Manual


SC-740


MC-3500


MC-4500

THE MOST **ADVANCED** NAME IN WATER MANAGEMENT SOLUTIONS™

ADS®

THE ISOLATOR® ROW

INTRODUCTION

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row is a technique to inexpensively enhance Total Suspended Solids (TSS) and Total Phosphorus (TP) removal with easy access for inspection and maintenance.

THE ISOLATOR ROW

The Isolator Row is a row of StormTech chambers, either SC-160, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-4500 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for settling and filtration of sediment as storm water rises in the Isolator Row and ultimately passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC- 310-3 and SC-740 models) allow storm water to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row protecting the storage areas of the adjacent stone and chambers from sediment accumulation.

A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the perforations in the sidewall of the chamber. The non-woven fabric is not required over the SC-160, DC-780, MC-3500 or MC-4500 models as these chambers do not have perforated side walls.

The Isolator Row is typically designed to capture the “first flush” and offers the versatility to be sized on a volume basis or flow rate basis. An upstream manhole provides access to the Isolator Row and typically includes a high flow weir. When flow rates or volumes exceed the Isolator Row weir capacity the water will flow over the weir and discharge through a manifold to the other chambers.

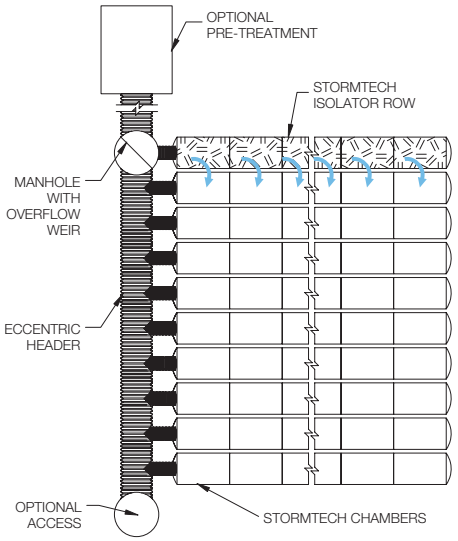
Another acceptable design uses one open grate inlet structure. Using a “high/low” design (low invert elevation on the Isolator Row and a higher invert elevation on the manifold) an open grate structure can provide the advantages of the Isolator Row by creating a differential between the Isolator Row and manifold thus allowing for settlement in the Isolator Row.

The Isolator Row may be part of a treatment train system. The design of the treatment train and selection of pretreatment devices by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, the Isolator Row is recommended by StormTech as an effective means to minimize maintenance requirements and maintenance costs.

Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row.

Looking down the Isolator Row from the manhole opening, woven geotextile is shown between the chamber and stone base.

StormTech Isolator Row with Overflow Spillway (not to scale)



ISOLATOR ROW INSPECTION/MAINTENANCE

INSPECTION

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row, clean-out should be performed.

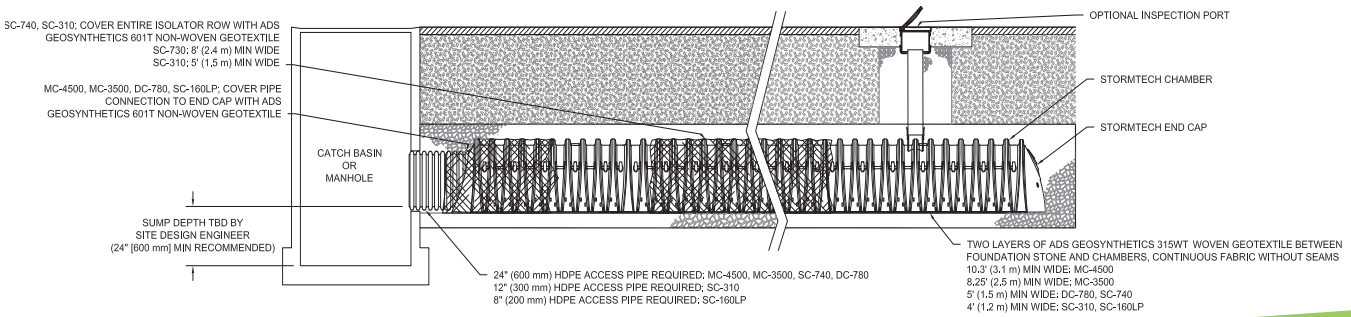
MAINTENANCE

The Isolator Row was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. Most JetVac reels have 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. **The JetVac process shall only be performed on StormTech Isolator Rows that have AASHTO class 1 woven geotextile (as specified by StormTech) over their angular base stone.**

StormTech Isolator Row (not to scale)

Note: Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-4500 chamber models and is not required over the entire Isolator Row.



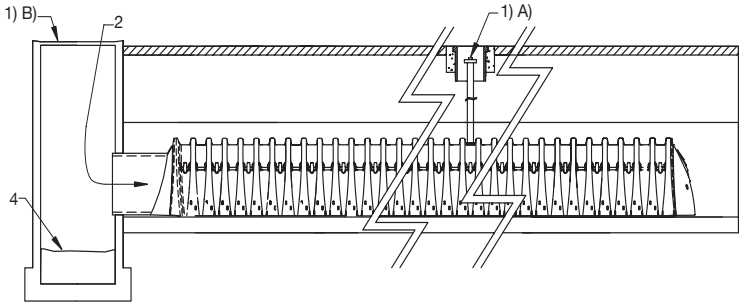
ISOLATOR ROW STEP BY STEP MAINTENANCE PROCEDURES

STEP 1
Inspect Isolator Row for sediment.
- A) Inspection ports (if present)
  - i. Remove lid from floor box frame
  - ii. Remove cap from inspection riser
  - iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.
  - iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.
- B) All Isolator Rows
  - i. Remove cover from manhole at upstream end of Isolator Row
  - ii. Using a flashlight, inspect down Isolator Row through outlet pipe
    1. Mirrors on poles or cameras may be used to avoid a confined space entry
    2. Follow OSHA regulations for confined space entry if entering manhole
  - iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2. If not, proceed to Step 3.

STEP 2
Clean out Isolator Row using the JetVac process.
- A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
- B) Apply multiple passes of JetVac until backflush water is clean
- C) Vacuum manhole sump as required

STEP 3
Replace all caps, lids and covers, record observations and actions.

STEP 4
Inspect & clean catch basins and manholes upstream of the StormTech system.



SAMPLE MAINTENANCE LOG

Date	Stadia Rod Readings		Sediment Depth (1)–(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

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An ADS company

Advanced Drainage Systems, Inc.
4640 Trueman Blvd., Hilliard, OH 43026
1-800-821-6710 www.ads-pipe.com

StormTech Maintenance Log

Project Name:
Location:

	Stadia Rod Readings				
Date	**Fixed point to chamber bottom (1)**	**Fixed point to top of sediment (2)**	**Sediment Depth (1) - (2)**	**Observations / Actions**	**Inspector**