PROJECT NARRATIVE
&
STORMWATER REPORT

For the Proposed:

SOAPY NOBLE EXPRESS CARWASH FACILITY

Located At:
230 Flanders Road
East Lyme, Connecticut 06333

Prepared On:
November 29th, 2022

Prepared For:
Town of East Lyme Zoning Permit

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INTRODUCTION

Solli Engineering (Solli) has prepared this Project Narrative & Stormwater Report (Report) to provide an analysis of the zoning regulations, the project's stormwater management, utility design and coordination, soil erosion and sediment control measures and subsurface conditions for the proposed commercial redevelopment located at 230 Flanders Road in the Town of East Lyme, Connecticut (Site). The proposed redevelopment has been designed in compliance with the Town of East Lyme Zoning Regulations, the 2004 Connecticut Stormwater Quality Manual, the Connecticut Department of Transportation 2000 Drainage Manual, and the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as well as all other applicable state and federal requirements and regulations.

EXISTING CONDITIONS

PROJECT SITE

SITE LOCATION

The Site is located at 230 Flanders Road in the Town of East Lyme, Connecticut. The property is approximately 1.35 acres and is bound by the Industrial Park Road to the north and west, Flanders Road to the east, and commercial developments to the south (see Appendix A, Figure 1, Site Location Map). The property is within the CA Commercial District. The Site is currently accessed from Industrial Park Road via one full-movement driveway and one egress-only driveway. The Site also has an egress-only driveway on Flanders Road.

For more information regarding the Site location, refer to Appendix A, Figure 1 - Site Location Map.

SITE CHARACTERISTICS

The Site is entirely developed and is improved with a one-story car wash, pylon sign, areas of pavement, curbing and concrete sidewalks, associated stormwater and utilities infrastructure, and areas of landscaping. Based on record mapping, the Site appears to have natural gas, water and sewer services stubbed within the property which is being utilized by the existing building. The Site has three curb cuts, including one 24-foot-wide full-movement driveway off Industrial Park Road, one 18-foot-wide egress-only driveway off Industrial Park Road, and one 16-foot-wide egress-only driveway off Flanders Road.

Currently, the Site is improved with approximately 15,960± square feet of impervious surfaces. A majority of the Site drains from northeast to southwest with elevations on-site ranging from approximately 53' to 30'. The Site's stormwater runoff is collected by a catch basin on Industrial Park Road and the wetlands located along the western portion of the site.

A wetlands and watercourse investigation was performed by William Kenny Associates for this site. Please see Appendix B for the complete report. Located within the wetland is the Pattagansett River and the 100-year FEMA floodway. For more details on regulated areas within the Site, please refer to the "Regulated Areas" section of this narrative.

For more information regarding the existing conditions of the Site, refer to the Property Survey in Appendix D of this Report.

REGULATED AREAS

WETLANDS

A wetlands and watercourse investigation was performed by William Kenny Associates for this site. Please see Appendix B for the complete report. The proposed redevelopment will impact the wetland system, which is located throughout the northern and western portions of the property, with a portion of the wetland along Industrial Park Road consisting of a man-made drainage ditch.

The direct impact caused by the redevelopment is proposed to be mitigated via the creation of a wetland area in the western area of the site, which will connect into the existing wetland system located along the Pattagansett River.

For more details on the existing wetlands and proposed mitigation, please see Appendix B of this report.

FEMA FLOODPLAIN

According to FEMA Flood Insurance Rate Map, Map Number 09011C0477J, portions of the site along the western property edge are located within special flood hazard areas subject to inundation by the 1% annual chance flood (100-year flood), as well as a portion of the site located within the 100-year floodway. (See Appendix A, Figure 2, FEMA Flood Map).

NATURAL DIVERSITY DATA BASE

Based on mapping produced by the Connecticut Department of Energy and Environmental Protection (CTDEEP) the Site is not located within vicinity of identified critical habitat or state and federally listed species. For more information regarding the Site location regarding the protected habitat areas refer to Appendix A, Figure 4 – Natural Diversity Data Base Map.

CONNECTICUT AQUIFER PROTECION AREAS

Based on mapping produced by the Connecticut Department of Energy and Environmental Protection (CTDEEP) the Site is located within the Aquifer Protection Area: Gorton's Pond 1. For more information refer to the interactive mapping produced by CTDEEP for the Connecticut Aquifer Protection Areas.

ZONING ASSESSMENT

As shown on the Town of East Lyme GIS Map and Zoning Map, the Site is located entirely within the Commercial (CA) Zoning District. The Site is bordered on the north, east, and south by properties zoned Commercial (CA) and to the west by a Light Industrial zoned property (LI).

COMMERCIAL (CA) ZONING DISTRICT

The general purpose of the Commercial (CA) Zoning District, in accordance with the Town of East Lyme Zoning Regulations, is to provide opportunities for moderate-scale business development opportunities to service town-wide and regional needs. All developments within the CA Zoning District are required to comply with the business bulk requirements set forth in Section 8.3 of the East Lyme Zoning Regulations; the CA dimensional requirements are provided below:

Table 1: Commercial (CA) Zoning District Dimensional Requirements

Zoning District	Min. Lot Area	Min. Lot Frontage	Min. Lot Width	Min. Front Yard	Min. Side Yard	Min. Rear Yard	Max. Building Height	Max. Building Coverage
CA	7,500 sf	80 ft	N/R	20 ft	12 ft	12 ft	30 ft	35%

*N/R = No Regulation

PARKING REGULATIONS

According to Section 22, Off-Street Parking, of the Town of East Lyme Zoning Regulations, car washing facilities are not a specified use so the required parking is to be set by the Zoning Commission. Parking spaces shall be 9' x 18' in accordance with Section 22.1.

PROPOSED CONDITIONS

PROJECT DESCRIPTION

The Applicant, Noble Energy Real Estate Holdings, LLC, is proposing to construct a Soapy Noble Express Car Wash facility, a 3,425± square foot car wash facility with thirteen (13) vacuum spaces, located at 230 Flanders Road in East Lyme, Connecticut. The proposed projects includes various site improvements including associated parking, drives, drainage, utilities, stormwater management measures, drainage infrastructure, landscaping, and lighting features to support the proposed use.

SITE ACCESS / EGRESS

The redevelopment proposes to modify the access and egress for the Site and improve the car wash use with a 24-foot-wide full-movement driveway off Industrial Park Road and a modified 16-foot-wide egress-only driveway off Industrial Park Road that would be utilized as an "escape" route for patrons. The Site also has an existing egress onto Flanders Roads, which will be closed off under proposed conditions. The driveways off Industrial Park Road are proposed to be located approximately 260 feet to the east of the intersection of Industrial Park Road and approximately 160 feet to the west of the intersection of Industrial Park Road and Flanders Road. Traffic signage and painted markings are proposed throughout the site to improve traffic flow and vehicular safety.

PARKING, LOADING & OPERATIONS

The project proposes the construction of a 3,425± square foot car wash facility with thirteen (13) vacuum spaces, designed in accordance with prototypical Soapy Noble Express Car wash Facilities. The Soapy Noble Express Car wash is a new-to-industry exterior car wash chain that will provide customers with "an inviting and easy-to-navigate car wash experience" in addition to a variety of free services including vacuums, wet mat cleaners, tire air nozzles and much more.

The proposed redevelopment will provide a total of four (4) passenger parking spaces, including one (1) ADA accessible parking space. The parking spaces have been designed in accordance with Section 22, Off-Street Parking and Loading, of the East Lyme Zoning Regulations and have been located to provide efficient and adequate access to the building's entrances. The parking spaces will be primarily utilized by employees of the car wash facility. The ADA accessible parking space has been designed in accordance with the US Access Board Accessibility Standards and the space is proposed to be a width of 8-feet with an 8-foot-wide loading aisle.

The project proposes a concrete dumpster pad and board-on-board fence enclosure to store the facility's dumpster receptacle. The dumpster enclosure is proposed to be located along the western curb line of the site which will be screened from the neighboring parcel by a row of evergreens.

The car wash's pay system and queueing have been designed in accordance with prototypical requirements. Each queue lane is proposed to be a width of 11-feet and the total vehicle queue on-site is approximately twenty-seven (27) vehicles. Two (2) pay stations have been proposed to help facilitate efficient operations of the facility.

STORMWATER MANAGEMENT

The redevelopment of the Site will provide approximately 22,700± square feet of impervious area, increasing the overall impervious surfaces by approximately 6,740± square feet compared to existing conditions. The proposed stormwater conveyance system consists of a series of proposed catch basins with 2-foot sumps, a drainage manhole and a water quality unit that will effectively clean the stormwater runoff prior to discharging into the stormwater basin. The existing and proposed hydraulic system has been analyzed for the 25-year storm event in accordance with the Connecticut Department of Transportation 2000 Drainage Manual.

SITE UTILITIES

WATER

Water service is provided by the Town of East Lyme Water Department via an existing main on Flanders Road. Domestic service to the site will be provided from an existing 2" Type K service lateral on-site, which connects to the existing main in Flanders Road.

The main is assumed to be in good condition and provide adequate flow for the proposed development. A flow test of the main and or inspection of the existing lateral is recommended to confirm these assumptions following the due diligence phase.

For more information pertaining to the proposed utility layout refer to the Utility Plan (Sheet 2.51) within the Permitting Plan Set, submitted in conjunction with this Report.

SANITARY

Waste from the proposed car wash exits the building through multiple Schedule 80 PVC lines and passes through a series of three sediment tanks and an oil water separator. From the oil water separator, waste then enters an existing sanitary manhole on-site, which connects to the main located within Flanders Road.

The East Lyme Water & Sewer Department is the utility provider for sanitary sewer service in the Town of East Lyme. According to the property's sewer service card, provided by the Town of East Lyme, an existing sewer connection exists along the frontage of Flanders Road at an existing sewer manhole. The exact depth of the stub is unknown, but the service card identifies an approximate depth of 8-feet. Assuming the 8-foot depth identified on the service card is accurate, the existing pipe is at an elevation of approximately 42-feet±.

In accordance with tenant specifications, the car wash's sanitary system has been designed with two (2) 4-inch SDR 35 PVC laterals; one for the facilities drain line and the other for domestic effluent. The overflow from the proposed car wash recirculation system and the drain line is proposed to be conveyed through a 1,000-gallon oil-water separator before combining with the domestic effluent lateral. The proposed reclaim system is designed to reuse approximately 68% of the total water used for car wash operations. The domestic effluent lateral and the outlet of the oil-water separator is proposed to combine via a "wye" connection upgradient of the proposed sanitary pump station. The project proposes to tie into the existing sewer manhole for a connection point. Prior to construction the Site general contractor will coordinate with the utility provider to receive approval and confirmation of location and size of the proposed service.

ELECTRIC / CABLE / TELECOMMUNICATIONS

Eversource Energy is the utility provider for electrical service in the Town of East Lyme. In accordance with tenant specifications, the car wash requires a minimum service size of 480Y/277V, 3 phase, 4 wire service. The Site's existing electrical connection is provided from overhead lines which connect to a utility pole on the opposite side of the Industrial Park Road right-of-way, adjacent to the Stop & Shop site drive.

The redevelopment proposes to install a new utility pole on-site and underground electrical service will be installed from the proposed utility pole to a pad-mounted transformer before entering the building's electrical meter. Prior to construction the Site general contractor will coordinate with the utility provider to receive approval and confirmation of location and size of the proposed service.

Frontier Communications has been identified as the telecommunications provider for the Site. The Project proposes cable and telecommunications to be fed underground from the same proposed utility pole located in the northeast corner of the Site. The cable and telecommunications conduit will tie into the building in the general location of the electrical meter. At this point of design, it is assumed that cable and telecommunications can be fed off the identified utility pole. Prior to construction, detailed conduit plans will be prepared in accordance with utility providers standards and requirements following approvals from the Town of East Lyme.

GAS

Eversource Energy is the utility provider for gas service in the Town of East Lyme. In accordance with tenant specifications, the car wash requires natural gas with a service load of 575 CFH. The project proposes to connect a new service into the existing gas main within the Industrial Park Road right-of-way. At this point, it is assumed the existing gas main can provide sufficient capacity for the car wash. Prior to construction the Site general contractor will coordinate with the utility provider to receive approval and confirmation of location and size of the proposed service.

For more information pertaining to the proposed utility layout refer to the Utility Plan (Sheet 2.51) within the Permitting Plan Set, submitted in conjunction with this Report.

SITE LANDSCAPING & LIGHTING

A comprehensive landscape plan has been provided. The proposed landscaping improvements include a variety of native species containing trees, shrubs, ground cover and seed mixes. The landscaping plan has been designed to provide vegetative screening surrounding the dumpster enclosures located on-site. Additionally, along the southern property line of the Site, a row of evergreen bushes is proposed to provide a vegetative buffer to screen the adjoining property commercial property.

The proposed Site Lighting Plan is comprised of pole mounted light fixtures and wall mounted building lights. The proposed wall mounted building lights and canopy lights are consistent with prototypical light fixtures for the car wash. All fixtures are proposed to be LED and meet "dark sky" principles. The lighting plan has been designed to ensure the Site has adequate light levels within parking areas, sidewalks, pedestrian areas and in the area of the car wash queue, while also minimizing light spillage across the property lines and within the adjoining wetland areas.

For more information pertaining to the landscape and lighting for the Site refer to the Landscape Plan (Sheet 2.61) and Lighting Plan (Sheet 2.71) within the Permitting Plan Set, submitted in conjunction with this Report.

STORMWATER MANAGEMENT & SOIL EROSION CONTROL

The proposed stormwater management has been designed to be in compliance with the Town of East Lyme Zoning Regulations, the 2004 Connecticut Stormwater Quality Manual, and the CT DOT 2000 Drainage Manual, while taking prevailing site conditions and practical considerations into account. The proposed soil erosion and sediment control measures have been designed in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

METHODOLOGY

Stormwater runoff analysis, for both existing and proposed conditions, was performed using the software package HydroCAD. This software uses a computer implementation of the SCS / NRCS – TR-55 methodology to compute volumes and rates of runoff. The watershed area, rainfall depths and intensity, curve number and time of concentration are factors that influence the computed results.

Rainfall depths for the site were used for calculating the volumes and rates of runoff for this project. The depths were taken from the NOAA Atlas documents (Latitude: 41.3557º, Longitude: -72.2108º, approximate elevation of 39.68 ft) and the rainfall values are listed in Table 2 below.

Table 2: Rainfall Data

Return Period (Storm Event)	24-hr Rainfall Depth (inches)
2-year	3.45
5-year	4.38
10-year	5.16
25-year	6.22
50-year	7.01
100-year	7.86

HydroCAD automatically computes the rainfall intensity from its own IDF curves when the rainfall intensity data is provided. This information was taken from the NOAA Atlas documents (Latitude: 41.3557º, Longitude: -72.2108º, approximate elevation of 39.68 ft and the rainfall values are listed in Table 3 below.

Table 3: IDF Table

Intermediate Intensity Values (in/hr)				
Return Period (Storm Event)	**5-Minute**	**15-Minute**	**30-Minute**	**60-Minute**
2-year	4.84	2.69	1.90	1.23
5-year	6.14	3.41	2.41	1.55
10-year	7.22	4.01	2.83	1.83
25-year	8.71	4.84	3.41	2.20
50-year	9.83	5.46	3.85	2.48
100-year	11.0	6.11	4.31	2.78

SCS / NRCS uses the runoff curve number (CN) method to estimate runoff from storm rainfall. The major factors that determine CN are the watershed's soil and cover conditions, cover type, treatment, and hydrologic condition. The higher percentage of impervious cover within a watershed will result in a higher curve number. A composite curve number was calculated for each analyzed watershed. The existing and proposed conditions were analyzed in the 2-, 5-, 10-, 25-, 50- and 100-year storm events. Refer to Appendix C for the calculations used in determining the existing and proposed curve numbers, for the individual drainage areas.

The time of concentration is the time it takes for runoff to travel from the hydraulically most distant point of the watershed to a point of interest within the watershed. The time of concentration is calculated by adding the travel times of sheet flow, shallow concentrated flow and open channel flow, or some combination of these depending on the watershed and its features. Refer to Appendix C for the calculations used in determining the existing and proposed time of concentrations, for the individual drainage areas.

HYDROLOGY

EXISTING CONDITIONS

Slopes on site range from approximately 1 percent to 25 percent, with a high elevation of approximately 53 feet near the eastern property edge, and a low elevation of approximate 29 feet on the western property edge. According to the NRCS Soil Survey Geographic database for the State of Connecticut, the majority of the site in which the development is proposed is comprised of Agawam fine sandy loam. This soil has a hydrologic soil group rating of B. A breakdown of all the soils, located within the property limits, as well as the NRCS Soil Survey Map for the site, can be found in Appendix A, Figure 3. A total of five (5) test pits were performed on-site, with a total of three located within the proposed parking area, and the other two located in the proposed stormwater basin area. The test pits confirm that soils on-site consist mostly of sandy loam, with coarse sand and gravel below. Refer to the Overall Site Layout Plan (Sheet 2.10), for more detailed locations and test pit logs.

Approximately 1.44 acres were analyzed for stormwater management purposes. Based on existing drainage patterns, the 1.44-acre area was divided into three (3) contributing drainage areas, labeled Existing Drainage Area 1A (EDA-1A), Existing Drainage Area 1B (EDA-1B) and Existing Drainage Area 1C (EDA-1C). The approximate location and delineation of these drainage areas can be seen on Sheet DA-1, Existing Drainage Area Map, found in Appendix C.

EDA-1A has a contributing drainage area of approximately 0.92 acres. The area of EDA-1A includes the majority of the pervious area west of the existing commercial building and parking area. The majority of runoff from EDA-1A flows west overland before discharging into the existing wetlands and Pattagansett River located on the western edge of the project site.

EDA-1B has a contributing drainage area of approximately 0.34 acres. The area of EDA-1B includes the parking lot/impervious area to the west of the existing commercial building as well as a portion of the building itself. The majority of runoff from EDA-1B flows northwest overland before entering into an existing drainage structure located at the existing site entrance. From that point, the runoff travels through the existing stormwater conveyance system located in Industrial Park Road, which eventually discharges into the Pattagansett River on the western edge of the property.

EDA-1C has a contributing drainage area of approximately 0.18 acres. The area of EDA-1C includes the parking lot/impervious area to the east of the existing commercial building as well as a portion of the building itself. The majority of runoff from EDA-1C flows northwest overland before entering into an existing drainage structure located at the existing site egress. From that point, the runoff travels through an existing 36” storm pipe, which discharges into an existing drainage ditch on-site, with an ultimate discharge point into the existing wetlands and the Pattagansett River.

Characteristics of this drainage area are summarized in Table 3. A map depicting the existing drainage area and its characteristics, entitled “Drainage Area Map (DA-1)”, can be found in Appendix D.

Table 4: Existing Drainage Areas

Drainage Area Label	Drainage Area	Curve Number	Time of Concentration
Existing Drainage Area 1A (EDA-1A)	**0.92 AC**	63	17.4 Min.
Existing Drainage Area 1B (EDA-1B)	**0.34 AC**	88	10.7 Min.
Existing Drainage Area 1C (EDA-1C)	**0.18 AC**	90	6.0 Min.
Total	**1.44 AC**	-	-

PROPOSED CONDITIONS

The proposed redevelopment consists of drainage areas that are of similar patterns to existing contributing areas, within the 1.44 acres analyzed. Based on the proposed drainage patterns, the 1.44-acre area was divided into three (3) contributing drainage areas, labeled Proposed Drainage Area 1A.1 (PDA-1A.1), Proposed Drainage Area 1A.2 (PDA-1A.2) and Proposed Drainage Area 1B (PDA-1B). The approximate location and delineation of these drainage areas can be seen on Sheet DA-1, Proposed Drainage Area Map, found in Appendix B.

PDA-1A.1 has a contributing area of approximately 0.37 acres. This area encompasses the portion of the site west of the proposed limits of disturbance, which includes the existing wetlands area. The majority of runoff from PDA-1A.1 travels west into the existing wetlands area located on the western edge of the property.

PDA-1A.2 has a contributing area of approximately 0.87 acres. This area encompasses the majority of the site including the roof area of the car wash. Runoff from PDA-1B travels overland across the proposed parking area before entering into one of the proposed drainage structures on-site.. From this point, the runoff passes through an outlet control structure before it eventually discharges to the proposed stormwater basin along the western edge of the property.

PDA-1B has a contributing drainage area of approximately 0.20 acres. The area of PDA-1B includes a portion of the pervious area and sidewalk along the frontage with Industrial Park Road and Flanders Road. The majority of runoff from PDA-1B flows north overland before entering into existing drainage structures located within Industrial Park Road. From that point, the runoff travels through the existing stormwater conveyance system located in Industrial Park Road, which eventually discharges into the Pattagansett River on the western edge of the property.

Characteristics of these drainage areas are summarized in Table 5. A map depicting proposed drainage areas can be found in Appendix D.

Table 5: Proposed Drainage Areas

Drainage Area Label	Drainage Area	Curve Number	Time of Concentration
Proposed Drainage Area 1A.1 (PDA-1A.1)	**0.37 AC**	67	13.5 Min.
Proposed Drainage Area 1A.2 (PDA-1A.2)	**0.87 AC**	84	13.6 Min.
Proposed Drainage Area 1B (PDA-1B)	**0.20 AC**	74	6.0 Min.
Total	**1.44 AC**	-	-

HYDROLOGIC CONCLUSIONS

Water quantity controls include an above-ground detention basin located to the west of the access driveway. Water quality treatment will be provided with a hydrodynamic separator. The hydrodynamic separator has been sized to treat the proposed Water Quality Flow (WQF) of the drainage area. The proposed detention basin serves to detain the increase in runoff by the proposed redevelopment.

Additional stormwater quality measures provided as part of the proposed redevelopment include catch basins with 2-foot sumps and hooded outlets. Combined, these measures will result in decreased peak flows, in all storm events, compared to existing conditions, refer to Table 6: Peak Flow Comparison Table for more information.

Table 6A: Peak Flow Comparison Table - Over

Peak Flow (cfs)			
Storm Event	**Total Drainage Areas**		**Percent Reduction in Peak Flow**
	EDA	**PDA**	
2-Year	1.37	0.97	29.2%
5-Year	2.11	1.38	34.6%
10-Year	2.78	2.00	28.1%
25-Year	3.74	3.17	15.2%
50-Year	4.49	3.89	13.4%
100-Year	5.31	4.60	13.4%

For more information regarding the hydrological analysis refer to Appendix C.

In addition to reducing overall peak flows to the existing wetlands, the peak flows have also been reduced to the stormwater conveyance system in Industrial Park Road (noted as EDA-1B & PDA-1B).

Additionally, flows from the site to the 36" pipe which collects runoff from Flanders Road have been removed under proposed conditions.

HYDRAULICS

PROPOSED CONDITIONS

The redevelopment of the Site proposes new catch basins within the low spots of the proposed car wash. The catch basins will capture runoff from their respective drainage areas and convey runoff into the proposed above-ground detention basin. Prior to discharging into the basin, the stormwater runoff will be conveyed through a water quality unit that will provide treatment to the runoff.

The analysis of the proposed conditions concluded that in the 25-year storm event (hydraulic design storm) all the structures and pipes function with the hydraulic grade line (HGL) being at elevations within the pipes.

For more information regarding the existing and proposed hydraulic conditions of the analyzed system, refer to the storm sewer analysis within Appendix C of this Report.

WATER QUALITY

In existing conditions, the Site's stormwater runoff discharges into the existing wetlands on-site with no water quality structures or devices. In an effort to improve the quality of stormwater discharge associated with the proposed parking area, and driveways, the project has been designed with catch basins with 2-foot-deep sumps and hooded outlets and a Contech hydrodynamic separator. A hydrodynamic separator uses swirl concentration and continuous deflective separation to screen, separate and trap trash, debris, sediment, and oil and grease from stormwater runoff. The hydrodynamic separator will capture and retain 100% of floatables; effectively removing sediment. The unit has been designed to remove more than 80% of the average annual post-construction load of TSS from the stormwater runoff prior to entering the stormwater basin and the existing basin. The hydrodynamic separator has been sized to treat the Water Quality Flow (WQF) of the drainage area, refer to Appendix C for more information.

SOIL EROSION & SEDIMENT CONTROL

The proposed plans for soil erosion and sediment control prepared for this project have been developed in accordance with the Town of East Lyme Zoning Regulations as well as the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, prepared by the Connecticut Council on Soil and Water Conservation in cooperation with the Connecticut Department of Environmental Protection.

The soil erosion and sediment control measures that will be proposed as part of this project include geotextile silt fences, a temporary sediment trap, temporary diversion swales, construction entrance, dust control measures, stone check dams, and inlet protection for existing and proposed drainage features.

The temporary sediment trap will be excavated to detain sediment-laden runoff from contributing drainage areas located within the project's limits of disturbance. The sediment traps are proposed in the low-lying areas of each contributing drainage area and have been sized to provide a minimum storage volume of134 cubic yards per acre of drainage area, per 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

The soil erosion and sediment control measures on site will be implemented in two (2) phases. Phase I measures area associated with the demolition of existing facilities. Phase II measures are associated with fine grading and installation of all buildings, hardscape and utilities on site.

For more detail regarding layout and design of the soil erosion and sediment control measures implemented as part of this project see Soil Erosion & Sediment Control Plan (Sheet 2.31) and Sediment Control Notes & Details (Sheet 2.41).

APPENDICES

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Appendix A – Figures

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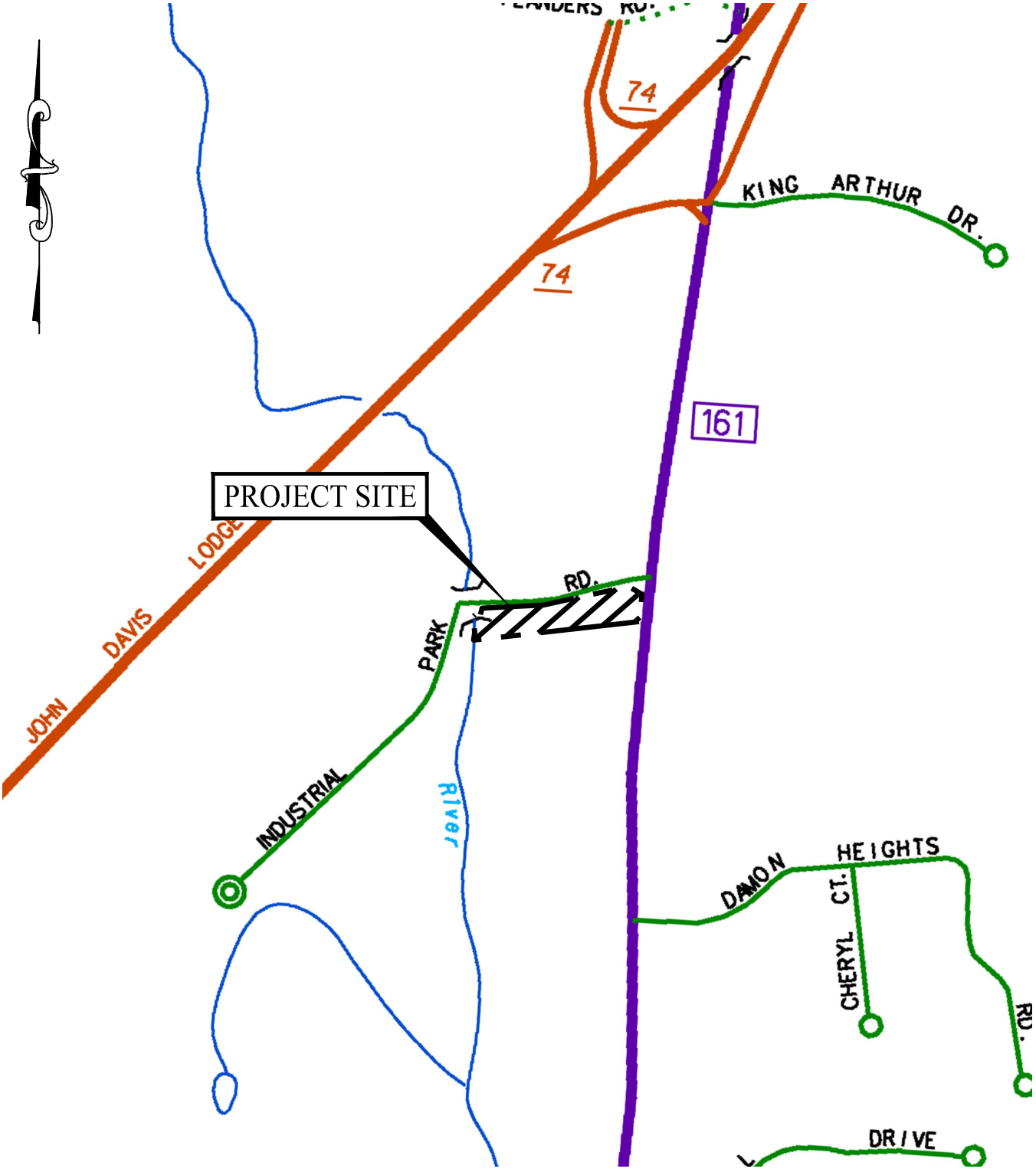
Figure 7 – Cut / Fill Exhibit



NOTE: BASE MAP INFORMATION TAKEN FROM
CTDOT TRU MAP NUMBER 44

500 0 250 500

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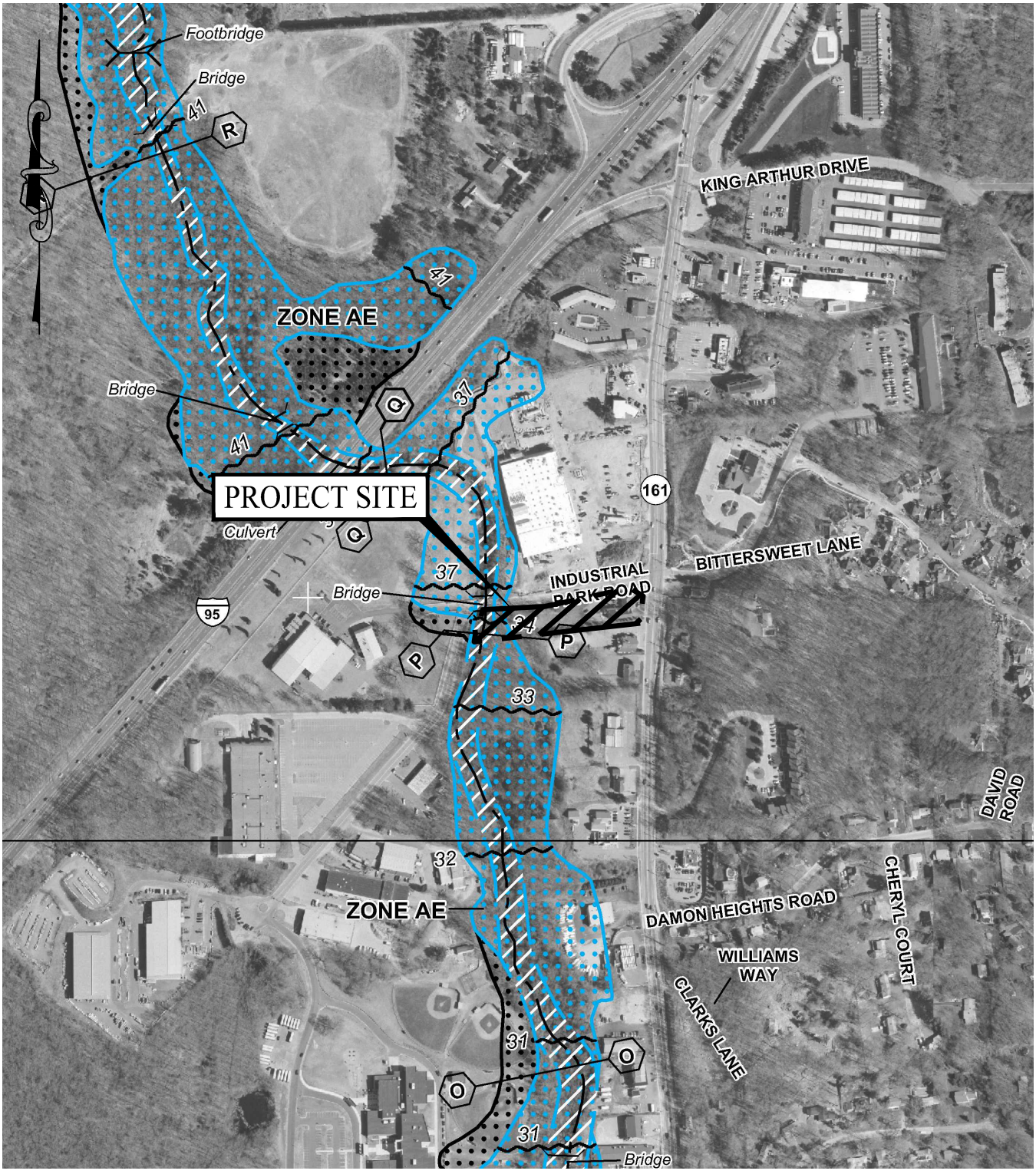
SITE LOCATION MAP

230 FLANDERS ROAD
EAST LYME, CONNECTICUT

Project #:	22105001
Plan Date:	11/29/22
Scale:	1" = 500'
Figure:	1



NOTE: BASE MAP INFORMATION TAKEN FROM FEMA FLOOD INSURANCE RATE MAP, MAP NUMBER 09011C0477J, EFFECTIVE 08/05/2013.

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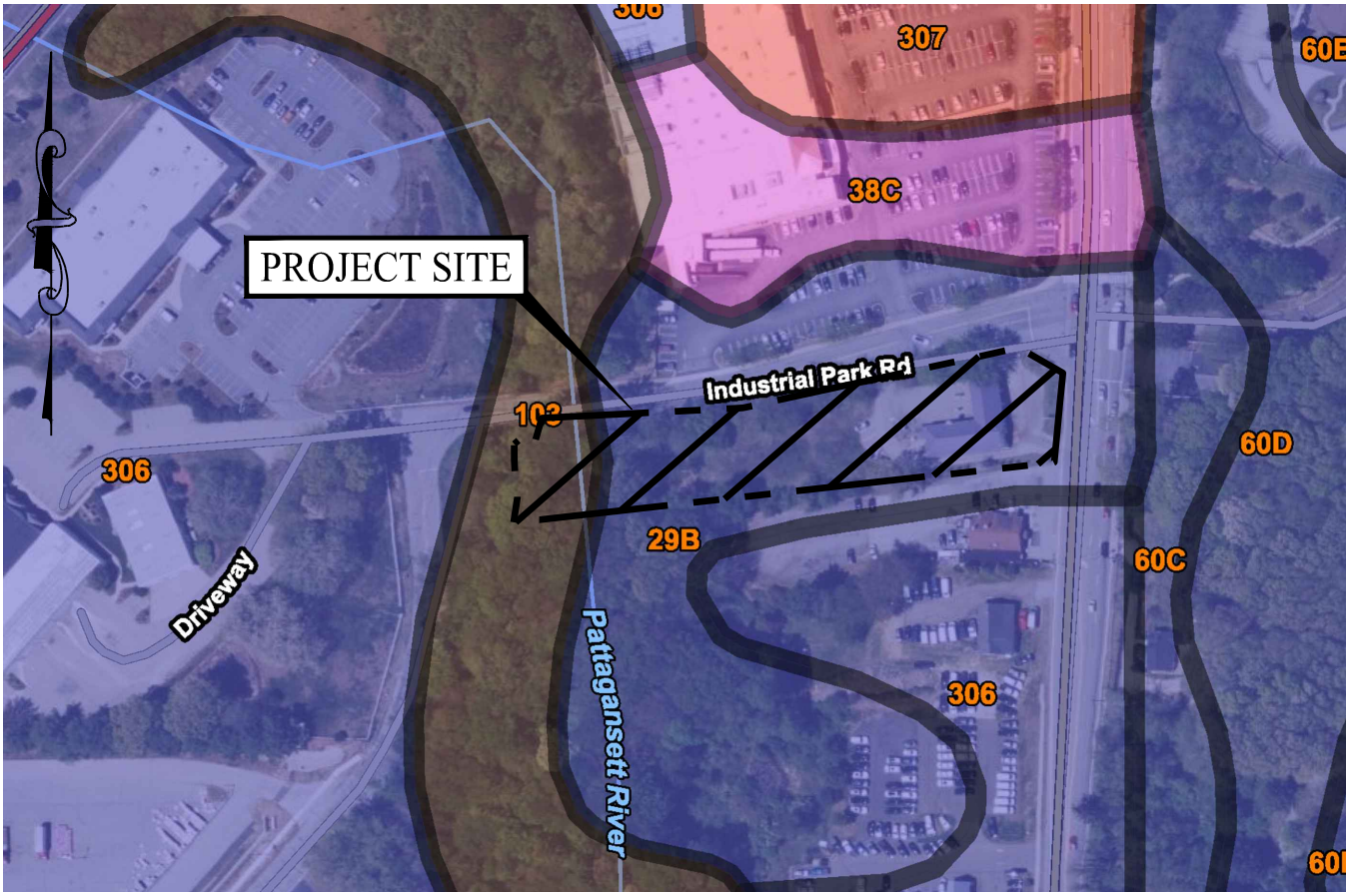
FEMA FLOOD MAP

230 FLANDERS ROAD
EAST LYME, CONNECTICUT

Project #:	22105001
Plan Date:	11/29/22
Scale:	1" = 500'
Figure:	2



Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
15	Scarboro muck, 0 to 3 percent slopes	A/D	0.1	0.2%
17	Timakwa and Natchaug soils, 0 to 2 percent slopes	B/D	0.2	0.5%
29A	Agawam fine sandy loam, 0 to 3 percent slopes	B	0.0	0.1%
29B	Agawam fine sandy loam, 3 to 8 percent slopes	B	5.7	15.0%
38C	Hinckley loamy sand, 3 to 15 percent slopes	A	2.0	5.3%
60B	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	B	0.6	1.6%
60C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes	B	1.4	3.6%
60D	Canton and Charlton soils, 15 to 25 percent slopes	B	3.6	9.4%
103	Rippowam fine sandy loam	B/D	4.6	12.2%
306	Udorthents-Urban land complex	B	18.0	47.4%
307	Urban land	D	1.8	4.7%

NOTE: BASE MAP RESOURCES TAKEN FROM THE NATURAL RESOURCES CONSERVATION SERVICE, URL: https://websoilsurvey.sc.egov.usda.gov.

400 0 200 400

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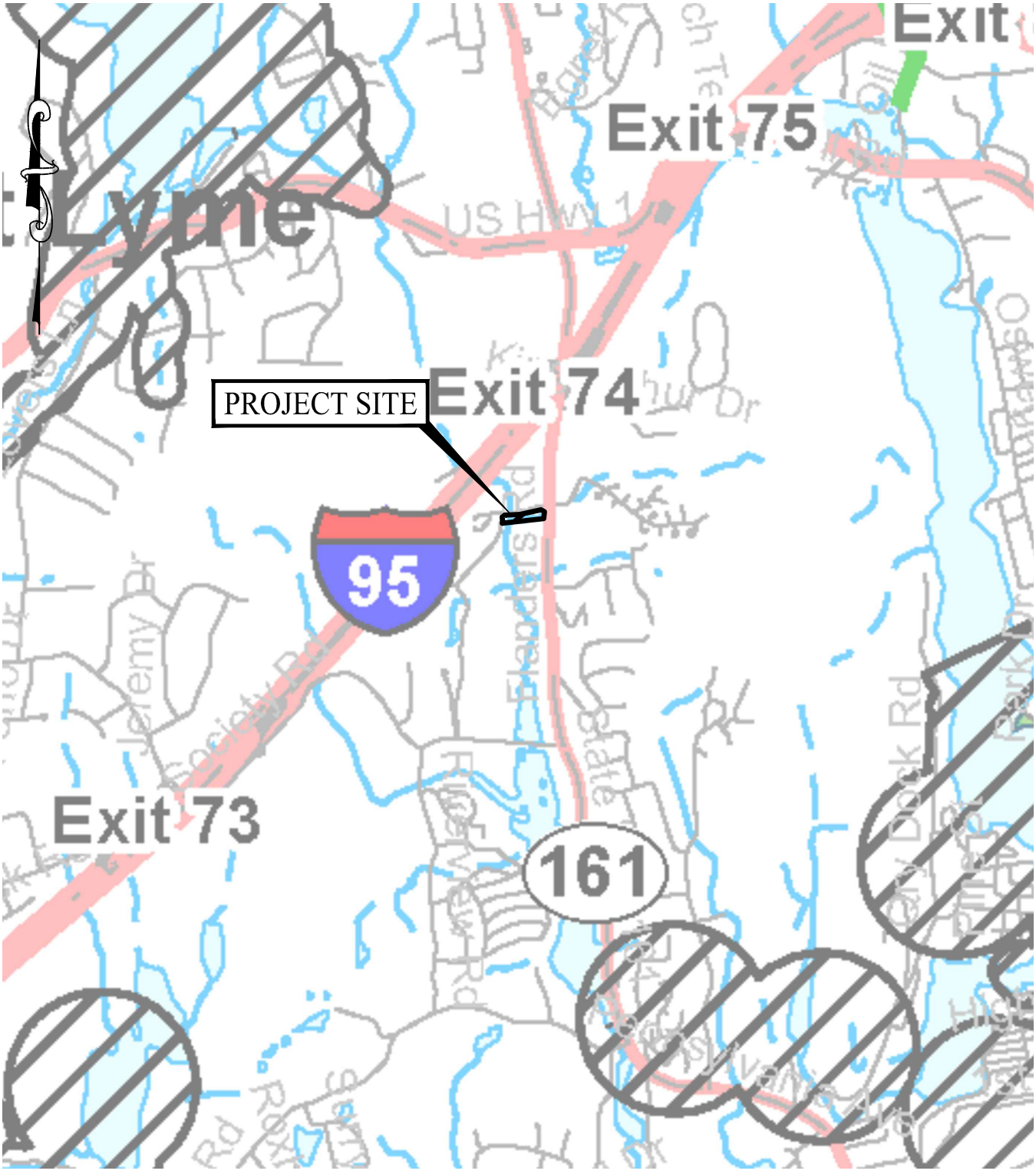
SOIL SURVEY MAP

230 FLANDERS ROAD
EAST LYME, CONNECTICUT

Project #:	22105001
Plan Date:	11/29/22
Scale:	1" = 200'
Figure:	3



NOTE: BASE MAP INFORMATION TAKEN FROM CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION, URL: https://portal.ct.gov/DEEP/NDDB/.

2,000 0 1,000 2,000

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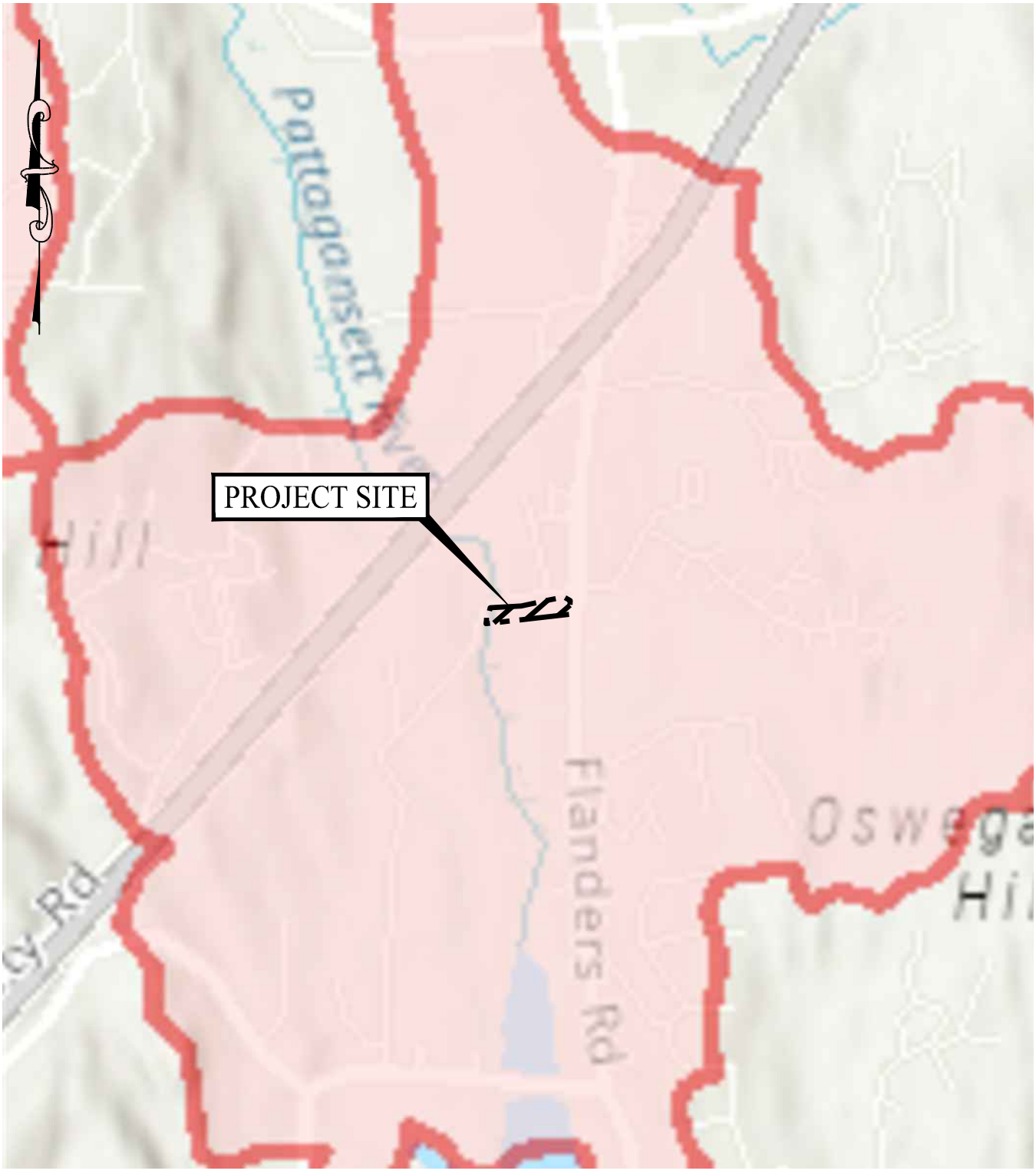
NATURAL DIVERSITY MAP

230 FLANDERS ROAD
EAST LYME, CONNECTICUT

Project #:	22105001
Plan Date:	11/29/22
Scale:	1" = 2,000'
Figure:	4



NOTE: BASE MAP INFORMATION TAKEN FROM
http://cteco.uconn.edu/map_services.htm.

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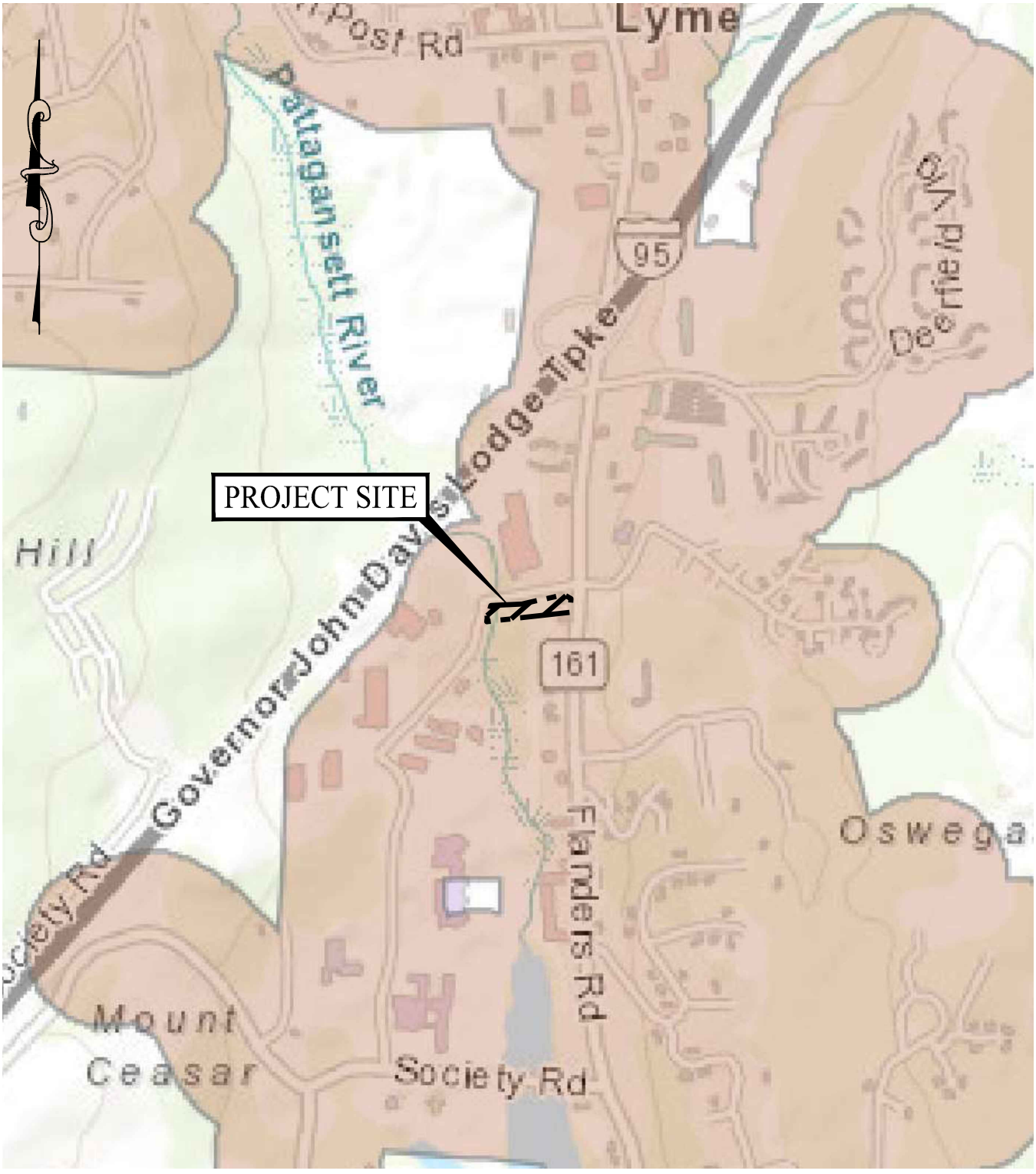
AQUIFER PROTECTION AREA MAP

230 FLANDERS ROAD
EAST LYME, CONNECTICUT

Project #:	22105001
Plan Date:	11/29/22
Scale:	1" = 1,000'
Figure:	5



NOTE: BASE MAP INFORMATION TAKEN FROM CONNECTICUT DEPARTMENT OF PUBLIC HEALTH GIS, URL: https://portal.ct.gov/DPH/Drinking-Water/DWS/Public-Water-Supply-Map.

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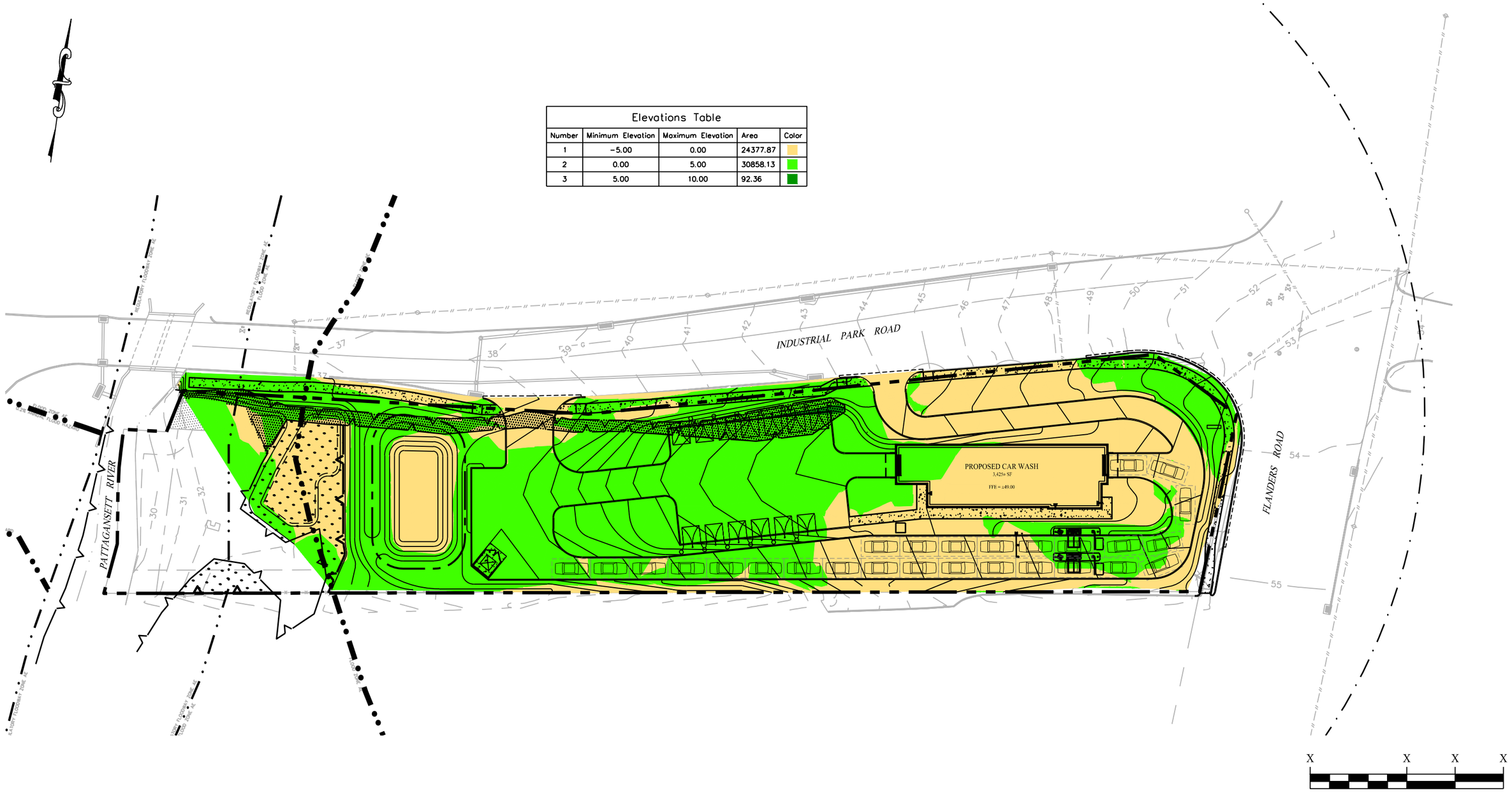
PUBLIC WATER SUPPLY MAP

230 FLANDERS ROAD
EAST LYME, CONNECTICUT

Project #:	22105001
Plan Date:	11/29/22
Scale:	1" = 1,000'
Figure:	6

Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-5.00	0.00	24377.87	
2	0.00	5.00	30858.13	
3	5.00	10.00	92.36	



Rev. #:	Date	Description

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Drawn By:	AWC
Checked By:	KMS
Project #:	22105001
Plan Date:	11/29/22
Scale:	X" = XX'

Project:
PROPOSED SOAPY NOBLE EXPRESS CAR WASH
230 FLANDERS ROAD
EAST LYME, CONNECTICUT

Sheet Title:
CUT / FILL EXHIBIT

SHEET #:
FIG. 7

Appendix B – Wetland Assessment

Wetlands Delineation & Report prepared by William Kenny Associates

SOIL LEGEND

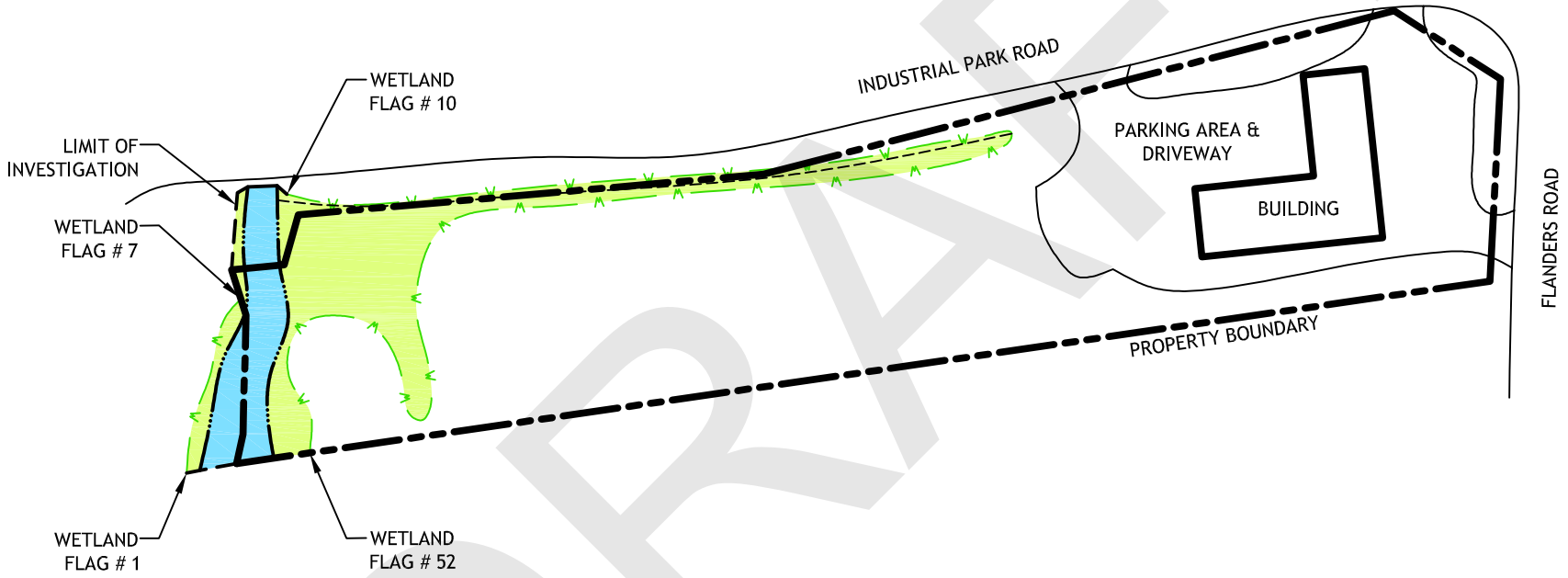
UPLAND

21 NINIGRET AND TISBURY SOILS
29 AGAWAM FINE SANDY LOAM
308 UDORTHENTS, SMOOTHED

WETLAND

1 AQUENTS
103 RIPPOWAM FINE SANDY LOAM

WILLIAM KENNY ASSOCIATES
LANDSCAPE ARCHITECTURE ▪ ECOLOGICAL SERVICES
1899 Bronson Road Fairfield CT 06824
203 366 0588 www.wkassociates.net



NOTES:

- *INFORMATION SHOWN ON THIS DRAWING, INCLUDING THE WETLAND BOUNDARY, IS APPROXIMATE. THE BOUNDARY IS NOT A SURVEYED REPRESENTATION OF WHAT WAS FIELD MARKED (FLAGGED).*
- *WETLAND AND SOIL INFORMATION PROVIDED BY WILLIAM KENNY ASSOC. OTHER INFORMATION TAKEN FROM A TOWN OF EAST LYME GIS MAP.*
- ***21, 29, 308, 1** AND **103** ARE SOIL MAPPING UNIT SYMBOLS. SEE WETLAND DELINEATION REPORT FOR THE SOIL MAP UNIT NAMES AND ADDITIONAL RELATED INFORMATION.*

I CERTIFY THAT THIS WETLAND MAP SUBSTANTIALLY REPRESENTS THE SOILS AND WETLANDS MAPPED IN THE FIELD

WILLIAM L. KENNY, SOIL SCIENTIST

WETLAND & WATERCOURSE MAP

230 FLANDERS ROAD
NIANTIC, CONNECTICUT

SCALE: NOT TO SCALE
DATE: MAY 27, 2022 - DRAFT

Ref. No. 5351

NORTH

Appendix C – Stormwater Calculations

Hydrology Calculations (2-, 5-, 10-, 25-, 50-, 100-year storm events)

NOAA Atlas Precipitation Data

Watershed Model Schematic

Hydrocad Reporting – Existing & Proposed Conditions

Storm Sewer Calculations (25-year storm event)

Proposed Storm Sewer System – Schematic, DOT Reporting, Profiles

Best Management Practices

WQS TSS Removal Calculations

Water Quality Flow Calculations

Hydrodynamic Separator Details

NOAA Atlas 14, Volume 10, Version 3
Location name: Niantic, Connecticut, USA*
Latitude: 41.3557°, Longitude: -72.2108°
Elevation: 39.68 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	0.337 (0.262-0.423)	0.403 (0.313-0.507)	0.512 (0.396-0.644)	0.602 (0.462-0.762)	0.726 (0.541-0.954)	0.819 (0.598-1.10)	0.917 (0.652-1.27)	1.03 (0.693-1.44)	1.19 (0.773-1.72)	1.33 (0.840-1.95)
10-min	0.478 (0.371-0.600)	0.572 (0.443-0.718)	0.726 (0.560-0.915)	0.853 (0.655-1.08)	1.03 (0.766-1.35)	1.16 (0.847-1.55)	1.30 (0.923-1.79)	1.46 (0.980-2.04)	1.69 (1.09-2.43)	1.88 (1.19-2.76)
15-min	0.562 (0.436-0.706)	0.672 (0.521-0.845)	0.852 (0.659-1.07)	1.00 (0.771-1.27)	1.21 (0.901-1.59)	1.36 (0.996-1.82)	1.53 (1.09-2.11)	1.72 (1.15-2.40)	1.99 (1.29-2.86)	2.21 (1.40-3.24)
30-min	0.793 (0.616-0.996)	0.949 (0.736-1.19)	1.20 (0.930-1.52)	1.41 (1.09-1.79)	1.71 (1.27-2.24)	1.92 (1.41-2.57)	2.15 (1.53-2.97)	2.42 (1.63-3.38)	2.80 (1.81-4.03)	3.11 (1.97-4.56)
60-min	1.02 (0.795-1.29)	1.23 (0.950-1.54)	1.55 (1.20-1.96)	1.83 (1.40-2.31)	2.20 (1.64-2.89)	2.48 (1.81-3.32)	2.78 (1.98-3.84)	3.12 (2.10-4.37)	3.61 (2.34-5.20)	4.01 (2.54-5.87)
2-hr	1.35 (1.05-1.68)	1.61 (1.26-2.01)	2.04 (1.59-2.55)	2.40 (1.86-3.01)	2.89 (2.17-3.77)	3.26 (2.40-4.33)	3.65 (2.62-5.01)	4.11 (2.78-5.70)	4.78 (3.11-6.82)	5.34 (3.39-7.74)
3-hr	1.56 (1.23-1.94)	1.87 (1.47-2.32)	2.37 (1.85-2.95)	2.78 (2.16-3.48)	3.35 (2.53-4.35)	3.78 (2.79-4.99)	4.23 (3.05-5.78)	4.76 (3.23-6.57)	5.55 (3.62-7.87)	6.21 (3.96-8.95)
6-hr	1.99 (1.57-2.45)	2.37 (1.88-2.92)	3.00 (2.36-3.70)	3.52 (2.76-4.37)	4.23 (3.22-5.45)	4.76 (3.55-6.25)	5.33 (3.86-7.22)	6.00 (4.09-8.20)	6.99 (4.58-9.82)	7.82 (5.00-11.2)
12-hr	2.46 (1.97-3.01)	2.93 (2.34-3.59)	3.70 (2.94-4.54)	4.33 (3.43-5.34)	5.21 (3.99-6.66)	5.87 (4.40-7.62)	6.56 (4.78-8.80)	7.37 (5.05-9.98)	8.57 (5.64-11.9)	9.56 (6.14-13.5)
24-hr	2.88 (2.32-3.50)	3.45 (2.78-4.19)	4.38 (3.52-5.34)	5.16 (4.11-6.31)	6.22 (4.80-7.89)	7.01 (5.30-9.05)	7.86 (5.77-10.5)	8.86 (6.10-11.9)	10.3 (6.84-14.2)	11.6 (7.48-16.2)
2-day	3.22 (2.62-3.88)	3.90 (3.17-4.70)	5.01 (4.05-6.05)	5.93 (4.77-7.20)	7.20 (5.61-9.07)	8.14 (6.21-10.4)	9.15 (6.79-12.1)	10.4 (7.19-13.8)	12.3 (8.14-16.7)	13.9 (8.98-19.2)
3-day	3.49 (2.85-4.19)	4.22 (3.45-5.07)	5.42 (4.41-6.53)	6.42 (5.19-7.75)	7.79 (6.09-9.76)	8.80 (6.74-11.2)	9.90 (7.37-13.1)	11.2 (7.80-14.8)	13.3 (8.83-18.0)	15.0 (9.75-20.6)
4-day	3.75 (3.08-4.48)	4.51 (3.70-5.40)	5.77 (4.71-6.92)	6.81 (5.53-8.20)	8.24 (6.47-10.3)	9.30 (7.15-11.8)	10.5 (7.80-13.7)	11.8 (8.24-15.6)	14.0 (9.31-18.8)	15.8 (10.3-21.6)
7-day	4.47 (3.69-5.31)	5.30 (4.38-6.30)	6.66 (5.48-7.94)	7.79 (6.36-9.32)	9.34 (7.37-11.6)	10.5 (8.09-13.2)	11.7 (8.77-15.2)	13.2 (9.23-17.2)	15.4 (10.3-20.6)	17.3 (11.3-23.4)
10-day	5.18 (4.30-6.13)	6.05 (5.01-7.16)	7.47 (6.17-8.86)	8.64 (7.09-10.3)	10.3 (8.12-12.6)	11.5 (8.87-14.3)	12.8 (9.54-16.4)	14.2 (10.0-18.5)	16.4 (11.0-21.8)	18.2 (11.9-24.6)
20-day	7.36 (6.16-8.64)	8.28 (6.93-9.74)	9.80 (8.17-11.5)	11.1 (9.16-13.1)	12.8 (10.2-15.5)	14.1 (11.0-17.4)	15.5 (11.6-19.5)	16.9 (12.0-21.7)	18.9 (12.8-24.8)	20.4 (13.4-27.3)
30-day	9.17 (7.72-10.7)	10.1 (8.53-11.9)	11.7 (9.82-13.8)	13.0 (10.9-15.3)	14.9 (11.9-17.9)	16.3 (12.6-19.8)	17.6 (13.2-21.9)	19.0 (13.5-24.2)	20.8 (14.1-27.2)	22.2 (14.6-29.4)
45-day	11.4 (9.67-13.3)	12.4 (10.5-14.5)	14.1 (11.9-16.5)	15.5 (13.0-18.2)	17.4 (14.0-20.8)	18.9 (14.8-22.9)	20.4 (15.2-25.0)	21.7 (15.5-27.5)	23.3 (15.9-30.2)	24.4 (16.1-32.1)
60-day	13.3 (11.3-15.4)	14.4 (12.2-16.7)	16.1 (13.6-18.8)	17.6 (14.8-20.5)	19.6 (15.8-23.3)	21.2 (16.6-25.5)	22.7 (16.9-27.7)	24.0 (17.2-30.2)	25.5 (17.4-32.9)	26.4 (17.5-34.7)

[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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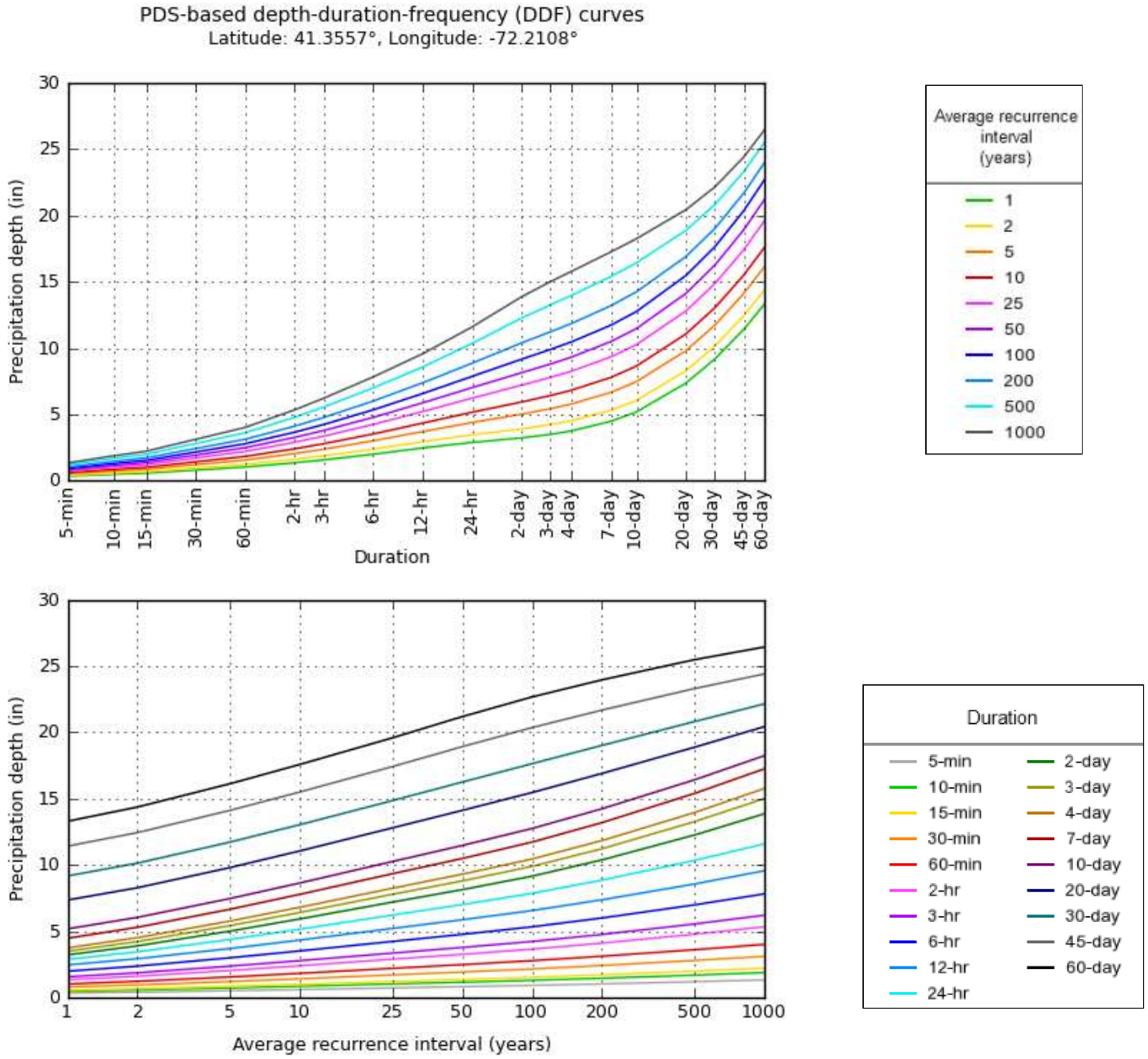
PF graphical



NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Thu Sep 8 16:32:59 2022

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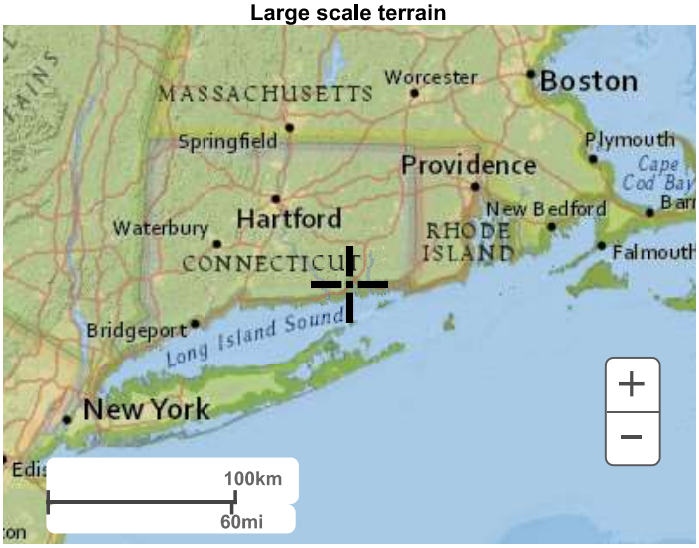
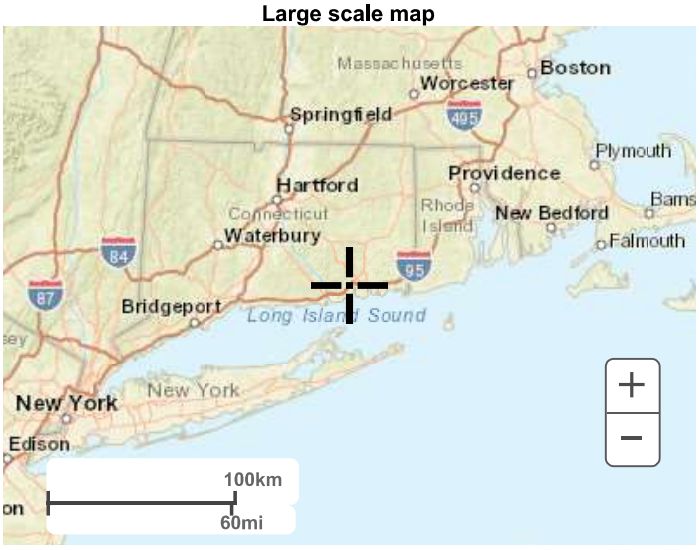
Maps & aerials

Small scale terrain

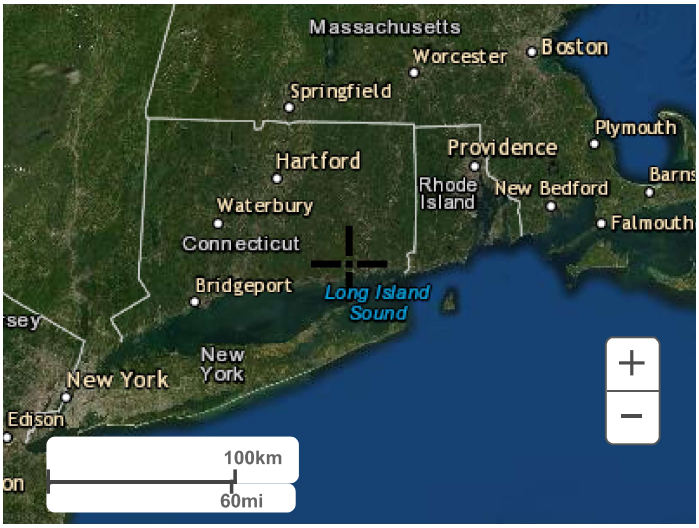
Large scale terrain



Large scale map



Large scale aerial



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

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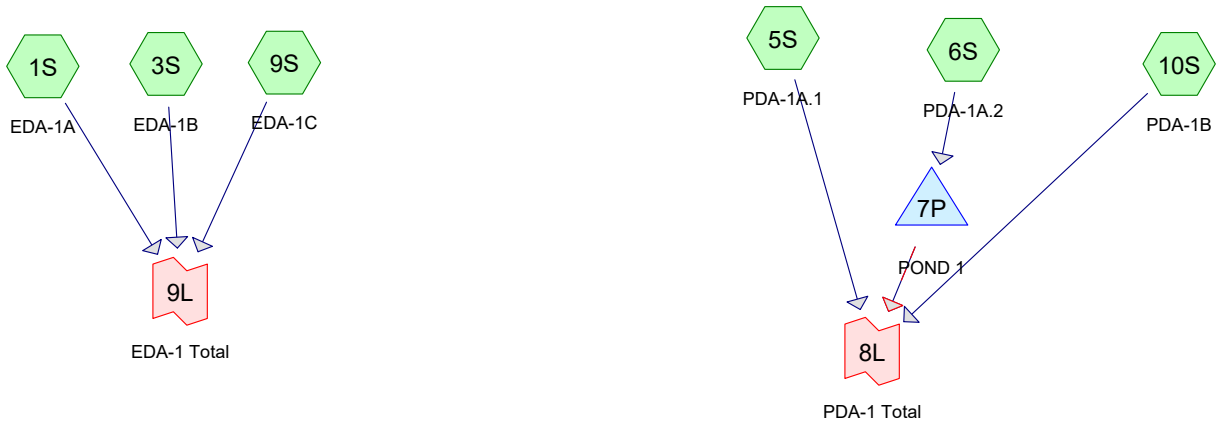


Subcat Reach Pond Link

Routing Diagram for East Lyme Hydrology

Prepared by {enter your company name here}, Printed 11/22/2022

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: EDA-1A Runoff Area=0.920 ac 1.09% Impervious Runoff Depth>0.63"
Flow Length=265' Tc=17.4 min CN=63 Runoff=0.37 cfs 0.048 af

Subcatchment 3S: EDA-1B Runoff Area=0.340 ac 73.53% Impervious Runoff Depth>2.22"
Flow Length=110' Slope=0.0450 '/' Tc=10.7 min CN=88 Runoff=0.75 cfs 0.063 af

Subcatchment 5S: PDA-1A.1 Runoff Area=0.370 ac 0.00% Impervious Runoff Depth>0.82"
Flow Length=390' Tc=13.5 min CN=67 Runoff=0.24 cfs 0.025 af

Subcatchment 6S: PDA-1A.2 Runoff Area=0.870 ac 62.07% Impervious Runoff Depth>1.89"
Flow Length=143' Tc=13.6 min CN=84 Runoff=1.50 cfs 0.137 af

Subcatchment 9S: EDA-1C Runoff Area=0.180 ac 77.78% Impervious Runoff Depth>2.40"
Tc=6.0 min CN=90 Runoff=0.49 cfs 0.036 af

Subcatchment 10S: PDA-1B Runoff Area=0.200 ac 35.00% Impervious Runoff Depth>1.20"
Tc=6.0 min CN=74 Runoff=0.27 cfs 0.020 af

Pond 7P: POND 1 Peak Elev=35.25' Storage=1,433 cf Inflow=1.50 cfs 0.137 af
Primary=0.67 cfs 0.135 af Secondary=0.00 cfs 0.000 af Outflow=0.67 cfs 0.135 af

Link 8L: PDA-1 Total Inflow=0.97 cfs 0.180 af
Primary=0.97 cfs 0.180 af

Link 9L: EDA-1 Total Inflow=1.37 cfs 0.147 af
Primary=1.37 cfs 0.147 af

Summary for Subcatchment 1S: EDA-1A

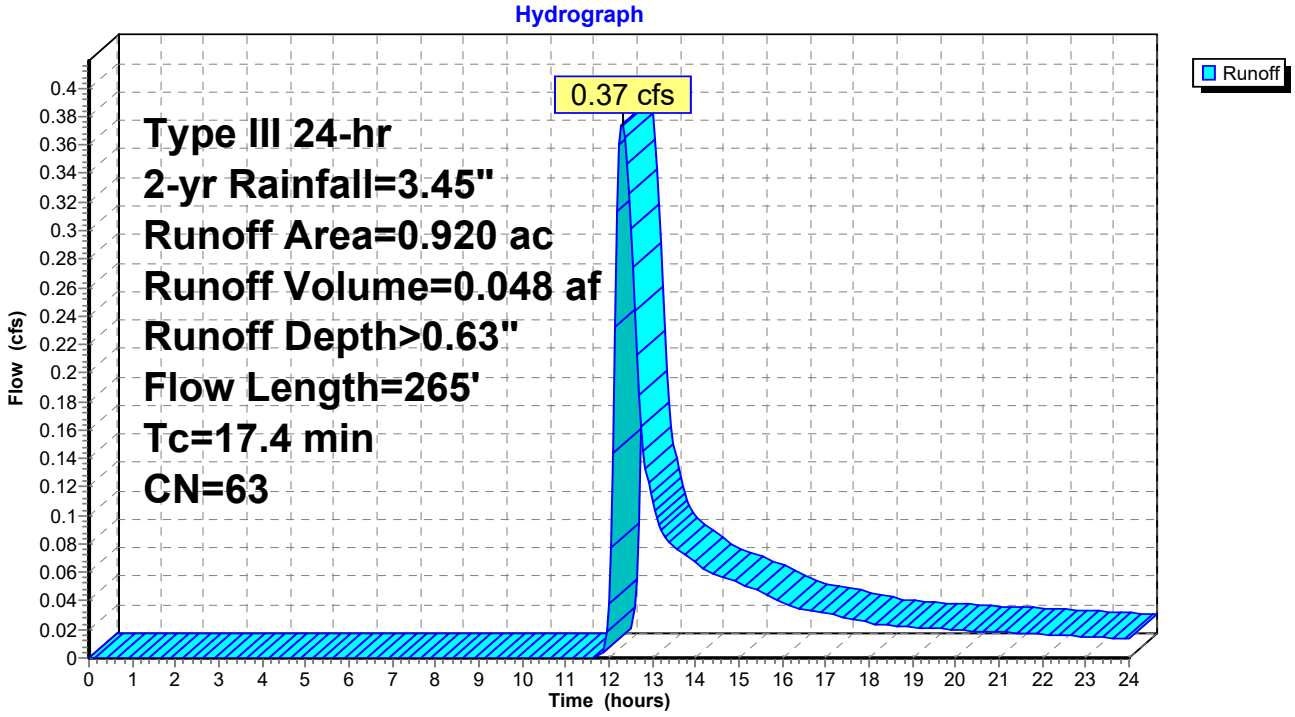
Runoff = 0.37 cfs @ 12.30 hrs, Volume= 0.048 af, Depth> 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.45"

Area (ac)	CN	Description
0.410	61	>75% Grass cover, Good, HSG B
0.290	55	Woods, Good, HSG B
0.210	77	Woods, Good, HSG D
0.010	98	Paved parking, HSG B
0.920	63	Weighted Average
0.910		98.91% Pervious Area
0.010		1.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	150	0.0267	0.15		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
0.5	115	0.0480	3.53		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
17.4	265	Total			

Subcatchment 1S: EDA-1A



Summary for Subcatchment 3S: EDA-1B

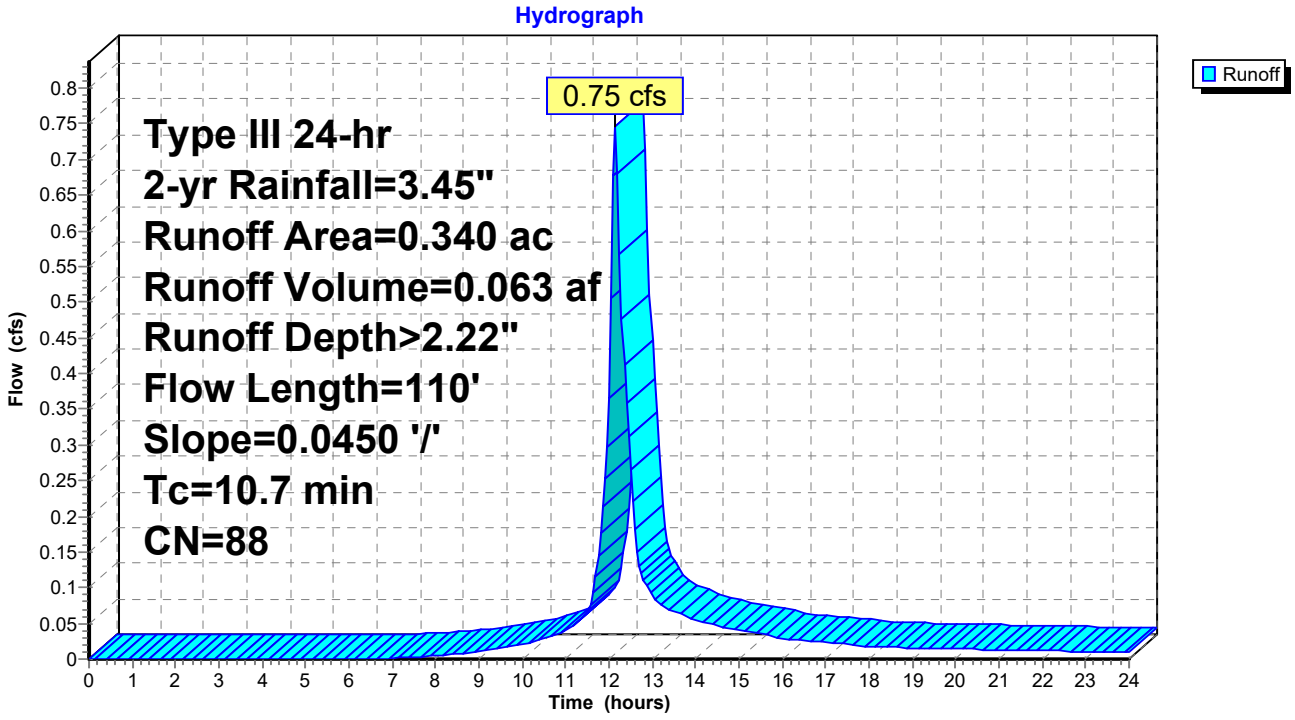
Runoff = 0.75 cfs @ 12.15 hrs, Volume= 0.063 af, Depth> 2.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.45"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG B
0.090	61	>75% Grass cover, Good, HSG B
0.340	88	Weighted Average
0.090		26.47% Pervious Area
0.250		73.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	110	0.0450	0.17		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"

Subcatchment 3S: EDA-1B



Summary for Subcatchment 5S: PDA-1A.1

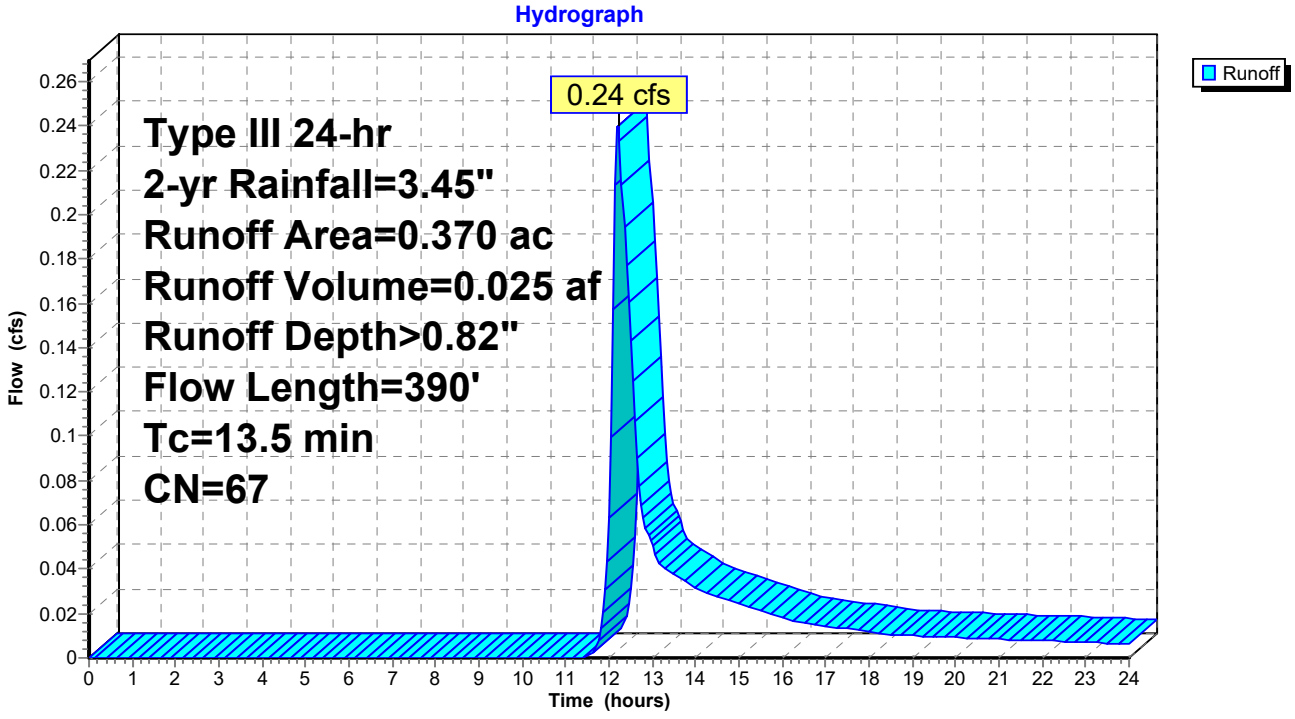
Runoff = 0.24 cfs @ 12.22 hrs, Volume= 0.025 af, Depth> 0.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.45"

Area (ac)	CN	Description
0.100	61	>75% Grass cover, Good, HSG B
0.090	55	Woods, Good, HSG B
0.180	77	Woods, Good, HSG D
0.370	67	Weighted Average
0.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	150	0.0600	0.20		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
1.3	240	0.0375	3.12		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
13.5	390	Total			

Subcatchment 5S: PDA-1A.1



Summary for Subcatchment 6S: PDA-1A.2

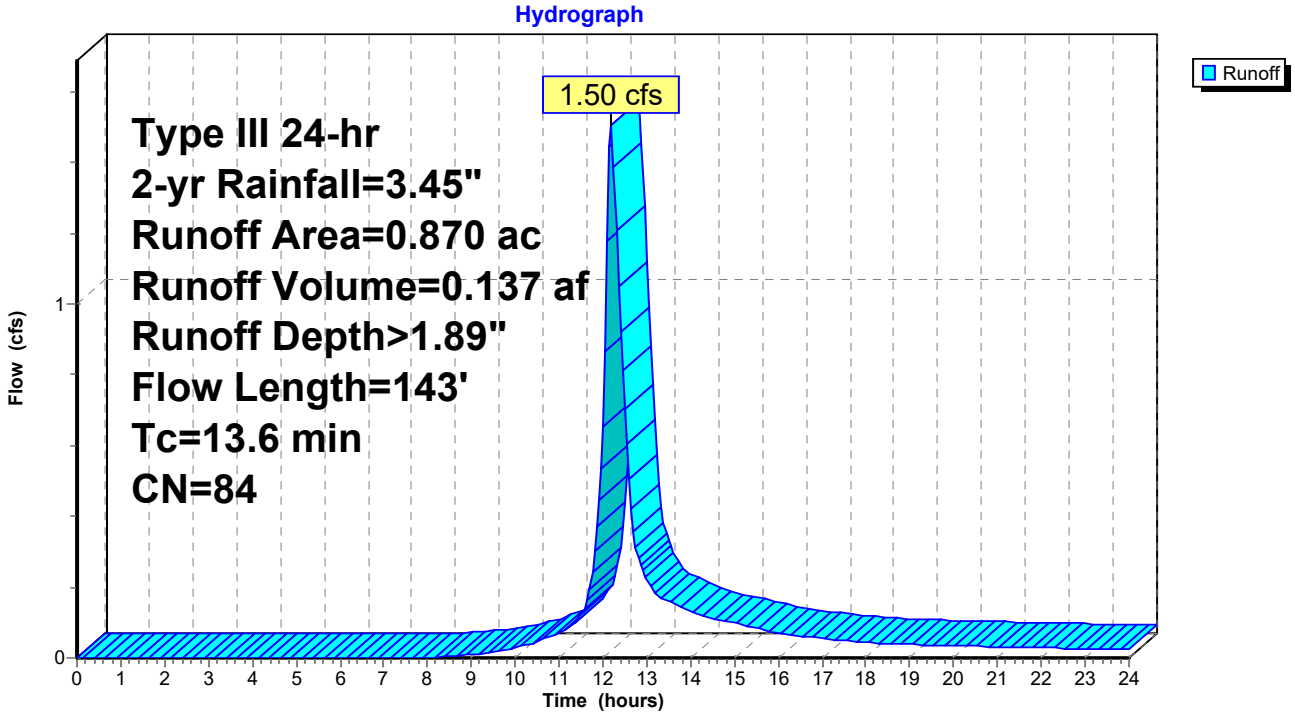
Runoff = 1.50 cfs @ 12.19 hrs, Volume= 0.137 af, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.45"

Area (ac)	CN	Description
0.330	61	>75% Grass cover, Good, HSG B
0.540	98	Paved parking, HSG B
0.870	84	Weighted Average
0.330		37.93% Pervious Area
0.540		62.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	133	0.0375	0.17		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
0.2	10	0.0200	0.90		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.45"
13.6	143	Total			

Subcatchment 6S: PDA-1A.2



Summary for Subcatchment 9S: EDA-1C

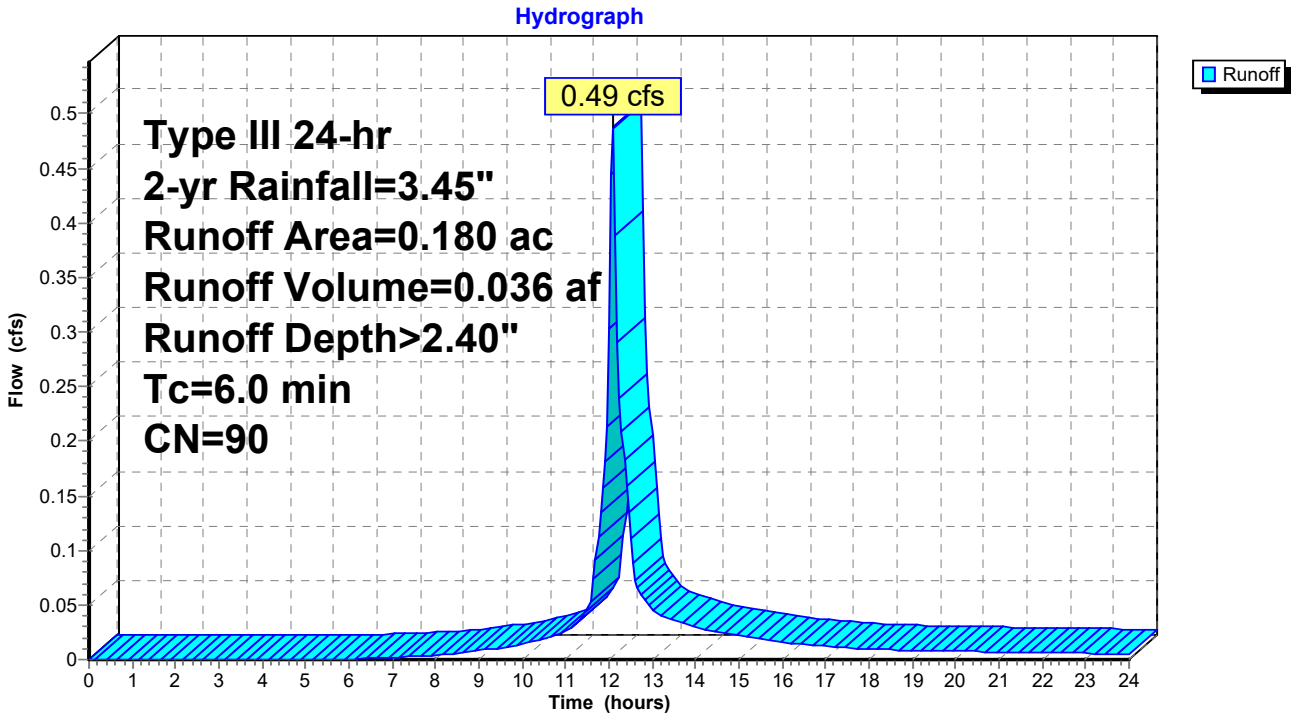
Runoff = 0.49 cfs @ 12.09 hrs, Volume= 0.036 af, Depth> 2.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.45"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG B
0.040	61	>75% Grass cover, Good, HSG B
0.180	90	Weighted Average
0.040		22.22% Pervious Area
0.140		77.78% Impervious Area

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

Subcatchment 9S: EDA-1C



Summary for Subcatchment 10S: PDA-1B

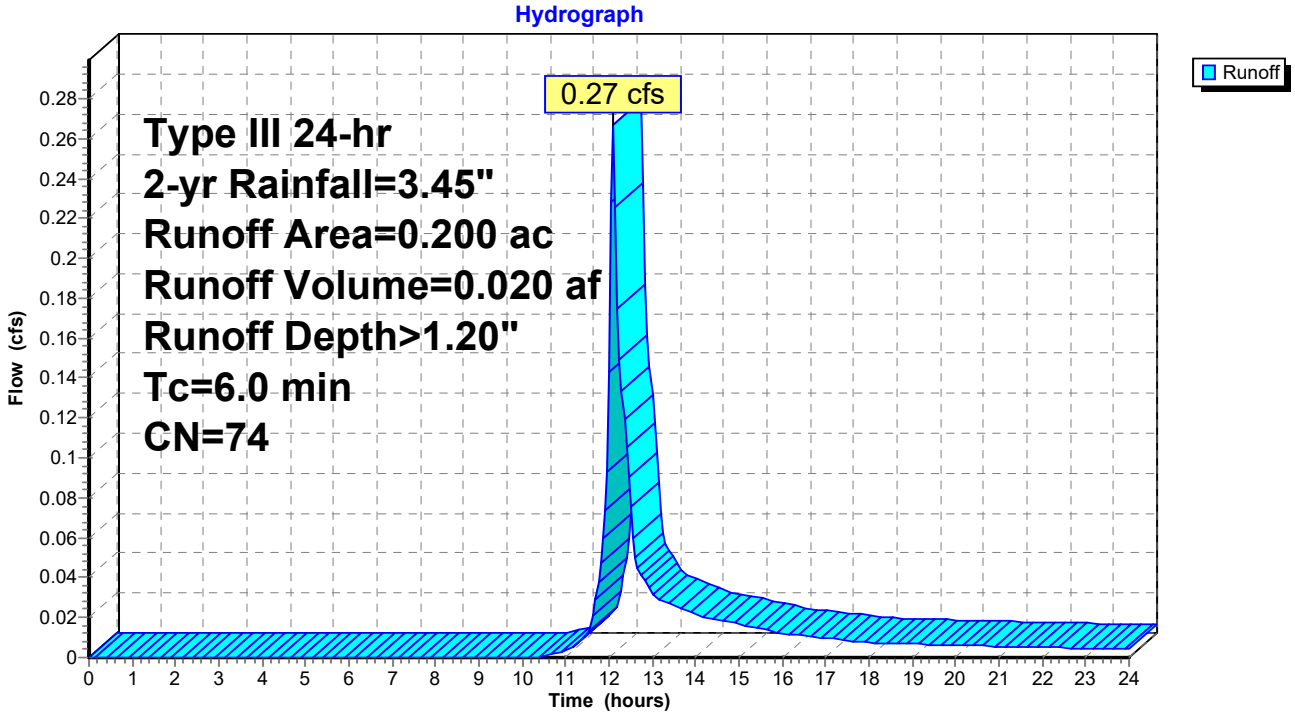
Runoff = 0.27 cfs @ 12.10 hrs, Volume= 0.020 af, Depth> 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.45"

Area (ac)	CN	Description
0.130	61	>75% Grass cover, Good, HSG B
0.070	98	Paved parking, HSG B
0.200	74	Weighted Average
0.130		65.00% Pervious Area
0.070		35.00% Impervious Area

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

Subcatchment 10S: PDA-1B



Summary for Pond 7P: POND 1

Inflow Area = 0.870 ac, 62.07% Impervious, Inflow Depth > 1.89" for 2-yr event
Inflow = 1.50 cfs @ 12.19 hrs, Volume= 0.137 af
Outflow = 0.67 cfs @ 12.52 hrs, Volume= 0.135 af, Atten= 56%, Lag= 19.5 min
Primary = 0.67 cfs @ 12.52 hrs, Volume= 0.135 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 35.25' @ 12.52 hrs Surf.Area= 1,373 sf Storage= 1,433 cf

Plug-Flow detention time= 33.7 min calculated for 0.135 af (98% of inflow)
Center-of-Mass det. time= 25.1 min (856.8 - 831.7)

Volume	Invert	Avail.Storage	Storage Description
#1	34.00'	8,243 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

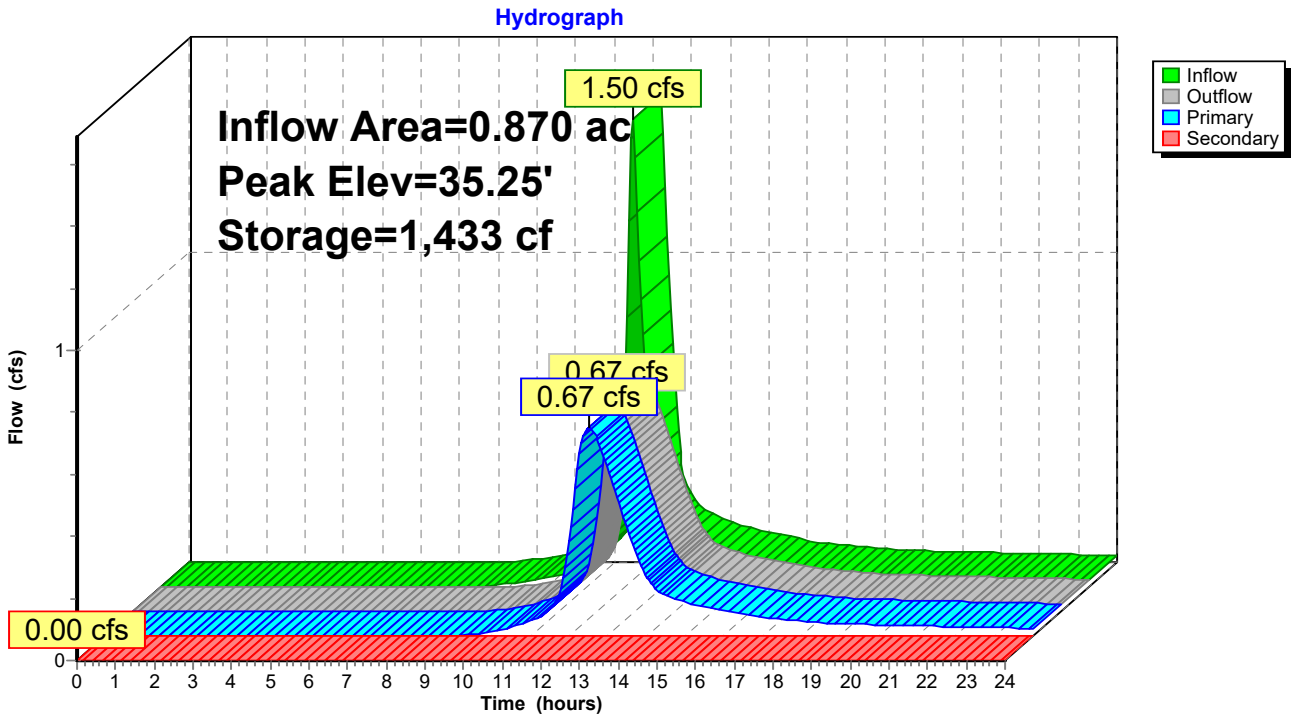
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.00	934	0	0
35.00	1,278	1,106	1,106
36.00	1,662	1,470	2,576
37.00	2,085	1,874	4,450
38.00	2,687	2,386	6,836
38.50	2,942	1,407	8,243

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.00' / 33.60' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	34.00'	**5.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	35.75'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	37.25'	**20.4" x 37.2" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	37.50'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.67 cfs @ 12.52 hrs HW=35.25' (Free Discharge)
└**1=Culvert** (Passes 0.67 cfs of 3.25 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.67 cfs @ 4.90 fps)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=34.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: POND 1



Stage-Discharge for Pond 7P: POND 1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
34.00	0.00	0.00	0.00
34.05	0.01	0.01	0.00
34.10	0.03	0.03	0.00
34.15	0.06	0.06	0.00
34.20	0.10	0.10	0.00
34.25	0.15	0.15	0.00
34.30	0.20	0.20	0.00
34.35	0.25	0.25	0.00
34.40	0.29	0.29	0.00
34.45	0.32	0.32	0.00
34.50	0.35	0.35	0.00
34.55	0.38	0.38	0.00
34.60	0.41	0.41	0.00
34.65	0.44	0.44	0.00
34.70	0.46	0.46	0.00
34.75	0.48	0.48	0.00
34.80	0.51	0.51	0.00
34.85	0.53	0.53	0.00
34.90	0.55	0.55	0.00
34.95	0.57	0.57	0.00
35.00	0.58	0.58	0.00
35.05	0.60	0.60	0.00
35.10	0.62	0.62	0.00
35.15	0.64	0.64	0.00
35.20	0.65	0.65	0.00
35.25	0.67	0.67	0.00
35.30	0.69	0.69	0.00
35.35	0.70	0.70	0.00
35.40	0.72	0.72	0.00
35.45	0.73	0.73	0.00
35.50	0.75	0.75	0.00
35.55	0.76	0.76	0.00
35.60	0.77	0.77	0.00
35.65	0.79	0.79	0.00
35.70	0.80	0.80	0.00
35.75	0.82	0.82	0.00
35.80	0.86	0.86	0.00
35.85	0.94	0.94	0.00
35.90	1.04	1.04	0.00
35.95	1.15	1.15	0.00
36.00	1.28	1.28	0.00
36.05	1.42	1.42	0.00
36.10	1.57	1.57	0.00
36.15	1.73	1.73	0.00
36.20	1.90	1.90	0.00
36.25	2.07	2.07	0.00
36.30	2.22	2.22	0.00
36.35	2.35	2.35	0.00
36.40	2.47	2.47	0.00
36.45	2.58	2.58	0.00
36.50	2.68	2.68	0.00
36.55	2.77	2.77	0.00
36.60	2.87	2.87	0.00
36.65	2.95	2.95	0.00
36.70	3.04	3.04	0.00
36.75	3.12	3.12	0.00
36.80	3.20	3.20	0.00
36.85	3.28	3.28	0.00
36.90	3.35	3.35	0.00
36.95	3.43	3.43	0.00
37.00	3.50	3.50	0.00
37.05	3.57	3.57	0.00
37.10	3.64	3.64	0.00
37.15	3.70	3.70	0.00
37.20	3.77	3.77	0.00
37.25	3.83	3.83	0.00
37.30	4.25	4.25	0.00
37.35	4.95	4.95	0.00
37.40	5.84	5.84	0.00
37.45	6.41	6.41	0.00
37.50	6.47	6.47	0.00
37.55	6.79	6.52	0.26
37.60	7.33	6.58	0.75
37.65	8.01	6.63	1.38
37.70	8.80	6.68	2.12
37.75	9.74	6.74	3.01
37.80	10.80	6.79	4.01
37.85	11.97	6.84	5.12
37.90	13.25	6.90	6.35
37.95	14.67	6.95	7.72
38.00	16.21	7.00	9.21
38.05	17.87	7.05	10.82
38.10	19.65	7.10	12.55
38.15	21.28	7.15	14.12
38.20	22.96	7.20	15.75
38.25	24.69	7.25	17.44
38.30	26.48	7.30	19.18
38.35	28.35	7.35	21.00
38.40	30.28	7.40	22.88
38.45	32.26	7.45	24.82
38.50	**34.30**	**7.50**	**26.80**

Stage-Area-Storage for Pond 7P: POND 1

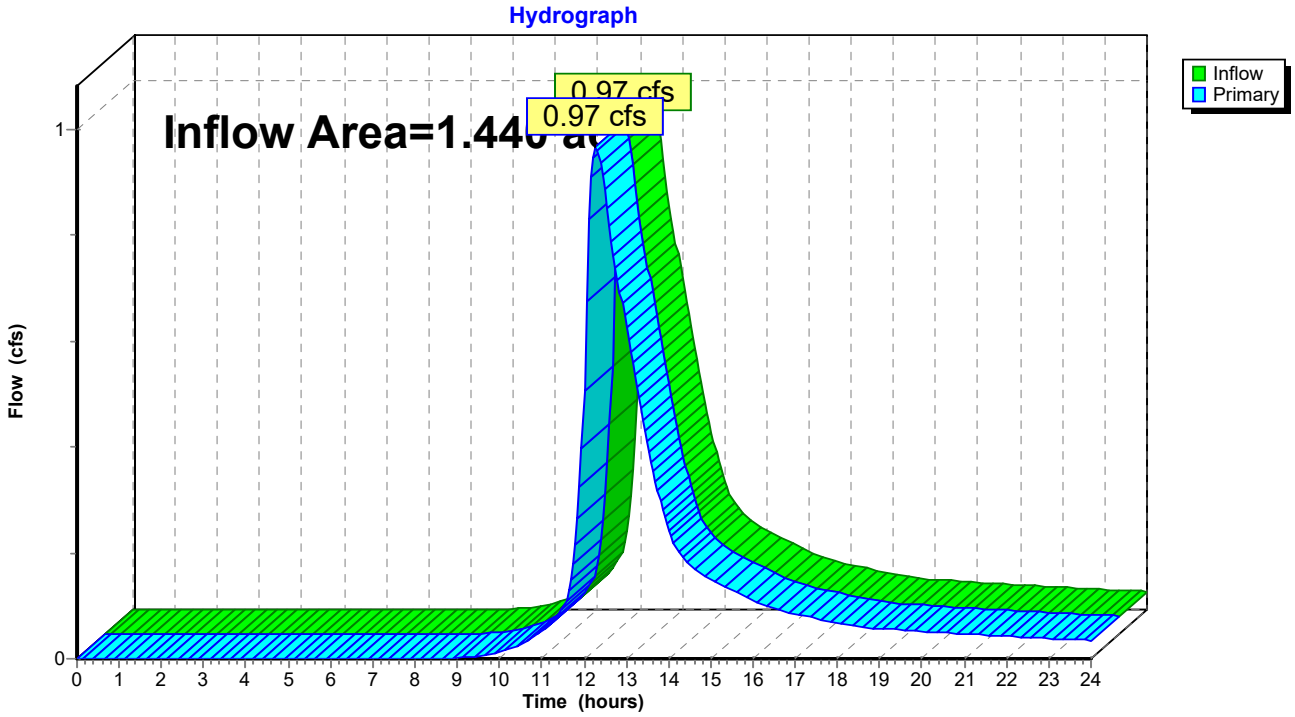
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.00	934	0
34.05	951	47
34.10	968	95
34.15	986	144
34.20	1,003	194
34.25	1,020	244
34.30	1,037	296
34.35	1,054	348
34.40	1,072	401
34.45	1,089	455
34.50	1,106	510
34.55	1,123	566
34.60	1,140	622
34.65	1,158	680
34.70	1,175	738
34.75	1,192	797
34.80	1,209	857
34.85	1,226	918
34.90	1,244	980
34.95	1,261	1,043
35.00	1,278	1,106
35.05	1,297	1,170
35.10	1,316	1,236
35.15	1,336	1,302
35.20	1,355	1,369
35.25	1,374	1,438
35.30	1,393	1,507
35.35	1,412	1,577
35.40	1,432	1,648
35.45	1,451	1,720
35.50	1,470	1,793
35.55	1,489	1,867
35.60	1,508	1,942
35.65	1,528	2,018
35.70	1,547	2,095
35.75	1,566	2,173
35.80	1,585	2,251
35.85	1,604	2,331
35.90	1,624	2,412
35.95	1,643	2,493
36.00	1,662	2,576
36.05	1,683	2,660
36.10	1,704	2,744
36.15	1,725	2,830
36.20	1,747	2,917
36.25	1,768	3,005
36.30	1,789	3,094
36.35	1,810	3,184
36.40	1,831	3,275
36.45	1,852	3,367
36.50	1,874	3,460
36.55	1,895	3,554
36.60	1,916	3,649
36.65	1,937	3,746
36.70	1,958	3,843
36.75	1,979	3,941
36.80	2,000	4,041
36.85	2,022	4,142
36.90	2,043	4,243
36.95	2,064	4,346
37.00	2,085	4,450
37.05	2,115	4,555
37.10	2,145	4,661
37.15	2,175	4,769
37.20	2,205	4,879
37.25	2,236	4,990
37.30	2,266	5,102
37.35	2,296	5,216
37.40	2,326	5,332
37.45	2,356	5,449
37.50	2,386	5,567
37.55	2,416	5,687
37.60	2,446	5,809
37.65	2,476	5,932
37.70	2,506	6,056
37.75	2,537	6,183
37.80	2,567	6,310
37.85	2,597	6,439
37.90	2,627	6,570
37.95	2,657	6,702
38.00	2,687	6,836
38.05	2,712	6,970
38.10	2,738	7,107
38.15	2,763	7,244
38.20	2,789	7,383
38.25	2,815	7,523
38.30	2,840	7,665
38.35	2,866	7,807
38.40	2,891	7,951
38.45	2,917	8,096
38.50	**2,942**	**8,243**

Summary for Link 8L: PDA-1 Total

Inflow Area = 1.440 ac, 42.36% Impervious, Inflow Depth > 1.50" for 2-yr event
Inflow = 0.97 cfs @ 12.27 hrs, Volume= 0.180 af
Primary = 0.97 cfs @ 12.27 hrs, Volume= 0.180 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: PDA-1 Total

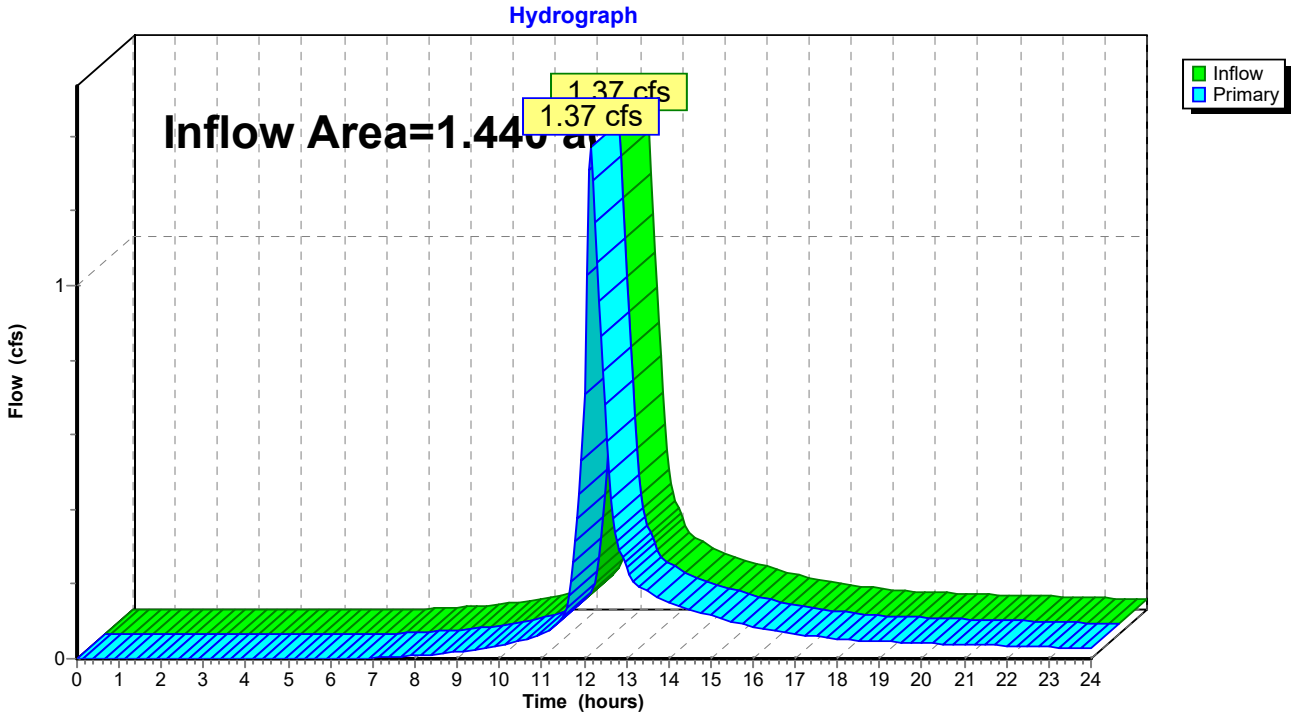


Summary for Link 9L: EDA-1 Total

Inflow Area = 1.440 ac, 27.78% Impervious, Inflow Depth > 1.23" for 2-yr event
Inflow = 1.37 cfs @ 12.15 hrs, Volume= 0.147 af
Primary = 1.37 cfs @ 12.15 hrs, Volume= 0.147 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 9L: EDA-1 Total



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: EDA-1A Runoff Area=0.920 ac 1.09% Impervious Runoff Depth>1.13"
Flow Length=265' Tc=17.4 min CN=63 Runoff=0.77 cfs 0.086 af

Subcatchment 3S: EDA-1B Runoff Area=0.340 ac 73.53% Impervious Runoff Depth>3.08"
Flow Length=110' Slope=0.0450 '/' Tc=10.7 min CN=88 Runoff=1.03 cfs 0.087 af

Subcatchment 5S: PDA-1A.1 Runoff Area=0.370 ac 0.00% Impervious Runoff Depth>1.38"
Flow Length=390' Tc=13.5 min CN=67 Runoff=0.44 cfs 0.043 af

Subcatchment 6S: PDA-1A.2 Runoff Area=0.870 ac 62.07% Impervious Runoff Depth>2.70"
Flow Length=143' Tc=13.6 min CN=84 Runoff=2.15 cfs 0.196 af

Subcatchment 9S: EDA-1C Runoff Area=0.180 ac 77.78% Impervious Runoff Depth>3.28"
Tc=6.0 min CN=90 Runoff=0.66 cfs 0.049 af

Subcatchment 10S: PDA-1B Runoff Area=0.200 ac 35.00% Impervious Runoff Depth>1.88"
Tc=6.0 min CN=74 Runoff=0.43 cfs 0.031 af

Pond 7P: POND 1 Peak Elev=35.79' Storage=2,232 cf Inflow=2.15 cfs 0.196 af
Primary=0.85 cfs 0.194 af Secondary=0.00 cfs 0.000 af Outflow=0.85 cfs 0.194 af

Link 8L: PDA-1 Total Inflow=1.38 cfs 0.267 af
Primary=1.38 cfs 0.267 af

Link 9L: EDA-1 Total Inflow=2.11 cfs 0.223 af
Primary=2.11 cfs 0.223 af

Summary for Subcatchment 1S: EDA-1A

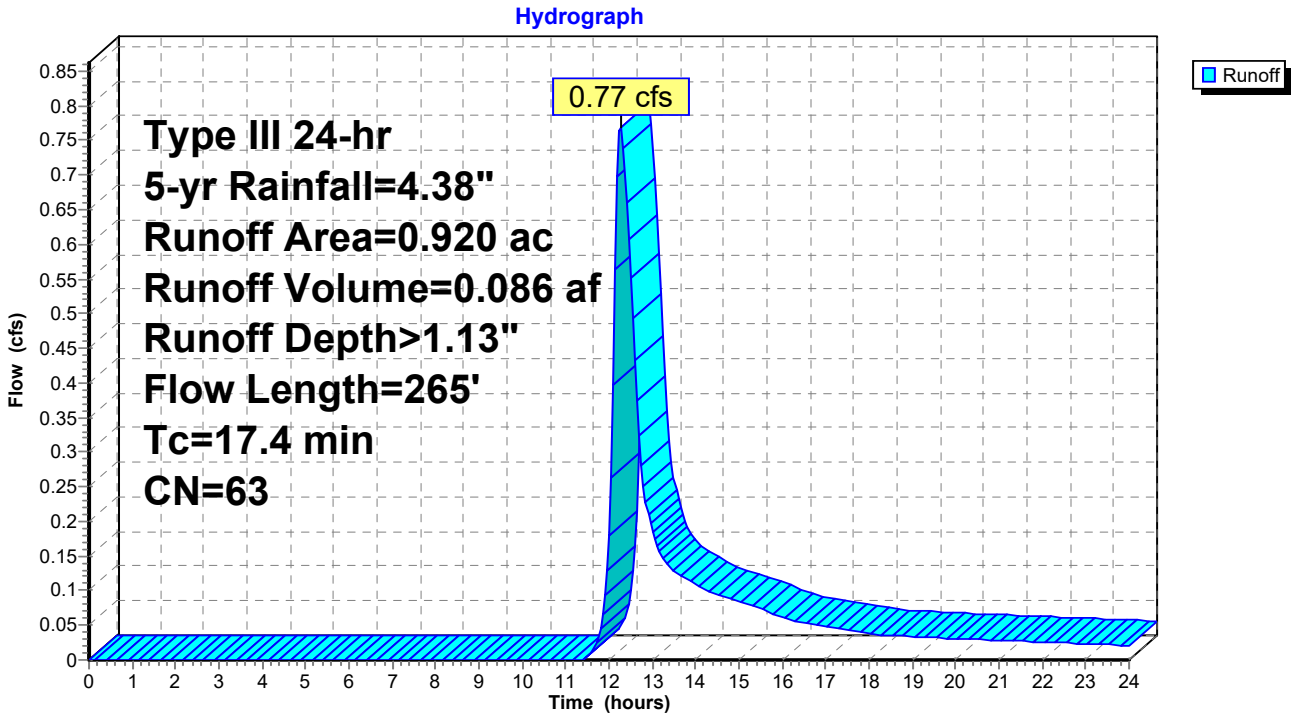
Runoff = 0.77 cfs @ 12.27 hrs, Volume= 0.086 af, Depth> 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.38"

Area (ac)	CN	Description
0.410	61	>75% Grass cover, Good, HSG B
0.290	55	Woods, Good, HSG B
0.210	77	Woods, Good, HSG D
0.010	98	Paved parking, HSG B
0.920	63	Weighted Average
0.910		98.91% Pervious Area
0.010		1.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	150	0.0267	0.15		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
0.5	115	0.0480	3.53		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
17.4	265	Total			

Subcatchment 1S: EDA-1A



Summary for Subcatchment 3S: EDA-1B

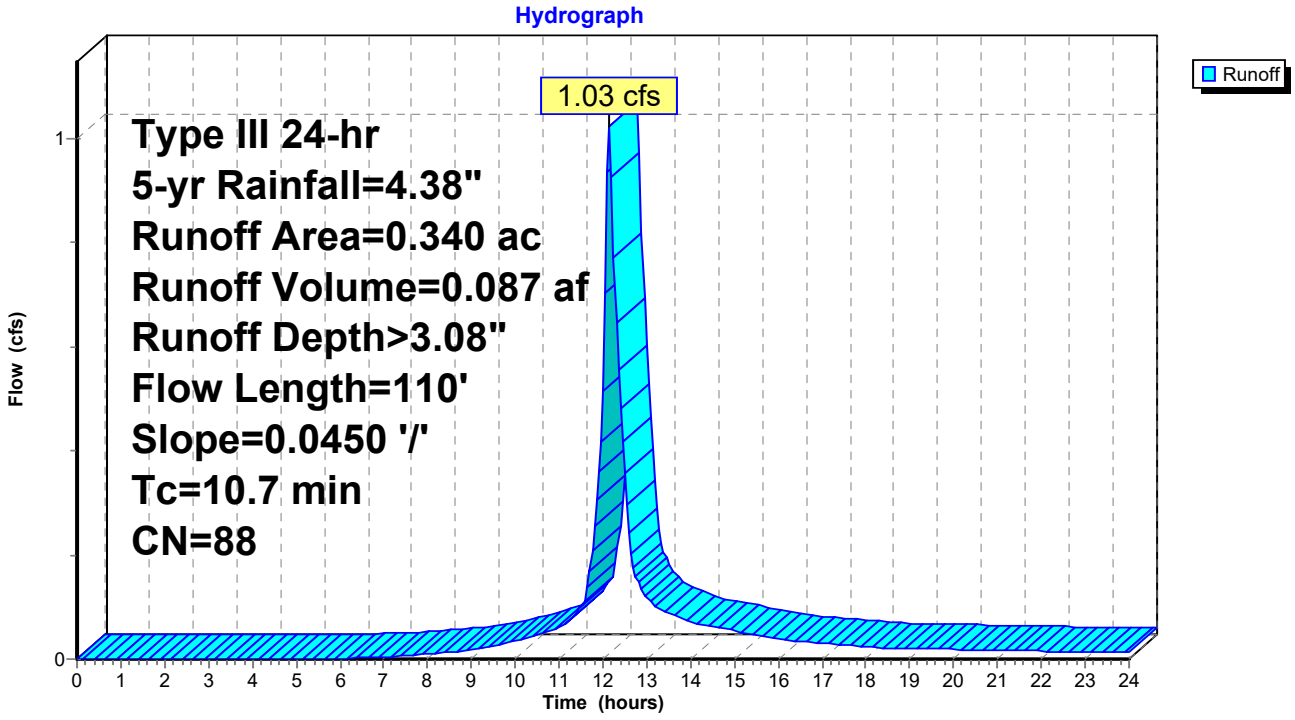
Runoff = 1.03 cfs @ 12.15 hrs, Volume= 0.087 af, Depth> 3.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.38"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG B
0.090	61	>75% Grass cover, Good, HSG B
0.340	88	Weighted Average
0.090		26.47% Pervious Area
0.250		73.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	110	0.0450	0.17		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"

Subcatchment 3S: EDA-1B



Summary for Subcatchment 5S: PDA-1A.1

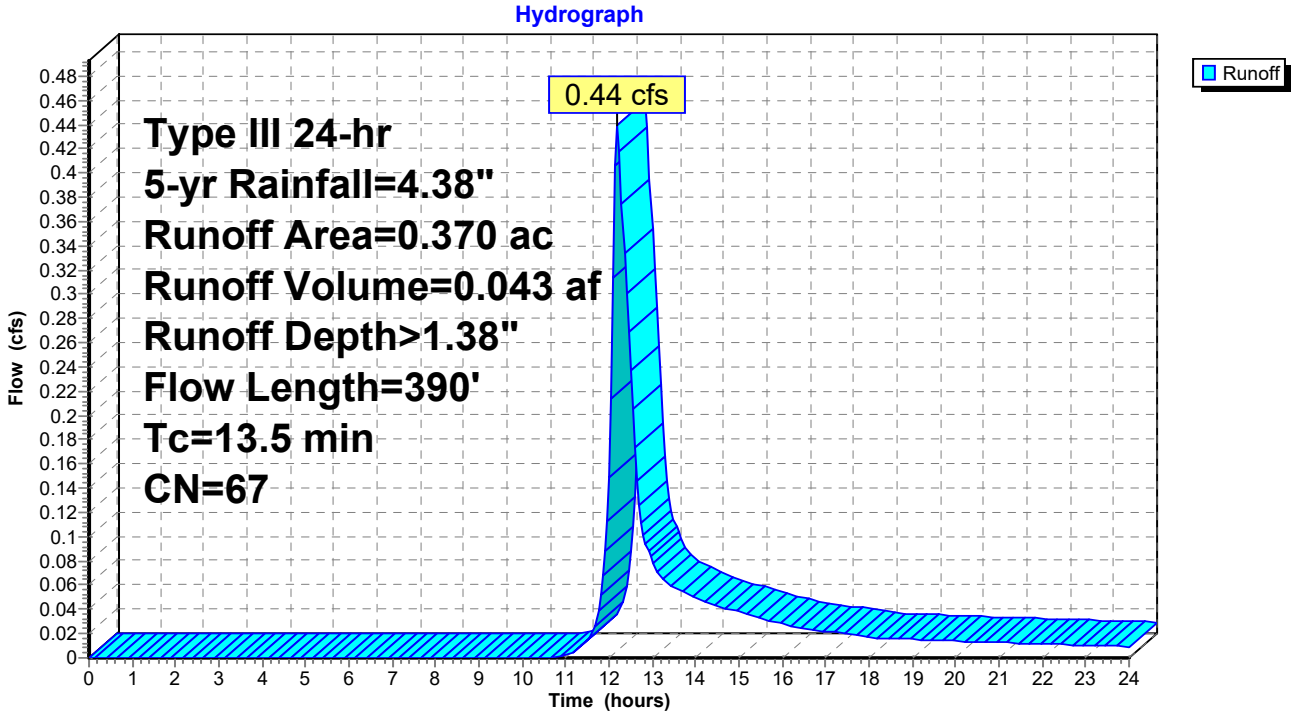
Runoff = 0.44 cfs @ 12.21 hrs, Volume= 0.043 af, Depth> 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.38"

Area (ac)	CN	Description
0.100	61	>75% Grass cover, Good, HSG B
0.090	55	Woods, Good, HSG B
0.180	77	Woods, Good, HSG D
0.370	67	Weighted Average
0.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	150	0.0600	0.20		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
1.3	240	0.0375	3.12		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
13.5	390	Total			

Subcatchment 5S: PDA-1A.1



Summary for Subcatchment 6S: PDA-1A.2

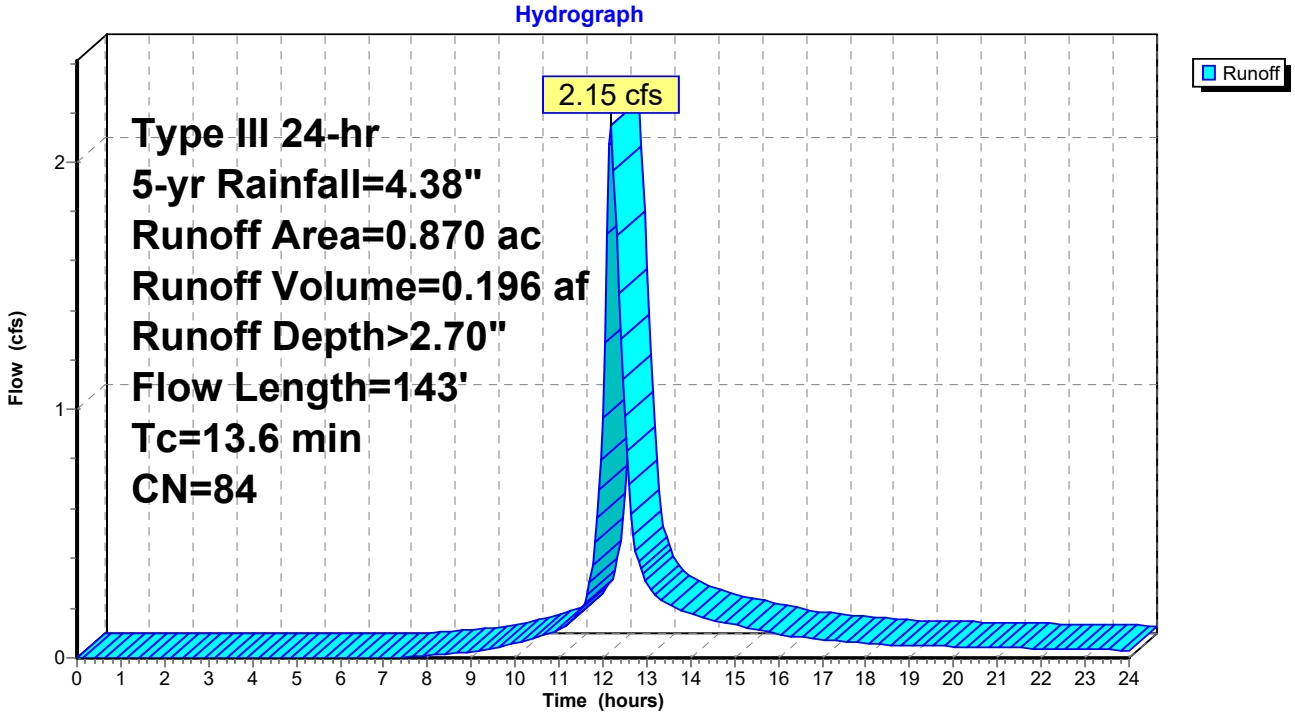
Runoff = 2.15 cfs @ 12.19 hrs, Volume= 0.196 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.38"

Area (ac)	CN	Description
0.330	61	>75% Grass cover, Good, HSG B
0.540	98	Paved parking, HSG B
0.870	84	Weighted Average
0.330		37.93% Pervious Area
0.540		62.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	133	0.0375	0.17		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
0.2	10	0.0200	0.90		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.45"
13.6	143	Total			

Subcatchment 6S: PDA-1A.2



Summary for Subcatchment 9S: EDA-1C

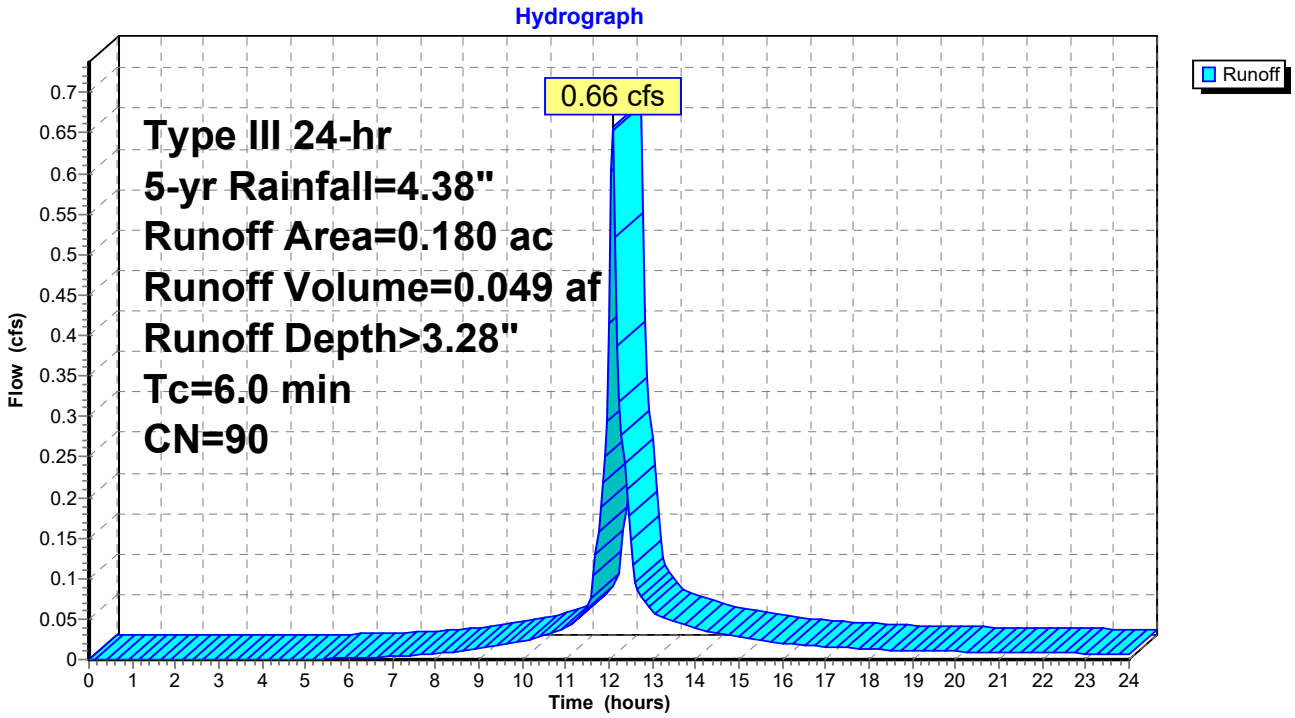
Runoff = 0.66 cfs @ 12.09 hrs, Volume= 0.049 af, Depth> 3.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.38"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG B
0.040	61	>75% Grass cover, Good, HSG B
0.180	90	Weighted Average
0.040		22.22% Pervious Area
0.140		77.78% Impervious Area

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

Subcatchment 9S: EDA-1C



Summary for Subcatchment 10S: PDA-1B

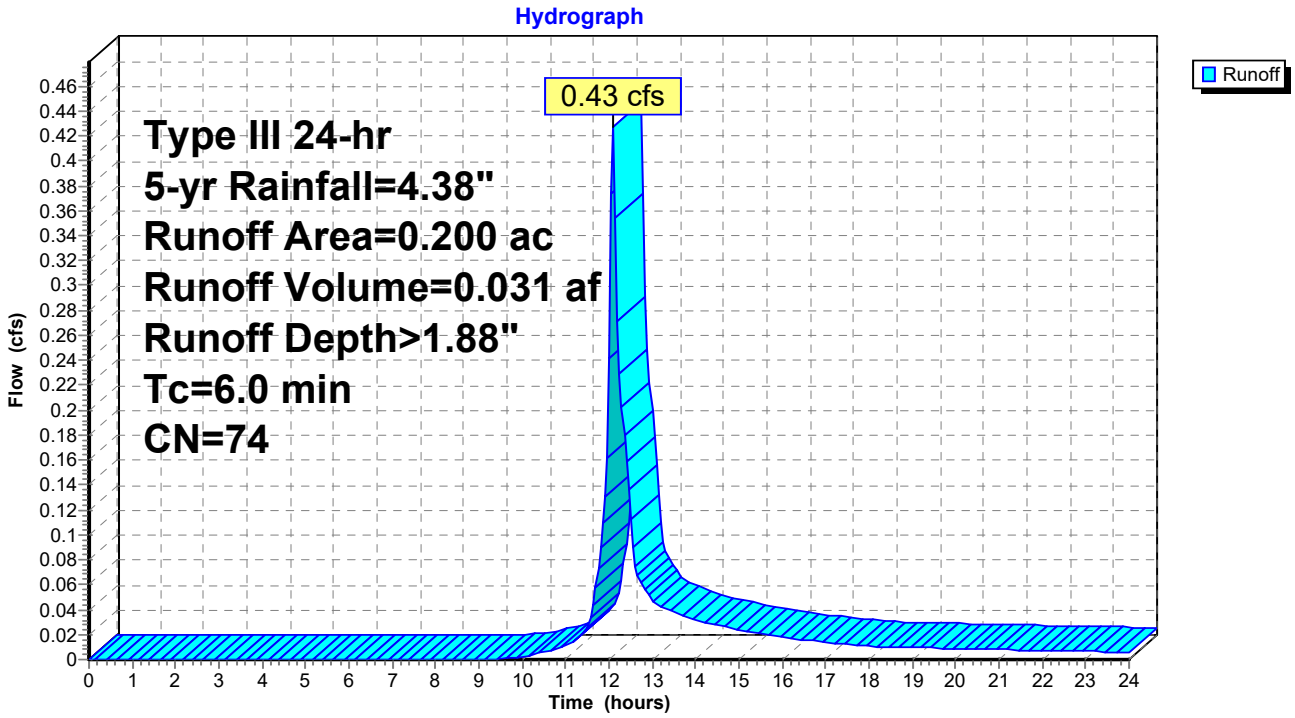
Runoff = 0.43 cfs @ 12.10 hrs, Volume= 0.031 af, Depth> 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-yr Rainfall=4.38"

Area (ac)	CN	Description
0.130	61	>75% Grass cover, Good, HSG B
0.070	98	Paved parking, HSG B
0.200	74	Weighted Average
0.130		65.00% Pervious Area
0.070		35.00% Impervious Area

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

Subcatchment 10S: PDA-1B



Summary for Pond 7P: POND 1

Inflow Area = 0.870 ac, 62.07% Impervious, Inflow Depth > 2.70" for 5-yr event
Inflow = 2.15 cfs @ 12.19 hrs, Volume= 0.196 af
Outflow = 0.85 cfs @ 12.54 hrs, Volume= 0.194 af, Atten= 60%, Lag= 21.3 min
Primary = 0.85 cfs @ 12.54 hrs, Volume= 0.194 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 35.79' @ 12.54 hrs Surf.Area= 1,581 sf Storage= 2,232 cf

Plug-Flow detention time= 35.4 min calculated for 0.193 af (99% of inflow)
Center-of-Mass det. time= 28.3 min (849.8 - 821.5)

Volume	Invert	Avail.Storage	Storage Description
#1	34.00'	8,243 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

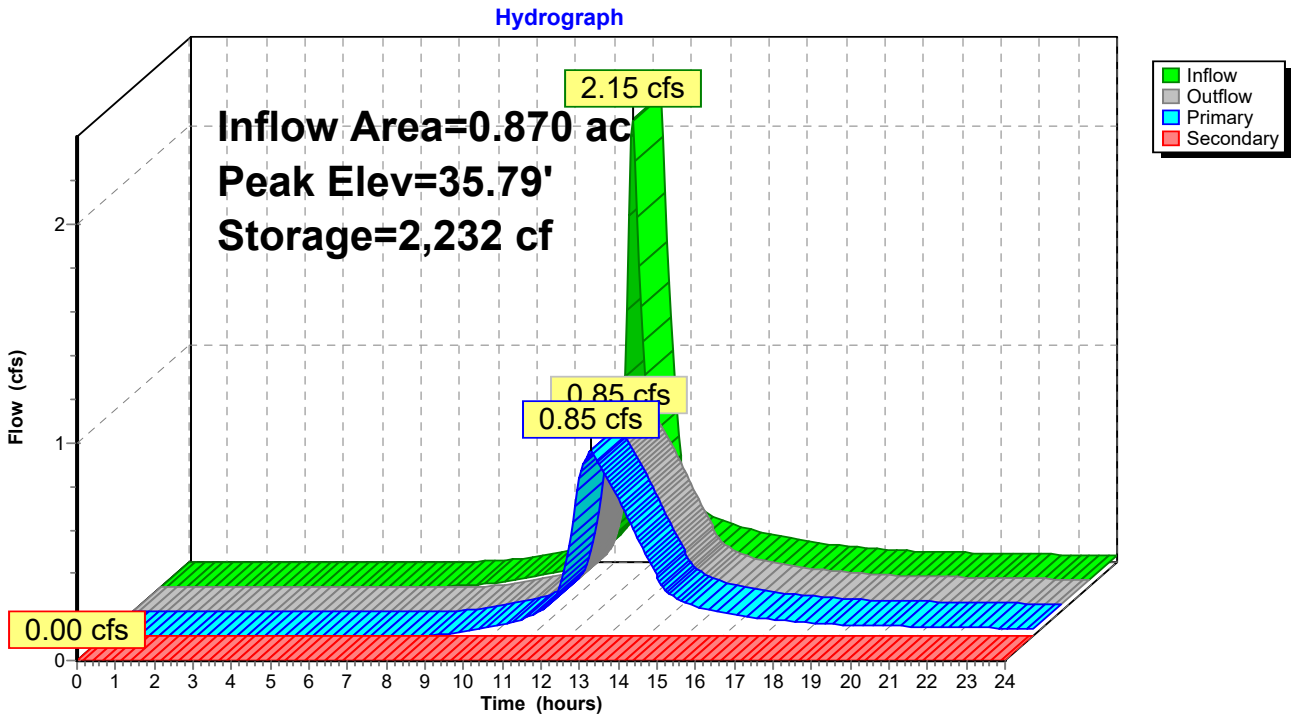
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.00	934	0	0
35.00	1,278	1,106	1,106
36.00	1,662	1,470	2,576
37.00	2,085	1,874	4,450
38.00	2,687	2,386	6,836
38.50	2,942	1,407	8,243

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.00' / 33.60' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	34.00'	**5.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	35.75'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	37.25'	**20.4" x 37.2" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	37.50'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.85 cfs @ 12.54 hrs HW=35.79' (Free Discharge)
└**1=Culvert** (Passes 0.85 cfs of 4.14 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.82 cfs @ 6.05 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.02 cfs @ 0.62 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=34.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: POND 1



Stage-Discharge for Pond 7P: POND 1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
34.00	0.00	0.00	0.00
34.05	0.01	0.01	0.00
34.10	0.03	0.03	0.00
34.15	0.06	0.06	0.00
34.20	0.10	0.10	0.00
34.25	0.15	0.15	0.00
34.30	0.20	0.20	0.00
34.35	0.25	0.25	0.00
34.40	0.29	0.29	0.00
34.45	0.32	0.32	0.00
34.50	0.35	0.35	0.00
34.55	0.38	0.38	0.00
34.60	0.41	0.41	0.00
34.65	0.44	0.44	0.00
34.70	0.46	0.46	0.00
34.75	0.48	0.48	0.00
34.80	0.51	0.51	0.00
34.85	0.53	0.53	0.00
34.90	0.55	0.55	0.00
34.95	0.57	0.57	0.00
35.00	0.58	0.58	0.00
35.05	0.60	0.60	0.00
35.10	0.62	0.62	0.00
35.15	0.64	0.64	0.00
35.20	0.65	0.65	0.00
35.25	0.67	0.67	0.00
35.30	0.69	0.69	0.00
35.35	0.70	0.70	0.00
35.40	0.72	0.72	0.00
35.45	0.73	0.73	0.00
35.50	0.75	0.75	0.00
35.55	0.76	0.76	0.00
35.60	0.77	0.77	0.00
35.65	0.79	0.79	0.00
35.70	0.80	0.80	0.00
35.75	0.82	0.82	0.00
35.80	0.86	0.86	0.00
35.85	0.94	0.94	0.00
35.90	1.04	1.04	0.00
35.95	1.15	1.15	0.00
36.00	1.28	1.28	0.00
36.05	1.42	1.42	0.00
36.10	1.57	1.57	0.00
36.15	1.73	1.73	0.00
36.20	1.90	1.90	0.00
36.25	2.07	2.07	0.00
36.30	2.22	2.22	0.00
36.35	2.35	2.35	0.00
36.40	2.47	2.47	0.00
36.45	2.58	2.58	0.00
36.50	2.68	2.68	0.00
36.55	2.77	2.77	0.00
36.60	2.87	2.87	0.00
36.65	2.95	2.95	0.00
36.70	3.04	3.04	0.00
36.75	3.12	3.12	0.00
36.80	3.20	3.20	0.00
36.85	3.28	3.28	0.00
36.90	3.35	3.35	0.00
36.95	3.43	3.43	0.00
37.00	3.50	3.50	0.00
37.05	3.57	3.57	0.00
37.10	3.64	3.64	0.00
37.15	3.70	3.70	0.00
37.20	3.77	3.77	0.00
37.25	3.83	3.83	0.00
37.30	4.25	4.25	0.00
37.35	4.95	4.95	0.00
37.40	5.84	5.84	0.00
37.45	6.41	6.41	0.00
37.50	6.47	6.47	0.00
37.55	6.79	6.52	0.26
37.60	7.33	6.58	0.75
37.65	8.01	6.63	1.38
37.70	8.80	6.68	2.12
37.75	9.74	6.74	3.01
37.80	10.80	6.79	4.01
37.85	11.97	6.84	5.12
37.90	13.25	6.90	6.35
37.95	14.67	6.95	7.72
38.00	16.21	7.00	9.21
38.05	17.87	7.05	10.82
38.10	19.65	7.10	12.55
38.15	21.28	7.15	14.12
38.20	22.96	7.20	15.75
38.25	24.69	7.25	17.44
38.30	26.48	7.30	19.18
38.35	28.35	7.35	21.00
38.40	30.28	7.40	22.88
38.45	32.26	7.45	24.82
38.50	**34.30**	**7.50**	**26.80**

Stage-Area-Storage for Pond 7P: POND 1

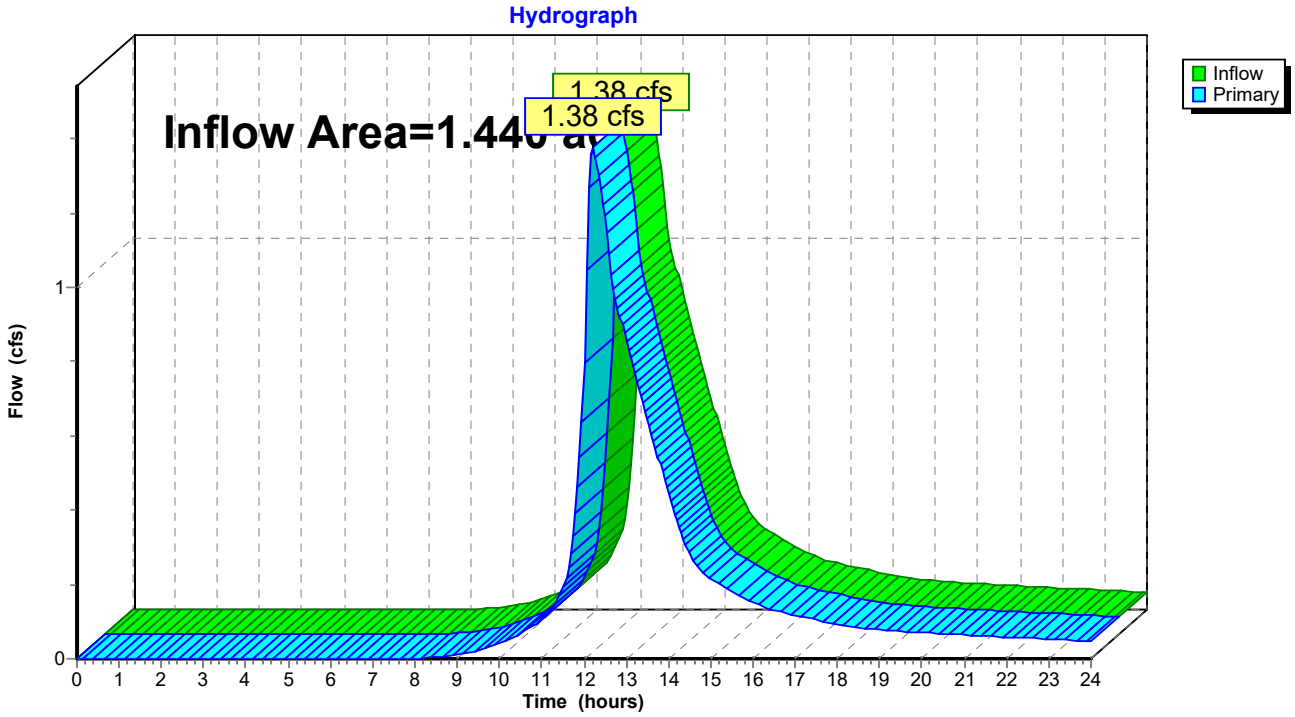
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.00	934	0
34.05	951	47
34.10	968	95
34.15	986	144
34.20	1,003	194
34.25	1,020	244
34.30	1,037	296
34.35	1,054	348
34.40	1,072	401
34.45	1,089	455
34.50	1,106	510
34.55	1,123	566
34.60	1,140	622
34.65	1,158	680
34.70	1,175	738
34.75	1,192	797
34.80	1,209	857
34.85	1,226	918
34.90	1,244	980
34.95	1,261	1,043
35.00	1,278	1,106
35.05	1,297	1,170
35.10	1,316	1,236
35.15	1,336	1,302
35.20	1,355	1,369
35.25	1,374	1,438
35.30	1,393	1,507
35.35	1,412	1,577
35.40	1,432	1,648
35.45	1,451	1,720
35.50	1,470	1,793
35.55	1,489	1,867
35.60	1,508	1,942
35.65	1,528	2,018
35.70	1,547	2,095
35.75	1,566	2,173
35.80	1,585	2,251
35.85	1,604	2,331
35.90	1,624	2,412
35.95	1,643	2,493
36.00	1,662	2,576
36.05	1,683	2,660
36.10	1,704	2,744
36.15	1,725	2,830
36.20	1,747	2,917
36.25	1,768	3,005
36.30	1,789	3,094
36.35	1,810	3,184
36.40	1,831	3,275
36.45	1,852	3,367
36.50	1,874	3,460
36.55	1,895	3,554
36.60	1,916	3,649
36.65	1,937	3,746
36.70	1,958	3,843
36.75	1,979	3,941
36.80	2,000	4,041
36.85	2,022	4,142
36.90	2,043	4,243
36.95	2,064	4,346
37.00	2,085	4,450
37.05	2,115	4,555
37.10	2,145	4,661
37.15	2,175	4,769
37.20	2,205	4,879
37.25	2,236	4,990
37.30	2,266	5,102
37.35	2,296	5,216
37.40	2,326	5,332
37.45	2,356	5,449
37.50	2,386	5,567
37.55	2,416	5,687
37.60	2,446	5,809
37.65	2,476	5,932
37.70	2,506	6,056
37.75	2,537	6,183
37.80	2,567	6,310
37.85	2,597	6,439
37.90	2,627	6,570
37.95	2,657	6,702
38.00	2,687	6,836
38.05	2,712	6,970
38.10	2,738	7,107
38.15	2,763	7,244
38.20	2,789	7,383
38.25	2,815	7,523
38.30	2,840	7,665
38.35	2,866	7,807
38.40	2,891	7,951
38.45	2,917	8,096
38.50	**2,942**	**8,243**

Summary for Link 8L: PDA-1 Total

Inflow Area = 1.440 ac, 42.36% Impervious, Inflow Depth > 2.23" for 5-yr event
Inflow = 1.38 cfs @ 12.21 hrs, Volume= 0.267 af
Primary = 1.38 cfs @ 12.21 hrs, Volume= 0.267 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: PDA-1 Total

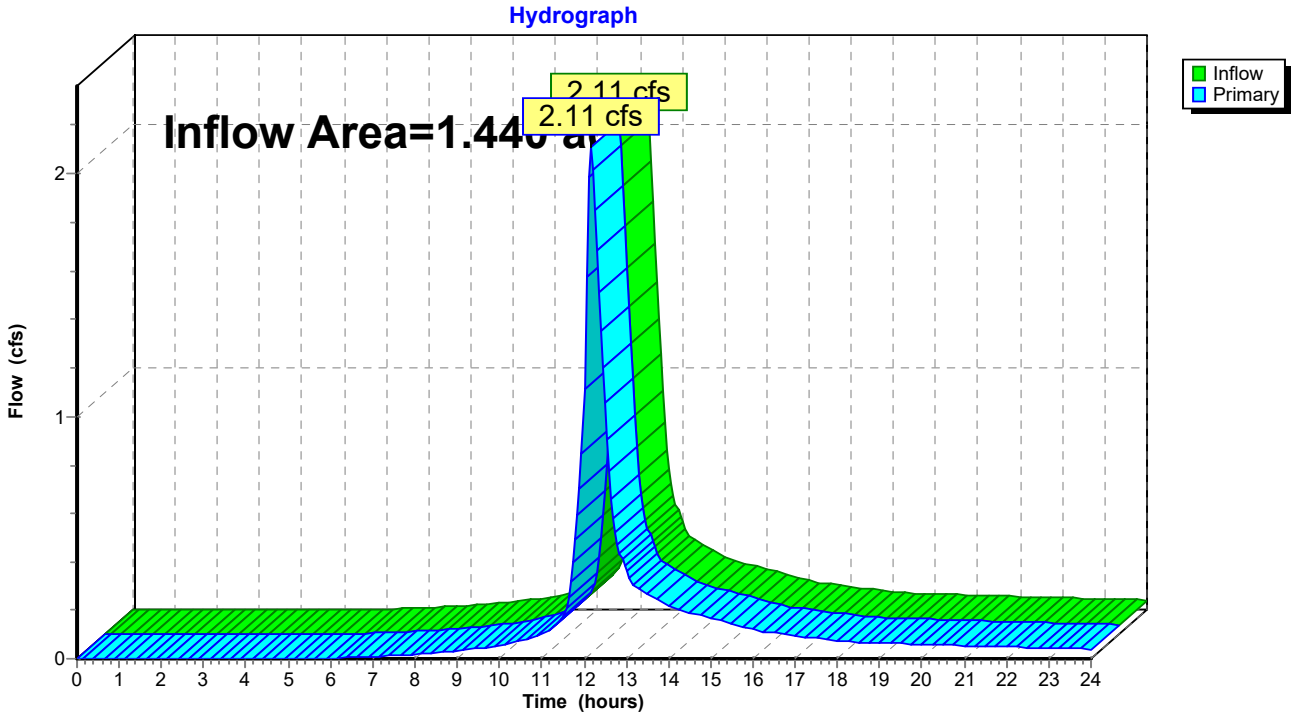


Summary for Link 9L: EDA-1 Total

Inflow Area = 1.440 ac, 27.78% Impervious, Inflow Depth > 1.86" for 5-yr event
Inflow = 2.11 cfs @ 12.15 hrs, Volume= 0.223 af
Primary = 2.11 cfs @ 12.15 hrs, Volume= 0.223 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 9L: EDA-1 Total



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: EDA-1A Runoff Area=0.920 ac 1.09% Impervious Runoff Depth>1.60"
Flow Length=265' Tc=17.4 min CN=63 Runoff=1.15 cfs 0.123 af

Subcatchment 3S: EDA-1B Runoff Area=0.340 ac 73.53% Impervious Runoff Depth>3.82"
Flow Length=110' Slope=0.0450 '/' Tc=10.7 min CN=88 Runoff=1.26 cfs 0.108 af

Subcatchment 5S: PDA-1A.1 Runoff Area=0.370 ac 0.00% Impervious Runoff Depth>1.91"
Flow Length=390' Tc=13.5 min CN=67 Runoff=0.63 cfs 0.059 af

Subcatchment 6S: PDA-1A.2 Runoff Area=0.870 ac 62.07% Impervious Runoff Depth>3.41"
Flow Length=143' Tc=13.6 min CN=84 Runoff=2.70 cfs 0.247 af

Subcatchment 9S: EDA-1C Runoff Area=0.180 ac 77.78% Impervious Runoff Depth>4.03"
Tc=6.0 min CN=90 Runoff=0.80 cfs 0.060 af

Subcatchment 10S: PDA-1B Runoff Area=0.200 ac 35.00% Impervious Runoff Depth>2.49"
Tc=6.0 min CN=74 Runoff=0.57 cfs 0.042 af

Pond 7P: POND 1 Peak Elev=36.05' Storage=2,655 cf Inflow=2.70 cfs 0.247 af
Primary=1.41 cfs 0.245 af Secondary=0.00 cfs 0.000 af Outflow=1.41 cfs 0.245 af

Link 8L: PDA-1 Total Inflow=2.00 cfs 0.345 af
Primary=2.00 cfs 0.345 af

Link 9L: EDA-1 Total Inflow=2.78 cfs 0.291 af
Primary=2.78 cfs 0.291 af

Summary for Subcatchment 1S: EDA-1A

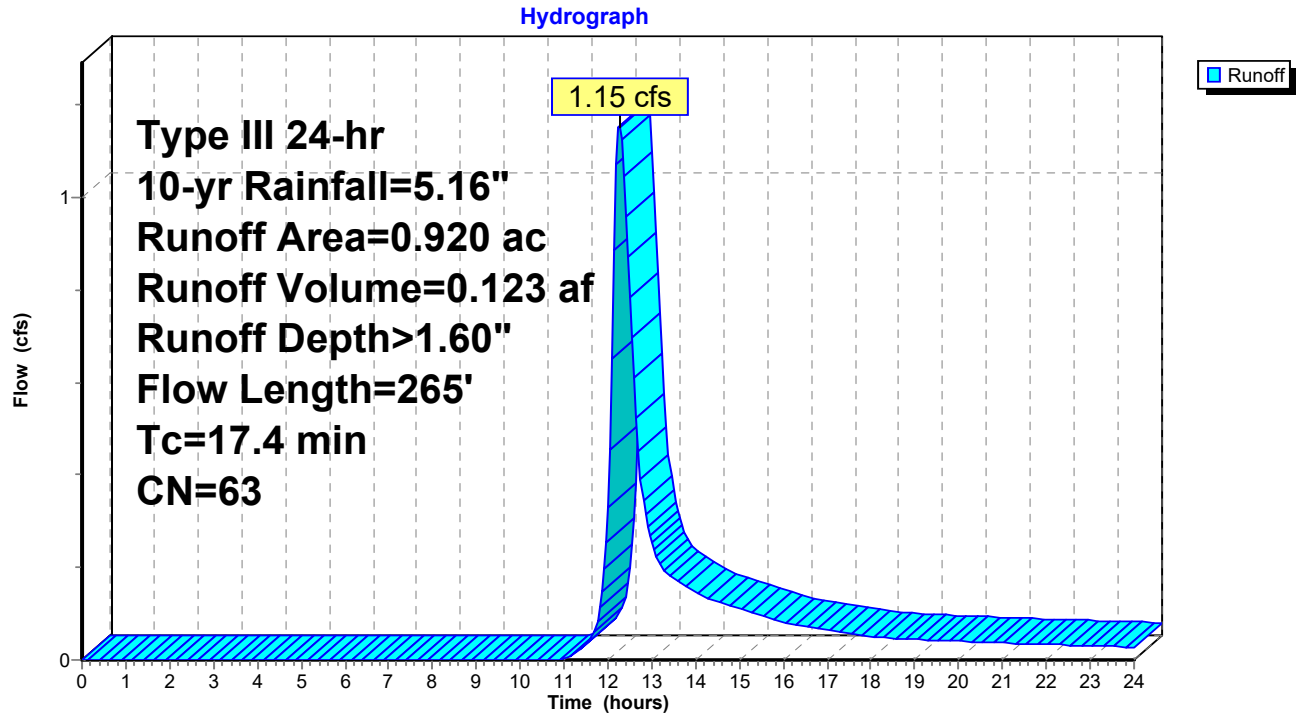
Runoff = 1.15 cfs @ 12.26 hrs, Volume= 0.123 af, Depth> 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.16"

Area (ac)	CN	Description
0.410	61	>75% Grass cover, Good, HSG B
0.290	55	Woods, Good, HSG B
0.210	77	Woods, Good, HSG D
0.010	98	Paved parking, HSG B
0.920	63	Weighted Average
0.910		98.91% Pervious Area
0.010		1.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	150	0.0267	0.15		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
0.5	115	0.0480	3.53		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
17.4	265	Total			

Subcatchment 1S: EDA-1A



Summary for Subcatchment 3S: EDA-1B

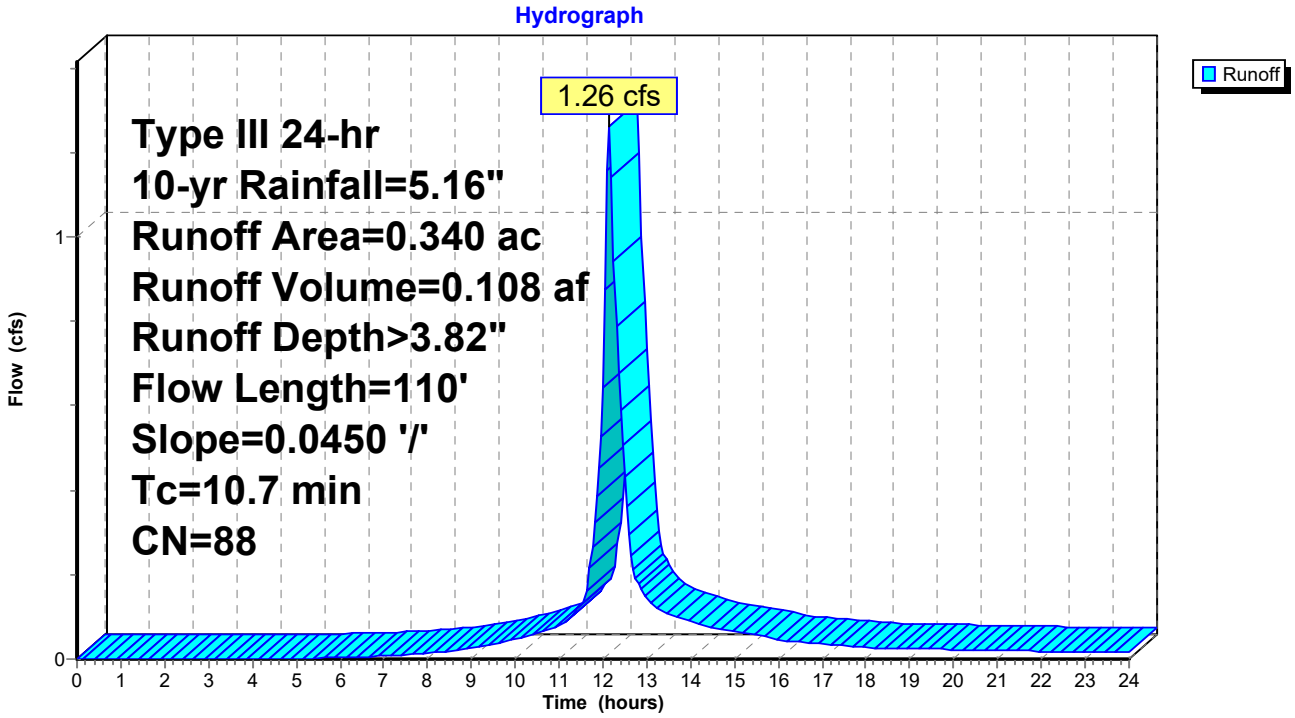
Runoff = 1.26 cfs @ 12.15 hrs, Volume= 0.108 af, Depth> 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.16"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG B
0.090	61	>75% Grass cover, Good, HSG B
0.340	88	Weighted Average
0.090		26.47% Pervious Area
0.250		73.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	110	0.0450	0.17		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"

Subcatchment 3S: EDA-1B



Summary for Subcatchment 5S: PDA-1A.1

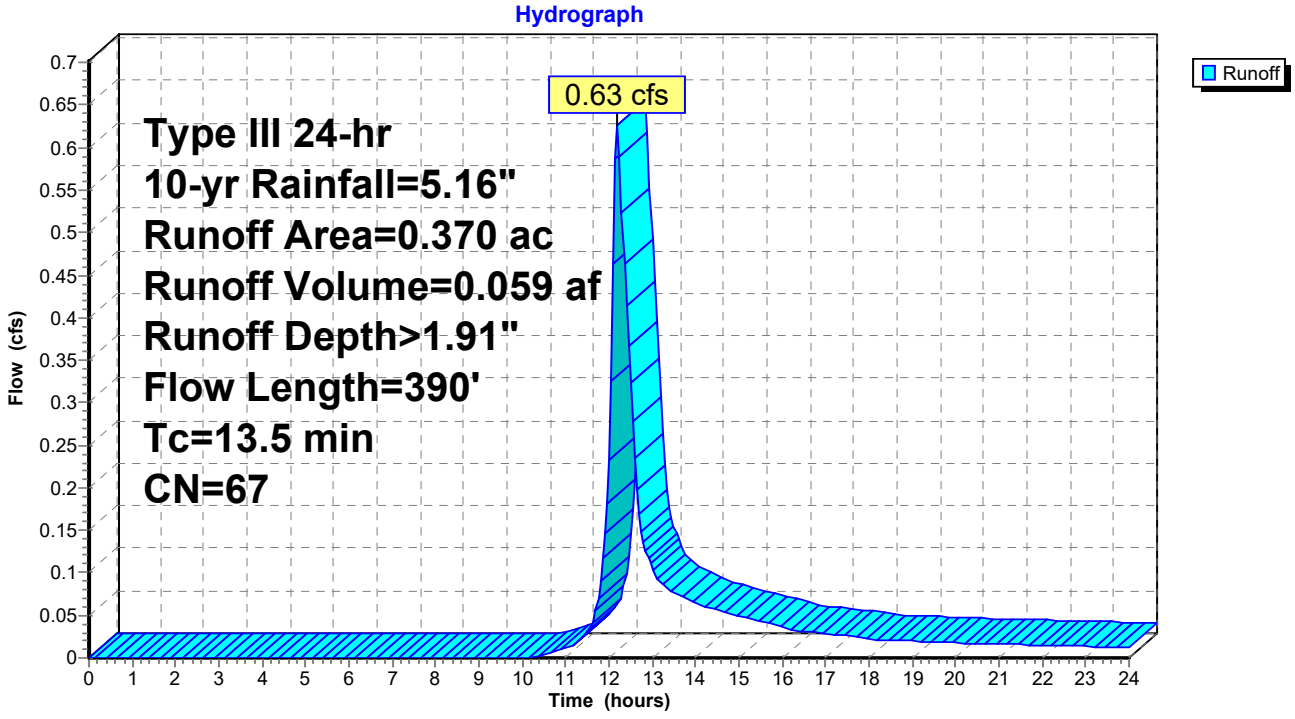
Runoff = 0.63 cfs @ 12.20 hrs, Volume= 0.059 af, Depth> 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.16"

Area (ac)	CN	Description
0.100	61	>75% Grass cover, Good, HSG B
0.090	55	Woods, Good, HSG B
0.180	77	Woods, Good, HSG D
0.370	67	Weighted Average
0.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	150	0.0600	0.20		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
1.3	240	0.0375	3.12		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
13.5	390	Total			

Subcatchment 5S: PDA-1A.1



Summary for Subcatchment 6S: PDA-1A.2

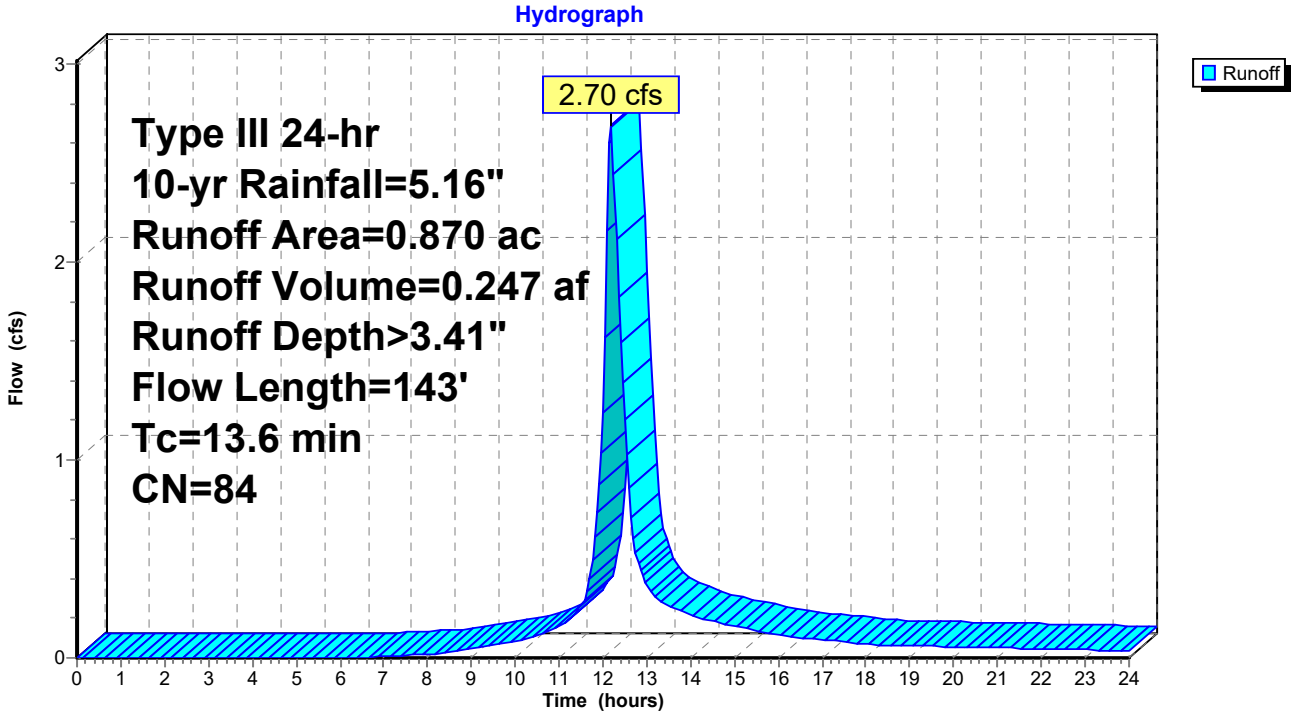
Runoff = 2.70 cfs @ 12.19 hrs, Volume= 0.247 af, Depth> 3.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.16"

Area (ac)	CN	Description
0.330	61	>75% Grass cover, Good, HSG B
0.540	98	Paved parking, HSG B
0.870	84	Weighted Average
0.330		37.93% Pervious Area
0.540		62.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	133	0.0375	0.17		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
0.2	10	0.0200	0.90		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.45"
13.6	143	Total			

Subcatchment 6S: PDA-1A.2



Summary for Subcatchment 9S: EDA-1C

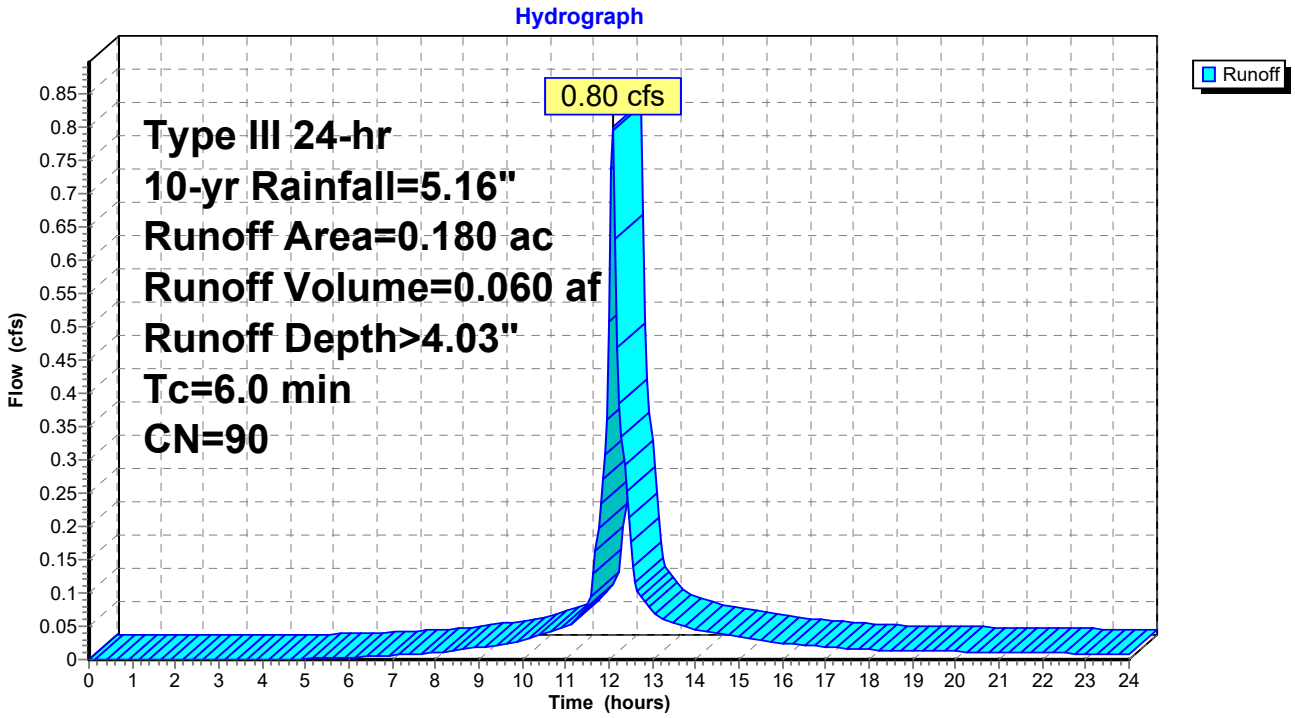
Runoff = 0.80 cfs @ 12.09 hrs, Volume= 0.060 af, Depth> 4.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.16"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG B
0.040	61	>75% Grass cover, Good, HSG B
0.180	90	Weighted Average
0.040		22.22% Pervious Area
0.140		77.78% Impervious Area

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

Subcatchment 9S: EDA-1C



Summary for Subcatchment 10S: PDA-1B

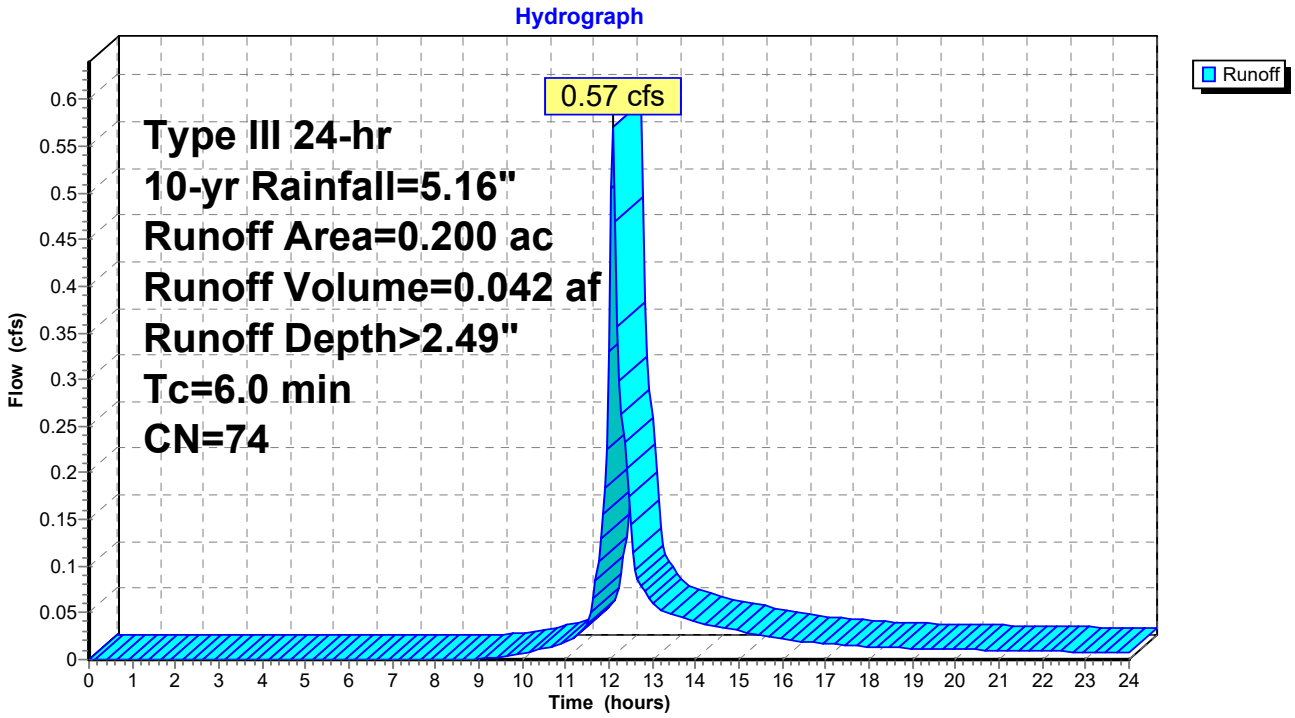
Runoff = 0.57 cfs @ 12.09 hrs, Volume= 0.042 af, Depth> 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.16"

Area (ac)	CN	Description
0.130	61	>75% Grass cover, Good, HSG B
0.070	98	Paved parking, HSG B
0.200	74	Weighted Average
0.130		65.00% Pervious Area
0.070		35.00% Impervious Area

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

Subcatchment 10S: PDA-1B



Summary for Pond 7P: POND 1

Inflow Area = 0.870 ac, 62.07% Impervious, Inflow Depth > 3.41" for 10-yr event
Inflow = 2.70 cfs @ 12.19 hrs, Volume= 0.247 af
Outflow = 1.41 cfs @ 12.45 hrs, Volume= 0.245 af, Atten= 48%, Lag= 15.7 min
Primary = 1.41 cfs @ 12.45 hrs, Volume= 0.245 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 36.05' @ 12.45 hrs Surf.Area= 1,682 sf Storage= 2,655 cf

Plug-Flow detention time= 33.9 min calculated for 0.245 af (99% of inflow)
Center-of-Mass det. time= 27.6 min (842.5 - 814.9)

Volume	Invert	Avail.Storage	Storage Description
#1	34.00'	8,243 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

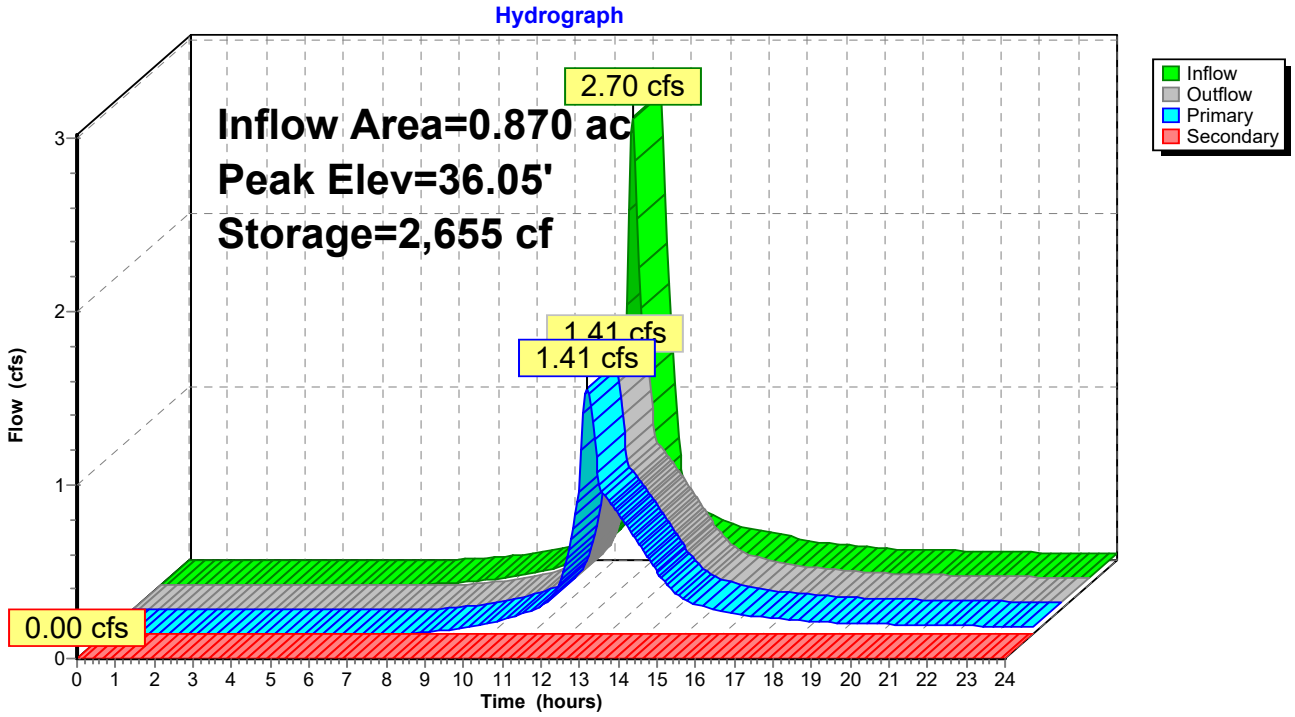
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.00	934	0	0
35.00	1,278	1,106	1,106
36.00	1,662	1,470	2,576
37.00	2,085	1,874	4,450
38.00	2,687	2,386	6,836
38.50	2,942	1,407	8,243

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.00' / 33.60' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	34.00'	**5.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	35.75'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	37.25'	**20.4" x 37.2" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	37.50'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=1.41 cfs @ 12.45 hrs HW=36.05' (Free Discharge)
└**1=Culvert** (Passes 1.41 cfs of 4.57 cfs potential flow)
├**2=Orifice/Grate** (Orifice Controls 0.89 cfs @ 6.53 fps)
├**3=Orifice/Grate** (Orifice Controls 0.52 cfs @ 1.75 fps)
└**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=34.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: POND 1



Stage-Discharge for Pond 7P: POND 1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
34.00	0.00	0.00	0.00
34.05	0.01	0.01	0.00
34.10	0.03	0.03	0.00
34.15	0.06	0.06	0.00
34.20	0.10	0.10	0.00
34.25	0.15	0.15	0.00
34.30	0.20	0.20	0.00
34.35	0.25	0.25	0.00
34.40	0.29	0.29	0.00
34.45	0.32	0.32	0.00
34.50	0.35	0.35	0.00
34.55	0.38	0.38	0.00
34.60	0.41	0.41	0.00
34.65	0.44	0.44	0.00
34.70	0.46	0.46	0.00
34.75	0.48	0.48	0.00
34.80	0.51	0.51	0.00
34.85	0.53	0.53	0.00
34.90	0.55	0.55	0.00
34.95	0.57	0.57	0.00
35.00	0.58	0.58	0.00
35.05	0.60	0.60	0.00
35.10	0.62	0.62	0.00
35.15	0.64	0.64	0.00
35.20	0.65	0.65	0.00
35.25	0.67	0.67	0.00
35.30	0.69	0.69	0.00
35.35	0.70	0.70	0.00
35.40	0.72	0.72	0.00
35.45	0.73	0.73	0.00
35.50	0.75	0.75	0.00
35.55	0.76	0.76	0.00
35.60	0.77	0.77	0.00
35.65	0.79	0.79	0.00
35.70	0.80	0.80	0.00
35.75	0.82	0.82	0.00
35.80	0.86	0.86	0.00
35.85	0.94	0.94	0.00
35.90	1.04	1.04	0.00
35.95	1.15	1.15	0.00
36.00	1.28	1.28	0.00
36.05	1.42	1.42	0.00
36.10	1.57	1.57	0.00
36.15	1.73	1.73	0.00
36.20	1.90	1.90	0.00
36.25	2.07	2.07	0.00
36.30	2.22	2.22	0.00
36.35	2.35	2.35	0.00
36.40	2.47	2.47	0.00
36.45	2.58	2.58	0.00
36.50	2.68	2.68	0.00
36.55	2.77	2.77	0.00
36.60	2.87	2.87	0.00
36.65	2.95	2.95	0.00
36.70	3.04	3.04	0.00
36.75	3.12	3.12	0.00
36.80	3.20	3.20	0.00
36.85	3.28	3.28	0.00
36.90	3.35	3.35	0.00
36.95	3.43	3.43	0.00
37.00	3.50	3.50	0.00
37.05	3.57	3.57	0.00
37.10	3.64	3.64	0.00
37.15	3.70	3.70	0.00
37.20	3.77	3.77	0.00
37.25	3.83	3.83	0.00
37.30	4.25	4.25	0.00
37.35	4.95	4.95	0.00
37.40	5.84	5.84	0.00
37.45	6.41	6.41	0.00
37.50	6.47	6.47	0.00
37.55	6.79	6.52	0.26
37.60	7.33	6.58	0.75
37.65	8.01	6.63	1.38
37.70	8.80	6.68	2.12
37.75	9.74	6.74	3.01
37.80	10.80	6.79	4.01
37.85	11.97	6.84	5.12
37.90	13.25	6.90	6.35
37.95	14.67	6.95	7.72
38.00	16.21	7.00	9.21
38.05	17.87	7.05	10.82
38.10	19.65	7.10	12.55
38.15	21.28	7.15	14.12
38.20	22.96	7.20	15.75
38.25	24.69	7.25	17.44
38.30	26.48	7.30	19.18
38.35	28.35	7.35	21.00
38.40	30.28	7.40	22.88
38.45	32.26	7.45	24.82
38.50	**34.30**	**7.50**	**26.80**

Stage-Area-Storage for Pond 7P: POND 1

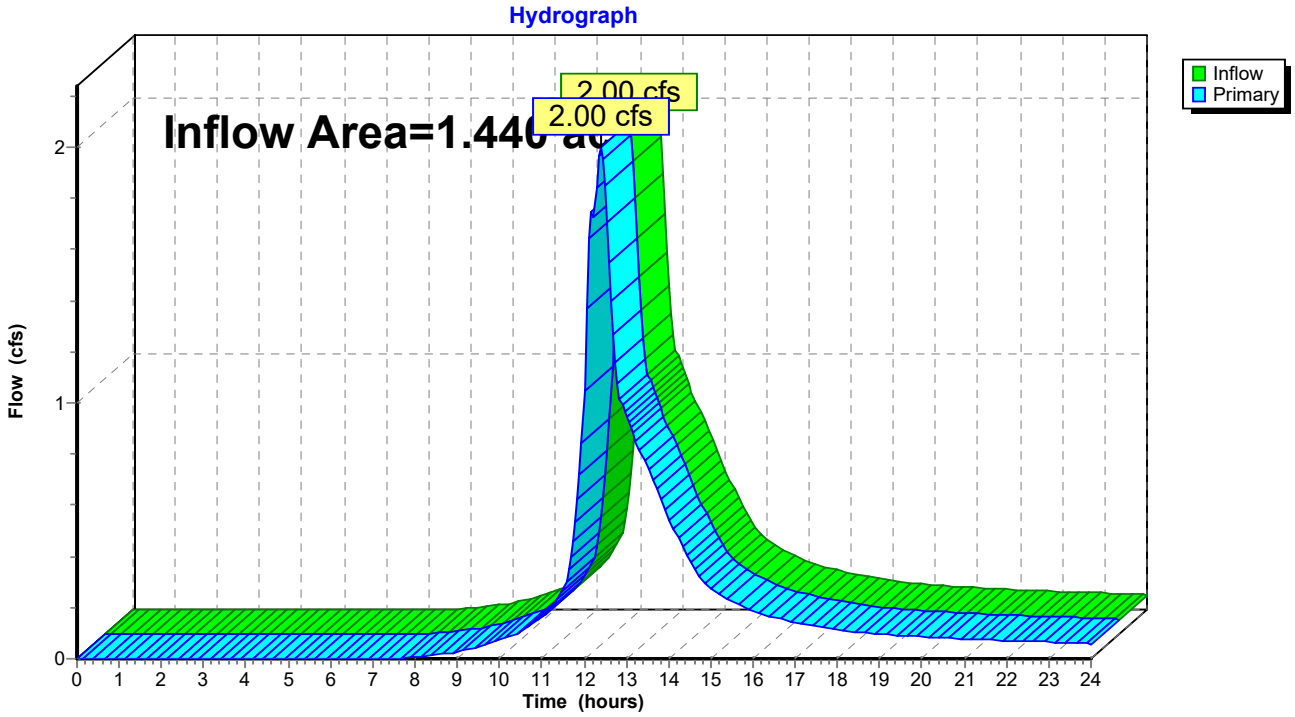
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.00	934	0
34.05	951	47
34.10	968	95
34.15	986	144
34.20	1,003	194
34.25	1,020	244
34.30	1,037	296
34.35	1,054	348
34.40	1,072	401
34.45	1,089	455
34.50	1,106	510
34.55	1,123	566
34.60	1,140	622
34.65	1,158	680
34.70	1,175	738
34.75	1,192	797
34.80	1,209	857
34.85	1,226	918
34.90	1,244	980
34.95	1,261	1,043
35.00	1,278	1,106
35.05	1,297	1,170
35.10	1,316	1,236
35.15	1,336	1,302
35.20	1,355	1,369
35.25	1,374	1,438
35.30	1,393	1,507
35.35	1,412	1,577
35.40	1,432	1,648
35.45	1,451	1,720
35.50	1,470	1,793
35.55	1,489	1,867
35.60	1,508	1,942
35.65	1,528	2,018
35.70	1,547	2,095
35.75	1,566	2,173
35.80	1,585	2,251
35.85	1,604	2,331
35.90	1,624	2,412
35.95	1,643	2,493
36.00	1,662	2,576
36.05	1,683	2,660
36.10	1,704	2,744
36.15	1,725	2,830
36.20	1,747	2,917
36.25	1,768	3,005
36.30	1,789	3,094
36.35	1,810	3,184
36.40	1,831	3,275
36.45	1,852	3,367
36.50	1,874	3,460
36.55	1,895	3,554
36.60	1,916	3,649
36.65	1,937	3,746
36.70	1,958	3,843
36.75	1,979	3,941
36.80	2,000	4,041
36.85	2,022	4,142
36.90	2,043	4,243
36.95	2,064	4,346
37.00	2,085	4,450
37.05	2,115	4,555
37.10	2,145	4,661
37.15	2,175	4,769
37.20	2,205	4,879
37.25	2,236	4,990
37.30	2,266	5,102
37.35	2,296	5,216
37.40	2,326	5,332
37.45	2,356	5,449
37.50	2,386	5,567
37.55	2,416	5,687
37.60	2,446	5,809
37.65	2,476	5,932
37.70	2,506	6,056
37.75	2,537	6,183
37.80	2,567	6,310
37.85	2,597	6,439
37.90	2,627	6,570
37.95	2,657	6,702
38.00	2,687	6,836
38.05	2,712	6,970
38.10	2,738	7,107
38.15	2,763	7,244
38.20	2,789	7,383
38.25	2,815	7,523
38.30	2,840	7,665
38.35	2,866	7,807
38.40	2,891	7,951
38.45	2,917	8,096
38.50	**2,942**	**8,243**

Summary for Link 8L: PDA-1 Total

Inflow Area = 1.440 ac, 42.36% Impervious, Inflow Depth > 2.87" for 10-yr event
Inflow = 2.00 cfs @ 12.40 hrs, Volume= 0.345 af
Primary = 2.00 cfs @ 12.40 hrs, Volume= 0.345 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: PDA-1 Total

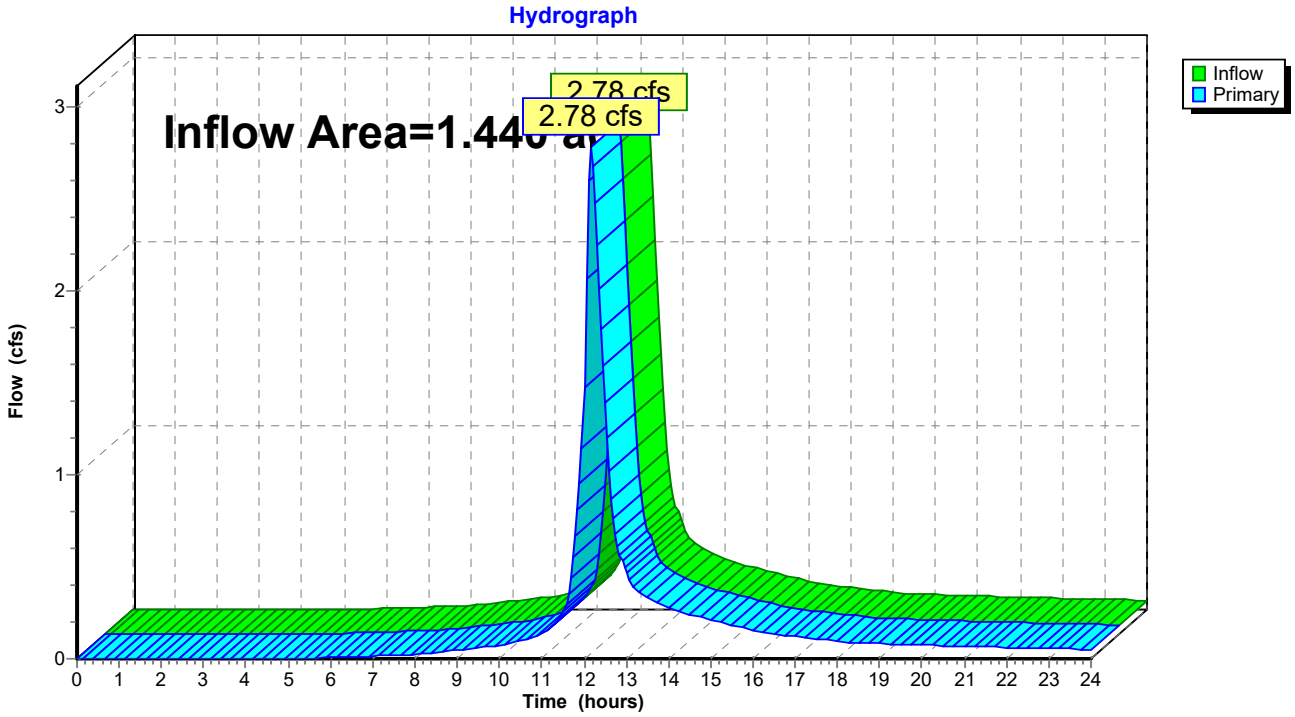


Summary for Link 9L: EDA-1 Total

Inflow Area = 1.440 ac, 27.78% Impervious, Inflow Depth > 2.43" for 10-yr event
Inflow = 2.78 cfs @ 12.16 hrs, Volume= 0.291 af
Primary = 2.78 cfs @ 12.16 hrs, Volume= 0.291 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 9L: EDA-1 Total



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: EDA-1A Runoff Area=0.920 ac 1.09% Impervious Runoff Depth>2.32"
Flow Length=265' Tc=17.4 min CN=63 Runoff=1.73 cfs 0.178 af

Subcatchment 3S: EDA-1B Runoff Area=0.340 ac 73.53% Impervious Runoff Depth>4.83"
Flow Length=110' Slope=0.0450 '/' Tc=10.7 min CN=88 Runoff=1.58 cfs 0.137 af

Subcatchment 5S: PDA-1A.1 Runoff Area=0.370 ac 0.00% Impervious Runoff Depth>2.69"
Flow Length=390' Tc=13.5 min CN=67 Runoff=0.90 cfs 0.083 af

Subcatchment 6S: PDA-1A.2 Runoff Area=0.870 ac 62.07% Impervious Runoff Depth>4.39"
Flow Length=143' Tc=13.6 min CN=84 Runoff=3.45 cfs 0.319 af

Subcatchment 9S: EDA-1C Runoff Area=0.180 ac 77.78% Impervious Runoff Depth>5.06"
Tc=6.0 min CN=90 Runoff=0.99 cfs 0.076 af

Subcatchment 10S: PDA-1B Runoff Area=0.200 ac 35.00% Impervious Runoff Depth>3.37"
Tc=6.0 min CN=74 Runoff=0.78 cfs 0.056 af

Pond 7P: POND 1 Peak Elev=36.29' Storage=3,073 cf Inflow=3.45 cfs 0.319 af
Primary=2.19 cfs 0.316 af Secondary=0.00 cfs 0.000 af Outflow=2.19 cfs 0.316 af

Link 8L: PDA-1 Total Inflow=3.17 cfs 0.455 af
Primary=3.17 cfs 0.455 af

Link 9L: EDA-1 Total Inflow=3.74 cfs 0.391 af
Primary=3.74 cfs 0.391 af

Summary for Subcatchment 1S: EDA-1A

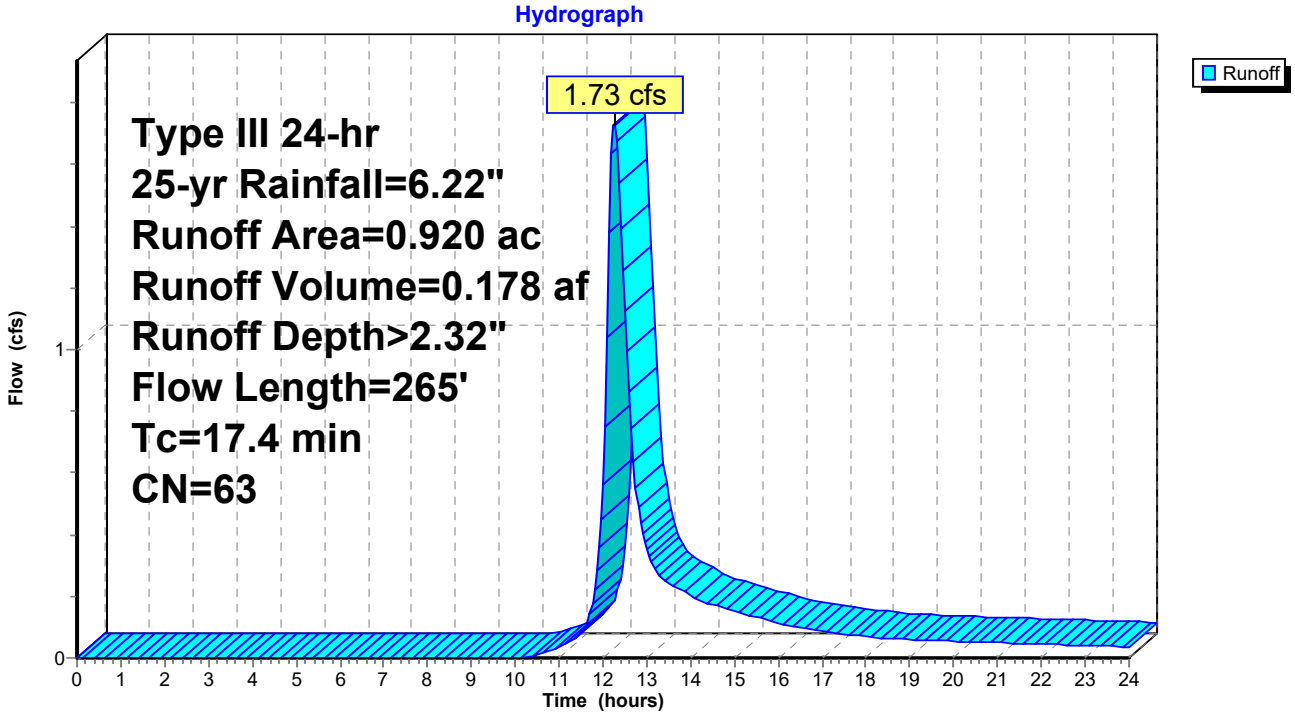
Runoff = 1.73 cfs @ 12.26 hrs, Volume= 0.178 af, Depth> 2.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.22"

Area (ac)	CN	Description
0.410	61	>75% Grass cover, Good, HSG B
0.290	55	Woods, Good, HSG B
0.210	77	Woods, Good, HSG D
0.010	98	Paved parking, HSG B
0.920	63	Weighted Average
0.910		98.91% Pervious Area
0.010		1.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	150	0.0267	0.15		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
0.5	115	0.0480	3.53		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
17.4	265	Total			

Subcatchment 1S: EDA-1A



Summary for Subcatchment 3S: EDA-1B

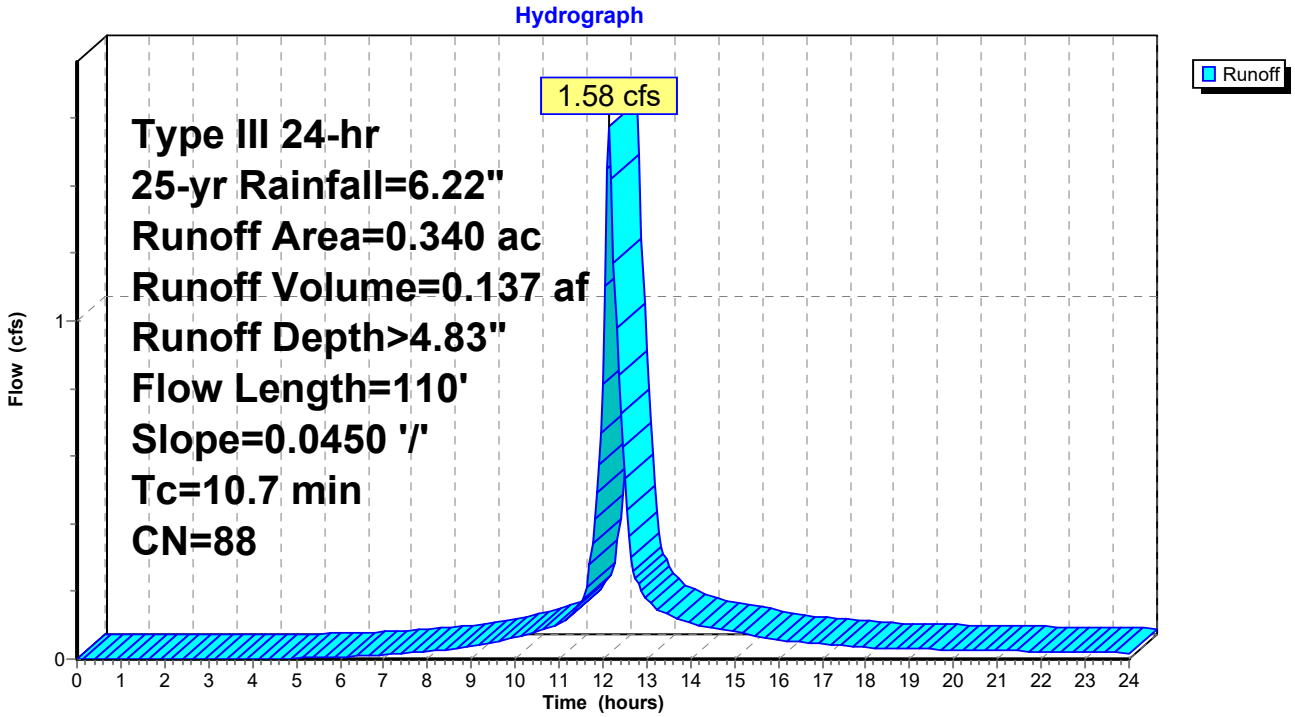
Runoff = 1.58 cfs @ 12.15 hrs, Volume= 0.137 af, Depth> 4.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.22"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG B
0.090	61	>75% Grass cover, Good, HSG B
0.340	88	Weighted Average
0.090		26.47% Pervious Area
0.250		73.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	110	0.0450	0.17		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"

Subcatchment 3S: EDA-1B



Summary for Subcatchment 5S: PDA-1A.1

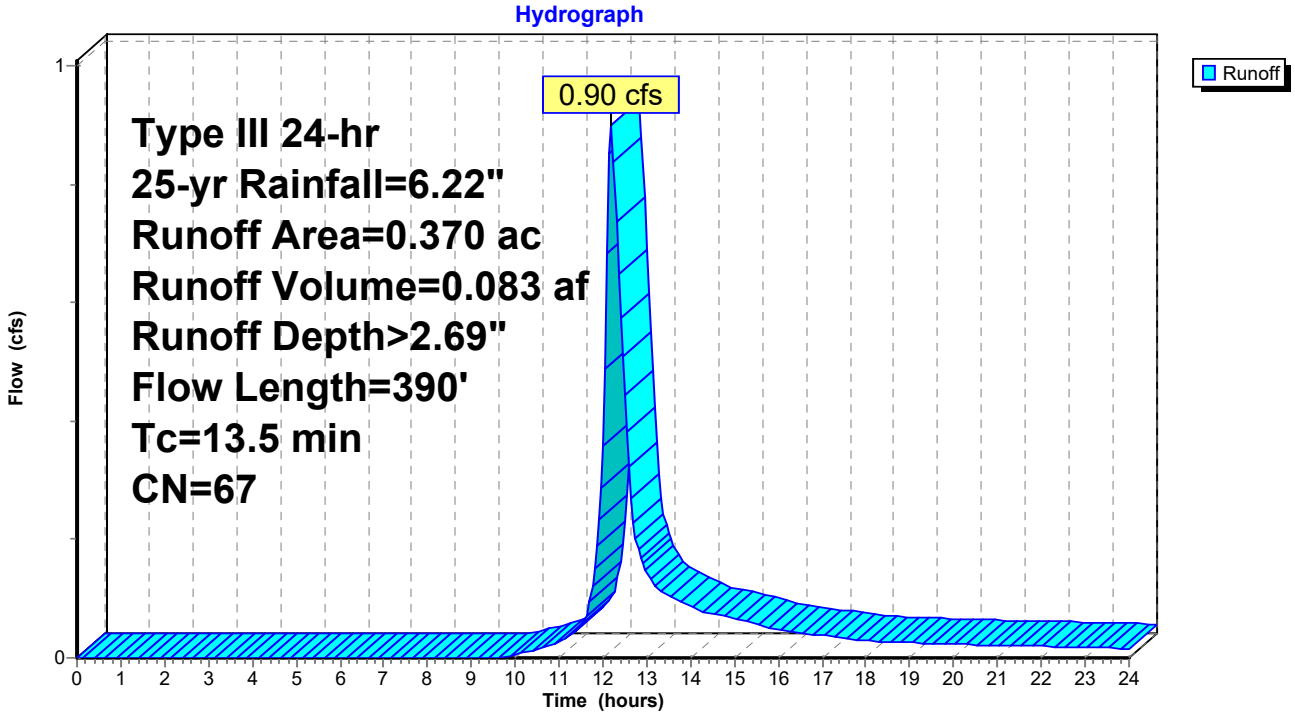
Runoff = 0.90 cfs @ 12.20 hrs, Volume= 0.083 af, Depth> 2.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.22"

Area (ac)	CN	Description
0.100	61	>75% Grass cover, Good, HSG B
0.090	55	Woods, Good, HSG B
0.180	77	Woods, Good, HSG D
0.370	67	Weighted Average
0.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	150	0.0600	0.20		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
1.3	240	0.0375	3.12		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
13.5	390	Total			

Subcatchment 5S: PDA-1A.1



Summary for Subcatchment 6S: PDA-1A.2

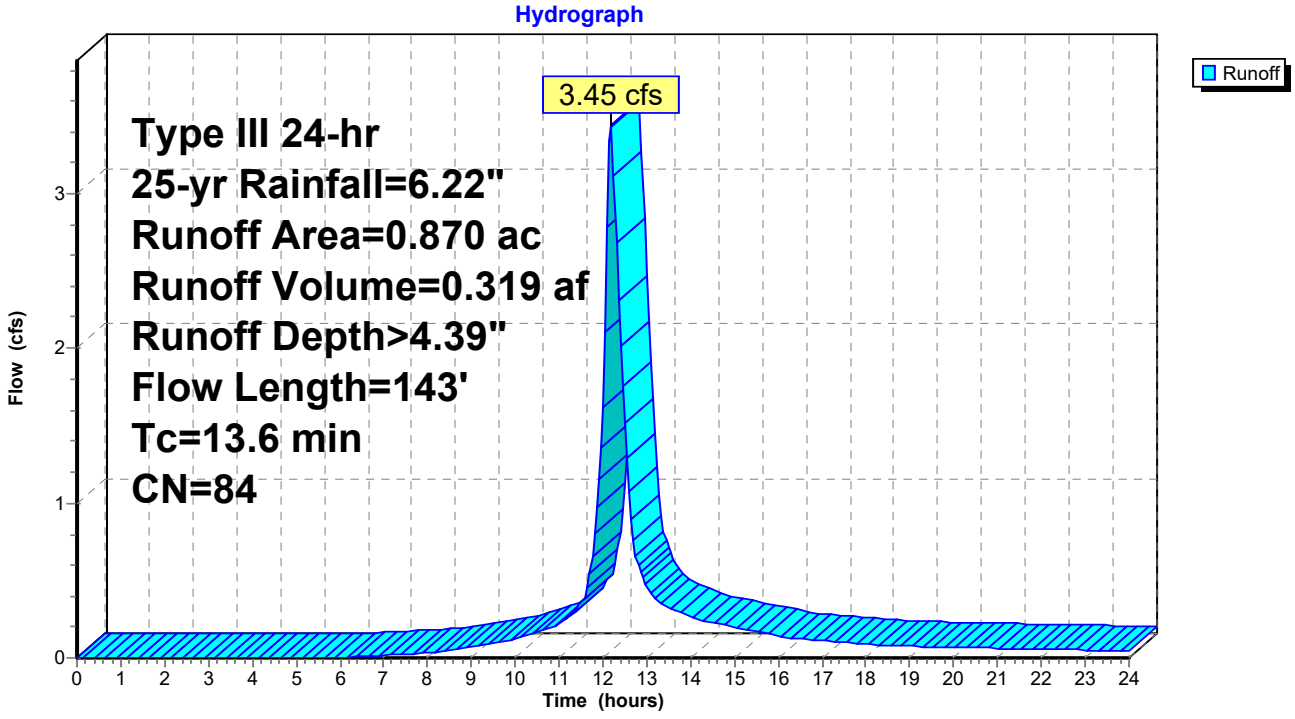
Runoff = 3.45 cfs @ 12.19 hrs, Volume= 0.319 af, Depth> 4.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.22"

Area (ac)	CN	Description
0.330	61	>75% Grass cover, Good, HSG B
0.540	98	Paved parking, HSG B
0.870	84	Weighted Average
0.330		37.93% Pervious Area
0.540		62.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	133	0.0375	0.17		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
0.2	10	0.0200	0.90		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.45"
13.6	143	Total			

Subcatchment 6S: PDA-1A.2



Summary for Subcatchment 9S: EDA-1C

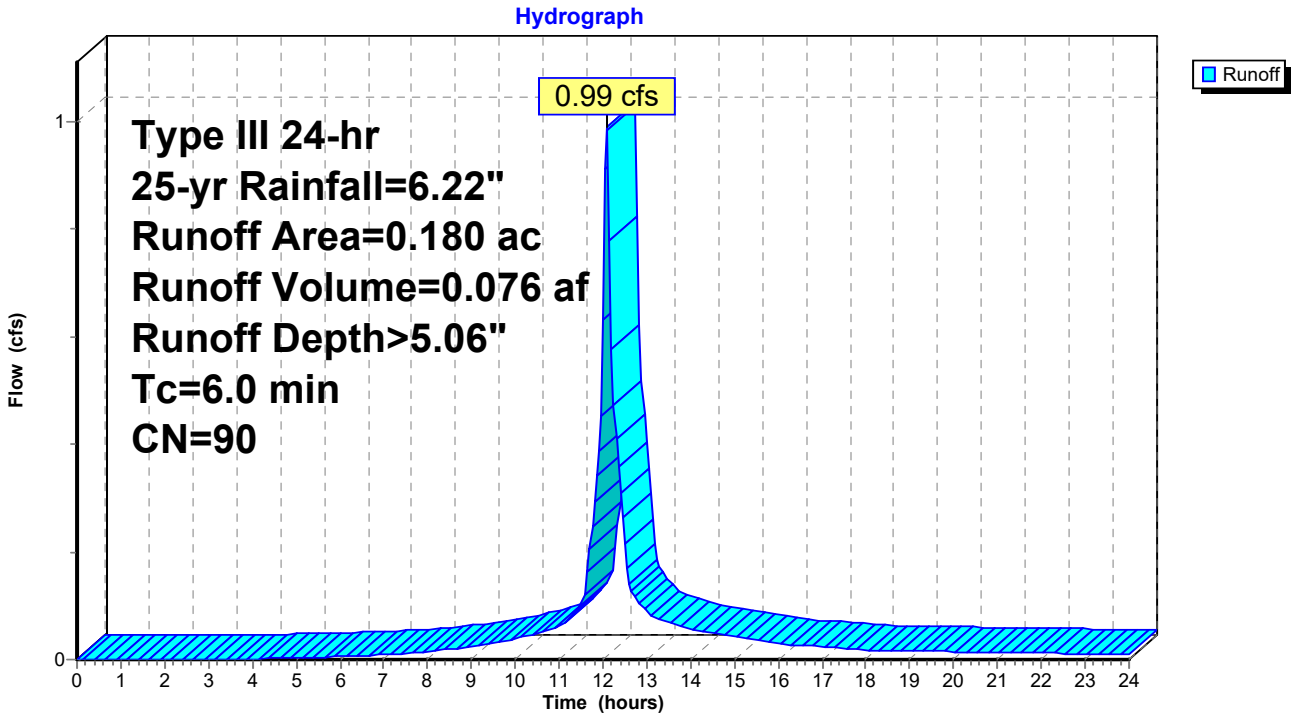
Runoff = 0.99 cfs @ 12.09 hrs, Volume= 0.076 af, Depth> 5.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.22"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG B
0.040	61	>75% Grass cover, Good, HSG B
0.180	90	Weighted Average
0.040		22.22% Pervious Area
0.140		77.78% Impervious Area

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

Subcatchment 9S: EDA-1C



Summary for Subcatchment 10S: PDA-1B

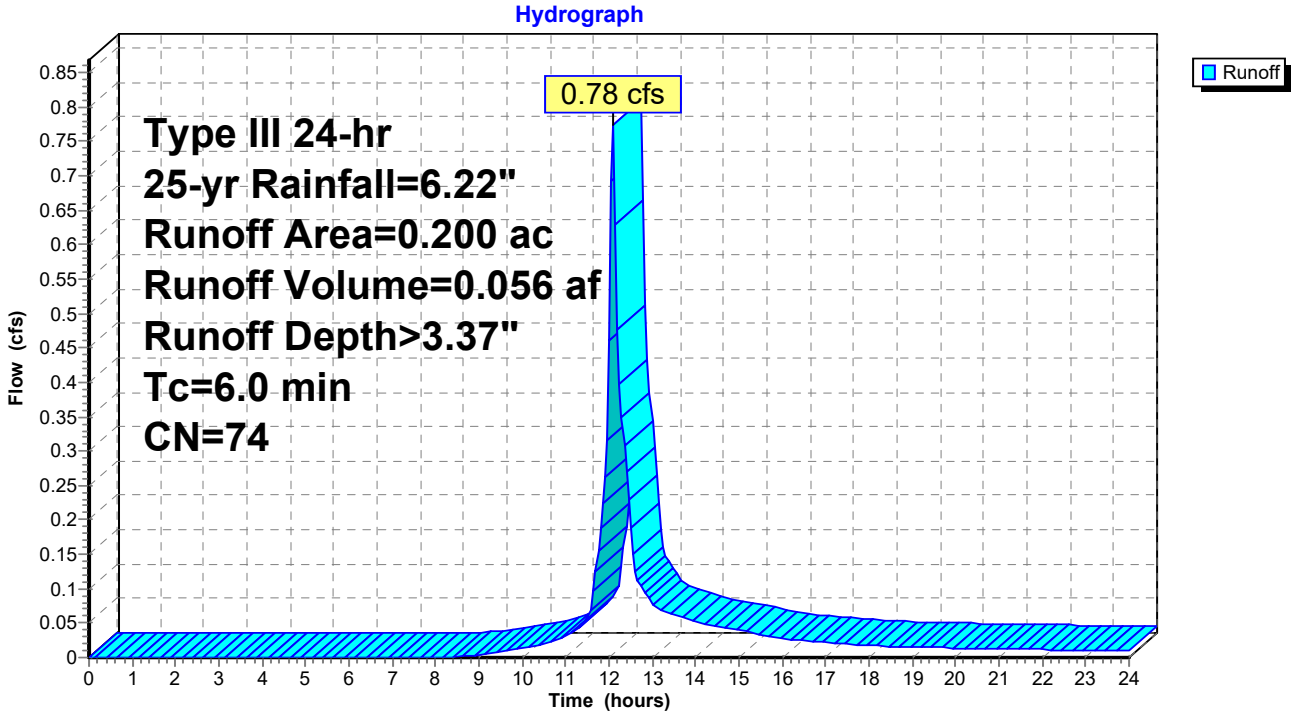
Runoff = 0.78 cfs @ 12.09 hrs, Volume= 0.056 af, Depth> 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.22"

Area (ac)	CN	Description
0.130	61	>75% Grass cover, Good, HSG B
0.070	98	Paved parking, HSG B
0.200	74	Weighted Average
0.130		65.00% Pervious Area
0.070		35.00% Impervious Area

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

Subcatchment 10S: PDA-1B



Summary for Pond 7P: POND 1

Inflow Area = 0.870 ac, 62.07% Impervious, Inflow Depth > 4.39" for 25-yr event
Inflow = 3.45 cfs @ 12.19 hrs, Volume= 0.319 af
Outflow = 2.19 cfs @ 12.37 hrs, Volume= 0.316 af, Atten= 36%, Lag= 11.3 min
Primary = 2.19 cfs @ 12.37 hrs, Volume= 0.316 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 36.29' @ 12.37 hrs Surf.Area= 1,784 sf Storage= 3,073 cf

Plug-Flow detention time= 31.4 min calculated for 0.316 af (99% of inflow)
Center-of-Mass det. time= 25.7 min (833.6 - 807.8)

Volume	Invert	Avail.Storage	Storage Description
#1	34.00'	8,243 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

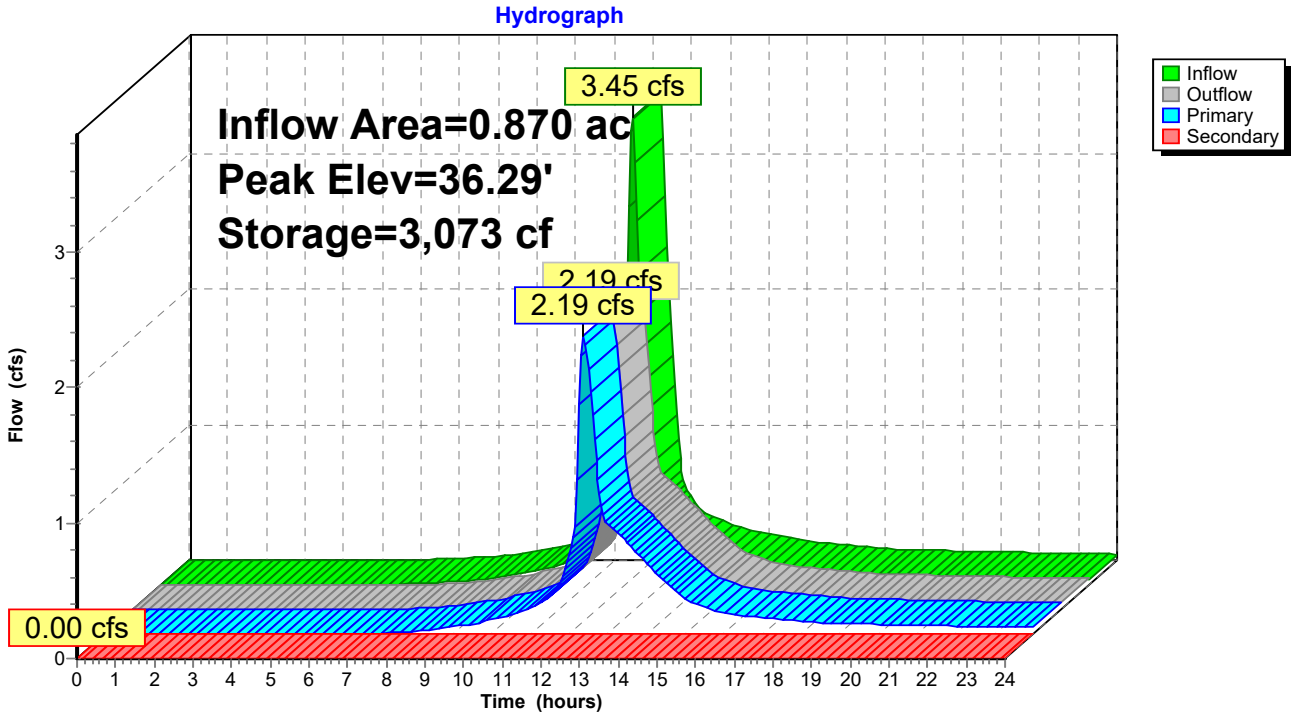
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.00	934	0	0
35.00	1,278	1,106	1,106
36.00	1,662	1,470	2,576
37.00	2,085	1,874	4,450
38.00	2,687	2,386	6,836
38.50	2,942	1,407	8,243

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.00' / 33.60' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	34.00'	**5.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	35.75'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	37.25'	**20.4" x 37.2" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	37.50'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=2.18 cfs @ 12.37 hrs HW=36.28' (Free Discharge)
└**1=Culvert** (Passes 2.18 cfs of 4.93 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.95 cfs @ 6.94 fps)
  ├**3=Orifice/Grate** (Orifice Controls 1.23 cfs @ 2.46 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=34.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: POND 1



Stage-Discharge for Pond 7P: POND 1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
34.00	0.00	0.00	0.00
34.05	0.01	0.01	0.00
34.10	0.03	0.03	0.00
34.15	0.06	0.06	0.00
34.20	0.10	0.10	0.00
34.25	0.15	0.15	0.00
34.30	0.20	0.20	0.00
34.35	0.25	0.25	0.00
34.40	0.29	0.29	0.00
34.45	0.32	0.32	0.00
34.50	0.35	0.35	0.00
34.55	0.38	0.38	0.00
34.60	0.41	0.41	0.00
34.65	0.44	0.44	0.00
34.70	0.46	0.46	0.00
34.75	0.48	0.48	0.00
34.80	0.51	0.51	0.00
34.85	0.53	0.53	0.00
34.90	0.55	0.55	0.00
34.95	0.57	0.57	0.00
35.00	0.58	0.58	0.00
35.05	0.60	0.60	0.00
35.10	0.62	0.62	0.00
35.15	0.64	0.64	0.00
35.20	0.65	0.65	0.00
35.25	0.67	0.67	0.00
35.30	0.69	0.69	0.00
35.35	0.70	0.70	0.00
35.40	0.72	0.72	0.00
35.45	0.73	0.73	0.00
35.50	0.75	0.75	0.00
35.55	0.76	0.76	0.00
35.60	0.77	0.77	0.00
35.65	0.79	0.79	0.00
35.70	0.80	0.80	0.00
35.75	0.82	0.82	0.00
35.80	0.86	0.86	0.00
35.85	0.94	0.94	0.00
35.90	1.04	1.04	0.00
35.95	1.15	1.15	0.00
36.00	1.28	1.28	0.00
36.05	1.42	1.42	0.00
36.10	1.57	1.57	0.00
36.15	1.73	1.73	0.00
36.20	1.90	1.90	0.00
36.25	2.07	2.07	0.00
36.30	2.22	2.22	0.00
36.35	2.35	2.35	0.00
36.40	2.47	2.47	0.00
36.45	2.58	2.58	0.00
36.50	2.68	2.68	0.00
36.55	2.77	2.77	0.00
36.60	2.87	2.87	0.00
36.65	2.95	2.95	0.00
36.70	3.04	3.04	0.00
36.75	3.12	3.12	0.00
36.80	3.20	3.20	0.00
36.85	3.28	3.28	0.00
36.90	3.35	3.35	0.00
36.95	3.43	3.43	0.00
37.00	3.50	3.50	0.00
37.05	3.57	3.57	0.00
37.10	3.64	3.64	0.00
37.15	3.70	3.70	0.00
37.20	3.77	3.77	0.00
37.25	3.83	3.83	0.00
37.30	4.25	4.25	0.00
37.35	4.95	4.95	0.00
37.40	5.84	5.84	0.00
37.45	6.41	6.41	0.00
37.50	6.47	6.47	0.00
37.55	6.79	6.52	0.26
37.60	7.33	6.58	0.75
37.65	8.01	6.63	1.38
37.70	8.80	6.68	2.12
37.75	9.74	6.74	3.01
37.80	10.80	6.79	4.01
37.85	11.97	6.84	5.12
37.90	13.25	6.90	6.35
37.95	14.67	6.95	7.72
38.00	16.21	7.00	9.21
38.05	17.87	7.05	10.82
38.10	19.65	7.10	12.55
38.15	21.28	7.15	14.12
38.20	22.96	7.20	15.75
38.25	24.69	7.25	17.44
38.30	26.48	7.30	19.18
38.35	28.35	7.35	21.00
38.40	30.28	7.40	22.88
38.45	32.26	7.45	24.82
38.50	**34.30**	**7.50**	**26.80**

Stage-Area-Storage for Pond 7P: POND 1

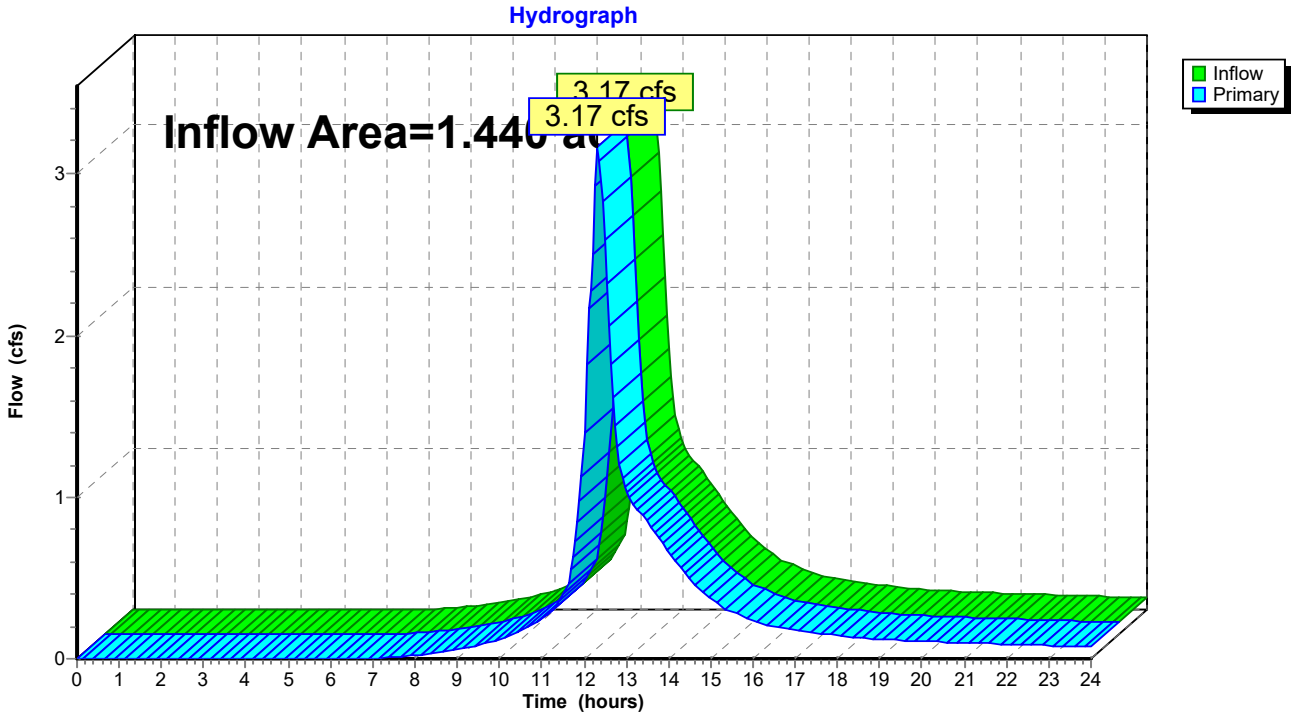
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.00	934	0
34.05	951	47
34.10	968	95
34.15	986	144
34.20	1,003	194
34.25	1,020	244
34.30	1,037	296
34.35	1,054	348
34.40	1,072	401
34.45	1,089	455
34.50	1,106	510
34.55	1,123	566
34.60	1,140	622
34.65	1,158	680
34.70	1,175	738
34.75	1,192	797
34.80	1,209	857
34.85	1,226	918
34.90	1,244	980
34.95	1,261	1,043
35.00	1,278	1,106
35.05	1,297	1,170
35.10	1,316	1,236
35.15	1,336	1,302
35.20	1,355	1,369
35.25	1,374	1,438
35.30	1,393	1,507
35.35	1,412	1,577
35.40	1,432	1,648
35.45	1,451	1,720
35.50	1,470	1,793
35.55	1,489	1,867
35.60	1,508	1,942
35.65	1,528	2,018
35.70	1,547	2,095
35.75	1,566	2,173
35.80	1,585	2,251
35.85	1,604	2,331
35.90	1,624	2,412
35.95	1,643	2,493
36.00	1,662	2,576
36.05	1,683	2,660
36.10	1,704	2,744
36.15	1,725	2,830
36.20	1,747	2,917
36.25	1,768	3,005
36.30	1,789	3,094
36.35	1,810	3,184
36.40	1,831	3,275
36.45	1,852	3,367
36.50	1,874	3,460
36.55	1,895	3,554
36.60	1,916	3,649
36.65	1,937	3,746
36.70	1,958	3,843
36.75	1,979	3,941
36.80	2,000	4,041
36.85	2,022	4,142
36.90	2,043	4,243
36.95	2,064	4,346
37.00	2,085	4,450
37.05	2,115	4,555
37.10	2,145	4,661
37.15	2,175	4,769
37.20	2,205	4,879
37.25	2,236	4,990
37.30	2,266	5,102
37.35	2,296	5,216
37.40	2,326	5,332
37.45	2,356	5,449
37.50	2,386	5,567
37.55	2,416	5,687
37.60	2,446	5,809
37.65	2,476	5,932
37.70	2,506	6,056
37.75	2,537	6,183
37.80	2,567	6,310
37.85	2,597	6,439
37.90	2,627	6,570
37.95	2,657	6,702
38.00	2,687	6,836
38.05	2,712	6,970
38.10	2,738	7,107
38.15	2,763	7,244
38.20	2,789	7,383
38.25	2,815	7,523
38.30	2,840	7,665
38.35	2,866	7,807
38.40	2,891	7,951
38.45	2,917	8,096
38.50	**2,942**	**8,243**

Summary for Link 8L: PDA-1 Total

Inflow Area = 1.440 ac, 42.36% Impervious, Inflow Depth > 3.79" for 25-yr event
Inflow = 3.17 cfs @ 12.32 hrs, Volume= 0.455 af
Primary = 3.17 cfs @ 12.32 hrs, Volume= 0.455 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: PDA-1 Total

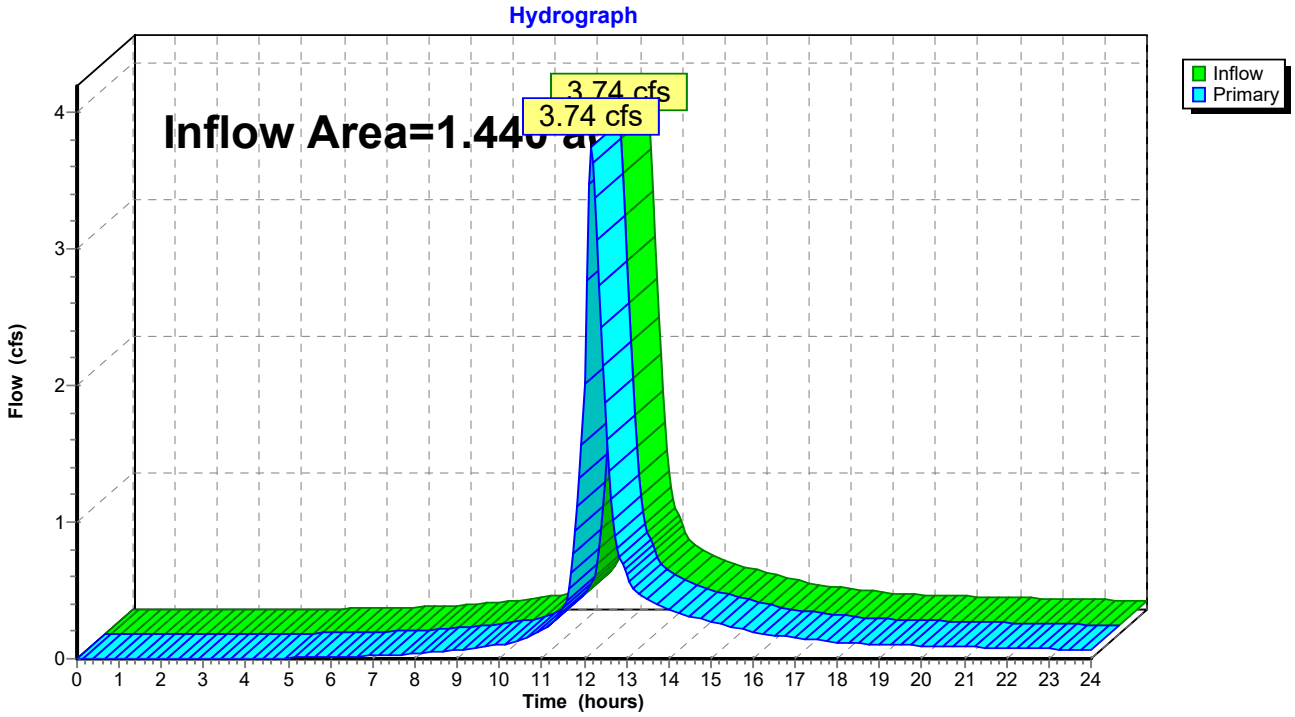


Summary for Link 9L: EDA-1 Total

Inflow Area = 1.440 ac, 27.78% Impervious, Inflow Depth > 3.26" for 25-yr event
Inflow = 3.74 cfs @ 12.16 hrs, Volume= 0.391 af
Primary = 3.74 cfs @ 12.16 hrs, Volume= 0.391 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 9L: EDA-1 Total



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: EDA-1A Runoff Area=0.920 ac 1.09% Impervious Runoff Depth>2.90"
Flow Length=265' Tc=17.4 min CN=63 Runoff=2.19 cfs 0.222 af

Subcatchment 3S: EDA-1B Runoff Area=0.340 ac 73.53% Impervious Runoff Depth>5.59"
Flow Length=110' Slope=0.0450 '/' Tc=10.7 min CN=88 Runoff=1.81 cfs 0.159 af

Subcatchment 5S: PDA-1A.1 Runoff Area=0.370 ac 0.00% Impervious Runoff Depth>3.31"
Flow Length=390' Tc=13.5 min CN=67 Runoff=1.12 cfs 0.102 af

Subcatchment 6S: PDA-1A.2 Runoff Area=0.870 ac 62.07% Impervious Runoff Depth>5.14"
Flow Length=143' Tc=13.6 min CN=84 Runoff=4.01 cfs 0.373 af

Subcatchment 9S: EDA-1C Runoff Area=0.180 ac 77.78% Impervious Runoff Depth>5.83"
Tc=6.0 min CN=90 Runoff=1.13 cfs 0.087 af

Subcatchment 10S: PDA-1B Runoff Area=0.200 ac 35.00% Impervious Runoff Depth>4.05"
Tc=6.0 min CN=74 Runoff=0.93 cfs 0.067 af

Pond 7P: POND 1 Peak Elev=36.47' Storage=3,410 cf Inflow=4.01 cfs 0.373 af
Primary=2.62 cfs 0.369 af Secondary=0.00 cfs 0.000 af Outflow=2.62 cfs 0.369 af

Link 8L: PDA-1 Total Inflow=3.89 cfs 0.539 af
Primary=3.89 cfs 0.539 af

Link 9L: EDA-1 Total Inflow=4.49 cfs 0.468 af
Primary=4.49 cfs 0.468 af

Summary for Subcatchment 1S: EDA-1A

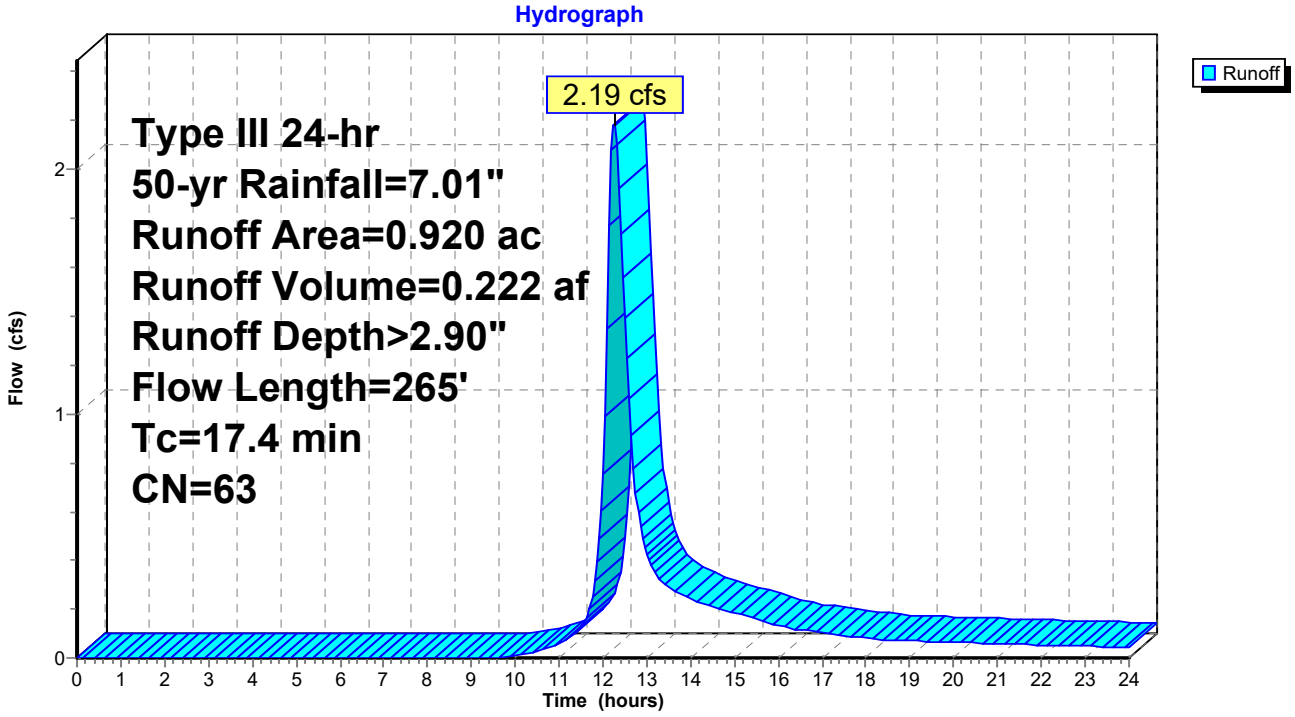
Runoff = 2.19 cfs @ 12.25 hrs, Volume= 0.222 af, Depth> 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.01"

Area (ac)	CN	Description
0.410	61	>75% Grass cover, Good, HSG B
0.290	55	Woods, Good, HSG B
0.210	77	Woods, Good, HSG D
0.010	98	Paved parking, HSG B
0.920	63	Weighted Average
0.910		98.91% Pervious Area
0.010		1.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	150	0.0267	0.15		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
0.5	115	0.0480	3.53		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
17.4	265	Total			

Subcatchment 1S: EDA-1A



Summary for Subcatchment 3S: EDA-1B

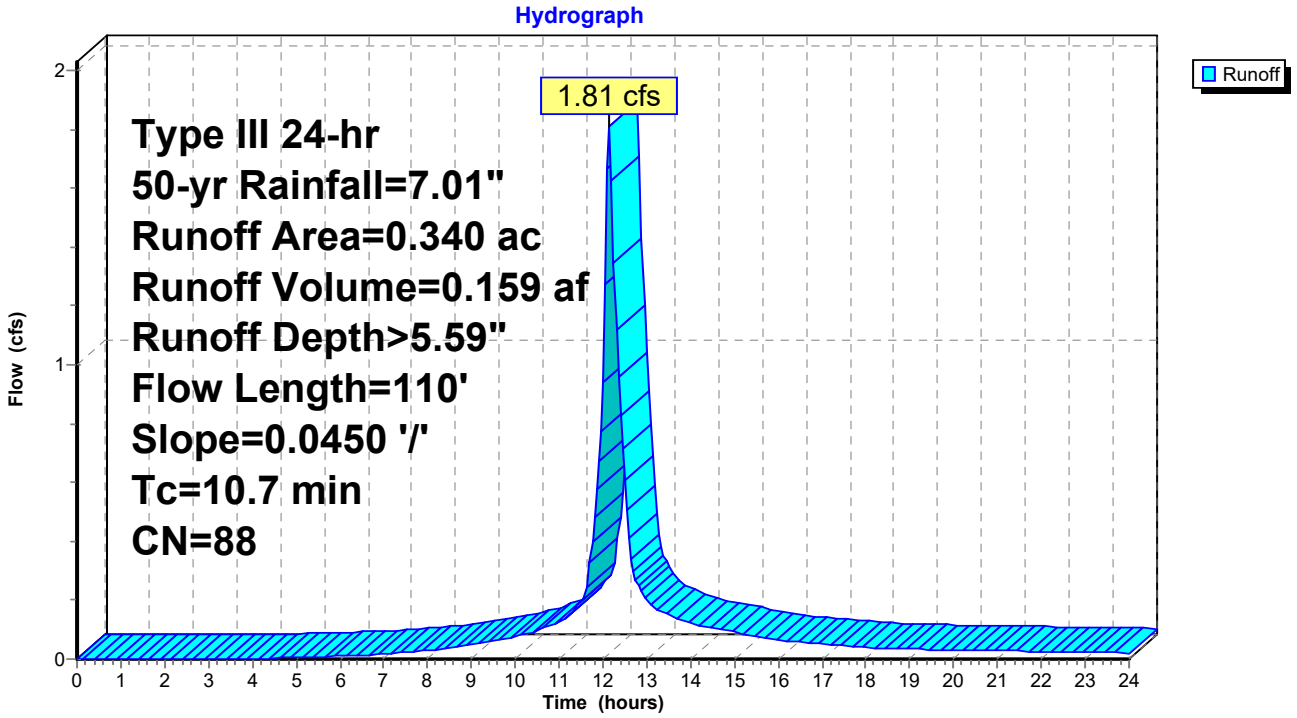
Runoff = 1.81 cfs @ 12.15 hrs, Volume= 0.159 af, Depth> 5.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.01"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG B
0.090	61	>75% Grass cover, Good, HSG B
0.340	88	Weighted Average
0.090		26.47% Pervious Area
0.250		73.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	110	0.0450	0.17		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"

Subcatchment 3S: EDA-1B



Summary for Subcatchment 5S: PDA-1A.1

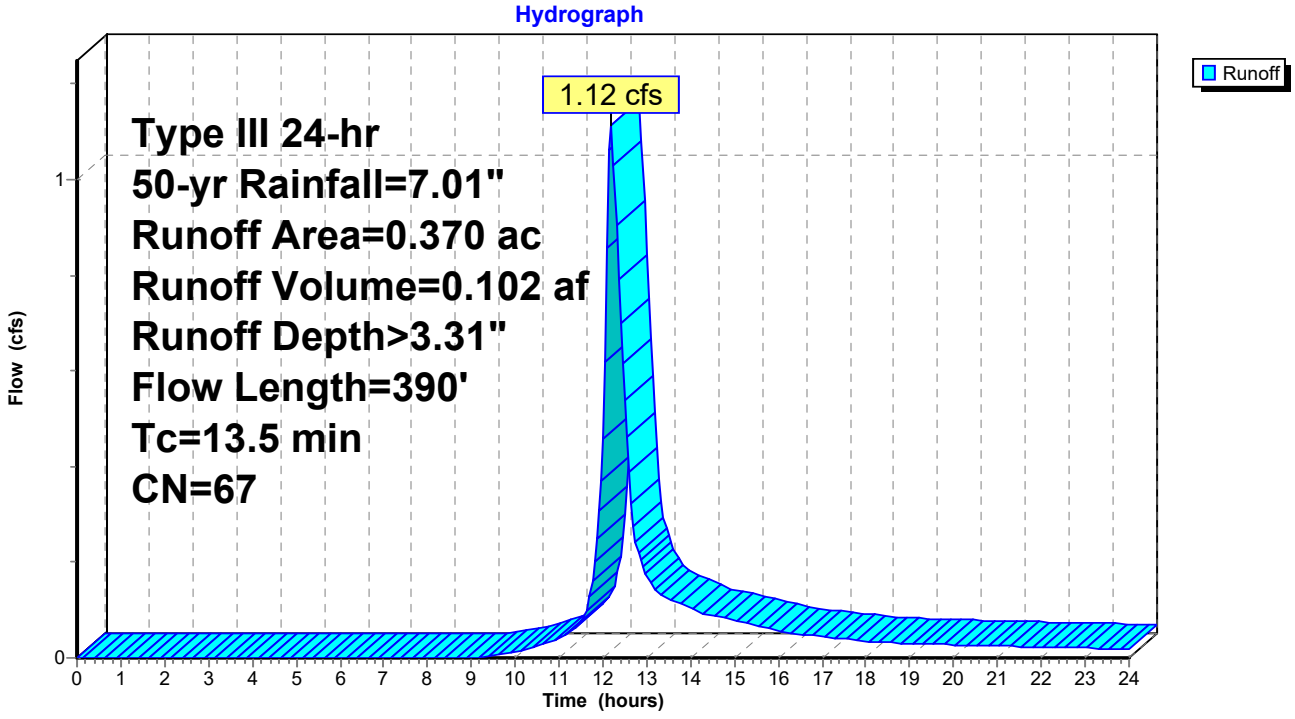
Runoff = 1.12 cfs @ 12.19 hrs, Volume= 0.102 af, Depth> 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.01"

Area (ac)	CN	Description
0.100	61	>75% Grass cover, Good, HSG B
0.090	55	Woods, Good, HSG B
0.180	77	Woods, Good, HSG D
0.370	67	Weighted Average
0.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	150	0.0600	0.20		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
1.3	240	0.0375	3.12		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
13.5	390	Total			

Subcatchment 5S: PDA-1A.1



Summary for Subcatchment 6S: PDA-1A.2

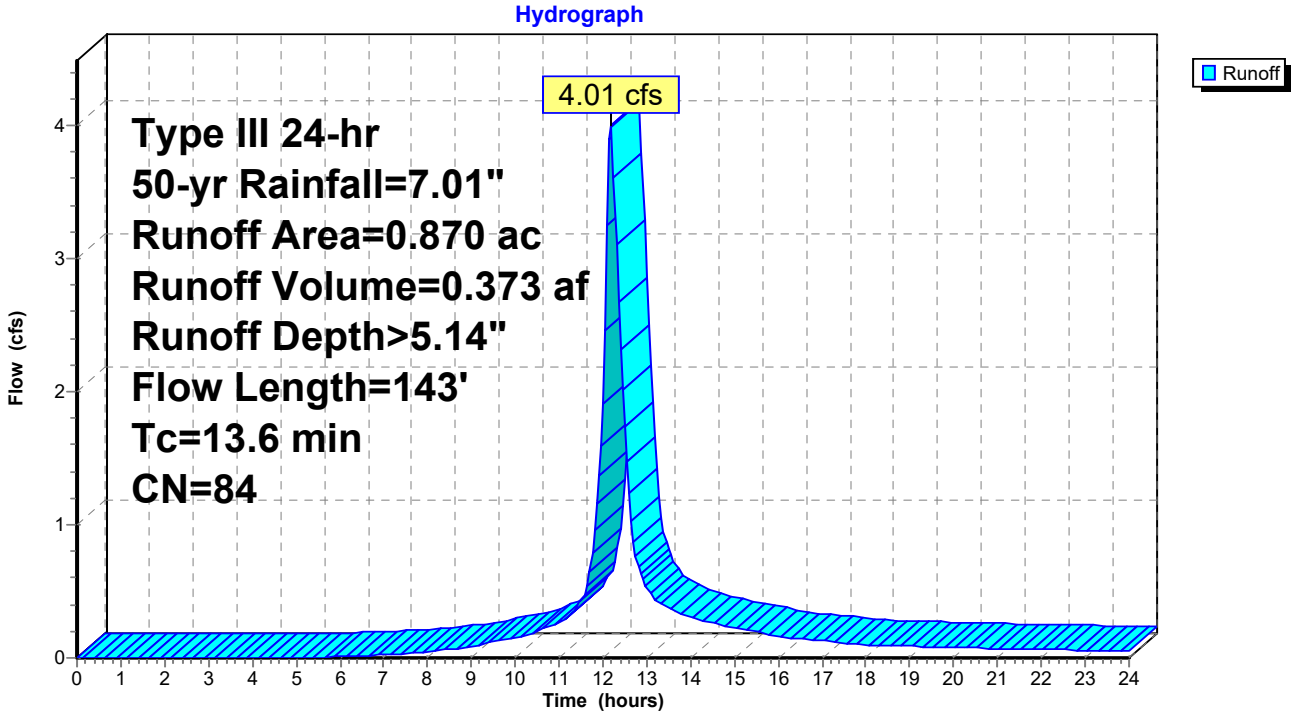
Runoff = 4.01 cfs @ 12.18 hrs, Volume= 0.373 af, Depth> 5.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.01"

Area (ac)	CN	Description
0.330	61	>75% Grass cover, Good, HSG B
0.540	98	Paved parking, HSG B
0.870	84	Weighted Average
0.330		37.93% Pervious Area
0.540		62.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	133	0.0375	0.17		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
0.2	10	0.0200	0.90		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.45"
13.6	143	Total			

Subcatchment 6S: PDA-1A.2



Summary for Subcatchment 9S: EDA-1C

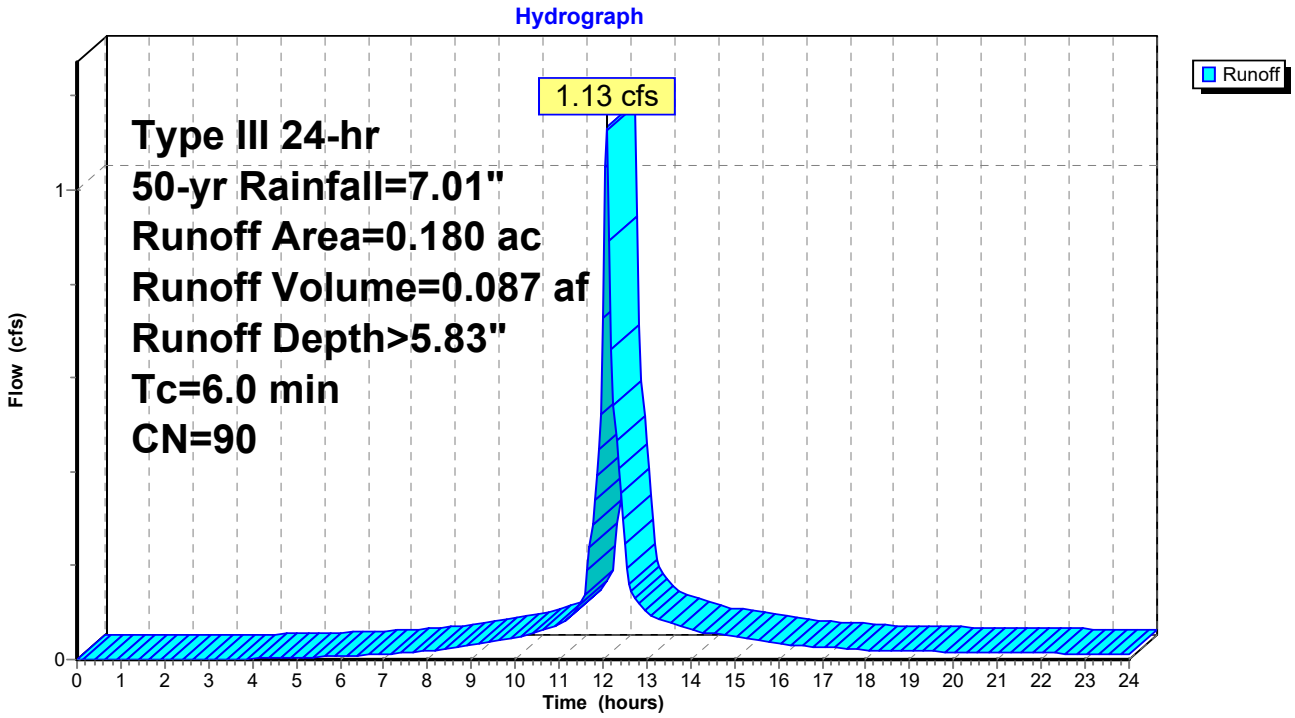
Runoff = 1.13 cfs @ 12.09 hrs, Volume= 0.087 af, Depth> 5.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.01"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG B
0.040	61	>75% Grass cover, Good, HSG B
0.180	90	Weighted Average
0.040		22.22% Pervious Area
0.140		77.78% Impervious Area

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

Subcatchment 9S: EDA-1C



Summary for Subcatchment 10S: PDA-1B

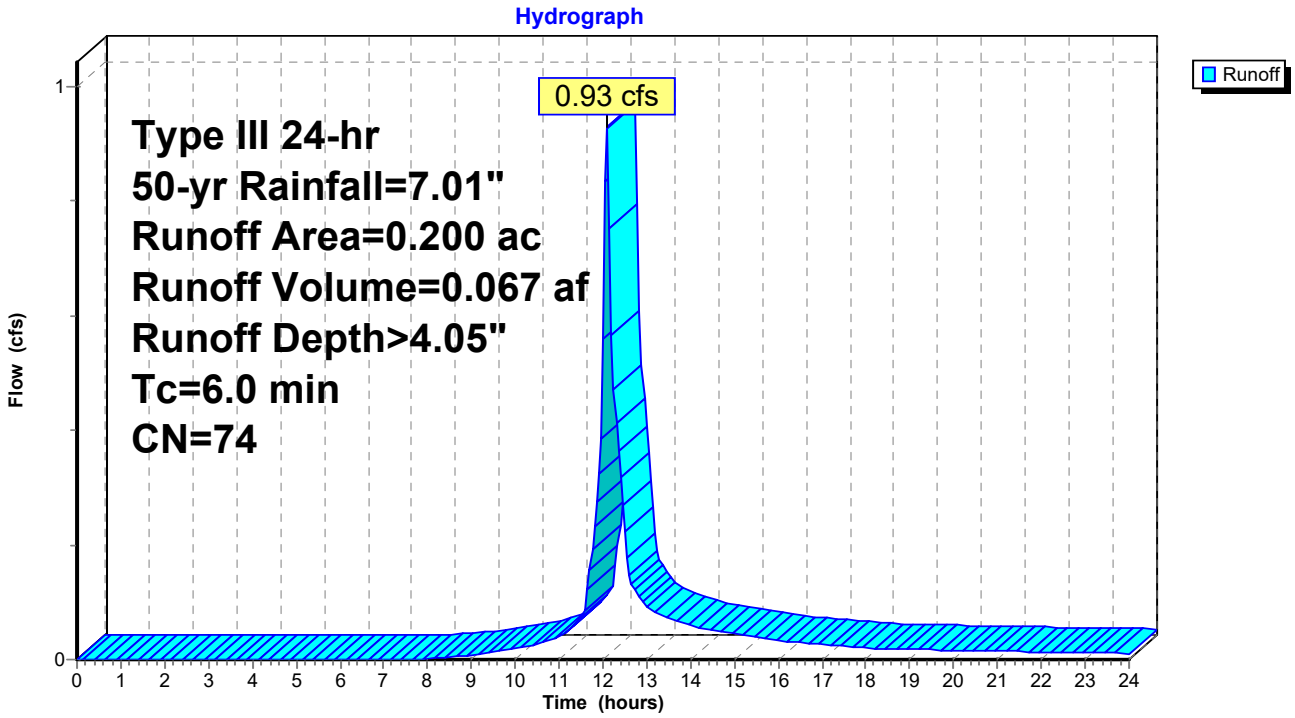
Runoff = 0.93 cfs @ 12.09 hrs, Volume= 0.067 af, Depth> 4.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.01"

Area (ac)	CN	Description
0.130	61	>75% Grass cover, Good, HSG B
0.070	98	Paved parking, HSG B
0.200	74	Weighted Average
0.130		65.00% Pervious Area
0.070		35.00% Impervious Area

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

Subcatchment 10S: PDA-1B



Summary for Pond 7P: POND 1

Inflow Area = 0.870 ac, 62.07% Impervious, Inflow Depth > 5.14" for 50-yr event
Inflow = 4.01 cfs @ 12.18 hrs, Volume= 0.373 af
Outflow = 2.62 cfs @ 12.36 hrs, Volume= 0.369 af, Atten= 35%, Lag= 10.6 min
Primary = 2.62 cfs @ 12.36 hrs, Volume= 0.369 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 36.47' @ 12.36 hrs Surf.Area= 1,862 sf Storage= 3,410 cf

Plug-Flow detention time= 30.0 min calculated for 0.369 af (99% of inflow)
Center-of-Mass det. time= 24.8 min (828.3 - 803.5)

Volume	Invert	Avail.Storage	Storage Description
#1	34.00'	8,243 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

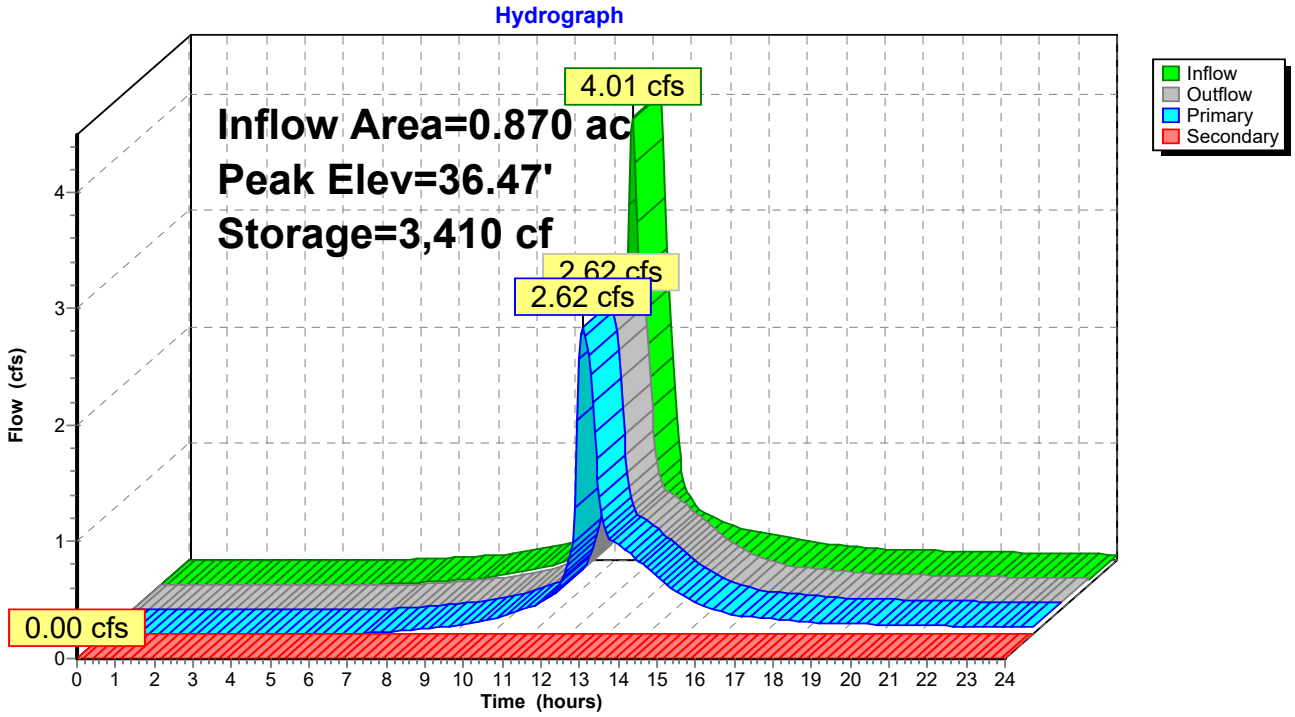
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.00	934	0	0
35.00	1,278	1,106	1,106
36.00	1,662	1,470	2,576
37.00	2,085	1,874	4,450
38.00	2,687	2,386	6,836
38.50	2,942	1,407	8,243

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.00' / 33.60' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	34.00'	**5.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	35.75'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	37.25'	**20.4" x 37.2" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	37.50'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=2.62 cfs @ 12.36 hrs HW=36.47' (Free Discharge)
└**1=Culvert** (Passes 2.62 cfs of 5.19 cfs potential flow)
├**2=Orifice/Grate** (Orifice Controls 0.99 cfs @ 7.24 fps)
├**3=Orifice/Grate** (Orifice Controls 1.63 cfs @ 3.26 fps)
└**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=34.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: POND 1



Stage-Discharge for Pond 7P: POND 1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
34.00	0.00	0.00	0.00
34.05	0.01	0.01	0.00
34.10	0.03	0.03	0.00
34.15	0.06	0.06	0.00
34.20	0.10	0.10	0.00
34.25	0.15	0.15	0.00
34.30	0.20	0.20	0.00
34.35	0.25	0.25	0.00
34.40	0.29	0.29	0.00
34.45	0.32	0.32	0.00
34.50	0.35	0.35	0.00
34.55	0.38	0.38	0.00
34.60	0.41	0.41	0.00
34.65	0.44	0.44	0.00
34.70	0.46	0.46	0.00
34.75	0.48	0.48	0.00
34.80	0.51	0.51	0.00
34.85	0.53	0.53	0.00
34.90	0.55	0.55	0.00
34.95	0.57	0.57	0.00
35.00	0.58	0.58	0.00
35.05	0.60	0.60	0.00
35.10	0.62	0.62	0.00
35.15	0.64	0.64	0.00
35.20	0.65	0.65	0.00
35.25	0.67	0.67	0.00
35.30	0.69	0.69	0.00
35.35	0.70	0.70	0.00
35.40	0.72	0.72	0.00
35.45	0.73	0.73	0.00
35.50	0.75	0.75	0.00
35.55	0.76	0.76	0.00
35.60	0.77	0.77	0.00
35.65	0.79	0.79	0.00
35.70	0.80	0.80	0.00
35.75	0.82	0.82	0.00
35.80	0.86	0.86	0.00
35.85	0.94	0.94	0.00
35.90	1.04	1.04	0.00
35.95	1.15	1.15	0.00
36.00	1.28	1.28	0.00
36.05	1.42	1.42	0.00
36.10	1.57	1.57	0.00
36.15	1.73	1.73	0.00
36.20	1.90	1.90	0.00
36.25	2.07	2.07	0.00
36.30	2.22	2.22	0.00
36.35	2.35	2.35	0.00
36.40	2.47	2.47	0.00
36.45	2.58	2.58	0.00
36.50	2.68	2.68	0.00
36.55	2.77	2.77	0.00
36.60	2.87	2.87	0.00
36.65	2.95	2.95	0.00
36.70	3.04	3.04	0.00
36.75	3.12	3.12	0.00
36.80	3.20	3.20	0.00
36.85	3.28	3.28	0.00
36.90	3.35	3.35	0.00
36.95	3.43	3.43	0.00
37.00	3.50	3.50	0.00
37.05	3.57	3.57	0.00
37.10	3.64	3.64	0.00
37.15	3.70	3.70	0.00
37.20	3.77	3.77	0.00
37.25	3.83	3.83	0.00
37.30	4.25	4.25	0.00
37.35	4.95	4.95	0.00
37.40	5.84	5.84	0.00
37.45	6.41	6.41	0.00
37.50	6.47	6.47	0.00
37.55	6.79	6.52	0.26
37.60	7.33	6.58	0.75
37.65	8.01	6.63	1.38
37.70	8.80	6.68	2.12
37.75	9.74	6.74	3.01
37.80	10.80	6.79	4.01
37.85	11.97	6.84	5.12
37.90	13.25	6.90	6.35
37.95	14.67	6.95	7.72
38.00	16.21	7.00	9.21
38.05	17.87	7.05	10.82
38.10	19.65	7.10	12.55
38.15	21.28	7.15	14.12
38.20	22.96	7.20	15.75
38.25	24.69	7.25	17.44
38.30	26.48	7.30	19.18
38.35	28.35	7.35	21.00
38.40	30.28	7.40	22.88
38.45	32.26	7.45	24.82
38.50	**34.30**	**7.50**	**26.80**

Stage-Area-Storage for Pond 7P: POND 1

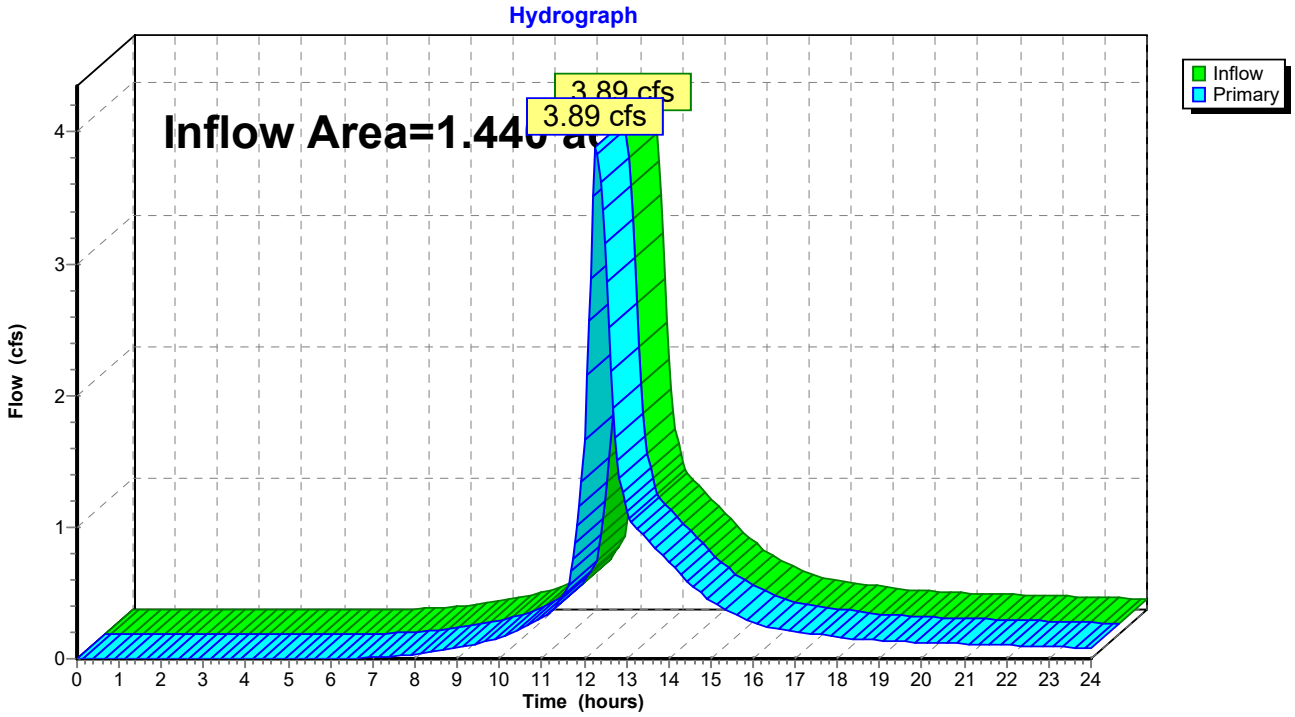
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.00	934	0
34.05	951	47
34.10	968	95
34.15	986	144
34.20	1,003	194
34.25	1,020	244
34.30	1,037	296
34.35	1,054	348
34.40	1,072	401
34.45	1,089	455
34.50	1,106	510
34.55	1,123	566
34.60	1,140	622
34.65	1,158	680
34.70	1,175	738
34.75	1,192	797
34.80	1,209	857
34.85	1,226	918
34.90	1,244	980
34.95	1,261	1,043
35.00	1,278	1,106
35.05	1,297	1,170
35.10	1,316	1,236
35.15	1,336	1,302
35.20	1,355	1,369
35.25	1,374	1,438
35.30	1,393	1,507
35.35	1,412	1,577
35.40	1,432	1,648
35.45	1,451	1,720
35.50	1,470	1,793
35.55	1,489	1,867
35.60	1,508	1,942
35.65	1,528	2,018
35.70	1,547	2,095
35.75	1,566	2,173
35.80	1,585	2,251
35.85	1,604	2,331
35.90	1,624	2,412
35.95	1,643	2,493
36.00	1,662	2,576
36.05	1,683	2,660
36.10	1,704	2,744
36.15	1,725	2,830
36.20	1,747	2,917
36.25	1,768	3,005
36.30	1,789	3,094
36.35	1,810	3,184
36.40	1,831	3,275
36.45	1,852	3,367
36.50	1,874	3,460
36.55	1,895	3,554
36.60	1,916	3,649
36.65	1,937	3,746
36.70	1,958	3,843
36.75	1,979	3,941
36.80	2,000	4,041
36.85	2,022	4,142
36.90	2,043	4,243
36.95	2,064	4,346
37.00	2,085	4,450
37.05	2,115	4,555
37.10	2,145	4,661
37.15	2,175	4,769
37.20	2,205	4,879
37.25	2,236	4,990
37.30	2,266	5,102
37.35	2,296	5,216
37.40	2,326	5,332
37.45	2,356	5,449
37.50	2,386	5,567
37.55	2,416	5,687
37.60	2,446	5,809
37.65	2,476	5,932
37.70	2,506	6,056
37.75	2,537	6,183
37.80	2,567	6,310
37.85	2,597	6,439
37.90	2,627	6,570
37.95	2,657	6,702
38.00	2,687	6,836
38.05	2,712	6,970
38.10	2,738	7,107
38.15	2,763	7,244
38.20	2,789	7,383
38.25	2,815	7,523
38.30	2,840	7,665
38.35	2,866	7,807
38.40	2,891	7,951
38.45	2,917	8,096
38.50	**2,942**	**8,243**

Summary for Link 8L: PDA-1 Total

Inflow Area = 1.440 ac, 42.36% Impervious, Inflow Depth > 4.49" for 50-yr event
Inflow = 3.89 cfs @ 12.28 hrs, Volume= 0.539 af
Primary = 3.89 cfs @ 12.28 hrs, Volume= 0.539 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: PDA-1 Total

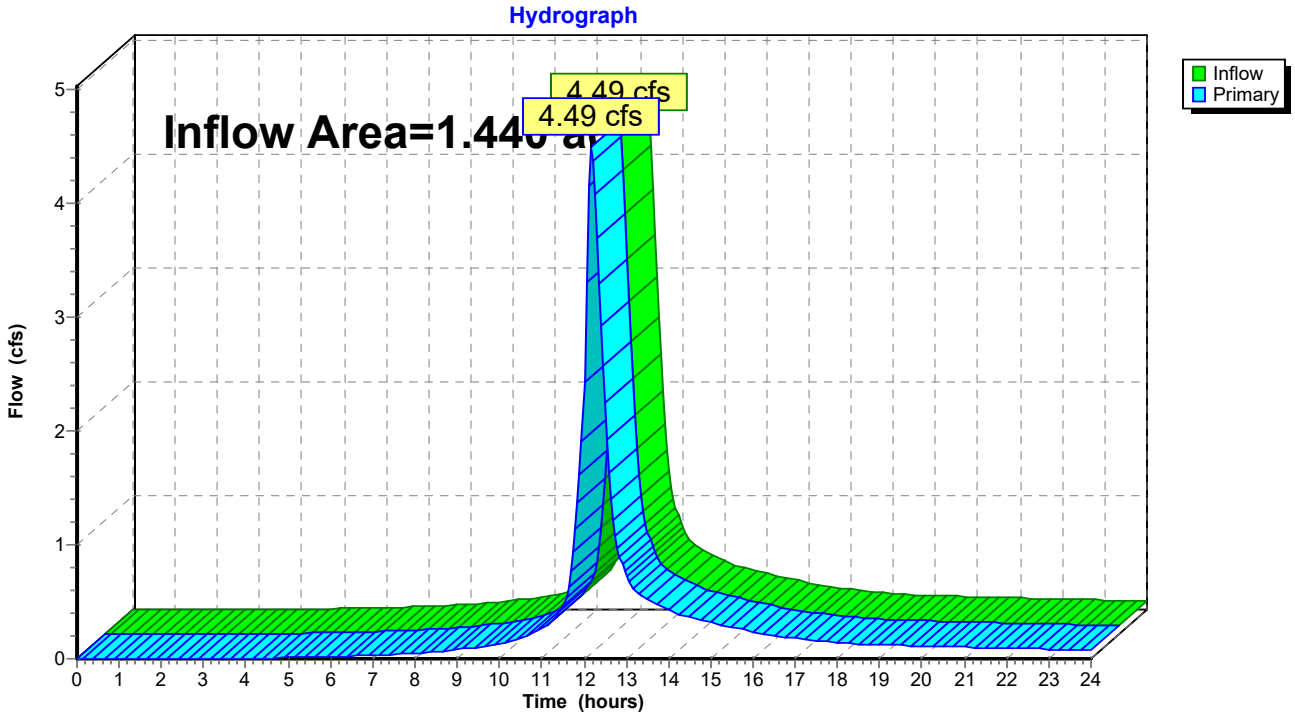


Summary for Link 9L: EDA-1 Total

Inflow Area = 1.440 ac, 27.78% Impervious, Inflow Depth > 3.90" for 50-yr event
Inflow = 4.49 cfs @ 12.16 hrs, Volume= 0.468 af
Primary = 4.49 cfs @ 12.16 hrs, Volume= 0.468 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 9L: EDA-1 Total



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1S: EDA-1A Runoff Area=0.920 ac 1.09% Impervious Runoff Depth>3.55"
Flow Length=265' Tc=17.4 min CN=63 Runoff=2.70 cfs 0.272 af

Subcatchment 3S: EDA-1B Runoff Area=0.340 ac 73.53% Impervious Runoff Depth>6.42"
Flow Length=110' Slope=0.0450 '/' Tc=10.7 min CN=88 Runoff=2.07 cfs 0.182 af

Subcatchment 5S: PDA-1A.1 Runoff Area=0.370 ac 0.00% Impervious Runoff Depth>4.00"
Flow Length=390' Tc=13.5 min CN=67 Runoff=1.35 cfs 0.123 af

Subcatchment 6S: PDA-1A.2 Runoff Area=0.870 ac 62.07% Impervious Runoff Depth>5.95"
Flow Length=143' Tc=13.6 min CN=84 Runoff=4.61 cfs 0.431 af

Subcatchment 9S: EDA-1C Runoff Area=0.180 ac 77.78% Impervious Runoff Depth>6.66"
Tc=6.0 min CN=90 Runoff=1.29 cfs 0.100 af

Subcatchment 10S: PDA-1B Runoff Area=0.200 ac 35.00% Impervious Runoff Depth>4.80"
Tc=6.0 min CN=74 Runoff=1.10 cfs 0.080 af

Pond 7P: POND 1 Peak Elev=36.69' Storage=3,820 cf Inflow=4.61 cfs 0.431 af
Primary=3.02 cfs 0.428 af Secondary=0.00 cfs 0.000 af Outflow=3.02 cfs 0.428 af

Link 8L: PDA-1 Total Inflow=4.60 cfs 0.631 af
Primary=4.60 cfs 0.631 af

Link 9L: EDA-1 Total Inflow=5.31 cfs 0.554 af
Primary=5.31 cfs 0.554 af

Summary for Subcatchment 1S: EDA-1A

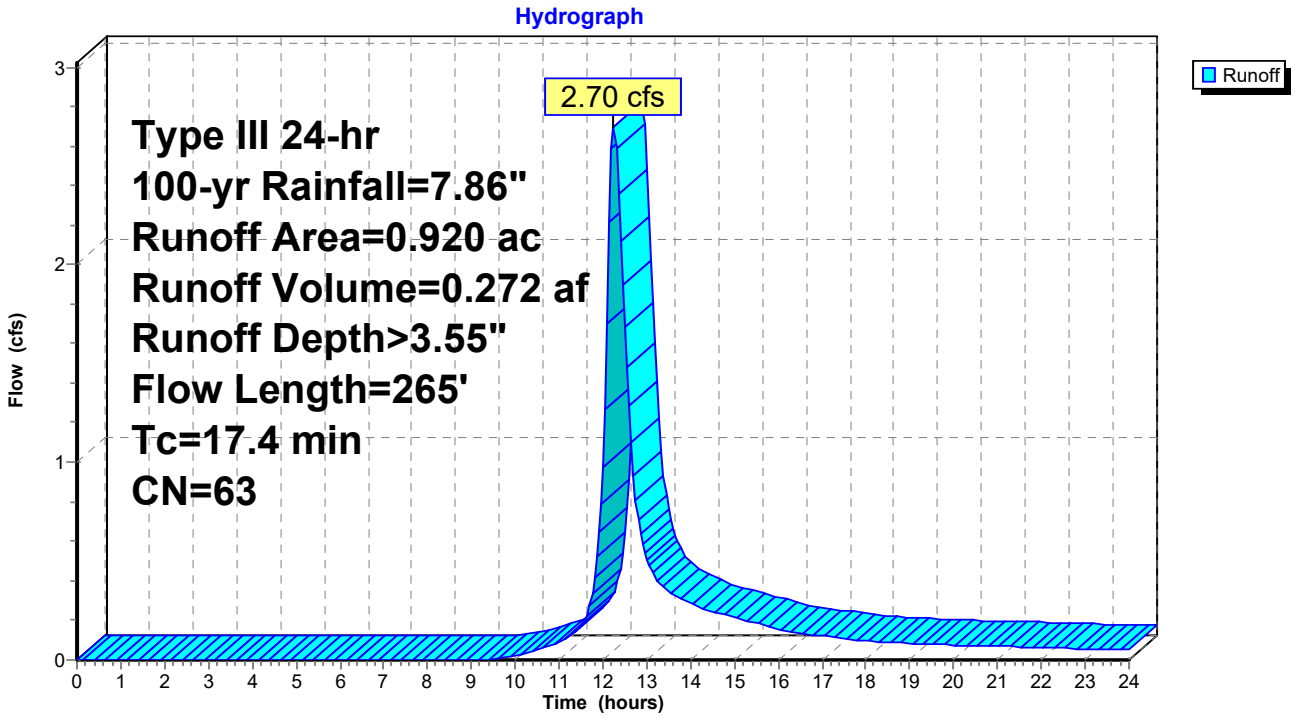
Runoff = 2.70 cfs @ 12.25 hrs, Volume= 0.272 af, Depth> 3.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=7.86"

Area (ac)	CN	Description
0.410	61	>75% Grass cover, Good, HSG B
0.290	55	Woods, Good, HSG B
0.210	77	Woods, Good, HSG D
0.010	98	Paved parking, HSG B
0.920	63	Weighted Average
0.910		98.91% Pervious Area
0.010		1.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	150	0.0267	0.15		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
0.5	115	0.0480	3.53		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
17.4	265	Total			

Subcatchment 1S: EDA-1A



Summary for Subcatchment 3S: EDA-1B

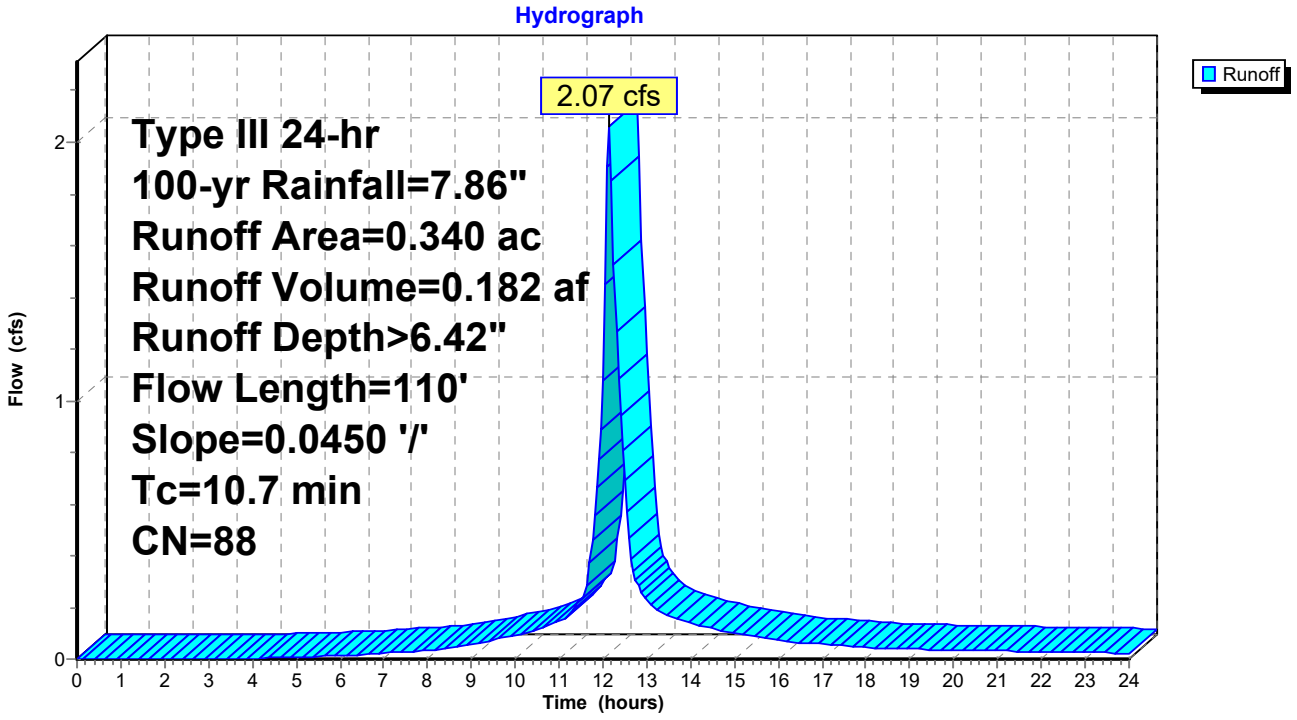
Runoff = 2.07 cfs @ 12.15 hrs, Volume= 0.182 af, Depth> 6.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=7.86"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG B
0.090	61	>75% Grass cover, Good, HSG B
0.340	88	Weighted Average
0.090		26.47% Pervious Area
0.250		73.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	110	0.0450	0.17		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"

Subcatchment 3S: EDA-1B



Summary for Subcatchment 5S: PDA-1A.1

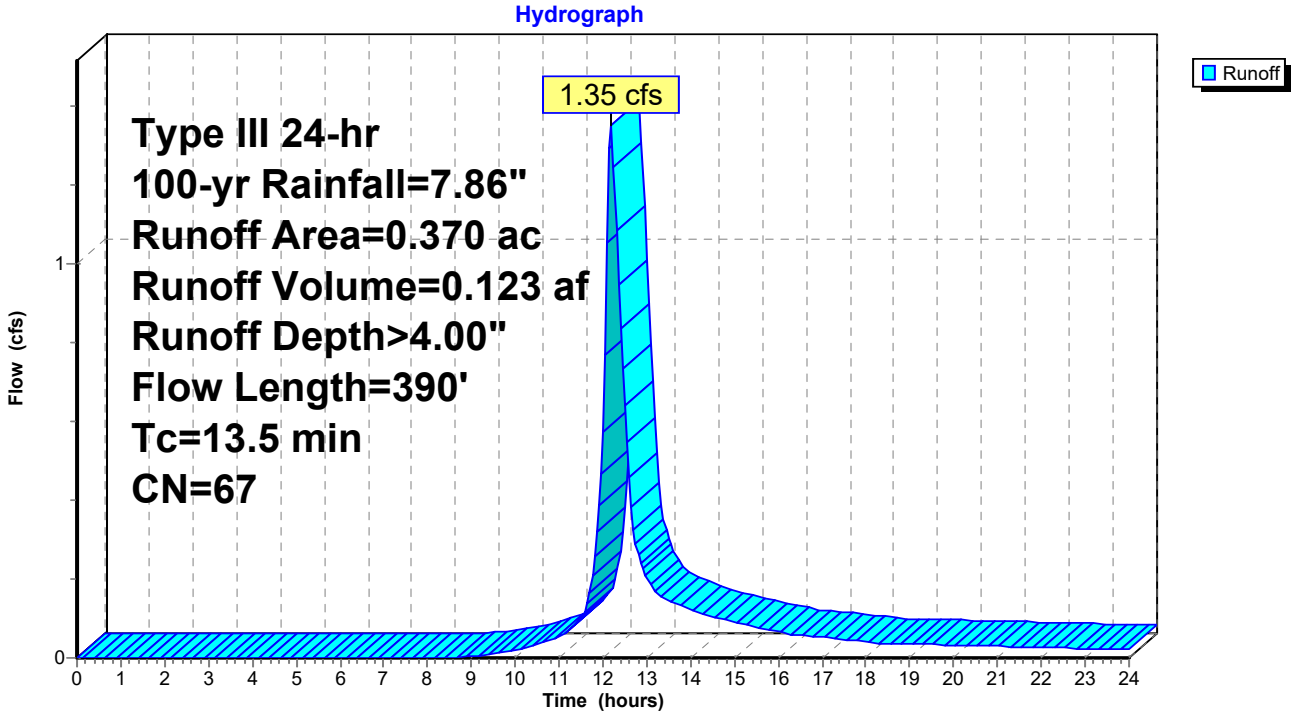
Runoff = 1.35 cfs @ 12.19 hrs, Volume= 0.123 af, Depth> 4.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=7.86"

Area (ac)	CN	Description
0.100	61	>75% Grass cover, Good, HSG B
0.090	55	Woods, Good, HSG B
0.180	77	Woods, Good, HSG D
0.370	67	Weighted Average
0.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	150	0.0600	0.20		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
1.3	240	0.0375	3.12		**Shallow Concentrated Flow, BC** Unpaved Kv= 16.1 fps
13.5	390	Total			

Subcatchment 5S: PDA-1A.1



Summary for Subcatchment 6S: PDA-1A.2

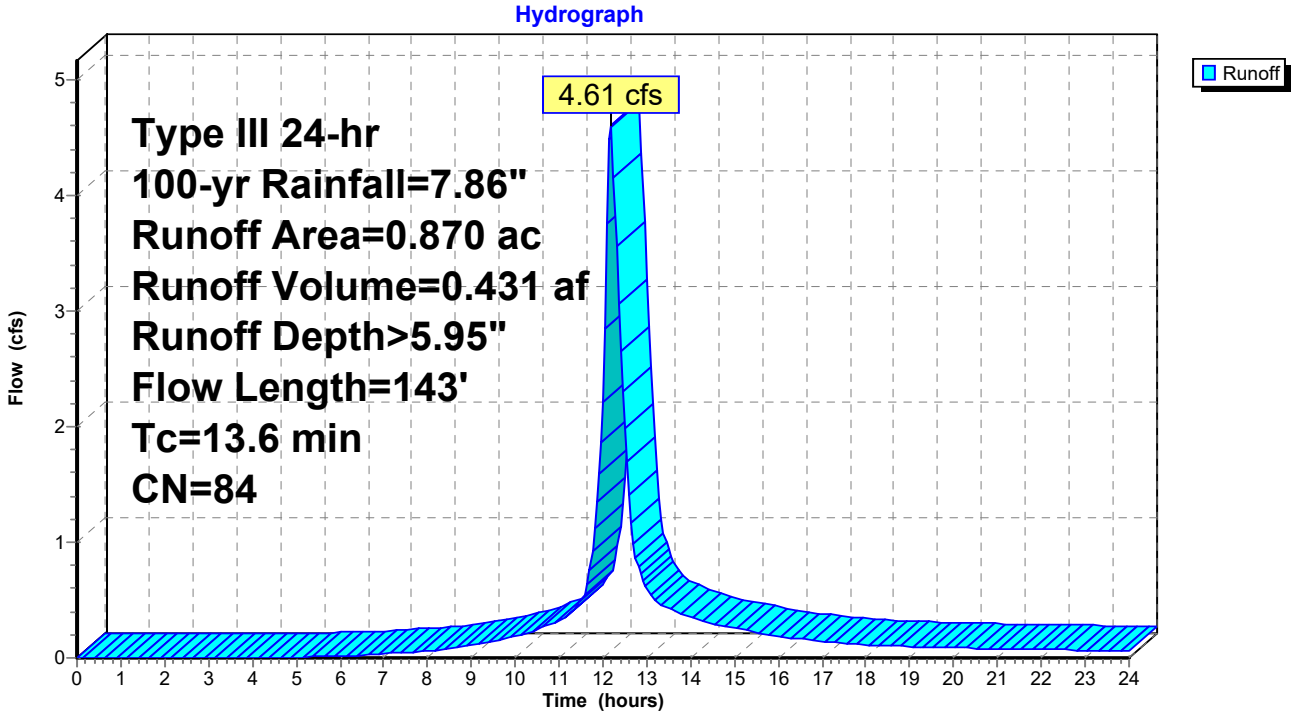
Runoff = 4.61 cfs @ 12.18 hrs, Volume= 0.431 af, Depth> 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=7.86"

Area (ac)	CN	Description
0.330	61	>75% Grass cover, Good, HSG B
0.540	98	Paved parking, HSG B
0.870	84	Weighted Average
0.330		37.93% Pervious Area
0.540		62.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	133	0.0375	0.17		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.45"
0.2	10	0.0200	0.90		**Sheet Flow, BC** Smooth surfaces n= 0.011 P2= 3.45"
13.6	143	Total			

Subcatchment 6S: PDA-1A.2



Summary for Subcatchment 9S: EDA-1C

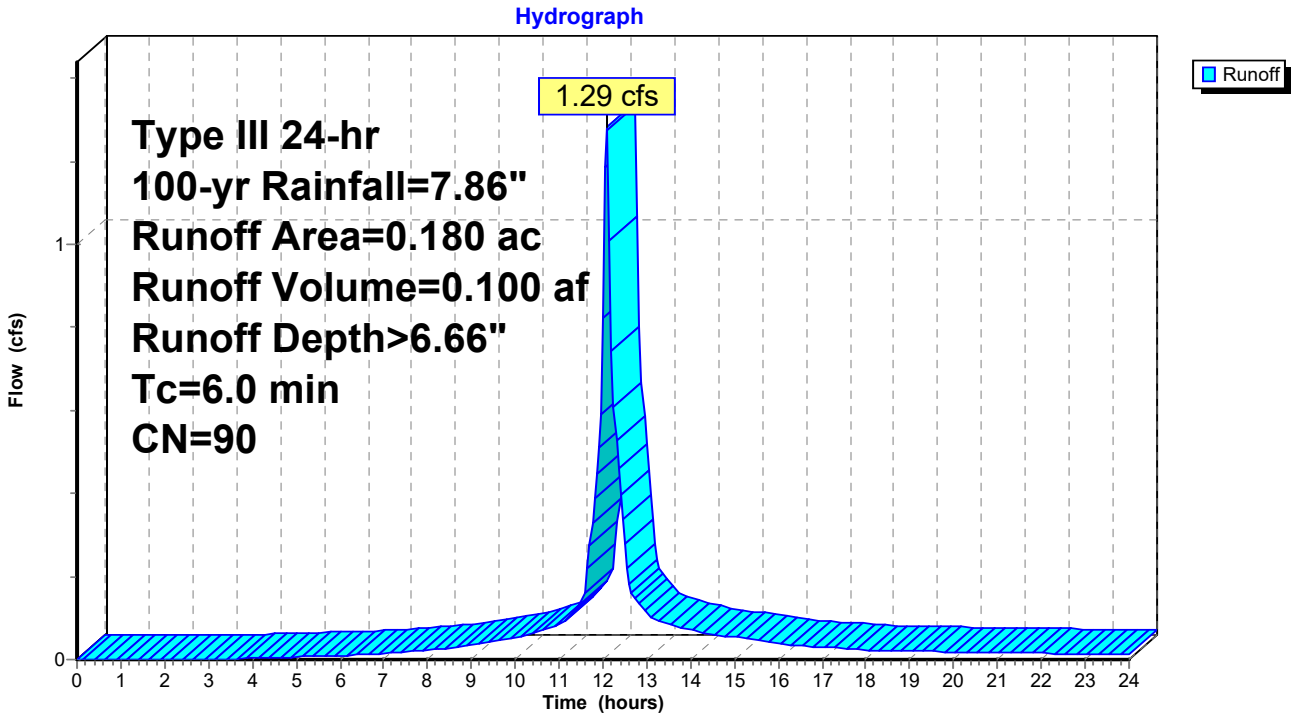
Runoff = 1.29 cfs @ 12.09 hrs, Volume= 0.100 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=7.86"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG B
0.040	61	>75% Grass cover, Good, HSG B
0.180	90	Weighted Average
0.040		22.22% Pervious Area
0.140		77.78% Impervious Area

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

Subcatchment 9S: EDA-1C



Summary for Subcatchment 10S: PDA-1B

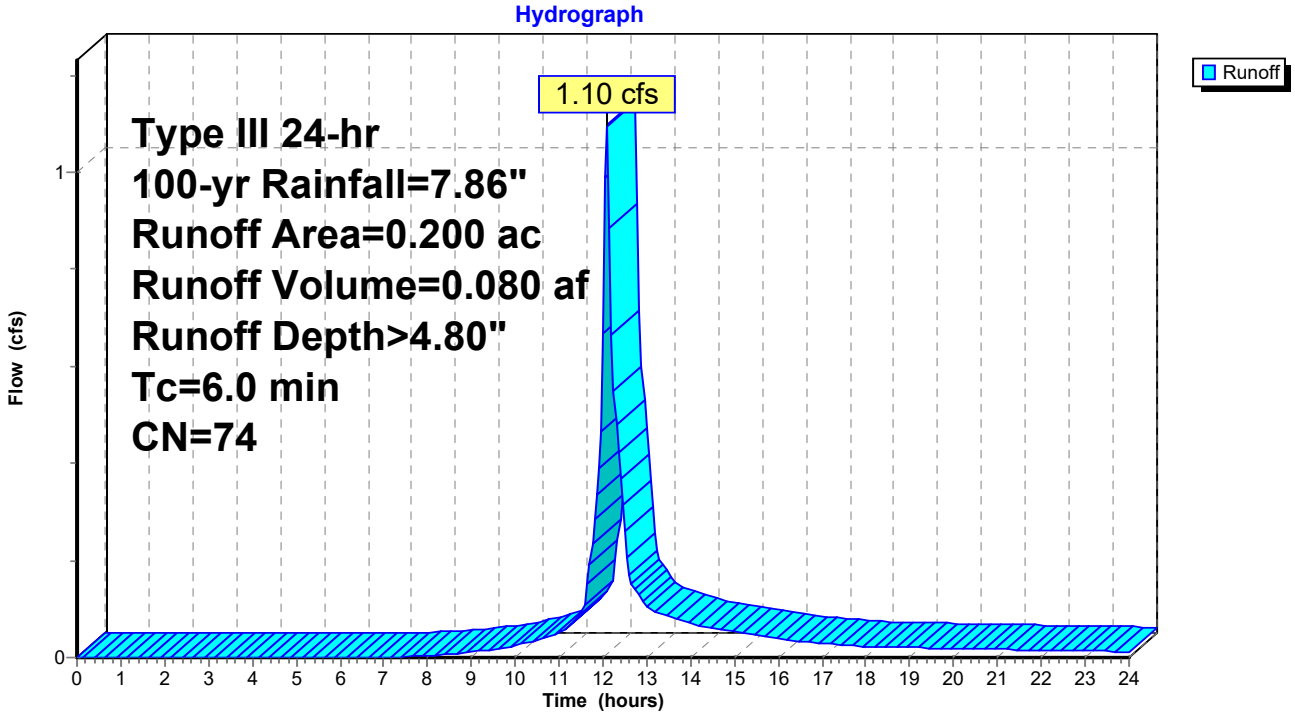
Runoff = 1.10 cfs @ 12.09 hrs, Volume= 0.080 af, Depth> 4.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=7.86"

Area (ac)	CN	Description
0.130	61	>75% Grass cover, Good, HSG B
0.070	98	Paved parking, HSG B
0.200	74	Weighted Average
0.130		65.00% Pervious Area
0.070		35.00% Impervious Area

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

Subcatchment 10S: PDA-1B



Summary for Pond 7P: POND 1

Inflow Area = 0.870 ac, 62.07% Impervious, Inflow Depth > 5.95" for 100-yr event
Inflow = 4.61 cfs @ 12.18 hrs, Volume= 0.431 af
Outflow = 3.02 cfs @ 12.36 hrs, Volume= 0.428 af, Atten= 35%, Lag= 10.5 min
Primary = 3.02 cfs @ 12.36 hrs, Volume= 0.428 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 36.69' @ 12.36 hrs Surf.Area= 1,953 sf Storage= 3,820 cf

Plug-Flow detention time= 29.0 min calculated for 0.427 af (99% of inflow)
Center-of-Mass det. time= 24.2 min (823.7 - 799.4)

Volume	Invert	Avail.Storage	Storage Description
#1	34.00'	8,243 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

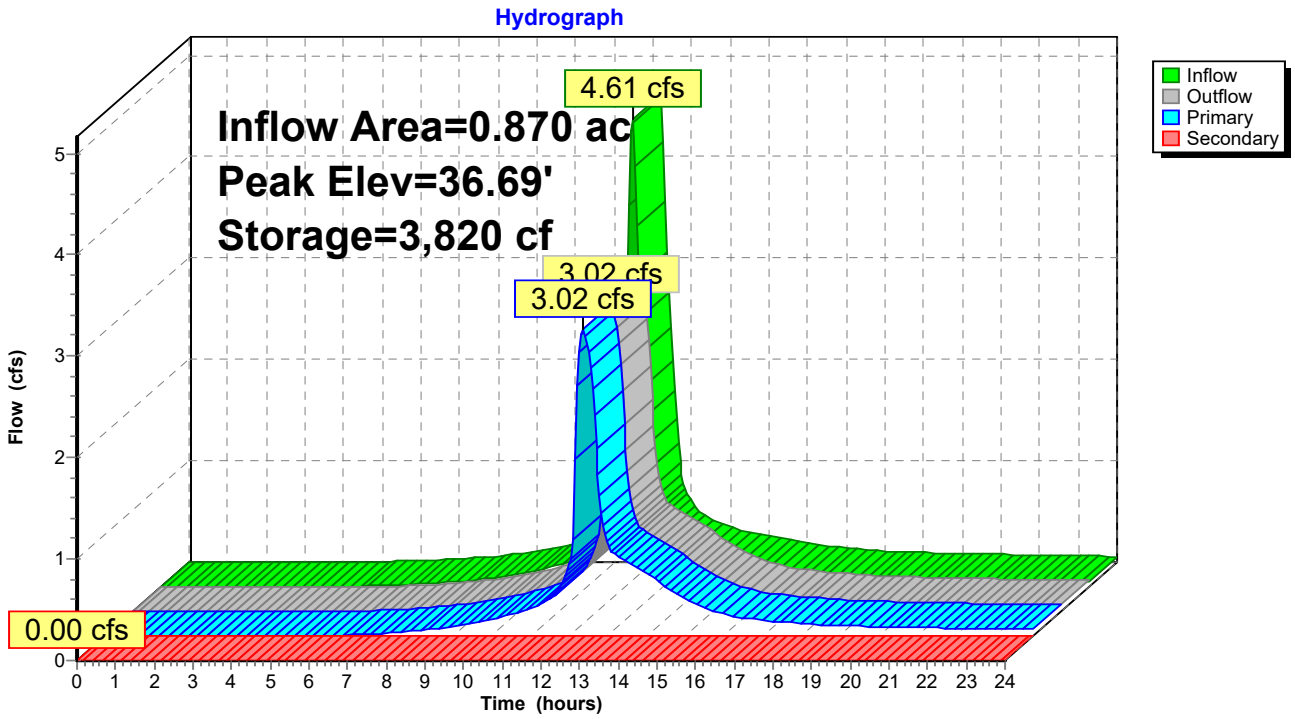
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.00	934	0	0
35.00	1,278	1,106	1,106
36.00	1,662	1,470	2,576
37.00	2,085	1,874	4,450
38.00	2,687	2,386	6,836
38.50	2,942	1,407	8,243

Device	Routing	Invert	Outlet Devices
#1	Primary	34.00'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.00' / 33.60' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	34.00'	**5.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	35.75'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	37.25'	**20.4" x 37.2" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	37.50'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=3.01 cfs @ 12.36 hrs HW=36.68' (Free Discharge)
└**1=Culvert** (Passes 3.01 cfs of 5.48 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.03 cfs @ 7.58 fps)
  ├**3=Orifice/Grate** (Orifice Controls 1.98 cfs @ 3.96 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=34.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: POND 1



Stage-Discharge for Pond 7P: POND 1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
34.00	0.00	0.00	0.00
34.05	0.01	0.01	0.00
34.10	0.03	0.03	0.00
34.15	0.06	0.06	0.00
34.20	0.10	0.10	0.00
34.25	0.15	0.15	0.00
34.30	0.20	0.20	0.00
34.35	0.25	0.25	0.00
34.40	0.29	0.29	0.00
34.45	0.32	0.32	0.00
34.50	0.35	0.35	0.00
34.55	0.38	0.38	0.00
34.60	0.41	0.41	0.00
34.65	0.44	0.44	0.00
34.70	0.46	0.46	0.00
34.75	0.48	0.48	0.00
34.80	0.51	0.51	0.00
34.85	0.53	0.53	0.00
34.90	0.55	0.55	0.00
34.95	0.57	0.57	0.00
35.00	0.58	0.58	0.00
35.05	0.60	0.60	0.00
35.10	0.62	0.62	0.00
35.15	0.64	0.64	0.00
35.20	0.65	0.65	0.00
35.25	0.67	0.67	0.00
35.30	0.69	0.69	0.00
35.35	0.70	0.70	0.00
35.40	0.72	0.72	0.00
35.45	0.73	0.73	0.00
35.50	0.75	0.75	0.00
35.55	0.76	0.76	0.00
35.60	0.77	0.77	0.00
35.65	0.79	0.79	0.00
35.70	0.80	0.80	0.00
35.75	0.82	0.82	0.00
35.80	0.86	0.86	0.00
35.85	0.94	0.94	0.00
35.90	1.04	1.04	0.00
35.95	1.15	1.15	0.00
36.00	1.28	1.28	0.00
36.05	1.42	1.42	0.00
36.10	1.57	1.57	0.00
36.15	1.73	1.73	0.00
36.20	1.90	1.90	0.00
36.25	2.07	2.07	0.00
36.30	2.22	2.22	0.00
36.35	2.35	2.35	0.00
36.40	2.47	2.47	0.00
36.45	2.58	2.58	0.00
36.50	2.68	2.68	0.00
36.55	2.77	2.77	0.00
36.60	2.87	2.87	0.00
36.65	2.95	2.95	0.00
36.70	3.04	3.04	0.00
36.75	3.12	3.12	0.00
36.80	3.20	3.20	0.00
36.85	3.28	3.28	0.00
36.90	3.35	3.35	0.00
36.95	3.43	3.43	0.00
37.00	3.50	3.50	0.00
37.05	3.57	3.57	0.00
37.10	3.64	3.64	0.00
37.15	3.70	3.70	0.00
37.20	3.77	3.77	0.00
37.25	3.83	3.83	0.00
37.30	4.25	4.25	0.00
37.35	4.95	4.95	0.00
37.40	5.84	5.84	0.00
37.45	6.41	6.41	0.00
37.50	6.47	6.47	0.00
37.55	6.79	6.52	0.26
37.60	7.33	6.58	0.75
37.65	8.01	6.63	1.38
37.70	8.80	6.68	2.12
37.75	9.74	6.74	3.01
37.80	10.80	6.79	4.01
37.85	11.97	6.84	5.12
37.90	13.25	6.90	6.35
37.95	14.67	6.95	7.72
38.00	16.21	7.00	9.21
38.05	17.87	7.05	10.82
38.10	19.65	7.10	12.55
38.15	21.28	7.15	14.12
38.20	22.96	7.20	15.75
38.25	24.69	7.25	17.44
38.30	26.48	7.30	19.18
38.35	28.35	7.35	21.00
38.40	30.28	7.40	22.88
38.45	32.26	7.45	24.82
38.50	**34.30**	**7.50**	**26.80**

Stage-Area-Storage for Pond 7P: POND 1

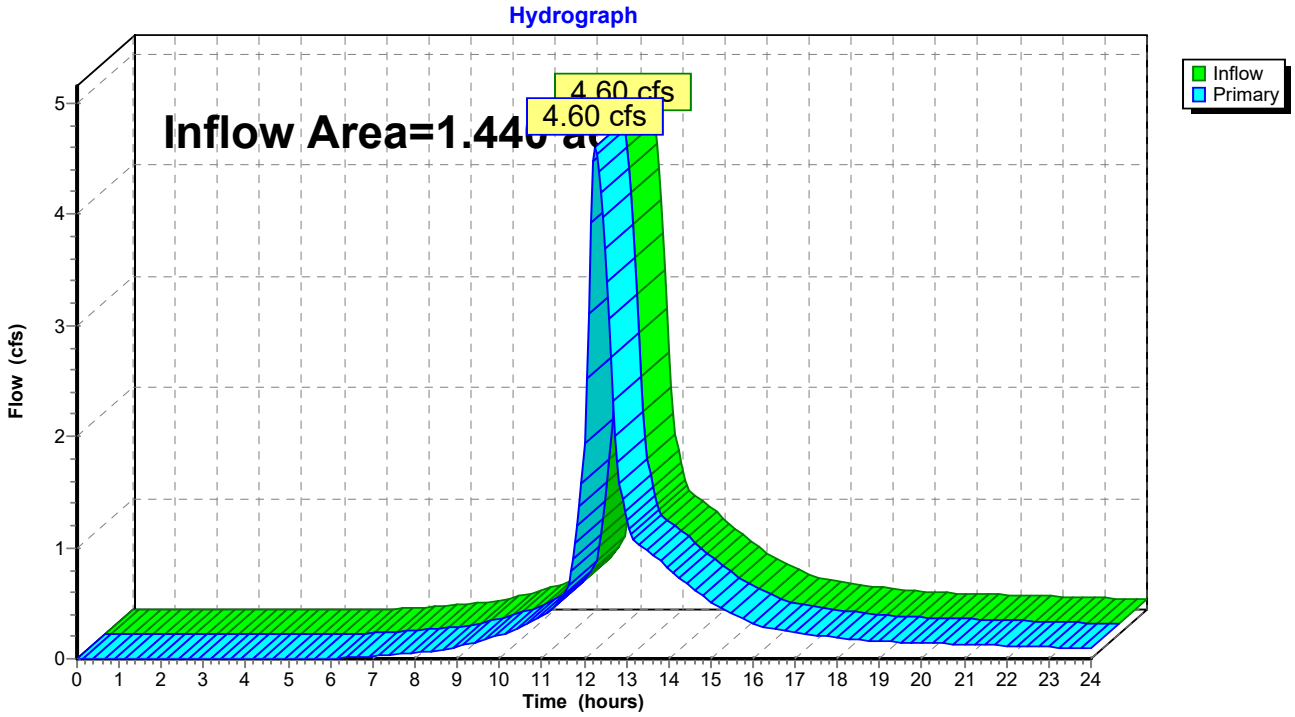
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.00	934	0
34.05	951	47
34.10	968	95
34.15	986	144
34.20	1,003	194
34.25	1,020	244
34.30	1,037	296
34.35	1,054	348
34.40	1,072	401
34.45	1,089	455
34.50	1,106	510
34.55	1,123	566
34.60	1,140	622
34.65	1,158	680
34.70	1,175	738
34.75	1,192	797
34.80	1,209	857
34.85	1,226	918
34.90	1,244	980
34.95	1,261	1,043
35.00	1,278	1,106
35.05	1,297	1,170
35.10	1,316	1,236
35.15	1,336	1,302
35.20	1,355	1,369
35.25	1,374	1,438
35.30	1,393	1,507
35.35	1,412	1,577
35.40	1,432	1,648
35.45	1,451	1,720
35.50	1,470	1,793
35.55	1,489	1,867
35.60	1,508	1,942
35.65	1,528	2,018
35.70	1,547	2,095
35.75	1,566	2,173
35.80	1,585	2,251
35.85	1,604	2,331
35.90	1,624	2,412
35.95	1,643	2,493
36.00	1,662	2,576
36.05	1,683	2,660
36.10	1,704	2,744
36.15	1,725	2,830
36.20	1,747	2,917
36.25	1,768	3,005
36.30	1,789	3,094
36.35	1,810	3,184
36.40	1,831	3,275
36.45	1,852	3,367
36.50	1,874	3,460
36.55	1,895	3,554
36.60	1,916	3,649
36.65	1,937	3,746
36.70	1,958	3,843
36.75	1,979	3,941
36.80	2,000	4,041
36.85	2,022	4,142
36.90	2,043	4,243
36.95	2,064	4,346
37.00	2,085	4,450
37.05	2,115	4,555
37.10	2,145	4,661
37.15	2,175	4,769
37.20	2,205	4,879
37.25	2,236	4,990
37.30	2,266	5,102
37.35	2,296	5,216
37.40	2,326	5,332
37.45	2,356	5,449
37.50	2,386	5,567
37.55	2,416	5,687
37.60	2,446	5,809
37.65	2,476	5,932
37.70	2,506	6,056
37.75	2,537	6,183
37.80	2,567	6,310
37.85	2,597	6,439
37.90	2,627	6,570
37.95	2,657	6,702
38.00	2,687	6,836
38.05	2,712	6,970
38.10	2,738	7,107
38.15	2,763	7,244
38.20	2,789	7,383
38.25	2,815	7,523
38.30	2,840	7,665
38.35	2,866	7,807
38.40	2,891	7,951
38.45	2,917	8,096
38.50	**2,942**	**8,243**

Summary for Link 8L: PDA-1 Total

Inflow Area = 1.440 ac, 42.36% Impervious, Inflow Depth > 5.26" for 100-yr event
Inflow = 4.60 cfs @ 12.26 hrs, Volume= 0.631 af
Primary = 4.60 cfs @ 12.26 hrs, Volume= 0.631 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: PDA-1 Total

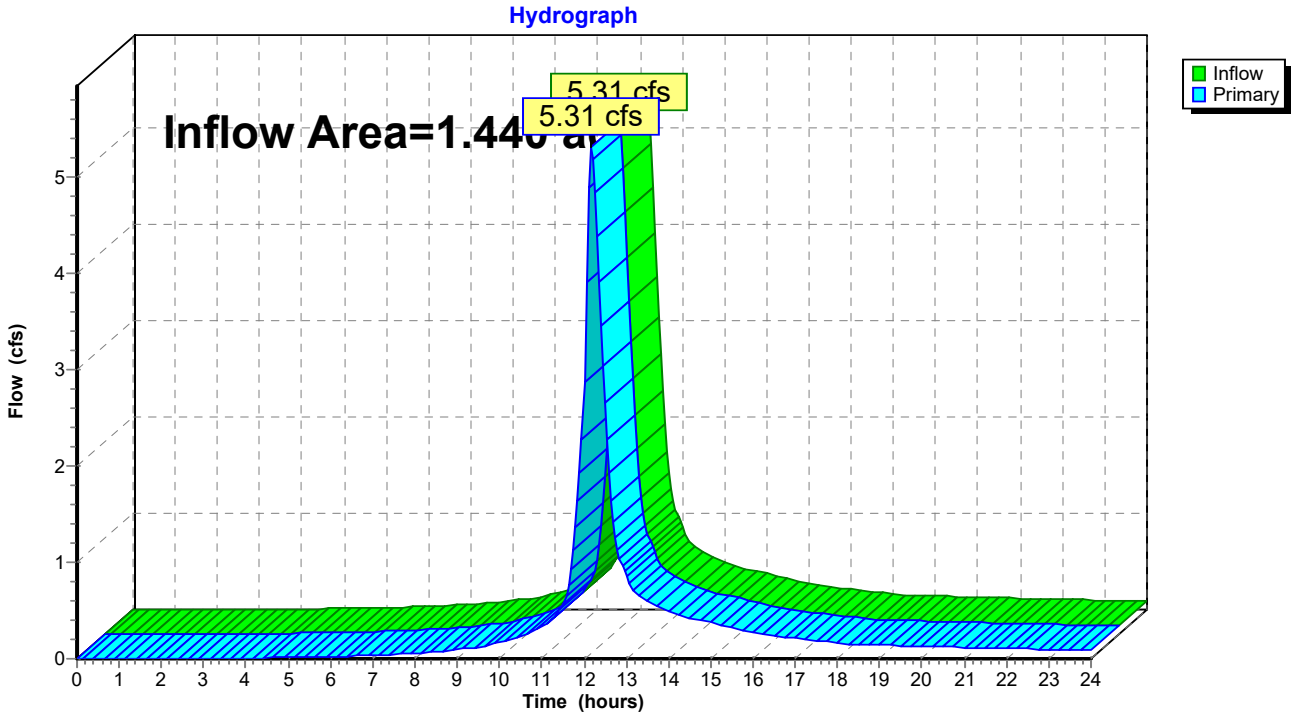


Summary for Link 9L: EDA-1 Total

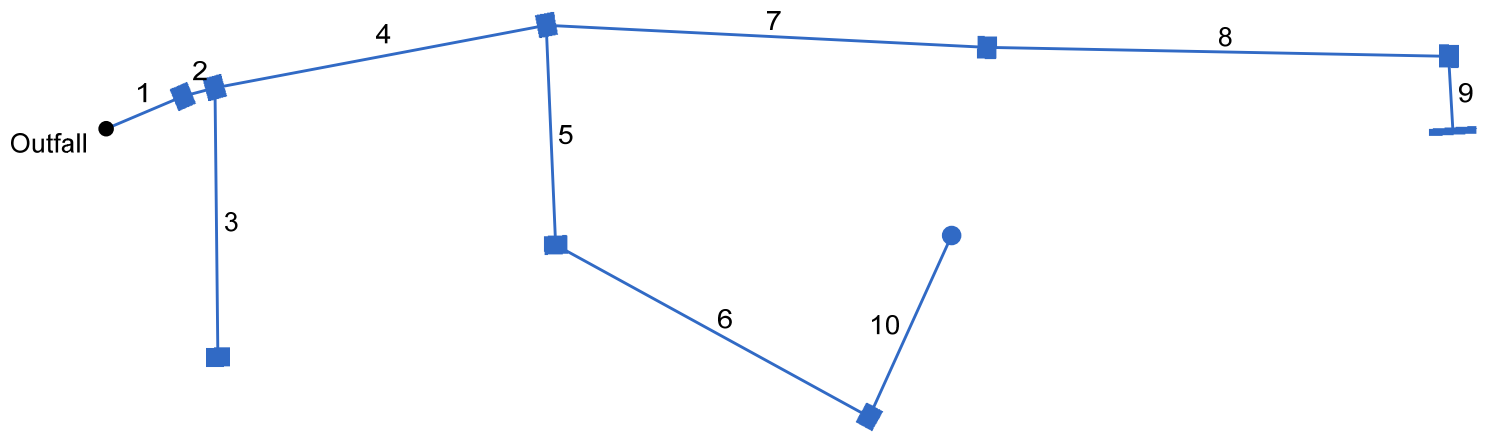
Inflow Area = 1.440 ac, 27.78% Impervious, Inflow Depth > 4.61" for 100-yr event
Inflow = 5.31 cfs @ 12.16 hrs, Volume= 0.554 af
Primary = 5.31 cfs @ 12.16 hrs, Volume= 0.554 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 9L: EDA-1 Total



230 Flanders Road



Project File: 230 Flanders Road.stm	Number of lines: 10	Date: 11/22/2022

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1		Manhole	39.50	Rect	4.33	5.33	15	Cir	35.40	12	Cir	35.50
2		Combination	39.00	Rect	4.33	5.33	12	Cir	35.58	12 12	Cir Cir	35.68 36.20
3		Combination	38.50	Rect	4.33	5.33	12	Cir	36.00			
4		Combination	44.50	Rect	4.33	5.33	12	Cir	40.77	12 12	Cir Cir	40.97 40.87
5		Combination	44.50	Rect	4.33	5.33	12	Cir	41.50	12	Cir	41.50
6		Combination	46.70	Rect	4.33	5.33	12	Cir	43.50	12	Cir	43.60
7		Combination	44.65	Rect	4.33	5.33	12	Cir	41.40	12	Cir	41.50
8		Combination	48.70	Rect	4.33	5.33	12	Cir	46.00	8	Cir	46.33
9		Grate	49.00	Rect	1.50	11.00	8	Cir	47.00			
10		Manhole	49.00	Cir	4.00	4.00	12	Cir	46.00			

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	20.000	0.00	0.77	0.00	0.00	0.61	0.0	10.7	6.1	3.71	9.89	3.75	15	2.00	35.00	35.40	36.29	36.20	36.25	39.50	
2	1	8.000	0.06	0.77	0.75	0.05	0.61	6.0	10.7	6.1	3.72	3.86	5.49	12	1.00	35.50	35.58	36.29	36.40	39.50	39.00	CB-8
3	2	65.000	0.17	0.17	0.74	0.13	0.13	6.0	6.0	8.1	1.01	2.71	2.25	12	0.49	35.68	36.00	36.40	36.46	39.00	38.50	CB-1
4	2	81.000	0.06	0.54	0.95	0.06	0.43	6.0	10.3	6.2	2.71	9.16	7.37	12	5.64	36.20	40.77	36.57	41.48	39.00	44.50	CB-7
5	4	53.000	0.07	0.29	0.86	0.06	0.25	6.0	7.8	7.2	1.76	3.86	4.14	12	1.00	40.97	41.50	41.48	42.06	44.50	44.50	CB-2
6	5	86.000	0.14	0.22	0.78	0.11	0.19	6.0	7.0	7.5	1.39	5.88	3.30	12	2.33	41.50	43.50	42.06	44.00	44.50	46.70	CB-3
7	4	106.000	0.08	0.19	0.80	0.06	0.13	6.0	9.0	6.7	0.89	2.73	2.43	12	0.50	40.87	41.40	41.48	41.79	44.50	44.65	CB-6
8	7	111.000	0.05	0.11	0.59	0.03	0.07	6.0	6.3	7.9	0.54	7.77	2.73	12	4.05	41.50	46.00	41.79	46.30	44.65	48.70	CB-5
9	8	18.000	0.06	0.06	0.65	0.04	0.04	6.0	6.0	8.1	0.31	2.52	3.71	8	3.72	46.33	47.00	46.49	47.26	48.70	49.00	CB-4
10	6	48.000	0.08	0.08	0.95	0.08	0.08	6.0	6.0	8.1	0.61	8.63	2.43	12	5.00	43.60	46.00	44.00	46.33	46.70	49.00	ROOF

230 Flanders Road | Number of lines: 10 | Run Date: 11/22/2022

NOTES:Intensity = 38.11 / (Inlet time + 3.60) ^ 0.69; Return period =Yrs. 25 ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
2		0.36	0.00	0.36	0.00	Comb	3.5	2.31	3.12	2.31	1.35	Sag	2.00	0.050	0.020	0.013	0.13	3.68	0.13	3.68	0.0	Off
3		1.01	0.00	1.01	0.00	Comb	3.5	2.31	3.12	2.31	1.35	Sag	2.00	0.050	0.020	0.013	0.22	7.79	0.22	7.79	0.0	Off
4		0.46	0.00	0.46	0.00	Comb	3.5	2.31	3.12	2.31	1.35	Sag	2.00	0.050	0.020	0.013	0.15	4.39	0.15	4.39	0.0	Off
5		0.49	0.00	0.49	0.00	Comb	3.5	2.31	3.12	2.31	1.35	Sag	2.00	0.050	0.020	0.013	0.15	4.58	0.15	4.58	0.0	Off
6		0.88	0.61	1.49	0.00	Comb	3.5	2.31	3.12	2.31	1.35	Sag	2.00	0.050	0.020	0.013	0.26	10.23	0.26	10.23	0.0	Off
7		0.52	0.00	0.52	0.00	Comb	3.5	2.31	3.12	2.31	1.35	Sag	2.00	0.050	0.020	0.013	0.16	4.79	0.16	4.79	0.0	Off
8		0.24	0.00	0.24	0.00	Comb	3.5	2.31	3.12	2.31	1.35	Sag	2.00	0.050	0.020	0.013	0.11	2.66	0.11	2.66	0.0	Off
9		0.31	0.00	0.31	0.00	Grate	0.0	0.00	86.00	8.33	10.33	Sag	2.00	0.050	0.020	0.013	0.05	0.94	0.05	0.94	0.0	Off
10		0.61	0.00	0.00	0.61	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	6

230 Flanders Road | Number of lines: 10 | Run Date: 11/22/2022

NOTES: Inlet N-Values = 0.016; Intensity = 38.11 / (Inlet time + 3.60) ^ 0.69; Return period = 25 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)		Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)		
(1)	(in) (2)	(cfs) (3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(ft) (12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(K) (23)	(ft) (24)
1	15	3.71	35.00	36.29	1.25	1.23	3.03	0.14	36.43	0.282	20.000	35.40	36.20	0.80	0.83	4.46	0.31	36.51	0.511	0.397	0.079	0.17	0.05
2	12	3.72	35.50	36.29	0.79*	0.66	5.60	0.45	36.74	0.000	8.000	35.58	36.40	0.82**	0.69	5.39	0.45	36.85	0.000	0.000	n/a	1.54	0.70
3	12	1.01	35.68	36.40	0.72	0.61	1.67	0.04	36.44	0.091	65.000	36.00	36.46	0.46	0.36	2.84	0.13	36.59	0.355	0.223	0.145	1.00	0.13
4	12	2.71	36.20	36.57	0.37*	0.27	10.16	0.33	36.90	0.000	81.000	40.77	41.48	0.71**	0.59	4.58	0.33	41.80	0.000	0.000	n/a	1.50	n/a
5	12	1.76	40.97	41.48	0.51	0.40	4.42	0.23	41.71	0.000	53.000	41.50	42.06	0.56**	0.46	3.86	0.23	42.29	0.000	0.000	n/a	1.32	0.31
6	12	1.39	41.50	42.06	0.56	0.39	3.05	0.20	42.26	0.000	86.000	43.50	44.00 j	0.50**	0.39	3.56	0.20	44.20	0.000	0.000	n/a	1.50	n/a
7	12	0.89	40.87	41.48	0.61	0.29	1.78	0.15	41.62	0.000	106.000	41.40	41.79	0.39**	0.29	3.08	0.15	41.94	0.000	0.000	n/a	0.50	n/a
8	12	0.54	41.50	41.79	0.29	0.19	2.80	0.11	41.90	0.000	111.000	46.00	46.30	0.30**	0.20	2.66	0.11	46.42	0.000	0.000	n/a	1.50	n/a
9	8	0.31	46.33	46.49	0.16*	0.06	4.92	0.10	46.59	0.000	18.000	47.00	47.26	0.26**	0.13	2.50	0.10	47.36	0.000	0.000	n/a	1.00	n/a
10	12	0.61	43.60	44.00	0.40	0.22	2.10	0.12	44.12	0.000	48.000	46.00	46.33 j	0.33**	0.22	2.76	0.12	46.44	0.000	0.000	n/a	1.00	n/a

230 Flanders Road | Number of lines: 10 | Run Date: 11/22/2022

Notes: * depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraflow HGL Computation Procedure

General Procedure:

Hydraflow computes the HGL using the Bernoulli energy equation. Manning's equation is used to determine energy losses due to pipe friction. In a standard step, iterative procedure, Hydraflow assumes upstream HGLs until the energy equation balances. If the energy equation cannot balance, supercritical flow exists and critical depth is temporarily assumed at the upstream end. A supercritical flow Profile is then computed using the same procedure in a downstream direction using momentum principles.

Col. 1 The line number being computed. Calculations begin at Line 1 and proceed upstream.

Col. 2 The line size. In the case of non-circular pipes, the line rise is printed above the span.

Col. 3 Total flow rate in the line.

Col. 4 The elevation of the downstream invert.

Col. 5 Elevation of the hydraulic grade line at the downstream end. This is computed as the upstream HGL + Minor loss of this line's downstream line.

Col. 6 The downstream depth of flow inside the pipe (HGL - Invert elevation) but not greater than the line size.

Col. 7 Cross-sectional area of the flow at the downstream end.

Col. 8 The velocity of the flow at the downstream end, (Col. 3 / Col. 7).

Col. 9 Velocity head (Velocity squared / 2g).

Col. 10 The elevation of the energy grade line at the downstream end, HGL + Velocity head, (Col. 5 + Col. 9).

Col. 11 The friction slope at the downstream end (the S or Slope term in Manning's equation).

Col. 12 The line length.

Col. 13 The elevation of the upstream invert.

Col. 14 Elevation of the hydraulic grade line at the upstream end.

Col. 15 The upstream depth of flow inside the pipe (HGL - Invert elevation) but not greater than the line size.

Col. 16 Cross-sectional area of the flow at the upstream end.

Col. 17 The velocity of the flow at the upstream end, (Col. 3 / Col. 16).

Col. 18 Velocity head (Velocity squared / 2g).

Col. 19 The elevation of the energy grade line at the upstream end, HGL + Velocity head, (Col. 14 + Col. 18) .

Col. 20 The friction slope at the upstream end (the S or Slope term in Manning's equation).

Col. 21 The average of the downstream and upstream friction slopes.

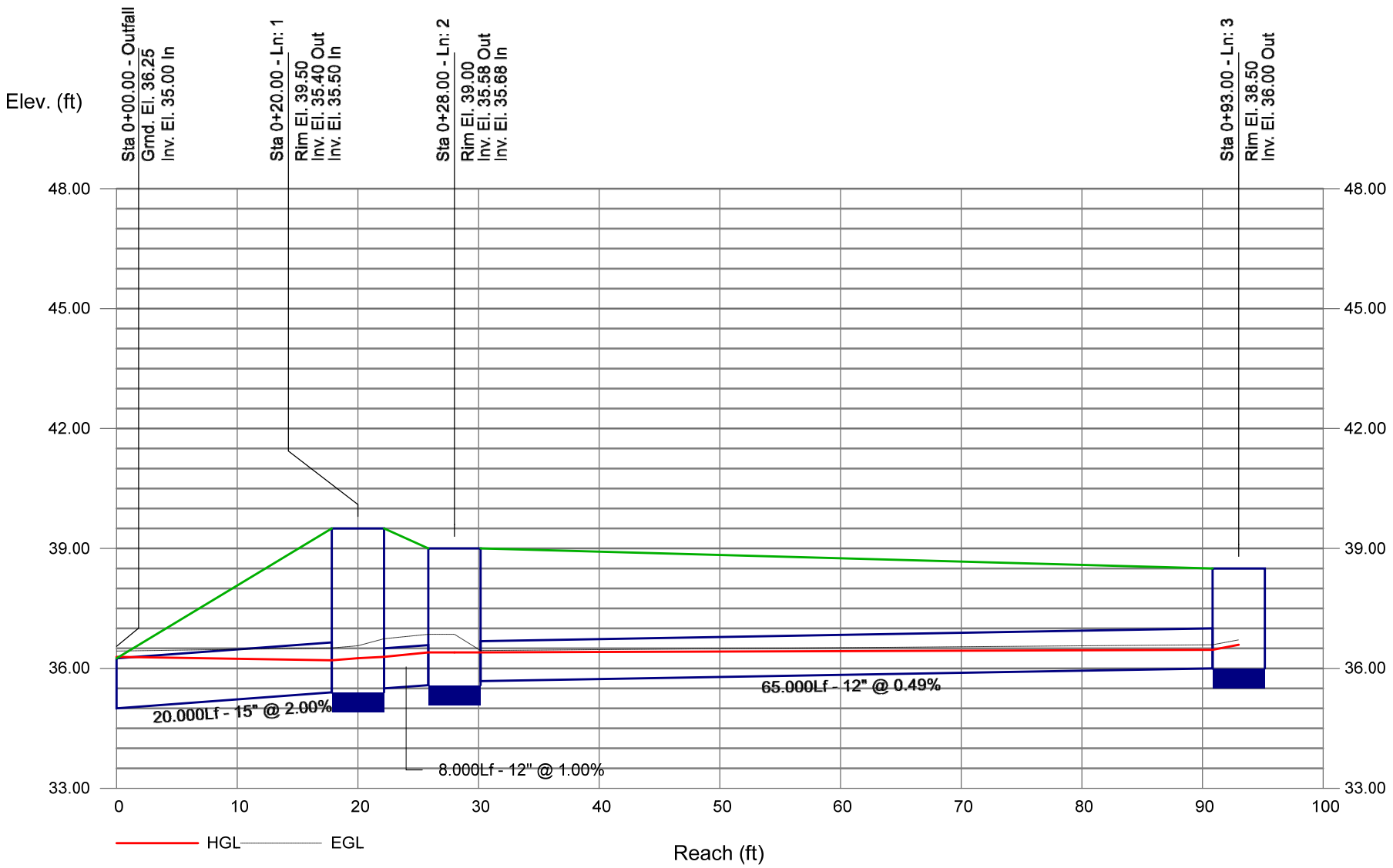
Col. 22 Energy loss. Average Sf/100 x Line Length (Col. 21/100 x Col. 12). Equals (EGL upstream - EGL downstream) +/- tolerance.

Col. 23 The junction loss coefficient (K).

Col. 24 Minor loss. (Col. 23 x Col. 18). Is added to upstream HGL and used as the starting HGL for the next upstream line(s).

Storm Sewer Profile

Proj. file: 230 Flanders Road.stm



Storm Sewer Profile

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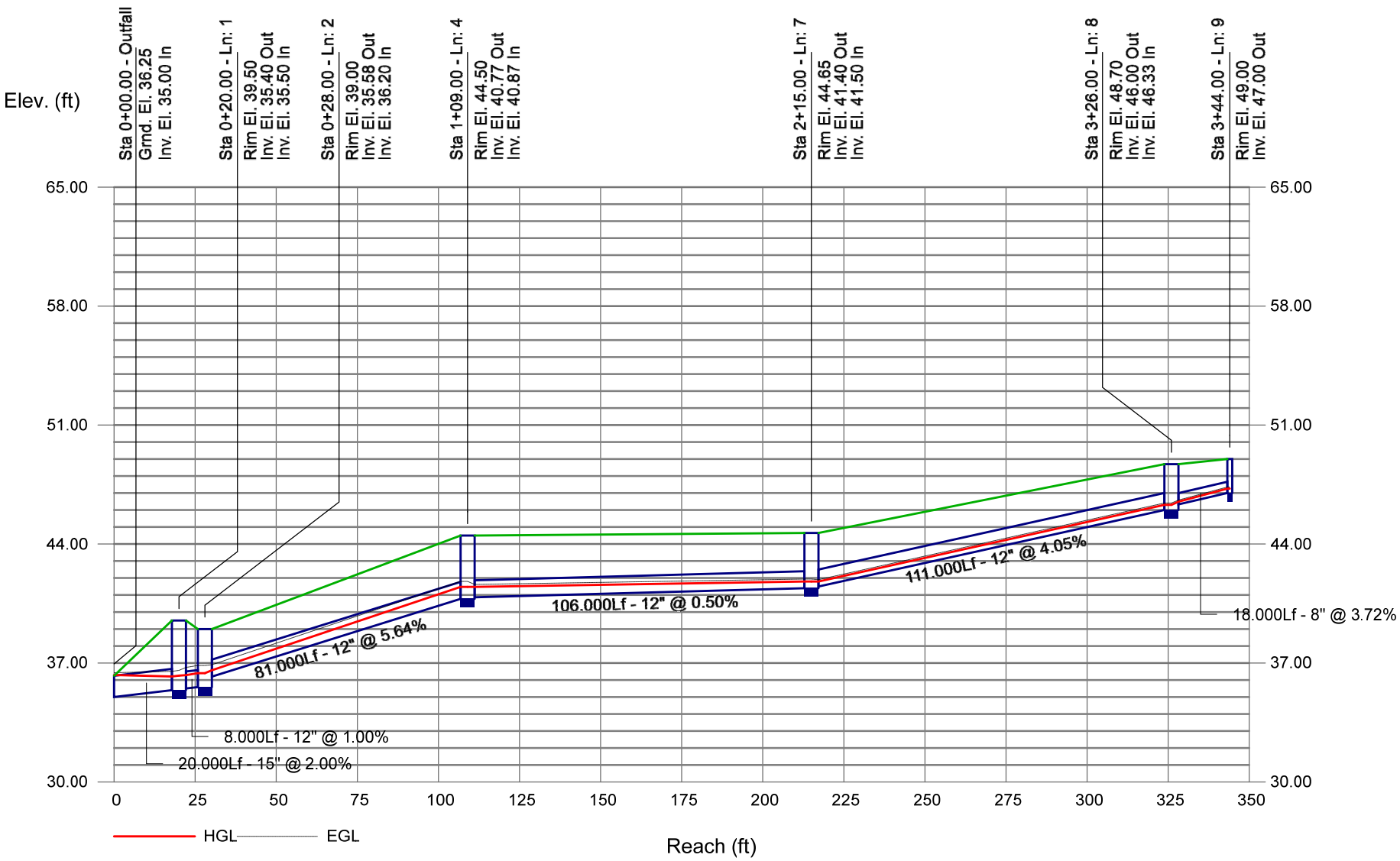
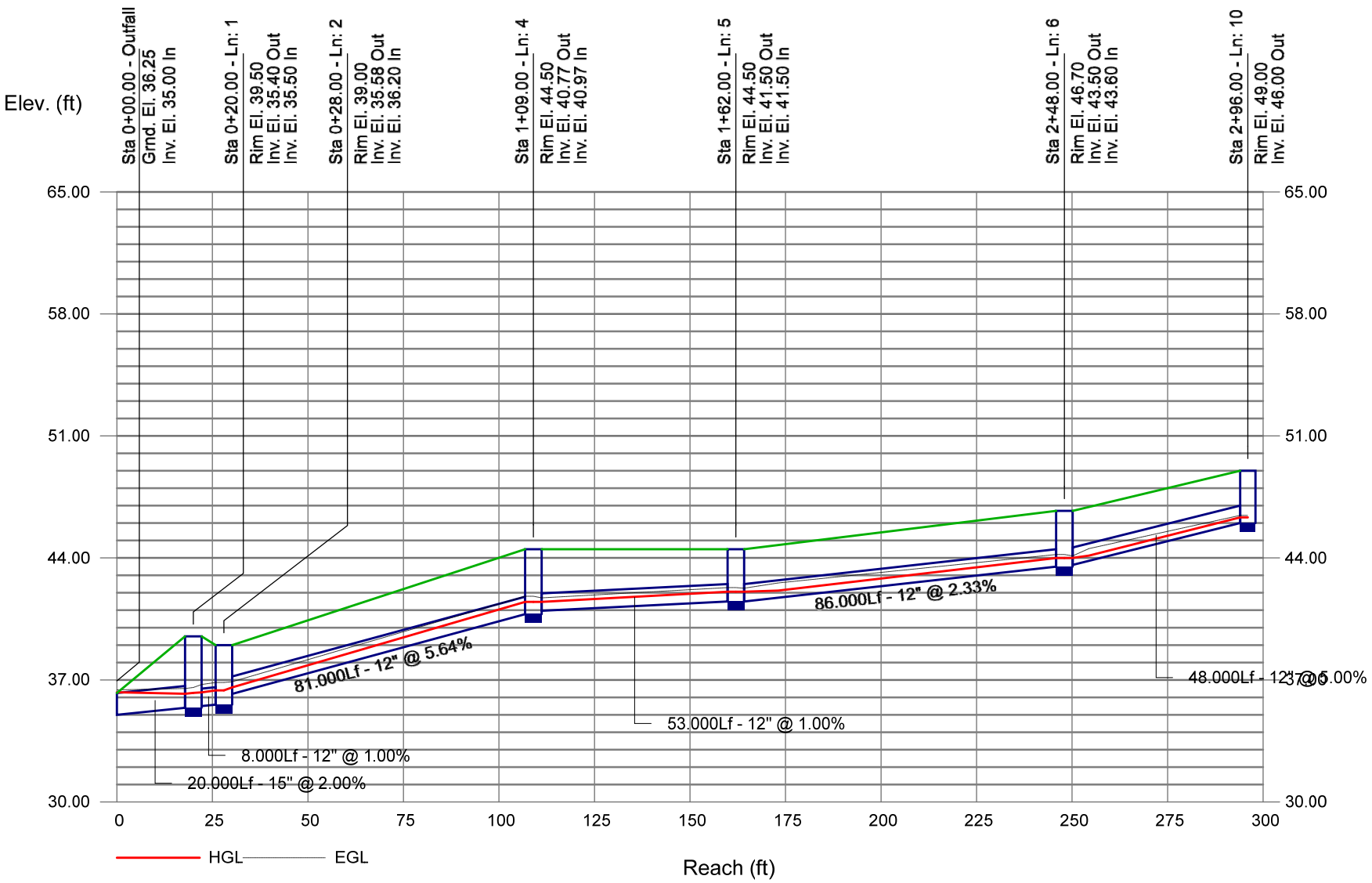


Storm Sewer Profile

Proj. file: 230 Flanders Road.stm



WATER QUALITY VOLUME (WQV) COMPUTATIONS FOR HYD-1

Project: Proposed Redevelopment
Location: 230 Flanders Road, East Lyme, CT
Date: 11/29/22

Water Quality Volume Calculations:

$$WQV = \frac{(1/2")(R)(A)}{12}$$

Where:
WQV = water quality volume (ac-ft)
R = volumentric runoff coefficient = 0.05+0.009(I)
I = percent impervious cover (see below)
A = site area in acres

$$I = \frac{A_{IMP}}{A_{TOT}} \times 100$$

Where:
I = percent impervious cover
A_{IMP} = area of impervious cover
A_{TOT} = total area of watershed

Watershed Description:	HYD-1		
Area of impervious coverage, A_{IMP}	0.54	Acres	
Total area of watershed, A_{TOT}	0.77	Acres	
Percent impverious cover, I	70.13	%	
Volumentric runoff coefficient, R	0.68		
Water Quality Volume, WQV	0.022	ac-ft	952 cf

Water Quality Flow Calculations:

WQf = (qu)(A)(Q)
WQf = Peak Discharge for water quality event (cfs)
qu = unit peak discharge (cfs/mi^2 /in)
A = drainage area (square miles)
Q = runoff volume (WQv/A) (watershed inches)

CN = 1000 /[10 + 5*P +10*Q - 10*(Q^2 +1.25*Q*P)$^{1/2}$] — *Chapter 7 of 2004 Connecticut Stormwater Quality Manual*

P=	1	inches
Q=	0.341	inches
WQv =	0.022	acre-ft
Total Drainage Area =	0.77	acre
CN =	86.00	

Ia = 200/CN -2

Ia = 0.326

Compute Ia/P

P=	1	inches
Ia / P =	0.33	

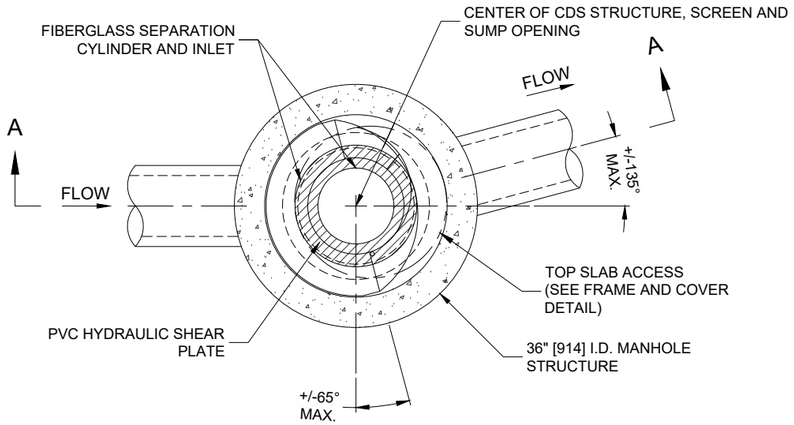
Tc= 13.6 min
0.227 hr

Exhibit 4-III

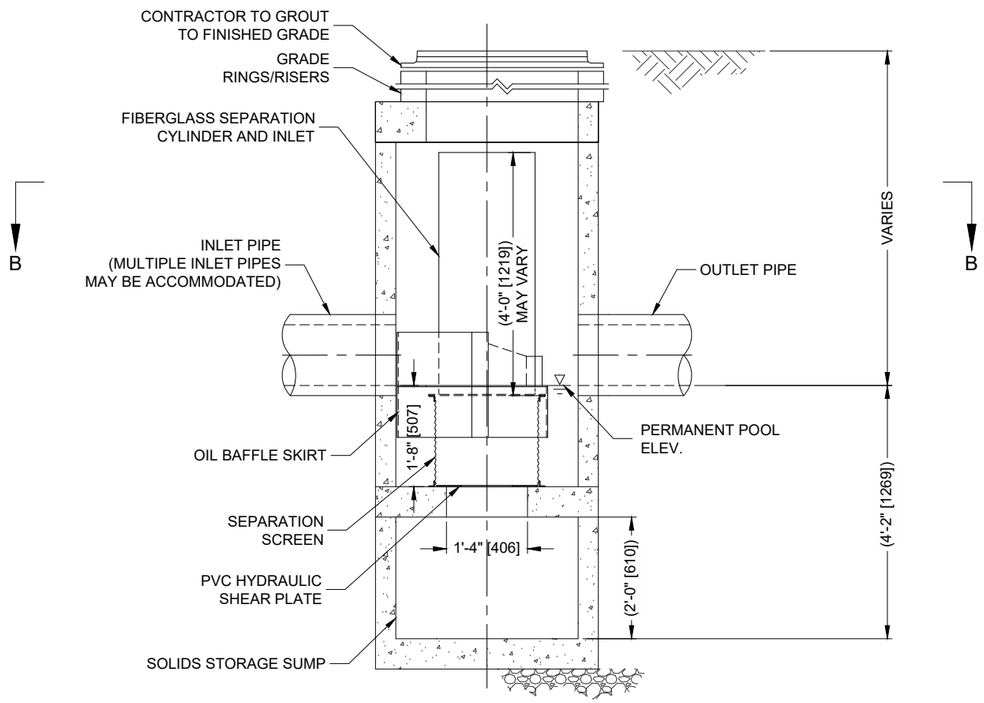
Tc=	0.227
Ia / P =	0.33
q_u =	450

WQf = (qu)(A)(Q)

qu =	450	csm/in
A =	0.001	mi^2 (acre/640)
Q =	0.341	inches
WQf =	0.18	cfs



PLAN VIEW B-B
N.T.S.

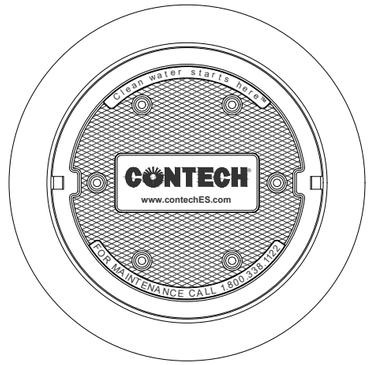


ELEVATION A-A
N.T.S.

CDS1515-3-C DESIGN NOTES

CDS1515-3-C RATED TREATMENT CAPACITY IS 1.0 CFS, OR PER LOCAL REGULATIONS.

THE STANDARD CDS1515-3-C CONFIGURATION IS SHOWN.



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS OR L/s)	*
PEAK FLOW RATE (CFS OR L/s)	*
RETURN PERIOD OF PEAK FLOW (YRS)	*
SCREEN APERTURE (2400 OR 4700)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO..
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS1515-3-C
ONLINE CDS
STANDARD DETAIL

Appendix D – Detailed Design Plans

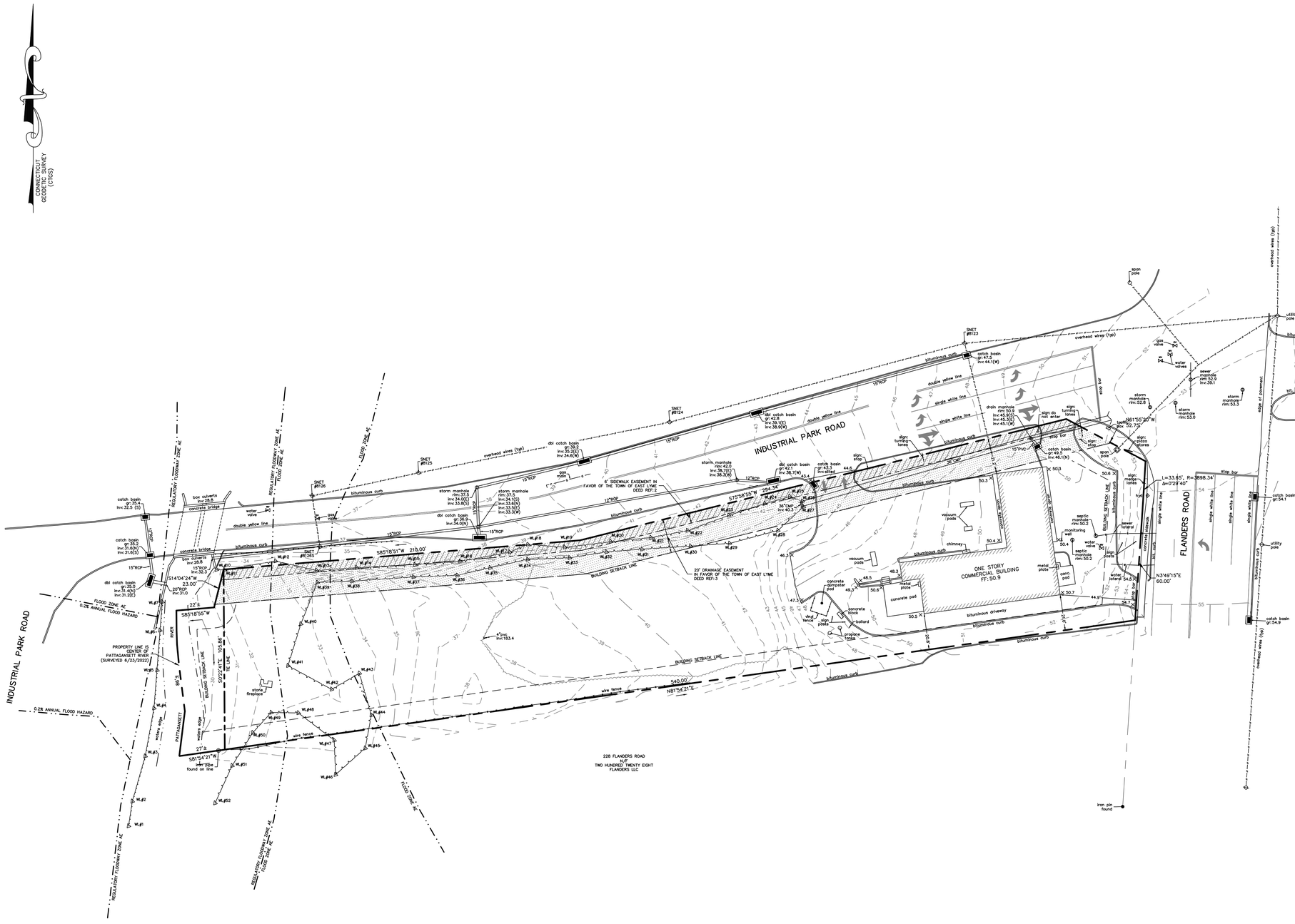
Property Survey of 230 Flanders Road, East Lyme, Connecticut

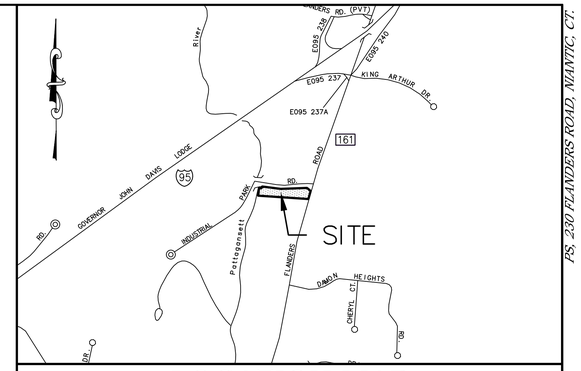
Prepared by Accurate Land Surveying, LLC.

Drainage Area Map (DA-1)

Subcatchment Drainage Area Map (DA-CB)

For more information regarding the Design Plans refer to the Permitting Plan Set, prepared by Solli Engineering, submitted in conjunction with this Report.





LOCATION MAP
SCALE: 1"=800'

GENERAL SURVEY NOTES

1. THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH THE REGULATION OF CONNECTICUT STATE AGENCIES, SECTION 20–300b–1 THROUGH 20–300b–20, EFFECTIVE OCTOBER 26, 2018, AND THE "MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC.
2. THE BOUNDARY DETERMINATION SHOWN HEREON IS CONSIDERED A RESURVEY.
3. THE SURVEY CONFORMS TO HORIZONTAL CLASS A–2 ACCURACY STANDARDS. VERTICAL DATA CONFORMS TO CLASS V–2 STANDARDS. TOPOGRAPHIC DATA CONFORMS TO CLASS T–2 STANDARDS. CONTOURS AND ELEVATIONS REFER TO NAVD 88 DATUM.
4. BEARING, COORDINATES AND ELEVATIONS ARE DERIVED FROM THE CONNECTICUT GEODETIC SURVEY (CTGS) VIA GPS TECHNOLOGY AND CONVENTIONAL SURVEY METHODS.
5. THIS IS A PROPERTY SURVEY. THE PURPOSE OF WHICH IS TO SHOW EXISTING CONDITIONS.
6. PROPERTY IS ALSO KNOWN AS TOWN OF EAST LYME ON ASSESSORS MAP 26.1 BLOCK 27.
7. TOTAL AREA: = 58,884.5 SQ.FT. OR 1.351 ACRES
8. PROPERTY LIES IN ZONING DISTRICT "CA".
9. A PORTION OF THE PARCEL LIES WITHIN FLOOD ZONE AE AND THE REGULATORY FLOODWAY ZONE AE AS SHOWN ON FEMA FIRM MAP 09011C0477J, EFFECTIVE DATE AUGUST 5, 2013.
10. WETLANDS DELINEATED BY WILLIAM KENNY ASSOCIATES ON MAY 27, 2022. FLAGS WERE LOCATED VIA CONVENTIONAL SURVEY METHODS.
11. THE LOCATION OF UNDERGROUND UTILITIES SHOULD BE CONSIDERED APPROXIMATE AND OTHER THAN DEPICTED HEREON, IF ANY, IS UNKNOWN.

MAP REFERENCES

1. PLAN ENTITLED "CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS RIGHT OF WAY MAP TOWN OF EAST LYME FLANDERS ROAD FROM SOCIETY ROAD NORTHERLY TO THE CONNECTICUT TURNPIKE", NUMBER 44–11 SHEET 3 OF 4 SCALE 1"=40'. DATED: JULY 31, 1970.
2. PLAN ENTITLED "SITE PLAN FOR COLONIAL CAR WASH INC. 230 FLANDERS ROAD EAST LYME, CONNECTICUT", SCALE 1"=20'. DATED: DECEMBER 1, 1993. BY D.W. GERWICK ENGINEERING. ON FILE IN THE TOWN OF EAST LYME CLERK'S OFFICE.
3. PLAN ENTITLED "BOUNDARY SURVEY OF LAND OF GLENN A. JETTE & HERBERT J. NYBERG 230 FLANDERS ROAD EAST LYME, CONNECTICUT", SCALE 1"=20'. DATED: JULY 27, 1994. BY FINN SURVEY. ON FILE IN THE TOWN OF EAST LYME CLERK'S OFFICE.
4. PLAN ENTITLED "PROPERTY SURVEY MAP PREPARED FOR DONALD J. SHERMAN 218 & 222 FLANDERS ROAD – CT ROUTE 161 EAST LYME, CONNECTICUT", SCALE 1"=40'. DATED: AUGUST 9, 2004. BY KENNY ASSOCIATES, INC. ON FILE IN THE TOWN OF EAST LYME CLERK'S OFFICE IN DRAWER 6 PAGE 183.
5. PLAN ENTITLED "ALTA/NSPS LAND TITLE SURVEY PREPARED FOR COLONIAL CAR WASH", SCALE 1"=20'. DATED: DECEMBER 16, 2019. BY N/V/S.

DEED REFERENCES

1. DEED VOLUME 300 PAGE 426, ON FILE IN THE TOWN OF EAST LYME CLERK'S OFFICE.
2. DEED VOLUME 378 PAGE 83, ON FILE IN THE TOWN OF EAST LYME CLERK'S OFFICE.
3. DEED VOLUME 378 PAGE 85, ON FILE IN THE TOWN OF EAST LYME CLERK'S OFFICE.
4. DEED VOLUME 814 PAGE 693, ON FILE IN THE TOWN OF EAST LYME CLERK'S OFFICE.

LEGEND

⊡ C.H.D.	Conn. Hwy. Dept. Monument	GG WV	Gas gate valve
⊡ Mon.	Monument	WG WV	Water gate valve
●	Iron Pin to be Set	WM	Water meter
■	Conc. Monument to be Set	hyd	Hydrant
◉ I. Pipe	Iron Pipe	W	Water main (existing)
●	Iron Pin	WS	Water service lateral
⊗ D.H.	Drill Hole	G	Gas Main (existing)
	Pile of Stones	SS	Sanitary Sewer Main (existing)
	Light Post	E	Electrical Line (existing)
Fnd.	Found	S	Sanitary Manhole
N/F	Now or Formerly	D	Drain Manhole
	Property Line		Chain Link or Split Rail Fence
	Property Line (adjoining)		Metal/Wire Fence
	Building Setback Line		Wooden or Vinyl Fence
	Easement Line		Utility Pole
	Edge of water	INV:	Invert Elevation of Pipe
	FEMA Flood Zone		Existing Catch Basin/Pipe
BFE:	Base Flood Elevation		Building (existing)
×200.0	Existing Spot Elevation		

	Evergreen Tree	123	Existing Contours
	Deciduous Tree	R.C.P.	Reinforced Concrete Pipe
	Swamp or Wetlands	C.M.P.	Corrugated Metal Pipe
	Tree Line	O PT A	Percolation Test Location
	Watercourse	TP 100	Deep Test Pit Location
	Retaining Wall		Stone Retaining Wall
	Stone Wall		Wetland Limit
WL	Wetland Flag Number		Wetland Setback
	Benchmark		Well (Existing)
O F.P.	Fence Post		

SITE STATISTICS
COMMERCIAL BUILDING

ZONING DISTRICT "CA"	REQUIRED	PROVIDED
BULK STATISTICS		
MIN. LOT AREA	0.172 ACRES (7,500 S.F.)	1.351 ACRES (58,884.5 S.F.)
MIN. LOT FRONTAGE	80'	650.74'
MIN. BUILDING SETBACK (STREET)	20'	21.1'
MIN. BUILDING SETBACK (SIDE)	12'	20.8'
MIN. BUILDING SETBACK (REAR)	12'	>12'
MAX. HEIGHT	30'	<30'
MAX. BUILDING COVERAGE	35% = 20,609.5 S.F.	BUILDING: 3,862.2 S.F. FIREPLACE: 20.4 S.F. VACUUM PADS -54.3 S.F. TOTAL: 3,936.9 S.F. (6.6%)

No.	Date	REVISION DESCRIPTION
1.	9/14/2022	ADDED DRAINAGE INVERTS

SCALE: 1"=30'
0 15 30 60 90

ACCURATE LAND SURVEYING, LLC
15 RESEARCH DRIVE, WOODBRIDGE, CT 06525, TEL: 203.881.8145
501 MAIN STREET, MONROE, CT 06468, TEL: 203.880.5455

PROPERTY SURVEY

OF

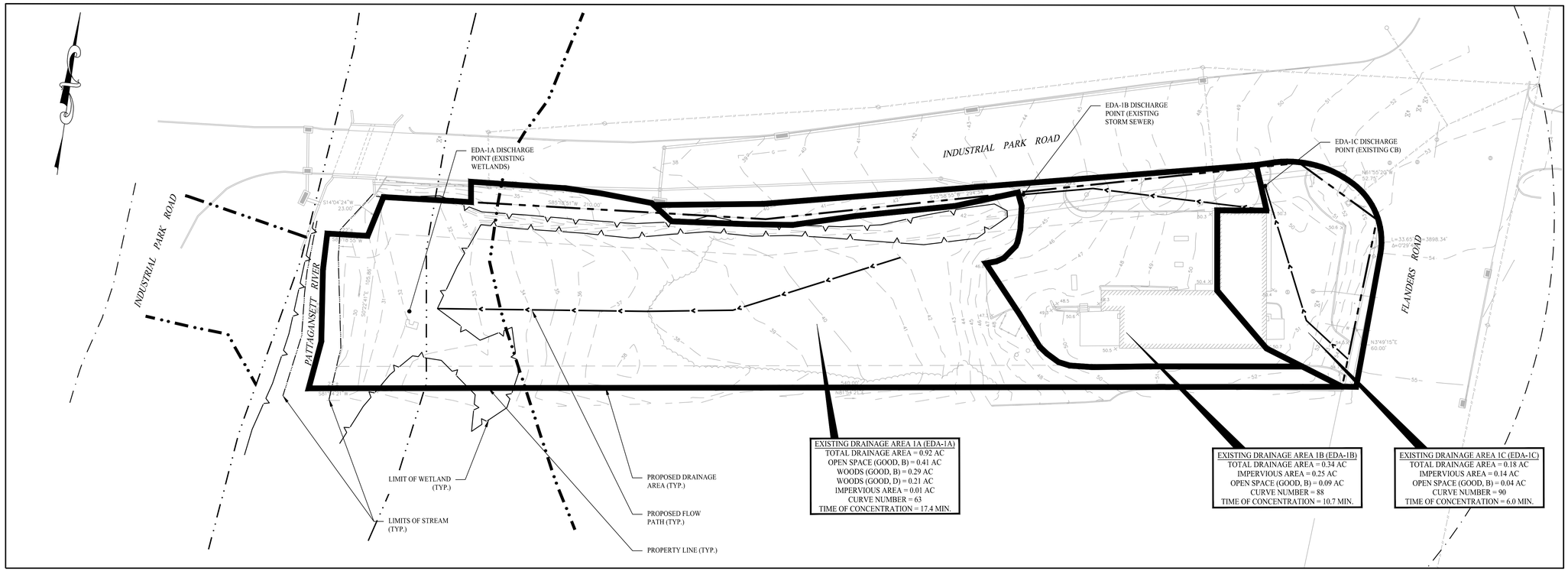
230 FLANDERS ROAD
NIANTIC, CONNECTICUT

PREPARED FOR
NOBLE ENERGY REAL ESTATE HOLDINGS, LLC
131 BUCKINGHAM STREET, SUITE 301
HARTFORD, CT 06106

TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

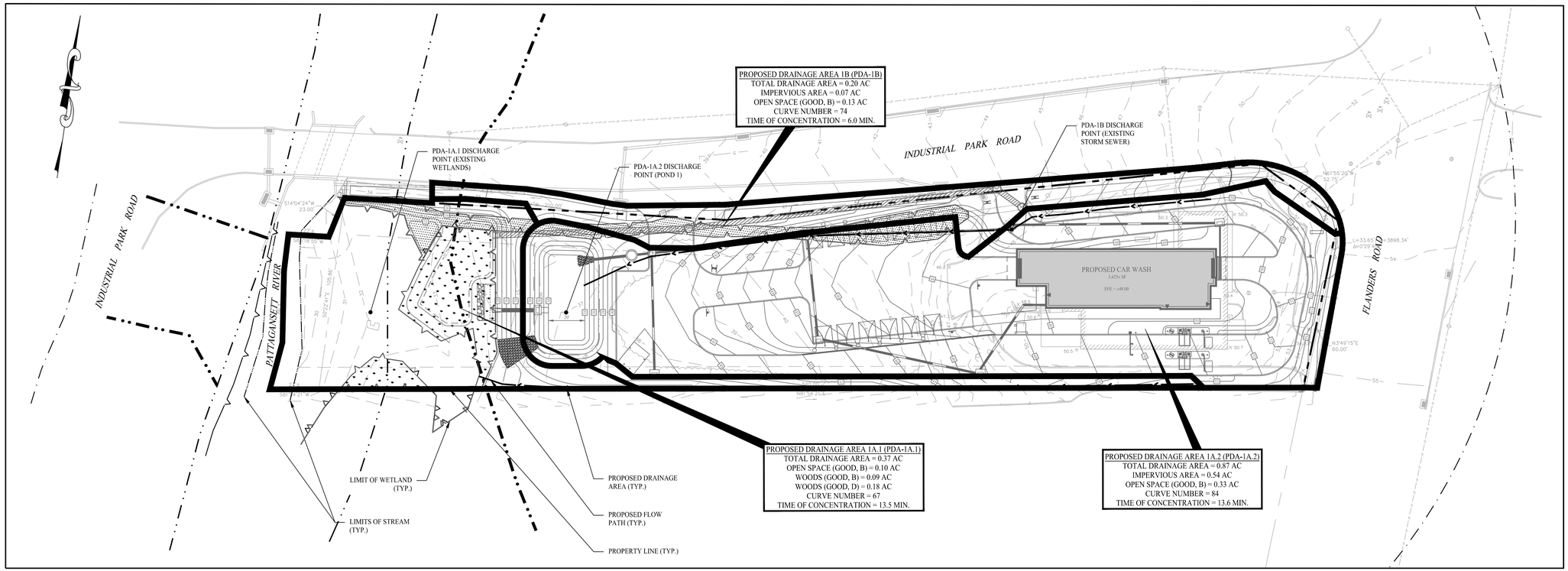
BRYAN P. NESTERIAK, PE, LS 23556

Date 7/6/2022
Scale 1"=30'
Job No. 1232
Drawing No. 1 of 1



EXISTING DRAINAGE AREA MAP

SCALE: 1" = 30'



PROPOSED DRAINAGE AREA MAP

SCALE: 1" = 30'

GENERAL NOTES

1. THE STORMWATER MANAGEMENT PLAN AND DESIGN IS INTENDED TO BE IN COMPLIANCE WITH THE 2000 CONNECTICUT DEPARTMENT OF TRANSPORTATION (CTDOT) DRAINAGE MANUAL AND THE 2004 CONNECTICUT STORMWATER QUALITY MANUAL.
2. STORMWATER RUNOFF ANALYSIS WAS CALCULATED USING THE SCS TR-55 METHODOLOGY.

LEGEND

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJOINING LOT LINE
- LIMIT OF DRAINAGE AREA
- FLOW PATH

Rev. #:	Date	Description

Graphic Scale: 30 0 30 60

SOLLI ENGINEERING
501 Main Street, Monroe, CT 06468 T: (203) 880-5455 F: (203) 880-9695
11 Vanderbilt Ave, Norwood, MA 02062 T: (781) 352-8491 F: (203) 880-9695

Drawn By:	JEP
Checked By:	CJB
Approved By:	KMS
Project #:	22105001
Plan Date:	11/29/22
Scale:	1" = 30'

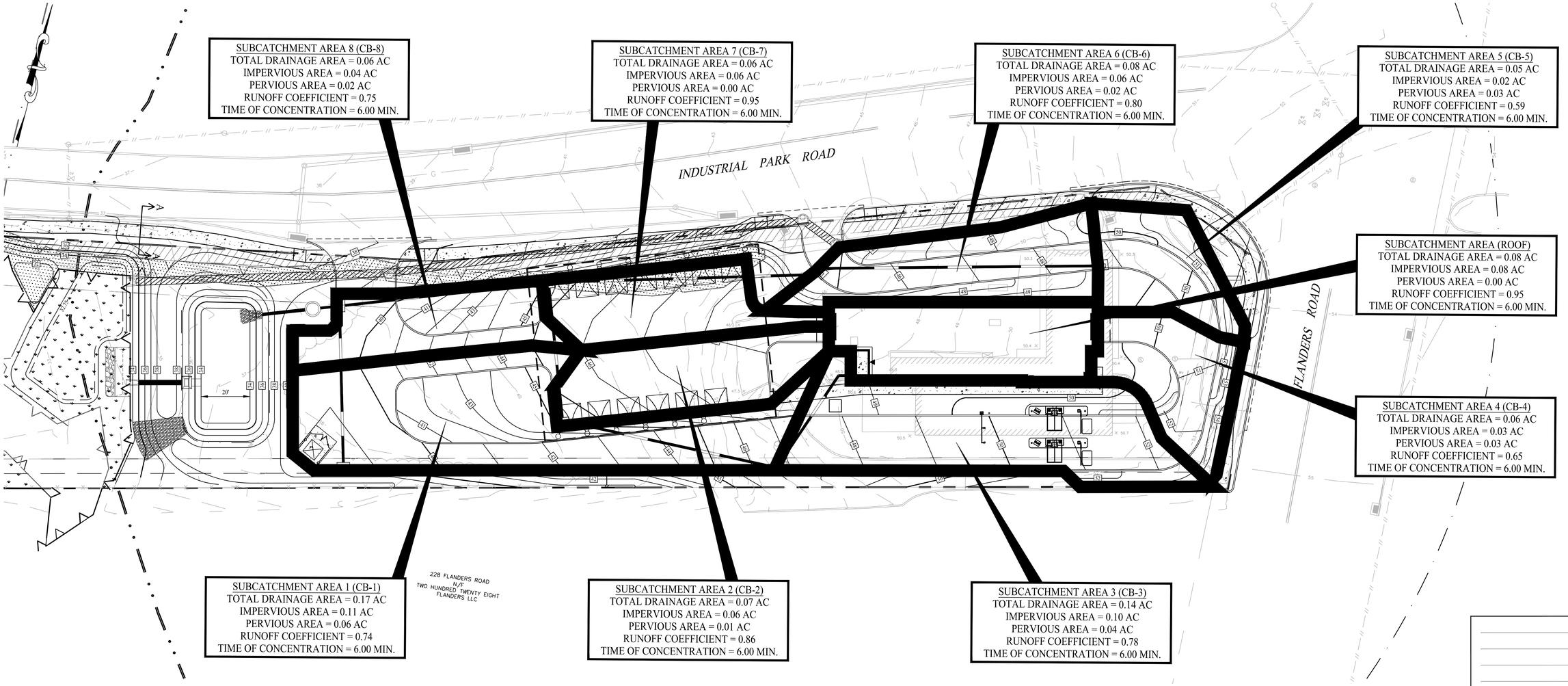
Kevin Solli, P.E.
CT 25759

Project:

PROPOSED SOAPY NOBLE EXPRESS CAR WASH

230 FLANDERS ROAD
EAST LYME, CONNECTICUT

Sheet Title:	Sheet #:
DRAINAGE AREA MAP	DA-1



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LEGEND

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJOINING LOT LINE
- LIMIT OF DRAINAGE AREA
- FLOW PATH

Rev. #:	Date	Description

Graphic Scale: 20 0 20 40

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Drawn By:	JEP
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Approved By:	KMS
Project #:	22105001
Plan Date:	11/29/22
Scale:	1" = 20'

Kevin Solli, P.E.
CT 25759

Project:

PROPOSED SOAPY NOBLE EXPRESS CAR WASH

230 FLANDERS ROAD
EAST LYME, CONNECTICUT

Sheet Title: SUBCATCHMENT DRAINAGE AREA MAP

Sheet #: DA-CB

Appendix E – Long-Term Operation & Maintenance

Operation & Maintenance Manual

LONG-TERM
OPERATION & MAINTENANCE MANUAL

For the Proposed:

SOAPY NOBLE EXPRESS
CARWASH FACILITY

Located At:
230 Flanders Road
East Lyme, Connecticut

Prepared On:
November 29th, 2022

Prepared For:
Town of East Lyme Zoning Permit

Prepared By:

SOLLI ENGINEERING
11 Vanderbilt Avenue, Suite 240
Norwood, Massachusetts 02062
T: (781) 352-8491

Prepared For:

Noble Energy Real Estate Holdings, LLC
131 Buckingham Street, Suite 301
Hartford, Connecticut 06106
T: (860) 593-0129

TABLE OF CONTENTS

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RESPONSIBILITY 2
DOCUMENTATION 2
MAINTENANCE PROGRAM 3
HYDRODYNAMIC SEPARATOR UNIT 3
CATCH BASIN 3
STREET MAINTENANCE 4
PESTICIDES, HERBICIDES AND FERTILIZERS 5
SNOW REMOVAL 5
EMEREGENCY SPILL CONTAINMENT 5

INTRODUCTION

Solli Engineering (Solli) has prepared this Operations and Maintenance (O&M), to be filed with the Town of East Lyme, Connecticut for the proposed Soapy Noble Express Car Wash Facility at 230 Flanders Road in East Lyme, Connecticut. The O&M Manual has been prepared to ensure that the stormwater management functions as designed. The owner possesses the primary responsibility for overseeing and implementing the O&M plan and assigning a Property Manager who will be responsible for the proper operation and maintenance of the stormwater structures. In case of transfer of property ownership, future property owners shall be notified of the presence of the stormwater management system and the requirements for proper implementation of the O&M plan. Included in the O&M plan identifying key components of the stormwater system as well as a log for tracking inspections & maintenance.

The stormwater management system protects and enhances the stormwater runoff water quality through the removal of sediment and pollutants, and source control significantly reduces the number of pollutants entering the system. Preventive maintenance of the system will include a comprehensive source reduction program of regular vacuuming and litter removal, prohibitions on the use of pesticides and maintenance of designated waste and recycling.

RESPONSIBILITY

The purpose of the Long-Term Operation and Maintenance (O&M) Manual is to ensure inspection of the system, removal of accumulated sediments, oils, and debris and implementation of corrective action and record keeping activities. The below O&M activities associated with the site will be performed by a Contract Operator for the scope of maintenance. The Contract Operator will be a professional engineer or other technical professional with expertise and experience with stormwater management facilities operation and maintenance.

The ongoing responsibility is the Owner, its successors, and assigns. Adequate maintenance is defined in this document as good working condition.

Responsibility for O&M (to be transferred upon sale of property / development):

Contact:	Michael Frisbie / Noble Energy Real Estate Holdings, LLC
Number:	860-593-0129
Address:	131 Buckingham Street, Suite 301
City, State:	Hartford, CT 06106

DOCUMENTATION

An inspection and maintenance record log and schedule will be kept by the Owner or Property Manager summarizing inspections, maintenance, repairs and any corrective actions taken. The log will include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediments or debris, the location where the sediment and debris was disposed after removal will be indicated. Inspection & Maintenance Logs will be kept on file at the on-site Property Management office.

MAINTENANCE PROGRAM

The Owner, Property Manager and maintenance staff will conduct the Operation and Maintenance program set forth in this document. The Owner or Property Manager will ensure that inspections and record keeping are timely and accurate, and that cleaning and maintenance are performed in accordance with the recommended frequency for each stormwater component. Inspection & Maintenance Log Forms shall include the date and the amount of the last significant storm event in excess of 1-inch of rain in a 24-hour period, physical conditions of the structures, depth of sediment in structures, evidence of overtopping or debris blockage and maintenance required of each structure. The following areas, facilities and measures will be inspected by the Owner or Property Manager and maintained as specified below. Identified deficiencies will be corrected. Accumulated sediments and debris will be properly handled and disposed of off-site, in accordance with local, state, and federal guidelines and regulations.

HYDRODYNAMIC SEPARATOR UNIT

Hydrodynamic separators protect the environment by removing a wide range of pollutants from stormwater runoff. Periodic removal of these captures pollutants is essential to the continuous, long-term functioning of the separator. The unit will capture and retain sediment and oil until the sediment and oil storage volumes are full to capacity. When sediment and oil storage capacities are reached, the structure will no longer be able to store removed sediment and oil.

The stormwater management system proposes to incorporate a Contech water quality unit. According to the Contech Guide Operation, Design, Performance and Maintenance, inspections shall take place at regular intervals to ensure optimum performance. At a minimum, inspections shall be performed twice a year (Ex.: spring & fall) however more frequent inspections may be required depending on several things one being severity of winter (excessive sanding/salting). The frequency of cleanout is determined in the field after installation. During the first year of operation, the units should be inspected regularly and then after, every six months (twice a year) to determine the rate of sediment and floatables accumulation. A simple probe can be used to determine the level of accumulated solids stored in the sump. This information should be recorded in the inspection logs. On the log it is important to note the date, location of structure (or identification), estimated volume of floatables, and depth of sediment. Securely replace the top of the structure and take down any safety equipment. Then notify the engineer of record for any irregularities in the structure's performance if any. The system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. Sediment and debris removal can be done manually or with approved sumpvac (or equal).

For more information regarding the CDS Guide Operation, Design, Performance and Maintenance visit:
https://www.conteches.com/Portals/0/Documents/Design%20Guides/CDSDesign%20Guide.pdf?ver=2018-05-16-083621-907

CATCH BASIN

Catch basins are underground concrete structures which are designed to retain removed trash, debris, and coarse sediment from stormwater runoff and serve as temporary spill containment devices for floatables such as oil and greases prior to discharge into a storm sewer pipe. The functions of a catch basin include:

- A grate and/or vertical notch found in the curbing that allow stormwater to enter the structure while filtering out larger objects such as trash and leaves.

- A two-foot (minimum) sump below the invert of the storm sewer pipe provides an area for detention time which allows sands and other sediments to settle out of the runoff prior discharge.
- An attached hooded outlet, that prevents floatables and sediment from entering the storm sewer pipes.

At a minimum, catch basins and drain manholes shall be inspected quarterly (four times per year). Ideally, inspections should be conducted in the fall, at the end of the leaf-drop, in the spring following snowmelt and following heavy rain falls, defined as a storm event exceeding 1-inch of rain fall within a twenty-four-hour period to verify that inlet openings are not clogged by debris. Each structure should be cleaned whenever the depth of sediment deposits is greater than or equal to one half the depth of the sump from the bottom of the structure to the bottom of the lowest pipe invert. Structures shall be inspected for a buildup of sediments, oils, debris, cracks, breaks, or deformations. Any function of the catch basin and drain manhole that is not in working order will be replaced with similar materials, as per detail, to prevent the storm sewer system from failing.

If floating hydrocarbons are observed during an inspection, the material should be removed immediately by skimming, absorbent materials, or other method and disposed in conformance with applicable state and federal regulations.

The catch basins shall be cleaned by means of handheld shovels, scallop shovel and/or vacuum truck. Vacuum truck may be required instead of shovels to avoid damage to structure. The grate opening shall be clear of any foreign or lodged object. If floating hydrocarbons are observed during an inspection, the material should be removed immediately by skimming, absorbent materials or other methods and salts used in the winter will be removed from the catch basin sumps in the early spring. Leaves, pine needles and branches brought down by autumn winds, rain, and cold weather will be removed from the catch basin sumps in the late fall. Collected sediment, debris and hydrocarbons will be properly disposed of per local, state and federal requirements.

Damaged Hoods should be replaced when noted by inspection.

STREET MAINTENANCE

Street maintenance is a non-structural source control performed by mechanical means to limit sediment and particulates from impervious surfaces as an effort to control or limit the sediment migration to other stormwater BMP's during storm events. There are three typical types of sweeping methods, including mechanical, regenerative air and vacuum filter. Mechanical sweepers are the most common and use brooms or brushes to scour the pavement. Regenerative air sweepers blow air onto the impervious surface causing sediment and other fine particles to be blown from the surface so they can be vacuumed. Vacuum filter sweepers are available in wet and dry types. Dry types use brooms to agitate the sediment prior to vacuuming. Wet types work in a similar fashion but use water to suppress dust during the collection activity. Because of street maintenance, sediment and other fine particulates are limited on the impervious surfaces and be further controlled from entering other BMP's. They also allow for the removal and prevention of accumulation of sediment along parking or road edges.

This should be done periodically during dry weather to remove excess sediments to reduce the amount of sediments that the drainage system shall have to remove from runoff. Sweeping should mostly be conducted between the months of March and November, with special attention to sweeping during the wetter (earlier) months. Sand containing the minimum amount of calcium chloride (or approved equal) needed for handling may be applied as part of the routine winter maintenance activities.

PESTICIDES, HERBICIDES AND FERTILIZERS

Pesticides and herbicides shall be used sparingly. Fertilizers should be restricted to the use of organic fertilizers only. Pesticides shall be natural rather than chemical whenever possible. Exterior storage of fertilizers, herbicides, pesticides or other toxic or hazardous materials should be prohibited.

SNOW REMOVAL

Snow accumulations removed from roadway, driveway and parking areas should be placed in areas where sand and other debris will remain after snowmelt for later removal. Excess snow should be removed from the site and properly disposed of in an approved snow disposal facility. Care must be exercised not to deposit snow in the following areas: on top of storm drain catch basins; in storm drainage swales; in natural depressions; and where sand and debris can get into the watercourse.

This project is located within an Aquifer Protection Area; stockpiling of snow or ice that contains de-icing chemicals is prohibited. The use of chemicals for de-icing and other related snow management should be minimized to the greatest extent possible. The use of sodium chloride is prohibited. A mixture of sand and calcium chloride is required.

EMEREGENCY SPILL CONTAINMENT

The Owner, along with the on-site Property Manager is responsible for educating staff and informing tenants on the environmental benefits associated with the use of pavement at the site. Staff must be trained, and tenants informed via the community website as to the proper spill prevention control and response procedures should a spill occur on the pavement surface. Proper spill control products, such as a granular dry absorbent, must be kept on-site at the property management office in a clean, dry chemical and corrosion resistant container.

A spill of greater than 10 gallons of oil or a spill of any quantity that has reached a surface water, into a sewer, storm drain, ditch, or culvert leading to a surface water, is immediately reported to one or more municipal, state, or federal authority. In the event of a hazardous waste spill on-site, the following protocol should be followed.

- If it is safe to do so, maintenance staff or tenants detecting an oil spill should immediately stop the release and use available materials to prevent the spread of oil.
- If there is a potentially flammable, toxic, or explosive condition, evacuate the vicinity of the spill.
- If it's believed that a reportable or dangerous condition exists, immediately call your local Fire Department to notify them of the release.
- If it is believed that a reportable condition exists, immediately call the Connecticut Department of Energy & Environmental Protection (DEEP) to notify them of the release.
- Call the DEEP Emergency Response Section toll free statewide number, 1-866-337-7745. Be prepared to provide the following information to the DEEP and the Fire Department:
    - Identity of the caller
    - Contact phone number Location of the spill
    - Type of product spilled

- Approximate quantity or product spilled Extent of actual and/or potential water pollution
- Date and time of spill
- Cause of spill
- Contact a Licensed Site Professional (LSP) to assist in further handling of the material(s) and DEEP.

	Title:	Inpsection #:
	Location:	Project #:
		Field Date:

INSPECTION & MAINTENANCE LOG

Name(s) & Title(s) of Individual(s) performing inspection: _____

Week of Inspection: _____

Type of Inspection:

☐ Monthly ☐ Quarterly ☐ Biannually ☐ Annually ☐ Emergency

Weather (during inspection)

☐ Clear ☐ Cloudy ☐ Rain ☐ Snow ☐ Sunny ☐ Windy ☐ Fog

Other:

Time of Inspection:		**Temp. during inspection:**	°F
Start Time:	**a.m.** **End Time:** **a.m.**	**Precip. since last inspection:**	"

Site Specific BMP's

#	BMP	Maintenance Required		Corrective Action Needed & Notes
1		☐ Yes	☐ No	
2		☐ Yes	☐ No	
3		☐ Yes	☐ No	
4		☐ Yes	☐ No	
5		☐ Yes	☐ No	
6		☐ Yes	☐ No	
7		☐ Yes	☐ No	
8		☐ Yes	☐ No	
9		☐ Yes	☐ No	
10		☐ Yes	☐ No	

Overall Site Maintenance Concerns

BMP/Activity	Maintenance Required		Corrective Action Needed & Notes
Are discharge points & receiving waters free of any sediment deposits?	☐ Yes	☐ No	
Are storm drain inlets properly working?	☐ Yes	☐ No	
Is trash/litter from site areas collected & placed in covered dumpsters?	☐ Yes	☐ No	
What is the level of sediment within infiltration basin?	☐ Yes	☐ No	
What is the level of sediment within the hydrodynamic separators?	☐ Yes	☐ No	
What is the levels of oil/grit/trash within the infiltration basin or hydrodynamic separators?	☐ Yes	☐ No	
(Other)	☐ Yes	☐ No	

Inspector(s) Signature(s): _____