

John U. Faulise, Jr., L.S.
Gerald J. Stefon, L.S.

Demian A. Sorrentino, AICP, C.S.S.

David C. McKay, P.E.
Jacob S. Faulise, E.I.T.



Boundaries LLC
179 Pachaug River Drive
P.O. Box 184
Griswold, CT 06351
T 860.376.2006 | F 860.376.5899

www.boundariesllc.net

STORMWATER MANAGEMENT REPORT

PREPARED FOR:

EDGEWATER HILL ENTERPRISES, LLC

SALT POND APARTMENTS
000 EAST HIGH STREET (CT ROUTE 66)
EAST HAMPTON, CONNECTICUT

DECEMBER 2020

PREPARED BY:

BOUNDARIES LLC

PROJECT I.D. No. 20-2853



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Introduction

On behalf of Edgewater Hill Enterprises, LLC., Boundaries, LLC. has prepared the following stormwater management report for the proposed forty-unit multifamily residential development located south of the East Hampton Town Hall and Police Department in the Edgewater Hill Mixed Use Development. Additional supporting information regarding the proposed development and the construction completed to date can be found in the approved development Master Plan documents prepared by others. The following analysis demonstrates that the proposed stormwater management system provides retention of the water quality volume and attenuation of peak stormwater flows.

The location of the project is shown on the Locus Map included as Figure 1. The FEMA Flood Insurance Rate Map is included as Figure 2.

Wetlands located on the subject properties include an existing man-made pond located in the central portion of the proposed development and upgradient wetland areas that contribute to the pond. Stormwater runoff from the man-made pond and from upgradient undeveloped and developed areas ultimately discharge through a series of open channels and pipes to Lake Pocotopaug.

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey the soils in the project area consist of Woodbridge fine sandy loam, 8 to 15% slopes, very stony, and Paxton and Montauk fine sandy loams, 15 to 35% slopes, extremely stony. Woodbridge soils are classified as Hydrologic Soil Group C/D and Paxton and Montauk soils are classified as Hydrologic Soil Group C. The NRCS Web Soil Survey Soils Report is provided in Appendix A. Given that the soils in the project area are classified as Hydrologic Soil Group C little to no infiltration of runoff is anticipated as part of the stormwater management system.

Pre- and post-development conditions hydrographs were estimated using the hydrologic modeling program HydroCAD. The methodology selected was NRCS TR-20. Times of concentration were estimated using multiple segment flow paths as described in the NRCS TR-55 manual. The Type III 24-hour storm was analyzed under antecedent moisture condition two (2). Rainfall totals were as reported by the NOAA Precipitation Frequency Data Server accessed on April 27, 2020. HydroCAD modeling results are presented in Appendix B. Pipe sizing calculations were completed using the calculated Manning's capacity of the pipe reaches. The water quality volume was calculated using the methods detailed in the CT DEEP Stormwater Quality Manual. Supporting calculations are included in Appendix C.

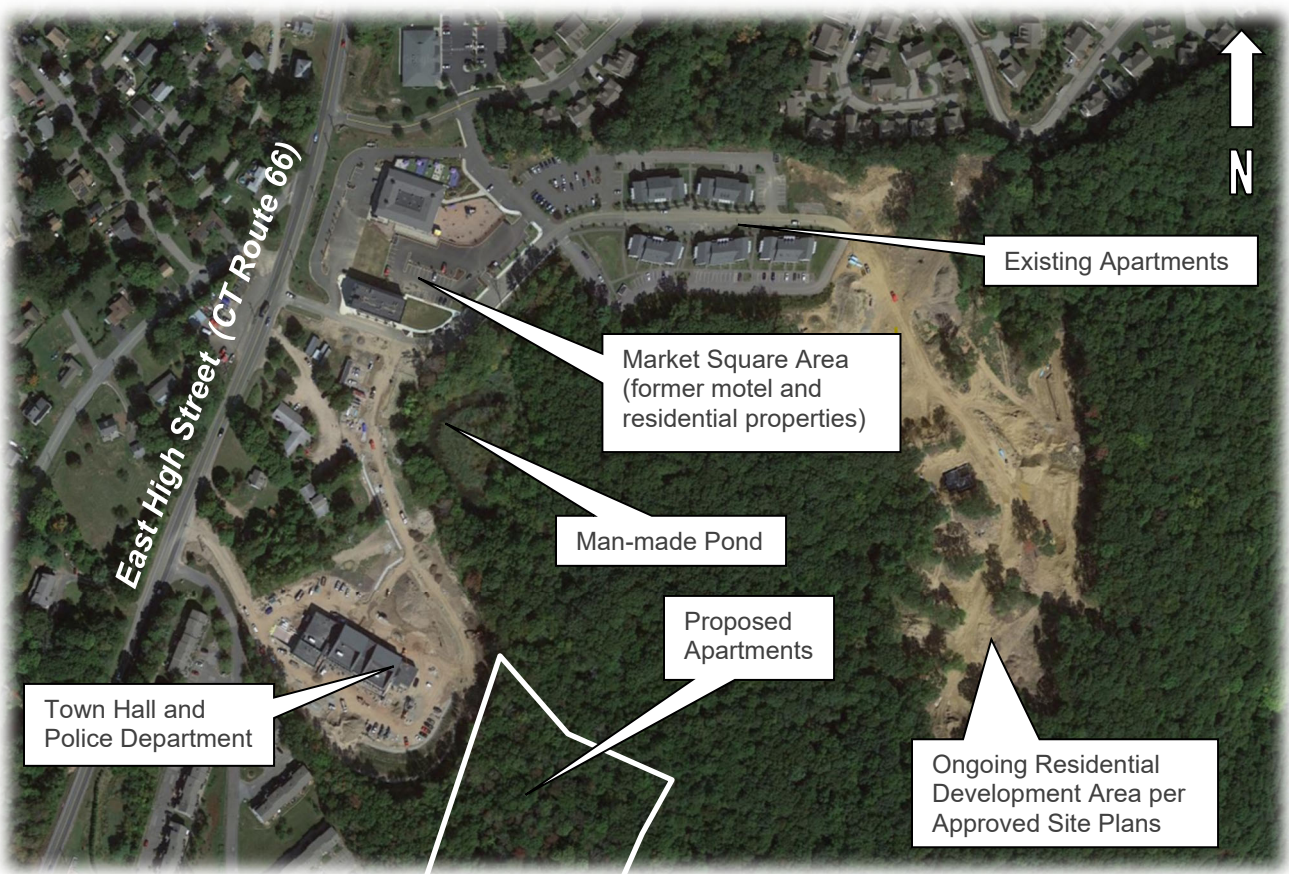
The proposed improvements include the construction of five (5) eight (8) unit apartment buildings, approximately 800 linear feet of new access roadway, associated sidewalks, circulation drives and parking areas and the extension of sewer, water, gas, electric and communications utilities to service the proposed buildings. Stormwater runoff from the proposed impervious areas will be collected in deep sump catch basins with hooded outlets at the downstream structures prior to discharging to two (2) stormwater basins for detention of peak stormwater runoff rates. The low-level outlets of the stormwater basins are elevated above the basin bottoms to retain the water quality volume on-site following storm events. Due to the presence of a restrictive layer and perched groundwater tables the bottom of the basins are sloped and will be provided with underdrains sized to allow the basins to drain within 72 hours following storm events. Groundwater recharge will be provided by dry wells with high level overflows that will capture the runoff from the proposed building roofs and grassed areas. Runoff will discharge to the wetlands system upgradient of the manmade pond in the same location as an existing drainage discharge installed as part of the Town Hall and Police Department project. The proposed site development plans are included in Appendix D. The stormwater basins are intended to provide attenuation of post-development peak discharge rates to match pre-development rates and to retain the water quality volume following storm



events. The stormwater management system has been designed to meet the requirements of the Connecticut Department of Energy and Environmental Protection (CT DEEP) Stormwater Quality Manual and the Connecticut Department of Transportation Drainage Manual for both peak stormwater runoff flow rate attenuation and retention of the stormwater quality volume for the 2, 10, 25, 50 and 100-year storm events.

Pre-Development Conditions

The Edgewater Hill development is located within the Edgewater Hill Mixed Use Development District. The development is being completed utilizing a phased approach. To date, the first two buildings in the Market Square area, the first phase of residential apartment buildings and the new Town Hall and Police Department have been constructed. A third mixed use commercial building in Market Square and additional residential lots are currently under construction. The project area formerly included a motel, residential properties and associated infrastructure. Runoff from the frontage along East High Street (CT Route 66) drains to CT DOT's 30-inch RCP culvert that carries flow under CT Route 66 and ultimately discharges to Lake Pocotopaug. Stormwater runoff from the Town Hall and Police Department, apartments, a small portion of the residential development and upgradient undeveloped areas flows to the existing pond. The pond is drained through an 18-inch diameter HDPE pipe that discharges to the stormwater management system in Edgewater Circle. Runoff from the remainder of the site flows overland to the east (away from State facilities and Lake Pocotopaug) and is not included in this analysis. Existing conditions aerial photography of the properties is shown below.



Aerial Photograph of Site



Pre-development watersheds are shown on Figure 3. Pre-development watersheds were delineated using topographic survey data for the subject parcels and aerial mapping for off-site contributing areas. Land uses were estimated using aerial photography and topographic survey data. The pre-development conditions analyzed in the model are based on the conditions before the Edgewater Hill project was initiated.

Runoff Curve Numbers (CN) used for the pre-development conditions analysis are as follows: 55 (woods with good ground cover) for wooded areas in Hydrologic Soil Group B, 70 (woods with good ground cover) for wooded areas in Hydrologic Soil Group C, 77 (woods with good ground cover) for wooded areas in Hydrologic Soil Group D, 61 (>75% grass cover) for the grassed areas in Hydrologic Soil Group B, 74 (>75% grass cover) for the grassed areas in Hydrologic Soil Group C, 80 (>75% grass cover) for the grassed areas in Hydrologic Soil Group D, 96 (gravel surface) for the exposed dirt/gravel areas, and 98 (impervious) for existing impervious areas such as paved areas, buildings and the pond surface.

The pre-development conditions watersheds are described further below:

Drainage Area #1 (DA #1)

This ±6.8 acre watershed encompasses the western portion of the project area, and is comprised of the former motel, residential properties, and areas that drain directly to the 30-inch culvert under Route 66. The weighted CN of the drainage area is 70. Runoff from this area flows overland to the shoulder of Route 66 prior to leaving the site through the 30-inch culvert.

Drainage Area #2 (DA #2)

This± 45.5 acre watershed encompasses the portion of the site that contributes runoff to the existing pond and is comprised of a portion of the existing residential properties and the wooded undeveloped areas. The weighted CN of the watershed is 66. Runoff from this area flows overland to the pond before it flows through an 18-inch drainage pipe to the 30-inch culvert that crosses Route 66.

Pre-development conditions peak runoff rates were analyzed at the 30-inch culvert, where the runoff leaves the site. Reported peak flow rates are summarized below in Table 1. Detailed modeling results are included in Appendix B.

Table 1
Peak Runoff Rates – Pre-Development Conditions

Design Storm Event	Total Off-Site Peak Runoff Rate – Pond 2P (CFS)	Peak Water Surface Elevation at 30-inch Culvert – Pond 2P (FT)	Time to Peak at 30-inch Culvert – Pond 2P (hours)
2-Year	6.62	521.10	12.57
10-Year	16.88	521.93	12.41
25-Year	21.32	522.26	12.40
50-Year	24.93	522.53	12.39
100-Year	28.78	522.85	12.38

Pre-development conditions peak runoff rates were also analyzed at the limits of the proposed development area. DA-APT EX is the ±9.2 acre wooded area that will be developed as part of this project. The weighted CN of the watershed is 70. Runoff from this area flows overland to the wetland areas



upgradient of the manmade pond. Reported peak flow rates are summarized below in Table 2. Detailed modeling results are included in Appendix B.

Table 2
Peak Runoff Rates – Pre-Development Conditions – Apartments Sub-Watershed

Design Storm Event	Apartments Sub-Watershed Peak Runoff Rate – Link 2L (CFS)
2-Year	6.77
10-Year	17.27
25-Year	24.55
50-Year	30.24
100-Year	36.47



Post-Development Conditions

The proposed improvements include the construction of approximately 800 feet of paved road, parking areas and circulation drives to serve the new apartment buildings. Stormwater runoff will be collected in deep sump catch basins with hooded outlets at the downstream structures. The catch basins will discharge to two stormwater basins intended to attenuate peak runoff rates. The water quality volume will be retained below the low-level outlets on the two stormwater basins following storm events.

The proposed stormwater management system components proposed for construction include the following:

- Fourteen (14) deep sump precast concrete catch basins;
- Seven (7) precast concrete drainage manholes;
- Two (2) precast concrete outlet control structures;
- Five (5) precast concrete drywell structures;
- Yard drains, cleanouts and drainage pipe of various diameters; and
- Two stormwater basins.

The proposed stormwater management system is intended to meet the following design standards:

- The post-development peak discharge rates from the 2-year, 10-year, 25-year, 50-year, and 100-year storms are less than or equal to pre-development peak discharge rates;
- The conveyance system leading to, from, and through stormwater management facilities has capacity for the 10-year, 24-hour storm, at a minimum;
- The groundwater recharge volume is captured; and
- The water quality volume is retained following storm events.

The post-development conditions hydrologic model includes the full buildout of the Market Square, the existing daycare, apartment buildings, and the Town Hall and Police Department and associated infrastructure. Individual site plans will need to be prepared for each of the future phases of the Market Square buildout, however the future development of Market Square has been included in the stormwater modeling to demonstrate that the stormwater management system as proposed meets the design standards noted above. Post-development conditions watersheds and the built-out Market Square development are shown on Figure 4. Post-development conditions watersheds were delineated using topographic survey data and the proposed development plans for the subject areas. Land uses were estimated using aerial photography and the proposed development plans. Site development plans are included in Appendix D.

Runoff Curve Numbers (CN) used for the post-development conditions analysis are as follows: 55 (woods with good ground cover) for wooded areas in Hydrologic Soil Group B, 70 (woods with good ground cover) for wooded areas in Hydrologic Soil Group C, 77 (woods with good ground cover) for wooded areas in Hydrologic Soil Group D, 61 (>75% grass cover) for the grassed areas in Hydrologic Soil Group B, 74 (>75% grass cover) for the grassed areas in Hydrologic Soil Group C, 80 (>75% grass cover) for the grassed areas in Hydrologic Soil Group D, 86 (newly graded area) for the mulched play areas in Hydrologic Soil Group B, and 98 (impervious) for existing and proposed impervious areas such as paved roads, driveways, buildings, and the pond surface.

The proposed conditions watersheds are described further below:



Drainage Area #1A (DA #1A)

This 2.1± acre watershed encompasses a portion of the existing Edgewater Hill mixed use development that flows to the 30-inch culvert, and is comprised of the parking lot, access drive, and building associated with the existing daycare. The weighted CN of the watershed is 91. Runoff from this area flows overland to a series of catch basins and discharges to the 30-inch culvert. The discharge to the 30-inch culvert was constructed as part of Phase 1 of the Edgewater Hill Development and will not be modified as part of this project.

Drainage Area #1B (DA #1B)

This 2.2± acre watershed encompasses the remainder of the northern half of the Market Square area and is comprised of the existing play areas associated with the daycare, the proposed buildings in the northern half of Market Square, associated parking areas and access drives, and a portion of the existing road to the apartment buildings. The weighted CN of the watershed is 92. Runoff from this area is collected by a series of catch basins and discharges through a hydrodynamic separator to the existing pond for treatment and attenuation of the runoff. Ultimately the runoff discharges through the 18-inch HDPE pipe to the 30-inch culvert. The discharge to the 30-inch culvert was constructed as part of Phase 1 of the Edgewater Hill Development and will not be modified as part of this project.

Drainage Area #1C (DA #1C)

This 0.3± acre watershed encompasses a portion of the southern half of Market Square and is comprised of the access drives and associated parking constructed as part of the Town Hall and Police Department project. The weighted CN of the watershed is 94. Runoff from this area is collected by a series of catch basins and discharges through a hydrodynamic separator to the existing pond for treatment and attenuation of the runoff. Ultimately the runoff discharges through the 18-inch HDPE pipe to the 30-inch culvert. The discharge to the 30-inch culvert was constructed as part of Phase 1 of the Edgewater Hill Development and will not be modified as part of this project.

Drainage Area #1D (DA #1D)

This 2.0± acre watershed encompasses a portion of the southern half of Market Square, and is comprised of the proposed buildings, parking lots and access drives that will be constructed during future phases of the development. The weighted CN of the watershed is 93. Runoff from this area will be collected by a water quality swale and water quality basin for treatment and attenuation of the runoff prior to discharging to the 30-inch culvert. The discharge to the 30-inch culvert was constructed as part of Phase 1 of the Edgewater Hill Development and will not be modified as part of this project.

Drainage Area #2A (DA #2A)

This 3.6± acre watershed encompasses a portion of the existing residential development associated with the Edgewater Hill project, and is comprised of the existing apartment buildings, existing access drives and associated parking areas. The weighted CN of the drainage area is 84. Runoff from this area is collected by a series of catch basins and discharges to the existing man-made pond.

Drainage Area #2B (DA #2B)

This 2.2± acre watershed encompasses a portion of the access drives for the apartment buildings and currently undeveloped areas and is comprised of the upgradient apartment units and adjacent wooded areas. The weighted CN of the drainage area is 72. Runoff from this area is collected by a catch basin and discharged to a detention basin prior to flowing to the existing man-made pond.



Drainage Area #2C (DA #2C)

This 30.2± acre watershed encompasses the remaining areas that drain to the existing man-made pond and is comprised of the existing wooded and wetland areas. The weighted CN of the drainage area is 68. Runoff from this area flows overland into the existing man-made pond.

Drainage Area #2D (DA #2D)

This 6.4± acre watershed encompasses the Town Hall and Police Department, associated access drives, parking lot and contributing areas. The weighted CN of the drainage area is 83. Runoff from this area is collected by a series of catch basins and swales and discharged to various underground storage/infiltration systems, retention basin and rain garden prior to draining to the existing man-made pond. Stormwater modeling results for this watershed are imported from the detailed model prepared for the Town Hall and Police Department site plan approval.

Drainage Area #2E (DA #2E)

This 3.1± acre watershed encompasses a portion of the southern half of the proposed apartments and contributing areas, and is comprised of the proposed buildings, parking lots and access drives, revegetated areas to be graded, and wooded areas that will remain undisturbed. The weighted CN of the watershed is 80. Runoff from this area will be collected by a series of catch basins and will discharge to Stormwater Basin 2.

Drainage Area #2F (DA #2F)

This 0.1± acre watershed encompasses the revegetated areas to be graded and wooded areas that will remain undisturbed which directly drain to Stormwater Basin 2. The weighted CN of the watershed is 83. Runoff from this area will flow overland and directly discharge to Stormwater Basin 2.

Drainage Area #2G (DA #2G)

This 0.4± acre watershed encompasses the revegetated areas to be graded that will directly drain to Stormwater Basin 1. The weighted CN of the watershed is 81. Runoff from this area will flow overland and directly discharge to Stormwater Basin 1.

Drainage Area #2H (DA #2H)

This 2.7± acre watershed encompasses the western half of the proposed apartments and contributing areas, and is comprised of the proposed buildings, parking lots and access drives, revegetated areas to be graded, and wooded areas that will remain undisturbed. The weighted CN of the watershed is 82. Runoff from this area will be collected by a series of catch basins and discharge to Stormwater Basin 1.

Drainage Area #2I (DA #2I)

This 0.5± acre watershed encompasses the eastern half of the northern apartments and contributing areas, and is comprised of the proposed buildings, parking lots and access drives, and revegetated areas to be graded. The weighted CN of the watershed is 89. Runoff from this area will be collected by a series of catch basins and discharge to Stormwater Basin 1.

Post-development conditions peak runoff rates were analyzed at the 30-inch culvert crossing Route 66. Comparisons of pre- and post-development peak runoff rates, water surface elevations, and time to peak flows at the 30-inch culvert are presented below in Tables 3 through 5.



Table 3
Peak Runoff Rates – Post-Development Conditions vs. Pre-Development Conditions

Storm Event	Post-Development Conditions Total Off-Site Peak Runoff Rate – Pond 2P (CFS)	Pre-Development Conditions Total Off-Site Peak Runoff Rate – Pond 2P (CFS)	Change in Peak Runoff Rate (CFS)
2-Year	6.62	6.62	-0.00
10-Year	14.64	16.88	-2.24
25-Year	20.72	21.32	-0.60
50-Year	24.69	24.93	-0.24
100-Year	28.54	28.78	-0.24

Table 4
Peak Water Surface Elevations – Post-Development Conditions vs. Pre-Development Conditions

Storm Event	Post-Development Conditions Peak Water Surface Elevation at 30-inch Culvert – Pond 2P (FT)	Pre-Development Conditions Peak Water Surface Elevation at 30-inch Culvert – Pond 2P (FT)	Change in Peak Water Surface Elevation (FT)
2-Year	521.10	521.10	0.00
10-Year	521.77	521.93	-0.16
25-Year	522.21	522.26	-0.05
50-Year	522.51	522.53	-0.02
100-Year	522.83	522.85	-0.02

Table 5
Time to Peak Flow – Post-Development Conditions vs. Pre-Development Conditions

Storm Event	Post-Development Conditions Time to Peak Flow at 30-inch Culvert – Pond 2P (hours)	Pre-Development Conditions Time to Peak Flow at 30-inch Culvert – Pond 2P (hours)	Change in Time of Peak Flow (hours)
2-Year	12.15	12.57	-0.42
10-Year	12.45	12.41	+0.04
25-Year	12.20	12.40	-0.20
50-Year	12.19	12.39	-0.20
100-Year	12.18	12.38	-0.20

As presented above, the proposed stormwater management system does not result in increases to off-site flow rates or water surface elevations, and therefore will have no impact to CT DOT drainage facilities and meets the recommendations of the CT DEEP Stormwater Quality Manual for peak flow rate attenuation. The decrease in time to peak flow during the 2-year, 25-year, 50-year and 100-year storm events is measured in minutes and will therefore not result in significant changes to downstream flow patterns. The time to peak flow during the 10-year storm event is essentially unchanged from pre-development conditions. The analysis results presented above include the full build-out of the Market Square area as shown on Figure 4.



An analysis of the proposed development area was also completed independently of the remainder of the overall Edgewater Hill project to confirm that peak flow rates to the on-site wetland system and pond are not increased as a result of the proposed development. Post-development watersheds of the apartment project area only are identified on Figure 5. A comparison of pre- to post-development peak runoff rates is presented below in Table 6.

Table 6

Peak Runoff Rates – Post-Development Conditions vs. Pre-Development Conditions – Apartments Only

Storm Event	Post-Development Conditions Total Off-Site Peak Runoff Rate – Pond 2P (CFS)	Pre-Development Conditions Total Off-Site Peak Runoff Rate – Pond 2P (CFS)	Change in Peak Runoff Rate (CFS)
2-Year	4.03	6.77	-2.74
10-Year	15.67	17.27	-1.60
25-Year	24.46	24.55	-0.09
50-Year	27.65	30.24	-2.59
100-Year	31.94	36.47	-4.53

Stormwater Management System Design

Pipe Sizing

Stormwater runoff from the proposed development area will be collected and discharged to two (2) stormwater basins. The proposed stormwater collection system consists of catch basins and curbing along the proposed roadway and parking lots. The proposed drains are sized for the 10-year storm event, at a minimum, based on the calculated Manning’s capacity of each pipe reach in accordance with the Town of East Hampton Zoning Regulations. Pipe sizing calculations are included in Appendix C.

Scour Protection

The piped discharge and overflow spillway will be protected from erosion by rip rap sized in accordance with the recommendations of the CT DOT Drainage Manual. Sizing calculations for the scour protection are summarized in Table 7 and included in Appendix C.



Table 7
Scour Protection Sizing

Stormwater Discharge	100-year Discharge Velocity (FPS)	Proposed Surface Treatment	Typical Allowable Velocity (FPS)
Stormwater Basin 1 Outlet	11.95	Intermediate Rip Rap Scour Hole	14.7 (Per DOT Drainage Manual)
Stormwater Basin 1 Inlet	6.35	Modified Rip Rap Scour Hole	14.7 (Per DOT Drainage Manual)
Stormwater Basin 1 Spillway	1.21	Modified Rip Rap	8 for rip rap (Per DOT Drainage Manual)
Stormwater Basin 2 Inlet	6.2	Modified Rip Rap Scour Hole	14.7 (Per DOT Drainage Manual)
Stormwater Basin 2 Spillway	No Modeled Discharge During 100-year Storm Event	Modified Rip Rap	8 for rip rap (Per DOT Drainage Manual)

Water Quality Volume

The stormwater management system is intended to provide treatment of the runoff from the proposed impervious areas. Treatment of runoff from the site will be accomplished using a series of deep sump catch basin with hooded outlet prior to the discharge to the sediment forebays of the stormwater basins. The stormwater basins are sized to retain the water quality volume associated with the upgradient impervious areas in the storage provided below the low-level outlets. The sediment forebays are sized for 10% of the water quality volume. Sizing calculations for the stormwater basins are summarized in Table 8 and are included in Appendix C.

Table 8
Water Quality Volume Sizing Criteria

Stormwater Basin	Contributing Impervious Area	Contributing Drainage Area	Water Quality Volume	Forebay Volume	Storage Volume Below Low-Level Outlet
Stormwater Basin 1	2.31 acres	7.00 acres	7,674 cubic feet	933 cubic feet	8,281 cubic feet
Stormwater Basin 2	0.99 acres	3.28 acres	3,278 cubic feet	358 cubic feet	3,450 cubic feet

Test holes were completed in the area of the stormwater basins to confirm soil conditions. The bottom of each basin was found to be above ledge rock encountered in the test holes, however the sediment forebay proposed in Stormwater Basin 1 will approximately match the ledge elevation. The soil profile also included a restrictive layer that varied from 3.5 feet in thickness to 4.5 feet in thickness overlaying a layer fine to medium sand with gravel. The restrictive layer has resulted in a perched groundwater table. The deeper excavated areas of the stormwater basins will extend below the restrictive layer allowing for some infiltration of collected runoff, however due to the variability of the soil profile the shallower areas



of the stormwater basin are intended to be provided with a sand filter underdrain that will allow for the water quality volume to drain following storm events to ensure that there is not a standing pool of water in the water quality basin between storm events. The underdrain will be embedded in crushed stone, wrapped in filter fabric, beneath a sand filter layer to filter and treat the stored runoff as it is released after storm events. This system will provide treatment of the water quality volume prior to discharge. Underdrain sizing calculations are included in Appendix C.

Groundwater Recharge Volume

The soils in the project area are mapped as Hydrologic Soil Group C and as such have limited ability for infiltration of stormwater. As mentioned above, the limiting factor for infiltration of runoff is a compact layer of silty sand that results in a perched groundwater table. The underlying soils were found to be fine to medium sand with gravel and were dry while groundwater was found to be seeping into the excavation at the restrictive layer above. Groundwater recharge is intended to be provided using drywells that will collect stormwater runoff from the building roofs and grassed areas surrounding the buildings. The drywells are located in locations where they will be installed below the encountered restrictive layer or in fill materials allowing them to drain between storm events. The drywells will be installed with high level overflows that will connect to the drainage system preventing surface overflows during storm events that exceed the storage capacity of the drywells. The groundwater recharge volume and dry well sizing calculations are included in Appendix C and summarized below in Table 9.

Table 9
Groundwater Recharge Volume Sizing Criteria

Sizing Criteria	Result
Groundwater Recharge Volume	926 cubic feet
Storage Volume Per Dry Well	208 cubic feet
Total Storage Volume	1,040 cubic feet

Construction Phase Stormwater Management

Construction phase stormwater management is intended to be provided in accordance with the erosion and sedimentation control plans included in the Site Development Plans. The following best management practices will be implemented to protect downstream water quality:

- The downgradient sediment fence barrier will be backed by hay bales.
- An upgradient sediment fence barrier embedded in wood chip berm will be installed to divert clean runoff around the disturbed areas.
- Grubbing of stumps is intended to be completed by phase.
 - Phase 1 includes the construction of the haul road and staging/stockpile area. Disturbed area will be approximately 1.8 acres. Disturbed areas outside of the gravel road surface will be seeded and mulched.
 - Phase 2 includes the extension of the proposed roadway, sidewalks and utilities. Disturbed areas will be approximately 2.3 acres.
 - Phase 3 includes the mass earthwork required to establishing the pad sites for the proposed buildings. Disturbed area will be approximately 4.7 acres.



- Intermediate sediment barriers will be installed during grading operations.
- Water bars will be constructed in the roadway to direct runoff to the sediment traps.
- Sediment traps are sized for 134 cubic yards of storage per acre of upgradient contributing area.
- Temporary seeding with perennial rye grass is intended for all stockpiles and disturbed areas that will remain unworked for greater than 21 days.

Temporary sediment trap sizing criteria is included in Appendix C and summarized below in Table 9.

Table 9
Temporary Sediment Trap Sizing Criteria

Temporary Sediment Trap	Contributing Area	Storage Volume Required	Storage Volume Below Spillway Elevation
Temporary Sediment Trap 1	2.4 acres	8,683 cubic feet	8,994 cubic feet
Temporary Sediment Trap 2	3.34 acres	12,084 cubic feet	13,280 cubic feet
Temporary Sediment Trap 3	0.25 acres	905 cubic feet	1,037 cubic feet

At the completion of construction, the temporary sediment traps will be backfilled, brought to design grades and loamed and seeded for final restoration.

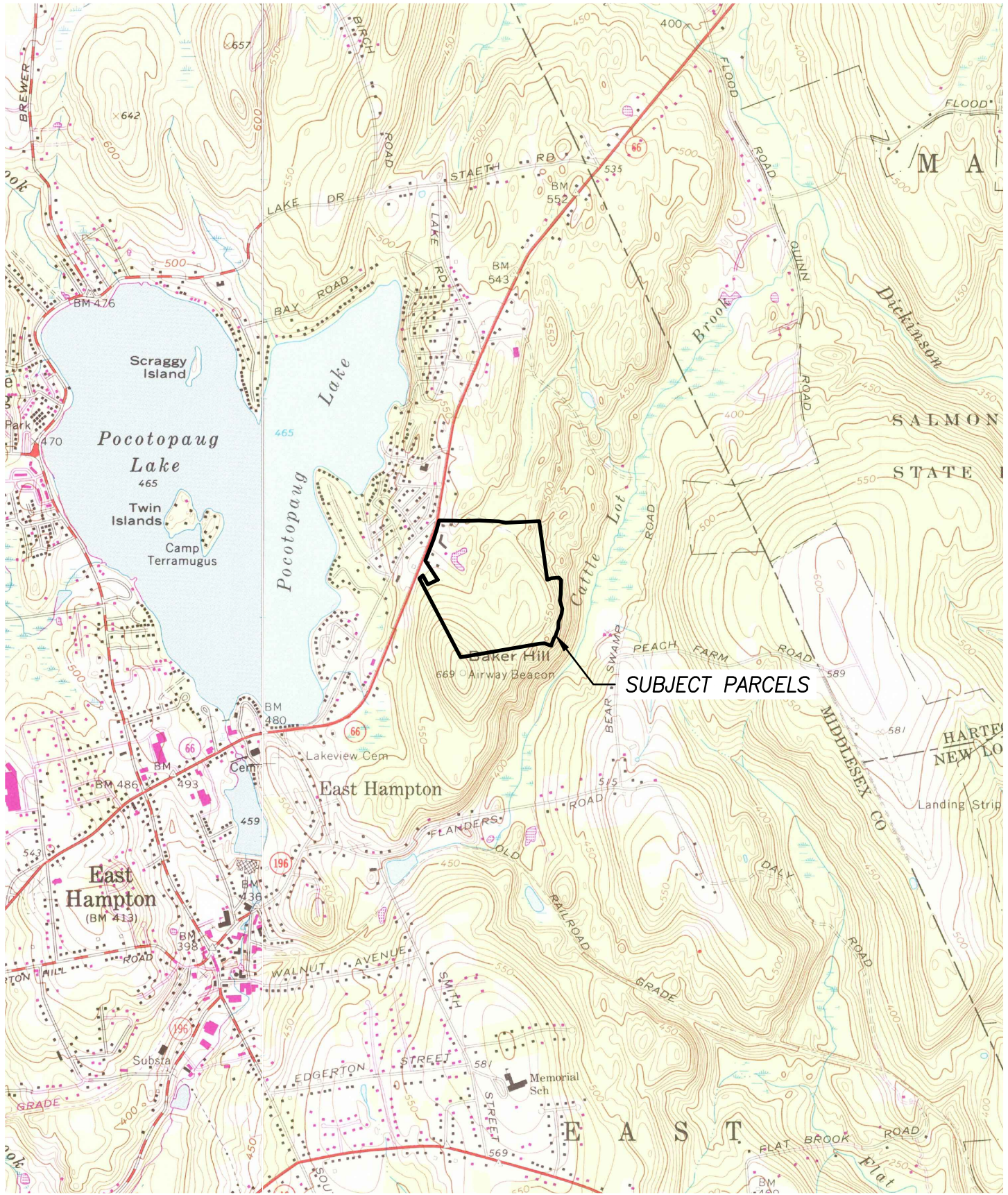
Summary

The proposed stormwater management system is intended to comply with the applicable requirements of CT DEEP, CT DOT and the Town of East Hampton. There will be no drainage impact to CT DOT facilities as a result of the proposed improvements depicted on the enclosed site plans.

The proposed improvements are shown on plans titled “Site Development Plan, Salt Pond Apartments, Prepared for Edgewater Hill Enterprises, LLC., 000 East High Street, East Hampton, Connecticut, December 2020, Job I.D. No. 20-2853, Sheet 1 through Sheet 25 of 25” prepared by Boundaries LLC.



Figures

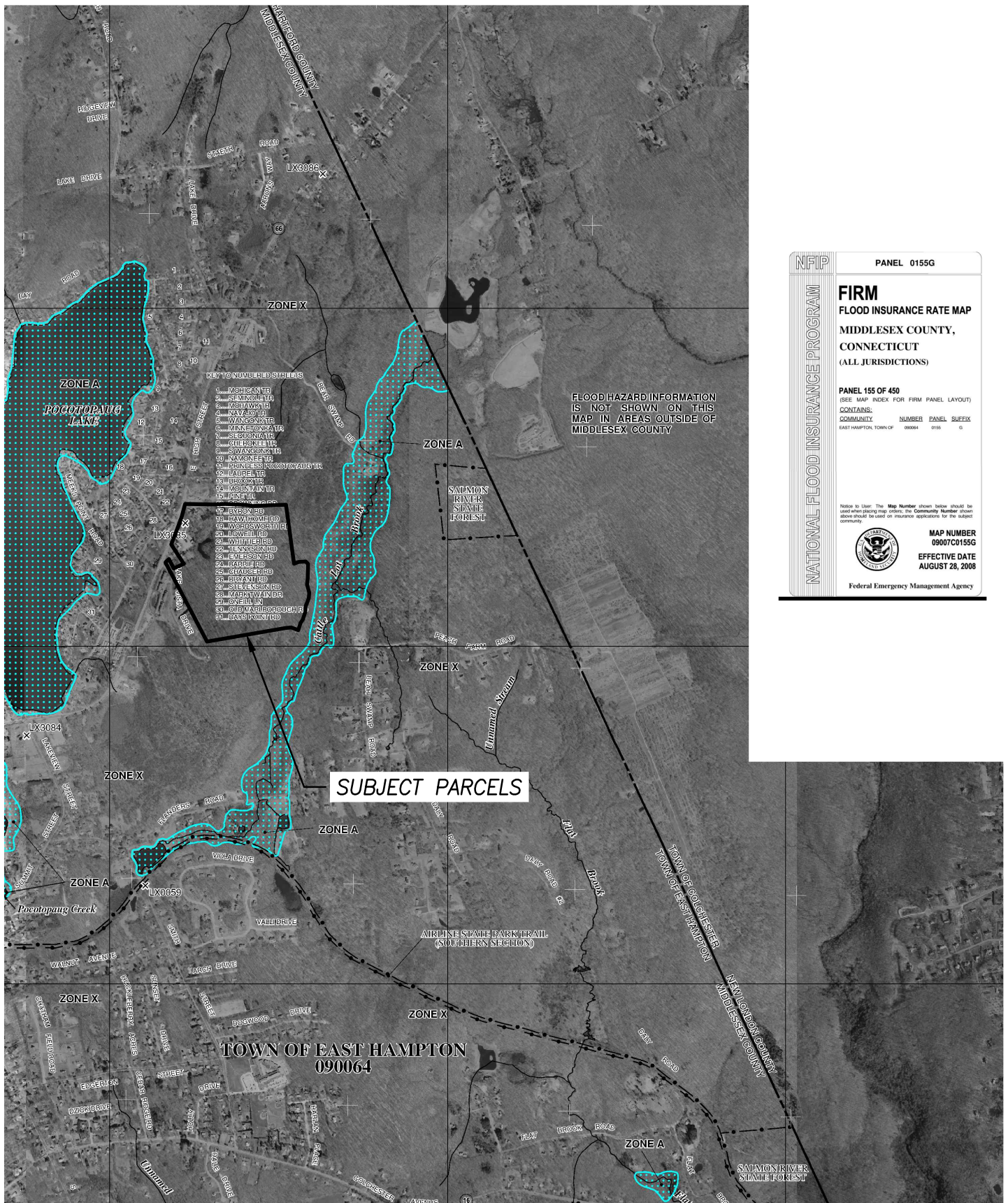


BOUNDARIES
 CIVIL ENGINEERING LAND SURVEYING LAND USE PLANNING SOIL SCIENCE
 Boundaries LLC
 179 Pachaug River Drive, Griswold, CT 06351
 T 860.376.2006 | www.boundariesllc.net



Locus Map
 (Middle Haddam - 68 / Moodus - 69 Quads)
Salt Pond Apartments
 East High Street, East Hampton, CT

SCALE:	1"=2,000'
DATE:	December 2020
JOB NO.	20-2853
FIGURE	1



PANEL 0155G

FIRM
FLOOD INSURANCE RATE MAP
MIDDLESEX COUNTY,
CONNECTICUT
(ALL JURISDICTIONS)

PANEL 155 OF 450
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:	COMMUNITY	NUMBER	PANEL	SUFFIX
	EAST HAMPTON, TOWN OF	090064	0155	G

Notice to User: The Map Number shown below should be used when placing firm orders. The Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
09007C0155G
EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

SUBJECT PARCELS

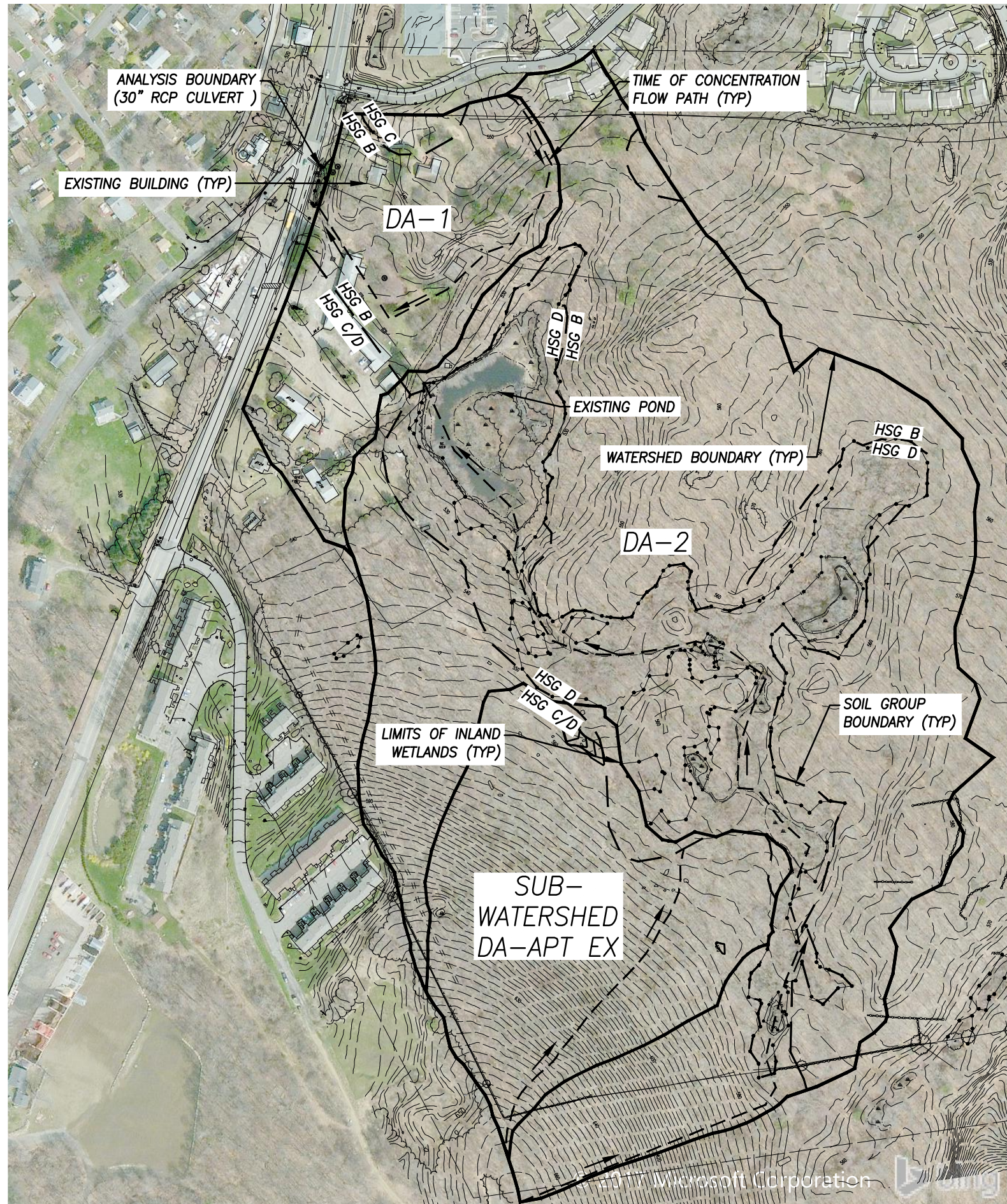
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FEMA Flood Insurance Rate Map
 Map 090064 Panel 155 G
Salt Pond Apartments
 East High Street, East Hampton, CT

SCALE: 1"=2,000'
DATE: December 2020
JOB NO. 20-2853
FIGURE 2

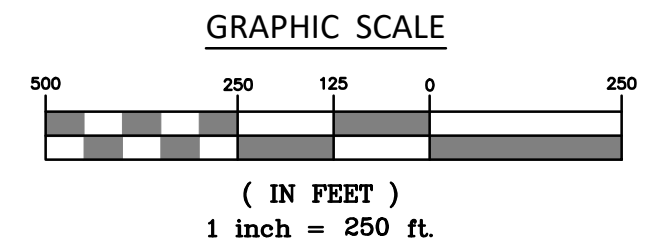


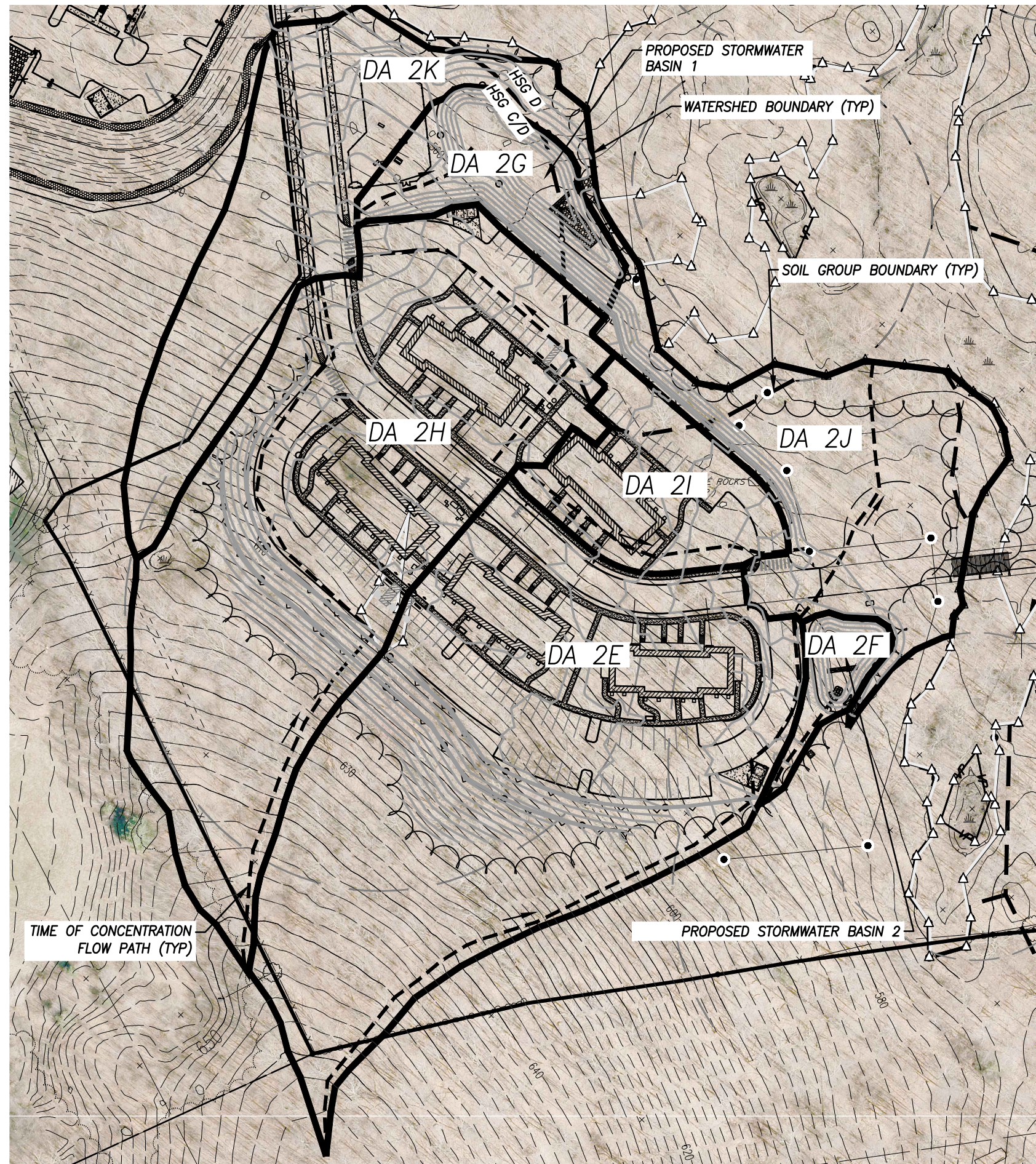
Overall Pre-Development Conditions

Watershed	Area (acres)	CN Value	Description
DA-1	6.763	70	Former residences, motel and associated parking lot
DA-2	45.453	66	Undeveloped land and two units of Laurel Ridge community
TOTAL	52.216	66	Former residences, motel, two units of Laurel Ridge community and undeveloped land

Sub-Watershed Pre-Development Conditions

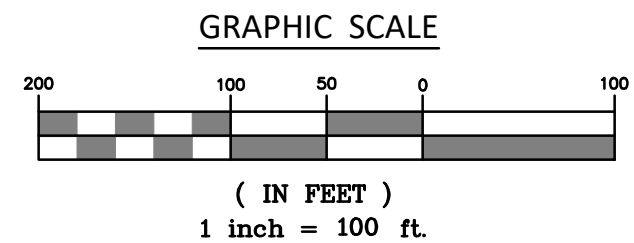
Watershed	Area (acres)	CN Value	Description
DA-APT EX	9.242	70	Wooded undeveloped land





Post-Development Conditions

Watershed	Area (acres)	CN Value	Description
DA-2E	3.136	80	Proposed apartments, roadway, parking (south) and grassed slope
DA-2F	0.141	83	Grassed slope and direct runoff to Stormwater Basin 2
DA-2G	0.444	81	Dog park and grassed slope and direct Runoff to Stormwater Basin 1
DA-2H	2.744	82	Proposed apartments, roadway, parking and grassed slope
DA-2I	0.536	89	Proposed apartments and parking (north)
DA-2J	2.298	80	Downgradient cleared areas and portions of Edgewater Circle
TOTAL	9.242	81	Apartments project area



Appendix A

NRCS Web Soil Survey Soils Report



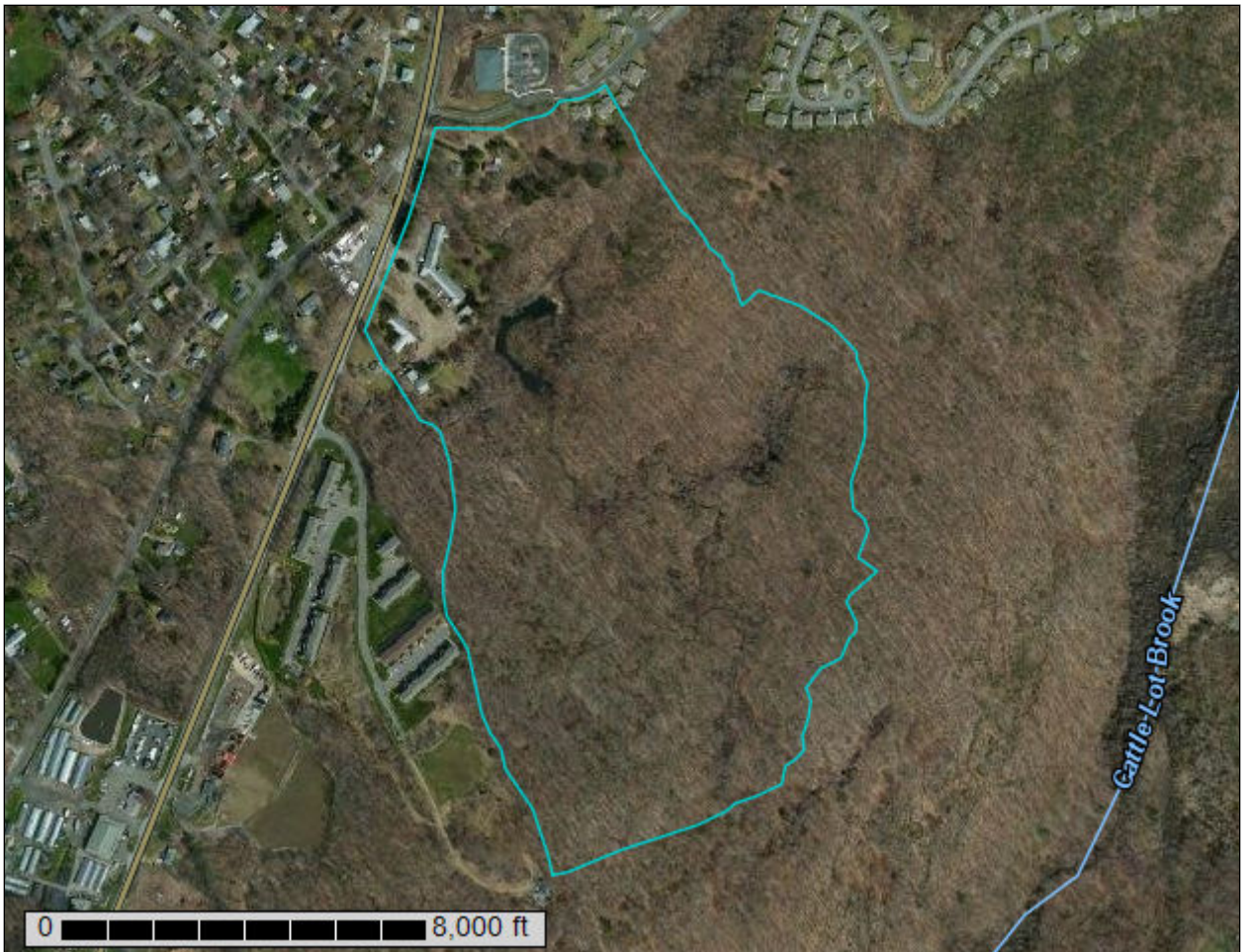
United States
Department of
Agriculture

NRCS

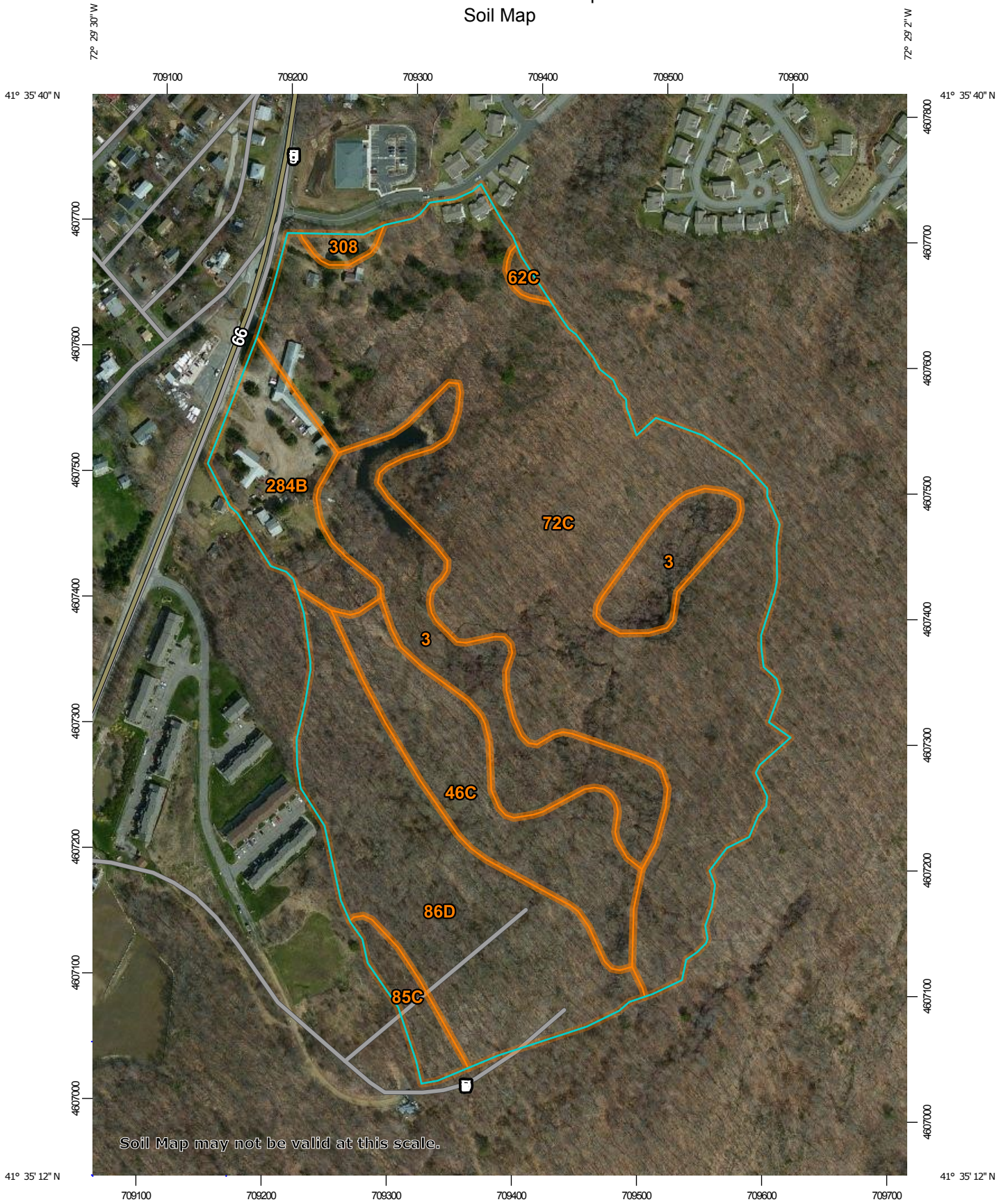
Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

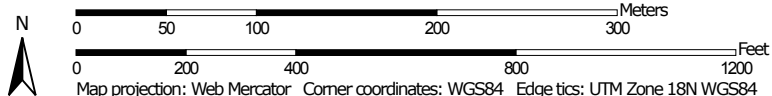
Custom Soil Resource Report for State of Connecticut



Custom Soil Resource Report Soil Map



Map Scale: 1:4,190 if printed on A portrait (8.5" x 11") sheet.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)


Soils


 Soil Map Unit Polygons


 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit


 Clay Spot


 Closed Depression

 Gravel Pit

 Gravelly Spot


 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water


 Perennial Water

 Rock Outcrop


 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole

 Slide or Slip


 Sodic Spot


 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals


Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut
 Survey Area Data: Version 15, Sep 28, 2016

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

Date(s) aerial images were photographed: Mar 28, 2011—Apr 18, 2011

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

Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	7.2	13.7%
46C	Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony	4.9	9.4%
62C	Canton and Charlton fine sandy loams, 3 to 15 percent slopes, extremely stony	0.2	0.3%
72C	Nipmuck-Brookfield complex, 3 to 15 percent slopes, very rocky	26.1	50.0%
85C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony	1.0	1.9%
86D	Paxton and Montauk fine sandy loams, 15 to 35 percent slopes, extremely stony	9.3	17.7%
284B	Paxton-Urban land complex, 3 to 8 percent slopes	3.3	6.3%
308	Udortheents, smoothed	0.3	0.6%
Totals for Area of Interest		52.2	100.0%

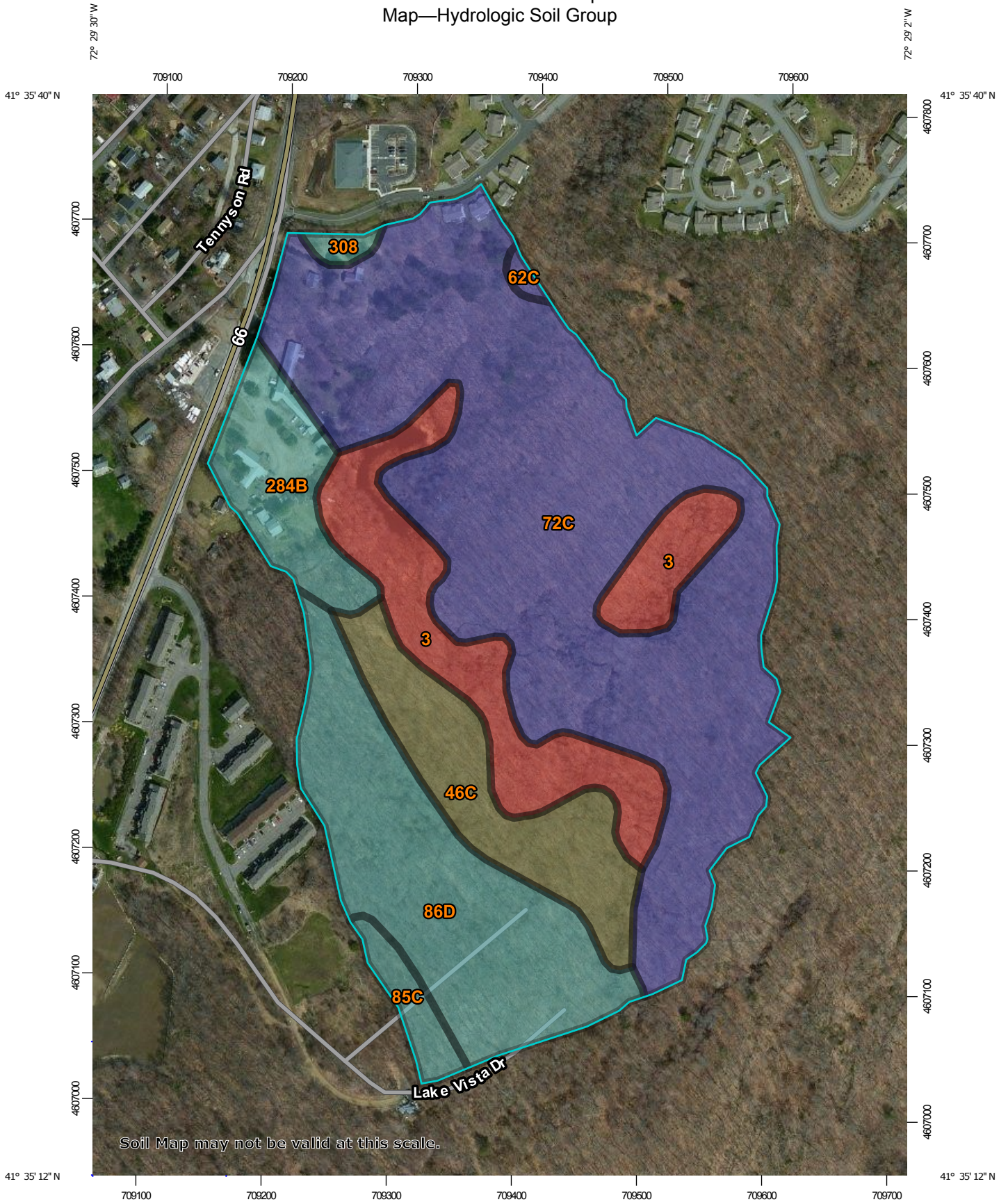
Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

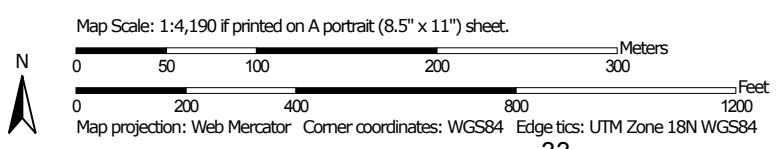
A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties

Custom Soil Resource Report
Map—Hydrologic Soil Group




Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





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

Soil Rating Lines


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

Soil Rating Points






-  A
-  A/D
-  B
-  B/D

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


Water Features

 Streams and Canals

Transportation

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

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut
 Survey Area Data: Version 15, Sep 28, 2016

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

Date(s) aerial images were photographed: Mar 28, 2011—Apr 18, 2011

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

Table—Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — State of Connecticut (CT600)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	D	7.2	13.7%
46C	Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony	C/D	4.9	9.4%
62C	Canton and Charlton fine sandy loams, 3 to 15 percent slopes, extremely stony	B	0.2	0.3%
72C	Nipmuck-Brookfield complex, 3 to 15 percent slopes, very rocky	B	26.1	50.0%
85C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony	C	1.0	1.9%
86D	Paxton and Montauk fine sandy loams, 15 to 35 percent slopes, extremely stony	C	9.3	17.7%
284B	Paxton-Urban land complex, 3 to 8 percent slopes	C	3.3	6.3%
308	Udorthents, smoothed	C	0.3	0.6%
Totals for Area of Interest			52.2	100.0%

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

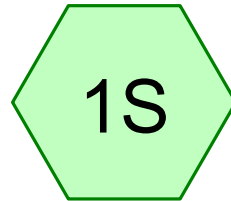
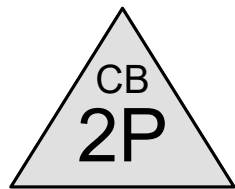
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix B

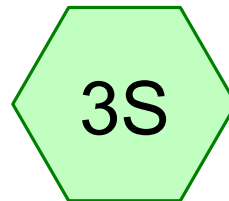
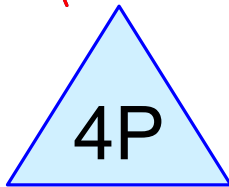
HydroCAD Modeling Results

Pre-Development Conditions HydroCAD Results



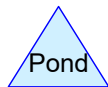
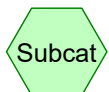
DA 1

30" RCP



DA 2

Pond



Routing Diagram for Existing to RT 66

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Existing to RT 66

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Page 2

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.37	2
2	10-Year	Type III 24-hr		Default	24.00	1	5.18	2
3	25-Year	Type III 24-hr		Default	24.00	1	6.30	2
4	50-Year	Type III 24-hr		Default	24.00	1	7.14	2
5	100-Year	Type III 24-hr		Default	24.00	1	8.04	2

Existing to RT 66

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Page 3

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.715	61	>75% Grass cover, Good, HSG B (1S, 3S)
1.356	74	>75% Grass cover, Good, HSG C (1S, 3S)
0.090	80	>75% Grass cover, Good, HSG D (3S)
0.076	96	Gravel surface, HSG B (1S, 3S)
0.332	96	Gravel surface, HSG C (1S, 3S)
0.977	98	Paved parking, HSG B (1S)
0.050	98	Paved parking, HSG C (1S, 3S)
0.207	98	Unconnected roofs, HSG B (1S, 3S)
0.155	98	Unconnected roofs, HSG C (1S)
0.839	98	Water Surface, 0% imp, HSG D (3S)
19.980	55	Woods, Good, HSG B (1S, 3S)
15.507	70	Woods, Good, HSG C (1S, 3S)
10.929	77	Woods, Good, HSG D (3S)
52.214	67	TOTAL AREA

Existing to RT 66

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Page 4

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
22.956	HSG B	1S, 3S
17.401	HSG C	1S, 3S
11.858	HSG D	3S
0.000	Other	
52.214		TOTAL AREA

Existing to RT 66

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Page 5

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	1.715	1.356	0.090	0.000	3.162	>75% Grass cover, Good	1S, 3S
0.000	0.076	0.332	0.000	0.000	0.408	Gravel surface	1S, 3S
0.000	0.977	0.050	0.000	0.000	1.027	Paved parking	1S, 3S
0.000	0.207	0.155	0.000	0.000	0.362	Unconnected roofs	1S, 3S
0.000	0.000	0.000	0.839	0.000	0.839	Water Surface, 0% imp	3S
0.000	19.980	15.507	10.929	0.000	46.417	Woods, Good	1S, 3S
0.000	22.956	17.401	11.858	0.000	52.214	TOTAL AREA	

Existing to RT 66

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Page 6

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	2P	519.92	519.62	80.0	0.0037	0.013	0.0	30.0	0.0
2	4P	522.29	520.81	440.8	0.0034	0.013	0.0	18.0	0.0

Existing to RT 66

Type III 24-hr 2-Year Rainfall=3.37"

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Page 7

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1

Runoff Area=294,524 sf 18.58% Impervious Runoff Depth=0.93"
Flow Length=1,064' Tc=26.2 min CN=70 Runoff=4.01 cfs 0.523 af

Subcatchment 3S: DA 2

Runoff Area=1,979,932 sf 0.29% Impervious Runoff Depth=0.73"
Tc=22.6 min CN=66 Runoff=20.84 cfs 2.768 af

Pond 2P: 30" RCP

Peak Elev=521.10' Inflow=6.62 cfs 3.262 af
30.0" Round Culvert n=0.013 L=80.0' S=0.0037 '/' Outflow=6.62 cfs 3.262 af

Pond 4P: Pond

Peak Elev=523.56' Storage=0.939 af Inflow=20.84 cfs 2.768 af
Primary=4.54 cfs 2.739 af Secondary=0.00 cfs 0.000 af Outflow=4.54 cfs 2.739 af

Total Runoff Area = 52.214 ac Runoff Volume = 3.291 af Average Runoff Depth = 0.76"
97.34% Pervious = 50.825 ac 2.66% Impervious = 1.389 ac

Existing to RT 66

Type III 24-hr 2-Year Rainfall=3.37"

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Summary for Subcatchment 1S: DA 1

Runoff = 4.01 cfs @ 12.41 hrs, Volume= 0.523 af, Depth= 0.93"

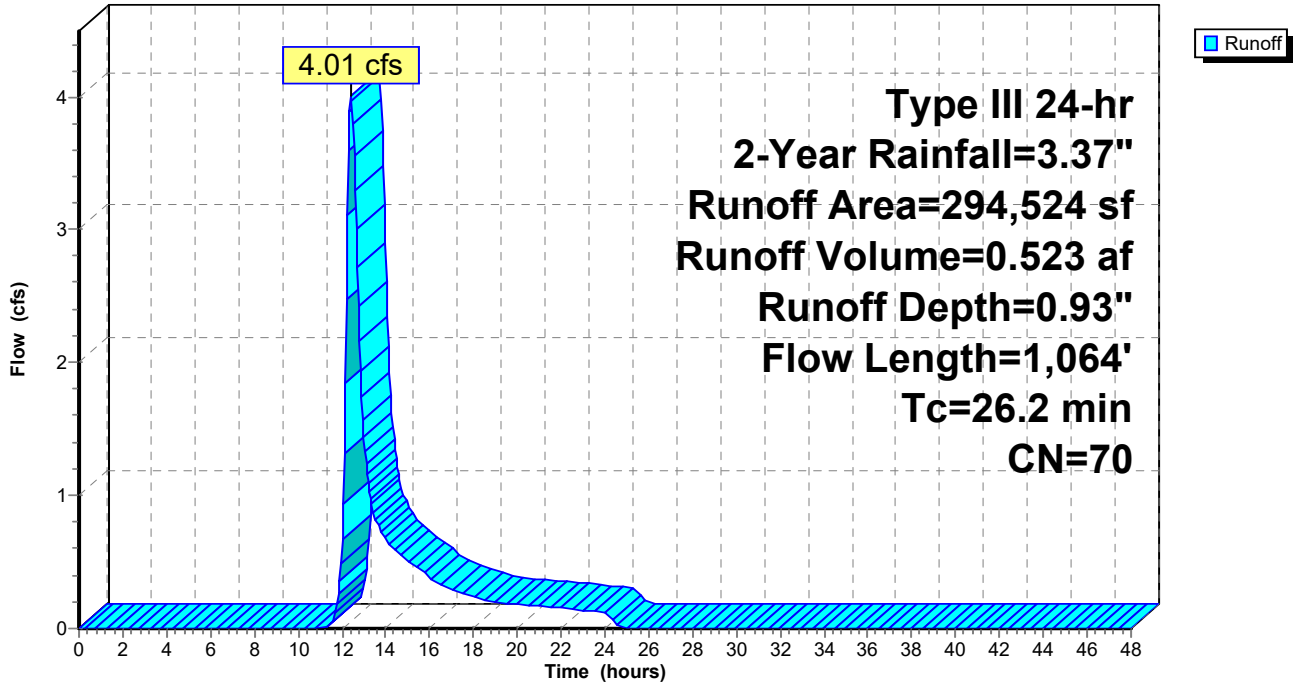
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.37"

Area (sf)	CN	Description
10,077	74	>75% Grass cover, Good, HSG C
1,575	98	Paved parking, HSG C
411	70	Woods, Good, HSG C
2,001	96	Gravel surface, HSG C
1,499	98	Unconnected roofs, HSG B
1,111	98	Unconnected roofs, HSG B
1,273	96	Gravel surface, HSG B
1,214	98	Unconnected roofs, HSG B
42,571	98	Paved parking, HSG B
1,694	96	Gravel surface, HSG B
4,509	98	Unconnected roofs, HSG C
113	98	Unconnected roofs, HSG C
2,133	98	Unconnected roofs, HSG C
12,266	96	Gravel surface, HSG C
2,876	70	Woods, Good, HSG C
1,206	70	Woods, Good, HSG C
677	70	Woods, Good, HSG C
650	70	Woods, Good, HSG C
3,876	70	Woods, Good, HSG C
641	70	Woods, Good, HSG C
4,468	55	Woods, Good, HSG B
99,615	55	Woods, Good, HSG B
62,431	61	>75% Grass cover, Good, HSG B
35,637	74	>75% Grass cover, Good, HSG C
294,524	70	Weighted Average
239,799		81.42% Pervious Area
54,725		18.58% Impervious Area
10,579		19.33% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1300	0.17		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
5.3	343	0.0466	1.08		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
10.3	434	0.0100	0.70		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.3	40	0.0183	2.18		Shallow Concentrated Flow, Gravel Unpaved Kv= 16.1 fps
0.4	147	0.0360	6.04	40.29	Parabolic Channel, Channel W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.035 Earth, dense weeds
26.2	1,064	Total			

Subcatchment 1S: DA 1

Hydrograph



Existing to RT 66

Type III 24-hr 2-Year Rainfall=3.37"

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Summary for Subcatchment 3S: DA 2

Runoff = 20.84 cfs @ 12.37 hrs, Volume= 2.768 af, Depth= 0.73"

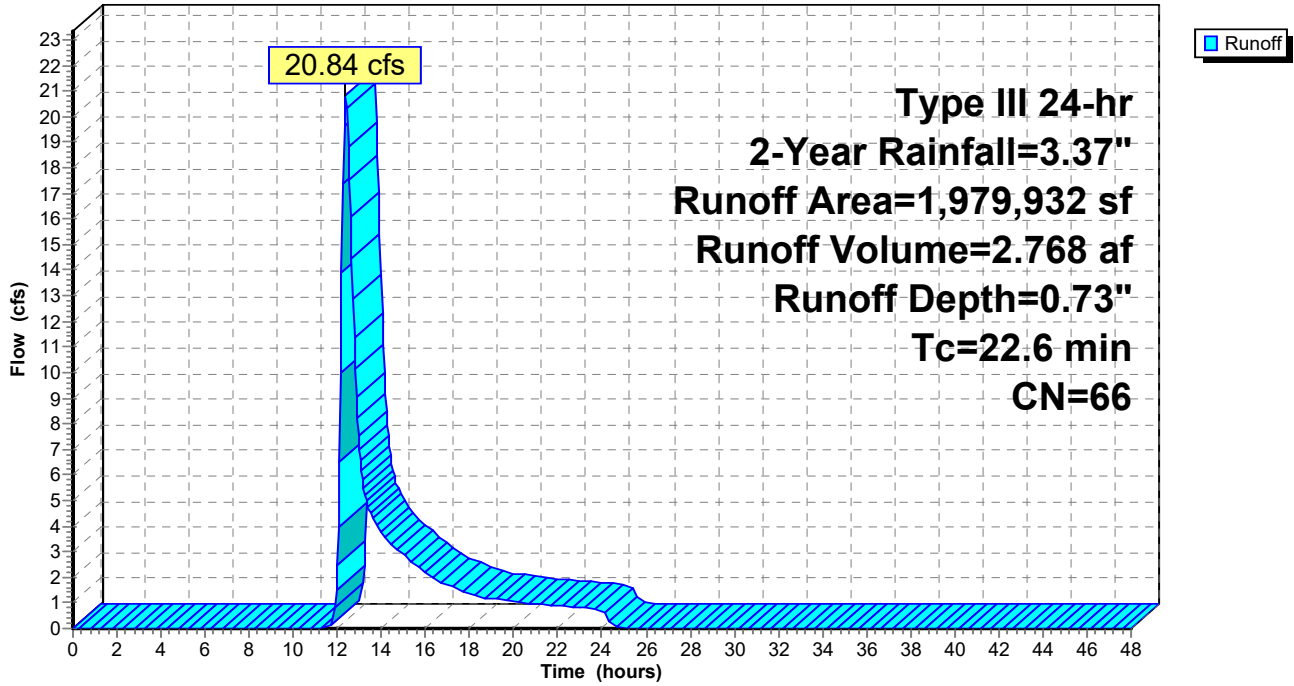
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.37"

Area (sf)	CN	Description
473,802	77	Woods, Good, HSG D
36,547	98	Water Surface, 0% imp, HSG D
3,920	80	>75% Grass cover, Good, HSG D
12,284	61	>75% Grass cover, Good, HSG B
5,184	98	Unconnected roofs, HSG B
766,264	55	Woods, Good, HSG B
663,462	70	Woods, Good, HSG C
2,265	77	Woods, Good, HSG D
1,699	70	Woods, Good, HSG C
174	96	Gravel surface, HSG C
348	96	Gravel surface, HSG B
610	98	Paved parking, HSG C
13,373	74	>75% Grass cover, Good, HSG C
1,979,932	66	Weighted Average
1,974,138		99.71% Pervious Area
5,794		0.29% Impervious Area
5,184		89.47% Unconnected

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

Subcatchment 3S: DA 2

Hydrograph



Existing to RT 66

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Type III 24-hr 2-Year Rainfall=3.37"

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Summary for Pond 2P: 30" RCP

Inflow Area = 52.214 ac, 2.66% Impervious, Inflow Depth > 0.75" for 2-Year event
 Inflow = 6.62 cfs @ 12.57 hrs, Volume= 3.262 af
 Outflow = 6.62 cfs @ 12.57 hrs, Volume= 3.262 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.62 cfs @ 12.57 hrs, Volume= 3.262 af

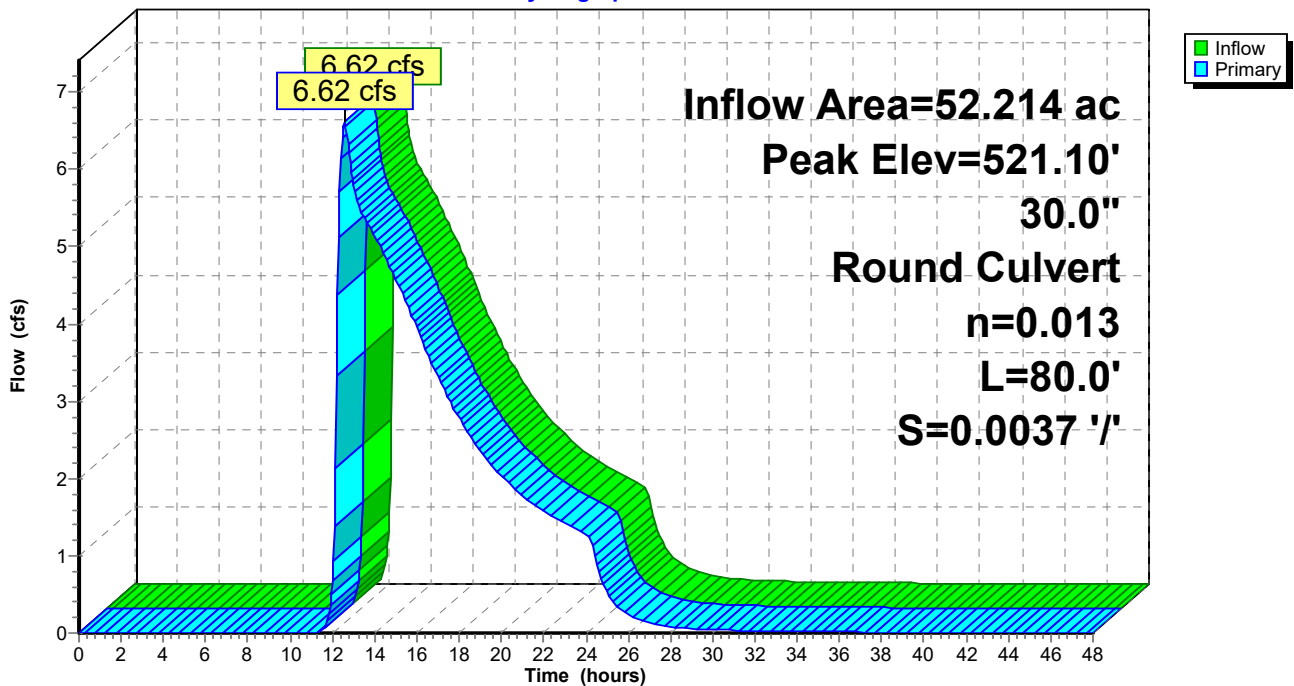
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 521.10' @ 12.57 hrs
 Flood Elev= 527.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	519.92'	30.0" Round 30" RC L= 80.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 519.92' / 519.62' S= 0.0037 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 4.91 sf

Primary OutFlow Max=6.61 cfs @ 12.57 hrs HW=521.10' (Free Discharge)
 ↳ 1=30" RC (Barrel Controls 6.61 cfs @ 4.24 fps)

Pond 2P: 30" RCP

Hydrograph



Existing to RT 66

Type III 24-hr 2-Year Rainfall=3.37"

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Summary for Pond 4P: Pond

Inflow Area = 45.453 ac, 0.29% Impervious, Inflow Depth = 0.73" for 2-Year event
 Inflow = 20.84 cfs @ 12.37 hrs, Volume= 2.768 af
 Outflow = 4.54 cfs @ 13.46 hrs, Volume= 2.739 af, Atten= 78%, Lag= 65.2 min
 Primary = 4.54 cfs @ 13.46 hrs, Volume= 2.739 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 523.56' @ 13.46 hrs Surf.Area= 1.304 ac Storage= 0.939 af

Plug-Flow detention time= 144.0 min calculated for 2.739 af (99% of inflow)
 Center-of-Mass det. time= 138.3 min (1,040.1 - 901.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	522.20'	10.783 af	Pond Storage (Irregular) Listed below		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
522.20	0.002	10.0	0.000	0.000	0.002
522.87	0.636	1,389.1	0.150	0.150	3.527
524.00	1.723	1,270.7	1.283	1.433	4.103
526.00	2.359	1,494.7	4.065	5.499	5.237
528.00	2.936	1,638.1	5.284	10.783	6.061

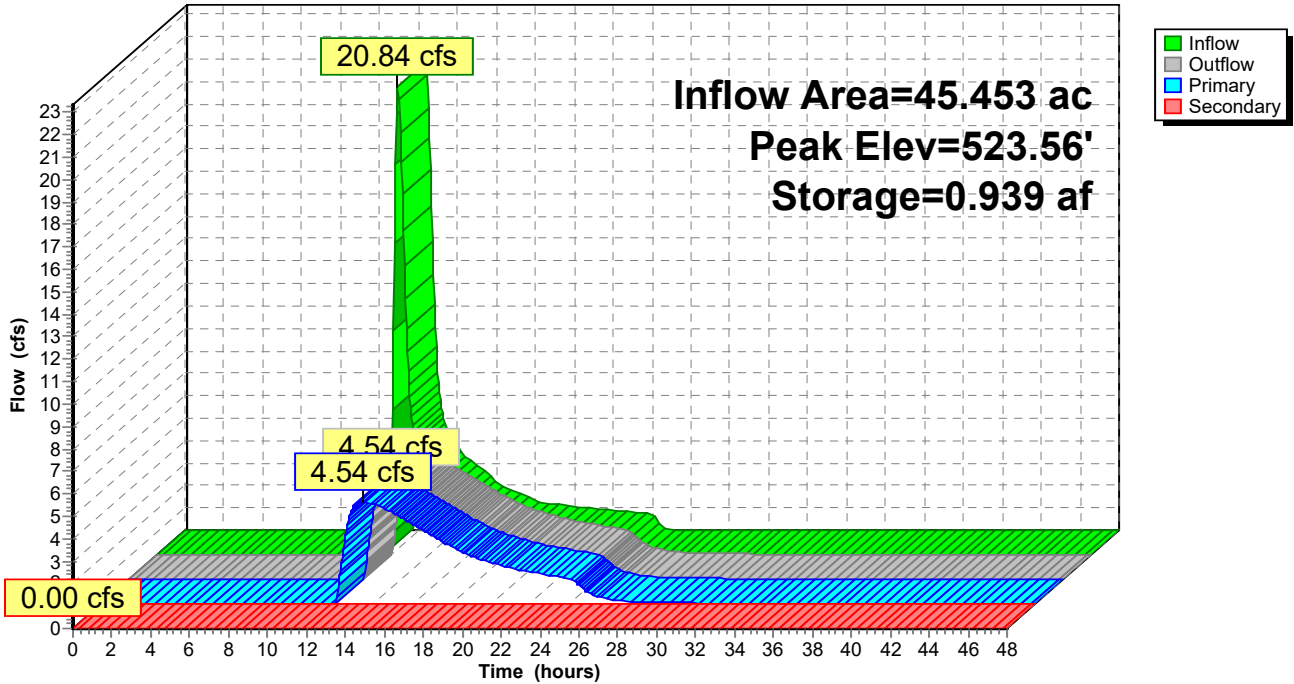
Device	Routing	Invert	Outlet Devices
#1	Primary	522.29'	18.0" Round 18" RCP L= 440.8' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 522.29' / 520.81' S= 0.0034 ' /' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Secondary	526.90'	83.0' long x 15.0' breadth Overflow Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=4.54 cfs @ 13.46 hrs HW=523.56' TW=520.98' (Dynamic Tailwater)
 ↑1=18" RCP (Barrel Controls 4.54 cfs @ 3.82 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=522.20' TW=519.92' (Dynamic Tailwater)
 ↑2=Overflow (Controls 0.00 cfs)

Pond 4P: Pond

Hydrograph



Existing to RT 66

Type III 24-hr 10-Year Rainfall=5.18"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1

Runoff Area=294,524 sf 18.58% Impervious Runoff Depth=2.17"
Flow Length=1,064' Tc=26.2 min CN=70 Runoff=10.12 cfs 1.223 af

Subcatchment 3S: DA 2

Runoff Area=1,979,932 sf 0.29% Impervious Runoff Depth=1.85"
Tc=22.6 min CN=66 Runoff=60.43 cfs 7.013 af

Pond 2P: 30" RCP

Peak Elev=521.93' Inflow=16.88 cfs 8.206 af
30.0" Round Culvert n=0.013 L=80.0' S=0.0037 '/' Outflow=16.88 cfs 8.206 af

Pond 4P: Pond

Peak Elev=524.88' Storage=3.229 af Inflow=60.43 cfs 7.013 af
Primary=7.48 cfs 6.983 af Secondary=0.00 cfs 0.000 af Outflow=7.48 cfs 6.983 af

Total Runoff Area = 52.214 ac Runoff Volume = 8.236 af Average Runoff Depth = 1.89"
97.34% Pervious = 50.825 ac 2.66% Impervious = 1.389 ac

Existing to RT 66

Type III 24-hr 10-Year Rainfall=5.18"

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Summary for Subcatchment 1S: DA 1

Runoff = 10.12 cfs @ 12.38 hrs, Volume= 1.223 af, Depth= 2.17"

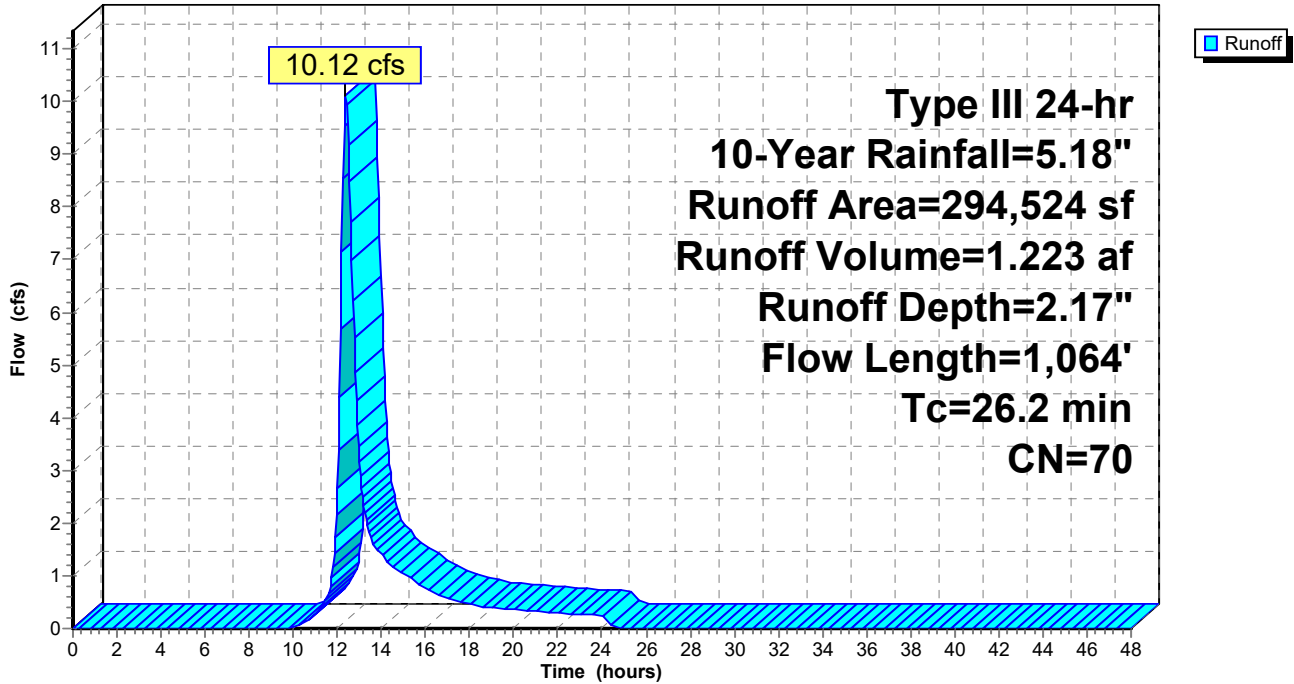
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.18"

Area (sf)	CN	Description
10,077	74	>75% Grass cover, Good, HSG C
1,575	98	Paved parking, HSG C
411	70	Woods, Good, HSG C
2,001	96	Gravel surface, HSG C
1,499	98	Unconnected roofs, HSG B
1,111	98	Unconnected roofs, HSG B
1,273	96	Gravel surface, HSG B
1,214	98	Unconnected roofs, HSG B
42,571	98	Paved parking, HSG B
1,694	96	Gravel surface, HSG B
4,509	98	Unconnected roofs, HSG C
113	98	Unconnected roofs, HSG C
2,133	98	Unconnected roofs, HSG C
12,266	96	Gravel surface, HSG C
2,876	70	Woods, Good, HSG C
1,206	70	Woods, Good, HSG C
677	70	Woods, Good, HSG C
650	70	Woods, Good, HSG C
3,876	70	Woods, Good, HSG C
641	70	Woods, Good, HSG C
4,468	55	Woods, Good, HSG B
99,615	55	Woods, Good, HSG B
62,431	61	>75% Grass cover, Good, HSG B
35,637	74	>75% Grass cover, Good, HSG C
294,524	70	Weighted Average
239,799		81.42% Pervious Area
54,725		18.58% Impervious Area
10,579		19.33% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1300	0.17		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
5.3	343	0.0466	1.08		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
10.3	434	0.0100	0.70		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.3	40	0.0183	2.18		Shallow Concentrated Flow, Gravel Unpaved Kv= 16.1 fps
0.4	147	0.0360	6.04	40.29	Parabolic Channel, Channel W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.035 Earth, dense weeds
26.2	1,064	Total			

Subcatchment 1S: DA 1

Hydrograph



Existing to RT 66

Type III 24-hr 10-Year Rainfall=5.18"

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Summary for Subcatchment 3S: DA 2

Runoff = 60.43 cfs @ 12.34 hrs, Volume= 7.013 af, Depth= 1.85"

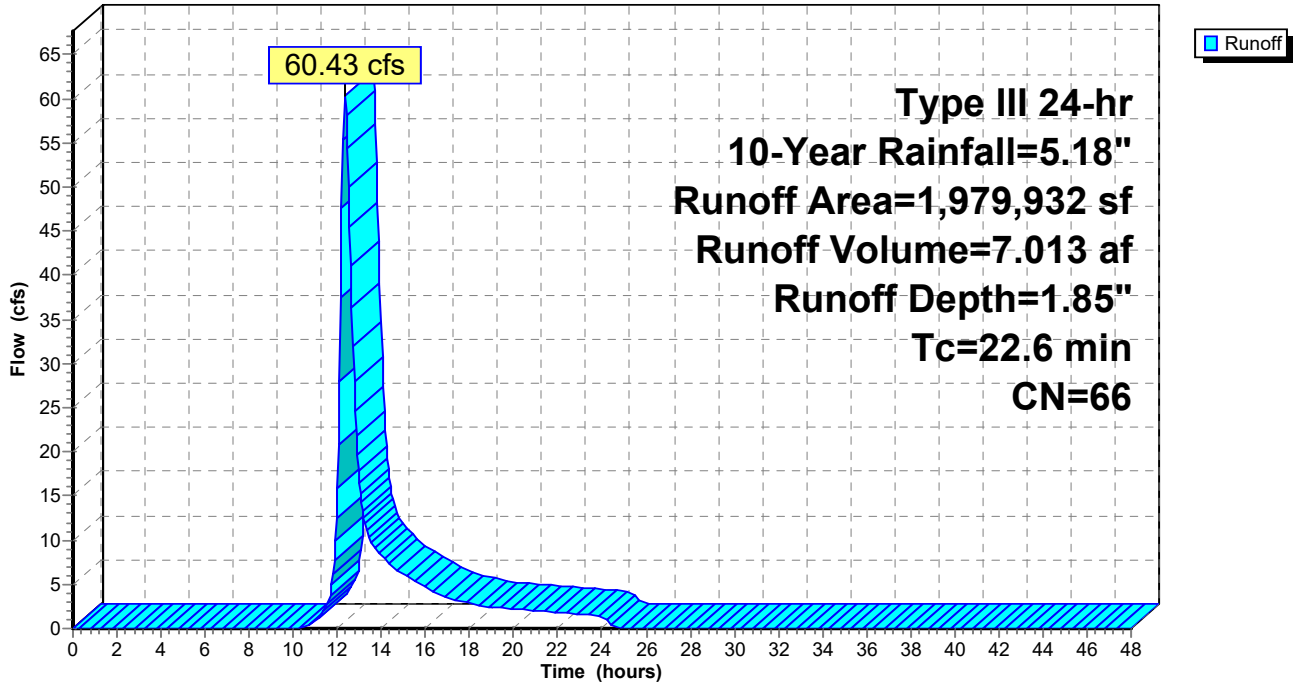
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.18"

Area (sf)	CN	Description
473,802	77	Woods, Good, HSG D
36,547	98	Water Surface, 0% imp, HSG D
3,920	80	>75% Grass cover, Good, HSG D
12,284	61	>75% Grass cover, Good, HSG B
5,184	98	Unconnected roofs, HSG B
766,264	55	Woods, Good, HSG B
663,462	70	Woods, Good, HSG C
2,265	77	Woods, Good, HSG D
1,699	70	Woods, Good, HSG C
174	96	Gravel surface, HSG C
348	96	Gravel surface, HSG B
610	98	Paved parking, HSG C
13,373	74	>75% Grass cover, Good, HSG C
1,979,932	66	Weighted Average
1,974,138		99.71% Pervious Area
5,794		0.29% Impervious Area
5,184		89.47% Unconnected

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

Subcatchment 3S: DA 2

Hydrograph



Existing to RT 66

Type III 24-hr 10-Year Rainfall=5.18"

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Summary for Pond 2P: 30" RCP

Inflow Area = 52.214 ac, 2.66% Impervious, Inflow Depth > 1.89" for 10-Year event
 Inflow = 16.88 cfs @ 12.41 hrs, Volume= 8.206 af
 Outflow = 16.88 cfs @ 12.41 hrs, Volume= 8.206 af, Atten= 0%, Lag= 0.0 min
 Primary = 16.88 cfs @ 12.41 hrs, Volume= 8.206 af

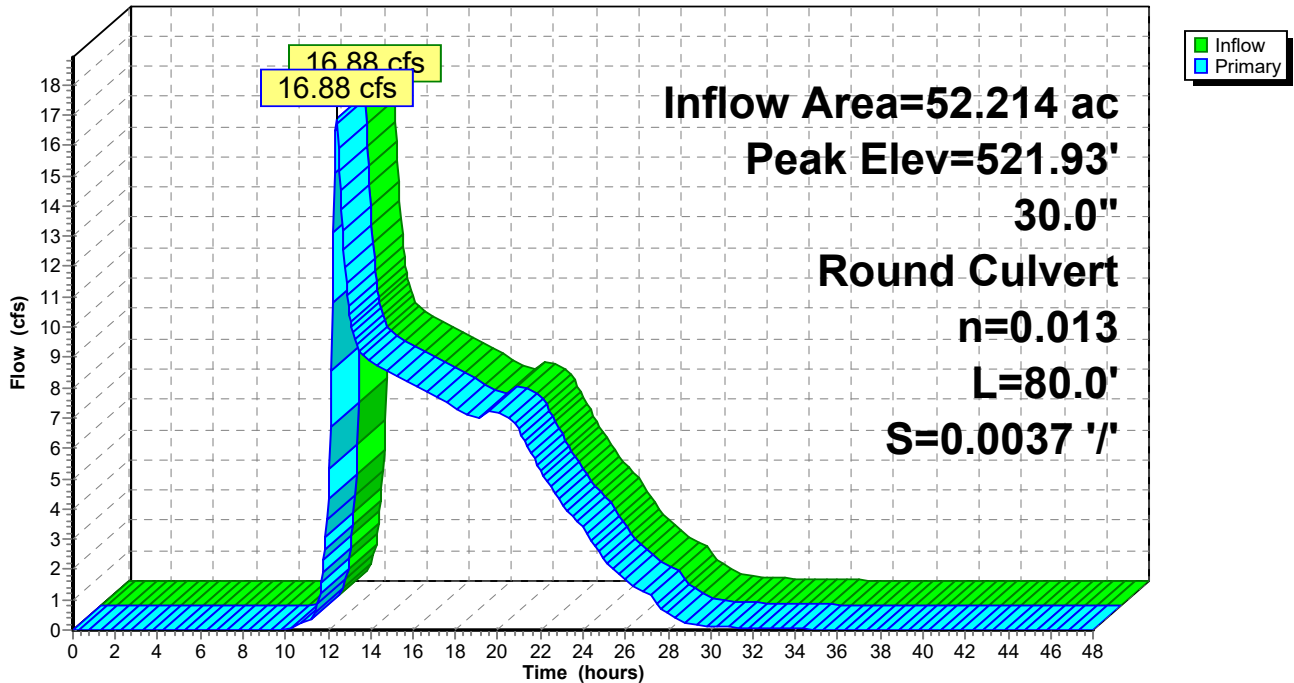
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 521.93' @ 12.41 hrs
 Flood Elev= 527.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	519.92'	30.0" Round 30" RC L= 80.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 519.92' / 519.62' S= 0.0037 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 4.91 sf

Primary OutFlow Max=16.84 cfs @ 12.41 hrs HW=521.93' (Free Discharge)
 ↳ 1=30" RC (Barrel Controls 16.84 cfs @ 5.45 fps)

Pond 2P: 30" RCP

Hydrograph



Existing to RT 66

Type III 24-hr 10-Year Rainfall=5.18"

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Summary for Pond 4P: Pond

Inflow Area = 45.453 ac, 0.29% Impervious, Inflow Depth = 1.85" for 10-Year event
 Inflow = 60.43 cfs @ 12.34 hrs, Volume= 7.013 af
 Outflow = 7.48 cfs @ 14.27 hrs, Volume= 6.983 af, Atten= 88%, Lag= 116.0 min
 Primary = 7.48 cfs @ 14.27 hrs, Volume= 6.983 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 524.88' @ 14.27 hrs Surf.Area= 2.004 ac Storage= 3.229 af

Plug-Flow detention time= 230.9 min calculated for 6.983 af (100% of inflow)
 Center-of-Mass det. time= 228.3 min (1,099.7 - 871.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	522.20'	10.783 af	Pond Storage (Irregular) Listed below		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
522.20	0.002	10.0	0.000	0.000	0.002
522.87	0.636	1,389.1	0.150	0.150	3.527
524.00	1.723	1,270.7	1.283	1.433	4.103
526.00	2.359	1,494.7	4.065	5.499	5.237
528.00	2.936	1,638.1	5.284	10.783	6.061

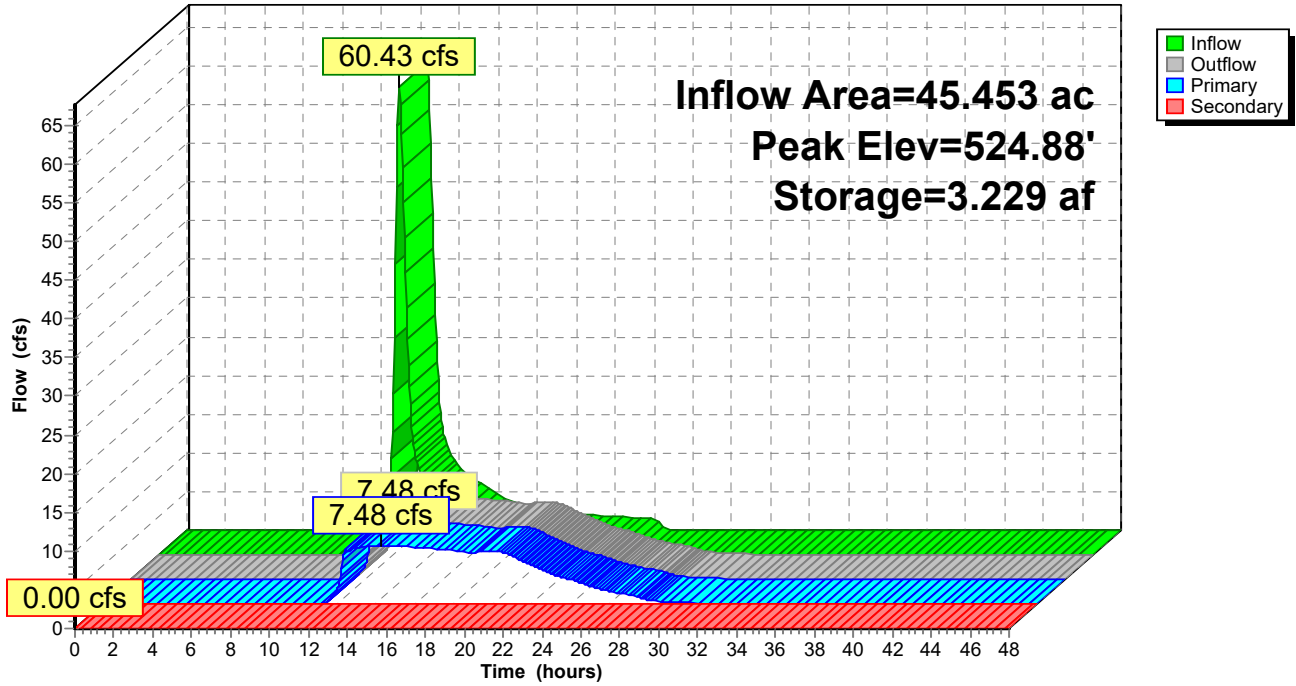
Device	Routing	Invert	Outlet Devices
#1	Primary	522.29'	18.0" Round 18" RCP L= 440.8' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 522.29' / 520.81' S= 0.0034 '/ n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Secondary	526.90'	83.0' long x 15.0' breadth Overflow Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=7.48 cfs @ 14.27 hrs HW=524.88' TW=521.30' (Dynamic Tailwater)
 ↑1=18" RCP (Barrel Controls 7.48 cfs @ 4.23 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=522.20' TW=519.92' (Dynamic Tailwater)
 ↑2=Overflow (Controls 0.00 cfs)

Pond 4P: Pond

Hydrograph



Existing to RT 66

Type III 24-hr 25-Year Rainfall=6.30"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1

Runoff Area=294,524 sf 18.58% Impervious Runoff Depth=3.05"
Flow Length=1,064' Tc=26.2 min CN=70 Runoff=14.40 cfs 1.716 af

Subcatchment 3S: DA 2

Runoff Area=1,979,932 sf 0.29% Impervious Runoff Depth=2.66"
Tc=22.6 min CN=66 Runoff=89.03 cfs 10.093 af

Pond 2P: 30" RCP

Peak Elev=522.26' Inflow=21.32 cfs 11.778 af
30.0" Round Culvert n=0.013 L=80.0' S=0.0037 '/' Outflow=21.32 cfs 11.778 af

Pond 4P: Pond

Peak Elev=525.84' Storage=5.181 af Inflow=89.03 cfs 10.093 af
Primary=8.76 cfs 10.062 af Secondary=0.00 cfs 0.000 af Outflow=8.76 cfs 10.062 af

Total Runoff Area = 52.214 ac Runoff Volume = 11.809 af Average Runoff Depth = 2.71"
97.34% Pervious = 50.825 ac 2.66% Impervious = 1.389 ac

Existing to RT 66

Type III 24-hr 25-Year Rainfall=6.30"

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Summary for Subcatchment 1S: DA 1

Runoff = 14.40 cfs @ 12.37 hrs, Volume= 1.716 af, Depth= 3.05"

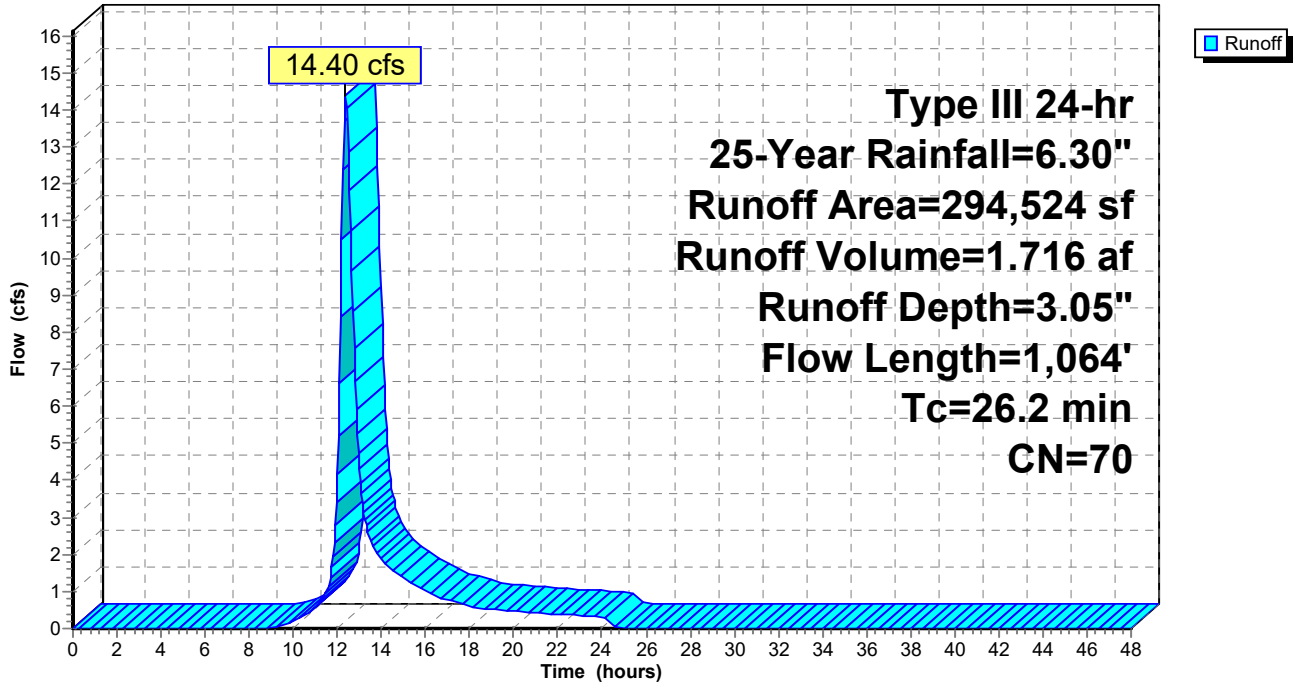
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.30"

Area (sf)	CN	Description
10,077	74	>75% Grass cover, Good, HSG C
1,575	98	Paved parking, HSG C
411	70	Woods, Good, HSG C
2,001	96	Gravel surface, HSG C
1,499	98	Unconnected roofs, HSG B
1,111	98	Unconnected roofs, HSG B
1,273	96	Gravel surface, HSG B
1,214	98	Unconnected roofs, HSG B
42,571	98	Paved parking, HSG B
1,694	96	Gravel surface, HSG B
4,509	98	Unconnected roofs, HSG C
113	98	Unconnected roofs, HSG C
2,133	98	Unconnected roofs, HSG C
12,266	96	Gravel surface, HSG C
2,876	70	Woods, Good, HSG C
1,206	70	Woods, Good, HSG C
677	70	Woods, Good, HSG C
650	70	Woods, Good, HSG C
3,876	70	Woods, Good, HSG C
641	70	Woods, Good, HSG C
4,468	55	Woods, Good, HSG B
99,615	55	Woods, Good, HSG B
62,431	61	>75% Grass cover, Good, HSG B
35,637	74	>75% Grass cover, Good, HSG C
294,524	70	Weighted Average
239,799		81.42% Pervious Area
54,725		18.58% Impervious Area
10,579		19.33% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1300	0.17		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
5.3	343	0.0466	1.08		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
10.3	434	0.0100	0.70		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.3	40	0.0183	2.18		Shallow Concentrated Flow, Gravel Unpaved Kv= 16.1 fps
0.4	147	0.0360	6.04	40.29	Parabolic Channel, Channel W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.035 Earth, dense weeds
26.2	1,064	Total			

Subcatchment 1S: DA 1

Hydrograph



Existing to RT 66

Type III 24-hr 25-Year Rainfall=6.30"

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Summary for Subcatchment 3S: DA 2

Runoff = 89.03 cfs @ 12.33 hrs, Volume= 10.093 af, Depth= 2.66"

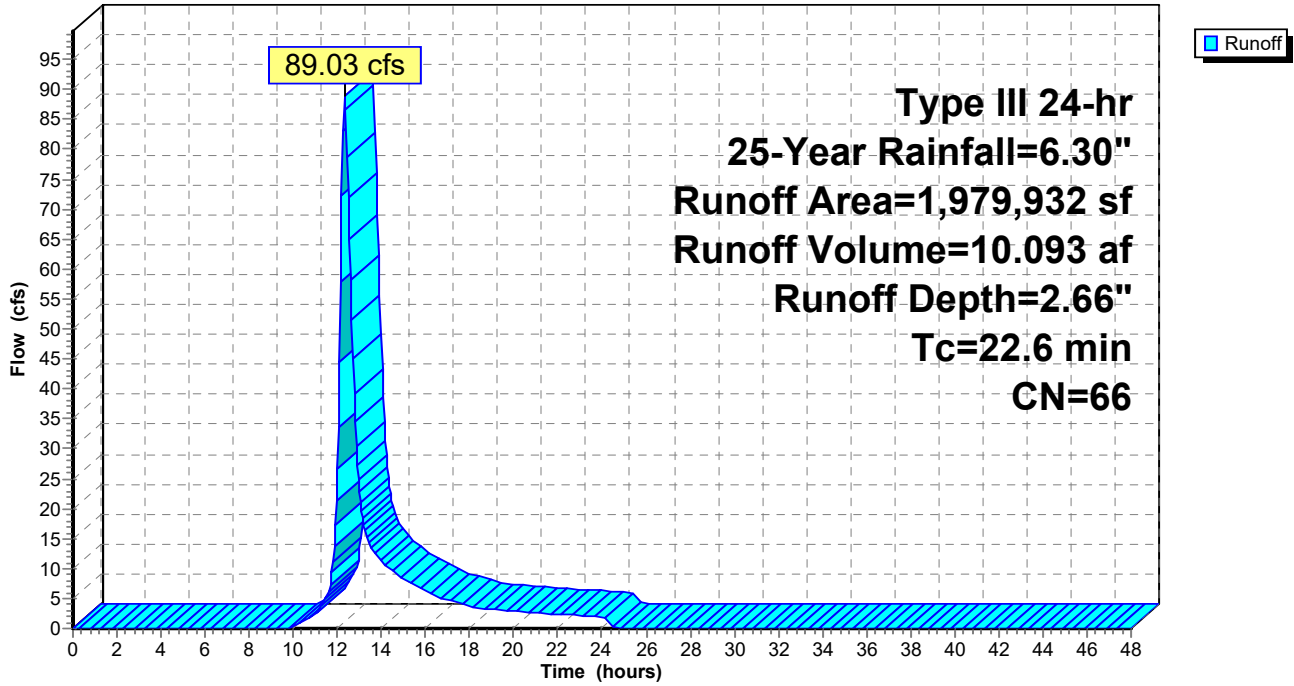
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.30"

Area (sf)	CN	Description
473,802	77	Woods, Good, HSG D
36,547	98	Water Surface, 0% imp, HSG D
3,920	80	>75% Grass cover, Good, HSG D
12,284	61	>75% Grass cover, Good, HSG B
5,184	98	Unconnected roofs, HSG B
766,264	55	Woods, Good, HSG B
663,462	70	Woods, Good, HSG C
2,265	77	Woods, Good, HSG D
1,699	70	Woods, Good, HSG C
174	96	Gravel surface, HSG C
348	96	Gravel surface, HSG B
610	98	Paved parking, HSG C
13,373	74	>75% Grass cover, Good, HSG C
1,979,932	66	Weighted Average
1,974,138		99.71% Pervious Area
5,794		0.29% Impervious Area
5,184		89.47% Unconnected

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

Subcatchment 3S: DA 2

Hydrograph



Existing to RT 66

Type III 24-hr 25-Year Rainfall=6.30"

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Summary for Pond 2P: 30" RCP

Inflow Area = 52.214 ac, 2.66% Impervious, Inflow Depth > 2.71" for 25-Year event
 Inflow = 21.32 cfs @ 12.40 hrs, Volume= 11.778 af
 Outflow = 21.32 cfs @ 12.40 hrs, Volume= 11.778 af, Atten= 0%, Lag= 0.0 min
 Primary = 21.32 cfs @ 12.40 hrs, Volume= 11.778 af

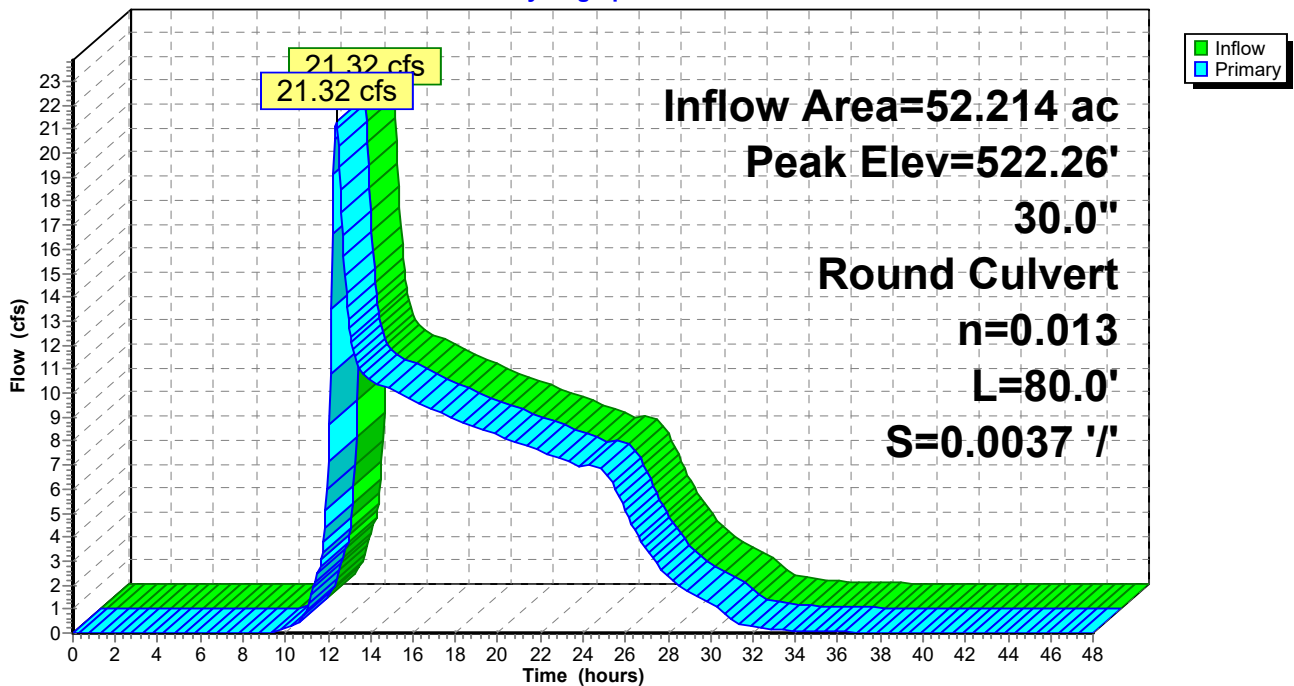
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 522.26' @ 12.40 hrs
 Flood Elev= 527.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	519.92'	30.0" Round 30" RC L= 80.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 519.92' / 519.62' S= 0.0037 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 4.91 sf

Primary OutFlow Max=21.30 cfs @ 12.40 hrs HW=522.25' (Free Discharge)
 ↳ 1=30" RC (Barrel Controls 21.30 cfs @ 5.80 fps)

Pond 2P: 30" RCP

Hydrograph



Existing to RT 66

Type III 24-hr 25-Year Rainfall=6.30"

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Summary for Pond 4P: Pond

Inflow Area = 45.453 ac, 0.29% Impervious, Inflow Depth = 2.66" for 25-Year event
 Inflow = 89.03 cfs @ 12.33 hrs, Volume= 10.093 af
 Outflow = 8.76 cfs @ 14.83 hrs, Volume= 10.062 af, Atten= 90%, Lag= 150.2 min
 Primary = 8.76 cfs @ 14.83 hrs, Volume= 10.062 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 525.84' @ 14.83 hrs Surf.Area= 2.309 ac Storage= 5.181 af

Plug-Flow detention time= 315.4 min calculated for 10.062 af (100% of inflow)
 Center-of-Mass det. time= 313.5 min (1,174.0 - 860.5)

Volume	Invert	Avail.Storage	Storage Description		
#1	522.20'	10.783 af	Pond Storage (Irregular) Listed below		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
522.20	0.002	10.0	0.000	0.000	0.002
522.87	0.636	1,389.1	0.150	0.150	3.527
524.00	1.723	1,270.7	1.283	1.433	4.103
526.00	2.359	1,494.7	4.065	5.499	5.237
528.00	2.936	1,638.1	5.284	10.783	6.061

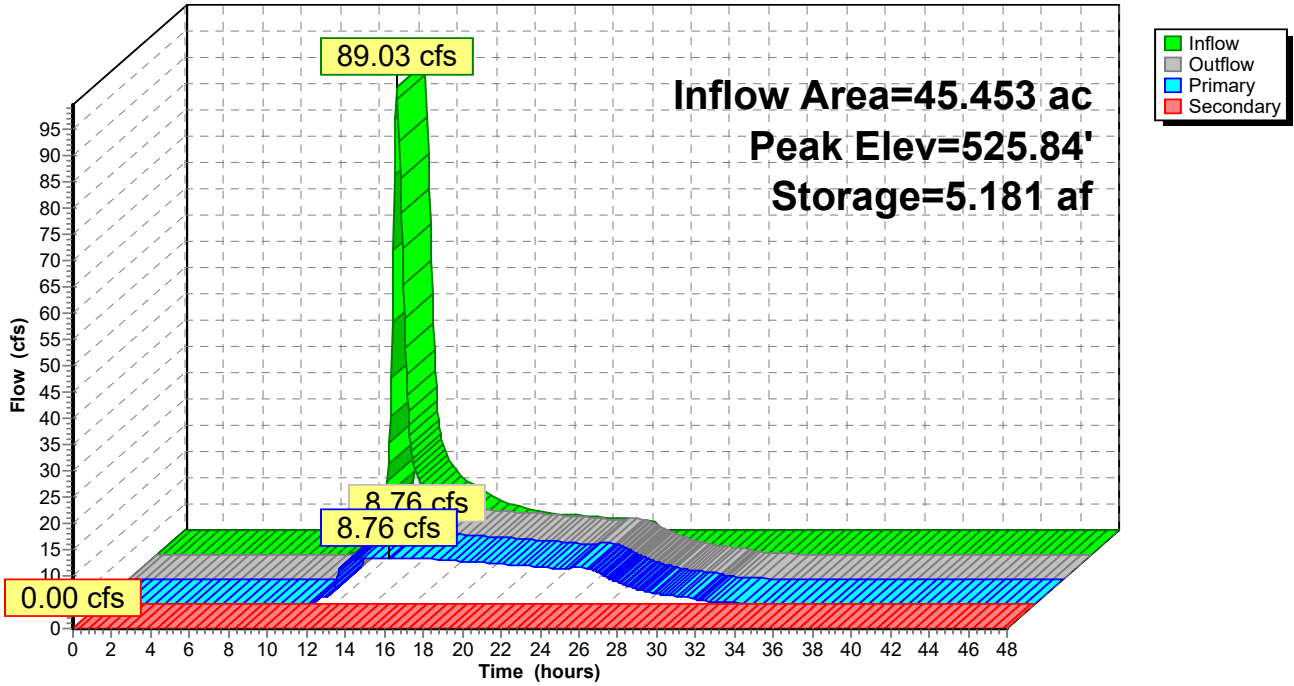
Device	Routing	Invert	Outlet Devices
#1	Primary	522.29'	18.0" Round 18" RCP L= 440.8' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 522.29' / 520.81' S= 0.0034 ' /' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Secondary	526.90'	83.0' long x 15.0' breadth Overflow Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=8.76 cfs @ 14.83 hrs HW=525.84' TW=521.42' (Dynamic Tailwater)
 ↑1=18" RCP (Barrel Controls 8.76 cfs @ 4.96 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=522.20' TW=519.92' (Dynamic Tailwater)
 ↑2=Overflow (Controls 0.00 cfs)

Pond 4P: Pond

Hydrograph



Existing to RT 66

Type III 24-hr 50-Year Rainfall=7.14"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1

Runoff Area=294,524 sf 18.58% Impervious Runoff Depth=3.74"
Flow Length=1,064' Tc=26.2 min CN=70 Runoff=17.73 cfs 2.105 af

Subcatchment 3S: DA 2

Runoff Area=1,979,932 sf 0.29% Impervious Runoff Depth=3.31"
Tc=22.6 min CN=66 Runoff=111.95 cfs 12.556 af

Pond 2P: 30" RCP

Peak Elev=522.53' Inflow=24.93 cfs 14.628 af
30.0" Round Culvert n=0.013 L=80.0' S=0.0037 '/' Outflow=24.93 cfs 14.628 af

Pond 4P: Pond

Peak Elev=526.51' Storage=6.834 af Inflow=111.95 cfs 12.556 af
Primary=9.54 cfs 12.523 af Secondary=0.00 cfs 0.000 af Outflow=9.54 cfs 12.523 af

Total Runoff Area = 52.214 ac Runoff Volume = 14.660 af Average Runoff Depth = 3.37"
97.34% Pervious = 50.825 ac 2.66% Impervious = 1.389 ac

Existing to RT 66

Type III 24-hr 50-Year Rainfall=7.14"

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Summary for Subcatchment 1S: DA 1

Runoff = 17.73 cfs @ 12.37 hrs, Volume= 2.105 af, Depth= 3.74"

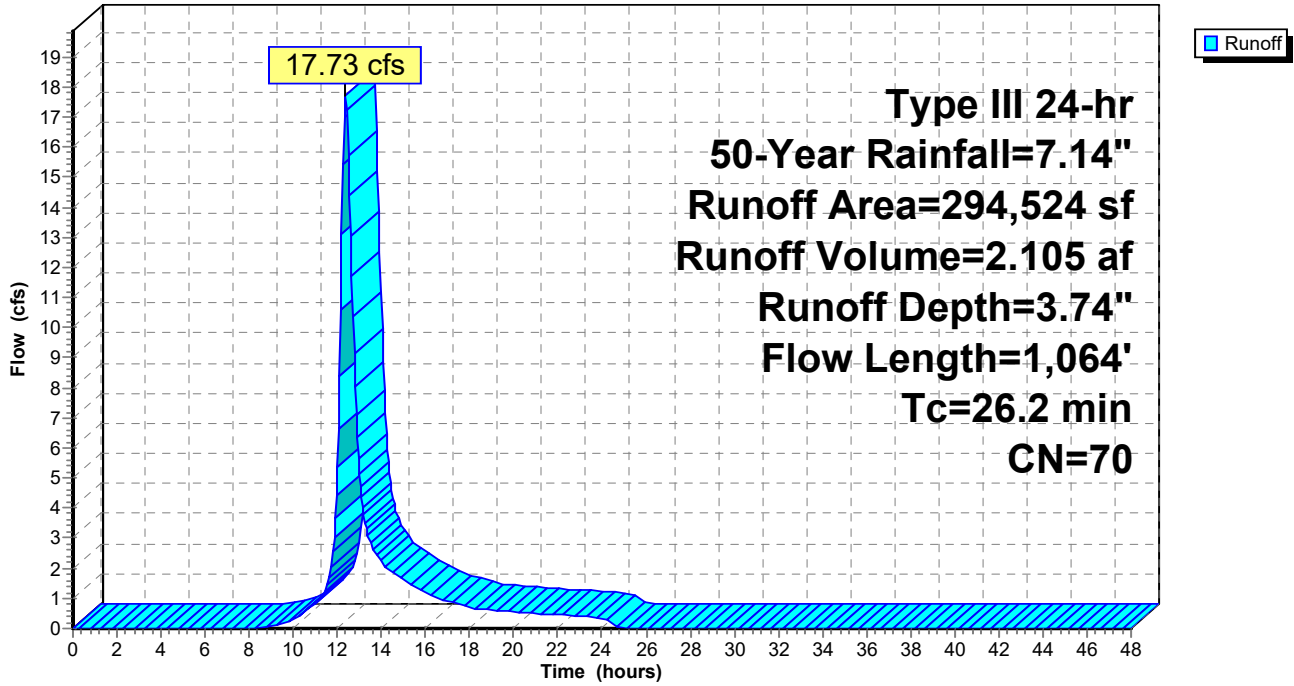
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.14"

Area (sf)	CN	Description
10,077	74	>75% Grass cover, Good, HSG C
1,575	98	Paved parking, HSG C
411	70	Woods, Good, HSG C
2,001	96	Gravel surface, HSG C
1,499	98	Unconnected roofs, HSG B
1,111	98	Unconnected roofs, HSG B
1,273	96	Gravel surface, HSG B
1,214	98	Unconnected roofs, HSG B
42,571	98	Paved parking, HSG B
1,694	96	Gravel surface, HSG B
4,509	98	Unconnected roofs, HSG C
113	98	Unconnected roofs, HSG C
2,133	98	Unconnected roofs, HSG C
12,266	96	Gravel surface, HSG C
2,876	70	Woods, Good, HSG C
1,206	70	Woods, Good, HSG C
677	70	Woods, Good, HSG C
650	70	Woods, Good, HSG C
3,876	70	Woods, Good, HSG C
641	70	Woods, Good, HSG C
4,468	55	Woods, Good, HSG B
99,615	55	Woods, Good, HSG B
62,431	61	>75% Grass cover, Good, HSG B
35,637	74	>75% Grass cover, Good, HSG C
294,524	70	Weighted Average
239,799		81.42% Pervious Area
54,725		18.58% Impervious Area
10,579		19.33% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1300	0.17		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
5.3	343	0.0466	1.08		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
10.3	434	0.0100	0.70		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.3	40	0.0183	2.18		Shallow Concentrated Flow, Gravel Unpaved Kv= 16.1 fps
0.4	147	0.0360	6.04	40.29	Parabolic Channel, Channel W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.035 Earth, dense weeds
26.2	1,064	Total			

Subcatchment 1S: DA 1

Hydrograph



Existing to RT 66

Type III 24-hr 50-Year Rainfall=7.14"

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Summary for Subcatchment 3S: DA 2

Runoff = 111.95 cfs @ 12.32 hrs, Volume= 12.556 af, Depth= 3.31"

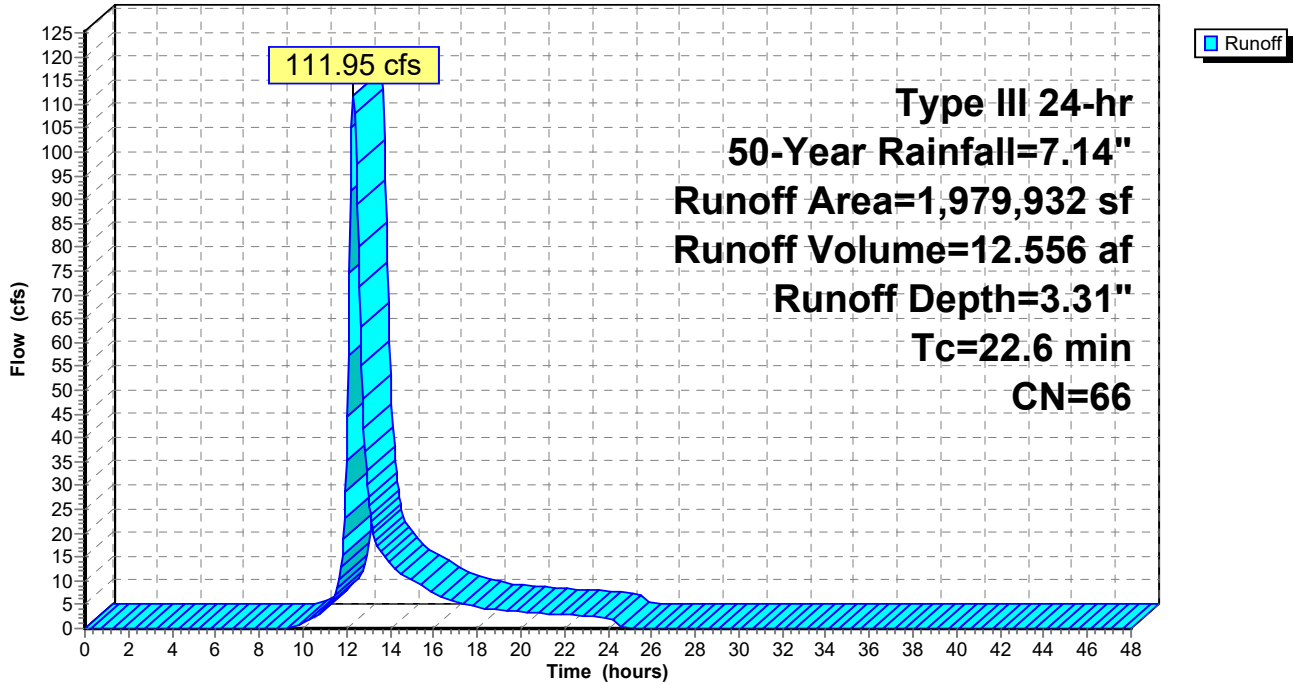
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-Year Rainfall=7.14"

Area (sf)	CN	Description
473,802	77	Woods, Good, HSG D
36,547	98	Water Surface, 0% imp, HSG D
3,920	80	>75% Grass cover, Good, HSG D
12,284	61	>75% Grass cover, Good, HSG B
5,184	98	Unconnected roofs, HSG B
766,264	55	Woods, Good, HSG B
663,462	70	Woods, Good, HSG C
2,265	77	Woods, Good, HSG D
1,699	70	Woods, Good, HSG C
174	96	Gravel surface, HSG C
348	96	Gravel surface, HSG B
610	98	Paved parking, HSG C
13,373	74	>75% Grass cover, Good, HSG C
1,979,932	66	Weighted Average
1,974,138		99.71% Pervious Area
5,794		0.29% Impervious Area
5,184		89.47% Unconnected

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

Subcatchment 3S: DA 2

Hydrograph



Existing to RT 66

Type III 24-hr 50-Year Rainfall=7.14"

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Summary for Pond 2P: 30" RCP

Inflow Area = 52.214 ac, 2.66% Impervious, Inflow Depth > 3.36" for 50-Year event
 Inflow = 24.93 cfs @ 12.39 hrs, Volume= 14.628 af
 Outflow = 24.93 cfs @ 12.39 hrs, Volume= 14.628 af, Atten= 0%, Lag= 0.0 min
 Primary = 24.93 cfs @ 12.39 hrs, Volume= 14.628 af

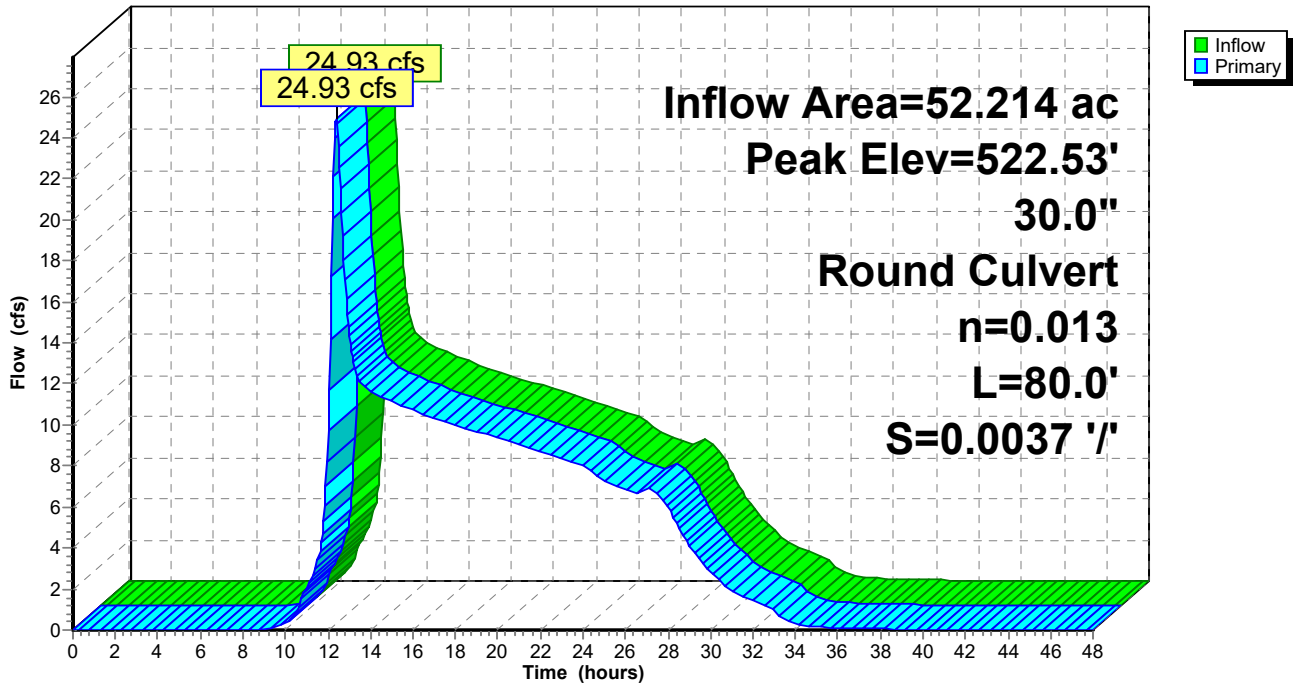
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 522.53' @ 12.39 hrs
 Flood Elev= 527.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	519.92'	30.0" Round 30" RC L= 80.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 519.92' / 519.62' S= 0.0037 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 4.91 sf

Primary OutFlow Max=24.87 cfs @ 12.39 hrs HW=522.52' (Free Discharge)
 ↳ 1=30" RC (Barrel Controls 24.87 cfs @ 6.05 fps)

Pond 2P: 30" RCP

Hydrograph



Existing to RT 66

Type III 24-hr 50-Year Rainfall=7.14"

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Summary for Pond 4P: Pond

Inflow Area = 45.453 ac, 0.29% Impervious, Inflow Depth = 3.31" for 50-Year event
 Inflow = 111.95 cfs @ 12.32 hrs, Volume= 12.556 af
 Outflow = 9.54 cfs @ 15.20 hrs, Volume= 12.523 af, Atten= 91%, Lag= 172.7 min
 Primary = 9.54 cfs @ 15.20 hrs, Volume= 12.523 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 526.51' @ 15.20 hrs Surf.Area= 2.505 ac Storage= 6.834 af

Plug-Flow detention time= 375.7 min calculated for 12.510 af (100% of inflow)
 Center-of-Mass det. time= 374.9 min (1,229.0 - 854.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	522.20'	10.783 af	Pond Storage (Irregular) Listed below		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
522.20	0.002	10.0	0.000	0.000	0.002
522.87	0.636	1,389.1	0.150	0.150	3.527
524.00	1.723	1,270.7	1.283	1.433	4.103
526.00	2.359	1,494.7	4.065	5.499	5.237
528.00	2.936	1,638.1	5.284	10.783	6.061

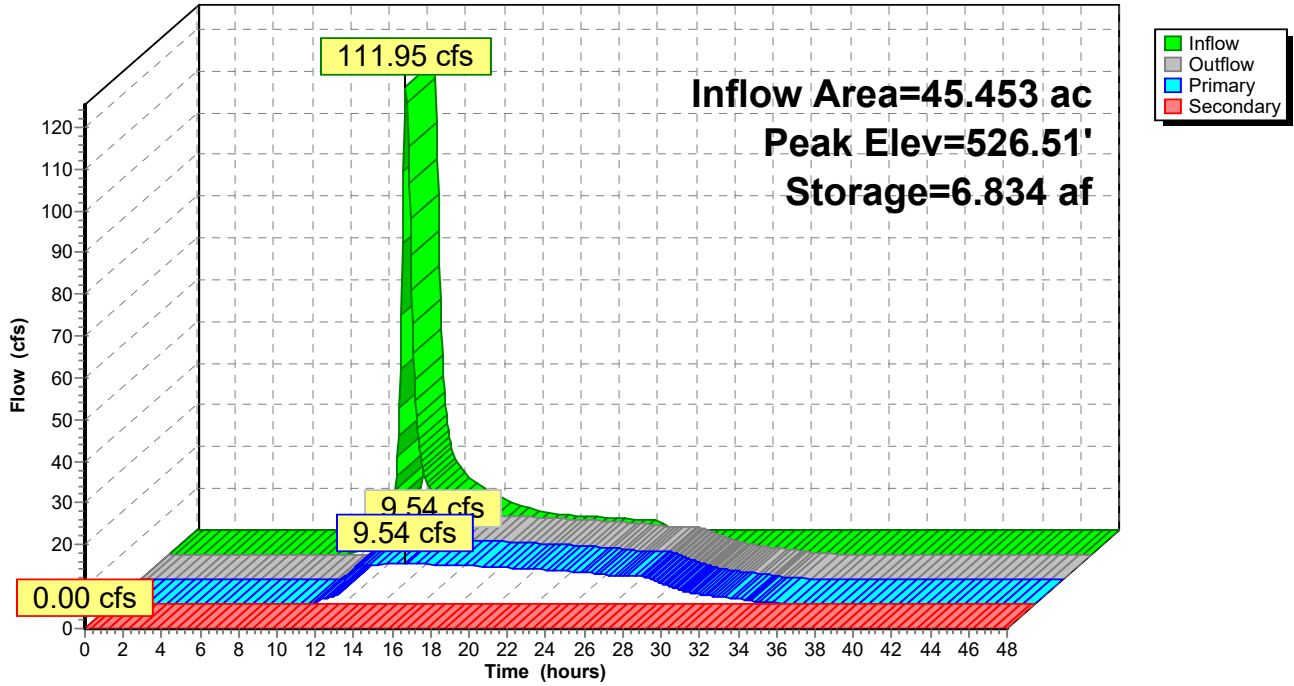
Device	Routing	Invert	Outlet Devices
#1	Primary	522.29'	18.0" Round 18" RCP L= 440.8' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 522.29' / 520.81' S= 0.0034 ' /' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Secondary	526.90'	83.0' long x 15.0' breadth Overflow Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=9.54 cfs @ 15.20 hrs HW=526.51' TW=521.49' (Dynamic Tailwater)
 ↑1=18" RCP (Barrel Controls 9.54 cfs @ 5.40 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=522.20' TW=519.92' (Dynamic Tailwater)
 ↑2=Overflow (Controls 0.00 cfs)

Pond 4P: Pond

Hydrograph



Existing to RT 66

Type III 24-hr 100-Year Rainfall=8.04"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1

Runoff Area=294,524 sf 18.58% Impervious Runoff Depth=4.50"
Flow Length=1,064' Tc=26.2 min CN=70 Runoff=21.39 cfs 2.535 af

Subcatchment 3S: DA 2

Runoff Area=1,979,932 sf 0.29% Impervious Runoff Depth=4.04"
Tc=22.6 min CN=66 Runoff=137.19 cfs 15.304 af

Pond 2P: 30" RCP

Peak Elev=522.85' Inflow=28.78 cfs 17.805 af
30.0" Round Culvert n=0.013 L=80.0' S=0.0037 '/' Outflow=28.78 cfs 17.805 af

Pond 4P: Pond

Peak Elev=527.00' Storage=8.135 af Inflow=137.19 cfs 15.304 af
Primary=10.09 cfs 14.422 af Secondary=6.81 cfs 0.848 af Outflow=16.90 cfs 15.270 af

Total Runoff Area = 52.214 ac Runoff Volume = 17.839 af Average Runoff Depth = 4.10"
97.34% Pervious = 50.825 ac 2.66% Impervious = 1.389 ac

Existing to RT 66

Type III 24-hr 100-Year Rainfall=8.04"

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Summary for Subcatchment 1S: DA 1

Runoff = 21.39 cfs @ 12.37 hrs, Volume= 2.535 af, Depth= 4.50"

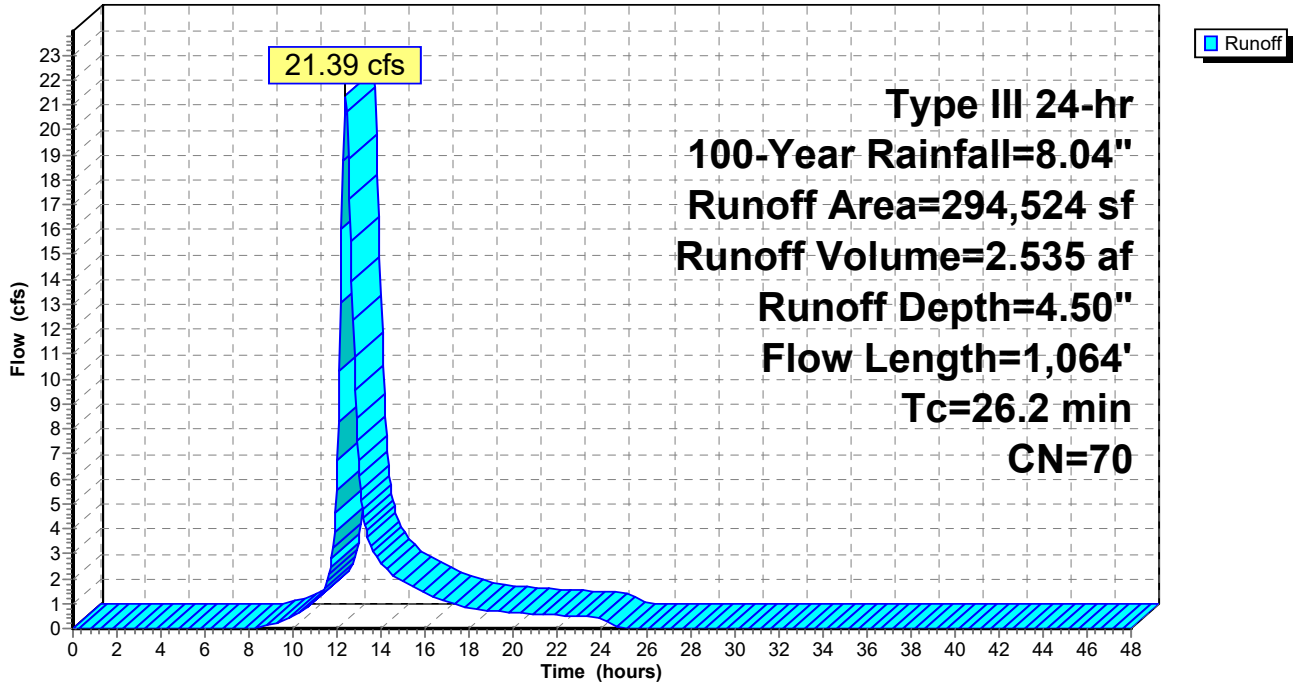
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.04"

Area (sf)	CN	Description
10,077	74	>75% Grass cover, Good, HSG C
1,575	98	Paved parking, HSG C
411	70	Woods, Good, HSG C
2,001	96	Gravel surface, HSG C
1,499	98	Unconnected roofs, HSG B
1,111	98	Unconnected roofs, HSG B
1,273	96	Gravel surface, HSG B
1,214	98	Unconnected roofs, HSG B
42,571	98	Paved parking, HSG B
1,694	96	Gravel surface, HSG B
4,509	98	Unconnected roofs, HSG C
113	98	Unconnected roofs, HSG C
2,133	98	Unconnected roofs, HSG C
12,266	96	Gravel surface, HSG C
2,876	70	Woods, Good, HSG C
1,206	70	Woods, Good, HSG C
677	70	Woods, Good, HSG C
650	70	Woods, Good, HSG C
3,876	70	Woods, Good, HSG C
641	70	Woods, Good, HSG C
4,468	55	Woods, Good, HSG B
99,615	55	Woods, Good, HSG B
62,431	61	>75% Grass cover, Good, HSG B
35,637	74	>75% Grass cover, Good, HSG C
294,524	70	Weighted Average
239,799		81.42% Pervious Area
54,725		18.58% Impervious Area
10,579		19.33% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1300	0.17		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
5.3	343	0.0466	1.08		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
10.3	434	0.0100	0.70		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.3	40	0.0183	2.18		Shallow Concentrated Flow, Gravel Unpaved Kv= 16.1 fps
0.4	147	0.0360	6.04	40.29	Parabolic Channel, Channel W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.035 Earth, dense weeds
26.2	1,064	Total			

Subcatchment 1S: DA 1

Hydrograph



Existing to RT 66

Type III 24-hr 100-Year Rainfall=8.04"

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Summary for Subcatchment 3S: DA 2

Runoff = 137.19 cfs @ 12.32 hrs, Volume= 15.304 af, Depth= 4.04"

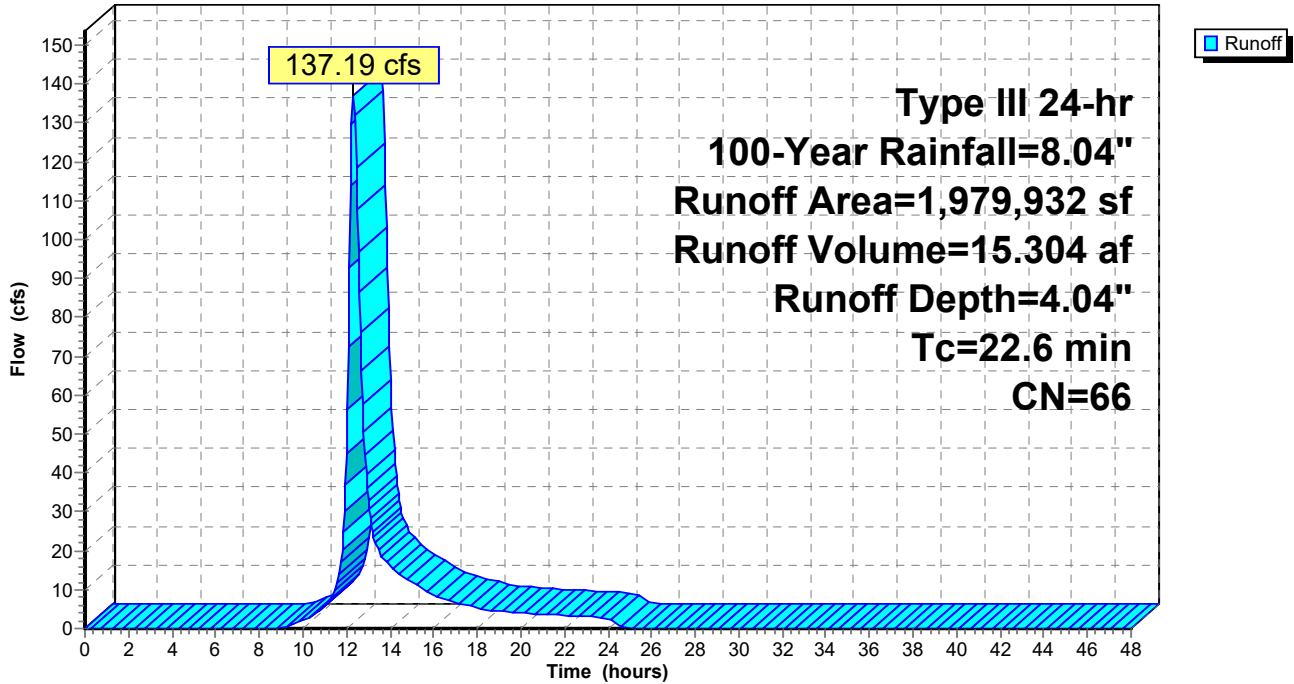
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.04"

Area (sf)	CN	Description
473,802	77	Woods, Good, HSG D
36,547	98	Water Surface, 0% imp, HSG D
3,920	80	>75% Grass cover, Good, HSG D
12,284	61	>75% Grass cover, Good, HSG B
5,184	98	Unconnected roofs, HSG B
766,264	55	Woods, Good, HSG B
663,462	70	Woods, Good, HSG C
2,265	77	Woods, Good, HSG D
1,699	70	Woods, Good, HSG C
174	96	Gravel surface, HSG C
348	96	Gravel surface, HSG B
610	98	Paved parking, HSG C
13,373	74	>75% Grass cover, Good, HSG C
1,979,932	66	Weighted Average
1,974,138		99.71% Pervious Area
5,794		0.29% Impervious Area
5,184		89.47% Unconnected

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

Subcatchment 3S: DA 2

Hydrograph



Existing to RT 66

Type III 24-hr 100-Year Rainfall=8.04"

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Summary for Pond 2P: 30" RCP

Inflow Area = 52.214 ac, 2.66% Impervious, Inflow Depth > 4.09" for 100-Year event
Inflow = 28.78 cfs @ 12.38 hrs, Volume= 17.805 af
Outflow = 28.78 cfs @ 12.38 hrs, Volume= 17.805 af, Atten= 0%, Lag= 0.0 min
Primary = 28.78 cfs @ 12.38 hrs, Volume= 17.805 af

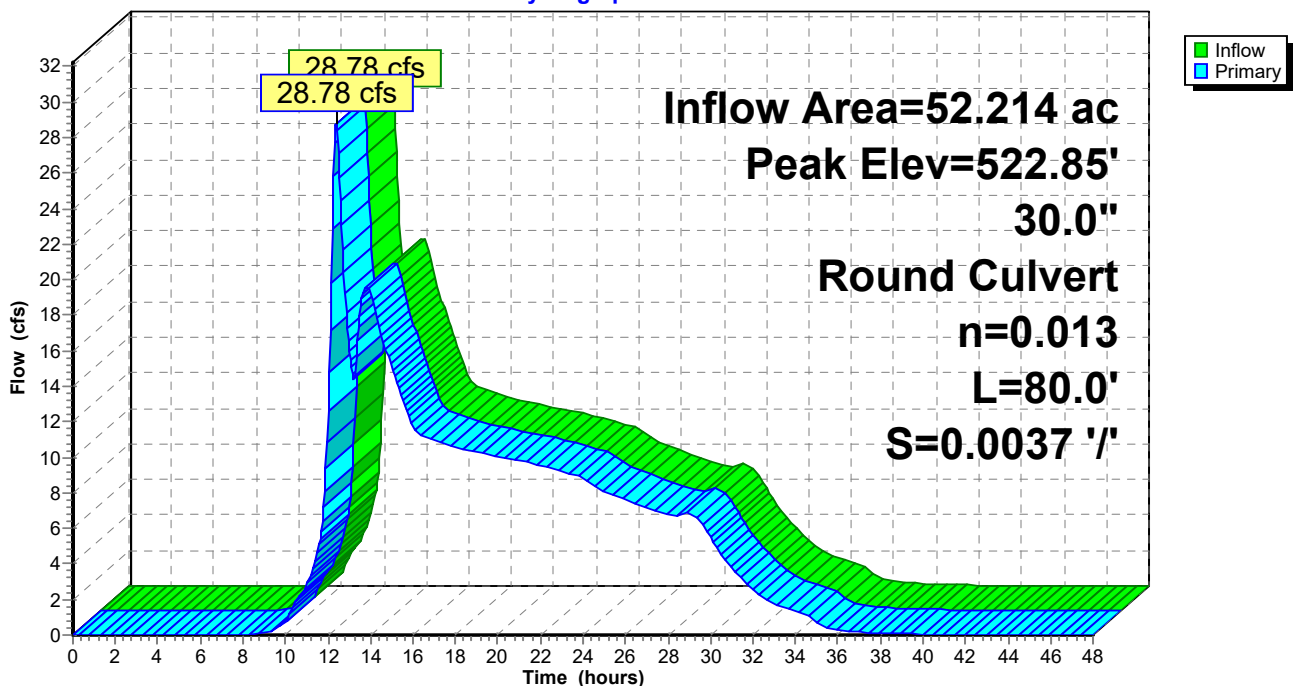
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 522.85' @ 12.38 hrs
Flood Elev= 527.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	519.92'	30.0" Round 30" RC L= 80.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 519.92' / 519.62' S= 0.0037 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 4.91 sf

Primary OutFlow Max=28.70 cfs @ 12.38 hrs HW=522.84' (Free Discharge)
↑1=30" RC (Barrel Controls 28.70 cfs @ 6.29 fps)

Pond 2P: 30" RCP

Hydrograph



Existing to RT 66

Type III 24-hr 100-Year Rainfall=8.04"

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Summary for Pond 4P: Pond

Inflow Area = 45.453 ac, 0.29% Impervious, Inflow Depth = 4.04" for 100-Year event
 Inflow = 137.19 cfs @ 12.32 hrs, Volume= 15.304 af
 Outflow = 16.90 cfs @ 13.87 hrs, Volume= 15.270 af, Atten= 88%, Lag= 93.0 min
 Primary = 10.09 cfs @ 13.87 hrs, Volume= 14.422 af
 Secondary = 6.81 cfs @ 13.87 hrs, Volume= 0.848 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 527.00' @ 13.87 hrs Surf.Area= 2.647 ac Storage= 8.135 af

Plug-Flow detention time= 396.8 min calculated for 15.270 af (100% of inflow)
 Center-of-Mass det. time= 395.4 min (1,243.8 - 848.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	522.20'	10.783 af	Pond Storage (Irregular) Listed below		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
522.20	0.002	10.0	0.000	0.000	0.002
522.87	0.636	1,389.1	0.150	0.150	3.527
524.00	1.723	1,270.7	1.283	1.433	4.103
526.00	2.359	1,494.7	4.065	5.499	5.237
528.00	2.936	1,638.1	5.284	10.783	6.061

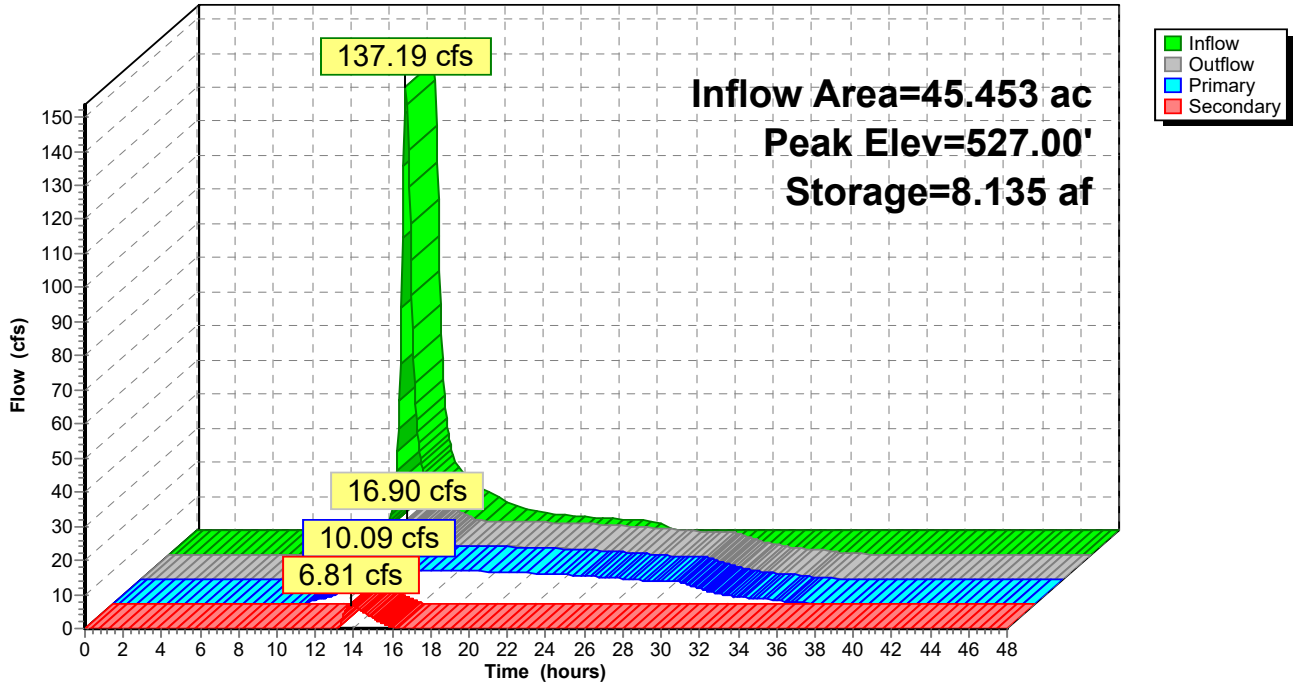
Device	Routing	Invert	Outlet Devices
#1	Primary	522.29'	18.0" Round 18" RCP L= 440.8' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 522.29' / 520.81' S= 0.0034 ' /' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Secondary	526.90'	83.0' long x 15.0' breadth Overflow Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.09 cfs @ 13.87 hrs HW=527.00' TW=522.13' (Dynamic Tailwater)
 ↑1=18" RCP (Barrel Controls 10.09 cfs @ 5.71 fps)

Secondary OutFlow Max=6.80 cfs @ 13.87 hrs HW=527.00' TW=522.13' (Dynamic Tailwater)
 ↑2=Overflow (Weir Controls 6.80 cfs @ 0.84 fps)

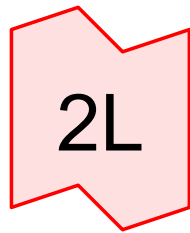
Pond 4P: Pond

Hydrograph

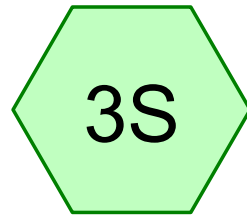


Pre-Development Conditions HydroCAD Results

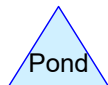
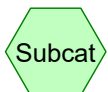
Apartment Project Area Only



Wetlands



DA-APTEX



Routing Diagram for Existing Apartments Only
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Existing Apartments Only

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Page 2

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.37	2
2	10-Year	Type III 24-hr		Default	24.00	1	5.18	2
3	25-Year	Type III 24-hr		Default	24.00	1	6.30	2
4	50-Year	Type III 24-hr		Default	24.00	1	7.14	2
5	100-Year	Type III 24-hr		Default	24.00	1	8.04	2

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Page 3

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
8.686	70	Woods, Good, HSG C (3S)
0.556	77	Woods, Good, HSG D (3S)
9.242	70	TOTAL AREA

Existing Apartments Only

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
8.686	HSG C	3S
0.556	HSG D	3S
0.000	Other	
9.242		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	8.686	0.556	0.000	9.242	Woods, Good	3S
0.000	0.000	8.686	0.556	0.000	9.242	TOTAL AREA	

Existing Apartments Only

Type III 24-hr 2-Year Rainfall=3.37"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: DA-APTEX

Runoff Area=402,581 sf 0.00% Impervious Runoff Depth=0.93"
Flow Length=758' Tc=15.3 min CN=70 Runoff=6.77 cfs 0.715 af

Link 2L: Wetlands

Inflow=6.77 cfs 0.715 af
Primary=6.77 cfs 0.715 af

Total Runoff Area = 9.242 ac Runoff Volume = 0.715 af Average Runoff Depth = 0.93"
100.00% Pervious = 9.242 ac 0.00% Impervious = 0.000 ac

Existing Apartments Only

Type III 24-hr 2-Year Rainfall=3.37"

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Summary for Subcatchment 3S: DA-APTEX

Runoff = 6.77 cfs @ 12.24 hrs, Volume= 0.715 af, Depth= 0.93"

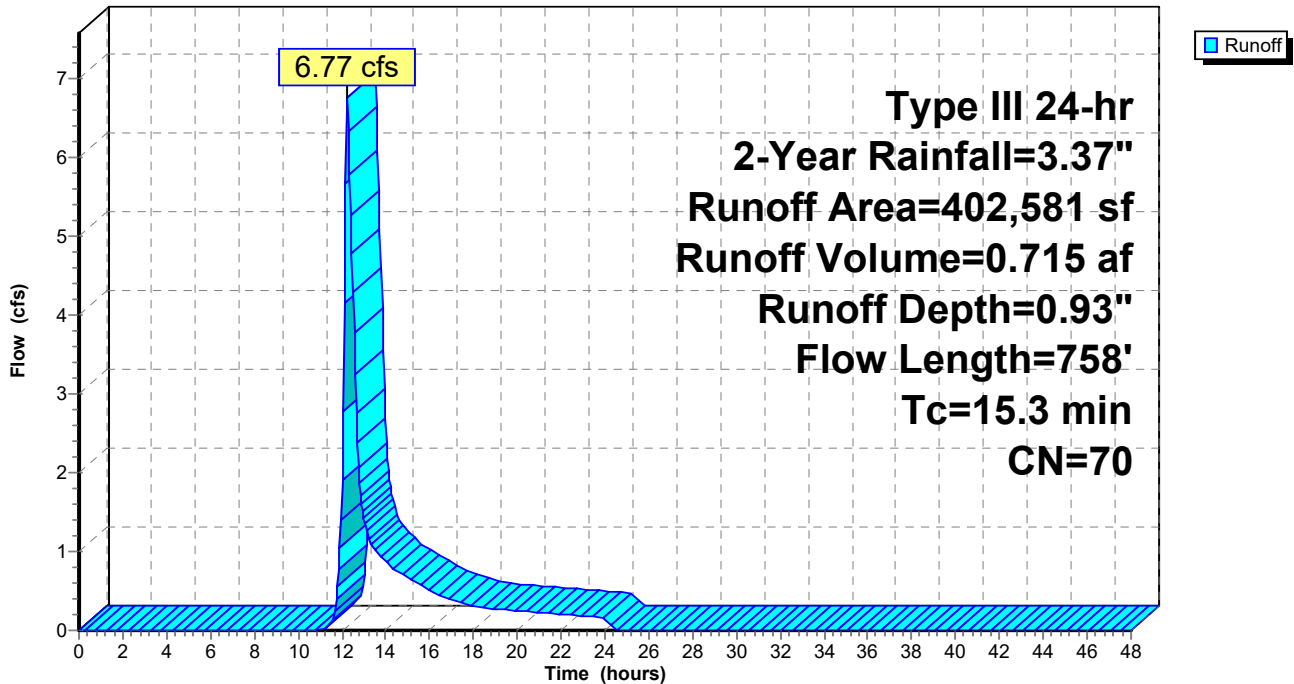
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.37"

Area (sf)	CN	Description
378,362	70	Woods, Good, HSG C
24,219	77	Woods, Good, HSG D
402,581	70	Weighted Average
402,581		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Grass Woods: Light underbrush n= 0.400 P2= 3.37"
6.2	708	0.1427	1.89		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
15.3	758	Total			

Subcatchment 3S: DA-APTEX

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.37"

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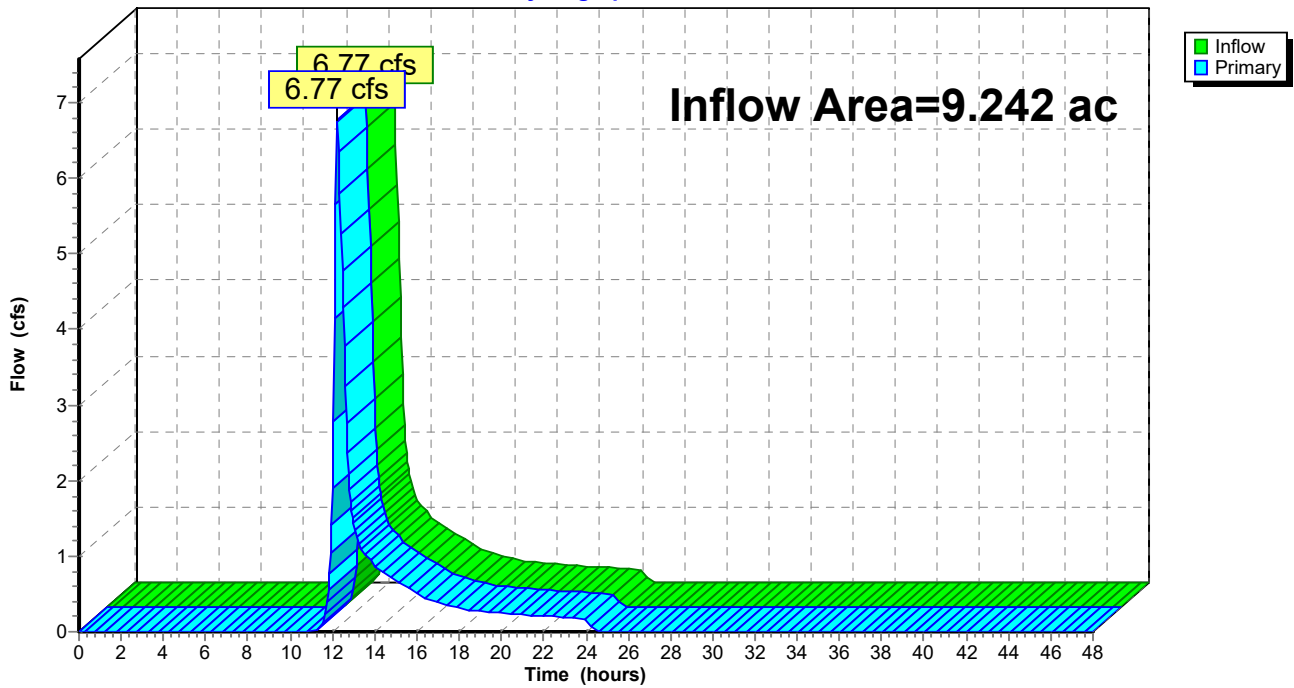
Summary for Link 2L: Wetlands

Inflow Area = 9.242 ac, 0.00% Impervious, Inflow Depth = 0.93" for 2-Year event
Inflow = 6.77 cfs @ 12.24 hrs, Volume= 0.715 af
Primary = 6.77 cfs @ 12.24 hrs, Volume= 0.715 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 2L: Wetlands

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.18"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: DA-APTEX

Runoff Area=402,581 sf 0.00% Impervious Runoff Depth=2.17"
Flow Length=758' Tc=15.3 min CN=70 Runoff=17.27 cfs 1.672 af

Link 2L: Wetlands

Inflow=17.27 cfs 1.672 af
Primary=17.27 cfs 1.672 af

Total Runoff Area = 9.242 ac Runoff Volume = 1.672 af Average Runoff Depth = 2.17"
100.00% Pervious = 9.242 ac 0.00% Impervious = 0.000 ac

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Type III 24-hr 10-Year Rainfall=5.18"

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Summary for Subcatchment 3S: DA-APTEX

Runoff = 17.27 cfs @ 12.22 hrs, Volume= 1.672 af, Depth= 2.17"

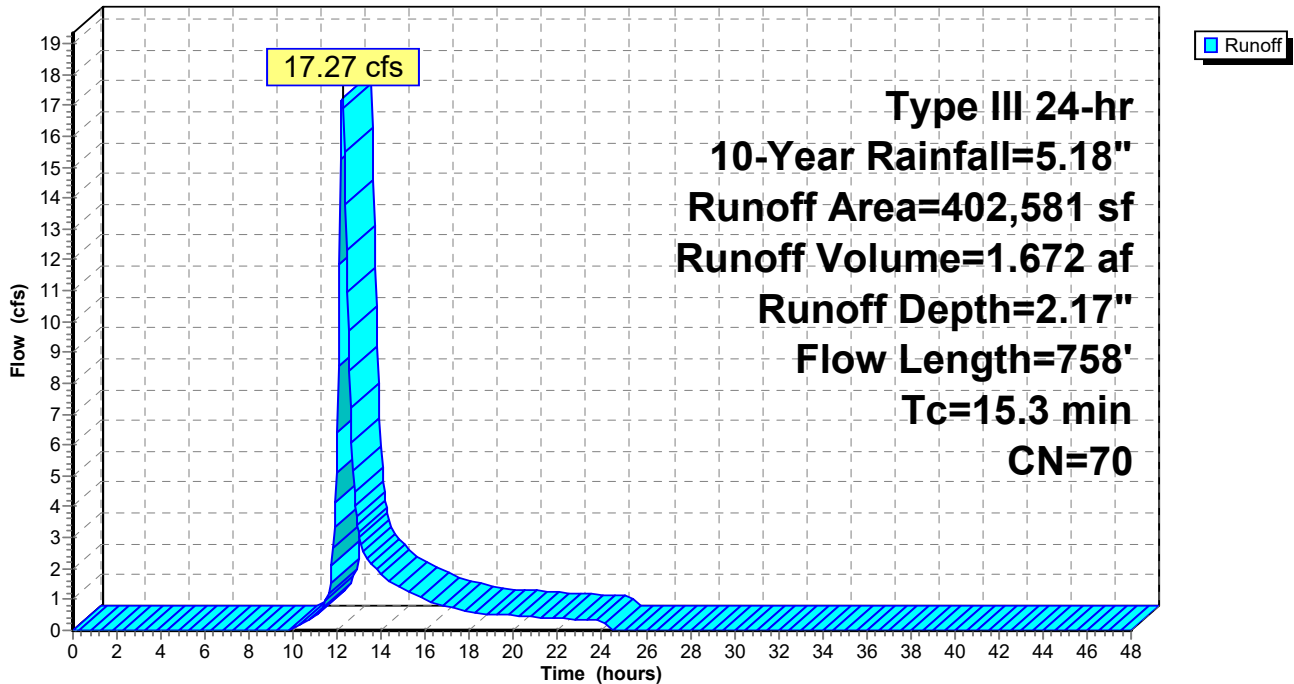
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.18"

Area (sf)	CN	Description
378,362	70	Woods, Good, HSG C
24,219	77	Woods, Good, HSG D
402,581	70	Weighted Average
402,581		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Grass Woods: Light underbrush n= 0.400 P2= 3.37"
6.2	708	0.1427	1.89		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
15.3	758	Total			

Subcatchment 3S: DA-APTEX

Hydrograph



Existing Apartments Only

Type III 24-hr 10-Year Rainfall=5.18"

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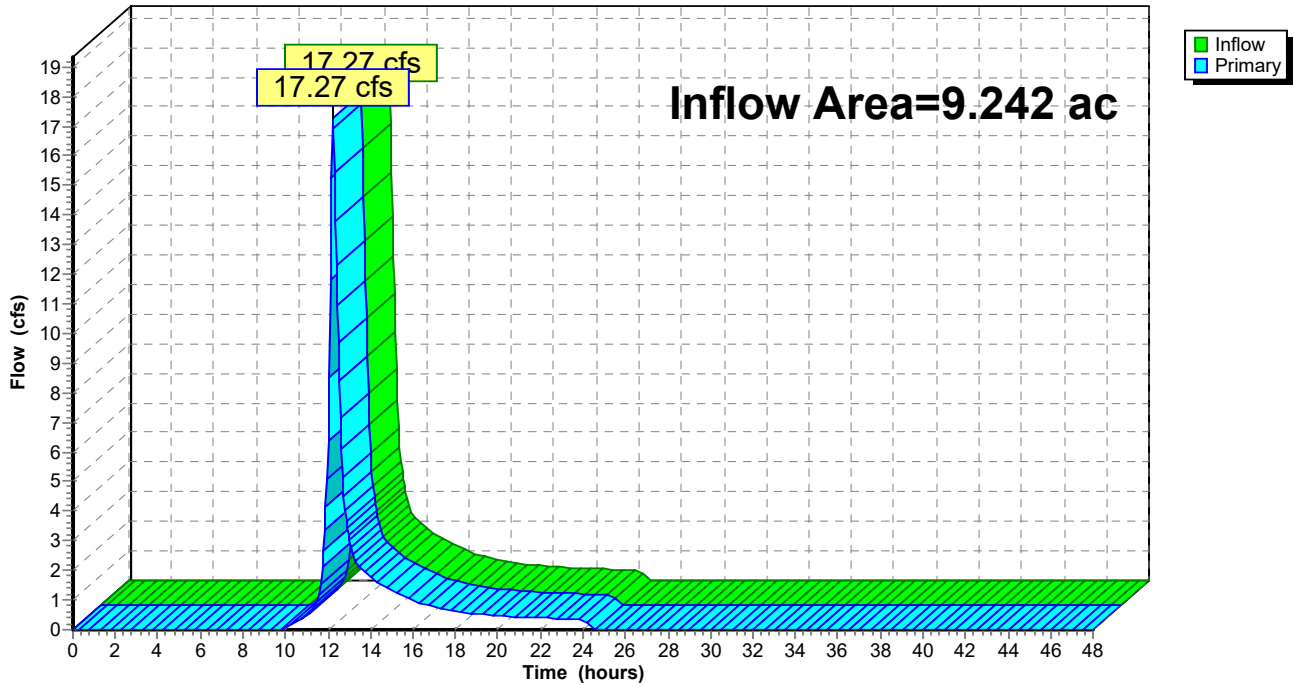
Summary for Link 2L: Wetlands

Inflow Area = 9.242 ac, 0.00% Impervious, Inflow Depth = 2.17" for 10-Year event
Inflow = 17.27 cfs @ 12.22 hrs, Volume= 1.672 af
Primary = 17.27 cfs @ 12.22 hrs, Volume= 1.672 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 2L: Wetlands

Hydrograph



Existing Apartments Only

Type III 24-hr 25-Year Rainfall=6.30"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: DA-APTEX

Runoff Area=402,581 sf 0.00% Impervious Runoff Depth=3.05"
Flow Length=758' Tc=15.3 min CN=70 Runoff=24.55 cfs 2.345 af

Link 2L: Wetlands

Inflow=24.55 cfs 2.345 af
Primary=24.55 cfs 2.345 af

Total Runoff Area = 9.242 ac Runoff Volume = 2.345 af Average Runoff Depth = 3.05"
100.00% Pervious = 9.242 ac 0.00% Impervious = 0.000 ac

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Type III 24-hr 25-Year Rainfall=6.30"

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Summary for Subcatchment 3S: DA-APTEX

Runoff = 24.55 cfs @ 12.22 hrs, Volume= 2.345 af, Depth= 3.05"

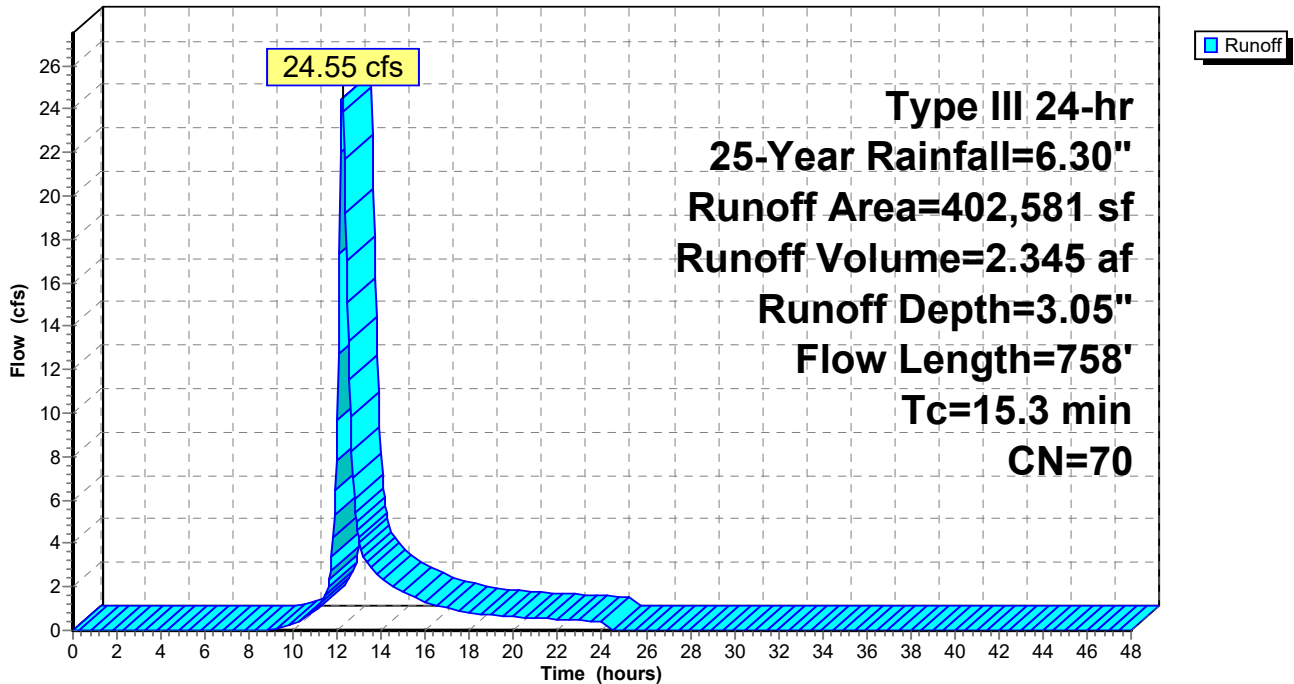
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.30"

Area (sf)	CN	Description
378,362	70	Woods, Good, HSG C
24,219	77	Woods, Good, HSG D
402,581	70	Weighted Average
402,581		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Grass Woods: Light underbrush n= 0.400 P2= 3.37"
6.2	708	0.1427	1.89		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
15.3	758	Total			

Subcatchment 3S: DA-APTEX

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.30"

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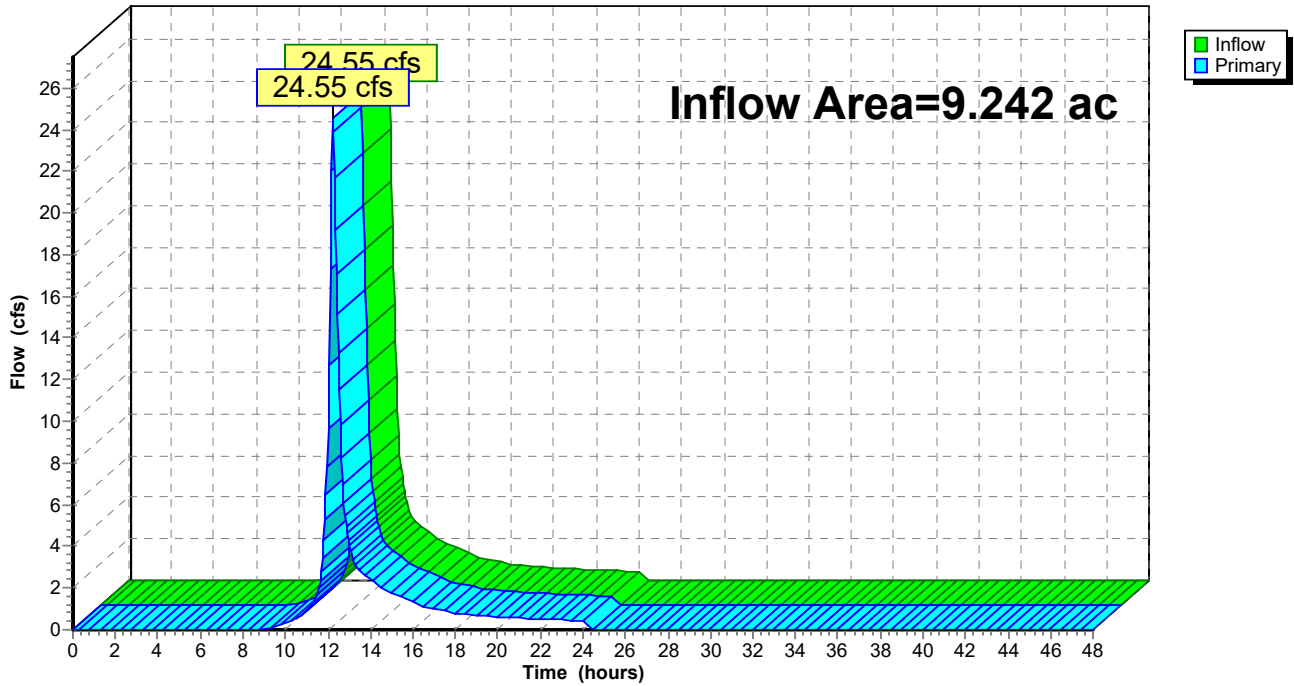
Summary for Link 2L: Wetlands

Inflow Area = 9.242 ac, 0.00% Impervious, Inflow Depth = 3.05" for 25-Year event
Inflow = 24.55 cfs @ 12.22 hrs, Volume= 2.345 af
Primary = 24.55 cfs @ 12.22 hrs, Volume= 2.345 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 2L: Wetlands

Hydrograph



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Type III 24-hr 50-Year Rainfall=7.14"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: DA-APTEX

Runoff Area=402,581 sf 0.00% Impervious Runoff Depth=3.74"
Flow Length=758' Tc=15.3 min CN=70 Runoff=30.24 cfs 2.877 af

Link 2L: Wetlands

Inflow=30.24 cfs 2.877 af
Primary=30.24 cfs 2.877 af

Total Runoff Area = 9.242 ac Runoff Volume = 2.877 af Average Runoff Depth = 3.74"
100.00% Pervious = 9.242 ac 0.00% Impervious = 0.000 ac

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Type III 24-hr 50-Year Rainfall=7.14"

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Summary for Subcatchment 3S: DA-APTEX

Runoff = 30.24 cfs @ 12.21 hrs, Volume= 2.877 af, Depth= 3.74"

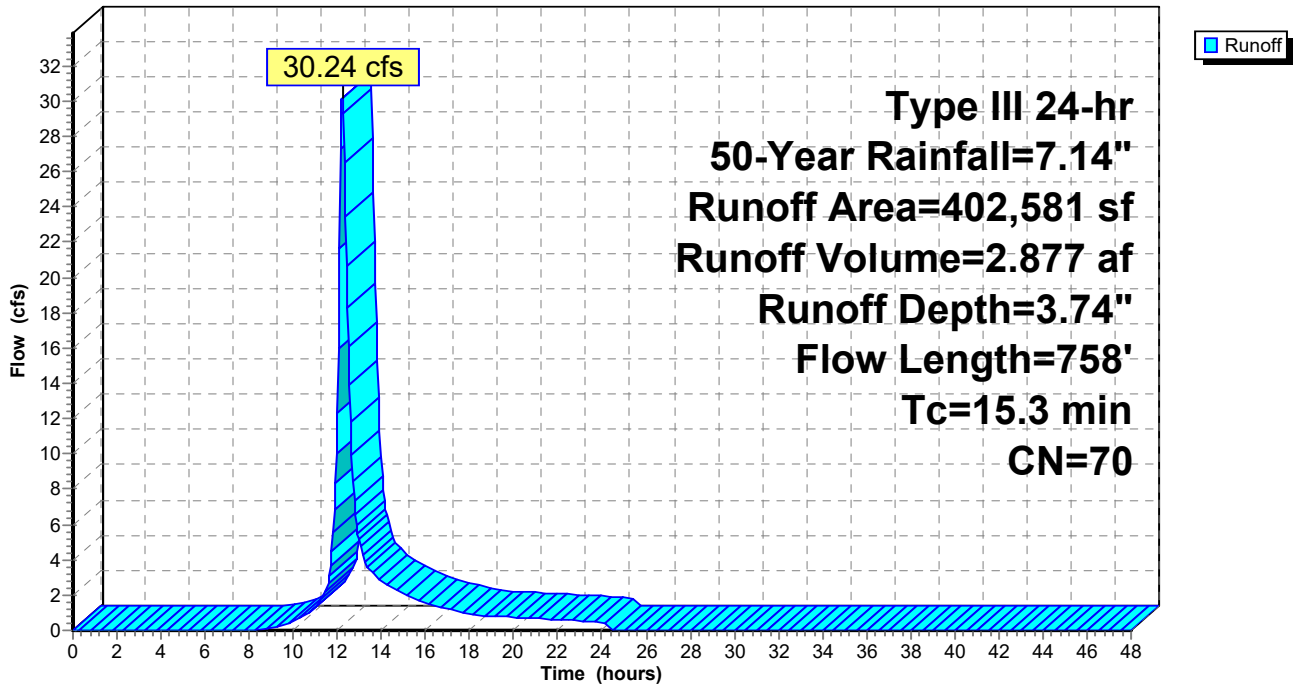
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.14"

Area (sf)	CN	Description
378,362	70	Woods, Good, HSG C
24,219	77	Woods, Good, HSG D
402,581	70	Weighted Average
402,581		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Grass Woods: Light underbrush n= 0.400 P2= 3.37"
6.2	708	0.1427	1.89		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
15.3	758	Total			

Subcatchment 3S: DA-APTEX

Hydrograph



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Type III 24-hr 50-Year Rainfall=7.14"

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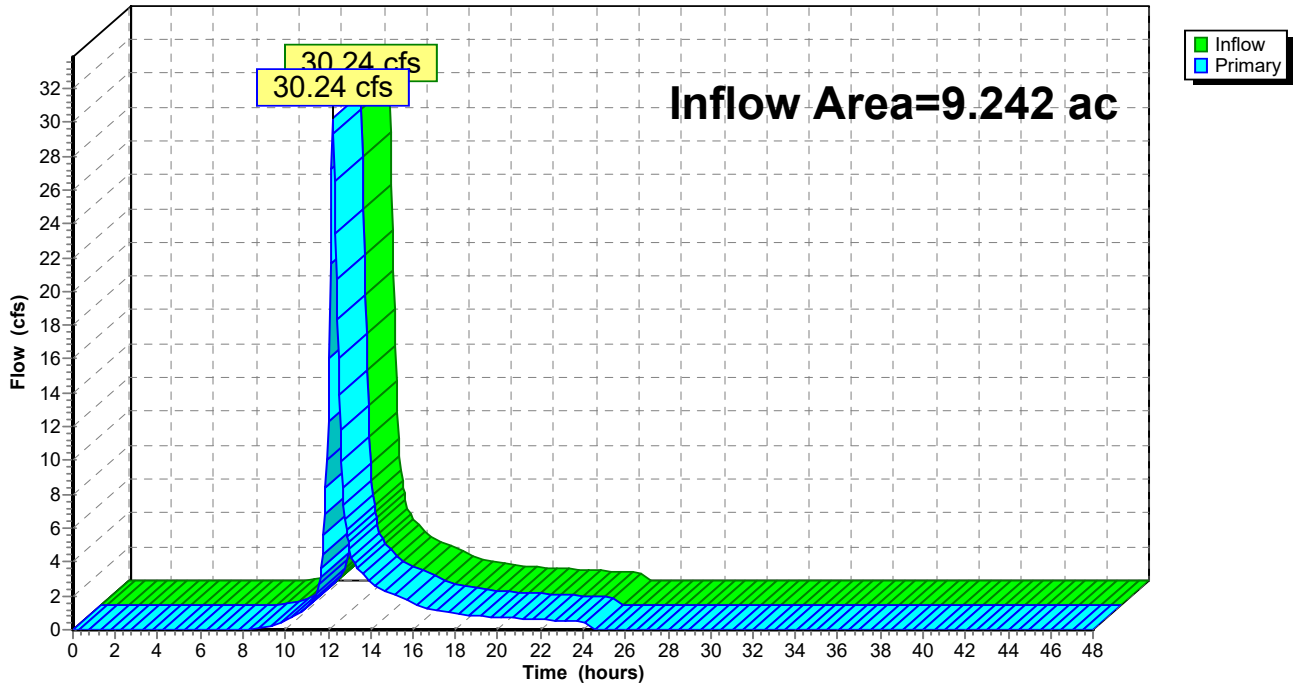
Summary for Link 2L: Wetlands

Inflow Area = 9.242 ac, 0.00% Impervious, Inflow Depth = 3.74" for 50-Year event
Inflow = 30.24 cfs @ 12.21 hrs, Volume= 2.877 af
Primary = 30.24 cfs @ 12.21 hrs, Volume= 2.877 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 2L: Wetlands

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.04"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: DA-APTEX

Runoff Area=402,581 sf 0.00% Impervious Runoff Depth=4.50"
Flow Length=758' Tc=15.3 min CN=70 Runoff=36.47 cfs 3.465 af

Link 2L: Wetlands

Inflow=36.47 cfs 3.465 af
Primary=36.47 cfs 3.465 af

Total Runoff Area = 9.242 ac Runoff Volume = 3.465 af Average Runoff Depth = 4.50"
100.00% Pervious = 9.242 ac 0.00% Impervious = 0.000 ac

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Type III 24-hr 100-Year Rainfall=8.04"

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Summary for Subcatchment 3S: DA-APTEX

Runoff = 36.47 cfs @ 12.21 hrs, Volume= 3.465 af, Depth= 4.50"

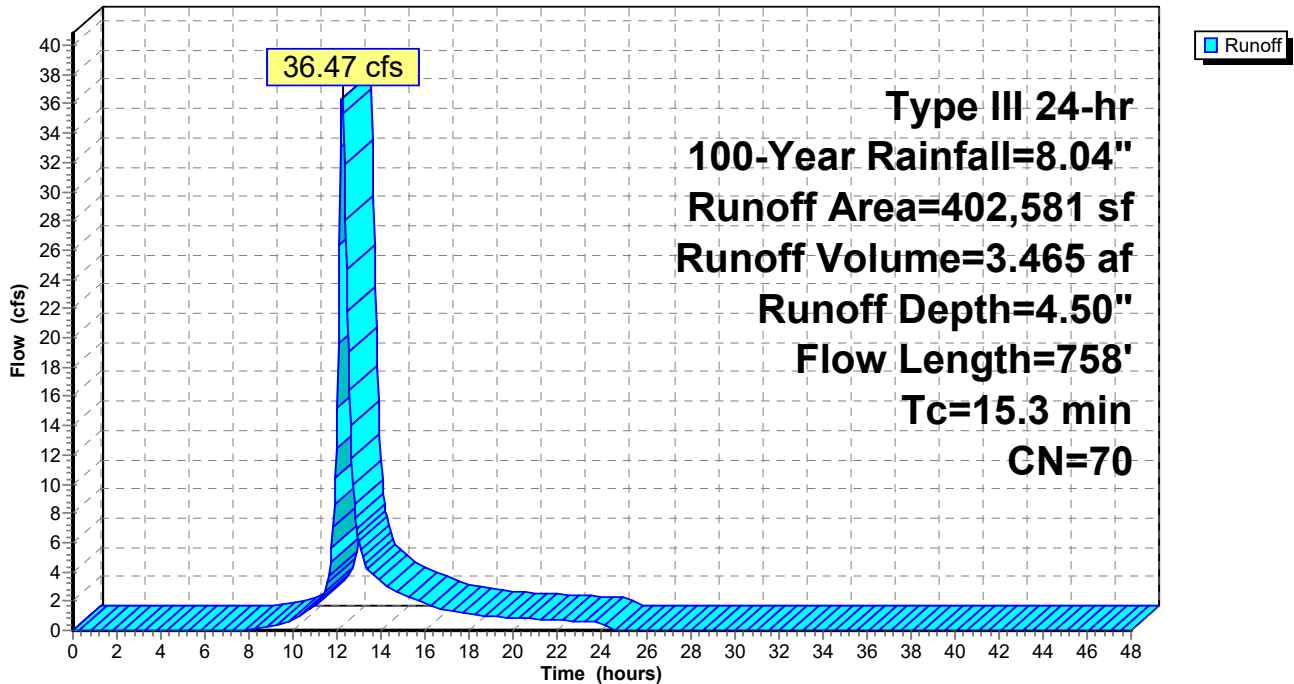
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.04"

Area (sf)	CN	Description
378,362	70	Woods, Good, HSG C
24,219	77	Woods, Good, HSG D
402,581	70	Weighted Average
402,581		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Grass Woods: Light underbrush n= 0.400 P2= 3.37"
6.2	708	0.1427	1.89		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
15.3	758	Total			

Subcatchment 3S: DA-APTEX

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.04"

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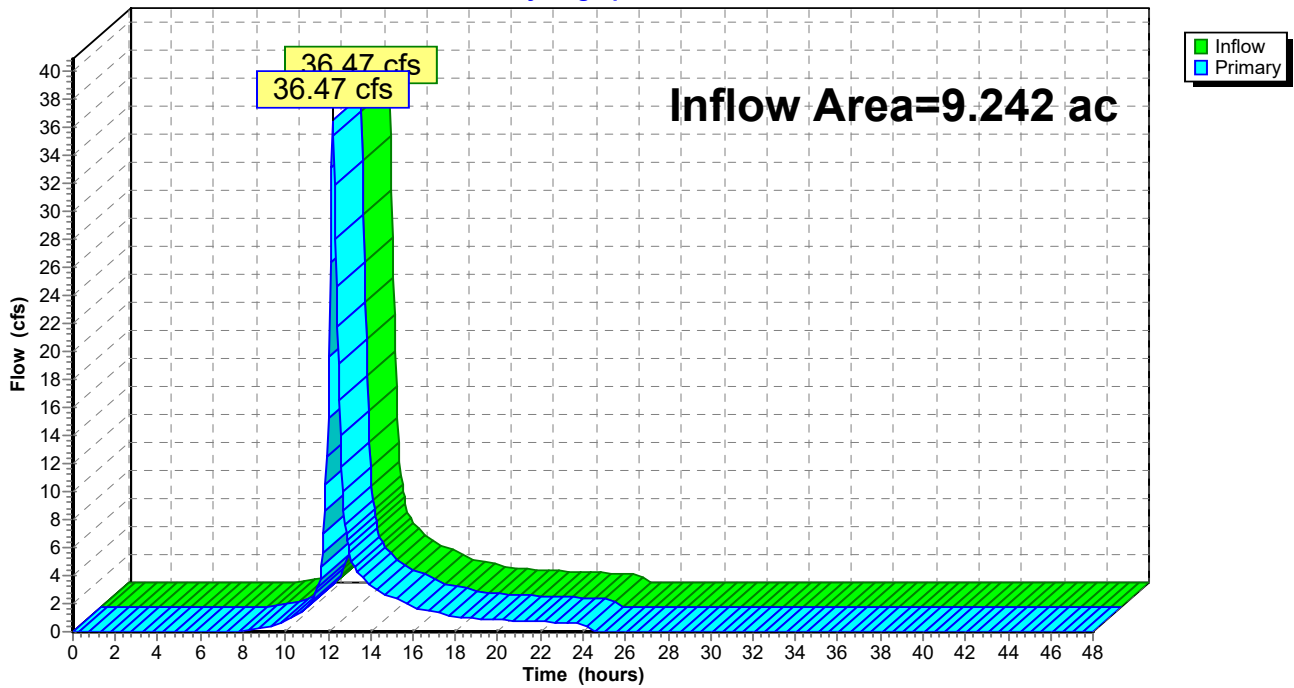
Summary for Link 2L: Wetlands

Inflow Area = 9.242 ac, 0.00% Impervious, Inflow Depth = 4.50" for 100-Year event
Inflow = 36.47 cfs @ 12.21 hrs, Volume= 3.465 af
Primary = 36.47 cfs @ 12.21 hrs, Volume= 3.465 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

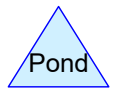
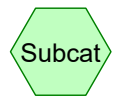
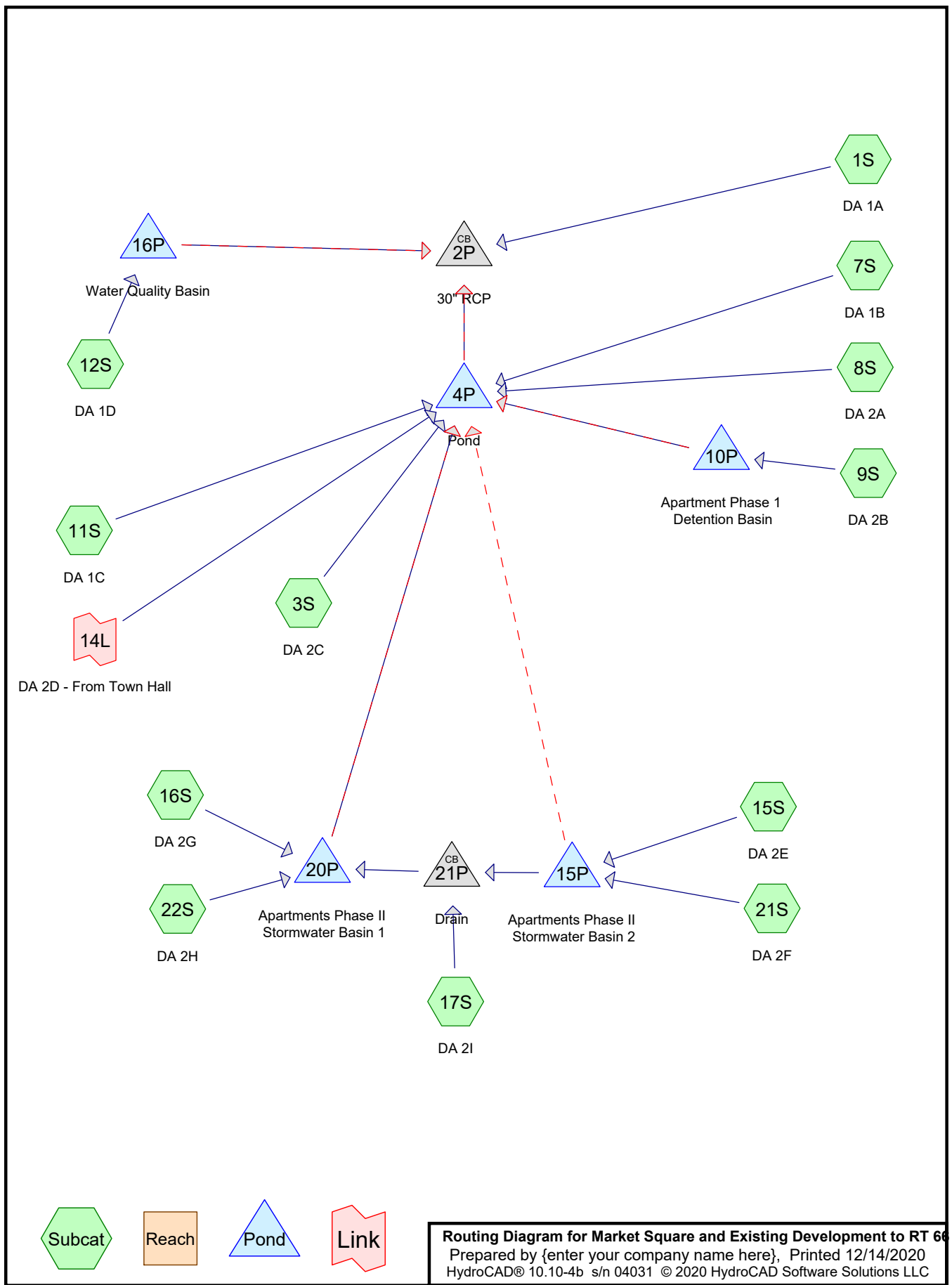
Link 2L: Wetlands

Hydrograph



Post-Development Conditions

HydroCAD Results



Routing Diagram for Market Square and Existing Development to RT 66
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Market Square and Existing Development to RT 66

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.37	2
2	10-Year	Type III 24-hr		Default	24.00	1	5.18	2
3	25-Year	Type III 24-hr		Default	24.00	1	6.30	2
4	50-Year	Type III 24-hr		Default	24.00	1	7.14	2
5	100-Year	Type III 24-hr		Default	24.00	1	8.04	2

Market Square and Existing Development to RT 66

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.126	61	>75% Grass cover, Good, HSG B (1S, 3S, 7S, 8S, 9S)
2.592	74	>75% Grass cover, Good, HSG C (1S, 3S, 11S, 12S, 15S, 16S, 21S, 22S)
0.505	74	>75% Grass cover, Good, HSG C, North (17S, 22S)
0.811	74	>75% Grass cover, Good, HSG C, South (15S, 22S)
0.429	80	>75% Grass cover, Good, HSG D (3S, 16S)
0.010	80	>75% Grass cover, Good, HSG D, North (22S)
0.271	86	Newly graded area, HSG B (7S)
5.700	98	Paved parking, HSG B (1S, 3S, 7S, 8S, 9S)
2.354	98	Paved parking, HSG C (1S, 3S, 11S, 12S)
0.775	98	Paved parking, HSG C, North (17S, 22S)
1.535	98	Paved parking, HSG C, South (15S, 22S)
0.152	98	Roofs, HSG B (8S)
0.110	98	Roofs, HSG C (3S)
0.184	98	Unconnected Roofs (3S)
0.870	98	Unconnected roofs, HSG B (3S)
0.076	98	Water Surface, 0% imp, HSG B (9S)
0.294	98	Water Surface, 0% imp, HSG C (12S, 16S, 21S)
0.839	98	Water Surface, 0% imp, HSG D (3S)
14.726	55	Woods, Good, HSG B (3S, 8S, 9S)
4.351	70	Woods, Good, HSG C (3S, 15S, 22S)
9.778	77	Woods, Good, HSG D (3S)
49.488	74	TOTAL AREA

Market Square and Existing Development to RT 66

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
24.921	HSG B	1S, 3S, 7S, 8S, 9S
13.327	HSG C	1S, 3S, 11S, 12S, 15S, 16S, 17S, 21S, 22S
11.056	HSG D	3S, 16S, 22S
0.184	Other	3S
49.488		TOTAL AREA

Market Square and Existing Development to RT 66

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	3.126	3.908	0.439	0.000	7.473	>75% Grass cover, Good	1S, 3S, 7S, 8S, 9S, 11S, 12S, 15S, 16S, 17S, 21S, 22S
0.000	0.271	0.000	0.000	0.000	0.271	Newly graded area	7S
0.000	5.700	4.664	0.000	0.000	10.364	Paved parking	1S, 3S, 7S, 8S, 9S, 11S, 12S, 15S, 17S, 22S
0.000	0.152	0.110	0.000	0.000	0.262	Roofs	3S, 8S
0.000	0.000	0.000	0.000	0.184	0.184	Unconnected Roofs	3S
0.000	0.870	0.000	0.000	0.000	0.870	Unconnected roofs	3S
0.000	0.076	0.294	0.839	0.000	1.209	Water Surface, 0% imp	3S, 9S, 12S, 16S, 21S
0.000	14.726	4.351	9.778	0.000	28.855	Woods, Good	3S, 8S, 9S, 15S, 22S
0.000	24.921	13.327	11.056	0.184	49.488	TOTAL AREA	

Market Square and Existing Development to RT 66

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	1S	0.00	0.00	253.0	0.0200	0.013	0.0	18.0	0.0
2	7S	0.00	0.00	167.0	0.0200	0.013	0.0	18.0	0.0
3	8S	0.00	0.00	82.0	0.0500	0.013	0.0	15.0	0.0
4	9S	0.00	0.00	108.0	0.0200	0.013	0.0	15.0	0.0
5	2P	519.92	519.62	80.0	0.0037	0.013	0.0	30.0	0.0
6	4P	520.91	520.64	110.8	0.0024	0.013	0.0	30.0	0.0
7	4P	521.46	520.91	86.8	0.0063	0.013	0.0	30.0	0.0
8	4P	521.41	521.40	157.1	0.0001	0.013	0.0	24.0	0.0
9	4P	523.45	521.82	117.9	0.0138	0.013	0.0	18.0	0.0
10	10P	536.00	534.50	75.0	0.0200	0.013	0.0	12.0	0.0
11	15P	562.00	561.60	68.0	0.0059	0.013	0.0	18.0	0.0
12	16P	522.75	521.75	75.0	0.0133	0.013	0.0	24.0	0.0
13	20P	551.00	549.00	152.0	0.0132	0.013	0.0	18.0	0.0
14	21P	561.40	559.50	260.0	0.0073	0.013	0.0	24.0	0.0

Market Square and Existing Development to RT 66 Type III 24-hr 2-Year Rainfall=3.37"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1A Runoff Area=2.061 ac 80.93% Impervious Runoff Depth=2.42"
Flow Length=532' Tc=11.0 min CN=91 Runoff=4.83 cfs 0.415 af

Subcatchment 3S: DA 2C Runoff Area=30.199 ac 4.93% Impervious Runoff Depth=0.78"
Flow Length=2,588' Tc=22.6 min UI Adjusted CN=67 Runoff=15.09 cfs 1.958 af

Subcatchment 7S: DA 1B Runoff Area=94,000 sf 75.97% Impervious Runoff Depth=2.51"
Flow Length=669' Tc=6.0 min CN=92 Runoff=6.05 cfs 0.452 af

Subcatchment 8S: DA 2A Runoff Area=3.613 ac 61.86% Impervious Runoff Depth=1.83"
Flow Length=740' Tc=12.1 min CN=84 Runoff=6.30 cfs 0.550 af

Subcatchment 9S: DA 2B Runoff Area=2.152 ac 30.72% Impervious Runoff Depth=1.04"
Flow Length=735' Tc=19.6 min CN=72 Runoff=1.65 cfs 0.186 af

Subcatchment 11S: DA 1C Runoff Area=14,897 sf 83.63% Impervious Runoff Depth=2.71"
Tc=6.0 min CN=94 Runoff=1.01 cfs 0.077 af

Subcatchment 12S: DA 1D Runoff Area=85,452 sf 71.00% Impervious Runoff Depth=2.61"
Tc=6.0 min CN=93 Runoff=5.66 cfs 0.427 af

Subcatchment 15S: DA 2E Runoff Area=3.136 ac 31.41% Impervious Runoff Depth=1.53"
Flow Length=671' Tc=12.0 min CN=80 Runoff=4.56 cfs 0.401 af

Subcatchment 16S: DA 2G Runoff Area=0.444 ac 0.00% Impervious Runoff Depth=1.60"
Flow Length=110' Tc=6.0 min CN=81 Runoff=0.82 cfs 0.059 af

Subcatchment 17S: DA 2I Runoff Area=0.536 ac 64.18% Impervious Runoff Depth=2.24"
Flow Length=230' Slope=0.0200 '/ Tc=11.0 min CN=89 Runoff=1.17 cfs 0.100 af

Subcatchment 21S: DA 2F Runoff Area=0.141 ac 0.00% Impervious Runoff Depth=1.75"
Flow Length=107' Tc=6.0 min CN=83 Runoff=0.28 cfs 0.021 af

Subcatchment 22S: DA 2H Runoff Area=2.744 ac 35.75% Impervious Runoff Depth=1.68"
Flow Length=676' Tc=10.0 min CN=82 Runoff=4.64 cfs 0.383 af

Pond 2P: 30" RCP Peak Elev=521.10' Inflow=6.62 cfs 5.343 af
Primary=6.62 cfs 5.343 af Secondary=0.00 cfs 0.000 af Outflow=6.62 cfs 5.343 af

Pond 4P: Pond Peak Elev=524.66' Storage=1.961 af Inflow=28.26 cfs 4.611 af
Primary=5.71 cfs 4.501 af Secondary=0.00 cfs 0.000 af Outflow=5.71 cfs 4.501 af

Pond 10P: Apartment Phase 1 Detention Basin Peak Elev=536.68' Storage=228 cf Inflow=1.65 cfs 0.186 af
Primary=1.61 cfs 0.186 af Secondary=0.00 cfs 0.000 af Outflow=1.61 cfs 0.186 af

Pond 15P: Apartments Phase II Stormwater Peak Elev=567.57' Storage=4,537 cf Inflow=4.77 cfs 0.421 af
Primary=4.00 cfs 0.342 af Secondary=0.00 cfs 0.000 af Outflow=4.00 cfs 0.342 af

Market Square and Existing Development to RT 66 Type III 24-hr 2-Year Rainfall=3.37"

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Pond 16P: Water Quality Basin

Peak Elev=526.92' Storage=7,712 cf Inflow=5.66 cfs 0.427 af
Outflow=0.57 cfs 0.427 af

Pond 20P: Apartments Phase II Stormwater

Peak Elev=557.00' Storage=15,826 cf Inflow=9.31 cfs 0.885 af
Primary=2.12 cfs 0.695 af Secondary=0.00 cfs 0.000 af Outflow=2.12 cfs 0.695 af

Pond 21P: Drain

Peak Elev=562.36' Inflow=4.88 cfs 0.442 af
24.0" Round Culvert n=0.013 L=260.0' S=0.0073 '/' Outflow=4.88 cfs 0.442 af

2-Year Link

Primary Outflow Imported from Proposed Conditions - Town Hall Site~Link EAST.hce Inflow=5.26 cfs 0.693 af
Area= 6.431 ac 40.57% Imperv. Primary=5.26 cfs 0.693 af

Total Runoff Area = 49.488 ac Runoff Volume = 5.029 af Average Runoff Depth = 1.22"
76.40% Pervious = 37.808 ac 23.60% Impervious = 11.680 ac

Summary for Subcatchment 1S: DA 1A

Runoff = 4.83 cfs @ 12.15 hrs, Volume= 0.415 af, Depth= 2.42"

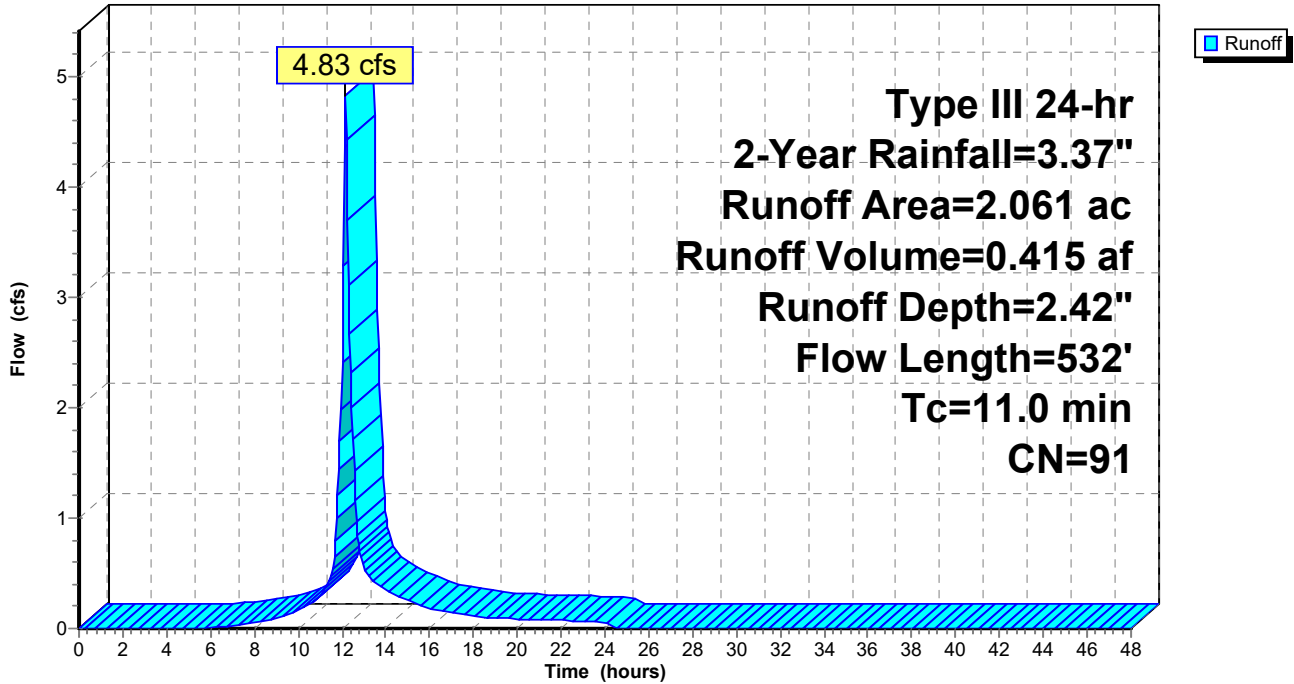
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.37"

Area (ac)	CN	Description
0.201	98	Paved parking, HSG C
1.260	98	Paved parking, HSG B
0.207	98	Paved parking, HSG C
0.074	74	>75% Grass cover, Good, HSG C
0.319	61	>75% Grass cover, Good, HSG B
2.061	91	Weighted Average
0.393		19.07% Pervious Area
1.668		80.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	40	0.0100	0.08		Sheet Flow, Lawn Grass: Dense n= 0.240 P2= 3.37"
1.7	239	0.0126	2.28		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.5	253	0.0200	8.41	14.86	Pipe Channel, HDPE Drain 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
11.0	532	Total			

Subcatchment 1S: DA 1A

Hydrograph



Summary for Subcatchment 3S: DA 2C

Runoff = 15.09 cfs @ 12.37 hrs, Volume= 1.958 af, Depth= 0.78"

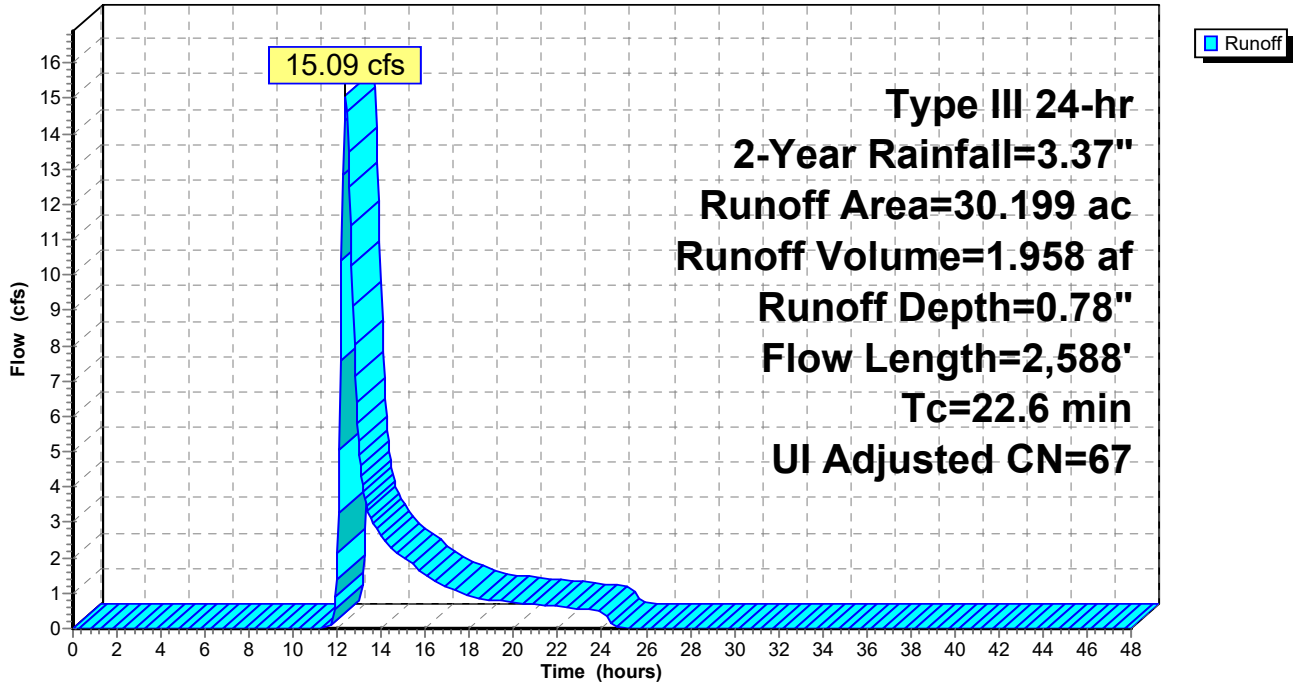
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.37"

Area (ac)	CN	Adj	Description
9.778	77		Woods, Good, HSG D
0.839	98		Water Surface, 0% imp, HSG D
13.926	55		Woods, Good, HSG B
2.515	70		Woods, Good, HSG C
0.066	98		Paved parking, HSG C
0.110	98		Roofs, HSG C
0.057	98		Paved parking, HSG B
0.566	61		>75% Grass cover, Good, HSG B
0.870	98		Unconnected roofs, HSG B
0.333	80		>75% Grass cover, Good, HSG D
0.061	98		Paved parking, HSG C
0.032	74		>75% Grass cover, Good, HSG C
0.140	98		Paved parking, HSG C
0.664	74		>75% Grass cover, Good, HSG C
0.058	70		Woods, Good, HSG C
* 0.184	98		Unconnected Roofs
30.199	68	67	Weighted Average, UI Adjusted
28.711			95.07% Pervious Area
1.488			4.93% Impervious Area
1.054			70.83% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.0850	0.14		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
5.1	598	0.1539	1.96		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
5.2	1,600	0.0262	5.16	34.37	Parabolic Channel, Channel W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.035 Earth, dense weeds
0.6	290		8.02		Lake or Reservoir, Pond Mean Depth= 2.00'
22.6	2,588	Total			

Subcatchment 3S: DA 2C

Hydrograph



Summary for Subcatchment 7S: DA 1B

Runoff = 6.05 cfs @ 12.09 hrs, Volume= 0.452 af, Depth= 2.51"

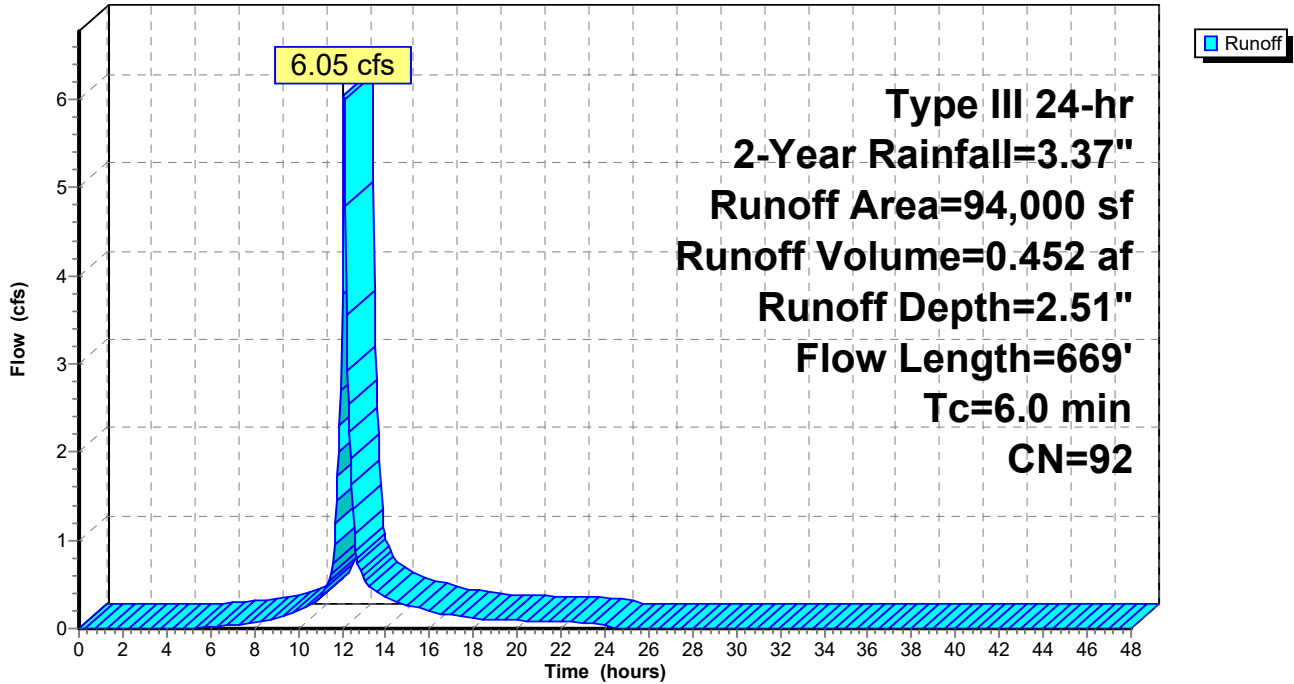
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.37"

Area (sf)	CN	Description
71,413	98	Paved parking, HSG B
11,784	86	Newly graded area, HSG B
10,803	61	>75% Grass cover, Good, HSG B
94,000	92	Weighted Average
22,587		24.03% Pervious Area
71,413		75.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		Sheet Flow, Play areas Smooth surfaces n= 0.011 P2= 3.37"
0.1	40	0.1500	6.24		Shallow Concentrated Flow, Play areas Unpaved Kv= 16.1 fps
2.2	362	0.0175	2.69		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.3	167	0.0200	8.41	14.86	Pipe Channel, HDPE 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
3.8	669	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7S: DA 1B

Hydrograph



Summary for Subcatchment 8S: DA 2A

Runoff = 6.30 cfs @ 12.17 hrs, Volume= 0.550 af, Depth= 1.83"

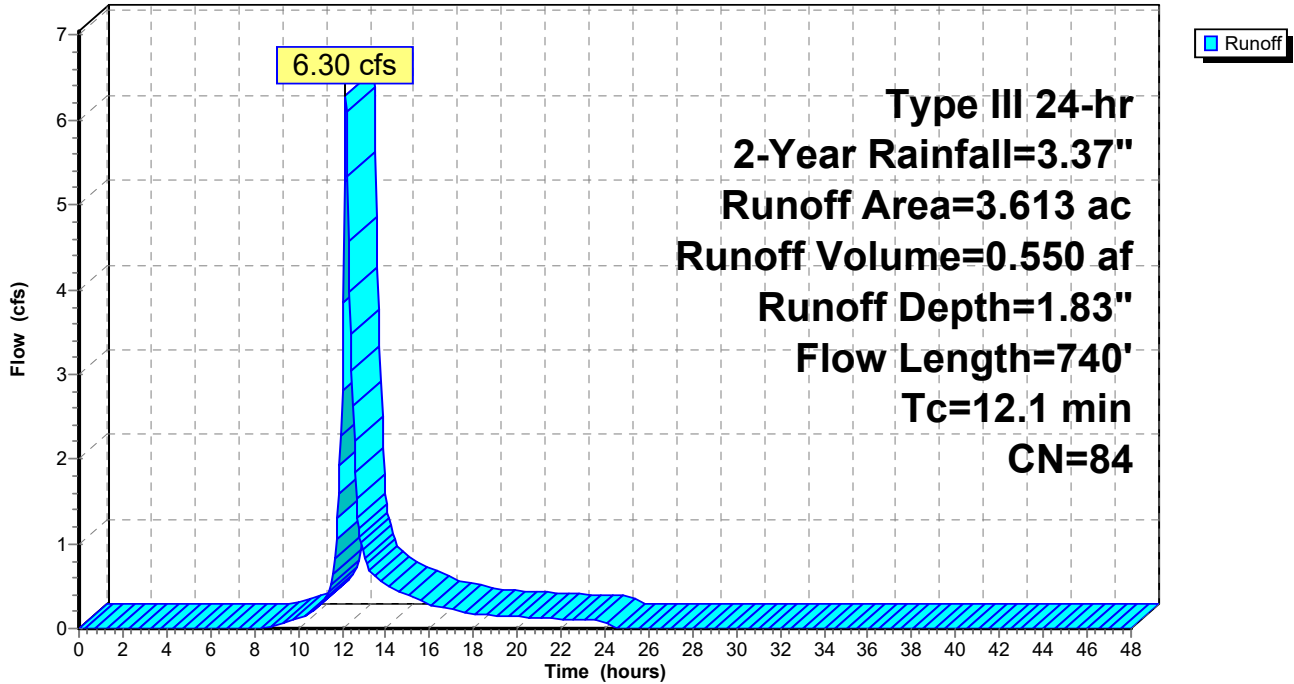
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.37"

Area (ac)	CN	Description
1.953	98	Paved parking, HSG B
0.152	98	Roofs, HSG B
0.394	61	>75% Grass cover, Good, HSG B
0.054	55	Woods, Good, HSG B
0.930	61	>75% Grass cover, Good, HSG B
0.130	98	Paved parking, HSG B
3.613	84	Weighted Average
1.378		38.14% Pervious Area
2.235		61.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	100	0.0650	0.19		Sheet Flow, Lawn Grass: Dense n= 0.240 P2= 3.37"
3.3	558	0.0191	2.81		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.1	82	0.0500	11.77	14.44	Pipe Channel, Discharge 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
12.1	740	Total			

Subcatchment 8S: DA 2A

Hydrograph



Summary for Subcatchment 9S: DA 2B

Runoff = 1.65 cfs @ 12.30 hrs, Volume= 0.186 af, Depth= 1.04"

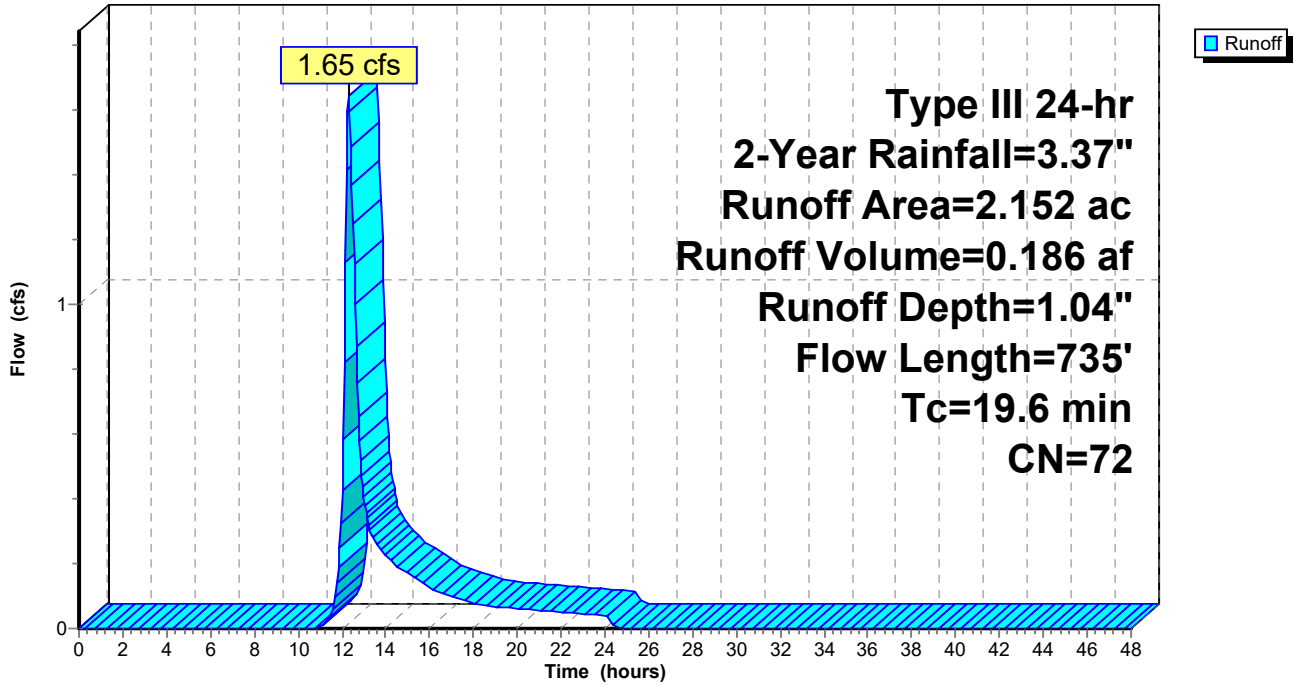
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.37"

Area (ac)	CN	Description
0.661	98	Paved parking, HSG B
0.746	55	Woods, Good, HSG B
0.669	61	>75% Grass cover, Good, HSG B
0.076	98	Water Surface, 0% imp, HSG B
2.152	72	Weighted Average
1.491		69.28% Pervious Area
0.661		30.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0450	0.11		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
2.1	100	0.0250	0.79		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.2	38	0.3333	4.04		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.8	314	0.0200	2.87		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.2	108	0.0200	7.44	9.14	Pipe Channel, Pipe 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.2	75		5.67		Lake or Reservoir, Mean Depth= 1.00'
19.6	735	Total			

Subcatchment 9S: DA 2B

Hydrograph



Summary for Subcatchment 11S: DA 1C

Runoff = 1.01 cfs @ 12.09 hrs, Volume= 0.077 af, Depth= 2.71"

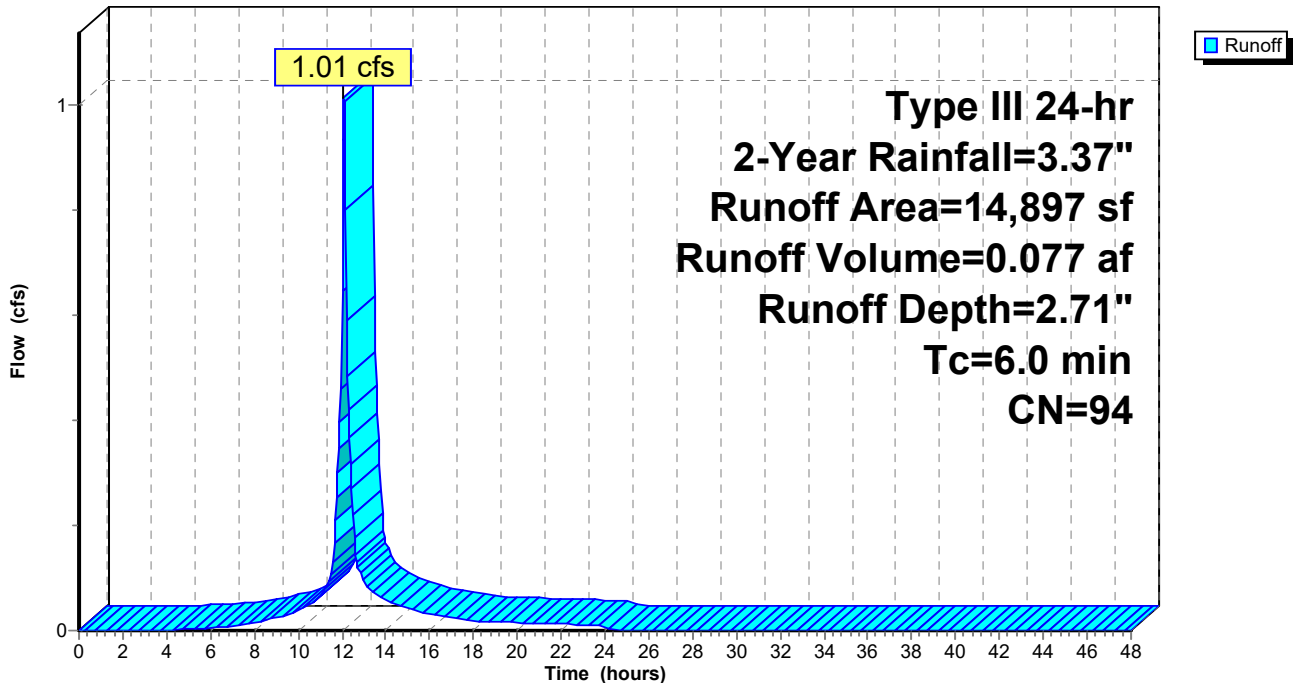
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.37"

Area (sf)	CN	Description
12,458	98	Paved parking, HSG C
2,439	74	>75% Grass cover, Good, HSG C
14,897	94	Weighted Average
2,439		16.37% Pervious Area
12,458		83.63% Impervious Area

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

Subcatchment 11S: DA 1C

Hydrograph



Summary for Subcatchment 12S: DA 1D

Runoff = 5.66 cfs @ 12.09 hrs, Volume= 0.427 af, Depth= 2.61"

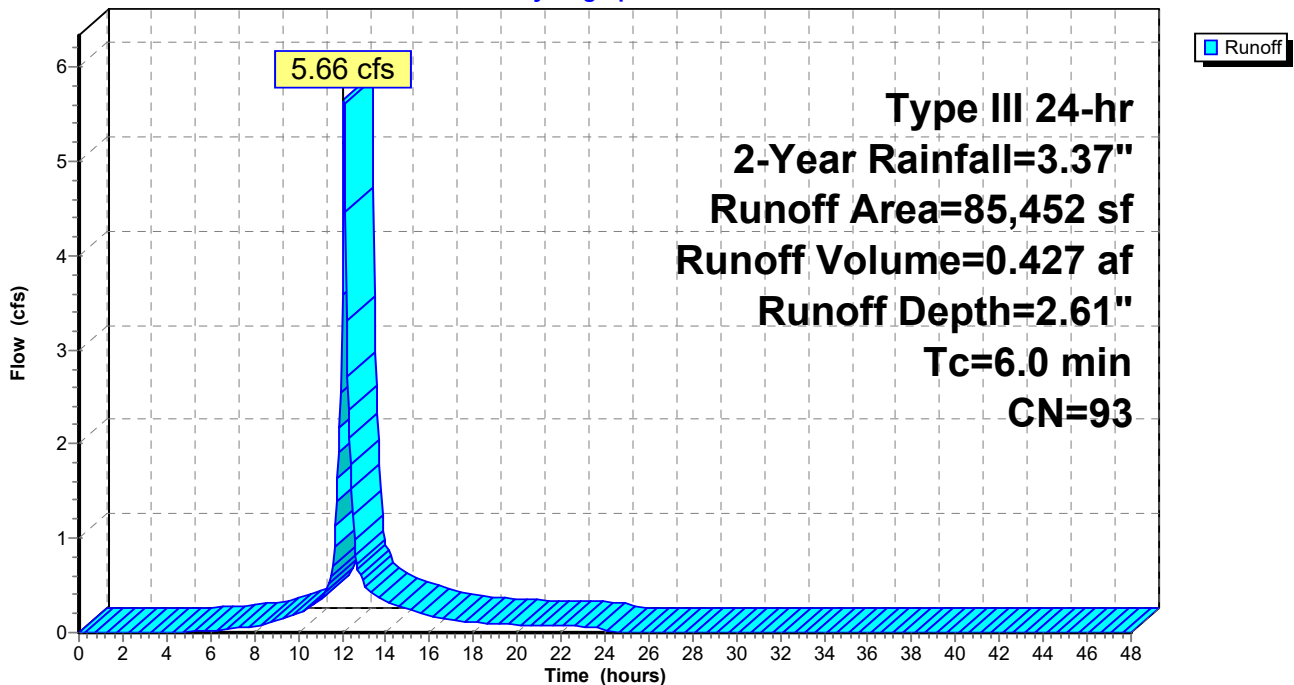
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.37"

Area (sf)	CN	Description
55,278	98	Paved parking, HSG C
6,098	98	Water Surface, 0% imp, HSG C
18,687	74	>75% Grass cover, Good, HSG C
5,389	98	Paved parking, HSG C
85,452	93	Weighted Average
24,785		29.00% Pervious Area
60,667		71.00% Impervious Area

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

Subcatchment 12S: DA 1D

Hydrograph



Summary for Subcatchment 15S: DA 2E

Runoff = 4.56 cfs @ 12.17 hrs, Volume= 0.401 af, Depth= 1.53"

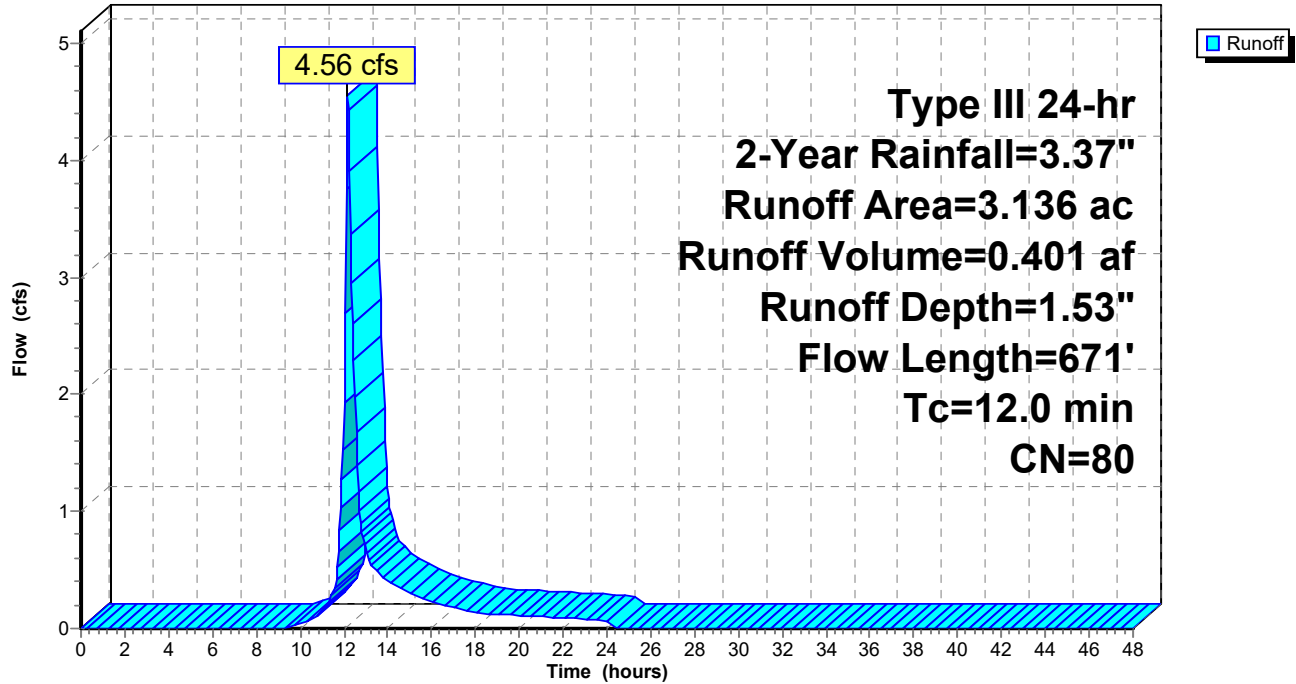
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.37"

Area (ac)	CN	Description
* 0.985	98	Paved parking, HSG C, South
* 0.455	74	>75% Grass cover, Good, HSG C, South
1.030	70	Woods, Good, HSG C
0.666	74	>75% Grass cover, Good, HSG C
3.136	80	Weighted Average
2.151		68.59% Pervious Area
0.985		31.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
3.3	417	0.1799	2.12		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	40	0.1000	2.21		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.7	164	0.0421	4.17		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
12.0	671	Total			

Subcatchment 15S: DA 2E

Hydrograph



Summary for Subcatchment 16S: DA 2G

Runoff = 0.82 cfs @ 12.09 hrs, Volume= 0.059 af, Depth= 1.60"

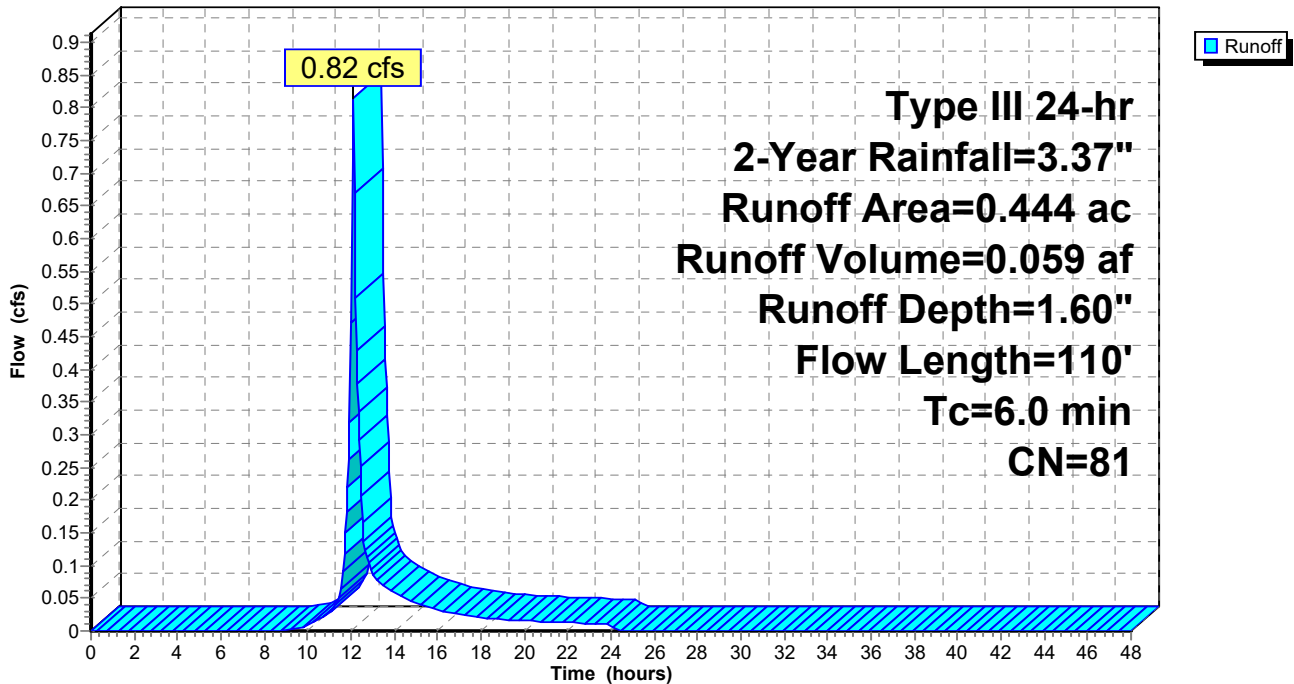
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.37"

Area (ac)	CN	Description
0.103	98	Water Surface, 0% imp, HSG C
0.017	80	>75% Grass cover, Good, HSG D
0.229	74	>75% Grass cover, Good, HSG C
0.079	80	>75% Grass cover, Good, HSG D
0.016	74	>75% Grass cover, Good, HSG C
0.444	81	Weighted Average
0.444		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.2	60	0.3500	4.14		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
5.7	110	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 16S: DA 2G

Hydrograph



Summary for Subcatchment 17S: DA 2I

Runoff = 1.17 cfs @ 12.15 hrs, Volume= 0.100 af, Depth= 2.24"

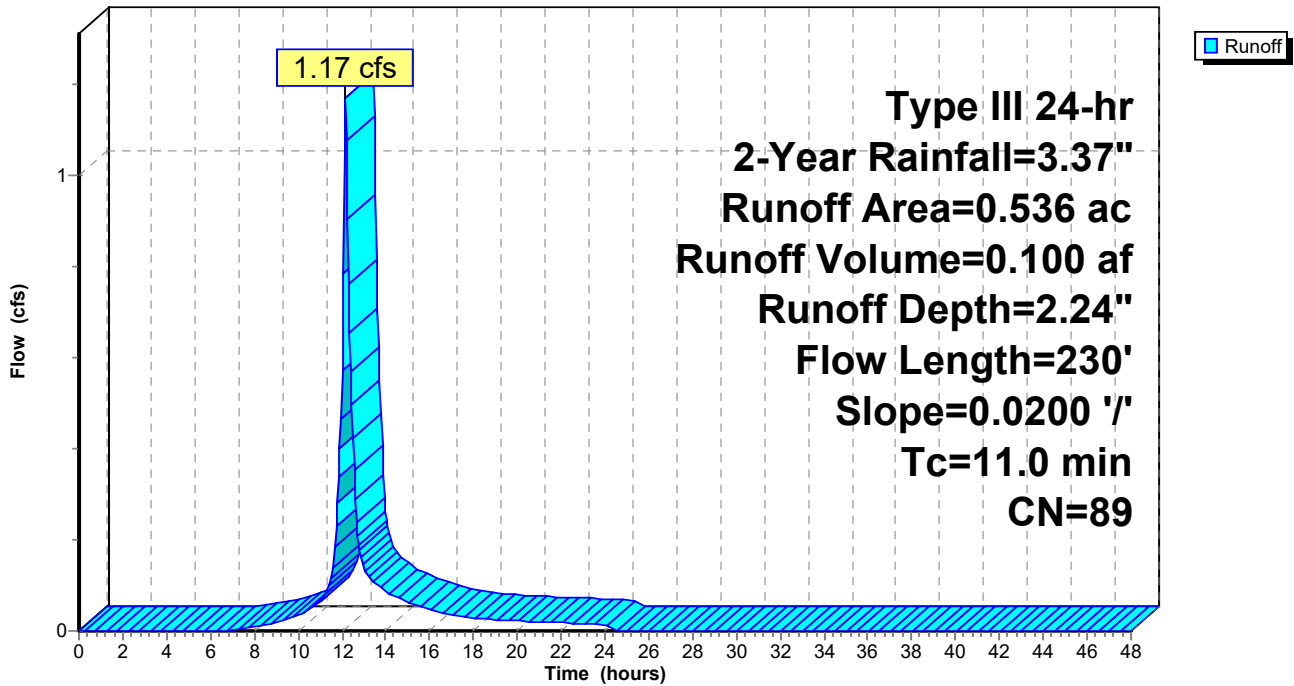
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.37"

Area (ac)	CN	Description
* 0.344	98	Paved parking, HSG C, North
* 0.192	74	>75% Grass cover, Good, HSG C, North
0.536	89	Weighted Average
0.192		35.82% Pervious Area
0.344		64.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
3.0	180	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
11.0	230	Total			

Subcatchment 17S: DA 2I

Hydrograph



Summary for Subcatchment 21S: DA 2F

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.021 af, Depth= 1.75"

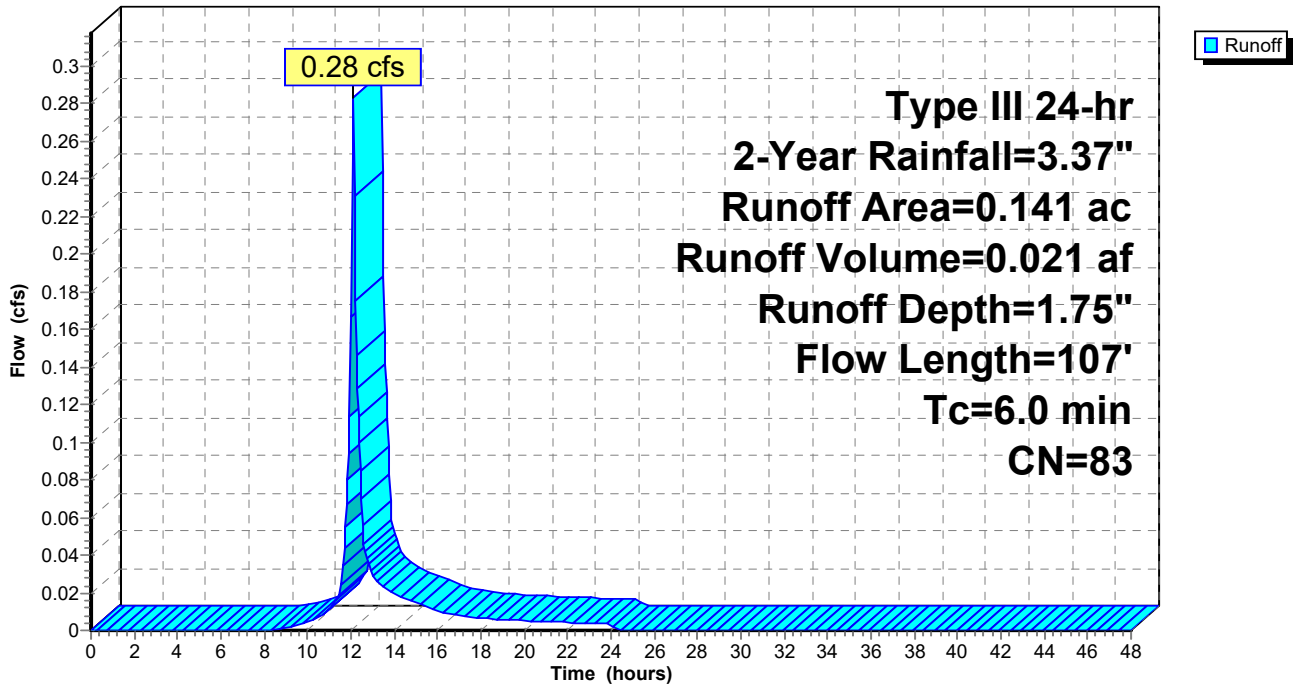
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.37"

Area (ac)	CN	Description
0.051	98	Water Surface, 0% imp, HSG C
0.090	74	>75% Grass cover, Good, HSG C
0.141	83	Weighted Average
0.141		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.3	57	0.1754	2.93		Shallow Concentrated Flow, Woods Short Grass Pasture Kv= 7.0 fps
4.5	107	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 21S: DA 2F

Hydrograph



Summary for Subcatchment 22S: DA 2H

Runoff = 4.64 cfs @ 12.15 hrs, Volume= 0.383 af, Depth= 1.68"

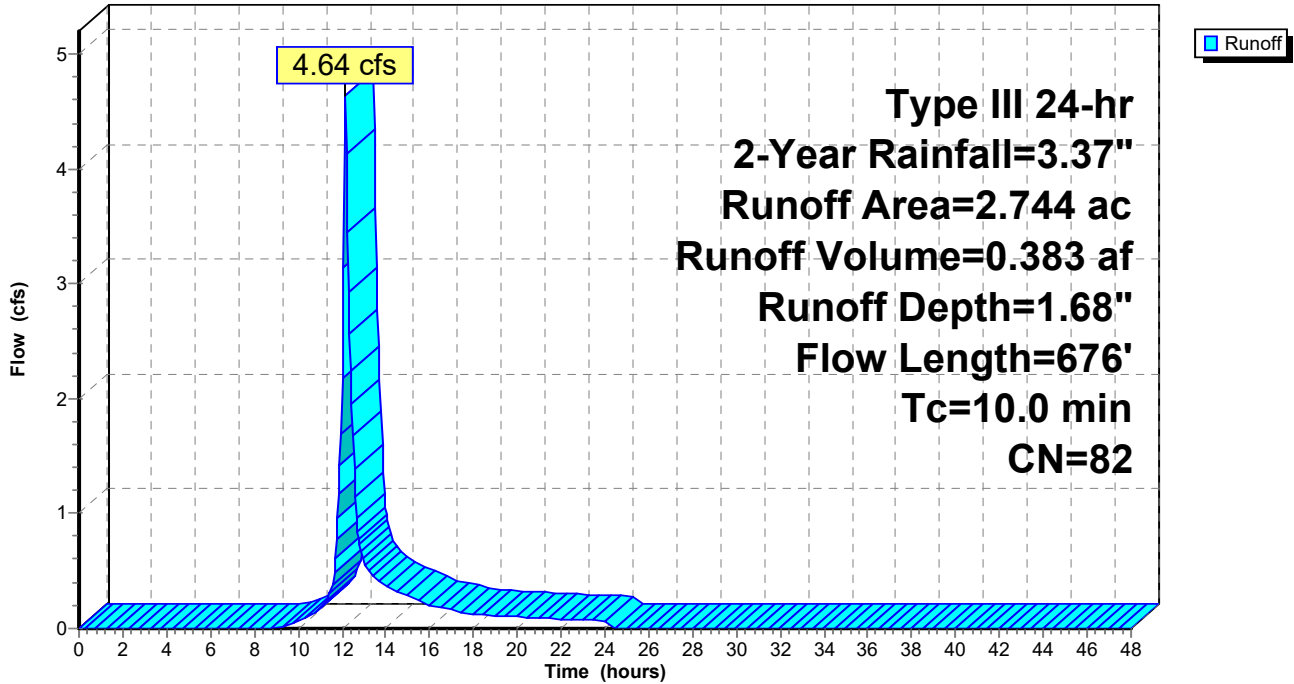
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.37"

Area (ac)	CN	Description
* 0.431	98	Paved parking, HSG C, North
* 0.010	80	>75% Grass cover, Good, HSG D, North
* 0.313	74	>75% Grass cover, Good, HSG C, North
* 0.550	98	Paved parking, HSG C, South
* 0.356	74	>75% Grass cover, Good, HSG C, South
0.748	70	Woods, Good, HSG C
0.336	74	>75% Grass cover, Good, HSG C
2.744	82	Weighted Average
1.763		64.25% Pervious Area
0.981		35.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
1.7	190	0.1316	1.81		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	81	0.3333	4.04		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.7	355	0.0310	3.57		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
10.0	676	Total			

Subcatchment 22S: DA 2H

Hydrograph



Summary for Pond 2P: 30" RCP

Inflow Area = 55.918 ac, 25.55% Impervious, Inflow Depth > 1.15" for 2-Year event
 Inflow = 6.62 cfs @ 12.17 hrs, Volume= 5.343 af
 Outflow = 6.62 cfs @ 12.17 hrs, Volume= 5.343 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.62 cfs @ 12.17 hrs, Volume= 5.343 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 521.10' @ 12.17 hrs
 Flood Elev= 527.20'

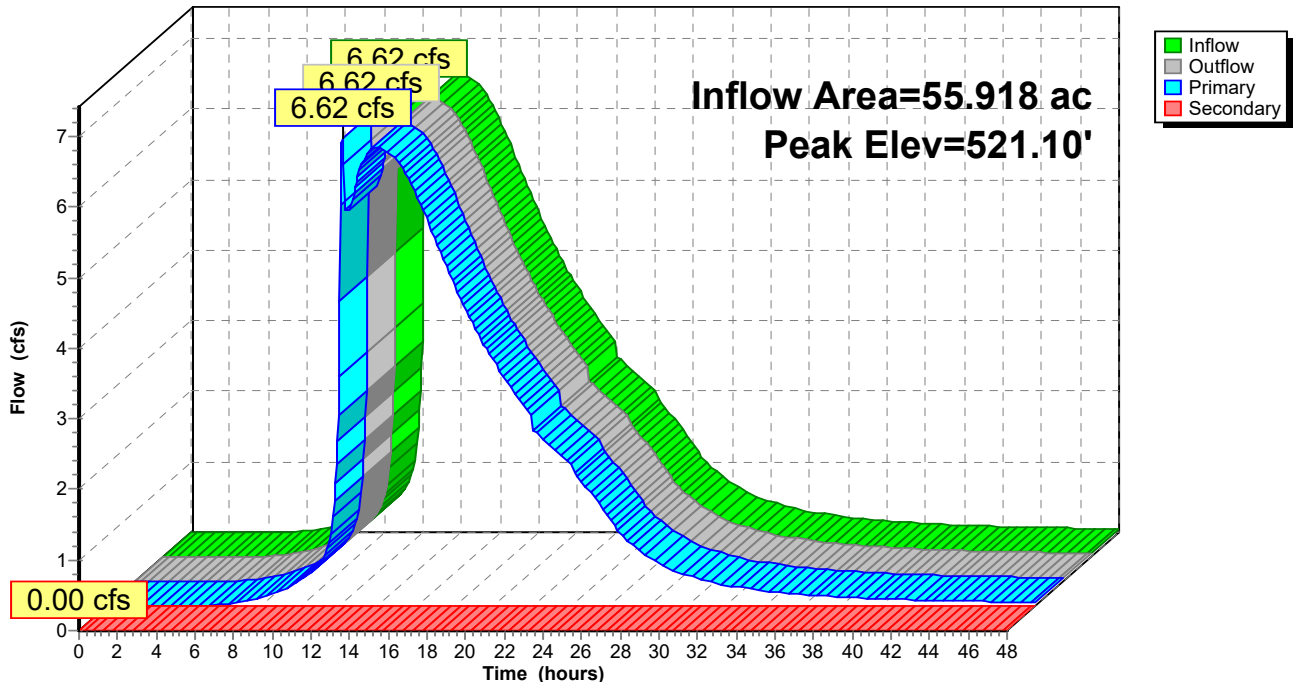
Device	Routing	Invert	Outlet Devices
#1	Primary	519.92'	30.0" Round 30" RC L= 80.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 519.92' / 519.62' S= 0.0037 ' / S= 0.0037 ' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 4.91 sf
#2	Secondary	527.20'	30.0' long x 10.0' breadth Overflow Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=6.51 cfs @ 12.17 hrs HW=521.09' (Free Discharge)
 ↳1=30" RC (Barrel Controls 6.51 cfs @ 4.23 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=519.92' (Free Discharge)
 ↳2=Overflow (Controls 0.00 cfs)

Pond 2P: 30" RCP

Hydrograph



Summary for Pond 4P: Pond

Inflow Area = 51.896 ac, 21.64% Impervious, Inflow Depth = 1.07" for 2-Year event
 Inflow = 28.26 cfs @ 12.32 hrs, Volume= 4.611 af
 Outflow = 5.71 cfs @ 14.34 hrs, Volume= 4.501 af, Atten= 80%, Lag= 121.3 min
 Primary = 5.71 cfs @ 14.34 hrs, Volume= 4.501 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 524.66' @ 14.34 hrs Surf.Area= 1.932 ac Storage= 1.961 af

Plug-Flow detention time= 275.7 min calculated for 4.501 af (98% of inflow)
 Center-of-Mass det. time= 261.2 min (1,142.9 - 881.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	523.45'	16.273 af	Pond Storage (Irregular) Listed below		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
523.45	0.636	1,389.1	0.000	0.000	0.636
524.00	1.723	1,270.7	0.624	0.624	1.212
526.00	2.359	1,494.7	4.065	4.690	2.345
528.00	2.936	1,638.1	5.284	9.974	3.169
530.00	3.368	1,700.4	6.299	16.273	3.556

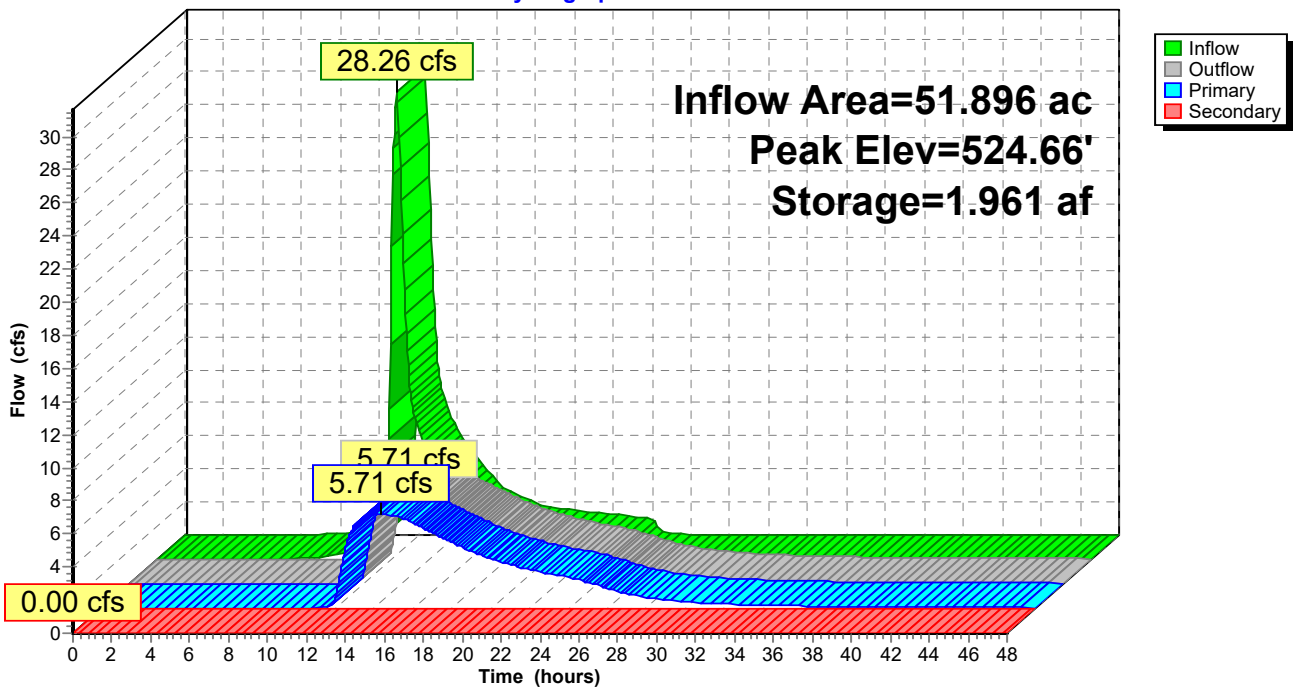
Device	Routing	Invert	Outlet Devices
#1	Primary	520.91'	30.0" Round 30" HDPE L= 110.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 520.91' / 520.64' S= 0.0024 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	521.46'	30.0" Round 30" HDPE L= 86.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 521.46' / 520.91' S= 0.0063 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	521.41'	24.0" Round 24" HDPE L= 157.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 521.41' / 521.40' S= 0.0001 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#4	Device 3	523.45'	18.0" Round 18" HDPE L= 117.9' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 523.45' / 521.82' S= 0.0138 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#5	Secondary	529.90'	50.0' long x 25.0' breadth Overflow Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.71 cfs @ 14.34 hrs HW=524.66' TW=521.09' (Dynamic Tailwater)
 ↳ 1=30" HDPE (Passes 5.71 cfs of 30.54 cfs potential flow)
 ↳ 2=30" HDPE (Passes 5.71 cfs of 30.56 cfs potential flow)
 ↳ 3=24" HDPE (Passes 5.71 cfs of 15.20 cfs potential flow)
 ↳ 4=18" HDPE (Inlet Controls 5.71 cfs @ 3.74 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=523.45' TW=519.92' (Dynamic Tailwater)
 ↳ 5=Overflow (Controls 0.00 cfs)

Pond 4P: Pond

Hydrograph



Summary for Pond 10P: Apartment Phase 1 Detention Basin

Inflow Area = 2.152 ac, 30.72% Impervious, Inflow Depth = 1.04" for 2-Year event
 Inflow = 1.65 cfs @ 12.30 hrs, Volume= 0.186 af
 Outflow = 1.61 cfs @ 12.35 hrs, Volume= 0.186 af, Atten= 2%, Lag= 2.8 min
 Primary = 1.61 cfs @ 12.35 hrs, Volume= 0.186 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 536.68' @ 12.35 hrs Surf.Area= 604 sf Storage= 228 cf

Plug-Flow detention time= 2.9 min calculated for 0.186 af (100% of inflow)
 Center-of-Mass det. time= 3.0 min (880.9 - 877.9)

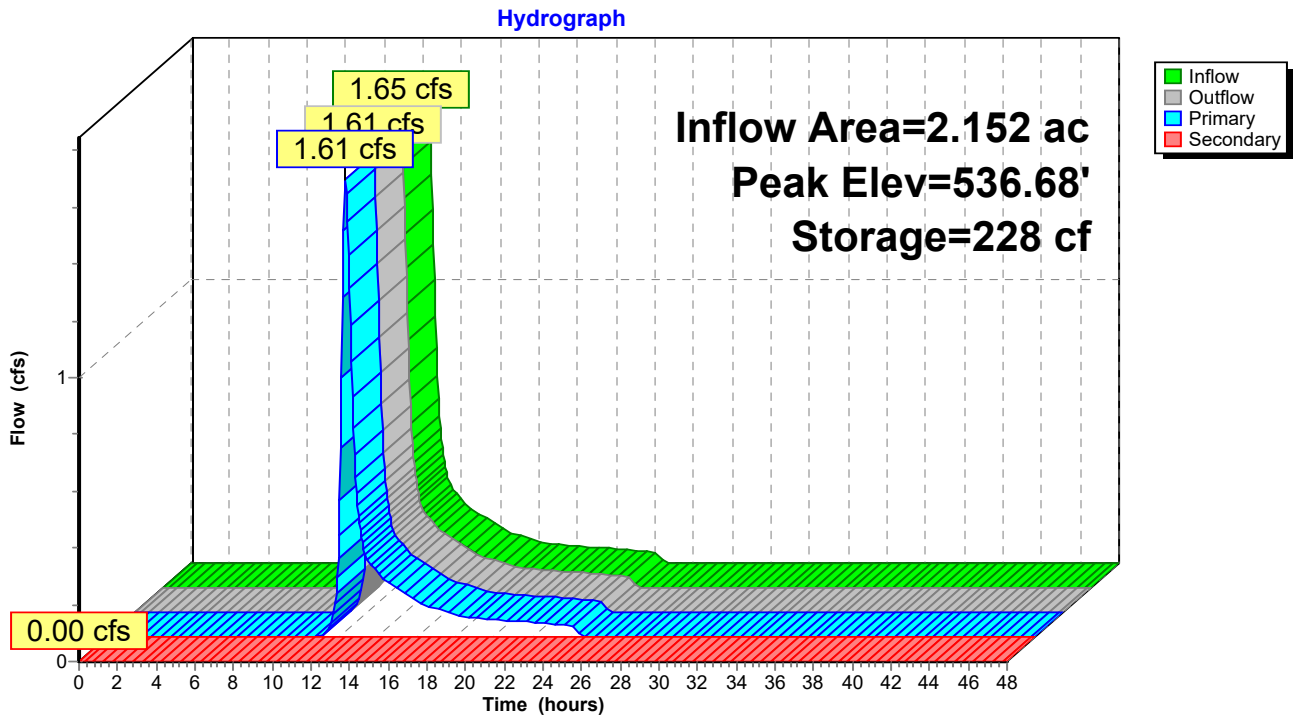
Volume	Invert	Avail.Storage	Storage Description			
#1	536.00'	7,026 cf	Detention Basin (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
536.00	100	40.0	0	0	100	
536.50	467	110.5	131	131	945	
537.60	1,559	173.6	1,056	1,186	2,380	
540.00	3,429	242.5	5,840	7,026	4,716	

Device	Routing	Invert	Outlet Devices
#1	Primary	536.00'	12.0" Round Culvert L= 75.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 536.00' / 534.50' S= 0.0200 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	539.50'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.61 cfs @ 12.35 hrs HW=536.68' TW=524.18' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 1.61 cfs @ 2.81 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=536.00' TW=523.45' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 10P: Apartment Phase 1 Detention Basin



Summary for Pond 15P: Apartments Phase II Stormwater Basin 2

Inflow Area = 3.277 ac, 30.06% Impervious, Inflow Depth = 1.54" for 2-Year event
 Inflow = 4.77 cfs @ 12.17 hrs, Volume= 0.421 af
 Outflow = 4.00 cfs @ 12.27 hrs, Volume= 0.342 af, Atten= 16%, Lag= 5.8 min
 Primary = 4.00 cfs @ 12.27 hrs, Volume= 0.342 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 567.57' @ 12.26 hrs Surf.Area= 2,143 sf Storage= 4,537 cf

Plug-Flow detention time= 119.1 min calculated for 0.342 af (81% of inflow)
 Center-of-Mass det. time= 42.4 min (887.3 - 845.0)

Volume	Invert	Avail.Storage	Storage Description
#1	562.00'	6 cf	3.00'W x 8.00'L x 2.50'H Sand Underdrain 60 cf Overall x 10.0% Voids
#2	564.50'	10,719 cf	Stormwater Basin (Irregular) Listed below
		10,725 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
564.50	4	8.2	0	0	4
564.75	257	68.5	24	24	372
565.00	1,193	160.0	167	191	2,036
566.00	1,533	172.5	1,359	1,551	2,406
568.00	2,277	197.6	3,786	5,336	3,233
570.00	3,128	222.7	5,383	10,719	4,172

Device	Routing	Invert	Outlet Devices
#1	Primary	562.00'	18.0" Round 18" HDPE L= 68.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 562.00' / 561.60' S= 0.0059 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	567.00'	36.0" W x 6.0" H Vert. 36" x 6" Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	568.00'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#4	Secondary	569.00'	8.0' long x 8.0' breadth Rip Rap Spillway 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#5	Device 1	562.00'	0.500 in/hr Sand Underdrain over Horizontal area from 562.00' - 564.50' Excluded Horizontal area = 24 sf Phase-In= 0.01'

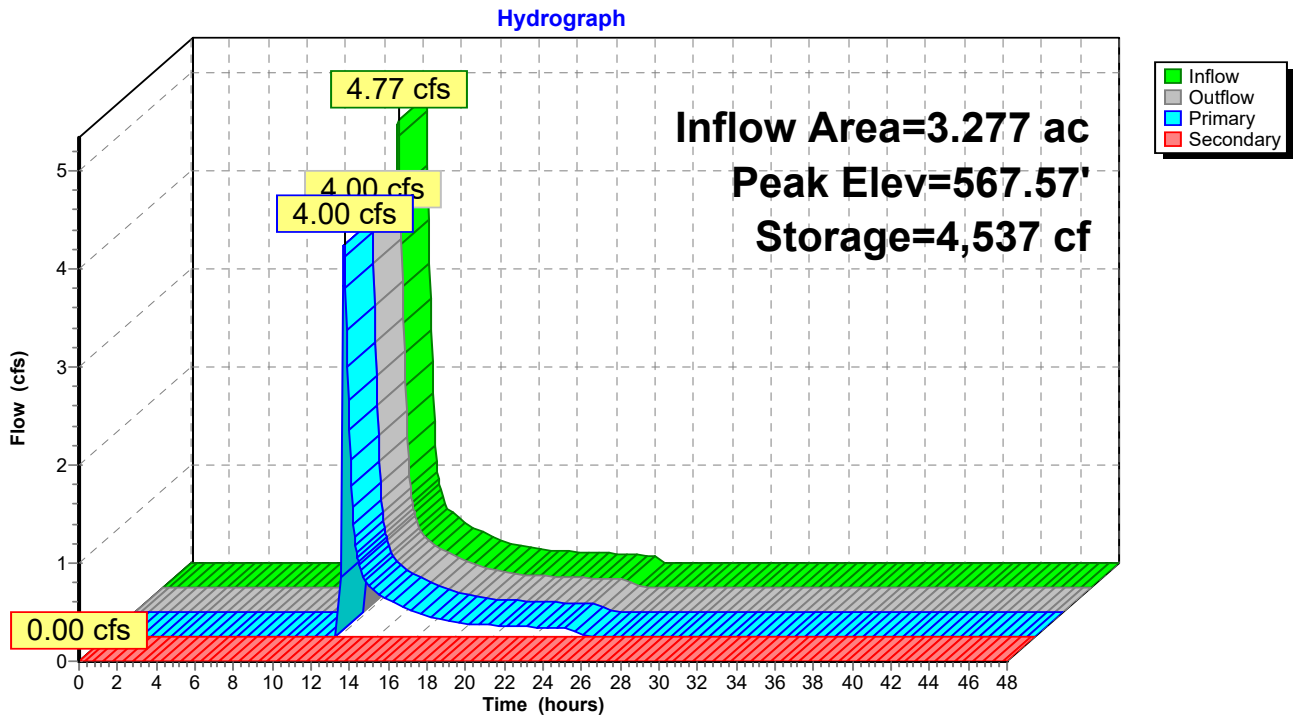
Primary OutFlow Max=3.95 cfs @ 12.27 hrs HW=567.57' TW=562.35' (Dynamic Tailwater)

- 1=18" HDPE (Passes 3.95 cfs of 18.10 cfs potential flow)
- 2=36" x 6" Orifice (Orifice Controls 3.95 cfs @ 2.63 fps)
- 3=Top of Frame (Controls 0.00 cfs)
- 5=Sand Underdrain (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=562.00' TW=523.45' (Dynamic Tailwater)

- 4=Rip Rap Spillway (Controls 0.00 cfs)

Pond 15P: Apartments Phase II Stormwater Basin 2



Summary for Pond 16P: Water Quality Basin

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=6)

Inflow Area = 1.962 ac, 71.00% Impervious, Inflow Depth = 2.61" for 2-Year event
 Inflow = 5.66 cfs @ 12.09 hrs, Volume= 0.427 af
 Outflow = 0.57 cfs @ 12.89 hrs, Volume= 0.427 af, Atten= 90%, Lag= 48.3 min
 Primary = 0.57 cfs @ 12.89 hrs, Volume= 0.427 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 526.92' @ 12.89 hrs Surf.Area= 5,060 sf Storage= 7,712 cf

Plug-Flow detention time= 143.5 min calculated for 0.426 af (100% of inflow)
 Center-of-Mass det. time= 143.2 min (934.1 - 790.9)

Volume	Invert	Avail.Storage	Storage Description
#1	523.75'	26,415 cf	Water Quality swale (Irregular) Listed below (Recalc)
#2	522.25'	5 cf	3.00'W x 3.00'L x 1.50'H Underdrain
			14 cf Overall x 40.0% Voids
		26,420 cf	Total Available Storage

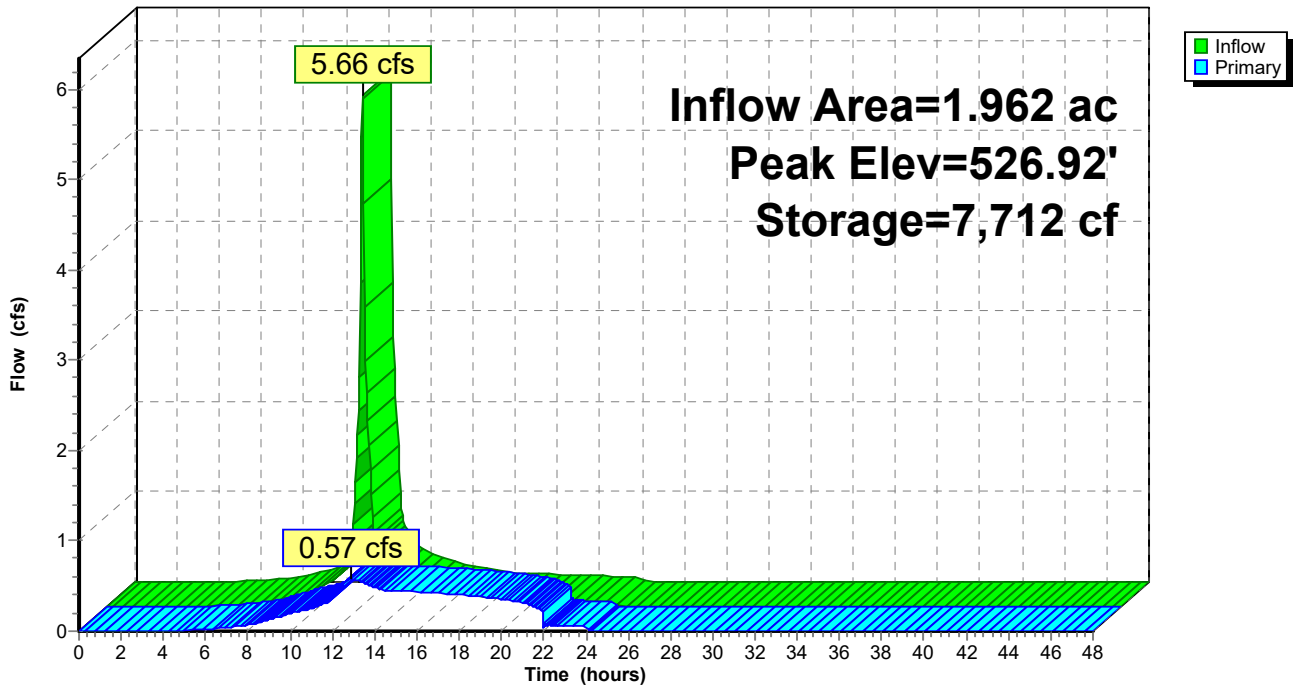
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
523.75	9	12.0	0	0	9
524.00	258	63.2	26	26	316
524.25	528	108.8	96	123	940
524.50	766	159.7	161	283	2,028
524.75	1,105	211.6	233	516	3,562
525.00	1,523	263.2	327	843	5,513
525.25	2,026	316.2	442	1,285	7,958
525.50	2,529	368.0	568	1,853	10,779
525.75	3,267	420.8	723	2,576	14,095
526.00	4,119	481.0	921	3,497	18,417
528.00	6,268	535.7	10,312	13,809	22,957
529.75	8,181	557.7	12,606	26,415	25,097

Device	Routing	Invert	Outlet Devices
#1	Primary	522.75'	24.0" Round 24" HDPE L= 75.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 522.75' / 521.75' S= 0.0133 ' S= 0.0133 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	523.00'	3.0" Vert. Underdrain C= 0.600 Limited to weir flow at low heads
#3	Device 1	526.75'	6.0" W x 6.0" H Vert. 6" Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	527.25'	18.0" W x 6.0" H Vert. 18x6 Orifice C= 0.600 Limited to weir flow at low heads
#5	Device 1	528.50'	20.0' long x 0.5' breadth Top of Frame Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

- Primary OutFlow** Max=0.57 cfs @ 12.89 hrs HW=526.92' TW=521.04' (Dynamic Tailwater)
- 1=24" HDPE (Passes 0.57 cfs of 26.93 cfs potential flow)
 - 2=Underdrain (Orifice Controls 0.46 cfs @ 9.38 fps)
 - 3=6" Orifice (Orifice Controls 0.11 cfs @ 1.32 fps)
 - 4=18x6 Orifice (Controls 0.00 cfs)
 - 5=Top of Frame (Controls 0.00 cfs)

Pond 16P: Water Quality Basin

Hydrograph



Summary for Pond 20P: Apartments Phase II Stormwater Basin 1

Inflow Area = 7.001 ac, 33.00% Impervious, Inflow Depth = 1.52" for 2-Year event
 Inflow = 9.31 cfs @ 12.21 hrs, Volume= 0.885 af
 Outflow = 2.12 cfs @ 12.78 hrs, Volume= 0.695 af, Atten= 77%, Lag= 34.3 min
 Primary = 2.12 cfs @ 12.78 hrs, Volume= 0.695 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 557.00' @ 12.78 hrs Surf.Area= 5,514 sf Storage= 15,826 cf

Plug-Flow detention time= 180.5 min calculated for 0.694 af (78% of inflow)
 Center-of-Mass det. time= 97.6 min (951.6 - 854.0)

Volume	Invert	Avail.Storage	Storage Description
#1	551.00'	4 cf	3.00'W x 8.00'L x 1.75'H Sand Underdrain 42 cf Overall x 10.0% Voids
#2	552.75'	40,883 cf	Stormwater Basin (Irregular) Listed below (Recalc)
#3	556.00'	424 cf	36.0" Round Pipe Storage-Impervious L= 60.0' S= 0.0083 ' /'
		41,312 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
552.75	120	43.3	0	0	120
553.00	865	110.3	109	109	939
553.25	1,552	155.7	298	407	1,901
553.50	2,135	207.8	459	866	3,409
553.75	2,928	261.6	630	1,496	5,419
554.00	3,512	310.5	804	2,300	7,646
555.00	4,145	323.0	3,824	6,124	8,352
556.00	4,804	335.6	4,470	10,595	9,090
557.00	5,490	348.1	5,143	15,738	9,851
558.00	6,569	422.7	6,021	21,759	14,443
559.00	7,426	435.3	6,993	28,752	15,404
560.00	8,310	447.8	7,864	36,616	16,387
560.50	8,761	454.1	4,267	40,883	16,893

Device	Routing	Invert	Outlet Devices
#1	Primary	551.00'	18.0" Round 18" HDPE L= 152.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 551.00' / 549.00' S= 0.0132 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	555.50'	6.0" Vert. 6" Orifices (2) X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	557.30'	48.0" W x 7.0" H Vert. 48" x 7" Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	558.75'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#5	Secondary	559.75'	8.0' long x 8.0' breadth Rip Rap Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

#6	Device 1	551.00'	2.50	3.00	3.50	4.00	4.50	5.00	5.50
			Coef. (English)	2.43	2.54	2.70	2.69	2.68	2.68
				2.64	2.65	2.65	2.66	2.66	2.64
				2.64	2.65	2.65	2.66	2.68	2.70
				2.64	2.65	2.65	2.66	2.68	2.74

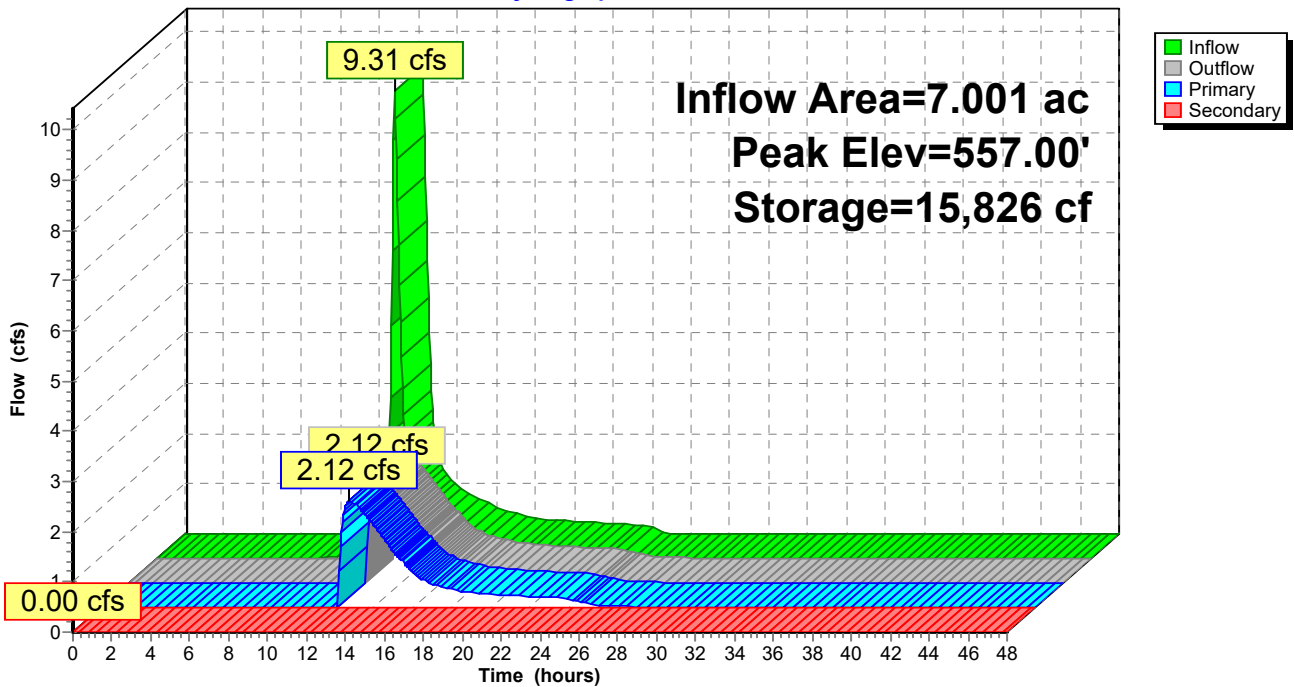
0.500 in/hr Sand Underdrain over Horizontal area from 551.00' - 552.75'
 Excluded Horizontal area = 24 sf Phase-In= 0.01'

Primary OutFlow Max=2.11 cfs @ 12.78 hrs HW=557.00' TW=524.49' (Dynamic Tailwater)
 1=18" HDPE (Passes 2.11 cfs of 17.48 cfs potential flow)
 2=6" Orifices (2) (Orifice Controls 2.11 cfs @ 5.38 fps)
 3=48" x 7" Orifice (Controls 0.00 cfs)
 4=Top of Frame (Controls 0.00 cfs)
 6=Sand Underdrain (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=551.00' TW=523.45' (Dynamic Tailwater)
 5=Rip Rap Spillway (Controls 0.00 cfs)

Pond 20P: Apartments Phase II Stormwater Basin 1

Hydrograph



Summary for Pond 21P: Drain

Inflow Area = 3.813 ac, 34.85% Impervious, Inflow Depth = 1.39" for 2-Year event
 Inflow = 4.88 cfs @ 12.25 hrs, Volume= 0.442 af
 Outflow = 4.88 cfs @ 12.25 hrs, Volume= 0.442 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.88 cfs @ 12.25 hrs, Volume= 0.442 af

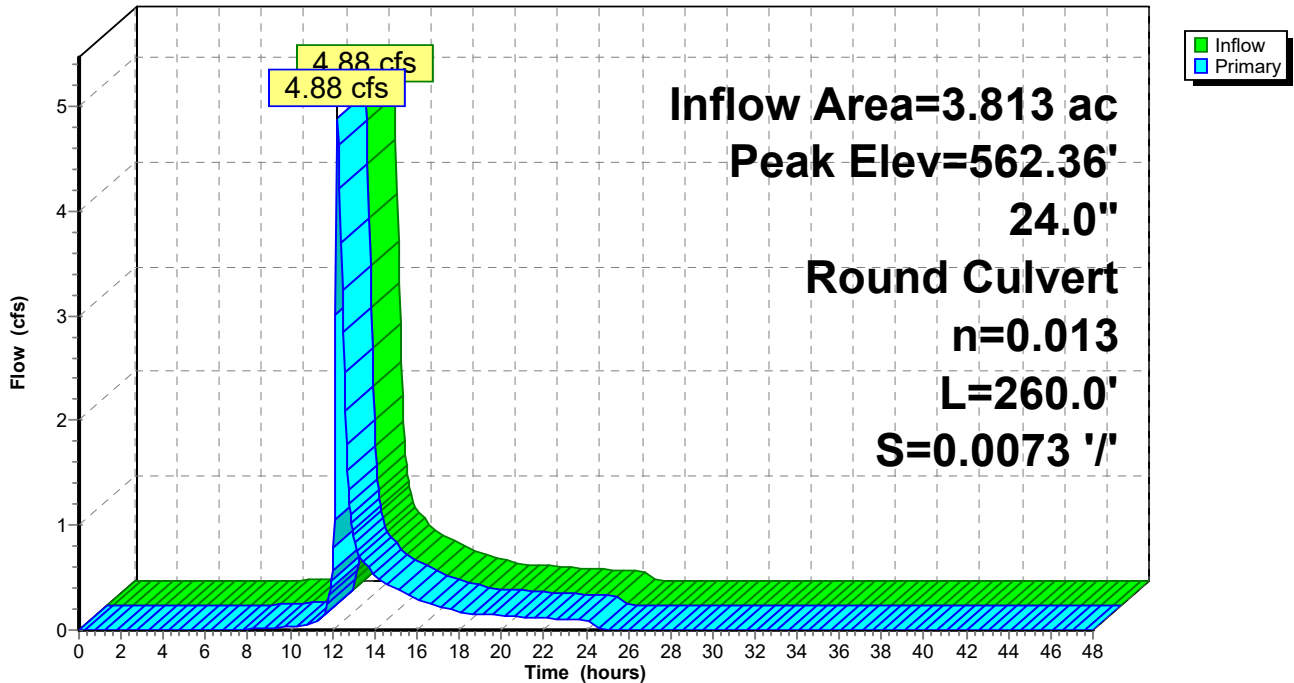
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 562.36' @ 12.25 hrs
 Flood Elev= 565.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	561.40'	24.0" Round Culvert L= 260.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 561.40' / 559.50' S= 0.0073 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=4.88 cfs @ 12.25 hrs HW=562.36' TW=555.89' (Dynamic Tailwater)
 ←1=Culvert (Barrel Controls 4.88 cfs @ 4.81 fps)

Pond 21P: Drain

Hydrograph



Summary for Link 14L: DA 2D - From Town Hall

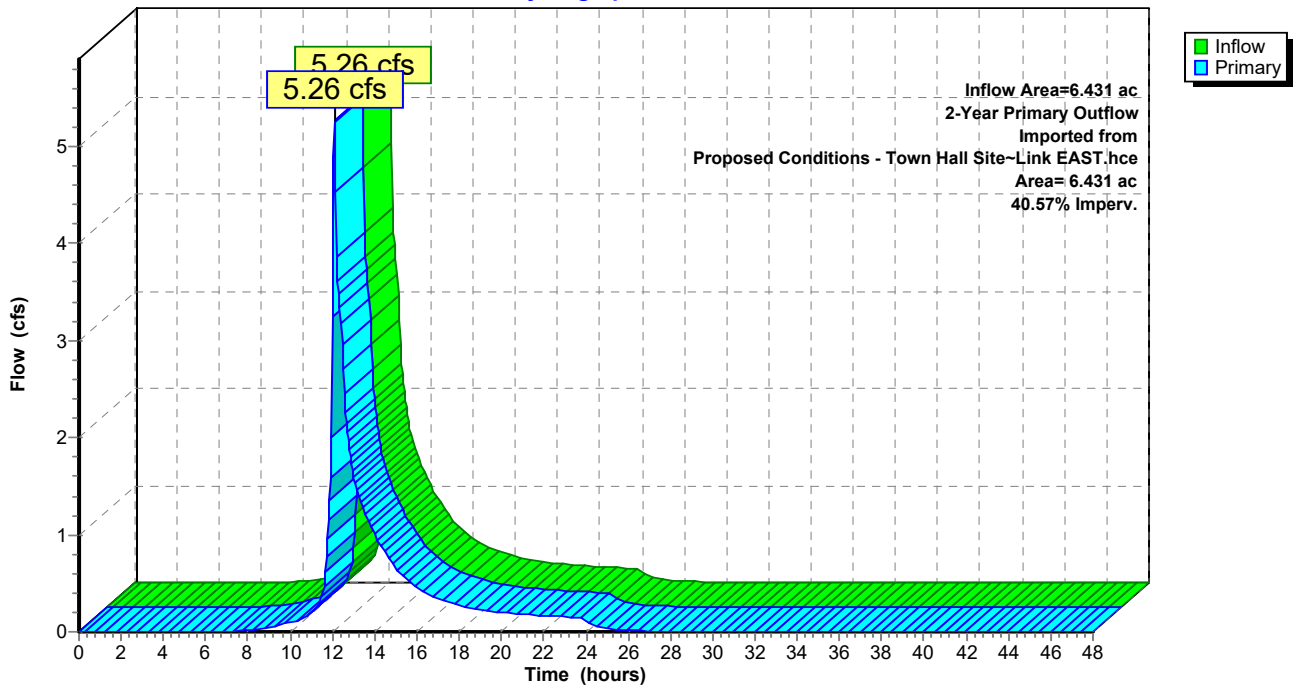
Inflow Area = 6.431 ac, 40.57% Impervious, Inflow Depth = 1.29" for 2-Year event
 Inflow = 5.26 cfs @ 12.09 hrs, Volume= 0.693 af
 Primary = 5.26 cfs @ 12.09 hrs, Volume= 0.693 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

2-Year Primary Outflow Imported from Proposed Conditions - Town Hall Site~Link EAST.hce

Link 14L: DA 2D - From Town Hall

Hydrograph



Market Square and Existing Development to RT 66 Type III 24-hr 10-Year Rainfall=5.18"

Prepared by {enter your company name here}

Printed 12/14/2020

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1A Runoff Area=2.061 ac 80.93% Impervious Runoff Depth=4.16"
Flow Length=532' Tc=11.0 min CN=91 Runoff=8.09 cfs 0.714 af

Subcatchment 3S: DA 2C Runoff Area=30.199 ac 4.93% Impervious Runoff Depth=1.93"
Flow Length=2,588' Tc=22.6 min UI Adjusted CN=67 Runoff=42.12 cfs 4.856 af

Subcatchment 7S: DA 1B Runoff Area=94,000 sf 75.97% Impervious Runoff Depth=4.27"
Flow Length=669' Tc=6.0 min CN=92 Runoff=9.98 cfs 0.767 af

Subcatchment 8S: DA 2A Runoff Area=3.613 ac 61.86% Impervious Runoff Depth=3.44"
Flow Length=740' Tc=12.1 min CN=84 Runoff=11.77 cfs 1.034 af

Subcatchment 9S: DA 2B Runoff Area=2.152 ac 30.72% Impervious Runoff Depth=2.34"
Flow Length=735' Tc=19.6 min CN=72 Runoff=3.94 cfs 0.419 af

Subcatchment 11S: DA 1C Runoff Area=14,897 sf 83.63% Impervious Runoff Depth=4.49"
Tc=6.0 min CN=94 Runoff=1.63 cfs 0.128 af

Subcatchment 12S: DA 1D Runoff Area=85,452 sf 71.00% Impervious Runoff Depth=4.37"
Tc=6.0 min CN=93 Runoff=9.22 cfs 0.715 af

Subcatchment 15S: DA 2E Runoff Area=3.136 ac 31.41% Impervious Runoff Depth=3.05"
Flow Length=671' Tc=12.0 min CN=80 Runoff=9.16 cfs 0.797 af

Subcatchment 16S: DA 2G Runoff Area=0.444 ac 0.00% Impervious Runoff Depth=3.14"
Flow Length=110' Tc=6.0 min CN=81 Runoff=1.60 cfs 0.116 af

Subcatchment 17S: DA 2I Runoff Area=0.536 ac 64.18% Impervious Runoff Depth=3.94"
Flow Length=230' Slope=0.0200 '/ Tc=11.0 min CN=89 Runoff=2.02 cfs 0.176 af

Subcatchment 21S: DA 2F Runoff Area=0.141 ac 0.00% Impervious Runoff Depth=3.34"
Flow Length=107' Tc=6.0 min CN=83 Runoff=0.54 cfs 0.039 af

Subcatchment 22S: DA 2H Runoff Area=2.744 ac 35.75% Impervious Runoff Depth=3.24"
Flow Length=676' Tc=10.0 min CN=82 Runoff=8.97 cfs 0.741 af

Pond 2P: 30" RCP Peak Elev=521.77' Inflow=14.64 cfs 11.587 af
Primary=14.64 cfs 11.587 af Secondary=0.00 cfs 0.000 af Outflow=14.64 cfs 11.587 af

Pond 4P: Pond Peak Elev=526.06' Storage=4.839 af Inflow=77.66 cfs 10.281 af
Primary=11.59 cfs 10.158 af Secondary=0.00 cfs 0.000 af Outflow=11.59 cfs 10.158 af

Pond 10P: Apartment Phase 1 Detention Basin Peak Elev=537.36' Storage=846 cf Inflow=3.94 cfs 0.419 af
Primary=3.50 cfs 0.419 af Secondary=0.00 cfs 0.000 af Outflow=3.50 cfs 0.419 af

Pond 15P: Apartments Phase II Stormwater Peak Elev=568.14' Storage=5,727 cf Inflow=9.55 cfs 0.836 af
Primary=9.25 cfs 0.757 af Secondary=0.00 cfs 0.000 af Outflow=9.25 cfs 0.757 af

Market Square and Existing Development to RT 66 Type III 24-hr 10-Year Rainfall=5.18"

Prepared by {enter your company name here}

Printed 12/14/2020

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Pond 16P: Water Quality Basin

Peak Elev=527.64' Storage=11,639 cf Inflow=9.22 cfs 0.715 af
Outflow=2.64 cfs 0.715 af

Pond 20P: Apartments Phase II

Peak Elev=558.31' Storage=24,123 cf Inflow=20.08 cfs 1.791 af
Primary=12.45 cfs 1.601 af Secondary=0.00 cfs 0.000 af Outflow=12.45 cfs 1.601 af

Pond 21P: Drain

Peak Elev=562.96' Inflow=11.05 cfs 0.933 af
24.0" Round Culvert n=0.013 L=260.0' S=0.0073 '/' Outflow=11.05 cfs 0.933 af

10-Year Link Primary Outflow Imported from Proposed Conditions - Town Hall Site~Link EAST.hce Inflow=10.41 cfs 1.476 af
Area= 6.431 ac 40.57% Imperv. Primary=10.41 cfs 1.476 af

Total Runoff Area = 49.488 ac Runoff Volume = 10.503 af Average Runoff Depth = 2.55"
76.40% Pervious = 37.808 ac 23.60% Impervious = 11.680 ac

Summary for Subcatchment 1S: DA 1A

Runoff = 8.09 cfs @ 12.15 hrs, Volume= 0.714 af, Depth= 4.16"

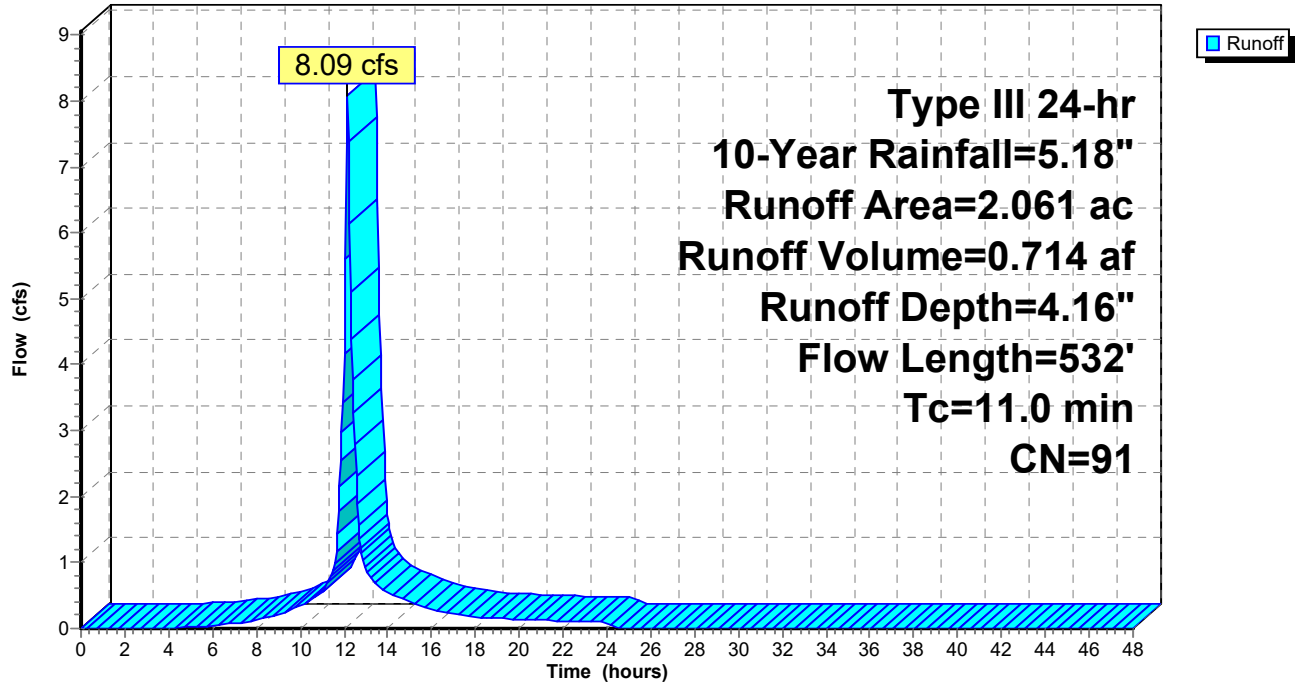
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.201	98	Paved parking, HSG C
1.260	98	Paved parking, HSG B
0.207	98	Paved parking, HSG C
0.074	74	>75% Grass cover, Good, HSG C
0.319	61	>75% Grass cover, Good, HSG B
2.061	91	Weighted Average
0.393		19.07% Pervious Area
1.668		80.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	40	0.0100	0.08		Sheet Flow, Lawn Grass: Dense n= 0.240 P2= 3.37"
1.7	239	0.0126	2.28		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.5	253	0.0200	8.41	14.86	Pipe Channel, HDPE Drain 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
11.0	532	Total			

Subcatchment 1S: DA 1A

Hydrograph



Summary for Subcatchment 3S: DA 2C

[47] Hint: Peak is 123% of capacity of segment #3

Runoff = 42.12 cfs @ 12.33 hrs, Volume= 4.856 af, Depth= 1.93"

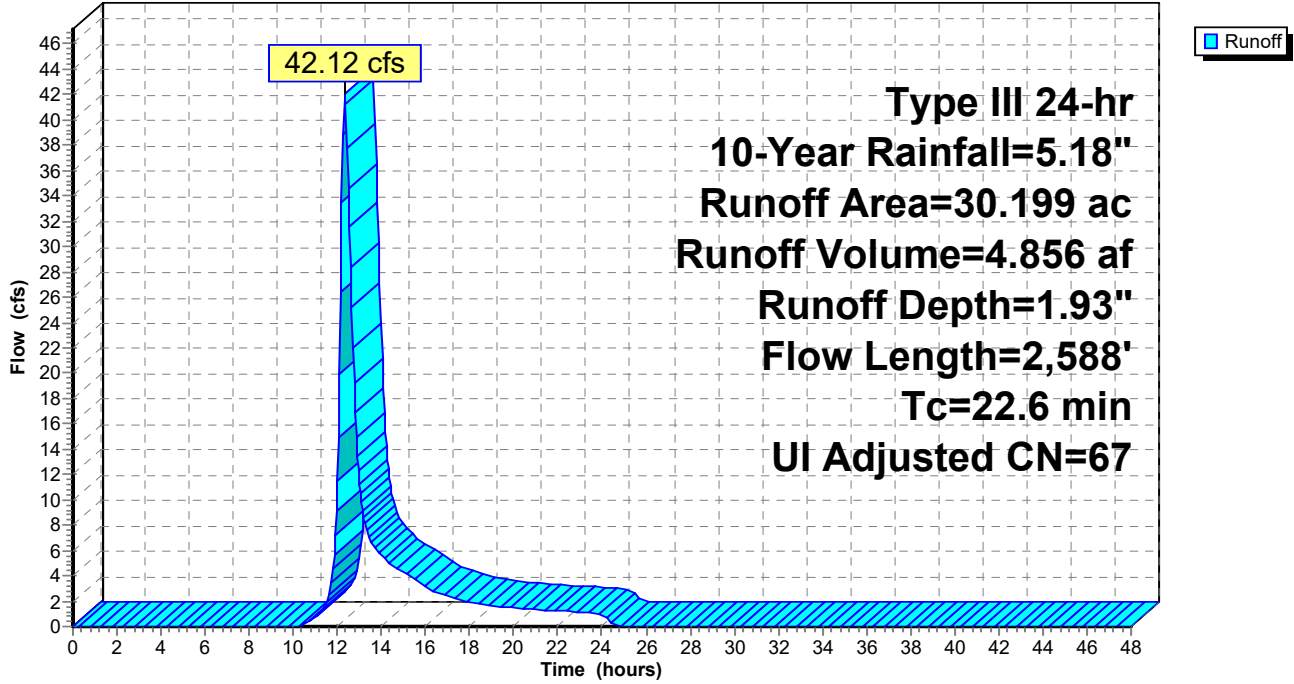
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=5.18"

Area (ac)	CN	Adj	Description
9.778	77		Woods, Good, HSG D
0.839	98		Water Surface, 0% imp, HSG D
13.926	55		Woods, Good, HSG B
2.515	70		Woods, Good, HSG C
0.066	98		Paved parking, HSG C
0.110	98		Roofs, HSG C
0.057	98		Paved parking, HSG B
0.566	61		>75% Grass cover, Good, HSG B
0.870	98		Unconnected roofs, HSG B
0.333	80		>75% Grass cover, Good, HSG D
0.061	98		Paved parking, HSG C
0.032	74		>75% Grass cover, Good, HSG C
0.140	98		Paved parking, HSG C
0.664	74		>75% Grass cover, Good, HSG C
0.058	70		Woods, Good, HSG C
* 0.184	98		Unconnected Roofs
30.199	68	67	Weighted Average, UI Adjusted
28.711			95.07% Pervious Area
1.488			4.93% Impervious Area
1.054			70.83% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.0850	0.14		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
5.1	598	0.1539	1.96		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
5.2	1,600	0.0262	5.16	34.37	Parabolic Channel, Channel W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.035 Earth, dense weeds
0.6	290		8.02		Lake or Reservoir, Pond Mean Depth= 2.00'
22.6	2,588	Total			

Subcatchment 3S: DA 2C

Hydrograph



Summary for Subcatchment 7S: DA 1B

Runoff = 9.98 cfs @ 12.09 hrs, Volume= 0.767 af, Depth= 4.27"

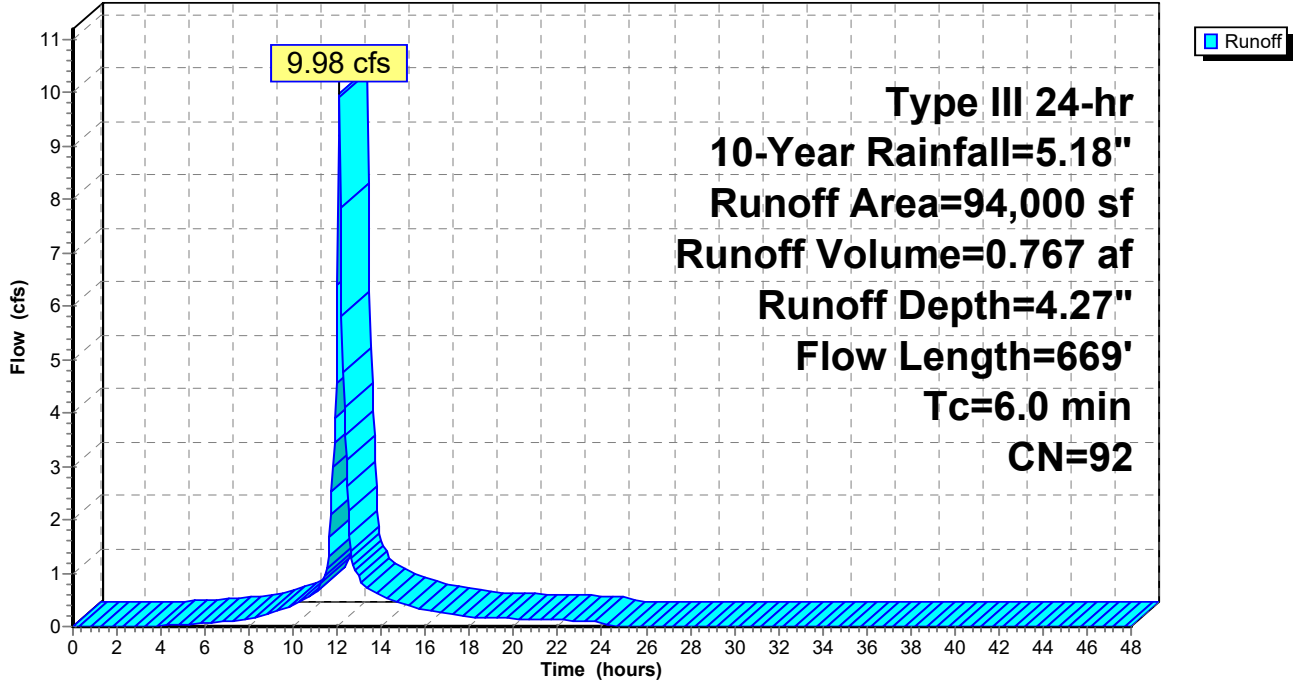
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=5.18"

Area (sf)	CN	Description
71,413	98	Paved parking, HSG B
11,784	86	Newly graded area, HSG B
10,803	61	>75% Grass cover, Good, HSG B
94,000	92	Weighted Average
22,587		24.03% Pervious Area
71,413		75.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		Sheet Flow, Play areas Smooth surfaces n= 0.011 P2= 3.37"
0.1	40	0.1500	6.24		Shallow Concentrated Flow, Play areas Unpaved Kv= 16.1 fps
2.2	362	0.0175	2.69		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.3	167	0.0200	8.41	14.86	Pipe Channel, HDPE 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
3.8	669	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7S: DA 1B

Hydrograph



Summary for Subcatchment 8S: DA 2A

Runoff = 11.77 cfs @ 12.17 hrs, Volume= 1.034 af, Depth= 3.44"

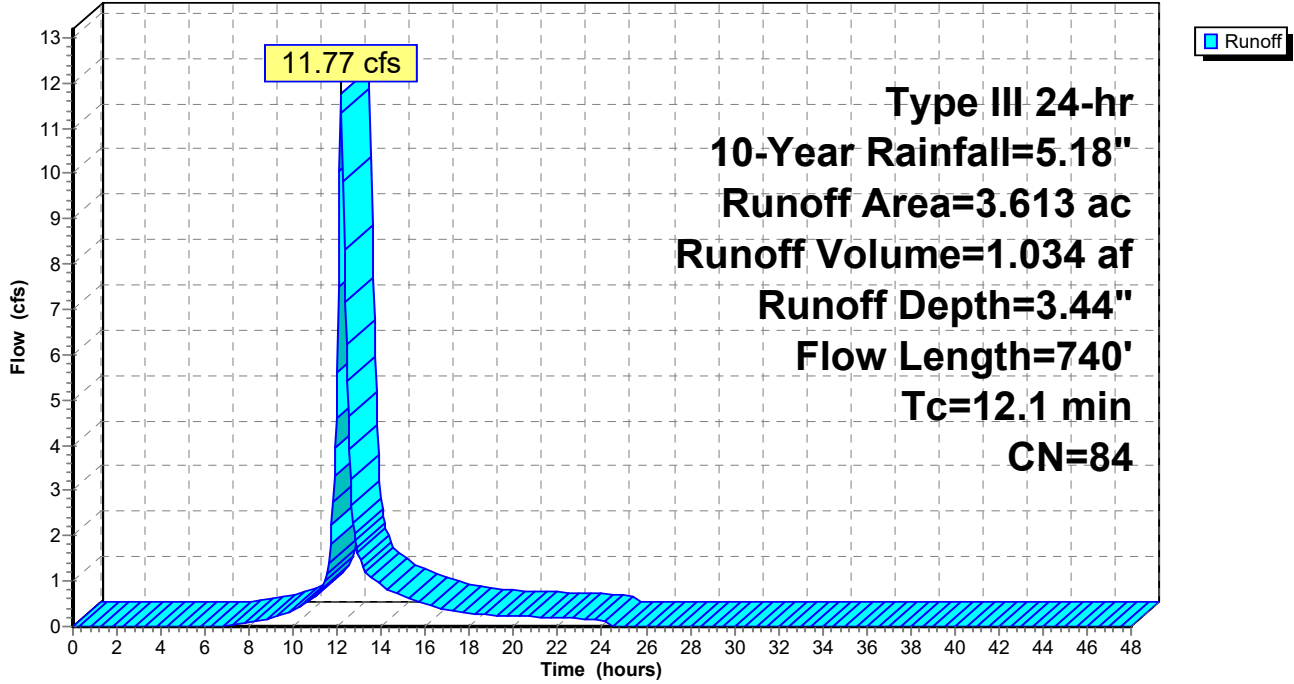
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=5.18"

Area (ac)	CN	Description
1.953	98	Paved parking, HSG B
0.152	98	Roofs, HSG B
0.394	61	>75% Grass cover, Good, HSG B
0.054	55	Woods, Good, HSG B
0.930	61	>75% Grass cover, Good, HSG B
0.130	98	Paved parking, HSG B
3.613	84	Weighted Average
1.378		38.14% Pervious Area
2.235		61.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	100	0.0650	0.19		Sheet Flow, Lawn Grass: Dense n= 0.240 P2= 3.37"
3.3	558	0.0191	2.81		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.1	82	0.0500	11.77	14.44	Pipe Channel, Discharge 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
12.1	740	Total			

Subcatchment 8S: DA 2A

Hydrograph



Summary for Subcatchment 9S: DA 2B

Runoff = 3.94 cfs @ 12.28 hrs, Volume= 0.419 af, Depth= 2.34"

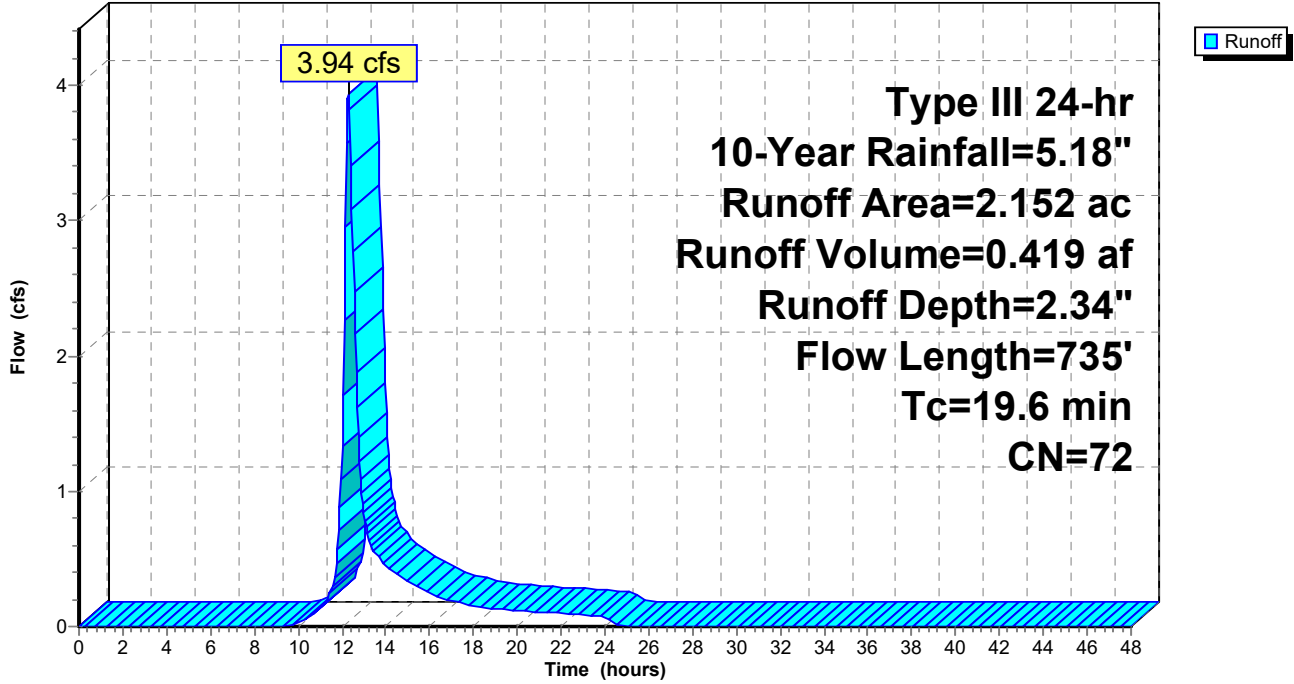
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.661	98	Paved parking, HSG B
0.746	55	Woods, Good, HSG B
0.669	61	>75% Grass cover, Good, HSG B
0.076	98	Water Surface, 0% imp, HSG B
2.152	72	Weighted Average
1.491		69.28% Pervious Area
0.661		30.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0450	0.11		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
2.1	100	0.0250	0.79		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.2	38	0.3333	4.04		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.8	314	0.0200	2.87		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.2	108	0.0200	7.44	9.14	Pipe Channel, Pipe 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.2	75		5.67		Lake or Reservoir, Mean Depth= 1.00'
19.6	735	Total			

Subcatchment 9S: DA 2B

Hydrograph



Summary for Subcatchment 11S: DA 1C

Runoff = 1.63 cfs @ 12.09 hrs, Volume= 0.128 af, Depth= 4.49"

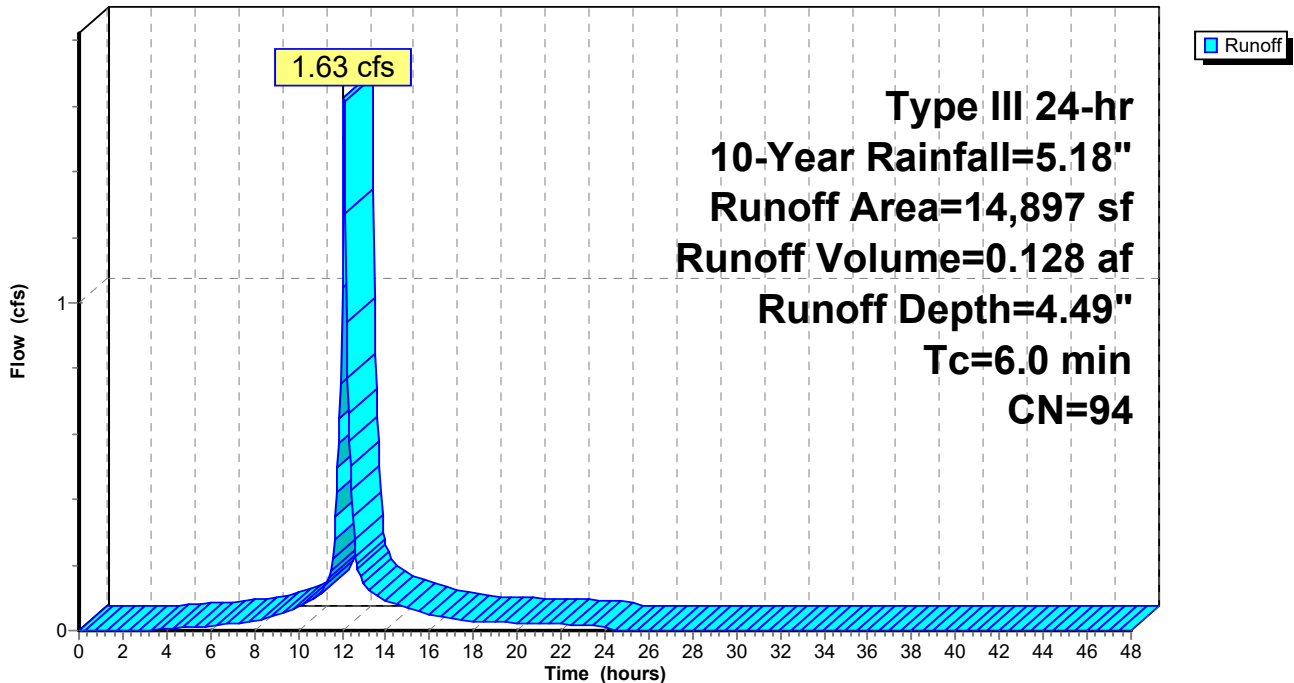
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=5.18"

Area (sf)	CN	Description
12,458	98	Paved parking, HSG C
2,439	74	>75% Grass cover, Good, HSG C
14,897	94	Weighted Average
2,439		16.37% Pervious Area
12,458		83.63% Impervious Area

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

Subcatchment 11S: DA 1C

Hydrograph



Summary for Subcatchment 12S: DA 1D

Runoff = 9.22 cfs @ 12.09 hrs, Volume= 0.715 af, Depth= 4.37"

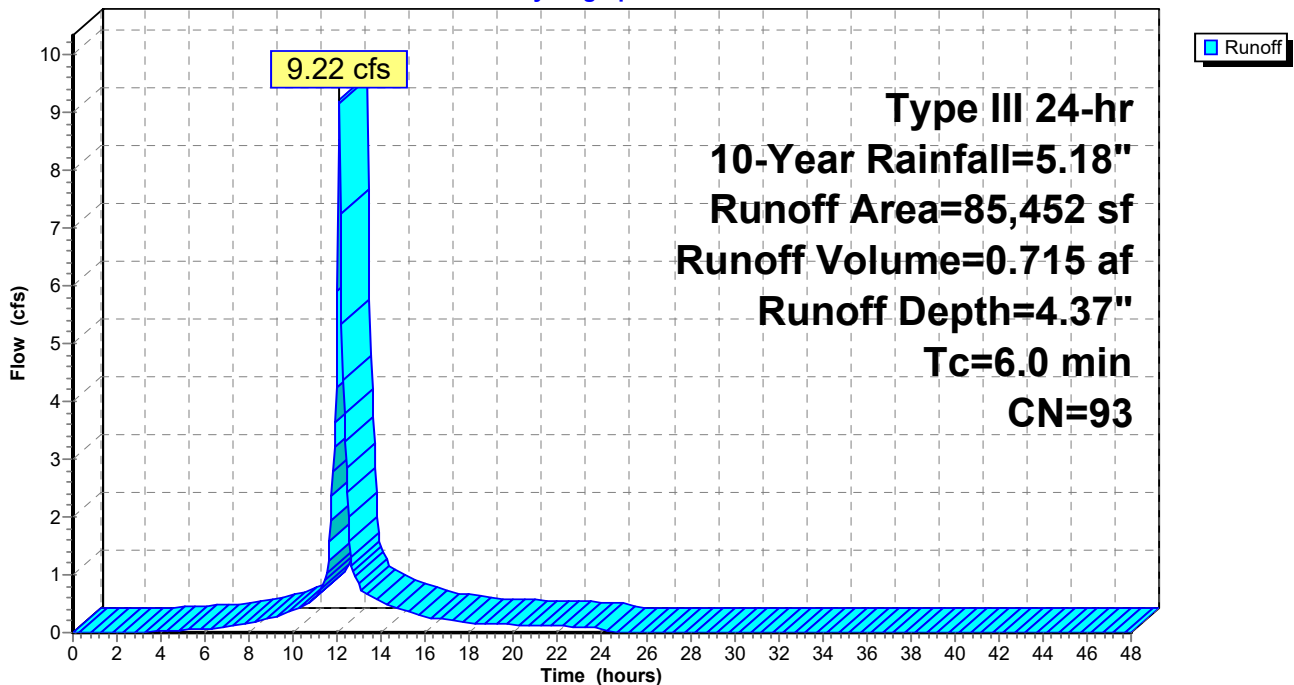
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=5.18"

Area (sf)	CN	Description
55,278	98	Paved parking, HSG C
6,098	98	Water Surface, 0% imp, HSG C
18,687	74	>75% Grass cover, Good, HSG C
5,389	98	Paved parking, HSG C
85,452	93	Weighted Average
24,785		29.00% Pervious Area
60,667		71.00% Impervious Area

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

Subcatchment 12S: DA 1D

Hydrograph



Summary for Subcatchment 15S: DA 2E

Runoff = 9.16 cfs @ 12.17 hrs, Volume= 0.797 af, Depth= 3.05"

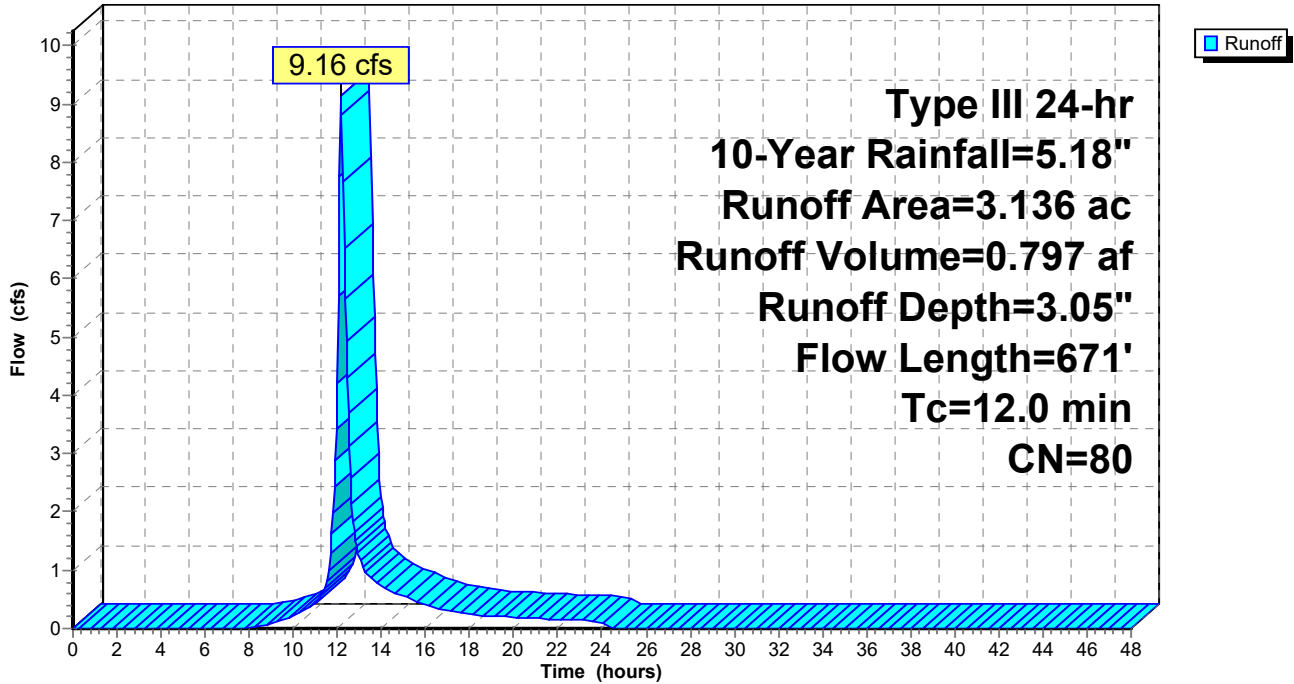
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=5.18"

Area (ac)	CN	Description
* 0.985	98	Paved parking, HSG C, South
* 0.455	74	>75% Grass cover, Good, HSG C, South
1.030	70	Woods, Good, HSG C
0.666	74	>75% Grass cover, Good, HSG C
3.136	80	Weighted Average
2.151		68.59% Pervious Area
0.985		31.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
3.3	417	0.1799	2.12		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	40	0.1000	2.21		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.7	164	0.0421	4.17		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
12.0	671	Total			

Subcatchment 15S: DA 2E

Hydrograph



Summary for Subcatchment 16S: DA 2G

Runoff = 1.60 cfs @ 12.09 hrs, Volume= 0.116 af, Depth= 3.14"

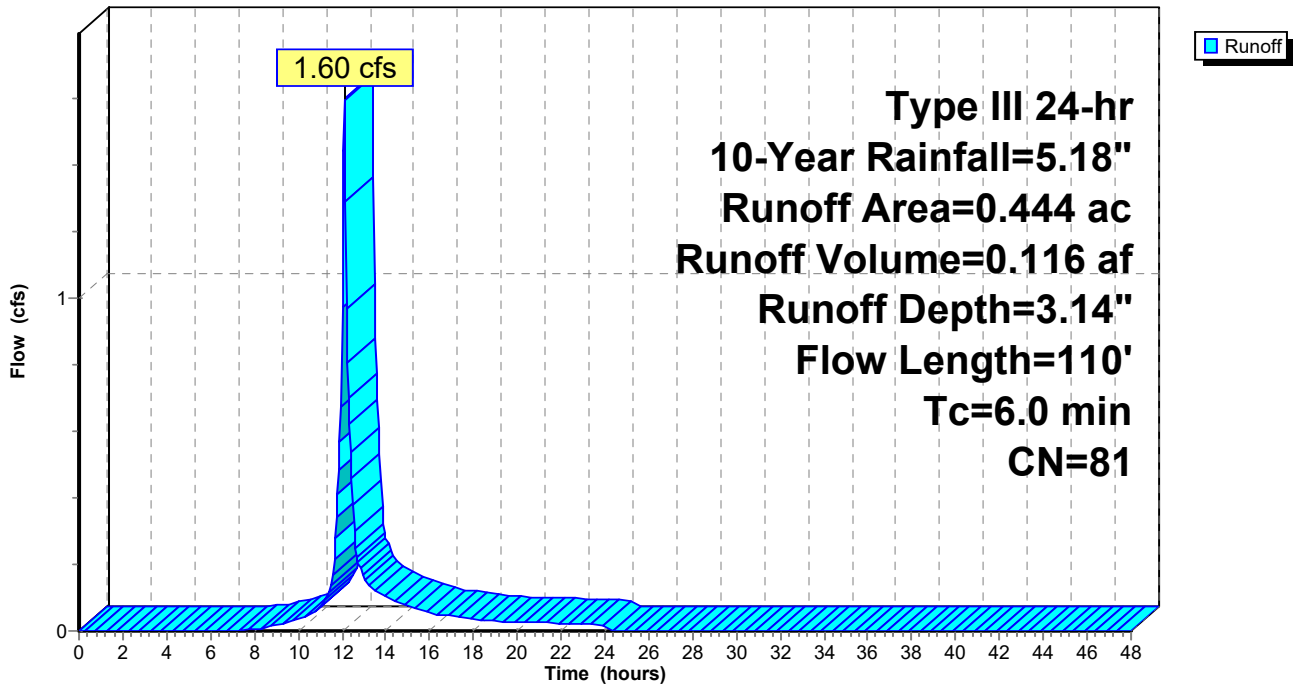
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.103	98	Water Surface, 0% imp, HSG C
0.017	80	>75% Grass cover, Good, HSG D
0.229	74	>75% Grass cover, Good, HSG C
0.079	80	>75% Grass cover, Good, HSG D
0.016	74	>75% Grass cover, Good, HSG C
0.444	81	Weighted Average
0.444		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.2	60	0.3500	4.14		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
5.7	110	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 16S: DA 2G

Hydrograph



Summary for Subcatchment 17S: DA 2I

Runoff = 2.02 cfs @ 12.15 hrs, Volume= 0.176 af, Depth= 3.94"

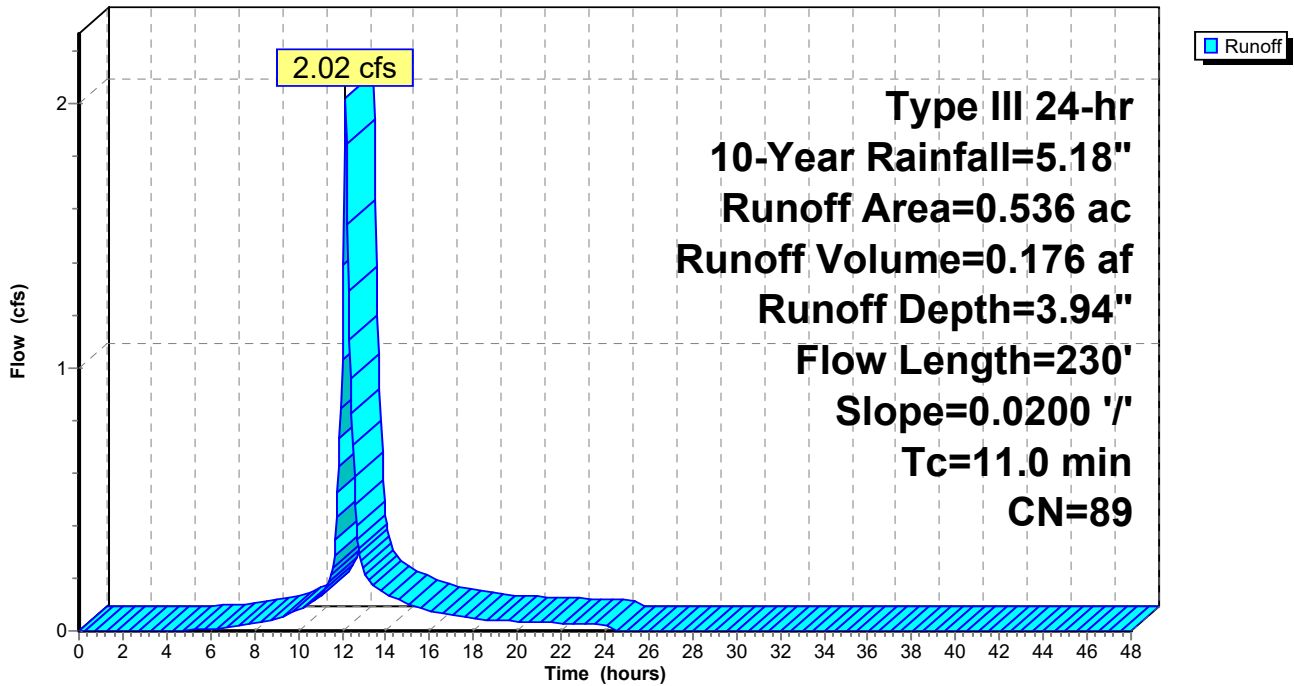
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=5.18"

Area (ac)	CN	Description
* 0.344	98	Paved parking, HSG C, North
* 0.192	74	>75% Grass cover, Good, HSG C, North
0.536	89	Weighted Average
0.192		35.82% Pervious Area
0.344		64.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
3.0	180	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
11.0	230	Total			

Subcatchment 17S: DA 2I

Hydrograph



Summary for Subcatchment 21S: DA 2F

Runoff = 0.54 cfs @ 12.09 hrs, Volume= 0.039 af, Depth= 3.34"

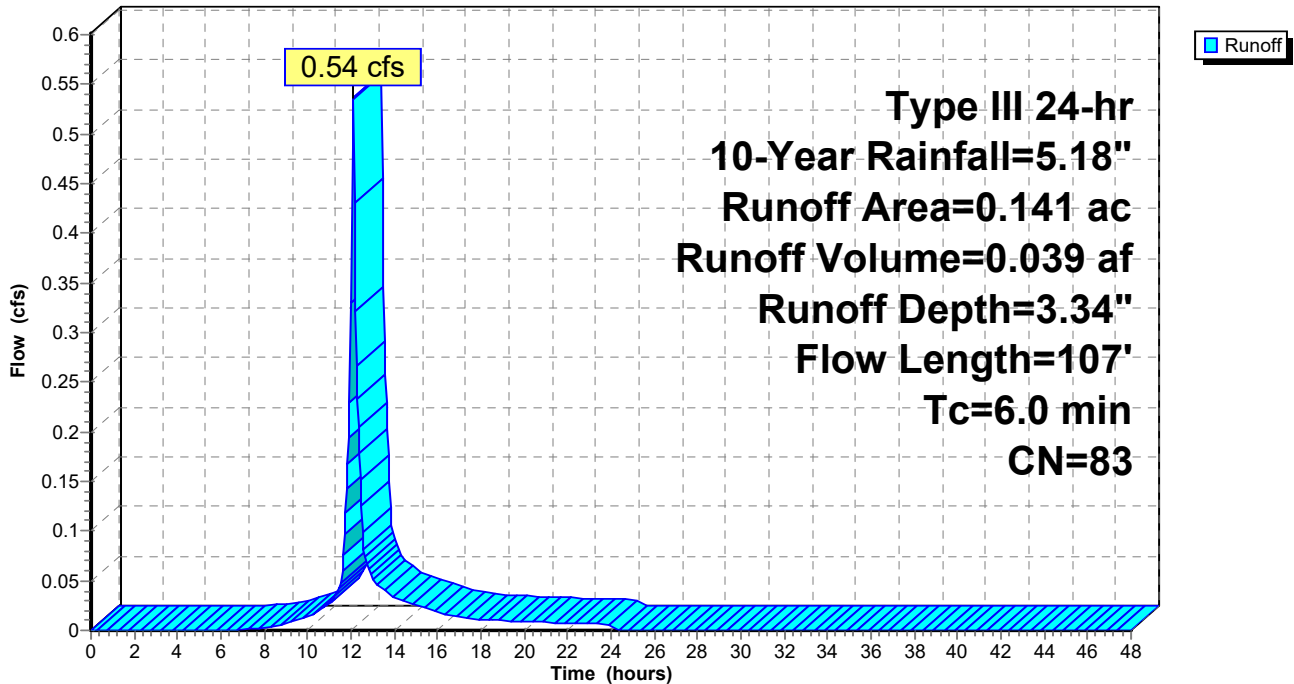
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.051	98	Water Surface, 0% imp, HSG C
0.090	74	>75% Grass cover, Good, HSG C
0.141	83	Weighted Average
0.141		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.3	57	0.1754	2.93		Shallow Concentrated Flow, Woods Short Grass Pasture Kv= 7.0 fps
4.5	107	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 21S: DA 2F

Hydrograph



Summary for Subcatchment 22S: DA 2H

Runoff = 8.97 cfs @ 12.14 hrs, Volume= 0.741 af, Depth= 3.24"

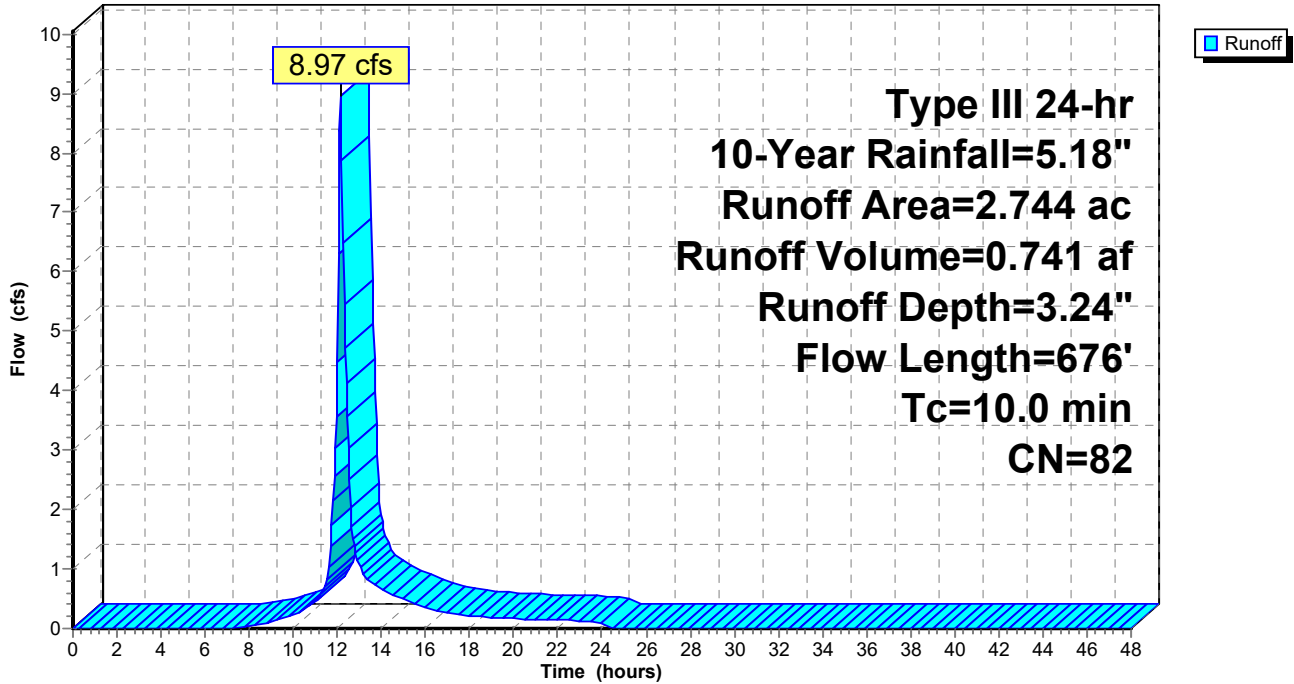
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=5.18"

Area (ac)	CN	Description
* 0.431	98	Paved parking, HSG C, North
* 0.010	80	>75% Grass cover, Good, HSG D, North
* 0.313	74	>75% Grass cover, Good, HSG C, North
* 0.550	98	Paved parking, HSG C, South
* 0.356	74	>75% Grass cover, Good, HSG C, South
0.748	70	Woods, Good, HSG C
0.336	74	>75% Grass cover, Good, HSG C
2.744	82	Weighted Average
1.763		64.25% Pervious Area
0.981		35.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
1.7	190	0.1316	1.81		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	81	0.3333	4.04		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.7	355	0.0310	3.57		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
10.0	676	Total			

Subcatchment 22S: DA 2H

Hydrograph



Summary for Pond 2P: 30" RCP

Inflow Area = 55.918 ac, 25.55% Impervious, Inflow Depth > 2.49" for 10-Year event
 Inflow = 14.64 cfs @ 12.44 hrs, Volume= 11.587 af
 Outflow = 14.64 cfs @ 12.44 hrs, Volume= 11.587 af, Atten= 0%, Lag= 0.0 min
 Primary = 14.64 cfs @ 12.44 hrs, Volume= 11.587 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 521.77' @ 12.44 hrs
 Flood Elev= 527.20'

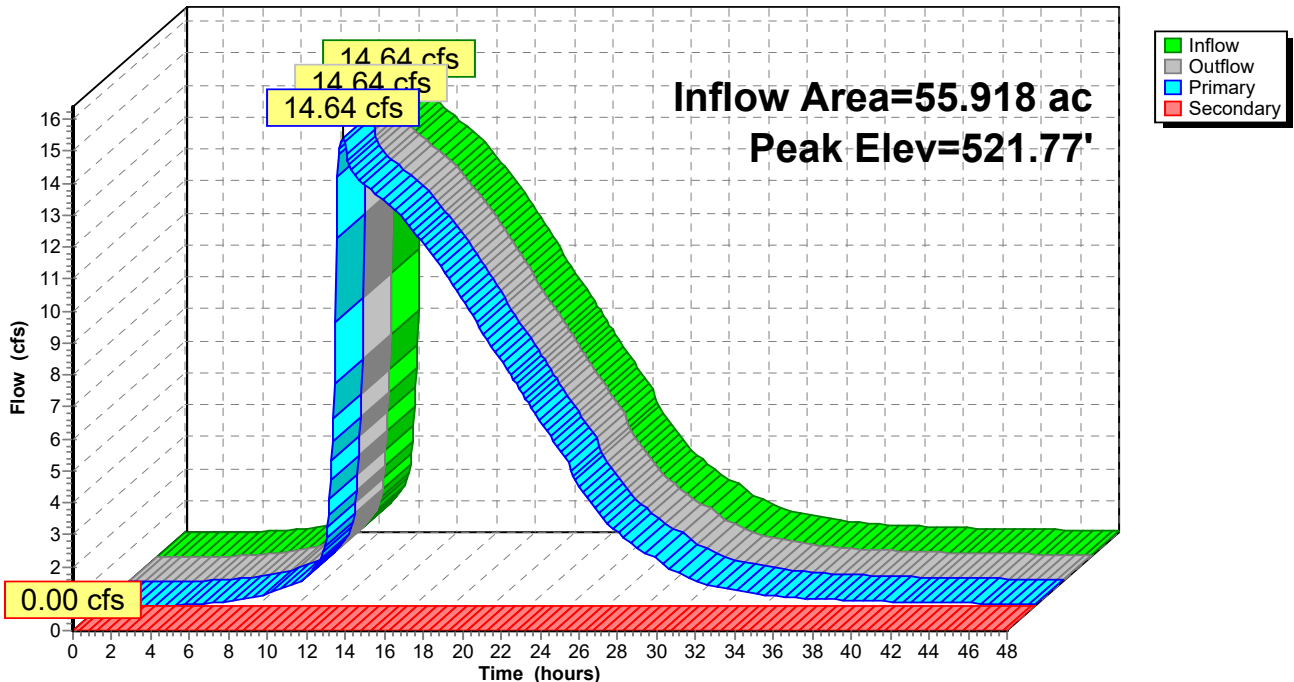
Device	Routing	Invert	Outlet Devices
#1	Primary	519.92'	30.0" Round 30" RC L= 80.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 519.92' / 519.62' S= 0.0037 ' / Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 4.91 sf
#2	Secondary	527.20'	30.0' long x 10.0' breadth Overflow Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=14.63 cfs @ 12.44 hrs HW=521.77' (Free Discharge)
 ↑1=30" RC (Barrel Controls 14.63 cfs @ 5.25 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=519.92' (Free Discharge)
 ↑2=Overflow (Controls 0.00 cfs)

Pond 2P: 30" RCP

Hydrograph



Summary for Pond 4P: Pond

Inflow Area = 51.896 ac, 21.64% Impervious, Inflow Depth = 2.38" for 10-Year event
 Inflow = 77.66 cfs @ 12.30 hrs, Volume= 10.281 af
 Outflow = 11.59 cfs @ 14.06 hrs, Volume= 10.158 af, Atten= 85%, Lag= 105.4 min
 Primary = 11.59 cfs @ 14.06 hrs, Volume= 10.158 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 526.06' @ 14.06 hrs Surf.Area= 2.375 ac Storage= 4.839 af

Plug-Flow detention time= 277.8 min calculated for 10.147 af (99% of inflow)
 Center-of-Mass det. time= 271.4 min (1,129.3 - 857.9)

Volume	Invert	Avail.Storage	Storage Description		
#1	523.45'	16.273 af	Pond Storage (Irregular) Listed below		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
523.45	0.636	1,389.1	0.000	0.000	0.636
524.00	1.723	1,270.7	0.624	0.624	1.212
526.00	2.359	1,494.7	4.065	4.690	2.345
528.00	2.936	1,638.1	5.284	9.974	3.169
530.00	3.368	1,700.4	6.299	16.273	3.556

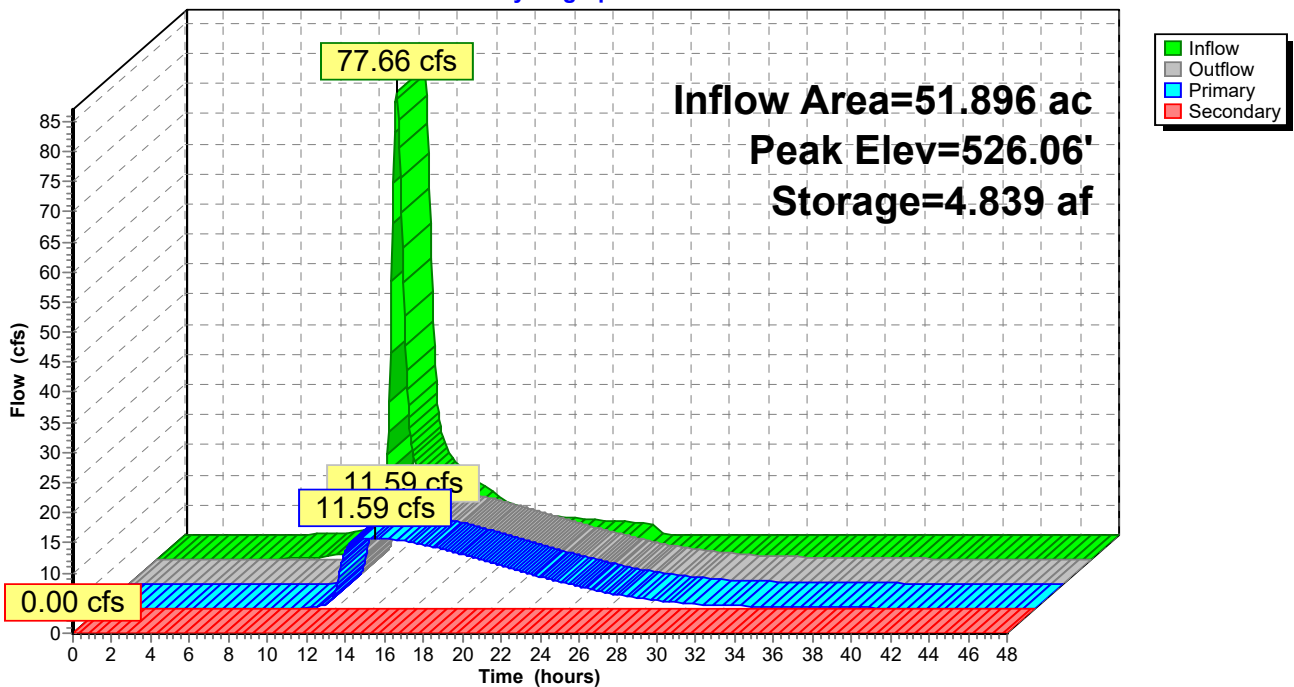
Device	Routing	Invert	Outlet Devices
#1	Primary	520.91'	30.0" Round 30" HDPE L= 110.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 520.91' / 520.64' S= 0.0024 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	521.46'	30.0" Round 30" HDPE L= 86.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 521.46' / 520.91' S= 0.0063 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	521.41'	24.0" Round 24" HDPE L= 157.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 521.41' / 521.40' S= 0.0001 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#4	Device 3	523.45'	18.0" Round 18" HDPE L= 117.9' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 523.45' / 521.82' S= 0.0138 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#5	Secondary	529.90'	50.0' long x 25.0' breadth Overflow Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=11.59 cfs @ 14.06 hrs HW=526.06' TW=521.64' (Dynamic Tailwater)
 ↳ 1=30" HDPE (Passes 11.59 cfs of 42.33 cfs potential flow)
 ↳ 2=30" HDPE (Passes 11.59 cfs of 42.22 cfs potential flow)
 ↳ 3=24" HDPE (Passes 11.59 cfs of 22.10 cfs potential flow)
 ↳ 4=18" HDPE (Inlet Controls 11.59 cfs @ 6.56 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=523.45' TW=519.92' (Dynamic Tailwater)
 ↳ 5=Overflow (Controls 0.00 cfs)

Pond 4P: Pond

Hydrograph



Summary for Pond 10P: Apartment Phase 1 Detention Basin

Inflow Area = 2.152 ac, 30.72% Impervious, Inflow Depth = 2.34" for 10-Year event
 Inflow = 3.94 cfs @ 12.28 hrs, Volume= 0.419 af
 Outflow = 3.50 cfs @ 12.39 hrs, Volume= 0.419 af, Atten= 11%, Lag= 6.4 min
 Primary = 3.50 cfs @ 12.39 hrs, Volume= 0.419 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 537.36' @ 12.39 hrs Surf.Area= 1,265 sf Storage= 846 cf

Plug-Flow detention time= 3.7 min calculated for 0.419 af (100% of inflow)
 Center-of-Mass det. time= 3.0 min (856.3 - 853.3)

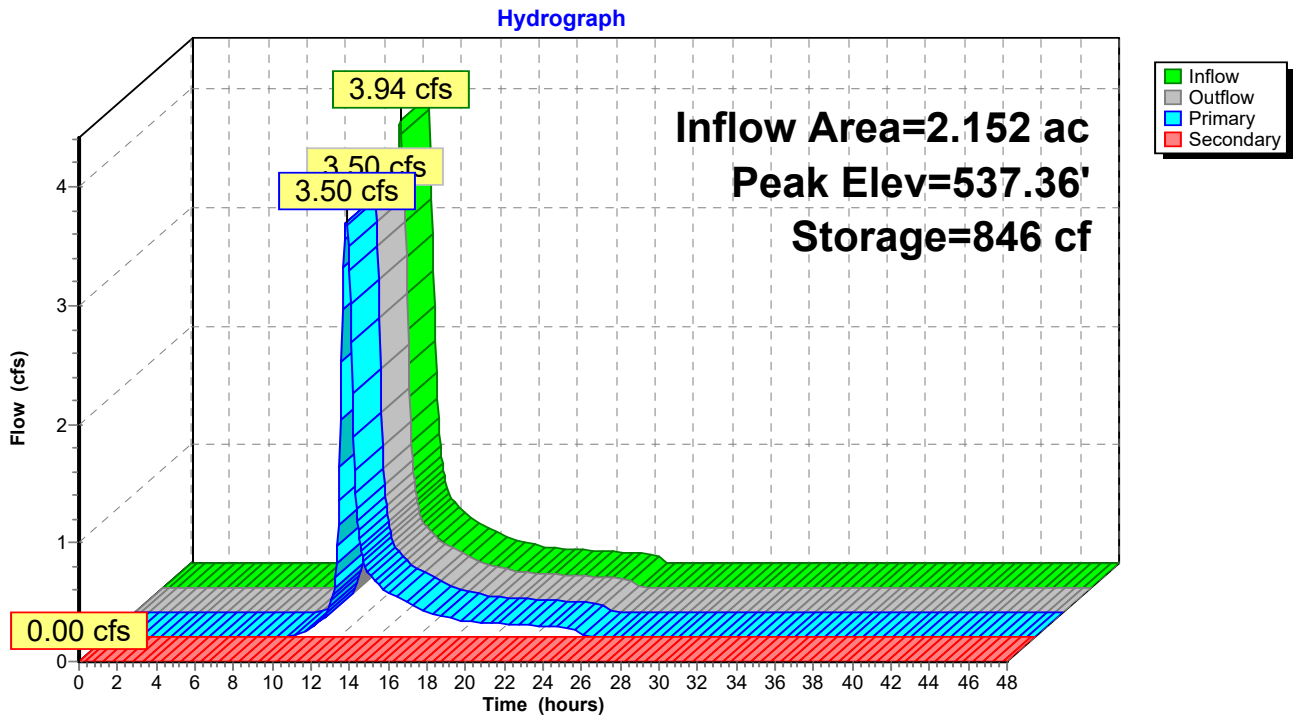
Volume	Invert	Avail.Storage	Storage Description			
#1	536.00'	7,026 cf	Detention Basin (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
536.00	100	40.0	0	0	100	
536.50	467	110.5	131	131	945	
537.60	1,559	173.6	1,056	1,186	2,380	
540.00	3,429	242.5	5,840	7,026	4,716	

Device	Routing	Invert	Outlet Devices
#1	Primary	536.00'	12.0" Round Culvert L= 75.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 536.00' / 534.50' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	539.50'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.50 cfs @ 12.39 hrs HW=537.35' TW=525.09' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 3.50 cfs @ 4.45 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=536.00' TW=523.45' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 10P: Apartment Phase 1 Detention Basin



Summary for Pond 15P: Apartments Phase II Stormwater Basin 2

Inflow Area = 3.277 ac, 30.06% Impervious, Inflow Depth = 3.06" for 10-Year event
 Inflow = 9.55 cfs @ 12.16 hrs, Volume= 0.836 af
 Outflow = 9.25 cfs @ 12.21 hrs, Volume= 0.757 af, Atten= 3%, Lag= 2.9 min
 Primary = 9.25 cfs @ 12.21 hrs, Volume= 0.757 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 568.14' @ 12.21 hrs Surf.Area= 2,362 sf Storage= 5,727 cf

Plug-Flow detention time= 72.9 min calculated for 0.756 af (90% of inflow)
 Center-of-Mass det. time= 26.9 min (852.0 - 825.2)

Volume	Invert	Avail.Storage	Storage Description
#1	562.00'	6 cf	3.00'W x 8.00'L x 2.50'H Sand Underdrain 60 cf Overall x 10.0% Voids
#2	564.50'	10,719 cf	Stormwater Basin (Irregular) Listed below
		10,725 cf	Total Available Storage

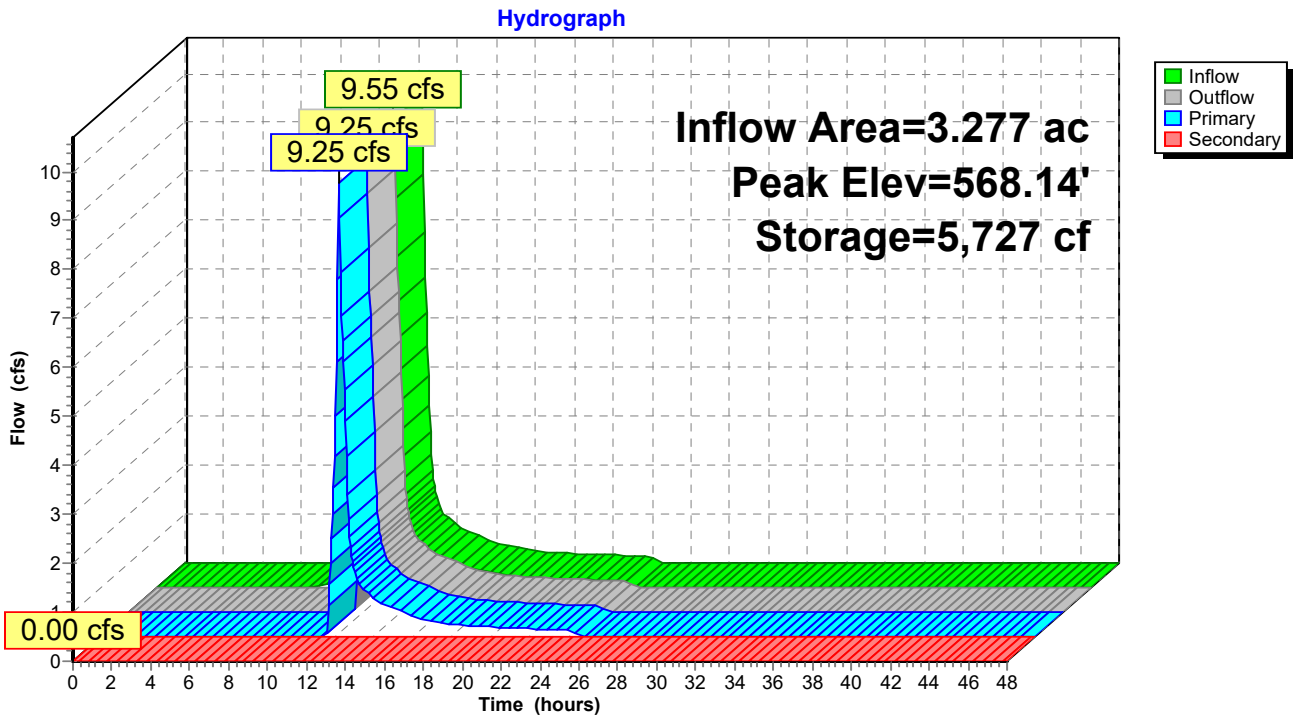
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
564.50	4	8.2	0	0	4
564.75	257	68.5	24	24	372
565.00	1,193	160.0	167	191	2,036
566.00	1,533	172.5	1,359	1,551	2,406
568.00	2,277	197.6	3,786	5,336	3,233
570.00	3,128	222.7	5,383	10,719	4,172

Device	Routing	Invert	Outlet Devices
#1	Primary	562.00'	18.0" Round 18" HDPE L= 68.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 562.00' / 561.60' S= 0.0059 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	567.00'	36.0" W x 6.0" H Vert. 36" x 6" Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	568.00'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#4	Secondary	569.00'	8.0' long x 8.0' breadth Rip Rap Spillway 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#5	Device 1	562.00'	0.500 in/hr Sand Underdrain over Horizontal area from 562.00' - 564.50' Excluded Horizontal area = 24 sf Phase-In= 0.01'

Primary OutFlow Max=9.01 cfs @ 12.21 hrs HW=568.13' TW=562.93' (Dynamic Tailwater)
 ↳ 1=18" HDPE (Passes 9.01 cfs of 19.21 cfs potential flow)
 ↳ 2=36" x 6" Orifice (Orifice Controls 6.77 cfs @ 4.51 fps)
 ↳ 3=Top of Frame (Weir Controls 2.25 cfs @ 1.20 fps)
 ↳ 5=Sand Underdrain (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=562.00' TW=523.45' (Dynamic Tailwater)
 ↳ 4=Rip Rap Spillway (Controls 0.00 cfs)

Pond 15P: Apartments Phase II Stormwater Basin 2



Summary for Pond 16P: Water Quality Basin

Inflow Area = 1.962 ac, 71.00% Impervious, Inflow Depth = 4.37" for 10-Year event
 Inflow = 9.22 cfs @ 12.09 hrs, Volume= 0.715 af
 Outflow = 2.64 cfs @ 12.43 hrs, Volume= 0.715 af, Atten= 71%, Lag= 20.3 min
 Primary = 2.64 cfs @ 12.43 hrs, Volume= 0.715 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 527.64' @ 12.43 hrs Surf.Area= 5,858 sf Storage= 11,639 cf

Plug-Flow detention time= 128.5 min calculated for 0.714 af (100% of inflow)
 Center-of-Mass det. time= 128.4 min (905.6 - 777.2)

Volume	Invert	Avail.Storage	Storage Description
#1	523.75'	26,415 cf	Water Quality swale (Irregular) Listed below (Recalc)
#2	522.25'	5 cf	3.00'W x 3.00'L x 1.50'H Underdrain
			14 cf Overall x 40.0% Voids
		26,420 cf	Total Available Storage

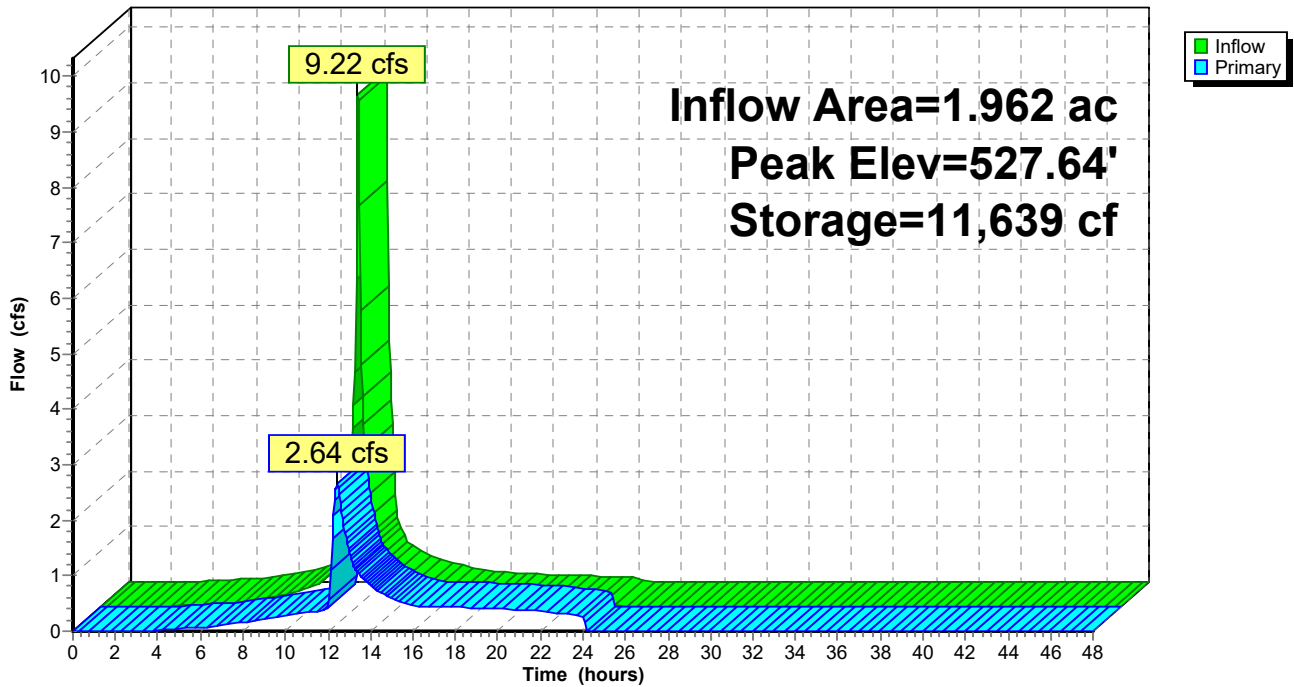
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
523.75	9	12.0	0	0	9
524.00	258	63.2	26	26	316
524.25	528	108.8	96	123	940
524.50	766	159.7	161	283	2,028
524.75	1,105	211.6	233	516	3,562
525.00	1,523	263.2	327	843	5,513
525.25	2,026	316.2	442	1,285	7,958
525.50	2,529	368.0	568	1,853	10,779
525.75	3,267	420.8	723	2,576	14,095
526.00	4,119	481.0	921	3,497	18,417
528.00	6,268	535.7	10,312	13,809	22,957
529.75	8,181	557.7	12,606	26,415	25,097

Device	Routing	Invert	Outlet Devices
#1	Primary	522.75'	24.0" Round 24" HDPE L= 75.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 522.75' / 521.75' S= 0.0133 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	523.00'	3.0" Vert. Underdrain C= 0.600 Limited to weir flow at low heads
#3	Device 1	526.75'	6.0" W x 6.0" H Vert. 6" Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	527.25'	18.0" W x 6.0" H Vert. 18x6 Orifice C= 0.600 Limited to weir flow at low heads
#5	Device 1	528.50'	20.0' long x 0.5' breadth Top of Frame Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

- Primary OutFlow** Max=2.63 cfs @ 12.43 hrs HW=527.64' TW=521.76' (Dynamic Tailwater)
- 1=24" HDPE (Passes 2.63 cfs of 29.83 cfs potential flow)
 - 2=Underdrain (Orifice Controls 0.50 cfs @ 10.23 fps)
 - 3=6" Orifice (Orifice Controls 0.96 cfs @ 3.82 fps)
 - 4=18x6 Orifice (Orifice Controls 1.17 cfs @ 2.00 fps)
 - 5=Top of Frame (Controls 0.00 cfs)

Pond 16P: Water Quality Basin

Hydrograph



Summary for Pond 20P: Apartments Phase II Stormwater Basin 1

Inflow Area = 7.001 ac, 33.00% Impervious, Inflow Depth = 3.07" for 10-Year event
 Inflow = 20.08 cfs @ 12.18 hrs, Volume= 1.791 af
 Outflow = 12.45 cfs @ 12.37 hrs, Volume= 1.601 af, Atten= 38%, Lag= 11.5 min
 Primary = 12.45 cfs @ 12.37 hrs, Volume= 1.601 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 558.31' @ 12.37 hrs Surf.Area= 6,850 sf Storage= 24,123 cf

Plug-Flow detention time= 116.2 min calculated for 1.601 af (89% of inflow)
 Center-of-Mass det. time= 65.2 min (895.8 - 830.6)

Volume	Invert	Avail.Storage	Storage Description
#1	551.00'	4 cf	3.00'W x 8.00'L x 1.75'H Sand Underdrain 42 cf Overall x 10.0% Voids
#2	552.75'	40,883 cf	Stormwater Basin (Irregular) Listed below (Recalc)
#3	556.00'	424 cf	36.0" Round Pipe Storage-Impervious L= 60.0' S= 0.0083 'f'
		41,312 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
552.75	120	43.3	0	0	120
553.00	865	110.3	109	109	939
553.25	1,552	155.7	298	407	1,901
553.50	2,135	207.8	459	866	3,409
553.75	2,928	261.6	630	1,496	5,419
554.00	3,512	310.5	804	2,300	7,646
555.00	4,145	323.0	3,824	6,124	8,352
556.00	4,804	335.6	4,470	10,595	9,090
557.00	5,490	348.1	5,143	15,738	9,851
558.00	6,569	422.7	6,021	21,759	14,443
559.00	7,426	435.3	6,993	28,752	15,404
560.00	8,310	447.8	7,864	36,616	16,387
560.50	8,761	454.1	4,267	40,883	16,893

Device	Routing	Invert	Outlet Devices
#1	Primary	551.00'	18.0" Round 18" HDPE L= 152.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 551.00' / 549.00' S= 0.0132 'f' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	555.50'	6.0" Vert. 6" Orifices (2) X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	557.30'	48.0" W x 7.0" H Vert. 48" x 7" Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	558.75'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#5	Secondary	559.75'	8.0' long x 8.0' breadth Rip Rap Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

#6	Device 1	551.00'	2.50	3.00	3.50	4.00	4.50	5.00	5.50
			Coef. (English)	2.43	2.54	2.70	2.69	2.68	2.68
				2.64	2.65	2.65	2.66	2.66	2.64
				2.64	2.65	2.65	2.66	2.68	2.74

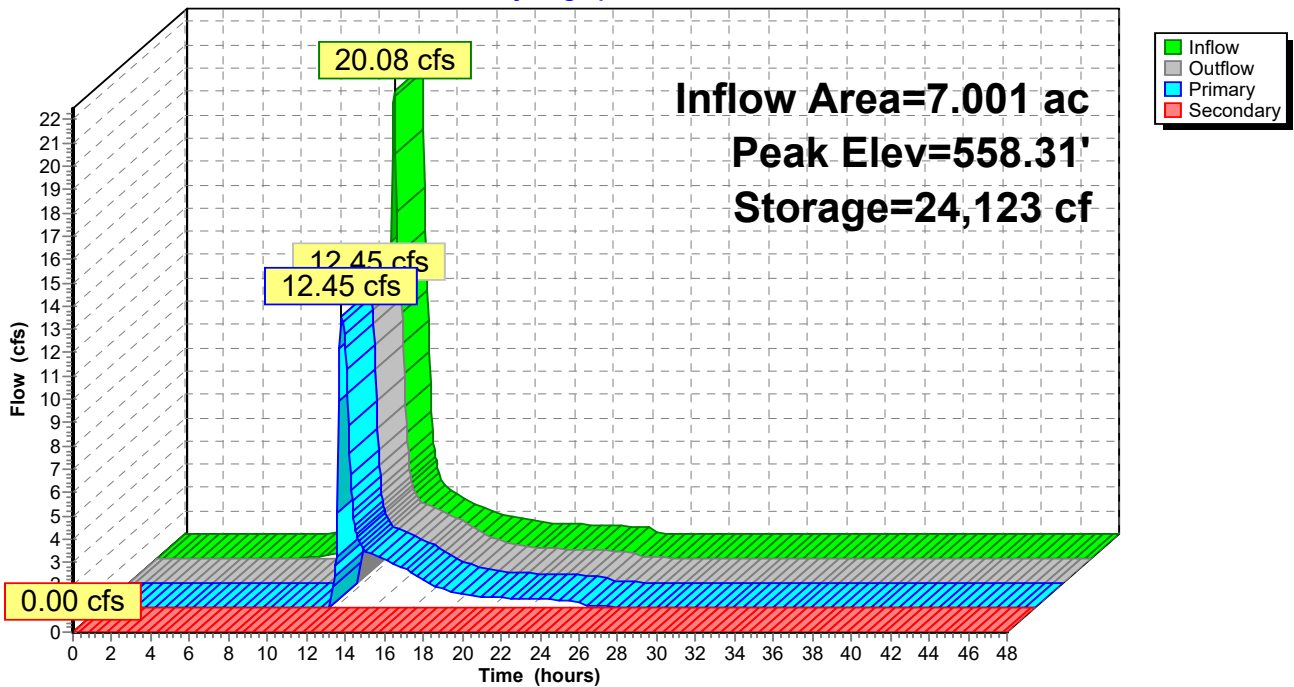
0.500 in/hr Sand Underdrain over Horizontal area from 551.00' - 552.75'
 Excluded Horizontal area = 24 sf Phase-In= 0.01'

Primary OutFlow Max=12.41 cfs @ 12.37 hrs HW=558.30' TW=525.05' (Dynamic Tailwater)
 1=18" HDPE (Passes 12.41 cfs of 19.15 cfs potential flow)
 2=6" Orifices (2) (Orifice Controls 3.02 cfs @ 7.69 fps)
 3=48" x 7" Orifice (Orifice Controls 9.39 cfs @ 4.02 fps)
 4=Top of Frame (Controls 0.00 cfs)
 6=Sand Underdrain (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=551.00' TW=523.45' (Dynamic Tailwater)
 5=Rip Rap Spillway (Controls 0.00 cfs)

Pond 20P: Apartments Phase II Stormwater Basin 1

Hydrograph



Summary for Pond 21P: Drain

Inflow Area = 3.813 ac, 34.85% Impervious, Inflow Depth = 2.94" for 10-Year event
 Inflow = 11.05 cfs @ 12.21 hrs, Volume= 0.933 af
 Outflow = 11.05 cfs @ 12.21 hrs, Volume= 0.933 af, Atten= 0%, Lag= 0.0 min
 Primary = 11.05 cfs @ 12.21 hrs, Volume= 0.933 af

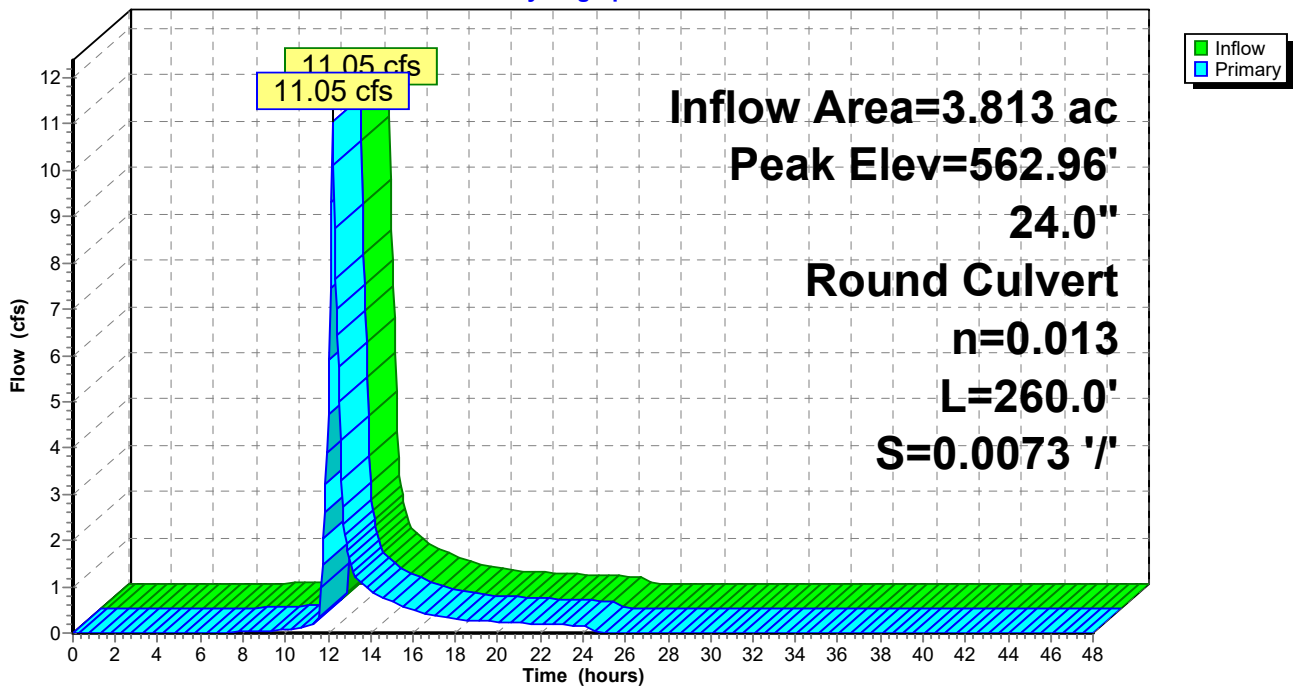
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 562.96' @ 12.21 hrs
 Flood Elev= 565.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	561.40'	24.0" Round Culvert L= 260.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 561.40' / 559.50' S= 0.0073 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=10.89 cfs @ 12.21 hrs HW=562.94' TW=557.94' (Dynamic Tailwater)
 ←1=Culvert (Barrel Controls 10.89 cfs @ 5.79 fps)

Pond 21P: Drain

Hydrograph



Summary for Link 14L: DA 2D - From Town Hall

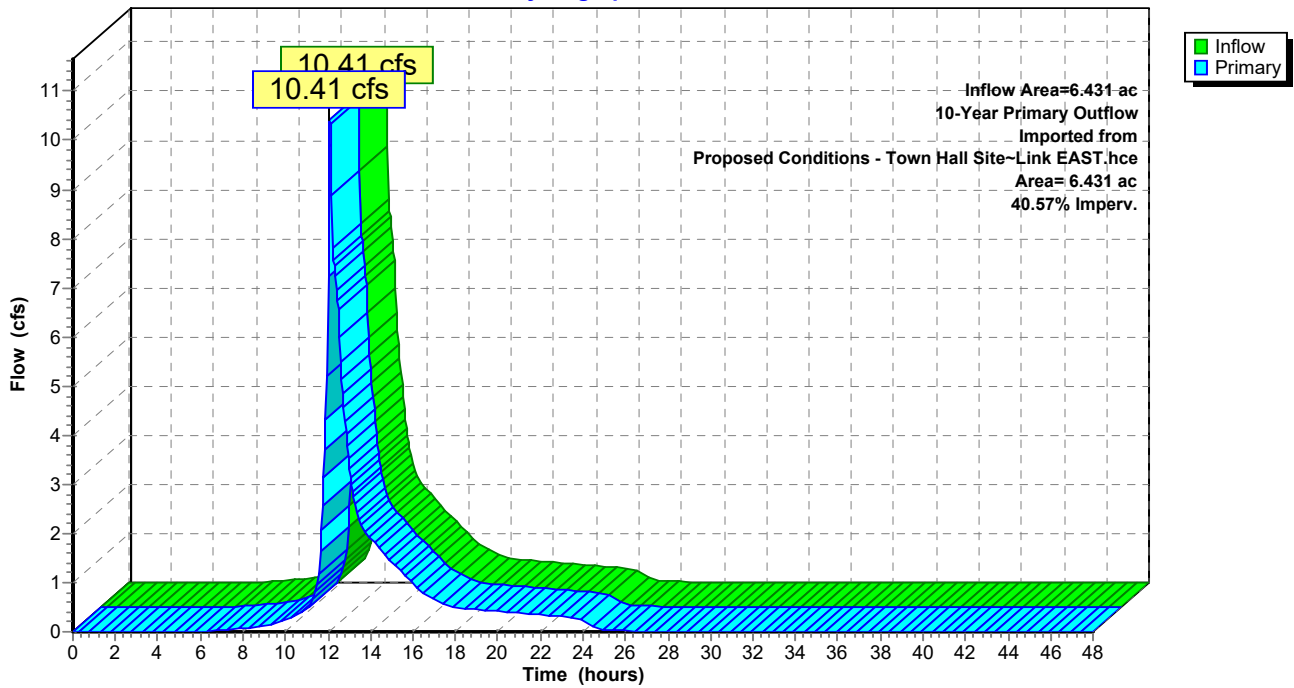
Inflow Area = 6.431 ac, 40.57% Impervious, Inflow Depth = 2.75" for 10-Year event
Inflow = 10.41 cfs @ 12.09 hrs, Volume= 1.476 af
Primary = 10.41 cfs @ 12.09 hrs, Volume= 1.476 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

10-Year Primary Outflow Imported from Proposed Conditions - Town Hall Site~Link EAST.hce

Link 14L: DA 2D - From Town Hall

Hydrograph



Market Square and Existing Development to RT 66 Type III 24-hr 25-Year Rainfall=6.30"

Prepared by {enter your company name here}

Printed 12/14/2020

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1A Runoff Area=2.061 ac 80.93% Impervious Runoff Depth=5.25"
Flow Length=532' Tc=11.0 min CN=91 Runoff=10.09 cfs 0.902 af

Subcatchment 3S: DA 2C Runoff Area=30.199 ac 4.93% Impervious Runoff Depth=2.76"
Flow Length=2,588' Tc=22.6 min UI Adjusted CN=67 Runoff=61.57 cfs 6.942 af

Subcatchment 7S: DA 1B Runoff Area=94,000 sf 75.97% Impervious Runoff Depth=5.36"
Flow Length=669' Tc=6.0 min CN=92 Runoff=12.39 cfs 0.965 af

Subcatchment 8S: DA 2A Runoff Area=3.613 ac 61.86% Impervious Runoff Depth=4.48"
Flow Length=740' Tc=12.1 min CN=84 Runoff=15.22 cfs 1.348 af

Subcatchment 9S: DA 2B Runoff Area=2.152 ac 30.72% Impervious Runoff Depth=3.24"
Flow Length=735' Tc=19.6 min CN=72 Runoff=5.53 cfs 0.581 af

Subcatchment 11S: DA 1C Runoff Area=14,897 sf 83.63% Impervious Runoff Depth=5.59"
Tc=6.0 min CN=94 Runoff=2.01 cfs 0.159 af

Subcatchment 12S: DA 1D Runoff Area=85,452 sf 71.00% Impervious Runoff Depth=5.48"
Tc=6.0 min CN=93 Runoff=11.39 cfs 0.896 af

Subcatchment 15S: DA 2E Runoff Area=3.136 ac 31.41% Impervious Runoff Depth=4.05"
Flow Length=671' Tc=12.0 min CN=80 Runoff=12.12 cfs 1.059 af

Subcatchment 16S: DA 2G Runoff Area=0.444 ac 0.00% Impervious Runoff Depth=4.16"
Flow Length=110' Tc=6.0 min CN=81 Runoff=2.10 cfs 0.154 af

Subcatchment 17S: DA 2I Runoff Area=0.536 ac 64.18% Impervious Runoff Depth=5.03"
Flow Length=230' Slope=0.0200 '/' Tc=11.0 min CN=89 Runoff=2.55 cfs 0.225 af

Subcatchment 21S: DA 2F Runoff Area=0.141 ac 0.00% Impervious Runoff Depth=4.37"
Flow Length=107' Tc=6.0 min CN=83 Runoff=0.70 cfs 0.051 af

Subcatchment 22S: DA 2H Runoff Area=2.744 ac 35.75% Impervious Runoff Depth=4.26"
Flow Length=676' Tc=10.0 min CN=82 Runoff=11.72 cfs 0.975 af

Pond 2P: 30" RCP Peak Elev=522.21' Inflow=20.72 cfs 15.879 af
Primary=20.72 cfs 15.879 af Secondary=0.00 cfs 0.000 af Outflow=20.72 cfs 15.879 af

Pond 4P: Pond Peak Elev=526.94' Storage=7.173 af Inflow=113.18 cfs 14.214 af
Primary=14.08 cfs 14.081 af Secondary=0.00 cfs 0.000 af Outflow=14.08 cfs 14.081 af

Pond 10P: Apartment Phase 1 Detention Peak Elev=537.89' Storage=1,673 cf Inflow=5.53 cfs 0.581 af
Primary=4.47 cfs 0.581 af Secondary=0.00 cfs 0.000 af Outflow=4.47 cfs 0.581 af

Pond 15P: Apartments Phase II Stormwater Peak Elev=568.24' Storage=5,977 cf Inflow=12.63 cfs 1.111 af
Primary=12.39 cfs 1.031 af Secondary=0.00 cfs 0.000 af Outflow=12.39 cfs 1.031 af

Market Square and Existing Development to RT 66 Type III 24-hr 25-Year Rainfall=6.30"

Prepared by {enter your company name here}

Printed 12/14/2020

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Pond 16P: Water Quality Basin

Peak Elev=527.97' Storage=13,599 cf Inflow=11.39 cfs 0.896 af
Outflow=4.13 cfs 0.896 af

Pond 20P: Apartments Phase II

Peak Elev=558.93' Storage=28,628 cf Inflow=27.96 cfs 2.385 af
Primary=19.80 cfs 2.195 af Secondary=0.00 cfs 0.000 af Outflow=19.80 cfs 2.195 af

Pond 21P: Drain

Peak Elev=563.34' Inflow=14.81 cfs 1.256 af
24.0" Round Culvert n=0.013 L=260.0' S=0.0073 '/' Outflow=14.81 cfs 1.256 af

25-Year Link Primary Outflow Imported from Proposed Conditions - Town Hall Site~Link EAST.hce Inflow=13.46 cfs 2.024 af
Area= 6.431 ac 40.57% Imperv. Primary=13.46 cfs 2.024 af

Total Runoff Area = 49.488 ac Runoff Volume = 14.257 af Average Runoff Depth = 3.46"
76.40% Pervious = 37.808 ac 23.60% Impervious = 11.680 ac

Summary for Subcatchment 1S: DA 1A

Runoff = 10.09 cfs @ 12.15 hrs, Volume= 0.902 af, Depth= 5.25"

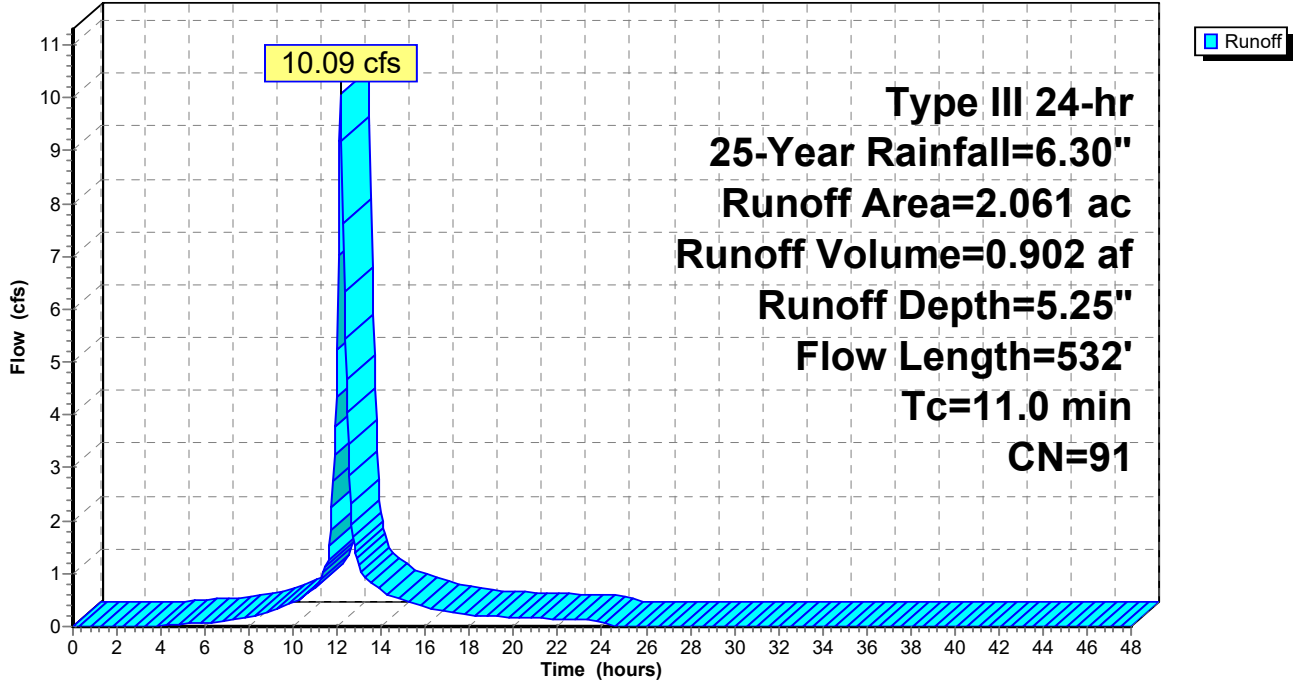
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.30"

Area (ac)	CN	Description
0.201	98	Paved parking, HSG C
1.260	98	Paved parking, HSG B
0.207	98	Paved parking, HSG C
0.074	74	>75% Grass cover, Good, HSG C
0.319	61	>75% Grass cover, Good, HSG B
2.061	91	Weighted Average
0.393		19.07% Pervious Area
1.668		80.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	40	0.0100	0.08		Sheet Flow, Lawn Grass: Dense n= 0.240 P2= 3.37"
1.7	239	0.0126	2.28		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.5	253	0.0200	8.41	14.86	Pipe Channel, HDPE Drain 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
11.0	532	Total			

Subcatchment 1S: DA 1A

Hydrograph



Summary for Subcatchment 3S: DA 2C

[47] Hint: Peak is 179% of capacity of segment #3

Runoff = 61.57 cfs @ 12.32 hrs, Volume= 6.942 af, Depth= 2.76"

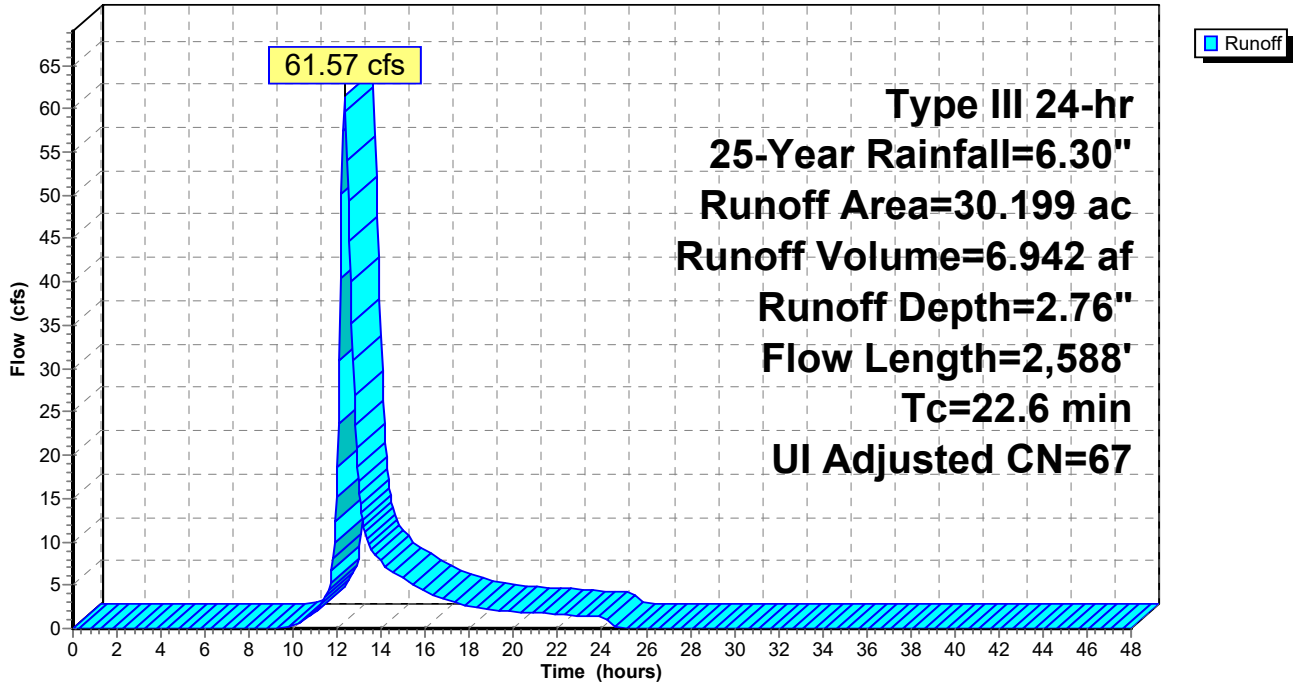
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.30"

Area (ac)	CN	Adj	Description
9.778	77		Woods, Good, HSG D
0.839	98		Water Surface, 0% imp, HSG D
13.926	55		Woods, Good, HSG B
2.515	70		Woods, Good, HSG C
0.066	98		Paved parking, HSG C
0.110	98		Roofs, HSG C
0.057	98		Paved parking, HSG B
0.566	61		>75% Grass cover, Good, HSG B
0.870	98		Unconnected roofs, HSG B
0.333	80		>75% Grass cover, Good, HSG D
0.061	98		Paved parking, HSG C
0.032	74		>75% Grass cover, Good, HSG C
0.140	98		Paved parking, HSG C
0.664	74		>75% Grass cover, Good, HSG C
0.058	70		Woods, Good, HSG C
* 0.184	98		Unconnected Roofs
30.199	68	67	Weighted Average, UI Adjusted
28.711			95.07% Pervious Area
1.488			4.93% Impervious Area
1.054			70.83% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.0850	0.14		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
5.1	598	0.1539	1.96		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
5.2	1,600	0.0262	5.16	34.37	Parabolic Channel, Channel W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.035 Earth, dense weeds
0.6	290		8.02		Lake or Reservoir, Pond Mean Depth= 2.00'
22.6	2,588	Total			

Subcatchment 3S: DA 2C

Hydrograph



Summary for Subcatchment 7S: DA 1B

Runoff = 12.39 cfs @ 12.09 hrs, Volume= 0.965 af, Depth= 5.36"

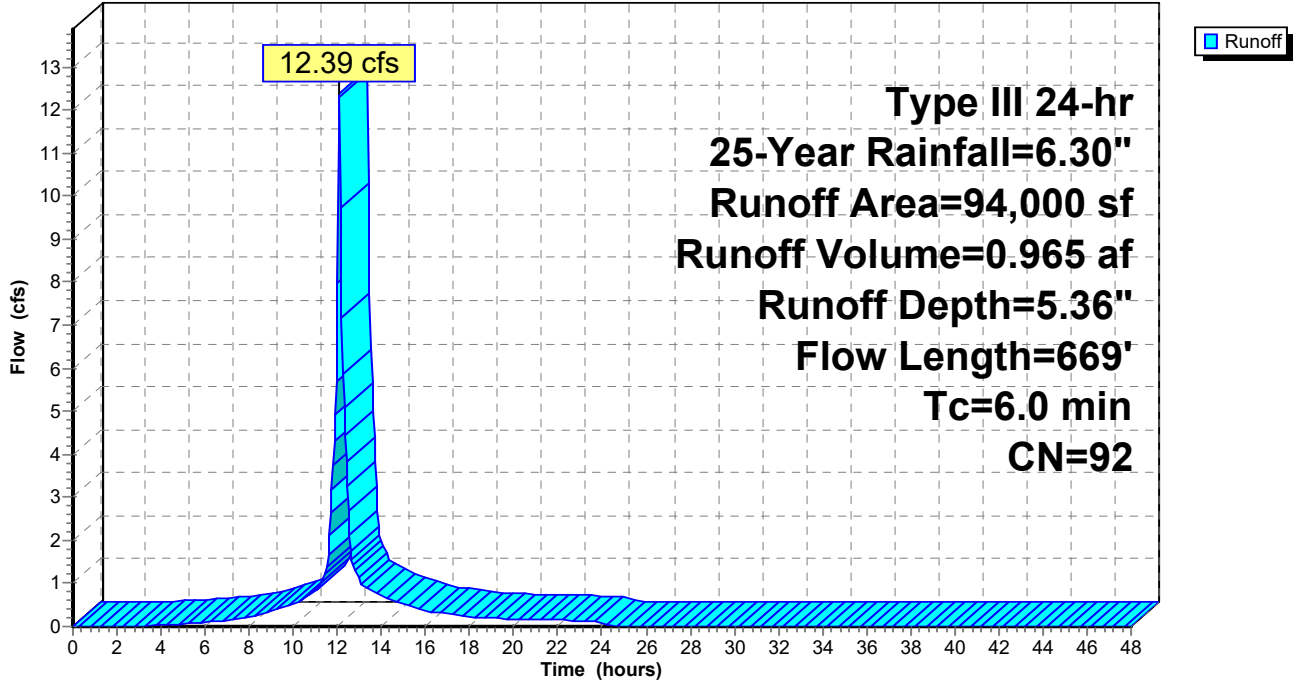
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.30"

Area (sf)	CN	Description
71,413	98	Paved parking, HSG B
11,784	86	Newly graded area, HSG B
10,803	61	>75% Grass cover, Good, HSG B
94,000	92	Weighted Average
22,587		24.03% Pervious Area
71,413		75.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		Sheet Flow, Play areas Smooth surfaces n= 0.011 P2= 3.37"
0.1	40	0.1500	6.24		Shallow Concentrated Flow, Play areas Unpaved Kv= 16.1 fps
2.2	362	0.0175	2.69		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.3	167	0.0200	8.41	14.86	Pipe Channel, HDPE 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
3.8	669	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7S: DA 1B

Hydrograph



Summary for Subcatchment 8S: DA 2A

[47] Hint: Peak is 105% of capacity of segment #3

Runoff = 15.22 cfs @ 12.16 hrs, Volume= 1.348 af, Depth= 4.48"

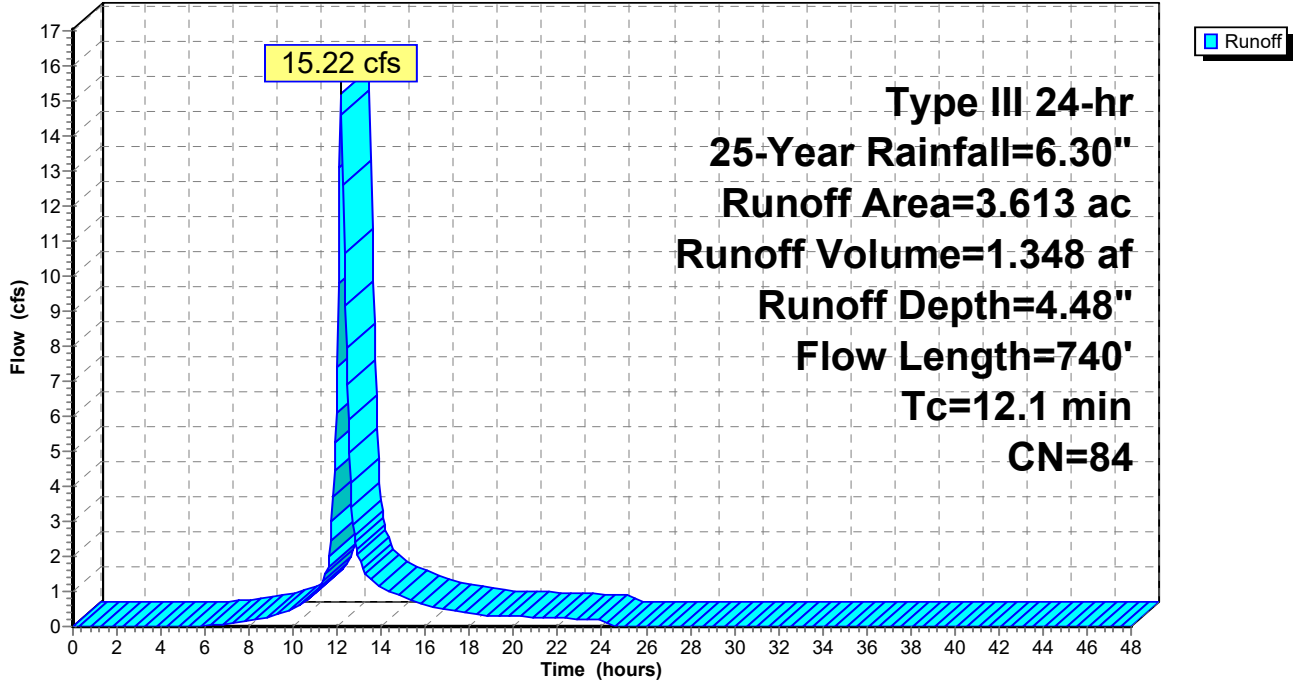
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.30"

Area (ac)	CN	Description
1.953	98	Paved parking, HSG B
0.152	98	Roofs, HSG B
0.394	61	>75% Grass cover, Good, HSG B
0.054	55	Woods, Good, HSG B
0.930	61	>75% Grass cover, Good, HSG B
0.130	98	Paved parking, HSG B
3.613	84	Weighted Average
1.378		38.14% Pervious Area
2.235		61.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	100	0.0650	0.19		Sheet Flow, Lawn Grass: Dense n= 0.240 P2= 3.37"
3.3	558	0.0191	2.81		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.1	82	0.0500	11.77	14.44	Pipe Channel, Discharge 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
12.1	740	Total			

Subcatchment 8S: DA 2A

Hydrograph



Summary for Subcatchment 9S: DA 2B

Runoff = 5.53 cfs @ 12.27 hrs, Volume= 0.581 af, Depth= 3.24"

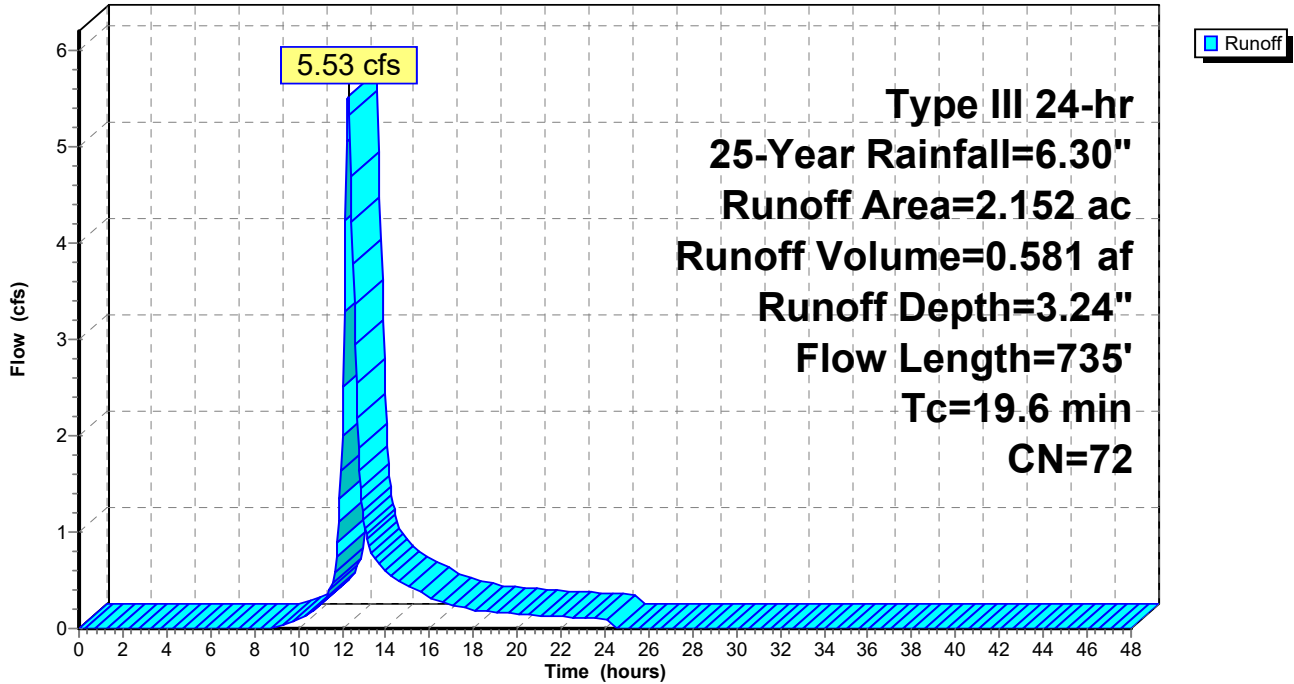
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.30"

Area (ac)	CN	Description
0.661	98	Paved parking, HSG B
0.746	55	Woods, Good, HSG B
0.669	61	>75% Grass cover, Good, HSG B
0.076	98	Water Surface, 0% imp, HSG B
2.152	72	Weighted Average
1.491		69.28% Pervious Area
0.661		30.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0450	0.11		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
2.1	100	0.0250	0.79		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.2	38	0.3333	4.04		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.8	314	0.0200	2.87		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.2	108	0.0200	7.44	9.14	Pipe Channel, Pipe 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.2	75		5.67		Lake or Reservoir, Mean Depth= 1.00'
19.6	735	Total			

Subcatchment 9S: DA 2B

Hydrograph



Summary for Subcatchment 11S: DA 1C

Runoff = 2.01 cfs @ 12.09 hrs, Volume= 0.159 af, Depth= 5.59"

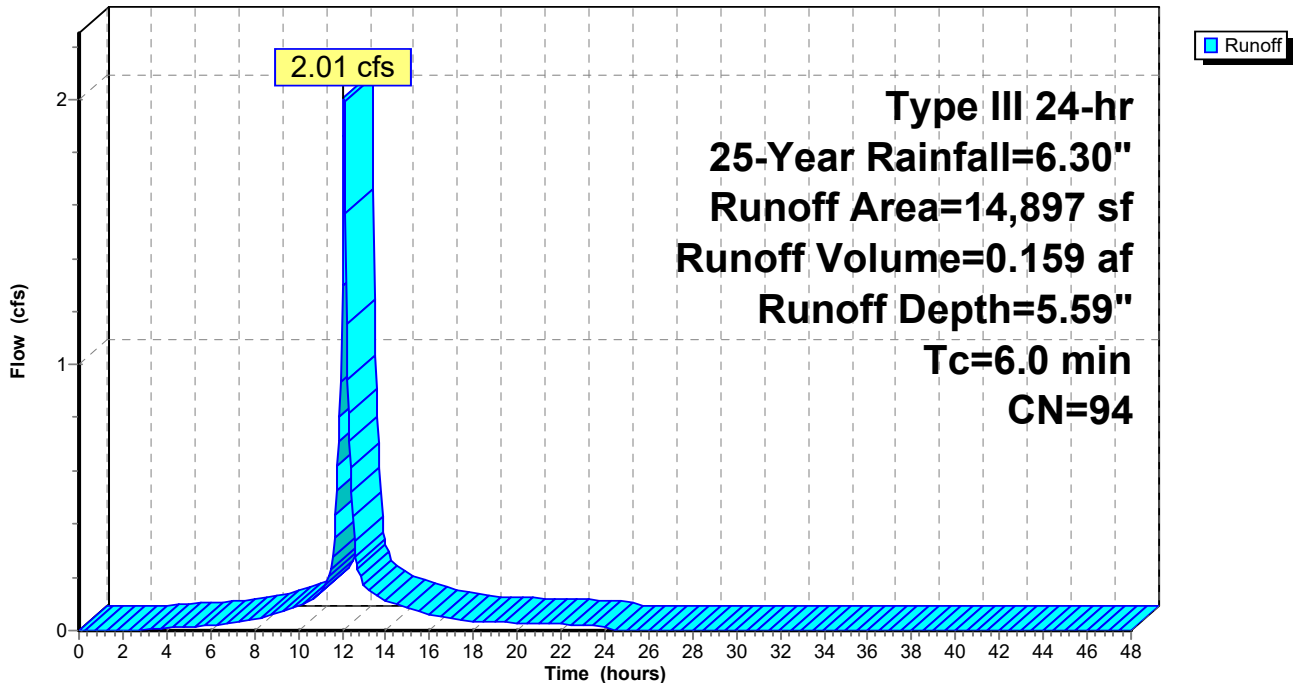
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.30"

Area (sf)	CN	Description
12,458	98	Paved parking, HSG C
2,439	74	>75% Grass cover, Good, HSG C
14,897	94	Weighted Average
2,439		16.37% Pervious Area
12,458		83.63% Impervious Area

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

Subcatchment 11S: DA 1C

Hydrograph



Summary for Subcatchment 12S: DA 1D

Runoff = 11.39 cfs @ 12.09 hrs, Volume= 0.896 af, Depth= 5.48"

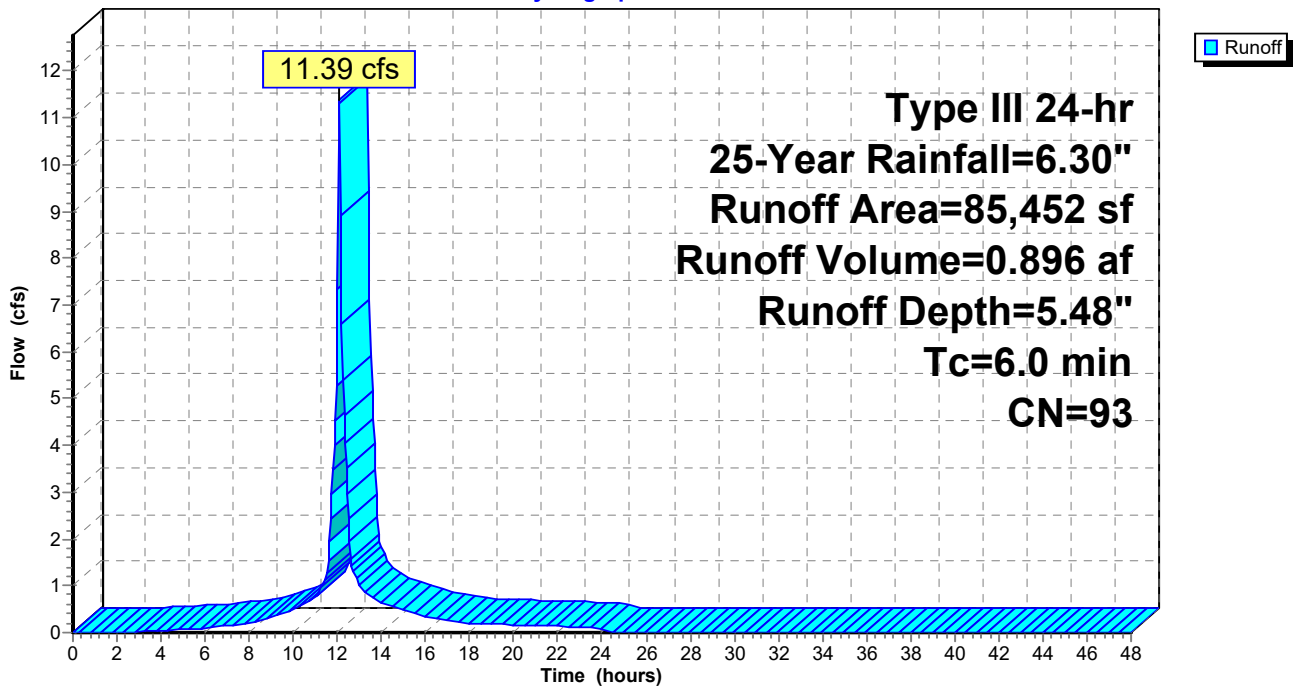
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.30"

Area (sf)	CN	Description
55,278	98	Paved parking, HSG C
6,098	98	Water Surface, 0% imp, HSG C
18,687	74	>75% Grass cover, Good, HSG C
5,389	98	Paved parking, HSG C
85,452	93	Weighted Average
24,785		29.00% Pervious Area
60,667		71.00% Impervious Area

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

Subcatchment 12S: DA 1D

Hydrograph



Summary for Subcatchment 15S: DA 2E

Runoff = 12.12 cfs @ 12.17 hrs, Volume= 1.059 af, Depth= 4.05"

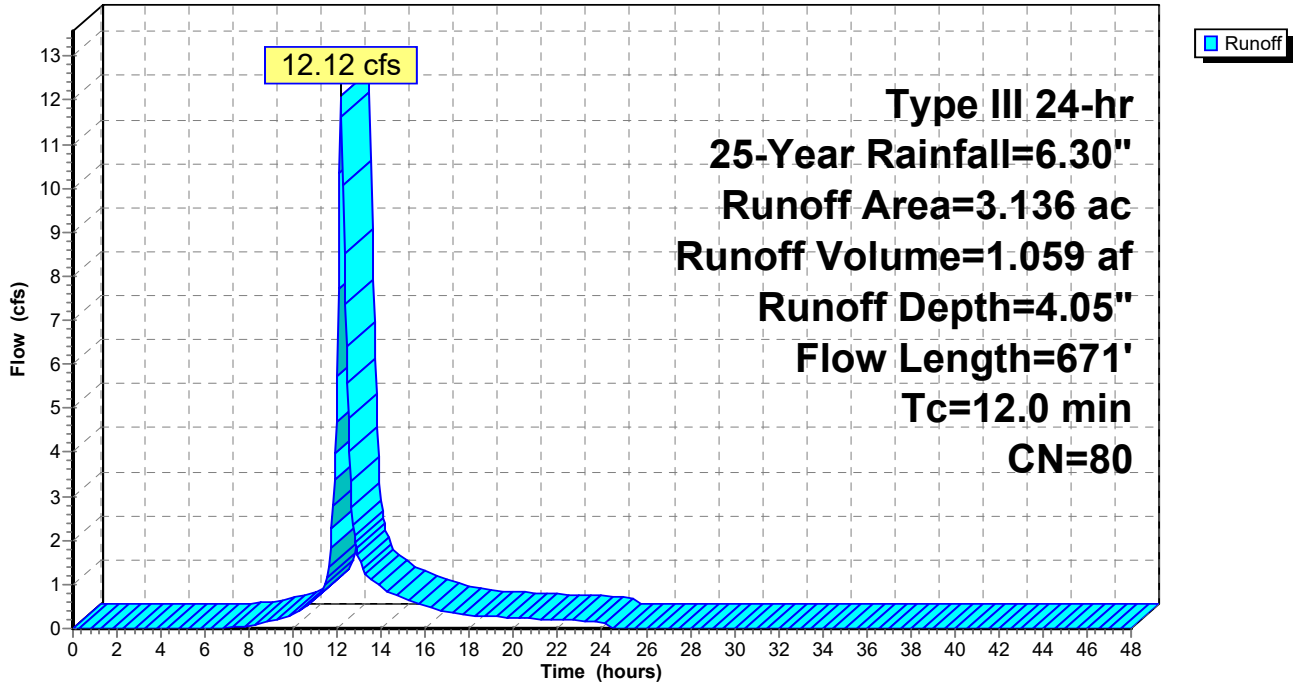
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.30"

Area (ac)	CN	Description
* 0.985	98	Paved parking, HSG C, South
* 0.455	74	>75% Grass cover, Good, HSG C, South
1.030	70	Woods, Good, HSG C
0.666	74	>75% Grass cover, Good, HSG C
3.136	80	Weighted Average
2.151		68.59% Pervious Area
0.985		31.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
3.3	417	0.1799	2.12		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	40	0.1000	2.21		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.7	164	0.0421	4.17		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
12.0	671	Total			

Subcatchment 15S: DA 2E

Hydrograph



Summary for Subcatchment 16S: DA 2G

Runoff = 2.10 cfs @ 12.09 hrs, Volume= 0.154 af, Depth= 4.16"

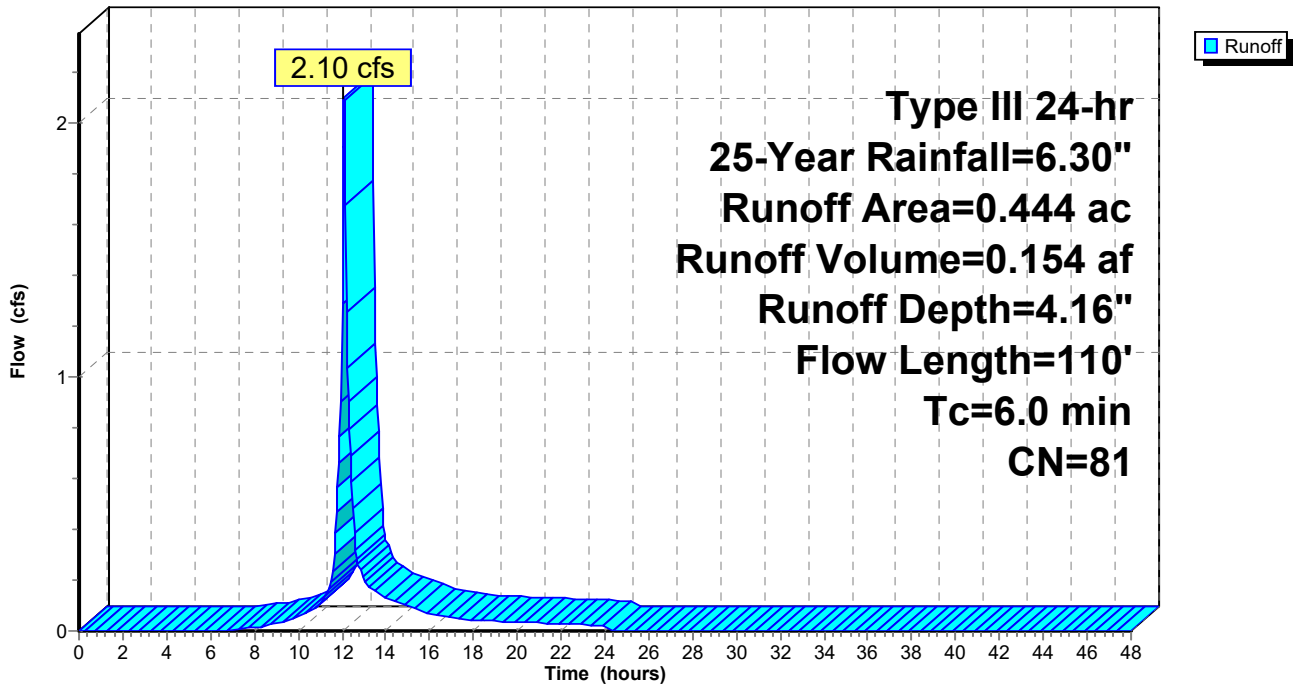
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.30"

Area (ac)	CN	Description
0.103	98	Water Surface, 0% imp, HSG C
0.017	80	>75% Grass cover, Good, HSG D
0.229	74	>75% Grass cover, Good, HSG C
0.079	80	>75% Grass cover, Good, HSG D
0.016	74	>75% Grass cover, Good, HSG C
0.444	81	Weighted Average
0.444		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.2	60	0.3500	4.14		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
5.7	110	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 16S: DA 2G

Hydrograph



Summary for Subcatchment 17S: DA 2I

Runoff = 2.55 cfs @ 12.15 hrs, Volume= 0.225 af, Depth= 5.03"

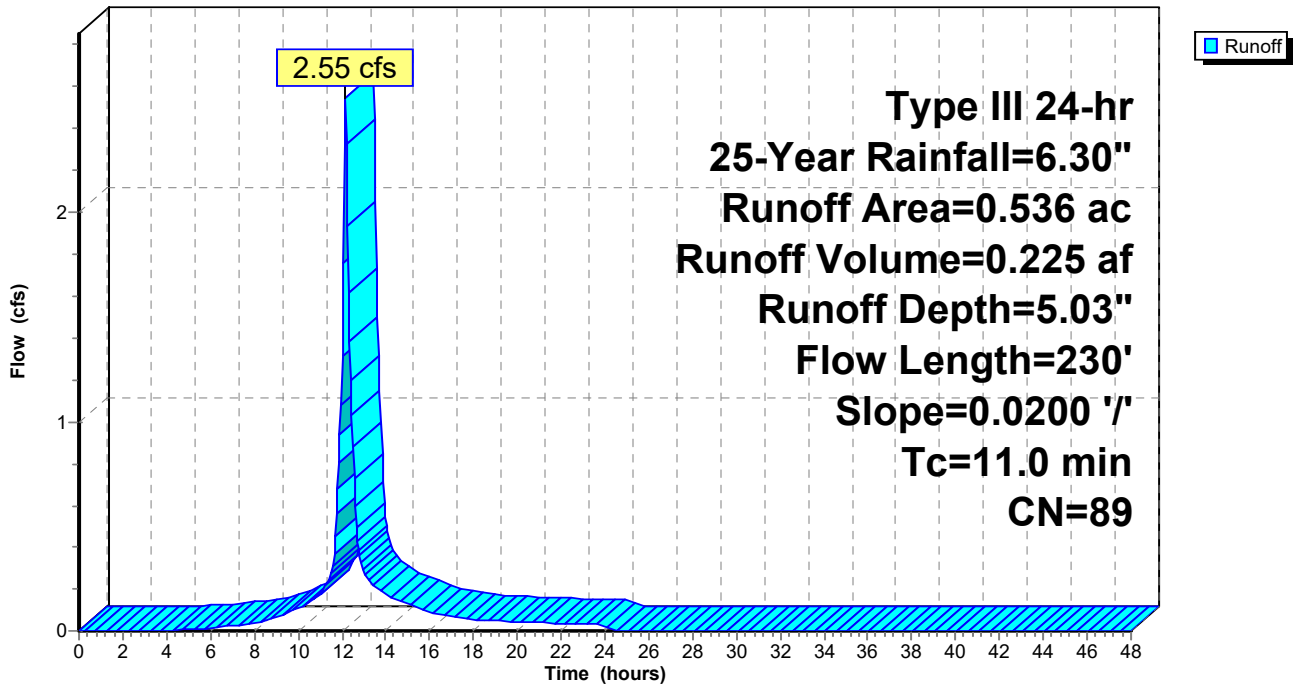
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.30"

Area (ac)	CN	Description
* 0.344	98	Paved parking, HSG C, North
* 0.192	74	>75% Grass cover, Good, HSG C, North
0.536	89	Weighted Average
0.192		35.82% Pervious Area
0.344		64.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
3.0	180	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
11.0	230	Total			

Subcatchment 17S: DA 2I

Hydrograph



Summary for Subcatchment 21S: DA 2F

Runoff = 0.70 cfs @ 12.09 hrs, Volume= 0.051 af, Depth= 4.37"

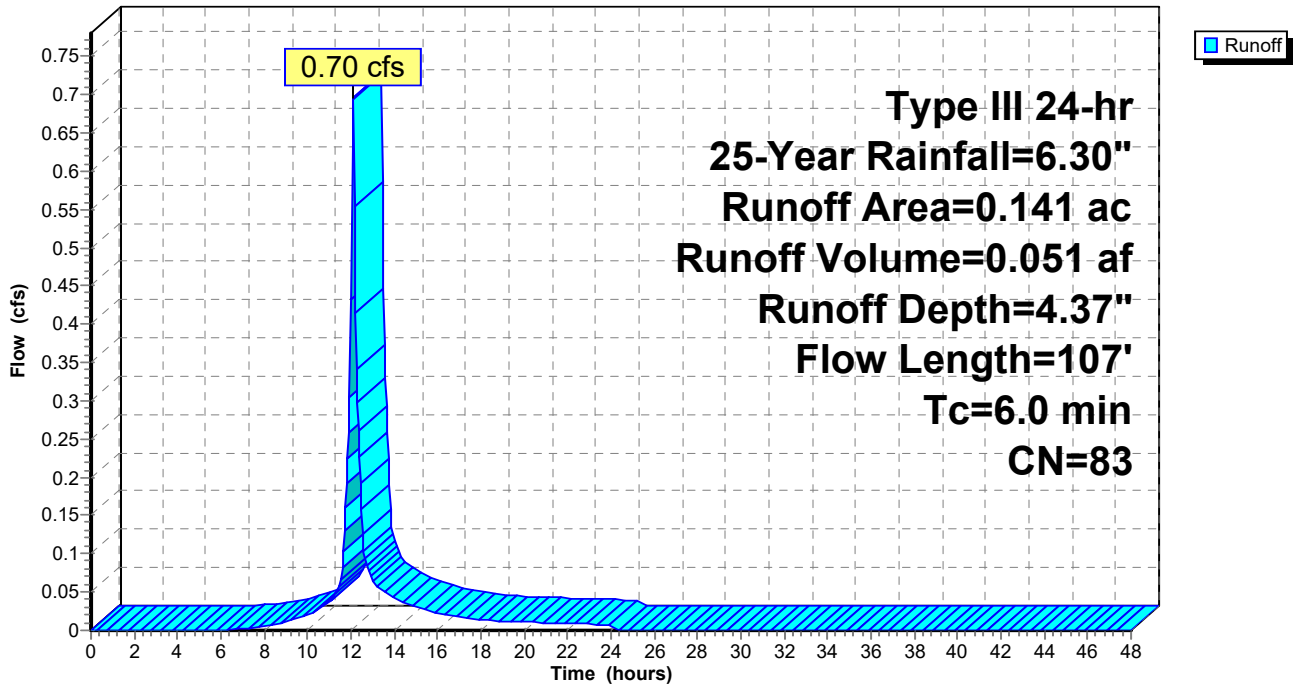
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.30"

Area (ac)	CN	Description
0.051	98	Water Surface, 0% imp, HSG C
0.090	74	>75% Grass cover, Good, HSG C
0.141	83	Weighted Average
0.141		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.3	57	0.1754	2.93		Shallow Concentrated Flow, Woods Short Grass Pasture Kv= 7.0 fps
4.5	107	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 21S: DA 2F

Hydrograph



Summary for Subcatchment 22S: DA 2H

Runoff = 11.72 cfs @ 12.14 hrs, Volume= 0.975 af, Depth= 4.26"

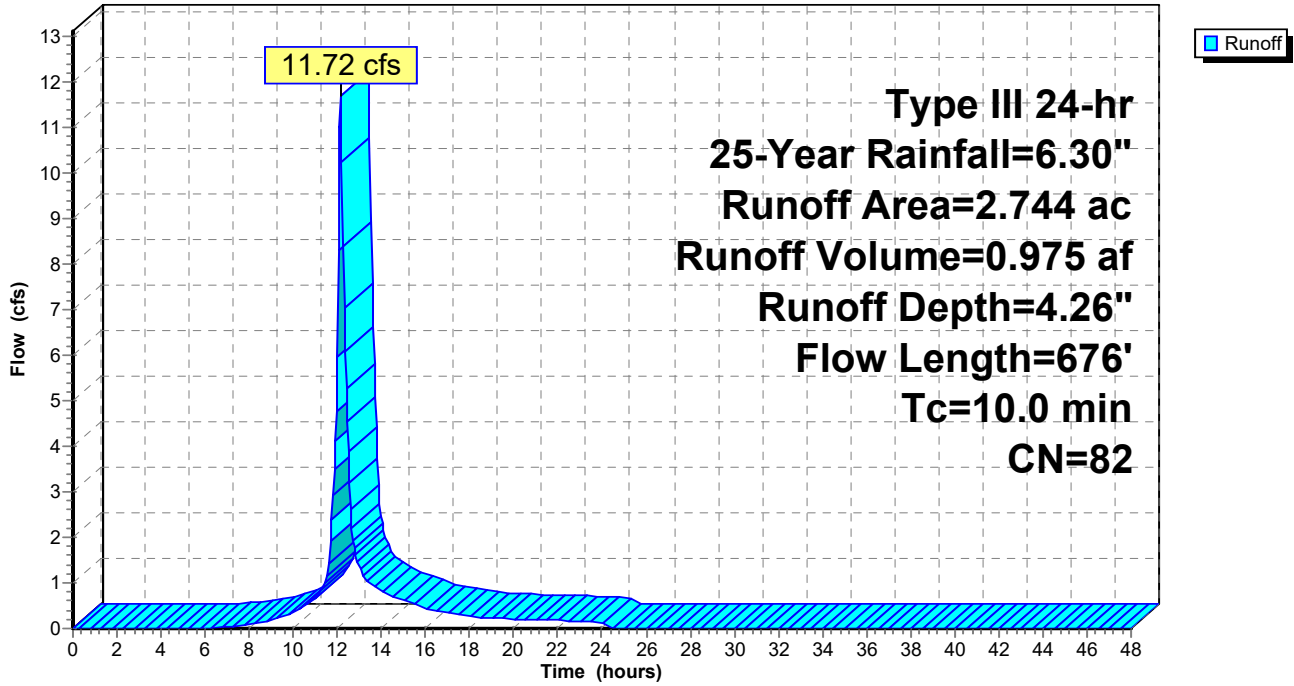
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.30"

Area (ac)	CN	Description
* 0.431	98	Paved parking, HSG C, North
* 0.010	80	>75% Grass cover, Good, HSG D, North
* 0.313	74	>75% Grass cover, Good, HSG C, North
* 0.550	98	Paved parking, HSG C, South
* 0.356	74	>75% Grass cover, Good, HSG C, South
0.748	70	Woods, Good, HSG C
0.336	74	>75% Grass cover, Good, HSG C
2.744	82	Weighted Average
1.763		64.25% Pervious Area
0.981		35.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
1.7	190	0.1316	1.81		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	81	0.3333	4.04		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.7	355	0.0310	3.57		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
10.0	676	Total			

Subcatchment 22S: DA 2H

Hydrograph



Summary for Pond 2P: 30" RCP

Inflow Area = 55.918 ac, 25.55% Impervious, Inflow Depth > 3.41" for 25-Year event
 Inflow = 20.72 cfs @ 12.20 hrs, Volume= 15.879 af
 Outflow = 20.72 cfs @ 12.20 hrs, Volume= 15.879 af, Atten= 0%, Lag= 0.0 min
 Primary = 20.72 cfs @ 12.20 hrs, Volume= 15.879 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 522.21' @ 12.20 hrs
 Flood Elev= 527.20'

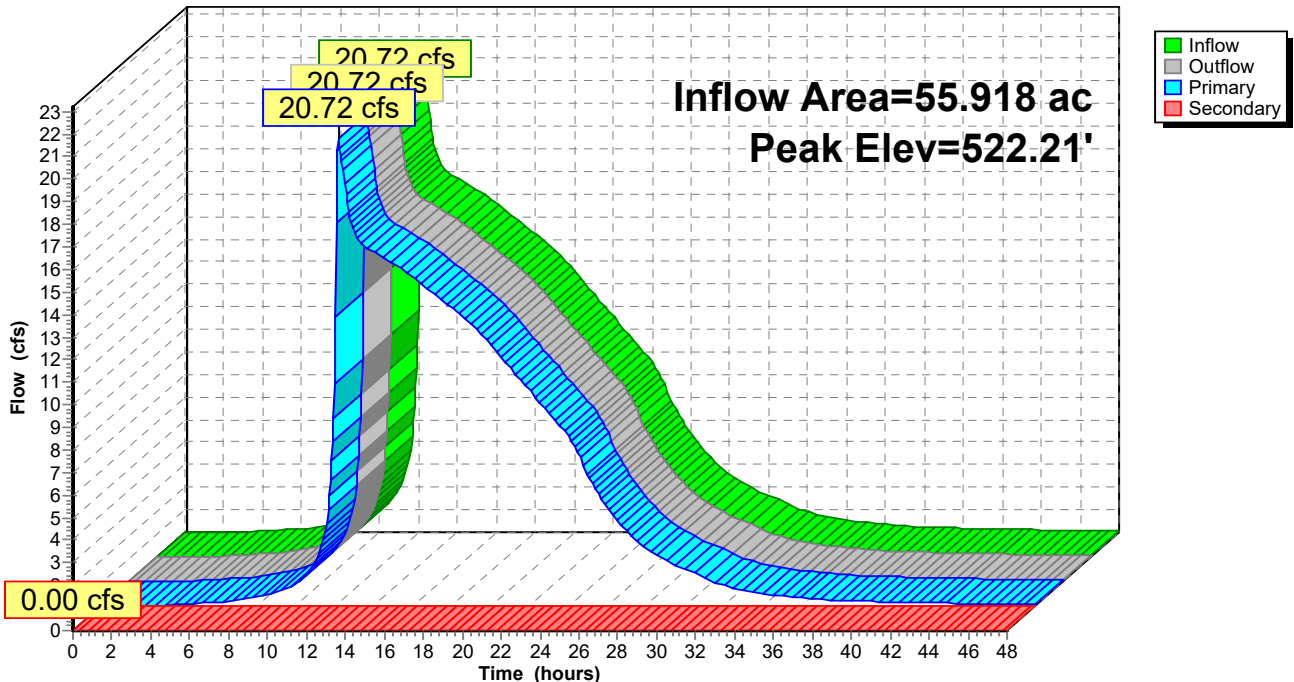
Device	Routing	Invert	Outlet Devices
#1	Primary	519.92'	30.0" Round 30" RC L= 80.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 519.92' / 519.62' S= 0.0037 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 4.91 sf
#2	Secondary	527.20'	30.0' long x 10.0' breadth Overflow Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=20.70 cfs @ 12.20 hrs HW=522.21' (Free Discharge)
 ↳1=30" RC (Barrel Controls 20.70 cfs @ 5.76 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=519.92' (Free Discharge)
 ↳2=Overflow (Controls 0.00 cfs)

Pond 2P: 30" RCP

Hydrograph



Summary for Pond 4P: Pond

Inflow Area = 51.896 ac, 21.64% Impervious, Inflow Depth = 3.29" for 25-Year event
 Inflow = 113.18 cfs @ 12.29 hrs, Volume= 14.214 af
 Outflow = 14.08 cfs @ 14.19 hrs, Volume= 14.081 af, Atten= 88%, Lag= 113.9 min
 Primary = 14.08 cfs @ 14.19 hrs, Volume= 14.081 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 526.94' @ 14.19 hrs Surf.Area= 2.630 ac Storage= 7.173 af

Plug-Flow detention time= 312.6 min calculated for 14.081 af (99% of inflow)
 Center-of-Mass det. time= 306.6 min (1,154.9 - 848.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	523.45'	16.273 af	Pond Storage (Irregular) Listed below		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
523.45	0.636	1,389.1	0.000	0.000	0.636
524.00	1.723	1,270.7	0.624	0.624	1.212
526.00	2.359	1,494.7	4.065	4.690	2.345
528.00	2.936	1,638.1	5.284	9.974	3.169
530.00	3.368	1,700.4	6.299	16.273	3.556

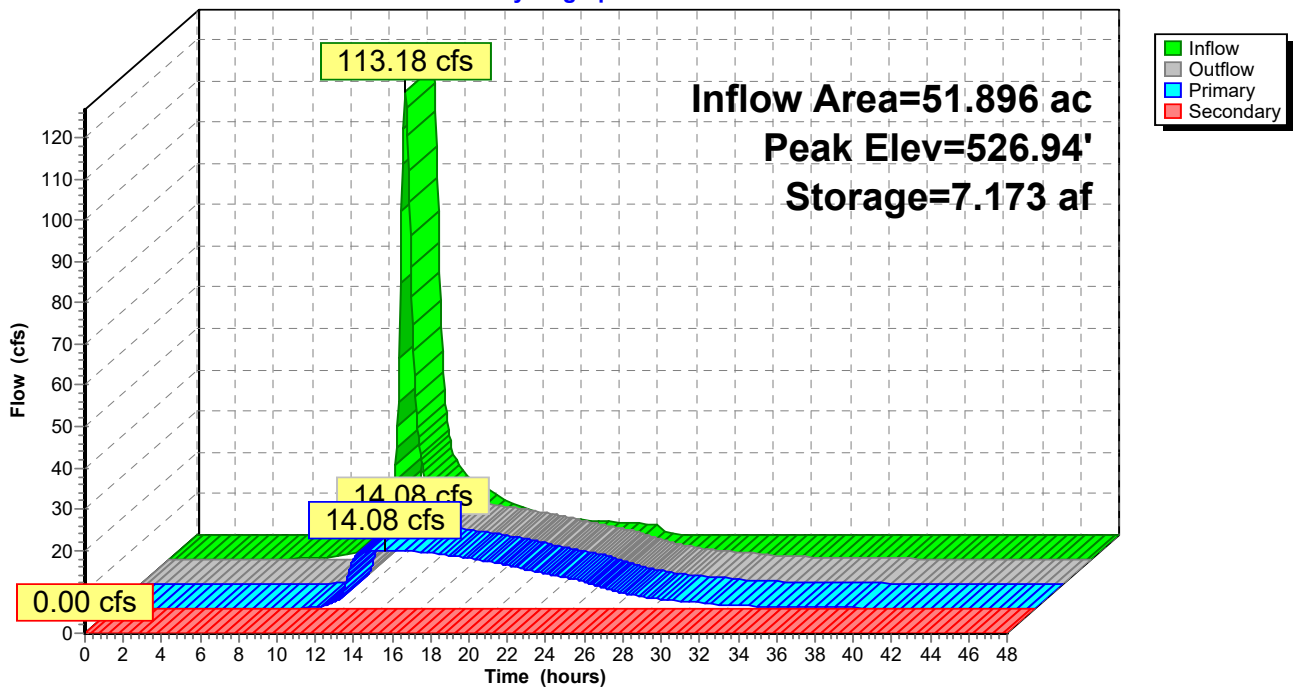
Device	Routing	Invert	Outlet Devices
#1	Primary	520.91'	30.0" Round 30" HDPE L= 110.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 520.91' / 520.64' S= 0.0024 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	521.46'	30.0" Round 30" HDPE L= 86.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 521.46' / 520.91' S= 0.0063 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	521.41'	24.0" Round 24" HDPE L= 157.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 521.41' / 521.40' S= 0.0001 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#4	Device 3	523.45'	18.0" Round 18" HDPE L= 117.9' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 523.45' / 521.82' S= 0.0138 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#5	Secondary	529.90'	50.0' long x 25.0' breadth Overflow Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=14.08 cfs @ 14.19 hrs HW=526.94' TW=521.84' (Dynamic Tailwater)
 ↳ 1=30" HDPE (Passes 14.08 cfs of 48.32 cfs potential flow)
 ↳ 2=30" HDPE (Passes 14.08 cfs of 48.61 cfs potential flow)
 ↳ 3=24" HDPE (Passes 14.08 cfs of 25.51 cfs potential flow)
 ↳ 4=18" HDPE (Inlet Controls 14.08 cfs @ 7.97 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=523.45' TW=519.92' (Dynamic Tailwater)
 ↳ 5=Overflow (Controls 0.00 cfs)

Pond 4P: Pond

Hydrograph



Summary for Pond 10P: Apartment Phase 1 Detention Basin

Inflow Area = 2.152 ac, 30.72% Impervious, Inflow Depth = 3.24" for 25-Year event
 Inflow = 5.53 cfs @ 12.27 hrs, Volume= 0.581 af
 Outflow = 4.47 cfs @ 12.43 hrs, Volume= 0.581 af, Atten= 19%, Lag= 9.1 min
 Primary = 4.47 cfs @ 12.43 hrs, Volume= 0.581 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 537.89' @ 12.43 hrs Surf.Area= 1,749 sf Storage= 1,673 cf

Plug-Flow detention time= 4.3 min calculated for 0.581 af (100% of inflow)
 Center-of-Mass det. time= 3.6 min (847.4 - 843.8)

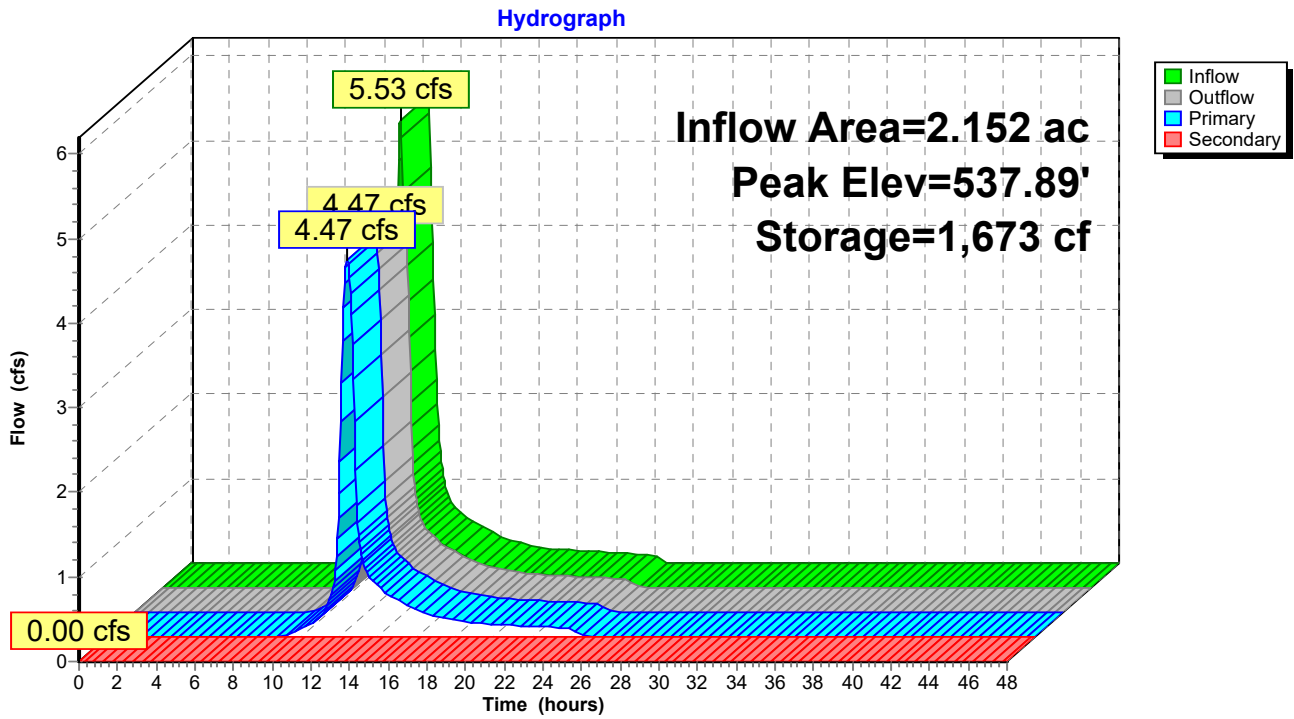
Volume	Invert	Avail.Storage	Storage Description			
#1	536.00'	7,026 cf	Detention Basin (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
536.00	100	40.0	0	0	100	
536.50	467	110.5	131	131	945	
537.60	1,559	173.6	1,056	1,186	2,380	
540.00	3,429	242.5	5,840	7,026	4,716	

Device	Routing	Invert	Outlet Devices
#1	Primary	536.00'	12.0" Round Culvert L= 75.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 536.00' / 534.50' S= 0.0200 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	539.50'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.46 cfs @ 12.43 hrs HW=537.89' TW=525.93' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 4.46 cfs @ 5.67 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=536.00' TW=523.45' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 10P: Apartment Phase 1 Detention Basin



Market Square and Existing Development to RT 66 Type III 24-hr 25-Year Rainfall=6.30"

Prepared by {enter your company name here}

Printed 12/14/2020

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Summary for Pond 15P: Apartments Phase II Stormwater Basin 2

Inflow Area = 3.277 ac, 30.06% Impervious, Inflow Depth = 4.07" for 25-Year event
 Inflow = 12.63 cfs @ 12.16 hrs, Volume= 1.111 af
 Outflow = 12.39 cfs @ 12.19 hrs, Volume= 1.031 af, Atten= 2%, Lag= 1.6 min
 Primary = 12.39 cfs @ 12.19 hrs, Volume= 1.031 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 568.24' @ 12.19 hrs Surf.Area= 2,401 sf Storage= 5,977 cf

Plug-Flow detention time= 61.4 min calculated for 1.031 af (93% of inflow)
 Center-of-Mass det. time= 23.6 min (840.7 - 817.1)

Volume	Invert	Avail.Storage	Storage Description
#1	562.00'	6 cf	3.00'W x 8.00'L x 2.50'H Sand Underdrain 60 cf Overall x 10.0% Voids
#2	564.50'	10,719 cf	Stormwater Basin (Irregular) Listed below
		10,725 cf	Total Available Storage

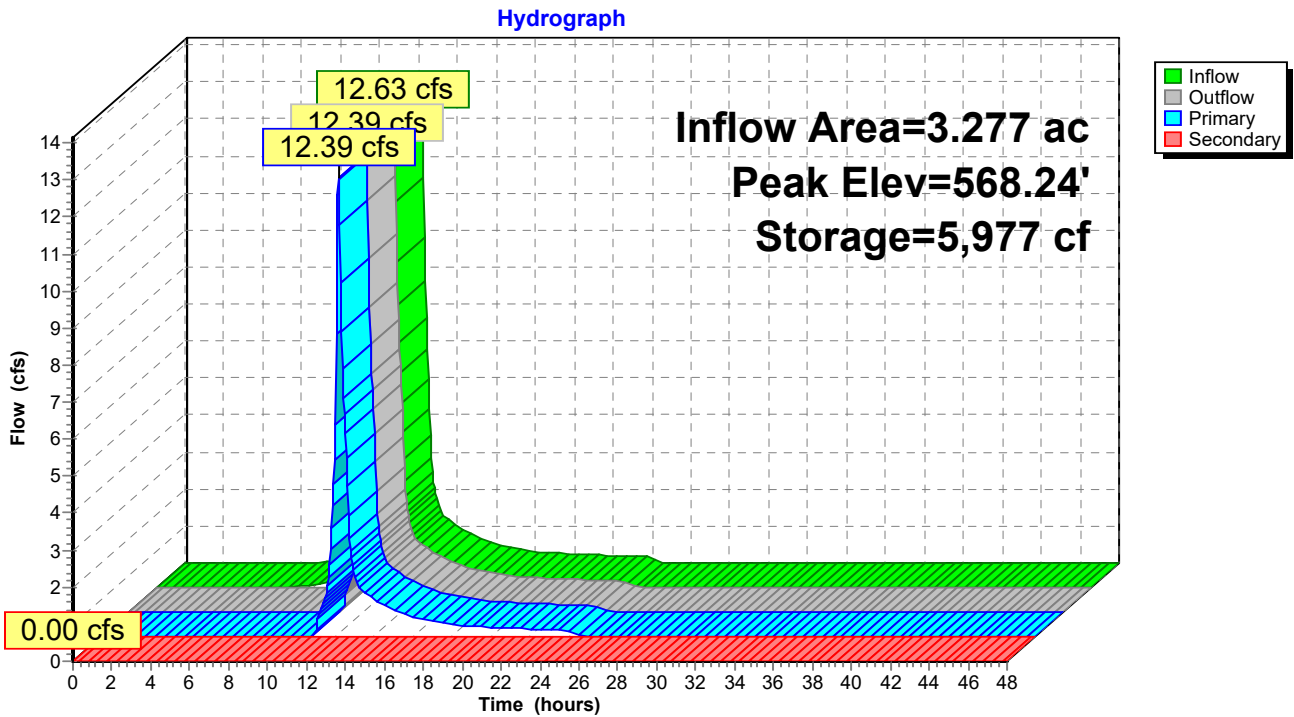
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
564.50	4	8.2	0	0	4
564.75	257	68.5	24	24	372
565.00	1,193	160.0	167	191	2,036
566.00	1,533	172.5	1,359	1,551	2,406
568.00	2,277	197.6	3,786	5,336	3,233
570.00	3,128	222.7	5,383	10,719	4,172

Device	Routing	Invert	Outlet Devices
#1	Primary	562.00'	18.0" Round 18" HDPE L= 68.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 562.00' / 561.60' S= 0.0059 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	567.00'	36.0" W x 6.0" H Vert. 36" x 6" Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	568.00'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#4	Secondary	569.00'	8.0' long x 8.0' breadth Rip Rap Spillway 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#5	Device 1	562.00'	0.500 in/hr Sand Underdrain over Horizontal area from 562.00' - 564.50' Excluded Horizontal area = 24 sf Phase-In= 0.01'

Primary OutFlow Max=12.24 cfs @ 12.19 hrs HW=568.23' TW=563.32' (Dynamic Tailwater)
 ↳ 1=18" HDPE (Passes 12.24 cfs of 18.86 cfs potential flow)
 ↳ 2=36" x 6" Orifice (Orifice Controls 7.14 cfs @ 4.76 fps)
 ↳ 3=Top of Frame (Weir Controls 5.11 cfs @ 1.57 fps)
 ↳ 5=Sand Underdrain (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=562.00' TW=523.45' (Dynamic Tailwater)
 ↳ 4=Rip Rap Spillway (Controls 0.00 cfs)

Pond 15P: Apartments Phase II Stormwater Basin 2



Market Square and Existing Development to RT 66 Type III 24-hr 25-Year Rainfall=6.30"

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Summary for Pond 16P: Water Quality Basin

Inflow Area = 1.962 ac, 71.00% Impervious, Inflow Depth = 5.48" for 25-Year event
 Inflow = 11.39 cfs @ 12.09 hrs, Volume= 0.896 af
 Outflow = 4.13 cfs @ 12.35 hrs, Volume= 0.896 af, Atten= 64%, Lag= 15.5 min
 Primary = 4.13 cfs @ 12.35 hrs, Volume= 0.896 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 527.97' @ 12.35 hrs Surf.Area= 6,236 sf Storage= 13,599 cf

Plug-Flow detention time= 118.9 min calculated for 0.895 af (100% of inflow)
 Center-of-Mass det. time= 118.9 min (890.6 - 771.6)

Volume	Invert	Avail.Storage	Storage Description
#1	523.75'	26,415 cf	Water Quality swale (Irregular) Listed below (Recalc)
#2	522.25'	5 cf	3.00'W x 3.00'L x 1.50'H Underdrain
			14 cf Overall x 40.0% Voids
		26,420 cf	Total Available Storage

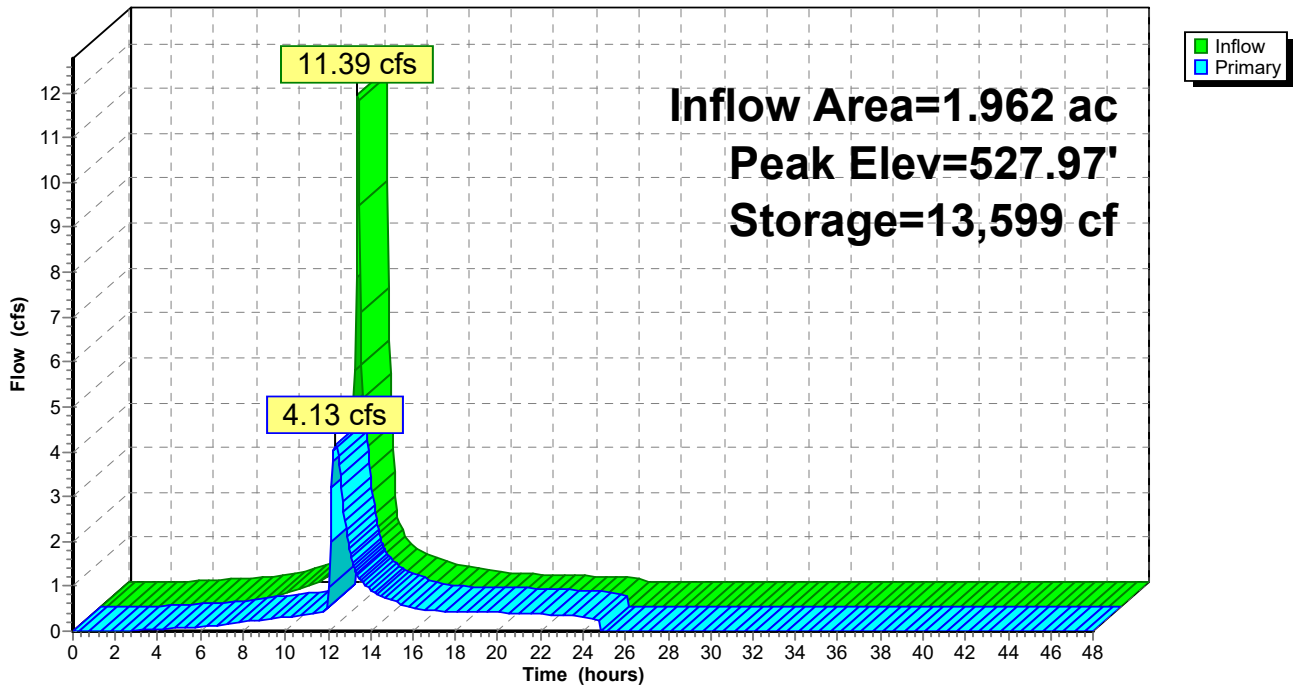
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
523.75	9	12.0	0	0	9
524.00	258	63.2	26	26	316
524.25	528	108.8	96	123	940
524.50	766	159.7	161	283	2,028
524.75	1,105	211.6	233	516	3,562
525.00	1,523	263.2	327	843	5,513
525.25	2,026	316.2	442	1,285	7,958
525.50	2,529	368.0	568	1,853	10,779
525.75	3,267	420.8	723	2,576	14,095
526.00	4,119	481.0	921	3,497	18,417
528.00	6,268	535.7	10,312	13,809	22,957
529.75	8,181	557.7	12,606	26,415	25,097

Device	Routing	Invert	Outlet Devices
#1	Primary	522.75'	24.0" Round 24" HDPE L= 75.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 522.75' / 521.75' S= 0.0133 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	523.00'	3.0" Vert. Underdrain C= 0.600 Limited to weir flow at low heads
#3	Device 1	526.75'	6.0" W x 6.0" H Vert. 6" Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	527.25'	18.0" W x 6.0" H Vert. 18x6 Orifice C= 0.600 Limited to weir flow at low heads
#5	Device 1	528.50'	20.0' long x 0.5' breadth Top of Frame Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

- Primary OutFlow** Max=4.13 cfs @ 12.35 hrs HW=527.96' TW=522.15' (Dynamic Tailwater)
- 1=24" HDPE (Passes 4.13 cfs of 31.06 cfs potential flow)
 - 2=Underdrain (Orifice Controls 0.52 cfs @ 10.59 fps)
 - 3=6" Orifice (Orifice Controls 1.18 cfs @ 4.72 fps)
 - 4=18x6 Orifice (Orifice Controls 2.43 cfs @ 3.24 fps)
 - 5=Top of Frame (Controls 0.00 cfs)

Pond 16P: Water Quality Basin

Hydrograph



Summary for Pond 20P: Apartments Phase II Stormwater Basin 1

Inflow Area = 7.001 ac, 33.00% Impervious, Inflow Depth = 4.09" for 25-Year event
 Inflow = 27.96 cfs @ 12.16 hrs, Volume= 2.385 af
 Outflow = 19.80 cfs @ 12.30 hrs, Volume= 2.195 af, Atten= 29%, Lag= 8.5 min
 Primary = 19.80 cfs @ 12.30 hrs, Volume= 2.195 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 558.93' @ 12.30 hrs Surf.Area= 7,387 sf Storage= 28,628 cf

Plug-Flow detention time= 98.5 min calculated for 2.195 af (92% of inflow)
 Center-of-Mass det. time= 57.6 min (879.4 - 821.8)

Volume	Invert	Avail.Storage	Storage Description
#1	551.00'	4 cf	3.00'W x 8.00'L x 1.75'H Sand Underdrain 42 cf Overall x 10.0% Voids
#2	552.75'	40,883 cf	Stormwater Basin (Irregular) Listed below (Recalc)
#3	556.00'	424 cf	36.0" Round Pipe Storage-Impervious L= 60.0' S= 0.0083 'f'
		41,312 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
552.75	120	43.3	0	0	120
553.00	865	110.3	109	109	939
553.25	1,552	155.7	298	407	1,901
553.50	2,135	207.8	459	866	3,409
553.75	2,928	261.6	630	1,496	5,419
554.00	3,512	310.5	804	2,300	7,646
555.00	4,145	323.0	3,824	6,124	8,352
556.00	4,804	335.6	4,470	10,595	9,090
557.00	5,490	348.1	5,143	15,738	9,851
558.00	6,569	422.7	6,021	21,759	14,443
559.00	7,426	435.3	6,993	28,752	15,404
560.00	8,310	447.8	7,864	36,616	16,387
560.50	8,761	454.1	4,267	40,883	16,893

Device	Routing	Invert	Outlet Devices
#1	Primary	551.00'	18.0" Round 18" HDPE L= 152.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 551.00' / 549.00' S= 0.0132 'f' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	555.50'	6.0" Vert. 6" Orifices (2) X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	557.30'	48.0" W x 7.0" H Vert. 48" x 7" Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	558.75'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#5	Secondary	559.75'	8.0' long x 8.0' breadth Rip Rap Spillway 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)							2.43	2.54	2.70	2.69	2.68	2.68	2.66	2.64	2.64
			2.64	2.65	2.65	2.66	2.66	2.68	2.70	2.74								
#6	Device 1	551.00'	0.500 in/hr Sand Underdrain over Horizontal area from 551.00' - 552.75'															
			Excluded Horizontal area = 24 sf Phase-In= 0.01'															

Primary OutFlow Max=19.76 cfs @ 12.30 hrs HW=558.93' TW=525.45' (Dynamic Tailwater)

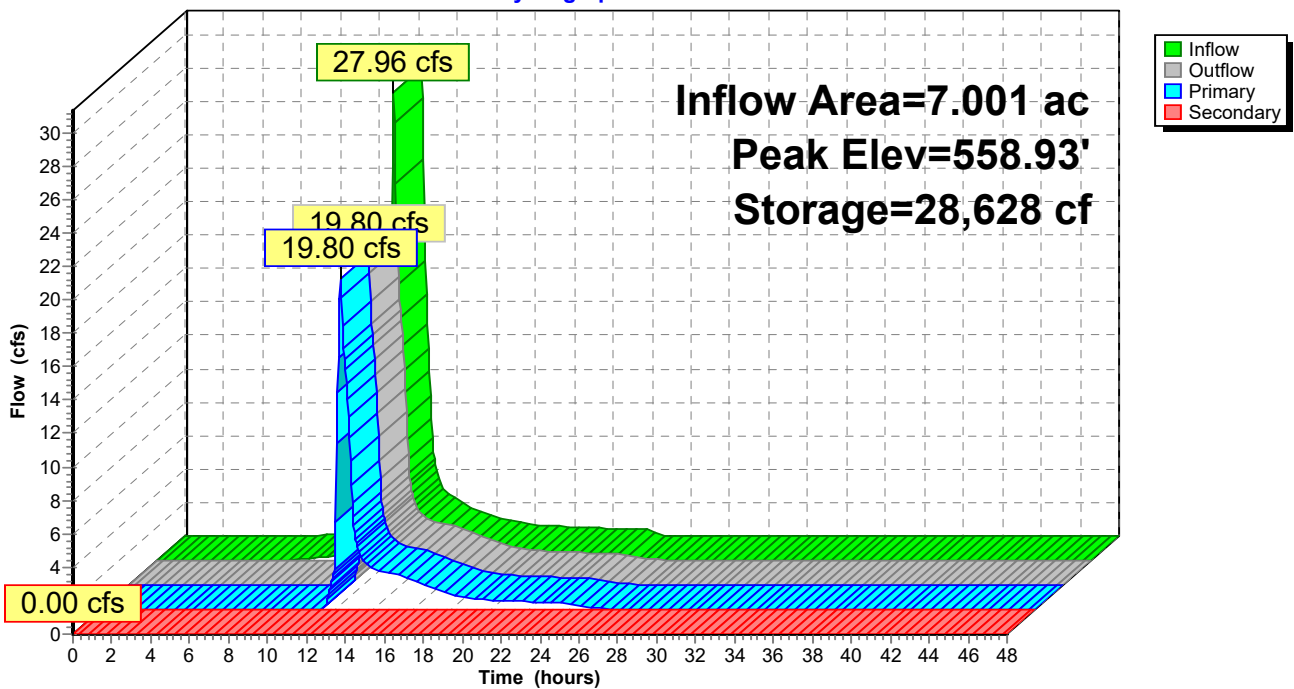
- 1=18" HDPE (Passes 19.76 cfs of 19.90 cfs potential flow)
- 2=6" Orifices (2) (Orifice Controls 3.37 cfs @ 8.58 fps)
- 3=48" x 7" Orifice (Orifice Controls 12.96 cfs @ 5.55 fps)
- 4=Top of Frame (Weir Controls 3.43 cfs @ 1.38 fps)
- 6=Sand Underdrain (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=551.00' TW=523.45' (Dynamic Tailwater)

- 5=Rip Rap Spillway (Controls 0.00 cfs)

Pond 20P: Apartments Phase II Stormwater Basin 1

Hydrograph



Summary for Pond 21P: Drain

Inflow Area = 3.813 ac, 34.85% Impervious, Inflow Depth = 3.95" for 25-Year event
 Inflow = 14.81 cfs @ 12.18 hrs, Volume= 1.256 af
 Outflow = 14.81 cfs @ 12.18 hrs, Volume= 1.256 af, Atten= 0%, Lag= 0.0 min
 Primary = 14.81 cfs @ 12.18 hrs, Volume= 1.256 af

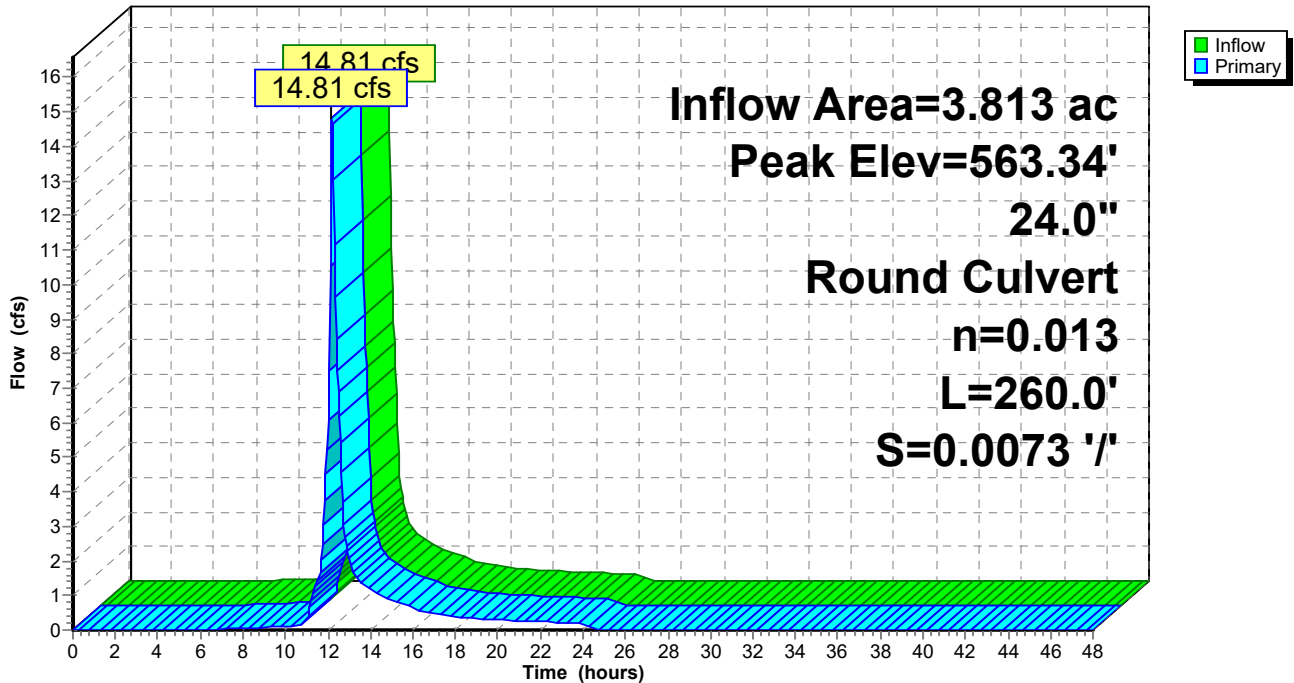
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 563.34' @ 12.18 hrs
 Flood Elev= 565.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	561.40'	24.0" Round Culvert L= 260.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 561.40' / 559.50' S= 0.0073 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=14.59 cfs @ 12.18 hrs HW=563.32' TW=558.58' (Dynamic Tailwater)
 ↳ **1=Culvert** (Inlet Controls 14.59 cfs @ 4.71 fps)

Pond 21P: Drain

Hydrograph



Summary for Link 14L: DA 2D - From Town Hall

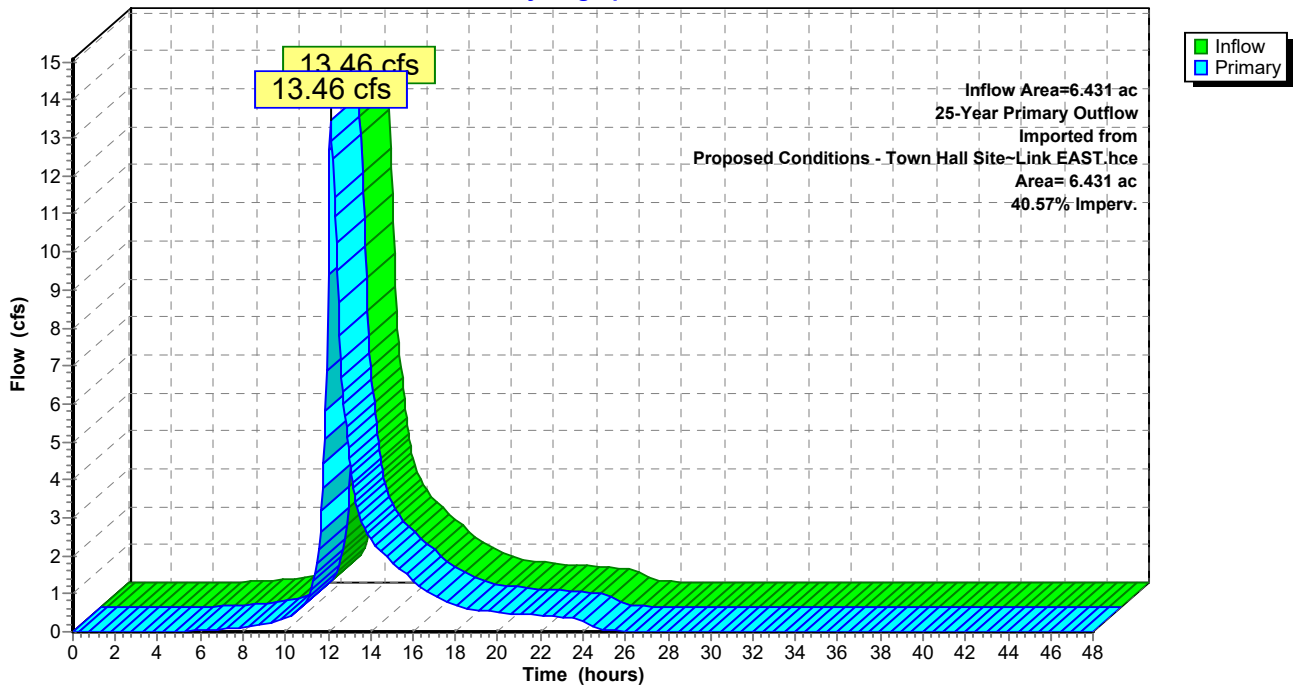
Inflow Area = 6.431 ac, 40.57% Impervious, Inflow Depth = 3.78" for 25-Year event
 Inflow = 13.46 cfs @ 12.10 hrs, Volume= 2.024 af
 Primary = 13.46 cfs @ 12.10 hrs, Volume= 2.024 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

25-Year Primary Outflow Imported from Proposed Conditions - Town Hall Site~Link EAST.hce

Link 14L: DA 2D - From Town Hall

Hydrograph



Market Square and Existing Development to RT 66 Type III 24-hr 50-Year Rainfall=7.14"

Prepared by {enter your company name here}

Printed 12/14/2020

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1A Runoff Area=2.061 ac 80.93% Impervious Runoff Depth=6.08"
Flow Length=532' Tc=11.0 min CN=91 Runoff=11.58 cfs 1.044 af

Subcatchment 3S: DA 2C Runoff Area=30.199 ac 4.93% Impervious Runoff Depth=3.42"
Flow Length=2,588' Tc=22.6 min UI Adjusted CN=67 Runoff=76.90 cfs 8.604 af

Subcatchment 7S: DA 1B Runoff Area=94,000 sf 75.97% Impervious Runoff Depth=6.19"
Flow Length=669' Tc=6.0 min CN=92 Runoff=14.19 cfs 1.114 af

Subcatchment 8S: DA 2A Runoff Area=3.613 ac 61.86% Impervious Runoff Depth=5.27"
Flow Length=740' Tc=12.1 min CN=84 Runoff=17.81 cfs 1.588 af

Subcatchment 9S: DA 2B Runoff Area=2.152 ac 30.72% Impervious Runoff Depth=3.95"
Flow Length=735' Tc=19.6 min CN=72 Runoff=6.76 cfs 0.708 af

Subcatchment 11S: DA 1C Runoff Area=14,897 sf 83.63% Impervious Runoff Depth=6.43"
Tc=6.0 min CN=94 Runoff=2.29 cfs 0.183 af

Subcatchment 12S: DA 1D Runoff Area=85,452 sf 71.00% Impervious Runoff Depth=6.31"
Tc=6.0 min CN=93 Runoff=13.02 cfs 1.032 af

Subcatchment 15S: DA 2E Runoff Area=3.136 ac 31.41% Impervious Runoff Depth=4.82"
Flow Length=671' Tc=12.0 min CN=80 Runoff=14.36 cfs 1.261 af

Subcatchment 16S: DA 2G Runoff Area=0.444 ac 0.00% Impervious Runoff Depth=4.94"
Flow Length=110' Tc=6.0 min CN=81 Runoff=2.48 cfs 0.183 af

Subcatchment 17S: DA 2I Runoff Area=0.536 ac 64.18% Impervious Runoff Depth=5.84"
Flow Length=230' Slope=0.0200 '/' Tc=11.0 min CN=89 Runoff=2.94 cfs 0.261 af

Subcatchment 21S: DA 2F Runoff Area=0.141 ac 0.00% Impervious Runoff Depth=5.16"
Flow Length=107' Tc=6.0 min CN=83 Runoff=0.82 cfs 0.061 af

Subcatchment 22S: DA 2H Runoff Area=2.744 ac 35.75% Impervious Runoff Depth=5.05"
Flow Length=676' Tc=10.0 min CN=82 Runoff=13.80 cfs 1.154 af

Pond 2P: 30" RCP Peak Elev=522.51' Inflow=24.69 cfs 19.219 af
Primary=24.69 cfs 19.219 af Secondary=0.00 cfs 0.000 af Outflow=24.69 cfs 19.219 af

Pond 4P: Pond Peak Elev=527.68' Storage=9.121 af Inflow=134.72 cfs 17.288 af
Primary=15.48 cfs 17.144 af Secondary=0.00 cfs 0.000 af Outflow=15.48 cfs 17.144 af

Pond 10P: Apartment Phase 1 Detention Peak Elev=538.33' Storage=2,500 cf Inflow=6.76 cfs 0.708 af
Primary=5.12 cfs 0.708 af Secondary=0.00 cfs 0.000 af Outflow=5.12 cfs 0.708 af

Pond 15P: Apartments Phase II Stormwater Peak Elev=568.30' Storage=6,138 cf Inflow=14.97 cfs 1.321 af
Primary=14.72 cfs 1.242 af Secondary=0.00 cfs 0.000 af Outflow=14.72 cfs 1.242 af

Market Square and Existing Development to RT 66 Type III 24-hr 50-Year Rainfall=7.14"

Prepared by {enter your company name here}

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Pond 16P: Water Quality Basin

Peak Elev=528.24' Storage=15,322 cf Inflow=13.02 cfs 1.032 af
Outflow=4.95 cfs 1.031 af

Pond 20P: Apartments Phase II

Peak Elev=559.44' Storage=32,519 cf Inflow=33.02 cfs 2.840 af
Primary=20.49 cfs 2.650 af Secondary=0.00 cfs 0.000 af Outflow=20.49 cfs 2.650 af

Pond 21P: Drain

Peak Elev=563.74' Inflow=17.53 cfs 1.503 af
24.0" Round Culvert n=0.013 L=260.0' S=0.0073 '/' Outflow=17.53 cfs 1.503 af

50-Year Link Primary Outflow Imported from Proposed Conditions - Town Hall Site~Link EAST.hce Inflow=18.23 cfs 2.441 af
Area= 6.431 ac 40.57% Imperv. Primary=18.23 cfs 2.441 af

Total Runoff Area = 49.488 ac Runoff Volume = 17.191 af Average Runoff Depth = 4.17"
76.40% Pervious = 37.808 ac 23.60% Impervious = 11.680 ac

Summary for Subcatchment 1S: DA 1A

Runoff = 11.58 cfs @ 12.15 hrs, Volume= 1.044 af, Depth= 6.08"

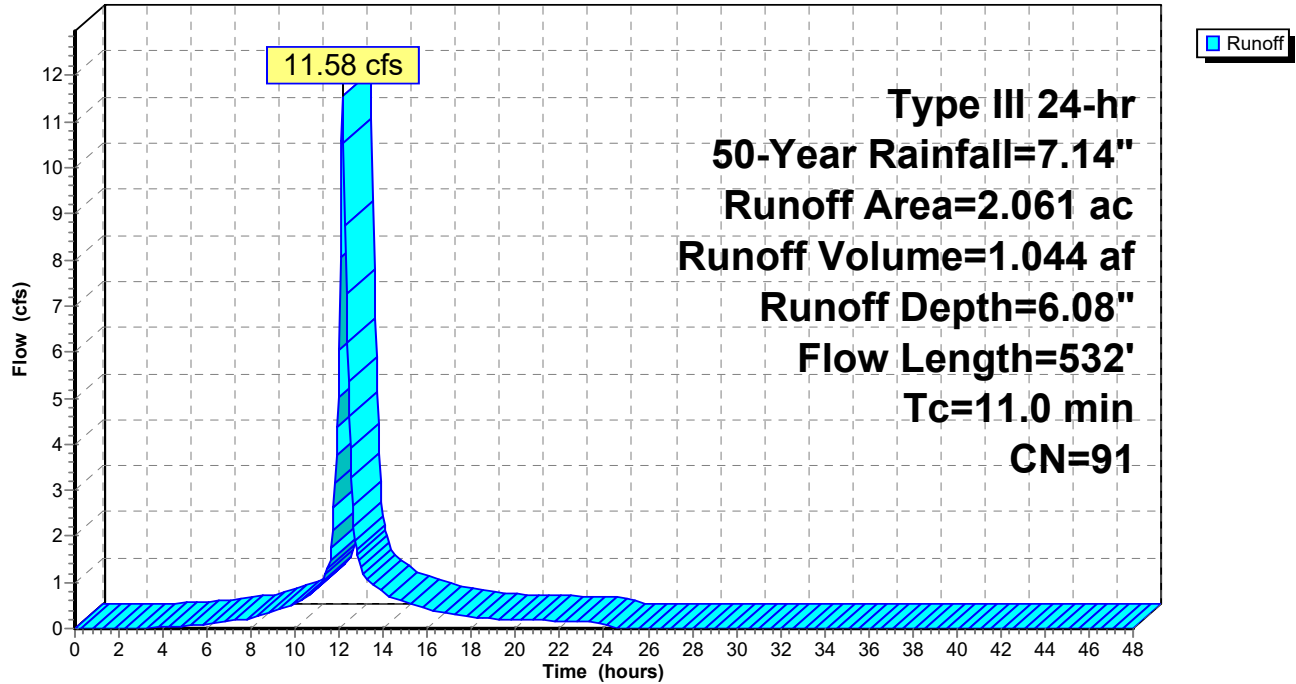
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-Year Rainfall=7.14"

Area (ac)	CN	Description
0.201	98	Paved parking, HSG C
1.260	98	Paved parking, HSG B
0.207	98	Paved parking, HSG C
0.074	74	>75% Grass cover, Good, HSG C
0.319	61	>75% Grass cover, Good, HSG B
2.061	91	Weighted Average
0.393		19.07% Pervious Area
1.668		80.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	40	0.0100	0.08		Sheet Flow, Lawn Grass: Dense n= 0.240 P2= 3.37"
1.7	239	0.0126	2.28		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.5	253	0.0200	8.41	14.86	Pipe Channel, HDPE Drain 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
11.0	532	Total			

Subcatchment 1S: DA 1A

Hydrograph



Summary for Subcatchment 3S: DA 2C

[47] Hint: Peak is 224% of capacity of segment #3

Runoff = 76.90 cfs @ 12.32 hrs, Volume= 8.604 af, Depth= 3.42"

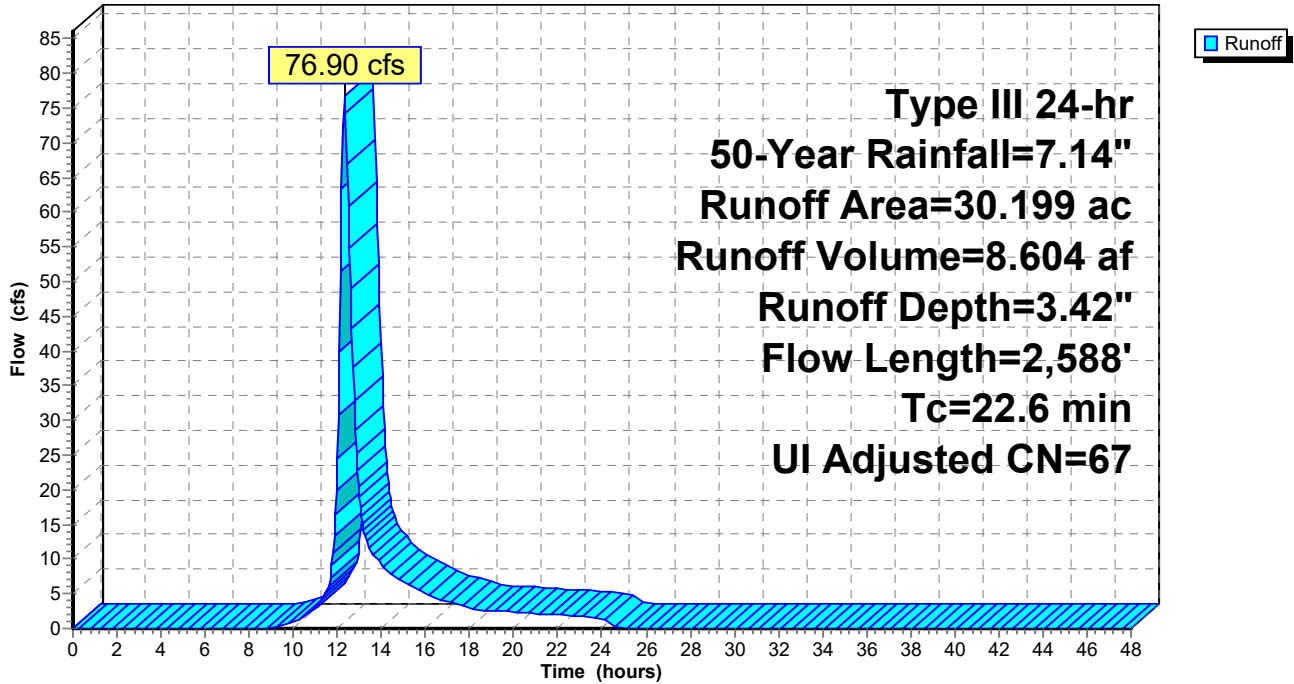
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-Year Rainfall=7.14"

Area (ac)	CN	Adj	Description
9.778	77		Woods, Good, HSG D
0.839	98		Water Surface, 0% imp, HSG D
13.926	55		Woods, Good, HSG B
2.515	70		Woods, Good, HSG C
0.066	98		Paved parking, HSG C
0.110	98		Roofs, HSG C
0.057	98		Paved parking, HSG B
0.566	61		>75% Grass cover, Good, HSG B
0.870	98		Unconnected roofs, HSG B
0.333	80		>75% Grass cover, Good, HSG D
0.061	98		Paved parking, HSG C
0.032	74		>75% Grass cover, Good, HSG C
0.140	98		Paved parking, HSG C
0.664	74		>75% Grass cover, Good, HSG C
0.058	70		Woods, Good, HSG C
* 0.184	98		Unconnected Roofs
30.199	68	67	Weighted Average, UI Adjusted
28.711			95.07% Pervious Area
1.488			4.93% Impervious Area
1.054			70.83% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.0850	0.14		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
5.1	598	0.1539	1.96		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
5.2	1,600	0.0262	5.16	34.37	Parabolic Channel, Channel W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.035 Earth, dense weeds
0.6	290		8.02		Lake or Reservoir, Pond Mean Depth= 2.00'
22.6	2,588	Total			

Subcatchment 3S: DA 2C

Hydrograph



Summary for Subcatchment 7S: DA 1B

Runoff = 14.19 cfs @ 12.09 hrs, Volume= 1.114 af, Depth= 6.19"

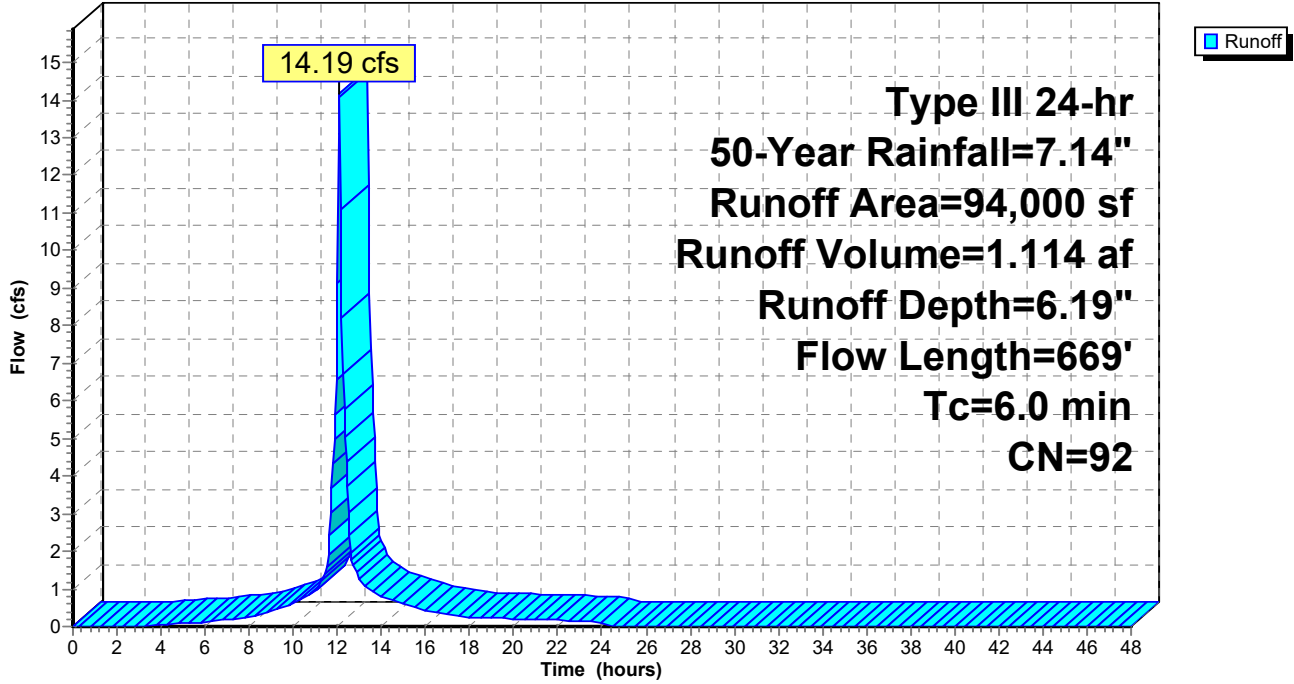
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-Year Rainfall=7.14"

Area (sf)	CN	Description
71,413	98	Paved parking, HSG B
11,784	86	Newly graded area, HSG B
10,803	61	>75% Grass cover, Good, HSG B
94,000	92	Weighted Average
22,587		24.03% Pervious Area
71,413		75.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		Sheet Flow, Play areas Smooth surfaces n= 0.011 P2= 3.37"
0.1	40	0.1500	6.24		Shallow Concentrated Flow, Play areas Unpaved Kv= 16.1 fps
2.2	362	0.0175	2.69		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.3	167	0.0200	8.41	14.86	Pipe Channel, HDPE 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
3.8	669	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7S: DA 1B

Hydrograph



Summary for Subcatchment 8S: DA 2A

[47] Hint: Peak is 123% of capacity of segment #3

Runoff = 17.81 cfs @ 12.16 hrs, Volume= 1.588 af, Depth= 5.27"

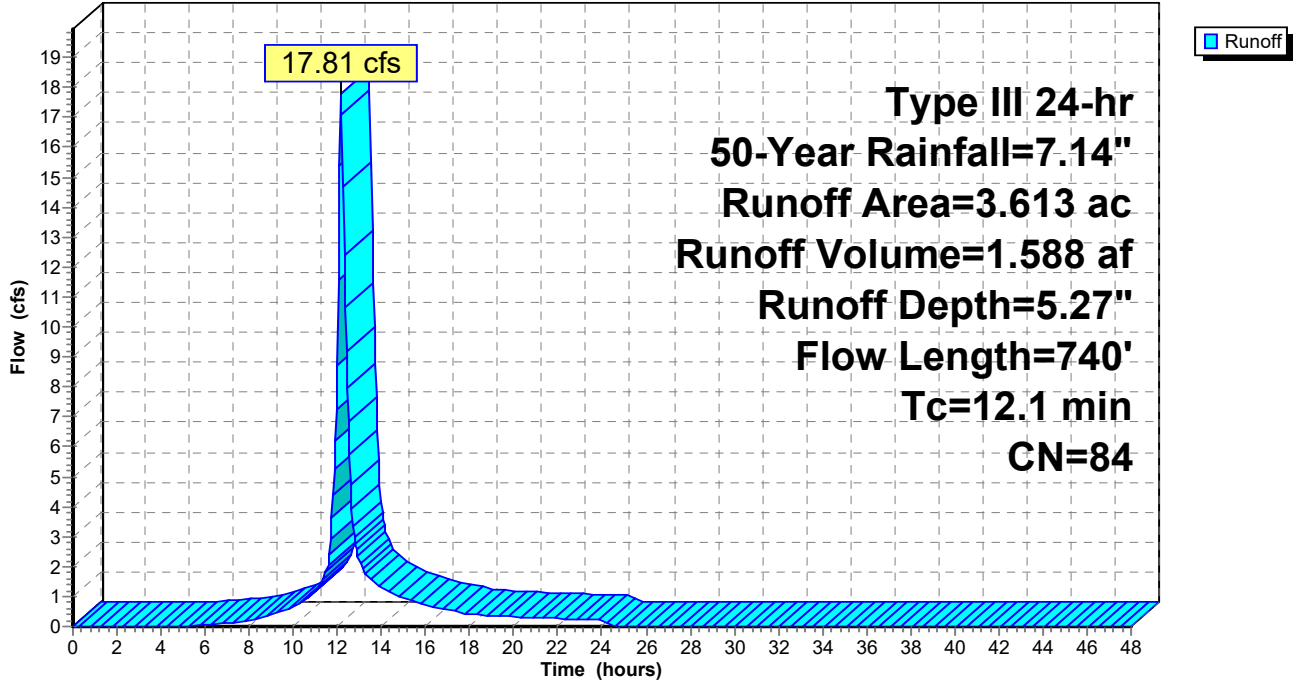
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-Year Rainfall=7.14"

Area (ac)	CN	Description
1.953	98	Paved parking, HSG B
0.152	98	Roofs, HSG B
0.394	61	>75% Grass cover, Good, HSG B
0.054	55	Woods, Good, HSG B
0.930	61	>75% Grass cover, Good, HSG B
0.130	98	Paved parking, HSG B
3.613	84	Weighted Average
1.378		38.14% Pervious Area
2.235		61.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	100	0.0650	0.19		Sheet Flow, Lawn Grass: Dense n= 0.240 P2= 3.37"
3.3	558	0.0191	2.81		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.1	82	0.0500	11.77	14.44	Pipe Channel, Discharge 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
12.1	740	Total			

Subcatchment 8S: DA 2A

Hydrograph



Summary for Subcatchment 9S: DA 2B

Runoff = 6.76 cfs @ 12.27 hrs, Volume= 0.708 af, Depth= 3.95"

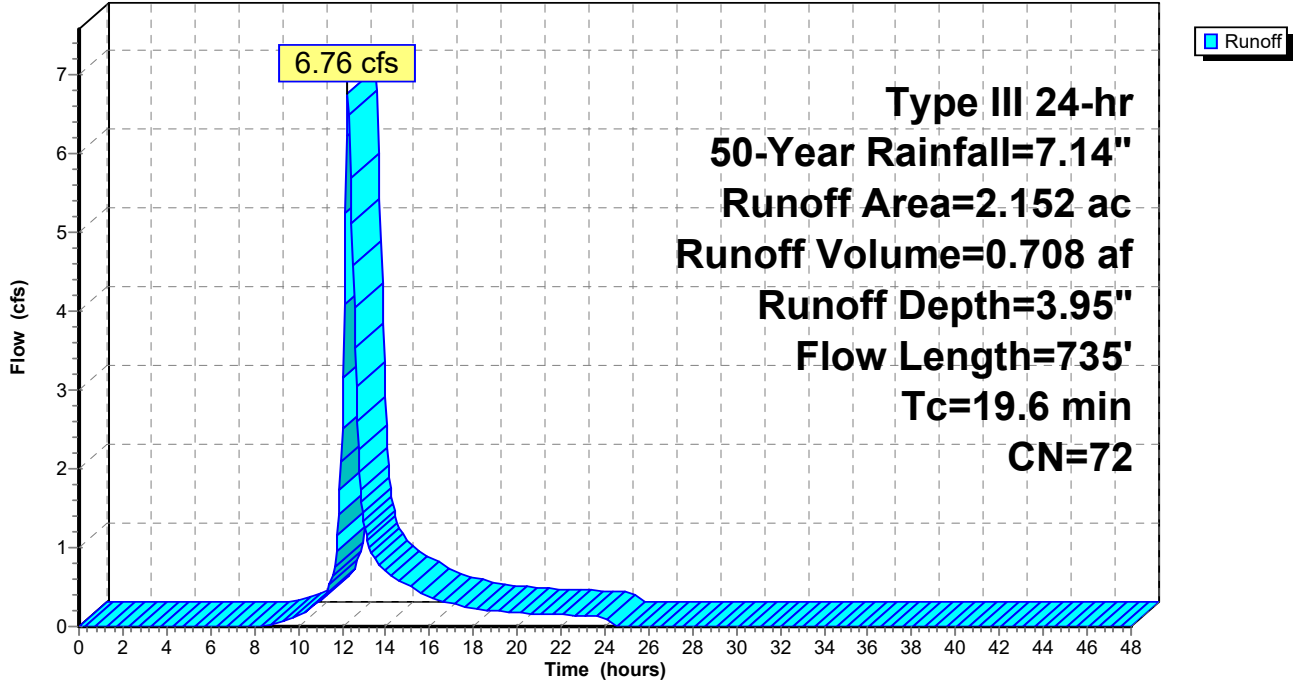
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-Year Rainfall=7.14"

Area (ac)	CN	Description
0.661	98	Paved parking, HSG B
0.746	55	Woods, Good, HSG B
0.669	61	>75% Grass cover, Good, HSG B
0.076	98	Water Surface, 0% imp, HSG B
2.152	72	Weighted Average
1.491		69.28% Pervious Area
0.661		30.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0450	0.11		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
2.1	100	0.0250	0.79		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.2	38	0.3333	4.04		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.8	314	0.0200	2.87		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.2	108	0.0200	7.44	9.14	Pipe Channel, Pipe 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.2	75		5.67		Lake or Reservoir, Mean Depth= 1.00'
19.6	735	Total			

Subcatchment 9S: DA 2B

Hydrograph



Summary for Subcatchment 11S: DA 1C

Runoff = 2.29 cfs @ 12.09 hrs, Volume= 0.183 af, Depth= 6.43"

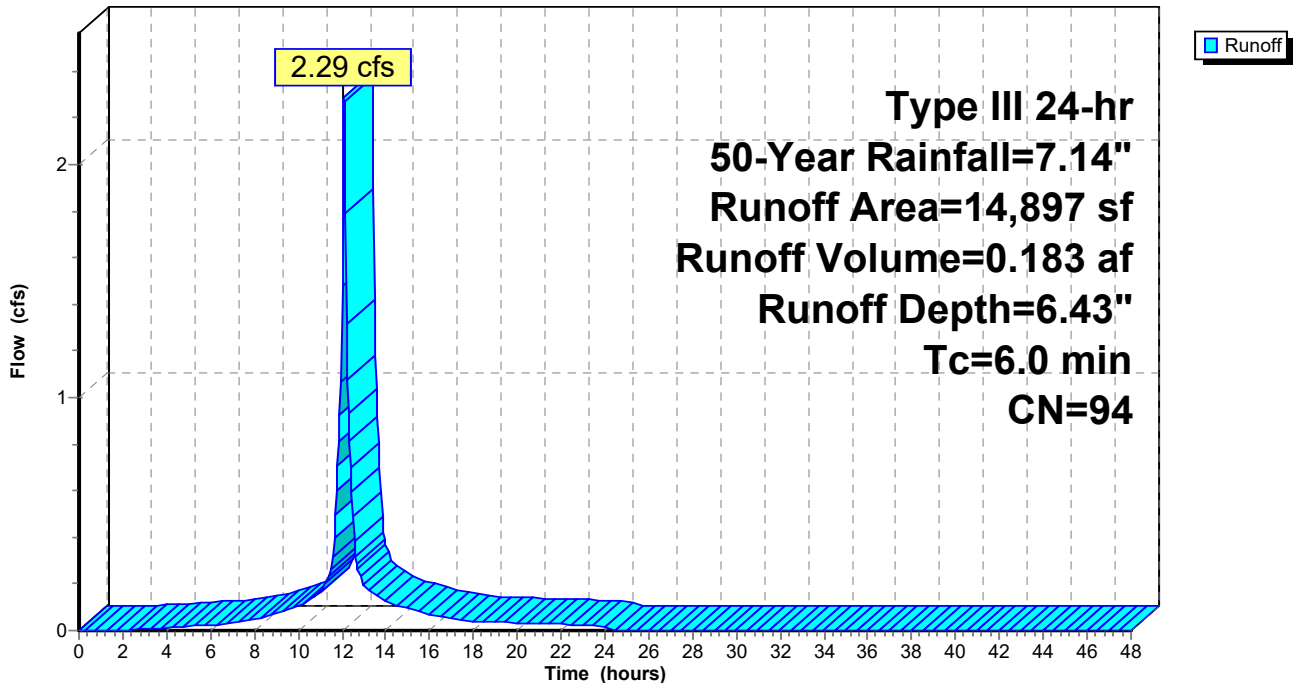
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-Year Rainfall=7.14"

Area (sf)	CN	Description
12,458	98	Paved parking, HSG C
2,439	74	>75% Grass cover, Good, HSG C
14,897	94	Weighted Average
2,439		16.37% Pervious Area
12,458		83.63% Impervious Area

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

Subcatchment 11S: DA 1C

Hydrograph



Summary for Subcatchment 12S: DA 1D

Runoff = 13.02 cfs @ 12.09 hrs, Volume= 1.032 af, Depth= 6.31"

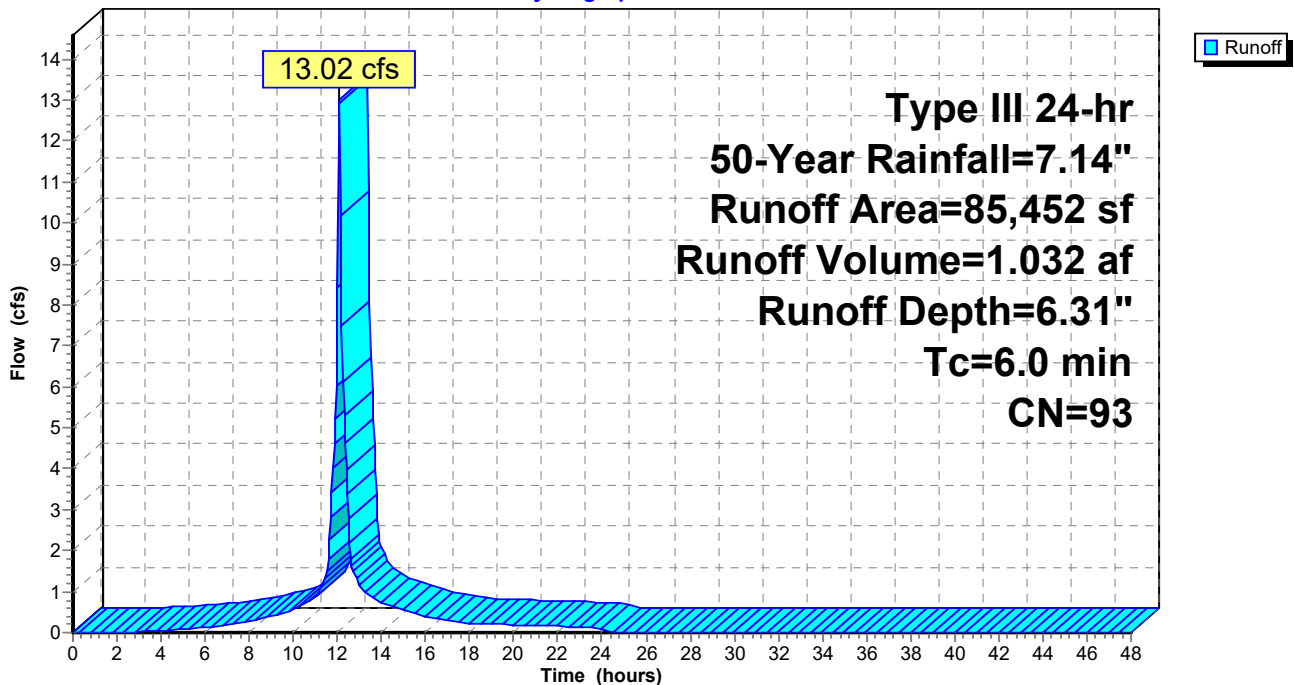
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-Year Rainfall=7.14"

Area (sf)	CN	Description
55,278	98	Paved parking, HSG C
6,098	98	Water Surface, 0% imp, HSG C
18,687	74	>75% Grass cover, Good, HSG C
5,389	98	Paved parking, HSG C
85,452	93	Weighted Average
24,785		29.00% Pervious Area
60,667		71.00% Impervious Area

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

Subcatchment 12S: DA 1D

Hydrograph



Summary for Subcatchment 15S: DA 2E

Runoff = 14.36 cfs @ 12.16 hrs, Volume= 1.261 af, Depth= 4.82"

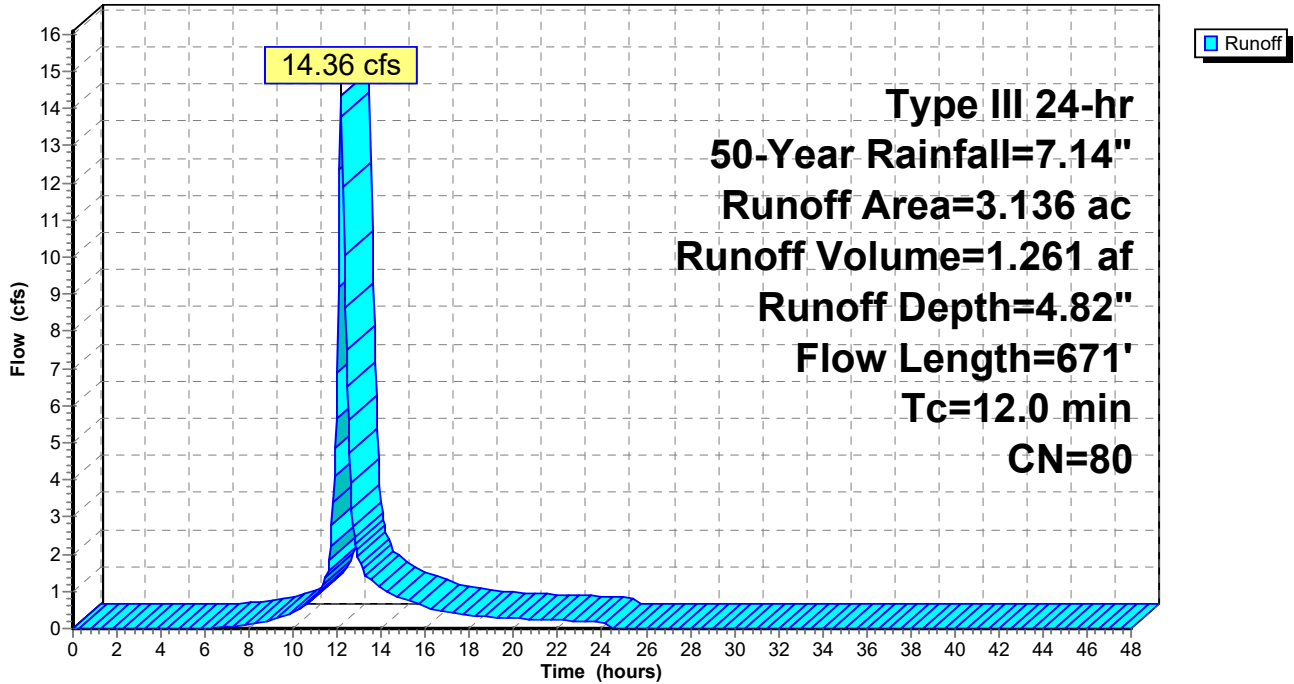
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-Year Rainfall=7.14"

Area (ac)	CN	Description
* 0.985	98	Paved parking, HSG C, South
* 0.455	74	>75% Grass cover, Good, HSG C, South
1.030	70	Woods, Good, HSG C
0.666	74	>75% Grass cover, Good, HSG C
3.136	80	Weighted Average
2.151		68.59% Pervious Area
0.985		31.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
3.3	417	0.1799	2.12		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	40	0.1000	2.21		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.7	164	0.0421	4.17		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
12.0	671	Total			

Subcatchment 15S: DA 2E

Hydrograph



Summary for Subcatchment 16S: DA 2G

Runoff = 2.48 cfs @ 12.09 hrs, Volume= 0.183 af, Depth= 4.94"

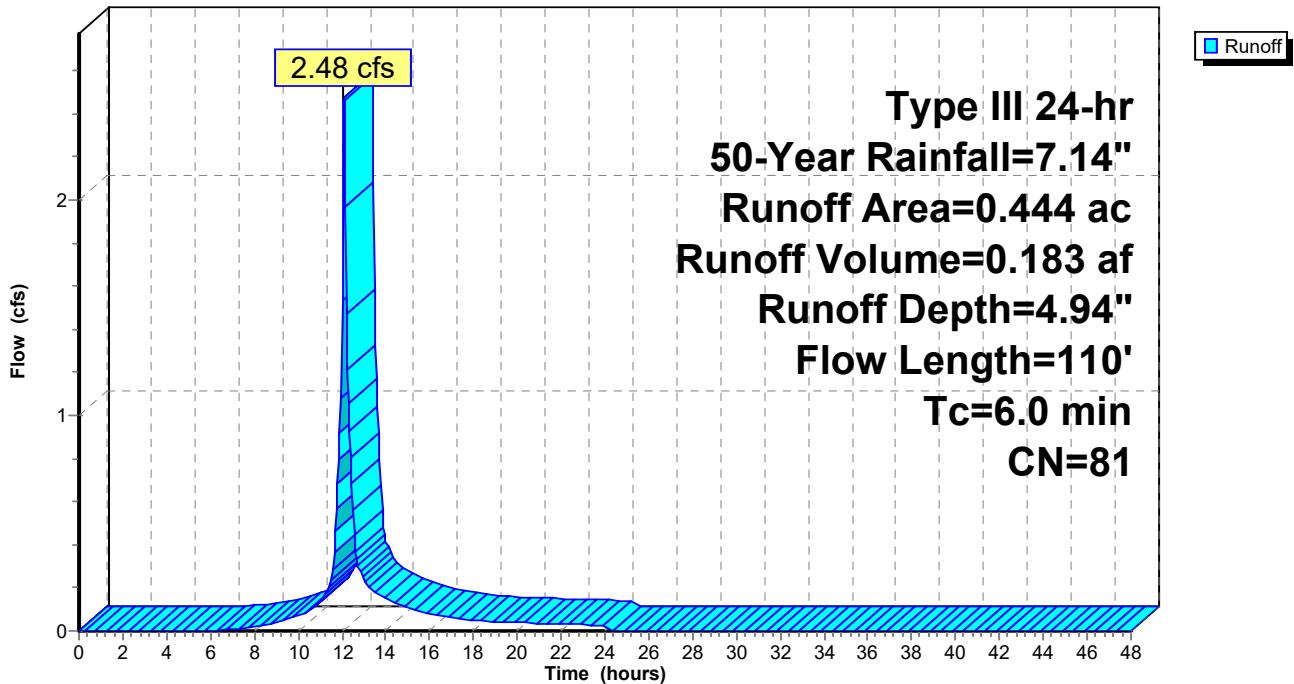
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-Year Rainfall=7.14"

Area (ac)	CN	Description
0.103	98	Water Surface, 0% imp, HSG C
0.017	80	>75% Grass cover, Good, HSG D
0.229	74	>75% Grass cover, Good, HSG C
0.079	80	>75% Grass cover, Good, HSG D
0.016	74	>75% Grass cover, Good, HSG C
0.444	81	Weighted Average
0.444		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.2	60	0.3500	4.14		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
5.7	110	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 16S: DA 2G

Hydrograph



Summary for Subcatchment 17S: DA 2I

Runoff = 2.94 cfs @ 12.15 hrs, Volume= 0.261 af, Depth= 5.84"

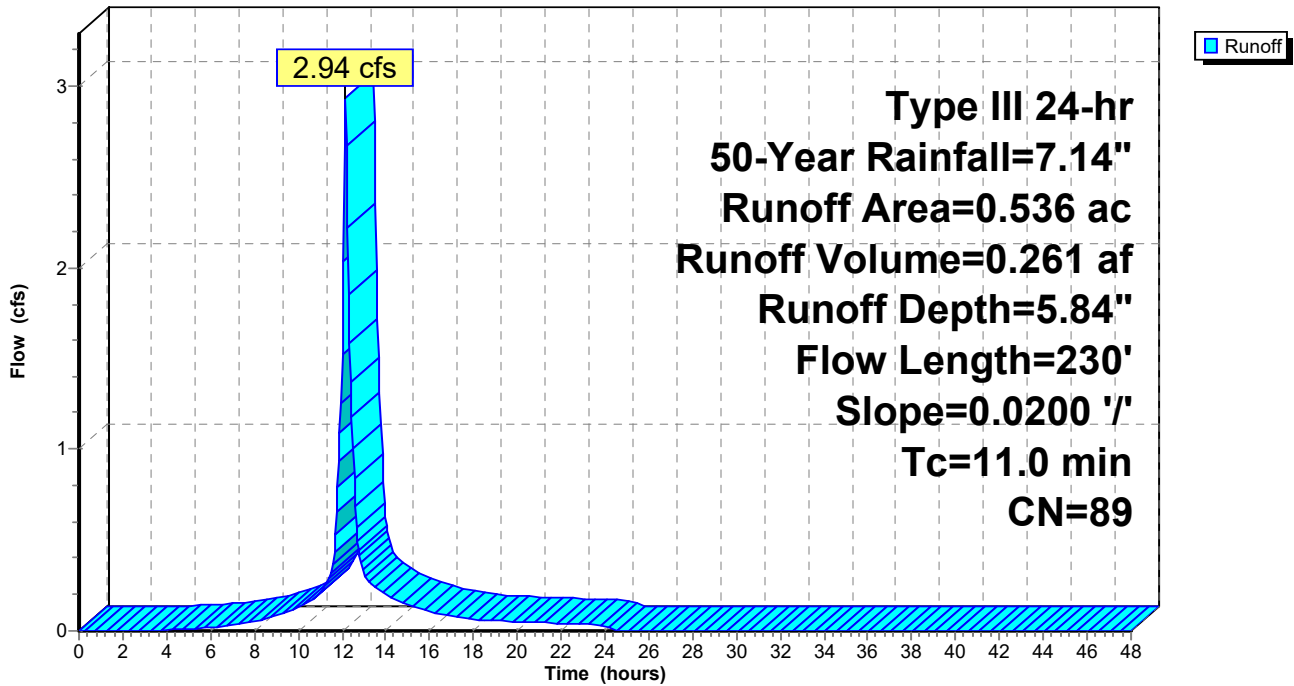
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-Year Rainfall=7.14"

Area (ac)	CN	Description
* 0.344	98	Paved parking, HSG C, North
* 0.192	74	>75% Grass cover, Good, HSG C, North
0.536	89	Weighted Average
0.192		35.82% Pervious Area
0.344		64.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
3.0	180	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
11.0	230	Total			

Subcatchment 17S: DA 2I

Hydrograph



Summary for Subcatchment 21S: DA 2F

Runoff = 0.82 cfs @ 12.09 hrs, Volume= 0.061 af, Depth= 5.16"

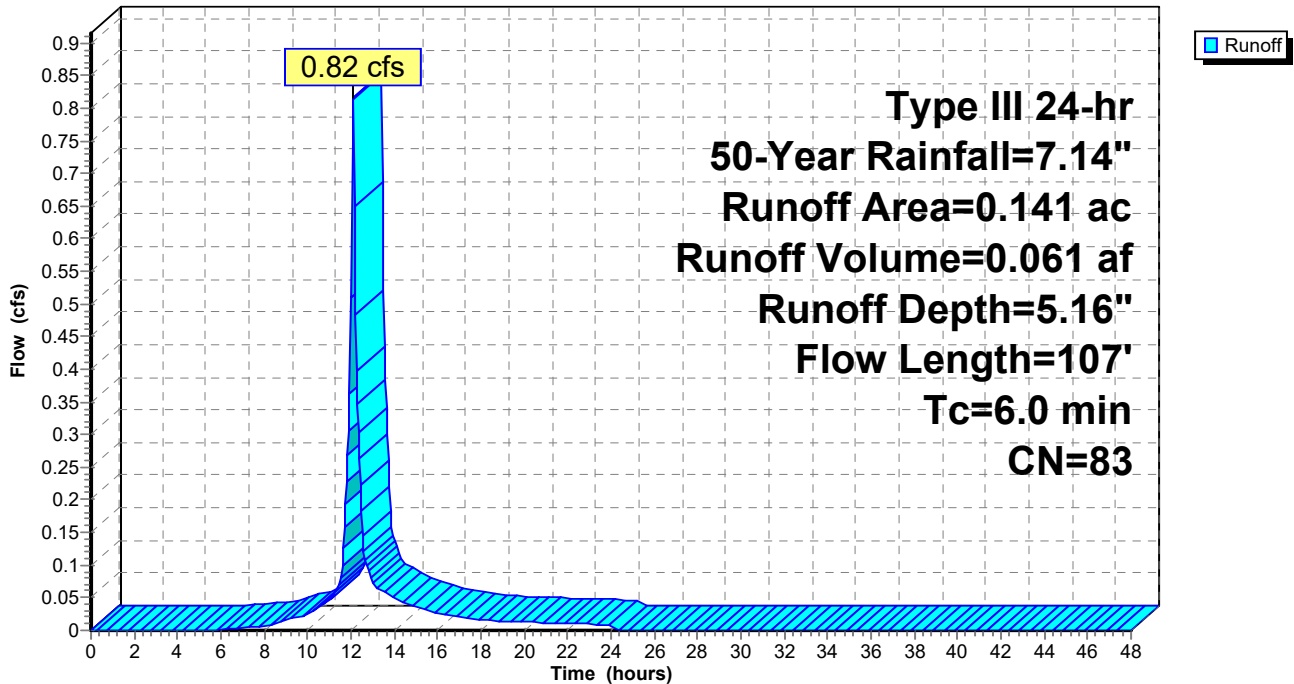
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-Year Rainfall=7.14"

Area (ac)	CN	Description
0.051	98	Water Surface, 0% imp, HSG C
0.090	74	>75% Grass cover, Good, HSG C
0.141	83	Weighted Average
0.141		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.3	57	0.1754	2.93		Shallow Concentrated Flow, Woods Short Grass Pasture Kv= 7.0 fps
4.5	107	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 21S: DA 2F

Hydrograph



Summary for Subcatchment 22S: DA 2H

Runoff = 13.80 cfs @ 12.14 hrs, Volume= 1.154 af, Depth= 5.05"

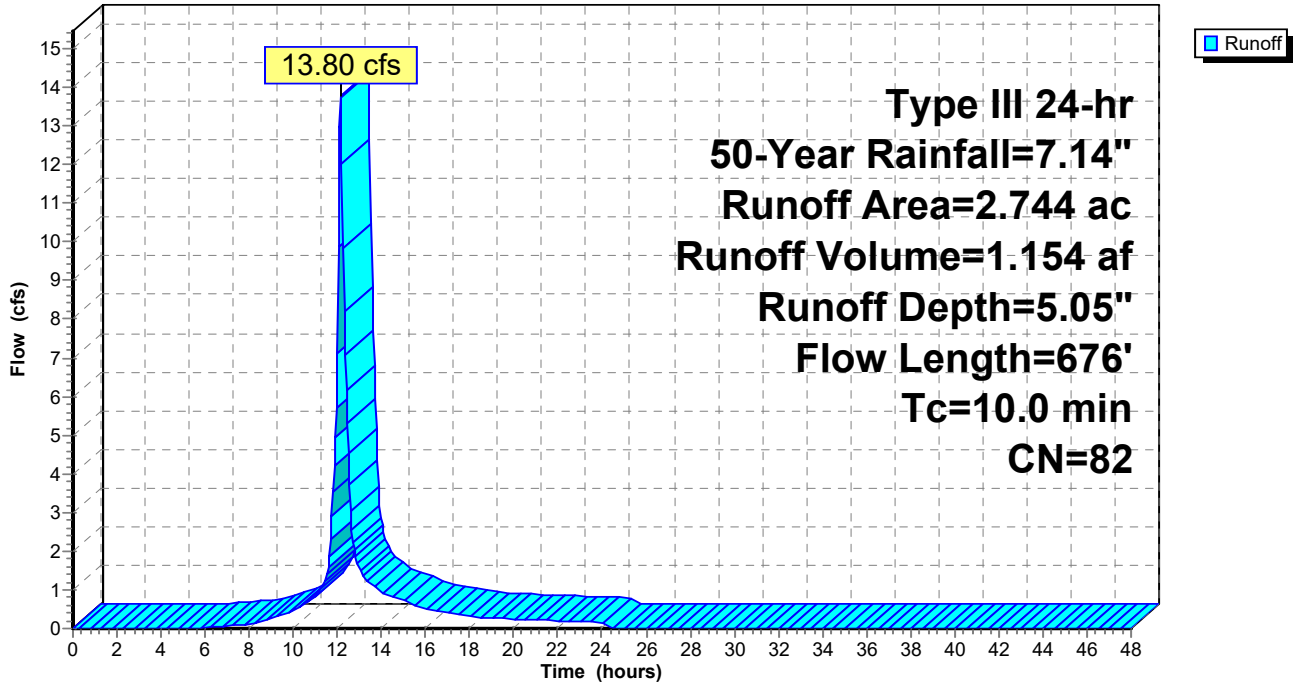
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-Year Rainfall=7.14"

Area (ac)	CN	Description
* 0.431	98	Paved parking, HSG C, North
* 0.010	80	>75% Grass cover, Good, HSG D, North
* 0.313	74	>75% Grass cover, Good, HSG C, North
* 0.550	98	Paved parking, HSG C, South
* 0.356	74	>75% Grass cover, Good, HSG C, South
0.748	70	Woods, Good, HSG C
0.336	74	>75% Grass cover, Good, HSG C
2.744	82	Weighted Average
1.763		64.25% Pervious Area
0.981		35.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
1.7	190	0.1316	1.81		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	81	0.3333	4.04		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.7	355	0.0310	3.57		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
10.0	676	Total			

Subcatchment 22S: DA 2H

Hydrograph



Summary for Pond 2P: 30" RCP

Inflow Area = 55.918 ac, 25.55% Impervious, Inflow Depth > 4.12" for 50-Year event
 Inflow = 24.69 cfs @ 12.19 hrs, Volume= 19.219 af
 Outflow = 24.69 cfs @ 12.19 hrs, Volume= 19.219 af, Atten= 0%, Lag= 0.0 min
 Primary = 24.69 cfs @ 12.19 hrs, Volume= 19.219 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 522.51' @ 12.19 hrs
 Flood Elev= 527.20'

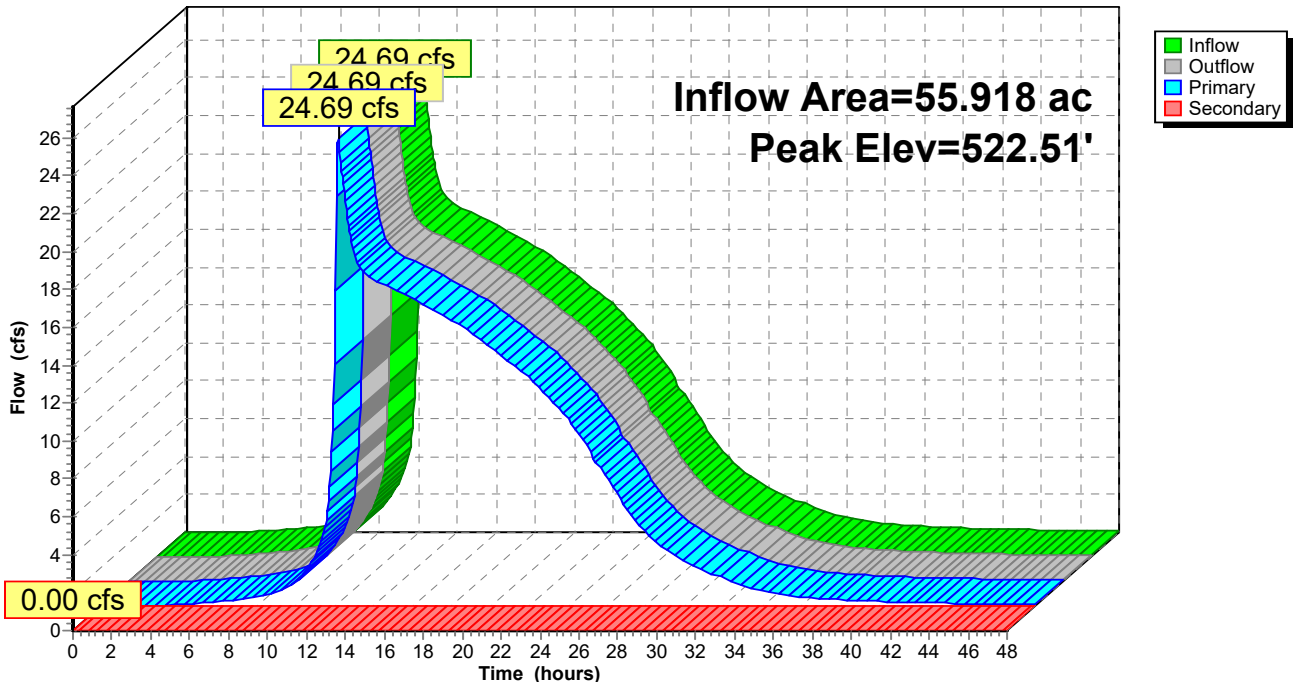
Device	Routing	Invert	Outlet Devices
#1	Primary	519.92'	30.0" Round 30" RC L= 80.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 519.92' / 519.62' S= 0.0037 ' / Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 4.91 sf
#2	Secondary	527.20'	30.0' long x 10.0' breadth Overflow Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=24.60 cfs @ 12.19 hrs HW=522.50' (Free Discharge)
 ↑1=30" RC (Barrel Controls 24.60 cfs @ 6.03 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=519.92' (Free Discharge)
 ↑2=Overflow (Controls 0.00 cfs)

Pond 2P: 30" RCP

Hydrograph



Summary for Pond 4P: Pond

Inflow Area = 51.896 ac, 21.64% Impervious, Inflow Depth = 4.00" for 50-Year event
 Inflow = 134.72 cfs @ 12.28 hrs, Volume= 17.288 af
 Outflow = 15.48 cfs @ 14.36 hrs, Volume= 17.144 af, Atten= 89%, Lag= 124.7 min
 Primary = 15.48 cfs @ 14.36 hrs, Volume= 17.144 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 527.68' @ 14.36 hrs Surf.Area= 2.843 ac Storage= 9.121 af

Plug-Flow detention time= 344.6 min calculated for 17.144 af (99% of inflow)
 Center-of-Mass det. time= 339.3 min (1,181.7 - 842.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	523.45'	16.273 af	Pond Storage (Irregular) Listed below		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
523.45	0.636	1,389.1	0.000	0.000	0.636
524.00	1.723	1,270.7	0.624	0.624	1.212
526.00	2.359	1,494.7	4.065	4.690	2.345
528.00	2.936	1,638.1	5.284	9.974	3.169
530.00	3.368	1,700.4	6.299	16.273	3.556

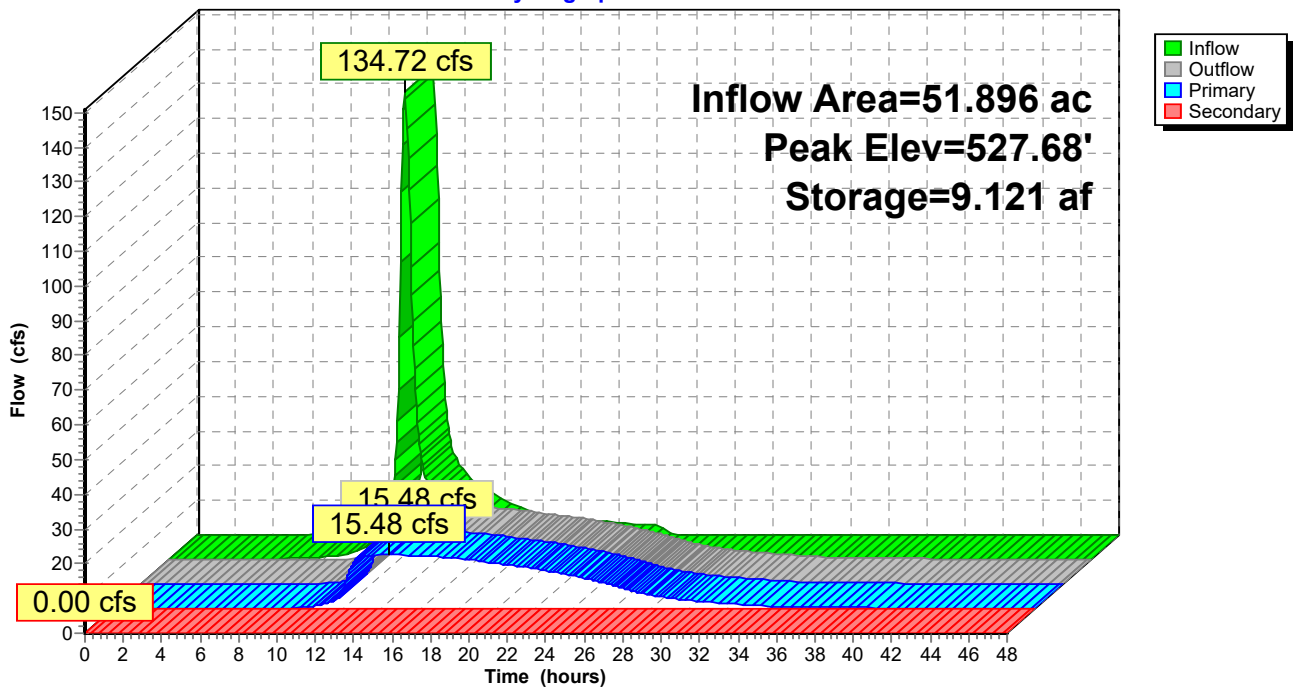
Device	Routing	Invert	Outlet Devices
#1	Primary	520.91'	30.0" Round 30" HDPE L= 110.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 520.91' / 520.64' S= 0.0024 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	521.46'	30.0" Round 30" HDPE L= 86.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 521.46' / 520.91' S= 0.0063 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	521.41'	24.0" Round 24" HDPE L= 157.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 521.41' / 521.40' S= 0.0001 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#4	Device 3	523.45'	18.0" Round 18" HDPE L= 117.9' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 523.45' / 521.82' S= 0.0138 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#5	Secondary	529.90'	50.0' long x 25.0' breadth Overflow Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=15.48 cfs @ 14.36 hrs HW=527.68' TW=521.95' (Dynamic Tailwater)
 ↳ 1=30" HDPE (Passes 15.48 cfs of 52.80 cfs potential flow)
 ↳ 2=30" HDPE (Passes 15.48 cfs of 52.68 cfs potential flow)
 ↳ 3=24" HDPE (Passes 15.48 cfs of 28.04 cfs potential flow)
 ↳ 4=18" HDPE (Barrel Controls 15.48 cfs @ 8.76 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=523.45' TW=519.92' (Dynamic Tailwater)
 ↳ 5=Overflow (Controls 0.00 cfs)

Pond 4P: Pond

Hydrograph



Summary for Pond 10P: Apartment Phase 1 Detention Basin

Inflow Area = 2.152 ac, 30.72% Impervious, Inflow Depth = 3.95" for 50-Year event
 Inflow = 6.76 cfs @ 12.27 hrs, Volume= 0.708 af
 Outflow = 5.12 cfs @ 12.45 hrs, Volume= 0.708 af, Atten= 24%, Lag= 10.8 min
 Primary = 5.12 cfs @ 12.45 hrs, Volume= 0.708 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 538.33' @ 12.45 hrs Surf.Area= 2,051 sf Storage= 2,500 cf

Plug-Flow detention time= 4.8 min calculated for 0.708 af (100% of inflow)
 Center-of-Mass det. time= 4.1 min (842.3 - 838.2)

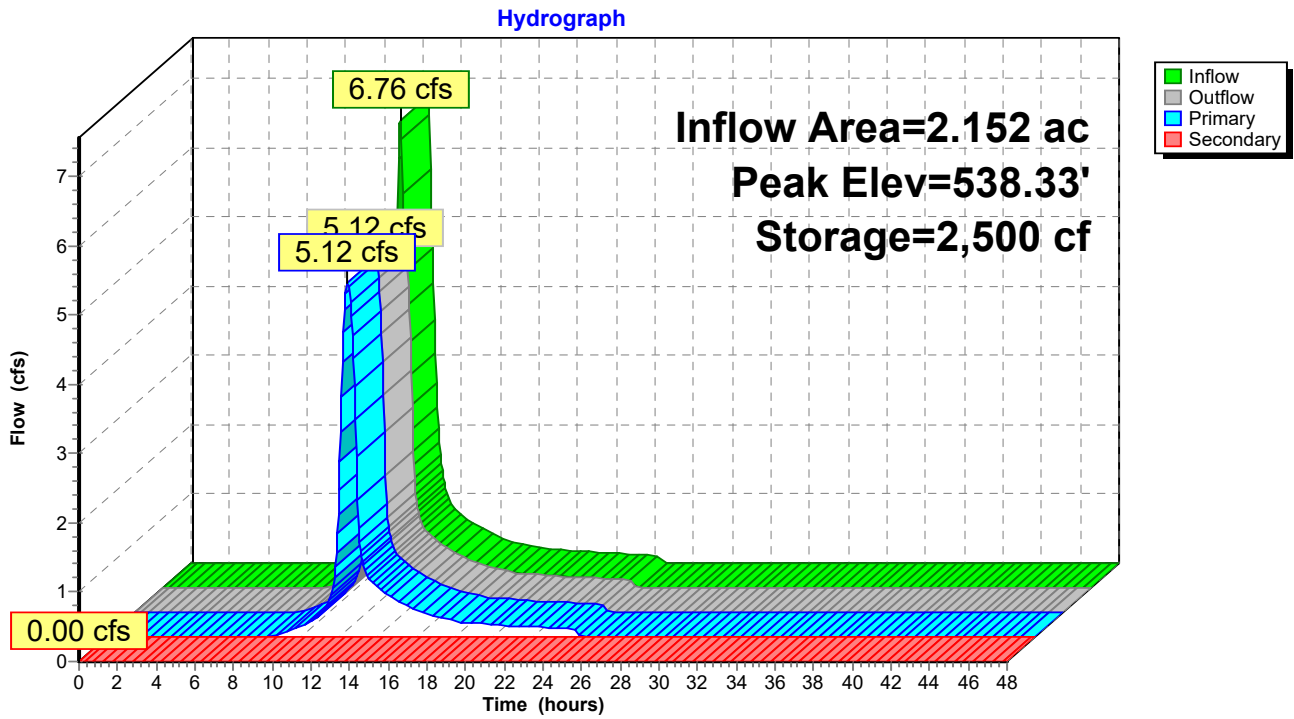
Volume	Invert	Avail.Storage	Storage Description			
#1	536.00'	7,026 cf	Detention Basin (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
536.00	100	40.0	0	0	100	
536.50	467	110.5	131	131	945	
537.60	1,559	173.6	1,056	1,186	2,380	
540.00	3,429	242.5	5,840	7,026	4,716	

Device	Routing	Invert	Outlet Devices
#1	Primary	536.00'	12.0" Round Culvert L= 75.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 536.00' / 534.50' S= 0.0200 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	539.50'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=5.11 cfs @ 12.45 hrs HW=538.33' TW=526.48' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 5.11 cfs @ 6.51 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=536.00' TW=523.45' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 10P: Apartment Phase 1 Detention Basin



Summary for Pond 15P: Apartments Phase II Stormwater Basin 2

Inflow Area = 3.277 ac, 30.06% Impervious, Inflow Depth = 4.84" for 50-Year event
 Inflow = 14.97 cfs @ 12.16 hrs, Volume= 1.321 af
 Outflow = 14.72 cfs @ 12.18 hrs, Volume= 1.242 af, Atten= 2%, Lag= 1.3 min
 Primary = 14.72 cfs @ 12.18 hrs, Volume= 1.242 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 568.30' @ 12.18 hrs Surf.Area= 2,427 sf Storage= 6,138 cf

Plug-Flow detention time= 53.8 min calculated for 1.241 af (94% of inflow)
 Center-of-Mass det. time= 21.9 min (834.1 - 812.2)

Volume	Invert	Avail.Storage	Storage Description
#1	562.00'	6 cf	3.00'W x 8.00'L x 2.50'H Sand Underdrain 60 cf Overall x 10.0% Voids
#2	564.50'	10,719 cf	Stormwater Basin (Irregular) Listed below
		10,725 cf	Total Available Storage

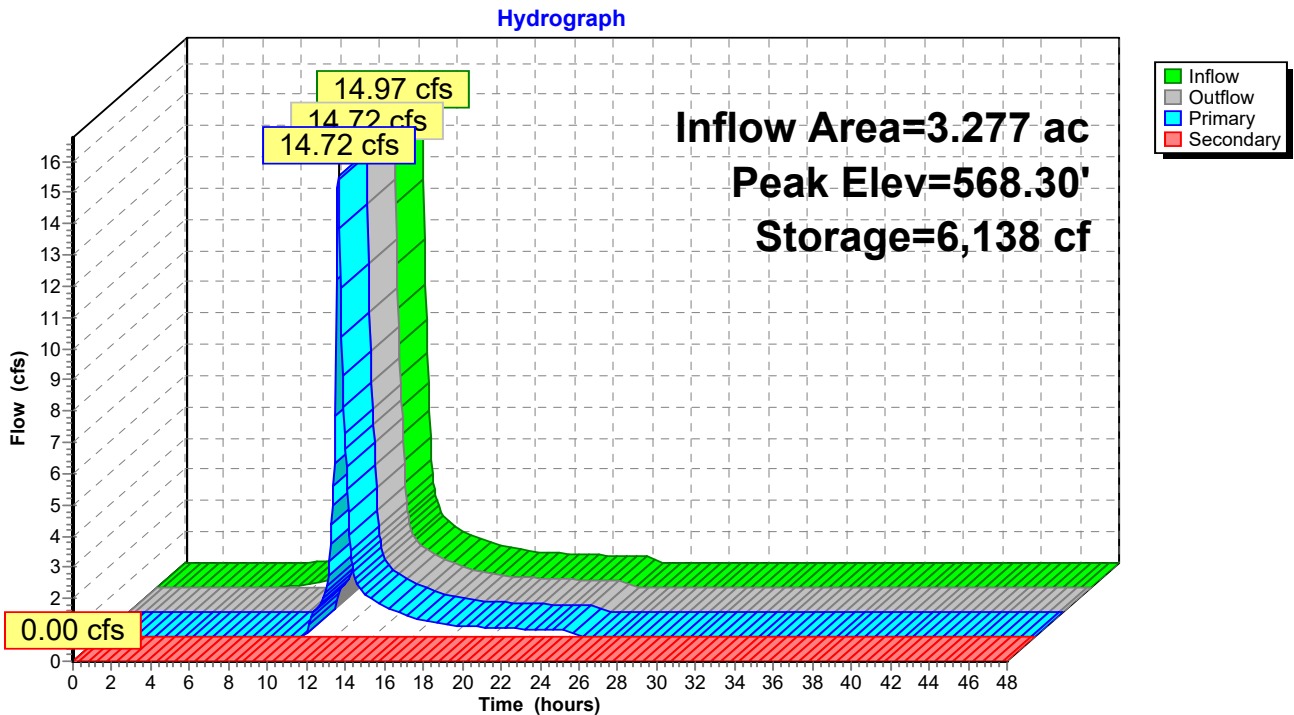
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
564.50	4	8.2	0	0	4
564.75	257	68.5	24	24	372
565.00	1,193	160.0	167	191	2,036
566.00	1,533	172.5	1,359	1,551	2,406
568.00	2,277	197.6	3,786	5,336	3,233
570.00	3,128	222.7	5,383	10,719	4,172

Device	Routing	Invert	Outlet Devices
#1	Primary	562.00'	18.0" Round 18" HDPE L= 68.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 562.00' / 561.60' S= 0.0059 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	567.00'	36.0" W x 6.0" H Vert. 36" x 6" Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	568.00'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#4	Secondary	569.00'	8.0' long x 8.0' breadth Rip Rap Spillway 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#5	Device 1	562.00'	0.500 in/hr Sand Underdrain over Horizontal area from 562.00' - 564.50' Excluded Horizontal area = 24 sf Phase-In= 0.01'

Primary OutFlow Max=14.51 cfs @ 12.18 hrs HW=568.29' TW=563.70' (Dynamic Tailwater)
 ↳ 1=18" HDPE (Passes 14.51 cfs of 18.22 cfs potential flow)
 ↳ 2=36" x 6" Orifice (Orifice Controls 7.35 cfs @ 4.90 fps)
 ↳ 3=Top of Frame (Weir Controls 7.16 cfs @ 1.76 fps)
 ↳ 5=Sand Underdrain (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=562.00' TW=523.45' (Dynamic Tailwater)
 ↳ 4=Rip Rap Spillway (Controls 0.00 cfs)

Pond 15P: Apartments Phase II Stormwater Basin 2



Summary for Pond 16P: Water Quality Basin

Inflow Area = 1.962 ac, 71.00% Impervious, Inflow Depth = 6.31" for 50-Year event
 Inflow = 13.02 cfs @ 12.09 hrs, Volume= 1.032 af
 Outflow = 4.95 cfs @ 12.33 hrs, Volume= 1.031 af, Atten= 62%, Lag= 14.3 min
 Primary = 4.95 cfs @ 12.33 hrs, Volume= 1.031 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 528.24' @ 12.33 hrs Surf.Area= 6,520 sf Storage= 15,322 cf

Plug-Flow detention time= 114.0 min calculated for 1.031 af (100% of inflow)
 Center-of-Mass det. time= 113.9 min (882.2 - 768.3)

Volume	Invert	Avail.Storage	Storage Description
#1	523.75'	26,415 cf	Water Quality swale (Irregular) Listed below (Recalc)
#2	522.25'	5 cf	3.00'W x 3.00'L x 1.50'H Underdrain
			14 cf Overall x 40.0% Voids
		26,420 cf	Total Available Storage

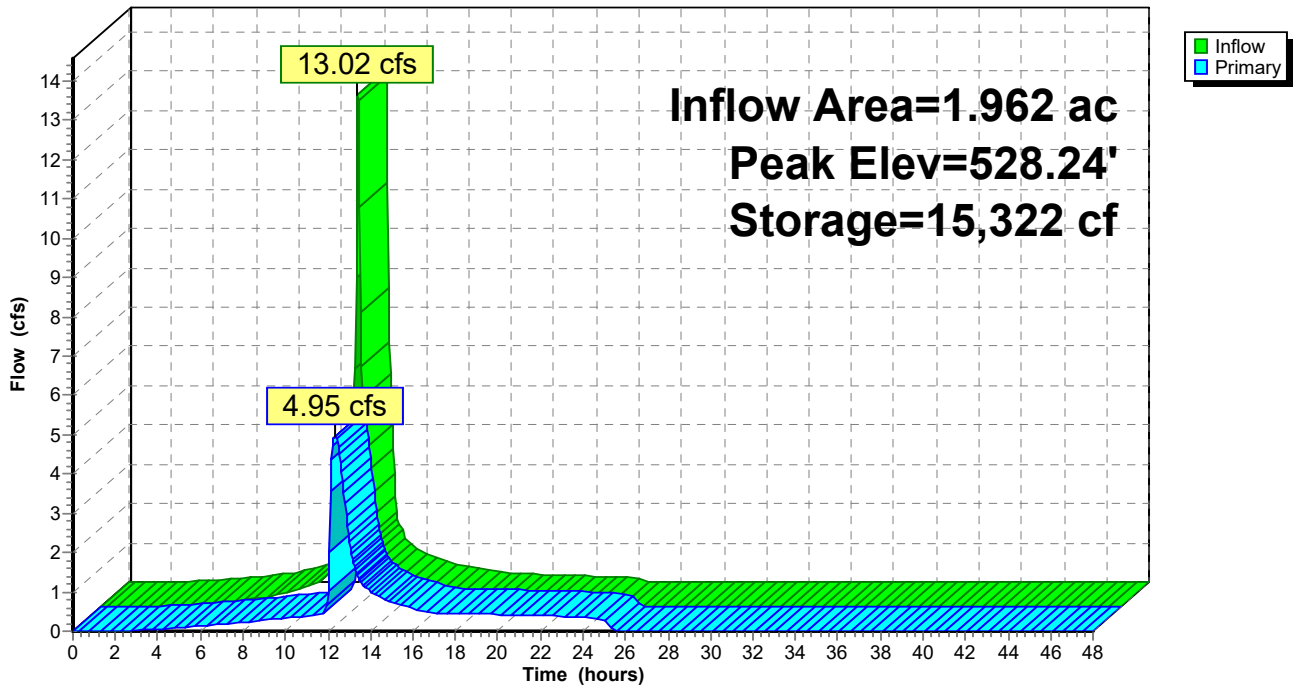
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
523.75	9	12.0	0	0	9
524.00	258	63.2	26	26	316
524.25	528	108.8	96	123	940
524.50	766	159.7	161	283	2,028
524.75	1,105	211.6	233	516	3,562
525.00	1,523	263.2	327	843	5,513
525.25	2,026	316.2	442	1,285	7,958
525.50	2,529	368.0	568	1,853	10,779
525.75	3,267	420.8	723	2,576	14,095
526.00	4,119	481.0	921	3,497	18,417
528.00	6,268	535.7	10,312	13,809	22,957
529.75	8,181	557.7	12,606	26,415	25,097

Device	Routing	Invert	Outlet Devices
#1	Primary	522.75'	24.0" Round 24" HDPE L= 75.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 522.75' / 521.75' S= 0.0133 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	523.00'	3.0" Vert. Underdrain C= 0.600 Limited to weir flow at low heads
#3	Device 1	526.75'	6.0" W x 6.0" H Vert. 6" Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	527.25'	18.0" W x 6.0" H Vert. 18x6 Orifice C= 0.600 Limited to weir flow at low heads
#5	Device 1	528.50'	20.0' long x 0.5' breadth Top of Frame Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

- Primary OutFlow** Max=4.95 cfs @ 12.33 hrs HW=528.23' TW=522.39' (Dynamic Tailwater)
- 1=24" HDPE (Passes 4.95 cfs of 32.03 cfs potential flow)
 - 2=Underdrain (Orifice Controls 0.53 cfs @ 10.88 fps)
 - 3=6" Orifice (Orifice Controls 1.33 cfs @ 5.34 fps)
 - 4=18x6 Orifice (Orifice Controls 3.08 cfs @ 4.10 fps)
 - 5=Top of Frame (Controls 0.00 cfs)

Pond 16P: Water Quality Basin

Hydrograph



Summary for Pond 20P: Apartments Phase II Stormwater Basin 1

Inflow Area = 7.001 ac, 33.00% Impervious, Inflow Depth = 4.87" for 50-Year event
 Inflow = 33.02 cfs @ 12.16 hrs, Volume= 2.840 af
 Outflow = 20.49 cfs @ 12.33 hrs, Volume= 2.650 af, Atten= 38%, Lag= 10.5 min
 Primary = 20.49 cfs @ 12.33 hrs, Volume= 2.650 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 559.44' @ 12.33 hrs Surf.Area= 7,831 sf Storage= 32,519 cf

Plug-Flow detention time= 88.6 min calculated for 2.647 af (93% of inflow)
 Center-of-Mass det. time= 54.2 min (870.7 - 816.5)

Volume	Invert	Avail.Storage	Storage Description
#1	551.00'	4 cf	3.00'W x 8.00'L x 1.75'H Sand Underdrain 42 cf Overall x 10.0% Voids
#2	552.75'	40,883 cf	Stormwater Basin (Irregular) Listed below (Recalc)
#3	556.00'	424 cf	36.0" Round Pipe Storage-Impervious L= 60.0' S= 0.0083 '"/>
		41,312 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
552.75	120	43.3	0	0	120
553.00	865	110.3	109	109	939
553.25	1,552	155.7	298	407	1,901
553.50	2,135	207.8	459	866	3,409
553.75	2,928	261.6	630	1,496	5,419
554.00	3,512	310.5	804	2,300	7,646
555.00	4,145	323.0	3,824	6,124	8,352
556.00	4,804	335.6	4,470	10,595	9,090
557.00	5,490	348.1	5,143	15,738	9,851
558.00	6,569	422.7	6,021	21,759	14,443
559.00	7,426	435.3	6,993	28,752	15,404
560.00	8,310	447.8	7,864	36,616	16,387
560.50	8,761	454.1	4,267	40,883	16,893

Device	Routing	Invert	Outlet Devices
#1	Primary	551.00'	18.0" Round 18" HDPE L= 152.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 551.00' / 549.00' S= 0.0132 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	555.50'	6.0" Vert. 6" Orifices (2) X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	557.30'	48.0" W x 7.0" H Vert. 48" x 7" Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	558.75'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#5	Secondary	559.75'	8.0' long x 8.0' breadth Rip Rap Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

#6	Device 1	551.00'	2.50	3.00	3.50	4.00	4.50	5.00	5.50			
			Coef. (English)	2.43	2.54	2.70	2.69	2.68	2.68	2.66	2.64	2.64
				2.64	2.65	2.65	2.66	2.66	2.68	2.70	2.74	
			0.500 in/hr Sand Underdrain over Horizontal area from 551.00' - 552.75'									
			Excluded Horizontal area = 24 sf Phase-In= 0.01'									

Primary OutFlow Max=20.49 cfs @ 12.33 hrs HW=559.43' TW=526.04' (Dynamic Tailwater)

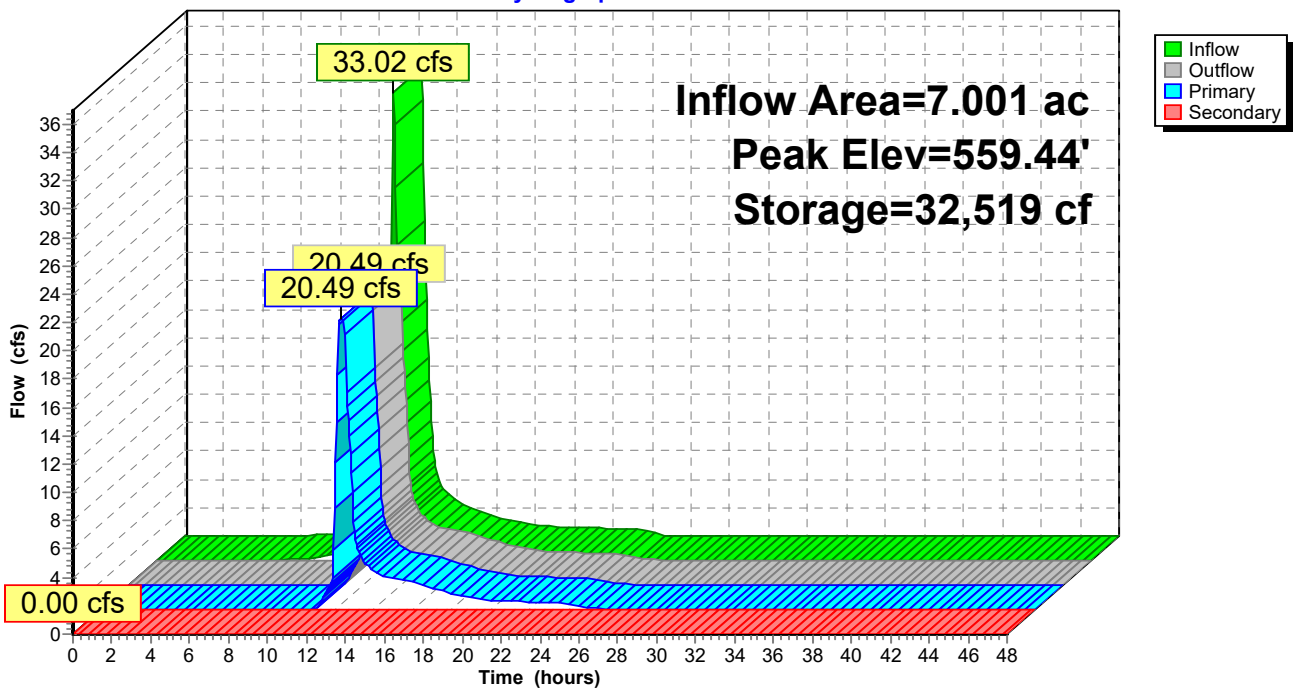
- 1=18" HDPE (Barrel Controls 20.49 cfs @ 11.59 fps)
- 2=6" Orifices (2) (Passes < 3.63 cfs potential flow)
- 3=48" x 7" Orifice (Passes < 15.22 cfs potential flow)
- 4=Top of Frame (Passes < 25.71 cfs potential flow)
- 6=Sand Underdrain (Passes < 0.00 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=551.00' TW=523.45' (Dynamic Tailwater)

- 5=Rip Rap Spillway (Controls 0.00 cfs)

Pond 20P: Apartments Phase II Stormwater Basin 1

Hydrograph



Summary for Pond 21P: Drain

Inflow Area = 3.813 ac, 34.85% Impervious, Inflow Depth = 4.73" for 50-Year event
 Inflow = 17.53 cfs @ 12.18 hrs, Volume= 1.503 af
 Outflow = 17.53 cfs @ 12.18 hrs, Volume= 1.503 af, Atten= 0%, Lag= 0.0 min
 Primary = 17.53 cfs @ 12.18 hrs, Volume= 1.503 af

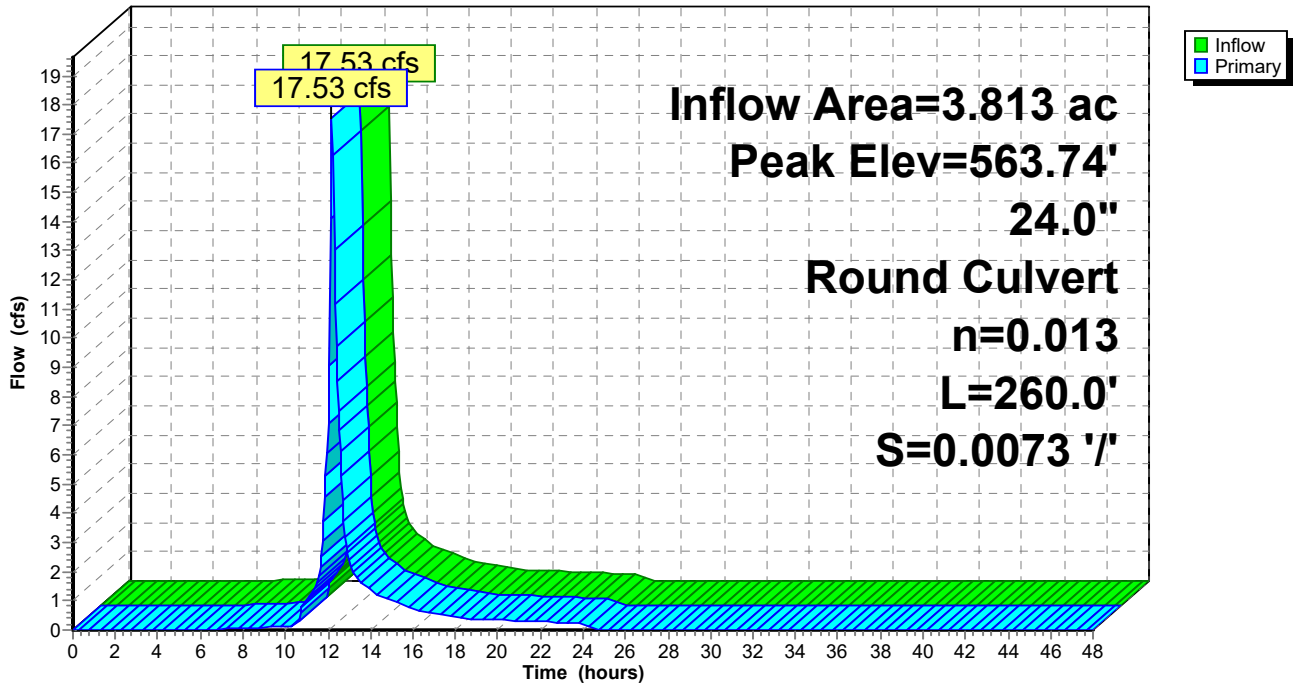
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 563.74' @ 12.18 hrs
 Flood Elev= 565.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	561.40'	24.0" Round Culvert L= 260.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 561.40' / 559.50' S= 0.0073 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=17.28 cfs @ 12.18 hrs HW=563.70' TW=558.98' (Dynamic Tailwater)
 ↳ **1=Culvert** (Inlet Controls 17.28 cfs @ 5.50 fps)

Pond 21P: Drain

Hydrograph



Summary for Link 14L: DA 2D - From Town Hall

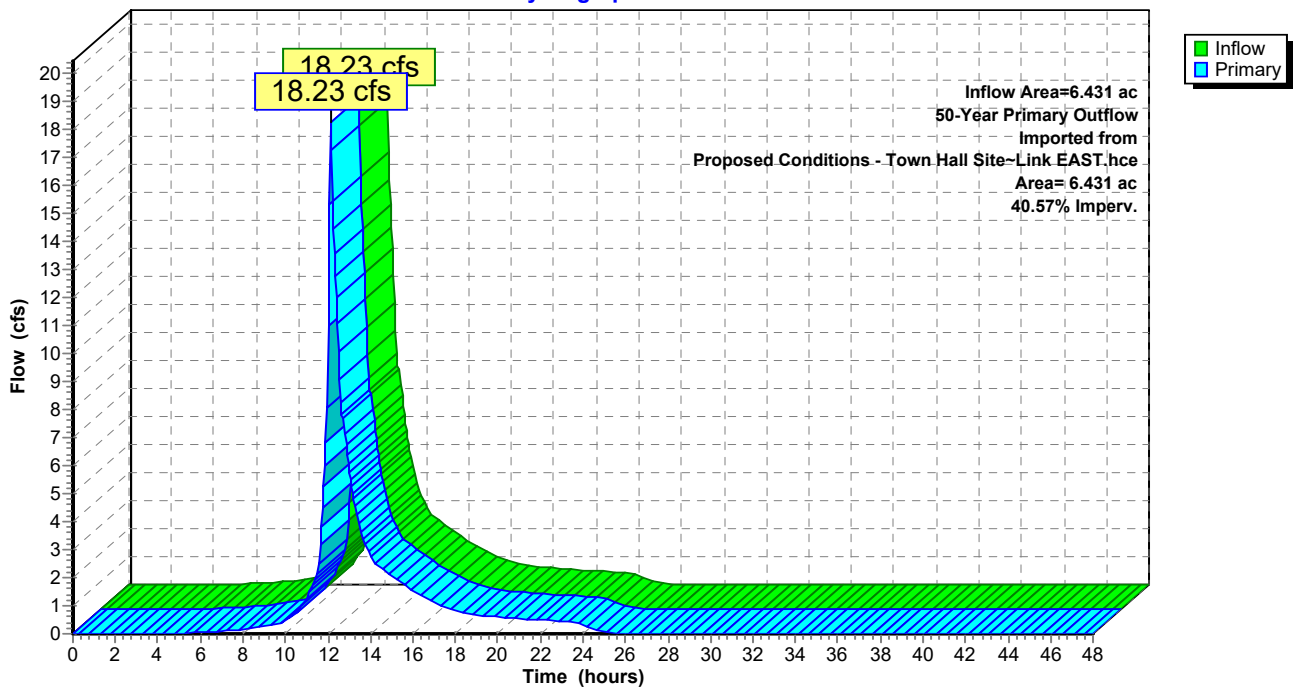
Inflow Area = 6.431 ac, 40.57% Impervious, Inflow Depth = 4.55" for 50-Year event
 Inflow = 18.23 cfs @ 12.11 hrs, Volume= 2.441 af
 Primary = 18.23 cfs @ 12.11 hrs, Volume= 2.441 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

50-Year Primary Outflow Imported from Proposed Conditions - Town Hall Site~Link EAST.hce

Link 14L: DA 2D - From Town Hall

Hydrograph



Market Square and Existing Development to RT 66 Type III 24-hr 100-Year Rainfall=8.04"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1A Runoff Area=2.061 ac 80.93% Impervious Runoff Depth=6.96"
Flow Length=532' Tc=11.0 min CN=91 Runoff=13.17 cfs 1.196 af

Subcatchment 3S: DA 2C Runoff Area=30.199 ac 4.93% Impervious Runoff Depth=4.15"
Flow Length=2,588' Tc=22.6 min UI Adjusted CN=67 Runoff=93.85 cfs 10.455 af

Subcatchment 7S: DA 1B Runoff Area=94,000 sf 75.97% Impervious Runoff Depth=7.08"
Flow Length=669' Tc=6.0 min CN=92 Runoff=16.10 cfs 1.274 af

Subcatchment 8S: DA 2A Runoff Area=3.613 ac 61.86% Impervious Runoff Depth=6.13"
Flow Length=740' Tc=12.1 min CN=84 Runoff=20.57 cfs 1.847 af

Subcatchment 9S: DA 2B Runoff Area=2.152 ac 30.72% Impervious Runoff Depth=4.73"
Flow Length=735' Tc=19.6 min CN=72 Runoff=8.10 cfs 0.848 af

Subcatchment 11S: DA 1C Runoff Area=14,897 sf 83.63% Impervious Runoff Depth=7.32"
Tc=6.0 min CN=94 Runoff=2.59 cfs 0.209 af

Subcatchment 12S: DA 1D Runoff Area=85,452 sf 71.00% Impervious Runoff Depth=7.20"
Tc=6.0 min CN=93 Runoff=14.75 cfs 1.177 af

Subcatchment 15S: DA 2E Runoff Area=3.136 ac 31.41% Impervious Runoff Depth=5.66"
Flow Length=671' Tc=12.0 min CN=80 Runoff=16.77 cfs 1.480 af

Subcatchment 16S: DA 2G Runoff Area=0.444 ac 0.00% Impervious Runoff Depth=5.78"
Flow Length=110' Tc=6.0 min CN=81 Runoff=2.89 cfs 0.214 af

Subcatchment 17S: DA 2I Runoff Area=0.536 ac 64.18% Impervious Runoff Depth=6.73"
Flow Length=230' Slope=0.0200 '/' Tc=11.0 min CN=89 Runoff=3.36 cfs 0.300 af

Subcatchment 21S: DA 2F Runoff Area=0.141 ac 0.00% Impervious Runoff Depth=6.02"
Flow Length=107' Tc=6.0 min CN=83 Runoff=0.95 cfs 0.071 af

Subcatchment 22S: DA 2H Runoff Area=2.744 ac 35.75% Impervious Runoff Depth=5.90"
Flow Length=676' Tc=10.0 min CN=82 Runoff=16.02 cfs 1.349 af

Pond 2P: 30" RCP Peak Elev=522.83' Inflow=28.54 cfs 22.886 af
Primary=28.54 cfs 22.886 af Secondary=0.00 cfs 0.000 af Outflow=28.54 cfs 22.886 af

Pond 4P: Pond Peak Elev=528.43' Storage=11.338 af Inflow=160.05 cfs 20.670 af
Primary=16.77 cfs 20.513 af Secondary=0.00 cfs 0.000 af Outflow=16.77 cfs 20.513 af

Pond 10P: Apartment Phase 1 Detention Peak Elev=538.80' Storage=3,557 cf Inflow=8.10 cfs 0.848 af
Primary=5.74 cfs 0.848 af Secondary=0.00 cfs 0.000 af Outflow=5.74 cfs 0.848 af

Pond 15P: Apartments Phase II Stormwater Peak Elev=568.37' Storage=6,342 cf Inflow=17.47 cfs 1.550 af
Primary=16.96 cfs 1.471 af Secondary=0.00 cfs 0.000 af Outflow=16.96 cfs 1.471 af

Market Square and Existing Development to RT 66 Type III 24-hr 100-Year Rainfall=8.04"

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Pond 16P: Water Quality Basin

Peak Elev=528.52' Storage=17,229 cf Inflow=14.75 cfs 1.177 af
Outflow=5.85 cfs 1.177 af

Pond 20P: Apartments Phase II

Peak Elev=560.00' Storage=37,060 cf Inflow=38.23 cfs 3.334 af
Primary=21.13 cfs 3.112 af Secondary=2.48 cfs 0.032 af Outflow=23.61 cfs 3.144 af

Pond 21P: Drain

Peak Elev=564.57' Inflow=20.33 cfs 1.772 af
24.0" Round Culvert n=0.013 L=260.0' S=0.0073 '/' Outflow=20.33 cfs 1.772 af

100-Year Link Primary Outflow Imported from Proposed Conditions - Town Hall Site~Link EAST.hce Inflow=22.23 cfs 2.893 af
Area= 6.431 ac 40.57% Imperv. Primary=22.23 cfs 2.893 af

Total Runoff Area = 49.488 ac Runoff Volume = 20.419 af Average Runoff Depth = 4.95"
76.40% Pervious = 37.808 ac 23.60% Impervious = 11.680 ac

Market Square and Existing Development to RT 66 Type III 24-hr 100-Year Rainfall=8.04"

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Summary for Subcatchment 1S: DA 1A

Runoff = 13.17 cfs @ 12.15 hrs, Volume= 1.196 af, Depth= 6.96"

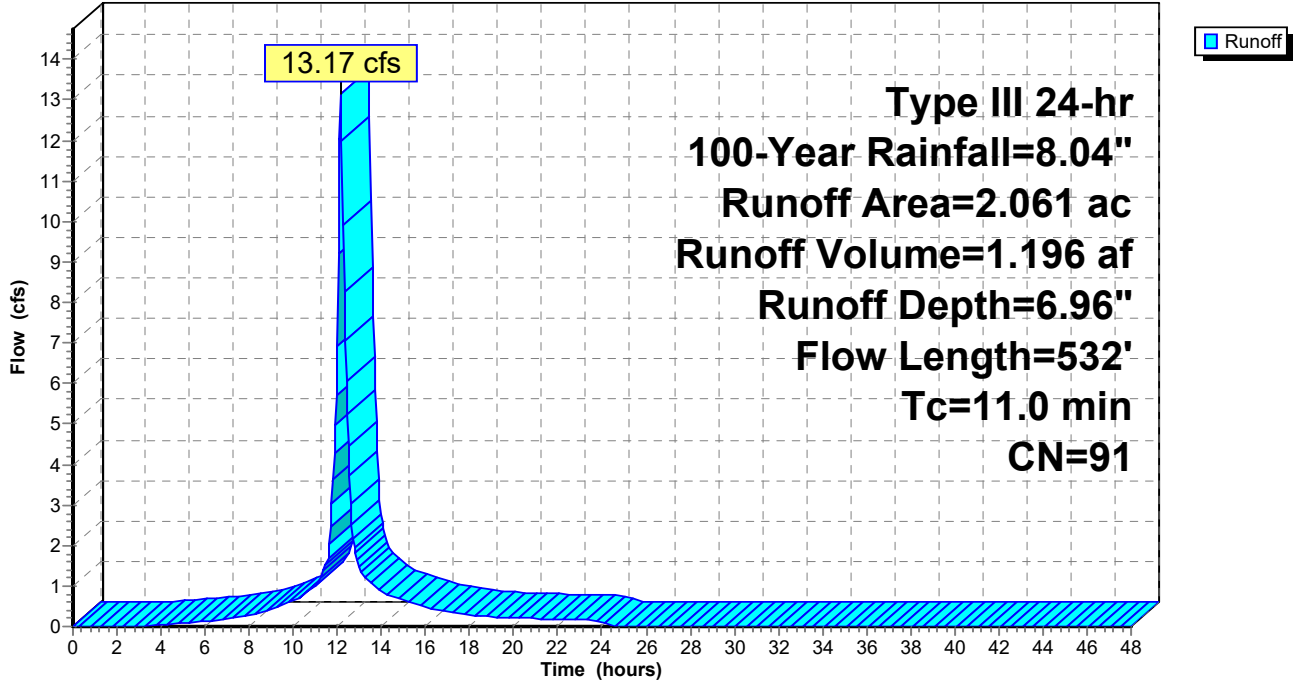
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.04"

Area (ac)	CN	Description
0.201	98	Paved parking, HSG C
1.260	98	Paved parking, HSG B
0.207	98	Paved parking, HSG C
0.074	74	>75% Grass cover, Good, HSG C
0.319	61	>75% Grass cover, Good, HSG B
2.061	91	Weighted Average
0.393		19.07% Pervious Area
1.668		80.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	40	0.0100	0.08		Sheet Flow, Lawn Grass: Dense n= 0.240 P2= 3.37"
1.7	239	0.0126	2.28		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.5	253	0.0200	8.41	14.86	Pipe Channel, HDPE Drain 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
11.0	532	Total			

Subcatchment 1S: DA 1A

Hydrograph



Summary for Subcatchment 3S: DA 2C

[47] Hint: Peak is 273% of capacity of segment #3

Runoff = 93.85 cfs @ 12.32 hrs, Volume= 10.455 af, Depth= 4.15"

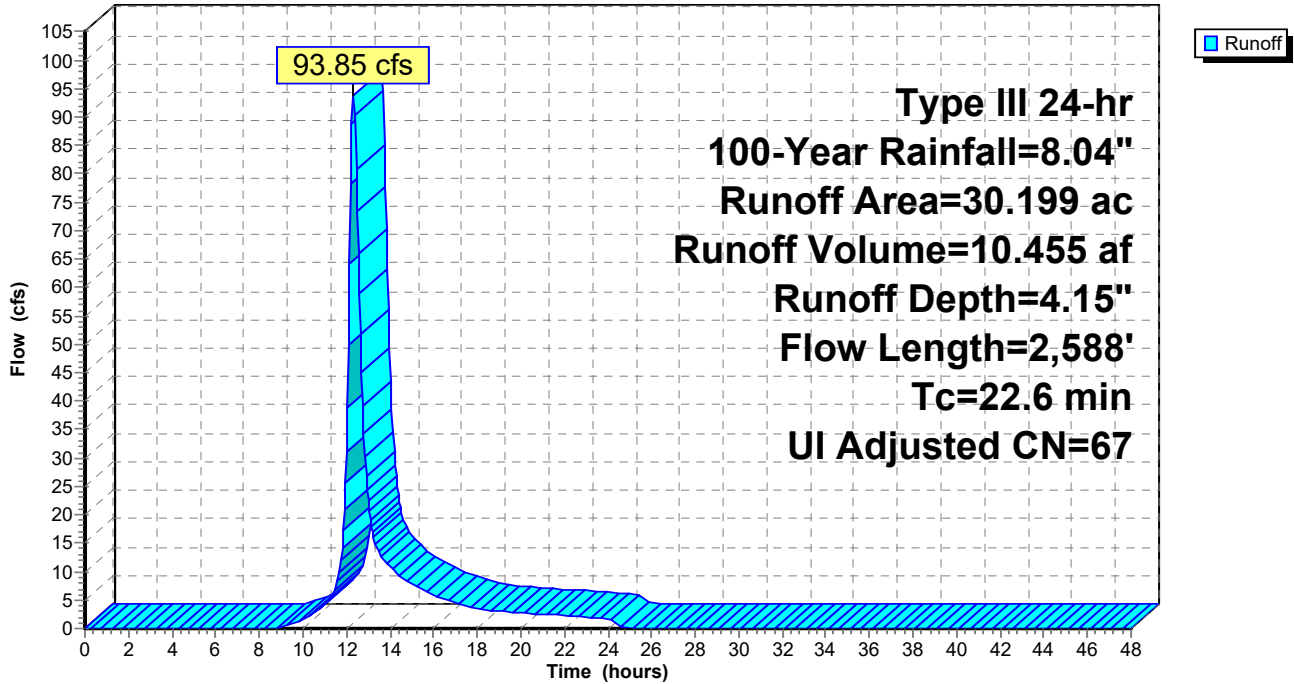
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.04"

Area (ac)	CN	Adj	Description
9.778	77		Woods, Good, HSG D
0.839	98		Water Surface, 0% imp, HSG D
13.926	55		Woods, Good, HSG B
2.515	70		Woods, Good, HSG C
0.066	98		Paved parking, HSG C
0.110	98		Roofs, HSG C
0.057	98		Paved parking, HSG B
0.566	61		>75% Grass cover, Good, HSG B
0.870	98		Unconnected roofs, HSG B
0.333	80		>75% Grass cover, Good, HSG D
0.061	98		Paved parking, HSG C
0.032	74		>75% Grass cover, Good, HSG C
0.140	98		Paved parking, HSG C
0.664	74		>75% Grass cover, Good, HSG C
0.058	70		Woods, Good, HSG C
* 0.184	98		Unconnected Roofs
30.199	68	67	Weighted Average, UI Adjusted
28.711			95.07% Pervious Area
1.488			4.93% Impervious Area
1.054			70.83% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.0850	0.14		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
5.1	598	0.1539	1.96		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
5.2	1,600	0.0262	5.16	34.37	Parabolic Channel, Channel W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.035 Earth, dense weeds
0.6	290		8.02		Lake or Reservoir, Pond Mean Depth= 2.00'
22.6	2,588	Total			

Subcatchment 3S: DA 2C

Hydrograph



Summary for Subcatchment 7S: DA 1B

[47] Hint: Peak is 108% of capacity of segment #4

Runoff = 16.10 cfs @ 12.09 hrs, Volume= 1.274 af, Depth= 7.08"

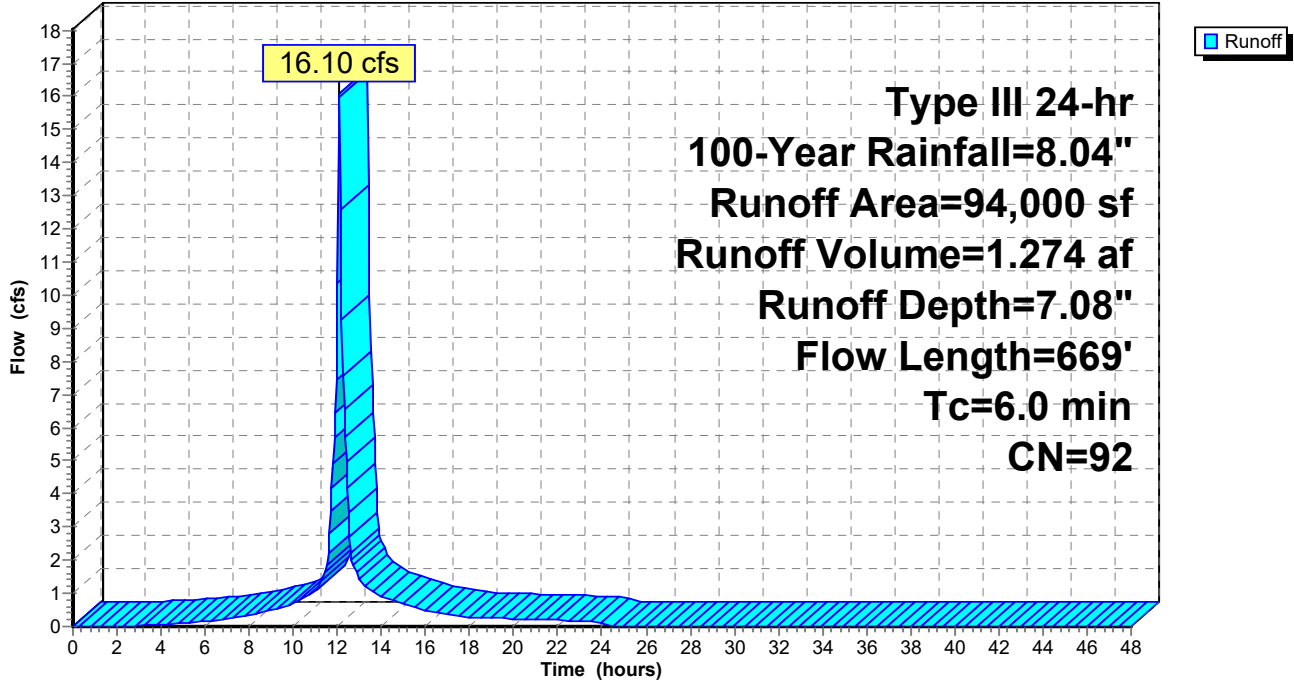
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=8.04"

Area (sf)	CN	Description
71,413	98	Paved parking, HSG B
11,784	86	Newly graded area, HSG B
10,803	61	>75% Grass cover, Good, HSG B
94,000	92	Weighted Average
22,587		24.03% Pervious Area
71,413		75.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	100	0.0200	1.41		Sheet Flow, Play areas Smooth surfaces n= 0.011 P2= 3.37"
0.1	40	0.1500	6.24		Shallow Concentrated Flow, Play areas Unpaved Kv= 16.1 fps
2.2	362	0.0175	2.69		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.3	167	0.0200	8.41	14.86	Pipe Channel, HDPE 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
3.8	669	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 7S: DA 1B

Hydrograph



Summary for Subcatchment 8S: DA 2A

[47] Hint: Peak is 142% of capacity of segment #3

Runoff = 20.57 cfs @ 12.16 hrs, Volume= 1.847 af, Depth= 6.13"

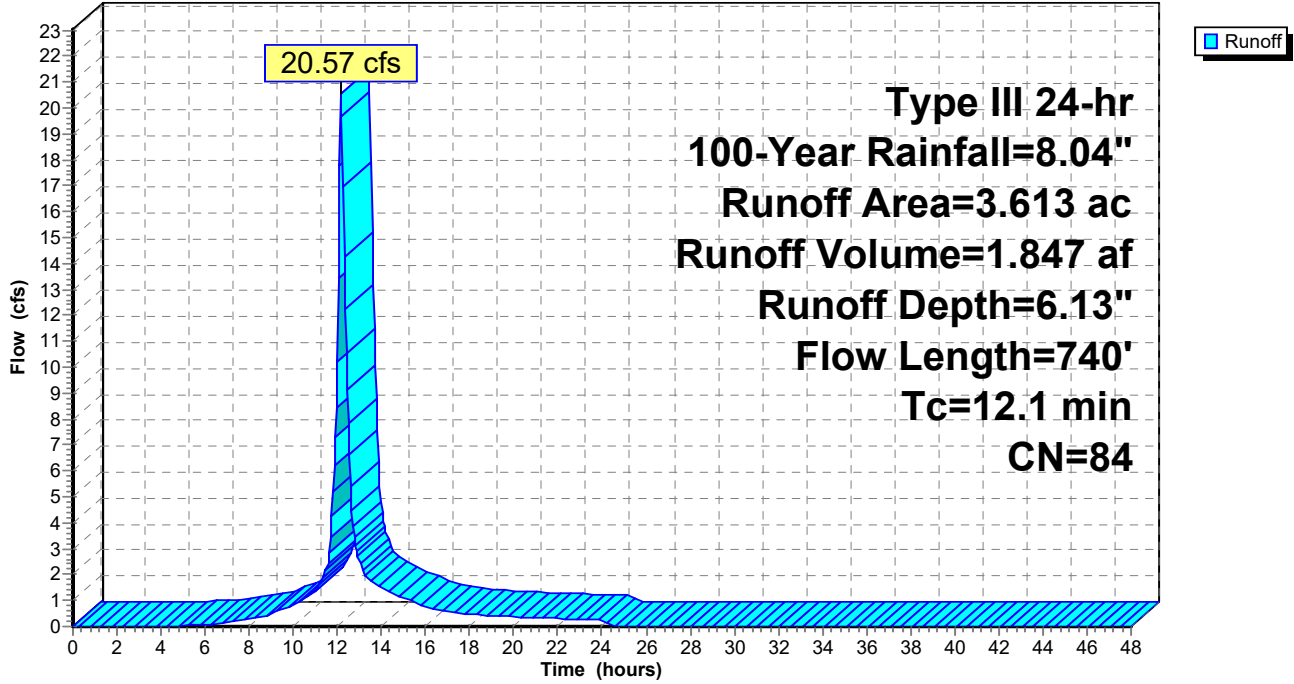
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=8.04"

Area (ac)	CN	Description
1.953	98	Paved parking, HSG B
0.152	98	Roofs, HSG B
0.394	61	>75% Grass cover, Good, HSG B
0.054	55	Woods, Good, HSG B
0.930	61	>75% Grass cover, Good, HSG B
0.130	98	Paved parking, HSG B
3.613	84	Weighted Average
1.378		38.14% Pervious Area
2.235		61.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	100	0.0650	0.19		Sheet Flow, Lawn Grass: Dense n= 0.240 P2= 3.37"
3.3	558	0.0191	2.81		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.1	82	0.0500	11.77	14.44	Pipe Channel, Discharge 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
12.1	740	Total			

Subcatchment 8S: DA 2A

Hydrograph



Market Square and Existing Development to RT 66 Type III 24-hr 100-Year Rainfall=8.04"

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Summary for Subcatchment 9S: DA 2B

Runoff = 8.10 cfs @ 12.27 hrs, Volume= 0.848 af, Depth= 4.73"

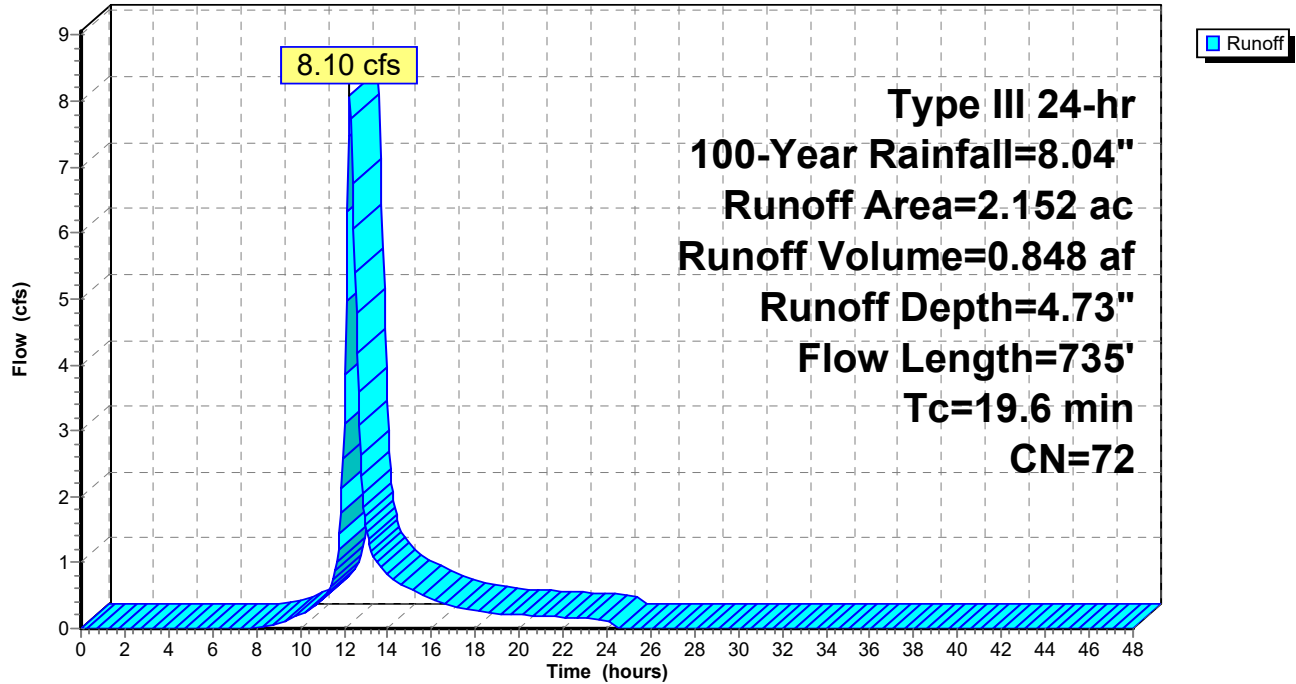
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.04"

Area (ac)	CN	Description
0.661	98	Paved parking, HSG B
0.746	55	Woods, Good, HSG B
0.669	61	>75% Grass cover, Good, HSG B
0.076	98	Water Surface, 0% imp, HSG B
2.152	72	Weighted Average
1.491		69.28% Pervious Area
0.661		30.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0450	0.11		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
2.1	100	0.0250	0.79		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.2	38	0.3333	4.04		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.8	314	0.0200	2.87		Shallow Concentrated Flow, Gutter Paved Kv= 20.3 fps
0.2	108	0.0200	7.44	9.14	Pipe Channel, Pipe 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.2	75		5.67		Lake or Reservoir, Mean Depth= 1.00'
19.6	735	Total			

Subcatchment 9S: DA 2B

Hydrograph



Summary for Subcatchment 11S: DA 1C

Runoff = 2.59 cfs @ 12.09 hrs, Volume= 0.209 af, Depth= 7.32"

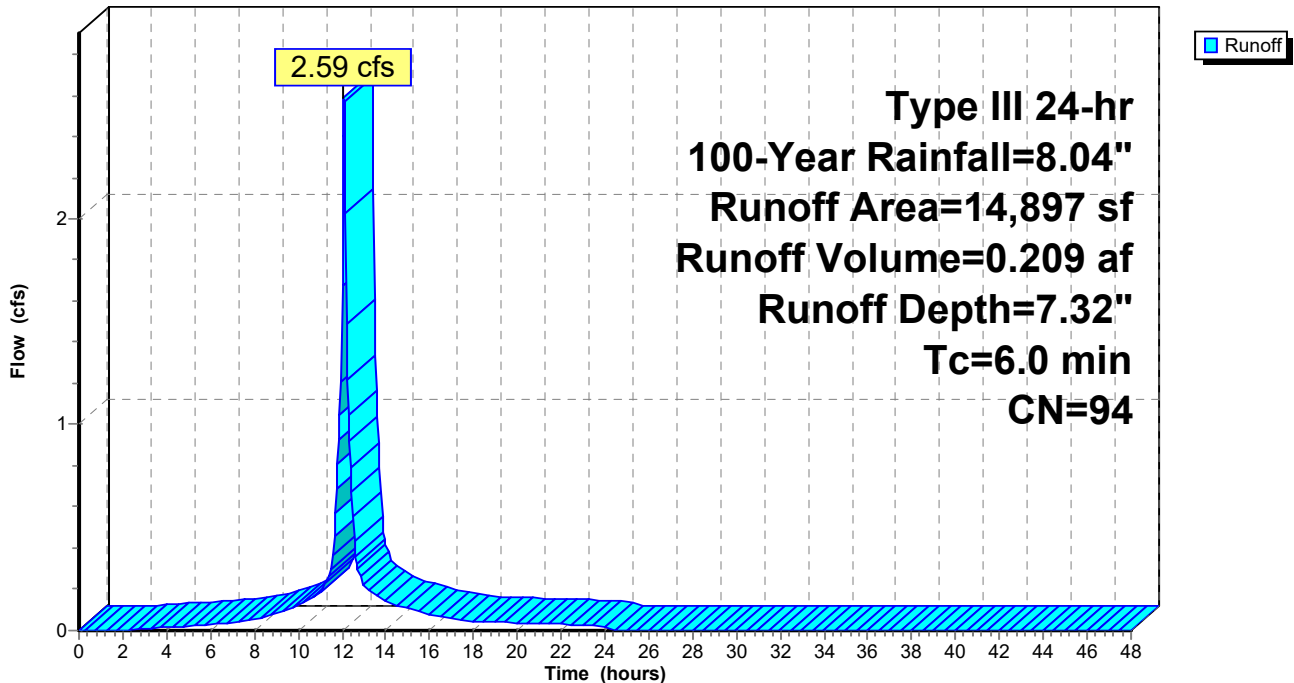
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=8.04"

Area (sf)	CN	Description
12,458	98	Paved parking, HSG C
2,439	74	>75% Grass cover, Good, HSG C
14,897	94	Weighted Average
2,439		16.37% Pervious Area
12,458		83.63% Impervious Area

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

Subcatchment 11S: DA 1C

Hydrograph



Summary for Subcatchment 12S: DA 1D

Runoff = 14.75 cfs @ 12.09 hrs, Volume= 1.177 af, Depth= 7.20"

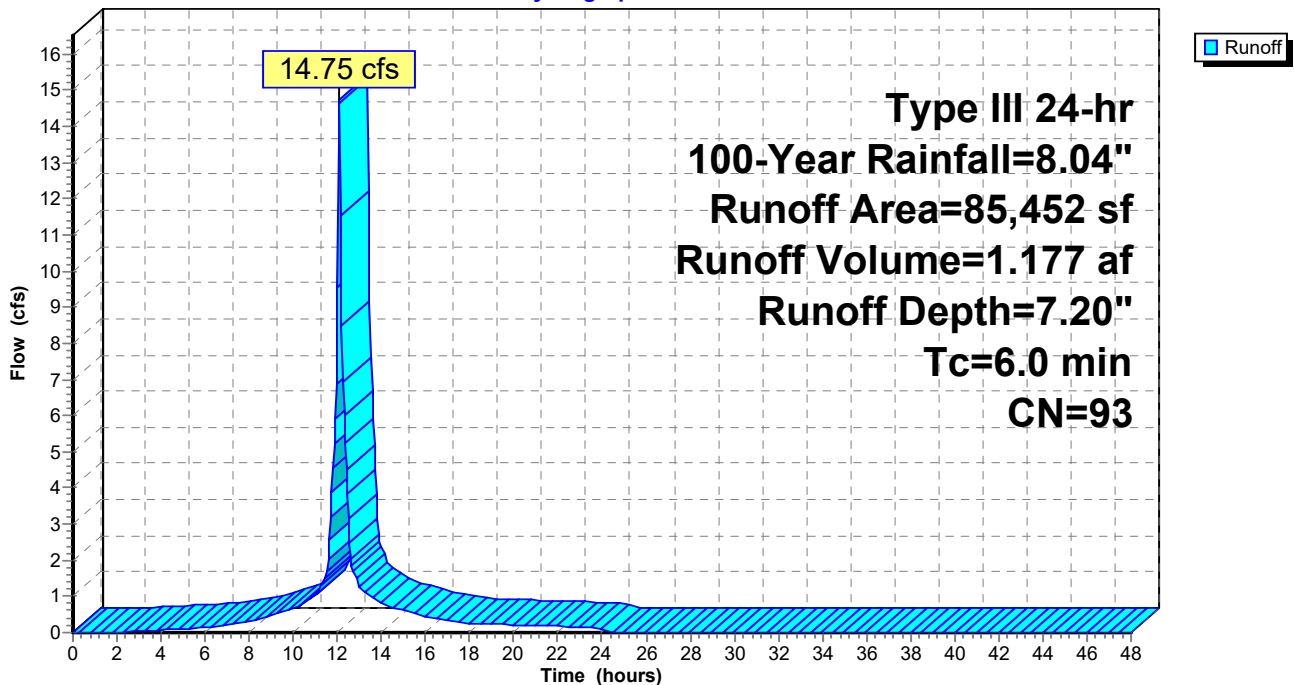
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=8.04"

Area (sf)	CN	Description
55,278	98	Paved parking, HSG C
6,098	98	Water Surface, 0% imp, HSG C
18,687	74	>75% Grass cover, Good, HSG C
5,389	98	Paved parking, HSG C
85,452	93	Weighted Average
24,785		29.00% Pervious Area
60,667		71.00% Impervious Area

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

Subcatchment 12S: DA 1D

Hydrograph



Summary for Subcatchment 15S: DA 2E

Runoff = 16.77 cfs @ 12.16 hrs, Volume= 1.480 af, Depth= 5.66"

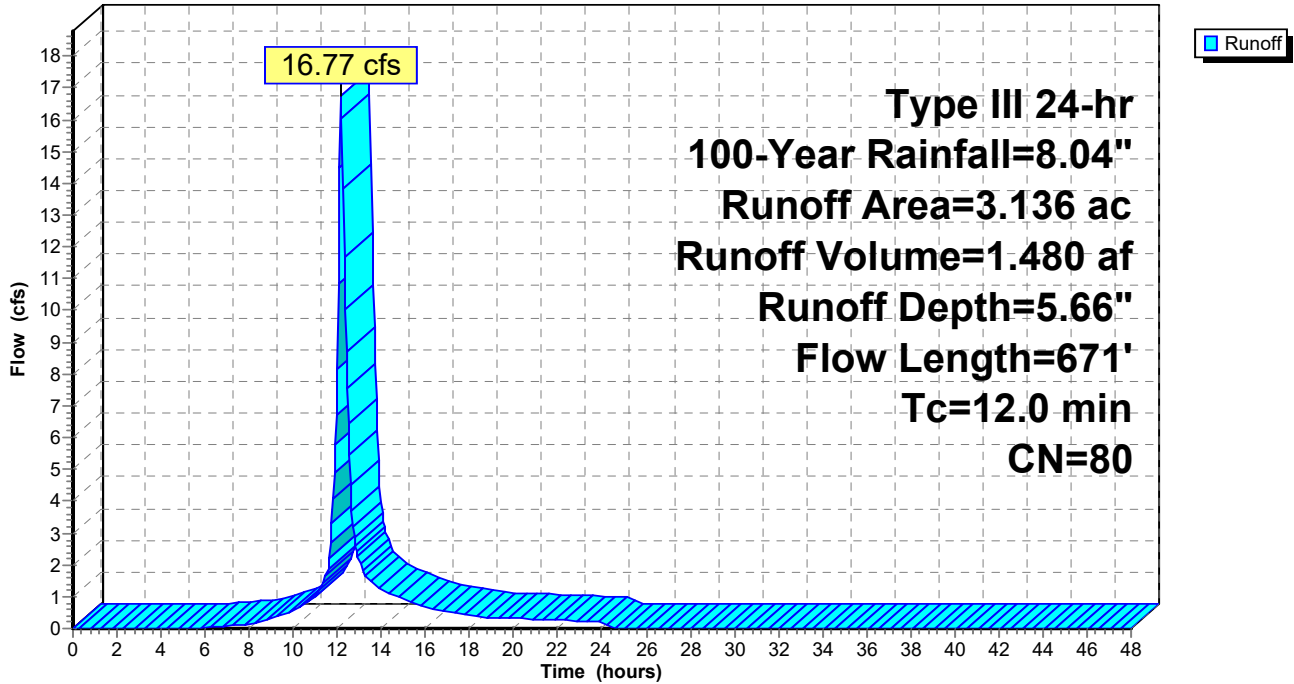
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=8.04"

Area (ac)	CN	Description
* 0.985	98	Paved parking, HSG C, South
* 0.455	74	>75% Grass cover, Good, HSG C, South
1.030	70	Woods, Good, HSG C
0.666	74	>75% Grass cover, Good, HSG C
3.136	80	Weighted Average
2.151		68.59% Pervious Area
0.985		31.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
3.3	417	0.1799	2.12		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	40	0.1000	2.21		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.7	164	0.0421	4.17		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
12.0	671	Total			

Subcatchment 15S: DA 2E

Hydrograph



Summary for Subcatchment 16S: DA 2G

Runoff = 2.89 cfs @ 12.09 hrs, Volume= 0.214 af, Depth= 5.78"

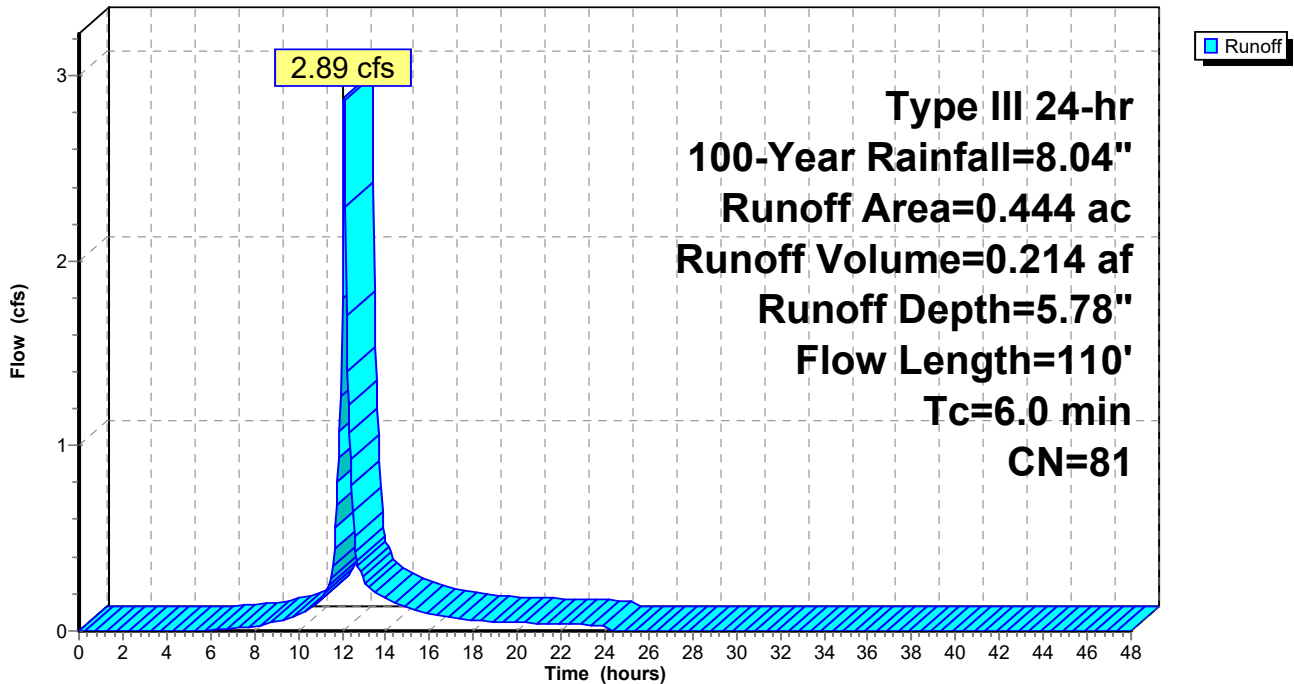
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=8.04"

Area (ac)	CN	Description
0.103	98	Water Surface, 0% imp, HSG C
0.017	80	>75% Grass cover, Good, HSG D
0.229	74	>75% Grass cover, Good, HSG C
0.079	80	>75% Grass cover, Good, HSG D
0.016	74	>75% Grass cover, Good, HSG C
0.444	81	Weighted Average
0.444		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.2	60	0.3500	4.14		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
5.7	110	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 16S: DA 2G

Hydrograph



Summary for Subcatchment 17S: DA 2I

Runoff = 3.36 cfs @ 12.15 hrs, Volume= 0.300 af, Depth= 6.73"

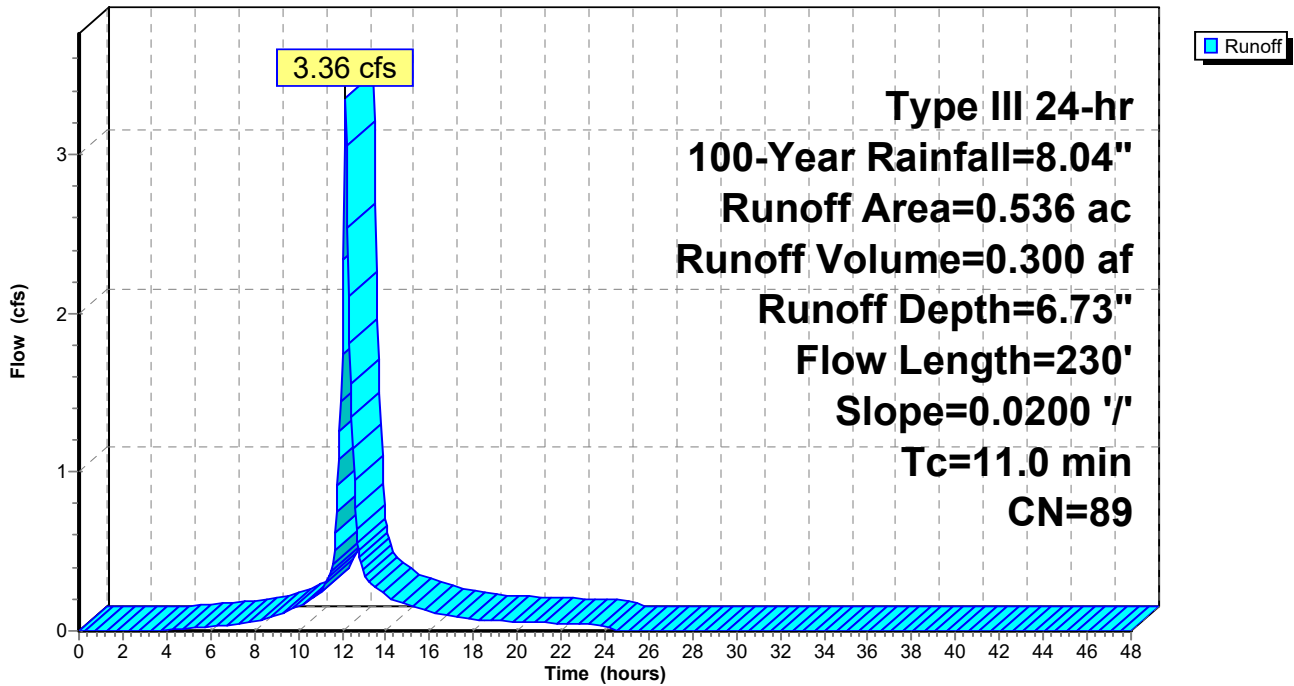
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=8.04"

Area (ac)	CN	Description
* 0.344	98	Paved parking, HSG C, North
* 0.192	74	>75% Grass cover, Good, HSG C, North
0.536	89	Weighted Average
0.192		35.82% Pervious Area
0.344		64.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
3.0	180	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
11.0	230	Total			

Subcatchment 17S: DA 2I

Hydrograph



Summary for Subcatchment 21S: DA 2F

Runoff = 0.95 cfs @ 12.09 hrs, Volume= 0.071 af, Depth= 6.02"

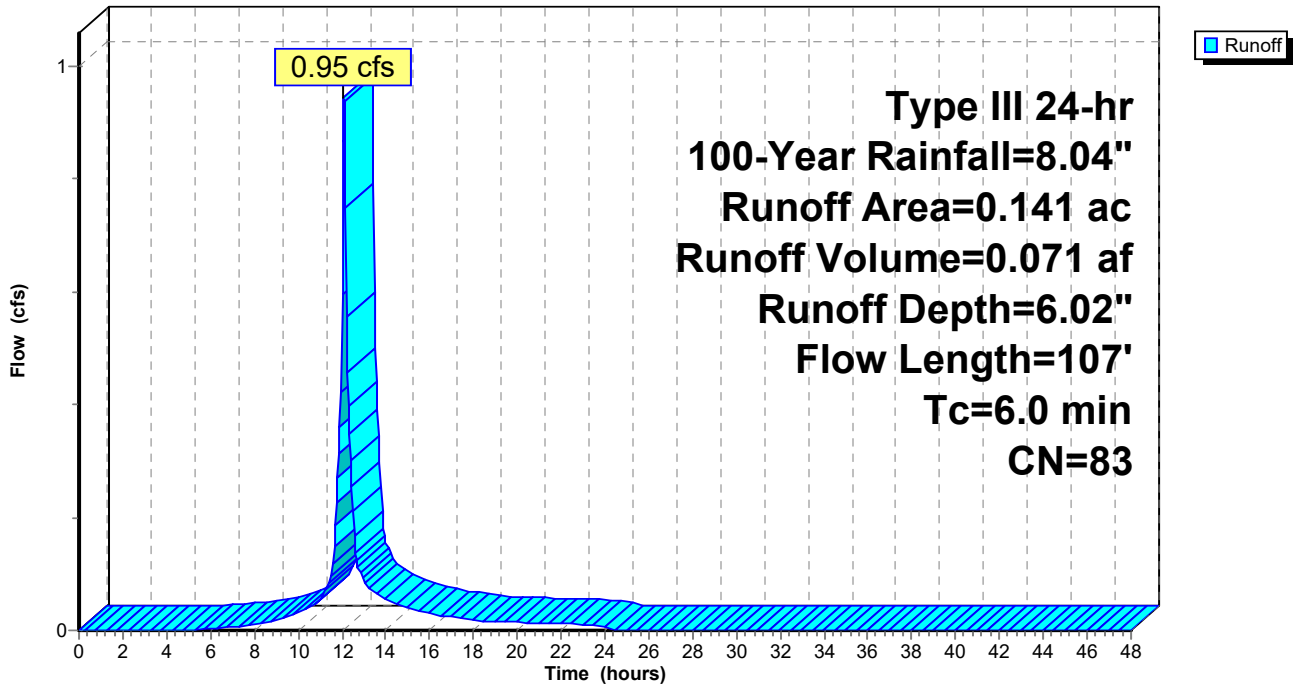
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=8.04"

Area (ac)	CN	Description
0.051	98	Water Surface, 0% imp, HSG C
0.090	74	>75% Grass cover, Good, HSG C
0.141	83	Weighted Average
0.141		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.3	57	0.1754	2.93		Shallow Concentrated Flow, Woods Short Grass Pasture Kv= 7.0 fps
4.5	107	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 21S: DA 2F

Hydrograph



Summary for Subcatchment 22S: DA 2H

Runoff = 16.02 cfs @ 12.14 hrs, Volume= 1.349 af, Depth= 5.90"

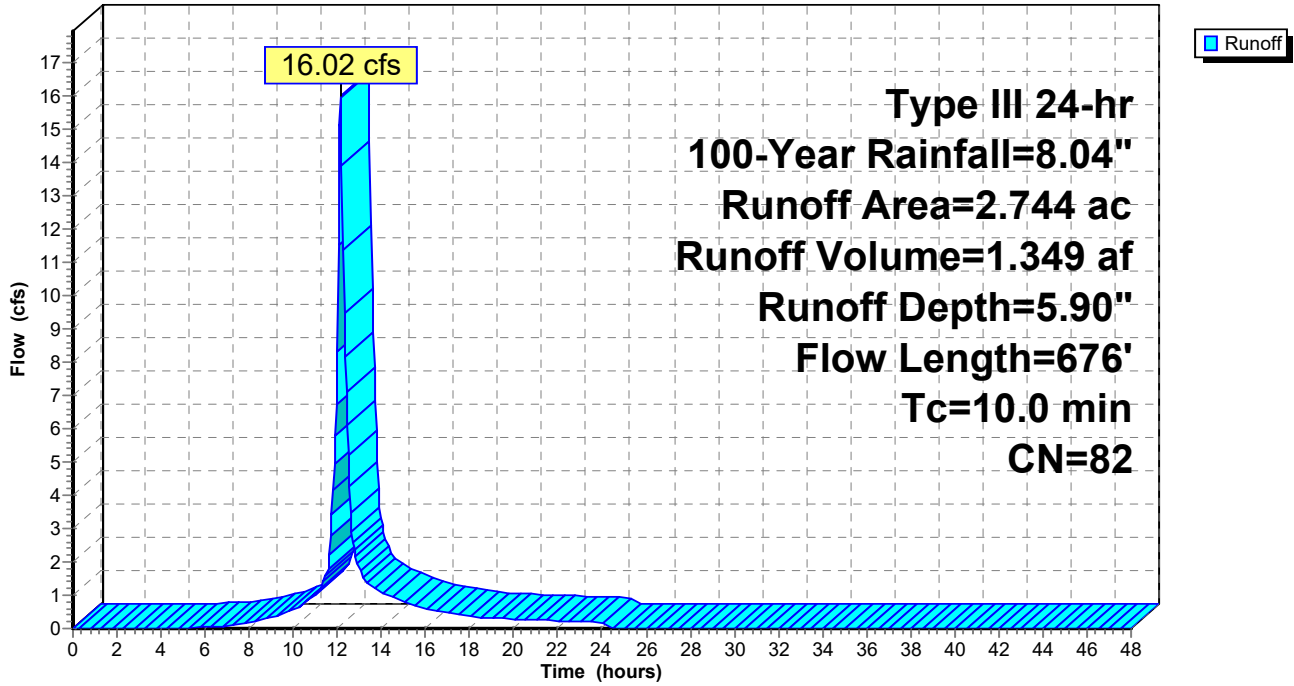
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=8.04"

Area (ac)	CN	Description
* 0.431	98	Paved parking, HSG C, North
* 0.010	80	>75% Grass cover, Good, HSG D, North
* 0.313	74	>75% Grass cover, Good, HSG C, North
* 0.550	98	Paved parking, HSG C, South
* 0.356	74	>75% Grass cover, Good, HSG C, South
0.748	70	Woods, Good, HSG C
0.336	74	>75% Grass cover, Good, HSG C
2.744	82	Weighted Average
1.763		64.25% Pervious Area
0.981		35.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
1.7	190	0.1316	1.81		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	81	0.3333	4.04		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.7	355	0.0310	3.57		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
10.0	676	Total			

Subcatchment 22S: DA 2H

Hydrograph



Summary for Pond 2P: 30" RCP

Inflow Area = 55.918 ac, 25.55% Impervious, Inflow Depth > 4.91" for 100-Year event
 Inflow = 28.54 cfs @ 12.18 hrs, Volume= 22.886 af
 Outflow = 28.54 cfs @ 12.18 hrs, Volume= 22.886 af, Atten= 0%, Lag= 0.0 min
 Primary = 28.54 cfs @ 12.18 hrs, Volume= 22.886 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 522.83' @ 12.18 hrs
 Flood Elev= 527.20'

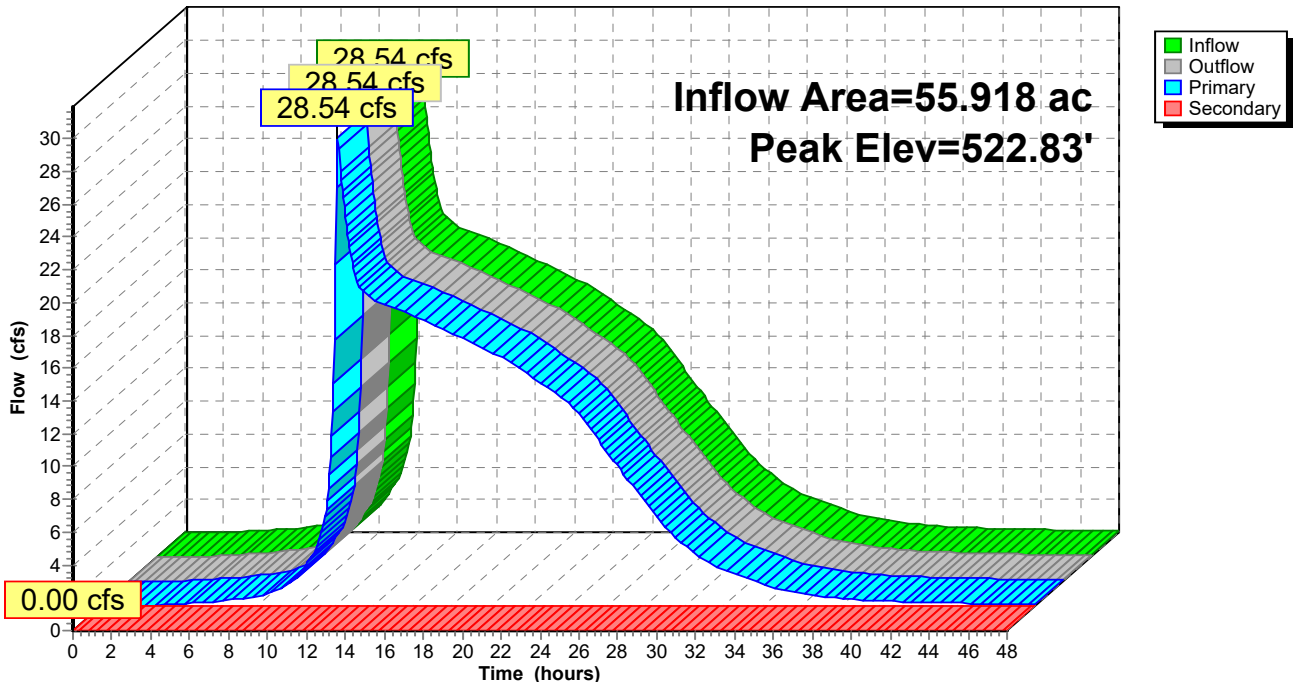
Device	Routing	Invert	Outlet Devices
#1	Primary	519.92'	30.0" Round 30" RC L= 80.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 519.92' / 519.62' S= 0.0037 ' / Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 4.91 sf
#2	Secondary	527.20'	30.0' long x 10.0' breadth Overflow Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=28.39 cfs @ 12.18 hrs HW=522.81' (Free Discharge)
 ↳1=30" RC (Barrel Controls 28.39 cfs @ 6.27 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=519.92' (Free Discharge)
 ↳2=Overflow (Controls 0.00 cfs)

Pond 2P: 30" RCP

Hydrograph



Summary for Pond 4P: Pond

Inflow Area = 51.896 ac, 21.64% Impervious, Inflow Depth = 4.78" for 100-Year event
 Inflow = 160.05 cfs @ 12.29 hrs, Volume= 20.670 af
 Outflow = 16.77 cfs @ 14.59 hrs, Volume= 20.513 af, Atten= 90%, Lag= 137.8 min
 Primary = 16.77 cfs @ 14.59 hrs, Volume= 20.513 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 528.43' @ 14.59 hrs Surf.Area= 3.030 ac Storage= 11.338 af

Plug-Flow detention time= 380.6 min calculated for 20.492 af (99% of inflow)
 Center-of-Mass det. time= 376.8 min (1,214.1 - 837.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	523.45'	16.273 af	Pond Storage (Irregular) Listed below		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
523.45	0.636	1,389.1	0.000	0.000	0.636
524.00	1.723	1,270.7	0.624	0.624	1.212
526.00	2.359	1,494.7	4.065	4.690	2.345
528.00	2.936	1,638.1	5.284	9.974	3.169
530.00	3.368	1,700.4	6.299	16.273	3.556

Device	Routing	Invert	Outlet Devices
#1	Primary	520.91'	30.0" Round 30" HDPE L= 110.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 520.91' / 520.64' S= 0.0024 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	521.46'	30.0" Round 30" HDPE L= 86.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 521.46' / 520.91' S= 0.0063 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	521.41'	24.0" Round 24" HDPE L= 157.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 521.41' / 521.40' S= 0.0001 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#4	Device 3	523.45'	18.0" Round 18" HDPE L= 117.9' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 523.45' / 521.82' S= 0.0138 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#5	Secondary	529.90'	50.0' long x 25.0' breadth Overflow Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=16.77 cfs @ 14.59 hrs HW=528.43' TW=522.04' (Dynamic Tailwater)

1=30" HDPE (Passes 16.77 cfs of 57.03 cfs potential flow)

2=30" HDPE (Passes 16.77 cfs of 56.54 cfs potential flow)

3=24" HDPE (Passes 16.77 cfs of 30.42 cfs potential flow)

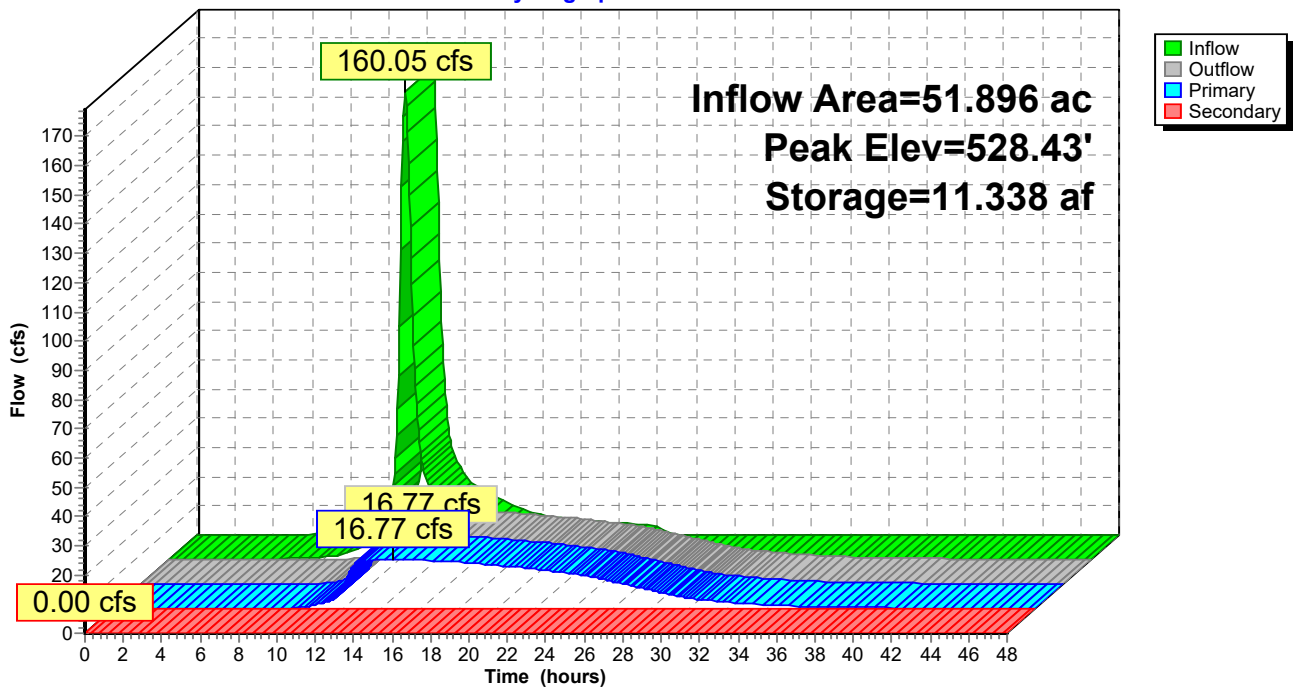
4=18" HDPE (Barrel Controls 16.77 cfs @ 9.49 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=523.45' TW=519.92' (Dynamic Tailwater)

5=Overflow (Controls 0.00 cfs)

Pond 4P: Pond

Hydrograph



Summary for Pond 10P: Apartment Phase 1 Detention Basin

Inflow Area = 2.152 ac, 30.72% Impervious, Inflow Depth = 4.73" for 100-Year event
 Inflow = 8.10 cfs @ 12.27 hrs, Volume= 0.848 af
 Outflow = 5.74 cfs @ 12.47 hrs, Volume= 0.848 af, Atten= 29%, Lag= 12.3 min
 Primary = 5.74 cfs @ 12.47 hrs, Volume= 0.848 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 538.80' @ 12.47 hrs Surf.Area= 2,407 sf Storage= 3,557 cf

Plug-Flow detention time= 4.8 min calculated for 0.847 af (100% of inflow)
 Center-of-Mass det. time= 4.9 min (837.8 - 833.0)

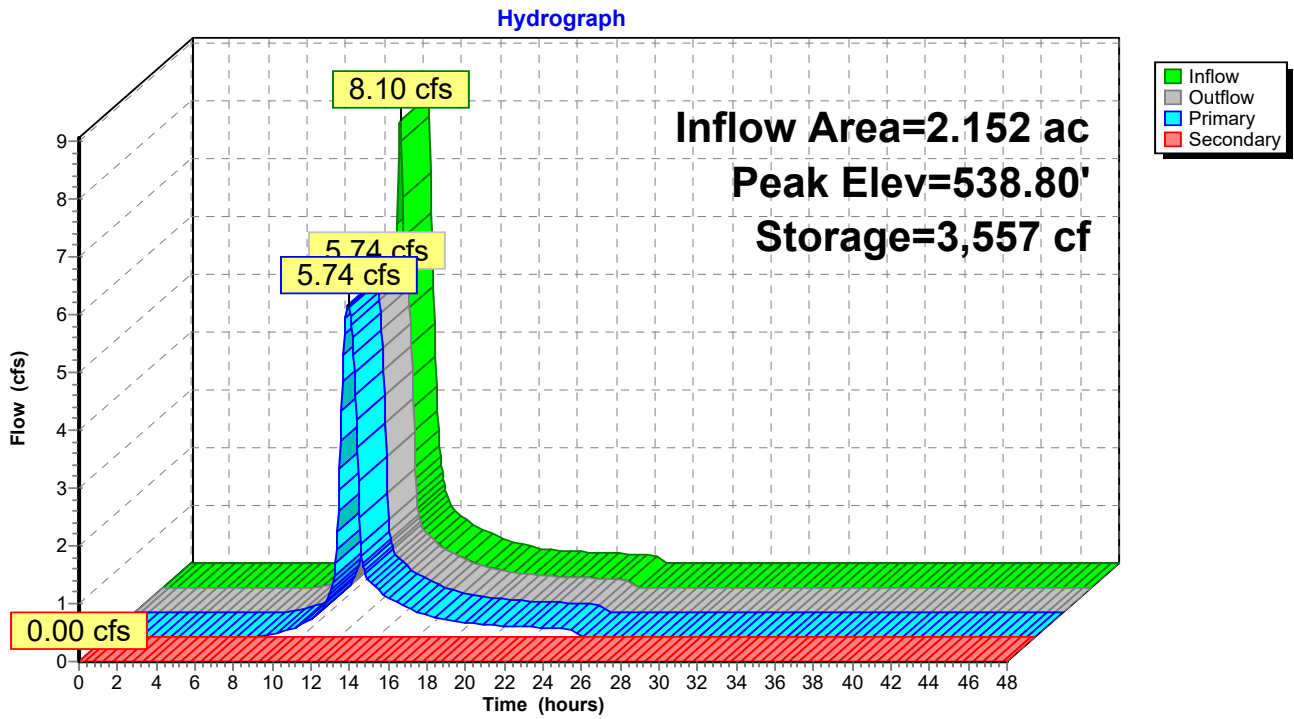
Volume	Invert	Avail.Storage	Storage Description			
#1	536.00'	7,026 cf	Detention Basin (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
536.00	100	40.0	0	0	100	
536.50	467	110.5	131	131	945	
537.60	1,559	173.6	1,056	1,186	2,380	
540.00	3,429	242.5	5,840	7,026	4,716	

Device	Routing	Invert	Outlet Devices
#1	Primary	536.00'	12.0" Round Culvert L= 75.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 536.00' / 534.50' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	539.50'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=5.73 cfs @ 12.47 hrs HW=538.80' TW=527.08' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 5.73 cfs @ 7.30 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=536.00' TW=523.45' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 10P: Apartment Phase 1 Detention Basin



Market Square and Existing Development to RT 66 Type III 24-hr 100-Year Rainfall=8.04"

Prepared by {enter your company name here}

Printed 12/14/2020

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Summary for Pond 15P: Apartments Phase II Stormwater Basin 2

Inflow Area = 3.277 ac, 30.06% Impervious, Inflow Depth = 5.68" for 100-Year event
 Inflow = 17.47 cfs @ 12.16 hrs, Volume= 1.550 af
 Outflow = 16.96 cfs @ 12.18 hrs, Volume= 1.471 af, Atten= 3%, Lag= 1.4 min
 Primary = 16.96 cfs @ 12.18 hrs, Volume= 1.471 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 568.37' @ 12.19 hrs Surf.Area= 2,459 sf Storage= 6,342 cf

Plug-Flow detention time= 48.3 min calculated for 1.470 af (95% of inflow)
 Center-of-Mass det. time= 20.4 min (828.1 - 807.7)

Volume	Invert	Avail.Storage	Storage Description
#1	562.00'	6 cf	3.00'W x 8.00'L x 2.50'H Sand Underdrain 60 cf Overall x 10.0% Voids
#2	564.50'	10,719 cf	Stormwater Basin (Irregular) Listed below
		10,725 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
564.50	4	8.2	0	0	4
564.75	257	68.5	24	24	372
565.00	1,193	160.0	167	191	2,036
566.00	1,533	172.5	1,359	1,551	2,406
568.00	2,277	197.6	3,786	5,336	3,233
570.00	3,128	222.7	5,383	10,719	4,172

Device	Routing	Invert	Outlet Devices
#1	Primary	562.00'	18.0" Round 18" HDPE L= 68.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 562.00' / 561.60' S= 0.0059 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	567.00'	36.0" W x 6.0" H Vert. 36" x 6" Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	568.00'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#4	Secondary	569.00'	8.0' long x 8.0' breadth Rip Rap Spillway 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#5	Device 1	562.00'	0.500 in/hr Sand Underdrain over Horizontal area from 562.00' - 564.50' Excluded Horizontal area = 24 sf Phase-In= 0.01'

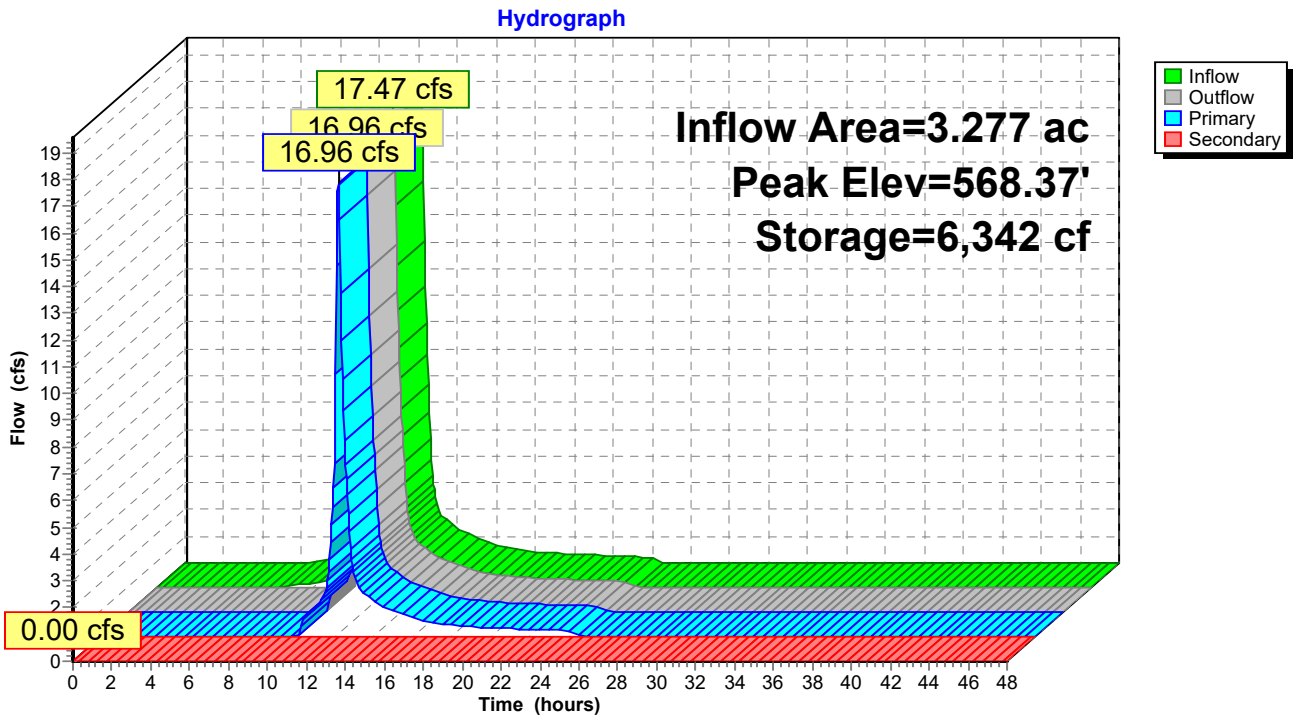
Primary OutFlow Max=16.80 cfs @ 12.18 hrs HW=568.36' TW=564.47' (Dynamic Tailwater)

- 1=18" HDPE (Inlet Controls 16.80 cfs @ 9.51 fps)
- 2=36" x 6" Orifice (Passes < 7.60 cfs potential flow)
- 3=Top of Frame (Passes < 10.03 cfs potential flow)
- 5=Sand Underdrain (Passes < 0.00 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=562.00' TW=523.45' (Dynamic Tailwater)

- 4=Rip Rap Spillway (Controls 0.00 cfs)

Pond 15P: Apartments Phase II Stormwater Basin 2



Market Square and Existing Development to RT 66 Type III 24-hr 100-Year Rainfall=8.04"

Prepared by {enter your company name here}

Printed 12/14/2020

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Summary for Pond 16P: Water Quality Basin

Inflow Area = 1.962 ac, 71.00% Impervious, Inflow Depth = 7.20" for 100-Year event
 Inflow = 14.75 cfs @ 12.09 hrs, Volume= 1.177 af
 Outflow = 5.85 cfs @ 12.31 hrs, Volume= 1.177 af, Atten= 60%, Lag= 13.5 min
 Primary = 5.85 cfs @ 12.31 hrs, Volume= 1.177 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 528.52' @ 12.31 hrs Surf.Area= 6,821 sf Storage= 17,229 cf

Plug-Flow detention time= 110.1 min calculated for 1.176 af (100% of inflow)
 Center-of-Mass det. time= 110.1 min (875.3 - 765.2)

Volume	Invert	Avail.Storage	Storage Description
#1	523.75'	26,415 cf	Water Quality swale (Irregular) Listed below (Recalc)
#2	522.25'	5 cf	3.00'W x 3.00'L x 1.50'H Underdrain
			14 cf Overall x 40.0% Voids
		26,420 cf	Total Available Storage

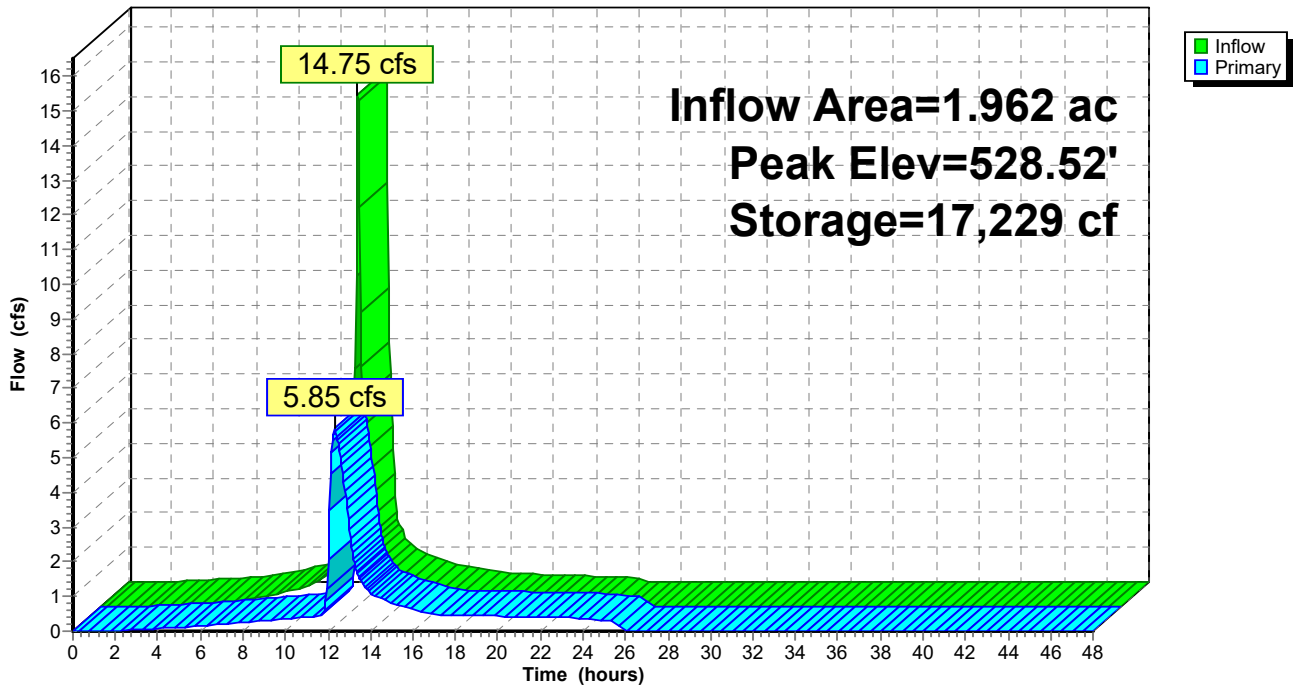
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
523.75	9	12.0	0	0	9
524.00	258	63.2	26	26	316
524.25	528	108.8	96	123	940
524.50	766	159.7	161	283	2,028
524.75	1,105	211.6	233	516	3,562
525.00	1,523	263.2	327	843	5,513
525.25	2,026	316.2	442	1,285	7,958
525.50	2,529	368.0	568	1,853	10,779
525.75	3,267	420.8	723	2,576	14,095
526.00	4,119	481.0	921	3,497	18,417
528.00	6,268	535.7	10,312	13,809	22,957
529.75	8,181	557.7	12,606	26,415	25,097

Device	Routing	Invert	Outlet Devices
#1	Primary	522.75'	24.0" Round 24" HDPE L= 75.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 522.75' / 521.75' S= 0.0133 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	523.00'	3.0" Vert. Underdrain C= 0.600 Limited to weir flow at low heads
#3	Device 1	526.75'	6.0" W x 6.0" H Vert. 6" Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	527.25'	18.0" W x 6.0" H Vert. 18x6 Orifice C= 0.600 Limited to weir flow at low heads
#5	Device 1	528.50'	20.0' long x 0.5' breadth Top of Frame Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

- Primary OutFlow** Max=5.83 cfs @ 12.31 hrs HW=528.52' TW=522.64' (Dynamic Tailwater)
- 1=24" HDPE (Passes 5.83 cfs of 33.04 cfs potential flow)
 - 2=Underdrain (Orifice Controls 0.55 cfs @ 11.18 fps)
 - 3=6" Orifice (Orifice Controls 1.48 cfs @ 5.93 fps)
 - 4=18x6 Orifice (Orifice Controls 3.64 cfs @ 4.85 fps)
 - 5=Top of Frame (Weir Controls 0.16 cfs @ 0.40 fps)

Pond 16P: Water Quality Basin

Hydrograph



Market Square and Existing Development to RT 66 Type III 24-hr 100-Year Rainfall=8.04"

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Summary for Pond 20P: Apartments Phase II Stormwater Basin 1

Inflow Area = 7.001 ac, 33.00% Impervious, Inflow Depth = 5.72" for 100-Year event
 Inflow = 38.23 cfs @ 12.15 hrs, Volume= 3.334 af
 Outflow = 23.61 cfs @ 12.33 hrs, Volume= 3.144 af, Atten= 38%, Lag= 10.8 min
 Primary = 21.13 cfs @ 12.33 hrs, Volume= 3.112 af
 Secondary = 2.48 cfs @ 12.33 hrs, Volume= 0.032 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 560.00' @ 12.33 hrs Surf.Area= 8,336 sf Storage= 37,060 cf

Plug-Flow detention time= 82.0 min calculated for 3.141 af (94% of inflow)
 Center-of-Mass det. time= 51.9 min (863.5 - 811.6)

Volume	Invert	Avail.Storage	Storage Description
#1	551.00'	4 cf	3.00'W x 8.00'L x 1.75'H Sand Underdrain 42 cf Overall x 10.0% Voids
#2	552.75'	40,883 cf	Stormwater Basin (Irregular) Listed below (Recalc)
#3	556.00'	424 cf	36.0" Round Pipe Storage-Impervious L= 60.0' S= 0.0083 ' /'
		41,312 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
552.75	120	43.3	0	0	120
553.00	865	110.3	109	109	939
553.25	1,552	155.7	298	407	1,901
553.50	2,135	207.8	459	866	3,409
553.75	2,928	261.6	630	1,496	5,419
554.00	3,512	310.5	804	2,300	7,646
555.00	4,145	323.0	3,824	6,124	8,352
556.00	4,804	335.6	4,470	10,595	9,090
557.00	5,490	348.1	5,143	15,738	9,851
558.00	6,569	422.7	6,021	21,759	14,443
559.00	7,426	435.3	6,993	28,752	15,404
560.00	8,310	447.8	7,864	36,616	16,387
560.50	8,761	454.1	4,267	40,883	16,893

Device	Routing	Invert	Outlet Devices
#1	Primary	551.00'	18.0" Round 18" HDPE L= 152.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 551.00' / 549.00' S= 0.0132 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	555.50'	6.0" Vert. 6" Orifices (2) X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	557.30'	48.0" W x 7.0" H Vert. 48" x 7" Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	558.75'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#5	Secondary	559.75'	8.0' long x 8.0' breadth Rip Rap Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

Market Square and Existing Development to RT 66 Type III 24-hr 100-Year Rainfall=8.04"

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#6	Device 1	551.00'	2.50	3.00	3.50	4.00	4.50	5.00	5.50			
			Coef. (English)	2.43	2.54	2.70	2.69	2.68	2.68	2.66	2.64	2.64
				2.64	2.65	2.65	2.66	2.66	2.68	2.70	2.74	
				0.500 in/hr Sand Underdrain over Horizontal area from 551.00' - 552.75'								
				Excluded Horizontal area = 24 sf Phase-In= 0.01'								

Primary OutFlow Max=21.12 cfs @ 12.33 hrs HW=559.99' TW=526.49' (Dynamic Tailwater)

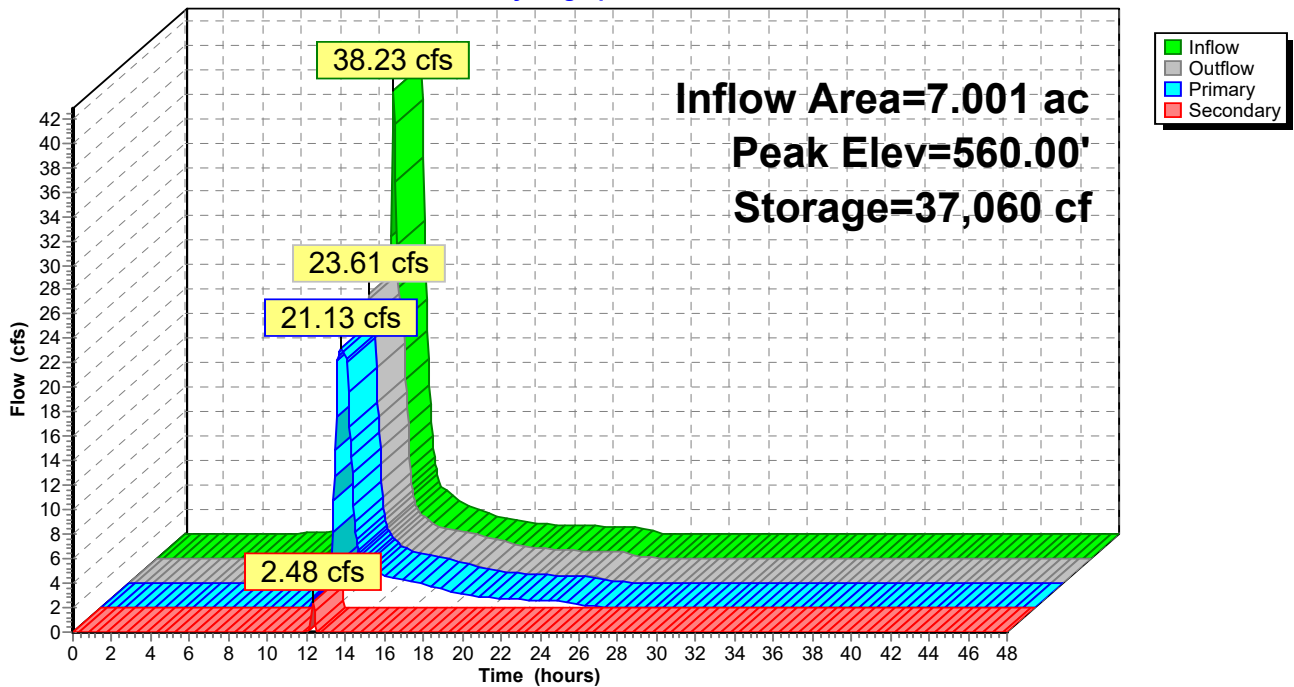
- 1=18" HDPE (Barrel Controls 21.12 cfs @ 11.95 fps)
- 2=6" Orifices (2) (Passes < 3.90 cfs potential flow)
- 3=48" x 7" Orifice (Passes < 17.41 cfs potential flow)
- 4=Top of Frame (Passes < 48.45 cfs potential flow)
- 6=Sand Underdrain (Passes < 0.00 cfs potential flow)

Secondary OutFlow Max=2.38 cfs @ 12.33 hrs HW=559.99' TW=526.49' (Dynamic Tailwater)

- 5=Rip Rap Spillway (Weir Controls 2.38 cfs @ 1.21 fps)

Pond 20P: Apartments Phase II Stormwater Basin 1

Hydrograph



Summary for Pond 21P: Drain

Inflow Area = 3.813 ac, 34.85% Impervious, Inflow Depth = 5.58" for 100-Year event
 Inflow = 20.33 cfs @ 12.17 hrs, Volume= 1.772 af
 Outflow = 20.33 cfs @ 12.17 hrs, Volume= 1.772 af, Atten= 0%, Lag= 0.0 min
 Primary = 20.33 cfs @ 12.17 hrs, Volume= 1.772 af

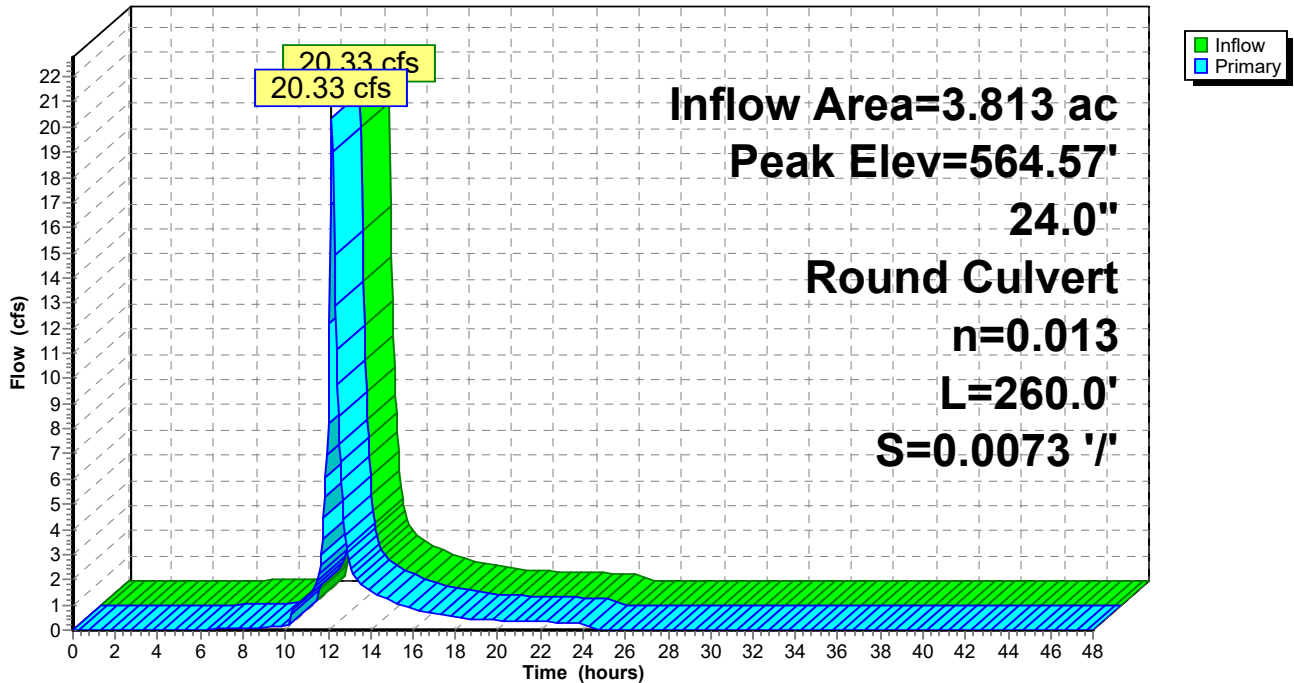
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 564.57' @ 12.17 hrs
 Flood Elev= 565.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	561.40'	24.0" Round Culvert L= 260.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 561.40' / 559.50' S= 0.0073 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=19.95 cfs @ 12.17 hrs HW=564.47' TW=559.40' (Dynamic Tailwater)
 ↳ **1=Culvert** (Barrel Controls 19.95 cfs @ 6.35 fps)

Pond 21P: Drain

Hydrograph



Summary for Link 14L: DA 2D - From Town Hall

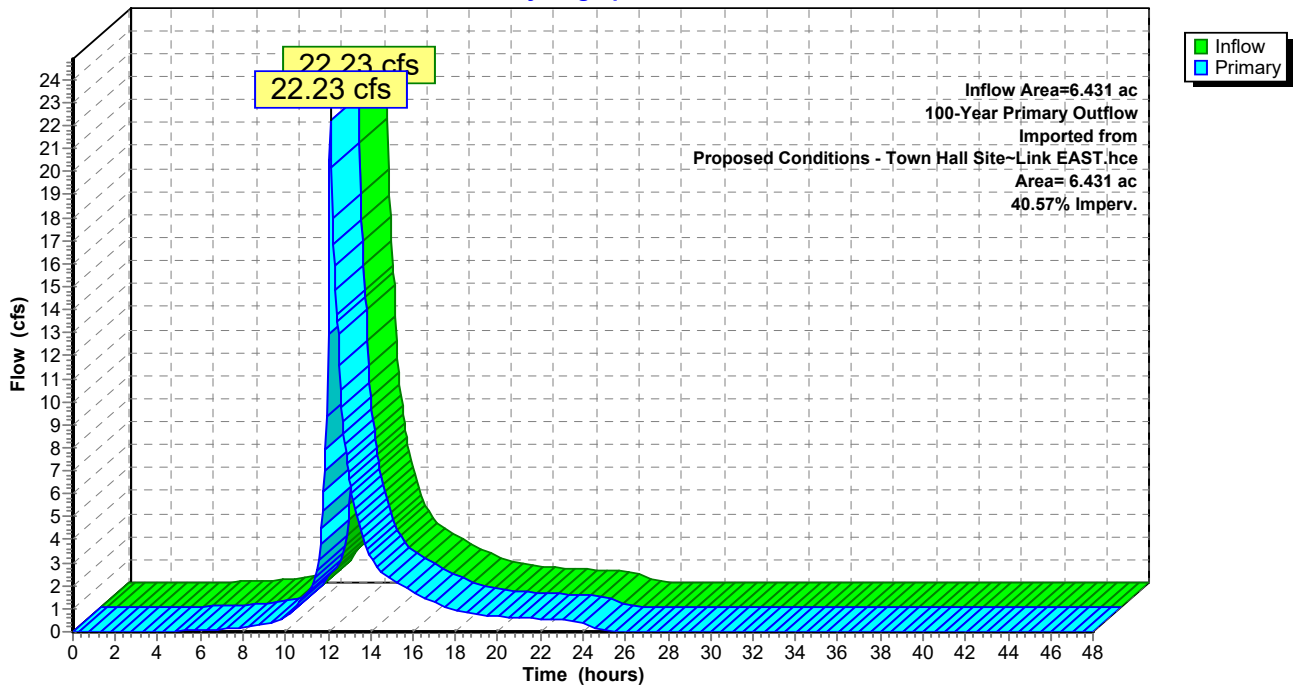
Inflow Area = 6.431 ac, 40.57% Impervious, Inflow Depth = 5.40" for 100-Year event
 Inflow = 22.23 cfs @ 12.10 hrs, Volume= 2.893 af
 Primary = 22.23 cfs @ 12.10 hrs, Volume= 2.893 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

100-Year Primary Outflow Imported from Proposed Conditions - Town Hall Site~Link EAST.hce

Link 14L: DA 2D - From Town Hall

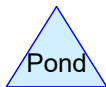
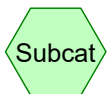
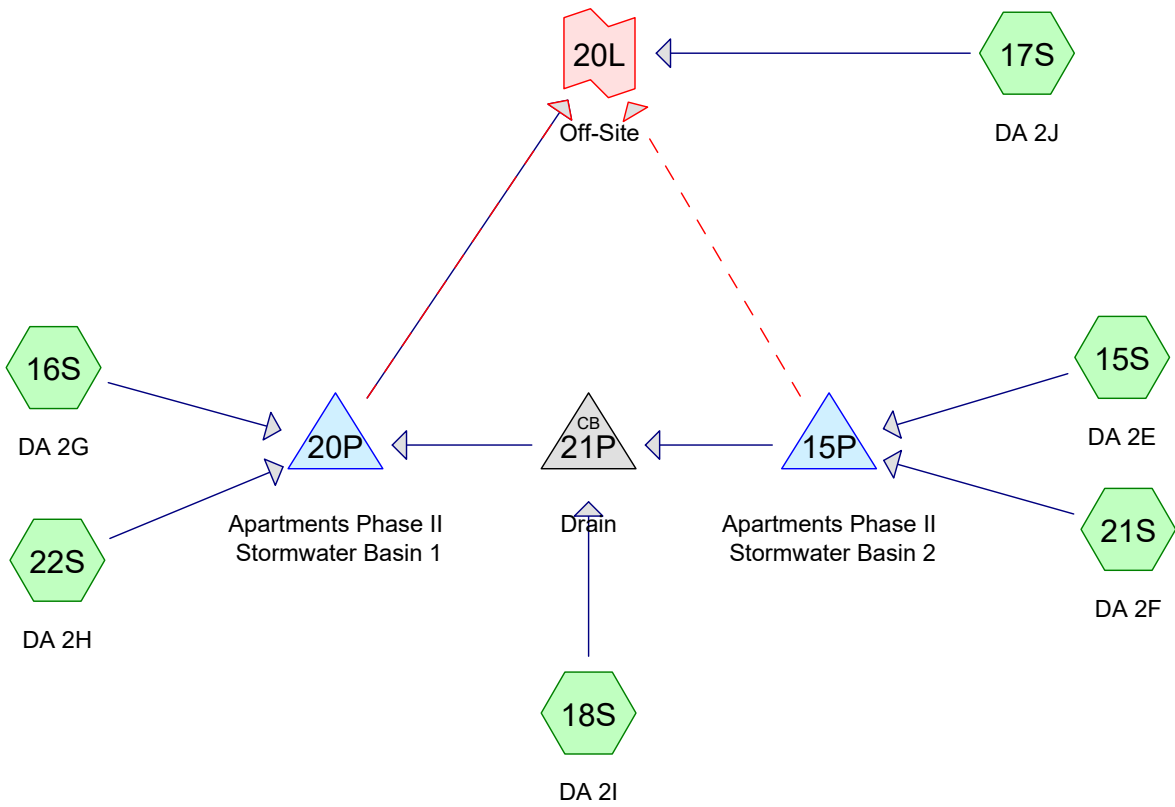
Hydrograph



Post-Development Conditions

HydroCAD Results

Apartment Project Area Only



Routing Diagram for Proposed - Apartments Only
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.37	2
2	10-Year	Type III 24-hr		Default	24.00	1	5.18	2
3	25-Year	Type III 24-hr		Default	24.00	1	6.30	2
4	50-Year	Type III 24-hr		Default	24.00	1	7.14	2
5	100-Year	Type III 24-hr		Default	24.00	1	8.04	2

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.078	74	>75% Grass cover, Good, HSG C (15S, 16S, 17S, 21S, 22S)
0.505	74	>75% Grass cover, Good, HSG C, North (18S, 22S)
0.811	74	>75% Grass cover, Good, HSG C, South (15S, 22S)
0.508	80	>75% Grass cover, Good, HSG D (16S, 17S)
0.010	80	>75% Grass cover, Good, HSG D, North (22S)
0.384	98	Paved parking, HSG C (17S)
0.775	98	Paved parking, HSG C, North (18S, 22S)
1.535	98	Paved parking, HSG C, South (15S, 22S)
0.184	98	Two single Family Houses and Paved Driveways (17S)
0.154	98	Water Surface, 0% imp, HSG C (16S, 21S)
2.355	70	Woods, Good, HSG C (15S, 17S, 22S)
9.299	81	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
8.597	HSG C	15S, 16S, 17S, 18S, 21S, 22S
0.518	HSG D	16S, 17S, 22S
0.184	Other	17S
9.299		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover
0.000	0.000	3.394	0.518	0.000	3.912	>75% Grass cover, Good
0.000	0.000	2.694	0.000	0.000	2.694	Paved parking
0.000	0.000	0.000	0.000	0.184	0.184	Two single Family Houses and Paved Driveways
0.000	0.000	0.154	0.000	0.000	0.154	Water Surface, 0% imp
0.000	0.000	2.355	0.000	0.000	2.355	Woods, Good
0.000	0.000	8.597	0.518	0.184	9.299	TOTAL AREA

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	15P	562.00	561.60	68.0	0.0059	0.013	0.0	18.0	0.0
2	20P	551.00	549.00	152.0	0.0132	0.013	0.0	18.0	0.0
3	21P	561.40	559.50	260.0	0.0073	0.013	0.0	24.0	0.0

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Type III 24-hr 2-Year Rainfall=3.37"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 15S: DA 2E Runoff Area=3.136 ac 31.41% Impervious Runoff Depth=1.53"
Flow Length=671' Tc=12.0 min CN=80 Runoff=4.56 cfs 0.401 af

Subcatchment 16S: DA 2G Runoff Area=0.444 ac 0.00% Impervious Runoff Depth=1.60"
Flow Length=110' Tc=6.0 min CN=81 Runoff=0.82 cfs 0.059 af

Subcatchment 17S: DA 2J Runoff Area=2.298 ac 24.72% Impervious Runoff Depth=1.53"
Flow Length=240' Tc=6.0 min CN=80 Runoff=4.03 cfs 0.294 af

Subcatchment 18S: DA 2I Runoff Area=0.536 ac 64.18% Impervious Runoff Depth=2.24"
Flow Length=230' Slope=0.0200 '/ Tc=11.0 min CN=89 Runoff=1.17 cfs 0.100 af

Subcatchment 21S: DA 2F Runoff Area=0.141 ac 0.00% Impervious Runoff Depth=1.75"
Flow Length=107' Tc=6.0 min CN=83 Runoff=0.28 cfs 0.021 af

Subcatchment 22S: DA 2H Runoff Area=2.744 ac 35.75% Impervious Runoff Depth=1.68"
Flow Length=676' Tc=10.0 min CN=82 Runoff=4.64 cfs 0.383 af

Pond 15P: Apartments Phase II Stormwater Peak Elev=567.57' Storage=4,537 cf Inflow=4.77 cfs 0.421 af
Primary=4.00 cfs 0.342 af Secondary=0.00 cfs 0.000 af Outflow=4.00 cfs 0.342 af

Pond 20P: Apartments Phase II Stormwater Peak Elev=557.00' Storage=15,826 cf Inflow=9.31 cfs 0.885 af
Primary=2.12 cfs 0.695 af Secondary=0.00 cfs 0.000 af Outflow=2.12 cfs 0.695 af

Pond 21P: Drain Peak Elev=562.36' Inflow=4.88 cfs 0.442 af
24.0" Round Culvert n=0.013 L=260.0' S=0.0073 '/ Outflow=4.88 cfs 0.442 af

Link 20L: Off-Site Inflow=4.03 cfs 0.989 af
Primary=4.03 cfs 0.989 af

Total Runoff Area = 9.299 ac Runoff Volume = 1.258 af Average Runoff Depth = 1.62"
69.05% Pervious = 6.421 ac 30.95% Impervious = 2.878 ac

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Type III 24-hr 2-Year Rainfall=3.37"

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Summary for Subcatchment 15S: DA 2E

Runoff = 4.56 cfs @ 12.17 hrs, Volume= 0.401 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.37"

Area (ac)	CN	Description
* 0.985	98	Paved parking, HSG C, South
* 0.455	74	>75% Grass cover, Good, HSG C, South
1.030	70	Woods, Good, HSG C
0.666	74	>75% Grass cover, Good, HSG C
3.136	80	Weighted Average
2.151		68.59% Pervious Area
0.985		31.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
3.3	417	0.1799	2.12		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	40	0.1000	2.21		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.7	164	0.0421	4.17		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
12.0	671	Total			

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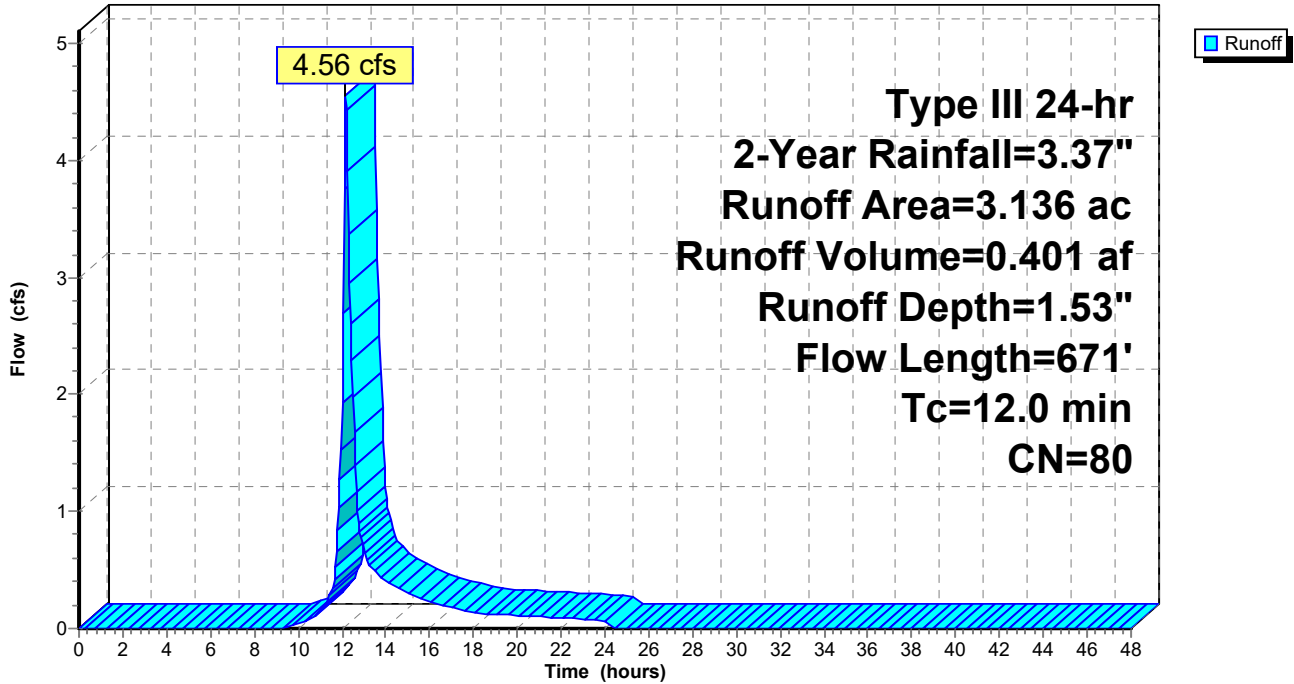
Type III 24-hr 2-Year Rainfall=3.37"

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Subcatchment 15S: DA 2E

Hydrograph



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Summary for Subcatchment 16S: DA 2G

Runoff = 0.82 cfs @ 12.09 hrs, Volume= 0.059 af, Depth= 1.60"

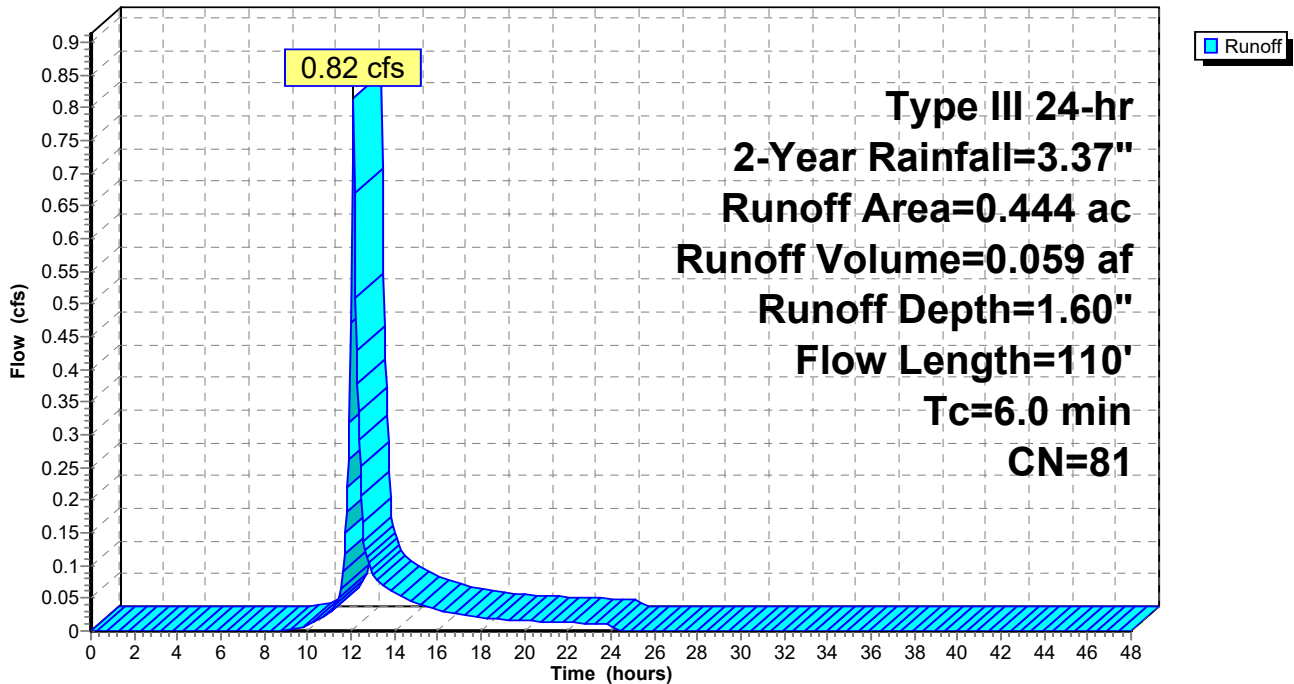
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.37"

Area (ac)	CN	Description
0.103	98	Water Surface, 0% imp, HSG C
0.017	80	>75% Grass cover, Good, HSG D
0.229	74	>75% Grass cover, Good, HSG C
0.079	80	>75% Grass cover, Good, HSG D
0.016	74	>75% Grass cover, Good, HSG C
0.444	81	Weighted Average
0.444		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.2	60	0.3500	4.14		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
5.7	110	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 16S: DA 2G

Hydrograph



Proposed - Apartments Only

Type III 24-hr 2-Year Rainfall=3.37"

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Summary for Subcatchment 17S: DA 2J

Runoff = 4.03 cfs @ 12.10 hrs, Volume= 0.294 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.37"

Area (ac)	CN	Description
0.412	80	>75% Grass cover, Good, HSG D
0.061	98	Paved parking, HSG C
0.032	74	>75% Grass cover, Good, HSG C
0.140	98	Paved parking, HSG C
0.680	74	>75% Grass cover, Good, HSG C
* 0.184	98	Two single Family Houses and Paved Driveways
0.183	98	Paved parking, HSG C
0.577	70	Woods, Good, HSG C
0.029	74	>75% Grass cover, Good, HSG C
2.298	80	Weighted Average
1.730		75.28% Pervious Area
0.568		24.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	24	0.1000	0.17		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.3	26	0.0500	1.56		Sheet Flow, Paved/Gravel Smooth surfaces n= 0.011 P2= 3.37"
0.3	85	0.0824	4.62		Shallow Concentrated Flow, Gravel Unpaved Kv= 16.1 fps
0.7	105	0.1333	2.56		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
3.6	240	Total, Increased to minimum Tc = 6.0 min			

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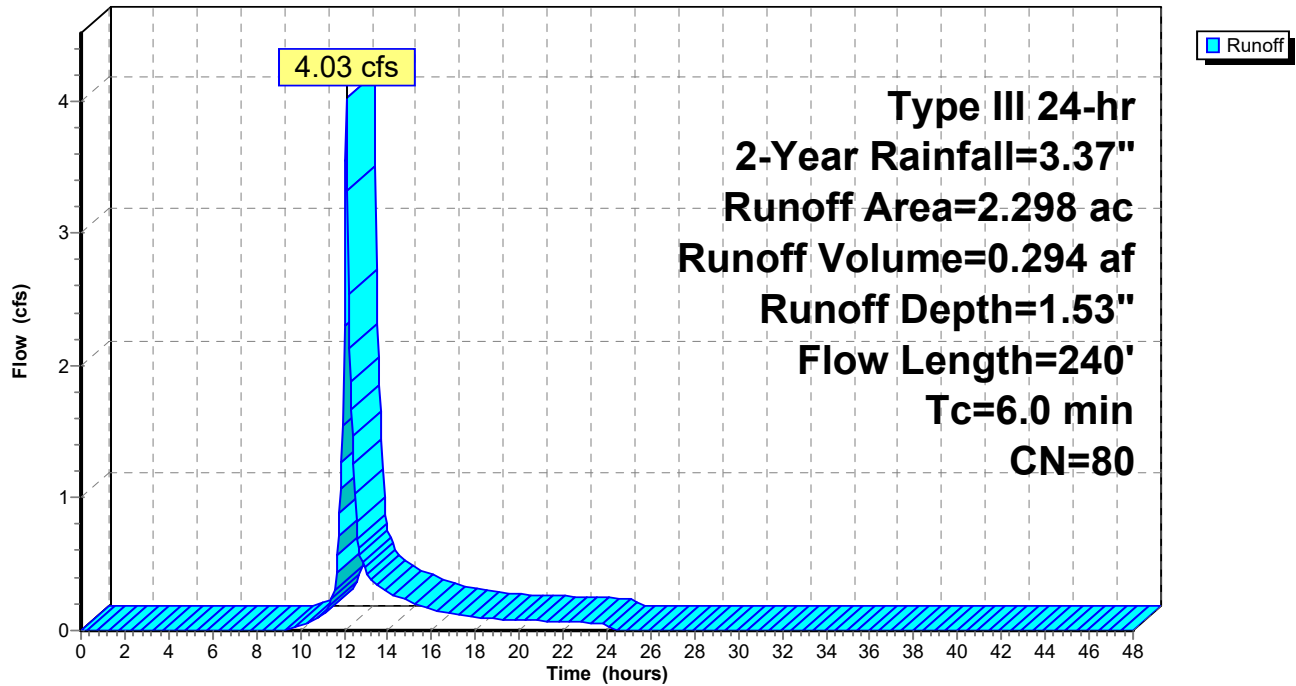
Type III 24-hr 2-Year Rainfall=3.37"

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Subcatchment 17S: DA 2J

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.37"

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Summary for Subcatchment 18S: DA 2I

Runoff = 1.17 cfs @ 12.15 hrs, Volume= 0.100 af, Depth= 2.24"

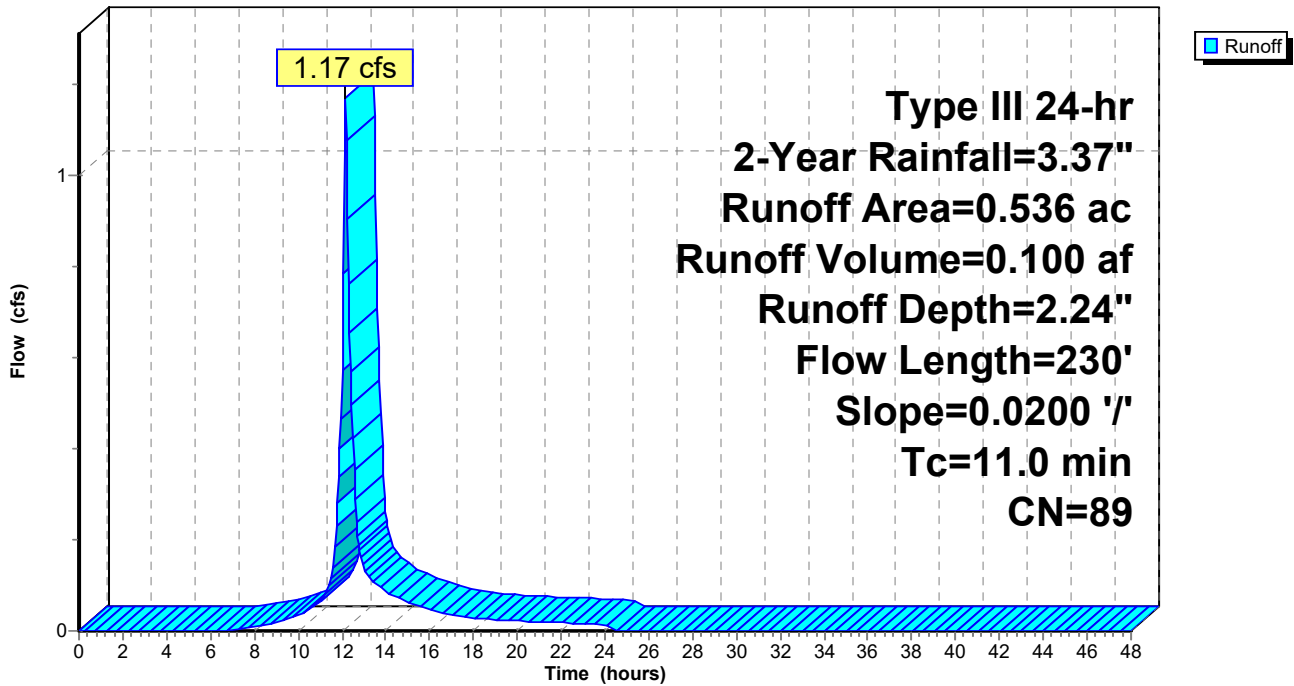
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.37"

Area (ac)	CN	Description
* 0.344	98	Paved parking, HSG C, North
* 0.192	74	>75% Grass cover, Good, HSG C, North
0.536	89	Weighted Average
0.192		35.82% Pervious Area
0.344		64.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
3.0	180	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
11.0	230	Total			

Subcatchment 18S: DA 2I

Hydrograph



Proposed - Apartments Only

Type III 24-hr 2-Year Rainfall=3.37"

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Summary for Subcatchment 21S: DA 2F

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.021 af, Depth= 1.75"

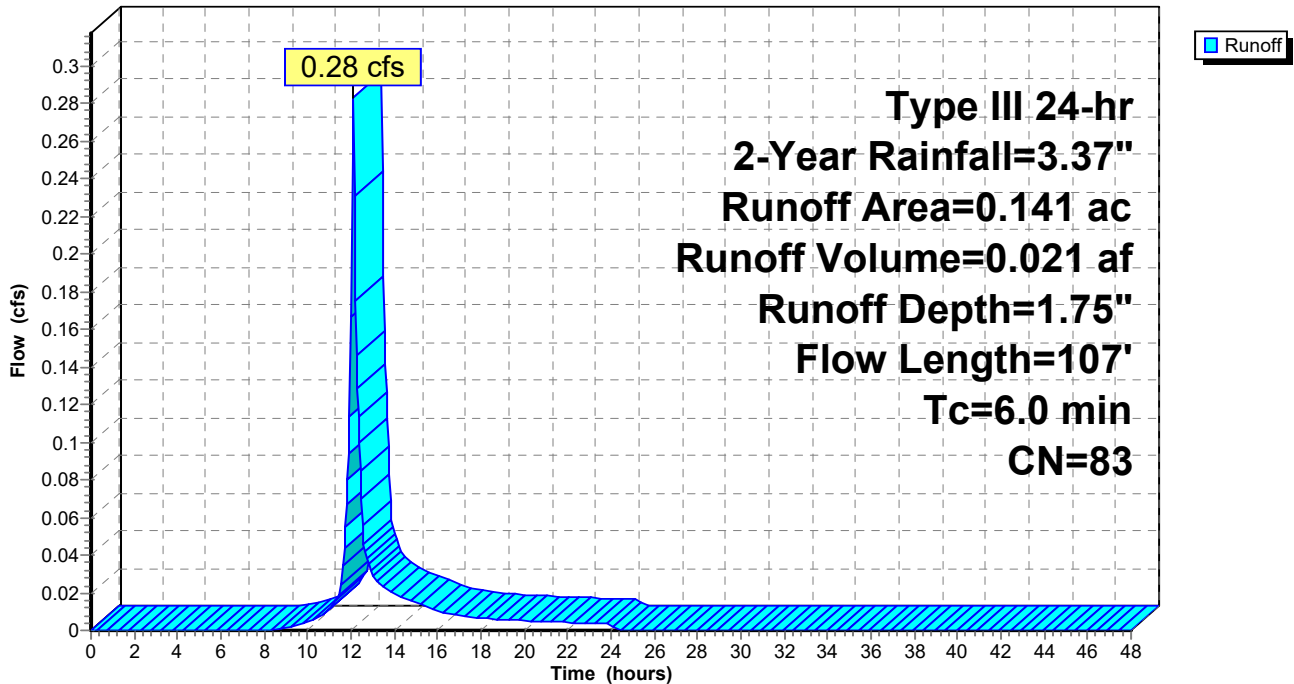
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.37"

Area (ac)	CN	Description
0.051	98	Water Surface, 0% imp, HSG C
0.090	74	>75% Grass cover, Good, HSG C
0.141	83	Weighted Average
0.141		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.3	57	0.1754	2.93		Shallow Concentrated Flow, Woods Short Grass Pasture Kv= 7.0 fps
4.5	107	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 21S: DA 2F

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.37"

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Summary for Subcatchment 22S: DA 2H

Runoff = 4.64 cfs @ 12.15 hrs, Volume= 0.383 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.37"

Area (ac)	CN	Description
* 0.431	98	Paved parking, HSG C, North
* 0.010	80	>75% Grass cover, Good, HSG D, North
* 0.313	74	>75% Grass cover, Good, HSG C, North
* 0.550	98	Paved parking, HSG C, South
* 0.356	74	>75% Grass cover, Good, HSG C, South
0.748	70	Woods, Good, HSG C
0.336	74	>75% Grass cover, Good, HSG C
2.744	82	Weighted Average
1.763		64.25% Pervious Area
0.981		35.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
1.7	190	0.1316	1.81		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	81	0.3333	4.04		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.7	355	0.0310	3.57		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
10.0	676	Total			

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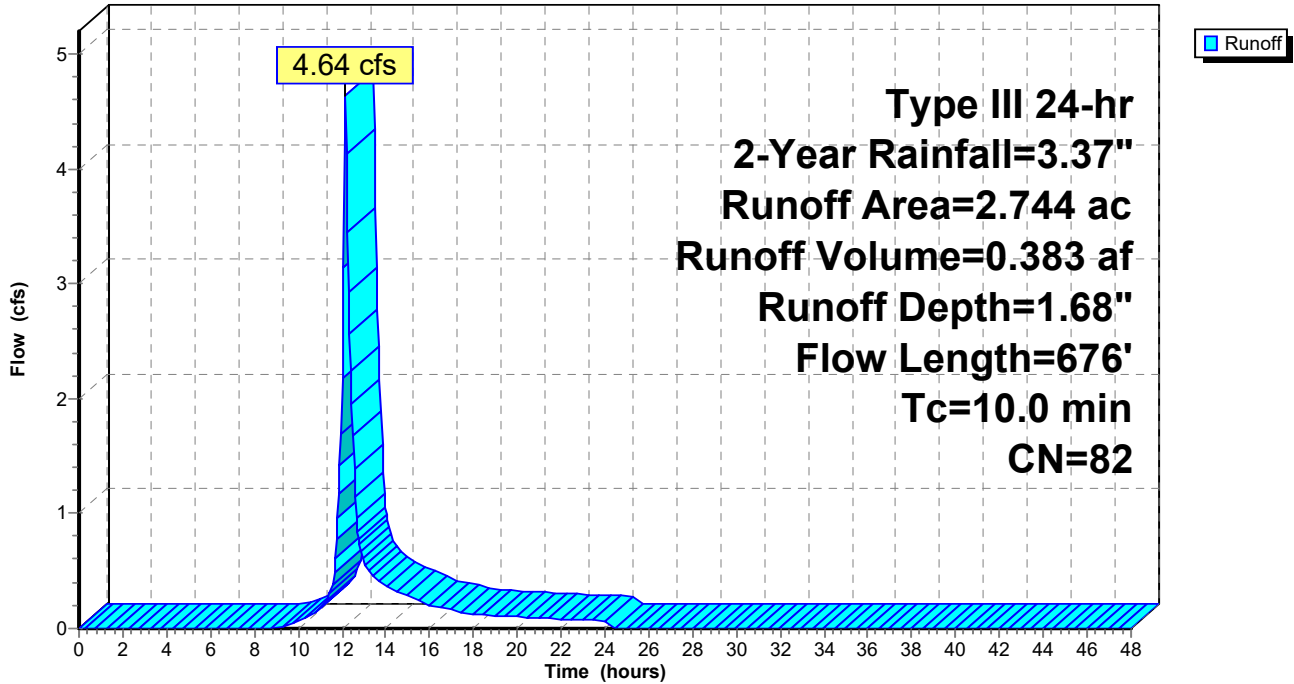
Type III 24-hr 2-Year Rainfall=3.37"

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Subcatchment 22S: DA 2H

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.37"

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Summary for Pond 15P: Apartments Phase II Stormwater Basin 2

Inflow Area = 3.277 ac, 30.06% Impervious, Inflow Depth = 1.54" for 2-Year event
 Inflow = 4.77 cfs @ 12.17 hrs, Volume= 0.421 af
 Outflow = 4.00 cfs @ 12.27 hrs, Volume= 0.342 af, Atten= 16%, Lag= 5.8 min
 Primary = 4.00 cfs @ 12.27 hrs, Volume= 0.342 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 567.57' @ 12.26 hrs Surf.Area= 2,143 sf Storage= 4,537 cf

Plug-Flow detention time= 119.1 min calculated for 0.342 af (81% of inflow)
 Center-of-Mass det. time= 42.4 min (887.3 - 845.0)

Volume	Invert	Avail.Storage	Storage Description
#1	562.00'	6 cf	3.00'W x 8.00'L x 2.50'H Sand Underdrain 60 cf Overall x 10.0% Voids
#2	564.50'	10,719 cf	Stormwater Basin (Irregular) Listed below
		10,725 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
564.50	4	8.2	0	0	4
564.75	257	68.5	24	24	372
565.00	1,193	160.0	167	191	2,036
566.00	1,533	172.5	1,359	1,551	2,406
568.00	2,277	197.6	3,786	5,336	3,233
570.00	3,128	222.7	5,383	10,719	4,172

Device	Routing	Invert	Outlet Devices
#1	Primary	562.00'	18.0" Round 18" HDPE L= 68.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 562.00' / 561.60' S= 0.0059 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	567.00'	36.0" W x 6.0" H Vert. 36" x 6" Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	568.00'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#4	Secondary	569.00'	8.0' long x 8.0' breadth Rip Rap Spillway 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#5	Device 1	562.00'	0.500 in/hr Sand Underdrain over Horizontal area from 562.00' - 564.50' Excluded Horizontal area = 24 sf Phase-In= 0.01'

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Type III 24-hr 2-Year Rainfall=3.37"

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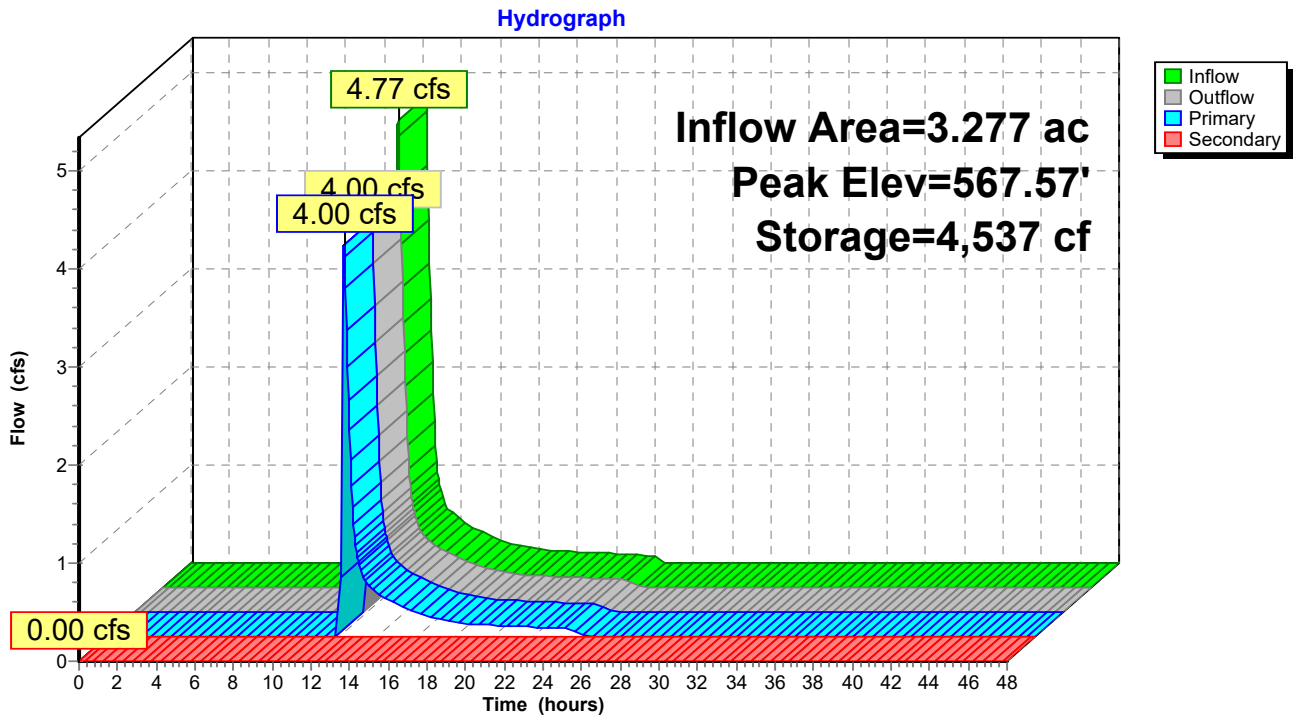
Primary OutFlow Max=3.95 cfs @ 12.27 hrs HW=567.57' TW=562.35' (Dynamic Tailwater)

- 1=18" HDPE (Passes 3.95 cfs of 18.10 cfs potential flow)
- 2=36" x 6" Orifice (Orifice Controls 3.95 cfs @ 2.63 fps)
- 3=Top of Frame (Controls 0.00 cfs)
- 5=Sand Underdrain (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=562.00' TW=0.00' (Dynamic Tailwater)

- 4=Rip Rap Spillway (Controls 0.00 cfs)

Pond 15P: Apartments Phase II Stormwater Basin 2



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Type III 24-hr 2-Year Rainfall=3.37"

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Summary for Pond 20P: Apartments Phase II Stormwater Basin 1

Inflow Area = 7.001 ac, 33.00% Impervious, Inflow Depth = 1.52" for 2-Year event
 Inflow = 9.31 cfs @ 12.21 hrs, Volume= 0.885 af
 Outflow = 2.12 cfs @ 12.78 hrs, Volume= 0.695 af, Atten= 77%, Lag= 34.3 min
 Primary = 2.12 cfs @ 12.78 hrs, Volume= 0.695 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 557.00' @ 12.78 hrs Surf.Area= 5,514 sf Storage= 15,826 cf

Plug-Flow detention time= 180.5 min calculated for 0.694 af (78% of inflow)
 Center-of-Mass det. time= 97.6 min (951.6 - 854.0)

Volume	Invert	Avail.Storage	Storage Description
#1	551.00'	4 cf	3.00'W x 8.00'L x 1.75'H Sand Underdrain 42 cf Overall x 10.0% Voids
#2	552.75'	40,883 cf	Stormwater Basin (Irregular) Listed below (Recalc)
#3	556.00'	424 cf	36.0" Round Pipe Storage-Impervious L= 60.0' S= 0.0083 ' /'
		41,312 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
552.75	120	43.3	0	0	120
553.00	865	110.3	109	109	939
553.25	1,552	155.7	298	407	1,901
553.50	2,135	207.8	459	866	3,409
553.75	2,928	261.6	630	1,496	5,419
554.00	3,512	310.5	804	2,300	7,646
555.00	4,145	323.0	3,824	6,124	8,352
556.00	4,804	335.6	4,470	10,595	9,090
557.00	5,490	348.1	5,143	15,738	9,851
558.00	6,569	422.7	6,021	21,759	14,443
559.00	7,426	435.3	6,993	28,752	15,404
560.00	8,310	447.8	7,864	36,616	16,387
560.50	8,761	454.1	4,267	40,883	16,893

Device	Routing	Invert	Outlet Devices
#1	Primary	551.00'	18.0" Round 18" HDPE L= 152.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 551.00' / 549.00' S= 0.0132 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	555.50'	6.0" Vert. 6" Orifices (2) X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	557.30'	48.0" W x 7.0" H Vert. 48" x 7" Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	558.75'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#5	Secondary	559.75'	8.0' long x 8.0' breadth Rip Rap Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

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#6	Device 1	551.00'	2.50	3.00	3.50	4.00	4.50	5.00	5.50			
			Coef. (English)	2.43	2.54	2.70	2.69	2.68	2.68	2.66	2.64	2.64
				2.64	2.65	2.65	2.66	2.66	2.68	2.70	2.74	
			0.500 in/hr Sand Underdrain over Horizontal area from 551.00' - 552.75'									
			Excluded Horizontal area = 24 sf Phase-In= 0.01'									

Primary OutFlow Max=2.11 cfs @ 12.78 hrs HW=557.00' TW=0.00' (Dynamic Tailwater)

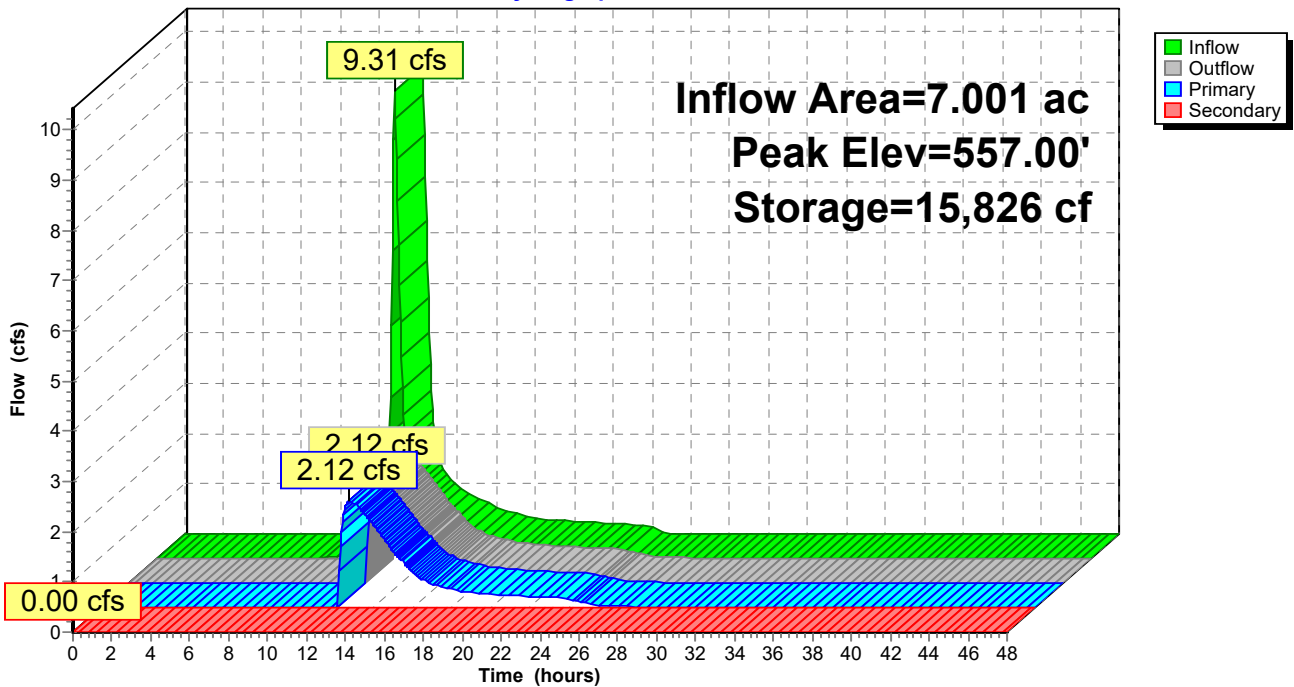
- 1=18" HDPE (Passes 2.11 cfs of 17.48 cfs potential flow)
- 2=6" Orifices (2) (Orifice Controls 2.11 cfs @ 5.38 fps)
- 3=48" x 7" Orifice (Controls 0.00 cfs)
- 4=Top of Frame (Controls 0.00 cfs)
- 6=Sand Underdrain (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=551.00' TW=0.00' (Dynamic Tailwater)

- 5=Rip Rap Spillway (Controls 0.00 cfs)

Pond 20P: Apartments Phase II Stormwater Basin 1

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.37"

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Summary for Pond 21P: Drain

Inflow Area = 3.813 ac, 34.85% Impervious, Inflow Depth = 1.39" for 2-Year event
 Inflow = 4.88 cfs @ 12.25 hrs, Volume= 0.442 af
 Outflow = 4.88 cfs @ 12.25 hrs, Volume= 0.442 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.88 cfs @ 12.25 hrs, Volume= 0.442 af

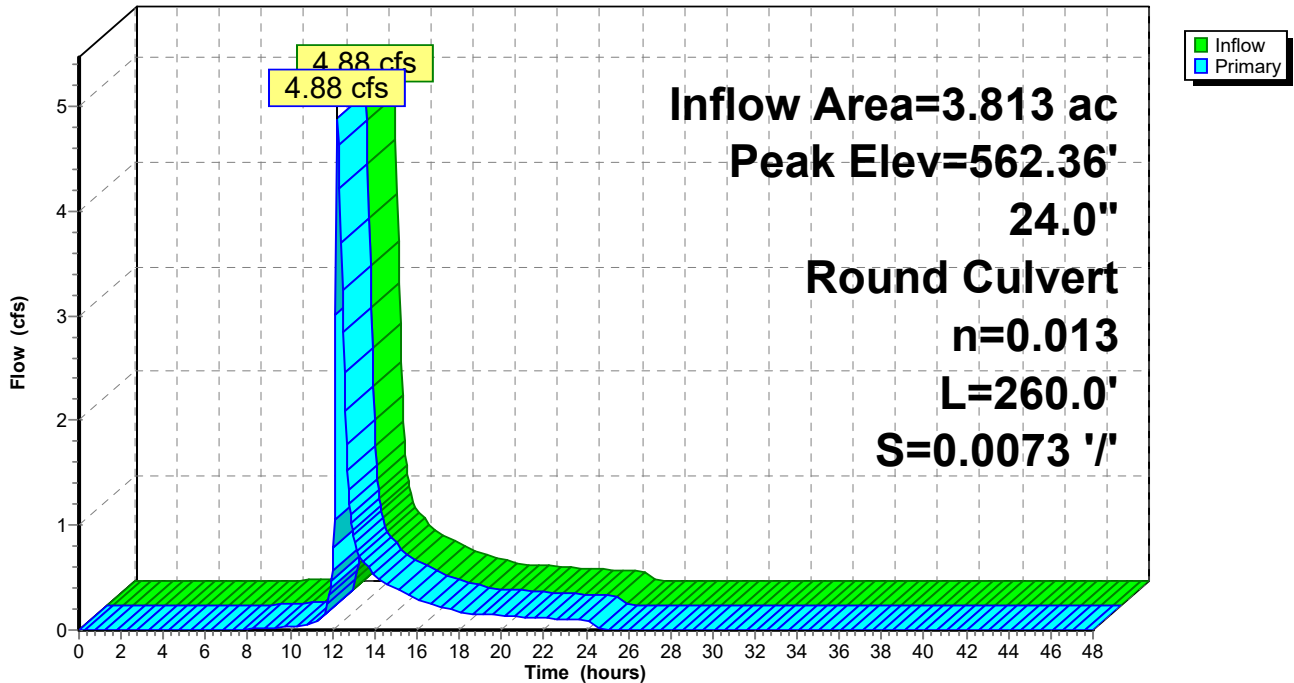
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 562.36' @ 12.25 hrs
 Flood Elev= 565.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	561.40'	24.0" Round Culvert L= 260.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 561.40' / 559.50' S= 0.0073 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=4.88 cfs @ 12.25 hrs HW=562.36' TW=555.89' (Dynamic Tailwater)
 ↳ **1=Culvert** (Barrel Controls 4.88 cfs @ 4.81 fps)

Pond 21P: Drain

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.37"

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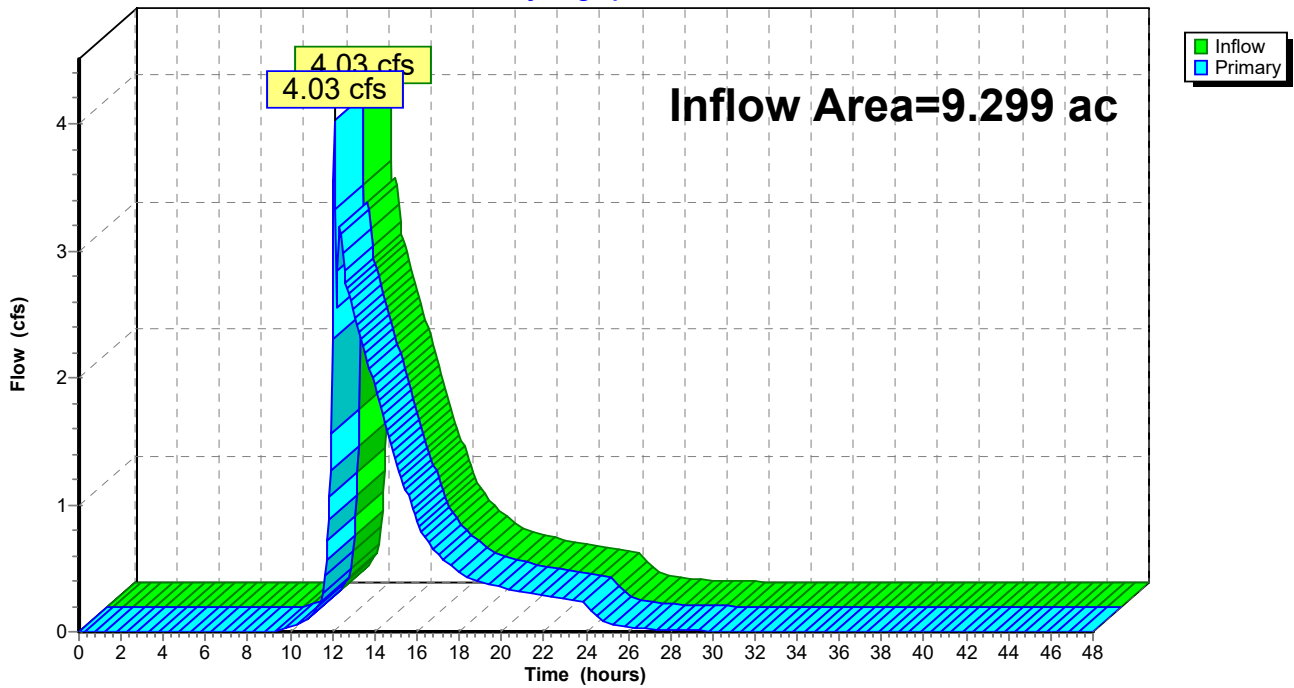
Summary for Link 20L: Off-Site

Inflow Area = 9.299 ac, 30.95% Impervious, Inflow Depth > 1.28" for 2-Year event
Inflow = 4.03 cfs @ 12.10 hrs, Volume= 0.989 af
Primary = 4.03 cfs @ 12.10 hrs, Volume= 0.989 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 20L: Off-Site

Hydrograph



Proposed - Apartments Only

Type III 24-hr 10-Year Rainfall=5.18"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 15S: DA 2E Runoff Area=3.136 ac 31.41% Impervious Runoff Depth=3.05"
Flow Length=671' Tc=12.0 min CN=80 Runoff=9.16 cfs 0.797 af

Subcatchment 16S: DA 2G Runoff Area=0.444 ac 0.00% Impervious Runoff Depth=3.14"
Flow Length=110' Tc=6.0 min CN=81 Runoff=1.60 cfs 0.116 af

Subcatchment 17S: DA 2J Runoff Area=2.298 ac 24.72% Impervious Runoff Depth=3.05"
Flow Length=240' Tc=6.0 min CN=80 Runoff=8.05 cfs 0.584 af

Subcatchment 18S: DA 2I Runoff Area=0.536 ac 64.18% Impervious Runoff Depth=3.94"
Flow Length=230' Slope=0.0200 '/' Tc=11.0 min CN=89 Runoff=2.02 cfs 0.176 af

Subcatchment 21S: DA 2F Runoff Area=0.141 ac 0.00% Impervious Runoff Depth=3.34"
Flow Length=107' Tc=6.0 min CN=83 Runoff=0.54 cfs 0.039 af

Subcatchment 22S: DA 2H Runoff Area=2.744 ac 35.75% Impervious Runoff Depth=3.24"
Flow Length=676' Tc=10.0 min CN=82 Runoff=8.97 cfs 0.741 af

Pond 15P: Apartments Phase II Stormwater Peak Elev=568.14' Storage=5,727 cf Inflow=9.55 cfs 0.836 af
Primary=9.25 cfs 0.757 af Secondary=0.00 cfs 0.000 af Outflow=9.25 cfs 0.757 af

Pond 20P: Apartments Phase II Peak Elev=558.31' Storage=24,123 cf Inflow=20.08 cfs 1.791 af
Primary=12.45 cfs 1.601 af Secondary=0.00 cfs 0.000 af Outflow=12.45 cfs 1.601 af

Pond 21P: Drain Peak Elev=562.96' Inflow=11.05 cfs 0.933 af
24.0" Round Culvert n=0.013 L=260.0' S=0.0073 '/' Outflow=11.05 cfs 0.933 af

Link 20L: Off-Site Inflow=15.67 cfs 2.185 af
Primary=15.67 cfs 2.185 af

Total Runoff Area = 9.299 ac Runoff Volume = 2.454 af Average Runoff Depth = 3.17"
69.05% Pervious = 6.421 ac 30.95% Impervious = 2.878 ac

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Summary for Subcatchment 15S: DA 2E

Runoff = 9.16 cfs @ 12.17 hrs, Volume= 0.797 af, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.18"

Area (ac)	CN	Description
* 0.985	98	Paved parking, HSG C, South
* 0.455	74	>75% Grass cover, Good, HSG C, South
1.030	70	Woods, Good, HSG C
0.666	74	>75% Grass cover, Good, HSG C
3.136	80	Weighted Average
2.151		68.59% Pervious Area
0.985		31.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
3.3	417	0.1799	2.12		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	40	0.1000	2.21		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.7	164	0.0421	4.17		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
12.0	671	Total			

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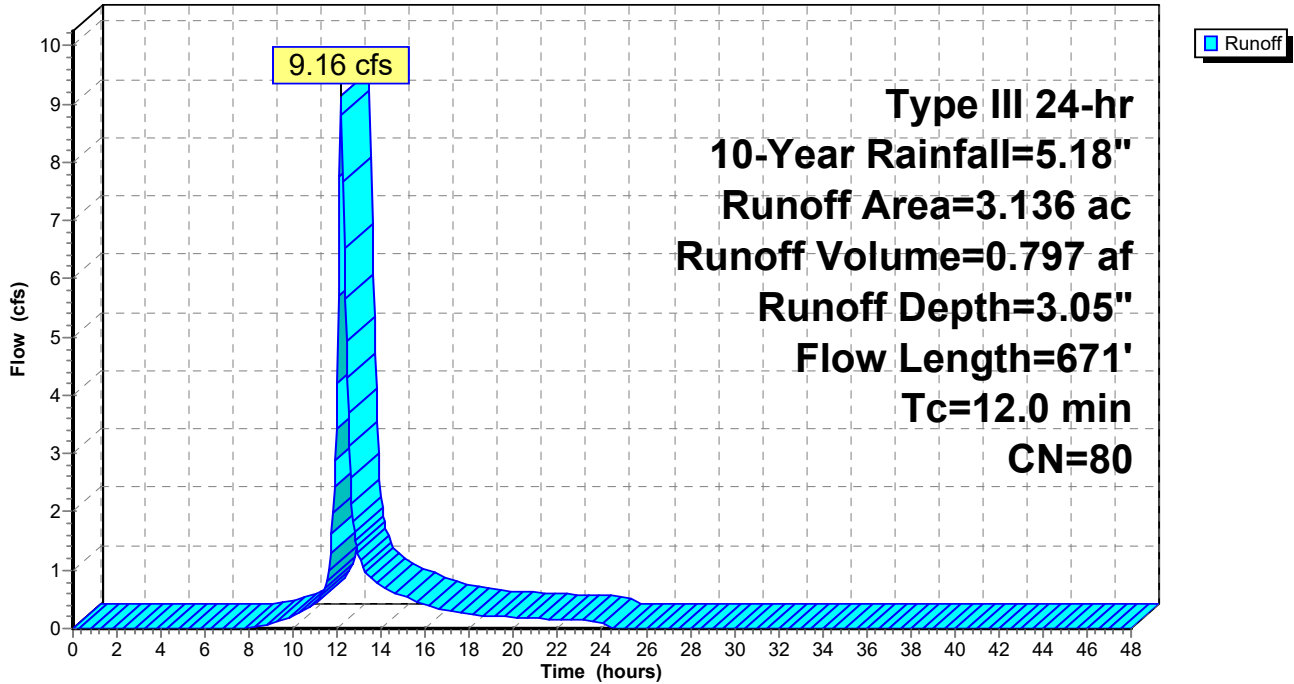
Type III 24-hr 10-Year Rainfall=5.18"

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Subcatchment 15S: DA 2E

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Summary for Subcatchment 16S: DA 2G

Runoff = 1.60 cfs @ 12.09 hrs, Volume= 0.116 af, Depth= 3.14"

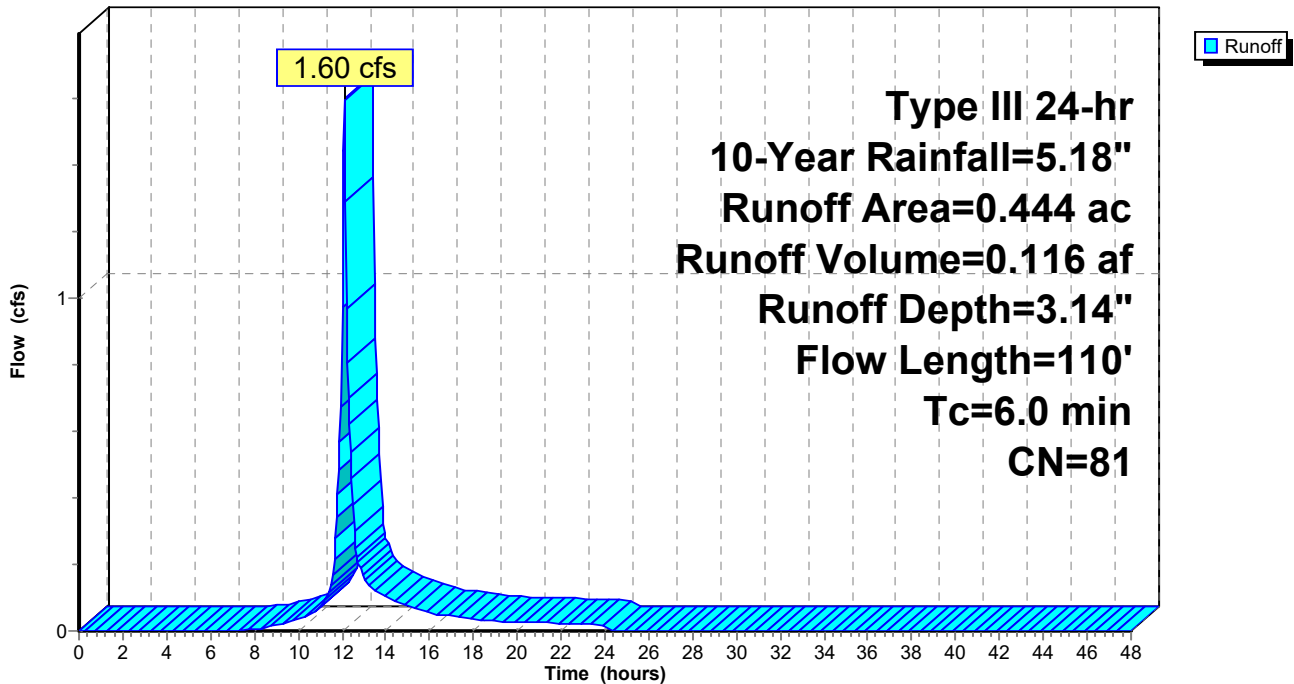
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.103	98	Water Surface, 0% imp, HSG C
0.017	80	>75% Grass cover, Good, HSG D
0.229	74	>75% Grass cover, Good, HSG C
0.079	80	>75% Grass cover, Good, HSG D
0.016	74	>75% Grass cover, Good, HSG C
0.444	81	Weighted Average
0.444		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.2	60	0.3500	4.14		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
5.7	110	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 16S: DA 2G

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.18"

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Summary for Subcatchment 17S: DA 2J

Runoff = 8.05 cfs @ 12.09 hrs, Volume= 0.584 af, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.412	80	>75% Grass cover, Good, HSG D
0.061	98	Paved parking, HSG C
0.032	74	>75% Grass cover, Good, HSG C
0.140	98	Paved parking, HSG C
0.680	74	>75% Grass cover, Good, HSG C
* 0.184	98	Two single Family Houses and Paved Driveways
0.183	98	Paved parking, HSG C
0.577	70	Woods, Good, HSG C
0.029	74	>75% Grass cover, Good, HSG C
2.298	80	Weighted Average
1.730		75.28% Pervious Area
0.568		24.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	24	0.1000	0.17		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.3	26	0.0500	1.56		Sheet Flow, Paved/Gravel Smooth surfaces n= 0.011 P2= 3.37"
0.3	85	0.0824	4.62		Shallow Concentrated Flow, Gravel Unpaved Kv= 16.1 fps
0.7	105	0.1333	2.56		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
3.6	240	Total, Increased to minimum Tc = 6.0 min			

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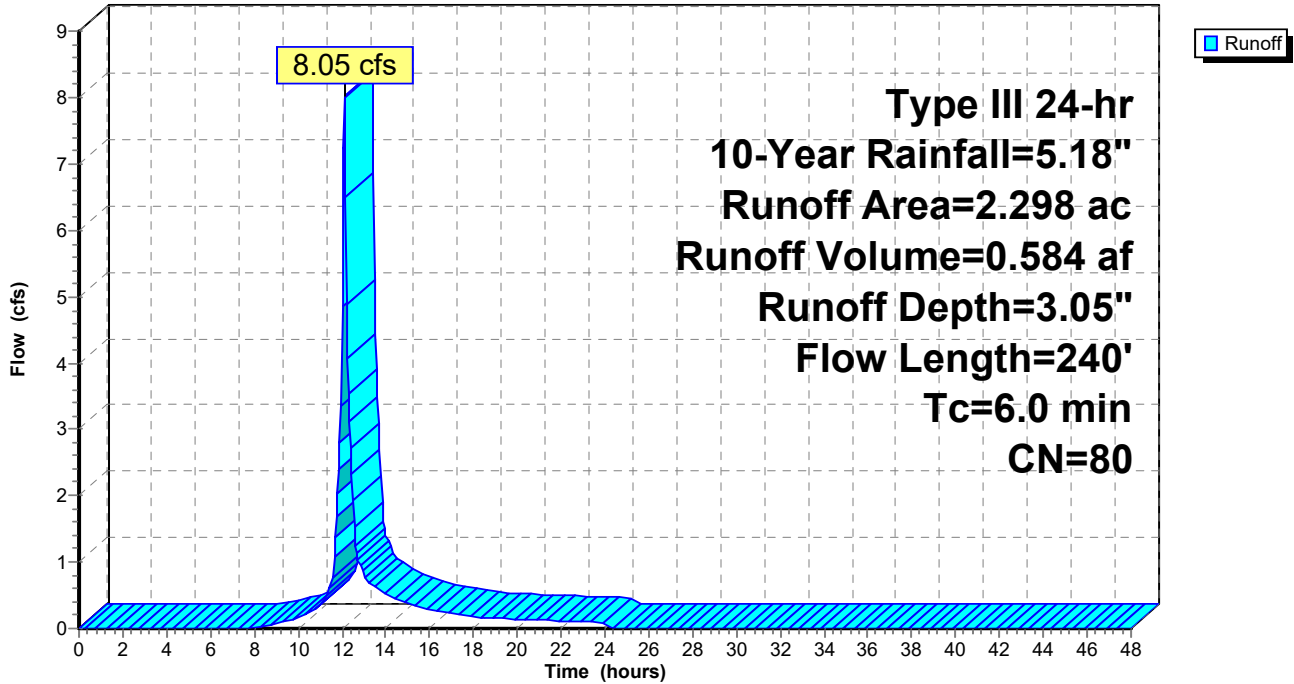
Type III 24-hr 10-Year Rainfall=5.18"

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Subcatchment 17S: DA 2J

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Summary for Subcatchment 18S: DA 2I

Runoff = 2.02 cfs @ 12.15 hrs, Volume= 0.176 af, Depth= 3.94"

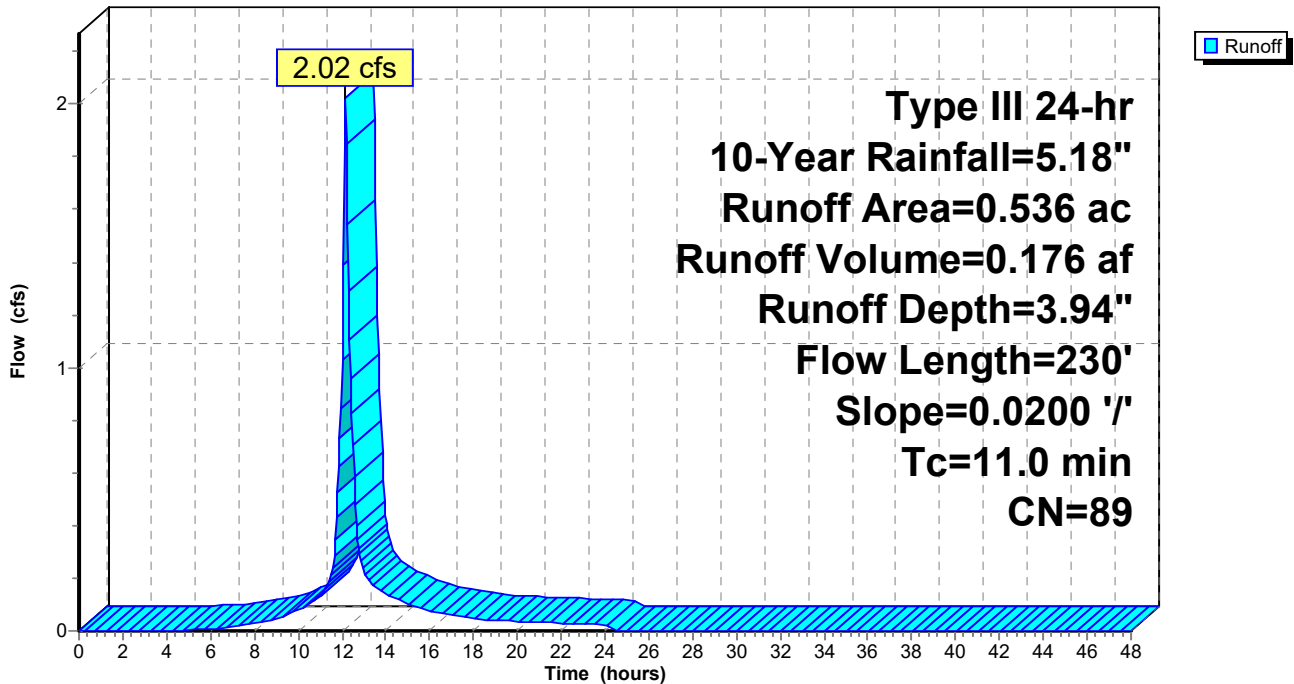
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.18"

Area (ac)	CN	Description
* 0.344	98	Paved parking, HSG C, North
* 0.192	74	>75% Grass cover, Good, HSG C, North
0.536	89	Weighted Average
0.192		35.82% Pervious Area
0.344		64.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
3.0	180	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
11.0	230	Total			

Subcatchment 18S: DA 2I

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.18"

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Summary for Subcatchment 21S: DA 2F

Runoff = 0.54 cfs @ 12.09 hrs, Volume= 0.039 af, Depth= 3.34"

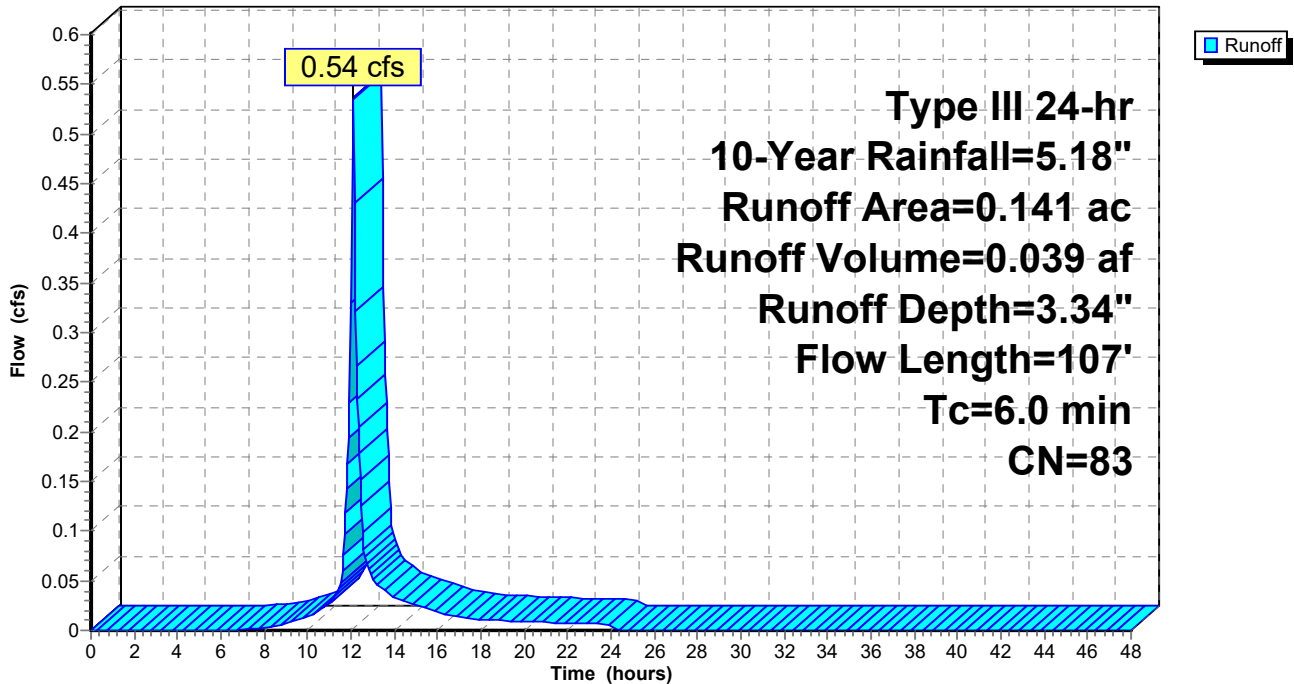
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.18"

Area (ac)	CN	Description
0.051	98	Water Surface, 0% imp, HSG C
0.090	74	>75% Grass cover, Good, HSG C
0.141	83	Weighted Average
0.141		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description	
4.2	50	0.1000	0.20		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"	
0.3	57	0.1754	2.93		Shallow Concentrated Flow, Woods Short Grass Pasture Kv= 7.0 fps	
4.5	107	Total, Increased to minimum Tc = 6.0 min				

Subcatchment 21S: DA 2F

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.18"

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Summary for Subcatchment 22S: DA 2H

Runoff = 8.97 cfs @ 12.14 hrs, Volume= 0.741 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=5.18"

Area (ac)	CN	Description
* 0.431	98	Paved parking, HSG C, North
* 0.010	80	>75% Grass cover, Good, HSG D, North
* 0.313	74	>75% Grass cover, Good, HSG C, North
* 0.550	98	Paved parking, HSG C, South
* 0.356	74	>75% Grass cover, Good, HSG C, South
0.748	70	Woods, Good, HSG C
0.336	74	>75% Grass cover, Good, HSG C
2.744	82	Weighted Average
1.763		64.25% Pervious Area
0.981		35.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
1.7	190	0.1316	1.81		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	81	0.3333	4.04		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.7	355	0.0310	3.57		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
10.0	676	Total			

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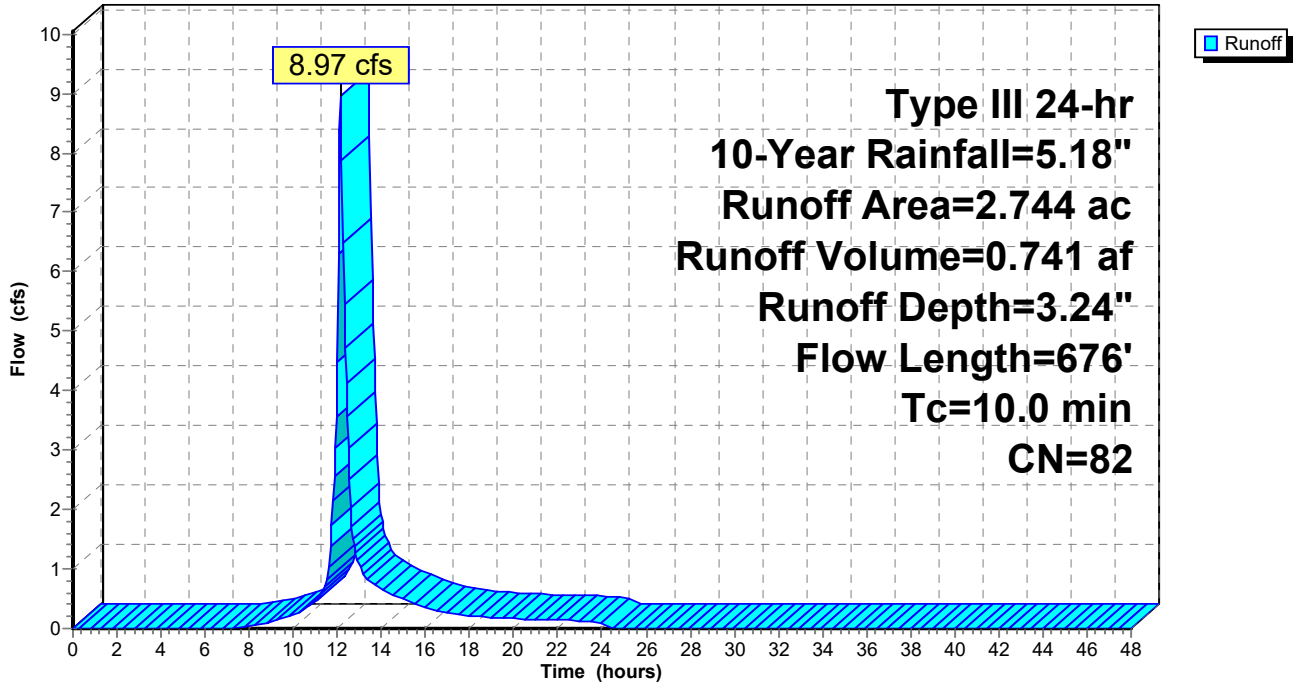
Type III 24-hr 10-Year Rainfall=5.18"

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Subcatchment 22S: DA 2H

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Summary for Pond 15P: Apartments Phase II Stormwater Basin 2

Inflow Area = 3.277 ac, 30.06% Impervious, Inflow Depth = 3.06" for 10-Year event
 Inflow = 9.55 cfs @ 12.16 hrs, Volume= 0.836 af
 Outflow = 9.25 cfs @ 12.21 hrs, Volume= 0.757 af, Atten= 3%, Lag= 2.9 min
 Primary = 9.25 cfs @ 12.21 hrs, Volume= 0.757 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 568.14' @ 12.21 hrs Surf.Area= 2,362 sf Storage= 5,727 cf

Plug-Flow detention time= 72.9 min calculated for 0.756 af (90% of inflow)
 Center-of-Mass det. time= 26.9 min (852.0 - 825.2)

Volume	Invert	Avail.Storage	Storage Description
#1	562.00'	6 cf	3.00'W x 8.00'L x 2.50'H Sand Underdrain 60 cf Overall x 10.0% Voids
#2	564.50'	10,719 cf	Stormwater Basin (Irregular) Listed below
		10,725 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
564.50	4	8.2	0	0	4
564.75	257	68.5	24	24	372
565.00	1,193	160.0	167	191	2,036
566.00	1,533	172.5	1,359	1,551	2,406
568.00	2,277	197.6	3,786	5,336	3,233
570.00	3,128	222.7	5,383	10,719	4,172

Device	Routing	Invert	Outlet Devices
#1	Primary	562.00'	18.0" Round 18" HDPE L= 68.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 562.00' / 561.60' S= 0.0059 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	567.00'	36.0" W x 6.0" H Vert. 36" x 6" Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	568.00'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#4	Secondary	569.00'	8.0' long x 8.0' breadth Rip Rap Spillway 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#5	Device 1	562.00'	0.500 in/hr Sand Underdrain over Horizontal area from 562.00' - 564.50' Excluded Horizontal area = 24 sf Phase-In= 0.01'

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Type III 24-hr 10-Year Rainfall=5.18"

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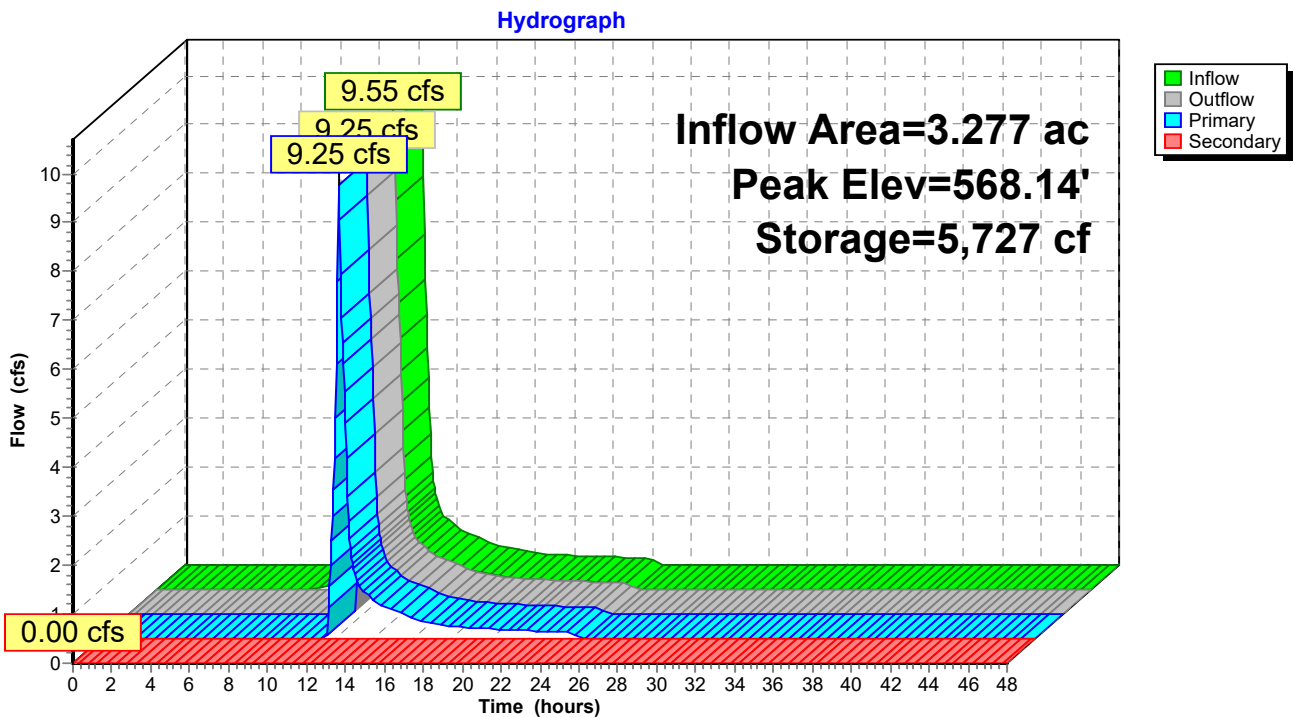
Primary OutFlow Max=9.01 cfs @ 12.21 hrs HW=568.13' TW=562.93' (Dynamic Tailwater)

- 1=18" HDPE (Passes 9.01 cfs of 19.21 cfs potential flow)
- 2=36" x 6" Orifice (Orifice Controls 6.77 cfs @ 4.51 fps)
- 3=Top of Frame (Weir Controls 2.25 cfs @ 1.20 fps)
- 5=Sand Underdrain (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=562.00' TW=0.00' (Dynamic Tailwater)

- 4=Rip Rap Spillway (Controls 0.00 cfs)

Pond 15P: Apartments Phase II Stormwater Basin 2



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Type III 24-hr 10-Year Rainfall=5.18"

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Summary for Pond 20P: Apartments Phase II Stormwater Basin 1

Inflow Area = 7.001 ac, 33.00% Impervious, Inflow Depth = 3.07" for 10-Year event
 Inflow = 20.08 cfs @ 12.18 hrs, Volume= 1.791 af
 Outflow = 12.45 cfs @ 12.37 hrs, Volume= 1.601 af, Atten= 38%, Lag= 11.5 min
 Primary = 12.45 cfs @ 12.37 hrs, Volume= 1.601 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 558.31' @ 12.37 hrs Surf.Area= 6,850 sf Storage= 24,123 cf

Plug-Flow detention time= 116.2 min calculated for 1.601 af (89% of inflow)
 Center-of-Mass det. time= 65.2 min (895.8 - 830.6)

Volume	Invert	Avail.Storage	Storage Description
#1	551.00'	4 cf	3.00'W x 8.00'L x 1.75'H Sand Underdrain 42 cf Overall x 10.0% Voids
#2	552.75'	40,883 cf	Stormwater Basin (Irregular) Listed below (Recalc)
#3	556.00'	424 cf	36.0" Round Pipe Storage-Impervious L= 60.0' S= 0.0083 ' /'
		41,312 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
552.75	120	43.3	0	0	120
553.00	865	110.3	109	109	939
553.25	1,552	155.7	298	407	1,901
553.50	2,135	207.8	459	866	3,409
553.75	2,928	261.6	630	1,496	5,419
554.00	3,512	310.5	804	2,300	7,646
555.00	4,145	323.0	3,824	6,124	8,352
556.00	4,804	335.6	4,470	10,595	9,090
557.00	5,490	348.1	5,143	15,738	9,851
558.00	6,569	422.7	6,021	21,759	14,443
559.00	7,426	435.3	6,993	28,752	15,404
560.00	8,310	447.8	7,864	36,616	16,387
560.50	8,761	454.1	4,267	40,883	16,893

Device	Routing	Invert	Outlet Devices
#1	Primary	551.00'	18.0" Round 18" HDPE L= 152.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 551.00' / 549.00' S= 0.0132 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	555.50'	6.0" Vert. 6" Orifices (2) X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	557.30'	48.0" W x 7.0" H Vert. 48" x 7" Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	558.75'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#5	Secondary	559.75'	8.0' long x 8.0' breadth Rip Rap Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

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#6	Device 1	551.00'	2.50	3.00	3.50	4.00	4.50	5.00	5.50			
			Coef. (English)	2.43	2.54	2.70	2.69	2.68	2.68	2.66	2.64	2.64
				2.64	2.65	2.65	2.66	2.66	2.68	2.70	2.74	
				0.500 in/hr Sand Underdrain over Horizontal area from 551.00' - 552.75'								
				Excluded Horizontal area = 24 sf Phase-In= 0.01'								

Primary OutFlow Max=12.41 cfs @ 12.37 hrs HW=558.30' TW=0.00' (Dynamic Tailwater)

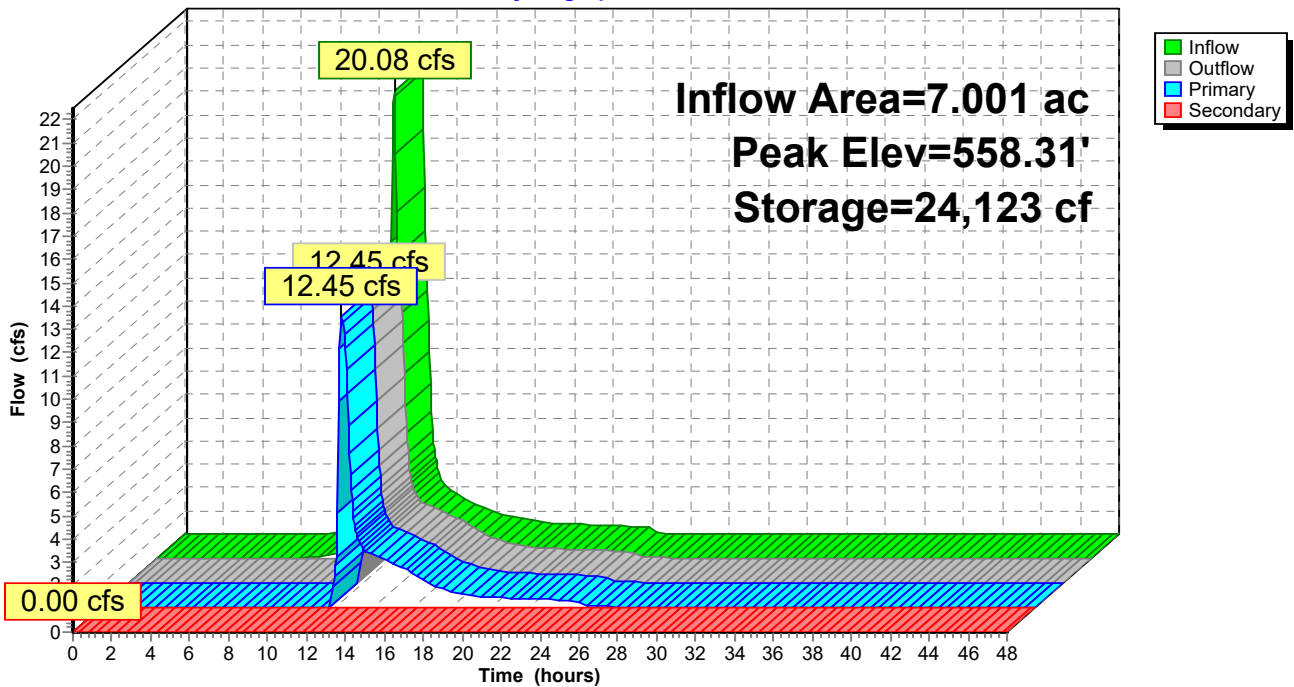
- 1=18" HDPE (Passes 12.41 cfs of 19.15 cfs potential flow)
- 2=6" Orifices (2) (Orifice Controls 3.02 cfs @ 7.69 fps)
- 3=48" x 7" Orifice (Orifice Controls 9.39 cfs @ 4.02 fps)
- 4=Top of Frame (Controls 0.00 cfs)
- 6=Sand Underdrain (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=551.00' TW=0.00' (Dynamic Tailwater)

- 5=Rip Rap Spillway (Controls 0.00 cfs)

Pond 20P: Apartments Phase II Stormwater Basin 1

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.18"

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Summary for Pond 21P: Drain

Inflow Area = 3.813 ac, 34.85% Impervious, Inflow Depth = 2.94" for 10-Year event
 Inflow = 11.05 cfs @ 12.21 hrs, Volume= 0.933 af
 Outflow = 11.05 cfs @ 12.21 hrs, Volume= 0.933 af, Atten= 0%, Lag= 0.0 min
 Primary = 11.05 cfs @ 12.21 hrs, Volume= 0.933 af

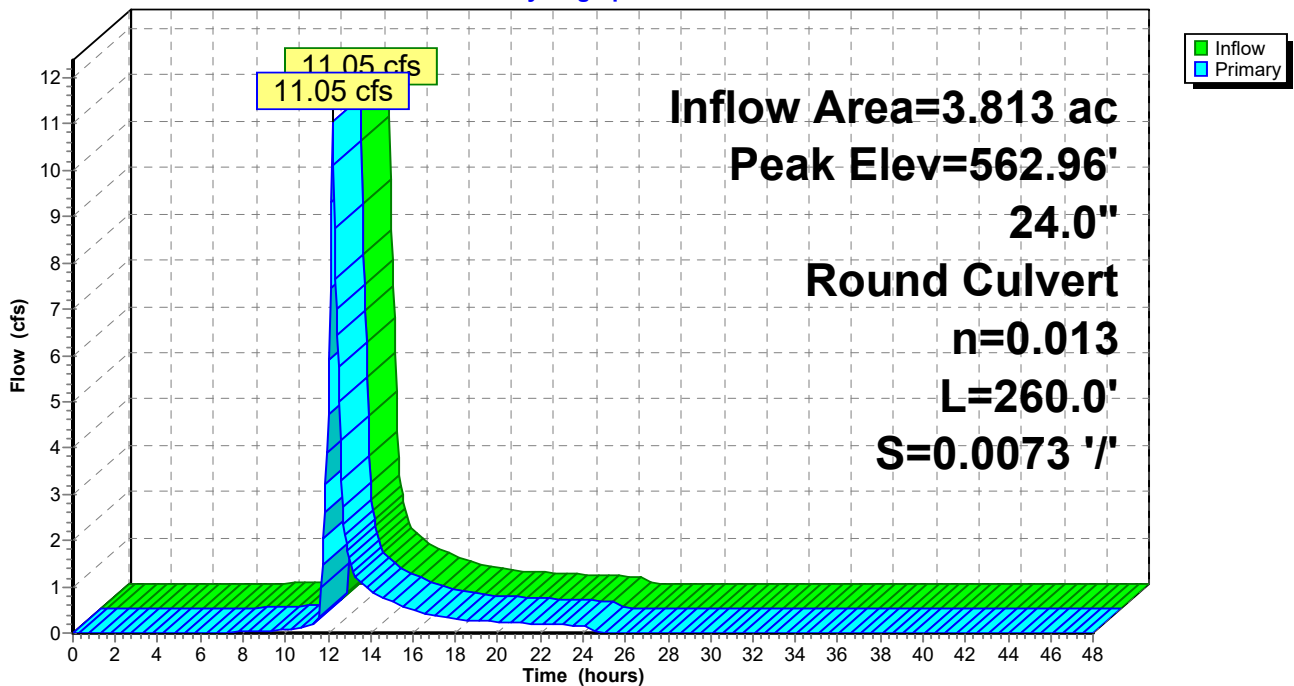
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 562.96' @ 12.21 hrs
 Flood Elev= 565.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	561.40'	24.0" Round Culvert L= 260.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 561.40' / 559.50' S= 0.0073 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=10.89 cfs @ 12.21 hrs HW=562.94' TW=557.94' (Dynamic Tailwater)
 ←1=Culvert (Barrel Controls 10.89 cfs @ 5.79 fps)

Pond 21P: Drain

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.18"

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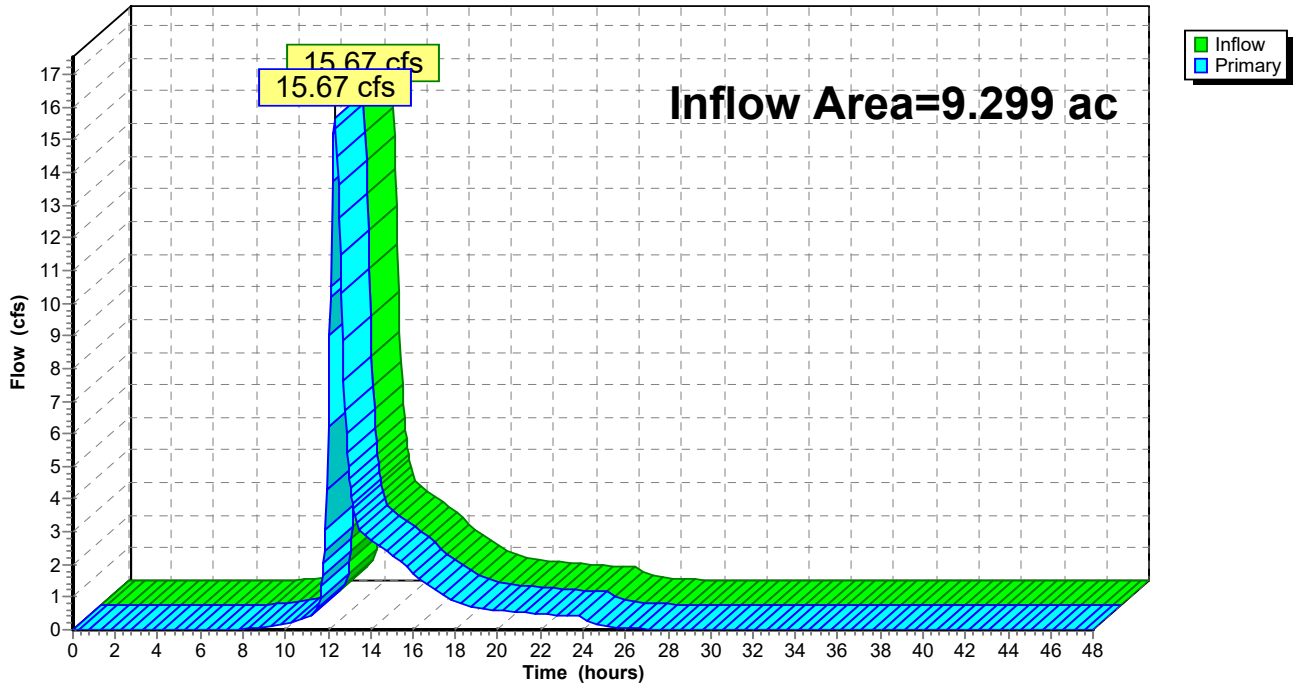
Summary for Link 20L: Off-Site

Inflow Area = 9.299 ac, 30.95% Impervious, Inflow Depth = 2.82" for 10-Year event
Inflow = 15.67 cfs @ 12.32 hrs, Volume= 2.185 af
Primary = 15.67 cfs @ 12.32 hrs, Volume= 2.185 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 20L: Off-Site

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.30"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 15S: DA 2E Runoff Area=3.136 ac 31.41% Impervious Runoff Depth=4.05"
Flow Length=671' Tc=12.0 min CN=80 Runoff=12.12 cfs 1.059 af

Subcatchment 16S: DA 2G Runoff Area=0.444 ac 0.00% Impervious Runoff Depth=4.16"
Flow Length=110' Tc=6.0 min CN=81 Runoff=2.10 cfs 0.154 af

Subcatchment 17S: DA 2J Runoff Area=2.298 ac 24.72% Impervious Runoff Depth=4.05"
Flow Length=240' Tc=6.0 min CN=80 Runoff=10.63 cfs 0.776 af

Subcatchment 18S: DA 2I Runoff Area=0.536 ac 64.18% Impervious Runoff Depth=5.03"
Flow Length=230' Slope=0.0200 '/' Tc=11.0 min CN=89 Runoff=2.55 cfs 0.225 af

Subcatchment 21S: DA 2F Runoff Area=0.141 ac 0.00% Impervious Runoff Depth=4.37"
Flow Length=107' Tc=6.0 min CN=83 Runoff=0.70 cfs 0.051 af

Subcatchment 22S: DA 2H Runoff Area=2.744 ac 35.75% Impervious Runoff Depth=4.26"
Flow Length=676' Tc=10.0 min CN=82 Runoff=11.72 cfs 0.975 af

Pond 15P: Apartments Phase II Stormwater Peak Elev=568.24' Storage=5,977 cf Inflow=12.63 cfs 1.111 af
Primary=12.39 cfs 1.031 af Secondary=0.00 cfs 0.000 af Outflow=12.39 cfs 1.031 af

Pond 20P: Apartments Phase II Peak Elev=558.93' Storage=28,628 cf Inflow=27.96 cfs 2.385 af
Primary=19.80 cfs 2.195 af Secondary=0.00 cfs 0.000 af Outflow=19.80 cfs 2.195 af

Pond 21P: Drain Peak Elev=563.34' Inflow=14.81 cfs 1.256 af
24.0" Round Culvert n=0.013 L=260.0' S=0.0073 '/' Outflow=14.81 cfs 1.256 af

Link 20L: Off-Site Inflow=24.46 cfs 2.971 af
Primary=24.46 cfs 2.971 af

Total Runoff Area = 9.299 ac Runoff Volume = 3.240 af Average Runoff Depth = 4.18"
69.05% Pervious = 6.421 ac 30.95% Impervious = 2.878 ac

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Summary for Subcatchment 15S: DA 2E

Runoff = 12.12 cfs @ 12.17 hrs, Volume= 1.059 af, Depth= 4.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.30"

Area (ac)	CN	Description
* 0.985	98	Paved parking, HSG C, South
* 0.455	74	>75% Grass cover, Good, HSG C, South
1.030	70	Woods, Good, HSG C
0.666	74	>75% Grass cover, Good, HSG C
3.136	80	Weighted Average
2.151		68.59% Pervious Area
0.985		31.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
3.3	417	0.1799	2.12		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	40	0.1000	2.21		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.7	164	0.0421	4.17		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
12.0	671	Total			

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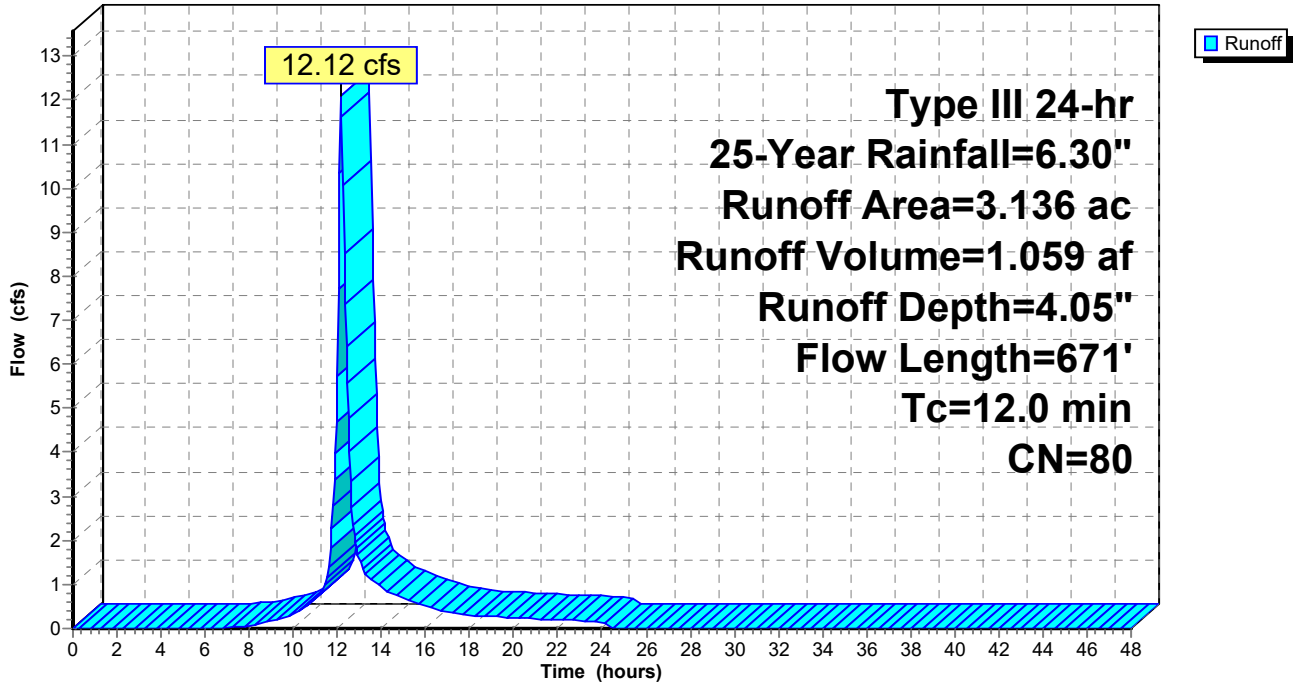
Type III 24-hr 25-Year Rainfall=6.30"

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Subcatchment 15S: DA 2E

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Summary for Subcatchment 16S: DA 2G

Runoff = 2.10 cfs @ 12.09 hrs, Volume= 0.154 af, Depth= 4.16"

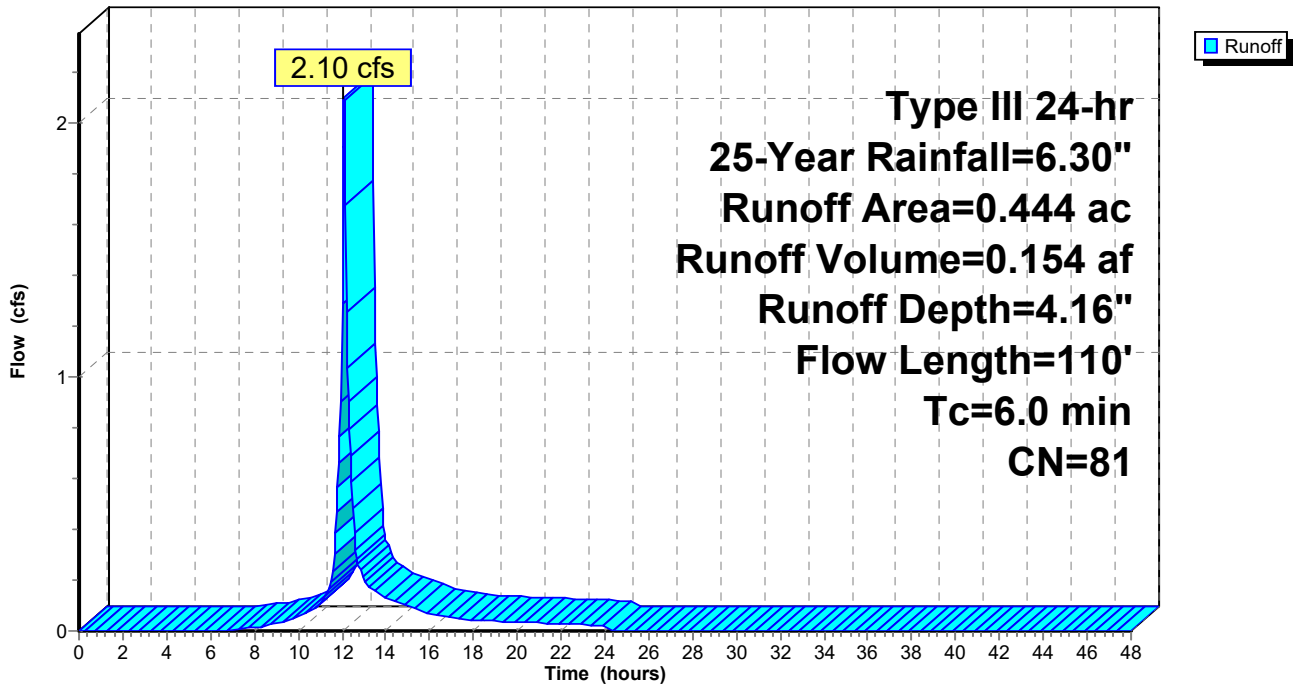
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.30"

Area (ac)	CN	Description
0.103	98	Water Surface, 0% imp, HSG C
0.017	80	>75% Grass cover, Good, HSG D
0.229	74	>75% Grass cover, Good, HSG C
0.079	80	>75% Grass cover, Good, HSG D
0.016	74	>75% Grass cover, Good, HSG C
0.444	81	Weighted Average
0.444		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.2	60	0.3500	4.14		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
5.7	110	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 16S: DA 2G

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.30"

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Summary for Subcatchment 17S: DA 2J

Runoff = 10.63 cfs @ 12.09 hrs, Volume= 0.776 af, Depth= 4.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.30"

Area (ac)	CN	Description
0.412	80	>75% Grass cover, Good, HSG D
0.061	98	Paved parking, HSG C
0.032	74	>75% Grass cover, Good, HSG C
0.140	98	Paved parking, HSG C
0.680	74	>75% Grass cover, Good, HSG C
* 0.184	98	Two single Family Houses and Paved Driveways
0.183	98	Paved parking, HSG C
0.577	70	Woods, Good, HSG C
0.029	74	>75% Grass cover, Good, HSG C
2.298	80	Weighted Average
1.730		75.28% Pervious Area
0.568		24.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	24	0.1000	0.17		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.3	26	0.0500	1.56		Sheet Flow, Paved/Gravel Smooth surfaces n= 0.011 P2= 3.37"
0.3	85	0.0824	4.62		Shallow Concentrated Flow, Gravel Unpaved Kv= 16.1 fps
0.7	105	0.1333	2.56		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
3.6	240	Total, Increased to minimum Tc = 6.0 min			

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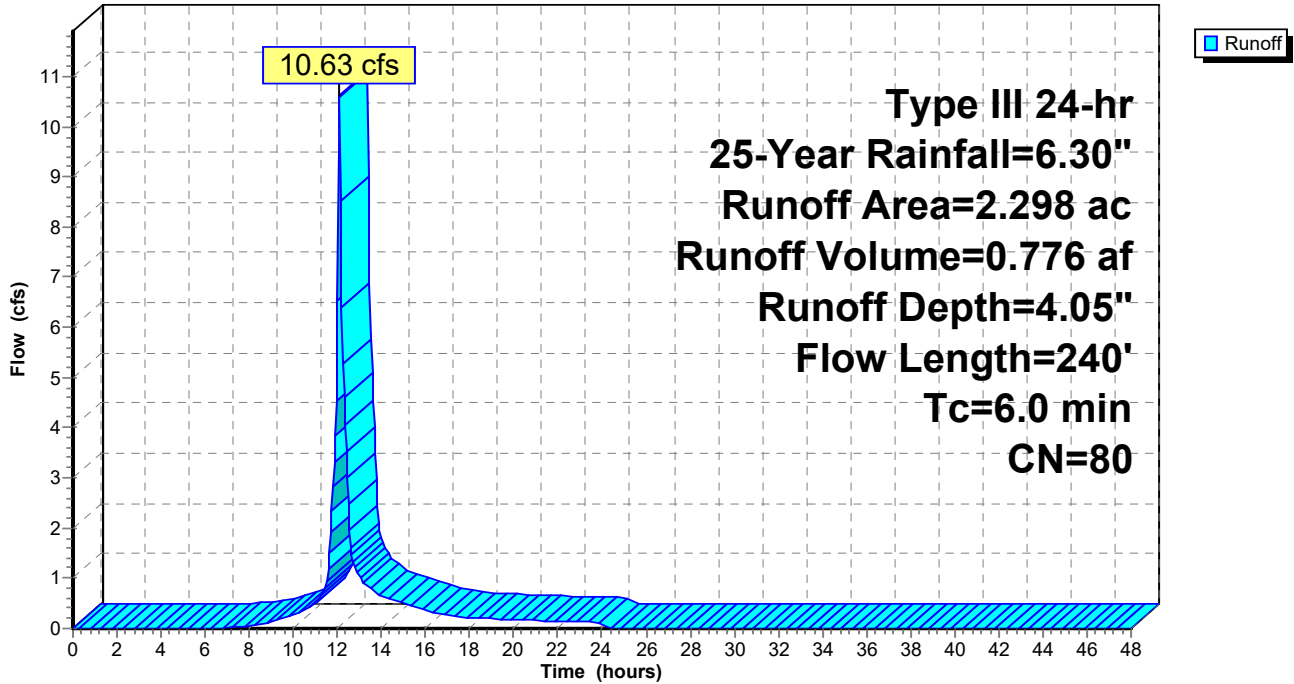
Type III 24-hr 25-Year Rainfall=6.30"

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Subcatchment 17S: DA 2J

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Type III 24-hr 25-Year Rainfall=6.30"

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Summary for Subcatchment 18S: DA 2I

Runoff = 2.55 cfs @ 12.15 hrs, Volume= 0.225 af, Depth= 5.03"

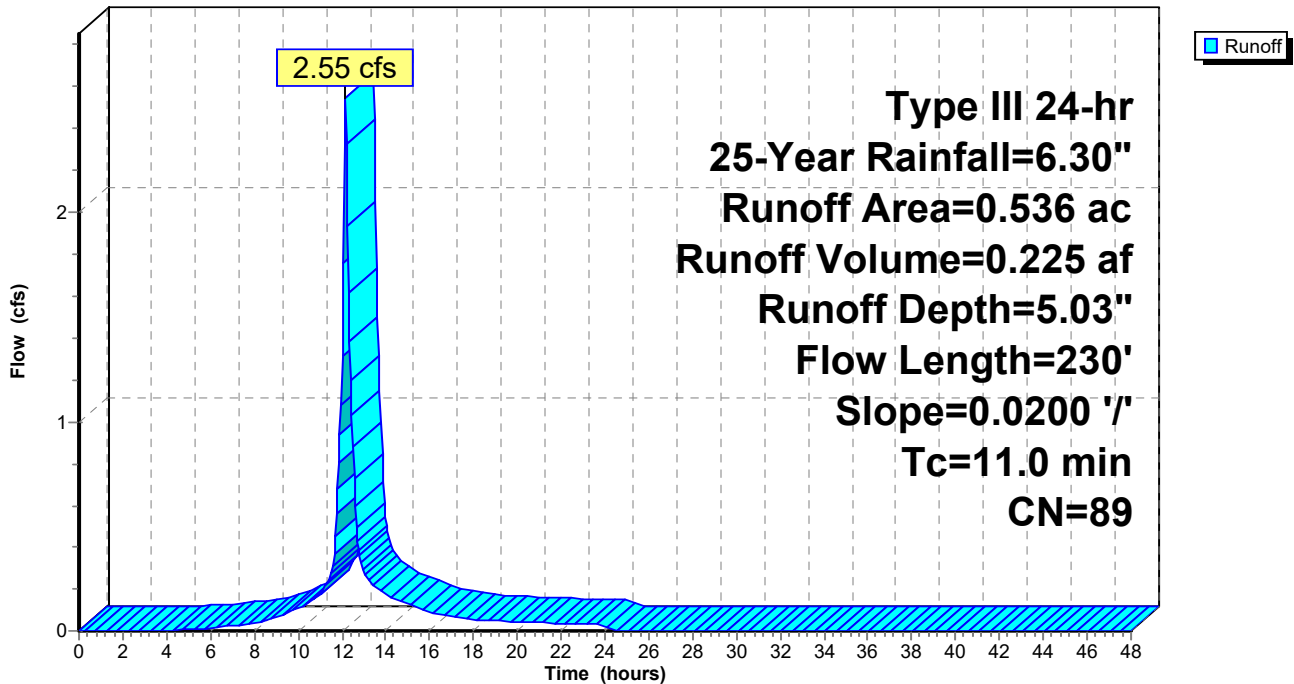
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.30"

Area (ac)	CN	Description
* 0.344	98	Paved parking, HSG C, North
* 0.192	74	>75% Grass cover, Good, HSG C, North
0.536	89	Weighted Average
0.192		35.82% Pervious Area
0.344		64.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
3.0	180	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
11.0	230	Total			

Subcatchment 18S: DA 2I

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.30"

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Summary for Subcatchment 21S: DA 2F

Runoff = 0.70 cfs @ 12.09 hrs, Volume= 0.051 af, Depth= 4.37"

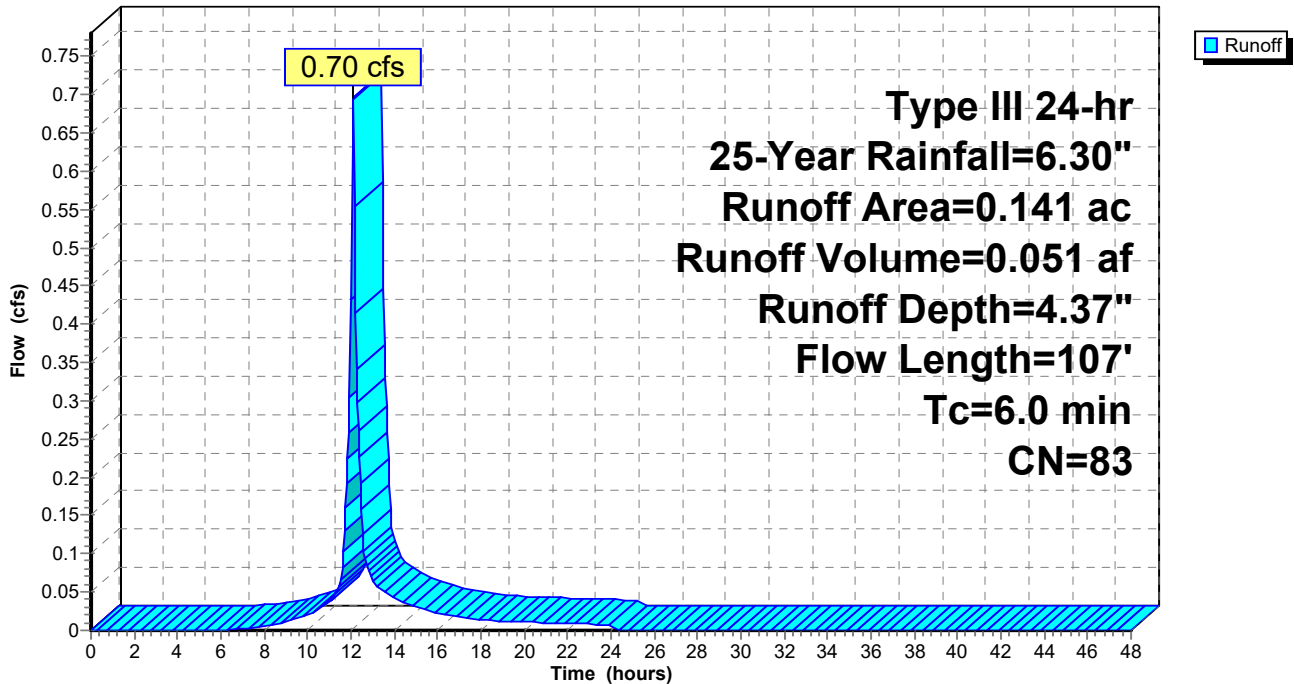
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.30"

Area (ac)	CN	Description
0.051	98	Water Surface, 0% imp, HSG C
0.090	74	>75% Grass cover, Good, HSG C
0.141	83	Weighted Average
0.141		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.3	57	0.1754	2.93		Shallow Concentrated Flow, Woods Short Grass Pasture Kv= 7.0 fps
4.5	107	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 21S: DA 2F

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.30"

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Summary for Subcatchment 22S: DA 2H

Runoff = 11.72 cfs @ 12.14 hrs, Volume= 0.975 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.30"

Area (ac)	CN	Description
* 0.431	98	Paved parking, HSG C, North
* 0.010	80	>75% Grass cover, Good, HSG D, North
* 0.313	74	>75% Grass cover, Good, HSG C, North
* 0.550	98	Paved parking, HSG C, South
* 0.356	74	>75% Grass cover, Good, HSG C, South
0.748	70	Woods, Good, HSG C
0.336	74	>75% Grass cover, Good, HSG C
2.744	82	Weighted Average
1.763		64.25% Pervious Area
0.981		35.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
1.7	190	0.1316	1.81		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	81	0.3333	4.04		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.7	355	0.0310	3.57		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
10.0	676	Total			

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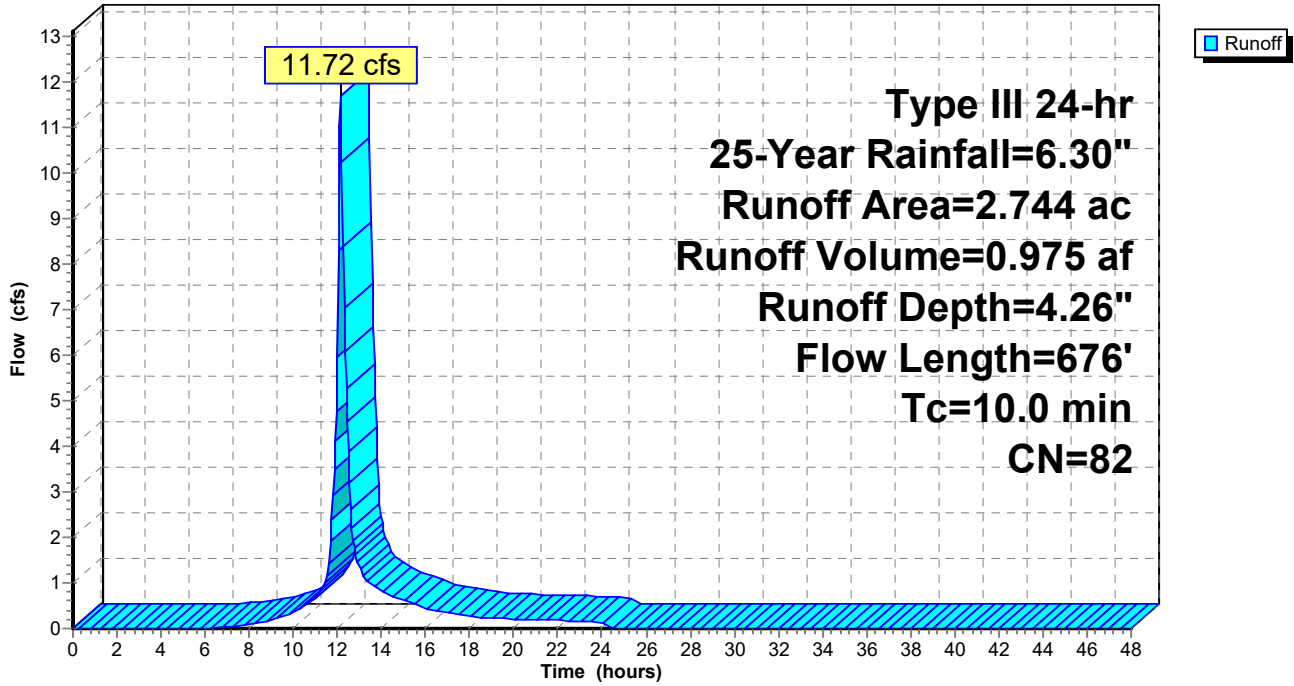
Type III 24-hr 25-Year Rainfall=6.30"

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Subcatchment 22S: DA 2H

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Type III 24-hr 25-Year Rainfall=6.30"

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Summary for Pond 15P: Apartments Phase II Stormwater Basin 2

Inflow Area = 3.277 ac, 30.06% Impervious, Inflow Depth = 4.07" for 25-Year event
 Inflow = 12.63 cfs @ 12.16 hrs, Volume= 1.111 af
 Outflow = 12.39 cfs @ 12.19 hrs, Volume= 1.031 af, Atten= 2%, Lag= 1.6 min
 Primary = 12.39 cfs @ 12.19 hrs, Volume= 1.031 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 568.24' @ 12.19 hrs Surf.Area= 2,401 sf Storage= 5,977 cf

Plug-Flow detention time= 61.4 min calculated for 1.031 af (93% of inflow)
 Center-of-Mass det. time= 23.6 min (840.7 - 817.1)

Volume	Invert	Avail.Storage	Storage Description
#1	562.00'	6 cf	3.00'W x 8.00'L x 2.50'H Sand Underdrain 60 cf Overall x 10.0% Voids
#2	564.50'	10,719 cf	Stormwater Basin (Irregular) Listed below
		10,725 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
564.50	4	8.2	0	0	4
564.75	257	68.5	24	24	372
565.00	1,193	160.0	167	191	2,036
566.00	1,533	172.5	1,359	1,551	2,406
568.00	2,277	197.6	3,786	5,336	3,233
570.00	3,128	222.7	5,383	10,719	4,172

Device	Routing	Invert	Outlet Devices
#1	Primary	562.00'	18.0" Round 18" HDPE L= 68.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 562.00' / 561.60' S= 0.0059 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	567.00'	36.0" W x 6.0" H Vert. 36" x 6" Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	568.00'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#4	Secondary	569.00'	8.0' long x 8.0' breadth Rip Rap Spillway 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#5	Device 1	562.00'	0.500 in/hr Sand Underdrain over Horizontal area from 562.00' - 564.50' Excluded Horizontal area = 24 sf Phase-In= 0.01'

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Type III 24-hr 25-Year Rainfall=6.30"

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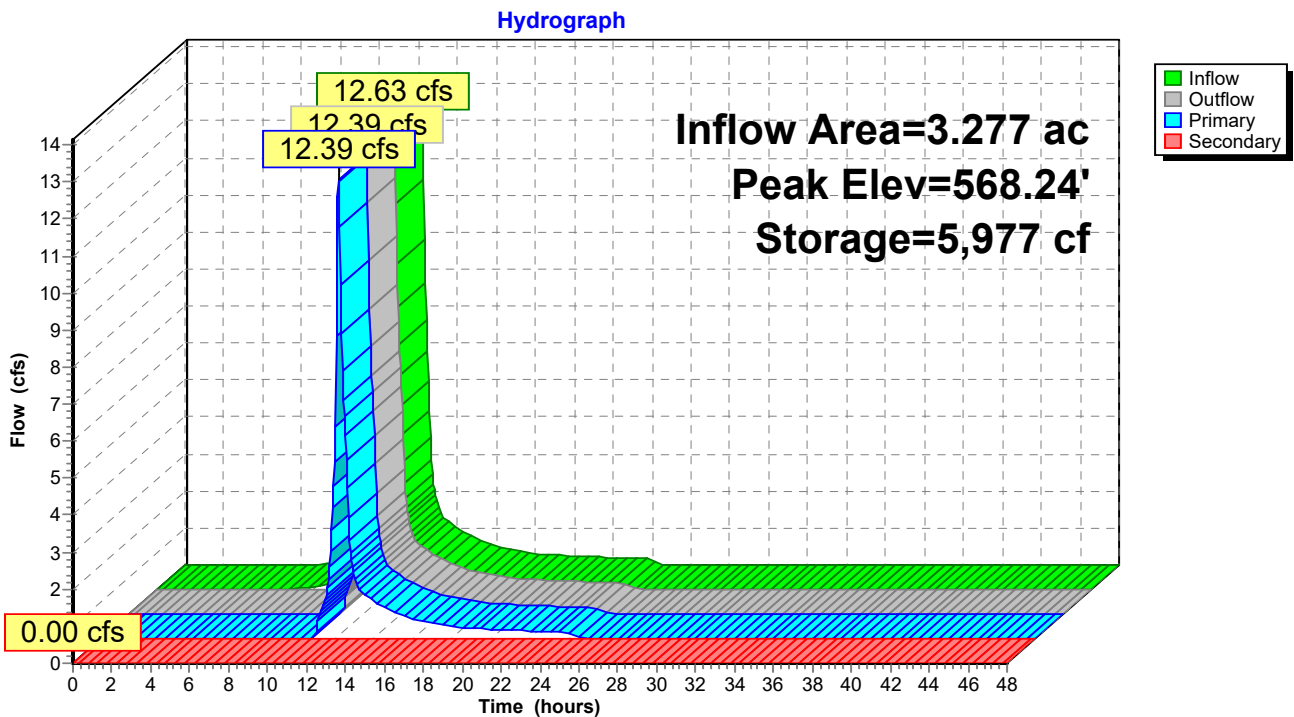
Primary OutFlow Max=12.24 cfs @ 12.19 hrs HW=568.23' TW=563.32' (Dynamic Tailwater)

- 1=18" HDPE (Passes 12.24 cfs of 18.86 cfs potential flow)
- 2=36" x 6" Orifice (Orifice Controls 7.14 cfs @ 4.76 fps)
- 3=Top of Frame (Weir Controls 5.11 cfs @ 1.57 fps)
- 5=Sand Underdrain (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=562.00' TW=0.00' (Dynamic Tailwater)

- 4=Rip Rap Spillway (Controls 0.00 cfs)

Pond 15P: Apartments Phase II Stormwater Basin 2



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Type III 24-hr 25-Year Rainfall=6.30"

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Summary for Pond 20P: Apartments Phase II Stormwater Basin 1

Inflow Area = 7.001 ac, 33.00% Impervious, Inflow Depth = 4.09" for 25-Year event
 Inflow = 27.96 cfs @ 12.16 hrs, Volume= 2.385 af
 Outflow = 19.80 cfs @ 12.30 hrs, Volume= 2.195 af, Atten= 29%, Lag= 8.5 min
 Primary = 19.80 cfs @ 12.30 hrs, Volume= 2.195 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 558.93' @ 12.30 hrs Surf.Area= 7,387 sf Storage= 28,628 cf

Plug-Flow detention time= 98.5 min calculated for 2.195 af (92% of inflow)
 Center-of-Mass det. time= 57.6 min (879.4 - 821.8)

Volume	Invert	Avail.Storage	Storage Description
#1	551.00'	4 cf	3.00'W x 8.00'L x 1.75'H Sand Underdrain 42 cf Overall x 10.0% Voids
#2	552.75'	40,883 cf	Stormwater Basin (Irregular) Listed below (Recalc)
#3	556.00'	424 cf	36.0" Round Pipe Storage-Impervious L= 60.0' S= 0.0083 ' /'
		41,312 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
552.75	120	43.3	0	0	120
553.00	865	110.3	109	109	939
553.25	1,552	155.7	298	407	1,901
553.50	2,135	207.8	459	866	3,409
553.75	2,928	261.6	630	1,496	5,419
554.00	3,512	310.5	804	2,300	7,646
555.00	4,145	323.0	3,824	6,124	8,352
556.00	4,804	335.6	4,470	10,595	9,090
557.00	5,490	348.1	5,143	15,738	9,851
558.00	6,569	422.7	6,021	21,759	14,443
559.00	7,426	435.3	6,993	28,752	15,404
560.00	8,310	447.8	7,864	36,616	16,387
560.50	8,761	454.1	4,267	40,883	16,893

Device	Routing	Invert	Outlet Devices
#1	Primary	551.00'	18.0" Round 18" HDPE L= 152.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 551.00' / 549.00' S= 0.0132 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	555.50'	6.0" Vert. 6" Orifices (2) X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	557.30'	48.0" W x 7.0" H Vert. 48" x 7" Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	558.75'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#5	Secondary	559.75'	8.0' long x 8.0' breadth Rip Rap Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

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Type III 24-hr 25-Year Rainfall=6.30"

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#6	Device 1	551.00'	2.50	3.00	3.50	4.00	4.50	5.00	5.50
			Coef. (English)	2.43	2.54	2.70	2.69	2.68	2.68
				2.64	2.65	2.65	2.66	2.66	2.64
				2.64	2.65	2.65	2.66	2.68	2.70
				2.64	2.65	2.65	2.66	2.68	2.70

0.500 in/hr Sand Underdrain over Horizontal area from 551.00' - 552.75'
 Excluded Horizontal area = 24 sf Phase-In= 0.01'

Primary OutFlow Max=19.76 cfs @ 12.30 hrs HW=558.93' TW=0.00' (Dynamic Tailwater)

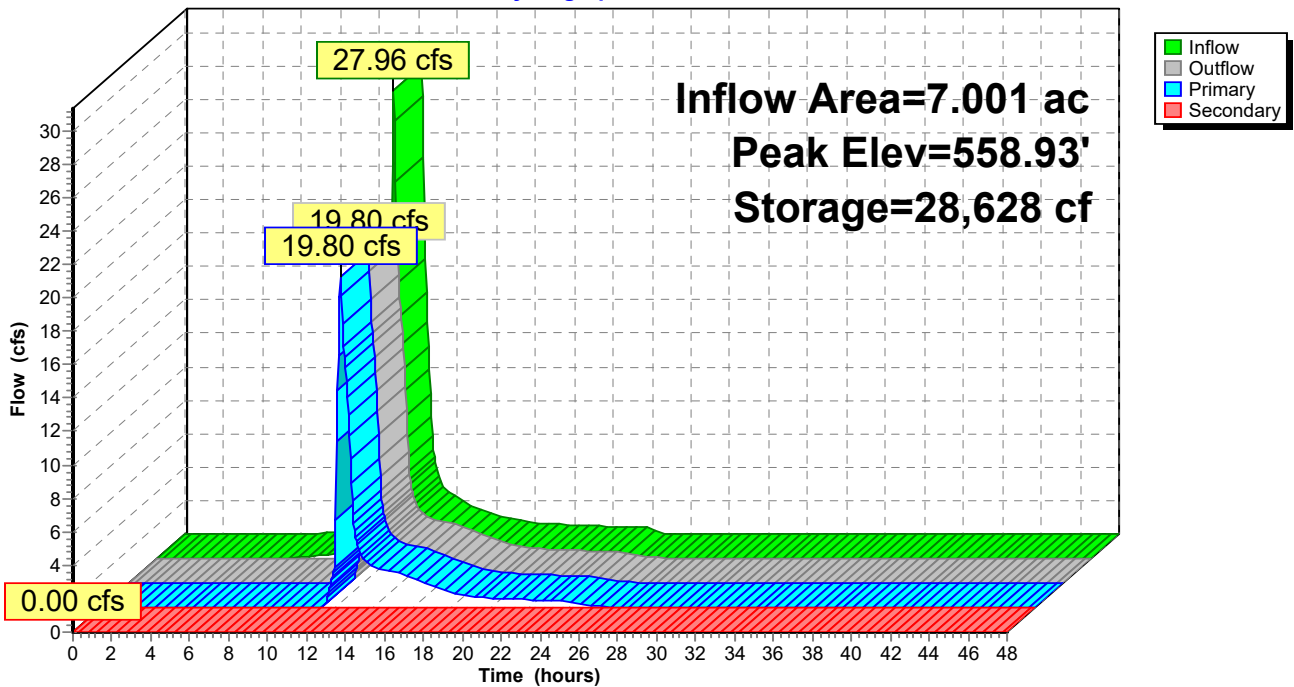
- 1=18" HDPE (Passes 19.76 cfs of 19.90 cfs potential flow)
- 2=6" Orifices (2) (Orifice Controls 3.37 cfs @ 8.58 fps)
- 3=48" x 7" Orifice (Orifice Controls 12.96 cfs @ 5.55 fps)
- 4=Top of Frame (Weir Controls 3.43 cfs @ 1.38 fps)
- 6=Sand Underdrain (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=551.00' TW=0.00' (Dynamic Tailwater)

- 5=Rip Rap Spillway (Controls 0.00 cfs)

Pond 20P: Apartments Phase II Stormwater Basin 1

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.30"

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Summary for Pond 21P: Drain

Inflow Area = 3.813 ac, 34.85% Impervious, Inflow Depth = 3.95" for 25-Year event
Inflow = 14.81 cfs @ 12.18 hrs, Volume= 1.256 af
Outflow = 14.81 cfs @ 12.18 hrs, Volume= 1.256 af, Atten= 0%, Lag= 0.0 min
Primary = 14.81 cfs @ 12.18 hrs, Volume= 1.256 af

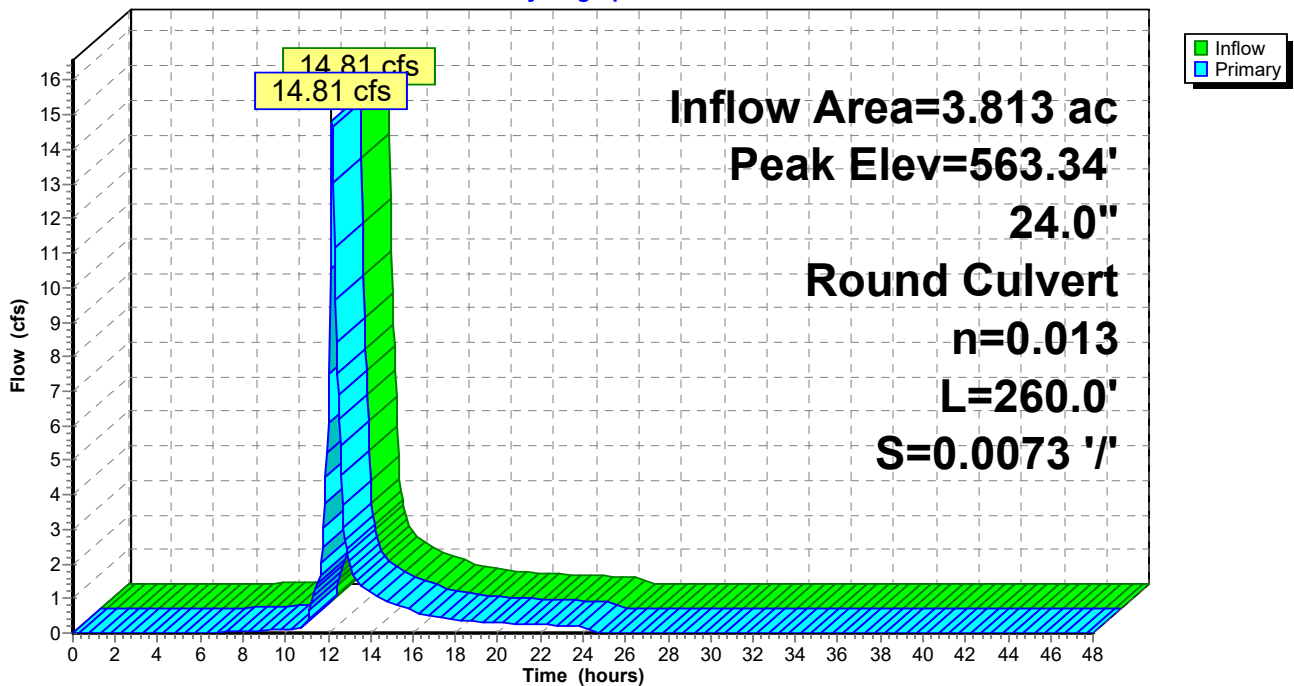
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 563.34' @ 12.18 hrs
Flood Elev= 565.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	561.40'	24.0" Round Culvert L= 260.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 561.40' / 559.50' S= 0.0073 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=14.59 cfs @ 12.18 hrs HW=563.32' TW=558.58' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 14.59 cfs @ 4.71 fps)

Pond 21P: Drain

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.30"

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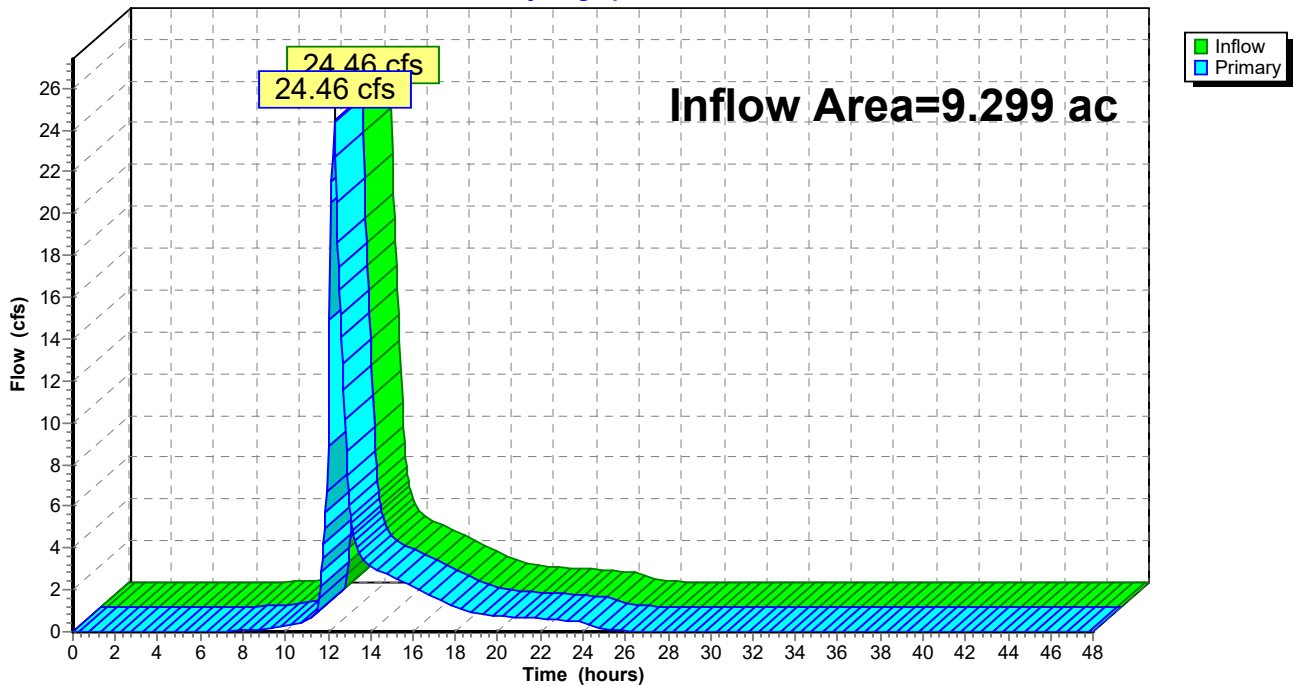
Summary for Link 20L: Off-Site

Inflow Area = 9.299 ac, 30.95% Impervious, Inflow Depth = 3.83" for 25-Year event
Inflow = 24.46 cfs @ 12.29 hrs, Volume= 2.971 af
Primary = 24.46 cfs @ 12.29 hrs, Volume= 2.971 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 20L: Off-Site

Hydrograph



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Type III 24-hr 50-Year Rainfall=7.14"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 15S: DA 2E Runoff Area=3.136 ac 31.41% Impervious Runoff Depth=4.82"
Flow Length=671' Tc=12.0 min CN=80 Runoff=14.36 cfs 1.261 af

Subcatchment 16S: DA 2G Runoff Area=0.444 ac 0.00% Impervious Runoff Depth=4.94"
Flow Length=110' Tc=6.0 min CN=81 Runoff=2.48 cfs 0.183 af

Subcatchment 17S: DA 2J Runoff Area=2.298 ac 24.72% Impervious Runoff Depth=4.82"
Flow Length=240' Tc=6.0 min CN=80 Runoff=12.58 cfs 0.924 af

Subcatchment 18S: DA 2I Runoff Area=0.536 ac 64.18% Impervious Runoff Depth=5.84"
Flow Length=230' Slope=0.0200 '/' Tc=11.0 min CN=89 Runoff=2.94 cfs 0.261 af

Subcatchment 21S: DA 2F Runoff Area=0.141 ac 0.00% Impervious Runoff Depth=5.16"
Flow Length=107' Tc=6.0 min CN=83 Runoff=0.82 cfs 0.061 af

Subcatchment 22S: DA 2H Runoff Area=2.744 ac 35.75% Impervious Runoff Depth=5.05"
Flow Length=676' Tc=10.0 min CN=82 Runoff=13.80 cfs 1.154 af

Pond 15P: Apartments Phase II Stormwater Peak Elev=568.30' Storage=6,138 cf Inflow=14.97 cfs 1.321 af
Primary=14.72 cfs 1.242 af Secondary=0.00 cfs 0.000 af Outflow=14.72 cfs 1.242 af

Pond 20P: Apartments Phase II Peak Elev=559.44' Storage=32,519 cf Inflow=33.02 cfs 2.840 af
Primary=20.49 cfs 2.650 af Secondary=0.00 cfs 0.000 af Outflow=20.49 cfs 2.650 af

Pond 21P: Drain Peak Elev=563.74' Inflow=17.53 cfs 1.503 af
24.0" Round Culvert n=0.013 L=260.0' S=0.0073 '/' Outflow=17.53 cfs 1.503 af

Link 20L: Off-Site Inflow=27.65 cfs 3.574 af
Primary=27.65 cfs 3.574 af

Total Runoff Area = 9.299 ac Runoff Volume = 3.843 af Average Runoff Depth = 4.96"
69.05% Pervious = 6.421 ac 30.95% Impervious = 2.878 ac

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Type III 24-hr 50-Year Rainfall=7.14"

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Summary for Subcatchment 15S: DA 2E

Runoff = 14.36 cfs @ 12.16 hrs, Volume= 1.261 af, Depth= 4.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.14"

Area (ac)	CN	Description
* 0.985	98	Paved parking, HSG C, South
* 0.455	74	>75% Grass cover, Good, HSG C, South
1.030	70	Woods, Good, HSG C
0.666	74	>75% Grass cover, Good, HSG C
3.136	80	Weighted Average
2.151		68.59% Pervious Area
0.985		31.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
3.3	417	0.1799	2.12		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	40	0.1000	2.21		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.7	164	0.0421	4.17		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
12.0	671	Total			

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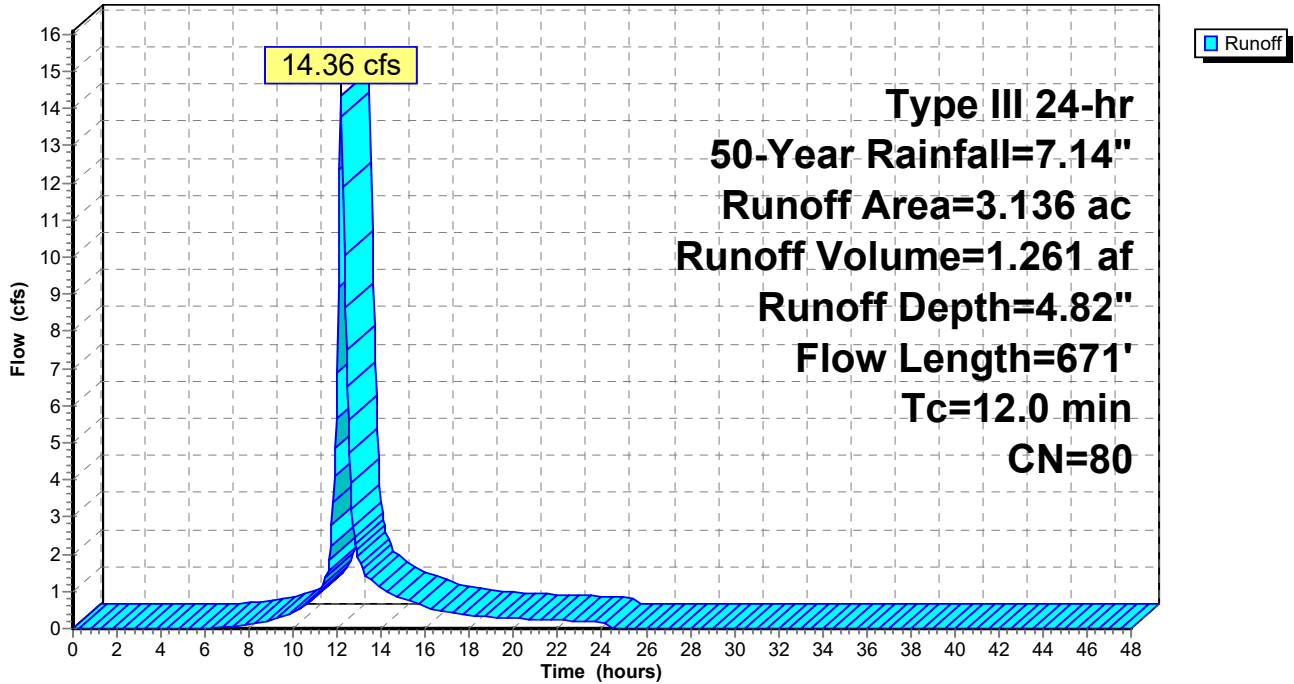
Type III 24-hr 50-Year Rainfall=7.14"

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Subcatchment 15S: DA 2E

Hydrograph



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Summary for Subcatchment 16S: DA 2G

Runoff = 2.48 cfs @ 12.09 hrs, Volume= 0.183 af, Depth= 4.94"

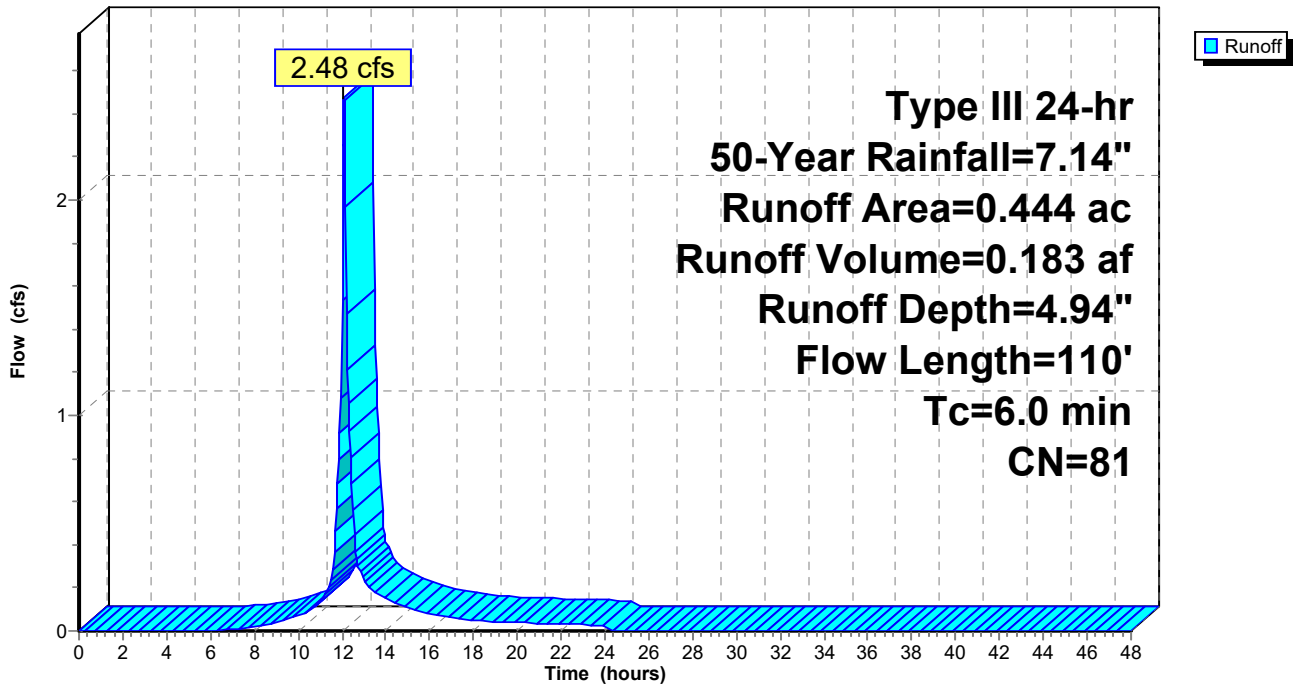
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.14"

Area (ac)	CN	Description
0.103	98	Water Surface, 0% imp, HSG C
0.017	80	>75% Grass cover, Good, HSG D
0.229	74	>75% Grass cover, Good, HSG C
0.079	80	>75% Grass cover, Good, HSG D
0.016	74	>75% Grass cover, Good, HSG C
0.444	81	Weighted Average
0.444		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.2	60	0.3500	4.14		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
5.7	110	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 16S: DA 2G

Hydrograph



Proposed - Apartments Only

Type III 24-hr 50-Year Rainfall=7.14"

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Summary for Subcatchment 17S: DA 2J

Runoff = 12.58 cfs @ 12.09 hrs, Volume= 0.924 af, Depth= 4.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.14"

Area (ac)	CN	Description
0.412	80	>75% Grass cover, Good, HSG D
0.061	98	Paved parking, HSG C
0.032	74	>75% Grass cover, Good, HSG C
0.140	98	Paved parking, HSG C
0.680	74	>75% Grass cover, Good, HSG C
* 0.184	98	Two single Family Houses and Paved Driveways
0.183	98	Paved parking, HSG C
0.577	70	Woods, Good, HSG C
0.029	74	>75% Grass cover, Good, HSG C
2.298	80	Weighted Average
1.730		75.28% Pervious Area
0.568		24.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	24	0.1000	0.17		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.3	26	0.0500	1.56		Sheet Flow, Paved/Gravel Smooth surfaces n= 0.011 P2= 3.37"
0.3	85	0.0824	4.62		Shallow Concentrated Flow, Gravel Unpaved Kv= 16.1 fps
0.7	105	0.1333	2.56		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
3.6	240	Total, Increased to minimum Tc = 6.0 min			

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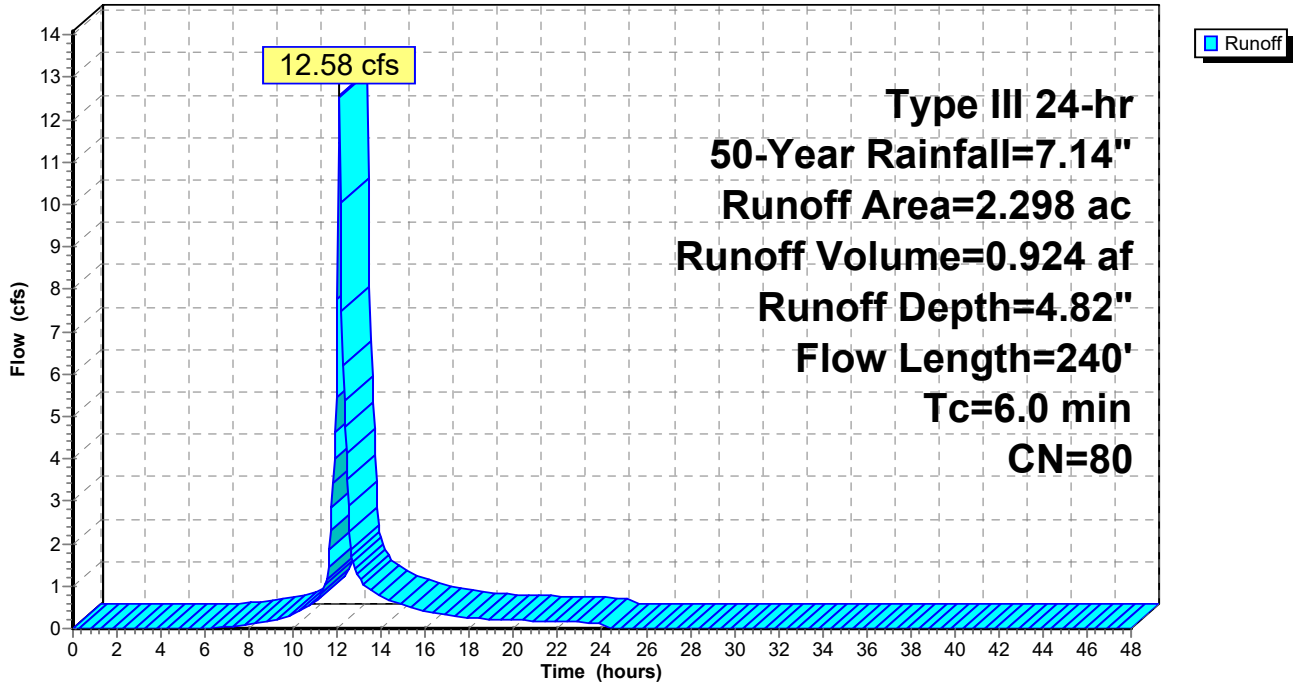
Type III 24-hr 50-Year Rainfall=7.14"

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Subcatchment 17S: DA 2J

Hydrograph



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Type III 24-hr 50-Year Rainfall=7.14"

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Summary for Subcatchment 18S: DA 2I

Runoff = 2.94 cfs @ 12.15 hrs, Volume= 0.261 af, Depth= 5.84"

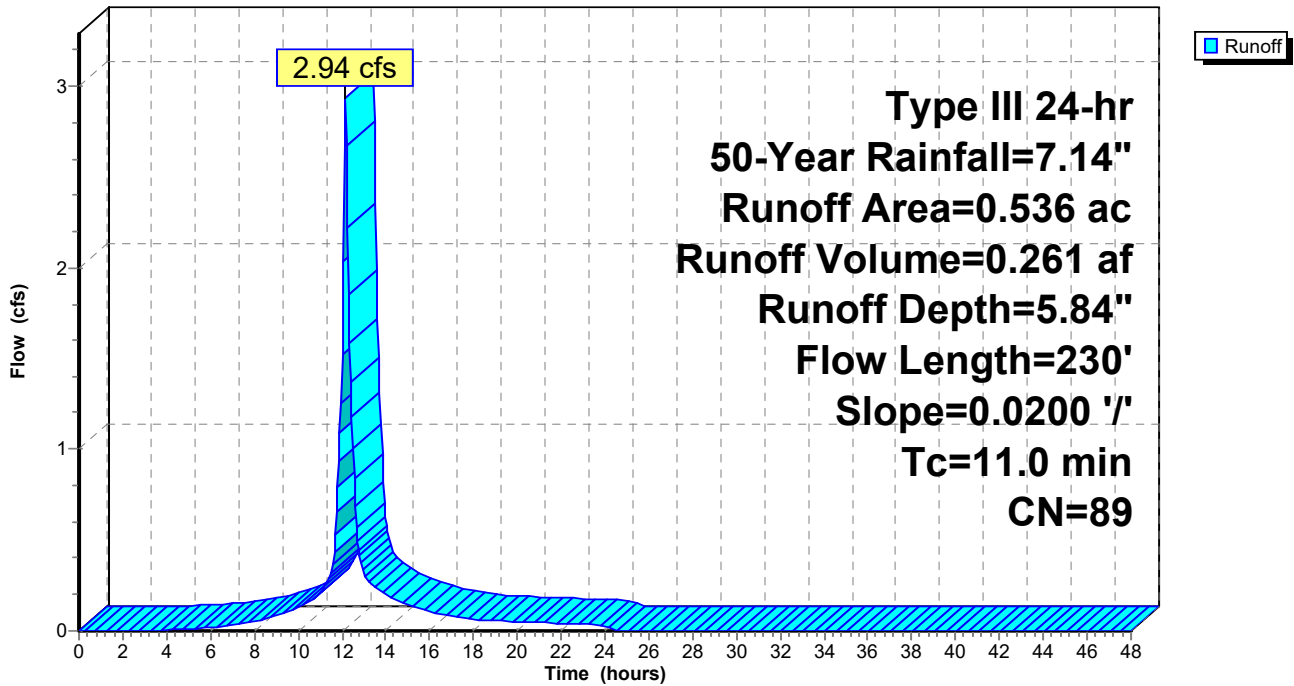
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.14"

Area (ac)	CN	Description
* 0.344	98	Paved parking, HSG C, North
* 0.192	74	>75% Grass cover, Good, HSG C, North
0.536	89	Weighted Average
0.192		35.82% Pervious Area
0.344		64.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
3.0	180	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
11.0	230	Total			

Subcatchment 18S: DA 2I

Hydrograph



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Type III 24-hr 50-Year Rainfall=7.14"

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Summary for Subcatchment 21S: DA 2F

Runoff = 0.82 cfs @ 12.09 hrs, Volume= 0.061 af, Depth= 5.16"

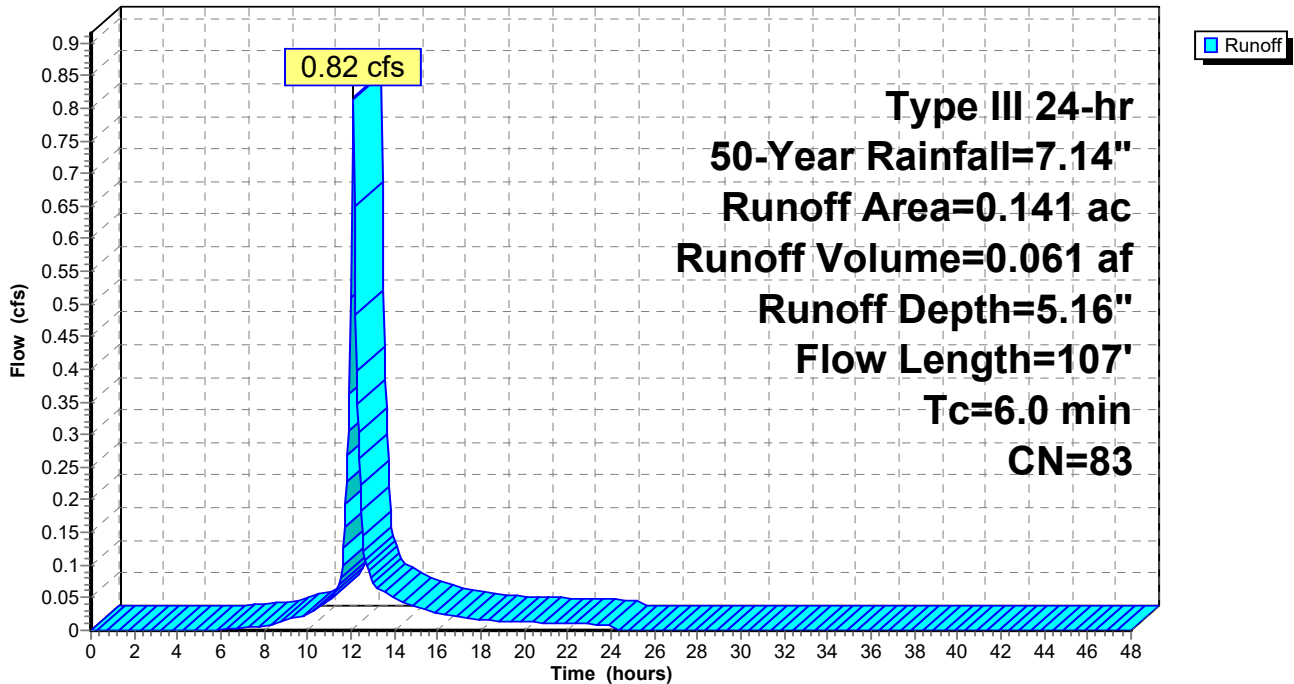
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.14"

Area (ac)	CN	Description
0.051	98	Water Surface, 0% imp, HSG C
0.090	74	>75% Grass cover, Good, HSG C
0.141	83	Weighted Average
0.141		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.3	57	0.1754	2.93		Shallow Concentrated Flow, Woods Short Grass Pasture Kv= 7.0 fps
4.5	107	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 21S: DA 2F

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Summary for Subcatchment 22S: DA 2H

Runoff = 13.80 cfs @ 12.14 hrs, Volume= 1.154 af, Depth= 5.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.14"

Area (ac)	CN	Description
* 0.431	98	Paved parking, HSG C, North
* 0.010	80	>75% Grass cover, Good, HSG D, North
* 0.313	74	>75% Grass cover, Good, HSG C, North
* 0.550	98	Paved parking, HSG C, South
* 0.356	74	>75% Grass cover, Good, HSG C, South
0.748	70	Woods, Good, HSG C
0.336	74	>75% Grass cover, Good, HSG C
2.744	82	Weighted Average
1.763		64.25% Pervious Area
0.981		35.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
1.7	190	0.1316	1.81		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	81	0.3333	4.04		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.7	355	0.0310	3.57		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
10.0	676	Total			

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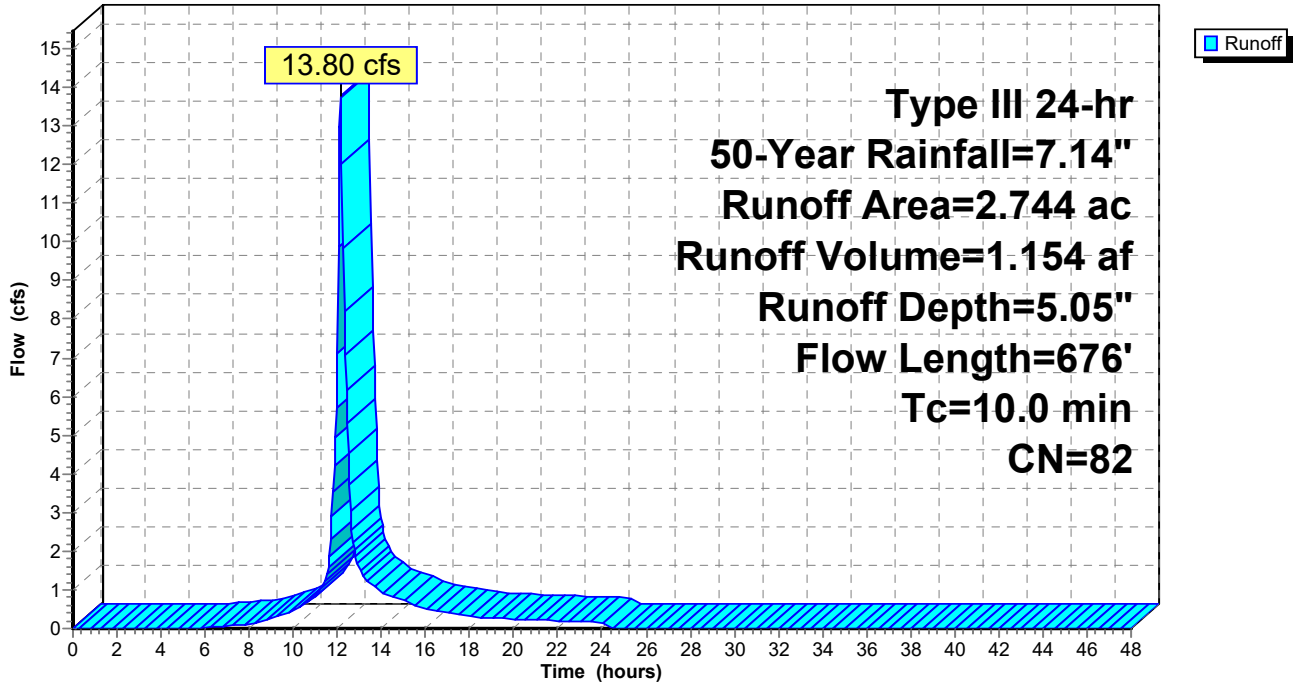
Type III 24-hr 50-Year Rainfall=7.14"

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Subcatchment 22S: DA 2H

Hydrograph



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Summary for Pond 15P: Apartments Phase II Stormwater Basin 2

Inflow Area = 3.277 ac, 30.06% Impervious, Inflow Depth = 4.84" for 50-Year event
 Inflow = 14.97 cfs @ 12.16 hrs, Volume= 1.321 af
 Outflow = 14.72 cfs @ 12.18 hrs, Volume= 1.242 af, Atten= 2%, Lag= 1.3 min
 Primary = 14.72 cfs @ 12.18 hrs, Volume= 1.242 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 568.30' @ 12.18 hrs Surf.Area= 2,427 sf Storage= 6,138 cf

Plug-Flow detention time= 53.8 min calculated for 1.241 af (94% of inflow)
 Center-of-Mass det. time= 21.9 min (834.1 - 812.2)

Volume	Invert	Avail.Storage	Storage Description
#1	562.00'	6 cf	3.00'W x 8.00'L x 2.50'H Sand Underdrain 60 cf Overall x 10.0% Voids
#2	564.50'	10,719 cf	Stormwater Basin (Irregular) Listed below
		10,725 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
564.50	4	8.2	0	0	4
564.75	257	68.5	24	24	372
565.00	1,193	160.0	167	191	2,036
566.00	1,533	172.5	1,359	1,551	2,406
568.00	2,277	197.6	3,786	5,336	3,233
570.00	3,128	222.7	5,383	10,719	4,172

Device	Routing	Invert	Outlet Devices
#1	Primary	562.00'	18.0" Round 18" HDPE L= 68.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 562.00' / 561.60' S= 0.0059 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	567.00'	36.0" W x 6.0" H Vert. 36" x 6" Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	568.00'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#4	Secondary	569.00'	8.0' long x 8.0' breadth Rip Rap Spillway 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#5	Device 1	562.00'	0.500 in/hr Sand Underdrain over Horizontal area from 562.00' - 564.50' Excluded Horizontal area = 24 sf Phase-In= 0.01'

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Type III 24-hr 50-Year Rainfall=7.14"

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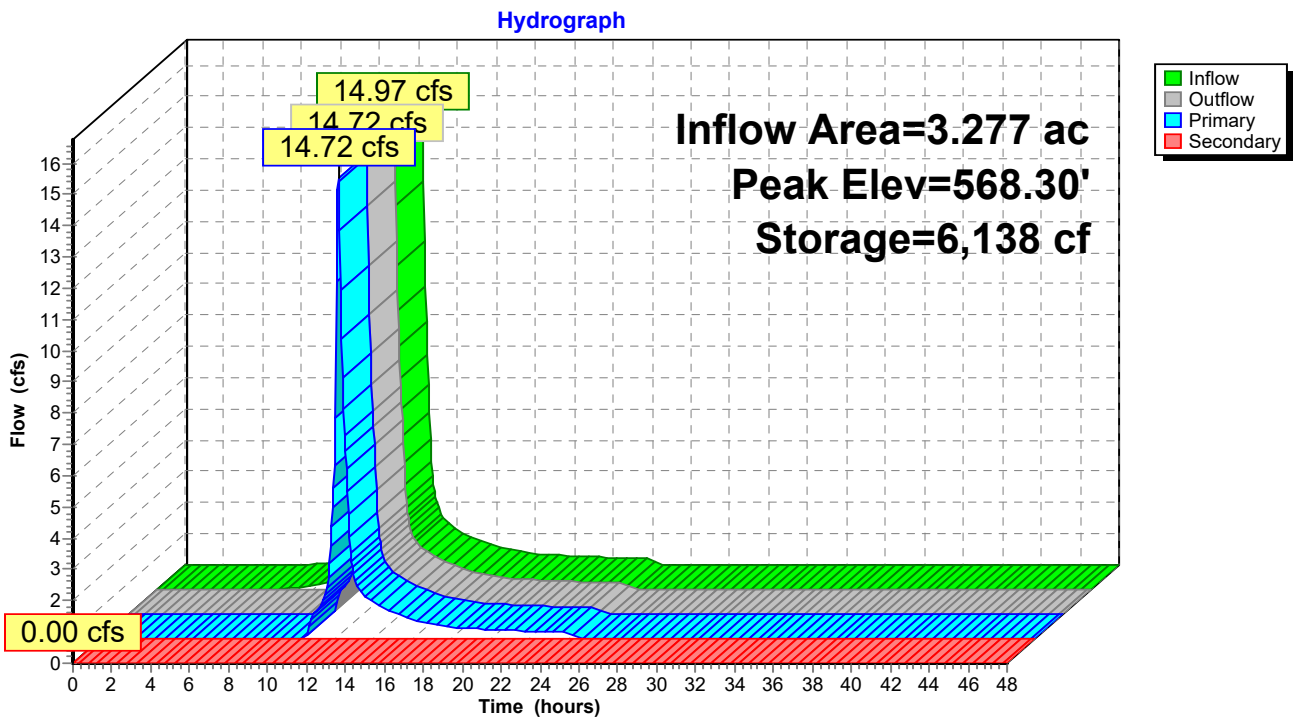
Primary OutFlow Max=14.51 cfs @ 12.18 hrs HW=568.29' TW=563.70' (Dynamic Tailwater)

- 1=18" HDPE (Passes 14.51 cfs of 18.22 cfs potential flow)
- 2=36" x 6" Orifice (Orifice Controls 7.35 cfs @ 4.90 fps)
- 3=Top of Frame (Weir Controls 7.16 cfs @ 1.76 fps)
- 5=Sand Underdrain (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=562.00' TW=0.00' (Dynamic Tailwater)

- 4=Rip Rap Spillway (Controls 0.00 cfs)

Pond 15P: Apartments Phase II Stormwater Basin 2



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Type III 24-hr 50-Year Rainfall=7.14"

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Summary for Pond 20P: Apartments Phase II Stormwater Basin 1

Inflow Area = 7.001 ac, 33.00% Impervious, Inflow Depth = 4.87" for 50-Year event
 Inflow = 33.02 cfs @ 12.16 hrs, Volume= 2.840 af
 Outflow = 20.49 cfs @ 12.33 hrs, Volume= 2.650 af, Atten= 38%, Lag= 10.5 min
 Primary = 20.49 cfs @ 12.33 hrs, Volume= 2.650 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 559.44' @ 12.33 hrs Surf.Area= 7,831 sf Storage= 32,519 cf

Plug-Flow detention time= 88.6 min calculated for 2.647 af (93% of inflow)
 Center-of-Mass det. time= 54.2 min (870.7 - 816.5)

Volume	Invert	Avail.Storage	Storage Description
#1	551.00'	4 cf	3.00'W x 8.00'L x 1.75'H Sand Underdrain 42 cf Overall x 10.0% Voids
#2	552.75'	40,883 cf	Stormwater Basin (Irregular) Listed below (Recalc)
#3	556.00'	424 cf	36.0" Round Pipe Storage-Impervious L= 60.0' S= 0.0083 'f'
		41,312 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
552.75	120	43.3	0	0	120
553.00	865	110.3	109	109	939
553.25	1,552	155.7	298	407	1,901
553.50	2,135	207.8	459	866	3,409
553.75	2,928	261.6	630	1,496	5,419
554.00	3,512	310.5	804	2,300	7,646
555.00	4,145	323.0	3,824	6,124	8,352
556.00	4,804	335.6	4,470	10,595	9,090
557.00	5,490	348.1	5,143	15,738	9,851
558.00	6,569	422.7	6,021	21,759	14,443
559.00	7,426	435.3	6,993	28,752	15,404
560.00	8,310	447.8	7,864	36,616	16,387
560.50	8,761	454.1	4,267	40,883	16,893

Device	Routing	Invert	Outlet Devices
#1	Primary	551.00'	18.0" Round 18" HDPE L= 152.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 551.00' / 549.00' S= 0.0132 'f' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	555.50'	6.0" Vert. 6" Orifices (2) X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	557.30'	48.0" W x 7.0" H Vert. 48" x 7" Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	558.75'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#5	Secondary	559.75'	8.0' long x 8.0' breadth Rip Rap Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

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#6	Device 1	551.00'	2.50	3.00	3.50	4.00	4.50	5.00	5.50
			Coef. (English)	2.43	2.54	2.70	2.69	2.68	2.68
				2.64	2.65	2.65	2.66	2.66	2.64
				2.64	2.65	2.65	2.66	2.68	2.74
				0.500 in/hr Sand Underdrain over Horizontal area from 551.00' - 552.75'					
				Excluded Horizontal area = 24 sf Phase-In= 0.01'					

Primary OutFlow Max=20.49 cfs @ 12.33 hrs HW=559.43' TW=0.00' (Dynamic Tailwater)

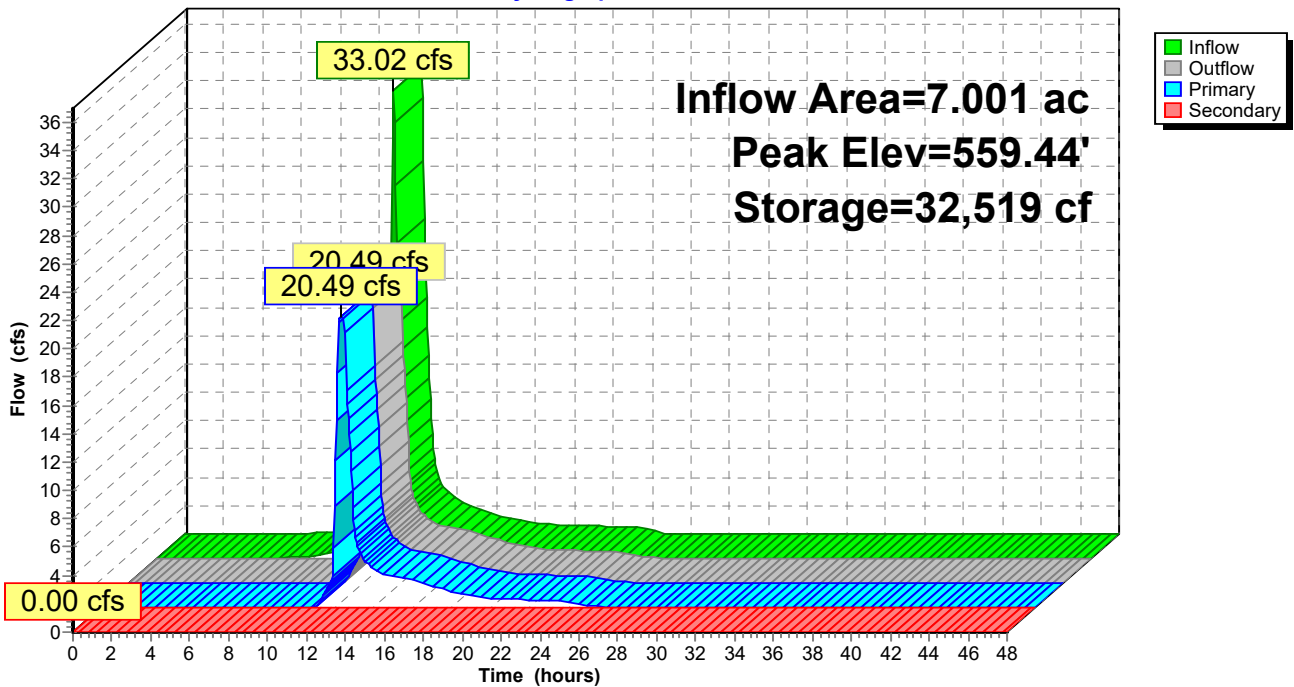
- 1=18" HDPE (Barrel Controls 20.49 cfs @ 11.59 fps)
- 2=6" Orifices (2) (Passes < 3.63 cfs potential flow)
- 3=48" x 7" Orifice (Passes < 15.22 cfs potential flow)
- 4=Top of Frame (Passes < 25.71 cfs potential flow)
- 6=Sand Underdrain (Passes < 0.00 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=551.00' TW=0.00' (Dynamic Tailwater)

- 5=Rip Rap Spillway (Controls 0.00 cfs)

Pond 20P: Apartments Phase II Stormwater Basin 1

Hydrograph



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Type III 24-hr 50-Year Rainfall=7.14"

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Summary for Pond 21P: Drain

Inflow Area = 3.813 ac, 34.85% Impervious, Inflow Depth = 4.73" for 50-Year event
Inflow = 17.53 cfs @ 12.18 hrs, Volume= 1.503 af
Outflow = 17.53 cfs @ 12.18 hrs, Volume= 1.503 af, Atten= 0%, Lag= 0.0 min
Primary = 17.53 cfs @ 12.18 hrs, Volume= 1.503 af

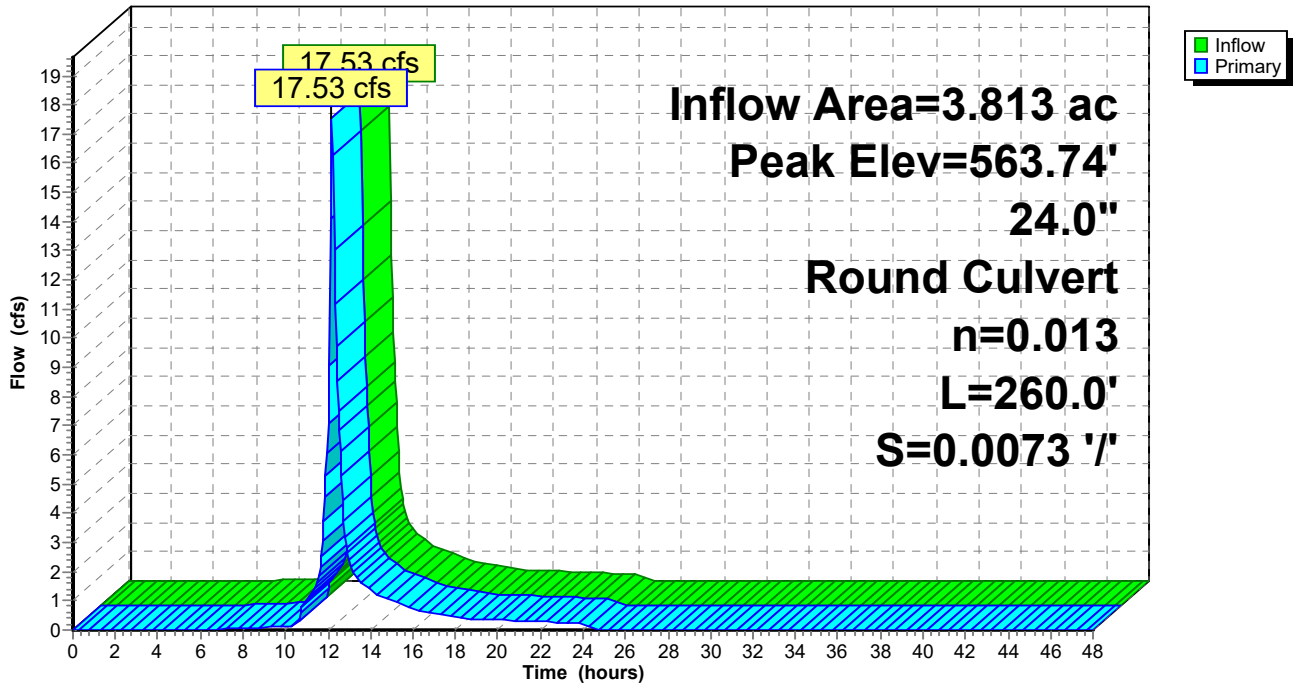
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 563.74' @ 12.18 hrs
Flood Elev= 565.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	561.40'	24.0" Round Culvert L= 260.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 561.40' / 559.50' S= 0.0073 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=17.28 cfs @ 12.18 hrs HW=563.70' TW=558.98' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 17.28 cfs @ 5.50 fps)

Pond 21P: Drain

Hydrograph



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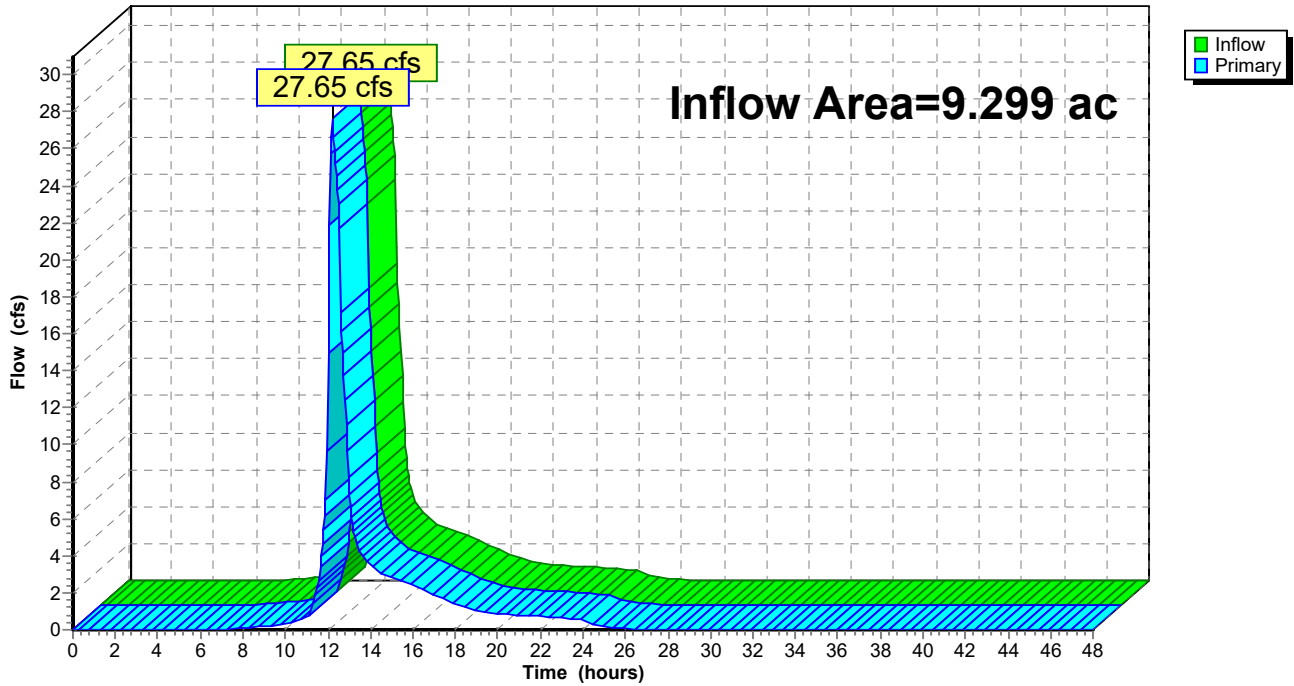
Summary for Link 20L: Off-Site

Inflow Area = 9.299 ac, 30.95% Impervious, Inflow Depth = 4.61" for 50-Year event
Inflow = 27.65 cfs @ 12.20 hrs, Volume= 3.574 af
Primary = 27.65 cfs @ 12.20 hrs, Volume= 3.574 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 20L: Off-Site

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.04"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 15S: DA 2E Runoff Area=3.136 ac 31.41% Impervious Runoff Depth=5.66"
Flow Length=671' Tc=12.0 min CN=80 Runoff=16.77 cfs 1.480 af

Subcatchment 16S: DA 2G Runoff Area=0.444 ac 0.00% Impervious Runoff Depth=5.78"
Flow Length=110' Tc=6.0 min CN=81 Runoff=2.89 cfs 0.214 af

Subcatchment 17S: DA 2J Runoff Area=2.298 ac 24.72% Impervious Runoff Depth=5.66"
Flow Length=240' Tc=6.0 min CN=80 Runoff=14.68 cfs 1.084 af

Subcatchment 18S: DA 2I Runoff Area=0.536 ac 64.18% Impervious Runoff Depth=6.73"
Flow Length=230' Slope=0.0200 '/' Tc=11.0 min CN=89 Runoff=3.36 cfs 0.300 af

Subcatchment 21S: DA 2F Runoff Area=0.141 ac 0.00% Impervious Runoff Depth=6.02"
Flow Length=107' Tc=6.0 min CN=83 Runoff=0.95 cfs 0.071 af

Subcatchment 22S: DA 2H Runoff Area=2.744 ac 35.75% Impervious Runoff Depth=5.90"
Flow Length=676' Tc=10.0 min CN=82 Runoff=16.02 cfs 1.349 af

Pond 15P: Apartments Phase II Stormwater Peak Elev=568.37' Storage=6,342 cf Inflow=17.47 cfs 1.550 af
Primary=16.96 cfs 1.471 af Secondary=0.00 cfs 0.000 af Outflow=16.96 cfs 1.471 af

Pond 20P: Apartments Phase II Peak Elev=560.00' Storage=37,060 cf Inflow=38.23 cfs 3.334 af
Primary=21.13 cfs 3.112 af Secondary=2.48 cfs 0.032 af Outflow=23.61 cfs 3.144 af

Pond 21P: Drain Peak Elev=564.57' Inflow=20.33 cfs 1.772 af
24.0" Round Culvert n=0.013 L=260.0' S=0.0073 '/' Outflow=20.33 cfs 1.772 af

Link 20L: Off-Site Inflow=31.94 cfs 4.229 af
Primary=31.94 cfs 4.229 af

Total Runoff Area = 9.299 ac Runoff Volume = 4.498 af Average Runoff Depth = 5.80"
69.05% Pervious = 6.421 ac 30.95% Impervious = 2.878 ac

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Summary for Subcatchment 15S: DA 2E

Runoff = 16.77 cfs @ 12.16 hrs, Volume= 1.480 af, Depth= 5.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.04"

Area (ac)	CN	Description
* 0.985	98	Paved parking, HSG C, South
* 0.455	74	>75% Grass cover, Good, HSG C, South
1.030	70	Woods, Good, HSG C
0.666	74	>75% Grass cover, Good, HSG C
3.136	80	Weighted Average
2.151		68.59% Pervious Area
0.985		31.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0600	0.11		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
3.3	417	0.1799	2.12		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	40	0.1000	2.21		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.7	164	0.0421	4.17		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
12.0	671	Total			

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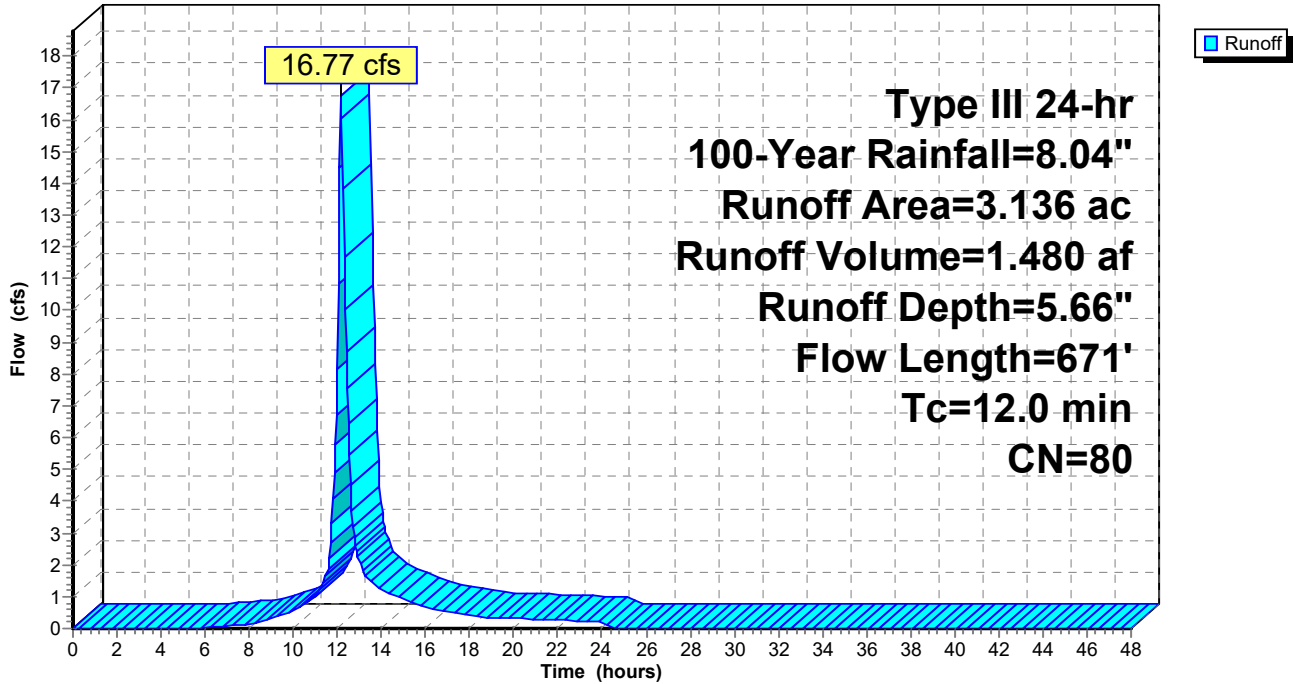
Type III 24-hr 100-Year Rainfall=8.04"

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Subcatchment 15S: DA 2E

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.04"

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Summary for Subcatchment 16S: DA 2G

Runoff = 2.89 cfs @ 12.09 hrs, Volume= 0.214 af, Depth= 5.78"

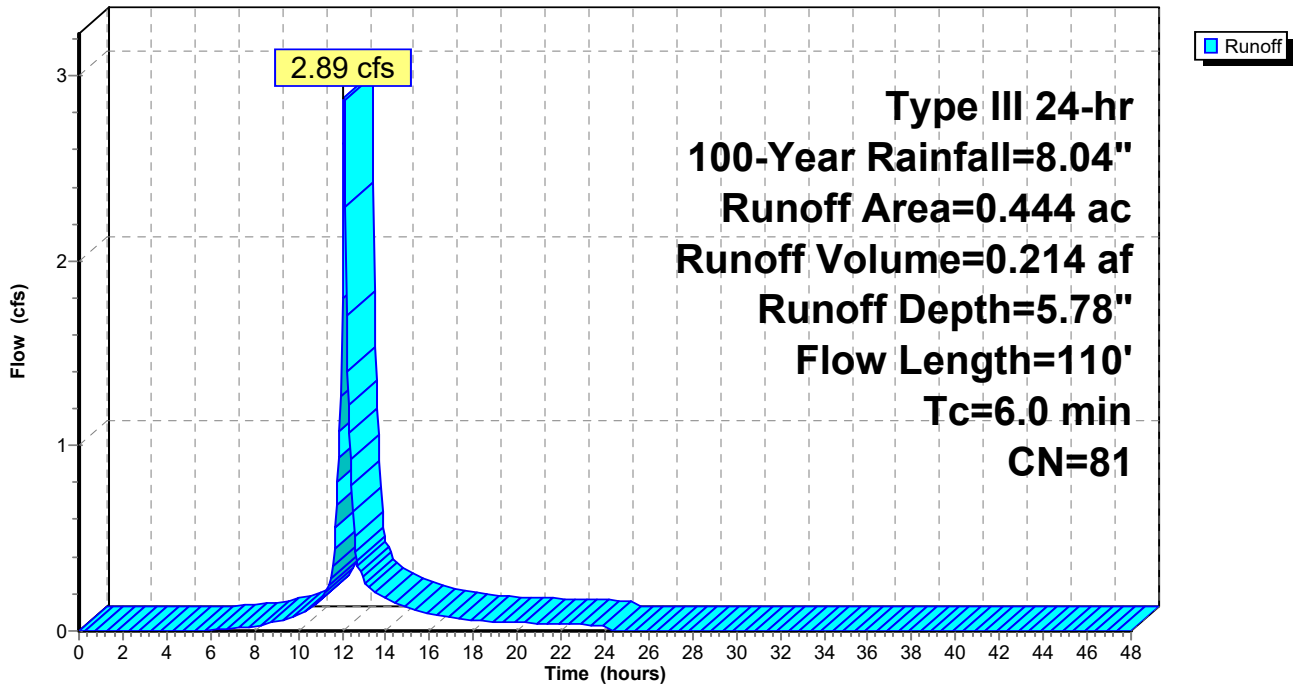
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.04"

Area (ac)	CN	Description
0.103	98	Water Surface, 0% imp, HSG C
0.017	80	>75% Grass cover, Good, HSG D
0.229	74	>75% Grass cover, Good, HSG C
0.079	80	>75% Grass cover, Good, HSG D
0.016	74	>75% Grass cover, Good, HSG C
0.444	81	Weighted Average
0.444		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0500	0.15		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.2	60	0.3500	4.14		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
5.7	110	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 16S: DA 2G

Hydrograph



Proposed - Apartments Only

Type III 24-hr 100-Year Rainfall=8.04"

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Summary for Subcatchment 17S: DA 2J

Runoff = 14.68 cfs @ 12.09 hrs, Volume= 1.084 af, Depth= 5.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.04"

Area (ac)	CN	Description
0.412	80	>75% Grass cover, Good, HSG D
0.061	98	Paved parking, HSG C
0.032	74	>75% Grass cover, Good, HSG C
0.140	98	Paved parking, HSG C
0.680	74	>75% Grass cover, Good, HSG C
* 0.184	98	Two single Family Houses and Paved Driveways
0.183	98	Paved parking, HSG C
0.577	70	Woods, Good, HSG C
0.029	74	>75% Grass cover, Good, HSG C
2.298	80	Weighted Average
1.730		75.28% Pervious Area
0.568		24.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	24	0.1000	0.17		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.3	26	0.0500	1.56		Sheet Flow, Paved/Gravel Smooth surfaces n= 0.011 P2= 3.37"
0.3	85	0.0824	4.62		Shallow Concentrated Flow, Gravel Unpaved Kv= 16.1 fps
0.7	105	0.1333	2.56		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
3.6	240	Total, Increased to minimum Tc = 6.0 min			

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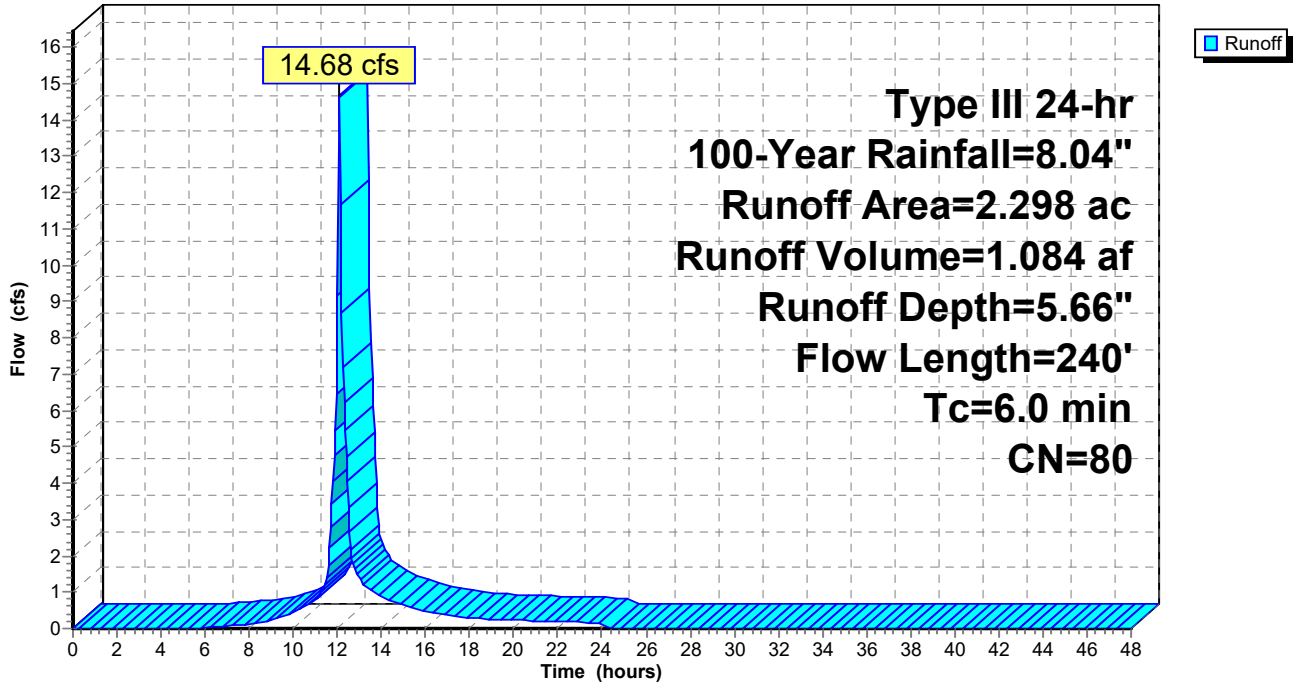
Type III 24-hr 100-Year Rainfall=8.04"

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Subcatchment 17S: DA 2J

Hydrograph



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Summary for Subcatchment 18S: DA 2I

Runoff = 3.36 cfs @ 12.15 hrs, Volume= 0.300 af, Depth= 6.73"

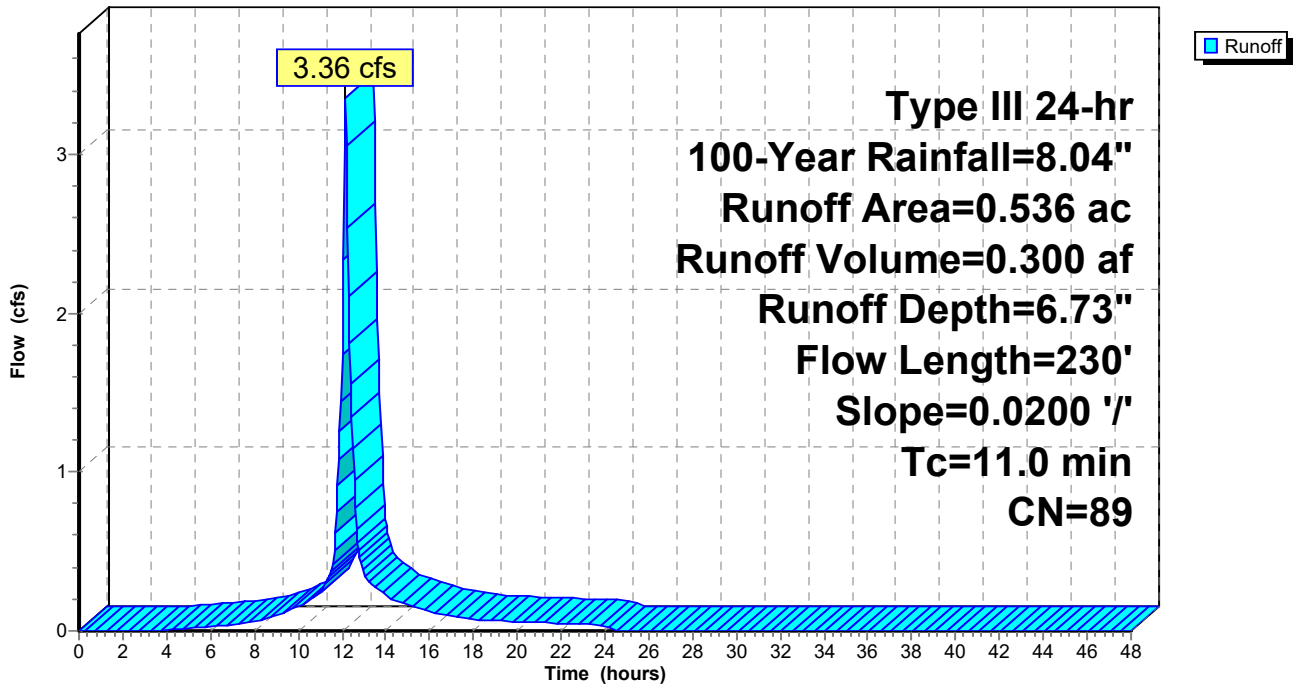
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.04"

Area (ac)	CN	Description
* 0.344	98	Paved parking, HSG C, North
* 0.192	74	>75% Grass cover, Good, HSG C, North
0.536	89	Weighted Average
0.192		35.82% Pervious Area
0.344		64.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
3.0	180	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
11.0	230	Total			

Subcatchment 18S: DA 2I

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.04"

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Summary for Subcatchment 21S: DA 2F

Runoff = 0.95 cfs @ 12.09 hrs, Volume= 0.071 af, Depth= 6.02"

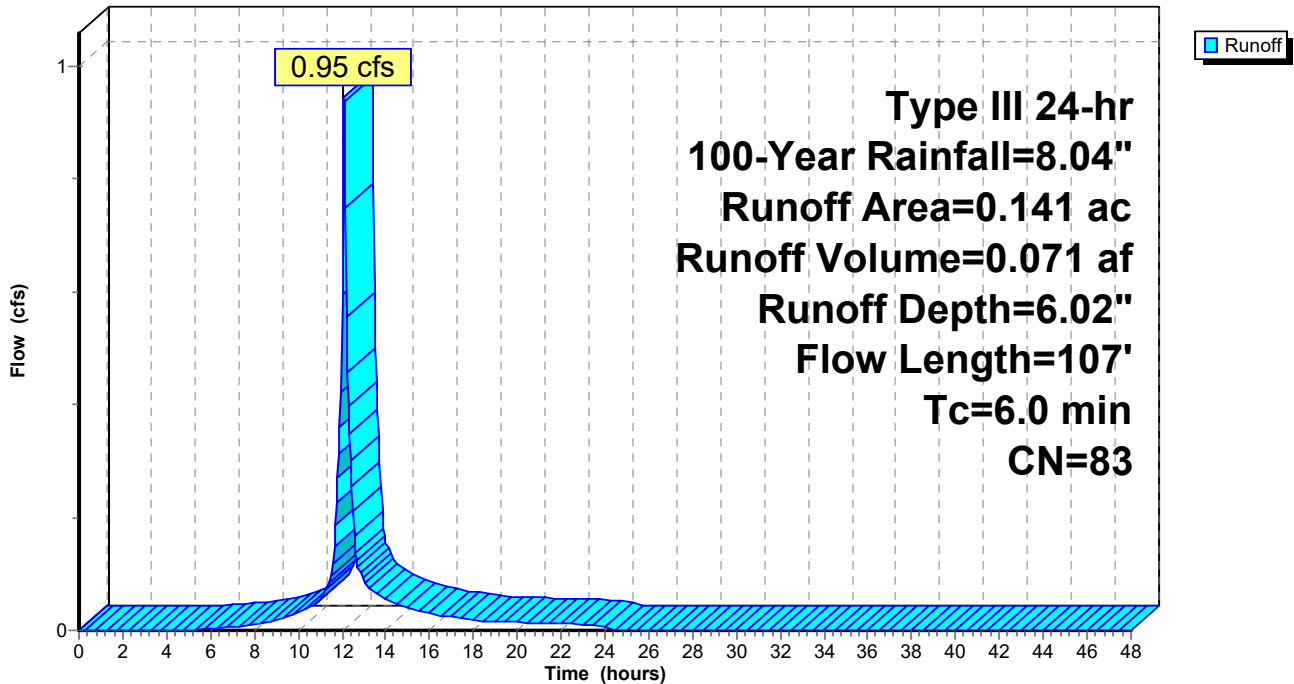
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.04"

Area (ac)	CN	Description
0.051	98	Water Surface, 0% imp, HSG C
0.090	74	>75% Grass cover, Good, HSG C
0.141	83	Weighted Average
0.141		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		Sheet Flow, Grass Grass: Dense n= 0.240 P2= 3.37"
0.3	57	0.1754	2.93		Shallow Concentrated Flow, Woods Short Grass Pasture Kv= 7.0 fps
4.5	107	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 21S: DA 2F

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Type III 24-hr 100-Year Rainfall=8.04"

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Summary for Subcatchment 22S: DA 2H

Runoff = 16.02 cfs @ 12.14 hrs, Volume= 1.349 af, Depth= 5.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.04"

Area (ac)	CN	Description
* 0.431	98	Paved parking, HSG C, North
* 0.010	80	>75% Grass cover, Good, HSG D, North
* 0.313	74	>75% Grass cover, Good, HSG C, North
* 0.550	98	Paved parking, HSG C, South
* 0.356	74	>75% Grass cover, Good, HSG C, South
0.748	70	Woods, Good, HSG C
0.336	74	>75% Grass cover, Good, HSG C
2.744	82	Weighted Average
1.763		64.25% Pervious Area
0.981		35.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1000	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.37"
1.7	190	0.1316	1.81		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	81	0.3333	4.04		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.7	355	0.0310	3.57		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
10.0	676	Total			

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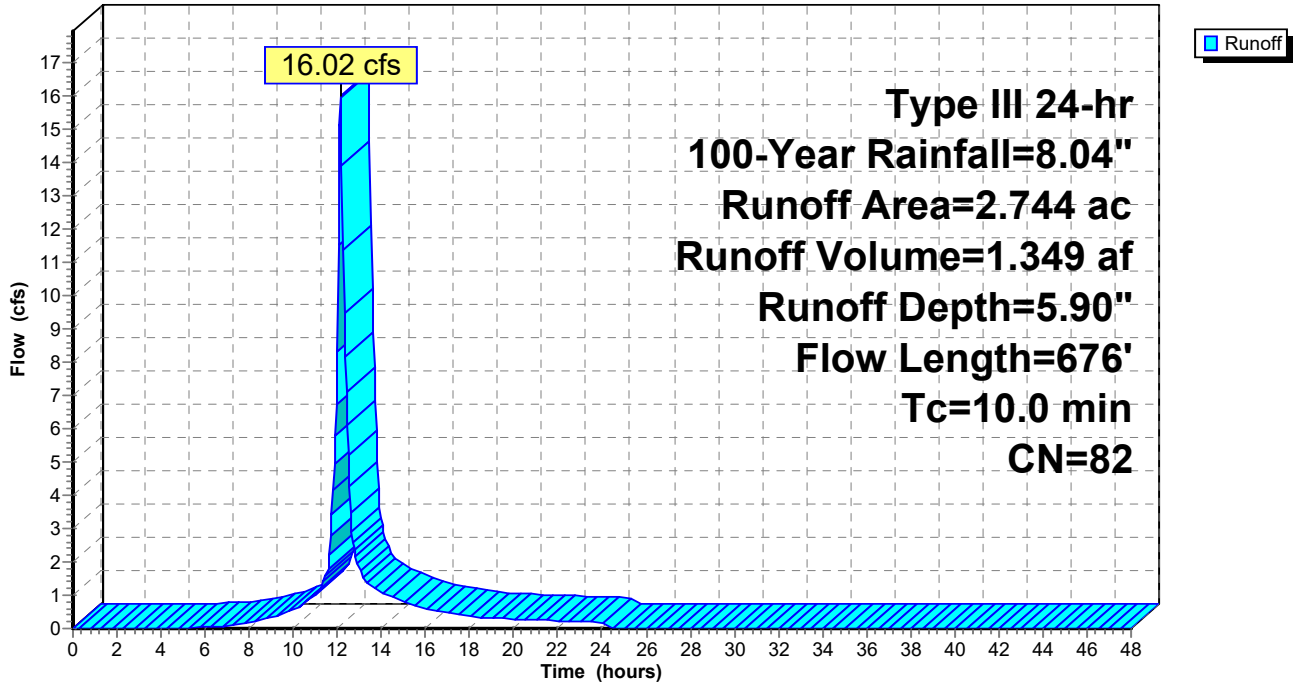
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Subcatchment 22S: DA 2H

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Summary for Pond 15P: Apartments Phase II Stormwater Basin 2

Inflow Area = 3.277 ac, 30.06% Impervious, Inflow Depth = 5.68" for 100-Year event
 Inflow = 17.47 cfs @ 12.16 hrs, Volume= 1.550 af
 Outflow = 16.96 cfs @ 12.18 hrs, Volume= 1.471 af, Atten= 3%, Lag= 1.4 min
 Primary = 16.96 cfs @ 12.18 hrs, Volume= 1.471 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 568.37' @ 12.19 hrs Surf.Area= 2,459 sf Storage= 6,342 cf

Plug-Flow detention time= 48.3 min calculated for 1.470 af (95% of inflow)
 Center-of-Mass det. time= 20.4 min (828.1 - 807.7)

Volume	Invert	Avail.Storage	Storage Description
#1	562.00'	6 cf	3.00'W x 8.00'L x 2.50'H Sand Underdrain 60 cf Overall x 10.0% Voids
#2	564.50'	10,719 cf	Stormwater Basin (Irregular) Listed below
		10,725 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
564.50	4	8.2	0	0	4
564.75	257	68.5	24	24	372
565.00	1,193	160.0	167	191	2,036
566.00	1,533	172.5	1,359	1,551	2,406
568.00	2,277	197.6	3,786	5,336	3,233
570.00	3,128	222.7	5,383	10,719	4,172

Device	Routing	Invert	Outlet Devices
#1	Primary	562.00'	18.0" Round 18" HDPE L= 68.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 562.00' / 561.60' S= 0.0059 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	567.00'	36.0" W x 6.0" H Vert. 36" x 6" Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	568.00'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#4	Secondary	569.00'	8.0' long x 8.0' breadth Rip Rap Spillway 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#5	Device 1	562.00'	0.500 in/hr Sand Underdrain over Horizontal area from 562.00' - 564.50' Excluded Horizontal area = 24 sf Phase-In= 0.01'

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Type III 24-hr 100-Year Rainfall=8.04"

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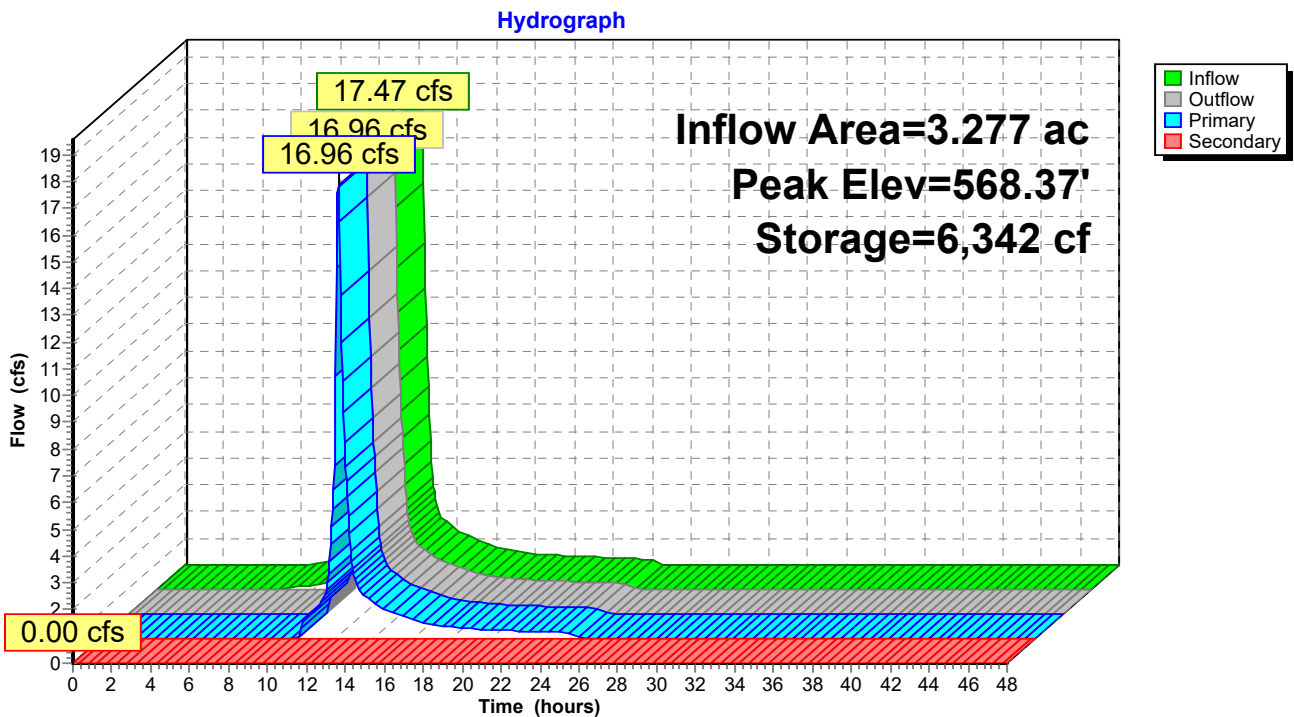
Primary OutFlow Max=16.80 cfs @ 12.18 hrs HW=568.36' TW=564.47' (Dynamic Tailwater)

- 1=18" HDPE (Inlet Controls 16.80 cfs @ 9.51 fps)
- 2=36" x 6" Orifice (Passes < 7.60 cfs potential flow)
- 3=Top of Frame (Passes < 10.03 cfs potential flow)
- 5=Sand Underdrain (Passes < 0.00 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=562.00' TW=0.00' (Dynamic Tailwater)

- 4=Rip Rap Spillway (Controls 0.00 cfs)

Pond 15P: Apartments Phase II Stormwater Basin 2



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Type III 24-hr 100-Year Rainfall=8.04"

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Summary for Pond 20P: Apartments Phase II Stormwater Basin 1

Inflow Area = 7.001 ac, 33.00% Impervious, Inflow Depth = 5.72" for 100-Year event
 Inflow = 38.23 cfs @ 12.15 hrs, Volume= 3.334 af
 Outflow = 23.61 cfs @ 12.33 hrs, Volume= 3.144 af, Atten= 38%, Lag= 10.8 min
 Primary = 21.13 cfs @ 12.33 hrs, Volume= 3.112 af
 Secondary = 2.48 cfs @ 12.33 hrs, Volume= 0.032 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 560.00' @ 12.33 hrs Surf.Area= 8,336 sf Storage= 37,060 cf

Plug-Flow detention time= 82.0 min calculated for 3.141 af (94% of inflow)
 Center-of-Mass det. time= 51.9 min (863.5 - 811.6)

Volume	Invert	Avail.Storage	Storage Description
#1	551.00'	4 cf	3.00'W x 8.00'L x 1.75'H Sand Underdrain 42 cf Overall x 10.0% Voids
#2	552.75'	40,883 cf	Stormwater Basin (Irregular) Listed below (Recalc)
#3	556.00'	424 cf	36.0" Round Pipe Storage-Impervious L= 60.0' S= 0.0083 ' /'
		41,312 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
552.75	120	43.3	0	0	120
553.00	865	110.3	109	109	939
553.25	1,552	155.7	298	407	1,901
553.50	2,135	207.8	459	866	3,409
553.75	2,928	261.6	630	1,496	5,419
554.00	3,512	310.5	804	2,300	7,646
555.00	4,145	323.0	3,824	6,124	8,352
556.00	4,804	335.6	4,470	10,595	9,090
557.00	5,490	348.1	5,143	15,738	9,851
558.00	6,569	422.7	6,021	21,759	14,443
559.00	7,426	435.3	6,993	28,752	15,404
560.00	8,310	447.8	7,864	36,616	16,387
560.50	8,761	454.1	4,267	40,883	16,893

Device	Routing	Invert	Outlet Devices
#1	Primary	551.00'	18.0" Round 18" HDPE L= 152.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 551.00' / 549.00' S= 0.0132 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	555.50'	6.0" Vert. 6" Orifices (2) X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	557.30'	48.0" W x 7.0" H Vert. 48" x 7" Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	558.75'	1.0" x 3.7" Horiz. Top of Frame X 39.00 columns X 9 rows C= 0.600 in 48.0" x 36.0" Grate (75% open area) Limited to weir flow at low heads
#5	Secondary	559.75'	8.0' long x 8.0' breadth Rip Rap Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

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#6	Device 1	551.00'	2.50	3.00	3.50	4.00	4.50	5.00	5.50			
			Coef. (English)	2.43	2.54	2.70	2.69	2.68	2.68	2.66	2.64	2.64
				2.64	2.65	2.65	2.66	2.66	2.68	2.70	2.74	
				0.500 in/hr Sand Underdrain over Horizontal area from 551.00' - 552.75'								
				Excluded Horizontal area = 24 sf Phase-In= 0.01'								

Primary OutFlow Max=21.12 cfs @ 12.33 hrs HW=559.99' TW=0.00' (Dynamic Tailwater)

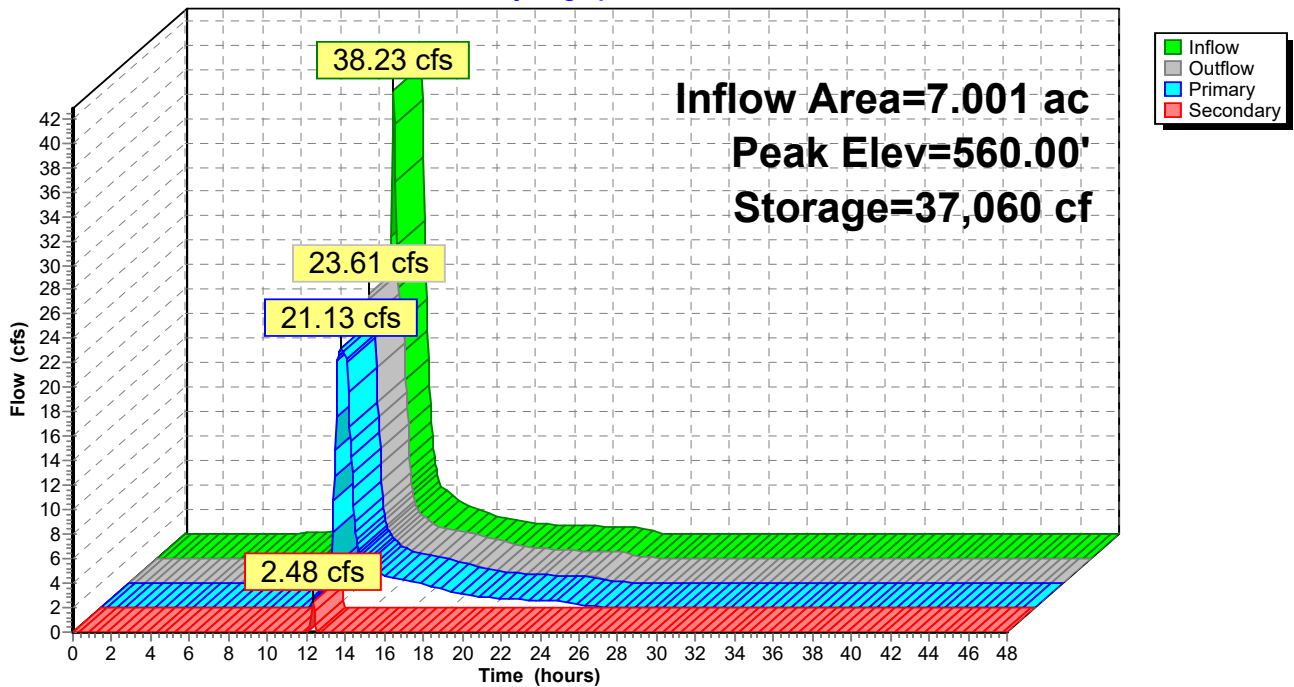
- 1=18" HDPE (Barrel Controls 21.12 cfs @ 11.95 fps)
- 2=6" Orifices (2) (Passes < 3.90 cfs potential flow)
- 3=48" x 7" Orifice (Passes < 17.41 cfs potential flow)
- 4=Top of Frame (Passes < 48.45 cfs potential flow)
- 6=Sand Underdrain (Passes < 0.00 cfs potential flow)

Secondary OutFlow Max=2.38 cfs @ 12.33 hrs HW=559.99' TW=0.00' (Dynamic Tailwater)

- 5=Rip Rap Spillway (Weir Controls 2.38 cfs @ 1.21 fps)

Pond 20P: Apartments Phase II Stormwater Basin 1

Hydrograph



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Summary for Pond 21P: Drain

Inflow Area = 3.813 ac, 34.85% Impervious, Inflow Depth = 5.58" for 100-Year event
 Inflow = 20.33 cfs @ 12.17 hrs, Volume= 1.772 af
 Outflow = 20.33 cfs @ 12.17 hrs, Volume= 1.772 af, Atten= 0%, Lag= 0.0 min
 Primary = 20.33 cfs @ 12.17 hrs, Volume= 1.772 af

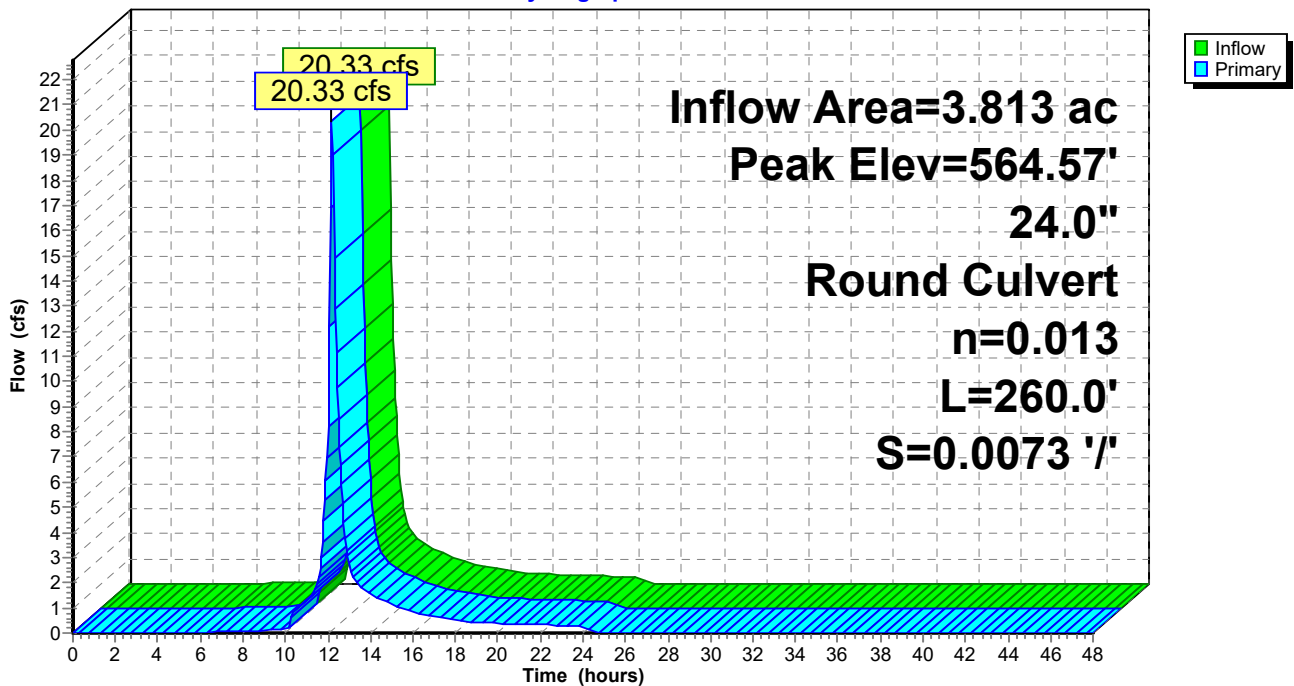
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 564.57' @ 12.17 hrs
 Flood Elev= 565.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	561.40'	24.0" Round Culvert L= 260.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 561.40' / 559.50' S= 0.0073 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=19.95 cfs @ 12.17 hrs HW=564.47' TW=559.40' (Dynamic Tailwater)
 ←1=Culvert (Barrel Controls 19.95 cfs @ 6.35 fps)

Pond 21P: Drain

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.04"

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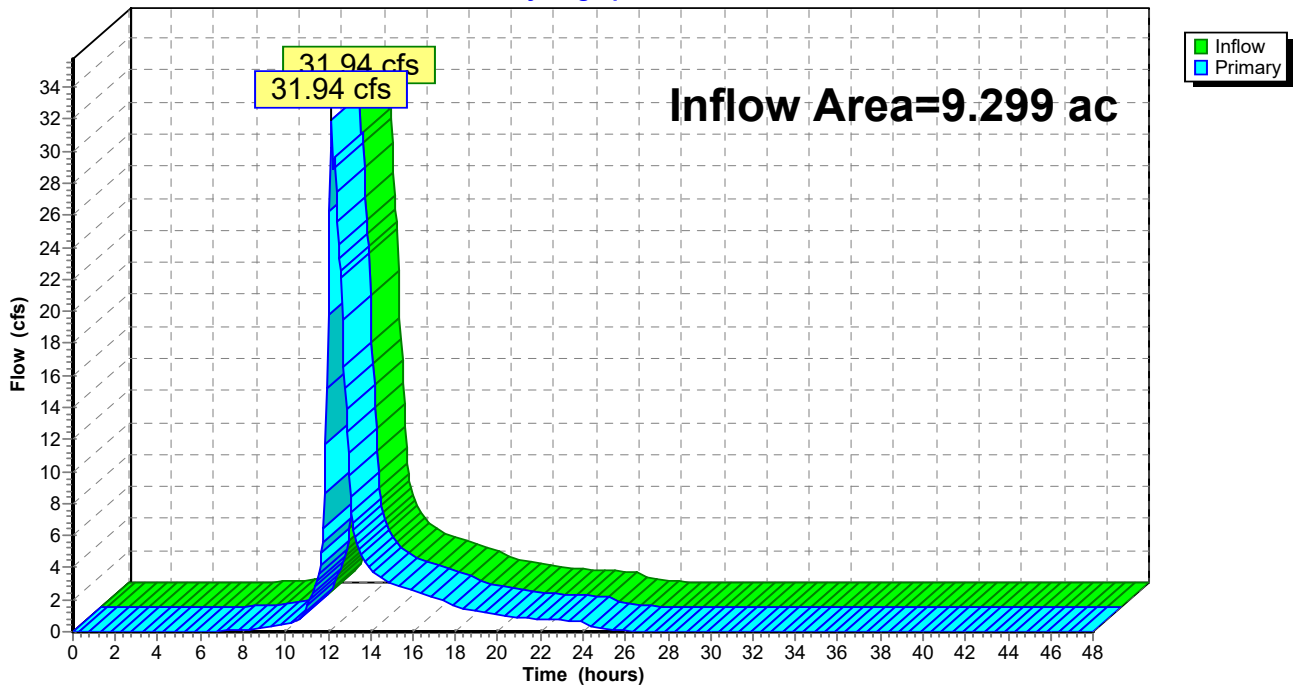
Summary for Link 20L: Off-Site

Inflow Area = 9.299 ac, 30.95% Impervious, Inflow Depth = 5.46" for 100-Year event
Inflow = 31.94 cfs @ 12.15 hrs, Volume= 4.229 af
Primary = 31.94 cfs @ 12.15 hrs, Volume= 4.229 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 20L: Off-Site

Hydrograph



Appendix C

Supporting Stormwater Calculations

Appendix C
Pipe Sizing Calculations

Manning's Equation for Open Channel Flow

$$Q = \frac{1.49}{n} AR^{2/3} S^{1/2}$$

Maximum pipe capacities for the trunk line drains are presented below as compared to the peak flow rates calculated using the Rational Method for the contributing watersheds or the HydroCAD modeling results as applicable. Pipes are sized with capacity for the 10-year design storm minimum in accordance with the recommendations of the CT DOT Drainage Manual for curb and gutter systems.

DMH 6 to DMH 2 (18-inch HDPE at S=0.015)

Q=	12.90 CFS	Flow Rate
<i>n</i> =	0.013	Roughness Coefficient
<i>A</i> =	1.77 SF	Area of Pipe
<i>R</i> =	0.375 FT	Hydraulic Radius = <i>A</i> / <i>P</i>
<i>S</i> =	0.015 FT/FT	Pipe Slope
<i>r</i> =	0.75 FT	Pipe Radius
<i>P</i> =	4.71 FT	Pipe Perimeter

Design Flow Rate

Q=	8.97 CFS
(10-year flow from DA 2H)	
CAPACITY FOR 10-YEAR EVENT (MIN)	

DMH 7 to DMH-6 (18-inch HDPE at S=0.015)

Q=	12.90 CFS	Flow Rate
<i>n</i> =	0.013	Roughness Coefficient
<i>A</i> =	1.77 SF	Area of Pipe
<i>R</i> =	0.375 FT	Hydraulic Radius = <i>A</i> / <i>P</i>
<i>S</i> =	0.015 FT/FT	Pipe Slope
<i>r</i> =	0.75 FT	Pipe Radius
<i>P</i> =	4.71 FT	Pipe Perimeter

Design Flow Rate

Q=	8.97 CFS
(10-year flow from DA 2H)	
CAPACITY FOR 10-YEAR EVENT (MIN)	

CB 1 to DMH 7 (15-inch HDPE at S = 0.060)

Q=	15.87 CFS	Flow Rate
<i>n</i> =	0.013	Roughness Coefficient
<i>A</i> =	1.23 SF	Area of Pipe
<i>R</i> =	0.3125 FT	Hydraulic Radius = <i>A</i> / <i>P</i>
<i>S</i> =	0.06 FT/FT	Pipe Slope
<i>r</i> =	0.625 FT	Pipe Radius
<i>P</i> =	3.93 FT	Pipe Perimeter

Design Flow Rate

Q=	8.97 CFS
(10-year flow from DA 2H)	
CAPACITY FOR 10-YEAR EVENT (MIN)	

CB 2 to CB 1 (15-inch HDPE at S = 0.072)

Q=	17.38 CFS	Flow Rate
<i>n</i> =	0.013	Roughness Coefficient
<i>A</i> =	1.23 SF	Area of Pipe
<i>R</i> =	0.3125 FT	Hydraulic Radius = <i>A</i> / <i>P</i>
<i>S</i> =	0.072 FT/FT	Pipe Slope
<i>r</i> =	0.625 FT	Pipe Radius
<i>P</i> =	3.93 FT	Pipe Perimeter

Design Flow Rate

Q=	8.97 CFS
(10-year flow from DA 2H)	
CAPACITY FOR 10-YEAR EVENT (MIN)	

Appendix C
Pipe Sizing Calculations

CB 3 to CB 2 (15-inch HDPE at S = 0.061)

Q= 16.00 CFS Flow Rate
n= 0.013 Roughness Coefficient
A= 1.23 SF Area of Pipe
R= 0.3125 FT Hydraulic Radius = *A*/*P*
S= 0.061 FT/FT Pipe Slope
r= 0.625 FT Pipe Radius
P= 3.93 FT Pipe Perimeter

Design Flow Rate

Q= 9.42 CFS

(10-year flow from DA 2H)

CAPACITY FOR 10-YEAR EVENT (MIN)

CB 4 to CB 3 (15-inch HDPE at S = 0.013)

Q= 7.39 CFS Flow Rate
n= 0.013 Roughness Coefficient
A= 1.23 SF Area of Pipe
R= 0.3125 FT Hydraulic Radius = *A*/*P*
S= 0.013 FT/FT Pipe Slope
r= 0.625 FT Pipe Radius
P= 3.93 FT Pipe Perimeter

Design Flow Rate

C_f= 1

C= 0.95

I= 5.42 in/hour

A= 0.16 acre

Q= 0.8 CFS

CAPACITY FOR 10-YEAR EVENT (MIN)

CB 5 to CB 3 (15-inch HDPE at S = 0.059)

Q= 15.73 CFS Flow Rate
n= 0.013 Roughness Coefficient
A= 1.23 SF Area of Pipe
R= 0.3125 FT Hydraulic Radius = *A*/*P*
S= 0.059 FT/FT Pipe Slope
r= 0.625 FT Pipe Radius
P= 3.93 FT Pipe Perimeter

Design Flow Rate

Q= 9.42 CFS

(10-year flow from DA 2H)

CAPACITY FOR 10-YEAR EVENT (MIN)

CB 6 to CB 5 (15-inch HDPE at S = 0.025)

Q= 10.24 CFS Flow Rate
n= 0.013 Roughness Coefficient
A= 1.23 SF Area of Pipe
R= 0.3125 FT Hydraulic Radius = *A*/*P*
S= 0.025 FT/FT Pipe Slope
r= 0.625 FT Pipe Radius
P= 3.93 FT Pipe Perimeter

Design Flow Rate

Q= 9.42 CFS

(10-year flow from DA 2H)

CAPACITY FOR 10-YEAR EVENT (MIN)

CB 7 to CB 6 (15-inch HDPE at S = 0.037)

Q= 12.46 CFS Flow Rate
n= 0.013 Roughness Coefficient
A= 1.23 SF Area of Pipe
R= 0.3125 FT Hydraulic Radius = *A*/*P*
S= 0.037 FT/FT Pipe Slope
r= 0.625 FT Pipe Radius
P= 3.93 FT Pipe Perimeter

Design Flow Rate

Q= 9.42 CFS

(10-year flow from DA 2H)

CAPACITY FOR 10-YEAR EVENT (MIN)

Appendix C
Pipe Sizing Calculations

CB 8 to DMH 5 (15-inch HDPE at S = 0.074)

Q=	17.62 CFS	Flow Rate
<i>n</i> =	0.013	Roughness Coefficient
<i>A</i> =	1.23 SF	Area of Pipe
<i>R</i> =	0.3125 FT	Hydraulic Radius = A/P
<i>S</i> =	0.074 FT/FT	Pipe Slope
<i>r</i> =	0.625 FT	Pipe Radius
<i>P</i> =	3.93 FT	Pipe Perimeter

Design Flow Rate

Q=	2.02 CFS
(10-year flow from DA 2I)	
CAPACITY FOR 10-YEAR EVENT (MIN)	

CB 9 to CB 8 (15-inch HDPE at S = 0.020)

Q=	9.16 CFS	Flow Rate
<i>n</i> =	0.013	Roughness Coefficient
<i>A</i> =	1.23 SF	Area of Pipe
<i>R</i> =	0.3125 FT	Hydraulic Radius = A/P
<i>S</i> =	0.02 FT/FT	Pipe Slope
<i>r</i> =	0.625 FT	Pipe Radius
<i>P</i> =	3.93 FT	Pipe Perimeter

Design Flow Rate

Q=	2.02 CFS
(10-year flow from DA 2I)	
CAPACITY FOR 10-YEAR EVENT (MIN)	

DMH 8 to Outlet (18-inch HDPE at S = 0.010)

Q=	10.53 CFS	Flow Rate
<i>n</i> =	0.013	Roughness Coefficient
<i>A</i> =	1.77 SF	Area of Pipe
<i>R</i> =	0.375 FT	Hydraulic Radius = A/P
<i>S</i> =	0.01 FT/FT	Pipe Slope
<i>r</i> =	0.75 FT	Pipe Radius
<i>P</i> =	4.71 FT	Pipe Perimeter

Design Flow Rate

Q=	9.16 CFS
(10-year flow from DA 2E)	
CAPACITY FOR 10-YEAR EVENT (MIN)	

CB 10 to DMH 8 (18-inch HDPE at S = 0.010)

Q=	10.53 CFS	Flow Rate
<i>n</i> =	0.013	Roughness Coefficient
<i>A</i> =	1.77 SF	Area of Pipe
<i>R</i> =	0.375 FT	Hydraulic Radius = A/P
<i>S</i> =	0.01 FT/FT	Pipe Slope
<i>r</i> =	0.75 FT	Pipe Radius
<i>P</i> =	4.71 FT	Pipe Perimeter

Design Flow Rate

Q=	9.16 CFS
(10-year flow from DA 2E)	
CAPACITY FOR 10-YEAR EVENT (MIN)	

CB 11 to CB 10 (18-inch HDPE at S = 0.010)

Q=	10.53 CFS	Flow Rate
<i>n</i> =	0.013	Roughness Coefficient
<i>A</i> =	1.77 SF	Area of Pipe
<i>R</i> =	0.375 FT	Hydraulic Radius = A/P
<i>S</i> =	0.01 FT/FT	Pipe Slope
<i>r</i> =	0.75 FT	Pipe Radius
<i>P</i> =	4.71 FT	Pipe Perimeter

Design Flow Rate

Q=	9.16 CFS
(10-year flow from DA 2E)	
CAPACITY FOR 10-YEAR EVENT (MIN)	

Appendix C
Pipe Sizing Calculations

CB 12 to CB 11 (18-inch HDPE at S = 0.010)

Q= 10.53 CFS Flow Rate
n= 0.013 Roughness Coefficient
A= 1.77 SF Area of Pipe
R= 0.375 FT Hydraulic Radius = *A*/*P*
S= 0.01 FT/FT Pipe Slope
r= 0.75 FT Pipe Radius
P= 4.71 FT Pipe Perimeter

Design Flow Rate

Q= 9.16 CFS
 (10-year flow from DA 2E)
CAPACITY FOR 10-YEAR EVENT (MIN)

CB 13 to CB 12 (15-inch HDPE at S = 0.014)

Q= 7.66 CFS Flow Rate
n= 0.013 Roughness Coefficient
A= 1.23 SF Area of Pipe
R= 0.3125 FT Hydraulic Radius = *A*/*P*
S= 0.014 FT/FT Pipe Slope
r= 0.625 FT Pipe Radius
P= 3.93 FT Pipe Perimeter

Design Flow Rate

C_f= 1
C= 0.95
I= 5.42 in/hour
A= 0.44 acre
Q= 2.3 CFS
CAPACITY FOR 10-YEAR EVENT (MIN)

CB 14 to CB 13 (15-inch HDPE at S = 0.009)

Q= 6.14 CFS Flow Rate
n= 0.013 Roughness Coefficient
A= 1.23 SF Area of Pipe
R= 0.3125 FT Hydraulic Radius = *A*/*P*
S= 0.009 FT/FT Pipe Slope
r= 0.625 FT Pipe Radius
P= 3.93 FT Pipe Perimeter

Design Flow Rate

C_f= 1
C= 0.95
I= 5.42 in/hour
A= 0.44 acre
Q= 2.3 CFS
CAPACITY FOR 10-YEAR EVENT (MIN)

DMH 3 to DMH 2 (24-inch HDPE at S = 0.006)

Q= 17.57 CFS Flow Rate
n= 0.013 Roughness Coefficient
A= 3.14 SF Area of Pipe
R= 0.5 FT Hydraulic Radius = *A*/*P*
S= 0.006 FT/FT Pipe Slope
r= 1 FT Pipe Radius
P= 6.28 FT Pipe Perimeter

Design Flow Rate

Q= 11.05 CFS
 (10-year flow from DA 2I and
 Stormwater Basin 2)
CAPACITY FOR 10-YEAR EVENT (MIN)

DMH 4 to DMH 3 (24-inch HDPE at S = 0.007)

Q= 18.98 CFS Flow Rate
n= 0.013 Roughness Coefficient
A= 3.14 SF Area of Pipe
R= 0.5 FT Hydraulic Radius = *A*/*P*
S= 0.007 FT/FT Pipe Slope
r= 1 FT Pipe Radius
P= 6.28 FT Pipe Perimeter

Design Flow Rate

Q= 11.05 CFS
 (10-year flow from DA 2I and
 Stormwater Basin 2)
CAPACITY FOR 10-YEAR EVENT (MIN)

Appendix C
Pipe Sizing Calculations

DMH 5 to DMH 4 (24-inch HDPE at S = 0.008)

Q=	20.29 CFS	Flow Rate
<i>n</i> =	0.013	Roughness Coefficient
<i>A</i> =	3.14 SF	Area of Pipe
<i>R</i> =	0.5 FT	Hydraulic Radius = <i>A</i> / <i>P</i>
<i>S</i> =	0.008 FT/FT	Pipe Slope
<i>r</i> =	1 FT	Pipe Radius
<i>P</i> =	6.28 FT	Pipe Perimeter

Design Flow Rate

Q=	11.05 CFS
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(10-year flow from DA 2I and Stormwater Basin 2)

CAPACITY FOR 10-YEAR EVENT (MIN)

Roof Drainage* (8-inch PVC at S = 0.02 minimum)

Q=	1.97 CFS	Flow Rate
<i>n</i> =	0.011	Roughness Coefficient
<i>A</i> =	0.34 SF	Area of Pipe
<i>R</i> =	0.165 FT	Hydraulic Radius = <i>A</i> / <i>P</i>
<i>S</i> =	0.02 FT/FT	Pipe Slope
<i>r</i> =	0.33 FT	Pipe Radius
<i>P</i> =	2.07 FT	Pipe Perimeter

Design Flow Rate

<i>C_f</i> =	1
<i>C</i> =	0.95
<i>I</i> =	5.42 in/hour
<i>A</i> =	0.318 acre
Q=	1.6 CFS

**CAPACITY FOR 10-YEAR EVENT (MIN)
FOR TWO BUILDINGS**

Roof Drainage* (8-inch PVC at S = 0.01 minimum)

Q=	1.39 CFS	Flow Rate
<i>n</i> =	0.011	Roughness Coefficient
<i>A</i> =	0.34 SF	Area of Pipe
<i>R</i> =	0.165 FT	Hydraulic Radius = <i>A</i> / <i>P</i>
<i>S</i> =	0.01 FT/FT	Pipe Slope
<i>r</i> =	0.33 FT	Pipe Radius
<i>P</i> =	2.07 FT	Pipe Perimeter

Design Flow Rate

<i>C_f</i> =	1
<i>C</i> =	0.95
<i>I</i> =	5.42 in/hour
<i>A</i> =	0.159 acre
Q=	0.8 CFS

**CAPACITY FOR 10-YEAR EVENT (MIN)
FOR ONE BUILDING**

**2015 International Plumbing Code specifies a rainfall intensity of 2.75 inches/hour for roof drain sizing. Proposed sizing is conservative.*

Appendix C
Preformed Scour Hole Sizing Calculations

Empirical Preformed Scour Hole Equations:

Type 1: Scour Hole Depression = one-half pipe rise, m (ft)

$$d_{50} = (0.0276 R_p^2 / TW) (Q/R_p^{2.5})^{1.333} \quad (d_{50} = (0.0125 R_p^2 / TW) (Q/R_p^{2.5})^{1.333}) \quad (11.35)$$

Type 1 and 2 preformed scour hole dimensions (See Figure 11-15)

$$\begin{aligned} C &= 3S_p + 6F && \text{Basin Length m (ft)} \\ B &= 2S_p + 6F && \text{Basin Inlet and Outlet Width m (ft)} \\ F &= 0.5R_p \text{ (Type 1) or } R_p \text{ (Type 2)} && \text{Basin Depression m (ft)} \end{aligned} \quad (11.37)$$

Table 11-14 solves the above set of equations for Type 1 and 2 preformed scour holes for various pipe sizes.

The type of riprap required is as follows:

Modified	$d_{50} < 0.13\text{m (0.42 ft)}$
Intermediate	$0.13\text{m (0.42 ft)} < d_{50} < 0.20\text{m (0.67 ft)}$
Standard	$0.20\text{m (0.67 ft)} < d_{50} < 0.38\text{m (1.25 ft)}$
Special Design	$0.38\text{m (1.25 ft)} < d_{50}$

L_a = length of apron, m (ft)

S_p = inside diameter for circular sections or maximum inside pipe span for non-circular sections, m (ft)

Q = pipe (design) discharge, cms (cfs)

TW = tailwater depth, m (ft)

R_p = maximum inside pipe rise, m (ft)

Note: $S_p = R_p$ = inside diameter for circular sections

Stormwater Basin 1 Inlet

S_p =	36 Inches	Pipe Diameter
Q =	20.3 CFS	100-year flow
d_{50} =	0.16 FT	Equation 11.35, Use Modified Riprap
F =	1.50 FT	Equation 11.37
C =	18.0 FT	Equation 11.37
B =	15 FT	Equation 11.37

Stormwater Basin 1 Outlet

S_p =	18 Inches	Pipe Diameter
Q =	21.1 CFS	100-year flow
d_{50} =	0.44 FT	Equation 11.35, Use Intermediate Riprap
F =	0.75 FT	Equation 11.37
C =	9.0 FT	Equation 11.37
B =	7.5 FT	Equation 11.37

Stormwater Basin 2 Inlet

S_p =	18 Inches	Pipe Diameter
Q =	17.5 CFS	100-year flow
d_{50} =	0.34 FT	Equation 11.35, Use Modified Riprap
F =	0.75 FT	Equation 11.37
C =	9.0 FT	Equation 11.37
B =	7.5 FT	Equation 11.37

Appendix C

Water Quality Volume Calculations

Water Quality Volume - Apartments Phase 2

$$WQV = (1")R(A)/12$$

WQV = Water Quality Volume (acre-feet)

R = Runoff Co-Efficient = $0.005 + 0.009(I)$

I = Impervious Area (%)

A = Site Area (acres)

Water Quality Volume for Contributing Area to Stormwater Basin 1 (DA 2E, DA 2F, DA 2G, 2H, DA 2I)

IA= 2.31 acres

I = 33.00 %

R = 0.30

A = 7.00 acres

WQV = 0.18 acre-feet

= **7,673.84 cubic feet**

8,281 cubic feet of storage between bottom of basin and lowest outlet. Due to high groundwater conditions and poor soils (HSG C) a sand filter underdrain will be installed to drain the retained Water Quality Volume from the stormwater basin to prevent extended periods of ponding.

Water Quality Volume for Contributing Area to Stormwater Basin 2 (DA 2E and DA 2F)

IA= 0.99 acres

I = 30.03 %

R = 0.28

A = 3.28 acres

WQV = 0.08 acre-feet

= **3,277.53 cubic feet**

3,450 cubic feet of storage between bottom of basin and lowest outlet. Due to high groundwater conditions and poor soils (HSG C) a sand filter underdrain will be installed to drain the retained Water Quality Volume from the stormwater basin to prevent extended periods of ponding.

Appendix C
Sediment Forebay Sizing

Stormwater Basin 1

Sediment forebay sized for 10% of the water quality volume. Sediment forebay is 3-feet deep.

Water Quality Volume for Stormwater Basin 1 =	7,674 cubic feet
Required Sediment Forebay Volume =	767 cubic feet
Sediment Forebay Volume Provided =	933 cubic feet

Stormwater Basin 2

Sediment forebay sized for 10% of the water quality volume. Sediment forebay is 1.5 feet deep.

Water Quality Volume for Stormwater Basin 2 =	3,278 cubic feet
Required Sediment Forebay Volume =	328 cubic feet
Sediment Forebay Volume Provided =	358 cubic feet

Appendix C
Underdrain Sizing Calculations

Time to Drain through Underdrain Filter

$$A_f = \frac{(WQV)(d)}{[(k)(t)(b+d)]}$$

where: A_f = filter bed surface area (ft²)
 WQV = water quality volume (ft³)
 d = filter bed depth (ft)
 k = hydraulic conductivity of filter media (ft/day)
 t = time for the water quality volume to drain from the system (24 hours)
 b = average height of water above filter bed during water quality design storm

Stormwater Basin 1

Af= 95.844907 sf (required filter surface area)
WQV= 8,281.00 cf (use retained volume)
d= 2.5 ft
k= 1 ft/day
t= 72 hours
h= 0.5 ft

Filter Surface Area Provided = 99 square feet (33 feet long x 3.0 feet wide)

Stormwater Basin 2

Af= 39.930556 sf (required filter surface area)
WQV= 3,450.00 cf (use retained volume)
d= 2.5 ft
k= 1 ft/day
t= 72 hours
h= 0.5 ft

Filter Surface Area Provided = 42 square feet (13 feet long x 3.0 feet wide)

Appendix C

Groundwater Recharge Volume Calculations

Groundwater Recharge Volume - Apartments Phase 2

$$GRV = (D)(A)(I)/12$$

GRV = Groundwater Recharge Volume (acre-feet)

D = Depth of runoff to be recharged (inches)

A = Site Area (acres)

I = Post-development site imperviousness

D= 0.10 inches HSG C (Table 7-4 of the DEEP Water Quality Manual)

A = 7.00 acres

IA = 2.55 acres

I = 0.36

GRV = 0.02 acre-feet

= **925.65** cubic feet

Groundwater recharge provided via infiltration of roof runoff in Stormtech infiltration chambers

= **1,040.60** cubic feet of on-site storage provided with five 8' diameter dry wells surrounded with 12" of crushed stone (1 dry well per building)

Drywell Volume

Inside Diameter = 7.33333 feet

Outside Diameter = 8 feet

Surrounding Stone = 10 feet

Structure Storage per Foot = 42.23693 cubic feet

Stone Storage per Foot = 11.30973 cubic feet

Stone Storage Below = 31.41593 cubic feet

Total Storage per Foot of Structure = 53.54666 cubic feet

Depth from Invert to Bottom of Structure = 3.3 feet

Total Storage per Structure Plus Stone = 208.1199 cubic feet

Appendix C

Temporary Sediment Trap Sizing Calculations

Temporary Sediment Traps sized for 134 cubic yards of storage per acre of contributing area.

Temporary Sediment Trap 1

Contributing area =	2.4 acres
Required storage =	322 cubic yards
	8,683 cubic feet
Bottom of excavation =	549.00
Emergency spillway =	553.00
Storage provided =	8,994 cubic feet
	138.80 cubic yards per acre

Temporary Sediment Trap 2

Contributing area =	3.34 acres
Required storage =	448 cubic yards
	12,084 cubic feet
Bottom of excavation =	558.00
Emergency spillway =	562.00
Storage provided =	13,280 cubic feet
	147.26 cubic yards per acre

Temporary Sediment Trap 3

Contributing area =	0.25 acres
Required storage =	34 cubic yards
	905 cubic feet
Bottom of excavation =	558.00
Emergency spillway =	561.00
Storage provided =	1,037 cubic feet
	153.63 cubic yards per acre

Appendix D

Proposed Site Development Plans
