STORMWATER MANAGEMENT REPORT

Founders Plaza
Parking Lot Improvements

323 & 321 Pitkin Street
East Hartford, Connecticut 06108

PREPARED FOR

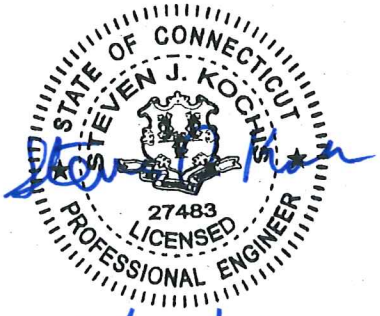
Merchant 99-111 Founders LLC
111 Founders Plaza
Suite 101
East Hartford, CT 06108

PREPARED BY

vhb

100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
860.807.4300

May 15, 2018



5/24/18

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Stormwater Report Narrative

Project Description

The proposed project includes the reconfiguration of and addition to the existing parking lots serving the 111 Founders Plaza office building.

Site Description

The Project Site (the site) is comprised of two (2) parcels consisting of 323 Pitkin Street (±3.45-acres, Map Lot 4-38) and 321 Pitkin Street (±5.73-acres, Map Lot 4-38C) in East Hartford, Connecticut. The site is the location of an active office building and parking garage, with associated parking lots. The site has interconnection with the adjacent hotel located directly to the northwest of the site, with the adjacent office building located directly to the south of the site, and with the adjacent office buildings located directly to the east of the site. The Site is bounded by Pitkin Street to the north, East River Drive to the west, an office building to the south, and office buildings to the east.

Per the National Resources Conservation Service (NRCS), surface soils on the Site include Udorthents Urban Land Complex and Urban Land soils (Hydraulic Soil Group B and D, moderate and very slow infiltration rate potential respectively), see Appendix A for more information.

The site is not located within a FEMA 100-yr flood zone, per FEMA map no. 09003C0368G, effective September 16, 2011 (included in Appendix A). It is located within a Zone X, described as "0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depths less than one foot or with drainage areas of less than one square mile". The site is protected from flood risk by levees constructed adjacent to the Connecticut River.

A geotechnical engineering evaluation of the adjacent property was performed by JGI Eastern, dated September 30, 2005. It is noted within the geotech report that bedrock was not encountered and that groundwater was encountered at depths between 10.5 and 15 feet below grade.

Existing Drainage Conditions

The existing site is developed with an office building, a parking garage, and associated parking lots. Untreated stormwater runoff from the site is generally captured by on-site catch basins and discharged to the south to Hartland Street. Based upon a review of available drainage mapping and topography within the town right-of-ways, it is anticipated that the entire proposed development area to the east of the parking garage drains to the Meadow Hill pumping station. The western portion of the area to the west of the parking garage drains to East River Drive, where it is captured by catch basins and conveyed north to the Pitkin Street pumping station. Figure 2 illustrates the existing drainage areas selected for the site. The following describes the four (4) drainage areas and their respective characteristics:

Area 1A – Untreated stormwater from this portion of the site, to the east of the parking garage, flows overland in an easterly direction where it is captured by an existing catch basin (Design Point 1). From this point, stormwater is discharged east and then south to the storm main in Hartland Street.

Area 2A – Untreated stormwater from this portion of the site, generally the northeast portions of the site, flows overland where it is captured by existing catch basins and discharged towards a common existing manhole (Design Point 2). From this point, stormwater is discharged south to the storm main in Hartland Street.

Area 3A – Untreated stormwater from this portion of the site flows overland to an existing catch basin (Design Point 3). From this point, stormwater is discharged west and then south to the storm main in Hartland Street.

Area 4A – Untreated stormwater from this portion of the site flows overland to East River Drive, where it is captured by an existing catch basin (Design Point 4). From this point, stormwater is discharged west and then north up East River Drive.

Table 1 below provides a summary of the existing conditions hydrologic data.

Table 1
Existing Conditions Hydrologic Data

Drainage Area	Discharge Location	Area (sq ft)	Curve Number	Time of Concentration (min)
Area 1A (DP-1)	Onsite Catch Basin	41,610	94	5.0
Area 2A (DP-2)	Onsite Manhole	123,645	90	5.0
Area 3A (DP-3)	Onsite Catch Basin	21,351	96	5.0
Area 4A (DP-4)	East River Drive Catch Basin	33,023	91	5.0

Proposed Drainage Conditions

The redevelopment project includes the reconfiguration of portions of the existing parking lots and addition of new pavement areas. The sum of the proposed improvements will increase onsite imperviousness by approximately 26,400 square feet.

Under proposed conditions, existing drainage patterns will largely be unchanged, with the minor exception that a portion of the northeast grassed areas which drain overland to Pitkin Street today will be captured, treated, and discharged to the south to Hartland Street. The proposed stormwater management systems, which are comprised of four (4) separate subsurface infiltration chamber areas, have been sized, located, and designed to both provide water quality treatment of the tributary watershed areas, and to mitigate peak flows from the proposed development to pre-construction conditions.

The proposed use of open-bottom plastic chambers as infiltration galleries promotes retention and infiltration of the first inch of rainfall over all new impervious surfaces, which is in line with State water quality standards and the Town's Stormwater Management Plan regarding the disconnection of impervious areas. As a side benefit of the project, approximately 21,300 square feet of currently-untreated existing pavement on the site are proposed to be connected to a stormwater management area and have the first inch of tributary rainfall retained and infiltrated.

Peak rates of runoff to East River Drive, Hartland Street, and Pitkin Street will be reduced by the proposed development. Rates to Pitkin Street will be reduced by virtue of the removal of tributary watershed and rates to East River Drive and Hartland Street will be reduced by the inclusion of subsurface stormwater management areas (see Table 2).

Figure 3 illustrates the proposed "post construction" drainage conditions for the project. Under proposed conditions, the site is divided into eight (8) drainage areas that discharge stormwater to the four (4) original design points (See Figure 3):

Area 1B – This area consists of the area to the east of the parking garage. It is proposed to install a new catch basin which will capture the runoff from this new pavement and discharge it to a subsurface infiltration system, prior to discharging to the existing catch basin (Design Point 1).

Area 1C – This area will continue to drain overland to the existing catch basin (Design Point 1).

Area 2B – This area consists of portion of existing pavement and a portion of new pavement, the runoff from which will be captured by an existing catch basin and discharged to a subsurface infiltration system. The outlet from this system will ultimately drain to the existing manhole (Design Point 2).

Area 2C – This area is primarily new pavement, the runoff from which will be captured by two new catch basins and discharged to a subsurface infiltration system. The outlet from this system will ultimately drain to the existing manhole (Design Point 2).

Area 2D – This area will continue to drain overland ultimately to the existing manhole (Design Point 2).

Area 3A – This area will continue to drain overland to the existing onsite catch basin (Design Point 3).

Area 4B – This area consists of the new parking stalls to the west of the parking garage and a portion of the existing garage ramp, the runoff from which will be captured by a new catch basin and discharged to a subsurface infiltration system. The outlet from this system will ultimately drain to the East River Drive catch basin (Design Point 4).

Area 4C – This area will continue to drain overland to the East River Drive catch basin (Design Point 4).

Table 2 below provides a summary of the proposed conditions hydrologic data.

Table 2
Proposed Conditions Hydrologic Data

Drainage Area	Discharge Location	Area (sq ft)	Curve Number	Time of Concentration (min)
Area 1B (DP-1)	Infiltration 1B	8,063	94	5.0
Area 1C (DP-1)	Onsite Catch Basin	33,547	97	5.0
Area 2B (DP-2)	Infiltration 2B	25,908	94	5.0
Area 2C (DP-2)	Infiltration 2C	10,949	95	5.0
Area 2D (DP-2)	Onsite Manhole	93,858	94	5.0
Area 3A (DP-3)	Onsite Catch Basin	21,351	96	5.0
Area 4B (DP-4)	Infiltration 4B	3,093	98	5.0
Area 4C (DP-4)	East River Drive Catch Basin	29,933	91	5.0

Hydrologic Analysis

The rainfall-runoff response of the site under existing and proposed conditions was evaluated for storm events with recurrence intervals of 2, 5, 10, 25 and 100-years. Rainfall volumes used for this analysis were based on the NOAA National Weather Service Type III, 24-hour storm event; they were 3.07, 4.06, 4.88, 6.01, and 7.75-inches, respectively. Runoff coefficients for the existing and proposed conditions, as previously shown in Tables 1 and 2 respectively, were determined using NRCS Technical Release 55 (TR-55) methodology as provided in HydroCAD. The HydroCAD model is based on the NRCS Technical Release 20 (TR-20) Model for Project Formulation Hydrology (see Appendix B for calculations).

Drainage areas used in the analyses were described in previous sections and shown on Figures 2 and 3. The HydroCAD model is based on the NRCS Technical Release 20 (TR-20) Model for Project Formulation Hydrology. Detailed printouts of the HydroCAD analyses are included in Appendix D. Table 3 presents a summary of the existing and proposed conditions peak discharge rates.

Table 3
Peak Discharge Rates (cfs*)

Design Point	2-year	5-year	10-year	25-year	100-year
Design Point 1: Onsite Catch Basin					
Existing	2.69	3.69	4.51	5.64	7.36
Proposed	2.34	3.63	4.50	5.60	7.29
Design Point 2: Onsite Manhole					
Existing	6.98	10.00	12.49	15.90	21.12
Proposed	6.34	9.43	12.20	15.81	20.85
Design Point 3: Onsite Catch Basin					
Existing	1.45	1.96	2.37	2.95	3.82
Proposed	1.42	1.93	2.35	2.93	3.81
Design Point 4: East River Drive Catch Basin					
Existing	1.93	2.74	3.40	4.31	5.70
Proposed	1.93	2.74	3.40	4.31	5.69

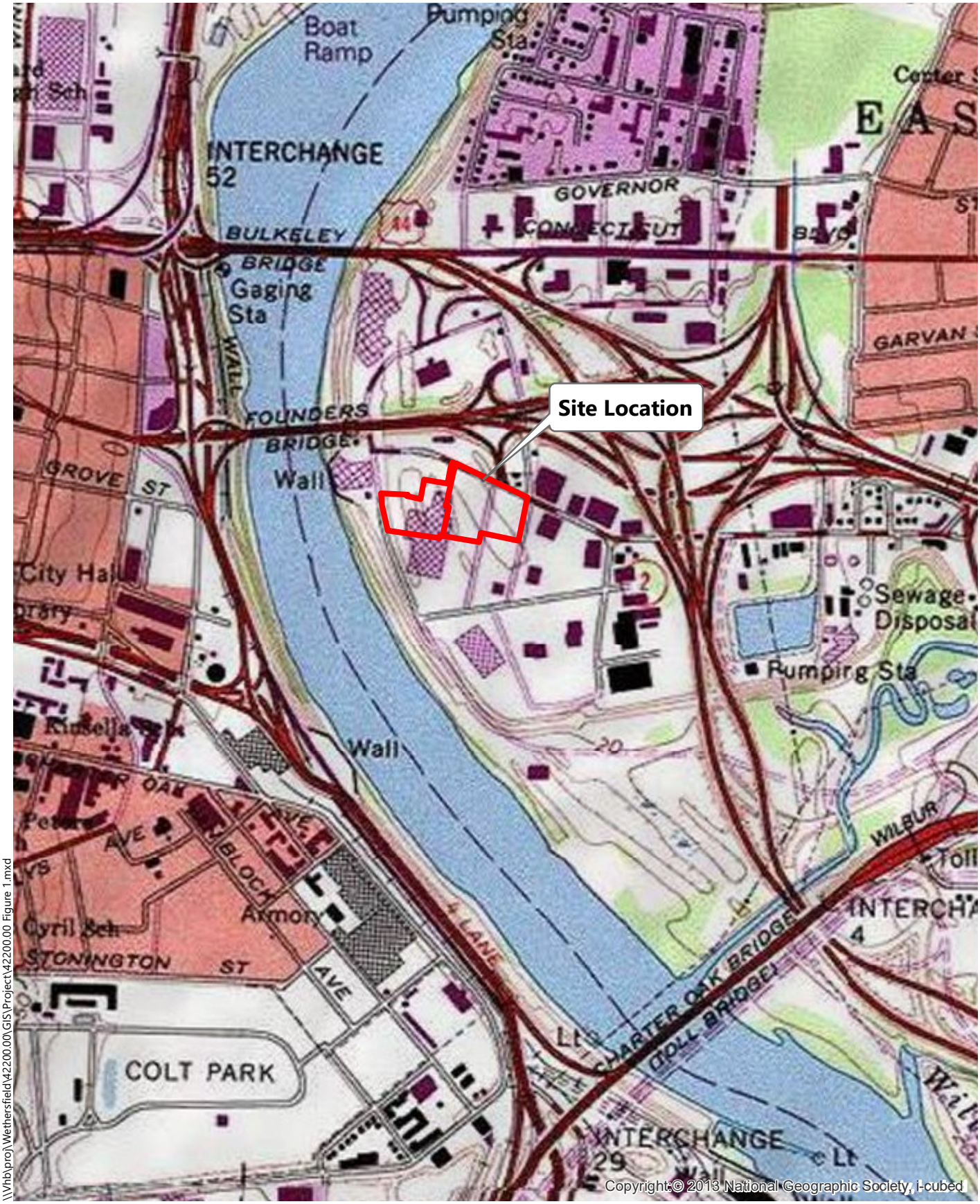
* Expressed in cubic feet per second

The results of the analysis indicate that there is no increase in peak flow runoff for all storm events between the pre- and post-development conditions at the Design Points.

Hydraulic Analysis

The only pipes proposed to accommodate the project are short runs of 18" HDPE pipes connecting the catch basins to the new subsurface galleries, and 12" RCP pipes outleting the subsurface systems to existing onsite structures. As such, the 12" RCP outlet pipes were analyzed using StormCAD, a HEC-22 based program, to safely convey the estimated 100-year flows exiting the subsurface systems. Pipe sizing calculations are included in Appendix D of this report.

Figure 1: Site Locus Map



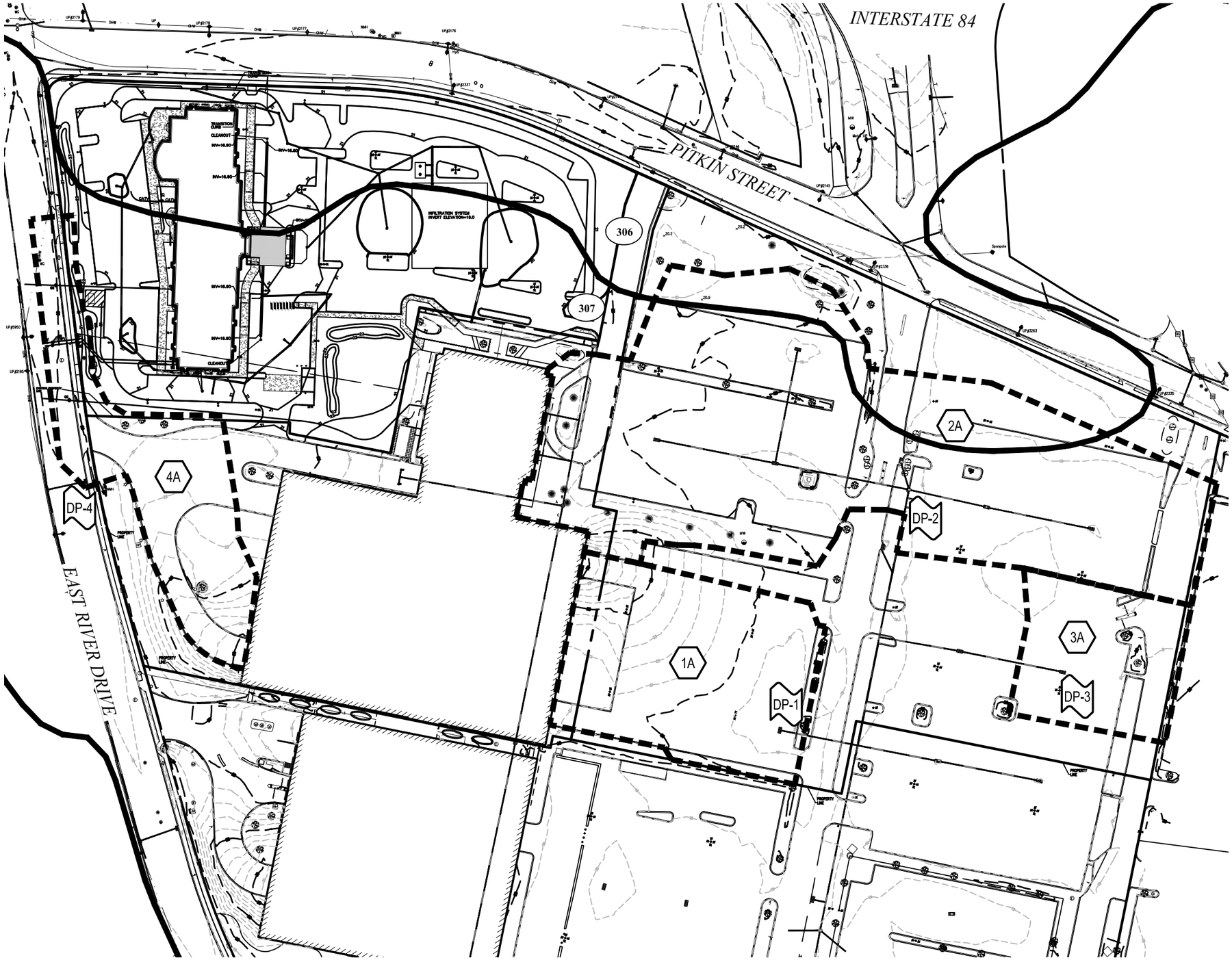
\\Vhb\pro\Wethersfield\42200.00\GIS\Project\42200.00 Figure 1.mxd

0 335 670 1340 Feet

Site Location Map

Founders Plaza
Parking Lot Improvements
323 & 321 Pitkin Street
East Hartford, Connecticut

Figure 2: Existing Drainage Areas



Legend

SYMBOLS

- DESIGN POINT
- DRAINAGE AREA DESIGNATION
- SUBSURFACE STORAGE

LINETYPES

- DRAINAGE AREA BOUNDARY
- SOIL TYPE BOUNDARY

SCS SOIL CLASSIFICATIONS

- 306 — UDORTHENTS–URBAN LAND COMPLEX, HSG B
- 307 — URBAN LAND, HSG D

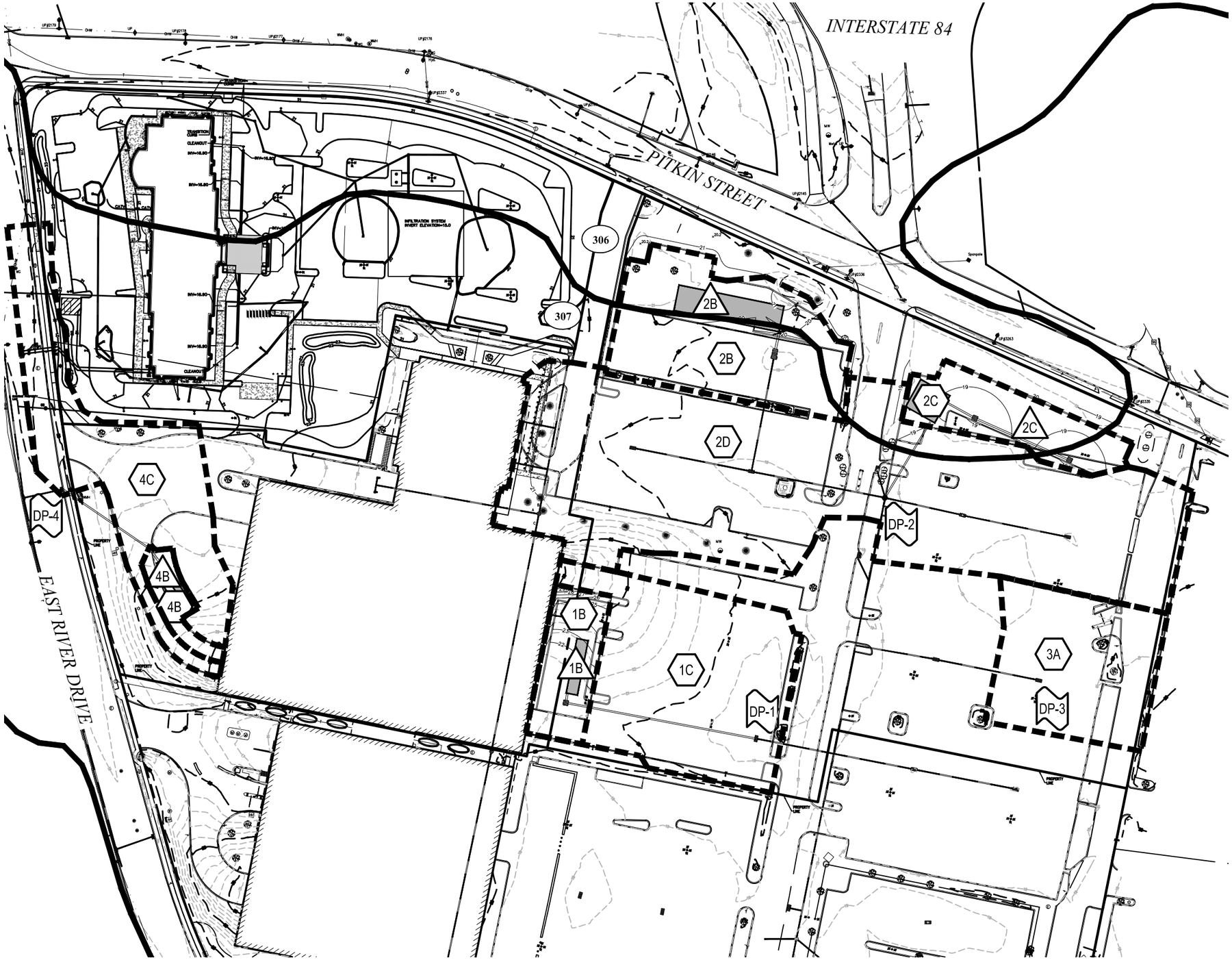
0 50 100 Feet

vhb

Existing Drainage Conditions **Figure 2**

Parking Lot Improvements 05/15/2018
Founders Plaza, Pitkin Street, East Hartford

Figure 3: Proposed Drainage Areas



Legend

SYMBOLS

X — DESIGN POINT

X — DRAINAGE AREA DESIGNATION

X — SUBSURFACE STORAGE

LINETYPES

DRAINAGE AREA BOUNDARY

SOIL TYPE BOUNDARY

SCS SOIL CLASSIFICATIONS

306 — UDORTHENTS–URBAN LAND COMPLEX, HSG B

307 — URBAN LAND, HSG D

0 50 100 Feet

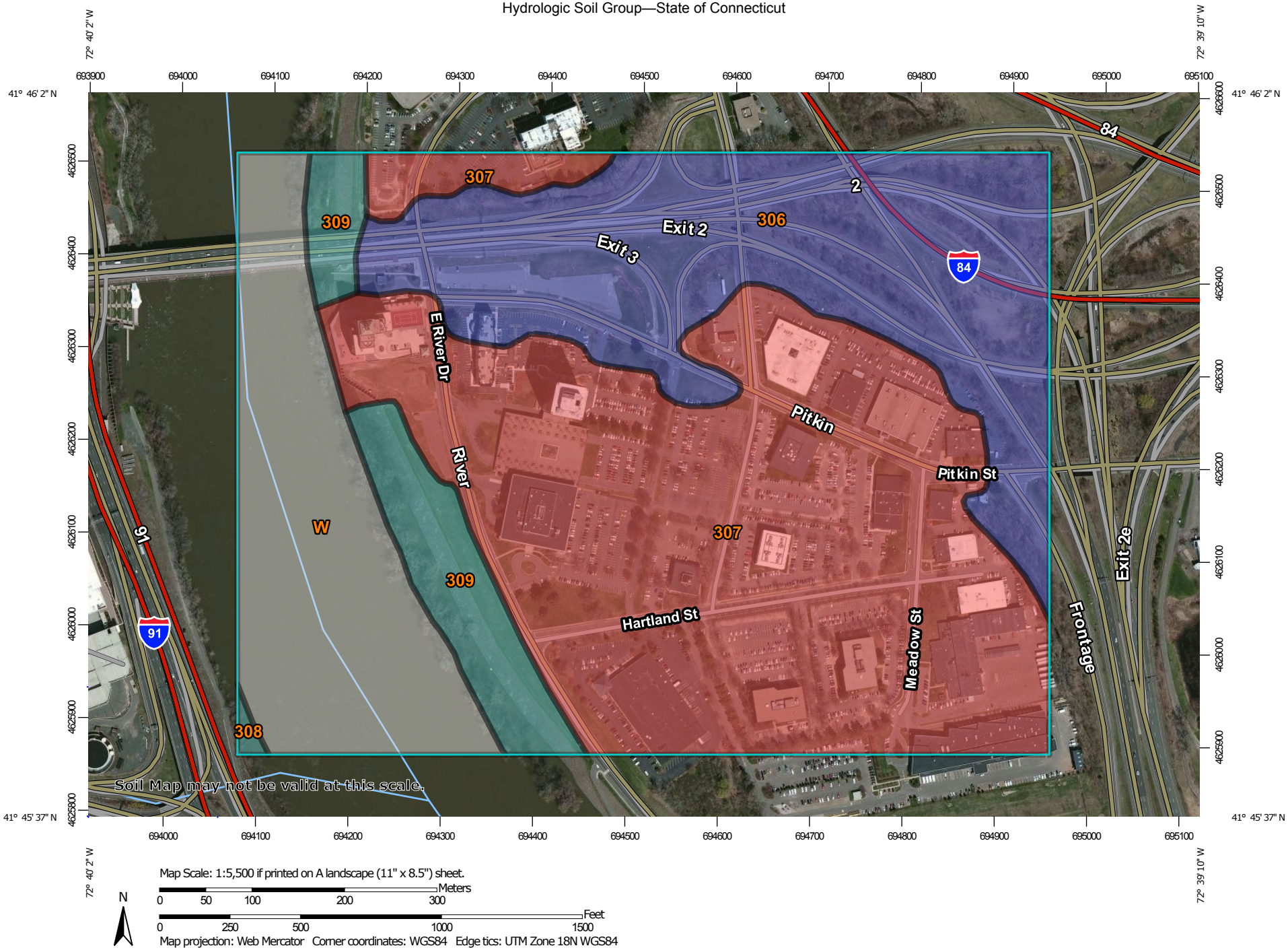
vhb

Proposed Drainage Conditions **Figure 3**

Parking Lot Improvements 05/15/2018
Founders Plaza, Pitkin Street, East Hartford

Appendix A
Additional Mapping

NRCS Web Soil Survey Mapping


72° 40' 2" W
72° 39' 10" W
41° 46' 2" N
41° 45' 37" N
693900
694000
694100
694200
694300
694400
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4626600
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307
309
Exit 2
Exit 3
306
2
84
E River Dr
River
Pitkin
Pitkin St
W
307
309
308
91
Hartland St
Meadow St
Frontage
Exit 2e
Soil Map may not be valid at this scale.
Map Scale: 1:5,500 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 50 100 200 300
Feet
0 250 500 1000 1500
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 16, Sep 15, 2017

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
306	Udorthents-Urban land complex	B	38.7	27.3%
307	Urban land	D	69.1	48.7%
308	Udorthents, smoothed	C	0.3	0.2%
309	Udorthents, flood control	C	10.0	7.0%
W	Water		23.7	16.7%
Totals for Area of Interest			**141.7**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

FEMA Mapping

National Flood Hazard Layer FIRMette

FEMA

0 250 500 1,000 1,500 2,000 Feet

1:6,241.13

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth
- Regulatory Floodway *Zone AE, AO, AH, VE, AR*

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The base map shown complies with FEMA's base map accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/16/2018 at 11:45:57 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: base map imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix B:

Long Term Operations and Maintenance Measures

Project Information

Site

Project Name:	Founders Plaza Parking Lot Improvements
Address or Locus:	111 Founders Plaza (323 & 321 Pitkin Street)
City, State & Zip:	East Hartford, Connecticut

Developer

Client Name:	Merchant 99-111 Founders LLC
Client Address:	111 Founders Plaza, Suite 101
Client City, State & Zip:	East Hartford, Connecticut 06108

Site Supervisor

Site Manager Name:	TBD
Site Manager Address:	
Site Manager City, State & Zip:	
Site Manager Telephone No.:	
Site Manager Cell Phone:	
Site Manager E-Mail:	

Long Term Stormwater Maintenance Measures

- Street Sweeping (Standard Pavement): Sweep or vacuum roads and parking areas 2x per year, preferably in late spring and late fall.
- Catch Basins with Deep Sumps and Oil/debris Traps: Inspect twice per year. Remove sediment once per year or whenever greater than 6 inches of sediment has accumulated.
- Trash/Litter: Routinely pick up and remove litter from entire property as required. Routinely inspect all dumpster and compactor locations for spills. Remove all trash litter from the enclosure and dispose of properly.
- Vegetated Areas: Inspect bi-annually. Replant bare areas upon identification. Routinely mow lawn and remove clippings, minimum once every 2 wks.
- Underground Infiltration Chambers: Inspect the system quarterly for the first year. Clean as needed via jet/vac in the first year. Subsequent to the first year, inspect the system two (2) times per year, preferably in the spring after snowmelt and before winter conditions. Clean the system once per year via jet/vac, preferably after snowmelt in the spring. Repair any damages immediately upon identification.

Long Term Best Management Practices Checklist

- The Long-Term BMP Maintenance/Evaluation Checklist is attached.

Parking Lot Improvements – 111 Founders Plaza, East Hartford, CT

Best Management Practices – Maintenance/ Evaluation Checklist

Long Term Practices

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed ☐yes ☐no (List Items)	Date of Cleaning/Repair	Performed by
Street Sweeping	2x per yr, preferably in late spring and late fall						
Catch Basins	Inspect/ Clean bi-annually						
Vegetated Areas	Inspect bi-annually Replant bare areas upon identification						
Trash/ Litter	Routinely pick up and remove litter from entire property as required. Routinely inspect all dumpster and compactor locations for spills. Remove all trash litter from the enclosure and dispose of properly.						
Underground Infiltration Chambers	Inspect the system quarterly for the first year. Clean as needed in the first year. Subsequent to the first year, inspect the system two (2) times per year, preferably in the spring after snowmelt and before winter conditions. Clean the system once per year via jet/vac.						

Stormwater Control Manager _____

Appendix C: Erosion and Sedimentation Control Measures

Erosion and Sedimentation Control Measures

The following erosion and sedimentation controls are for use during the earthwork and construction phases of the project. The following controls are provided as recommendations for the site contractor and do not constitute or replace the final Stormwater Pollution Prevention Plan that must be fully implemented by the Contractor and owner in Compliance with EPA NPDES regulations.

Straw Bale Barriers

Straw bale barriers will be placed to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site. Bales will be set at least four inches into the existing ground to minimize undercutting by runoff.

Silt Fencing

In areas where high runoff velocities or high sediment loads are expected, straw bale barriers will be backed up with silt fencing. This semi-permeable barrier made of a synthetic porous fabric will provide additional protection. The silt fences and straw bale barrier will be replaced as determined by periodic field inspections.

Catch Basin Protection

Newly constructed and existing catch basins will be protected with straw bale barriers (where appropriate) or silt sacks throughout construction.

Vegetative Slope Stabilization

Stabilization of open soil surfaces will be implemented within 14 days after grading or construction activities have temporarily or permanently ceased, unless there is sufficient snow cover to prohibit implementation. Vegetative slope stabilization will be used to minimize erosion on slopes of 3:1 or flatter. Annual grasses, such as annual rye, will be used to ensure rapid germination and production of root mass. Permanent stabilization will be completed with the planting of perennial grasses or legumes. Establishment of temporary and permanent vegetative cover may be established by hydro-seeding or sodding. A suitable topsoil, good seedbed preparation, and adequate lime, fertilizer and water will be provided for effective establishment of these vegetative stabilization methods. Mulch will also be used after permanent seeding to

protect soil from the impact of falling rain and to increase the capacity of the soil to absorb water.

Maintenance

- The contractor or subcontractor will be responsible for implementing each control shown on the Sedimentation and Erosion Control Plan. In accordance with EPA regulations, the contractor must sign a copy of a certification to verify that a plan has been prepared and that permit regulations are understood.

- The on-site contractor will inspect all sediment and erosion control structures periodically and after each rainfall event. Records of the inspections will be prepared and maintained on-site by the contractor.

- Silt shall be removed from behind barriers if greater than 6-inches deep or as needed.

- Damaged or deteriorated items will be repaired immediately after identification.

- The underside of straw bales should be kept in close contact with the earth and reset as necessary.

- Sediment that is collected in structures shall be disposed of properly and covered if stored on-site.

- Erosion control structures shall remain in place until all disturbed earth has been securely stabilized. After removal of structures, disturbed areas shall be regraded and stabilized as necessary.

The sedimentation and erosion control plan is included in project plan set; a reduced version and Erosion Control Maintenance checklist is included here for quick reference.

Construction Best Management Practices - Maintenance/Evaluation Checklist

Parking Lot Improvements – 111 Founders Plaza, East Hartford, CT

Best Management Practices – Maintenance/ Evaluation Checklist

Construction Practices

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed ☐yes ☐no (List Items)	Date of Cleaning/Repair	Performed by
Straw Bales/Silt Fencing	Once per week or after a 1" or greater storm event						
Catch Basin Protection	Once per week or after a 1" or greater storm event						
Vegetated Slope Stabilization	Once per week or after a 1" or greater storm event						

Stormwater Control Manager _____

Appendix D
Hydrologic Computations

- Water Quality Design Calculations
- Rainfall Data
- HydroCAD Analysis: Existing Conditions
- HydroCAD Analysis: Proposed Conditions
- StormCAD Table (Hydraulic Spreadsheet)

Design Calculations

Water Quality Volume

Water Quality Volume Calculations

Project: Founders Plaza By: SJK Date: 5/15/18
Location: 111 Founders Plaza, East Hartford, CT Checked: PV Date: 5/15/18

Basin Name	Infiltration 1B	Infiltration 2B	Infiltration 2C	Infiltration 4B	
Rainfall, P	1.0 in.	1.0 in.	1.0 in.	1.0 in.	a
Area, A	0.19 ac	0.59 ac	0.25 ac	0.07 ac	b
Impervious Cover Area	0.15 ac	0.51 ac	0.23 ac	0.07 ac	c
% Impervious, I	79 %	87 %	90 %	100 %	
Volumetric Runoff Coeff., R	0.758	0.829	0.856	0.950	d
Required Water Quality Volume, WQV	0.012 ac-ft	0.041 ac-ft	0.018 ac-ft	0.006 ac-ft	e
	509 cf	1,790 cf	781 cf	245 cf	
Provided Water Quality Volume, WQV	**0.015 ac-ft**	**0.055 ac-ft**	**0.018 ac-ft**	**0.006 ac-ft**	f
	669 cf	**2,397 cf**	**791 cf**	**246 cf**	

*** The proposed stormwater management system will retain and treat the first inch of rainfall over 1.10 acres of impervious area. The project only proposes to add 0.61 acres of impervious area.**

a First one inch of rainfall; 2004 Connecticut Stormwater Quality Manual

b Area tributary to the stormwater management basin

c Impervious cover area tributary to the stormwater management basin

d R=0.05+0.009*I; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

e WQV=P*R*A/12; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

f Volumetric storage below the low-flow orifice; from Proposed HydroCAD output

Rainfall Data

NOAA Atlas 14, Volume 10, Version 2
Location name: East Hartford, Connecticut, USA*
Latitude: 41.7639°, Longitude: -72.6588°
Elevation: 19.6 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.333 (0.263-0.420)	0.404 (0.320-0.511)	0.521 (0.410-0.661)	0.618 (0.484-0.789)	0.752 (0.568-1.01)	0.855 (0.632-1.17)	0.958 (0.686-1.37)	1.09 (0.735-1.59)	1.26 (0.815-1.91)	1.39 (0.876-2.15)
10-min	0.472 (0.373-0.595)	0.573 (0.453-0.723)	0.739 (0.582-0.936)	0.876 (0.686-1.12)	1.07 (0.805-1.43)	1.21 (0.895-1.66)	1.36 (0.972-1.93)	1.54 (1.04-2.25)	1.78 (1.16-2.70)	1.96 (1.24-3.04)
15-min	0.555 (0.439-0.700)	0.674 (0.533-0.851)	0.869 (0.684-1.10)	1.03 (0.807-1.32)	1.25 (0.947-1.68)	1.43 (1.05-1.95)	1.60 (1.14-2.28)	1.81 (1.23-2.65)	2.09 (1.36-3.18)	2.31 (1.46-3.58)
30-min	0.744 (0.588-0.938)	0.906 (0.715-1.14)	1.17 (0.921-1.48)	1.39 (1.09-1.77)	1.69 (1.28-2.26)	1.92 (1.42-2.64)	2.16 (1.54-3.07)	2.45 (1.65-3.58)	2.83 (1.84-4.29)	3.12 (1.97-4.84)
60-min	0.933 (0.738-1.18)	1.14 (0.898-1.44)	1.47 (1.16-1.86)	1.75 (1.37-2.23)	2.13 (1.61-2.85)	2.42 (1.79-3.32)	2.72 (1.95-3.87)	3.08 (2.08-4.50)	3.56 (2.31-5.41)	3.93 (2.49-6.10)
2-hr	1.21 (0.967-1.52)	1.47 (1.17-1.85)	1.89 (1.50-2.38)	2.24 (1.77-2.84)	2.73 (2.07-3.63)	3.10 (2.31-4.23)	3.47 (2.51-4.94)	3.97 (2.70-5.78)	4.64 (3.02-7.01)	5.15 (3.27-7.94)
3-hr	1.40 (1.12-1.75)	1.70 (1.35-2.12)	2.18 (1.73-2.74)	2.58 (2.04-3.26)	3.13 (2.40-4.17)	3.56 (2.67-4.85)	3.99 (2.90-5.68)	4.59 (3.12-6.65)	5.39 (3.52-8.11)	6.00 (3.82-9.21)
6-hr	1.75 (1.41-2.17)	2.12 (1.71-2.64)	2.74 (2.19-3.41)	3.25 (2.58-4.07)	3.95 (3.04-5.23)	4.49 (3.39-6.10)	5.03 (3.69-7.15)	5.83 (3.98-8.40)	6.89 (4.51-10.3)	7.70 (4.91-11.7)
12-hr	2.12 (1.71-2.61)	2.59 (2.10-3.20)	3.38 (2.72-4.18)	4.03 (3.22-5.02)	4.92 (3.81-6.48)	5.61 (4.25-7.58)	6.30 (4.64-8.91)	7.34 (5.03-10.5)	8.72 (5.72-13.0)	9.76 (6.25-14.8)
24-hr	2.46 (2.01-3.02)	3.07 (2.50-3.76)	4.06 (3.29-4.99)	4.88 (3.93-6.04)	6.01 (4.69-7.88)	6.88 (5.26-9.28)	7.75 (5.78-11.0)	9.16 (6.29-13.0)	11.0 (7.25-16.3)	12.4 (7.97-18.7)
2-day	2.79 (2.29-3.39)	3.54 (2.90-4.31)	4.76 (3.88-5.81)	5.77 (4.68-7.10)	7.16 (5.63-9.38)	8.24 (6.36-11.1)	9.31 (7.03-13.2)	11.2 (7.72-15.9)	13.7 (9.05-20.2)	15.6 (10.1-23.4)
3-day	3.04 (2.50-3.68)	3.86 (3.17-4.68)	5.20 (4.26-6.33)	6.32 (5.14-7.73)	7.85 (6.20-10.2)	9.03 (7.00-12.1)	10.2 (7.75-14.5)	12.4 (8.53-17.4)	15.2 (10.0-22.2)	17.3 (11.2-25.9)
4-day	3.25 (2.68-3.92)	4.12 (3.40-4.98)	5.55 (4.56-6.73)	6.73 (5.49-8.22)	8.36 (6.62-10.9)	9.62 (7.47-12.9)	10.9 (8.26-15.4)	13.2 (9.09-18.5)	16.2 (10.7-23.6)	18.5 (11.9-27.5)
7-day	3.82 (3.17-4.59)	4.79 (3.97-5.76)	6.38 (5.26-7.70)	7.69 (6.31-9.34)	9.50 (7.55-12.3)	10.9 (8.49-14.5)	12.3 (9.35-17.3)	14.7 (10.2-20.6)	18.0 (11.9-26.1)	20.4 (13.2-30.3)
10-day	4.41 (3.67-5.28)	5.43 (4.52-6.51)	7.10 (5.88-8.54)	8.48 (6.97-10.3)	10.4 (8.26-13.3)	11.9 (9.24-15.7)	13.3 (10.1-18.5)	15.8 (11.0-22.0)	19.1 (12.7-27.6)	21.5 (14.0-31.8)
20-day	6.35 (5.33-7.55)	7.43 (6.22-8.84)	9.18 (7.65-11.0)	10.6 (8.81-12.8)	12.6 (10.1-16.0)	14.2 (11.1-18.4)	15.7 (11.9-21.4)	18.0 (12.6-24.9)	21.0 (14.1-30.2)	23.3 (15.2-34.2)
30-day	8.03 (6.76-9.51)	9.13 (7.67-10.8)	10.9 (9.15-13.0)	12.4 (10.3-14.9)	14.5 (11.6-18.2)	16.1 (12.5-20.6)	17.6 (13.2-23.6)	19.7 (13.9-27.1)	22.4 (15.1-32.0)	24.5 (16.0-35.8)
45-day	10.1 (8.57-12.0)	11.3 (9.52-13.3)	13.2 (11.0-15.6)	14.7 (12.3-17.5)	16.8 (13.5-20.9)	18.5 (14.4-23.5)	20.1 (15.0-26.5)	21.9 (15.5-29.9)	24.2 (16.3-34.4)	26.0 (17.0-37.9)
60-day	11.9 (10.1-14.0)	13.1 (11.1-15.4)	15.0 (12.7-17.8)	16.7 (13.9-19.8)	18.9 (15.1-23.3)	20.6 (16.0-26.0)	22.3 (16.6-29.0)	23.8 (16.9-32.4)	25.9 (17.5-36.7)	27.5 (18.0-39.8)

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

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

Please refer to NOAA Atlas 14 document for more information.

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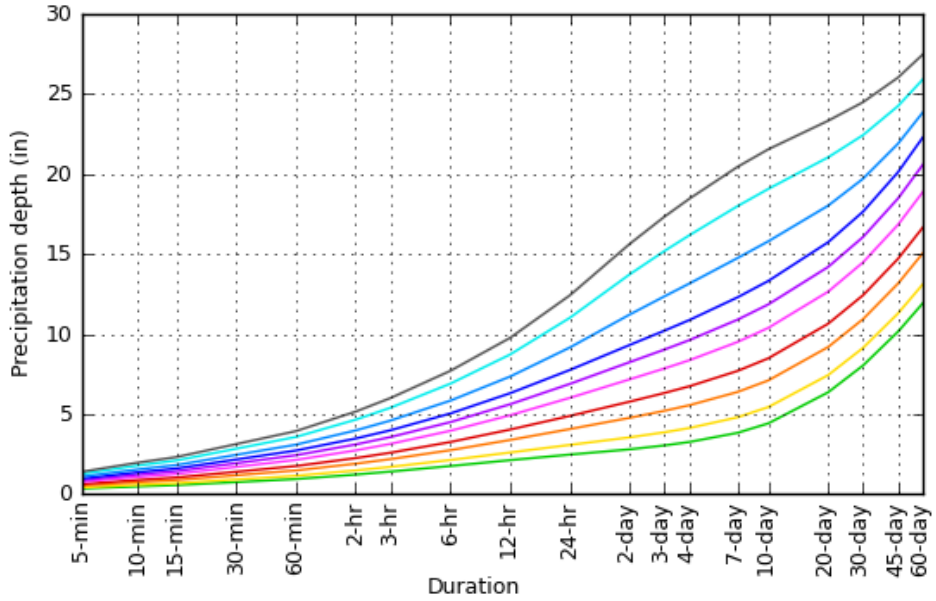
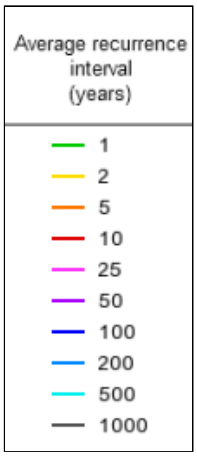
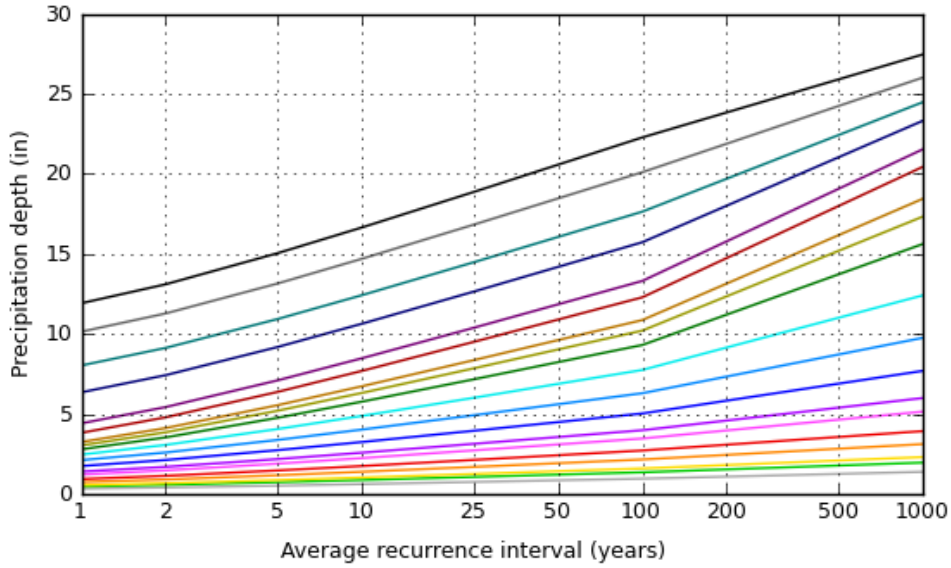
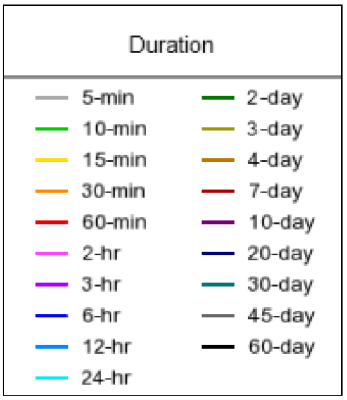
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 41.7639°, Longitude: -72.6588°









NOAA Atlas 14, Volume 10, Version 2 Created (GMT): Mon Mar 5 20:44:19 2018

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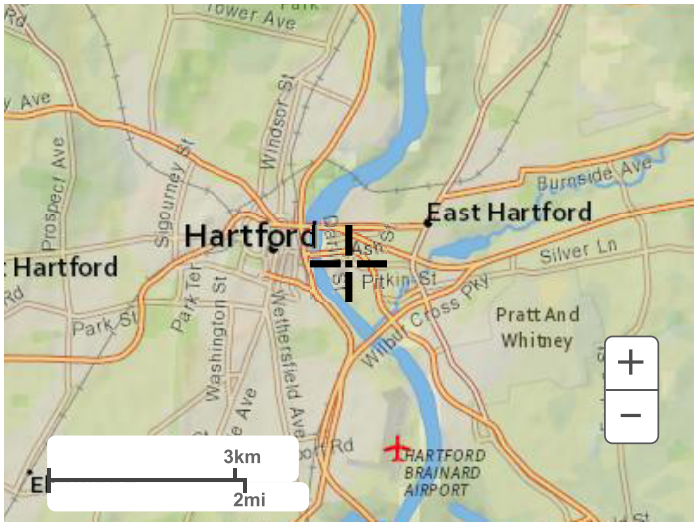
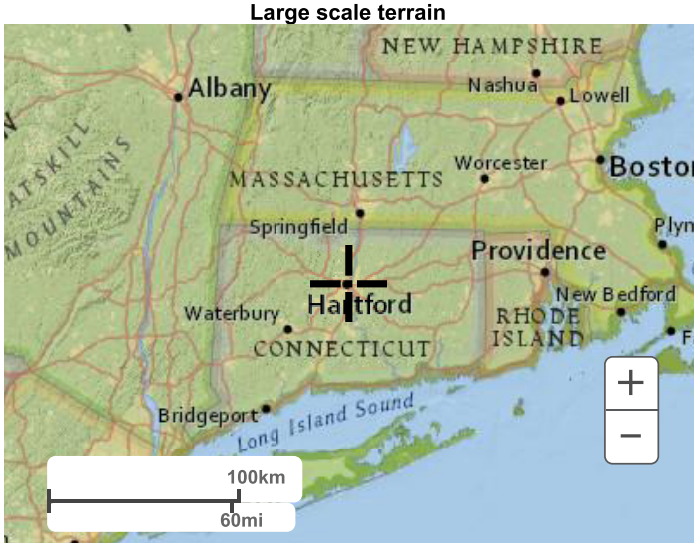
Maps & aerials

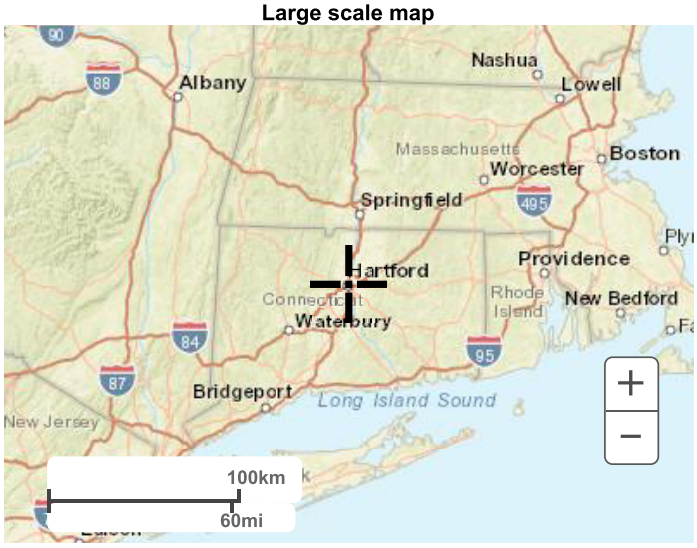
Small scale terrain



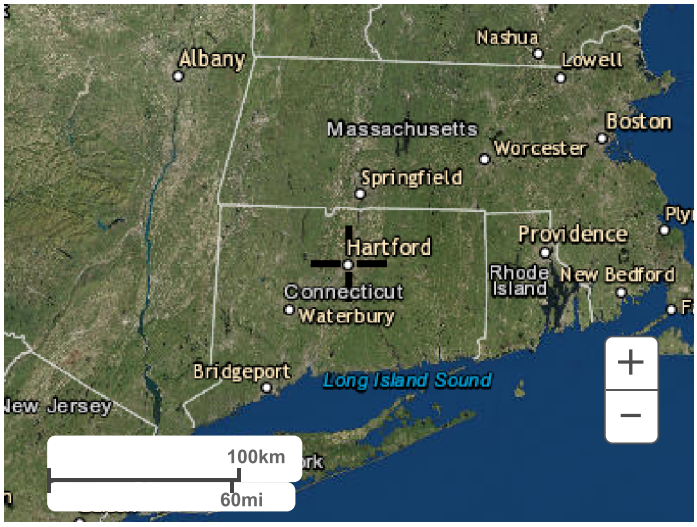
Large scale terrain



Large scale map



Large scale aerial



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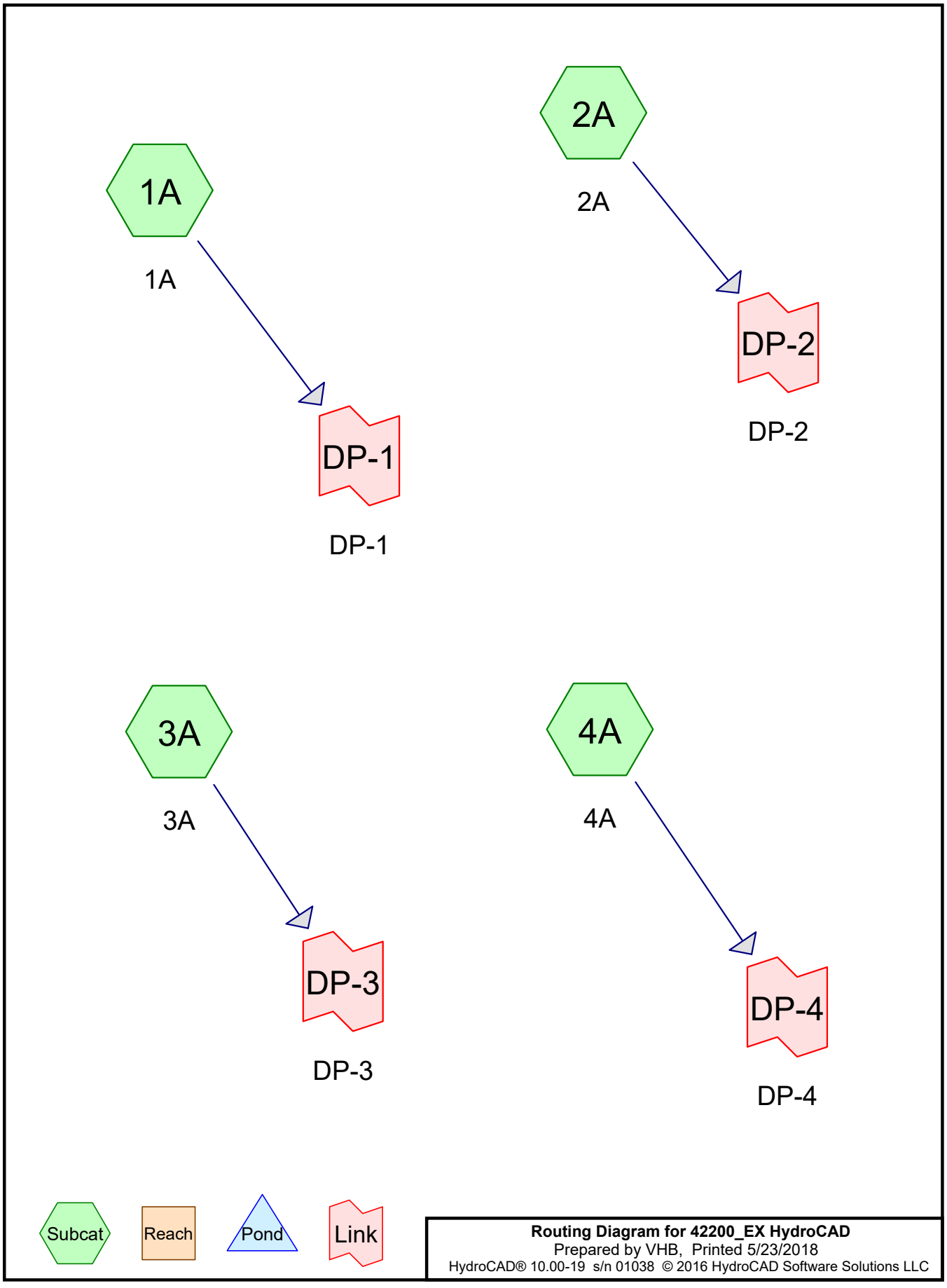
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

HydroCAD Analysis: Existing Conditions



Routing Diagram for 42200_EX HydroCAD
Prepared by VHB, Printed 5/23/2018

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
14,380	61	>75% Grass cover, Good, HSG B (2A)
47,709	80	>75% Grass cover, Good, HSG D (1A, 2A, 3A, 4A)
85,338	98	Paved parking, HSG D (2A)
72,202	98	Unconnected pavement, HSG D (1A, 3A, 4A)
219,629	**92**	**TOTAL AREA**

2-Year Storm Event – Existing

Time span=0.00-30.00 hrs, dt=0.02 hrs, 1501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A: 1A Runoff Area=41,610 sf 80.19% Impervious Runoff Depth=2.42"
Tc=5.0 min CN=94 Runoff=2.69 cfs 8,384 cf

Subcatchment2A: 2A Runoff Area=123,645 sf 69.02% Impervious Runoff Depth=2.05"
Tc=5.0 min CN=90 Runoff=6.98 cfs 21,107 cf

Subcatchment3A: 3A Runoff Area=21,351 sf 86.13% Impervious Runoff Depth=2.62"
Tc=5.0 min CN=96 Runoff=1.45 cfs 4,663 cf

Subcatchment4A: 4A Runoff Area=33,023 sf 61.91% Impervious Runoff Depth=2.14"
Tc=5.0 min CN=91 Runoff=1.93 cfs 5,880 cf

Link DP-1: DP-1 Inflow=2.69 cfs 8,384 cf
Primary=2.69 cfs 8,384 cf

Link DP-2: DP-2 Inflow=6.98 cfs 21,107 cf
Primary=6.98 cfs 21,107 cf

Link DP-3: DP-3 Inflow=1.45 cfs 4,663 cf
Primary=1.45 cfs 4,663 cf

Link DP-4: DP-4 Inflow=1.93 cfs 5,880 cf
Primary=1.93 cfs 5,880 cf

Total Runoff Area = 219,629 sf Runoff Volume = 40,034 cf Average Runoff Depth = 2.19"
28.27% Pervious = 62,089 sf 71.73% Impervious = 157,540 sf

Summary for Subcatchment 1A: 1A

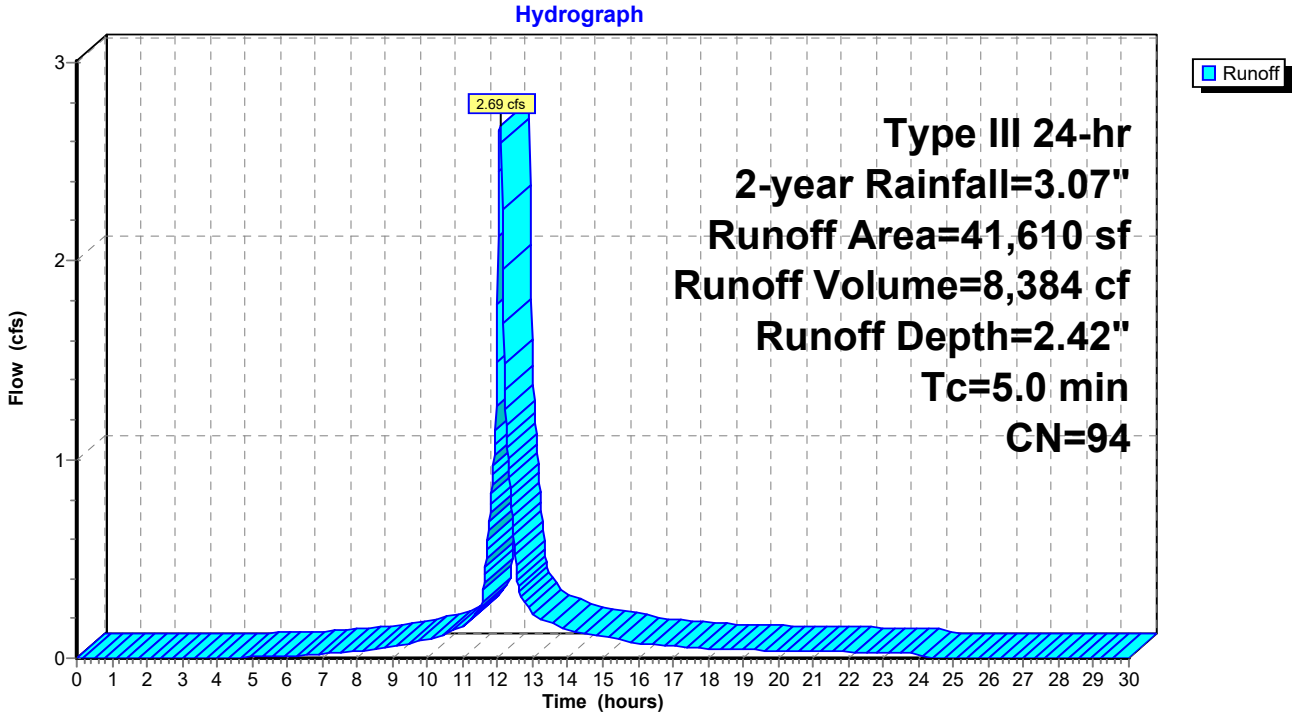
Runoff = 2.69 cfs @ 12.07 hrs, Volume= 8,384 cf, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-year Rainfall=3.07"

Area (sf)	CN	Description
33,367	98	Unconnected pavement, HSG D
8,243	80	>75% Grass cover, Good, HSG D
41,610	94	Weighted Average
8,243		19.81% Pervious Area
33,367		80.19% Impervious Area
33,367		100.00% Unconnected

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

Subcatchment 1A: 1A



Summary for Subcatchment 2A: 2A

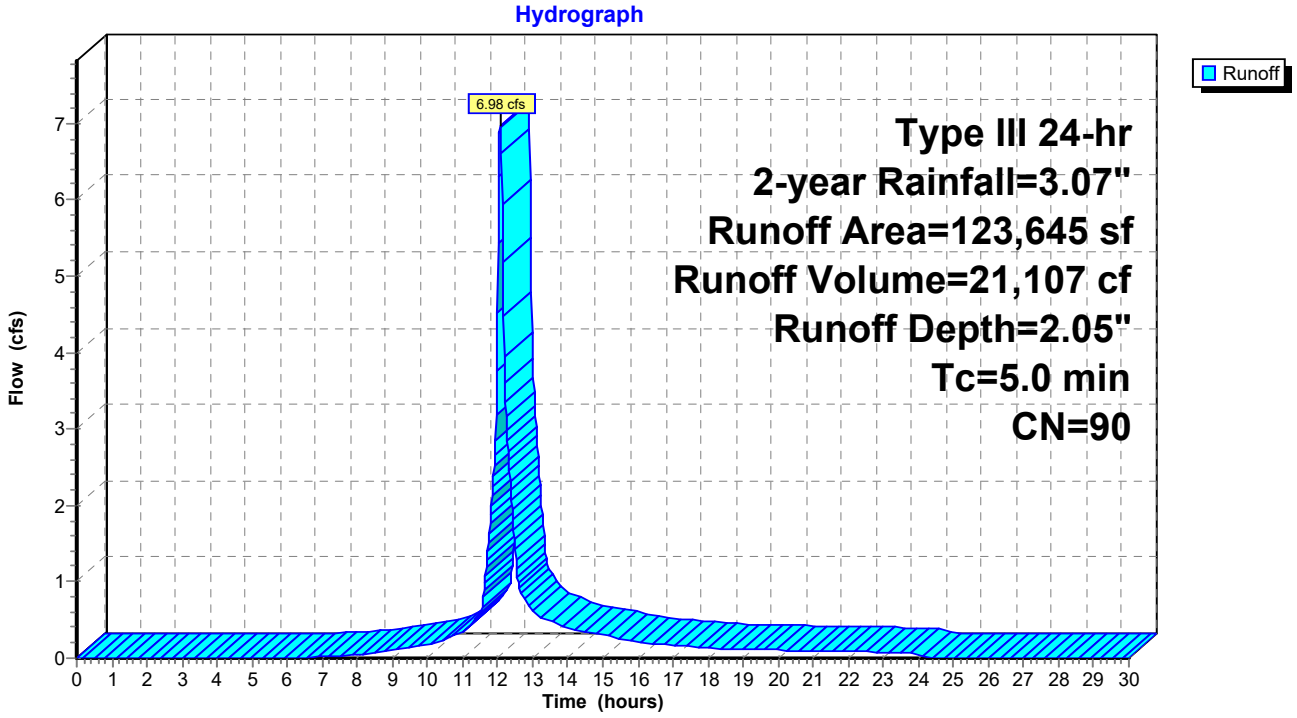
Runoff = 6.98 cfs @ 12.07 hrs, Volume= 21,107 cf, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-year Rainfall=3.07"

Area (sf)	CN	Description
85,338	98	Paved parking, HSG D
23,927	80	>75% Grass cover, Good, HSG D
14,380	61	>75% Grass cover, Good, HSG B
123,645	90	Weighted Average
38,307		30.98% Pervious Area
85,338		69.02% Impervious Area

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

Subcatchment 2A: 2A



Summary for Subcatchment 3A: 3A

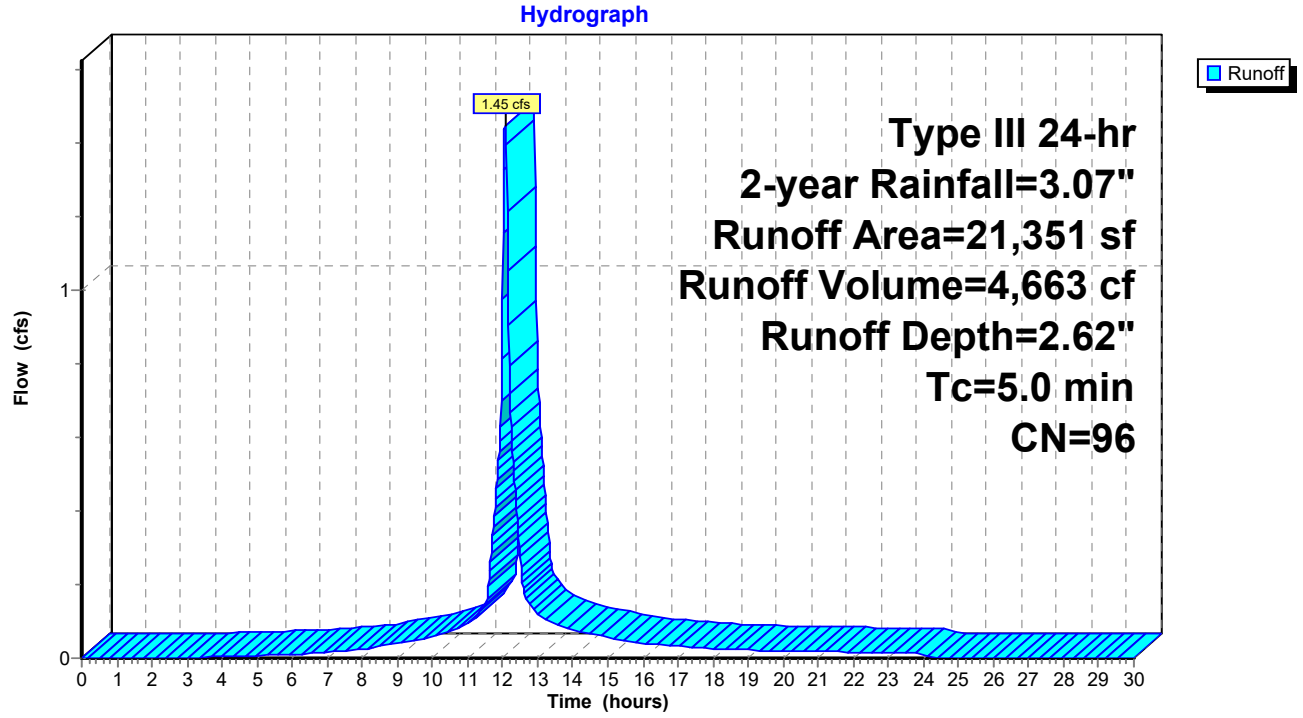
Runoff = 1.45 cfs @ 12.07 hrs, Volume= 4,663 cf, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-year Rainfall=3.07"

Area (sf)	CN	Description
18,390	98	Unconnected pavement, HSG D
2,961	80	>75% Grass cover, Good, HSG D
21,351	96	Weighted Average
2,961		13.87% Pervious Area
18,390		86.13% Impervious Area
18,390		100.00% Unconnected

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

Subcatchment 3A: 3A



Summary for Subcatchment 4A: 4A

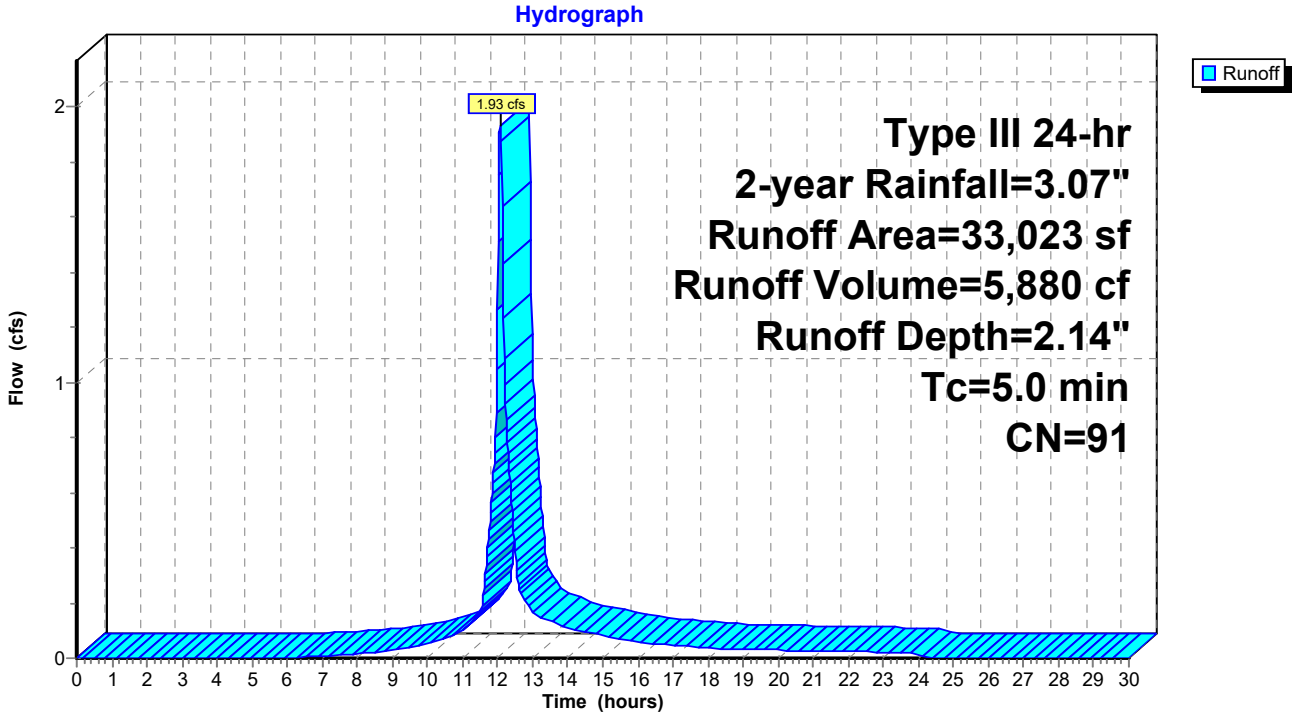
Runoff = 1.93 cfs @ 12.07 hrs, Volume= 5,880 cf, Depth= 2.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-year Rainfall=3.07"

Area (sf)	CN	Description
20,445	98	Unconnected pavement, HSG D
12,578	80	>75% Grass cover, Good, HSG D
33,023	91	Weighted Average
12,578		38.09% Pervious Area
20,445		61.91% Impervious Area
20,445		100.00% Unconnected

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

Subcatchment 4A: 4A

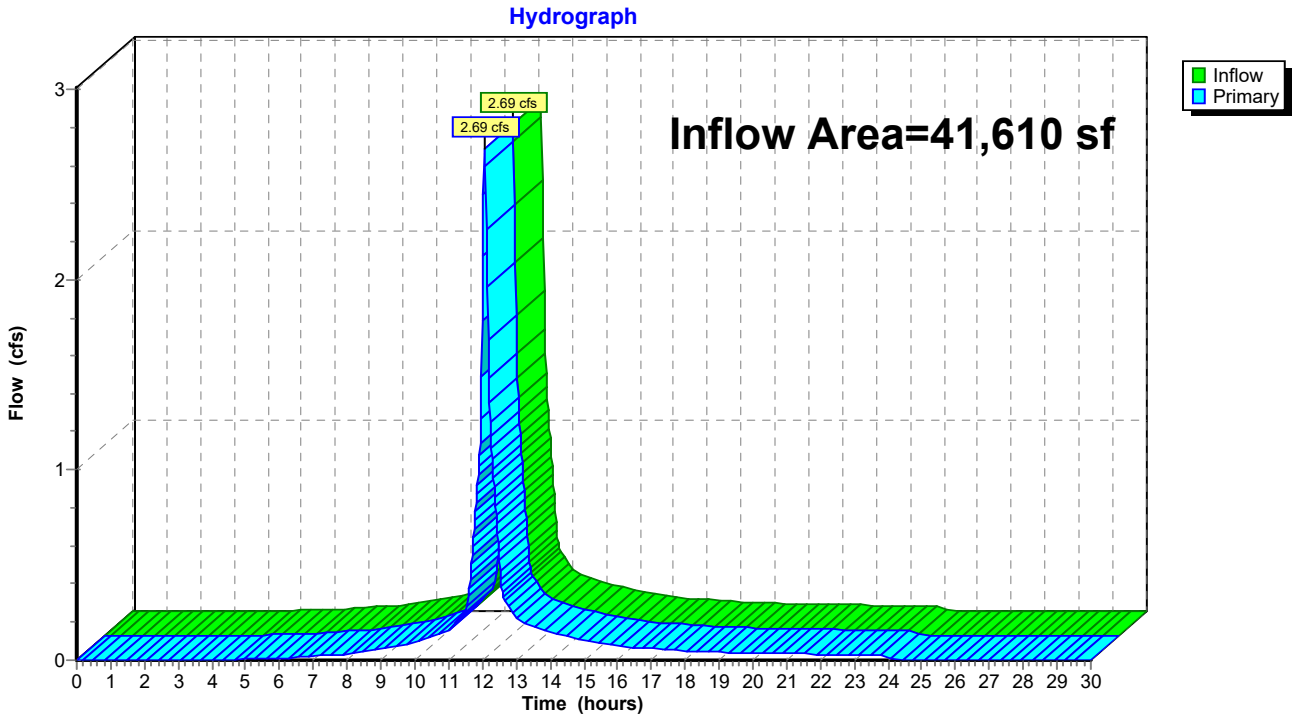


Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 80.19% Impervious, Inflow Depth = 2.42" for 2-year event
Inflow = 2.69 cfs @ 12.07 hrs, Volume= 8,384 cf
Primary = 2.69 cfs @ 12.07 hrs, Volume= 8,384 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-1: DP-1

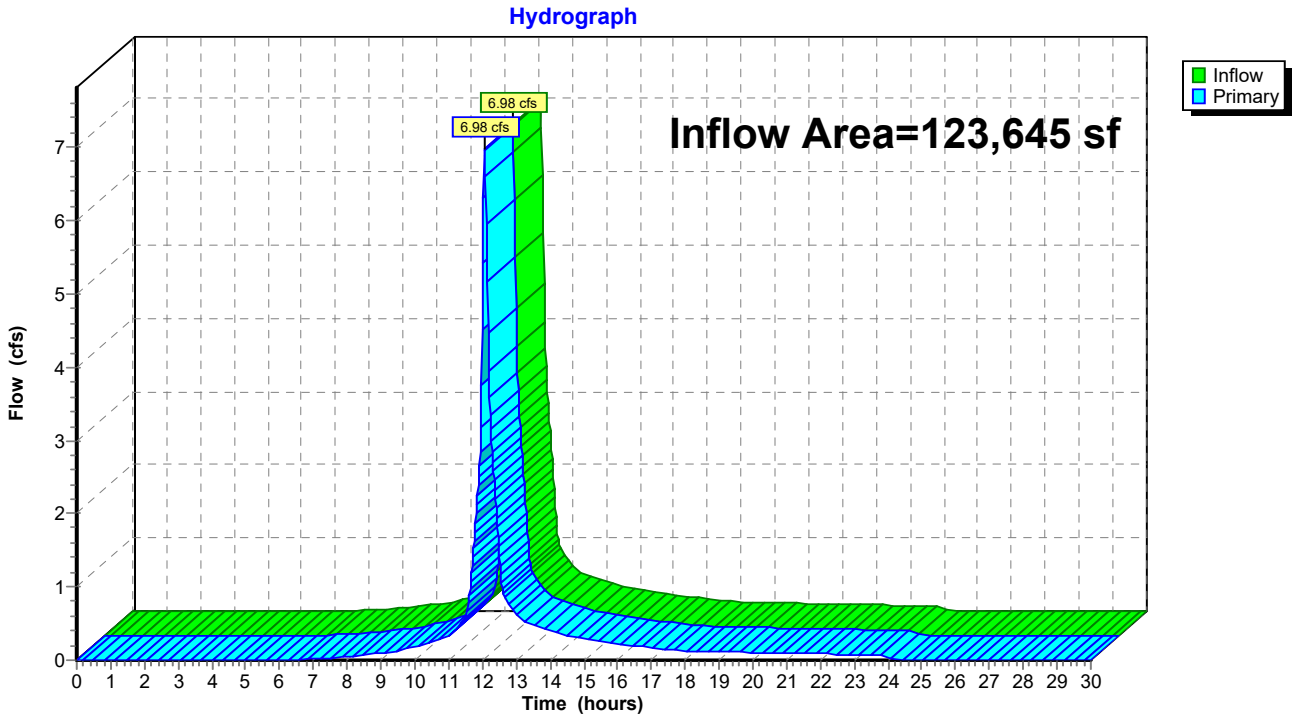


Summary for Link DP-2: DP-2

Inflow Area = 123,645 sf, 69.02% Impervious, Inflow Depth = 2.05" for 2-year event
Inflow = 6.98 cfs @ 12.07 hrs, Volume= 21,107 cf
Primary = 6.98 cfs @ 12.07 hrs, Volume= 21,107 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-2: DP-2

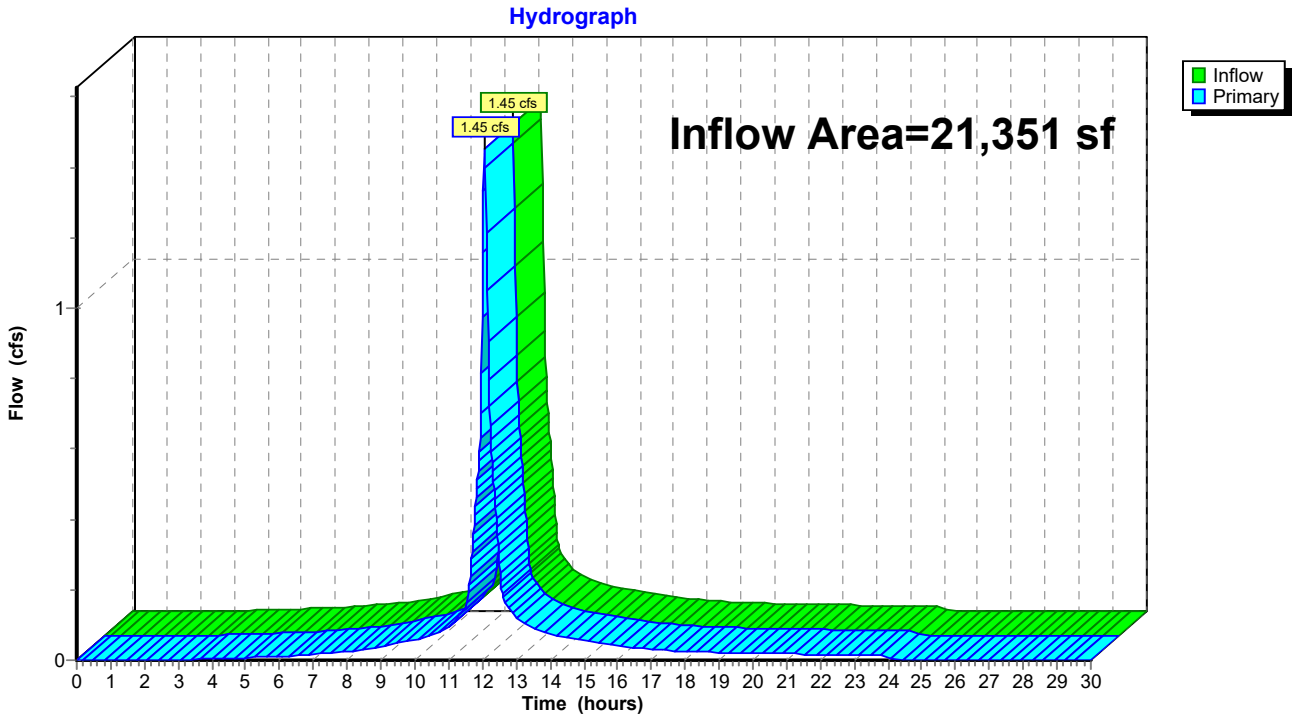


Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.13% Impervious, Inflow Depth = 2.62" for 2-year event
Inflow = 1.45 cfs @ 12.07 hrs, Volume= 4,663 cf
Primary = 1.45 cfs @ 12.07 hrs, Volume= 4,663 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-3: DP-3

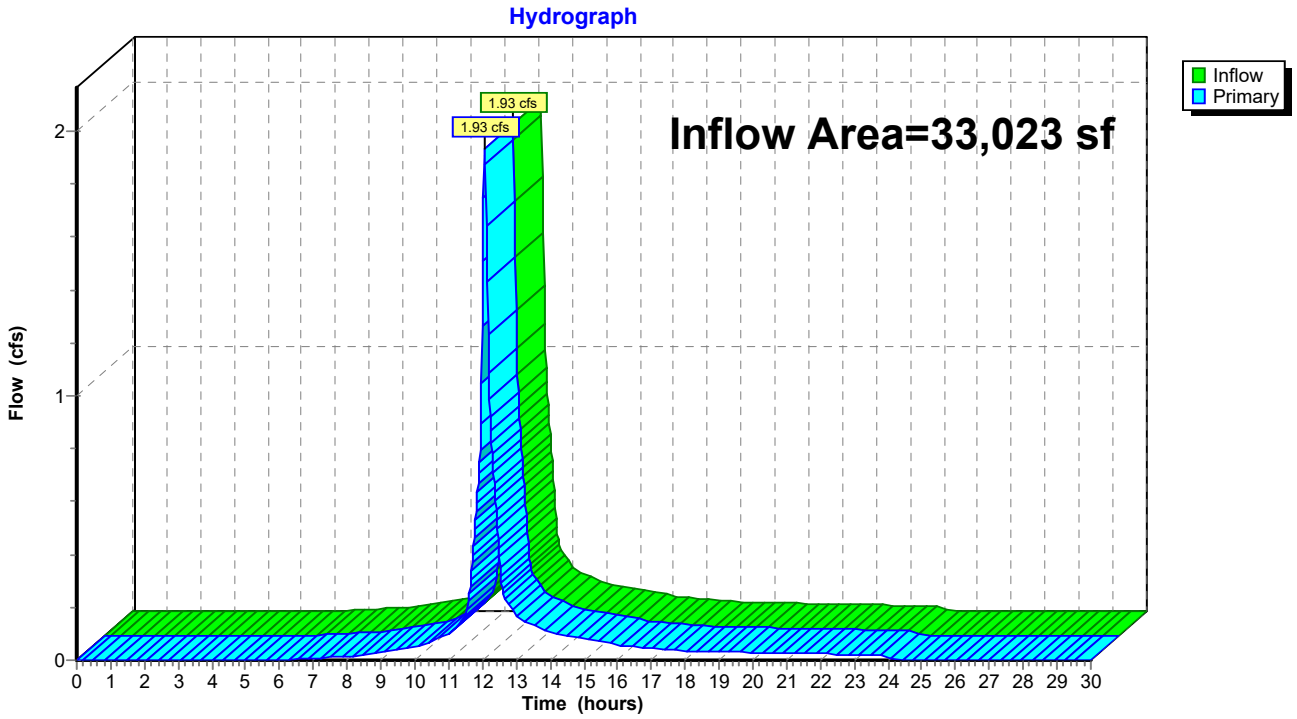


Summary for Link DP-4: DP-4

Inflow Area = 33,023 sf, 61.91% Impervious, Inflow Depth = 2.14" for 2-year event
Inflow = 1.93 cfs @ 12.07 hrs, Volume= 5,880 cf
Primary = 1.93 cfs @ 12.07 hrs, Volume= 5,880 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-4: DP-4



5-Year Storm Event – Existing

Time span=0.00-30.00 hrs, dt=0.02 hrs, 1501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A: 1A Runoff Area=41,610 sf 80.19% Impervious Runoff Depth=3.38"
Tc=5.0 min CN=94 Runoff=3.69 cfs 11,731 cf

Subcatchment2A: 2A Runoff Area=123,645 sf 69.02% Impervious Runoff Depth=2.98"
Tc=5.0 min CN=90 Runoff=10.00 cfs 30,665 cf

Subcatchment3A: 3A Runoff Area=21,351 sf 86.13% Impervious Runoff Depth=3.60"
Tc=5.0 min CN=96 Runoff=1.96 cfs 6,404 cf

Subcatchment4A: 4A Runoff Area=33,023 sf 61.91% Impervious Runoff Depth=3.07"
Tc=5.0 min CN=91 Runoff=2.74 cfs 8,462 cf

Link DP-1: DP-1 Inflow=3.69 cfs 11,731 cf
Primary=3.69 cfs 11,731 cf

Link DP-2: DP-2 Inflow=10.00 cfs 30,665 cf
Primary=10.00 cfs 30,665 cf

Link DP-3: DP-3 Inflow=1.96 cfs 6,404 cf
Primary=1.96 cfs 6,404 cf

Link DP-4: DP-4 Inflow=2.74 cfs 8,462 cf
Primary=2.74 cfs 8,462 cf

Total Runoff Area = 219,629 sf Runoff Volume = 57,263 cf Average Runoff Depth = 3.13"
28.27% Pervious = 62,089 sf 71.73% Impervious = 157,540 sf

Summary for Subcatchment 1A: 1A

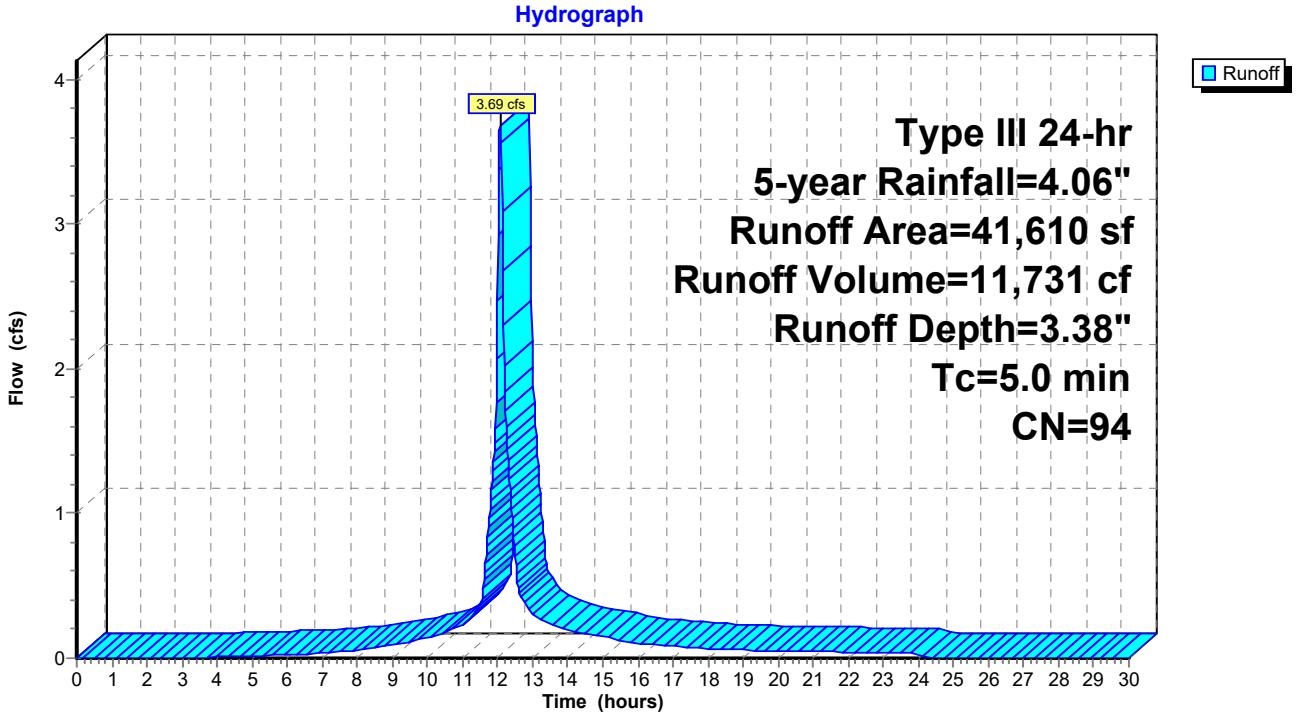
Runoff = 3.69 cfs @ 12.07 hrs, Volume= 11,731 cf, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 5-year Rainfall=4.06"

Area (sf)	CN	Description
33,367	98	Unconnected pavement, HSG D
8,243	80	>75% Grass cover, Good, HSG D
41,610	94	Weighted Average
8,243		19.81% Pervious Area
33,367		80.19% Impervious Area
33,367		100.00% Unconnected

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

Subcatchment 1A: 1A



Summary for Subcatchment 2A: 2A

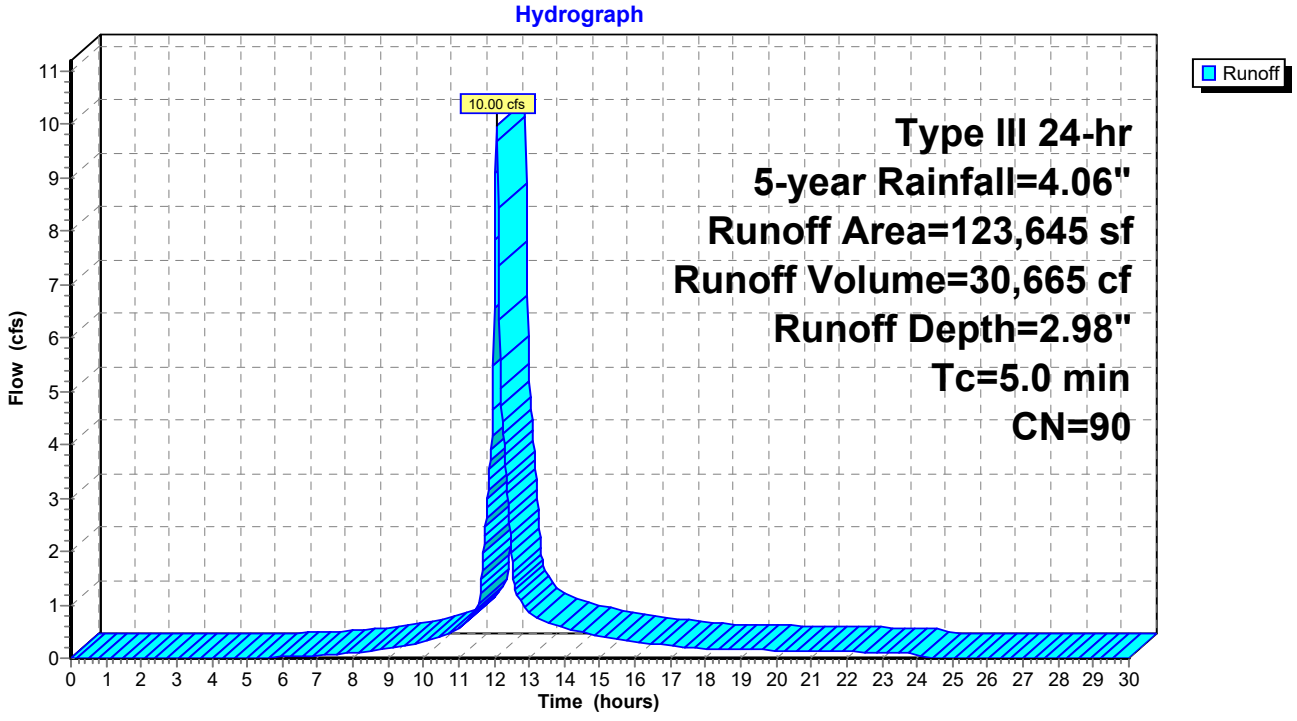
Runoff = 10.00 cfs @ 12.07 hrs, Volume= 30,665 cf, Depth= 2.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 5-year Rainfall=4.06"

Area (sf)	CN	Description
85,338	98	Paved parking, HSG D
23,927	80	>75% Grass cover, Good, HSG D
14,380	61	>75% Grass cover, Good, HSG B
123,645	90	Weighted Average
38,307		30.98% Pervious Area
85,338		69.02% Impervious Area

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

Subcatchment 2A: 2A



Summary for Subcatchment 3A: 3A

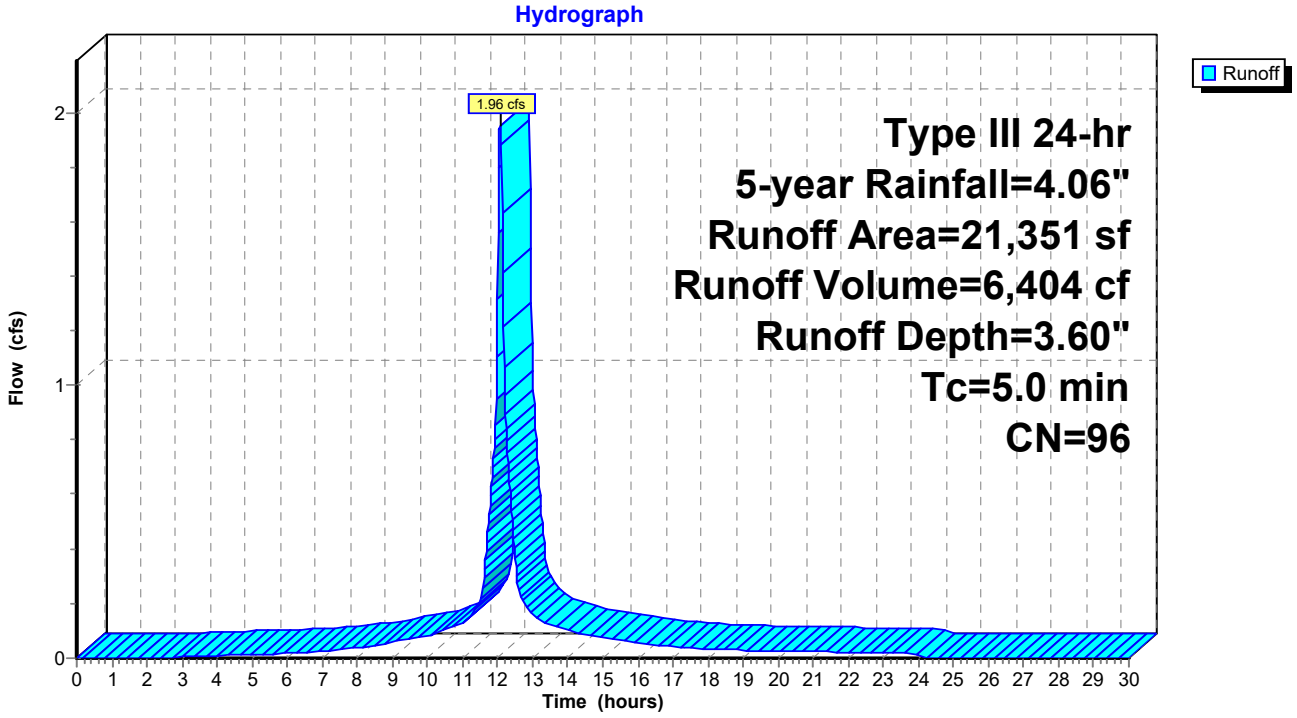
Runoff = 1.96 cfs @ 12.07 hrs, Volume= 6,404 cf, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 5-year Rainfall=4.06"

Area (sf)	CN	Description
18,390	98	Unconnected pavement, HSG D
2,961	80	>75% Grass cover, Good, HSG D
21,351	96	Weighted Average
2,961		13.87% Pervious Area
18,390		86.13% Impervious Area
18,390		100.00% Unconnected

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

Subcatchment 3A: 3A



Summary for Subcatchment 4A: 4A

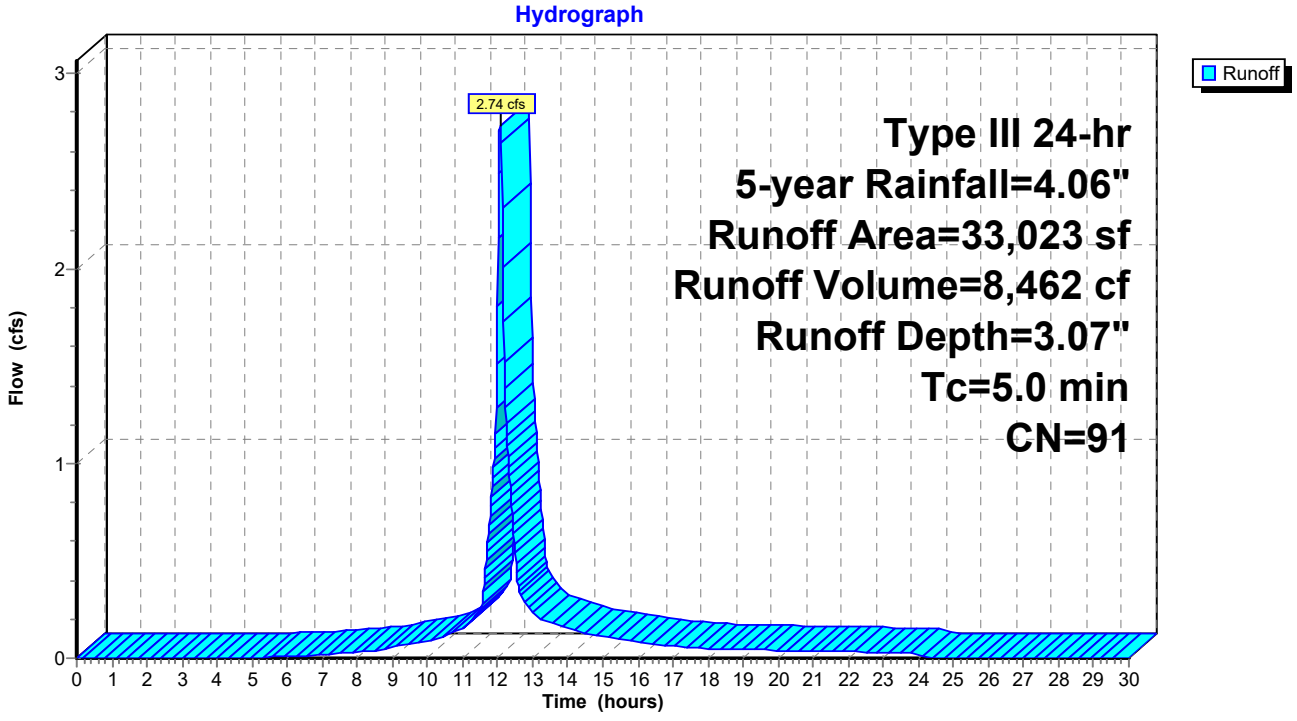
Runoff = 2.74 cfs @ 12.07 hrs, Volume= 8,462 cf, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 5-year Rainfall=4.06"

Area (sf)	CN	Description
20,445	98	Unconnected pavement, HSG D
12,578	80	>75% Grass cover, Good, HSG D
33,023	91	Weighted Average
12,578		38.09% Pervious Area
20,445		61.91% Impervious Area
20,445		100.00% Unconnected

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

Subcatchment 4A: 4A

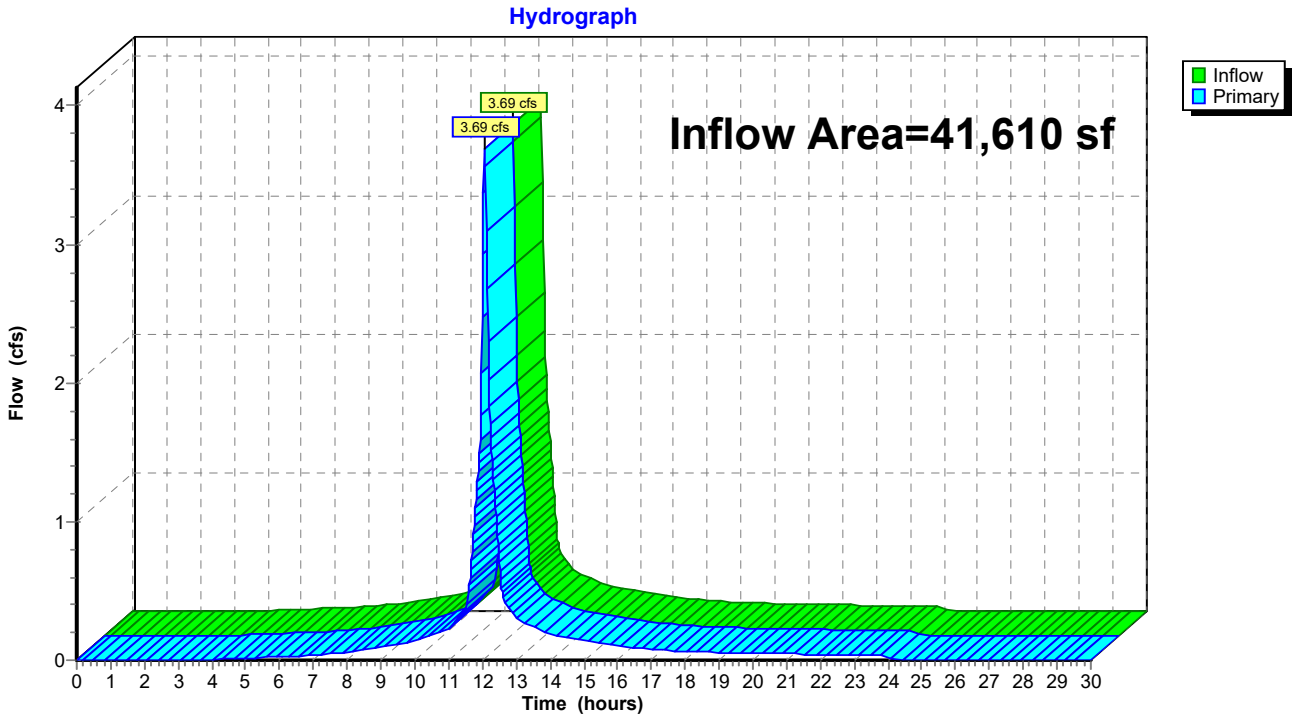


Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 80.19% Impervious, Inflow Depth = 3.38" for 5-year event
Inflow = 3.69 cfs @ 12.07 hrs, Volume= 11,731 cf
Primary = 3.69 cfs @ 12.07 hrs, Volume= 11,731 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-1: DP-1

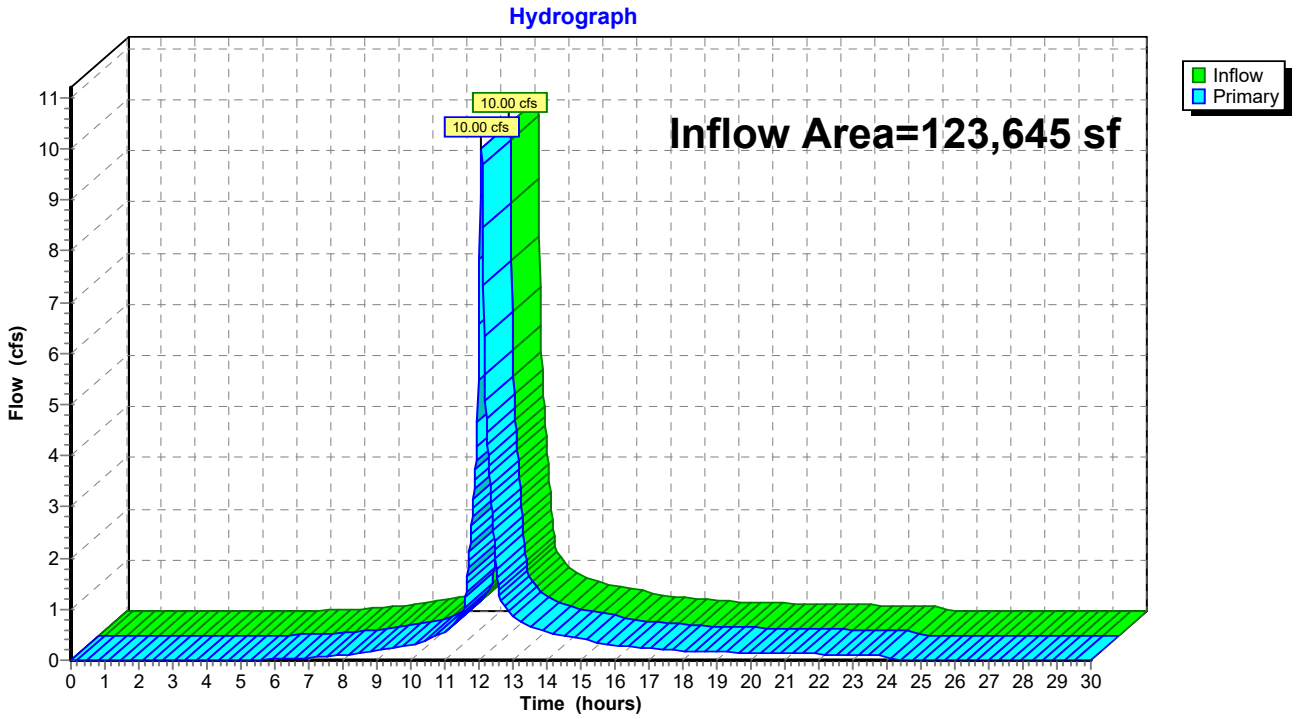


Summary for Link DP-2: DP-2

Inflow Area = 123,645 sf, 69.02% Impervious, Inflow Depth = 2.98" for 5-year event
Inflow = 10.00 cfs @ 12.07 hrs, Volume= 30,665 cf
Primary = 10.00 cfs @ 12.07 hrs, Volume= 30,665 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-2: DP-2

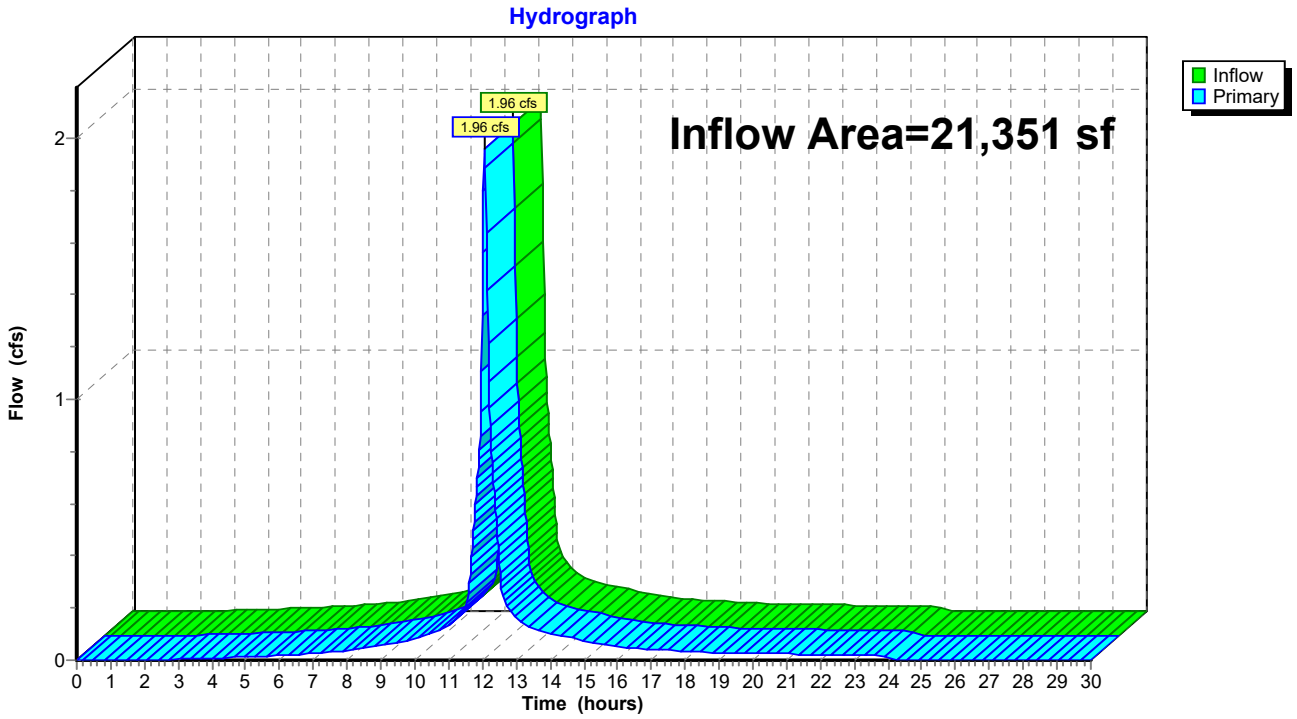


Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.13% Impervious, Inflow Depth = 3.60" for 5-year event
Inflow = 1.96 cfs @ 12.07 hrs, Volume= 6,404 cf
Primary = 1.96 cfs @ 12.07 hrs, Volume= 6,404 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-3: DP-3

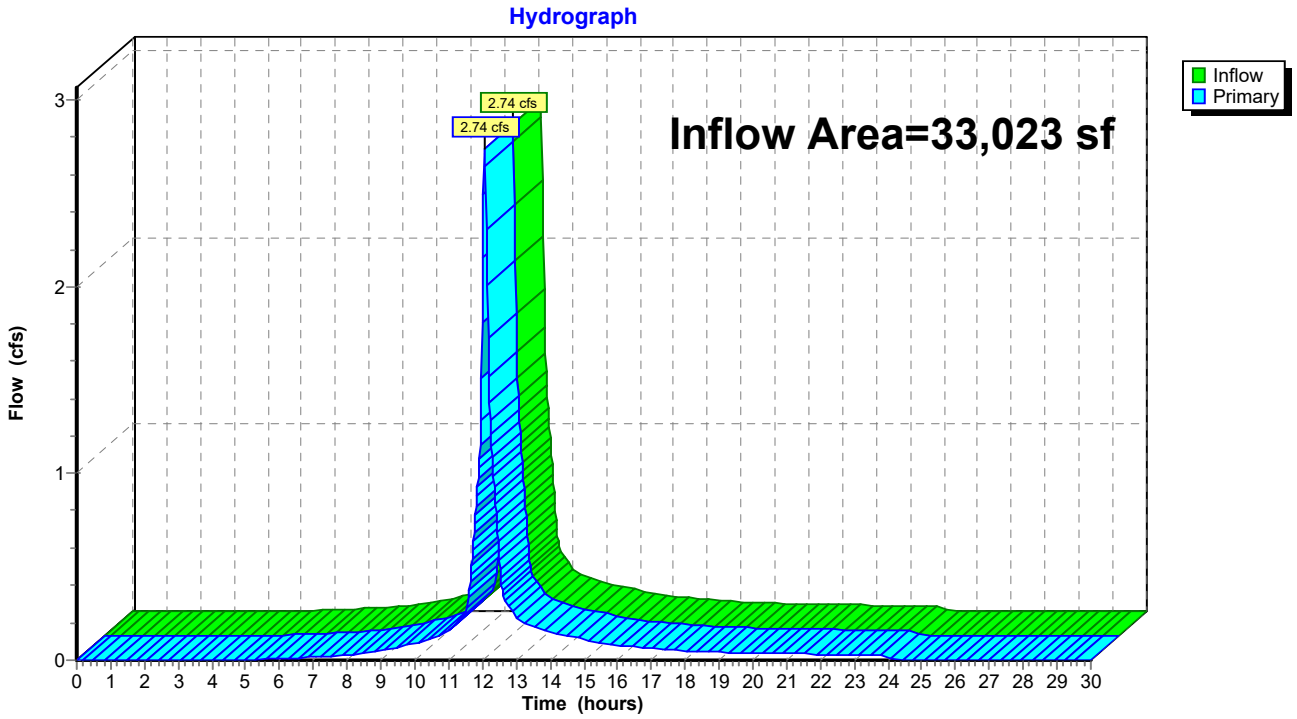


Summary for Link DP-4: DP-4

Inflow Area = 33,023 sf, 61.91% Impervious, Inflow Depth = 3.07" for 5-year event
Inflow = 2.74 cfs @ 12.07 hrs, Volume= 8,462 cf
Primary = 2.74 cfs @ 12.07 hrs, Volume= 8,462 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-4: DP-4



10-Year Storm Event – Existing

Time span=0.00-30.00 hrs, dt=0.02 hrs, 1501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A: 1A Runoff Area=41,610 sf 80.19% Impervious Runoff Depth=4.19"
Tc=5.0 min CN=94 Runoff=4.51 cfs 14,528 cf

Subcatchment2A: 2A Runoff Area=123,645 sf 69.02% Impervious Runoff Depth=3.76"
Tc=5.0 min CN=90 Runoff=12.49 cfs 38,749 cf

Subcatchment3A: 3A Runoff Area=21,351 sf 86.13% Impervious Runoff Depth=4.41"
Tc=5.0 min CN=96 Runoff=2.37 cfs 7,852 cf

Subcatchment4A: 4A Runoff Area=33,023 sf 61.91% Impervious Runoff Depth=3.87"
Tc=5.0 min CN=91 Runoff=3.40 cfs 10,638 cf

Link DP-1: DP-1 Inflow=4.51 cfs 14,528 cf
Primary=4.51 cfs 14,528 cf

Link DP-2: DP-2 Inflow=12.49 cfs 38,749 cf
Primary=12.49 cfs 38,749 cf

Link DP-3: DP-3 Inflow=2.37 cfs 7,852 cf
Primary=2.37 cfs 7,852 cf

Link DP-4: DP-4 Inflow=3.40 cfs 10,638 cf
Primary=3.40 cfs 10,638 cf

Total Runoff Area = 219,629 sf Runoff Volume = 71,767 cf Average Runoff Depth = 3.92"
28.27% Pervious = 62,089 sf 71.73% Impervious = 157,540 sf

Summary for Subcatchment 1A: 1A

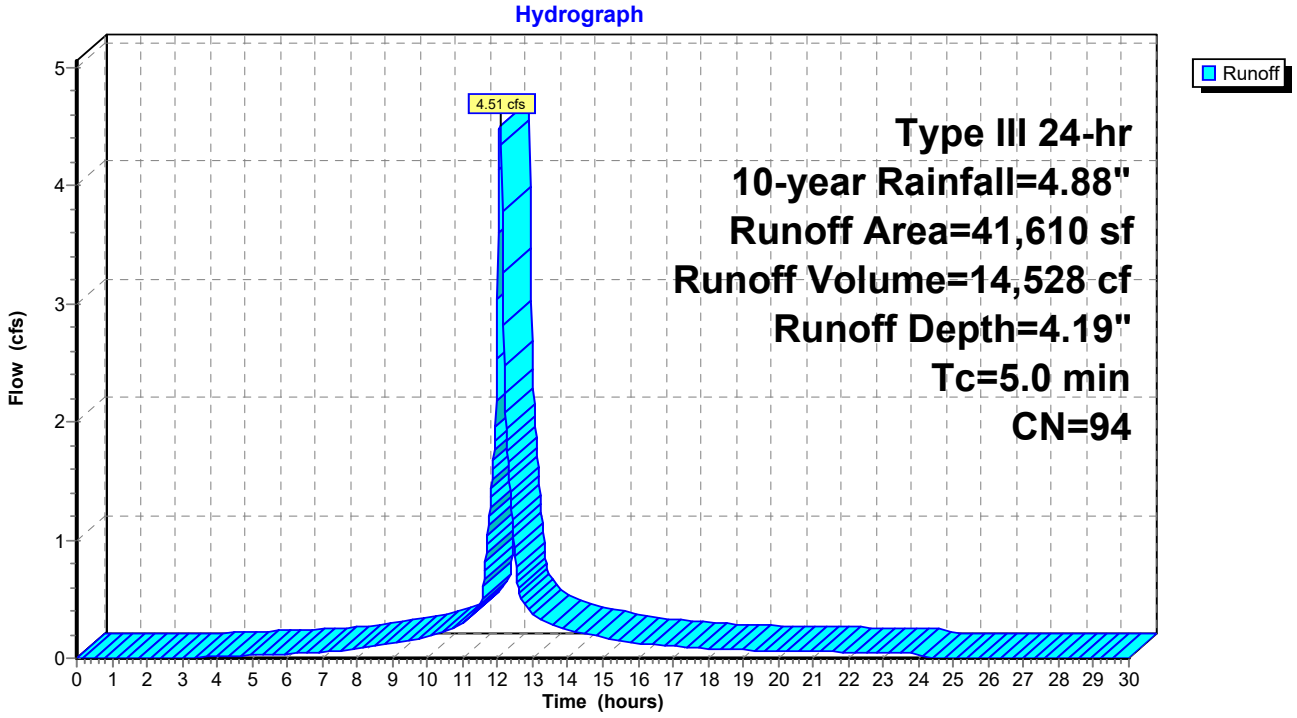
Runoff = 4.51 cfs @ 12.07 hrs, Volume= 14,528 cf, Depth= 4.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-year Rainfall=4.88"

Area (sf)	CN	Description
33,367	98	Unconnected pavement, HSG D
8,243	80	>75% Grass cover, Good, HSG D
41,610	94	Weighted Average
8,243		19.81% Pervious Area
33,367		80.19% Impervious Area
33,367		100.00% Unconnected

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

Subcatchment 1A: 1A



Summary for Subcatchment 2A: 2A

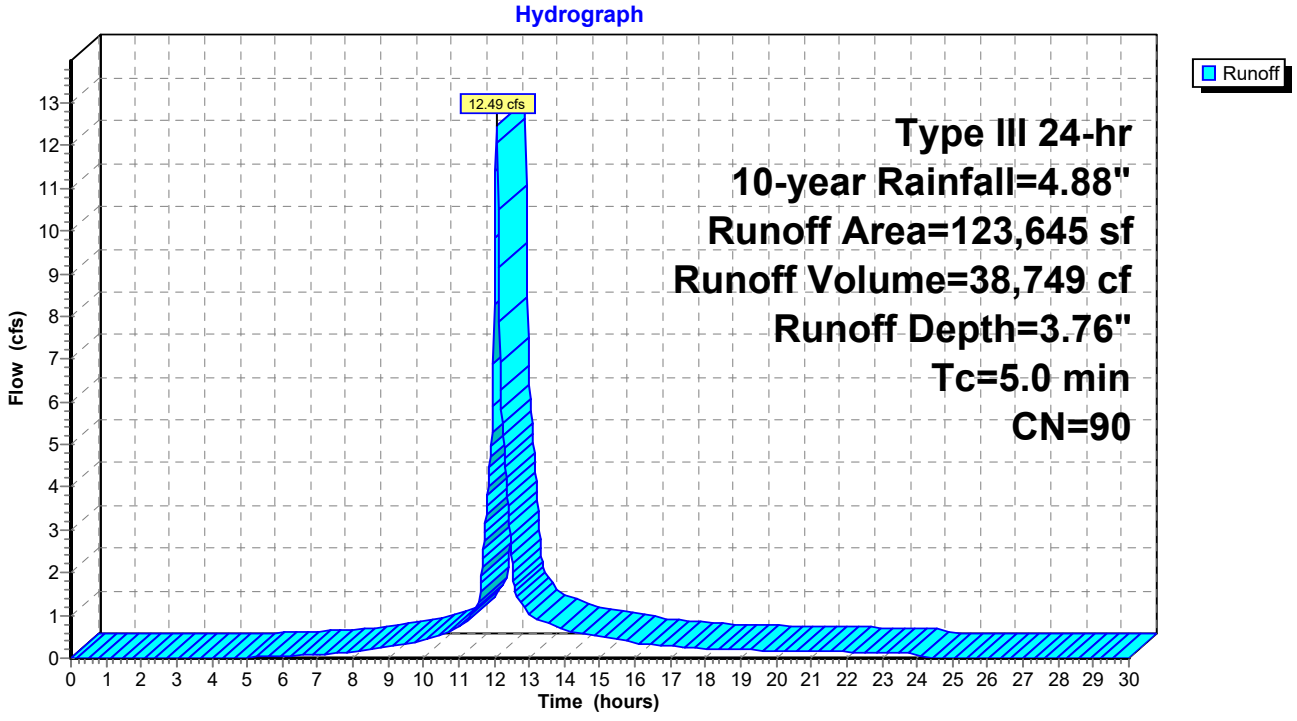
Runoff = 12.49 cfs @ 12.07 hrs, Volume= 38,749 cf, Depth= 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-year Rainfall=4.88"

Area (sf)	CN	Description
85,338	98	Paved parking, HSG D
23,927	80	>75% Grass cover, Good, HSG D
14,380	61	>75% Grass cover, Good, HSG B
123,645	90	Weighted Average
38,307		30.98% Pervious Area
85,338		69.02% Impervious Area

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

Subcatchment 2A: 2A



Summary for Subcatchment 3A: 3A

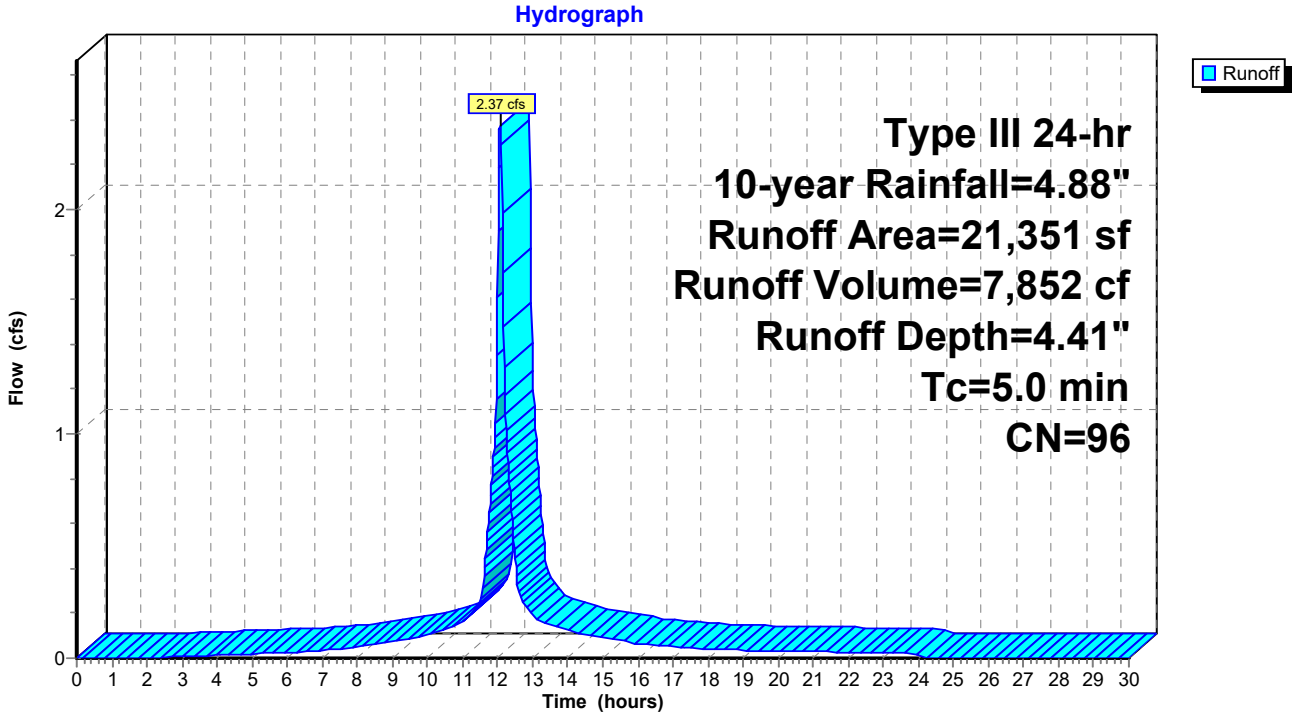
Runoff = 2.37 cfs @ 12.07 hrs, Volume= 7,852 cf, Depth= 4.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-year Rainfall=4.88"

Area (sf)	CN	Description
18,390	98	Unconnected pavement, HSG D
2,961	80	>75% Grass cover, Good, HSG D
21,351	96	Weighted Average
2,961		13.87% Pervious Area
18,390		86.13% Impervious Area
18,390		100.00% Unconnected

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

Subcatchment 3A: 3A



Summary for Subcatchment 4A: 4A

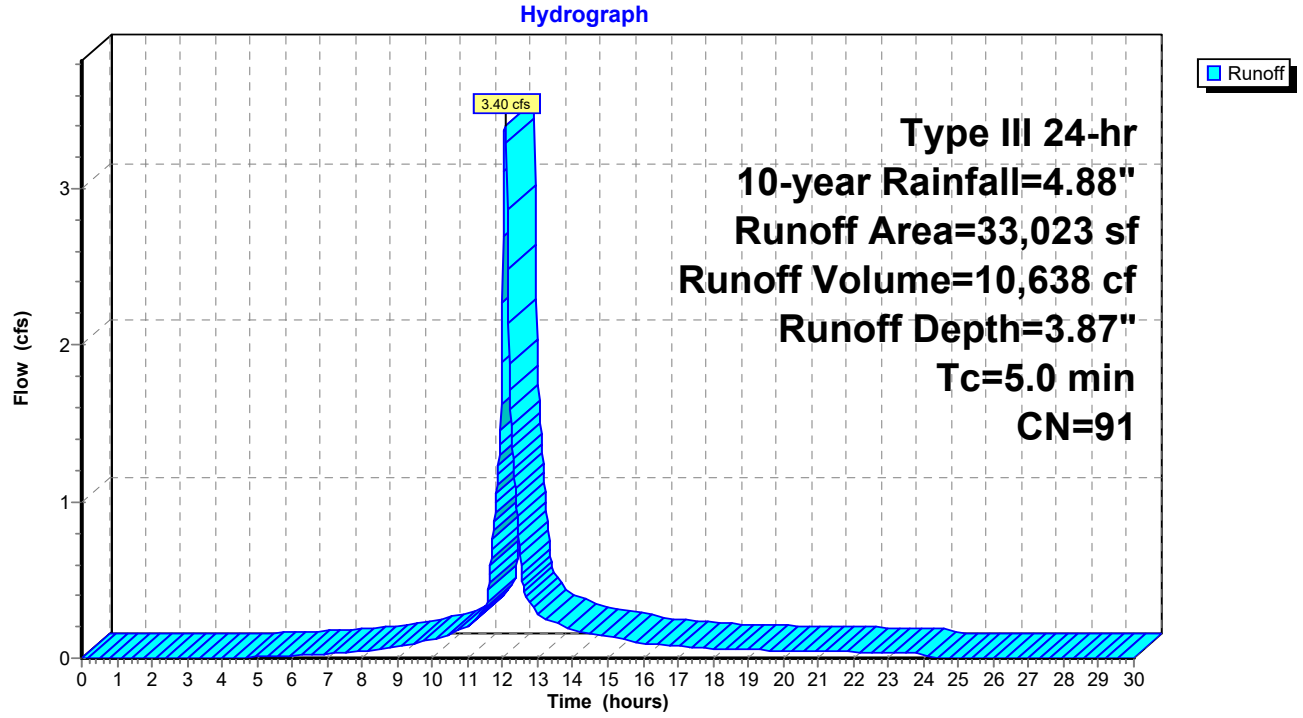
Runoff = 3.40 cfs @ 12.07 hrs, Volume= 10,638 cf, Depth= 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-year Rainfall=4.88"

Area (sf)	CN	Description
20,445	98	Unconnected pavement, HSG D
12,578	80	>75% Grass cover, Good, HSG D
33,023	91	Weighted Average
12,578		38.09% Pervious Area
20,445		61.91% Impervious Area
20,445		100.00% Unconnected

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

Subcatchment 4A: 4A

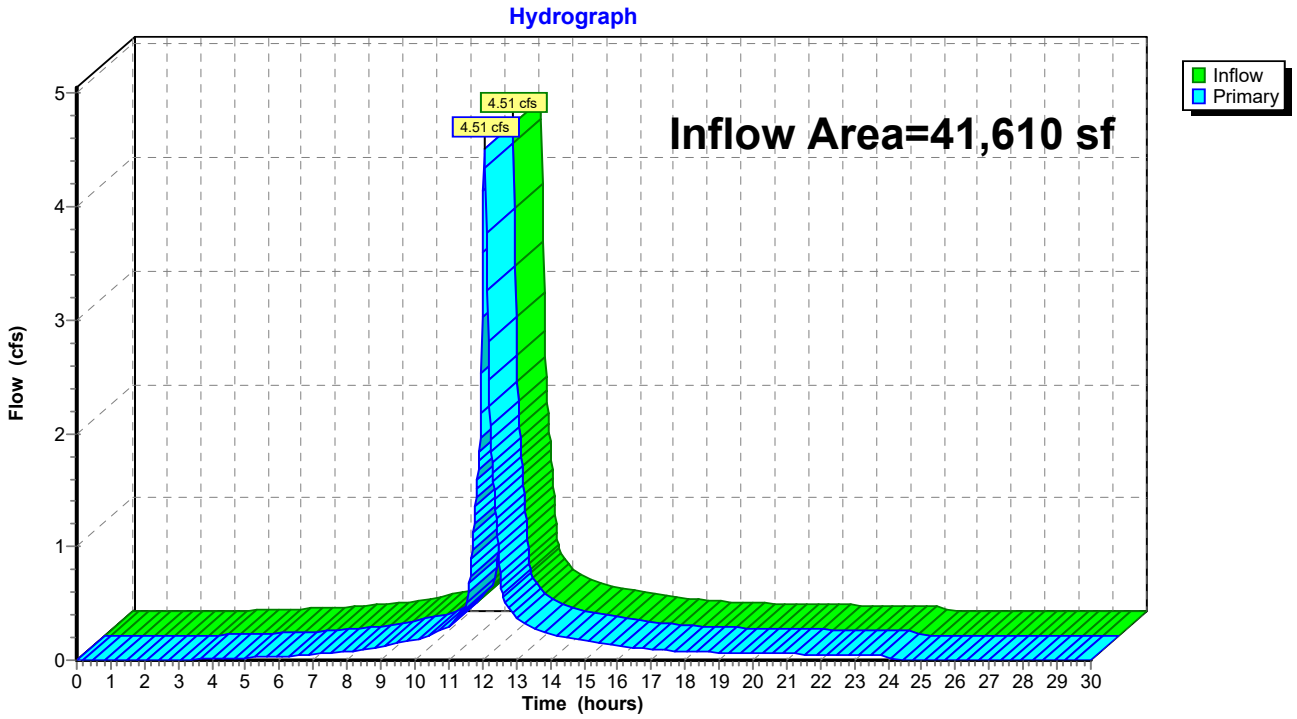


Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 80.19% Impervious, Inflow Depth = 4.19" for 10-year event
Inflow = 4.51 cfs @ 12.07 hrs, Volume= 14,528 cf
Primary = 4.51 cfs @ 12.07 hrs, Volume= 14,528 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-1: DP-1

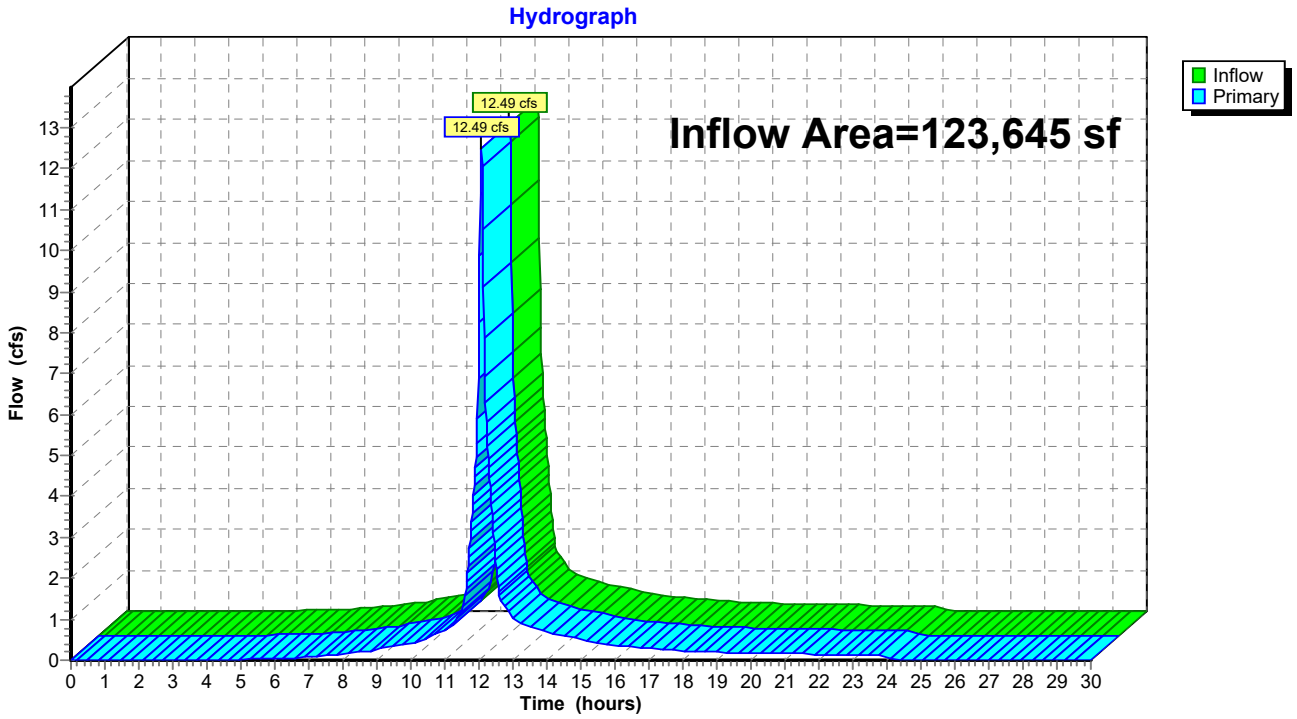


Summary for Link DP-2: DP-2

Inflow Area = 123,645 sf, 69.02% Impervious, Inflow Depth = 3.76" for 10-year event
Inflow = 12.49 cfs @ 12.07 hrs, Volume= 38,749 cf
Primary = 12.49 cfs @ 12.07 hrs, Volume= 38,749 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-2: DP-2

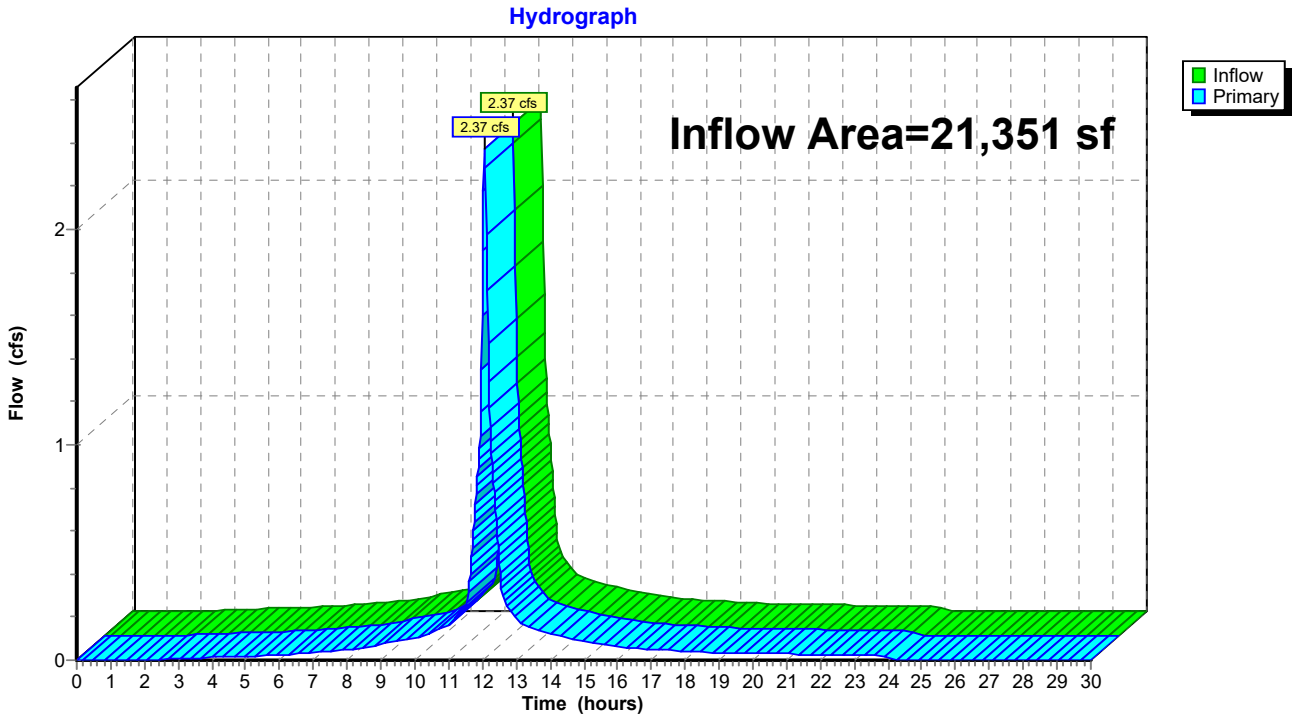


Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.13% Impervious, Inflow Depth = 4.41" for 10-year event
Inflow = 2.37 cfs @ 12.07 hrs, Volume= 7,852 cf
Primary = 2.37 cfs @ 12.07 hrs, Volume= 7,852 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-3: DP-3

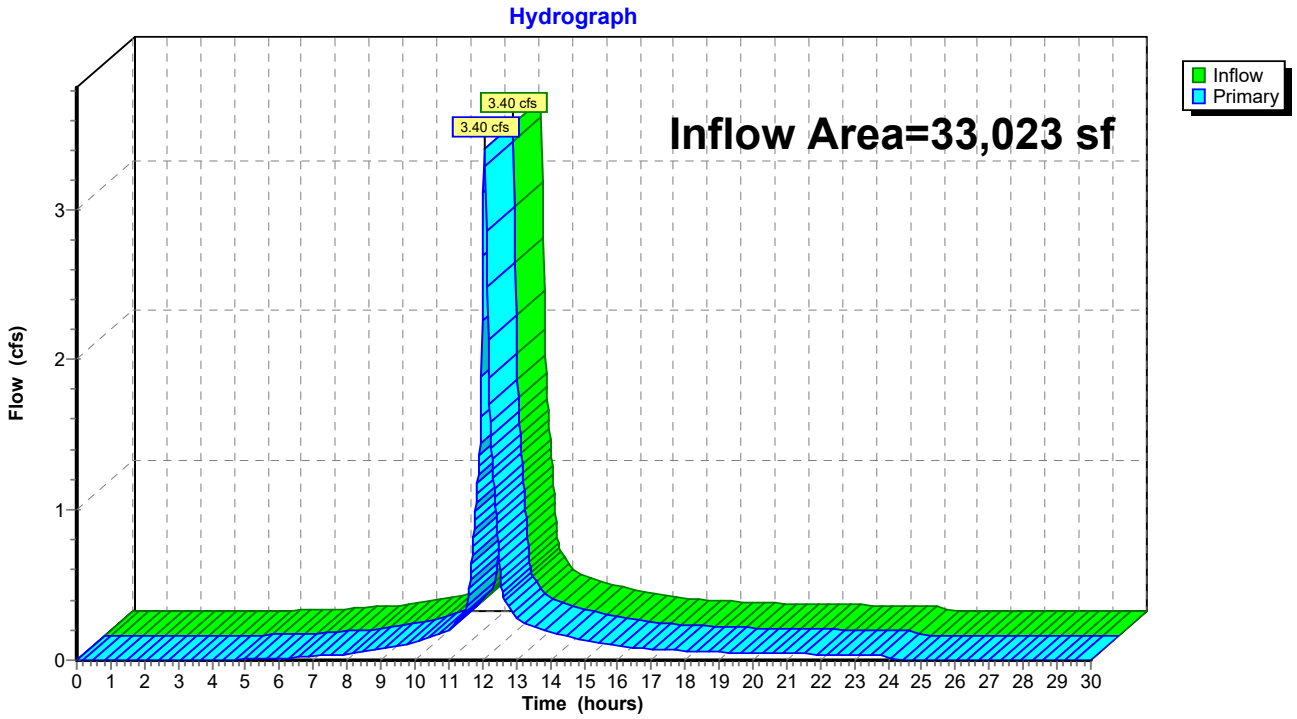


Summary for Link DP-4: DP-4

Inflow Area = 33,023 sf, 61.91% Impervious, Inflow Depth = 3.87" for 10-year event
Inflow = 3.40 cfs @ 12.07 hrs, Volume= 10,638 cf
Primary = 3.40 cfs @ 12.07 hrs, Volume= 10,638 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-4: DP-4



25-Year Storm Event- Existing

Time span=0.00-30.00 hrs, dt=0.02 hrs, 1501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A: 1A Runoff Area=41,610 sf 80.19% Impervious Runoff Depth=5.31"
Tc=5.0 min CN=94 Runoff=5.64 cfs 18,400 cf

Subcatchment2A: 2A Runoff Area=123,645 sf 69.02% Impervious Runoff Depth=4.86"
Tc=5.0 min CN=90 Runoff=15.90 cfs 50,031 cf

Subcatchment3A: 3A Runoff Area=21,351 sf 86.13% Impervious Runoff Depth=5.54"
Tc=5.0 min CN=96 Runoff=2.95 cfs 9,852 cf

Subcatchment4A: 4A Runoff Area=33,023 sf 61.91% Impervious Runoff Depth=4.97"
Tc=5.0 min CN=91 Runoff=4.31 cfs 13,669 cf

Link DP-1: DP-1 Inflow=5.64 cfs 18,400 cf
Primary=5.64 cfs 18,400 cf

Link DP-2: DP-2 Inflow=15.90 cfs 50,031 cf
Primary=15.90 cfs 50,031 cf

Link DP-3: DP-3 Inflow=2.95 cfs 9,852 cf
Primary=2.95 cfs 9,852 cf

Link DP-4: DP-4 Inflow=4.31 cfs 13,669 cf
Primary=4.31 cfs 13,669 cf

Total Runoff Area = 219,629 sf Runoff Volume = 91,953 cf Average Runoff Depth = 5.02"
28.27% Pervious = 62,089 sf 71.73% Impervious = 157,540 sf

Summary for Subcatchment 1A: 1A

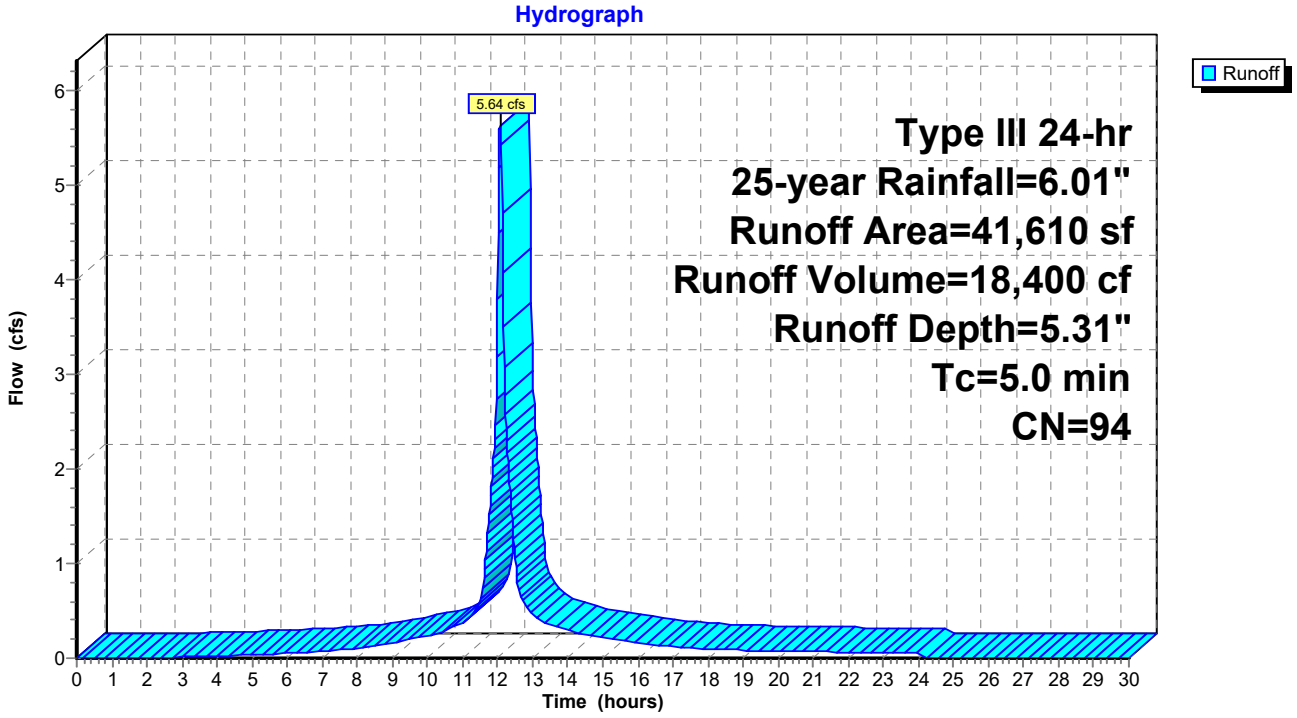
Runoff = 5.64 cfs @ 12.07 hrs, Volume= 18,400 cf, Depth= 5.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-year Rainfall=6.01"

Area (sf)	CN	Description
33,367	98	Unconnected pavement, HSG D
8,243	80	>75% Grass cover, Good, HSG D
41,610	94	Weighted Average
8,243		19.81% Pervious Area
33,367		80.19% Impervious Area
33,367		100.00% Unconnected

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

Subcatchment 1A: 1A



Summary for Subcatchment 2A: 2A

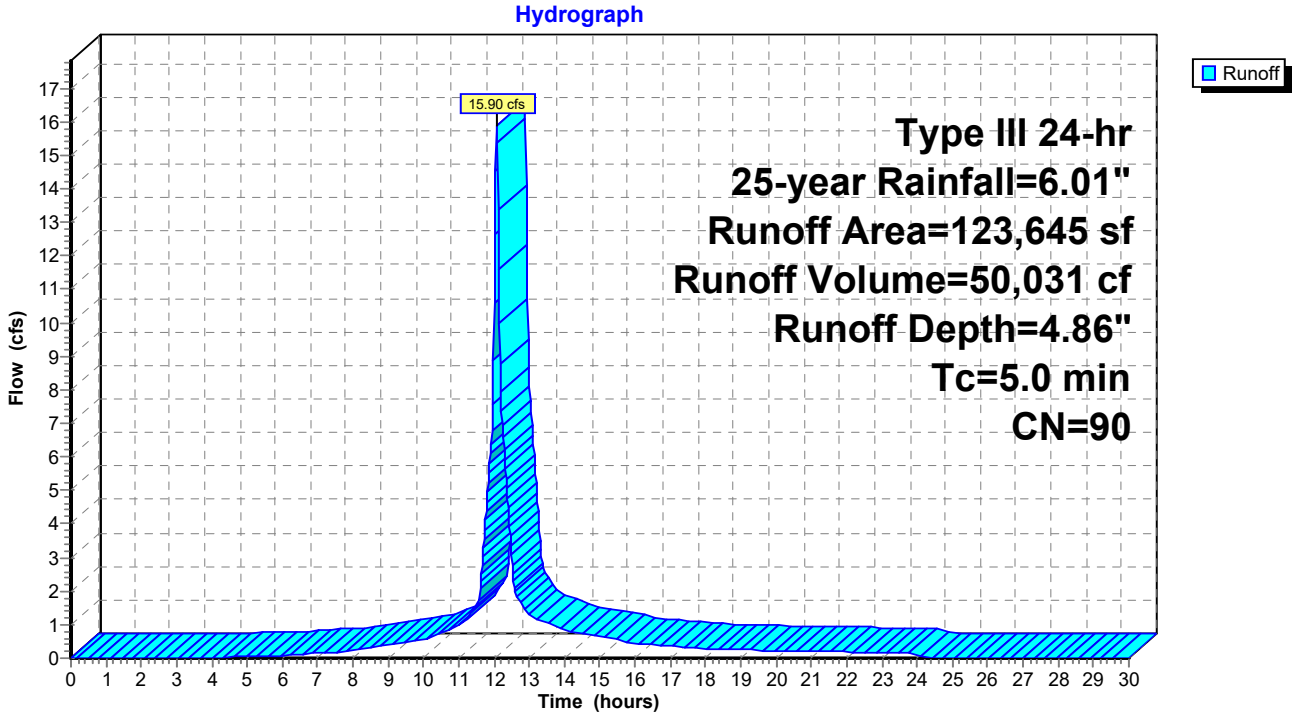
Runoff = 15.90 cfs @ 12.07 hrs, Volume= 50,031 cf, Depth= 4.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-year Rainfall=6.01"

Area (sf)	CN	Description
85,338	98	Paved parking, HSG D
23,927	80	>75% Grass cover, Good, HSG D
14,380	61	>75% Grass cover, Good, HSG B
123,645	90	Weighted Average
38,307		30.98% Pervious Area
85,338		69.02% Impervious Area

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

Subcatchment 2A: 2A



Summary for Subcatchment 3A: 3A

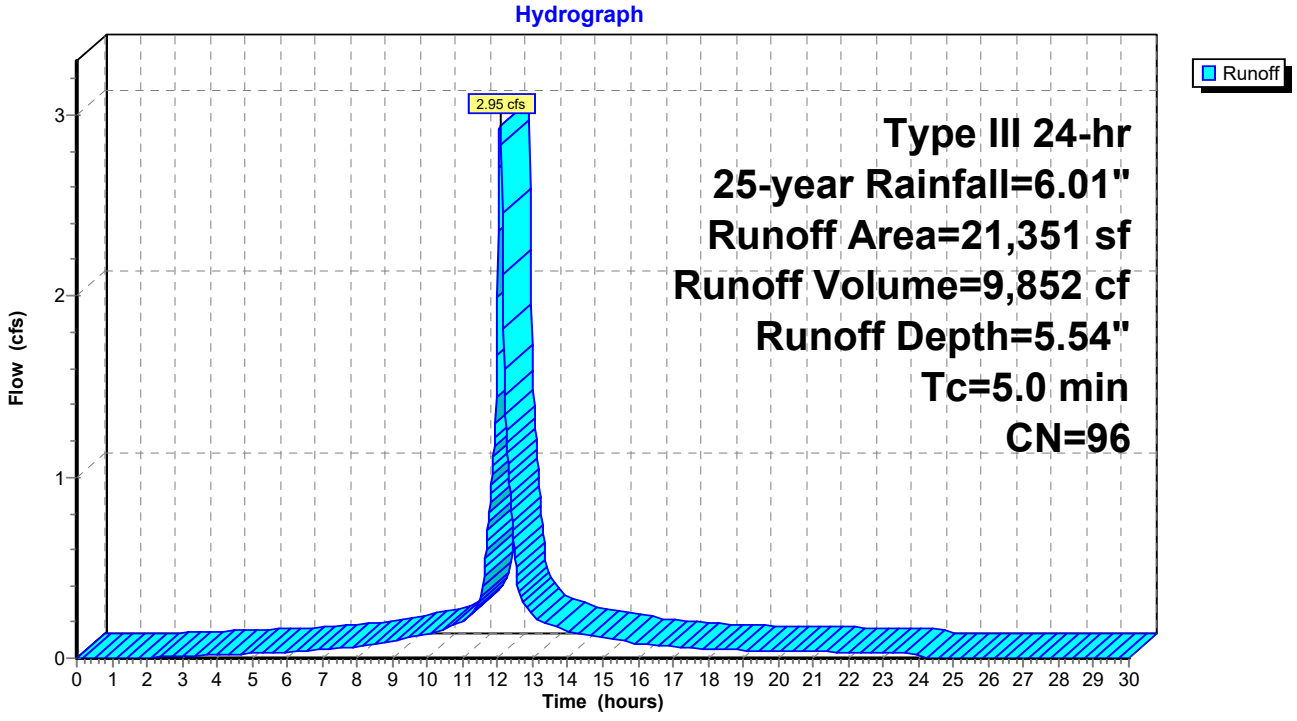
Runoff = 2.95 cfs @ 12.07 hrs, Volume= 9,852 cf, Depth= 5.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-year Rainfall=6.01"

Area (sf)	CN	Description
18,390	98	Unconnected pavement, HSG D
2,961	80	>75% Grass cover, Good, HSG D
21,351	96	Weighted Average
2,961		13.87% Pervious Area
18,390		86.13% Impervious Area
18,390		100.00% Unconnected

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

Subcatchment 3A: 3A



Summary for Subcatchment 4A: 4A

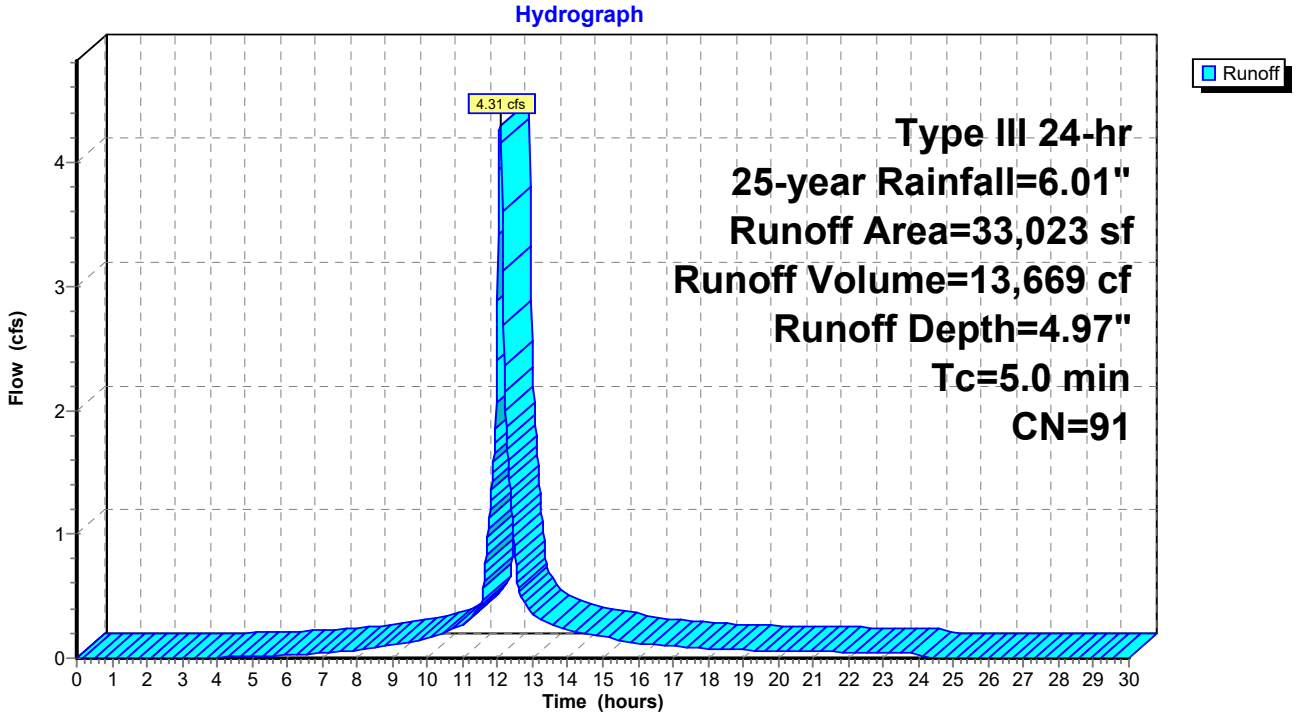
Runoff = 4.31 cfs @ 12.07 hrs, Volume= 13,669 cf, Depth= 4.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-year Rainfall=6.01"

Area (sf)	CN	Description
20,445	98	Unconnected pavement, HSG D
12,578	80	>75% Grass cover, Good, HSG D
33,023	91	Weighted Average
12,578		38.09% Pervious Area
20,445		61.91% Impervious Area
20,445		100.00% Unconnected

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

Subcatchment 4A: 4A

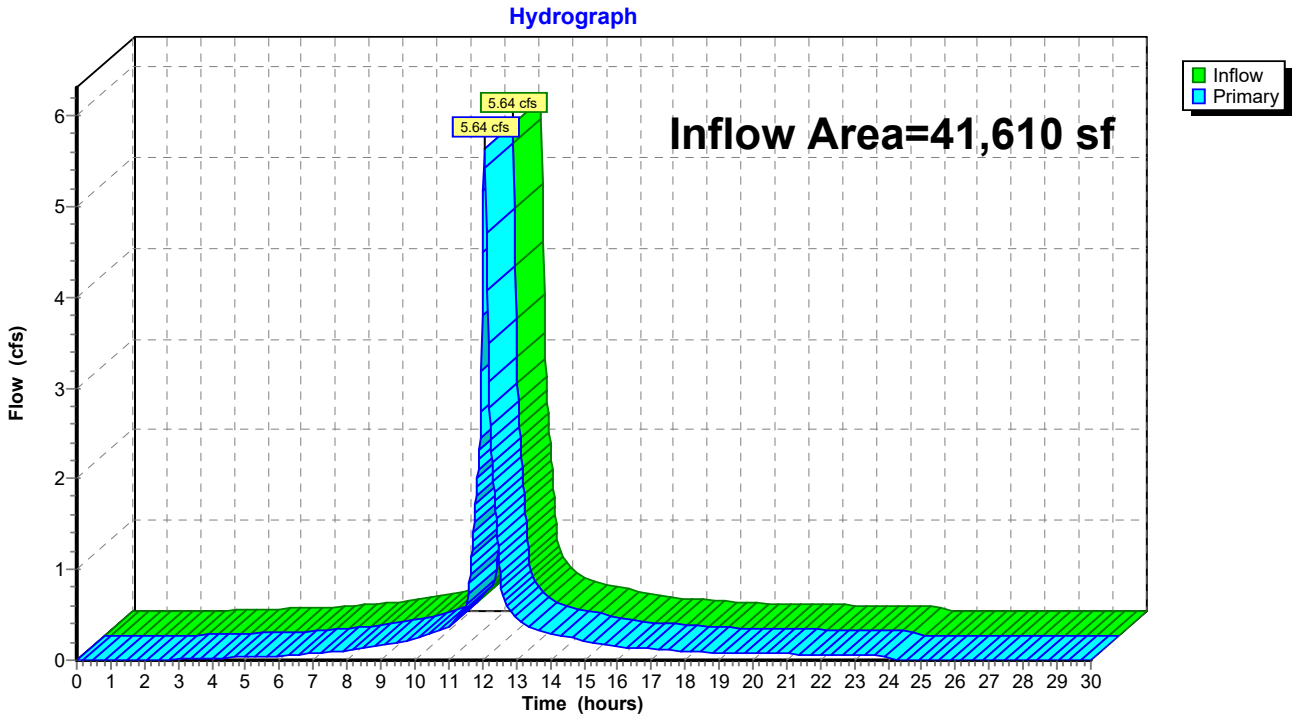


Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 80.19% Impervious, Inflow Depth = 5.31" for 25-year event
Inflow = 5.64 cfs @ 12.07 hrs, Volume= 18,400 cf
Primary = 5.64 cfs @ 12.07 hrs, Volume= 18,400 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-1: DP-1

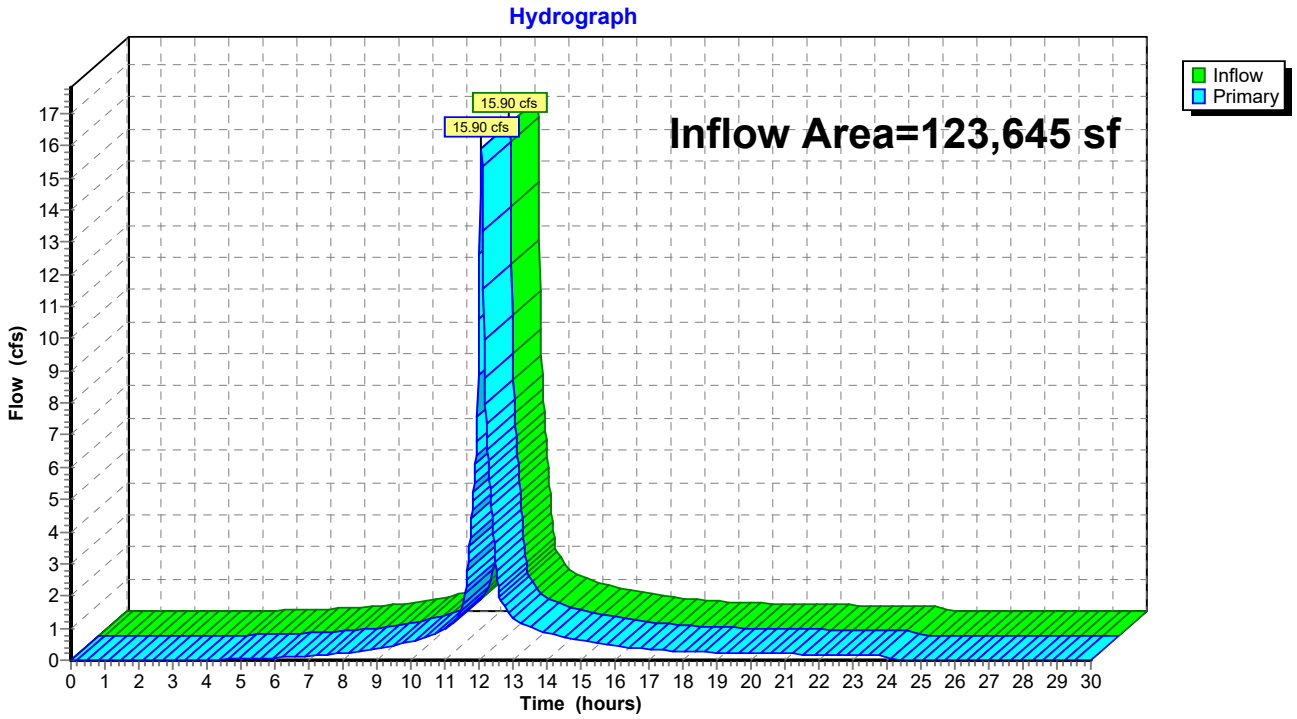


Summary for Link DP-2: DP-2

Inflow Area = 123,645 sf, 69.02% Impervious, Inflow Depth = 4.86" for 25-year event
Inflow = 15.90 cfs @ 12.07 hrs, Volume= 50,031 cf
Primary = 15.90 cfs @ 12.07 hrs, Volume= 50,031 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-2: DP-2

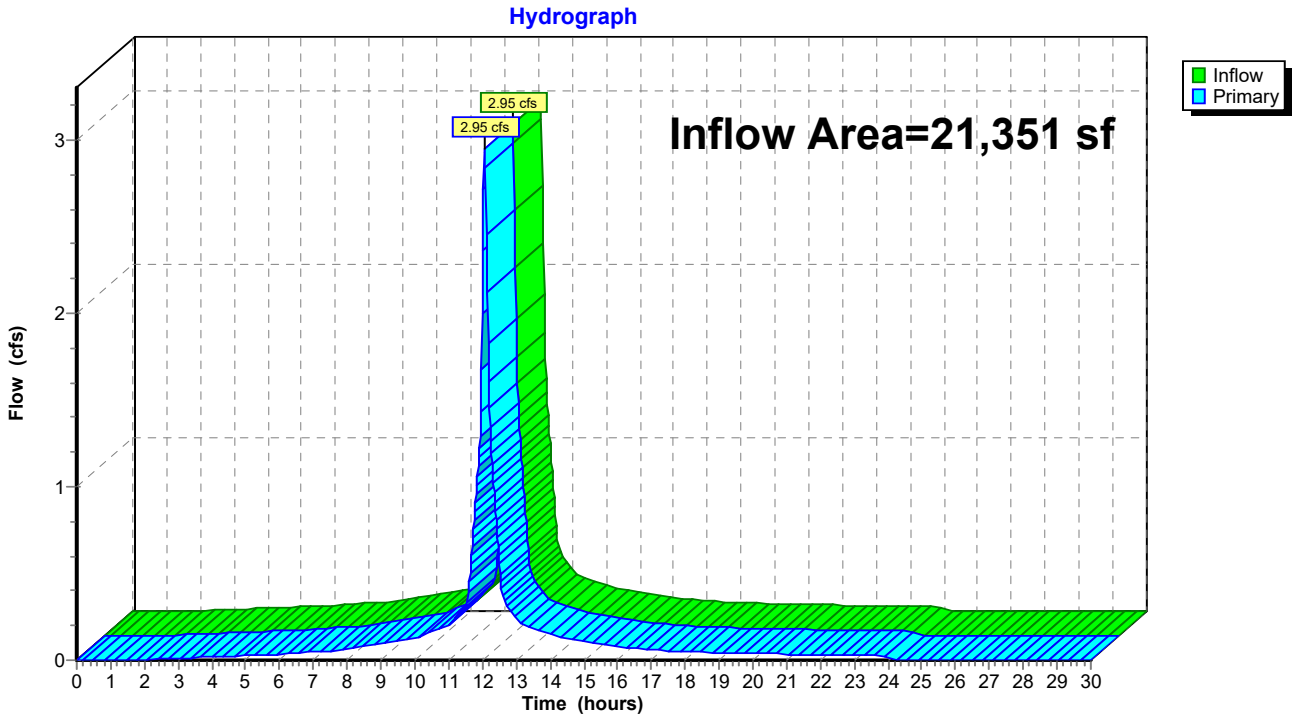


Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.13% Impervious, Inflow Depth = 5.54" for 25-year event
Inflow = 2.95 cfs @ 12.07 hrs, Volume= 9,852 cf
Primary = 2.95 cfs @ 12.07 hrs, Volume= 9,852 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-3: DP-3

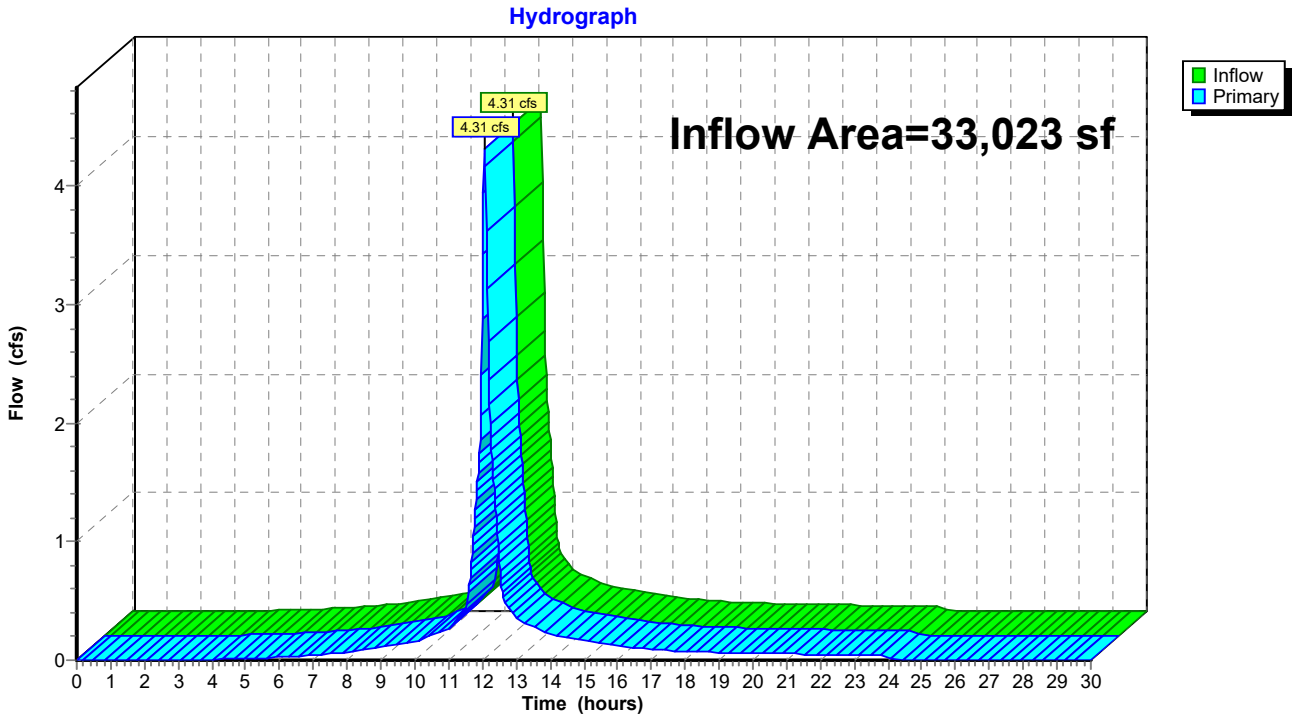


Summary for Link DP-4: DP-4

Inflow Area = 33,023 sf, 61.91% Impervious, Inflow Depth = 4.97" for 25-year event
Inflow = 4.31 cfs @ 12.07 hrs, Volume= 13,669 cf
Primary = 4.31 cfs @ 12.07 hrs, Volume= 13,669 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-4: DP-4



100-Year Storm Event – Existing

Time span=0.00-30.00 hrs, dt=0.02 hrs, 1501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A: 1A Runoff Area=41,610 sf 80.19% Impervious Runoff Depth=7.03"
Tc=5.0 min CN=94 Runoff=7.36 cfs 24,388 cf

Subcatchment2A: 2A Runoff Area=123,645 sf 69.02% Impervious Runoff Depth=6.56"
Tc=5.0 min CN=90 Runoff=21.12 cfs 67,588 cf

Subcatchment3A: 3A Runoff Area=21,351 sf 86.13% Impervious Runoff Depth=7.27"
Tc=5.0 min CN=96 Runoff=3.82 cfs 12,938 cf

Subcatchment4A: 4A Runoff Area=33,023 sf 61.91% Impervious Runoff Depth=6.68"
Tc=5.0 min CN=91 Runoff=5.70 cfs 18,376 cf

Link DP-1: DP-1 Inflow=7.36 cfs 24,388 cf
Primary=7.36 cfs 24,388 cf

Link DP-2: DP-2 Inflow=21.12 cfs 67,588 cf
Primary=21.12 cfs 67,588 cf

Link DP-3: DP-3 Inflow=3.82 cfs 12,938 cf
Primary=3.82 cfs 12,938 cf

Link DP-4: DP-4 Inflow=5.70 cfs 18,376 cf
Primary=5.70 cfs 18,376 cf

Total Runoff Area = 219,629 sf Runoff Volume = 123,291 cf Average Runoff Depth = 6.74"
28.27% Pervious = 62,089 sf 71.73% Impervious = 157,540 sf

Summary for Subcatchment 1A: 1A

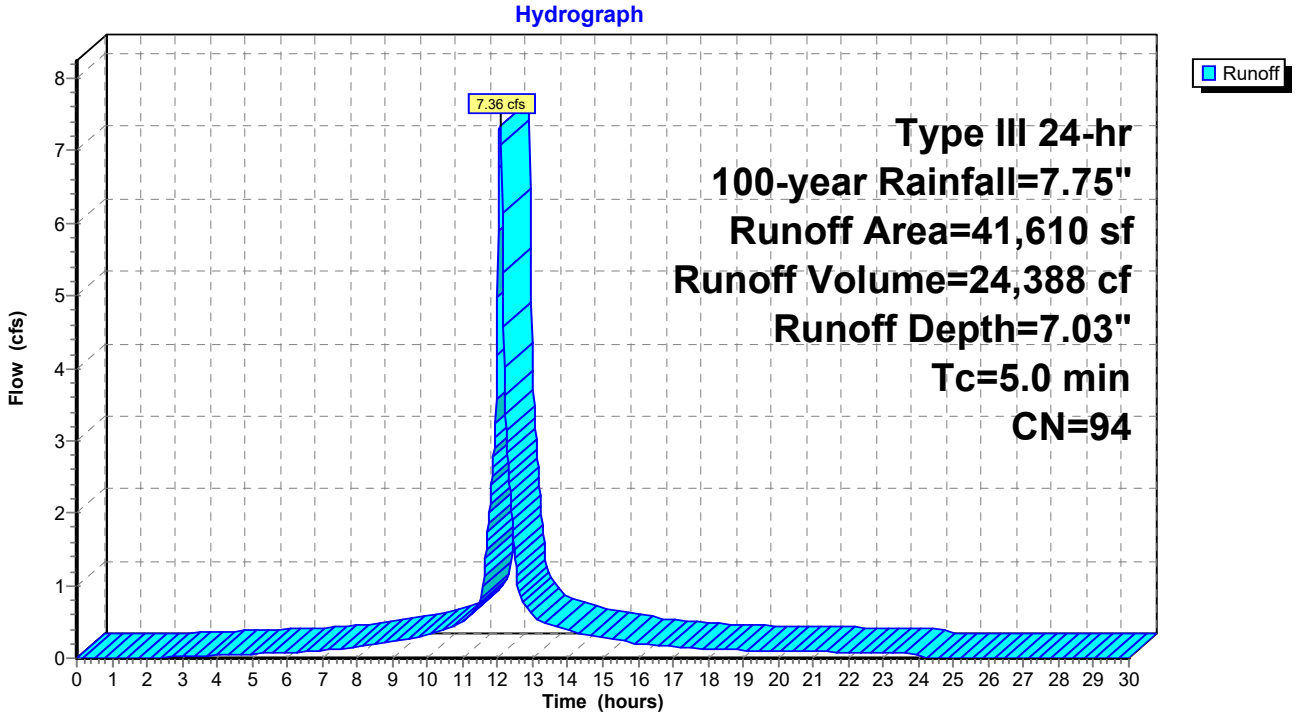
Runoff = 7.36 cfs @ 12.07 hrs, Volume= 24,388 cf, Depth= 7.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-year Rainfall=7.75"

Area (sf)	CN	Description
33,367	98	Unconnected pavement, HSG D
8,243	80	>75% Grass cover, Good, HSG D
41,610	94	Weighted Average
8,243		19.81% Pervious Area
33,367		80.19% Impervious Area
33,367		100.00% Unconnected

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

Subcatchment 1A: 1A



Summary for Subcatchment 2A: 2A

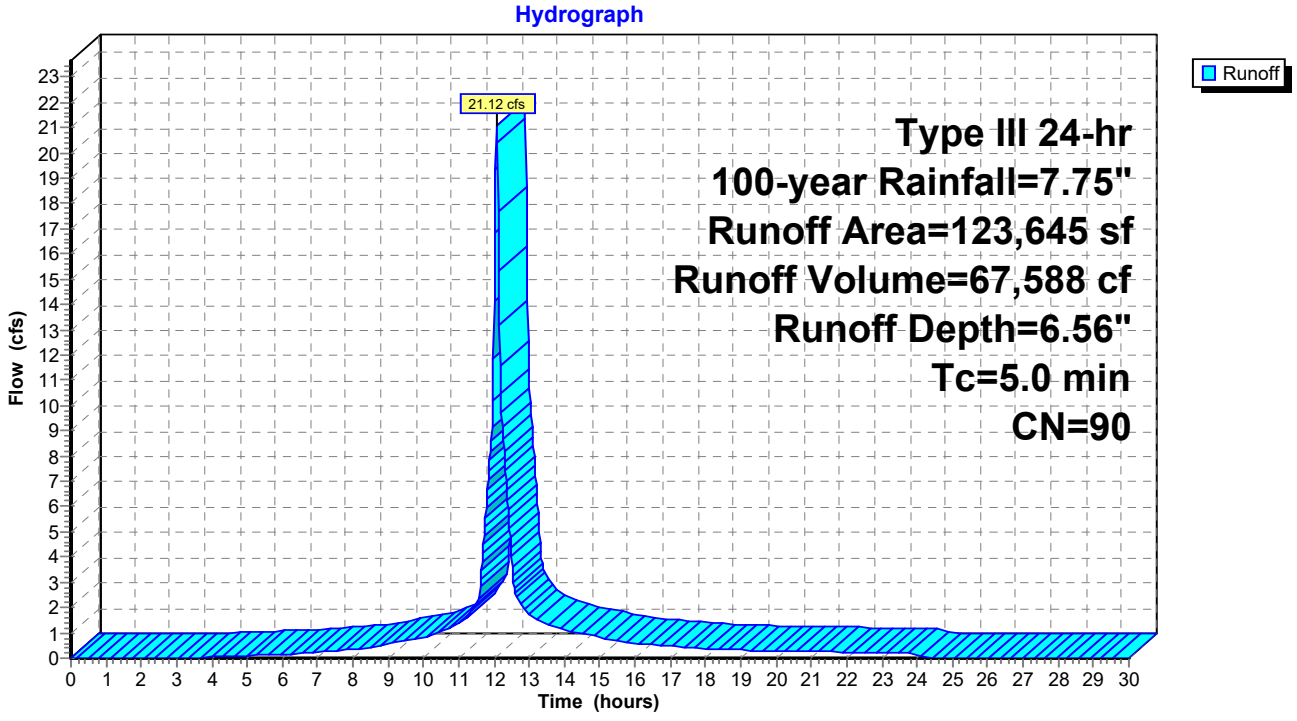
Runoff = 21.12 cfs @ 12.07 hrs, Volume= 67,588 cf, Depth= 6.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-year Rainfall=7.75"

Area (sf)	CN	Description
85,338	98	Paved parking, HSG D
23,927	80	>75% Grass cover, Good, HSG D
14,380	61	>75% Grass cover, Good, HSG B
123,645	90	Weighted Average
38,307		30.98% Pervious Area
85,338		69.02% Impervious Area

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

Subcatchment 2A: 2A



Summary for Subcatchment 3A: 3A

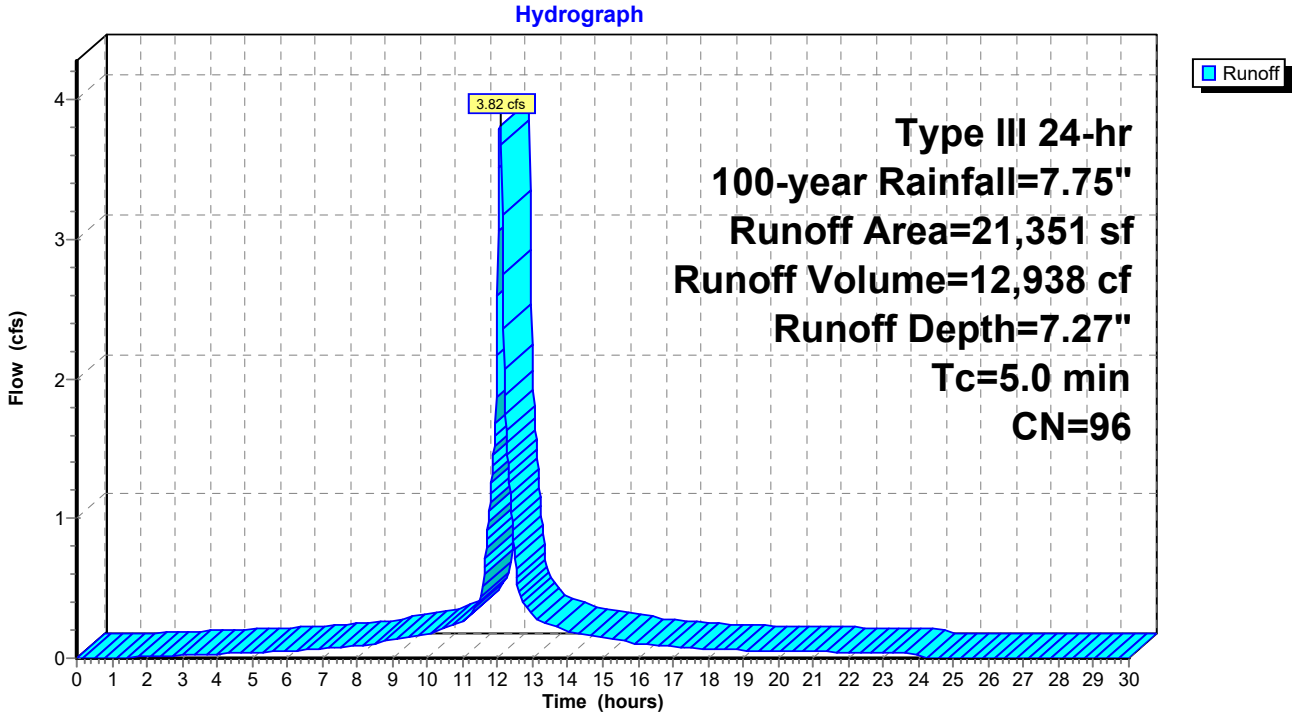
Runoff = 3.82 cfs @ 12.07 hrs, Volume= 12,938 cf, Depth= 7.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-year Rainfall=7.75"

Area (sf)	CN	Description
18,390	98	Unconnected pavement, HSG D
2,961	80	>75% Grass cover, Good, HSG D
21,351	96	Weighted Average
2,961		13.87% Pervious Area
18,390		86.13% Impervious Area
18,390		100.00% Unconnected

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

Subcatchment 3A: 3A



Summary for Subcatchment 4A: 4A

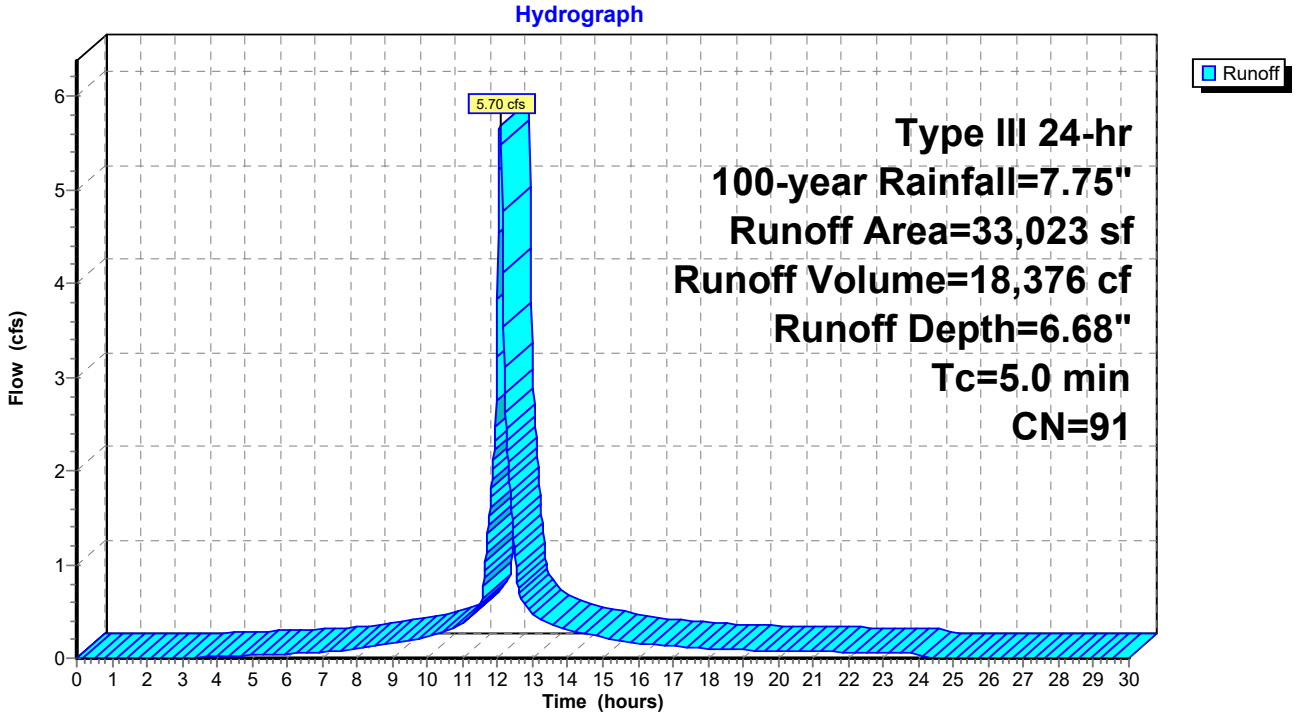
Runoff = 5.70 cfs @ 12.07 hrs, Volume= 18,376 cf, Depth= 6.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-year Rainfall=7.75"

Area (sf)	CN	Description
20,445	98	Unconnected pavement, HSG D
12,578	80	>75% Grass cover, Good, HSG D
33,023	91	Weighted Average
12,578		38.09% Pervious Area
20,445		61.91% Impervious Area
20,445		100.00% Unconnected

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

Subcatchment 4A: 4A

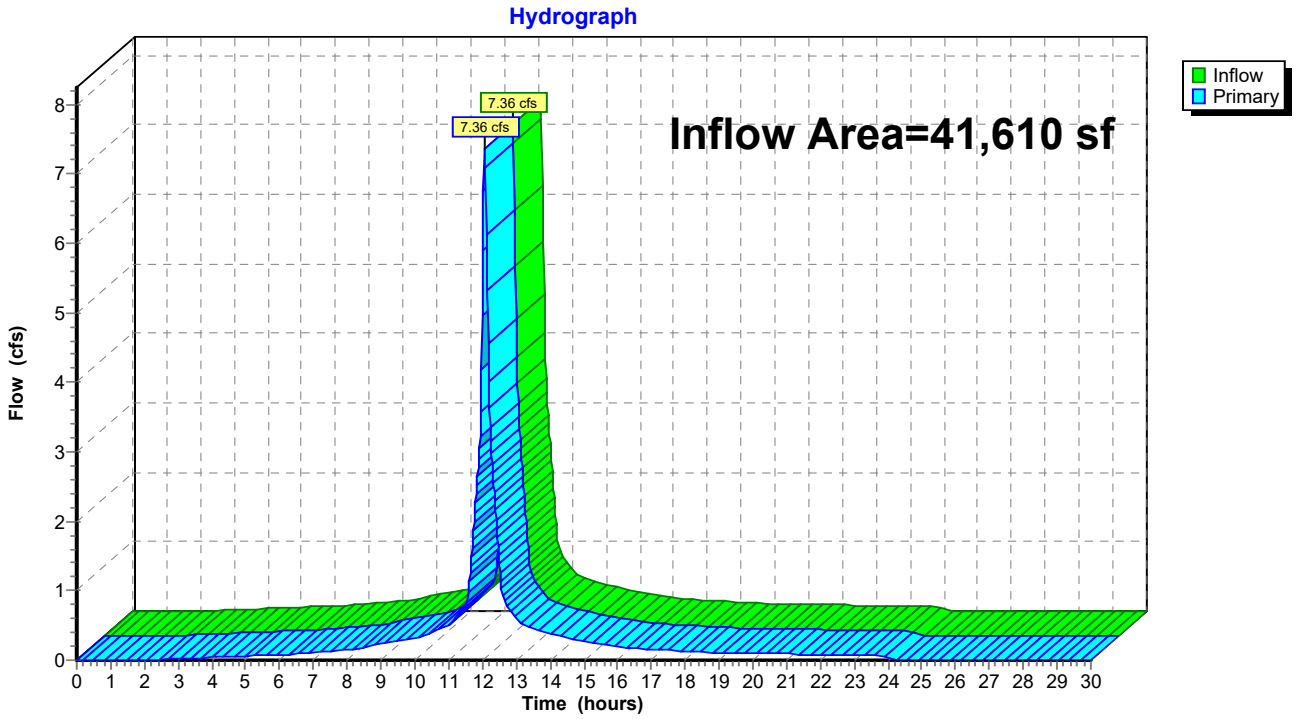


Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 80.19% Impervious, Inflow Depth = 7.03" for 100-year event
Inflow = 7.36 cfs @ 12.07 hrs, Volume= 24,388 cf
Primary = 7.36 cfs @ 12.07 hrs, Volume= 24,388 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-1: DP-1

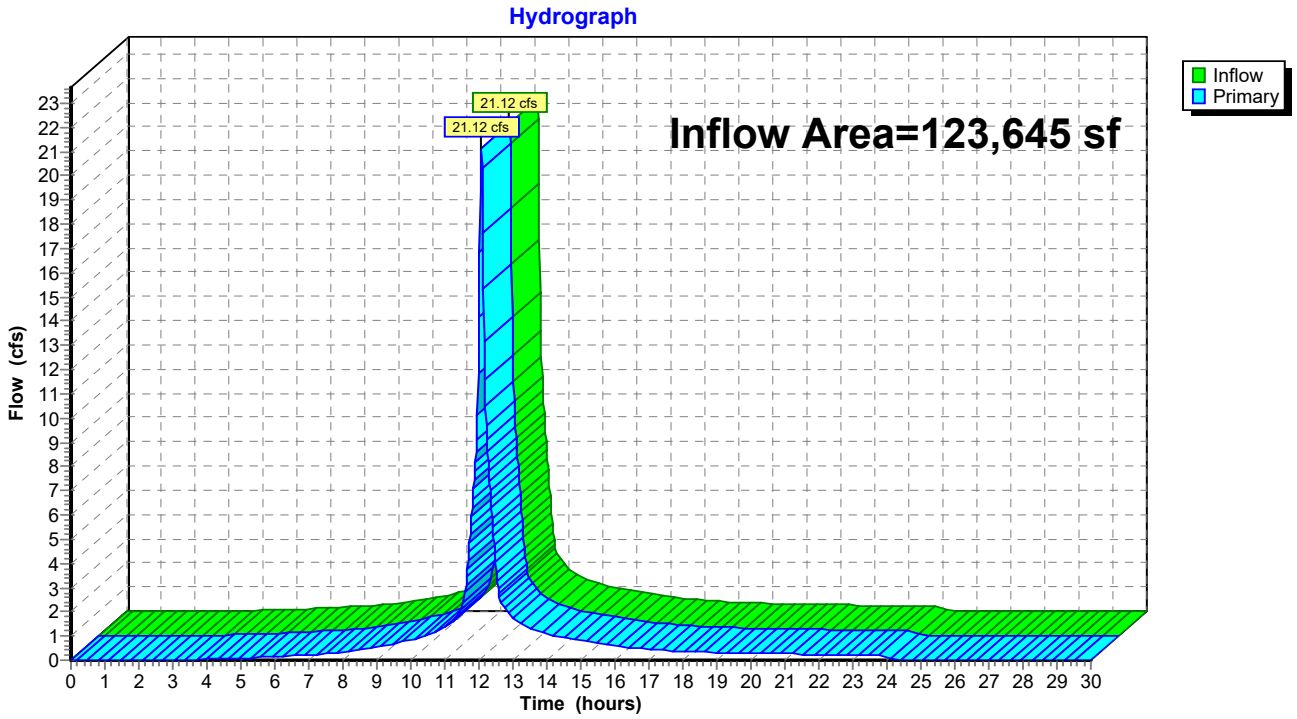


Summary for Link DP-2: DP-2

Inflow Area = 123,645 sf, 69.02% Impervious, Inflow Depth = 6.56" for 100-year event
Inflow = 21.12 cfs @ 12.07 hrs, Volume= 67,588 cf
Primary = 21.12 cfs @ 12.07 hrs, Volume= 67,588 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-2: DP-2

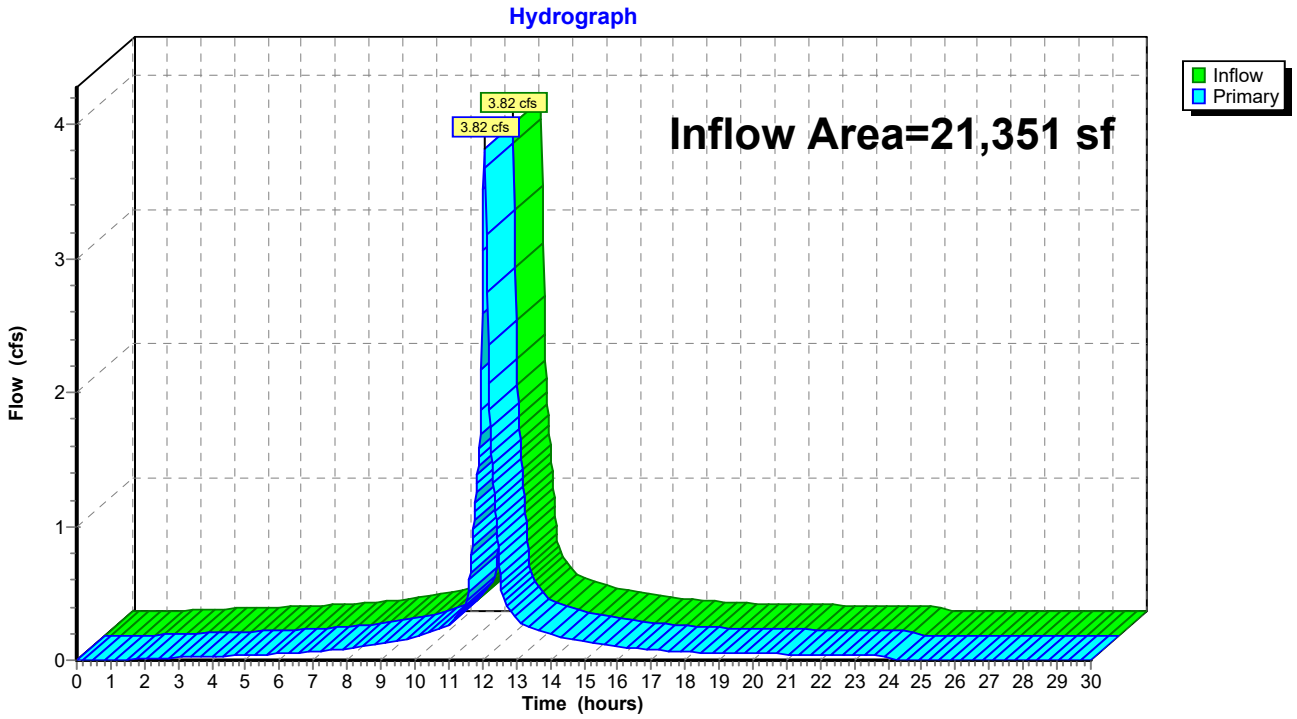


Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.13% Impervious, Inflow Depth = 7.27" for 100-year event
Inflow = 3.82 cfs @ 12.07 hrs, Volume= 12,938 cf
Primary = 3.82 cfs @ 12.07 hrs, Volume= 12,938 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-3: DP-3

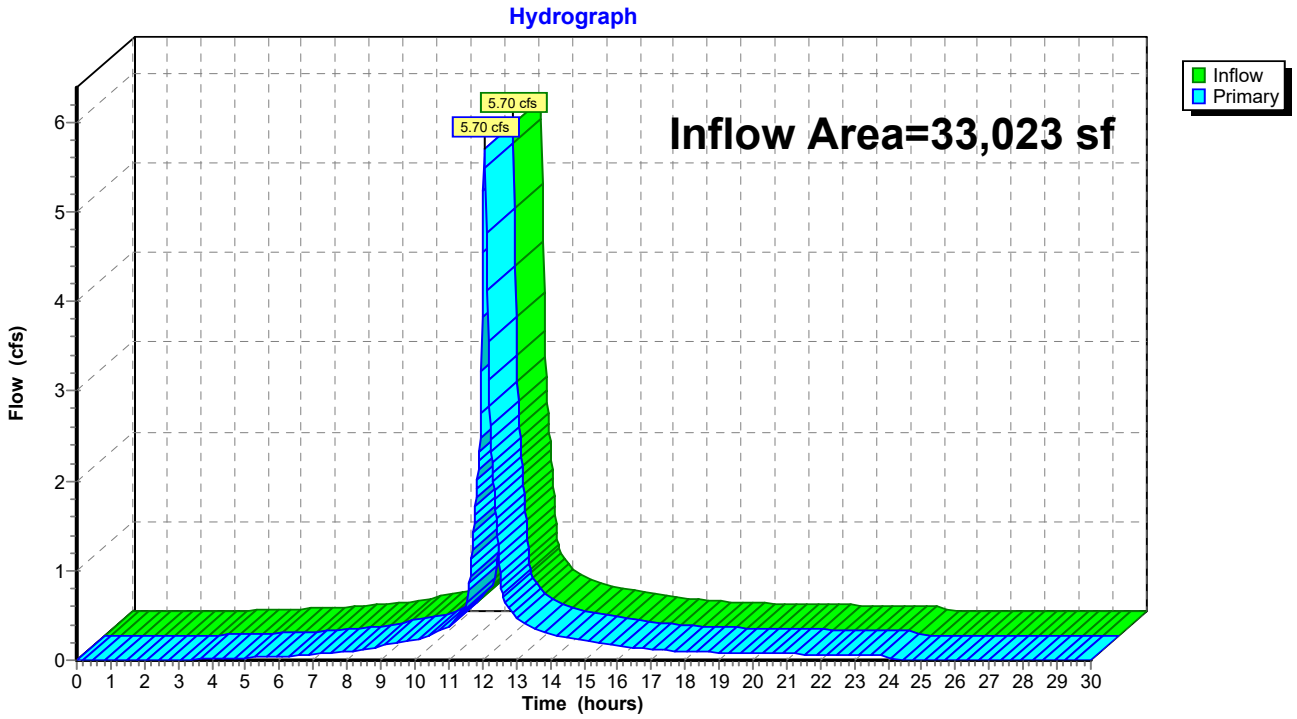


Summary for Link DP-4: DP-4

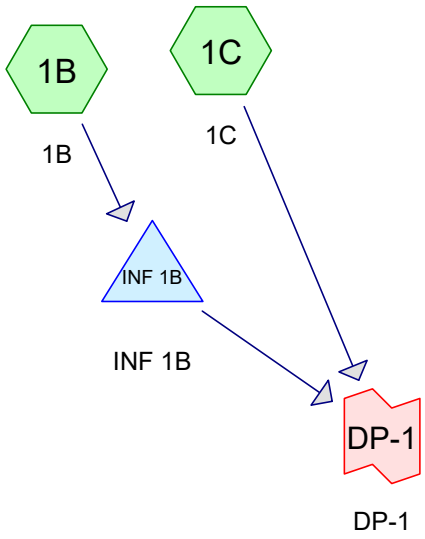
Inflow Area = 33,023 sf, 61.91% Impervious, Inflow Depth = 6.68" for 100-year event
Inflow = 5.70 cfs @ 12.07 hrs, Volume= 18,376 cf
Primary = 5.70 cfs @ 12.07 hrs, Volume= 18,376 cf, Atten= 0%, Lag= 0.0 min

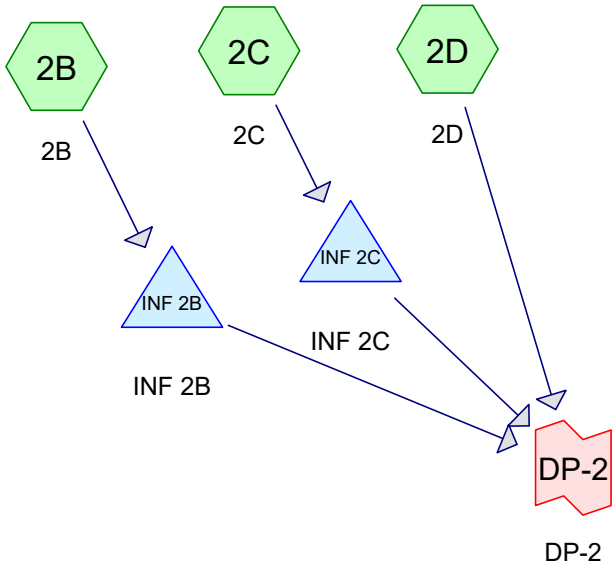
Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

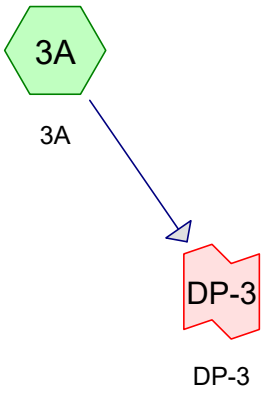
Link DP-4: DP-4

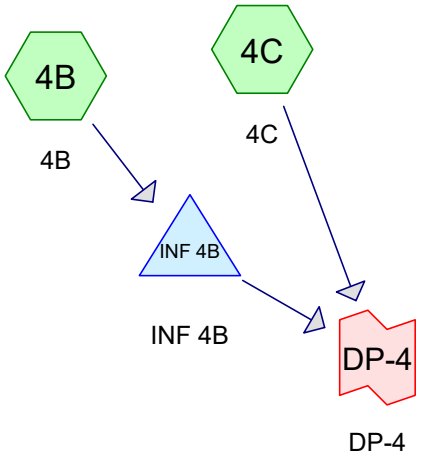


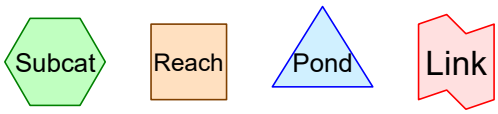
HydroCAD Analysis: Proposed Conditions











Routing Diagram for 42200_PR HydroCAD
Prepared by VHB, Printed 5/23/2018

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
3,149	61	>75% Grass cover, Good, HSG B (2B, 2C, 2D)
39,410	80	>75% Grass cover, Good, HSG D (1B, 1C, 2B, 2C, 2D, 3A, 4C)
184,143	98	Paved parking, HSG D (1B, 1C, 2B, 2C, 2D, 3A, 4B, 4C)
226,702	**94**	**TOTAL AREA**

2-Year Storm Event – Proposed

Time span=0.00-40.00 hrs, dt=0.01 hrs, 4001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1B: 1B Runoff Area=8,063 sf 78.66% Impervious Runoff Depth=2.42"
Tc=5.0 min CN=94 Runoff=0.52 cfs 1,625 cf

Subcatchment1C: 1C Runoff Area=33,547 sf 91.76% Impervious Runoff Depth=2.73"
Tc=5.0 min CN=97 Runoff=2.34 cfs 7,626 cf

Subcatchment2B: 2B Runoff Area=25,908 sf 87.45% Impervious Runoff Depth=2.42"
Tc=5.0 min CN=94 Runoff=1.68 cfs 5,220 cf

Subcatchment2C: 2C Runoff Area=10,949 sf 89.54% Impervious Runoff Depth=2.52"
Tc=5.0 min CN=95 Runoff=0.73 cfs 2,297 cf

Subcatchment2D: 2D Runoff Area=93,858 sf 79.22% Impervious Runoff Depth=2.42"
Tc=5.0 min CN=94 Runoff=6.08 cfs 18,911 cf

Subcatchment3A: 3A Runoff Area=21,351 sf 86.08% Impervious Runoff Depth=2.52"
Tc=5.0 min CN=95 Runoff=1.42 cfs 4,480 cf

Subcatchment4B: 4B Runoff Area=3,093 sf 100.00% Impervious Runoff Depth=2.84"
Tc=5.0 min CN=98 Runoff=0.22 cfs 731 cf

Subcatchment4C: 4C Runoff Area=29,933 sf 62.58% Impervious Runoff Depth=2.14"
Tc=5.0 min CN=91 Runoff=1.76 cfs 5,329 cf

Pond INF 1B: INF 1B Peak Elev=17.63' Storage=785 cf Inflow=0.52 cfs 1,625 cf
Outflow=0.22 cfs 955 cf

Pond INF 2B: INF 2B Peak Elev=16.26' Storage=3,048 cf Inflow=1.68 cfs 5,220 cf
Outflow=0.28 cfs 2,815 cf

Pond INF 2C: INF 2C Peak Elev=15.95' Storage=983 cf Inflow=0.73 cfs 2,297 cf
Outflow=0.50 cfs 1,506 cf

Pond INF 4B: INF 4B Peak Elev=20.21' Storage=299 cf Inflow=0.22 cfs 731 cf
Outflow=0.19 cfs 486 cf

Link DP-1: DP-1 Inflow=2.34 cfs 8,581 cf
Primary=2.34 cfs 8,581 cf

Link DP-2: DP-2 Inflow=6.34 cfs 23,232 cf
Primary=6.34 cfs 23,232 cf

Link DP-3: DP-3 Inflow=1.42 cfs 4,480 cf
Primary=1.42 cfs 4,480 cf

Link DP-4: DP-4 Inflow=1.93 cfs 5,815 cf
Primary=1.93 cfs 5,815 cf

Total Runoff Area = 226,702 sf Runoff Volume = 46,219 cf Average Runoff Depth = 2.45"
18.77% Pervious = 42,559 sf 81.23% Impervious = 184,143 sf

Summary for Subcatchment 1B: 1B

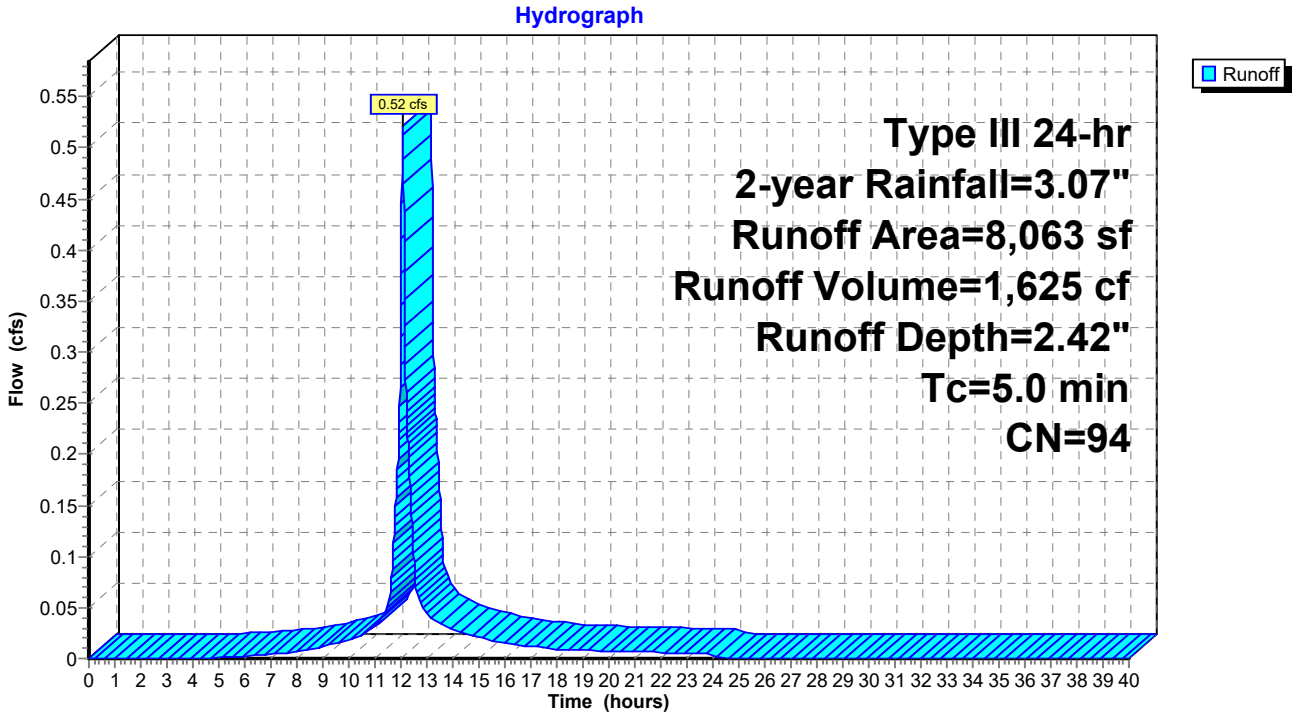
Runoff = 0.52 cfs @ 12.07 hrs, Volume= 1,625 cf, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.07"

Area (sf)	CN	Description
6,342	98	Paved parking, HSG D
1,721	80	>75% Grass cover, Good, HSG D
8,063	94	Weighted Average
1,721		21.34% Pervious Area
6,342		78.66% Impervious Area

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

Subcatchment 1B: 1B



Summary for Subcatchment 1C: 1C

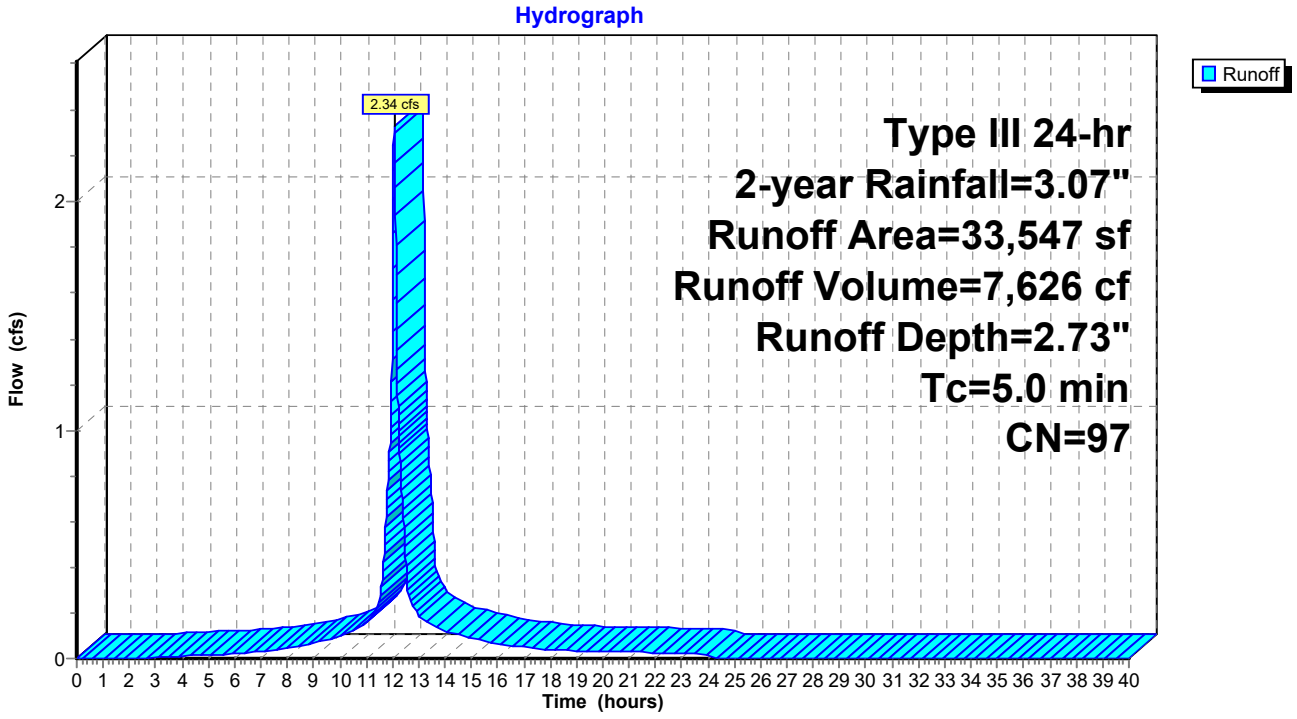
Runoff = 2.34 cfs @ 12.07 hrs, Volume= 7,626 cf, Depth= 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.07"

Area (sf)	CN	Description
30,784	98	Paved parking, HSG D
2,763	80	>75% Grass cover, Good, HSG D
33,547	97	Weighted Average
2,763		8.24% Pervious Area
30,784		91.76% Impervious Area

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

Subcatchment 1C: 1C



Summary for Subcatchment 2B: 2B

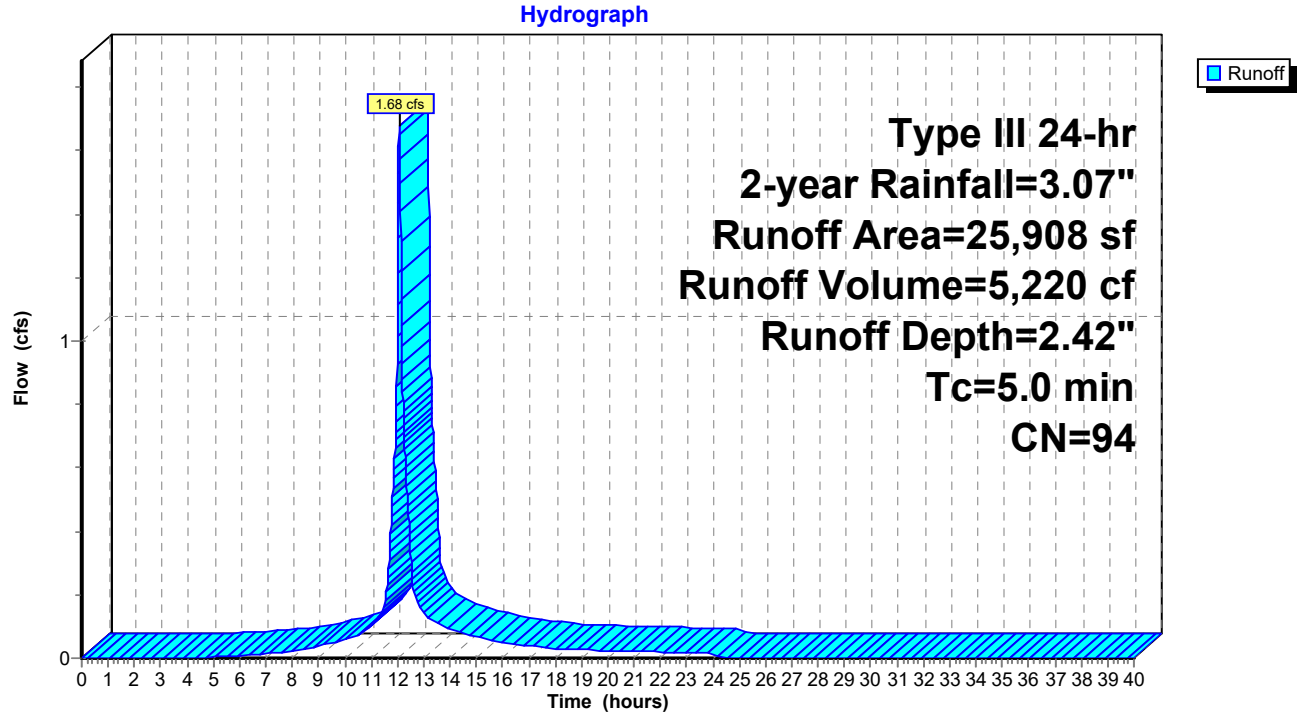
Runoff = 1.68 cfs @ 12.07 hrs, Volume= 5,220 cf, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.07"

Area (sf)	CN	Description
22,657	98	Paved parking, HSG D
1,214	80	>75% Grass cover, Good, HSG D
2,037	61	>75% Grass cover, Good, HSG B
25,908	94	Weighted Average
3,251		12.55% Pervious Area
22,657		87.45% Impervious Area

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

Subcatchment 2B: 2B



Summary for Subcatchment 2C: 2C

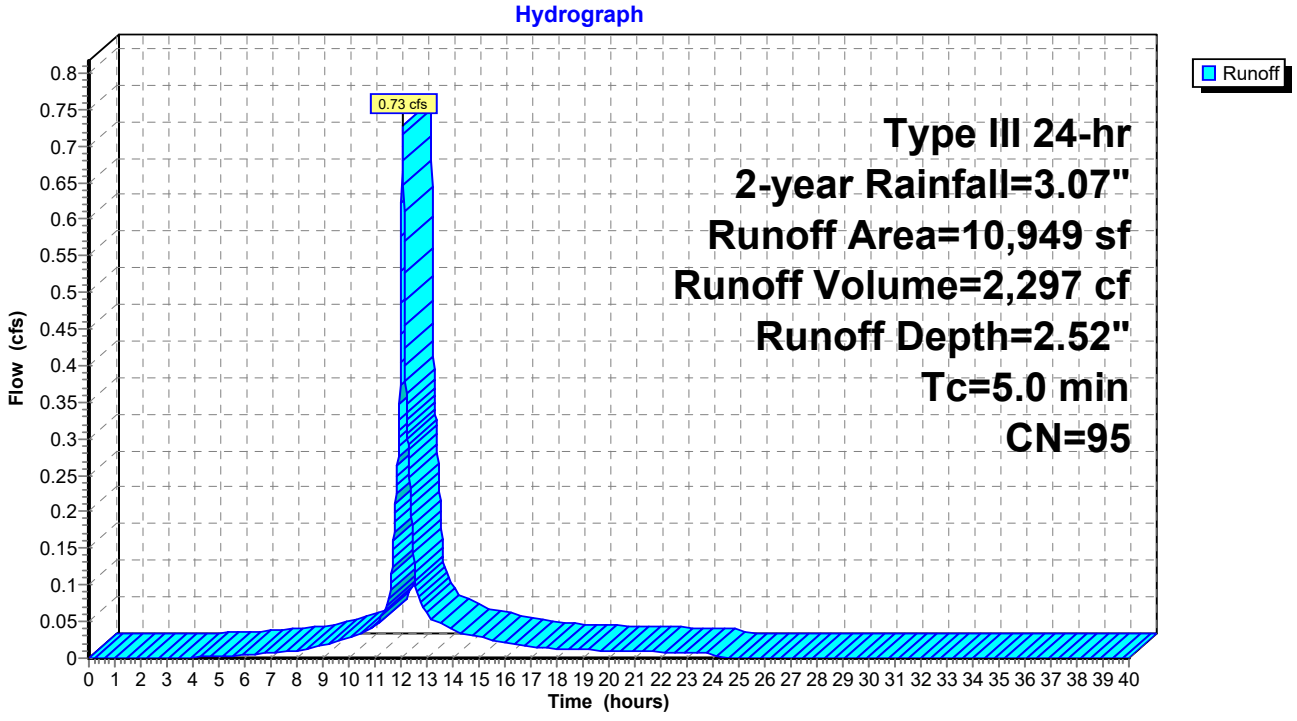
Runoff = 0.73 cfs @ 12.07 hrs, Volume= 2,297 cf, Depth= 2.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.07"

Area (sf)	CN	Description
9,804	98	Paved parking, HSG D
343	80	>75% Grass cover, Good, HSG D
802	61	>75% Grass cover, Good, HSG B
10,949	95	Weighted Average
1,145		10.46% Pervious Area
9,804		89.54% Impervious Area

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

Subcatchment 2C: 2C



Summary for Subcatchment 2D: 2D

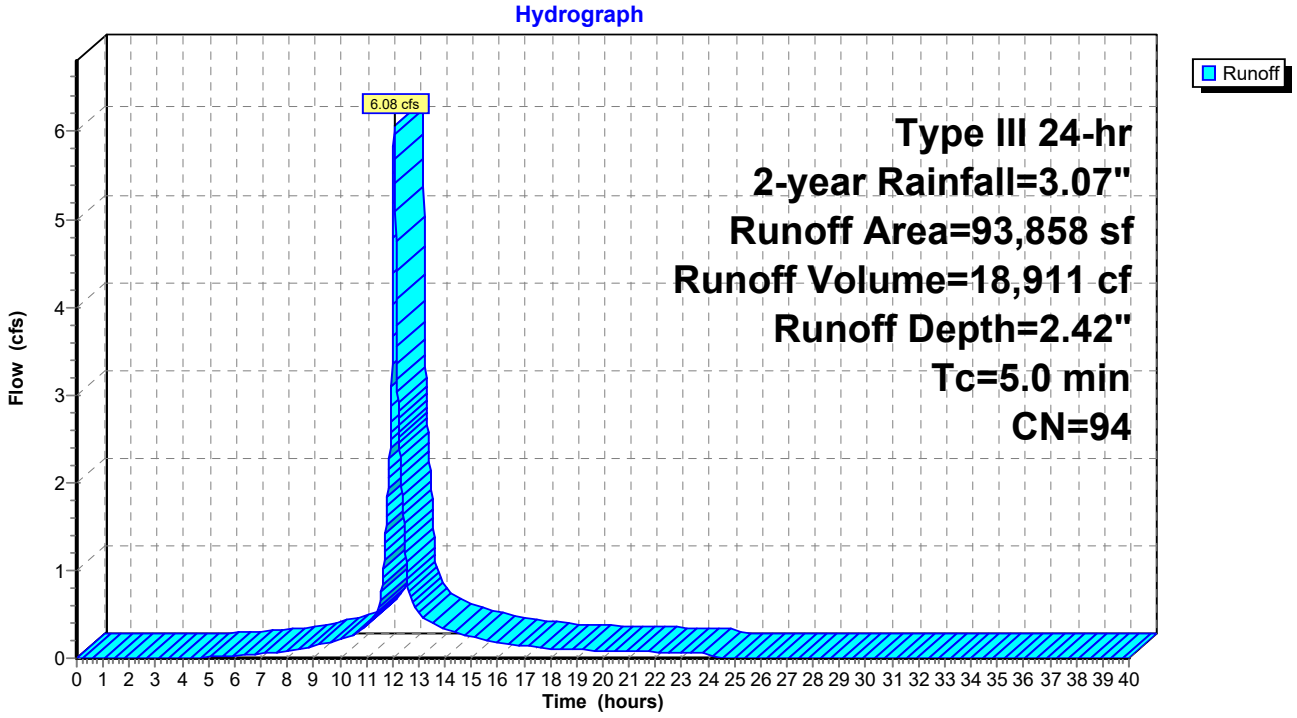
Runoff = 6.08 cfs @ 12.07 hrs, Volume= 18,911 cf, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.07"

Area (sf)	CN	Description
74,350	98	Paved parking, HSG D
19,198	80	>75% Grass cover, Good, HSG D
310	61	>75% Grass cover, Good, HSG B
93,858	94	Weighted Average
19,508		20.78% Pervious Area
74,350		79.22% Impervious Area

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

Subcatchment 2D: 2D



Summary for Subcatchment 3A: 3A

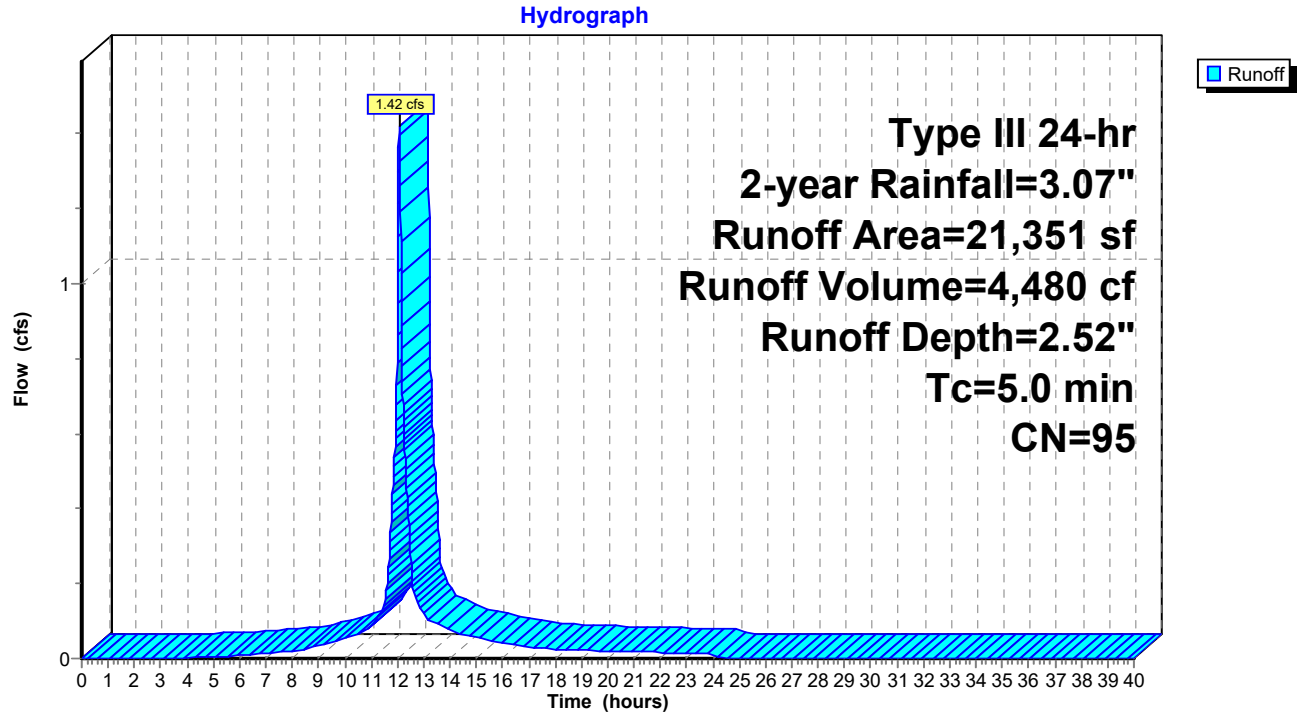
Runoff = 1.42 cfs @ 12.07 hrs, Volume= 4,480 cf, Depth= 2.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.07"

Area (sf)	CN	Description
18,380	98	Paved parking, HSG D
2,971	80	>75% Grass cover, Good, HSG D
21,351	95	Weighted Average
2,971		13.92% Pervious Area
18,380		86.08% Impervious Area

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

Subcatchment 3A: 3A



Summary for Subcatchment 4B: 4B

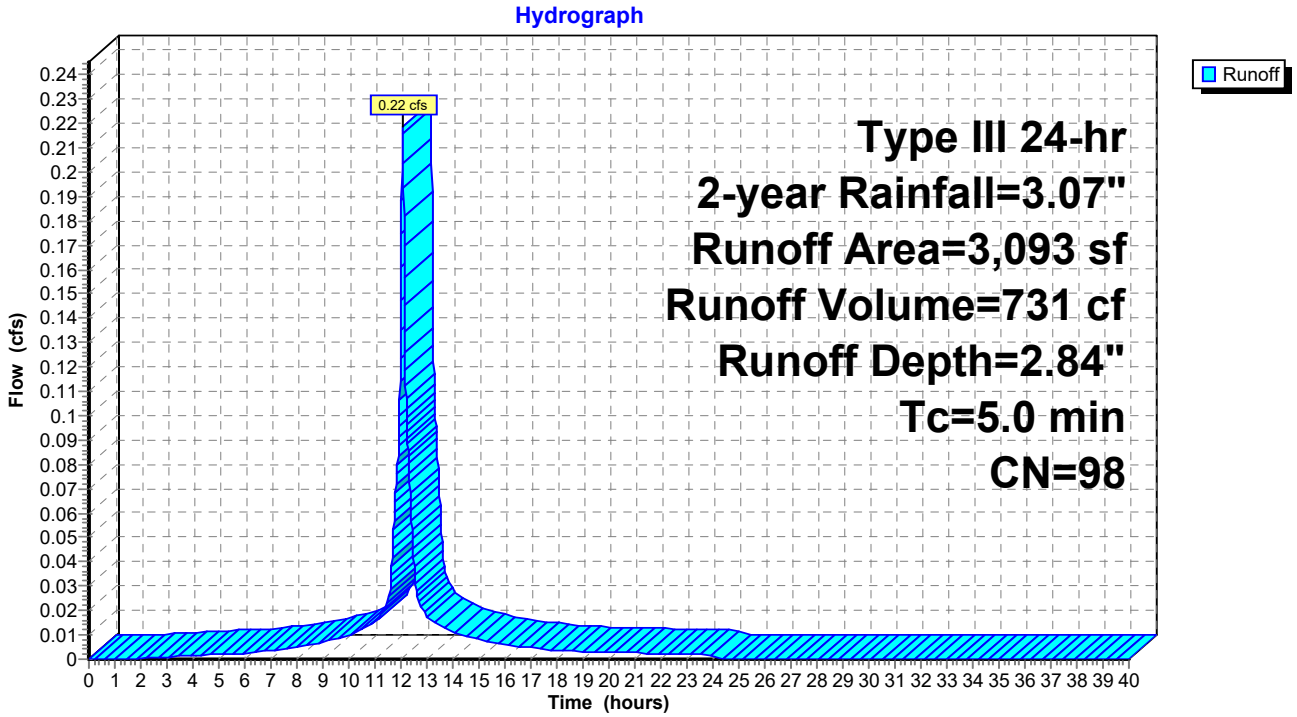
Runoff = 0.22 cfs @ 12.07 hrs, Volume= 731 cf, Depth= 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.07"

Area (sf)	CN	Description
3,093	98	Paved parking, HSG D
3,093		100.00% Impervious Area

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

Subcatchment 4B: 4B



Summary for Subcatchment 4C: 4C

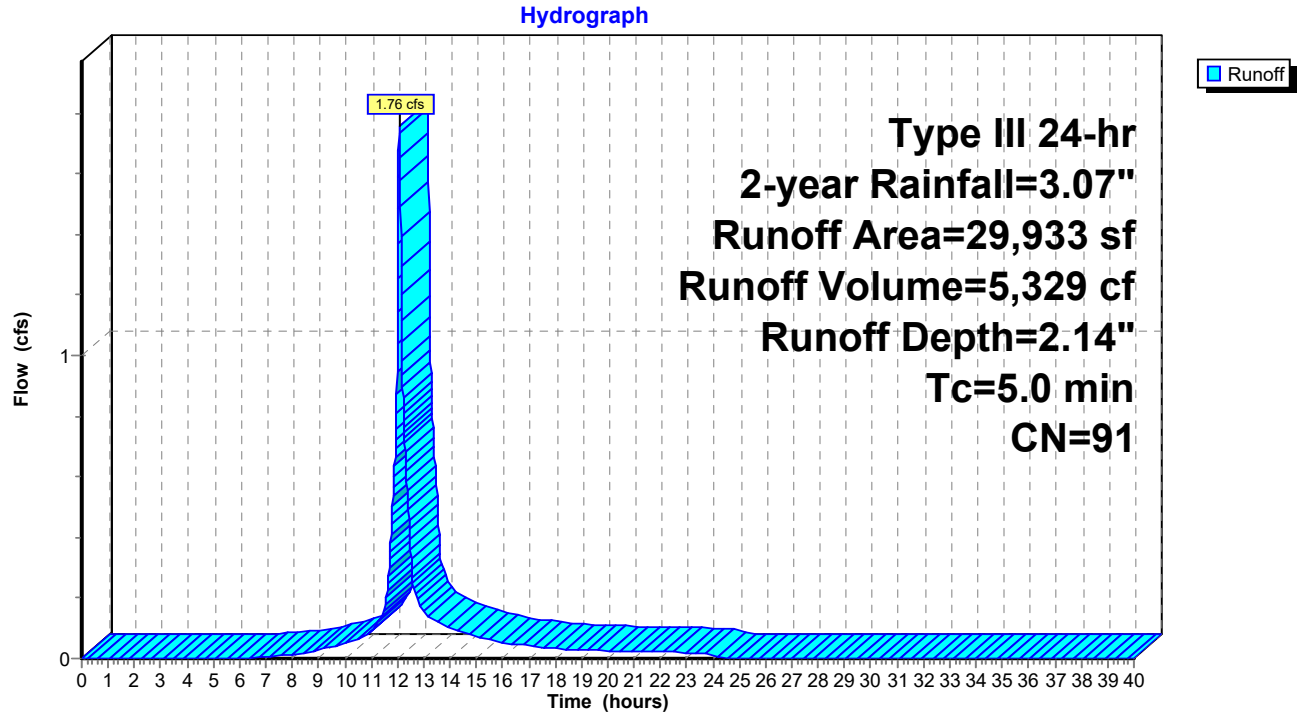
Runoff = 1.76 cfs @ 12.07 hrs, Volume= 5,329 cf, Depth= 2.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.07"

Area (sf)	CN	Description
18,733	98	Paved parking, HSG D
11,200	80	>75% Grass cover, Good, HSG D
29,933	91	Weighted Average
11,200		37.42% Pervious Area
18,733		62.58% Impervious Area

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

Subcatchment 4C: 4C



Summary for Pond INF 1B: INF 1B

Inflow Area = 8,063 sf, 78.66% Impervious, Inflow Depth = 2.42" for 2-year event
Inflow = 0.52 cfs @ 12.07 hrs, Volume= 1,625 cf
Outflow = 0.22 cfs @ 12.25 hrs, Volume= 955 cf, Atten= 58%, Lag= 10.8 min
Primary = 0.22 cfs @ 12.25 hrs, Volume= 955 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 17.63' @ 12.25 hrs Surf.Area= 745 sf Storage= 785 cf

Plug-Flow detention time= 216.0 min calculated for 955 cf (59% of inflow)
Center-of-Mass det. time= 112.0 min (899.6 - 787.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	15.90'	587 cf	**11.00'W x 67.70'L x 3.50'H Field A** 2,606 cf Overall - 827 cf Embedded = 1,779 cf x 33.0% Voids
#2A	16.40'	827 cf	**ADS_StormTech SC-740 +Cap** x 18 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 2 Rows of 9 Chambers
		1,414 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	17.40'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.22 cfs @ 12.25 hrs HW=17.63' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.22 cfs @ 1.63 fps)

Pond INF 1B: INF 1B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

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

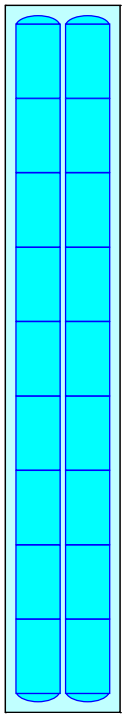
9 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 65.70' Row Length +12.0" End Stone x 2 = 67.70' Base Length
2 Rows x 51.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.00' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

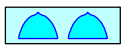
18 Chambers x 45.9 cf = 826.9 cf Chamber Storage

2,606.3 cf Field - 826.9 cf Chambers = 1,779.4 cf Stone x 33.0% Voids = 587.2 cf Stone Storage

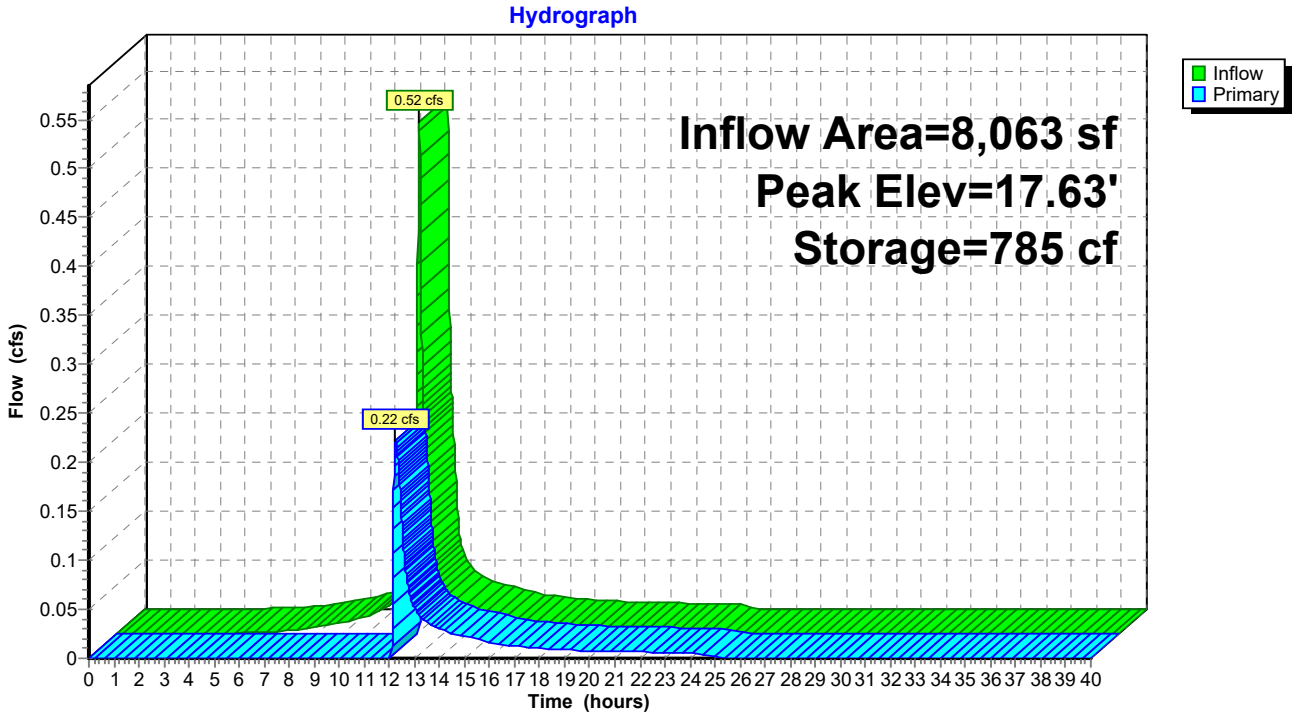
Chamber Storage + Stone Storage = 1,414.1 cf = 0.032 af
Overall Storage Efficiency = 54.3%
Overall System Size = 67.70' x 11.00' x 3.50'

18 Chambers
96.5 cy Field
65.9 cy Stone





Pond INF 1B: INF 1B



Summary for Pond INF 2B: INF 2B

Inflow Area = 25,908 sf, 87.45% Impervious, Inflow Depth = 2.42" for 2-year event
Inflow = 1.68 cfs @ 12.07 hrs, Volume= 5,220 cf
Outflow = 0.28 cfs @ 12.53 hrs, Volume= 2,815 cf, Atten= 83%, Lag= 27.4 min
Primary = 0.28 cfs @ 12.53 hrs, Volume= 2,815 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 16.26' @ 12.53 hrs Surf.Area= 3,327 sf Storage= 3,048 cf

Plug-Flow detention time= 289.6 min calculated for 2,814 cf (54% of inflow)
Center-of-Mass det. time= 180.5 min (968.1 - 787.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	14.80'	2,479 cf	**25.25'W x 131.78'L x 3.50'H Field A** 11,646 cf Overall - 4,135 cf Embedded = 7,511 cf x 33.0% Voids
#2A	15.30'	4,135 cf	**ADS_StormTech SC-740 +Cap** x 90 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 18 Chambers
		6,613 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	16.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.28 cfs @ 12.53 hrs HW=16.26' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.28 cfs @ 1.73 fps)

Pond INF 2B: INF 2B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

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

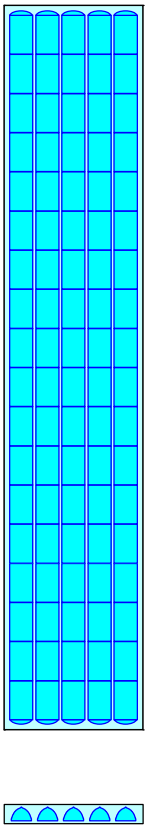
18 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 129.78' Row Length +12.0" End Stone x 2 = 131.78' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

90 Chambers x 45.9 cf = 4,134.6 cf Chamber Storage

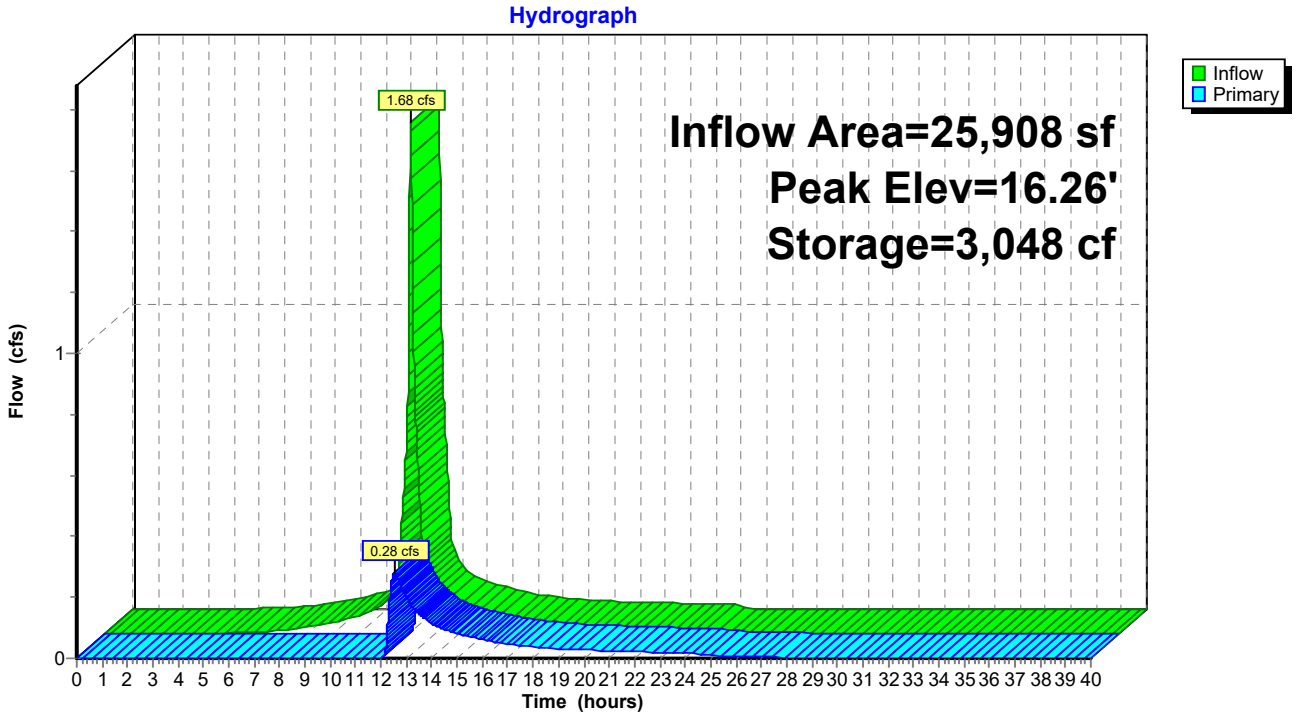
11,645.8 cf Field - 4,134.6 cf Chambers = 7,511.2 cf Stone x 33.0% Voids = 2,478.7 cf Stone Storage

Chamber Storage + Stone Storage = 6,613.3 cf = 0.152 af
Overall Storage Efficiency = 56.8%
Overall System Size = 131.78' x 25.25' x 3.50'

90 Chambers
431.3 cy Field
278.2 cy Stone



Pond INF 2B: INF 2B



Summary for Pond INF 2C: INF 2C

Inflow Area = 10,949 sf, 89.54% Impervious, Inflow Depth = 2.52" for 2-year event
Inflow = 0.73 cfs @ 12.07 hrs, Volume= 2,297 cf
Outflow = 0.50 cfs @ 12.15 hrs, Volume= 1,506 cf, Atten= 31%, Lag= 4.5 min
Primary = 0.50 cfs @ 12.15 hrs, Volume= 1,506 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 15.95' @ 12.15 hrs Surf.Area= 810 sf Storage= 983 cf

Plug-Flow detention time= 192.4 min calculated for 1,506 cf (66% of inflow)
Center-of-Mass det. time= 95.1 min (876.4 - 781.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	14.00'	633 cf	**25.25'W x 32.10'L x 3.50'H Field A** 2,837 cf Overall - 919 cf Embedded = 1,918 cf x 33.0% Voids
#2A	14.50'	919 cf	**ADS_StormTech SC-740 +Cap** x 20 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 4 Chambers
		1,552 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	15.60'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.50 cfs @ 12.15 hrs HW=15.95' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.50 cfs @ 2.02 fps)

Pond INF 2C: INF 2C - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

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

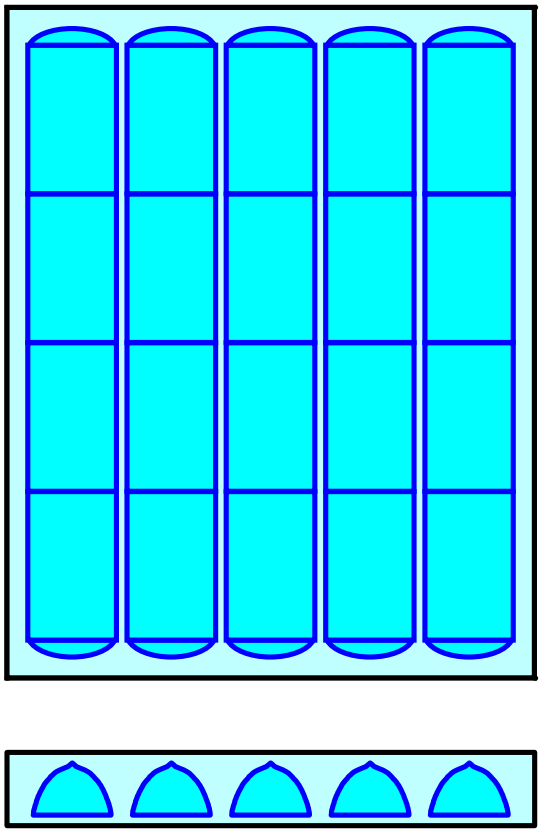
4 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 30.10' Row Length +12.0" End Stone x 2 = 32.10' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

20 Chambers x 45.9 cf = 918.8 cf Chamber Storage

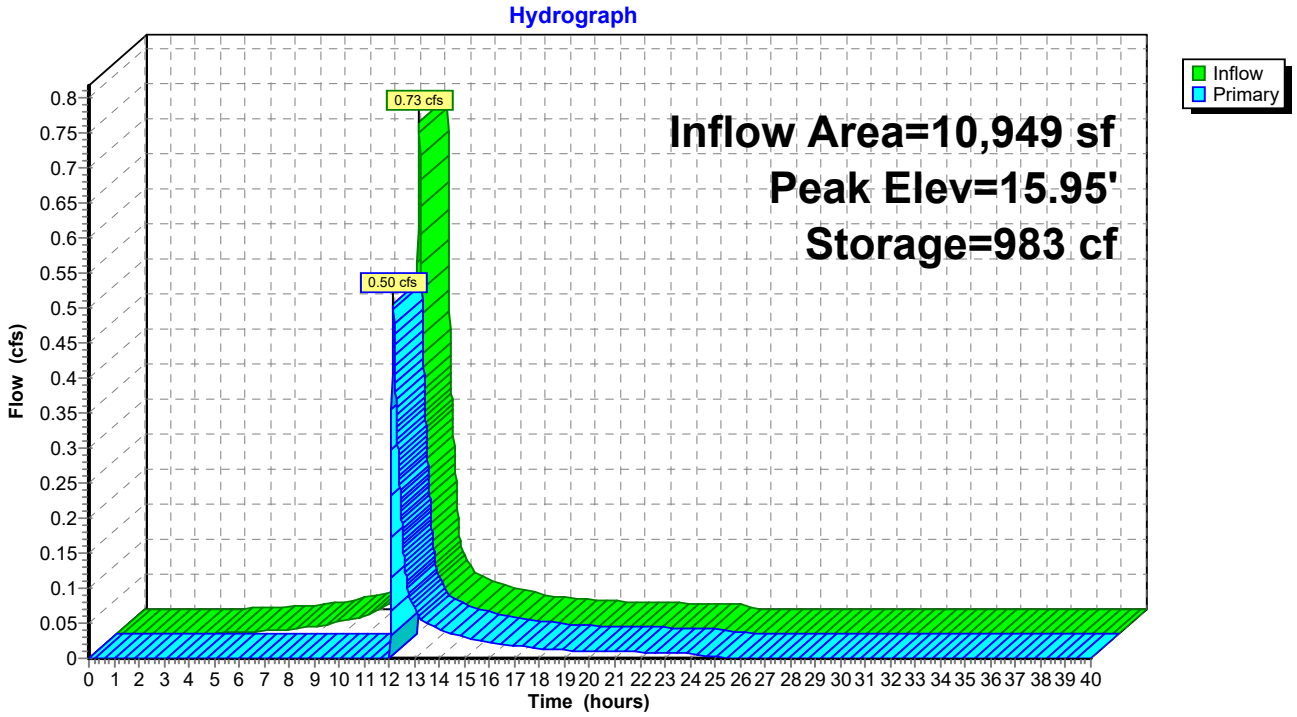
2,836.5 cf Field - 918.8 cf Chambers = 1,917.7 cf Stone x 33.0% Voids = 632.9 cf Stone Storage

Chamber Storage + Stone Storage = 1,551.7 cf = 0.036 af
Overall Storage Efficiency = 54.7%
Overall System Size = 32.10' x 25.25' x 3.50'

20 Chambers
105.1 cy Field
71.0 cy Stone



Pond INF 2C: INF 2C



Summary for Pond INF 4B: INF 4B

Inflow Area = 3,093 sf,100.00% Impervious, Inflow Depth = 2.84" for 2-year event
Inflow = 0.22 cfs @ 12.07 hrs, Volume= 731 cf
Outflow = 0.19 cfs @ 12.11 hrs, Volume= 486 cf, Atten= 12%, Lag= 2.5 min
Primary = 0.19 cfs @ 12.11 hrs, Volume= 486 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 20.21' @ 12.11 hrs Surf.Area= 379 sf Storage= 299 cf

Plug-Flow detention time= 198.9 min calculated for 486 cf (66% of inflow)
Center-of-Mass det. time= 100.3 min (856.7 - 756.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	18.80'	316 cf	**6.25'W x 60.58'L x 3.50'H Field A** 1,325 cf Overall - 368 cf Embedded = 958 cf x 33.0% Voids
#2A	19.30'	368 cf	**ADS_StormTech SC-740 +Cap** x 8 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		684 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	20.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.19 cfs @ 12.11 hrs HW=20.21' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.19 cfs @ 1.57 fps)

Pond INF 4B: INF 4B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

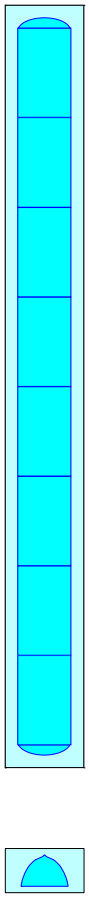
8 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 58.58' Row Length +12.0" End Stone x 2 = 60.58' Base Length
1 Rows x 51.0" Wide + 12.0" Side Stone x 2 = 6.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

8 Chambers x 45.9 cf = 367.5 cf Chamber Storage

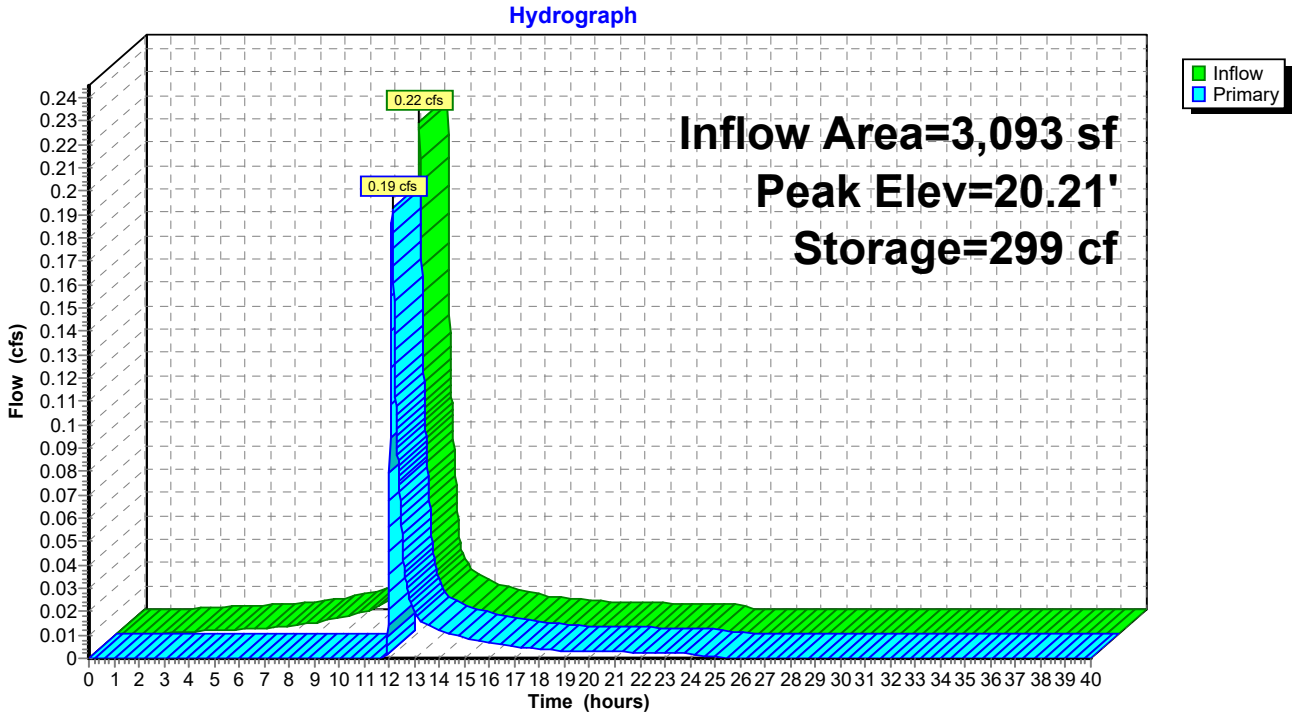
1,325.1 cf Field - 367.5 cf Chambers = 957.6 cf Stone x 33.0% Voids = 316.0 cf Stone Storage

Chamber Storage + Stone Storage = 683.5 cf = 0.016 af
Overall Storage Efficiency = 51.6%
Overall System Size = 60.58' x 6.25' x 3.50'

8 Chambers
49.1 cy Field
35.5 cy Stone



Pond INF 4B: INF 4B

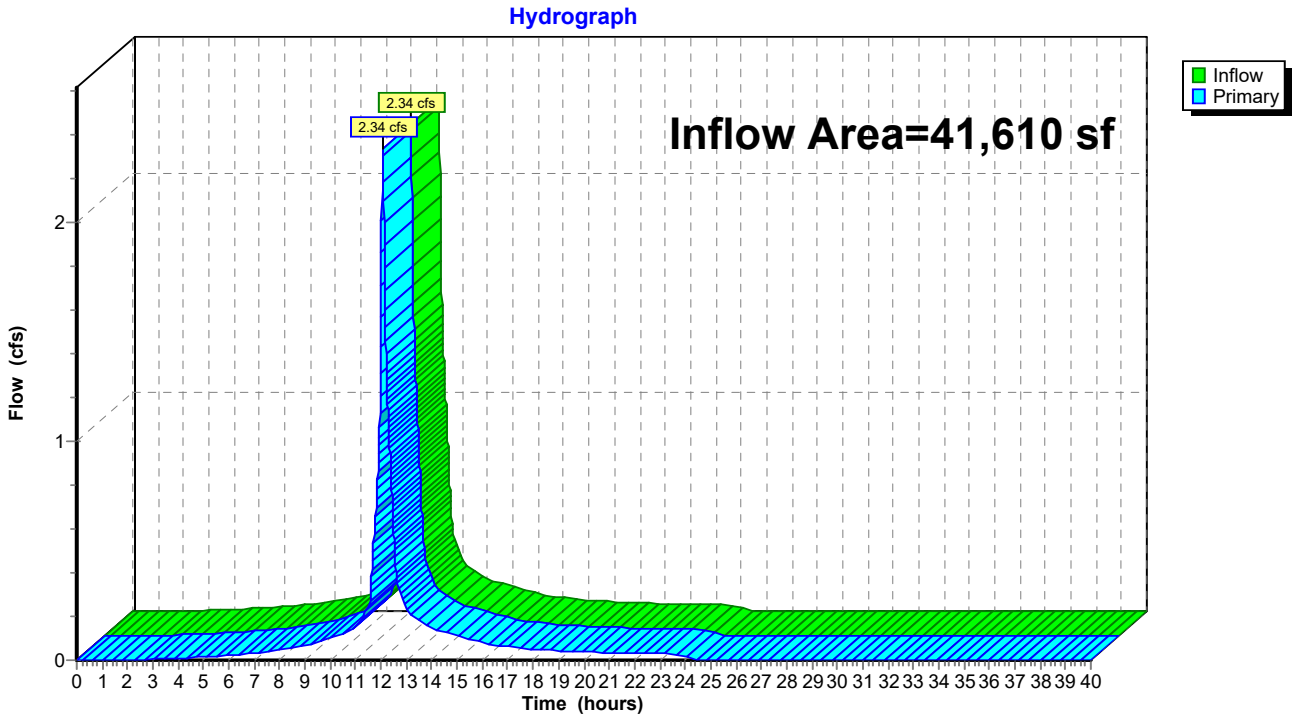


Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 89.22% Impervious, Inflow Depth = 2.47" for 2-year event
Inflow = 2.34 cfs @ 12.07 hrs, Volume= 8,581 cf
Primary = 2.34 cfs @ 12.07 hrs, Volume= 8,581 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-1: DP-1

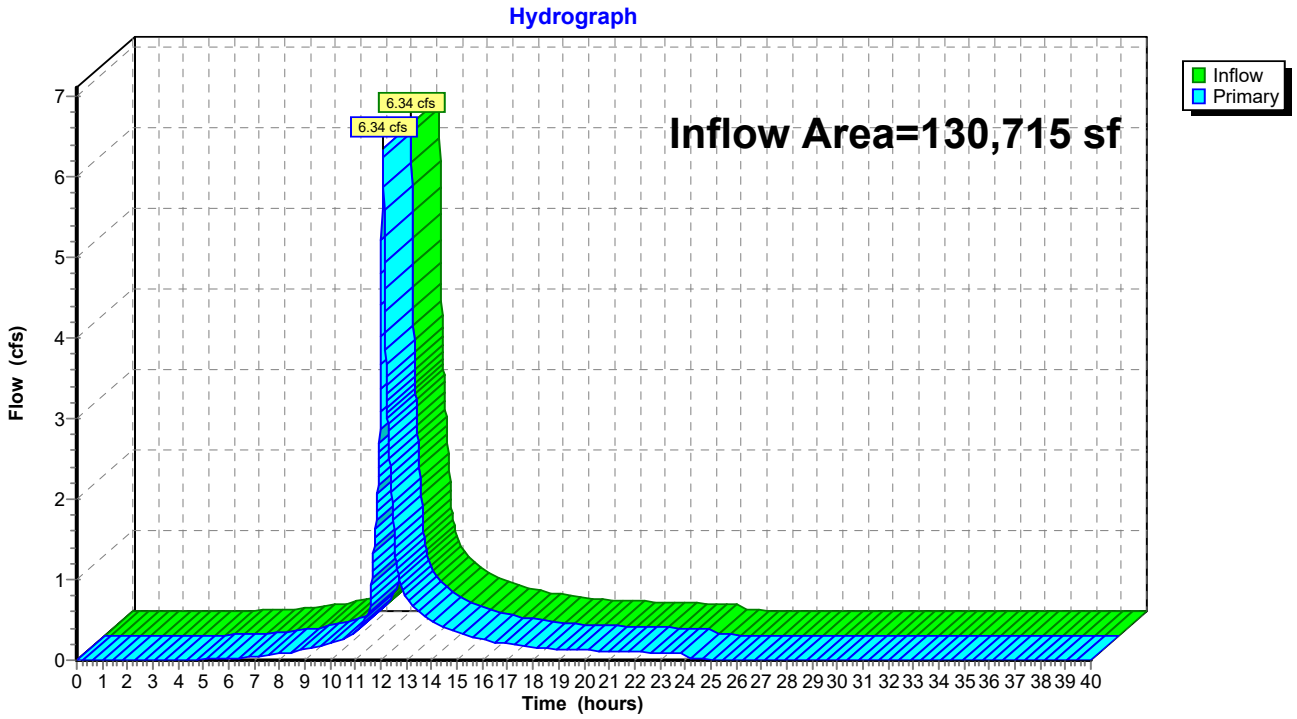


Summary for Link DP-2: DP-2

Inflow Area = 130,715 sf, 81.71% Impervious, Inflow Depth = 2.13" for 2-year event
Inflow = 6.34 cfs @ 12.08 hrs, Volume= 23,232 cf
Primary = 6.34 cfs @ 12.08 hrs, Volume= 23,232 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-2: DP-2

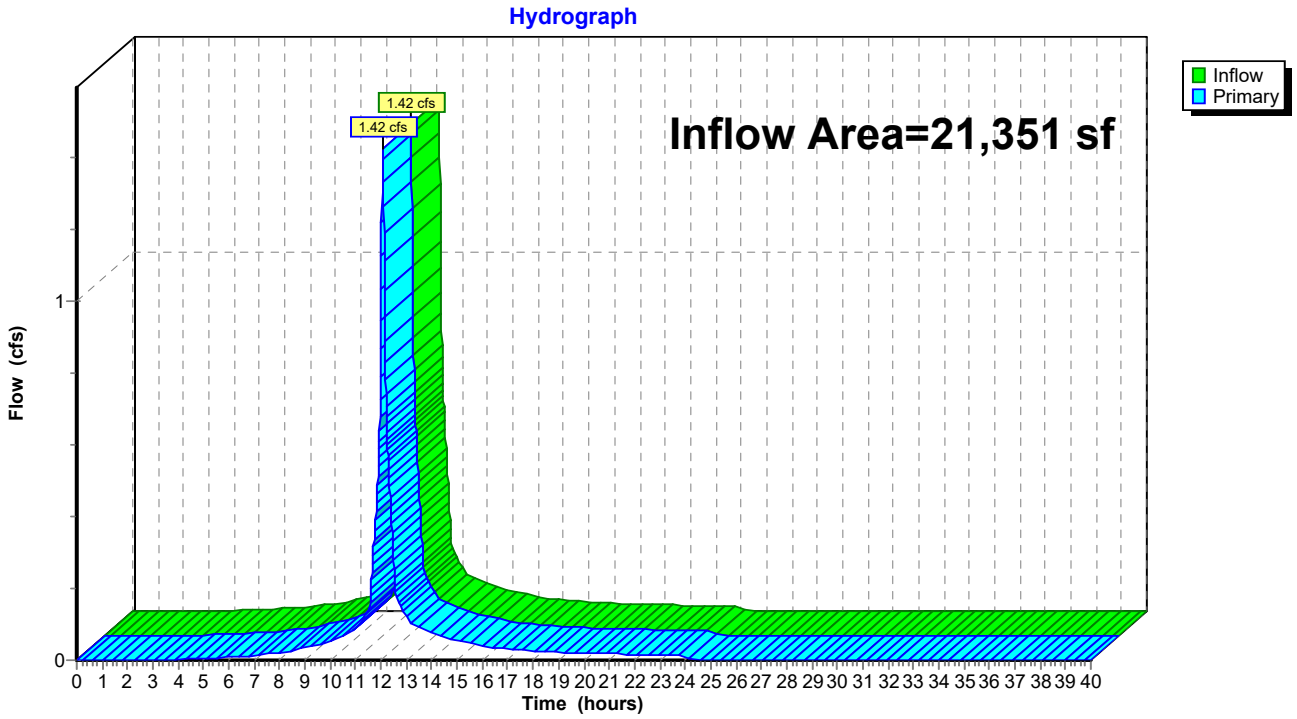


Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.08% Impervious, Inflow Depth = 2.52" for 2-year event
Inflow = 1.42 cfs @ 12.07 hrs, Volume= 4,480 cf
Primary = 1.42 cfs @ 12.07 hrs, Volume= 4,480 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-3: DP-3

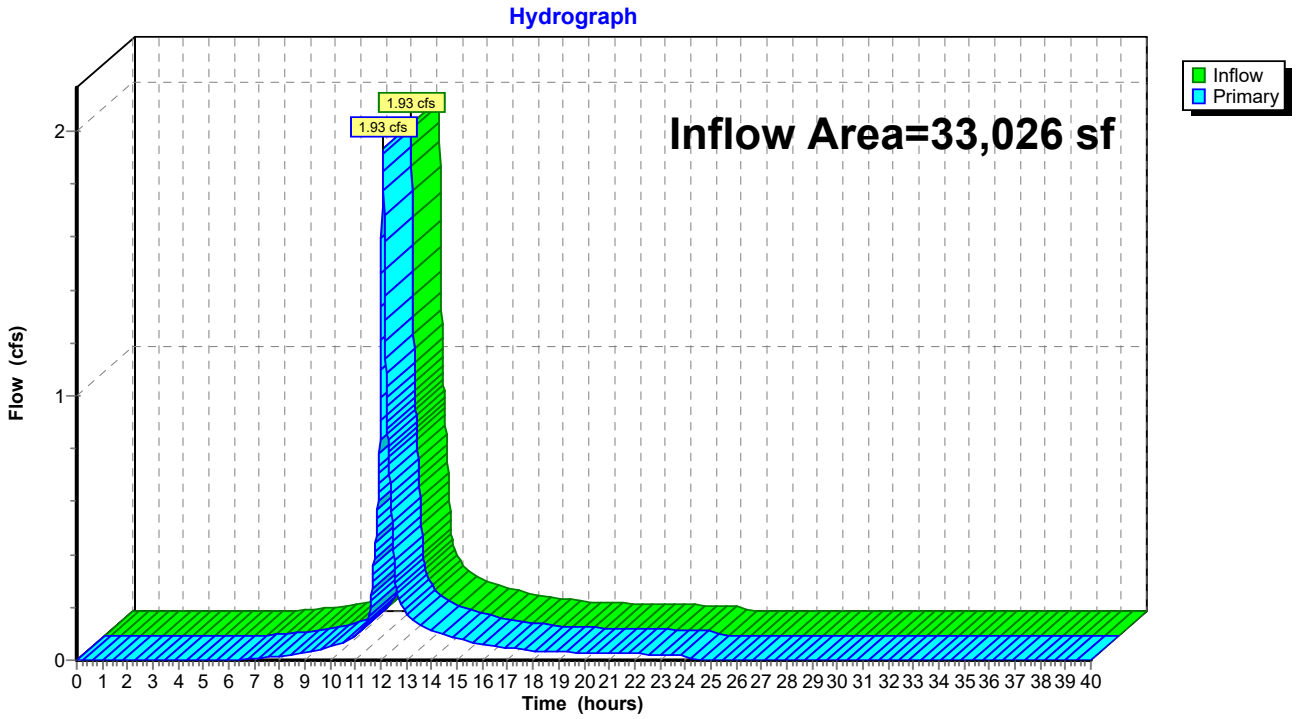


Summary for Link DP-4: DP-4

Inflow Area = 33,026 sf, 66.09% Impervious, Inflow Depth = 2.11" for 2-year event
Inflow = 1.93 cfs @ 12.08 hrs, Volume= 5,815 cf
Primary = 1.93 cfs @ 12.08 hrs, Volume= 5,815 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-4: DP-4



5-Year Storm Event – Proposed

Time span=0.00-40.00 hrs, dt=0.01 hrs, 4001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1B: 1B Runoff Area=8,063 sf 78.66% Impervious Runoff Depth=3.38"
Tc=5.0 min CN=94 Runoff=0.72 cfs 2,273 cf

Subcatchment1C: 1C Runoff Area=33,547 sf 91.76% Impervious Runoff Depth=3.71"
Tc=5.0 min CN=97 Runoff=3.13 cfs 10,375 cf

Subcatchment2B: 2B Runoff Area=25,908 sf 87.45% Impervious Runoff Depth=3.38"
Tc=5.0 min CN=94 Runoff=2.30 cfs 7,304 cf

Subcatchment2C: 2C Runoff Area=10,949 sf 89.54% Impervious Runoff Depth=3.49"
Tc=5.0 min CN=95 Runoff=0.99 cfs 3,185 cf

Subcatchment2D: 2D Runoff Area=93,858 sf 79.22% Impervious Runoff Depth=3.38"
Tc=5.0 min CN=94 Runoff=8.35 cfs 26,462 cf

Subcatchment3A: 3A Runoff Area=21,351 sf 86.08% Impervious Runoff Depth=3.49"
Tc=5.0 min CN=95 Runoff=1.93 cfs 6,210 cf

Subcatchment4B: 4B Runoff Area=3,093 sf 100.00% Impervious Runoff Depth=3.82"
Tc=5.0 min CN=98 Runoff=0.29 cfs 986 cf

Subcatchment4C: 4C Runoff Area=29,933 sf 62.58% Impervious Runoff Depth=3.07"
Tc=5.0 min CN=91 Runoff=2.49 cfs 7,670 cf

Pond INF 1B: INF 1B Peak Elev=17.79' Storage=864 cf Inflow=0.72 cfs 2,273 cf
Outflow=0.60 cfs 1,604 cf

Pond INF 2B: INF 2B Peak Elev=16.48' Storage=3,582 cf Inflow=2.30 cfs 7,304 cf
Outflow=0.88 cfs 4,898 cf

Pond INF 2C: INF 2C Peak Elev=16.08' Storage=1,049 cf Inflow=0.99 cfs 3,185 cf
Outflow=0.88 cfs 2,393 cf

Pond INF 4B: INF 4B Peak Elev=20.25' Storage=309 cf Inflow=0.29 cfs 986 cf
Outflow=0.27 cfs 740 cf

Link DP-1: DP-1 Inflow=3.63 cfs 11,979 cf
Primary=3.63 cfs 11,979 cf

Link DP-2: DP-2 Inflow=9.43 cfs 33,753 cf
Primary=9.43 cfs 33,753 cf

Link DP-3: DP-3 Inflow=1.93 cfs 6,210 cf
Primary=1.93 cfs 6,210 cf

Link DP-4: DP-4 Inflow=2.74 cfs 8,410 cf
Primary=2.74 cfs 8,410 cf

Total Runoff Area = 226,702 sf Runoff Volume = 64,464 cf Average Runoff Depth = 3.41"
18.77% Pervious = 42,559 sf 81.23% Impervious = 184,143 sf

Summary for Subcatchment 1B: 1B

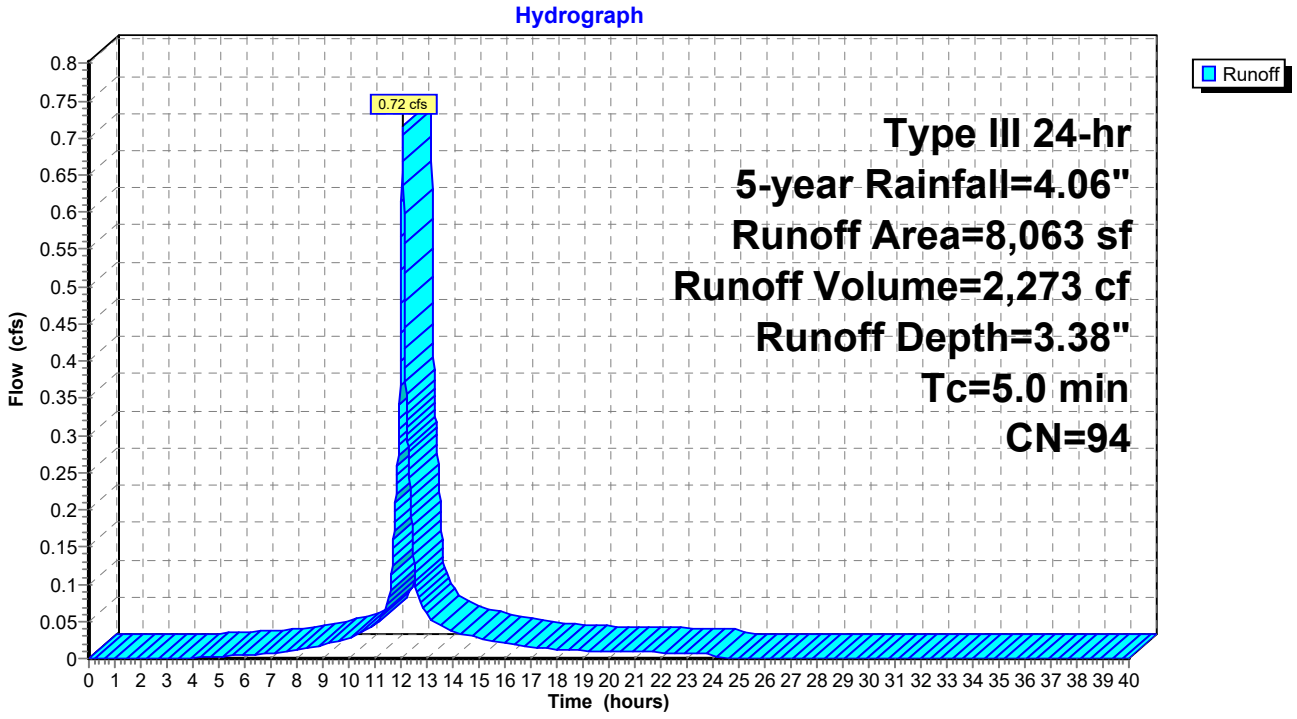
Runoff = 0.72 cfs @ 12.07 hrs, Volume= 2,273 cf, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-year Rainfall=4.06"

Area (sf)	CN	Description
6,342	98	Paved parking, HSG D
1,721	80	>75% Grass cover, Good, HSG D
8,063	94	Weighted Average
1,721		21.34% Pervious Area
6,342		78.66% Impervious Area

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

Subcatchment 1B: 1B



Summary for Subcatchment 1C: 1C

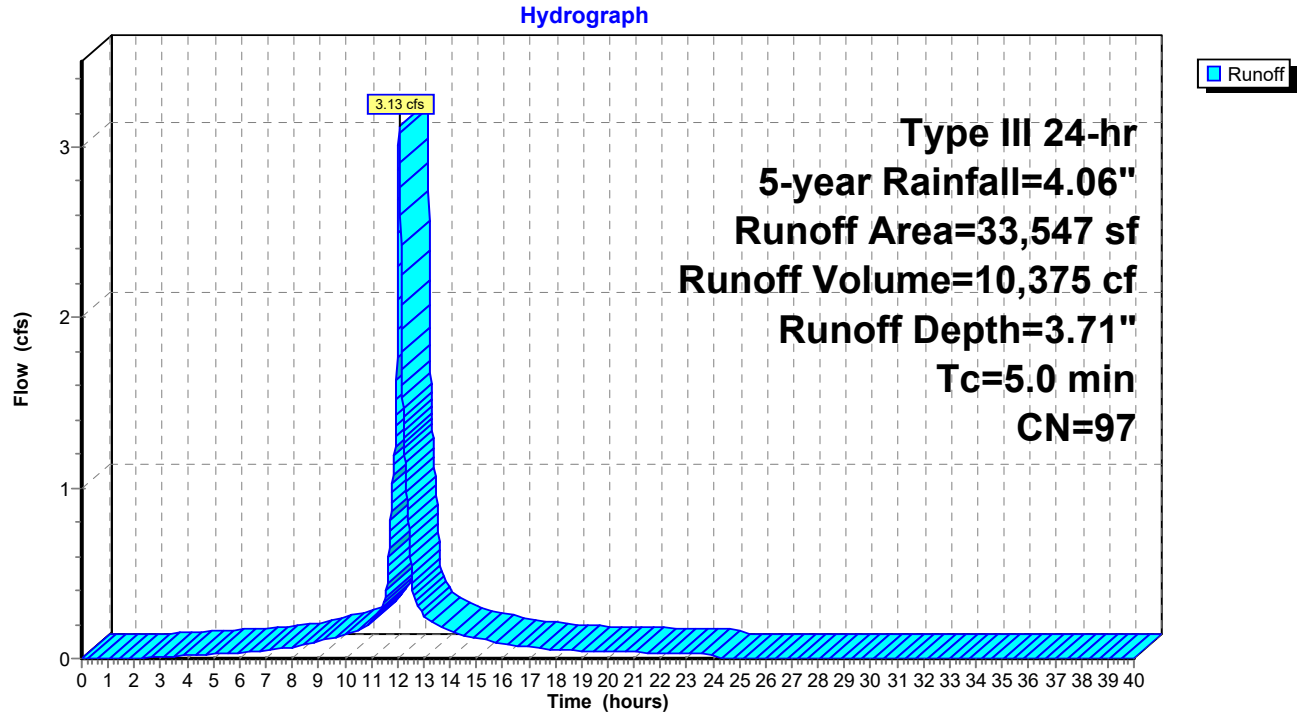
Runoff = 3.13 cfs @ 12.07 hrs, Volume= 10,375 cf, Depth= 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-year Rainfall=4.06"

Area (sf)	CN	Description
30,784	98	Paved parking, HSG D
2,763	80	>75% Grass cover, Good, HSG D
33,547	97	Weighted Average
2,763		8.24% Pervious Area
30,784		91.76% Impervious Area

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

Subcatchment 1C: 1C



Summary for Subcatchment 2B: 2B

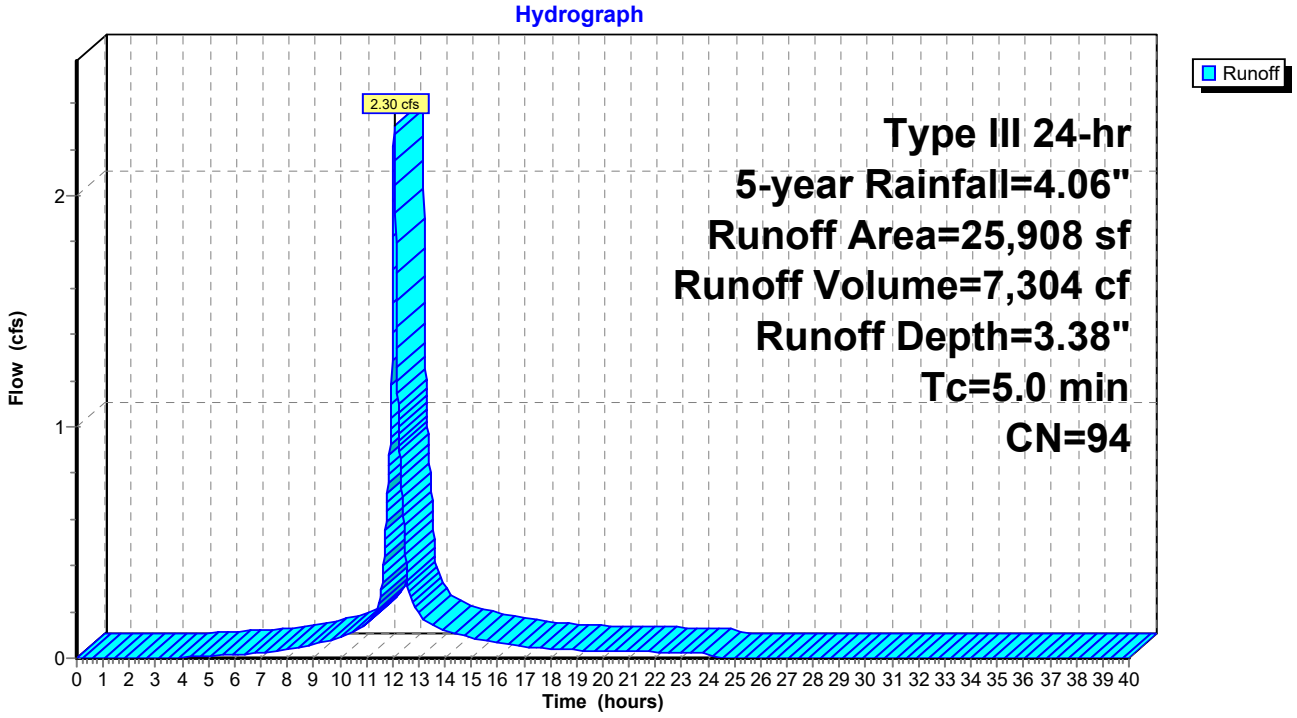
Runoff = 2.30 cfs @ 12.07 hrs, Volume= 7,304 cf, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-year Rainfall=4.06"

Area (sf)	CN	Description
22,657	98	Paved parking, HSG D
1,214	80	>75% Grass cover, Good, HSG D
2,037	61	>75% Grass cover, Good, HSG B
25,908	94	Weighted Average
3,251		12.55% Pervious Area
22,657		87.45% Impervious Area

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

Subcatchment 2B: 2B



Summary for Subcatchment 2C: 2C

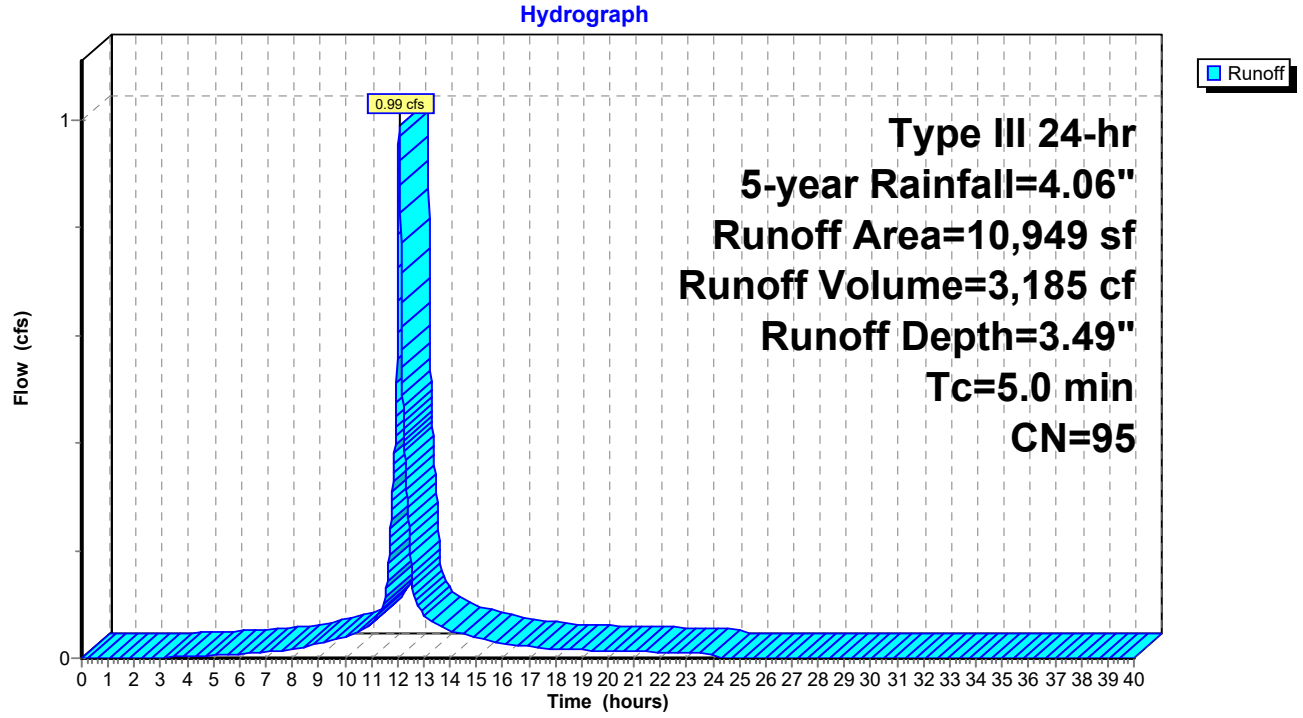
Runoff = 0.99 cfs @ 12.07 hrs, Volume= 3,185 cf, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-year Rainfall=4.06"

Area (sf)	CN	Description
9,804	98	Paved parking, HSG D
343	80	>75% Grass cover, Good, HSG D
802	61	>75% Grass cover, Good, HSG B
10,949	95	Weighted Average
1,145		10.46% Pervious Area
9,804		89.54% Impervious Area

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

Subcatchment 2C: 2C



Summary for Subcatchment 2D: 2D

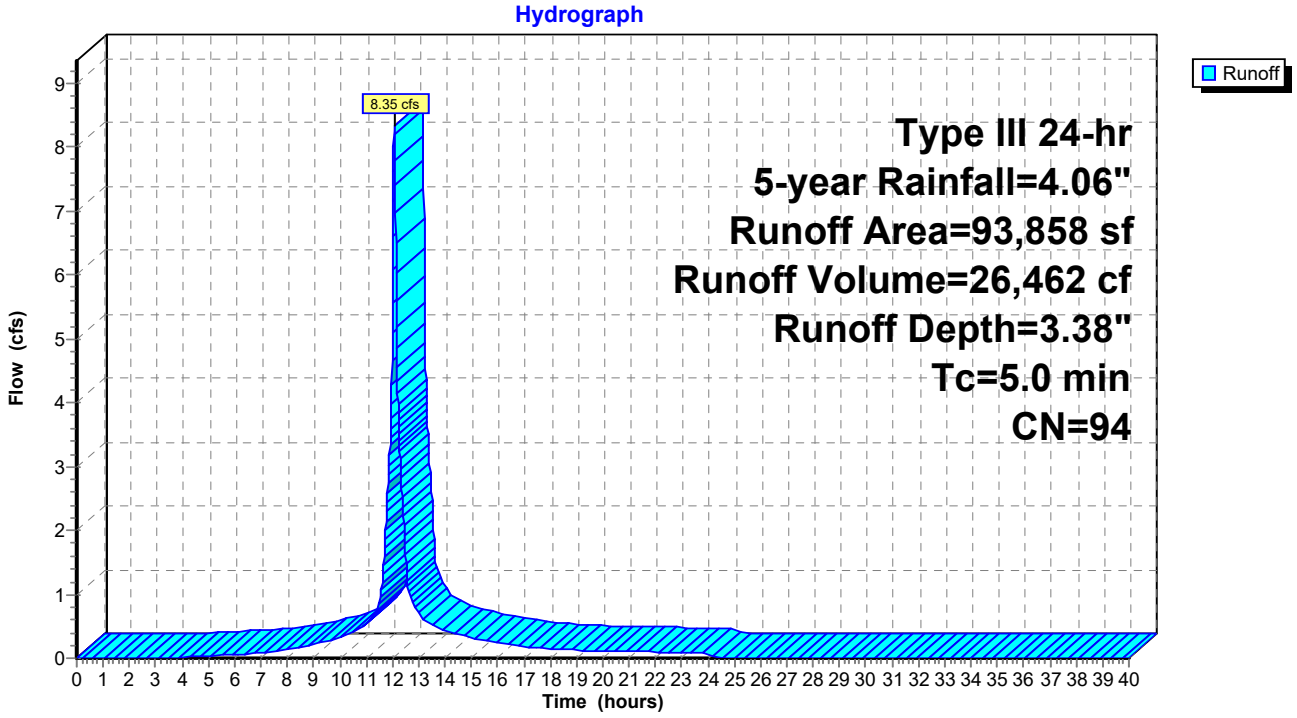
Runoff = 8.35 cfs @ 12.07 hrs, Volume= 26,462 cf, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-year Rainfall=4.06"

Area (sf)	CN	Description
74,350	98	Paved parking, HSG D
19,198	80	>75% Grass cover, Good, HSG D
310	61	>75% Grass cover, Good, HSG B
93,858	94	Weighted Average
19,508		20.78% Pervious Area
74,350		79.22% Impervious Area

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

Subcatchment 2D: 2D



Summary for Subcatchment 3A: 3A

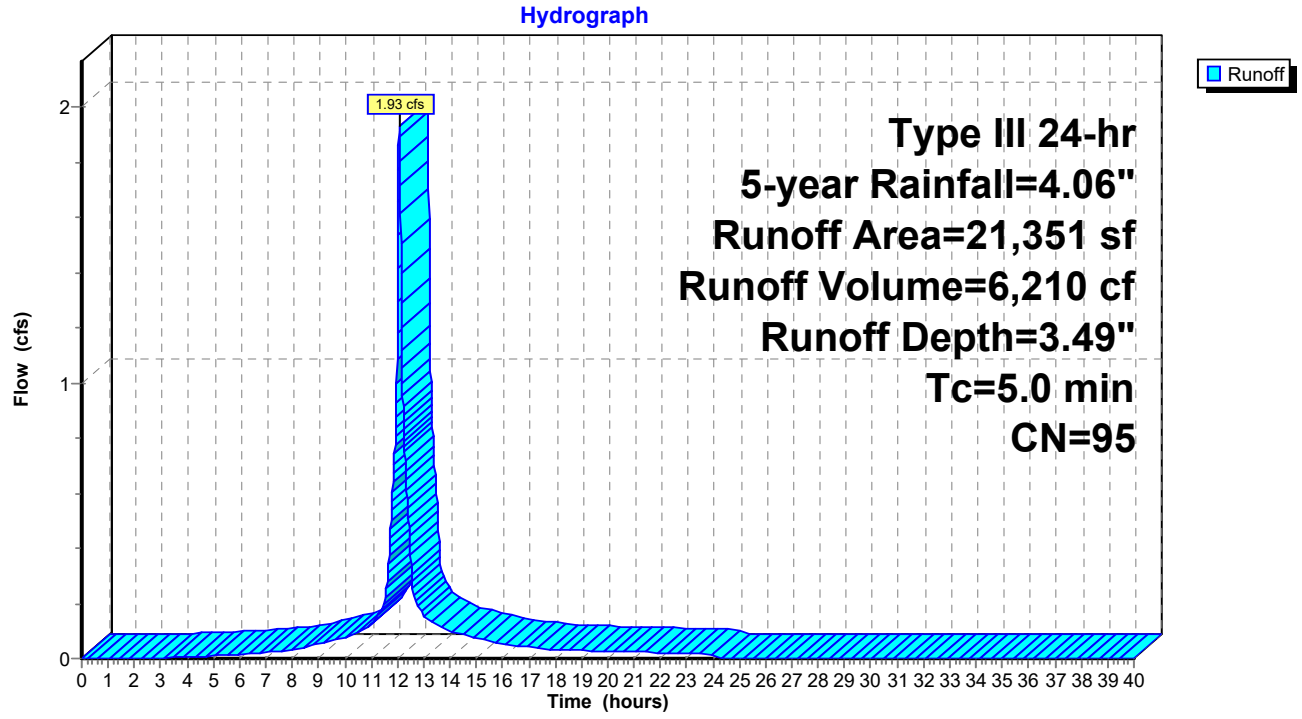
Runoff = 1.93 cfs @ 12.07 hrs, Volume= 6,210 cf, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-year Rainfall=4.06"

Area (sf)	CN	Description
18,380	98	Paved parking, HSG D
2,971	80	>75% Grass cover, Good, HSG D
21,351	95	Weighted Average
2,971		13.92% Pervious Area
18,380		86.08% Impervious Area

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

Subcatchment 3A: 3A



Summary for Subcatchment 4B: 4B

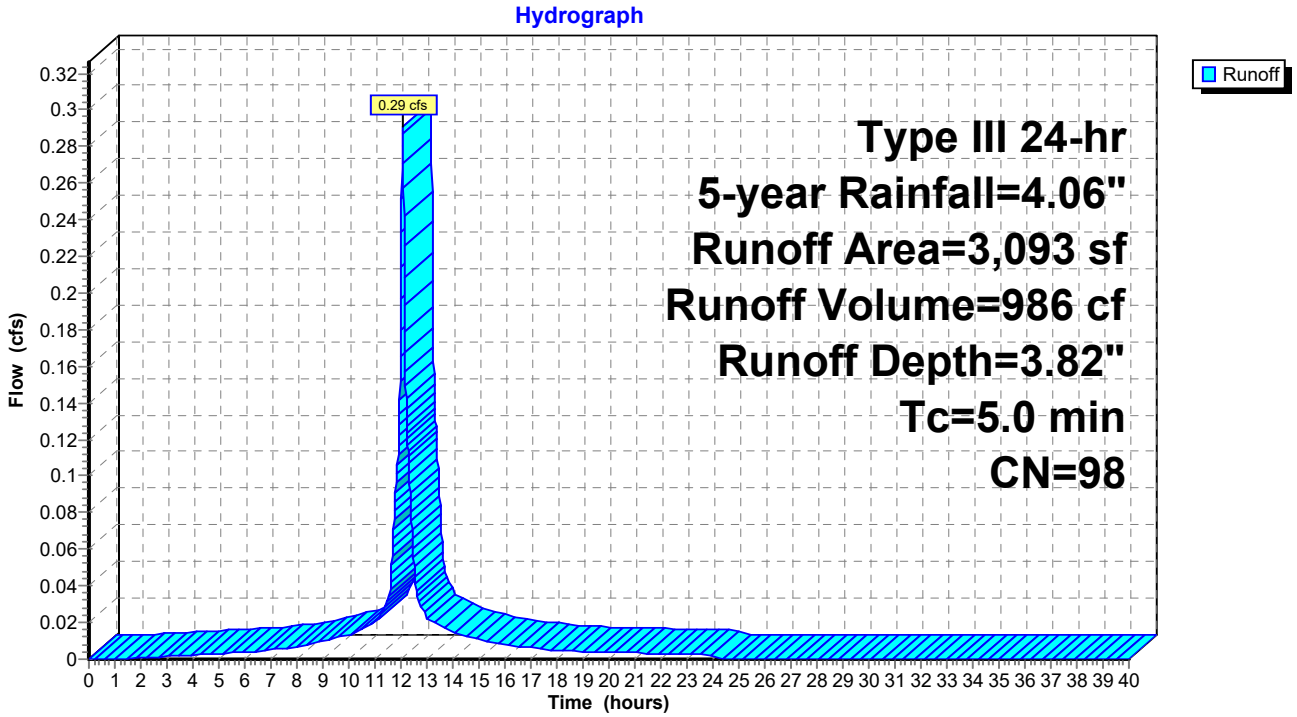
Runoff = 0.29 cfs @ 12.07 hrs, Volume= 986 cf, Depth= 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-year Rainfall=4.06"

Area (sf)	CN	Description
3,093	98	Paved parking, HSG D
3,093		100.00% Impervious Area

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

Subcatchment 4B: 4B



Summary for Subcatchment 4C: 4C

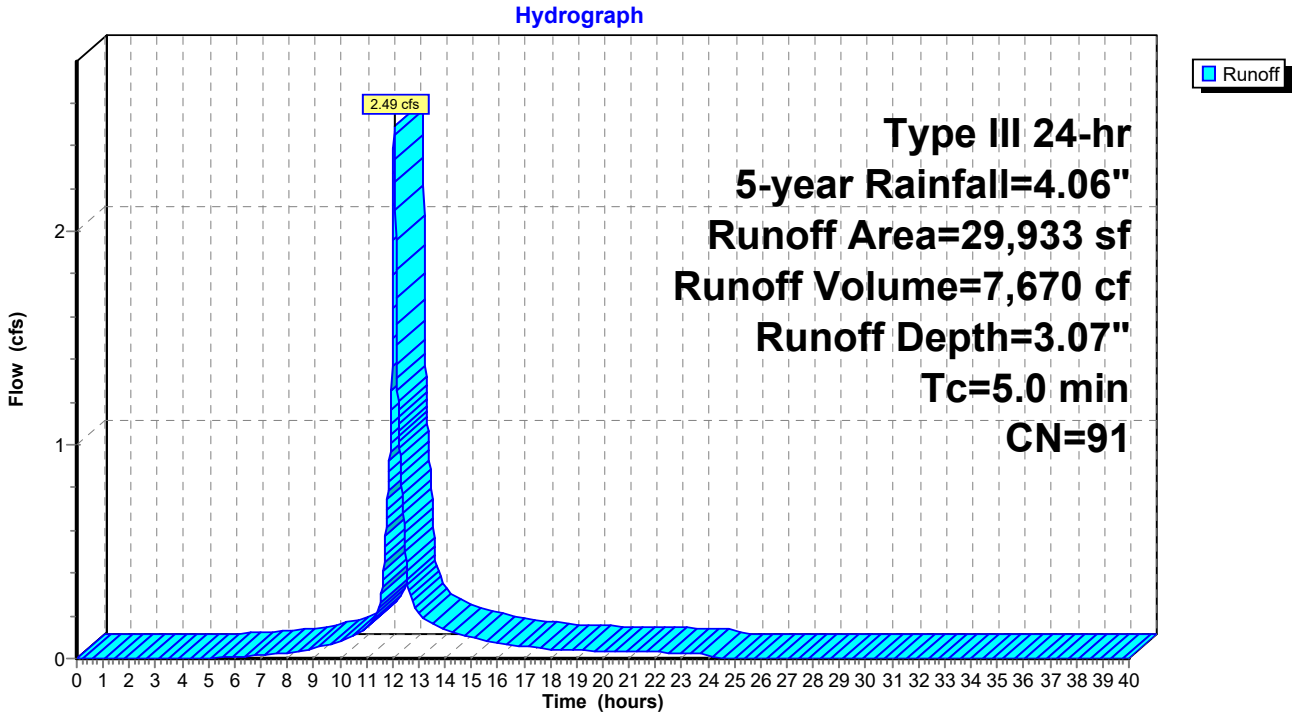
Runoff = 2.49 cfs @ 12.07 hrs, Volume= 7,670 cf, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-year Rainfall=4.06"

Area (sf)	CN	Description
18,733	98	Paved parking, HSG D
11,200	80	>75% Grass cover, Good, HSG D
29,933	91	Weighted Average
11,200		37.42% Pervious Area
18,733		62.58% Impervious Area

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

Subcatchment 4C: 4C



Summary for Pond INF 1B: INF 1B

Inflow Area = 8,063 sf, 78.66% Impervious, Inflow Depth = 3.38" for 5-year event
Inflow = 0.72 cfs @ 12.07 hrs, Volume= 2,273 cf
Outflow = 0.60 cfs @ 12.12 hrs, Volume= 1,604 cf, Atten= 16%, Lag= 2.9 min
Primary = 0.60 cfs @ 12.12 hrs, Volume= 1,604 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 17.79' @ 12.12 hrs Surf.Area= 745 sf Storage= 864 cf

Plug-Flow detention time= 174.8 min calculated for 1,604 cf (71% of inflow)
Center-of-Mass det. time= 83.6 min (862.3 - 778.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	15.90'	587 cf	**11.00'W x 67.70'L x 3.50'H Field A** 2,606 cf Overall - 827 cf Embedded = 1,779 cf x 33.0% Voids
#2A	16.40'	827 cf	**ADS_StormTech SC-740 +Cap** x 18 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 2 Rows of 9 Chambers
		1,414 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	17.40'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.60 cfs @ 12.12 hrs HW=17.79' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.60 cfs @ 2.12 fps)

Pond INF 1B: INF 1B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

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

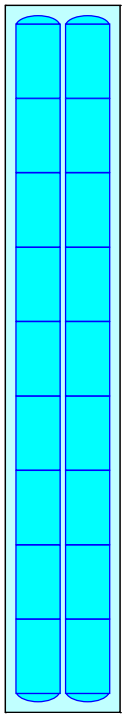
9 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 65.70' Row Length +12.0" End Stone x 2 = 67.70' Base Length
2 Rows x 51.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.00' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

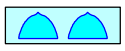
18 Chambers x 45.9 cf = 826.9 cf Chamber Storage

2,606.3 cf Field - 826.9 cf Chambers = 1,779.4 cf Stone x 33.0% Voids = 587.2 cf Stone Storage

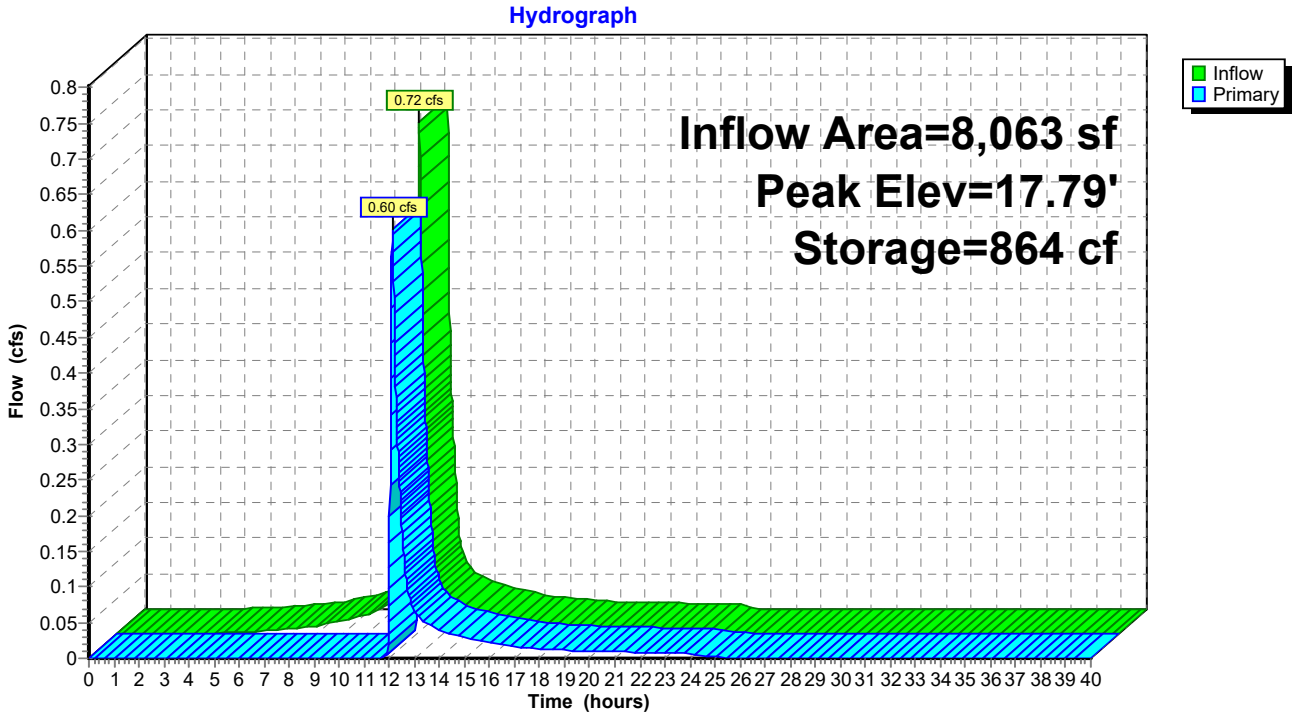
Chamber Storage + Stone Storage = 1,414.1 cf = 0.032 af
Overall Storage Efficiency = 54.3%
Overall System Size = 67.70' x 11.00' x 3.50'

18 Chambers
96.5 cy Field
65.9 cy Stone





Pond INF 1B: INF 1B



Summary for Pond INF 2B: INF 2B

Inflow Area = 25,908 sf, 87.45% Impervious, Inflow Depth = 3.38" for 5-year event
Inflow = 2.30 cfs @ 12.07 hrs, Volume= 7,304 cf
Outflow = 0.88 cfs @ 12.29 hrs, Volume= 4,898 cf, Atten= 62%, Lag= 13.0 min
Primary = 0.88 cfs @ 12.29 hrs, Volume= 4,898 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 16.48' @ 12.29 hrs Surf.Area= 3,327 sf Storage= 3,582 cf

Plug-Flow detention time= 224.9 min calculated for 4,898 cf (67% of inflow)
Center-of-Mass det. time= 129.2 min (907.9 - 778.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	14.80'	2,479 cf	**25.25'W x 131.78'L x 3.50'H Field A** 11,646 cf Overall - 4,135 cf Embedded = 7,511 cf x 33.0% Voids
#2A	15.30'	4,135 cf	**ADS_StormTech SC-740 +Cap** x 90 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 18 Chambers
		6,613 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	16.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.88 cfs @ 12.29 hrs HW=16.48' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.88 cfs @ 2.36 fps)

Pond INF 2B: INF 2B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

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

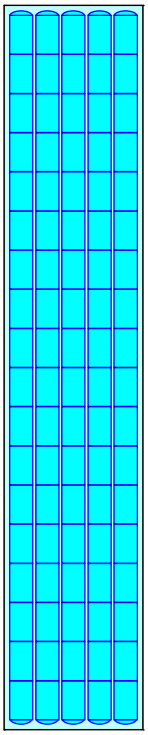
18 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 129.78' Row Length +12.0" End Stone x 2 = 131.78' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

90 Chambers x 45.9 cf = 4,134.6 cf Chamber Storage

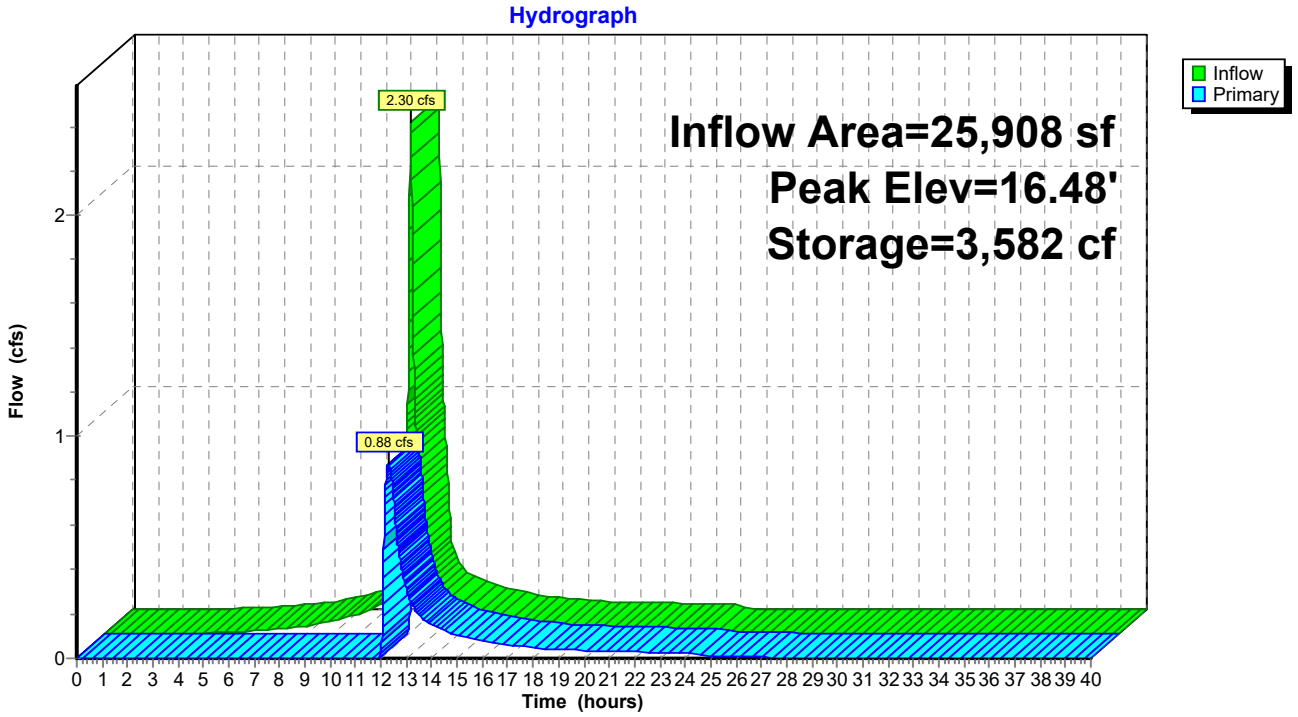
11,645.8 cf Field - 4,134.6 cf Chambers = 7,511.2 cf Stone x 33.0% Voids = 2,478.7 cf Stone Storage

Chamber Storage + Stone Storage = 6,613.3 cf = 0.152 af
Overall Storage Efficiency = 56.8%
Overall System Size = 131.78' x 25.25' x 3.50'

90 Chambers
431.3 cy Field
278.2 cy Stone



Pond INF 2B: INF 2B



Summary for Pond INF 2C: INF 2C

Inflow Area = 10,949 sf, 89.54% Impervious, Inflow Depth = 3.49" for 5-year event
Inflow = 0.99 cfs @ 12.07 hrs, Volume= 3,185 cf
Outflow = 0.88 cfs @ 12.11 hrs, Volume= 2,393 cf, Atten= 11%, Lag= 2.3 min
Primary = 0.88 cfs @ 12.11 hrs, Volume= 2,393 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 16.08' @ 12.11 hrs Surf.Area= 810 sf Storage= 1,049 cf

Plug-Flow detention time= 160.4 min calculated for 2,393 cf (75% of inflow)
Center-of-Mass det. time= 76.3 min (849.3 - 773.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	14.00'	633 cf	**25.25'W x 32.10'L x 3.50'H Field A** 2,837 cf Overall - 919 cf Embedded = 1,918 cf x 33.0% Voids
#2A	14.50'	919 cf	**ADS_StormTech SC-740 +Cap** x 20 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 4 Chambers
		1,552 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	15.60'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.88 cfs @ 12.11 hrs HW=16.08' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.88 cfs @ 2.36 fps)

Pond INF 2C: INF 2C - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

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

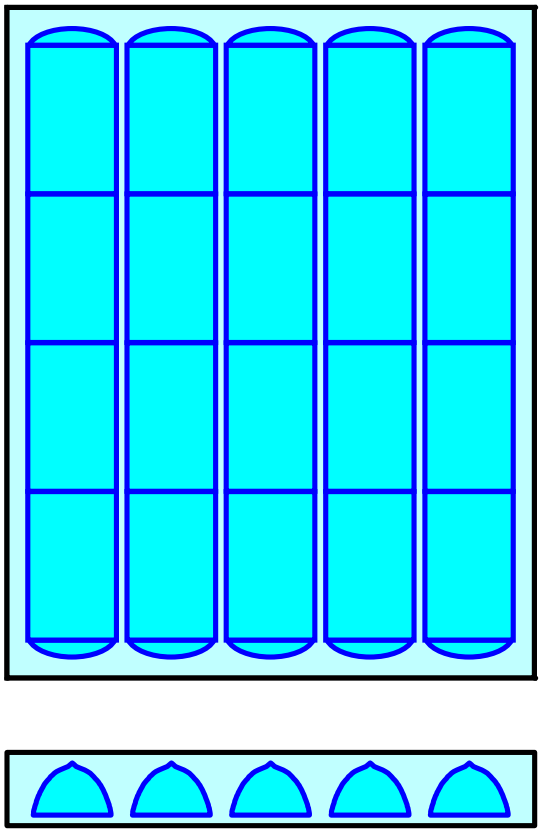
4 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 30.10' Row Length +12.0" End Stone x 2 = 32.10' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

20 Chambers x 45.9 cf = 918.8 cf Chamber Storage

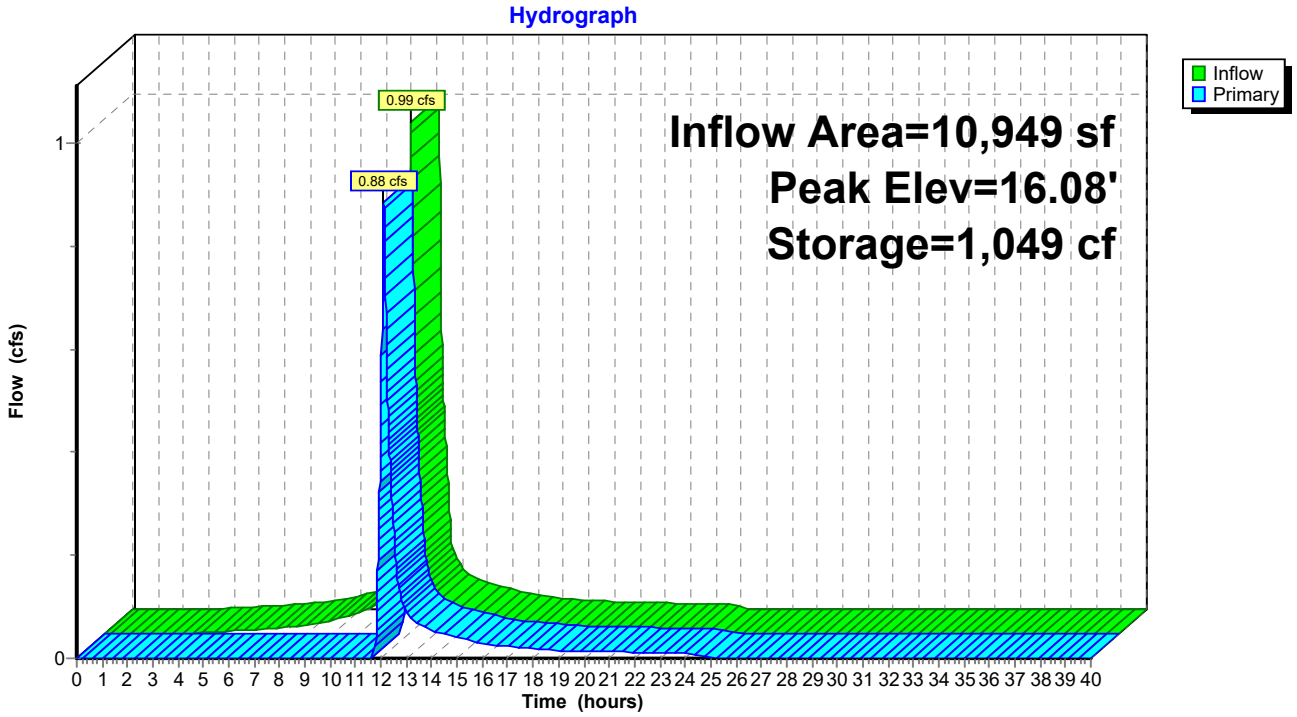
2,836.5 cf Field - 918.8 cf Chambers = 1,917.7 cf Stone x 33.0% Voids = 632.9 cf Stone Storage

Chamber Storage + Stone Storage = 1,551.7 cf = 0.036 af
Overall Storage Efficiency = 54.7%
Overall System Size = 32.10' x 25.25' x 3.50'

20 Chambers
105.1 cy Field
71.0 cy Stone



Pond INF 2C: INF 2C



Summary for Pond INF 4B: INF 4B

Inflow Area = 3,093 sf,100.00% Impervious, Inflow Depth = 3.82" for 5-year event
Inflow = 0.29 cfs @ 12.07 hrs, Volume= 986 cf
Outflow = 0.27 cfs @ 12.10 hrs, Volume= 740 cf, Atten= 8%, Lag= 1.9 min
Primary = 0.27 cfs @ 12.10 hrs, Volume= 740 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 20.25' @ 12.10 hrs Surf.Area= 379 sf Storage= 309 cf

Plug-Flow detention time= 171.7 min calculated for 740 cf (75% of inflow)
Center-of-Mass det. time= 85.3 min (836.1 - 750.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	18.80'	316 cf	**6.25'W x 60.58'L x 3.50'H Field A** 1,325 cf Overall - 368 cf Embedded = 958 cf x 33.0% Voids
#2A	19.30'	368 cf	**ADS_StormTech SC-740 +Cap** x 8 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		684 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	20.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.27 cfs @ 12.10 hrs HW=20.25' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.27 cfs @ 1.71 fps)

Pond INF 4B: INF 4B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

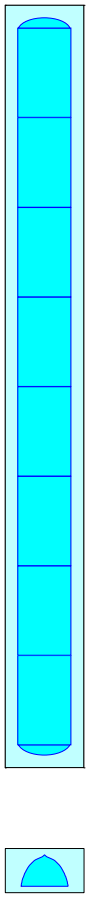
8 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 58.58' Row Length +12.0" End Stone x 2 = 60.58' Base Length
1 Rows x 51.0" Wide + 12.0" Side Stone x 2 = 6.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

8 Chambers x 45.9 cf = 367.5 cf Chamber Storage

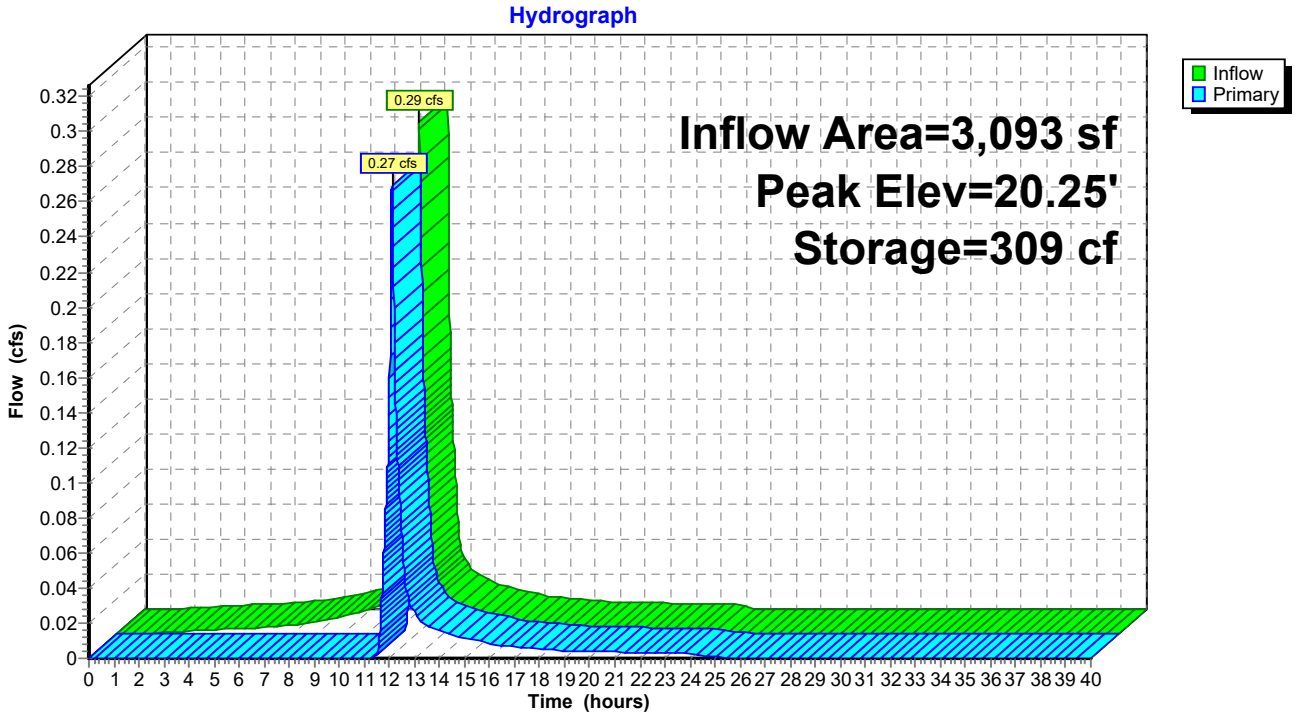
1,325.1 cf Field - 367.5 cf Chambers = 957.6 cf Stone x 33.0% Voids = 316.0 cf Stone Storage

Chamber Storage + Stone Storage = 683.5 cf = 0.016 af
Overall Storage Efficiency = 51.6%
Overall System Size = 60.58' x 6.25' x 3.50'

8 Chambers
49.1 cy Field
35.5 cy Stone



Pond INF 4B: INF 4B

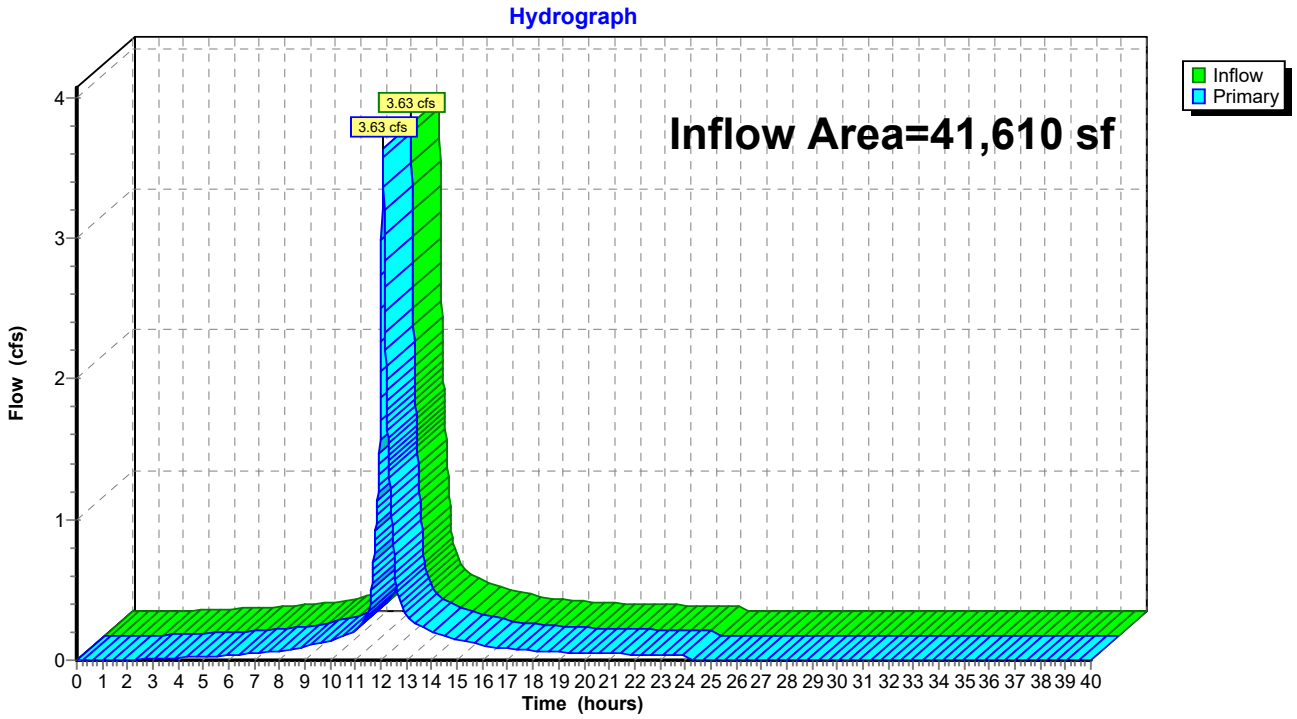


Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 89.22% Impervious, Inflow Depth = 3.45" for 5-year event
Inflow = 3.63 cfs @ 12.08 hrs, Volume= 11,979 cf
Primary = 3.63 cfs @ 12.08 hrs, Volume= 11,979 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-1: DP-1

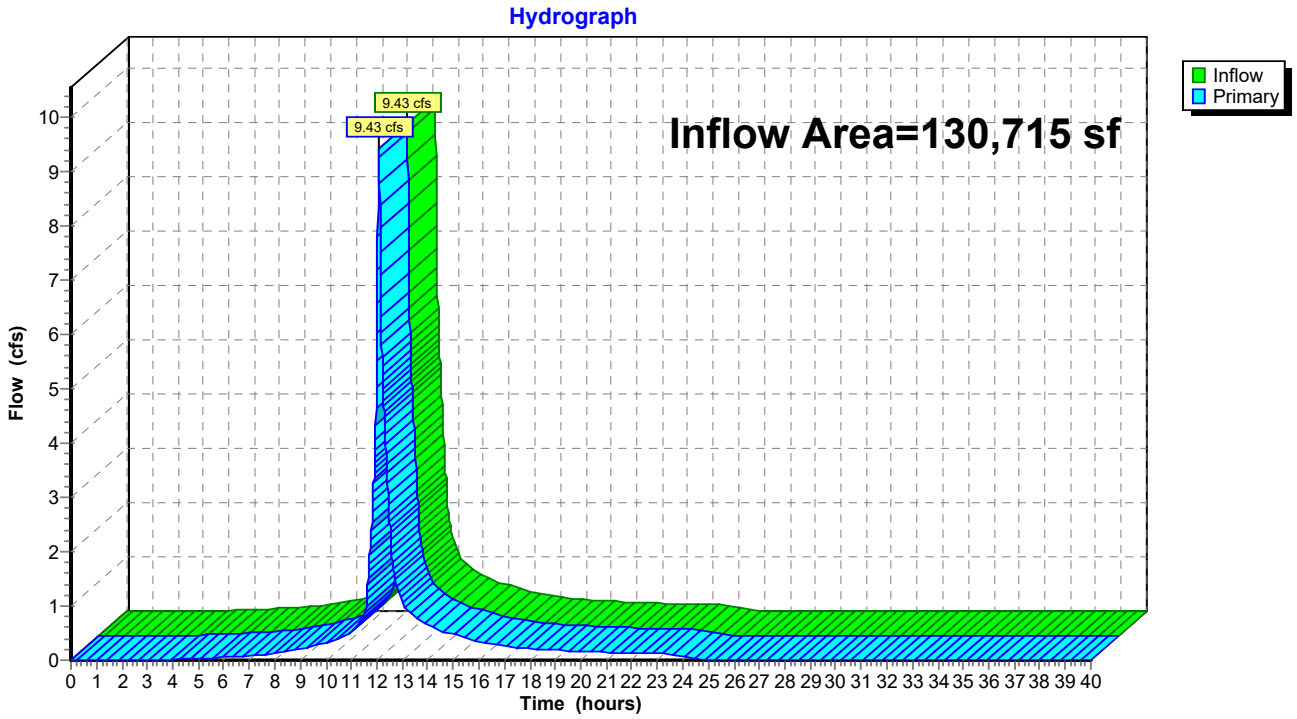


Summary for Link DP-2: DP-2

Inflow Area = 130,715 sf, 81.71% Impervious, Inflow Depth = 3.10" for 5-year event
Inflow = 9.43 cfs @ 12.08 hrs, Volume= 33,753 cf
Primary = 9.43 cfs @ 12.08 hrs, Volume= 33,753 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-2: DP-2

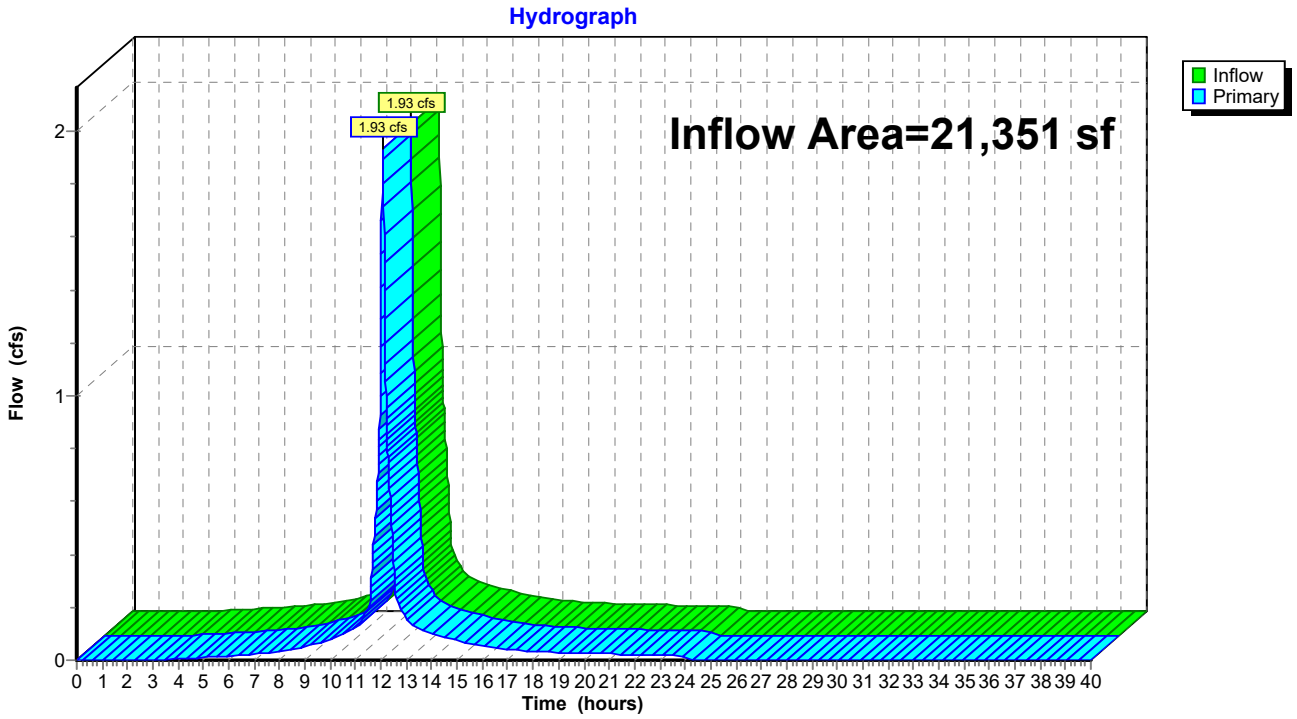


Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.08% Impervious, Inflow Depth = 3.49" for 5-year event
Inflow = 1.93 cfs @ 12.07 hrs, Volume= 6,210 cf
Primary = 1.93 cfs @ 12.07 hrs, Volume= 6,210 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-3: DP-3

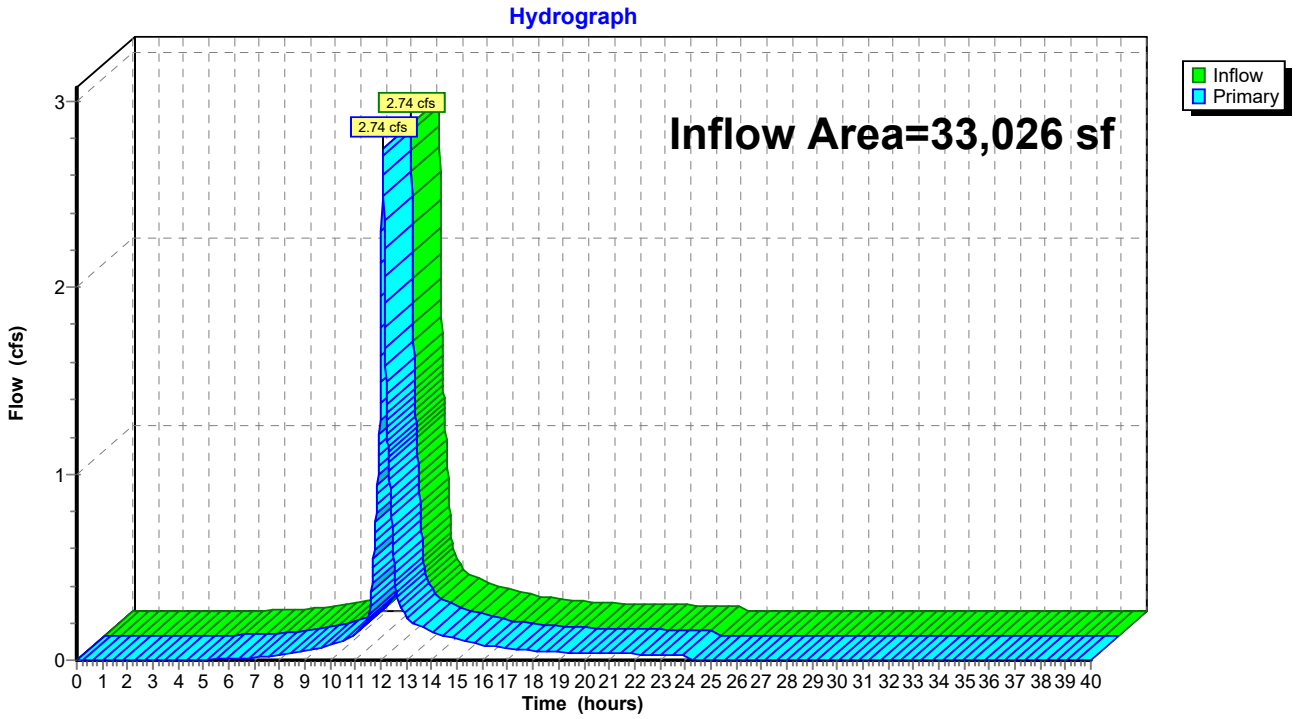


Summary for Link DP-4: DP-4

Inflow Area = 33,026 sf, 66.09% Impervious, Inflow Depth = 3.06" for 5-year event
Inflow = 2.74 cfs @ 12.07 hrs, Volume= 8,410 cf
Primary = 2.74 cfs @ 12.07 hrs, Volume= 8,410 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-4: DP-4



10-Year Storm Event- Proposed

Time span=0.00-40.00 hrs, dt=0.01 hrs, 4001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1B: 1B Runoff Area=8,063 sf 78.66% Impervious Runoff Depth=4.19"
Tc=5.0 min CN=94 Runoff=0.88 cfs 2,815 cf

Subcatchment1C: 1C Runoff Area=33,547 sf 91.76% Impervious Runoff Depth=4.53"
Tc=5.0 min CN=97 Runoff=3.78 cfs 12,657 cf

Subcatchment2B: 2B Runoff Area=25,908 sf 87.45% Impervious Runoff Depth=4.19"
Tc=5.0 min CN=94 Runoff=2.82 cfs 9,045 cf

Subcatchment2C: 2C Runoff Area=10,949 sf 89.54% Impervious Runoff Depth=4.30"
Tc=5.0 min CN=95 Runoff=1.21 cfs 3,924 cf

Subcatchment2D: 2D Runoff Area=93,858 sf 79.22% Impervious Runoff Depth=4.19"
Tc=5.0 min CN=94 Runoff=10.21 cfs 32,769 cf

Subcatchment3A: 3A Runoff Area=21,351 sf 86.08% Impervious Runoff Depth=4.30"
Tc=5.0 min CN=95 Runoff=2.35 cfs 7,652 cf

Subcatchment4B: 4B Runoff Area=3,093 sf 100.00% Impervious Runoff Depth=4.64"
Tc=5.0 min CN=98 Runoff=0.35 cfs 1,197 cf

Subcatchment4C: 4C Runoff Area=29,933 sf 62.58% Impervious Runoff Depth=3.87"
Tc=5.0 min CN=91 Runoff=3.09 cfs 9,643 cf

Pond INF 1B: INF 1B Peak Elev=17.85' Storage=893 cf Inflow=0.88 cfs 2,815 cf
Outflow=0.79 cfs 2,146 cf

Pond INF 2B: INF 2B Peak Elev=16.65' Storage=3,987 cf Inflow=2.82 cfs 9,045 cf
Outflow=1.49 cfs 6,639 cf

Pond INF 2C: INF 2C Peak Elev=16.14' Storage=1,080 cf Inflow=1.21 cfs 3,924 cf
Outflow=1.09 cfs 3,133 cf

Pond INF 4B: INF 4B Peak Elev=20.28' Storage=316 cf Inflow=0.35 cfs 1,197 cf
Outflow=0.33 cfs 951 cf

Link DP-1: DP-1 Inflow=4.50 cfs 14,803 cf
Primary=4.50 cfs 14,803 cf

Link DP-2: DP-2 Inflow=12.20 cfs 42,541 cf
Primary=12.20 cfs 42,541 cf

Link DP-3: DP-3 Inflow=2.35 cfs 7,652 cf
Primary=2.35 cfs 7,652 cf

Link DP-4: DP-4 Inflow=3.40 cfs 10,594 cf
Primary=3.40 cfs 10,594 cf

Total Runoff Area = 226,702 sf Runoff Volume = 79,702 cf Average Runoff Depth = 4.22"
18.77% Pervious = 42,559 sf 81.23% Impervious = 184,143 sf

Summary for Subcatchment 1B: 1B

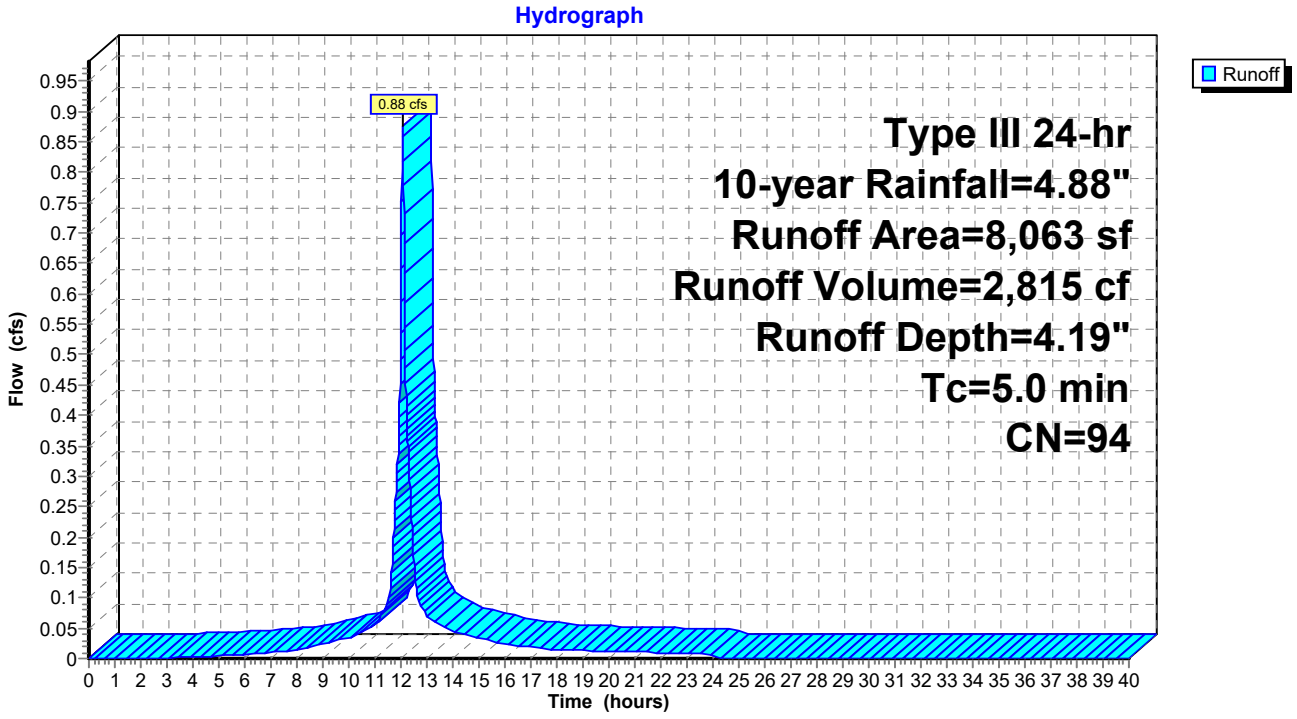
Runoff = 0.88 cfs @ 12.07 hrs, Volume= 2,815 cf, Depth= 4.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.88"

Area (sf)	CN	Description
6,342	98	Paved parking, HSG D
1,721	80	>75% Grass cover, Good, HSG D
8,063	94	Weighted Average
1,721		21.34% Pervious Area
6,342		78.66% Impervious Area

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

Subcatchment 1B: 1B



Summary for Subcatchment 1C: 1C

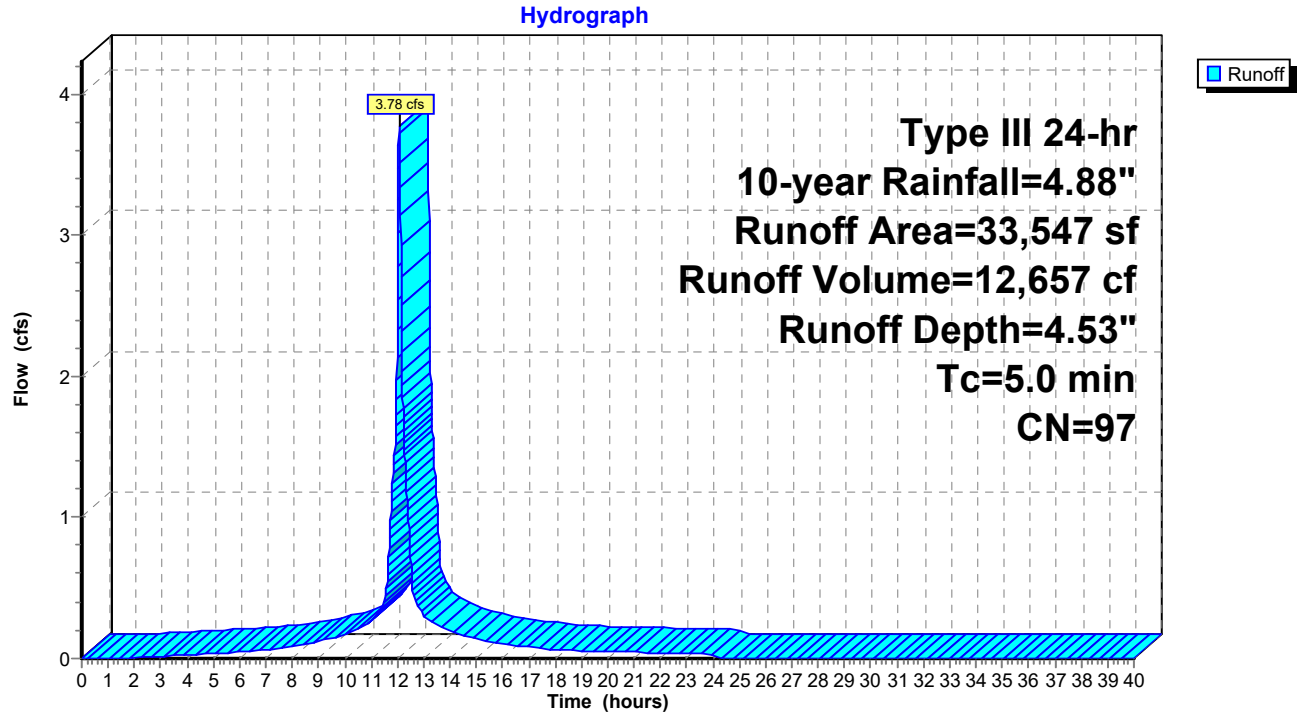
Runoff = 3.78 cfs @ 12.07 hrs, Volume= 12,657 cf, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.88"

Area (sf)	CN	Description
30,784	98	Paved parking, HSG D
2,763	80	>75% Grass cover, Good, HSG D
33,547	97	Weighted Average
2,763		8.24% Pervious Area
30,784		91.76% Impervious Area

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

Subcatchment 1C: 1C



Summary for Subcatchment 2B: 2B

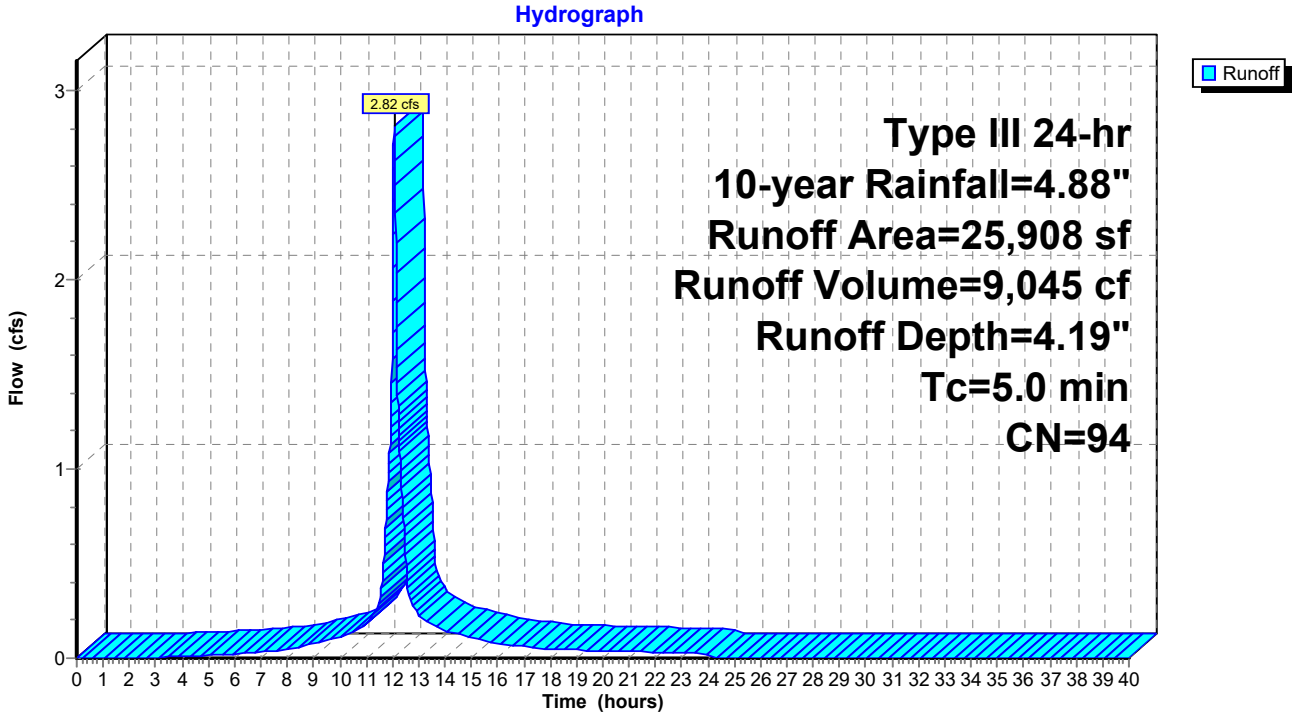
Runoff = 2.82 cfs @ 12.07 hrs, Volume= 9,045 cf, Depth= 4.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.88"

Area (sf)	CN	Description
22,657	98	Paved parking, HSG D
1,214	80	>75% Grass cover, Good, HSG D
2,037	61	>75% Grass cover, Good, HSG B
25,908	94	Weighted Average
3,251		12.55% Pervious Area
22,657		87.45% Impervious Area

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

Subcatchment 2B: 2B



Summary for Subcatchment 2C: 2C

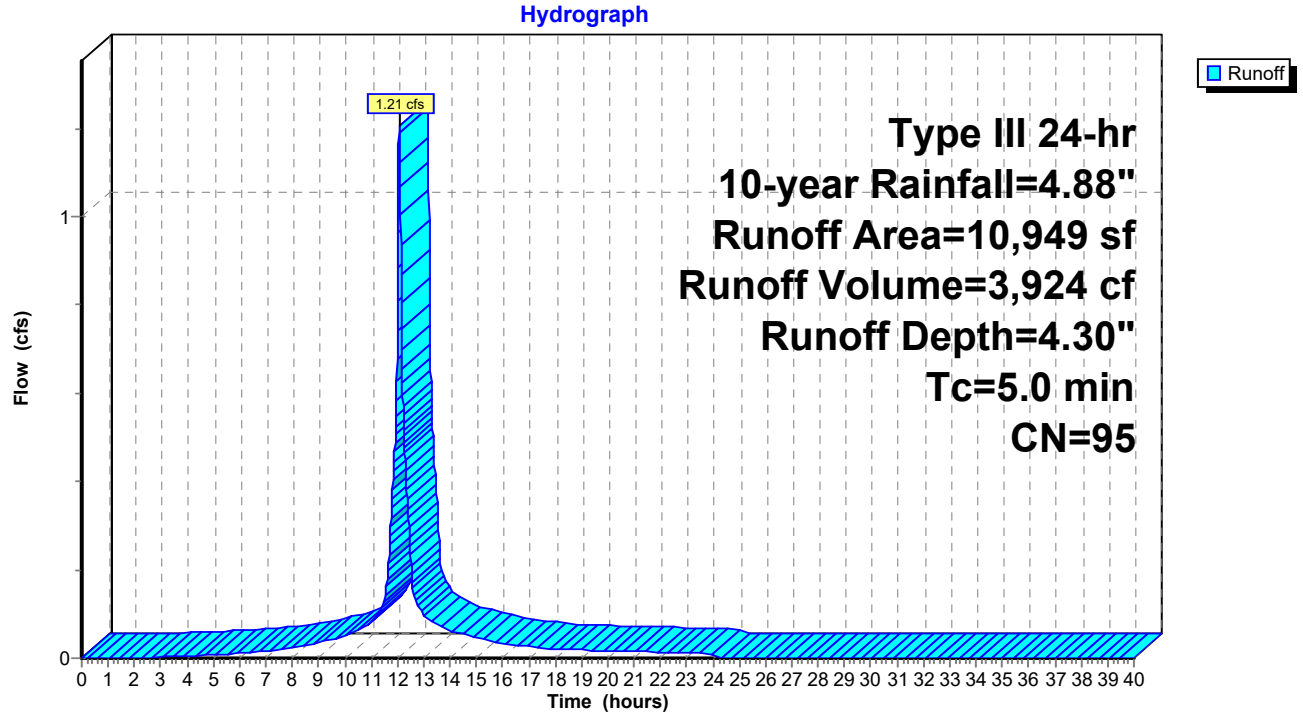
Runoff = 1.21 cfs @ 12.07 hrs, Volume= 3,924 cf, Depth= 4.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.88"

Area (sf)	CN	Description
9,804	98	Paved parking, HSG D
343	80	>75% Grass cover, Good, HSG D
802	61	>75% Grass cover, Good, HSG B
10,949	95	Weighted Average
1,145		10.46% Pervious Area
9,804		89.54% Impervious Area

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

Subcatchment 2C: 2C



Summary for Subcatchment 2D: 2D

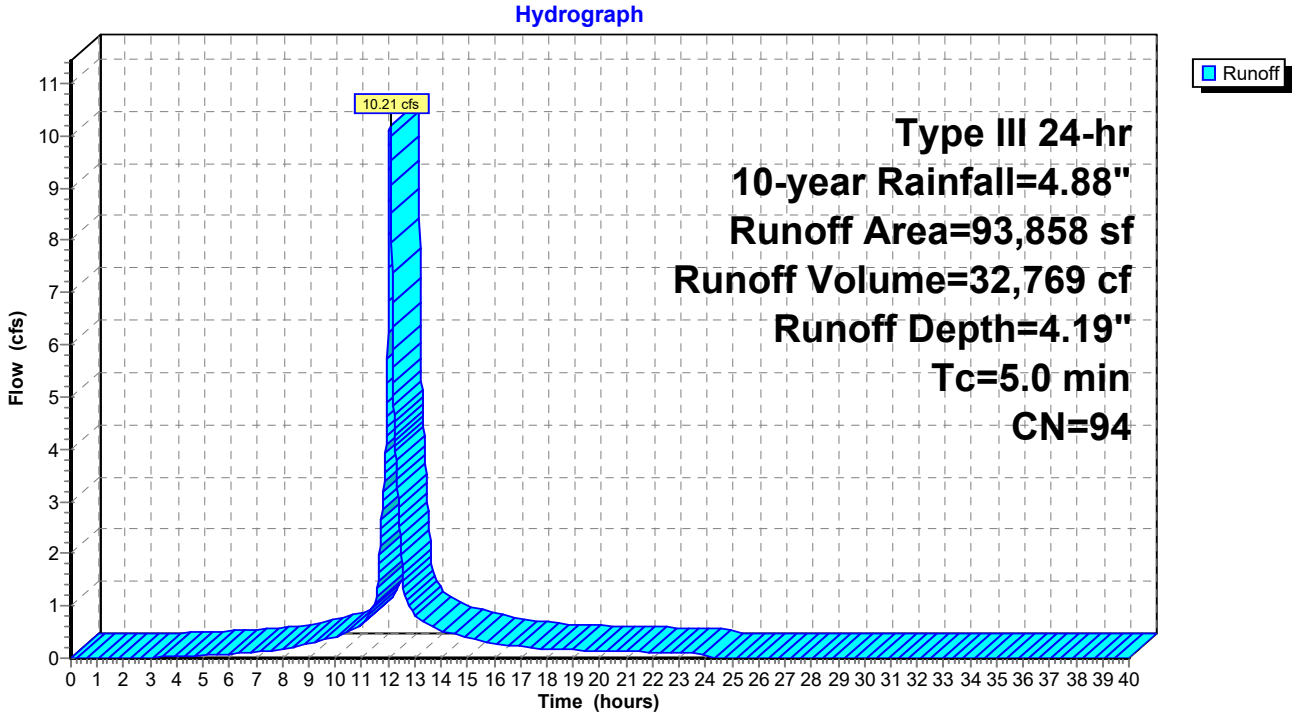
Runoff = 10.21 cfs @ 12.07 hrs, Volume= 32,769 cf, Depth= 4.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.88"

Area (sf)	CN	Description
74,350	98	Paved parking, HSG D
19,198	80	>75% Grass cover, Good, HSG D
310	61	>75% Grass cover, Good, HSG B
93,858	94	Weighted Average
19,508		20.78% Pervious Area
74,350		79.22% Impervious Area

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

Subcatchment 2D: 2D



Summary for Subcatchment 3A: 3A

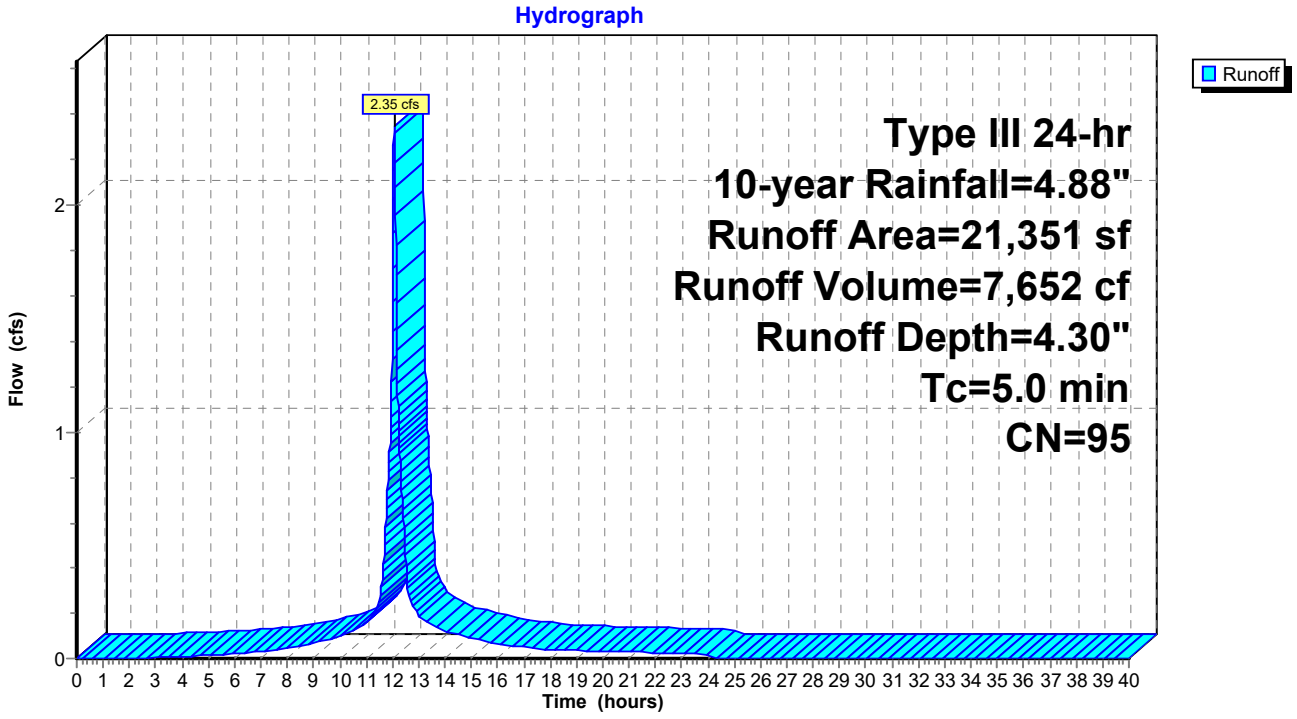
Runoff = 2.35 cfs @ 12.07 hrs, Volume= 7,652 cf, Depth= 4.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.88"

Area (sf)	CN	Description
18,380	98	Paved parking, HSG D
2,971	80	>75% Grass cover, Good, HSG D
21,351	95	Weighted Average
2,971		13.92% Pervious Area
18,380		86.08% Impervious Area

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

Subcatchment 3A: 3A



Summary for Subcatchment 4B: 4B

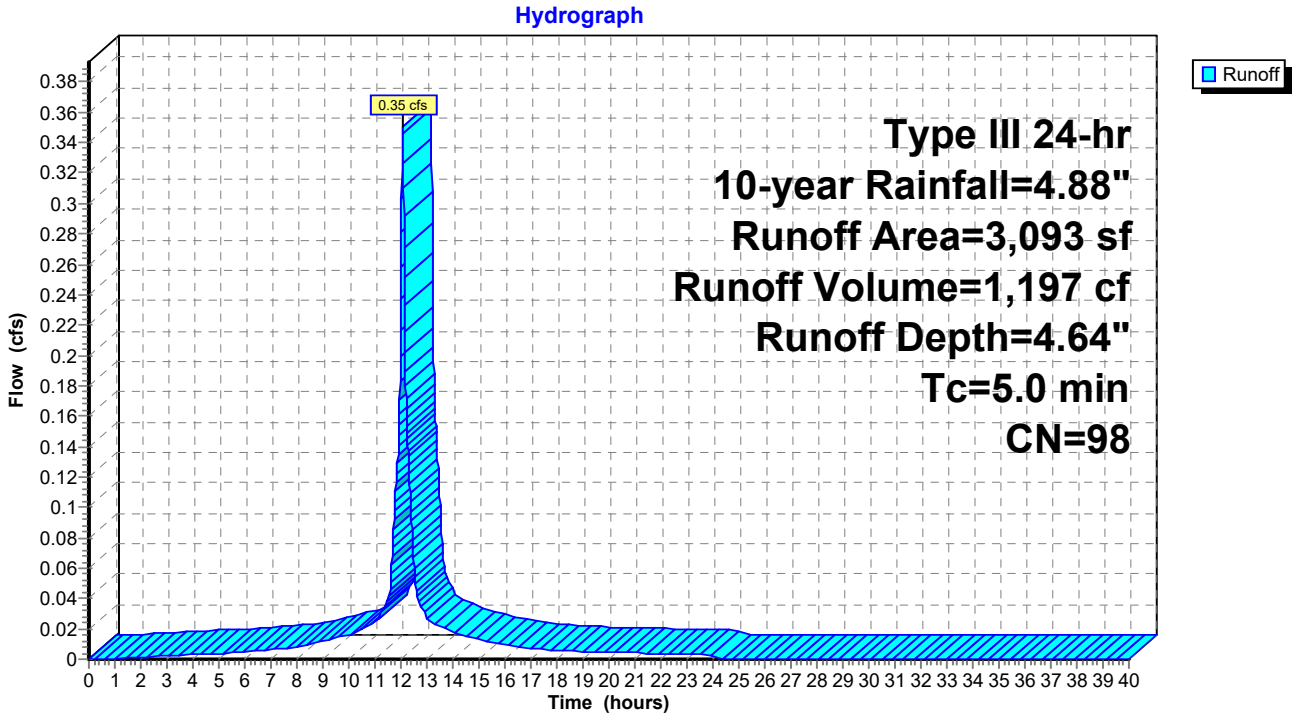
Runoff = 0.35 cfs @ 12.07 hrs, Volume= 1,197 cf, Depth= 4.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.88"

Area (sf)	CN	Description
3,093	98	Paved parking, HSG D
3,093		100.00% Impervious Area

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

Subcatchment 4B: 4B



Summary for Subcatchment 4C: 4C

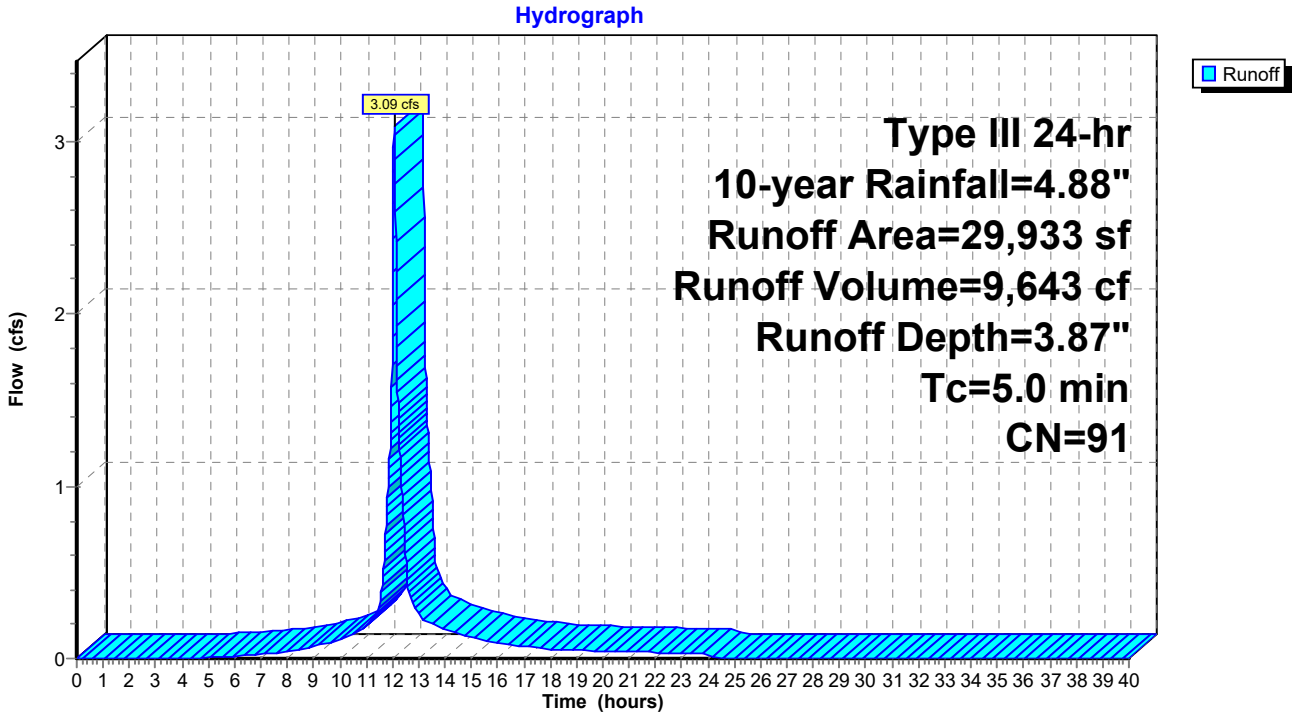
Runoff = 3.09 cfs @ 12.07 hrs, Volume= 9,643 cf, Depth= 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.88"

Area (sf)	CN	Description
18,733	98	Paved parking, HSG D
11,200	80	>75% Grass cover, Good, HSG D
29,933	91	Weighted Average
11,200		37.42% Pervious Area
18,733		62.58% Impervious Area

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

Subcatchment 4C: 4C



Summary for Pond INF 1B: INF 1B

Inflow Area = 8,063 sf, 78.66% Impervious, Inflow Depth = 4.19" for 10-year event
Inflow = 0.88 cfs @ 12.07 hrs, Volume= 2,815 cf
Outflow = 0.79 cfs @ 12.11 hrs, Volume= 2,146 cf, Atten= 11%, Lag= 2.3 min
Primary = 0.79 cfs @ 12.11 hrs, Volume= 2,146 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 17.85' @ 12.11 hrs Surf.Area= 745 sf Storage= 893 cf

Plug-Flow detention time= 156.2 min calculated for 2,146 cf (76% of inflow)
Center-of-Mass det. time= 73.6 min (846.9 - 773.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	15.90'	587 cf	**11.00'W x 67.70'L x 3.50'H Field A** 2,606 cf Overall - 827 cf Embedded = 1,779 cf x 33.0% Voids
#2A	16.40'	827 cf	**ADS_StormTech SC-740 +Cap** x 18 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 2 Rows of 9 Chambers
		1,414 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	17.40'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.78 cfs @ 12.11 hrs HW=17.85' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.78 cfs @ 2.28 fps)

Pond INF 1B: INF 1B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

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

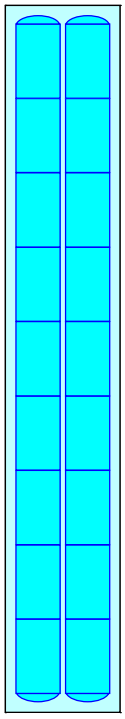
9 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 65.70' Row Length +12.0" End Stone x 2 = 67.70' Base Length
2 Rows x 51.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.00' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

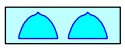
18 Chambers x 45.9 cf = 826.9 cf Chamber Storage

2,606.3 cf Field - 826.9 cf Chambers = 1,779.4 cf Stone x 33.0% Voids = 587.2 cf Stone Storage

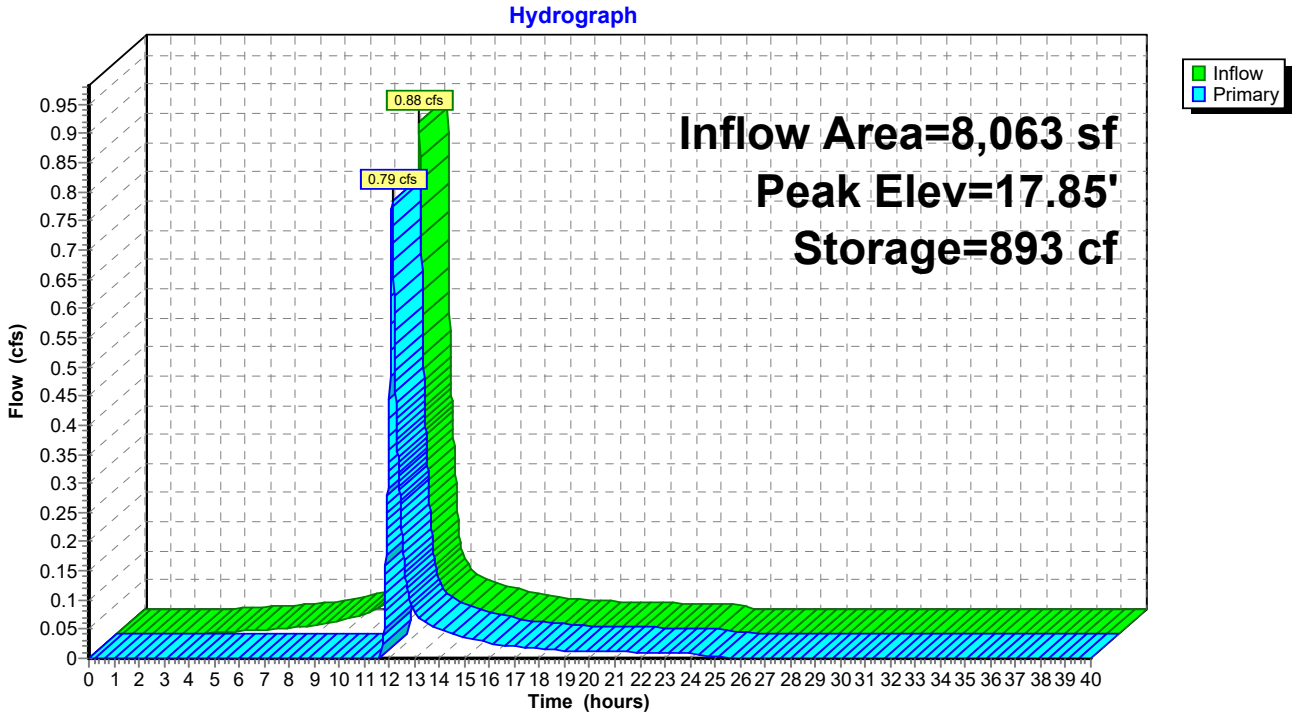
Chamber Storage + Stone Storage = 1,414.1 cf = 0.032 af
Overall Storage Efficiency = 54.3%
Overall System Size = 67.70' x 11.00' x 3.50'

18 Chambers
96.5 cy Field
65.9 cy Stone





Pond INF 1B: INF 1B



Summary for Pond INF 2B: INF 2B

Inflow Area = 25,908 sf, 87.45% Impervious, Inflow Depth = 4.19" for 10-year event
Inflow = 2.82 cfs @ 12.07 hrs, Volume= 9,045 cf
Outflow = 1.49 cfs @ 12.19 hrs, Volume= 6,639 cf, Atten= 47%, Lag= 6.9 min
Primary = 1.49 cfs @ 12.19 hrs, Volume= 6,639 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 16.65' @ 12.19 hrs Surf.Area= 3,327 sf Storage= 3,987 cf

Plug-Flow detention time= 198.2 min calculated for 6,639 cf (73% of inflow)
Center-of-Mass det. time= 111.0 min (884.2 - 773.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	14.80'	2,479 cf	**25.25'W x 131.78'L x 3.50'H Field A** 11,646 cf Overall - 4,135 cf Embedded = 7,511 cf x 33.0% Voids
#2A	15.30'	4,135 cf	**ADS_StormTech SC-740 +Cap** x 90 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 18 Chambers
		6,613 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	16.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.49 cfs @ 12.19 hrs HW=16.65' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 1.49 cfs @ 2.75 fps)

Pond INF 2B: INF 2B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

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

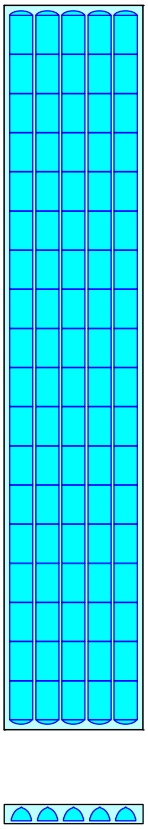
18 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 129.78' Row Length +12.0" End Stone x 2 = 131.78' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

90 Chambers x 45.9 cf = 4,134.6 cf Chamber Storage

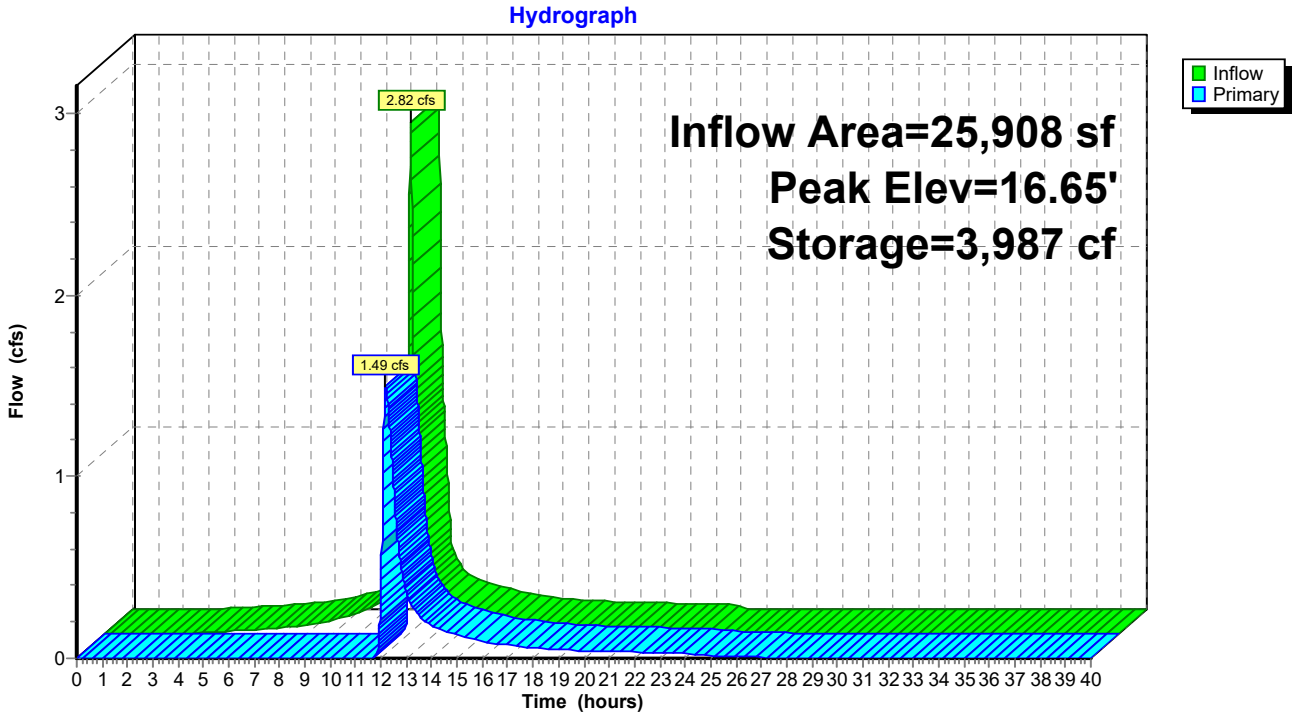
11,645.8 cf Field - 4,134.6 cf Chambers = 7,511.2 cf Stone x 33.0% Voids = 2,478.7 cf Stone Storage

Chamber Storage + Stone Storage = 6,613.3 cf = 0.152 af
Overall Storage Efficiency = 56.8%
Overall System Size = 131.78' x 25.25' x 3.50'

90 Chambers
431.3 cy Field
278.2 cy Stone



Pond INF 2B: INF 2B



Summary for Pond INF 2C: INF 2C

Inflow Area = 10,949 sf, 89.54% Impervious, Inflow Depth = 4.30" for 10-year event
Inflow = 1.21 cfs @ 12.07 hrs, Volume= 3,924 cf
Outflow = 1.09 cfs @ 12.11 hrs, Volume= 3,133 cf, Atten= 9%, Lag= 2.1 min
Primary = 1.09 cfs @ 12.11 hrs, Volume= 3,133 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 16.14' @ 12.11 hrs Surf.Area= 810 sf Storage= 1,080 cf

Plug-Flow detention time= 144.8 min calculated for 3,133 cf (80% of inflow)
Center-of-Mass det. time= 68.9 min (836.8 - 767.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	14.00'	633 cf	**25.25'W x 32.10'L x 3.50'H Field A** 2,837 cf Overall - 919 cf Embedded = 1,918 cf x 33.0% Voids
#2A	14.50'	919 cf	**ADS_StormTech SC-740 +Cap** x 20 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 4 Chambers
		1,552 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	15.60'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.09 cfs @ 12.11 hrs HW=16.14' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 1.09 cfs @ 2.51 fps)

Pond INF 2C: INF 2C - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

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

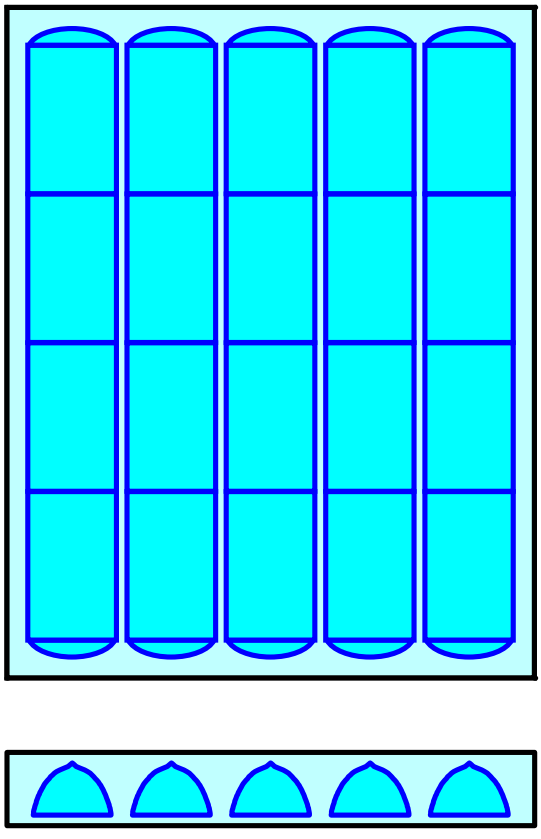
4 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 30.10' Row Length +12.0" End Stone x 2 = 32.10' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

20 Chambers x 45.9 cf = 918.8 cf Chamber Storage

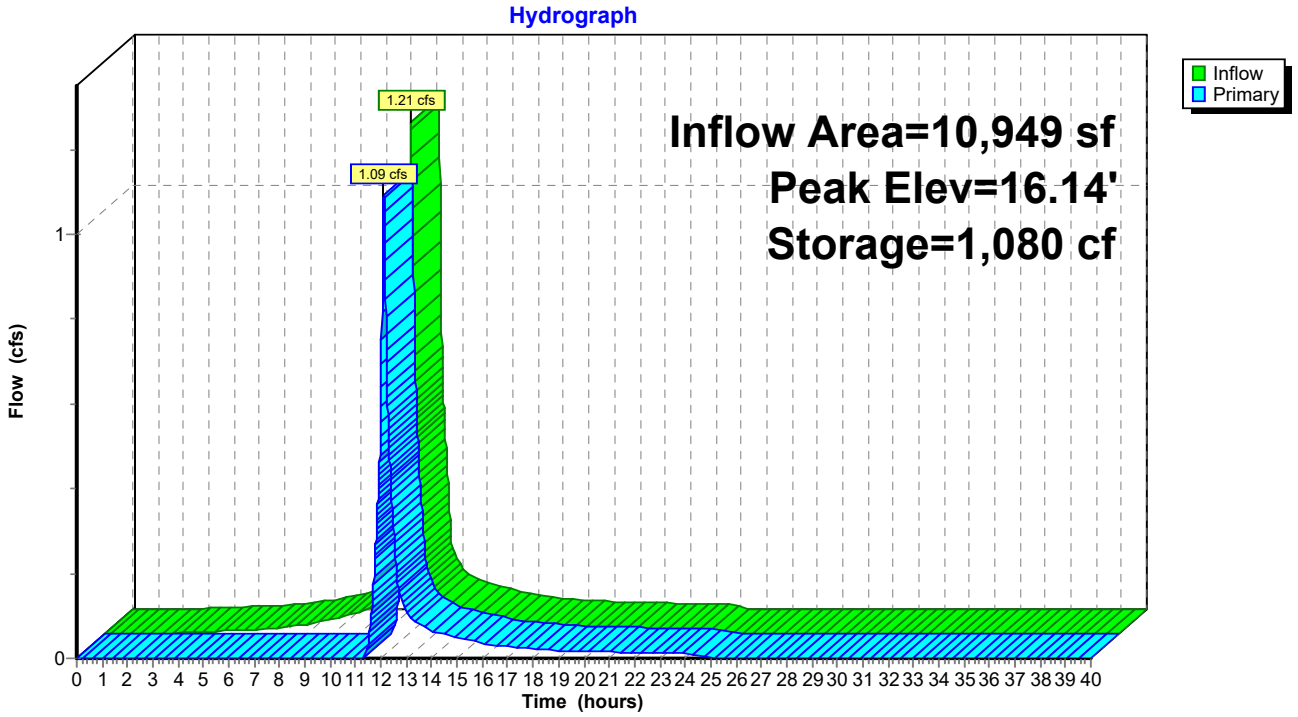
2,836.5 cf Field - 918.8 cf Chambers = 1,917.7 cf Stone x 33.0% Voids = 632.9 cf Stone Storage

Chamber Storage + Stone Storage = 1,551.7 cf = 0.036 af
Overall Storage Efficiency = 54.7%
Overall System Size = 32.10' x 25.25' x 3.50'

20 Chambers
105.1 cy Field
71.0 cy Stone



Pond INF 2C: INF 2C



Summary for Pond INF 4B: INF 4B

Inflow Area = 3,093 sf,100.00% Impervious, Inflow Depth = 4.64" for 10-year event
Inflow = 0.35 cfs @ 12.07 hrs, Volume= 1,197 cf
Outflow = 0.33 cfs @ 12.10 hrs, Volume= 951 cf, Atten= 7%, Lag= 1.8 min
Primary = 0.33 cfs @ 12.10 hrs, Volume= 951 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 20.28' @ 12.10 hrs Surf.Area= 379 sf Storage= 316 cf

Plug-Flow detention time= 156.2 min calculated for 951 cf (79% of inflow)
Center-of-Mass det. time= 77.9 min (825.4 - 747.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	18.80'	316 cf	**6.25'W x 60.58'L x 3.50'H Field A** 1,325 cf Overall - 368 cf Embedded = 958 cf x 33.0% Voids
#2A	19.30'	368 cf	**ADS_StormTech SC-740 +Cap** x 8 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		684 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	20.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.33 cfs @ 12.10 hrs HW=20.28' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.33 cfs @ 1.80 fps)

Pond INF 4B: INF 4B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

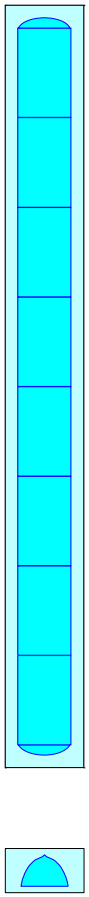
8 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 58.58' Row Length +12.0" End Stone x 2 = 60.58' Base Length
1 Rows x 51.0" Wide + 12.0" Side Stone x 2 = 6.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

8 Chambers x 45.9 cf = 367.5 cf Chamber Storage

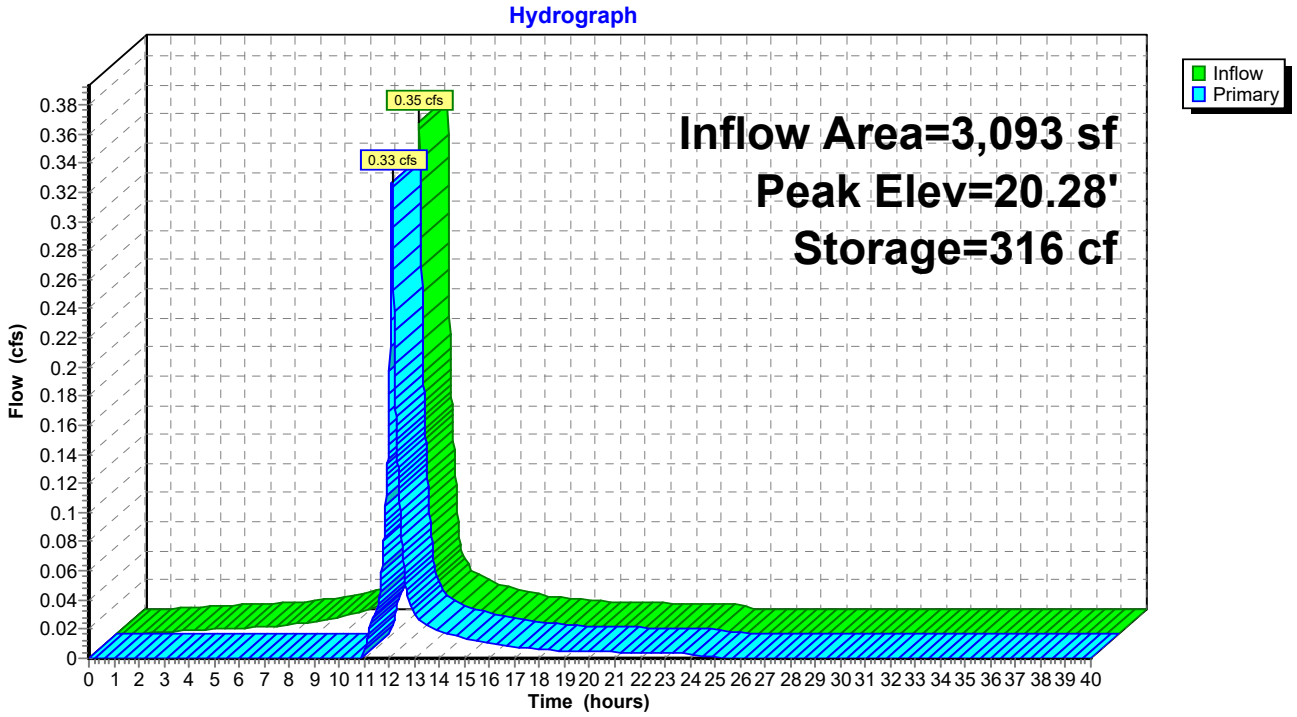
1,325.1 cf Field - 367.5 cf Chambers = 957.6 cf Stone x 33.0% Voids = 316.0 cf Stone Storage

Chamber Storage + Stone Storage = 683.5 cf = 0.016 af
Overall Storage Efficiency = 51.6%
Overall System Size = 60.58' x 6.25' x 3.50'

8 Chambers
49.1 cy Field
35.5 cy Stone



Pond INF 4B: INF 4B

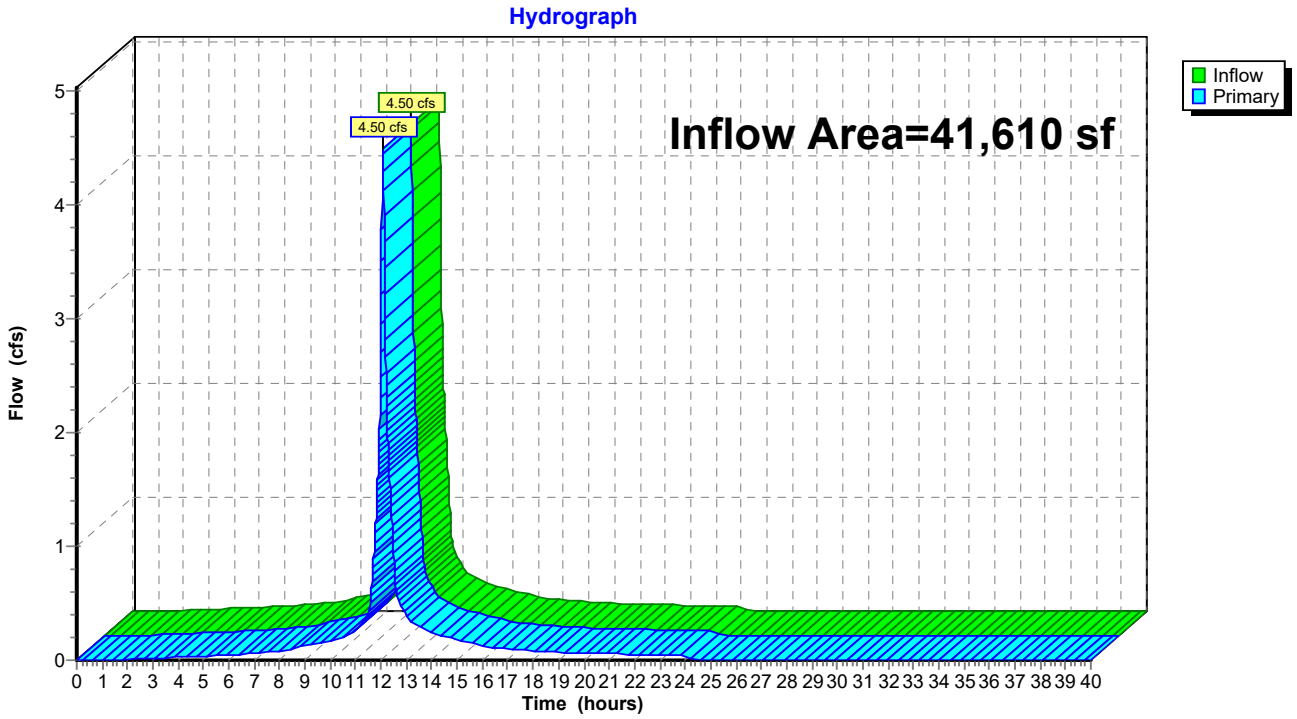


Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 89.22% Impervious, Inflow Depth = 4.27" for 10-year event
Inflow = 4.50 cfs @ 12.08 hrs, Volume= 14,803 cf
Primary = 4.50 cfs @ 12.08 hrs, Volume= 14,803 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-1: DP-1

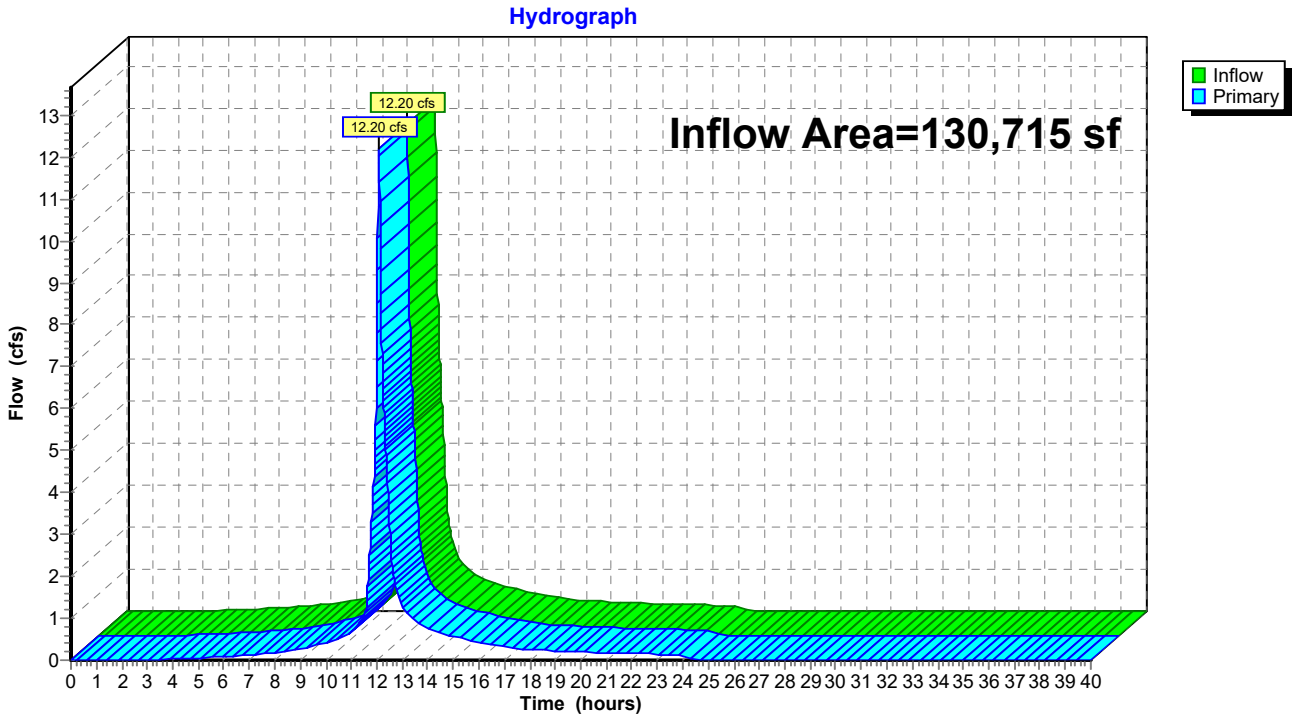


Summary for Link DP-2: DP-2

Inflow Area = 130,715 sf, 81.71% Impervious, Inflow Depth = 3.91" for 10-year event
Inflow = 12.20 cfs @ 12.08 hrs, Volume= 42,541 cf
Primary = 12.20 cfs @ 12.08 hrs, Volume= 42,541 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-2: DP-2

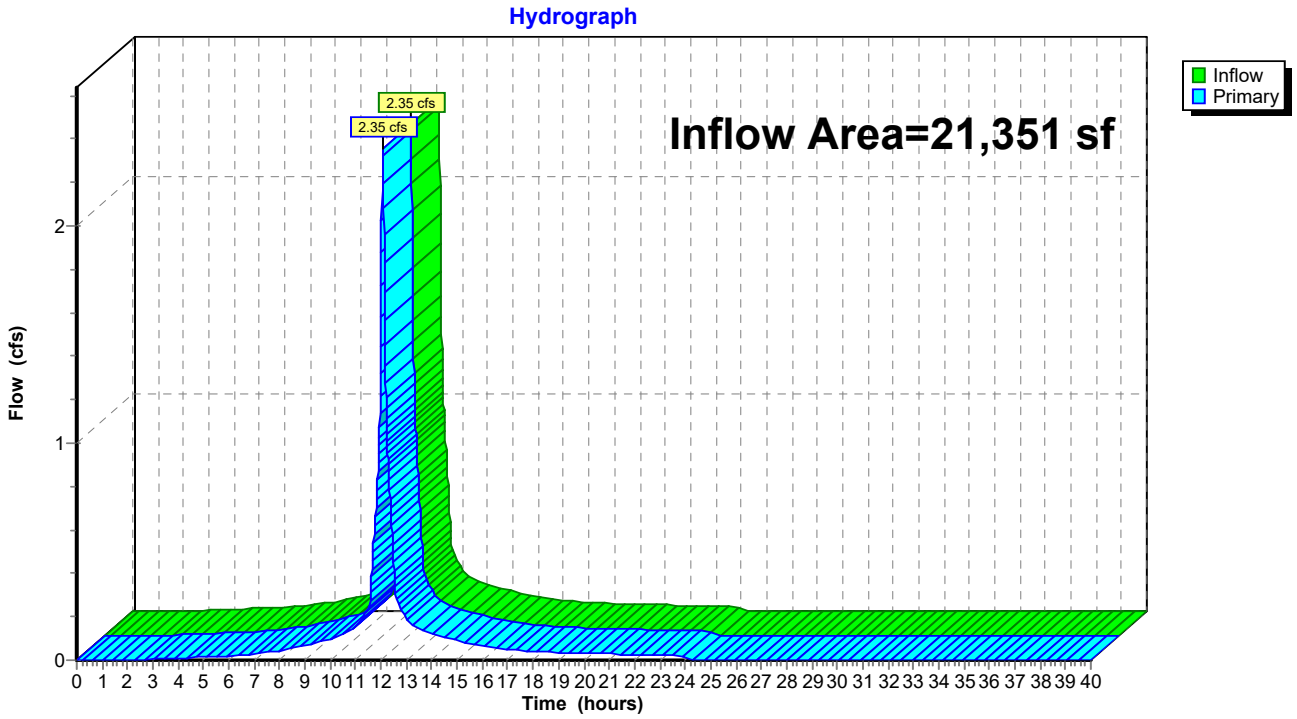


Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.08% Impervious, Inflow Depth = 4.30" for 10-year event
Inflow = 2.35 cfs @ 12.07 hrs, Volume= 7,652 cf
Primary = 2.35 cfs @ 12.07 hrs, Volume= 7,652 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-3: DP-3

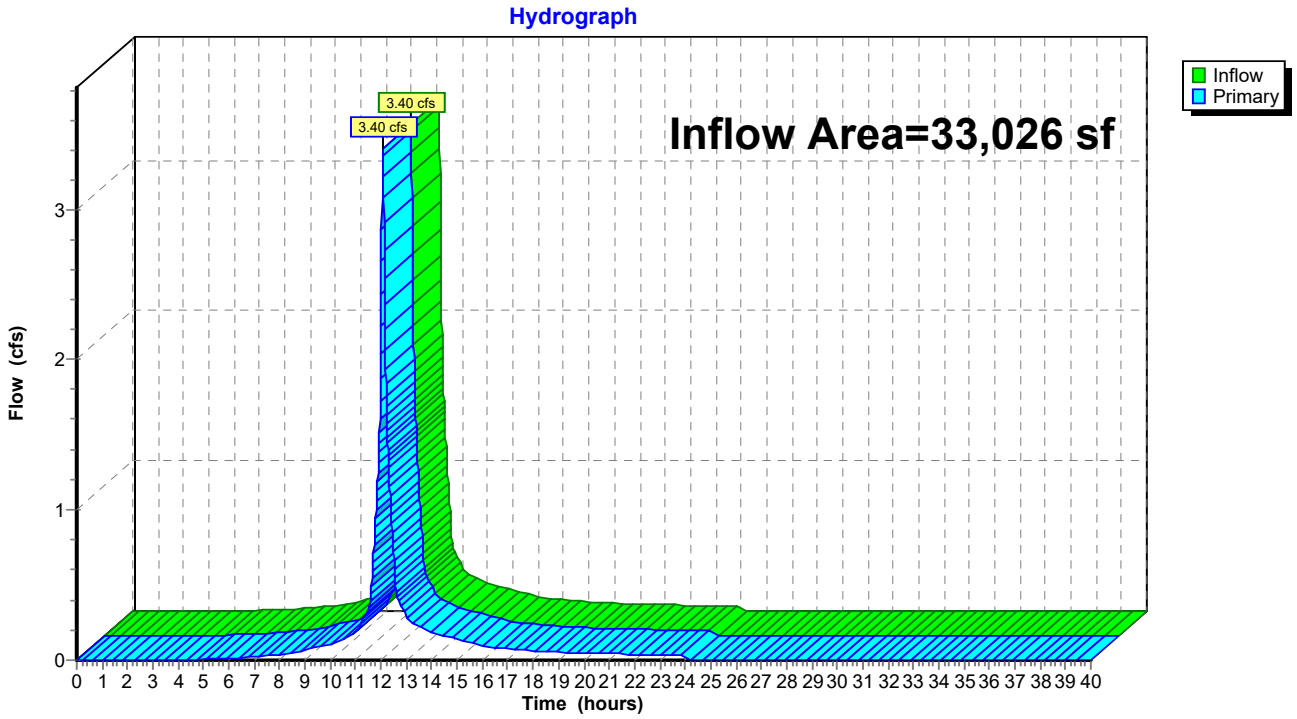


Summary for Link DP-4: DP-4

Inflow Area = 33,026 sf, 66.09% Impervious, Inflow Depth = 3.85" for 10-year event
Inflow = 3.40 cfs @ 12.07 hrs, Volume= 10,594 cf
Primary = 3.40 cfs @ 12.07 hrs, Volume= 10,594 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-4: DP-4



25-Year Storm Event- Proposed

Time span=0.00-40.00 hrs, dt=0.01 hrs, 4001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1B: 1B Runoff Area=8,063 sf 78.66% Impervious Runoff Depth=5.31"
Tc=5.0 min CN=94 Runoff=1.10 cfs 3,566 cf

Subcatchment1C: 1C Runoff Area=33,547 sf 91.76% Impervious Runoff Depth=5.65"
Tc=5.0 min CN=97 Runoff=4.68 cfs 15,807 cf

Subcatchment2B: 2B Runoff Area=25,908 sf 87.45% Impervious Runoff Depth=5.31"
Tc=5.0 min CN=94 Runoff=3.52 cfs 11,457 cf

Subcatchment2C: 2C Runoff Area=10,949 sf 89.54% Impervious Runoff Depth=5.42"
Tc=5.0 min CN=95 Runoff=1.50 cfs 4,947 cf

Subcatchment2D: 2D Runoff Area=93,858 sf 79.22% Impervious Runoff Depth=5.31"
Tc=5.0 min CN=94 Runoff=12.76 cfs 41,505 cf

Subcatchment3A: 3A Runoff Area=21,351 sf 86.08% Impervious Runoff Depth=5.42"
Tc=5.0 min CN=95 Runoff=2.93 cfs 9,646 cf

Subcatchment4B: 4B Runoff Area=3,093 sf 100.00% Impervious Runoff Depth=5.77"
Tc=5.0 min CN=98 Runoff=0.43 cfs 1,488 cf

Subcatchment4C: 4C Runoff Area=29,933 sf 62.58% Impervious Runoff Depth=4.97"
Tc=5.0 min CN=91 Runoff=3.92 cfs 12,390 cf

Pond INF 1B: INF 1B Peak Elev=17.92' Storage=924 cf Inflow=1.10 cfs 3,566 cf
Outflow=1.00 cfs 2,896 cf

Pond INF 2B: INF 2B Peak Elev=16.84' Storage=4,418 cf Inflow=3.52 cfs 11,457 cf
Outflow=2.21 cfs 9,050 cf

Pond INF 2C: INF 2C Peak Elev=16.22' Storage=1,118 cf Inflow=1.50 cfs 4,947 cf
Outflow=1.38 cfs 4,155 cf

Pond INF 4B: INF 4B Peak Elev=20.32' Storage=325 cf Inflow=0.43 cfs 1,488 cf
Outflow=0.41 cfs 1,242 cf

Link DP-1: DP-1 Inflow=5.60 cfs 18,703 cf
Primary=5.60 cfs 18,703 cf

Link DP-2: DP-2 Inflow=15.81 cfs 54,711 cf
Primary=15.81 cfs 54,711 cf

Link DP-3: DP-3 Inflow=2.93 cfs 9,646 cf
Primary=2.93 cfs 9,646 cf

Link DP-4: DP-4 Inflow=4.31 cfs 13,632 cf
Primary=4.31 cfs 13,632 cf

Total Runoff Area = 226,702 sf Runoff Volume = 100,804 cf Average Runoff Depth = 5.34"
18.77% Pervious = 42,559 sf 81.23% Impervious = 184,143 sf

Summary for Subcatchment 1B: 1B

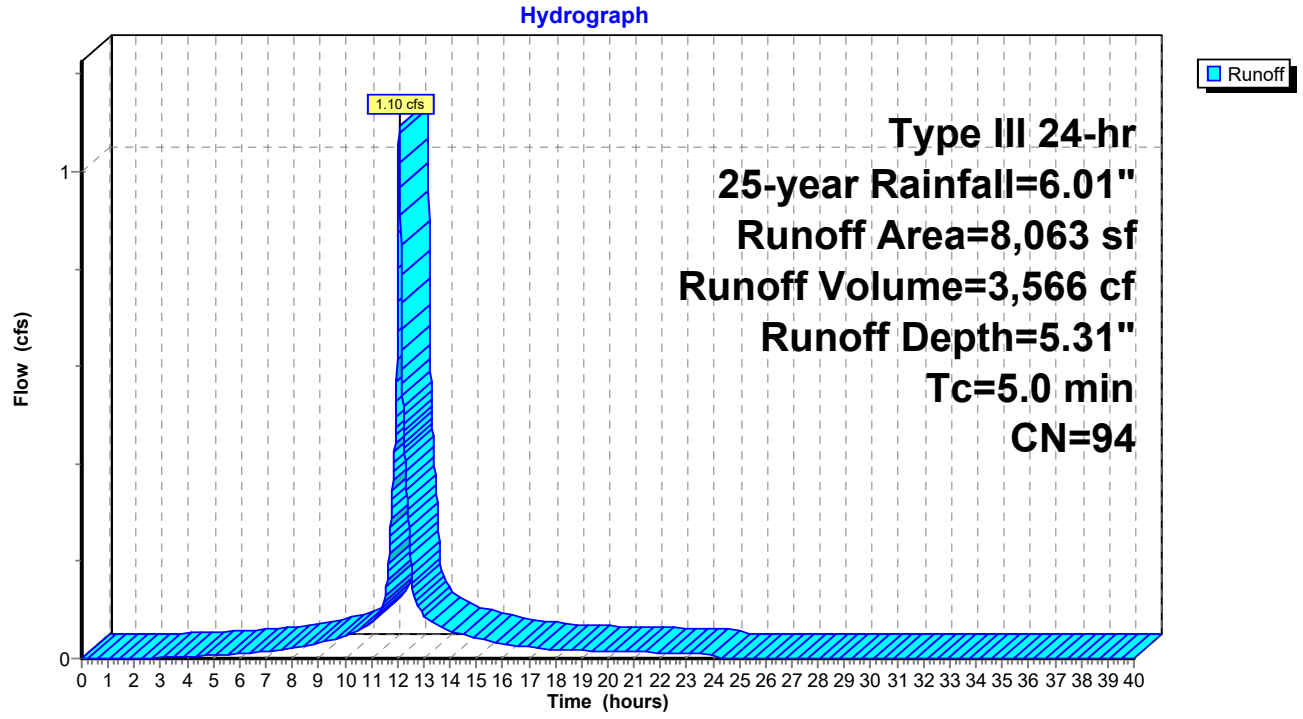
Runoff = 1.10 cfs @ 12.07 hrs, Volume= 3,566 cf, Depth= 5.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.01"

Area (sf)	CN	Description
6,342	98	Paved parking, HSG D
1,721	80	>75% Grass cover, Good, HSG D
8,063	94	Weighted Average
1,721		21.34% Pervious Area
6,342		78.66% Impervious Area

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

Subcatchment 1B: 1B



Summary for Subcatchment 1C: 1C

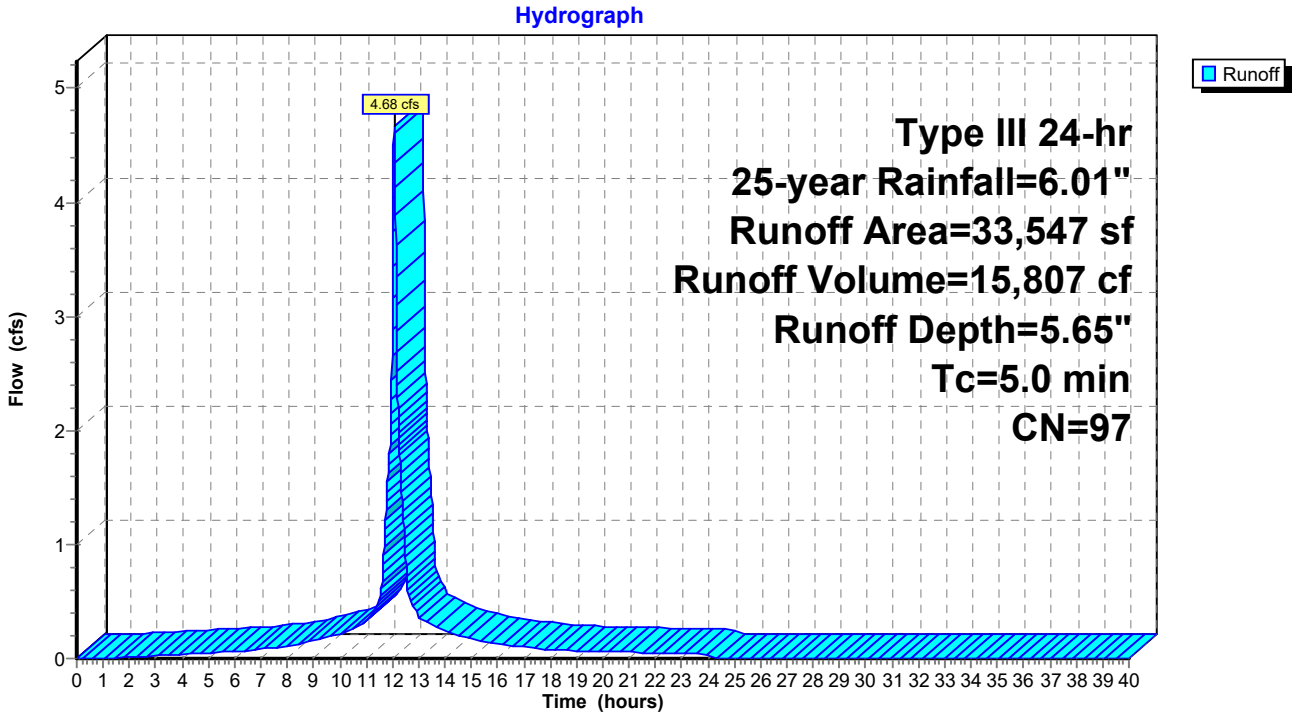
Runoff = 4.68 cfs @ 12.07 hrs, Volume= 15,807 cf, Depth= 5.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.01"

Area (sf)	CN	Description
30,784	98	Paved parking, HSG D
2,763	80	>75% Grass cover, Good, HSG D
33,547	97	Weighted Average
2,763		8.24% Pervious Area
30,784		91.76% Impervious Area

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

Subcatchment 1C: 1C



Summary for Subcatchment 2B: 2B

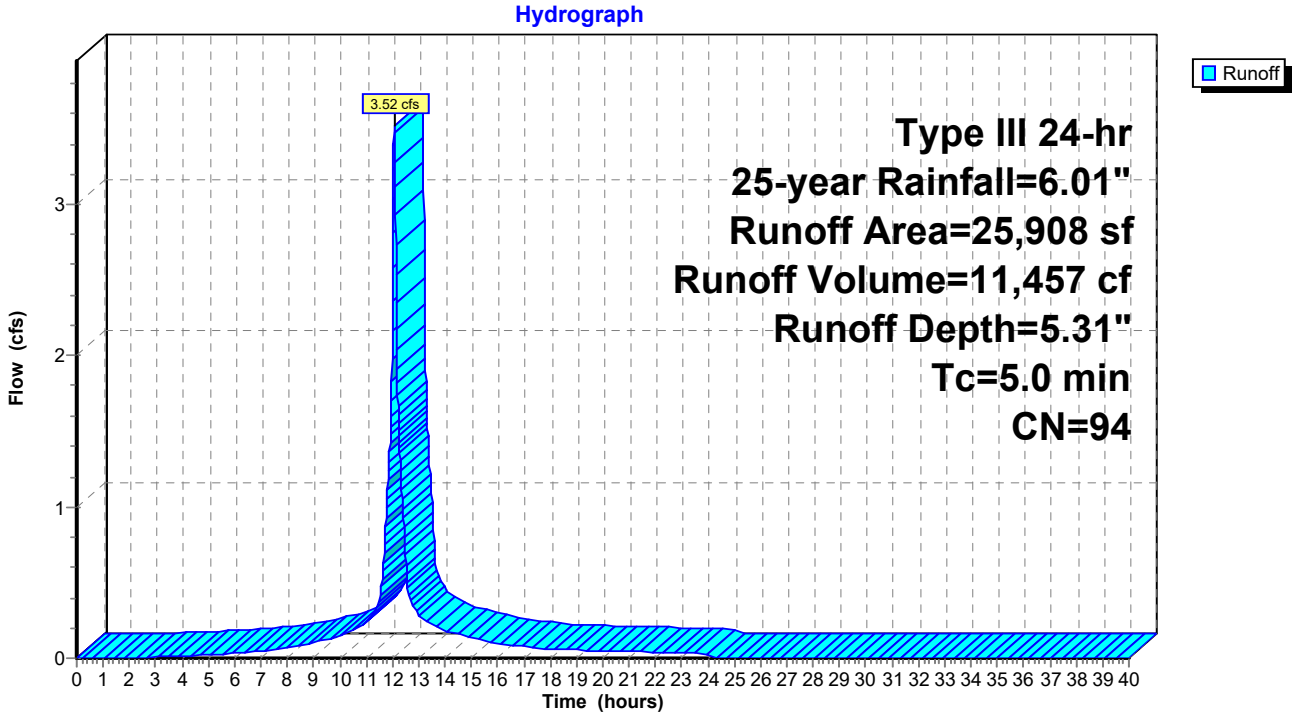
Runoff = 3.52 cfs @ 12.07 hrs, Volume= 11,457 cf, Depth= 5.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.01"

Area (sf)	CN	Description
22,657	98	Paved parking, HSG D
1,214	80	>75% Grass cover, Good, HSG D
2,037	61	>75% Grass cover, Good, HSG B
25,908	94	Weighted Average
3,251		12.55% Pervious Area
22,657		87.45% Impervious Area

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

Subcatchment 2B: 2B



Summary for Subcatchment 2C: 2C

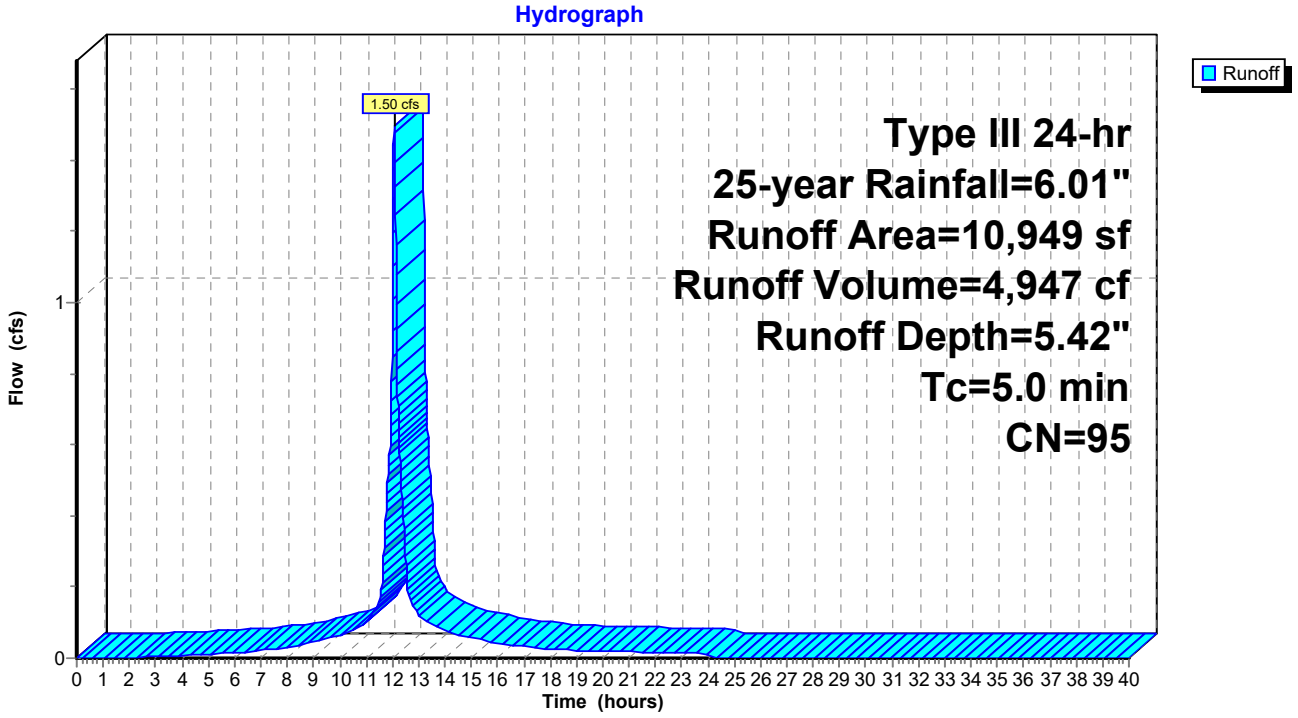
Runoff = 1.50 cfs @ 12.07 hrs, Volume= 4,947 cf, Depth= 5.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.01"

Area (sf)	CN	Description
9,804	98	Paved parking, HSG D
343	80	>75% Grass cover, Good, HSG D
802	61	>75% Grass cover, Good, HSG B
10,949	95	Weighted Average
1,145		10.46% Pervious Area
9,804		89.54% Impervious Area

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

Subcatchment 2C: 2C



Summary for Subcatchment 2D: 2D

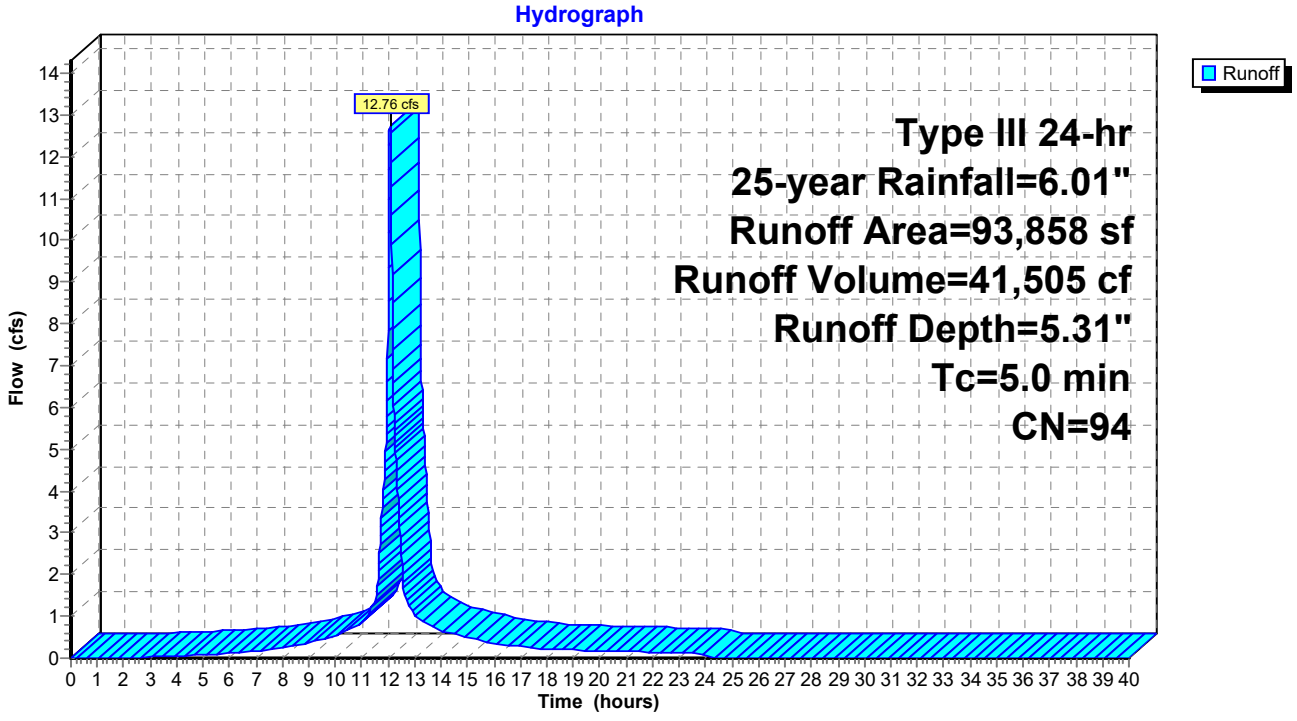
Runoff = 12.76 cfs @ 12.07 hrs, Volume= 41,505 cf, Depth= 5.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.01"

Area (sf)	CN	Description
74,350	98	Paved parking, HSG D
19,198	80	>75% Grass cover, Good, HSG D
310	61	>75% Grass cover, Good, HSG B
93,858	94	Weighted Average
19,508		20.78% Pervious Area
74,350		79.22% Impervious Area

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

Subcatchment 2D: 2D



Summary for Subcatchment 3A: 3A

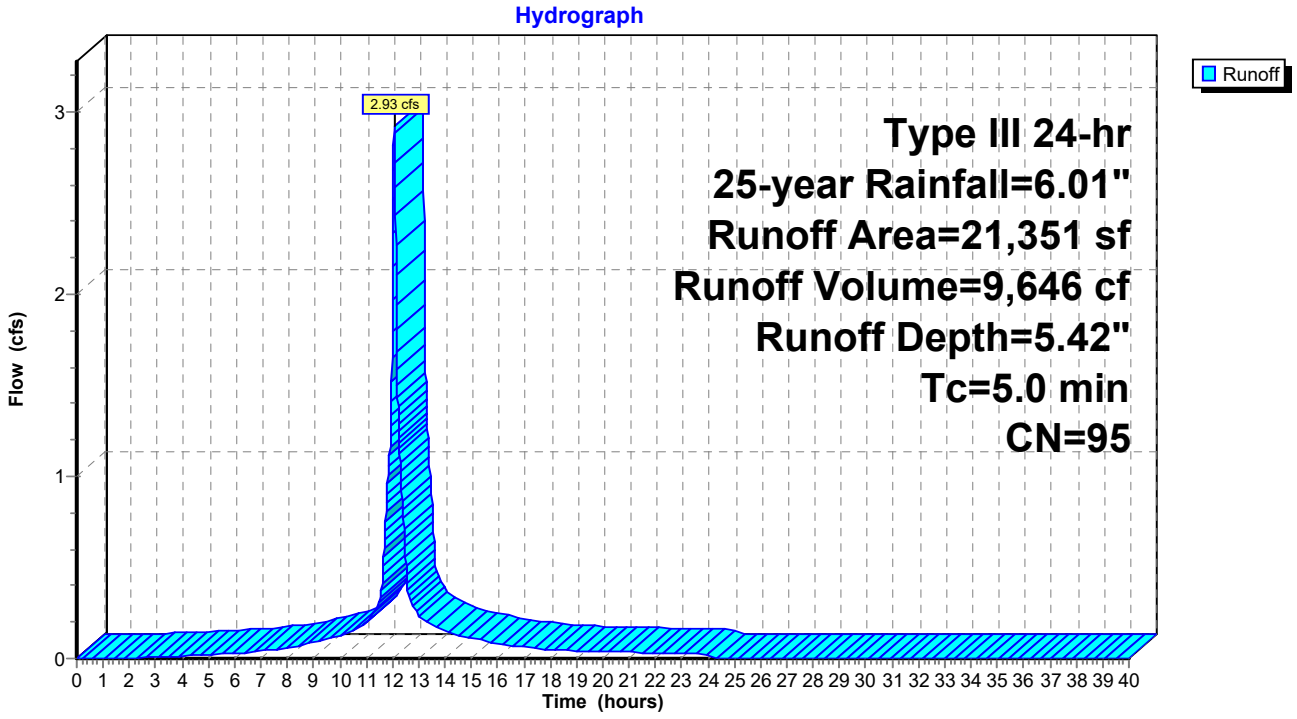
Runoff = 2.93 cfs @ 12.07 hrs, Volume= 9,646 cf, Depth= 5.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.01"

Area (sf)	CN	Description
18,380	98	Paved parking, HSG D
2,971	80	>75% Grass cover, Good, HSG D
21,351	95	Weighted Average
2,971		13.92% Pervious Area
18,380		86.08% Impervious Area

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

Subcatchment 3A: 3A



Summary for Subcatchment 4B: 4B

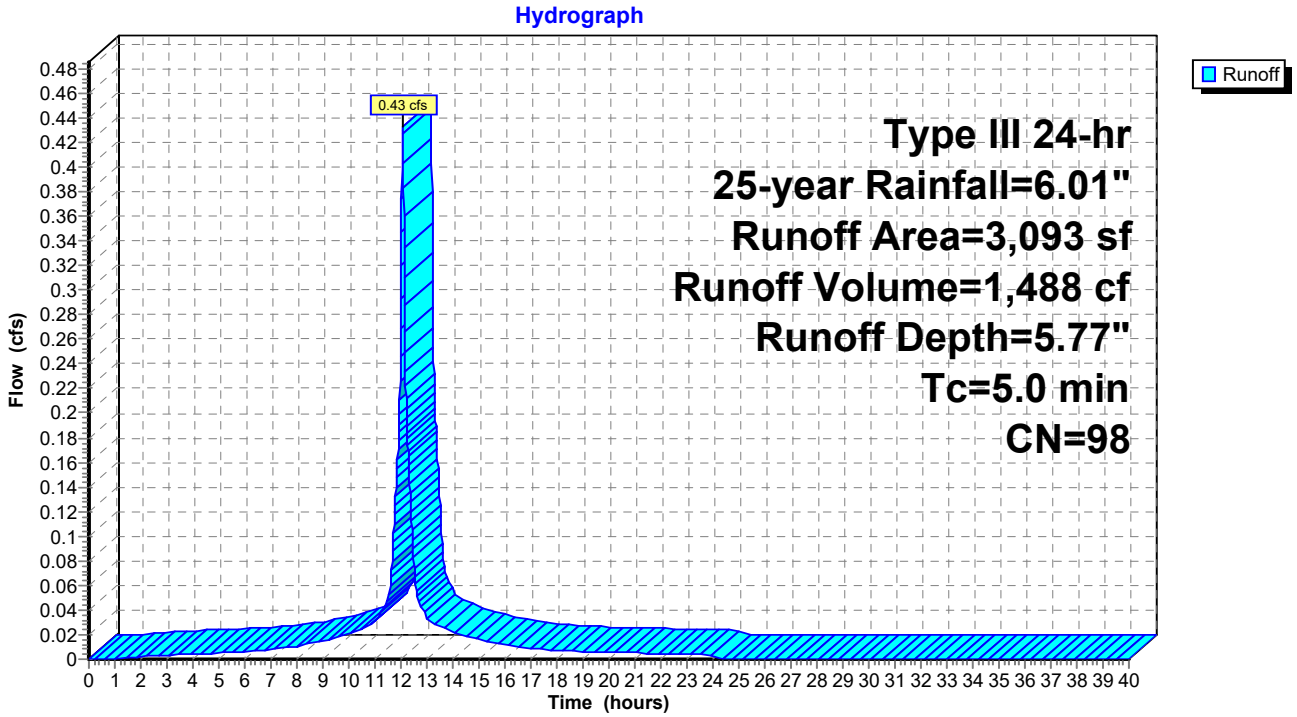
Runoff = 0.43 cfs @ 12.07 hrs, Volume= 1,488 cf, Depth= 5.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.01"

Area (sf)	CN	Description
3,093	98	Paved parking, HSG D
3,093		100.00% Impervious Area

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

Subcatchment 4B: 4B



Summary for Subcatchment 4C: 4C

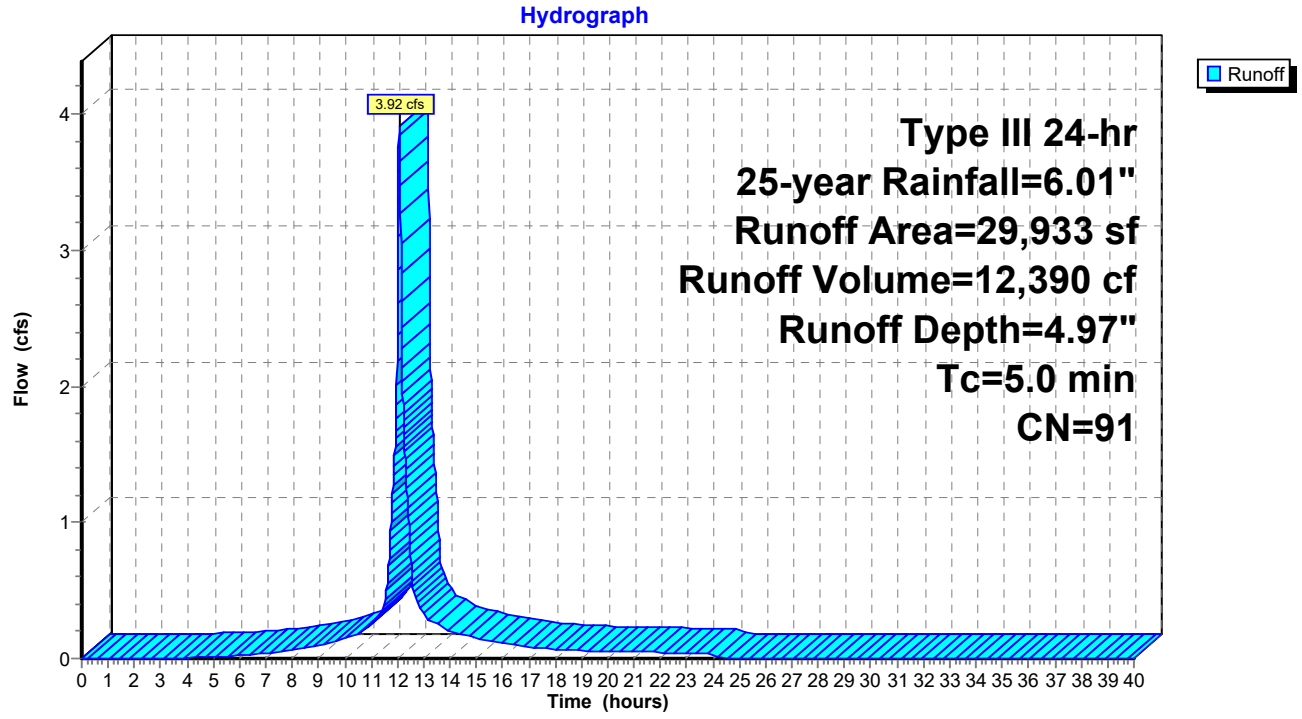
Runoff = 3.92 cfs @ 12.07 hrs, Volume= 12,390 cf, Depth= 4.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.01"

Area (sf)	CN	Description
18,733	98	Paved parking, HSG D
11,200	80	>75% Grass cover, Good, HSG D
29,933	91	Weighted Average
11,200		37.42% Pervious Area
18,733		62.58% Impervious Area

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

Subcatchment 4C: 4C



Summary for Pond INF 1B: INF 1B

Inflow Area = 8,063 sf, 78.66% Impervious, Inflow Depth = 5.31" for 25-year event
Inflow = 1.10 cfs @ 12.07 hrs, Volume= 3,566 cf
Outflow = 1.00 cfs @ 12.10 hrs, Volume= 2,896 cf, Atten= 9%, Lag= 2.1 min
Primary = 1.00 cfs @ 12.10 hrs, Volume= 2,896 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 17.92' @ 12.10 hrs Surf.Area= 745 sf Storage= 924 cf

Plug-Flow detention time= 138.6 min calculated for 2,896 cf (81% of inflow)
Center-of-Mass det. time= 65.9 min (833.4 - 767.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	15.90'	587 cf	**11.00'W x 67.70'L x 3.50'H Field A** 2,606 cf Overall - 827 cf Embedded = 1,779 cf x 33.0% Voids
#2A	16.40'	827 cf	**ADS_StormTech SC-740 +Cap** x 18 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 2 Rows of 9 Chambers
		1,414 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	17.40'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.00 cfs @ 12.10 hrs HW=17.91' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 1.00 cfs @ 2.44 fps)

Pond INF 1B: INF 1B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

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

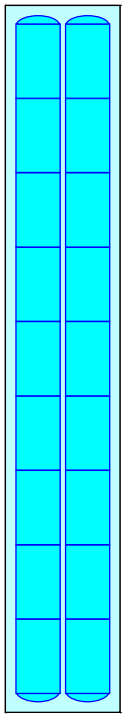
9 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 65.70' Row Length +12.0" End Stone x 2 = 67.70' Base Length
2 Rows x 51.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.00' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

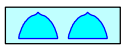
18 Chambers x 45.9 cf = 826.9 cf Chamber Storage

2,606.3 cf Field - 826.9 cf Chambers = 1,779.4 cf Stone x 33.0% Voids = 587.2 cf Stone Storage

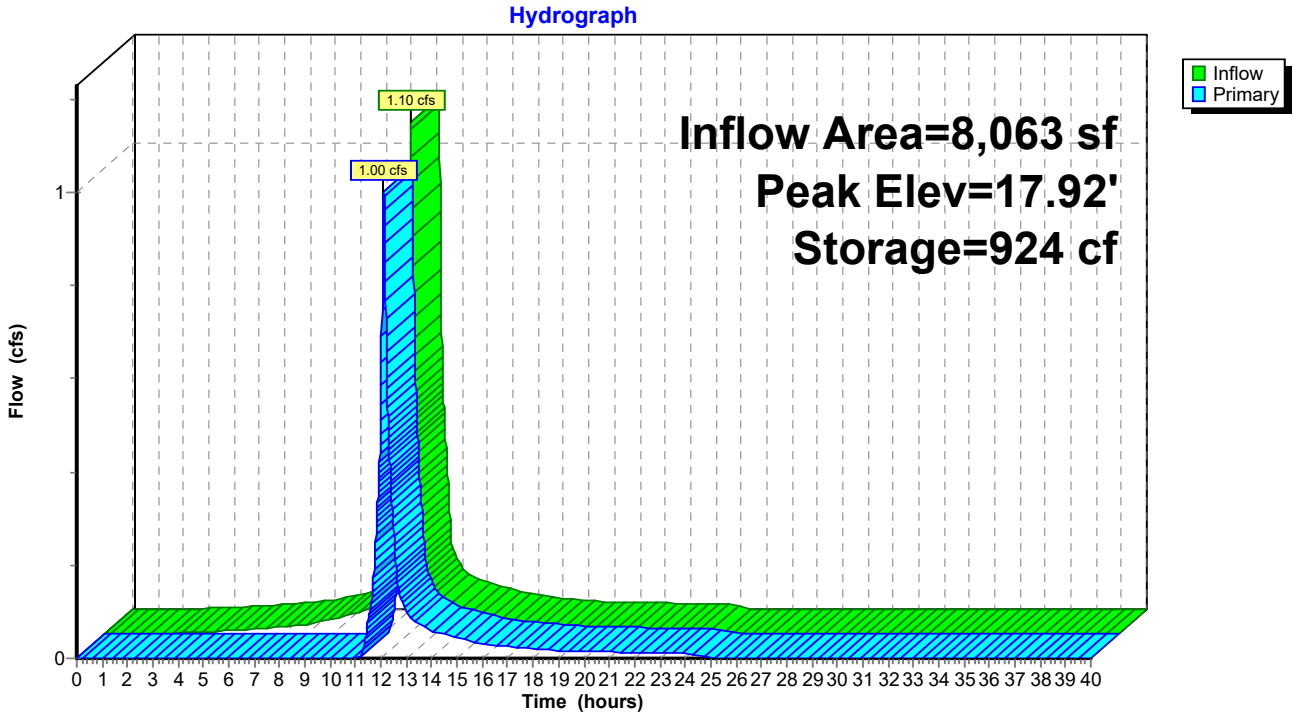
Chamber Storage + Stone Storage = 1,414.1 cf = 0.032 af
Overall Storage Efficiency = 54.3%
Overall System Size = 67.70' x 11.00' x 3.50'

18 Chambers
96.5 cy Field
65.9 cy Stone





Pond INF 1B: INF 1B



Summary for Pond INF 2B: INF 2B

Inflow Area = 25,908 sf, 87.45% Impervious, Inflow Depth = 5.31" for 25-year event
Inflow = 3.52 cfs @ 12.07 hrs, Volume= 11,457 cf
Outflow = 2.21 cfs @ 12.16 hrs, Volume= 9,050 cf, Atten= 37%, Lag= 5.3 min
Primary = 2.21 cfs @ 12.16 hrs, Volume= 9,050 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 16.84' @ 12.16 hrs Surf.Area= 3,327 sf Storage= 4,418 cf

Plug-Flow detention time= 174.5 min calculated for 9,048 cf (79% of inflow)
Center-of-Mass det. time= 97.2 min (864.8 - 767.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	14.80'	2,479 cf	**25.25'W x 131.78'L x 3.50'H Field A** 11,646 cf Overall - 4,135 cf Embedded = 7,511 cf x 33.0% Voids
#2A	15.30'	4,135 cf	**ADS_StormTech SC-740 +Cap** x 90 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 18 Chambers
		6,613 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	16.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.21 cfs @ 12.16 hrs HW=16.84' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 2.21 cfs @ 3.13 fps)

Pond INF 2B: INF 2B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

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

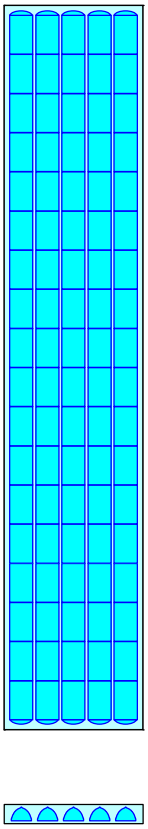
18 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 129.78' Row Length +12.0" End Stone x 2 = 131.78' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

90 Chambers x 45.9 cf = 4,134.6 cf Chamber Storage

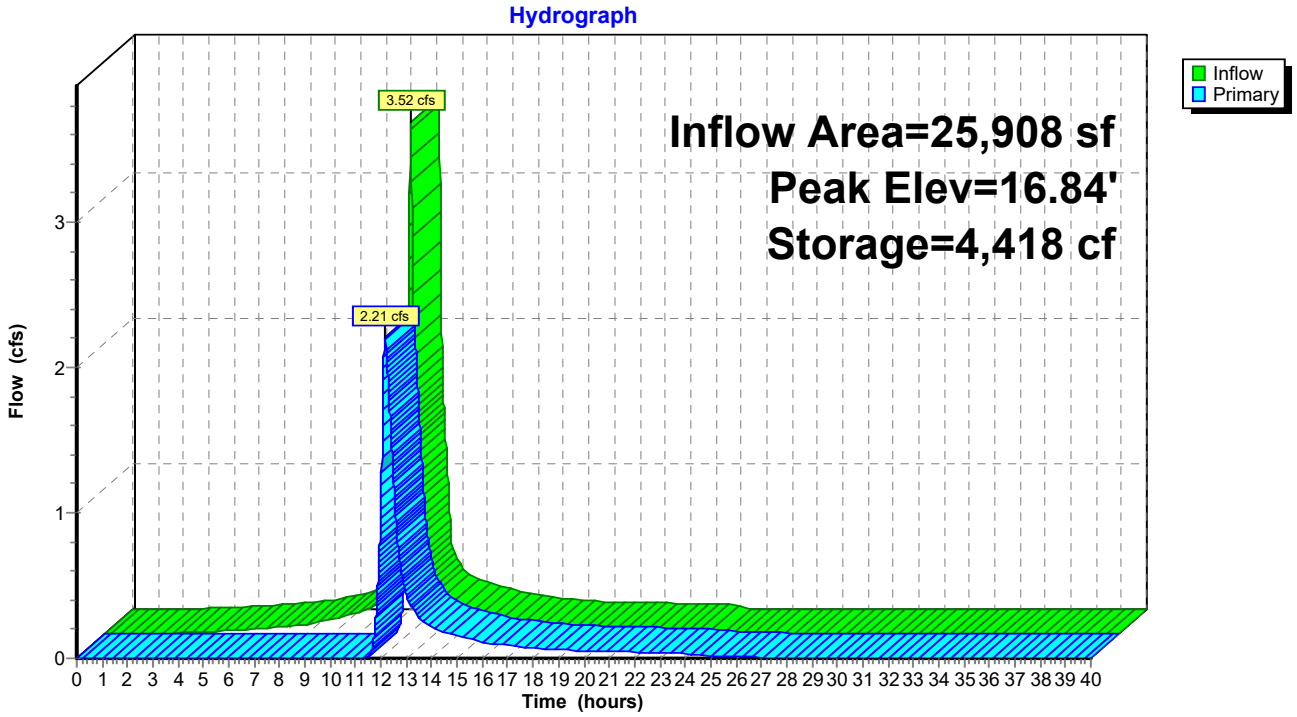
11,645.8 cf Field - 4,134.6 cf Chambers = 7,511.2 cf Stone x 33.0% Voids = 2,478.7 cf Stone Storage

Chamber Storage + Stone Storage = 6,613.3 cf = 0.152 af
Overall Storage Efficiency = 56.8%
Overall System Size = 131.78' x 25.25' x 3.50'

90 Chambers
431.3 cy Field
278.2 cy Stone



Pond INF 2B: INF 2B



Summary for Pond INF 2C: INF 2C

Inflow Area = 10,949 sf, 89.54% Impervious, Inflow Depth = 5.42" for 25-year event
Inflow = 1.50 cfs @ 12.07 hrs, Volume= 4,947 cf
Outflow = 1.38 cfs @ 12.10 hrs, Volume= 4,155 cf, Atten= 8%, Lag= 2.0 min
Primary = 1.38 cfs @ 12.10 hrs, Volume= 4,155 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 16.22' @ 12.10 hrs Surf.Area= 810 sf Storage= 1,118 cf

Plug-Flow detention time= 128.6 min calculated for 4,154 cf (84% of inflow)
Center-of-Mass det. time= 62.1 min (824.8 - 762.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	14.00'	633 cf	**25.25'W x 32.10'L x 3.50'H Field A** 2,837 cf Overall - 919 cf Embedded = 1,918 cf x 33.0% Voids
#2A	14.50'	919 cf	**ADS_StormTech SC-740 +Cap** x 20 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 4 Chambers
		1,552 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	15.60'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.38 cfs @ 12.10 hrs HW=16.22' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 1.38 cfs @ 2.68 fps)

Pond INF 2C: INF 2C - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

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

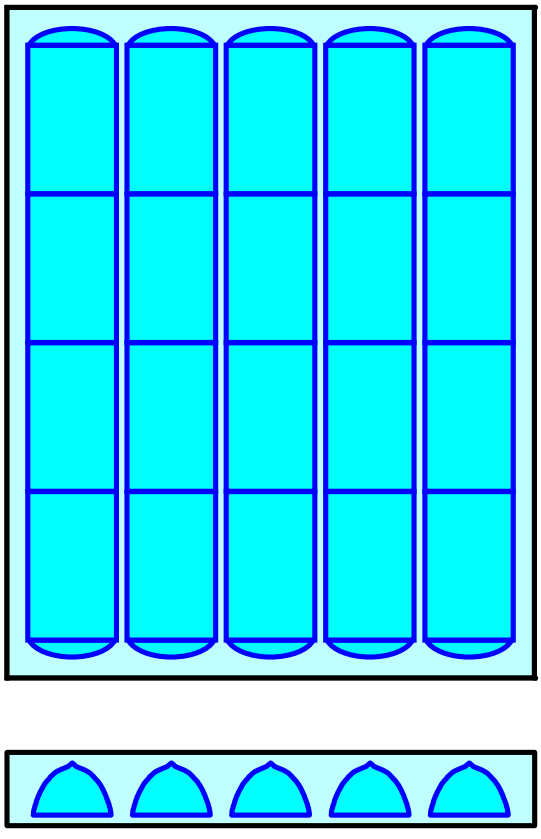
4 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 30.10' Row Length +12.0" End Stone x 2 = 32.10' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

20 Chambers x 45.9 cf = 918.8 cf Chamber Storage

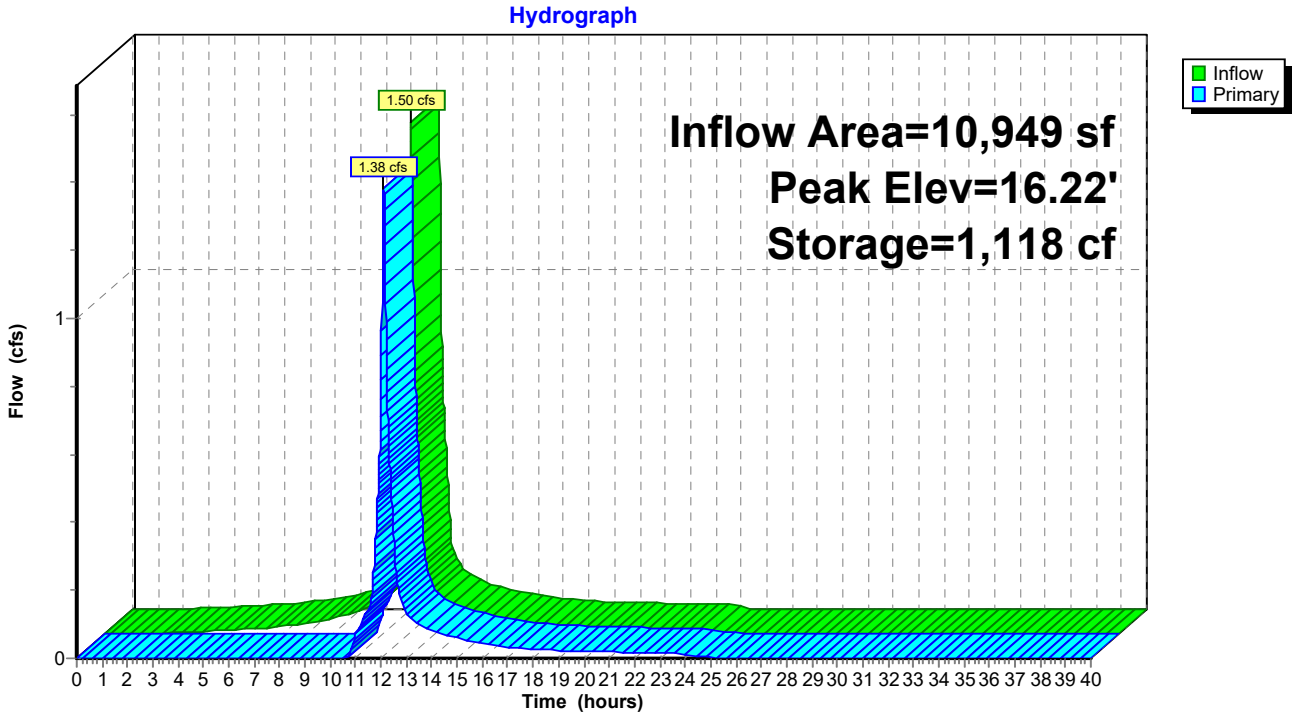
2,836.5 cf Field - 918.8 cf Chambers = 1,917.7 cf Stone x 33.0% Voids = 632.9 cf Stone Storage

Chamber Storage + Stone Storage = 1,551.7 cf = 0.036 af
Overall Storage Efficiency = 54.7%
Overall System Size = 32.10' x 25.25' x 3.50'

20 Chambers
105.1 cy Field
71.0 cy Stone



Pond INF 2C: INF 2C



Summary for Pond INF 4B: INF 4B

Inflow Area = 3,093 sf,100.00% Impervious, Inflow Depth = 5.77" for 25-year event
Inflow = 0.43 cfs @ 12.07 hrs, Volume= 1,488 cf
Outflow = 0.41 cfs @ 12.10 hrs, Volume= 1,242 cf, Atten= 6%, Lag= 1.6 min
Primary = 0.41 cfs @ 12.10 hrs, Volume= 1,242 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 20.32' @ 12.10 hrs Surf.Area= 379 sf Storage= 325 cf

Plug-Flow detention time= 139.6 min calculated for 1,242 cf (83% of inflow)
Center-of-Mass det. time= 70.2 min (814.4 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	18.80'	316 cf	**6.25'W x 60.58'L x 3.50'H Field A** 1,325 cf Overall - 368 cf Embedded = 958 cf x 33.0% Voids
#2A	19.30'	368 cf	**ADS_StormTech SC-740 +Cap** x 8 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		684 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	20.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.41 cfs @ 12.10 hrs HW=20.32' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.41 cfs @ 1.91 fps)

Pond INF 4B: INF 4B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

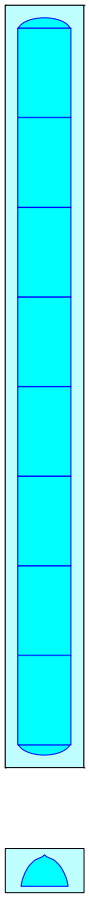
8 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 58.58' Row Length +12.0" End Stone x 2 = 60.58' Base Length
1 Rows x 51.0" Wide + 12.0" Side Stone x 2 = 6.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

8 Chambers x 45.9 cf = 367.5 cf Chamber Storage

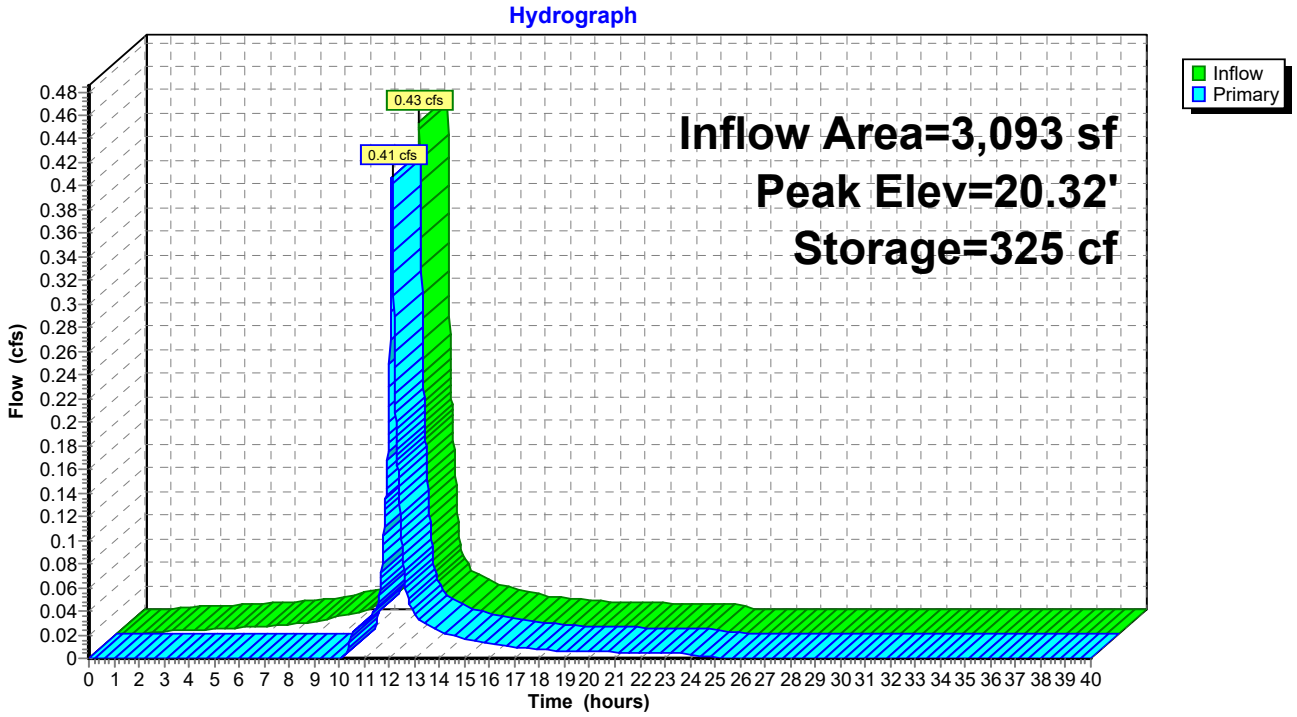
1,325.1 cf Field - 367.5 cf Chambers = 957.6 cf Stone x 33.0% Voids = 316.0 cf Stone Storage

Chamber Storage + Stone Storage = 683.5 cf = 0.016 af
Overall Storage Efficiency = 51.6%
Overall System Size = 60.58' x 6.25' x 3.50'

8 Chambers
49.1 cy Field
35.5 cy Stone



Pond INF 4B: INF 4B

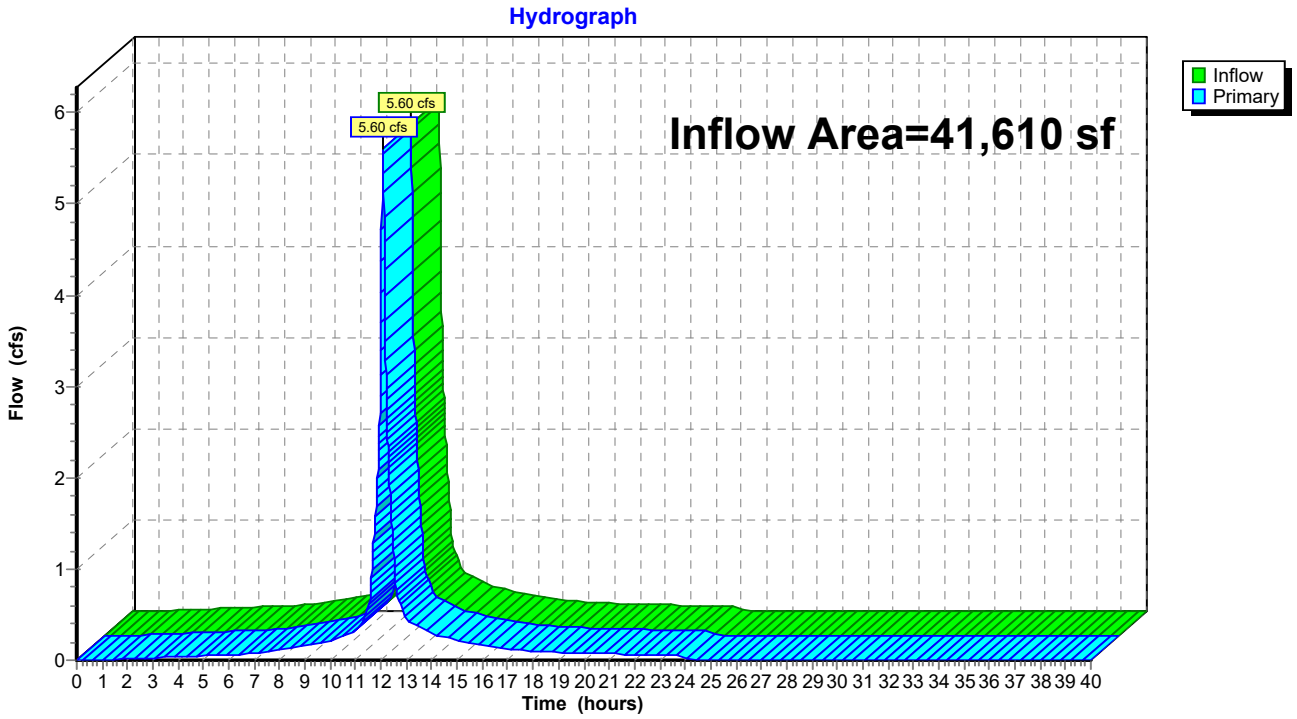


Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 89.22% Impervious, Inflow Depth = 5.39" for 25-year event
Inflow = 5.60 cfs @ 12.07 hrs, Volume= 18,703 cf
Primary = 5.60 cfs @ 12.07 hrs, Volume= 18,703 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-1: DP-1

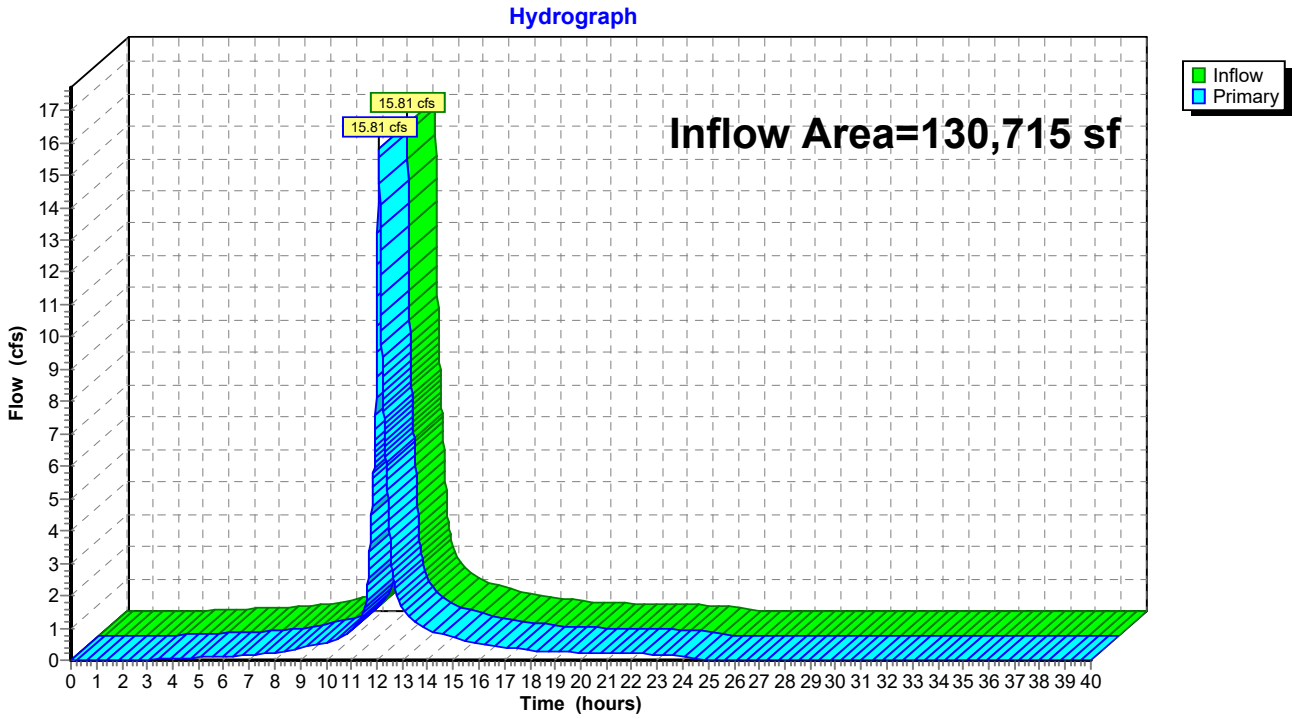


Summary for Link DP-2: DP-2

Inflow Area = 130,715 sf, 81.71% Impervious, Inflow Depth = 5.02" for 25-year event
Inflow = 15.81 cfs @ 12.08 hrs, Volume= 54,711 cf
Primary = 15.81 cfs @ 12.08 hrs, Volume= 54,711 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-2: DP-2

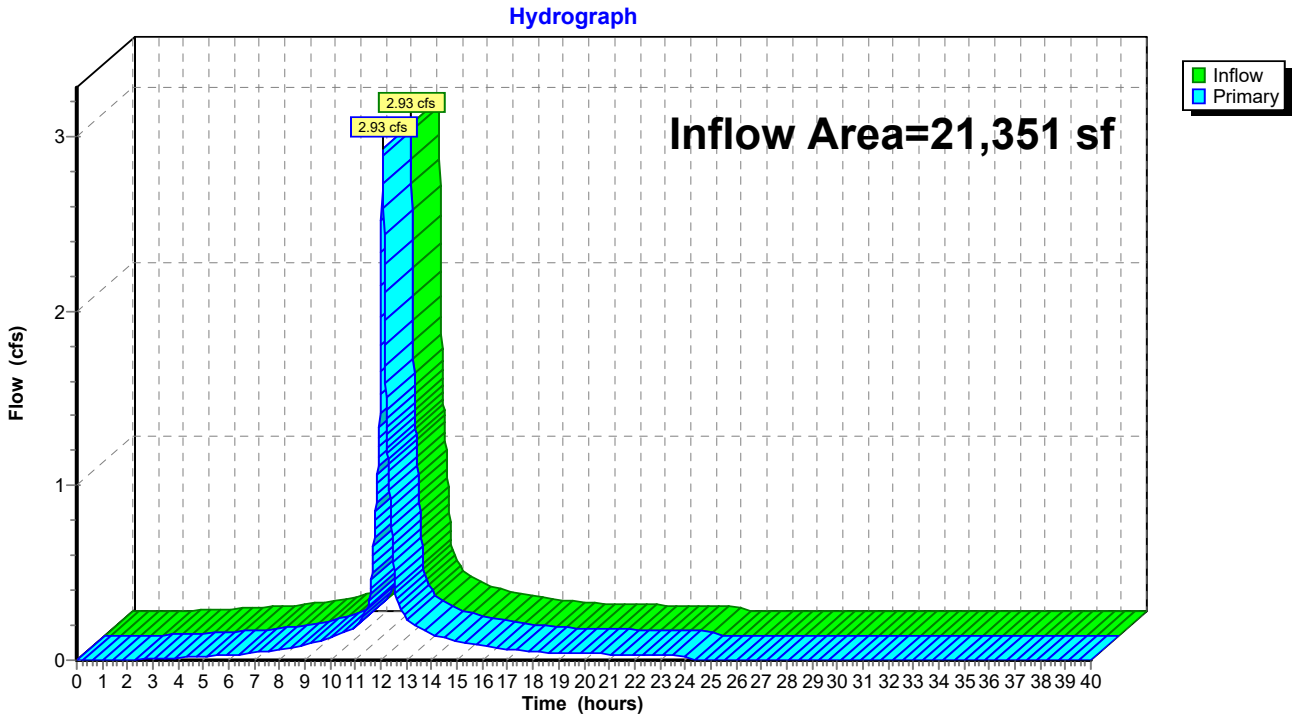


Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.08% Impervious, Inflow Depth = 5.42" for 25-year event
Inflow = 2.93 cfs @ 12.07 hrs, Volume= 9,646 cf
Primary = 2.93 cfs @ 12.07 hrs, Volume= 9,646 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-3: DP-3

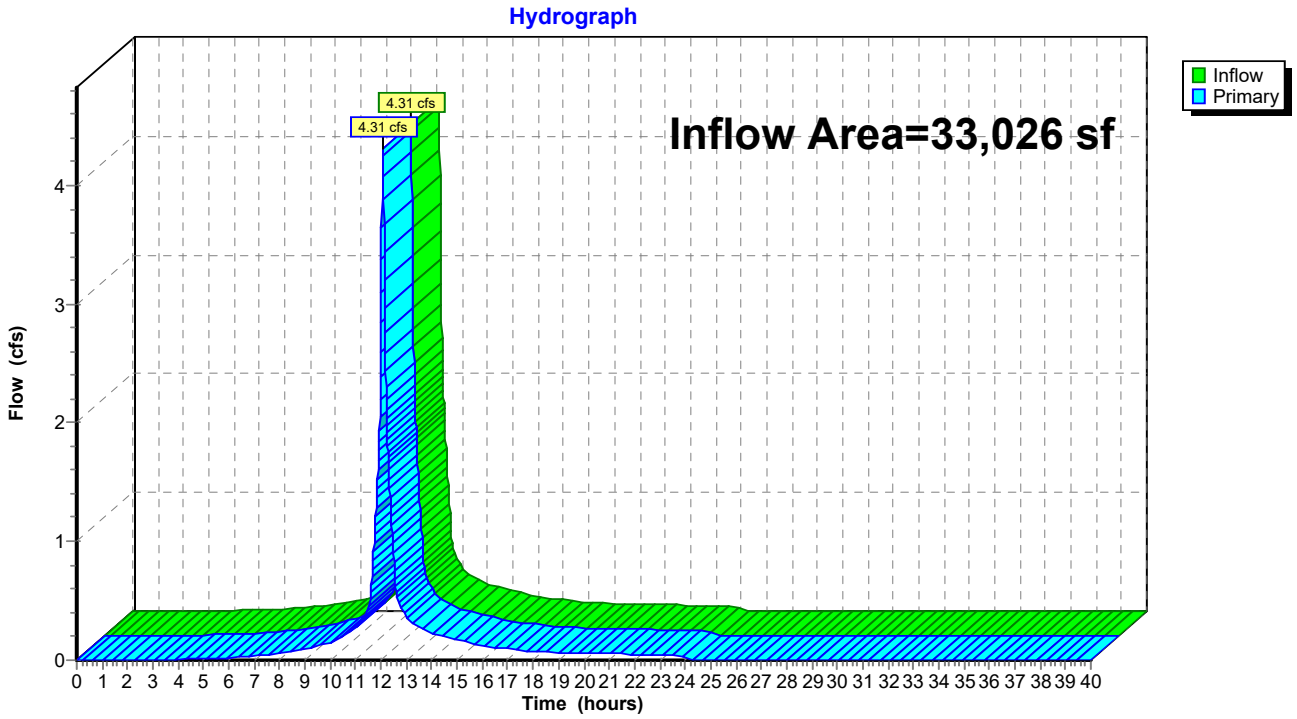


Summary for Link DP-4: DP-4

Inflow Area = 33,026 sf, 66.09% Impervious, Inflow Depth = 4.95" for 25-year event
Inflow = 4.31 cfs @ 12.07 hrs, Volume= 13,632 cf
Primary = 4.31 cfs @ 12.07 hrs, Volume= 13,632 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-4: DP-4



100-Year Storm Event – Proposed

Time span=0.00-40.00 hrs, dt=0.01 hrs, 4001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1B: 1B Runoff Area=8,063 sf 78.66% Impervious Runoff Depth=7.03"
Tc=5.0 min CN=94 Runoff=1.43 cfs 4,726 cf

Subcatchment1C: 1C Runoff Area=33,547 sf 91.76% Impervious Runoff Depth=7.39"
Tc=5.0 min CN=97 Runoff=6.05 cfs 20,662 cf

Subcatchment2B: 2B Runoff Area=25,908 sf 87.45% Impervious Runoff Depth=7.03"
Tc=5.0 min CN=94 Runoff=4.60 cfs 15,185 cf

Subcatchment2C: 2C Runoff Area=10,949 sf 89.54% Impervious Runoff Depth=7.15"
Tc=5.0 min CN=95 Runoff=1.96 cfs 6,526 cf

Subcatchment2D: 2D Runoff Area=93,858 sf 79.22% Impervious Runoff Depth=7.03"
Tc=5.0 min CN=94 Runoff=16.66 cfs 55,011 cf

Subcatchment3A: 3A Runoff Area=21,351 sf 86.08% Impervious Runoff Depth=7.15"
Tc=5.0 min CN=95 Runoff=3.81 cfs 12,726 cf

Subcatchment4B: 4B Runoff Area=3,093 sf 100.00% Impervious Runoff Depth=7.51"
Tc=5.0 min CN=98 Runoff=0.56 cfs 1,936 cf

Subcatchment4C: 4C Runoff Area=29,933 sf 62.58% Impervious Runoff Depth=6.68"
Tc=5.0 min CN=91 Runoff=5.18 cfs 16,657 cf

Pond INF 1B: INF 1B Peak Elev=18.01' Storage=966 cf Inflow=1.43 cfs 4,726 cf
Outflow=1.32 cfs 4,057 cf

Pond INF 2B: INF 2B Peak Elev=17.09' Storage=4,931 cf Inflow=4.60 cfs 15,185 cf
Outflow=2.90 cfs 12,778 cf

Pond INF 2C: INF 2C Peak Elev=16.34' Storage=1,173 cf Inflow=1.96 cfs 6,526 cf
Outflow=1.81 cfs 5,735 cf

Pond INF 4B: INF 4B Peak Elev=20.36' Storage=337 cf Inflow=0.56 cfs 1,936 cf
Outflow=0.53 cfs 1,690 cf

Link DP-1: DP-1 Inflow=7.29 cfs 24,718 cf
Primary=7.29 cfs 24,718 cf

Link DP-2: DP-2 Inflow=20.85 cfs 73,524 cf
Primary=20.85 cfs 73,524 cf

Link DP-3: DP-3 Inflow=3.81 cfs 12,726 cf
Primary=3.81 cfs 12,726 cf

Link DP-4: DP-4 Inflow=5.69 cfs 18,347 cf
Primary=5.69 cfs 18,347 cf

Total Runoff Area = 226,702 sf Runoff Volume = 133,428 cf Average Runoff Depth = 7.06"
18.77% Pervious = 42,559 sf 81.23% Impervious = 184,143 sf

Summary for Subcatchment 1B: 1B

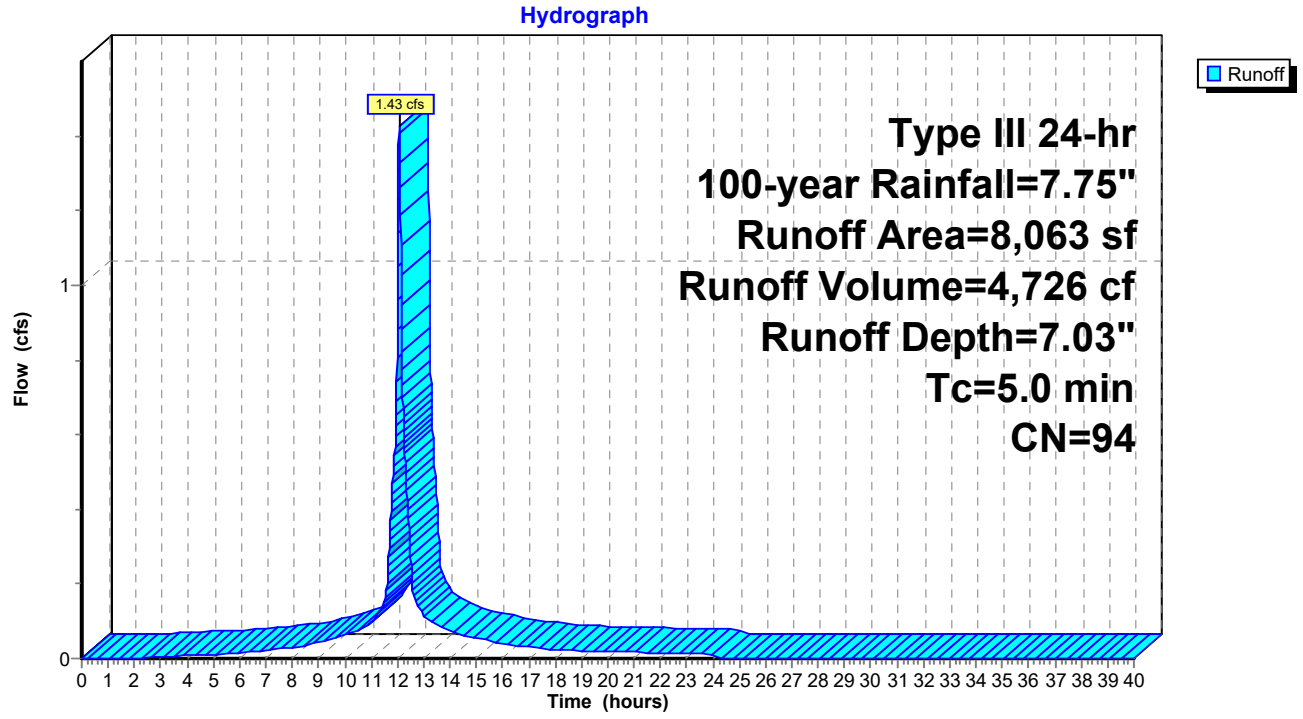
Runoff = 1.43 cfs @ 12.07 hrs, Volume= 4,726 cf, Depth= 7.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.75"

Area (sf)	CN	Description
6,342	98	Paved parking, HSG D
1,721	80	>75% Grass cover, Good, HSG D
8,063	94	Weighted Average
1,721		21.34% Pervious Area
6,342		78.66% Impervious Area

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

Subcatchment 1B: 1B



Summary for Subcatchment 1C: 1C

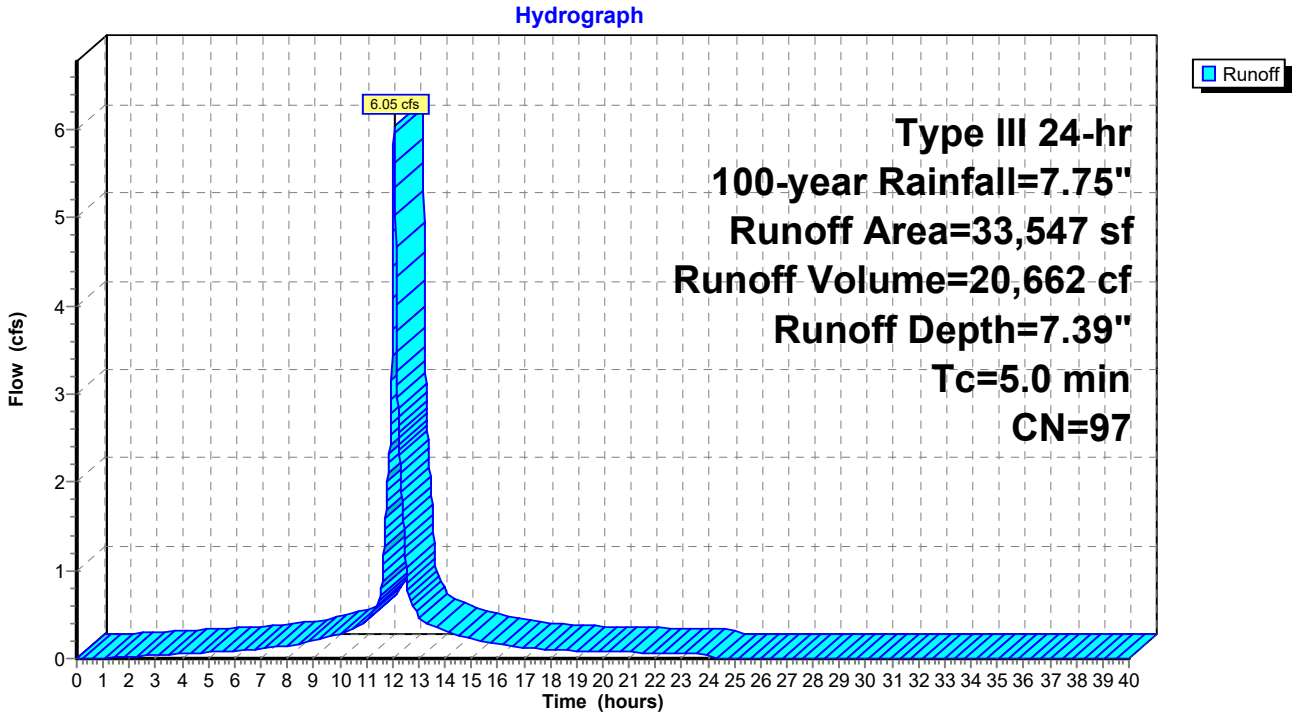
Runoff = 6.05 cfs @ 12.07 hrs, Volume= 20,662 cf, Depth= 7.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.75"

Area (sf)	CN	Description
30,784	98	Paved parking, HSG D
2,763	80	>75% Grass cover, Good, HSG D
33,547	97	Weighted Average
2,763		8.24% Pervious Area
30,784		91.76% Impervious Area

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

Subcatchment 1C: 1C



Summary for Subcatchment 2B: 2B

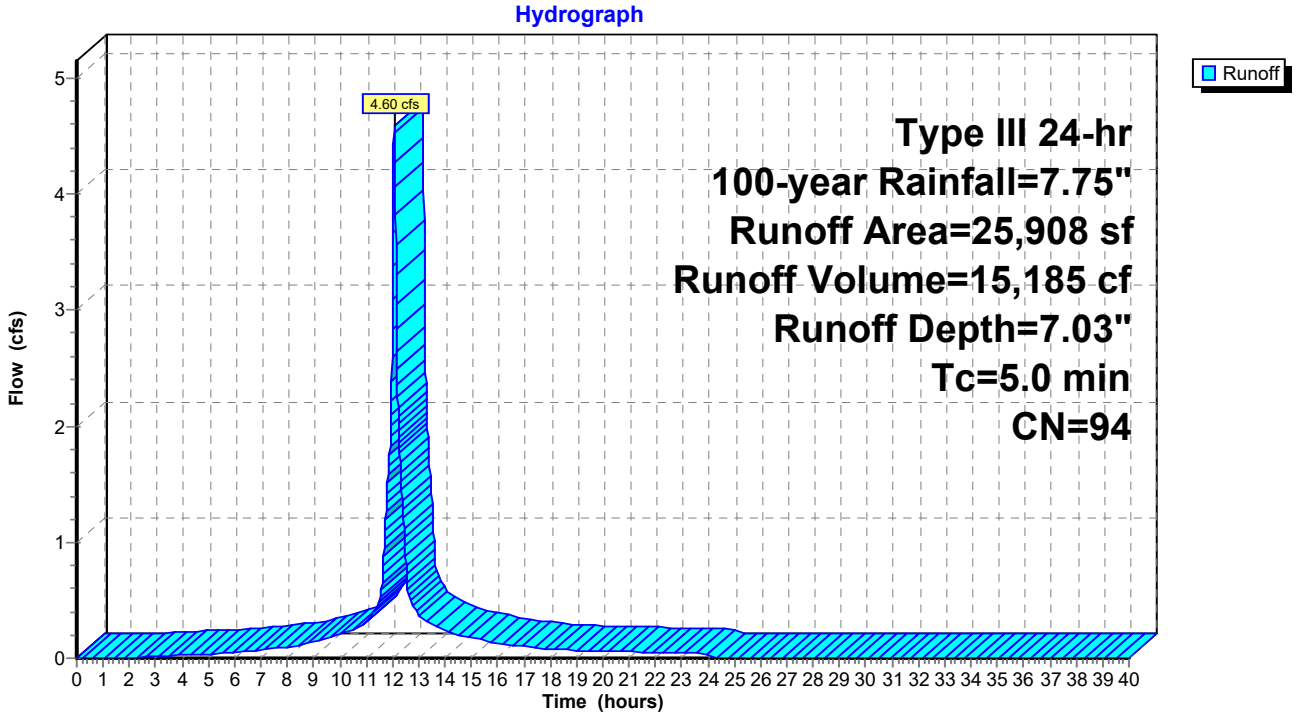
Runoff = 4.60 cfs @ 12.07 hrs, Volume= 15,185 cf, Depth= 7.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.75"

Area (sf)	CN	Description
22,657	98	Paved parking, HSG D
1,214	80	>75% Grass cover, Good, HSG D
2,037	61	>75% Grass cover, Good, HSG B
25,908	94	Weighted Average
3,251		12.55% Pervious Area
22,657		87.45% Impervious Area

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

Subcatchment 2B: 2B



Summary for Subcatchment 2C: 2C

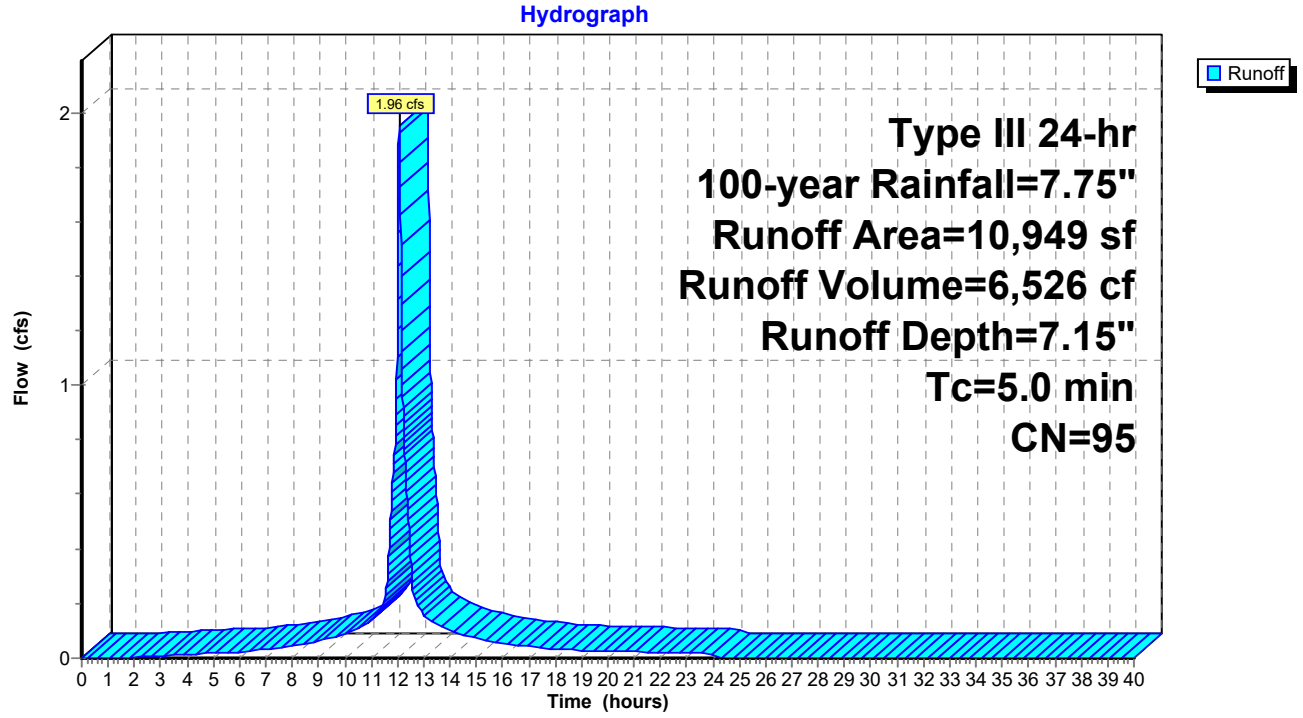
Runoff = 1.96 cfs @ 12.07 hrs, Volume= 6,526 cf, Depth= 7.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.75"

Area (sf)	CN	Description
9,804	98	Paved parking, HSG D
343	80	>75% Grass cover, Good, HSG D
802	61	>75% Grass cover, Good, HSG B
10,949	95	Weighted Average
1,145		10.46% Pervious Area
9,804		89.54% Impervious Area

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

Subcatchment 2C: 2C



Summary for Subcatchment 2D: 2D

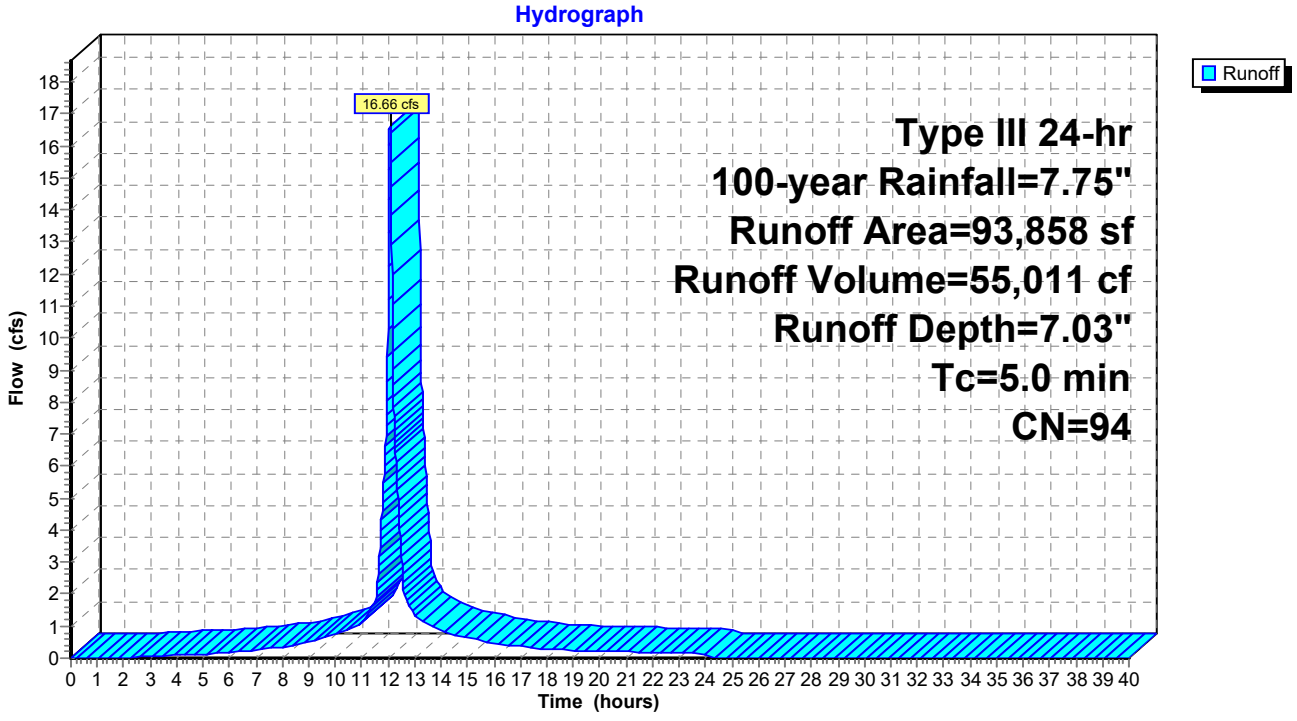
Runoff = 16.66 cfs @ 12.07 hrs, Volume= 55,011 cf, Depth= 7.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.75"

Area (sf)	CN	Description
74,350	98	Paved parking, HSG D
19,198	80	>75% Grass cover, Good, HSG D
310	61	>75% Grass cover, Good, HSG B
93,858	94	Weighted Average
19,508		20.78% Pervious Area
74,350		79.22% Impervious Area

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

Subcatchment 2D: 2D



Summary for Subcatchment 3A: 3A

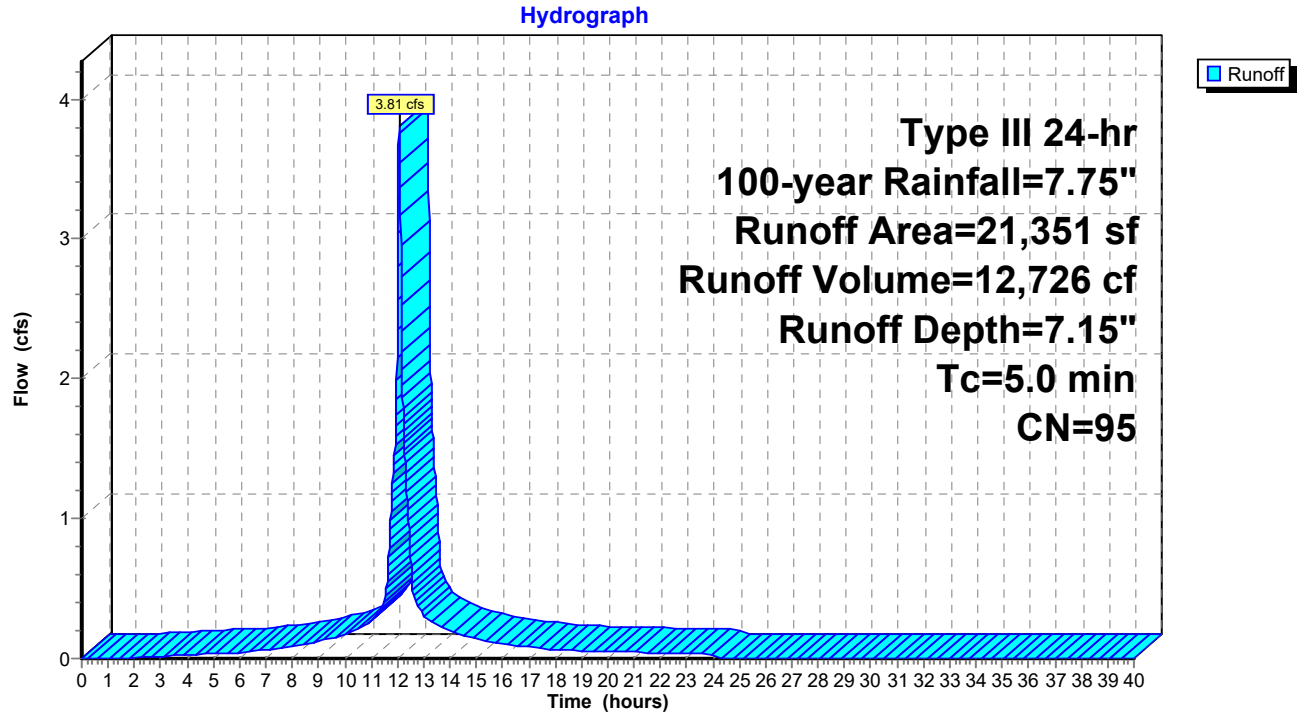
Runoff = 3.81 cfs @ 12.07 hrs, Volume= 12,726 cf, Depth= 7.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.75"

Area (sf)	CN	Description
18,380	98	Paved parking, HSG D
2,971	80	>75% Grass cover, Good, HSG D
21,351	95	Weighted Average
2,971		13.92% Pervious Area
18,380		86.08% Impervious Area

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

Subcatchment 3A: 3A



Summary for Subcatchment 4B: 4B

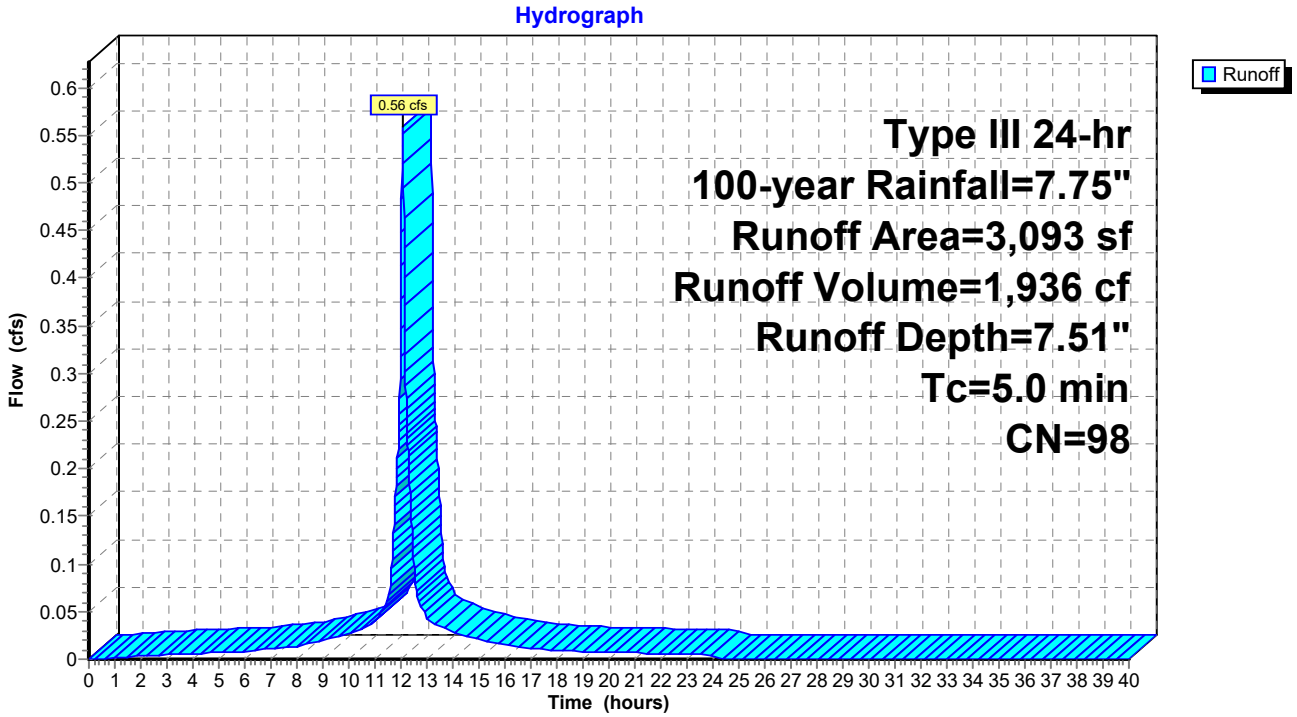
Runoff = 0.56 cfs @ 12.07 hrs, Volume= 1,936 cf, Depth= 7.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.75"

Area (sf)	CN	Description
3,093	98	Paved parking, HSG D
3,093		100.00% Impervious Area

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

Subcatchment 4B: 4B



Summary for Subcatchment 4C: 4C

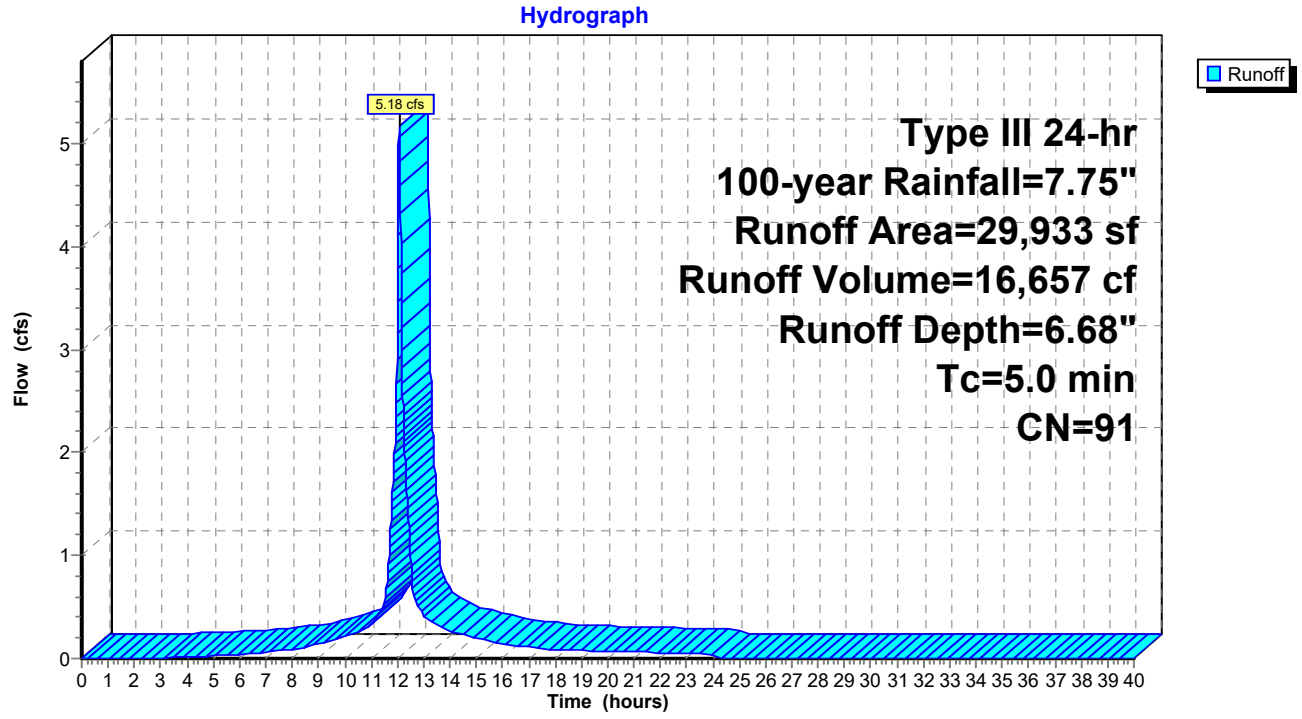
Runoff = 5.18 cfs @ 12.07 hrs, Volume= 16,657 cf, Depth= 6.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.75"

Area (sf)	CN	Description
18,733	98	Paved parking, HSG D
11,200	80	>75% Grass cover, Good, HSG D
29,933	91	Weighted Average
11,200		37.42% Pervious Area
18,733		62.58% Impervious Area

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

Subcatchment 4C: 4C



Summary for Pond INF 1B: INF 1B

Inflow Area = 8,063 sf, 78.66% Impervious, Inflow Depth = 7.03" for 100-year event
Inflow = 1.43 cfs @ 12.07 hrs, Volume= 4,726 cf
Outflow = 1.32 cfs @ 12.10 hrs, Volume= 4,057 cf, Atten= 8%, Lag= 1.9 min
Primary = 1.32 cfs @ 12.10 hrs, Volume= 4,057 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 18.01' @ 12.10 hrs Surf.Area= 745 sf Storage= 966 cf

Plug-Flow detention time= 119.9 min calculated for 4,056 cf (86% of inflow)
Center-of-Mass det. time= 58.1 min (819.3 - 761.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	15.90'	587 cf	**11.00'W x 67.70'L x 3.50'H Field A** 2,606 cf Overall - 827 cf Embedded = 1,779 cf x 33.0% Voids
#2A	16.40'	827 cf	**ADS_StormTech SC-740 +Cap** x 18 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 2 Rows of 9 Chambers
		1,414 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	17.40'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.32 cfs @ 12.10 hrs HW=18.01' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 1.32 cfs @ 2.65 fps)

Pond INF 1B: INF 1B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

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

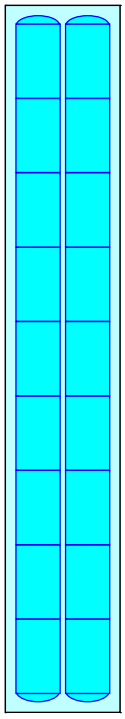
9 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 65.70' Row Length +12.0" End Stone x 2 = 67.70' Base Length
2 Rows x 51.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.00' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

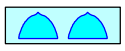
18 Chambers x 45.9 cf = 826.9 cf Chamber Storage

2,606.3 cf Field - 826.9 cf Chambers = 1,779.4 cf Stone x 33.0% Voids = 587.2 cf Stone Storage

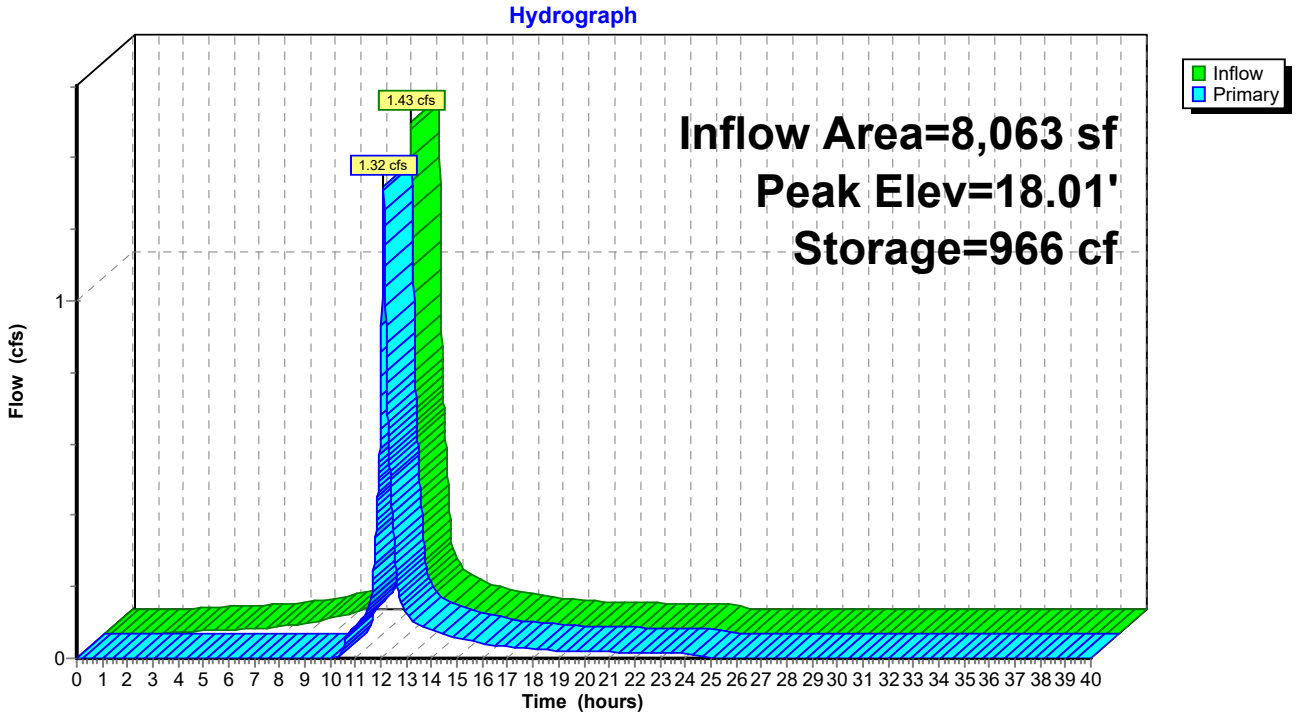
Chamber Storage + Stone Storage = 1,414.1 cf = 0.032 af
Overall Storage Efficiency = 54.3%
Overall System Size = 67.70' x 11.00' x 3.50'

18 Chambers
96.5 cy Field
65.9 cy Stone





Pond INF 1B: INF 1B



Summary for Pond INF 2B: INF 2B

Inflow Area = 25,908 sf, 87.45% Impervious, Inflow Depth = 7.03" for 100-year event
Inflow = 4.60 cfs @ 12.07 hrs, Volume= 15,185 cf
Outflow = 2.90 cfs @ 12.16 hrs, Volume= 12,778 cf, Atten= 37%, Lag= 5.2 min
Primary = 2.90 cfs @ 12.16 hrs, Volume= 12,778 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 17.09' @ 12.16 hrs Surf.Area= 3,327 sf Storage= 4,931 cf

Plug-Flow detention time= 151.6 min calculated for 12,778 cf (84% of inflow)
Center-of-Mass det. time= 85.2 min (846.4 - 761.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	14.80'	2,479 cf	**25.25'W x 131.78'L x 3.50'H Field A** 11,646 cf Overall - 4,135 cf Embedded = 7,511 cf x 33.0% Voids
#2A	15.30'	4,135 cf	**ADS_StormTech SC-740 +Cap** x 90 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 18 Chambers
		6,613 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	16.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.90 cfs @ 12.16 hrs HW=17.09' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 2.90 cfs @ 3.69 fps)

Pond INF 2B: INF 2B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

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

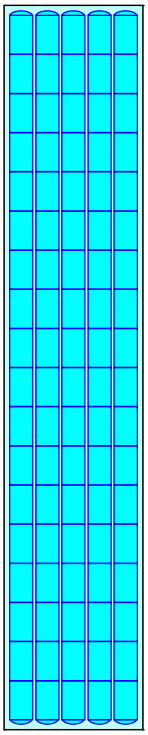
18 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 129.78' Row Length +12.0" End Stone x 2 = 131.78' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

90 Chambers x 45.9 cf = 4,134.6 cf Chamber Storage

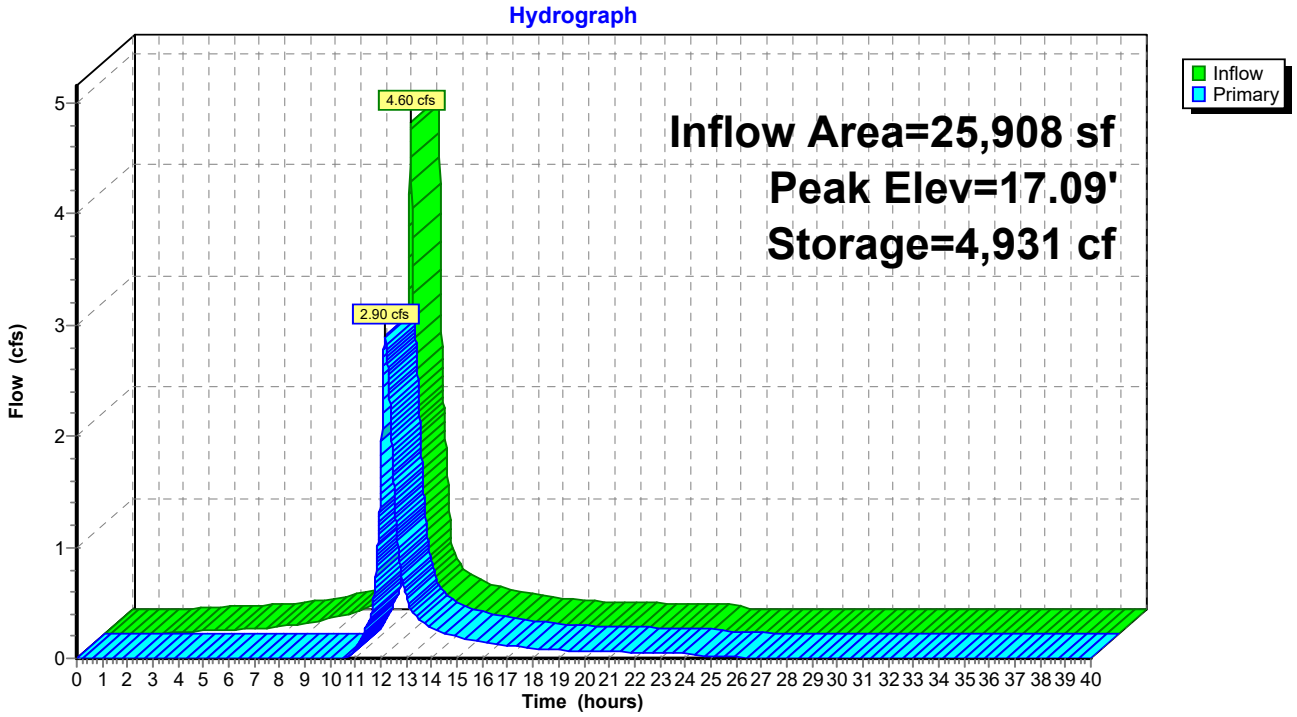
11,645.8 cf Field - 4,134.6 cf Chambers = 7,511.2 cf Stone x 33.0% Voids = 2,478.7 cf Stone Storage

Chamber Storage + Stone Storage = 6,613.3 cf = 0.152 af
Overall Storage Efficiency = 56.8%
Overall System Size = 131.78' x 25.25' x 3.50'

90 Chambers
431.3 cy Field
278.2 cy Stone



Pond INF 2B: INF 2B



Summary for Pond INF 2C: INF 2C

Inflow Area = 10,949 sf, 89.54% Impervious, Inflow Depth = 7.15" for 100-year event
Inflow = 1.96 cfs @ 12.07 hrs, Volume= 6,526 cf
Outflow = 1.81 cfs @ 12.10 hrs, Volume= 5,735 cf, Atten= 7%, Lag= 1.8 min
Primary = 1.81 cfs @ 12.10 hrs, Volume= 5,735 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 16.34' @ 12.10 hrs Surf.Area= 810 sf Storage= 1,173 cf

Plug-Flow detention time= 110.8 min calculated for 5,733 cf (88% of inflow)
Center-of-Mass det. time= 54.6 min (811.4 - 756.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	14.00'	633 cf	**25.25'W x 32.10'L x 3.50'H Field A** 2,837 cf Overall - 919 cf Embedded = 1,918 cf x 33.0% Voids
#2A	14.50'	919 cf	**ADS_StormTech SC-740 +Cap** x 20 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 4 Chambers
		1,552 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	15.60'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.81 cfs @ 12.10 hrs HW=16.34' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 1.81 cfs @ 2.92 fps)

Pond INF 2C: INF 2C - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

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

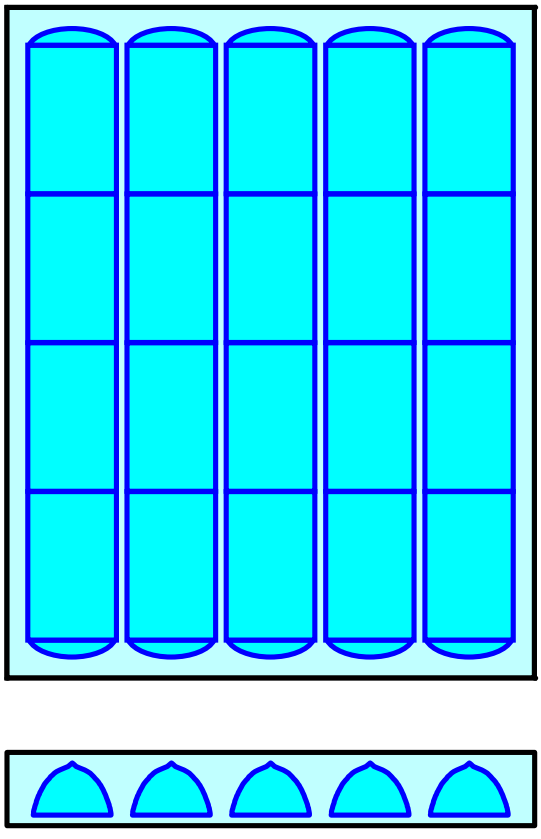
4 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 30.10' Row Length +12.0" End Stone x 2 = 32.10' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

20 Chambers x 45.9 cf = 918.8 cf Chamber Storage

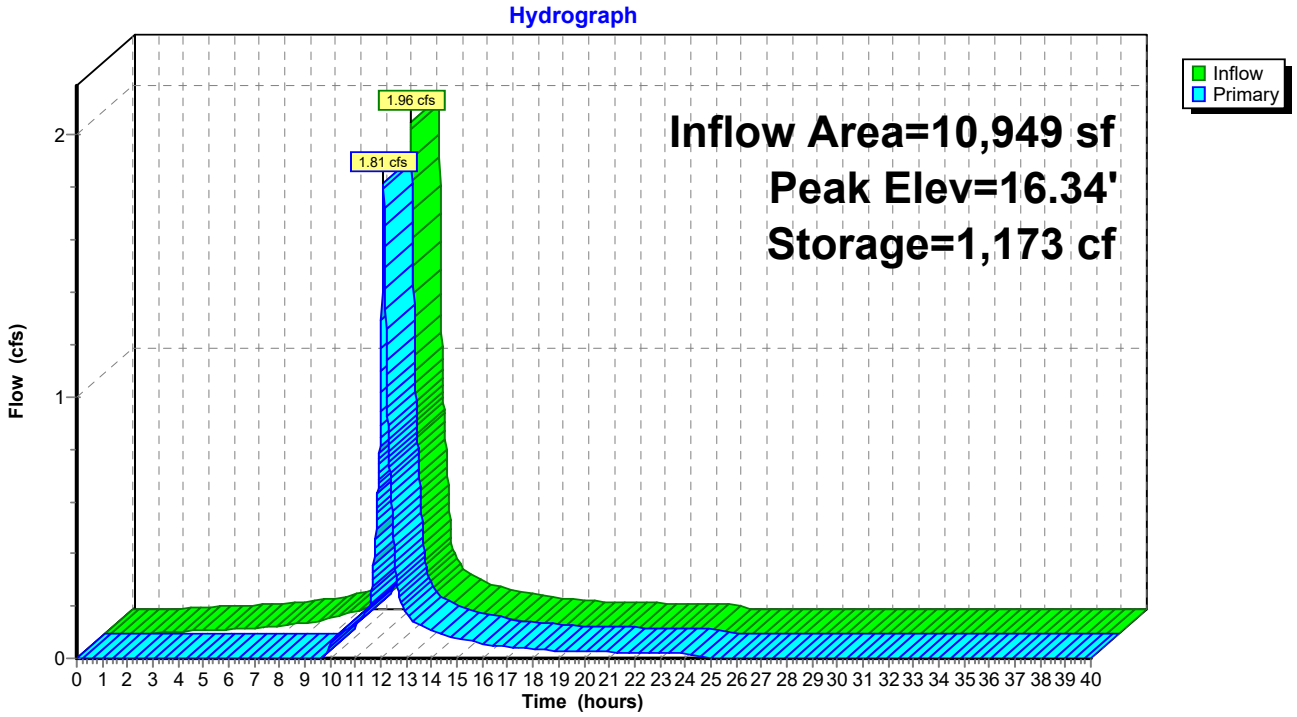
2,836.5 cf Field - 918.8 cf Chambers = 1,917.7 cf Stone x 33.0% Voids = 632.9 cf Stone Storage

Chamber Storage + Stone Storage = 1,551.7 cf = 0.036 af
Overall Storage Efficiency = 54.7%
Overall System Size = 32.10' x 25.25' x 3.50'

20 Chambers
105.1 cy Field
71.0 cy Stone



Pond INF 2C: INF 2C



Summary for Pond INF 4B: INF 4B

Inflow Area = 3,093 sf,100.00% Impervious, Inflow Depth = 7.51" for 100-year event
Inflow = 0.56 cfs @ 12.07 hrs, Volume= 1,936 cf
Outflow = 0.53 cfs @ 12.09 hrs, Volume= 1,690 cf, Atten= 5%, Lag= 1.5 min
Primary = 0.53 cfs @ 12.09 hrs, Volume= 1,690 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 20.36' @ 12.09 hrs Surf.Area= 379 sf Storage= 337 cf

Plug-Flow detention time= 120.5 min calculated for 1,690 cf (87% of inflow)
Center-of-Mass det. time= 61.3 min (802.0 - 740.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	18.80'	316 cf	**6.25'W x 60.58'L x 3.50'H Field A** 1,325 cf Overall - 368 cf Embedded = 958 cf x 33.0% Voids
#2A	19.30'	368 cf	**ADS_StormTech SC-740 +Cap** x 8 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		684 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	20.00'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.53 cfs @ 12.09 hrs HW=20.36' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.53 cfs @ 2.05 fps)

Pond INF 4B: INF 4B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

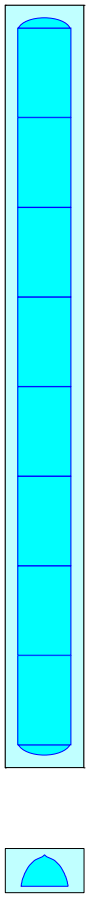
8 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 58.58' Row Length +12.0" End Stone x 2 = 60.58' Base Length
1 Rows x 51.0" Wide + 12.0" Side Stone x 2 = 6.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

8 Chambers x 45.9 cf = 367.5 cf Chamber Storage

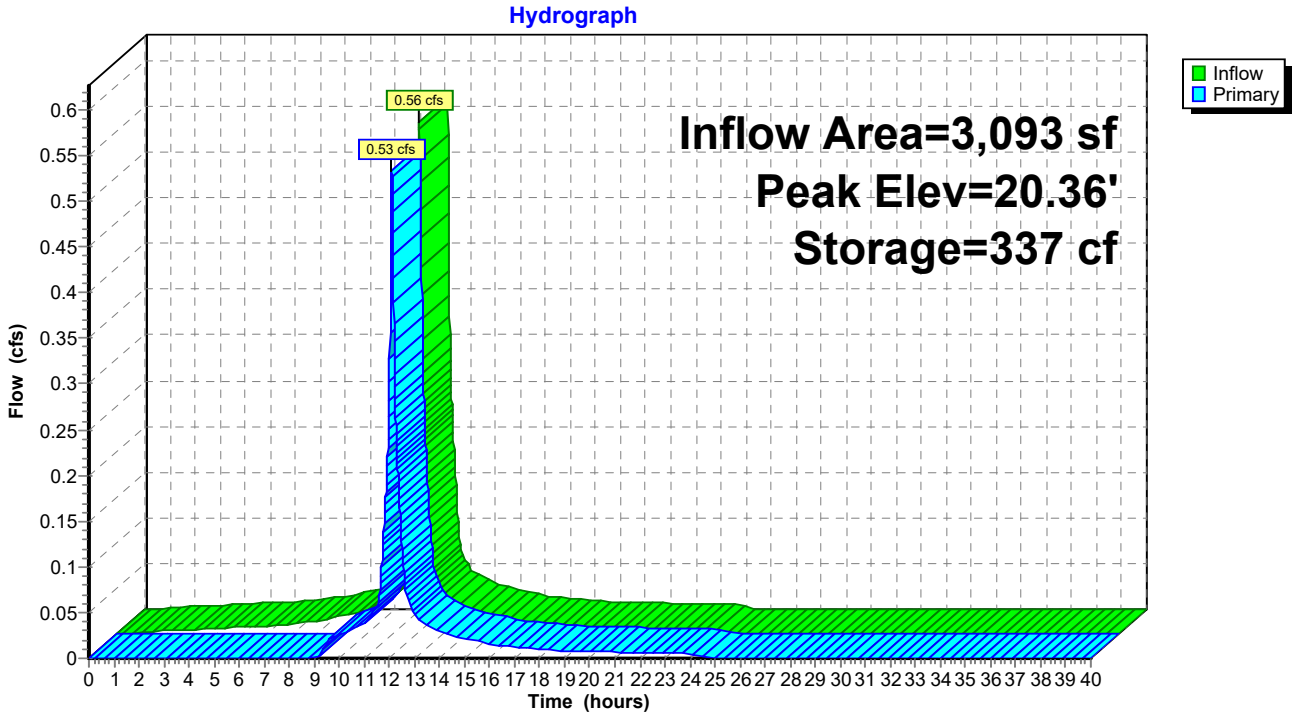
1,325.1 cf Field - 367.5 cf Chambers = 957.6 cf Stone x 33.0% Voids = 316.0 cf Stone Storage

Chamber Storage + Stone Storage = 683.5 cf = 0.016 af
Overall Storage Efficiency = 51.6%
Overall System Size = 60.58' x 6.25' x 3.50'

8 Chambers
49.1 cy Field
35.5 cy Stone



Pond INF 4B: INF 4B

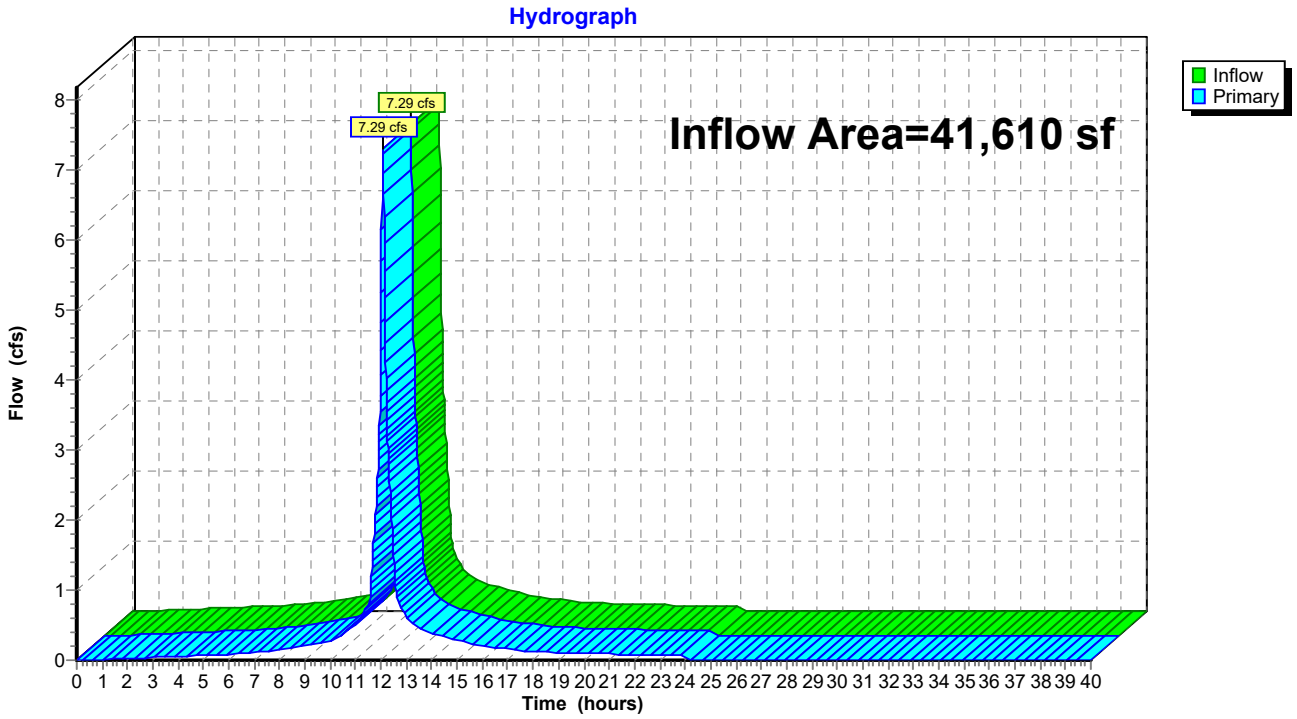


Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 89.22% Impervious, Inflow Depth = 7.13" for 100-year event
Inflow = 7.29 cfs @ 12.07 hrs, Volume= 24,718 cf
Primary = 7.29 cfs @ 12.07 hrs, Volume= 24,718 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-1: DP-1

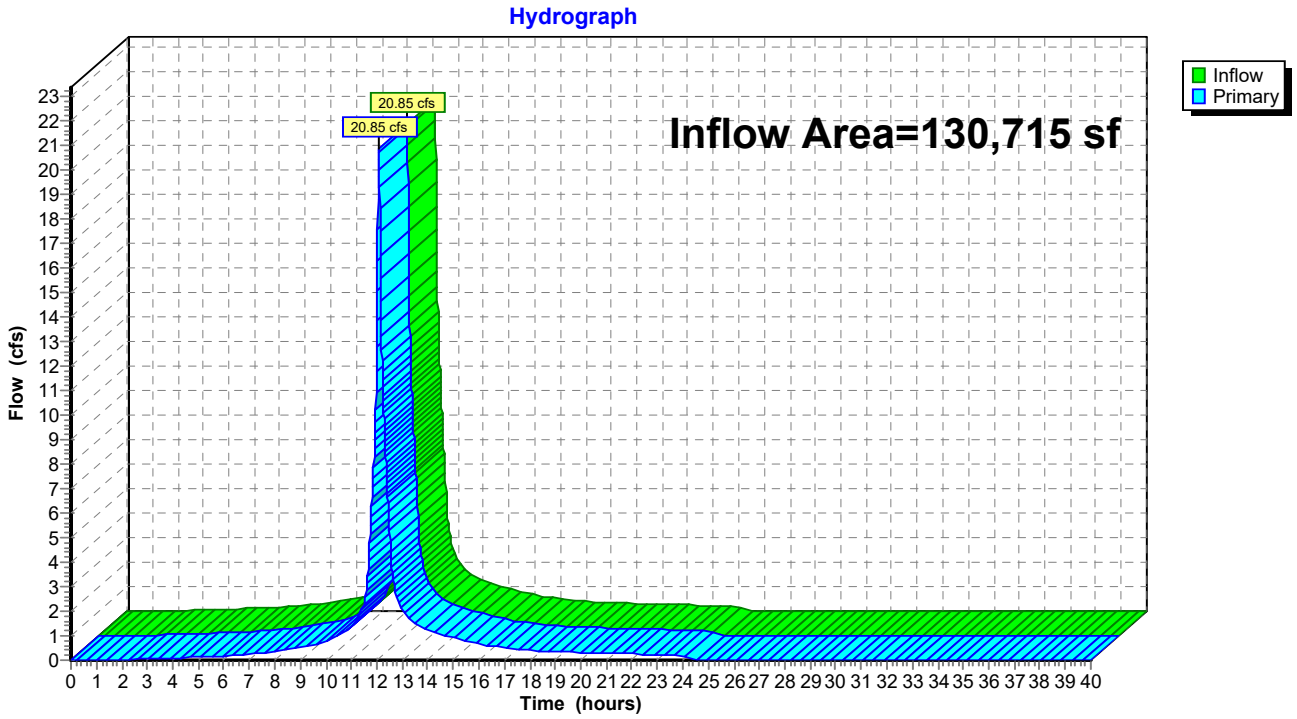


Summary for Link DP-2: DP-2

Inflow Area = 130,715 sf, 81.71% Impervious, Inflow Depth = 6.75" for 100-year event
Inflow = 20.85 cfs @ 12.08 hrs, Volume= 73,524 cf
Primary = 20.85 cfs @ 12.08 hrs, Volume= 73,524 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-2: DP-2

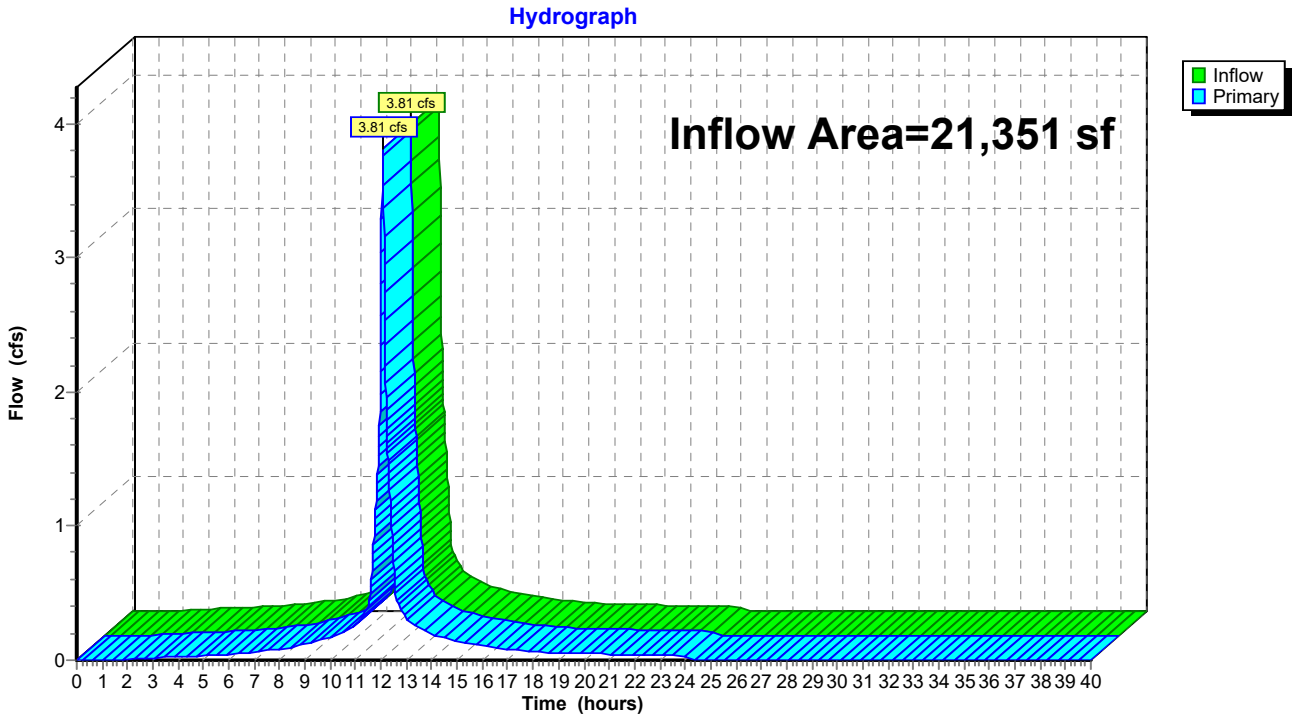


Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.08% Impervious, Inflow Depth = 7.15" for 100-year event
Inflow = 3.81 cfs @ 12.07 hrs, Volume= 12,726 cf
Primary = 3.81 cfs @ 12.07 hrs, Volume= 12,726 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-3: DP-3

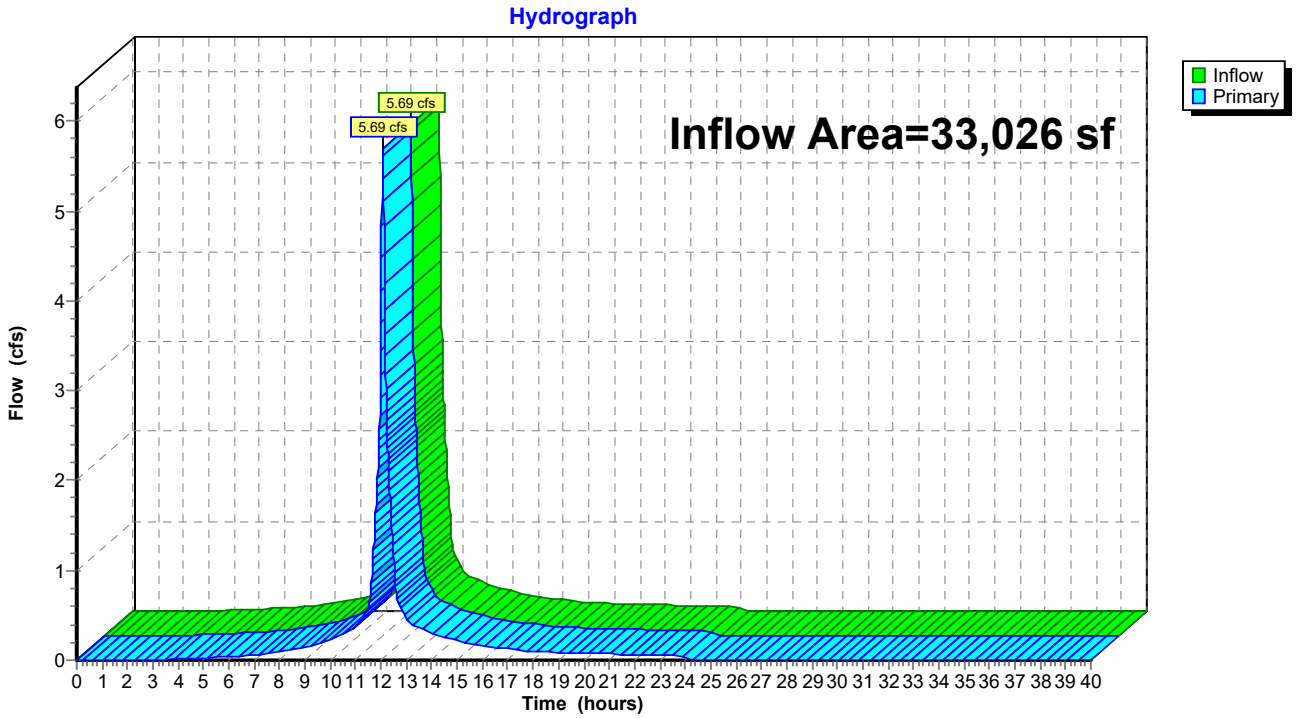


Summary for Link DP-4: DP-4

Inflow Area = 33,026 sf, 66.09% Impervious, Inflow Depth = 6.67" for 100-year event
Inflow = 5.69 cfs @ 12.07 hrs, Volume= 18,347 cf
Primary = 5.69 cfs @ 12.07 hrs, Volume= 18,347 cf, Atten= 0%, Lag= 0.0 min

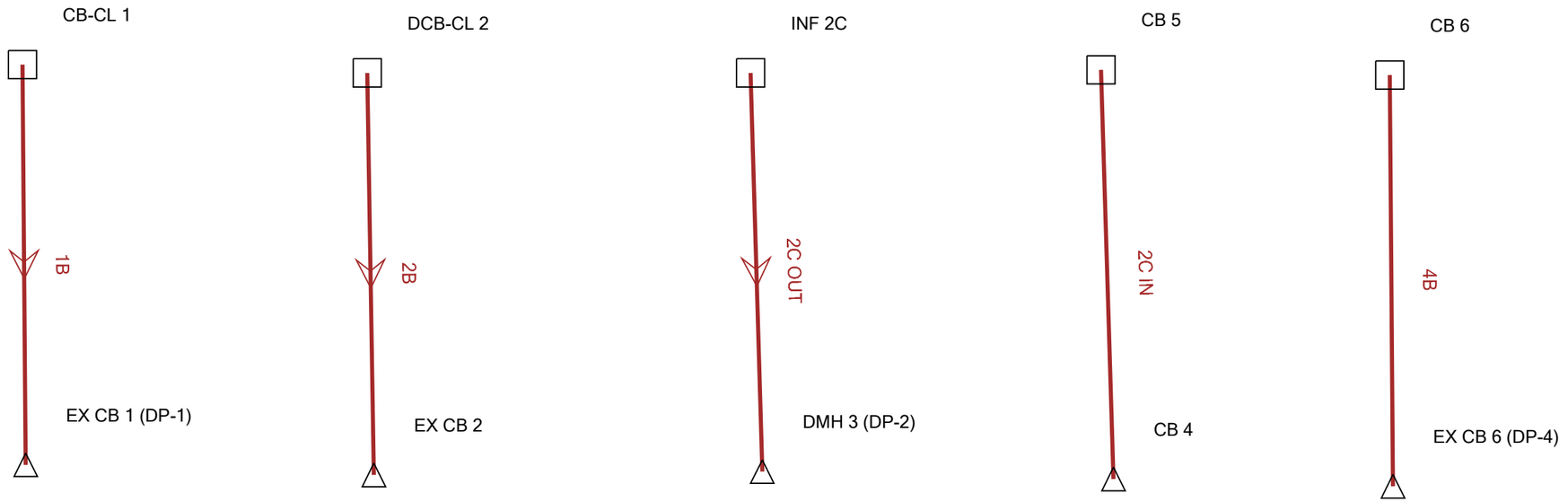
Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-4: DP-4



StormCAD Table (Hydraulic Spreadsheet)

Scenario: Base



FlexTable: Conduit Table

Label	Start Node	Stop Node	Elevation Ground (Start) (ft)	Hydraulic Grade Line (In) (ft)	Invert (Start) (ft)	Elevation Ground (Stop) (ft)	Hydraulic Grade Line (Out) (ft)	Invert (Stop) (ft)	Length (User Defined) (ft)	Slope (Calculated) (ft/ft)	Section Type	Diameter (in)	Manning's n	Flow (cfs)	Velocity (ft/s)	Capacity (Full Flow) (cfs)	Flow / Capacity (Design) (%)
1B	CB-CL 1	EX CB 1 (DP-1)	20.40	17.89	17.40	18.15	15.81	15.40	182.0	0.011	Circle	12.0	0.013	1.32	4.34	3.73	35.3
2B	DCB-CL 2	EX CB 2	18.50	16.92	16.00	18.55	16.13	15.40	110.0	0.005	Circle	12.0	0.013	2.90	3.69	2.63	110.2
2C OUT	INF 2C	DMH 3 (DP-2)	18.40	16.17	15.60	19.10	15.00	14.50	110.0	0.010	Circle	12.0	0.013	1.81	4.56	3.56	50.8
4B	CB 6	EX CB 6 (DP-4)	23.20	20.30	20.00	19.00	16.29	16.10	99.0	0.039	Circle	12.0	0.013	0.53	5.28	7.07	7.5