

STORMWATER REPORT

FOR

AUTUMN HILL SENIOR VILLAGE

FRANKLIN MA, 02038

PROPOSED SENIOR VILLAGE DEVELOPMENT

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VOLUME 1 OF 1



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REVISIONS

July 18, 2024 Revision:

This revisions reflects changes made per comments received by the Town and by peer review.

September 23, 2024 Revision

This revisions reflects additional changes made per comments received by the Town and by peer review.

January 21, 2025 Revision

This revision reflects a reduction in the size of the development to 28 units. The stormwater facilities have likewise been reduced in scale and number. All changes made for this revision are highlighted.

INTRODUCTION

This report presents a description along with supporting calculations for the stormwater runoff treatment and mitigation systems proposed for the senior village development as presented on a plan set entitled "Autumn Hill Senior Village Franklin, MA Site Plan" prepared by Legacy Engineering LLC with an original date of January 26, 2024. The development consists of 28 senior dwelling units.

EXISTING SITE

The proposed development lies on the easterly side of Summer Street in Franklin, totaling approximately 12.39 acres. The site predominately consists of woods, and borders Uncas Brook in the eastern corner.

SOILS

The soils conservation service maps (see Attachment H) indicate that the site is comprised of various soil types as follows:

Westerly Portions:

- Charlton Hollis (103C): A class B glacial soil.
- Hollis (104C): A class C soil.

Easterly Portions:

- Hollis (104D): An unclassified soil.

Based on soil testing conducted across the site all soils are classified as Class B for all calculations in this report.

GROUNDWATER CONDITIONS

On-site testing did not encounter groundwater in many of the test pits across the site. Where groundwater was encountered, it was usually within an inch or two of ledge. The only exception to this is at the front of the site at test pits 14 and 15, where groundwater was encountered 31" below the existing grade.

SOIL PERMEABILITY

For the purposes of this report and based on the soils present at the proposed stormwater infiltration facilities, Infiltration Basin #1 has an infiltration rate of 1.02 in/hr for sandy loam soils, while the remainder of the infiltration facilities have an infiltration rate of 2.40 for loamy sand soils.

FLOOD PLAIN

No portion of this site lies within a flood plain.

WETLAND PROTECTION ACT

The site borders Uncas Brook, however, no portion of the site to be developed lies within a wetland jurisdictional area.

PROPOSED DEVELOPMENT

The proposed construction consists of 8 new multifamily residential buildings with a total of 26 units, along with all appurtenant driveways, landscaping, utilities, and stormwater management facilities. The two existing dwellings will remain on the site as the final 2 of the total 28 units.

MASSACHUSETTS STORMWATER MANAGEMENT STANDARDS

The stormwater management system design consists of a series of catch basins, manholes, and piping which collect runoff from the proposed development and the adjacent watersheds. These devices provide pretreatment prior to conveying stormwater into the various BMPs described herein. The stormwater management system is designed in accordance with the provisions of the DEP Stormwater Management Standards and Handbook, which are summarized below.

STANDARD 1 - New Stormwater Conveyances

No New Stormwater Conveyances (e.g. outfalls) May Discharge Untreated Stormwater Directly to or Cause Erosion in Wetlands or Waters of the Commonwealth. The proposed development complies with this standard.

The development includes two primary stormwater discharge points. Note the following:

- Design Point #1: Flow to Summer Street – In the existing condition, stormwater runoff flows uncontrolled to this design point from the existing dwellings (Units 1 & 10) and some forest area. In the proposed condition, the flow from the existing dwellings is treated by infiltrations fields and Infiltration Basin #1. Concentrated flow from the development will be from overflow of Infiltration Basin #1. The facility outlet has been designed with a level spreader to dissipate the flow.
- Design Point #2: Flow to Uncas Brook – In the existing condition, runoff from wooded areas flows by sheet flow to the brook. In the proposed condition, runoff is collected into 4 infiltration fields. The facility outlets have been designed with level spreaders to dissipate the flow before it reaches the wetlands. The undisturbed forest area between the development and the brook will further dissipate flows.

STANDARD 2 – Peak Discharge Rates

Stormwater Management Systems shall be designed so that the Post-Development Peak Discharge Rates do not Exceed Pre-Development Peak Discharge Rates. The proposed development complies with this standard.

In order to model pre and post peak discharges, a program called Hydrocad was used, which employs the TR-20 modeling system. The DEP Stormwater Management regulations require that the 2- and 10-year storms should be considered for peak rates and the 100-year storm for flooding considerations. The Town of Franklin additionally requires analysis of the 25-year storm for catch basins and related installations (although not for peak rate or volume calculations). The following theoretical storm events were used to model the site before and after the proposed activities occur¹:

<u>Design Storm</u>	<u>Rainfall</u>
2-Year	3.36 inches
10-Year	5.22 inches
25-Year	6.37 inches
100-Year	8.15 inches

¹ Rainfall depths are as specified by NOAA Atlas-14. Rainfall distribution is defined by the NOAA10 24-hr, curve “D” storm type.

DESIGN POINT #1: Flow to Summer Street

Description of Existing Conditions: In the existing condition, Watershed E1 represents the uncontrolled runoff from the western portion of the site consisting of the existing dwellings and some woodland.

Description of Proposed Conditions: In the proposed condition, Watersheds P1a through P1f represent the runoff that is captured and infiltrated by Infiltration Basin #1. Watersheds P1g through P1i represents the roof runoff from the existing dwelling at 488 Summer to Infiltration Fields #1 & #2. Watershed P1j represents the uncontrolled runoff to this design point.

Summary of Peak Flow Rates to Design Point:

Design Storm (Year)	Peak Runoff Rate (cfs)		Volume of Runoff (ac-ft)	
	Existing	Proposed	Existing	Proposed
2	1.29	0.74	0.165	0.111
10	3.96	3.93	0.392	0.348
25	6.00	5.70	0.564	0.530
100	9.50	8.50	0.862	0.846

DESIGN POINT #2: Flow to Uncas Brook

Description of Existing Conditions: In the existing condition, Watersheds E2a and E2b represent uncontrolled overland flow to Uncas Brook.

Description of Proposed Conditions: In the proposed condition, Watersheds P2a through P2f represent stormwater runoff that is captured and infiltrated by Infiltration Field #6. Watersheds P2g and P2h represent the uncontrolled runoff that flows to the design point. Roof runoff watersheds from units 11-19 is represented by Watershed R11-19, roof runoff from units 20-28 is represented by Watershed R20-28, and roof runoff from units 2-3 and 27-28 is represented by Watershed R2-3, 27-28. This design point is further broken down into sub-design points to analyze the rate and volume of runoff to the northern abutter (which then flows to Uncas Brook).

Summary of Peak Flow Rates to Design Point:

Design Storm (Year)	Peak Runoff Rate (cfs)		Volume of Runoff (ac-ft)	
	Existing ²	Proposed	Existing	Proposed
2	1.21	0.94	0.269	0.179
10	7.98	5.68	0.888	0.631
25	13.56	9.54	1.384	1.089
100	23.40	18.60	2.268	1.970

In addition to the above analysis, this design point has also been split into two sub design points for the purpose of analyzing flows to the northern abutter at 486 Summer Street. The proposed design reduces both flow rate and volume to this abutter as shown in the table below.

Summary of Peak Flow Rates to the Northern Abutter (Sub-DP#2b):

Design Storm (Year)	Peak Runoff Rate (cfs)		Volume of Runoff (ac-ft)	
	Existing	Proposed	Existing	Proposed
2	0.49	0.48	0.111	0.082
10	3.07	2.50	0.362	0.263
25	5.19	4.15	0.563	0.465
100	8.92	8.31	0.920	0.865

STANDARD 3 - Loss of Annual Recharge

Loss of Annual Recharge to Groundwater shall be Eliminated or Minimized through the use of Environmentally Sensitive Site Design, Low Impact Development Techniques, Stormwater Best Management Practices, and Good Operation and Maintenance.

RECHARGE CALCULATIONS AND METHODS

The DEP Stormwater Management Standards typically require that a minimum volume of runoff (Required Recharge Volume, Rv) be recharged on the site based on soils conditions in accordance with the following table:

² A minor discrepancy was found in the design revision, which yielded revised existing conditions values.

	Class A Soils	Class B Soils	Class C Soils	Class D Soils
Runoff Depth (d) to be Recharged	d = 0.60 inches	d = 0.35 inches	d = 0.25 inches	d = 0.10 inches

The Required Recharge Volume is calculated by multiplying the runoff depth to be recharged (d) for each soils class by the amount of impervious coverage (on the site) under the proposed condition.

STORMWATER INFILTRATION BASIN #1

Recharge required (Rv)=(Impervious coverage)*(depth to be recharged)

	Class A Soils	Class B Soils	Class C Soils	Class D Soils
On-Site Impervious Area	0 s.f.	15,133 s.f.	0 s.f.	0 s.f.
Required Recharge Volume (Rv)	0 c.f.	441 c.f.	0 c.f.	0 c.f.
Total Rv	441 c.f.			

Standard 3 requires that infiltration facilities be provided and sized in accordance with three acceptable methods; 1) the Static Method, 2) The Simple Dynamic Method, and 3) the Dynamic Field Method. Each method is summarized below.

Static Method: The Static Method simply requires that the proposed recharge facility contain a total raw volume (adjusted for void space if stone is used within the storage volume) equal to or greater than the Required Recharge Volume.

Simple Dynamic Method: The Simple Dynamic method allows for a very conservative inclusion of some of the recharge which occurs within the infiltration facility during the design storm in accordance with the following formula:

$$V - kTA = V'$$

Where

V is the Required Recharge Volume. If the infiltration facility also treats the Water Quality Volume, the greater of the two values is used.

k is the saturated hydraulic conductivity determined by the Rawls Rate (Table 2.3.3 of Volume 3, Chapter 1 of the Stormwater Handbook)

T is the allowable drawdown during the peak of the storm = 2 hours for this method

A is the basin bottom area

V' is the minimum required storage volume of the infiltration facility when including 2 hours of recharge

This method allows the designer to include two hours of ongoing recharge during the design storm using a permeability rate (saturated hydraulic conductivity) selected based on the classification of the soil under the infiltration facility.

Dynamic Field Method: The Dynamic Field Method uses a more aggressive inclusion of on-going recharge from an infiltration facility during the design storm. This method is calculated using rainfall routing software (Hydrocad) and a truncated hydrograph which assumes that the Required Recharge Volume is loaded to the infiltration facility during a 12 hour period. For this method the design permeability rate must be based on in-situ permeability testing with a safety factor of 50% applied to the actual rate found.

For this infiltration facility, the Simple Dynamic Method has been utilized, which allows for 2 hours of ongoing recharge during the design storm. The required storage volume is calculated using the following values:

$$V - kTA = V'$$

Where:

$$V = 1,261 \text{ cubic feet (WQV)}$$

$$K = 1.02 \text{ inches per hour} = 0.085 \text{ feet per hour}$$

$$T = 2 \text{ Hours}$$

$$A = 1,814 \text{ square feet}$$

$$1,261 \text{ c.f.} - 0.085 \text{ in/hr} * 2 \text{ hr} * 1,814 \text{ s.f.} = 953 \text{ c.f.}$$

The infiltration basin has a storage volume of 971 c.f., which meets this requirement.

A secondary check is required to ensure that the Rv will recharge within at least 72 hours. A K value of 1.02 is used for drawdown design purposes since soils testing found sandy loam soils at this location. Using the following formula, the drawdown time is calculated:

$$\text{Time}_{\text{drawdown}} = [\text{WQV}/(K \times \text{Bottom Area})]$$

Where:

$$\text{WQV} = 1,261 \text{ c.f.}$$

$$K = 1.02 \text{ inches per hour} = 0.085 \text{ feet per hour}$$

$$\text{Bottom Area} = 1,814 \text{ s.f.}$$

It is concluded that the drawdown time for the infiltrated volume is 8.2 hours, which satisfies this requirement.

Mounding Analysis:

A mounding analysis has been conducted and can be found in attachment L. The bottom of Infiltration Basin #1 is at elevation 411.3, with a seasonal high groundwater elevation below the basin at 408.8. The mound for the infiltration of the WQV of this basin is 2.49 feet.

STORMWATER INFILTRATION FIELD #1

Recharge required (Rv)=(Impervious coverage)*(depth to be recharged)

	Class A Soils	Class B Soils	Class C Soils	Class D Soils
On-Site Impervious Area	0 s.f.	653 s.f.	0 s.f.	0 s.f.
Required Recharge Volume (Rv)	0 c.f.	19 c.f.	0 c.f.	0 c.f.
Total Rv	19 c.f.			

For this infiltration facility, the Simple Dynamic Method has been utilized, which allows for 2 hours of ongoing recharge during the design storm. The required storage volume is calculated using the following values:

$$V - kTA = V'$$

Where:

$$V = 54 \text{ cubic feet (WQV)}$$

$$K = 2.40 \text{ inches per hour} = 0.20 \text{ feet per hour}$$

$$T = 2 \text{ Hours}$$

$$A = 104 \text{ square feet} * 40\% \text{ voids} = 42 \text{ s.f.}$$

$$54 \text{ c.f.} - 0.20 \text{ in/hr} * 2 \text{ hr} * 42 \text{ s.f.} = 38 \text{ c.f.}$$

The infiltration field has a storage volume of 139 c.f., which meets this requirement.

A secondary check is required to ensure that the Rv will recharge within at least 72 hours. A K value of 2.40 is used for drawdown design purposes since soils testing found loamy sand soils at this location. Using the following formula, the drawdown time is calculated:

$$\text{Time}_{\text{drawdown}} = [\text{WQV}/(\text{K} \times \text{Bottom Area})]$$

Where:

$$\text{WQV} = 54 \text{ c.f.}$$

$$\text{K} = 2.40 \text{ inches per hour} = 0.20 \text{ feet per hour}$$

$$\text{Bottom Area} = 42 \text{ s.f.}$$

It is concluded that the drawdown time for the infiltrated volume is 6.5 hours, which satisfies this requirement.

Mounding Analysis:

Based on soils testing in the field, seasonal high groundwater under the infiltration field was not found to a depth of 393.6. With a proposed bottom elevation of 397.8, the proposed field lies more than 4 feet above seasonal high groundwater. Thus, a mounding analysis is not required.

STORMWATER INFILTRATION FIELD #2

Recharge required (Rv)=(Impervious coverage)*(depth to be recharged)

	Class A Soils	Class B Soils	Class C Soils	Class D Soils
On-Site Impervious Area	0 s.f.	2,735 s.f.	0 s.f.	0 s.f.
Required Recharge Volume (Rv)	0 c.f.	80 c.f.	0 c.f.	0 c.f.
Total Rv	80 c.f.			

For this infiltration facility, the Simple Dynamic Method has been utilized, which allows for 2 hours of ongoing recharge during the design storm. The required storage volume is calculated using the following values:

$$V - kTA = V'$$

Where:

$$V = 228 \text{ cubic feet (WQV)}$$

$$\text{K} = 2.40 \text{ inches per hour} = 0.20 \text{ feet per hour}$$

$$\text{T} = 2 \text{ Hours}$$

$$\text{A} = 186 \text{ square feet} \times 40\% \text{ voids} = 74 \text{ s.f.}$$

$$228 \text{ c.f.} - 0.20 \text{ in/hr} \times 2 \text{ hr} \times 74 \text{ s.f.} = 198 \text{ c.f.}$$

The infiltration field has a storage volume of 254 c.f., which meets this requirement.

A secondary check is required to ensure that the Rv will recharge within at least 72 hours. A K value of 2.40 is used for drawdown design purposes since soils

testing found loamy sand soils at this location. Using the following formula, the drawdown time is calculated:

$$\text{Time}_{\text{drawdown}} = [\text{WOV}/(\text{K} \times \text{Bottom Area})]$$

Where:

$$\text{WOV} = 228 \text{ c.f.}$$

$$\text{K} = 2.40 \text{ inches per hour} = 0.20 \text{ feet per hour}$$

$$\text{Bottom Area} = 74 \text{ s.f.}$$

It is concluded that the drawdown time for the infiltrated volume is 15.3 hours, which satisfies this requirement.

Mounding Analysis:

Based on soils testing in the field, seasonal high groundwater under the infiltration field was not found to a depth of 390.3. With a proposed bottom elevation of 396.3, the proposed field lies more than 4 feet above seasonal high groundwater. Thus, a mounding analysis is not required.

STORMWATER INFILTRATION FIELD #3

Recharge required (Rv)=(Impervious coverage)*(depth to be recharged)

	Class A Soils	Class B Soils	Class C Soils	Class D Soils
On-Site Impervious Area	0 s.f.	6,318 s.f.	0 s.f.	0 s.f.
Required Recharge Volume (Rv)	0 c.f.	184 c.f.	0 c.f.	0 c.f.
Total Rv	184 c.f.			

For this infiltration facility, the Simple Dynamic Method has been utilized, which allows for 2 hours of ongoing recharge during the design storm. The required storage volume is calculated using the following values:

$$V - kTA = V'$$

Where:

$$V = 527 \text{ cubic feet}$$

$$\text{K} = 2.40 \text{ inches per hour} = 0.20 \text{ feet per hour}$$

$$\text{T} = 2 \text{ Hours}$$

$$\text{A} = 644 \text{ s.f.} \times 40\% \text{ Voids} = 258 \text{ s.f.}$$

$$527 \text{ c.f.} - 0.20 \text{ in/hr} \times 2 \text{ hr} \times 258 \text{ s.f.} = 423 \text{ c.f.}$$

The infiltration field has a storage volume of 2,193 c.f., which meets this requirement.

A secondary check is required to ensure that the Rv will recharge within at least 72 hours. A K value of 2.40 is used for drawdown design purposes since soils testing found loamy sandy soils at this location. Using the following formula, the drawdown time is calculated:

$$\text{Time}_{\text{drawdown}} = [Rv / (K \times \text{Bottom Area})]$$

Where:

$$WQV = 527 \text{ c.f.}$$

$$K = 2.40 \text{ inches per hour} = 0.20 \text{ feet per hour}$$

$$\text{Bottom Area} = 258 \text{ s.f.}$$

It is concluded that the drawdown time for the infiltrated volume is 10.2 hours, which satisfies this requirement.

Mounding Analysis:

Based on soils testing near the field, seasonal high groundwater was not found to a depth of 370.3. With a proposed bottom elevation of 382.5, the proposed field lies more than 4 feet above seasonal high groundwater. Thus, a mounding analysis is not required.

STORMWATER INFILTRATION FIELD #4

$$\text{Recharge required (Rv)} = (\text{Impervious coverage}) * (\text{depth to be recharged})$$

	Class A Soils	Class B Soils	Class C Soils	Class D Soils
On-Site Impervious Area	0 s.f.	6,318 s.f.	0 s.f.	0 s.f.
Required Recharge Volume (Rv)	0 c.f.	184 c.f.	0 c.f.	0 c.f.
Total Rv	184 c.f.			

For this infiltration facility, the Simple Dynamic Method has been utilized, which allows for 2 hours of ongoing recharge during the design storm. The required storage volume is calculated using the following values:

$$V - kTA = V'$$

Where:

$$V = 527 \text{ cubic feet}$$

$$K = 2.40 \text{ inches per hour} = 0.20 \text{ feet per hour}$$

$$T = 2 \text{ Hours}$$

$$A = 1,134 \text{ s.f.} * 40\% \text{ Voids} = 454 \text{ s.f.}$$

$$527 \text{ c.f.} - 0.20 \text{ in/hr} * 2 \text{ hr} * 454 \text{ s.f.} = 345 \text{ c.f.}$$

The infiltration field has a storage volume of 1,630 c.f., which meets this requirement.

A secondary check is required to ensure that the Rv will recharge within at least 72 hours. A K value of 2.40 is used for drawdown design purposes since soils testing found loamy sandy soils at this location. Using the following formula, the drawdown time is calculated:

$$\text{Time}_{\text{drawdown}} = [Rv / (K \times \text{Bottom Area})]$$

Where:

$$WQV = 527 \text{ c.f.}$$

$$K = 2.40 \text{ inches per hour} = 0.20 \text{ feet per hour}$$

$$\text{Bottom Area} = 454 \text{ s.f.}$$

It is concluded that the drawdown time for the infiltrated volume is 5.8 hours, which satisfies this requirement.

Mounding Analysis:

Based on soils testing near the field, seasonal high groundwater was not found to a depth of 382.8. With a proposed bottom elevation of 387.5, the proposed field lies more than 4 feet above seasonal high groundwater. Thus, a mounding analysis is not required.

STORMWATER INFILTRATION FIELD #5

Recharge required (Rv) = (Impervious coverage) * (depth to be recharged)

	Class A Soils	Class B Soils	Class C Soils	Class D Soils
On-Site Impervious Area	0 s.f.	2,808 s.f.	0 s.f.	0 s.f.
Required Recharge Volume (Rv)	0 c.f.	82 c.f.	0 c.f.	0 c.f.
Total Rv	82 c.f.			

For this infiltration facility, the Simple Dynamic Method has been utilized, which allows for 2 hours of ongoing recharge during the design storm. The required storage volume is calculated using the following values:

$$V - kTA = V'$$

Where:

$$V = 234 \text{ cubic feet}$$

$$K = 2.40 \text{ inches per hour} = 0.20 \text{ feet per hour}$$

$$T = 2 \text{ Hours}$$

$$A = 486 \text{ s.f.} * 40\% \text{ Voids} = 194 \text{ s.f.}$$

$$234 \text{ c.f.} - 0.20 \text{ in/hr} * 2 \text{ hr} * 194 \text{ s.f.} = 156 \text{ c.f.}$$

The infiltration field has a storage volume of 694 c.f., which meets this requirement.

A secondary check is required to ensure that the Rv will recharge within at least 72 hours. A K value of 2.40 is used for drawdown design purposes since soils testing found loamy sandy soils at this location. Using the following formula, the drawdown time is calculated:

$$\text{Time}_{\text{drawdown}} = [Rv / (K * \text{Bottom Area})]$$

Where:

$$WQV = 234 \text{ c.f.}$$

$$K = 2.40 \text{ inches per hour} = 0.20 \text{ feet per hour}$$

$$\text{Bottom Area} = 194 \text{ s.f.}$$

It is concluded that the drawdown time for the infiltrated volume is 6.0 hours, which satisfies this requirement.

Mounding Analysis:

A mounding analysis has been conducted and can be found in attachment L. The bottom of Infiltration Field #5 is at elevation 405.7, with a seasonal high groundwater elevation below the field not found to an elevation of 402.5. The mound for the infiltration of the WQV of this basin is 1.2 feet.

STORMWATER INFILTRATION FIELD #6

$$\text{Recharge required (Rv)} = (\text{Impervious coverage}) * (\text{depth to be recharged})$$

	Class A Soils	Class B Soils	Class C Soils	Class D Soils
On-Site Impervious Area	0 s.f.	57,395 s.f.	0 s.f.	0 s.f.
Required Recharge Volume (Rv)	0 c.f.	1,674 c.f.	0 c.f.	0 c.f.
Total Rv	1,674 c.f.			

For this infiltration facility, the Simple Dynamic Method has been utilized, which allows for 2 hours of ongoing recharge during the design storm. The required storage volume is calculated using the following values:

$$V - kTA = V'$$

Where:

$$V = 4,783 \text{ cubic feet (WQV)}$$

$K = 2.40 \text{ inches per hour} = 0.20 \text{ feet per hour}$

$T = 2 \text{ Hours}$

$A = 5,128 * 40\% \text{ voids} = 2,051 \text{ s.f.}$

$4,783 \text{ c.f.} - 0.20 \text{ in/hr} * 2 \text{ hr} * 2,051 \text{ s.f.} = 3,962 \text{ c.f.}$

The infiltration field has a storage volume of 4,276 c.f., which meets this requirement.

A secondary check is required to ensure that the Rv will recharge within at least 72 hours. A K value of 2.40 is used for drawdown design purposes since soils testing found loamy sand soils at this location. Using the following formula, the drawdown time is calculated:

$$\text{Time}_{\text{drawdown}} = [\text{WOV}/(K \times \text{Bottom Area})]$$

Where:

$\text{WOV} = 4,783 \text{ c.f.}$

$K = 2.40 \text{ inches per hour} = 0.20 \text{ feet per hour}$

$\text{Bottom Area} = 2,051 \text{ s.f.}$

It is concluded that the drawdown time for the infiltrated volume is 11.7 hours, which satisfies this requirement.

Mounding Analysis:

Based on soils testing in the field, seasonal high groundwater under the infiltration field was not found to a depth of 374.0. With a proposed bottom elevation of 378.0, the proposed field lies 4 feet above seasonal high groundwater. Thus, a mounding analysis is not required.

Capture Area Adjustment: All impervious surfaces are routed through infiltration BMPs except for the beginning of the existing and proposed driveways. A capture area adjustment is provided as follows:

- Total Proposed On-Site Impervious Coverage: 93,725 s.f.
- Treated Impervious Coverage: 91,360 s.f.
- Percent to Infiltration BMP: 97.5%
- Ratio: 1.03
- Capture Area Adjusted Rv: 2,733 c.f.

The total Rv treated between all infiltration facilities is 10,157 c.f., which greatly exceeds the required recharge volume.

STANDARD 4 - TSS Removal

Stormwater Management Systems shall be Designed to Remove 80% of Average Annual Post-Construction Load of Total Suspended Solids (TSS). This standard is met when:

- a) A long-term pollution prevention plan is provided and implemented as required (refer to Attachment A),
- b) Structural stormwater BMP's are provided as required, and
- c) Pretreatment is provided as required.

The proposed stormwater management system has been designed to provide a series of Best Management Practices in accordance with the Stormwater Management Policy to remove the pollutants found in runoff as described below for each drainage sub-system.

WATER QUALITY VOLUME (WQV)

The Water Quality Volume represents the volume of water which must receive TSS removal treatment in order to comply with Standard 4. The water quality volume is calculated based on either 0.5 inches of runoff or 1.0 inches of runoff from all impervious surfaces on the site. The Town of Franklin requires that all new construction treat 1" of all impervious runoff. The total WQV for the site is split amongst the various BMP treatment trains as described below (or may not apply if the specific BMP's utilized do not use it as a sizing criteria). Using the following formula, the WQV is calculated:

$$\begin{aligned}\text{WQV} &= (\text{Proposed Impervious Area}) * (1 \text{ in.}) \\ \text{WQV} &= (91,360 \text{ sq. ft.}) * (1 \text{ in.}) / (12 \text{ in./ft}) = 7,613 \text{ c.f.}\end{aligned}$$

This treatment volume is met by the proposed infiltration facilities. An additional 2,355 s.f. is not treated, however compliance with this Standard is maintained through use of the De Minimis Discharge calculation. All impervious runoff to Design Point #2 is captured in the latest design update.

The section below demonstrates compliance with the WQV treatment requirements for each treatment facility.

PROPOSED BMP DESIGN

Deep Sump Catch Basins/First Defense Units:

All proposed deep sump catch basins have 4' sumps with hoods designed in accordance with the DEP Stormwater Handbook. Each structure represents one of the pretreatment BMP's in each treatment train and provides a 25% TSS

removal credit. First defense units provide 44% TSS removal, information for which can be found in attachment N. Each 4' diameter unit is capable of treating 1.5 cubic feet per second of runoff.

The proposed stormwater treatment system includes **four** First Defense Units capable of treating the first 1" of stormwater runoff. The flows to each of these units during a 1" storm are as follows:

- FD A: 0.04 cfs
- FD 0+79 **0.09** cfs
- FD B: **0.20** cfs
- **FD C:** **0.96** cfs

These flows are all within the 1.5 cfs treatment limit. HydroCAD calculations for these values can be found in Attachment N.

Sediment Forebay

In accordance with the DEP Handbook, a forebay is sized to hold 0.1" of runoff from its tributary impervious area.

For Stormwater Infiltration Basin #1, the tributary impervious area is **15,133** s.f. and the minimum forebay volume is **126** cubic feet. With the water trapped behind the 12" high checkdam at the piped outlet, the designed forebays will contain 126 cubic feet each, meeting the requirement.

Underground Infiltration Fields:

Infiltration Fields #1, 2, **4, & 5** consist of Cultec 150 XLHD units and Infiltration Fields #3 **& 6** consist of Cultec **902HD** units surrounded in crushed stone. Underground infiltration fields achieve 80% TSS removal when including a pretreatment facility. Pretreatment is not required when treating roof runoff.

Stormwater Infiltration Basin:

The infiltration basin is designed with a total depth of 2.7 feet. Trapped infiltration water reaches a maximum depth of 0.5 feet (elevation of lowest basin outlet) and the maximum water level in the 100-year storm event is 1.65 feet, leaving 1.05 feet of freeboard.

Infiltration Basins provide 80% TSS removal when including a pretreatment facility.

De Minimis Discharges

Design Point #1

The total impervious runoff to Design Point #1 is 20,876 s.f. Of this, 2,355 s.f. of impervious surface is not treated. The untreated runoff meets the following requirements to be counted as De Minimis:

- Physical site constraints preclude installation of TSS treatment devices;
- Discharge from the impervious areas are less than 1 cfs in the 2-year storm;
- An average of at least 80% TSS removal is achieved for the site as a whole
 - The calculations are as follows:
Treated Impervious Area: 13,316 s.f. @ 94% TSS removal
1,817 s.f. @ 89% TSS removal
3,388 s.f. @ 80% TSS removal
Untreated Impervious Area: 2,355 s.f. @ 0% TSS removal

$$\frac{A * TSS}{\text{Total Area}} = \frac{13,316 \text{ s.f.} * 0.94 + 1,817 \text{ s.f.} * 0.89 + 3,388 \text{ s.f.} * 0.80}{20,876} = 80.7\%$$

- The stormwater in the previous calculation all discharges to the same design point;
- Erosion controls are placed at all outlets;
- Standards 2 and 3 are met;
- Pollution prevention measures are included in the SWPPP; and
- The untreated area of runoff has been reduced as much as is practicable.

TSS REMOVAL CALCULATIONS

In accordance with the DEP Stormwater Management Handbook, each of the stormwater treatment trains has been analyzed for TSS removal. The required TSS removal calculation sheets are included in Attachment E and the following sections provide a narrative discussion of each.

Infiltration Basins:

Infiltration Basin #1 receives stormwater runoff from both the existing and proposed driveways and existing roof. For all but the trench drain on the proposed driveway, pretreatment is provided by a deep sump structure, First Defense Unit, another deep sump structure, and double sediment forebays. When including the double forebays, the basin itself provides 80% TSS removal for a total TSS removal of 94% for this treatment train. The treatment for runoff to the trench drain on the proposed driveway consists of a First Defense Unit and double sediment forebays, providing a total of 89% TSS removal when including the basin itself.

Infiltration Fields #1 & 2 are preceded by double deep sump area drains for driveway runoff, or a single deep sump area drain for roof runoff (which does not require pretreatment). When including two pretreatment devices, the field itself provides 80% TSS removal for a total TSS removal of 80% for this treatment train.

Infiltration Fields #3, 4, & 5 treat roof runoff only and do not require pretreatment. The total TSS removal for these facilities is 80%.

Infiltration Field #6 is pretreated by a first defense unit and deep sump catch basins. When including the First Defense unit, the field provides 80% TSS removal on top of the 25% provided by the deep sump catch basins for a total of 85% TSS removal.

STANDARD 5 - Land Uses with Higher Potential Pollutant Loads

For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If, through source control and/or pollution prevention, all land uses with higher potential pollutant load cannot be completely protected from exposure to rain, snow, snow melt and stormwater runoff, the proponent shall use the specific structural stormwater BMP's determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

This development is not a Land Use with Higher Potential Pollutant Loads.

STANDARD 6 – Critical Areas

Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharge near or to any other critical area requires the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such area, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A

“stormwater discharge” as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone 1 or Zone A are prohibited unless essential to the operation of the public water supply.

This site does not lie within or discharge to a critical area.

STANDARD 7 - Redevelopment

A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structures stormwater best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

The site contains two existing dwellings which are not proposed to be altered. New stormwater facilities will be added to treat a majority of the existing runoff. These dwellings and the surrounding yard are considered redevelopment areas and are required to meet these standards only to the maximum extent practicable. All standards are met however.

STANDARD 8 – Erosion Control

A plan to control construction-related impacts, including erosion, sedimentation, and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.

A construction activity NPDES Stormwater Pollution Prevention Plan has been prepared and included as Attachment D.

STANDARD 9 – Long-Term Operations and Maintenance Plan

A Long-Term Operations and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed.

A Drainage System Operations and Maintenance Plan has been prepared and included as Attachment A.

STANDARD 10 – Illicit Discharge Compliance

All illicit discharges to the stormwater management system are prohibited.

See Attachment C for the Illicit Discharge Compliance Statement.

ATTACHMENT A: OPERATIONS AND MAINTENANCE PLAN

OPERATIONS & MAINTENANCE PLAN

FOR

AUTUMN HILL SENIOR VILLAGE

FRANKLIN MA, 02038

PROPOSED SENIOR VILLAGE DEVELOPMENT

JANUARY 26, 2024
REVISED JULY 18, 2024
REVISED SEPTEMBER 23, 2024
REVISED JANUARY 21, 2025

PREPARED BY:
LEGACY ENGINEERING LLC
CONSULTING ENGINEERS
730 MAIN STREET, SUITE 2C
MILLIS, MA 02054

PREPARED FOR:
SUEJO CORP.
P.O. Box 934
WRENTHAM, MA 02093

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INTRODUCTION

This Operations and Maintenance Plan (hereinafter referred to “O&M Plan”) is provided to ensure the long-term monitoring and maintenance of various components of the development’s infrastructure. This O&M Plan includes the following provisions:

1. Stormwater System Operations and Maintenance
2. Integrated Pest Management Plan
3. Miscellaneous Provisions
4. Accidental Spill and Emergency Response Plan

The “Development” and the various components which are referenced in this O&M Plan are described on the site plan referenced below.

Project Name

Autumn Hill Senior Village

Project Location

496 Summer Street
Franklin, MA 02038

Operator Name and Address

Suejo Corp.
P.O. Box 934
Wrentham, MA 02093

References

This O&M Plan references other documents as follows:

Site Plan - Plans entitled “Autumn Hill Senior Village Franklin, MA” with an original date of January 26, 2024 (as may be amended), and prepared by Legacy Engineering LLC, hereinafter referred to as the “Site Plan”.

Stormwater Report – Report entitled “Stormwater Report for Autumn Hill Senior Village” prepared by Legacy Engineering LLC with an original date of January 26, 2024 (as may be amended).

Site Description

The site is a senior village development consisting of 28 residential units located on 12.39 acres of land on Summer Street in Franklin and includes all appurtenant utility systems, landscape areas, and stormwater management systems. Those land areas are collectively referred to herein as the “Development.”

Site Usage and Activities

Multi-family senior residential buildings and associated appurtenances.

PART 1: STORMWATER SYSTEM OPERATIONS AND MAINTENANCE

In order to maximize the continued effectiveness of the Stormwater Management BMP's for the development, the following Operation and Maintenance requirements apply to all stormwater facilities within the extents of the Development. The stormwater facilities are depicted on the Site Plan and are hereinafter referred to as the "Stormwater Facilities."

Operations and Maintenance Responsibilities

The Operator or its designee shall be responsible for implementing all Operations and Maintenance (O&M) responsibilities.

Commencement of Operations and Maintenance Responsibilities

Operations and Maintenance tasks shall be commenced once each respective Stormwater Facility is fully constructed and is receiving runoff from the Development.

Operations and Maintenance Tasks

Deep Sump Catch Basins/Drain Manholes/Area Drains:

1. Deep sump catch basins/drain manholes/area drains shall be inspected daily during construction activities and all sediments and debris shall be removed four times per year unless the owner can determine through recorded observations that sediment accumulation does not warrant such frequent cleanings. If deep sump cleaning occurs less than four times per year, cleaning shall occur when two feet of sediments have accumulated in the sump and at least once per year.
2. Silt sacks shall be installed on all catch basins throughout the time of construction.
3. All sediments and hydrocarbons shall be disposed of off-site in accordance with all applicable local, state, and federal regulations.

Sediment Forebays:

1. Sediment forebays shall be inspected at least four times per year to insure proper operation (during a storm event).
2. Sediment forebays should be mowed and all clippings and debris removed at least twice per year. Debris shall be removed at more frequent intervals if warranted by extreme weather events.
3. Sediment should be removed when 3-inches of sediment accumulates anywhere in the forebay.
4. Remove woody vegetation, leaves, and other materials that would affect the life of the system or its operations.

Stormwater Infiltration Basin:

1. Stormwater basins shall be inspected at least twice per year to insure proper operation (during a storm event).
2. Inspections shall include ensuring that inlet, outlet, and splash pad rip-rap aprons are in good condition and that that interior wall systems are in good condition. Deficiencies shall be remedied immediately.
3. Inspections shall include an observation of the accumulation of sediment in the basin. Pretreatment BMPs are intended to capture and contain coarse sediments. Should indication of significant accumulation of sediments in the infiltration basin be observed, increased frequency of cleaning of the preceding sediment forebay and catch basins shall be implemented.
4. Inspections shall include ensuring that outlet structures are unobstructed and free-flowing per the Site Plan design specifications.
5. Inspections shall include ensuring that all berms are fully stabilized, structurally sound and not eroded. Deficiencies shall be remedied immediately.
6. Stormwater basins should be mowed and all clippings and debris removed at least twice per year. Debris shall be removed at more frequent intervals if warranted by extreme weather events. If wetland vegetation grows at the bottom of the stormwater basin, it shall only be mowed once per year at the beginning of the winter season.
7. Sediment should be removed at least once every 5 years or when 2-inches of sediment accumulates anywhere in the basin and disposed of off-site in accordance with all applicable local, state, and federal regulations. Two sedimentation markers shall be installed in the basin by a Registered Land Surveyors with a clear marking of the 2-inch accumulation line. It is recommended that stone bounds be installed with chiseled marks indicating the limit of accumulation, although other similarly permanent marking methods may be utilized.

Stormwater Treatment Units (shown on the Site Plan as "First Defense Units"): (maintenance tasks and frequency from manufacturer published data)

1. Stormwater Treatment units shall be inspected twice per year. Sediments and floating debris and petroleum products shall be removed with a vacuum truck when either the sediment depth reaches 6-inches or the floating depth of petroleum products reaches 3-inches. Sediment and floating debris removal shall occur at least once per year unless the Operator can demonstrate that sediment/floating debris accumulation does not achieve the thresholds noted above within a typical year. The Operator shall submit an analysis by a Registered Professional Engineer to the Planning Board explaining the basis for more infrequent cleaning.
2. All sediments and hydrocarbons shall be disposed of off-site in accordance with all applicable local, state, and federal regulations.

Infiltration Fields:

Infiltration Fields shall be maintained in good working order at all times. Gutters and downspouts shall be maintained in good working order at all times. The roof runoff leaching system shall be inspected once per calendar year shortly after a small

rainstorm event to ensure that water accumulation within the infiltration fields is not excessive. Overflow during small storm events is likely an indication of a failed system due to clogging of the soils around the system or may be indicative of a blocked pipe. If this happens, the system shall be replaced in accordance with the original design or effect an appropriate repair, if it is determined that this repair will alleviate the problem.

French Drains:

1. French drains shall be cleared of debris in the spring and in the fall each year.
2. French drains shall be inspected at least once per year after a rainfall event of 1.5 inches or greater. If stormwater is observed to be ponding on top of the french drain, the stone is to be removed and replaced.

Trench Drains:

1. Trench drains shall be cleared of debris in the spring and in the fall each year.
2. All sediments and hydrocarbons shall be disposed of off-site in accordance with all applicable local, state, and federal regulations.

Stormwater Pipes, Inlets and Outfalls:

1. All stormwater inlets and outfalls shall be inspected twice per year.
2. Trash, leaves, debris and sediment shall be removed from inlets and outfalls as needed to keep them free flowing.
3. If inspections indicate that stormwater pipelines have become partially obstructed with trash, leaves, debris or sediment, the pipelines shall be cleaned by water jet truck and the obstructions removed and disposed of.

The various operations and maintenance schedule requirements listed above may be reduced in frequency by approval from the Town. Should such permission be desired, the Operator shall provide documentation of actual on-site maintenance observations by a qualified source (engineer or other qualified person meeting the approval of the Town) demonstrating that the particular Stormwater BMP in question does not warrant the specified frequency of inspection or maintenance activities.

Reporting Requirements

The following documentation shall be submitted no later than December 31st of each calendar year to the DPW:

1. A statement, signed by an authorized representative of the Operator indicating that the requirements of this O&M Plan were performed during the previous calendar year. Where requirements were not met, a schedule for their completion shall be provided and a follow-up statement submitted when complete.
2. A list of the maintenance activities performed along with the approximate date of the work.

3. A list of the inspections performed along with a statement by each inspector summarizing the results of the inspections performed in accordance with this O&M plan.
4. Copies of appurtenant documentation supporting the completion of the O&M responsibilities such as copies of contracts and/or receipts with parties engaged to perform maintenance and inspection services.
5. A notation regarding whether there has been any change in the name and or contact information for the Operator.

Public Safety Features

The stormwater system has been designed to safely collect surface runoff from developed areas (as described on the Site Plan and Stormwater Report) by providing collections systems at regular intervals to prevent surface flooding and to treat that runoff in accordance with the provisions of the Massachusetts Stormwater Management Standards and Handbook.

PART 2: INTEGRATED PEST MANAGEMENT PLAN

Applicability

The Development shall adhere to this IPM in perpetuity, unless the conservation Commission releases the Operator from this obligation in writing.

Lawn Preparation and Installation

The following methods shall be employed for all lawn installation and replacements.

- Topsoil installed in lawn areas shall be installed to a minimum thickness of 4-inches. Installation shall be in a manner that minimizes compaction of the topsoil. Topsoil should include a minimum organic content of 18% in the top 4-inches. In areas where existing topsoil is limited or non-existent due to bedrock or hardpan, 6-24 inches of sandy loam topsoil should be spread with a minimum 18% organic content in the top 6-inches.
- Topsoil shall be tested for pH, organic content and mineral content including calcium, magnesium, potassium and sodium at the time of installation and supplements shall be added as recommended. Lime shall be added at the rates recommended by the soil test lab to bring topsoil pH within recommended levels.
- Seeding shall include at least three of the following turf types: Fine Fescue, Kentucky Bluegrass, Perennial Rye Grass, and Tall Fescue.
- Fertilizer application at the time of seeding shall not exceed 0.5 pounds per 1,000 square feet and shall be either organic or mineral.
- During the period of turf establishment (1-2 seasons after seeding), up to two broadleaf weed control applications per year may be applied to the entire lawn area to encourage the establishment of the turf and prevent weed infestations.

Mechanical Lawn Care Standards

The following maintenance guidelines shall be generally applied to lawn care, although specific adherence to every standard is not necessary. Adherence to these mechanical lawn care standards will encourage the development of a thick, dense, and healthy turf system which will ultimately result in fewer Lawn Care Treatment requirements.

- Lawn cutting height should be adjusted according to the season using the following as guidance:
 - May – June: 2.5" Cut Height
 - July – August: 3-3.5" Cut Height
 - September: 2.5-3" Cut Height
 - October – November: 2" Cut Height
- Lawn mowing should be at sufficient frequency such that not more than 1/3 of the leaf blade height is cut off.
- Aerate the lawn generally once per year in the mid-summer to mid-fall period. A second aeration in the spring may be appropriate for compact soils conditions.
- Dethatching is generally not necessary unless the thatch layer exceed ¾".

Core Lawn Care Treatment Program

Each lawn shall adhere to the following lawn care practices and restrictions:

- A soil test shall be conducted at least once every two years to evaluate topsoil pH level and the necessary application of lime will be made to bring soil pH within recommended levels. Recommended topsoil pH levels are between 6.5 and 6.8. Soils testing shall also include organic content, mineral content, including calcium, magnesium, potassium and sodium, total cation exchange capacity, and hydrogen. Ideal base saturation percentages for these parameters are as follows:
 - Calcium: 68-70%
 - Magnesium: 15-20%
 - Potassium: 4.5-6%
 - Sodium: <3%
 - Other Bases: 4-8%
 - Hydrogen: 5-10%
- Fertilizer application shall be as-needed based on the results of the latest soils test, plant health, rooting characteristics, growth rate desired, and season. Fertilizer application shall not exceed five times per calendar year and the total quantity of fertilizer applied in any given year shall not result in the application of more than three pounds of nitrogen per 1,000 square feet with not more than one pound of nitrogen applied per 1,000 square feet in any single application. Nitrogen, in the form of fertilizer, should generally be applied in small increments to avoid nitrate leachate and runoff, undesired sprits in growth, and increase in pest population. Granular organic and/or organic/synthetic slow release fertilizers shall be used. The optimal use of fertilizers is to create an organic foundation for soil health and development which provides sufficient nutrients for controlled plant growth and avoiding subsurface and surface nutrient loss to groundwater or stormwater runoff.
- Except as noted below, only one application of crab-grass prevention product is permitted per year during March or April, and only in portions of the lawn in full sun which are prone to such infestations. The use of corn gluton (organic crab-grass control method) is permitted twice per year.
- At the time of fertilizer application, any accidental spillage onto impervious surfaces such as driveways, walkways, patios, and streets shall be swept up and either applied to the lawn or removed from the site.

Optional Maintenance Practices to be Applied as Needed

- Where topsoil testing demonstrates a deficiency, mineral or organic micro-nutrients may be added to achieve recommended levels.
- Generally, chemical pesticides should be used as a final option and the minimum amount necessary to achieve the desired result should be used. Non chemical means of pest control should be tried first. In the event of suspected pest problem, a visual inspection shall first be made by qualified personnel to confirm the presence of stressed vegetation, wildlife activity, pathogens, and other similar indicators. Should a pest problem be identified, the condition shall be monitored periodically such that if the problem subsides, treatment methods can stop as soon as possible thereafter.
- Root bio-stimulants from organic sources (examples include Roots, Organica, or PHC type products, which are brand names and which may change depending on market conditions) may be used as needed.
- Compost topdressing (1/8" – 1/4" depth) may be applied as needed.

- Spot treatment of weeds and Crabgrass may be implemented at any time as needed, but only on a spot-treatment basis and only to those areas affected.
- Spot treatment for turf disease may be implemented at any time as needed, but only on a spot-treatment basis and only to those areas affected.
- Grub control products and similar products may be applied to localized areas only where grub activity is evident. Grub control may be applied when grub populations reach an average of 8 -10 grubs per square foot or if the plant/lawns are showing signs of stress from grub activity.
- One application of Imidacloprid (Merit) or similar products per year is permitted during June and July in areas where grub activity has historically occurred.
- Pesticides which are classified for Restricted Use pursuant to 333 CMR may only be applied by properly licensed or certified personnel or by individuals under the direct on-site supervision of properly licensed or certified personnel in accordance with 333 CMR.

PART 3: MISCELLANEOUS PROVISIONS

Good Housekeeping Controls

The following good housekeeping measures will be implemented in the day-to-day operation of the Development:

1. The site will be maintained in a neat and orderly manner.
2. Fertilizers and pesticide application shall be in accordance with manufacturer recommendations.
3. All waste materials from the development will be collected in dumpsters and removed from the site by properly licensed disposal companies.

Management of Deicing Chemicals and Snow

Management of on-site snow will be as follows:

1. The site shall be plowed as needed to maintain safe driving conditions. Snow will be stored in windrows along pavement edges and shall be piled in landscape strips as needed.
2. Snow will not be plowed into piles which block or obstruct stormwater management facilities.
3. Snow will not be plowed into piles at roadway intersections such that it would obstruct visibility for entering or exiting vehicles.
4. Deicing chemicals application will be as little as possible while provide a safe environment for vehicular operation and function.
5. At such time as snow accumulations exceed the capacity of on-site storage areas, such excess snow shall be removed from the site and disposed of in accordance with state, local, and federal laws and regulations.

Operator Training

The Operator is responsible for providing training for the staff that will be responsible for the implementation of this O&M Plan. Such training shall occur at least once annually.

Illicit Discharges

The Operator shall not allow non-stormwater discharges into the development's stormwater system. Any discovered non-stormwater discharges into the development's stormwater system shall be immediately disconnected.

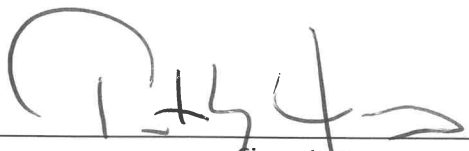
Estimated Operations and Maintenance Budget

It is estimated that the regular annual maintenance tasks described herein will cost \$4,000 per year (2025 value).

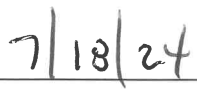
PART 4: ACCIDENTAL SPILL AND EMERGENCY RESPONSE PLAN

In the event of an accident within the boundaries of the Site, where significant gasoline or other petroleum products or other hazardous materials are released, the following procedure shall be followed in the order noted.

1. As quickly as possible, attempt to block the nearest stormwater catch basins if on a roadway, or if in proximity to wetlands, create a berm of soil downslope of the spill.
2. Immediately, and while the containment measures are implemented as described above, notify the following governmental entities and inform them of the type of spill that occurred:
 - Franklin Fire Department at 508-528-2323,
 - Franklin Board of Health at 508-520-4905,
 - Franklin Conservation Commission at 508-520-4929,
 - Mass. Department of Environmental Protection (DEP) Central Region at (508) 792-7650 (address is 8 New Bond Street, Worcester, MA 01606), and
 - National Response Center (NRC) at (800) 424-8802 (for spills that require such notification pursuant to 40 CFR Part 110, 40 CFR Part 117, and 40 CR Part 302).
3. Once the various emergency response teams have arrived at the site and if the spill occurs on a lot, the owner shall follow the instructions of the various governmental entities, which may include the following:
 - A clean up firm may need to be immediately contacted.
 - If the hazardous materials have entered the stormwater system, portions of it may need to be cleaned and restored per the DEP. All such activities shall be as specified by the DEP.



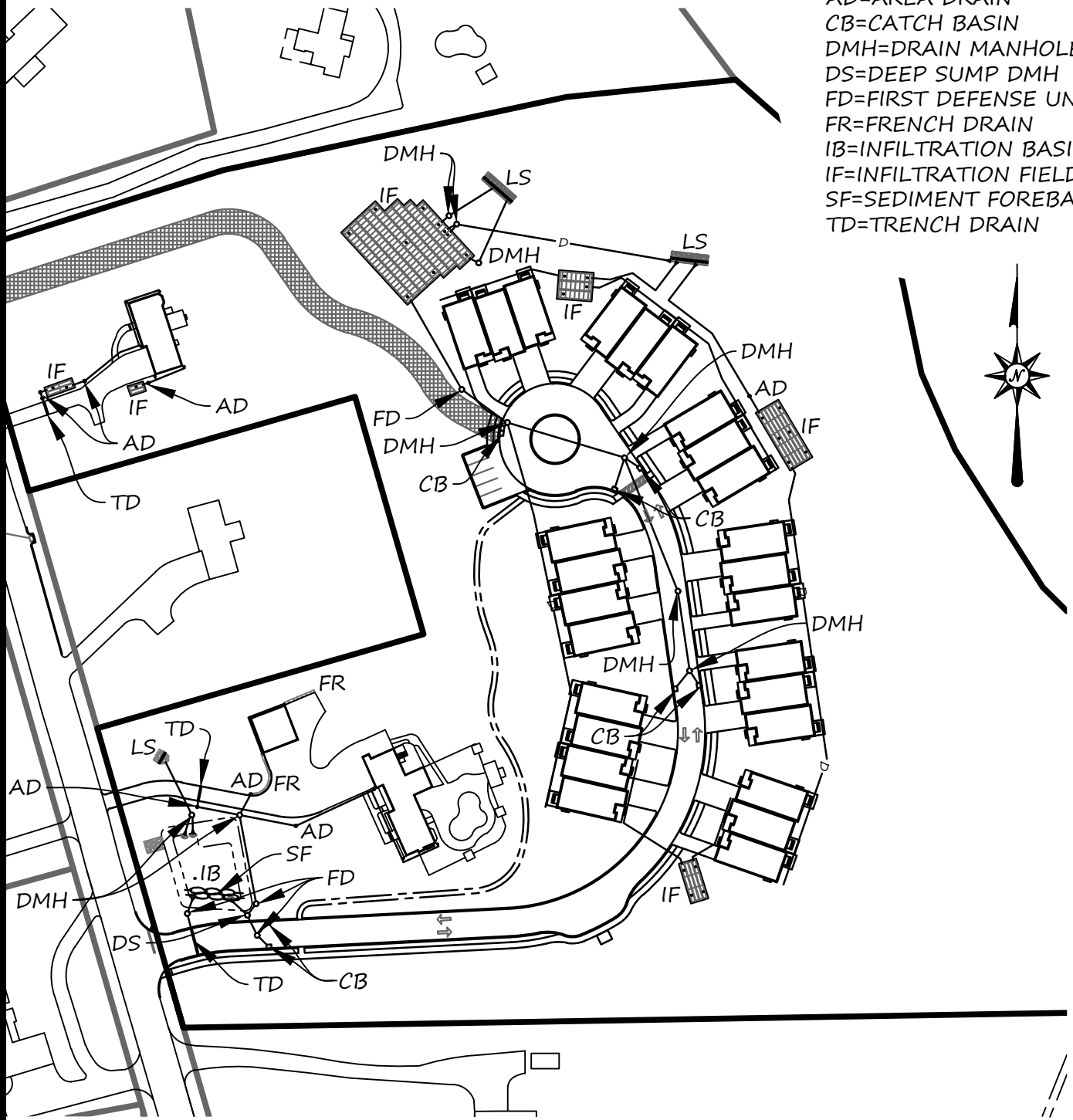
Signature



Date

EXHIBIT 1 STORMWATER FACILITIES SITE PLAN

LEGEND
 AD=AREA DRAIN
 CB=CATCH BASIN
 DMH=DRAIN MANHOLE
 DS=DEEP SUMP DMH
 FD=FIRST DEFENSE UNIT
 FR=FRENCH DRAIN
 IB=INFILTRATION BASIN
 IF=INFILTRATION FIELD
 SF=SEDIMENT FOREBAY
 TD=TRENCH DRAIN



730 MAIN STREET
 SUITE 2C
 MILLIS, MA 02054
 508-376-8883(o)

SHEET 1 OF 1

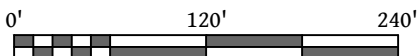


LEGACY
 ENGINEERING

AUTUMN HILL
 SENIOR VILLAGE
 O&M
 PLAN OF LAN IN
 FRANKLIN, MA

PLAN DATE: 2024-01-26

PLAN SCALE: 1"=120'



REVISION	DATE
REV. PER COM.	2024-7-18
REV. PER COM.	2024-9-23
REV. SITE DESIGN	2025-1-21

EXHIBIT 2 STORMWATER SYSTEM OPERATIONS AND MAINTENANCE LOG FORM

Stormwater System Operations and Maintenance Log

Year _____

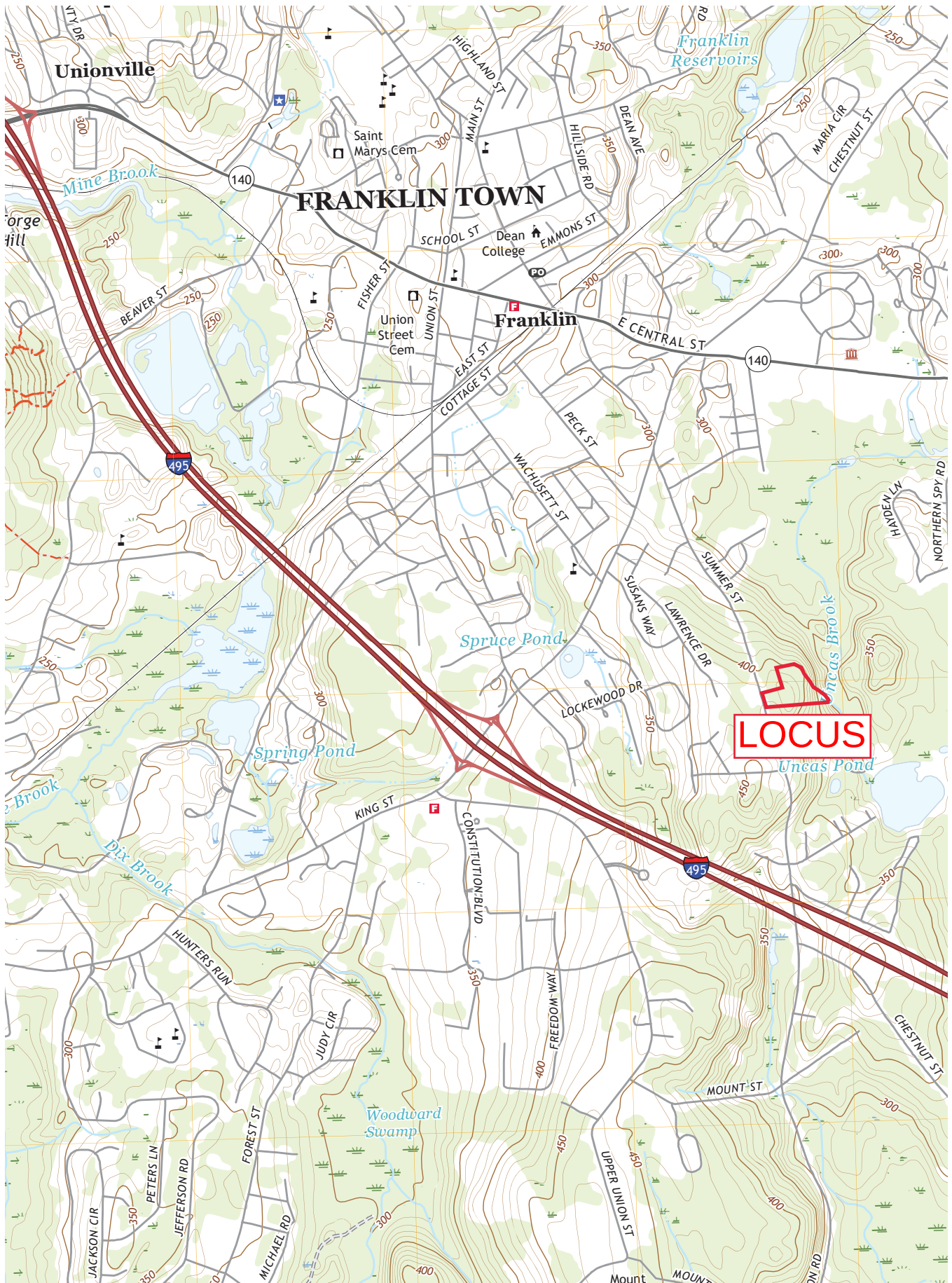
General Information	
Project Name	Autumn Hill Senior Village
Site Location	496 Summer Street Franklin, MA 02038
Inspector's Name	
Inspector's Title	
Inspector's Phone	
Signature of Operator at end of Year, Certifying that Work was Completed as Noted. Date:	

O&M Task Checklist

	O&M Activity	Date Completed	Notes/Comments
Deep Sump Catch Basins/Drain Manholes/Area Drains			
	1 st Quarter Cleanout		
	2 nd Quarter Cleanout		
	3 rd Quarter Cleanout		
	4 th Quarter Cleanout		
Sediment Forebay			
	1 st Annual Inspection		
	2 nd Annual Inspection		
	3 rd Annual Inspection		
	4 th Annual Inspection		
	1 st Annual Mowing		
	2 nd Annual Mowing		
	Sediment Rem. Req'd?		
Stormwater Infiltration Basin			
	1 st Annual Inspection		
	2 nd Annual Inspection		
	1 st Annual Mowing		

	O&M Activity	Date Completed	Notes/Comments
	2 nd Annual Mowing		
	Sediment Removal Req'd?		
First Defense Units			
	1 st Inspection		
	2 nd Inspection		
	Unit Cleaning		
French Drain			
	1 st Cleanout		
	2 nd Cleanout		
	Annual Inspection		
Trench Drain			
	1 st Cleanout		
	2 nd Cleanout		
	Annual Inspection		
Underground Infiltration Field			
	1 st Annual Inspection		
	2 nd Annual inspection		
	System Repl. Req'd?		
Stormwater Pipes, Inlets and Outlets			
	1 st Annual Inspection		
	2 nd Annual inspection		

ATTACHMENT B: USGS MAP



ATTACHMENT C: ILLICIT DISCHARGE COMPLIANCE STATEMENT

ILLICIT DISCHARGE COMPLIANCE STATEMENT

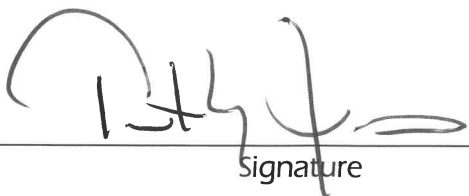
**Autumn Hill Senior Village
496 Summer Street
Franklin, MA**

This statement is provided in accordance with the provisions of the Massachusetts Stormwater Management Standard 10 and of the Massachusetts Stormwater Management Handbook.

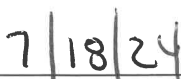
Note the following:

- All stormwater management systems contain no connection to the site's wastewater sewer system or to any other non-stormwater collection system.
- Groundwater collection systems on the site are not connected to the site's wastewater sewer system or to any other non-stormwater collection system.
- The facility's Operations & Maintenance Plan is designed to prevent any discharge of non-stormwater to the drainage system.
- Any illicit discharges identified during or after construction will be immediately disconnected.

Date: July 18, 2024



Signature



Date

**ATTACHMENT D: CONSTRUCTION
ACTIVITY NPDES STORMWATER POLLUTION
PREVENTION PLAN**

Stormwater Pollution Prevention Plan (SWPPP)

For Construction Activities At:

Autumn Hill Senior Village
496 Summer Street
Franklin, MA 02038
774-572-1972

SWPPP Prepared For:

Suejo Corp.
Tim Jones
P.O. Box 934
Wrentham, MA 02093
774-571-1972
gracewooddevelopment@gmail.com

SWPPP Prepared By:

Legacy Engineering, LLC
730 Main Street, Suite 2C
Millis, MA 02054
508-376-8883
dan@legacy-ce.com

SWPPP Preparation Date:

01/21/2025

Estimated Project Dates:

Project Start Date: [Insert Date](#)

Project Completion Date: [Insert Date](#)

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SECTION 1: CONTACT INFORMATION/RESPONSIBLE PARTIES

1.1 Operator(s) / Subcontractor(s)

Operator(s):

Suejo Corp.
Tim Jones
P.O. Box 934
Wrentham, MA 02093
774-571-1972

[Repeat as necessary.]

Subcontractor(s):

To Be Determined Prior to Construction
Insert Name
Insert Address
Insert City, State, Zip Code
Insert Telephone Number
Insert Fax/Email
Insert area of control (if more than one operator at site)

[Repeat as necessary.]

Emergency 24-Hour Contact:

To Be Determined Prior to Construction
Insert Name
Insert Telephone Number

1.2 Stormwater Team

Stormwater Team

Name and/or Position, and Contact	Responsibilities	I Have Completed Training Required by CGP Part 6.2	I Have Read the CGP and Understand the Applicable Requirements
Daniel Merrikin, P.E. President 508-376-8883 dan@legacy-ce.com	Design of stormwater controls	☒ Yes ☐ No	☒ Yes Date: 3/1/2022
Insert Name of Responsible Person Insert Position Insert Telephone Number Insert Email	Inspections of stormwater controls	☐ Yes ☒ No	☐ Yes Date: Click here to enter a date.
Insert Name of Responsible Person Insert Position Insert Telephone Number Insert Email	Installation, maintenance and/or repair of stormwater controls. Taking corrective actions	☐ Yes ☒ No	☐ Yes Date: Click here to enter a date.

[Insert or delete rows as necessary.]

Stormwater Team Members Who Conduct Inspections Pursuant to CGP Part 4

Name and/or Position and Contact	Training(s) Received	Date Training(s) Completed	If Training is a Non-EPA Training, Confirm that it Satisfies the Minimum Elements of CGP Part 6.3.b
Insert Name of Responsible Person Insert Position Insert Telephone Number Insert Email	Insert Title of Training Received	Date: Click here to enter a date.	☐ Principles and practices of erosion and sediment control and pollution prevention practices at construction sites ☐ Proper installation and maintenance of erosion and sediment controls and pollution prevention practices used at construction sites ☐ Performance of inspections, including the proper completion of required reports and documentation, consistent with the requirements of Part 4
Insert Name of Responsible Person Insert Position Insert Telephone Number Insert Email	Insert Title of Training Received	Date: Click here to enter a date.	☐ Principles and practices of erosion and sediment control and pollution prevention practices at construction sites ☐ Proper installation and maintenance of erosion and sediment controls and pollution prevention practices used at construction sites ☐ Performance of inspections, including the proper completion of required reports and documentation, consistent with the requirements of Part 4
Insert Name of Responsible Person Insert Position Insert Telephone Number Insert Email	Insert Title of Training Received	Date: Click here to enter a date.	☐ Principles and practices of erosion and sediment control and pollution prevention practices at construction sites ☐ Proper installation and maintenance of erosion and sediment controls and pollution prevention practices used at construction sites ☐ Performance of inspections, including the proper completion of required reports and documentation, consistent with the requirements of Part 4

[Insert or delete rows as necessary.]

SECTION 2: SITE EVALUATION, ASSESSMENT, AND PLANNING

2.1 Project/Site Information

Project Name and Address

Project/Site Name: Autumn Hill Senior Village
Street/Location: 496 Summer Street
City: Franklin
State: MA
ZIP Code: 02038
County or Similar Government Division: Norfolk

Project Latitude/Longitude

Latitude: 42.0670° N
(decimal degrees)

Longitude: - 71.3840 ° W
(decimal degrees)

Latitude/longitude data source: ☒ Map ☐ GPS ☐ Other (please specify):

Horizontal Reference Datum: ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

Additional Site Information

Is your site located on Indian country lands, or on a property of religious or cultural significance to an Indian Tribe? ☐ Yes ☒ No

If yes, provide the name of the Indian Tribe associated with the area of Indian country (including the name of Indian reservation if applicable), or if not in Indian country, provide the name of the Indian Tribe associated with the property: Not applicable

2.2 Discharge Information

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? ☒ Yes ☐ No

Are there any waters of the U.S. within 50 feet of your project's earth disturbances? ☐ Yes ☒ No

For each point of discharge, provide a point of discharge ID (a unique 3-digit ID, e.g., 001, 002), the name of the first receiving water that receives stormwater directly from the point of discharge and/or from the MS4 that the point of discharge discharges to, and the following receiving water information, if applicable:

Point of Discharge ID	Name of receiving water that receives stormwater discharge:	Is the receiving water impaired (on the CWA 303(d) list)?	If yes, list the pollutants that are causing the impairment:	Has a TMDL been completed for this receiving waterbody?	If yes, list TMDL Name and ID:	Pollutant(s) for which there is a TMDL:	Is this receiving water designated as a Tier 2, Tier 2.5, or Tier 3 water?	If yes, specify which Tier (2, 2.5, or 3)?
[001]	Uncas Brook	☐ Yes ☒ No		☐ Yes ☒ No			☐ Yes ☒ No	
[002]	Uncas Pond	☐ Yes ☒ No		☐ Yes ☒ No			☐ Yes ☒ No	
[003]	Insert Text Here	☐ Yes ☐ No		☐ Yes ☐ No			☐ Yes ☐ No	[INSERT "Tier 2", "Tier 2.5", or "Tier 3"]
[004]	Insert Text Here	☐ Yes ☐ No		☐ Yes ☐ No			☐ Yes ☐ No	[INSERT "Tier 2", "Tier 2.5", or "Tier 3"]
[005]	Insert Text Here	☐ Yes ☐ No		☐ Yes ☐ No			☐ Yes ☐ No	[INSERT "Tier 2", "Tier 2.5", or "Tier 3"]
[006]	Insert Text Here	☐ Yes ☐ No		☐ Yes ☐ No			☐ Yes ☐ No	[INSERT "Tier 2", "Tier 2.5", or "Tier 3"]

[Include additional rows or delete as necessary.]

2.3 Nature of the Construction Activities

General Description of Project

Provide a general description of the nature of your construction activities, including the age or dates of past renovations for structures that are undergoing demolition:

Construction of 42 senior residential units along with appurtenant driveways, landscape areas, utilities, and stormwater management systems.

If you are conducting earth-disturbing activities in response to a public emergency, document the cause of the public emergency (e.g., *mud slides, earthquake, extreme flooding conditions, widespread disruption in essential public services*), information substantiating its occurrence (e.g., *State disaster declaration or similar State or local declaration*), and a description of the construction necessary to reestablish affected public services:

- The work is not related to a public emergency

Business days and hours for the project: Monday through Saturday, 7:00 am to 9:00 pm

Size of Construction Site

Size of Property	12.39 Acres
Total Area Expected to be Disturbed by Construction Activities	6.3 Acres
Maximum Area Expected to be Disturbed at Any One Time, Including On-site and Off-site Construction Support Areas	3.8 Acres

[Repeat as necessary for individual project phases.]

Type of Construction Site (check all that apply):

- ☐ Single-Family Residential ☒ Multi-Family Residential ☐ Commercial ☐ Industrial
☐ Institutional ☐ Highway or Road ☐ Utility ☐ Other _____

Will you be discharging dewatering water from your site? ☐ Yes ☒ No

If yes, will you be discharging dewatering water from a current or former Federal or State remediation site? ☐ Yes ☒ No

Pollutant-Generating Activities

List and describe all pollutant-generating activities and indicate for each activity the associated pollutants or pollutant constituents that could be discharged in stormwater from your construction site. Take into account where potential spills and leaks could occur that contribute pollutants to stormwater discharges, and any known hazardous or toxic substances, such as PCBs and asbestos, that will be disturbed during construction.

Pollutant-Generating Activity (e.g., paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering operations)	Pollutants or Pollutant Constituents (e.g., sediment, fertilizers, pesticides, paints, caulks, sealants, fluorescent light ballasts, contaminated substrates, solvents, fuels)
Paving operations	Asphalt
Concrete washout	Concrete byproducts
Solid waste storage and disposal	Solid waste, trash, construction debris, etc..

[Include additional rows or delete as necessary.]

Construction Support Activities *(only provide if applicable)*

Describe any construction support activities for the project (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas):

1. Equipment staging yards, including construction equipment (trucks, excavators, rollers, etc..)
2. Material storage areas, including site-related construction materials (pipes, manholes, fittings, etc...) and building related materials (concrete, wood, lumber, trim, siding, steel, roofing materials, etc...), and
3. Earthen materials stockpiles, including items like soil, crushed stone, sand, general fill, topsoil, etc...

Contact information for construction support activity:

To Be Determined

Insert Telephone No.

Insert Email

Insert Address And/Or Latitude/Longitude

[Repeat as necessary.]

2.4 Sequence and Estimated Dates of Construction Activities

Phase I

Infrastructure Construction	
Estimated Start Date of Construction Activities for this Phase	Insert Estimated Date
Estimated End Date of Construction Activities for this Phase	Insert Estimated Date
Estimated Date(s) of Application of Stabilization Measures for Areas of the Site Required to be Stabilized	Insert Estimated Date <i>[Add additional dates as necessary]</i>
Estimated Date(s) when Stormwater Controls will be Removed	Insert Estimated Date <i>[Add additional dates as necessary]</i>

Phase II

Building Construction	
Estimated Start Date of Construction Activities for this Phase	Insert Estimated Date
Estimated End Date of Construction Activities for this Phase	Insert Estimated Date
Estimated Date(s) of Application of Stabilization Measures for Areas of the Site Required to be Stabilized	Insert Estimated Date [Add additional dates as necessary]
Estimated Date(s) when Stormwater Controls will be Removed	Insert Estimated Date [Add additional dates as necessary]

[Repeat as needed.]

2.5 Authorized Non-Stormwater Discharges

List of Authorized Non-Stormwater Discharges Present at the Site

Authorized Non-Stormwater Discharge	Will or May Occur at Your Site?
Discharges from emergency fire-fighting activities	☐ Yes ☒ No
Fire hydrant flushings	☒ Yes ☐ No
Landscape irrigation	☒ Yes ☐ No
Water used to wash vehicles and equipment	☐ Yes ☒ No
Water used to control dust	☒ Yes ☐ No
Potable water including uncontaminated water line flushings	☒ Yes ☐ No
External building washdown (soaps/solvents are not used and external surfaces do not contain hazardous substances)	☒ Yes ☐ No
Pavement wash waters	☐ Yes ☒ No
Uncontaminated air conditioning or compressor condensate	☒ Yes ☐ No
Uncontaminated, non-turbid discharges of ground water or spring water	☒ Yes ☐ No
Foundation or footing drains	☒ Yes ☐ No
Uncontaminated construction dewatering water	☒ Yes ☐ No

(Note: You are required to identify the likely locations of these authorized non-stormwater discharges on your site map. See Section 2.6, below, of this SWPPP Template.)

2.6 Site Maps

The project "Site Maps" are comprised of a variety of documents which cumulatively contain the information required by the SWPPP. These documents include the full detailed site or subdivision plans ("site plan") (as applicable) and the stormwater report (if applicable).

SECTION 3: DOCUMENTATION OF COMPLIANCE WITH OTHER FEDERAL REQUIREMENTS

3.1 Endangered Species Protection

Eligibility Criterion

Following the process outlined in Appendix D, under which criterion are you eligible for coverage under this permit?

- ☒ **Criterion A:** No ESA-listed species and/or designated critical habitat present in action area.
Using the process outlined in Appendix D of the CGP, you certify that ESA-listed species and designated critical habitat(s) under the jurisdiction of the USFWS or NMFS are not likely to occur in your site's "action area" as defined in Appendix A of the CGP. *Please Note: NMFS' jurisdiction includes ESA-listed marine and estuarine species that spawn in inland rivers.*
- ☒ Check to confirm you have provided documentation in your SWPPP as required by CGP Appendix D (Note: reliance on State resources is not acceptable; see CGP Appendix D).

3.2 Historic Property Screening Process

Appendix E, Step 1

Do you plan on installing any stormwater controls that require subsurface earth disturbance, including, but not limited to, any of the following stormwater controls at your site? Check all that apply below, and proceed to Appendix E, Step 2.

- ☐ Dike
- ☐ Berm
- ☒ Catch Basin
- ☐ Pond
- ☐ Constructed Site Drainage Feature (e.g., ditch, trench, perimeter drain, swale, etc.)
- ☐ Culvert
- ☐ Channel
- ☐ Other type of ground-disturbing stormwater control:

(Note: If you will not be installing any subsurface earth-disturbing stormwater controls, no further documentation is required for Section 3.2 of the Template.)

Appendix E, Step 2

If you answered yes in Step 1, have prior professional cultural resource surveys or other evaluations determined that historic properties do not exist, or have prior disturbances at the site have precluded the existence of historic properties? ☐ YES ☒ NO

- If yes, no further documentation is required for Section 3.2 of the Template and you may provide the prior documentation in your SWPPP.
 - Not applicable.
- If no, proceed to Appendix E, Step 3.

Appendix E, Step 3

If you answered no in Step 2, have you determined that your installation of subsurface earth-disturbing stormwater controls will have no effect on historic properties? ☒ YES ☐ NO

- If yes, provide documentation of the basis for your determination: A search on the MA Historical Commission website did not return any results for the site.
- If no, proceed to Appendix E, Step 4.

3.3 Safe Drinking Water Act Underground Injection Control Requirements

Do you plan to install any of the following controls? Check all that apply below.

- ☐ Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)
- ☐ Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow
- ☐ Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

Construction-stage erosion controls do not include the items noted above.

SECTION 4: EROSION AND SEDIMENT CONTROLS AND DEWATERING PRACTICES

4.1 Natural Buffers or Equivalent Sediment Controls

Buffer Compliance Alternatives

Are there any receiving waters within 50 feet of your project's earth disturbances? ☐ YES ☒ NO

4.2 Perimeter Controls

General

- Perimeter erosion and sediment control barriers will be provided, installed, and maintained downstream of all proposed construction activities in accordance with this Plan, the Site Plan, and all permits issued for the site development. Such controls must be installed before any earth-disturbing activities occur on the site in question. Erosion and sediment controls may be

installed in phases so long as it precedes any earth-disturbing activities within the controls' upstream watershed.

- The proposed perimeter erosion controls will provide adequate protection. The ends of the perimeter controls shall extend upslope at a 45-degree angle to prevent stormwater from circumnavigating the edge of the perimeter control. After a storm event, erosion controls are to be extended where evidence of circumventing or undercutting of the perimeter control is found.
- Sediment shall be removed along such controls on a regular basis. In no case, shall sediment be allowed to reach a depth equal to one half of the above ground height of the erosion control device.

Specific Perimeter Controls

Compost Sock & Orange Snow Fence	
Description: Compost sock & orange snow fence	
Installation	Insert approximate date of installation
Maintenance Requirements	Remove sediment before it has accumulated to one-half of the above-ground height of any perimeter control. After a storm event, if there is evidence of stormwater circumventing or undercutting the perimeter control, extend controls and/or repair undercut areas to fix the problem.
Design Specifications	Refer to details on Site Plan

[Repeat as needed for individual perimeter controls.]

4.3 Sediment Track-Out

General

- Construction vehicles will use designated entry points for each site. Crushed stone or rip-rap entry/construction apron(s) will be installed and properly maintained during construction until the site is paved. All construction access will be via the construction entrances noted on the Site Plan. At construction entrances and in their general vicinity, existing roads will be kept clean and swept as needed to minimize the tracking of soils and dust from the site.

Specific Track-Out Controls

Construction Entrance	
Description: Crushed stone or rip-rap construction entrance	
Installation	Insert approximate date of installation
Maintenance Requirements	Where sediment has been tracked-out from your site onto paved roads, sidewalks, or other paved areas outside of your site, remove the deposited sediment by the end of the same business day in which the track-out occurs or by the end of the next business day if track-out occurs on a non-business day. Remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. You are prohibited from hosing or sweeping tracked-out sediment into any constructed or natural site drainage feature, storm drain inlet, or receiving water.
Design Specifications	Refer to details on Site Plan

[Repeat as needed for individual track-out controls.]

4.4 Stockpiles or Land Clearing Debris Piles Comprised of Sediment or Soil

General

- Soil stockpiles to be left in place more than 24 hours shall be surrounded with a line of compost sock to prevent the piles from eroding into the site and to discourage on-site runoff from eroding the stockpiles. Soil stockpiles to be left in place more than 14 days shall be stabilized temporarily in accordance with this temporary stabilization provisions of this plan. Dust control measures shall be implemented to prevent wind erosion of the stockpiles.

Specific Stockpile Controls

Stockpile Perimeter Controls	
Description: Compost sock around stockpile area	
Installation	Insert approximate date of installation
Maintenance Requirements	Secure stockpiles to prevent erosion during rainfall events that may impact wetland resource areas. You are prohibited from hosing down or sweeping soil or sediment accumulated on pavement or other impervious surfaces into any constructed or natural site drainage feature, storm drain inlet, or receiving water.
Design Specifications	Refer to details on Site Plan

[Repeat as needed for individual stockpile controls.]

4.5 Minimize Dust

General

- Dust control measures will be implemented regularly to prevent the off-site deposition of wind-eroded soils. The principal form of dust control will be water application.

Specific Dust Controls

Water Application	
Description: Use of a water truck to spray down dry areas of disturbed ground to prevent dust generation.	
Installation	As needed
Maintenance Requirements	Apply as needed to prevent dust generation
Design Specifications	Water truck on-site

[Repeat as needed for individual dust controls.]

4.6 Minimize Steep Slope Disturbances

General

- Contractors must pay careful attention to steep slopes and must implement additional temporary erosion and sediment control measures during work on steep slopes to prevent erosion.

Specific Steep Slope Controls

Erosion Control Blankets	
Description: Installation of erosion control blankets	
Installation	Insert approximate date of installation
Maintenance Requirements	Replace or reinforce as needed to prevent erosion.
Design Specifications	New England Wetland Plants, Inc. ECS-2B or equal

Hydroseed	
Description: Hydroseed with tackifier	
Installation	Insert approximate date of installation
Maintenance Requirements	Ensure vegetation growth and supplement with additional hydroseed as needed.
Design Specifications	Slope control mix

[Repeat as needed for individual steep slope controls.]

4.7 Topsoil

General

- Topsoil generated from the site construction activities must either be stockpiled for reuse on site in accordance with the practices noted above, or shall be removed from the site for reuse on other sites. Topsoil may not be mixed with general fill.

Specific Topsoil Controls

Preserve Topsoil	
Description: Stockpile all topsoil from work areas and reuse on site or truck off-site for use on other sites.	
Installation	Insert approximate date of installation
Maintenance Requirements	None
Design Specifications	None

[Repeat as needed for individual topsoil controls.]

4.8 Soil Compaction

General

- Areas designated for final vegetative surfaces or construction-stage or final stormwater infiltration practices shall be protected from excessive compaction by restricting vehicle access and the types of equipment that may be used in such areas.

Specific Soil Compaction Controls

Access Restrictions	
Description: Prevent access by vehicles to areas that will be vegetated or used for stormwater infiltration once rough grading is complete.	
Installation	Various
Maintenance Requirements	Prevent vehicular access to affected areas
Design Specifications	None

Soil Conditioning	
Description: Prior to seeding/planting of such areas, exposed soil that has been compacted shall be loosened by tilling or other similar methods. Conditioning shall consist of deep tilling with a rotary tiller, disc harrowing, or manual loosening and re-grading with an excavator bucket. Conditioning shall extend to a depth of at least 12-inches.	
Installation	Insert approximate date of installation
Maintenance Requirements	Once conditioned, prevent re-compaction by excluding vehicular access
Design Specifications	None

[Repeat as needed for individual soil compaction controls.]

4.9 Storm Drain Inlets

General

- All storm drain system inlets inside of perimeter controls shall be protected with sediment control measures designed to remove sediment from stormwater prior to entering the inlet. Catch basins along the street frontage shall also be protected.

Specific Storm Drain Inlet Controls

Silt Sack	
Description: Install silt socks in downstream catch basin grates	
Installation	Insert approximate date of installation
Maintenance Requirements	Clean, or remove and replace, the inlet protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, remove the deposited sediment by the end of the same business day in which it is found or by the end of the following business day if removal by the same business day is not feasible.
Design Specifications	Siltsack or equal

[Repeat as needed for individual storm drain inlet controls.]

4.10 Constructed Site Drainage Feature

General

- Where appropriate, temporary sediment traps will be installed at stormwater collection points. Each trap will include a rip-rap outlet apron to prevent discharge erosion.

Specific Constructed Site Drainage Features

Temporary Sediment Trap	
Description: Where shown on the site plan or where determined appropriate in the field, provide temporary sediment traps to collect and control construction-stage stormwater runoff.	
Installation	Insert approximate date of installation
Maintenance Requirements	Periodically inspect and remove accumulated sediments as needed to prevent the discharge of sediment from the traps. Remove accumulated sediment to maintain at least one-half of the design capacity and conduct all other appropriate maintenance to ensure the basin or impoundment remains in effective operating condition
Design Specifications	Refer to Site Plan

[Repeat as needed for individual constructed site drainage features.]

4.11 Sediment Basins or Similar Impoundments

General

- Where appropriate, temporary sediment traps will be installed at stormwater collection points. Each trap will include a rip-rap outlet apron to prevent discharge erosion.

Specific Sediment Basin Controls

Temporary Sediment Trap	
Description: Where shown on the site plan or where determined appropriate in the field, provide temporary sediment traps to collect and control construction-stage stormwater runoff.	
Installation	Insert approximate date of installation
Maintenance Requirements	Periodically inspect and remove accumulated sediments as needed to prevent the discharge of sediment from the traps. Remove accumulated sediment to maintain at least one-half of the design capacity and conduct all other appropriate maintenance to ensure the basin or impoundment remains in effective operating condition
Design Specifications	Refer to Site Plan

[Repeat as needed for individual sediment basin controls.]

4.12 Chemical Treatment

Soil Types

List all the soil types including soil types expected to be exposed during construction in areas of the project that will drain to chemical treatment systems and those expected to be found in fill material:

- Not applicable. No chemical treatment expected.

Treatment Chemicals

List all treatment chemicals that will be used at the site and explain why these chemicals are suited to the soil characteristics:

- Not applicable

Describe the dosage of all treatment chemicals you will use at the site or the methodology you will use to determine dosage:

- Not applicable

Provide information from any applicable Safety Data Sheets (SDS):

- Not applicable

Describe how each of the chemicals will be stored consistent with CGP Part 2.2.13c:

- Not applicable

Include references to applicable State or local requirements affecting the use of treatment chemicals, and copies of applicable manufacturer's specifications regarding the use of your specific treatment chemicals and/or chemical treatment systems:

- Not applicable

Special Controls for Cationic Treatment Chemicals (if applicable)

If the applicable EPA Regional Office authorized you to use cationic treatment chemicals, include the official EPA authorization letter or other communication, and identify the specific controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a discharge that does not meet water quality standards:

- Not applicable

Schematic Drawings of Stormwater Controls/Chemical Treatment Systems

Provide schematic drawings of any chemically-enhanced stormwater controls or chemical treatment systems to be used for application of treatment chemicals:

- Not applicable

Training

Describe the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to the use of treatment chemicals:

- Not applicable

4.13 Dewatering Practices

General

- Dewatering is not expected to be needed. However, should dewatering be required, it will be pumped into a temporary dewatering pit or designated dewatering area to prevent any discharge of dewatering water to receiving waters. Should the discharge of dewatering waters to receiving waters be required, the requirements of section 2.4 and 3.0 of the CGP shall be adhered to, including required testing and reporting.

Specific Dewatering Practices

Temporary Dewatering Pit	
Description: Construction of temporary dewatering pit of suitable size and volume to contain anticipated dewatering volume. The pit can be excavated or can be created by the installation of earthen berms to create a containment area.	
Installation	Insert approximate date of installation
Maintenance Requirements	Maintain volume of temporary area as needed to contain discharge volume. For backwash water, either haul it away for disposal or return it to the beginning of the treatment process; replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.
Design Specifications	None

[Repeat as needed for individual dewatering practices.]

4.14 Other Stormwater Controls

General

- None. Not applicable.

4.15 Site Stabilization

Total Amount of Land Disturbance Occurring at Any One Time

- ☒ Five Acres or less
☐ More than Five Acres

Use this template box if you are not located in an arid, semi-arid, or drought-stricken area and are not discharging to a sediment- or nutrient-impaired water or Tier 2, Tier 2.5, or Tier 3 water.

Temporary Vegetative Site Stabilization	
☒ Vegetative ☐ Non-Vegetative ☐ Temporary ☐ Permanent	
Description: - Where seeded for temporary erosion control purposes, a minimum of 6 pounds per 1,000 square feet of seed will be applied along with an appropriate fertilizer (based on the time of year applied) or as necessary to obtain a 70% vegetative cover. Additional seeding will be completed if needed and periodic watering will also be employed if necessary. Where stabilization by the 14th day is precluded by snow cover, frozen ground conditions, or other similar circumstances, stabilization measures will be initiated as soon as practicable. - For disturbed areas less than 5 acres, initiate within 14 days of completion of work and complete stabilization within 14 days of the initiation of stabilization measures.	
Installation	Insert approximate date of installation
Completion	Insert approximate completion date
Maintenance Requirements	Water periodically as needed to maintain vegetative cover
Design Specifications	Native grass seed mixture

Temporary Non-Vegetative Site Stabilization	
☐ Vegetative ☒ Non-Vegetative ☐ Temporary ☐ Permanent	
Description: - Apply erosion control blankets, mulch, straw or stump grindings to disturbed areas. - For disturbed areas less than 5 acres, initiate within 14 days of completion of work and complete stabilization within 14 days of the initiation of stabilization measures.	
Installation	Insert approximate date of installation
Completion	Insert approximate completion date
Maintenance Requirements	Maintain to ensure effective stabilization control
Design Specifications	Wood mulch, erosion control blankets, straw, and/or stump grindings.

Final Site Stabilization	
☒ Vegetative ☒ Non-Vegetative ☐ Temporary ☒ Permanent	
Description: - Final site stabilization per the site plan including lawn and landscape areas, pavement, walkways and other final site features. - For disturbed areas less than 5 acres, initiate within 14 days of completion of work and complete stabilization within 14 days of the initiation of stabilization measures.	
Installation	Insert approximate date of installation

Final Site Stabilization	
Completion	Insert approximate completion date
Maintenance Requirements	None
Design Specifications	Refer to site plan

[Repeat as needed for additional stabilization practices.]

Use this template box if you are discharging to a sediment- or nutrient-impaired water or to a water that is identified by your State, Tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes.

Temporary Vegetative Site Stabilization	
☒ Vegetative ☐ Non-Vegetative ☐ Temporary ☐ Permanent	
Description: - Where seeded for temporary erosion control purposes, a minimum of 6 pounds per 1,000 square feet of seed will be applied along with an appropriate fertilizer (based on the time of year applied) or as necessary to obtain a 70% vegetative cover. Additional seeding will be completed if needed and periodic watering will also be employed if necessary. Where stabilization by the 14th day is precluded by snow cover, frozen ground conditions, or other similar circumstances, stabilization measures will be initiated as soon as practicable. - For disturbed areas less than 5 acres, initiate within 7 days of completion of work and complete stabilization within 7 days of the initiation of stabilization measures.	
Installation	Insert approximate date of installation
Completion	Insert approximate completion date
Maintenance Requirements	Water periodically as needed to maintain vegetative cover
Design Specifications	Native grass seed mixture

Temporary Non-Vegetative Site Stabilization	
☐ Vegetative ☒ Non-Vegetative ☐ Temporary ☐ Permanent	
Description: - Apply erosion control blankets, mulch, straw or stump grindings to disturbed areas. - For disturbed areas less than 5 acres, initiate within 7 days of completion of work and complete stabilization within 7 days of the initiation of stabilization measures.	
Installation	Insert approximate date of installation
Completion	Insert approximate completion date
Maintenance Requirements	Maintain to ensure effective stabilization control
Design Specifications	Wood mulch, erosion control blankets, straw, and/or stump grindings.

Final Site Stabilization	
☐ Vegetative ☒ Non-Vegetative ☒ Temporary ☒ Permanent	
Description: ▪ Final site stabilization per the site plan including lawn and landscape areas, pavement, walkways and other final site features, ▪ Initiate within 7 days of completion of work and complete stabilization within 7 days of the initiation of stabilization measures	
Installation	Insert approximate date of installation
Completion	(Must be completed as soon as practicable, but no later than seven calendar days after stabilization has been initiated) Insert approximate completion date
Maintenance Requirements	None
Design Specifications	Refer to site plan

Use this template box if unforeseen circumstances have delayed the initiation and/or completion of vegetative stabilization. Note: You will not be able to include this information in your initial SWPPP. If you are affected by circumstances such as those described in CGP Part 2.2.14.b.ii, you will need to modify your SWPPP to include this information.

Insert name of site stabilization practice	
☐ Vegetative ☐ Non-Vegetative ☐ Temporary ☐ Permanent	
Description: ▪ Insert description of stabilization practice to be installed ▪ Note how design will meet requirements of Part 2.2.14.b.ii	
Justification	Insert description of circumstances that prevent you from meeting the deadlines required in CGP CGP Parts 2.2.14.a
Installation and completion schedule	Vegetative Measures: Describe the schedule you will follow for initiating and completing vegetative stabilization ▪ Approximate installation date: Insert approximate date ▪ Approximate completion date: Insert the approximate date Non-Vegetative Measures: (Must be completed within 14 days of the cessation of construction if disturbing 5 acres or less; within 7 days if disturbing more than 5 acres) ▪ Approximate installation date: Insert the approximate date ▪ Approximate completion date: Insert the approximate date
Maintenance Requirements	Insert maintenance requirements for the stabilization practice
Design Specifications	Include copies of design specifications here

[Repeat as needed for additional stabilization practices.]

SECTION 5: POLLUTION PREVENTION CONTROLS

5.1 Potential Sources of Pollution

Construction Site Pollutants

Insert text or use table below: To be determined at the time of construction

Pollutant-Generating Activity	Pollutants or Pollutant Constituents (That could be discharged if exposed to stormwater)	Location on Site (Or reference SWPPP site map where this is shown)

[Include additional rows as necessary.]

5.2 Spill Prevention and Response

(This portion of the document is written as if giving instructions to parties working on the property and/or the owner of the property)

In the event of an accident where significant gasoline or other petroleum products are released, the following procedure shall be followed in the order noted.

- ✓ Seek to contain the spill by constructing a berm of earthen or other materials around the spill site until the appropriate emergency response personnel has arrived. Seek to seal off any downstream stormwater facilities by earthen berms or the emergency spill kit materials.
- ✓ Immediately notify the following governmental entities and inform them of the type of spill that occurred:
 - Franklin Fire Department at 508-528-2323,
 - Franklin Board of Health at 508-520-4905,
 - Franklin Conservation Commission at 508-520-4929,
 - Mass. Department of Environmental Protection (DEP) Central Region at (508) 792-7650 (address is 8 New Bond Street, Worcester, MA 01606), and
 - National Response Center (NRC) at (800) 424-8802 (for spills that require such notification pursuant to 40 CFR Part 110, 40 CFR Part 117, and 40 CR Part 302).
- ✓ Once the various emergency response teams have arrived at the site, the owner shall follow the instructions of the various governmental entities, which may include the following:
 - A clean up firm may need to be immediately contacted.
 - If the materials have remained trapped in the catch basins or proprietary stormwater treatment units, then these structures may be pumped out. All materials shall be removed by qualified personnel and disposed of in accordance with all applicable local, state, and federal regulations.

5.3 Fueling and Maintenance of Equipment or Vehicles

General

The Operator will designate a specific area of the site for fueling and overnight storage of vehicles on the site. Such area shall be located as far from wetlands areas and stormwater inlets as practicable and outside of the 100' buffer zone. Refer to the Site Plan for vehicle storage area location(s).

All equipment stored on-site will be monitored for leaks and will receive regular preventative maintenance to reduce the chance of leakage. Where vehicle leaks are identified, drip pans and absorbent pads shall be employed until the leak can be repaired, which shall be completed as soon as practicable. The Operator will maintain a bag of chemical sorbent, absorbent pads and an emergency spill kit on the site at all times within one of the designated Staging Areas. A sign shall be posted at the entrance to each Staging Area noting the location of the emergency spill kit. Spill kits shall include the following at a minimum.

- Universal chemical sorbent capable of absorbing up to 15 gallons of liquid.
- Gloves and safety glasses,
- Four chemical socks,
- Four chemical pads,
- Four chemical pillows, and
- Four plastic disposal bags.

5.4 Washing of Equipment and Vehicles

General

- Vehicle or equipment washing is not allowed on-site.

5.5 Storage, Handling, and Disposal of Building Products, Materials, and Wastes

5.5.1 Building Materials and Building Products

(Note: Examples include asphalt sealants, copper flashing, roofing materials, adhesives, concrete admixtures, and gravel and mulch stockpiles.)

General

- The site will be maintained in a neat and orderly manner, with debris regularly disposed of.
- All products and materials stored on-site will be stored in a neat and orderly manner in appropriate containers. Building materials that may discharge pollutants if in contact with water must be stored under cover (i.e. under a roof or under plastic sheeting) to prevent contact with rainwater.
- Manufacturer recommendations relative to the proper storage, use, and disposal of products and materials will be followed.
- An effort will be made to minimize the on-site storage of excess construction materials. In all cases, materials will be removed from the site if unused for more than three months.
- When use of products and materials have been completed, any excess products and materials will be promptly removed from the site and/or properly disposed of in accordance with all applicable state and federal regulations.
- All equipment to be stored on-site will be stored in a neat and orderly manner and such equipment will only be stored in the designated equipment Staging Areas on the site.

5.5.2 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscape Materials

General

- Such materials may not be stored on-site and shall only be brought on-site in the quantities needed for application. Application shall be in accordance with manufacturer recommendation. Disposal of excess products shall follow local, state and federal law.

5.5.3 Diesel Fuel, Oil, Hydraulic Fluids, Other Petroleum Products, and Other Chemicals

General

- Petroleum products may only be stored on-site in the limited quantities necessary for the ongoing work.
- All chemical containers must be watertight and closed, sealed, and secured when not in use.
- Outside storage must use a containment pallet or similar, to capture small leaks and spills.
- A spill kit must be readily available and in good working condition. Personnel must be available to respond immediately in the event of a leak or spill.
- Containers storing chemical with a storage capacity of 55 gallons or more must be stored more than 50 feet from receiving waters, drainage features, or inlets and must be provided with cover.

5.5.4 Hazardous or Toxic Waste

(Note: Examples include paints, caulks, sealants, fluorescent light ballasts, solvents, petroleum-based products, wood preservatives, additives, curing compounds, and acids.)

General

- The use of hazardous products during construction will be in accordance with manufacturer recommendations and established construction practices.
- Hazardous materials must be stored in a separately designated area, under cover, and within secondary storage containers designed to hold at least 110% of the volume of the substance in question.
- Hazardous products will be kept in their original containers until they are used, and the container labels will be kept on-site within a designated Staging Area until use of the product is no longer needed.
- Unused quantities of hazardous products will be removed from the site in accordance with all applicable state and federal regulations.
- Hazardous waste materials generated by the construction (if any) will be disposed of off-site in accordance with all applicable state and federal regulations pertaining to such disposal. The Site Manager will be informed of these requirements and will ensure that this provision is adhered to.
- Any spills of hazardous materials found on the site will be cleaned up immediately using dry-cleanup procedures and reported in accordance with procedures established by local, state, and federal regulations. Washdowns of spill areas is prohibited.
- The Site Manager will be properly trained in hazardous materials spill prevention and clean-up.

5.5.5 Construction and Domestic Waste

(Note: Examples include packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, styrofoam, concrete, demolition debris, and other trash or discarded materials.)

General

- All waste materials from the site will be collected in dumpsters and disposed of off-site in accordance with all applicable state and federal regulations. The dumpster will be emptied as needed and the Operator will ensure that trash collection does not accumulate outside the dumpster. Trash and debris will be collected at least once per working day.
- Containers with lids shall be sealed at the end of each day. Containers without lids shall be covered with sheeting or a tarp. Cleanup trash and debris on the site at the end of each workday.

5.5.6 Sanitary Waste

General

- The Operator will keep a portable toilet on the site for the use of work personnel and shall dispose of the waste materials in accordance with local, state, and federal regulations. The portable toilet shall be located away from receiving waters, storm drains, and constructed or natural site drainage features.

5.6 Washing of Applicators and Containers used for Stucco, Paint, Concrete, Form Release Oils, Cutting Compounds, or Other Materials

General

- Any such wash water shall be directed into a leak-proof container and disposed of off-site in accordance with local, state and federal regulations.
- No liquid waste shall be allowed to enter drainage features and receiving waters or be allowed to infiltrate into the ground.

- Concrete trucks will only wash out or dump surplus concrete within areas designated by the Operator on the site in designated depressions to prevent uncontrolled migration of such materials. All such surplus concrete will be cleaned-up by crushing the concrete and either re-using it in the construction activities or by removing it from the site.
- Wash waters from concrete or stucco applications, or from paint brushes or other similar activities must be directed into a leak-proof container or pit designed to prevent overflows due to precipitation. Accumulated wastewater must be disposed of in accordance with all local, state, and federal regulations to the extent it is deemed hazardous. Washwater generating activities must be conducted as far away from wetlands areas and storm drain inlets as possible.

5.7 Application of Fertilizers

General

- Fertilizer shall be applied in accordance with the rates specified herein and in no case more than stipulated in the manufacturer's specifications.
- To the extent practicable, apply fertilizers in optimal seasons to maximize vegetation uptake and growth.
- Avoid applying fertilizers before heavy rains are expected and never apply to frozen ground or during winter conditions.
- Fertilizer may not be used in constructed or natural site drainage features.
- Fertilizers are not to be applied within buffer zones or within the Zone II for drinking water.

5.8 Other Pollution Prevention Practices

Instructions:

Describe any additional pollution prevention practices that do not fit into the above categories.

General

- [Insert general description of the problem this control is designed to address](#)

Specific Pollution Prevention Practices

Insert name of pollution prevention practice	
Description: Insert description of practice to be implemented	
Implementation	Insert approximate date of implementation
Maintenance Requirements	Insert maintenance requirements for the pollution prevention practice
Design Specifications	If applicable include copies of design specifications here

[Repeat as needed.]

SECTION 6: INSPECTION, MAINTENANCE, AND CORRECTIVE ACTION

6.1 Inspection Personnel and Procedures

Site Inspection Schedule

Select the inspection frequency(ies) that applies, based on CGP Parts 4.2, 4.3, or 4.4

(Note: you may be subject to different inspection frequencies in different areas of the site. Check all that apply and indicate which portion(s) of the site it applies to.)

Standard Frequency:

- ☐ Every 7 calendar days
- ☒ Every 14 calendar days and within 24 hours of either:
 - A storm event that produces 0.25 inches or more of rain within a 24-hour period (including when there are multiple, smaller storms that alone produce less than 0.25 inches but together produce 0.25 inches or more in 24 hours), or
 - A storm event that produces 0.25 inches or more of rain within a 24-hour period on the first day of a storm and continues to produce 0.25 inches or more of rain on subsequent days (you conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the last day of the storm that produces 0.25 inches or more of rain (i.e., only two inspections would be required for such a storm event)), or
 - A discharge caused by snowmelt from a storm event that produces 3.25 inches or more of snow within a 24-hour period.

Increased Frequency (if applicable):

For areas of sites discharging to sediment or nutrient-impaired waters or to waters designated as Tier 2, Tier 2.5, or Tier 3

- ☐ Every 7 days and within 24 hours of either:
 - A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
 - A discharge caused by snowmelt from a storm event that produces 3.25 inches or more of snow within a 24-hour period.

Reduced Frequency (if applicable)

For stabilized areas

- ☐ Twice during first month, no more than 14 calendar days apart; then once per month after first month until permit coverage is terminated consistent with Part 9 in any area of your site where the stabilization steps in 2.2.14.a have been completed.
 - Specify locations where stabilization steps have been completed
 - Insert date that they were completed

(Note: It is likely that you will not be able to include this in your initial SWPPP. If you qualify for this reduction (see CGP Part 4.4.1), you will need to modify your SWPPP to include this information. If construction activity resumes in this portion of the site at a later date, the inspection frequency immediately increases to that required in Parts 4.2 and 4.3, as applicable.)

For frozen conditions where construction activities are being conducted

- ☐ Once per month

Insert beginning and ending dates of frozen conditions on your site:

- Beginning date of frozen conditions: [Insert approximate date](#)
- Ending date of frozen conditions: [Insert approximate date](#)

For frozen conditions where construction activities are suspended

- ☐ Inspections are temporarily suspended

Insert beginning and ending dates of frozen conditions on your site:

- Beginning date of frozen conditions: [Insert approximate date](#)
- Ending date of frozen conditions: [Insert approximate date](#)

Dewatering Inspection Schedule

Select the inspection frequency that applies based on CGP Part 4.3.2

Dewatering Inspection

- ☐ Once per day on which the discharge of dewatering water occurs.

Rain Gauge Location (if applicable)

[Specify location\(s\) of rain gauge to be used for determining whether a rain event of 0.25 inches or greater has occurred \(only applies to inspections conducted for Part 4.2.2, 4.3, or 4.4.2\)](#)

Inspection Report Forms

Insert a copy of any inspection report forms you will use here or in Appendix D of this SWPPP template

(Note: EPA has developed a sample inspection form that CGP operators can use. The form is available at <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources>)

6.2 Corrective Action

Personnel Responsible for Corrective Actions

Tim Jones

Corrective Action Logs

See Appendix E

(Note: EPA has developed a sample corrective action log that CGP operators can use. The form is available at <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources>)

6.3 Delegation of Authority

Instructions:

- Identify the individual(s) or positions within the company who have been delegated authority to sign inspection reports.
- Attach a copy of the signed delegation of authority (see example in Appendix J of this SWPPP Template.)
- For more on this topic, see Appendix G, Subsection 11 of EPA's CGP.

Duly Authorized Representative(s) or Position(s):

Suejo Corp.

Tim Jones

Insert Position

P. O. Box 934

Wrentham, MA 02093

774-571-1972

gracewooddevelopment@gmail.com

SECTION 7: TURBIDITY BENCHMARK MONITORING FOR DEWATERING DISCHARGES

Instructions (see CGP Part 3.3 and 7.2.8):

- If you are required to comply with the Part 3.3 turbidity benchmark monitoring requirements, describe the procedures you will follow to:
 - ✓ Collect and evaluate samples,
 - ✓ Report results to EPA and keep records of monitoring information, and
 - ✓ Take corrective action when necessary.
- Include the specific type of turbidity meter you will use for monitoring, as well as any manuals or manufacturer instructions on how to operate and calibrate the meter.
- Describe any coordinating arrangement you may have with any other permitted operators on the same site with respect to compliance with the turbidity monitoring requirements, including which parties are tasked with specific responsibilities.
- If EPA has approved of an alternate turbidity benchmark pursuant to Part 3.3.2.b, include any data and other documentation you relied on to request use of the specific alternative benchmark.

Procedures:

Collecting and evaluating samples	Describe how you will collect and evaluate samples
Reporting results and keeping monitoring information records	Describe how you will report results to EPA and keep monitoring information records
Taking corrective action when necessary	Describe how you will take corrective action when necessary

Turbidity Meter:

Type of turbidity meter	Insert the type of turbidity meter

Turbidity meter manuals and manufacturer instructions

Insert a copy of any manuals and manufacturer instructions in Appendix N of this SWPPP Template.

Coordinating Arrangements for Turbidity Monitoring (if applicable):

Permitted operator name	Insert operator name
Permitted operator NPDES ID	Insert operator NPDES ID
Coordinating Arrangement	Describe the coordinating arrangement including which parties are tasked with specific responsibilities

[Repeat as necessary.]

Alternate turbidity benchmark (if applicable):

Alternate turbidity benchmark (NTU)	Insert alternate turbidity benchmark
Data and documentation used to request the alternate benchmark	Insert the data and documentation that was submitted to EPA to request the alternate benchmark

SECTION 8: CERTIFICATION AND NOTIFICATION

Instructions (CGP Appendix G, Part G.11.2):

- The following certification statement must be signed and dated by a person who meets the requirements of Appendix G, Part G.11.2.
- This certification must be re-signed in the event of a SWPPP Modification.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____ Title: _____

Signature: _____ Date: _____

[Repeat as needed for multiple construction operators at the site.]

SWPPP APPENDICES

Attach the following documentation to the SWPPP:

Appendix A – Site Maps

Appendix B – Copy of 2022 CGP

Appendix C – NOI and EPA Authorization Email

Appendix D – Site Inspection Form and Dewatering Inspection Form (if applicable)

Appendix E – Corrective Action Log

Appendix F – SWPPP Amendment Log

Appendix G – Subcontractor Certifications/Agreements

Appendix H – Grading and Stabilization Activities Log

Appendix I – Training Documentation

Appendix J – Delegation of Authority

Appendix K – Endangered Species Documentation

Appendix L – Historic Preservation Documentation

Appendix M – Rainfall Gauge Recording

Appendix N – Turbidity Meter Manual and Manufacturer's Instructions

Appendix A – Site Maps

An overview site map is included below. For detailed information, refer to the detailed project Site Plan/Subdivision Plan and any associated stormwater report.

Appendix B – Copy of 2022 CGP

INSERT COPY OF 2022 CGP

Appendix C – Copy of NOI and EPA Authorization Email

INSERT COPY OF NOI AND EPA'S AUTHORIZATION EMAIL PROVIDING COVERAGE UNDER THE CGP

Appendix D – Copy of Site and Dewatering Inspection Forms

Not expected to be applicable. Should it become necessary, utilize the EPA template available at <https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates>

Appendix E – Copy of Corrective Action Log

The following corrective action log form will be used and is available at
<https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources>

2022 CGP Corrective Action Log

Project Name:

NPDES ID Number:

Section A – Individual Completing this Log	
Name:	Title:
Company Name:	Email:
Address:	Phone Number:
Section B – Details of the Problem (CGP Part 5.4.1.a) Complete this section <u>within 24 hours</u> of discovering the condition that triggered corrective action.	
Date problem was first identified:	Time problem was first identified:
What site conditions triggered this corrective action? <i>(Check the box that applies. See instructions for a description of each triggering condition (1 thru 6).)</i> ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5a ☐ 5b ☐ 6	
Specific location where problem identified:	
Provide a description of the specific condition that triggered the need for corrective action and the cause (if identifiable):	
Section C – Corrective Action Completion (CGP Part 5.4.1.b) Complete this section <u>within 24 hours</u> after completing the corrective action.	
For site condition # 1, 2, 3, 4, or 6 (those not related to a dewatering discharge) confirm that you met the following deadlines (CGP Part 5.2.1):	
☐ Immediately took all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events. AND	
☐ Completed corrective action by the close of the next business day, unless a new or replacement control, or significant repair, was required. OR	
☐ Completed corrective action within seven (7) calendar days from the time of discovery because a new or replacement control, or significant repair, was necessary to complete the installation of the new or modified control or complete the repair. OR	
☐ It was infeasible to complete the installation or repair within 7 calendar days from the time of discovery. Provide the following additional information:	

Explain why 7 calendar days was infeasible to complete the installation or repair:			
Provide your schedule for installing the stormwater control and making it operational as soon as feasible after the 7 calendar days:			
For site condition # 5a, 5b, or 6 (those related to a dewatering discharge), confirm that you met the following deadlines: ☐ Immediately took all reasonable steps to minimize or prevent the discharge of pollutants until a solution could be implemented, including shutting off the dewatering discharge as soon as possible depending on the severity of the condition taking safety considerations into account. ☐ Determined whether the dewatering controls were operating effectively and whether they were causing the conditions. ☐ Made any necessary adjustments, repairs, or replacements to the dewatering controls to lower the turbidity levels below the benchmark or remove the visible plume or sheen.			
Describe any modification(s) made as part of corrective action: <i>(Insert additional rows below if applicable)</i>	Date of completion:	SWPPP update necessary?	If yes, date SWPPP was updated:
1.		☐ Yes ☐ No	
2.		☐ Yes ☐ No	
Section D - Signature and Certification (CGP Part 5.4.2)			
"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."			
MANDATORY: Signature of Operator or "Duly Authorized Representative:"			
Signature:	Date:		
Printed Name:	Affiliation:		
OPTIONAL: Signature of Contractor or Subcontractor			
Signature:	Date:		
Printed Name:	Affiliation:		

General Instructions

This Corrective Action Log Template is provided to assist you creating a corrective action log that complies with the minimum reporting requirements of Part 5.4 of the EPA's Construction General Permit (CGP). For each triggering condition on your site, you will need to fill out a separate corrective action log.

The entire form must be completed to be compliant with the requirements of the permit. (Note: In Section C, if you do not need the number of rows provided in the corrective action log, you may delete these or cross them off. Alternatively, if you need more space to describe any modifications, you may insert additional rows in the electronic version of this form or use the bottom of the page in the field version of this form.)

If you are covered under a State CGP, this template may be helpful in developing a log that can be used for that permit; however, you will likely need to modify this form to meet the specific requirements of any State-issued permit. If your permitting authority requires you to use a specific corrective action log, you should not use this template.

Instructions for Section A

Individual completing this form Enter the name of the person completing this log. Include the person's contact information (title, affiliated company name, address, email, and phone number).

Instructions for Section B

You must complete Section B within 24 hours of discovering the condition that triggered corrective action. (CGP Part 5.4)

When was the problem first discovered?

Specify the date and time when the triggering condition was first discovered.

What site conditions triggered this corrective action? (CGP Parts 5.1 and 5.3)

Check the box corresponding to the numbered triggering condition below that applies to your site.

1. A stormwater control needs a significant repair or a new or replacement control is needed, or, in accordance with Part Error! Reference source not found., you find it necessary to repeatedly (i.e., 3 or more times) conduct the same routine maintenance fix to the same control at the same location (unless you document in your inspection report under Part Error! Reference source not found. that the specific reoccurrence of this same problem should still be addressed as a routine maintenance fix under Part Error! Reference source not found.);
2. A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly;
3. Your discharges are not meeting applicable water quality standards;
4. A prohibited discharge has occurred (see Part 1.3);
5. During discharge from site dewatering activities:
 - a. The weekly average of your turbidity monitoring results exceeds the 50 NTU benchmark (or alternate benchmark if approved by EPA pursuant to Part **Error! Reference source not found.**); or
 - b. You observe or you are informed by EPA, State, or local authorities of the presence of any of the following at the point of discharge to a receiving water flowing through or immediately adjacent to your site and/or to constructed or natural site drainage features or storm drain inlets:
 - sediment plume
 - suspended solids
 - unusual color
 - presence of odor
 - decreased clarity
 - presence of foam
 - visible sheen on the water surface or visible oily deposits on the bottom or shoreline of the receiving water

6. EPA requires corrective action as a result of permit violations found during an inspection carried out under Part 4.8.

Provide a description of the problem (CGP Part 5.4.1.a)

Provide a summary description of the condition you found that triggered corrective action, the cause of the problem (if identifiable), and the specific location where it was found. Be as specific as possible about the location; it is recommended that you refer to a precise point on your site map.

Instructions for Section C

You must complete Section C within 24 hours after completing the correction action. (CGP Part 5.4)

Deadlines for completing corrective action for condition # 1, 2, 3, 4, or 6 (if not relating to a dewatering discharge) (CGP Part 5.2.1)

Check the box to confirm that you met the deadlines that apply to each triggering condition. You are always required to check the first box (i.e., Immediately took all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events.). Only one of the next three boxes should be checked depending on the situation that applies to this corrective action.

Check the second box if the corrective action for this particular triggering condition does not require a new or replacement control, or a significant repair. These actions must be completed by the close of the next business day from the time of discovery of the condition.

Check the third box if the corrective action for this particular triggering condition requires a new or replacement control, or a significant repair. These actions must be completed by no later than seven calendar days from the time of discovery of the condition.

Check the fourth box if the corrective action for this particular triggering condition requires a new or replacement control, or a significant repair, and if it is infeasible to complete the work within seven calendar days. Additionally, you will need to fill out the table below the checkbox that requires:

1. An explanation as to why it was infeasible to complete the installation or repair within seven calendar days of discovering the condition.
2. Provide the schedule you will adhere to for installing the stormwater control and making it operational as soon as feasible after the seventh day following discovery.

Note: Per Part 5.2.1.c, where these actions result in changes to any of the stormwater controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within seven calendar days of completing this work.

Deadlines for completing corrective action for condition # 5a, 5b, or 6 related to a dewatering discharge (CGP Part 5.2.2)

These deadlines apply to conditions relating to construction dewatering activities. Check the box to confirm that you met the deadlines that apply to each triggering condition. You are required to check all of the boxes in this section to indicate your compliance with the corrective action deadlines.

List of modification(s) to correct problem

Provide a list of modifications you completed to correct the problem.

Date of completion

Enter the date you completed the modification. The work must be completed by the deadline you indicated above.

SWPPP update necessary?

Check "Yes" or "No" to indicate if a SWPPP update is necessary consistent with Part 7.4.1.a in order to reflect changes implemented at your site. If "Yes," then enter the date you updated your SWPPP. The

SWPPP updates must be made within seven calendar days of completing a corrective action. (CGP Part 5.2.1.c)

Instructions for Section D

Each corrective action log entry must be signed and certified following completion of Section D to be considered complete. (CGP Part 5.4.2)

Operator or "Duly Authorized Representative" – MANDATORY (CGP Appendix G Part G.11.2 and CGP Appendix H Section X)

At a minimum, the corrective action log must be signed by either (1) the person who signed the NOI, or (2) a duly authorized representative of that person. The following requirements apply:

If the signatory will be the person who signed the NOI for permit coverage, as a reminder, that person must be one of the following types of individuals:

- *For a corporation:* By a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- *For a partnership or sole proprietorship:* By a general partner or the proprietor, respectively.
- *For a municipality, State, Federal, or other public agency:* By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

If the signatory will be a duly authorized representative, the following requirements must be met:

- The authorization is made in writing by the person who signed the NOI (see above);
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

Sign, date and print your name and affiliation.

Contractor or Subcontractor - OPTIONAL

Where you rely on a contractor or subcontractor to complete this log and the associated corrective action, you should consider requiring the individual(s) to sign and certify each log entry. Note that this does not relieve you, the permitted operator, of the requirement to sign and certify the log as well. If applicable, sign, date, and print your name and affiliation.

Recordkeeping

Logs must be retained for at least 3 years from the date your permit coverage expires or is terminated. (CGP Part 5.4.4)

Keep copies of your signed corrective action log entries at the site or at an easily accessible location so that it can be made immediately available at the time of an on-site inspection or upon request by EPA. (CGP Part 5.4.3) Include a copy of the corrective action log in your SWPPP. (CGP Part 7.2.7.e)

Note

While EPA has made every effort to ensure the accuracy of all instructions contained in this template, it is the permit, not this template, that determines the actual obligations of regulated construction stormwater discharges. In the event of a conflict between this template and any corresponding provision of the CGP, you must abide by the requirements in the permit. EPA welcomes comments on this Corrective Action Log Template at any time and will consider those comments in any future revision. You may contact EPA for CGP-related inquiries at cgp@epa.gov

- Create a log here of changes and updates to the SWPPP. You may use the table below to track these modifications.
- SWPPP modifications are required pursuant to CGP Part 7.4.1 in the following circumstances:
 - ✓ Whenever new operators become active in construction activities on your site, or you make changes to your construction plans, stormwater controls, or other activities at your site that are no longer accurately reflected in your SWPPP (this includes changes made in response to corrective actions triggered under CGP Part 5);
 - ✓ To reflect areas on your site map where operational control has been transferred (and the date of transfer) since initiating permit coverage;
 - ✓ If inspections or investigations determine that SWPPP modifications are necessary for compliance with this permit;
 - ✓ Where EPA determines it is necessary to install and/or implement additional controls at your site in order to meet requirements of the permit;
 - ✓ To reflect any revisions to applicable Federal, State, Tribal, or local requirements that affect the stormwater control measures implemented at the site; and
 - ✓ If applicable, if a change in chemical treatment systems or chemically-enhanced stormwater control is made, including use of a different treatment chemical, different dosage rate, or different area of application.

[illegible]

Appendix G – *Sample* Subcontractor Certifications/Agreements

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

Project Number: _____

Project Title: _____

Operator(s): _____

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: _____

Address: _____

Telephone Number: _____

Type of construction service to be provided: _____

Signature: _____

Title: _____

Date: _____

Appendix I –Training Documentation

INSERT DOCUMENTATION CONSISTENT WITH SWPPP TEMPLATE SECTION 1.2 AND CGP PART 7.2.2

Appendix J – *Sample* Delegation of Authority Form

Delegation of Authority

I, _____ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the EPA's Construction General Permit (CGP), at the _____ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

_____ (name of person or position)
_____ (company)
_____ (address)
_____ (city, State, zip)
_____ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in Appendix G of EPA's CGP, and that the designee above meets the definition of a "duly authorized representative" as set forth in Appendix G.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____

Company: _____

Title: _____

Signature: _____

Date: _____

Appendix K – Endangered Species Documentation

INSERT DOCUMENTATION CONSISTENT WITH SWPPP TEMPLATE SECTION 3.1 AND CGP APPENDIX D

Appendix L – Historic Properties Documentation

INSERT DOCUMENTATION CONSISTENT WITH SWPPP TEMPLATE SECTION 3.2 AND CGP APPENDIX E

Appendix M – Rainfall Gauge Recording

Not expected to be needed as it is expected that the Operator will rely on a weather station that is representative of the site location, but if this option is elected by the Operator, use the table below to record on-site rainfall gauge readings at the beginning and end of each work day.

Month/Year			Month/Year			Month/Year		
Day	Start time	End time	Day	Start time	End time	Day	Start time	End time
1			1			1		
2			2			2		
3			3			3		
4			4			4		
5			5			5		
6			6			6		
7			7			7		
8			8			8		
9			9			9		
10			10			10		
11			11			11		
12			12			12		
13			13			13		
14			14			14		
15			15			15		
16			16			16		
17			17			17		
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21			21			21		
22			22			22		
23			23			23		
24			24			24		
25			25			25		
26			26			26		
27			27			27		
28			28			28		
29			29			29		
30			30			30		
31			31			31		

Example Rainfall Gauge Recording

April 2022			May 2022			June 2022		
Day	7:00 am	4:400 pm	Day	7:00 am	4:00 pm	Day	7:00 am	4:00 pm
1	--	--	1	0.2	0	1	0	0.4
2	--	--	2	0	0	2	0	0
3	0	0	3	0.1	0.3	3	--	--
4	0	0.3	4	0	0	4	--	--
5	0	0	5	0	0	5	0	0

In this example (for only partial months), 0.25-inch rainfall inspections would have been conducted on April 4 and June 1.

Appendix N – Turbidity Monitoring Sampling Documentation

INSERT DOCUMENTATION CONSISTENT WITH SWPPP TEMPLATE SECTION 7.2.8 AND CGP PART 3.3.4

ATTACHMENT E: TSS REMOVAL CALCULATION SHEETS

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Infiltration Basin #1 from Trench Drain 0+28

TSS Removal Calculation Worksheet

A	B	C	D	E
BMP1	TSS Removal Rate1	Starting TSS Load*	Amount Removed (B*C)	Remaining Load (C-D)
First Defense Unit	44%	1.00	44%	56%
Infiltration Basin w/ Double Sediment Forebay	80%	0.56	45%	11%

Total TSS Removal =

89%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: Autumn Hill Senior Village
 Prepared By: Legacy Engineering LLC
 Date: January 21, 2025

*Equals remaining load from previous BMP (E) which enters the BMP

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Infiltration Basin #1 From CB 0+88 & Existing Impervious

TSS Removal Calculation Worksheet

A	B	C	D	E
BMP1	TSS Removal Rate1	Starting TSS Load*	Amount Removed (B*C)	Remaining Load (C-D)
Deep Sump Catch Basin or Area Drain	25%	1.00	25%	75%
First Defense Unit	44%	0.75	33%	42%
Deep Sump Structure	25%	0.42	10%	32%
Infiltration Basin w/ Double Sediment Forebay	80%	0.32	26%	6%

Total TSS Removal =

94%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: Autumn Hill Senior Village
 Prepared By: Legacy Engineering LLC
 Date: January 21, 2025

*Equals remaining load from previous BMP (E) which enters the BMP

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Infiltration Fields #1 & #2 @ Unit 10

TSS Removal Calculation Worksheet

A	B	C	D	E
BMP1	TSS Removal Rate1	Starting TSS Load*	Amount Removed (B*C)	Remaining Load (C-D)
Infiltration Field W/ 2 Deep Sump A.D. or Roof Runoff Not Req. Pretreatment	80%	0.75	80%	20%

Total TSS Removal =

80%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: Autumn Hill Senior Village
 Prepared By: Legacy Engineering LLC
 Date: January 21, 2025

*Equals remaining load from previous BMP (E) which enters the BMP

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Infiltration Field #6

TSS Removal Calculation
Worksheet

A	B	C	D	E
BMP1	TSS Removal Rate1	Starting TSS Load*	Amount Removed (B*C)	Remaining Load (C-D)
Deep Sump Catch Basin	25%	1.00	25%	75%
Infiltration Basin w/ First Defense Unit	80%	0.75	60%	15%

Total TSS Removal =

85%

Separate Form Needs to be
Completed for Each Outlet
or BMP Train

Project: Autumn Hill Senior Village
Prepared By: Legacy Engineering LLC
Date: January 21, 2025

*Equals remaining load from previous BMP (E)
which enters the BMP

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Infiltration Fields #3, 4 & 5

TSS Removal Calculation Worksheet	A	B	C	D	E
	BMP1	TSS Removal Rate1	Starting TSS Load*	Amount Removed (B*C)	Remaining Load (C-D)
	Infiltration Field (roof runoff)	80%	1.00	80%	20%

Total TSS Removal =

80%

Separate Form Needs to be
Completed for Each Outlet
or BMP Train

Project: Autumn Hill Senior Village
Prepared By: Legacy Engineering LLC
Date: January 21, 2025

*Equals remaining load from previous BMP (E)
which enters the BMP

ATTACHMENT F: STORMWATER MANAGEMENT HANDBOOK CHECKLIST



Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

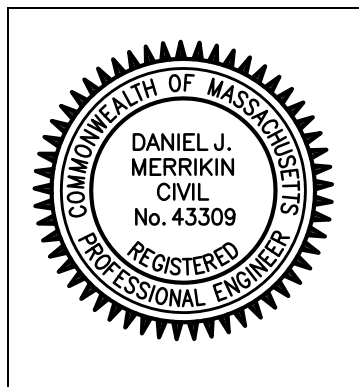
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



Digitally signed by Daniel J.
Merrikin, P.E.
Date: 2025.02.04 11:52:07 -05'00'

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

- ☐ New development
- ☐ Redevelopment
- ☒ Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
 - ☐ Credit 1
 - ☐ Credit 2
 - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☐ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

- ☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- ☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- ☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- ☒ Soil Analysis provided.
- ☒ Required Recharge Volume calculation provided.
- ☐ Required Recharge volume reduced through use of the LID site Design Credits.
- ☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - ☐ Static
 - ☒ Simple Dynamic
 - ☐ Dynamic Field¹
- ☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.
- ☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- ☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- ☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
 - ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
 - ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- ☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- ☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

- ☒ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- ☒ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
 - Provisions for storing materials and waste products inside or under cover;
 - Vehicle washing controls;
 - Requirements for routine inspections and maintenance of stormwater BMPs;
 - Spill prevention and response plans;
 - Provisions for maintenance of lawns, gardens, and other landscaped areas;
 - Requirements for storage and use of fertilizers, herbicides, and pesticides;
 - Pet waste management provisions;
 - Provisions for operation and management of septic systems;
 - Provisions for solid waste management;
 - Snow disposal and plowing plans relative to Wetland Resource Areas;
 - Winter Road Salt and/or Sand Use and Storage restrictions;
 - Street sweeping schedules;
 - Provisions for prevention of illicit discharges to the stormwater management system;
 - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
 - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
 - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- ☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
 - ☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - ☐ is within the Zone II or Interim Wellhead Protection Area
 - ☐ is near or to other critical areas
 - ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - ☐ involves runoff from land uses with higher potential pollutant loads.
 - ☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.
 - ☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

- ☒ The BMP is sized (and calculations provided) based on:
 - ☒ The ½" or 1" Water Quality Volume or
 - ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- ☒ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- ☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- ☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- ☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- ☐ The NPDES Multi-Sector General Permit does **not** cover the land use.
- ☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- ☐ All exposure has been eliminated.
- ☐ All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- ☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- ☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- ☐ Critical areas and BMPs are identified in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- ☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - ☐ Limited Project
 - ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - ☐ Bike Path and/or Foot Path
 - ☐ Redevelopment Project
- ☒ Redevelopment portion of mix of new and redevelopment.
- ☒ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- ☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
 - Construction Period Operation and Maintenance Plan;
 - Names of Persons or Entity Responsible for Plan Compliance;
 - Construction Period Pollution Prevention Measures;
 - Erosion and Sedimentation Control Plan Drawings;
 - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
 - Vegetation Planning;
 - Site Development Plan;
 - Construction Sequencing Plan;
 - Sequencing of Erosion and Sedimentation Controls;
 - Operation and Maintenance of Erosion and Sedimentation Controls;
 - Inspection Schedule;
 - Maintenance Schedule;
 - Inspection and Maintenance Log Form.
- ☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- ☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- ☐ The project is **not** covered by a NPDES Construction General Permit.
- ☒ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- ☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- ☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - ☒ Name of the stormwater management system owners;
 - ☒ Party responsible for operation and maintenance;
 - ☒ Schedule for implementation of routine and non-routine maintenance tasks;
 - ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
 - ☒ Description and delineation of public safety features;
 - ☒ Estimated operation and maintenance budget; and
 - ☒ Operation and Maintenance Log Form.
- ☐ The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

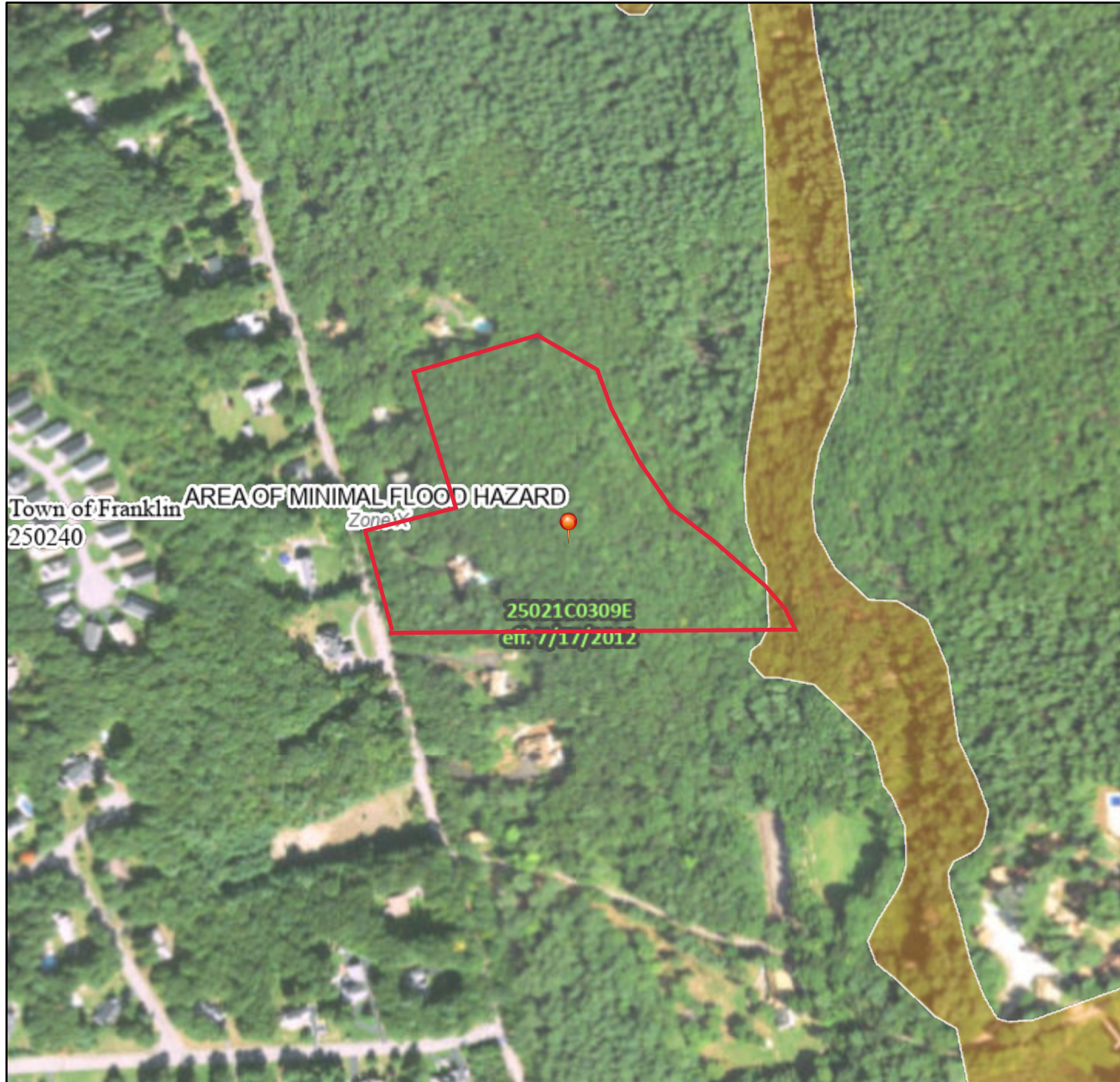
- ☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- ☒ An Illicit Discharge Compliance Statement is attached;
- ☐ NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.

ATTACHMENT G: FEMA FIRMETTE

National Flood Hazard Layer FIRMette



71°23'20"W 42°4'15"N



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

1:6,000

71°22'43"W 42°3'48"N

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

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 Zone AE, AO, AH, VE, AR
		Regulatory Floodway
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
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		Cross Sections with 1% Annual Chance Water Surface Elevation
OTHER FEATURES		Coastal Transect
		Base Flood Elevation Line (BFE)
OTHER FEATURES		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
OTHER FEATURES		Hydrographic Feature
		Digital Data Available
MAP PANELS		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

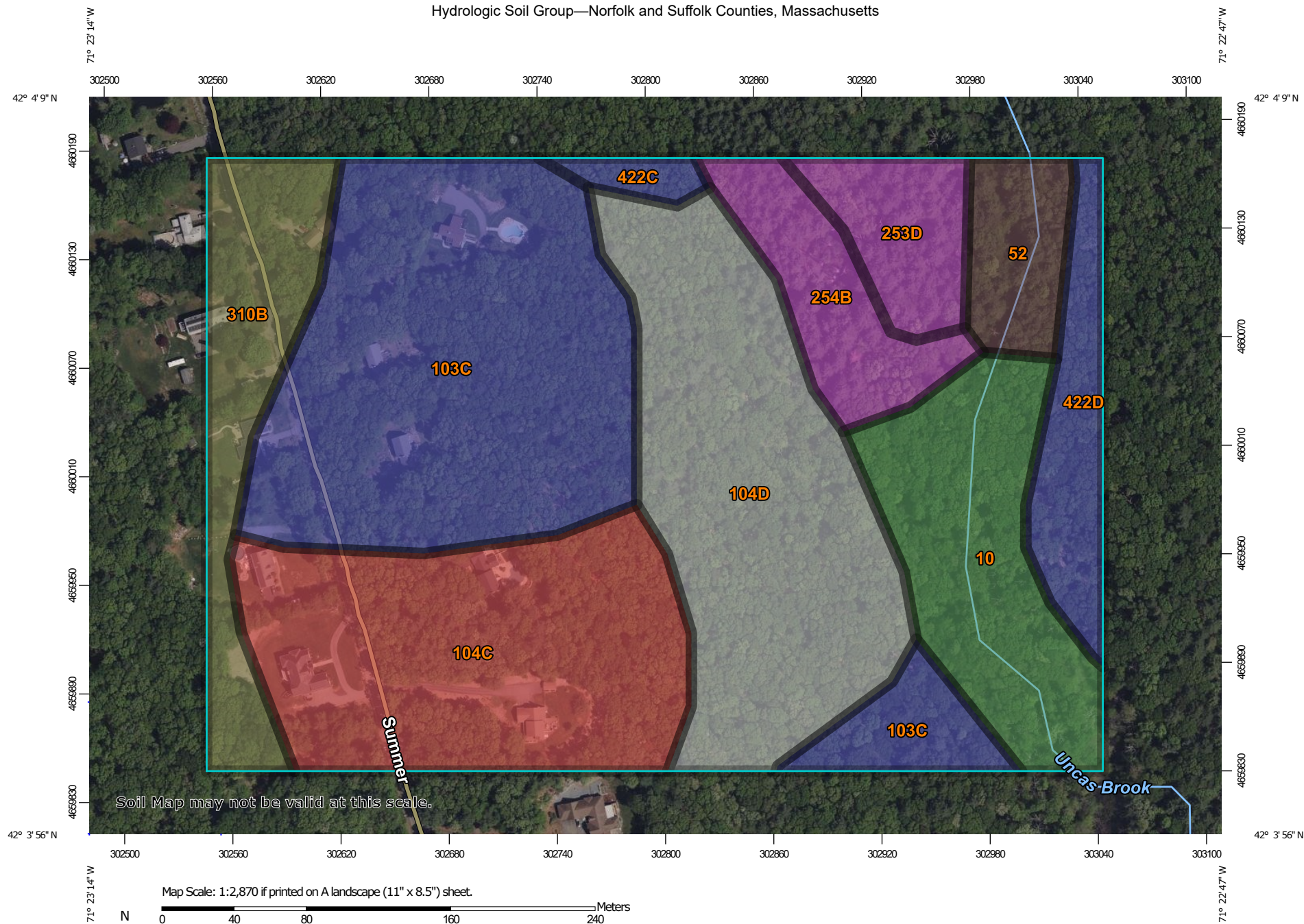
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **10/27/2022 at 12:00 PM** 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: basemap 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.

ATTACHMENT H: SOILS DATA

Hydrologic Soil Group—Norfolk and Suffolk Counties, Massachusetts



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 1:25,000.

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: Norfolk and Suffolk Counties, Massachusetts
 Survey Area Data: Version 18, Sep 9, 2022

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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
10	Scarboro and Birdsall soils, 0 to 3 percent slopes	A/D	4.5	10.7%
52	Freetown muck, 0 to 1 percent slopes	B/D	1.5	3.5%
103C	Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes	B	10.8	25.8%
104C	Hollis-Rock outcrop-Charlton complex, 0 to 15 percent slopes	D	7.5	18.0%
104D	Hollis-Rock outcrop-Charlton complex, 15 to 35 percent slopes		8.2	19.6%
253D	Hinckley loamy sand, 15 to 35 percent slopes	A	1.6	3.9%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	A	2.2	5.2%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	C/D	3.3	7.8%
422C	Canton fine sandy loam, 8 to 15 percent slopes, extremely stony	B	0.4	0.9%
422D	Canton fine sandy loam, 15 to 35 percent slopes, extremely stony	B	1.9	4.5%
Totals for Area of Interest			41.8	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

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 1

Date of Test Hole: October 28, 2022

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
6"	A	10YR4/3				Loamy Sand	1%	<1%	Massive	V. Friable	
19"	Bw	10YR6/8				Sandy Loam	1%	1%	Massive	V. Friable	
95"	C	2.5Y6/4				Loamy Sand	3%	2%	Massive	V. Friable	Possible Refusal @ 90"

Additional Notes: Ground Elev.=402.9

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 2

Date of Test Hole: October 28, 2022

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
7"	A	10YR4/3				Loamy Sand	1%	<1%	Massive	V. Friable	
20"	Bw	10YR6/8				Loamy Sand	1%	1%	Massive	V. Friable	
80"	C	2.5Y6/4	78"	7.5Y6/8	5%	Loamy Sand	3%	2%	Massive	V. Friable	Refusal @ 80"

Additional Notes: Ground Elev.=389.6

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☒ Depth to soil redoximorphic features (mottles): 78" (Elev.=383.1)

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 3

Date of Test Hole: October 28, 2022

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
6"	A	10YR4/3				Loamy Sand	1%	1%	Massive	V. Friable	
28"	Bw	10YR6/8				Loamy Sand	3%	1%	Massive	V. Friable	
48"	C1	10YR6/6				Loamy Sand	1%	1%	Massive	V. Friable	
110"	C2	2.5Y6/4				LS/S	3%	4%	Massive	V. Friable	

Additional Notes: Ground Elev.=378.3

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 4

Date of Test Hole: October 28, 2022

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
5"	A	10YR4/3				Loamy Sand	1%	1%	Massive	V. Friable	
26"	Bw	10YR6/8				Loamy Sand	1%	1%	Massive	V. Friable	
50"	C1	10YR6/6				Loamy Sand	1%	1%	Massive	V. Friable	
120"	C2	2.5Y6/4				Med. Sand	7%	10%	Single Grain	Loose	

Additional Notes: Ground Elev.=377.6

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 5

Date of Test Hole: October 28, 2022

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
5"	A	10YR4/3				Loamy Sand	1%	1%	Massive	V. Friable	
26"	B	10YR6/8				Loamy Sand	1%	1%	Massive	V. Friable	
72"	C	2.5Y6/4				Loamy Sand	6%	10%	Massive	V. Friable	Boulders @ Bottom

Additional Notes: Ground Elev.=372.4

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 6

Date of Test Hole: October 28, 2022

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
5"	A	10YR4/3				Loamy Sand	1%	1%	Massive	V. Friable	
20"	Bw	10YR6/8				Loamy Sand	2%	1%	Massive	V. Friable	
110"	C	2.5Y6/4				Loamy Sand	3%	2%	Massive	V. Friable	

Additional Notes: Ground Elev.=392.0

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 7

Date of Test Hole: October 28, 2022

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
10"	A	10YR4/3				Loamy Sand	1%	1%	Massive	V. Friable	Refusal @ 10"

Additional Notes: Ground Elev.=399.2

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 8

Date of Test Hole: October 28, 2022

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
4"	A	10YR4/3				Loamy Sand	1%	1%	Massive	V. Friable	Surface Boulders
24"	Bw	10YR6/8				Loamy Sand	1%	1%	Massive	V. Friable	
94"	C	2.5Y6/4				Loamy Sand	4%	3%	Massive	V. Friable	

Additional Notes: Ground Elev.=351.7

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 9

Date of Test Hole: October 28, 2022

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
3"	A	10YR4/3				Loamy Sand	1%	1%	Massive	V. Friable	
18"	Bw	10YR6/8				Loamy Sand	2%	1%	Massive	V. Friable	
76"	C	2.5Y6/4				Loamy Sand	4%	6%	Massive	V. Friable	

Additional Notes: Ground Elev.=356.1

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 10

Date of Test Hole: October 28, 2022

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
3"	A	10YR4/3				Loamy Sand	1%	1%	Massive	V. Friable	
20"	Bw	10YR6/8				Loamy Sand	2%	1%	Massive	V. Friable	
96"	C	2.5Y6/4				Loamy Sand	3%	1%	Massive	V. Friable	

Additional Notes: Ground Elev.=375.8

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 11

Date of Test Hole: October 28, 2022

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
3"	A	10YR4/3				Loamy Sand	1%	1%	Massive	V. Friable	
21"	Bw	10YR6/8				Loamy Sand	1%	1%	Massive	V. Friable	
62"	C	2.5Y6/4				Loamy Sand	4%	2%	Massive	V. Friable	Likely Refusal @ 62"

Additional Notes: Ground Elev.=407.7

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 12

Date of Test Hole: October 28, 2022

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
4"	A	10YR4/3				Sandy Loam	1%	<1%	Massive	V. Friable	
20"	Bw	10YR6/6				Sandy Loam	1%	1%	Massive	V. Friable	
30"	C	2.5Y6/3				Loamy Sand	2%	1%	Massive	V. Friable	Refusal @ 30"

Additional Notes: Ground Elev.=424.3

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 13

Date of Test Hole: October 28, 2022

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
3"	A	10YR4/3				Loamy Sand	1%	<1%	Massive	V. Friable	
23"	Bw	10YR6/8				Loamy Sand	2%	2%	Massive	V. Friable	
72"	C	2.5Y6/4				Loamy Sand	3%	2%	Massive	V. Friable	

Additional Notes: Ground Elev.=420.2

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 14

Date of Test Hole: October 28, 2022

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
4"	A	10YR4/3				Loamy Sand	1%	1%	Massive	V. Friable	
24"	Bw	10YR6/8				LS/SL	1%	1%	Massive	V. Friable	
80"	C	2.5Y6/4	31"	7.5Y6/8	5%	LS/SL	2%	1%	Massive	V. Friable	

Additional Notes: Ground Elev.=411.2

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☒ Depth to soil redoximorphic features (mottles): 31" (Elev.=408.6)

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 15

Date of Test Hole: October 28, 2022

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
4"	A	10YR4/3				Loamy Sand	1%	1%	Massive	V. Friable	
24"	Bw	10YR6/8				LS/SL	1%	1%	Massive	V. Friable	
80"	C	2.5Y6/4	31"	7.5Y6/8	5%	LS/SL	2%	1%	Massive	V. Friable	

Additional Notes: Ground Elev.=411.4

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☒ Depth to soil redoximorphic features (mottles): 31" (Elev.=408.8)

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 16

Date of Test Hole: May 23, 2023

Soil Evaluation By: Daniel J. Merrikin, P.E.

(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
4"	A	10YR4/3				Loamy Sand	1%	<1%	Massive	V. Friable	
30"	Bw	10YR6/8				Loamy Sand	2%	1%	Massive	V. Friable	
138"	C	2.5Y6/4				Loamy Sand/Sand	5%	2%	Massive	V. Friable	

Additional Notes: Ground Elev.=385.5

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 17

Date of Test Hole: May 23, 2023

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
4"	A	10YR4/3				Loamy Sand	1%	<1%	Massive	V. Friable	
31"	Bw	10YR6/8				Loamy Sand	1%	1%	Massive	V. Friable	
130"	C	2.5Y6/4				Loamy Sand/Sand	3%	4%	Massive	V. Friable	

Additional Notes: Ground Elev.=381.9

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☒ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 18

Date of Test Hole: May 23, 2023

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
5"	A	10YR4/3				Loamy Sand	1%	<1%	Massive	V. Friable	
29"	Bw	10YR6/8				Loamy Sand	1%	2%	Massive	V. Friable	Boulders
138"	C	2.5Y6/4				Loamy Sand/Sand	3%	2%	Massive	V. Friable	

Additional Notes: Ground Elev.=381.8

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 19

Date of Test Hole: May 23, 2023

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
4"	A	10YR4/3				Loamy Sand	1%	<1%	Massive	V. Friable	
25"	Bw	10YR6/8				Loamy Sand	1%	2%	Massive	V. Friable	
102"	C1	2.5Y6/4				Loamy Sand	3%	1%	Massive	V. Friable	

Additional Notes: Ground Elev.=388.4

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 20

Date of Test Hole: May 23, 2023

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
3"	A	10YR4/3				Loamy Sand	<1%	<1%	Massive	V. Friable	
18"	Bw	10YR6/8				Loamy Sand	1%	<1%	Massive	V. Friable	
105"	C	2.5Y6/4				Loamy Sand	4%	2%	Massive	V. Friable	Likely refusal @ 105"

Additional Notes: Ground Elev.=380.0

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 21

Date of Test Hole: May 23, 2023

Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
4"	A	10YR4/3				Loamy Sand	1%	<1%	Massive	V. Friable	
19"	Bw	10YR6/8				Loamy Sand	1%	1%	Massive	V. Friable	
115"	C	2.5Y6/4				Loamy Sand	4%	2%	Massive	V. Friable	Likely refusal @ 115"

Additional Notes: Ground Elev.=381.0

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 22

Date of Test Hole: July 11, 2024

Soil Evaluation By: Daniel J. Merrikin, P.E.

(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
25"	Fill										
94"	C	2.5Y6/3				Loamy Sand	3%	1%	Massive	V. Friable	

Additional Notes: Ground Elev.=401.4

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 23 Date of Test Hole: July 11, 2024 Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
5"	A	10YR4/3				Loamy Sand	1%	<1%	Massive	V. Friable	
24"	Bw	10YR6/8				Loamy Sand	1%	1%	Massive	V. Friable	
120"	C	2.5Y6/4				Loamy Sand	4%	1%	Massive	V. Friable	Few Boulders

Additional Notes: Ground Elev.=400.3

Groundwater Indicators Observed at Time of Testing:

☐ Depth observed standing water in observation hole: None

☐ Depth to soil redoximorphic features (mottles): None

☐ Depth weeping from side of observation hole: None

DEEP OBSERVATION TEST HOLE SOIL LOG

496 SUMMER STREET, FRANKLIN MA 02038

Deep Observation Hole: OTH 24 Date of Test Hole: July 11, 2024 Soil Evaluation By: Daniel J. Merrikin, P.E.
(Mass. Approved Soil Evaluator)

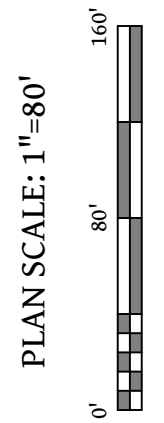
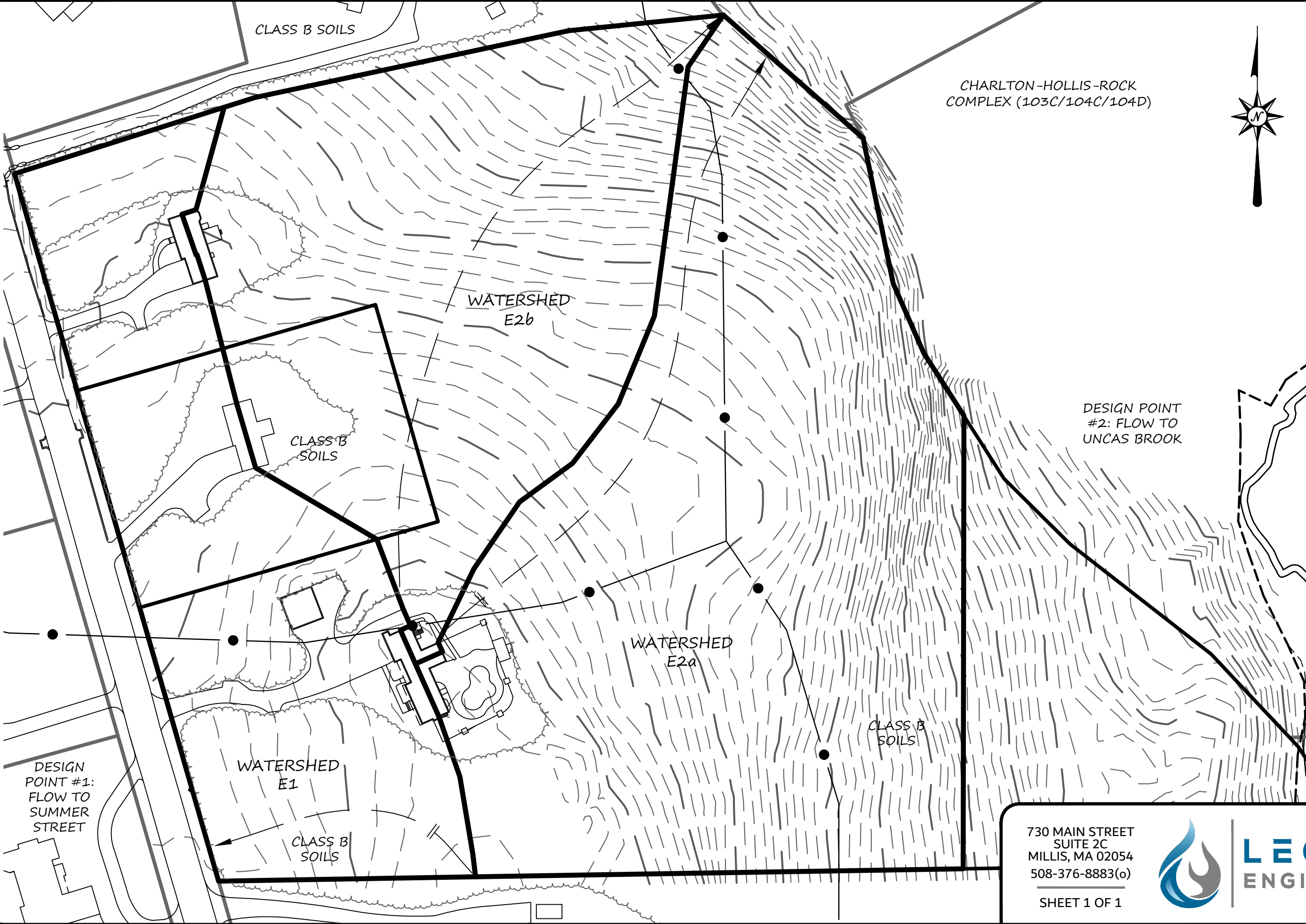
Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
5"	A	10YR4/3				Loamy Sand	1%	<1%	Massive	V. Friable	
36"	Bw	10YR6/8				Loamy Sand	1%	<1%	Massive	V. Friable	
127"	C	2.5Y6/4				LS/SL	3%	1%	Massive	V. Friable	

Additional Notes: Ground Elev.=412.7

Groundwater Indicators Observed at Time of Testing:

- ☐ Depth observed standing water in observation hole: None
 ☐ Depth to soil redoximorphic features (mottles): None
- ☐ Depth weeping from side of observation hole: None

ATTACHMENT I: EXISTING WATERSHED PLAN



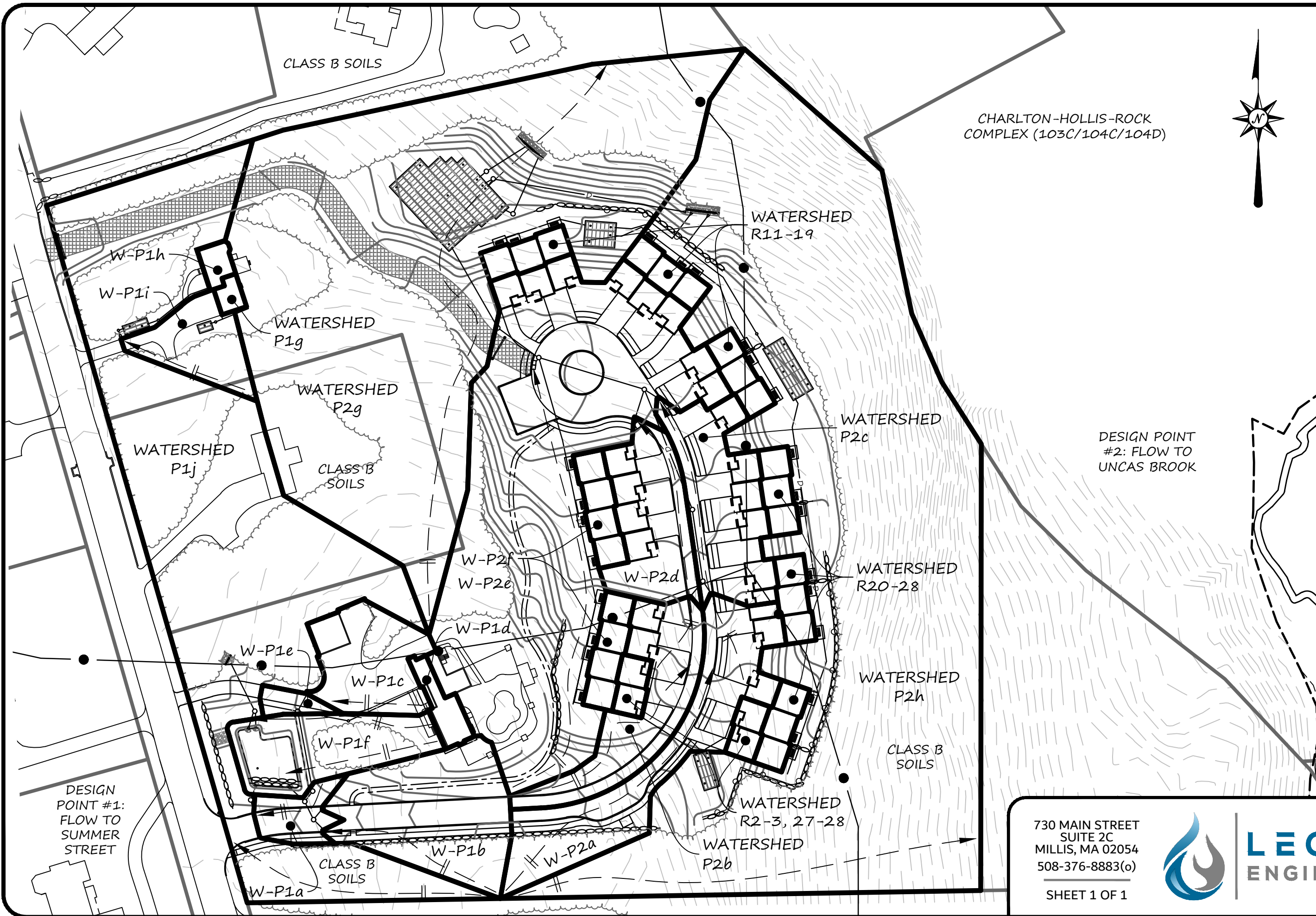
PLAN DATE: JANUARY 26, 2024			
REVISION	DATE	BY	
REV. PER COMMENTS	2024-7-18	DJM	
REV. PER COMMENTS	2024-9-23	DJM	
REVISED SITE DESIGN	2025-1-21	DJM	

AUTUMN HILL
SENIOR VILLAGE
EXISTING WATERSHED
PLAN OF LAND IN
FRANKLIN, MA

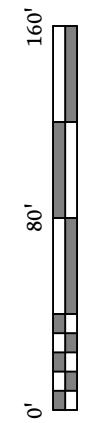
730 MAIN STREET
SUITE 2C
MILLIS, MA 02054
508-376-8883(o)
SHEET 1 OF 1



ATTACHMENT J: PROPOSED WATERSHED PLAN



PLAN SCALE: 1"=80'



PLAN DATE: JANUARY 26, 2024

REVISION	DATE	BY
REV. PER COMMENTS	2024-7-18	DJM
REV. PER COMMENTS	2024-9-23	DJM
REVISED SITE DESIGN	2025-1-21	DJM

AUTUMN HILL
SENIOR VILLAGE
PROPOSED WATERSHED
PLAN OF LAND IN
FRANKLIN, MA

DESIGN POINT
#2: FLOW TO
UNCAS BROOK

DESIGN POINT #1:
FLOW TO
SUMMER
STREET

730 MAIN STREET
SUITE 2C
MILLIS, MA 02054
508-376-8883(o)

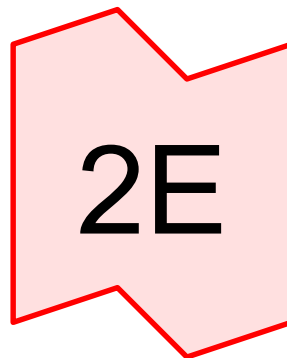
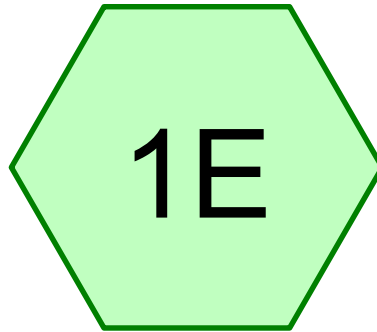
SHEET 1 OF 1



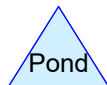
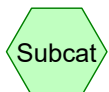
LEGACY
ENGINEERING

ATTACHMENT K: HYDROCAD HYDROLOGY CALCULATIONS

**DESIGN POINT #1: FLOW TO SUMMER
STREET EXISTING CONDITIONS**



Desing Point #1: Flow to Summer Street



Routing Diagram for HydroCAD 2

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HydroCAD 2

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-YR	NOAA10 24-hr	D	Default	24.00	1	3.36	2
2	10-YR	NOAA10 24-hr	D	Default	24.00	1	5.22	2
3	25-YR	NOAA10 24-hr	D	Default	24.00	1	6.37	2
4	100-YR	NOAA10 24-hr	D	Default	24.00	1	8.15	2

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.444	61	>75% Grass cover, Good HSG B (1E)
0.277	98	Paved parking HSG B (1E)
0.088	98	Roofs, HSG B (1E)
2.035	55	Woods, Good, HSG B (1E)
2.844	61	TOTAL AREA

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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1E: E1

Runoff Area=123,892 sf 12.85% Impervious Runoff Depth=0.70"

Flow Length=255' Tc=11.7 min CN=WQ Runoff=1.29 cfs 0.165 af

Link 2E: Desing Point #1: Flow to Summer Street

Inflow=1.29 cfs 0.165 af

Primary=1.29 cfs 0.165 af

Total Runoff Area = 2.844 ac Runoff Volume = 0.165 af Average Runoff Depth = 0.70"
87.15% Pervious = 2.479 ac 12.85% Impervious = 0.365 ac

HydroCAD 2

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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Subcatchment 1E: E1

Runoff = 1.29 cfs @ 12.20 hrs, Volume= 0.165 af, Depth= 0.70"

Routed to Link 2E : Desing Point #1: Flow to Summer Street

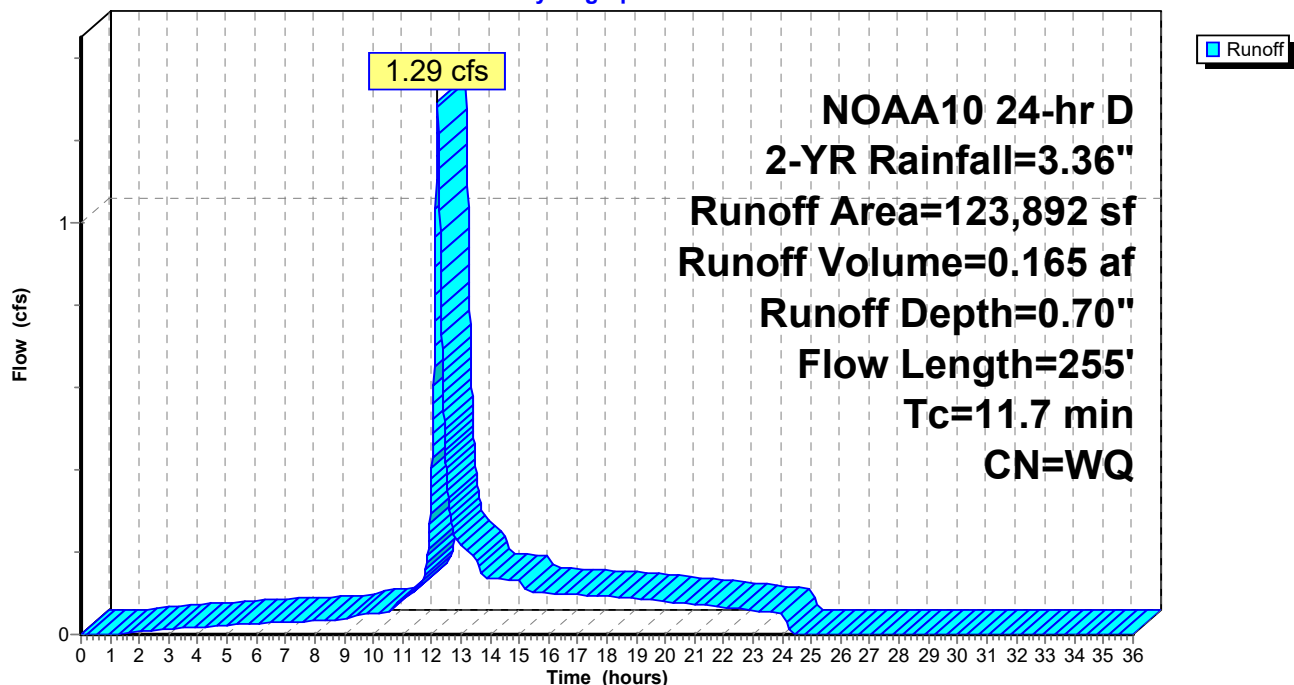
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
12,064	98	Paved parking HSG B
3,855	98	Roofs, HSG B
19,323	61	>75% Grass cover, Good HSG B
88,650	55	Woods, Good, HSG B
123,892		Weighted Average
107,973		87.15% Pervious Area
15,919		12.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
2.6	205	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.7	255	Total			

Subcatchment 1E: E1

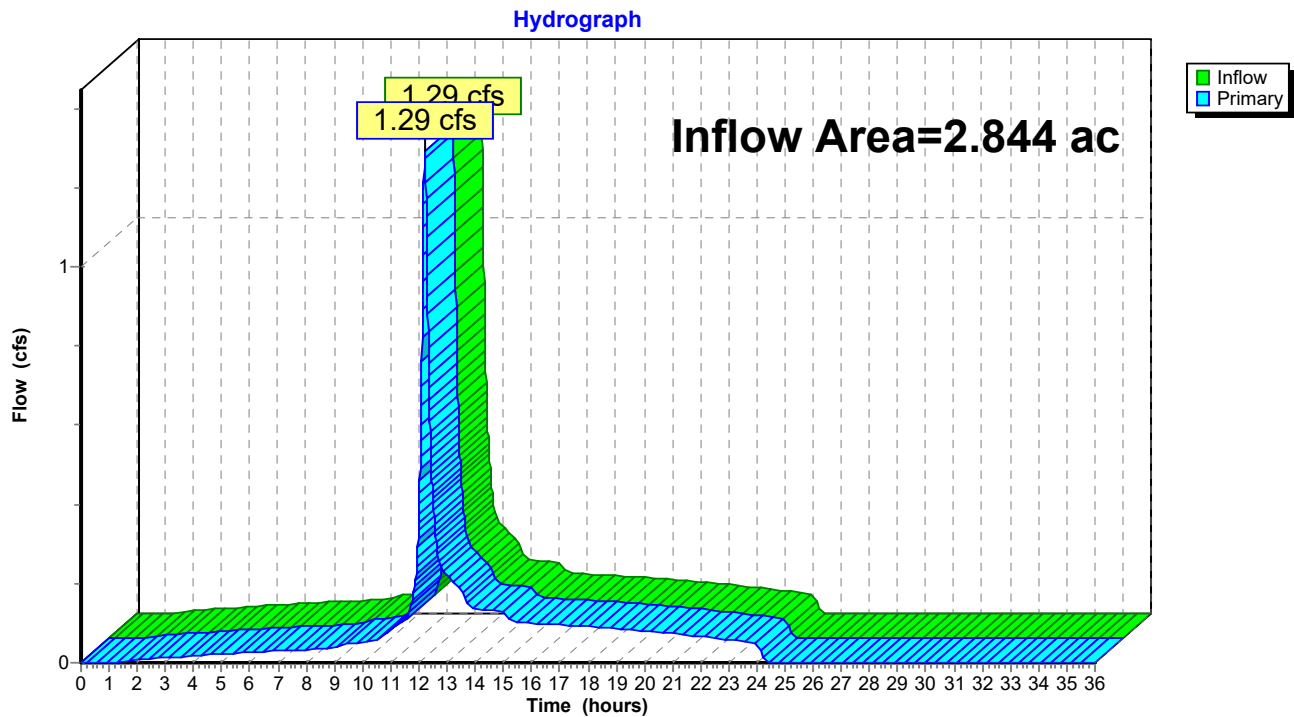
Hydrograph



Summary for Link 2E: Desing Point #1: Flow to Summer Street

Inflow Area = 2.844 ac, 12.85% Impervious, Inflow Depth = 0.70" for 2-YR event
Inflow = 1.29 cfs @ 12.20 hrs, Volume= 0.165 af
Primary = 1.29 cfs @ 12.20 hrs, Volume= 0.165 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 2E: Desing Point #1: Flow to Summer Street

HydroCAD 2

NOAA10 24-hr D 10-YR Rainfall=5.22"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1E: E1

Runoff Area=123,892 sf 12.85% Impervious Runoff Depth=1.66"

Flow Length=255' Tc=11.7 min CN=WQ Runoff=3.96 cfs 0.392 af

Link 2E: Desing Point #1: Flow to Summer Street

Inflow=3.96 cfs 0.392 af

Primary=3.96 cfs 0.392 af

Total Runoff Area = 2.844 ac Runoff Volume = 0.392 af Average Runoff Depth = 1.66"
87.15% Pervious = 2.479 ac 12.85% Impervious = 0.365 ac

Summary for Subcatchment 1E: E1

Runoff = 3.96 cfs @ 12.20 hrs, Volume= 0.392 af, Depth= 1.66"

Routed to Link 2E : Desing Point #1: Flow to Summer Street

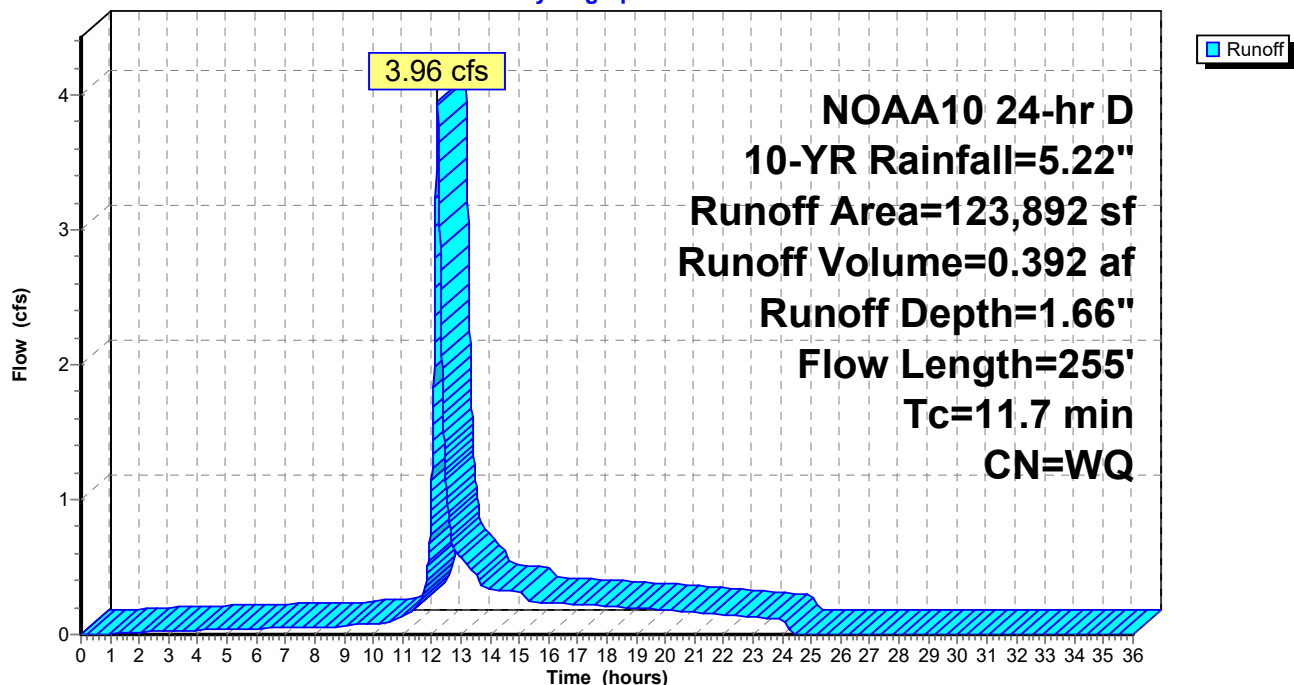
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
12,064	98	Paved parking HSG B
3,855	98	Roofs, HSG B
19,323	61	>75% Grass cover, Good HSG B
88,650	55	Woods, Good, HSG B
123,892		Weighted Average
107,973		87.15% Pervious Area
15,919		12.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
2.6	205	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.7	255	Total			

Subcatchment 1E: E1

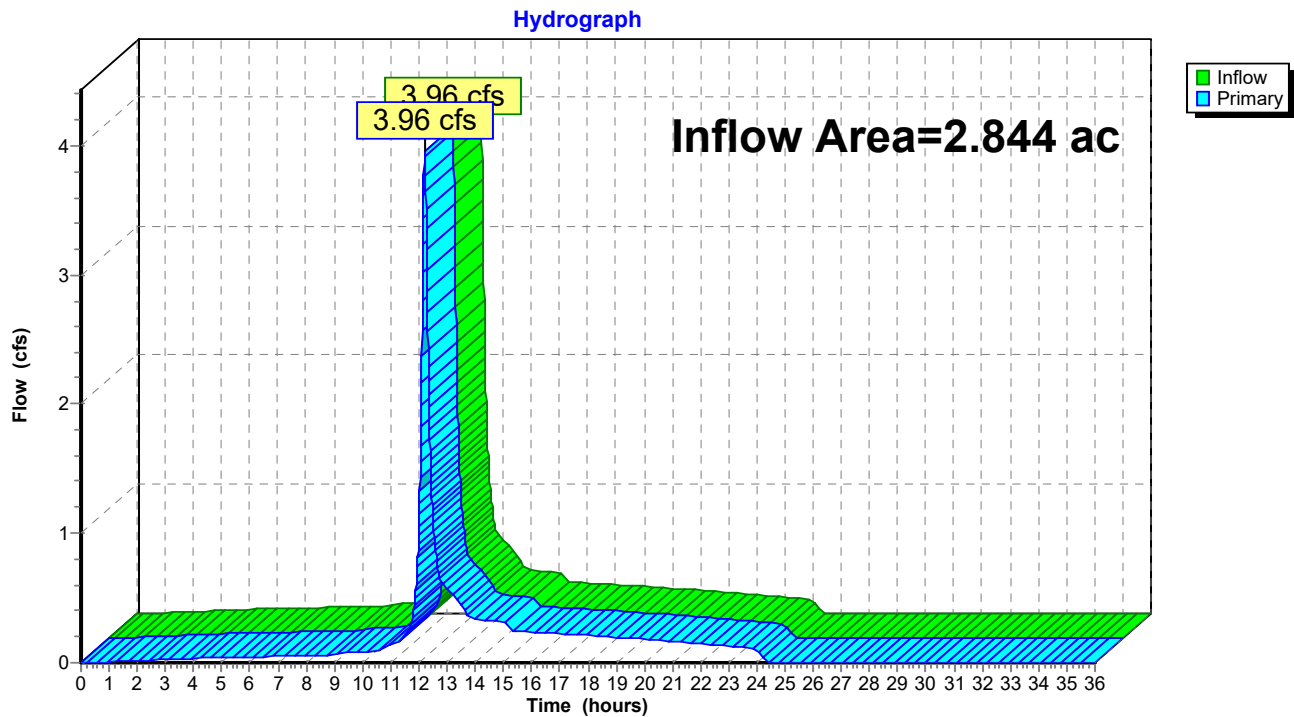
Hydrograph



Summary for Link 2E: Desing Point #1: Flow to Summer Street

Inflow Area = 2.844 ac, 12.85% Impervious, Inflow Depth = 1.66" for 10-YR event
Inflow = 3.96 cfs @ 12.20 hrs, Volume= 0.392 af
Primary = 3.96 cfs @ 12.20 hrs, Volume= 0.392 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 2E: Desing Point #1: Flow to Summer Street

HydroCAD 2

NOAA10 24-hr D 25-YR Rainfall=6.37"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1E: E1

Runoff Area=123,892 sf 12.85% Impervious Runoff Depth=2.38"
Flow Length=255' Tc=11.7 min CN=WQ Runoff=6.00 cfs 0.564 af

Link 2E: Desing Point #1: Flow to Summer Street

Inflow=6.00 cfs 0.564 af
Primary=6.00 cfs 0.564 af

Total Runoff Area = 2.844 ac Runoff Volume = 0.564 af Average Runoff Depth = 2.38"
87.15% Pervious = 2.479 ac 12.85% Impervious = 0.365 ac

HydroCAD 2

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NOAA10 24-hr D 25-YR Rainfall=6.37"

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Summary for Subcatchment 1E: E1

Runoff = 6.00 cfs @ 12.20 hrs, Volume= 0.564 af, Depth= 2.38"

Routed to Link 2E : Desing Point #1: Flow to Summer Street

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

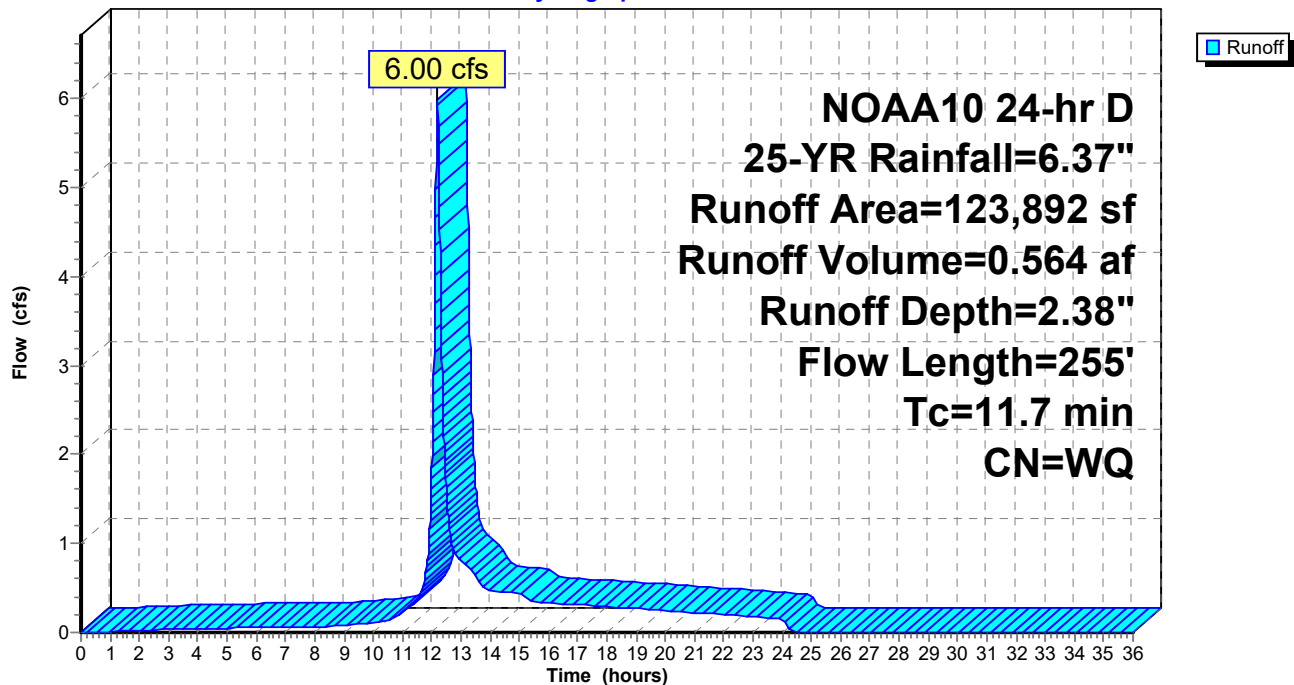
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
12,064	98	Paved parking HSG B
3,855	98	Roofs, HSG B
19,323	61	>75% Grass cover, Good HSG B
88,650	55	Woods, Good, HSG B
123,892		Weighted Average
107,973		87.15% Pervious Area
15,919		12.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
2.6	205	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.7	255	Total			

Subcatchment 1E: E1

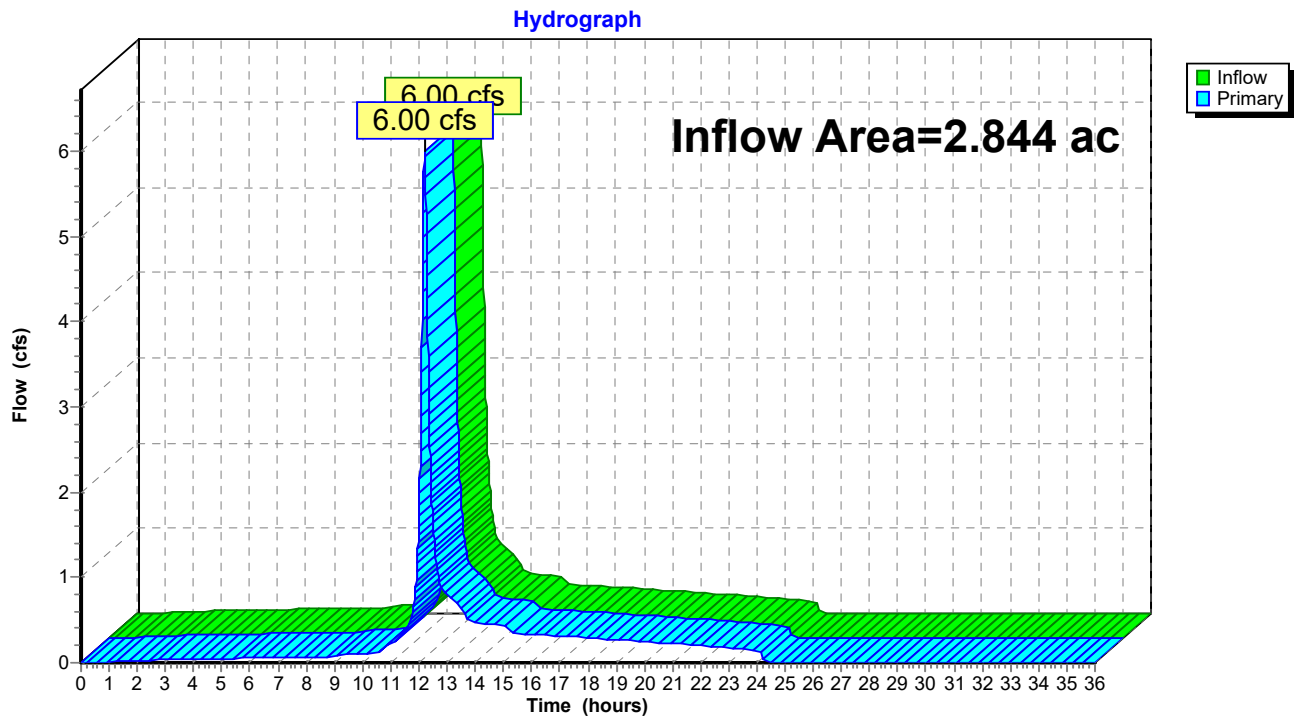
Hydrograph



Summary for Link 2E: Desing Point #1: Flow to Summer Street

Inflow Area = 2.844 ac, 12.85% Impervious, Inflow Depth = 2.38" for 25-YR event
Inflow = 6.00 cfs @ 12.20 hrs, Volume= 0.564 af
Primary = 6.00 cfs @ 12.20 hrs, Volume= 0.564 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 2E: Desing Point #1: Flow to Summer Street

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1E: E1

Runoff Area=123,892 sf 12.85% Impervious Runoff Depth=3.64"

Flow Length=255' Tc=11.7 min CN=WQ Runoff=9.50 cfs 0.862 af

Link 2E: Desing Point #1: Flow to Summer Street

Inflow=9.50 cfs 0.862 af

Primary=9.50 cfs 0.862 af

Total Runoff Area = 2.844 ac Runoff Volume = 0.862 af Average Runoff Depth = 3.64"
87.15% Pervious = 2.479 ac 12.85% Impervious = 0.365 ac

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NOAA10 24-hr D 100-YR Rainfall=8.15"

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Summary for Subcatchment 1E: E1

Runoff = 9.50 cfs @ 12.20 hrs, Volume= 0.862 af, Depth= 3.64"
Routed to Link 2E : Desing Point #1: Flow to Summer Street

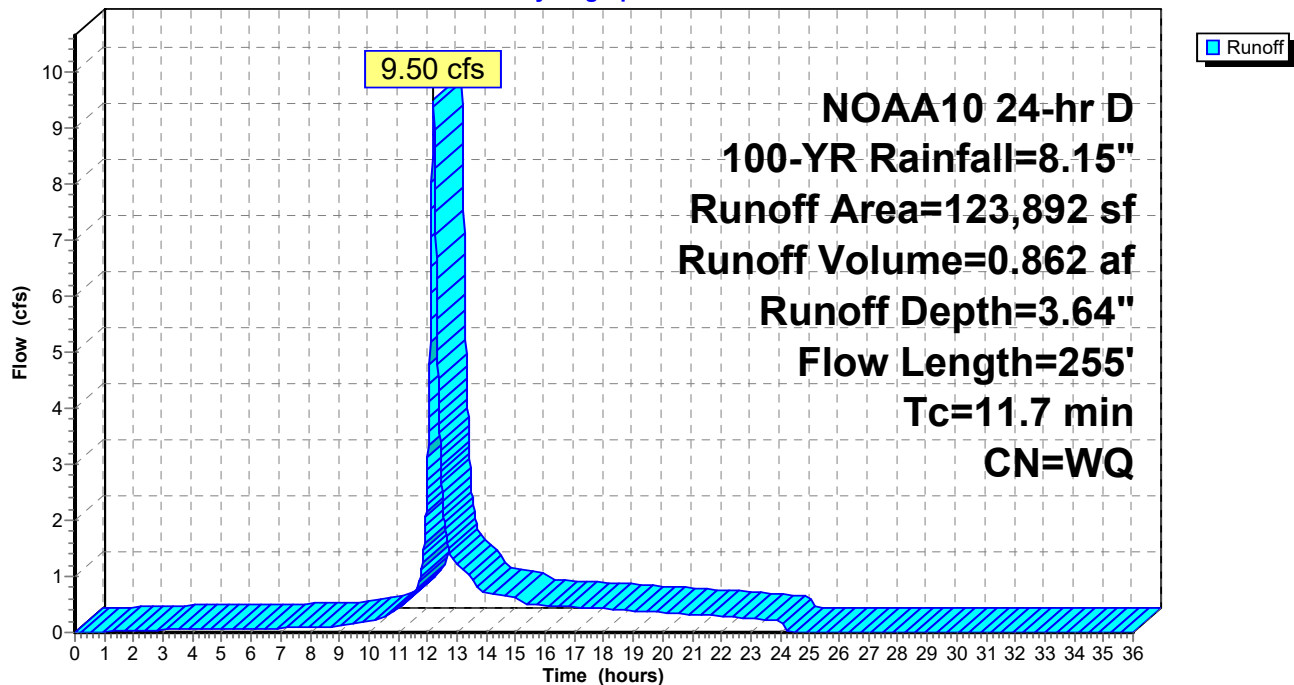
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
12,064	98	Paved parking HSG B
3,855	98	Roofs, HSG B
19,323	61	>75% Grass cover, Good HSG B
88,650	55	Woods, Good, HSG B
123,892		Weighted Average
107,973		87.15% Pervious Area
15,919		12.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
2.6	205	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.7	255	Total			

Subcatchment 1E: E1

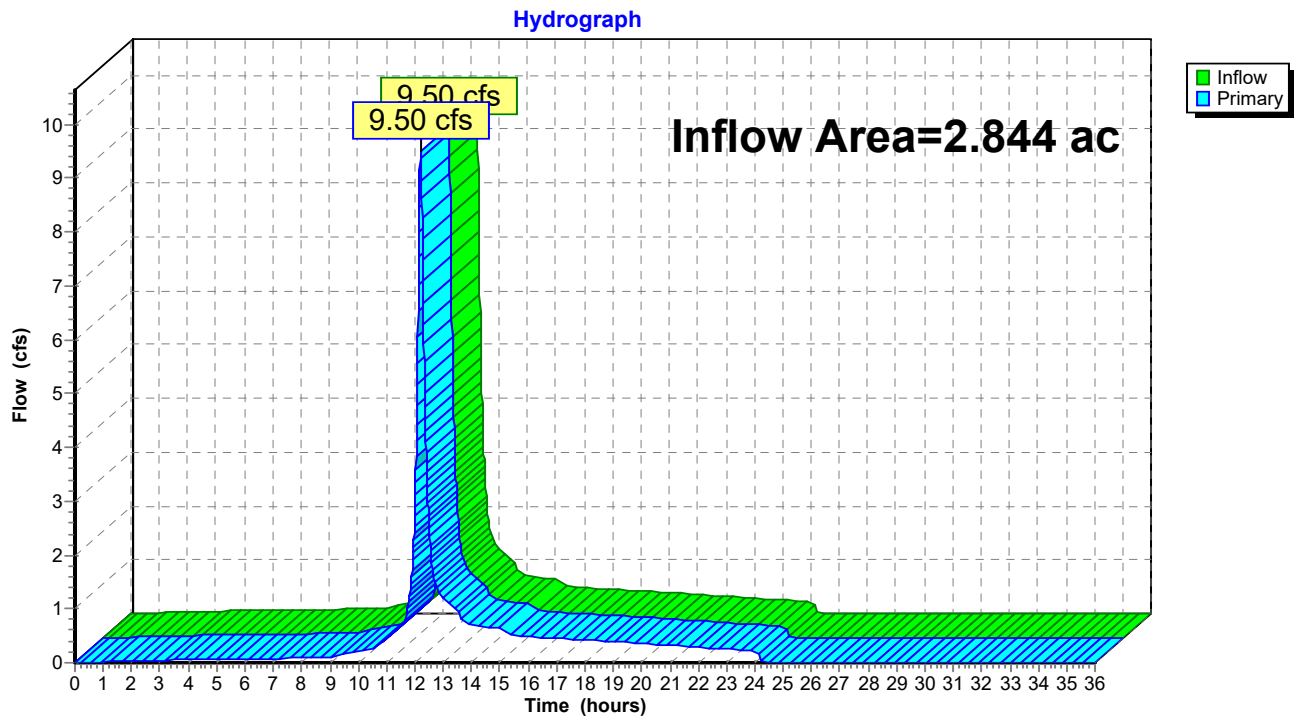
Hydrograph



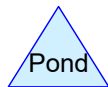
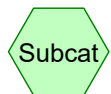
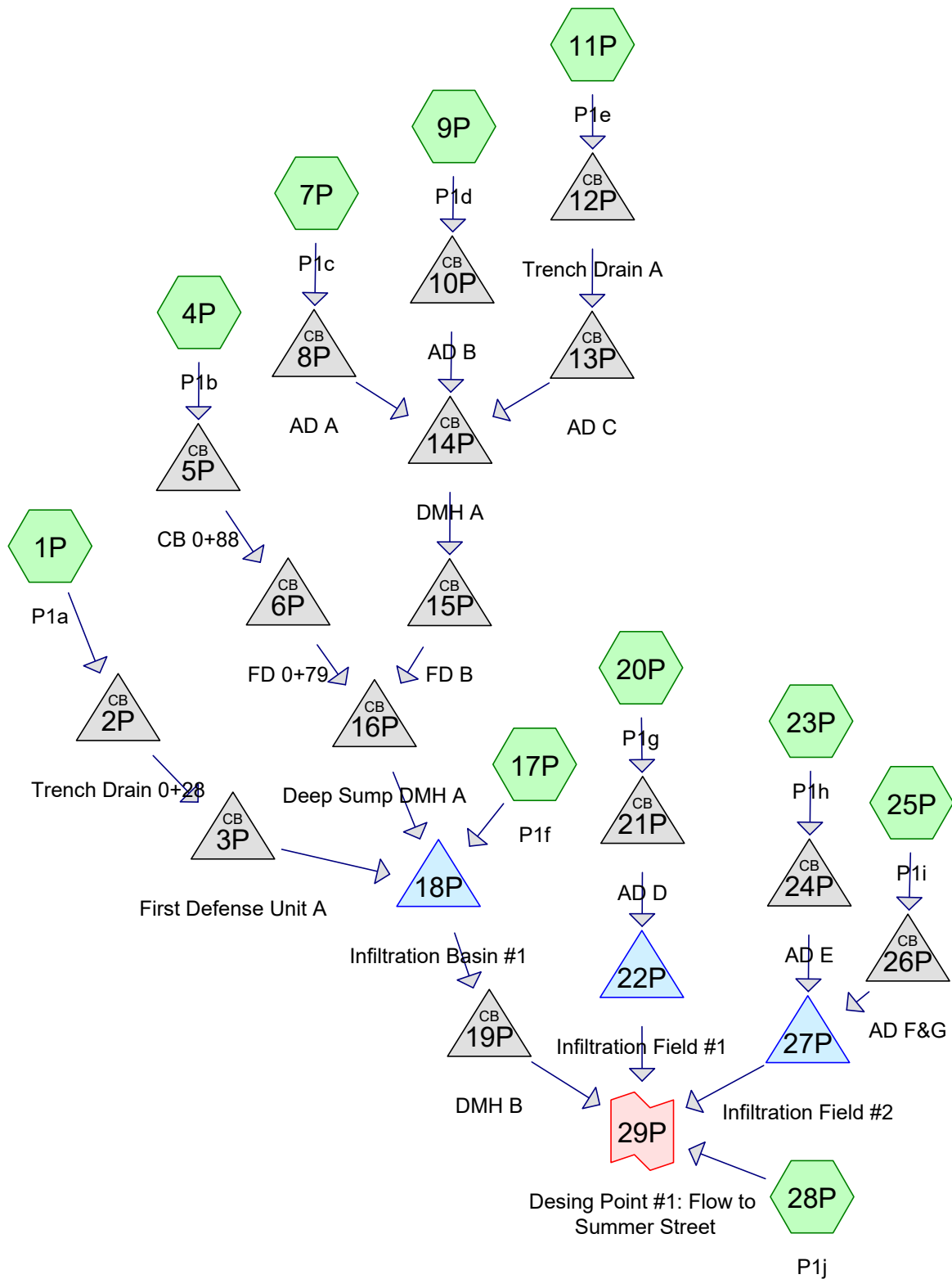
Summary for Link 2E: Desing Point #1: Flow to Summer Street

Inflow Area = 2.844 ac, 12.85% Impervious, Inflow Depth = 3.64" for 100-YR event
Inflow = 9.50 cfs @ 12.20 hrs, Volume= 0.862 af
Primary = 9.50 cfs @ 12.20 hrs, Volume= 0.862 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 2E: Desing Point #1: Flow to Summer Street

**DESIGN POINT #1: FLOW TO SUMMER
STREET PROPOSED CONDITIONS**



Routing Diagram for HydroCAD 2

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-YR	NOAA10 24-hr	D	Default	24.00	1	3.36	2
2	10-YR	NOAA10 24-hr	D	Default	24.00	1	5.22	2
3	25-YR	NOAA10 24-hr	D	Default	24.00	1	6.37	2
4	100-YR	NOAA10 24-hr	D	Default	24.00	1	8.15	2

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.835	61	>75% Grass cover, Good HSG B (1P, 7P, 11P, 17P, 25P, 28P)
0.170	61	>75% Grass cover, Good, HSG B (4P)
0.333	98	Paved parking HSG B (1P, 7P, 11P, 25P, 28P)
0.112	98	Paved parking, HSG B (4P, 17P)
0.118	98	Roofs HSG B (7P, 9P, 20P, 23P, 28P)
1.277	55	Woods, Good HSG B (7P, 17P, 25P, 28P)
0.084	55	Woods, Good, HSG B (4P)
2.929	65	TOTAL AREA

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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1P: P1a

Runoff Area=3,133 sf 58.00% Impervious Runoff Depth=2.03"
Flow Length=73' Tc=2.7 min CN=WQ Runoff=0.17 cfs 0.012 af

Pond 2P: Trench Drain 0+28

Peak Elev=412.01' Inflow=0.17 cfs 0.012 af
10.0" Round Culvert n=0.011 L=11.0' S=0.0355 '/' Outflow=0.17 cfs 0.012 af

Pond 3P: First Defense Unit A

Peak Elev=411.98' Inflow=0.17 cfs 0.012 af
10.0" Round Culvert n=0.011 L=12.0' S=0.0050 '/' Outflow=0.17 cfs 0.012 af

Subcatchment4P: P1b

Runoff Area=15,777 sf 29.99% Impervious Runoff Depth=1.25"
Flow Length=168' Tc=10.0 min CN=WQ Runoff=0.38 cfs 0.038 af

Pond 5P: CB 0+88

Peak Elev=412.08' Inflow=0.38 cfs 0.038 af
12.0" Round Culvert x 2.00 n=0.011 L=9.0' S=0.0056 '/' Outflow=0.38 cfs 0.038 af

Pond 6P: FD 0+79

Peak Elev=412.06' Inflow=0.38 cfs 0.038 af
12.0" Round Culvert n=0.011 L=15.0' S=0.0067 '/' Outflow=0.38 cfs 0.038 af

Subcatchment7P: P1c

Runoff Area=8,619 sf 69.83% Impervious Runoff Depth=2.32"
Flow Length=82' Tc=3.9 min CN=WQ Runoff=0.53 cfs 0.038 af

Pond 8P: AD A

Peak Elev=413.57' Inflow=0.53 cfs 0.038 af
6.0" Round Culvert n=0.011 L=19.0' S=0.0500 '/' Outflow=0.53 cfs 0.038 af

Subcatchment9P: P1d

Runoff Area=1,857 sf 100.00% Impervious Runoff Depth=3.13"
Tc=2.0 min CN=98 Runoff=0.16 cfs 0.011 af

Pond 10P: AD B

Peak Elev=417.25' Inflow=0.16 cfs 0.011 af
6.0" Round Culvert n=0.011 L=49.0' S=0.1010 '/' Outflow=0.16 cfs 0.011 af

Subcatchment11P: P1e

Runoff Area=1,233 sf 57.42% Impervious Runoff Depth=2.01"
Flow Length=164' Slope=0.0700 '/' Tc=5.3 min CN=WQ Runoff=0.06 cfs 0.005 af

Pond 12P: Trench Drain A

Peak Elev=412.54' Inflow=0.06 cfs 0.005 af
8.0" Round Culvert n=0.011 L=4.0' S=0.0125 '/' Outflow=0.06 cfs 0.005 af

Pond 13P: AD C

Peak Elev=412.53' Inflow=0.06 cfs 0.005 af
8.0" Round Culvert n=0.011 L=26.0' S=0.0058 '/' Outflow=0.06 cfs 0.005 af

Pond 14P: DMH A

Peak Elev=412.51' Inflow=0.75 cfs 0.054 af
12.0" Round Culvert n=0.011 L=69.0' S=0.0058 '/' Outflow=0.75 cfs 0.054 af

Pond 15P: FD B

Peak Elev=412.14' Inflow=0.75 cfs 0.054 af
12.0" Round Culvert n=0.011 L=8.0' S=0.0125 '/' Outflow=0.75 cfs 0.054 af

Pond 16P: Deep Sump DMH A

Peak Elev=412.01' Inflow=1.04 cfs 0.092 af
12.0" Round Culvert n=0.011 L=16.0' S=0.0062 '/' Outflow=1.04 cfs 0.092 af

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Subcatchment17P: P1fRunoff Area=10,226 sf 1.29% Impervious Runoff Depth=0.49"
Flow Length=162' Tc=8.3 min CN=WQ Runoff=0.09 cfs 0.010 af**Pond 18P: Infiltration Basin #1**Peak Elev=411.98' Storage=1,344 cf Inflow=1.27 cfs 0.113 af
Discarded=0.05 cfs 0.090 af Primary=0.21 cfs 0.023 af Outflow=0.26 cfs 0.113 af**Pond 19P: DMH B**Peak Elev=411.04' Inflow=0.21 cfs 0.023 af
12.0" Round Culvert n=0.011 L=46.0' S=0.0065 '/' Outflow=0.21 cfs 0.023 af**Subcatchment20P: P1g**Runoff Area=653 sf 100.00% Impervious Runoff Depth=3.13"
Tc=2.0 min CN=98 Runoff=0.06 cfs 0.004 af**Pond 21P: AD D**Peak Elev=400.16' Inflow=0.06 cfs 0.004 af
4.0" Round Culvert n=0.011 L=30.0' S=0.0100 '/' Outflow=0.06 cfs 0.004 af**Pond 22P: Infiltration Field #1**Peak Elev=398.53' Storage=37 cf Inflow=0.06 cfs 0.004 af
Discarded=0.01 cfs 0.004 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.004 af**Subcatchment23P: P1h**Runoff Area=930 sf 100.00% Impervious Runoff Depth=3.13"
Tc=2.0 min CN=98 Runoff=0.08 cfs 0.006 af**Pond 24P: AD E**Peak Elev=398.86' Inflow=0.08 cfs 0.006 af
6.0" Round Culvert n=0.011 L=119.0' S=0.0050 '/' Outflow=0.08 cfs 0.006 af**Subcatchment25P: P1i**Runoff Area=5,938 sf 30.43% Impervious Runoff Depth=1.23"
Flow Length=120' Tc=9.1 min CN=WQ Runoff=0.15 cfs 0.014 af**Pond 26P: AD F&G**Peak Elev=398.86' Inflow=0.15 cfs 0.014 af
8.0" Round Culvert n=0.011 L=4.0' S=0.0500 '/' Outflow=0.15 cfs 0.014 af**Pond 27P: Infiltration Field #2**Peak Elev=398.86' Storage=257 cf Inflow=0.19 cfs 0.020 af
Discarded=0.01 cfs 0.018 af Primary=0.02 cfs 0.001 af Outflow=0.03 cfs 0.020 af**Subcatchment28P: P1j**Runoff Area=79,206 sf 7.39% Impervious Runoff Depth=0.57"
Flow Length=229' Tc=11.4 min CN=WQ Runoff=0.65 cfs 0.087 af**Link 29P: Desing Point #1: Flow to Summer Street**Inflow=0.74 cfs 0.111 af
Primary=0.74 cfs 0.111 af**Total Runoff Area = 2.929 ac Runoff Volume = 0.223 af Average Runoff Depth = 0.92"**
80.79% Pervious = 2.366 ac 19.21% Impervious = 0.563 ac

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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Subcatchment 1P: P1a

Runoff = 0.17 cfs @ 12.10 hrs, Volume= 0.012 af, Depth= 2.03"
Routed to Pond 2P : Trench Drain 0+28

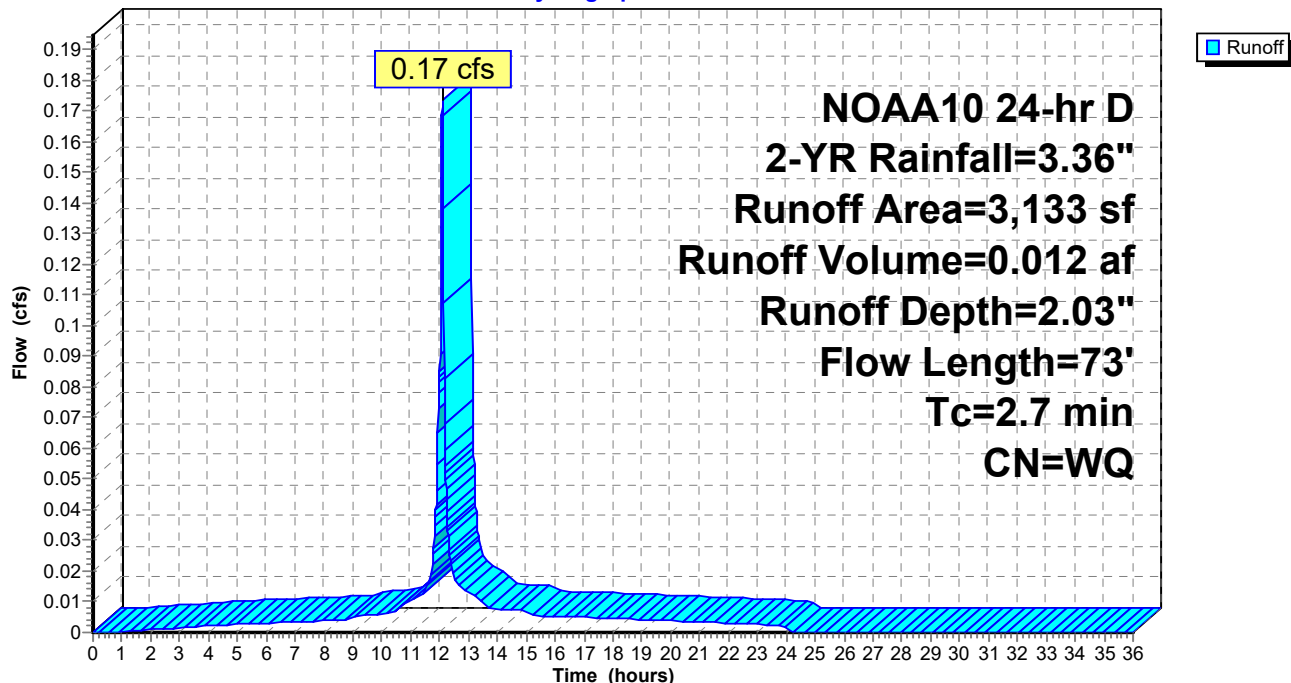
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
1,817	98	Paved parking HSG B
1,316	61	>75% Grass cover, Good HSG B
3,133		Weighted Average
1,316		42.00% Pervious Area
1,817		58.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	23	0.1000	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
0.3	25	0.0300	1.26		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.36"
0.1	25	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7	73	Total			

Subcatchment 1P: P1a

Hydrograph



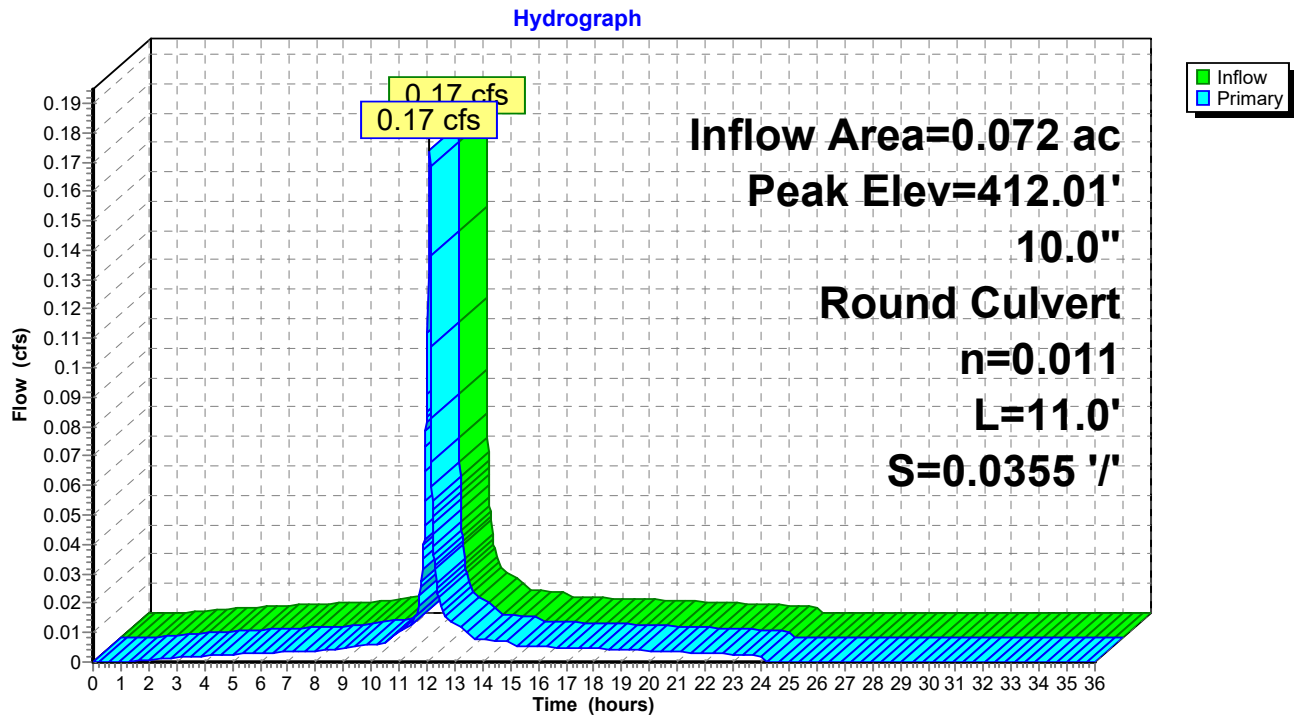
Summary for Pond 2P: Trench Drain 0+28

Inflow Area = 0.072 ac, 58.00% Impervious, Inflow Depth = 2.03" for 2-YR event
 Inflow = 0.17 cfs @ 12.10 hrs, Volume= 0.012 af
 Outflow = 0.17 cfs @ 12.10 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.17 cfs @ 12.10 hrs, Volume= 0.012 af
 Routed to Pond 3P : First Defense Unit A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.01' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.80'	10.0" Round Culvert L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.80' / 411.41' S= 0.0355 '/ Cc= 0.900 n= 0.011, Flow Area= 0.55 sf

Primary OutFlow Max=0.17 cfs @ 12.10 hrs HW=412.01' TW=411.75' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 0.17 cfs @ 1.57 fps)

Pond 2P: Trench Drain 0+28

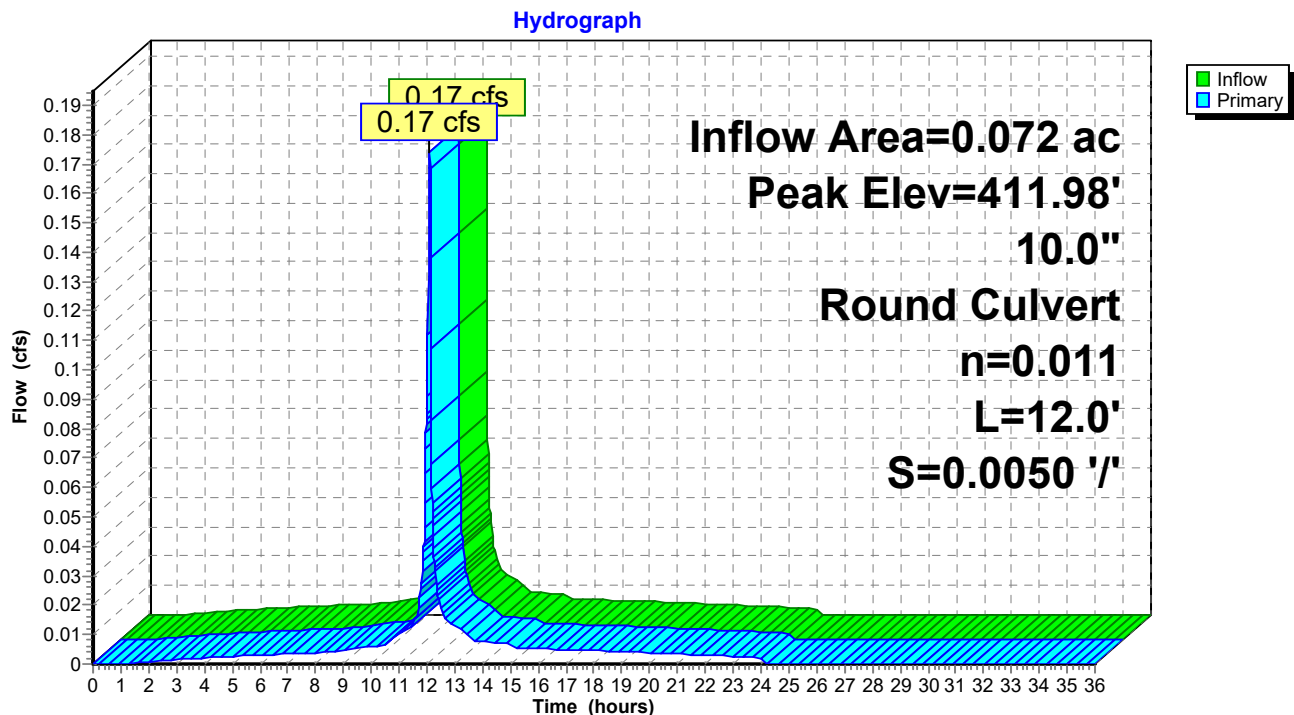
Summary for Pond 3P: First Defense Unit A

Inflow Area = 0.072 ac, 58.00% Impervious, Inflow Depth = 2.03" for 2-YR event
 Inflow = 0.17 cfs @ 12.10 hrs, Volume= 0.012 af
 Outflow = 0.17 cfs @ 12.10 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.17 cfs @ 12.10 hrs, Volume= 0.012 af
 Routed to Pond 18P : Infiltration Basin #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 411.98' @ 12.43 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.36'	10.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.36' / 411.30' S= 0.0050 '/ Cc= 0.900 n= 0.011, Flow Area= 0.55 sf

Primary OutFlow Max=0.10 cfs @ 12.10 hrs HW=411.75' TW=411.74' (Dynamic Tailwater)
 1=Culvert (Outlet Controls 0.10 cfs @ 0.61 fps)

Pond 3P: First Defense Unit A

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Summary for Subcatchment 4P: P1b

Runoff = 0.38 cfs @ 12.18 hrs, Volume= 0.038 af, Depth= 1.25"
Routed to Pond 5P : CB 0+88

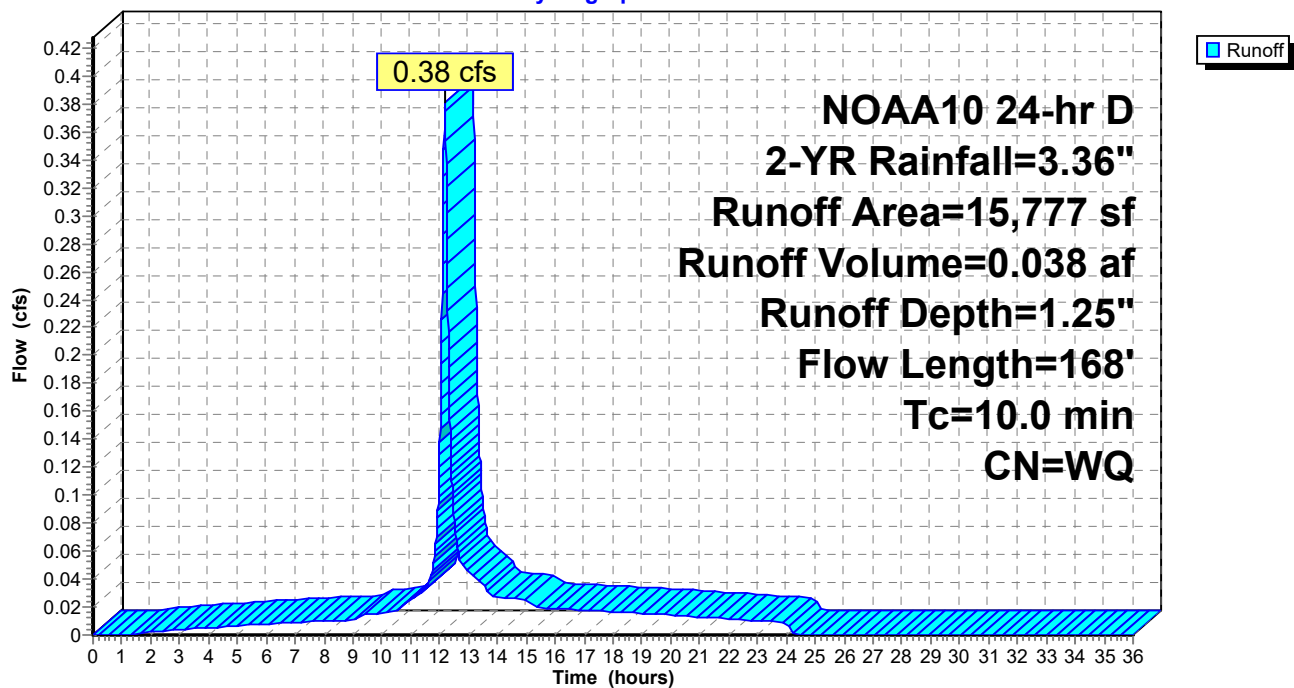
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
3,647	55	Woods, Good, HSG B
4,732	98	Paved parking, HSG B
7,398	61	>75% Grass cover, Good, HSG B
15,777		Weighted Average
11,045		70.01% Pervious Area
4,732		29.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	51	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
0.4	49	0.1100	2.32		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	68	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.0	168	Total			

Subcatchment 4P: P1b

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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Pond 5P: CB 0+88

Inflow Area = 0.362 ac, 29.99% Impervious, Inflow Depth = 1.25" for 2-YR event
Inflow = 0.38 cfs @ 12.18 hrs, Volume= 0.038 af
Outflow = 0.38 cfs @ 12.18 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min
Primary = 0.38 cfs @ 12.18 hrs, Volume= 0.038 af
Routed to Pond 6P : FD 0+79

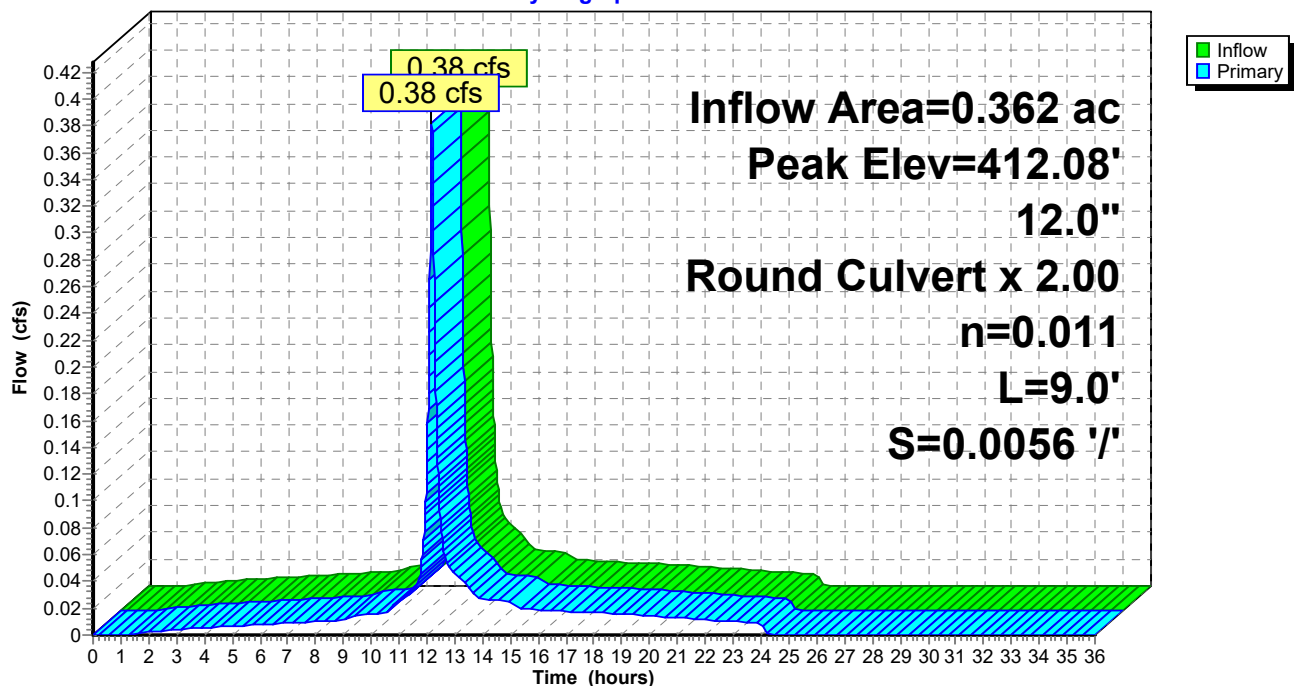
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 412.08' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.65'	12.0" Round Culvert X 2.00 L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.65' / 411.60' S= 0.0056 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.40 cfs @ 12.18 hrs HW=412.07' TW=412.05' (Dynamic Tailwater)
↑ **1=Culvert** (Outlet Controls 0.40 cfs @ 0.94 fps)

Pond 5P: CB 0+88

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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Pond 6P: FD 0+79

Inflow Area = 0.362 ac, 29.99% Impervious, Inflow Depth = 1.25" for 2-YR event
Inflow = 0.38 cfs @ 12.18 hrs, Volume= 0.038 af
Outflow = 0.38 cfs @ 12.18 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min
Primary = 0.38 cfs @ 12.18 hrs, Volume= 0.038 af
Routed to Pond 16P : Deep Sump DMH A

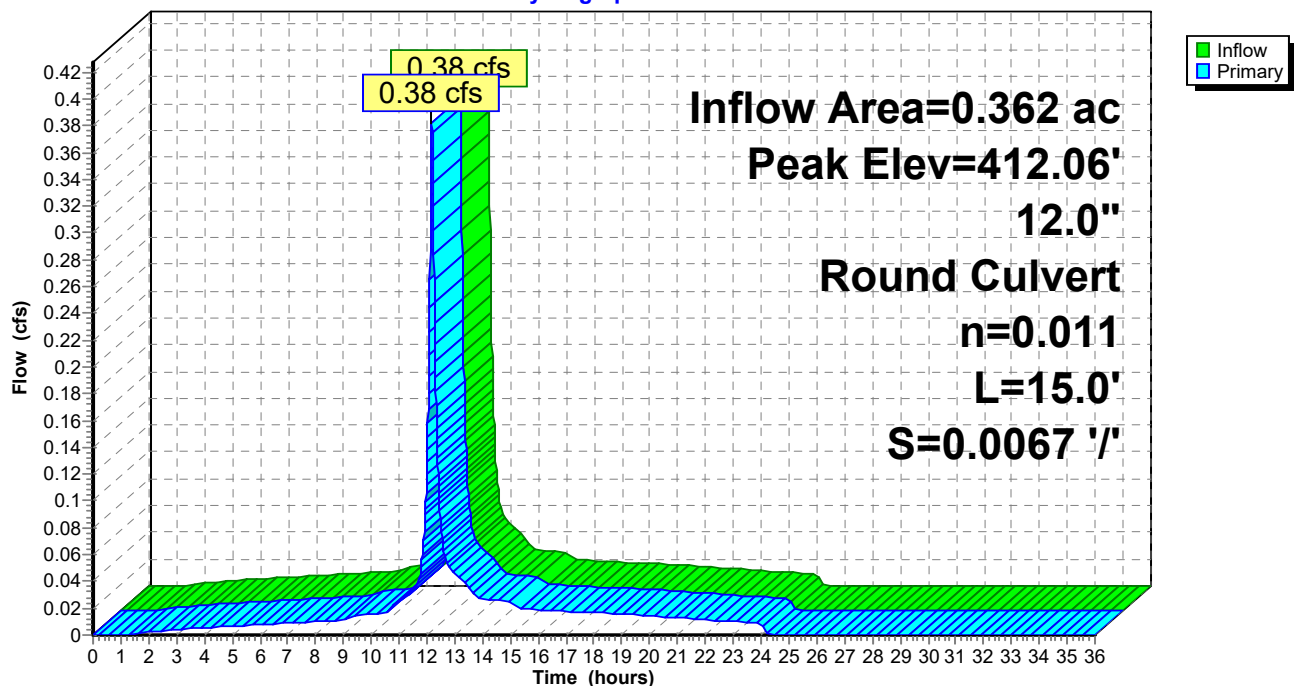
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 412.06' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.55'	12.0" Round Culvert L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.55' / 411.45' S= 0.0067 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 12.18 hrs HW=412.05' TW=411.99' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.39 cfs @ 1.44 fps)

Pond 6P: FD 0+79

Hydrograph



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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Subcatchment 7P: P1c

Runoff = 0.53 cfs @ 12.11 hrs, Volume= 0.038 af, Depth= 2.32"
Routed to Pond 8P : AD A

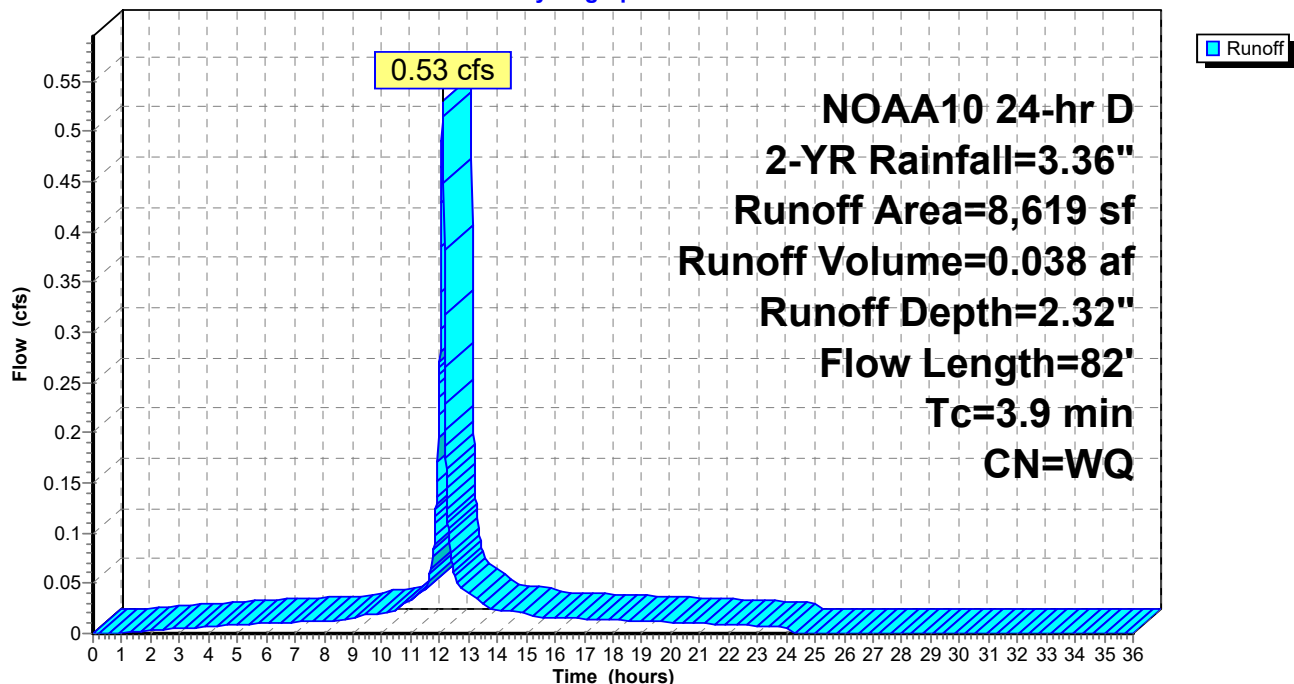
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
924	98	Roofs HSG B
5,095	98	Paved parking HSG B
703	55	Woods, Good HSG B
1,897	61	>75% Grass cover, Good HSG B
8,619		Weighted Average
2,600		30.17% Pervious Area
6,019		69.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	36	0.0700	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
0.1	14	0.0700	1.57		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.36"
0.1	32	0.0600	4.97		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.9	82	Total			

Subcatchment 7P: P1c

Hydrograph



Summary for Pond 8P: AD A

Inflow Area = 0.198 ac, 69.83% Impervious, Inflow Depth = 2.32" for 2-YR event
 Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.038 af
 Outflow = 0.53 cfs @ 12.11 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.53 cfs @ 12.11 hrs, Volume= 0.038 af
 Routed to Pond 14P : DMH A

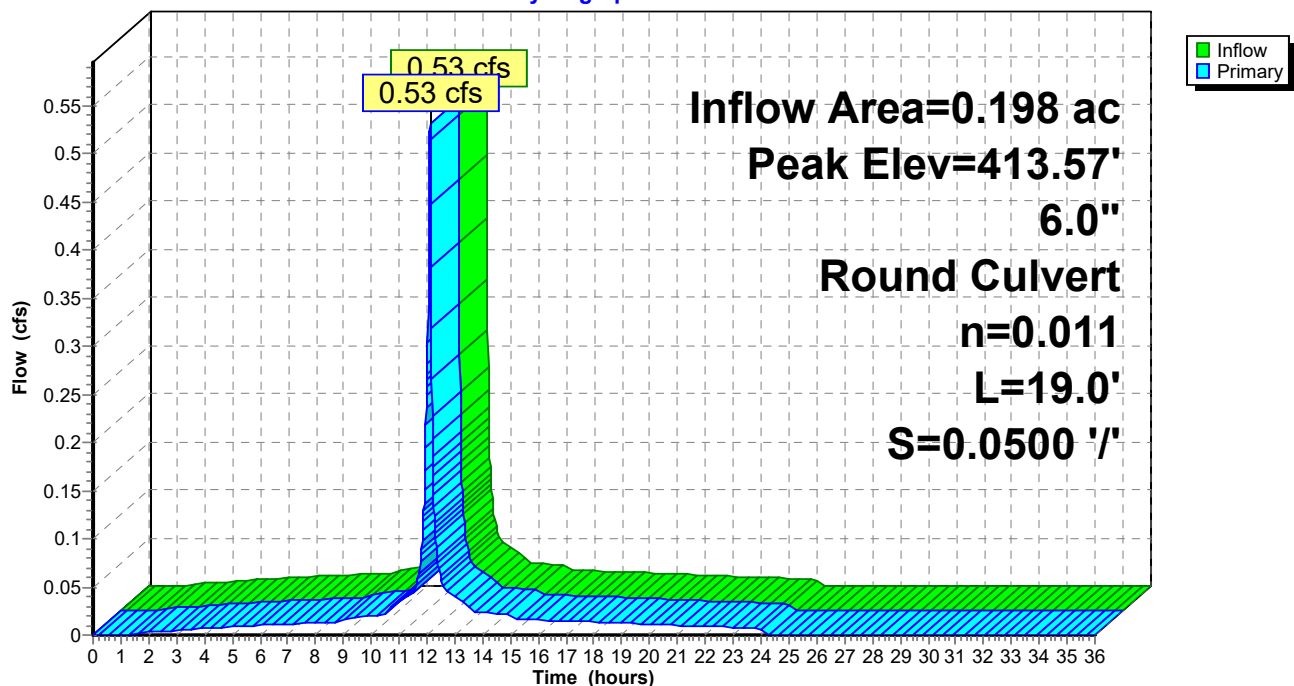
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 413.57' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	413.00'	6.0" Round Culvert L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 413.00' / 412.05' S= 0.0500 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Primary OutFlow Max=0.53 cfs @ 12.11 hrs HW=413.56' TW=412.51' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 0.53 cfs @ 2.70 fps)

Pond 8P: AD A

Hydrograph



Summary for Subcatchment 9P: P1d

Runoff = 0.16 cfs @ 12.10 hrs, Volume= 0.011 af, Depth= 3.13"
 Routed to Pond 10P : AD B

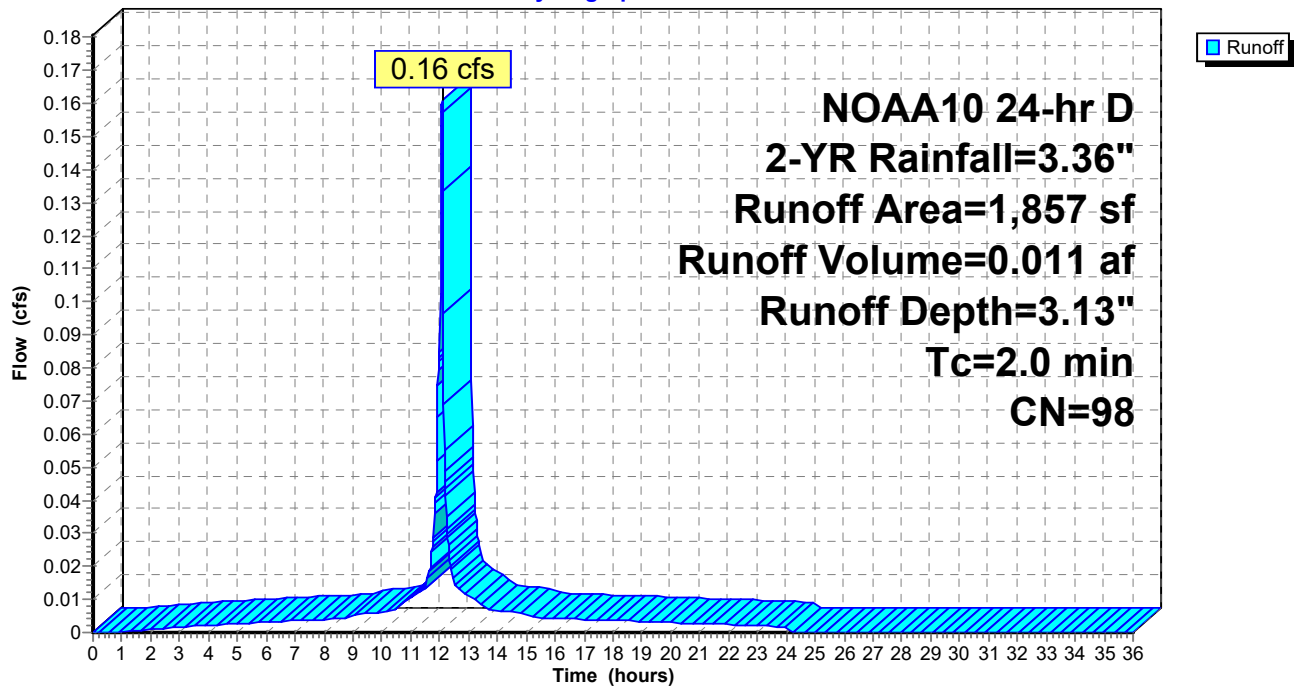
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
1,857	98	Roofs HSG B
1,857		100.00% Impervious Area

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

Subcatchment 9P: P1d

Hydrograph



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Summary for Pond 10P: AD B

Inflow Area = 0.043 ac, 100.00% Impervious, Inflow Depth = 3.13" for 2-YR event
Inflow = 0.16 cfs @ 12.10 hrs, Volume= 0.011 af
Outflow = 0.16 cfs @ 12.10 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
Primary = 0.16 cfs @ 12.10 hrs, Volume= 0.011 af
Routed to Pond 14P : DMH A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

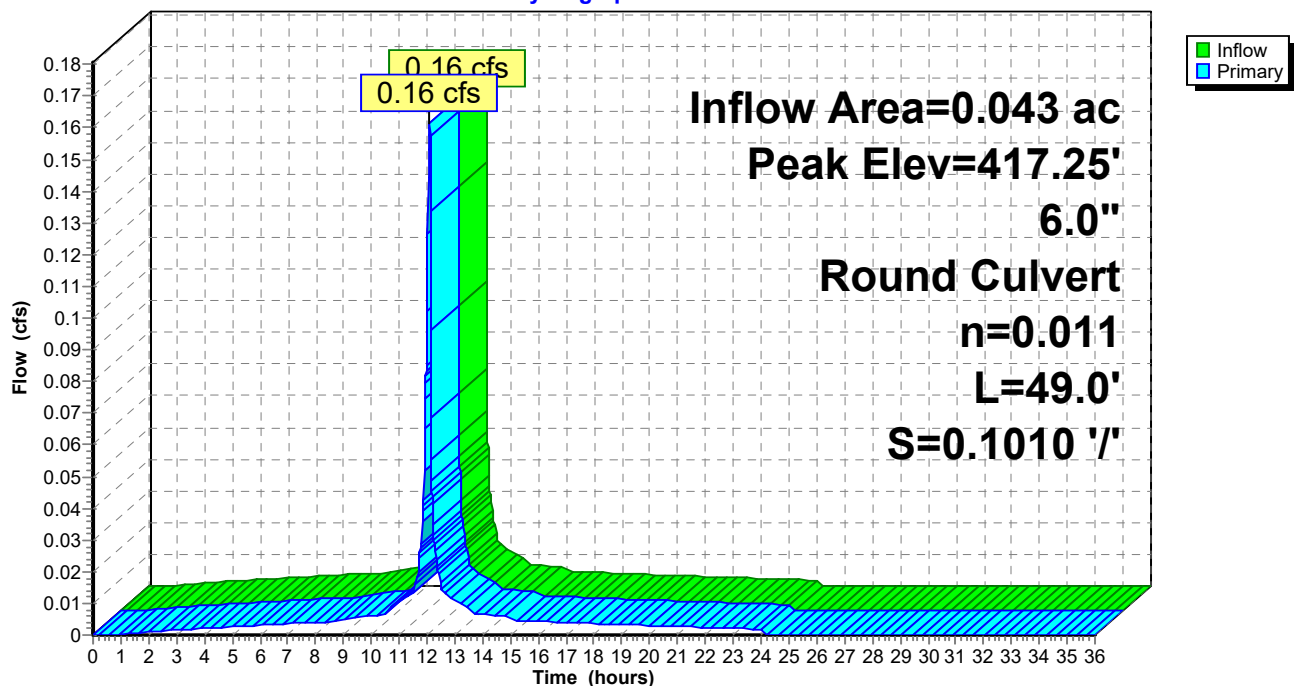
Peak Elev= 417.25' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	417.00'	6.0" Round Culvert L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 417.00' / 412.05' S= 0.1010 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Primary OutFlow Max=0.16 cfs @ 12.10 hrs HW=417.25' TW=412.51' (Dynamic Tailwater)
↑ **1=Culvert** (Inlet Controls 0.16 cfs @ 1.69 fps)

Pond 10P: AD B

Hydrograph



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Summary for Subcatchment 11P: P1e

Runoff = 0.06 cfs @ 12.12 hrs, Volume= 0.005 af, Depth= 2.01"
Routed to Pond 12P : Trench Drain A

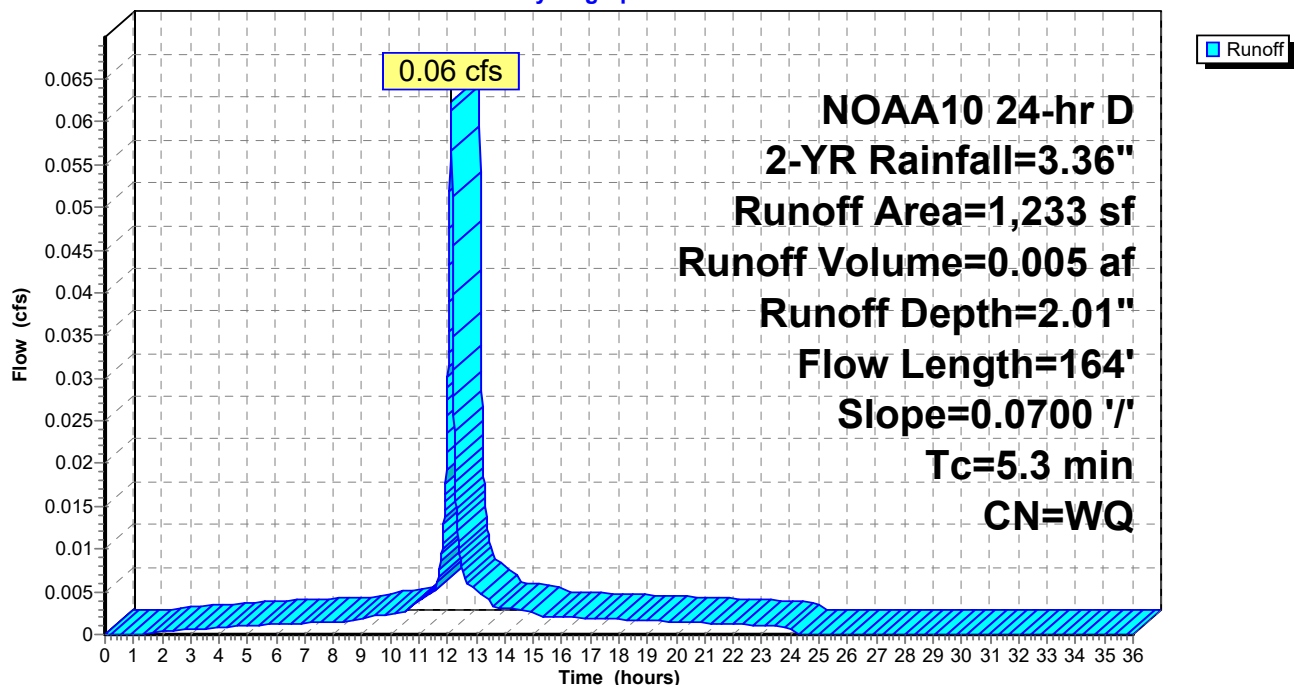
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
708	98	Paved parking HSG B
525	61	>75% Grass cover, Good HSG B
1,233		Weighted Average
525		42.58% Pervious Area
708		57.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
0.2	25	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	89	0.0700	5.37		Shallow Concentrated Flow, Paved Kv= 20.3 fps
5.3	164	Total			

Subcatchment 11P: P1e

Hydrograph



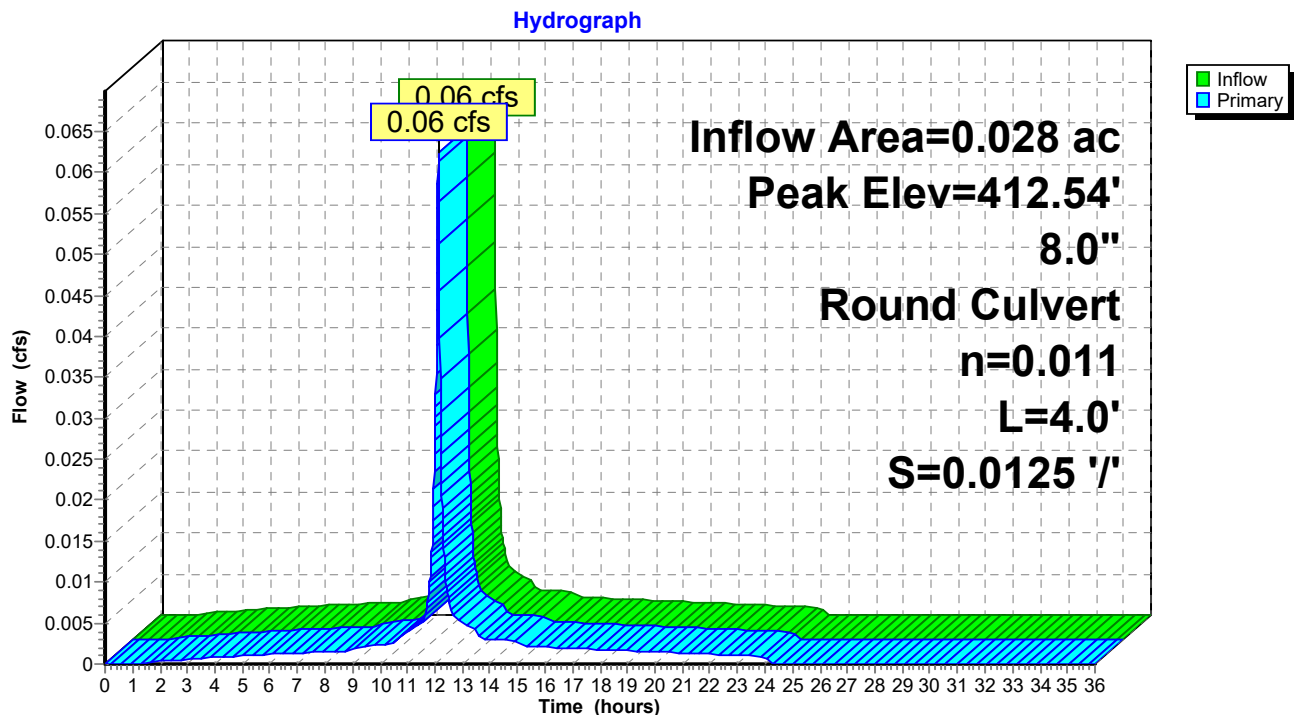
Summary for Pond 12P: Trench Drain A

Inflow Area = 0.028 ac, 57.42% Impervious, Inflow Depth = 2.01" for 2-YR event
 Inflow = 0.06 cfs @ 12.12 hrs, Volume= 0.005 af
 Outflow = 0.06 cfs @ 12.12 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.06 cfs @ 12.12 hrs, Volume= 0.005 af
 Routed to Pond 13P : AD C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.54' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	412.30'	8.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.30' / 412.25' S= 0.0125 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.06 cfs @ 12.12 hrs HW=412.54' TW=412.52' (Dynamic Tailwater)
 1=Culvert (Outlet Controls 0.06 cfs @ 0.79 fps)

Pond 12P: Trench Drain A

Summary for Pond 13P: AD C

Inflow Area = 0.028 ac, 57.42% Impervious, Inflow Depth = 2.01" for 2-YR event
 Inflow = 0.06 cfs @ 12.12 hrs, Volume= 0.005 af
 Outflow = 0.06 cfs @ 12.12 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.06 cfs @ 12.12 hrs, Volume= 0.005 af
 Routed to Pond 14P : DMH A

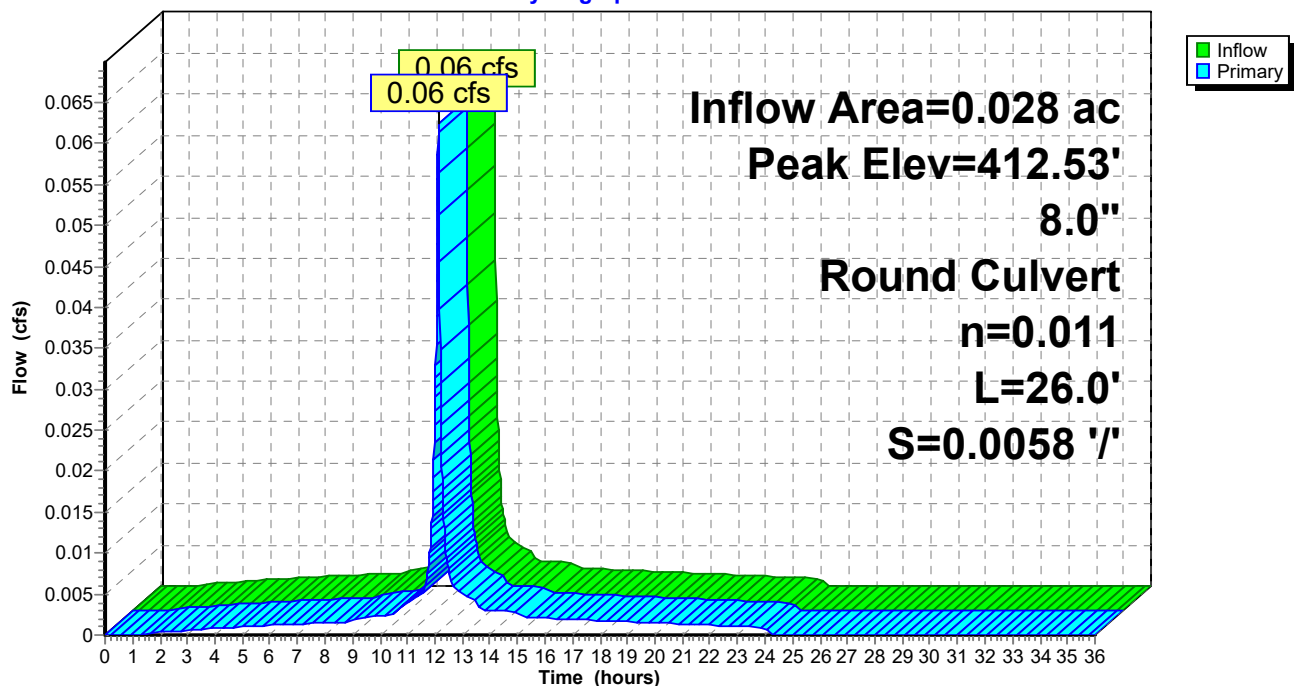
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.53' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	412.20'	8.0" Round Culvert L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.20' / 412.05' S= 0.0058 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.09 cfs @ 12.12 hrs HW=412.52' TW=412.50' (Dynamic Tailwater)
 1=Culvert (Outlet Controls 0.09 cfs @ 0.75 fps)

Pond 13P: AD C

Hydrograph



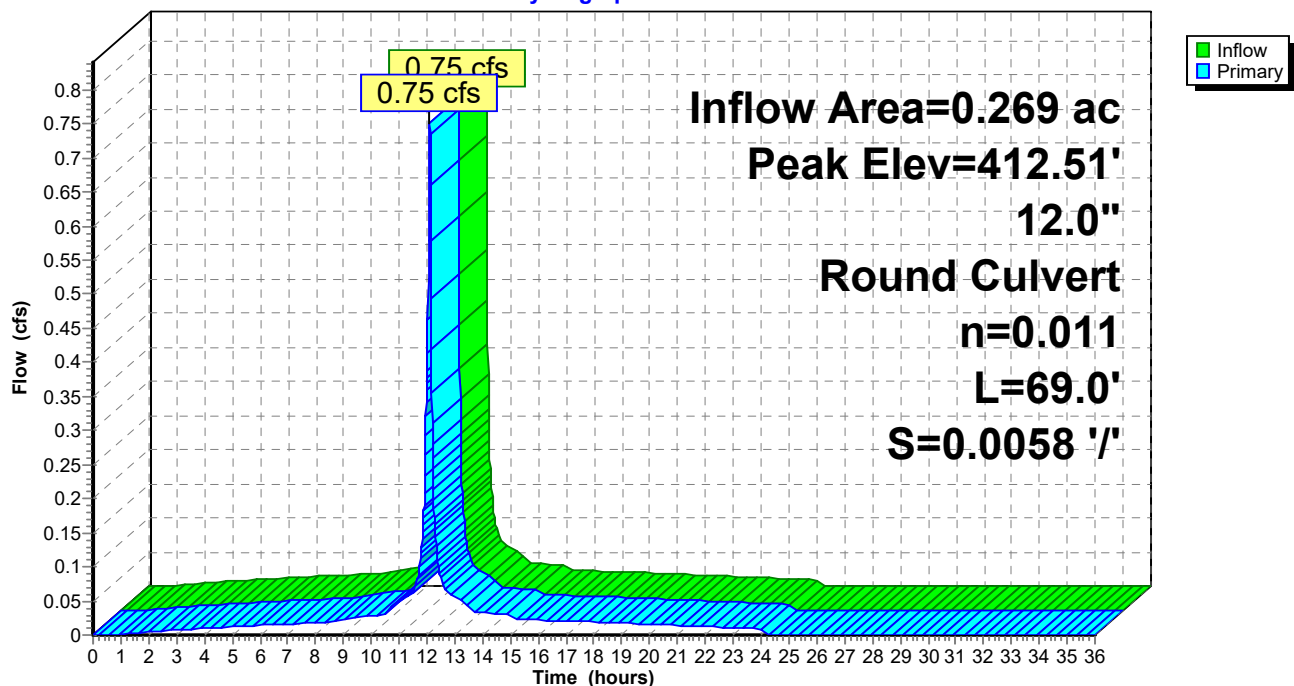
Summary for Pond 14P: DMH A

Inflow Area = 0.269 ac, 73.31% Impervious, Inflow Depth = 2.42" for 2-YR event
 Inflow = 0.75 cfs @ 12.11 hrs, Volume= 0.054 af
 Outflow = 0.75 cfs @ 12.11 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.75 cfs @ 12.11 hrs, Volume= 0.054 af
 Routed to Pond 15P : FD B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.51' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	412.00'	12.0" Round Culvert L= 69.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.00' / 411.60' S= 0.0058 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.74 cfs @ 12.11 hrs HW=412.51' TW=412.13' (Dynamic Tailwater)
 1=Culvert (Outlet Controls 0.74 cfs @ 2.65 fps)

Pond 14P: DMH A**Hydrograph**

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Summary for Pond 15P: FD B

Inflow Area = 0.269 ac, 73.31% Impervious, Inflow Depth = 2.42" for 2-YR event
Inflow = 0.75 cfs @ 12.11 hrs, Volume= 0.054 af
Outflow = 0.75 cfs @ 12.11 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min
Primary = 0.75 cfs @ 12.11 hrs, Volume= 0.054 af
Routed to Pond 16P : Deep Sump DMH A

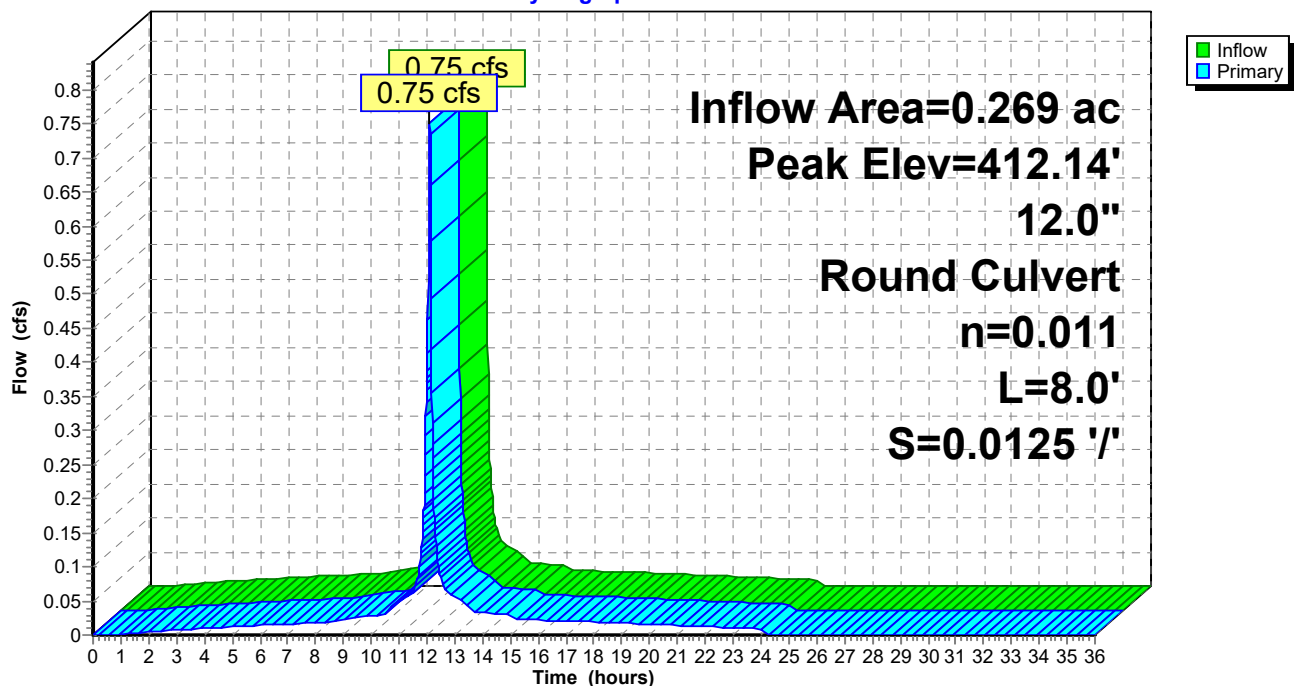
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 412.14' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.55'	12.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.55' / 411.45' S= 0.0125 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.72 cfs @ 12.11 hrs HW=412.13' TW=412.01' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.72 cfs @ 2.17 fps)

Pond 15P: FD B

Hydrograph



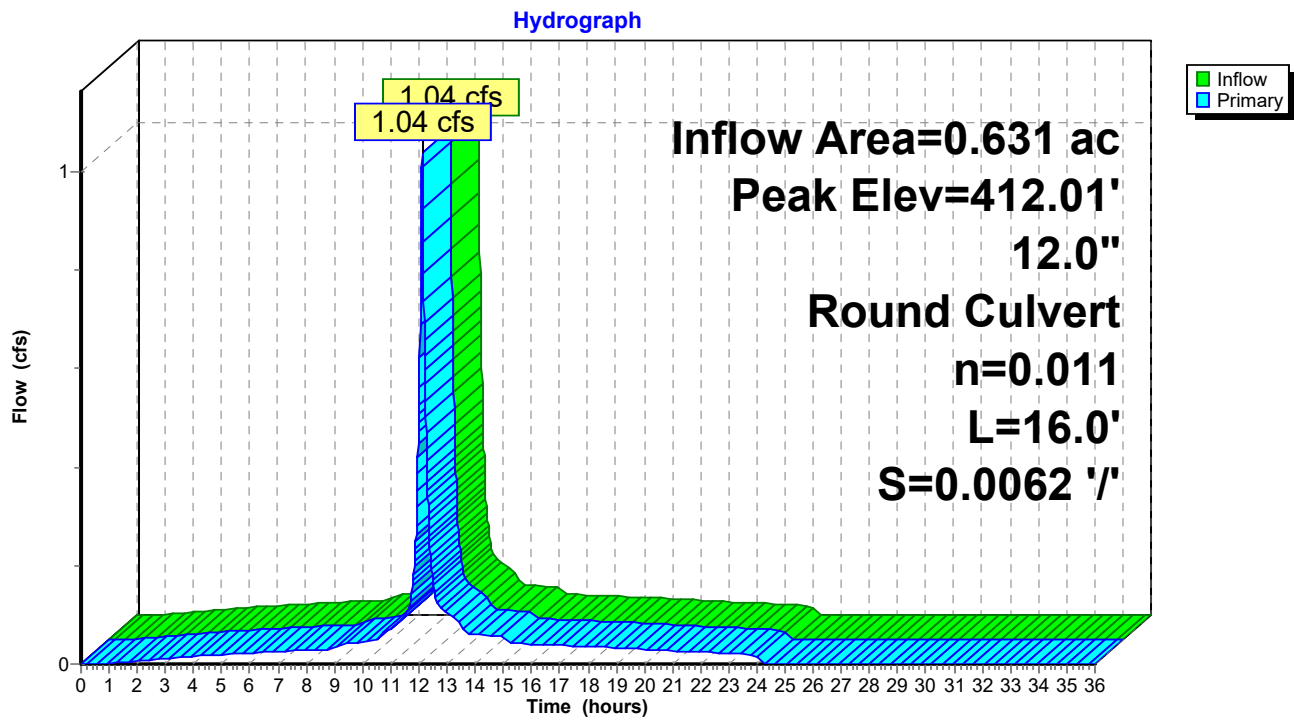
Summary for Pond 16P: Deep Sump DMH A

Inflow Area = 0.631 ac, 48.45% Impervious, Inflow Depth = 1.74" for 2-YR event
 Inflow = 1.04 cfs @ 12.11 hrs, Volume= 0.092 af
 Outflow = 1.04 cfs @ 12.11 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.04 cfs @ 12.11 hrs, Volume= 0.092 af
 Routed to Pond 18P : Infiltration Basin #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.01' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.40'	12.0" Round Culvert L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.40' / 411.30' S= 0.0062 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.03 cfs @ 12.11 hrs HW=412.01' TW=411.76' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 1.03 cfs @ 2.94 fps)

Pond 16P: Deep Sump DMH A

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Summary for Subcatchment 17P: P1f

Runoff = 0.09 cfs @ 12.17 hrs, Volume= 0.010 af, Depth= 0.49"
 Routed to Pond 18P : Infiltration Basin #1

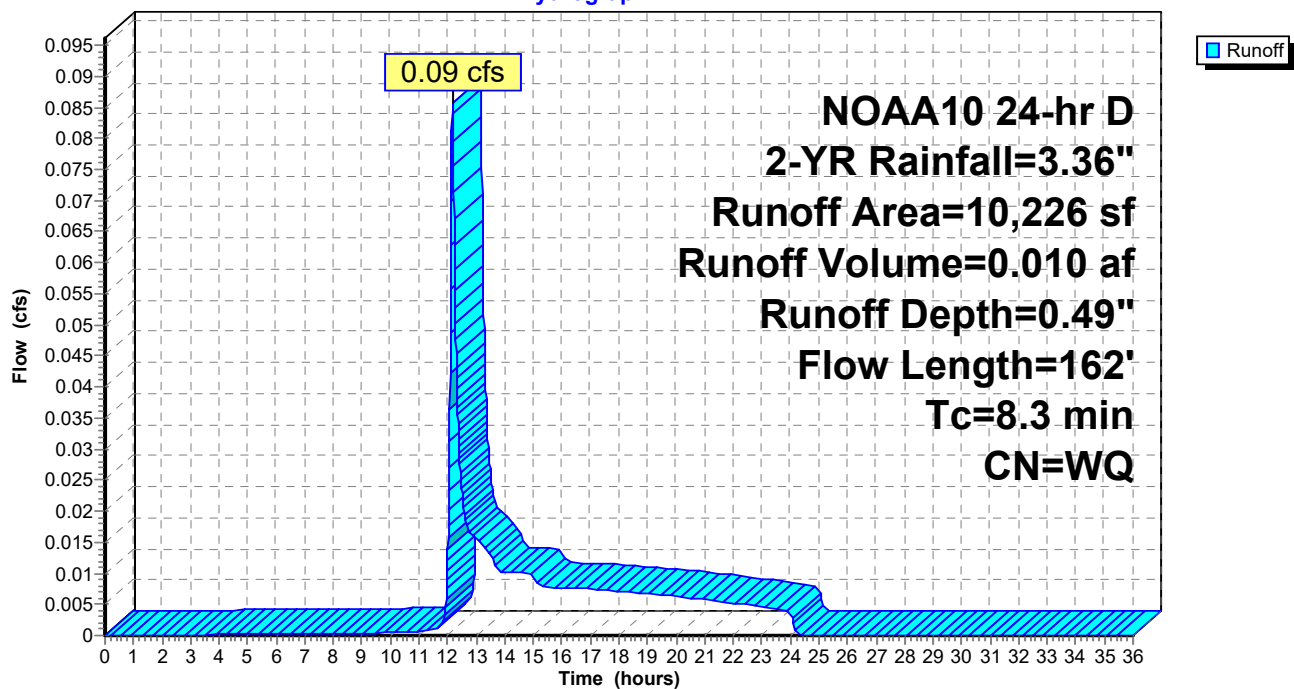
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
132	98	Paved parking, HSG B
2,793	55	Woods, Good HSG B
7,301	61	>75% Grass cover, Good HSG B
10,226		Weighted Average
10,094		98.71% Pervious Area
132		1.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	22	0.0700	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
4.6	28	0.0700	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
0.9	75	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	37	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
8.3	162	Total			

Subcatchment 17P: P1f

Hydrograph



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Summary for Pond 18P: Infiltration Basin #1

Inflow Area = 0.938 ac, 37.37% Impervious, Inflow Depth = 1.45" for 2-YR event
 Inflow = 1.27 cfs @ 12.11 hrs, Volume= 0.113 af
 Outflow = 0.26 cfs @ 12.42 hrs, Volume= 0.113 af, Atten= 79%, Lag= 18.3 min
 Discarded = 0.05 cfs @ 12.42 hrs, Volume= 0.090 af
 Primary = 0.21 cfs @ 12.42 hrs, Volume= 0.023 af
 Routed to Pond 19P : DMH B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 411.98' @ 12.42 hrs Surf.Area= 2,168 sf Storage= 1,344 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 170.3 min (970.9 - 800.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	411.30'	6,950 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
411.30	1,814	182.0	0	0	1,814
414.00	3,418	231.0	6,950	6,950	3,518
Device	Routing	Invert	Outlet Devices		
#1	Primary	411.30'	15.0" Round Culvert L= 13.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.30' / 410.85' S= 0.0346 ' /' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf		
#2	Discarded	411.30'	1.020 in/hr Exfiltration over Surface area		
#3	Device 1	411.80'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads		
#4	Device 1	411.80'	3.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads		

Discarded OutFlow Max=0.05 cfs @ 12.42 hrs HW=411.98' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.05 cfs)

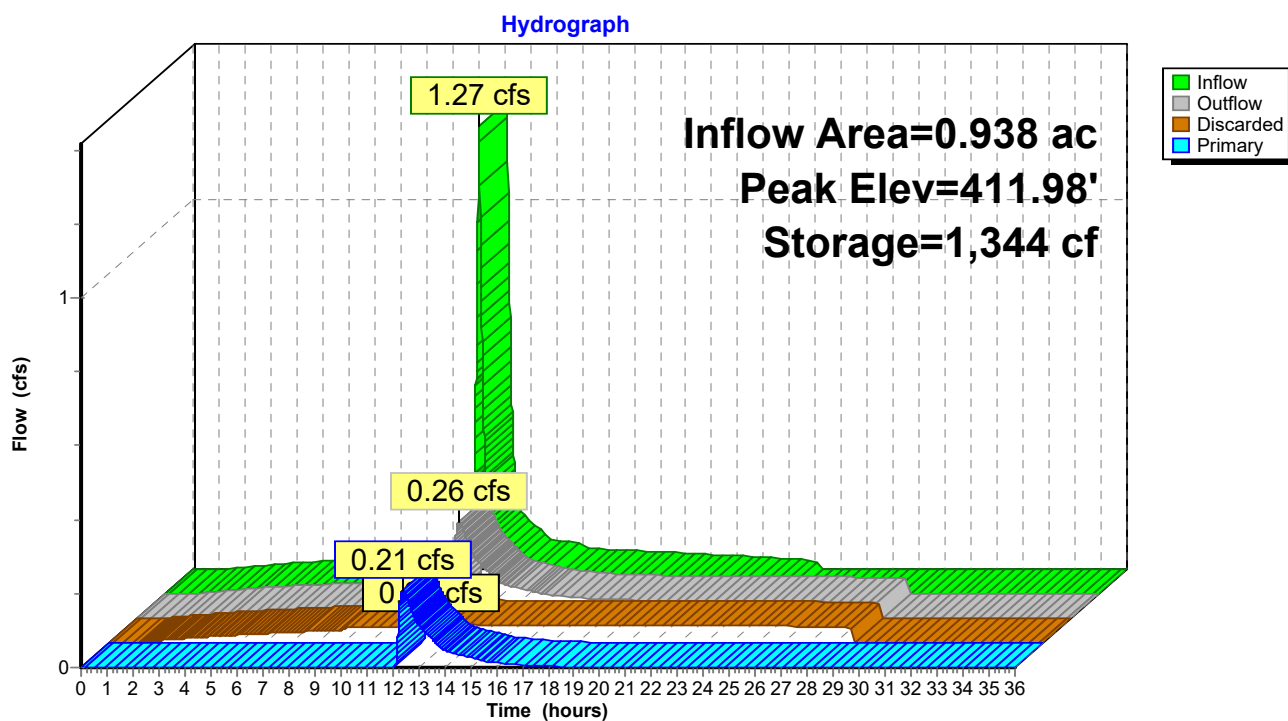
Primary OutFlow Max=0.21 cfs @ 12.42 hrs HW=411.98' TW=411.04' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.21 cfs of 1.90 cfs potential flow)

↑ **3=Orifice/Grate** (Orifice Controls 0.11 cfs @ 1.43 fps)

↑ **4=Orifice/Grate** (Orifice Controls 0.11 cfs @ 1.43 fps)

Pond 18P: Infiltration Basin #1



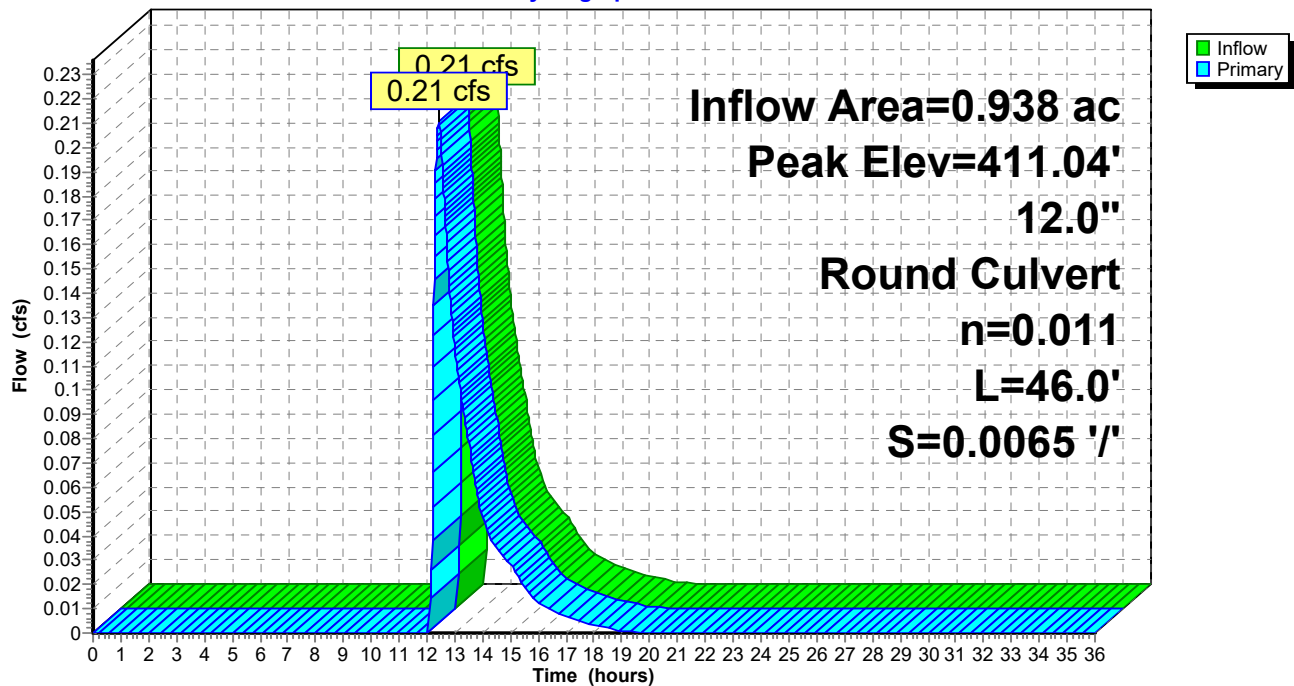
Summary for Pond 19P: DMH B

Inflow Area = 0.938 ac, 37.37% Impervious, Inflow Depth = 0.30" for 2-YR event
 Inflow = 0.21 cfs @ 12.42 hrs, Volume= 0.023 af
 Outflow = 0.21 cfs @ 12.42 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.21 cfs @ 12.42 hrs, Volume= 0.023 af
 Routed to Link 29P : Desing Point #1: Flow to Summer Street

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 411.04' @ 12.42 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	410.80'	12.0" Round Culvert L= 46.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 410.80' / 410.50' S= 0.0065 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.21 cfs @ 12.42 hrs HW=411.04' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 0.21 cfs @ 2.23 fps)

Pond 19P: DMH B**Hydrograph**

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Summary for Subcatchment 20P: P1g

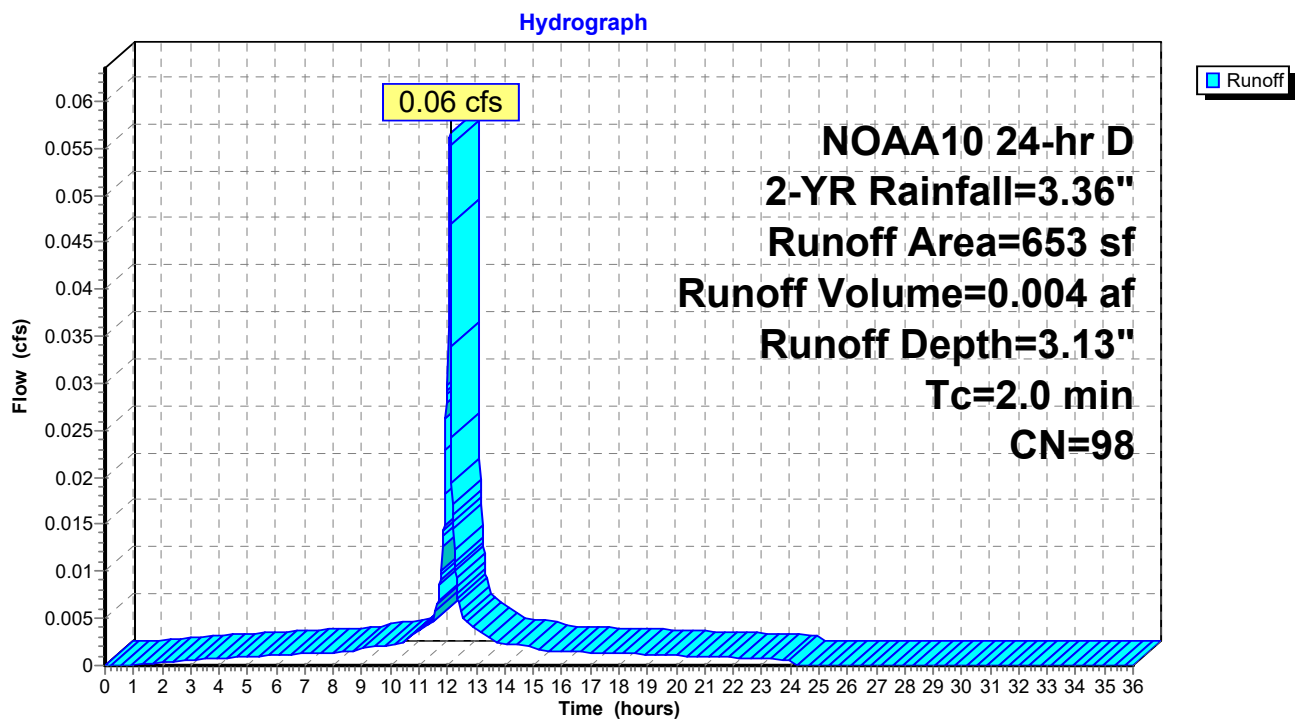
Runoff = 0.06 cfs @ 12.10 hrs, Volume= 0.004 af, Depth= 3.13"
Routed to Pond 21P : AD D

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
653	98	Roofs HSG B
653		100.00% Impervious Area

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

Subcatchment 20P: P1g



Summary for Pond 21P: AD D

Inflow Area = 0.015 ac, 100.00% Impervious, Inflow Depth = 3.13" for 2-YR event
 Inflow = 0.06 cfs @ 12.10 hrs, Volume= 0.004 af
 Outflow = 0.06 cfs @ 12.10 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.06 cfs @ 12.10 hrs, Volume= 0.004 af
 Routed to Pond 22P : Infiltration Field #1

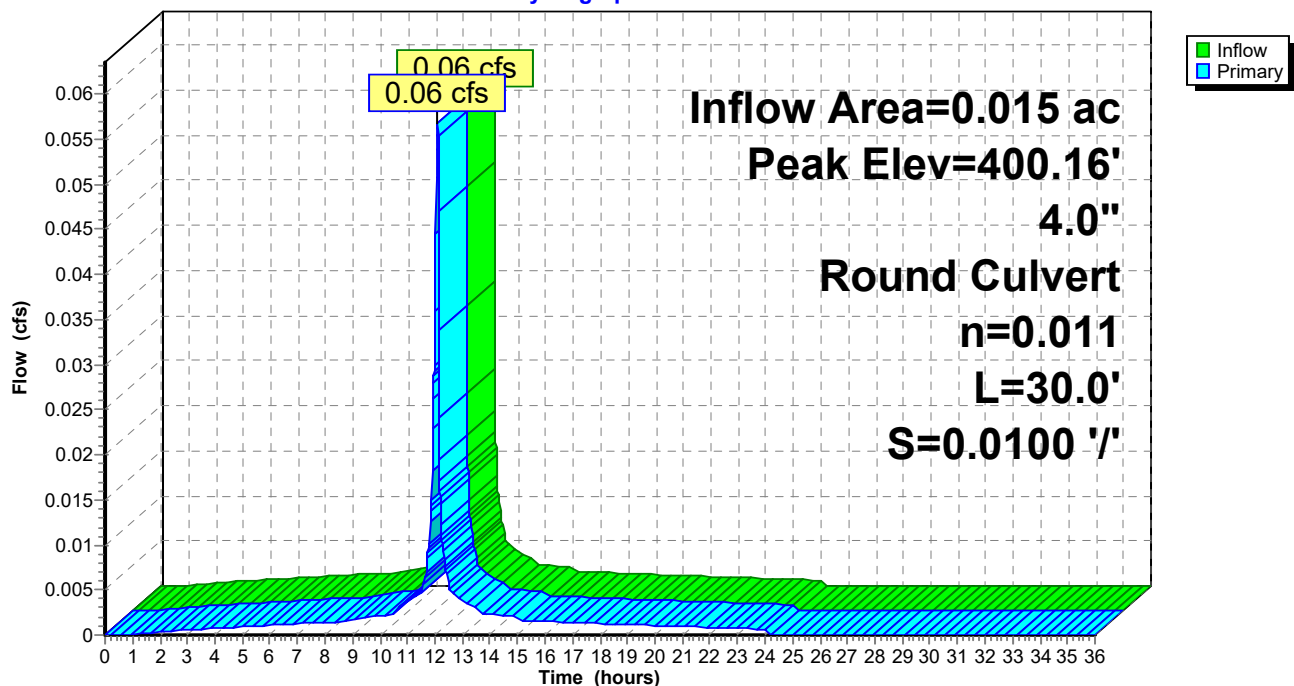
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 400.16' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	400.00'	4.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 400.00' / 399.70' S= 0.0100 '/ Cc= 0.900 n= 0.011, Flow Area= 0.09 sf

Primary OutFlow Max=0.06 cfs @ 12.10 hrs HW=400.16' TW=398.38' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 0.06 cfs @ 1.36 fps)

Pond 21P: AD D

Hydrograph



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Summary for Pond 22P: Infiltration Field #1

Inflow Area = 0.015 ac, 100.00% Impervious, Inflow Depth = 3.13" for 2-YR event
 Inflow = 0.06 cfs @ 12.10 hrs, Volume= 0.004 af
 Outflow = 0.01 cfs @ 11.83 hrs, Volume= 0.004 af, Atten= 90%, Lag= 0.0 min
 Discarded = 0.01 cfs @ 11.83 hrs, Volume= 0.004 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 29P : Desing Point #1: Flow to Summer Street

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 398.53' @ 12.51 hrs Surf.Area= 104 sf Storage= 37 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 31.1 min (786.8 - 755.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	397.80'	82 cf	8.00'W x 13.00'L x 2.54'H Field A 264 cf Overall - 58 cf Embedded = 206 cf x 40.0% Voids
#2A	398.30'	58 cf	Cultec R-150XLHD x 2 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 2 rows
#3	400.30'	2 cf	1.00'D x 2.00'H Vertical Cone/Cylinder
		142 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.80'	2.400 in/hr Exfiltration over Surface area
#2	Primary	400.30'	4.0" Round Culvert X 2.00 L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 400.30' / 400.20' S= 0.1000 ' / ' Cc= 0.900 n= 0.011, Flow Area= 0.09 sf

Discarded OutFlow Max=0.01 cfs @ 11.83 hrs HW=397.85' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=397.80' TW=0.00' (Dynamic Tailwater)

↑ **2=Culvert** (Controls 0.00 cfs)

Pond 22P: Infiltration Field #1 - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 2 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

1 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 11.00' Row Length +12.0" End Stone x 2 = 13.00' Base Length

2 Rows x 33.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 8.00' Base Width

6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

2 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 2 Rows = 58.3 cf Chamber Storage

264.3 cf Field - 58.3 cf Chambers = 206.1 cf Stone x 40.0% Voids = 82.4 cf Stone Storage

Chamber Storage + Stone Storage = 140.7 cf = 0.003 af

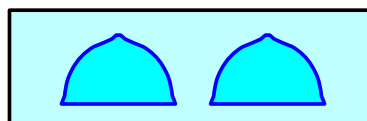
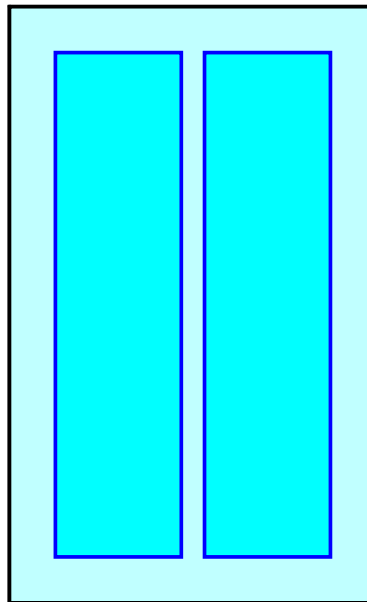
Overall Storage Efficiency = 53.2%

Overall System Size = 13.00' x 8.00' x 2.54'

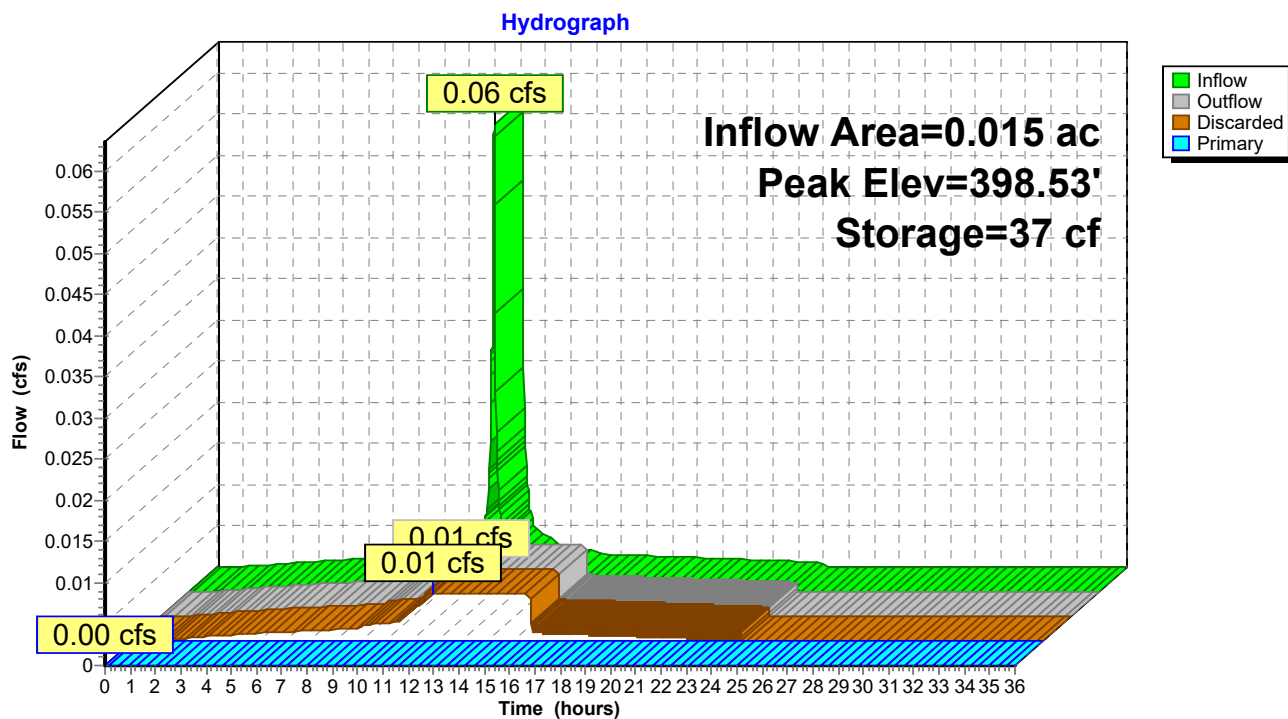
2 Chambers

9.8 cy Field

7.6 cy Stone



Pond 22P: Infiltration Field #1



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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Subcatchment 23P: P1h

Runoff = 0.08 cfs @ 12.10 hrs, Volume= 0.006 af, Depth= 3.13"
Routed to Pond 24P : AD E

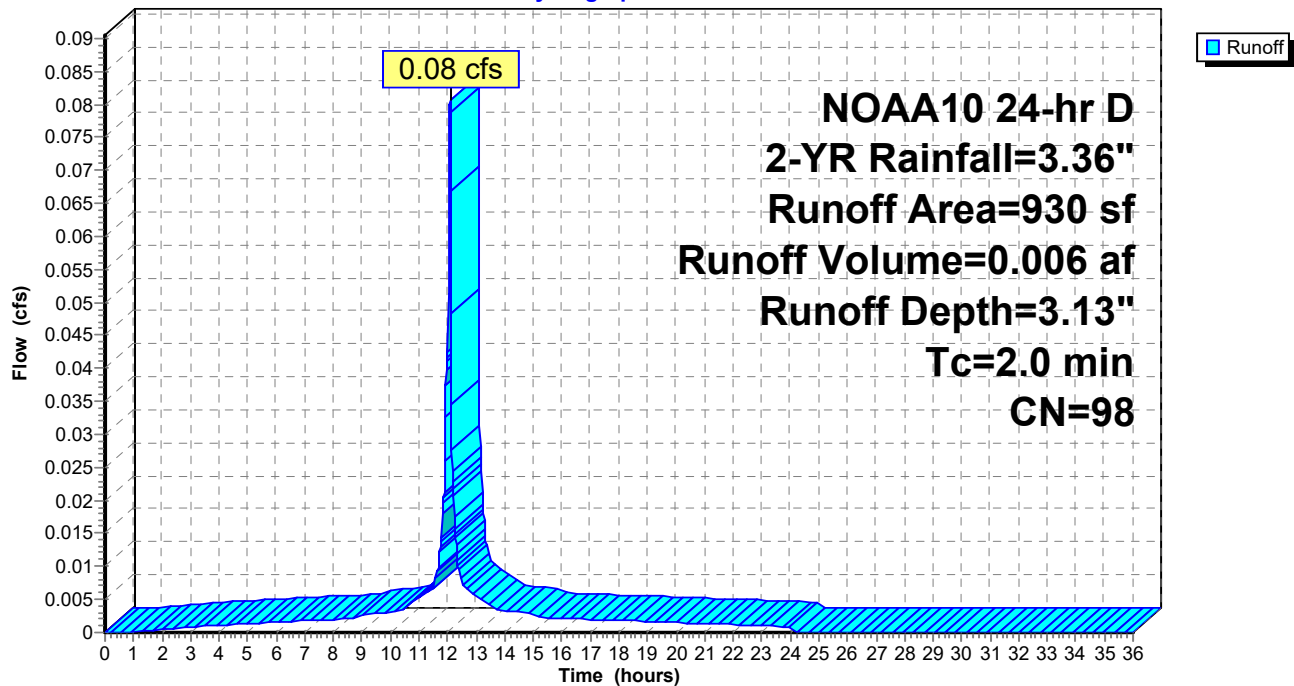
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
930	98	Roofs HSG B
930		100.00% Impervious Area

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

Subcatchment 23P: P1h

Hydrograph



Summary for Pond 24P: AD E

Inflow Area = 0.021 ac, 100.00% Impervious, Inflow Depth = 3.13" for 2-YR event
 Inflow = 0.08 cfs @ 12.10 hrs, Volume= 0.006 af
 Outflow = 0.08 cfs @ 12.10 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.08 cfs @ 12.10 hrs, Volume= 0.006 af
 Routed to Pond 27P : Infiltration Field #2

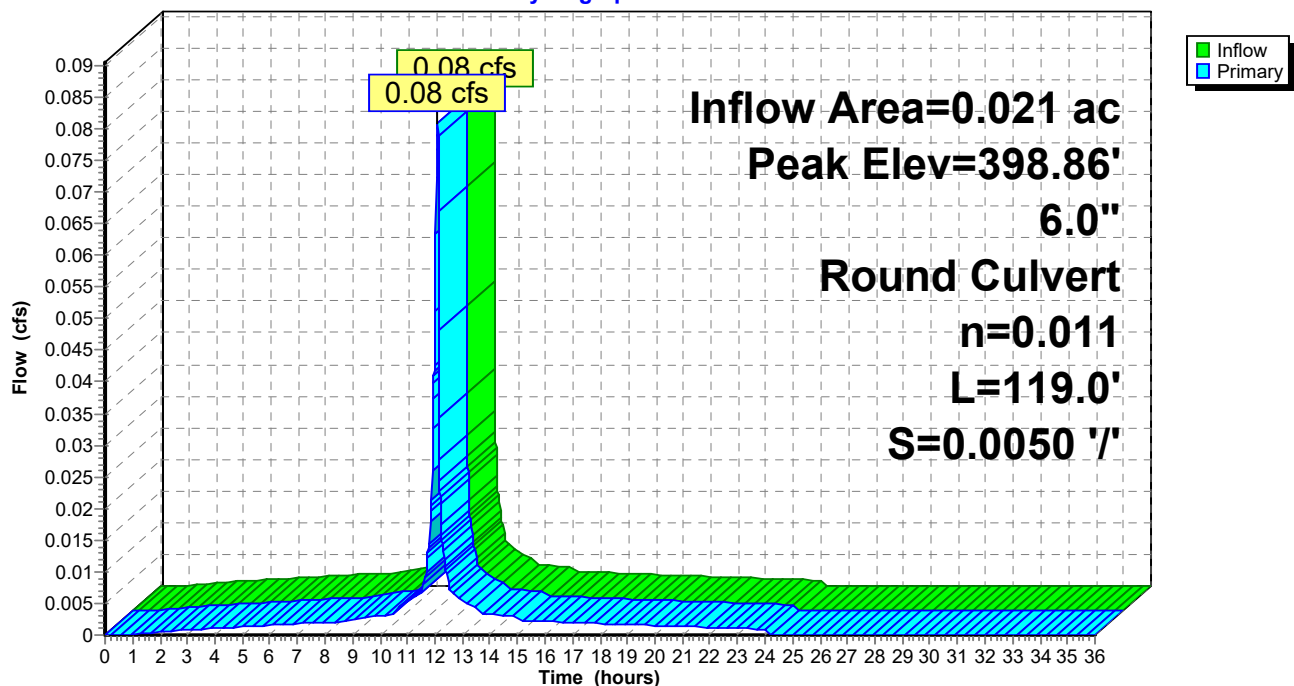
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 398.86' @ 12.73 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	398.00'	6.0" Round Culvert L= 119.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.00' / 397.40' S= 0.0050 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Primary OutFlow Max=0.08 cfs @ 12.10 hrs HW=398.19' TW=397.39' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 0.08 cfs @ 1.76 fps)

Pond 24P: AD E

Hydrograph



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Summary for Subcatchment 25P: P1i

Runoff = 0.15 cfs @ 12.17 hrs, Volume= 0.014 af, Depth= 1.23"
 Routed to Pond 26P : AD F&G

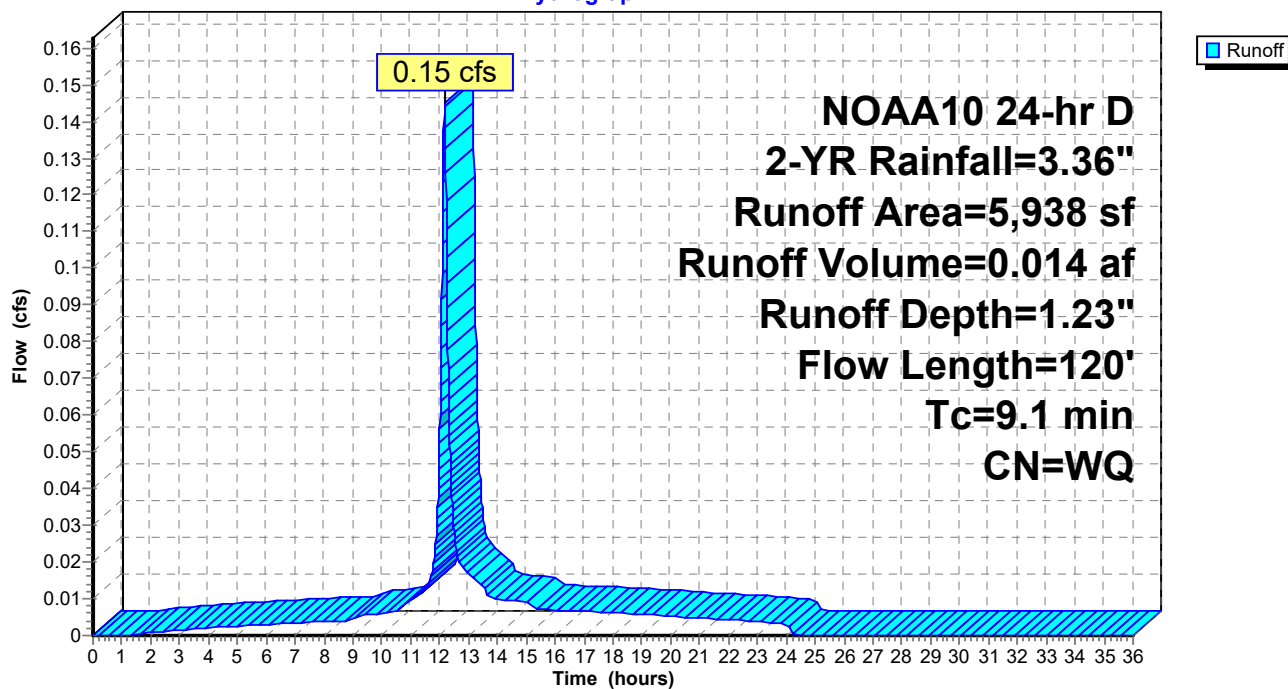
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
1,807	98	Paved parking HSG B
2,161	55	Woods, Good HSG B
1,970	61	>75% Grass cover, Good HSG B
5,938		Weighted Average
4,131		69.57% Pervious Area
1,807		30.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0500	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
0.4	26	0.0500	1.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	24	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.1	120	Total			

Subcatchment 25P: P1i

Hydrograph



Summary for Pond 26P: AD F&G

Inflow Area = 0.136 ac, 30.43% Impervious, Inflow Depth = 1.23" for 2-YR event
 Inflow = 0.15 cfs @ 12.17 hrs, Volume= 0.014 af
 Outflow = 0.15 cfs @ 12.17 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.15 cfs @ 12.17 hrs, Volume= 0.014 af
 Routed to Pond 27P : Infiltration Field #2

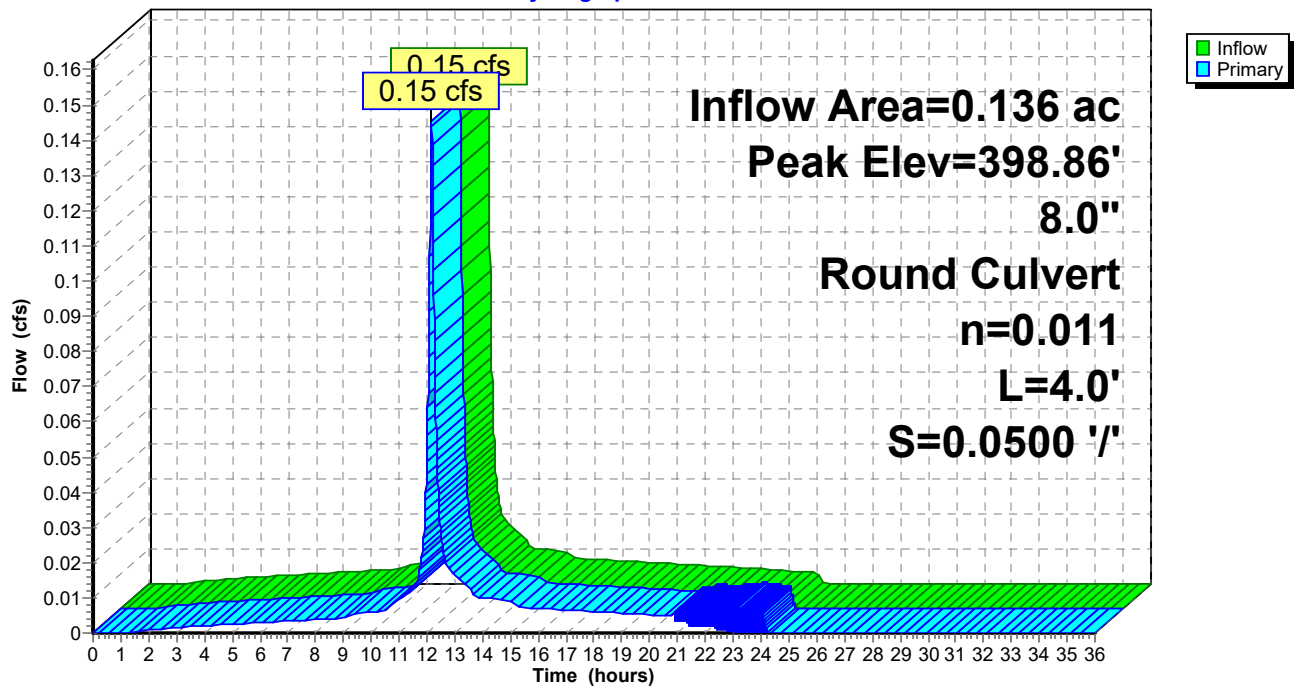
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 398.86' @ 12.73 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	397.00'	8.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.00' / 396.80' S= 0.0500 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.00 cfs @ 12.17 hrs HW=397.67' TW=397.71' (Dynamic Tailwater)
 ↑1=Culvert (Controls 0.00 cfs)

Pond 26P: AD F&G

Hydrograph



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Summary for Pond 27P: Infiltration Field #2

Inflow Area = 0.158 ac, 39.85% Impervious, Inflow Depth = 1.49" for 2-YR event
 Inflow = 0.19 cfs @ 12.11 hrs, Volume= 0.020 af
 Outflow = 0.03 cfs @ 12.72 hrs, Volume= 0.020 af, Atten= 86%, Lag= 36.7 min
 Discarded = 0.01 cfs @ 12.65 hrs, Volume= 0.018 af
 Primary = 0.02 cfs @ 12.72 hrs, Volume= 0.001 af
 Routed to Link 29P : Desing Point #1: Flow to Summer Street

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 398.86' @ 12.72 hrs Surf.Area= 186 sf Storage= 257 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 210.3 min (1,006.4 - 796.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	396.30'	144 cf	8.00'W x 23.25'L x 2.54'H Field A 473 cf Overall - 113 cf Embedded = 360 cf x 40.0% Voids
#2A	396.80'	113 cf	Cultec R-150XLHD x 4 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 2 rows
#3	398.80'	0 cf	0.50'D x 1.00'H Vertical Cone/Cylinder
		257 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	396.30'	2.400 in/hr Exfiltration over Surface area
#2	Primary	398.80'	4.0" Round Culvert X 2.00 L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.80' / 398.70' S= 0.1000 ' /' Cc= 0.900 n= 0.011, Flow Area= 0.09 sf

Discarded OutFlow Max=0.01 cfs @ 12.65 hrs HW=398.81' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.02 cfs @ 12.72 hrs HW=398.86' TW=0.00' (Dynamic Tailwater)

↑**2=Culvert** (Inlet Controls 0.02 cfs @ 0.81 fps)

Pond 27P: Infiltration Field #2 - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 2 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

2 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 21.25' Row Length +12.0" End Stone x 2 = 23.25' Base Length

2 Rows x 33.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 8.00' Base Width

6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

4 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 2 Rows = 112.6 cf Chamber Storage

472.8 cf Field - 112.6 cf Chambers = 360.2 cf Stone x 40.0% Voids = 144.1 cf Stone Storage

Chamber Storage + Stone Storage = 256.6 cf = 0.006 af

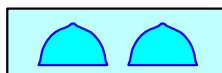
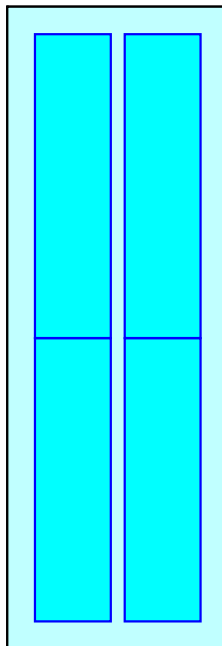
Overall Storage Efficiency = 54.3%

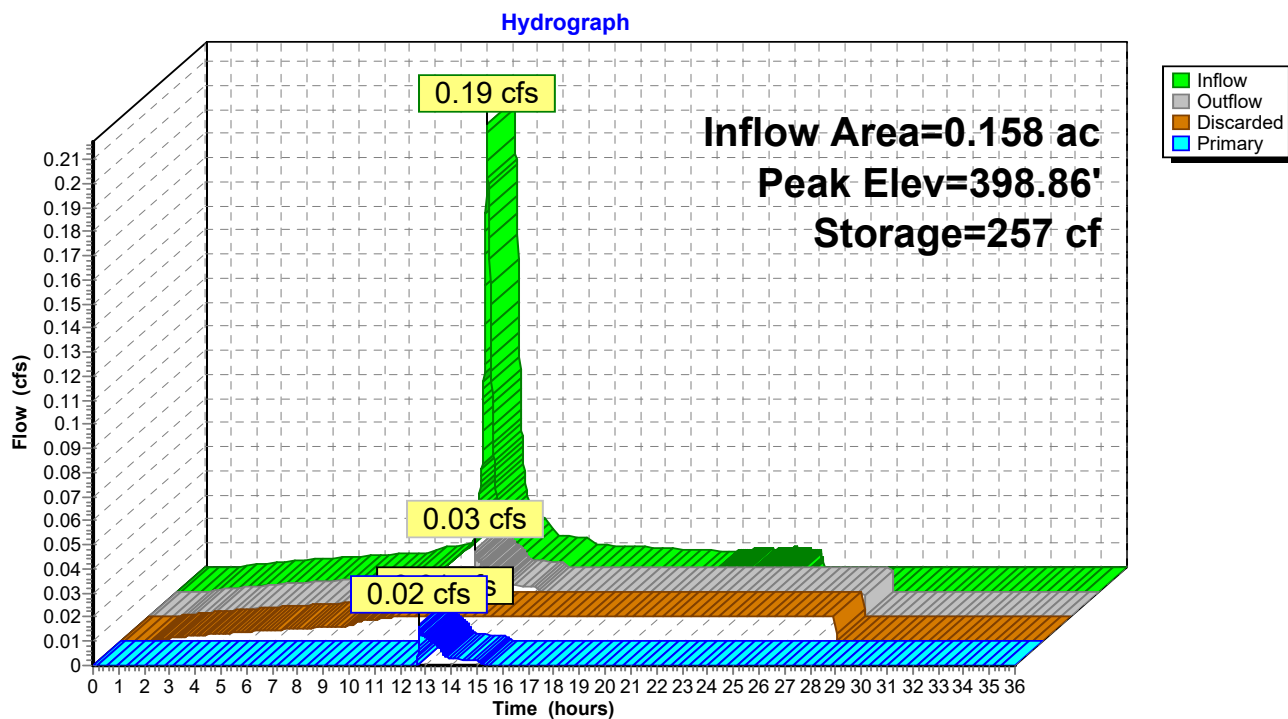
Overall System Size = 23.25' x 8.00' x 2.54'

4 Chambers

17.5 cy Field

13.3 cy Stone



Pond 27P: Infiltration Field #2

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Summary for Subcatchment 28P: P1j

Runoff = 0.65 cfs @ 12.20 hrs, Volume= 0.087 af, Depth= 0.57"

Routed to Link 29P : Desing Point #1: Flow to Summer Street

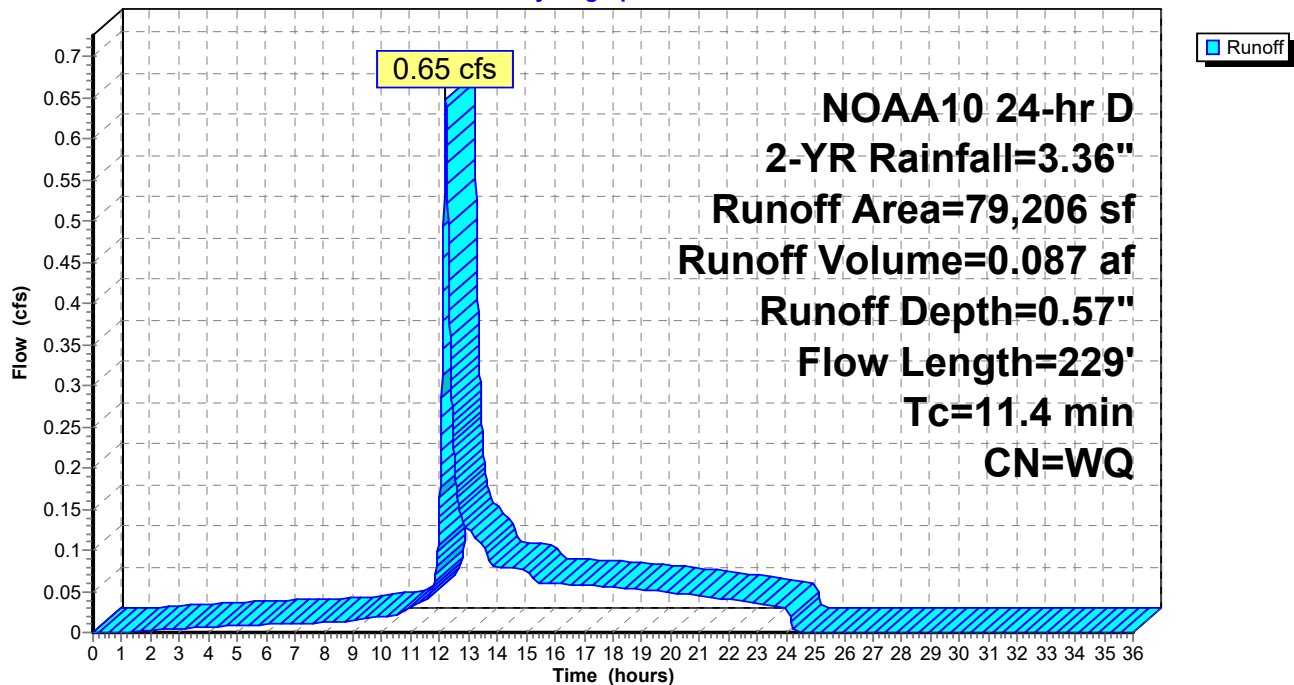
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
762	98	Roofs HSG B
5,095	98	Paved parking HSG B
49,980	55	Woods, Good HSG B
23,369	61	>75% Grass cover, Good HSG B
79,206		Weighted Average
73,349		92.61% Pervious Area
5,857		7.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
2.3	179	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.4	229	Total			

Subcatchment 28P: P1j

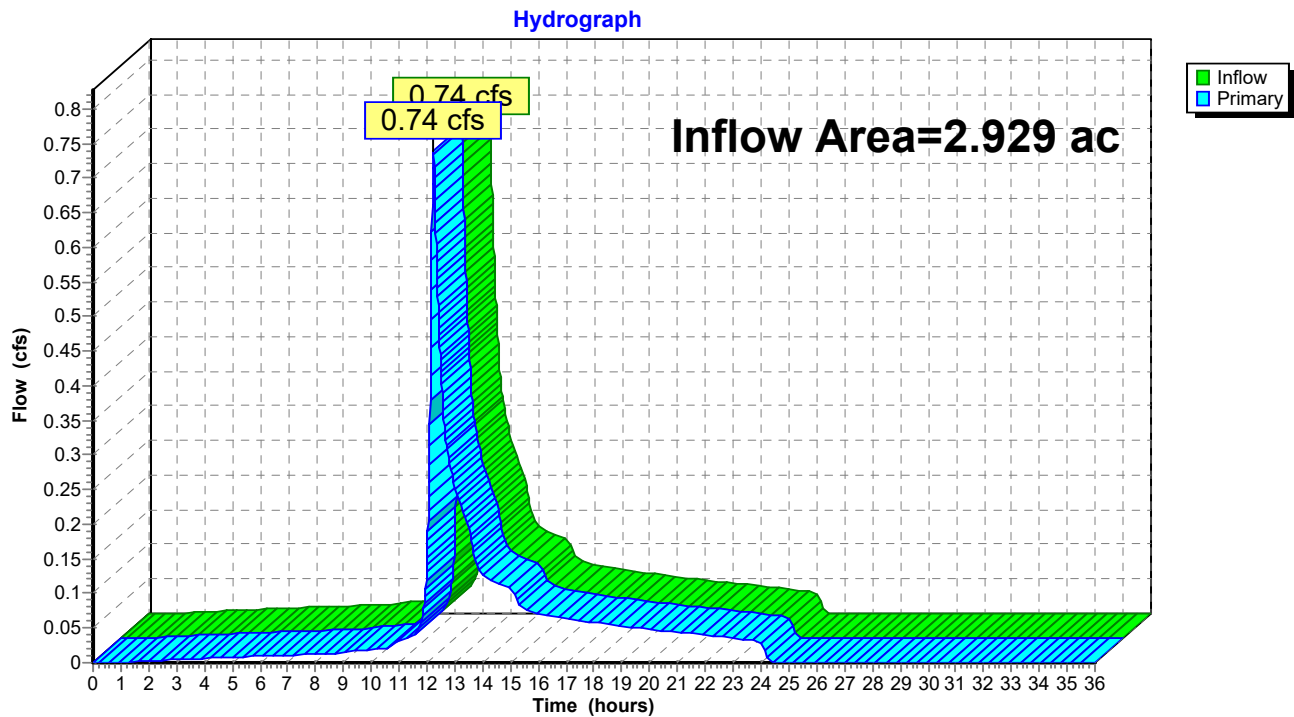
Hydrograph



Summary for Link 29P: Desing Point #1: Flow to Summer Street

Inflow Area = 2.929 ac, 19.21% Impervious, Inflow Depth = 0.46" for 2-YR event
Inflow = 0.74 cfs @ 12.23 hrs, Volume= 0.111 af
Primary = 0.74 cfs @ 12.23 hrs, Volume= 0.111 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 29P: Desing Point #1: Flow to Summer Street

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1P: P1a

Runoff Area=3,133 sf 58.00% Impervious Runoff Depth=3.52"
Flow Length=73' Tc=2.7 min CN=WQ Runoff=0.31 cfs 0.021 af

Pond 2P: Trench Drain 0+28

Peak Elev=412.36' Inflow=0.31 cfs 0.021 af
10.0" Round Culvert n=0.011 L=11.0' S=0.0355 '/' Outflow=0.31 cfs 0.021 af

Pond 3P: First Defense Unit A

Peak Elev=412.36' Inflow=0.31 cfs 0.021 af
10.0" Round Culvert n=0.011 L=12.0' S=0.0050 '/' Outflow=0.31 cfs 0.021 af

Subcatchment4P: P1b

Runoff Area=15,777 sf 29.99% Impervious Runoff Depth=2.45"
Flow Length=168' Tc=10.0 min CN=WQ Runoff=0.82 cfs 0.074 af

Pond 5P: CB 0+88

Peak Elev=412.51' Inflow=0.82 cfs 0.074 af
12.0" Round Culvert x 2.00 n=0.011 L=9.0' S=0.0056 '/' Outflow=0.82 cfs 0.074 af

Pond 6P: FD 0+79

Peak Elev=412.50' Inflow=0.82 cfs 0.074 af
12.0" Round Culvert n=0.011 L=15.0' S=0.0067 '/' Outflow=0.82 cfs 0.074 af

Subcatchment7P: P1c

Runoff Area=8,619 sf 69.83% Impervious Runoff Depth=3.90"
Flow Length=82' Tc=3.9 min CN=WQ Runoff=0.90 cfs 0.064 af

Pond 8P: AD A

Peak Elev=414.15' Inflow=0.90 cfs 0.064 af
6.0" Round Culvert n=0.011 L=19.0' S=0.0500 '/' Outflow=0.90 cfs 0.064 af

Subcatchment9P: P1d

Runoff Area=1,857 sf 100.00% Impervious Runoff Depth=4.98"
Tc=2.0 min CN=98 Runoff=0.25 cfs 0.018 af

Pond 10P: AD B

Peak Elev=417.32' Inflow=0.25 cfs 0.018 af
6.0" Round Culvert n=0.011 L=49.0' S=0.1010 '/' Outflow=0.25 cfs 0.018 af

Subcatchment11P: P1e

Runoff Area=1,233 sf 57.42% Impervious Runoff Depth=3.50"
Flow Length=164' Slope=0.0700 '/' Tc=5.3 min CN=WQ Runoff=0.11 cfs 0.008 af

Pond 12P: Trench Drain A

Peak Elev=412.80' Inflow=0.11 cfs 0.008 af
8.0" Round Culvert n=0.011 L=4.0' S=0.0125 '/' Outflow=0.11 cfs 0.008 af

Pond 13P: AD C

Peak Elev=412.79' Inflow=0.11 cfs 0.008 af
8.0" Round Culvert n=0.011 L=26.0' S=0.0058 '/' Outflow=0.11 cfs 0.008 af

Pond 14P: DMH A

Peak Elev=412.78' Inflow=1.25 cfs 0.090 af
12.0" Round Culvert n=0.011 L=69.0' S=0.0058 '/' Outflow=1.25 cfs 0.090 af

Pond 15P: FD B

Peak Elev=412.53' Inflow=1.25 cfs 0.090 af
12.0" Round Culvert n=0.011 L=8.0' S=0.0125 '/' Outflow=1.25 cfs 0.090 af

Pond 16P: Deep Sump DMH A

Peak Elev=412.45' Inflow=1.88 cfs 0.164 af
12.0" Round Culvert n=0.011 L=16.0' S=0.0062 '/' Outflow=1.88 cfs 0.164 af

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Subcatchment17P: P1fRunoff Area=10,226 sf 1.29% Impervious Runoff Depth=1.44"
Flow Length=162' Tc=8.3 min CN=WQ Runoff=0.35 cfs 0.028 af**Pond 18P: Infiltration Basin #1**Peak Elev=412.36' Storage=2,222 cf Inflow=2.47 cfs 0.213 af
Discarded=0.06 cfs 0.107 af Primary=1.11 cfs 0.107 af Outflow=1.17 cfs 0.213 af**Pond 19P: DMH B**Peak Elev=411.39' Inflow=1.11 cfs 0.107 af
12.0" Round Culvert n=0.011 L=46.0' S=0.0065 '/' Outflow=1.11 cfs 0.107 af**Subcatchment20P: P1g**Runoff Area=653 sf 100.00% Impervious Runoff Depth=4.98"
Tc=2.0 min CN=98 Runoff=0.09 cfs 0.006 af**Pond 21P: AD D**Peak Elev=400.21' Inflow=0.09 cfs 0.006 af
4.0" Round Culvert n=0.011 L=30.0' S=0.0100 '/' Outflow=0.09 cfs 0.006 af**Pond 22P: Infiltration Field #1**Peak Elev=399.04' Storage=74 cf Inflow=0.09 cfs 0.006 af
Discarded=0.01 cfs 0.006 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.006 af**Subcatchment23P: P1h**Runoff Area=930 sf 100.00% Impervious Runoff Depth=4.98"
Tc=2.0 min CN=98 Runoff=0.13 cfs 0.009 af**Pond 24P: AD E**Peak Elev=399.51' Inflow=0.13 cfs 0.009 af
6.0" Round Culvert n=0.011 L=119.0' S=0.0050 '/' Outflow=0.13 cfs 0.009 af**Subcatchment25P: P1i**Runoff Area=5,938 sf 30.43% Impervious Runoff Depth=2.41"
Flow Length=120' Tc=9.1 min CN=WQ Runoff=0.31 cfs 0.027 af**Pond 26P: AD F&G**Peak Elev=399.49' Inflow=0.31 cfs 0.027 af
8.0" Round Culvert n=0.011 L=4.0' S=0.0500 '/' Outflow=0.31 cfs 0.027 af**Pond 27P: Infiltration Field #2**Peak Elev=399.46' Storage=257 cf Inflow=0.37 cfs 0.036 af
Discarded=0.01 cfs 0.023 af Primary=0.59 cfs 0.014 af Outflow=0.60 cfs 0.036 af**Subcatchment28P: P1j**Runoff Area=79,206 sf 7.39% Impervious Runoff Depth=1.50"
Flow Length=229' Tc=11.4 min CN=WQ Runoff=2.36 cfs 0.227 af**Link 29P: Desing Point #1: Flow to Summer Street**Inflow=3.93 cfs 0.348 af
Primary=3.93 cfs 0.348 af**Total Runoff Area = 2.929 ac Runoff Volume = 0.483 af Average Runoff Depth = 1.98"**
80.79% Pervious = 2.366 ac 19.21% Impervious = 0.563 ac

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Summary for Subcatchment 1P: P1a

Runoff = 0.31 cfs @ 12.10 hrs, Volume= 0.021 af, Depth= 3.52"
Routed to Pond 2P : Trench Drain 0+28

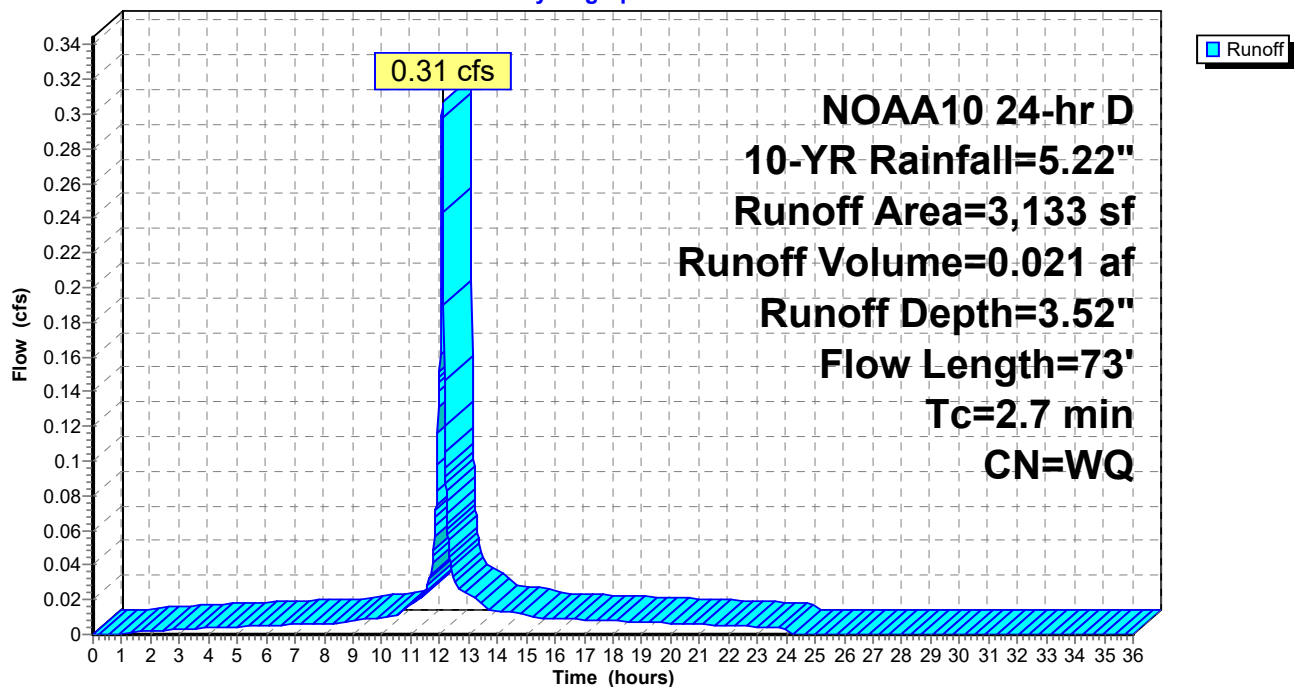
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
1,817	98	Paved parking HSG B
1,316	61	>75% Grass cover, Good HSG B
3,133		Weighted Average
1,316		42.00% Pervious Area
1,817		58.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	23	0.1000	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
0.3	25	0.0300	1.26		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.36"
0.1	25	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7	73	Total			

Subcatchment 1P: P1a

Hydrograph



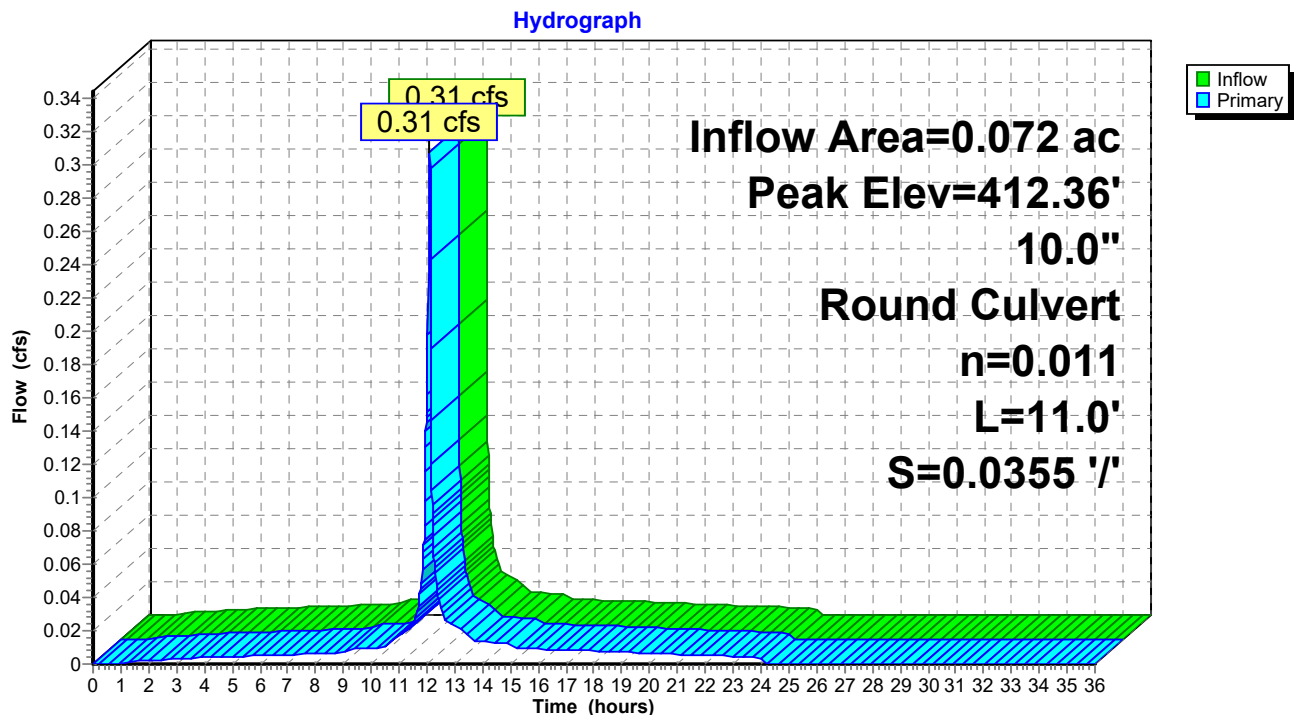
Summary for Pond 2P: Trench Drain 0+28

Inflow Area = 0.072 ac, 58.00% Impervious, Inflow Depth = 3.52" for 10-YR event
 Inflow = 0.31 cfs @ 12.10 hrs, Volume= 0.021 af
 Outflow = 0.31 cfs @ 12.10 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.31 cfs @ 12.10 hrs, Volume= 0.021 af
 Routed to Pond 3P : First Defense Unit A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.36' @ 12.27 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.80'	10.0" Round Culvert L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.80' / 411.41' S= 0.0355 '/ Cc= 0.900 n= 0.011, Flow Area= 0.55 sf

Primary OutFlow Max=0.25 cfs @ 12.10 hrs HW=412.22' TW=412.16' (Dynamic Tailwater)
 ↳ **1=Culvert** (Outlet Controls 0.25 cfs @ 1.35 fps)

Pond 2P: Trench Drain 0+28

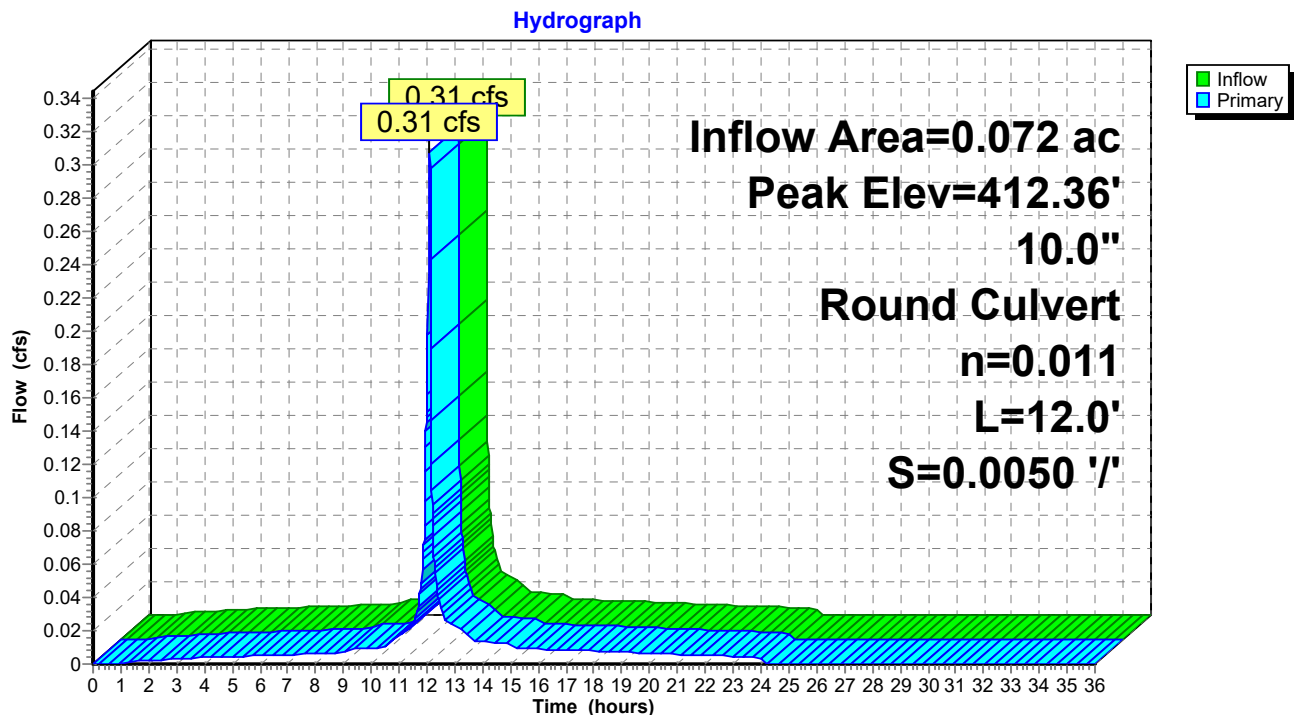
Summary for Pond 3P: First Defense Unit A

Inflow Area = 0.072 ac, 58.00% Impervious, Inflow Depth = 3.52" for 10-YR event
 Inflow = 0.31 cfs @ 12.10 hrs, Volume= 0.021 af
 Outflow = 0.31 cfs @ 12.10 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.31 cfs @ 12.10 hrs, Volume= 0.021 af
 Routed to Pond 18P : Infiltration Basin #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.36' @ 12.26 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.36'	10.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.36' / 411.30' S= 0.0050 '/ Cc= 0.900 n= 0.011, Flow Area= 0.55 sf

Primary OutFlow Max=0.00 cfs @ 12.10 hrs HW=412.16' TW=412.18' (Dynamic Tailwater)
 ↑1=Culvert (Controls 0.00 cfs)

Pond 3P: First Defense Unit A

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NOAA10 24-hr D 10-YR Rainfall=5.22"

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Summary for Subcatchment 4P: P1b

Runoff = 0.82 cfs @ 12.18 hrs, Volume= 0.074 af, Depth= 2.45"
Routed to Pond 5P : CB 0+88

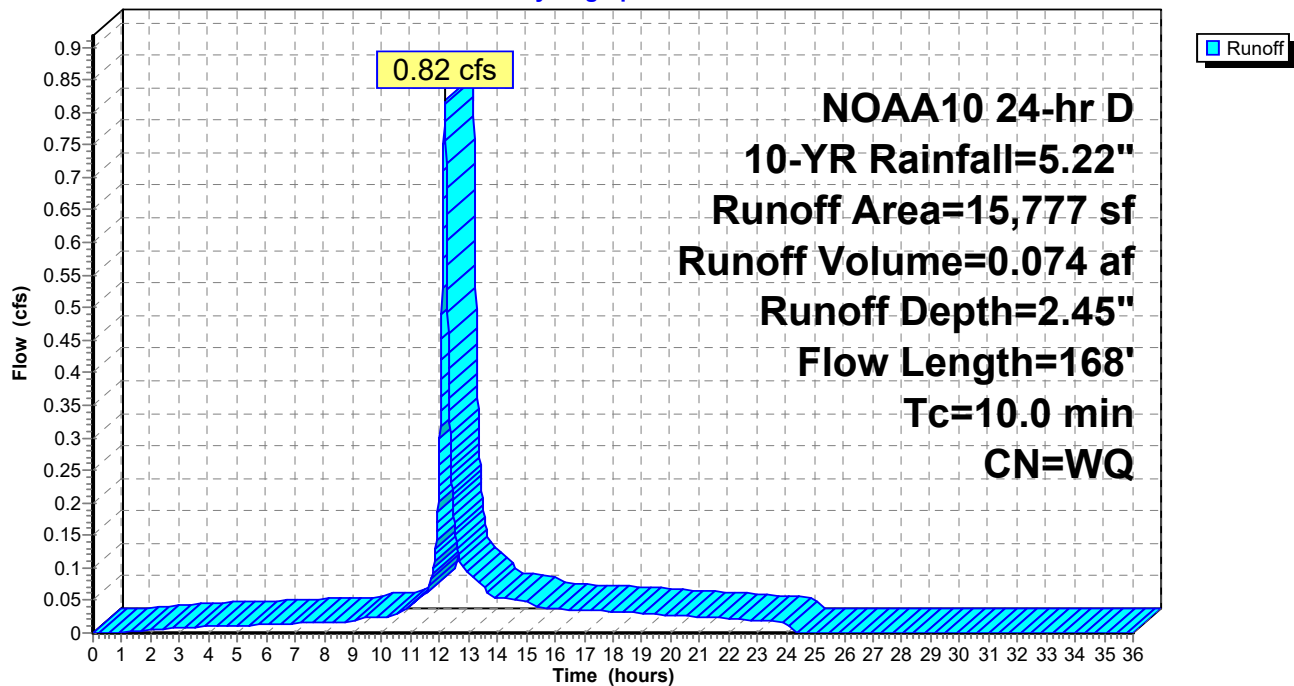
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
3,647	55	Woods, Good, HSG B
4,732	98	Paved parking, HSG B
7,398	61	>75% Grass cover, Good, HSG B
15,777		Weighted Average
11,045		70.01% Pervious Area
4,732		29.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	51	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
0.4	49	0.1100	2.32		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	68	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.0	168	Total			

Subcatchment 4P: P1b

Hydrograph



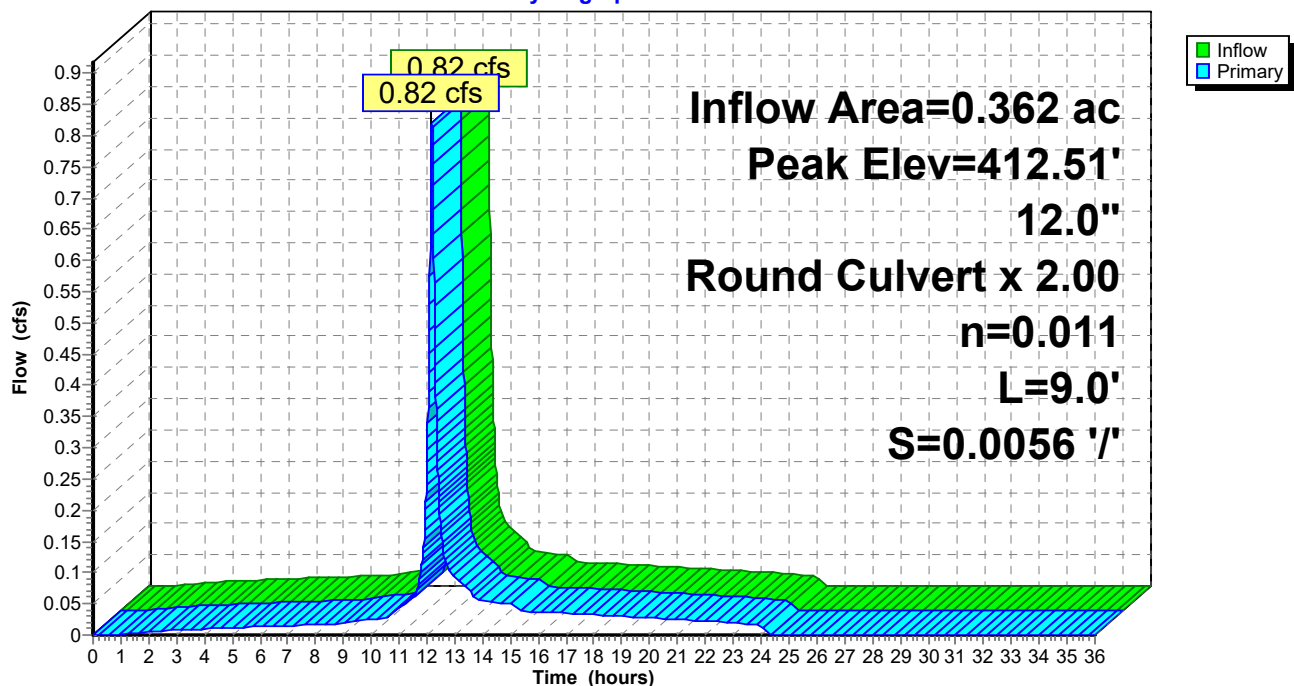
Summary for Pond 5P: CB 0+88

Inflow Area = 0.362 ac, 29.99% Impervious, Inflow Depth = 2.45" for 10-YR event
 Inflow = 0.82 cfs @ 12.18 hrs, Volume= 0.074 af
 Outflow = 0.82 cfs @ 12.18 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.82 cfs @ 12.18 hrs, Volume= 0.074 af
 Routed to Pond 6P : FD 0+79

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.51' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.65'	12.0" Round Culvert X 2.00 L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.65' / 411.60' S= 0.0056 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.88 cfs @ 12.18 hrs HW=412.51' TW=412.49' (Dynamic Tailwater)
 1=Culvert (Outlet Controls 0.88 cfs @ 0.82 fps)

Pond 5P: CB 0+88**Hydrograph**

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NOAA10 24-hr D 10-YR Rainfall=5.22"

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Summary for Pond 6P: FD 0+79

Inflow Area = 0.362 ac, 29.99% Impervious, Inflow Depth = 2.45" for 10-YR event
Inflow = 0.82 cfs @ 12.18 hrs, Volume= 0.074 af
Outflow = 0.82 cfs @ 12.18 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min
Primary = 0.82 cfs @ 12.18 hrs, Volume= 0.074 af
Routed to Pond 16P : Deep Sump DMH A

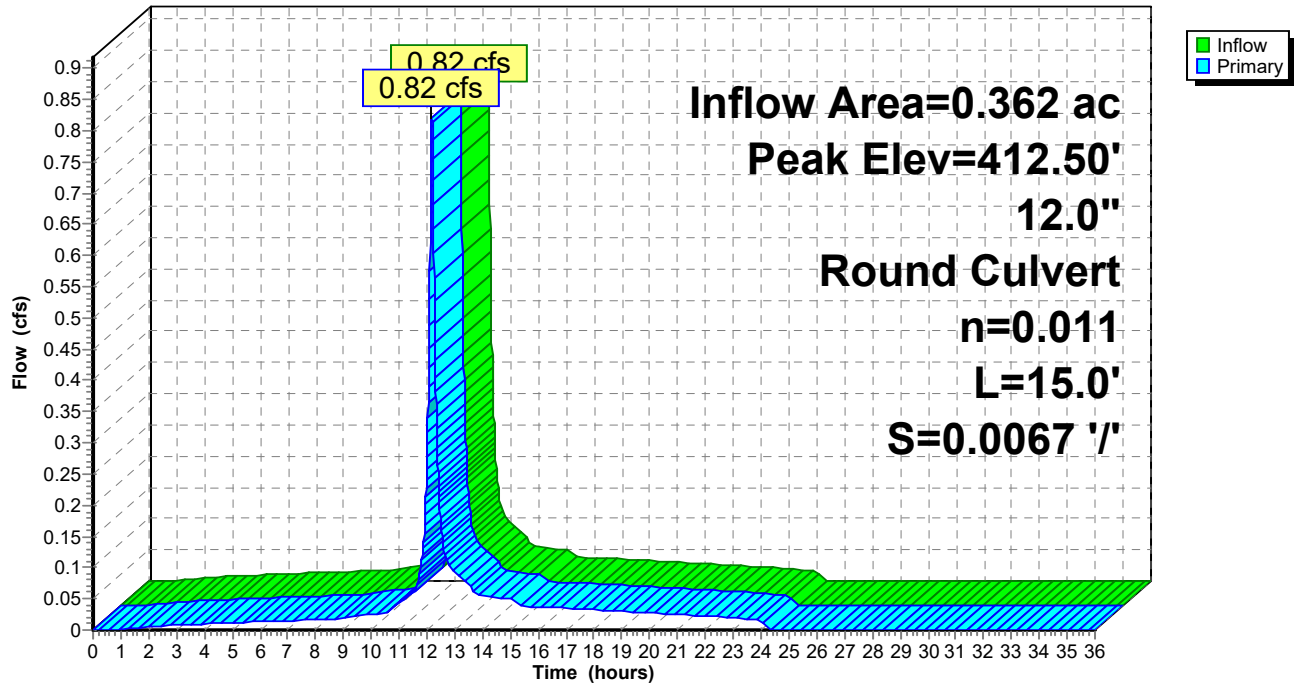
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 412.50' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.55'	12.0" Round Culvert L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.55' / 411.45' S= 0.0067 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.83 cfs @ 12.18 hrs HW=412.49' TW=412.44' (Dynamic Tailwater)
↑ **1=Culvert** (Outlet Controls 0.83 cfs @ 1.40 fps)

Pond 6P: FD 0+79

Hydrograph



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NOAA10 24-hr D 10-YR Rainfall=5.22"

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Summary for Subcatchment 7P: P1c

Runoff = 0.90 cfs @ 12.11 hrs, Volume= 0.064 af, Depth= 3.90"
 Routed to Pond 8P : AD A

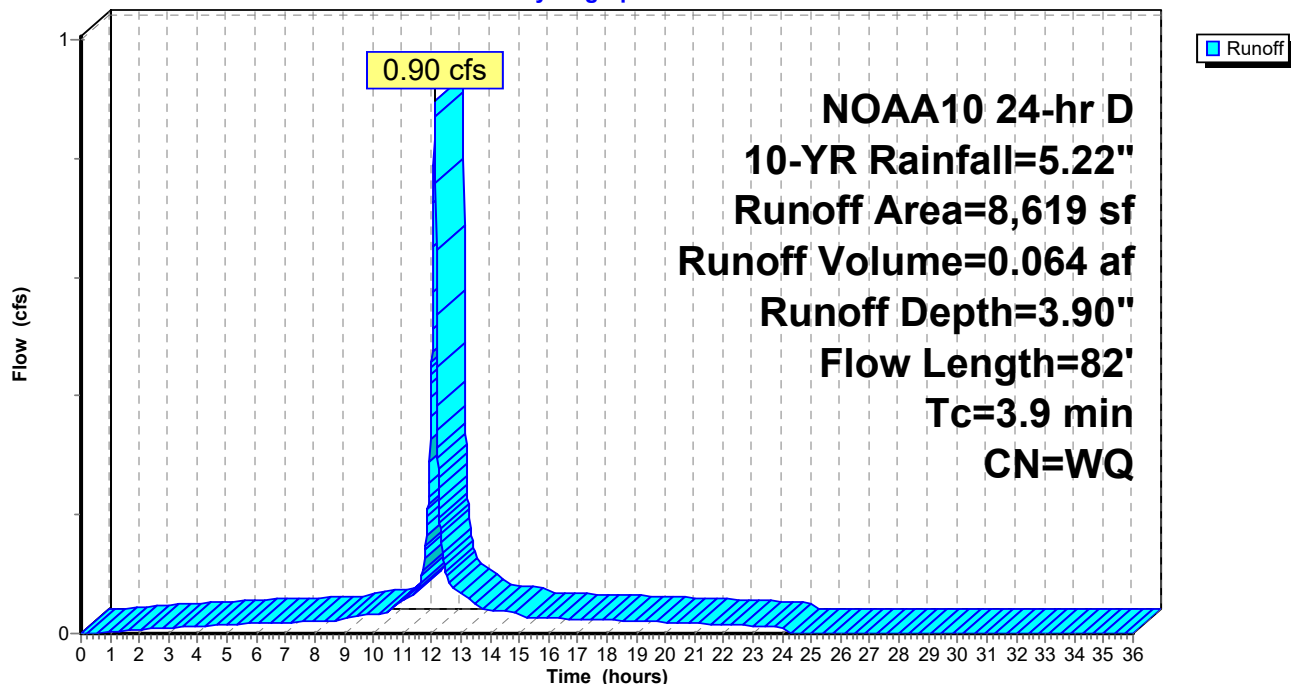
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
924	98	Roofs HSG B
5,095	98	Paved parking HSG B
703	55	Woods, Good HSG B
1,897	61	>75% Grass cover, Good HSG B
8,619		Weighted Average
2,600		30.17% Pervious Area
6,019		69.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	36	0.0700	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
0.1	14	0.0700	1.57		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.36"
0.1	32	0.0600	4.97		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.9	82	Total			

Subcatchment 7P: P1c

Hydrograph



Summary for Pond 8P: AD A

Inflow Area = 0.198 ac, 69.83% Impervious, Inflow Depth = 3.90" for 10-YR event
 Inflow = 0.90 cfs @ 12.11 hrs, Volume= 0.064 af
 Outflow = 0.90 cfs @ 12.11 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.90 cfs @ 12.11 hrs, Volume= 0.064 af
 Routed to Pond 14P : DMH A

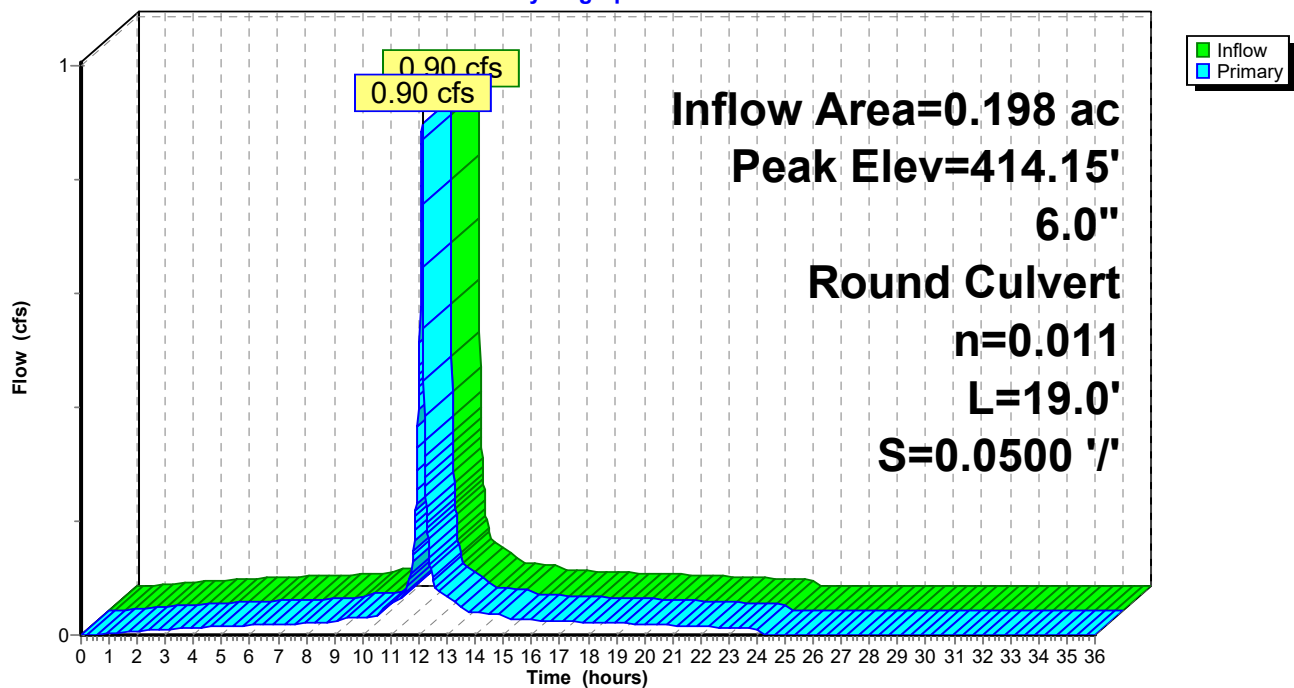
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 414.15' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	413.00'	6.0" Round Culvert L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 413.00' / 412.05' S= 0.0500 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Primary OutFlow Max=0.90 cfs @ 12.11 hrs HW=414.15' TW=412.78' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 0.90 cfs @ 4.57 fps)

Pond 8P: AD A

Hydrograph



Summary for Subcatchment 9P: P1d

Runoff = 0.25 cfs @ 12.10 hrs, Volume= 0.018 af, Depth= 4.98"
 Routed to Pond 10P : AD B

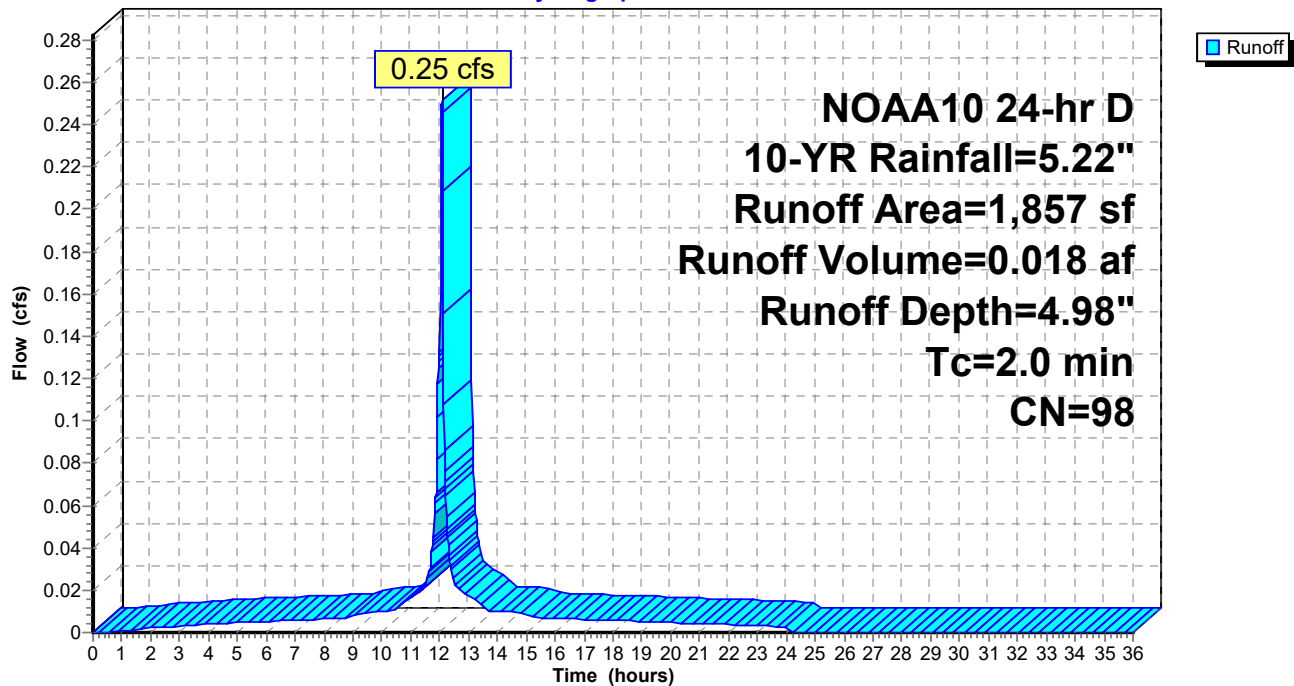
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
1,857	98	Roofs HSG B
1,857		100.00% Impervious Area

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

Subcatchment 9P: P1d

Hydrograph



Summary for Pond 10P: AD B

Inflow Area = 0.043 ac, 100.00% Impervious, Inflow Depth = 4.98" for 10-YR event
 Inflow = 0.25 cfs @ 12.10 hrs, Volume= 0.018 af
 Outflow = 0.25 cfs @ 12.10 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.25 cfs @ 12.10 hrs, Volume= 0.018 af
 Routed to Pond 14P : DMH A

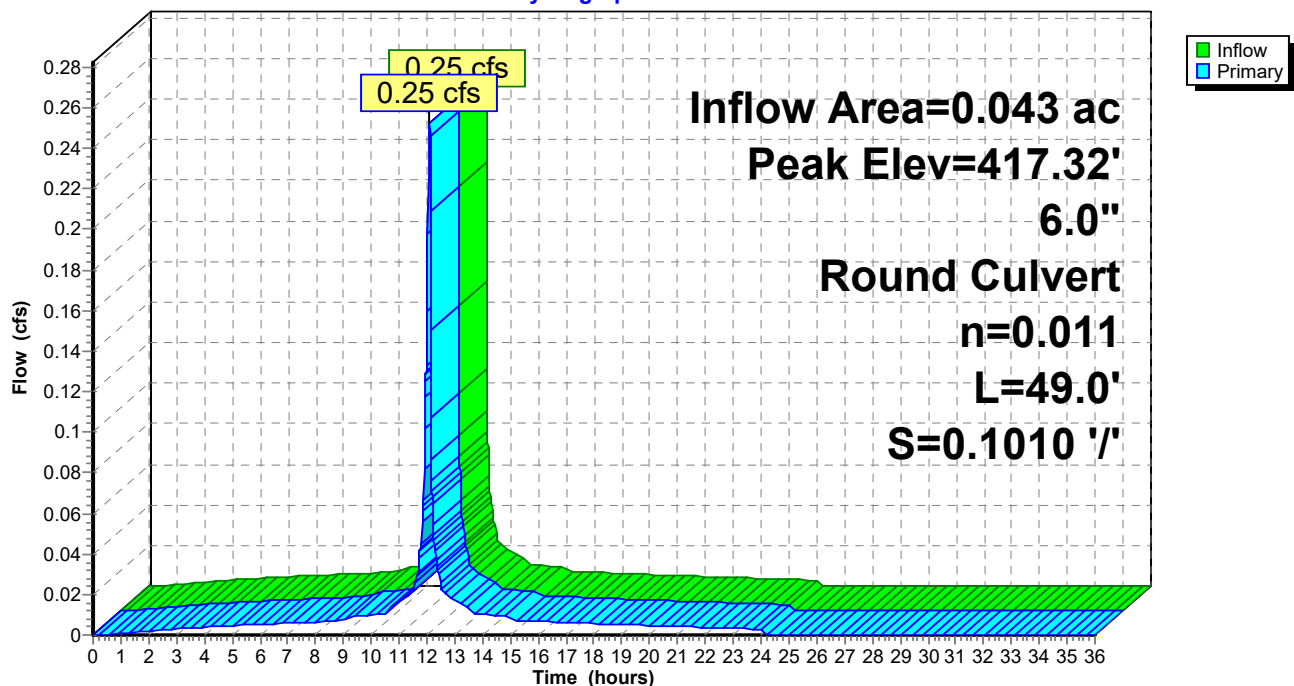
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 417.32' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	417.00'	6.0" Round Culvert L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 417.00' / 412.05' S= 0.1010 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Primary OutFlow Max=0.25 cfs @ 12.10 hrs HW=417.32' TW=412.76' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 0.25 cfs @ 1.92 fps)

Pond 10P: AD B

Hydrograph



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NOAA10 24-hr D 10-YR Rainfall=5.22"

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Summary for Subcatchment 11P: P1e

Runoff = 0.11 cfs @ 12.12 hrs, Volume= 0.008 af, Depth= 3.50"
Routed to Pond 12P : Trench Drain A

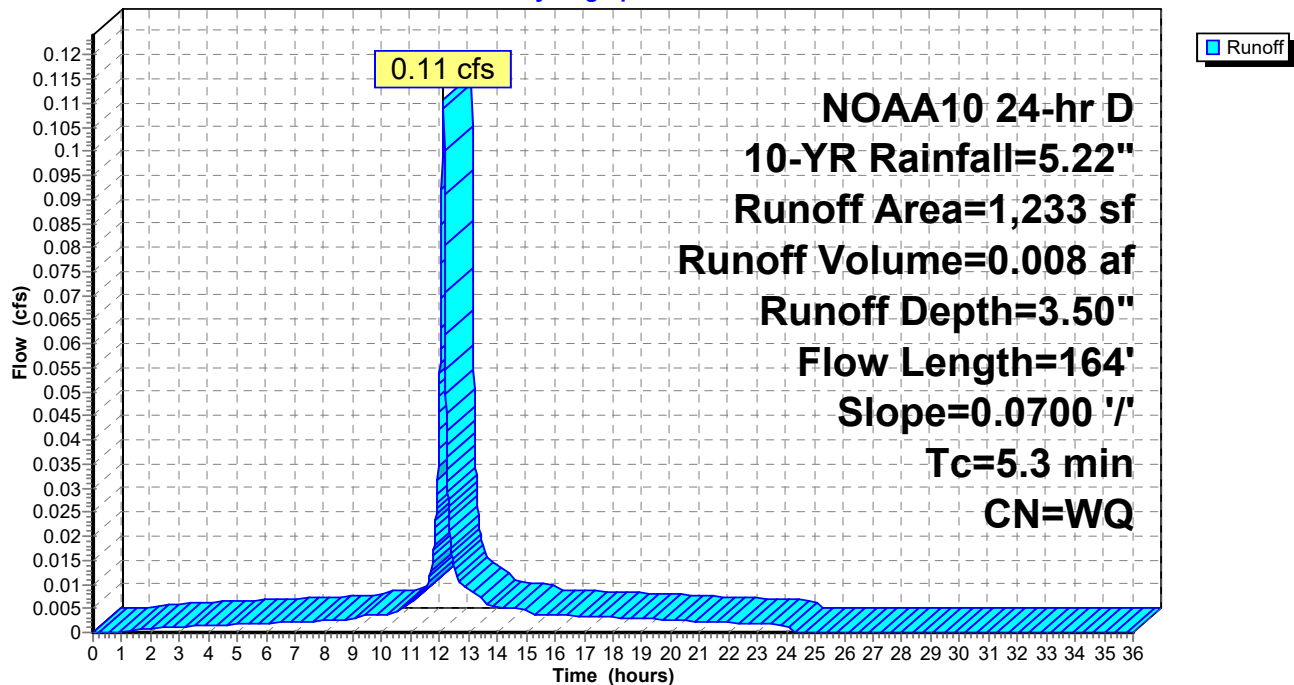
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
708	98	Paved parking HSG B
525	61	>75% Grass cover, Good HSG B
1,233		Weighted Average
525		42.58% Pervious Area
708		57.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
0.2	25	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	89	0.0700	5.37		Shallow Concentrated Flow, Paved Kv= 20.3 fps
5.3	164	Total			

Subcatchment 11P: P1e

Hydrograph



Summary for Pond 12P: Trench Drain A

Inflow Area = 0.028 ac, 57.42% Impervious, Inflow Depth = 3.50" for 10-YR event
 Inflow = 0.11 cfs @ 12.12 hrs, Volume= 0.008 af
 Outflow = 0.11 cfs @ 12.12 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.11 cfs @ 12.12 hrs, Volume= 0.008 af
 Routed to Pond 13P : AD C

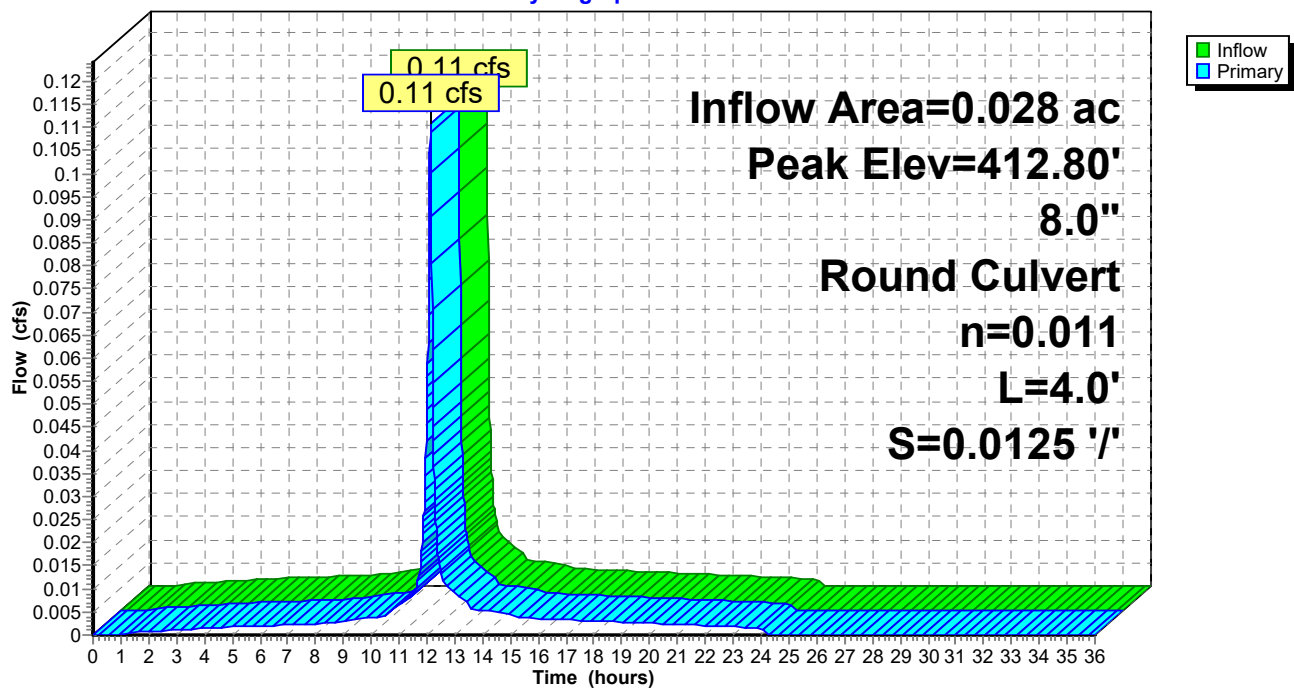
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.80' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	412.30'	8.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.30' / 412.25' S= 0.0125 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.00 cfs @ 12.12 hrs HW=412.78' TW=412.79' (Dynamic Tailwater)
 ↑1=Culvert (Controls 0.00 cfs)

Pond 12P: Trench Drain A

Hydrograph



Summary for Pond 13P: AD C

Inflow Area = 0.028 ac, 57.42% Impervious, Inflow Depth = 3.50" for 10-YR event
 Inflow = 0.11 cfs @ 12.12 hrs, Volume= 0.008 af
 Outflow = 0.11 cfs @ 12.12 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.11 cfs @ 12.12 hrs, Volume= 0.008 af
 Routed to Pond 14P : DMH A

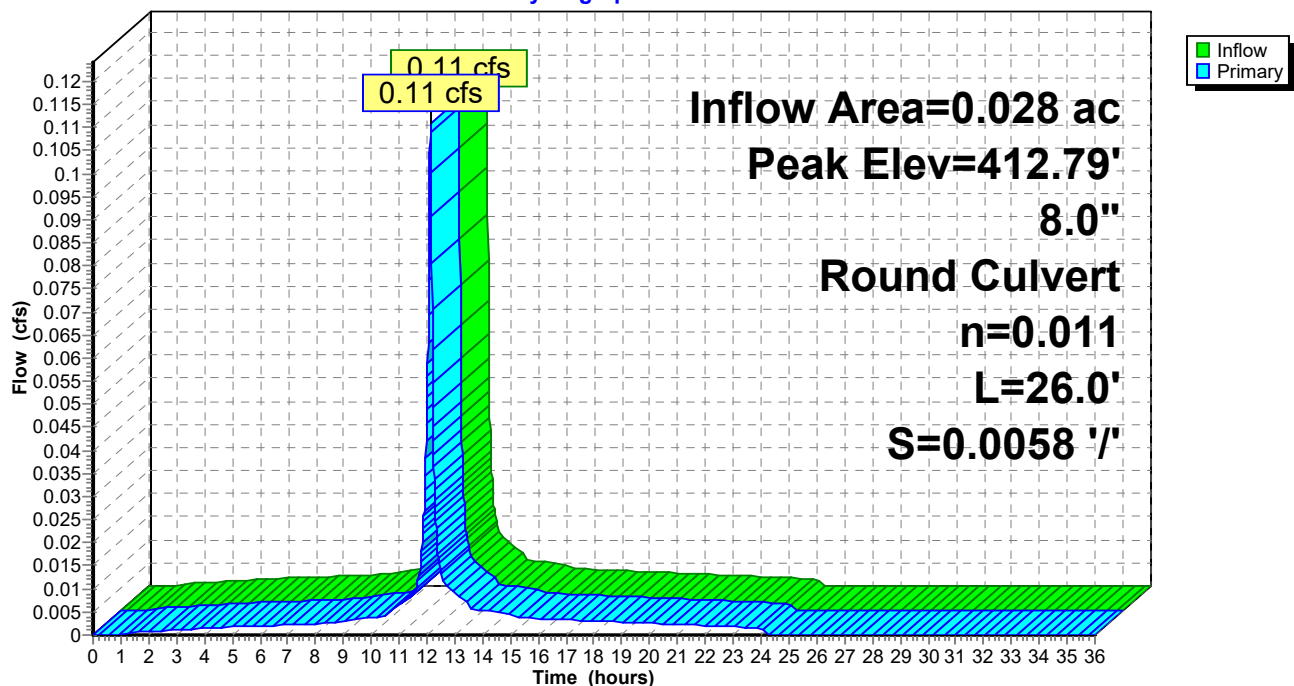
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.79' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	412.20'	8.0" Round Culvert L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.20' / 412.05' S= 0.0058 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.14 cfs @ 12.12 hrs HW=412.79' TW=412.77' (Dynamic Tailwater)
 1=Culvert (Outlet Controls 0.14 cfs @ 0.57 fps)

Pond 13P: AD C

Hydrograph



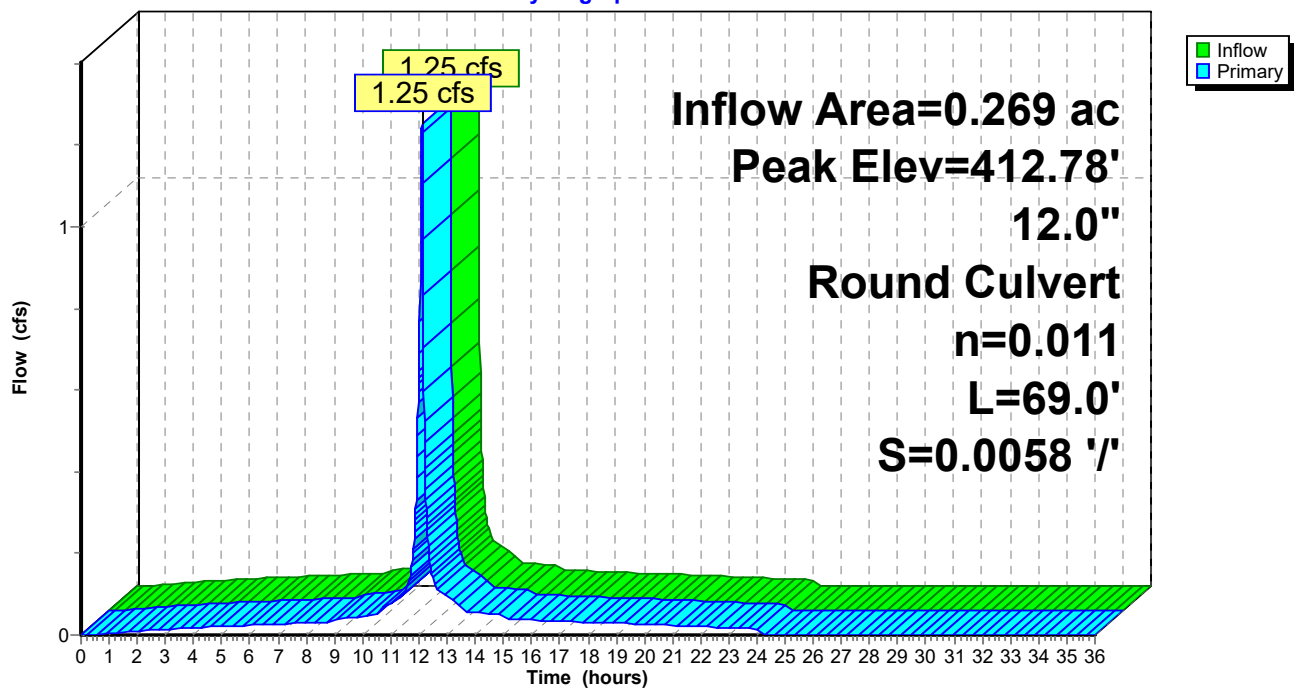
Summary for Pond 14P: DMH A

Inflow Area = 0.269 ac, 73.31% Impervious, Inflow Depth = 4.03" for 10-YR event
 Inflow = 1.25 cfs @ 12.11 hrs, Volume= 0.090 af
 Outflow = 1.25 cfs @ 12.11 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.25 cfs @ 12.11 hrs, Volume= 0.090 af
 Routed to Pond 15P : FD B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.78' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	412.00'	12.0" Round Culvert L= 69.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.00' / 411.60' S= 0.0058 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.20 cfs @ 12.11 hrs HW=412.77' TW=412.49' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 1.20 cfs @ 2.53 fps)

Pond 14P: DMH A**Hydrograph**

Summary for Pond 15P: FD B

Inflow Area = 0.269 ac, 73.31% Impervious, Inflow Depth = 4.03" for 10-YR event
 Inflow = 1.25 cfs @ 12.11 hrs, Volume= 0.090 af
 Outflow = 1.25 cfs @ 12.11 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.25 cfs @ 12.11 hrs, Volume= 0.090 af
 Routed to Pond 16P : Deep Sump DMH A

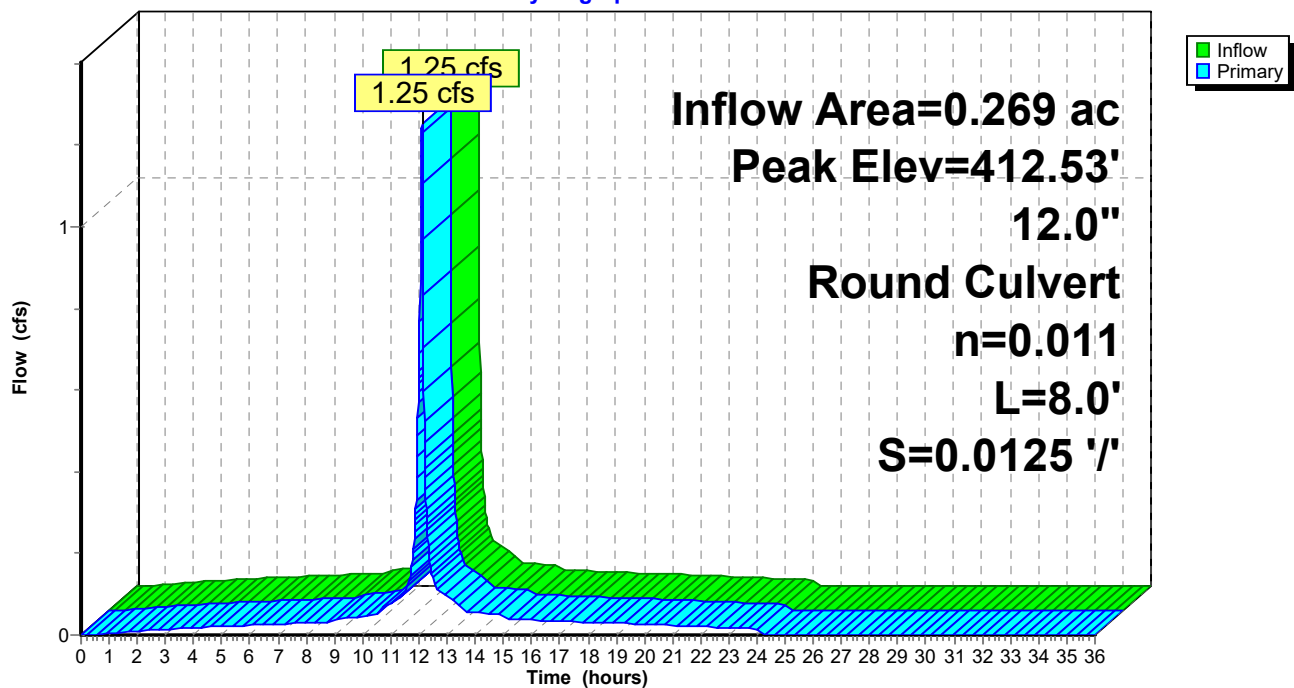
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.53' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.55'	12.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.55' / 411.45' S= 0.0125 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.07 cfs @ 12.11 hrs HW=412.49' TW=412.40' (Dynamic Tailwater)
 ↳ **1=Culvert** (Inlet Controls 1.07 cfs @ 1.40 fps)

Pond 15P: FD B

Hydrograph



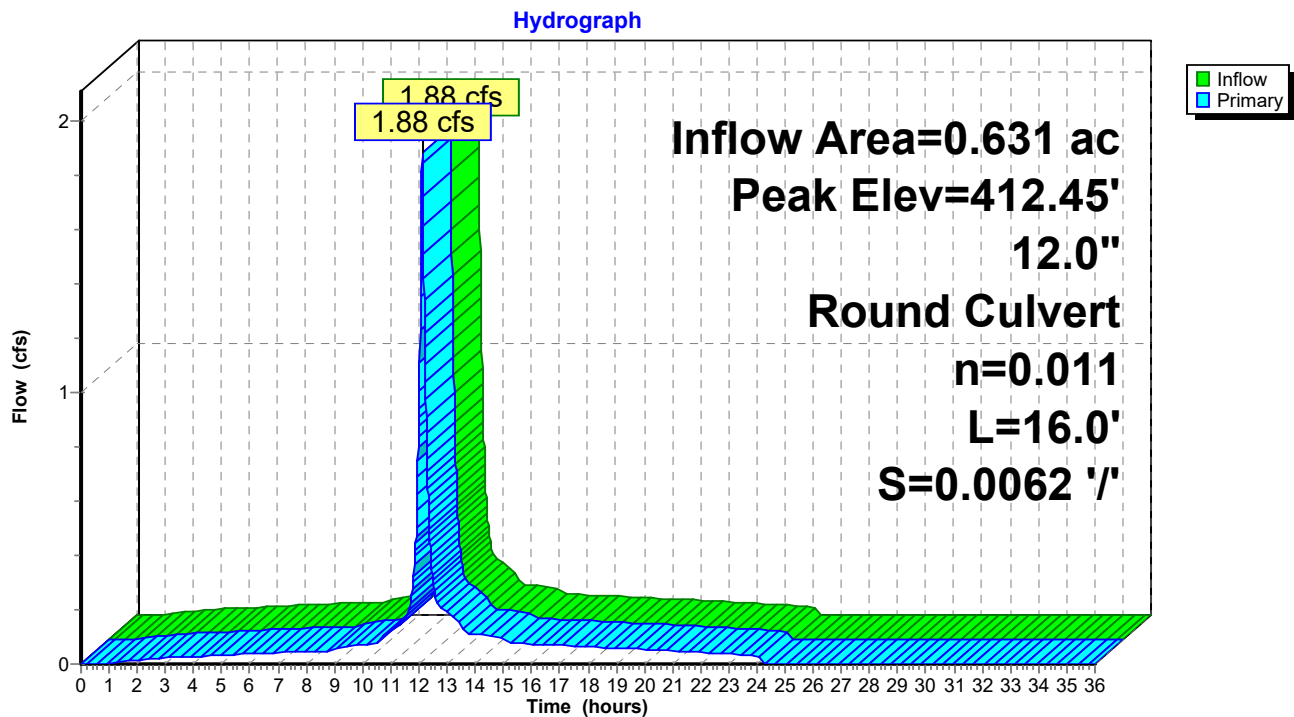
Summary for Pond 16P: Deep Sump DMH A

Inflow Area = 0.631 ac, 48.45% Impervious, Inflow Depth = 3.12" for 10-YR event
 Inflow = 1.88 cfs @ 12.12 hrs, Volume= 0.164 af
 Outflow = 1.88 cfs @ 12.12 hrs, Volume= 0.164 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.88 cfs @ 12.12 hrs, Volume= 0.164 af
 Routed to Pond 18P : Infiltration Basin #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.45' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.40'	12.0" Round Culvert L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.40' / 411.30' S= 0.0062 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.77 cfs @ 12.12 hrs HW=412.43' TW=412.21' (Dynamic Tailwater)
 ↳ **1=Culvert** (Inlet Controls 1.77 cfs @ 2.26 fps)

Pond 16P: Deep Sump DMH A

Summary for Subcatchment 17P: P1f

Runoff = 0.35 cfs @ 12.16 hrs, Volume= 0.028 af, Depth= 1.44"
 Routed to Pond 18P : Infiltration Basin #1

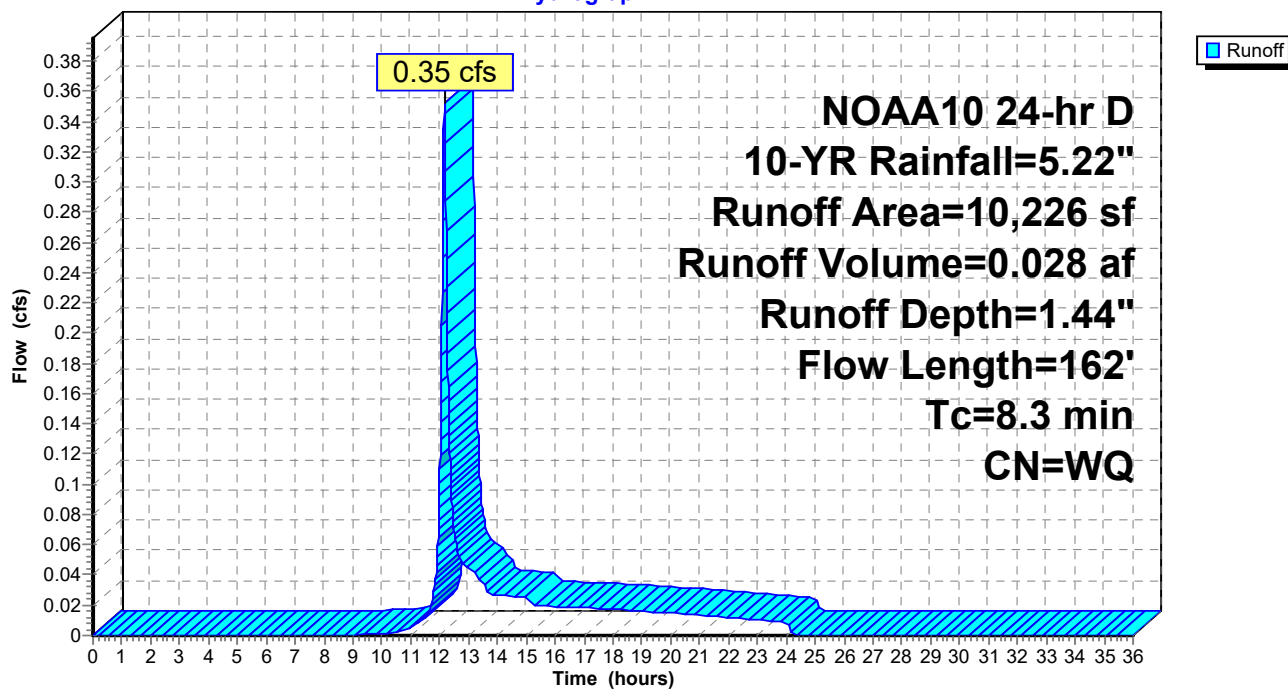
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
132	98	Paved parking, HSG B
2,793	55	Woods, Good HSG B
7,301	61	>75% Grass cover, Good HSG B
10,226		Weighted Average
10,094		98.71% Pervious Area
132		1.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	22	0.0700	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
4.6	28	0.0700	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
0.9	75	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	37	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
8.3	162	Total			

Subcatchment 17P: P1f

Hydrograph



Summary for Pond 18P: Infiltration Basin #1

Inflow Area = 0.938 ac, 37.37% Impervious, Inflow Depth = 2.73" for 10-YR event
 Inflow = 2.47 cfs @ 12.12 hrs, Volume= 0.213 af
 Outflow = 1.17 cfs @ 12.25 hrs, Volume= 0.213 af, Atten= 53%, Lag= 8.2 min
 Discarded = 0.06 cfs @ 12.25 hrs, Volume= 0.107 af
 Primary = 1.11 cfs @ 12.25 hrs, Volume= 0.107 af
 Routed to Pond 19P : DMH B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.36' @ 12.25 hrs Surf.Area= 2,385 sf Storage= 2,222 cf

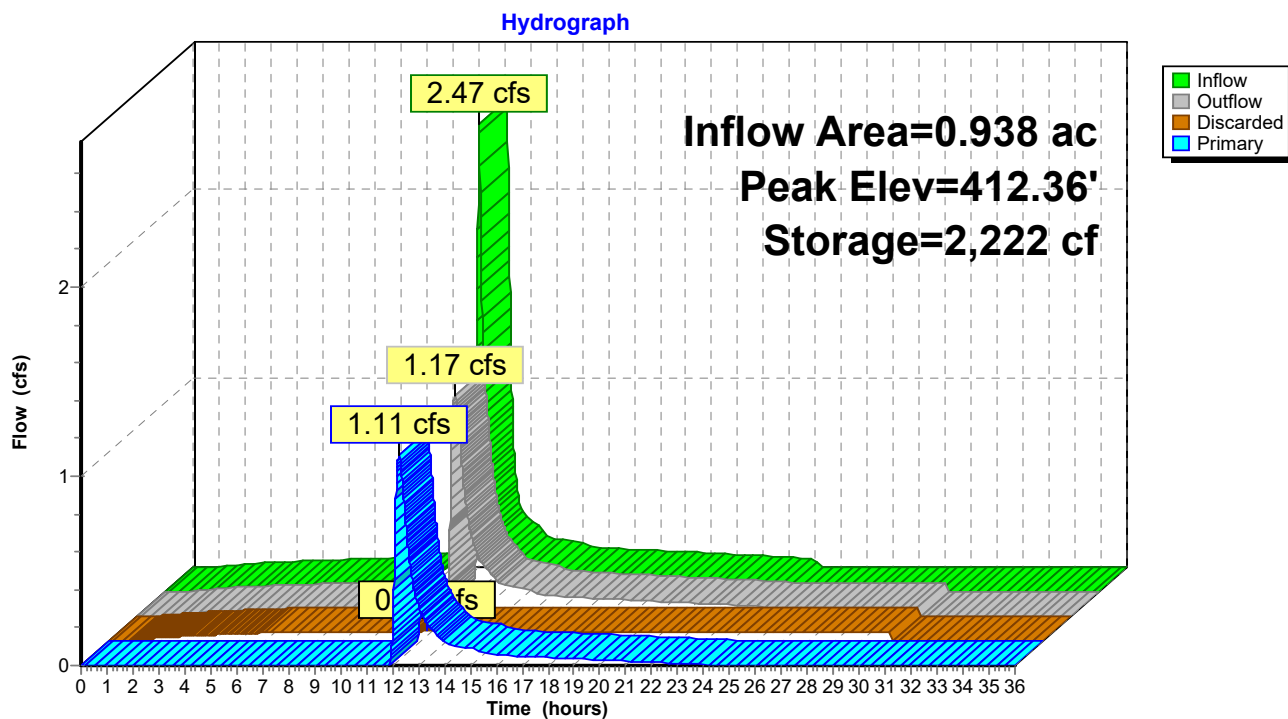
Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 119.7 min (923.2 - 803.5)

Volume	Invert	Avail.Storage	Storage Description		
#1	411.30'	6,950 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
411.30	1,814	182.0	0	0	1,814
414.00	3,418	231.0	6,950	6,950	3,518
Device	Routing	Invert	Outlet Devices		
#1	Primary	411.30'	15.0" Round Culvert L= 13.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.30' / 410.85' S= 0.0346 ' /' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf		
#2	Discarded	411.30'	1.020 in/hr Exfiltration over Surface area		
#3	Device 1	411.80'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads		
#4	Device 1	411.80'	3.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads		

Discarded OutFlow Max=0.06 cfs @ 12.25 hrs HW=412.36' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=1.11 cfs @ 12.25 hrs HW=412.36' TW=411.39' (Dynamic Tailwater)
 ↳ **1=Culvert** (Passes 1.11 cfs of 3.90 cfs potential flow)
 ↳ **3=Orifice/Grate** (Orifice Controls 0.80 cfs @ 2.55 fps)
 ↳ **4=Orifice/Grate** (Orifice Controls 0.31 cfs @ 3.18 fps)

Pond 18P: Infiltration Basin #1



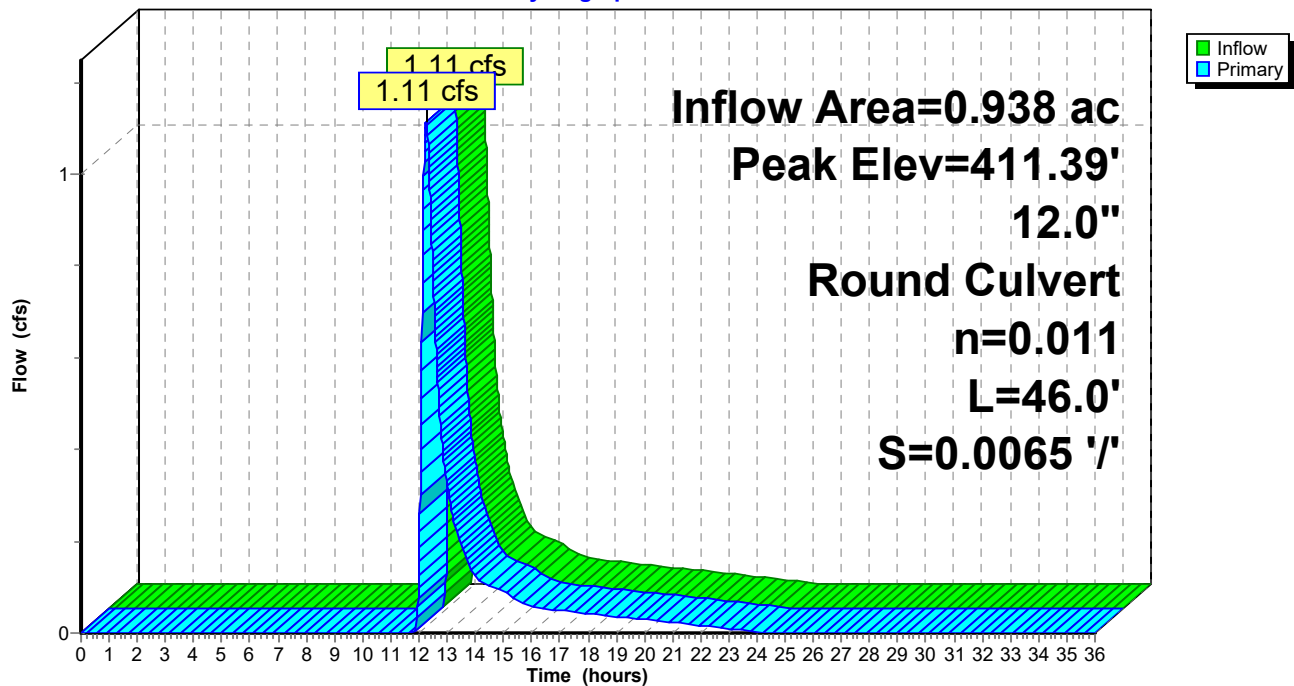
Summary for Pond 19P: DMH B

Inflow Area = 0.938 ac, 37.37% Impervious, Inflow Depth = 1.37" for 10-YR event
 Inflow = 1.11 cfs @ 12.25 hrs, Volume= 0.107 af
 Outflow = 1.11 cfs @ 12.25 hrs, Volume= 0.107 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.11 cfs @ 12.25 hrs, Volume= 0.107 af
 Routed to Link 29P : Desing Point #1: Flow to Summer Street

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 411.39' @ 12.25 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	410.80'	12.0" Round Culvert L= 46.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 410.80' / 410.50' S= 0.0065 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.11 cfs @ 12.25 hrs HW=411.39' TW=0.00' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 1.11 cfs @ 3.30 fps)

Pond 19P: DMH B**Hydrograph**

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NOAA10 24-hr D 10-YR Rainfall=5.22"

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Summary for Subcatchment 20P: P1g

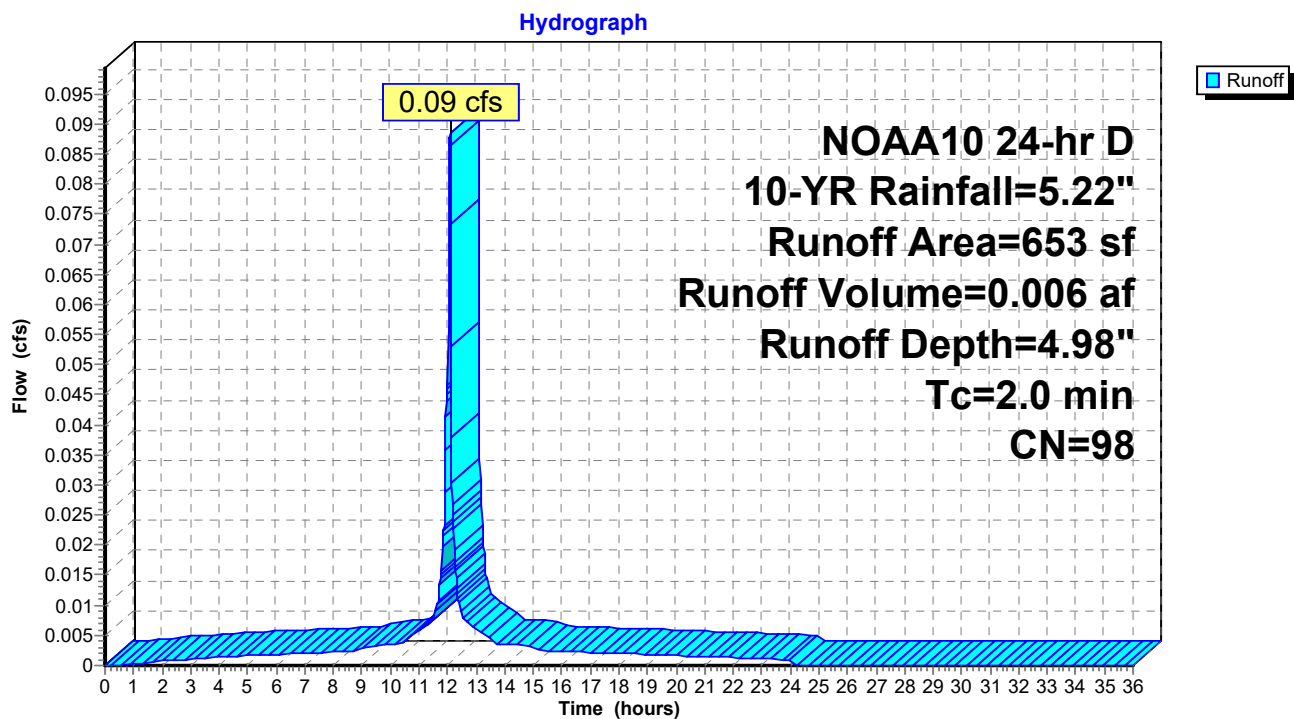
Runoff = 0.09 cfs @ 12.10 hrs, Volume= 0.006 af, Depth= 4.98"
Routed to Pond 21P : AD D

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
653	98	Roofs HSG B
653		100.00% Impervious Area

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

Subcatchment 20P: P1g



Summary for Pond 21P: AD D

Inflow Area = 0.015 ac, 100.00% Impervious, Inflow Depth = 4.98" for 10-YR event
 Inflow = 0.09 cfs @ 12.10 hrs, Volume= 0.006 af
 Outflow = 0.09 cfs @ 12.10 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.09 cfs @ 12.10 hrs, Volume= 0.006 af
 Routed to Pond 22P : Infiltration Field #1

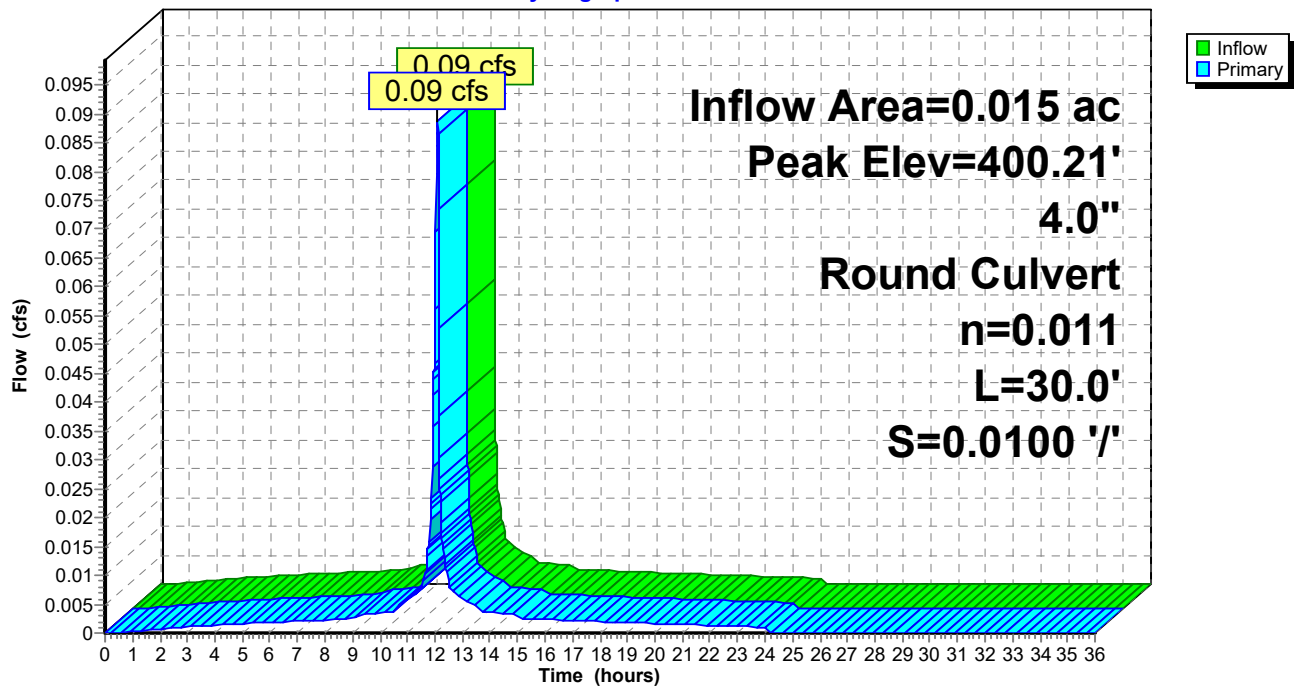
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 400.21' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	400.00'	4.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 400.00' / 399.70' S= 0.0100 '/ Cc= 0.900 n= 0.011, Flow Area= 0.09 sf

Primary OutFlow Max=0.09 cfs @ 12.10 hrs HW=400.21' TW=398.70' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 0.09 cfs @ 1.55 fps)

Pond 21P: AD D

Hydrograph



Summary for Pond 22P: Infiltration Field #1

Inflow Area = 0.015 ac, 100.00% Impervious, Inflow Depth = 4.98" for 10-YR event
 Inflow = 0.09 cfs @ 12.10 hrs, Volume= 0.006 af
 Outflow = 0.01 cfs @ 11.55 hrs, Volume= 0.006 af, Atten= 93%, Lag= 0.0 min
 Discarded = 0.01 cfs @ 11.55 hrs, Volume= 0.006 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 29P : Desing Point #1: Flow to Summer Street

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 399.04' @ 13.12 hrs Surf.Area= 104 sf Storage= 74 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 77.7 min (823.8 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	397.80'	82 cf	8.00'W x 13.00'L x 2.54'H Field A 264 cf Overall - 58 cf Embedded = 206 cf x 40.0% Voids
#2A	398.30'	58 cf	Cultec R-150XLHD x 2 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 2 rows
#3	400.30'	2 cf	1.00'D x 2.00'H Vertical Cone/Cylinder
		142 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.80'	2.400 in/hr Exfiltration over Surface area
#2	Primary	400.30'	4.0" Round Culvert X 2.00 L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 400.30' / 400.20' S= 0.1000 ' / ' Cc= 0.900 n= 0.011, Flow Area= 0.09 sf

Discarded OutFlow Max=0.01 cfs @ 11.55 hrs HW=397.85' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=397.80' TW=0.00' (Dynamic Tailwater)
 ↑ **2=Culvert** (Controls 0.00 cfs)

Pond 22P: Infiltration Field #1 - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 2 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

1 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 11.00' Row Length +12.0" End Stone x 2 = 13.00' Base Length

2 Rows x 33.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 8.00' Base Width

6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

2 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 2 Rows = 58.3 cf Chamber Storage

264.3 cf Field - 58.3 cf Chambers = 206.1 cf Stone x 40.0% Voids = 82.4 cf Stone Storage

Chamber Storage + Stone Storage = 140.7 cf = 0.003 af

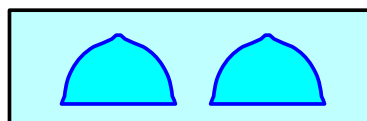
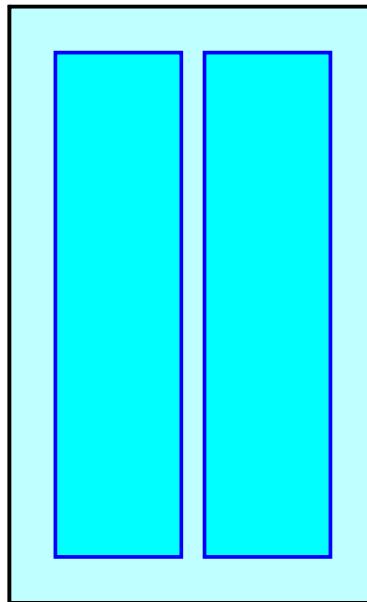
Overall Storage Efficiency = 53.2%

Overall System Size = 13.00' x 8.00' x 2.54'

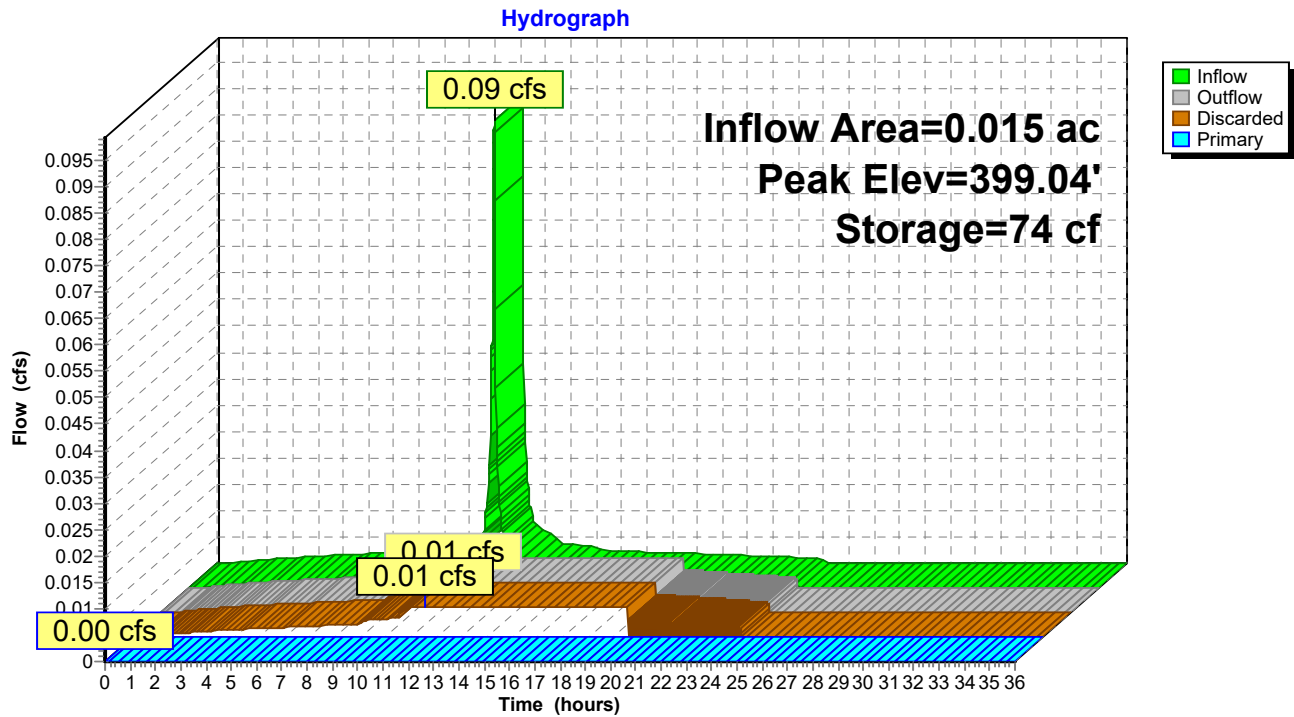
2 Chambers

9.8 cy Field

7.6 cy Stone



Pond 22P: Infiltration Field #1



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NOAA10 24-hr D 10-YR Rainfall=5.22"

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Summary for Subcatchment 23P: P1h

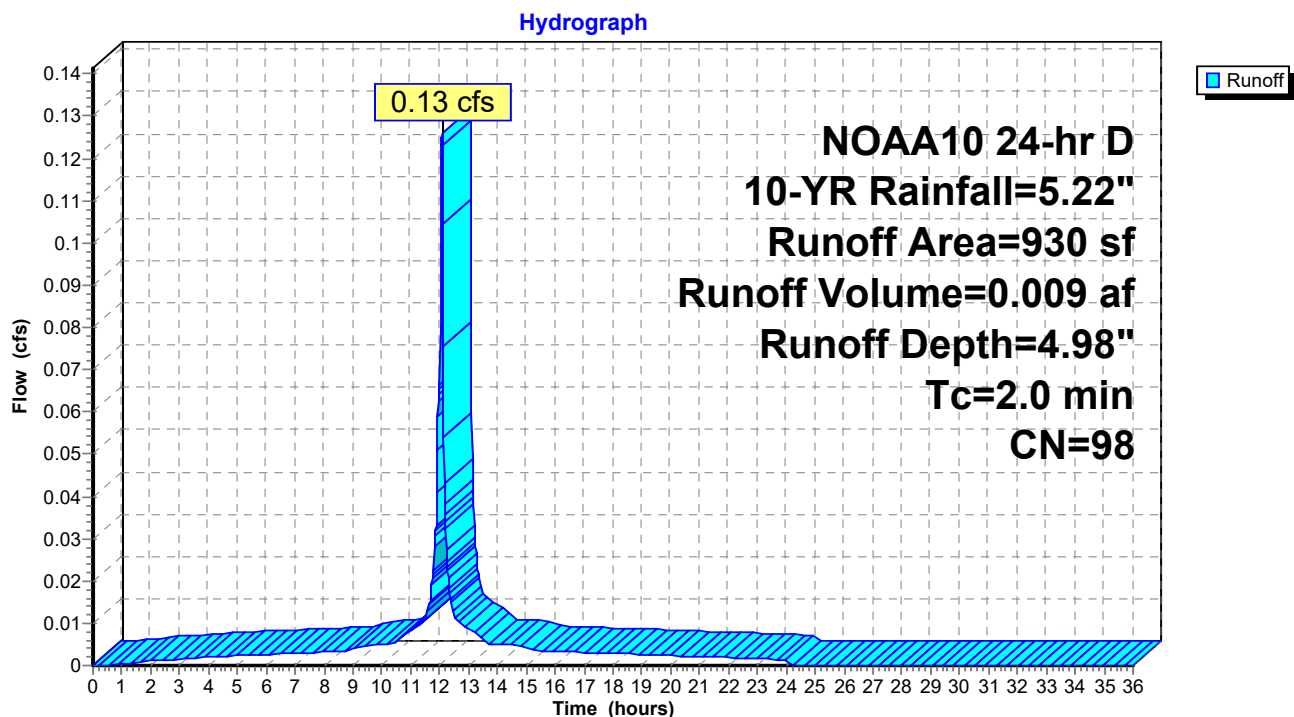
Runoff = 0.13 cfs @ 12.10 hrs, Volume= 0.009 af, Depth= 4.98"
Routed to Pond 24P : AD E

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
930	98	Roofs HSG B
930		100.00% Impervious Area

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

Subcatchment 23P: P1h



Summary for Pond 24P: AD E

Inflow Area = 0.021 ac, 100.00% Impervious, Inflow Depth = 4.98" for 10-YR event
 Inflow = 0.13 cfs @ 12.10 hrs, Volume= 0.009 af
 Outflow = 0.13 cfs @ 12.10 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.13 cfs @ 12.10 hrs, Volume= 0.009 af
 Routed to Pond 27P : Infiltration Field #2

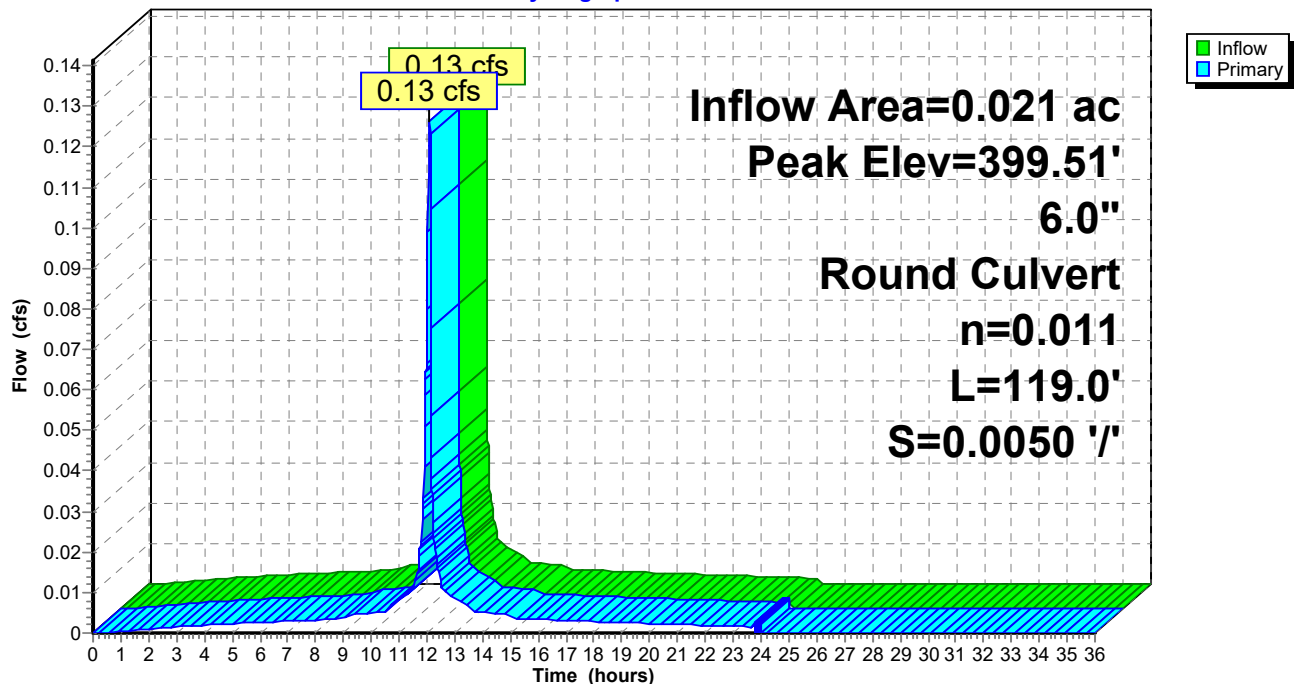
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 399.51' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	398.00'	6.0" Round Culvert L= 119.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.00' / 397.40' S= 0.0050 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Primary OutFlow Max=0.00 cfs @ 12.10 hrs HW=398.99' TW=399.46' (Dynamic Tailwater)
 ↑ **1=Culvert** (Controls 0.00 cfs)

Pond 24P: AD E

Hydrograph



Summary for Subcatchment 25P: P1i

Runoff = 0.31 cfs @ 12.16 hrs, Volume= 0.027 af, Depth= 2.41"
 Routed to Pond 26P : AD F&G

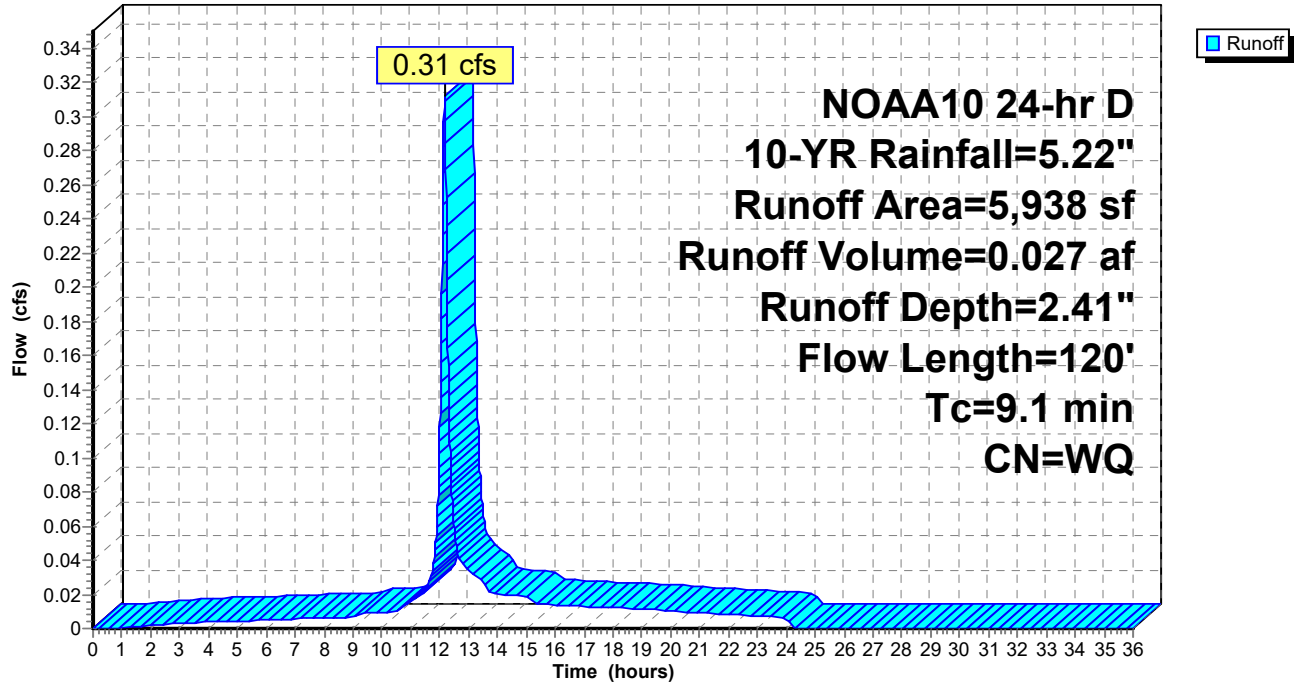
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
1,807	98	Paved parking HSG B
2,161	55	Woods, Good HSG B
1,970	61	>75% Grass cover, Good HSG B
5,938		Weighted Average
4,131		69.57% Pervious Area
1,807		30.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0500	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
0.4	26	0.0500	1.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	24	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.1	120	Total			

Subcatchment 25P: P1i

Hydrograph



Summary for Pond 26P: AD F&G

Inflow Area = 0.136 ac, 30.43% Impervious, Inflow Depth = 2.41" for 10-YR event
 Inflow = 0.31 cfs @ 12.16 hrs, Volume= 0.027 af
 Outflow = 0.31 cfs @ 12.16 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.31 cfs @ 12.16 hrs, Volume= 0.027 af
 Routed to Pond 27P : Infiltration Field #2

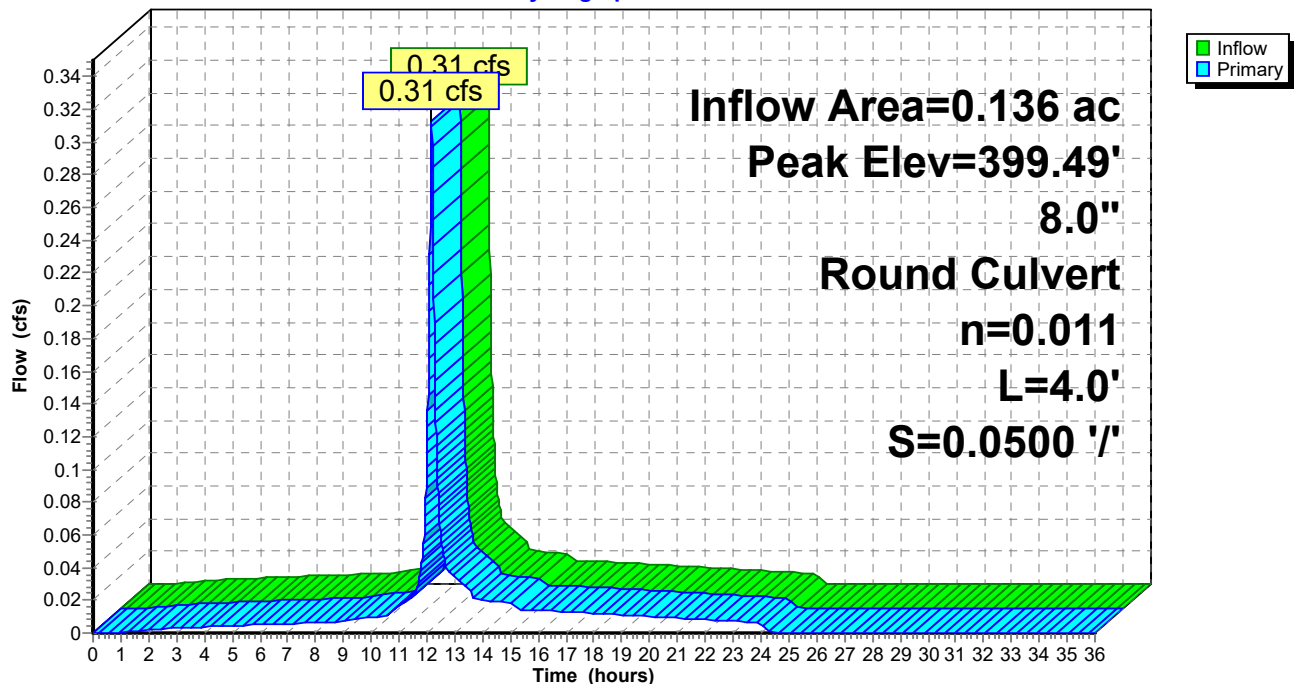
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 399.49' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	397.00'	8.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.00' / 396.80' S= 0.0500 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.29 cfs @ 12.16 hrs HW=399.22' TW=399.19' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 0.29 cfs @ 0.84 fps)

Pond 26P: AD F&G

Hydrograph



Summary for Pond 27P: Infiltration Field #2

Inflow Area = 0.158 ac, 39.85% Impervious, Inflow Depth = 2.76" for 10-YR event
 Inflow = 0.37 cfs @ 12.11 hrs, Volume= 0.036 af
 Outflow = 0.60 cfs @ 12.12 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.3 min
 Discarded = 0.01 cfs @ 12.09 hrs, Volume= 0.023 af
 Primary = 0.59 cfs @ 12.12 hrs, Volume= 0.014 af
 Routed to Link 29P : Desing Point #1: Flow to Summer Street

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 399.46' @ 12.12 hrs Surf.Area= 186 sf Storage= 257 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 150.9 min (950.5 - 799.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	396.30'	144 cf	8.00'W x 23.25'L x 2.54'H Field A 473 cf Overall - 113 cf Embedded = 360 cf x 40.0% Voids
#2A	396.80'	113 cf	Cultec R-150XLHD x 4 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 2 rows
#3	398.80'	0 cf	0.50'D x 1.00'H Vertical Cone/Cylinder
		257 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	396.30'	2.400 in/hr Exfiltration over Surface area
#2	Primary	398.80'	4.0" Round Culvert X 2.00 L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.80' / 398.70' S= 0.1000 ' ' Cc= 0.900 n= 0.011, Flow Area= 0.09 sf

Discarded OutFlow Max=0.01 cfs @ 12.09 hrs HW=398.93' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.59 cfs @ 12.12 hrs HW=399.46' TW=0.00' (Dynamic Tailwater)
 ↑**2=Culvert** (Inlet Controls 0.59 cfs @ 3.38 fps)

Pond 27P: Infiltration Field #2 - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 2 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

2 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 21.25' Row Length +12.0" End Stone x 2 = 23.25' Base Length

2 Rows x 33.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 8.00' Base Width

6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

4 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 2 Rows = 112.6 cf Chamber Storage

472.8 cf Field - 112.6 cf Chambers = 360.2 cf Stone x 40.0% Voids = 144.1 cf Stone Storage

Chamber Storage + Stone Storage = 256.6 cf = 0.006 af

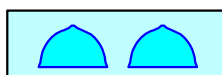
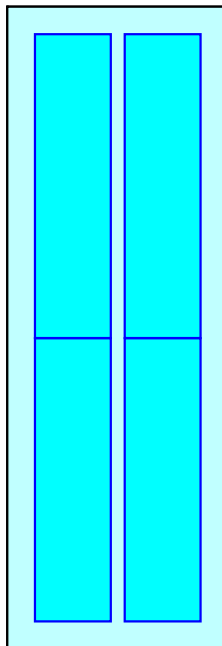
Overall Storage Efficiency = 54.3%

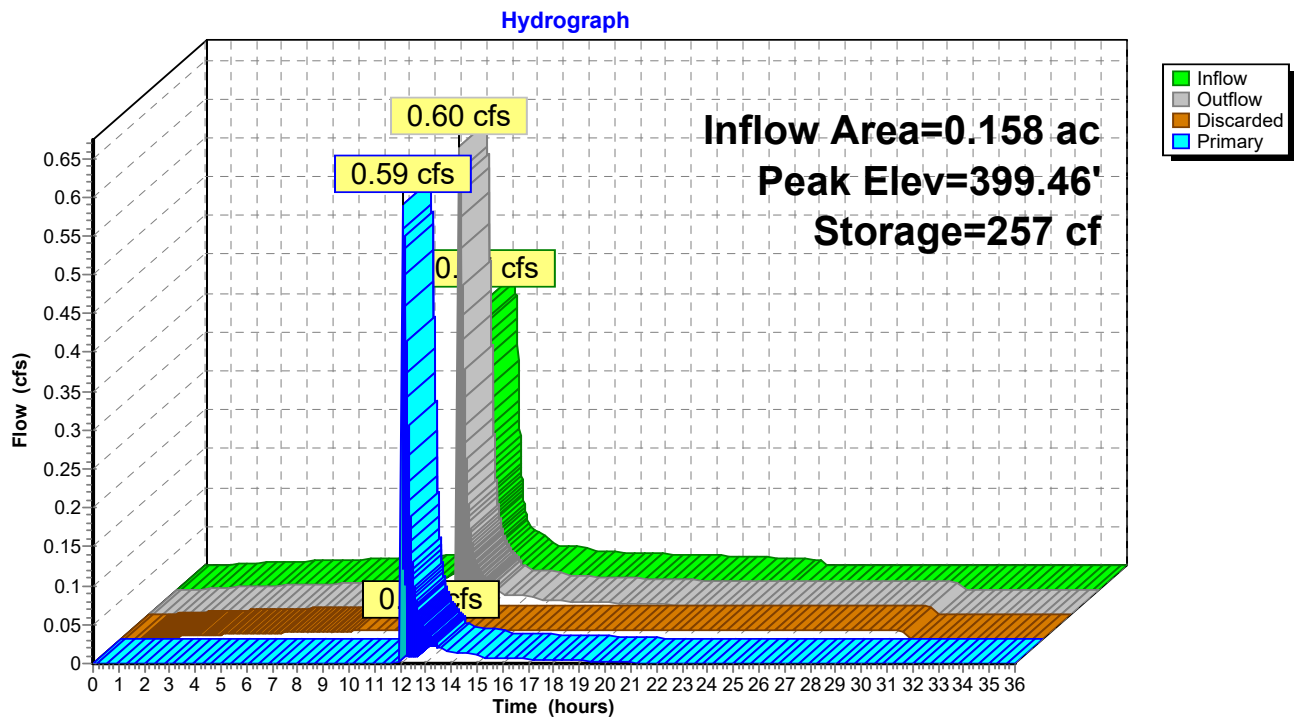
Overall System Size = 23.25' x 8.00' x 2.54'

4 Chambers

17.5 cy Field

13.3 cy Stone



Pond 27P: Infiltration Field #2

Summary for Subcatchment 28P: P1j

Runoff = 2.36 cfs @ 12.20 hrs, Volume= 0.227 af, Depth= 1.50"

Routed to Link 29P : Desing Point #1: Flow to Summer Street

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

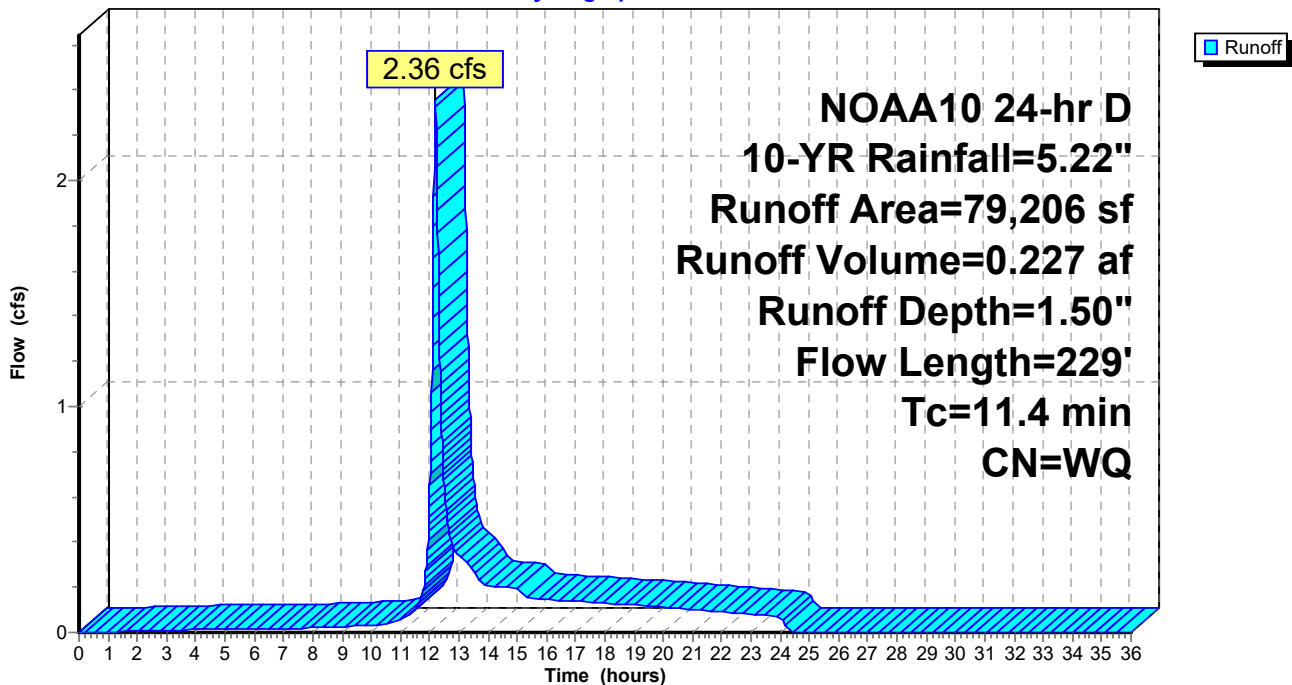
NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
762	98	Roofs HSG B
5,095	98	Paved parking HSG B
49,980	55	Woods, Good HSG B
23,369	61	>75% Grass cover, Good HSG B
79,206		Weighted Average
73,349		92.61% Pervious Area
5,857		7.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
2.3	179	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.4	229	Total			

Subcatchment 28P: P1j

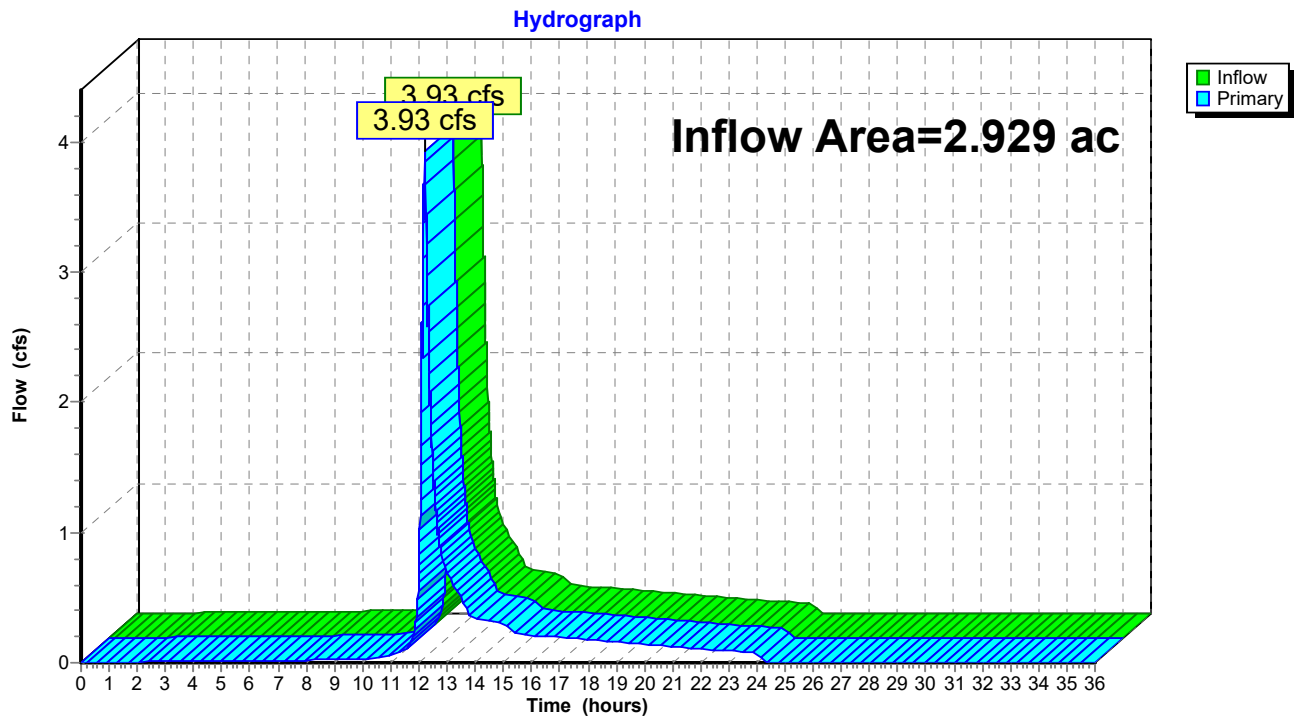
Hydrograph



Summary for Link 29P: Desing Point #1: Flow to Summer Street

Inflow Area = 2.929 ac, 19.21% Impervious, Inflow Depth = 1.43" for 10-YR event
Inflow = 3.93 cfs @ 12.20 hrs, Volume= 0.348 af
Primary = 3.93 cfs @ 12.20 hrs, Volume= 0.348 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 29P: Desing Point #1: Flow to Summer Street

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NOAA10 24-hr D 25-YR Rainfall=6.37"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1P: P1a

Runoff Area=3,133 sf 58.00% Impervious Runoff Depth=4.50"
Flow Length=73' Tc=2.7 min CN=WQ Runoff=0.40 cfs 0.027 af

Pond 2P: Trench Drain 0+28

Peak Elev=412.60' Inflow=0.40 cfs 0.027 af
10.0" Round Culvert n=0.011 L=11.0' S=0.0355 '/' Outflow=0.40 cfs 0.027 af

Pond 3P: First Defense Unit A

Peak Elev=412.60' Inflow=0.40 cfs 0.027 af
10.0" Round Culvert n=0.011 L=12.0' S=0.0050 '/' Outflow=0.40 cfs 0.027 af

Subcatchment4P: P1b

Runoff Area=15,777 sf 29.99% Impervious Runoff Depth=3.30"
Flow Length=168' Tc=10.0 min CN=WQ Runoff=1.13 cfs 0.100 af

Pond 5P: CB 0+88

Peak Elev=412.92' Inflow=1.13 cfs 0.100 af
12.0" Round Culvert x 2.00 n=0.011 L=9.0' S=0.0056 '/' Outflow=1.13 cfs 0.100 af

Pond 6P: FD 0+79

Peak Elev=412.90' Inflow=1.13 cfs 0.100 af
12.0" Round Culvert n=0.011 L=15.0' S=0.0067 '/' Outflow=1.13 cfs 0.100 af

Subcatchment7P: P1c

Runoff Area=8,619 sf 69.83% Impervious Runoff Depth=4.92"
Flow Length=82' Tc=3.9 min CN=WQ Runoff=1.14 cfs 0.081 af

Pond 8P: AD A

Peak Elev=414.69' Inflow=1.14 cfs 0.081 af
6.0" Round Culvert n=0.011 L=19.0' S=0.0500 '/' Outflow=1.14 cfs 0.081 af

Subcatchment9P: P1d

Runoff Area=1,857 sf 100.00% Impervious Runoff Depth=6.13"
Tc=2.0 min CN=98 Runoff=0.31 cfs 0.022 af

Pond 10P: AD B

Peak Elev=417.36' Inflow=0.31 cfs 0.022 af
6.0" Round Culvert n=0.011 L=49.0' S=0.1010 '/' Outflow=0.31 cfs 0.022 af

Subcatchment11P: P1e

Runoff Area=1,233 sf 57.42% Impervious Runoff Depth=4.48"
Flow Length=164' Slope=0.0700 '/' Tc=5.3 min CN=WQ Runoff=0.14 cfs 0.011 af

Pond 12P: Trench Drain A

Peak Elev=413.12' Inflow=0.14 cfs 0.011 af
8.0" Round Culvert n=0.011 L=4.0' S=0.0125 '/' Outflow=0.14 cfs 0.011 af

Pond 13P: AD C

Peak Elev=413.12' Inflow=0.14 cfs 0.011 af
8.0" Round Culvert n=0.011 L=26.0' S=0.0058 '/' Outflow=0.14 cfs 0.011 af

Pond 14P: DMH A

Peak Elev=413.11' Inflow=1.58 cfs 0.113 af
12.0" Round Culvert n=0.011 L=69.0' S=0.0058 '/' Outflow=1.58 cfs 0.113 af

Pond 15P: FD B

Peak Elev=412.95' Inflow=1.58 cfs 0.113 af
12.0" Round Culvert n=0.011 L=8.0' S=0.0125 '/' Outflow=1.58 cfs 0.113 af

Pond 16P: Deep Sump DMH A

Peak Elev=412.82' Inflow=2.45 cfs 0.213 af
12.0" Round Culvert n=0.011 L=16.0' S=0.0062 '/' Outflow=2.45 cfs 0.213 af

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NOAA10 24-hr D 25-YR Rainfall=6.37"

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Subcatchment17P: P1fRunoff Area=10,226 sf 1.29% Impervious Runoff Depth=2.16"
Flow Length=162' Tc=8.3 min CN=WQ Runoff=0.56 cfs 0.042 af**Pond 18P: Infiltration Basin #1**Peak Elev=412.60' Storage=2,806 cf Inflow=3.30 cfs 0.282 af
Discarded=0.06 cfs 0.111 af Primary=1.54 cfs 0.171 af Outflow=1.60 cfs 0.282 af**Pond 19P: DMH B**Peak Elev=411.52' Inflow=1.54 cfs 0.171 af
12.0" Round Culvert n=0.011 L=46.0' S=0.0065 '/' Outflow=1.54 cfs 0.171 af**Subcatchment20P: P1g**Runoff Area=653 sf 100.00% Impervious Runoff Depth=6.13"
Tc=2.0 min CN=98 Runoff=0.11 cfs 0.008 af**Pond 21P: AD D**Peak Elev=400.23' Inflow=0.11 cfs 0.008 af
4.0" Round Culvert n=0.011 L=30.0' S=0.0100 '/' Outflow=0.11 cfs 0.008 af**Pond 22P: Infiltration Field #1**Peak Elev=399.47' Storage=102 cf Inflow=0.11 cfs 0.008 af
Discarded=0.01 cfs 0.008 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.008 af**Subcatchment23P: P1h**Runoff Area=930 sf 100.00% Impervious Runoff Depth=6.13"
Tc=2.0 min CN=98 Runoff=0.15 cfs 0.011 af**Pond 24P: AD E**Peak Elev=399.55' Inflow=0.15 cfs 0.011 af
6.0" Round Culvert n=0.011 L=119.0' S=0.0050 '/' Outflow=0.15 cfs 0.011 af**Subcatchment25P: P1i**Runoff Area=5,938 sf 30.43% Impervious Runoff Depth=3.25"
Flow Length=120' Tc=9.1 min CN=WQ Runoff=0.43 cfs 0.037 af**Pond 26P: AD F&G**Peak Elev=399.56' Inflow=0.43 cfs 0.037 af
8.0" Round Culvert n=0.011 L=4.0' S=0.0500 '/' Outflow=0.43 cfs 0.037 af**Pond 27P: Infiltration Field #2**Peak Elev=399.50' Storage=257 cf Inflow=0.50 cfs 0.048 af
Discarded=0.01 cfs 0.024 af Primary=0.61 cfs 0.024 af Outflow=0.62 cfs 0.048 af**Subcatchment28P: P1j**Runoff Area=79,206 sf 7.39% Impervious Runoff Depth=2.21"
Flow Length=229' Tc=11.4 min CN=WQ Runoff=3.68 cfs 0.335 af**Link 29P: Desing Point #1: Flow to Summer Street**Inflow=5.70 cfs 0.530 af
Primary=5.70 cfs 0.530 af**Total Runoff Area = 2.929 ac Runoff Volume = 0.673 af Average Runoff Depth = 2.76"**
80.79% Pervious = 2.366 ac 19.21% Impervious = 0.563 ac

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NOAA10 24-hr D 25-YR Rainfall=6.37"

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Summary for Subcatchment 1P: P1a

Runoff = 0.40 cfs @ 12.10 hrs, Volume= 0.027 af, Depth= 4.50"
Routed to Pond 2P : Trench Drain 0+28

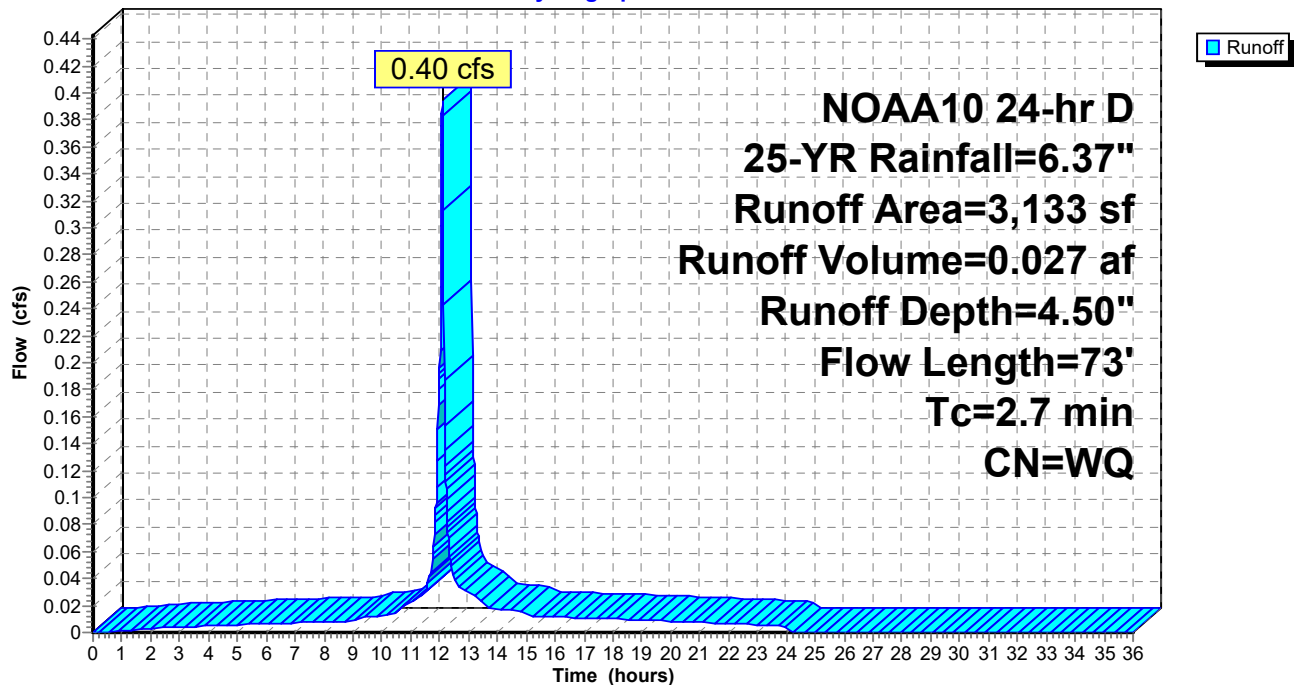
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
1,817	98	Paved parking HSG B
1,316	61	>75% Grass cover, Good HSG B
3,133		Weighted Average
1,316		42.00% Pervious Area
1,817		58.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	23	0.1000	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
0.3	25	0.0300	1.26		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.36"
0.1	25	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7	73	Total			

Subcatchment 1P: P1a

Hydrograph



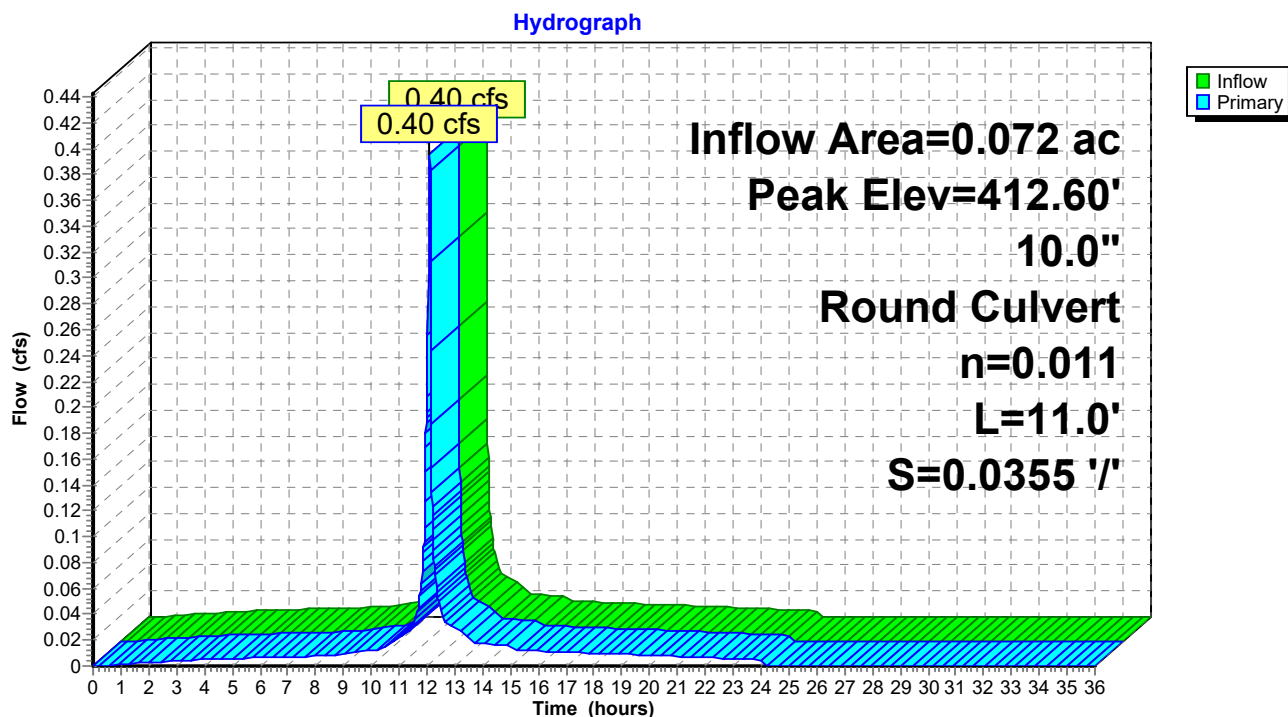
Summary for Pond 2P: Trench Drain 0+28

Inflow Area = 0.072 ac, 58.00% Impervious, Inflow Depth = 4.50" for 25-YR event
 Inflow = 0.40 cfs @ 12.10 hrs, Volume= 0.027 af
 Outflow = 0.40 cfs @ 12.10 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.40 cfs @ 12.10 hrs, Volume= 0.027 af
 Routed to Pond 3P : First Defense Unit A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.60' @ 12.27 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.80'	10.0" Round Culvert L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.80' / 411.41' S= 0.0355 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf

Primary OutFlow Max=0.26 cfs @ 12.10 hrs HW=412.39' TW=412.37' (Dynamic Tailwater)
 1=Culvert (Outlet Controls 0.26 cfs @ 0.87 fps)

Pond 2P: Trench Drain 0+28

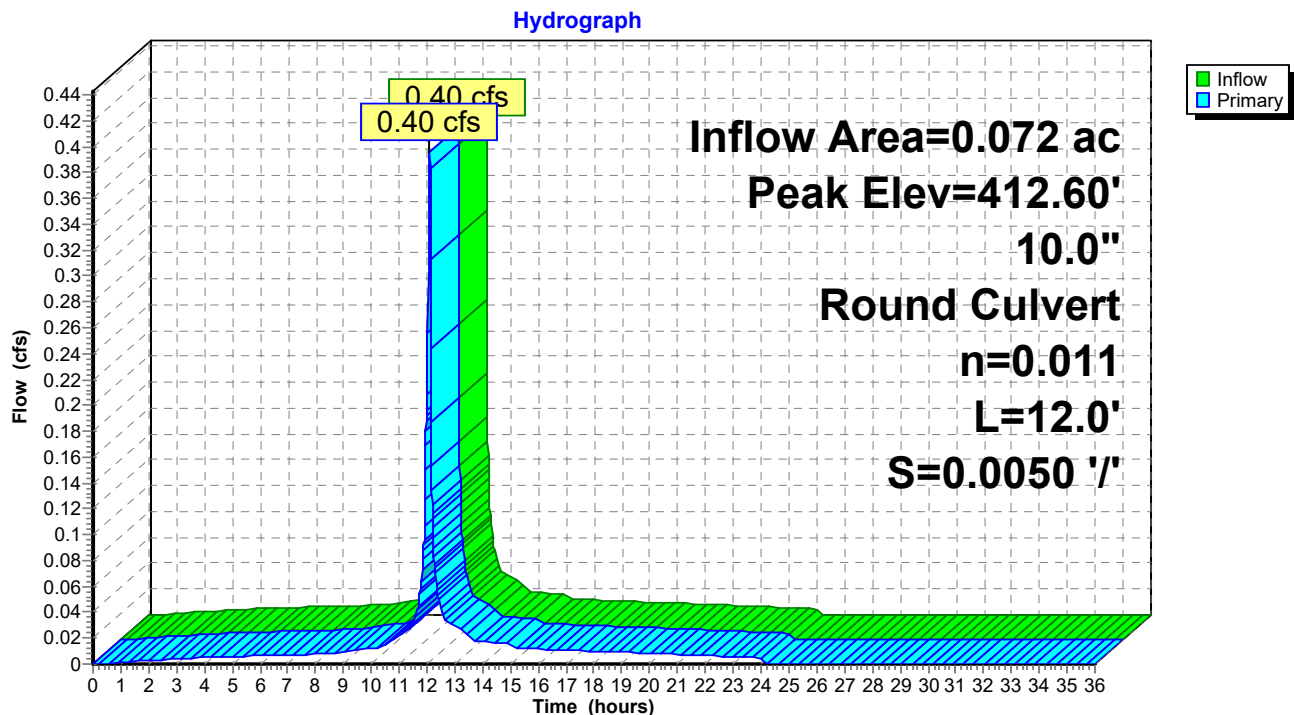
Summary for Pond 3P: First Defense Unit A

Inflow Area = 0.072 ac, 58.00% Impervious, Inflow Depth = 4.50" for 25-YR event
 Inflow = 0.40 cfs @ 12.10 hrs, Volume= 0.027 af
 Outflow = 0.40 cfs @ 12.10 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.40 cfs @ 12.10 hrs, Volume= 0.027 af
 Routed to Pond 18P : Infiltration Basin #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.60' @ 12.26 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.36'	10.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.36' / 411.30' S= 0.0050 '/ Cc= 0.900 n= 0.011, Flow Area= 0.55 sf

Primary OutFlow Max=0.00 cfs @ 12.10 hrs HW=412.37' TW=412.38' (Dynamic Tailwater)
 ↑1=Culvert (Controls 0.00 cfs)

Pond 3P: First Defense Unit A

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NOAA10 24-hr D 25-YR Rainfall=6.37"

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Summary for Subcatchment 4P: P1b

Runoff = 1.13 cfs @ 12.17 hrs, Volume= 0.100 af, Depth= 3.30"
Routed to Pond 5P : CB 0+88

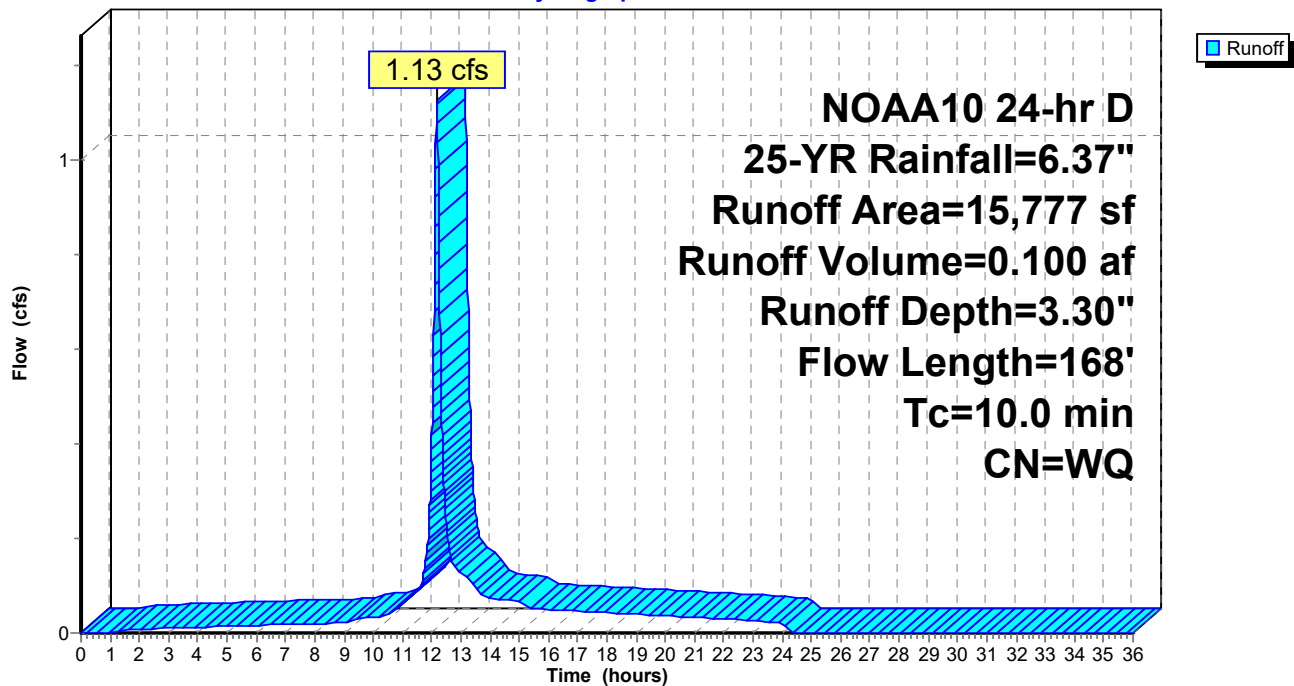
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
3,647	55	Woods, Good, HSG B
4,732	98	Paved parking, HSG B
7,398	61	>75% Grass cover, Good, HSG B
15,777		Weighted Average
11,045		70.01% Pervious Area
4,732		29.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	51	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
0.4	49	0.1100	2.32		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	68	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.0	168	Total			

Subcatchment 4P: P1b

Hydrograph



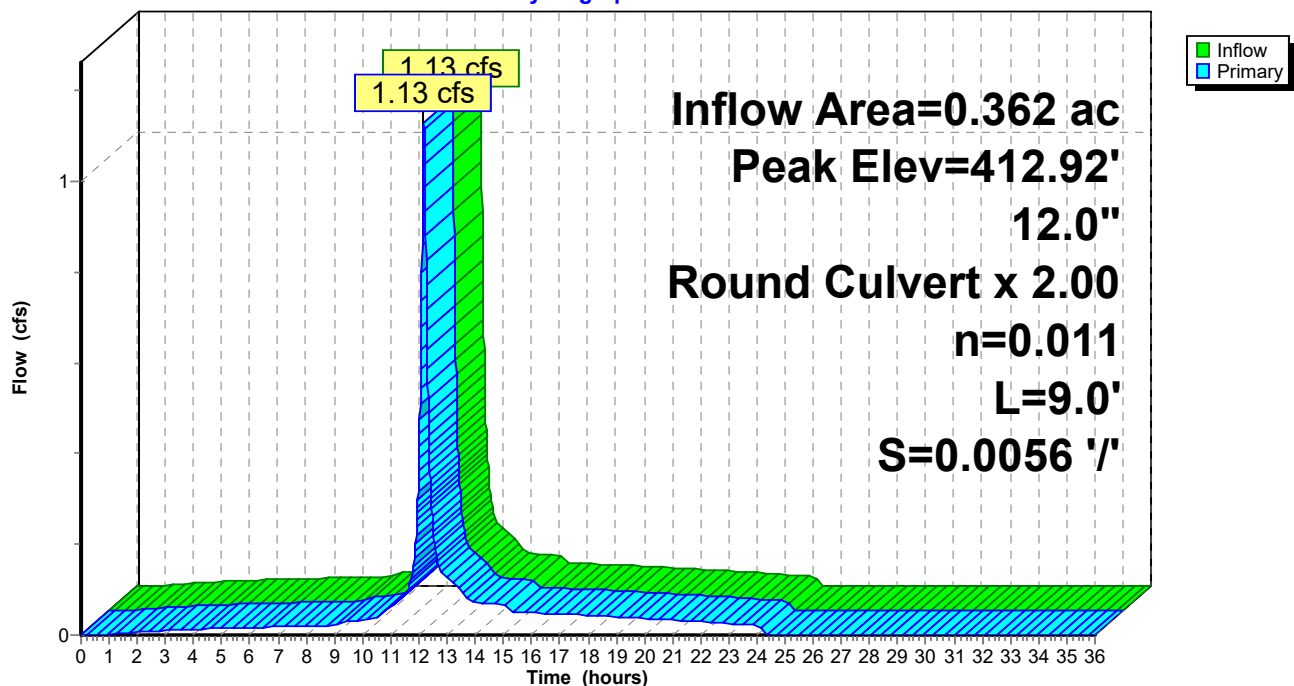
Summary for Pond 5P: CB 0+88

Inflow Area = 0.362 ac, 29.99% Impervious, Inflow Depth = 3.30" for 25-YR event
 Inflow = 1.13 cfs @ 12.17 hrs, Volume= 0.100 af
 Outflow = 1.13 cfs @ 12.17 hrs, Volume= 0.100 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.13 cfs @ 12.17 hrs, Volume= 0.100 af
 Routed to Pond 6P : FD 0+79

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.92' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.65'	12.0" Round Culvert X 2.00 L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.65' / 411.60' S= 0.0056 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.41 cfs @ 12.17 hrs HW=412.90' TW=412.86' (Dynamic Tailwater)
 ↳ **1=Culvert** (Inlet Controls 1.41 cfs @ 0.90 fps)

Pond 5P: CB 0+88**Hydrograph**

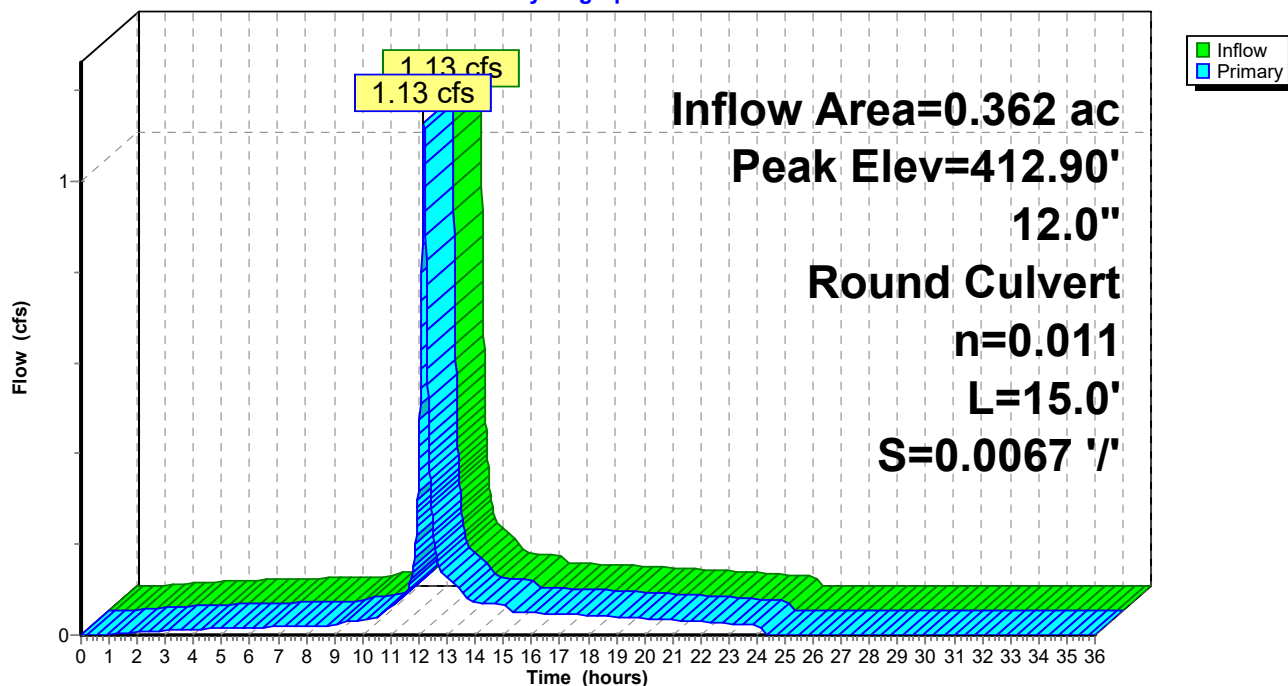
Summary for Pond 6P: FD 0+79

Inflow Area = 0.362 ac, 29.99% Impervious, Inflow Depth = 3.30" for 25-YR event
 Inflow = 1.13 cfs @ 12.17 hrs, Volume= 0.100 af
 Outflow = 1.13 cfs @ 12.17 hrs, Volume= 0.100 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.13 cfs @ 12.17 hrs, Volume= 0.100 af
 Routed to Pond 16P : Deep Sump DMH A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.90' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.55'	12.0" Round Culvert L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.55' / 411.45' S= 0.0067 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.19 cfs @ 12.17 hrs HW=412.86' TW=412.77' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 1.19 cfs @ 1.51 fps)

Pond 6P: FD 0+79**Hydrograph**

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Summary for Subcatchment 7P: P1c

Runoff = 1.14 cfs @ 12.11 hrs, Volume= 0.081 af, Depth= 4.92"
Routed to Pond 8P : AD A

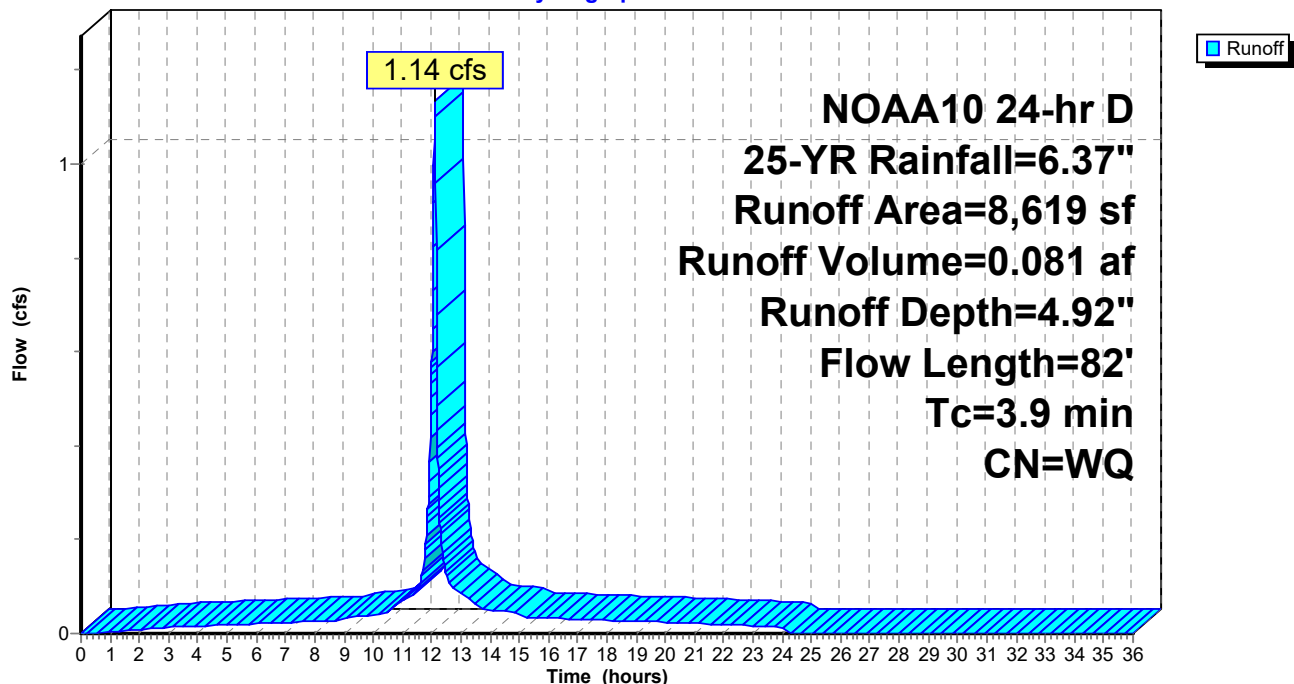
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
924	98	Roofs HSG B
5,095	98	Paved parking HSG B
703	55	Woods, Good HSG B
1,897	61	>75% Grass cover, Good HSG B
8,619		Weighted Average
2,600		30.17% Pervious Area
6,019		69.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	36	0.0700	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
0.1	14	0.0700	1.57		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.36"
0.1	32	0.0600	4.97		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.9	82	Total			

Subcatchment 7P: P1c

Hydrograph



Summary for Pond 8P: AD A

Inflow Area = 0.198 ac, 69.83% Impervious, Inflow Depth = 4.92" for 25-YR event
 Inflow = 1.14 cfs @ 12.11 hrs, Volume= 0.081 af
 Outflow = 1.14 cfs @ 12.11 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.14 cfs @ 12.11 hrs, Volume= 0.081 af
 Routed to Pond 14P : DMH A

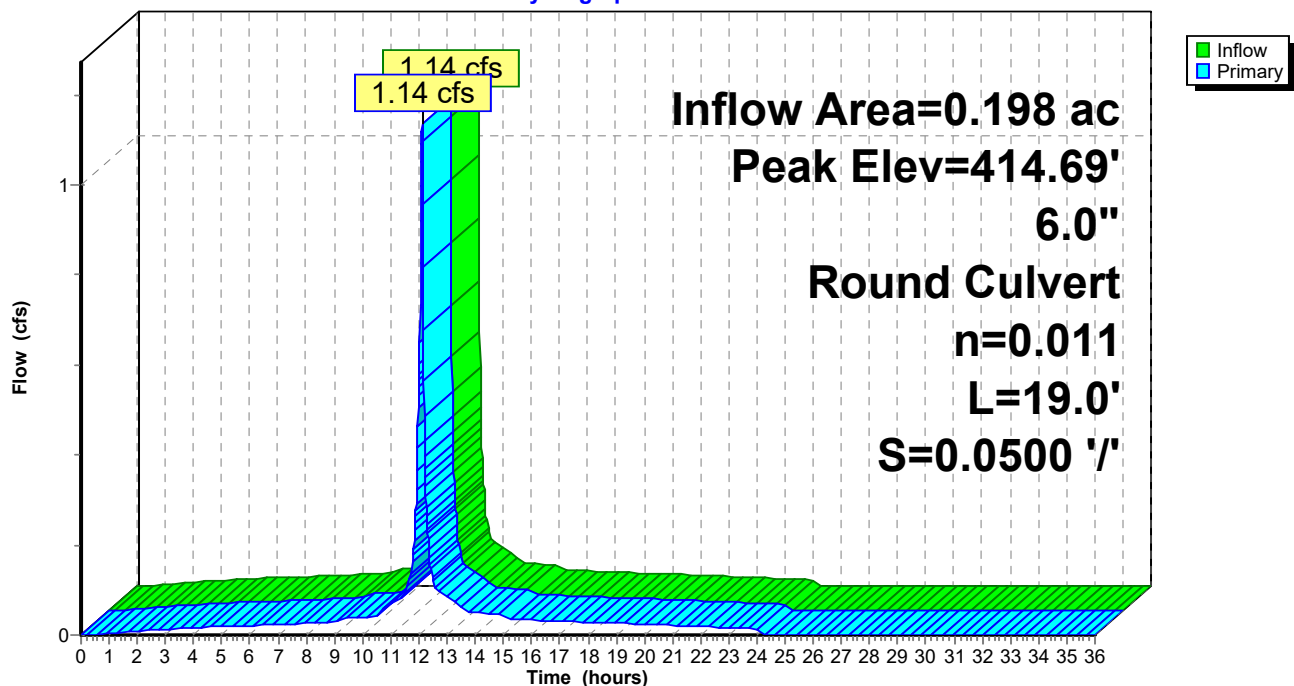
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 414.69' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	413.00'	6.0" Round Culvert L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 413.00' / 412.05' S= 0.0500 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Primary OutFlow Max=1.13 cfs @ 12.11 hrs HW=414.69' TW=413.07' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 1.13 cfs @ 5.78 fps)

Pond 8P: AD A

Hydrograph



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Summary for Subcatchment 9P: P1d

Runoff = 0.31 cfs @ 12.10 hrs, Volume= 0.022 af, Depth= 6.13"
Routed to Pond 10P : AD B

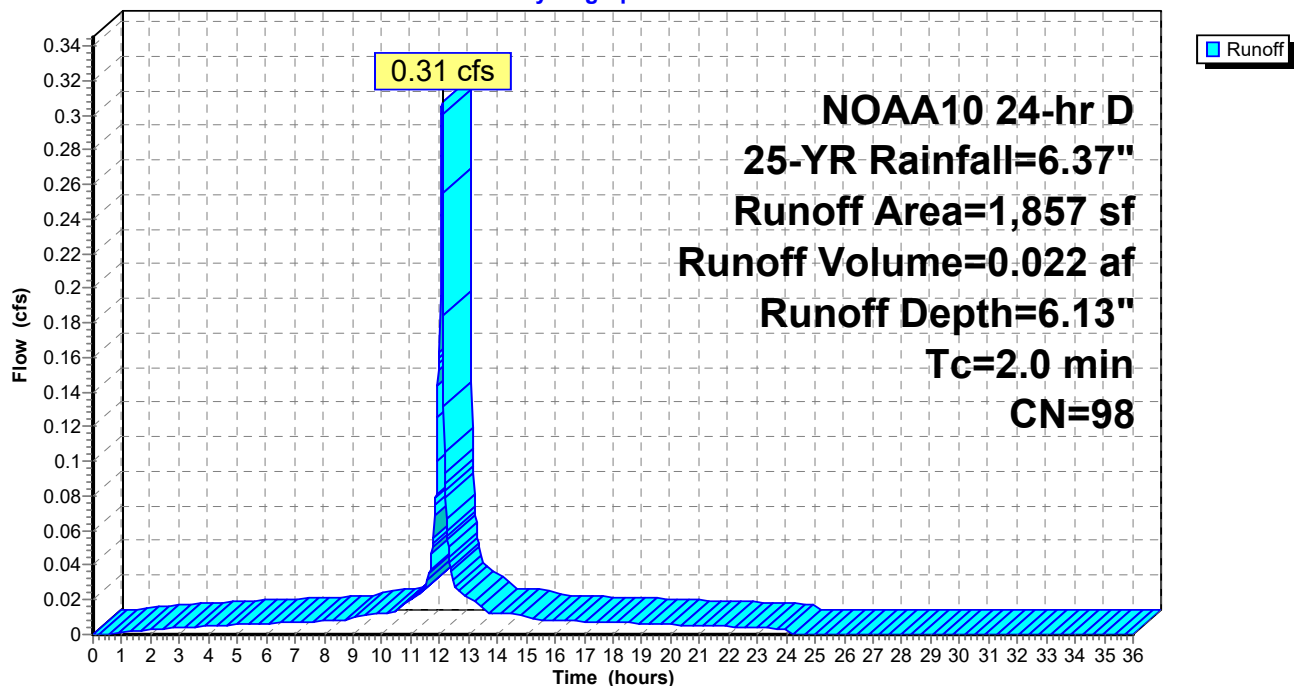
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
1,857	98	Roofs HSG B
1,857		100.00% Impervious Area

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

Subcatchment 9P: P1d

Hydrograph



Summary for Pond 10P: AD B

Inflow Area = 0.043 ac, 100.00% Impervious, Inflow Depth = 6.13" for 25-YR event
 Inflow = 0.31 cfs @ 12.10 hrs, Volume= 0.022 af
 Outflow = 0.31 cfs @ 12.10 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.31 cfs @ 12.10 hrs, Volume= 0.022 af
 Routed to Pond 14P : DMH A

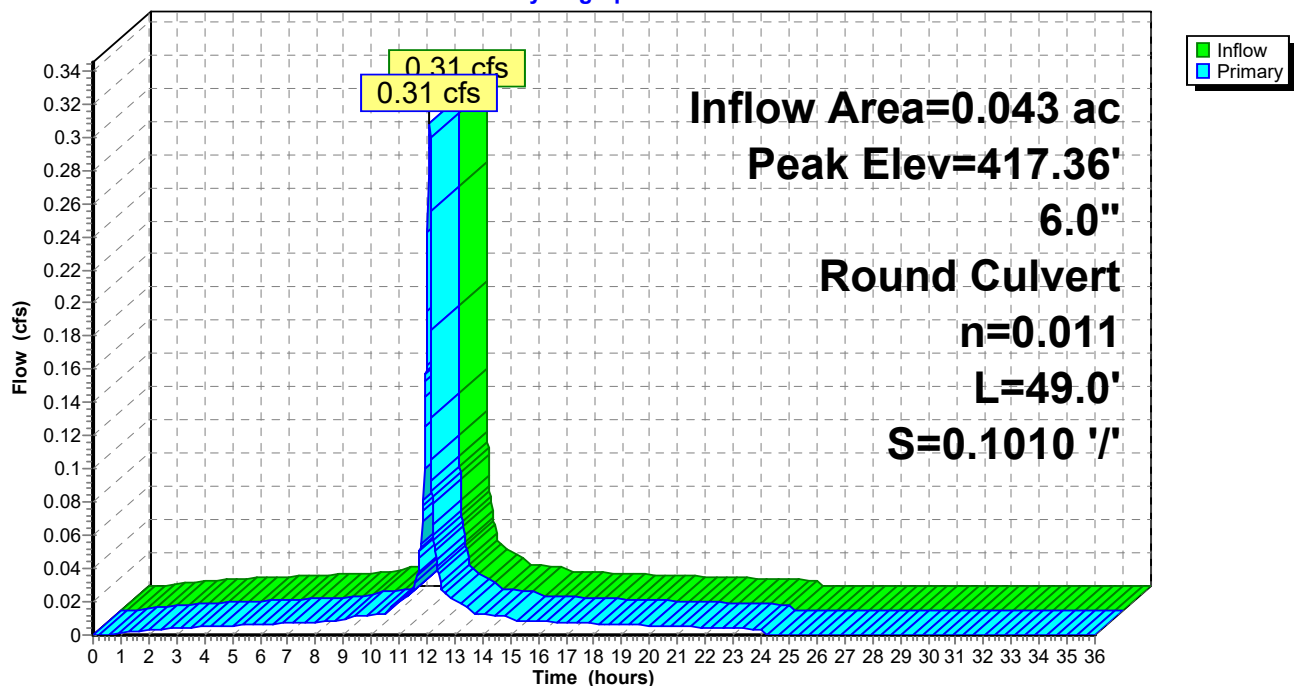
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 417.36' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	417.00'	6.0" Round Culvert L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 417.00' / 412.05' S= 0.1010 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Primary OutFlow Max=0.31 cfs @ 12.10 hrs HW=417.36' TW=413.02' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 0.31 cfs @ 2.04 fps)

Pond 10P: AD B

Hydrograph



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Summary for Subcatchment 11P: P1e

Runoff = 0.14 cfs @ 12.12 hrs, Volume= 0.011 af, Depth= 4.48"
Routed to Pond 12P : Trench Drain A

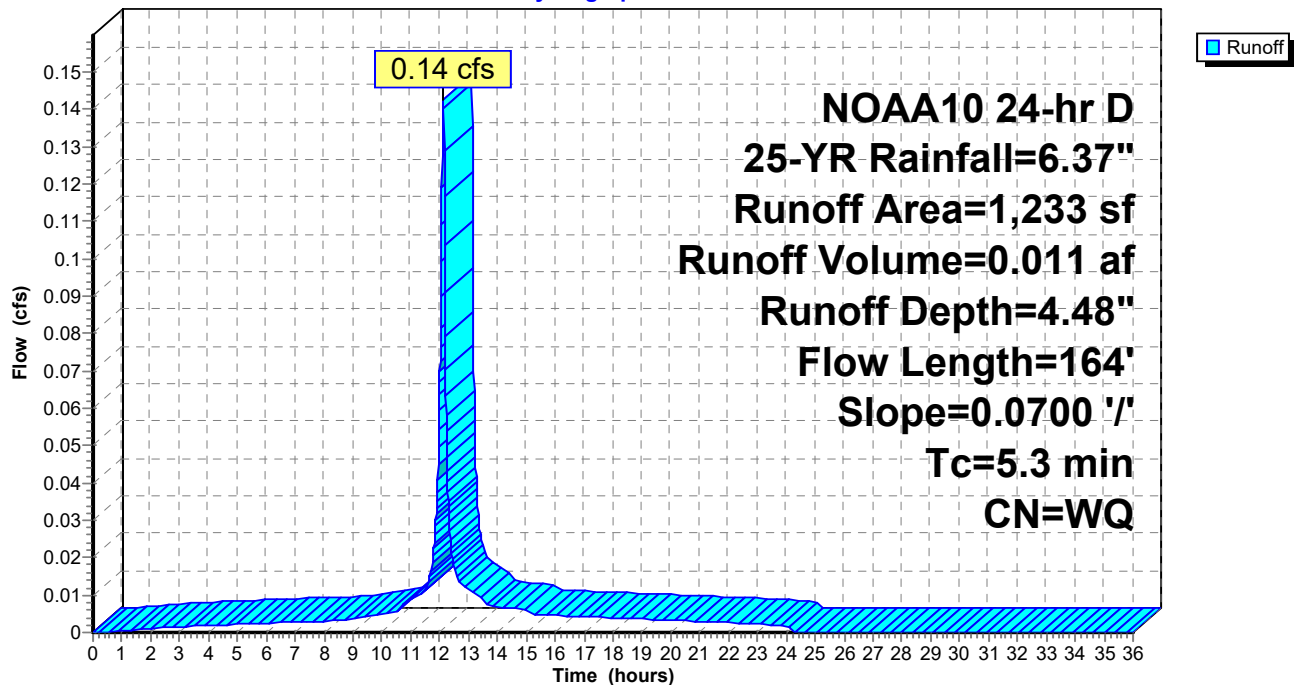
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
708	98	Paved parking HSG B
525	61	>75% Grass cover, Good HSG B
1,233		Weighted Average
525		42.58% Pervious Area
708		57.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
0.2	25	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	89	0.0700	5.37		Shallow Concentrated Flow, Paved Kv= 20.3 fps
5.3	164	Total			

Subcatchment 11P: P1e

Hydrograph



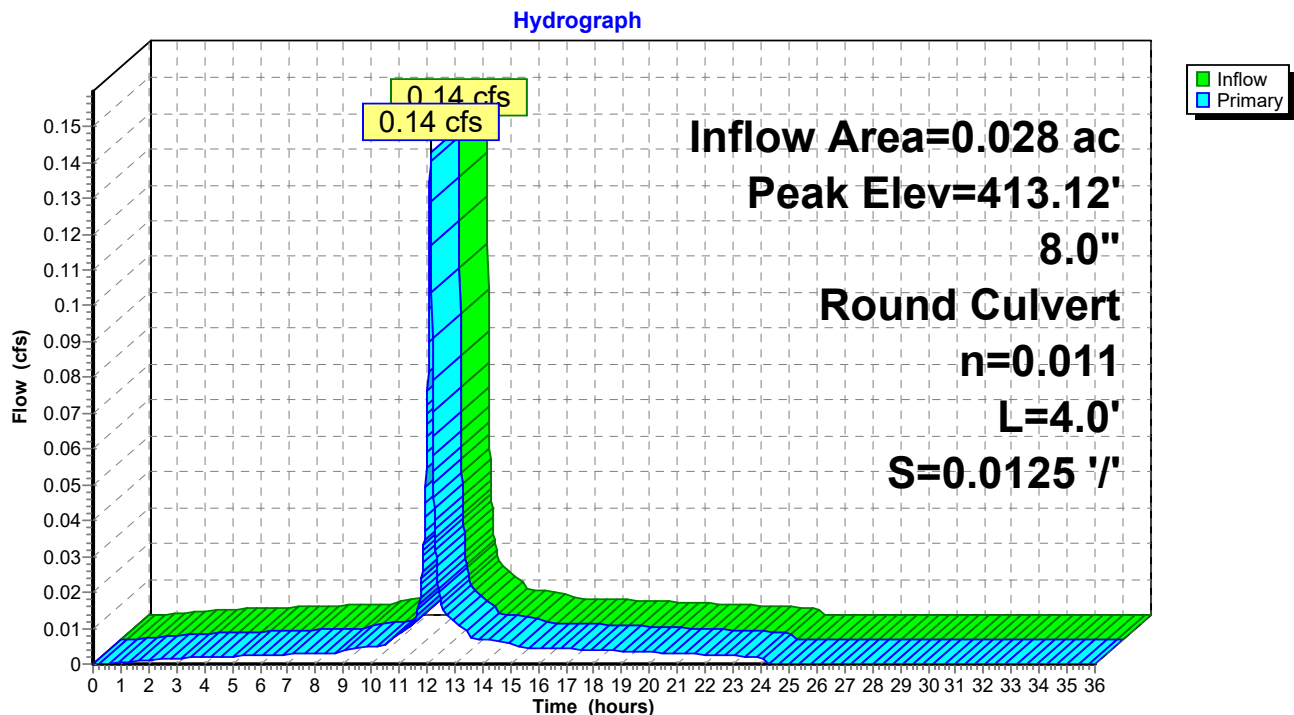
Summary for Pond 12P: Trench Drain A

Inflow Area = 0.028 ac, 57.42% Impervious, Inflow Depth = 4.48" for 25-YR event
 Inflow = 0.14 cfs @ 12.12 hrs, Volume= 0.011 af
 Outflow = 0.14 cfs @ 12.12 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.14 cfs @ 12.12 hrs, Volume= 0.011 af
 Routed to Pond 13P : AD C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 413.12' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	412.30'	8.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.30' / 412.25' S= 0.0125 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.00 cfs @ 12.12 hrs HW=413.05' TW=413.09' (Dynamic Tailwater)
 ↑ **1=Culvert** (Controls 0.00 cfs)

Pond 12P: Trench Drain A

Summary for Pond 13P: AD C

Inflow Area = 0.028 ac, 57.42% Impervious, Inflow Depth = 4.48" for 25-YR event
 Inflow = 0.14 cfs @ 12.12 hrs, Volume= 0.011 af
 Outflow = 0.14 cfs @ 12.12 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.14 cfs @ 12.12 hrs, Volume= 0.011 af
 Routed to Pond 14P : DMH A

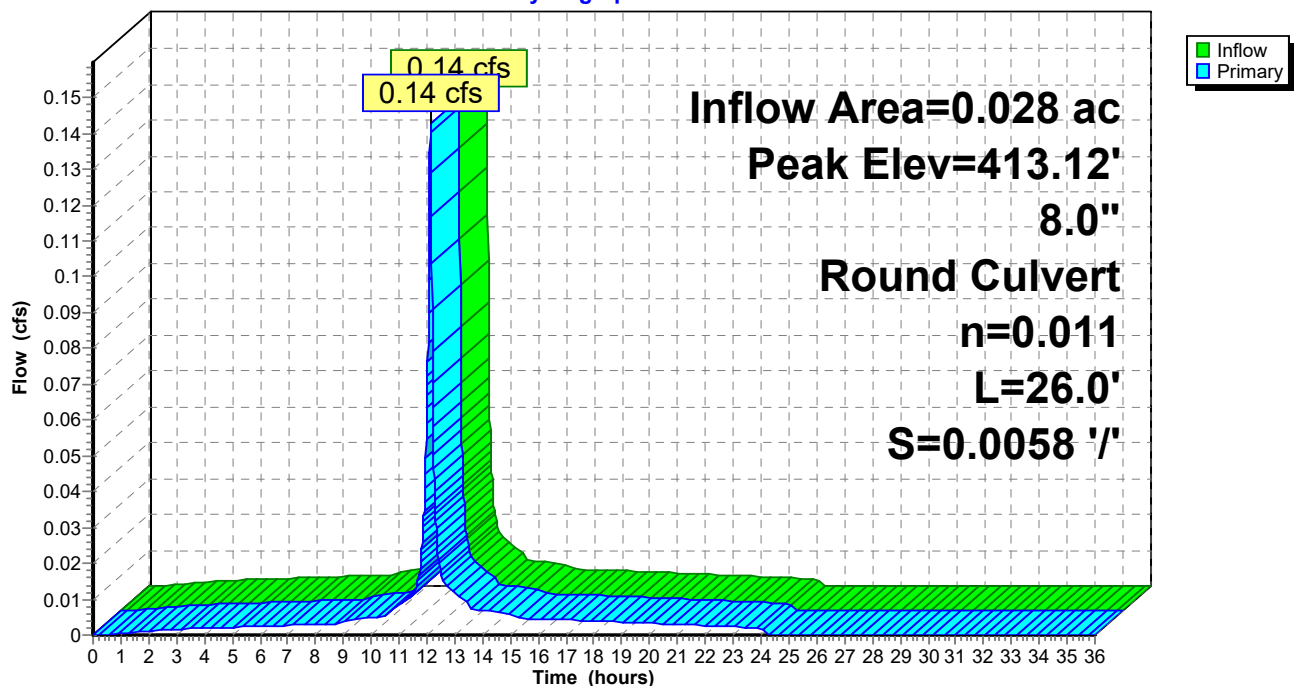
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 413.12' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	412.20'	8.0" Round Culvert L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.20' / 412.05' S= 0.0058 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.00 cfs @ 12.12 hrs HW=413.09' TW=413.10' (Dynamic Tailwater)
 ↑ **1=Culvert** (Controls 0.00 cfs)

Pond 13P: AD C

Hydrograph



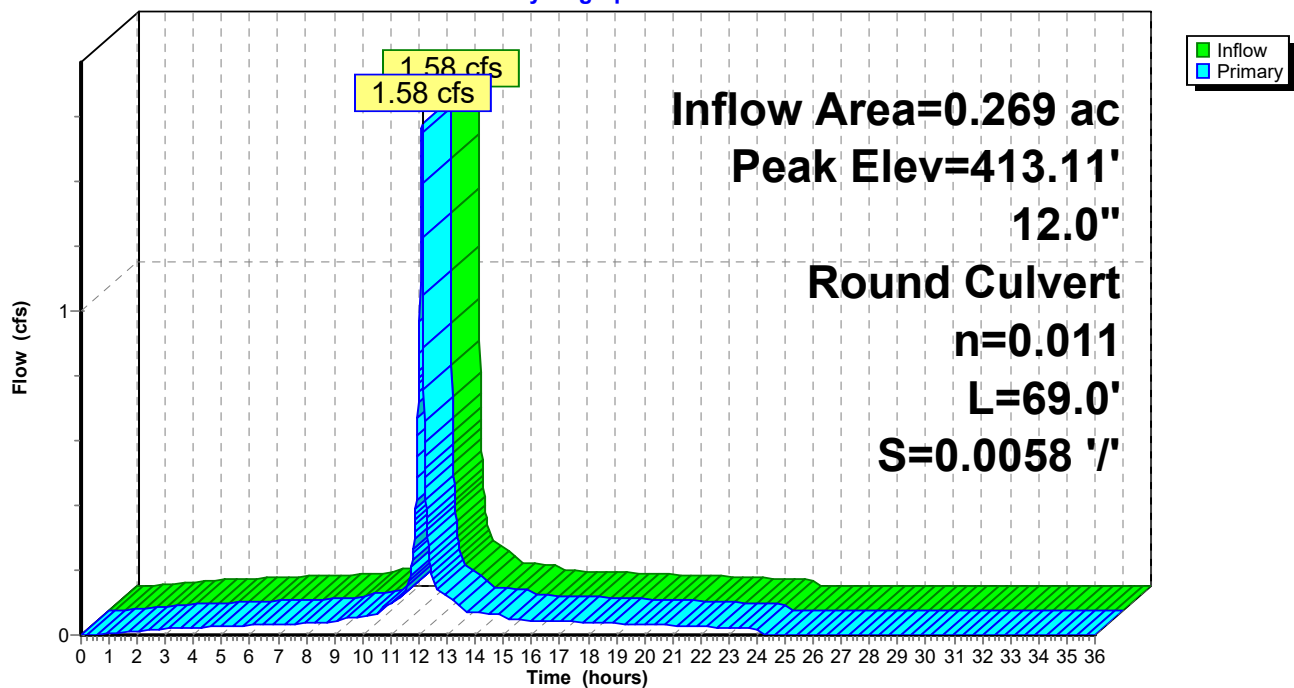
Summary for Pond 14P: DMH A

Inflow Area = 0.269 ac, 73.31% Impervious, Inflow Depth = 5.07" for 25-YR event
 Inflow = 1.58 cfs @ 12.11 hrs, Volume= 0.113 af
 Outflow = 1.58 cfs @ 12.11 hrs, Volume= 0.113 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.58 cfs @ 12.11 hrs, Volume= 0.113 af
 Routed to Pond 15P : FD B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 413.11' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	412.00'	12.0" Round Culvert L= 69.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.00' / 411.60' S= 0.0058 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.34 cfs @ 12.11 hrs HW=413.05' TW=412.88' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 1.34 cfs @ 2.02 fps)

Pond 14P: DMH A**Hydrograph**

Summary for Pond 15P: FD B

Inflow Area = 0.269 ac, 73.31% Impervious, Inflow Depth = 5.07" for 25-YR event
 Inflow = 1.58 cfs @ 12.11 hrs, Volume= 0.113 af
 Outflow = 1.58 cfs @ 12.11 hrs, Volume= 0.113 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.58 cfs @ 12.11 hrs, Volume= 0.113 af
 Routed to Pond 16P : Deep Sump DMH A

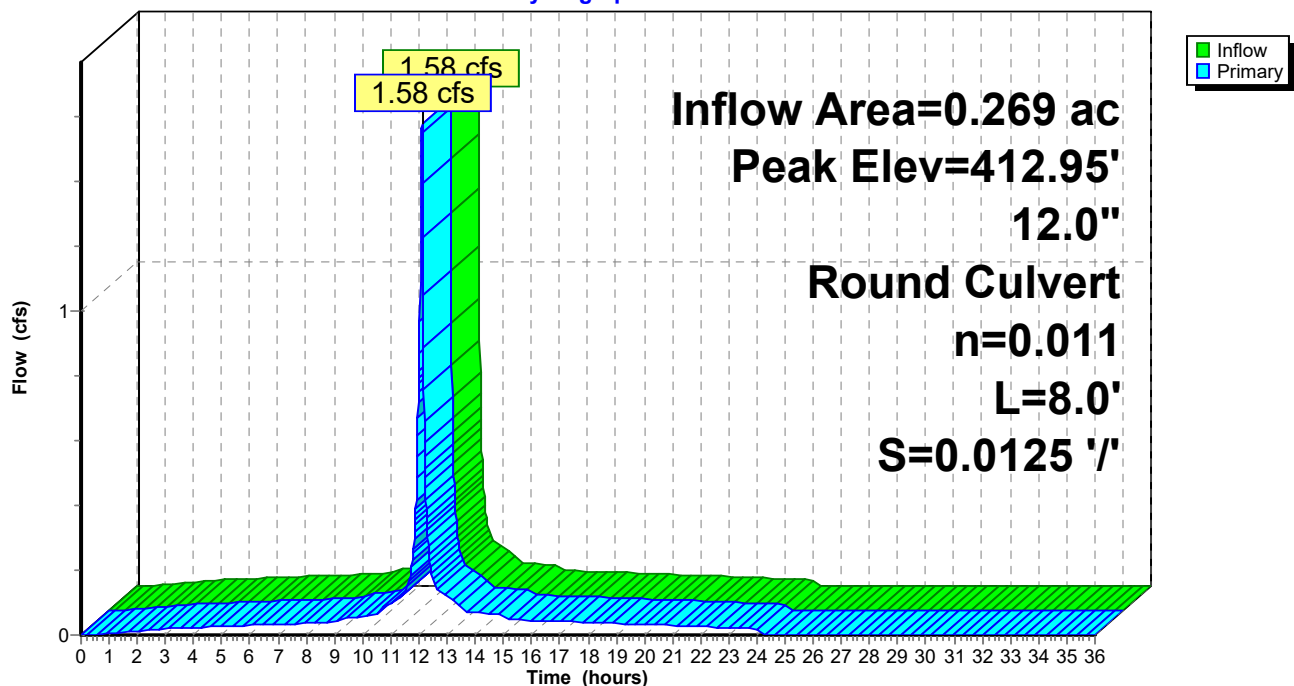
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.95' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.55'	12.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.55' / 411.45' S= 0.0125 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.29 cfs @ 12.11 hrs HW=412.88' TW=412.76' (Dynamic Tailwater)
 ↳ **1=Culvert** (Inlet Controls 1.29 cfs @ 1.64 fps)

Pond 15P: FD B

Hydrograph



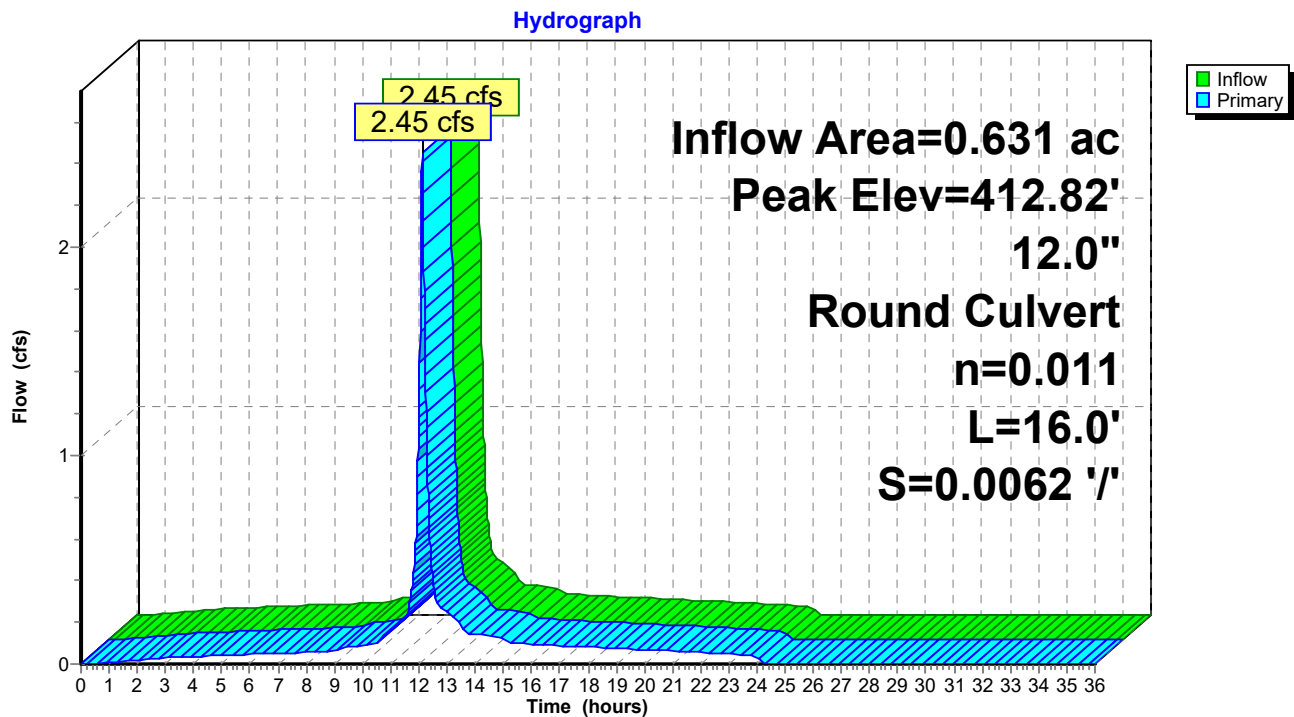
Summary for Pond 16P: Deep Sump DMH A

Inflow Area = 0.631 ac, 48.45% Impervious, Inflow Depth = 4.05" for 25-YR event
 Inflow = 2.45 cfs @ 12.12 hrs, Volume= 0.213 af
 Outflow = 2.45 cfs @ 12.12 hrs, Volume= 0.213 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.45 cfs @ 12.12 hrs, Volume= 0.213 af
 Routed to Pond 18P : Infiltration Basin #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.82' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.40'	12.0" Round Culvert L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.40' / 411.30' S= 0.0062 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=2.35 cfs @ 12.12 hrs HW=412.80' TW=412.41' (Dynamic Tailwater)
 ↳ **1=Culvert** (Inlet Controls 2.35 cfs @ 3.00 fps)

Pond 16P: Deep Sump DMH A

Summary for Subcatchment 17P: P1f

Runoff = 0.56 cfs @ 12.16 hrs, Volume= 0.042 af, Depth= 2.16"
 Routed to Pond 18P : Infiltration Basin #1

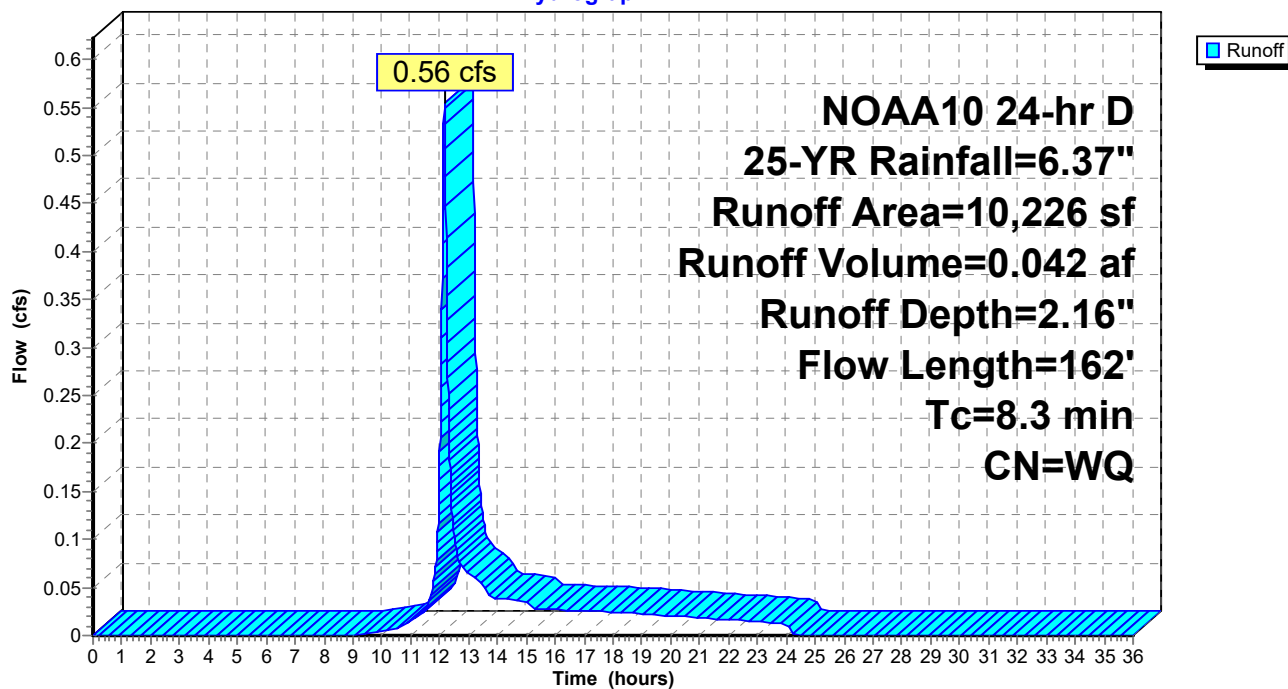
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
132	98	Paved parking, HSG B
2,793	55	Woods, Good HSG B
7,301	61	>75% Grass cover, Good HSG B
10,226		Weighted Average
10,094		98.71% Pervious Area
132		1.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	22	0.0700	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
4.6	28	0.0700	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
0.9	75	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	37	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
8.3	162	Total			

Subcatchment 17P: P1f

Hydrograph



Summary for Pond 18P: Infiltration Basin #1

Inflow Area = 0.938 ac, 37.37% Impervious, Inflow Depth = 3.61" for 25-YR event
 Inflow = 3.30 cfs @ 12.12 hrs, Volume= 0.282 af
 Outflow = 1.60 cfs @ 12.25 hrs, Volume= 0.282 af, Atten= 52%, Lag= 8.2 min
 Discarded = 0.06 cfs @ 12.25 hrs, Volume= 0.111 af
 Primary = 1.54 cfs @ 12.25 hrs, Volume= 0.171 af
 Routed to Pond 19P : DMH B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.60' @ 12.25 hrs Surf.Area= 2,523 sf Storage= 2,806 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 102.0 min (905.0 - 803.0)

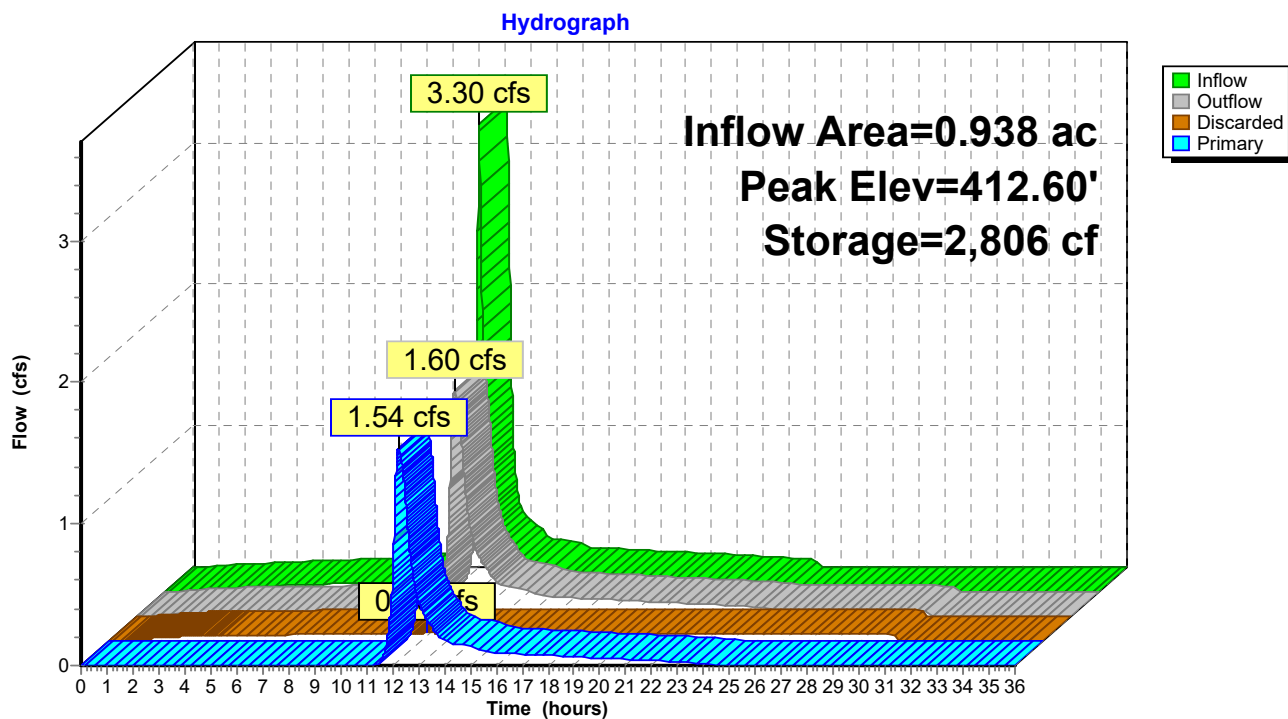
Volume	Invert	Avail.Storage	Storage Description		
#1	411.30'	6,950 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
411.30	1,814	182.0	0	0	1,814
414.00	3,418	231.0	6,950	6,950	3,518

Device	Routing	Invert	Outlet Devices
#1	Primary	411.30'	15.0" Round Culvert L= 13.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.30' / 410.85' S= 0.0346 ' S= 0.0346 ' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf
#2	Discarded	411.30'	1.020 in/hr Exfiltration over Surface area
#3	Device 1	411.80'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	411.80'	3.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 12.25 hrs HW=412.60' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=1.54 cfs @ 12.25 hrs HW=412.60' TW=411.52' (Dynamic Tailwater)
 ↳ **1=Culvert** (Passes 1.54 cfs of 4.85 cfs potential flow)
 ↳ **3=Orifice/Grate** (Orifice Controls 1.15 cfs @ 3.29 fps)
 ↳ **4=Orifice/Grate** (Orifice Controls 0.39 cfs @ 3.95 fps)

Pond 18P: Infiltration Basin #1



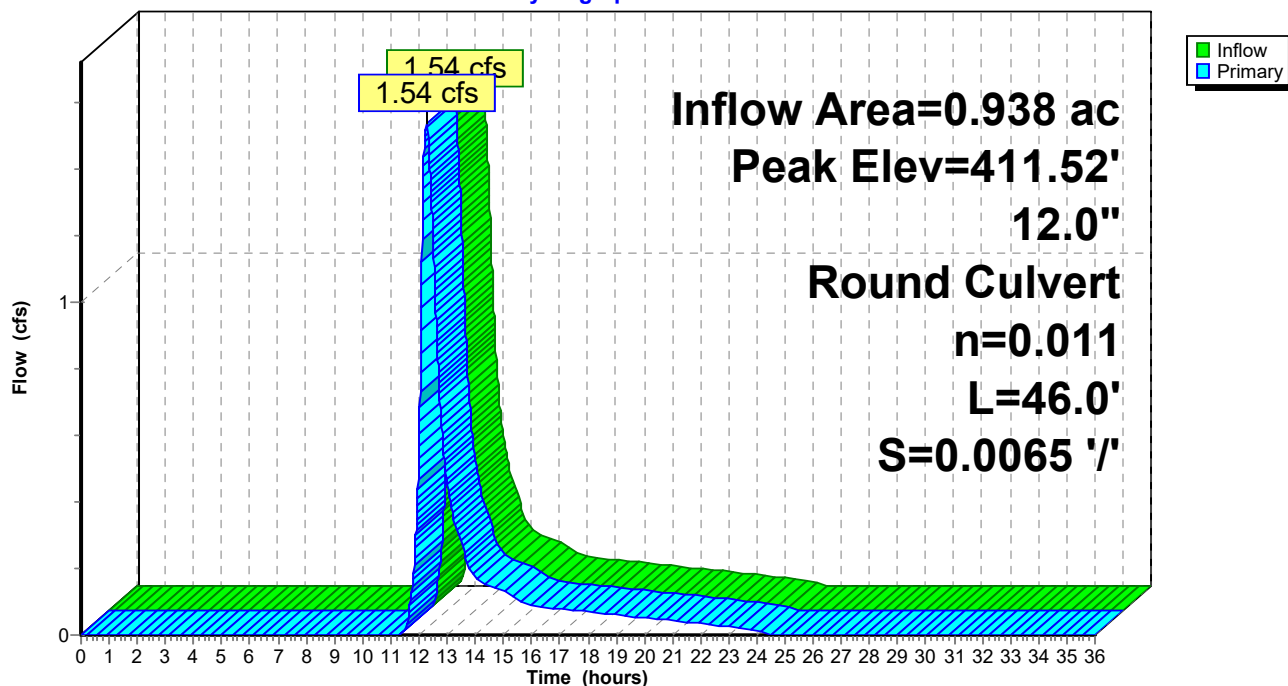
Summary for Pond 19P: DMH B

Inflow Area = 0.938 ac, 37.37% Impervious, Inflow Depth = 2.19" for 25-YR event
 Inflow = 1.54 cfs @ 12.25 hrs, Volume= 0.171 af
 Outflow = 1.54 cfs @ 12.25 hrs, Volume= 0.171 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.54 cfs @ 12.25 hrs, Volume= 0.171 af
 Routed to Link 29P : Desing Point #1: Flow to Summer Street

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 411.52' @ 12.25 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	410.80'	12.0" Round Culvert L= 46.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 410.80' / 410.50' S= 0.0065 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.54 cfs @ 12.25 hrs HW=411.52' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 1.54 cfs @ 3.54 fps)

Pond 19P: DMH B**Hydrograph**

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NOAA10 24-hr D 25-YR Rainfall=6.37"

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Summary for Subcatchment 20P: P1g

Runoff = 0.11 cfs @ 12.10 hrs, Volume= 0.008 af, Depth= 6.13"
Routed to Pond 21P : AD D

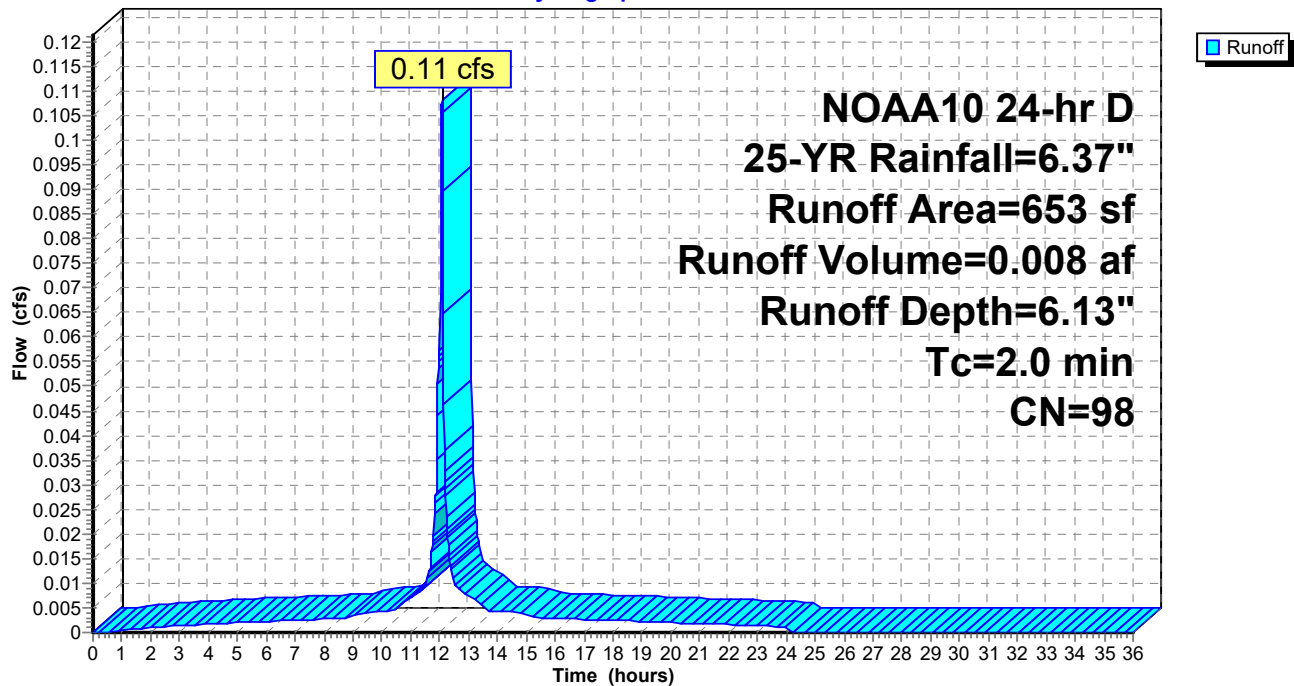
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
653	98	Roofs HSG B
653		100.00% Impervious Area

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

Subcatchment 20P: P1g

Hydrograph



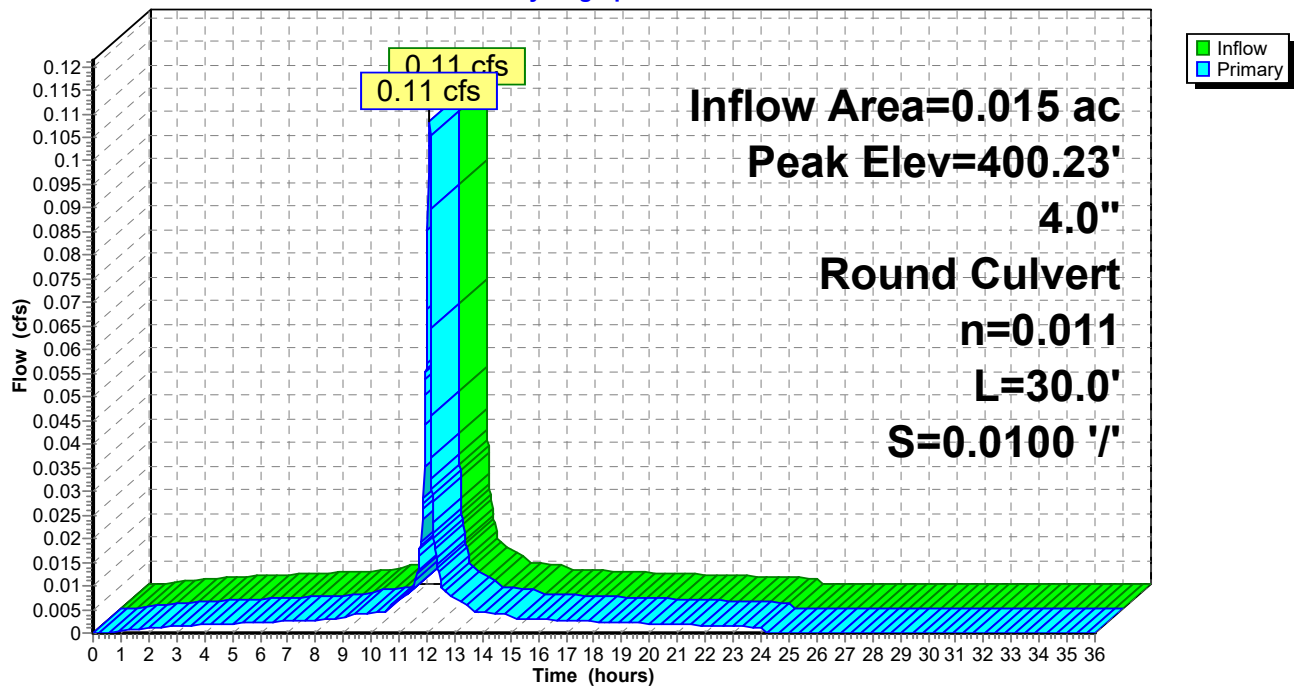
Summary for Pond 21P: AD D

Inflow Area = 0.015 ac, 100.00% Impervious, Inflow Depth = 6.13" for 25-YR event
 Inflow = 0.11 cfs @ 12.10 hrs, Volume= 0.008 af
 Outflow = 0.11 cfs @ 12.10 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.11 cfs @ 12.10 hrs, Volume= 0.008 af
 Routed to Pond 22P : Infiltration Field #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 400.23' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	400.00'	4.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 400.00' / 399.70' S= 0.0100 '/ Cc= 0.900 n= 0.011, Flow Area= 0.09 sf

Primary OutFlow Max=0.11 cfs @ 12.10 hrs HW=400.23' TW=398.94' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 0.11 cfs @ 1.65 fps)

Pond 21P: AD D**Hydrograph**

Summary for Pond 22P: Infiltration Field #1

Inflow Area = 0.015 ac, 100.00% Impervious, Inflow Depth = 6.13" for 25-YR event
 Inflow = 0.11 cfs @ 12.10 hrs, Volume= 0.008 af
 Outflow = 0.01 cfs @ 11.15 hrs, Volume= 0.008 af, Atten= 95%, Lag= 0.0 min
 Discarded = 0.01 cfs @ 11.15 hrs, Volume= 0.008 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 29P : Desing Point #1: Flow to Summer Street

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 399.47' @ 13.44 hrs Surf.Area= 104 sf Storage= 102 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 119.9 min (862.5 - 742.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	397.80'	82 cf	8.00'W x 13.00'L x 2.54'H Field A 264 cf Overall - 58 cf Embedded = 206 cf x 40.0% Voids
#2A	398.30'	58 cf	Cultec R-150XLHD x 2 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 2 rows
#3	400.30'	2 cf	1.00'D x 2.00'H Vertical Cone/Cylinder
		142 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.80'	2.400 in/hr Exfiltration over Surface area
#2	Primary	400.30'	4.0" Round Culvert X 2.00 L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 400.30' / 400.20' S= 0.1000 ' ' Cc= 0.900 n= 0.011, Flow Area= 0.09 sf

Discarded OutFlow Max=0.01 cfs @ 11.15 hrs HW=397.85' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=397.80' TW=0.00' (Dynamic Tailwater)

↑ **2=Culvert** (Controls 0.00 cfs)

Pond 22P: Infiltration Field #1 - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 2 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

1 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 11.00' Row Length +12.0" End Stone x 2 = 13.00' Base Length

2 Rows x 33.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 8.00' Base Width

6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

2 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 2 Rows = 58.3 cf Chamber Storage

264.3 cf Field - 58.3 cf Chambers = 206.1 cf Stone x 40.0% Voids = 82.4 cf Stone Storage

Chamber Storage + Stone Storage = 140.7 cf = 0.003 af

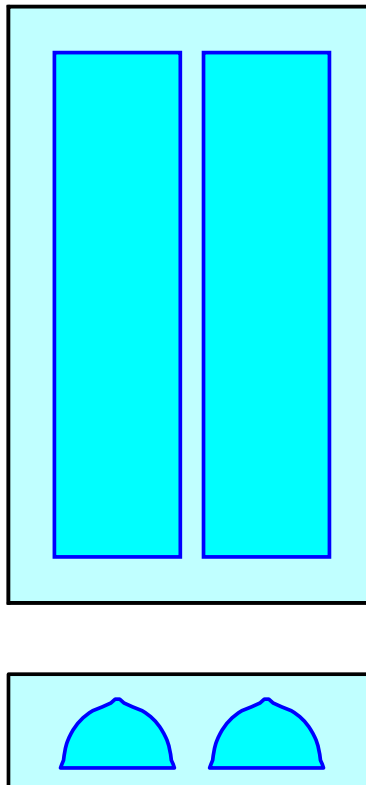
Overall Storage Efficiency = 53.2%

Overall System Size = 13.00' x 8.00' x 2.54'

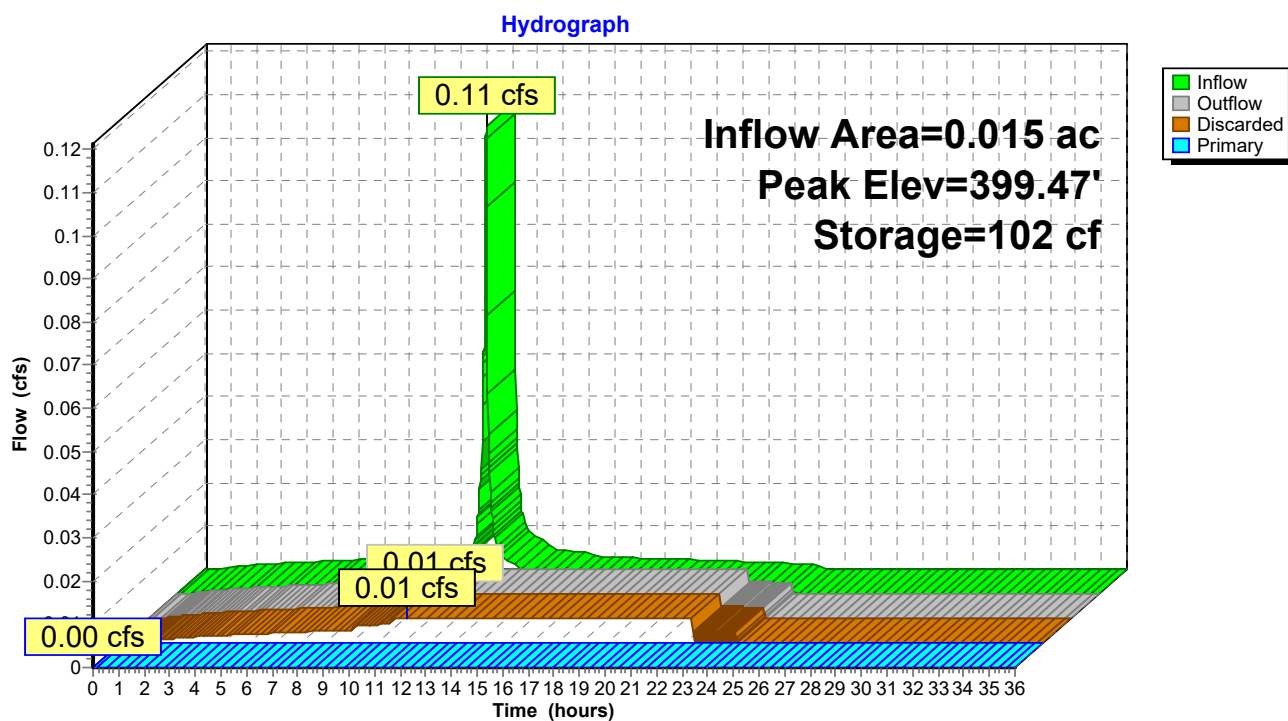
2 Chambers

9.8 cy Field

7.6 cy Stone



Pond 22P: Infiltration Field #1



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Summary for Subcatchment 23P: P1h

Runoff = 0.15 cfs @ 12.10 hrs, Volume= 0.011 af, Depth= 6.13"
Routed to Pond 24P : AD E

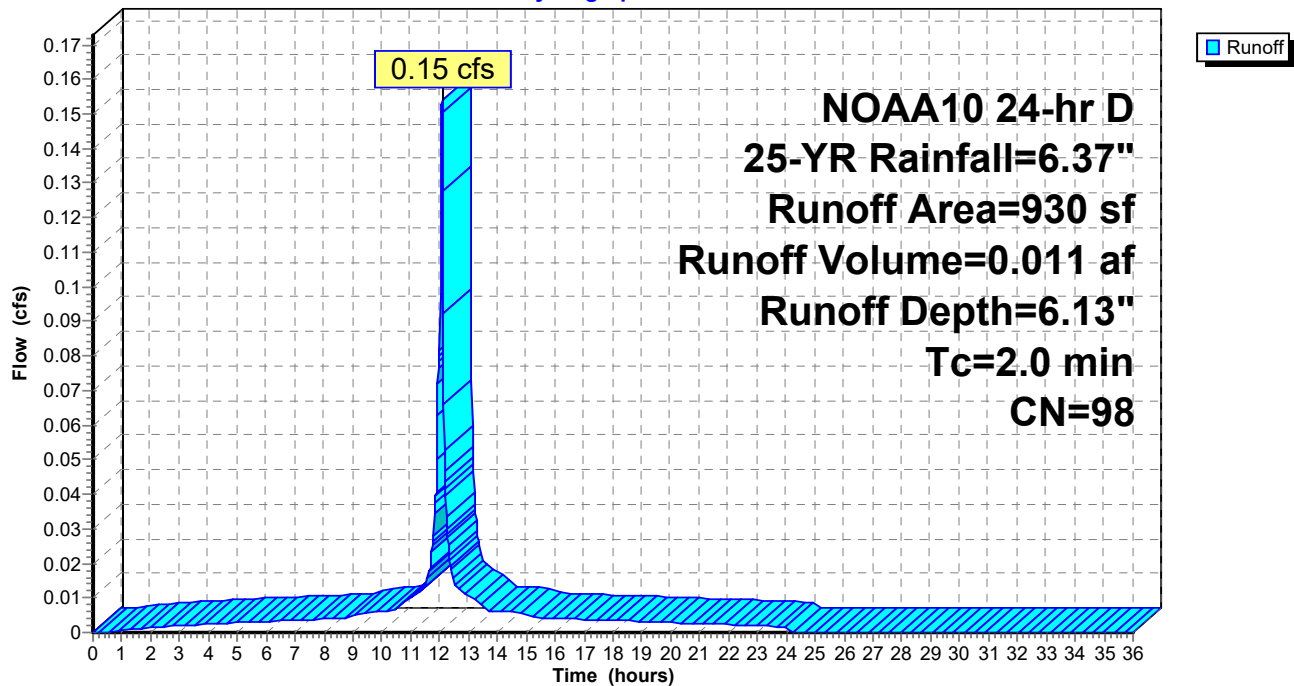
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
930	98	Roofs HSG B
930		100.00% Impervious Area

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

Subcatchment 23P: P1h

Hydrograph



Summary for Pond 24P: AD E

Inflow Area = 0.021 ac, 100.00% Impervious, Inflow Depth = 6.13" for 25-YR event
 Inflow = 0.15 cfs @ 12.10 hrs, Volume= 0.011 af
 Outflow = 0.15 cfs @ 12.10 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.15 cfs @ 12.10 hrs, Volume= 0.011 af
 Routed to Pond 27P : Infiltration Field #2

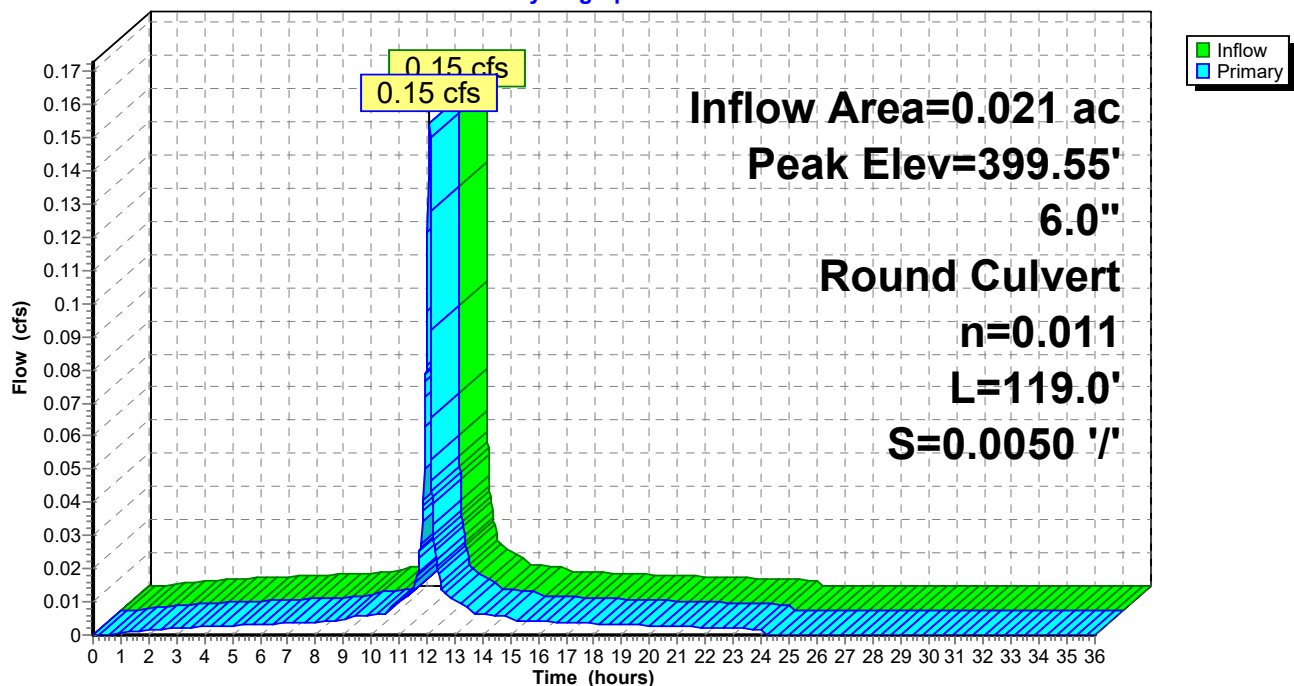
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 399.55' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	398.00'	6.0" Round Culvert L= 119.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.00' / 397.40' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Primary OutFlow Max=0.00 cfs @ 12.10 hrs HW=399.17' TW=399.48' (Dynamic Tailwater)
 ↑ **1=Culvert** (Controls 0.00 cfs)

Pond 24P: AD E

Hydrograph



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Summary for Subcatchment 25P: P1i

Runoff = 0.43 cfs @ 12.16 hrs, Volume= 0.037 af, Depth= 3.25"
 Routed to Pond 26P : AD F&G

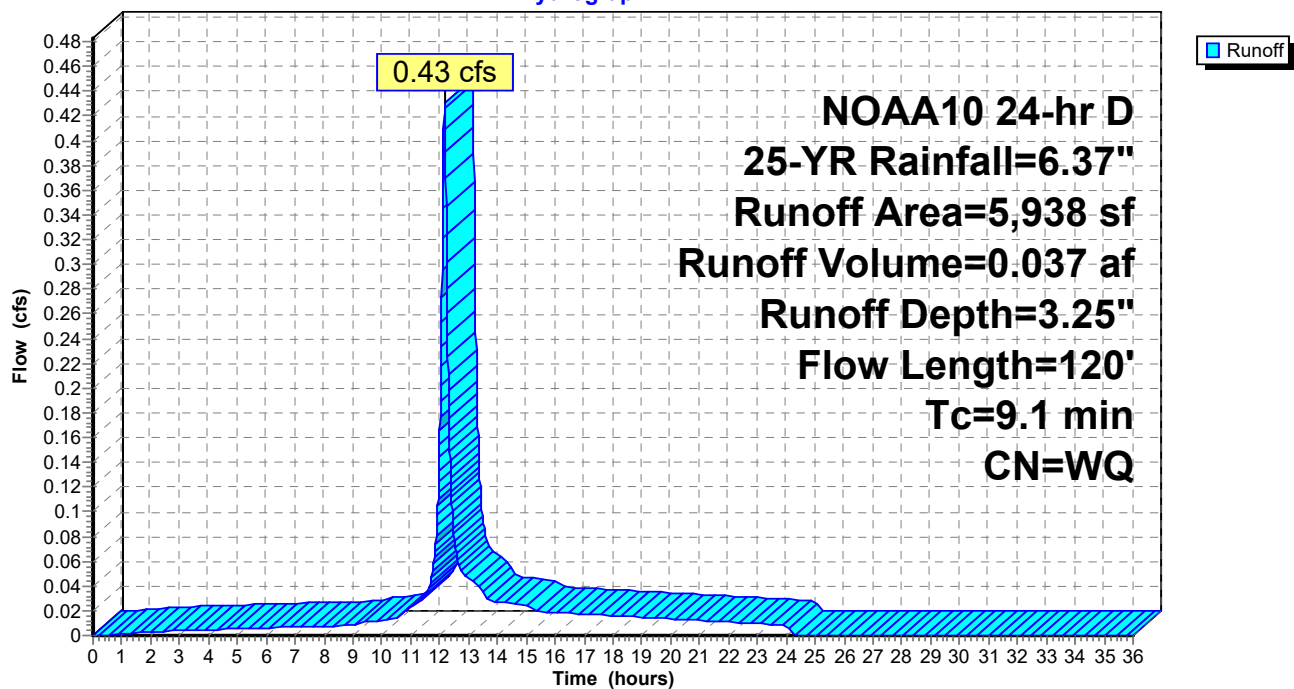
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
1,807	98	Paved parking HSG B
2,161	55	Woods, Good HSG B
1,970	61	>75% Grass cover, Good HSG B
5,938		Weighted Average
4,131		69.57% Pervious Area
1,807		30.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0500	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
0.4	26	0.0500	1.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	24	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.1	120	Total			

Subcatchment 25P: P1i

Hydrograph



Summary for Pond 26P: AD F&G

Inflow Area = 0.136 ac, 30.43% Impervious, Inflow Depth = 3.25" for 25-YR event
 Inflow = 0.43 cfs @ 12.16 hrs, Volume= 0.037 af
 Outflow = 0.43 cfs @ 12.16 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.43 cfs @ 12.16 hrs, Volume= 0.037 af
 Routed to Pond 27P : Infiltration Field #2

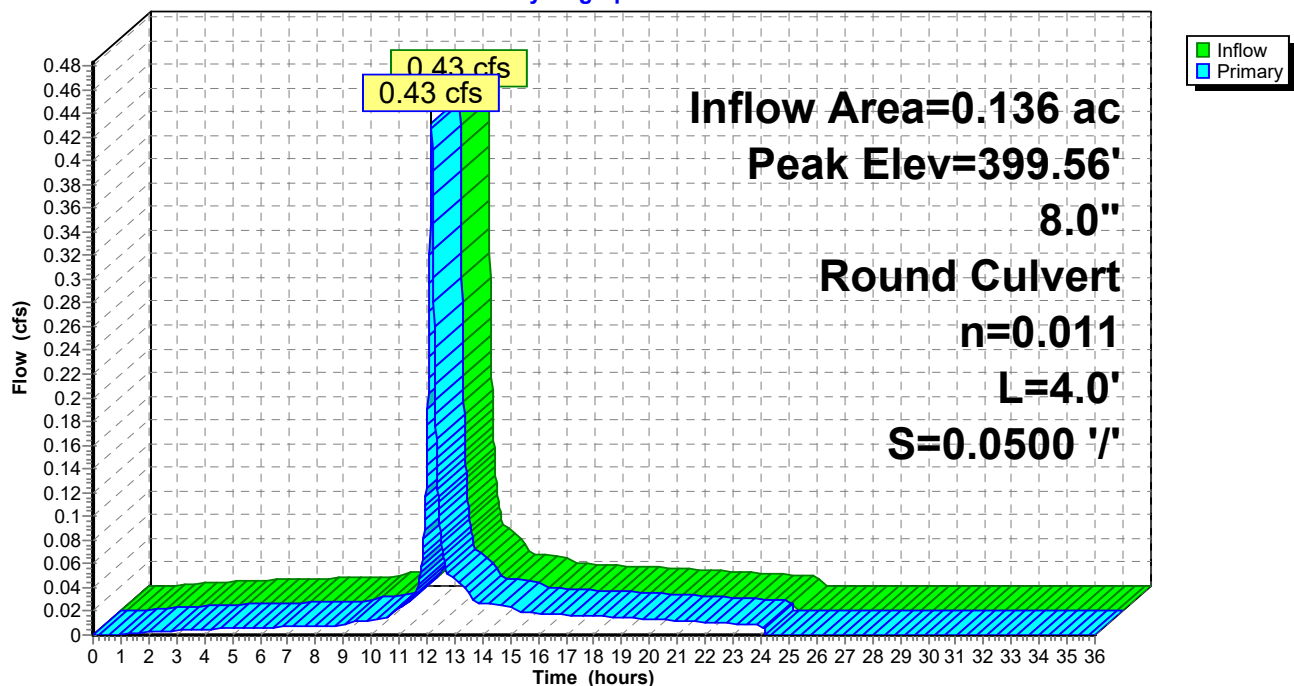
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 399.56' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	397.00'	8.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.00' / 396.80' S= 0.0500 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.30 cfs @ 12.16 hrs HW=399.34' TW=399.31' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 0.30 cfs @ 0.87 fps)

Pond 26P: AD F&G

Hydrograph



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Summary for Pond 27P: Infiltration Field #2

Inflow Area = 0.158 ac, 39.85% Impervious, Inflow Depth = 3.64" for 25-YR event
 Inflow = 0.50 cfs @ 12.12 hrs, Volume= 0.048 af
 Outflow = 0.62 cfs @ 12.12 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.2 min
 Discarded = 0.01 cfs @ 11.97 hrs, Volume= 0.024 af
 Primary = 0.61 cfs @ 12.12 hrs, Volume= 0.024 af
 Routed to Link 29P : Desing Point #1: Flow to Summer Street

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 399.50' @ 12.12 hrs Surf.Area= 186 sf Storage= 257 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 120.6 min (920.3 - 799.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	396.30'	144 cf	8.00'W x 23.25'L x 2.54'H Field A 473 cf Overall - 113 cf Embedded = 360 cf x 40.0% Voids
#2A	396.80'	113 cf	Cultec R-150XLHD x 4 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 2 rows
#3	398.80'	0 cf	0.50'D x 1.00'H Vertical Cone/Cylinder
		257 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	396.30'	2.400 in/hr Exfiltration over Surface area
#2	Primary	398.80'	4.0" Round Culvert X 2.00 L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.80' / 398.70' S= 0.1000 ' ' Cc= 0.900 n= 0.011, Flow Area= 0.09 sf

Discarded OutFlow Max=0.01 cfs @ 11.97 hrs HW=398.86' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.61 cfs @ 12.12 hrs HW=399.50' TW=0.00' (Dynamic Tailwater)

↑**2=Culvert** (Inlet Controls 0.61 cfs @ 3.51 fps)

Pond 27P: Infiltration Field #2 - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 2 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

2 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 21.25' Row Length +12.0" End Stone x 2 =
23.25' Base Length

2 Rows x 33.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 8.00' Base Width

6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

4 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 2 Rows = 112.6 cf Chamber Storage

472.8 cf Field - 112.6 cf Chambers = 360.2 cf Stone x 40.0% Voids = 144.1 cf Stone Storage

Chamber Storage + Stone Storage = 256.6 cf = 0.006 af

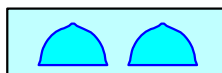
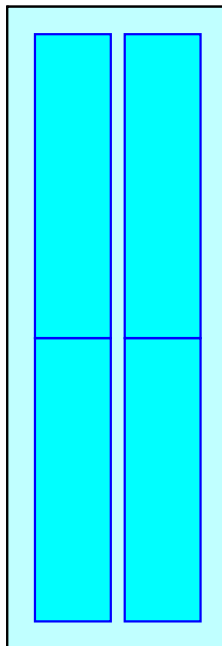
Overall Storage Efficiency = 54.3%

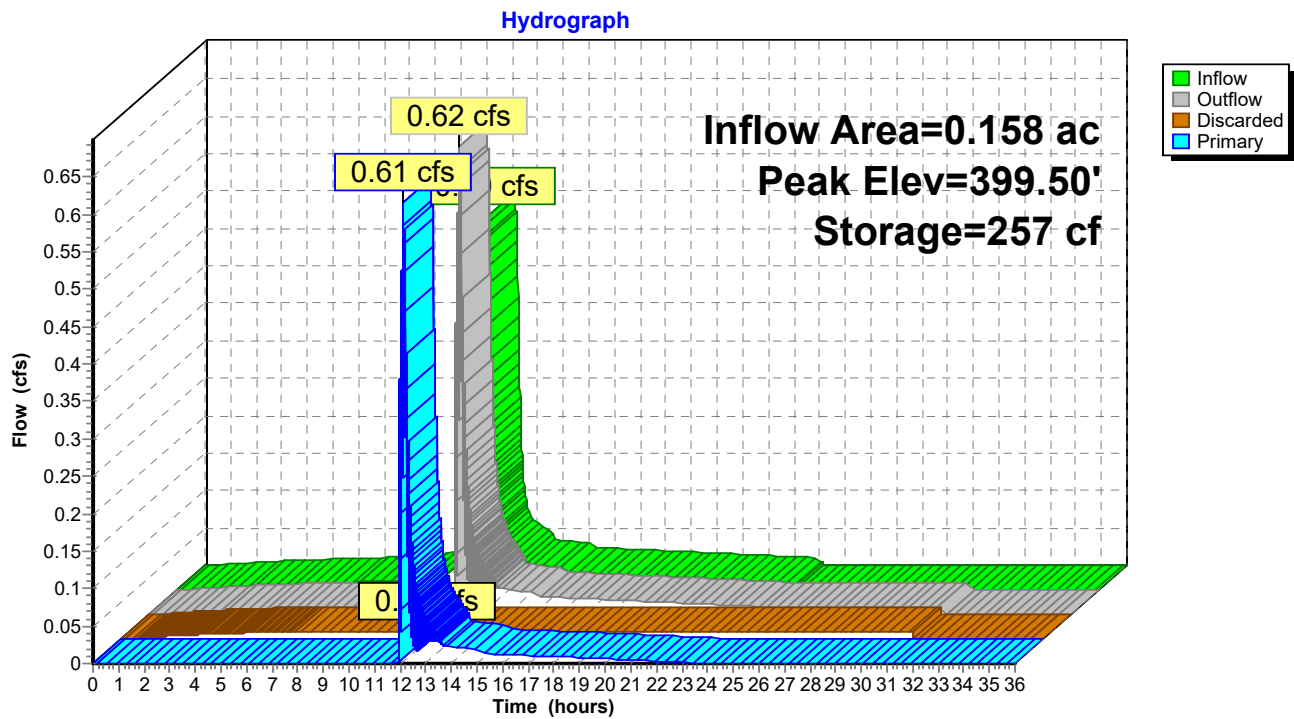
Overall System Size = 23.25' x 8.00' x 2.54'

4 Chambers

17.5 cy Field

13.3 cy Stone



Pond 27P: Infiltration Field #2

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Summary for Subcatchment 28P: P1j

Runoff = 3.68 cfs @ 12.20 hrs, Volume= 0.335 af, Depth= 2.21"

Routed to Link 29P : Desing Point #1: Flow to Summer Street

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

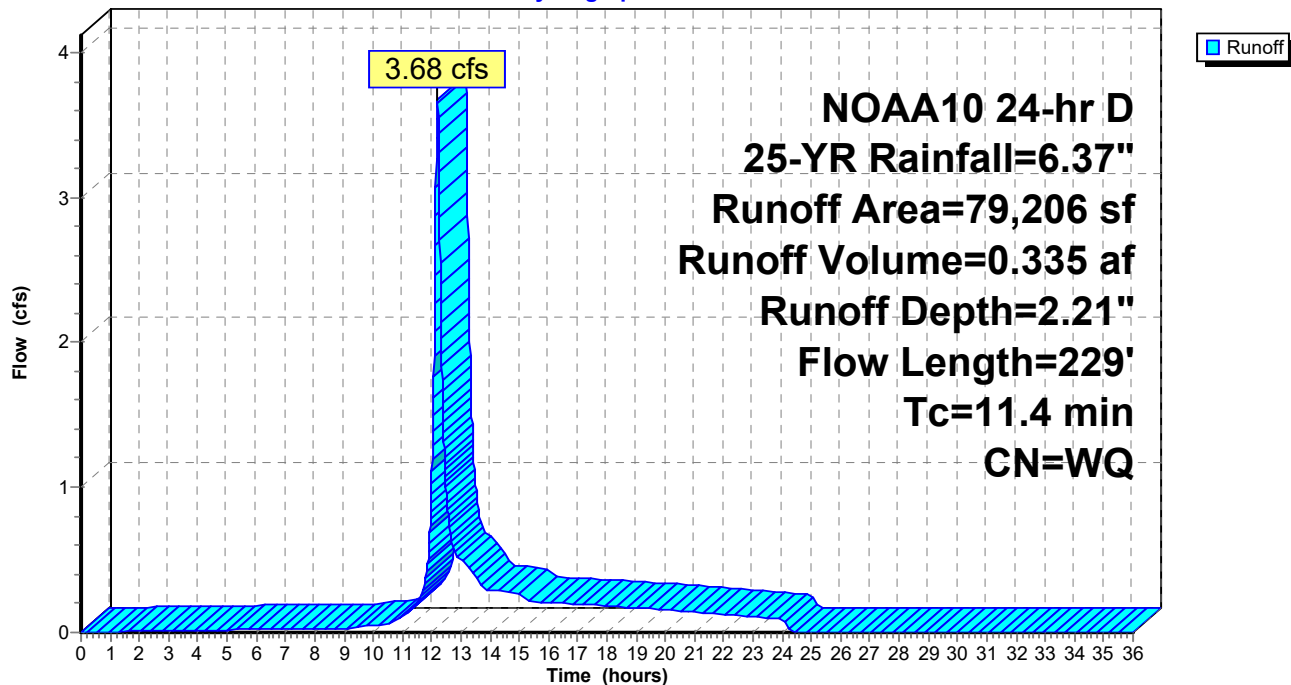
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
762	98	Roofs HSG B
5,095	98	Paved parking HSG B
49,980	55	Woods, Good HSG B
23,369	61	>75% Grass cover, Good HSG B
79,206		Weighted Average
73,349		92.61% Pervious Area
5,857		7.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
2.3	179	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.4	229	Total			

Subcatchment 28P: P1j

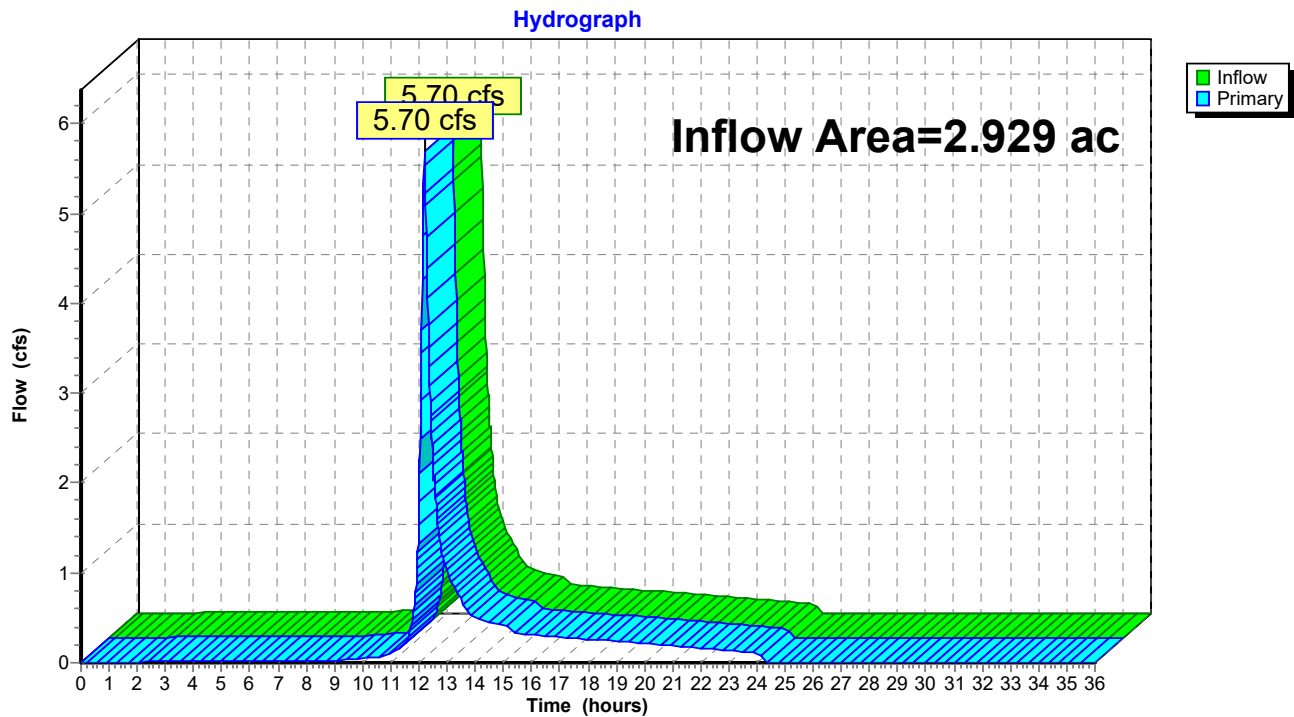
Hydrograph



Summary for Link 29P: Desing Point #1: Flow to Summer Street

Inflow Area = 2.929 ac, 19.21% Impervious, Inflow Depth = 2.17" for 25-YR event
Inflow = 5.70 cfs @ 12.20 hrs, Volume= 0.530 af
Primary = 5.70 cfs @ 12.20 hrs, Volume= 0.530 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 29P: Desing Point #1: Flow to Summer Street

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1P: P1a

Runoff Area=3,133 sf 58.00% Impervious Runoff Depth=6.08"
Flow Length=73' Tc=2.7 min CN=WQ Runoff=0.54 cfs 0.036 af

Pond 2P: Trench Drain 0+28

Peak Elev=412.95' Inflow=0.54 cfs 0.036 af
10.0" Round Culvert n=0.011 L=11.0' S=0.0355 '/' Outflow=0.54 cfs 0.036 af

Pond 3P: First Defense Unit A

Peak Elev=412.95' Inflow=0.54 cfs 0.036 af
10.0" Round Culvert n=0.011 L=12.0' S=0.0050 '/' Outflow=0.54 cfs 0.036 af

Subcatchment4P: P1b

Runoff Area=15,777 sf 29.99% Impervious Runoff Depth=4.71"
Flow Length=168' Tc=10.0 min CN=WQ Runoff=1.64 cfs 0.142 af

Pond 5P: CB 0+88

Peak Elev=413.63' Inflow=1.64 cfs 0.142 af
12.0" Round Culvert x 2.00 n=0.011 L=9.0' S=0.0056 '/' Outflow=1.64 cfs 0.142 af

Pond 6P: FD 0+79

Peak Elev=413.59' Inflow=1.64 cfs 0.142 af
12.0" Round Culvert n=0.011 L=15.0' S=0.0067 '/' Outflow=1.64 cfs 0.142 af

Subcatchment7P: P1c

Runoff Area=8,619 sf 69.83% Impervious Runoff Depth=6.54"
Flow Length=82' Tc=3.9 min CN=WQ Runoff=1.51 cfs 0.108 af

Pond 8P: AD A

Peak Elev=416.34' Inflow=1.51 cfs 0.108 af
6.0" Round Culvert n=0.011 L=19.0' S=0.0500 '/' Outflow=1.51 cfs 0.108 af

Subcatchment9P: P1d

Runoff Area=1,857 sf 100.00% Impervious Runoff Depth=7.91"
Tc=2.0 min CN=98 Runoff=0.39 cfs 0.028 af

Pond 10P: AD B

Peak Elev=417.42' Inflow=0.39 cfs 0.028 af
6.0" Round Culvert n=0.011 L=49.0' S=0.1010 '/' Outflow=0.39 cfs 0.028 af

Subcatchment11P: P1e

Runoff Area=1,233 sf 57.42% Impervious Runoff Depth=6.06"
Flow Length=164' Slope=0.0700 '/' Tc=5.3 min CN=WQ Runoff=0.19 cfs 0.014 af

Pond 12P: Trench Drain A

Peak Elev=413.94' Inflow=0.19 cfs 0.014 af
8.0" Round Culvert n=0.011 L=4.0' S=0.0125 '/' Outflow=0.19 cfs 0.014 af

Pond 13P: AD C

Peak Elev=413.93' Inflow=0.19 cfs 0.014 af
8.0" Round Culvert n=0.011 L=26.0' S=0.0058 '/' Outflow=0.19 cfs 0.014 af

Pond 14P: DMH A

Peak Elev=413.92' Inflow=2.09 cfs 0.150 af
12.0" Round Culvert n=0.011 L=69.0' S=0.0058 '/' Outflow=2.09 cfs 0.150 af

Pond 15P: FD B

Peak Elev=413.67' Inflow=2.09 cfs 0.150 af
12.0" Round Culvert n=0.011 L=8.0' S=0.0125 '/' Outflow=2.09 cfs 0.150 af

Pond 16P: Deep Sump DMH A

Peak Elev=413.43' Inflow=3.38 cfs 0.292 af
12.0" Round Culvert n=0.011 L=16.0' S=0.0062 '/' Outflow=3.38 cfs 0.292 af

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Subcatchment17P: P1fRunoff Area=10,226 sf 1.29% Impervious Runoff Depth=3.43"
Flow Length=162' Tc=8.3 min CN=WQ Runoff=0.90 cfs 0.067 af**Pond 18P: Infiltration Basin #1**Peak Elev=412.95' Storage=3,720 cf Inflow=4.67 cfs 0.396 af
Discarded=0.06 cfs 0.116 af Primary=1.99 cfs 0.280 af Outflow=2.06 cfs 0.396 af**Pond 19P: DMH B**Peak Elev=411.66' Inflow=1.99 cfs 0.280 af
12.0" Round Culvert n=0.011 L=46.0' S=0.0065 '/' Outflow=1.99 cfs 0.280 af**Subcatchment20P: P1g**Runoff Area=653 sf 100.00% Impervious Runoff Depth=7.91"
Tc=2.0 min CN=98 Runoff=0.14 cfs 0.010 af**Pond 21P: AD D**Peak Elev=400.33' Inflow=0.14 cfs 0.010 af
4.0" Round Culvert n=0.011 L=30.0' S=0.0100 '/' Outflow=0.14 cfs 0.010 af**Pond 22P: Infiltration Field #1**Peak Elev=400.33' Storage=140 cf Inflow=0.14 cfs 0.010 af
Discarded=0.01 cfs 0.010 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.010 af**Subcatchment23P: P1h**Runoff Area=930 sf 100.00% Impervious Runoff Depth=7.91"
Tc=2.0 min CN=98 Runoff=0.20 cfs 0.014 af**Pond 24P: AD E**Peak Elev=399.72' Inflow=0.20 cfs 0.014 af
6.0" Round Culvert n=0.011 L=119.0' S=0.0050 '/' Outflow=0.20 cfs 0.014 af**Subcatchment25P: P1i**Runoff Area=5,938 sf 30.43% Impervious Runoff Depth=4.64"
Flow Length=120' Tc=9.1 min CN=WQ Runoff=0.63 cfs 0.053 af**Pond 26P: AD F&G**Peak Elev=399.78' Inflow=0.63 cfs 0.053 af
8.0" Round Culvert n=0.011 L=4.0' S=0.0500 '/' Outflow=0.63 cfs 0.053 af**Pond 27P: Infiltration Field #2**Peak Elev=399.66' Storage=257 cf Inflow=0.71 cfs 0.067 af
Discarded=0.01 cfs 0.025 af Primary=0.70 cfs 0.042 af Outflow=0.71 cfs 0.067 af**Subcatchment28P: P1j**Runoff Area=79,206 sf 7.39% Impervious Runoff Depth=3.46"
Flow Length=229' Tc=11.4 min CN=WQ Runoff=5.95 cfs 0.524 af**Link 29P: Desing Point #1: Flow to Summer Street**Inflow=8.50 cfs 0.846 af
Primary=8.50 cfs 0.846 af**Total Runoff Area = 2.929 ac Runoff Volume = 0.996 af Average Runoff Depth = 4.08"**
80.79% Pervious = 2.366 ac 19.21% Impervious = 0.563 ac

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Summary for Subcatchment 1P: P1a

Runoff = 0.54 cfs @ 12.10 hrs, Volume= 0.036 af, Depth= 6.08"
Routed to Pond 2P : Trench Drain 0+28

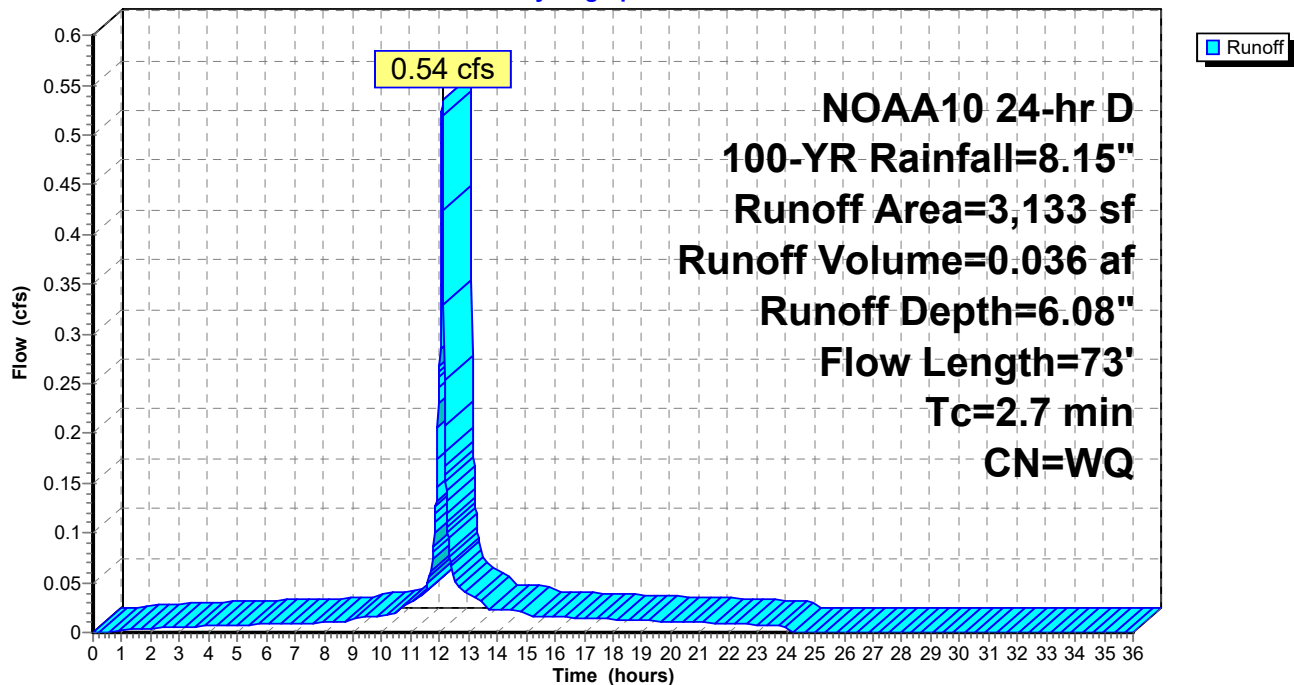
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
1,817	98	Paved parking HSG B
1,316	61	>75% Grass cover, Good HSG B
3,133		Weighted Average
1,316		42.00% Pervious Area
1,817		58.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	23	0.1000	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
0.3	25	0.0300	1.26		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.36"
0.1	25	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7	73	Total			

Subcatchment 1P: P1a

Hydrograph



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Summary for Pond 2P: Trench Drain 0+28

Inflow Area = 0.072 ac, 58.00% Impervious, Inflow Depth = 6.08" for 100-YR event
Inflow = 0.54 cfs @ 12.10 hrs, Volume= 0.036 af
Outflow = 0.54 cfs @ 12.10 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
Primary = 0.54 cfs @ 12.10 hrs, Volume= 0.036 af
Routed to Pond 3P : First Defense Unit A

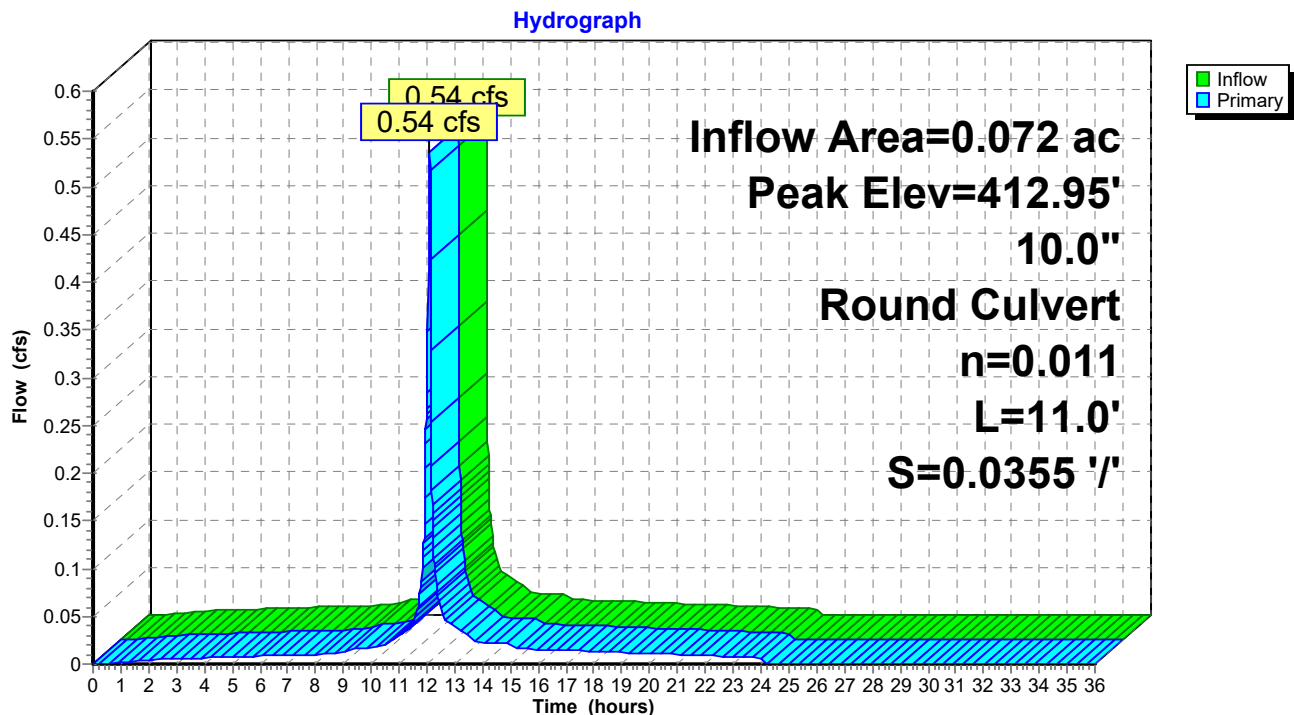
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Peak Elev= 412.95' @ 12.29 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.80'	10.0" Round Culvert L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.80' / 411.41' S= 0.0355 '/ Cc= 0.900 n= 0.011, Flow Area= 0.55 sf

Primary OutFlow Max=0.16 cfs @ 12.10 hrs HW=412.60' TW=412.60' (Dynamic Tailwater)
↑ **1=Culvert** (Outlet Controls 0.16 cfs @ 0.39 fps)

Pond 2P: Trench Drain 0+28



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Summary for Pond 3P: First Defense Unit A

Inflow Area = 0.072 ac, 58.00% Impervious, Inflow Depth = 6.08" for 100-YR event
Inflow = 0.54 cfs @ 12.10 hrs, Volume= 0.036 af
Outflow = 0.54 cfs @ 12.10 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
Primary = 0.54 cfs @ 12.10 hrs, Volume= 0.036 af
Routed to Pond 18P : Infiltration Basin #1

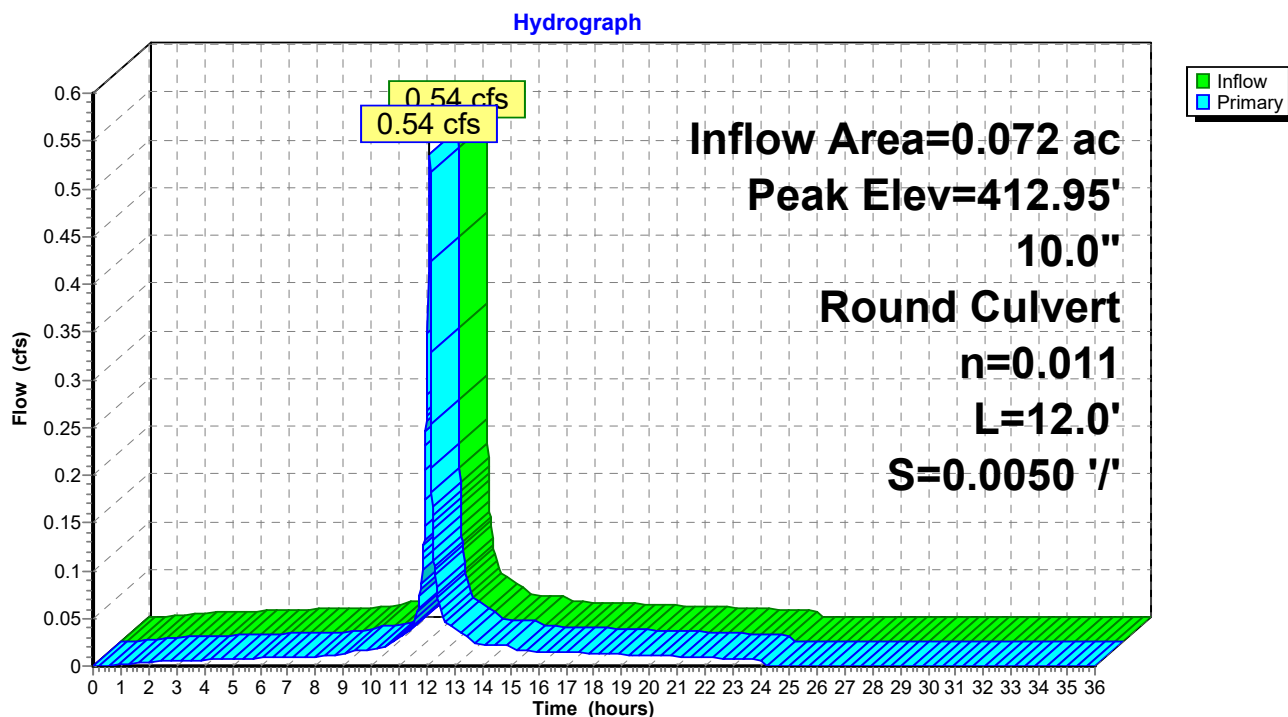
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Peak Elev= 412.95' @ 12.28 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.36'	10.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.36' / 411.30' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf

Primary OutFlow Max=0.06 cfs @ 12.10 hrs HW=412.60' TW=412.60' (Dynamic Tailwater)
↑ **1=Culvert** (Inlet Controls 0.06 cfs @ 0.12 fps)

Pond 3P: First Defense Unit A



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Summary for Subcatchment 4P: P1b

Runoff = 1.64 cfs @ 12.17 hrs, Volume= 0.142 af, Depth= 4.71"
Routed to Pond 5P : CB 0+88

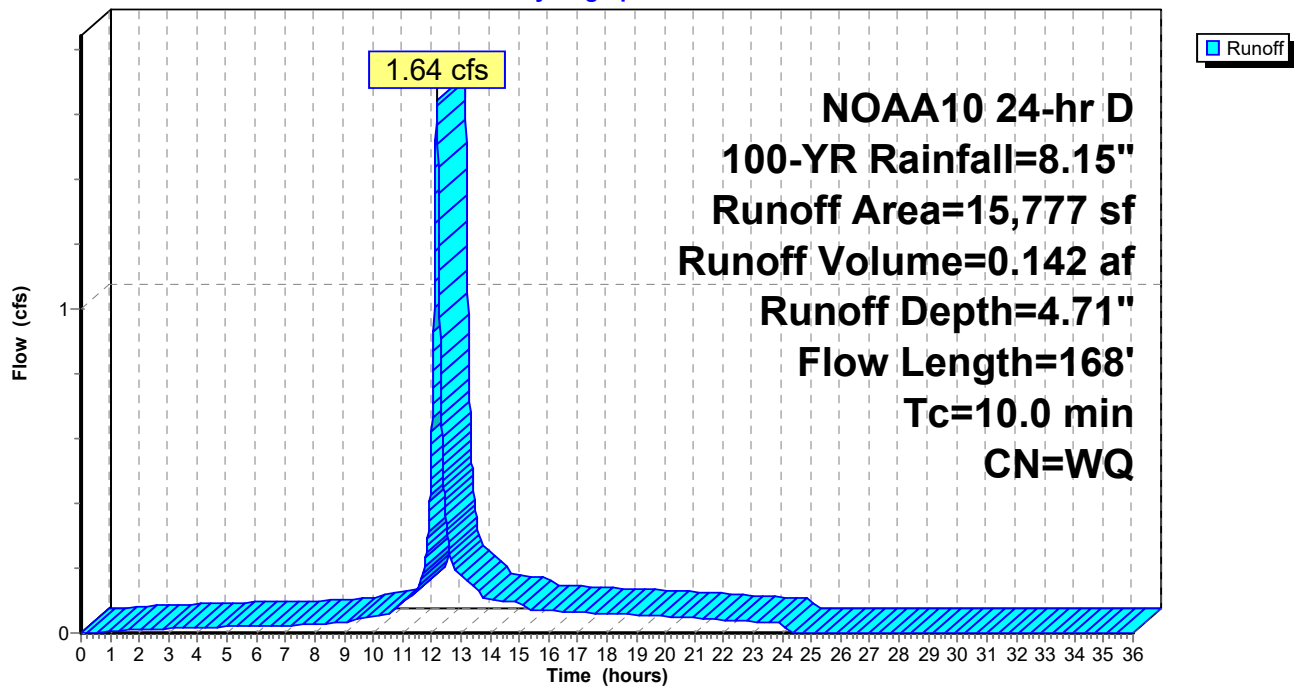
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
3,647	55	Woods, Good, HSG B
4,732	98	Paved parking, HSG B
7,398	61	>75% Grass cover, Good, HSG B
15,777		Weighted Average
11,045		70.01% Pervious Area
4,732		29.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	51	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
0.4	49	0.1100	2.32		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	68	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
10.0	168	Total			

Subcatchment 4P: P1b

Hydrograph



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Summary for Pond 5P: CB 0+88

Inflow Area = 0.362 ac, 29.99% Impervious, Inflow Depth = 4.71" for 100-YR event
Inflow = 1.64 cfs @ 12.17 hrs, Volume= 0.142 af
Outflow = 1.64 cfs @ 12.17 hrs, Volume= 0.142 af, Atten= 0%, Lag= 0.0 min
Primary = 1.64 cfs @ 12.17 hrs, Volume= 0.142 af
Routed to Pond 6P : FD 0+79

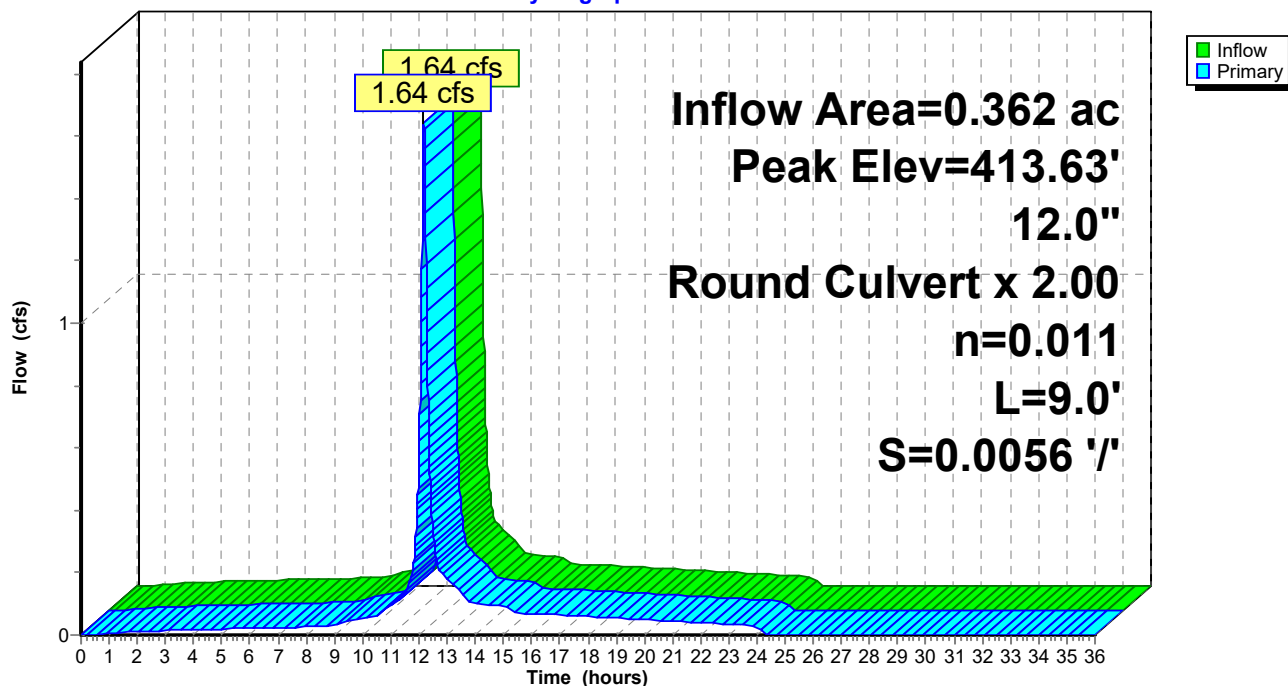
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 413.63' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.65'	12.0" Round Culvert X 2.00 L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.65' / 411.60' S= 0.0056 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=2.11 cfs @ 12.17 hrs HW=413.58' TW=413.50' (Dynamic Tailwater)
↑ **1=Culvert** (Inlet Controls 2.11 cfs @ 1.34 fps)

Pond 5P: CB 0+88

Hydrograph



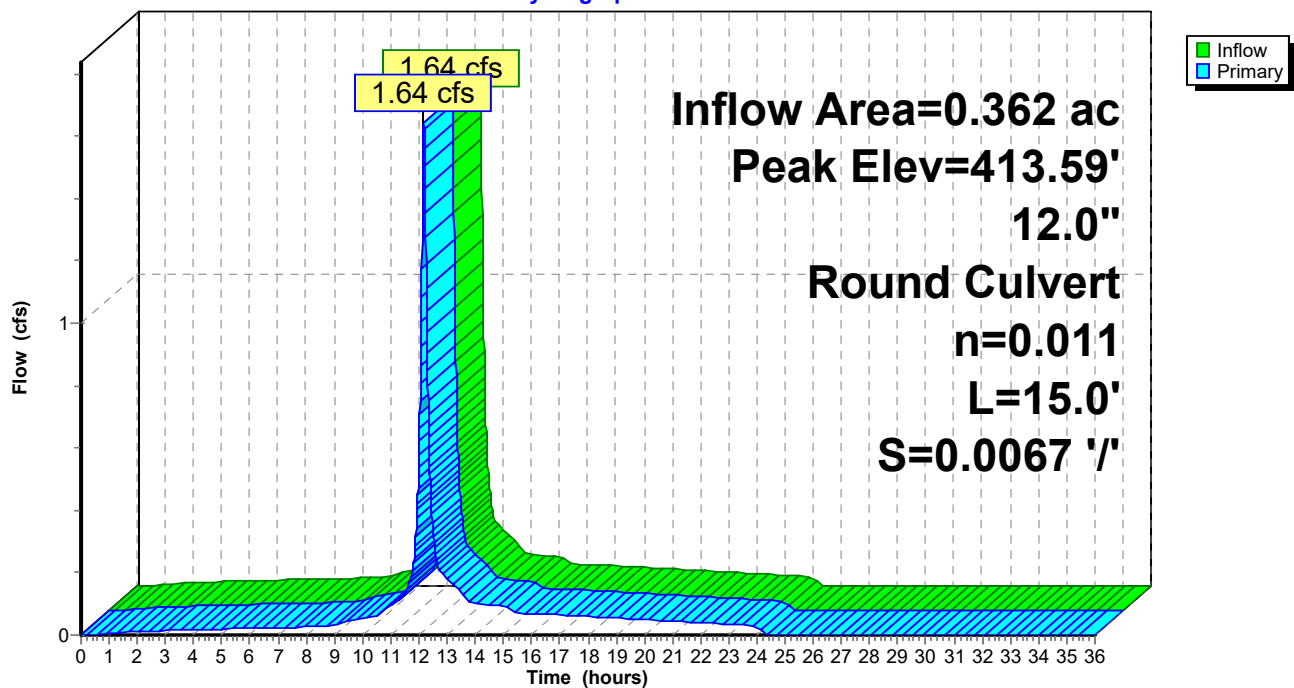
Summary for Pond 6P: FD 0+79

Inflow Area = 0.362 ac, 29.99% Impervious, Inflow Depth = 4.71" for 100-YR event
 Inflow = 1.64 cfs @ 12.17 hrs, Volume= 0.142 af
 Outflow = 1.64 cfs @ 12.17 hrs, Volume= 0.142 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.64 cfs @ 12.17 hrs, Volume= 0.142 af
 Routed to Pond 16P : Deep Sump DMH A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 413.59' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.55'	12.0" Round Culvert L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.55' / 411.45' S= 0.0067 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.75 cfs @ 12.17 hrs HW=413.50' TW=413.29' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 1.75 cfs @ 2.22 fps)

Pond 6P: FD 0+79**Hydrograph**

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Summary for Subcatchment 7P: P1c

Runoff = 1.51 cfs @ 12.11 hrs, Volume= 0.108 af, Depth= 6.54"
 Routed to Pond 8P : AD A

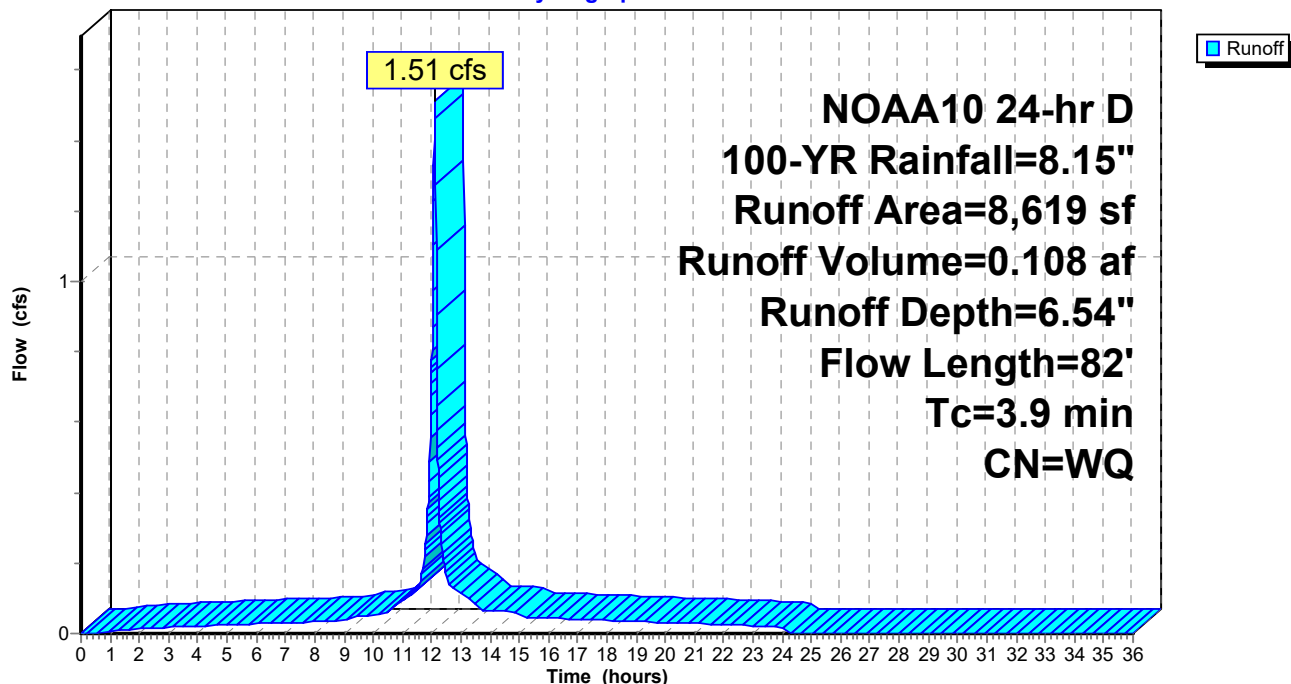
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
924	98	Roofs HSG B
5,095	98	Paved parking HSG B
703	55	Woods, Good HSG B
1,897	61	>75% Grass cover, Good HSG B
8,619		Weighted Average
2,600		30.17% Pervious Area
6,019		69.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	36	0.0700	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
0.1	14	0.0700	1.57		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.36"
0.1	32	0.0600	4.97		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.9	82	Total			

Subcatchment 7P: P1c

Hydrograph



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Summary for Pond 8P: AD A

Inflow Area = 0.198 ac, 69.83% Impervious, Inflow Depth = 6.54" for 100-YR event
Inflow = 1.51 cfs @ 12.11 hrs, Volume= 0.108 af
Outflow = 1.51 cfs @ 12.11 hrs, Volume= 0.108 af, Atten= 0%, Lag= 0.0 min
Primary = 1.51 cfs @ 12.11 hrs, Volume= 0.108 af
Routed to Pond 14P : DMH A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

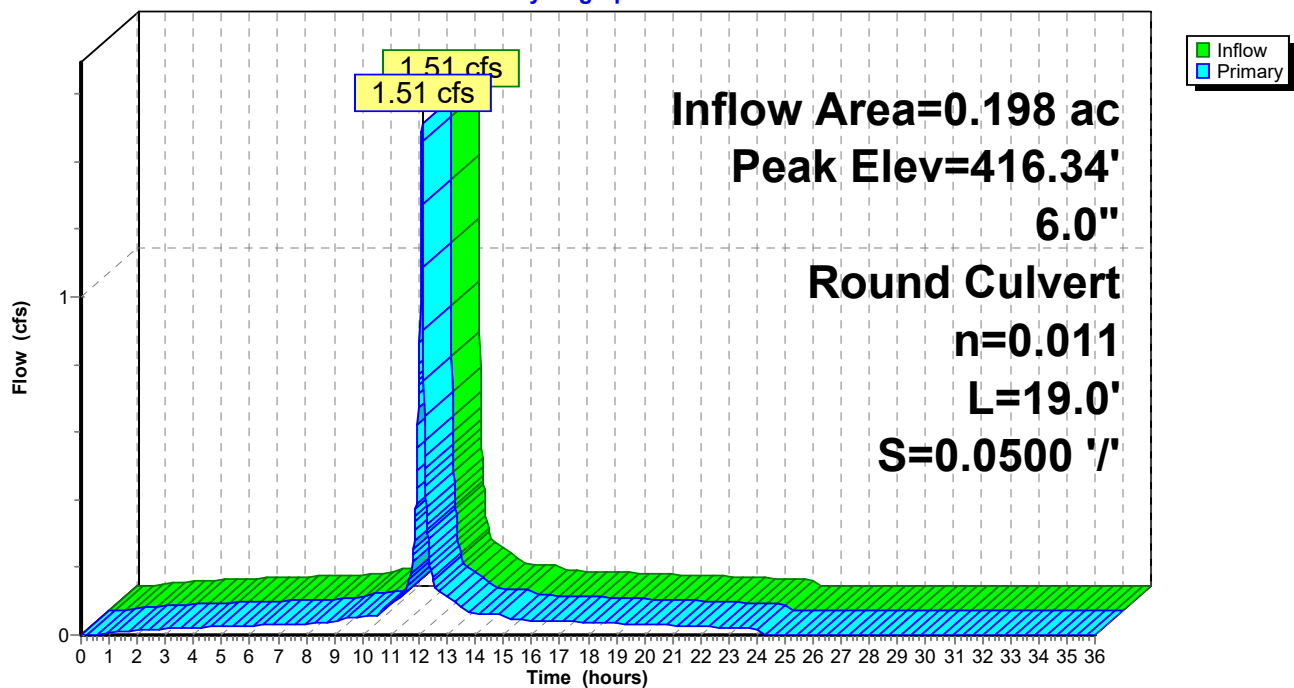
Peak Elev= 416.34' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	413.00'	6.0" Round Culvert L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 413.00' / 412.05' S= 0.0500 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Primary OutFlow Max=1.48 cfs @ 12.11 hrs HW=416.27' TW=413.83' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.48 cfs @ 7.52 fps)

Pond 8P: AD A

Hydrograph



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Summary for Subcatchment 9P: P1d

Runoff = 0.39 cfs @ 12.10 hrs, Volume= 0.028 af, Depth= 7.91"
Routed to Pond 10P : AD B

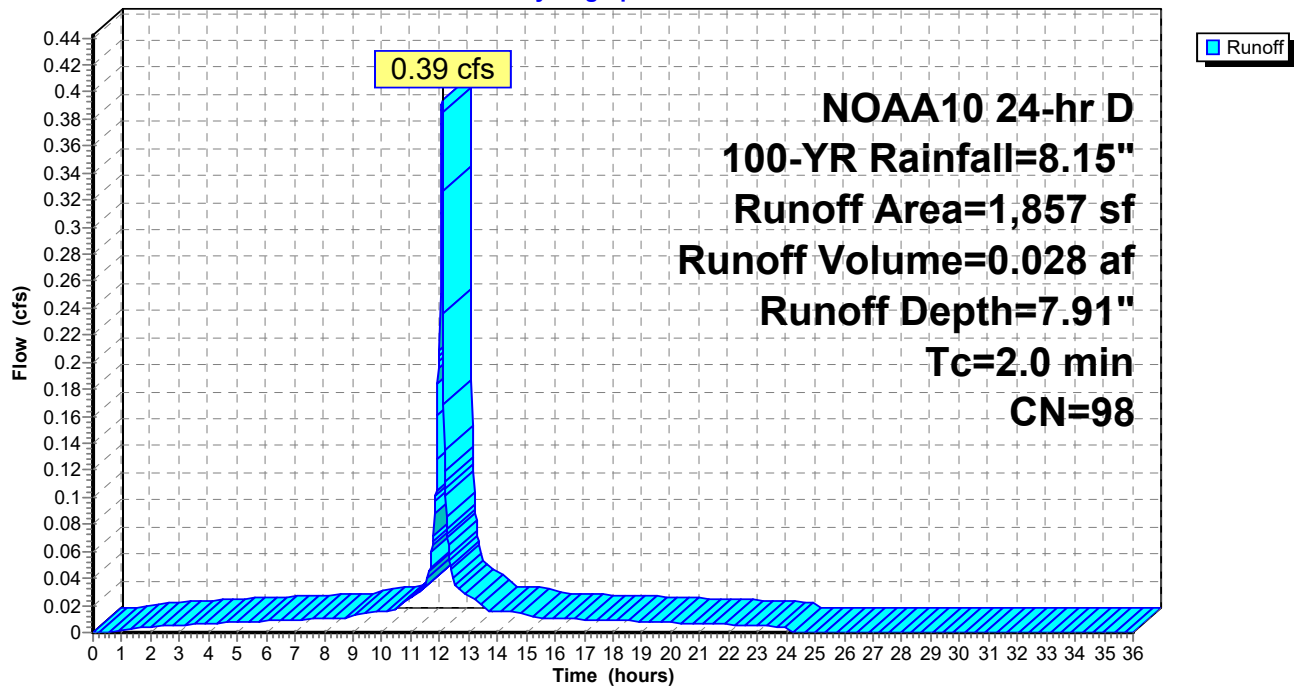
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
1,857	98	Roofs HSG B
1,857		100.00% Impervious Area

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

Subcatchment 9P: P1d

Hydrograph



Summary for Pond 10P: AD B

Inflow Area = 0.043 ac, 100.00% Impervious, Inflow Depth = 7.91" for 100-YR event
 Inflow = 0.39 cfs @ 12.10 hrs, Volume= 0.028 af
 Outflow = 0.39 cfs @ 12.10 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.39 cfs @ 12.10 hrs, Volume= 0.028 af
 Routed to Pond 14P : DMH A

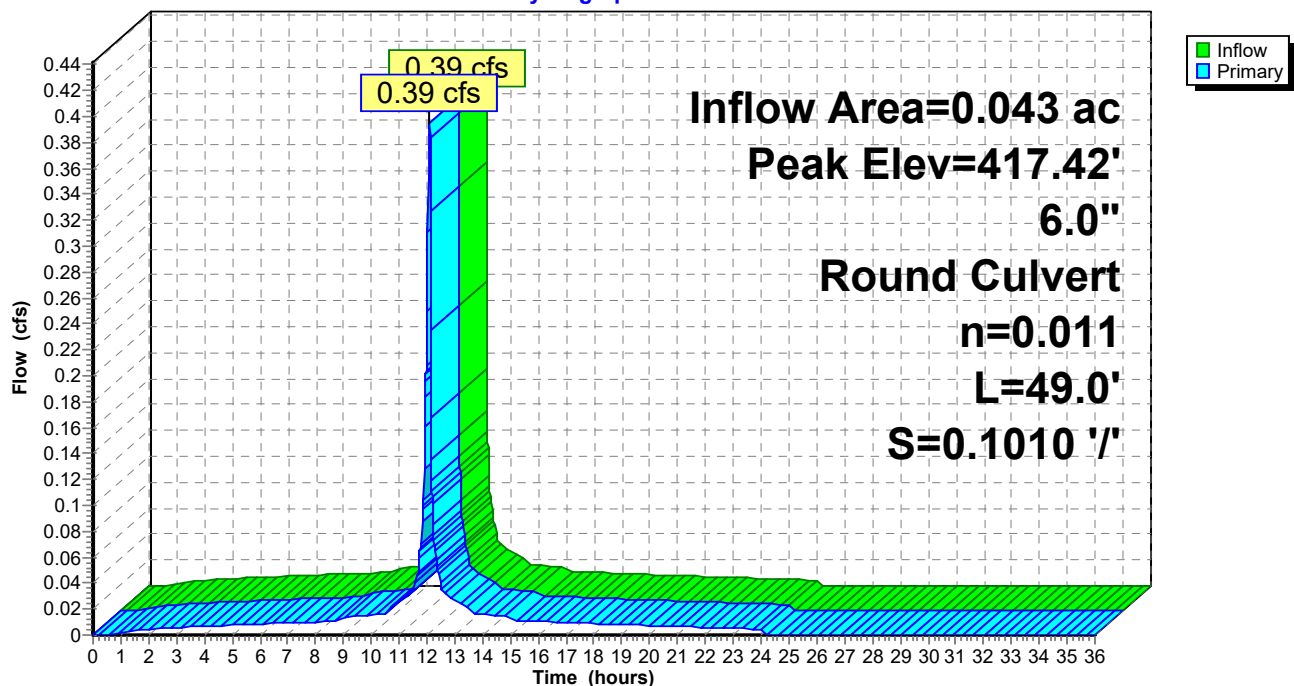
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 417.42' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	417.00'	6.0" Round Culvert L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 417.00' / 412.05' S= 0.1010 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Primary OutFlow Max=0.39 cfs @ 12.10 hrs HW=417.42' TW=413.69' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 0.39 cfs @ 2.22 fps)

Pond 10P: AD B

Hydrograph



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Summary for Subcatchment 11P: P1e

Runoff = 0.19 cfs @ 12.12 hrs, Volume= 0.014 af, Depth= 6.06"
Routed to Pond 12P : Trench Drain A

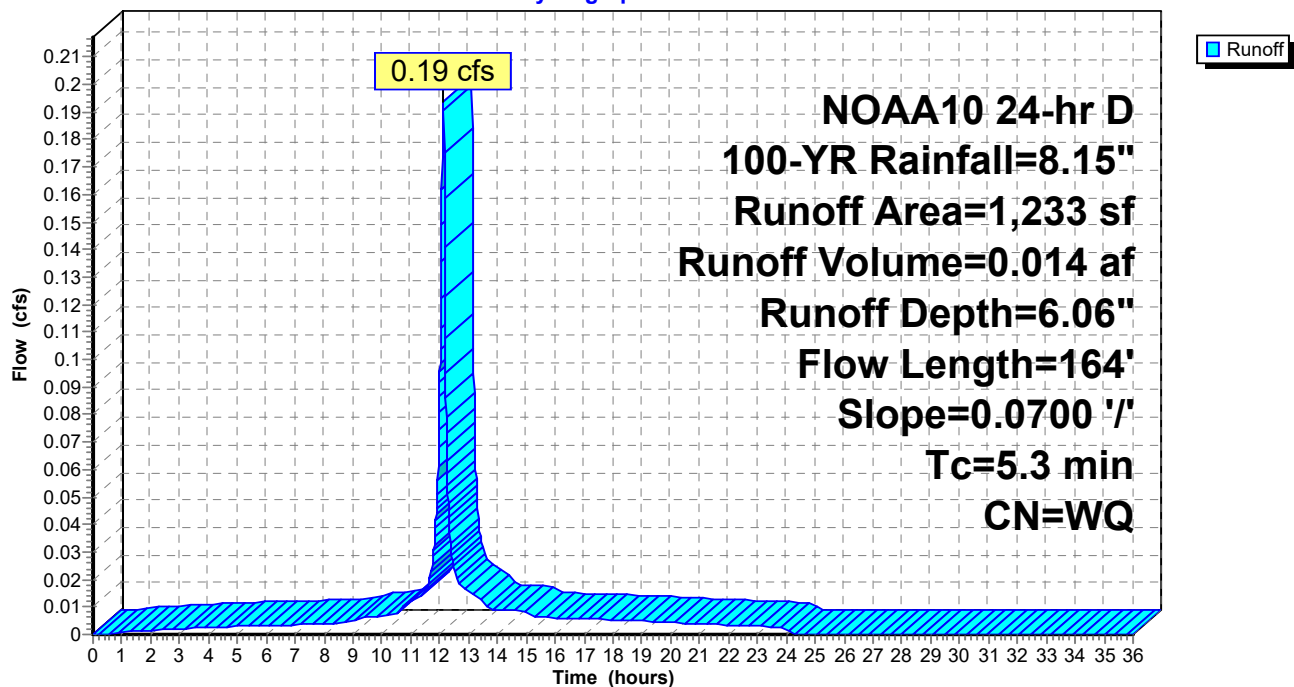
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
708	98	Paved parking HSG B
525	61	>75% Grass cover, Good HSG B
1,233		Weighted Average
525		42.58% Pervious Area
708		57.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0700	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
0.2	25	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	89	0.0700	5.37		Shallow Concentrated Flow, Paved Kv= 20.3 fps
5.3	164	Total			

Subcatchment 11P: P1e

Hydrograph



Summary for Pond 12P: Trench Drain A

Inflow Area = 0.028 ac, 57.42% Impervious, Inflow Depth = 6.06" for 100-YR event
 Inflow = 0.19 cfs @ 12.12 hrs, Volume= 0.014 af
 Outflow = 0.19 cfs @ 12.12 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.19 cfs @ 12.12 hrs, Volume= 0.014 af
 Routed to Pond 13P : AD C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

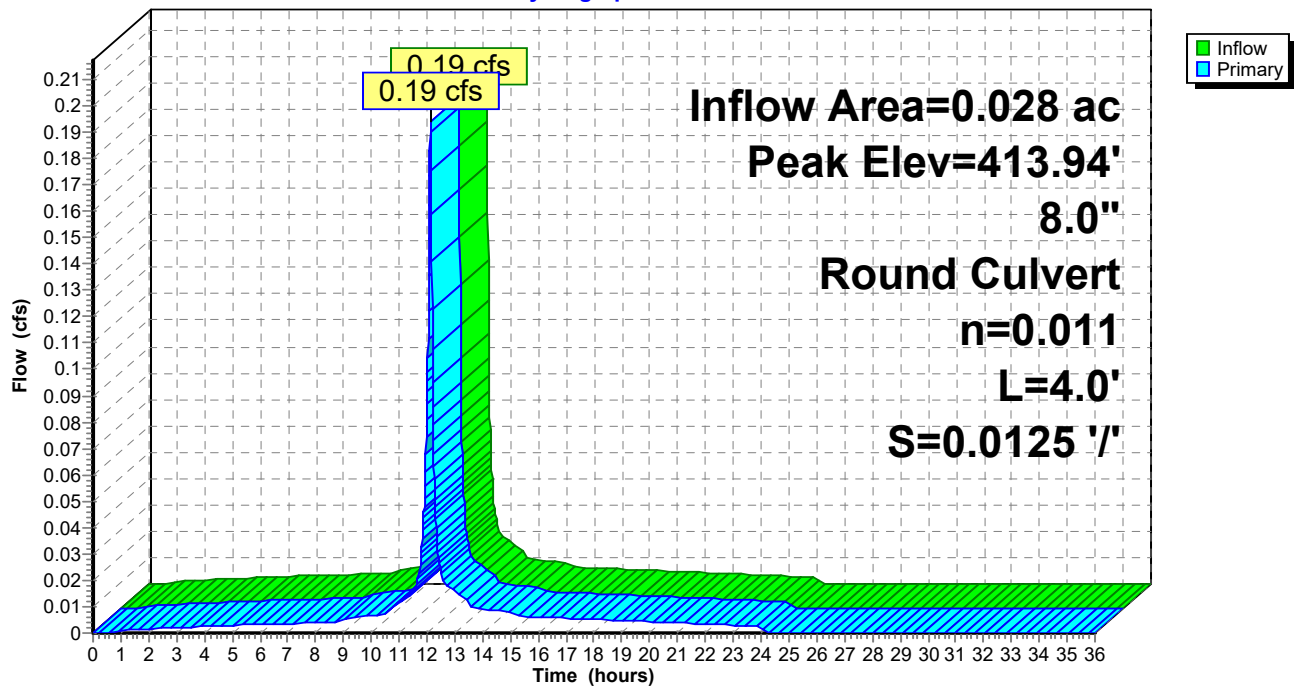
Peak Elev= 413.94' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	412.30'	8.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.30' / 412.25' S= 0.0125 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.00 cfs @ 12.12 hrs HW=413.77' TW=413.86' (Dynamic Tailwater)
 ↑1=Culvert (Controls 0.00 cfs)

Pond 12P: Trench Drain A

Hydrograph



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Summary for Pond 13P: AD C

Inflow Area = 0.028 ac, 57.42% Impervious, Inflow Depth = 6.06" for 100-YR event
Inflow = 0.19 cfs @ 12.12 hrs, Volume= 0.014 af
Outflow = 0.19 cfs @ 12.12 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
Primary = 0.19 cfs @ 12.12 hrs, Volume= 0.014 af
Routed to Pond 14P : DMH A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

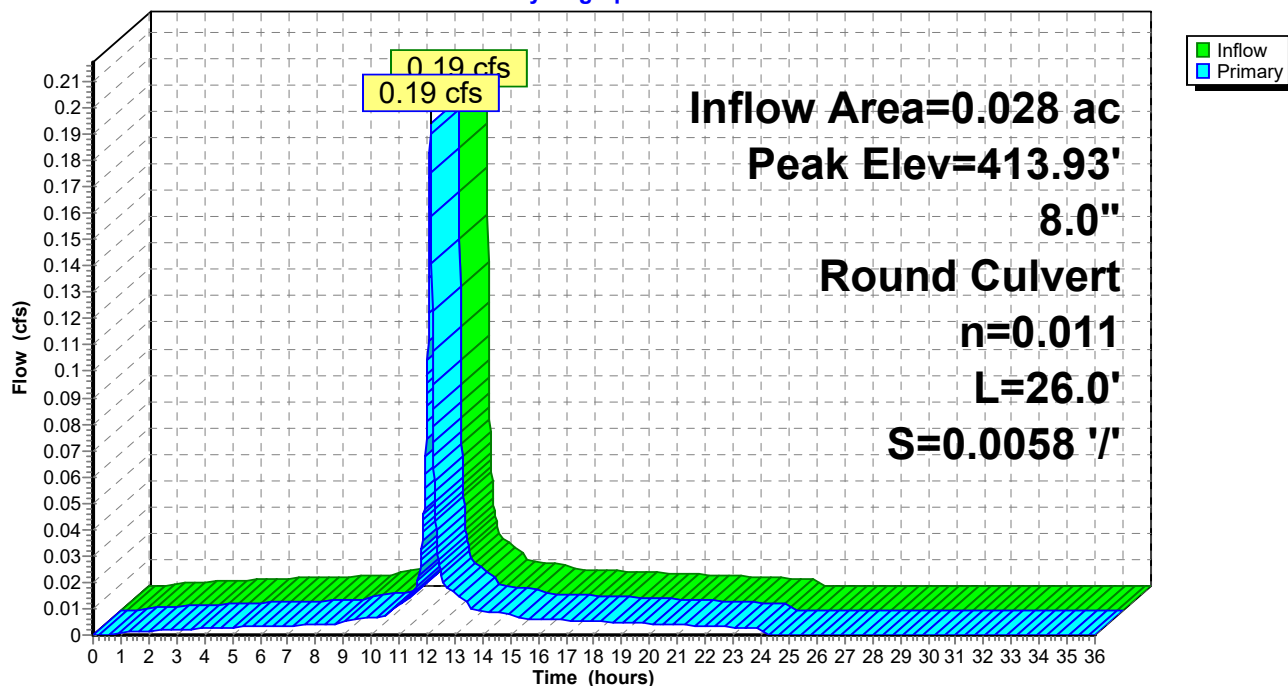
Peak Elev= 413.93' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	412.20'	8.0" Round Culvert L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.20' / 412.05' S= 0.0058 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.00 cfs @ 12.12 hrs HW=413.86' TW=413.91' (Dynamic Tailwater)
↑1=Culvert (Controls 0.00 cfs)

Pond 13P: AD C

Hydrograph



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Summary for Pond 14P: DMH A

Inflow Area = 0.269 ac, 73.31% Impervious, Inflow Depth = 6.71" for 100-YR event
Inflow = 2.09 cfs @ 12.11 hrs, Volume= 0.150 af
Outflow = 2.09 cfs @ 12.11 hrs, Volume= 0.150 af, Atten= 0%, Lag= 0.0 min
Primary = 2.09 cfs @ 12.11 hrs, Volume= 0.150 af
Routed to Pond 15P : FD B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

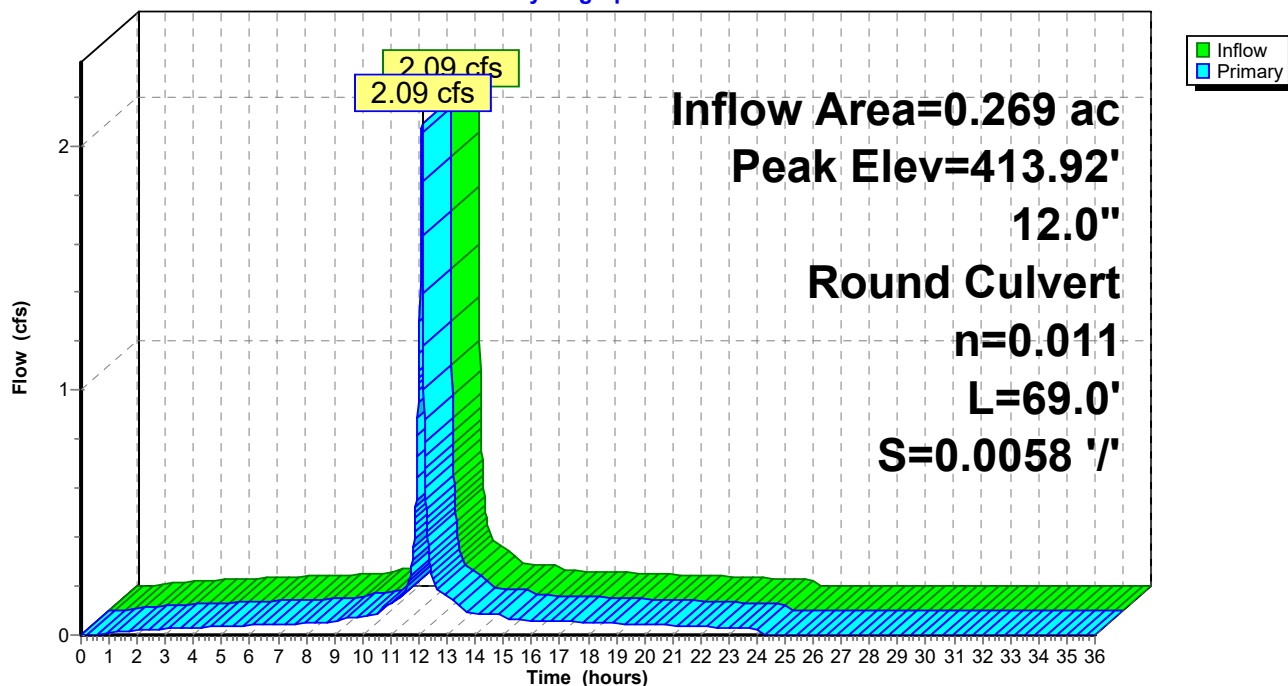
Peak Elev= 413.92' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	412.00'	12.0" Round Culvert L= 69.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 412.00' / 411.60' S= 0.0058 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.72 cfs @ 12.11 hrs HW=413.78' TW=413.55' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 1.72 cfs @ 2.19 fps)

Pond 14P: DMH A

Hydrograph



Summary for Pond 15P: FD B

Inflow Area = 0.269 ac, 73.31% Impervious, Inflow Depth = 6.71" for 100-YR event
 Inflow = 2.09 cfs @ 12.11 hrs, Volume= 0.150 af
 Outflow = 2.09 cfs @ 12.11 hrs, Volume= 0.150 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.09 cfs @ 12.11 hrs, Volume= 0.150 af
 Routed to Pond 16P : Deep Sump DMH A

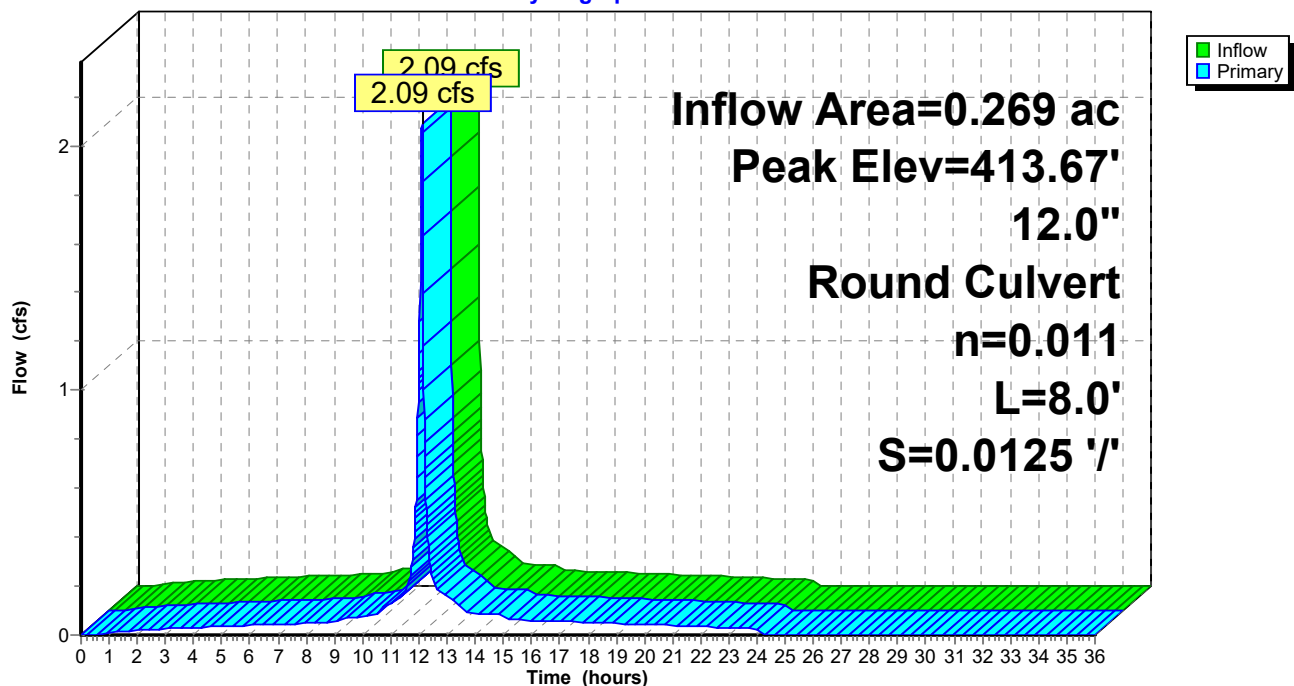
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 413.67' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.55'	12.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.55' / 411.45' S= 0.0125 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.73 cfs @ 12.11 hrs HW=413.55' TW=413.34' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 1.73 cfs @ 2.21 fps)

Pond 15P: FD B

Hydrograph



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Summary for Pond 16P: Deep Sump DMH A

Inflow Area = 0.631 ac, 48.45% Impervious, Inflow Depth = 5.56" for 100-YR event
Inflow = 3.38 cfs @ 12.12 hrs, Volume= 0.292 af
Outflow = 3.38 cfs @ 12.12 hrs, Volume= 0.292 af, Atten= 0%, Lag= 0.0 min
Primary = 3.38 cfs @ 12.12 hrs, Volume= 0.292 af
Routed to Pond 18P : Infiltration Basin #1

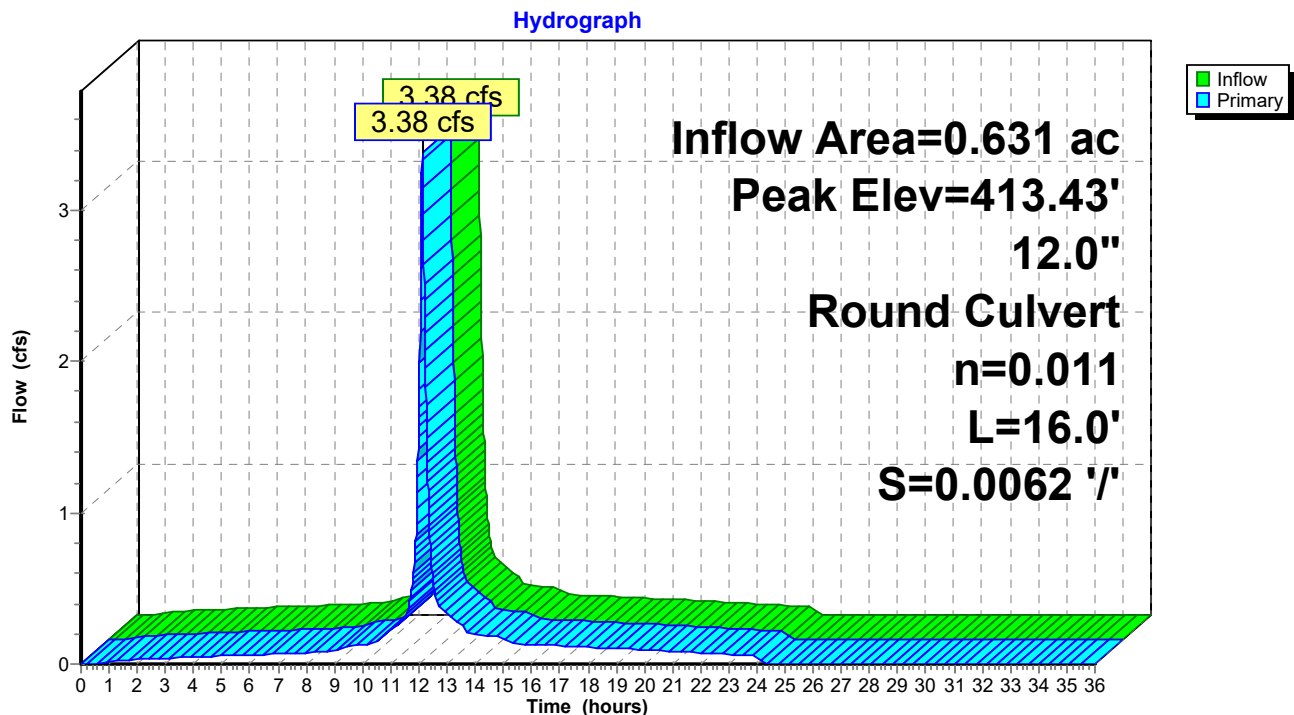
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Peak Elev= 413.43' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	411.40'	12.0" Round Culvert L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.40' / 411.30' S= 0.0062 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=3.28 cfs @ 12.12 hrs HW=413.41' TW=412.66' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.28 cfs @ 4.17 fps)

Pond 16P: Deep Sump DMH A



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Summary for Subcatchment 17P: P1f

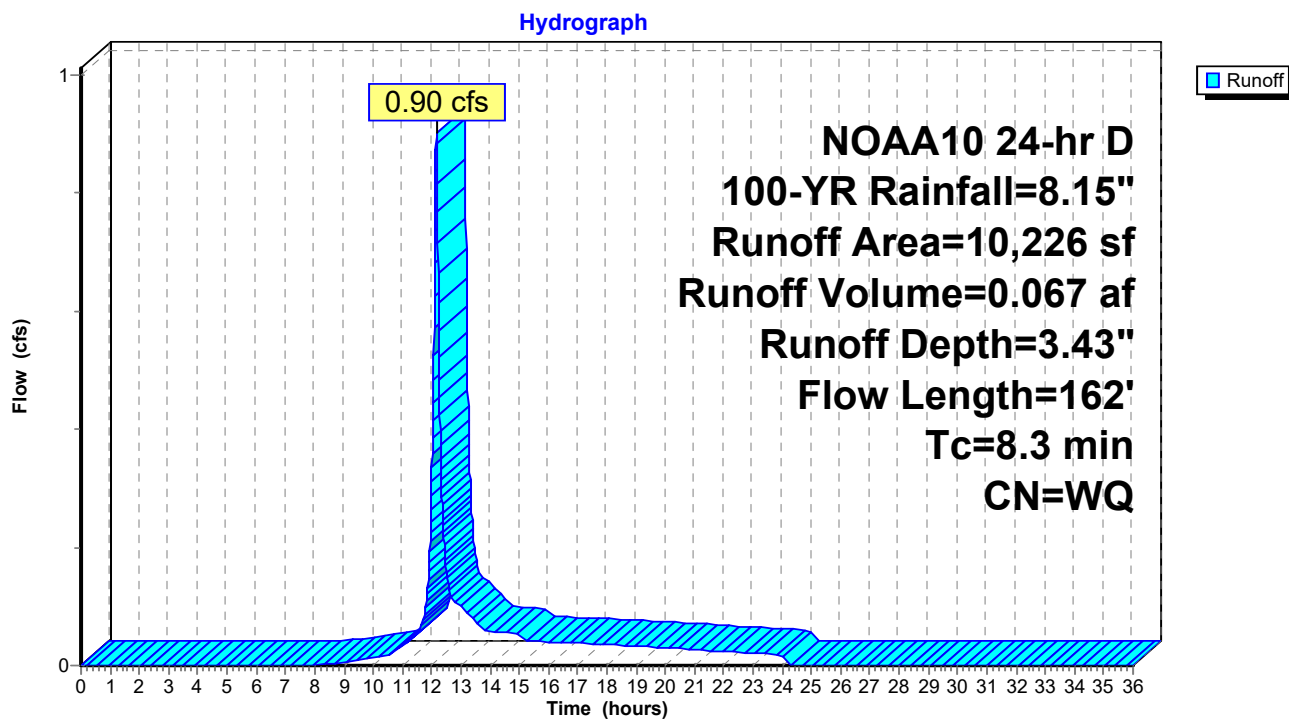
Runoff = 0.90 cfs @ 12.16 hrs, Volume= 0.067 af, Depth= 3.43"
 Routed to Pond 18P : Infiltration Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
132	98	Paved parking, HSG B
2,793	55	Woods, Good HSG B
7,301	61	>75% Grass cover, Good HSG B
10,226		Weighted Average
10,094		98.71% Pervious Area
132		1.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	22	0.0700	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
4.6	28	0.0700	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
0.9	75	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	37	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
8.3	162	Total			

Subcatchment 17P: P1f



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Summary for Pond 18P: Infiltration Basin #1

Inflow Area = 0.938 ac, 37.37% Impervious, Inflow Depth = 5.07" for 100-YR event
 Inflow = 4.67 cfs @ 12.12 hrs, Volume= 0.396 af
 Outflow = 2.06 cfs @ 12.27 hrs, Volume= 0.396 af, Atten= 56%, Lag= 9.1 min
 Discarded = 0.06 cfs @ 12.27 hrs, Volume= 0.116 af
 Primary = 1.99 cfs @ 12.27 hrs, Volume= 0.280 af
 Routed to Pond 19P : DMH B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 412.95' @ 12.27 hrs Surf.Area= 2,733 sf Storage= 3,720 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 85.7 min (886.7 - 801.0)

Volume	Invert	Avail.Storage	Storage Description		
#1	411.30'	6,950 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
411.30	1,814	182.0	0	0	1,814
414.00	3,418	231.0	6,950	6,950	3,518
Device	Routing	Invert	Outlet Devices		
#1	Primary	411.30'	15.0" Round Culvert L= 13.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 411.30' / 410.85' S= 0.0346 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf		
#2	Discarded	411.30'	1.020 in/hr Exfiltration over Surface area		
#3	Device 1	411.80'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads		
#4	Device 1	411.80'	3.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads		

Discarded OutFlow Max=0.06 cfs @ 12.27 hrs HW=412.95' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.06 cfs)

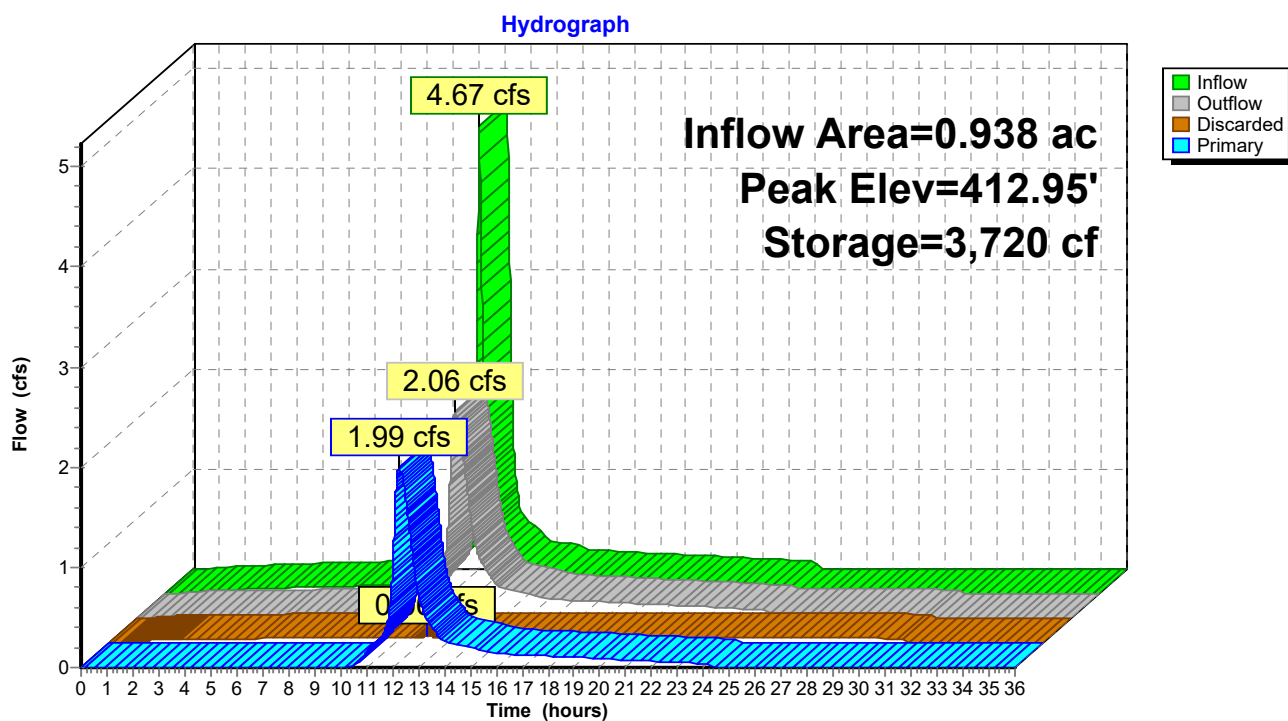
Primary OutFlow Max=1.99 cfs @ 12.27 hrs HW=412.95' TW=411.66' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 1.99 cfs of 5.97 cfs potential flow)

↑ **3=Orifice/Grate** (Orifice Controls 1.52 cfs @ 4.34 fps)

↑ **4=Orifice/Grate** (Orifice Controls 0.48 cfs @ 4.87 fps)

Pond 18P: Infiltration Basin #1



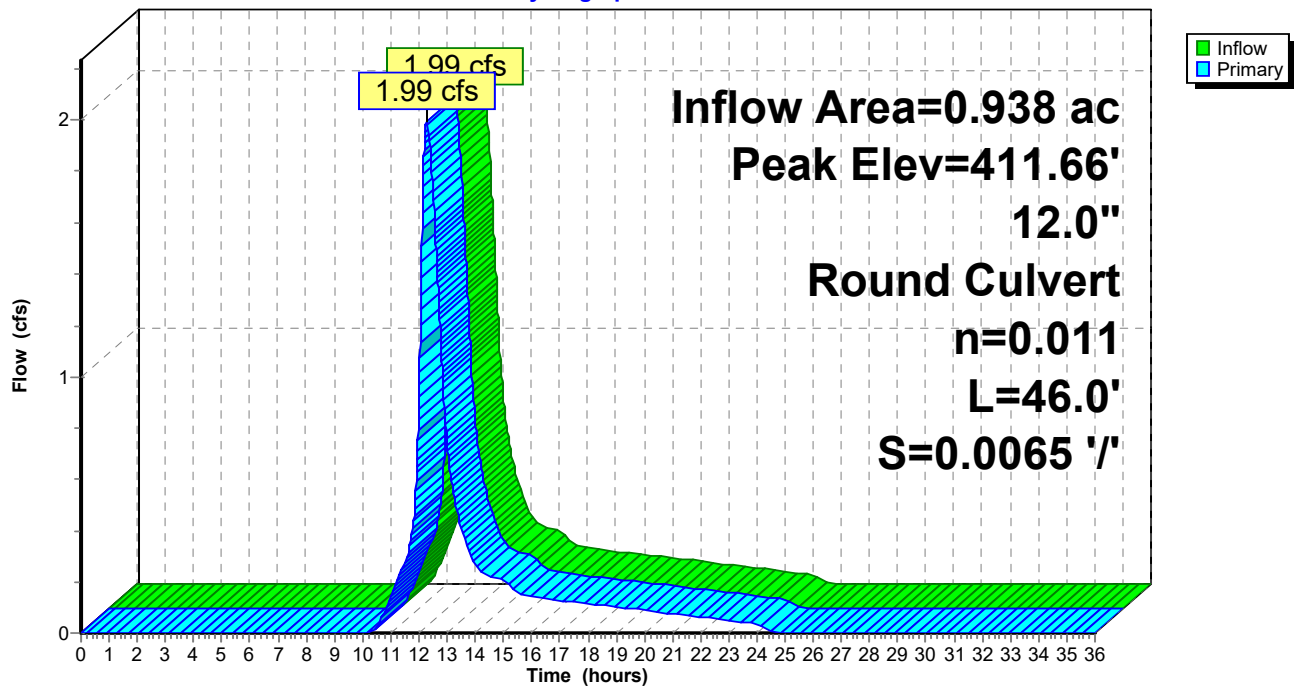
Summary for Pond 19P: DMH B

Inflow Area = 0.938 ac, 37.37% Impervious, Inflow Depth = 3.58" for 100-YR event
 Inflow = 1.99 cfs @ 12.27 hrs, Volume= 0.280 af
 Outflow = 1.99 cfs @ 12.27 hrs, Volume= 0.280 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.99 cfs @ 12.27 hrs, Volume= 0.280 af
 Routed to Link 29P : Desing Point #1: Flow to Summer Street

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 411.66' @ 12.27 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	410.80'	12.0" Round Culvert L= 46.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 410.80' / 410.50' S= 0.0065 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.99 cfs @ 12.27 hrs HW=411.66' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 1.99 cfs @ 3.74 fps)

Pond 19P: DMH B**Hydrograph**

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Summary for Subcatchment 20P: P1g

Runoff = 0.14 cfs @ 12.10 hrs, Volume= 0.010 af, Depth= 7.91"
Routed to Pond 21P : AD D

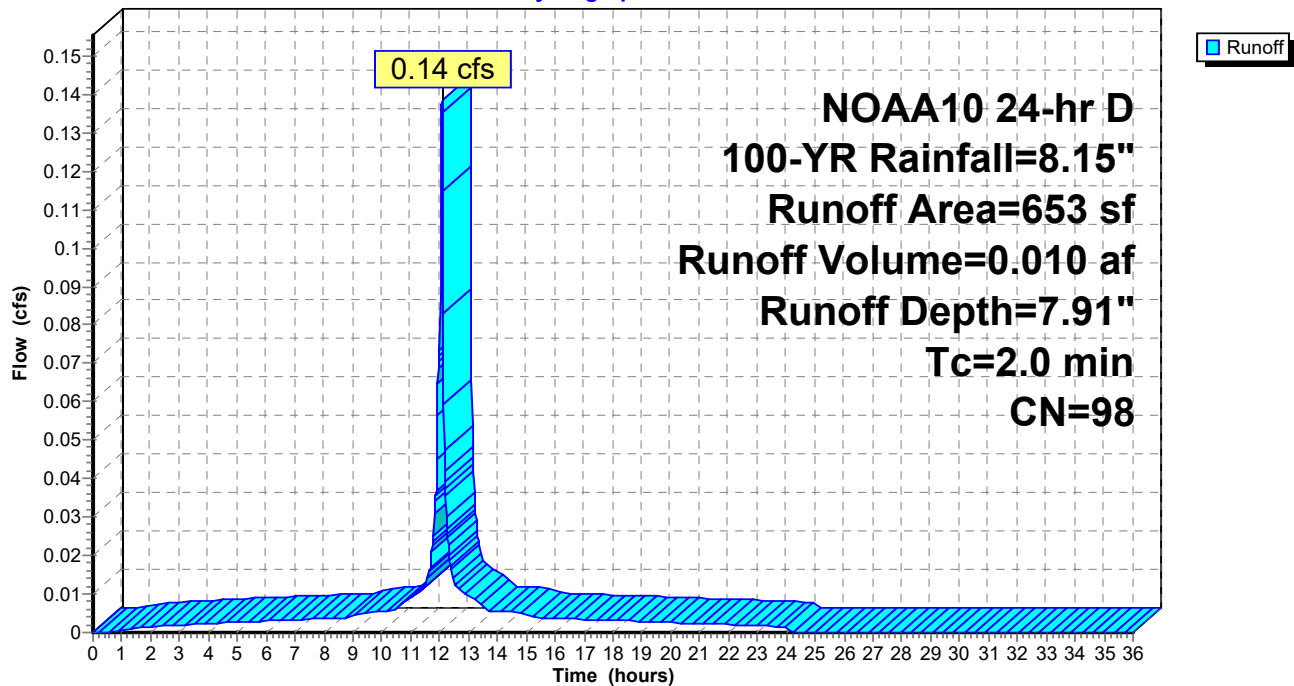
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
653	98	Roofs HSG B
653		100.00% Impervious Area

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

Subcatchment 20P: P1g

Hydrograph



Summary for Pond 21P: AD D

Inflow Area = 0.015 ac, 100.00% Impervious, Inflow Depth = 7.91" for 100-YR event
 Inflow = 0.14 cfs @ 12.10 hrs, Volume= 0.010 af
 Outflow = 0.14 cfs @ 12.10 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.14 cfs @ 12.10 hrs, Volume= 0.010 af
 Routed to Pond 22P : Infiltration Field #1

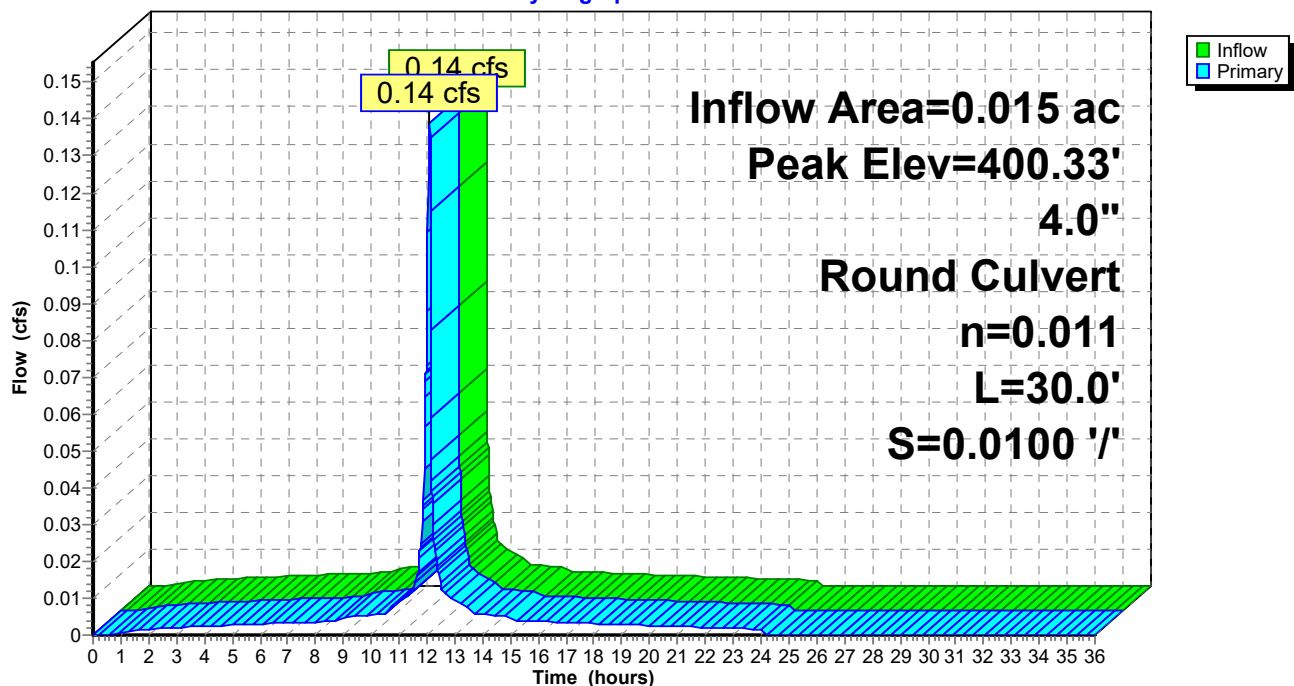
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 400.33' @ 12.93 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	400.00'	4.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 400.00' / 399.70' S= 0.0100 '/ Cc= 0.900 n= 0.011, Flow Area= 0.09 sf

Primary OutFlow Max=0.14 cfs @ 12.10 hrs HW=400.28' TW=399.36' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 0.14 cfs @ 1.79 fps)

Pond 21P: AD D

Hydrograph



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Summary for Pond 22P: Infiltration Field #1

Inflow Area = 0.015 ac, 100.00% Impervious, Inflow Depth = 7.91" for 100-YR event
 Inflow = 0.14 cfs @ 12.10 hrs, Volume= 0.010 af
 Outflow = 0.01 cfs @ 12.93 hrs, Volume= 0.010 af, Atten= 93%, Lag= 49.6 min
 Discarded = 0.01 cfs @ 12.76 hrs, Volume= 0.010 af
 Primary = 0.00 cfs @ 12.93 hrs, Volume= 0.000 af
 Routed to Link 29P : Desing Point #1: Flow to Summer Street

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 400.33' @ 12.93 hrs Surf.Area= 105 sf Storage= 140 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 181.3 min (920.0 - 738.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	397.80'	82 cf	8.00'W x 13.00'L x 2.54'H Field A 264 cf Overall - 58 cf Embedded = 206 cf x 40.0% Voids
#2A	398.30'	58 cf	Cultec R-150XLHD x 2 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 2 rows
#3	400.30'	2 cf	1.00'D x 2.00'H Vertical Cone/Cylinder
		142 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.80'	2.400 in/hr Exfiltration over Surface area
#2	Primary	400.30'	4.0" Round Culvert X 2.00 L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 400.30' / 400.20' S= 0.1000 ' / ' Cc= 0.900 n= 0.011, Flow Area= 0.09 sf

Discarded OutFlow Max=0.01 cfs @ 12.76 hrs HW=400.30' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.01 cfs)**Primary OutFlow** Max=0.00 cfs @ 12.93 hrs HW=400.33' TW=0.00' (Dynamic Tailwater)↑ **2=Culvert** (Inlet Controls 0.00 cfs @ 0.57 fps)

Pond 22P: Infiltration Field #1 - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 2 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

1 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 11.00' Row Length +12.0" End Stone x 2 = 13.00' Base Length

2 Rows x 33.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 8.00' Base Width

6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

2 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 2 Rows = 58.3 cf Chamber Storage

264.3 cf Field - 58.3 cf Chambers = 206.1 cf Stone x 40.0% Voids = 82.4 cf Stone Storage

Chamber Storage + Stone Storage = 140.7 cf = 0.003 af

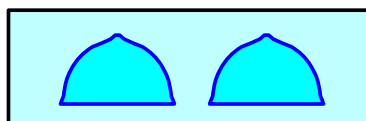
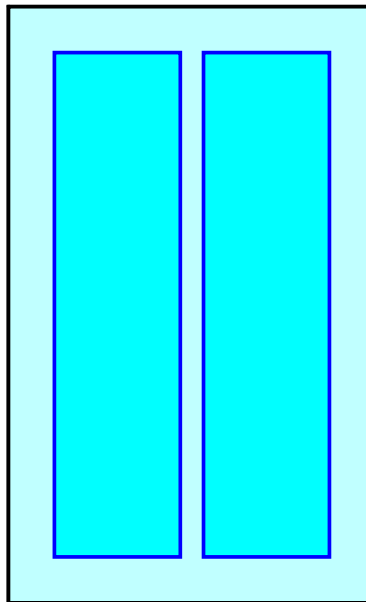
Overall Storage Efficiency = 53.2%

Overall System Size = 13.00' x 8.00' x 2.54'

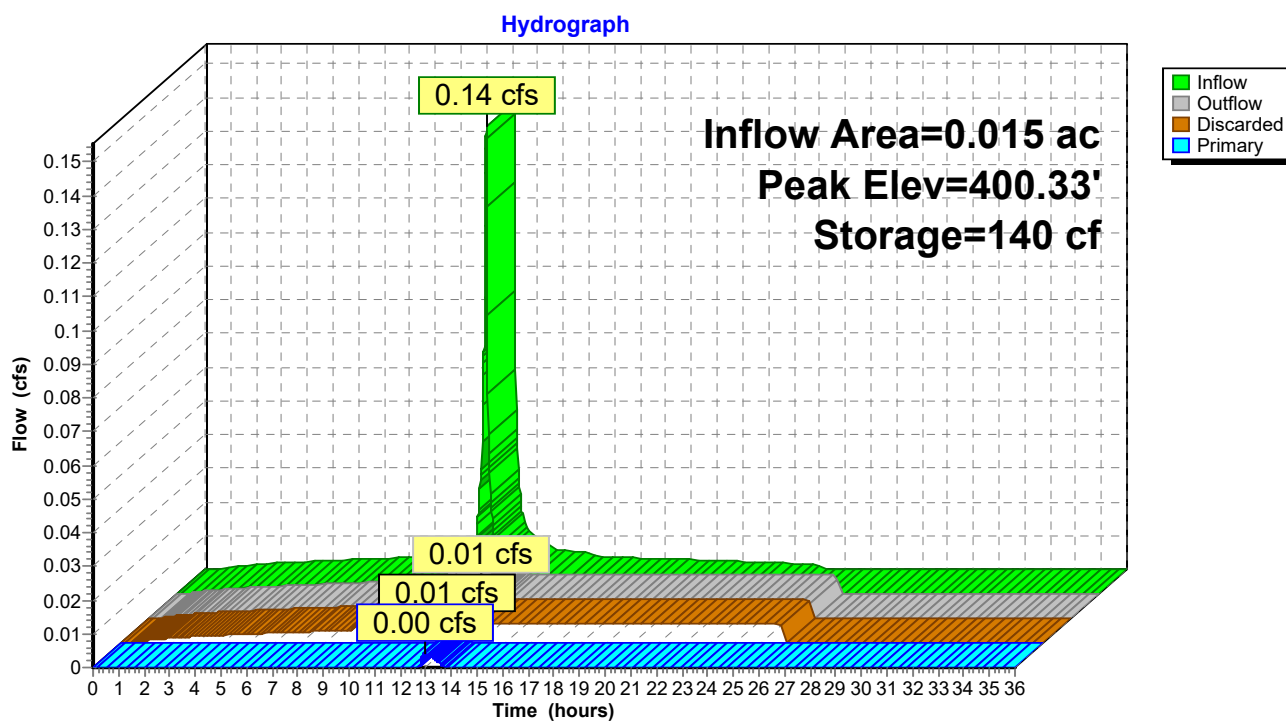
2 Chambers

9.8 cy Field

7.6 cy Stone



Pond 22P: Infiltration Field #1



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Summary for Subcatchment 23P: P1h

Runoff = 0.20 cfs @ 12.10 hrs, Volume= 0.014 af, Depth= 7.91"
Routed to Pond 24P : AD E

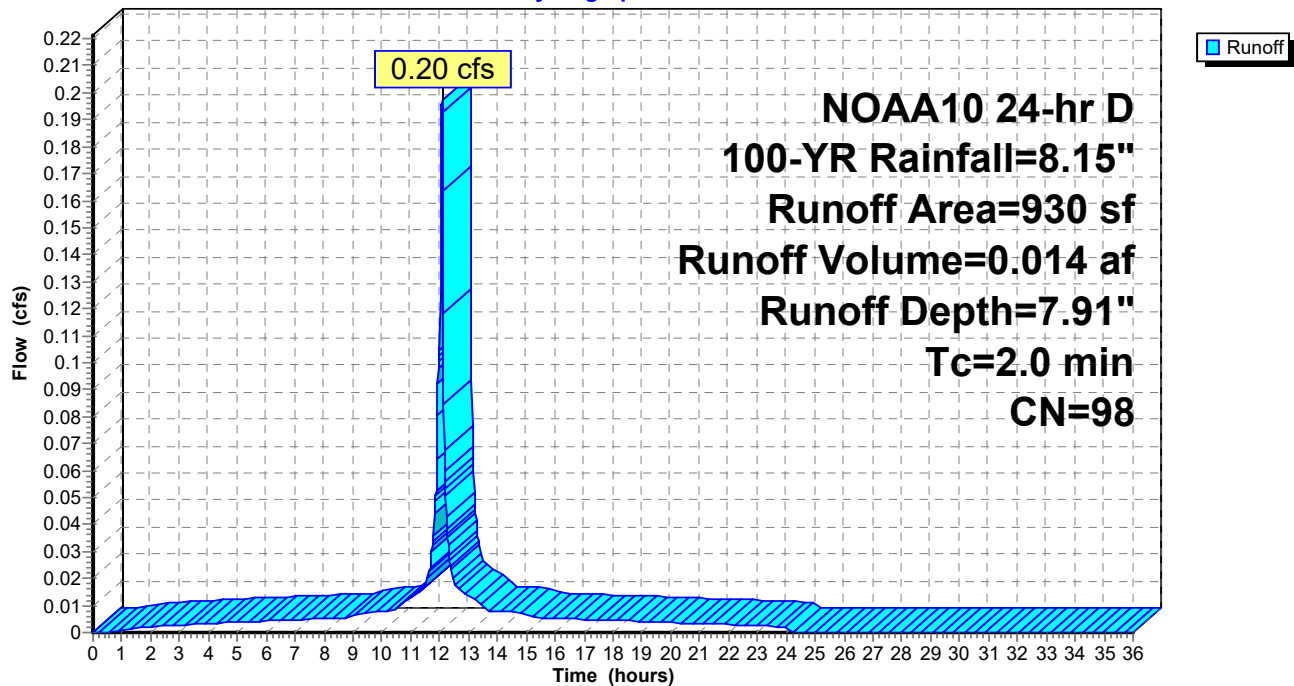
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
930	98	Roofs HSG B
930		100.00% Impervious Area

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

Subcatchment 23P: P1h

Hydrograph



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Summary for Pond 24P: AD E

Inflow Area = 0.021 ac, 100.00% Impervious, Inflow Depth = 7.91" for 100-YR event
Inflow = 0.20 cfs @ 12.10 hrs, Volume= 0.014 af
Outflow = 0.20 cfs @ 12.10 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
Primary = 0.20 cfs @ 12.10 hrs, Volume= 0.014 af
Routed to Pond 27P : Infiltration Field #2

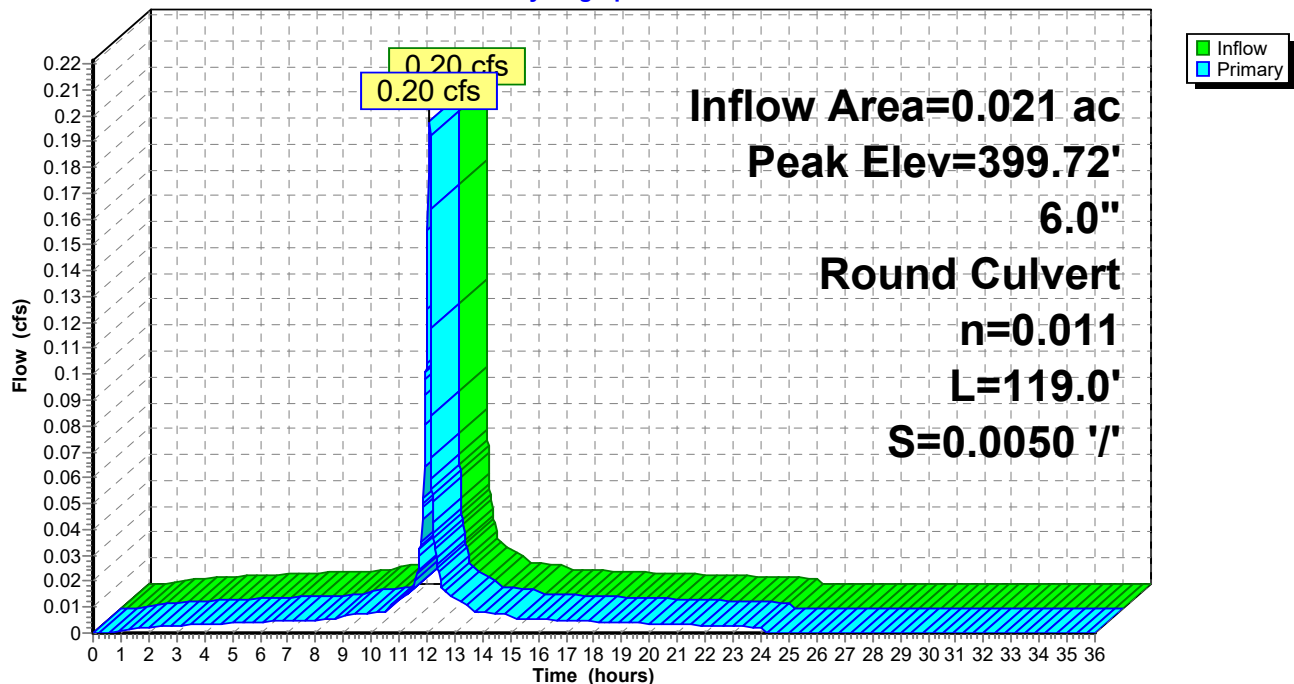
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 399.72' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	398.00'	6.0" Round Culvert L= 119.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.00' / 397.40' S= 0.0050 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Primary OutFlow Max=0.12 cfs @ 12.10 hrs HW=399.64' TW=399.59' (Dynamic Tailwater)
↑ **1=Culvert** (Outlet Controls 0.12 cfs @ 0.61 fps)

Pond 24P: AD E

Hydrograph



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Summary for Subcatchment 25P: P1i

Runoff = 0.63 cfs @ 12.16 hrs, Volume= 0.053 af, Depth= 4.64"
 Routed to Pond 26P : AD F&G

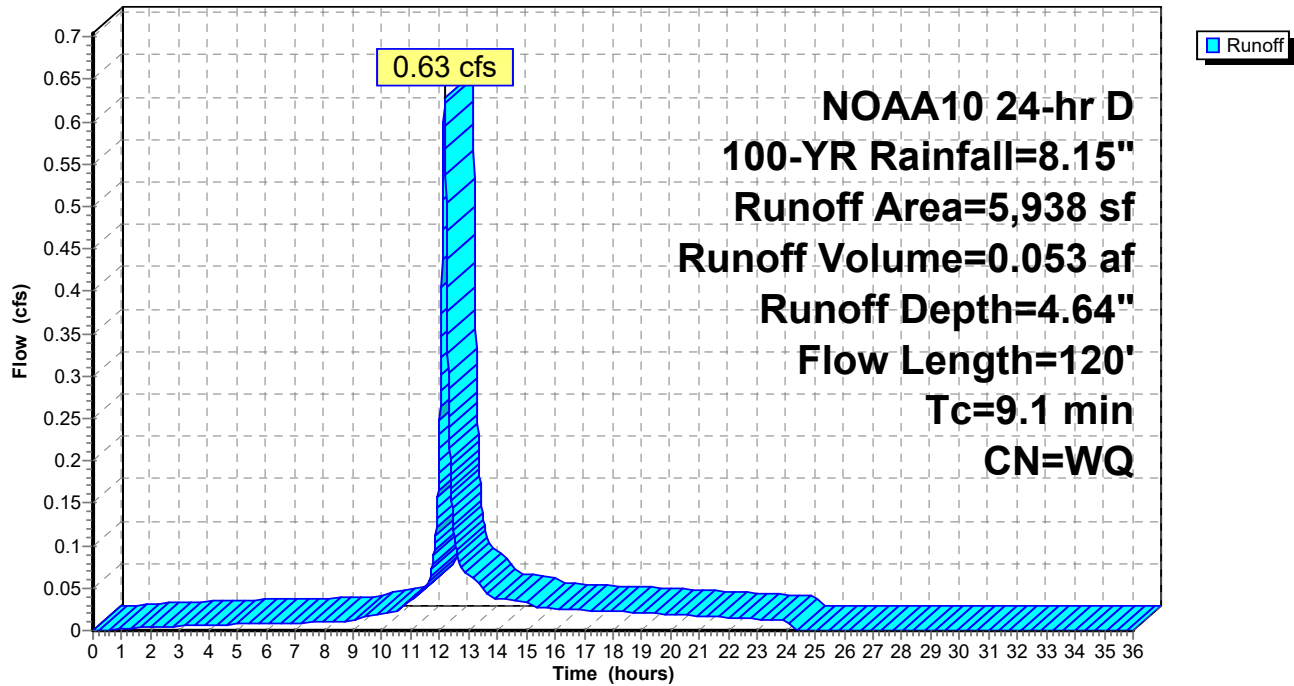
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
1,807	98	Paved parking HSG B
2,161	55	Woods, Good HSG B
1,970	61	>75% Grass cover, Good HSG B
5,938		Weighted Average
4,131		69.57% Pervious Area
1,807		30.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0500	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
0.4	26	0.0500	1.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	24	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.1	120	Total			

Subcatchment 25P: P1i

Hydrograph



Summary for Pond 26P: AD F&G

Inflow Area = 0.136 ac, 30.43% Impervious, Inflow Depth = 4.64" for 100-YR event
 Inflow = 0.63 cfs @ 12.16 hrs, Volume= 0.053 af
 Outflow = 0.63 cfs @ 12.16 hrs, Volume= 0.053 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.63 cfs @ 12.16 hrs, Volume= 0.053 af
 Routed to Pond 27P : Infiltration Field #2

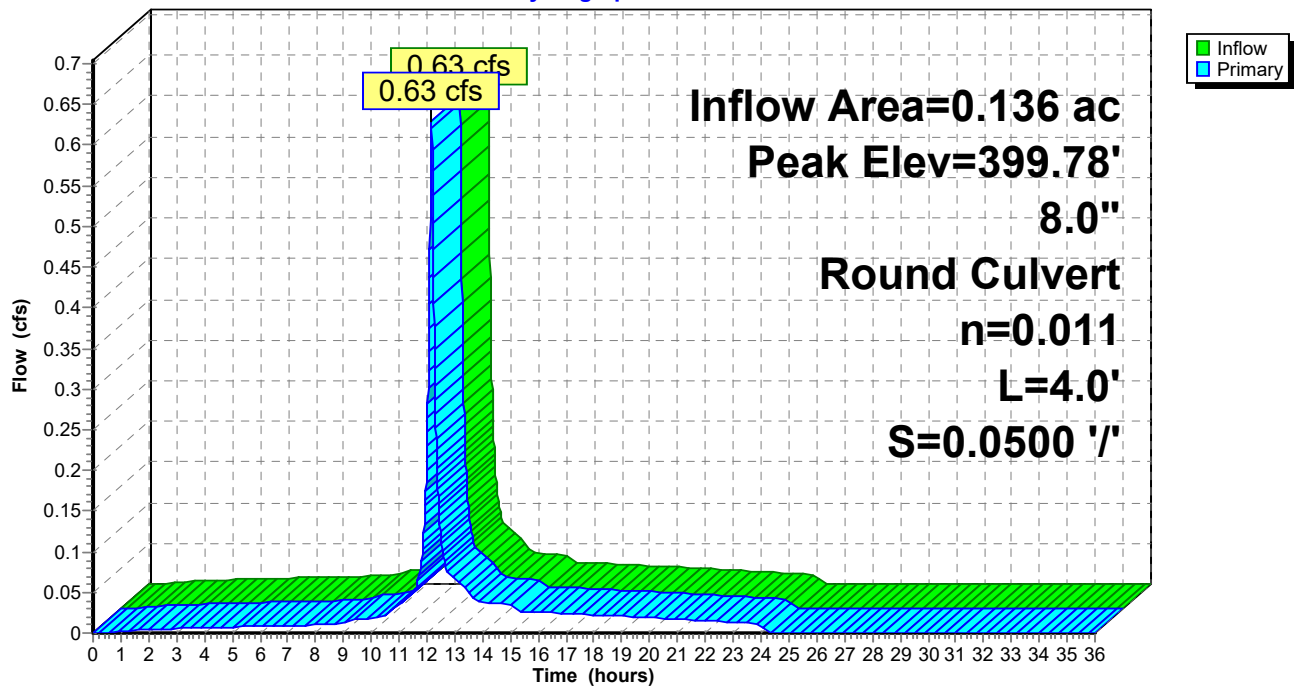
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 399.78' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	397.00'	8.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.00' / 396.80' S= 0.0500 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.62 cfs @ 12.16 hrs HW=399.75' TW=399.61' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 0.62 cfs @ 1.78 fps)

Pond 26P: AD F&G

Hydrograph



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Summary for Pond 27P: Infiltration Field #2

Inflow Area = 0.158 ac, 39.85% Impervious, Inflow Depth = 5.08" for 100-YR event
 Inflow = 0.71 cfs @ 12.12 hrs, Volume= 0.067 af
 Outflow = 0.71 cfs @ 12.12 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.1 min
 Discarded = 0.01 cfs @ 11.44 hrs, Volume= 0.025 af
 Primary = 0.70 cfs @ 12.12 hrs, Volume= 0.042 af
 Routed to Link 29P : Desing Point #1: Flow to Summer Street

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 399.66' @ 12.12 hrs Surf.Area= 186 sf Storage= 257 cf

Plug-Flow detention time= 92.9 min calculated for 0.067 af (100% of inflow)
 Center-of-Mass det. time= 93.0 min (891.3 - 798.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	396.30'	144 cf	8.00'W x 23.25'L x 2.54'H Field A 473 cf Overall - 113 cf Embedded = 360 cf x 40.0% Voids
#2A	396.80'	113 cf	Cultec R-150XLHD x 4 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 2 rows
#3	398.80'	0 cf	0.50'D x 1.00'H Vertical Cone/Cylinder
		257 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	396.30'	2.400 in/hr Exfiltration over Surface area
#2	Primary	398.80'	4.0" Round Culvert X 2.00 L= 1.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.80' / 398.70' S= 0.1000 ' ' Cc= 0.900 n= 0.011, Flow Area= 0.09 sf

Discarded OutFlow Max=0.01 cfs @ 11.44 hrs HW=398.81' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.70 cfs @ 12.12 hrs HW=399.66' TW=0.00' (Dynamic Tailwater)

↑**2=Culvert** (Inlet Controls 0.70 cfs @ 4.00 fps)

Pond 27P: Infiltration Field #2 - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 2 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

2 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 21.25' Row Length +12.0" End Stone x 2 =
23.25' Base Length

2 Rows x 33.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 8.00' Base Width

6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

4 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 2 Rows = 112.6 cf Chamber Storage

472.8 cf Field - 112.6 cf Chambers = 360.2 cf Stone x 40.0% Voids = 144.1 cf Stone Storage

Chamber Storage + Stone Storage = 256.6 cf = 0.006 af

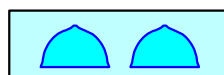
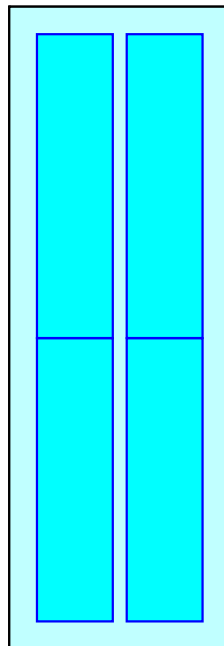
Overall Storage Efficiency = 54.3%

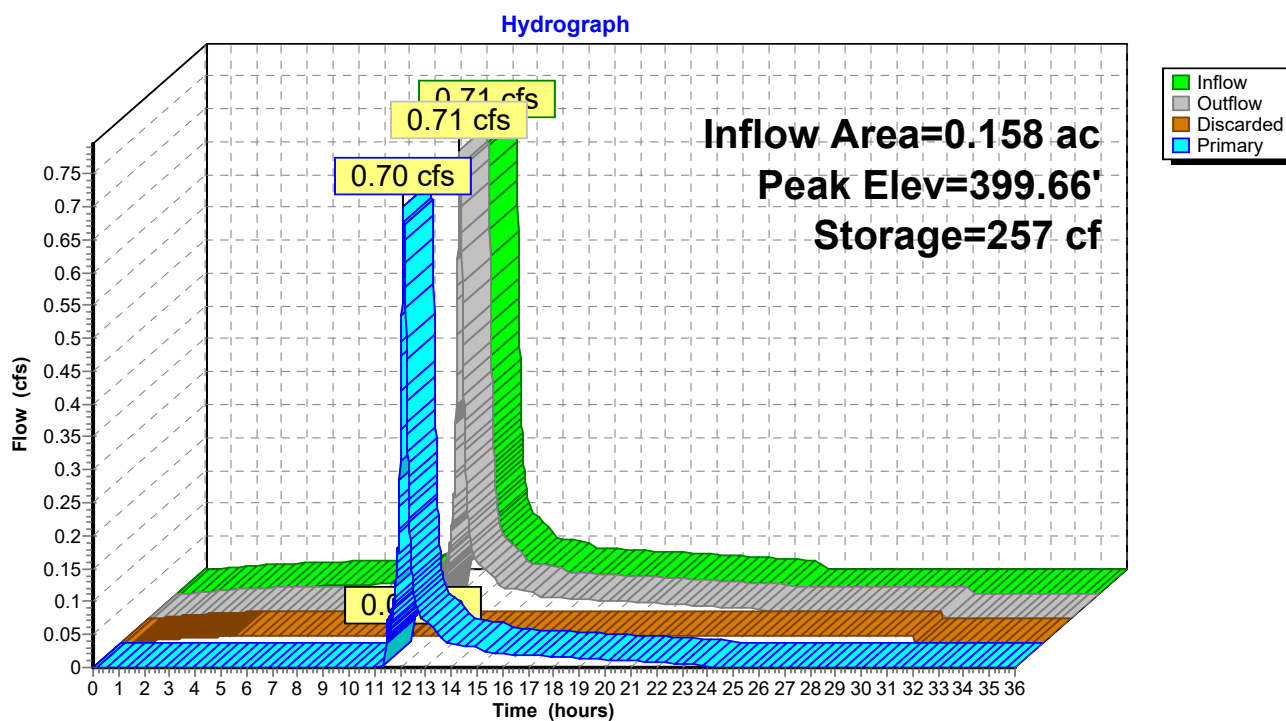
Overall System Size = 23.25' x 8.00' x 2.54'

4 Chambers

17.5 cy Field

13.3 cy Stone



Pond 27P: Infiltration Field #2

Summary for Subcatchment 28P: P1j

Runoff = 5.95 cfs @ 12.19 hrs, Volume= 0.524 af, Depth= 3.46"

Routed to Link 29P : Desing Point #1: Flow to Summer Street

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

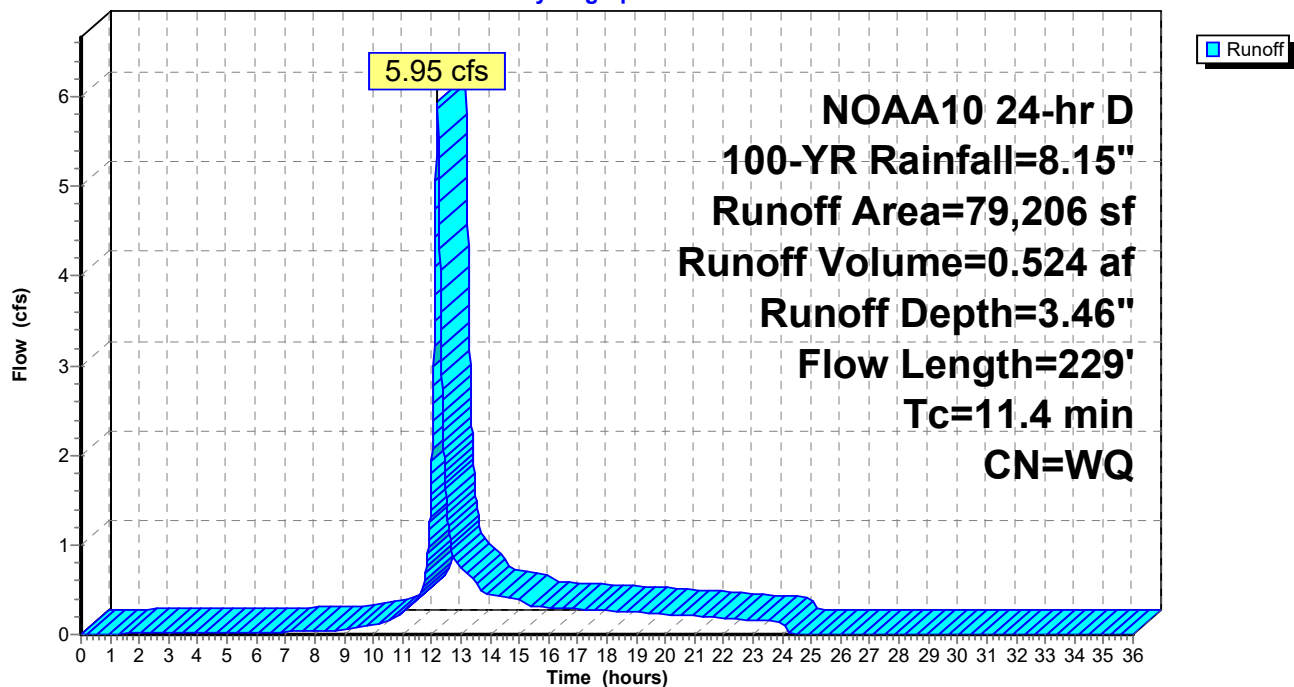
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
762	98	Roofs HSG B
5,095	98	Paved parking HSG B
49,980	55	Woods, Good HSG B
23,369	61	>75% Grass cover, Good HSG B
79,206		Weighted Average
73,349		92.61% Pervious Area
5,857		7.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
2.3	179	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.4	229	Total			

Subcatchment 28P: P1j

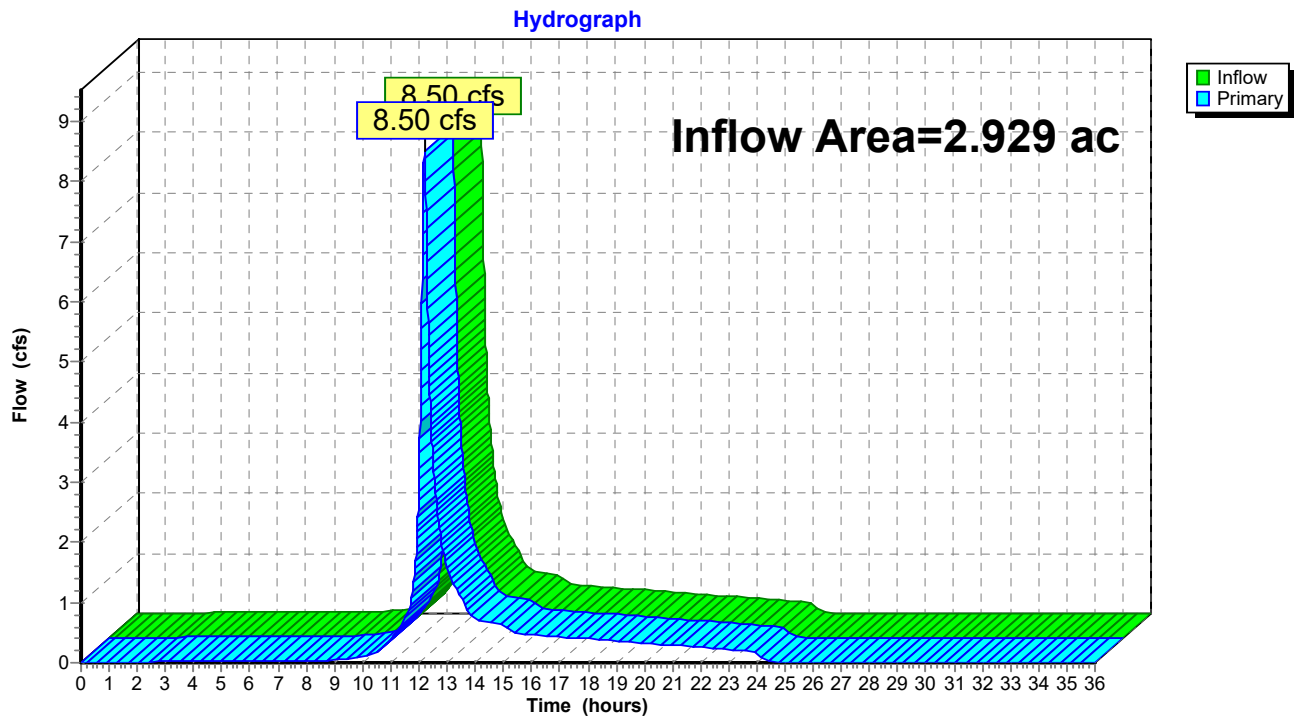
Hydrograph



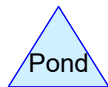
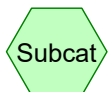
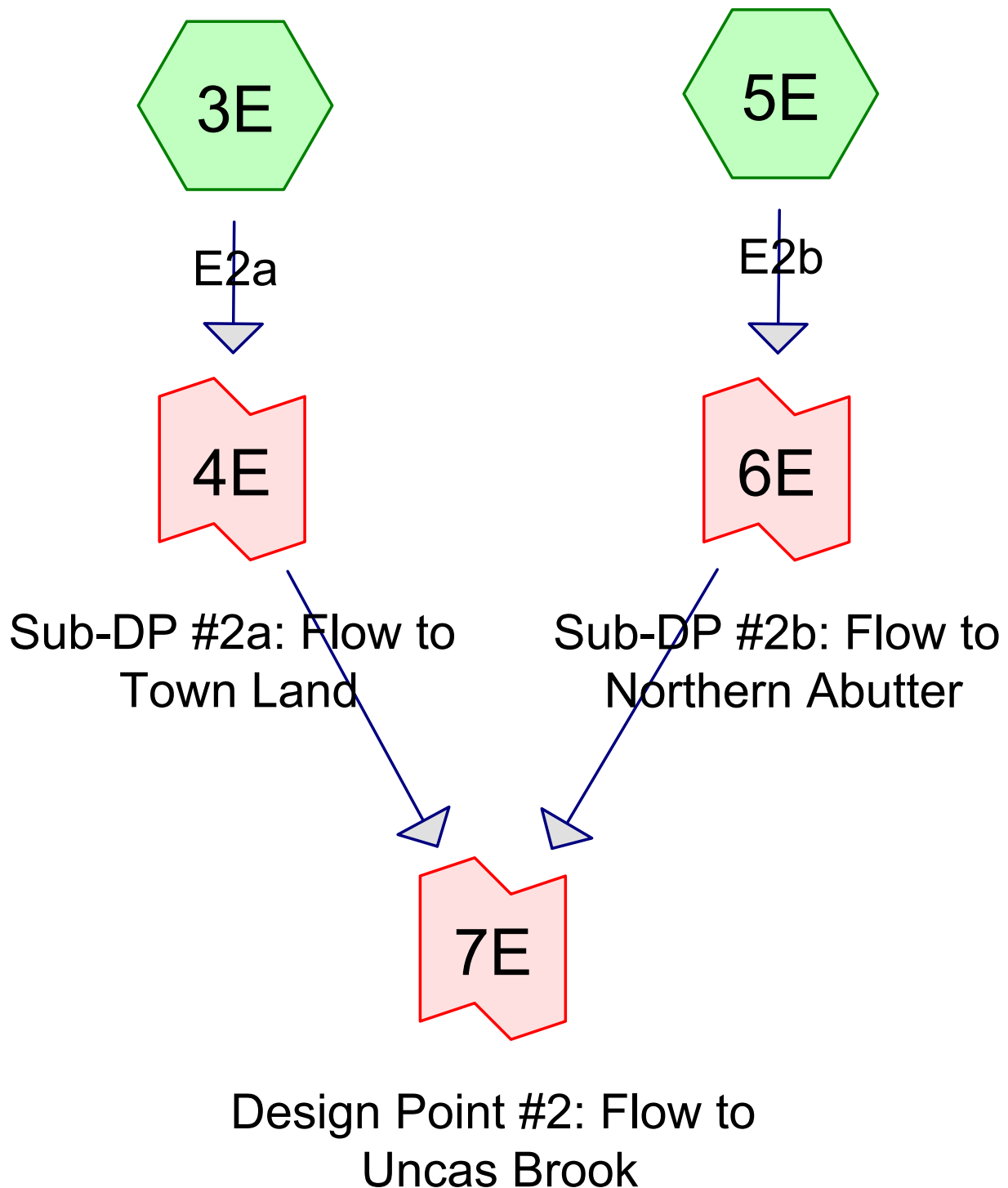
Summary for Link 29P: Desing Point #1: Flow to Summer Street

Inflow Area = 2.929 ac, 19.21% Impervious, Inflow Depth = 3.47" for 100-YR event
Inflow = 8.50 cfs @ 12.19 hrs, Volume= 0.846 af
Primary = 8.50 cfs @ 12.19 hrs, Volume= 0.846 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 29P: Desing Point #1: Flow to Summer Street

**DESIGN POINT #2: FLOW TO UNCAS
BROOK EXISTING CONDITIONS**



Routing Diagram for HydroCAD 2

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-YR	NOAA10 24-hr	D	Default	24.00	1	3.36	2
2	10-YR	NOAA10 24-hr	D	Default	24.00	1	5.22	2
3	25-YR	NOAA10 24-hr	D	Default	24.00	1	6.37	2
4	100-YR	NOAA10 24-hr	D	Default	24.00	1	8.15	2

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.474	61	>75% Grass cover, Good HSG B (3E, 5E)
0.075	98	Paved parking HSG B (3E, 5E)
0.050	98	Roofs HSG B (5E)
0.020	98	Roofs, HSG B (3E)
3.249	55	Woods, Good HSG B (5E)
5.198	55	Woods, Good, HSG B (3E)
9.066	56	TOTAL AREA

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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment3E: E2a

Runoff Area=236,411 sf 1.52% Impervious Runoff Depth=0.35"
Flow Length=615' Tc=12.5 min CN=WQ Runoff=0.73 cfs 0.158 af

Link 4E: Sub-DP #2a: Flow to Town Land

Inflow=0.73 cfs 0.158 af
Primary=0.73 cfs 0.158 af

Subcatchment5E: E2b

Runoff Area=158,520 sf 1.71% Impervious Runoff Depth=0.37"
Flow Length=613' Tc=16.2 min CN=WQ Runoff=0.49 cfs 0.111 af

Link 6E: Sub-DP #2b: Flow to Northern Abutter

Inflow=0.49 cfs 0.111 af
Primary=0.49 cfs 0.111 af

Link 7E: Design Point #2: Flow to Uncas Brook

Inflow=1.21 cfs 0.269 af
Primary=1.21 cfs 0.269 af

Total Runoff Area = 9.066 ac Runoff Volume = 0.269 af Average Runoff Depth = 0.36"
98.41% Pervious = 8.922 ac 1.59% Impervious = 0.145 ac

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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Subcatchment 3E: E2a

Runoff = 0.73 cfs @ 12.26 hrs, Volume= 0.158 af, Depth= 0.35"

Routed to Link 4E : Sub-DP #2a: Flow to Town Land

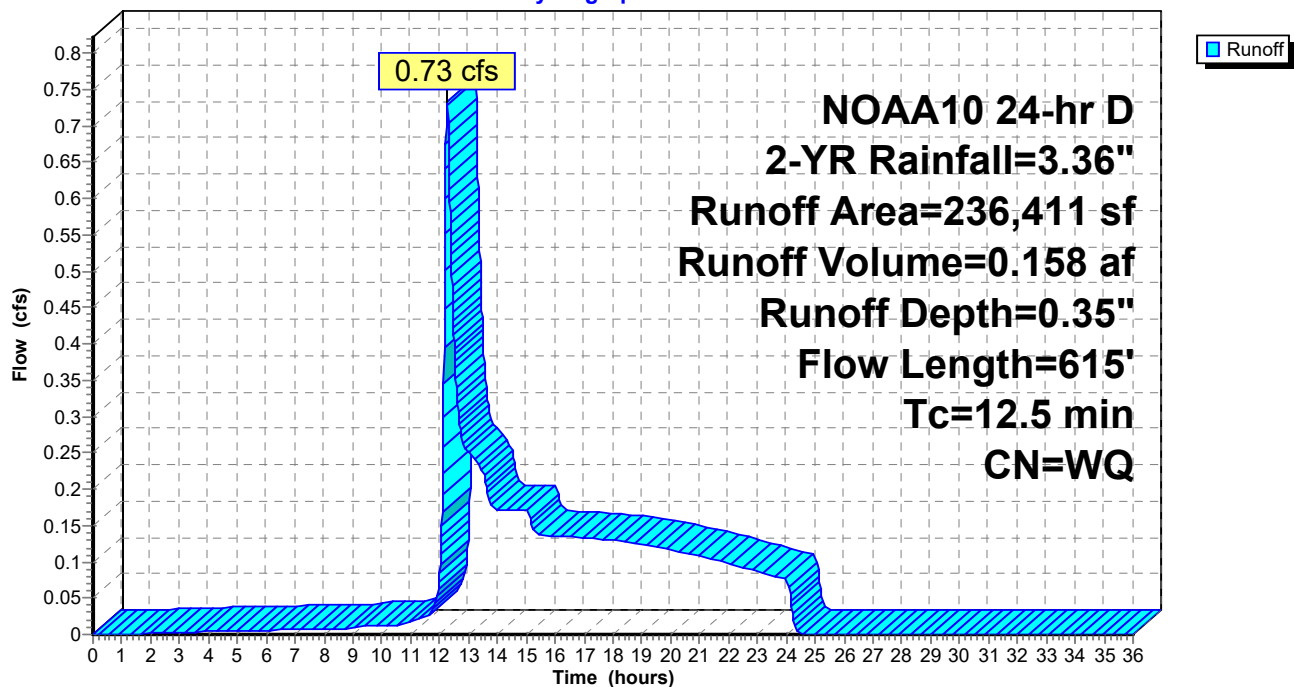
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
2,724	98	Paved parking HSG B
870	98	Roofs, HSG B
6,381	61	>75% Grass cover, Good HSG B
226,436	55	Woods, Good, HSG B
236,411		Weighted Average
232,817		98.48% Pervious Area
3,594		1.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	50	0.0700	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
5.2	565	0.1300	1.80		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.5	615	Total			

Subcatchment 3E: E2a

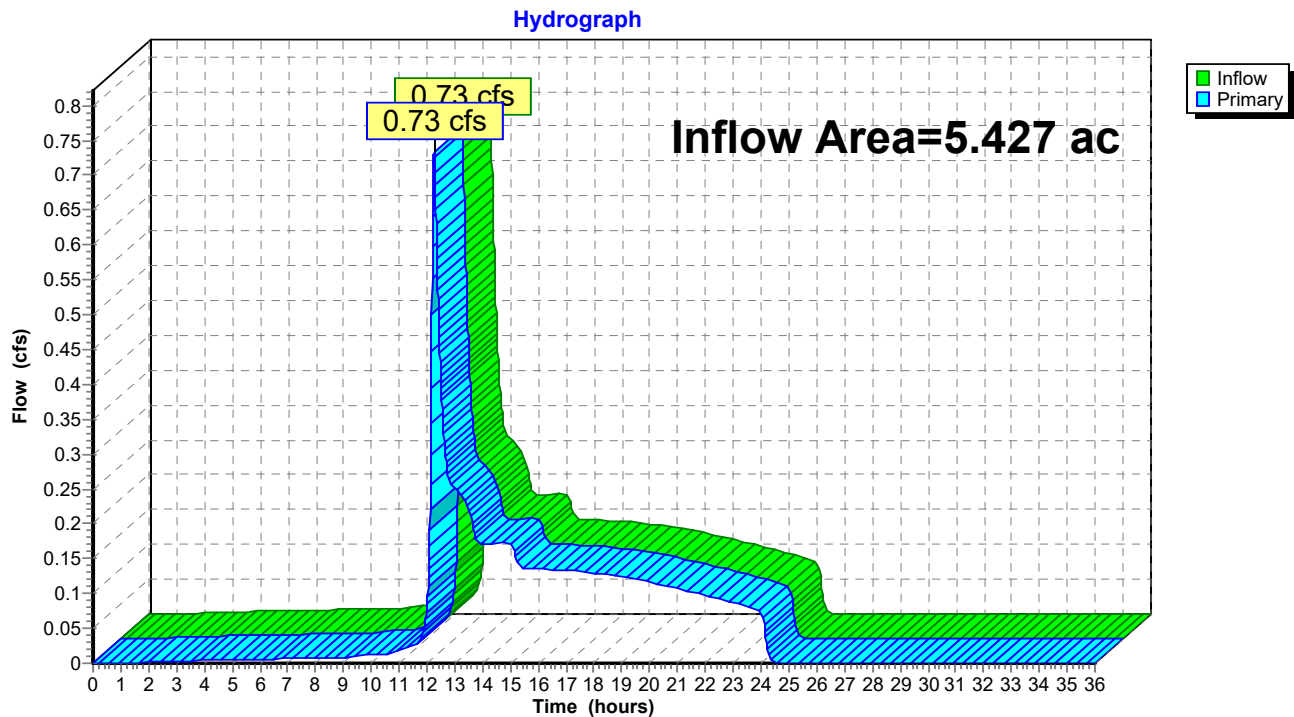
Hydrograph



Summary for Link 4E: Sub-DP #2a: Flow to Town Land

Inflow Area = 5.427 ac, 1.52% Impervious, Inflow Depth = 0.35" for 2-YR event
Inflow = 0.73 cfs @ 12.26 hrs, Volume= 0.158 af
Primary = 0.73 cfs @ 12.26 hrs, Volume= 0.158 af, Atten= 0%, Lag= 0.0 min
Routed to Link 7E : Design Point #2: Flow to Uncas Brook

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 4E: Sub-DP #2a: Flow to Town Land

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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Subcatchment 5E: E2b

Runoff = 0.49 cfs @ 12.30 hrs, Volume= 0.111 af, Depth= 0.37"

Routed to Link 6E : Sub-DP #2b: Flow to Northern Abutter

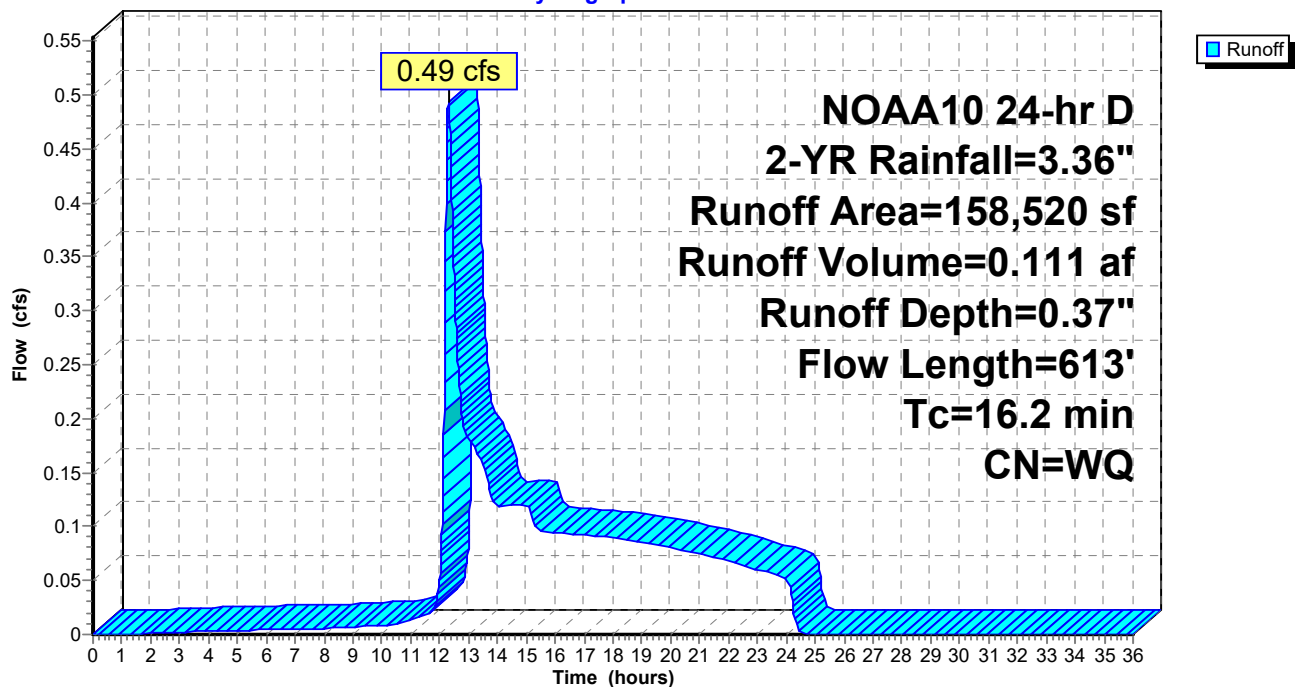
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
525	98	Paved parking HSG B
2,180	98	Roofs HSG B
141,538	55	Woods, Good HSG B
14,277	61	>75% Grass cover, Good HSG B
158,520		Weighted Average
155,815		98.29% Pervious Area
2,705		1.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
7.1	563	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
16.2	613	Total			

Subcatchment 5E: E2b

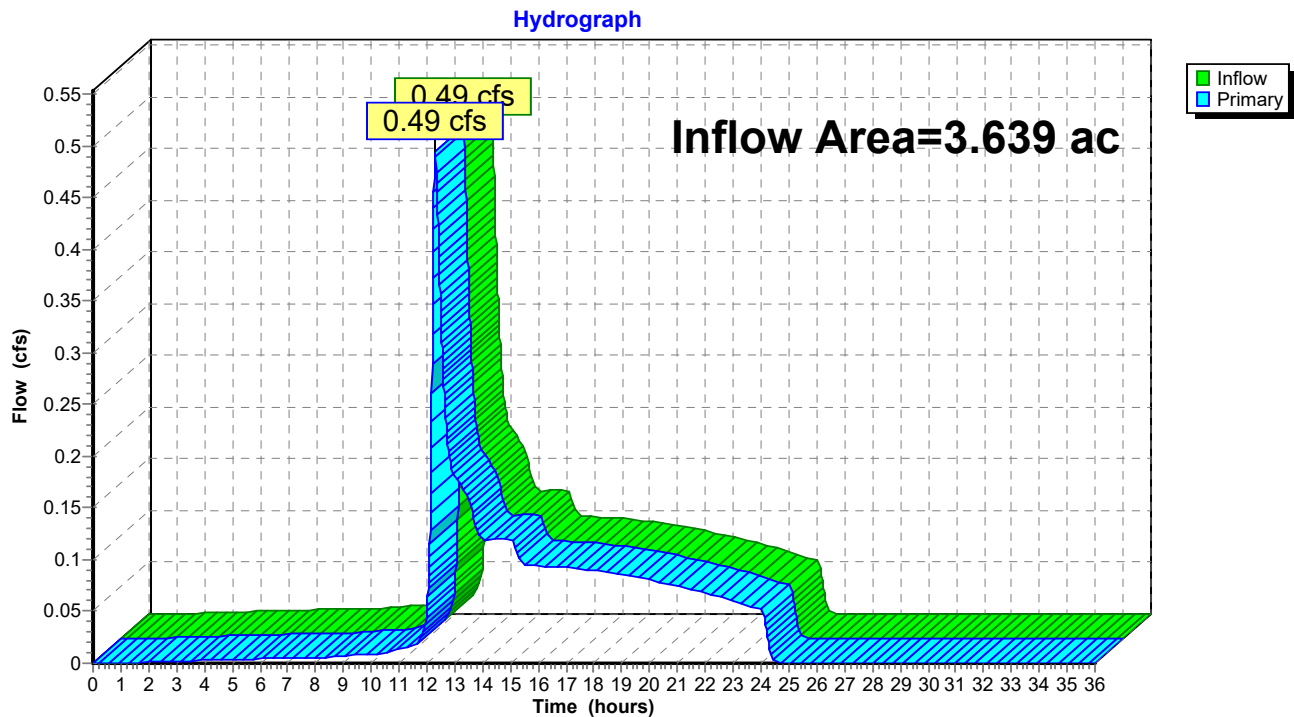
Hydrograph



Summary for Link 6E: Sub-DP #2b: Flow to Northern Abutter

Inflow Area = 3.639 ac, 1.71% Impervious, Inflow Depth = 0.37" for 2-YR event
Inflow = 0.49 cfs @ 12.30 hrs, Volume= 0.111 af
Primary = 0.49 cfs @ 12.30 hrs, Volume= 0.111 af, Atten= 0%, Lag= 0.0 min
Routed to Link 7E : Design Point #2: Flow to Uncas Brook

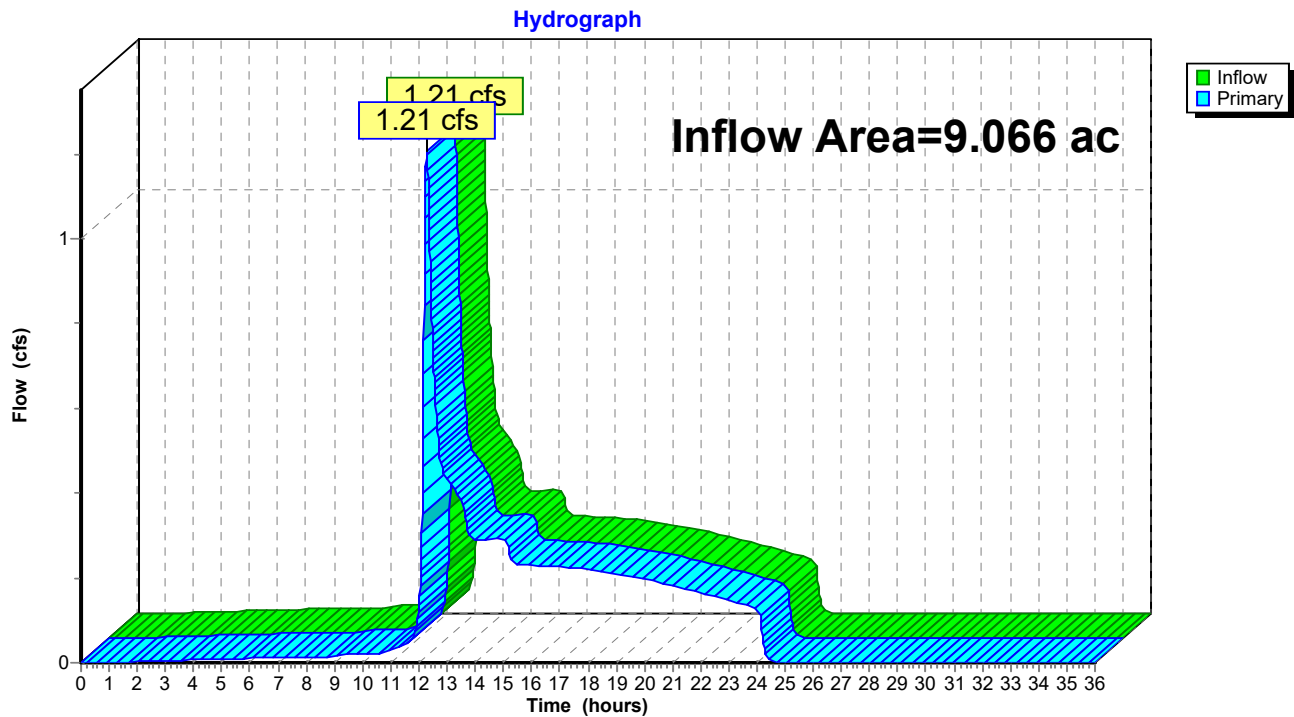
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 6E: Sub-DP #2b: Flow to Northern Abutter

Summary for Link 7E: Design Point #2: Flow to Uncas Brook

Inflow Area = 9.066 ac, 1.59% Impervious, Inflow Depth = 0.36" for 2-YR event
Inflow = 1.21 cfs @ 12.27 hrs, Volume= 0.269 af
Primary = 1.21 cfs @ 12.27 hrs, Volume= 0.269 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 7E: Design Point #2: Flow to Uncas Brook

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NOAA10 24-hr D 10-YR Rainfall=5.22"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment3E: E2a

Runoff Area=236,411 sf 1.52% Impervious Runoff Depth=1.16"
Flow Length=613' Tc=12.5 min CN=WQ Runoff=5.06 cfs 0.525 af

Link 4E: Sub-DP #2a: Flow to Town Land

Inflow=5.06 cfs 0.525 af
Primary=5.06 cfs 0.525 af

Subcatchment5E: E2b

Runoff Area=158,520 sf 1.71% Impervious Runoff Depth=1.20"
Flow Length=613' Tc=16.2 min CN=WQ Runoff=3.07 cfs 0.362 af

Link 6E: Sub-DP #2b: Flow to Northern Abutter

Inflow=3.07 cfs 0.362 af
Primary=3.07 cfs 0.362 af

Link 7E: Design Point #2: Flow to Uncas Brook

Inflow=7.98 cfs 0.888 af
Primary=7.98 cfs 0.888 af

Total Runoff Area = 9.066 ac Runoff Volume = 0.888 af Average Runoff Depth = 1.18"
98.41% Pervious = 8.922 ac 1.59% Impervious = 0.145 ac

Summary for Subcatchment 3E: E2a

Runoff = 5.06 cfs @ 12.21 hrs, Volume= 0.525 af, Depth= 1.16"
 Routed to Link 4E : Sub-DP #2a: Flow to Town Land

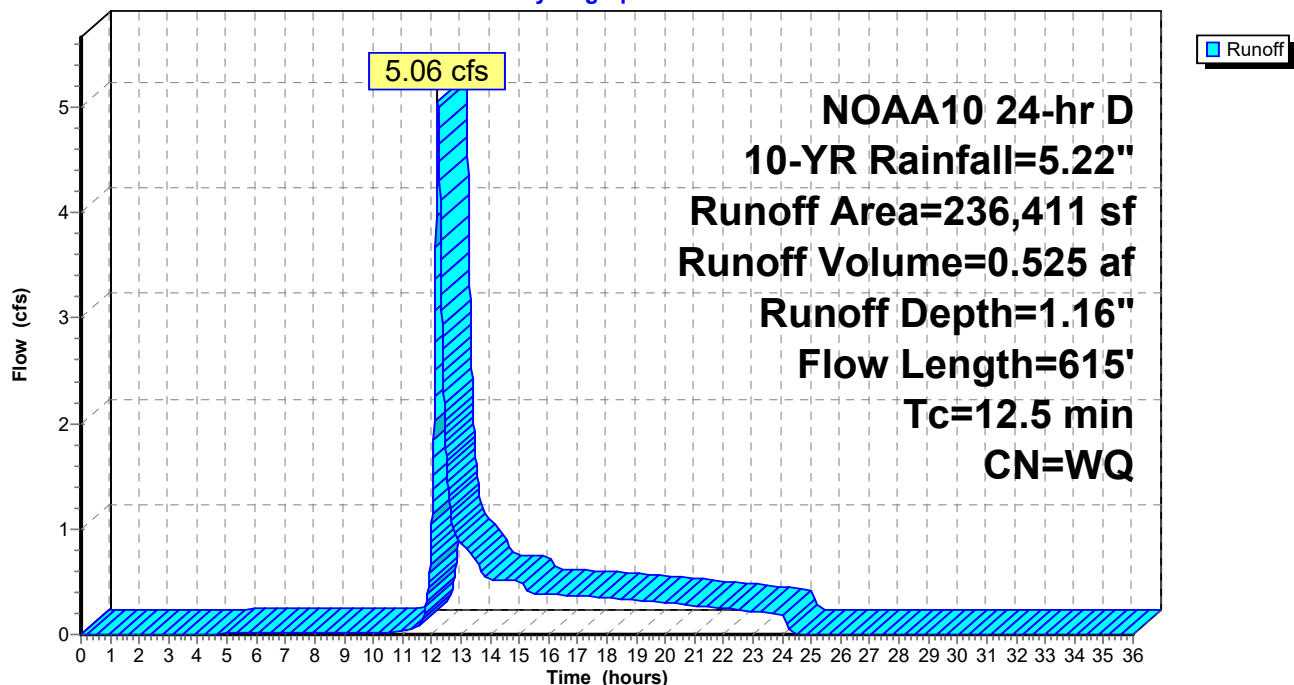
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
2,724	98	Paved parking HSG B
870	98	Roofs, HSG B
6,381	61	>75% Grass cover, Good HSG B
226,436	55	Woods, Good, HSG B
236,411		Weighted Average
232,817		98.48% Pervious Area
3,594		1.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	50	0.0700	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
5.2	565	0.1300	1.80		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.5	615	Total			

Subcatchment 3E: E2a

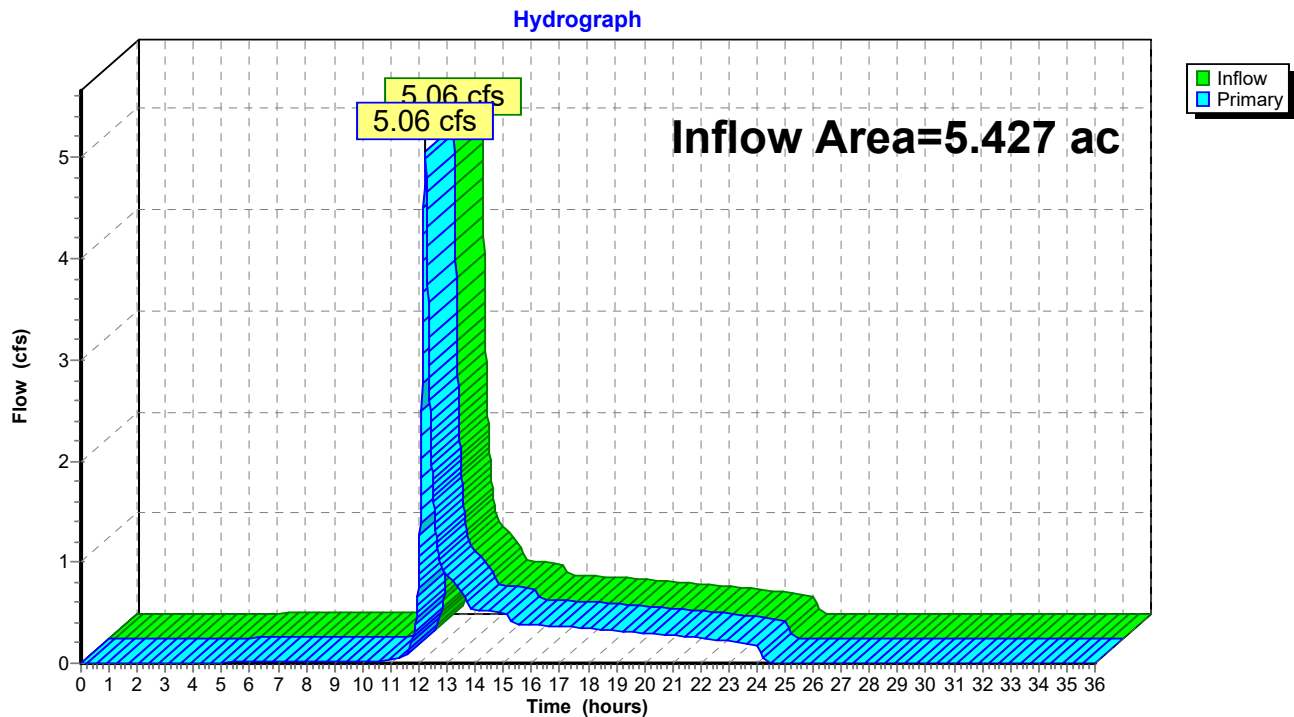
Hydrograph



Summary for Link 4E: Sub-DP #2a: Flow to Town Land

Inflow Area = 5.427 ac, 1.52% Impervious, Inflow Depth = 1.16" for 10-YR event
Inflow = 5.06 cfs @ 12.21 hrs, Volume= 0.525 af
Primary = 5.06 cfs @ 12.21 hrs, Volume= 0.525 af, Atten= 0%, Lag= 0.0 min
Routed to Link 7E : Design Point #2: Flow to Uncas Brook

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 4E: Sub-DP #2a: Flow to Town Land

Summary for Subcatchment 5E: E2b

Runoff = 3.07 cfs @ 12.26 hrs, Volume= 0.362 af, Depth= 1.20"

Routed to Link 6E : Sub-DP #2b: Flow to Northern Abutter

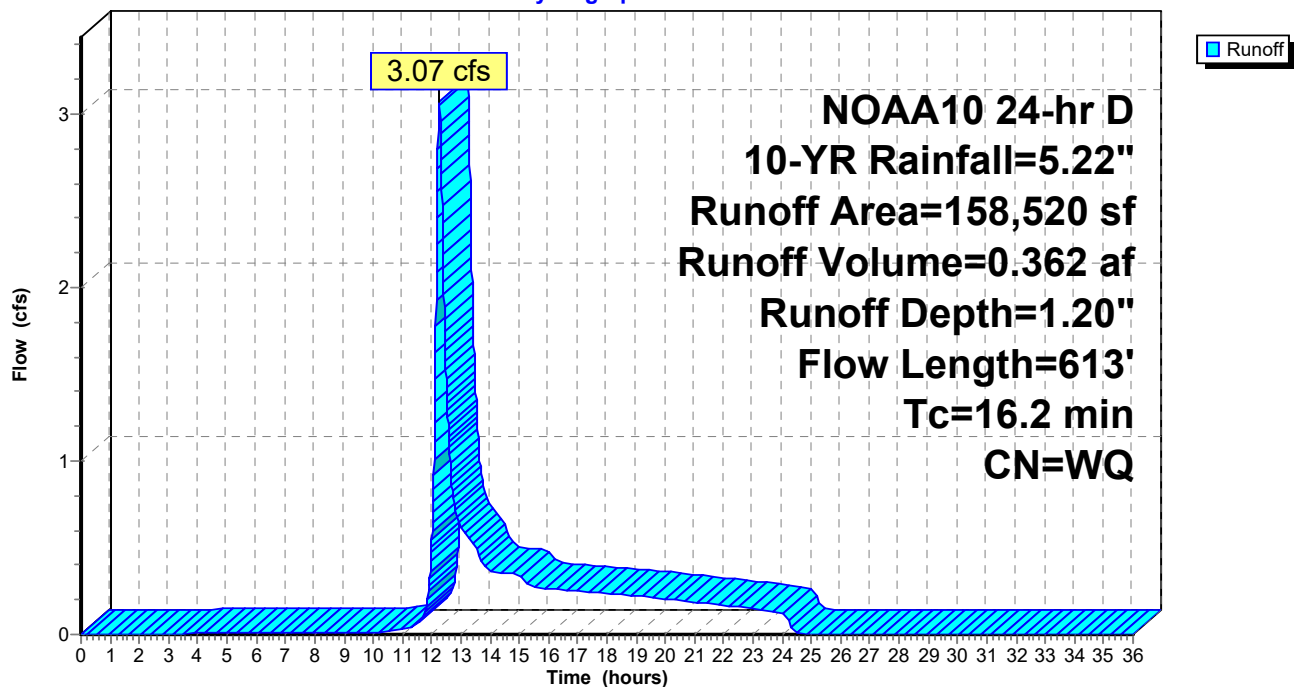
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
525	98	Paved parking HSG B
2,180	98	Roofs HSG B
141,538	55	Woods, Good HSG B
14,277	61	>75% Grass cover, Good HSG B
158,520		Weighted Average
155,815		98.29% Pervious Area
2,705		1.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
7.1	563	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
16.2	613	Total			

Subcatchment 5E: E2b

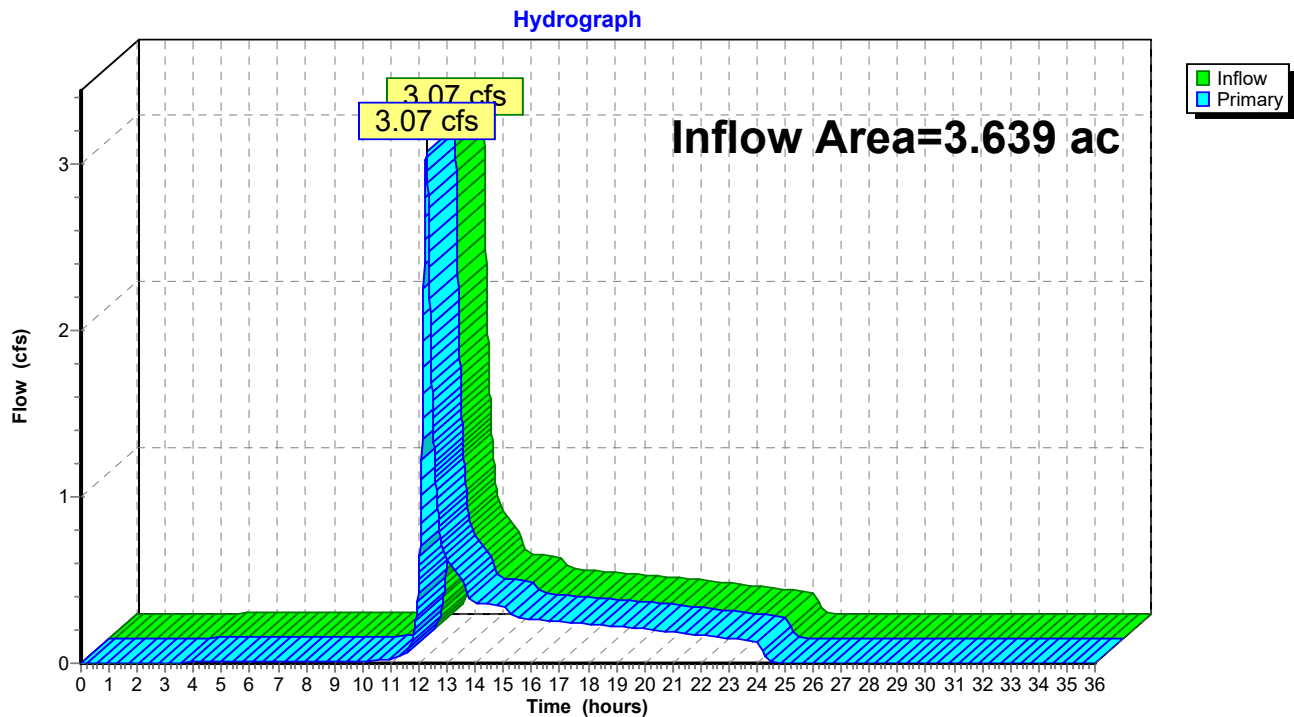
Hydrograph



Summary for Link 6E: Sub-DP #2b: Flow to Northern Abutter

Inflow Area = 3.639 ac, 1.71% Impervious, Inflow Depth = 1.20" for 10-YR event
Inflow = 3.07 cfs @ 12.26 hrs, Volume= 0.362 af
Primary = 3.07 cfs @ 12.26 hrs, Volume= 0.362 af, Atten= 0%, Lag= 0.0 min
Routed to Link 7E : Design Point #2: Flow to Uncas Brook

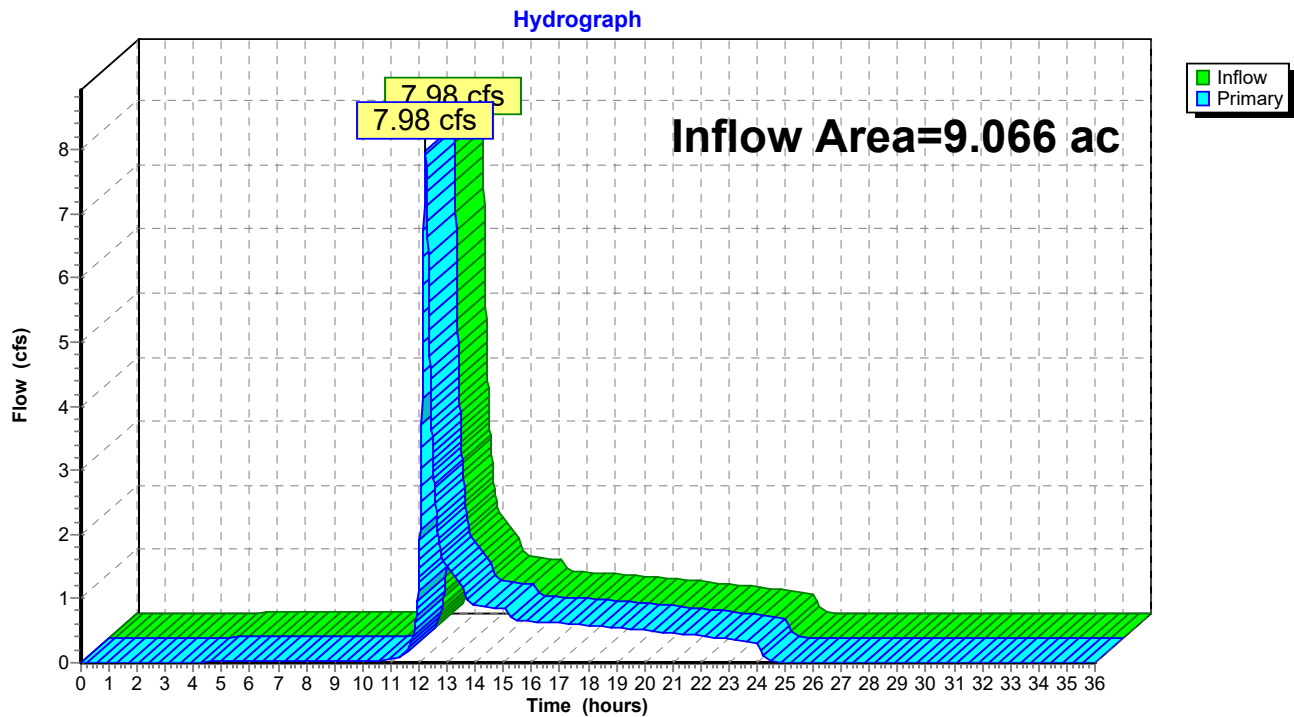
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 6E: Sub-DP #2b: Flow to Northern Abutter

Summary for Link 7E: Design Point #2: Flow to Uncas Brook

Inflow Area = 9.066 ac, 1.59% Impervious, Inflow Depth = 1.18" for 10-YR event
Inflow = 7.98 cfs @ 12.23 hrs, Volume= 0.888 af
Primary = 7.98 cfs @ 12.23 hrs, Volume= 0.888 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 7E: Design Point #2: Flow to Uncas Brook

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NOAA10 24-hr D 25-YR Rainfall=6.37"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment3E: E2a

Runoff Area=236,411 sf 1.52% Impervious Runoff Depth=1.82"
Flow Length=615' Tc=12.5 min CN=WQ Runoff=8.61 cfs 0.821 af

Link 4E: Sub-DP #2a: Flow to Town Land

Inflow=8.61 cfs 0.821 af
Primary=8.61 cfs 0.821 af

Subcatchment5E: E2b

Runoff Area=158,520 sf 1.71% Impervious Runoff Depth=1.86"
Flow Length=613' Tc=16.2 min CN=WQ Runoff=5.19 cfs 0.563 af

Link 6E: Sub-DP #2b: Flow to Northern Abutter

Inflow=5.19 cfs 0.563 af
Primary=5.19 cfs 0.563 af

Link 7E: Design Point #2: Flow to Uncas Brook

Inflow=13.56 cfs 1.384 af
Primary=13.56 cfs 1.384 af

Total Runoff Area = 9.066 ac Runoff Volume = 1.384 af Average Runoff Depth = 1.83"
98.41% Pervious = 8.922 ac 1.59% Impervious = 0.145 ac

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NOAA10 24-hr D 25-YR Rainfall=6.37"

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Summary for Subcatchment 3E: E2a

Runoff = 8.61 cfs @ 12.21 hrs, Volume= 0.821 af, Depth= 1.82"

Routed to Link 4E : Sub-DP #2a: Flow to Town Land

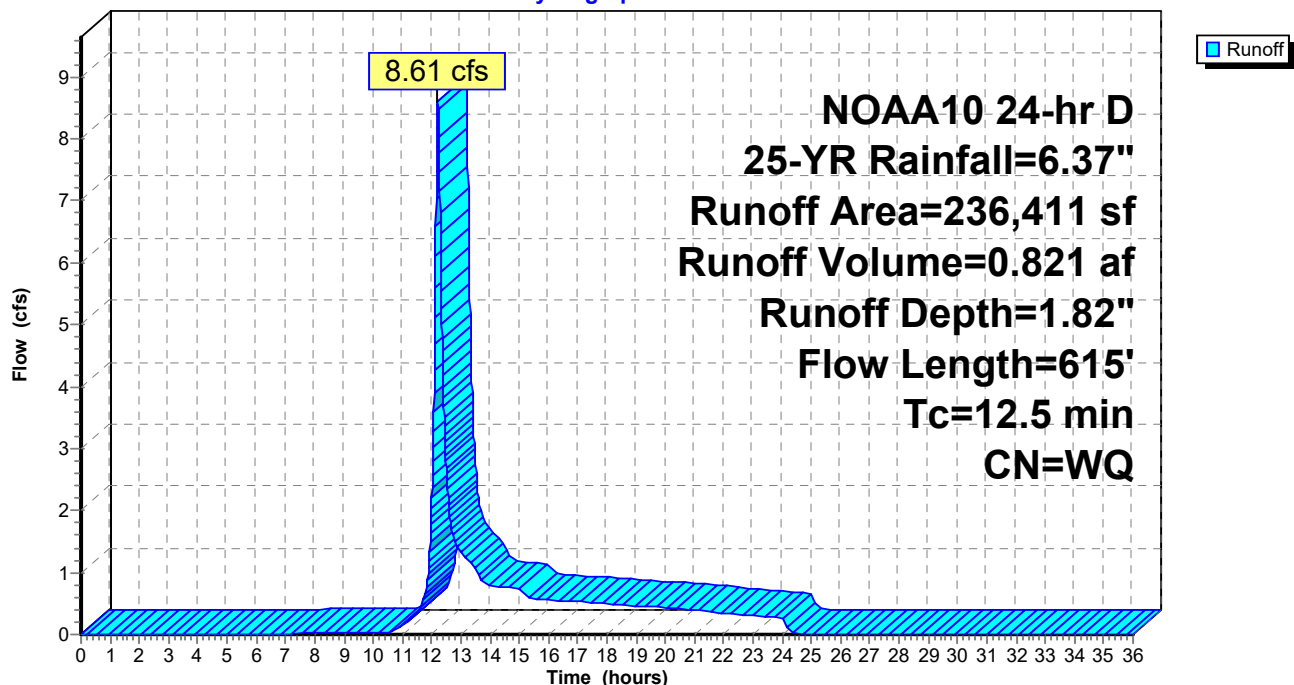
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
2,724	98	Paved parking HSG B
870	98	Roofs, HSG B
6,381	61	>75% Grass cover, Good HSG B
226,436	55	Woods, Good, HSG B
236,411		Weighted Average
232,817		98.48% Pervious Area
3,594		1.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	50	0.0700	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
5.2	565	0.1300	1.80		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.5	615	Total			

Subcatchment 3E: E2a

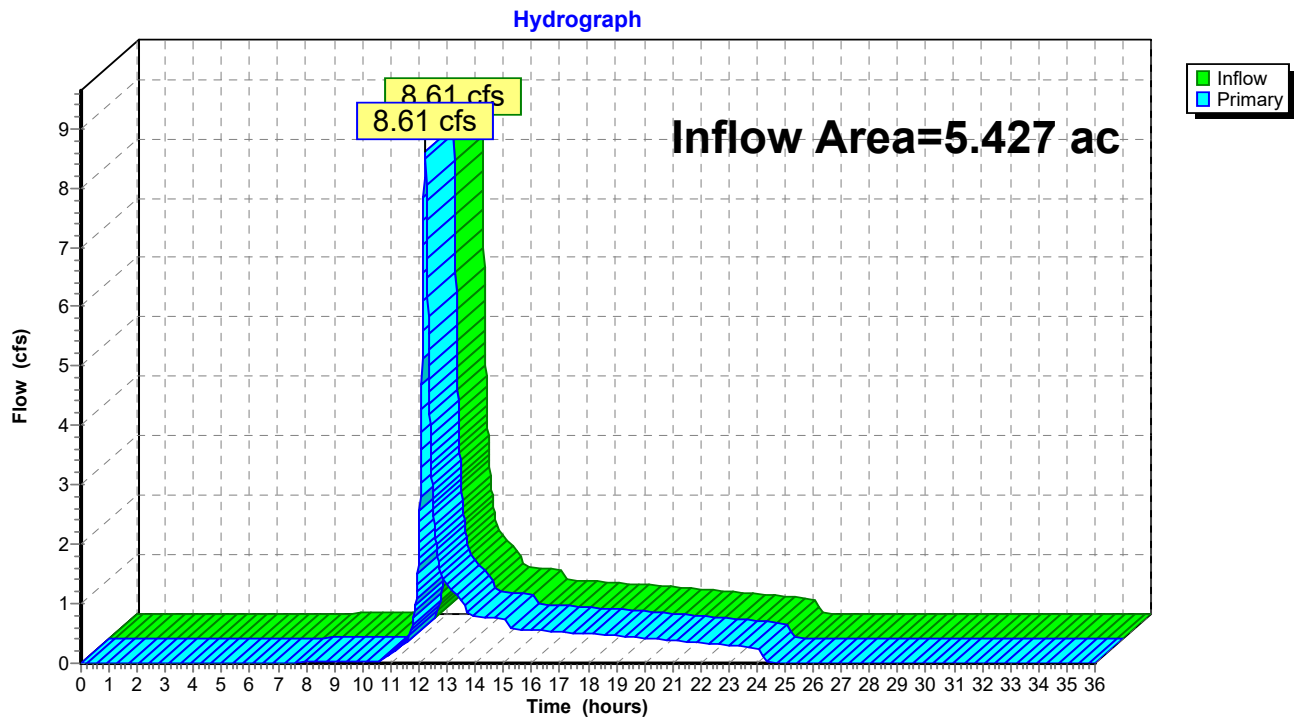
Hydrograph



Summary for Link 4E: Sub-DP #2a: Flow to Town Land

Inflow Area = 5.427 ac, 1.52% Impervious, Inflow Depth = 1.82" for 25-YR event
Inflow = 8.61 cfs @ 12.21 hrs, Volume= 0.821 af
Primary = 8.61 cfs @ 12.21 hrs, Volume= 0.821 af, Atten= 0%, Lag= 0.0 min
Routed to Link 7E : Design Point #2: Flow to Uncas Brook

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 4E: Sub-DP #2a: Flow to Town Land

Summary for Subcatchment 5E: E2b

Runoff = 5.19 cfs @ 12.26 hrs, Volume= 0.563 af, Depth= 1.86"

Routed to Link 6E : Sub-DP #2b: Flow to Northern Abutter

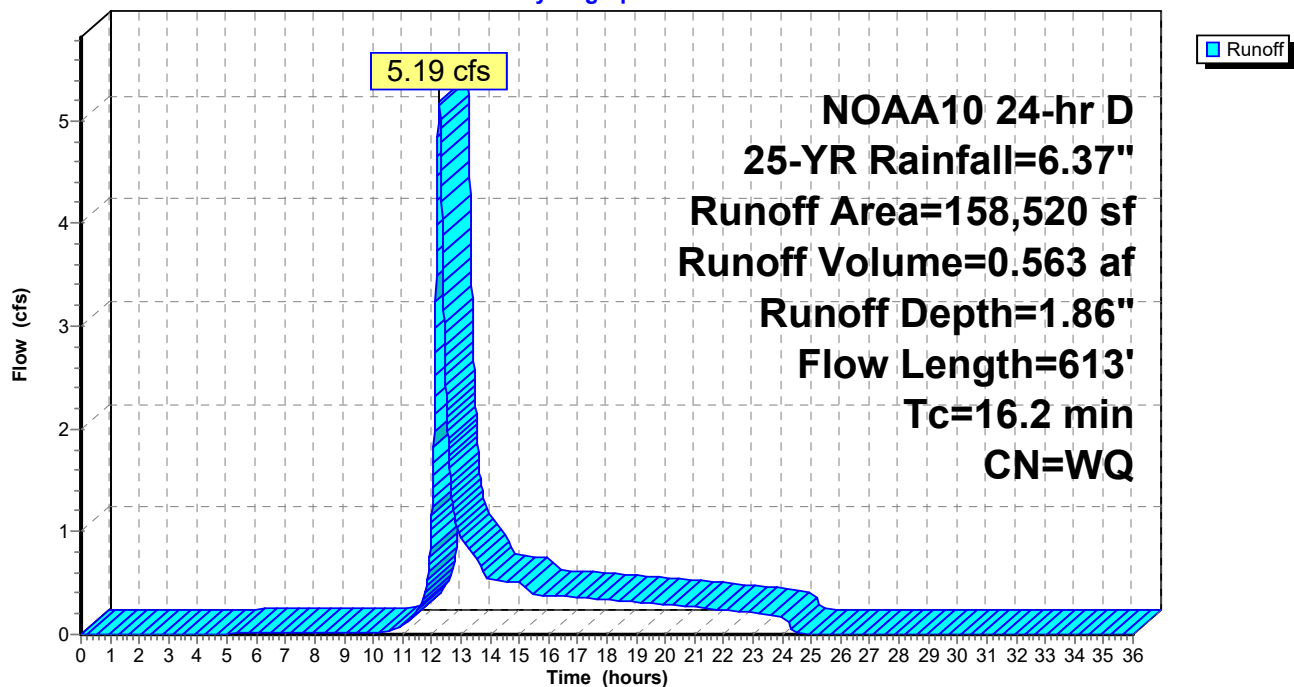
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
525	98	Paved parking HSG B
2,180	98	Roofs HSG B
141,538	55	Woods, Good HSG B
14,277	61	>75% Grass cover, Good HSG B
158,520		Weighted Average
155,815		98.29% Pervious Area
2,705		1.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
7.1	563	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
16.2	613	Total			

Subcatchment 5E: E2b

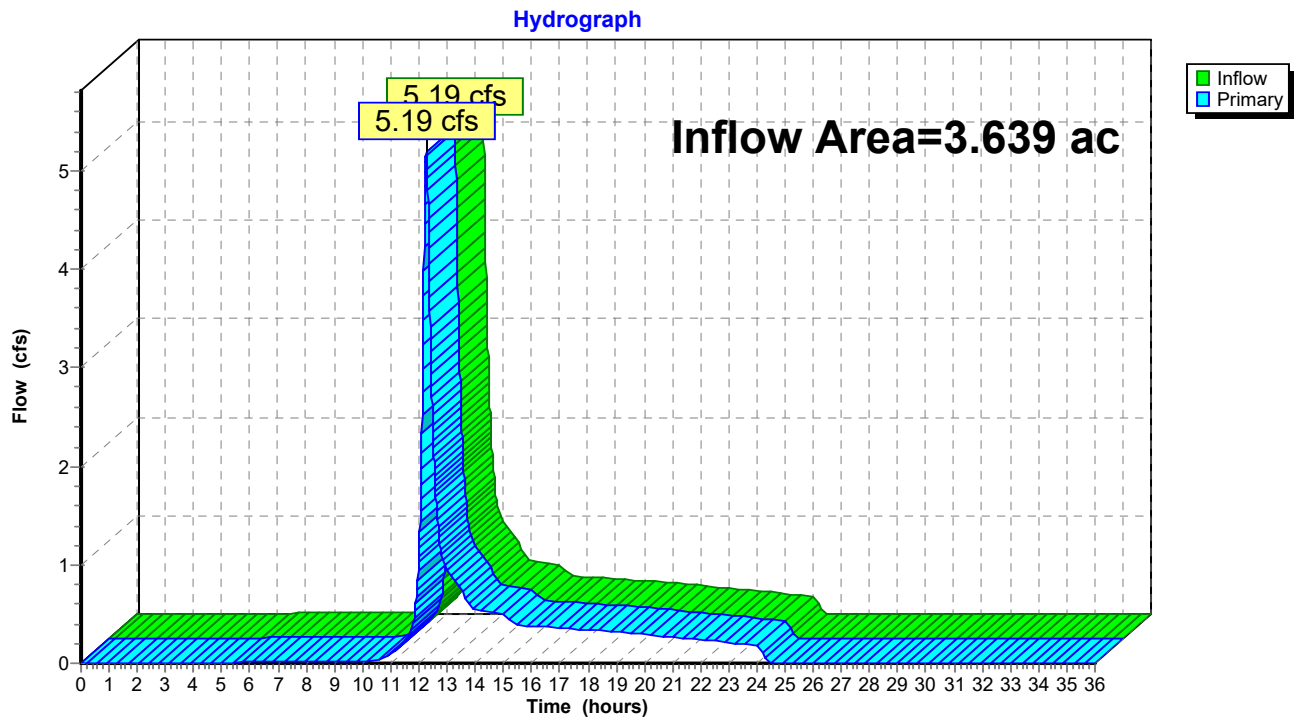
Hydrograph



Summary for Link 6E: Sub-DP #2b: Flow to Northern Abutter

Inflow Area = 3.639 ac, 1.71% Impervious, Inflow Depth = 1.86" for 25-YR event
Inflow = 5.19 cfs @ 12.26 hrs, Volume= 0.563 af
Primary = 5.19 cfs @ 12.26 hrs, Volume= 0.563 af, Atten= 0%, Lag= 0.0 min
Routed to Link 7E : Design Point #2: Flow to Uncas Brook

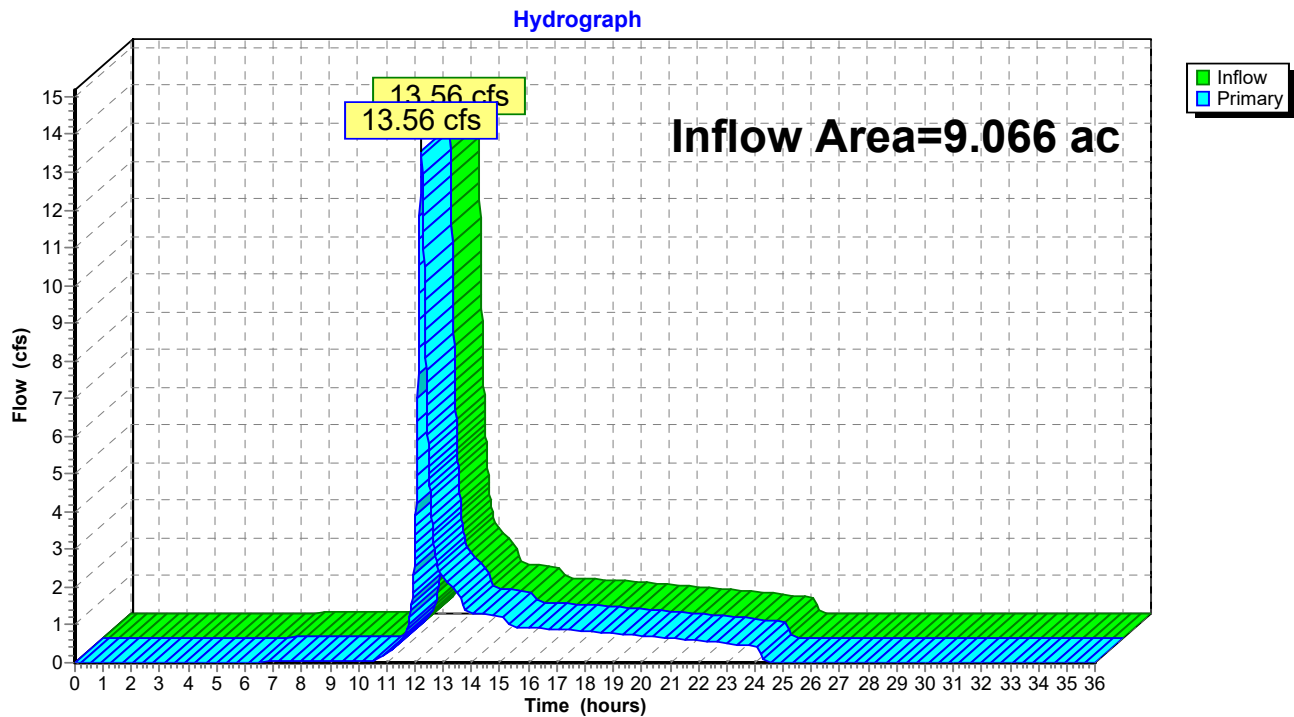
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 6E: Sub-DP #2b: Flow to Northern Abutter

Summary for Link 7E: Design Point #2: Flow to Uncas Brook

Inflow Area = 9.066 ac, 1.59% Impervious, Inflow Depth = 1.83" for 25-YR event
Inflow = 13.56 cfs @ 12.22 hrs, Volume= 1.384 af
Primary = 13.56 cfs @ 12.22 hrs, Volume= 1.384 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 7E: Design Point #2: Flow to Uncas Brook

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NOAA10 24-hr D 100-YR Rainfall=8.15"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment3E: E2a

Runoff Area=236,411 sf 1.52% Impervious Runoff Depth=2.98"
Flow Length=615' Tc=12.5 min CN=WQ Runoff=14.87 cfs 1.349 af

Link 4E: Sub-DP #2a: Flow to Town Land

Inflow=14.87 cfs 1.349 af
Primary=14.87 cfs 1.349 af

Subcatchment5E: E2b

Runoff Area=158,520 sf 1.71% Impervious Runoff Depth=3.03"
Flow Length=613' Tc=16.2 min CN=WQ Runoff=8.92 cfs 0.920 af

Link 6E: Sub-DP #2b: Flow to Northern Abutter

Inflow=8.92 cfs 0.920 af
Primary=8.92 cfs 0.920 af

Link 7E: Design Point #2: Flow to Uncas Brook

Inflow=23.40 cfs 2.268 af
Primary=23.40 cfs 2.268 af

Total Runoff Area = 9.066 ac Runoff Volume = 2.268 af Average Runoff Depth = 3.00"
98.41% Pervious = 8.922 ac 1.59% Impervious = 0.145 ac

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NOAA10 24-hr D 100-YR Rainfall=8.15"

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Summary for Subcatchment 3E: E2a

Runoff = 14.87 cfs @ 12.21 hrs, Volume= 1.349 af, Depth= 2.98"

Routed to Link 4E : Sub-DP #2a: Flow to Town Land

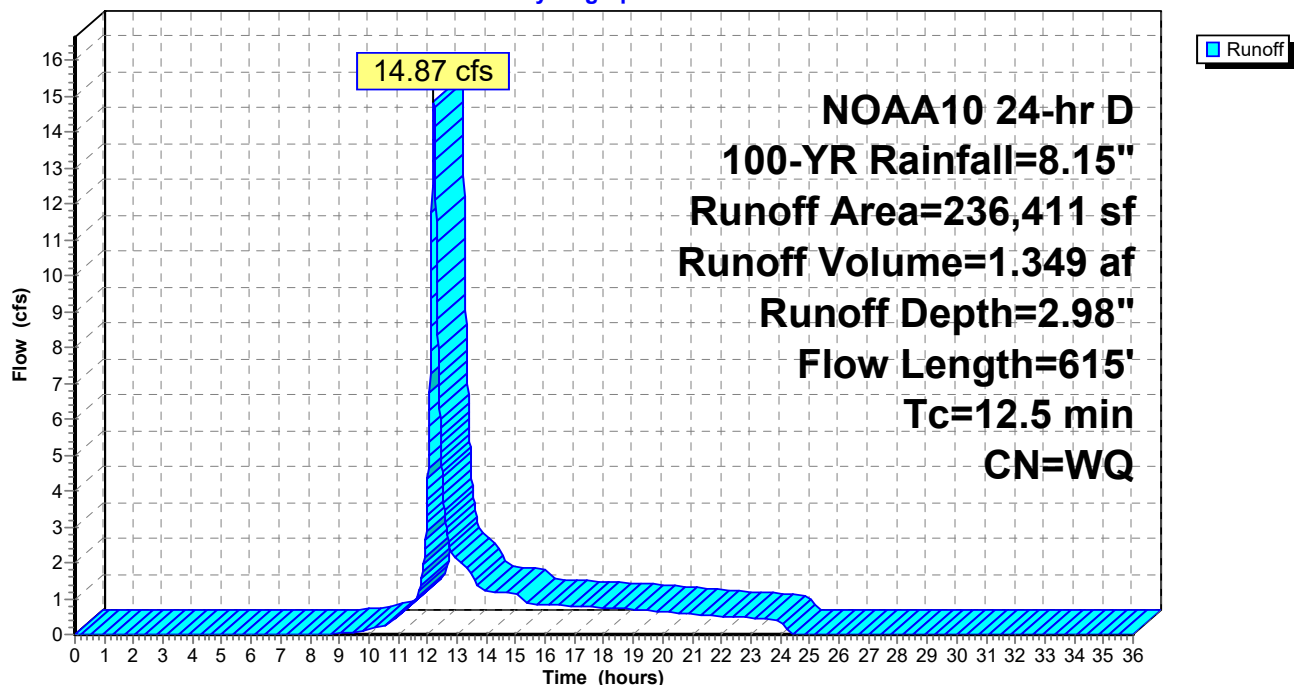
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
2,724	98	Paved parking HSG B
870	98	Roofs, HSG B
6,381	61	>75% Grass cover, Good HSG B
226,436	55	Woods, Good, HSG B
236,411		Weighted Average
232,817		98.48% Pervious Area
3,594		1.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	50	0.0700	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
5.2	565	0.1300	1.80		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.5	615	Total			

Subcatchment 3E: E2a

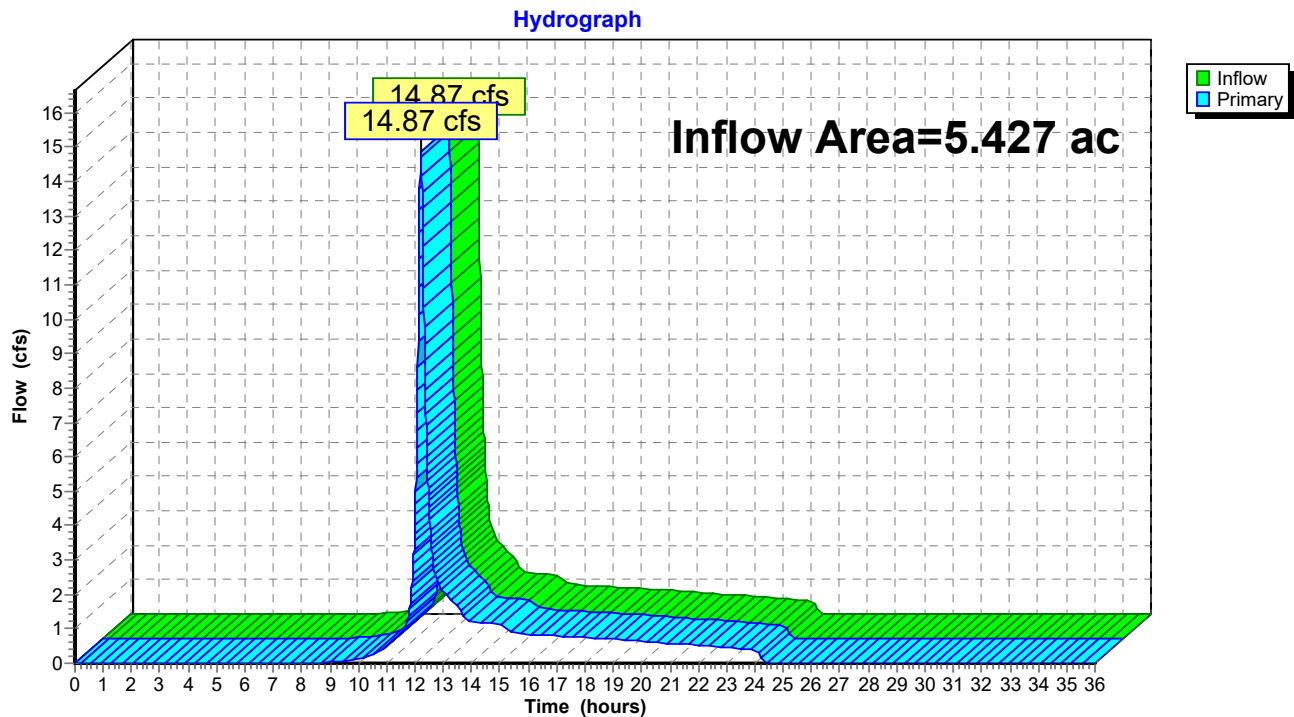
Hydrograph



Summary for Link 4E: Sub-DP #2a: Flow to Town Land

Inflow Area = 5.427 ac, 1.52% Impervious, Inflow Depth = 2.98" for 100-YR event
Inflow = 14.87 cfs @ 12.21 hrs, Volume= 1.349 af
Primary = 14.87 cfs @ 12.21 hrs, Volume= 1.349 af, Atten= 0%, Lag= 0.0 min
Routed to Link 7E : Design Point #2: Flow to Uncas Brook

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 4E: Sub-DP #2a: Flow to Town Land

Summary for Subcatchment 5E: E2b

Runoff = 8.92 cfs @ 12.25 hrs, Volume= 0.920 af, Depth= 3.03"
 Routed to Link 6E : Sub-DP #2b: Flow to Northern Abutter

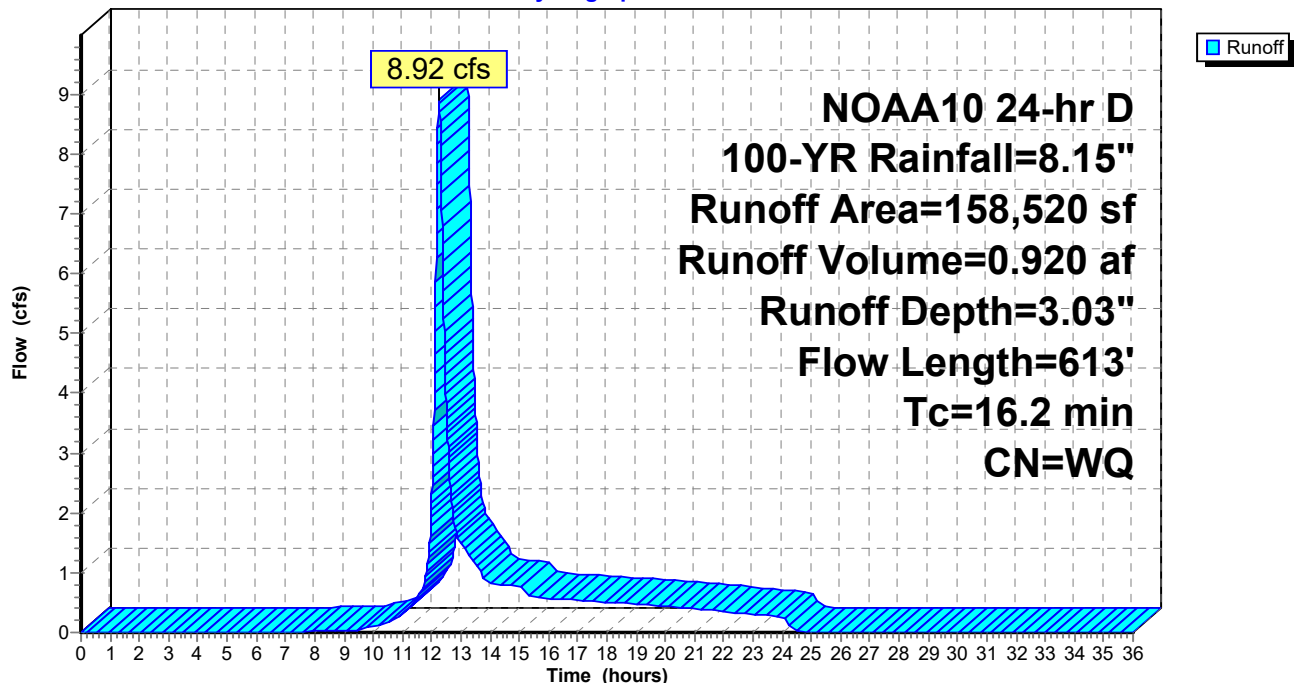
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
525	98	Paved parking HSG B
2,180	98	Roofs HSG B
141,538	55	Woods, Good HSG B
14,277	61	>75% Grass cover, Good HSG B
158,520		Weighted Average
155,815		98.29% Pervious Area
2,705		1.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
7.1	563	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
16.2	613	Total			

Subcatchment 5E: E2b

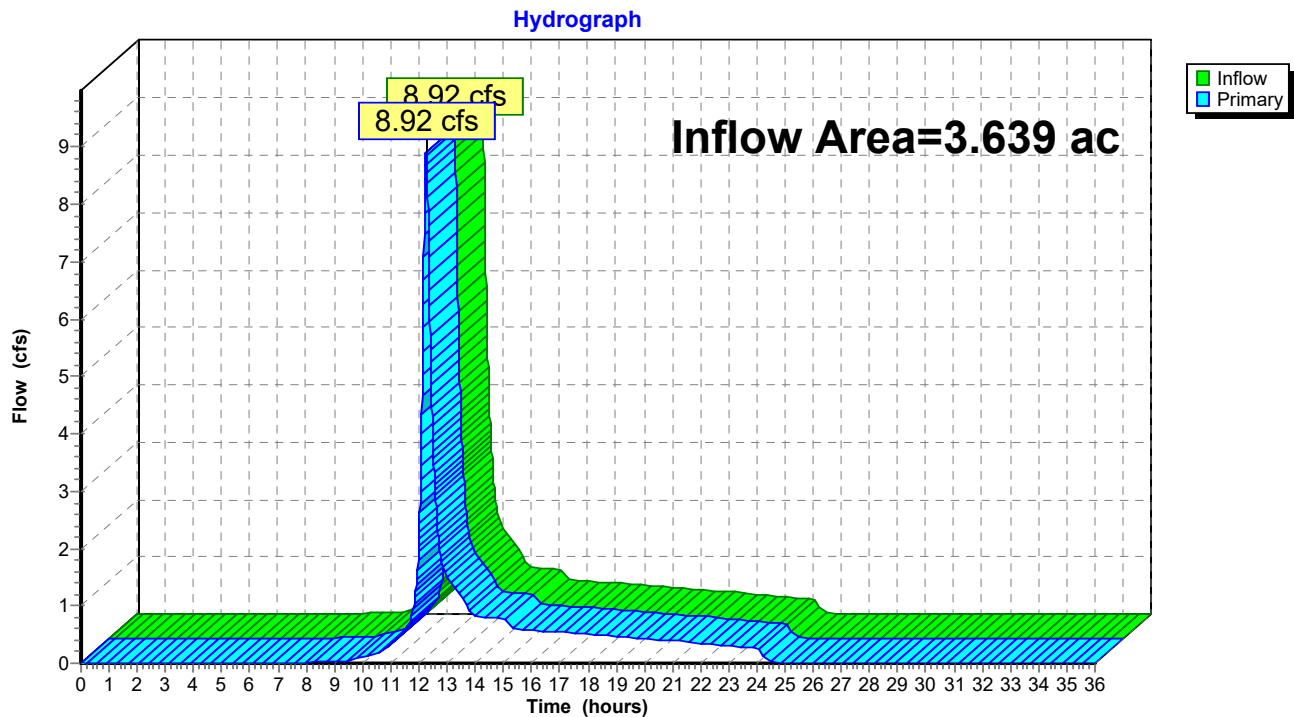
Hydrograph



Summary for Link 6E: Sub-DP #2b: Flow to Northern Abutter

Inflow Area = 3.639 ac, 1.71% Impervious, Inflow Depth = 3.03" for 100-YR event
Inflow = 8.92 cfs @ 12.25 hrs, Volume= 0.920 af
Primary = 8.92 cfs @ 12.25 hrs, Volume= 0.920 af, Atten= 0%, Lag= 0.0 min
Routed to Link 7E : Design Point #2: Flow to Uncas Brook

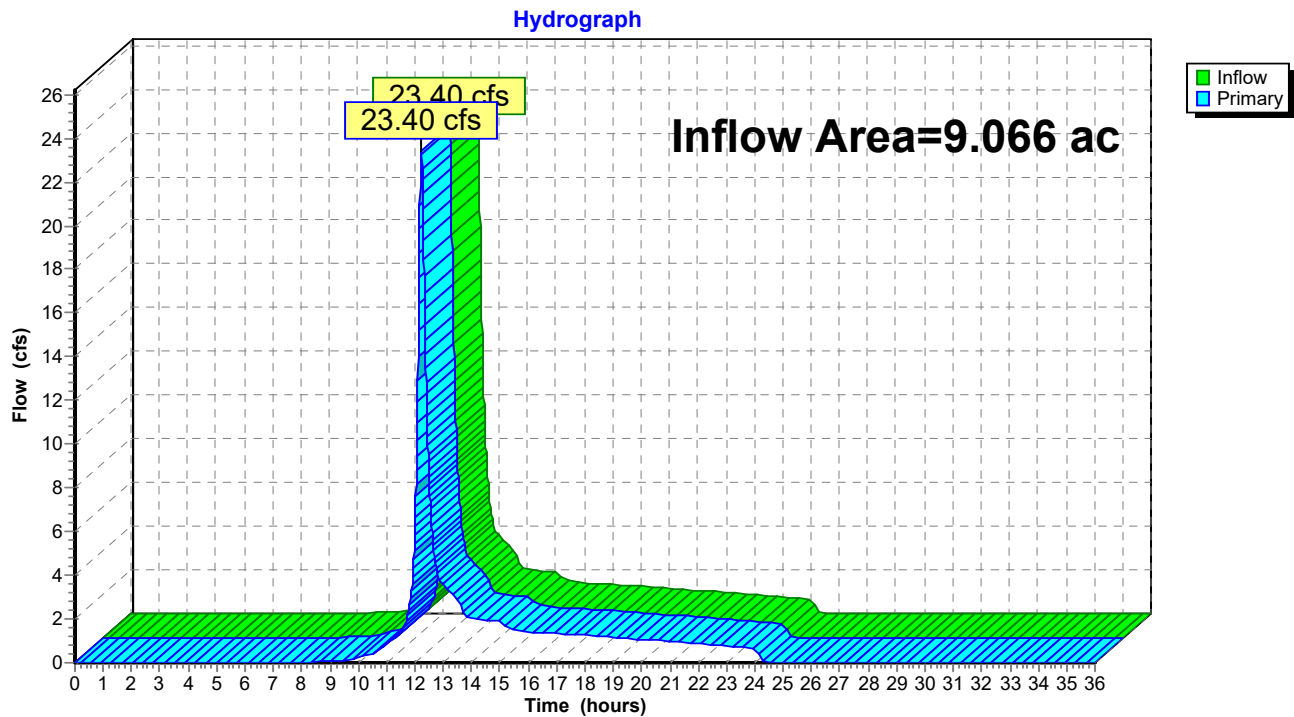
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 6E: Sub-DP #2b: Flow to Northern Abutter

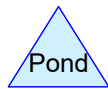
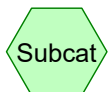
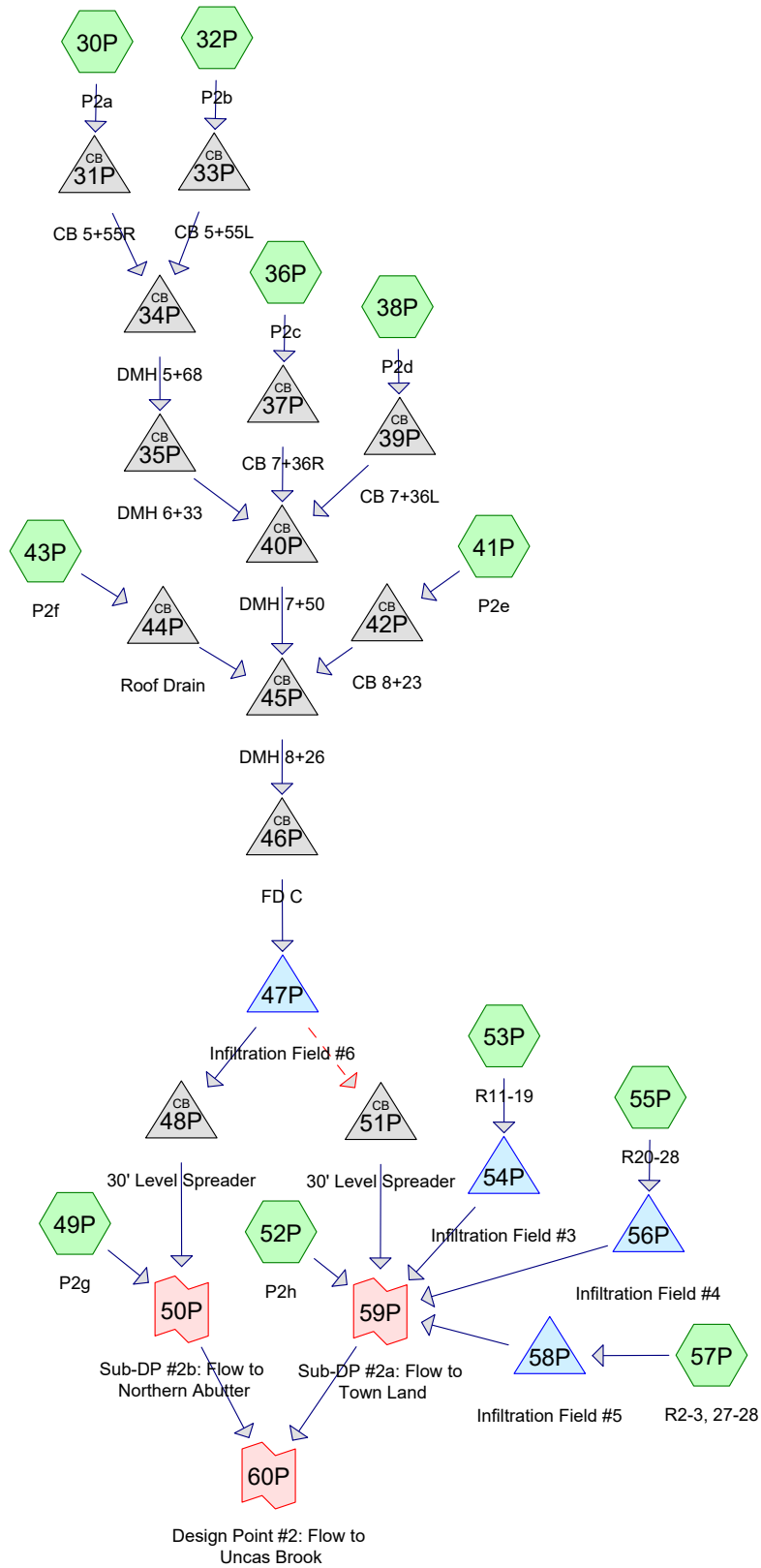
Summary for Link 7E: Design Point #2: Flow to Uncas Brook

Inflow Area = 9.066 ac, 1.59% Impervious, Inflow Depth = 3.00" for 100-YR event
Inflow = 23.40 cfs @ 12.22 hrs, Volume= 2.268 af
Primary = 23.40 cfs @ 12.22 hrs, Volume= 2.268 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 7E: Design Point #2: Flow to Uncas Brook

**DESIGN POINT #2: FLOW TO UNCAS
BROOK PROPOSED CONDITIONS**



Routing Diagram for HydroCAD 2

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-YR	NOAA10 24-hr	D	Default	24.00	1	3.36	2
2	10-YR	NOAA10 24-hr	D	Default	24.00	1	5.22	2
3	25-YR	NOAA10 24-hr	D	Default	24.00	1	6.37	2
4	100-YR	NOAA10 24-hr	D	Default	24.00	1	8.15	2

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.859	61	>75% Grass cover, Good HSG B (30P, 32P, 36P, 38P, 41P, 49P, 52P)
0.303	48	Brush, Good, HSG B (49P, 52P)
0.811	98	Paved parking HSG B (30P, 32P, 36P, 38P, 41P)
0.367	98	Roofs HSG B (30P, 36P, 38P, 41P, 49P)
0.515	98	Roofs, HSG B (32P, 43P, 53P, 55P, 57P)
4.127	55	Woods, Good HSG B (30P, 41P, 49P, 52P)
8.982	65	TOTAL AREA

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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment30P: P2a

Runoff Area=16,661 sf 55.72% Impervious Runoff Depth=1.93"
Flow Length=287' Tc=11.0 min CN=WQ Runoff=0.63 cfs 0.061 af

Pond 31P: CB 5+55R

Peak Elev=402.00' Inflow=0.63 cfs 0.061 af
12.0" Round Culvert n=0.011 L=10.0' S=0.0400 '/' Outflow=0.63 cfs 0.061 af

Subcatchment32P: P2b

Runoff Area=11,091 sf 55.26% Impervious Runoff Depth=1.96"
Flow Length=209' Tc=7.7 min CN=WQ Runoff=0.49 cfs 0.042 af

Pond 33P: CB 5+55L

Peak Elev=401.96' Inflow=0.49 cfs 0.042 af
12.0" Round Culvert n=0.011 L=14.0' S=0.0286 '/' Outflow=0.49 cfs 0.042 af

Pond 34P: DMH 5+68

Peak Elev=401.69' Inflow=1.10 cfs 0.103 af
12.0" Round Culvert n=0.011 L=61.0' S=0.0287 '/' Outflow=1.10 cfs 0.103 af

Pond 35P: DMH 6+33

Peak Elev=400.19' Inflow=1.10 cfs 0.103 af
12.0" Round Culvert n=0.011 L=112.0' S=0.0326 '/' Outflow=1.10 cfs 0.103 af

Subcatchment36P: P2c

Runoff Area=12,059 sf 71.70% Impervious Runoff Depth=2.39"
Flow Length=265' Tc=5.7 min CN=WQ Runoff=0.72 cfs 0.055 af

Pond 37P: CB 7+36R

Peak Elev=396.65' Inflow=0.72 cfs 0.055 af
12.0" Round Culvert n=0.011 L=11.0' S=0.0273 '/' Outflow=0.72 cfs 0.055 af

Subcatchment38P: P2d

Runoff Area=10,116 sf 58.55% Impervious Runoff Depth=2.04"
Flow Length=247' Tc=3.3 min CN=WQ Runoff=0.56 cfs 0.040 af

Pond 39P: CB 7+36L

Peak Elev=396.61' Inflow=0.56 cfs 0.040 af
12.0" Round Culvert n=0.011 L=23.0' S=0.0130 '/' Outflow=0.56 cfs 0.040 af

Pond 40P: DMH 7+50

Peak Elev=396.49' Inflow=2.23 cfs 0.197 af
15.0" Round Culvert n=0.011 L=95.0' S=0.0395 '/' Outflow=2.23 cfs 0.197 af

Subcatchment41P: P2e

Runoff Area=64,914 sf 33.60% Impervious Runoff Depth=1.37"
Flow Length=410' Tc=9.9 min CN=WQ Runoff=1.78 cfs 0.170 af

Pond 42P: CB 8+23

Peak Elev=394.04' Inflow=1.78 cfs 0.170 af
15.0" Round Culvert n=0.011 L=6.0' S=0.0167 '/' Outflow=1.78 cfs 0.170 af

Subcatchment43P: P2f

Runoff Area=5,603 sf 100.00% Impervious Runoff Depth=3.13"
Tc=0.0 min CN=98 Runoff=0.49 cfs 0.034 af

Pond 44P: Roof Drain

Peak Elev=408.41' Inflow=0.49 cfs 0.034 af
8.0" Round Culvert n=0.011 L=320.0' S=0.0500 '/' Outflow=0.49 cfs 0.034 af

Pond 45P: DMH 8+26

Peak Elev=387.95' Inflow=3.93 cfs 0.401 af
18.0" Round Culvert n=0.011 L=41.0' S=0.0244 '/' Outflow=3.93 cfs 0.401 af

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Pond 46P: FD CPeak Elev=386.85' Inflow=3.93 cfs 0.401 af
18.0" Round Culvert n=0.011 L=81.0' S=0.0883 ' Outflow=3.93 cfs 0.401 af**Pond 47P: Infiltration Field #6**Peak Elev=379.65' Storage=5,310 cf Inflow=3.93 cfs 0.401 af
Discarded=0.28 cfs 0.398 af Primary=0.00 cfs 0.000 af Secondary=0.01 cfs 0.003 af Outflow=0.30 cfs 0.401 af**Pond 48P: 30' Level Spreader**Peak Elev=374.00' Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af**Subcatchment49P: P2g**Runoff Area=110,536 sf 0.83% Impervious Runoff Depth=0.39"
Flow Length=573' Tc=13.6 min CN=WQ Runoff=0.48 cfs 0.082 af**Link 50P: Sub-DP #2b: Flow to Northern Abutter**Inflow=0.48 cfs 0.082 af
Primary=0.48 cfs 0.082 af**Pond 51P: 30' Level Spreader**Peak Elev=377.00' Inflow=0.01 cfs 0.003 af
Outflow=0.01 cfs 0.003 af**Subcatchment52P: P2h**Runoff Area=144,833 sf 0.00% Impervious Runoff Depth=0.34"
Flow Length=416' Tc=12.4 min CN=WQ Runoff=0.46 cfs 0.093 af**Subcatchment53P: R11-19**Runoff Area=6,318 sf 100.00% Impervious Runoff Depth=3.13"
Tc=0.0 min CN=98 Runoff=0.55 cfs 0.038 af**Pond 54P: Infiltration Field #3**Peak Elev=383.77' Storage=454 cf Inflow=0.55 cfs 0.038 af
Discarded=0.04 cfs 0.038 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.038 af**Subcatchment55P: R20-28**Runoff Area=6,318 sf 100.00% Impervious Runoff Depth=3.13"
Tc=2.0 min CN=98 Runoff=0.55 cfs 0.038 af**Pond 56P: Infiltration Field #4**Peak Elev=388.12' Storage=340 cf Inflow=0.55 cfs 0.038 af
Discarded=0.06 cfs 0.038 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.038 af**Subcatchment57P: R2-3, 27-28**Runoff Area=2,808 sf 100.00% Impervious Runoff Depth=3.13"
Tc=2.0 min CN=98 Runoff=0.24 cfs 0.017 af**Pond 58P: Infiltration Field #5**Peak Elev=406.35' Storage=154 cf Inflow=0.24 cfs 0.017 af
Outflow=0.03 cfs 0.017 af**Link 59P: Sub-DP #2a: Flow to Town Land**Inflow=0.46 cfs 0.097 af
Primary=0.46 cfs 0.097 af**Link 60P: Design Point #2: Flow to Uncas Brook**Inflow=0.94 cfs 0.179 af
Primary=0.94 cfs 0.179 af**Total Runoff Area = 8.982 ac Runoff Volume = 0.669 af Average Runoff Depth = 0.89"**
81.15% Pervious = 7.289 ac 18.85% Impervious = 1.693 ac

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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Subcatchment 30P: P2a

Runoff = 0.63 cfs @ 12.18 hrs, Volume= 0.061 af, Depth= 1.93"
 Routed to Pond 31P : CB 5+55R

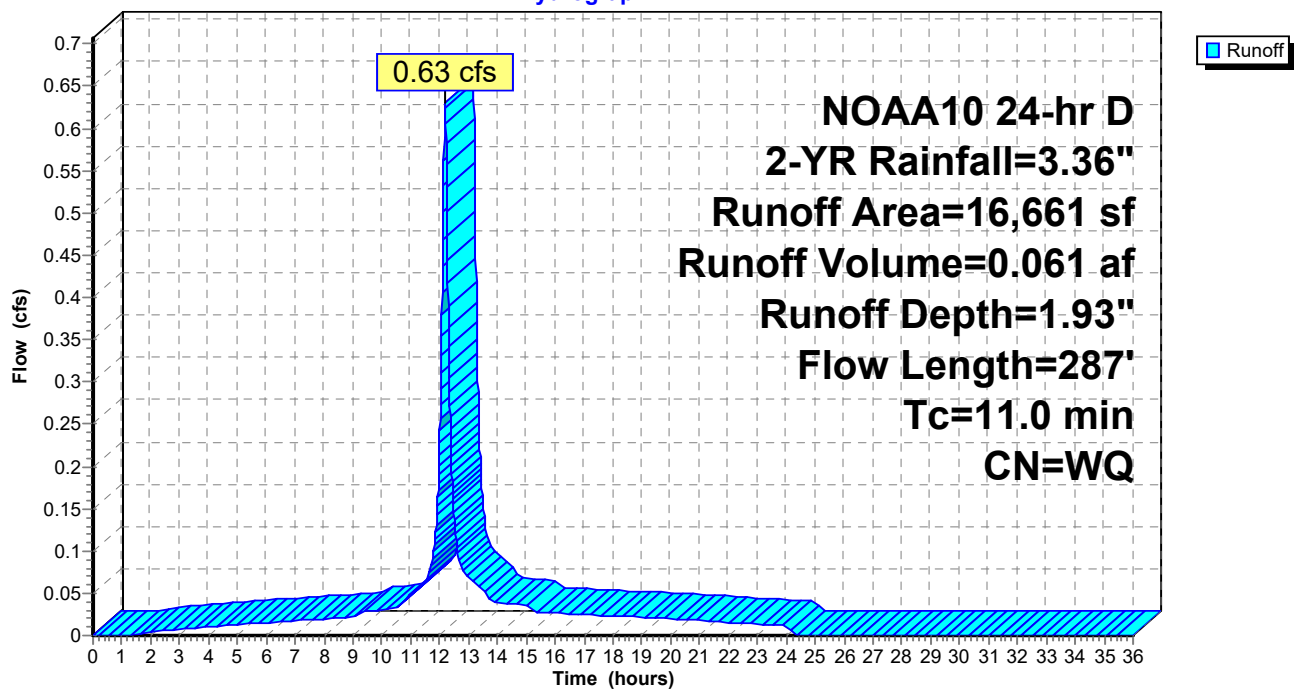
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
7,449	98	Paved parking HSG B
3,408	55	Woods, Good HSG B
1,835	98	Roofs HSG B
3,969	61	>75% Grass cover, Good HSG B
16,661		Weighted Average
7,377		44.28% Pervious Area
9,284		55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	36	0.0200	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
0.8	35	0.0200	0.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	26	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.6	190	0.0600	4.97		Shallow Concentrated Flow, Paved Kv= 20.3 fps
11.0	287	Total			

Subcatchment 30P: P2a

Hydrograph



Summary for Pond 31P: CB 5+55R

Inflow Area = 0.382 ac, 55.72% Impervious, Inflow Depth = 1.93" for 2-YR event
 Inflow = 0.63 cfs @ 12.18 hrs, Volume= 0.061 af
 Outflow = 0.63 cfs @ 12.18 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.63 cfs @ 12.18 hrs, Volume= 0.061 af
 Routed to Pond 34P : DMH 5+68

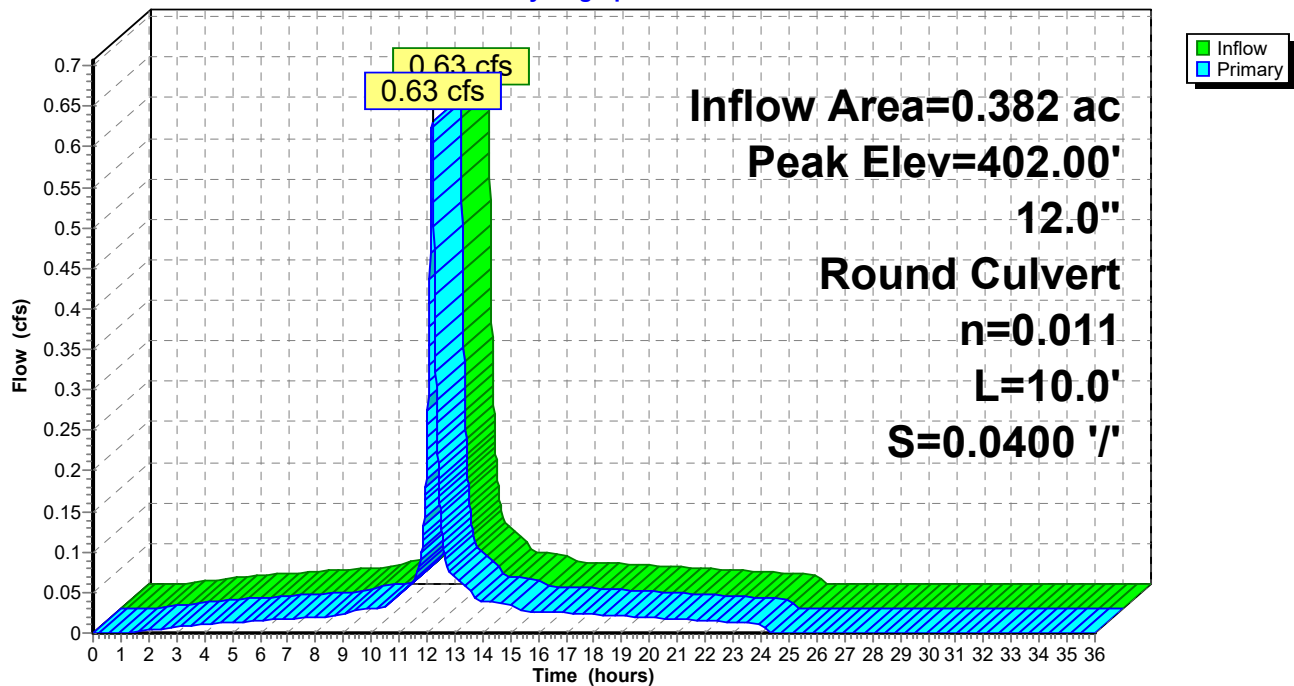
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 402.00' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	401.60'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.60' / 401.20' S= 0.0400 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.63 cfs @ 12.18 hrs HW=402.00' TW=401.68' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 0.63 cfs @ 2.15 fps)

Pond 31P: CB 5+55R

Hydrograph



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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Subcatchment 32P: P2b

Runoff = 0.49 cfs @ 12.15 hrs, Volume= 0.042 af, Depth= 1.96"
 Routed to Pond 33P : CB 5+55L

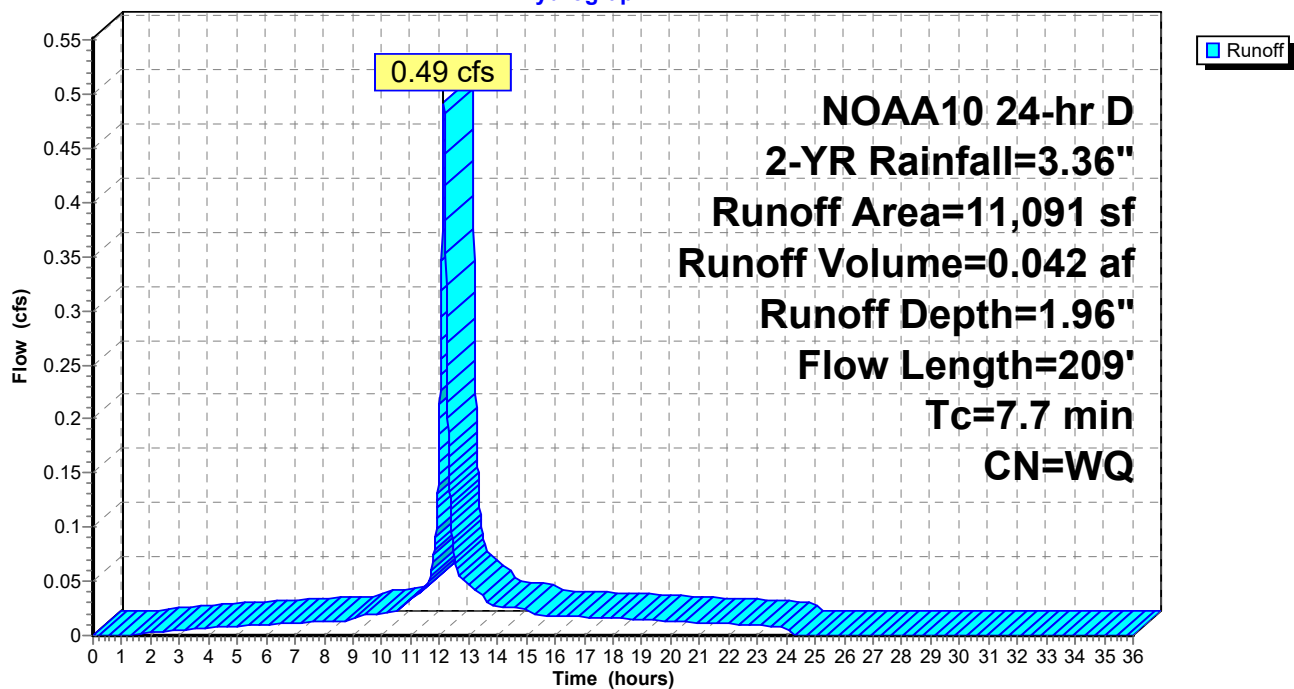
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
4,725	98	Paved parking HSG B
1,404	98	Roofs, HSG B
4,962	61	>75% Grass cover, Good HSG B
11,091		Weighted Average
4,962		44.74% Pervious Area
6,129		55.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	50	0.0350	0.13		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
1.0	113	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	23	0.0600	4.97		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	23	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.7	209	Total			

Subcatchment 32P: P2b

Hydrograph



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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Pond 33P: CB 5+55L

Inflow Area = 0.255 ac, 55.26% Impervious, Inflow Depth = 1.96" for 2-YR event
Inflow = 0.49 cfs @ 12.15 hrs, Volume= 0.042 af
Outflow = 0.49 cfs @ 12.15 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min
Primary = 0.49 cfs @ 12.15 hrs, Volume= 0.042 af
Routed to Pond 34P : DMH 5+68

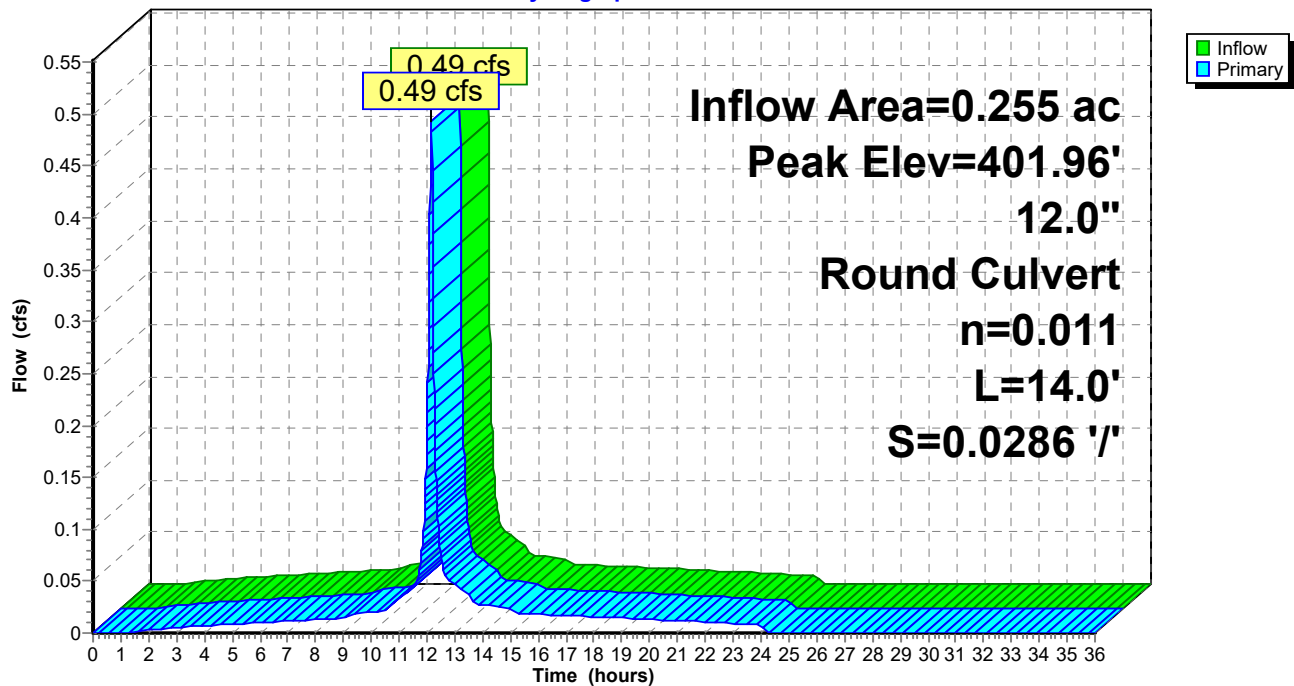
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 401.96' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	401.60'	12.0" Round Culvert L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.60' / 401.20' S= 0.0286 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.48 cfs @ 12.15 hrs HW=401.96' TW=401.69' (Dynamic Tailwater)
↑ **1=Culvert** (Outlet Controls 0.48 cfs @ 2.87 fps)

Pond 33P: CB 5+55L

Hydrograph



Summary for Pond 34P: DMH 5+68

Inflow Area = 0.637 ac, 55.54% Impervious, Inflow Depth = 1.94" for 2-YR event
 Inflow = 1.10 cfs @ 12.16 hrs, Volume= 0.103 af
 Outflow = 1.10 cfs @ 12.16 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.10 cfs @ 12.16 hrs, Volume= 0.103 af
 Routed to Pond 35P : DMH 6+33

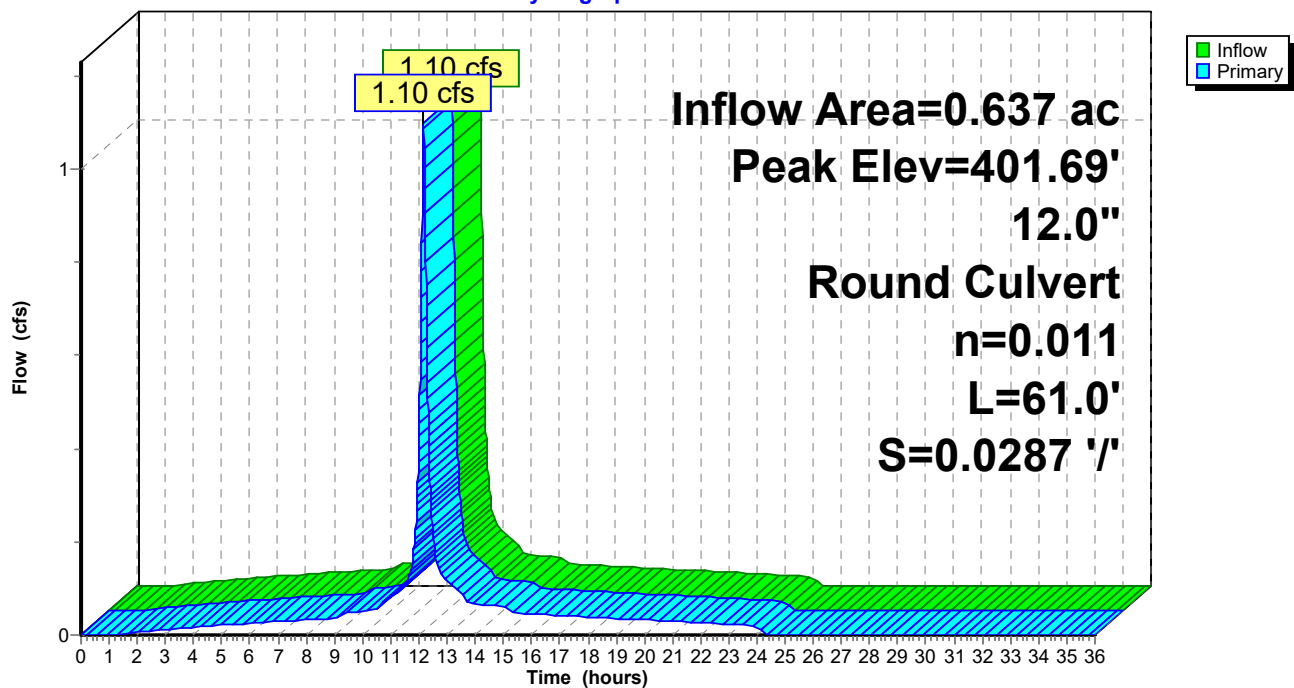
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 401.69' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	401.15'	12.0" Round Culvert L= 61.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.15' / 399.40' S= 0.0287 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.09 cfs @ 12.16 hrs HW=401.69' TW=400.19' (Dynamic Tailwater)
 ↳ **1=Culvert** (Inlet Controls 1.09 cfs @ 2.51 fps)

Pond 34P: DMH 5+68

Hydrograph



Summary for Pond 35P: DMH 6+33

Inflow Area = 0.637 ac, 55.54% Impervious, Inflow Depth = 1.94" for 2-YR event
 Inflow = 1.10 cfs @ 12.16 hrs, Volume= 0.103 af
 Outflow = 1.10 cfs @ 12.16 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.10 cfs @ 12.16 hrs, Volume= 0.103 af
 Routed to Pond 40P : DMH 7+50

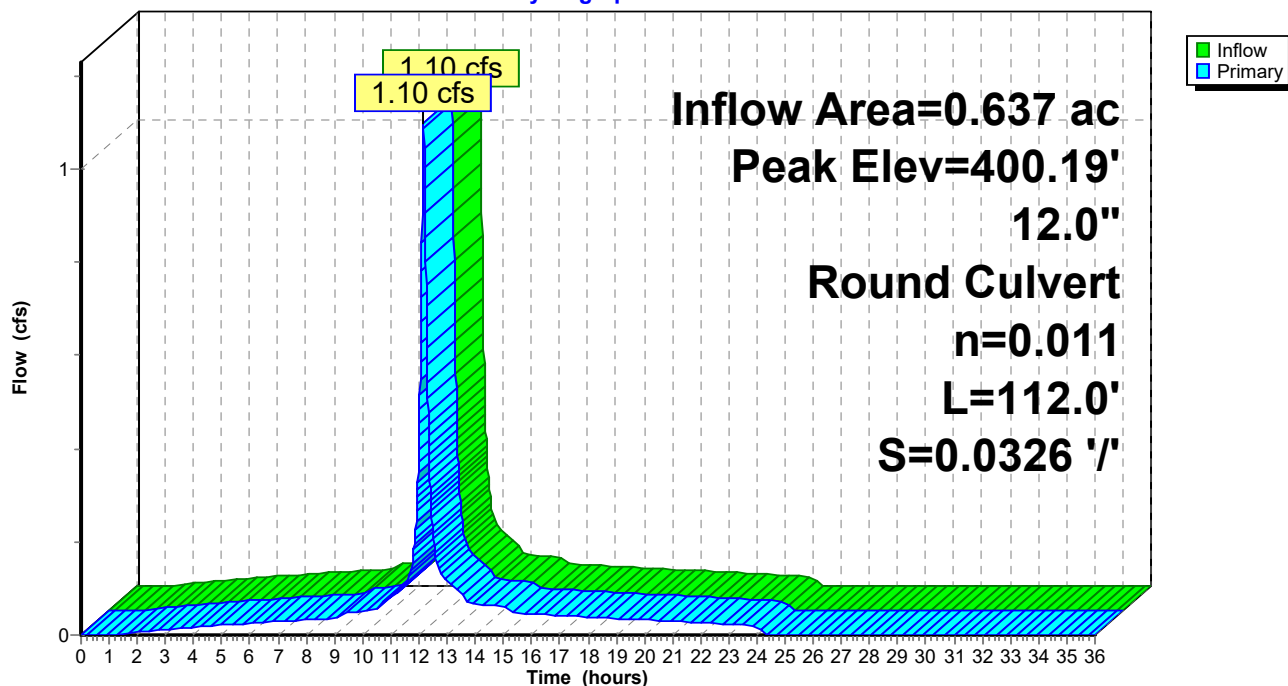
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 400.19' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	399.65'	12.0" Round Culvert L= 112.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 399.65' / 396.00' S= 0.0326 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.09 cfs @ 12.16 hrs HW=400.19' TW=396.44' (Dynamic Tailwater)
 ↳ **1=Culvert** (Inlet Controls 1.09 cfs @ 2.51 fps)

Pond 35P: DMH 6+33

Hydrograph



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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Subcatchment 36P: P2c

Runoff = 0.72 cfs @ 12.13 hrs, Volume= 0.055 af, Depth= 2.39"
Routed to Pond 37P : CB 7+36R

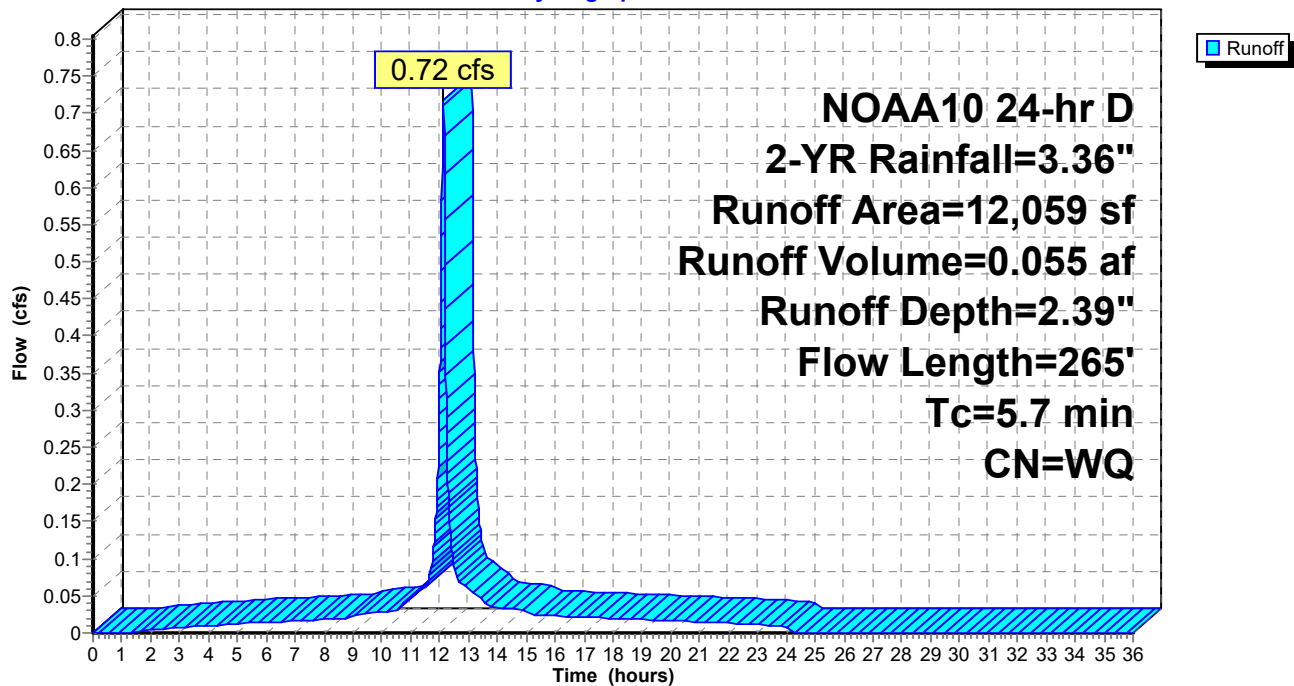
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
3,871	98	Roofs HSG B
4,775	98	Paved parking HSG B
3,413	61	>75% Grass cover, Good HSG B
12,059		Weighted Average
3,413		28.30% Pervious Area
8,646		71.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	40	0.0500	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
1.1	225	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
5.7	265	Total			

Subcatchment 36P: P2c

Hydrograph



Summary for Pond 37P: CB 7+36R

Inflow Area = 0.277 ac, 71.70% Impervious, Inflow Depth = 2.39" for 2-YR event
 Inflow = 0.72 cfs @ 12.13 hrs, Volume= 0.055 af
 Outflow = 0.72 cfs @ 12.13 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.72 cfs @ 12.13 hrs, Volume= 0.055 af
 Routed to Pond 40P : DMH 7+50

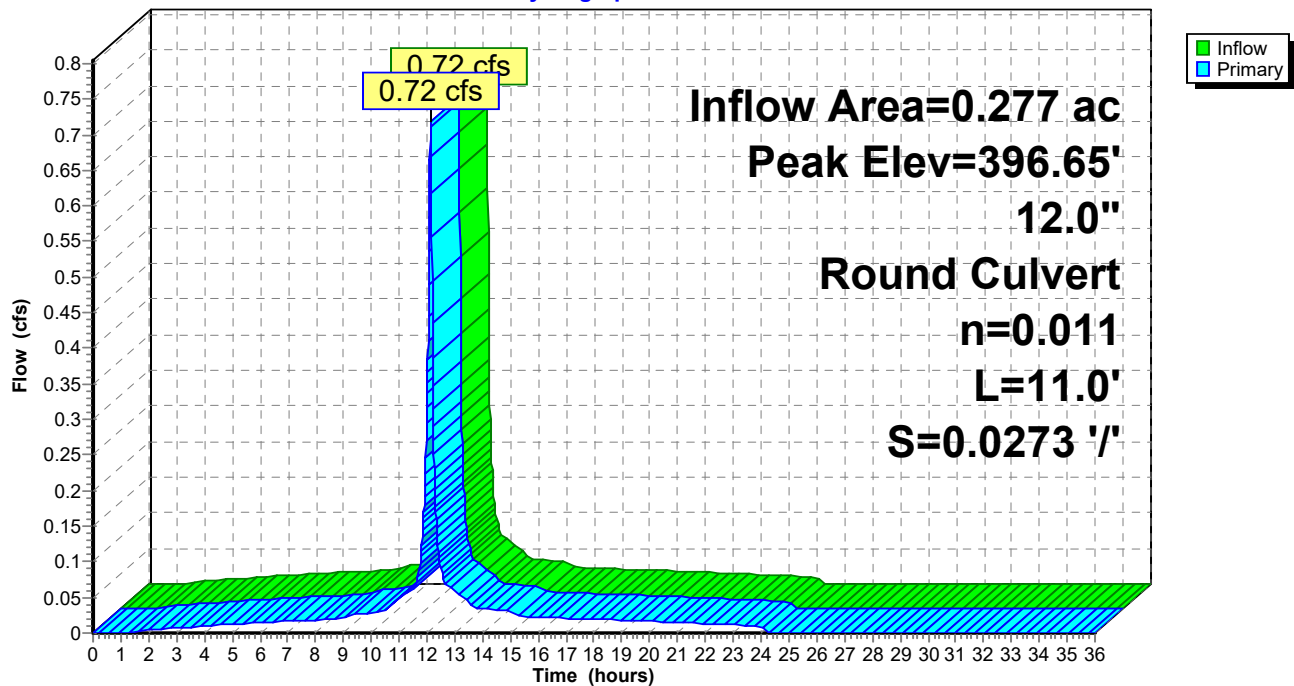
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 396.65' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	396.10'	12.0" Round Culvert L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 396.10' / 395.80' S= 0.0273 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.71 cfs @ 12.13 hrs HW=396.64' TW=396.49' (Dynamic Tailwater)
 1=Culvert (Outlet Controls 0.71 cfs @ 2.34 fps)

Pond 37P: CB 7+36R

Hydrograph



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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Subcatchment 38P: P2d

Runoff = 0.56 cfs @ 12.11 hrs, Volume= 0.040 af, Depth= 2.04"
Routed to Pond 39P : CB 7+36L

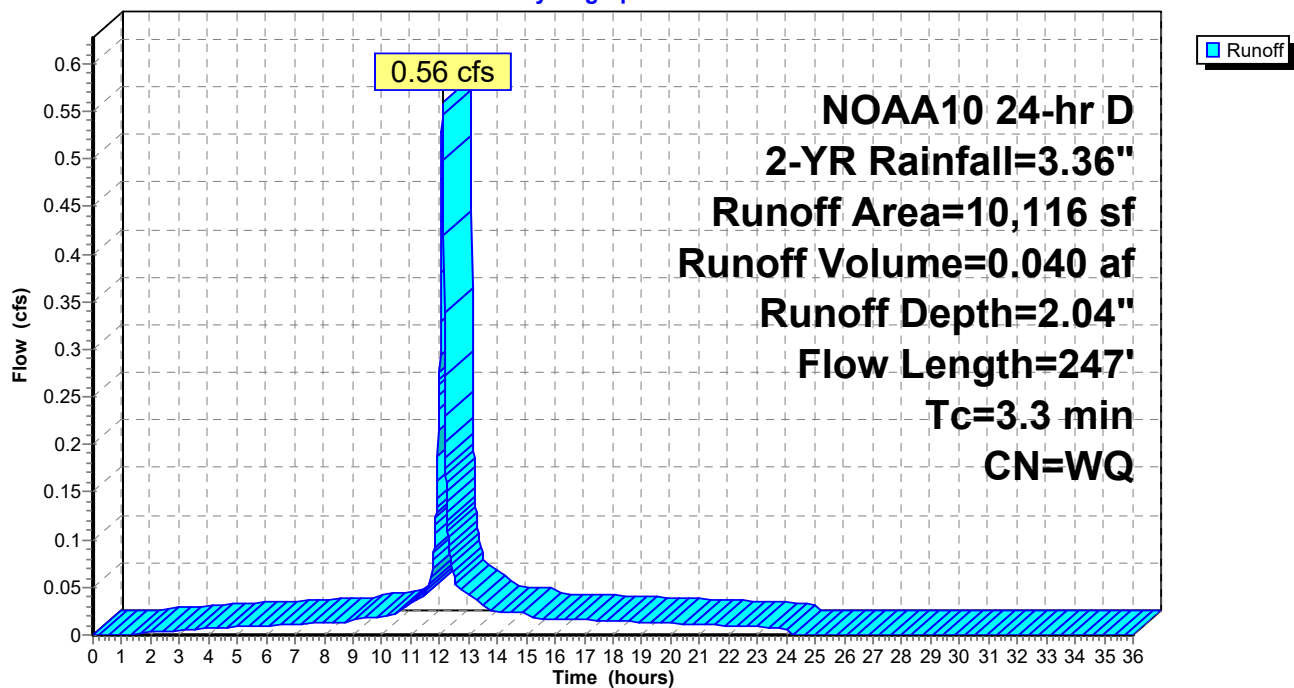
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
3,108	98	Paved parking HSG B
2,815	98	Roofs HSG B
4,193	61	>75% Grass cover, Good HSG B
10,116		Weighted Average
4,193		41.45% Pervious Area
5,923		58.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	21	0.1000	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
0.3	30	0.0700	1.83		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.36"
0.9	196	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.3	247	Total			

Subcatchment 38P: P2d

Hydrograph



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Summary for Pond 39P: CB 7+36L

Inflow Area = 0.232 ac, 58.55% Impervious, Inflow Depth = 2.04" for 2-YR event
Inflow = 0.56 cfs @ 12.11 hrs, Volume= 0.040 af
Outflow = 0.56 cfs @ 12.11 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min
Primary = 0.56 cfs @ 12.11 hrs, Volume= 0.040 af
Routed to Pond 40P : DMH 7+50

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

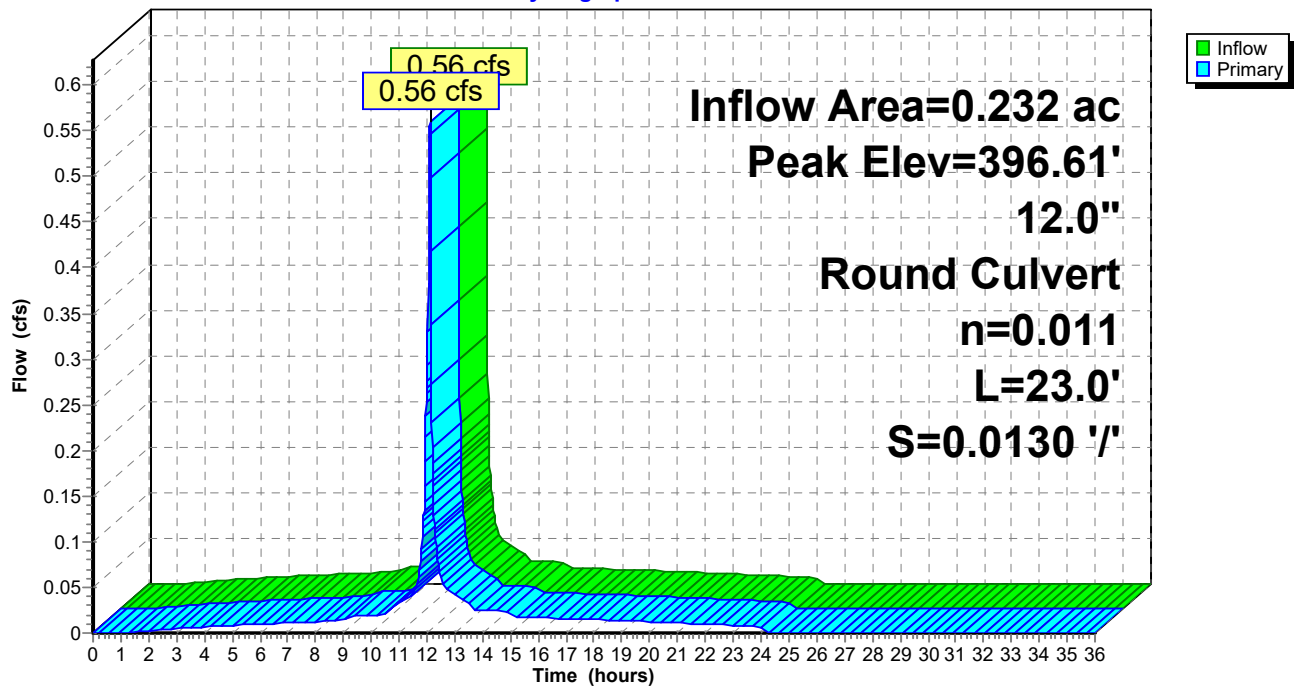
Peak Elev= 396.61' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	396.10'	12.0" Round Culvert L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 396.10' / 395.80' S= 0.0130 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.52 cfs @ 12.11 hrs HW=396.60' TW=396.47' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.52 cfs @ 1.93 fps)

Pond 39P: CB 7+36L

Hydrograph



Summary for Pond 40P: DMH 7+50

Inflow Area = 1.146 ac, 60.05% Impervious, Inflow Depth = 2.07" for 2-YR event
 Inflow = 2.23 cfs @ 12.13 hrs, Volume= 0.197 af
 Outflow = 2.23 cfs @ 12.13 hrs, Volume= 0.197 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.23 cfs @ 12.13 hrs, Volume= 0.197 af
 Routed to Pond 45P : DMH 8+26

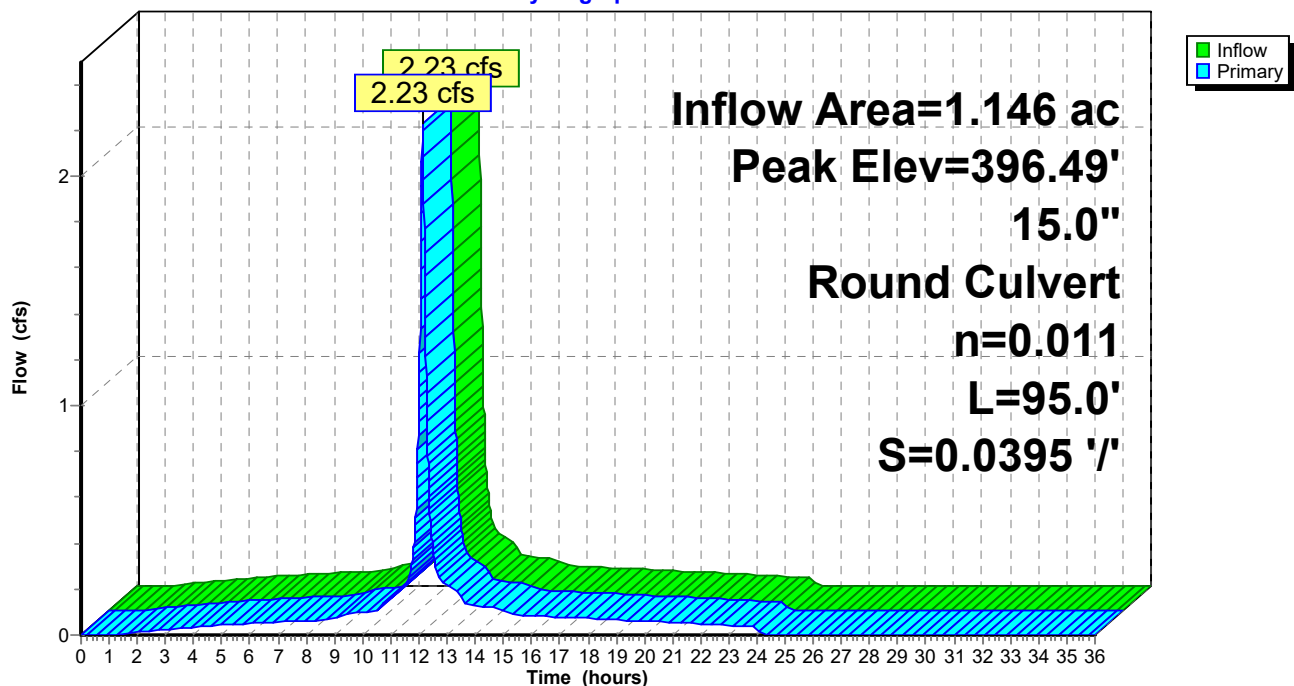
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 396.49' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	395.75'	15.0" Round Culvert L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 395.75' / 392.00' S= 0.0395 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf

Primary OutFlow Max=2.22 cfs @ 12.13 hrs HW=396.49' TW=387.94' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 2.22 cfs @ 2.93 fps)

Pond 40P: DMH 7+50

Hydrograph



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Summary for Subcatchment 41P: P2e

Runoff = 1.78 cfs @ 12.17 hrs, Volume= 0.170 af, Depth= 1.37"
Routed to Pond 42P : CB 8+23

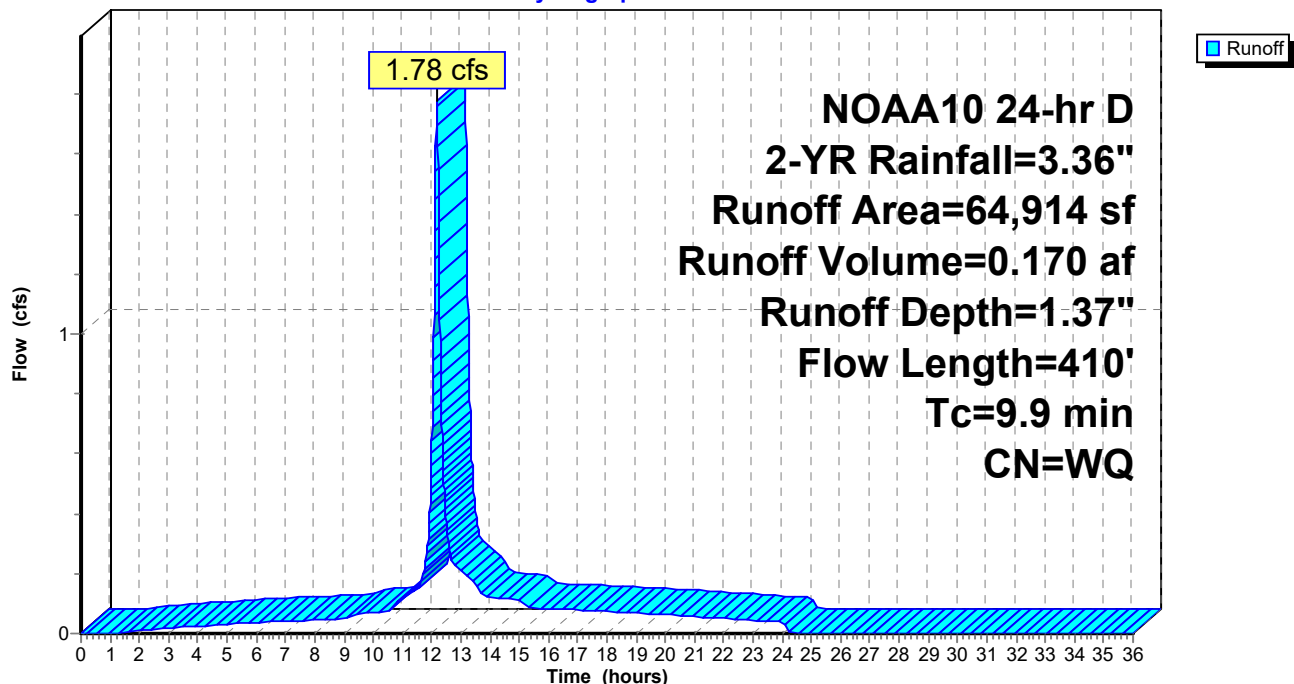
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
6,559	98	Roofs HSG B
5,857	55	Woods, Good HSG B
15,251	98	Paved parking HSG B
37,247	61	>75% Grass cover, Good HSG B
64,914		Weighted Average
43,104		66.40% Pervious Area
21,810		33.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
2.8	310	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	50	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.9	410	Total			

Subcatchment 41P: P2e

Hydrograph



Summary for Pond 42P: CB 8+23

Inflow Area = 1.490 ac, 33.60% Impervious, Inflow Depth = 1.37" for 2-YR event
 Inflow = 1.78 cfs @ 12.17 hrs, Volume= 0.170 af
 Outflow = 1.78 cfs @ 12.17 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.78 cfs @ 12.17 hrs, Volume= 0.170 af
 Routed to Pond 45P : DMH 8+26

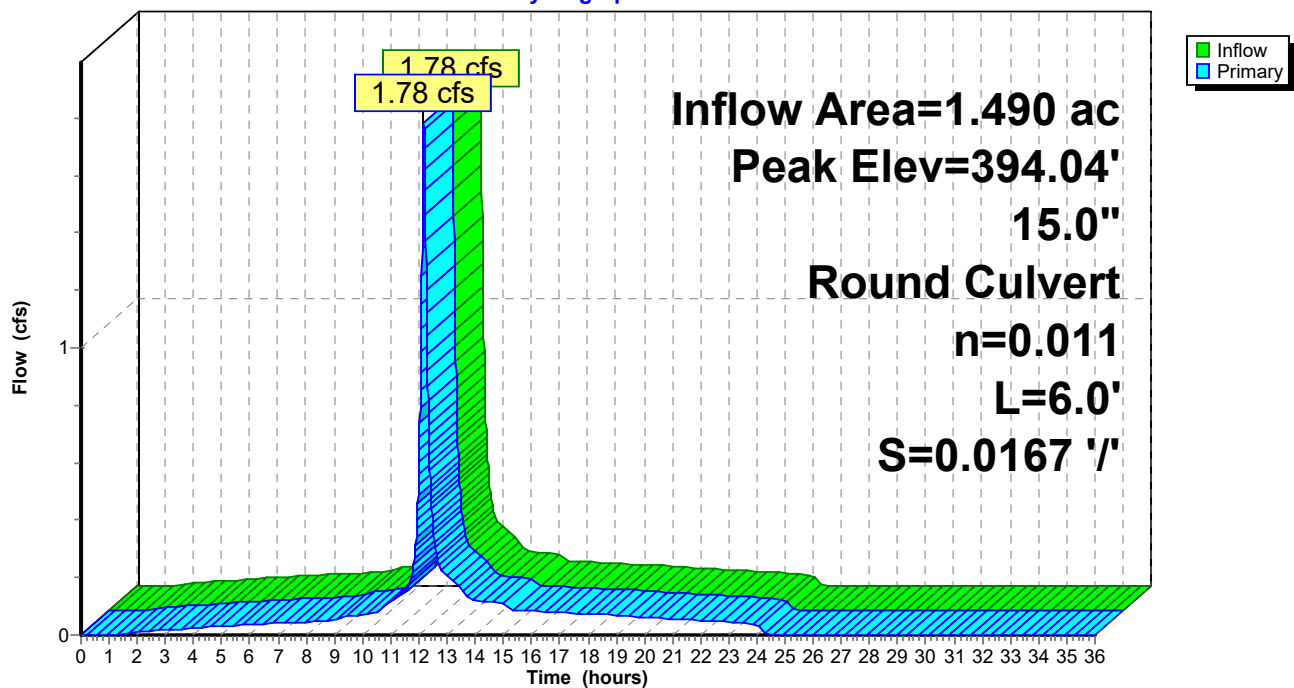
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 394.04' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	393.30'	15.0" Round Culvert L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 393.30' / 393.20' S= 0.0167 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf

Primary OutFlow Max=1.78 cfs @ 12.17 hrs HW=394.04' TW=387.92' (Dynamic Tailwater)
 ↳ **1=Culvert** (Barrel Controls 1.78 cfs @ 3.38 fps)

Pond 42P: CB 8+23

Hydrograph



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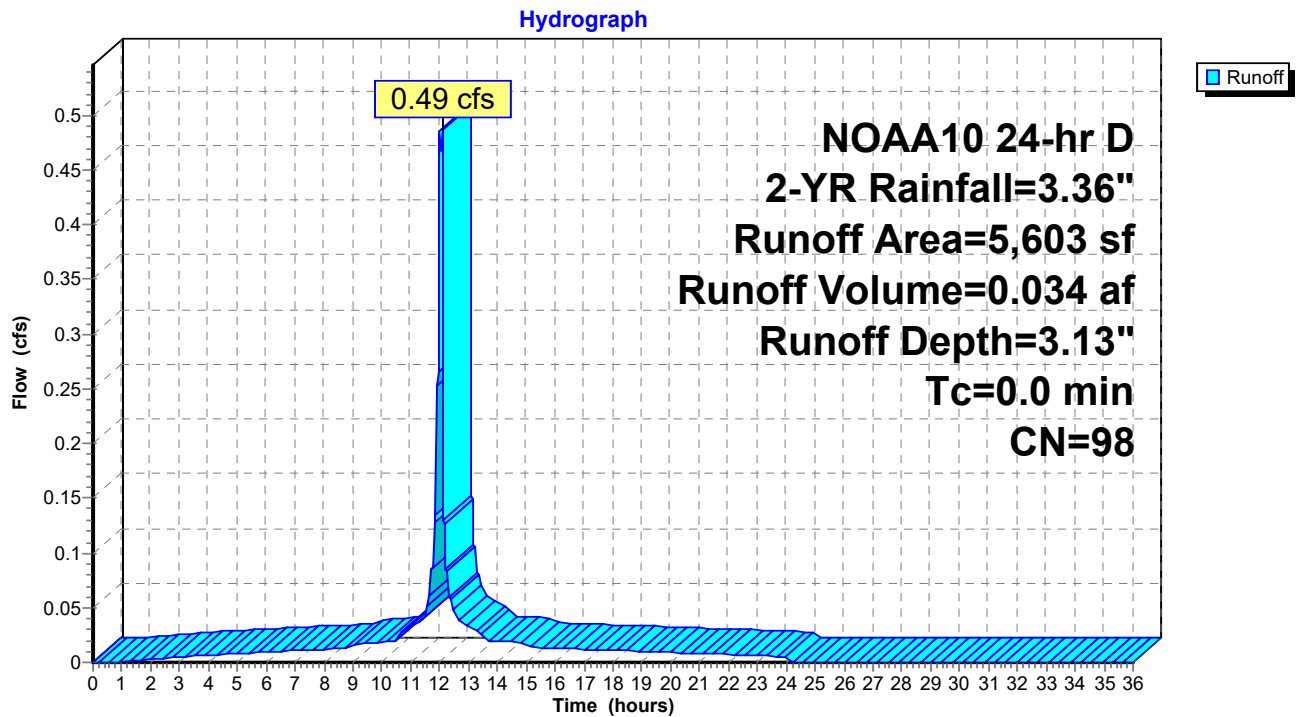
Summary for Subcatchment 43P: P2f

Runoff = 0.49 cfs @ 12.09 hrs, Volume= 0.034 af, Depth= 3.13"
Routed to Pond 44P : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
5,603	98	Roofs, HSG B
5,603		100.00% Impervious Area

Subcatchment 43P: P2f



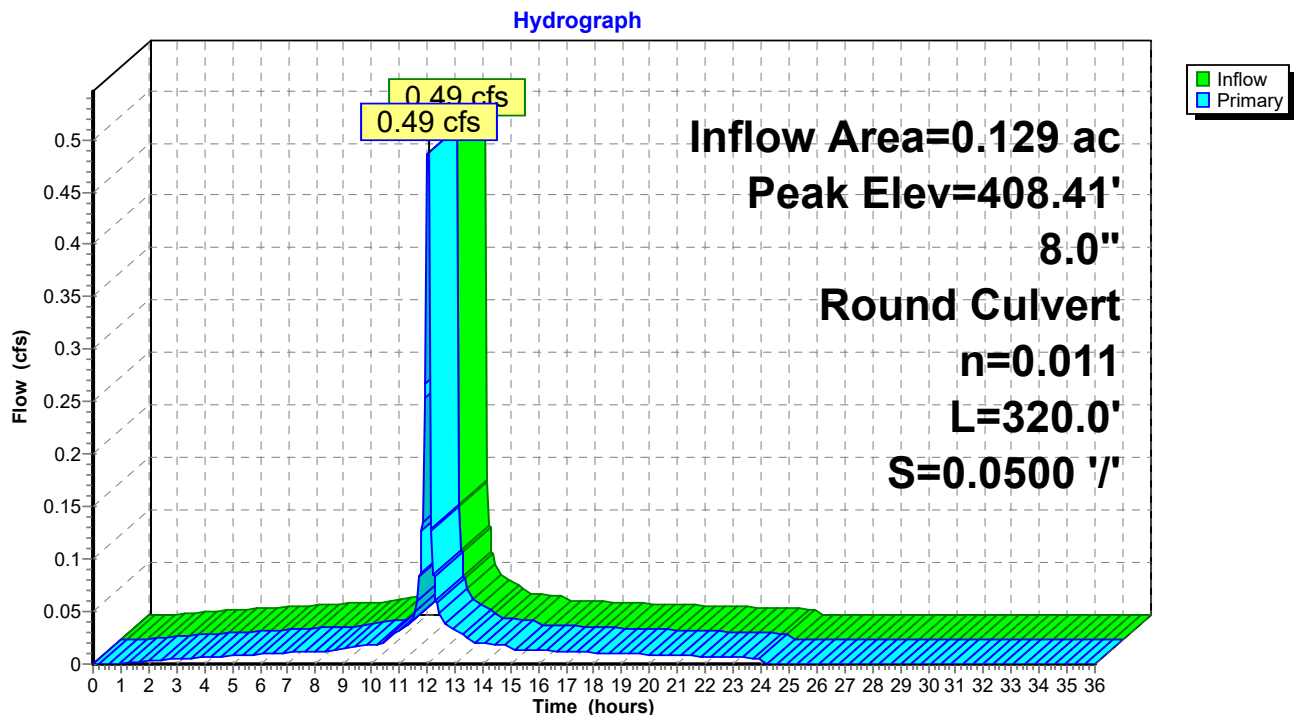
Summary for Pond 44P: Roof Drain

Inflow Area = 0.129 ac, 100.00% Impervious, Inflow Depth = 3.13" for 2-YR event
 Inflow = 0.49 cfs @ 12.09 hrs, Volume= 0.034 af
 Outflow = 0.49 cfs @ 12.09 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.49 cfs @ 12.09 hrs, Volume= 0.034 af
 Routed to Pond 45P : DMH 8+26

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 408.41' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	408.00'	8.0" Round Culvert L= 320.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 408.00' / 392.00' S= 0.0500 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.49 cfs @ 12.09 hrs HW=408.41' TW=387.90' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 0.49 cfs @ 2.18 fps)

Pond 44P: Roof Drain

Summary for Pond 45P: DMH 8+26

Inflow Area = 2.765 ac, 47.65% Impervious, Inflow Depth = 1.74" for 2-YR event
 Inflow = 3.93 cfs @ 12.14 hrs, Volume= 0.401 af
 Outflow = 3.93 cfs @ 12.14 hrs, Volume= 0.401 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.93 cfs @ 12.14 hrs, Volume= 0.401 af
 Routed to Pond 46P : FD C

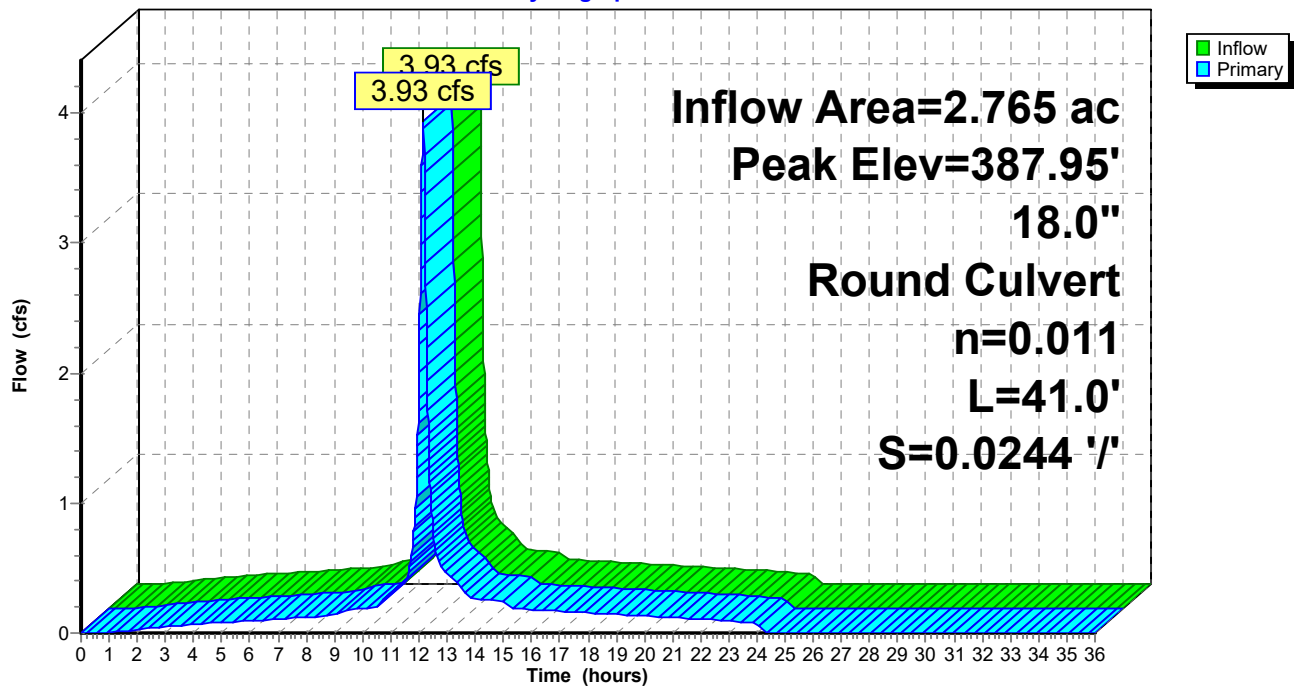
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 387.95' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	387.00'	18.0" Round Culvert L= 41.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 387.00' / 386.00' S= 0.0244 '/ Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=3.93 cfs @ 12.14 hrs HW=387.95' TW=386.85' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 3.93 cfs @ 3.32 fps)

Pond 45P: DMH 8+26

Hydrograph



Summary for Pond 46P: FD C

Inflow Area = 2.765 ac, 47.65% Impervious, Inflow Depth = 1.74" for 2-YR event
 Inflow = 3.93 cfs @ 12.14 hrs, Volume= 0.401 af
 Outflow = 3.93 cfs @ 12.14 hrs, Volume= 0.401 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.93 cfs @ 12.14 hrs, Volume= 0.401 af
 Routed to Pond 47P : Infiltration Field #6

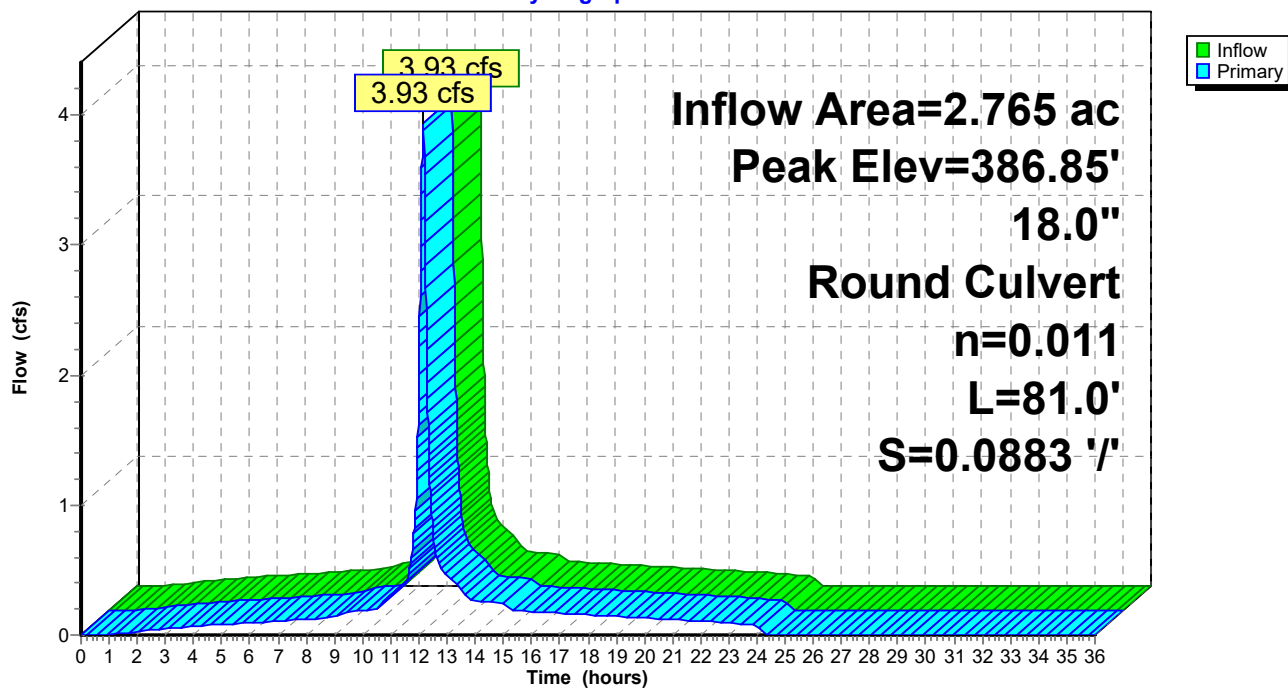
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 386.85' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	385.90'	18.0" Round Culvert L= 81.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 385.90' / 378.75' S= 0.0883 '/ Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=3.93 cfs @ 12.14 hrs HW=386.85' TW=378.97' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 3.93 cfs @ 3.32 fps)

Pond 46P: FD C

Hydrograph



Summary for Pond 47P: Infiltration Field #6

Inflow Area = 2.765 ac, 47.65% Impervious, Inflow Depth = 1.74" for 2-YR event
 Inflow = 3.93 cfs @ 12.14 hrs, Volume= 0.401 af
 Outflow = 0.30 cfs @ 13.64 hrs, Volume= 0.401 af, Atten= 92%, Lag= 90.0 min
 Discarded = 0.28 cfs @ 11.51 hrs, Volume= 0.398 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 48P : 30' Level Spreader
 Secondary = 0.01 cfs @ 13.64 hrs, Volume= 0.003 af
 Routed to Pond 51P : 30' Level Spreader

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 379.65' @ 13.64 hrs Surf.Area= 5,127 sf Storage= 5,310 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 144.7 min (935.7 - 790.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	378.00'	1,502 cf	15.75'W x 64.67'L x 5.75'H Field A 5,856 cf Overall - 2,102 cf Embedded = 3,754 cf x 40.0% Voids
#2A	378.75'	2,102 cf	Cultec R-902HD v2 x 32 Inside #1 Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 32 Chambers in 2 Rows Cap Storage= 18.0 cf x 2 x 2 rows = 72.1 cf
#3B	378.00'	4,233 cf	37.50'W x 79.33'L x 5.75'H Field B 17,106 cf Overall - 6,524 cf Embedded = 10,582 cf x 40.0% Voids
#4B	378.75'	6,524 cf	Cultec R-902HD v2 x 100 Inside #3 Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 100 Chambers in 5 Rows Cap Storage= 18.0 cf x 2 x 5 rows = 180.2 cf
#5C	378.00'	1,666 cf	15.75'W x 72.00'L x 5.75'H Field C 6,521 cf Overall - 2,356 cf Embedded = 4,164 cf x 40.0% Voids
#6C	378.75'	2,356 cf	Cultec R-902HD v2 x 36 Inside #5 Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 36 Chambers in 2 Rows Cap Storage= 18.0 cf x 2 x 2 rows = 72.1 cf
		18,383 cf	Total Available Storage

Storage Group A created with Chamber Wizard
 Storage Group B created with Chamber Wizard
 Storage Group C created with Chamber Wizard

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Device	Routing	Invert	Outlet Devices
#1	Discarded	378.00'	2.400 in/hr Exfiltration over Surface area
#2	Secondary	378.00'	12.0" Round Culvert L= 173.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 377.00' S= 0.0058 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#3	Primary	378.00'	12.0" Round Culvert L= 39.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 374.00' S= 0.1026 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#4	Device 2	379.40'	1.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 2	382.10'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Device 3	382.10'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Primary	378.00'	12.0" Round Culvert L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 374.00' S= 0.0727 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#8	Device 7	383.55'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.28 cfs @ 11.51 hrs HW=378.07' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.28 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=378.00' TW=374.00' (Dynamic Tailwater)↑ **3=Culvert** (Controls 0.00 cfs)↑ **6=Orifice/Grate** (Controls 0.00 cfs)↑ **7=Culvert** (Controls 0.00 cfs)↑ **8=Orifice/Grate** (Controls 0.00 cfs)**Secondary OutFlow** Max=0.01 cfs @ 13.64 hrs HW=379.65' TW=377.00' (Dynamic Tailwater)↑ **2=Culvert** (Passes 0.01 cfs of 3.49 cfs potential flow)↑ **4=Orifice/Grate** (Orifice Controls 0.01 cfs @ 2.20 fps)↑ **5=Orifice/Grate** (Controls 0.00 cfs)

Pond 47P: Infiltration Field #6 - Chamber Wizard Field A

Chamber Model = Cultec R-902HD v2 (Cultec Recharger® 902HD v2)

Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf

Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap

Cap Storage= 18.0 cf x 2 x 2 rows = 72.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

16 Chambers/Row x 3.67' Long +2.00' Cap Length x 2 = 62.67' Row Length +12.0" End Stone x 2 = 64.67' Base Length

2 Rows x 78.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 15.75' Base Width

9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

32 Chambers x 63.4 cf + 18.0 cf Cap Volume x 2 x 2 Rows = 2,102.2 cf Chamber Storage

5,856.4 cf Field - 2,102.2 cf Chambers = 3,754.1 cf Stone x 40.0% Voids = 1,501.7 cf Stone Storage

Chamber Storage + Stone Storage = 3,603.9 cf = 0.083 af

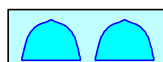
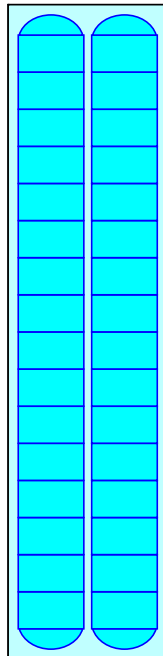
Overall Storage Efficiency = 61.5%

Overall System Size = 64.67' x 15.75' x 5.75'

32 Chambers

216.9 cy Field

139.0 cy Stone



Pond 47P: Infiltration Field #6 - Chamber Wizard Field B

Chamber Model = Cultec R-902HD v2 (Cultec Recharger® 902HD v2)

Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf

Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap

Cap Storage= 18.0 cf x 2 x 5 rows = 180.2 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

20 Chambers/Row x 3.67' Long +2.00' Cap Length x 2 = 77.33' Row Length +12.0" End Stone x 2 = 79.33' Base Length

5 Rows x 78.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.50' Base Width

9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

100 Chambers x 63.4 cf + 18.0 cf Cap Volume x 2 x 5 Rows = 6,524.5 cf Chamber Storage

17,106.2 cf Field - 6,524.5 cf Chambers = 10,581.8 cf Stone x 40.0% Voids = 4,232.7 cf Stone Storage

Chamber Storage + Stone Storage = 10,757.2 cf = 0.247 af

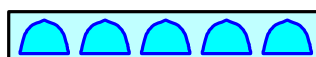
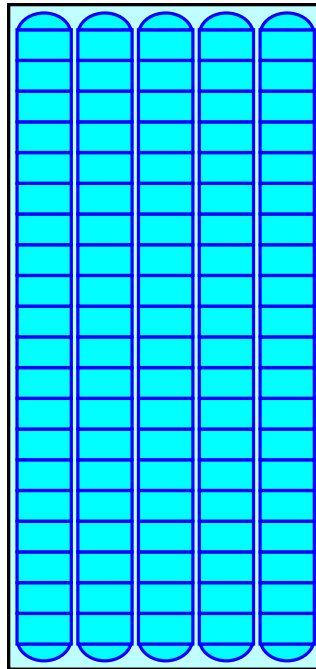
Overall Storage Efficiency = 62.9%

Overall System Size = 79.33' x 37.50' x 5.75'

100 Chambers

633.6 cy Field

391.9 cy Stone



Pond 47P: Infiltration Field #6 - Chamber Wizard Field C

Chamber Model = Cultec R-902HD v2 (Cultec Recharger® 902HD v2)

Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf

Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap

Cap Storage= 18.0 cf x 2 x 2 rows = 72.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

18 Chambers/Row x 3.67' Long +2.00' Cap Length x 2 = 70.00' Row Length +12.0" End Stone x 2 = 72.00' Base Length

2 Rows x 78.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 15.75' Base Width

9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

36 Chambers x 63.4 cf + 18.0 cf Cap Volume x 2 x 2 Rows = 2,356.0 cf Chamber Storage

6,520.5 cf Field - 2,356.0 cf Chambers = 4,164.5 cf Stone x 40.0% Voids = 1,665.8 cf Stone Storage

Chamber Storage + Stone Storage = 4,021.8 cf = 0.092 af

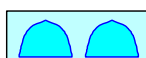
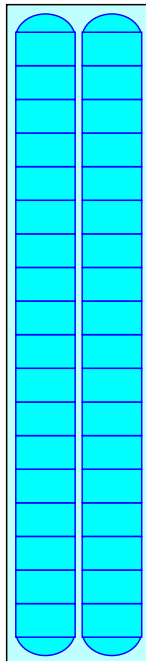
Overall Storage Efficiency = 61.7%

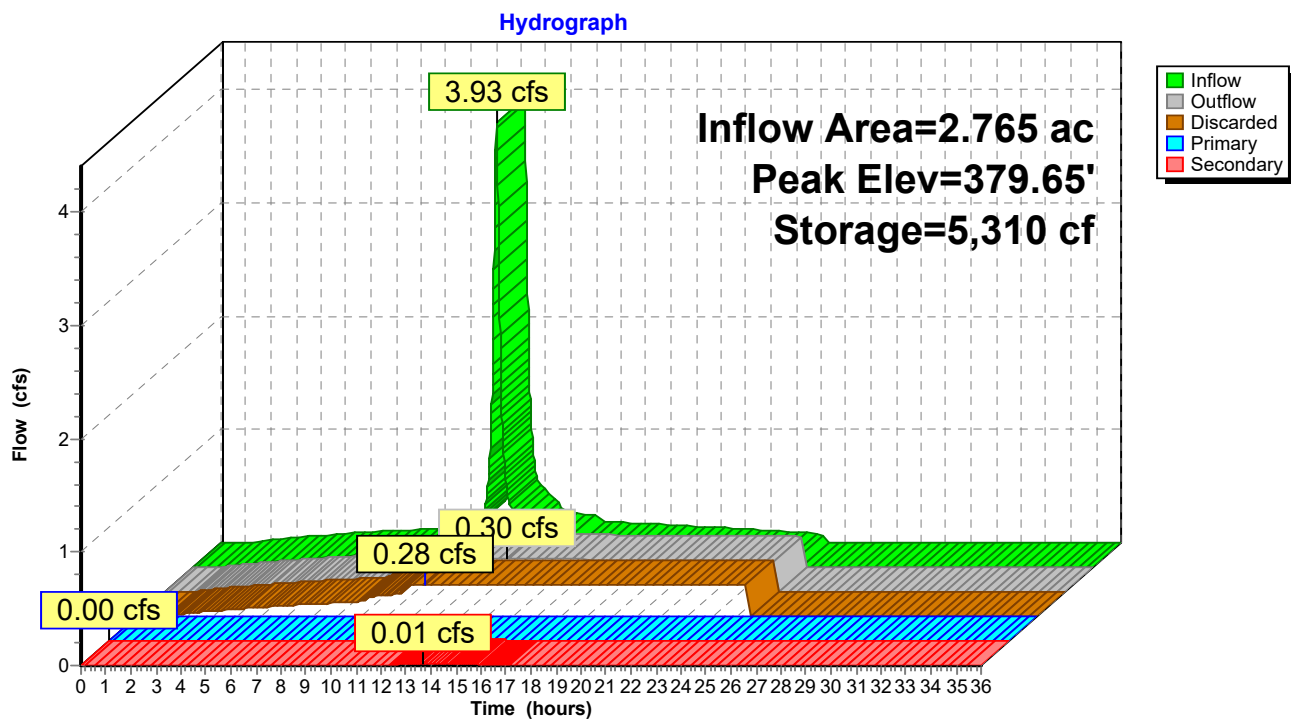
Overall System Size = 72.00' x 15.75' x 5.75'

36 Chambers

241.5 cy Field

154.2 cy Stone



Pond 47P: Infiltration Field #6

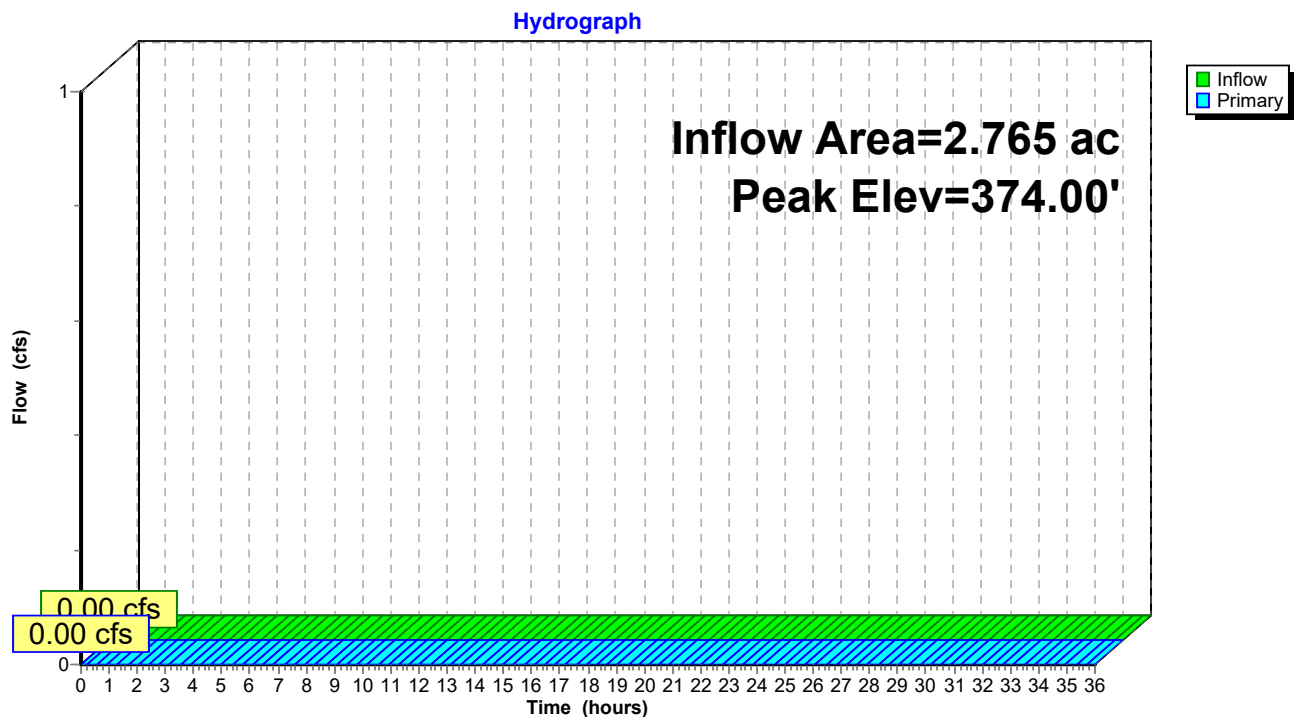
Summary for Pond 48P: 30' Level Spreader

Inflow Area = 2.765 ac, 47.65% Impervious, Inflow Depth = 0.00" for 2-YR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 50P : Sub-DP #2b: Flow to Northern Abutter

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 374.00' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	374.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Elev. (feet) 374.00 375.00 Width (feet) 40.00 40.00

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=374.00' TW=0.00' (Dynamic Tailwater)
↑1=Custom Weir/Orifice (Controls 0.00 cfs)

Pond 48P: 30' Level Spreader

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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Subcatchment 49P: P2g

Runoff = 0.48 cfs @ 12.25 hrs, Volume= 0.082 af, Depth= 0.39"

Routed to Link 50P : Sub-DP #2b: Flow to Northern Abutter

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

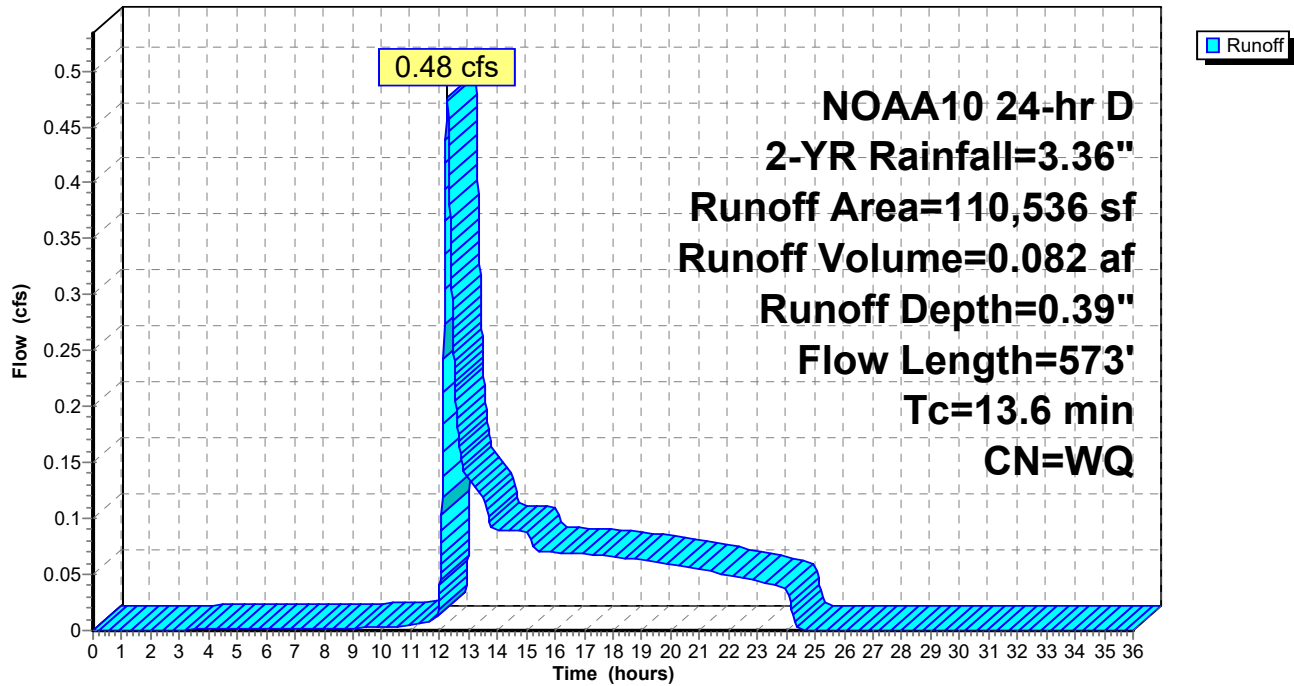
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
918	98	Roofs HSG B
58,029	55	Woods, Good HSG B
9,336	48	Brush, Good, HSG B
42,253	61	>75% Grass cover, Good HSG B
110,536		Weighted Average
109,618		99.17% Pervious Area
918		0.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
1.7	156	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.0	270	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.8	97	0.1800	2.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.6	573	Total			

Subcatchment 49P: P2g

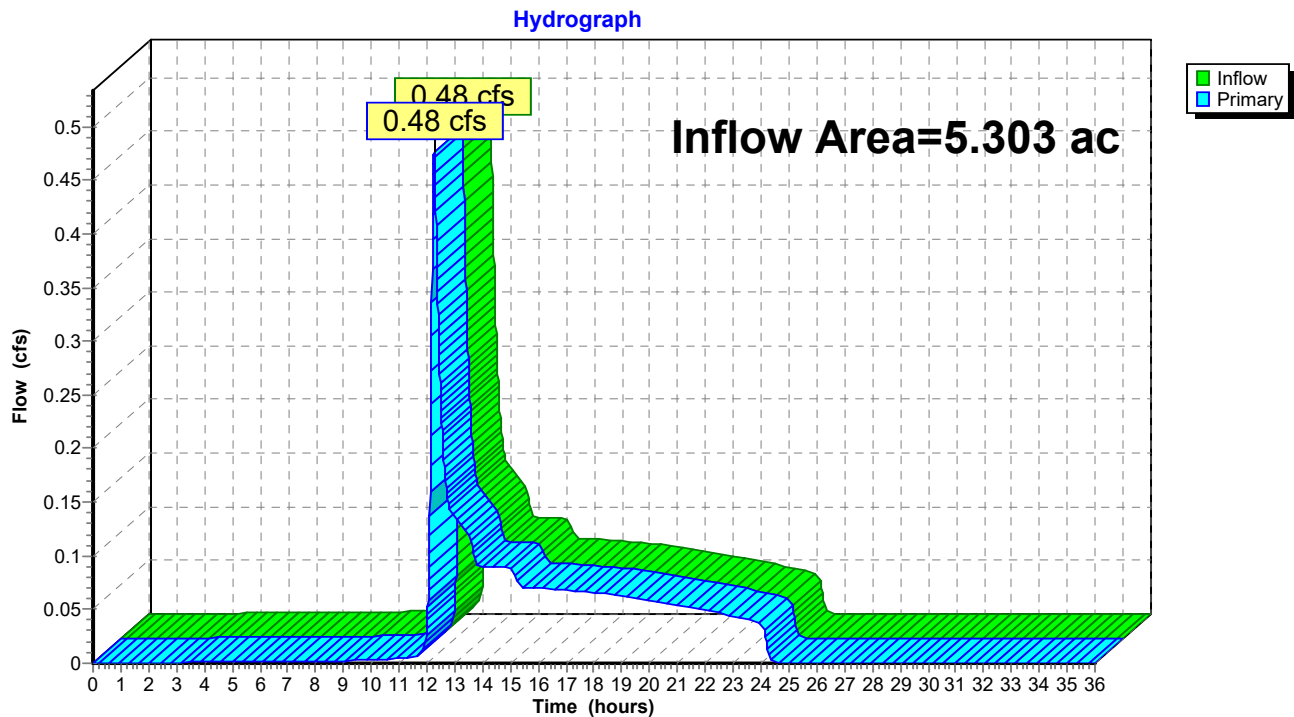
Hydrograph



Summary for Link 50P: Sub-DP #2b: Flow to Northern Abutter

Inflow Area = 5.303 ac, 25.25% Impervious, Inflow Depth = 0.19" for 2-YR event
Inflow = 0.48 cfs @ 12.25 hrs, Volume= 0.082 af
Primary = 0.48 cfs @ 12.25 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.0 min
Routed to Link 60P : Design Point #2: Flow to Uncas Brook

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 50P: Sub-DP #2b: Flow to Northern Abutter

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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Pond 51P: 30' Level Spreader

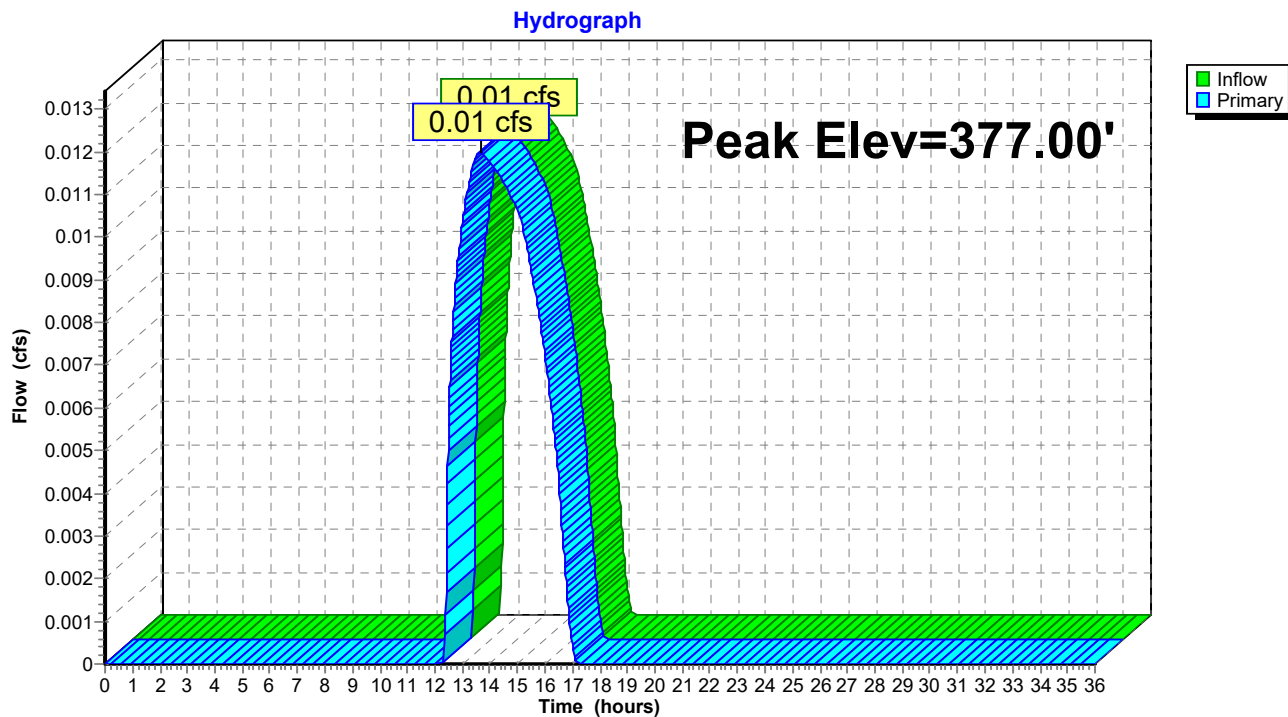
Inflow = 0.01 cfs @ 13.64 hrs, Volume= 0.003 af
Outflow = 0.01 cfs @ 13.64 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.2 min
Primary = 0.01 cfs @ 13.64 hrs, Volume= 0.003 af
Routed to Link 59P : Sub-DP #2a: Flow to Town Land

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 377.00' @ 13.64 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	377.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Elev. (feet) 377.00 378.00 Width (feet) 25.00 25.00

Primary OutFlow Max=0.01 cfs @ 13.64 hrs HW=377.00' TW=0.00' (Dynamic Tailwater)
↑1=Custom Weir/Orifice (Weir Controls 0.01 cfs @ 0.17 fps)

Pond 51P: 30' Level Spreader



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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Subcatchment 52P: P2h

Runoff = 0.46 cfs @ 12.25 hrs, Volume= 0.093 af, Depth= 0.34"

Routed to Link 59P : Sub-DP #2a: Flow to Town Land

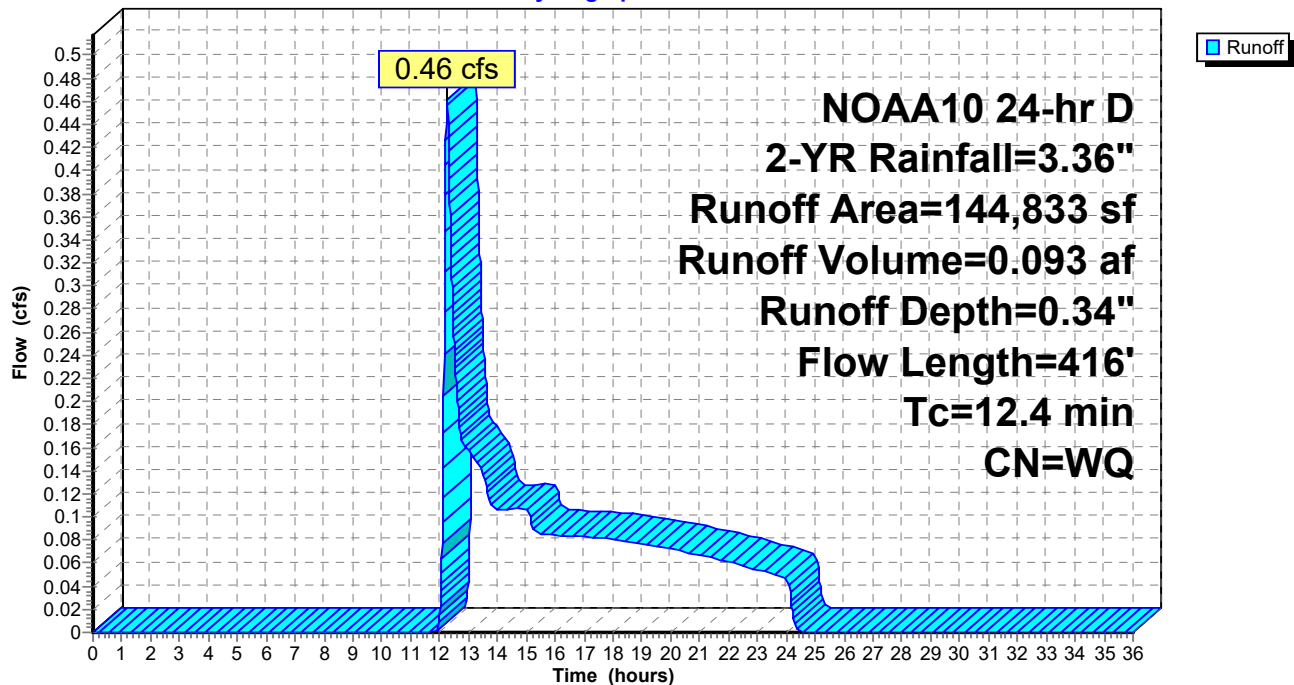
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
112,470	55	Woods, Good HSG B
3,868	48	Brush, Good, HSG B
28,495	61	>75% Grass cover, Good HSG B
144,833		Weighted Average
144,833		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	36	0.0200	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
3.1	380	0.1700	2.06		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.4	416	Total			

Subcatchment 52P: P2h

Hydrograph

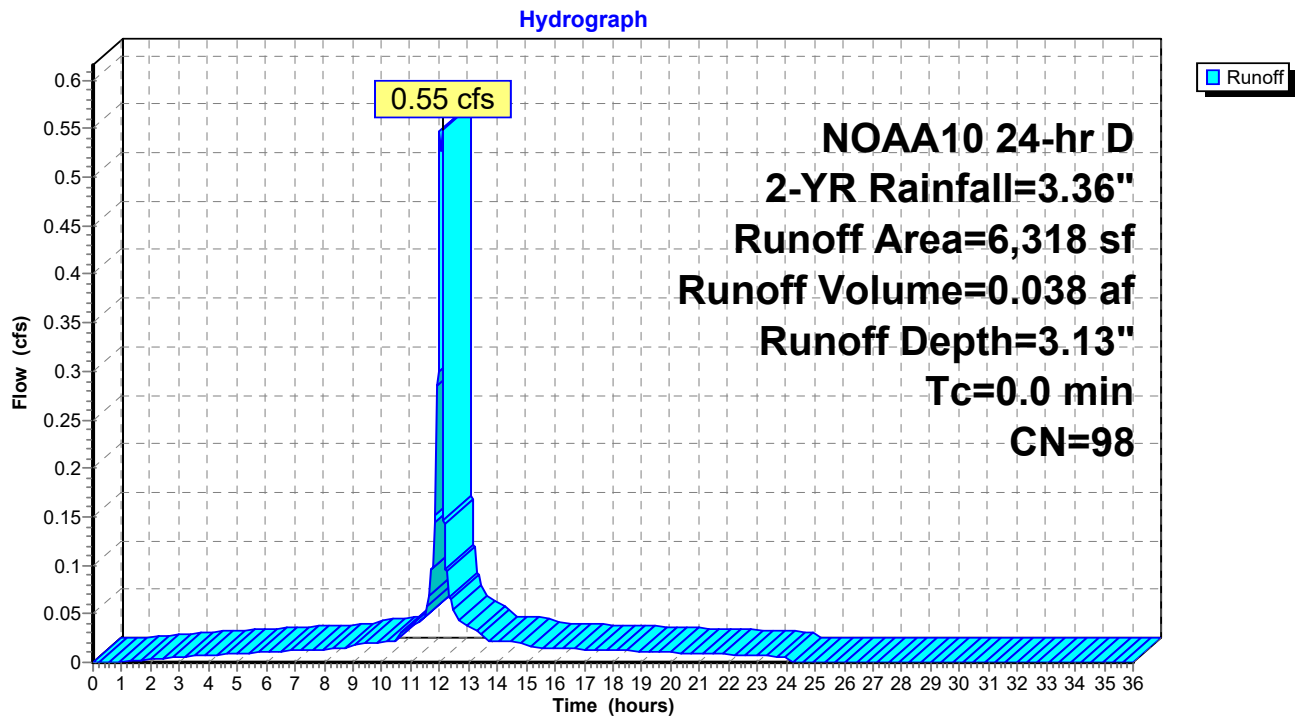


Summary for Subcatchment 53P: R11-19

Runoff = 0.55 cfs @ 12.09 hrs, Volume= 0.038 af, Depth= 3.13"
Routed to Pond 54P : Infiltration Field #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
6,318	98	Roofs, HSG B
6,318		100.00% Impervious Area

Subcatchment 53P: R11-19

Summary for Pond 54P: Infiltration Field #3

Inflow Area = 0.145 ac, 100.00% Impervious, Inflow Depth = 3.13" for 2-YR event
 Inflow = 0.55 cfs @ 12.09 hrs, Volume= 0.038 af
 Outflow = 0.04 cfs @ 11.58 hrs, Volume= 0.038 af, Atten= 93%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 11.58 hrs, Volume= 0.038 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 59P : Sub-DP #2a: Flow to Town Land

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 383.77' @ 13.10 hrs Surf.Area= 644 sf Storage= 454 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 78.9 min (832.8 - 753.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	382.50'	981 cf	23.00'W x 28.00'L x 5.75'H Field A 3,703 cf Overall - 1,250 cf Embedded = 2,453 cf x 40.0% Voids
#2A	383.25'	1,250 cf	Cultec R-902HD v2 x 18 Inside #1 Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 18 Chambers in 3 Rows Cap Storage= 18.0 cf x 2 x 3 rows = 108.1 cf
		2,231 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	382.50'	2.400 in/hr Exfiltration over Surface area
#2	Primary	386.25'	8.0" Round Culvert L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 386.25' / 380.00' S= 0.0727 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Discarded OutFlow Max=0.04 cfs @ 11.58 hrs HW=382.56' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=382.50' TW=0.00' (Dynamic Tailwater)

↑**2=Culvert** (Controls 0.00 cfs)

Pond 54P: Infiltration Field #3 - Chamber Wizard Field A

Chamber Model = Cultec R-902HD v2 (Cultec Recharger® 902HD v2)

Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf

Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap

Cap Storage= 18.0 cf x 2 x 3 rows = 108.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

6 Chambers/Row x 3.67' Long +2.00' Cap Length x 2 = 26.00' Row Length +12.0" End Stone x 2 = 28.00' Base Length

3 Rows x 78.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 23.00' Base Width

9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

18 Chambers x 63.4 cf + 18.0 cf Cap Volume x 2 x 3 Rows = 1,250.1 cf Chamber Storage

3,703.0 cf Field - 1,250.1 cf Chambers = 2,452.9 cf Stone x 40.0% Voids = 981.2 cf Stone Storage

Chamber Storage + Stone Storage = 2,231.3 cf = 0.051 af

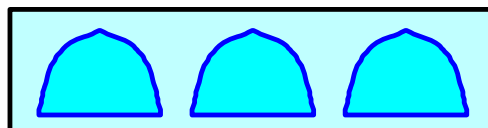
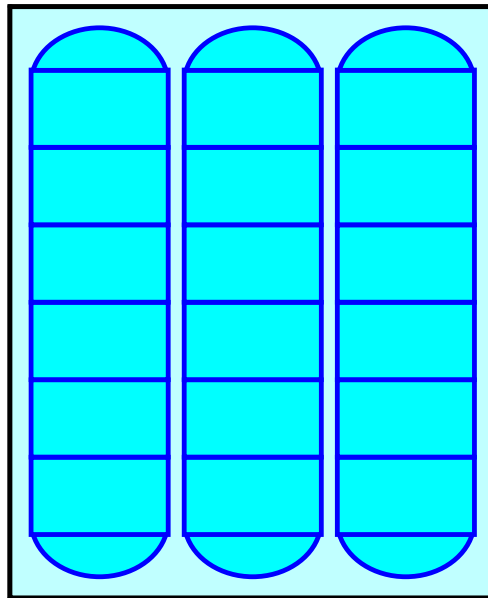
Overall Storage Efficiency = 60.3%

Overall System Size = 28.00' x 23.00' x 5.75'

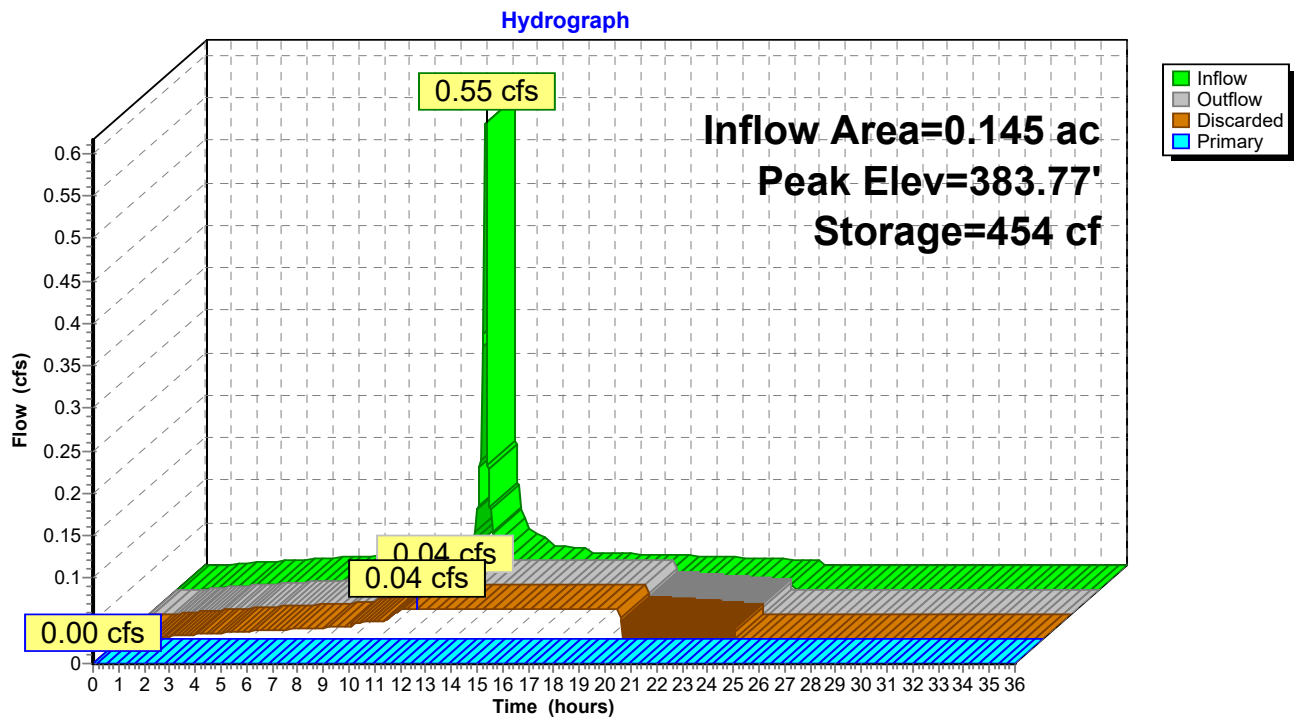
18 Chambers

137.1 cy Field

90.8 cy Stone



Pond 54P: Infiltration Field #3



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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Subcatchment 55P: R20-28

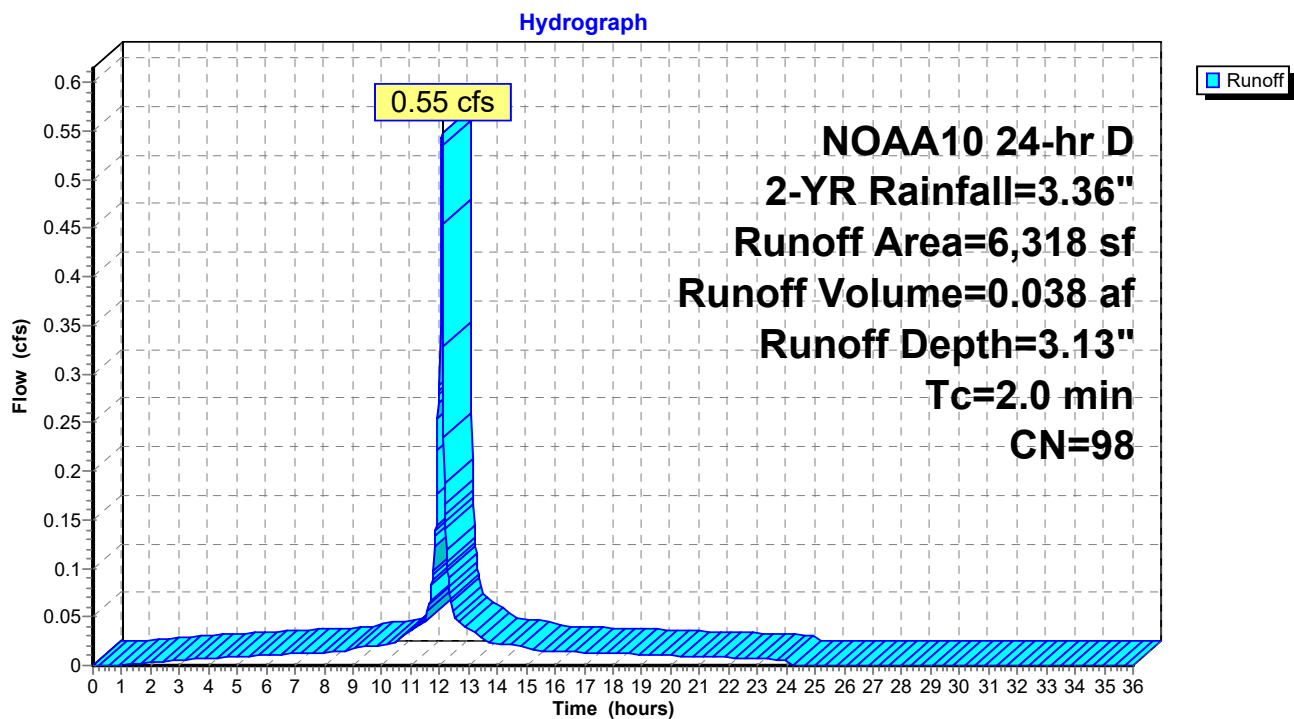
Runoff = 0.55 cfs @ 12.10 hrs, Volume= 0.038 af, Depth= 3.13"
Routed to Pond 56P : Infiltration Field #4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
6,318	98	Roofs, HSG B
6,318		100.00% Impervious Area

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

Subcatchment 55P: R20-28



Summary for Pond 56P: Infiltration Field #4

Inflow Area = 0.145 ac, 100.00% Impervious, Inflow Depth = 3.13" for 2-YR event
 Inflow = 0.55 cfs @ 12.10 hrs, Volume= 0.038 af
 Outflow = 0.06 cfs @ 11.83 hrs, Volume= 0.038 af, Atten= 89%, Lag= 0.0 min
 Discarded = 0.06 cfs @ 11.83 hrs, Volume= 0.038 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 59P : Sub-DP #2a: Flow to Town Land

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 388.12' @ 12.42 hrs Surf.Area= 1,134 sf Storage= 340 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 24.3 min (780.1 - 755.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	387.50'	822 cf	21.00'W x 54.00'L x 2.54'H Field A 2,882 cf Overall - 826 cf Embedded = 2,056 cf x 40.0% Voids
#2A	388.00'	826 cf	Cultec R-150XLHD x 30 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 6 rows
		1,649 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	387.50'	2.400 in/hr Exfiltration over Surface area
#2	Primary	389.50'	8.0" Round Culvert L= 137.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 389.50' / 380.00' S= 0.0693 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Discarded OutFlow Max=0.06 cfs @ 11.83 hrs HW=387.53' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=387.50' TW=0.00' (Dynamic Tailwater)

↑ **2=Culvert** (Controls 0.00 cfs)

Pond 56P: Infiltration Field #4 - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 6 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

5 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 52.00' Row Length +12.0" End Stone x 2 =
54.00' Base Length

6 Rows x 33.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 21.00' Base Width

6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

30 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 6 Rows = 826.5 cf Chamber Storage

2,882.3 cf Field - 826.5 cf Chambers = 2,055.8 cf Stone x 40.0% Voids = 822.3 cf Stone Storage

Chamber Storage + Stone Storage = 1,648.8 cf = 0.038 af

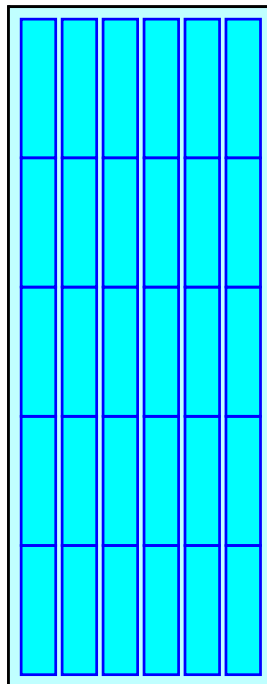
Overall Storage Efficiency = 57.2%

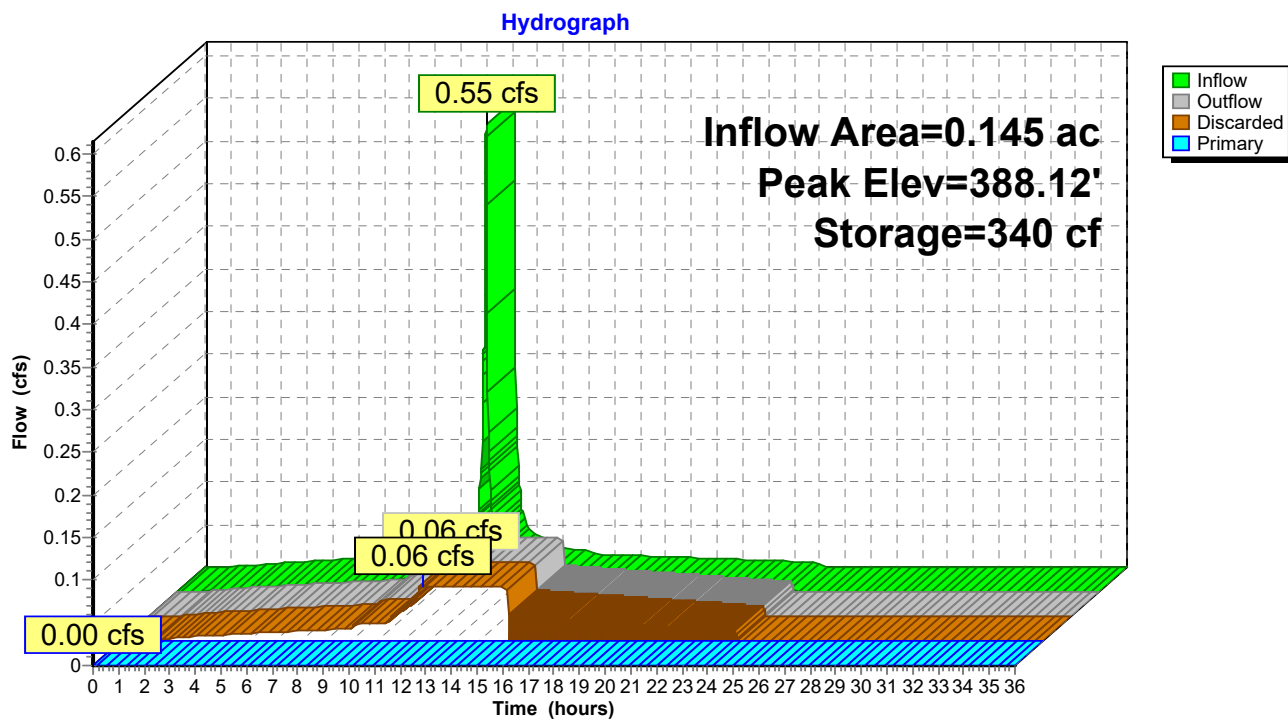
Overall System Size = 54.00' x 21.00' x 2.54'

30 Chambers

106.8 cy Field

76.1 cy Stone



Pond 56P: Infiltration Field #4

Summary for Subcatchment 57P: R2-3, 27-28

Runoff = 0.24 cfs @ 12.10 hrs, Volume= 0.017 af, Depth= 3.13"
 Routed to Pond 58P : Infiltration Field #5

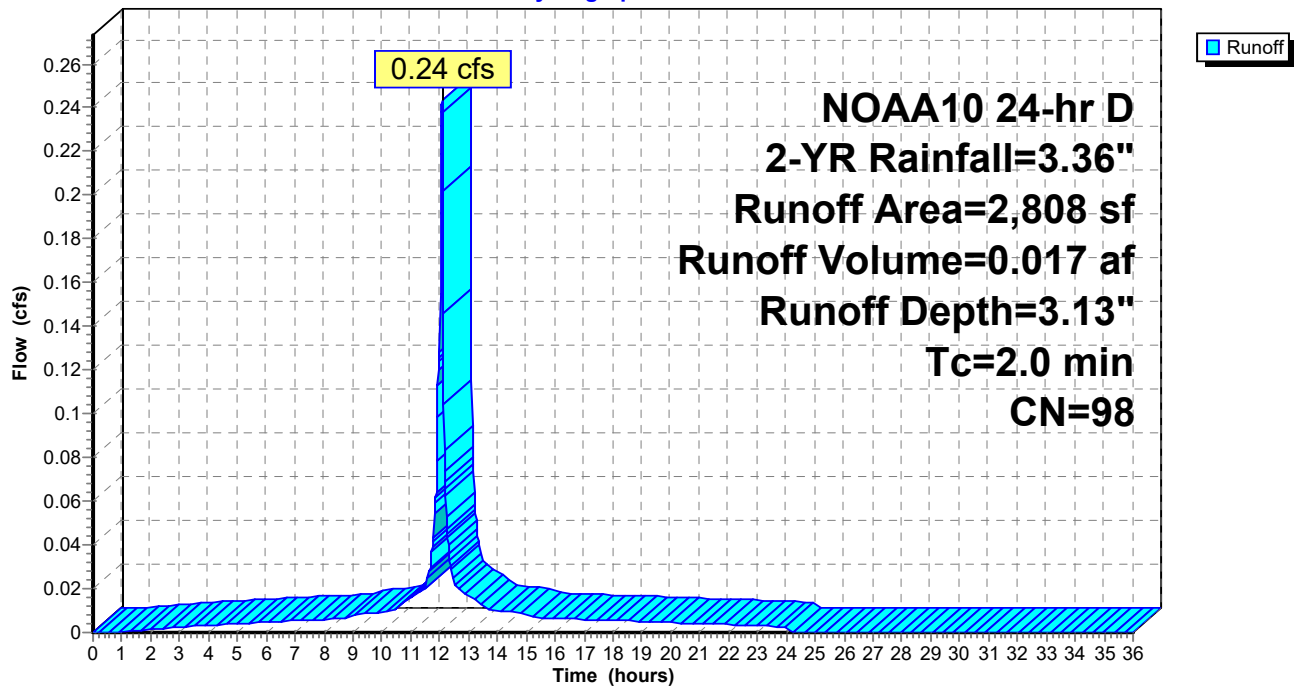
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 2-YR Rainfall=3.36"

Area (sf)	CN	Description
2,808	98	Roofs, HSG B
2,808		100.00% Impervious Area

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

Subcatchment 57P: R2-3, 27-28

Hydrograph



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NOAA10 24-hr D 2-YR Rainfall=3.36"

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Summary for Pond 58P: Infiltration Field #5

Inflow Area = 0.064 ac, 100.00% Impervious, Inflow Depth = 3.13" for 2-YR event
 Inflow = 0.24 cfs @ 12.10 hrs, Volume= 0.017 af
 Outflow = 0.03 cfs @ 11.81 hrs, Volume= 0.017 af, Atten= 89%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 11.81 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 406.35' @ 12.43 hrs Surf.Area= 486 sf Storage= 154 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 26.3 min (782.1 - 755.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	405.70'	360 cf	14.50'W x 33.50'L x 2.54'H Field A 1,235 cf Overall - 334 cf Embedded = 901 cf x 40.0% Voids
#2A	406.20'	334 cf	Cultec R-150XLHD x 12 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 4 rows
		694 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	405.70'	2.400 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.03 cfs @ 11.81 hrs HW=405.73' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 58P: Infiltration Field #5 - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 4 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

3 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 31.50' Row Length +12.0" End Stone x 2 = 33.50' Base Length

4 Rows x 33.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 14.50' Base Width

6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

12 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 4 Rows = 333.8 cf Chamber Storage

1,234.6 cf Field - 333.8 cf Chambers = 900.8 cf Stone x 40.0% Voids = 360.3 cf Stone Storage

Chamber Storage + Stone Storage = 694.1 cf = 0.016 af

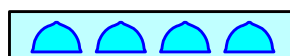
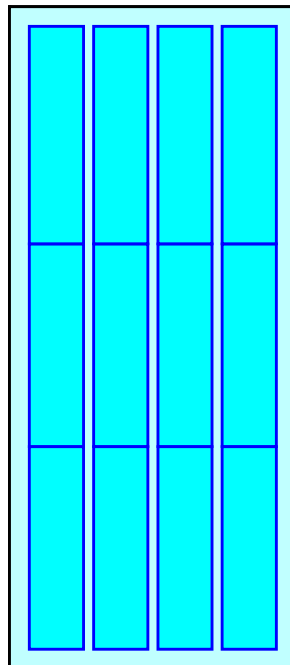
Overall Storage Efficiency = 56.2%

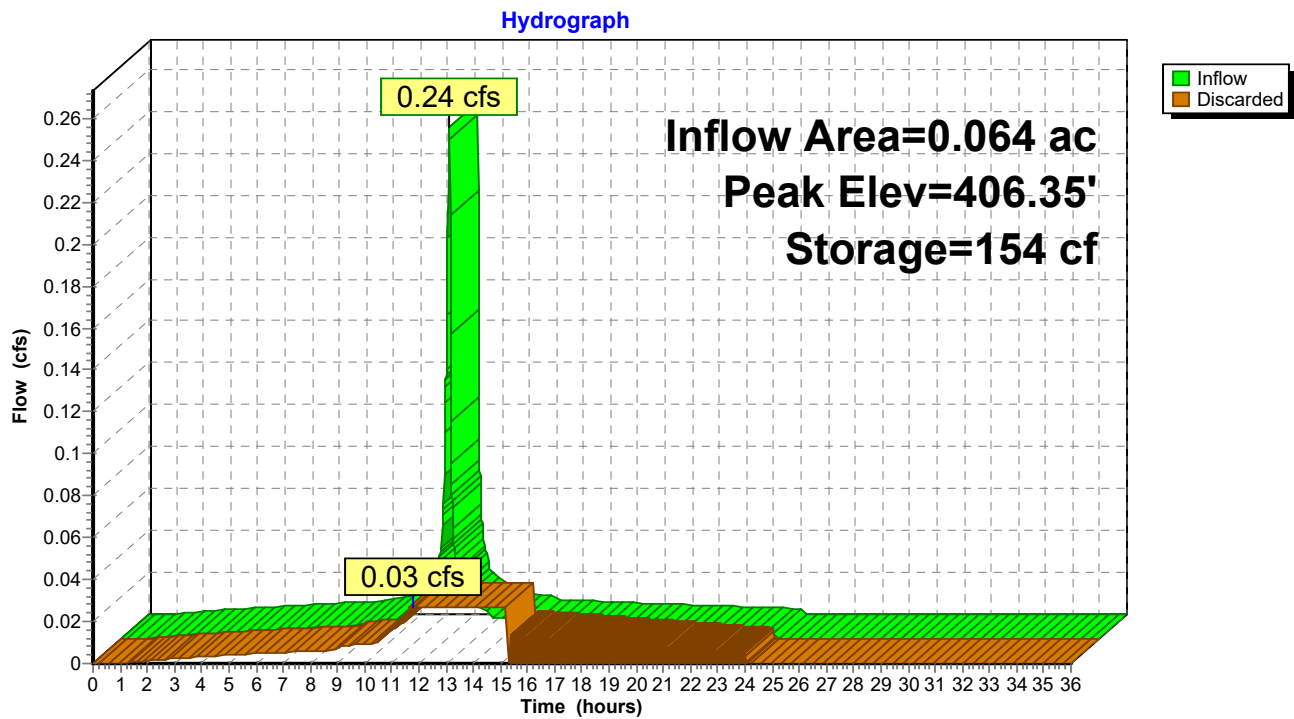
Overall System Size = 33.50' x 14.50' x 2.54'

12 Chambers

45.7 cy Field

33.4 cy Stone

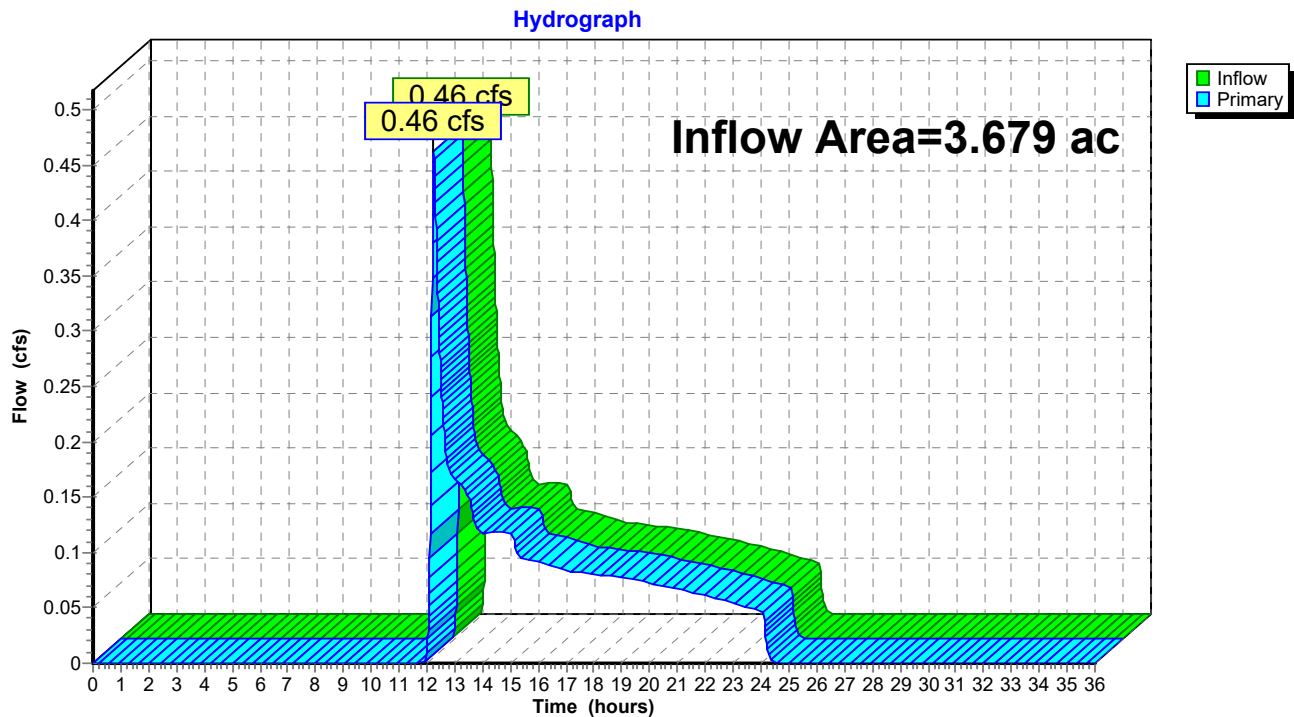


Pond 58P: Infiltration Field #5

Summary for Link 59P: Sub-DP #2a: Flow to Town Land

Inflow Area = 3.679 ac, 9.64% Impervious, Inflow Depth = 0.32" for 2-YR event
Inflow = 0.46 cfs @ 12.25 hrs, Volume= 0.097 af
Primary = 0.46 cfs @ 12.25 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.0 min
Routed to Link 60P : Design Point #2: Flow to Uncas Brook

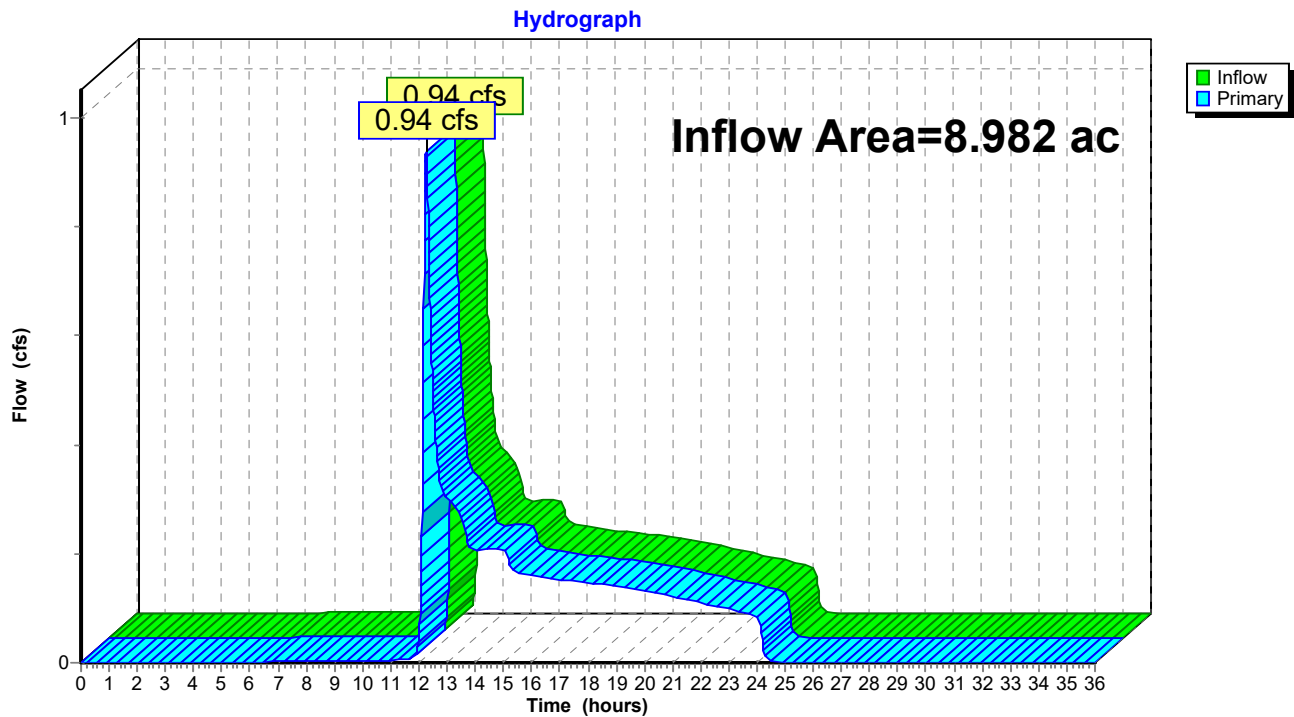
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 59P: Sub-DP #2a: Flow to Town Land

Summary for Link 60P: Design Point #2: Flow to Uncas Brook

Inflow Area = 8.982 ac, 18.85% Impervious, Inflow Depth = 0.24" for 2-YR event
Inflow = 0.94 cfs @ 12.25 hrs, Volume= 0.179 af
Primary = 0.94 cfs @ 12.25 hrs, Volume= 0.179 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 60P: Design Point #2: Flow to Uncas Brook

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NOAA10 24-hr D 10-YR Rainfall=5.22"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment30P: P2a

Runoff Area=16,661 sf 55.72% Impervious Runoff Depth=3.36"
Flow Length=287' Tc=11.0 min CN=WQ Runoff=1.13 cfs 0.107 af

Pond 31P: CB 5+55R

Peak Elev=402.21' Inflow=1.13 cfs 0.107 af
12.0" Round Culvert n=0.011 L=10.0' S=0.0400 '/' Outflow=1.13 cfs 0.107 af

Subcatchment32P: P2b

Runoff Area=11,091 sf 55.26% Impervious Runoff Depth=3.43"
Flow Length=209' Tc=7.7 min CN=WQ Runoff=0.88 cfs 0.073 af

Pond 33P: CB 5+55L

Peak Elev=402.15' Inflow=0.88 cfs 0.073 af
12.0" Round Culvert n=0.011 L=14.0' S=0.0286 '/' Outflow=0.88 cfs 0.073 af

Pond 34P: DMH 5+68

Peak Elev=401.93' Inflow=1.96 cfs 0.180 af
12.0" Round Culvert n=0.011 L=61.0' S=0.0287 '/' Outflow=1.96 cfs 0.180 af

Pond 35P: DMH 6+33

Peak Elev=400.43' Inflow=1.96 cfs 0.180 af
12.0" Round Culvert n=0.011 L=112.0' S=0.0326 '/' Outflow=1.96 cfs 0.180 af

Subcatchment36P: P2c

Runoff Area=12,059 sf 71.70% Impervious Runoff Depth=4.00"
Flow Length=265' Tc=5.7 min CN=WQ Runoff=1.21 cfs 0.092 af

Pond 37P: CB 7+36R

Peak Elev=396.95' Inflow=1.21 cfs 0.092 af
12.0" Round Culvert n=0.011 L=11.0' S=0.0273 '/' Outflow=1.21 cfs 0.092 af

Subcatchment38P: P2d

Runoff Area=10,116 sf 58.55% Impervious Runoff Depth=3.54"
Flow Length=247' Tc=3.3 min CN=WQ Runoff=0.99 cfs 0.069 af

Pond 39P: CB 7+36L

Peak Elev=396.91' Inflow=0.99 cfs 0.069 af
12.0" Round Culvert n=0.011 L=23.0' S=0.0130 '/' Outflow=0.99 cfs 0.069 af

Pond 40P: DMH 7+50

Peak Elev=396.81' Inflow=3.90 cfs 0.340 af
15.0" Round Culvert n=0.011 L=95.0' S=0.0395 '/' Outflow=3.90 cfs 0.340 af

Subcatchment41P: P2e

Runoff Area=64,914 sf 33.60% Impervious Runoff Depth=2.64"
Flow Length=410' Tc=9.9 min CN=WQ Runoff=3.68 cfs 0.327 af

Pond 42P: CB 8+23

Peak Elev=394.47' Inflow=3.68 cfs 0.327 af
15.0" Round Culvert n=0.011 L=6.0' S=0.0167 '/' Outflow=3.68 cfs 0.327 af

Subcatchment43P: P2f

Runoff Area=5,603 sf 100.00% Impervious Runoff Depth=4.98"
Tc=0.0 min CN=98 Runoff=0.76 cfs 0.053 af

Pond 44P: Roof Drain

Peak Elev=408.54' Inflow=0.76 cfs 0.053 af
8.0" Round Culvert n=0.011 L=320.0' S=0.0500 '/' Outflow=0.76 cfs 0.053 af

Pond 45P: DMH 8+26

Peak Elev=388.51' Inflow=7.39 cfs 0.721 af
18.0" Round Culvert n=0.011 L=41.0' S=0.0244 '/' Outflow=7.39 cfs 0.721 af

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Pond 46P: FD CPeak Elev=387.41' Inflow=7.39 cfs 0.721 af
18.0" Round Culvert n=0.011 L=81.0' S=0.0883 ' Outflow=7.39 cfs 0.721 af**Pond 47P: Infiltration Field #6**Peak Elev=381.64' Storage=13,070 cf Inflow=7.39 cfs 0.721 af
Discarded=0.28 cfs 0.675 af Primary=0.00 cfs 0.000 af Secondary=0.04 cfs 0.046 af Outflow=0.32 cfs 0.721 af**Pond 48P: 30' Level Spreader**Peak Elev=374.00' Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af**Subcatchment49P: P2g**Runoff Area=110,536 sf 0.83% Impervious Runoff Depth=1.25"
Flow Length=573' Tc=13.6 min CN=WQ Runoff=2.50 cfs 0.263 af**Link 50P: Sub-DP #2b: Flow to Northern Abutter**Inflow=2.50 cfs 0.263 af
Primary=2.50 cfs 0.263 af**Pond 51P: 30' Level Spreader**Peak Elev=377.01' Inflow=0.04 cfs 0.046 af
Outflow=0.04 cfs 0.046 af**Subcatchment52P: P2h**Runoff Area=144,833 sf 0.00% Impervious Runoff Depth=1.16"
Flow Length=416' Tc=12.4 min CN=WQ Runoff=3.17 cfs 0.322 af**Subcatchment53P: R11-19**Runoff Area=6,318 sf 100.00% Impervious Runoff Depth=4.98"
Tc=0.0 min CN=98 Runoff=0.86 cfs 0.060 af**Pond 54P: Infiltration Field #3**Peak Elev=384.70' Storage=911 cf Inflow=0.86 cfs 0.060 af
Discarded=0.04 cfs 0.060 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.060 af**Subcatchment55P: R20-28**Runoff Area=6,318 sf 100.00% Impervious Runoff Depth=4.98"
Tc=2.0 min CN=98 Runoff=0.86 cfs 0.060 af**Pond 56P: Infiltration Field #4**Peak Elev=388.49' Storage=664 cf Inflow=0.86 cfs 0.060 af
Discarded=0.06 cfs 0.060 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.060 af**Subcatchment57P: R2-3, 27-28**Runoff Area=2,808 sf 100.00% Impervious Runoff Depth=4.98"
Tc=2.0 min CN=98 Runoff=0.38 cfs 0.027 af**Pond 58P: Infiltration Field #5**Peak Elev=406.75' Storage=301 cf Inflow=0.38 cfs 0.027 af
Outflow=0.03 cfs 0.027 af**Link 59P: Sub-DP #2a: Flow to Town Land**Inflow=3.19 cfs 0.368 af
Primary=3.19 cfs 0.368 af**Link 60P: Design Point #2: Flow to Uncas Brook**Inflow=5.68 cfs 0.631 af
Primary=5.68 cfs 0.631 af**Total Runoff Area = 8.982 ac Runoff Volume = 1.454 af Average Runoff Depth = 1.94"**
81.15% Pervious = 7.289 ac 18.85% Impervious = 1.693 ac

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NOAA10 24-hr D 10-YR Rainfall=5.22"

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Summary for Subcatchment 30P: P2a

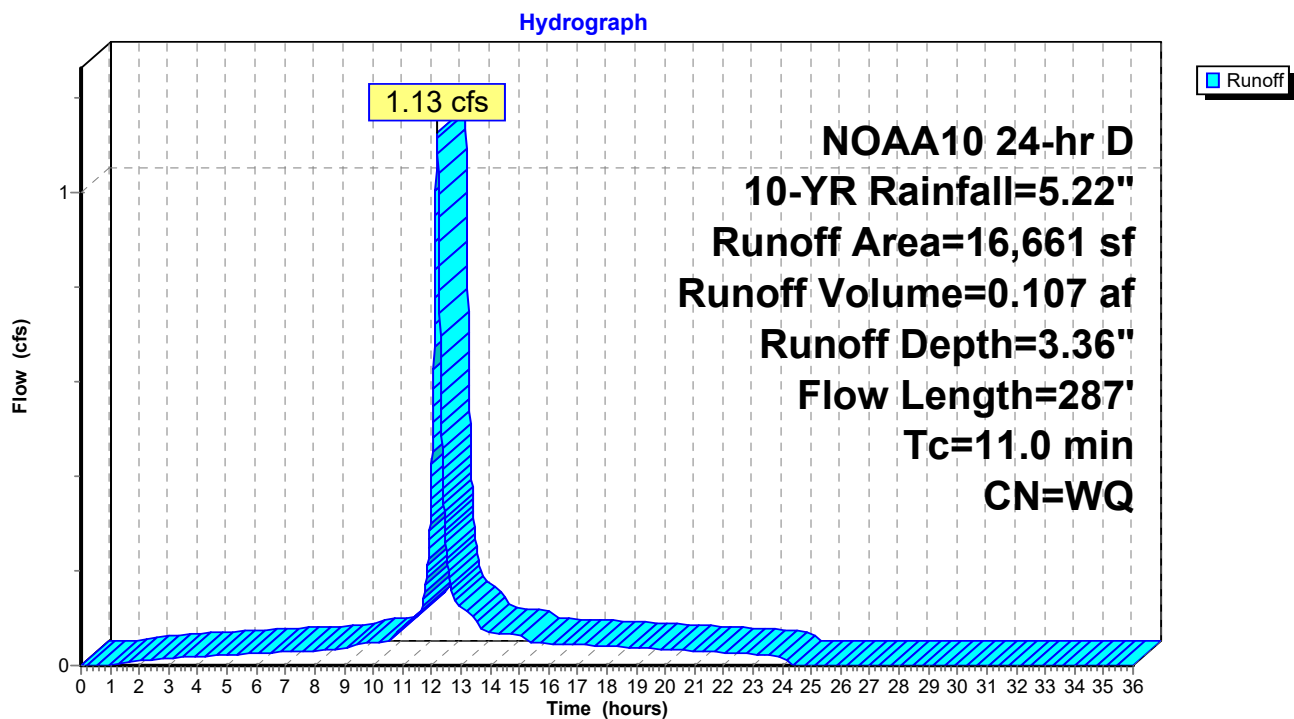
Runoff = 1.13 cfs @ 12.18 hrs, Volume= 0.107 af, Depth= 3.36"
 Routed to Pond 31P : CB 5+55R

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
7,449	98	Paved parking HSG B
3,408	55	Woods, Good HSG B
1,835	98	Roofs HSG B
3,969	61	>75% Grass cover, Good HSG B
16,661		Weighted Average
7,377		44.28% Pervious Area
9,284		55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	36	0.0200	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
0.8	35	0.0200	0.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	26	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.6	190	0.0600	4.97		Shallow Concentrated Flow, Paved Kv= 20.3 fps
11.0	287	Total			

Subcatchment 30P: P2a



Summary for Pond 31P: CB 5+55R

Inflow Area = 0.382 ac, 55.72% Impervious, Inflow Depth = 3.36" for 10-YR event
 Inflow = 1.13 cfs @ 12.18 hrs, Volume= 0.107 af
 Outflow = 1.13 cfs @ 12.18 hrs, Volume= 0.107 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.13 cfs @ 12.18 hrs, Volume= 0.107 af
 Routed to Pond 34P : DMH 5+68

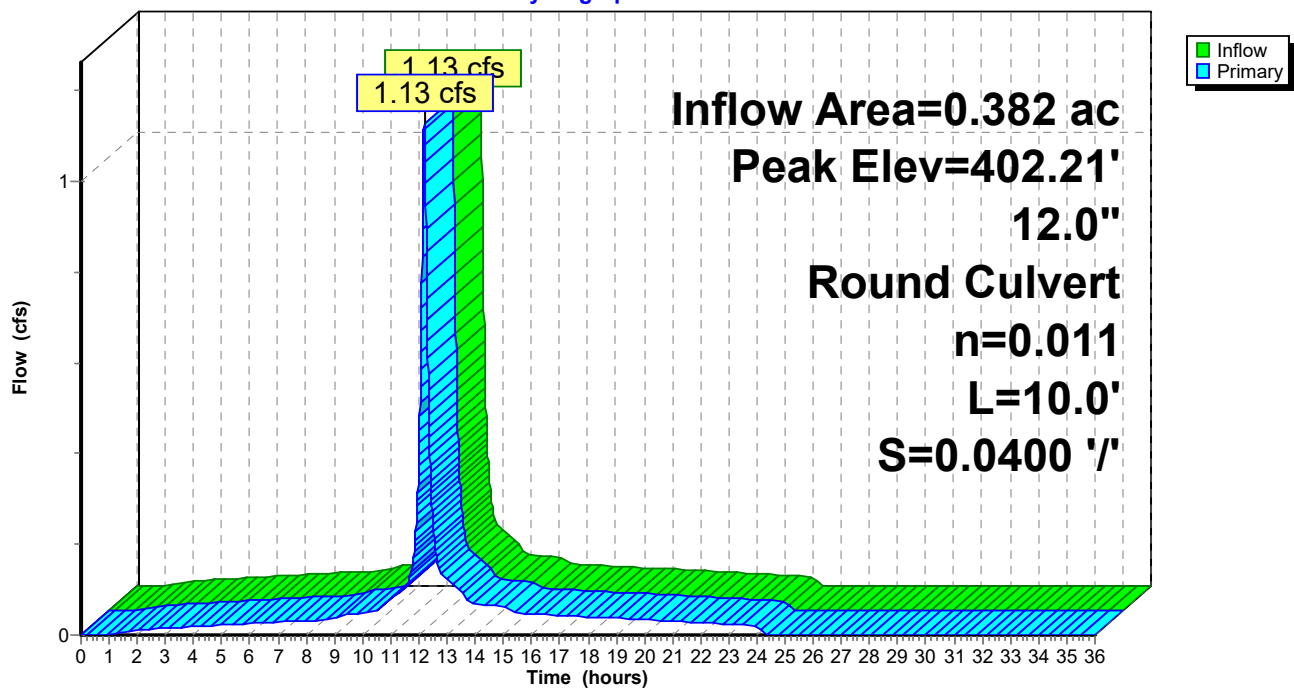
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 402.21' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	401.60'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.60' / 401.20' S= 0.0400 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.15 cfs @ 12.18 hrs HW=402.21' TW=401.91' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 1.15 cfs @ 3.30 fps)

Pond 31P: CB 5+55R

Hydrograph



Summary for Subcatchment 32P: P2b

Runoff = 0.88 cfs @ 12.15 hrs, Volume= 0.073 af, Depth= 3.43"
 Routed to Pond 33P : CB 5+55L

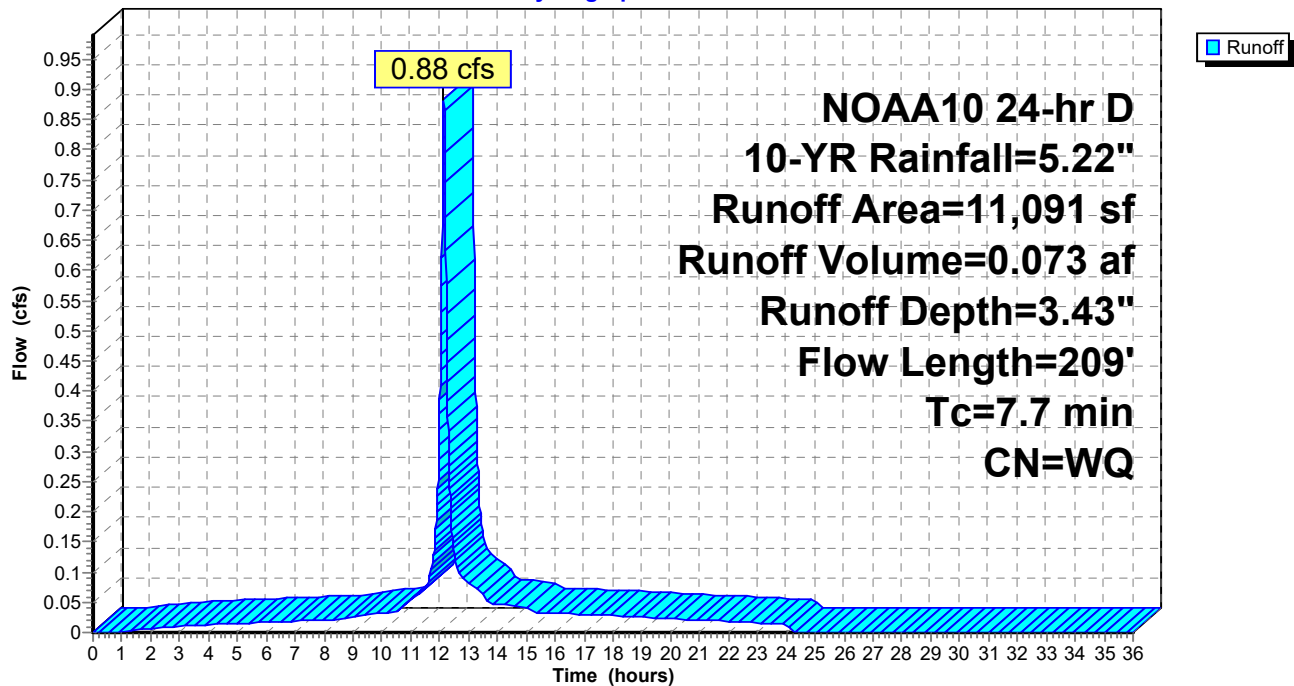
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
4,725	98	Paved parking HSG B
1,404	98	Roofs, HSG B
4,962	61	>75% Grass cover, Good HSG B
11,091		Weighted Average
4,962		44.74% Pervious Area
6,129		55.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	50	0.0350	0.13		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
1.0	113	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	23	0.0600	4.97		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	23	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.7	209	Total			

Subcatchment 32P: P2b

Hydrograph



Summary for Pond 33P: CB 5+55L

Inflow Area = 0.255 ac, 55.26% Impervious, Inflow Depth = 3.43" for 10-YR event
 Inflow = 0.88 cfs @ 12.15 hrs, Volume= 0.073 af
 Outflow = 0.88 cfs @ 12.15 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.88 cfs @ 12.15 hrs, Volume= 0.073 af
 Routed to Pond 34P : DMH 5+68

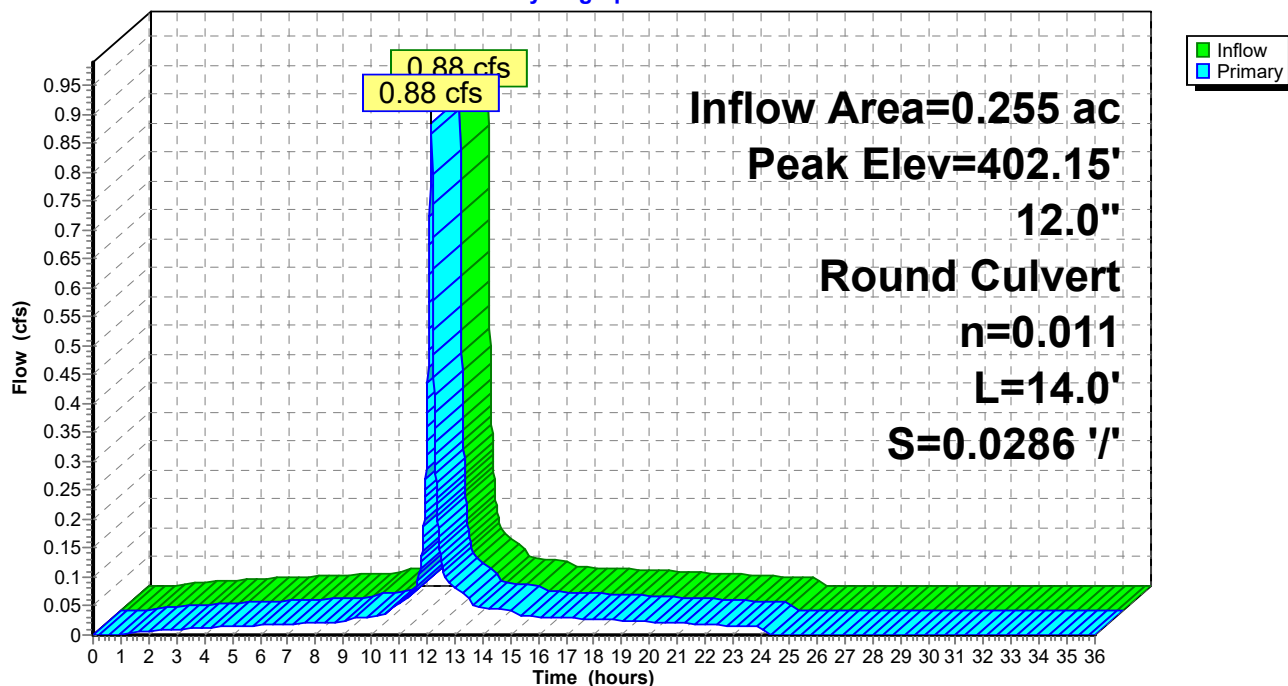
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 402.15' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	401.60'	12.0" Round Culvert L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.60' / 401.20' S= 0.0286 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.86 cfs @ 12.15 hrs HW=402.15' TW=401.92' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 0.86 cfs @ 2.82 fps)

Pond 33P: CB 5+55L

Hydrograph



Summary for Pond 34P: DMH 5+68

Inflow Area = 0.637 ac, 55.54% Impervious, Inflow Depth = 3.39" for 10-YR event
 Inflow = 1.96 cfs @ 12.16 hrs, Volume= 0.180 af
 Outflow = 1.96 cfs @ 12.16 hrs, Volume= 0.180 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.96 cfs @ 12.16 hrs, Volume= 0.180 af
 Routed to Pond 35P : DMH 6+33

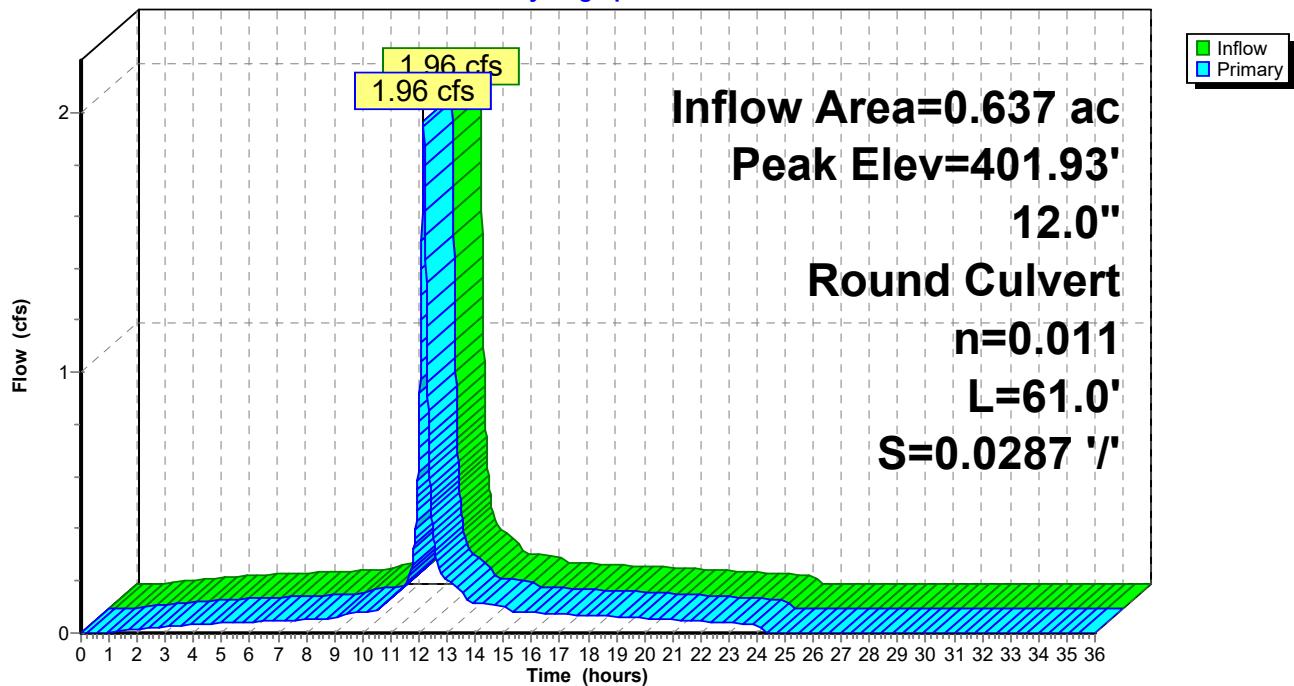
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 401.93' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	401.15'	12.0" Round Culvert L= 61.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.15' / 399.40' S= 0.0287 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.96 cfs @ 12.16 hrs HW=401.93' TW=400.43' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 1.96 cfs @ 3.00 fps)

Pond 34P: DMH 5+68

Hydrograph



Summary for Pond 35P: DMH 6+33

Inflow Area = 0.637 ac, 55.54% Impervious, Inflow Depth = 3.39" for 10-YR event
 Inflow = 1.96 cfs @ 12.16 hrs, Volume= 0.180 af
 Outflow = 1.96 cfs @ 12.16 hrs, Volume= 0.180 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.96 cfs @ 12.16 hrs, Volume= 0.180 af
 Routed to Pond 40P : DMH 7+50

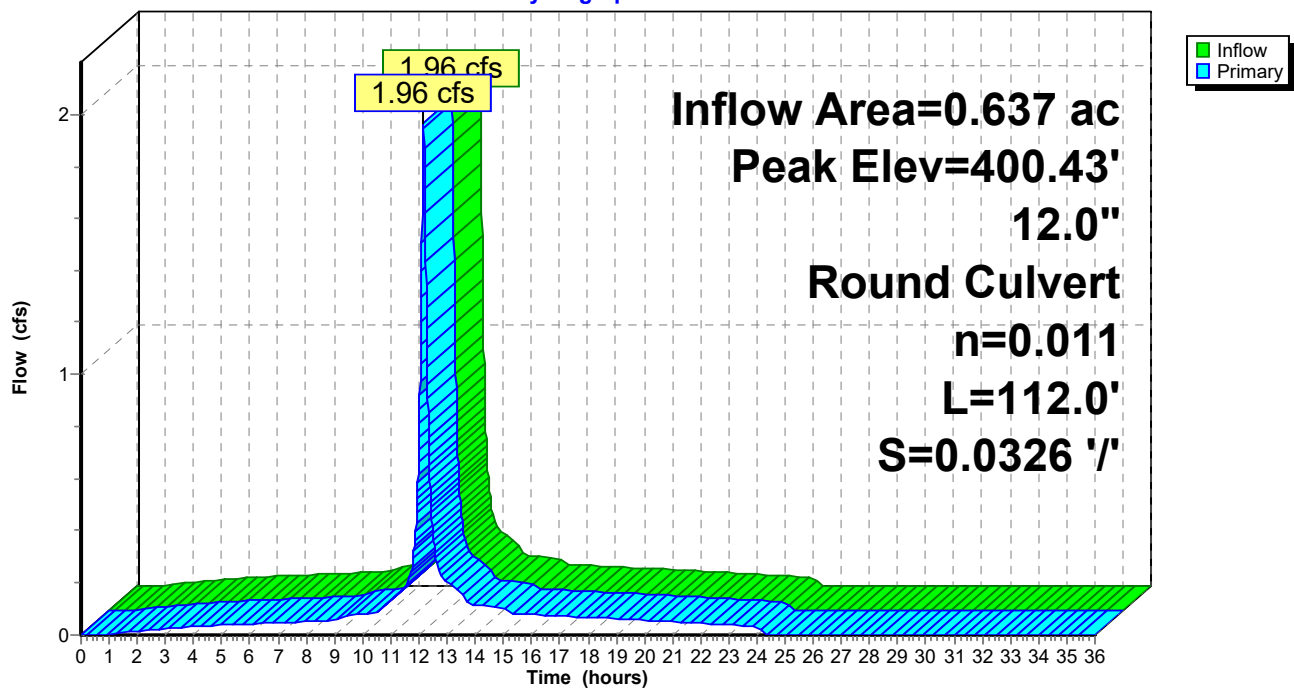
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 400.43' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	399.65'	12.0" Round Culvert L= 112.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 399.65' / 396.00' S= 0.0326 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.96 cfs @ 12.16 hrs HW=400.43' TW=396.72' (Dynamic Tailwater)
 ↳ **1=Culvert** (Inlet Controls 1.96 cfs @ 3.00 fps)

Pond 35P: DMH 6+33

Hydrograph



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NOAA10 24-hr D 10-YR Rainfall=5.22"

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Summary for Subcatchment 36P: P2c

Runoff = 1.21 cfs @ 12.13 hrs, Volume= 0.092 af, Depth= 4.00"
Routed to Pond 37P : CB 7+36R

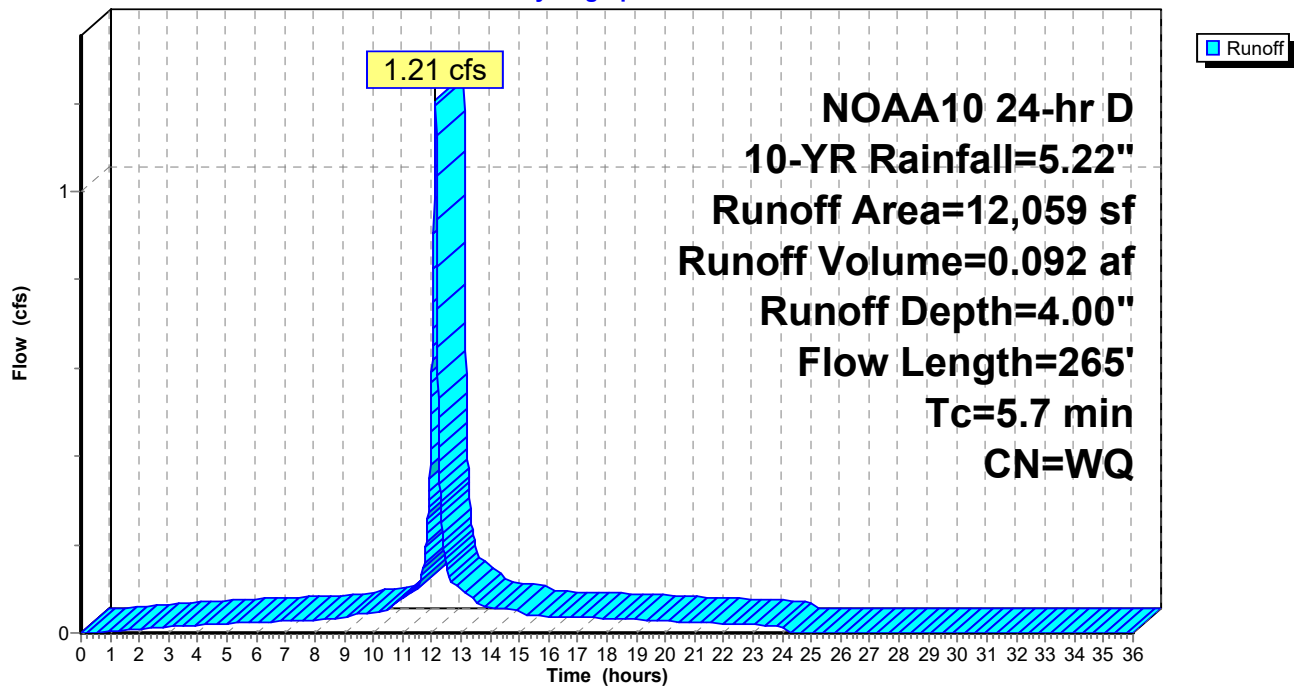
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
3,871	98	Roofs HSG B
4,775	98	Paved parking HSG B
3,413	61	>75% Grass cover, Good HSG B
12,059		Weighted Average
3,413		28.30% Pervious Area
8,646		71.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	40	0.0500	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
1.1	225	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
5.7	265	Total			

Subcatchment 36P: P2c

Hydrograph



Summary for Pond 37P: CB 7+36R

Inflow Area = 0.277 ac, 71.70% Impervious, Inflow Depth = 4.00" for 10-YR event
 Inflow = 1.21 cfs @ 12.13 hrs, Volume= 0.092 af
 Outflow = 1.21 cfs @ 12.13 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.21 cfs @ 12.13 hrs, Volume= 0.092 af
 Routed to Pond 40P : DMH 7+50

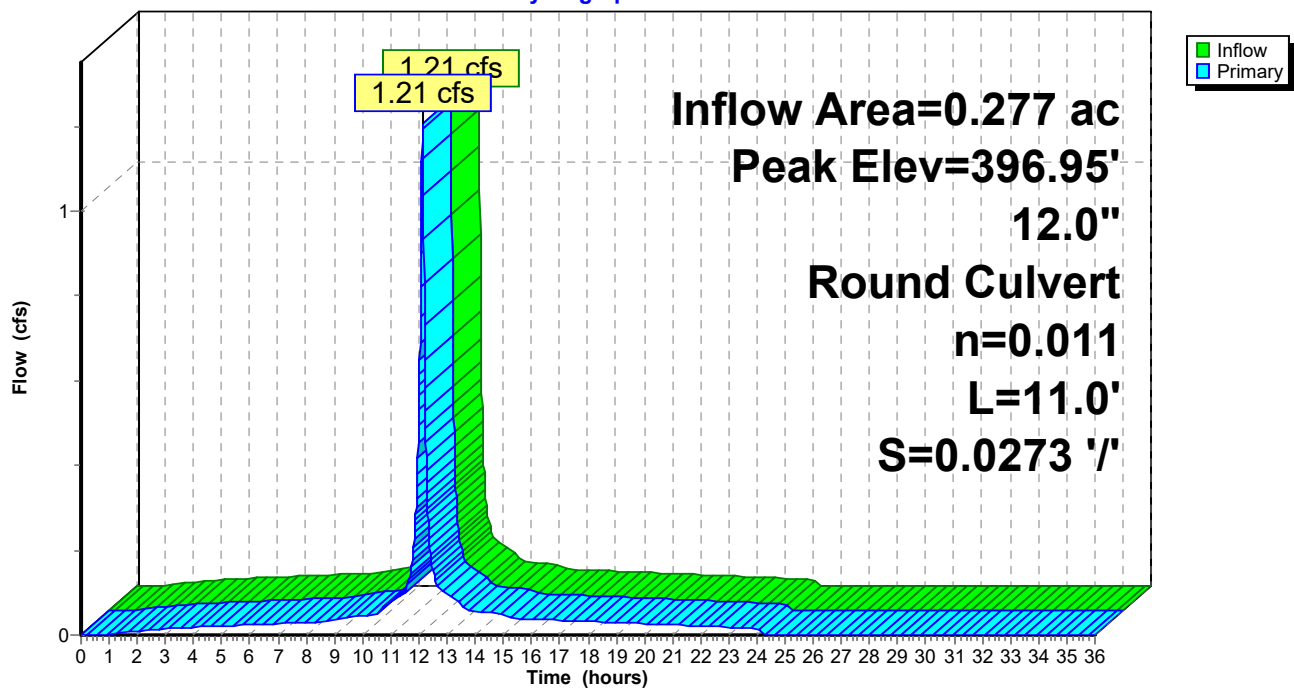
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 396.95' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	396.10'	12.0" Round Culvert L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 396.10' / 395.80' S= 0.0273 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.17 cfs @ 12.13 hrs HW=396.94' TW=396.81' (Dynamic Tailwater)
 ↳ **1=Culvert** (Outlet Controls 1.17 cfs @ 2.24 fps)

Pond 37P: CB 7+36R

Hydrograph



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NOAA10 24-hr D 10-YR Rainfall=5.22"

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Summary for Subcatchment 38P: P2d

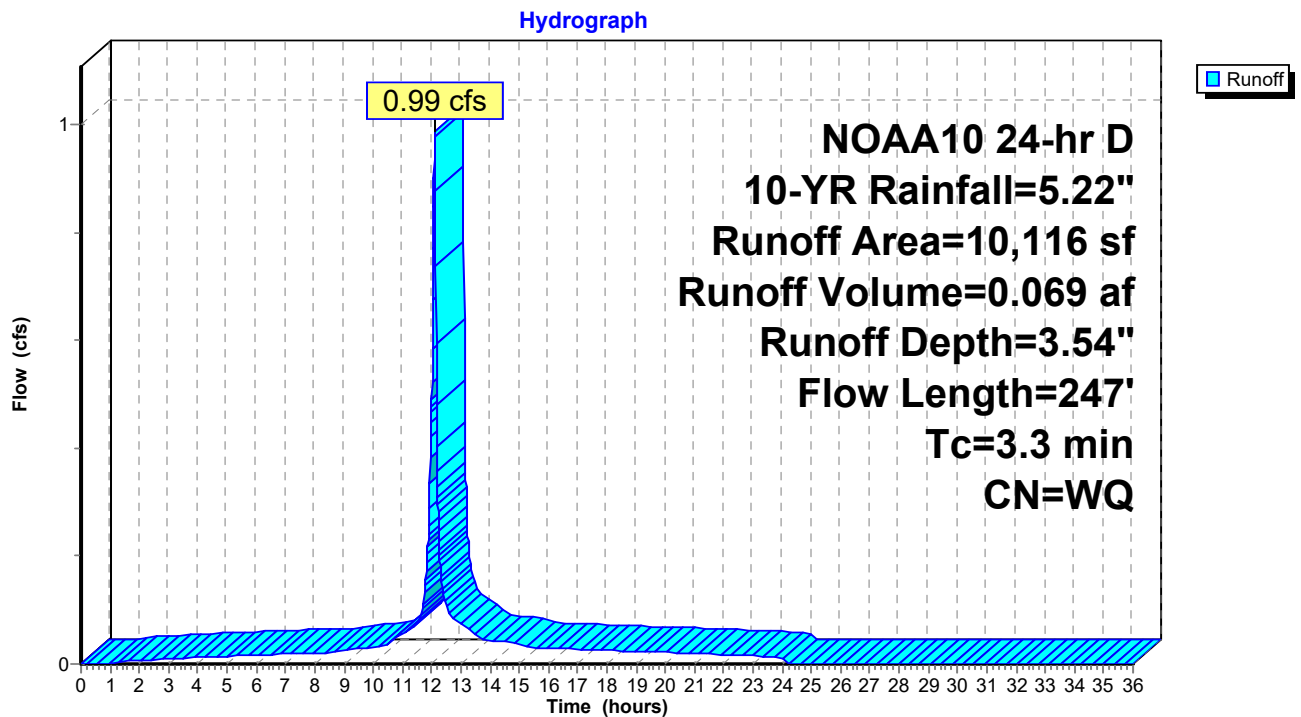
Runoff = 0.99 cfs @ 12.11 hrs, Volume= 0.069 af, Depth= 3.54"
Routed to Pond 39P : CB 7+36L

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
3,108	98	Paved parking HSG B
2,815	98	Roofs HSG B
4,193	61	>75% Grass cover, Good HSG B
10,116		Weighted Average
4,193		41.45% Pervious Area
5,923		58.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	21	0.1000	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
0.3	30	0.0700	1.83		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.36"
0.9	196	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.3	247	Total			

Subcatchment 38P: P2d



Summary for Pond 39P: CB 7+36L

Inflow Area = 0.232 ac, 58.55% Impervious, Inflow Depth = 3.54" for 10-YR event
 Inflow = 0.99 cfs @ 12.11 hrs, Volume= 0.069 af
 Outflow = 0.99 cfs @ 12.11 hrs, Volume= 0.069 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.99 cfs @ 12.11 hrs, Volume= 0.069 af
 Routed to Pond 40P : DMH 7+50

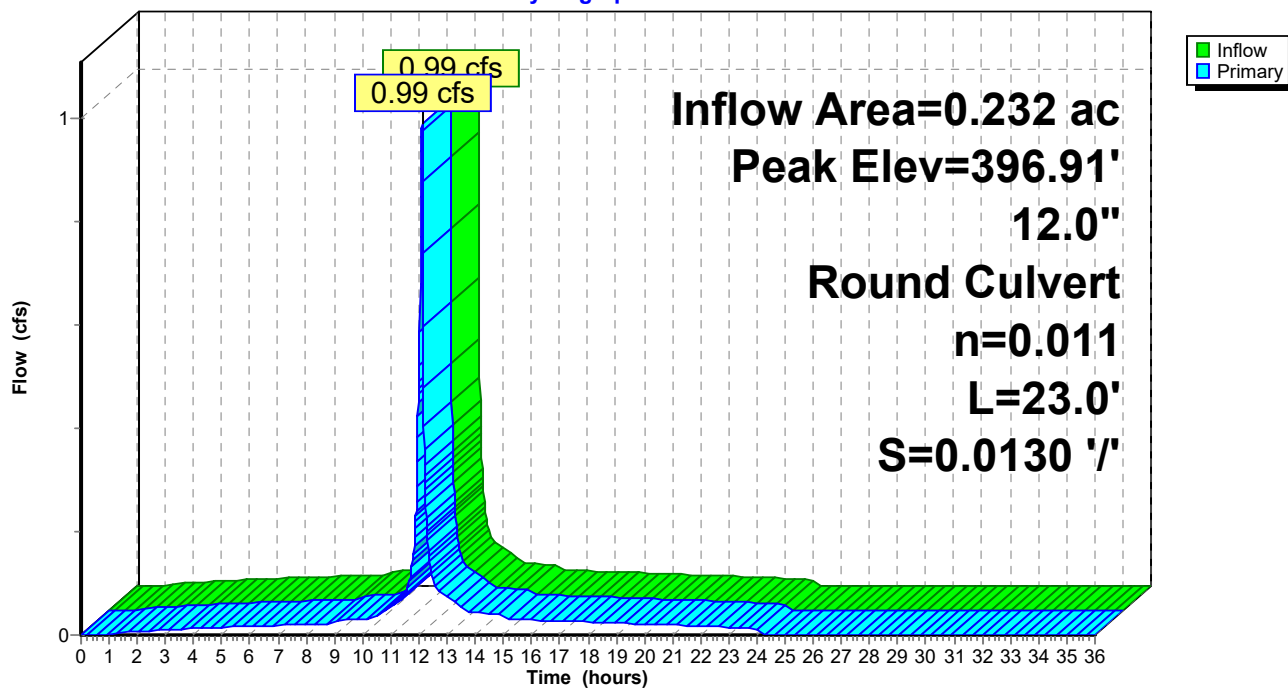
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 396.91' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	396.10'	12.0" Round Culvert L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 396.10' / 395.80' S= 0.0130 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.85 cfs @ 12.11 hrs HW=396.88' TW=396.78' (Dynamic Tailwater)
 1=Culvert (Outlet Controls 0.85 cfs @ 1.79 fps)

Pond 39P: CB 7+36L

Hydrograph



Summary for Pond 40P: DMH 7+50

Inflow Area = 1.146 ac, 60.05% Impervious, Inflow Depth = 3.56" for 10-YR event
 Inflow = 3.90 cfs @ 12.13 hrs, Volume= 0.340 af
 Outflow = 3.90 cfs @ 12.13 hrs, Volume= 0.340 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.90 cfs @ 12.13 hrs, Volume= 0.340 af
 Routed to Pond 45P : DMH 8+26

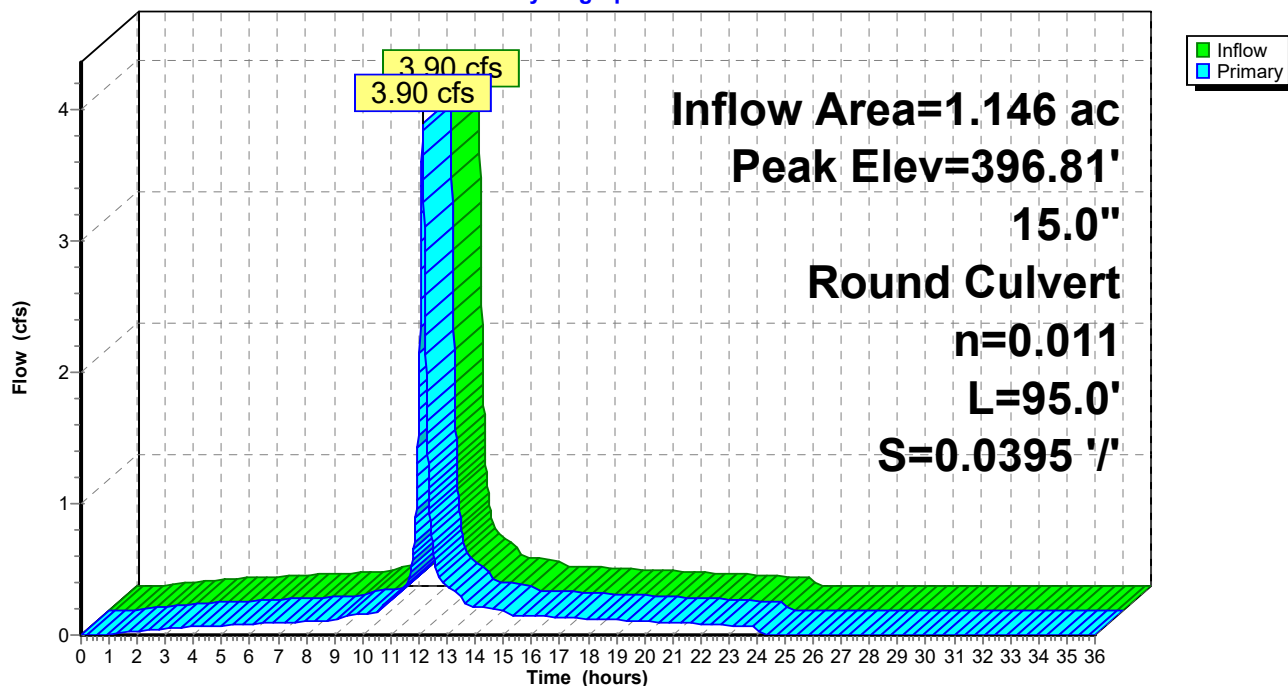
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 396.81' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	395.75'	15.0" Round Culvert L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 395.75' / 392.00' S= 0.0395 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf

Primary OutFlow Max=3.89 cfs @ 12.13 hrs HW=396.81' TW=388.46' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 3.89 cfs @ 3.50 fps)

Pond 40P: DMH 7+50

Hydrograph



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NOAA10 24-hr D 10-YR Rainfall=5.22"

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Summary for Subcatchment 41P: P2e

Runoff = 3.68 cfs @ 12.17 hrs, Volume= 0.327 af, Depth= 2.64"
 Routed to Pond 42P : CB 8+23

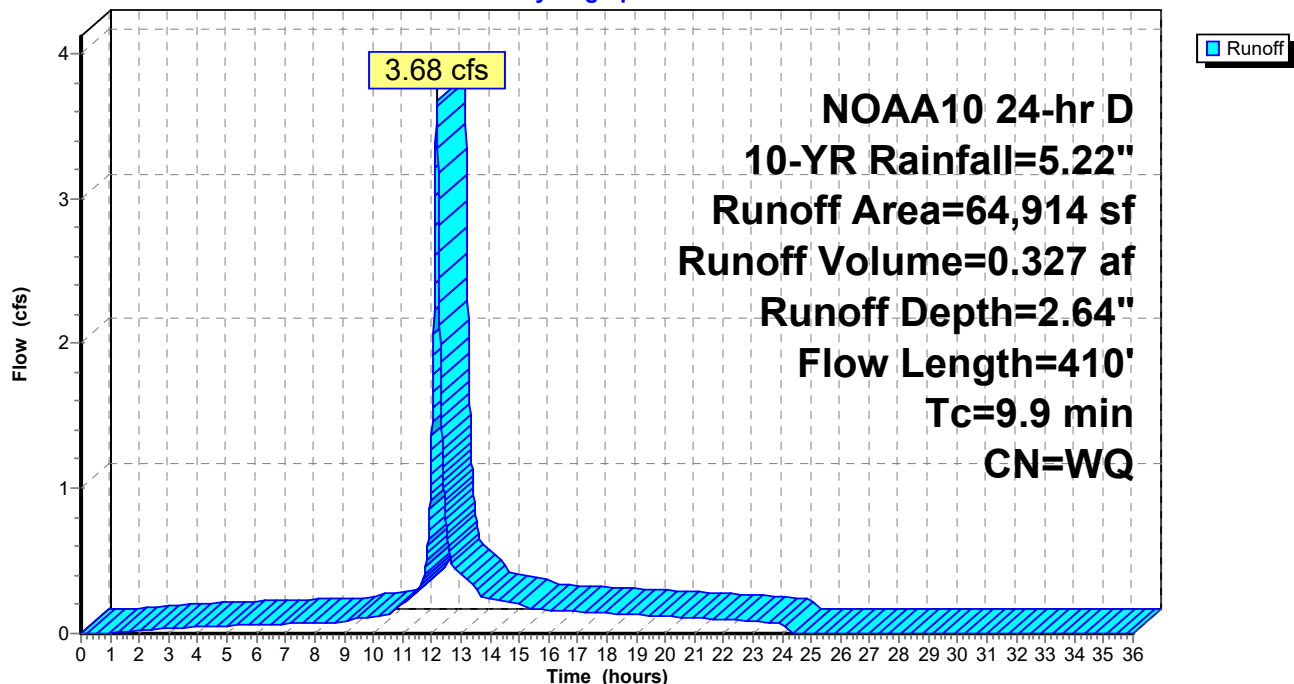
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
6,559	98	Roofs HSG B
5,857	55	Woods, Good HSG B
15,251	98	Paved parking HSG B
37,247	61	>75% Grass cover, Good HSG B
64,914		Weighted Average
43,104		66.40% Pervious Area
21,810		33.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
2.8	310	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	50	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.9	410	Total			

Subcatchment 41P: P2e

Hydrograph



Summary for Pond 42P: CB 8+23

Inflow Area = 1.490 ac, 33.60% Impervious, Inflow Depth = 2.64" for 10-YR event
 Inflow = 3.68 cfs @ 12.17 hrs, Volume= 0.327 af
 Outflow = 3.68 cfs @ 12.17 hrs, Volume= 0.327 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.68 cfs @ 12.17 hrs, Volume= 0.327 af
 Routed to Pond 45P : DMH 8+26

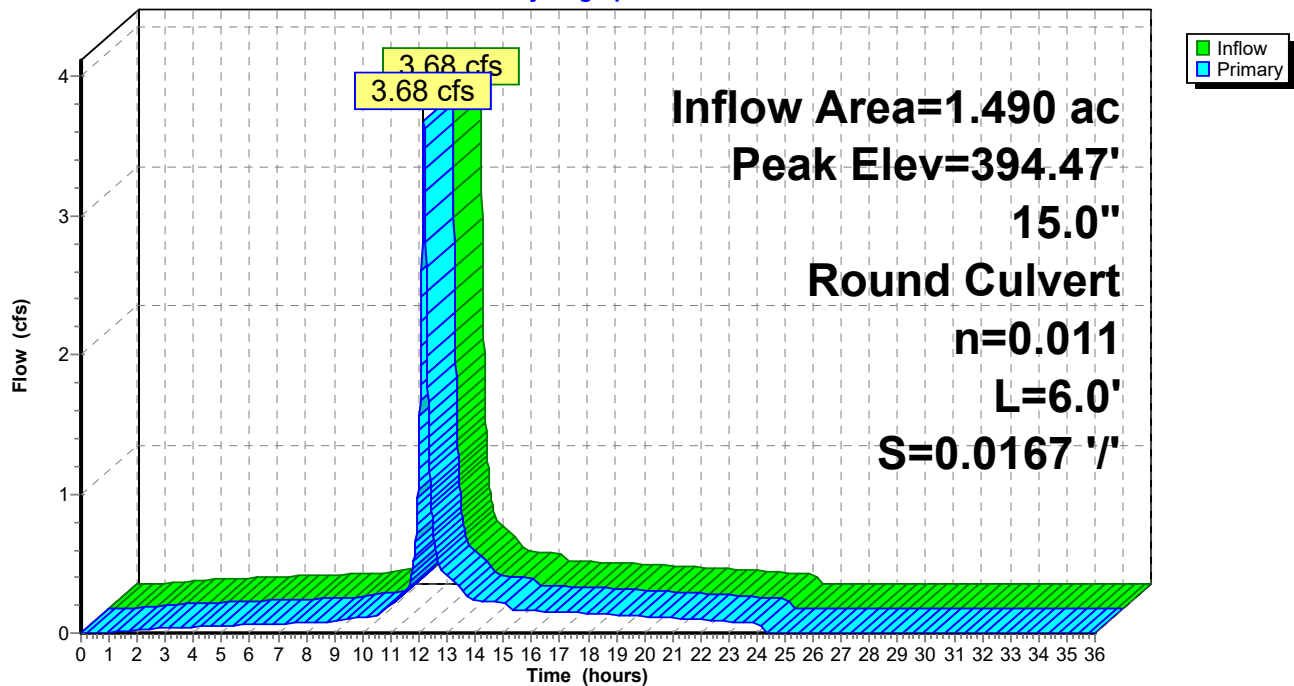
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 394.47' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	393.30'	15.0" Round Culvert L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 393.30' / 393.20' S= 0.0167 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf

Primary OutFlow Max=3.67 cfs @ 12.17 hrs HW=394.47' TW=388.43' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 3.67 cfs @ 4.00 fps)

Pond 42P: CB 8+23

Hydrograph



HydroCAD 2

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NOAA10 24-hr D 10-YR Rainfall=5.22"

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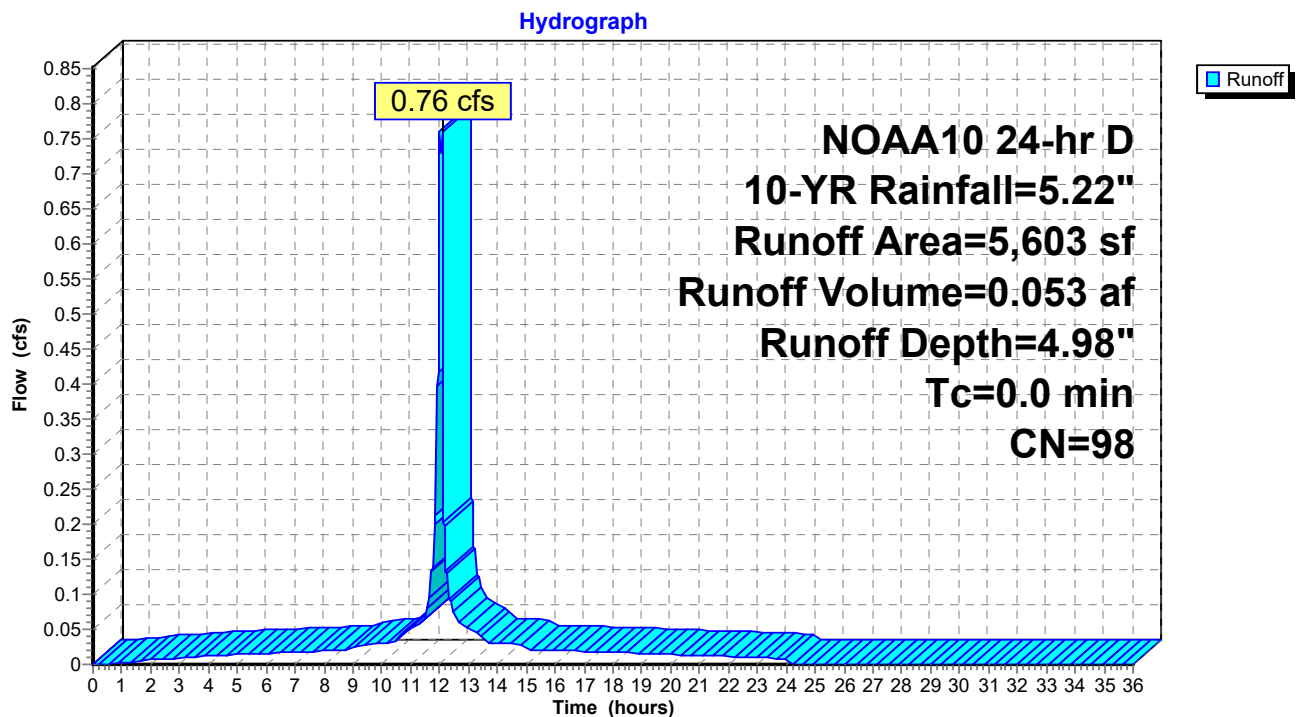
Summary for Subcatchment 43P: P2f

Runoff = 0.76 cfs @ 12.09 hrs, Volume= 0.053 af, Depth= 4.98"
Routed to Pond 44P : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
5,603	98	Roofs, HSG B
5,603		100.00% Impervious Area

Subcatchment 43P: P2f



Summary for Pond 44P: Roof Drain

Inflow Area = 0.129 ac, 100.00% Impervious, Inflow Depth = 4.98" for 10-YR event
 Inflow = 0.76 cfs @ 12.09 hrs, Volume= 0.053 af
 Outflow = 0.76 cfs @ 12.09 hrs, Volume= 0.053 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.76 cfs @ 12.09 hrs, Volume= 0.053 af
 Routed to Pond 45P : DMH 8+26

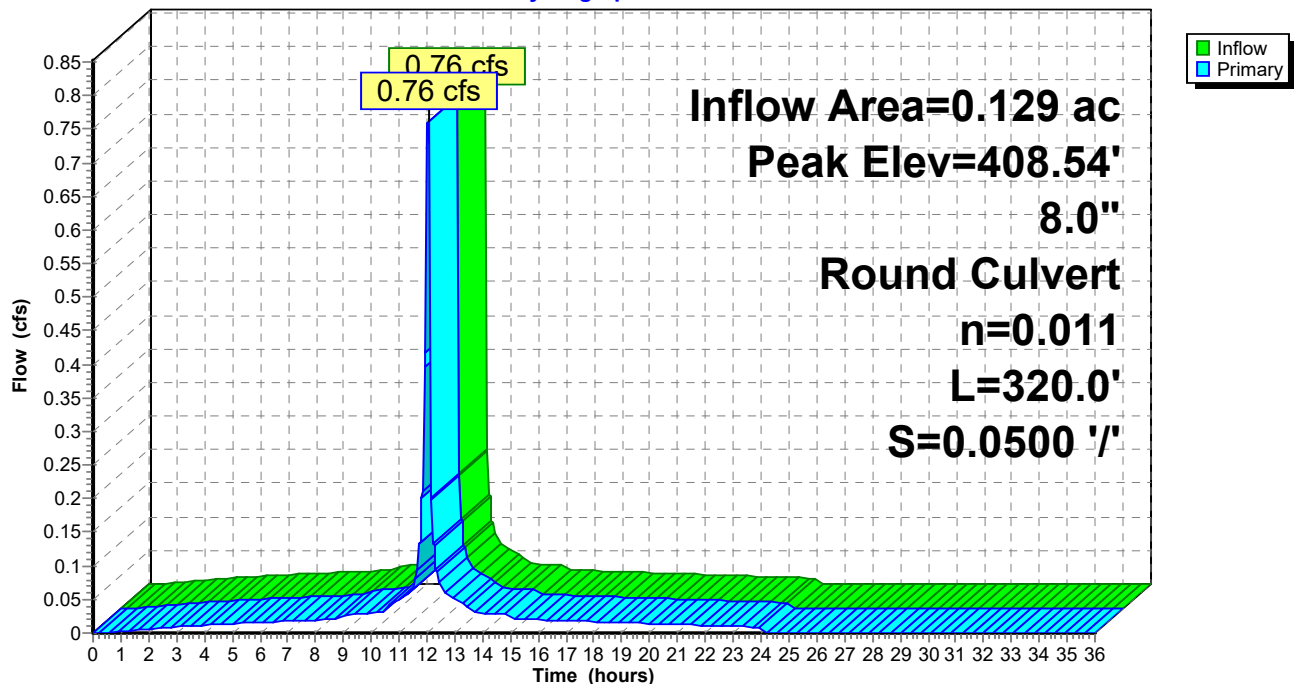
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 408.54' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	408.00'	8.0" Round Culvert L= 320.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 408.00' / 392.00' S= 0.0500 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.76 cfs @ 12.09 hrs HW=408.54' TW=388.34' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 0.76 cfs @ 2.51 fps)

Pond 44P: Roof Drain

Hydrograph



Summary for Pond 45P: DMH 8+26

Inflow Area = 2.765 ac, 47.65% Impervious, Inflow Depth = 3.13" for 10-YR event
 Inflow = 7.39 cfs @ 12.14 hrs, Volume= 0.721 af
 Outflow = 7.39 cfs @ 12.14 hrs, Volume= 0.721 af, Atten= 0%, Lag= 0.0 min
 Primary = 7.39 cfs @ 12.14 hrs, Volume= 0.721 af
 Routed to Pond 46P : FD C

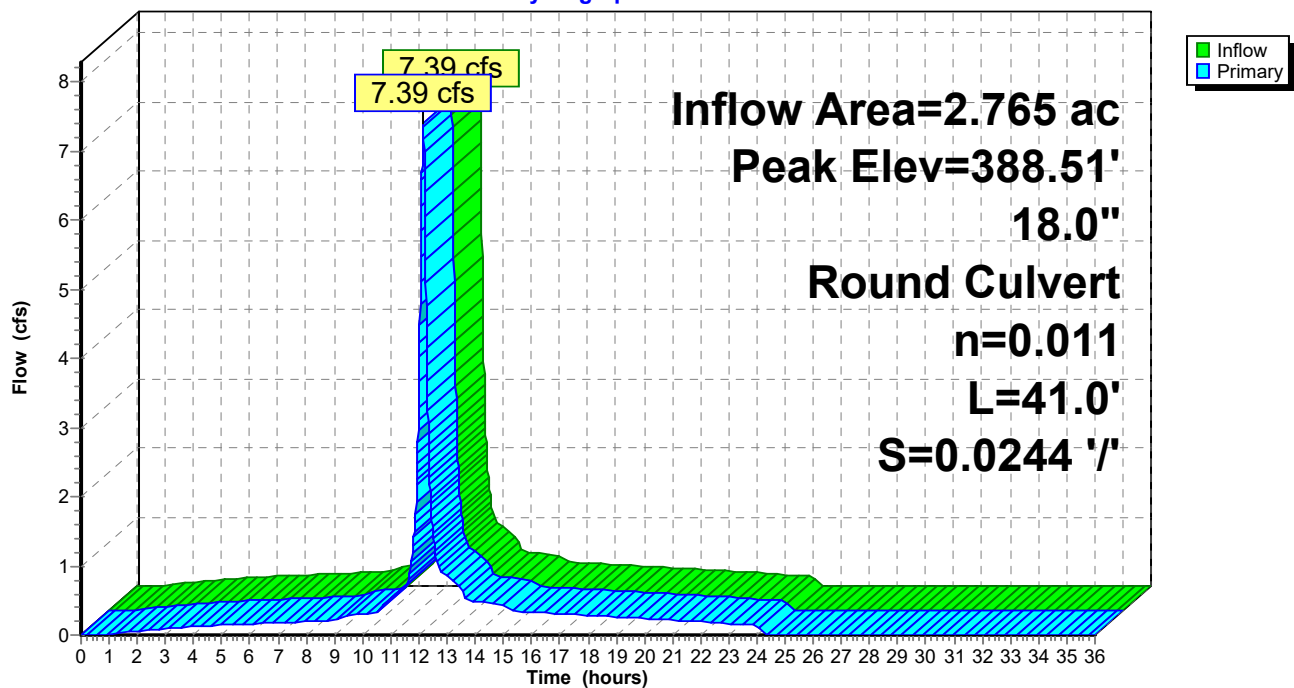
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 388.51' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	387.00'	18.0" Round Culvert L= 41.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 387.00' / 386.00' S= 0.0244 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=7.38 cfs @ 12.14 hrs HW=388.50' TW=387.40' (Dynamic Tailwater)
 ↳ **1=Culvert** (Inlet Controls 7.38 cfs @ 4.18 fps)

Pond 45P: DMH 8+26

Hydrograph



Summary for Pond 46P: FD C

Inflow Area = 2.765 ac, 47.65% Impervious, Inflow Depth = 3.13" for 10-YR event
 Inflow = 7.39 cfs @ 12.14 hrs, Volume= 0.721 af
 Outflow = 7.39 cfs @ 12.14 hrs, Volume= 0.721 af, Atten= 0%, Lag= 0.0 min
 Primary = 7.39 cfs @ 12.14 hrs, Volume= 0.721 af
 Routed to Pond 47P : Infiltration Field #6

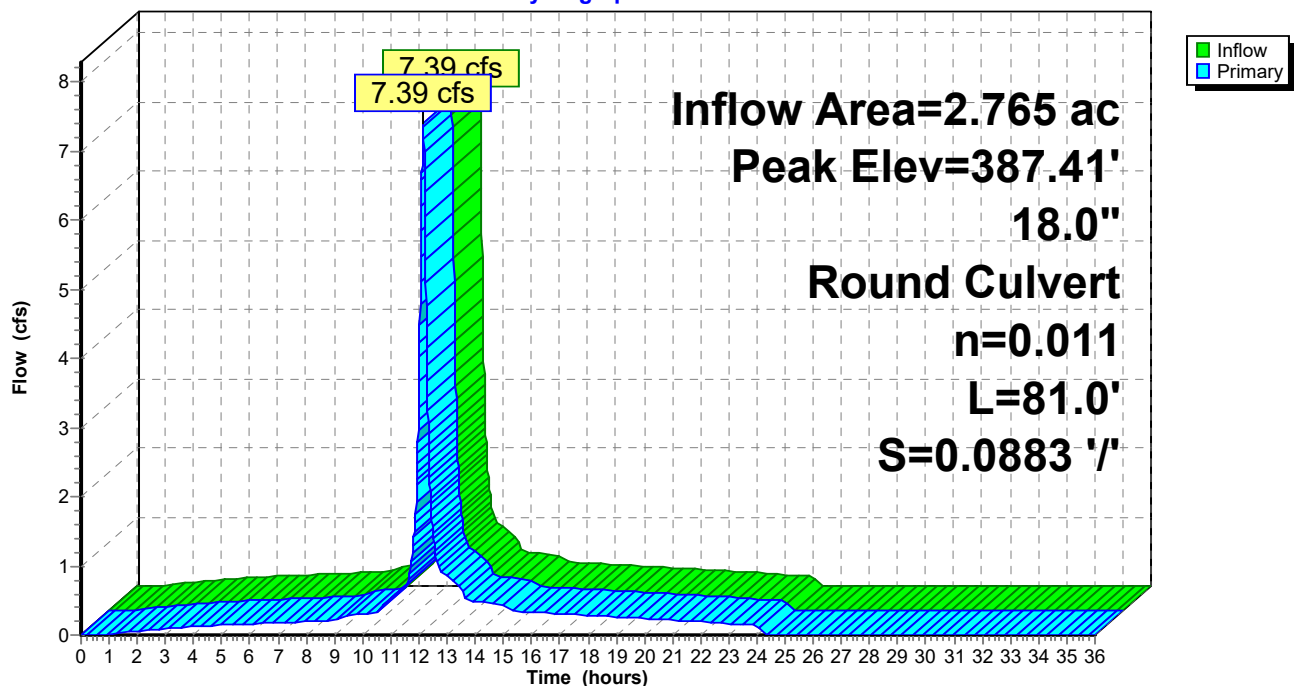
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 387.41' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	385.90'	18.0" Round Culvert L= 81.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 385.90' / 378.75' S= 0.0883 '/ Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=7.38 cfs @ 12.14 hrs HW=387.40' TW=379.76' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 7.38 cfs @ 4.18 fps)

Pond 46P: FD C

Hydrograph



Summary for Pond 47P: Infiltration Field #6

Inflow Area = 2.765 ac, 47.65% Impervious, Inflow Depth = 3.13" for 10-YR event
 Inflow = 7.39 cfs @ 12.14 hrs, Volume= 0.721 af
 Outflow = 0.32 cfs @ 16.10 hrs, Volume= 0.721 af, Atten= 96%, Lag= 237.6 min
 Discarded = 0.28 cfs @ 10.74 hrs, Volume= 0.675 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 48P : 30' Level Spreader
 Secondary = 0.04 cfs @ 16.10 hrs, Volume= 0.046 af
 Routed to Pond 51P : 30' Level Spreader

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 381.64' @ 16.10 hrs Surf.Area= 5,127 sf Storage= 13,070 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 379.0 min (1,170.4 - 791.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	378.00'	1,502 cf	15.75'W x 64.67'L x 5.75'H Field A 5,856 cf Overall - 2,102 cf Embedded = 3,754 cf x 40.0% Voids
#2A	378.75'	2,102 cf	Cultec R-902HD v2 x 32 Inside #1 Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 32 Chambers in 2 Rows Cap Storage= 18.0 cf x 2 x 2 rows = 72.1 cf
#3B	378.00'	4,233 cf	37.50'W x 79.33'L x 5.75'H Field B 17,106 cf Overall - 6,524 cf Embedded = 10,582 cf x 40.0% Voids
#4B	378.75'	6,524 cf	Cultec R-902HD v2 x 100 Inside #3 Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 100 Chambers in 5 Rows Cap Storage= 18.0 cf x 2 x 5 rows = 180.2 cf
#5C	378.00'	1,666 cf	15.75'W x 72.00'L x 5.75'H Field C 6,521 cf Overall - 2,356 cf Embedded = 4,164 cf x 40.0% Voids
#6C	378.75'	2,356 cf	Cultec R-902HD v2 x 36 Inside #5 Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 36 Chambers in 2 Rows Cap Storage= 18.0 cf x 2 x 2 rows = 72.1 cf
		18,383 cf	Total Available Storage

Storage Group A created with Chamber Wizard
 Storage Group B created with Chamber Wizard
 Storage Group C created with Chamber Wizard

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Device	Routing	Invert	Outlet Devices
#1	Discarded	378.00'	2.400 in/hr Exfiltration over Surface area
#2	Secondary	378.00'	12.0" Round Culvert L= 173.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 377.00' S= 0.0058 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#3	Primary	378.00'	12.0" Round Culvert L= 39.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 374.00' S= 0.1026 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#4	Device 2	379.40'	1.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 2	382.10'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Device 3	382.10'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Primary	378.00'	12.0" Round Culvert L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 374.00' S= 0.0727 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#8	Device 7	383.55'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.28 cfs @ 10.74 hrs HW=378.07' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.28 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=378.00' TW=374.00' (Dynamic Tailwater)↑ **3=Culvert** (Controls 0.00 cfs)↑ **6=Orifice/Grate** (Controls 0.00 cfs)↑ **7=Culvert** (Controls 0.00 cfs)↑ **8=Orifice/Grate** (Controls 0.00 cfs)**Secondary OutFlow** Max=0.04 cfs @ 16.10 hrs HW=381.64' TW=377.01' (Dynamic Tailwater)↑ **2=Culvert** (Passes 0.04 cfs of 5.18 cfs potential flow)↑ **4=Orifice/Grate** (Orifice Controls 0.04 cfs @ 7.14 fps)↑ **5=Orifice/Grate** (Controls 0.00 cfs)

Pond 47P: Infiltration Field #6 - Chamber Wizard Field A**Chamber Model = Cultec R-902HD v2 (Cultec Recharger® 902HD v2)**

Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf

Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap

Cap Storage= 18.0 cf x 2 x 2 rows = 72.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

16 Chambers/Row x 3.67' Long +2.00' Cap Length x 2 = 62.67' Row Length +12.0" End Stone x 2 =
64.67' Base Length

2 Rows x 78.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 15.75' Base Width

9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

32 Chambers x 63.4 cf + 18.0 cf Cap Volume x 2 x 2 Rows = 2,102.2 cf Chamber Storage

5,856.4 cf Field - 2,102.2 cf Chambers = 3,754.1 cf Stone x 40.0% Voids = 1,501.7 cf Stone Storage

Chamber Storage + Stone Storage = 3,603.9 cf = 0.083 af

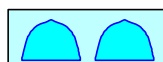
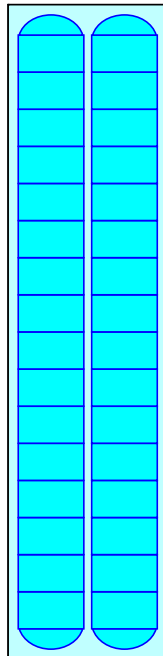
Overall Storage Efficiency = 61.5%

Overall System Size = 64.67' x 15.75' x 5.75'

32 Chambers

216.9 cy Field

139.0 cy Stone



Pond 47P: Infiltration Field #6 - Chamber Wizard Field B**Chamber Model = Cultec R-902HD v2 (Cultec Recharger® 902HD v2)**

Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf

Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap

Cap Storage= 18.0 cf x 2 x 5 rows = 180.2 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

20 Chambers/Row x 3.67' Long +2.00' Cap Length x 2 = 77.33' Row Length +12.0" End Stone x 2 =
79.33' Base Length

5 Rows x 78.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.50' Base Width

9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

100 Chambers x 63.4 cf + 18.0 cf Cap Volume x 2 x 5 Rows = 6,524.5 cf Chamber Storage

17,106.2 cf Field - 6,524.5 cf Chambers = 10,581.8 cf Stone x 40.0% Voids = 4,232.7 cf Stone Storage

Chamber Storage + Stone Storage = 10,757.2 cf = 0.247 af

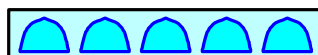
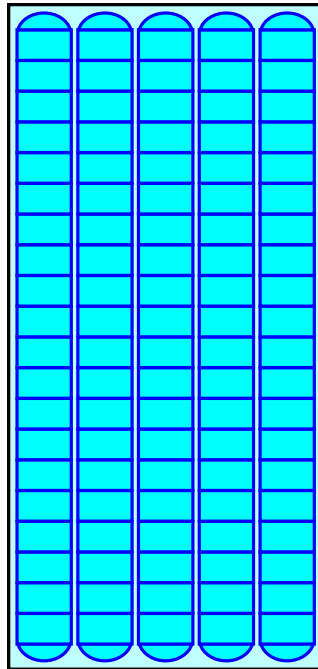
Overall Storage Efficiency = 62.9%

Overall System Size = 79.33' x 37.50' x 5.75'

100 Chambers

633.6 cy Field

391.9 cy Stone



Pond 47P: Infiltration Field #6 - Chamber Wizard Field C**Chamber Model = Cultec R-902HD v2 (Cultec Recharger® 902HD v2)**

Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf

Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap

Cap Storage= 18.0 cf x 2 x 2 rows = 72.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

18 Chambers/Row x 3.67' Long +2.00' Cap Length x 2 = 70.00' Row Length +12.0" End Stone x 2 =
72.00' Base Length

2 Rows x 78.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 15.75' Base Width

9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

36 Chambers x 63.4 cf + 18.0 cf Cap Volume x 2 x 2 Rows = 2,356.0 cf Chamber Storage

6,520.5 cf Field - 2,356.0 cf Chambers = 4,164.5 cf Stone x 40.0% Voids = 1,665.8 cf Stone Storage

Chamber Storage + Stone Storage = 4,021.8 cf = 0.092 af

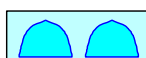
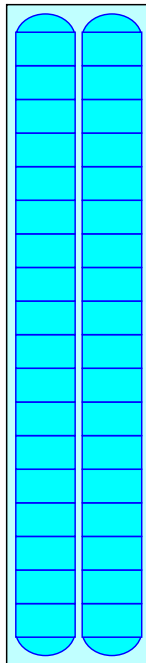
Overall Storage Efficiency = 61.7%

Overall System Size = 72.00' x 15.75' x 5.75'

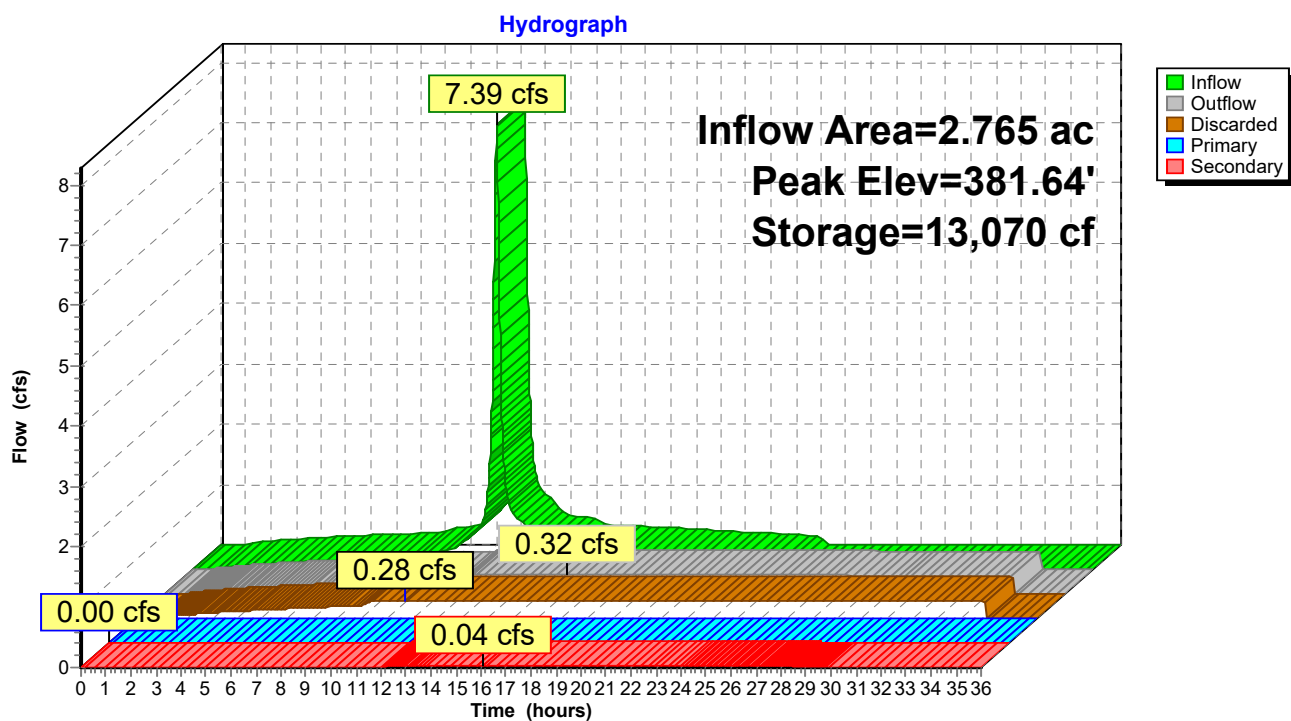
36 Chambers

241.5 cy Field

154.2 cy Stone



Pond 47P: Infiltration Field #6



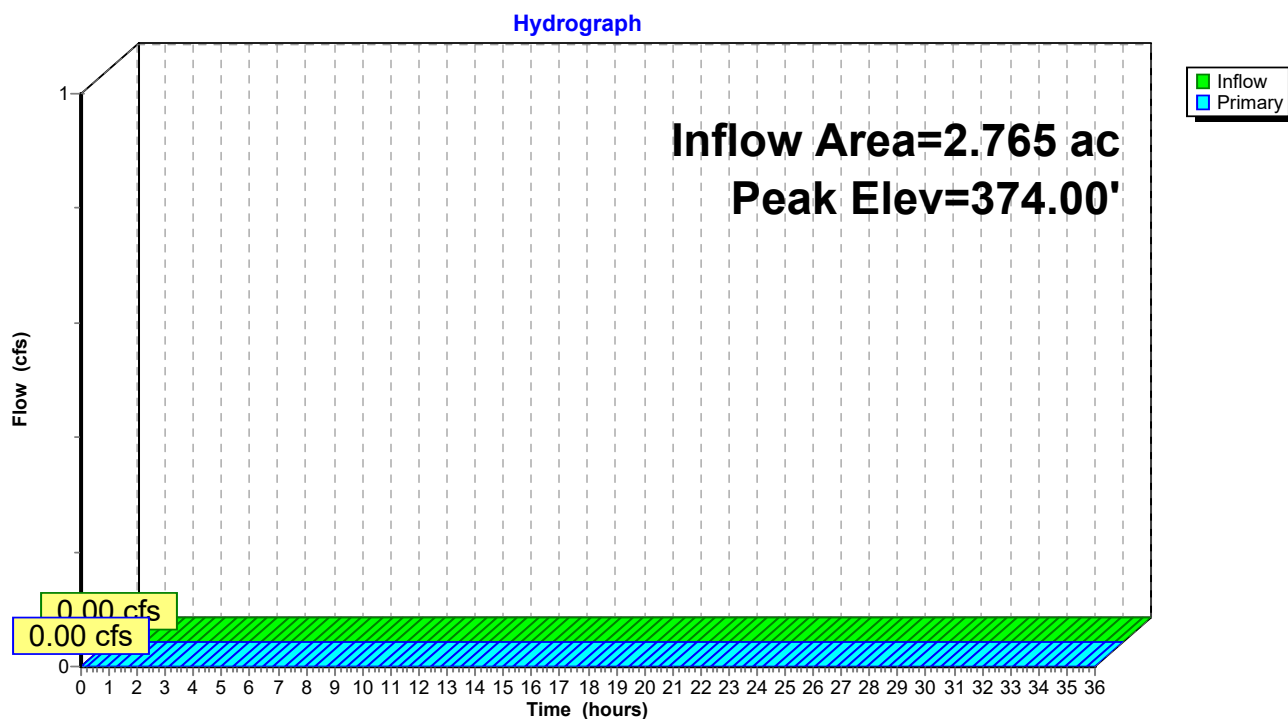
Summary for Pond 48P: 30' Level Spreader

Inflow Area = 2.765 ac, 47.65% Impervious, Inflow Depth = 0.00" for 10-YR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 50P : Sub-DP #2b: Flow to Northern Abutter

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 374.00' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	374.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Elev. (feet) 374.00 375.00 Width (feet) 40.00 40.00

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=374.00' TW=0.00' (Dynamic Tailwater)
↑1=Custom Weir/Orifice (Controls 0.00 cfs)

Pond 48P: 30' Level Spreader

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Summary for Subcatchment 49P: P2g

Runoff = 2.50 cfs @ 12.23 hrs, Volume= 0.263 af, Depth= 1.25"

Routed to Link 50P : Sub-DP #2b: Flow to Northern Abutter

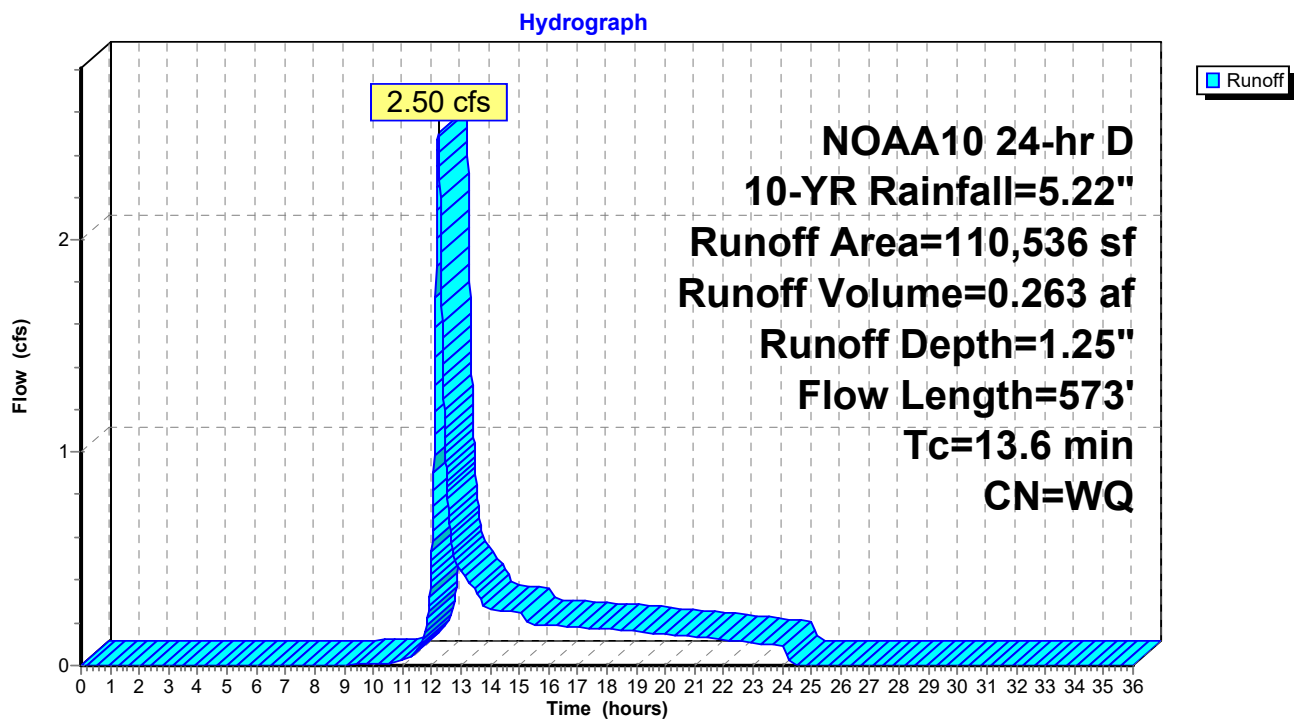
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
918	98	Roofs HSG B
58,029	55	Woods, Good HSG B
9,336	48	Brush, Good, HSG B
42,253	61	>75% Grass cover, Good HSG B
110,536		Weighted Average
109,618		99.17% Pervious Area
918		0.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
1.7	156	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.0	270	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.8	97	0.1800	2.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.6	573	Total			

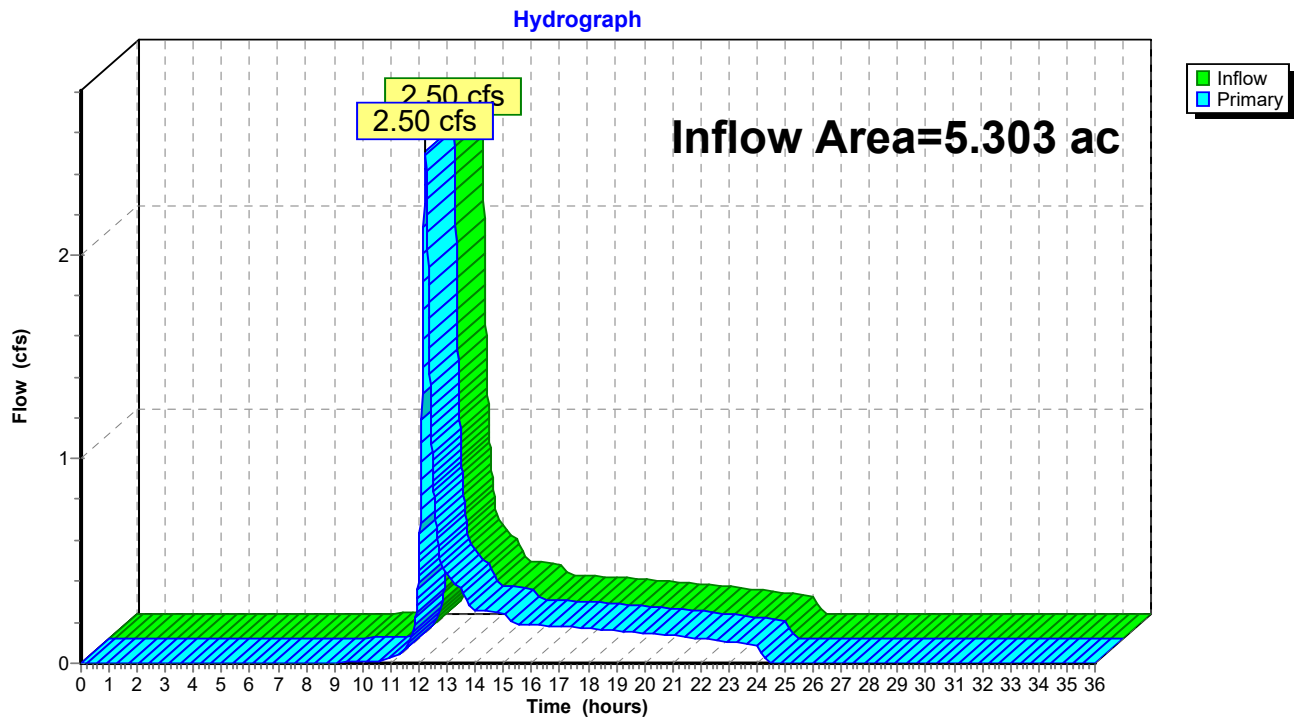
Subcatchment 49P: P2g



Summary for Link 50P: Sub-DP #2b: Flow to Northern Abutter

Inflow Area = 5.303 ac, 25.25% Impervious, Inflow Depth = 0.60" for 10-YR event
Inflow = 2.50 cfs @ 12.23 hrs, Volume= 0.263 af
Primary = 2.50 cfs @ 12.23 hrs, Volume= 0.263 af, Atten= 0%, Lag= 0.0 min
Routed to Link 60P : Design Point #2: Flow to Uncas Brook

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 50P: Sub-DP #2b: Flow to Northern Abutter

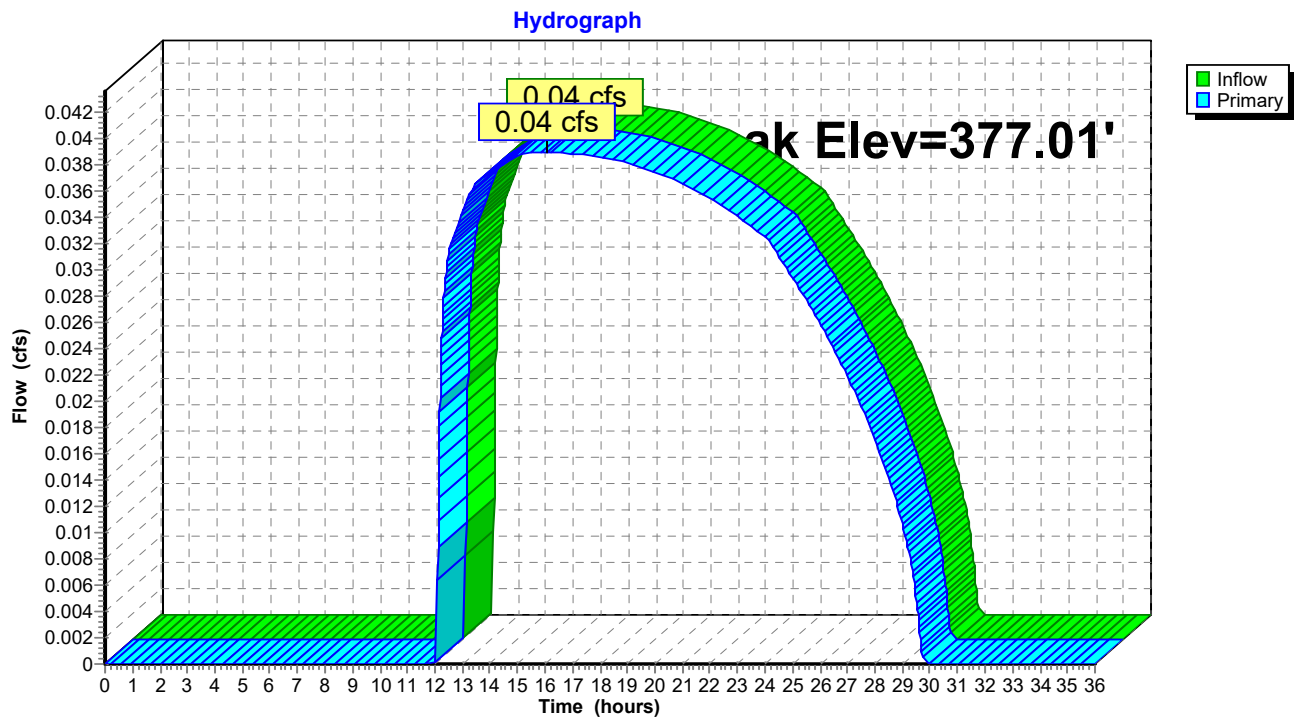
Summary for Pond 51P: 30' Level Spreader

Inflow = 0.04 cfs @ 16.10 hrs, Volume= 0.046 af
Outflow = 0.04 cfs @ 16.10 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min
Primary = 0.04 cfs @ 16.10 hrs, Volume= 0.046 af
Routed to Link 59P : Sub-DP #2a: Flow to Town Land

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 377.01' @ 16.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	377.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Elev. (feet) 377.00 378.00 Width (feet) 25.00 25.00

Primary OutFlow Max=0.04 cfs @ 16.10 hrs HW=377.01' TW=0.00' (Dynamic Tailwater)
↑1=Custom Weir/Orifice (Weir Controls 0.04 cfs @ 0.26 fps)

Pond 51P: 30' Level Spreader

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Summary for Subcatchment 52P: P2h

Runoff = 3.17 cfs @ 12.21 hrs, Volume= 0.322 af, Depth= 1.16"

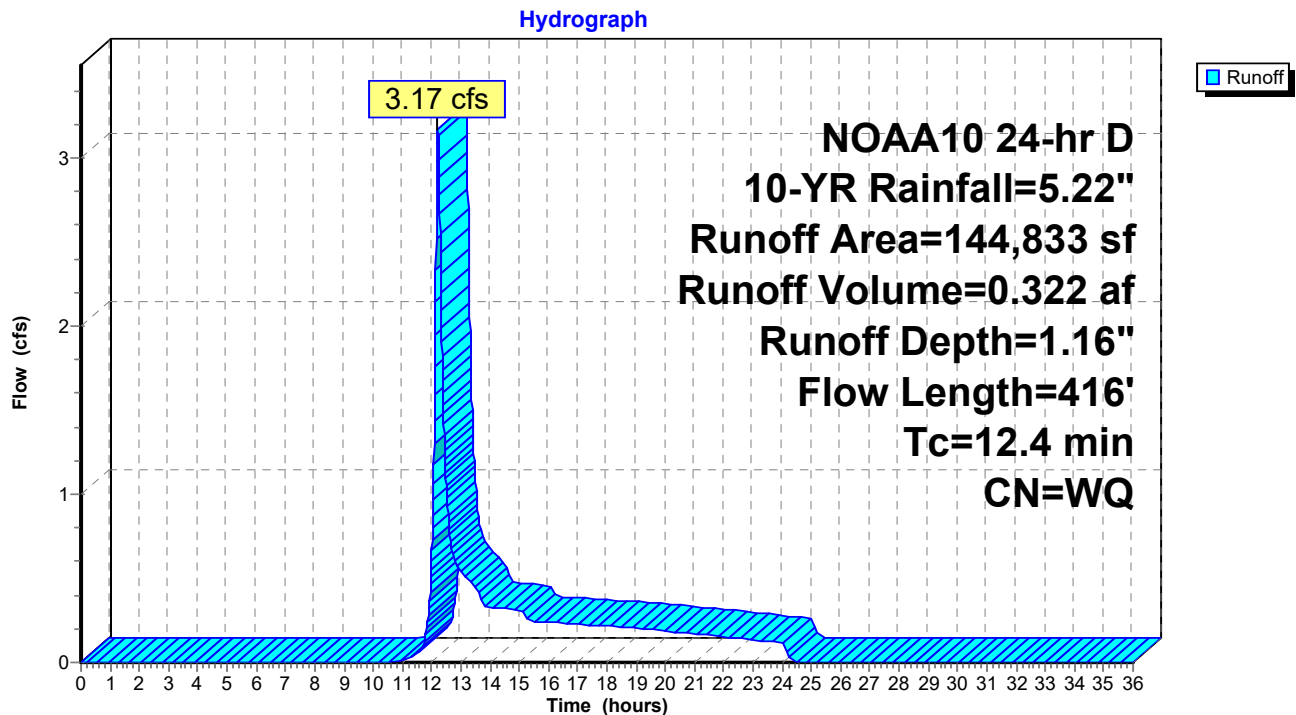
Routed to Link 59P : Sub-DP #2a: Flow to Town Land

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
112,470	55	Woods, Good HSG B
3,868	48	Brush, Good, HSG B
28,495	61	>75% Grass cover, Good HSG B
144,833		Weighted Average
144,833		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	36	0.0200	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
3.1	380	0.1700	2.06		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.4	416	Total			

Subcatchment 52P: P2h



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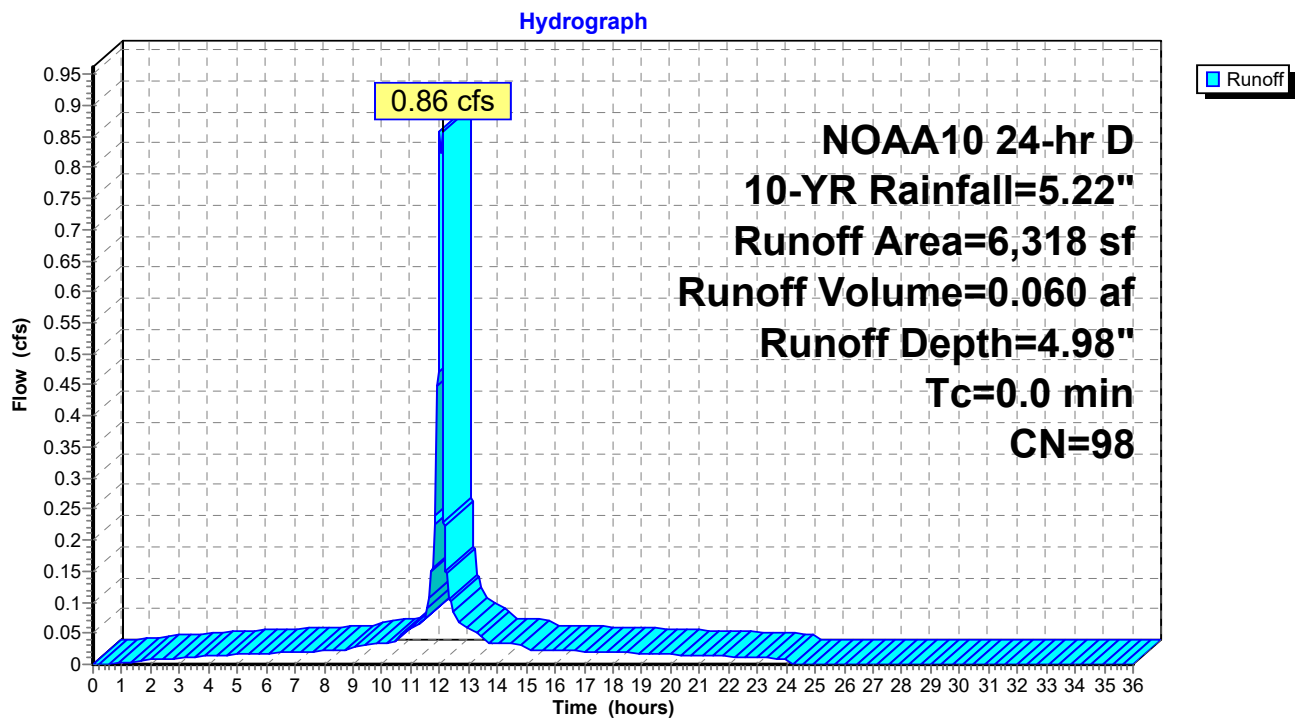
Summary for Subcatchment 53P: R11-19

Runoff = 0.86 cfs @ 12.09 hrs, Volume= 0.060 af, Depth= 4.98"
Routed to Pond 54P : Infiltration Field #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
6,318	98	Roofs, HSG B
6,318		100.00% Impervious Area

Subcatchment 53P: R11-19



Summary for Pond 54P: Infiltration Field #3

Inflow Area = 0.145 ac, 100.00% Impervious, Inflow Depth = 4.98" for 10-YR event
 Inflow = 0.86 cfs @ 12.09 hrs, Volume= 0.060 af
 Outflow = 0.04 cfs @ 10.84 hrs, Volume= 0.060 af, Atten= 96%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 10.84 hrs, Volume= 0.060 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 59P : Sub-DP #2a: Flow to Town Land

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 384.70' @ 13.51 hrs Surf.Area= 644 sf Storage= 911 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 198.4 min (942.6 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	382.50'	981 cf	23.00'W x 28.00'L x 5.75'H Field A 3,703 cf Overall - 1,250 cf Embedded = 2,453 cf x 40.0% Voids
#2A	383.25'	1,250 cf	Cultec R-902HD v2 x 18 Inside #1 Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 18 Chambers in 3 Rows Cap Storage= 18.0 cf x 2 x 3 rows = 108.1 cf
		2,231 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	382.50'	2.400 in/hr Exfiltration over Surface area
#2	Primary	386.25'	8.0" Round Culvert L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 386.25' / 380.00' S= 0.0727 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Discarded OutFlow Max=0.04 cfs @ 10.84 hrs HW=382.56' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=382.50' TW=0.00' (Dynamic Tailwater)

↑ **2=Culvert** (Controls 0.00 cfs)

Pond 54P: Infiltration Field #3 - Chamber Wizard Field A**Chamber Model = Cultec R-902HD v2 (Cultec Recharger® 902HD v2)**

Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf

Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap

Cap Storage= 18.0 cf x 2 x 3 rows = 108.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

6 Chambers/Row x 3.67' Long +2.00' Cap Length x 2 = 26.00' Row Length +12.0" End Stone x 2 = 28.00' Base Length

3 Rows x 78.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 23.00' Base Width

9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

18 Chambers x 63.4 cf + 18.0 cf Cap Volume x 2 x 3 Rows = 1,250.1 cf Chamber Storage

3,703.0 cf Field - 1,250.1 cf Chambers = 2,452.9 cf Stone x 40.0% Voids = 981.2 cf Stone Storage

Chamber Storage + Stone Storage = 2,231.3 cf = 0.051 af

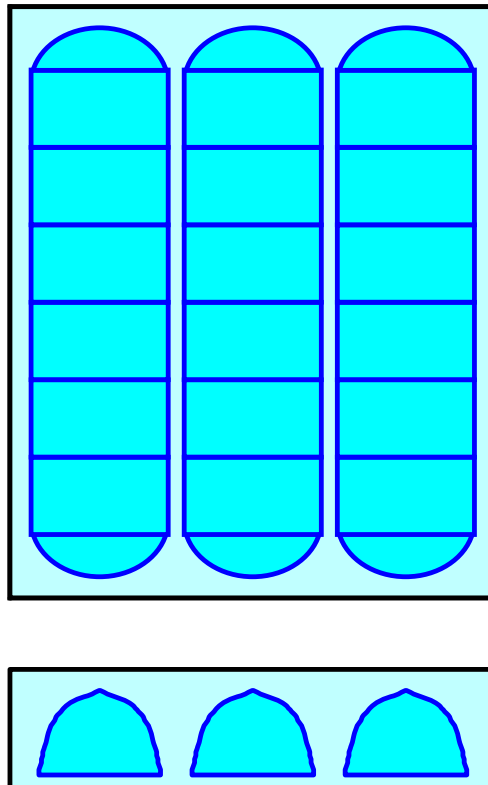
Overall Storage Efficiency = 60.3%

Overall System Size = 28.00' x 23.00' x 5.75'

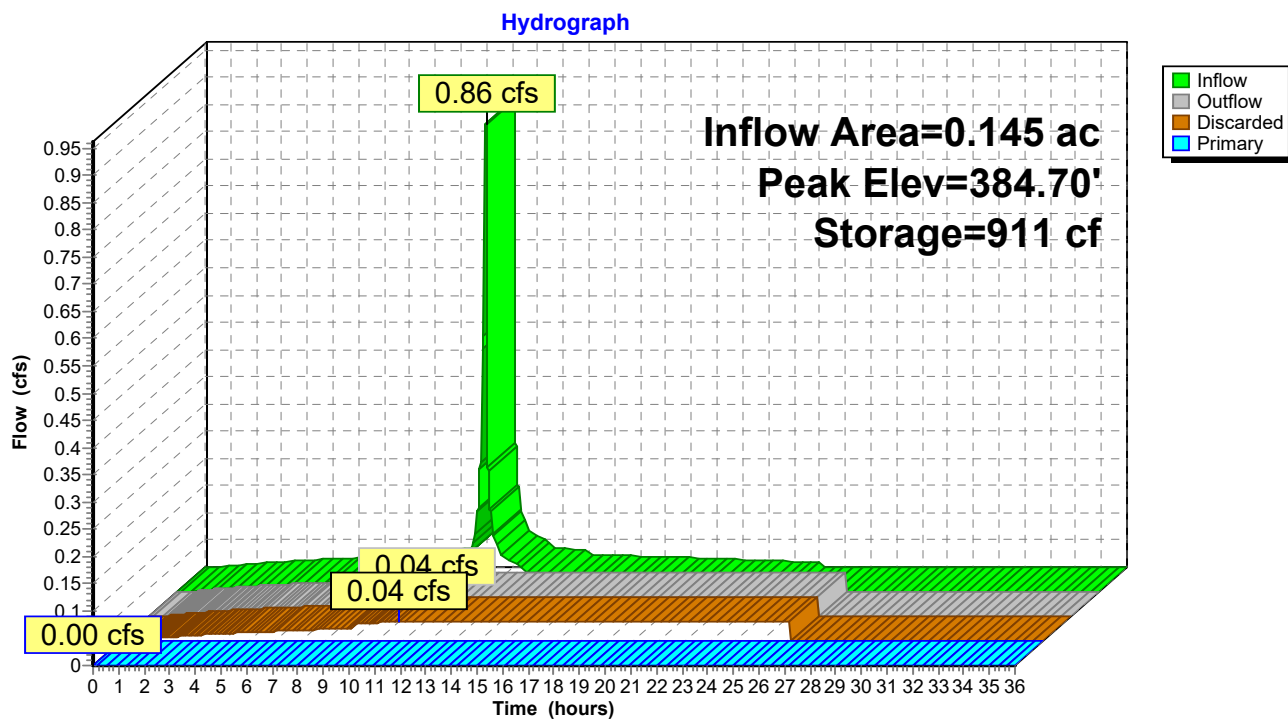
18 Chambers

137.1 cy Field

90.8 cy Stone



Pond 54P: Infiltration Field #3



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NOAA10 24-hr D 10-YR Rainfall=5.22"

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Summary for Subcatchment 55P: R20-28

Runoff = 0.86 cfs @ 12.10 hrs, Volume= 0.060 af, Depth= 4.98"
Routed to Pond 56P : Infiltration Field #4

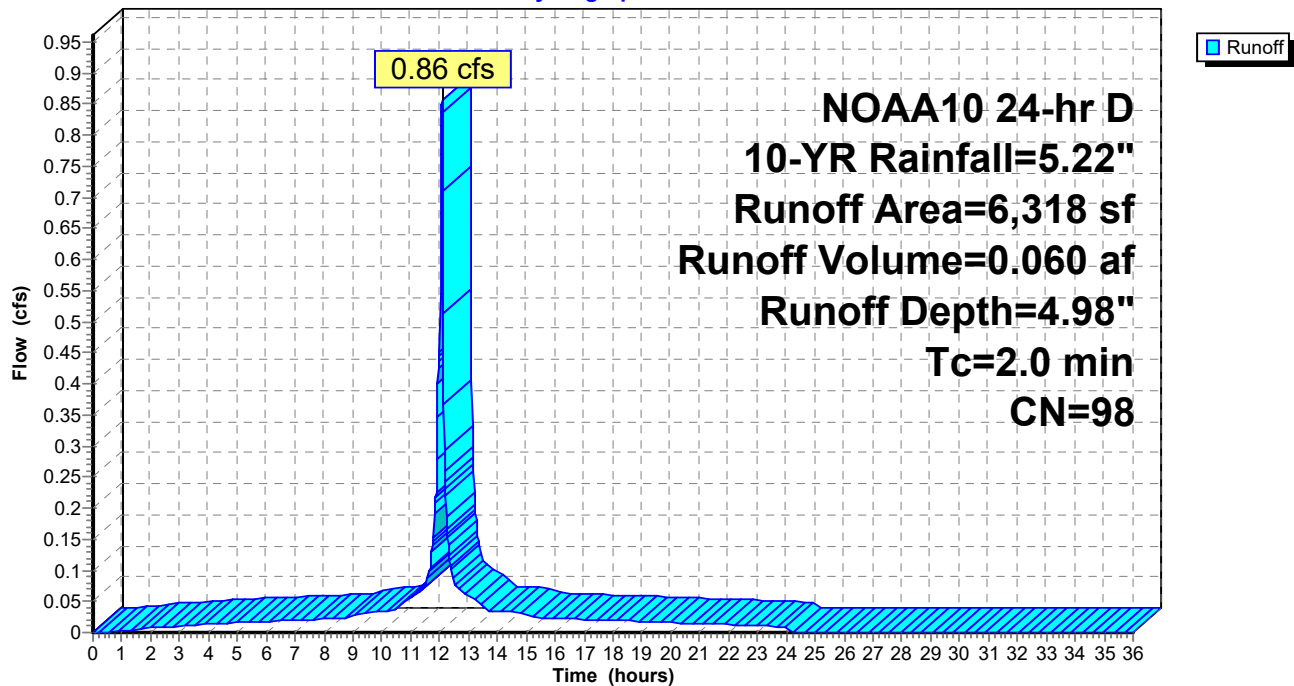
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
6,318	98	Roofs, HSG B
6,318		100.00% Impervious Area

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

Subcatchment 55P: R20-28

Hydrograph



Summary for Pond 56P: Infiltration Field #4

Inflow Area = 0.145 ac, 100.00% Impervious, Inflow Depth = 4.98" for 10-YR event
 Inflow = 0.86 cfs @ 12.10 hrs, Volume= 0.060 af
 Outflow = 0.06 cfs @ 11.61 hrs, Volume= 0.060 af, Atten= 93%, Lag= 0.0 min
 Discarded = 0.06 cfs @ 11.61 hrs, Volume= 0.060 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 59P : Sub-DP #2a: Flow to Town Land

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 388.49' @ 12.85 hrs Surf.Area= 1,134 sf Storage= 664 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 59.9 min (806.0 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	387.50'	822 cf	21.00'W x 54.00'L x 2.54'H Field A 2,882 cf Overall - 826 cf Embedded = 2,056 cf x 40.0% Voids
#2A	388.00'	826 cf	Cultec R-150XLHD x 30 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 6 rows
		1,649 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	387.50'	2.400 in/hr Exfiltration over Surface area
#2	Primary	389.50'	8.0" Round Culvert L= 137.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 389.50' / 380.00' S= 0.0693 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Discarded OutFlow Max=0.06 cfs @ 11.61 hrs HW=387.53' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=387.50' TW=0.00' (Dynamic Tailwater)

↑ **2=Culvert** (Controls 0.00 cfs)

Pond 56P: Infiltration Field #4 - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 6 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

5 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 52.00' Row Length +12.0" End Stone x 2 = 54.00' Base Length

6 Rows x 33.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 21.00' Base Width

6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

30 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 6 Rows = 826.5 cf Chamber Storage

2,882.3 cf Field - 826.5 cf Chambers = 2,055.8 cf Stone x 40.0% Voids = 822.3 cf Stone Storage

Chamber Storage + Stone Storage = 1,648.8 cf = 0.038 af

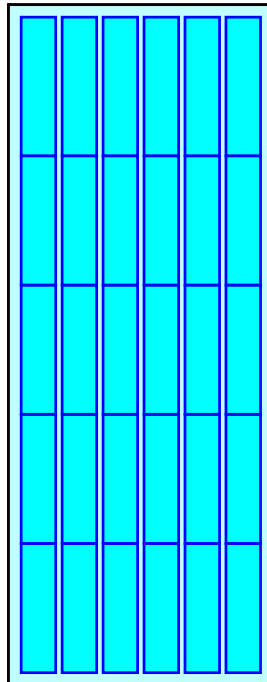
Overall Storage Efficiency = 57.2%

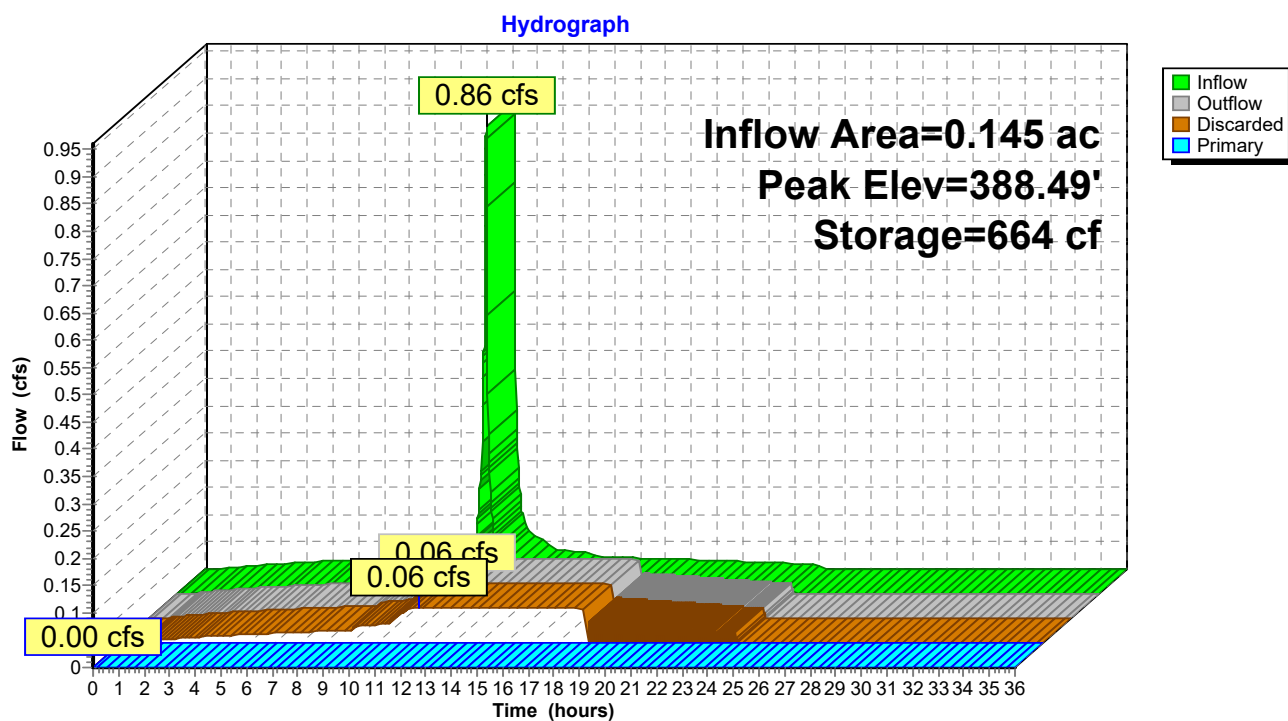
Overall System Size = 54.00' x 21.00' x 2.54'

30 Chambers

106.8 cy Field

76.1 cy Stone



Pond 56P: Infiltration Field #4

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Summary for Subcatchment 57P: R2-3, 27-28

Runoff = 0.38 cfs @ 12.10 hrs, Volume= 0.027 af, Depth= 4.98"
Routed to Pond 58P : Infiltration Field #5

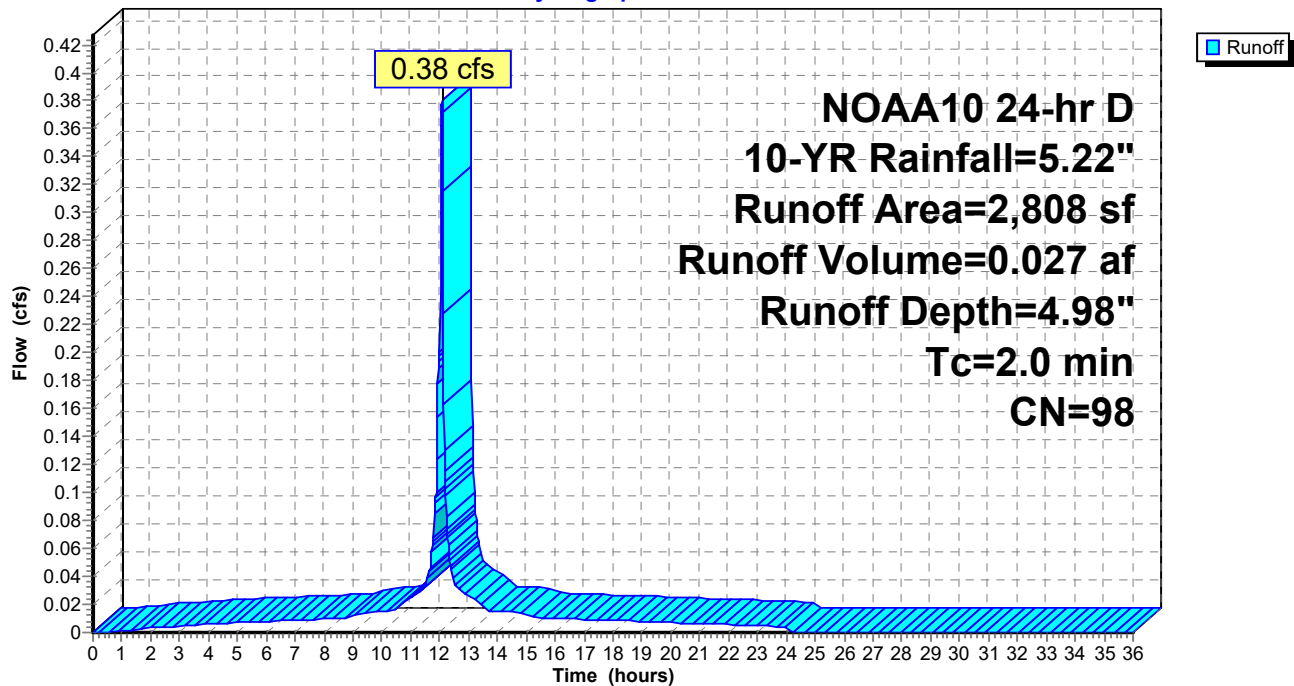
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 10-YR Rainfall=5.22"

Area (sf)	CN	Description
2,808	98	Roofs, HSG B
2,808		100.00% Impervious Area

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

Subcatchment 57P: R2-3, 27-28

Hydrograph



Summary for Pond 58P: Infiltration Field #5

Inflow Area = 0.064 ac, 100.00% Impervious, Inflow Depth = 4.98" for 10-YR event
 Inflow = 0.38 cfs @ 12.10 hrs, Volume= 0.027 af
 Outflow = 0.03 cfs @ 11.57 hrs, Volume= 0.027 af, Atten= 93%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 11.57 hrs, Volume= 0.027 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 406.75' @ 12.94 hrs Surf.Area= 486 sf Storage= 301 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 64.9 min (811.0 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	405.70'	360 cf	14.50'W x 33.50'L x 2.54'H Field A 1,235 cf Overall - 334 cf Embedded = 901 cf x 40.0% Voids
#2A	406.20'	334 cf	Cultec R-150XLHD x 12 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 4 rows
		694 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	405.70'	2.400 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.03 cfs @ 11.57 hrs HW=405.73' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 58P: Infiltration Field #5 - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 4 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

3 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 31.50' Row Length +12.0" End Stone x 2 =
33.50' Base Length

4 Rows x 33.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 14.50' Base Width

6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

12 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 4 Rows = 333.8 cf Chamber Storage

1,234.6 cf Field - 333.8 cf Chambers = 900.8 cf Stone x 40.0% Voids = 360.3 cf Stone Storage

Chamber Storage + Stone Storage = 694.1 cf = 0.016 af

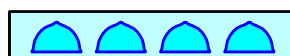
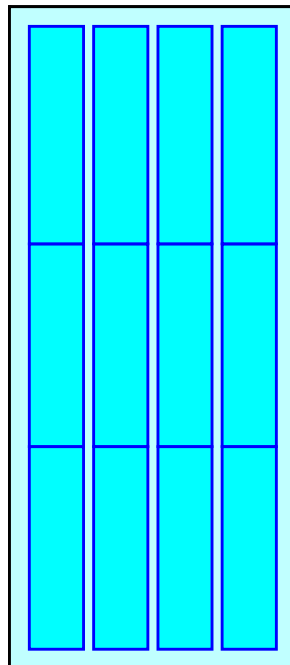
Overall Storage Efficiency = 56.2%

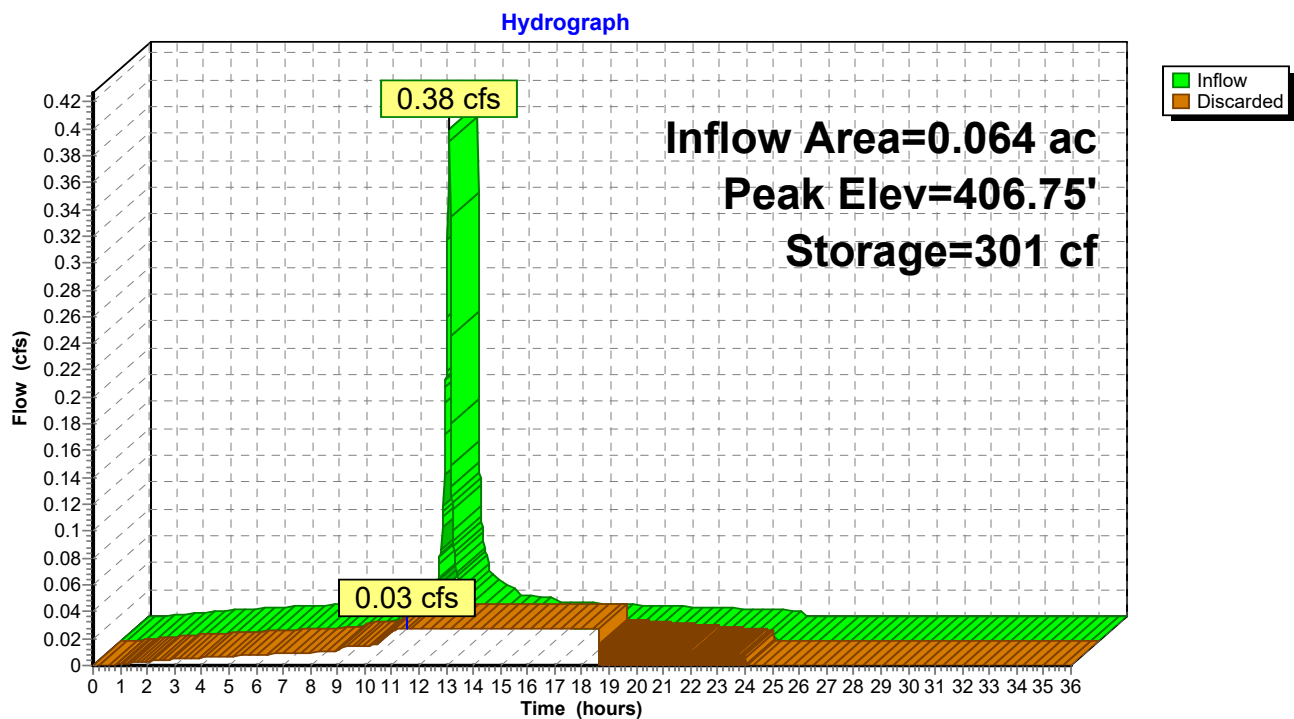
Overall System Size = 33.50' x 14.50' x 2.54'

12 Chambers

45.7 cy Field

33.4 cy Stone

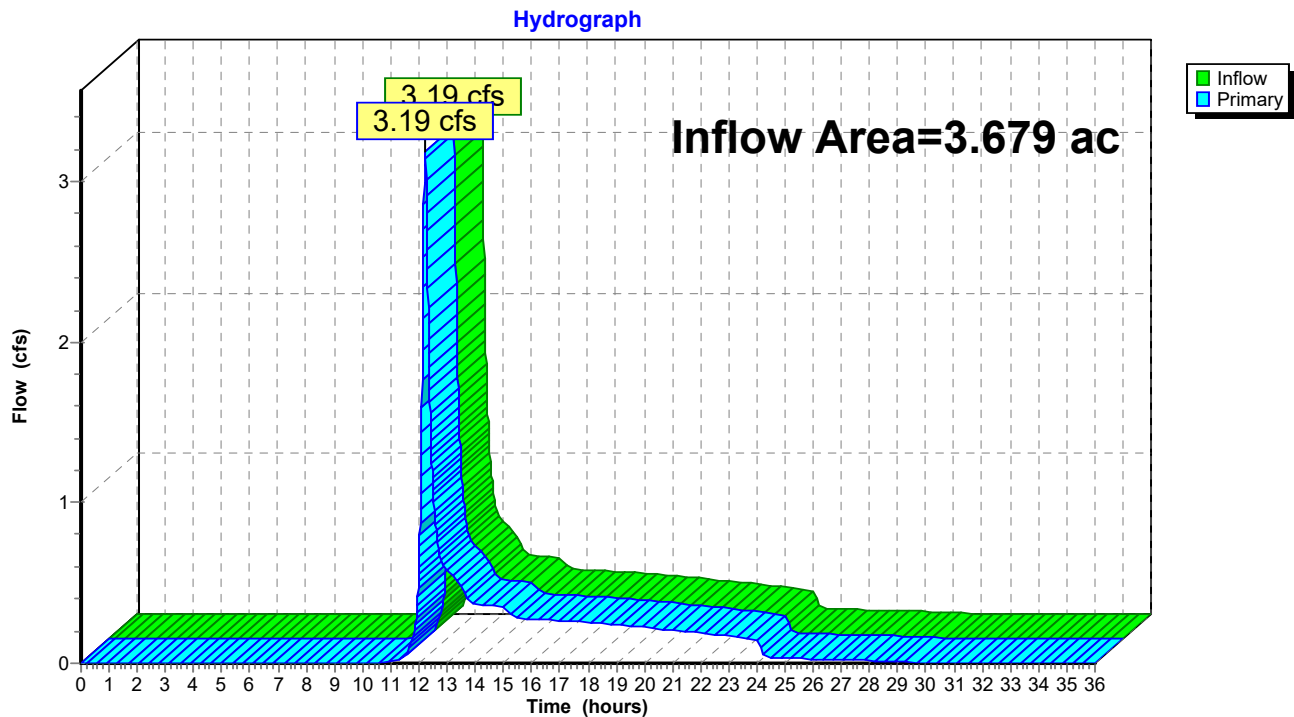


Pond 58P: Infiltration Field #5

Summary for Link 59P: Sub-DP #2a: Flow to Town Land

Inflow Area = 3.679 ac, 9.64% Impervious, Inflow Depth = 1.20" for 10-YR event
Inflow = 3.19 cfs @ 12.21 hrs, Volume= 0.368 af
Primary = 3.19 cfs @ 12.21 hrs, Volume= 0.368 af, Atten= 0%, Lag= 0.0 min
Routed to Link 60P : Design Point #2: Flow to Uncas Brook

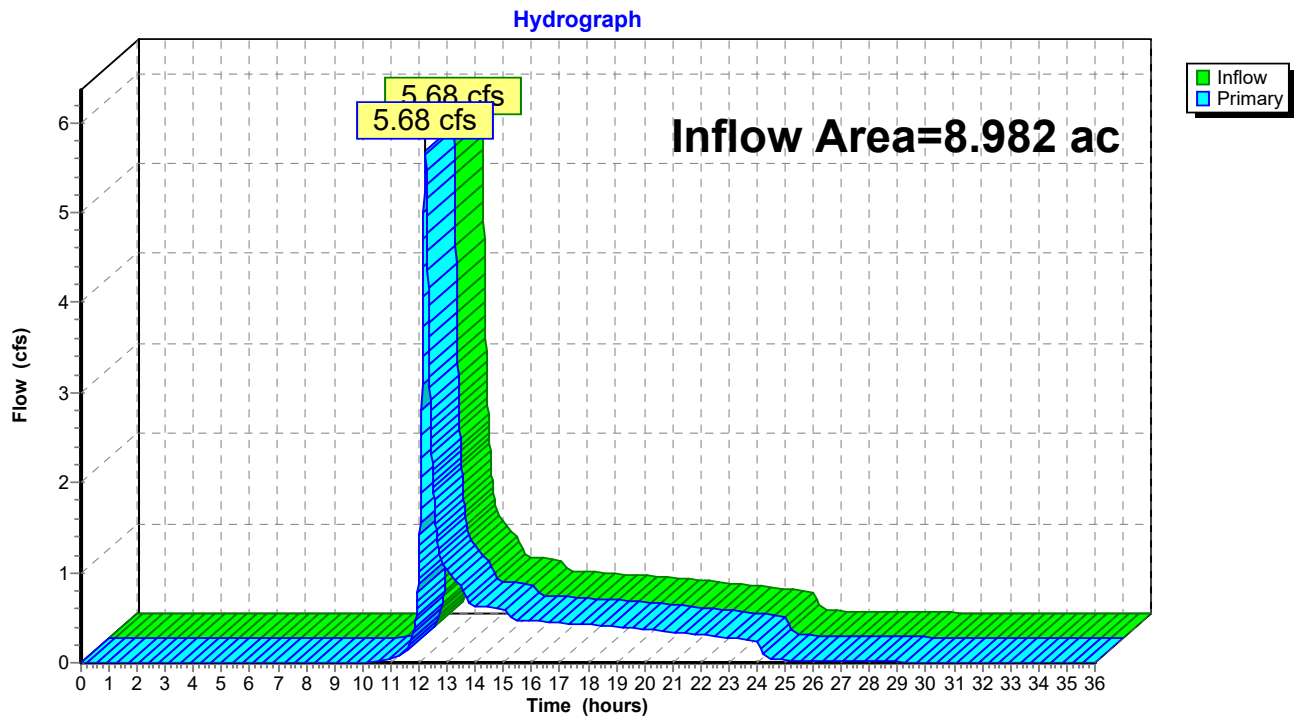
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 59P: Sub-DP #2a: Flow to Town Land

Summary for Link 60P: Design Point #2: Flow to Uncas Brook

Inflow Area = 8.982 ac, 18.85% Impervious, Inflow Depth = 0.84" for 10-YR event
Inflow = 5.68 cfs @ 12.22 hrs, Volume= 0.631 af
Primary = 5.68 cfs @ 12.22 hrs, Volume= 0.631 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 60P: Design Point #2: Flow to Uncas Brook

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment30P: P2a

Runoff Area=16,661 sf 55.72% Impervious Runoff Depth=4.31"
Flow Length=287' Tc=11.0 min CN=WQ Runoff=1.46 cfs 0.137 af

Pond 31P: CB 5+55R

Peak Elev=402.36' Inflow=1.46 cfs 0.137 af
12.0" Round Culvert n=0.011 L=10.0' S=0.0400 '/' Outflow=1.46 cfs 0.137 af

Subcatchment32P: P2b

Runoff Area=11,091 sf 55.26% Impervious Runoff Depth=4.40"
Flow Length=209' Tc=7.7 min CN=WQ Runoff=1.14 cfs 0.093 af

Pond 33P: CB 5+55L

Peak Elev=402.29' Inflow=1.14 cfs 0.093 af
12.0" Round Culvert n=0.011 L=14.0' S=0.0286 '/' Outflow=1.14 cfs 0.093 af

Pond 34P: DMH 5+68

Peak Elev=402.09' Inflow=2.54 cfs 0.231 af
12.0" Round Culvert n=0.011 L=61.0' S=0.0287 '/' Outflow=2.54 cfs 0.231 af

Pond 35P: DMH 6+33

Peak Elev=400.59' Inflow=2.54 cfs 0.231 af
12.0" Round Culvert n=0.011 L=112.0' S=0.0326 '/' Outflow=2.54 cfs 0.231 af

Subcatchment36P: P2c

Runoff Area=12,059 sf 71.70% Impervious Runoff Depth=5.03"
Flow Length=265' Tc=5.7 min CN=WQ Runoff=1.52 cfs 0.116 af

Pond 37P: CB 7+36R

Peak Elev=397.25' Inflow=1.52 cfs 0.116 af
12.0" Round Culvert n=0.011 L=11.0' S=0.0273 '/' Outflow=1.52 cfs 0.116 af

Subcatchment38P: P2d

Runoff Area=10,116 sf 58.55% Impervious Runoff Depth=4.53"
Flow Length=247' Tc=3.3 min CN=WQ Runoff=1.27 cfs 0.088 af

Pond 39P: CB 7+36L

Peak Elev=397.17' Inflow=1.27 cfs 0.088 af
12.0" Round Culvert n=0.011 L=23.0' S=0.0130 '/' Outflow=1.27 cfs 0.088 af

Pond 40P: DMH 7+50

Peak Elev=397.09' Inflow=5.00 cfs 0.434 af
15.0" Round Culvert n=0.011 L=95.0' S=0.0395 '/' Outflow=5.00 cfs 0.434 af

Subcatchment41P: P2e

Runoff Area=64,914 sf 33.60% Impervious Runoff Depth=3.51"
Flow Length=410' Tc=9.9 min CN=WQ Runoff=4.99 cfs 0.436 af

Pond 42P: CB 8+23

Peak Elev=394.77' Inflow=4.99 cfs 0.436 af
15.0" Round Culvert n=0.011 L=6.0' S=0.0167 '/' Outflow=4.99 cfs 0.436 af

Subcatchment43P: P2f

Runoff Area=5,603 sf 100.00% Impervious Runoff Depth=6.13"
Tc=0.0 min CN=98 Runoff=0.93 cfs 0.066 af

Pond 44P: Roof Drain

Peak Elev=408.63' Inflow=0.93 cfs 0.066 af
8.0" Round Culvert n=0.011 L=320.0' S=0.0500 '/' Outflow=0.93 cfs 0.066 af

Pond 45P: DMH 8+26

Peak Elev=389.26' Inflow=9.74 cfs 0.936 af
18.0" Round Culvert n=0.011 L=41.0' S=0.0244 '/' Outflow=9.74 cfs 0.936 af

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Pond 46P: FD CPeak Elev=387.96' Inflow=9.74 cfs 0.936 af
18.0" Round Culvert n=0.011 L=81.0' S=0.0883 ' Outflow=9.74 cfs 0.936 af**Pond 47P: Infiltration Field #6**Peak Elev=382.43' Storage=15,589 cf Inflow=9.74 cfs 0.936 af
Discarded=0.28 cfs 0.747 af Primary=0.34 cfs 0.059 af Secondary=0.39 cfs 0.119 af Outflow=1.01 cfs 0.924 af**Pond 48P: 30' Level Spreader**Peak Elev=374.02' Inflow=0.34 cfs 0.059 af
Outflow=0.34 cfs 0.059 af**Subcatchment49P: P2g**Runoff Area=110,536 sf 0.83% Impervious Runoff Depth=1.92"
Flow Length=573' Tc=13.6 min CN=WQ Runoff=4.15 cfs 0.407 af**Link 50P: Sub-DP #2b: Flow to Northern Abutter**Inflow=4.15 cfs 0.465 af
Primary=4.15 cfs 0.465 af**Pond 51P: 30' Level Spreader**Peak Elev=377.03' Inflow=0.39 cfs 0.119 af
Outflow=0.39 cfs 0.119 af**Subcatchment52P: P2h**Runoff Area=144,833 sf 0.00% Impervious Runoff Depth=1.82"
Flow Length=416' Tc=12.4 min CN=WQ Runoff=5.38 cfs 0.505 af**Subcatchment53P: R11-19**Runoff Area=6,318 sf 100.00% Impervious Runoff Depth=6.13"
Tc=0.0 min CN=98 Runoff=1.05 cfs 0.074 af**Pond 54P: Infiltration Field #3**Peak Elev=385.41' Storage=1,249 cf Inflow=1.05 cfs 0.074 af
Discarded=0.04 cfs 0.074 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.074 af**Subcatchment55P: R20-28**Runoff Area=6,318 sf 100.00% Impervious Runoff Depth=6.13"
Tc=2.0 min CN=98 Runoff=1.05 cfs 0.074 af**Pond 56P: Infiltration Field #4**Peak Elev=388.79' Storage=915 cf Inflow=1.05 cfs 0.074 af
Discarded=0.06 cfs 0.074 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.074 af**Subcatchment57P: R2-3, 27-28**Runoff Area=2,808 sf 100.00% Impervious Runoff Depth=6.13"
Tc=2.0 min CN=98 Runoff=0.47 cfs 0.033 af**Pond 58P: Infiltration Field #5**Peak Elev=407.08' Storage=416 cf Inflow=0.47 cfs 0.033 af
Outflow=0.03 cfs 0.033 af**Link 59P: Sub-DP #2a: Flow to Town Land**Inflow=5.41 cfs 0.624 af
Primary=5.41 cfs 0.624 af**Link 60P: Design Point #2: Flow to Uncas Brook**Inflow=9.54 cfs 1.089 af
Primary=9.54 cfs 1.089 af**Total Runoff Area = 8.982 ac Runoff Volume = 2.029 af Average Runoff Depth = 2.71"**
81.15% Pervious = 7.289 ac 18.85% Impervious = 1.693 ac

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NOAA10 24-hr D 25-YR Rainfall=6.37"

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Summary for Subcatchment 30P: P2a

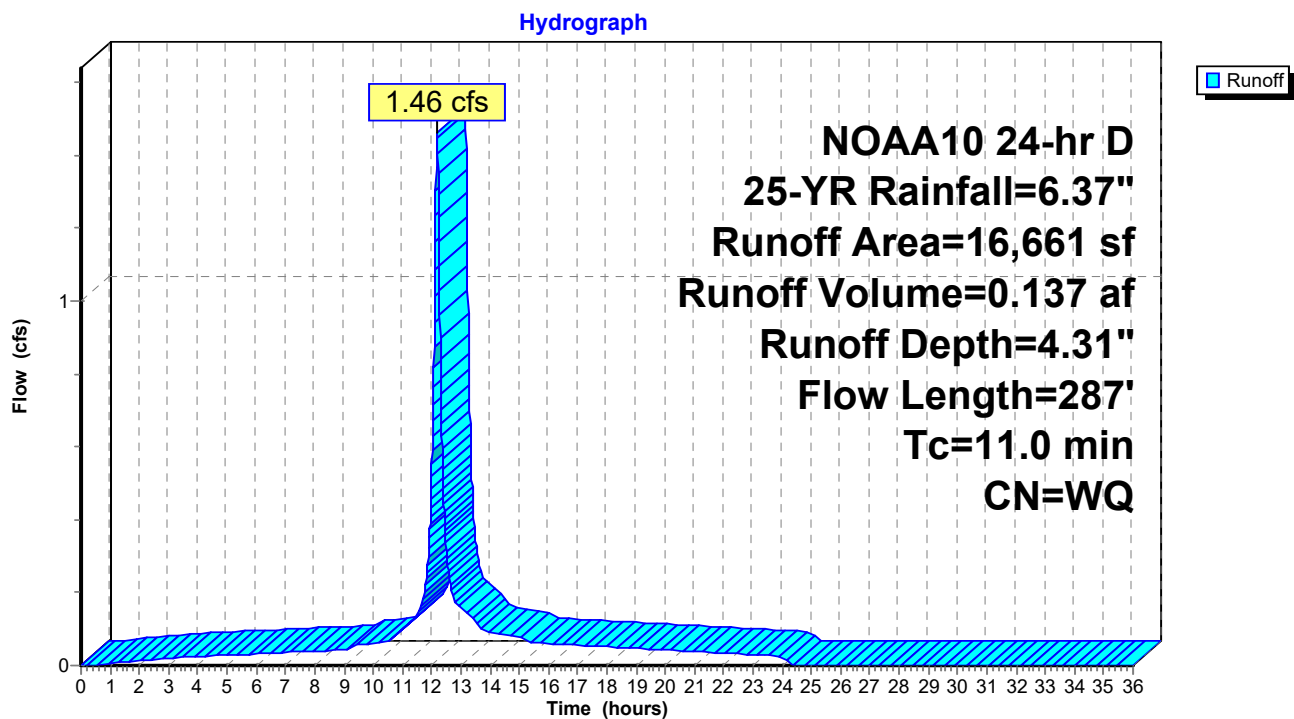
Runoff = 1.46 cfs @ 12.18 hrs, Volume= 0.137 af, Depth= 4.31"
 Routed to Pond 31P : CB 5+55R

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
7,449	98	Paved parking HSG B
3,408	55	Woods, Good HSG B
1,835	98	Roofs HSG B
3,969	61	>75% Grass cover, Good HSG B
16,661		Weighted Average
7,377		44.28% Pervious Area
9,284		55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	36	0.0200	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
0.8	35	0.0200	0.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	26	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.6	190	0.0600	4.97		Shallow Concentrated Flow, Paved Kv= 20.3 fps
11.0	287	Total			

Subcatchment 30P: P2a



Summary for Pond 31P: CB 5+55R

Inflow Area = 0.382 ac, 55.72% Impervious, Inflow Depth = 4.31" for 25-YR event
 Inflow = 1.46 cfs @ 12.18 hrs, Volume= 0.137 af
 Outflow = 1.46 cfs @ 12.18 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.46 cfs @ 12.18 hrs, Volume= 0.137 af
 Routed to Pond 34P : DMH 5+68

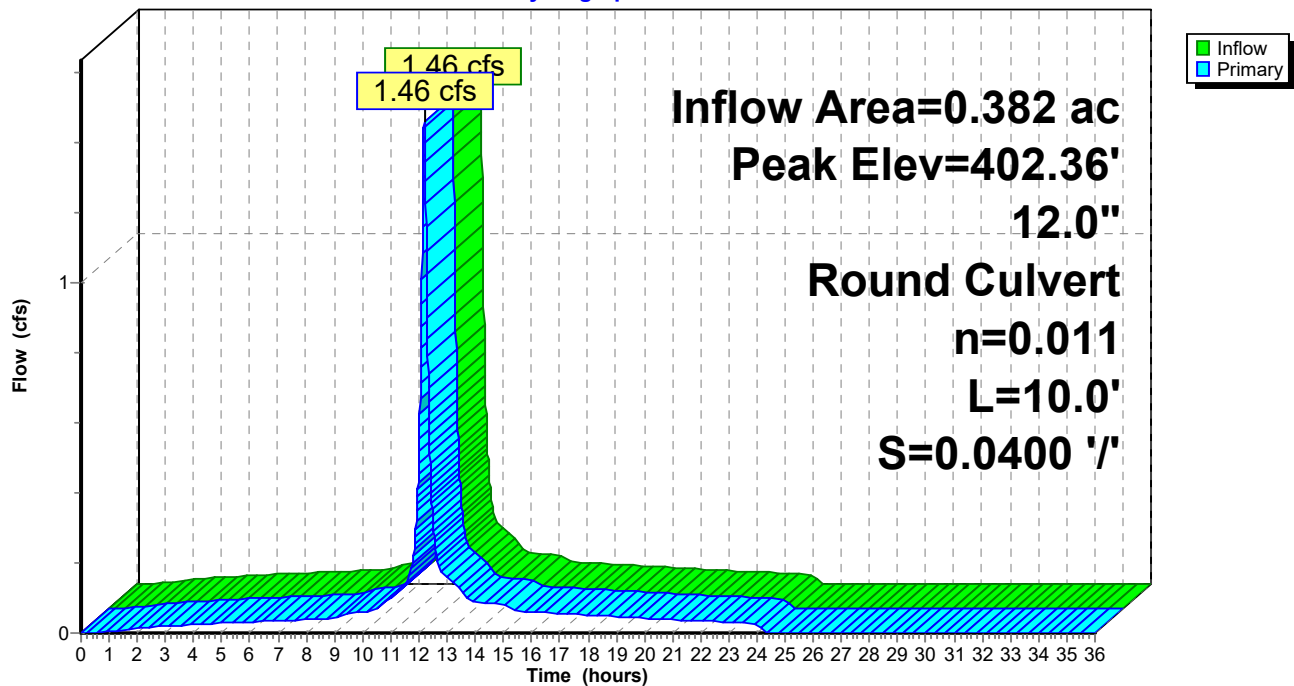
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 402.36' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	401.60'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.60' / 401.20' S= 0.0400 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.51 cfs @ 12.18 hrs HW=402.35' TW=402.07' (Dynamic Tailwater)
 1=Culvert (Outlet Controls 1.51 cfs @ 3.29 fps)

Pond 31P: CB 5+55R

Hydrograph



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NOAA10 24-hr D 25-YR Rainfall=6.37"

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Summary for Subcatchment 32P: P2b

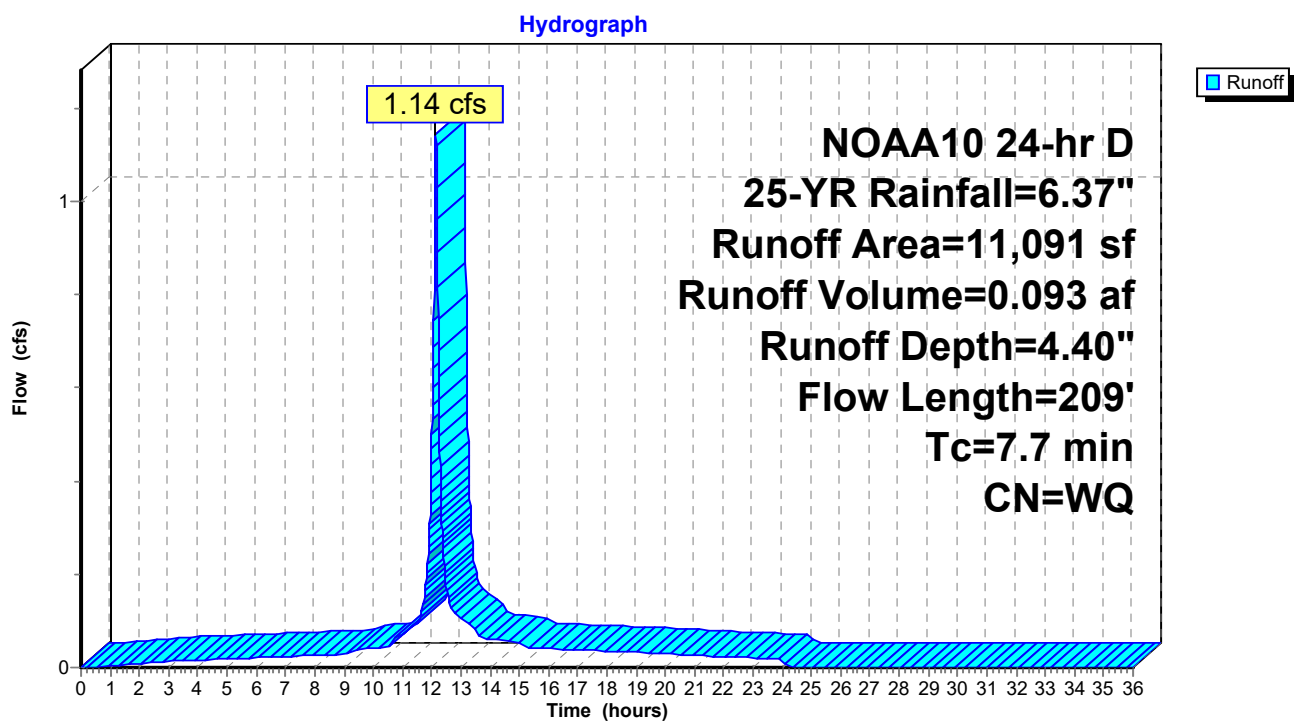
Runoff = 1.14 cfs @ 12.15 hrs, Volume= 0.093 af, Depth= 4.40"
 Routed to Pond 33P : CB 5+55L

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
4,725	98	Paved parking HSG B
1,404	98	Roofs, HSG B
4,962	61	>75% Grass cover, Good HSG B
11,091		Weighted Average
4,962		44.74% Pervious Area
6,129		55.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	50	0.0350	0.13		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
1.0	113	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	23	0.0600	4.97		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	23	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.7	209	Total			

Subcatchment 32P: P2b



Summary for Pond 33P: CB 5+55L

Inflow Area = 0.255 ac, 55.26% Impervious, Inflow Depth = 4.40" for 25-YR event
 Inflow = 1.14 cfs @ 12.15 hrs, Volume= 0.093 af
 Outflow = 1.14 cfs @ 12.15 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.14 cfs @ 12.15 hrs, Volume= 0.093 af
 Routed to Pond 34P : DMH 5+68

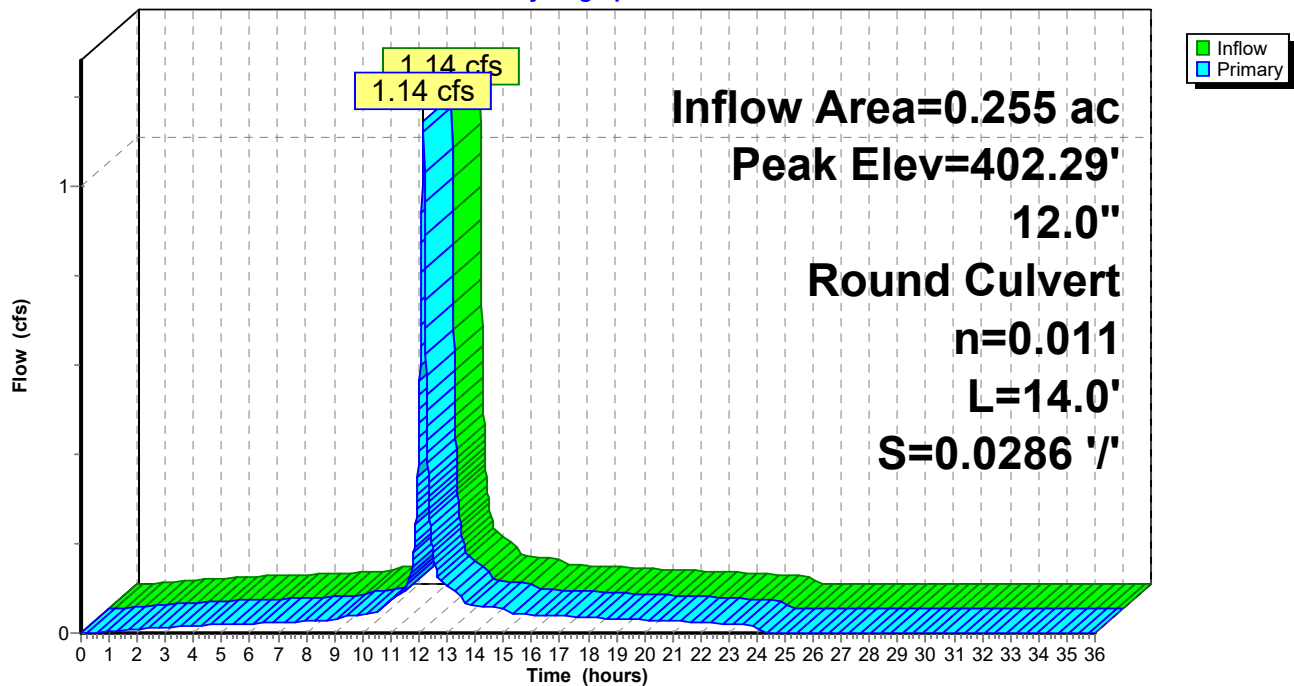
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 402.29' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	401.60'	12.0" Round Culvert L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.60' / 401.20' S= 0.0286 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.08 cfs @ 12.15 hrs HW=402.28' TW=402.08' (Dynamic Tailwater)
 ↳ **1=Culvert** (Outlet Controls 1.08 cfs @ 2.69 fps)

Pond 33P: CB 5+55L

Hydrograph



Summary for Pond 34P: DMH 5+68

Inflow Area = 0.637 ac, 55.54% Impervious, Inflow Depth = 4.34" for 25-YR event
 Inflow = 2.54 cfs @ 12.16 hrs, Volume= 0.231 af
 Outflow = 2.54 cfs @ 12.16 hrs, Volume= 0.231 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.54 cfs @ 12.16 hrs, Volume= 0.231 af
 Routed to Pond 35P : DMH 6+33

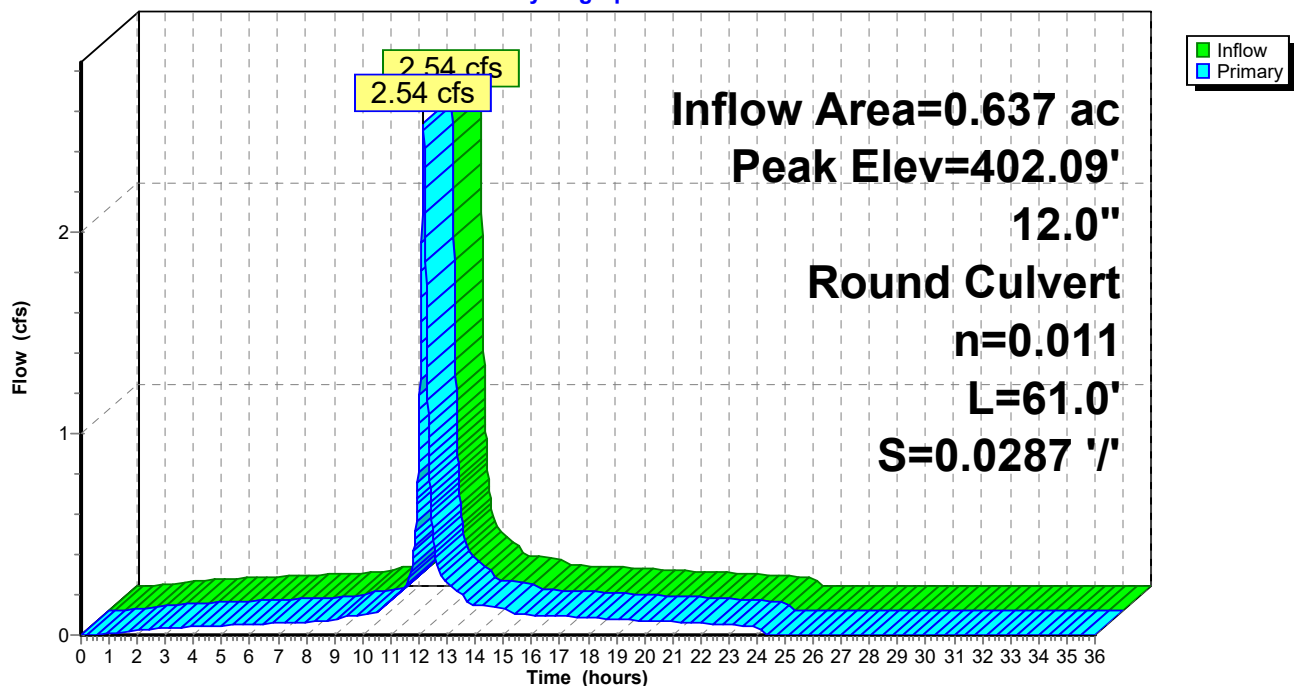
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 402.09' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	401.15'	12.0" Round Culvert L= 61.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.15' / 399.40' S= 0.0287 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=2.54 cfs @ 12.16 hrs HW=402.09' TW=400.59' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 2.54 cfs @ 3.31 fps)

Pond 34P: DMH 5+68

Hydrograph



Summary for Pond 35P: DMH 6+33

Inflow Area = 0.637 ac, 55.54% Impervious, Inflow Depth = 4.34" for 25-YR event
 Inflow = 2.54 cfs @ 12.16 hrs, Volume= 0.231 af
 Outflow = 2.54 cfs @ 12.16 hrs, Volume= 0.231 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.54 cfs @ 12.16 hrs, Volume= 0.231 af
 Routed to Pond 40P : DMH 7+50

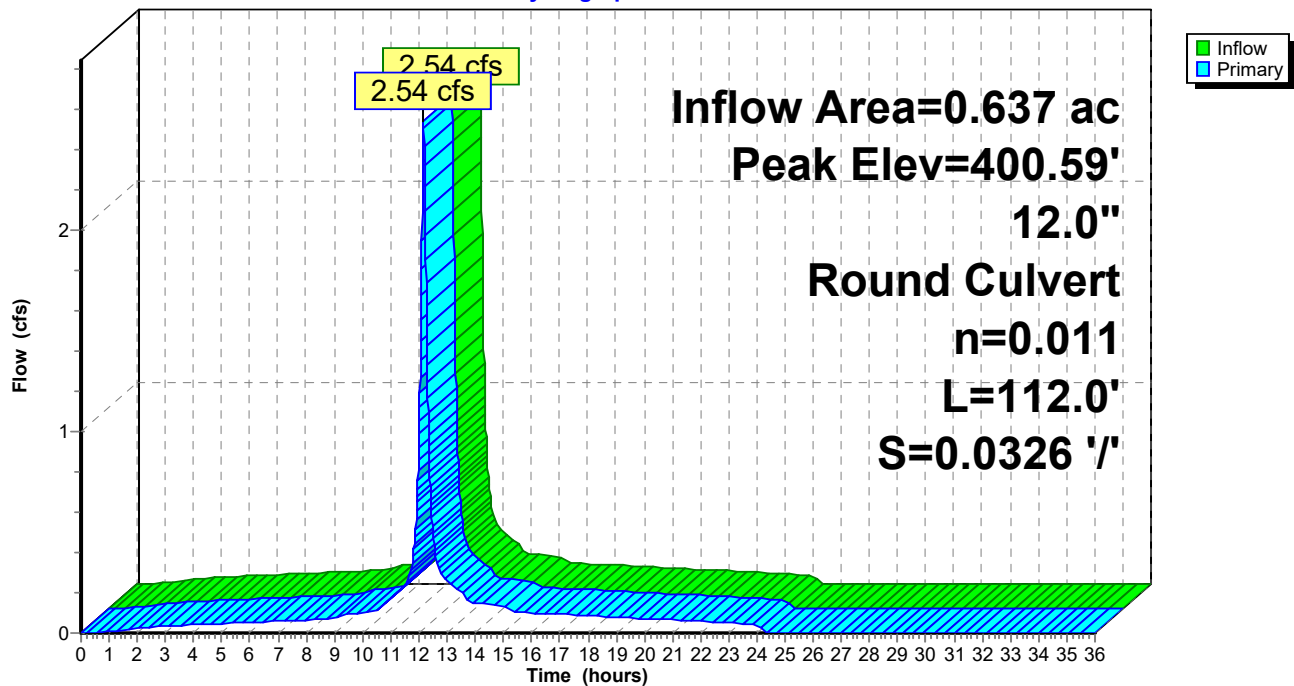
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 400.59' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	399.65'	12.0" Round Culvert L= 112.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 399.65' / 396.00' S= 0.0326 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=2.54 cfs @ 12.16 hrs HW=400.59' TW=396.92' (Dynamic Tailwater)
 ↳ **1=Culvert** (Inlet Controls 2.54 cfs @ 3.31 fps)

Pond 35P: DMH 6+33

Hydrograph



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Summary for Subcatchment 36P: P2c

Runoff = 1.52 cfs @ 12.13 hrs, Volume= 0.116 af, Depth= 5.03"
Routed to Pond 37P : CB 7+36R

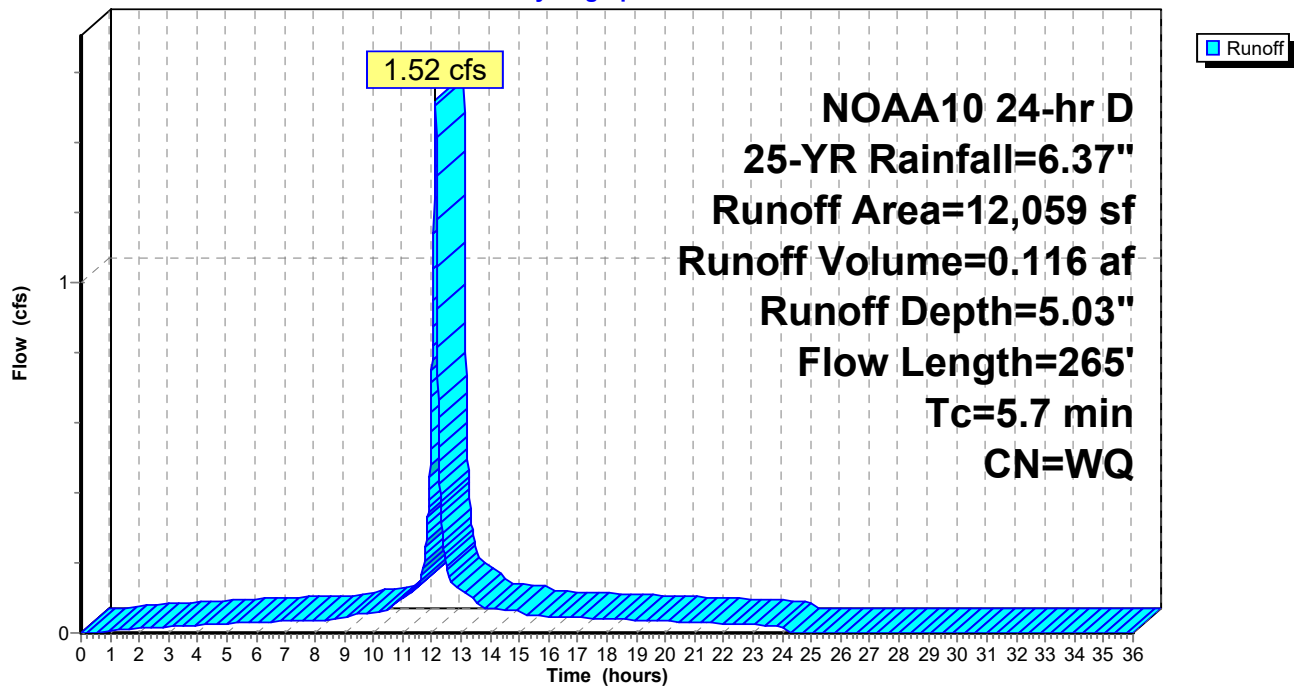
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
3,871	98	Roofs HSG B
4,775	98	Paved parking HSG B
3,413	61	>75% Grass cover, Good HSG B
12,059		Weighted Average
3,413		28.30% Pervious Area
8,646		71.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	40	0.0500	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
1.1	225	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
5.7	265	Total			

Subcatchment 36P: P2c

Hydrograph



Summary for Pond 37P: CB 7+36R

Inflow Area = 0.277 ac, 71.70% Impervious, Inflow Depth = 5.03" for 25-YR event
 Inflow = 1.52 cfs @ 12.13 hrs, Volume= 0.116 af
 Outflow = 1.52 cfs @ 12.13 hrs, Volume= 0.116 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.52 cfs @ 12.13 hrs, Volume= 0.116 af
 Routed to Pond 40P : DMH 7+50

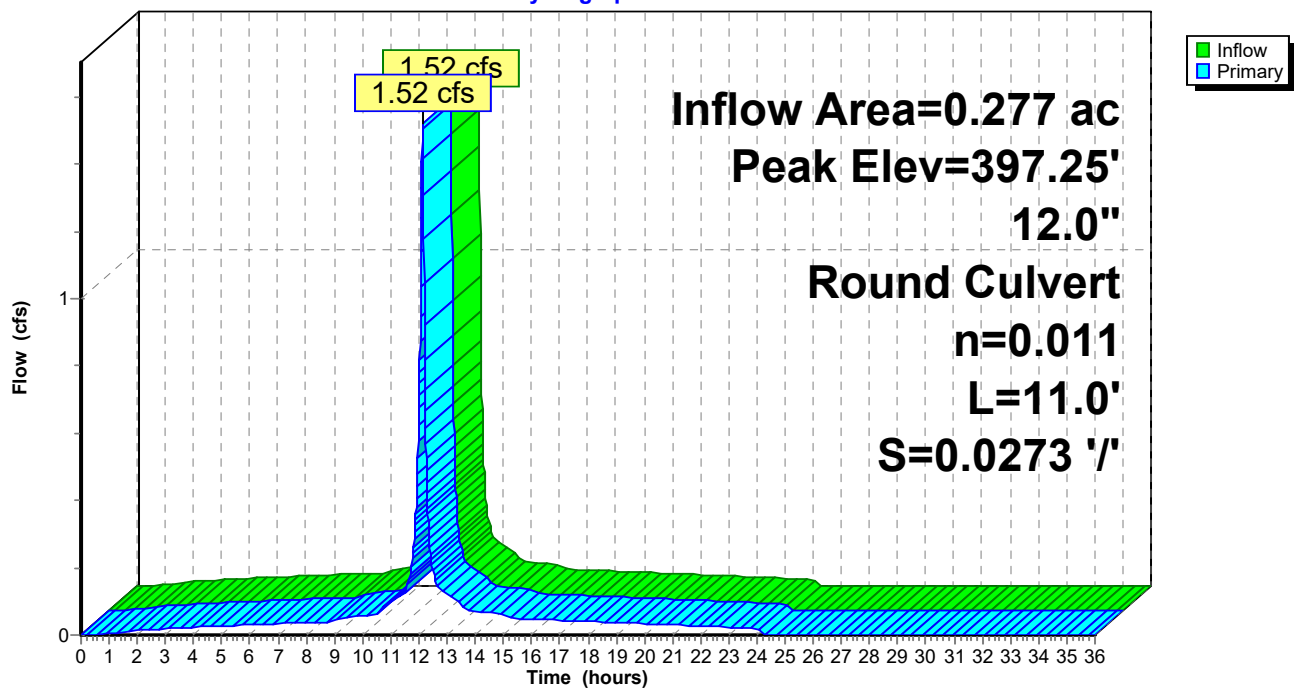
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 397.25' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	396.10'	12.0" Round Culvert L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 396.10' / 395.80' S= 0.0273 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.45 cfs @ 12.13 hrs HW=397.23' TW=397.09' (Dynamic Tailwater)
 ↳ **1=Culvert** (Inlet Controls 1.45 cfs @ 1.85 fps)

Pond 37P: CB 7+36R

Hydrograph



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Summary for Subcatchment 38P: P2d

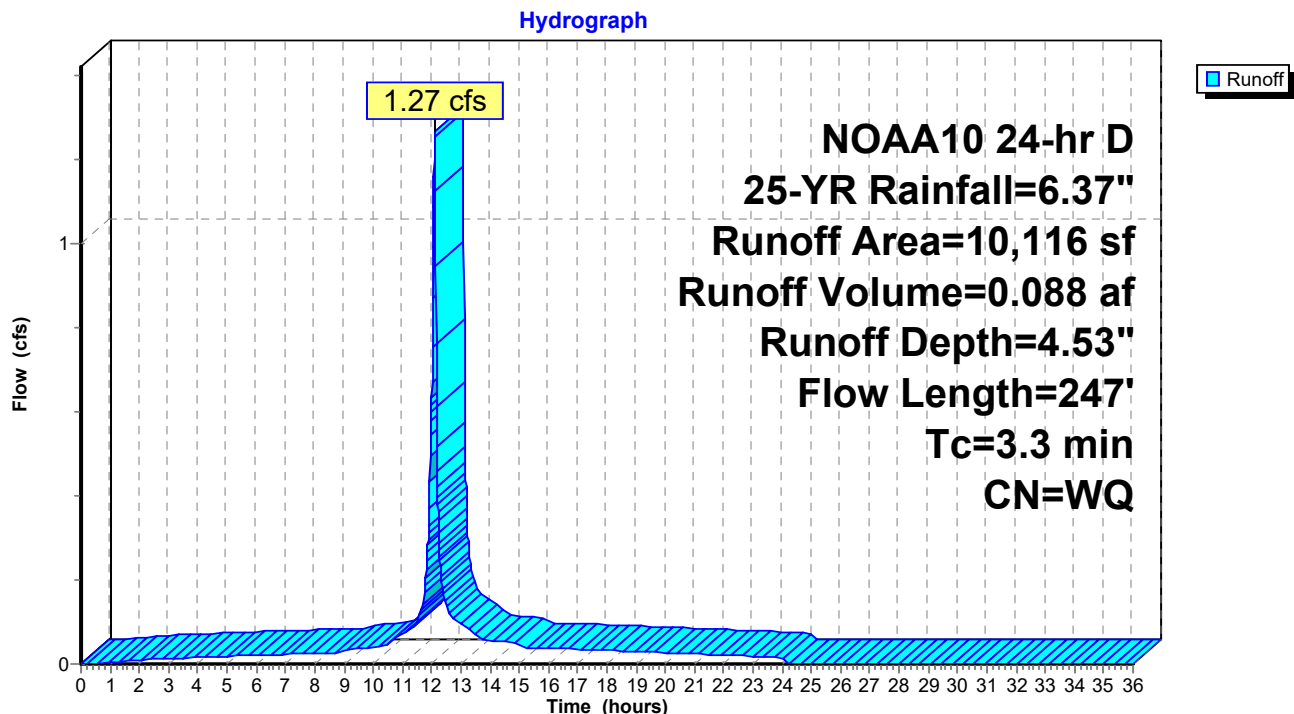
Runoff = 1.27 cfs @ 12.11 hrs, Volume= 0.088 af, Depth= 4.53"
Routed to Pond 39P : CB 7+36L

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
3,108	98	Paved parking HSG B
2,815	98	Roofs HSG B
4,193	61	>75% Grass cover, Good HSG B
10,116		Weighted Average
4,193		41.45% Pervious Area
5,923		58.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	21	0.1000	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
0.3	30	0.0700	1.83		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.36"
0.9	196	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.3	247	Total			

Subcatchment 38P: P2d



Summary for Pond 39P: CB 7+36L

Inflow Area = 0.232 ac, 58.55% Impervious, Inflow Depth = 4.53" for 25-YR event
 Inflow = 1.27 cfs @ 12.11 hrs, Volume= 0.088 af
 Outflow = 1.27 cfs @ 12.11 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.27 cfs @ 12.11 hrs, Volume= 0.088 af
 Routed to Pond 40P : DMH 7+50

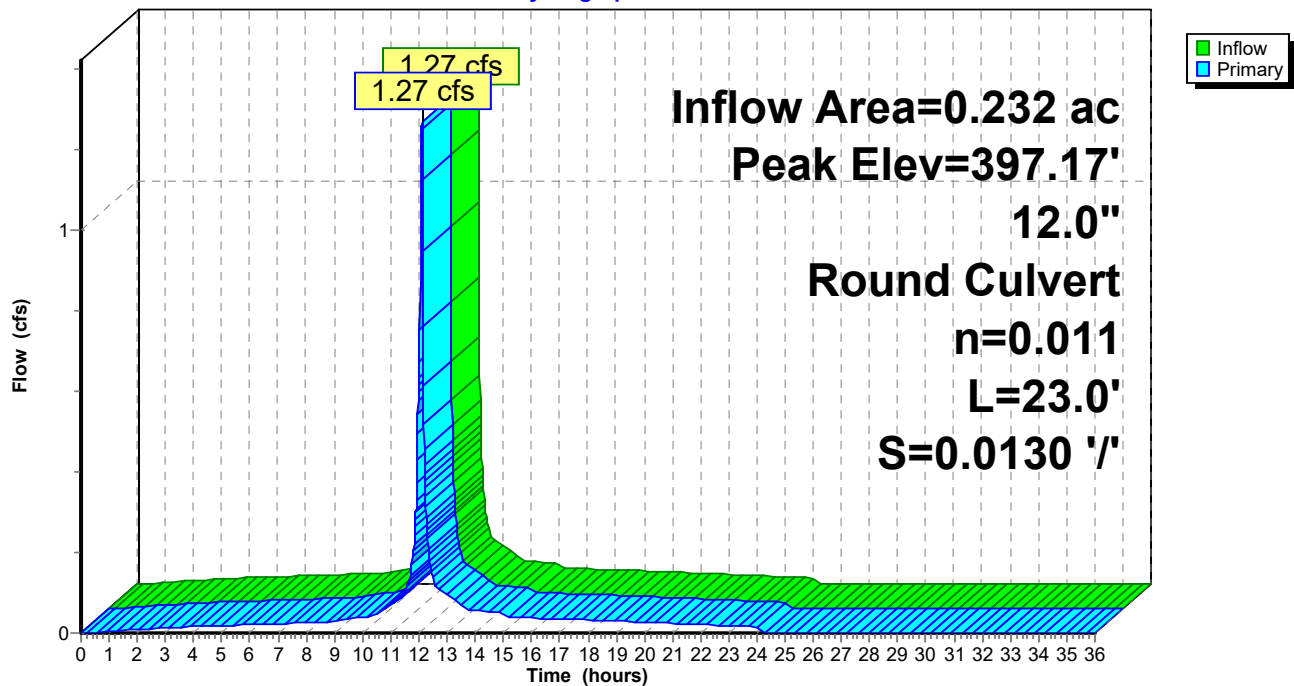
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 397.17' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	396.10'	12.0" Round Culvert L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 396.10' / 395.80' S= 0.0130 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.88 cfs @ 12.11 hrs HW=397.09' TW=397.03' (Dynamic Tailwater)
 ↳ **1=Culvert** (Outlet Controls 0.88 cfs @ 1.40 fps)

Pond 39P: CB 7+36L

Hydrograph



Summary for Pond 40P: DMH 7+50

Inflow Area = 1.146 ac, 60.05% Impervious, Inflow Depth = 4.55" for 25-YR event
 Inflow = 5.00 cfs @ 12.13 hrs, Volume= 0.434 af
 Outflow = 5.00 cfs @ 12.13 hrs, Volume= 0.434 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.00 cfs @ 12.13 hrs, Volume= 0.434 af
 Routed to Pond 45P : DMH 8+26

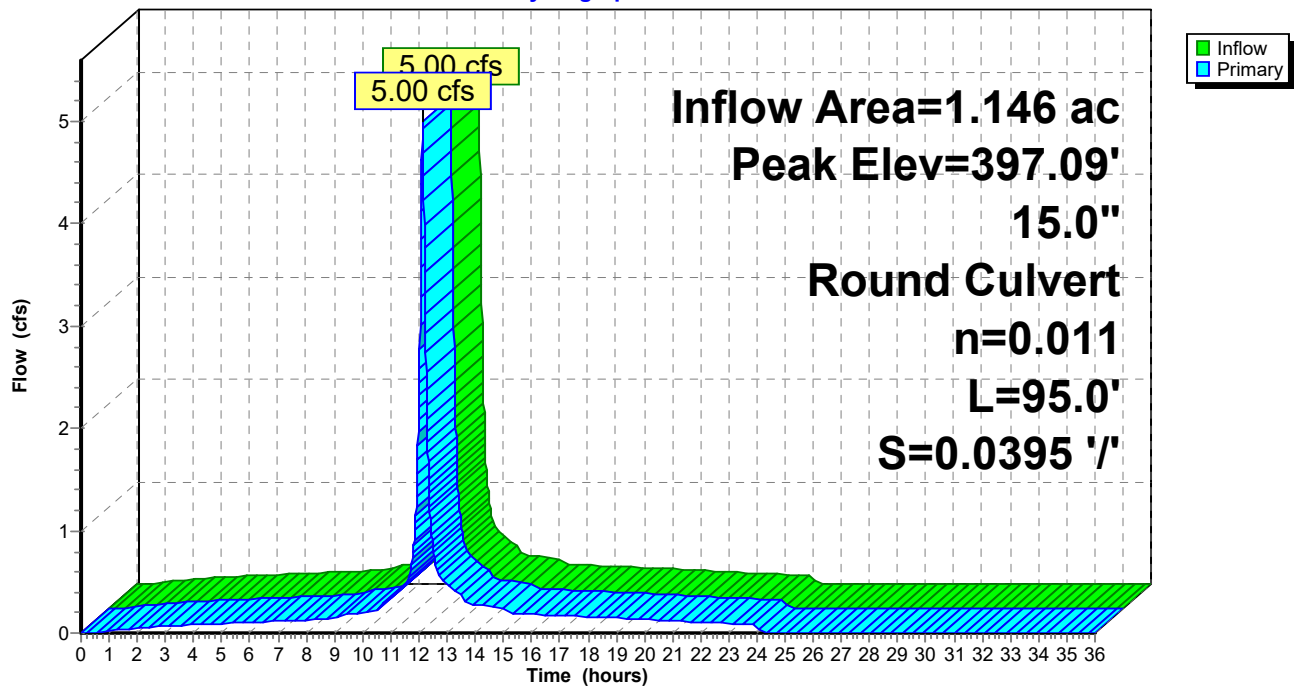
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 397.09' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	395.75'	15.0" Round Culvert L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 395.75' / 392.00' S= 0.0395 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf

Primary OutFlow Max=4.98 cfs @ 12.13 hrs HW=397.09' TW=389.06' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 4.98 cfs @ 4.06 fps)

Pond 40P: DMH 7+50

Hydrograph



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Summary for Subcatchment 41P: P2e

Runoff = 4.99 cfs @ 12.17 hrs, Volume= 0.436 af, Depth= 3.51"
Routed to Pond 42P : CB 8+23

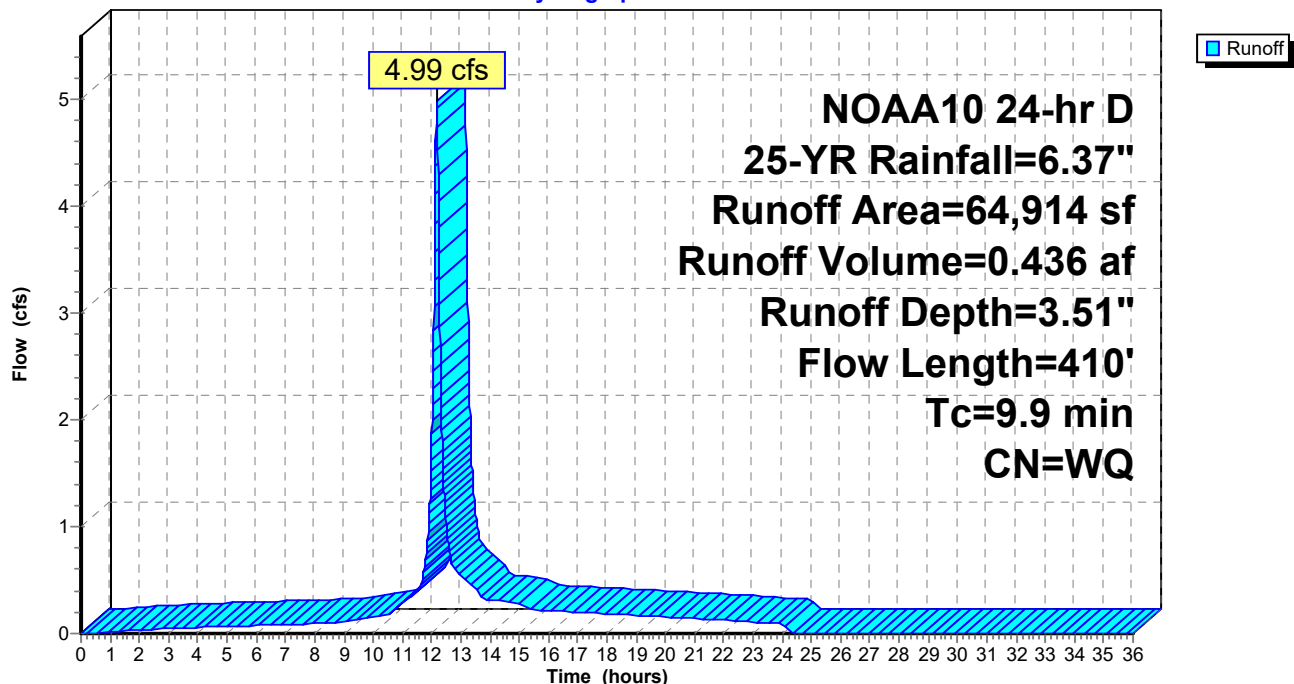
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
6,559	98	Roofs HSG B
5,857	55	Woods, Good HSG B
15,251	98	Paved parking HSG B
37,247	61	>75% Grass cover, Good HSG B
64,914		Weighted Average
43,104		66.40% Pervious Area
21,810		33.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
2.8	310	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	50	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.9	410	Total			

Subcatchment 41P: P2e

Hydrograph



Summary for Pond 42P: CB 8+23

Inflow Area = 1.490 ac, 33.60% Impervious, Inflow Depth = 3.51" for 25-YR event
 Inflow = 4.99 cfs @ 12.17 hrs, Volume= 0.436 af
 Outflow = 4.99 cfs @ 12.17 hrs, Volume= 0.436 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.99 cfs @ 12.17 hrs, Volume= 0.436 af
 Routed to Pond 45P : DMH 8+26

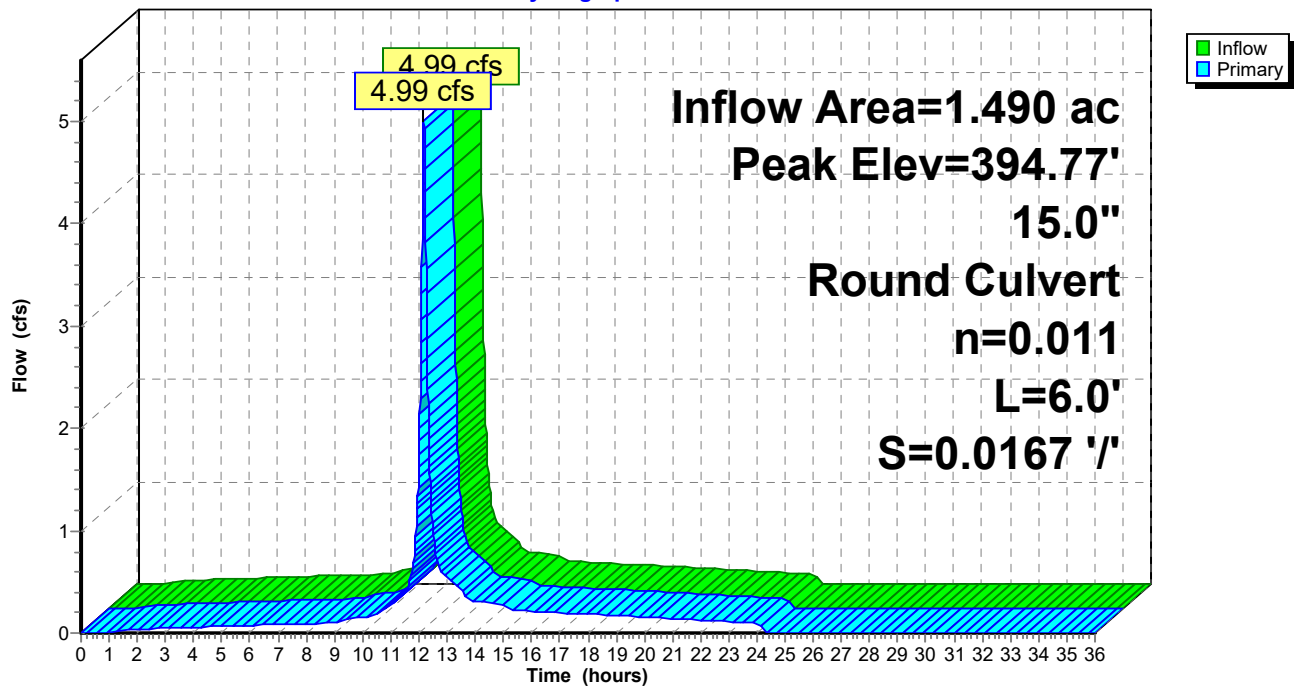
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 394.77' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	393.30'	15.0" Round Culvert L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 393.30' / 393.20' S= 0.0167 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf

Primary OutFlow Max=4.98 cfs @ 12.17 hrs HW=394.76' TW=389.13' (Dynamic Tailwater)
 ↳ **1=Culvert** (Barrel Controls 4.98 cfs @ 4.36 fps)

Pond 42P: CB 8+23

Hydrograph



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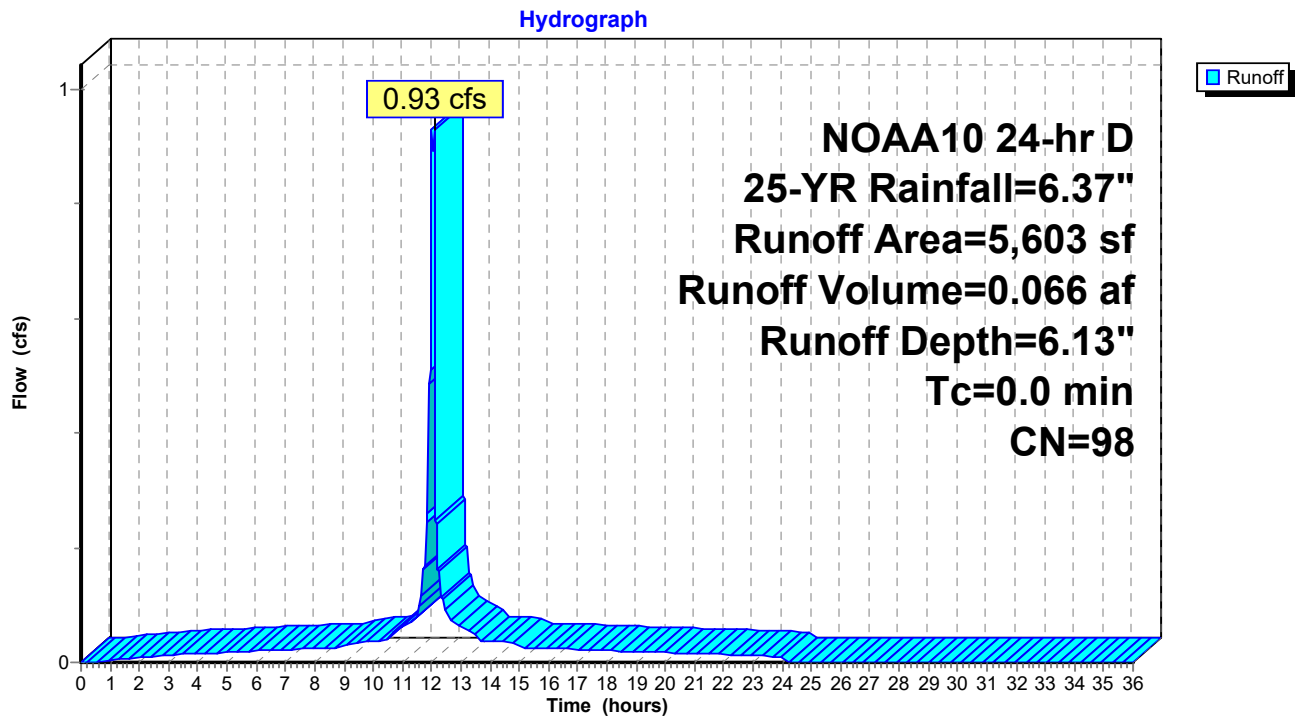
Summary for Subcatchment 43P: P2f

Runoff = 0.93 cfs @ 12.09 hrs, Volume= 0.066 af, Depth= 6.13"
Routed to Pond 44P : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
5,603	98	Roofs, HSG B
5,603		100.00% Impervious Area

Subcatchment 43P: P2f



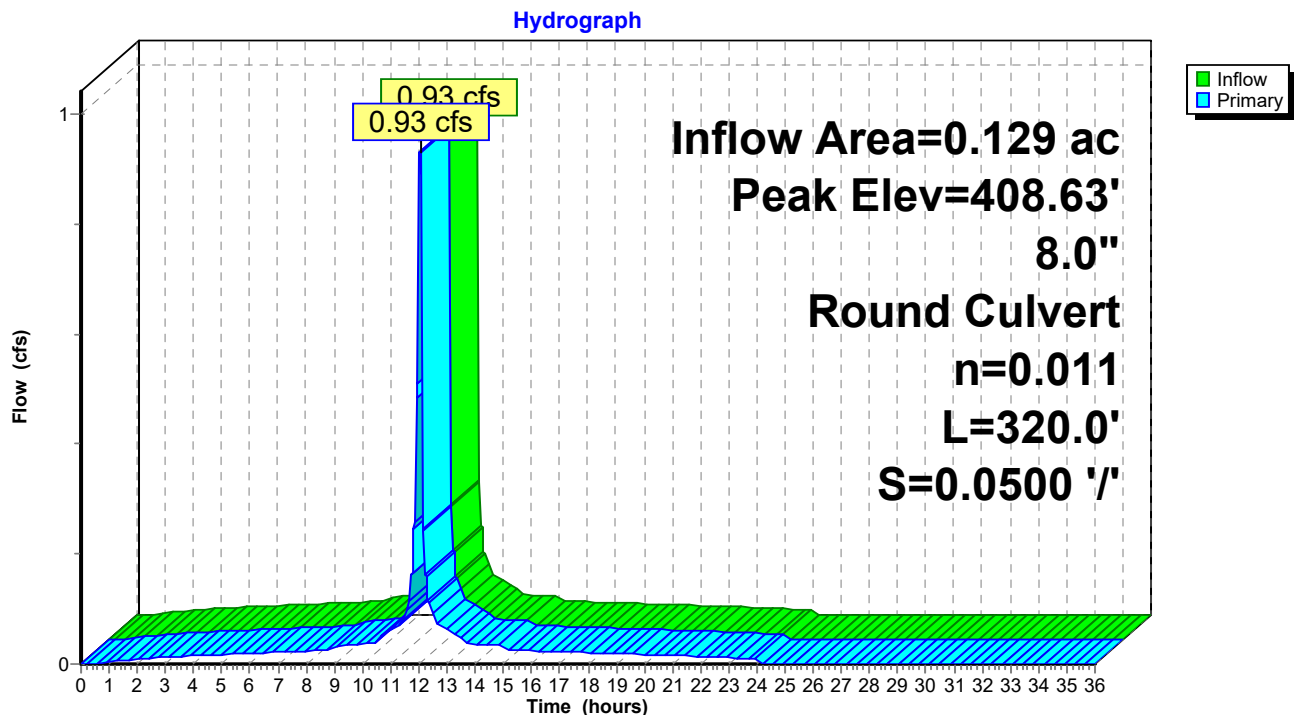
Summary for Pond 44P: Roof Drain

Inflow Area = 0.129 ac, 100.00% Impervious, Inflow Depth = 6.13" for 25-YR event
 Inflow = 0.93 cfs @ 12.09 hrs, Volume= 0.066 af
 Outflow = 0.93 cfs @ 12.09 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.93 cfs @ 12.09 hrs, Volume= 0.066 af
 Routed to Pond 45P : DMH 8+26

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 408.63' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	408.00'	8.0" Round Culvert L= 320.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 408.00' / 392.00' S= 0.0500 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=0.93 cfs @ 12.09 hrs HW=408.63' TW=388.78' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 0.93 cfs @ 2.71 fps)

Pond 44P: Roof Drain

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Summary for Pond 45P: DMH 8+26

Inflow Area = 2.765 ac, 47.65% Impervious, Inflow Depth = 4.06" for 25-YR event
Inflow = 9.74 cfs @ 12.14 hrs, Volume= 0.936 af
Outflow = 9.74 cfs @ 12.14 hrs, Volume= 0.936 af, Atten= 0%, Lag= 0.0 min
Primary = 9.74 cfs @ 12.14 hrs, Volume= 0.936 af
Routed to Pond 46P : FD C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

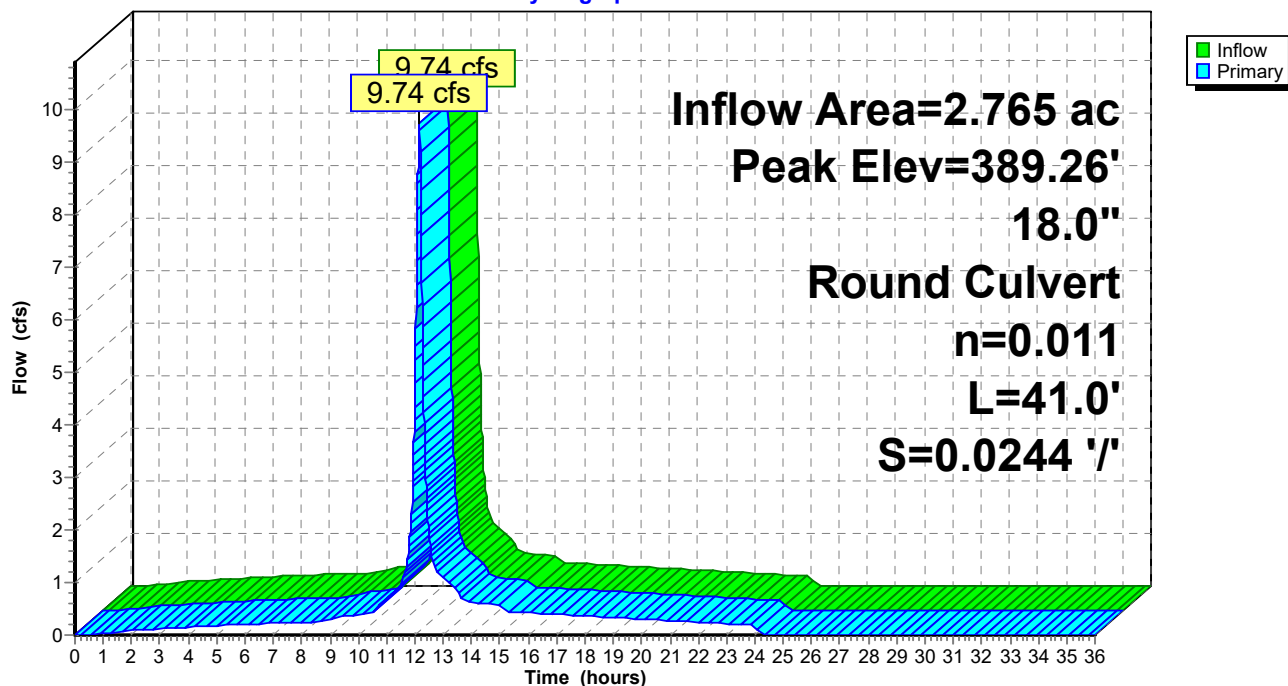
Peak Elev= 389.26' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	387.00'	18.0" Round Culvert L= 41.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 387.00' / 386.00' S= 0.0244 '/ Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=9.67 cfs @ 12.14 hrs HW=389.25' TW=387.96' (Dynamic Tailwater)
↑ **1=Culvert** (Inlet Controls 9.67 cfs @ 5.47 fps)

Pond 45P: DMH 8+26

Hydrograph



Summary for Pond 46P: FD C

Inflow Area = 2.765 ac, 47.65% Impervious, Inflow Depth = 4.06" for 25-YR event
 Inflow = 9.74 cfs @ 12.14 hrs, Volume= 0.936 af
 Outflow = 9.74 cfs @ 12.14 hrs, Volume= 0.936 af, Atten= 0%, Lag= 0.0 min
 Primary = 9.74 cfs @ 12.14 hrs, Volume= 0.936 af
 Routed to Pond 47P : Infiltration Field #6

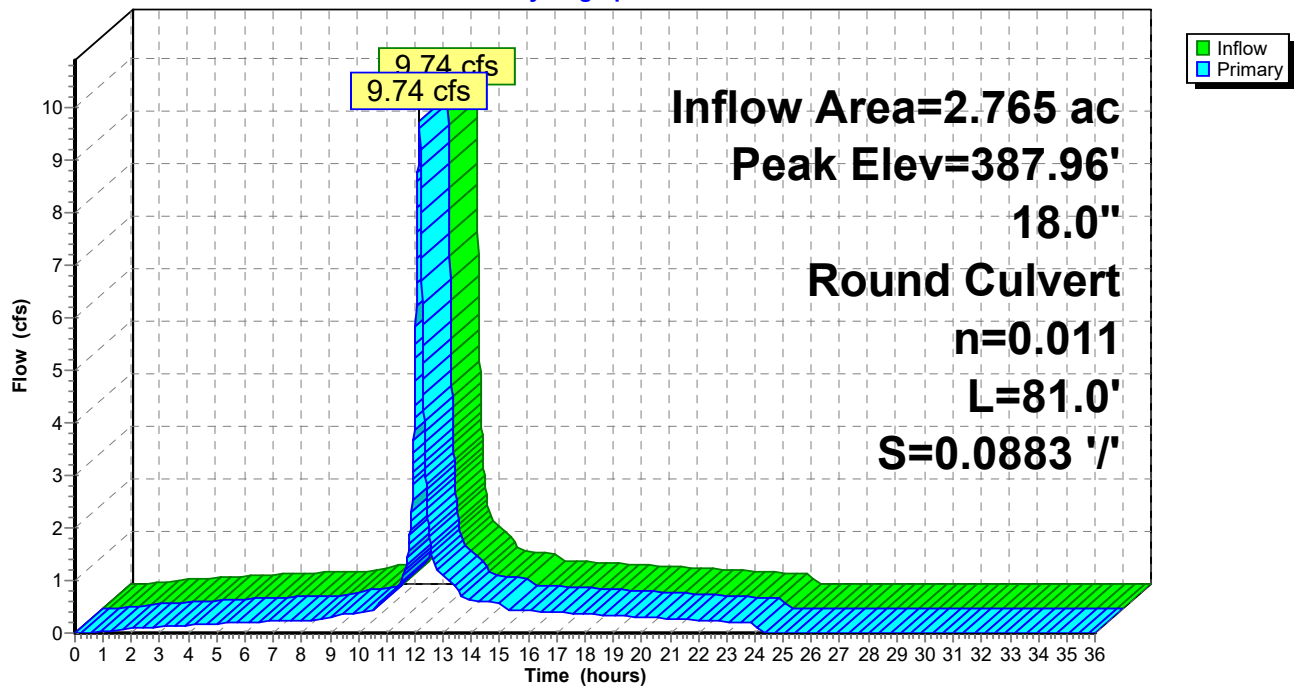
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 387.96' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	385.90'	18.0" Round Culvert L= 81.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 385.90' / 378.75' S= 0.0883 '/ Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=9.72 cfs @ 12.14 hrs HW=387.96' TW=380.45' (Dynamic Tailwater)
 ↳ **1=Culvert** (Inlet Controls 9.72 cfs @ 5.50 fps)

Pond 46P: FD C

Hydrograph



Summary for Pond 47P: Infiltration Field #6

Inflow Area = 2.765 ac, 47.65% Impervious, Inflow Depth = 4.06" for 25-YR event
 Inflow = 9.74 cfs @ 12.14 hrs, Volume= 0.936 af
 Outflow = 1.01 cfs @ 13.17 hrs, Volume= 0.924 af, Atten= 90%, Lag= 61.3 min
 Discarded = 0.28 cfs @ 9.70 hrs, Volume= 0.747 af
 Primary = 0.34 cfs @ 13.17 hrs, Volume= 0.059 af
 Routed to Pond 48P : 30' Level Spreader
 Secondary = 0.39 cfs @ 13.17 hrs, Volume= 0.119 af
 Routed to Pond 51P : 30' Level Spreader

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 382.43' @ 13.17 hrs Surf.Area= 5,127 sf Storage= 15,589 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 370.7 min (1,161.4 - 790.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	378.00'	1,502 cf	15.75'W x 64.67'L x 5.75'H Field A 5,856 cf Overall - 2,102 cf Embedded = 3,754 cf x 40.0% Voids
#2A	378.75'	2,102 cf	Cultec R-902HD v2 x 32 Inside #1 Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 32 Chambers in 2 Rows Cap Storage= 18.0 cf x 2 x 2 rows = 72.1 cf
#3B	378.00'	4,233 cf	37.50'W x 79.33'L x 5.75'H Field B 17,106 cf Overall - 6,524 cf Embedded = 10,582 cf x 40.0% Voids
#4B	378.75'	6,524 cf	Cultec R-902HD v2 x 100 Inside #3 Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 100 Chambers in 5 Rows Cap Storage= 18.0 cf x 2 x 5 rows = 180.2 cf
#5C	378.00'	1,666 cf	15.75'W x 72.00'L x 5.75'H Field C 6,521 cf Overall - 2,356 cf Embedded = 4,164 cf x 40.0% Voids
#6C	378.75'	2,356 cf	Cultec R-902HD v2 x 36 Inside #5 Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 36 Chambers in 2 Rows Cap Storage= 18.0 cf x 2 x 2 rows = 72.1 cf
		18,383 cf	Total Available Storage

Storage Group A created with Chamber Wizard
 Storage Group B created with Chamber Wizard
 Storage Group C created with Chamber Wizard

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Device	Routing	Invert	Outlet Devices
#1	Discarded	378.00'	2.400 in/hr Exfiltration over Surface area
#2	Secondary	378.00'	12.0" Round Culvert L= 173.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 377.00' S= 0.0058 ' /' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#3	Primary	378.00'	12.0" Round Culvert L= 39.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 374.00' S= 0.1026 ' /' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#4	Device 2	379.40'	1.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 2	382.10'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Device 3	382.10'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Primary	378.00'	12.0" Round Culvert L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 374.00' S= 0.0727 ' /' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#8	Device 7	383.55'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.28 cfs @ 9.70 hrs HW=378.07' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.28 cfs)**Primary OutFlow** Max=0.34 cfs @ 13.17 hrs HW=382.43' TW=374.02' (Dynamic Tailwater)↑ **3=Culvert** (Passes 0.34 cfs of 7.50 cfs potential flow)↑ **6=Orifice/Grate** (Orifice Controls 0.34 cfs @ 1.96 fps)↑ **7=Culvert** (Passes 0.00 cfs of 7.50 cfs potential flow)↑ **8=Orifice/Grate** (Controls 0.00 cfs)**Secondary OutFlow** Max=0.39 cfs @ 13.17 hrs HW=382.43' TW=377.03' (Dynamic Tailwater)↑ **2=Culvert** (Passes 0.39 cfs of 5.72 cfs potential flow)↑ **4=Orifice/Grate** (Orifice Controls 0.05 cfs @ 8.33 fps)↑ **5=Orifice/Grate** (Orifice Controls 0.34 cfs @ 1.96 fps)

Pond 47P: Infiltration Field #6 - Chamber Wizard Field A**Chamber Model = Cultec R-902HD v2 (Cultec Recharger® 902HD v2)**

Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf

Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap

Cap Storage= 18.0 cf x 2 x 2 rows = 72.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

16 Chambers/Row x 3.67' Long +2.00' Cap Length x 2 = 62.67' Row Length +12.0" End Stone x 2 =
64.67' Base Length

2 Rows x 78.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 15.75' Base Width

9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

32 Chambers x 63.4 cf + 18.0 cf Cap Volume x 2 x 2 Rows = 2,102.2 cf Chamber Storage

5,856.4 cf Field - 2,102.2 cf Chambers = 3,754.1 cf Stone x 40.0% Voids = 1,501.7 cf Stone Storage

Chamber Storage + Stone Storage = 3,603.9 cf = 0.083 af

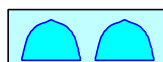
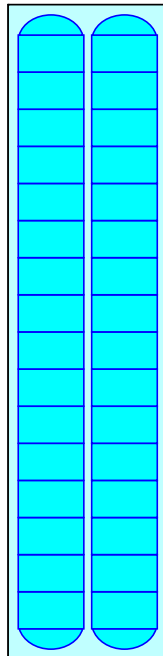
Overall Storage Efficiency = 61.5%

Overall System Size = 64.67' x 15.75' x 5.75'

32 Chambers

216.9 cy Field

139.0 cy Stone



Pond 47P: Infiltration Field #6 - Chamber Wizard Field B

Chamber Model = Cultec R-902HD v2 (Cultec Recharger® 902HD v2)

Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf

Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap

Cap Storage= 18.0 cf x 2 x 5 rows = 180.2 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

20 Chambers/Row x 3.67' Long +2.00' Cap Length x 2 = 77.33' Row Length +12.0" End Stone x 2 = 79.33' Base Length

5 Rows x 78.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.50' Base Width

9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

100 Chambers x 63.4 cf + 18.0 cf Cap Volume x 2 x 5 Rows = 6,524.5 cf Chamber Storage

17,106.2 cf Field - 6,524.5 cf Chambers = 10,581.8 cf Stone x 40.0% Voids = 4,232.7 cf Stone Storage

Chamber Storage + Stone Storage = 10,757.2 cf = 0.247 af

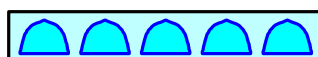
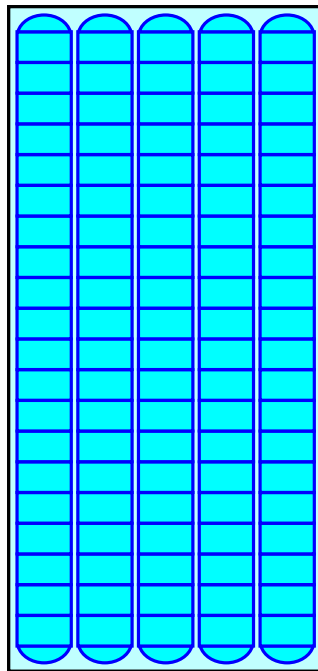
Overall Storage Efficiency = 62.9%

Overall System Size = 79.33' x 37.50' x 5.75'

100 Chambers

633.6 cy Field

391.9 cy Stone



Pond 47P: Infiltration Field #6 - Chamber Wizard Field C**Chamber Model = Cultec R-902HD v2 (Cultec Recharger® 902HD v2)**

Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf

Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap

Cap Storage= 18.0 cf x 2 x 2 rows = 72.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

18 Chambers/Row x 3.67' Long +2.00' Cap Length x 2 = 70.00' Row Length +12.0" End Stone x 2 = 72.00' Base Length

2 Rows x 78.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 15.75' Base Width

9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

36 Chambers x 63.4 cf + 18.0 cf Cap Volume x 2 x 2 Rows = 2,356.0 cf Chamber Storage

6,520.5 cf Field - 2,356.0 cf Chambers = 4,164.5 cf Stone x 40.0% Voids = 1,665.8 cf Stone Storage

Chamber Storage + Stone Storage = 4,021.8 cf = 0.092 af

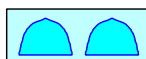
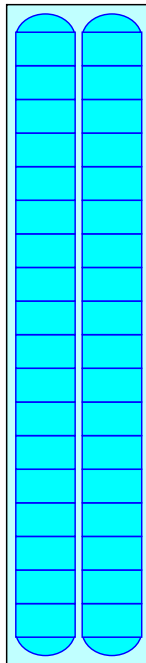
Overall Storage Efficiency = 61.7%

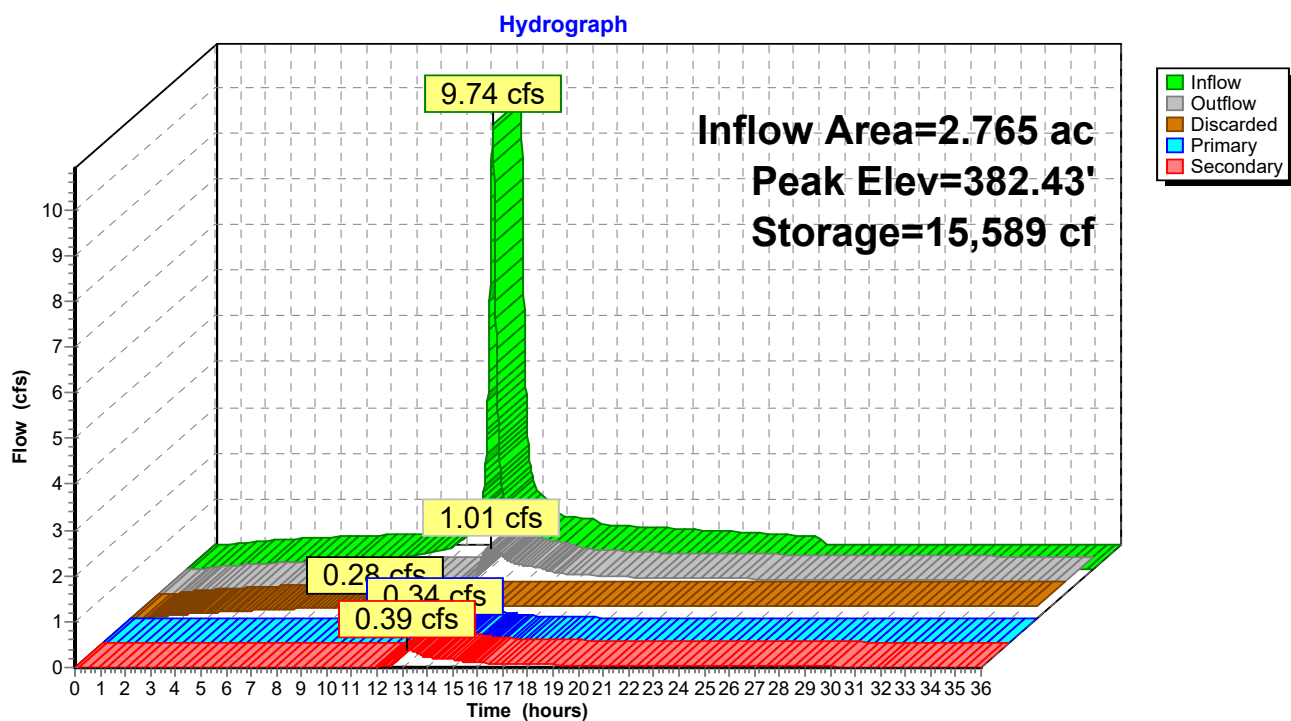
Overall System Size = 72.00' x 15.75' x 5.75'

36 Chambers

241.5 cy Field

154.2 cy Stone



Pond 47P: Infiltration Field #6

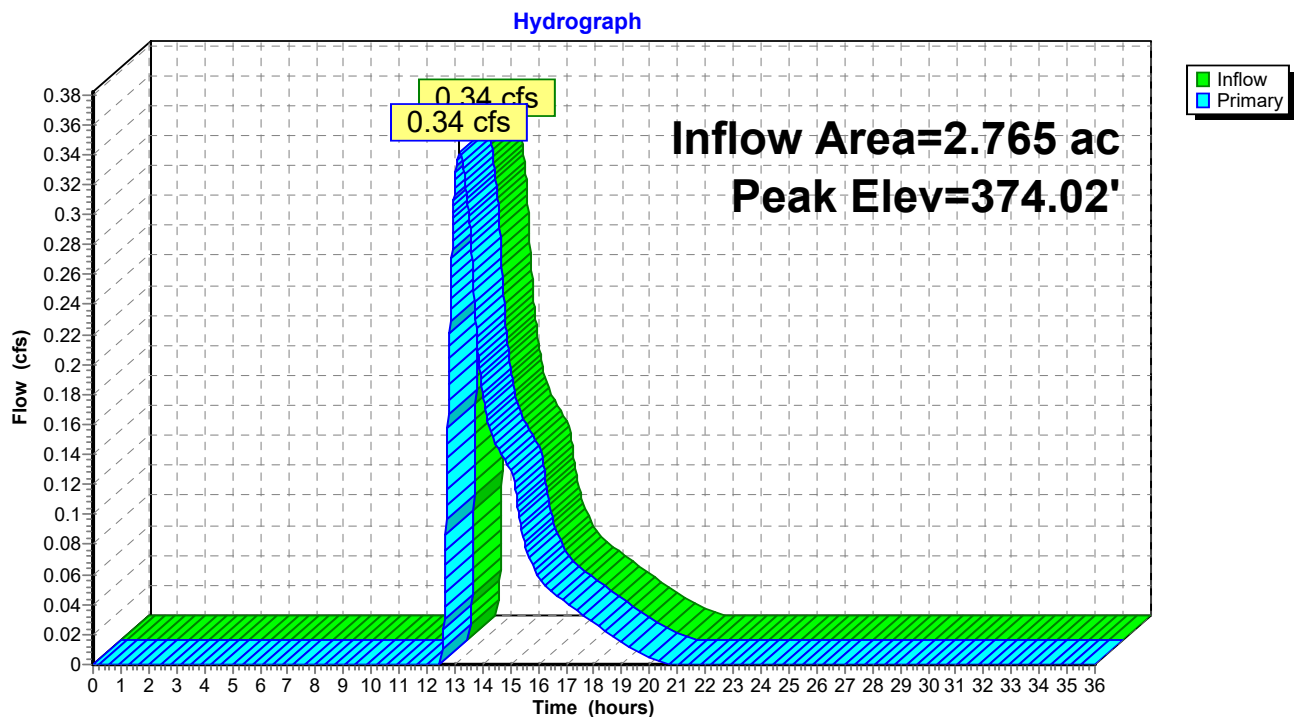
Summary for Pond 48P: 30' Level Spreader

Inflow Area = 2.765 ac, 47.65% Impervious, Inflow Depth = 0.25" for 25-YR event
 Inflow = 0.34 cfs @ 13.17 hrs, Volume= 0.059 af
 Outflow = 0.34 cfs @ 13.17 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.34 cfs @ 13.17 hrs, Volume= 0.059 af
 Routed to Link 50P : Sub-DP #2b: Flow to Northern Abutter

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 374.02' @ 13.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	374.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Elev. (feet) 374.00 375.00 Width (feet) 40.00 40.00

Primary OutFlow Max=0.34 cfs @ 13.17 hrs HW=374.02' TW=0.00' (Dynamic Tailwater)
 1=Custom Weir/Orifice (Weir Controls 0.34 cfs @ 0.45 fps)

Pond 48P: 30' Level Spreader

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NOAA10 24-hr D 25-YR Rainfall=6.37"

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Summary for Subcatchment 49P: P2g

Runoff = 4.15 cfs @ 12.22 hrs, Volume= 0.407 af, Depth= 1.92"

Routed to Link 50P : Sub-DP #2b: Flow to Northern Abutter

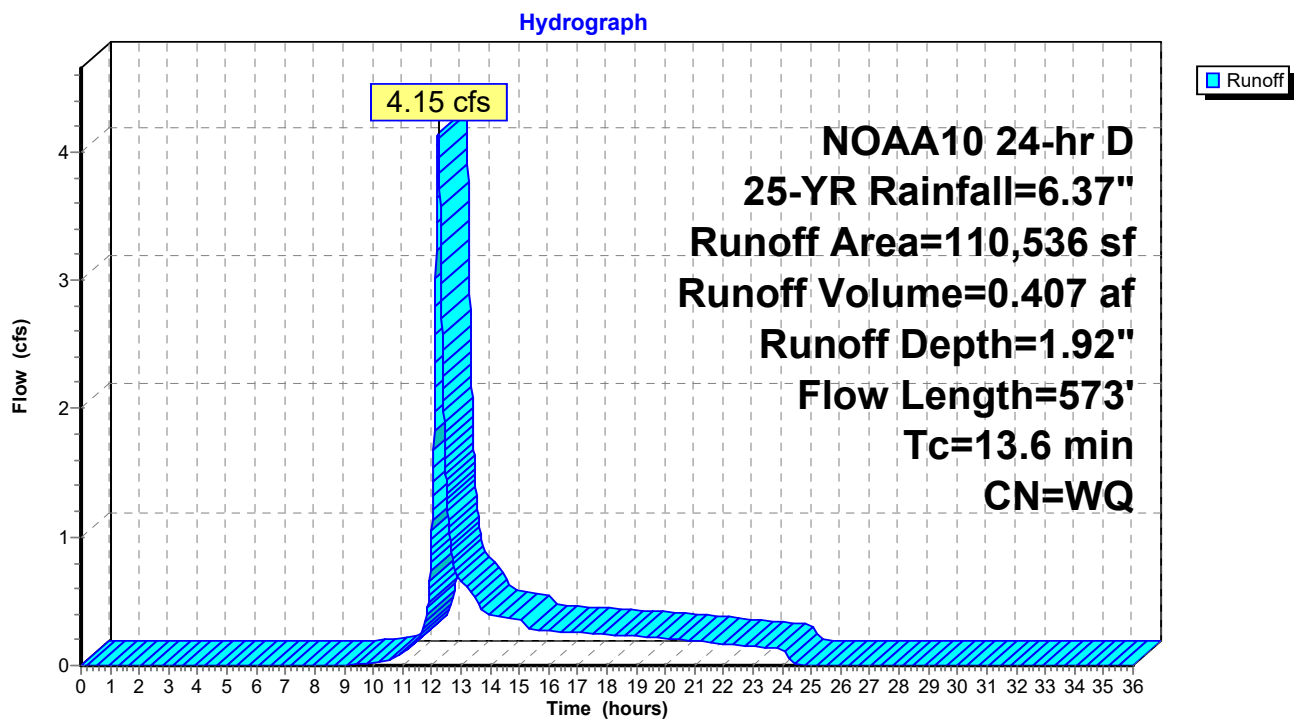
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
918	98	Roofs HSG B
58,029	55	Woods, Good HSG B
9,336	48	Brush, Good, HSG B
42,253	61	>75% Grass cover, Good HSG B
110,536		Weighted Average
109,618		99.17% Pervious Area
918		0.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
1.7	156	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.0	270	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.8	97	0.1800	2.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.6	573	Total			

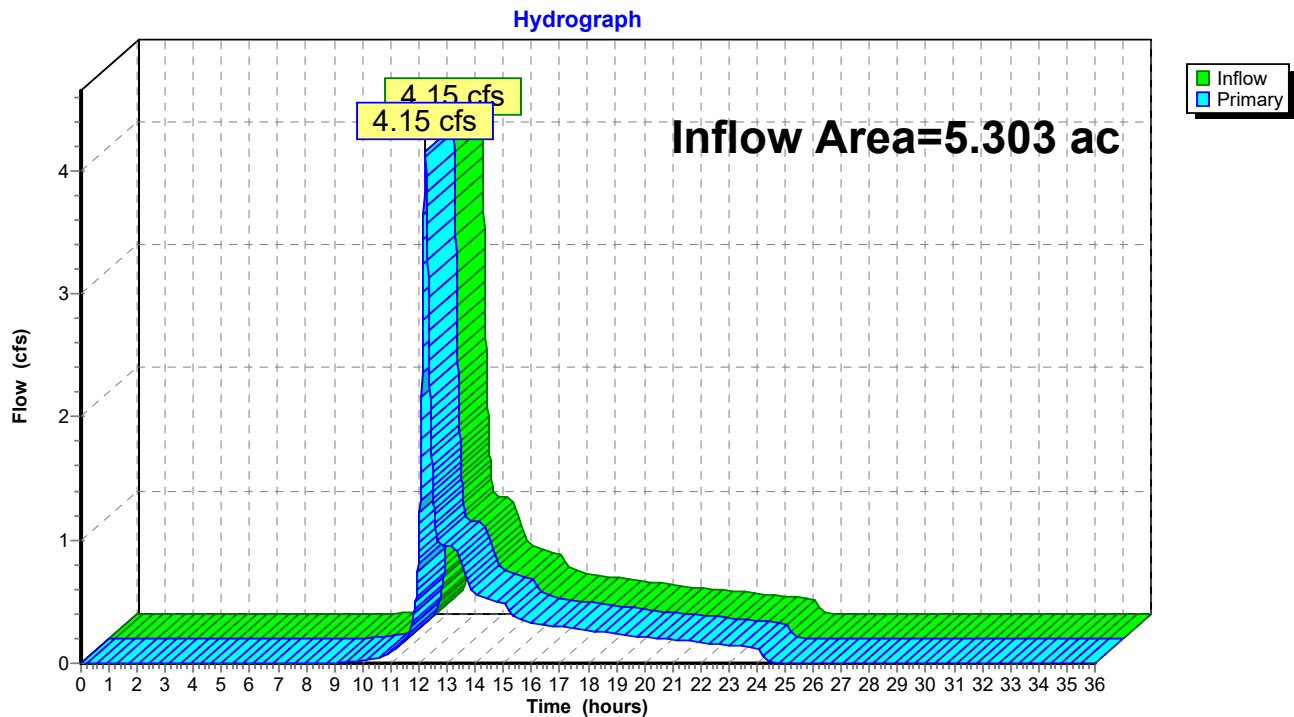
Subcatchment 49P: P2g



Summary for Link 50P: Sub-DP #2b: Flow to Northern Abutter

Inflow Area = 5.303 ac, 25.25% Impervious, Inflow Depth = 1.05" for 25-YR event
Inflow = 4.15 cfs @ 12.22 hrs, Volume= 0.465 af
Primary = 4.15 cfs @ 12.22 hrs, Volume= 0.465 af, Atten= 0%, Lag= 0.0 min
Routed to Link 60P : Design Point #2: Flow to Uncas Brook

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 50P: Sub-DP #2b: Flow to Northern Abutter

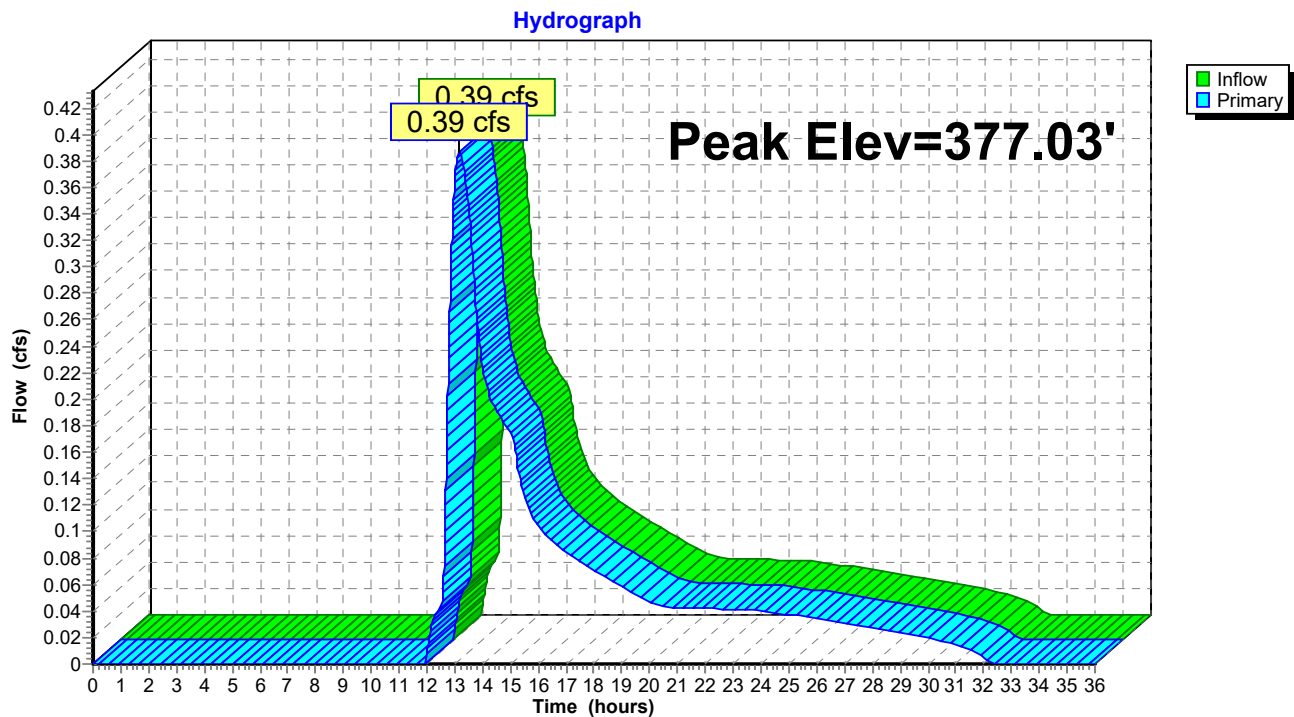
Summary for Pond 51P: 30' Level Spreader

Inflow = 0.39 cfs @ 13.17 hrs, Volume= 0.119 af
Outflow = 0.39 cfs @ 13.17 hrs, Volume= 0.119 af, Atten= 0%, Lag= 0.0 min
Primary = 0.39 cfs @ 13.17 hrs, Volume= 0.119 af
Routed to Link 59P : Sub-DP #2a: Flow to Town Land

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 377.03' @ 13.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	377.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Elev. (feet) 377.00 378.00 Width (feet) 25.00 25.00

Primary OutFlow Max=0.39 cfs @ 13.17 hrs HW=377.03' TW=0.00' (Dynamic Tailwater)
↑1=Custom Weir/Orifice (Weir Controls 0.39 cfs @ 0.55 fps)

Pond 51P: 30' Level Spreader

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Summary for Subcatchment 52P: P2h

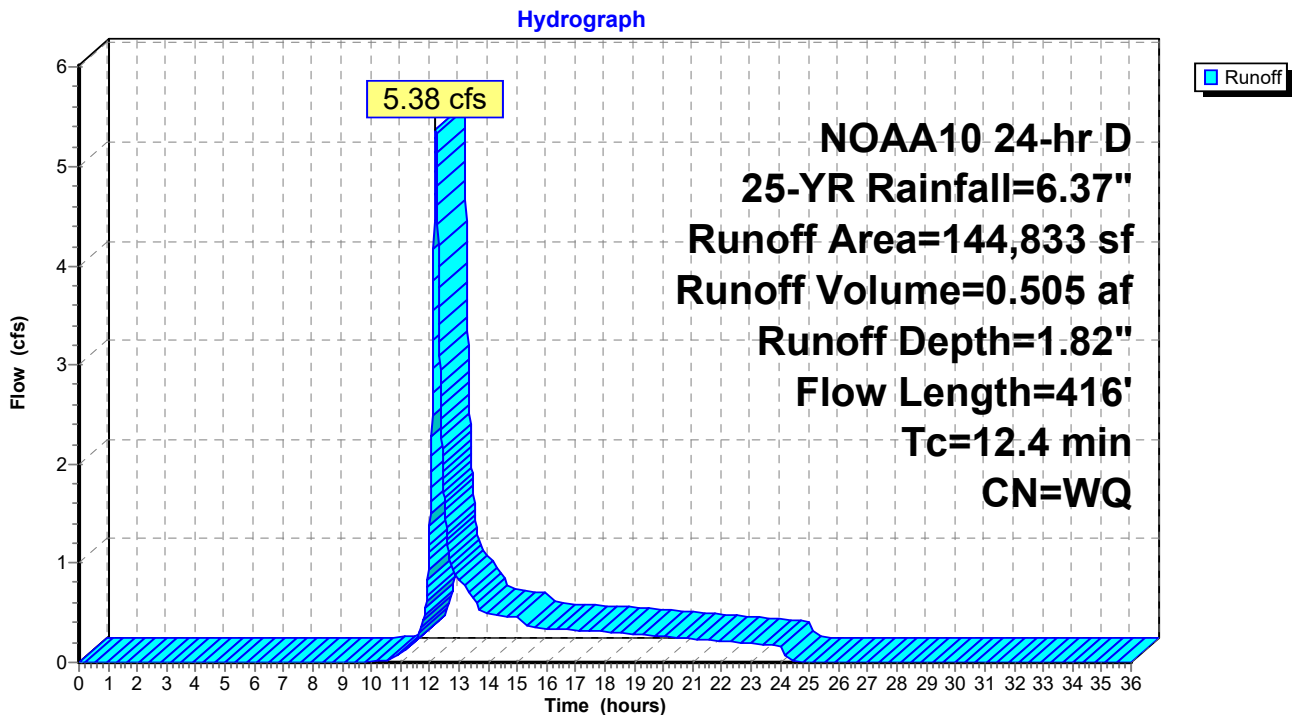
Runoff = 5.38 cfs @ 12.21 hrs, Volume= 0.505 af, Depth= 1.82"
Routed to Link 59P : Sub-DP #2a: Flow to Town Land

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
112,470	55	Woods, Good HSG B
3,868	48	Brush, Good, HSG B
28,495	61	>75% Grass cover, Good HSG B
144,833		Weighted Average
144,833		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	36	0.0200	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
3.1	380	0.1700	2.06		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.4	416	Total			

Subcatchment 52P: P2h



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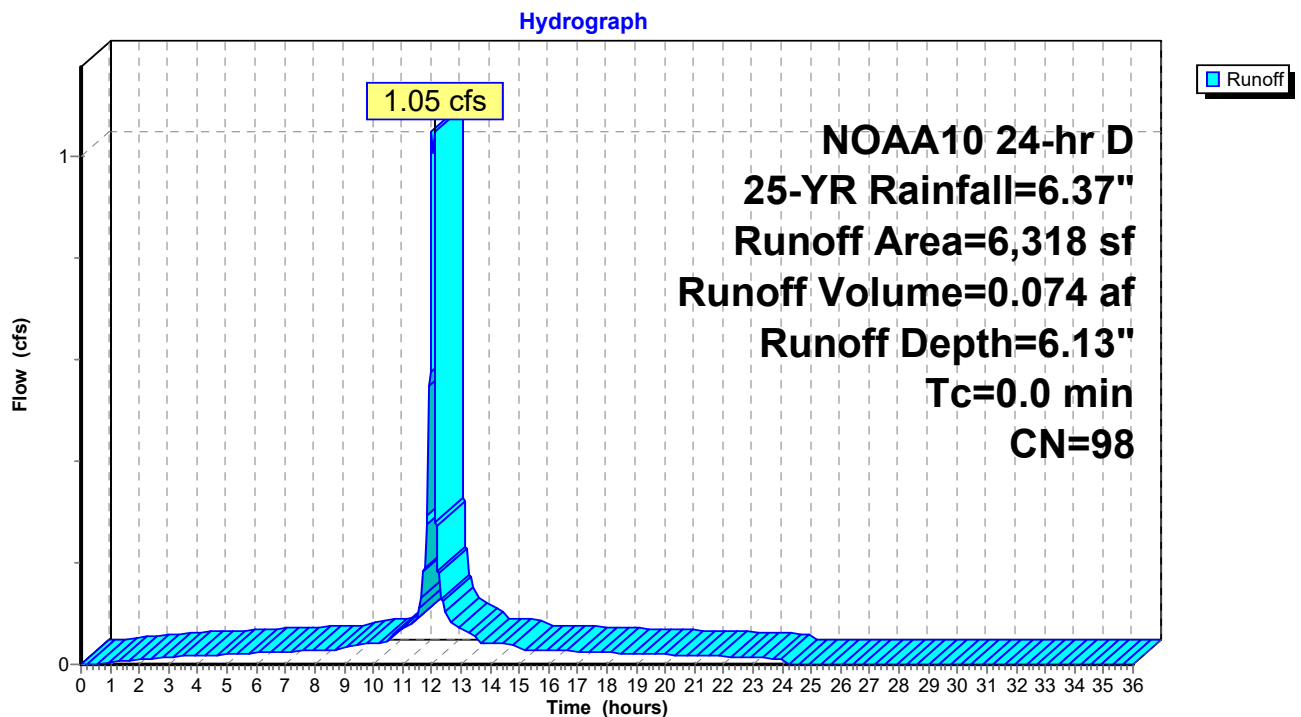
Summary for Subcatchment 53P: R11-19

Runoff = 1.05 cfs @ 12.09 hrs, Volume= 0.074 af, Depth= 6.13"
Routed to Pond 54P : Infiltration Field #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
6,318	98	Roofs, HSG B
6,318		100.00% Impervious Area

Subcatchment 53P: R11-19



Summary for Pond 54P: Infiltration Field #3

Inflow Area = 0.145 ac, 100.00% Impervious, Inflow Depth = 6.13" for 25-YR event
 Inflow = 1.05 cfs @ 12.09 hrs, Volume= 0.074 af
 Outflow = 0.04 cfs @ 10.16 hrs, Volume= 0.074 af, Atten= 97%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 10.16 hrs, Volume= 0.074 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 59P : Sub-DP #2a: Flow to Town Land

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 385.41' @ 15.00 hrs Surf.Area= 644 sf Storage= 1,249 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 285.3 min (1,025.9 - 740.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	382.50'	981 cf	23.00'W x 28.00'L x 5.75'H Field A 3,703 cf Overall - 1,250 cf Embedded = 2,453 cf x 40.0% Voids
#2A	383.25'	1,250 cf	Cultec R-902HD v2 x 18 Inside #1 Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 18 Chambers in 3 Rows Cap Storage= 18.0 cf x 2 x 3 rows = 108.1 cf
		2,231 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	382.50'	2.400 in/hr Exfiltration over Surface area
#2	Primary	386.25'	8.0" Round Culvert L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 386.25' / 380.00' S= 0.0727 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Discarded OutFlow Max=0.04 cfs @ 10.16 hrs HW=382.56' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=382.50' TW=0.00' (Dynamic Tailwater)

↑ **2=Culvert** (Controls 0.00 cfs)

Pond 54P: Infiltration Field #3 - Chamber Wizard Field A**Chamber Model = Cultec R-902HD v2 (Cultec Recharger® 902HD v2)**

Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf

Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap

Cap Storage= 18.0 cf x 2 x 3 rows = 108.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

6 Chambers/Row x 3.67' Long +2.00' Cap Length x 2 = 26.00' Row Length +12.0" End Stone x 2 = 28.00' Base Length

3 Rows x 78.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 23.00' Base Width

9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

18 Chambers x 63.4 cf + 18.0 cf Cap Volume x 2 x 3 Rows = 1,250.1 cf Chamber Storage

3,703.0 cf Field - 1,250.1 cf Chambers = 2,452.9 cf Stone x 40.0% Voids = 981.2 cf Stone Storage

Chamber Storage + Stone Storage = 2,231.3 cf = 0.051 af

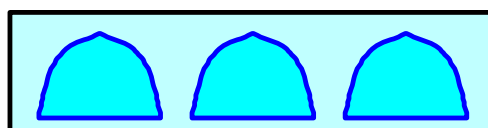
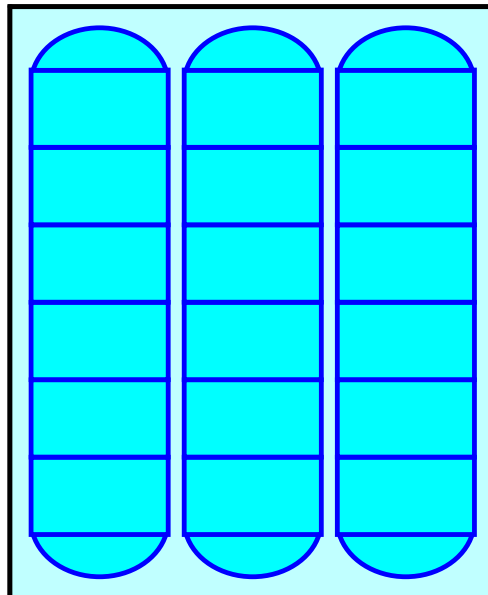
Overall Storage Efficiency = 60.3%

Overall System Size = 28.00' x 23.00' x 5.75'

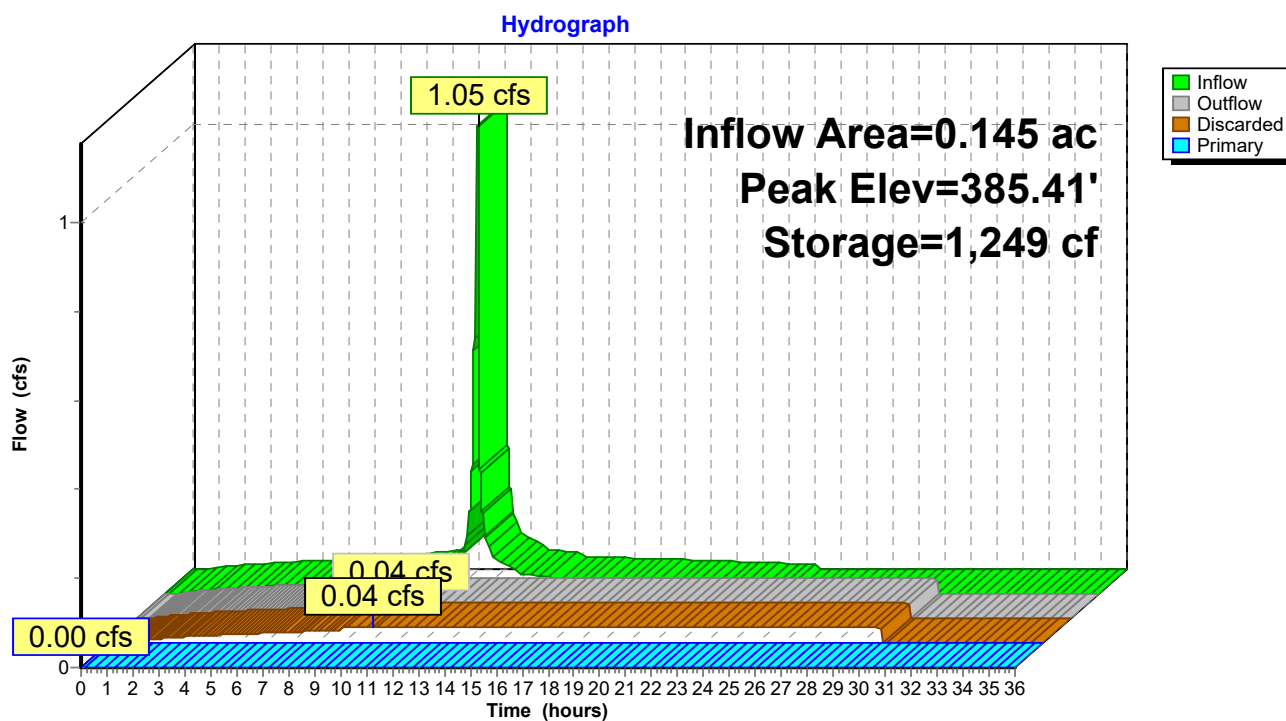
18 Chambers

137.1 cy Field

90.8 cy Stone



Pond 54P: Infiltration Field #3



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Summary for Subcatchment 55P: R20-28

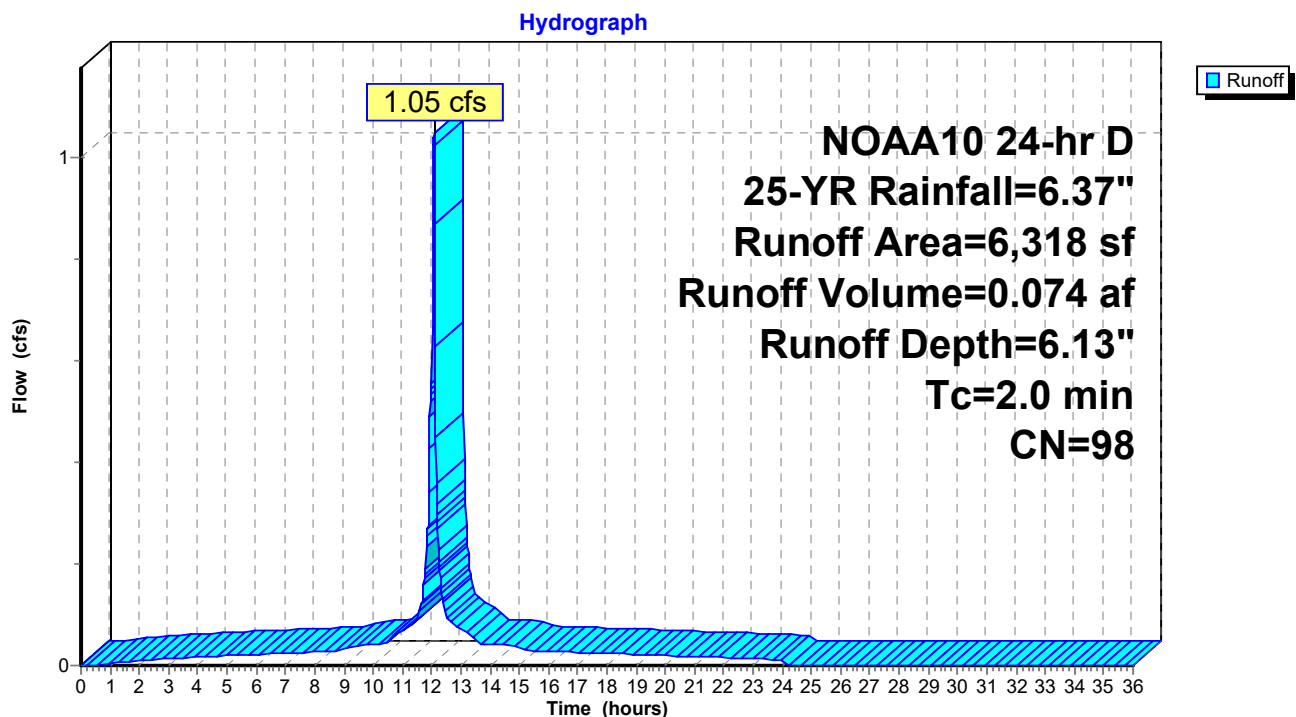
Runoff = 1.05 cfs @ 12.10 hrs, Volume= 0.074 af, Depth= 6.13"
Routed to Pond 56P : Infiltration Field #4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
6,318	98	Roofs, HSG B
6,318		100.00% Impervious Area

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

Subcatchment 55P: R20-28



Summary for Pond 56P: Infiltration Field #4

Inflow Area = 0.145 ac, 100.00% Impervious, Inflow Depth = 6.13" for 25-YR event
 Inflow = 1.05 cfs @ 12.10 hrs, Volume= 0.074 af
 Outflow = 0.06 cfs @ 11.25 hrs, Volume= 0.074 af, Atten= 94%, Lag= 0.0 min
 Discarded = 0.06 cfs @ 11.25 hrs, Volume= 0.074 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 59P : Sub-DP #2a: Flow to Town Land

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 388.79' @ 13.24 hrs Surf.Area= 1,134 sf Storage= 915 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 92.3 min (834.8 - 742.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	387.50'	822 cf	21.00'W x 54.00'L x 2.54'H Field A 2,882 cf Overall - 826 cf Embedded = 2,056 cf x 40.0% Voids
#2A	388.00'	826 cf	Cultec R-150XLHD x 30 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 6 rows
		1,649 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	387.50'	2.400 in/hr Exfiltration over Surface area
#2	Primary	389.50'	8.0" Round Culvert L= 137.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 389.50' / 380.00' S= 0.0693 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Discarded OutFlow Max=0.06 cfs @ 11.25 hrs HW=387.53' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=387.50' TW=0.00' (Dynamic Tailwater)

↑**2=Culvert** (Controls 0.00 cfs)

Pond 56P: Infiltration Field #4 - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 6 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

5 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 52.00' Row Length +12.0" End Stone x 2 = 54.00' Base Length

6 Rows x 33.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 21.00' Base Width

6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

30 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 6 Rows = 826.5 cf Chamber Storage

2,882.3 cf Field - 826.5 cf Chambers = 2,055.8 cf Stone x 40.0% Voids = 822.3 cf Stone Storage

Chamber Storage + Stone Storage = 1,648.8 cf = 0.038 af

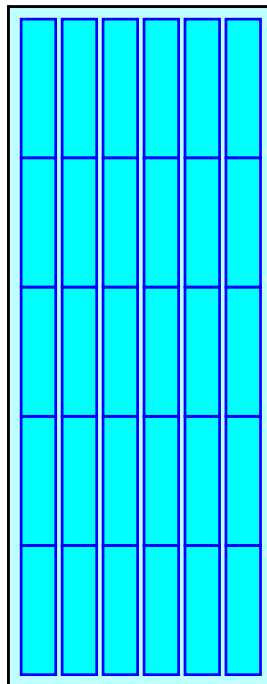
Overall Storage Efficiency = 57.2%

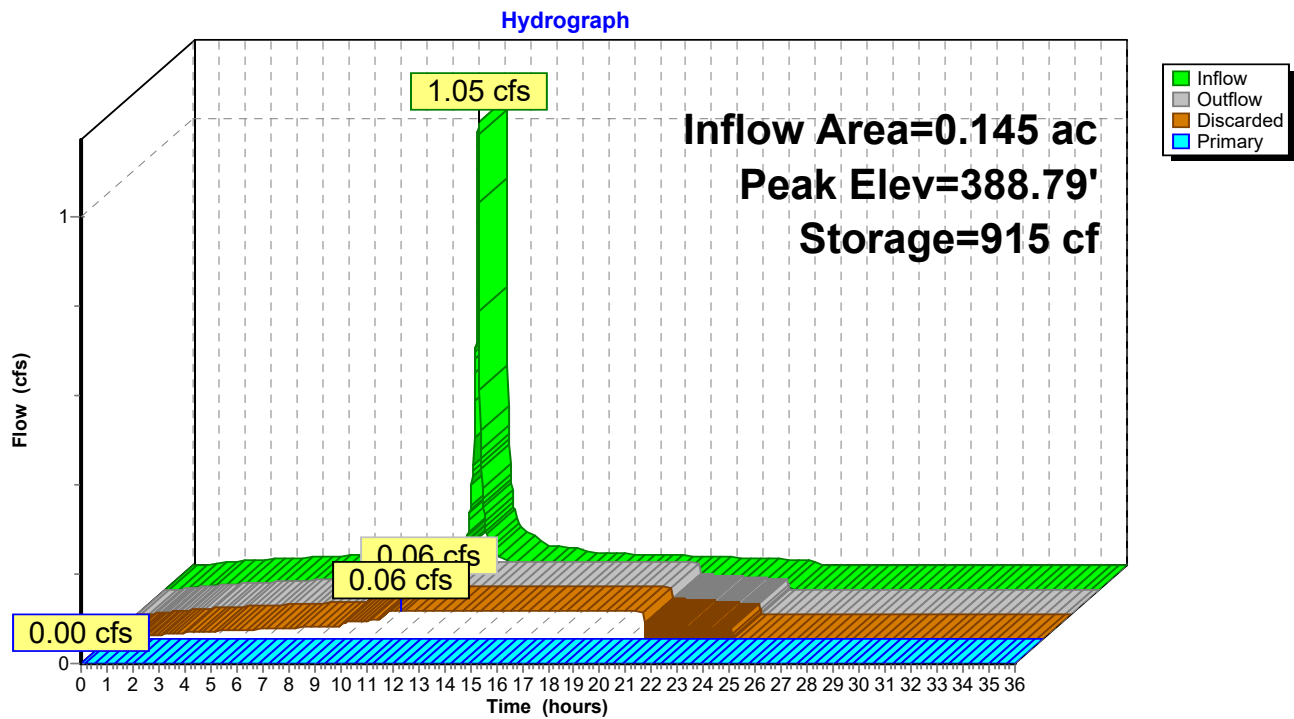
Overall System Size = 54.00' x 21.00' x 2.54'

30 Chambers

106.8 cy Field

76.1 cy Stone



Pond 56P: Infiltration Field #4

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Summary for Subcatchment 57P: R2-3, 27-28

Runoff = 0.47 cfs @ 12.10 hrs, Volume= 0.033 af, Depth= 6.13"
Routed to Pond 58P : Infiltration Field #5

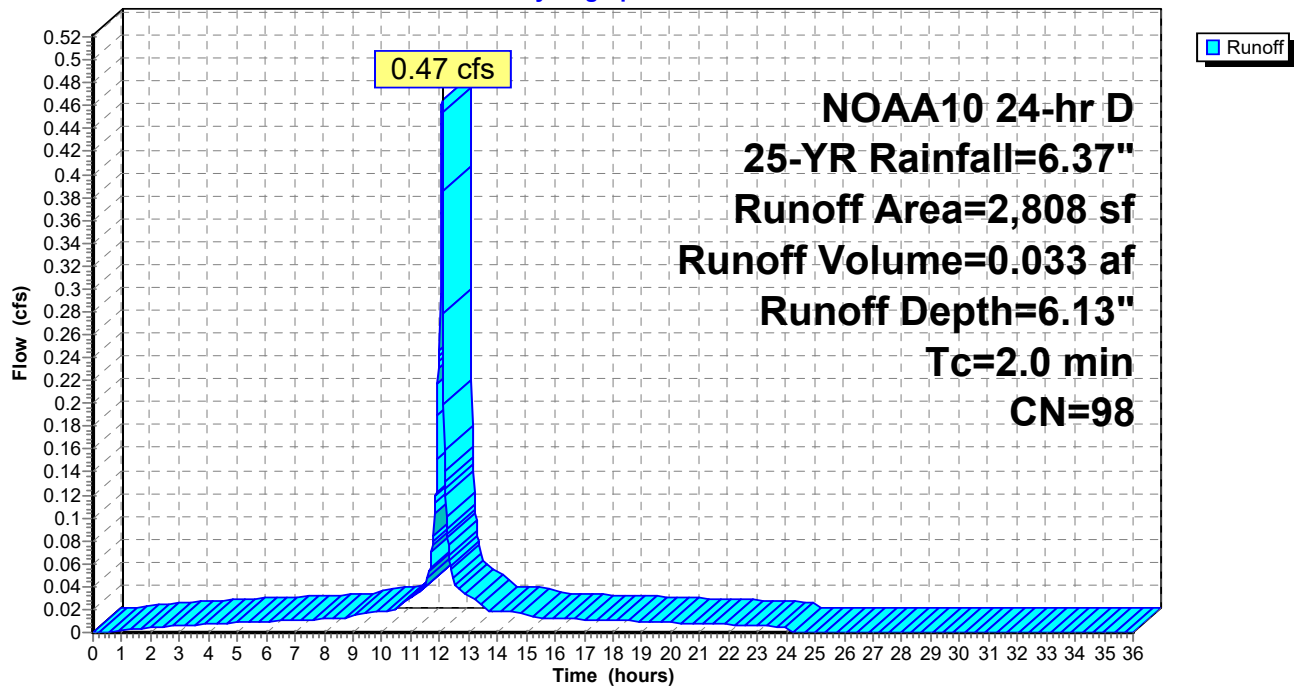
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 25-YR Rainfall=6.37"

Area (sf)	CN	Description
2,808	98	Roofs, HSG B
2,808		100.00% Impervious Area

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

Subcatchment 57P: R2-3, 27-28

Hydrograph



Summary for Pond 58P: Infiltration Field #5

Inflow Area = 0.064 ac, 100.00% Impervious, Inflow Depth = 6.13" for 25-YR event
 Inflow = 0.47 cfs @ 12.10 hrs, Volume= 0.033 af
 Outflow = 0.03 cfs @ 11.17 hrs, Volume= 0.033 af, Atten= 94%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 11.17 hrs, Volume= 0.033 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 407.08' @ 13.33 hrs Surf.Area= 486 sf Storage= 416 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 100.1 min (842.6 - 742.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	405.70'	360 cf	14.50'W x 33.50'L x 2.54'H Field A 1,235 cf Overall - 334 cf Embedded = 901 cf x 40.0% Voids
#2A	406.20'	334 cf	Cultec R-150XLHD x 12 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 4 rows
		694 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	405.70'	2.400 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.03 cfs @ 11.17 hrs HW=405.73' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 58P: Infiltration Field #5 - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 4 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

3 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 31.50' Row Length +12.0" End Stone x 2 =
33.50' Base Length

4 Rows x 33.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 14.50' Base Width

6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

12 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 4 Rows = 333.8 cf Chamber Storage

1,234.6 cf Field - 333.8 cf Chambers = 900.8 cf Stone x 40.0% Voids = 360.3 cf Stone Storage

Chamber Storage + Stone Storage = 694.1 cf = 0.016 af

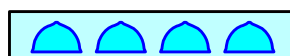
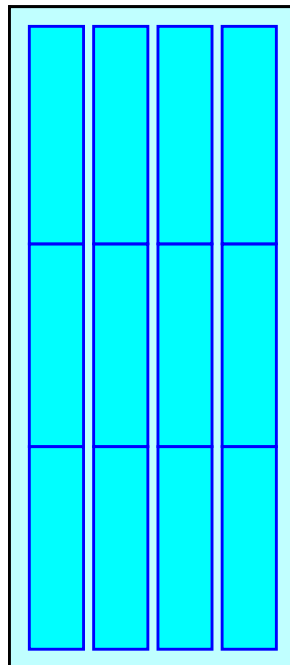
Overall Storage Efficiency = 56.2%

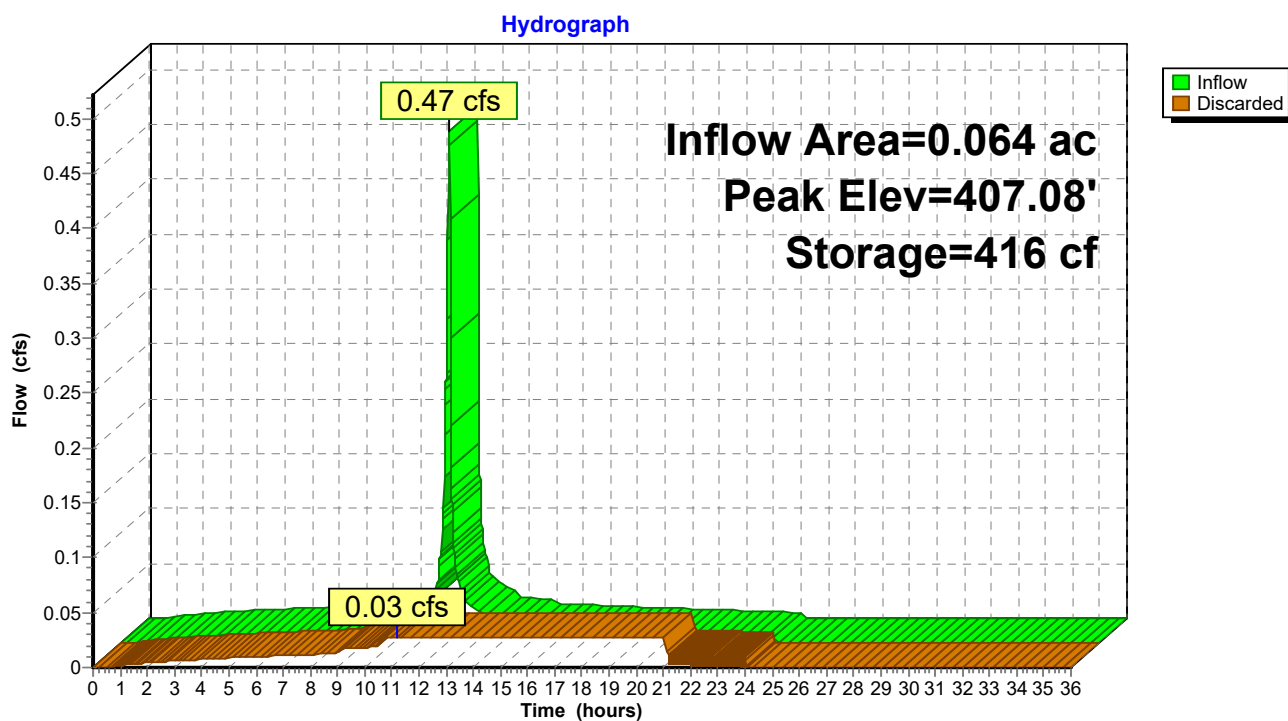
Overall System Size = 33.50' x 14.50' x 2.54'

12 Chambers

45.7 cy Field

33.4 cy Stone

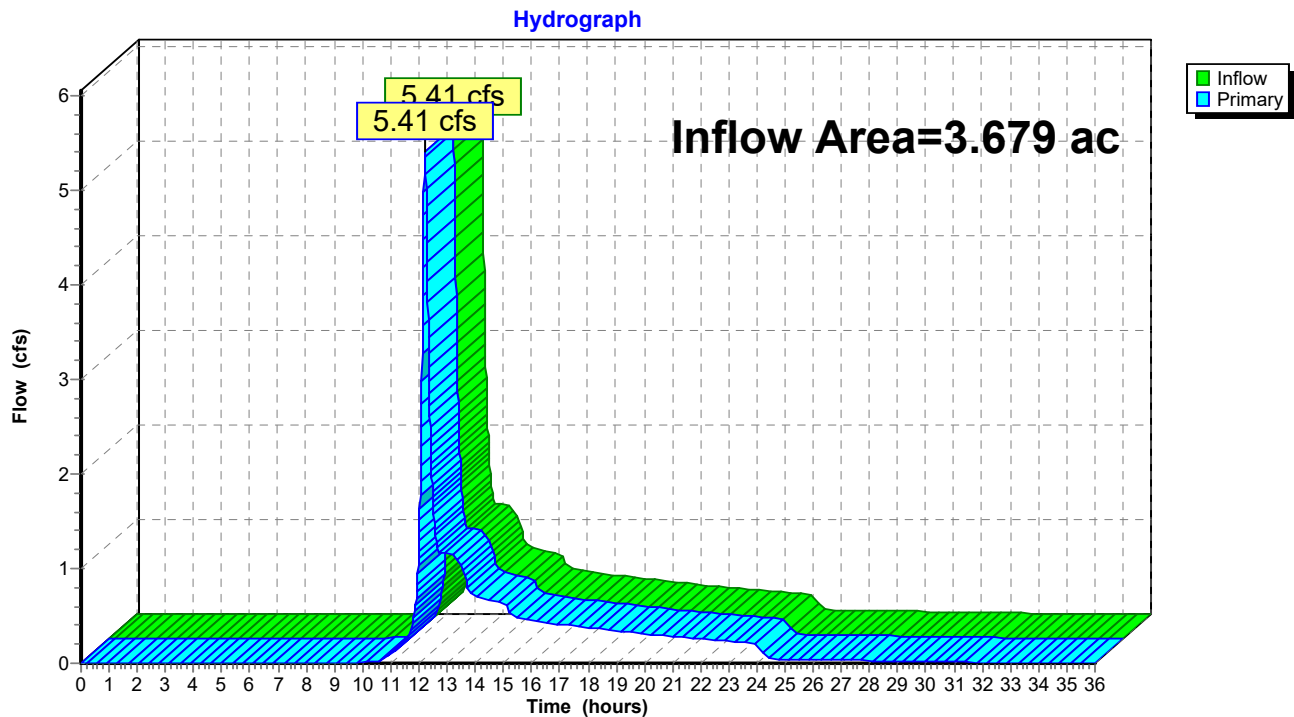


Pond 58P: Infiltration Field #5

Summary for Link 59P: Sub-DP #2a: Flow to Town Land

Inflow Area = 3.679 ac, 9.64% Impervious, Inflow Depth = 2.03" for 25-YR event
Inflow = 5.41 cfs @ 12.21 hrs, Volume= 0.624 af
Primary = 5.41 cfs @ 12.21 hrs, Volume= 0.624 af, Atten= 0%, Lag= 0.0 min
Routed to Link 60P : Design Point #2: Flow to Uncas Brook

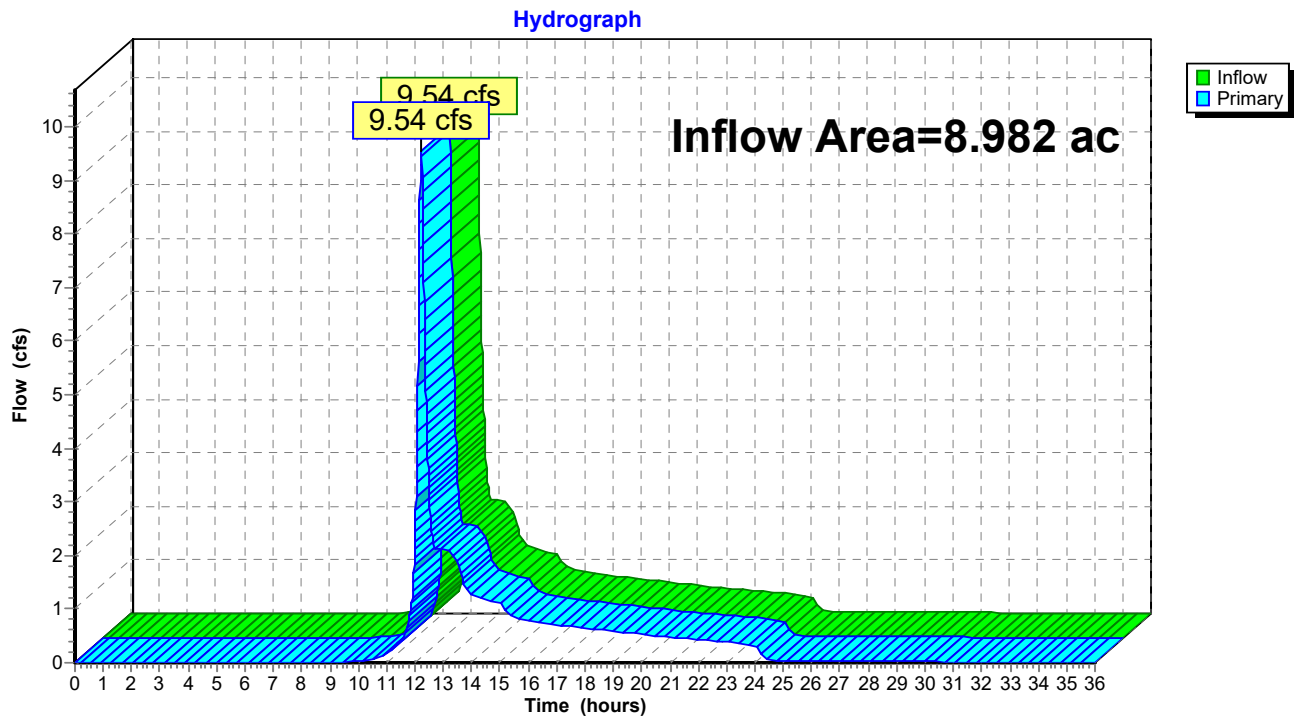
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 59P: Sub-DP #2a: Flow to Town Land

Summary for Link 60P: Design Point #2: Flow to Uncas Brook

Inflow Area = 8.982 ac, 18.85% Impervious, Inflow Depth = 1.45" for 25-YR event
Inflow = 9.54 cfs @ 12.22 hrs, Volume= 1.089 af
Primary = 9.54 cfs @ 12.22 hrs, Volume= 1.089 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 60P: Design Point #2: Flow to Uncas Brook

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment30P: P2a

Runoff Area=16,661 sf 55.72% Impervious Runoff Depth=5.85"
Flow Length=287' Tc=11.0 min CN=WQ Runoff=2.00 cfs 0.186 af

Pond 31P: CB 5+55R

Peak Elev=402.77' Inflow=2.00 cfs 0.186 af
12.0" Round Culvert n=0.011 L=10.0' S=0.0400 '/' Outflow=2.00 cfs 0.186 af

Subcatchment32P: P2b

Runoff Area=11,091 sf 55.26% Impervious Runoff Depth=5.96"
Flow Length=209' Tc=7.7 min CN=WQ Runoff=1.56 cfs 0.127 af

Pond 33P: CB 5+55L

Peak Elev=402.65' Inflow=1.56 cfs 0.127 af
12.0" Round Culvert n=0.011 L=14.0' S=0.0286 '/' Outflow=1.56 cfs 0.127 af

Pond 34P: DMH 5+68

Peak Elev=402.49' Inflow=3.47 cfs 0.313 af
12.0" Round Culvert n=0.011 L=61.0' S=0.0287 '/' Outflow=3.47 cfs 0.313 af

Pond 35P: DMH 6+33

Peak Elev=400.99' Inflow=3.47 cfs 0.313 af
12.0" Round Culvert n=0.011 L=112.0' S=0.0326 '/' Outflow=3.47 cfs 0.313 af

Subcatchment36P: P2c

Runoff Area=12,059 sf 71.70% Impervious Runoff Depth=6.68"
Flow Length=265' Tc=5.7 min CN=WQ Runoff=2.02 cfs 0.154 af

Pond 37P: CB 7+36R

Peak Elev=397.97' Inflow=2.02 cfs 0.154 af
12.0" Round Culvert n=0.011 L=11.0' S=0.0273 '/' Outflow=2.02 cfs 0.154 af

Subcatchment38P: P2d

Runoff Area=10,116 sf 58.55% Impervious Runoff Depth=6.11"
Flow Length=247' Tc=3.3 min CN=WQ Runoff=1.72 cfs 0.118 af

Pond 39P: CB 7+36L

Peak Elev=397.83' Inflow=1.72 cfs 0.118 af
12.0" Round Culvert n=0.011 L=23.0' S=0.0130 '/' Outflow=1.72 cfs 0.118 af

Pond 40P: DMH 7+50

Peak Elev=397.68' Inflow=6.76 cfs 0.585 af
15.0" Round Culvert n=0.011 L=95.0' S=0.0395 '/' Outflow=6.76 cfs 0.585 af

Subcatchment41P: P2e

Runoff Area=64,914 sf 33.60% Impervious Runoff Depth=4.96"
Flow Length=410' Tc=9.9 min CN=WQ Runoff=7.16 cfs 0.616 af

Pond 42P: CB 8+23

Peak Elev=395.39' Inflow=7.16 cfs 0.616 af
15.0" Round Culvert n=0.011 L=6.0' S=0.0167 '/' Outflow=7.16 cfs 0.616 af

Subcatchment43P: P2f

Runoff Area=5,603 sf 100.00% Impervious Runoff Depth=7.91"
Tc=0.0 min CN=98 Runoff=1.19 cfs 0.085 af

Pond 44P: Roof Drain

Peak Elev=408.84' Inflow=1.19 cfs 0.085 af
8.0" Round Culvert n=0.011 L=320.0' S=0.0500 '/' Outflow=1.19 cfs 0.085 af

Pond 45P: DMH 8+26

Peak Elev=391.71' Inflow=13.55 cfs 1.286 af
18.0" Round Culvert n=0.011 L=41.0' S=0.0244 '/' Outflow=13.55 cfs 1.286 af

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Pond 46P: FD CPeak Elev=389.19' Inflow=13.55 cfs 1.286 af
18.0" Round Culvert n=0.011 L=81.0' S=0.0883 ' Outflow=13.55 cfs 1.286 af**Pond 47P: Infiltration Field #6**Peak Elev=383.70' Storage=18,272 cf Inflow=13.55 cfs 1.286 af
Discarded=0.28 cfs 0.780 af Primary=1.98 cfs 0.205 af Secondary=1.94 cfs 0.269 af Outflow=4.21 cfs 1.255 af**Pond 48P: 30' Level Spreader**Peak Elev=374.06' Inflow=1.98 cfs 0.205 af
Outflow=1.98 cfs 0.205 af**Subcatchment49P: P2g**Runoff Area=110,536 sf 0.83% Impervious Runoff Depth=3.12"
Flow Length=573' Tc=13.6 min CN=WQ Runoff=7.03 cfs 0.660 af**Link 50P: Sub-DP #2b: Flow to Northern Abutter**Inflow=8.31 cfs 0.865 af
Primary=8.31 cfs 0.865 af**Pond 51P: 30' Level Spreader**Peak Elev=377.08' Inflow=1.94 cfs 0.269 af
Outflow=1.94 cfs 0.269 af**Subcatchment52P: P2h**Runoff Area=144,833 sf 0.00% Impervious Runoff Depth=3.00"
Flow Length=416' Tc=12.4 min CN=WQ Runoff=9.27 cfs 0.831 af**Subcatchment53P: R11-19**Runoff Area=6,318 sf 100.00% Impervious Runoff Depth=7.91"
Tc=0.0 min CN=98 Runoff=1.34 cfs 0.096 af**Pond 54P: Infiltration Field #3**Peak Elev=386.36' Storage=1,665 cf Inflow=1.34 cfs 0.096 af
Discarded=0.04 cfs 0.091 af Primary=0.04 cfs 0.005 af Outflow=0.08 cfs 0.096 af**Subcatchment55P: R20-28**Runoff Area=6,318 sf 100.00% Impervious Runoff Depth=7.91"
Tc=2.0 min CN=98 Runoff=1.34 cfs 0.096 af**Pond 56P: Infiltration Field #4**Peak Elev=389.40' Storage=1,352 cf Inflow=1.34 cfs 0.096 af
Discarded=0.06 cfs 0.096 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.096 af**Subcatchment57P: R2-3, 27-28**Runoff Area=2,808 sf 100.00% Impervious Runoff Depth=7.91"
Tc=2.0 min CN=98 Runoff=0.60 cfs 0.042 af**Pond 58P: Infiltration Field #5**Peak Elev=407.82' Storage=612 cf Inflow=0.60 cfs 0.042 af
Outflow=0.03 cfs 0.042 af**Link 59P: Sub-DP #2a: Flow to Town Land**Inflow=10.36 cfs 1.105 af
Primary=10.36 cfs 1.105 af**Link 60P: Design Point #2: Flow to Uncas Brook**Inflow=18.60 cfs 1.970 af
Primary=18.60 cfs 1.970 af**Total Runoff Area = 8.982 ac Runoff Volume = 3.011 af Average Runoff Depth = 4.02"**
81.15% Pervious = 7.289 ac 18.85% Impervious = 1.693 ac

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Summary for Subcatchment 30P: P2a

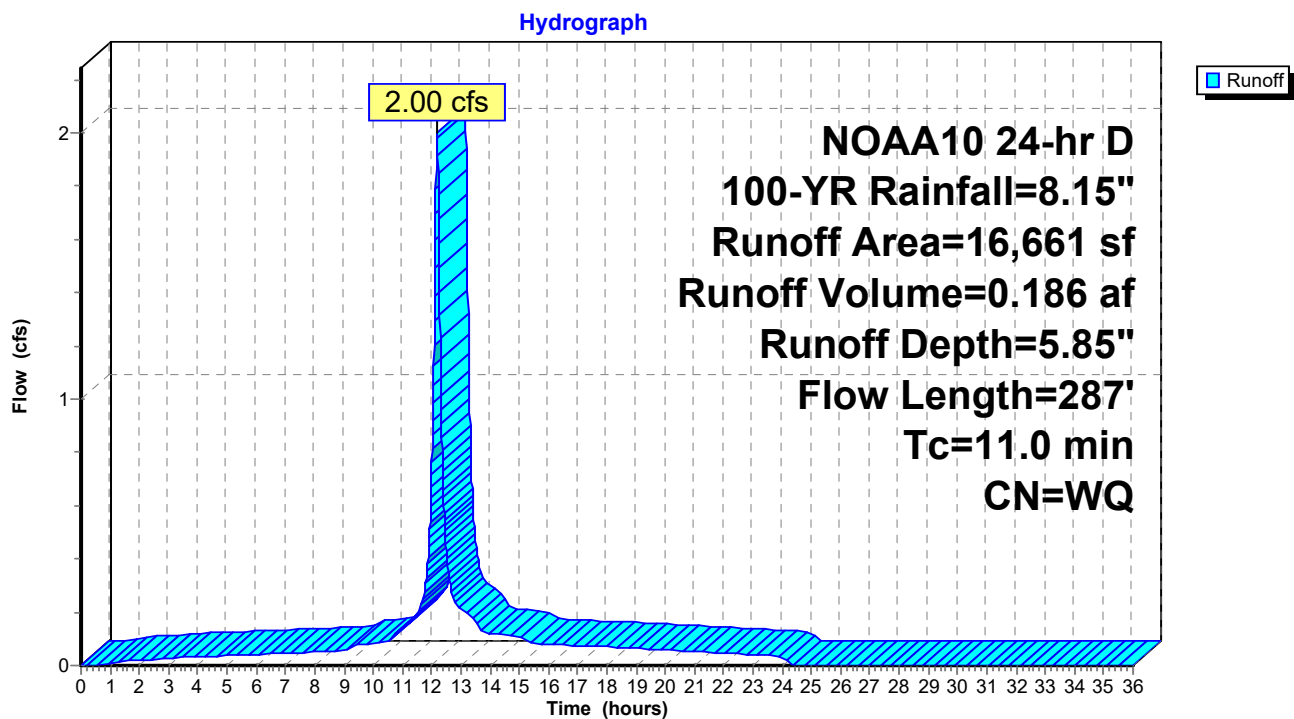
Runoff = 2.00 cfs @ 12.18 hrs, Volume= 0.186 af, Depth= 5.85"
 Routed to Pond 31P : CB 5+55R

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
7,449	98	Paved parking HSG B
3,408	55	Woods, Good HSG B
1,835	98	Roofs HSG B
3,969	61	>75% Grass cover, Good HSG B
16,661		Weighted Average
7,377		44.28% Pervious Area
9,284		55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	36	0.0200	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
0.8	35	0.0200	0.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	26	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.6	190	0.0600	4.97		Shallow Concentrated Flow, Paved Kv= 20.3 fps
11.0	287	Total			

Subcatchment 30P: P2a



Summary for Pond 31P: CB 5+55R

Inflow Area = 0.382 ac, 55.72% Impervious, Inflow Depth = 5.85" for 100-YR event
 Inflow = 2.00 cfs @ 12.18 hrs, Volume= 0.186 af
 Outflow = 2.00 cfs @ 12.18 hrs, Volume= 0.186 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.00 cfs @ 12.18 hrs, Volume= 0.186 af
 Routed to Pond 34P : DMH 5+68

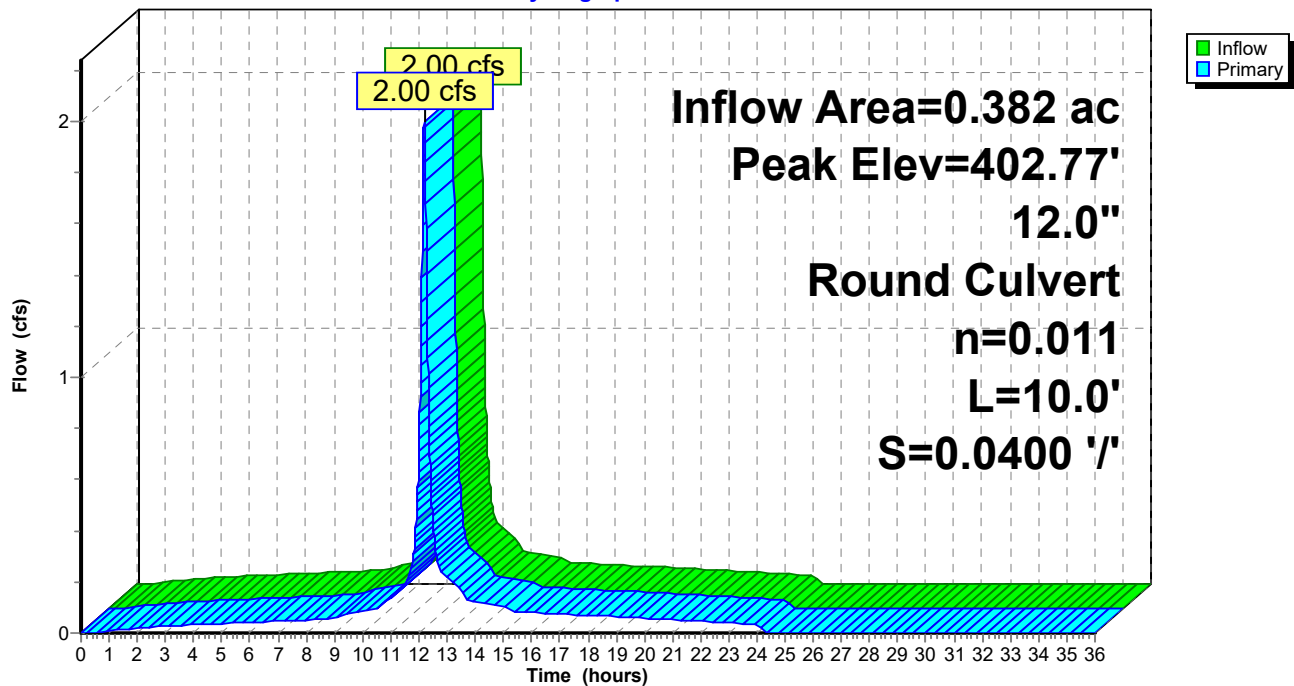
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 402.77' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	401.60'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.60' / 401.20' S= 0.0400 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=2.11 cfs @ 12.18 hrs HW=402.76' TW=402.44' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 2.11 cfs @ 2.69 fps)

Pond 31P: CB 5+55R

Hydrograph



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Summary for Subcatchment 32P: P2b

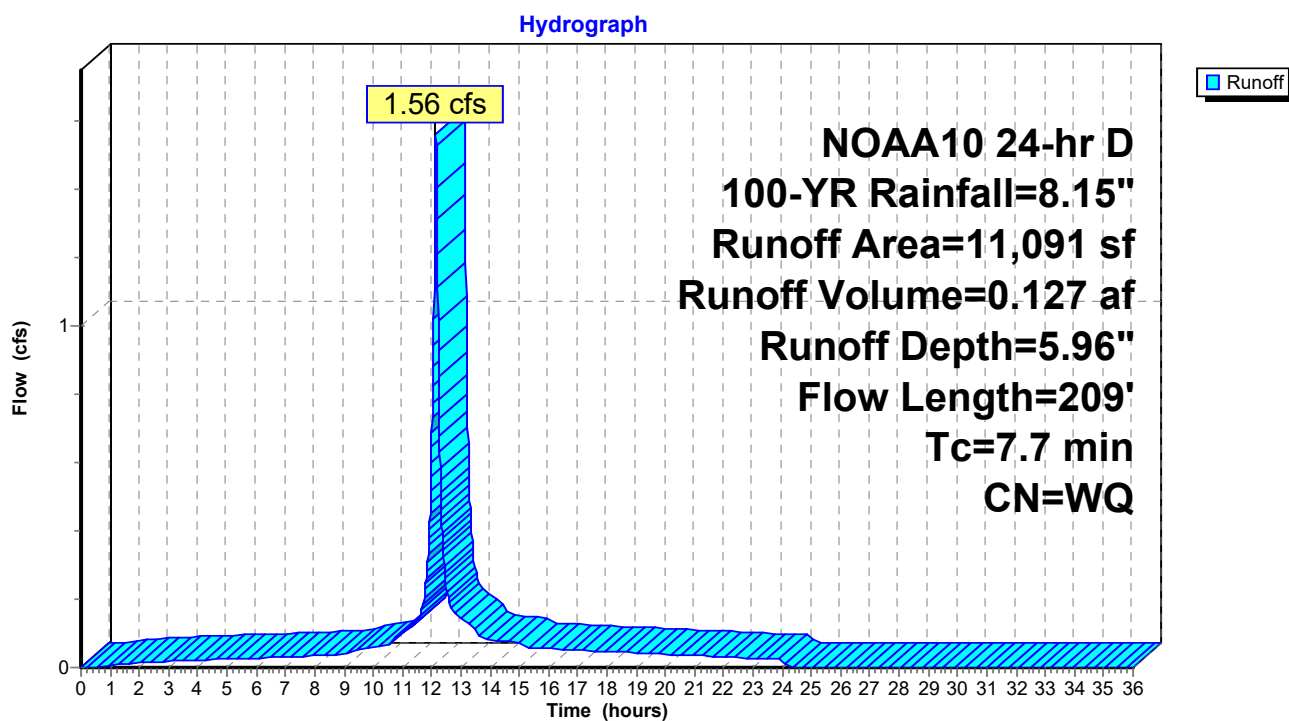
Runoff = 1.56 cfs @ 12.15 hrs, Volume= 0.127 af, Depth= 5.96"
 Routed to Pond 33P : CB 5+55L

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
4,725	98	Paved parking HSG B
1,404	98	Roofs, HSG B
4,962	61	>75% Grass cover, Good HSG B
11,091		Weighted Average
4,962		44.74% Pervious Area
6,129		55.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	50	0.0350	0.13		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
1.0	113	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	23	0.0600	4.97		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	23	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.7	209	Total			

Subcatchment 32P: P2b



Summary for Pond 33P: CB 5+55L

Inflow Area = 0.255 ac, 55.26% Impervious, Inflow Depth = 5.96" for 100-YR event
 Inflow = 1.56 cfs @ 12.15 hrs, Volume= 0.127 af
 Outflow = 1.56 cfs @ 12.15 hrs, Volume= 0.127 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.56 cfs @ 12.15 hrs, Volume= 0.127 af
 Routed to Pond 34P : DMH 5+68

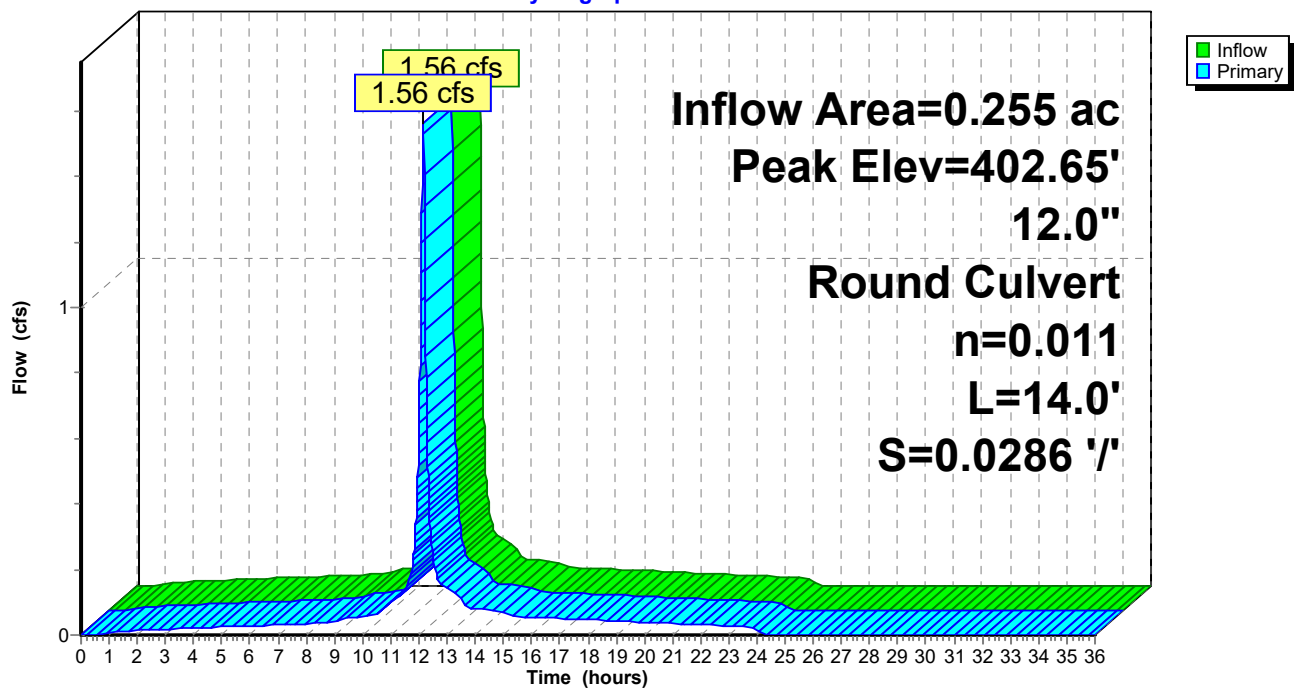
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 402.65' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	401.60'	12.0" Round Culvert L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.60' / 401.20' S= 0.0286 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.34 cfs @ 12.15 hrs HW=402.59' TW=402.46' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 1.34 cfs @ 1.71 fps)

Pond 33P: CB 5+55L

Hydrograph



Summary for Pond 34P: DMH 5+68

Inflow Area = 0.637 ac, 55.54% Impervious, Inflow Depth = 5.89" for 100-YR event
 Inflow = 3.47 cfs @ 12.16 hrs, Volume= 0.313 af
 Outflow = 3.47 cfs @ 12.16 hrs, Volume= 0.313 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.47 cfs @ 12.16 hrs, Volume= 0.313 af
 Routed to Pond 35P : DMH 6+33

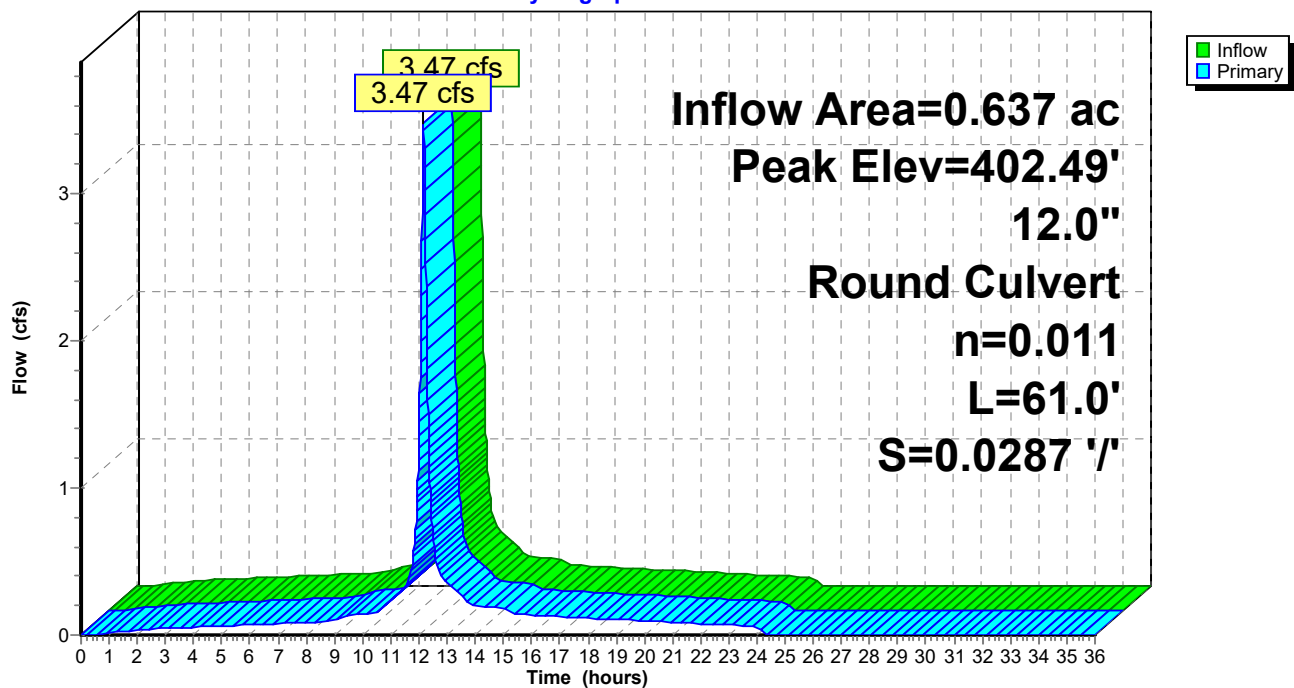
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 402.49' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	401.15'	12.0" Round Culvert L= 61.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.15' / 399.40' S= 0.0287 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=3.47 cfs @ 12.16 hrs HW=402.49' TW=400.99' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 3.47 cfs @ 4.41 fps)

Pond 34P: DMH 5+68

Hydrograph



Summary for Pond 35P: DMH 6+33

Inflow Area = 0.637 ac, 55.54% Impervious, Inflow Depth = 5.89" for 100-YR event
 Inflow = 3.47 cfs @ 12.16 hrs, Volume= 0.313 af
 Outflow = 3.47 cfs @ 12.16 hrs, Volume= 0.313 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.47 cfs @ 12.16 hrs, Volume= 0.313 af
 Routed to Pond 40P : DMH 7+50

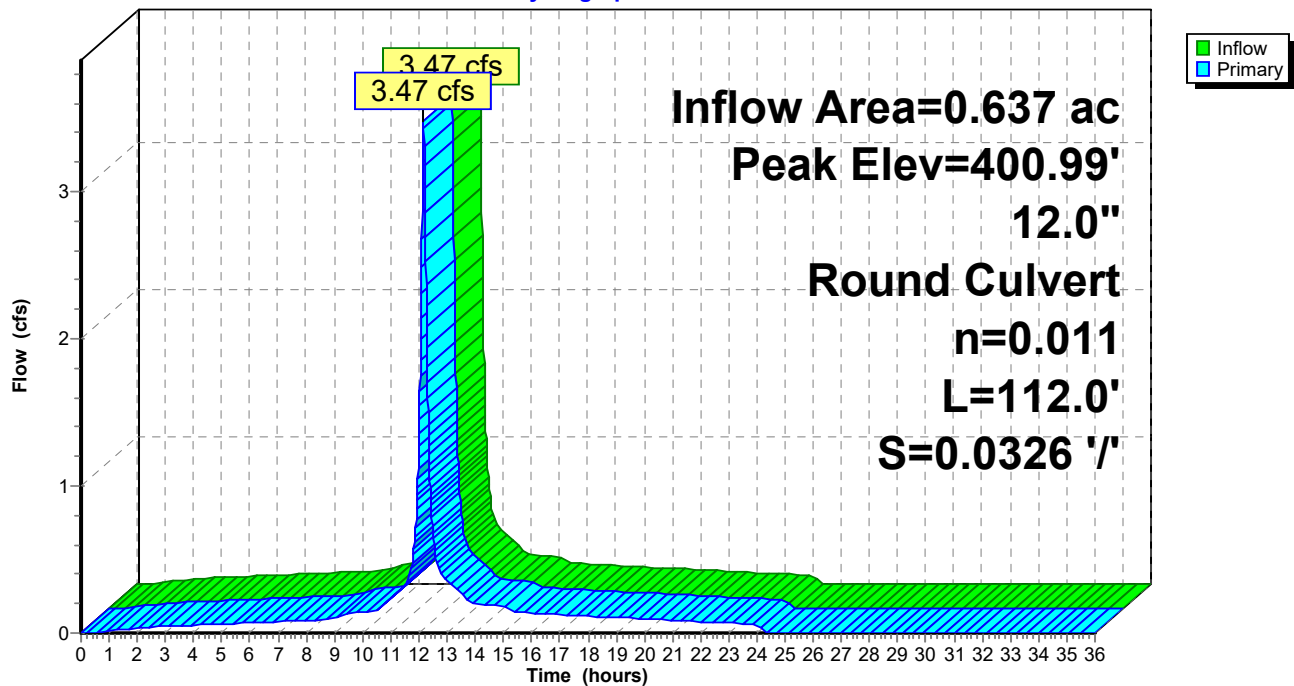
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 400.99' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	399.65'	12.0" Round Culvert L= 112.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 399.65' / 396.00' S= 0.0326 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=3.47 cfs @ 12.16 hrs HW=400.99' TW=397.39' (Dynamic Tailwater)
 ↳ **1=Culvert** (Inlet Controls 3.47 cfs @ 4.41 fps)

Pond 35P: DMH 6+33

Hydrograph



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Summary for Subcatchment 36P: P2c

Runoff = 2.02 cfs @ 12.13 hrs, Volume= 0.154 af, Depth= 6.68"
Routed to Pond 37P : CB 7+36R

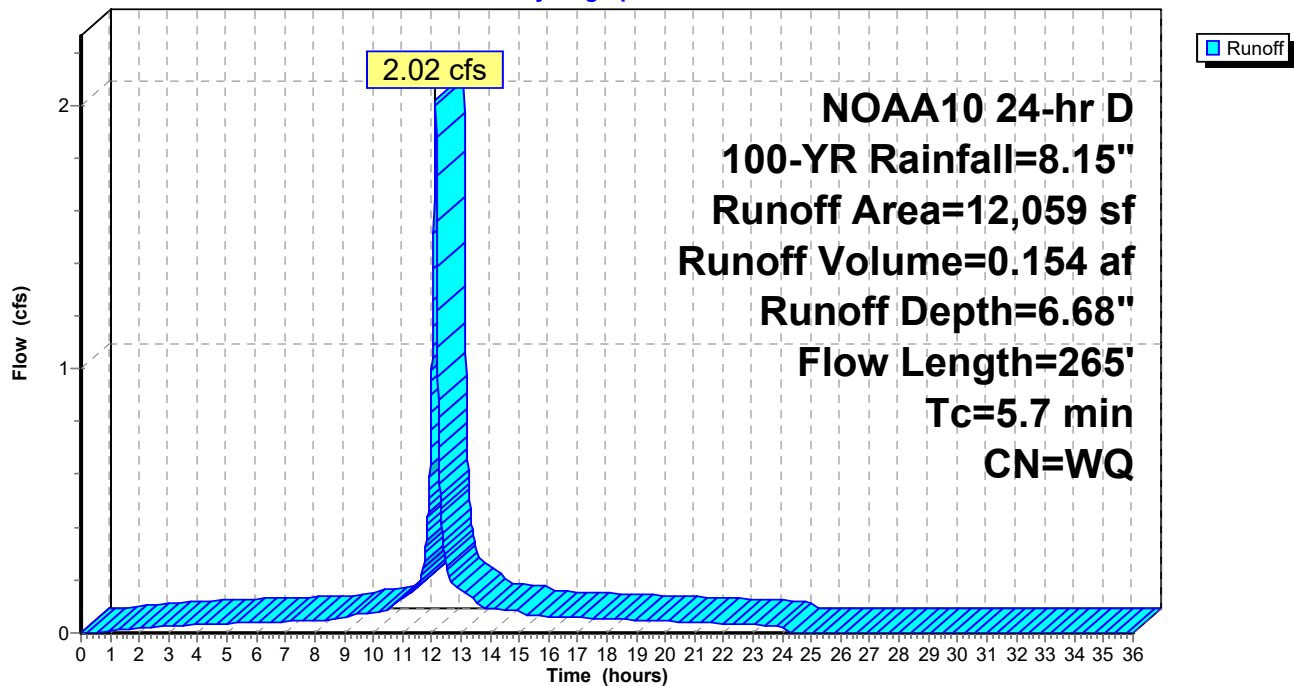
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
3,871	98	Roofs HSG B
4,775	98	Paved parking HSG B
3,413	61	>75% Grass cover, Good HSG B
12,059		Weighted Average
3,413		28.30% Pervious Area
8,646		71.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	40	0.0500	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
1.1	225	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
5.7	265	Total			

Subcatchment 36P: P2c

Hydrograph



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Summary for Pond 37P: CB 7+36R

Inflow Area = 0.277 ac, 71.70% Impervious, Inflow Depth = 6.68" for 100-YR event
Inflow = 2.02 cfs @ 12.13 hrs, Volume= 0.154 af
Outflow = 2.02 cfs @ 12.13 hrs, Volume= 0.154 af, Atten= 0%, Lag= 0.0 min
Primary = 2.02 cfs @ 12.13 hrs, Volume= 0.154 af
Routed to Pond 40P : DMH 7+50

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

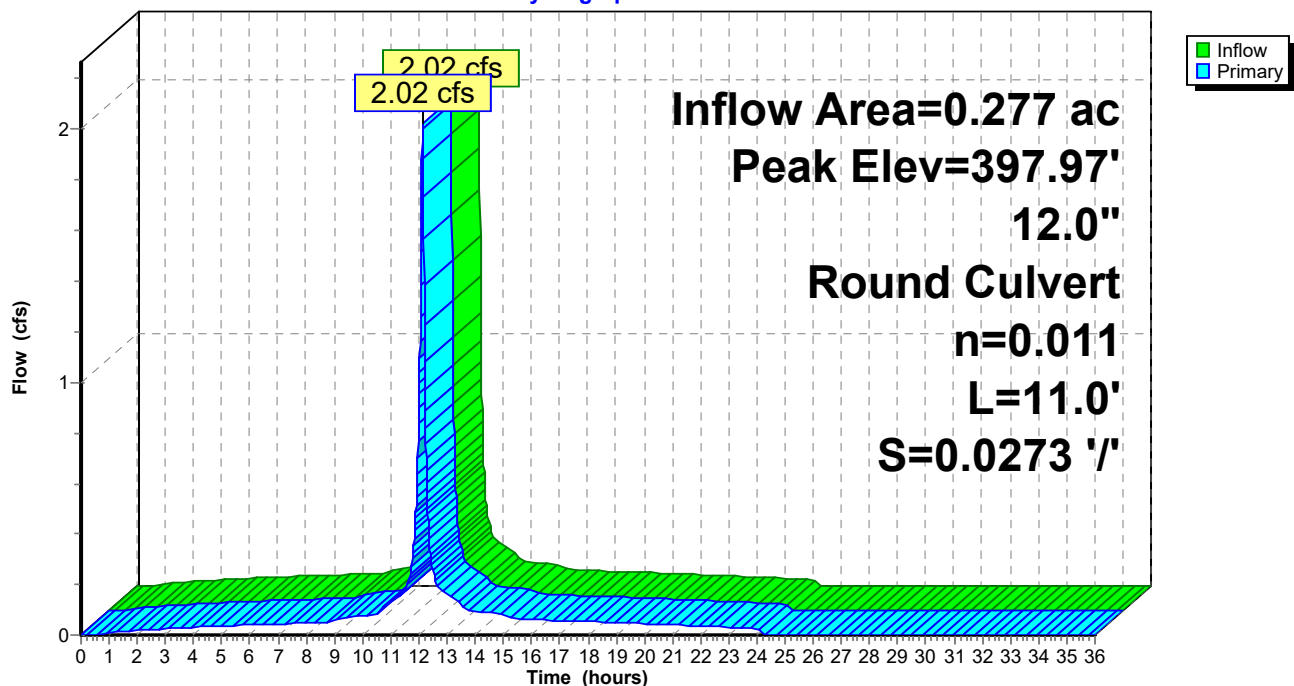
Peak Elev= 397.97' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	396.10'	12.0" Round Culvert L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 396.10' / 395.80' S= 0.0273 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.93 cfs @ 12.13 hrs HW=397.94' TW=397.68' (Dynamic Tailwater)
↑ **1=Culvert** (Inlet Controls 1.93 cfs @ 2.45 fps)

Pond 37P: CB 7+36R

Hydrograph



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Summary for Subcatchment 38P: P2d

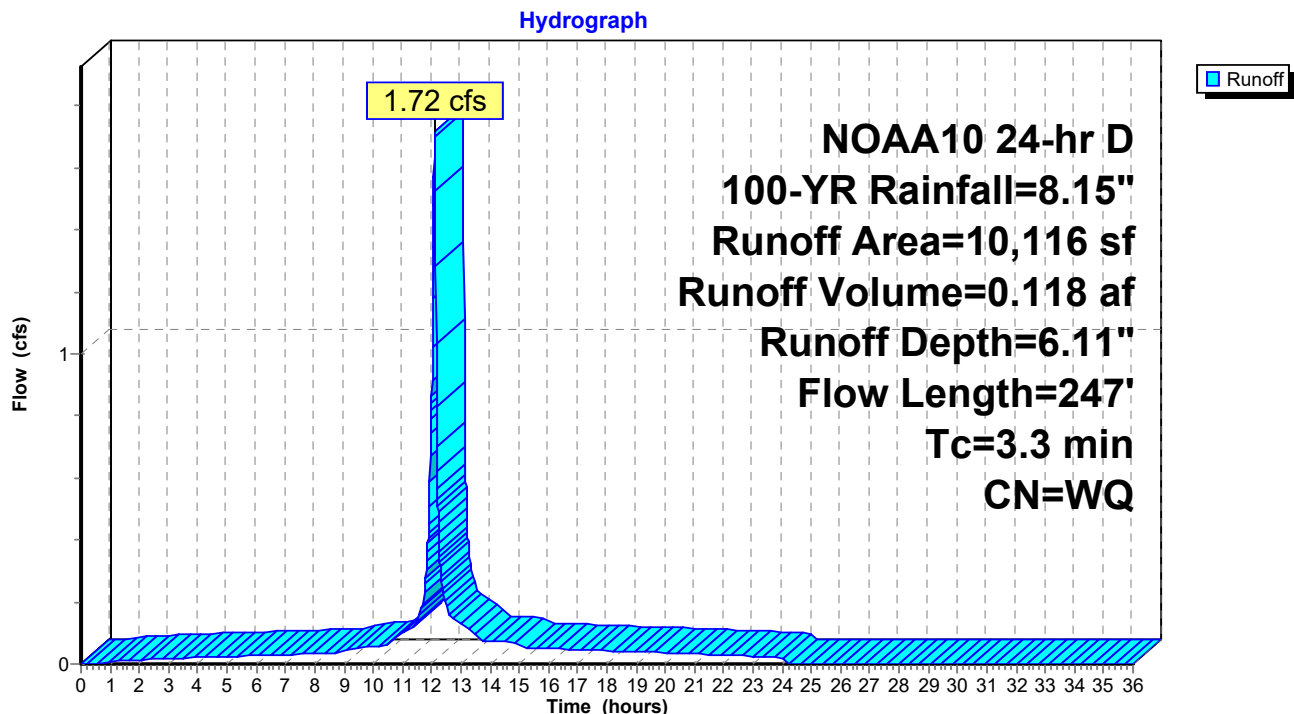
Runoff = 1.72 cfs @ 12.11 hrs, Volume= 0.118 af, Depth= 6.11"
Routed to Pond 39P : CB 7+36L

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
3,108	98	Paved parking HSG B
2,815	98	Roofs HSG B
4,193	61	>75% Grass cover, Good HSG B
10,116		Weighted Average
4,193		41.45% Pervious Area
5,923		58.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	21	0.1000	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
0.3	30	0.0700	1.83		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.36"
0.9	196	0.0300	3.52		Shallow Concentrated Flow, Paved Kv= 20.3 fps
3.3	247	Total			

Subcatchment 38P: P2d



HydroCAD 2

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NOAA10 24-hr D 100-YR Rainfall=8.15"

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Summary for Pond 39P: CB 7+36L

Inflow Area = 0.232 ac, 58.55% Impervious, Inflow Depth = 6.11" for 100-YR event
Inflow = 1.72 cfs @ 12.11 hrs, Volume= 0.118 af
Outflow = 1.72 cfs @ 12.11 hrs, Volume= 0.118 af, Atten= 0%, Lag= 0.0 min
Primary = 1.72 cfs @ 12.11 hrs, Volume= 0.118 af
Routed to Pond 40P : DMH 7+50

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

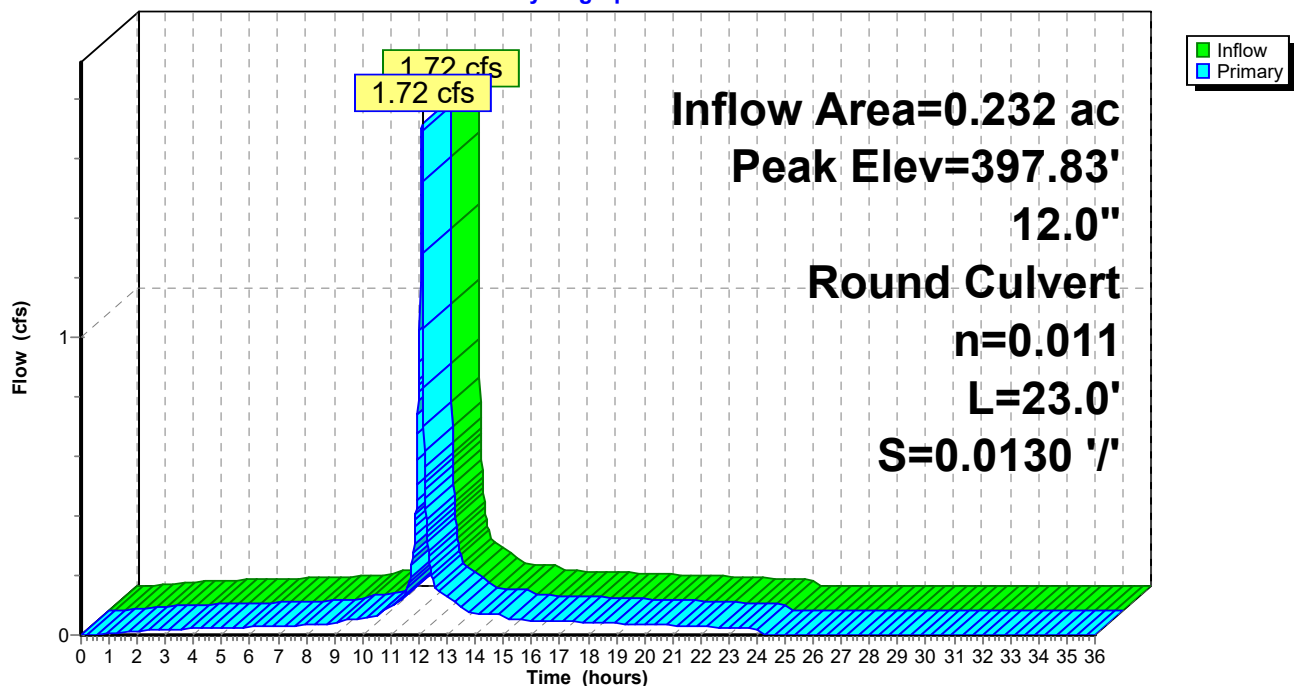
Peak Elev= 397.83' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	396.10'	12.0" Round Culvert L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 396.10' / 395.80' S= 0.0130 '/ Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=1.19 cfs @ 12.11 hrs HW=397.67' TW=397.57' (Dynamic Tailwater)
↑ **1=Culvert** (Inlet Controls 1.19 cfs @ 1.52 fps)

Pond 39P: CB 7+36L

Hydrograph



Summary for Pond 40P: DMH 7+50

Inflow Area = 1.146 ac, 60.05% Impervious, Inflow Depth = 6.13" for 100-YR event
 Inflow = 6.76 cfs @ 12.13 hrs, Volume= 0.585 af
 Outflow = 6.76 cfs @ 12.13 hrs, Volume= 0.585 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.76 cfs @ 12.13 hrs, Volume= 0.585 af
 Routed to Pond 45P : DMH 8+26

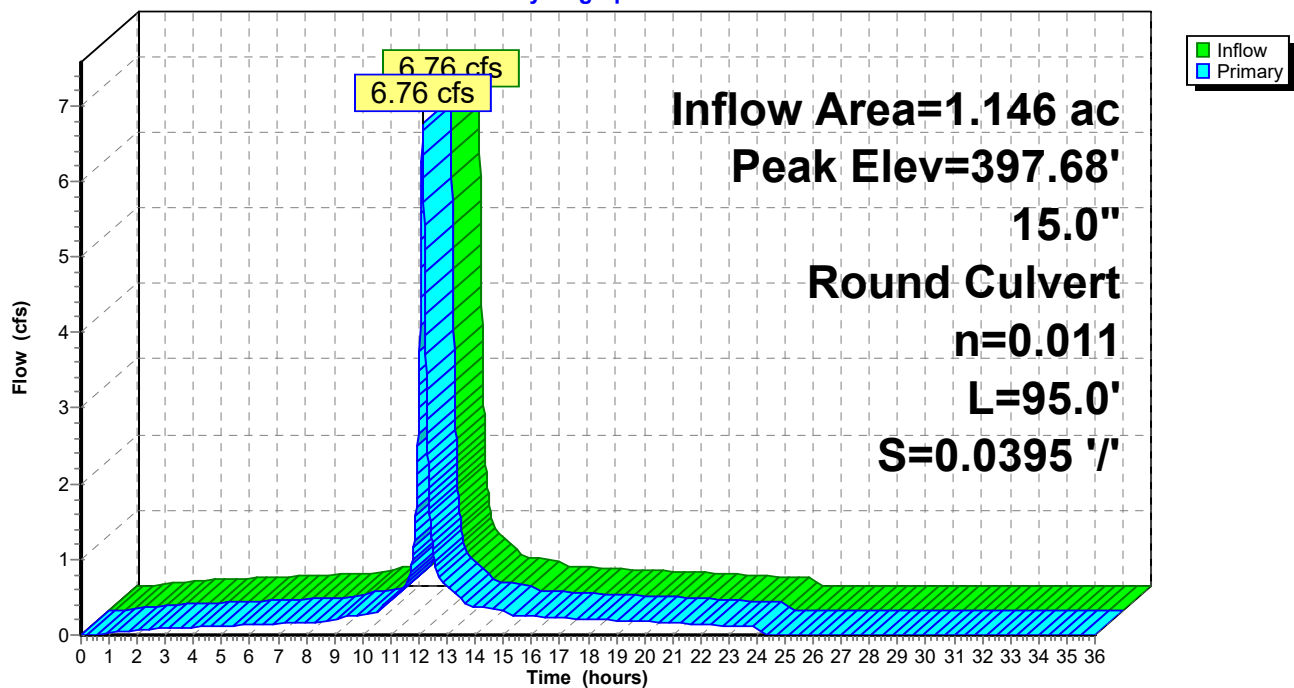
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 397.68' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	395.75'	15.0" Round Culvert L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 395.75' / 392.00' S= 0.0395 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf

Primary OutFlow Max=6.74 cfs @ 12.13 hrs HW=397.68' TW=391.32' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 6.74 cfs @ 5.49 fps)

Pond 40P: DMH 7+50

Hydrograph



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NOAA10 24-hr D 100-YR Rainfall=8.15"

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Summary for Subcatchment 41P: P2e

Runoff = 7.16 cfs @ 12.17 hrs, Volume= 0.616 af, Depth= 4.96"
Routed to Pond 42P : CB 8+23

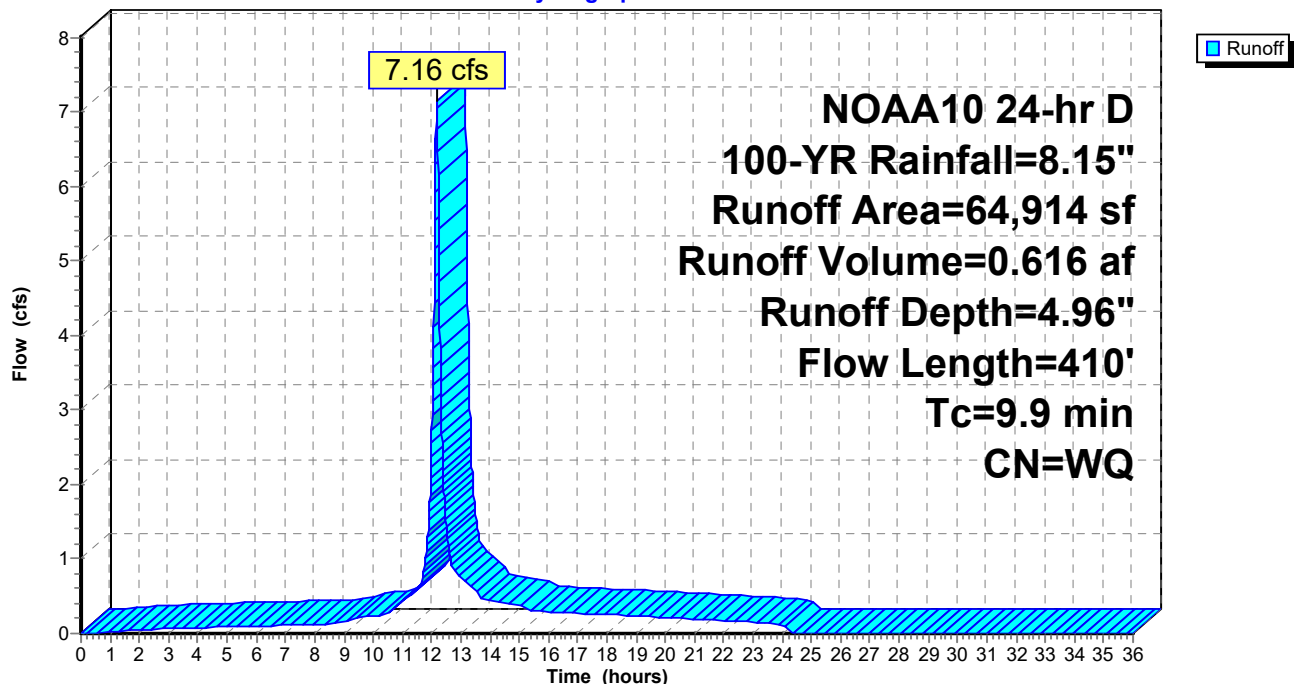
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
6,559	98	Roofs HSG B
5,857	55	Woods, Good HSG B
15,251	98	Paved parking HSG B
37,247	61	>75% Grass cover, Good HSG B
64,914		Weighted Average
43,104		66.40% Pervious Area
21,810		33.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.36"
2.8	310	0.0700	1.85		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	50	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.9	410	Total			

Subcatchment 41P: P2e

Hydrograph



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NOAA10 24-hr D 100-YR Rainfall=8.15"

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Summary for Pond 42P: CB 8+23

Inflow Area = 1.490 ac, 33.60% Impervious, Inflow Depth = 4.96" for 100-YR event
Inflow = 7.16 cfs @ 12.17 hrs, Volume= 0.616 af
Outflow = 7.16 cfs @ 12.17 hrs, Volume= 0.616 af, Atten= 0%, Lag= 0.0 min
Primary = 7.16 cfs @ 12.17 hrs, Volume= 0.616 af
Routed to Pond 45P : DMH 8+26

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

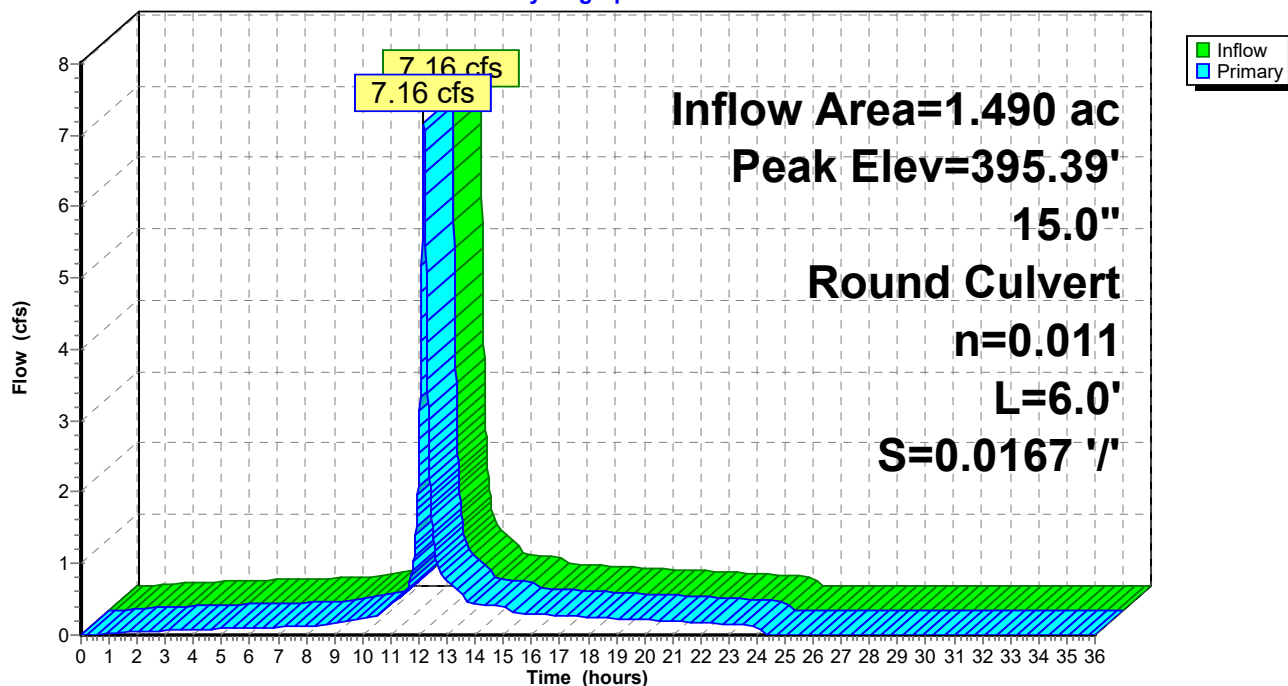
Peak Elev= 395.39' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	393.30'	15.0" Round Culvert L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 393.30' / 393.20' S= 0.0167 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf

Primary OutFlow Max=7.15 cfs @ 12.17 hrs HW=395.39' TW=391.48' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 7.15 cfs @ 5.82 fps)

Pond 42P: CB 8+23

Hydrograph



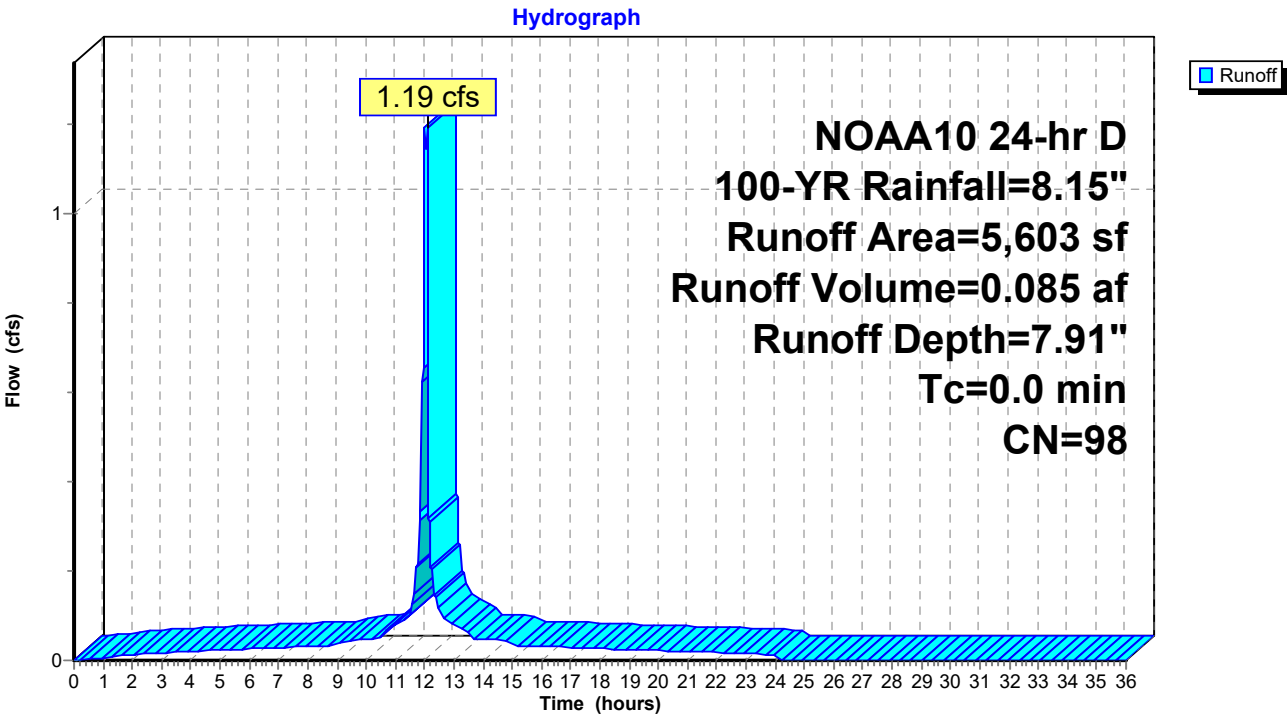
Summary for Subcatchment 43P: P2f

Runoff = 1.19 cfs @ 12.09 hrs, Volume= 0.085 af, Depth= 7.91"
Routed to Pond 44P : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
5,603	98	Roofs, HSG B
5,603		100.00% Impervious Area

Subcatchment 43P: P2f



Summary for Pond 44P: Roof Drain

Inflow Area = 0.129 ac, 100.00% Impervious, Inflow Depth = 7.91" for 100-YR event
 Inflow = 1.19 cfs @ 12.09 hrs, Volume= 0.085 af
 Outflow = 1.19 cfs @ 12.09 hrs, Volume= 0.085 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.19 cfs @ 12.09 hrs, Volume= 0.085 af
 Routed to Pond 45P : DMH 8+26

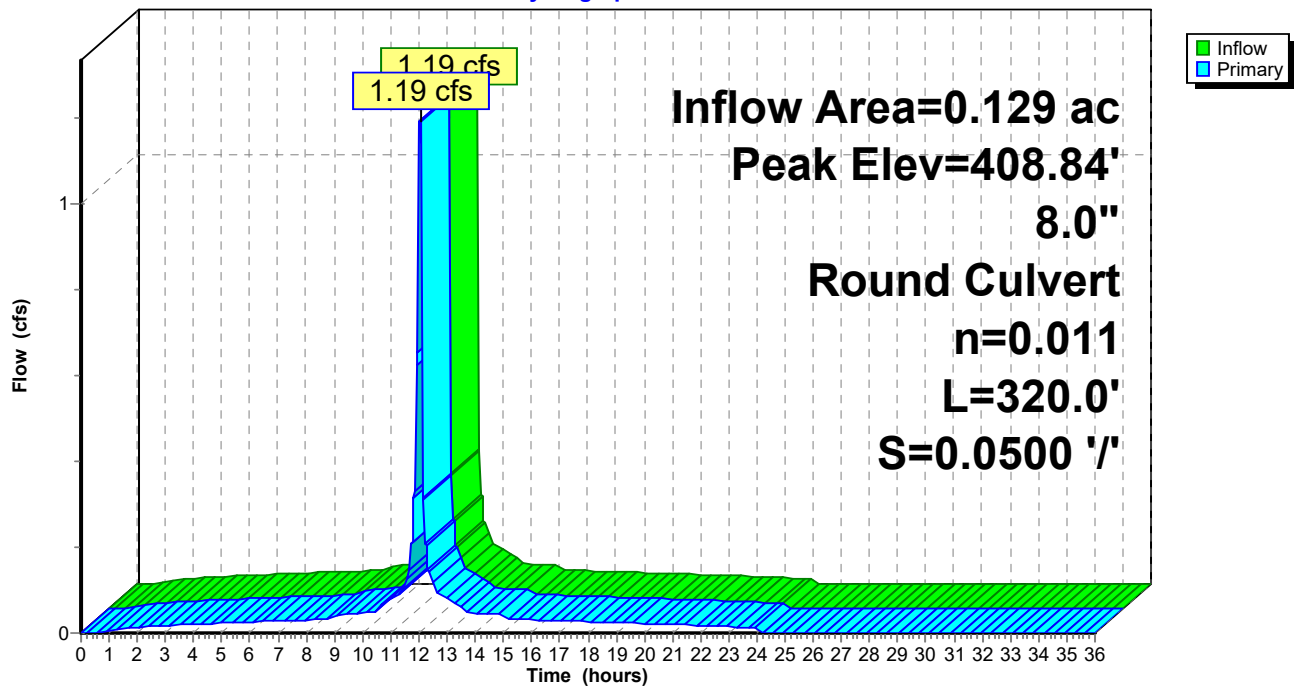
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 408.84' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	408.00'	8.0" Round Culvert L= 320.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 408.00' / 392.00' S= 0.0500 '/ Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Primary OutFlow Max=1.19 cfs @ 12.09 hrs HW=408.84' TW=390.35' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 1.19 cfs @ 3.41 fps)

Pond 44P: Roof Drain

Hydrograph



Summary for Pond 45P: DMH 8+26

Inflow Area = 2.765 ac, 47.65% Impervious, Inflow Depth = 5.58" for 100-YR event
 Inflow = 13.55 cfs @ 12.15 hrs, Volume= 1.286 af
 Outflow = 13.55 cfs @ 12.15 hrs, Volume= 1.286 af, Atten= 0%, Lag= 0.0 min
 Primary = 13.55 cfs @ 12.15 hrs, Volume= 1.286 af
 Routed to Pond 46P : FD C

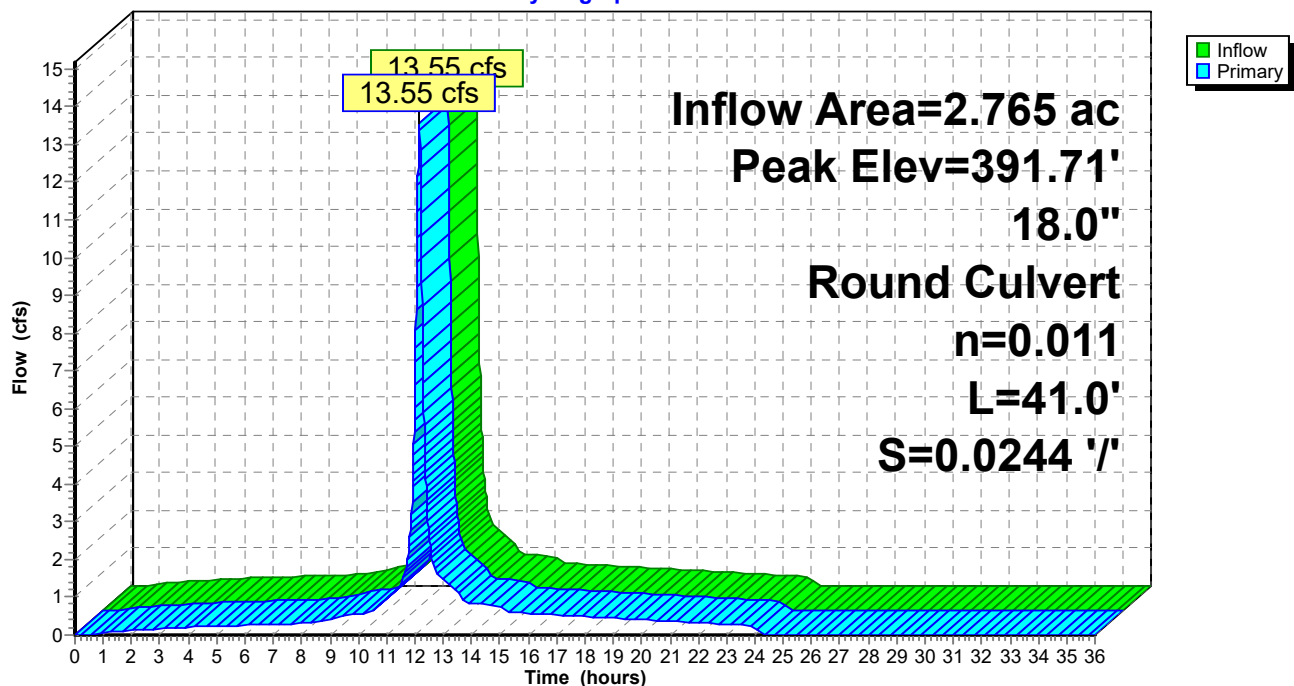
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 391.71' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	387.00'	18.0" Round Culvert L= 41.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 387.00' / 386.00' S= 0.0244 '/ Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=13.46 cfs @ 12.15 hrs HW=391.68' TW=389.18' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 13.46 cfs @ 7.62 fps)

Pond 45P: DMH 8+26

Hydrograph



Summary for Pond 46P: FD C

Inflow Area = 2.765 ac, 47.65% Impervious, Inflow Depth = 5.58" for 100-YR event
 Inflow = 13.55 cfs @ 12.15 hrs, Volume= 1.286 af
 Outflow = 13.55 cfs @ 12.15 hrs, Volume= 1.286 af, Atten= 0%, Lag= 0.0 min
 Primary = 13.55 cfs @ 12.15 hrs, Volume= 1.286 af
 Routed to Pond 47P : Infiltration Field #6

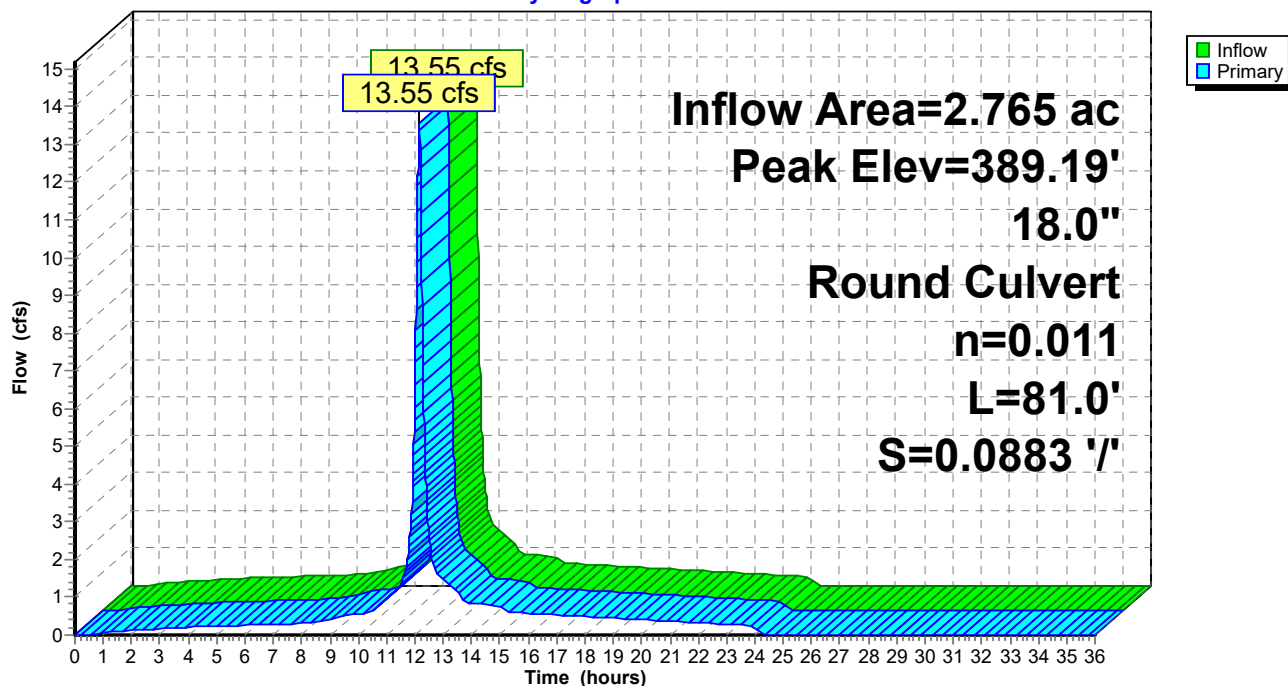
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 389.19' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	385.90'	18.0" Round Culvert L= 81.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 385.90' / 378.75' S= 0.0883 '/ Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=13.54 cfs @ 12.15 hrs HW=389.18' TW=381.77' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 13.54 cfs @ 7.66 fps)

Pond 46P: FD C

Hydrograph



Summary for Pond 47P: Infiltration Field #6

Inflow Area = 2.765 ac, 47.65% Impervious, Inflow Depth = 5.58" for 100-YR event
 Inflow = 13.55 cfs @ 12.15 hrs, Volume= 1.286 af
 Outflow = 4.21 cfs @ 12.38 hrs, Volume= 1.255 af, Atten= 69%, Lag= 13.8 min
 Discarded = 0.28 cfs @ 8.53 hrs, Volume= 0.780 af
 Primary = 1.98 cfs @ 12.38 hrs, Volume= 0.205 af
 Routed to Pond 48P : 30' Level Spreader
 Secondary = 1.94 cfs @ 12.38 hrs, Volume= 0.269 af
 Routed to Pond 51P : 30' Level Spreader

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 383.70' @ 12.38 hrs Surf.Area= 5,127 sf Storage= 18,272 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 275.7 min (1,064.6 - 788.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	378.00'	1,502 cf	15.75'W x 64.67'L x 5.75'H Field A 5,856 cf Overall - 2,102 cf Embedded = 3,754 cf x 40.0% Voids
#2A	378.75'	2,102 cf	Cultec R-902HD v2 x 32 Inside #1 Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 32 Chambers in 2 Rows Cap Storage= 18.0 cf x 2 x 2 rows = 72.1 cf
#3B	378.00'	4,233 cf	37.50'W x 79.33'L x 5.75'H Field B 17,106 cf Overall - 6,524 cf Embedded = 10,582 cf x 40.0% Voids
#4B	378.75'	6,524 cf	Cultec R-902HD v2 x 100 Inside #3 Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 100 Chambers in 5 Rows Cap Storage= 18.0 cf x 2 x 5 rows = 180.2 cf
#5C	378.00'	1,666 cf	15.75'W x 72.00'L x 5.75'H Field C 6,521 cf Overall - 2,356 cf Embedded = 4,164 cf x 40.0% Voids
#6C	378.75'	2,356 cf	Cultec R-902HD v2 x 36 Inside #5 Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 36 Chambers in 2 Rows Cap Storage= 18.0 cf x 2 x 2 rows = 72.1 cf
		18,383 cf	Total Available Storage

Storage Group A created with Chamber Wizard
 Storage Group B created with Chamber Wizard
 Storage Group C created with Chamber Wizard

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Device	Routing	Invert	Outlet Devices
#1	Discarded	378.00'	2.400 in/hr Exfiltration over Surface area
#2	Secondary	378.00'	12.0" Round Culvert L= 173.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 377.00' S= 0.0058 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#3	Primary	378.00'	12.0" Round Culvert L= 39.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 374.00' S= 0.1026 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#4	Device 2	379.40'	1.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 2	382.10'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Device 3	382.10'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Primary	378.00'	12.0" Round Culvert L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 374.00' S= 0.0727 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#8	Device 7	383.55'	12.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.28 cfs @ 8.53 hrs HW=378.07' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.28 cfs)**Primary OutFlow** Max=1.98 cfs @ 12.38 hrs HW=383.70' TW=374.06' (Dynamic Tailwater)↑ **3=Culvert** (Passes 1.89 cfs of 8.62 cfs potential flow)↑ **6=Orifice/Grate** (Orifice Controls 1.89 cfs @ 5.41 fps)↑ **7=Culvert** (Passes 0.09 cfs of 8.62 cfs potential flow)↑ **8=Orifice/Grate** (Orifice Controls 0.09 cfs @ 1.30 fps)**Secondary OutFlow** Max=1.94 cfs @ 12.38 hrs HW=383.70' TW=377.08' (Dynamic Tailwater)↑ **2=Culvert** (Passes 1.94 cfs of 6.48 cfs potential flow)↑ **4=Orifice/Grate** (Orifice Controls 0.05 cfs @ 9.93 fps)↑ **5=Orifice/Grate** (Orifice Controls 1.89 cfs @ 5.41 fps)

Pond 47P: Infiltration Field #6 - Chamber Wizard Field A**Chamber Model = Cultec R-902HD v2 (Cultec Recharger® 902HD v2)**

Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf

Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap

Cap Storage= 18.0 cf x 2 x 2 rows = 72.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

16 Chambers/Row x 3.67' Long +2.00' Cap Length x 2 = 62.67' Row Length +12.0" End Stone x 2 =
64.67' Base Length

2 Rows x 78.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 15.75' Base Width

9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

32 Chambers x 63.4 cf + 18.0 cf Cap Volume x 2 x 2 Rows = 2,102.2 cf Chamber Storage

5,856.4 cf Field - 2,102.2 cf Chambers = 3,754.1 cf Stone x 40.0% Voids = 1,501.7 cf Stone Storage

Chamber Storage + Stone Storage = 3,603.9 cf = 0.083 af

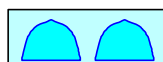
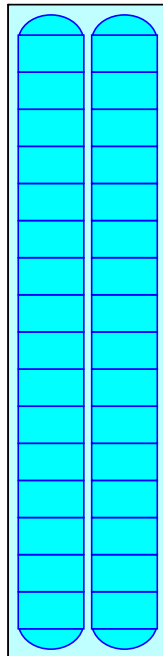
Overall Storage Efficiency = 61.5%

Overall System Size = 64.67' x 15.75' x 5.75'

32 Chambers

216.9 cy Field

139.0 cy Stone



Pond 47P: Infiltration Field #6 - Chamber Wizard Field B

Chamber Model = Cultec R-902HD v2 (Cultec Recharger® 902HD v2)

Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf

Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap

Cap Storage= 18.0 cf x 2 x 5 rows = 180.2 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

20 Chambers/Row x 3.67' Long +2.00' Cap Length x 2 = 77.33' Row Length +12.0" End Stone x 2 = 79.33' Base Length

5 Rows x 78.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.50' Base Width

9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

100 Chambers x 63.4 cf + 18.0 cf Cap Volume x 2 x 5 Rows = 6,524.5 cf Chamber Storage

17,106.2 cf Field - 6,524.5 cf Chambers = 10,581.8 cf Stone x 40.0% Voids = 4,232.7 cf Stone Storage

Chamber Storage + Stone Storage = 10,757.2 cf = 0.247 af

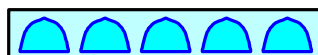
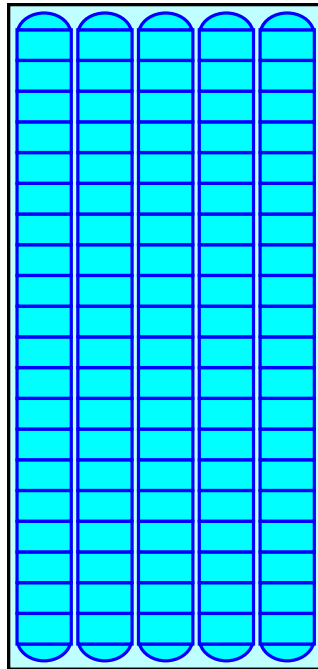
Overall Storage Efficiency = 62.9%

Overall System Size = 79.33' x 37.50' x 5.75'

100 Chambers

633.6 cy Field

391.9 cy Stone



Pond 47P: Infiltration Field #6 - Chamber Wizard Field C

Chamber Model = Cultec R-902HD v2 (Cultec Recharger® 902HD v2)

Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf

Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap

Cap Storage= 18.0 cf x 2 x 2 rows = 72.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

18 Chambers/Row x 3.67' Long +2.00' Cap Length x 2 = 70.00' Row Length +12.0" End Stone x 2 = 72.00' Base Length

2 Rows x 78.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 15.75' Base Width

9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

36 Chambers x 63.4 cf + 18.0 cf Cap Volume x 2 x 2 Rows = 2,356.0 cf Chamber Storage

6,520.5 cf Field - 2,356.0 cf Chambers = 4,164.5 cf Stone x 40.0% Voids = 1,665.8 cf Stone Storage

Chamber Storage + Stone Storage = 4,021.8 cf = 0.092 af

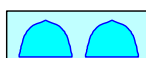
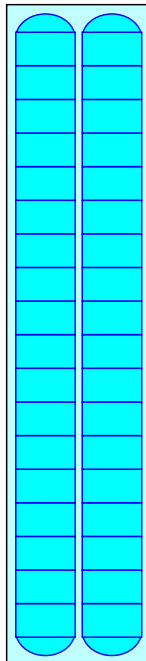
Overall Storage Efficiency = 61.7%

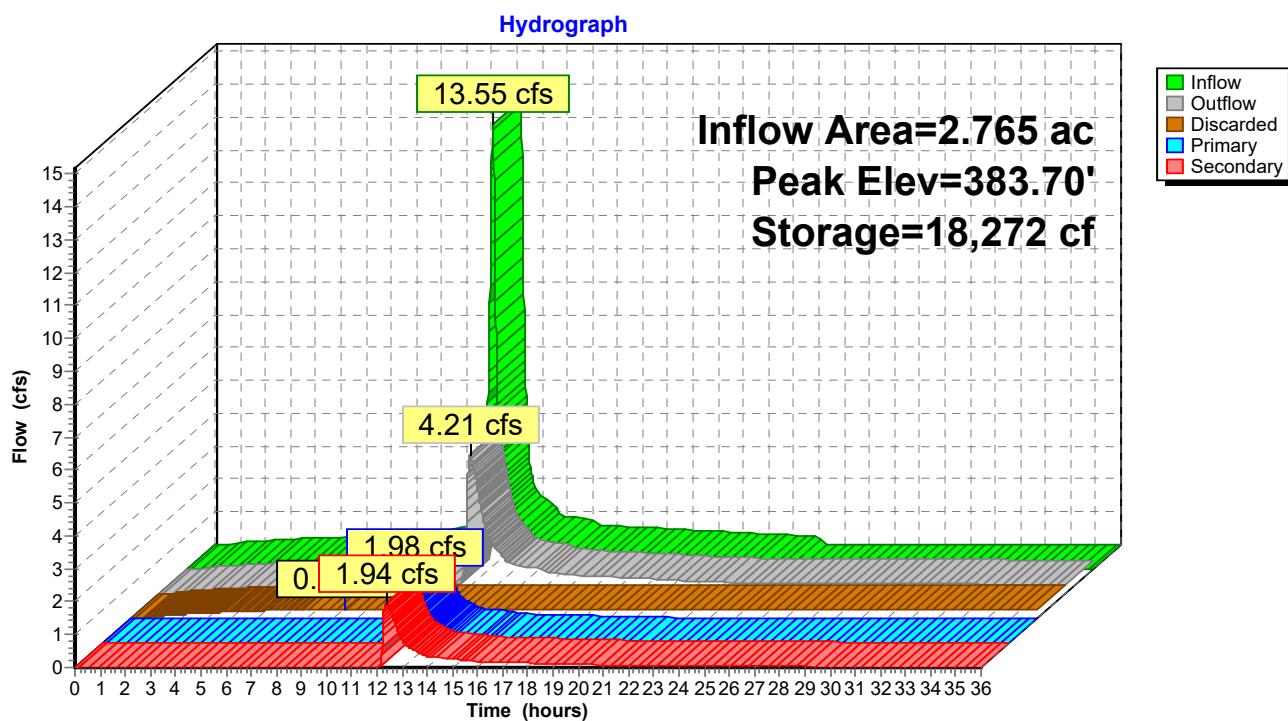
Overall System Size = 72.00' x 15.75' x 5.75'

36 Chambers

241.5 cy Field

154.2 cy Stone



Pond 47P: Infiltration Field #6

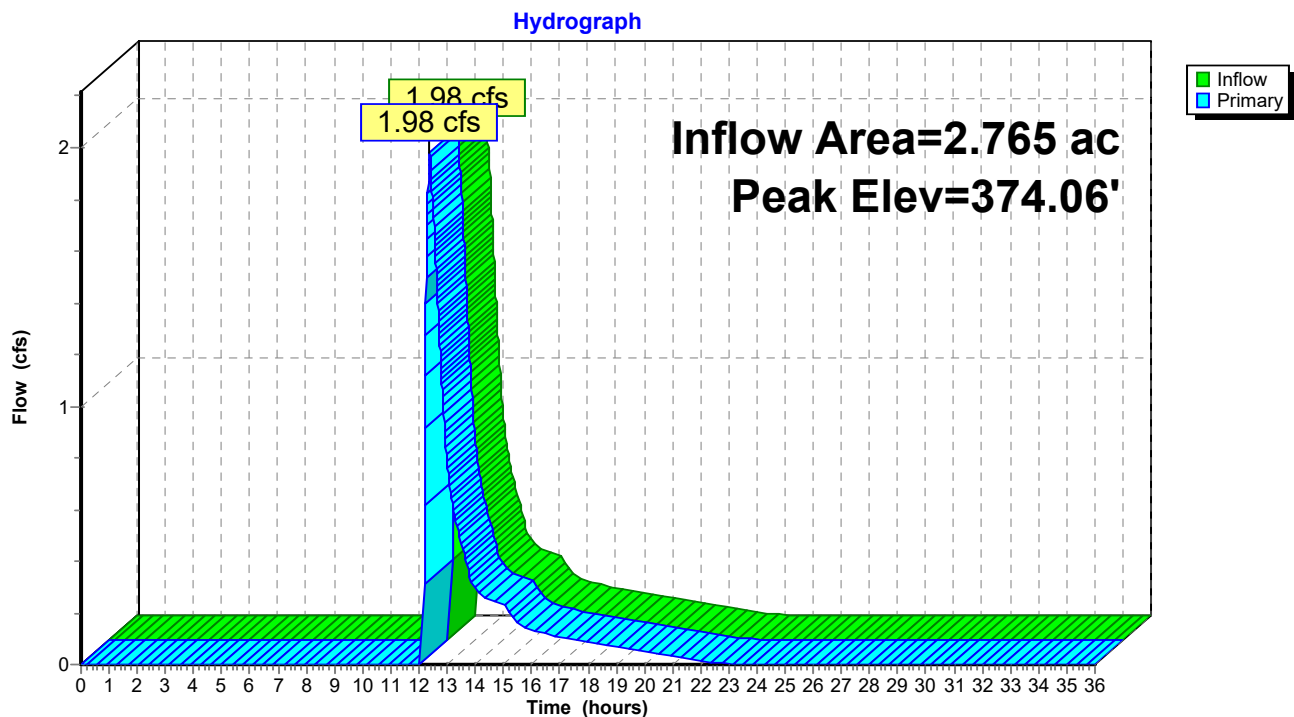
Summary for Pond 48P: 30' Level Spreader

Inflow Area = 2.765 ac, 47.65% Impervious, Inflow Depth = 0.89" for 100-YR event
Inflow = 1.98 cfs @ 12.38 hrs, Volume= 0.205 af
Outflow = 1.98 cfs @ 12.38 hrs, Volume= 0.205 af, Atten= 0%, Lag= 0.0 min
Primary = 1.98 cfs @ 12.38 hrs, Volume= 0.205 af
Routed to Link 50P : Sub-DP #2b: Flow to Northern Abutter

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 374.06' @ 12.38 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	374.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Elev. (feet) 374.00 375.00 Width (feet) 40.00 40.00

Primary OutFlow Max=1.98 cfs @ 12.38 hrs HW=374.06' TW=0.00' (Dynamic Tailwater)
↑1=Custom Weir/Orifice (Weir Controls 1.98 cfs @ 0.81 fps)

Pond 48P: 30' Level Spreader

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NOAA10 24-hr D 100-YR Rainfall=8.15"

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Summary for Subcatchment 49P: P2g

Runoff = 7.03 cfs @ 12.22 hrs, Volume= 0.660 af, Depth= 3.12"

Routed to Link 50P : Sub-DP #2b: Flow to Northern Abutter

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

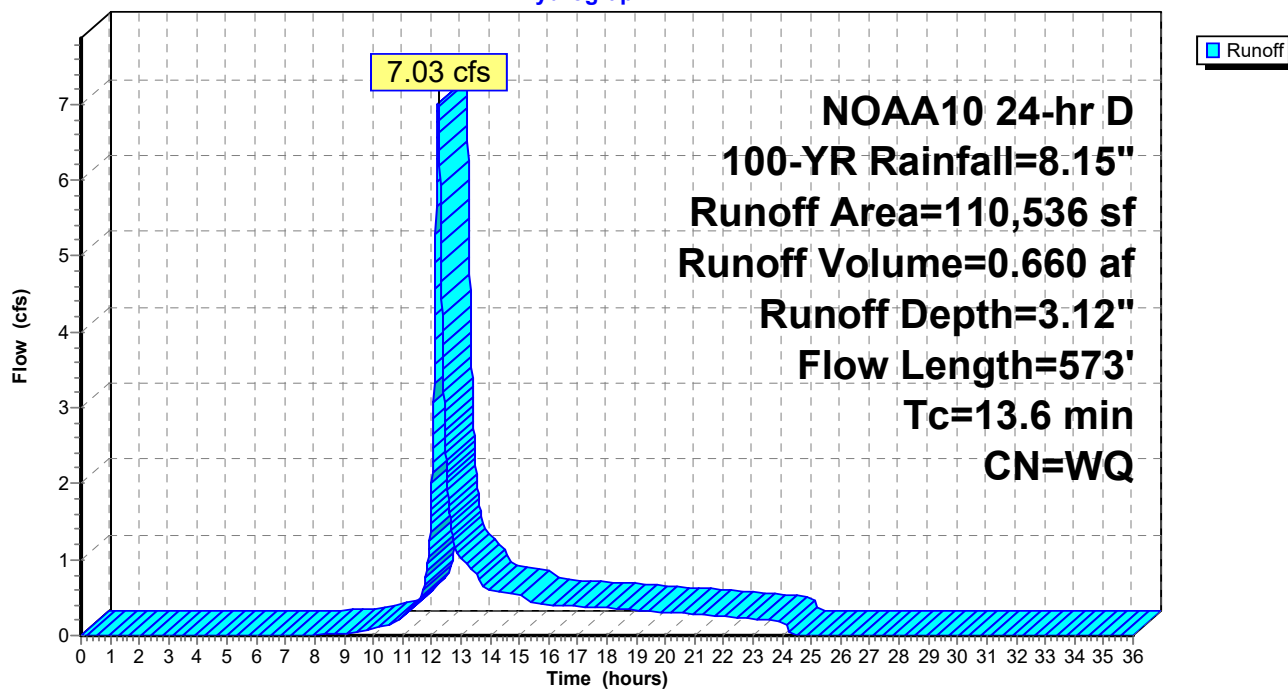
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
918	98	Roofs HSG B
58,029	55	Woods, Good HSG B
9,336	48	Brush, Good, HSG B
42,253	61	>75% Grass cover, Good HSG B
110,536		Weighted Average
109,618		99.17% Pervious Area
918		0.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	50	0.0400	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
1.7	156	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.0	270	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.8	97	0.1800	2.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.6	573	Total			

Subcatchment 49P: P2g

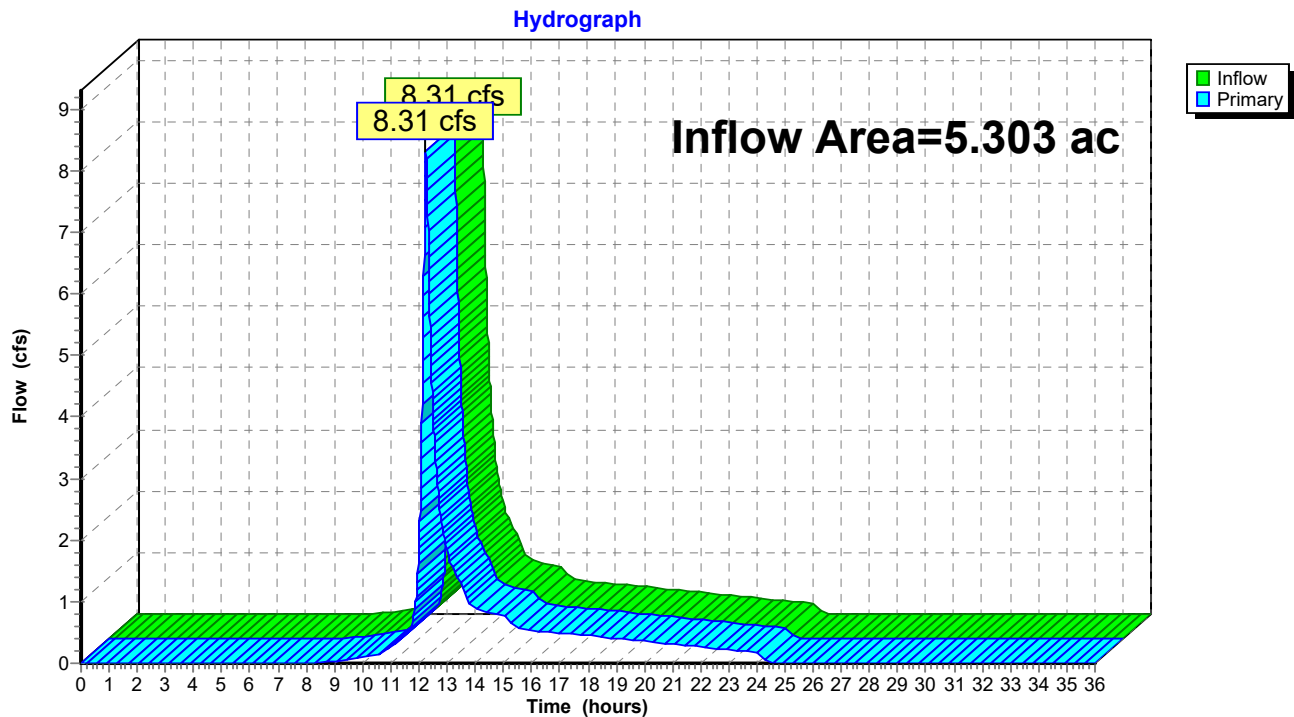
Hydrograph



Summary for Link 50P: Sub-DP #2b: Flow to Northern Abutter

Inflow Area = 5.303 ac, 25.25% Impervious, Inflow Depth = 1.96" for 100-YR event
Inflow = 8.31 cfs @ 12.24 hrs, Volume= 0.865 af
Primary = 8.31 cfs @ 12.24 hrs, Volume= 0.865 af, Atten= 0%, Lag= 0.0 min
Routed to Link 60P : Design Point #2: Flow to Uncas Brook

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 50P: Sub-DP #2b: Flow to Northern Abutter

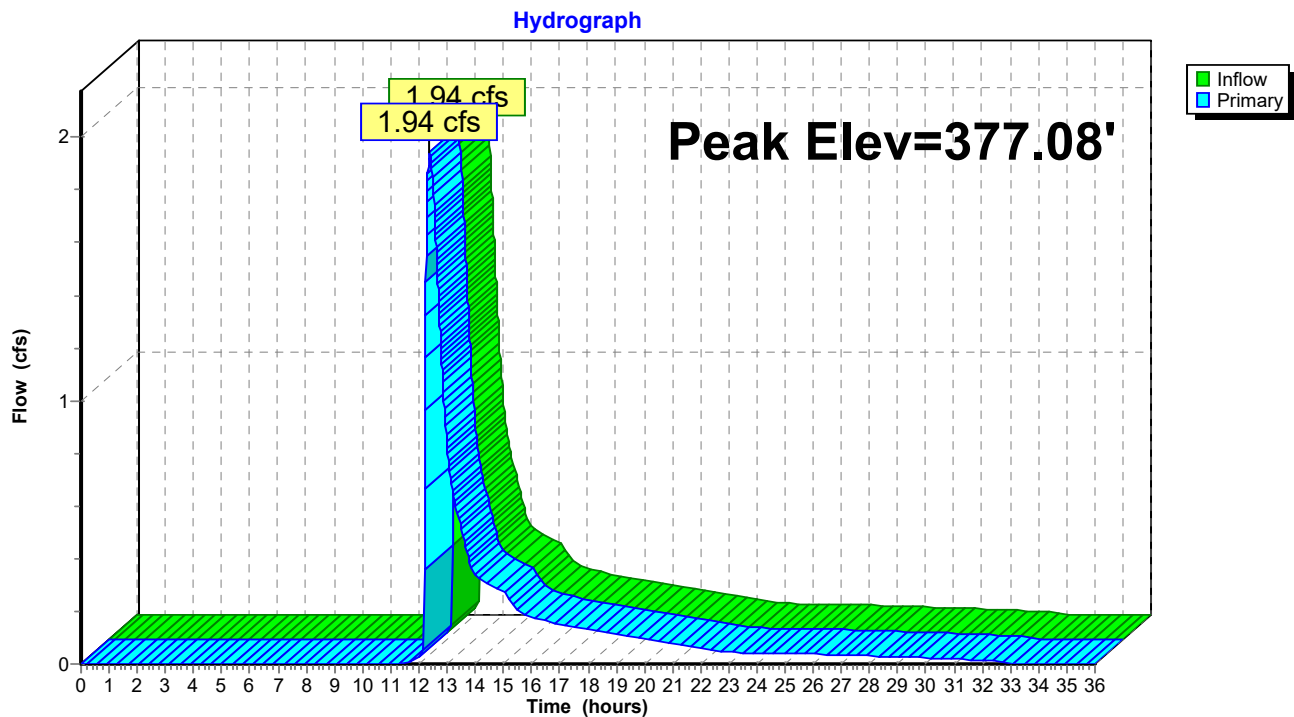
Summary for Pond 51P: 30' Level Spreader

Inflow = 1.94 cfs @ 12.38 hrs, Volume= 0.269 af
Outflow = 1.94 cfs @ 12.38 hrs, Volume= 0.269 af, Atten= 0%, Lag= 0.0 min
Primary = 1.94 cfs @ 12.38 hrs, Volume= 0.269 af
Routed to Link 59P : Sub-DP #2a: Flow to Town Land

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 377.08' @ 12.38 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	377.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Elev. (feet) 377.00 378.00 Width (feet) 25.00 25.00

Primary OutFlow Max=1.94 cfs @ 12.38 hrs HW=377.08' TW=0.00' (Dynamic Tailwater)
↑1=Custom Weir/Orifice (Weir Controls 1.94 cfs @ 0.94 fps)

Pond 51P: 30' Level Spreader

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NOAA10 24-hr D 100-YR Rainfall=8.15"

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Summary for Subcatchment 52P: P2h

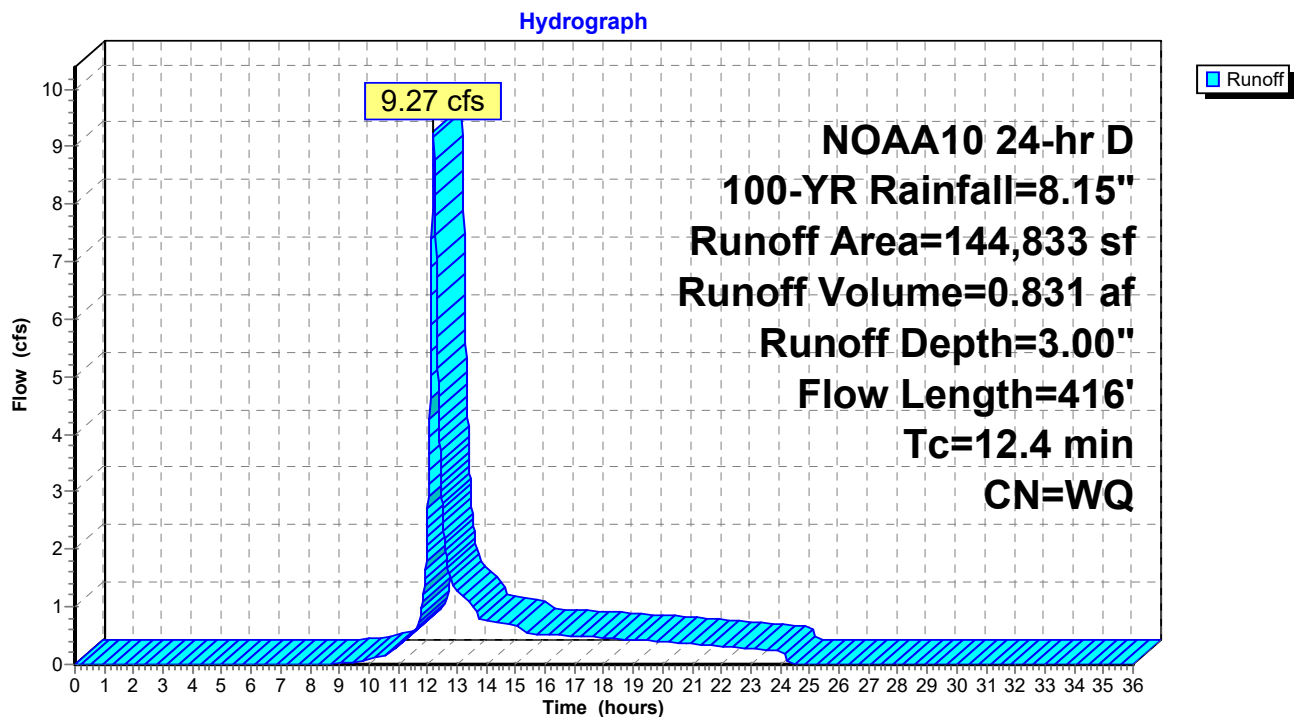
Runoff = 9.27 cfs @ 12.20 hrs, Volume= 0.831 af, Depth= 3.00"
Routed to Link 59P : Sub-DP #2a: Flow to Town Land

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
112,470	55	Woods, Good HSG B
3,868	48	Brush, Good, HSG B
28,495	61	>75% Grass cover, Good HSG B
144,833		Weighted Average
144,833		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	36	0.0200	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.36"
3.1	380	0.1700	2.06		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.4	416	Total			

Subcatchment 52P: P2h



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NOAA10 24-hr D 100-YR Rainfall=8.15"

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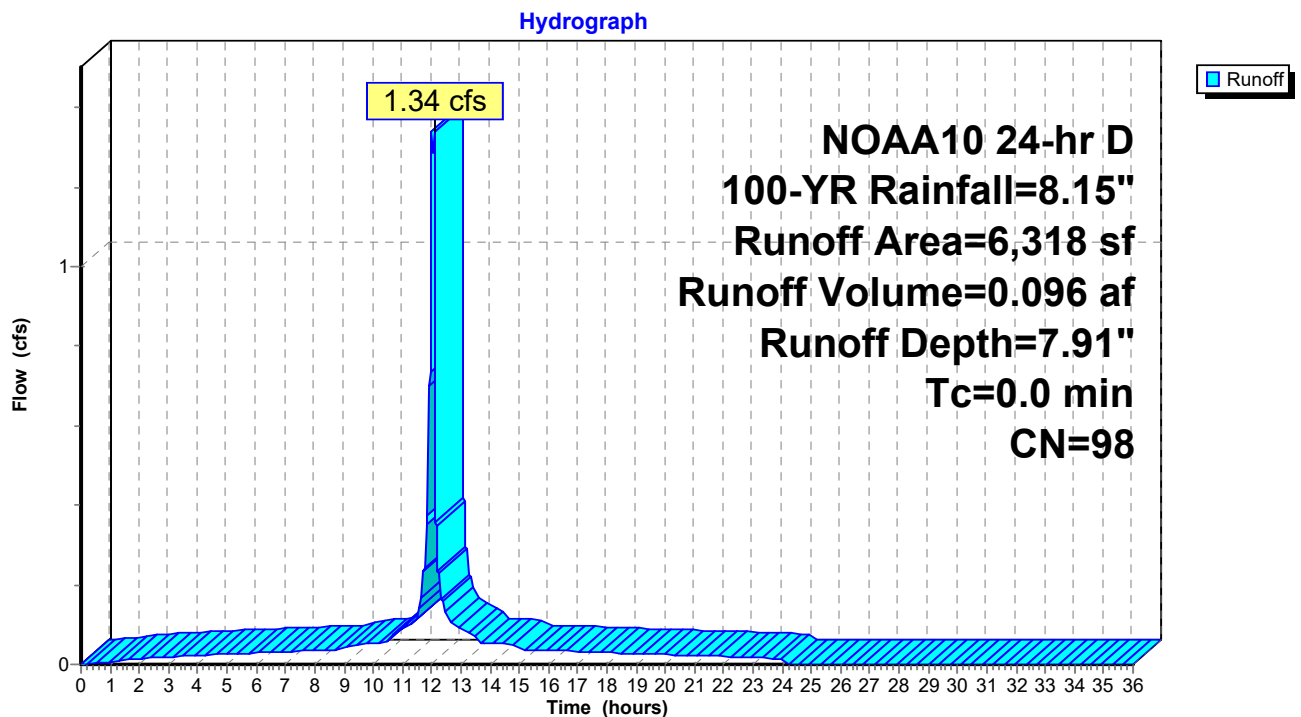
Summary for Subcatchment 53P: R11-19

Runoff = 1.34 cfs @ 12.09 hrs, Volume= 0.096 af, Depth= 7.91"
Routed to Pond 54P : Infiltration Field #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
6,318	98	Roofs, HSG B
6,318		100.00% Impervious Area

Subcatchment 53P: R11-19



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NOAA10 24-hr D 100-YR Rainfall=8.15"

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Summary for Pond 54P: Infiltration Field #3

Inflow Area = 0.145 ac, 100.00% Impervious, Inflow Depth = 7.91" for 100-YR event
 Inflow = 1.34 cfs @ 12.09 hrs, Volume= 0.096 af
 Outflow = 0.08 cfs @ 13.30 hrs, Volume= 0.096 af, Atten= 94%, Lag= 72.6 min
 Discarded = 0.04 cfs @ 9.29 hrs, Volume= 0.091 af
 Primary = 0.04 cfs @ 13.30 hrs, Volume= 0.005 af
 Routed to Link 59P : Sub-DP #2a: Flow to Town Land

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 386.36' @ 13.30 hrs Surf.Area= 644 sf Storage= 1,665 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 370.2 min (1,107.1 - 736.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	382.50'	981 cf	23.00'W x 28.00'L x 5.75'H Field A 3,703 cf Overall - 1,250 cf Embedded = 2,453 cf x 40.0% Voids
#2A	383.25'	1,250 cf	Cultec R-902HD v2 x 18 Inside #1 Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 18 Chambers in 3 Rows Cap Storage= 18.0 cf x 2 x 3 rows = 108.1 cf
		2,231 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	382.50'	2.400 in/hr Exfiltration over Surface area
#2	Primary	386.25'	8.0" Round Culvert L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 386.25' / 380.00' S= 0.0727 '/' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Discarded OutFlow Max=0.04 cfs @ 9.29 hrs HW=382.56' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.04 cfs @ 13.30 hrs HW=386.36' TW=0.00' (Dynamic Tailwater)
 ↑**2=Culvert** (Inlet Controls 0.04 cfs @ 1.12 fps)

Pond 54P: Infiltration Field #3 - Chamber Wizard Field A

Chamber Model = Cultec R-902HD v2 (Cultec Recharger® 902HD v2)

Effective Size= 69.1"W x 48.0"H => 17.30 sf x 3.67'L = 63.4 cf

Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap

Cap Storage= 18.0 cf x 2 x 3 rows = 108.1 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

6 Chambers/Row x 3.67' Long +2.00' Cap Length x 2 = 26.00' Row Length +12.0" End Stone x 2 = 28.00' Base Length

3 Rows x 78.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 23.00' Base Width

9.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 5.75' Field Height

18 Chambers x 63.4 cf + 18.0 cf Cap Volume x 2 x 3 Rows = 1,250.1 cf Chamber Storage

3,703.0 cf Field - 1,250.1 cf Chambers = 2,452.9 cf Stone x 40.0% Voids = 981.2 cf Stone Storage

Chamber Storage + Stone Storage = 2,231.3 cf = 0.051 af

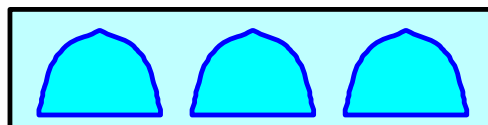
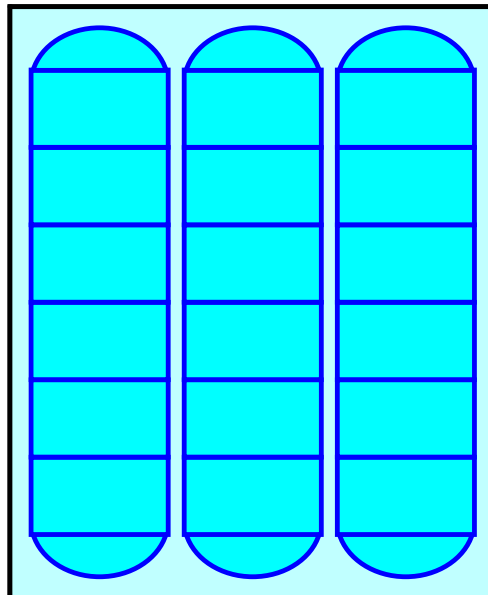
Overall Storage Efficiency = 60.3%

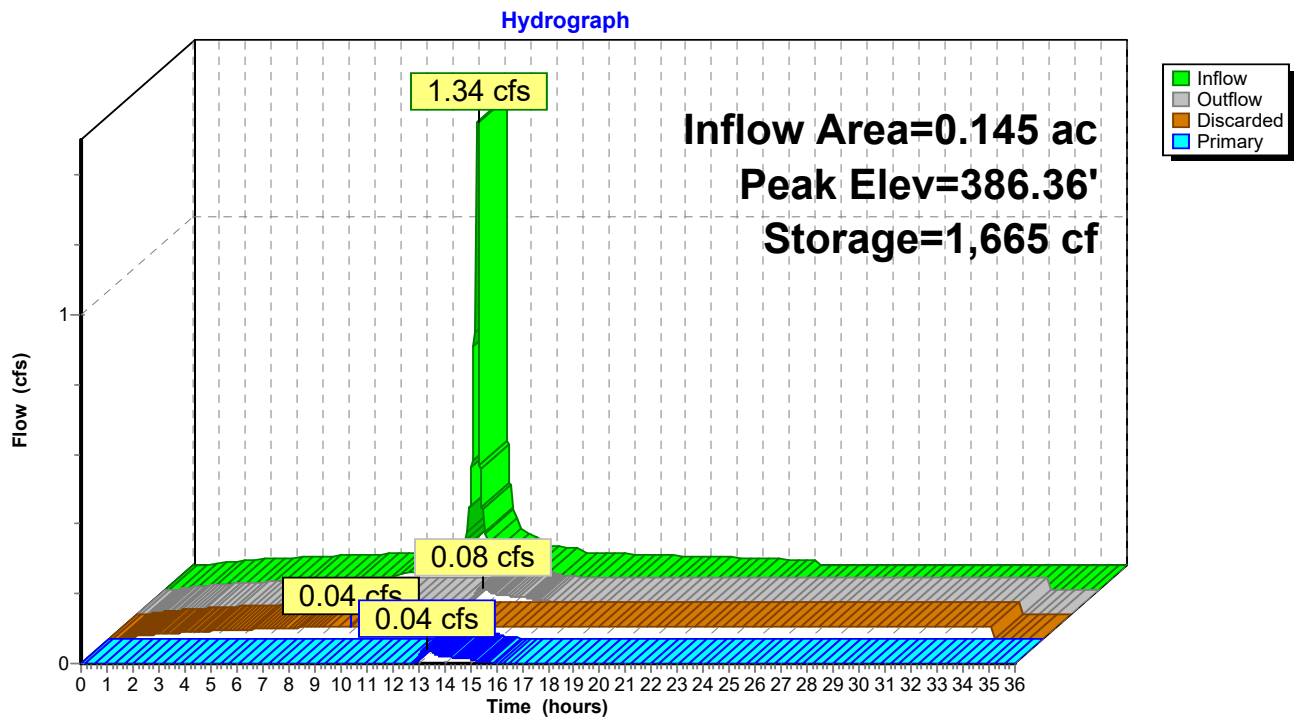
Overall System Size = 28.00' x 23.00' x 5.75'

18 Chambers

137.1 cy Field

90.8 cy Stone



Pond 54P: Infiltration Field #3

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NOAA10 24-hr D 100-YR Rainfall=8.15"

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Summary for Subcatchment 55P: R20-28

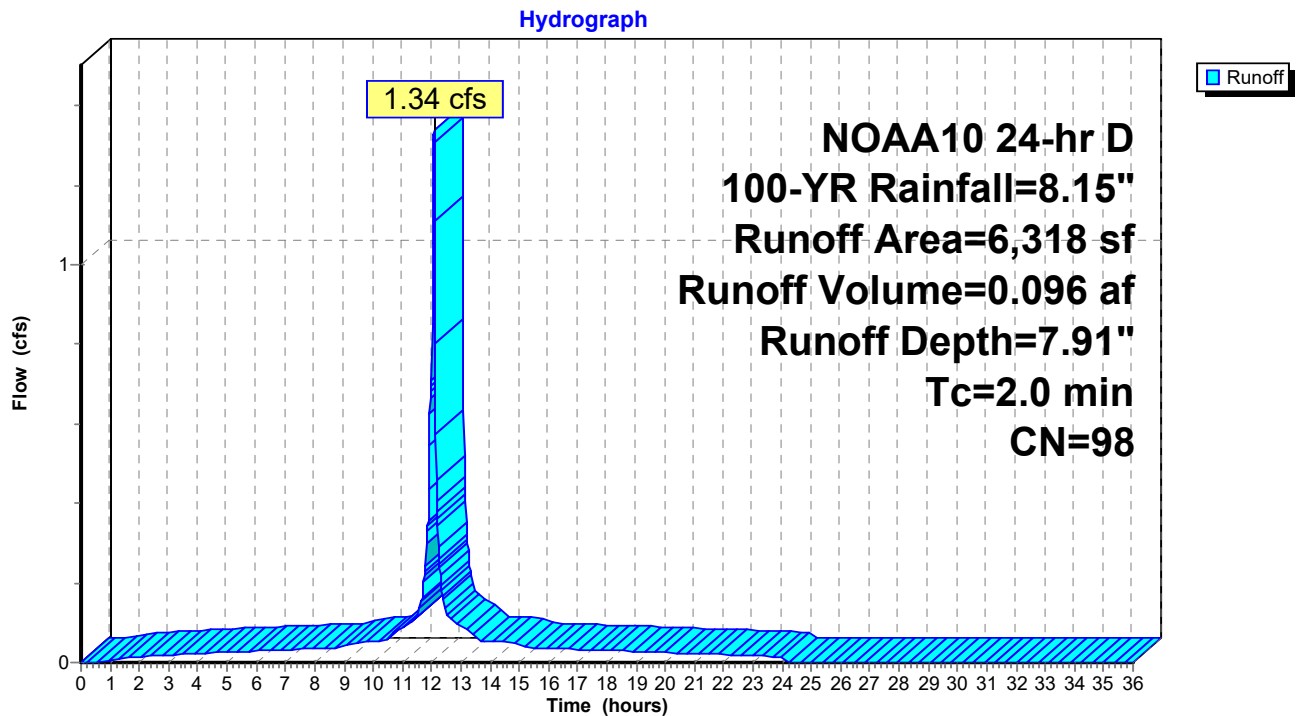
Runoff = 1.34 cfs @ 12.10 hrs, Volume= 0.096 af, Depth= 7.91"
Routed to Pond 56P : Infiltration Field #4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
6,318	98	Roofs, HSG B
6,318		100.00% Impervious Area

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

Subcatchment 55P: R20-28



Summary for Pond 56P: Infiltration Field #4

Inflow Area = 0.145 ac, 100.00% Impervious, Inflow Depth = 7.91" for 100-YR event
 Inflow = 1.34 cfs @ 12.10 hrs, Volume= 0.096 af
 Outflow = 0.06 cfs @ 10.83 hrs, Volume= 0.096 af, Atten= 95%, Lag= 0.0 min
 Discarded = 0.06 cfs @ 10.83 hrs, Volume= 0.096 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 59P : Sub-DP #2a: Flow to Town Land

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 389.40' @ 13.53 hrs Surf.Area= 1,134 sf Storage= 1,352 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 156.3 min (895.0 - 738.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	387.50'	822 cf	21.00'W x 54.00'L x 2.54'H Field A 2,882 cf Overall - 826 cf Embedded = 2,056 cf x 40.0% Voids
#2A	388.00'	826 cf	Cultec R-150XLHD x 30 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 6 rows
		1,649 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	387.50'	2.400 in/hr Exfiltration over Surface area
#2	Primary	389.50'	8.0" Round Culvert L= 137.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 389.50' / 380.00' S= 0.0693 ' /' Cc= 0.900 n= 0.011, Flow Area= 0.35 sf

Discarded OutFlow Max=0.06 cfs @ 10.83 hrs HW=387.53' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=387.50' TW=0.00' (Dynamic Tailwater)

↑ **2=Culvert** (Controls 0.00 cfs)

Pond 56P: Infiltration Field #4 - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 6 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

5 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 52.00' Row Length +12.0" End Stone x 2 = 54.00' Base Length

6 Rows x 33.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 21.00' Base Width

6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

30 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 6 Rows = 826.5 cf Chamber Storage

2,882.3 cf Field - 826.5 cf Chambers = 2,055.8 cf Stone x 40.0% Voids = 822.3 cf Stone Storage

Chamber Storage + Stone Storage = 1,648.8 cf = 0.038 af

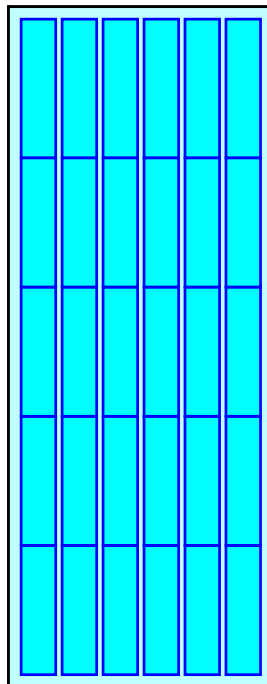
Overall Storage Efficiency = 57.2%

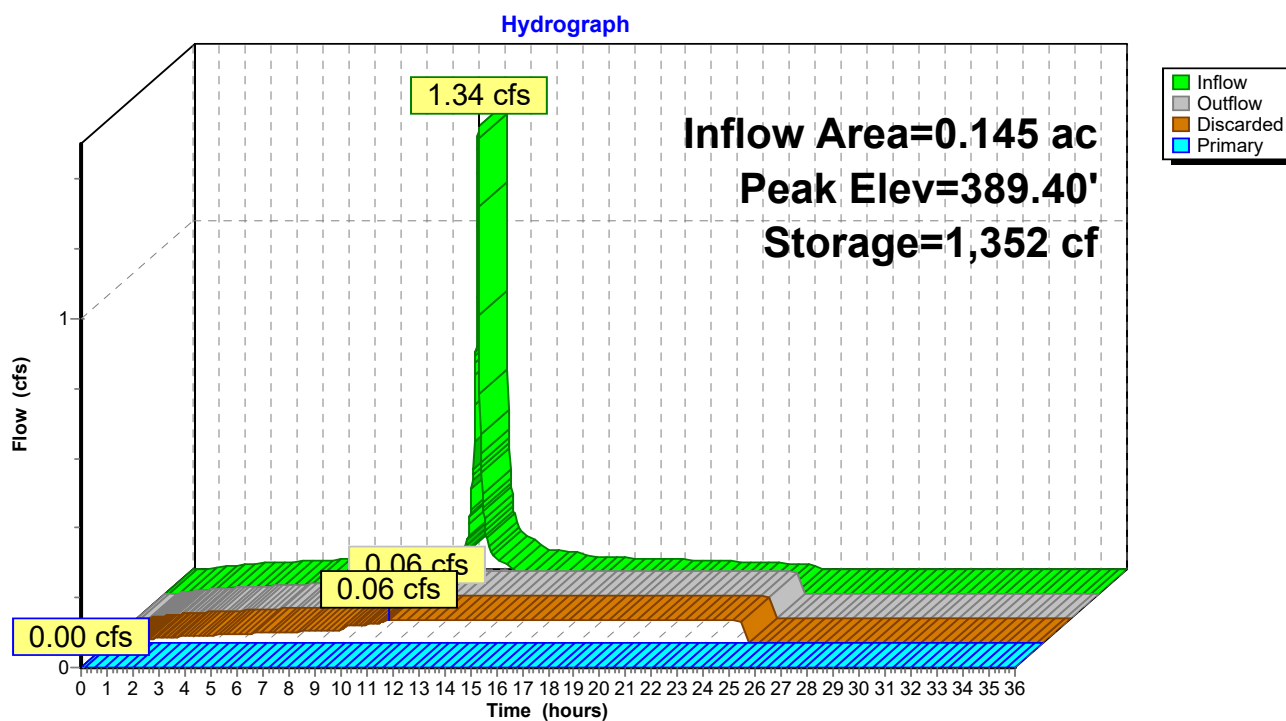
Overall System Size = 54.00' x 21.00' x 2.54'

30 Chambers

106.8 cy Field

76.1 cy Stone



Pond 56P: Infiltration Field #4

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NOAA10 24-hr D 100-YR Rainfall=8.15"

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Summary for Subcatchment 57P: R2-3, 27-28

Runoff = 0.60 cfs @ 12.10 hrs, Volume= 0.042 af, Depth= 7.91"
Routed to Pond 58P : Infiltration Field #5

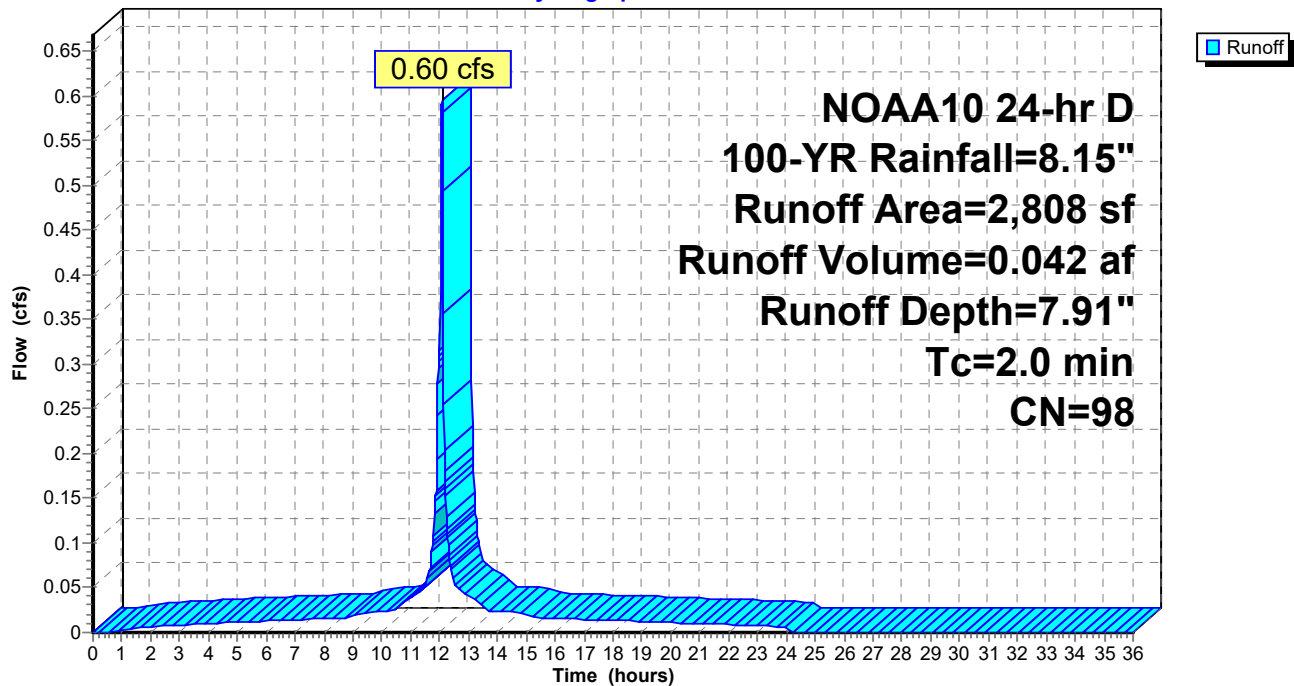
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
NOAA10 24-hr D 100-YR Rainfall=8.15"

Area (sf)	CN	Description
2,808	98	Roofs, HSG B
2,808		100.00% Impervious Area

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

Subcatchment 57P: R2-3, 27-28

Hydrograph



Summary for Pond 58P: Infiltration Field #5

Inflow Area = 0.064 ac, 100.00% Impervious, Inflow Depth = 7.91" for 100-YR event
 Inflow = 0.60 cfs @ 12.10 hrs, Volume= 0.042 af
 Outflow = 0.03 cfs @ 10.78 hrs, Volume= 0.042 af, Atten= 95%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 10.78 hrs, Volume= 0.042 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 407.82' @ 13.53 hrs Surf.Area= 486 sf Storage= 612 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 168.2 min (907.0 - 738.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	405.70'	360 cf	14.50'W x 33.50'L x 2.54'H Field A 1,235 cf Overall - 334 cf Embedded = 901 cf x 40.0% Voids
#2A	406.20'	334 cf	Cultec R-150XLHD x 12 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 4 rows
		694 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	405.70'	2.400 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.03 cfs @ 10.78 hrs HW=405.73' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Pond 58P: Infiltration Field #5 - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 4 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

3 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 31.50' Row Length +12.0" End Stone x 2 =
33.50' Base Length

4 Rows x 33.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 14.50' Base Width

6.0" Stone Base + 18.5" Chamber Height + 6.0" Stone Cover = 2.54' Field Height

12 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 4 Rows = 333.8 cf Chamber Storage

1,234.6 cf Field - 333.8 cf Chambers = 900.8 cf Stone x 40.0% Voids = 360.3 cf Stone Storage

Chamber Storage + Stone Storage = 694.1 cf = 0.016 af

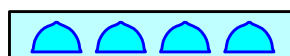
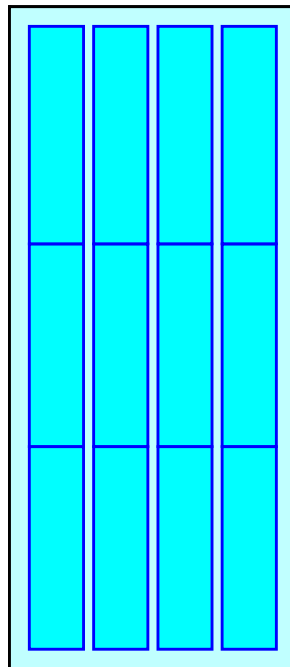
Overall Storage Efficiency = 56.2%

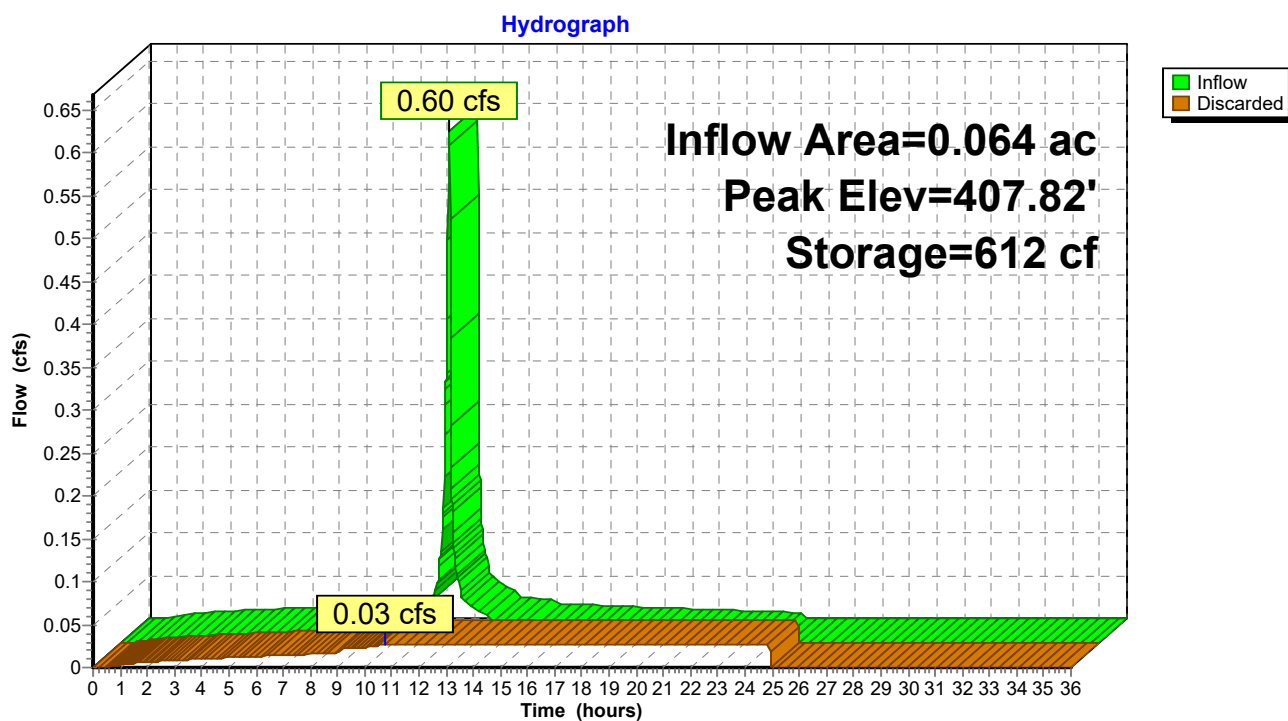
Overall System Size = 33.50' x 14.50' x 2.54'

12 Chambers

45.7 cy Field

33.4 cy Stone

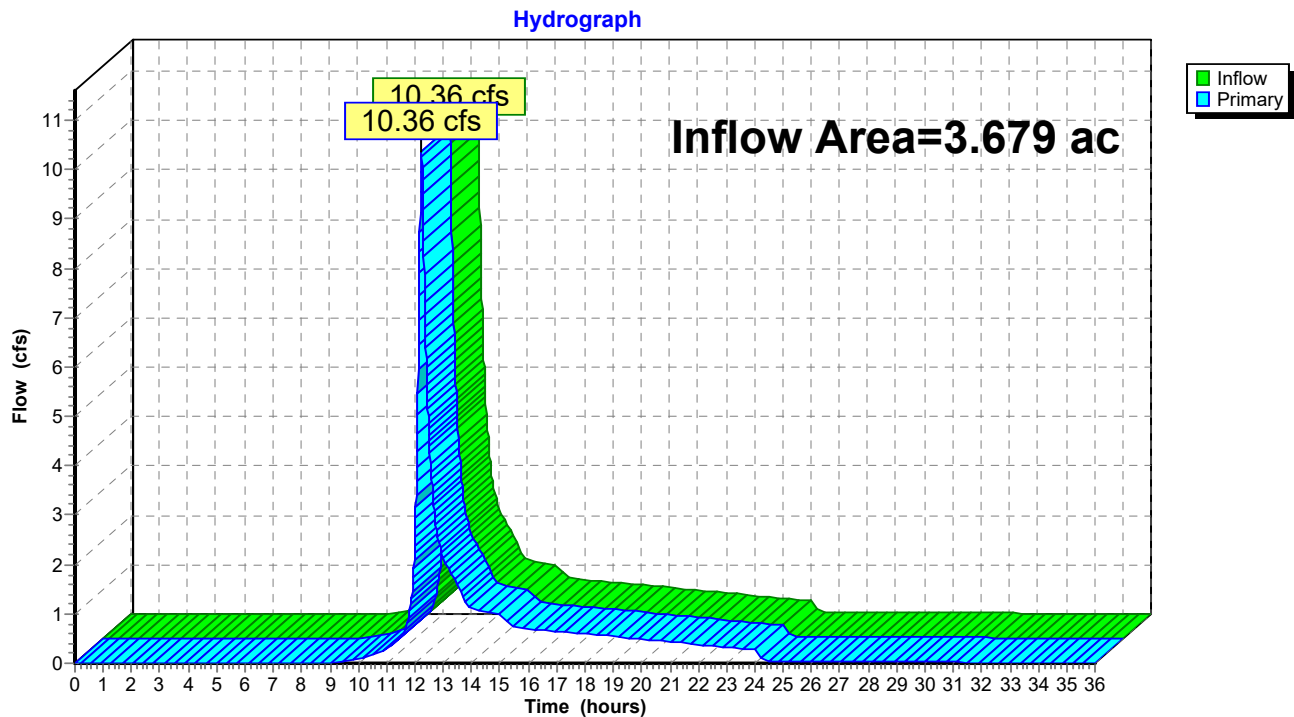


Pond 58P: Infiltration Field #5

Summary for Link 59P: Sub-DP #2a: Flow to Town Land

Inflow Area = 3.679 ac, 9.64% Impervious, Inflow Depth = 3.60" for 100-YR event
Inflow = 10.36 cfs @ 12.22 hrs, Volume= 1.105 af
Primary = 10.36 cfs @ 12.22 hrs, Volume= 1.105 af, Atten= 0%, Lag= 0.0 min
Routed to Link 60P : Design Point #2: Flow to Uncas Brook

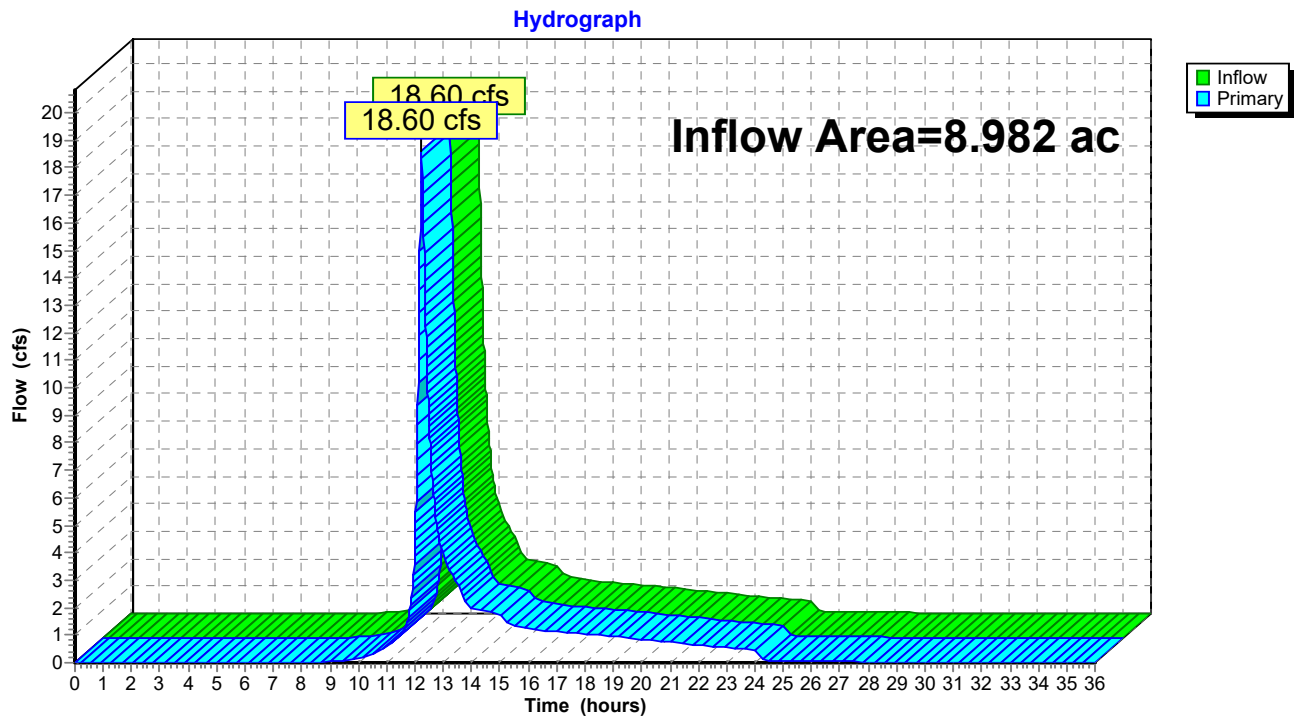
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 59P: Sub-DP #2a: Flow to Town Land

Summary for Link 60P: Design Point #2: Flow to Uncas Brook

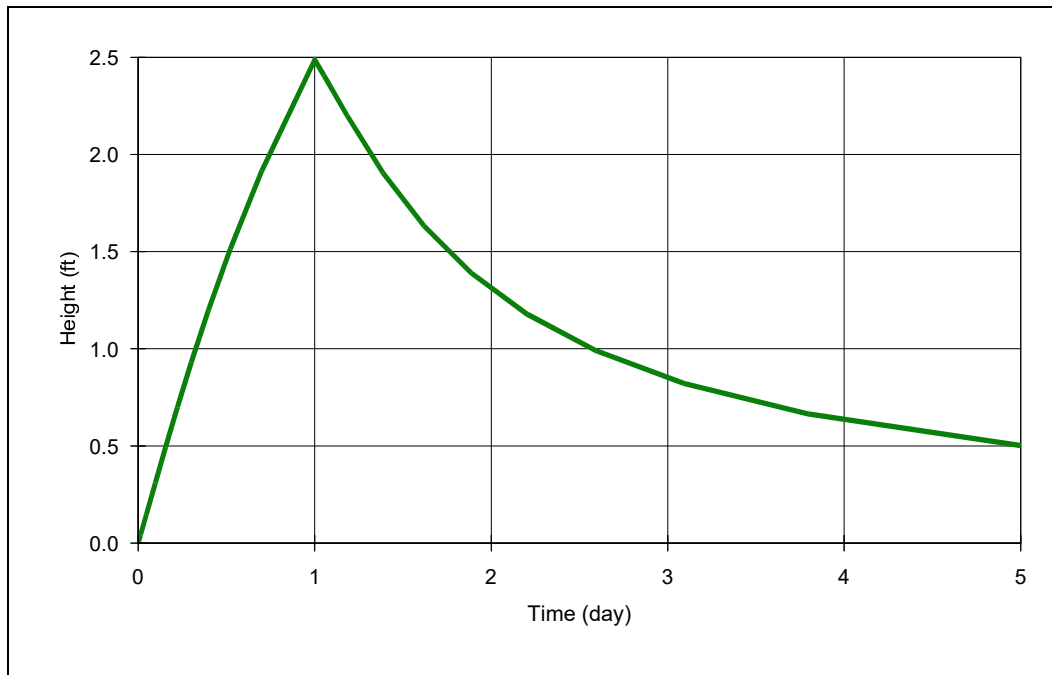
Inflow Area = 8.982 ac, 18.85% Impervious, Inflow Depth = 2.63" for 100-YR event
Inflow = 18.60 cfs @ 12.23 hrs, Volume= 1.970 af
Primary = 18.60 cfs @ 12.23 hrs, Volume= 1.970 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link 60P: Design Point #2: Flow to Uncas Brook

ATTACHMENT L: MOUNDING CALCULATIONS

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: Legacy Engineering

PROJECT: Infiltration Basin #1

ANALYST: Daniel J. Merrikin, P.E.

DATE: 11/19/2024 TIME: 2:33:09 PM

INPUT PARAMETERS

Application rate: 0.64 c.ft/day/sq. ft

Duration of application: 1 day

Total simulation time: 5 day

Fillable porosity: 0.2

Hydraulic conductivity: 2 ft/day

Initial saturated thickness: 20 ft

Length of application area: 50 ft

Width of application area: 38.8 ft

Constant head boundary used at: 200 ft

Groundwater mounding @

X coordinate: 0 ft

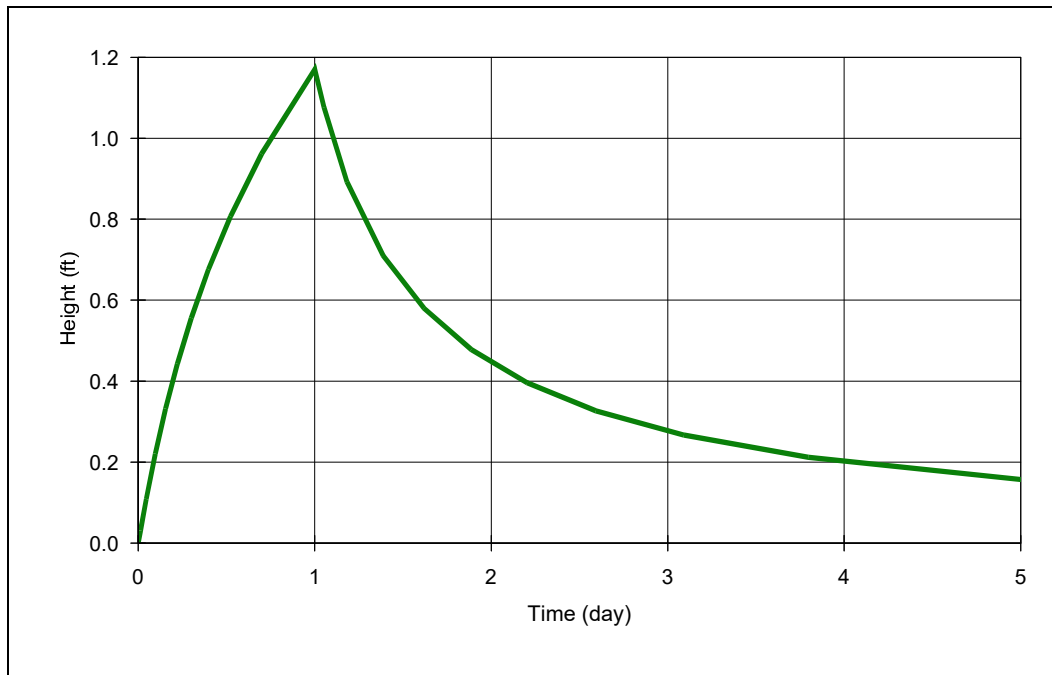
Y coordinate: 0 ft

Total volume applied: 1241.6 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.04
0	0.15
0.1	0.31
0.2	0.49
0.2	0.7
0.3	0.93
0.4	1.2
0.5	1.52
0.7	1.91
1	2.49
1.1	2.41
1.2	2.2
1.4	1.9
1.6	1.63
1.9	1.39
2.2	1.18
2.6	0.99
3.1	0.82
3.8	0.66
5	0.5

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: Legacy Engineering

PROJECT: Infiltration Field #5

ANALYST: Daniel J. Merrikin, P.E.

DATE: 2/4/2025 TIME: 10:17:36 AM

INPUT PARAMETERS

Application rate: 0.48 c.ft/day/sq. ft

Duration of application: 1 day

Total simulation time: 5 day

Fillable porosity: 0.2

Hydraulic conductivity: 4.8 ft/day

Initial saturated thickness: 5.2 ft

Length of application area: 33.5 ft

Width of application area: 14.5 ft

Constant head boundary used at: 200 ft

Groundwater mounding @

X coordinate: 0 ft

Y coordinate: 0 ft

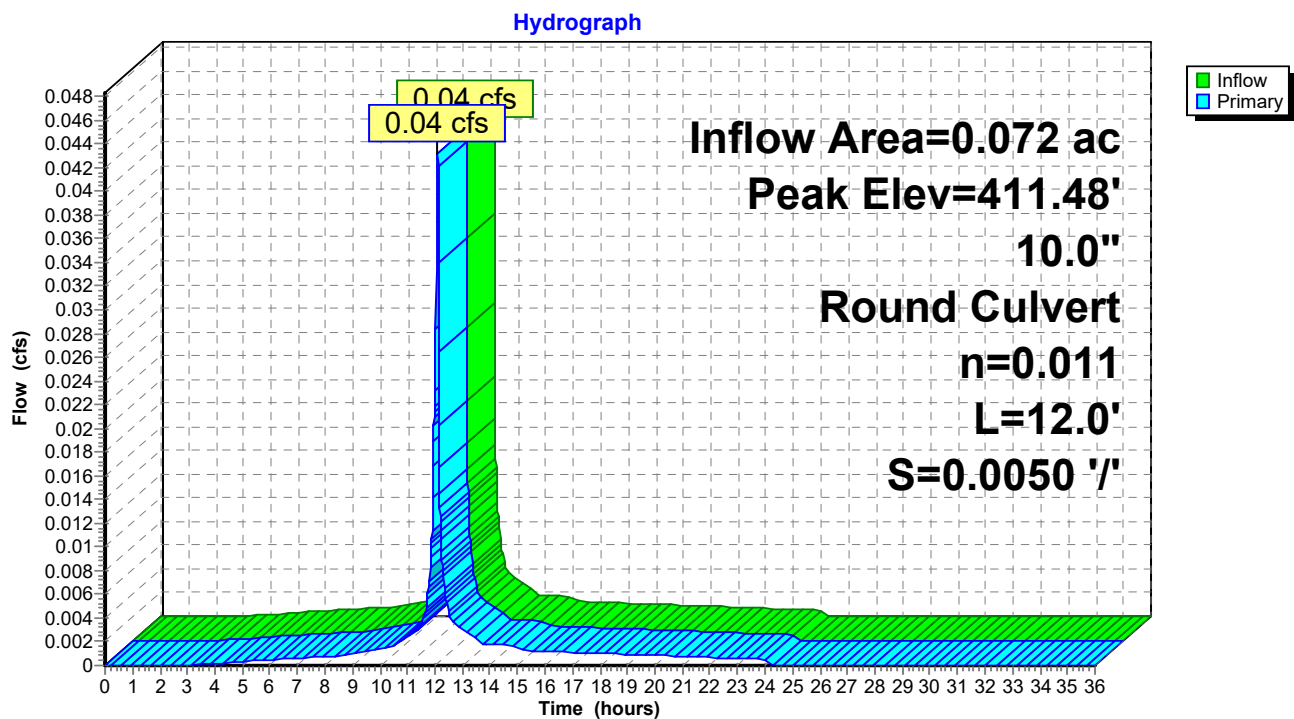
Total volume applied: 233.16 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.03
0	0.11
0.1	0.22
0.2	0.33
0.2	0.44
0.3	0.56
0.4	0.68
0.5	0.81
0.7	0.96
1	1.17
1.1	1.08
1.2	0.89
1.4	0.71
1.6	0.58
1.9	0.48
2.2	0.4
2.6	0.33
3.1	0.27
3.8	0.21
5	0.16

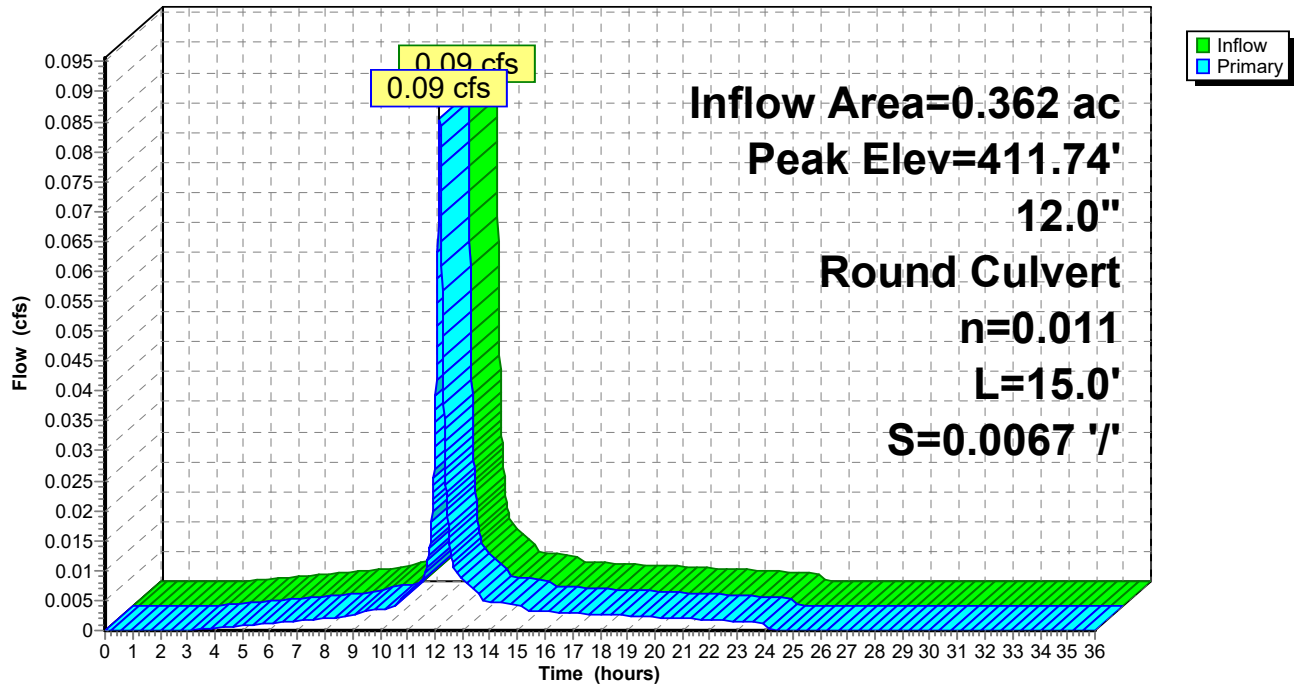
ATTACHMENT M: FIRST DEFENSE PROPRIETARY TREATMENT UNITS

Pond 3P: First Defense Unit A



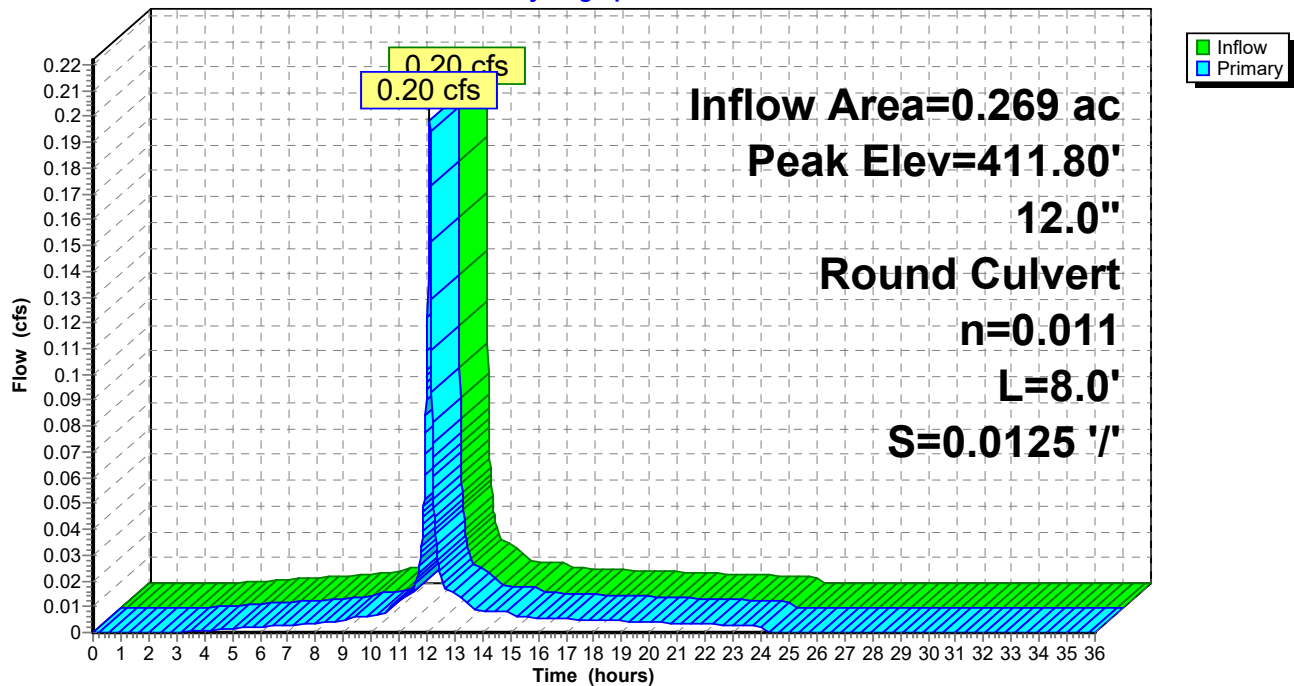
Pond 6P: FD 0+79

Hydrograph



Pond 15P: FD B

Hydrograph



Pond 46P: FD C

Hydrograph

