

SHEET FLOW					
ID	SURFACE	ROUGH COEFF.	START EL. (FT.)	END EL. (FT.)	SLOPE (FT./FT.)
SFA	LAWN	0.240	361.5	368.5	0.214
SFB	WOODS	0.600	359.5	354.8	0.116
TOTAL SHEET FLOW LENGTH:					46

\*CALCULATED Tc IS LESS THAN 10.0 MIN. USE 10.0 MIN. MINIMUM.

SHEET FLOW					
ID	SURFACE	ROUGH COEFF.	START EL. (FT.)	END EL. (FT.)	SLOPE (FT./FT.)
SFA	LAWN	0.240	432.5	429.0	0.059
SFB	WOODS	0.600	429.0	418.3	0.118
TOTAL SHEET FLOW LENGTH:					150

\*CONSERVATIVELY, ASSUME Tc FOR OPEN CHANNEL FLOW THRU DRAINAGE PIPES IS ESSENTIALLY NEGLIGIBLE

SHALLOW CONCENTRATED FLOW					
ID	SURFACE	START EL. (FT.)	END EL. (FT.)	LENGTH (FT.)	SLOPE (FT./FT.)
SCF2A	UNPAVED	418.3	364.1	547	0.099

\*PROP. SUBAREA #2B 'SA2B' IS THE INTERIOR OF THE BASIN, MORE OR LESS, THEREFORE USE 5.0 MIN. Tc

SHEET FLOW					
ID	SURFACE	ROUGH COEFF.	START EL. (FT.)	END EL. (FT.)	SLOPE (FT./FT.)
SF3A	WOODS	0.600	425.0	417.8	0.081
SF3B	LAWN	0.240	417.8	404.0	0.226
TOTAL SHEET FLOW LENGTH:					150

\*PROP. SUBAREA #2C 'SA2C' IS THE INTERIOR OF THE BASIN, MORE OR LESS, THEREFORE USE 5.0 MIN. Tc

SHEET FLOW					
ID	SURFACE	ROUGH COEFF.	START EL. (FT.)	END EL. (FT.)	SLOPE (FT./FT.)
SF2A	LAWN	0.240	344.0	336.0	0.250
SF2B	WOODS	0.600	336.0	325.5	0.228
TOTAL SHEET FLOW LENGTH:					78

\*CALCULATED Tc IS LESS THAN 10.0 MIN. USE 10.0 MIN. MINIMUM.

SHALLOW CONCENTRATED FLOW					
ID	SURFACE	START EL. (FT.)	END EL. (FT.)	LENGTH (FT.)	SLOPE (FT./FT.)
SCF3A	UNPAVED	404.0	395.0	105	0.086
SCF3A	PAVED	395.0	394.0	70	0.014

SHALLOW CONCENTRATED FLOW					
ID	SURFACE	START EL. (FT.)	END EL. (FT.)	LENGTH (FT.)	SLOPE (FT./FT.)
SCF3A	UNPAVED	404.0	395.0	105	0.086
SCF3A	PAVED	395.0	394.0	70	0.014

SHALLOW CONCENTRATED FLOW					
ID	SURFACE	START EL. (FT.)	END EL. (FT.)	LENGTH (FT.)	SLOPE (FT./FT.)
SCF3A	UNPAVED	404.0	395.0	105	0.086
SCF3A	PAVED	395.0	394.0	70	0.014

SHALLOW CONCENTRATED FLOW					
ID	SURFACE	START EL. (FT.)	END EL. (FT.)	LENGTH (FT.)	SLOPE (FT./FT.)
SCF3A	UNPAVED	404.0	395.0	105	0.086
SCF3A	PAVED	395.0	394.0	70	0.014

SHALLOW CONCENTRATED FLOW					
ID	SURFACE	START EL. (FT.)	END EL. (FT.)	LENGTH (FT.)	SLOPE (FT./FT.)
SCF3A	UNPAVED	404.0	395.0	105	0.086
SCF3A	PAVED	395.0	394.0	70	0.014

SHALLOW CONCENTRATED FLOW					
ID	SURFACE	START EL. (FT.)	END EL. (FT.)	LENGTH (FT.)	SLOPE (FT./FT.)
SCF3A	UNPAVED	404.0	395.0	105	0.086
SCF3A	PAVED	395.0	394.0	70	0.014

SHALLOW CONCENTRATED FLOW					
ID	SURFACE	START EL. (FT.)	END EL. (FT.)	LENGTH (FT.)	SLOPE (FT./FT.)
SCF3A	UNPAVED	404.0	395.0	105	0.086
SCF3A	PAVED	395.0	394.0	70	0.014

ON-SITE NRCS HYDROLOGIC SOIL GROUPS			
UNIT	NAME	RATING	RATING
46B	WOODBIDGE FINE SANDY LOAMS, 0-8% SLOPES, VERY STONY	C/D	C/D
47C	WOODBIDGE FINE SANDY LOAMS, 3-15% SLOPES, EXTREMELY STONY	C/D	C/D
62D	CANTON & CHARLTON FINE SANDY LOAMS, 15-35% SLOPES, EXTREMELY STONY	B	B
84B	PAXTON & MONTAUK FINE SANDY LOAMS, 3-8% SLOPES	C	C
85C	PAXTON & MONTAUK FINE SANDY LOAMS, 8-15% SLOPES, VERY STONY	C	C

EXISTING CB TYPE 'C'			
TF	INVERT	RCP	DIAMETER
TF-337.65	337.65	15"	36"
TF-360.97	360.97	15"	36"
TF-360.97	360.97	15"	36"
TF-360.87	360.87	15"	36"

EXISTING CB TYPE 'C'			
TF	INVERT	RCP	DIAMETER
TF-385.97	385.97	15"	36"
TF-393.97	393.97	15"	36"
TF-393.97	393.97	15"	36"
TF-393.82	393.82	15"	36"

PROP. WATERSHED SUBAREA #1 - 'SA1'			
RATING	GROUND COVER	CN	AREA (AC.)
-	BLDGS. / IMPERVIOUS	98	169
C	LAWN (GOOD)	74	10,517
C	WOODS (GOOD)	70	412
TOTAL WATERSHED SUBAREA:		11,088	0.255
WEIGHTED CN VALUE:		74	

PROP. WATERSHED SUBAREA #2A - 'SA2A'			
RATING	GROUND COVER	CN	AREA (AC.)
-	BLDGS. / IMPERVIOUS	98	85,897
C	COMPACT GRAVEL (EST.)	92	2,809
C	OPEN DECK (EST.)	86	3,353
C	LAWN (GOOD)	74	241,863
C	WOODS (GOOD)	70	125,769
TOTAL WATERSHED SUBAREA:		459,691	10,553
WEIGHTED CN VALUE:		78	

PROP. WATERSHED SUBAREA #2B - 'SA2B'			
RATING	GROUND COVER	CN	AREA (AC.)
-	BLDGS. / IMPERVIOUS	98	784
C	OPEN DECK (EST.)	86	151
C	LAWN (GOOD)	74	22,922
TOTAL WATERSHED SUBAREA:		23,857	0.548
WEIGHTED CN VALUE:		75	

PROP. WATERSHED SUBAREA #2C - 'SA2C'			
RATING	GROUND COVER	CN	AREA (AC.)
C	LAWN (GOOD)	74	12,571
C	WOODS (GOOD)	70	12,571
TOTAL WATERSHED SUBAREA:		12,571	0.289
WEIGHTED CN VALUE:		74	

PROP. WATERSHED SUBAREA #2D - 'SA2D'			
RATING	GROUND COVER	CN	AREA (AC.)
C	LAWN (GOOD)	74	2,138
C	WOODS (GOOD)	70	1,349
D	WOODS (GOOD) (WETLANDS)	77	390
TOTAL WATERSHED SUBAREA:		3,877	0.089
WEIGHTED CN VALUE:		73	

PROP. WATERSHED SUBAREA #3A - 'SA3A'			
RATING	GROUND COVER	CN	AREA (AC.)
-	BLDGS. / IMPERVIOUS	98	21,859
C	OPEN DECK (EST.)	86	454
C	LAWN (GOOD)	74	48,227
C	WOODS (GOOD)	70	4,012
TOTAL WATERSHED SUBAREA:		74,552	1.711
WEIGHTED CN VALUE:		81	



SHEET FLOW					
ID	SURFACE	ROUGH COEFF.	START EL. (FT.)	END EL. (FT.)	SLOPE (FT./FT.)
SFA	LAWN	0.240	434.5	433.0	0.079
SFB	WOODS	0.600	433.0	420.1	0.098
TOTAL SHEET FLOW LENGTH:					150

\*CALCULATED Tc IS LESS THAN 10.0 MIN. USE 10.0 MIN. MINIMUM.

SHEET FLOW					
ID	SURFACE	ROUGH COEFF.	START EL. (FT.)	END EL. (FT.)	SLOPE (FT./FT.)
SFA	LAWN	0.240	361.5	346.3	0.101
SFB	WOODS	0.600	359.5	354.8	0.116
TOTAL SHEET FLOW LENGTH:					150

\*CONSERVATIVELY, ASSUME Tc FOR OPEN CHANNEL FLOW THRU DRAINAGE PIPES IS ESSENTIALLY NEGLIGIBLE

SHALLOW CONCENTRATED FLOW					
ID	SURFACE	START EL. (FT.)	END EL. (FT.)	LENGTH (FT.)	SLOPE (FT./FT.)
SCF2A	UNPAVED	346.3	334.0	96	0.128

\*Tc FLOW TIME BEYOND TERMINAL LEVEL SPREADER EXCLUDED FROM CALCULATIONS.

PROP. WATERSHED SUBAREA #3B - 'SA3B'			
RATING	GROUND COVER	CN	AREA (AC.)
-	BLDGS. / IMPERVIOUS	98	20,012
C	COMPACT GRAVEL (EST.)	92	596
C	OPEN DECK (EST.)	86	1,221
B	LAWN (GOOD)	61	372
C	LAWN (GOOD)	74	109,208
B	WOODS (GOOD)	55	32,752
C	WOODS (GOOD)	70	61,228
TOTAL WATERSHED SUBAREA:		225,379	5.174
WEIGHTED CN VALUE:		72	

PROP. WATERSHED SUBAREA #2B - 'SA2B'			
RATING	GROUND COVER	CN	AREA (AC.)
-	BLDGS. / IMPERVIOUS	98	784
C	OPEN DECK (EST.)	86	151
C	LAWN (GOOD)	74	22,922
TOTAL WATERSHED SUBAREA:		23,857	0.548
WEIGHTED CN VALUE:		75	

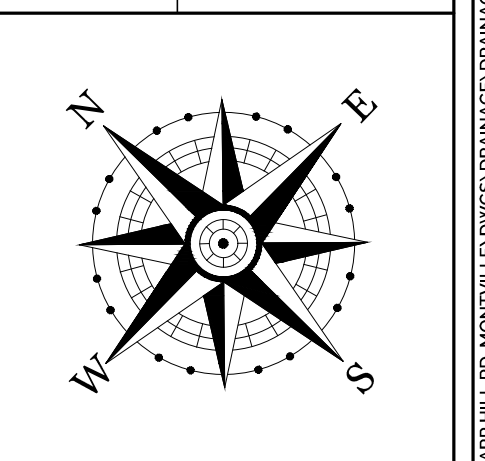
PROP. WATERSHED SUBAREA #2C - 'SA2C'			
RATING	GROUND COVER	CN	AREA (AC.)
C	LAWN (GOOD)	74	12,571
C	WOODS (GOOD)	70	12,571
TOTAL WATERSHED SUBAREA:		12,571	0.289
WEIGHTED CN VALUE:		74	

PROP. WATERSHED SUBAREA #2D - 'SA2D'			
RATING	GROUND COVER	CN	AREA (AC.)
C	LAWN (GOOD)	74	2,138
C	WOODS (GOOD)	70	1,349
D	WOODS (GOOD) (WETLANDS)	77	390
TOTAL WATERSHED SUBAREA:		3,877	0.089
WEIGHTED CN VALUE:		73	

PROP. WATERSHED SUBAREA #3A - 'SA3A'			
RATING	GROUND COVER	CN	AREA (AC.)
-	BLDGS. / IMPERVIOUS	98	21,859
C	OPEN DECK (EST.)	86	454
C	LAWN (GOOD)	74	48,227
C	WOODS (GOOD)	70	4,012
TOTAL WATERSHED SUBAREA:		74,552	1.711
WEIGHTED CN VALUE:		81	

REV.	DATE	DESCRIPTION
1	11/13/25	REVISIONS PER COMMENTS FROM TOWN

**POST-DEVELOPMENT DRAINAGE AREA MAP**  
23-Lot Residential Resubdivision  
PROPERTY ADDRESS:  
47 SHARP HILL ROAD, MONTVILLE, CONNECTICUT 06382  
PREPARED FOR:  
MT KINEO BUILDERS, LLC  
P.O. BOX 246, WEST MYSTIC, CT 06388



PROJECT NO.	SCALE:
2025-0197	1" = 50'
DRAWN BY:	DATE:
REG	7/10/2025
CHECKED BY:	DATE:
SMM	7/10/2025

# Technical Appendices for Stormwater Management Report

## Resubdivision Plans 23-Lot Residential Resubdivision 47 Sharp Hill Road Montville, CT 06382

July 10, 2025  
Revised: November 13, 2025

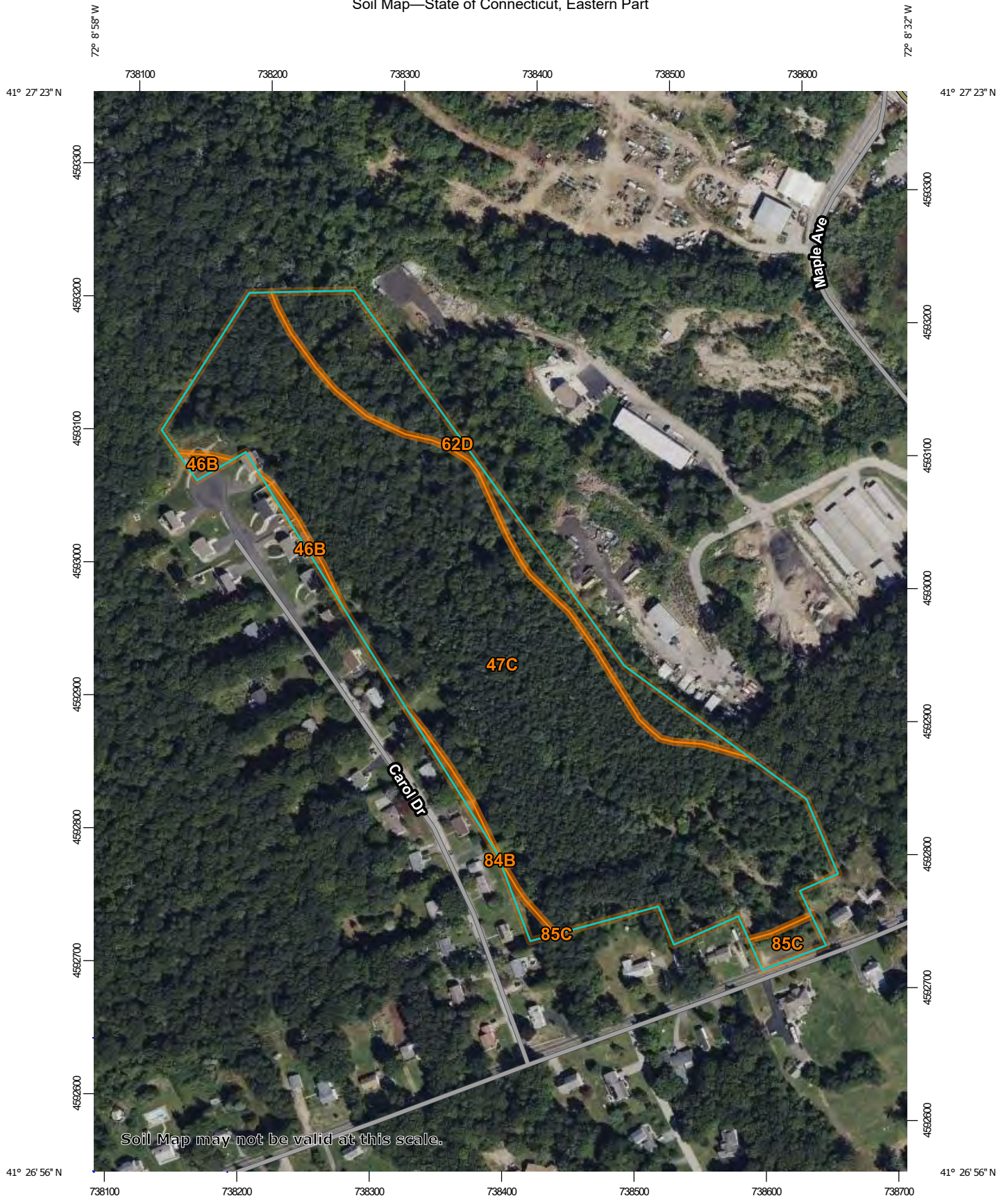
Prepared for:  
**Mt. Kineo Builders, LLC**  
P.O. Box 246  
West Mystic, CT 06388

Prepared by:  
**H+H Engineering Associates, LLC**  
232 Greenmanville Avenue  
Suite 201  
Mystic, CT 06355

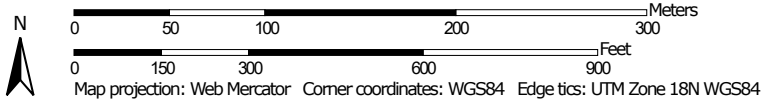


**Appendix A –  
NRCS Soil Mapping**

Soil Map—State of Connecticut, Eastern Part




Map Scale: 1:3,960 if printed on A portrait (8.5" x 11") sheet.



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut, Eastern Part  
 Survey Area Data: Version 2, Aug 30, 2024

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

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 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.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	0.2	0.9%
47C	Woodbridge fine sandy loam, 3 to 15 percent slopes, extremely stony	19.9	84.5%
62D	Canton and Charlton fine sandy loams, 15 to 35 percent slopes, extremely stony	2.9	12.3%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	0.2	1.0%
85C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony	0.3	1.3%
<b>Totals for Area of Interest</b>		<b>23.6</b>	<b>100.0%</b>

## State of Connecticut, Eastern Part

### 47C—Woodbridge fine sandy loam, 3 to 15 percent slopes, extremely stony

#### Map Unit Setting

*National map unit symbol:* 2w685

*Elevation:* 10 to 1,470 feet

*Mean annual precipitation:* 36 to 71 inches

*Mean annual air temperature:* 39 to 55 degrees F

*Frost-free period:* 145 to 240 days

*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Woodbridge, extremely stony, and similar soils:* 83 percent

*Minor components:* 17 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Woodbridge, Extremely Stony

##### Setting

*Landform:* Ground moraines, hills, drumlins

*Landform position (two-dimensional):* Backslope, footslope, summit

*Landform position (three-dimensional):* Side slope, crest

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Parent material:* Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

##### Typical profile

*Oe - 0 to 2 inches:* moderately decomposed plant material

*A - 2 to 9 inches:* fine sandy loam

*Bw1 - 9 to 20 inches:* fine sandy loam

*Bw2 - 20 to 32 inches:* fine sandy loam

*Cd - 32 to 67 inches:* gravelly fine sandy loam

##### Properties and qualities

*Slope:* 3 to 15 percent

*Surface area covered with cobbles, stones or boulders:* 9.0 percent

*Depth to restrictive feature:* 20 to 43 inches to densic material

*Drainage class:* Moderately well drained

*Runoff class:* Medium

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)

*Depth to water table:* About 19 to 27 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 5.3 inches)

### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 7s

*Hydrologic Soil Group:* C/D

*Ecological site:* F144AY037MA - Moist Dense Till Uplands

*Hydric soil rating:* No

### **Minor Components**

#### **Paxton, extremely stony**

*Percent of map unit:* 9 percent

*Landform:* Ground moraines, hills, drumlins

*Landform position (two-dimensional):* Summit, shoulder, backslope

*Landform position (three-dimensional):* Crest, side slope

*Down-slope shape:* Convex, linear

*Across-slope shape:* Linear, convex

*Hydric soil rating:* No

#### **Ridgebury, extremely stony**

*Percent of map unit:* 5 percent

*Landform:* Drumlins, depressions, hills, drainageways, ground moraines

*Landform position (two-dimensional):* Toeslope, footslope

*Landform position (three-dimensional):* Base slope, head slope

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

#### **Sutton, extremely stony**

*Percent of map unit:* 2 percent

*Landform:* Hills, ground moraines

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Base slope

*Down-slope shape:* Concave

*Across-slope shape:* Linear

*Hydric soil rating:* No

#### **Whitman, extremely stony**

*Percent of map unit:* 1 percent

*Landform:* Drainageways, depressions

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

## **Data Source Information**

Soil Survey Area: State of Connecticut, Eastern Part

Survey Area Data: Version 2, Aug 30, 2024

## State of Connecticut, Eastern Part

### 62D—Canton and Charlton fine sandy loams, 15 to 35 percent slopes, extremely stony

#### Map Unit Setting

*National map unit symbol:* 2w81r

*Elevation:* 0 to 1,640 feet

*Mean annual precipitation:* 36 to 71 inches

*Mean annual air temperature:* 39 to 55 degrees F

*Frost-free period:* 145 to 240 days

*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Canton, extremely stony, and similar soils:* 55 percent

*Charlton, extremely stony, and similar soils:* 30 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Canton, Extremely Stony

##### Setting

*Landform:* Moraines, hills, ridges

*Landform position (two-dimensional):* Backslope, summit, shoulder

*Landform position (three-dimensional):* Crest, nose slope, side slope

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex

*Parent material:* Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

##### Typical profile

*O<sub>i</sub> - 0 to 2 inches:* slightly decomposed plant material

*A - 2 to 5 inches:* fine sandy loam

*B<sub>w</sub>1 - 5 to 16 inches:* fine sandy loam

*B<sub>w</sub>2 - 16 to 22 inches:* gravelly fine sandy loam

*2C - 22 to 67 inches:* gravelly loamy sand

##### Properties and qualities

*Slope:* 15 to 35 percent

*Surface area covered with cobbles, stones or boulders:* 9.0 percent

*Depth to restrictive feature:* 19 to 39 inches to strongly contrasting textural stratification

*Drainage class:* Well drained

*Runoff class:* Medium

*Capacity of the most limiting layer to transmit water*

*(K<sub>sat</sub>):* Moderately low to high (0.14 to 14.17 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 3.4 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 7s

*Hydrologic Soil Group:* B

*Ecological site:* F144AY034CT - Well Drained Till Uplands

*Hydric soil rating:* No

#### **Description of Charlton, Extremely Stony**

##### **Setting**

*Landform:* Ridges, ground moraines, hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex

*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

##### **Typical profile**

*Oe - 0 to 2 inches:* moderately decomposed plant material

*A - 2 to 4 inches:* fine sandy loam

*Bw - 4 to 27 inches:* gravelly fine sandy loam

*C - 27 to 65 inches:* gravelly fine sandy loam

##### **Properties and qualities**

*Slope:* 15 to 35 percent

*Surface area covered with cobbles, stones or boulders:* 9.0 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water*

*(Ksat):* Moderately low to high (0.14 to 14.17 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Moderate (about 8.7 inches)

##### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 7s

*Hydrologic Soil Group:* B

*Ecological site:* F144AY034CT - Well Drained Till Uplands

*Hydric soil rating:* No

#### **Minor Components**

##### **Hollis, extremely stony**

*Percent of map unit:* 5 percent

*Landform:* Ridges, hills

*Landform position (two-dimensional):* Shoulder, backslope, summit

*Landform position (three-dimensional):* Crest, side slope, nose  
slope

*Down-slope shape:* Convex

*Across-slope shape:* Linear, convex

*Hydric soil rating:* No

**Chatfield, extremely stony**

*Percent of map unit:* 5 percent

*Landform:* Ridges, hills

*Landform position (two-dimensional):* Summit, backslope, shoulder

*Landform position (three-dimensional):* Crest, side slope, nose  
slope

*Down-slope shape:* Convex

*Across-slope shape:* Linear, convex

*Hydric soil rating:* No

**Sutton, extremely stony**

*Percent of map unit:* 5 percent

*Landform:* Ground moraines, hills

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Base slope

*Down-slope shape:* Concave

*Across-slope shape:* Linear

*Hydric soil rating:* No

## Data Source Information

Soil Survey Area: State of Connecticut, Eastern Part

Survey Area Data: Version 2, Aug 30, 2024

## State of Connecticut, Eastern Part

### 85C—Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony

#### Map Unit Setting

*National map unit symbol:* 2w67f

*Elevation:* 0 to 1,520 feet

*Mean annual precipitation:* 36 to 71 inches

*Mean annual air temperature:* 39 to 55 degrees F

*Frost-free period:* 145 to 240 days

*Farmland classification:* Farmland of statewide importance

#### Map Unit Composition

*Paxton, very stony, and similar soils:* 55 percent

*Montauk, very stony, and similar soils:* 30 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Paxton, Very Stony

##### Setting

*Landform:* Hills, drumlins, ground moraines

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex

*Parent material:* Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

##### Typical profile

*Oe - 0 to 2 inches:* moderately decomposed plant material

*A - 2 to 10 inches:* fine sandy loam

*Bw1 - 10 to 17 inches:* fine sandy loam

*Bw2 - 17 to 28 inches:* fine sandy loam

*Cd - 28 to 67 inches:* gravelly fine sandy loam

##### Properties and qualities

*Slope:* 8 to 15 percent

*Surface area covered with cobbles, stones or boulders:* 1.6 percent

*Depth to restrictive feature:* 20 to 43 inches to densic material

*Drainage class:* Well drained

*Runoff class:* Medium

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)

*Depth to water table:* About 18 to 37 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 4.8 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6s

*Hydrologic Soil Group:* C

*Ecological site:* F144AY007CT - Well Drained Dense Till Uplands

*Hydric soil rating:* No

### Description of Montauk, Very Stony

#### Setting

*Landform:* Recessional moraines, ground moraines, hills, drumlins

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex

*Parent material:* Coarse-loamy over sandy lodgment till derived from gneiss, granite, and/or schist

#### Typical profile

*Oe - 0 to 2 inches:* moderately decomposed plant material

*A - 2 to 6 inches:* fine sandy loam

*Bw1 - 6 to 28 inches:* fine sandy loam

*Bw2 - 28 to 36 inches:* sandy loam

*2Cd - 36 to 74 inches:* gravelly loamy sand

#### Properties and qualities

*Slope:* 8 to 15 percent

*Surface area covered with cobbles, stones or boulders:* 1.6 percent

*Depth to restrictive feature:* 20 to 43 inches to densic material

*Drainage class:* Well drained

*Runoff class:* Medium

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately high (0.00 to 1.42 in/hr)

*Depth to water table:* About 18 to 37 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 5.6 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6s

*Hydrologic Soil Group:* C

*Ecological site:* F144AY007CT - Well Drained Dense Till Uplands

*Hydric soil rating:* No

### Minor Components

#### Woodbridge, very stony

*Percent of map unit:* 6 percent

*Landform:* Ground moraines, hills, drumlins

*Landform position (two-dimensional):* Backslope, footslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

**Charlton, very stony**

*Percent of map unit:* 5 percent  
*Landform:* Hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

**Ridgebury, very stony**

*Percent of map unit:* 3 percent  
*Landform:* Drumlins, depressions, ground moraines, hills, drainageways  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Base slope, head slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

**Stockbridge, very stony**

*Percent of map unit:* 1 percent  
*Landform:* Hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

## Data Source Information

Soil Survey Area: State of Connecticut, Eastern Part  
Survey Area Data: Version 2, Aug 30, 2024

**Appendix B –  
NOAA Point Precipitation  
Frequency Estimates**



**POINT PRECIPITATION FREQUENCY ESTIMATES**

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

NOAA, National Weather Service, Silver Spring, Maryland

[PF\\_tabular](#) | [PF\\_graphical](#) | [Maps & aerials](#)

**PF tabular**

<b>PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)<sup>1</sup></b>										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
<b>5-min</b>	<b>0.340</b> (0.265-0.426)	<b>0.406</b> (0.316-0.509)	<b>0.514</b> (0.399-0.647)	<b>0.604</b> (0.466-0.763)	<b>0.728</b> (0.544-0.953)	<b>0.821</b> (0.601-1.09)	<b>0.918</b> (0.654-1.26)	<b>1.03</b> (0.693-1.44)	<b>1.19</b> (0.770-1.70)	<b>1.32</b> (0.836-1.93)
<b>10-min</b>	<b>0.482</b> (0.375-0.603)	<b>0.576</b> (0.448-0.721)	<b>0.729</b> (0.566-0.916)	<b>0.856</b> (0.660-1.08)	<b>1.03</b> (0.771-1.35)	<b>1.16</b> (0.852-1.55)	<b>1.30</b> (0.926-1.79)	<b>1.46</b> (0.982-2.03)	<b>1.68</b> (1.09-2.42)	<b>1.87</b> (1.18-2.73)
<b>15-min</b>	<b>0.567</b> (0.442-0.710)	<b>0.677</b> (0.527-0.849)	<b>0.857</b> (0.665-1.08)	<b>1.01</b> (0.777-1.27)	<b>1.21</b> (0.907-1.59)	<b>1.37</b> (1.00-1.82)	<b>1.53</b> (1.09-2.10)	<b>1.72</b> (1.16-2.39)	<b>1.98</b> (1.28-2.84)	<b>2.20</b> (1.39-3.21)
<b>30-min</b>	<b>0.798</b> (0.622-1.00)	<b>0.953</b> (0.742-1.20)	<b>1.21</b> (0.937-1.52)	<b>1.42</b> (1.09-1.79)	<b>1.71</b> (1.28-2.24)	<b>1.92</b> (1.41-2.56)	<b>2.15</b> (1.53-2.96)	<b>2.41</b> (1.62-3.36)	<b>2.78</b> (1.80-4.00)	<b>3.09</b> (1.96-4.51)
<b>60-min</b>	<b>1.03</b> (0.802-1.29)	<b>1.23</b> (0.957-1.54)	<b>1.56</b> (1.21-1.96)	<b>1.83</b> (1.41-2.31)	<b>2.20</b> (1.64-2.88)	<b>2.48</b> (1.82-3.31)	<b>2.78</b> (1.98-3.82)	<b>3.11</b> (2.10-4.34)	<b>3.59</b> (2.33-5.15)	<b>3.98</b> (2.52-5.81)
<b>2-hr</b>	<b>1.35</b> (1.06-1.68)	<b>1.61</b> (1.27-2.01)	<b>2.04</b> (1.59-2.54)	<b>2.39</b> (1.86-3.00)	<b>2.88</b> (2.17-3.74)	<b>3.24</b> (2.39-4.29)	<b>3.63</b> (2.60-4.96)	<b>4.07</b> (2.76-5.63)	<b>4.73</b> (3.08-6.72)	<b>5.27</b> (3.35-7.62)
<b>3-hr</b>	<b>1.57</b> (1.24-1.95)	<b>1.87</b> (1.48-2.32)	<b>2.36</b> (1.86-2.94)	<b>2.77</b> (2.16-3.46)	<b>3.33</b> (2.52-4.32)	<b>3.75</b> (2.78-4.94)	<b>4.19</b> (3.02-5.71)	<b>4.71</b> (3.20-6.48)	<b>5.48</b> (3.57-7.75)	<b>6.12</b> (3.90-8.79)
<b>6-hr</b>	<b>2.00</b> (1.59-2.46)	<b>2.37</b> (1.88-2.92)	<b>2.99</b> (2.36-3.69)	<b>3.50</b> (2.75-4.33)	<b>4.20</b> (3.19-5.39)	<b>4.72</b> (3.52-6.17)	<b>5.27</b> (3.82-7.12)	<b>5.92</b> (4.04-8.08)	<b>6.88</b> (4.51-9.64)	<b>7.68</b> (4.91-10.9)
<b>12-hr</b>	<b>2.47</b> (1.98-3.02)	<b>2.93</b> (2.34-3.58)	<b>3.68</b> (2.93-4.51)	<b>4.30</b> (3.41-5.30)	<b>5.16</b> (3.95-6.58)	<b>5.80</b> (4.35-7.53)	<b>6.48</b> (4.72-8.67)	<b>7.27</b> (4.98-9.83)	<b>8.42</b> (5.54-11.7)	<b>9.38</b> (6.02-13.2)
<b>24-hr</b>	<b>2.90</b> (2.34-3.52)	<b>3.45</b> (2.78-4.20)	<b>4.36</b> (3.50-5.31)	<b>5.12</b> (4.08-6.26)	<b>6.16</b> (4.75-7.80)	<b>6.94</b> (5.24-8.93)	<b>7.76</b> (5.69-10.3)	<b>8.72</b> (6.01-11.7)	<b>10.1</b> (6.71-14.0)	<b>11.3</b> (7.31-15.8)
<b>2-day</b>	<b>3.25</b> (2.64-3.91)	<b>3.91</b> (3.18-4.72)	<b>5.00</b> (4.04-6.04)	<b>5.90</b> (4.74-7.16)	<b>7.14</b> (5.55-8.99)	<b>8.06</b> (6.14-10.3)	<b>9.06</b> (6.70-12.0)	<b>10.2</b> (7.09-13.6)	<b>12.0</b> (7.98-16.4)	<b>13.6</b> (8.77-18.8)
<b>3-day</b>	<b>3.52</b> (2.88-4.23)	<b>4.24</b> (3.46-5.10)	<b>5.42</b> (4.40-6.53)	<b>6.40</b> (5.16-7.73)	<b>7.74</b> (6.05-9.71)	<b>8.74</b> (6.68-11.2)	<b>9.82</b> (7.29-12.9)	<b>11.1</b> (7.71-14.7)	<b>13.1</b> (8.69-17.7)	<b>14.7</b> (9.55-20.3)
<b>4-day</b>	<b>3.78</b> (3.10-4.53)	<b>4.54</b> (3.72-5.44)	<b>5.78</b> (4.71-6.94)	<b>6.81</b> (5.51-8.20)	<b>8.22</b> (6.44-10.3)	<b>9.27</b> (7.11-11.8)	<b>10.4</b> (7.74-13.7)	<b>11.8</b> (8.18-15.5)	<b>13.8</b> (9.20-18.7)	<b>15.6</b> (10.1-21.3)
<b>7-day</b>	<b>4.52</b> (3.72-5.37)	<b>5.34</b> (4.40-6.36)	<b>6.70</b> (5.50-8.00)	<b>7.83</b> (6.38-9.38)	<b>9.38</b> (7.38-11.6)	<b>10.5</b> (8.10-13.3)	<b>11.8</b> (8.78-15.3)	<b>13.2</b> (9.24-17.3)	<b>15.4</b> (10.3-20.6)	<b>17.2</b> (11.2-23.4)
<b>10-day</b>	<b>5.24</b> (4.33-6.21)	<b>6.10</b> (5.05-7.24)	<b>7.53</b> (6.20-8.95)	<b>8.71</b> (7.12-10.4)	<b>10.3</b> (8.15-12.7)	<b>11.5</b> (8.90-14.5)	<b>12.8</b> (9.57-16.5)	<b>14.3</b> (10.0-18.6)	<b>16.5</b> (11.1-22.0)	<b>18.3</b> (12.0-24.8)
<b>20-day</b>	<b>7.45</b> (6.21-8.76)	<b>8.37</b> (6.98-9.86)	<b>9.89</b> (8.20-11.7)	<b>11.1</b> (9.19-13.2)	<b>12.9</b> (10.2-15.7)	<b>14.2</b> (11.0-17.5)	<b>15.5</b> (11.6-19.6)	<b>17.0</b> (12.0-21.8)	<b>18.9</b> (12.8-24.9)	<b>20.4</b> (13.4-27.3)
<b>30-day</b>	<b>9.29</b> (7.78-10.9)	<b>10.2</b> (8.58-12.0)	<b>11.8</b> (9.85-13.9)	<b>13.1</b> (10.9-15.5)	<b>14.9</b> (11.9-18.0)	<b>16.3</b> (12.6-19.9)	<b>17.7</b> (13.1-22.0)	<b>19.0</b> (13.5-24.3)	<b>20.7</b> (14.1-27.2)	<b>22.0</b> (14.5-29.3)
<b>45-day</b>	<b>11.6</b> (9.74-13.5)	<b>12.6</b> (10.6-14.7)	<b>14.2</b> (11.9-16.6)	<b>15.6</b> (13.0-18.3)	<b>17.5</b> (13.9-20.9)	<b>19.0</b> (14.7-23.0)	<b>20.4</b> (15.1-25.1)	<b>21.6</b> (15.4-27.5)	<b>23.2</b> (15.8-30.2)	<b>24.2</b> (15.9-32.0)
<b>60-day</b>	<b>13.5</b> (11.4-15.7)	<b>14.5</b> (12.2-16.9)	<b>16.2</b> (13.6-18.9)	<b>17.7</b> (14.7-20.7)	<b>19.6</b> (15.7-23.4)	<b>21.2</b> (16.5-25.6)	<b>22.7</b> (16.8-27.8)	<b>23.9</b> (17.1-30.3)	<b>25.3</b> (17.3-32.9)	<b>26.2</b> (17.4-34.5)

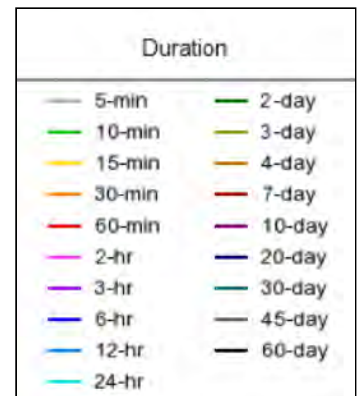
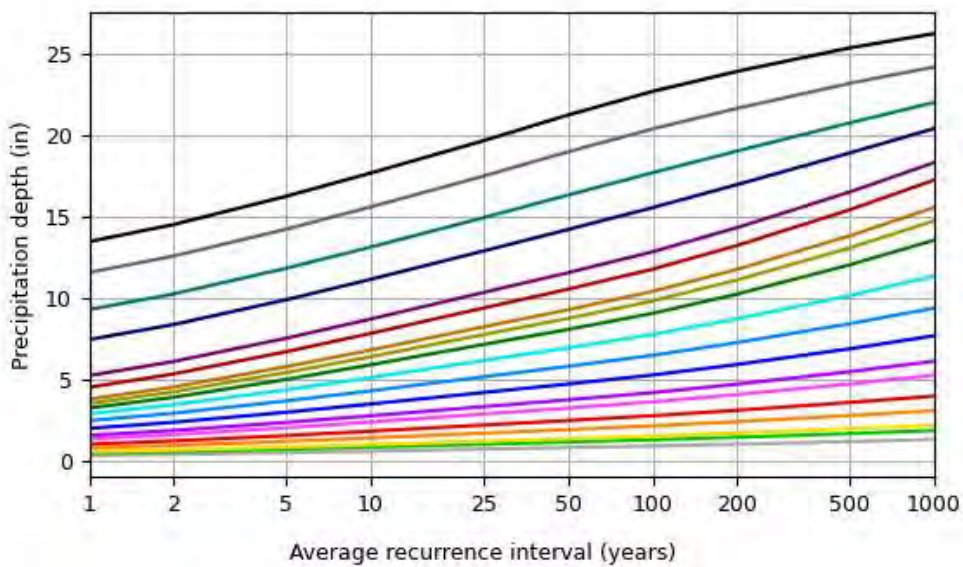
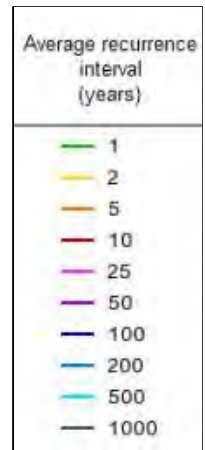
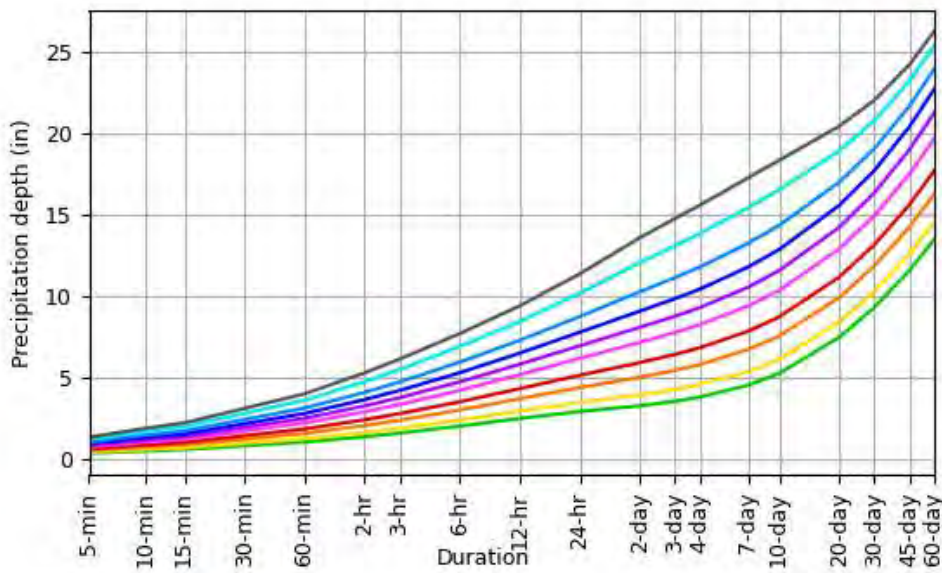
<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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**PF graphical**

PDS-based depth-duration-frequency (DDF) curves

Latitude: 41.4506°, Longitude: -72.1433°



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**Maps & aerials**

**Small scale terrain**



Large scale terrain



Large scale map



Large scale aerial



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**Appendix C –  
Water Quality Volume  
Calculations**

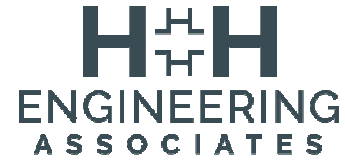
**WQV CALCULATIONS - STORMWATER MANAGEMENT AREA 'SA2A' - WATER QUALITY BASIN**

<b>Project:</b> 47 Sharp Hill Road	<b>Calculated By</b>	<b>Date</b>
<b>Client:</b> Mt Kineo Builders, LLC	REG	11/13/2025

**Water Quality Volume (WQV)**

10,552 ac	A = Area draining to the practice
1,972 ac	A <sub>I</sub> = Impervious area draining to the practice
0.187 decimal	I = Percent impervious area draining to the practice, in decimal form
0.218 unitless	R <sub>V</sub> = Runoff coefficient = 0.05 + (0.9 x I)
2,993 ac-in	WQV = 1.3" x R <sub>V</sub> x A
10,865 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

<b>Designer</b>	<b>Stormwater Management Area 'SA2A'</b>
<b>Notes:</b>	The 1.3" WQV storm event was analyzed using HydroCAD, which takes into account both the ground coverage and underlying soil conditions and demonstrates that 94% of the stormwater runoff from the first 1.3" WQV is contained up to the top of the first orifice in the outlet control structure for the Water Quality Basin. The remaining runoff is completely contained within Bioretention Basin 'A'.



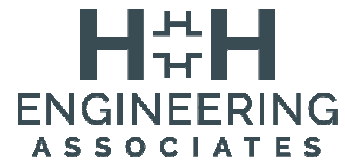
**WQV CALCULATIONS - STORMWATER MANAGEMENT AREA 'SA2B' - BIORETENTION BASIN 'A'**

<b>Project:</b> 47 Sharp Hill Road	<b>Calculated By</b>	<b>Date</b>
<b>Client:</b> Mt Kineo Builders, LLC	REG	11/13/2025

**Water Quality Volume (WQV)**

0,526 ac	A = Area draining to the practice
0,018 ac	A <sub>I</sub> = Impervious area draining to the practice
0,034 decimal	I = Percent impervious area draining to the practice, in decimal form
0,081 unitless	R <sub>V</sub> = Runoff coefficient = 0.05 + (0.9 x I)
0,055 ac-in	WQV = 1.3" x R <sub>V</sub> x A
201 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

<b>Designer</b>	<b>Stormwater Management Area 'SA2A'</b>
<b>Notes:</b>	The 1.3" WQV storm event was analyzed using HydroCAD, which takes into account both the ground coverage and underlying soil conditions and demonstrates that the stormwater runoff from the first 1.3" WQV is completely contained up to the top of the first orifice in the outlet control structure for Bioretention Basin 'A'.



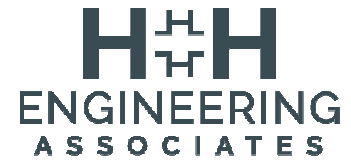
**WQV CALCULATIONS - STORMWATER MANAGEMENT AREA 'SA3A' - BIORETENTION BASIN 'C'**

<b>Project:</b> 47 Sharp Hill Road	<b>Calculated By</b>	<b>Date</b>
<b>Client:</b> Mt Kineo Builders, LLC	REG	11/13/2025

**Water Quality Volume (WQV)**

1.711 ac	A = Area draining to the practice
0.502 ac	A <sub>I</sub> = Impervious area draining to the practice
0.293 decimal	I = Percent impervious area draining to the practice, in decimal form
0.314 unitless	R <sub>V</sub> = Runoff coefficient = 0.05 + (0.9 x I)
0.699 ac-in	WQV = 1.3" x R <sub>V</sub> x A
2.536 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

<b>Designer</b>	<b>Stormwater Management Area 'SA3A'</b>
<b>Notes:</b>	The 1.3" WQV storm event was analyzed using HydroCAD, which takes into account both the ground coverage and underlying soil conditions and demonstrates that the stormwater runoff from the first 1.3" WQV is completely contained up to the top of the first orifice in the outlet control structure for Bioretention Basin 'C'.



# **Appendix D – Riprap Apron Calculations**

**Outlet Protection Design**

Outlet FES-1

Reference: Connecticut Department of Transportation Drainage Manual, Dated October 2000

- A. Apron width at culvert end ( $W_1$ ) = 3 Sp where Sp = outlet pipe diameter
- B. Apron length (La) =  $\frac{1.8 (Q-5)}{(Sp)^{3/2}} + 10$
- C. Apron width at downstream end (W) = 3Sp + 0.7La where La = apron length

Type A Riprap Apron (Tailwater Condition) : TW < 0.5 dia of outlet

Peak Q(25yr)=  cfs      PIPE DIA=  ft

A.  $W_1 = 3(Sp) =$  ft

B.  $La = \frac{1.8 (Q-5)}{(Sp)^{1.5}} + 10 =$  ft

C.  $W_2 = 3(Sp) + 0.7(La) =$  ft

**Table 11.11 Allowable Outlet Velocities for Type A and B Riprap Aprons**

Outlet Velocity - mps (fps)	Riprap Specification
0-2.44 (0-8)	Modified
2.44-3.05 (8-10)	Intermediate
3.05-4.27 (10-14)	Standard

V(25yr)=  fps      Therefore; Use Standard Riprap

**Outlet Protection Design**

Outlet FES-2

Reference: Connecticut Department of Transportation Drainage Manual, Dated October 2000

- A. Apron width at culvert end ( $W_1$ ) = 3 Sp where Sp = outlet pipe diameter
- B. Apron length (La) =  $\frac{1.8 (Q-5)}{(Sp)^{3/2}} + 10$
- C. Apron width at downstream end (W) = 3Sp + 0.7La where La = apron length

Type A Riprap Apron (Tailwater Condition) : TW < 0.5 dia of outlet

Peak Q(25yr)=  cfs      PIPE DIA=  ft

A.  $W_1 = 3(Sp) =$  ft

B.  $La = \frac{1.8 (Q-5)}{(Sp)^{1.5}} + 10 =$  ft

C.  $W_2 = 3(Sp) + 0.7(La) =$  ft

**Table 11.11 Allowable Outlet Velocities for Type A and B Riprap Aprons**

Outlet Velocity - mps (fps)	Riprap Specification
0-2.44 (0-8)	Modified
2.44-3.05 (8-10)	Intermediate
3.05-4.27 (10-14)	Standard

V(25yr)=  fps      Therefore; Use Standard Riprap

**Outlet Protection Design**

Outlet FES-3

Reference: Connecticut Department of Transportation Drainage Manual, Dated October 2000

- A. Apron width at culvert end ( $W_1$ ) = 3 Sp where Sp = outlet pipe diameter
- B. Apron length (La) =  $\frac{1.8 (Q-5)}{(Sp)^{3/2}} + 10$
- C. Apron width at downstream end (W) = 3Sp + 0.7La where La = apron length

Type A Riprap Apron (Tailwater Condition) : TW < 0.5 dia of outlet

Peak Q(25yr)=  cfs      PIPE DIA=  ft

A.  $W_1 = 3(Sp) =$  ft

B.  $La = \frac{1.8 (Q-5)}{(Sp)^{1.5}} + 10 =$  ft

C.  $W_2 = 3(Sp) + 0.7(La) =$  ft

**Table 11.11 Allowable Outlet Velocities for Type A and B Riprap Aprons**

Outlet Velocity - mps (fps)	Riprap Specification
0-2.44 (0-8)	Modified
2.44-3.05 (8-10)	Intermediate
3.05-4.27 (10-14)	Standard

V(25yr)=  fps      Therefore; Use Standard Riprap

**Outlet Protection Design**

Outlet FES-4

Reference: Connecticut Department of Transportation Drainage Manual, Dated October 2000

- A. Apron width at culvert end ( $W_1$ ) = 3 Sp where Sp = outlet pipe diameter
- B. Apron length (La) =  $\frac{1.8 (Q-5)}{(Sp)^{3/2}} + 10$
- C. Apron width at downstream end (W) = 3Sp + 0.7La where La = apron length

Type A Riprap Apron (Tailwater Condition) : TW < 0.5 dia of outlet

Peak Q(25yr)=  cfs      PIPE DIA=  ft

A.  $W_1 = 3(Sp) =$  ft  ft

B.  $La = \frac{1.8 (Q-5)}{(Sp)^{1.5}} + 10 =$  ft  ft

C.  $W_2 = 3(Sp) + 0.7(La) =$  ft  ft

**Table 11.11 Allowable Outlet Velocities for Type A and B Riprap Aprons**

Outlet Velocity - mps (fps)	Riprap Specification
0-2.44 (0-8)	Modified
2.44-3.05 (8-10)	Intermediate
3.05-4.27 (10-14)	Standard

V(25yr)=  fps      Therefore; Use Standard Riprap

**Outlet Protection Design**

Outlet FES-5

Reference: Connecticut Department of Transportation Drainage Manual, Dated October 2000

- A. Apron width at culvert end ( $W_1$ ) = 3 Sp where Sp = outlet pipe diameter
- B. Apron length (La) =  $\frac{1.8 (Q-5)}{(Sp)^{3/2}} + 10$
- C. Apron width at downstream end (W) = 3Sp + 0.7La where La = apron length

Type A Riprap Apron (Tailwater Condition) : TW < 0.5 dia of outlet

Peak Q(25yr)=  cfs      PIPE DIA=  ft

A.  $W_1 = 3(Sp) =$  ft

B.  $La = \frac{1.8 (Q-5)}{(Sp)^{1.5}} + 10 =$  ft

C.  $W_2 = 3(Sp) + 0.7(La) =$  ft

**Table 11.11 Allowable Outlet Velocities for Type A and B Riprap Aprons**

Outlet Velocity - mps (fps)	Riprap Specification
0-2.44 (0-8)	Modified
2.44-3.05 (8-10)	Intermediate
3.05-4.27 (10-14)	Standard

V(25yr)=  fps      Therefore; Use Modified Riprap

**Outlet Protection Design**

Outlet FES-6

Reference: Connecticut Department of Transportation Drainage Manual, Dated October 2000

- A. Apron width at culvert end ( $W_1$ ) = 3 Sp where Sp = outlet pipe diameter
- B. Apron length (La) =  $\frac{1.8 (Q-5)}{(Sp)^{3/2}} + 10$
- C. Apron width at downstream end (W) = 3Sp + 0.7La where La = apron length

Type A Riprap Apron (Tailwater Condition) : TW < 0.5 dia of outlet

Peak Q(25yr)=  cfs      PIPE DIA=  ft

A.  $W_1 = 3(Sp) =$  ft

B. La =  $\frac{1.8 (Q-5)}{(Sp)^{1.5}} + 10 =$  ft

C.  $W_2 = 3(Sp) + 0.7(La) =$  ft

**Table 11.11 Allowable Outlet Velocities for Type A and B Riprap Aprons**

Outlet Velocity - mps (fps)	Riprap Specification
0-2.44 (0-8)	Modified
2.44-3.05 (8-10)	Intermediate
3.05-4.27 (10-14)	Standard

V(25yr)=  fps      Therefore; Use Modified Riprap

**Appendix E –  
BMP Inspection  
Checklist**

# INSPECTION CHECKLIST

DATE/ TIME: \_\_\_\_\_

INSPECTOR: \_\_\_\_\_

TYPE OF BMP: \_\_\_\_\_

WEATHER DURING INSPECTION: \_\_\_\_\_

LOCATION: \_\_\_\_\_

TYPE OF INSPECTION (check if applicable):

Storm Event       Complaint Response       Routine

AS IS BUILT PLANS AVAILABLE: Yes       No

PRECIPITATION AMOUNT IN 24 HR PRIOR TO INSPECTION: \_\_\_\_\_

<b>INLET</b>	APPLICABLE: Yes <input type="checkbox"/> No <input type="checkbox"/>
<u>Circle or note applicable element(s):</u> level spreader, inlet curb cut opening, inlet structure, piped flow entrance, flow diversion structure  _____	<u>Guidance on what to look for:</u> -Accumulated debris/ sediment at the inlet and within the structure (if applicable) -Structural damage or erosion
<b>CONDITION:</b> Satisfactory <input type="checkbox"/> Unsatisfactory <input type="checkbox"/>	

<b>RECOMMENDED MAINTANENCE</b>
_____ _____ _____ _____ _____ _____ _____ _____ _____

<b>NOTES</b>
_____ _____ _____ _____
<b>DATE FOR FOLLOW UP</b>
_____

<b>PRETREATMENT</b>		<b>APPLICABLE:</b> Yes <input type="checkbox"/> No <input type="checkbox"/>	
<u>Circle or note applicable element(s):</u> sediment forebay, pretreatment vegetated filter strip, deep sump pump catch basin, oil grit separator, proprietary treatment device _____		<u>Guidance on what to look for:</u> -Accumulated debris/ sediment -Structural damage or erosion	
<b>CONDITION:</b> Satisfactory <input type="checkbox"/>		Unsatisfactory <input type="checkbox"/>	

<b>RECOMMENDED MAINTANENCE</b>
_____ _____ _____ _____ _____ _____ _____ _____ _____ _____

<b>NOTES</b>
_____ _____ _____ _____
<b>DATE FOR FOLLOW UP</b>
_____

<b>BASIN CELL</b>		<b>APPLICABLE:</b> Yes <input type="checkbox"/> No <input type="checkbox"/>	
<u>Circle or note applicable element(s):</u> infiltration trench, infiltration basin, bioretention, sand filter, subsurface gravel wetland _____		<u>Guidance on what to look for:</u> -Accumulated debris -Damage (e.g. erosion/ animal burrowing) -Overgrown/ dead vegetation -Standing water -Condition of wetland vegetation	
<b>CONDITION:</b> Satisfactory <input type="checkbox"/>		Unsatisfactory <input type="checkbox"/>	

<b>RECOMMENDED MAINTANENCE</b>
_____ _____ _____ _____ _____ _____ _____ _____ _____ _____

<b>NOTES</b>
_____ _____ _____ _____
<b>DATE FOR FOLLOW UP</b>
_____

**FILTER BED** APPLICABLE: Yes  No

<p><u>Circle or note applicable element(s):</u> bioretention, sand filter, tree filter, dry water quality swale, permeable pavement</p> <p>_____</p>	<p><u>Guidance on what to look for:</u> - Accumulated debris/ sediment -Overgrown/ dead vegetation and weeds -Standing water above filter bed -Erosion/ rutting in upgradient areas -Cracks or damage to permeable pavement</p>
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CONDITION: Satisfactory  Unsatisfactory

**RECOMMENDED MAINTANENCE**

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**DATE FOR FOLLOW UP**

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**SUBSURFACE RESERVOIR/ OBSERVATION WELL** APPLICABLE: Yes  No

<p><u>Circle or note applicable element(s):</u> infiltration trench, underground infiltration system, dry well, bioretention, tree filter, dry water quality swale, subsurface gravel wetland*</p> <p>_____</p>	<p><u>Guidance on what to look for:</u> -Standing water in the</p> <p style="text-align: right;">*if underdra in present</p>
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CONDITION: Satisfactory  Unsatisfactory

**RECOMMENDED MAINTANENCE**

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**DATE FOR FOLLOW UP**

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<b>Berm/ Weir</b> APPLICABLE: Yes <input type="checkbox"/> No <input type="checkbox"/>	
<u>Circle or note applicable element(s):</u> stormwater ponds, stormwater wetlands including subsurface gravel wetland, water quality swales <hr/>	<u>Guidance on what to look for:</u> -Debris sediment buildup -Damage (e.g. erosion, cracks, spalling, seepage/ weeps, failure, animal burrows)
<b>CONDITION:</b> Satisfactory <input type="checkbox"/>	Unsatisfactory <input type="checkbox"/>

<b>RECOMMENDED MAINTANENCE</b>
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<b>DATE FOR FOLLOW UP</b>
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<b>Outlet</b> APPLICABLE: Yes <input type="checkbox"/> No <input type="checkbox"/>	
<u>Circle or note applicable element(s):</u> outlet curb cut openings, raised overflow structures or risers, outflow weirs, outlet pipes/ culverts, stone riprap apron, stone riprap stilling basin or plunge pool <hr/>	<u>Guidance on what to look for:</u> -Accumulated debris/ sediment at the outlet and within the structure (if applicable) -Structural damage or erosion
<b>CONDITION:</b> Satisfactory <input type="checkbox"/>	Unsatisfactory <input type="checkbox"/>

<b>RECOMMENDED MAINTANENCE</b>
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<b>DATE FOR FOLLOW UP</b>
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**Maintenance Access**                      APPLICABLE: Yes                       No

All BMPs are applicable  
Guidance on what to look for:  
 -Access to pretreatment and all parts of BMP that require routine maintenance or sediment removal  
 -Structural damage or erosion access road  
 -Overgrown/ dead vegetation preventing or impeding access by maintenance personnel or equipment

CONDITION:                      Satisfactory                       Unsatisfactory

**RECOMMENDED MAINTANENCE**

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**NOTES**

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**DATE FOR FOLLOW UP**

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**Other:** \_\_\_\_\_

Note applicable element(s):  
 \_\_\_\_\_  
 \_\_\_\_\_

CONDITION:                      Satisfactory                       Unsatisfactory

**RECOMMENDED MAINTANENCE**

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**NOTES**

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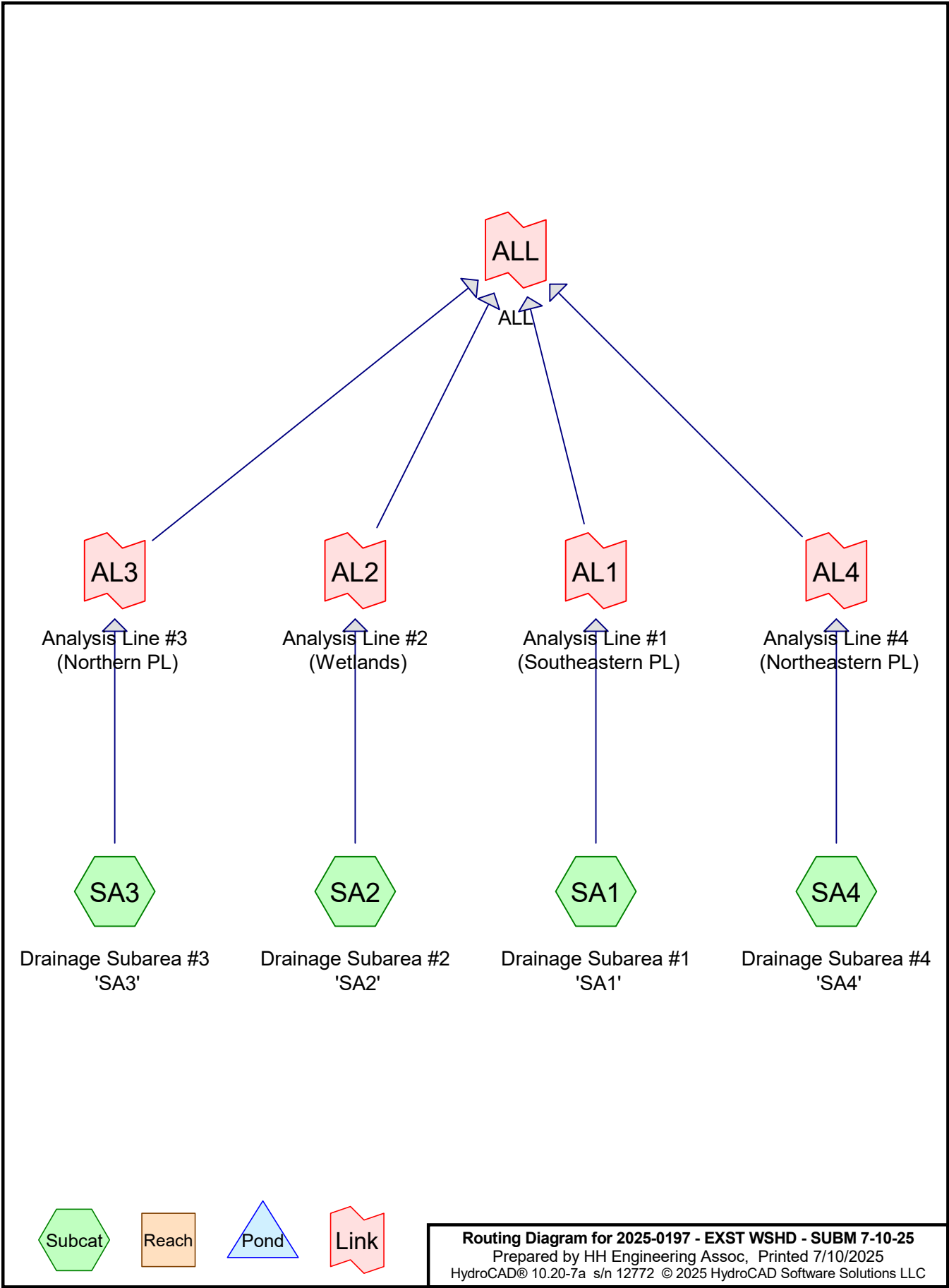
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**DATE FOR FOLLOW UP**

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**Appendix F –  
Pre-Development  
HydroCAD Report**



**2025-0197 - EXST WSHD - SUBM 7-10-25**

Prepared by HH Engineering Assoc

HydroCAD® 10.20-7a s/n 12772 © 2025 HydroCAD Software Solutions LLC

Printed 7/10/2025

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**Area Listing (selected nodes)**

Area (sq-ft)	CN	Description (subcatchment-numbers)
34,240	98	Bldgs./Impervious (SA1, SA2, SA3)
3,938	92	Compact Gravel (est.), HSG C (SA1, SA2, SA3)
162,130	74	Lawn, Good, HSG C (SA1, SA2, SA3)
1,689	86	Open Deck (est.), HSG C (SA1, SA2)
33,140	55	Woods, Good, HSG B (SA2, SA3)
584,148	70	Woods, Good, HSG C (SA1, SA2, SA3, SA4)
390	77	Woods, Good, HSG D (SA2)
<b>819,675</b>	<b>71</b>	<b>TOTAL AREA</b>

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 2  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=84,177 sf 10.80% Impervious Runoff Depth=0.12"  
Flow Length=781' Tc=16.3 min CN=76 Runoff=0.09 cfs 819 cf

**Subcatchment SA2: Drainage Subarea #2** Runoff Area=436,939 sf 4.21% Impervious Runoff Depth=0.06"  
Flow Length=1,108' Tc=23.5 min CN=72 Runoff=0.12 cfs 2,251 cf

**Subcatchment SA3: Drainage Subarea #3** Runoff Area=289,358 sf 2.33% Impervious Runoff Depth=0.04"  
Flow Length=660' Tc=22.6 min CN=70 Runoff=0.04 cfs 1,000 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=9,201 sf 0.00% Impervious Runoff Depth=0.04"  
Flow Length=231' Tc=10.5 min CN=70 Runoff=0.00 cfs 32 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=0.09 cfs 819 cf  
Primary=0.09 cfs 819 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=0.12 cfs 2,251 cf  
Primary=0.12 cfs 2,251 cf

**Link AL3: Analysis Line #3 (Northern PL)** Inflow=0.04 cfs 1,000 cf  
Primary=0.04 cfs 1,000 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.00 cfs 32 cf  
Primary=0.00 cfs 32 cf

**Link ALL: ALL** Inflow=0.20 cfs 4,102 cf  
Primary=0.20 cfs 4,102 cf

**Total Runoff Area = 819,675 sf Runoff Volume = 4,102 cf Average Runoff Depth = 0.06"**  
**95.82% Pervious = 785,435 sf 4.18% Impervious = 34,240 sf**

**Summary for Subcatchment SA1: Drainage Subarea #1 'SA1'**

Runoff = 0.09 cfs @ 12.46 hrs, Volume= 819 cf, Depth= 0.12"

Routed to Link AL1 : Analysis Line #1 (Southeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
Type III 24-hr WQV Rainfall=1.30"

Area (sf)	CN	Description
* 9,093	98	Bldgs./Impervious
* 2,325	92	Compact Gravel (est.), HSG C
* 575	86	Open Deck (est.), HSG C
* 46,031	74	Lawn, Good, HSG C
* 26,153	70	Woods, Good, HSG C
84,177	76	Weighted Average
75,084	73	89.20% Pervious Area
9,093	98	10.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	106	0.0920	0.23		<b>Sheet Flow, SF1A, Lawn</b> n= 0.240 P2= 3.43"
2.9	11	0.0730	0.06		<b>Sheet Flow, SF1B, Woods</b> n= 0.600 P2= 3.43"
3.5	33	0.0670	0.16		<b>Sheet Flow, SF1C, Lawn</b> n= 0.240 P2= 3.43"
0.7	195	0.0760	4.44		<b>Shallow Concentrated Flow, SCF1A, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	3	0.0670	5.25		<b>Shallow Concentrated Flow, SCF1B, Paved</b> Paved Kv= 20.3 fps
0.1	29	0.2280	7.69		<b>Shallow Concentrated Flow, SCF1C, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	16	0.0810	5.78		<b>Shallow Concentrated Flow, SCF1D, Paved</b> Paved Kv= 20.3 fps
0.6	158	0.0850	4.69		<b>Shallow Concentrated Flow, SCF1E, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	4	0.0750	5.56		<b>Shallow Concentrated Flow, SCF1F, Paved</b> Paved Kv= 20.3 fps
0.0	1	0.1000	6.42		<b>Shallow Concentrated Flow, SCF1H, Unpaved</b> Paved Kv= 20.3 fps
0.7	225	0.1000	5.09		<b>Shallow Concentrated Flow, SCF1I, Paved</b> Unpaved Kv= 16.1 fps
16.3	781	Total			

**Summary for Subcatchment SA2: Drainage Subarea #2 'SA2'**

Runoff = 0.12 cfs @ 12.72 hrs, Volume= 2,251 cf, Depth= 0.06"  
 Routed to Link AL2 : Analysis Line #2 (Wetlands)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr WQV Rainfall=1.30"

Area (sf)	CN	Description
* 18,392	98	Bldgs./Impervious
* 1,017	92	Compact Gravel (est.), HSG C
* 1,114	86	Open Deck (est.), HSG C
* 76,515	74	Lawn, Good, HSG C
* 2,776	55	Woods, Good, HSG B
* 336,735	70	Woods, Good, HSG C
* 390	77	Woods, Good, HSG D
436,939	72	Weighted Average
418,547	71	95.79% Pervious Area
18,392	98	4.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	28	0.1680	0.22		<b>Sheet Flow, SF2A, Lawn</b> n= 0.240 P2= 3.43"
18.2	122	0.0930	0.11		<b>Sheet Flow, SF2B, Woods</b> n= 0.600 P2= 3.43"
3.2	958	0.0960	4.99		<b>Shallow Concentrated Flow, SCF2A, Unpaved</b> Unpaved Kv= 16.1 fps
23.5	1,108	Total			

**Summary for Subcatchment SA3: Drainage Subarea #3 'SA3'**

Runoff = 0.04 cfs @ 13.99 hrs, Volume= 1,000 cf, Depth= 0.04"

Routed to Link AL3 : Analysis Line #3 (Northern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr WQV Rainfall=1.30"

Area (sf)	CN	Description
* 6,755	98	Bldgs./Impervious
* 596	92	Compact Gravel (est.), HSG C
* 39,584	74	Lawn, Good, HSG C
* 30,364	55	Woods, Good, HSG B
* 212,059	70	Woods, Good, HSG C
289,358	70	Weighted Average
282,603	69	97.67% Pervious Area
6,755	98	2.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	18	0.0830	0.15		<b>Sheet Flow, SF3A, Lawn</b> n= 0.240 P2= 3.43"
19.0	132	0.0970	0.12		<b>Sheet Flow, SF3B, Woods</b> n= 0.600 P2= 3.43"
1.6	510	0.1030	5.17		<b>Shallow Concentrated Flow, SCF3A, Unpaved</b> Unpaved Kv= 16.1 fps
22.6	660	Total			

**Summary for Subcatchment SA4: Drainage Subarea #4 'SA4'**

Runoff = 0.00 cfs @ 13.80 hrs, Volume= 32 cf, Depth= 0.04"

Routed to Link AL4 : Analysis Line #4 (Northeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr WQV Rainfall=1.30"

Area (sf)	CN	Description
* 9,201	70	Woods, Good, HSG C
9,201	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	150	0.0930	0.24		<b>Sheet Flow, SF4A</b> n= 0.240 P2= 3.43"
0.2	81	0.1300	5.80		<b>Shallow Concentrated Flow, SCF4A</b> Unpaved Kv= 16.1 fps
10.5	231	Total			

**Summary for Link AL1: Analysis Line #1 (Southeastern PL)**

Inflow Area = 84,177 sf, 10.80% Impervious, Inflow Depth = 0.12" for WQV event  
Inflow = 0.09 cfs @ 12.46 hrs, Volume= 819 cf  
Primary = 0.09 cfs @ 12.46 hrs, Volume= 819 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL2: Analysis Line #2 (Wetlands)**

Inflow Area = 436,939 sf, 4.21% Impervious, Inflow Depth = 0.06" for WQV event  
Inflow = 0.12 cfs @ 12.72 hrs, Volume= 2,251 cf  
Primary = 0.12 cfs @ 12.72 hrs, Volume= 2,251 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL3: Analysis Line #3 (Northern PL)**

Inflow Area = 289,358 sf, 2.33% Impervious, Inflow Depth = 0.04" for WQV event  
Inflow = 0.04 cfs @ 13.99 hrs, Volume= 1,000 cf  
Primary = 0.04 cfs @ 13.99 hrs, Volume= 1,000 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL4: Analysis Line #4 (Northeastern PL)**

Inflow Area = 9,201 sf, 0.00% Impervious, Inflow Depth = 0.04" for WQV event  
Inflow = 0.00 cfs @ 13.80 hrs, Volume= 32 cf  
Primary = 0.00 cfs @ 13.80 hrs, Volume= 32 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link ALL: ALL**

Inflow Area = 819,675 sf, 4.18% Impervious, Inflow Depth = 0.06" for WQV event  
Inflow = 0.20 cfs @ 12.67 hrs, Volume= 4,102 cf  
Primary = 0.20 cfs @ 12.67 hrs, Volume= 4,102 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 2  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=84,177 sf 10.80% Impervious Runoff Depth=0.95"  
Flow Length=781' Tc=16.3 min CN=76 Runoff=1.48 cfs 6,652 cf

**Subcatchment SA2: Drainage Subarea #2** Runoff Area=436,939 sf 4.21% Impervious Runoff Depth=0.75"  
Flow Length=1,108' Tc=23.5 min CN=72 Runoff=4.94 cfs 27,281 cf

**Subcatchment SA3: Drainage Subarea #3** Runoff Area=289,358 sf 2.33% Impervious Runoff Depth=0.66"  
Flow Length=660' Tc=22.6 min CN=70 Runoff=2.80 cfs 15,901 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=9,201 sf 0.00% Impervious Runoff Depth=0.66"  
Flow Length=231' Tc=10.5 min CN=70 Runoff=0.12 cfs 506 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=1.48 cfs 6,652 cf  
Primary=1.48 cfs 6,652 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=4.94 cfs 27,281 cf  
Primary=4.94 cfs 27,281 cf

**Link AL3: Analysis Line #3 (Northern PL)** Inflow=2.80 cfs 15,901 cf  
Primary=2.80 cfs 15,901 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.12 cfs 506 cf  
Primary=0.12 cfs 506 cf

**Link ALL: ALL** Inflow=9.08 cfs 50,340 cf  
Primary=9.08 cfs 50,340 cf

**Total Runoff Area = 819,675 sf Runoff Volume = 50,340 cf Average Runoff Depth = 0.74"**  
**95.82% Pervious = 785,435 sf 4.18% Impervious = 34,240 sf**

**Summary for Subcatchment SA1: Drainage Subarea #1 'SA1'**

Runoff = 1.48 cfs @ 12.24 hrs, Volume= 6,652 cf, Depth= 0.95"

Routed to Link AL1 : Analysis Line #1 (Southeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 1-year Rainfall=2.90"

Area (sf)	CN	Description
* 9,093	98	Bldgs./Impervious
* 2,325	92	Compact Gravel (est.), HSG C
* 575	86	Open Deck (est.), HSG C
* 46,031	74	Lawn, Good, HSG C
* 26,153	70	Woods, Good, HSG C
84,177	76	Weighted Average
75,084	73	89.20% Pervious Area
9,093	98	10.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	106	0.0920	0.23		<b>Sheet Flow, SF1A, Lawn</b> n= 0.240 P2= 3.43"
2.9	11	0.0730	0.06		<b>Sheet Flow, SF1B, Woods</b> n= 0.600 P2= 3.43"
3.5	33	0.0670	0.16		<b>Sheet Flow, SF1C, Lawn</b> n= 0.240 P2= 3.43"
0.7	195	0.0760	4.44		<b>Shallow Concentrated Flow, SCF1A, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	3	0.0670	5.25		<b>Shallow Concentrated Flow, SCF1B, Paved</b> Paved Kv= 20.3 fps
0.1	29	0.2280	7.69		<b>Shallow Concentrated Flow, SCF1C, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	16	0.0810	5.78		<b>Shallow Concentrated Flow, SCF1D, Paved</b> Paved Kv= 20.3 fps
0.6	158	0.0850	4.69		<b>Shallow Concentrated Flow, SCF1E, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	4	0.0750	5.56		<b>Shallow Concentrated Flow, SCF1F, Paved</b> Paved Kv= 20.3 fps
0.0	1	0.1000	6.42		<b>Shallow Concentrated Flow, SCF1H, Unpaved</b> Paved Kv= 20.3 fps
0.7	225	0.1000	5.09		<b>Shallow Concentrated Flow, SCF1I, Paved</b> Unpaved Kv= 16.1 fps
16.3	781	Total			

**Summary for Subcatchment SA2: Drainage Subarea #2 'SA2'**

Runoff = 4.94 cfs @ 12.37 hrs, Volume= 27,281 cf, Depth= 0.75"  
 Routed to Link AL2 : Analysis Line #2 (Wetlands)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 1-year Rainfall=2.90"

Area (sf)	CN	Description
* 18,392	98	Bldgs./Impervious
* 1,017	92	Compact Gravel (est.), HSG C
* 1,114	86	Open Deck (est.), HSG C
* 76,515	74	Lawn, Good, HSG C
* 2,776	55	Woods, Good, HSG B
* 336,735	70	Woods, Good, HSG C
* 390	77	Woods, Good, HSG D
436,939	72	Weighted Average
418,547	71	95.79% Pervious Area
18,392	98	4.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	28	0.1680	0.22		<b>Sheet Flow, SF2A, Lawn</b> n= 0.240 P2= 3.43"
18.2	122	0.0930	0.11		<b>Sheet Flow, SF2B, Woods</b> n= 0.600 P2= 3.43"
3.2	958	0.0960	4.99		<b>Shallow Concentrated Flow, SCF2A, Unpaved</b> Unpaved Kv= 16.1 fps
23.5	1,108	Total			

**Summary for Subcatchment SA3: Drainage Subarea #3 'SA3'**

Runoff = 2.80 cfs @ 12.38 hrs, Volume= 15,901 cf, Depth= 0.66"

Routed to Link AL3 : Analysis Line #3 (Northern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 1-year Rainfall=2.90"

Area (sf)	CN	Description
* 6,755	98	Bldgs./Impervious
* 596	92	Compact Gravel (est.), HSG C
* 39,584	74	Lawn, Good, HSG C
* 30,364	55	Woods, Good, HSG B
* 212,059	70	Woods, Good, HSG C
289,358	70	Weighted Average
282,603	69	97.67% Pervious Area
6,755	98	2.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	18	0.0830	0.15		<b>Sheet Flow, SF3A, Lawn</b> n= 0.240 P2= 3.43"
19.0	132	0.0970	0.12		<b>Sheet Flow, SF3B, Woods</b> n= 0.600 P2= 3.43"
1.6	510	0.1030	5.17		<b>Shallow Concentrated Flow, SCF3A, Unpaved</b> Unpaved Kv= 16.1 fps
22.6	660	Total			

**Summary for Subcatchment SA4: Drainage Subarea #4 'SA4'**

Runoff = 0.12 cfs @ 12.17 hrs, Volume= 506 cf, Depth= 0.66"

Routed to Link AL4 : Analysis Line #4 (Northeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 1-year Rainfall=2.90"

Area (sf)	CN	Description
* 9,201	70	Woods, Good, HSG C
9,201	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	150	0.0930	0.24		<b>Sheet Flow, SF4A</b> n= 0.240 P2= 3.43"
0.2	81	0.1300	5.80		<b>Shallow Concentrated Flow, SCF4A</b> Unpaved Kv= 16.1 fps
10.5	231	Total			

**Summary for Link AL1: Analysis Line #1 (Southeastern PL)**

Inflow Area = 84,177 sf, 10.80% Impervious, Inflow Depth = 0.95" for 1-year event  
Inflow = 1.48 cfs @ 12.24 hrs, Volume= 6,652 cf  
Primary = 1.48 cfs @ 12.24 hrs, Volume= 6,652 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL2: Analysis Line #2 (Wetlands)**

Inflow Area = 436,939 sf, 4.21% Impervious, Inflow Depth = 0.75" for 1-year event  
Inflow = 4.94 cfs @ 12.37 hrs, Volume= 27,281 cf  
Primary = 4.94 cfs @ 12.37 hrs, Volume= 27,281 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL3: Analysis Line #3 (Northern PL)**

Inflow Area = 289,358 sf, 2.33% Impervious, Inflow Depth = 0.66" for 1-year event  
Inflow = 2.80 cfs @ 12.38 hrs, Volume= 15,901 cf  
Primary = 2.80 cfs @ 12.38 hrs, Volume= 15,901 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL4: Analysis Line #4 (Northeastern PL)**

Inflow Area = 9,201 sf, 0.00% Impervious, Inflow Depth = 0.66" for 1-year event  
Inflow = 0.12 cfs @ 12.17 hrs, Volume= 506 cf  
Primary = 0.12 cfs @ 12.17 hrs, Volume= 506 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link ALL: ALL**

Inflow Area = 819,675 sf, 4.18% Impervious, Inflow Depth = 0.74" for 1-year event  
Inflow = 9.08 cfs @ 12.35 hrs, Volume= 50,340 cf  
Primary = 9.08 cfs @ 12.35 hrs, Volume= 50,340 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 2  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=84,177 sf 10.80% Impervious Runoff Depth=1.33"  
Flow Length=781' Tc=16.3 min CN=76 Runoff=2.14 cfs 9,324 cf

**Subcatchment SA2: Drainage Subarea #2** Runoff Area=436,939 sf 4.21% Impervious Runoff Depth=1.09"  
Flow Length=1,108' Tc=23.5 min CN=72 Runoff=7.56 cfs 39,628 cf

**Subcatchment SA3: Drainage Subarea #3** Runoff Area=289,358 sf 2.33% Impervious Runoff Depth=0.98"  
Flow Length=660' Tc=22.6 min CN=70 Runoff=4.45 cfs 23,567 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=9,201 sf 0.00% Impervious Runoff Depth=0.98"  
Flow Length=231' Tc=10.5 min CN=70 Runoff=0.19 cfs 749 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=2.14 cfs 9,324 cf  
Primary=2.14 cfs 9,324 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=7.56 cfs 39,628 cf  
Primary=7.56 cfs 39,628 cf

**Link AL3: Analysis Line #3 (Northern PL)** Inflow=4.45 cfs 23,567 cf  
Primary=4.45 cfs 23,567 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.19 cfs 749 cf  
Primary=0.19 cfs 749 cf

**Link ALL: ALL** Inflow=13.95 cfs 73,269 cf  
Primary=13.95 cfs 73,269 cf

**Total Runoff Area = 819,675 sf Runoff Volume = 73,269 cf Average Runoff Depth = 1.07"**  
**95.82% Pervious = 785,435 sf 4.18% Impervious = 34,240 sf**

**Summary for Subcatchment SA1: Drainage Subarea #1 'SA1'**

Runoff = 2.14 cfs @ 12.23 hrs, Volume= 9,324 cf, Depth= 1.33"

Routed to Link AL1 : Analysis Line #1 (Southeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 2-Year Rainfall=3.45"

Area (sf)	CN	Description
* 9,093	98	Bldgs./Impervious
* 2,325	92	Compact Gravel (est.), HSG C
* 575	86	Open Deck (est.), HSG C
* 46,031	74	Lawn, Good, HSG C
* 26,153	70	Woods, Good, HSG C
84,177	76	Weighted Average
75,084	73	89.20% Pervious Area
9,093	98	10.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	106	0.0920	0.23		<b>Sheet Flow, SF1A, Lawn</b> n= 0.240 P2= 3.43"
2.9	11	0.0730	0.06		<b>Sheet Flow, SF1B, Woods</b> n= 0.600 P2= 3.43"
3.5	33	0.0670	0.16		<b>Sheet Flow, SF1C, Lawn</b> n= 0.240 P2= 3.43"
0.7	195	0.0760	4.44		<b>Shallow Concentrated Flow, SCF1A, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	3	0.0670	5.25		<b>Shallow Concentrated Flow, SCF1B, Paved</b> Paved Kv= 20.3 fps
0.1	29	0.2280	7.69		<b>Shallow Concentrated Flow, SCF1C, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	16	0.0810	5.78		<b>Shallow Concentrated Flow, SCF1D, Paved</b> Paved Kv= 20.3 fps
0.6	158	0.0850	4.69		<b>Shallow Concentrated Flow, SCF1E, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	4	0.0750	5.56		<b>Shallow Concentrated Flow, SCF1F, Paved</b> Paved Kv= 20.3 fps
0.0	1	0.1000	6.42		<b>Shallow Concentrated Flow, SCF1H, Unpaved</b> Paved Kv= 20.3 fps
0.7	225	0.1000	5.09		<b>Shallow Concentrated Flow, SCF1I, Paved</b> Unpaved Kv= 16.1 fps
16.3	781	Total			

**Summary for Subcatchment SA2: Drainage Subarea #2 'SA2'**

Runoff = 7.56 cfs @ 12.35 hrs, Volume= 39,628 cf, Depth= 1.09"  
 Routed to Link AL2 : Analysis Line #2 (Wetlands)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 2-Year Rainfall=3.45"

Area (sf)	CN	Description
* 18,392	98	Bldgs./Impervious
* 1,017	92	Compact Gravel (est.), HSG C
* 1,114	86	Open Deck (est.), HSG C
* 76,515	74	Lawn, Good, HSG C
* 2,776	55	Woods, Good, HSG B
* 336,735	70	Woods, Good, HSG C
* 390	77	Woods, Good, HSG D
436,939	72	Weighted Average
418,547	71	95.79% Pervious Area
18,392	98	4.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	28	0.1680	0.22		<b>Sheet Flow, SF2A, Lawn</b> n= 0.240 P2= 3.43"
18.2	122	0.0930	0.11		<b>Sheet Flow, SF2B, Woods</b> n= 0.600 P2= 3.43"
3.2	958	0.0960	4.99		<b>Shallow Concentrated Flow, SCF2A, Unpaved</b> Unpaved Kv= 16.1 fps
23.5	1,108	Total			

**Summary for Subcatchment SA3: Drainage Subarea #3 'SA3'**

Runoff = 4.45 cfs @ 12.35 hrs, Volume= 23,567 cf, Depth= 0.98"

Routed to Link AL3 : Analysis Line #3 (Northern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 2-Year Rainfall=3.45"

Area (sf)	CN	Description
* 6,755	98	Bldgs./Impervious
* 596	92	Compact Gravel (est.), HSG C
* 39,584	74	Lawn, Good, HSG C
* 30,364	55	Woods, Good, HSG B
* 212,059	70	Woods, Good, HSG C
289,358	70	Weighted Average
282,603	69	97.67% Pervious Area
6,755	98	2.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	18	0.0830	0.15		<b>Sheet Flow, SF3A, Lawn</b> n= 0.240 P2= 3.43"
19.0	132	0.0970	0.12		<b>Sheet Flow, SF3B, Woods</b> n= 0.600 P2= 3.43"
1.6	510	0.1030	5.17		<b>Shallow Concentrated Flow, SCF3A, Unpaved</b> Unpaved Kv= 16.1 fps
22.6	660	Total			

**Summary for Subcatchment SA4: Drainage Subarea #4 'SA4'**

Runoff = 0.19 cfs @ 12.16 hrs, Volume= 749 cf, Depth= 0.98"

Routed to Link AL4 : Analysis Line #4 (Northeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 2-Year Rainfall=3.45"

Area (sf)	CN	Description
* 9,201	70	Woods, Good, HSG C
9,201	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	150	0.0930	0.24		<b>Sheet Flow, SF4A</b> n= 0.240 P2= 3.43"
0.2	81	0.1300	5.80		<b>Shallow Concentrated Flow, SCF4A</b> Unpaved Kv= 16.1 fps
10.5	231	Total			

**Summary for Link AL1: Analysis Line #1 (Southeastern PL)**

Inflow Area = 84,177 sf, 10.80% Impervious, Inflow Depth = 1.33" for 2-Year event  
Inflow = 2.14 cfs @ 12.23 hrs, Volume= 9,324 cf  
Primary = 2.14 cfs @ 12.23 hrs, Volume= 9,324 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL2: Analysis Line #2 (Wetlands)**

Inflow Area = 436,939 sf, 4.21% Impervious, Inflow Depth = 1.09" for 2-Year event  
Inflow = 7.56 cfs @ 12.35 hrs, Volume= 39,628 cf  
Primary = 7.56 cfs @ 12.35 hrs, Volume= 39,628 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL3: Analysis Line #3 (Northern PL)**

Inflow Area = 289,358 sf, 2.33% Impervious, Inflow Depth = 0.98" for 2-Year event  
Inflow = 4.45 cfs @ 12.35 hrs, Volume= 23,567 cf  
Primary = 4.45 cfs @ 12.35 hrs, Volume= 23,567 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL4: Analysis Line #4 (Northeastern PL)**

Inflow Area = 9,201 sf, 0.00% Impervious, Inflow Depth = 0.98" for 2-Year event  
Inflow = 0.19 cfs @ 12.16 hrs, Volume= 749 cf  
Primary = 0.19 cfs @ 12.16 hrs, Volume= 749 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link ALL: ALL**

Inflow Area = 819,675 sf, 4.18% Impervious, Inflow Depth = 1.07" for 2-Year event  
Inflow = 13.95 cfs @ 12.33 hrs, Volume= 73,269 cf  
Primary = 13.95 cfs @ 12.33 hrs, Volume= 73,269 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 2  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=84,177 sf 10.80% Impervious Runoff Depth=2.63"  
Flow Length=781' Tc=16.3 min CN=76 Runoff=4.37 cfs 18,482 cf

**Subcatchment SA2: Drainage Subarea #2** Runoff Area=436,939 sf 4.21% Impervious Runoff Depth=2.29"  
Flow Length=1,108' Tc=23.5 min CN=72 Runoff=16.75 cfs 83,408 cf

**Subcatchment SA3: Drainage Subarea #3** Runoff Area=289,358 sf 2.33% Impervious Runoff Depth=2.13"  
Flow Length=660' Tc=22.6 min CN=70 Runoff=10.40 cfs 51,258 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=9,201 sf 0.00% Impervious Runoff Depth=2.13"  
Flow Length=231' Tc=10.5 min CN=70 Runoff=0.44 cfs 1,630 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=4.37 cfs 18,482 cf  
Primary=4.37 cfs 18,482 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=16.75 cfs 83,408 cf  
Primary=16.75 cfs 83,408 cf

**Link AL3: Analysis Line #3 (Northern PL)** Inflow=10.40 cfs 51,258 cf  
Primary=10.40 cfs 51,258 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.44 cfs 1,630 cf  
Primary=0.44 cfs 1,630 cf

**Link ALL: ALL** Inflow=31.19 cfs 154,777 cf  
Primary=31.19 cfs 154,777 cf

**Total Runoff Area = 819,675 sf Runoff Volume = 154,777 cf Average Runoff Depth = 2.27"**  
**95.82% Pervious = 785,435 sf 4.18% Impervious = 34,240 sf**

**Summary for Subcatchment SA1: Drainage Subarea #1 'SA1'**

Runoff = 4.37 cfs @ 12.23 hrs, Volume= 18,482 cf, Depth= 2.63"

Routed to Link AL1 : Analysis Line #1 (Southeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=5.12"

Area (sf)	CN	Description
* 9,093	98	Bldgs./Impervious
* 2,325	92	Compact Gravel (est.), HSG C
* 575	86	Open Deck (est.), HSG C
* 46,031	74	Lawn, Good, HSG C
* 26,153	70	Woods, Good, HSG C
84,177	76	Weighted Average
75,084	73	89.20% Pervious Area
9,093	98	10.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	106	0.0920	0.23		<b>Sheet Flow, SF1A, Lawn</b> n= 0.240 P2= 3.43"
2.9	11	0.0730	0.06		<b>Sheet Flow, SF1B, Woods</b> n= 0.600 P2= 3.43"
3.5	33	0.0670	0.16		<b>Sheet Flow, SF1C, Lawn</b> n= 0.240 P2= 3.43"
0.7	195	0.0760	4.44		<b>Shallow Concentrated Flow, SCF1A, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	3	0.0670	5.25		<b>Shallow Concentrated Flow, SCF1B, Paved</b> Paved Kv= 20.3 fps
0.1	29	0.2280	7.69		<b>Shallow Concentrated Flow, SCF1C, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	16	0.0810	5.78		<b>Shallow Concentrated Flow, SCF1D, Paved</b> Paved Kv= 20.3 fps
0.6	158	0.0850	4.69		<b>Shallow Concentrated Flow, SCF1E, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	4	0.0750	5.56		<b>Shallow Concentrated Flow, SCF1F, Paved</b> Paved Kv= 20.3 fps
0.0	1	0.1000	6.42		<b>Shallow Concentrated Flow, SCF1H, Unpaved</b> Paved Kv= 20.3 fps
0.7	225	0.1000	5.09		<b>Shallow Concentrated Flow, SCF1I, Paved</b> Unpaved Kv= 16.1 fps
16.3	781	Total			

**Summary for Subcatchment SA2: Drainage Subarea #2 'SA2'**

Runoff = 16.75 cfs @ 12.34 hrs, Volume= 83,408 cf, Depth= 2.29"  
 Routed to Link AL2 : Analysis Line #2 (Wetlands)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 10-Year Rainfall=5.12"

Area (sf)	CN	Description
* 18,392	98	Bldgs./Impervious
* 1,017	92	Compact Gravel (est.), HSG C
* 1,114	86	Open Deck (est.), HSG C
* 76,515	74	Lawn, Good, HSG C
* 2,776	55	Woods, Good, HSG B
* 336,735	70	Woods, Good, HSG C
* 390	77	Woods, Good, HSG D
436,939	72	Weighted Average
418,547	71	95.79% Pervious Area
18,392	98	4.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	28	0.1680	0.22		<b>Sheet Flow, SF2A, Lawn</b> n= 0.240 P2= 3.43"
18.2	122	0.0930	0.11		<b>Sheet Flow, SF2B, Woods</b> n= 0.600 P2= 3.43"
3.2	958	0.0960	4.99		<b>Shallow Concentrated Flow, SCF2A, Unpaved</b> Unpaved Kv= 16.1 fps
23.5	1,108	Total			

**Summary for Subcatchment SA3: Drainage Subarea #3 'SA3'**

Runoff = 10.40 cfs @ 12.33 hrs, Volume= 51,258 cf, Depth= 2.13"

Routed to Link AL3 : Analysis Line #3 (Northern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 10-Year Rainfall=5.12"

Area (sf)	CN	Description
* 6,755	98	Bldgs./Impervious
* 596	92	Compact Gravel (est.), HSG C
* 39,584	74	Lawn, Good, HSG C
* 30,364	55	Woods, Good, HSG B
* 212,059	70	Woods, Good, HSG C
289,358	70	Weighted Average
282,603	69	97.67% Pervious Area
6,755	98	2.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	18	0.0830	0.15		<b>Sheet Flow, SF3A, Lawn</b> n= 0.240 P2= 3.43"
19.0	132	0.0970	0.12		<b>Sheet Flow, SF3B, Woods</b> n= 0.600 P2= 3.43"
1.6	510	0.1030	5.17		<b>Shallow Concentrated Flow, SCF3A, Unpaved</b> Unpaved Kv= 16.1 fps
22.6	660	Total			

**Summary for Subcatchment SA4: Drainage Subarea #4 'SA4'**

Runoff = 0.44 cfs @ 12.15 hrs, Volume= 1,630 cf, Depth= 2.13"

Routed to Link AL4 : Analysis Line #4 (Northeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 10-Year Rainfall=5.12"

Area (sf)	CN	Description
* 9,201	70	Woods, Good, HSG C
9,201	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	150	0.0930	0.24		<b>Sheet Flow, SF4A</b> n= 0.240 P2= 3.43"
0.2	81	0.1300	5.80		<b>Shallow Concentrated Flow, SCF4A</b> Unpaved Kv= 16.1 fps
10.5	231	Total			

**Summary for Link AL1: Analysis Line #1 (Southeastern PL)**

Inflow Area = 84,177 sf, 10.80% Impervious, Inflow Depth = 2.63" for 10-Year event  
Inflow = 4.37 cfs @ 12.23 hrs, Volume= 18,482 cf  
Primary = 4.37 cfs @ 12.23 hrs, Volume= 18,482 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL2: Analysis Line #2 (Wetlands)**

Inflow Area = 436,939 sf, 4.21% Impervious, Inflow Depth = 2.29" for 10-Year event  
Inflow = 16.75 cfs @ 12.34 hrs, Volume= 83,408 cf  
Primary = 16.75 cfs @ 12.34 hrs, Volume= 83,408 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL3: Analysis Line #3 (Northern PL)**

Inflow Area = 289,358 sf, 2.33% Impervious, Inflow Depth = 2.13" for 10-Year event  
Inflow = 10.40 cfs @ 12.33 hrs, Volume= 51,258 cf  
Primary = 10.40 cfs @ 12.33 hrs, Volume= 51,258 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL4: Analysis Line #4 (Northeastern PL)**

Inflow Area = 9,201 sf, 0.00% Impervious, Inflow Depth = 2.13" for 10-Year event  
Inflow = 0.44 cfs @ 12.15 hrs, Volume= 1,630 cf  
Primary = 0.44 cfs @ 12.15 hrs, Volume= 1,630 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link ALL: ALL**

Inflow Area = 819,675 sf, 4.18% Impervious, Inflow Depth = 2.27" for 10-Year event  
Inflow = 31.19 cfs @ 12.32 hrs, Volume= 154,777 cf  
Primary = 31.19 cfs @ 12.32 hrs, Volume= 154,777 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 2  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=84,177 sf 10.80% Impervious Runoff Depth=3.52"  
Flow Length=781' Tc=16.3 min CN=76 Runoff=5.85 cfs 24,682 cf

**Subcatchment SA2: Drainage Subarea #2** Runoff Area=436,939 sf 4.21% Impervious Runoff Depth=3.12"  
Flow Length=1,108' Tc=23.5 min CN=72 Runoff=23.05 cfs 113,771 cf

**Subcatchment SA3: Drainage Subarea #3** Runoff Area=289,358 sf 2.33% Impervious Runoff Depth=2.93"  
Flow Length=660' Tc=22.6 min CN=70 Runoff=14.54 cfs 70,716 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=9,201 sf 0.00% Impervious Runoff Depth=2.93"  
Flow Length=231' Tc=10.5 min CN=70 Runoff=0.62 cfs 2,249 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=5.85 cfs 24,682 cf  
Primary=5.85 cfs 24,682 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=23.05 cfs 113,771 cf  
Primary=23.05 cfs 113,771 cf

**Link AL3: Analysis Line #3 (Northern PL)** Inflow=14.54 cfs 70,716 cf  
Primary=14.54 cfs 70,716 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.62 cfs 2,249 cf  
Primary=0.62 cfs 2,249 cf

**Link ALL: ALL** Inflow=43.07 cfs 211,418 cf  
Primary=43.07 cfs 211,418 cf

**Total Runoff Area = 819,675 sf Runoff Volume = 211,418 cf Average Runoff Depth = 3.10"**  
**95.82% Pervious = 785,435 sf 4.18% Impervious = 34,240 sf**

**Summary for Subcatchment SA1: Drainage Subarea #1 'SA1'**

Runoff = 5.85 cfs @ 12.22 hrs, Volume= 24,682 cf, Depth= 3.52"

Routed to Link AL1 : Analysis Line #1 (Southeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=6.16"

Area (sf)	CN	Description
* 9,093	98	Bldgs./Impervious
* 2,325	92	Compact Gravel (est.), HSG C
* 575	86	Open Deck (est.), HSG C
* 46,031	74	Lawn, Good, HSG C
* 26,153	70	Woods, Good, HSG C
84,177	76	Weighted Average
75,084	73	89.20% Pervious Area
9,093	98	10.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	106	0.0920	0.23		<b>Sheet Flow, SF1A, Lawn</b> n= 0.240 P2= 3.43"
2.9	11	0.0730	0.06		<b>Sheet Flow, SF1B, Woods</b> n= 0.600 P2= 3.43"
3.5	33	0.0670	0.16		<b>Sheet Flow, SF1C, Lawn</b> n= 0.240 P2= 3.43"
0.7	195	0.0760	4.44		<b>Shallow Concentrated Flow, SCF1A, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	3	0.0670	5.25		<b>Shallow Concentrated Flow, SCF1B, Paved</b> Paved Kv= 20.3 fps
0.1	29	0.2280	7.69		<b>Shallow Concentrated Flow, SCF1C, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	16	0.0810	5.78		<b>Shallow Concentrated Flow, SCF1D, Paved</b> Paved Kv= 20.3 fps
0.6	158	0.0850	4.69		<b>Shallow Concentrated Flow, SCF1E, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	4	0.0750	5.56		<b>Shallow Concentrated Flow, SCF1F, Paved</b> Paved Kv= 20.3 fps
0.0	1	0.1000	6.42		<b>Shallow Concentrated Flow, SCF1H, Unpaved</b> Paved Kv= 20.3 fps
0.7	225	0.1000	5.09		<b>Shallow Concentrated Flow, SCF1I, Paved</b> Unpaved Kv= 16.1 fps
16.3	781	Total			

**Summary for Subcatchment SA2: Drainage Subarea #2 'SA2'**

Runoff = 23.05 cfs @ 12.33 hrs, Volume= 113,771 cf, Depth= 3.12"

Routed to Link AL2 : Analysis Line #2 (Wetlands)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 25-Year Rainfall=6.16"

Area (sf)	CN	Description
* 18,392	98	Bldgs./Impervious
* 1,017	92	Compact Gravel (est.), HSG C
* 1,114	86	Open Deck (est.), HSG C
* 76,515	74	Lawn, Good, HSG C
* 2,776	55	Woods, Good, HSG B
* 336,735	70	Woods, Good, HSG C
* 390	77	Woods, Good, HSG D
436,939	72	Weighted Average
418,547	71	95.79% Pervious Area
18,392	98	4.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	28	0.1680	0.22		<b>Sheet Flow, SF2A, Lawn</b> n= 0.240 P2= 3.43"
18.2	122	0.0930	0.11		<b>Sheet Flow, SF2B, Woods</b> n= 0.600 P2= 3.43"
3.2	958	0.0960	4.99		<b>Shallow Concentrated Flow, SCF2A, Unpaved</b> Unpaved Kv= 16.1 fps
23.5	1,108	Total			

**Summary for Subcatchment SA3: Drainage Subarea #3 'SA3'**

Runoff = 14.54 cfs @ 12.33 hrs, Volume= 70,716 cf, Depth= 2.93"

Routed to Link AL3 : Analysis Line #3 (Northern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 25-Year Rainfall=6.16"

Area (sf)	CN	Description
* 6,755	98	Bldgs./Impervious
* 596	92	Compact Gravel (est.), HSG C
* 39,584	74	Lawn, Good, HSG C
* 30,364	55	Woods, Good, HSG B
* 212,059	70	Woods, Good, HSG C
289,358	70	Weighted Average
282,603	69	97.67% Pervious Area
6,755	98	2.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	18	0.0830	0.15		<b>Sheet Flow, SF3A, Lawn</b> n= 0.240 P2= 3.43"
19.0	132	0.0970	0.12		<b>Sheet Flow, SF3B, Woods</b> n= 0.600 P2= 3.43"
1.6	510	0.1030	5.17		<b>Shallow Concentrated Flow, SCF3A, Unpaved</b> Unpaved Kv= 16.1 fps
22.6	660	Total			

**Summary for Subcatchment SA4: Drainage Subarea #4 'SA4'**

Runoff = 0.62 cfs @ 12.15 hrs, Volume= 2,249 cf, Depth= 2.93"

Routed to Link AL4 : Analysis Line #4 (Northeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 25-Year Rainfall=6.16"

Area (sf)	CN	Description
* 9,201	70	Woods, Good, HSG C
9,201	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	150	0.0930	0.24		<b>Sheet Flow, SF4A</b> n= 0.240 P2= 3.43"
0.2	81	0.1300	5.80		<b>Shallow Concentrated Flow, SCF4A</b> Unpaved Kv= 16.1 fps
10.5	231	Total			

**Summary for Link AL1: Analysis Line #1 (Southeastern PL)**

Inflow Area = 84,177 sf, 10.80% Impervious, Inflow Depth = 3.52" for 25-Year event  
Inflow = 5.85 cfs @ 12.22 hrs, Volume= 24,682 cf  
Primary = 5.85 cfs @ 12.22 hrs, Volume= 24,682 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL2: Analysis Line #2 (Wetlands)**

Inflow Area = 436,939 sf, 4.21% Impervious, Inflow Depth = 3.12" for 25-Year event  
Inflow = 23.05 cfs @ 12.33 hrs, Volume= 113,771 cf  
Primary = 23.05 cfs @ 12.33 hrs, Volume= 113,771 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL3: Analysis Line #3 (Northern PL)**

Inflow Area = 289,358 sf, 2.33% Impervious, Inflow Depth = 2.93" for 25-Year event  
Inflow = 14.54 cfs @ 12.33 hrs, Volume= 70,716 cf  
Primary = 14.54 cfs @ 12.33 hrs, Volume= 70,716 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL4: Analysis Line #4 (Northeastern PL)**

Inflow Area = 9,201 sf, 0.00% Impervious, Inflow Depth = 2.93" for 25-Year event  
Inflow = 0.62 cfs @ 12.15 hrs, Volume= 2,249 cf  
Primary = 0.62 cfs @ 12.15 hrs, Volume= 2,249 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link ALL: ALL**

Inflow Area = 819,675 sf, 4.18% Impervious, Inflow Depth = 3.10" for 25-Year event  
Inflow = 43.07 cfs @ 12.30 hrs, Volume= 211,418 cf  
Primary = 43.07 cfs @ 12.30 hrs, Volume= 211,418 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 2  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=84,177 sf 10.80% Impervious Runoff Depth=4.94"  
Flow Length=781' Tc=16.3 min CN=76 Runoff=8.18 cfs 34,653 cf

**Subcatchment SA2: Drainage Subarea #2** Runoff Area=436,939 sf 4.21% Impervious Runoff Depth=4.48"  
Flow Length=1,108' Tc=23.5 min CN=72 Runoff=33.19 cfs 163,288 cf

**Subcatchment SA3: Drainage Subarea #3** Runoff Area=289,358 sf 2.33% Impervious Runoff Depth=4.26"  
Flow Length=660' Tc=22.6 min CN=70 Runoff=21.22 cfs 102,692 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=9,201 sf 0.00% Impervious Runoff Depth=4.26"  
Flow Length=231' Tc=10.5 min CN=70 Runoff=0.91 cfs 3,265 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=8.18 cfs 34,653 cf  
Primary=8.18 cfs 34,653 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=33.19 cfs 163,288 cf  
Primary=33.19 cfs 163,288 cf

**Link AL3: Analysis Line #3 (Northern PL)** Inflow=21.22 cfs 102,692 cf  
Primary=21.22 cfs 102,692 cf

**Link AL4: Analysis Line #4 (Northeastern PL)** Inflow=0.91 cfs 3,265 cf  
Primary=0.91 cfs 3,265 cf

**Link ALL: ALL** Inflow=62.19 cfs 303,898 cf  
Primary=62.19 cfs 303,898 cf

**Total Runoff Area = 819,675 sf Runoff Volume = 303,898 cf Average Runoff Depth = 4.45"**  
**95.82% Pervious = 785,435 sf 4.18% Impervious = 34,240 sf**

**Summary for Subcatchment SA1: Drainage Subarea #1 'SA1'**

Runoff = 8.18 cfs @ 12.22 hrs, Volume= 34,653 cf, Depth= 4.94"

Routed to Link AL1 : Analysis Line #1 (Southeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 100-Year Rainfall=7.76"

Area (sf)	CN	Description
* 9,093	98	Bldgs./Impervious
* 2,325	92	Compact Gravel (est.), HSG C
* 575	86	Open Deck (est.), HSG C
* 46,031	74	Lawn, Good, HSG C
* 26,153	70	Woods, Good, HSG C
84,177	76	Weighted Average
75,084	73	89.20% Pervious Area
9,093	98	10.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	106	0.0920	0.23		<b>Sheet Flow, SF1A, Lawn</b> n= 0.240 P2= 3.43"
2.9	11	0.0730	0.06		<b>Sheet Flow, SF1B, Woods</b> n= 0.600 P2= 3.43"
3.5	33	0.0670	0.16		<b>Sheet Flow, SF1C, Lawn</b> n= 0.240 P2= 3.43"
0.7	195	0.0760	4.44		<b>Shallow Concentrated Flow, SCF1A, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	3	0.0670	5.25		<b>Shallow Concentrated Flow, SCF1B, Paved</b> Paved Kv= 20.3 fps
0.1	29	0.2280	7.69		<b>Shallow Concentrated Flow, SCF1C, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	16	0.0810	5.78		<b>Shallow Concentrated Flow, SCF1D, Paved</b> Paved Kv= 20.3 fps
0.6	158	0.0850	4.69		<b>Shallow Concentrated Flow, SCF1E, Unpaved</b> Unpaved Kv= 16.1 fps
0.0	4	0.0750	5.56		<b>Shallow Concentrated Flow, SCF1F, Paved</b> Paved Kv= 20.3 fps
0.0	1	0.1000	6.42		<b>Shallow Concentrated Flow, SCF1H, Unpaved</b> Paved Kv= 20.3 fps
0.7	225	0.1000	5.09		<b>Shallow Concentrated Flow, SCF1I, Paved</b> Unpaved Kv= 16.1 fps
16.3	781	Total			

**Summary for Subcatchment SA2: Drainage Subarea #2 'SA2'**

Runoff = 33.19 cfs @ 12.32 hrs, Volume= 163,288 cf, Depth= 4.48"

Routed to Link AL2 : Analysis Line #2 (Wetlands)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 100-Year Rainfall=7.76"

Area (sf)	CN	Description
* 18,392	98	Bldgs./Impervious
* 1,017	92	Compact Gravel (est.), HSG C
* 1,114	86	Open Deck (est.), HSG C
* 76,515	74	Lawn, Good, HSG C
* 2,776	55	Woods, Good, HSG B
* 336,735	70	Woods, Good, HSG C
* 390	77	Woods, Good, HSG D
436,939	72	Weighted Average
418,547	71	95.79% Pervious Area
18,392	98	4.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	28	0.1680	0.22		<b>Sheet Flow, SF2A, Lawn</b> n= 0.240 P2= 3.43"
18.2	122	0.0930	0.11		<b>Sheet Flow, SF2B, Woods</b> n= 0.600 P2= 3.43"
3.2	958	0.0960	4.99		<b>Shallow Concentrated Flow, SCF2A, Unpaved</b> Unpaved Kv= 16.1 fps
23.5	1,108	Total			

**Summary for Subcatchment SA3: Drainage Subarea #3 'SA3'**

Runoff = 21.22 cfs @ 12.32 hrs, Volume= 102,692 cf, Depth= 4.26"

Routed to Link AL3 : Analysis Line #3 (Northern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 100-Year Rainfall=7.76"

Area (sf)	CN	Description
* 6,755	98	Bldgs./Impervious
* 596	92	Compact Gravel (est.), HSG C
* 39,584	74	Lawn, Good, HSG C
* 30,364	55	Woods, Good, HSG B
* 212,059	70	Woods, Good, HSG C
289,358	70	Weighted Average
282,603	69	97.67% Pervious Area
6,755	98	2.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	18	0.0830	0.15		<b>Sheet Flow, SF3A, Lawn</b> n= 0.240 P2= 3.43"
19.0	132	0.0970	0.12		<b>Sheet Flow, SF3B, Woods</b> n= 0.600 P2= 3.43"
1.6	510	0.1030	5.17		<b>Shallow Concentrated Flow, SCF3A, Unpaved</b> Unpaved Kv= 16.1 fps
22.6	660	Total			

**Summary for Subcatchment SA4: Drainage Subarea #4 'SA4'**

Runoff = 0.91 cfs @ 12.15 hrs, Volume= 3,265 cf, Depth= 4.26"

Routed to Link AL4 : Analysis Line #4 (Northeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 100-Year Rainfall=7.76"

Area (sf)	CN	Description
* 9,201	70	Woods, Good, HSG C
9,201	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	150	0.0930	0.24		<b>Sheet Flow, SF4A</b> n= 0.240 P2= 3.43"
0.2	81	0.1300	5.80		<b>Shallow Concentrated Flow, SCF4A</b> Unpaved Kv= 16.1 fps
10.5	231	Total			

**Summary for Link AL1: Analysis Line #1 (Southeastern PL)**

Inflow Area = 84,177 sf, 10.80% Impervious, Inflow Depth = 4.94" for 100-Year event  
Inflow = 8.18 cfs @ 12.22 hrs, Volume= 34,653 cf  
Primary = 8.18 cfs @ 12.22 hrs, Volume= 34,653 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL2: Analysis Line #2 (Wetlands)**

Inflow Area = 436,939 sf, 4.21% Impervious, Inflow Depth = 4.48" for 100-Year event  
Inflow = 33.19 cfs @ 12.32 hrs, Volume= 163,288 cf  
Primary = 33.19 cfs @ 12.32 hrs, Volume= 163,288 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL3: Analysis Line #3 (Northern PL)**

Inflow Area = 289,358 sf, 2.33% Impervious, Inflow Depth = 4.26" for 100-Year event  
Inflow = 21.22 cfs @ 12.32 hrs, Volume= 102,692 cf  
Primary = 21.22 cfs @ 12.32 hrs, Volume= 102,692 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link AL4: Analysis Line #4 (Northeastern PL)**

Inflow Area = 9,201 sf, 0.00% Impervious, Inflow Depth = 4.26" for 100-Year event  
Inflow = 0.91 cfs @ 12.15 hrs, Volume= 3,265 cf  
Primary = 0.91 cfs @ 12.15 hrs, Volume= 3,265 cf, Atten= 0%, Lag= 0.0 min  
Routed to Link ALL : ALL

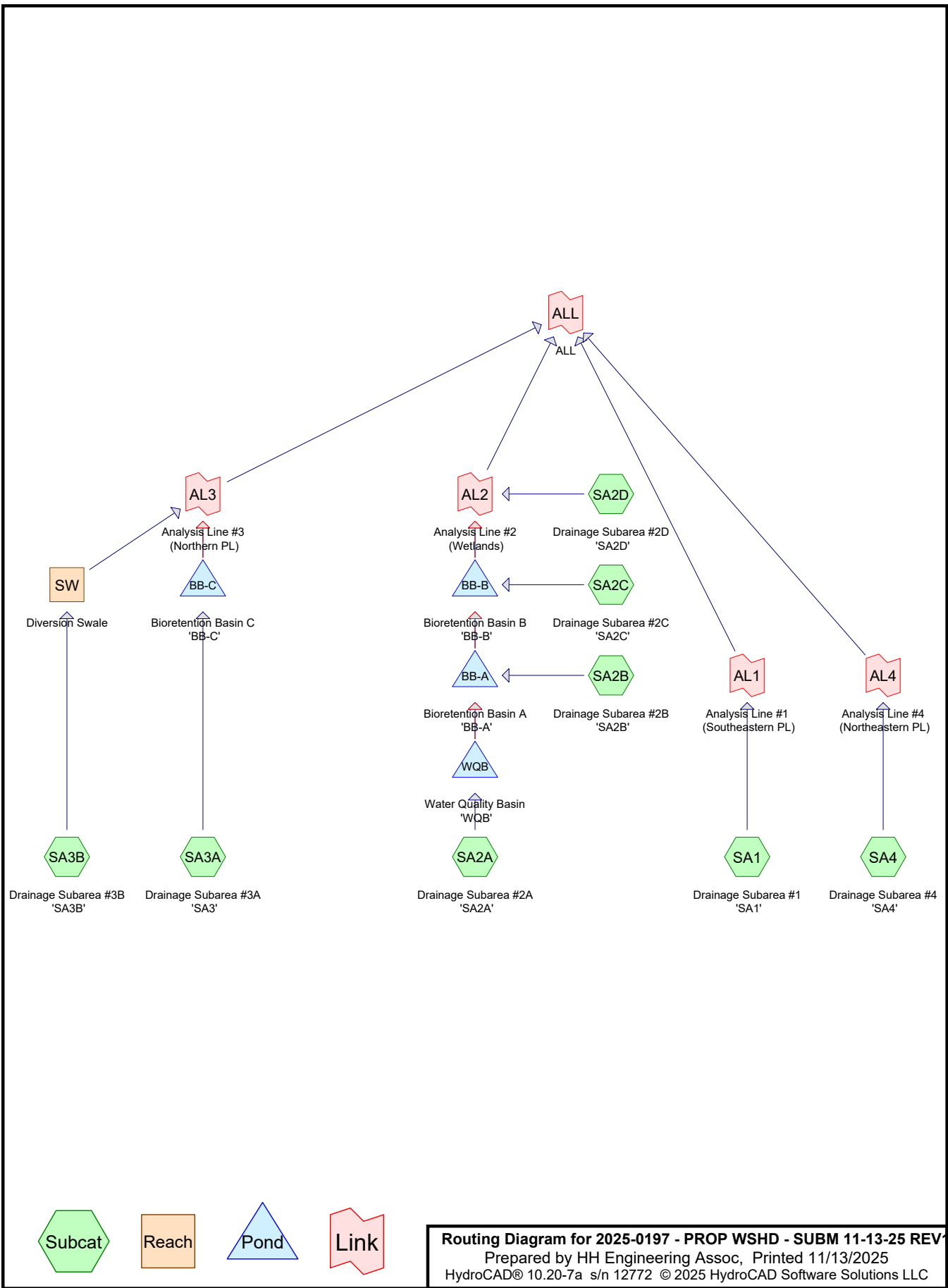
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Summary for Link ALL: ALL**

Inflow Area = 819,675 sf, 4.18% Impervious, Inflow Depth = 4.45" for 100-Year event  
Inflow = 62.19 cfs @ 12.30 hrs, Volume= 303,898 cf  
Primary = 62.19 cfs @ 12.30 hrs, Volume= 303,898 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

**Appendix G –  
Post-Development  
HydroCAD Report**



**2025-0197 - PROP WSHD - SUBM 11-13-25 REV1**

Prepared by HH Engineering Assoc

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**Rainfall Events Listing**

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	WQV	Type III 24-hr		Default	24.00	1	1.30	2
2	1-year	Type III 24-hr		Default	24.00	1	2.90	2
3	2-Year	Type III 24-hr		Default	24.00	1	3.45	2
4	10-Year	Type III 24-hr		Default	24.00	1	5.12	2
5	25-Year	Type III 24-hr		Default	24.00	1	6.16	2
6	100-Year	Type III 24-hr		Default	24.00	1	7.76	2

**Area Listing (all nodes)**

Area (sq-ft)	CN	Description (subcatchment-numbers)
128,714	98	Bldgs./Impervious (SA1, SA2A, SA2B, SA3A, SA3B)
3,384	92	Compact Gravel (est.), HSG C (SA2A, SA3B)
372	61	Lawn, Good, HSG B (SA3B)
455,385	74	Lawn, Good, HSG C (SA1, SA2A, SA2B, SA2C, SA2D, SA3A, SA3B, SA4)
5,170	86	Open Deck (est.), HSG C (SA2A, SA2B, SA3A, SA3B)
32,752	55	Woods, Good, HSG B (SA3B)
194,973	70	Woods, Good, HSG C (SA1, SA2A, SA2D, SA3A, SA3B, SA4)
390	77	Woods, Good, HSG D (SA2D)
<b>821,140</b>	<b>76</b>	<b>TOTAL AREA</b>

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**Soil Listing (all nodes)**

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
33,124	HSG B	SA3B
658,912	HSG C	SA1, SA2A, SA2B, SA2C, SA2D, SA3A, SA3B, SA4
390	HSG D	SA2D
128,714	Other	SA1, SA2A, SA2B, SA3A, SA3B
<b>821,140</b>		<b>TOTAL AREA</b>

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**Ground Covers (all nodes)**

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcate Numbe
0	0	0	0	128,714	128,714	Bldgs./Impervious	
0	0	3,384	0	0	3,384	Compact Gravel (est.)	
0	372	455,385	0	0	455,757	Lawn, Good	
0	0	5,170	0	0	5,170	Open Deck (est.)	
0	32,752	194,973	390	0	228,115	Woods, Good	
<b>0</b>	<b>33,124</b>	<b>658,912</b>	<b>390</b>	<b>128,714</b>	<b>821,140</b>	<b>TOTAL AREA</b>	

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**Pipe Listing (all nodes)**

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	BB-A	339.00	338.00	38.0	0.0263	0.013	0.0	24.0	0.0	
2	BB-B	335.00	334.00	47.0	0.0213	0.013	0.0	21.0	0.0	
3	BB-C	385.50	385.00	32.0	0.0156	0.013	0.0	15.0	0.0	
4	WQB	345.00	343.50	50.0	0.0300	0.013	0.0	24.0	0.0	

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Subcatchment SA1: Drainage Subarea #1** Runoff Area=11,088 sf 1.43% Impervious Runoff Depth=0.09"  
Tc=10.0 min CN=74 Runoff=0.01 cfs 80 cf

**Subcatchment SA2A: Drainage Subarea** Runoff Area=10.552 ac 18.69% Impervious Runoff Depth=0.15"  
Flow Length=697' Tc=20.8 min CN=78 Runoff=0.74 cfs 5,833 cf

**Subcatchment SA2B: Drainage Subarea** Runoff Area=23,857 sf 3.29% Impervious Runoff Depth=0.10"  
Tc=10.0 min CN=75 Runoff=0.02 cfs 201 cf

**Subcatchment SA2C: Drainage Subarea** Runoff Area=12,571 sf 0.00% Impervious Runoff Depth=0.09"  
Tc=10.0 min CN=74 Runoff=0.01 cfs 91 cf

**Subcatchment SA2D: Drainage Subarea #2D** Runoff Area=3,877 sf 0.00% Impervious Runoff Depth=0.07"  
Tc=10.0 min CN=73 Runoff=0.00 cfs 24 cf

**Subcatchment SA3A: Drainage Subarea** Runoff Area=74,552 sf 29.32% Impervious Runoff Depth=0.22"  
Flow Length=325' Tc=19.3 min CN=81 Runoff=0.22 cfs 1,350 cf

**Subcatchment SA3B: Drainage Subarea** Runoff Area=225,379 sf 8.88% Impervious Runoff Depth=0.06"  
Flow Length=165' Tc=21.1 min CN=72 Runoff=0.06 cfs 1,161 cf

**Subcatchment SA4: Drainage Subarea #4** Runoff Area=10,171 sf 0.00% Impervious Runoff Depth=0.07"  
Flow Length=246' Tc=10.3 min CN=73 Runoff=0.01 cfs 62 cf

**Reach SW: Diversion Swale** Avg. Flow Depth=0.03' Max Vel=0.53 fps Inflow=0.06 cfs 1,161 cf  
n=0.069 L=396.0' S=0.0788 '/' Capacity=32.66 cfs Outflow=0.06 cfs 1,161 cf

**Pond BB-A: Bioretention Basin A 'BB-A'** Peak Elev=343.02' Storage=103 cf Inflow=0.07 cfs 770 cf  
Discarded=0.05 cfs 770 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.05 cfs 770 cf

**Pond BB-B: Bioretention Basin B 'BB-B'** Peak Elev=337.50' Storage=11 cf Inflow=0.01 cfs 91 cf  
Discarded=0.00 cfs 91 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 91 cf

**Pond BB-C: Bioretention Basin C 'BB-C'** Peak Elev=387.76' Storage=425 cf Inflow=0.22 cfs 1,350 cf  
Discarded=0.04 cfs 1,350 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.04 cfs 1,350 cf

**Pond WQB: Water Quality Basin 'WQB'** Peak Elev=355.78' Storage=3,034 cf Inflow=0.74 cfs 5,833 cf  
Discarded=0.06 cfs 5,263 cf Primary=0.06 cfs 569 cf Secondary=0.00 cfs 0 cf Outflow=0.12 cfs 5,833 cf

**Link AL1: Analysis Line #1 (Southeastern PL)** Inflow=0.01 cfs 80 cf  
Primary=0.01 cfs 80 cf

**Link AL2: Analysis Line #2 (Wetlands)** Inflow=0.00 cfs 24 cf  
Primary=0.00 cfs 24 cf

**Link AL3: Analysis Line #3 (Northern PL)** Inflow=0.06 cfs 1,161 cf  
Primary=0.06 cfs 1,161 cf

**Link AL4: Analysis Line #4 (Northeastern PL)**

Inflow=0.01 cfs 62 cf  
Primary=0.01 cfs 62 cf

**Link ALL: ALL**

Inflow=0.06 cfs 1,328 cf  
Primary=0.06 cfs 1,328 cf

**Total Runoff Area = 821,140 sf Runoff Volume = 8,802 cf Average Runoff Depth = 0.13"  
84.32% Pervious = 692,426 sf 15.68% Impervious = 128,714 sf**

**Summary for Subcatchment SA1: Drainage Subarea #1 'SA1'**

Runoff = 0.01 cfs @ 12.43 hrs, Volume= 80 cf, Depth= 0.09"

Routed to Link AL1 : Analysis Line #1 (Southeastern PL)

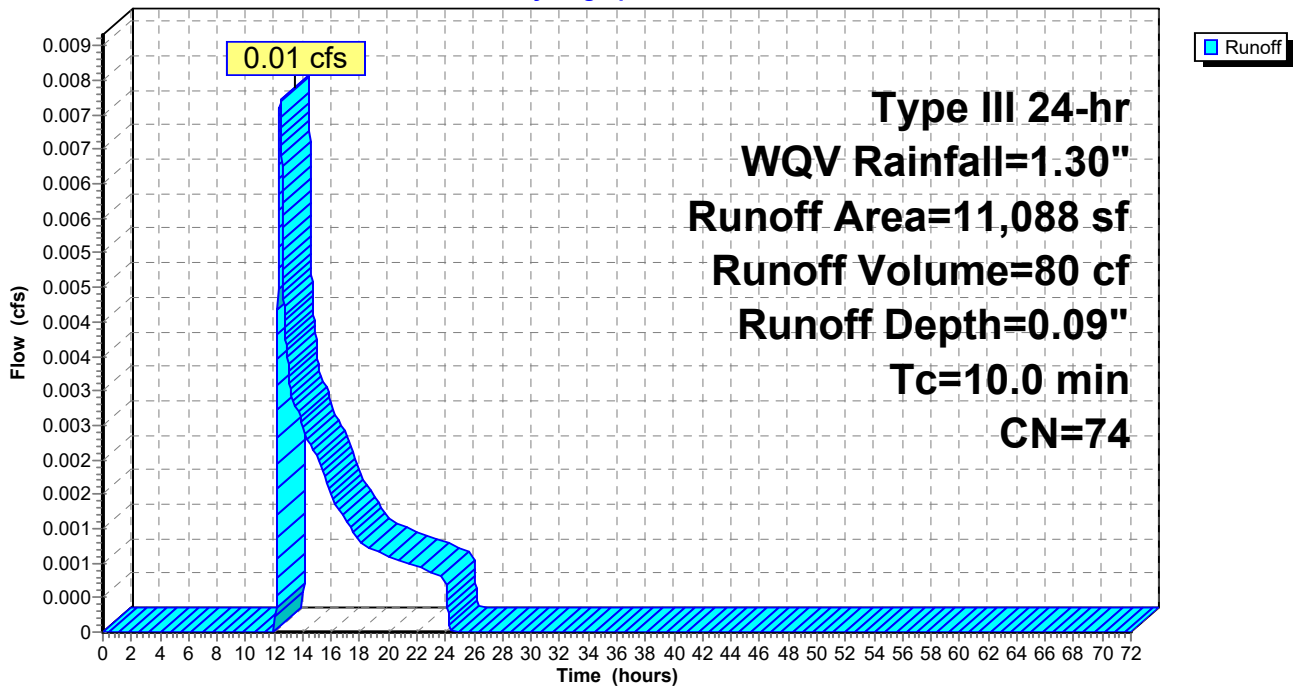
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr WQV Rainfall=1.30"

	Area (sf)	CN	Description
*	159	98	Bldgs./Impervious
*	10,517	74	Lawn, Good, HSG C
*	412	70	Woods, Good, HSG C
	11,088	74	Weighted Average
	10,929	74	98.57% Pervious Area
	159	98	1.43% Impervious Area

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

**Subcatchment SA1: Drainage Subarea #1 'SA1'**

Hydrograph



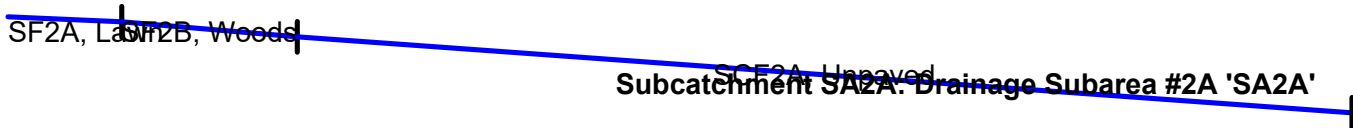
**Summary for Subcatchment SA2A: Drainage Subarea #2A 'SA2A'**

Runoff = 0.74 cfs @ 12.46 hrs, Volume= 5,833 cf, Depth= 0.15"  
 Routed to Pond WQB : Water Quality Basin 'WQB'

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr WQV Rainfall=1.30"

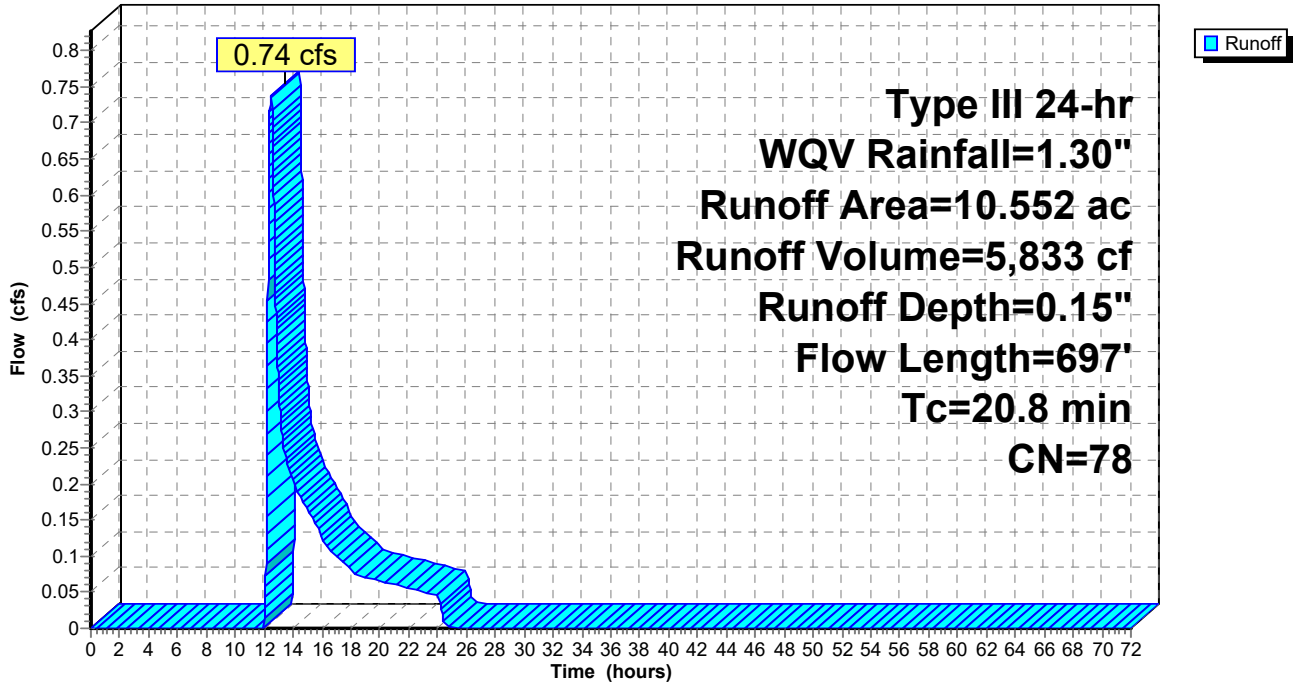
Area (ac)	CN	Description
* 1.972	98	Bldgs./Impervious
* 0.064	92	Compact Gravel (est.), HSG C
* 0.077	86	Open Deck (est.), HSG C
* 5.552	74	Lawn, Good, HSG C
* 2.887	70	Woods, Good, HSG C
10.552	78	Weighted Average
8.580	73	81.31% Pervious Area
1.972	98	18.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	59	0.0590	0.17		<b>Sheet Flow, SF2A, Lawn</b> n= 0.240 P2= 3.43"
13.1	91	0.1180	0.12		<b>Sheet Flow, SF2B, Woods</b> n= 0.600 P2= 3.43"
1.8	547	0.0990	5.07		<b>Shallow Concentrated Flow, SCF2A, Unpaved</b> Unpaved Kv= 16.1 fps
20.8	697	Total			



### Subcatchment SA2A: Drainage Subarea #2A 'SA2A'

Hydrograph



**Summary for Subcatchment SA2B: Drainage Subarea #2B 'SA2B'**

Runoff = 0.02 cfs @ 12.39 hrs, Volume= 201 cf, Depth= 0.10"  
 Routed to Pond BB-A : Bioretention Basin A 'BB-A'

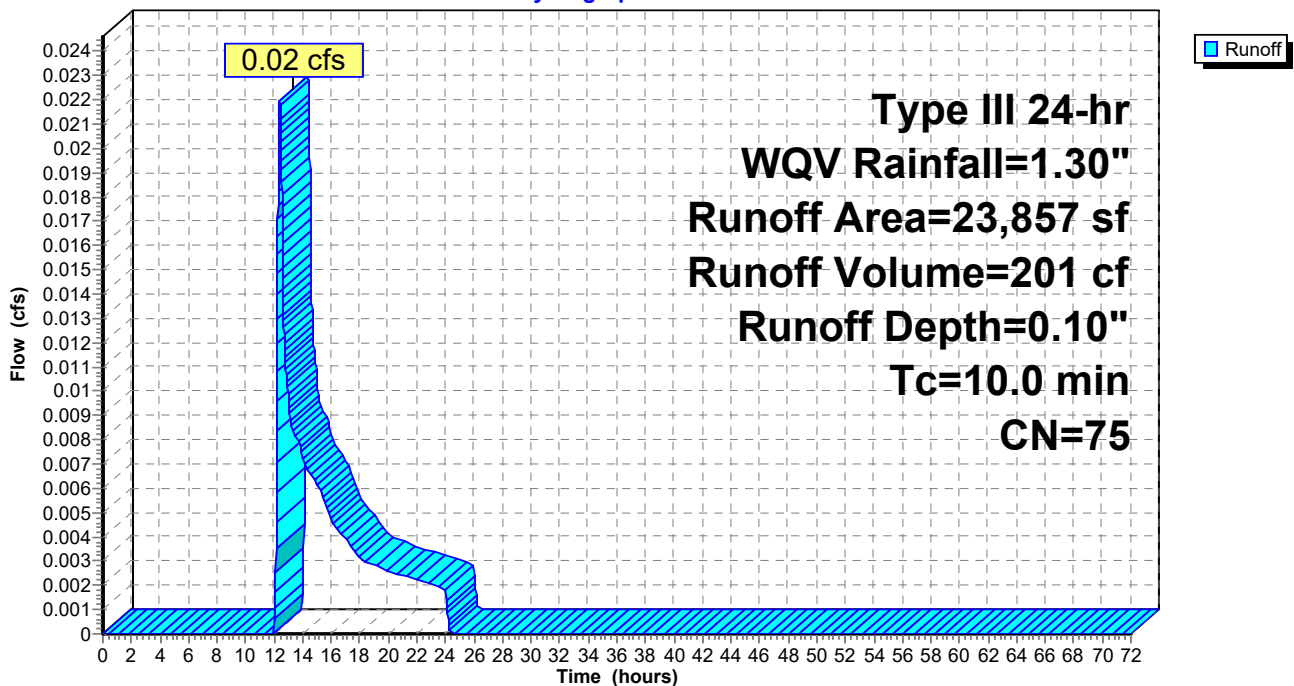
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr WQV Rainfall=1.30"

	Area (sf)	CN	Description
*	784	98	Bldgs./Impervious
*	151	86	Open Deck (est.), HSG C
*	22,922	74	Lawn, Good, HSG C
	23,857	75	Weighted Average
	23,073	74	96.71% Pervious Area
	784	98	3.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry, Direct</b>
5.0	0				Total, Increased to minimum Tc = 10.0 min

**Subcatchment SA2B: Drainage Subarea #2B 'SA2B'**

Hydrograph



**Summary for Subcatchment SA2C: Drainage Subarea #2C 'SA2C'**

Runoff = 0.01 cfs @ 12.43 hrs, Volume= 91 cf, Depth= 0.09"  
 Routed to Pond BB-B : Bioretention Basin B 'BB-B'

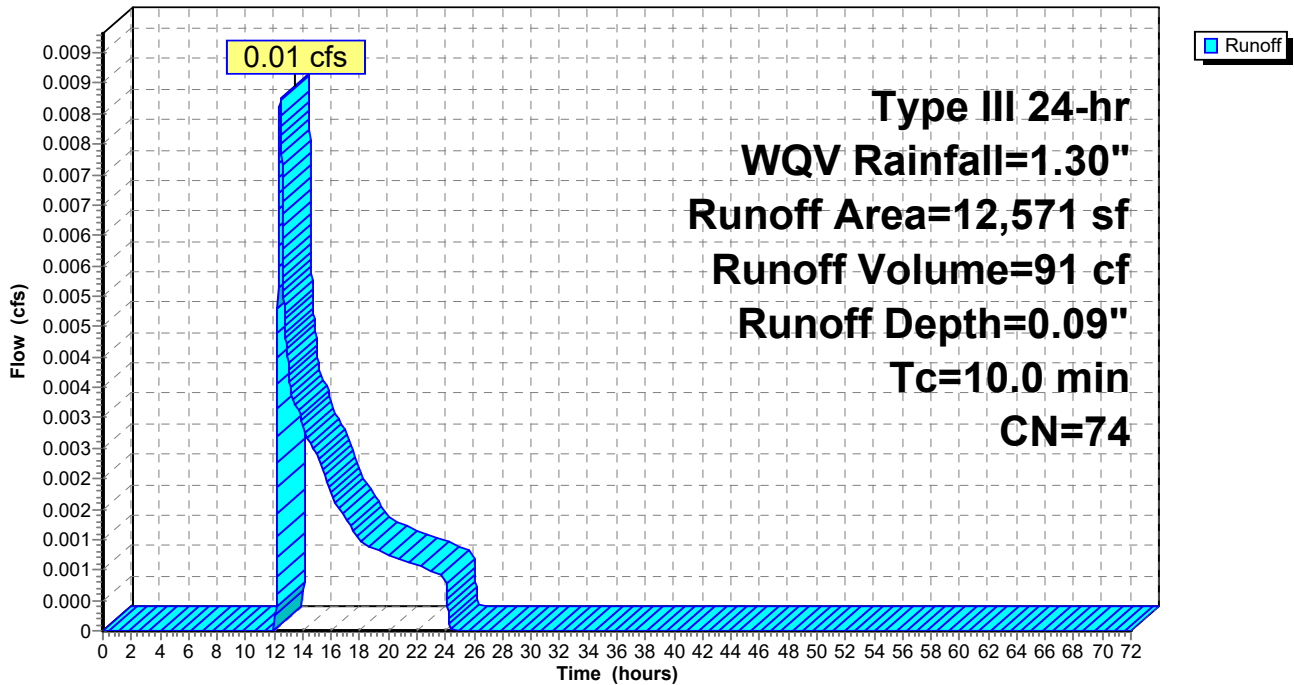
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr WQV Rainfall=1.30"

Area (sf)	CN	Description
* 12,571	74	Lawn, Good, HSG C
12,571	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry, Direct</b>
5.0	0	Total, Increased to minimum Tc = 10.0 min			

**Subcatchment SA2C: Drainage Subarea #2C 'SA2C'**

Hydrograph



**Summary for Subcatchment SA2D: Drainage Subarea #2D 'SA2D'**

Runoff = 0.00 cfs @ 12.46 hrs, Volume= 24 cf, Depth= 0.07"  
 Routed to Link AL2 : Analysis Line #2 (Wetlands)

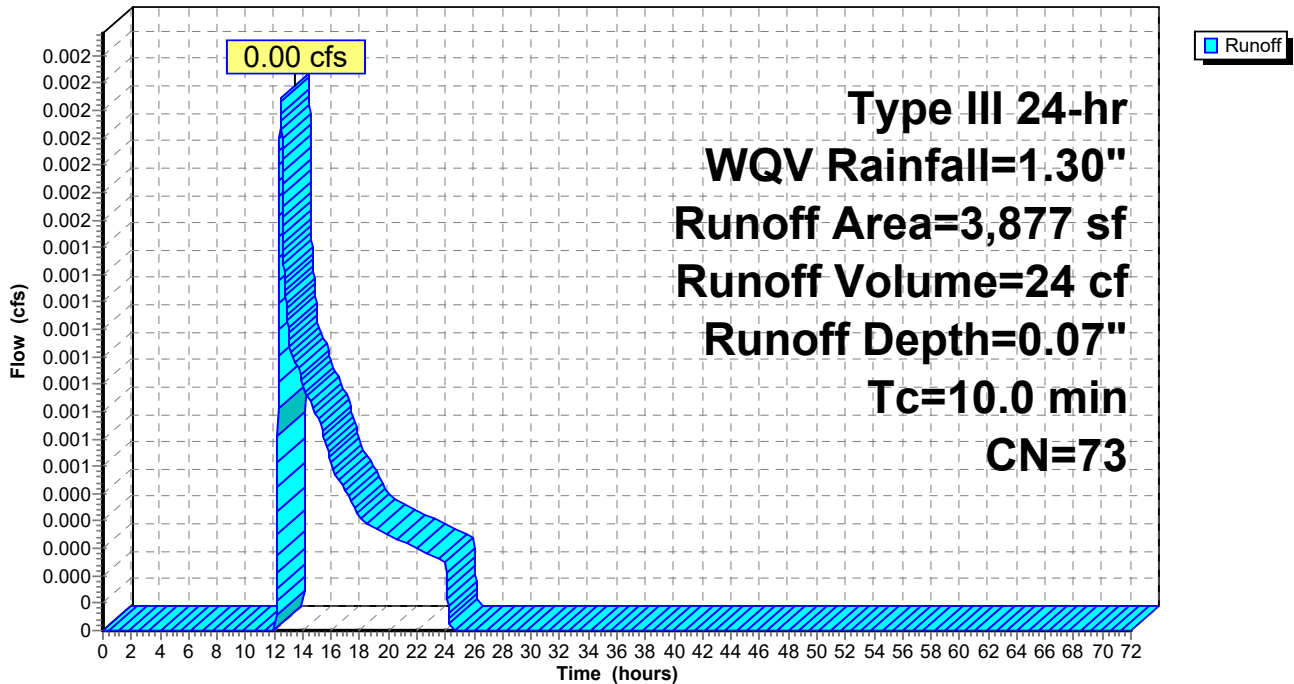
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr WQV Rainfall=1.30"

	Area (sf)	CN	Description
*	2,138	74	Lawn, Good, HSG C
*	1,349	70	Woods, Good, HSG C
*	390	77	Woods, Good, HSG D
	3,877	73	Weighted Average
	3,877	73	100.00% Pervious Area

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

**Subcatchment SA2D: Drainage Subarea #2D 'SA2D'**

Hydrograph



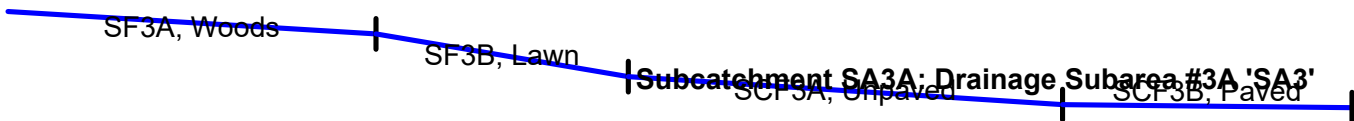
**Summary for Subcatchment SA3A: Drainage Subarea #3A 'SA3'**

Runoff = 0.22 cfs @ 12.34 hrs, Volume= 1,350 cf, Depth= 0.22"  
 Routed to Pond BB-C : Bioretention Basin C 'BB-C'

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr WQV Rainfall=1.30"

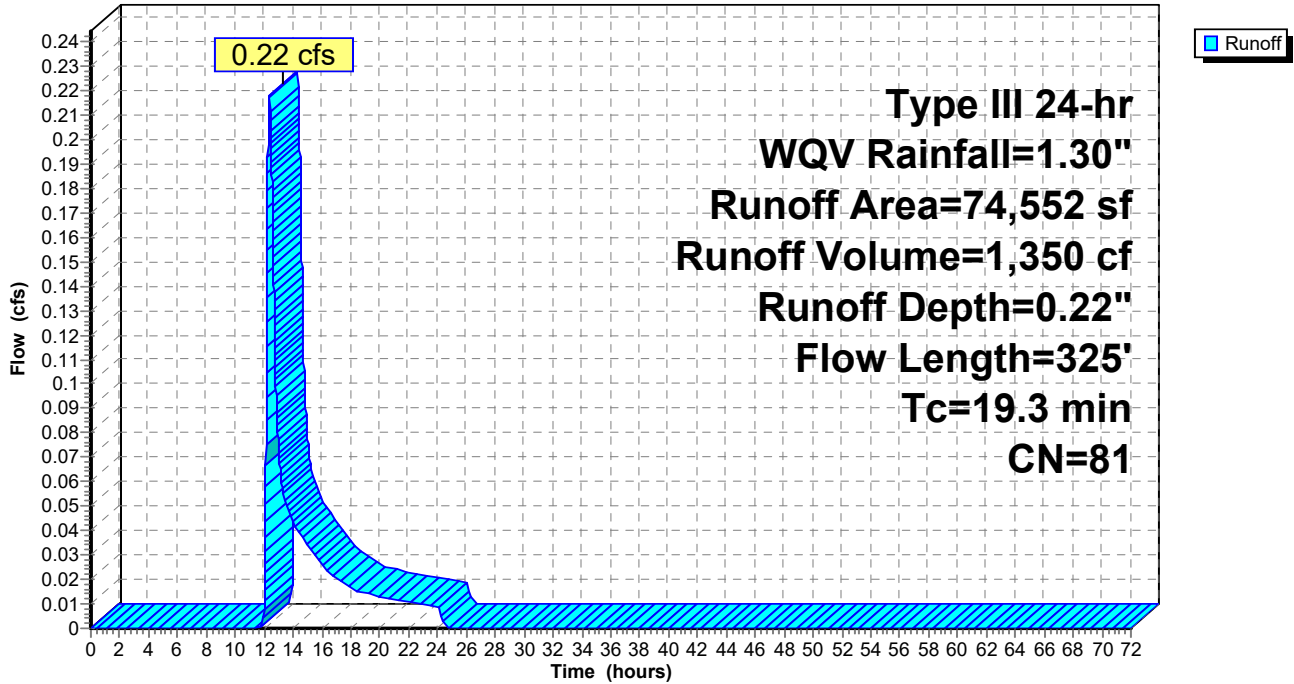
	Area (sf)	CN	Description
*	21,859	98	Bldgs./Impervious
*	454	86	Open Deck (est.), HSG C
*	48,227	74	Lawn, Good, HSG C
*	4,012	70	Woods, Good, HSG C
	74,552	81	Weighted Average
	52,693	74	70.68% Pervious Area
	21,859	98	29.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	89	0.0810	0.10		<b>Sheet Flow, SF3A, Woods</b> n= 0.600 P2= 3.43"
3.5	61	0.2260	0.29		<b>Sheet Flow, SF3B, Lawn</b> n= 0.240 P2= 3.43"
0.4	105	0.0860	4.72		<b>Shallow Concentrated Flow, SCF3A, Unpaved</b> Unpaved Kv= 16.1 fps
0.5	70	0.0140	2.40		<b>Shallow Concentrated Flow, SCF3B, Paved</b> Paved Kv= 20.3 fps
19.3	325	Total			



**Subcatchment SA3A: Drainage Subarea #3A 'SA3'**

Hydrograph



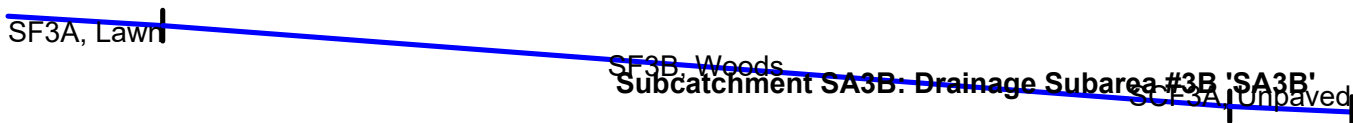
**Summary for Subcatchment SA3B: Drainage Subarea #3B 'SA3B'**

Runoff = 0.06 cfs @ 12.68 hrs, Volume= 1,161 cf, Depth= 0.06"  
 Routed to Reach SW : Diversion Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Type III 24-hr WQV Rainfall=1.30"

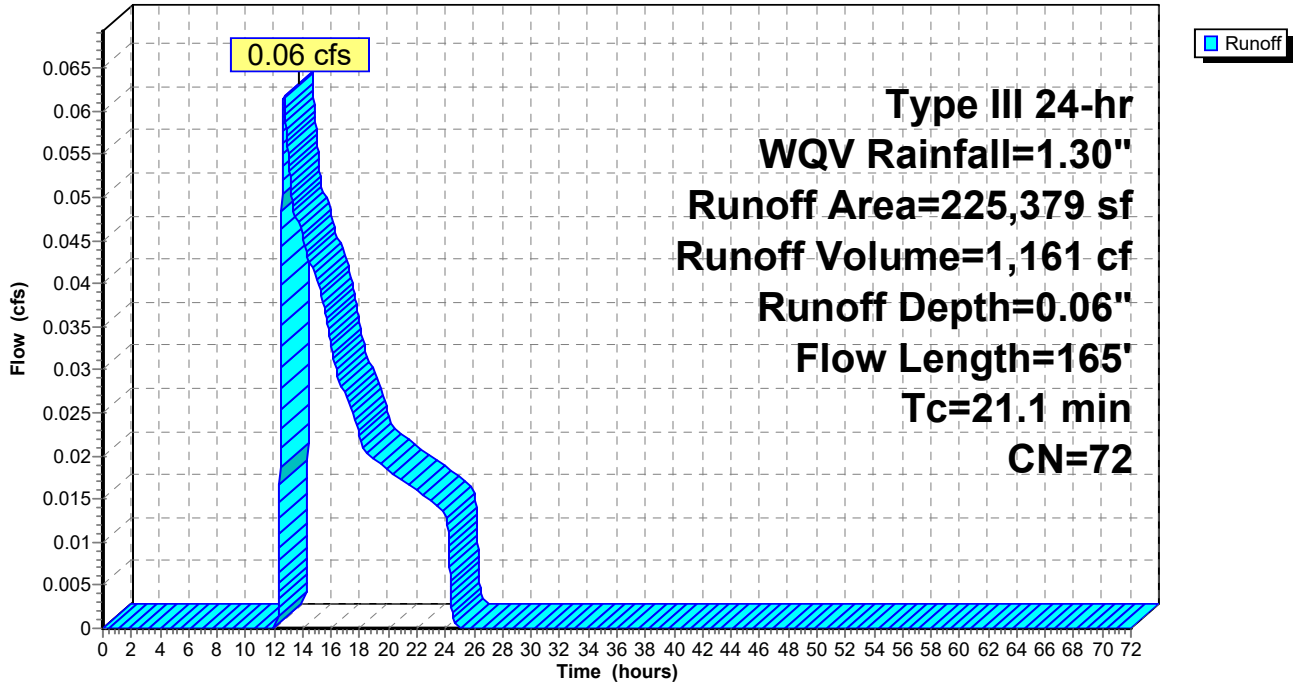
Area (sf)	CN	Description
* 20,012	98	Bldgs./Impervious
* 596	92	Compact Gravel (est.), HSG C
* 1,211	86	Open Deck (est.), HSG C
* 372	61	Lawn, Good, HSG B
* 109,208	74	Lawn, Good, HSG C
* 32,752	55	Woods, Good, HSG B
* 61,228	70	Woods, Good, HSG C
225,379	72	Weighted Average
205,367	70	91.12% Pervious Area
20,012	98	8.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	19	0.0790	0.15		<b>Sheet Flow, SF3A, Lawn</b> n= 0.240 P2= 3.43"
18.9	131	0.0980	0.12		<b>Sheet Flow, SF3B, Woods</b> n= 0.600 P2= 3.43"
0.1	15	0.0600	3.94		<b>Shallow Concentrated Flow, SCF3A, Unpaved</b> Unpaved Kv= 16.1 fps
21.1	165	Total			



Subcatchment SA3B: Drainage Subarea #3B 'SA3B'

Hydrograph



**Summary for Subcatchment SA4: Drainage Subarea #4 'SA4'**

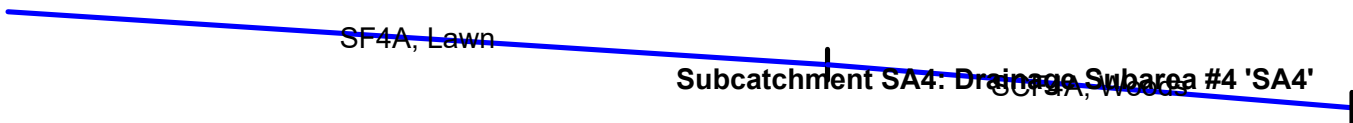
Runoff = 0.01 cfs @ 12.47 hrs, Volume= 62 cf, Depth= 0.07"

Routed to Link AL4 : Analysis Line #4 (Northeastern PL)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
Type III 24-hr WQV Rainfall=1.30"

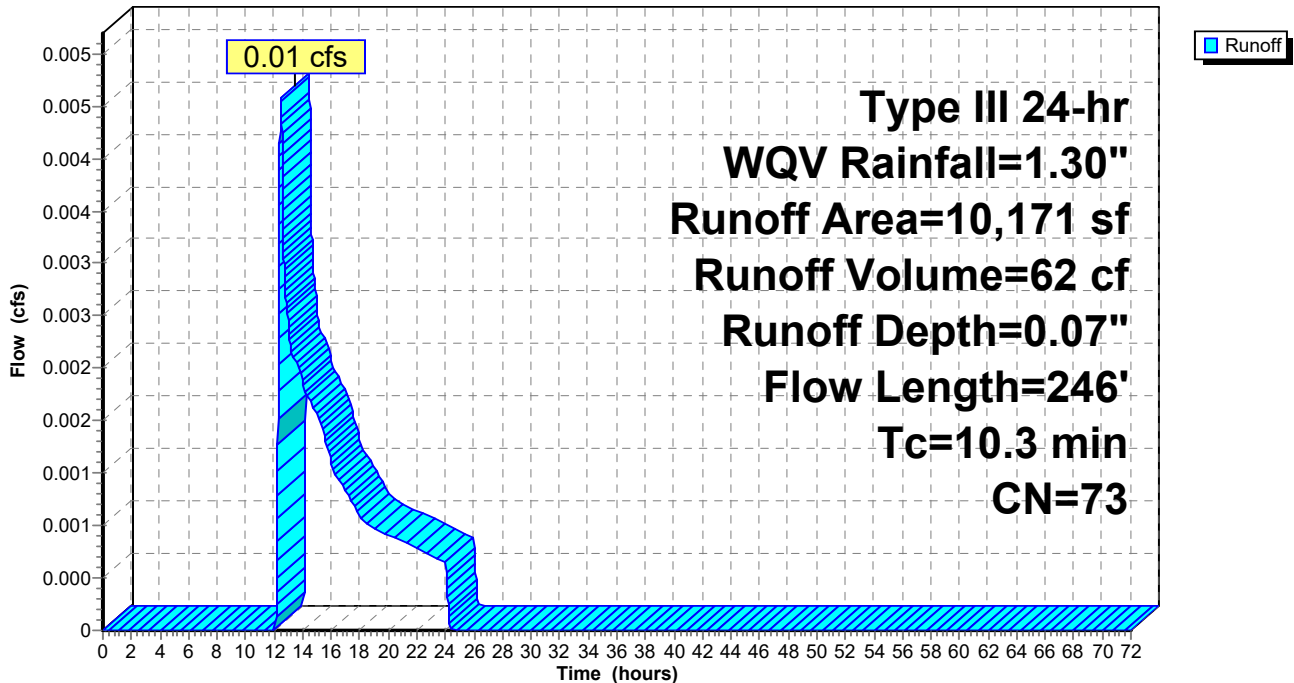
	Area (sf)	CN	Description
*	7,957	74	Lawn, Good, HSG C
*	2,214	70	Woods, Good, HSG C
	10,171	73	Weighted Average
	10,171	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	150	0.1010	0.25		<b>Sheet Flow, SF4A, Lawn</b> n= 0.240 P2= 3.43"
0.3	96	0.1280	5.76		<b>Shallow Concentrated Flow, SCF4A, Woods</b> Unpaved Kv= 16.1 fps
10.3	246	Total			



**Subcatchment SA4: Drainage Subarea #4 'SA4'**

Hydrograph



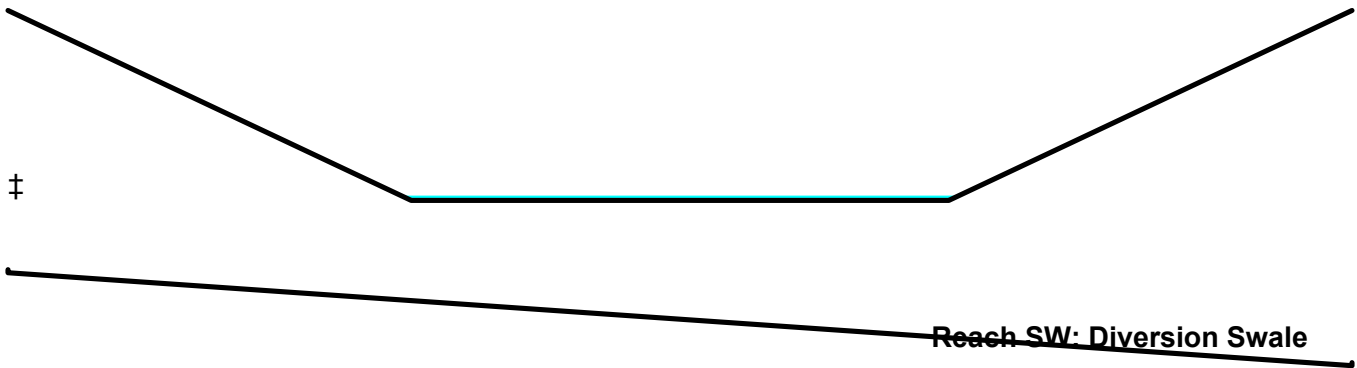
### Summary for Reach SW: Diversion Swale

Inflow Area = 225,379 sf, 8.88% Impervious, Inflow Depth = 0.06" for WQV event  
 Inflow = 0.06 cfs @ 12.68 hrs, Volume= 1,161 cf  
 Outflow = 0.06 cfs @ 12.97 hrs, Volume= 1,161 cf, Atten= 11%, Lag= 17.4 min  
 Routed to Link AL3 : Analysis Line #3 (Northern PL)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Max. Velocity= 0.53 fps, Min. Travel Time= 12.5 min  
 Avg. Velocity = 0.37 fps, Avg. Travel Time= 17.7 min

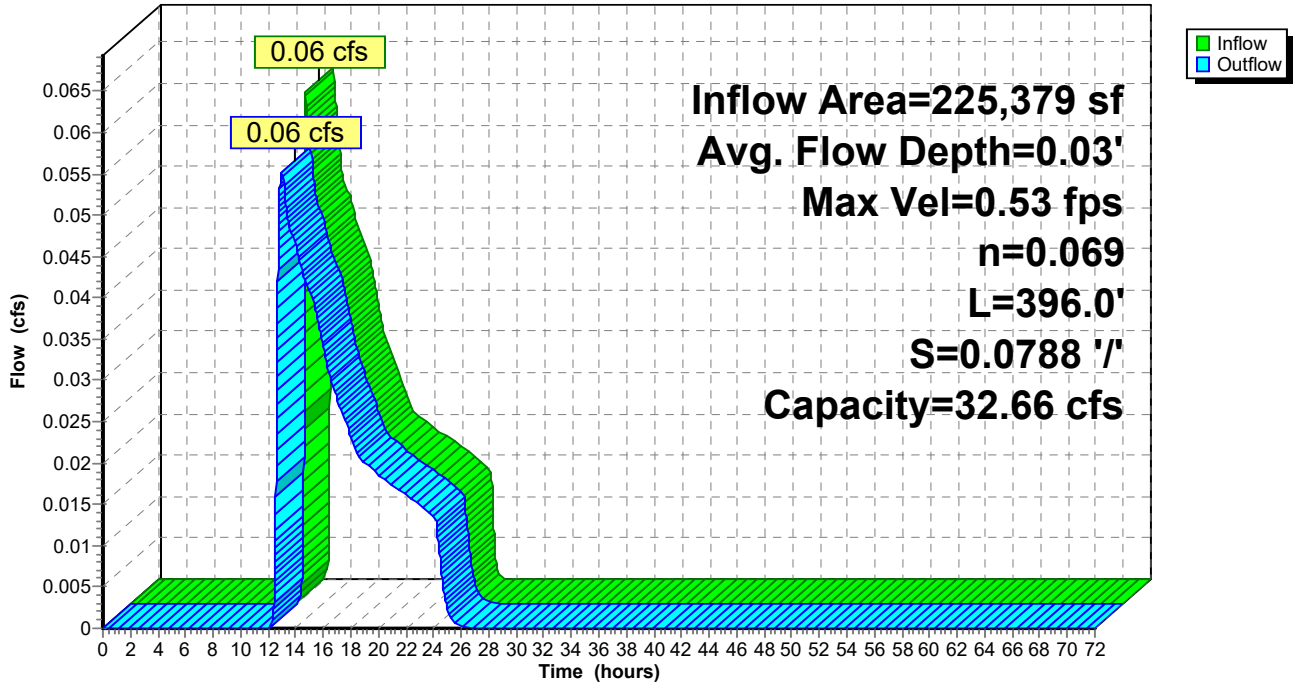
Peak Storage= 41 cf @ 12.97 hrs  
 Average Depth at Peak Storage= 0.03' , Surface Width= 4.15'  
 Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 32.66 cfs

4.00' x 1.00' deep channel, n= 0.069 Riprap, 6-inch  
 Side Slope Z-value= 3.0 '/' Top Width= 10.00'  
 Length= 396.0' Slope= 0.0788 '/'  
 Inlet Invert= 419.20', Outlet Invert= 388.00'



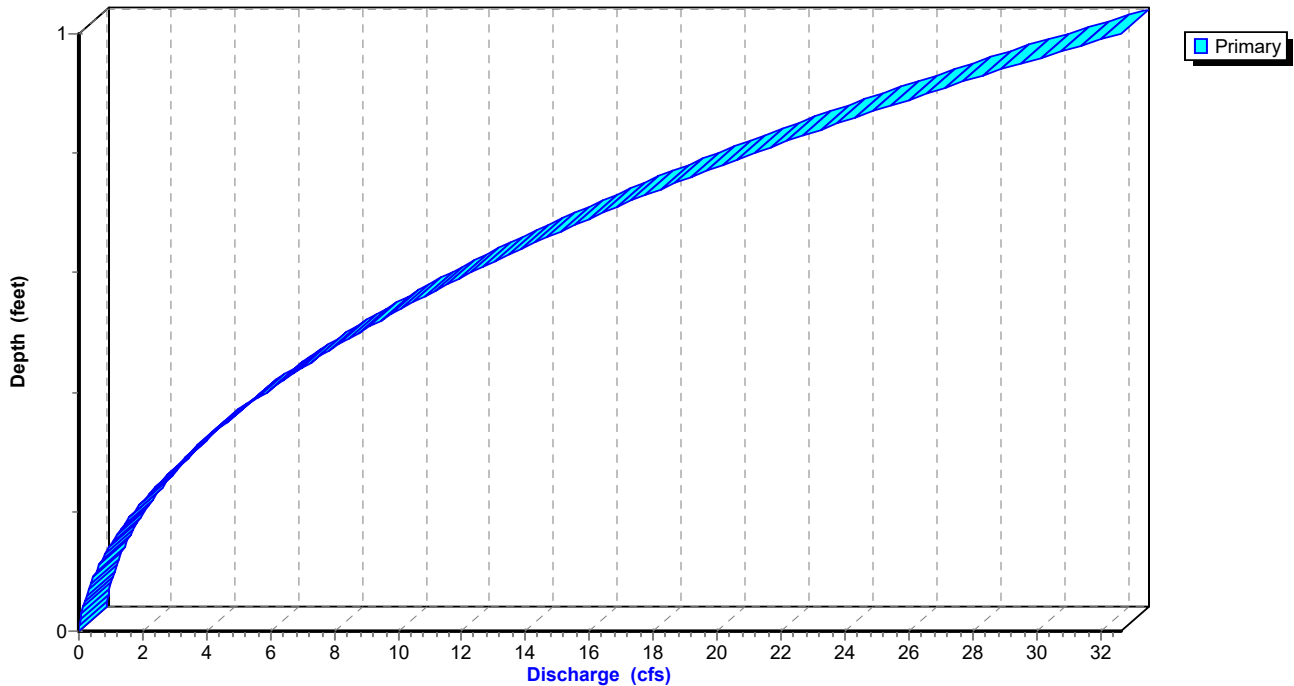
### Reach SW: Diversion Swale

Hydrograph

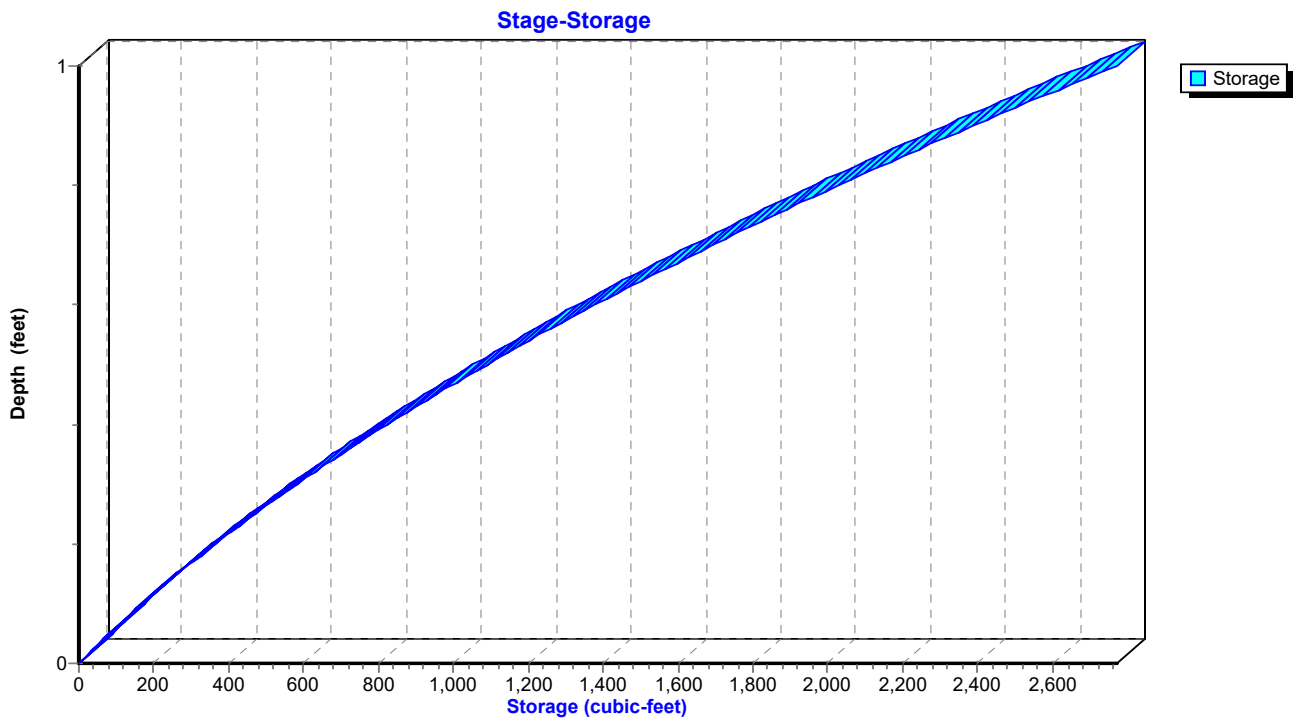


### Reach SW: Diversion Swale

Stage-Discharge



### Reach SW: Diversion Swale



**Summary for Pond BB-A: Bioretention Basin A 'BB-A'**

Inflow Area = 483,502 sf, 17.93% Impervious, Inflow Depth = 0.02" for WQV event  
 Inflow = 0.07 cfs @ 16.18 hrs, Volume= 770 cf  
 Outflow = 0.05 cfs @ 16.93 hrs, Volume= 770 cf, Atten= 21%, Lag= 45.2 min  
 Discarded = 0.05 cfs @ 16.93 hrs, Volume= 770 cf  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
 Routed to Pond BB-B : Bioretention Basin B 'BB-B'  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
 Routed to Pond BB-B : Bioretention Basin B 'BB-B'

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 343.02' @ 16.93 hrs Surf.Area= 5,189 sf Storage= 103 cf

Plug-Flow detention time= 32.2 min calculated for 770 cf (100% of inflow)  
 Center-of-Mass det. time= 32.2 min ( 1,061.0 - 1,028.7 )

Volume	Invert	Avail.Storage	Storage Description			
#1	343.00'	37,180 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
343.00	5,164	425.1	0	0	5,164	
344.00	6,467	444.0	5,803	5,803	6,541	
345.00	7,852	466.6	7,148	12,952	8,241	
346.00	9,304	489.1	8,568	21,519	10,018	
347.00	10,823	511.6	10,054	31,573	11,878	
347.50	11,607	522.8	5,606	37,180	12,836	

Device	Routing	Invert	Outlet Devices
#1	Primary	339.00'	<b>24.0" Round Outlet Pipe</b> L= 38.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 339.00' / 338.00' S= 0.0263 ' S= 0.0263 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	344.35'	<b>5.0" Vert. Low Orifice</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	346.25'	<b>48.0" W x 6.0" H Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	346.65'	<b>48.0" x 48.0" Horiz. Grate</b> C= 0.600
#5	Secondary	347.00'	<b>15.0' long + 2.0 ' SideZ x 5.0' breadth Spillway</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#6	Discarded	343.00'	<b>1.000 in/hr Exfiltration over Surface area</b>

Discarded OutFlow Max=0.12 cfs @ 16.93 hrs HW=343.02' (Free Discharge)

6=Exfiltration (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=343.00' (Free Discharge)

1=Outlet Pipe (Passes 0.00 cfs of 26.20 cfs potential flow)

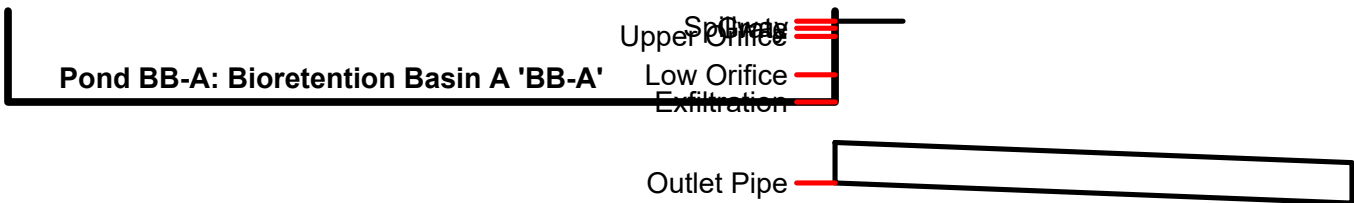
2=Low Orifice ( Controls 0.00 cfs)

3=Upper Orifice ( Controls 0.00 cfs)

4=Grate ( Controls 0.00 cfs)

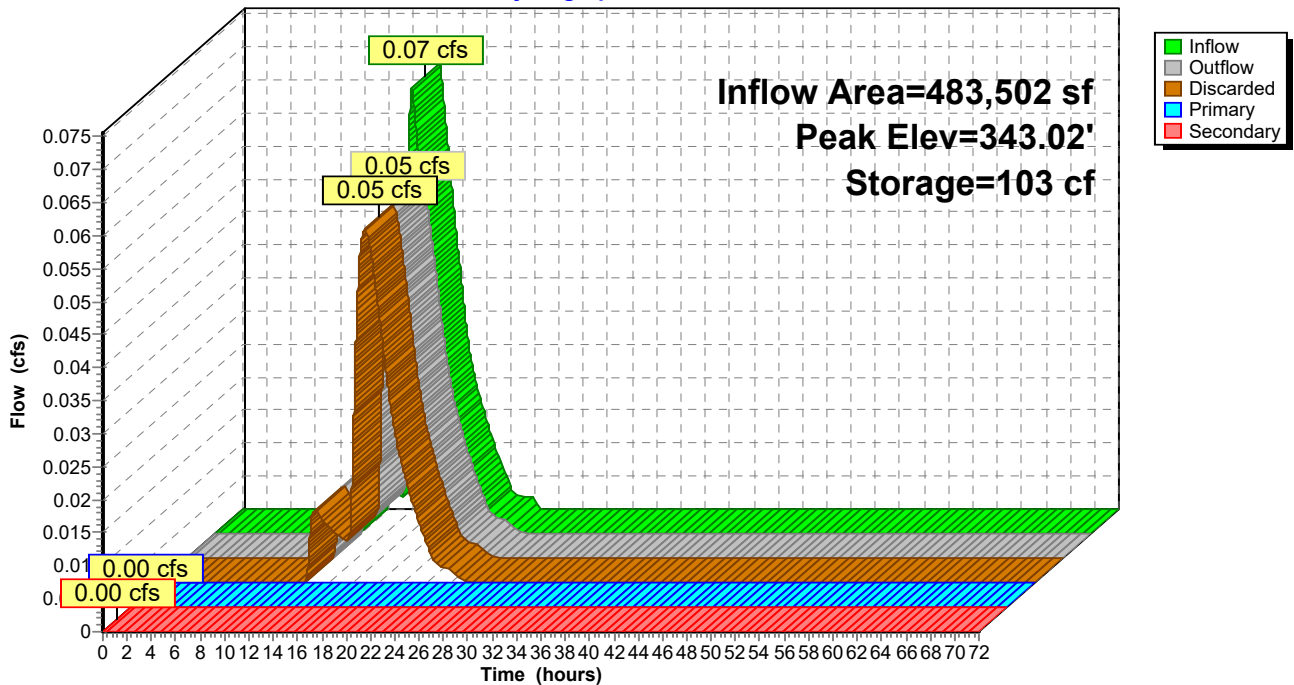
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=343.00' (Free Discharge)

5=Spillway ( Controls 0.00 cfs)

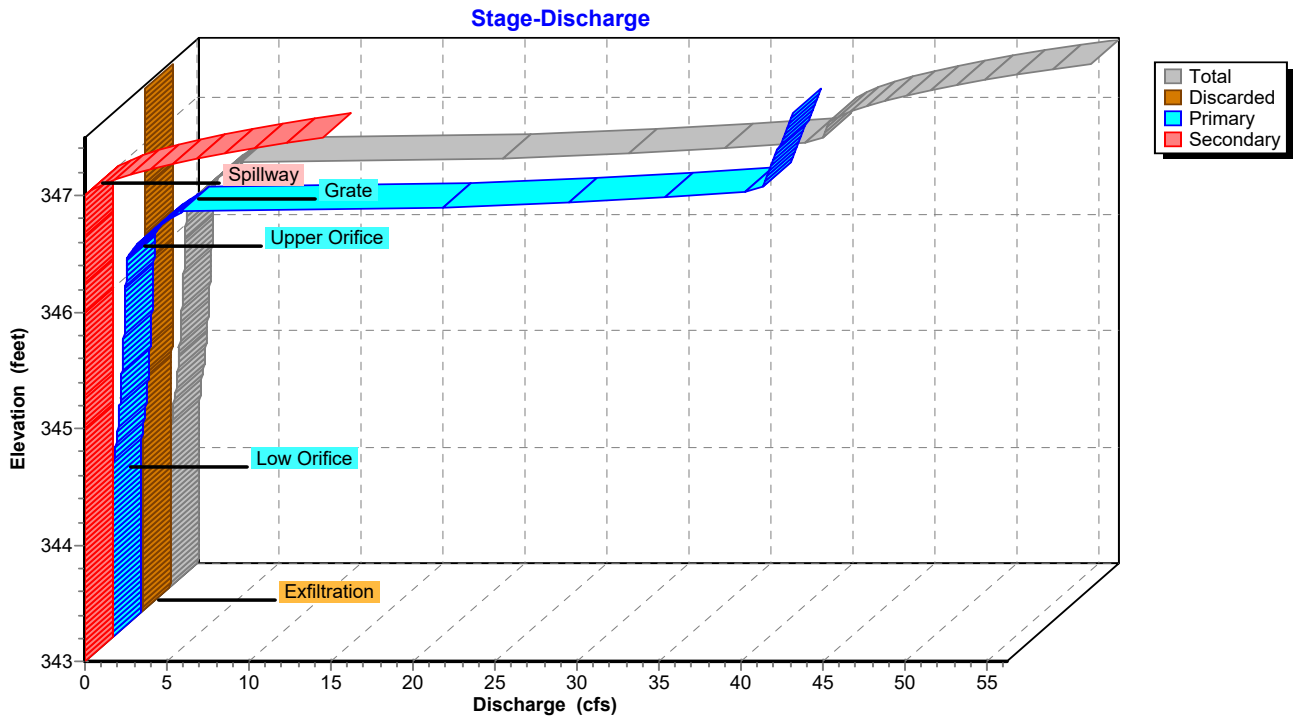


Pond BB-A: Bioretention Basin A 'BB-A'

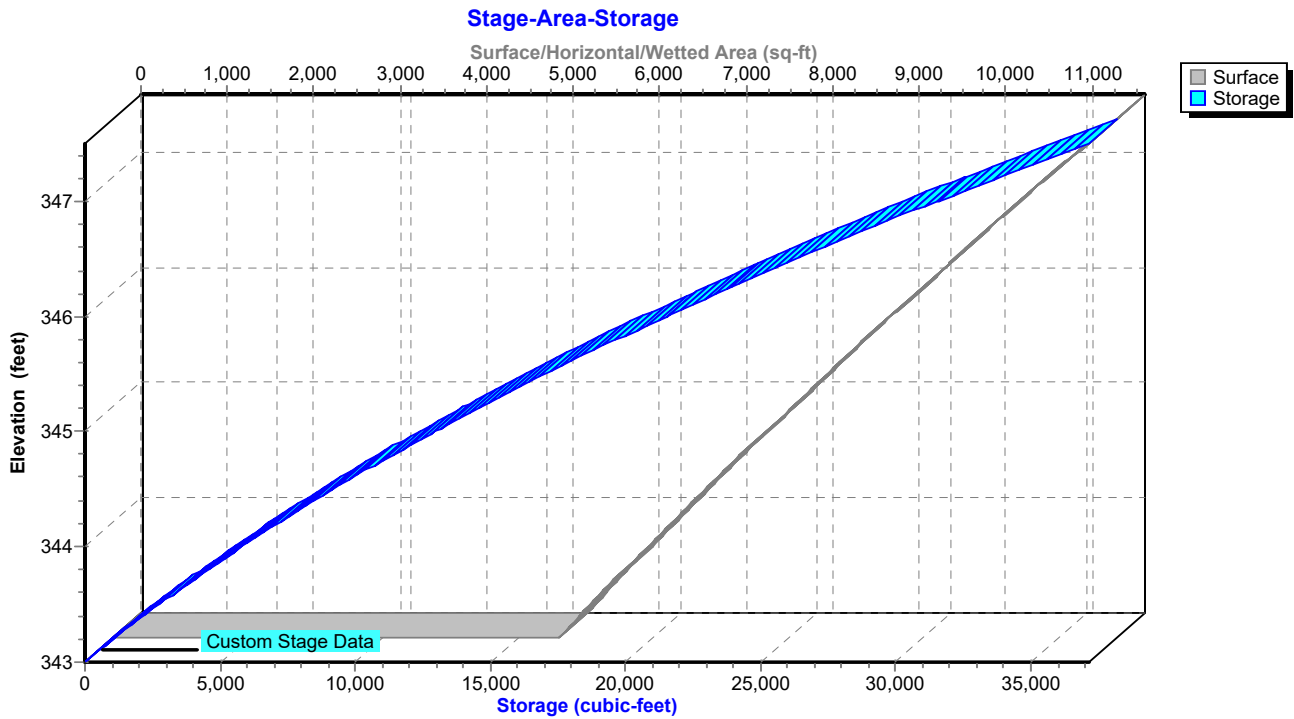
Hydrograph



### Pond BB-A: Bioretention Basin A 'BB-A'



### Pond BB-A: Bioretention Basin A 'BB-A'



**Summary for Pond BB-B: Bioretention Basin B 'BB-B'**

Inflow Area = 496,073 sf, 17.47% Impervious, Inflow Depth = 0.00" for WQV event  
 Inflow = 0.01 cfs @ 12.43 hrs, Volume= 91 cf  
 Outflow = 0.00 cfs @ 13.18 hrs, Volume= 91 cf, Atten= 56%, Lag= 45.1 min  
 Discarded = 0.00 cfs @ 13.18 hrs, Volume= 91 cf  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
 Routed to Link AL2 : Analysis Line #2 (Wetlands)  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
 Routed to Link AL2 : Analysis Line #2 (Wetlands)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 337.50' @ 13.18 hrs Surf.Area= 2,412 sf Storage= 11 cf

Plug-Flow detention time= 46.4 min calculated for 91 cf (100% of inflow)  
 Center-of-Mass det. time= 46.3 min ( 1,017.9 - 971.6 )

Volume	Invert	Avail.Storage	Storage Description		
#1	337.50'	36,426 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
337.50	2,408	287.3	0	0	2,408
339.00	3,765	315.6	4,592	4,592	3,839
340.00	4,739	334.4	4,243	8,835	4,864
341.00	5,771	353.3	5,247	14,081	5,954
342.00	6,859	372.1	6,307	20,388	7,099
343.00	8,004	391.0	7,424	27,813	8,308
344.00	9,237	411.1	8,613	36,426	9,652

Device	Routing	Invert	Outlet Devices
#1	Primary	335.00'	<b>21.0" Round Outlet Pipe</b> L= 47.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 335.00' / 334.00' S= 0.0213 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf
#2	Device 1	337.75'	<b>5.0" Vert. Low Orifice</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	338.70'	<b>48.0" W x 6.0" H Vert. Middle Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	340.90'	<b>48.0" W x 6.0" H Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	341.60'	<b>48.0" x 48.0" Horiz. Grate</b> C= 0.600 Limited to weir flow at low heads
#6	Secondary	343.00'	<b>15.0' long + 2.0 ' SideZ x 5.0' breadth Spillway</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#7	Discarded	337.50'	<b>1.000 in/hr Exfiltration over Surface area</b>

**Discarded OutFlow** Max=0.06 cfs @ 13.18 hrs HW=337.50' (Free Discharge)

↳ **7=Exfiltration** (Exfiltration Controls 0.06 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=337.50' (Free Discharge)

↳ **1=Outlet Pipe** (Passes 0.00 cfs of 14.76 cfs potential flow)

↳ **2=Low Orifice** ( Controls 0.00 cfs)

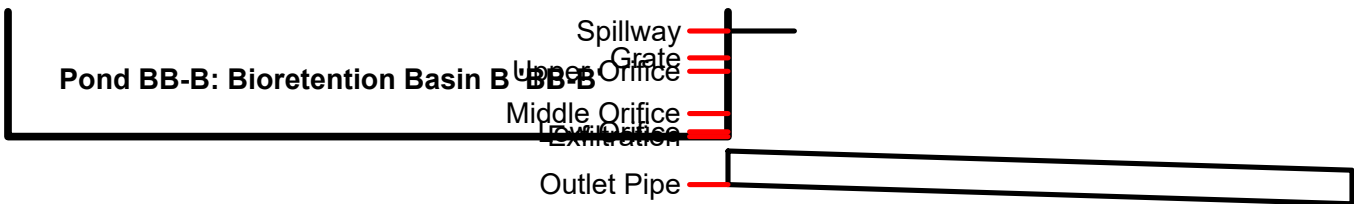
↳ **3=Middle Orifice** ( Controls 0.00 cfs)

↳ **4=Upper Orifice** ( Controls 0.00 cfs)

↳ **5=Gate** ( Controls 0.00 cfs)

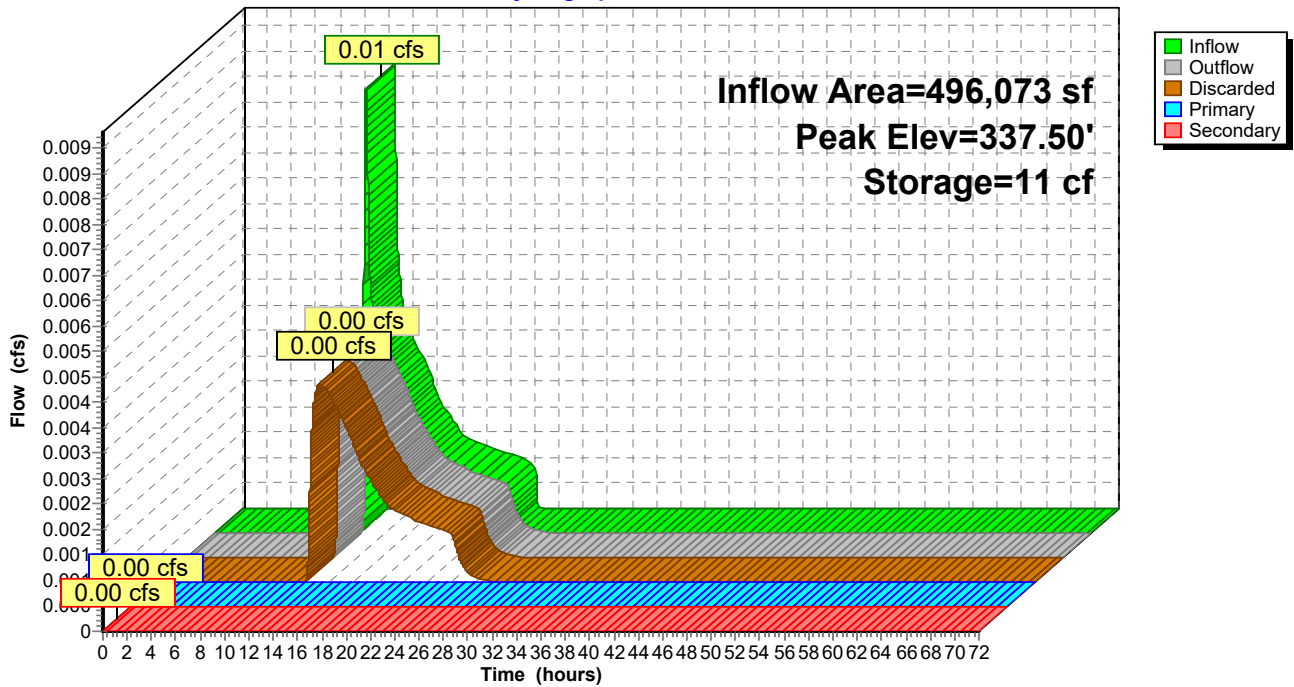
**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=337.50' (Free Discharge)

↳ **6=Spillway** ( Controls 0.00 cfs)

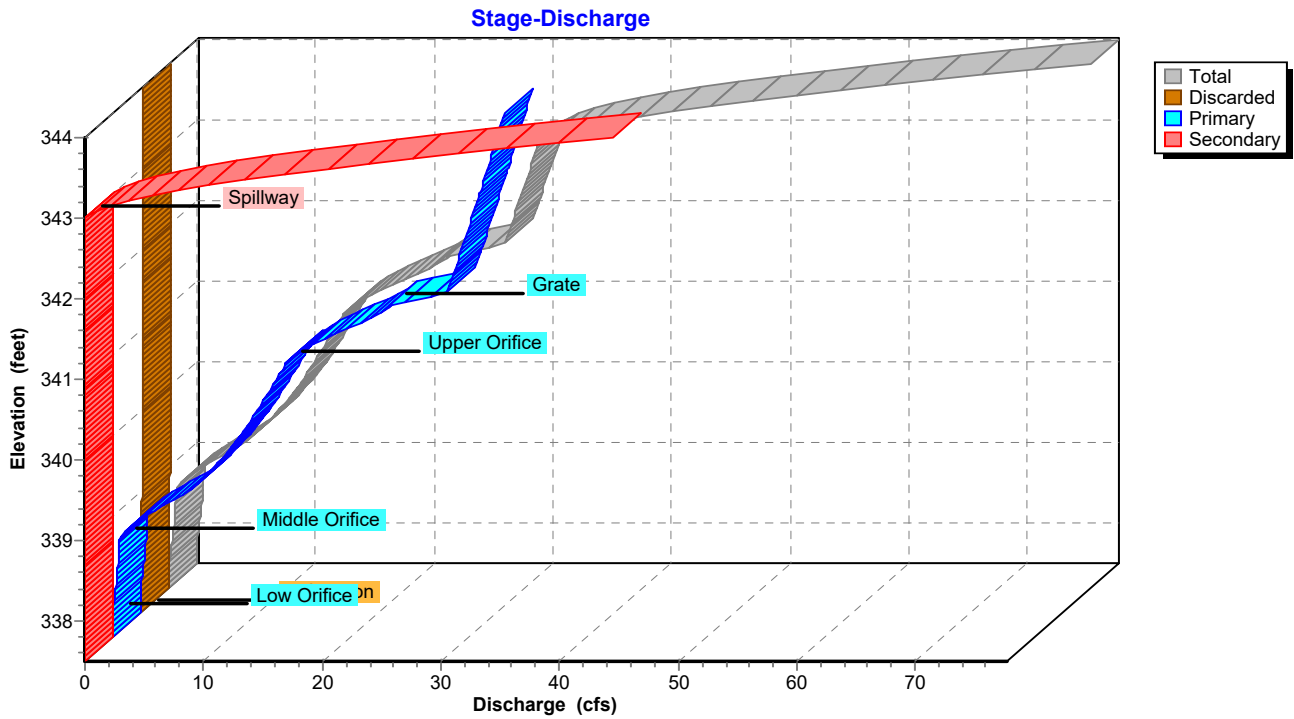


**Pond BB-B: Bioretention Basin B 'BB-B'**

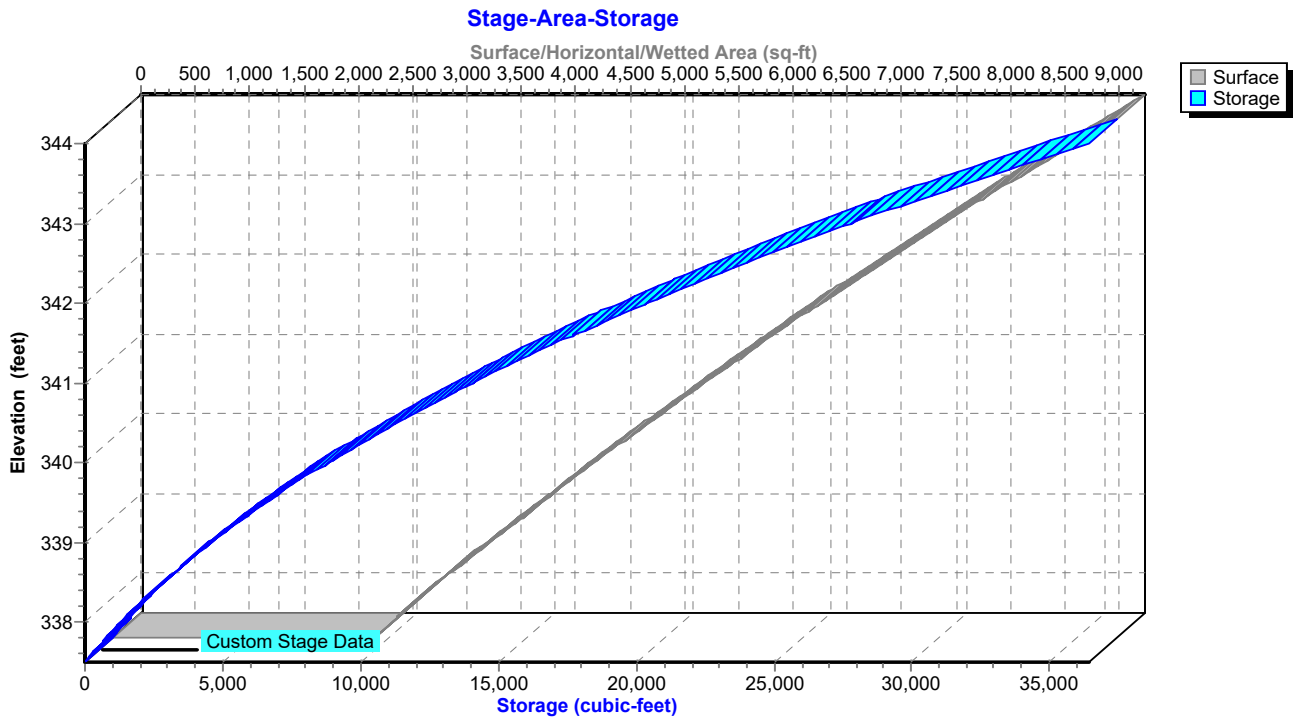
Hydrograph



### Pond BB-B: Bioretention Basin B 'BB-B'



### Pond BB-B: Bioretention Basin B 'BB-B'



**Summary for Pond BB-C: Bioretention Basin C 'BB-C'**

Inflow Area = 74,552 sf, 29.32% Impervious, Inflow Depth = 0.22" for WQV event  
 Inflow = 0.22 cfs @ 12.34 hrs, Volume= 1,350 cf  
 Outflow = 0.04 cfs @ 14.31 hrs, Volume= 1,350 cf, Atten= 82%, Lag= 118.2 min  
 Discarded = 0.04 cfs @ 14.31 hrs, Volume= 1,350 cf  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
 Routed to Link AL3 : Analysis Line #3 (Northern PL)  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
 Routed to Link AL3 : Analysis Line #3 (Northern PL)

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 387.76' @ 14.31 hrs Surf.Area= 1,722 sf Storage= 425 cf

Plug-Flow detention time= 113.7 min calculated for 1,350 cf (100% of inflow)  
 Center-of-Mass det. time= 113.7 min ( 1,028.6 - 915.0 )

Volume	Invert	Avail.Storage	Storage Description			
#1	387.50'	13,929 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
387.50	1,568	193.8	0	0	1,568	
388.00	1,872	204.2	859	859	1,912	
389.00	2,526	224.8	2,191	3,050	2,647	
390.00	3,229	243.7	2,870	5,920	3,390	
391.00	3,988	262.5	3,602	9,522	4,188	
392.00	4,841	285.5	4,408	13,929	5,228	

Device	Routing	Invert	Outlet Devices
#1	Primary	385.50'	<b>15.0" Round Outlet Pipe</b> L= 32.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 385.50' / 385.00' S= 0.0156 1/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	388.10'	<b>4.0" Vert. Low Orifice</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	389.00'	<b>10.0" W x 4.0" H Vert. Middle Orifice</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	390.70'	<b>24.0" W x 6.0" H Vert. Upper Orifice</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	391.25'	<b>48.0" x 48.0" Horiz. Grate</b> C= 0.600
#6	Secondary	391.50'	<b>15.0' long + 2.0 1/' SideZ x 5.0' breadth Spillway</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#7	Discarded	387.50'	<b>1.000 in/hr Exfiltration over Surface area</b>

**Discarded OutFlow** Max=0.04 cfs @ 14.31 hrs HW=387.76' (Free Discharge)

↳ **7=Exfiltration** (Exfiltration Controls 0.04 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=387.50' (Free Discharge)

↳ **1=Outlet Pipe** (Passes 0.00 cfs of 6.93 cfs potential flow)

↳ **2=Low Orifice** ( Controls 0.00 cfs)

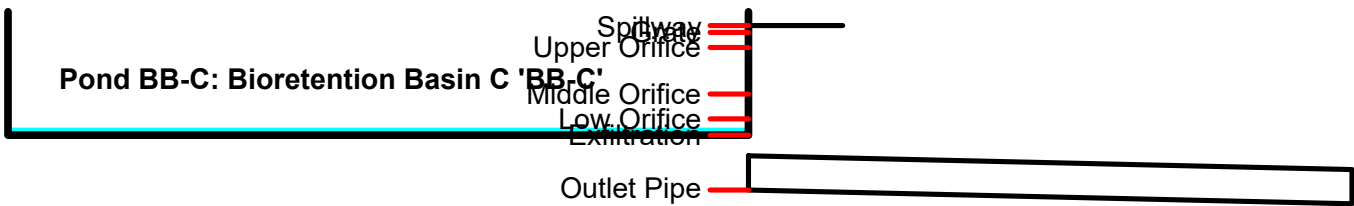
↳ **3=Middle Orifice** ( Controls 0.00 cfs)

↳ **4=Upper Orifice** ( Controls 0.00 cfs)

↳ **5=Grate** ( Controls 0.00 cfs)

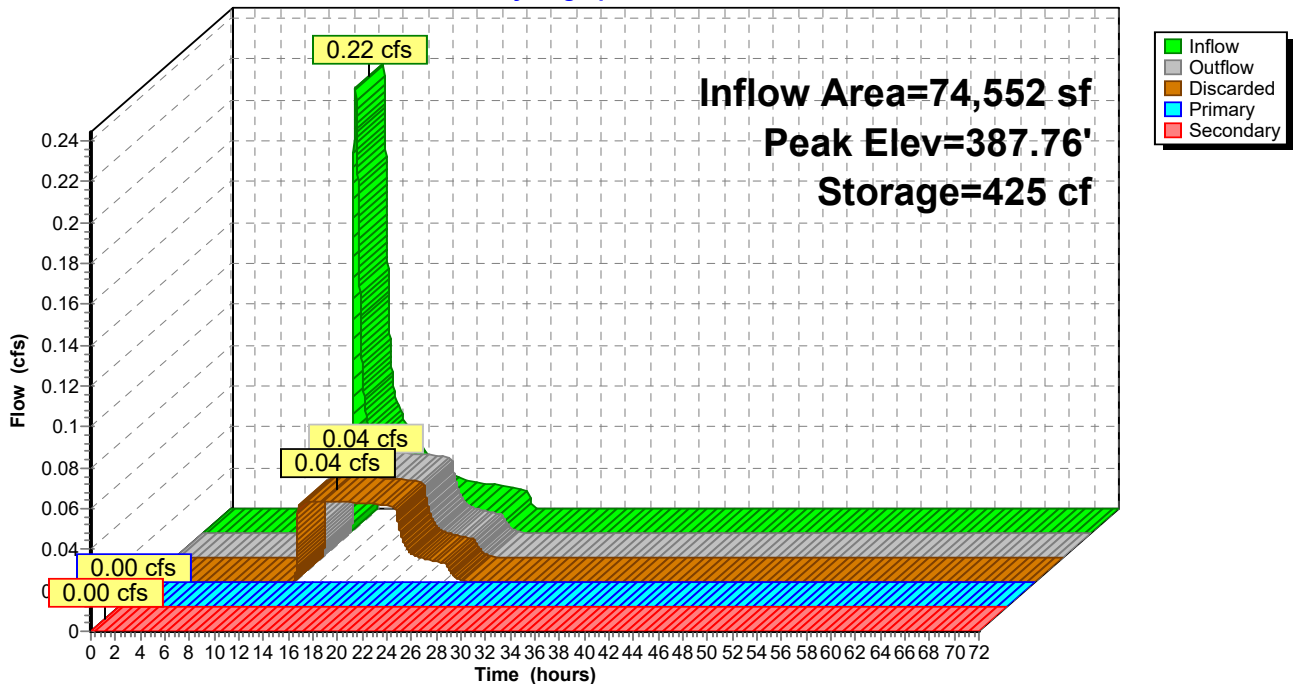
**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=387.50' (Free Discharge)

↳ **6=Spillway** ( Controls 0.00 cfs)

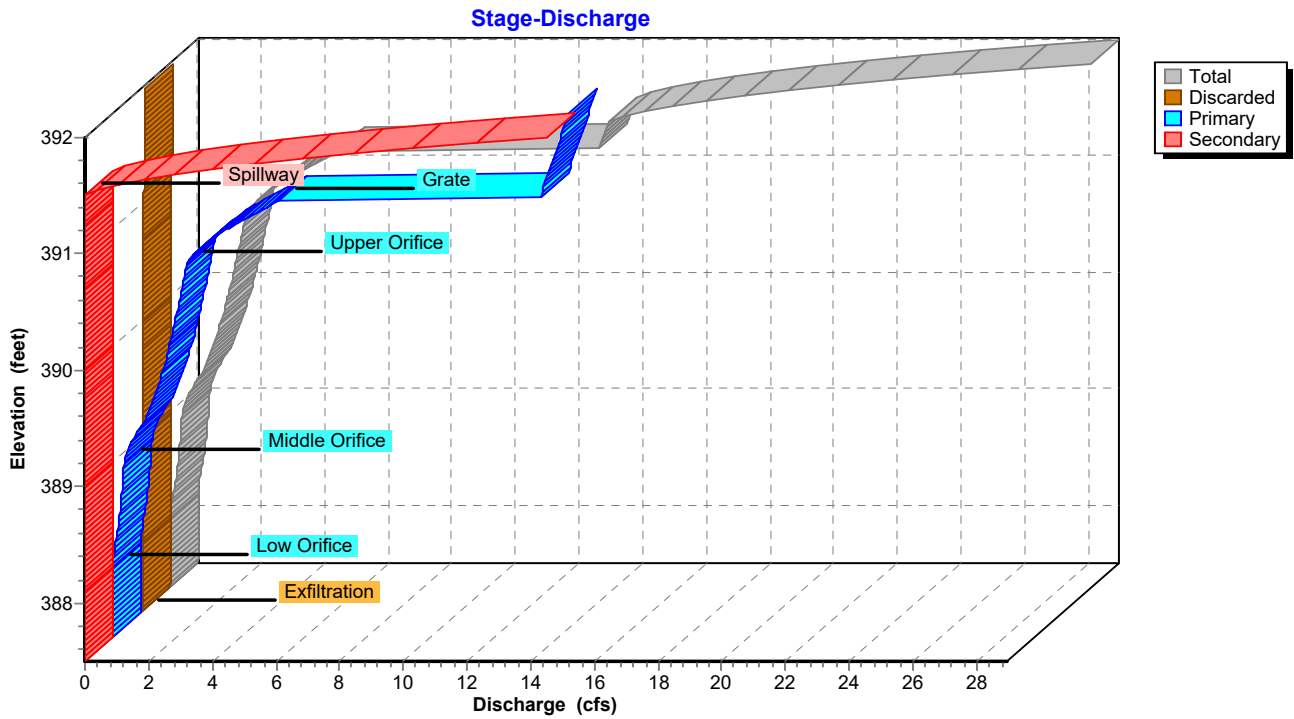


**Pond BB-C: Bioretention Basin C 'BB-C'**

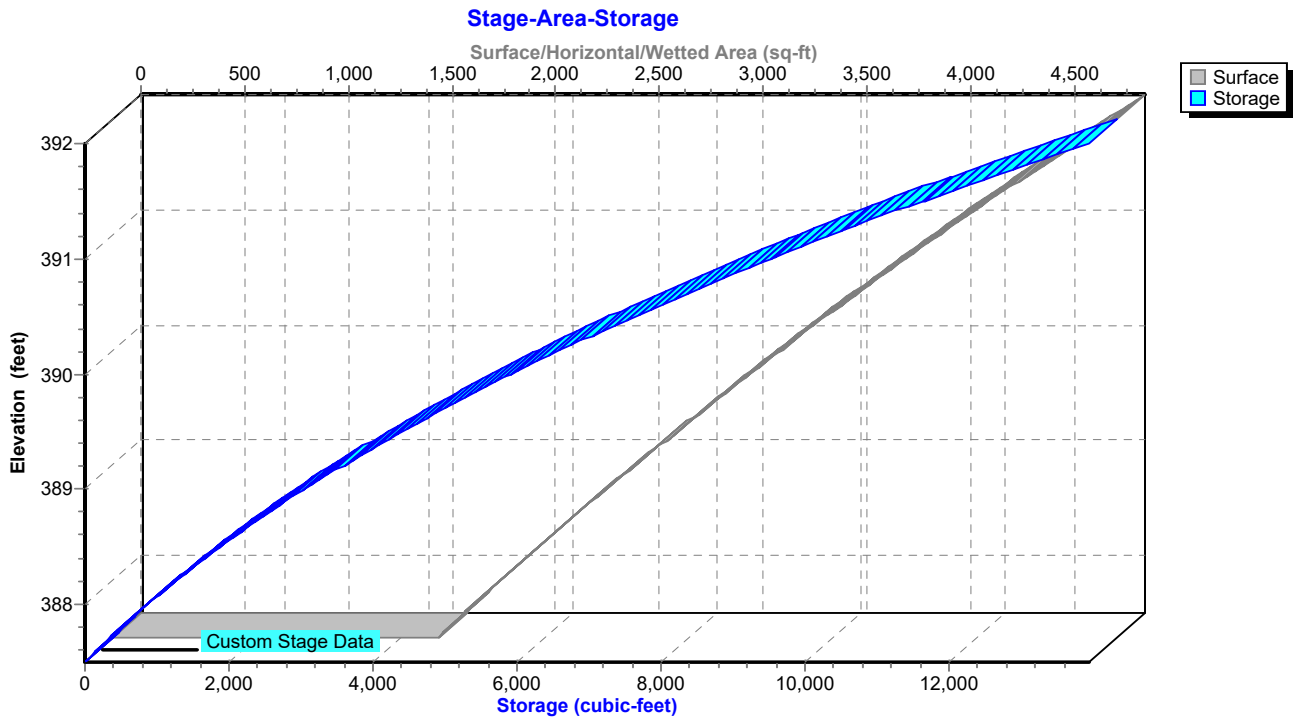
Hydrograph



**Pond BB-C: Bioretention Basin C 'BB-C'**



**Pond BB-C: Bioretention Basin C 'BB-C'**



**Summary for Pond WQB: Water Quality Basin 'WQB'**

Inflow Area = 459,645 sf, 18.69% Impervious, Inflow Depth = 0.15" for WQV event  
 Inflow = 0.74 cfs @ 12.46 hrs, Volume= 5,833 cf  
 Outflow = 0.12 cfs @ 16.18 hrs, Volume= 5,833 cf, Atten= 84%, Lag= 223.3 min  
 Discarded = 0.06 cfs @ 16.18 hrs, Volume= 5,263 cf  
 Primary = 0.06 cfs @ 16.18 hrs, Volume= 569 cf  
 Routed to Pond BB-A : Bioretention Basin A 'BB-A'  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf  
 Routed to Pond BB-A : Bioretention Basin A 'BB-A'

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 355.78' @ 16.18 hrs Surf.Area= 2,444 sf Storage= 3,034 cf

Plug-Flow detention time= 606.7 min calculated for 5,832 cf (100% of inflow)  
 Center-of-Mass det. time= 606.8 min ( 1,546.7 - 940.0 )

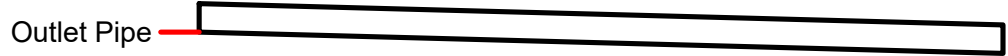
Volume	Invert	Avail.Storage	Storage Description			
#1	354.00'	6,684 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
354.00	1,014	251.0	0	0	1,014	
355.00	1,803	271.5	1,390	1,390	1,906	
356.00	2,645	290.3	2,211	3,600	2,792	
357.00	3,545	309.2	3,084	6,684	3,742	

Device	Routing	Invert	Outlet Devices
#1	Primary	345.00'	<b>24.0" Round Outlet Pipe</b> L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 345.00' / 343.50' S= 0.0300 1/1" Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	355.75'	<b>48.0" W x 6.0" H Vert. Orifice</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	356.25'	<b>48.0" x 48.0" Horiz. Grate</b> C= 0.600
#4	Secondary	356.50'	<b>15.0' long + 2.0 1/1" SideZ x 5.0' breadth Spillway</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#5	Discarded	354.00'	<b>1.000 in/hr Exfiltration over Surface area</b>

**Discarded OutFlow** Max=0.06 cfs @ 16.18 hrs HW=355.78' (Free Discharge)  
 ↳5=Exfiltration (Exfiltration Controls 0.06 cfs)

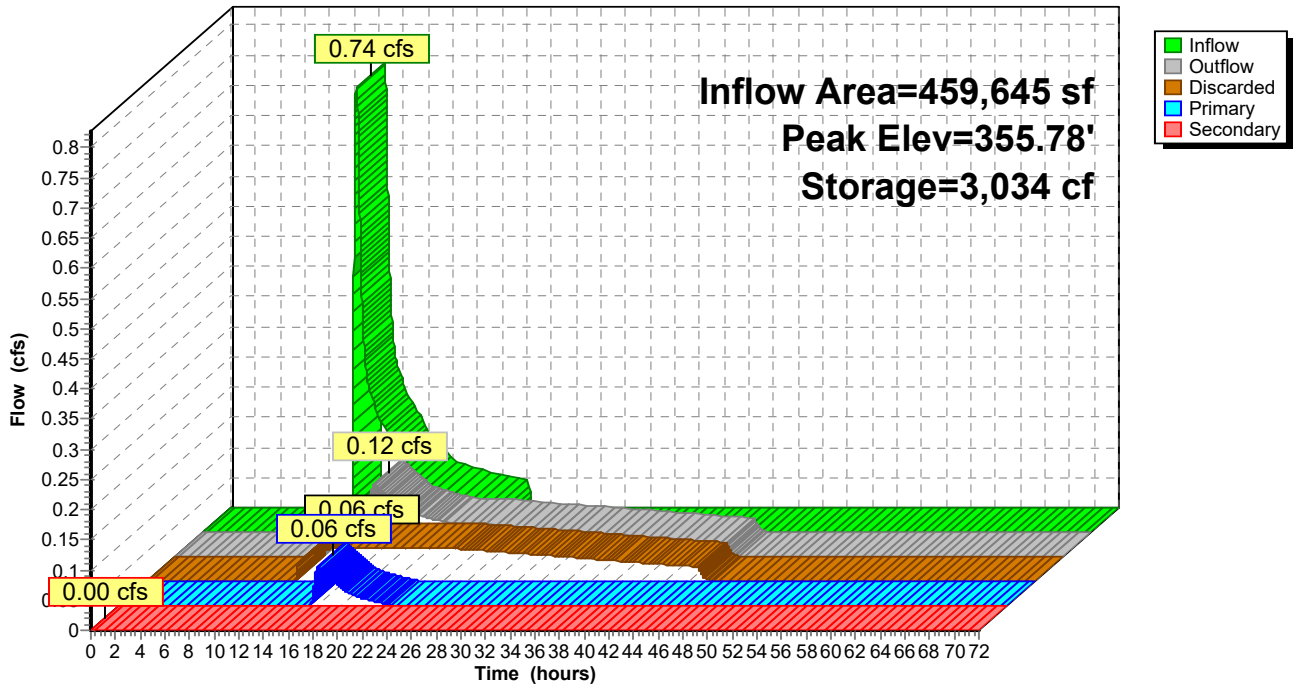
**Primary OutFlow** Max=0.06 cfs @ 16.18 hrs HW=355.78' (Free Discharge)  
 ↳1=Outlet Pipe (Passes 0.06 cfs of 47.30 cfs potential flow)  
 ↳2=Orifice (Orifice Controls 0.06 cfs @ 0.53 fps)  
 ↳3=Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=354.00' (Free Discharge)  
 ↳4=Spillway ( Controls 0.00 cfs)

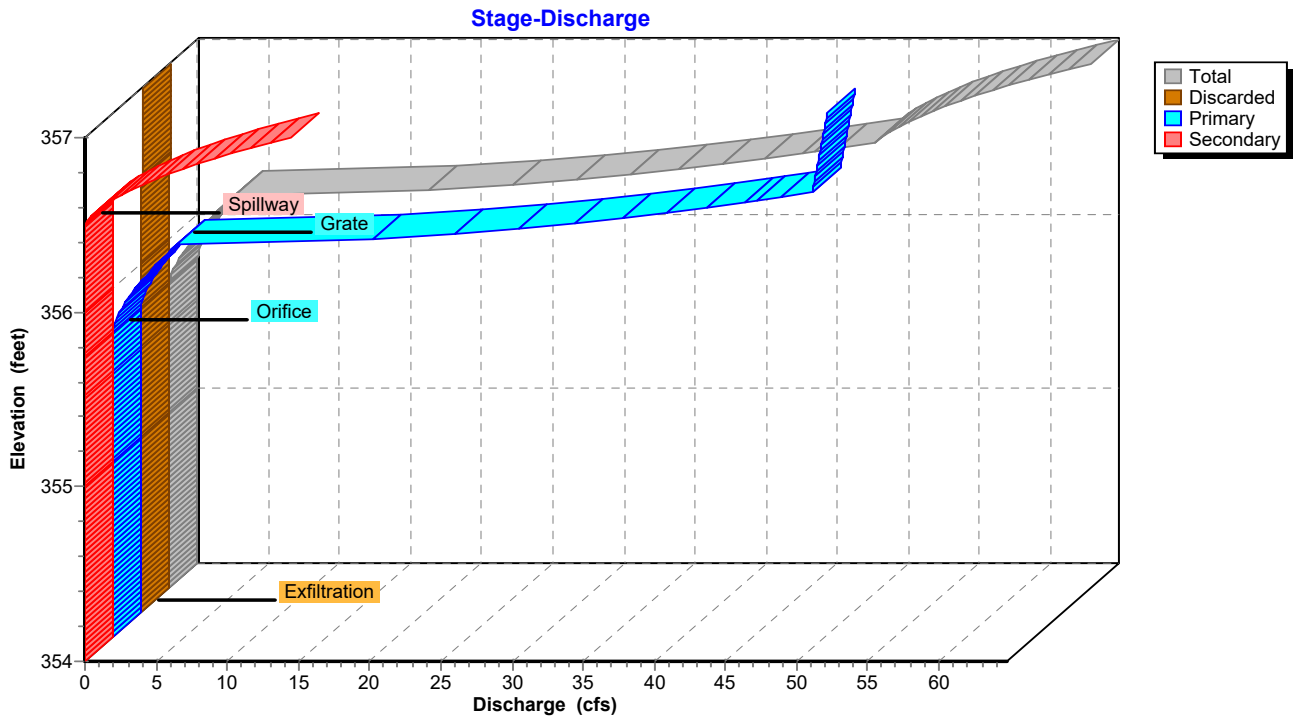


### Pond WQB: Water Quality Basin 'WQB'

Hydrograph



### Pond WQB: Water Quality Basin 'WQB'



### Pond WQB: Water Quality Basin 'WQB'

