

DRAINAGE CALCULATIONS

**TO DEMONSTRATE COMPLIANCE WITH
THE
AMESBURY STORMWATER REGULATIONS**

FOR A

**PROPOSED HOME REPLACEMENT
LOCATED AT**

4 LAKE ATTITASH ROAD, AMESBURY MA 01913

**BEING
MAP 71 LOT 72**



Prepared for:

**MDC River Street R.T. c/o Matthew Curley Tr.
451 Newburyport Turnpike
Rowley, MA 01913**

Prepared by:

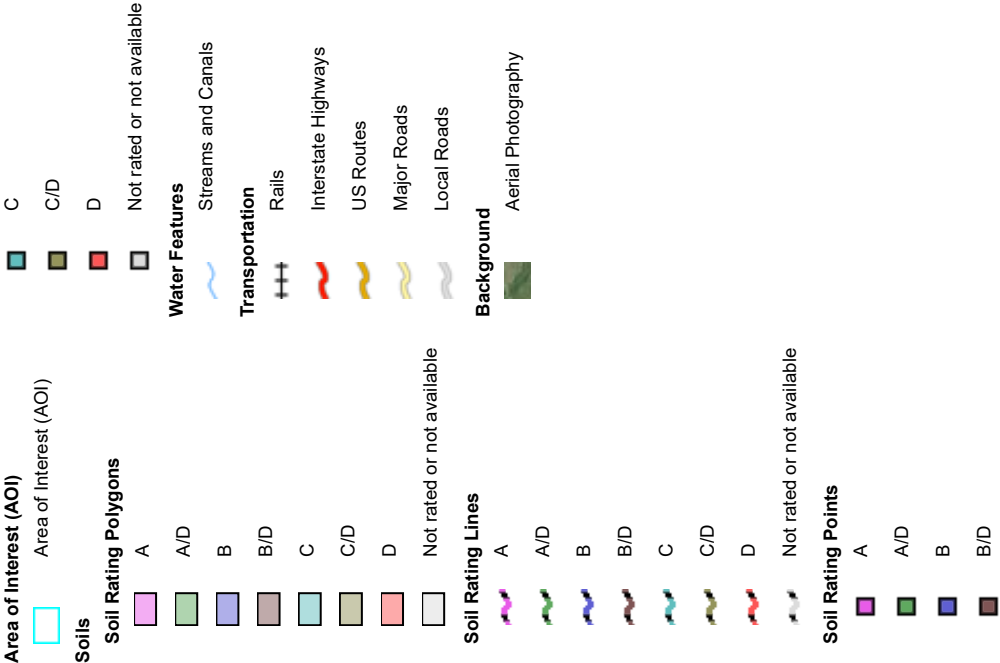
**WGH Land Survey and Design
Thad D. Berry, PE and William G. Holt, PLS, RS
83 West Main Street
Merrimac, MA 01860**

July 2026

Hydrologic Soil Group—Essex County, Massachusetts, Northern Part
(4 Lake Atitash Soil Map HSG)



MAP LEGEND



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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: Essex County, Massachusetts, Northern Part
Survey Area Data: Version 21, Sep 5, 2025

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

Date(s) aerial images were photographed: Mar 1, 2023—Sep 1, 2023

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		0.0	0.7%
31A	Walpole sandy loam, 0 to 3 percent slopes	B/D	0.1	97.4%
651	Udorthents, smoothed	A	0.0	1.9%
Totals for Area of Interest			0.1	100.0%

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

PRE DEVELOPMENT CALCULATIONS

LOCATED AT

4 LAKE ATTITASH ROAD, AMESBURY MA 01913

**BEING
MAP 71 LOT 72**



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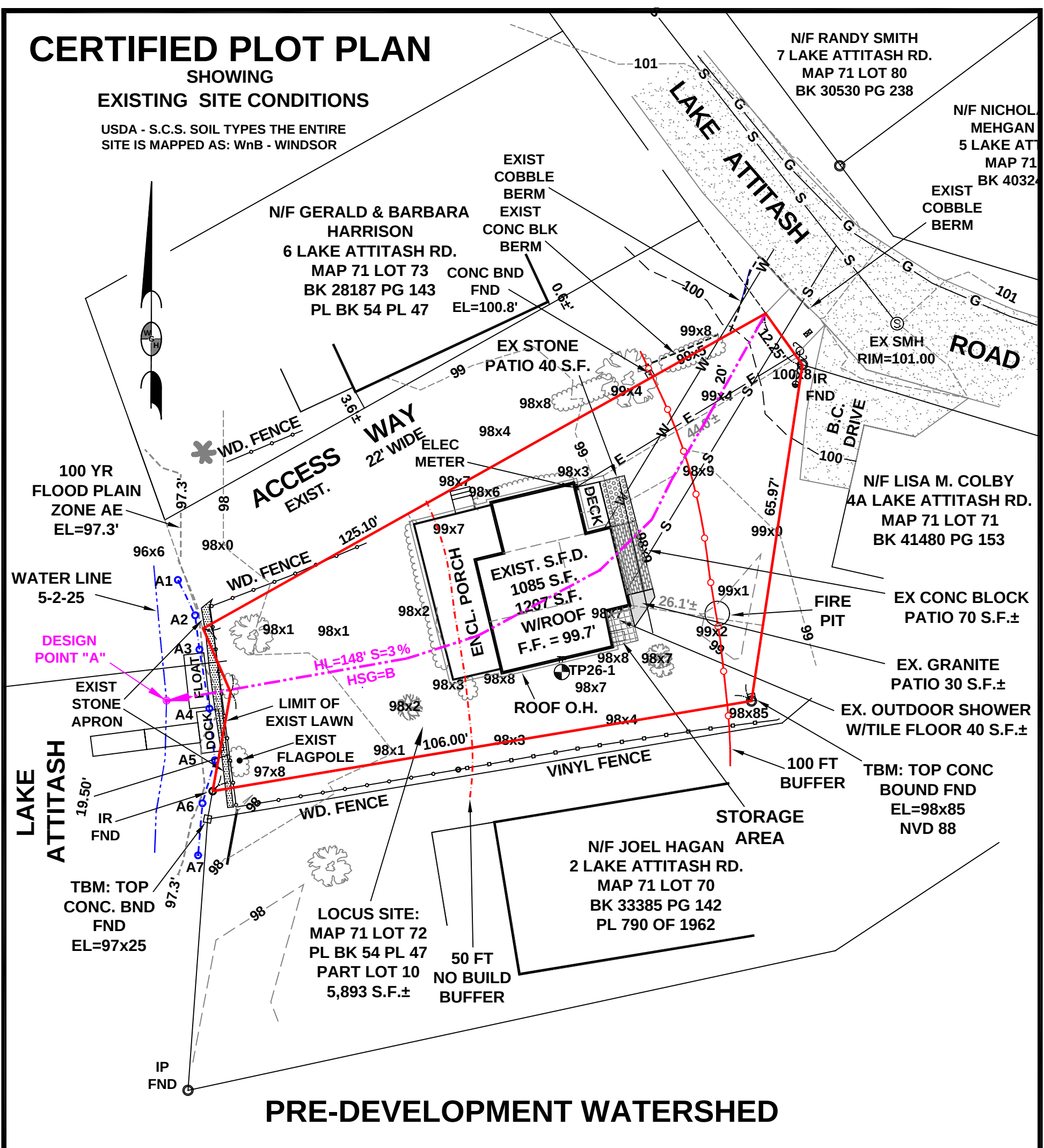
Prepared by:

**WGH Land Survey and Design
Thad D. Berry, PE and William G. Holt, PLS, RS
83 West Main Street
Merrimac, MA 01860**

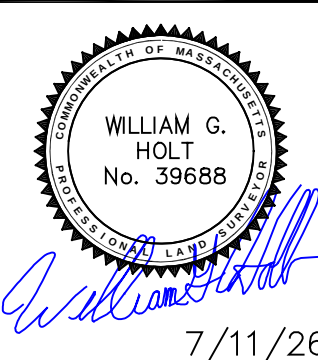
July 2026

CERTIFIED PLOT PLAN
SHOWING
EXISTING SITE CONDITIONS

USDA - S.C.S. SOIL TYPES THE ENTIRE
SITE IS MAPPED AS: WnB - WINDSOR



LOCATION: #4 LAKE ATTITASH ROAD ~ MAP 71 LOT 72

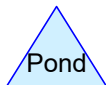
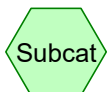
REVISED:	BY:	LOCATION: AMESBURY MASSACHUSETTS
DRAWN: 7/10/26	BY: WGH	CITY/TOWN STATE
		DATE: 11 JULY 2026 SCALE: 1 INCH = 20 FEET.
		DEED AND PLAN REFERENCE: ESSEX SOUTH REGISTRY OF DEEDS.
		DEED BOOK: 41,523 PAGE: 414 PL. BK.: 54 PLAN 47
		CERTIFICATE OF TITLE NUMBER: PLAN No.
		CERTIFICATION IS HEREBY MADE TO: TOWN OF AMESBURY
		OWNER: MDC RIVER STREET R.T.
		c/o MATTHEW CURLEY
WILLIAM G. HOLT PLS, RS, SE 83 WEST MAIN ST MERRIMAC, MA 01860 TEL: (978) 257-4576 E-MAIL: billgholt@aol.com		CERTIFICATION IS HEREBY MADE THAT THE STRUCTURES SHOWN ON THIS PLAN ARE NOT LOCATED WITHIN A SPECIAL FLOOD HAZARD AREA (100 YEAR) AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR: THE TOWN OF MERRIMAC, MASSACHUSETTS.
		JOB NUMBER: 25-114-CPP



Existing Cond flow to
Design Point A Lake
Attitash



Analysis Design Point A
flow off site



4 Lake Attitash Amesbury Stormwater Pre FP

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.105	61	>75% Grass cover, Good, HSG B (PRE-1)
0.001	98	Entry Decks impervious, HSG B (PRE-1)
0.001	98	Shower tile floor impervious, HSB B (PRE-1)
0.025	98	Unconnected roofs, HSG B (PRE-1)
0.002	98	Walk Conc Block impervious, HSG B (PRE-1)
0.001	98	Walk Granite impervious, HSG B (PRE-1)
0.001	98	Walk Stone impervious, HSG B (PRE-1)
0.135	69	TOTAL AREA

4 Lake Attitash Amesbury Stormwater Pre FP

Type III 24-hr 2 Year Rainfall=3.10"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

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

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PRE-1: Existing Cond flow Runoff Area=5,893 sf 22.48% Impervious Runoff Depth=0.59"
Flow Length=148' Tc=6.1 min UI Adjusted CN=66 Runoff=0.07 cfs 0.007 af

Link AP-1PRE: Analysis Design Point A flow off site

Inflow=0.07 cfs 0.007 af

Primary=0.07 cfs 0.007 af

Total Runoff Area = 0.135 ac Runoff Volume = 0.007 af Average Runoff Depth = 0.59"
77.52% Pervious = 0.105 ac 22.48% Impervious = 0.030 ac

4 Lake Attitash Amesbury Stormwater Pre FP

Type III 24-hr 2 Year Rainfall=3.10"

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Summary for Subcatchment PRE-1: Existing Cond flow to Design Point A Lake Attitash

Runoff = 0.07 cfs @ 12.11 hrs, Volume= 0.007 af, Depth= 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Adj	Description
1,081	98		Unconnected roofs, HSG B
0	98		Paved parking, HSG B
* 64	98		Entry Decks impervious, HSG B
* 40	98		Walk Stone impervious, HSG B
* 70	98		Walk Conc Block impervious, HSG B
* 30	98		Walk Granite impervious, HSG B
* 40	98		Shower tile floor impervious, HSB B
4,568	61		>75% Grass cover, Good, HSG B
5,893	69	66	Weighted Average, UI Adjusted
4,568			77.52% Pervious Area
1,325			22.48% Impervious Area
1,081			81.58% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0320	0.18		Sheet Flow, WOODS
					Grass: Short n= 0.150 P2= 3.10"
1.4	98	0.0296	1.20		Shallow Concentrated Flow, Grass lawn
					Short Grass Pasture Kv= 7.0 fps
6.1	148	Total			

4 Lake Attitash Amesbury Stormwater Pre FP

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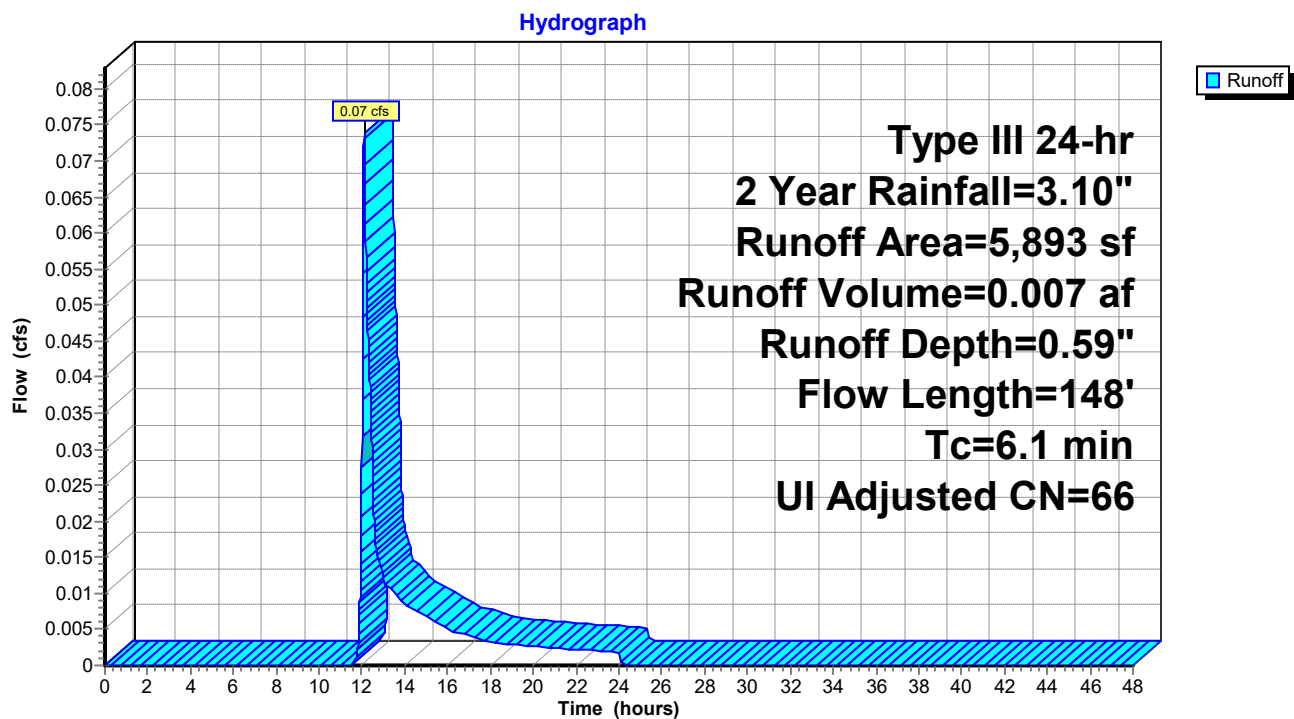
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Type III 24-hr 2 Year Rainfall=3.10"

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Subcatchment PRE-1: Existing Cond flow to Design Point A Lake Attitash

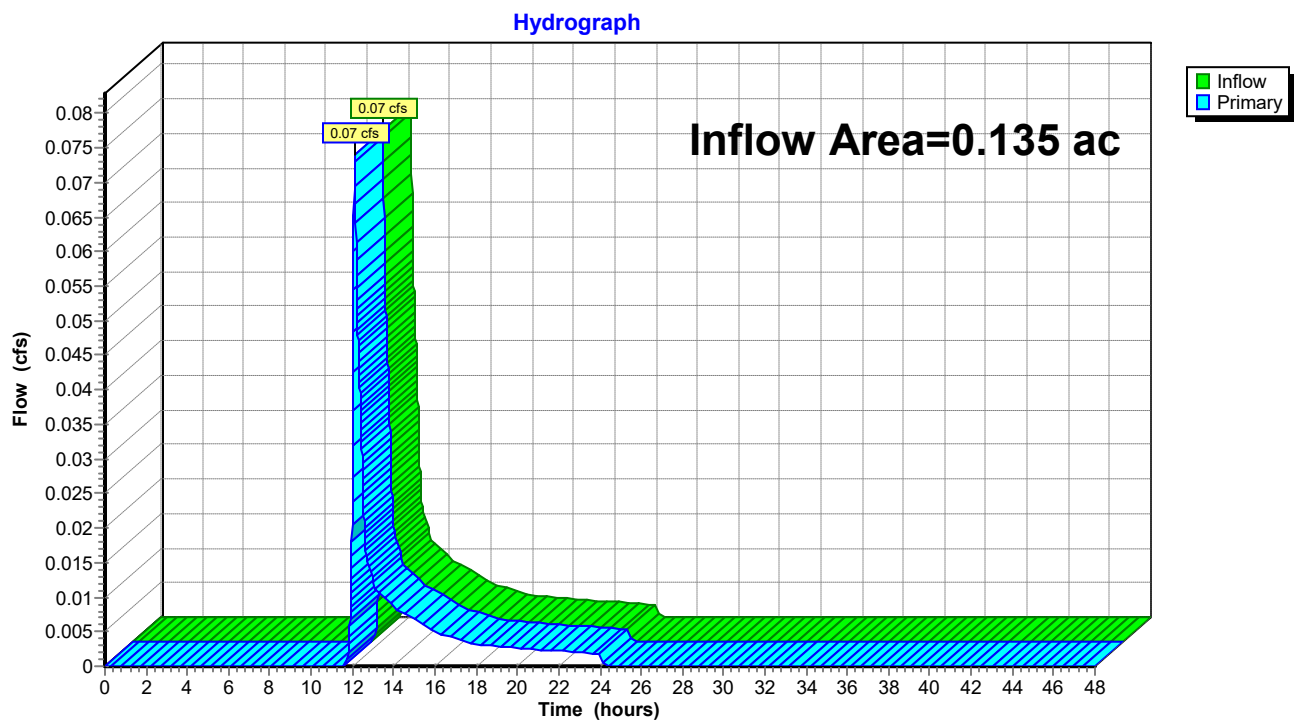


Summary for Link AP-1PRE: Analysis Design Point A flow off site

Inflow Area = 0.135 ac, 22.48% Impervious, Inflow Depth = 0.59" for 2 Year event
Inflow = 0.07 cfs @ 12.11 hrs, Volume= 0.007 af
Primary = 0.07 cfs @ 12.11 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 39.50'

Link AP-1PRE: Analysis Design Point A flow off site

4 Lake Attitash Amesbury Stormwater Pre FP

Type III 24-hr 25 Year Rainfall=5.40"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

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

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PRE-1: Existing Cond flow Runoff Area=5,893 sf 22.48% Impervious Runoff Depth=2.01"
Flow Length=148' Tc=6.1 min UI Adjusted CN=66 Runoff=0.31 cfs 0.023 af

Link AP-1PRE: Analysis Design Point A flow off site

Inflow=0.31 cfs 0.023 af

Primary=0.31 cfs 0.023 af

Total Runoff Area = 0.135 ac Runoff Volume = 0.023 af Average Runoff Depth = 2.01"
77.52% Pervious = 0.105 ac 22.48% Impervious = 0.030 ac

4 Lake Attitash Amesbury Stormwater Pre FP

Type III 24-hr 25 Year Rainfall=5.40"

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Summary for Subcatchment PRE-1: Existing Cond flow to Design Point A Lake Attitash

Runoff = 0.31 cfs @ 12.10 hrs, Volume= 0.023 af, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.40"

Area (sf)	CN	Adj	Description
1,081	98		Unconnected roofs, HSG B
0	98		Paved parking, HSG B
* 64	98		Entry Decks impervious, HSG B
* 40	98		Walk Stone impervious, HSG B
* 70	98		Walk Conc Block impervious, HSG B
* 30	98		Walk Granite impervious, HSG B
* 40	98		Shower tile floor impervious, HSB B
4,568	61		>75% Grass cover, Good, HSG B
5,893	69	66	Weighted Average, UI Adjusted
4,568			77.52% Pervious Area
1,325			22.48% Impervious Area
1,081			81.58% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0320	0.18		Sheet Flow, WOODS
					Grass: Short n= 0.150 P2= 3.10"
1.4	98	0.0296	1.20		Shallow Concentrated Flow, Grass lawn
					Short Grass Pasture Kv= 7.0 fps
6.1	148	Total			

4 Lake Attitash Amesbury Stormwater Pre FP

Prepared by {enter your company name here}

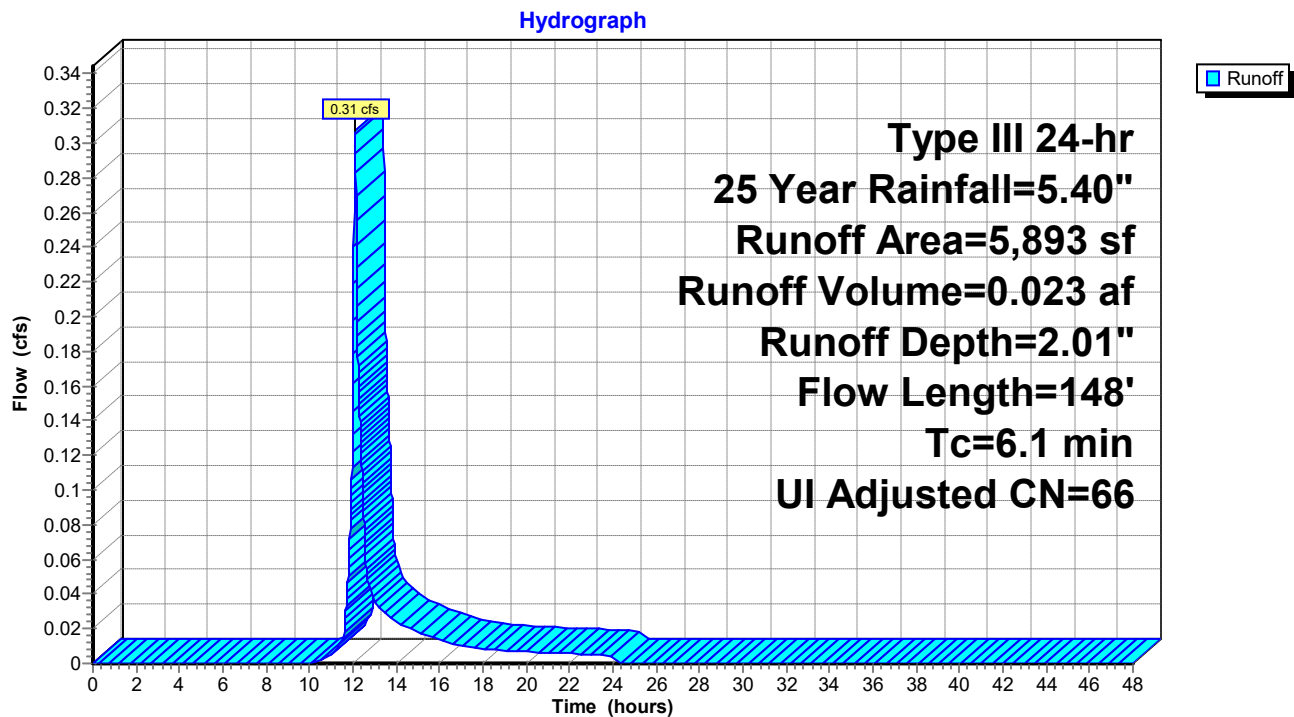
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Type III 24-hr 25 Year Rainfall=5.40"

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Subcatchment PRE-1: Existing Cond flow to Design Point A Lake Attitash



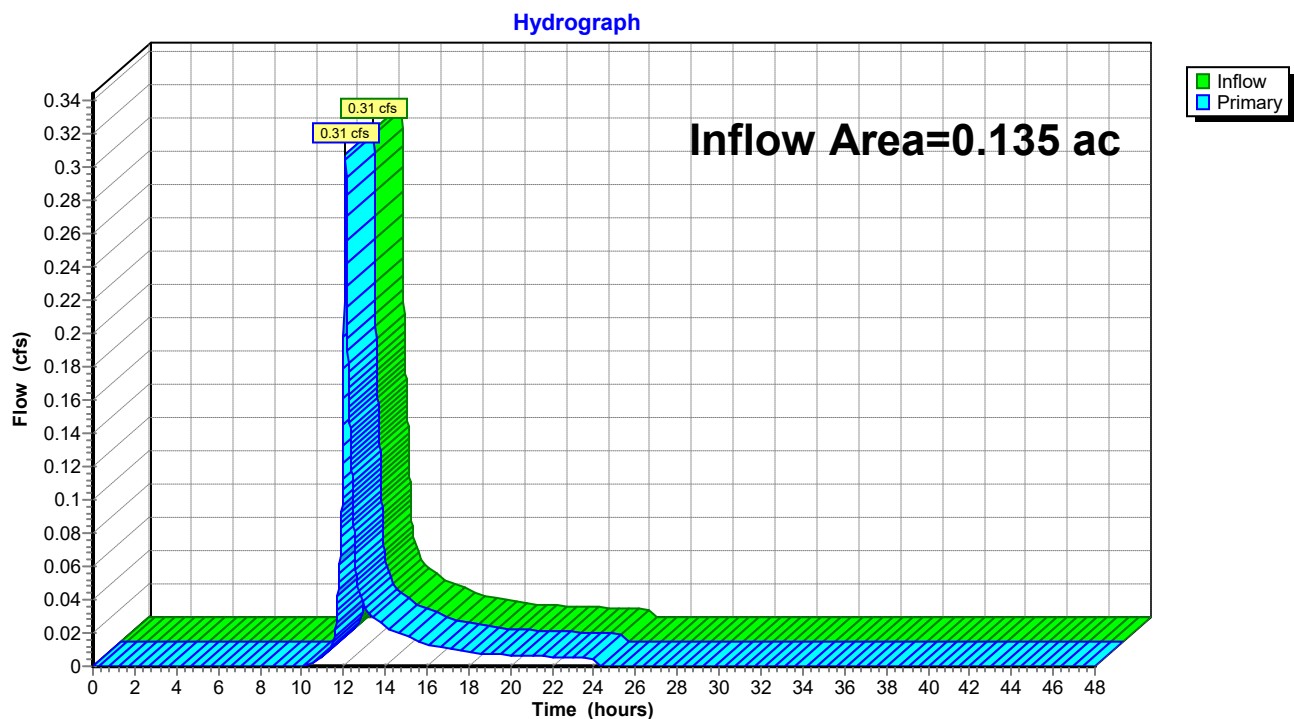
Summary for Link AP-1PRE: Analysis Design Point A flow off site

Inflow Area = 0.135 ac, 22.48% Impervious, Inflow Depth = 2.01" for 25 Year event
 Inflow = 0.31 cfs @ 12.10 hrs, Volume= 0.023 af
 Primary = 0.31 cfs @ 12.10 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 39.50'

Link AP-1PRE: Analysis Design Point A flow off site



4 Lake Attitash Amesbury Stormwater Pre FP

Type III 24-hr 100 Year Rainfall=7.00"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

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

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PRE-1: Existing Cond flow Runoff Area=5,893 sf 22.48% Impervious Runoff Depth=3.20"
Flow Length=148' Tc=6.1 min UI Adjusted CN=66 Runoff=0.50 cfs 0.036 af

Link AP-1PRE: Analysis Design Point A flow off site

Inflow=0.50 cfs 0.036 af

Primary=0.50 cfs 0.036 af

Total Runoff Area = 0.135 ac Runoff Volume = 0.036 af Average Runoff Depth = 3.20"
77.52% Pervious = 0.105 ac 22.48% Impervious = 0.030 ac

4 Lake Attitash Amesbury Stormwater Pre FP

Type III 24-hr 100 Year Rainfall=7.00"

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Summary for Subcatchment PRE-1: Existing Cond flow to Design Point A Lake Attitash

Runoff = 0.50 cfs @ 12.09 hrs, Volume= 0.036 af, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=7.00"

Area (sf)	CN	Adj	Description
1,081	98		Unconnected roofs, HSG B
0	98		Paved parking, HSG B
* 64	98		Entry Decks impervious, HSG B
* 40	98		Walk Stone impervious, HSG B
* 70	98		Walk Conc Block impervious, HSG B
* 30	98		Walk Granite impervious, HSG B
* 40	98		Shower tile floor impervious, HSB B
4,568	61		>75% Grass cover, Good, HSG B
5,893	69	66	Weighted Average, UI Adjusted
4,568			77.52% Pervious Area
1,325			22.48% Impervious Area
1,081			81.58% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0320	0.18		Sheet Flow, WOODS
					Grass: Short n= 0.150 P2= 3.10"
1.4	98	0.0296	1.20		Shallow Concentrated Flow, Grass lawn
					Short Grass Pasture Kv= 7.0 fps
6.1	148	Total			

4 Lake Attitash Amesbury Stormwater Pre FP

Prepared by {enter your company name here}

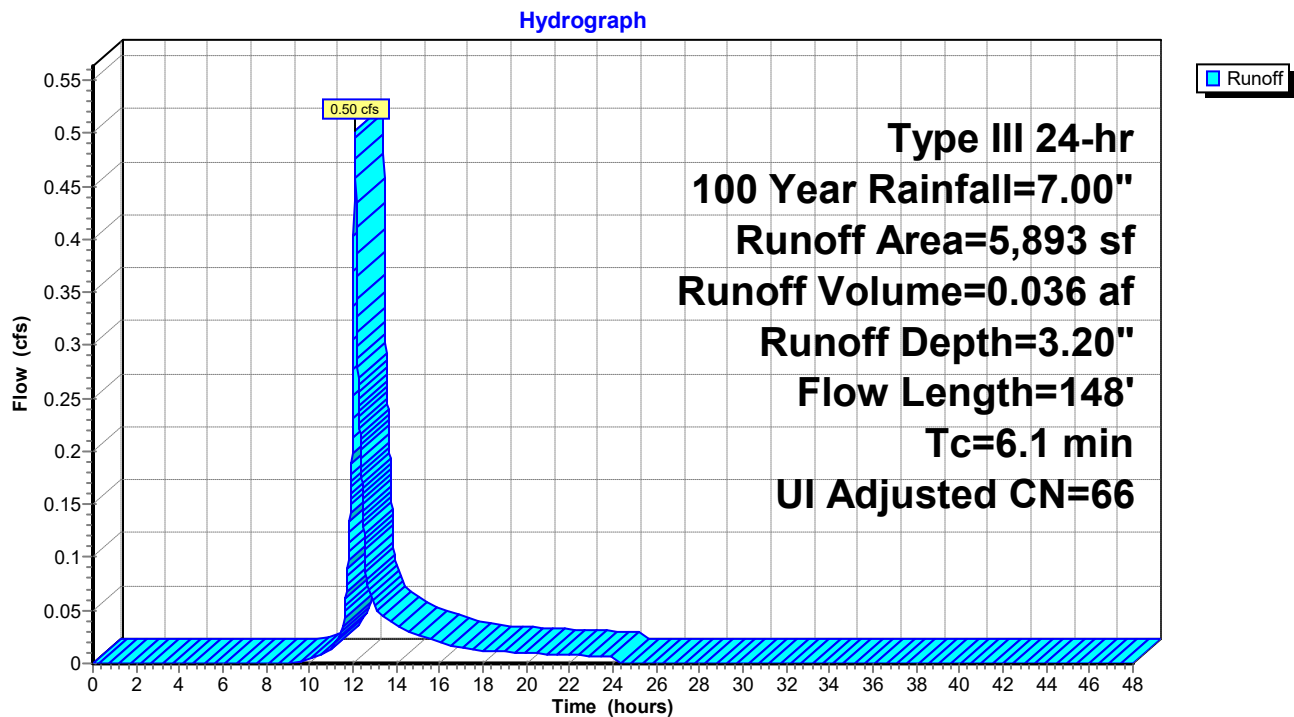
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Type III 24-hr 100 Year Rainfall=7.00"

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Subcatchment PRE-1: Existing Cond flow to Design Point A Lake Attitash

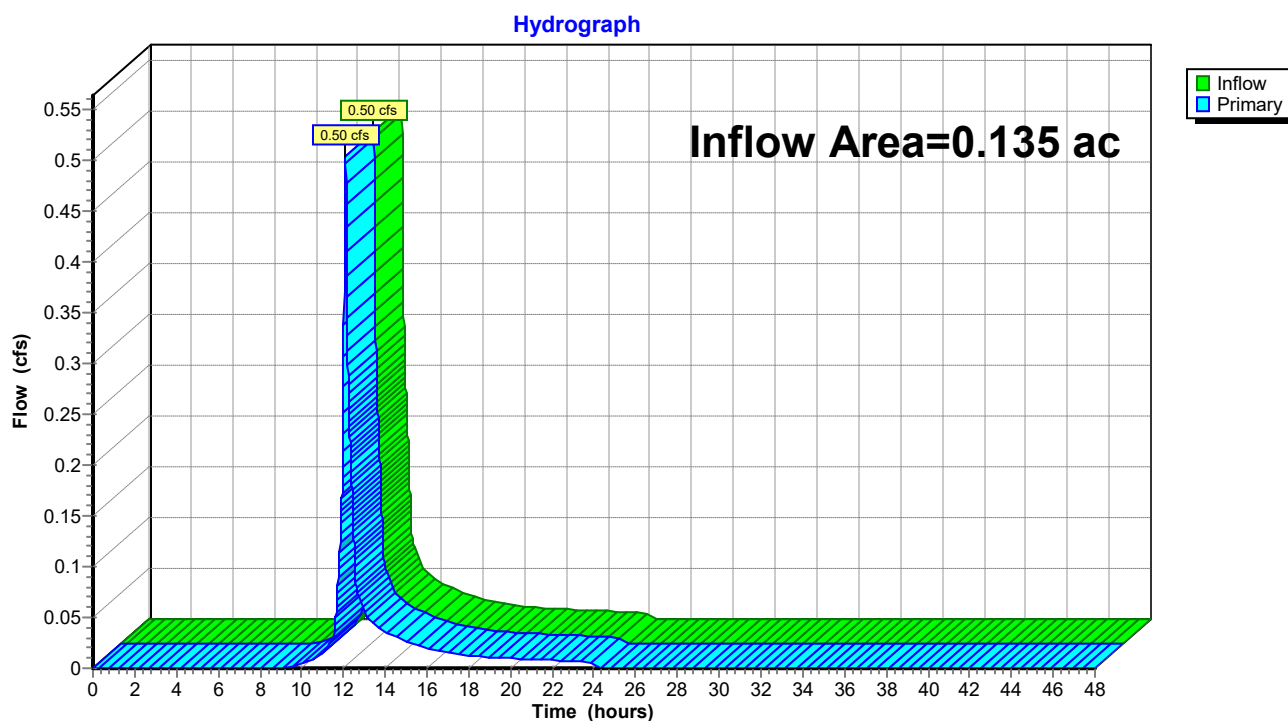


Summary for Link AP-1PRE: Analysis Design Point A flow off site

Inflow Area = 0.135 ac, 22.48% Impervious, Inflow Depth = 3.20" for 100 Year event
Inflow = 0.50 cfs @ 12.09 hrs, Volume= 0.036 af
Primary = 0.50 cfs @ 12.09 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 39.50'

Link AP-1PRE: Analysis Design Point A flow off site

POST DEVELOPMENT CALCULATIONS

LOCATED AT

4 LAKE ATTITASH ROAD, AMESBURY MA 01913

**BEING
MAP 71 LOT 72**



Prepared for:

**MDC River Street R.T. c/o Matthew Curley Tr.
451 Newburyport Turnpike
Rowley, MA 01913**

Prepared by:

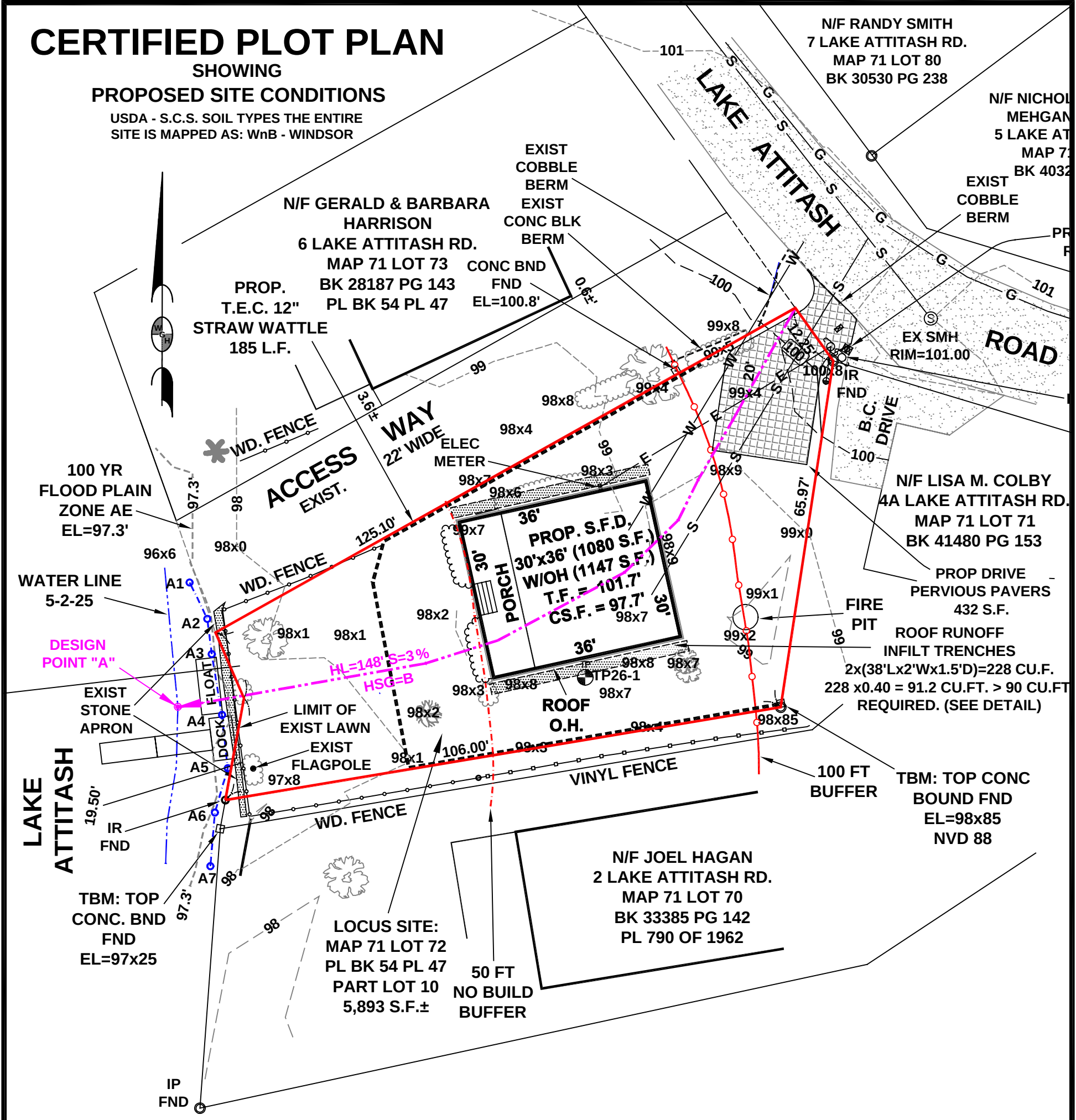
**WGH Land Survey and Design
Thad D. Berry, PE and William G. Holt, PLS, RS
83 West Main Street
Merrimac, MA 01860**

July 2026

CERTIFIED PLOT PLAN

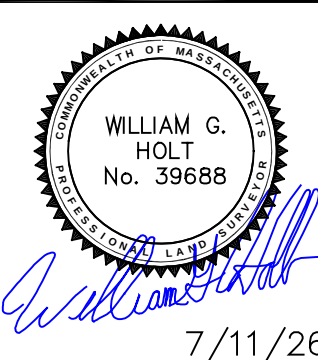
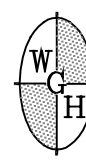
SHOWING
PROPOSED SITE CONDITIONS

USDA - S.C.S. SOIL TYPES THE ENTIRE
SITE IS MAPPED AS: WnB - WINDSOR



POST-DEVELOPMENT WATERSHED

LOCATION: #4 LAKE ATTITASH ROAD ~ MAP 71 LOT 72

REVISED:	BY:	LOCATION:	AMESBURY	MASSACHUSETTS
DRAWN: 7/10/26	BY: WGH	CITY/TOWN	STATE	
 7/11/26 P.L.S. DATE		DATE:	11 JULY 2026	SCALE: 1 INCH = 20 FEET.
		DEED AND PLAN REFERENCE:		
		DEED BOOK: 41,523 PAGE: 414 PL. BK.: 54 PLAN 47		
		CERTIFICATE OF TITLE NUMBER: _____ PLAN No. _____		
 WILLIAM G. HOLT PLS, RS, SE 83 WEST MAIN ST MERRIMAC, MA 01860 TEL: (978) 257-4576 E-MAIL: billgholt@aol.com		CERTIFICATION IS HEREBY MADE TO: TOWN OF AMESBURY		
		OWNER: MDC RIVER STREET R.T.		
		c/o MATTHEW CURLEY		
CERTIFICATION IS HEREBY MADE THAT THE STRUCTURES SHOWN ON THIS PLAN ARE NOT LOCATED WITHIN A SPECIAL FLOOD HAZARD AREA (100 YEAR) AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR: THE TOWN OF MERRIMAC, MASSACHUSETTS.				
JOB NUMBER: 26-036-CPP				



Prop Cond flow No Hse
to Design Point A Lake
Attitash



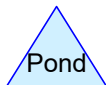
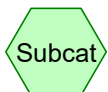
Prop Cond flow Hse
Only to Infiltr then Point
A Lake Attitash



Roof Infiltr Trench Pond



Analysis Design Point A
flow off site



Routing Diagram for 4 Lake Attitash Amesbury Stormwater Post FP

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4 Lake Attitash Amesbury Stormwater Post FP

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.099	61	>75% Grass cover, Good, HSG B (PST-1)
0.002	98	Entry Decks impervious, HSG B (PST-1)
0.010	61	Porous Pavers parking, HSG B (PST-1)
0.025	98	Unconnected roofs, HSG B (PST-2)
0.135	68	TOTAL AREA

4 Lake Attitash Amesbury Stormwater Post FP

Type III 24-hr 2 Year Rainfall=3.10"

Prepared by {enter your company name here}

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

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

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PST-1: Prop Cond flow No Runoff Area=4,813 sf 1.48% Impervious Runoff Depth=0.44"
Flow Length=148' Tc=6.1 min CN=62 Runoff=0.04 cfs 0.004 af

Subcatchment PST-2: Prop Cond flow Hse Runoff Area=1,080 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=148' Tc=6.1 min CN=98 Runoff=0.07 cfs 0.006 af

Pond 1P: Roof Infiltration Trench Pond Peak Elev=97.15' Storage=14 cf Inflow=0.07 cfs 0.006 af
Discarded=0.04 cfs 0.006 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.006 af

Link AP-1PST: Analysis Design Point A flow off site Inflow=0.04 cfs 0.004 af
Primary=0.04 cfs 0.004 af

Total Runoff Area = 0.135 ac Runoff Volume = 0.010 af Average Runoff Depth = 0.88"
80.47% Pervious = 0.109 ac 19.53% Impervious = 0.026 ac

4 Lake Attitash Amesbury Stormwater Post FP

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Type III 24-hr 2 Year Rainfall=3.10"

Printed 7/12/2026

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Summary for Subcatchment PST-1: Prop Cond flow No Hse to Design Point A Lake Attitash

Runoff = 0.04 cfs @ 12.12 hrs, Volume= 0.004 af, Depth= 0.44"

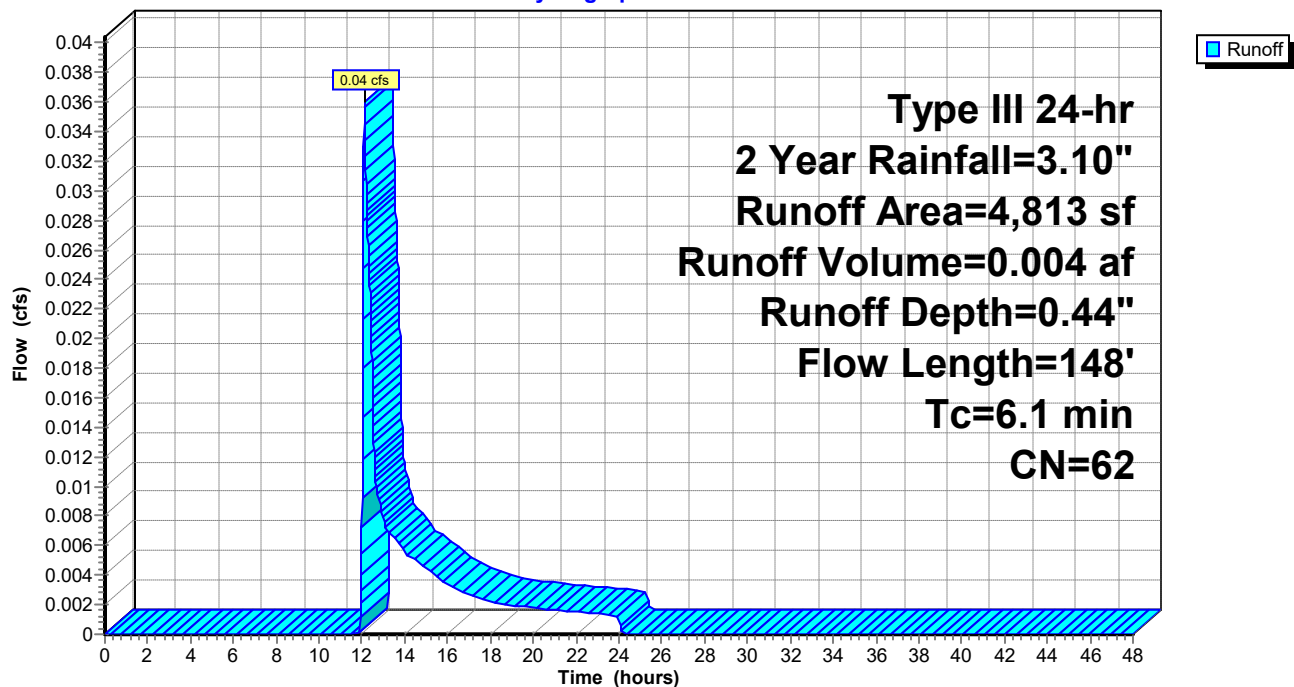
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
* 432	61	Porous Pavers parking, HSG B
* 71	98	Entry Decks impervious, HSG B
* 0	98	Walk Stone impervious, HSG B
* 0	98	Walk Conc Block impervious, HSG B
* 0	98	Walk Granite impervious, HSG B
* 0	98	Shower tile floor impervious, HSB B
4,310	61	>75% Grass cover, Good, HSG B
4,813	62	Weighted Average
4,742		98.52% Pervious Area
71		1.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0320	0.18		Sheet Flow, WOODS
					Grass: Short n= 0.150 P2= 3.10"
1.4	98	0.0296	1.20		Shallow Concentrated Flow, Grass lawn
					Short Grass Pasture Kv= 7.0 fps
6.1	148	Total			

Subcatchment PST-1: Prop Cond flow No Hse to Design Point A Lake Attitash

Hydrograph



4 Lake Attitash Amesbury Stormwater Post FP

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Type III 24-hr 2 Year Rainfall=3.10"

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Summary for Subcatchment PST-2: Prop Cond flow Hse Only to Infil then Point A Lake Attitash

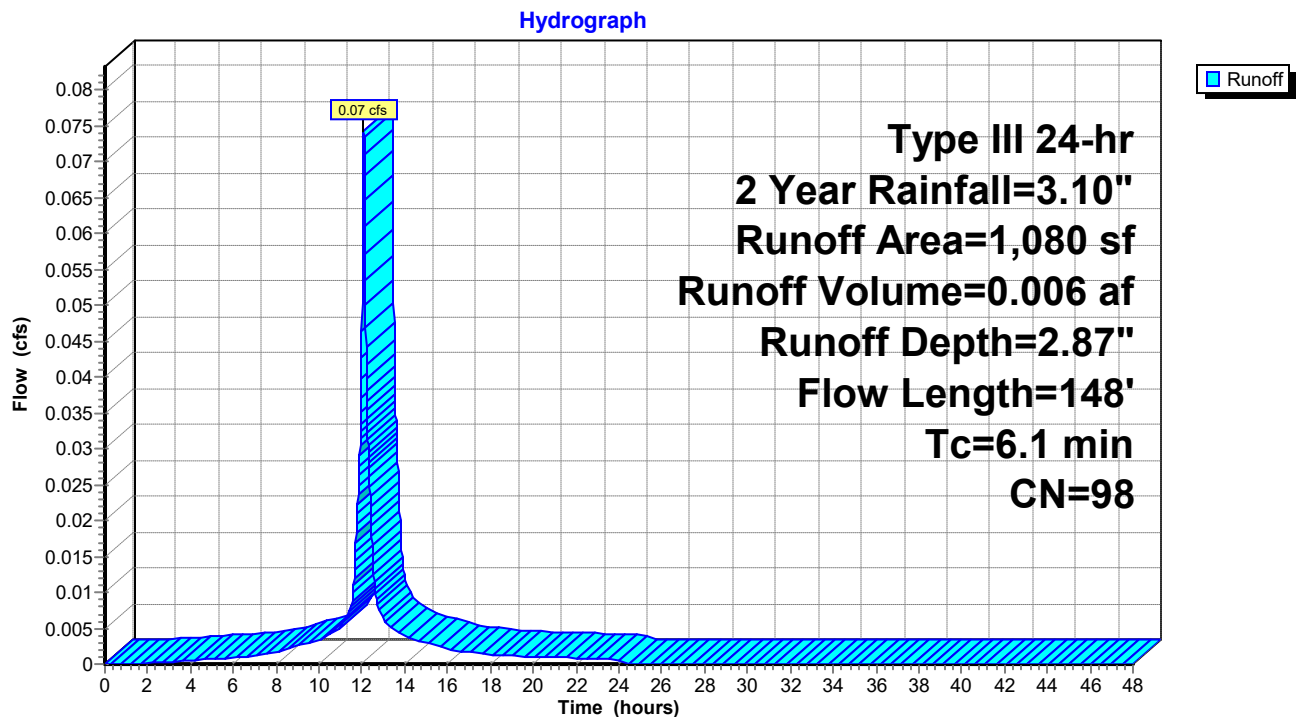
Runoff = 0.07 cfs @ 12.08 hrs, Volume= 0.006 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
1,080	98	Unconnected roofs, HSG B
1,080		100.00% Impervious Area
1,080		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0320	0.18		Sheet Flow, WOODS
					Grass: Short n= 0.150 P2= 3.10"
1.4	98	0.0296	1.20		Shallow Concentrated Flow, Grass lawn
					Short Grass Pasture Kv= 7.0 fps
6.1	148	Total			

Subcatchment PST-2: Prop Cond flow Hse Only to Infil then Point A Lake Attitash



4 Lake Attitash Amesbury Stormwater Post FP

Type III 24-hr 2 Year Rainfall=3.10"

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Summary for Pond 1P: Roof Infiltr Trench Pond

Inflow Area = 0.025 ac, 100.00% Impervious, Inflow Depth = 2.87" for 2 Year event
Inflow = 0.07 cfs @ 12.08 hrs, Volume= 0.006 af
Outflow = 0.04 cfs @ 12.19 hrs, Volume= 0.006 af, Atten= 41%, Lag= 6.4 min
Discarded = 0.04 cfs @ 12.19 hrs, Volume= 0.006 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 97.15' @ 12.19 hrs Surf.Area= 228 sf Storage= 14 cf

Flood Elev= 98.70' Surf.Area= 228 sf Storage= 137 cf

Plug-Flow detention time= 1.4 min calculated for 0.006 af (100% of inflow)

Center-of-Mass det. time= 1.3 min (758.5 - 757.2)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	137 cf	3.00'W x 38.00'L x 1.50'H Field A x 2 342 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	97.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 48.00'
#2	Primary	98.60'	2.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.04 cfs @ 12.19 hrs HW=97.15' (Free Discharge)

↑**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=97.00' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

4 Lake Attitash Amesbury Stormwater Post FP

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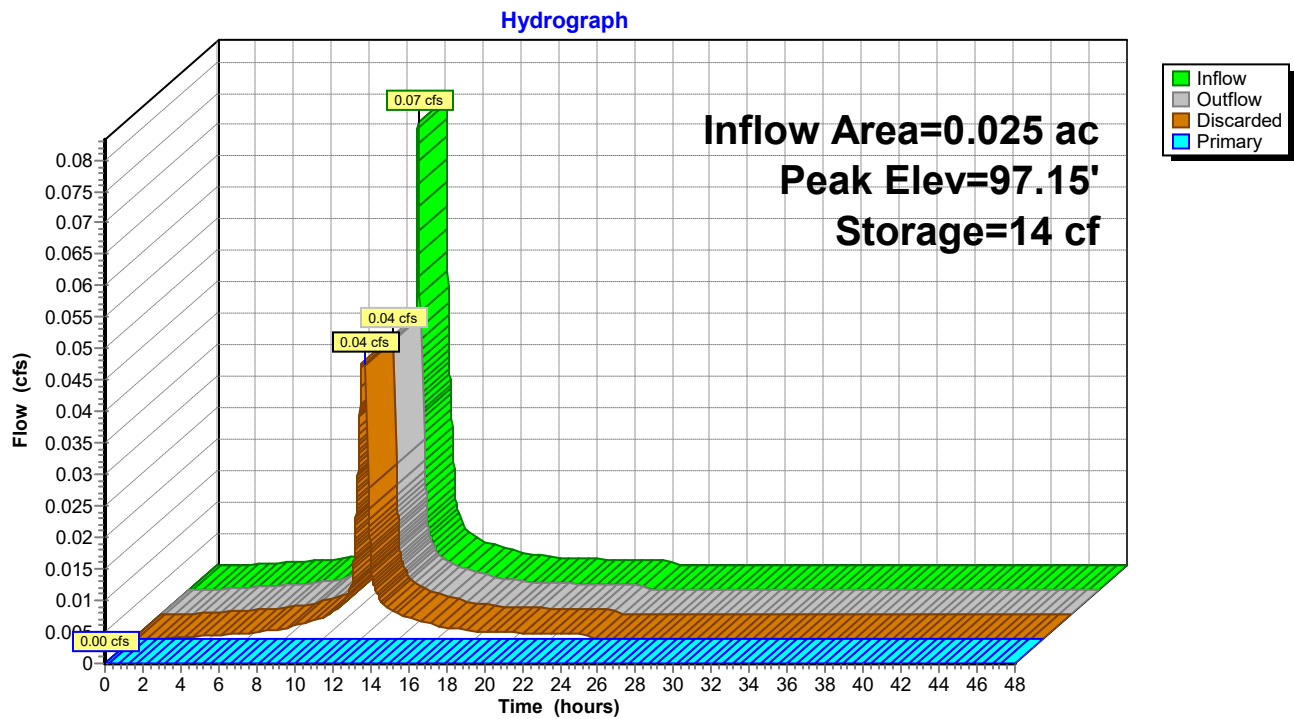
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Type III 24-hr 2 Year Rainfall=3.10"

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Pond 1P: Roof Infiltr Trench Pond

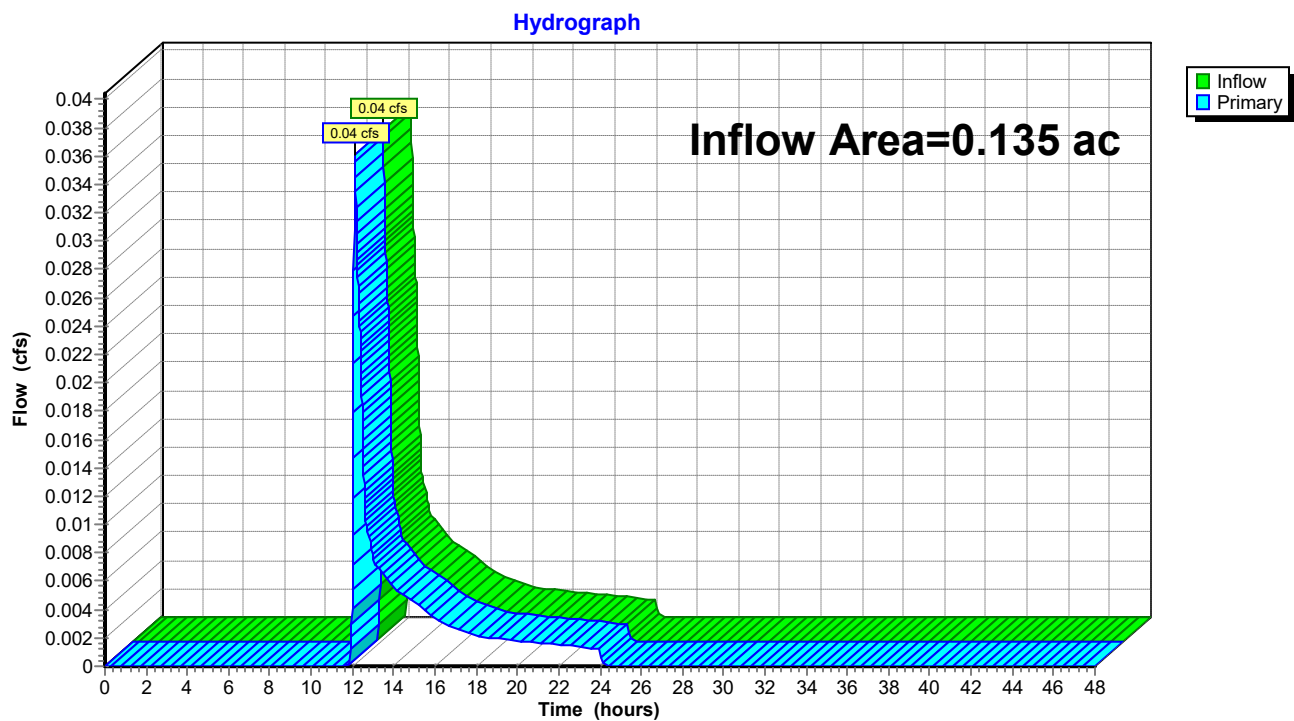


Summary for Link AP-1PST: Analysis Design Point A flow off site

Inflow Area = 0.135 ac, 19.53% Impervious, Inflow Depth = 0.36" for 2 Year event
Inflow = 0.04 cfs @ 12.12 hrs, Volume= 0.004 af
Primary = 0.04 cfs @ 12.12 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 39.50'

Link AP-1PST: Analysis Design Point A flow off site

4 Lake Attitash Amesbury Stormwater Post FP

Type III 24-hr 25 Year Rainfall=5.40"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

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

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PST-1: Prop Cond flow No Runoff Area=4,813 sf 1.48% Impervious Runoff Depth=1.69"
Flow Length=148' Tc=6.1 min CN=62 Runoff=0.21 cfs 0.016 af

Subcatchment PST-2: Prop Cond flow Hse Runoff Area=1,080 sf 100.00% Impervious Runoff Depth=5.16"
Flow Length=148' Tc=6.1 min CN=98 Runoff=0.13 cfs 0.011 af

Pond 1P: Roof Infiltration Pond Peak Elev=97.67' Storage=62 cf Inflow=0.13 cfs 0.011 af
Discarded=0.04 cfs 0.011 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.011 af

Link AP-1PST: Analysis Design Point A flow off site Inflow=0.21 cfs 0.016 af
Primary=0.21 cfs 0.016 af

Total Runoff Area = 0.135 ac Runoff Volume = 0.026 af Average Runoff Depth = 2.33"
80.47% Pervious = 0.109 ac 19.53% Impervious = 0.026 ac

4 Lake Attitash Amesbury Stormwater Post FP

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Type III 24-hr 25 Year Rainfall=5.40"

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Summary for Subcatchment PST-1: Prop Cond flow No Hse to Design Point A Lake Attitash

Runoff = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af, Depth= 1.69"

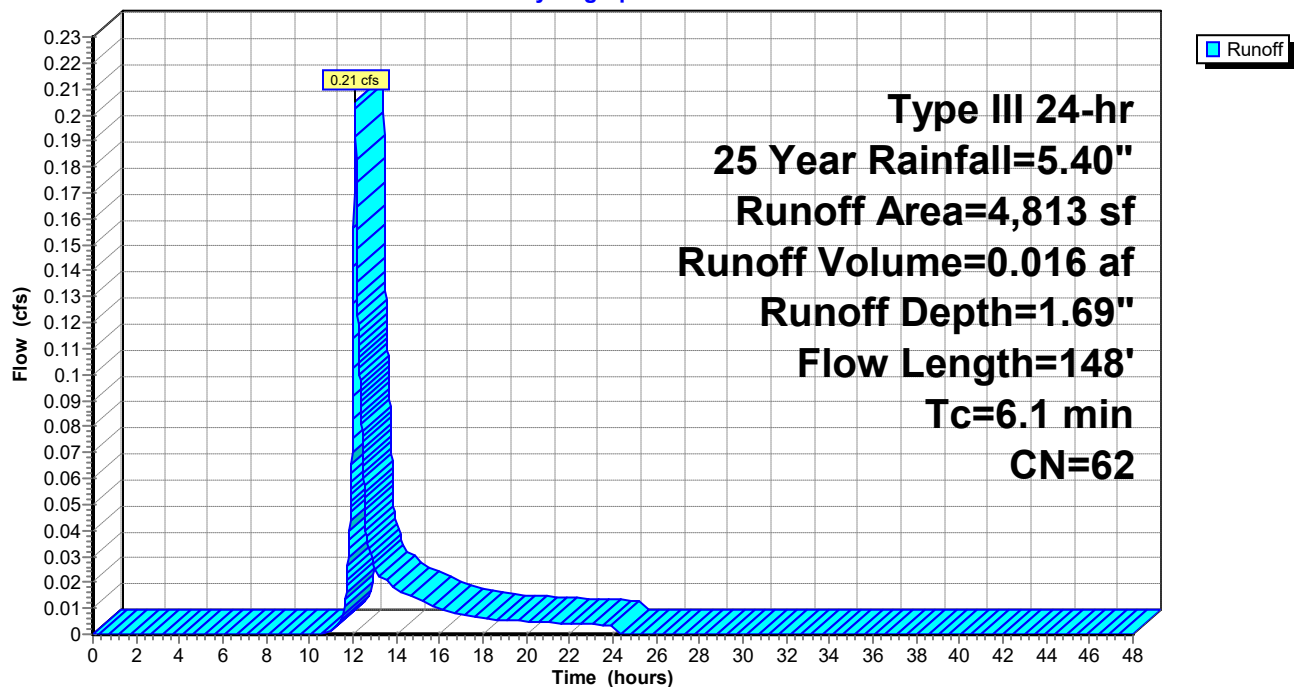
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.40"

	Area (sf)	CN	Description
*	432	61	Porous Pavers parking, HSG B
*	71	98	Entry Decks impervious, HSG B
*	0	98	Walk Stone impervious, HSG B
*	0	98	Walk Conc Block impervious, HSG B
*	0	98	Walk Granite impervious, HSG B
*	0	98	Shower tile floor impervious, HSB B
	4,310	61	>75% Grass cover, Good, HSG B
	4,813	62	Weighted Average
	4,742		98.52% Pervious Area
	71		1.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0320	0.18		Sheet Flow, WOODS
					Grass: Short n= 0.150 P2= 3.10"
1.4	98	0.0296	1.20		Shallow Concentrated Flow, Grass lawn
					Short Grass Pasture Kv= 7.0 fps
6.1	148	Total			

Subcatchment PST-1: Prop Cond flow No Hse to Design Point A Lake Attitash

Hydrograph



4 Lake Attitash Amesbury Stormwater Post FP

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Type III 24-hr 25 Year Rainfall=5.40"

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Summary for Subcatchment PST-2: Prop Cond flow Hse Only to Infil then Point A Lake Attitash

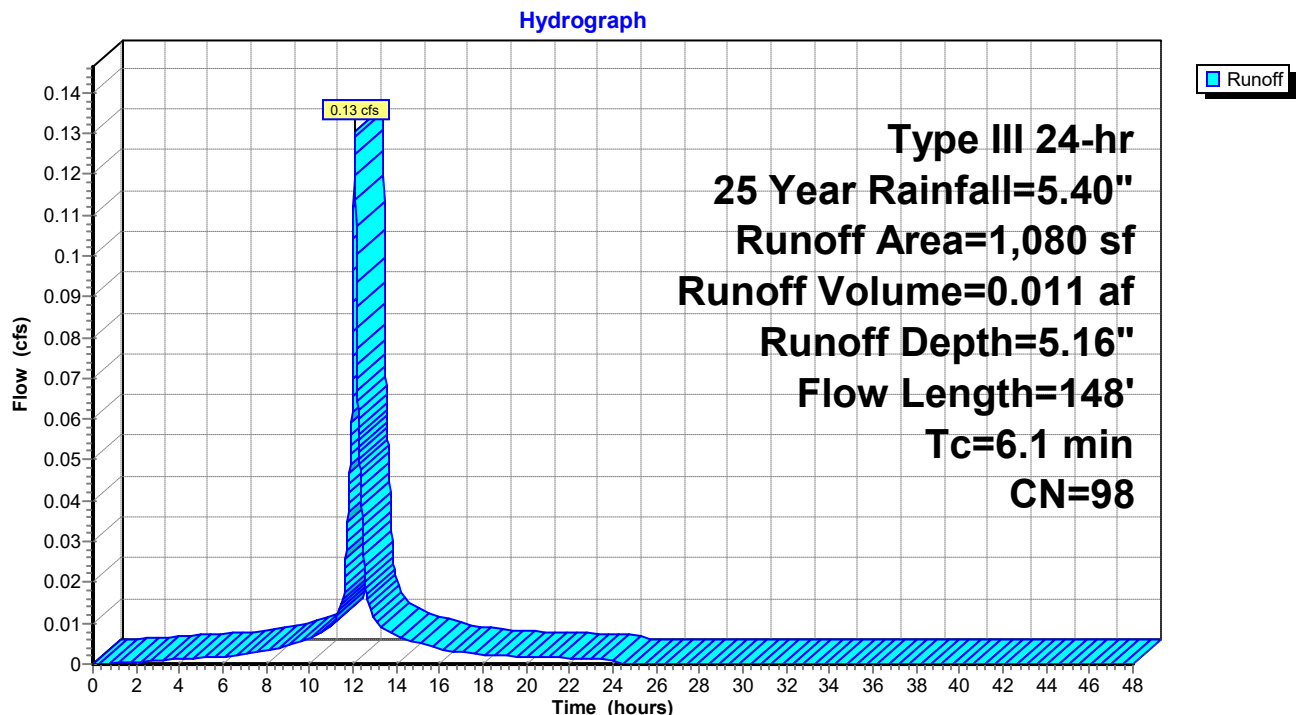
Runoff = 0.13 cfs @ 12.08 hrs, Volume= 0.011 af, Depth= 5.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.40"

Area (sf)	CN	Description
1,080	98	Unconnected roofs, HSG B
1,080		100.00% Impervious Area
1,080		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0320	0.18		Sheet Flow, WOODS Grass: Short n= 0.150 P2= 3.10"
1.4	98	0.0296	1.20		Shallow Concentrated Flow, Grass lawn Short Grass Pasture Kv= 7.0 fps
6.1	148	Total			

Subcatchment PST-2: Prop Cond flow Hse Only to Infil then Point A Lake Attitash



4 Lake Attitash Amesbury Stormwater Post FP

Type III 24-hr 25 Year Rainfall=5.40"

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Summary for Pond 1P: Roof Infiltr Trench Pond

Inflow Area = 0.025 ac, 100.00% Impervious, Inflow Depth = 5.16" for 25 Year event
Inflow = 0.13 cfs @ 12.08 hrs, Volume= 0.011 af
Outflow = 0.04 cfs @ 12.36 hrs, Volume= 0.011 af, Atten= 66%, Lag= 16.4 min
Discarded = 0.04 cfs @ 12.36 hrs, Volume= 0.011 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 97.67' @ 12.36 hrs Surf.Area= 228 sf Storage= 62 cf

Flood Elev= 98.70' Surf.Area= 228 sf Storage= 137 cf

Plug-Flow detention time= 5.8 min calculated for 0.011 af (100% of inflow)

Center-of-Mass det. time= 5.7 min (752.6 - 746.9)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	137 cf	3.00'W x 38.00'L x 1.50'H Field A x 2 342 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	97.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 48.00'
#2	Primary	98.60'	2.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.04 cfs @ 12.36 hrs HW=97.67' (Free Discharge)

↑**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=97.00' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

4 Lake Attitash Amesbury Stormwater Post FP

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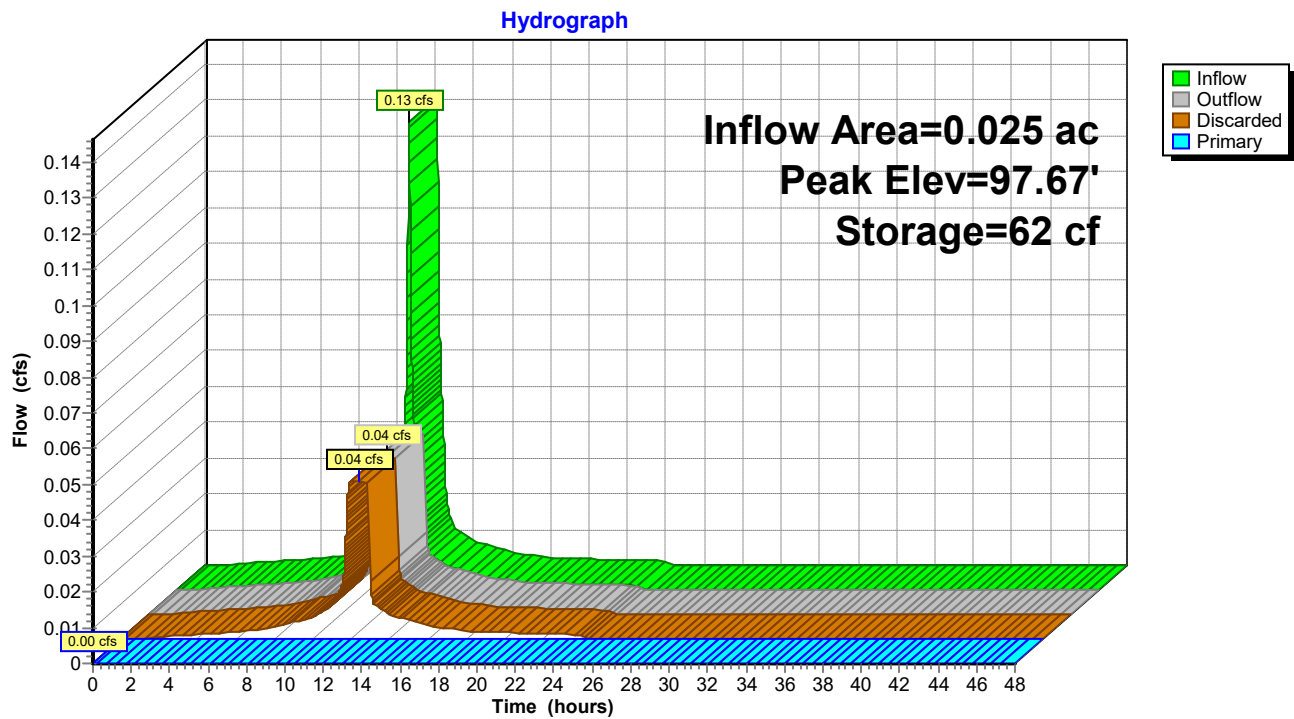
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Type III 24-hr 25 Year Rainfall=5.40"

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Pond 1P: Roof Infiltr Trench Pond

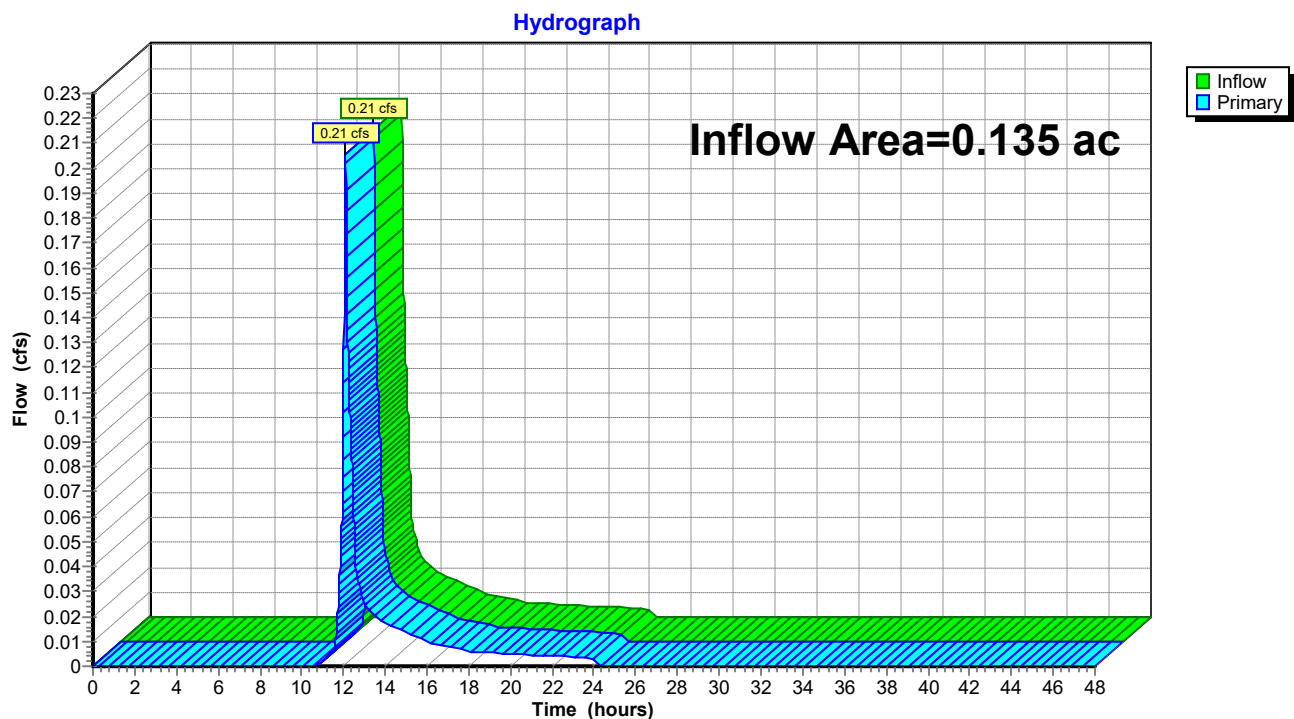


Summary for Link AP-1PST: Analysis Design Point A flow off site

Inflow Area = 0.135 ac, 19.53% Impervious, Inflow Depth = 1.38" for 25 Year event
Inflow = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af
Primary = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 39.50'

Link AP-1PST: Analysis Design Point A flow off site

4 Lake Attitash Amesbury Stormwater Post FP

Type III 24-hr 100 Year Rainfall=7.00"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

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

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PST-1: Prop Cond flow No Runoff Area=4,813 sf 1.48% Impervious Runoff Depth=2.80"
Flow Length=148' Tc=6.1 min CN=62 Runoff=0.35 cfs 0.026 af

Subcatchment PST-2: Prop Cond flow Hse Runoff Area=1,080 sf 100.00% Impervious Runoff Depth=6.76"
Flow Length=148' Tc=6.1 min CN=98 Runoff=0.17 cfs 0.014 af

Pond 1P: Roof Infiltration Pond Peak Elev=98.18' Storage=108 cf Inflow=0.17 cfs 0.014 af
Discarded=0.04 cfs 0.014 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.014 af

Link AP-1PST: Analysis Design Point A flow off site Inflow=0.35 cfs 0.026 af
Primary=0.35 cfs 0.026 af

Total Runoff Area = 0.135 ac Runoff Volume = 0.040 af Average Runoff Depth = 3.53"
80.47% Pervious = 0.109 ac 19.53% Impervious = 0.026 ac

4 Lake Attitash Amesbury Stormwater Post FP

Type III 24-hr 100 Year Rainfall=7.00"

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Summary for Subcatchment PST-1: Prop Cond flow No Hse to Design Point A Lake Attitash

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 0.026 af, Depth= 2.80"

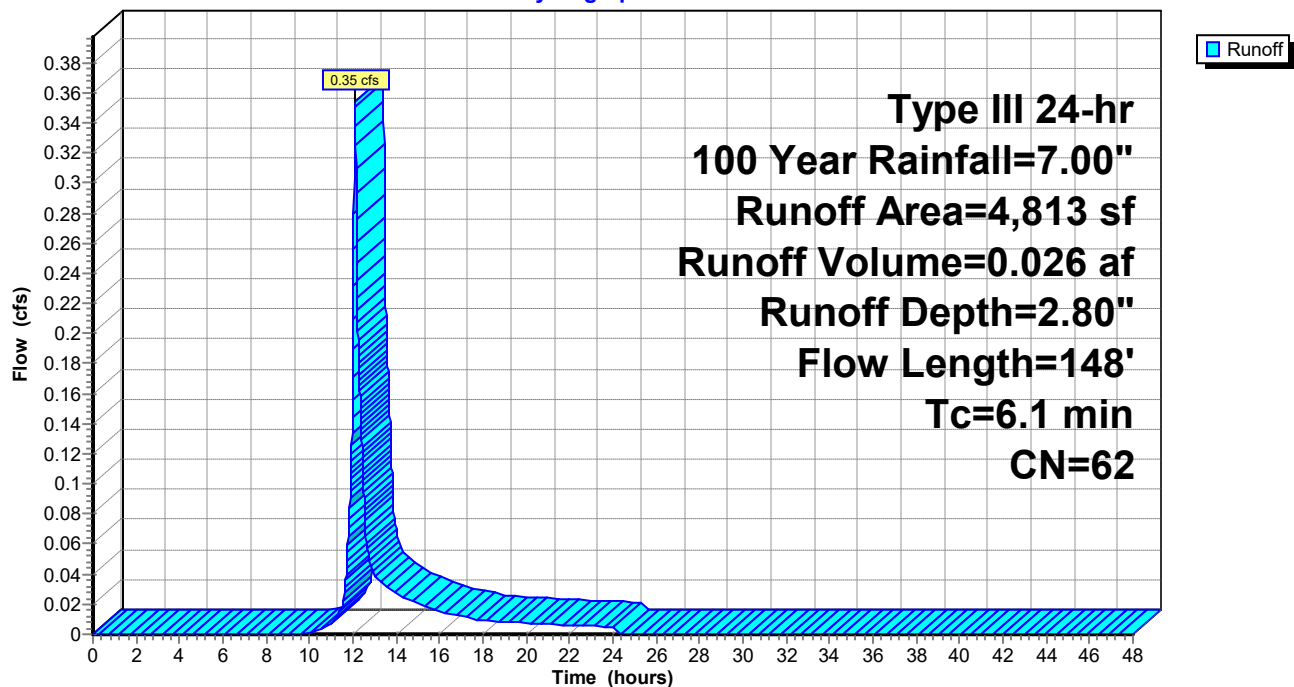
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=7.00"

	Area (sf)	CN	Description
*	432	61	Porous Pavers parking, HSG B
*	71	98	Entry Decks impervious, HSG B
*	0	98	Walk Stone impervious, HSG B
*	0	98	Walk Conc Block impervious, HSG B
*	0	98	Walk Granite impervious, HSG B
*	0	98	Shower tile floor impervious, HSB B
	4,310	61	>75% Grass cover, Good, HSG B
	4,813	62	Weighted Average
	4,742		98.52% Pervious Area
	71		1.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0320	0.18		Sheet Flow, WOODS
					Grass: Short n= 0.150 P2= 3.10"
1.4	98	0.0296	1.20		Shallow Concentrated Flow, Grass lawn
					Short Grass Pasture Kv= 7.0 fps
6.1	148	Total			

Subcatchment PST-1: Prop Cond flow No Hse to Design Point A Lake Attitash

Hydrograph



4 Lake Attitash Amesbury Stormwater Post FP

Type III 24-hr 100 Year Rainfall=7.00"

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Summary for Subcatchment PST-2: Prop Cond flow Hse Only to Infil then Point A Lake Attitash

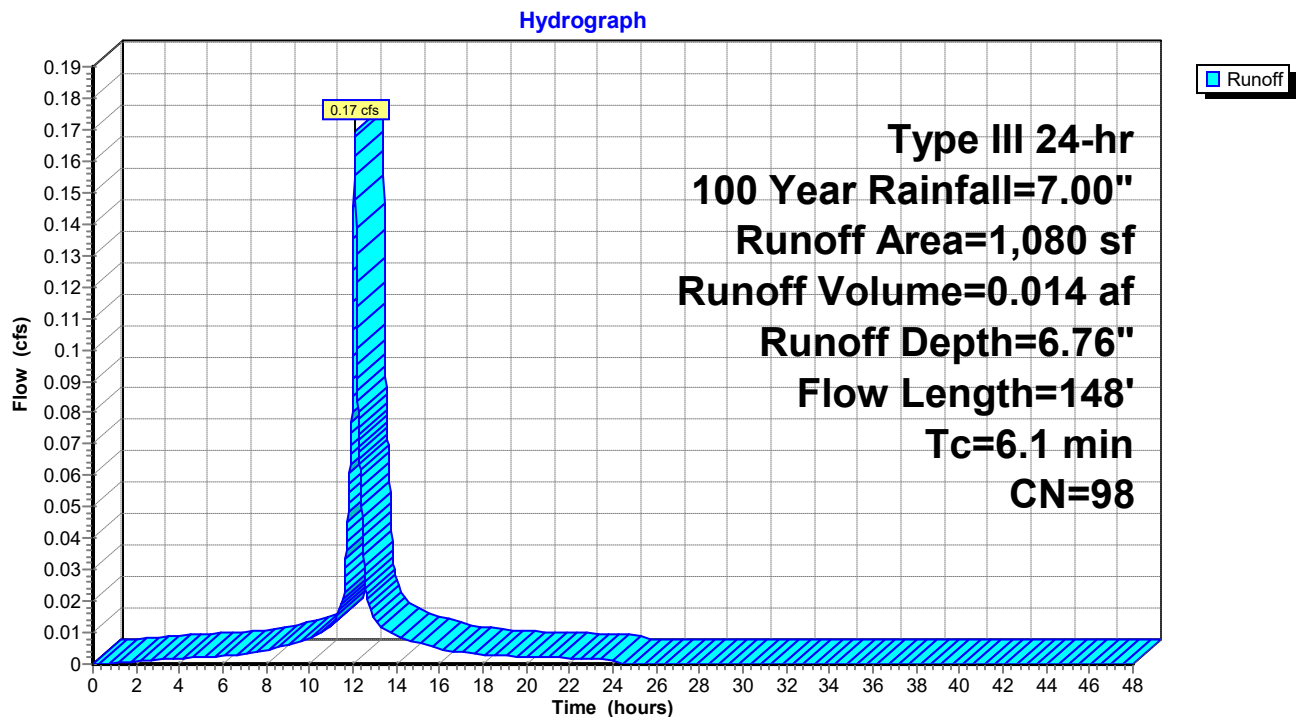
Runoff = 0.17 cfs @ 12.08 hrs, Volume= 0.014 af, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=7.00"

Area (sf)	CN	Description
1,080	98	Unconnected roofs, HSG B
1,080		100.00% Impervious Area
1,080		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0320	0.18		Sheet Flow, WOODS Grass: Short n= 0.150 P2= 3.10"
1.4	98	0.0296	1.20		Shallow Concentrated Flow, Grass lawn Short Grass Pasture Kv= 7.0 fps
6.1	148	Total			

Subcatchment PST-2: Prop Cond flow Hse Only to Infil then Point A Lake Attitash



4 Lake Attitash Amesbury Stormwater Post FP

Type III 24-hr 100 Year Rainfall=7.00"

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Summary for Pond 1P: Roof Infiltr Trench Pond

Inflow Area = 0.025 ac, 100.00% Impervious, Inflow Depth = 6.76" for 100 Year event
Inflow = 0.17 cfs @ 12.08 hrs, Volume= 0.014 af
Outflow = 0.04 cfs @ 12.44 hrs, Volume= 0.014 af, Atten= 74%, Lag= 21.3 min
Discarded = 0.04 cfs @ 12.44 hrs, Volume= 0.014 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 98.18' @ 12.44 hrs Surf.Area= 228 sf Storage= 108 cf

Flood Elev= 98.70' Surf.Area= 228 sf Storage= 137 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 10.7 min (753.7 - 743.0)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	137 cf	3.00'W x 38.00'L x 1.50'H Field A x 2 342 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	97.00'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 48.00'
#2	Primary	98.60'	2.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

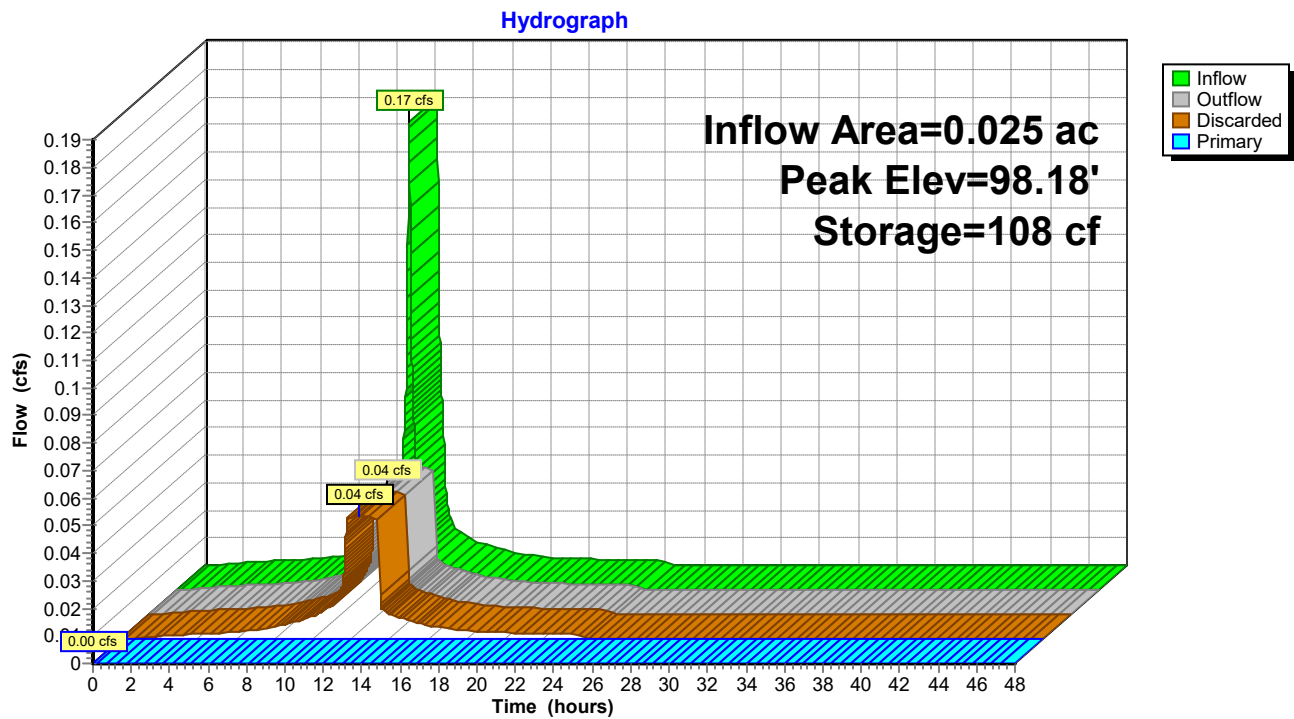
Discarded OutFlow Max=0.04 cfs @ 12.44 hrs HW=98.18' (Free Discharge)

↑**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=97.00' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Roof Infiltr Trench Pond



Summary for Link AP-1PST: Analysis Design Point A flow off site

Inflow Area = 0.135 ac, 19.53% Impervious, Inflow Depth = 2.29" for 100 Year event
 Inflow = 0.35 cfs @ 12.09 hrs, Volume= 0.026 af
 Primary = 0.35 cfs @ 12.09 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 39.50'

Link AP-1PST: Analysis Design Point A flow off site

