

DRAINAGE SUMMARY

**PROPOSED 22-UNIT
RESIDENTIAL BUILDING
15 FRONT STREET
WEYMOUTH, MASSACHUSETTS**



November 27, 2020
(Revised February 17, 2021)

**GREATER BOSTON SURVEY AND ENGINEERING
17 FREDITH ROAD
WEYMOUTH, MA 02189**

DRAINAGE SUMMARY
PROPOSED 22-UNIT
RESIDENTIAL BUILDING
WEYMOUTH, MASSACHUSETTS

The proposed project consists of the demolition of two existing commercial buildings and bituminous concrete parking lots, and the construction of a new twenty-two (22) unit residential building, including underground parking in Weymouth, MA, under the requirements of the City of Weymouth.

The on-site soils in the area are shown as predominantly “602-Urban Land 0 to 15 percent slopes” that are soils that do not fall within the Hydrological Soil Group. A geotechnical investigation was completed on October 14, 2020 and the onsite soils were confirmed as a sandy/gravel fill material above granular utwash. These soils generally include a brown, well-graded, fine to coarse Sand & Gravel, trace silt. For purposes of our drainage design, we have designed based on soil Type C and used a conservative infiltration rate of 0.27 in/hr based on Rawles Rates.

Ground cover on the site is an existing building and two bituminous concrete parking lots. The existing drainage on the site flows overland from Front street towards the rear of the property and ultimately sheet flowing towards Smelt Brook. Overall, the proposed site will consist mostly of the proposed building, however stormwater runoff will be collected, infiltrated to maximum extent practical, before it continues to flow towards the rear of the property

There is a perennial stream (Smelt Brook) north of the property and the project locus falls within the 200 and 100 riverfront riparian zones. The amount of impervious area within the riverfront zones will be reduced by 3,214 sf. There are no Bordering Vegetated wetlands within the project area. The proposed drainage controls are designed to capture & contain the runoff from the proposed building. This system will store the runoff from the proposed Building and allow the stored water to slowly infiltrate after the storm event and overflow offsite.

Under the proposed conditions, the rate of site runoff from the re-developed lot area will be greater than the existing conditions for the 2, 10, 25 and 100-year storm events. The proposed controls have been designed to store this increase to maintain the pre and post runoff rates. In addition, the proposed controls will provide some additional recharge of the groundwater at the site.

COMPLIANCE WITH STORMWATER STANDARDS

Untreated Stormwater (Standard 1)

The project is designed so that new stormwater conveyances (outfalls/discharges) do not discharge untreated stormwater into, or cause erosion to, existing wetlands.

Post-Development Peak Rates (Standard 2)

A hydrologic study was performed to determine the rate of runoff for the 2-, 10-, 50- and 100-year storm events under pre-development (existing) conditions. Unmitigated post-development rates were then computed in a similar manner. The study point where the peak rates were compared were taken at one (1) location at the existing offsite flow area. From these analyses, it was determined that the proposed project and its stormwater management system would not increase the peak runoff rates above existing levels. It is the intent of the stormwater management system to minimize impacts to drainage patterns, downstream property, and wetlands prior to its release from the site or discharge to wetlands.

The *United States Department of Agriculture (U.S.D.A)*. Soil Conservation Service (SCS) Technical Release 55 (TR-55), 1986, was used as the procedure for estimating runoff. A SCS TR-20-based computer program was used for estimating peak discharges. TR-55 is a generally accepted model for use on small sites that begin with a rainfall amount uniformly imposed on the watershed over a specified time distribution. Mass rainfall is converted to mass runoff by using a runoff curve number (CN). CN is based on soils, plant cover, impervious areas, interception, and surface storage. Runoff is then transformed into a hydrograph that depends on runoff travel time through segments of the watershed.

Development in a watershed changes the watershed's response to precipitation. The most common effects are reduced infiltration and decreased travel time, which can result in significantly higher peak rates of runoff. The volume of runoff is determined primarily by the amount of precipitation and by infiltration characteristics related to soil type, antecedent rainfall, type of vegetal cover, impervious surfaces, and surface retention. Travel time is determined primarily by slope, flow length, depth of flow, and roughness of flow surfaces. Peak rates of discharge are based on the relationship of the above parameters, as well as the total drainage area of the watershed, the location of the development in relation to the total drainage area, and the effect of any flood control works or other manmade storage. Peak rates of discharge are also influenced by the distribution of rainfall within a given storm event.

Stormwater management computations for the full-build were performed using a SCS-based *HYDROCAD* for existing and proposed conditions, curve numbers, time of concentrations and unit hydrograph computations. NOAA Atlas 14, NOAA Hydrometeorological Design Studies Center, September 2015 was used for the 24-hr design storm.

Existing Conditions

Table 1. Shows the curve numbers, areas and times of concentration used to develop the pre-development hydrologic model of the site.

Table 1. – Existing Conditions					
Sub-Areas	Surface Cover	Curve Number (CN)	Area (SF)	Tc (Mins.)	Remarks
Area #1				5.0	
	Exist Bldg.	98	1,795		
	Exist. Imp.	98	10,552		Driveway & Walks
	Lawn Areas	79	4,481		
		Total Area	16,828		
*CN based on Class C soils.					

Proposed Conditions

The proposed conditions will result in a new collection system that will collect the site run-off from the proposed building and direct it to underground leaching systems prior to overflowing off-site.

Table 2. Shows the curve numbers, areas and times of concentration used to develop the post-development hydrologic model of the site.

Table 2. – Proposed Conditions					
Sub-Areas	Surface Cover	Curve Number (CN)	Area (SF)	Tc (Mins.)	Remarks
Area #1				5.0	
	Exist. Lawn	79	3,898		
	Conc. Walk	98	822		
Area #2				5.0	
	Prop. Bldg	98	12,108		Incls. Patio
		Total Area	16,828		
*CN based on Class C soils.					

Peak Rate Summary

Table 3. Shows the peak runoff for the existing, as well as for the developed site at 2-, 10-, 25- and 100-year design storms.

Areas	Design Storm	Existing Runoff* (CFS)	Existing Volume* (Ac-Ft)	Proposed Runoff* (CFS)	Proposed Volume* (Ac-Ft)
Offsite Flow					
	2-yr.	1.09	0.079	0.20	0.014
	10-yr.	1.74	0.131	0.37	0.027

	25-yr	2.25	0.172	0.52	0.059
	100-yr.	3.29	0.256	0.94	0.142

Recharge to Groundwater (Standard 3)

The change in groundcover for the new development will change by decreasing the impervious areas by approximately 331 sf of impervious area.

Required Recharge Volume for the entire site was calculated in accordance with the Massachusetts Stormwater Management Standards:

$R_v = F * \text{impervious area (in acres)}$

$R_v = (0.25/12) * 0.275 = 0.0057 \text{ Ac-ft.} = 249.6 \text{ CF}$

R_v = Required Recharge Volume;

F = Target Depth Factor (0.25 in. for soils of Hydrologic Soil Group C);

Impervious area = building, pavement on site in post development condition (0.275 Ac).

The proposed onsite leaching systems will infiltrate over 249.6 cf in the 2-year storm event alone. This requirement has been met.

Removal of TSS (Standard 4)

The underground stormwater storage is sized based on the building roof footprint, which will be clean runoff. Therefore, TSS removal is not anticipated.

Land Uses with Higher Potential Pollutant Loads (Standard 5)

The use proposed does not differ from the current use of the space and has no higher potential for pollution.

Critical Areas (Standard 6 – Water Quality Treatments)

This site does not lie within a critical area. One-half inch (1/2”) of runoff is the standard for treatment relative to water quality, but as stated prior, the proposed use will not create pollutants in excess of what exists today.

Redevelopment (Standard 7)

Redevelopment projects are those that involve development, rehabilitation or expansion on previously developed sites provided the redevelopment results in no net increase in impervious area. Furthermore, components of redevelopment project, which include development of previously undeveloped sites, do not fall under Standard 7. In addition, redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable. However, if it is not practicable to meet all

the Standards, new (retrofitted or expanded) stormwater management systems must be designed to improve existing conditions.

The project, as proposed, is a new building on an existing site that has been previously developed. GBSE has considered this project a re-development and we have met all of the applicable standards of the Massachusetts Stormwater Policy to the maximum extent possible.

Erosion and Sedimentation Controls (Standard 8)

Erosion control is depicted on the Proposed Site Plan provided as part of the application.

Operation and Maintenance Plan (Standard 9)

An Operation and Maintenance (O&M) Plan is provided as part of the application.

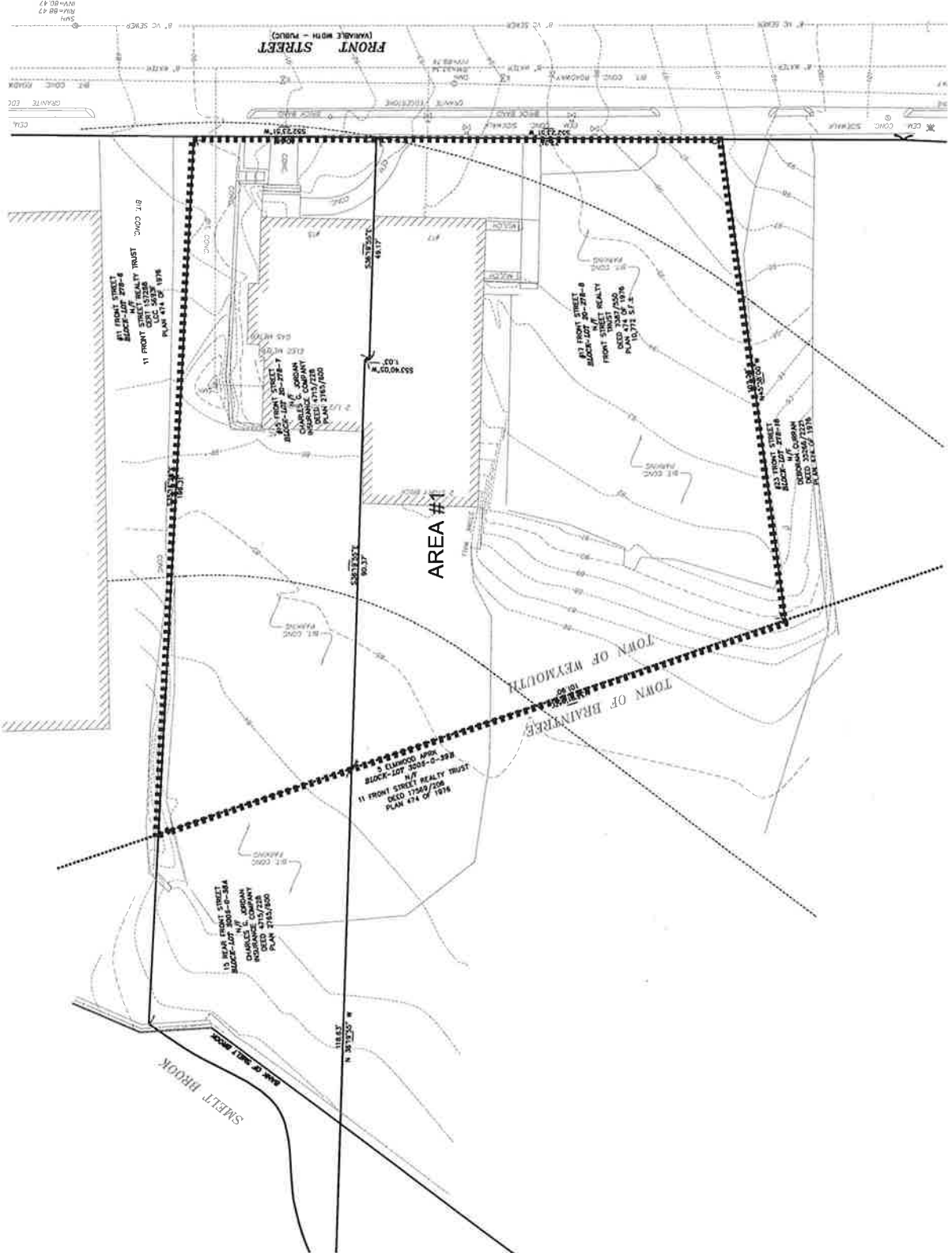
Prohibition of Illicit Discharges

The Owner and User of the facility, assures that there will not be illicit discharges to the nearby wetlands from the proposed facility.

Floodplain (310 CMR 10.57)

The project site does not fall within a floodplain district.

**15-17 FRONT ST
WEYMOUTH, MA
PRE-DEVELOPMENT
CATCHMENT AREA PLAN
n.t.s.**



Front ST Existing

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15 Front St - Pre Development
Type III 24-hr 10-Year Rainfall=4.86"

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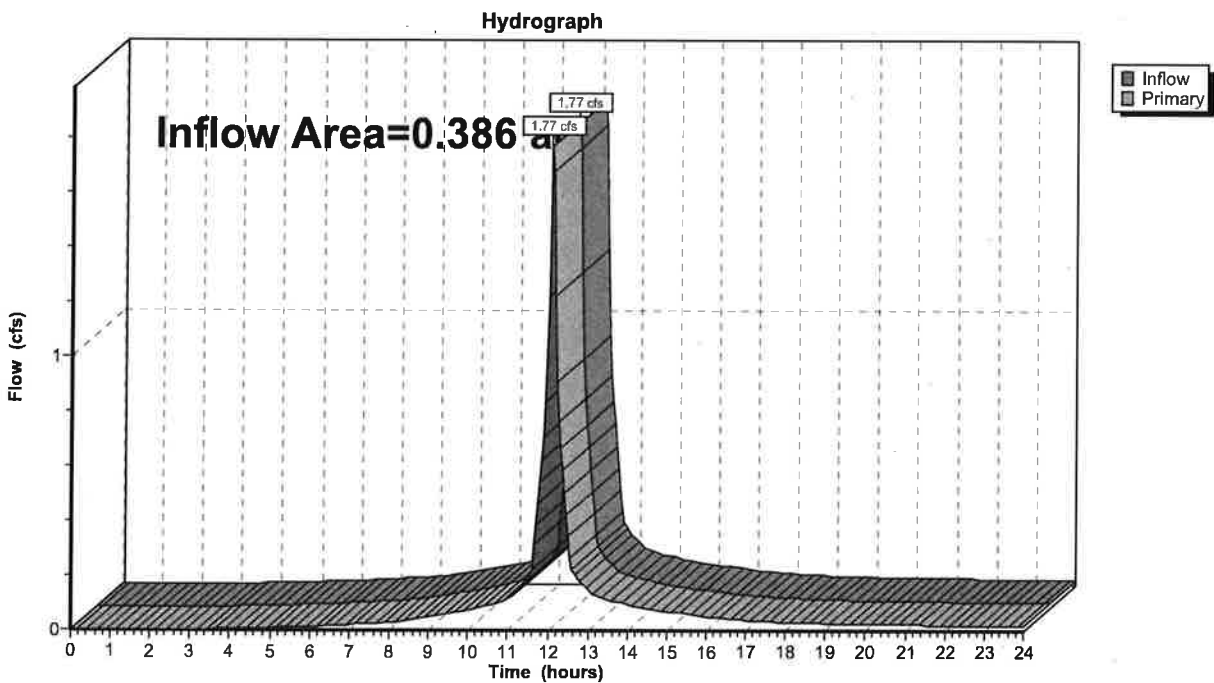
Summary for Pond 1P: Offsite - Smelt Brook

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.386 ac, 78.52% Impervious, Inflow Depth > 4.17" for 10-Year event
Inflow = 1.77 cfs @ 12.07 hrs, Volume= 0.134 af
Primary = 1.77 cfs @ 12.07 hrs, Volume= 0.134 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite - Smelt Brook



Front ST Existing

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.103	79	50-75% Grass cover, Fair, HSG C (1)
0.233	98	Existing Bit Conc. Parking (1)
0.041	98	Existing Building (1)
0.009	98	Existing Walks (1)
0.386	93	TOTAL AREA

Front ST Existing

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Type III 24-hr 2-Year Rainfall=3.22"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 1: Existing Site

Runoff Area=16,828 sf 73.37% Impervious Runoff Depth>2.46"
Tc=5.0 min CN=93 Runoff=1.09 cfs 0.079 af

Pond 1P: Offsite - Smelt Brook

Inflow=1.09 cfs 0.079 af
Primary=1.09 cfs 0.079 af

Total Runoff Area = 0.386 ac Runoff Volume = 0.079 af Average Runoff Depth = 2.46"
26.63% Pervious = 0.103 ac 73.37% Impervious = 0.283 ac

Front ST Existing

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 Type III 24-hr 2-Year Rainfall=3.22"

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Summary for Subcatchment 1: Existing Site

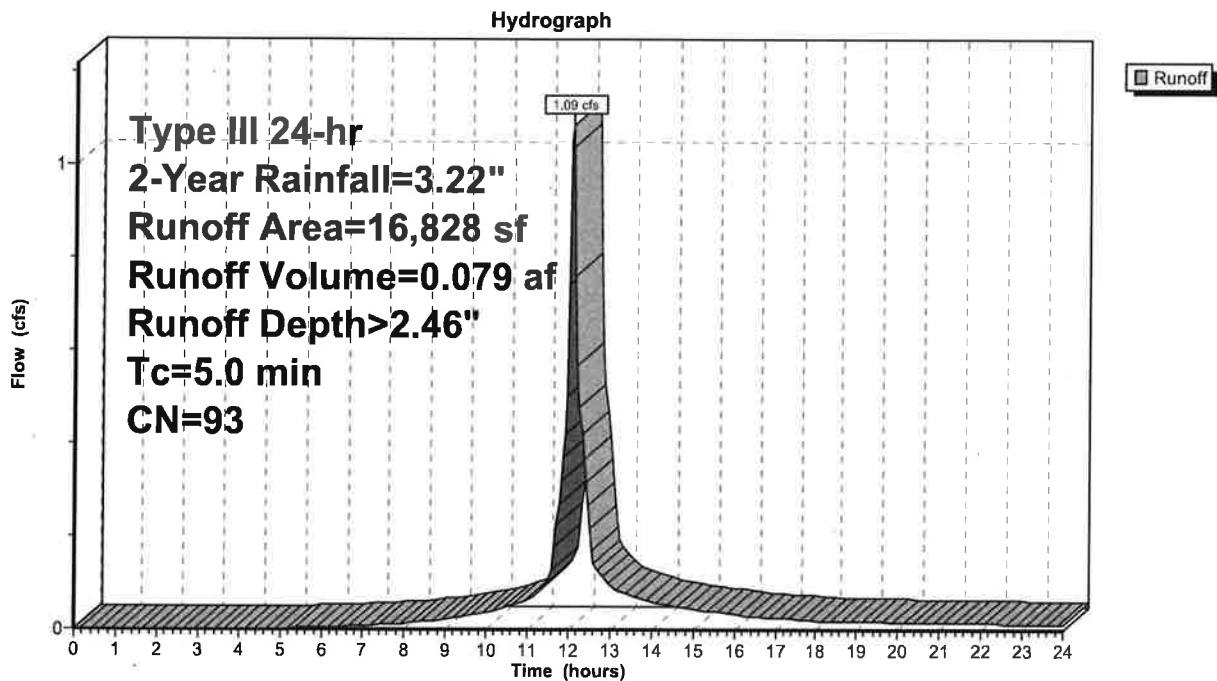
Runoff = 1.09 cfs @ 12.07 hrs, Volume= 0.079 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.22"

Area (sf)	CN	Description
4,481	79	50-75% Grass cover, Fair, HSG C
* 1,795	98	Existing Building
* 10,164	98	Existing Bit Conc. Parking
* 388	98	Existing Walks
16,828	93	Weighted Average
4,481		26.63% Pervious Area
12,347		73.37% Impervious Area

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

Subcatchment 1: Existing Site



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15 Front St - Pre Development
Type III 24-hr 2-Year Rainfall=3.22"

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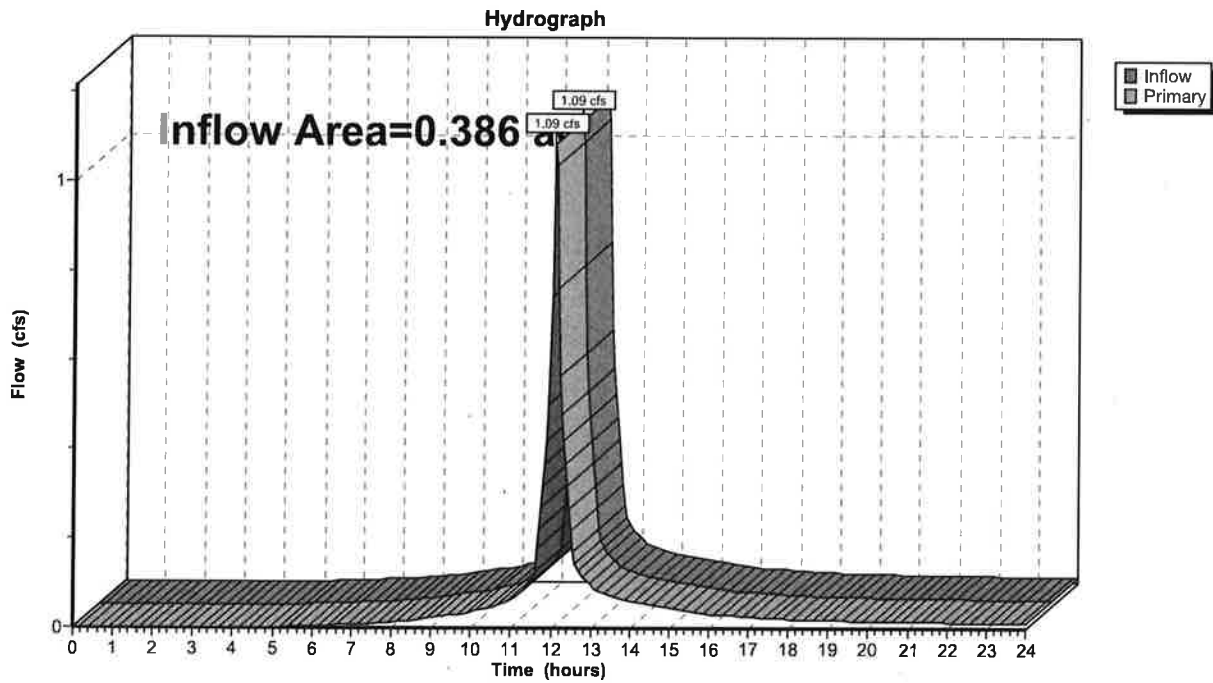
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Summary for Pond 1P: Offsite - Smelt Brook

Inflow Area = 0.386 ac, 73.37% Impervious, Inflow Depth > 2.46" for 2-Year event
Inflow = 1.09 cfs @ 12.07 hrs, Volume= 0.079 af
Primary = 1.09 cfs @ 12.07 hrs, Volume= 0.079 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite - Smelt Brook



Front ST Existing

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Type III 24-hr 10-Year Rainfall=4.86"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 1: Existing Site

Runoff Area=16,828 sf 73.37% Impervious Runoff Depth>4.06"
Tc=5.0 min CN=93 Runoff=1.74 cfs 0.131 af

Pond 1P: Offsite - Smelt Brook

Inflow=1.74 cfs 0.131 af
Primary=1.74 cfs 0.131 af

Total Runoff Area = 0.386 ac Runoff Volume = 0.131 af Average Runoff Depth = 4.06"
26.63% Pervious = 0.103 ac 73.37% Impervious = 0.283 ac

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 Type III 24-hr 10-Year Rainfall=4.86"

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Summary for Subcatchment 1: Existing Site

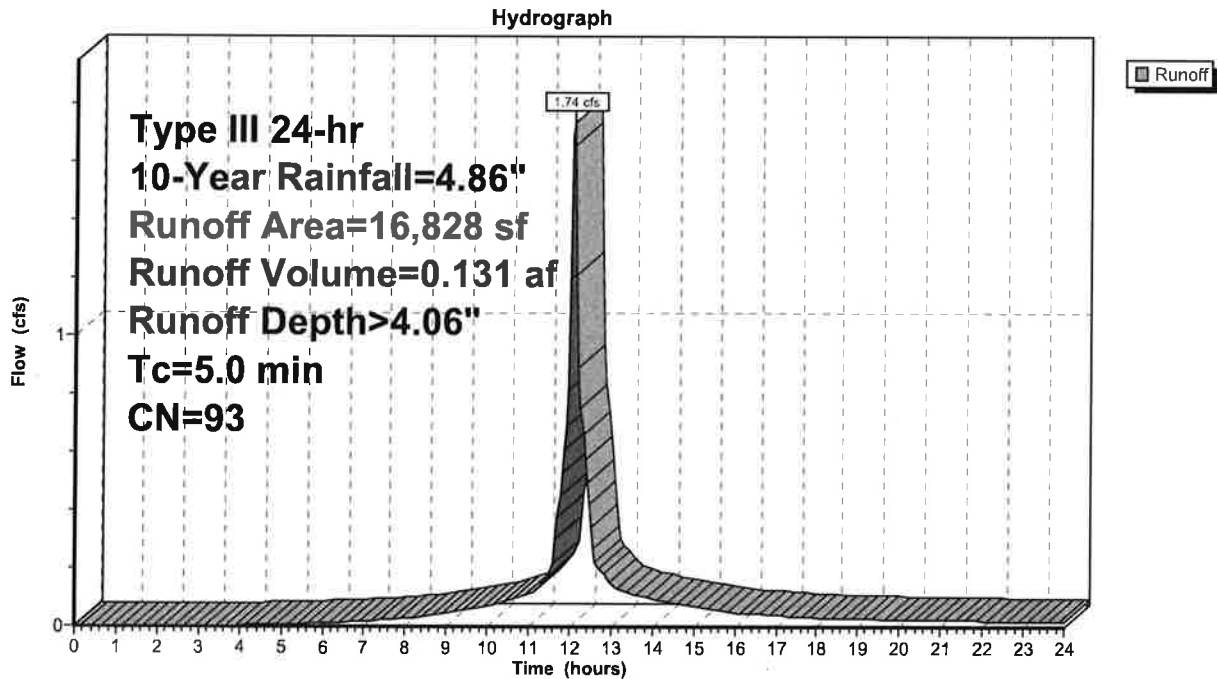
Runoff = 1.74 cfs @ 12.07 hrs, Volume= 0.131 af, Depth> 4.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.86"

	Area (sf)	CN	Description
	4,481	79	50-75% Grass cover, Fair, HSG C
*	1,795	98	Existing Building
*	10,164	98	Existing Bit Conc. Parking
*	388	98	Existing Walks
	16,828	93	Weighted Average
	4,481		26.63% Pervious Area
	12,347		73.37% Impervious Area

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

Subcatchment 1: Existing Site



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15 Front St - Pre Development
Type III 24-hr 10-Year Rainfall=4.86"

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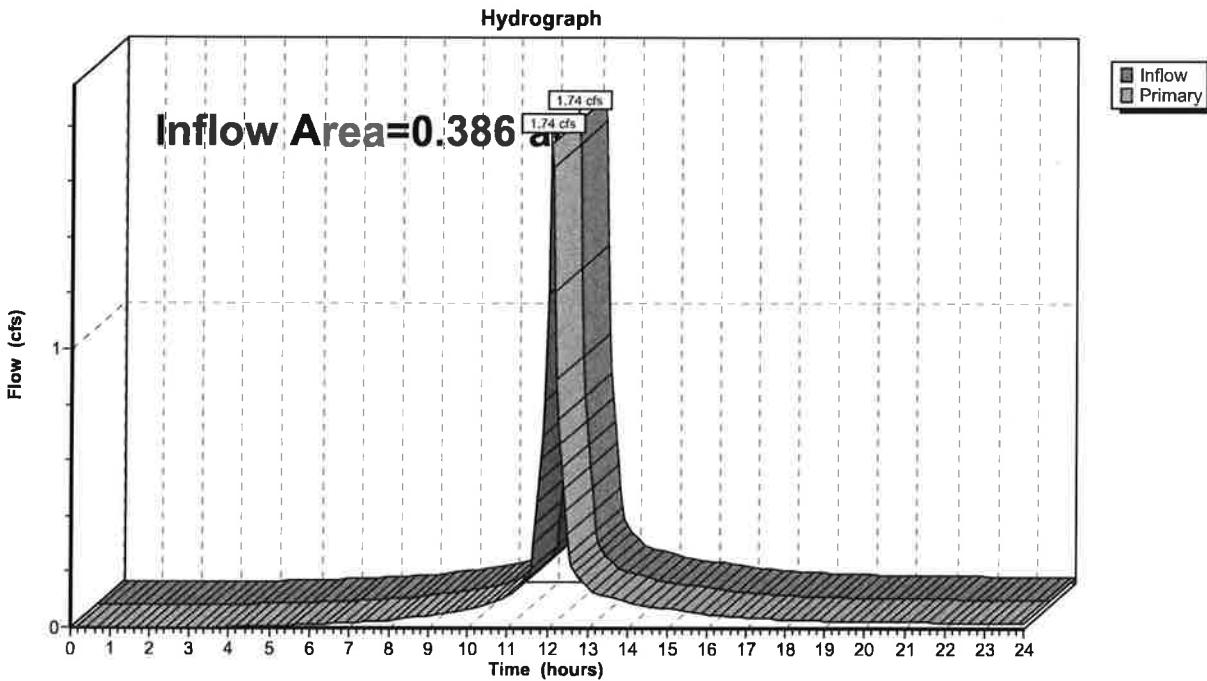
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Summary for Pond 1P: Offsite - Smelt Brook

Inflow Area = 0.386 ac, 73.37% Impervious, Inflow Depth > 4.06" for 10-Year event
Inflow = 1.74 cfs @ 12.07 hrs, Volume= 0.131 af
Primary = 1.74 cfs @ 12.07 hrs, Volume= 0.131 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite - Smelt Brook



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Type III 24-hr 25-Year Rainfall=6.15"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Existing Site

Runoff Area=16,828 sf 73.37% Impervious Runoff Depth>5.33"
Tc=5.0 min CN=93 Runoff=2.25 cfs 0.172 af

Pond 1P: Offsite - Smelt Brook

Inflow=2.25 cfs 0.172 af
Primary=2.25 cfs 0.172 af

Total Runoff Area = 0.386 ac Runoff Volume = 0.172 af Average Runoff Depth = 5.33"
26.63% Pervious = 0.103 ac 73.37% Impervious = 0.283 ac

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15 Front St - Pre Development
Type III 24-hr 25-Year Rainfall=6.15"

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Summary for Subcatchment 1: Existing Site

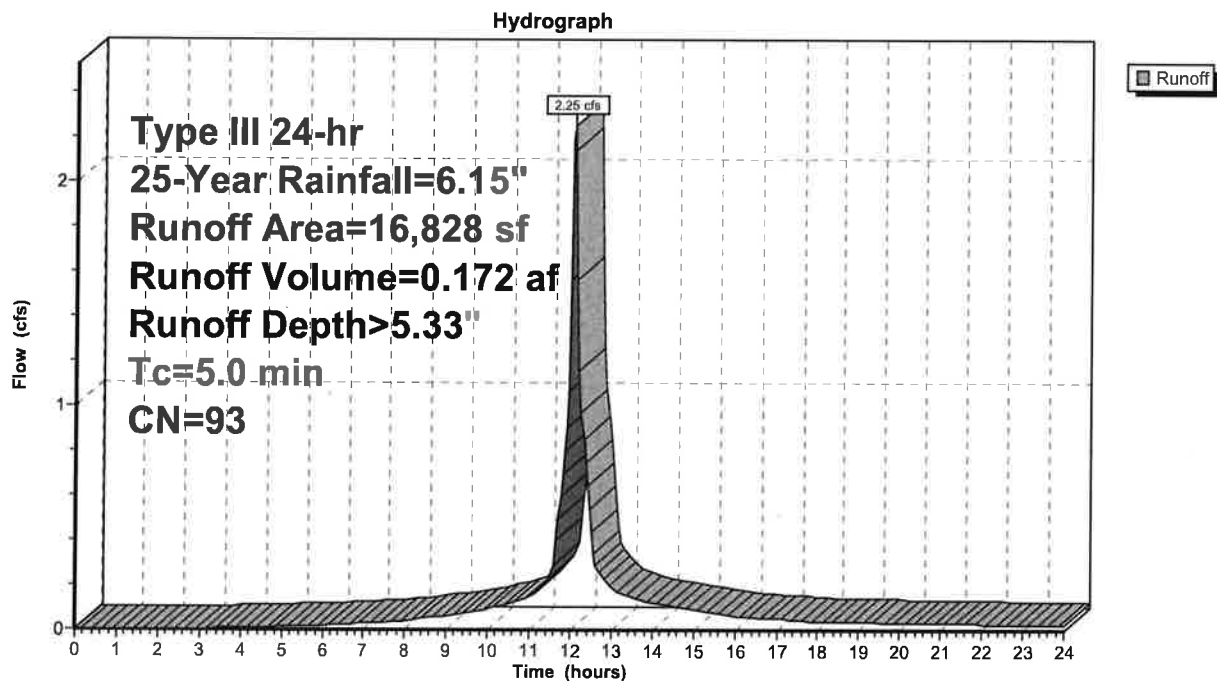
Runoff = 2.25 cfs @ 12.07 hrs, Volume= 0.172 af, Depth> 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.15"

Area (sf)	CN	Description
4,481	79	50-75% Grass cover, Fair, HSG C
* 1,795	98	Existing Building
* 10,164	98	Existing Bit Conc. Parking
* 388	98	Existing Walks
16,828	93	Weighted Average
4,481		26.63% Pervious Area
12,347		73.37% Impervious Area

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

Subcatchment 1: Existing Site



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15 Front St - Pre Development
Type III 24-hr 25-Year Rainfall=6.15"

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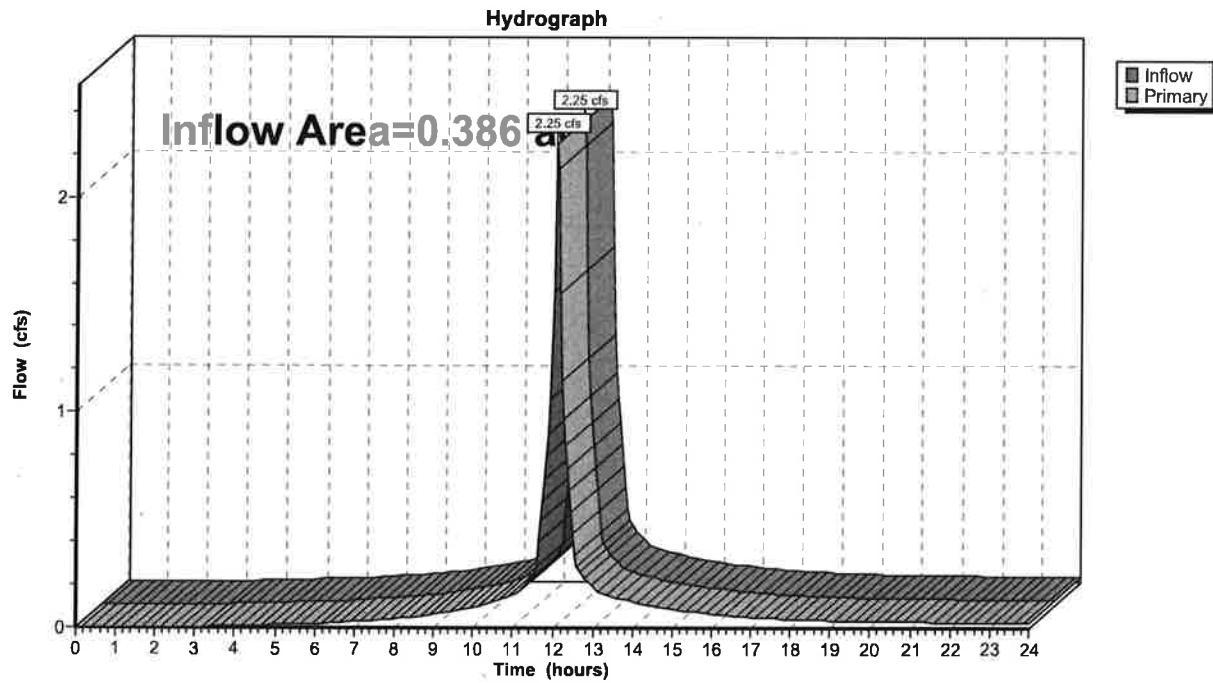
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Summary for Pond 1P: Offsite - Smelt Brook

Inflow Area = 0.386 ac, 73.37% Impervious, Inflow Depth > 5.33" for 25-Year event
Inflow = 2.25 cfs @ 12.07 hrs, Volume= 0.172 af
Primary = 2.25 cfs @ 12.07 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite - Smelt Brook



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15 Front St - Pre Development
Type III 24-hr 100-Year Rainfall=8.80"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Existing Site

Runoff Area=16,828 sf 73.37% Impervious Runoff Depth>7.95"
Tc=5.0 min CN=93 Runoff=3.29 cfs 0.256 af

Pond 1P: Offsite - Smelt Brook

Inflow=3.29 cfs 0.256 af
Primary=3.29 cfs 0.256 af

Total Runoff Area = 0.386 ac Runoff Volume = 0.256 af Average Runoff Depth = 7.95"
26.63% Pervious = 0.103 ac 73.37% Impervious = 0.283 ac

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15 Front St - Pre Development
 Type III 24-hr 100-Year Rainfall=8.80"

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Summary for Subcatchment 1: Existing Site

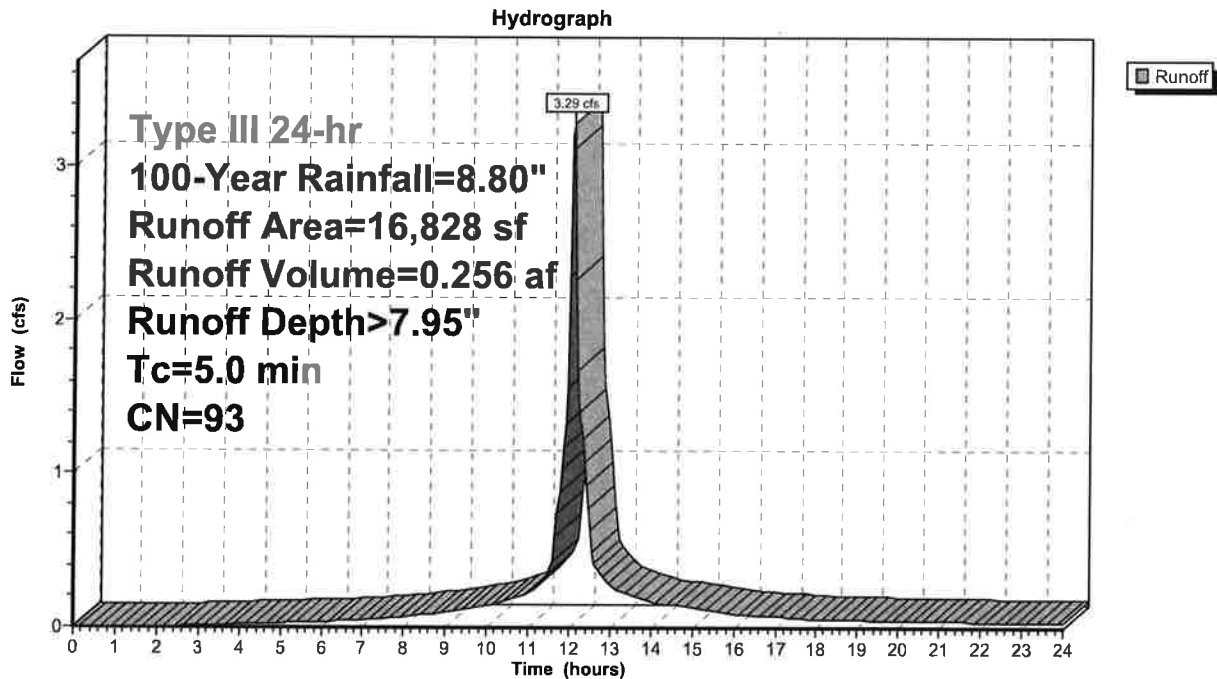
Runoff = 3.29 cfs @ 12.07 hrs, Volume= 0.256 af, Depth> 7.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=8.80"

	Area (sf)	CN	Description
	4,481	79	50-75% Grass cover, Fair, HSG C
*	1,795	98	Existing Building
*	10,164	98	Existing Bit Conc. Parking
*	388	98	Existing Walks
	16,828	93	Weighted Average
	4,481		26.63% Pervious Area
	12,347		73.37% Impervious Area

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

Subcatchment 1: Existing Site



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15 Front St - Pre Development
Type III 24-hr 100-Year Rainfall=8.80"

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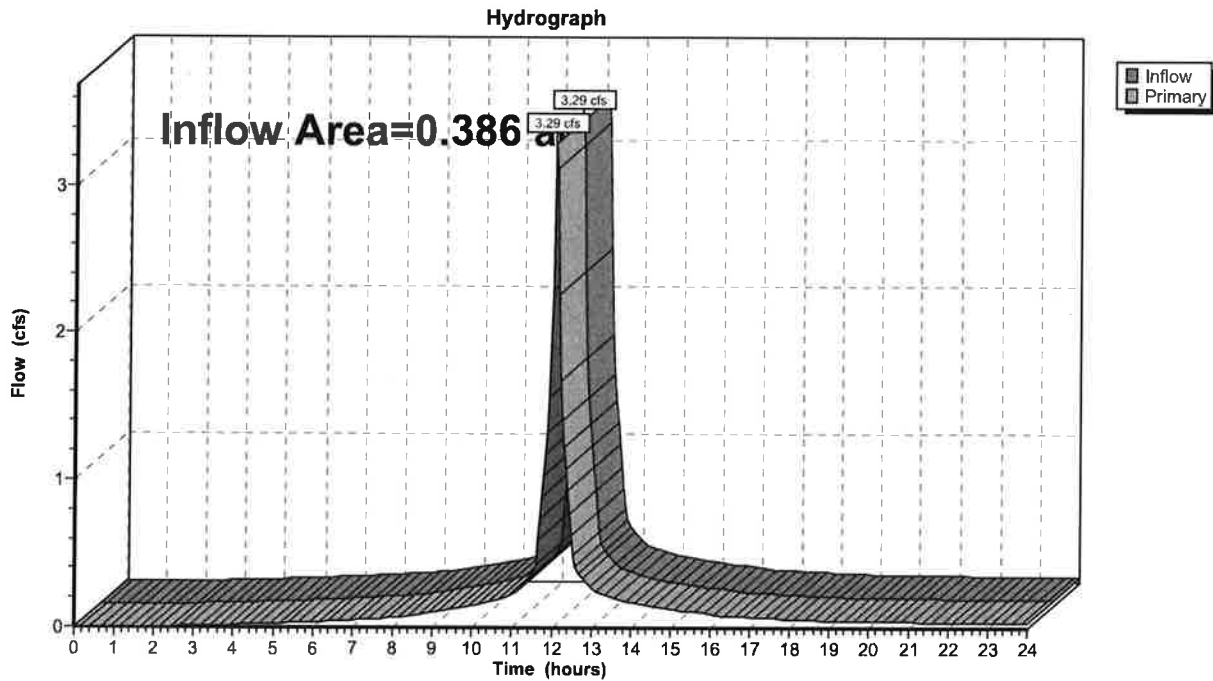
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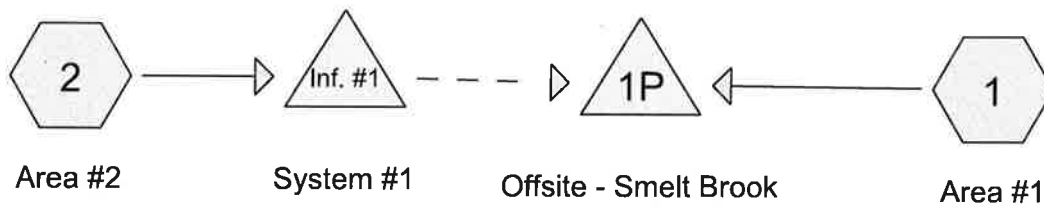
Summary for Pond 1P: Offsite - Smelt Brook

Inflow Area = 0.386 ac, 73.37% Impervious, Inflow Depth > 7.95" for 100-Year event
Inflow = 3.29 cfs @ 12.07 hrs, Volume= 0.256 af
Primary = 3.29 cfs @ 12.07 hrs, Volume= 0.256 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite - Smelt Brook





Front St Proposed_rev

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.089	79	50-75% Grass cover, Fair, HSG C (1)
0.278	98	Prop. Buidling (2)
0.019	98	Stamped Conc. Walks (1)
0.386	94	TOTAL AREA

Front St Proposed_rev

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15 Front St - Post Development
Type III 24-hr 2-Year Rainfall=3.22"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Area #1

Runoff Area=4,720 sf 17.42% Impervious Runoff Depth>1.55"
Tc=5.0 min CN=82 Runoff=0.20 cfs 0.014 af

Subcatchment2: Area #2

Runoff Area=12,108 sf 100.00% Impervious Runoff Depth>2.99"
Tc=5.0 min CN=98 Runoff=0.87 cfs 0.069 af

Pond 1P: Offsite - Smelt Brook

Inflow=0.20 cfs 0.014 af
Primary=0.20 cfs 0.014 af

Pond Inf. #1: System #1

Peak Elev=83.85' Storage=0.051 af Inflow=0.87 cfs 0.069 af
Discarded=0.01 cfs 0.019 af Secondary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.019 af

Total Runoff Area = 0.386 ac Runoff Volume = 0.083 af Average Runoff Depth = 2.58"
23.16% Pervious = 0.089 ac 76.84% Impervious = 0.297 ac

Front St Proposed_rev

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15 Front St - Post Development
Type III 24-hr 2-Year Rainfall=3.22"

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Summary for Subcatchment 1: Area #1

[49] Hint: $T_c < 2dt$ may require smaller dt

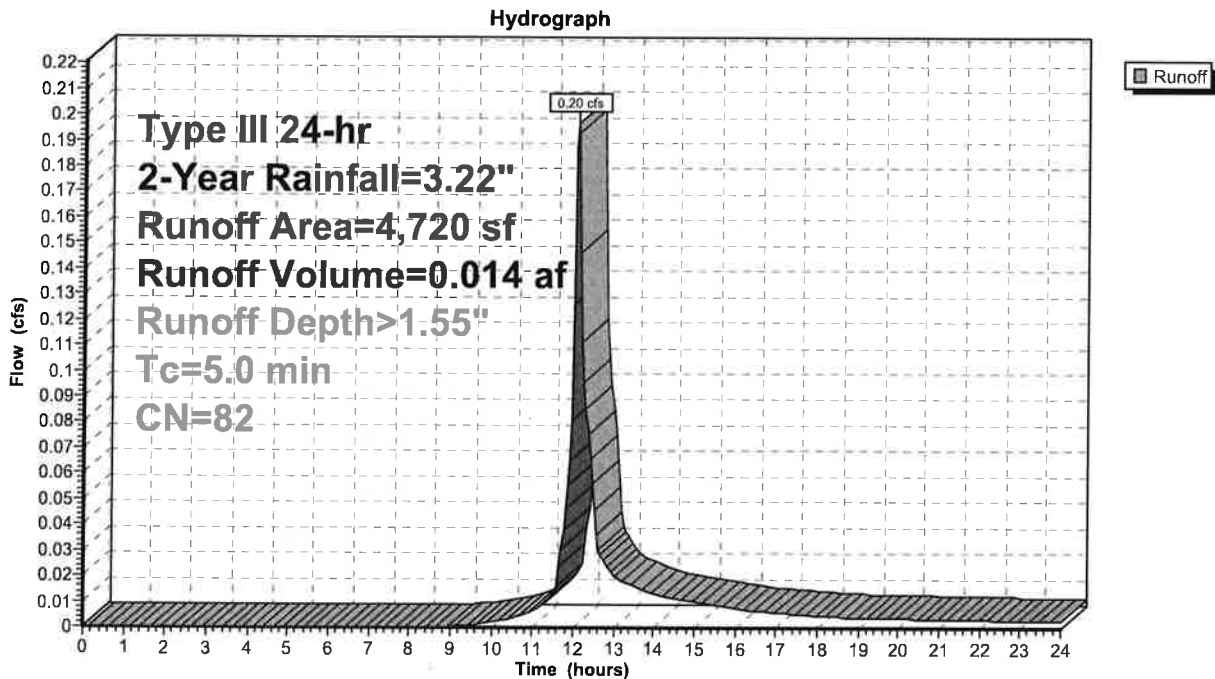
Runoff = 0.20 cfs @ 12.08 hrs, Volume= 0.014 af, Depth> 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, $dt= 0.05$ hrs
Type III 24-hr 2-Year Rainfall=3.22"

Area (sf)	CN	Description
3,898	79	50-75% Grass cover, Fair, HSG C
* 822	98	Stamped Conc. Walks
4,720	82	Weighted Average
3,898		82.58% Pervious Area
822		17.42% Impervious Area

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

Subcatchment 1: Area #1



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15 Front St - Post Development
 Type III 24-hr 2-Year Rainfall=3.22"

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Summary for Subcatchment 2: Area #2

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.87 cfs @ 12.07 hrs, Volume= 0.069 af, Depth> 2.99"

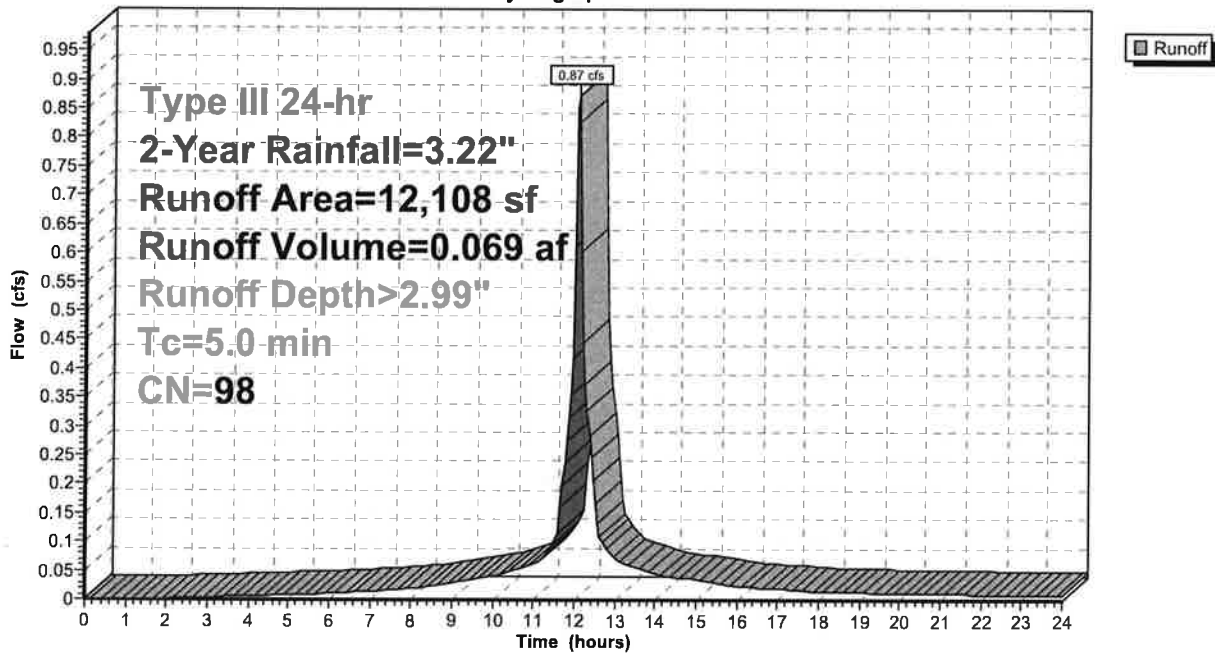
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.22"

Area (sf)	CN	Description
* 12,108	98	Prop. Buidling
12,108		100.00% Impervious Area

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

Subcatchment 2: Area #2

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.22"

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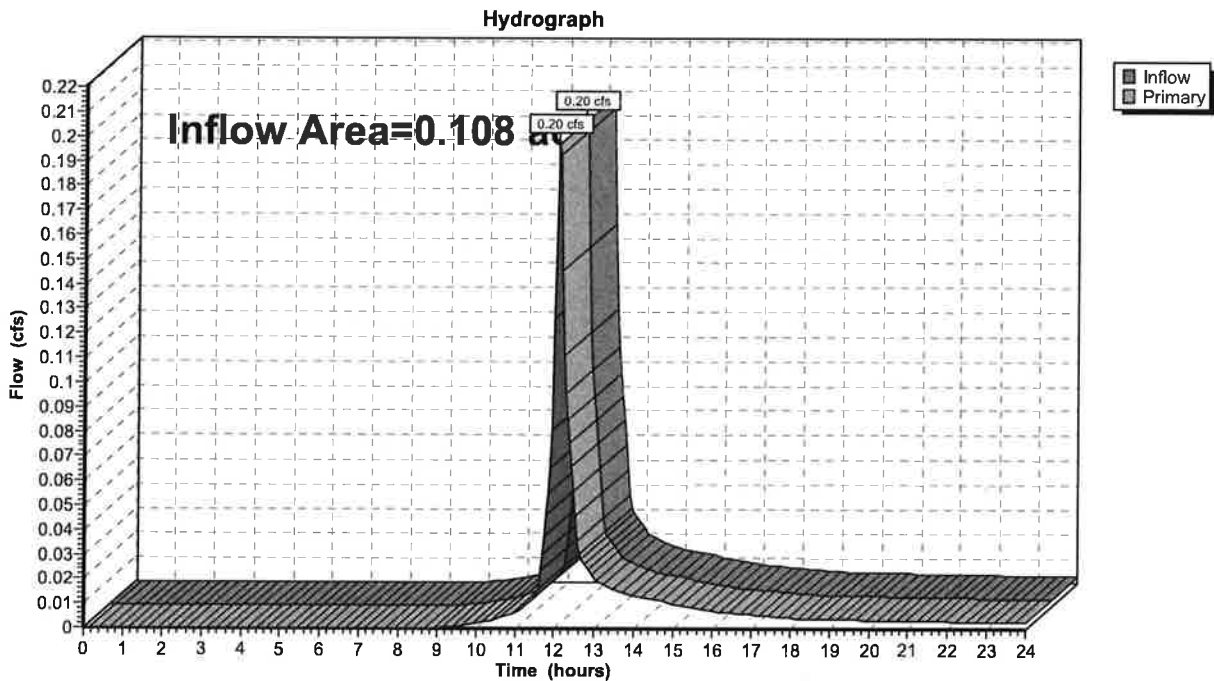
Summary for Pond 1P: Offsite - Smelt Brook

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.108 ac, 17.42% Impervious, Inflow Depth > 1.55" for 2-Year event
Inflow = 0.20 cfs @ 12.08 hrs, Volume= 0.014 af
Primary = 0.20 cfs @ 12.08 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite - Smelt Brook



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Type III 24-hr 2-Year Rainfall=3.22"

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Summary for Pond Inf. #1: System #1

Inflow Area = 0.278 ac, 100.00% Impervious, Inflow Depth > 2.99" for 2-Year event
 Inflow = 0.87 cfs @ 12.07 hrs, Volume= 0.069 af
 Outflow = 0.01 cfs @ 7.05 hrs, Volume= 0.019 af, Atten= 99%, Lag= 0.0 min
 Discarded = 0.01 cfs @ 7.05 hrs, Volume= 0.019 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 83.85' @ 19.83 hrs Surf.Area= 0.044 ac Storage= 0.051 af

Plug-Flow detention time= 293.7 min calculated for 0.019 af (28% of inflow)
 Center-of-Mass det. time= 99.7 min (854.7 - 755.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	82.00'	0.044 af	32.33'W x 59.50'L x 4.04'H.Field A 0.179 af Overall - 0.069 af Embedded = 0.110 af x 40.0% Voids
#2A	83.00'	0.069 af	Cultec R-330XLHD x 56 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 7 rows
		0.113 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	82.00'	0.270 in/hr Exfiltration over Surface area
#2	Secondary	84.54'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 7.05 hrs HW=82.04' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=82.00' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

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Type III 24-hr 2-Year Rainfall=3.22"

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Pond Inf. #1: System #1 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger®330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 7 rows

8 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 57.50' Row Length +12.0" End Stone x 2 = 59.50' Base Length

7 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 32.33' Base Width

12.0" Base + 30.5" Chamber Height + 6.0" Cover = 4.04' Field Height

56 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 7 Rows = 2,999.0 cf Chamber Storage

7,775.5 cf Field - 2,999.0 cf Chambers = 4,776.5 cf Stone x 40.0% Voids = 1,910.6 cf Stone Storage

Chamber Storage + Stone Storage = 4,909.6 cf = 0.113 af

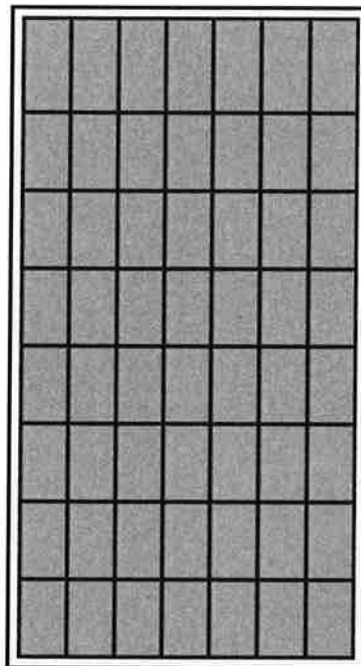
Overall Storage Efficiency = 63.1%

Overall System Size = 59.50' x 32.33' x 4.04'

56 Chambers

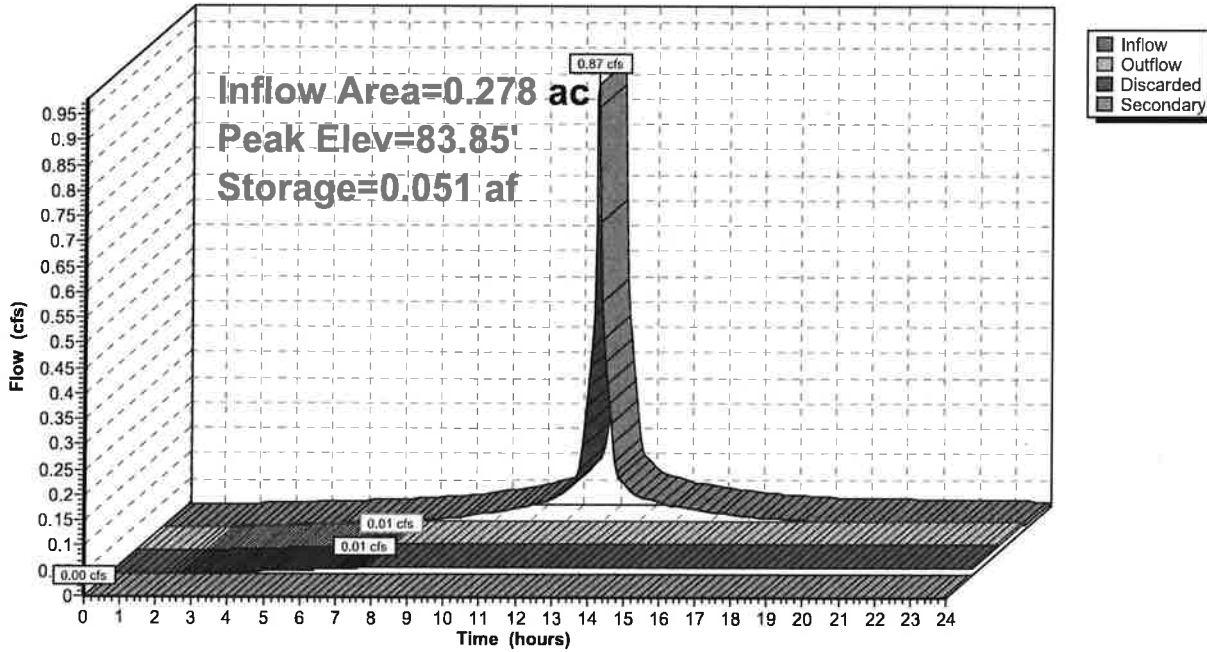
288.0 cy Field

176.9 cy Stone



Pond Inf. #1: System #1

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.86"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Area #1 Runoff Area=4,720 sf 17.42% Impervious Runoff Depth>2.95"
Tc=5.0 min CN=82 Runoff=0.37 cfs 0.027 af

Subcatchment2: Area #2 Runoff Area=12,108 sf 100.00% Impervious Runoff Depth>4.62"
Tc=5.0 min CN=98 Runoff=1.33 cfs 0.107 af

Pond 1P: Offsite - Smelt Brook Inflow=0.37 cfs 0.036 af
Primary=0.37 cfs 0.036 af

Pond Inf. #1: System #1 Peak Elev=84.63' Storage=0.079 af Inflow=1.33 cfs 0.107 af
Discarded=0.01 cfs 0.021 af Secondary=0.02 cfs 0.009 af Outflow=0.04 cfs 0.030 af

Total Runoff Area = 0.386 ac Runoff Volume = 0.134 af Average Runoff Depth = 4.15"
23.16% Pervious = 0.089 ac 76.84% Impervious = 0.297 ac

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 Type III 24-hr 10-Year Rainfall=4.86"

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Summary for Subcatchment 1: Area #1

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.37 cfs @ 12.08 hrs, Volume= 0.027 af, Depth> 2.95"

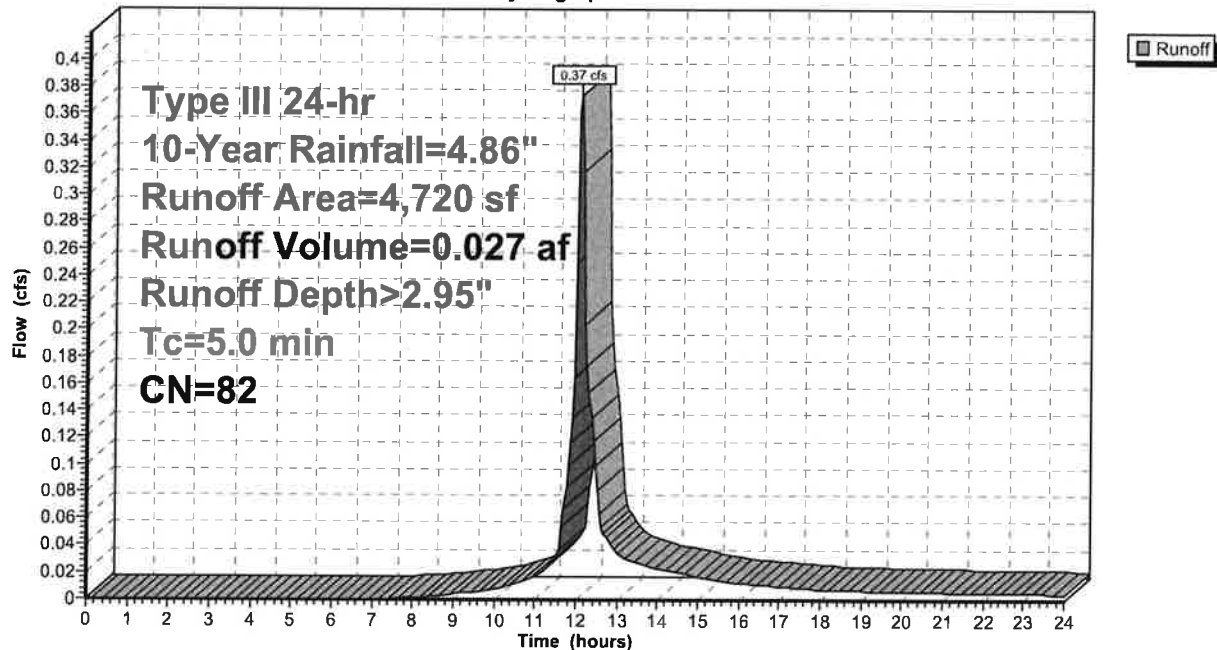
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, $dt= 0.05$ hrs
 Type III 24-hr 10-Year Rainfall=4.86"

Area (sf)	CN	Description
3,898	79	50-75% Grass cover, Fair, HSG C
* 822	98	Stamped Conc. Walks
4,720	82	Weighted Average
3,898		82.58% Pervious Area
822		17.42% Impervious Area

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

Subcatchment 1: Area #1

Hydrograph



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 Type III 24-hr 10-Year Rainfall=4.86"

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Summary for Subcatchment 2: Area #2

[49] Hint: $T_c < 2dt$ may require smaller dt

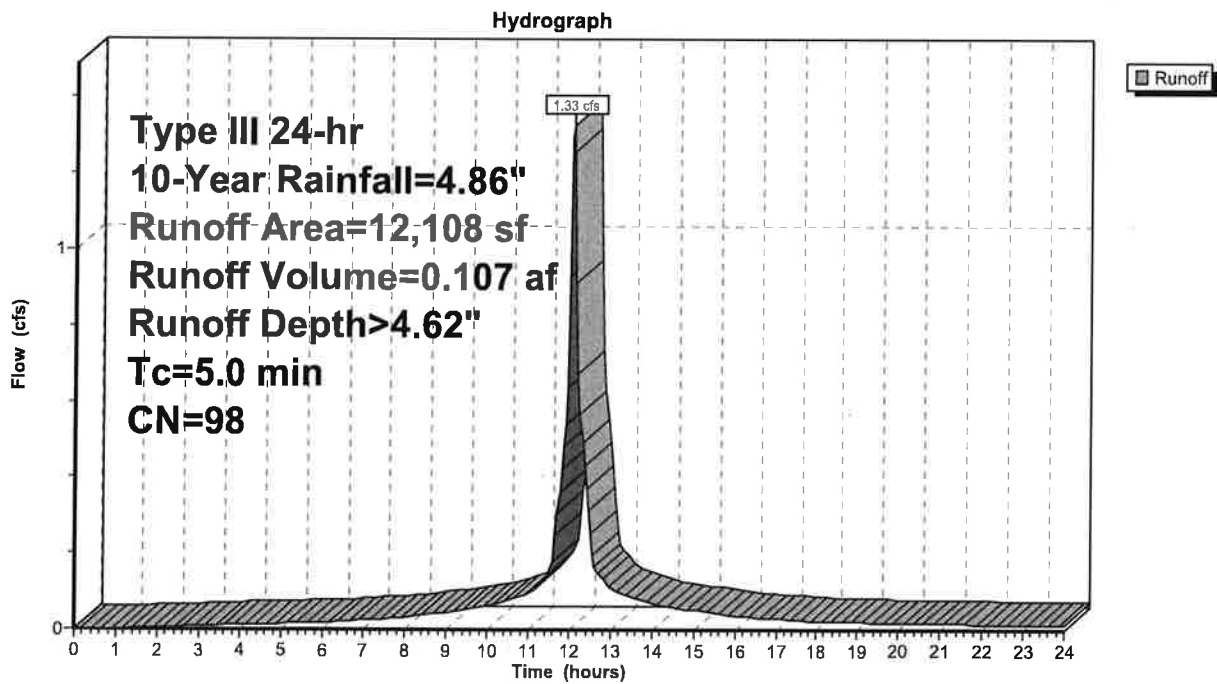
Runoff = 1.33 cfs @ 12.07 hrs, Volume= 0.107 af, Depth> 4.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, $dt= 0.05$ hrs
 Type III 24-hr 10-Year Rainfall=4.86"

Area (sf)	CN	Description
* 12,108	98	Prop. Buidling
12,108		100.00% Impervious Area

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

Subcatchment 2: Area #2



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Type III 24-hr 10-Year Rainfall=4.86"

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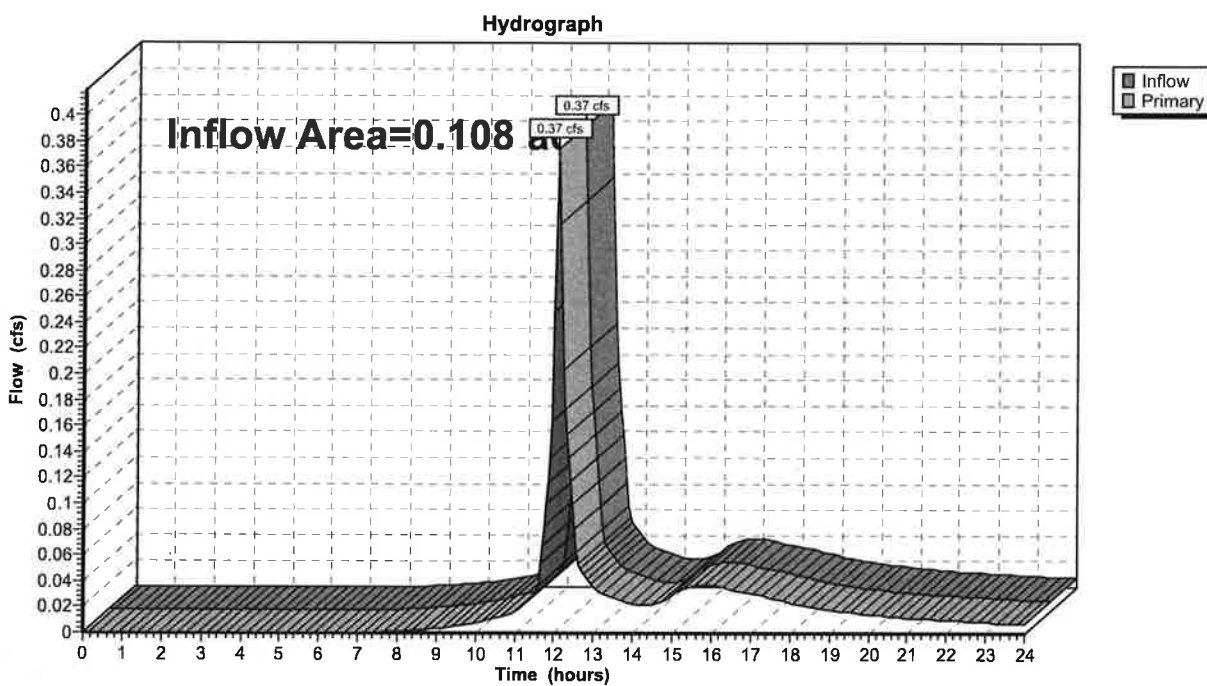
Summary for Pond 1P: Offsite - Smelt Brook

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.108 ac, 17.42% Impervious, Inflow Depth > 3.97" for 10-Year event
Inflow = 0.37 cfs @ 12.08 hrs, Volume= 0.036 af
Primary = 0.37 cfs @ 12.08 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite - Smelt Brook



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Type III 24-hr 10-Year Rainfall=4.86"

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Summary for Pond Inf. #1: System #1

Inflow Area = 0.278 ac, 100.00% Impervious, Inflow Depth > 4.62" for 10-Year event
 Inflow = 1.33 cfs @ 12.07 hrs, Volume= 0.107 af
 Outflow = 0.04 cfs @ 16.01 hrs, Volume= 0.030 af, Atten= 97%, Lag= 236.1 min
 Discarded = 0.01 cfs @ 4.75 hrs, Volume= 0.021 af
 Secondary = 0.02 cfs @ 16.01 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 84.63' @ 16.01 hrs Surf.Area= 0.044 ac Storage= 0.079 af

Plug-Flow detention time= 348.5 min calculated for 0.030 af (28% of inflow)
 Center-of-Mass det. time= 142.9 min (890.2 - 747.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	82.00'	0.044 af	32.33'W x 59.50'L x 4.04'H Field A 0.179 af Overall - 0.069 af Embedded = 0.110 af x 40.0% Voids
#2A	83.00'	0.069 af	Cultec R-330XLHD x 56 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 7 rows
		0.113 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	82.00'	0.270 in/hr Exfiltration over Surface area
#2	Secondary	84.54'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 4.75 hrs HW=82.04' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.02 cfs @ 16.01 hrs HW=84.63' (Free Discharge)
 ↑2=Orifice/Grate (Orifice Controls 0.02 cfs @ 1.02 fps)

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Type III 24-hr 10-Year Rainfall=4.86"

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Pond Inf. #1: System #1 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger®330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 7 rows

8 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 57.50' Row Length +12.0" End Stone x 2 = 59.50' Base Length

7 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 32.33' Base Width

12.0" Base + 30.5" Chamber Height + 6.0" Cover = 4.04' Field Height

56 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 7 Rows = 2,999.0 cf Chamber Storage

7,775.5 cf Field - 2,999.0 cf Chambers = 4,776.5 cf Stone x 40.0% Voids = 1,910.6 cf Stone Storage

Chamber Storage + Stone Storage = 4,909.6 cf = 0.113 af

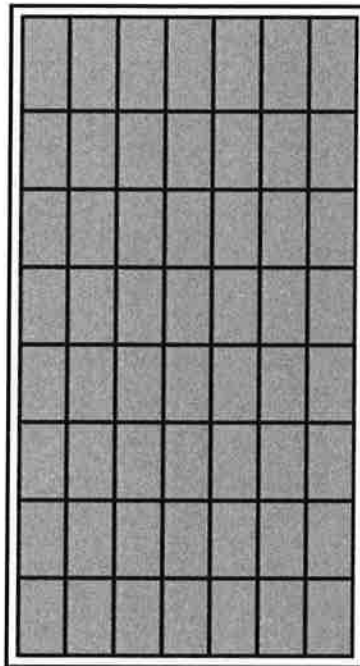
Overall Storage Efficiency = 63.1%

Overall System Size = 59.50' x 32.33' x 4.04'

56 Chambers

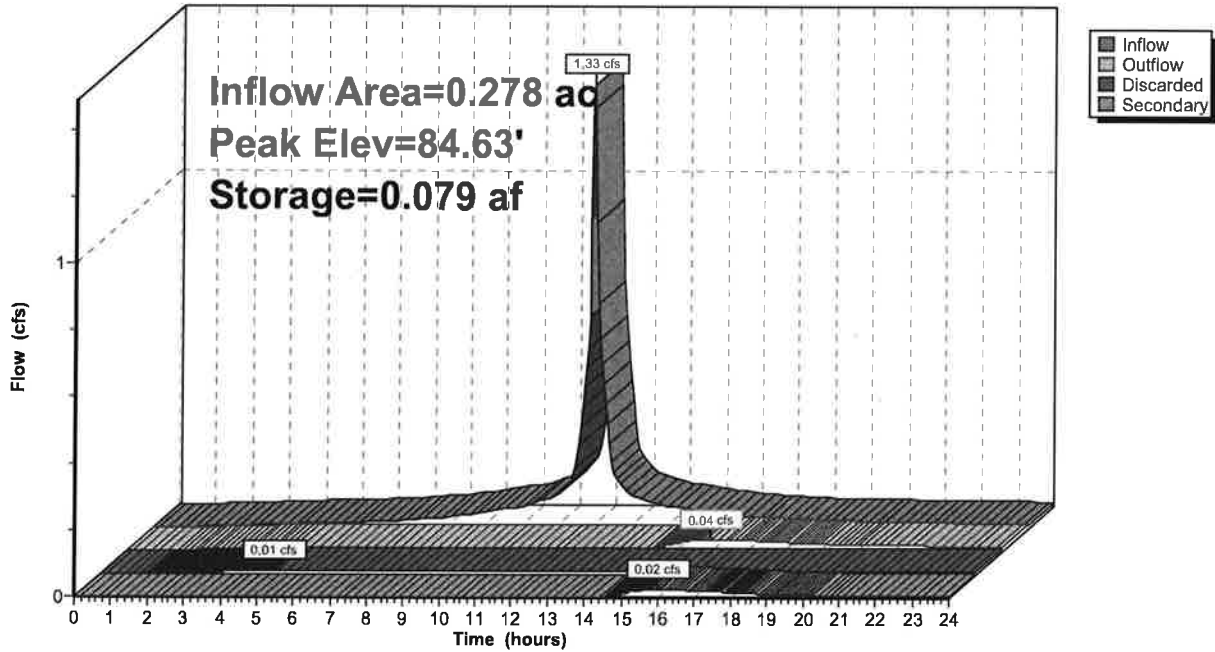
288.0 cy Field

176.9 cy Stone



Pond Inf. #1: System #1

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.15"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Area#1

Runoff Area=4,720 sf 17.42% Impervious Runoff Depth>4.12"
Tc=5.0 min CN=82 Runoff=0.52 cfs 0.037 af

Subcatchment2: Area#2

Runoff Area=12,108 sf 100.00% Impervious Runoff Depth>5.91"
Tc=5.0 min CN=98 Runoff=1.69 cfs 0.137 af

Pond 1P: Offsite - Smelt Brook

Inflow=0.52 cfs 0.075 af
Primary=0.52 cfs 0.075 af

Pond Inf. #1: System#1

Peak Elev=84.77' Storage=0.084 af Inflow=1.69 cfs 0.137 af
Discarded=0.01 cfs 0.022 af Secondary=0.15 cfs 0.038 af Outflow=0.16 cfs 0.059 af

Total Runoff Area = 0.386 ac Runoff Volume = 0.174 af Average Runoff Depth = 5.41"
23.16% Pervious = 0.089 ac 76.84% Impervious = 0.297 ac

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Type III 24-hr 25-Year Rainfall=6.15"

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Summary for Subcatchment 1: Area #1

[49] Hint: $T_c < 2dt$ may require smaller dt

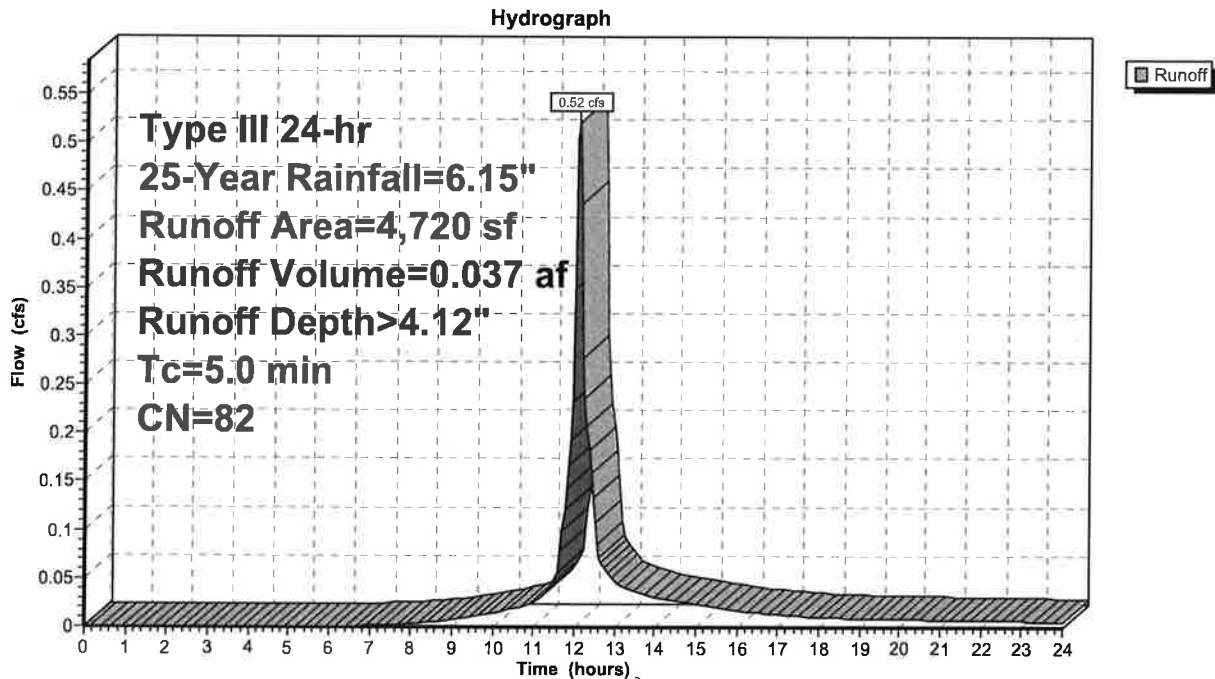
Runoff = 0.52 cfs @ 12.07 hrs, Volume= 0.037 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, $dt= 0.05$ hrs
Type III 24-hr 25-Year Rainfall=6.15"

Area (sf)	CN	Description
3,898	79	50-75% Grass cover, Fair, HSG C
* 822	98	Stamped Conc. Walks
4,720	82	Weighted Average
3,898		82.58% Pervious Area
822		17.42% Impervious Area

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

Subcatchment 1: Area #1



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Type III 24-hr 25-Year Rainfall=6.15"

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Summary for Subcatchment 2: Area #2

[49] Hint: $T_c < 2dt$ may require smaller dt

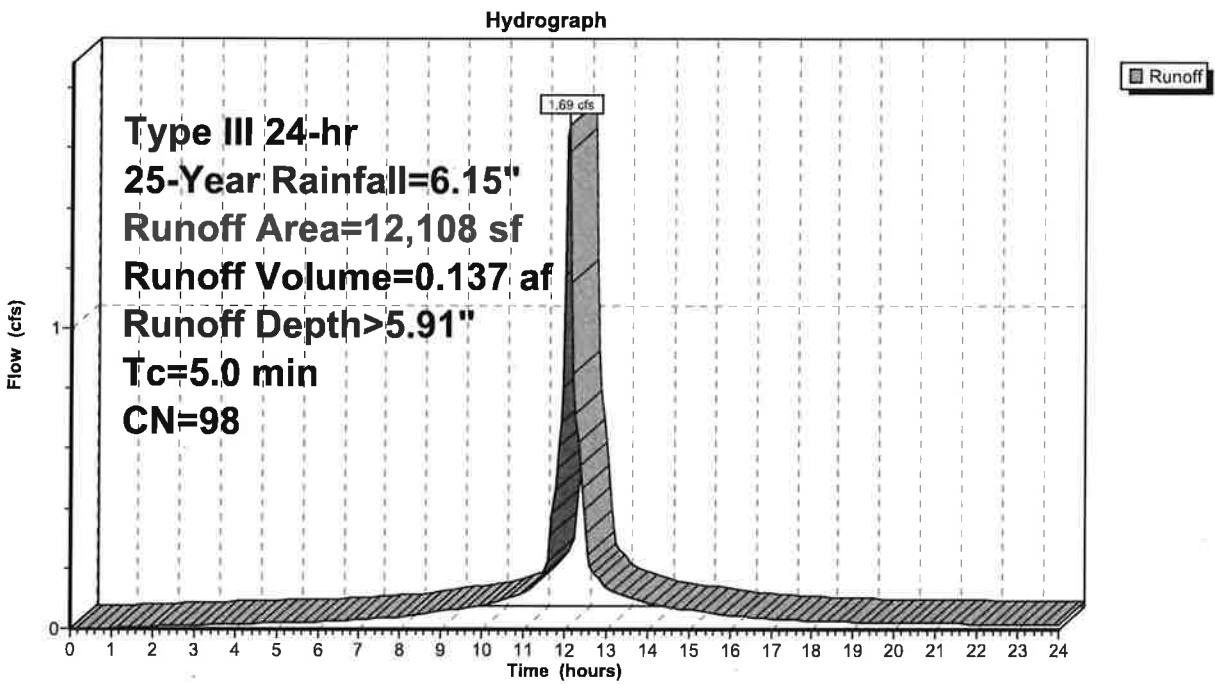
Runoff = 1.69 cfs @ 12.07 hrs, Volume= 0.137 af, Depth > 5.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, $dt = 0.05$ hrs
Type III 24-hr 25-Year Rainfall=6.15"

Area (sf)	CN	Description
* 12,108	98	Prop. Buidling
12,108		100.00% Impervious Area

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

Subcatchment 2: Area #2



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Type III 24-hr 25-Year Rainfall=6.15"

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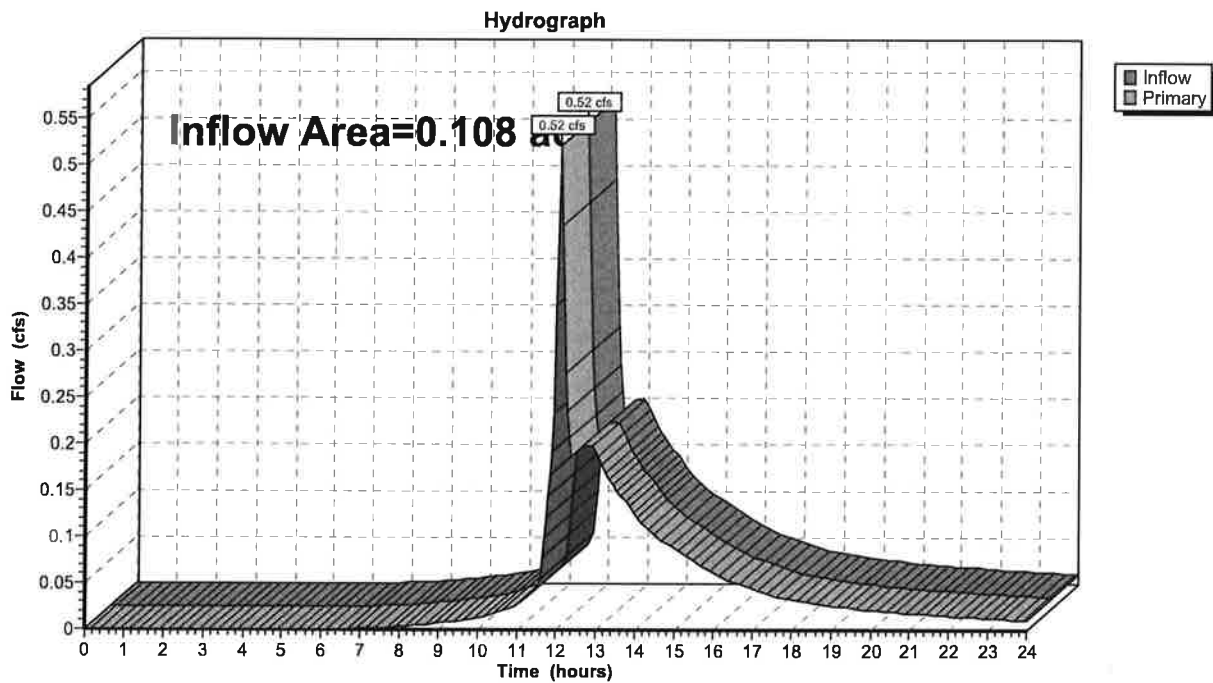
Summary for Pond 1P: Offsite - Smelt Brook

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.108 ac, 17.42% Impervious, Inflow Depth > 8.30" for 25-Year event
Inflow = 0.52 cfs @ 12.07 hrs, Volume= 0.075 af
Primary = 0.52 cfs @ 12.07 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite - Smelt Brook



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15 Front St - Post Development
Type III 24-hr 25-Year Rainfall=6.15"

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Summary for Pond Inf. #1: System #1

Inflow Area = 0.278 ac, 100.00% Impervious, Inflow Depth > 5.91" for 25-Year event
 Inflow = 1.69 cfs @ 12.07 hrs, Volume= 0.137 af
 Outflow = 0.16 cfs @ 12.87 hrs, Volume= 0.059 af, Atten= 91%, Lag= 48.2 min
 Discarded = 0.01 cfs @ 3.60 hrs, Volume= 0.022 af
 Secondary = 0.15 cfs @ 12.87 hrs, Volume= 0.038 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 84.77' @ 12.87 hrs Surf.Area= 0.044 ac Storage= 0.084 af

Plug-Flow detention time= 275.8 min calculated for 0.059 af (43% of inflow)
 Center-of-Mass det. time= 127.5 min (871.0 - 743.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	82.00'	0.044 af	32.33'W x 59.50'L x 4.04'H Field A 0.179 af Overall - 0.069 af Embedded = 0.110 af x 40.0% Voids
#2A	83.00'	0.069 af	Cultec R-330XLHD x 56 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 7 rows
		0.113 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	82.00'	0.270 in/hr Exfiltration over Surface area
#2	Secondary	84.54'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 3.60 hrs HW=82.04' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.15 cfs @ 12.87 hrs HW=84.77' (Free Discharge)
 ↑2=Orifice/Grate (Orifice Controls 0.15 cfs @ 1.64 fps)

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15 Front St - Post Development
Type III 24-hr 25-Year Rainfall=6.15"

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Pond Inf. #1: System #1 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger®330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 7 rows

8 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 57.50' Row Length +12.0" End Stone x 2 = 59.50' Base Length

7 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 32.33' Base Width

12.0" Base + 30.5" Chamber Height + 6.0" Cover = 4.04' Field Height

56 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 7 Rows = 2,999.0 cf Chamber Storage

7,775.5 cf Field - 2,999.0 cf Chambers = 4,776.5 cf Stone x 40.0% Voids = 1,910.6 cf Stone Storage

Chamber Storage + Stone Storage = 4,909.6 cf = 0.113 af

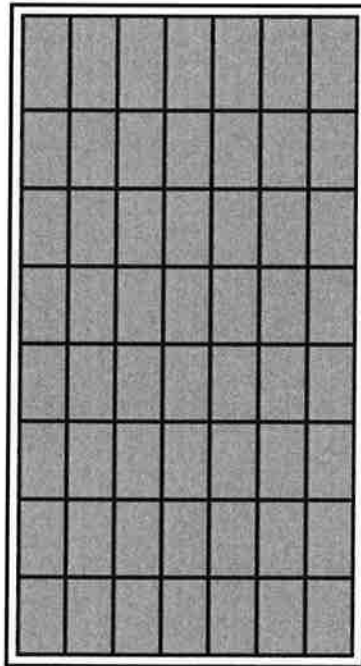
Overall Storage Efficiency = 63.1%

Overall System Size = 59.50' x 32.33' x 4.04'

56 Chambers

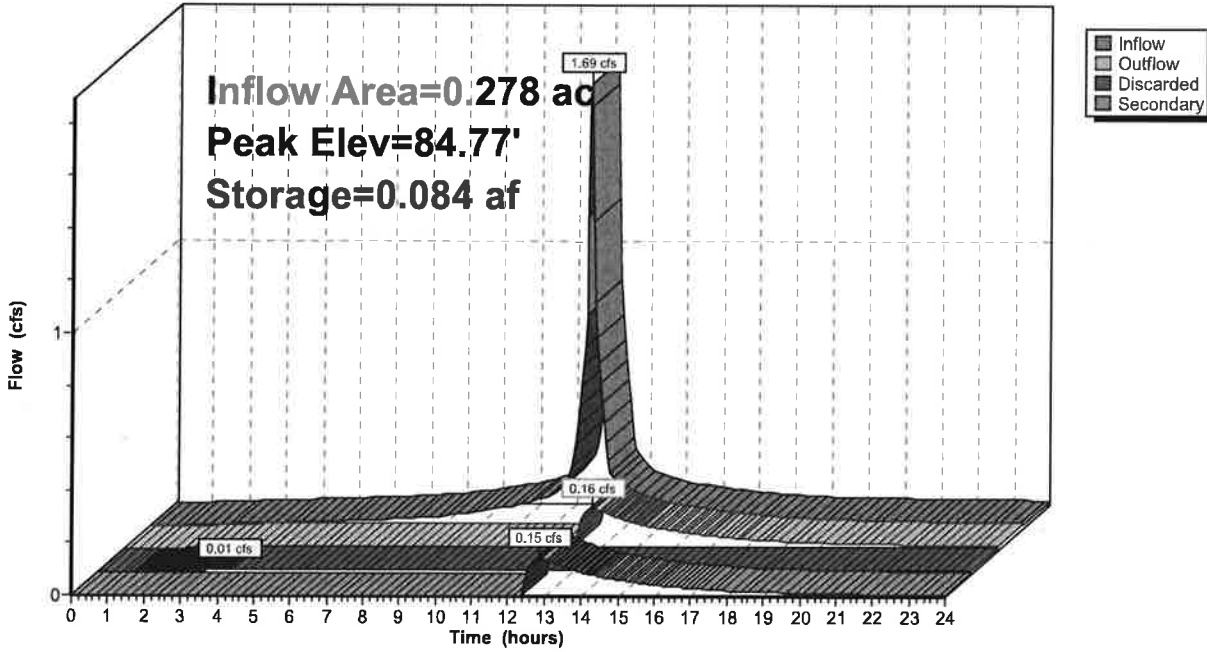
288.0 cy Field

176.9 cy Stone



Pond Inf. #1: System #1

Hydrograph



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15 Front St - Post Development
Type III 24-hr 100-Year Rainfall=8.80"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Area #1

Runoff Area=4,720 sf 17.42% Impervious Runoff Depth>6.62"
Tc=5.0 min CN=82 Runoff=0.82 cfs 0.060 af

Subcatchment2: Area #2

Runoff Area=12,108 sf 100.00% Impervious Runoff Depth>8.56"
Tc=5.0 min CN=98 Runoff=2.42 cfs 0.198 af

Pond 1P: Offsite - Smelt Brook

Inflow=1.20 cfs 0.157 af
Primary=1.20 cfs 0.157 af

Pond Inf. #1: System #1

Peak Elev=85.43' Storage=0.102 af Inflow=2.42 cfs 0.198 af
Discarded=0.01 cfs 0.022 af Secondary=0.76 cfs 0.098 af Outflow=0.77 cfs 0.120 af

Total Runoff Area = 0.386 ac Runoff Volume = 0.258 af Average Runoff Depth = 8.01"
23.16% Pervious = 0.089 ac 76.84% Impervious = 0.297 ac

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15 Front St - Post Development
 Type III 24-hr 100-Year Rainfall=8.80"

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Summary for Subcatchment 1: Area #1

[49] Hint: $T_c < 2dt$ may require smaller dt

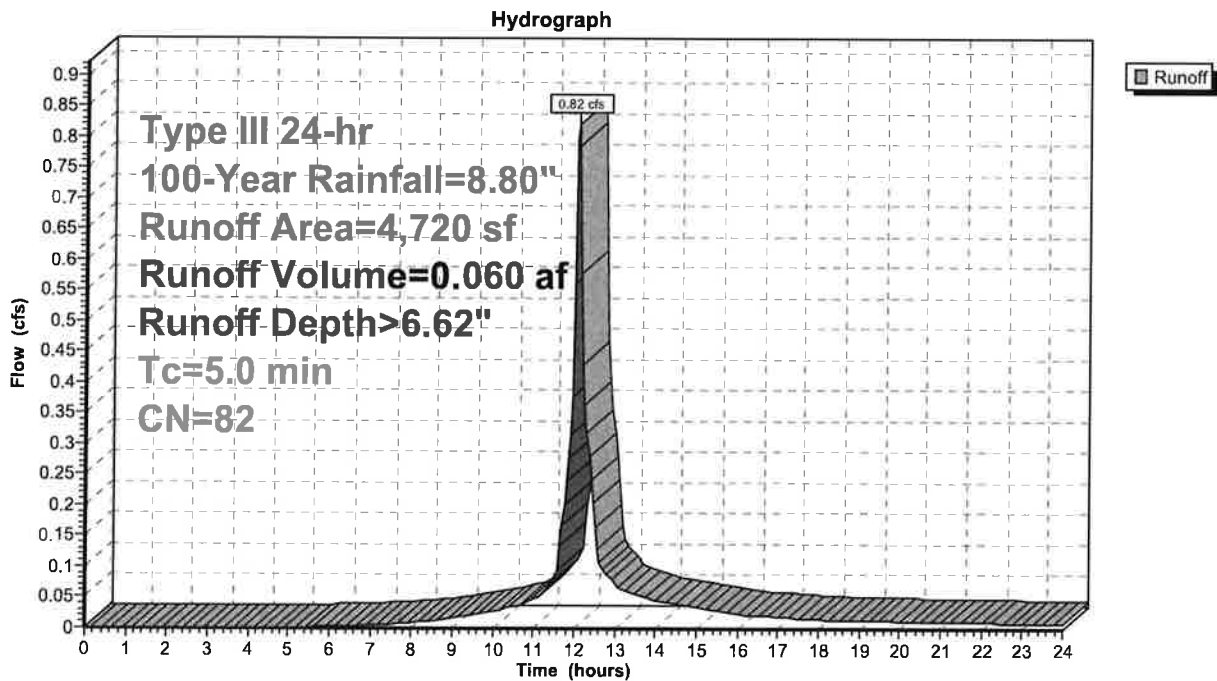
Runoff = 0.82 cfs @ 12.07 hrs, Volume= 0.060 af, Depth> 6.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, $dt= 0.05$ hrs
 Type III 24-hr 100-Year Rainfall=8.80"

Area (sf)	CN	Description
3,898	79	50-75% Grass cover, Fair, HSG C
* 822	98	Stamped Conc. Walks
4,720	82	Weighted Average
3,898		82.58% Pervious Area
822		17.42% Impervious Area

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

Subcatchment 1: Area #1



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Summary for Subcatchment 2: Area #2

[49] Hint: Tc<2dt may require smaller dt

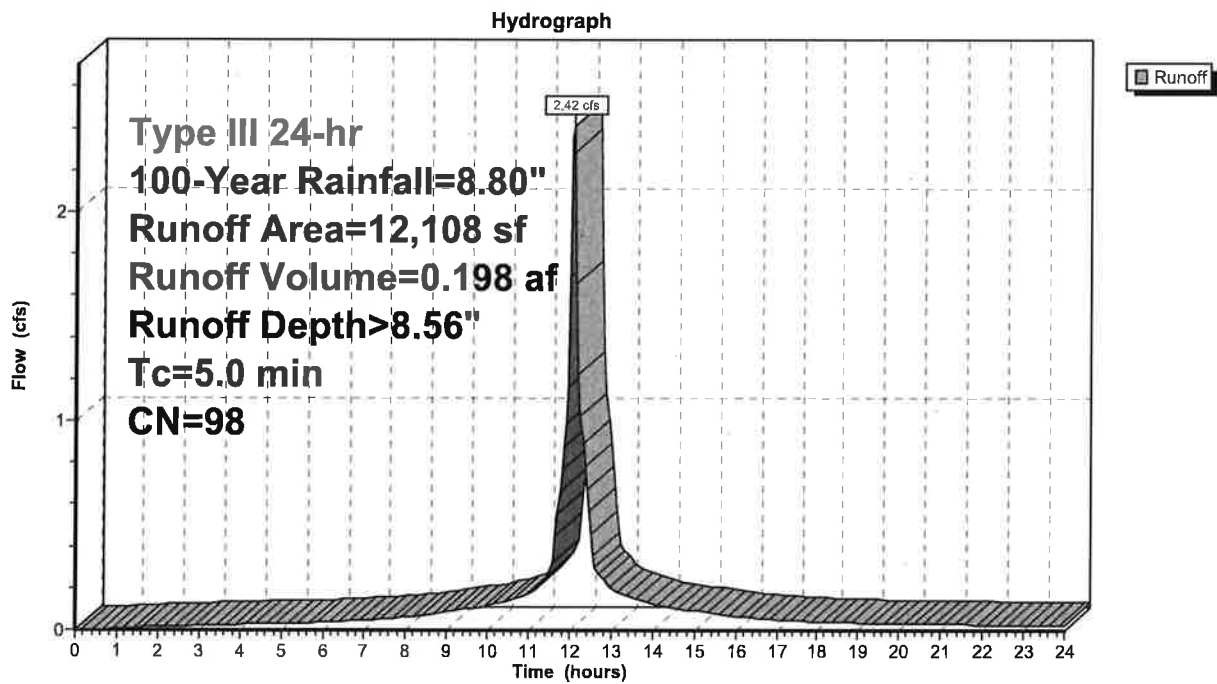
Runoff = 2.42 cfs @ 12.07 hrs, Volume= 0.198 af, Depth> 8.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=8.80"

Area (sf)	CN	Description
* 12,108	98	Prop. Buidling
12,108		100.00% Impervious Area

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

Subcatchment 2: Area #2



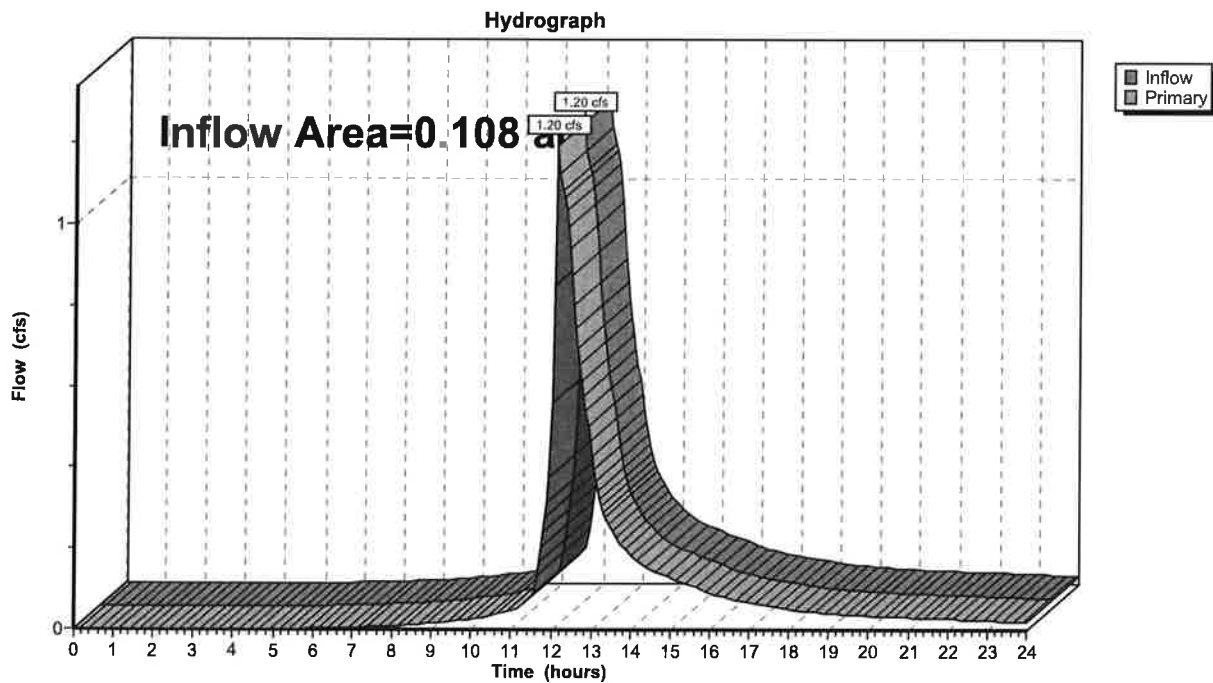
Summary for Pond 1P: Offsite - Smelt Brook

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.108 ac, 17.42% Impervious, Inflow Depth > 17.43" for 100-Year event
Inflow = 1.20 cfs @ 12.12 hrs, Volume= 0.157 af
Primary = 1.20 cfs @ 12.12 hrs, Volume= 0.157 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite - Smelt Brook



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Type III 24-hr 100-Year Rainfall=8.80"

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Summary for Pond Inf. #1: System #1

Inflow Area = 0.278 ac, 100.00% Impervious, Inflow Depth > 8.56" for 100-Year event
Inflow = 2.42 cfs @ 12.07 hrs, Volume= 0.198 af
Outflow = 0.77 cfs @ 12.36 hrs, Volume= 0.120 af, Atten= 68%, Lag= 17.3 min
Discarded = 0.01 cfs @ 2.30 hrs, Volume= 0.022 af
Secondary = 0.76 cfs @ 12.36 hrs, Volume= 0.098 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 85.43' @ 12.36 hrs Surf.Area= 0.044 ac Storage= 0.102 af

Plug-Flow detention time= 212.7 min calculated for 0.120 af (60% of inflow)
Center-of-Mass det. time= 101.3 min (840.1 - 738.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	82.00'	0.044 af	32.33'W x 59.50'L x 4.04'H Field A 0.179 af Overall - 0.069 af Embedded = 0.110 af x 40.0% Voids
#2A	83.00'	0.069 af	Cultec R-330XLHD x 56 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 7 rows
		0.113 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	82.00'	0.270 in/hr Exfiltration over Surface area
#2	Secondary	84.54'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 2.30 hrs HW=82.04' (Free Discharge)
↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.76 cfs @ 12.36 hrs HW=85.43' (Free Discharge)
↑2=Orifice/Grate (Orifice Controls 0.76 cfs @ 3.85 fps)

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Pond Inf. #1: System #1 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger®330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 7 rows

8 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 57.50' Row Length +12.0" End Stone x 2 = 59.50' Base Length

7 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 32.33' Base Width

12.0" Base + 30.5" Chamber Height + 6.0" Cover = 4.04' Field Height

56 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 7 Rows = 2,999.0 cf Chamber Storage

7,775.5 cf Field - 2,999.0 cf Chambers = 4,776.5 cf Stone x 40.0% Voids = 1,910.6 cf Stone Storage

Chamber Storage + Stone Storage = 4,909.6 cf = 0.113 af

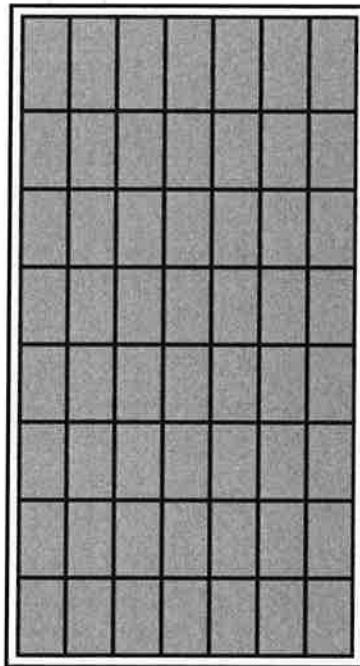
Overall Storage Efficiency = 63.1%

Overall System Size = 59.50' x 32.33' x 4.04'

56 Chambers

288.0 cy Field

176.9 cy Stone



Pond Inf. #1: System #1

Hydrograph

