Tier 4 Stormwater Control Plan

Prepared for:
Housing Authority of the County of Santa Barbara
817 W Ocean Avenue
Lompoc, CA 9343

Prepared By:
Ashley & Vance Engineering, Inc.
210 East Cota Street
Santa Barbara, CA 93101
805-962-9966

Escalante Meadows

1093 Escalante Street
Guadalupe, CA 93434

APN: 115-230-003, 115-230-004
AV Job Number 19021
April 12, 2019

April 12, 2019

Attn: Larry Deese

Housing Authority of the
County of Santa Barbara
817 W Ocean Avenue
Lompoc, CA 9343

Subject: **Escalante Meadows**

Re: **Tier 4 Stormwater Control Plan**

Please find enclosed the Tier 4 Stormwater Management Control Plan for the above referenced project.

The study calculations were prepared using the Stormwater Technical Guide for Low Impact Development per Santa Barbara County's Project Clean Water.

Please contact me for any clarifications or supporting information you need with reference to this plan.

Regards,

Bruce Jones, PE

Contents

Project Data

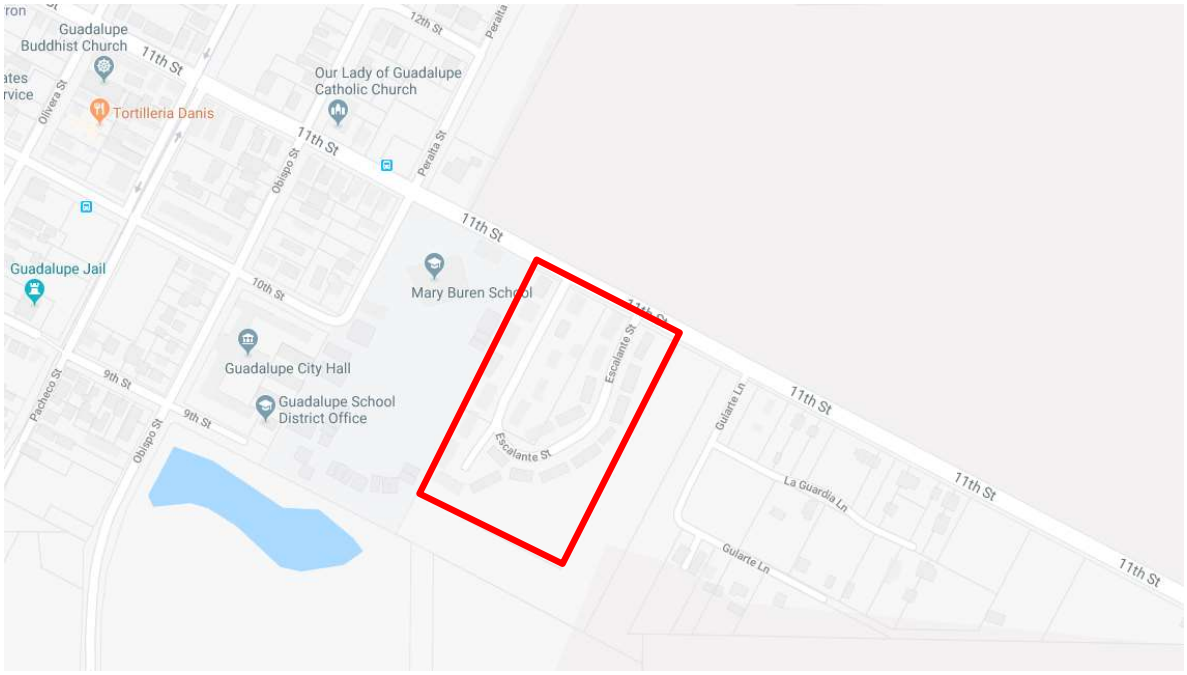
Project Name/Number	Escalante Meadows
Application Submittal Date	April 12, 2019
Project Location	1093 Escalante Street Guadalupe, CA 93464
Project Phase No.	1 and 2
Project Type and Description	New buildings, hardscape and landscape for multi-family housing development
Total Project Site Area	395,522 sf, 9.08 ac
Total New and Replaced Impervious Surface Area	222,782 sf, 5.11 ac
Total Pre-Project Impervious Surface Area	187,578 sf, 4.31 ac
Total Post-Project Impervious Surface Area	222,782 sf, 5.11 ac
Net Impervious Area	222,782 sf, 5.11 ac
Watershed Management Zone(s)	4
Design Storm Frequency and Depth	95th percentile storm, 1.5 inches
Urban Sustainability Area	Guadalupe

Setting

Project Location and Description

This project is located on 11th street in the City of Guadalupe. The project will include new structures, new parking and drive isles, and associated hardscape and landscaping.

Vicinity Map



Existing Site Features and Conditions

The existing 8.96 acre lot is a multi-family housing development consisting of 28 structures, and associated parking, drive isles, hardscape and landscape. All the surface improvements will be demolished to accommodate the improvements. The lot slopes to the southwest at slopes of 2%-5%. Per the web soil survey, the onsite soils are type C/D.

Opportunities and Constraints for Stormwater Control

The main opportunities for stormwater control on site are due to the existing onsite slopes. The site currently drains to a single point allowing a new collection system to be installed for treatment and detention in a single basin. The site is underlain by type C and D soil, this will limit the onsite infiltration rate.

Low Impact Development Design Strategies

Optimization of Site Layout

The site minimizes the amount of impervious surface to the maximum extent practical.

Dispersal of Runoff to Pervious Areas

Runoff from impervious areas is directed to pervious areas and is treated and stored within the onsite SCMs.

Stormwater Control Measures

In order to meet Project Clean Water's Tier 4 requirements, runoff generated from the site will be directed to a single combination bio-retention / detention basin SCM. The bioretention area provides treatment for runoff water. Bioretention area designed per the cross section in the Technical Guide and shall have 2 feet of sand compost mix over class II permeable gravel. Calculations showing the depths of gravel are for each area are shown in the SCM spreadsheet.

Documentation of Drainage Design

Refer to the Post Construction Drainage exhibit for location of drainage management areas.

Description of Drainage Management Areas.

Below is a description of each drainage management area. Refer to the SCM sizing spreadsheet in the next section.

DMA 1- drains 63,511 sf of roof area. This area drains to SCM 1 through a storm drain collection system. No notable characteristics or conditions.

DMA 2- drains 154,071 sf of asphalt and concrete. This area drains to SCM 1 through a storm drain collection system. No notable characteristics or conditions.

DMA 3- drains 19,710 sf of offsite asphalt and concrete that drains onto the site. This area drains to SCM 1 through a storm drain collection system. No notable characteristics or conditions.

DMA 4- drains 172,740 sf of landscaping. This area is self-treating.

Tabulation and Sizing Calculations

Central Coast Region Stormwater Control Measure Sizing Calculator

1. Project Information

Project name:	Escalante Meadows
Project location:	1093 Escalante Street, Guadalupe
Tier 2/Tier 3:	Tier 3 - Retention
Design rainfall depth (in):	1.5
Total project area (ft2):	410032
Total DMA area (ft2):	410032
Total new impervious area (ft2):	0
Total replaced impervious within a USA (ft2):	237292
Total replaced impervious not in a USA (ft2):	0
Total pervious/landscape area (ft2):	172740
Total SCM area (ft2):	3993

2. DMA Characterization

Name	DMA Type	Area (ft2)	Surface Type	New, Replaced?	Connection
DMA 1	Drains to SCM	63511	Roof	Replaced within a USA	SCM 1
DMA 2	Drains to SCM	154071	Concrete or asphalt	Replaced within a USA	SCM 1
DMA 3	Drains to SCM	19710	Concrete or asphalt	Replaced within a USA	SCM 1
DMA 4	Self-Treating	172740			

DMA Summary Area	
Total assigned DMA area (ft2):	410032
New impervious area (ft2):	0
Replaced impervious within a USA (ft2):	237292
Replaced impervious not in a USA (ft2):	0
Total pervious/landscape area (ft2):	172740

3. SCM Characterization

Name	SCM Type	Safety Factor	SCM Soil Type	Infilt. Rate (in/hr)	Area (ft2)
SCM 1	Bioretention	1	HSG C/D	0.25	3993

4. Run SBUH Model

5. SCM Minimum Sizing Requirements

SCM Name	Min. Required Storage Vol. (ft3)	Depth Below Underdrain (ft)	Drain Time (hours)	Orifice Diameter (in)
SCM 1	1597	1.00	0.0	1.17

6. Self-Retaining Area Sizing Checks

Self-Retaining DMA Name	Self-Retaining DMA Area (ft2)	Tributary DMA Name(s)	Eff. Tributary DMA Area (ft2)	Effective Tributary / SRA Area Ratio

Source Control Measures

The final project will be a shopping center.

Potential Source of Runoff Pollutants	Permanent Source Control BMPs	Operational Source Control BMPs
Landscape/ Outdoor Pesticide Use/Building and Grounds Maintenance	Design Landscaping to minimize irrigation and runoff, to promote surface infiltration and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution Where landscaped areas are used to retain or detain stromwater, specify plants that are tolerant of saturated soil conditions	Maintain landscaping using minimum or no pesticides See applicable operational BMPs in Fact Sheet CS-41 "Building and Grounds Maintenance" in the CASQA Stormwater Quality Handbook Provide IPM information to new owners, lessees and operators
Plazas, sidewalks and Parking Lots		Sweep Plazas, sidewalks and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.
Refuse Areas	Dumpster will be covered. Sign will be posted on or near the dumpster with the words "Do not dump hazardous material here"	Receptacles will be inspected and repaired if a leak is observed. Receptacles to be covered. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials on site.

Stormwater Facility Maintenance

In order to maintain stormwater quality the stormwater control areas will need to be properly maintained.

Ownership and Responsibility for Maintenance in Perpetuity

All Stormwater Control Measures are required conditions at the time of project approval under the City's authority. The failure to maintain or the physical removal of any feature described herein is a zoning violation and can result in penalties including but not limited to fines, property liens, and other actions for enforcement of a civil judgment.

Summary of Maintenance Requirements for Stormwater Facilities

The Stormwater Control Measures are located throughout the site. Refer to the Post Project Drainage exhibit for location. Each feature shall be inspected in October of each year prior to the rainy season, and after each rain event greater than 1.2 inches in a 24 hour period.

The soil in the bioretention areas will need to be maintained to insure infiltration. Periodically remove and replace the planting soil to ensure free draining conditions. Remove Trash and Debris.

Remove weeds; replace damaged or dead plants using plant species appropriate for the infiltration area. Prune excessive plant growth to ensure distributed flow across entire infiltration area. If replanting, be careful to maintain the design surface elevation. Minimize introduction of soil, and if needed, use design soil mix (60%-70% ASTM C33 fine aggregate and 30%-40% well decomposed, stable, weed-free compost). Add aged mulch occasionally to keep soils moist and replenish nutrients. Maintain mulch thickness 1"-2". Use care when applying mulch around inlets to avoid resuspension of material
If water is not entering the area, remove obstruction, restore opening and grade drop. If erosion is occurring, reduce scouring velocity using energy dissipaters (i.e. stone, erosion control blanket, geotextile, etc.) and restore distribution of flow across the widest possible area. If sediment is accumulating and interfering with flows, remove excess sediment and restore grade. If area is not draining adequately, restore grade to outlet.
If routine landscape activity requires ground disturbance in the landscape areas where these storm water quality features are located, this disturbance should be kept to a minimum and any flow line and grade elevations be restored to the original condition.

Owner to ensure that all graded features in landscape areas are kept in good condition and maintain positive drainage away from building foundation.

No ponded water should remain for more than 72 hours in any landscaped areas.

Hydraulic Analysis

In order to meet the requirements of project clean water for a tier 4 project peak flow from the site must be maintained at the same level or reduced for the 2 through 100 year storms.

Peak Flow Attenuation

Peak offsite flow rate and total surface runoff volume are reduced when comparing the pre project condition with the post project condition for all design storm events. See attached HydroCAD report for additional information.

	Design Storm					
	2 year	5 year	10 year	25 year	50 year	100 year
Pre-Project Peak Runoff Rate (cfs)	4.19	7.17	9.33	12.15	14.28	16.41
Post-Project Peak Runoff Rate (cfs)	0.60	4.03	7.21	11.01	13.15	15.12
Percent Decrease	86%	44%	23%	9%	8%	8%

The table above shows a decrease in peak flow rate leaving the site for all design storms comparing the post project condition with the pre project condition. This is accomplished through the use of a central detention basin to reduce peak runoff.

Conclusion

This project provides flow attenuation, treatment and retention for the volume of water required by Project Clean Water.

Drainage Area Exhibits

74,307 SF - IMPERVIOUS ROOF AREA

108,071 SF - IMPERVIOUS PAVEMENT AREA

207,944 SF - LANDSCAPE AREA

390,322 SF - TOTAL ONSITE AREA

18,514 SF - IMPERVIOUS PAVEMENT AREA

1,196 SF - LANDSCAPE AREA

19,710 SF - TOTAL OFFSITE AREA

SCALE: 1" = 100'

0 100 200 300 400

DRAINAGE EXHIBIT
PRE-PROJECT
ESCALANTE MEADOWS

APRIL 12, 2019

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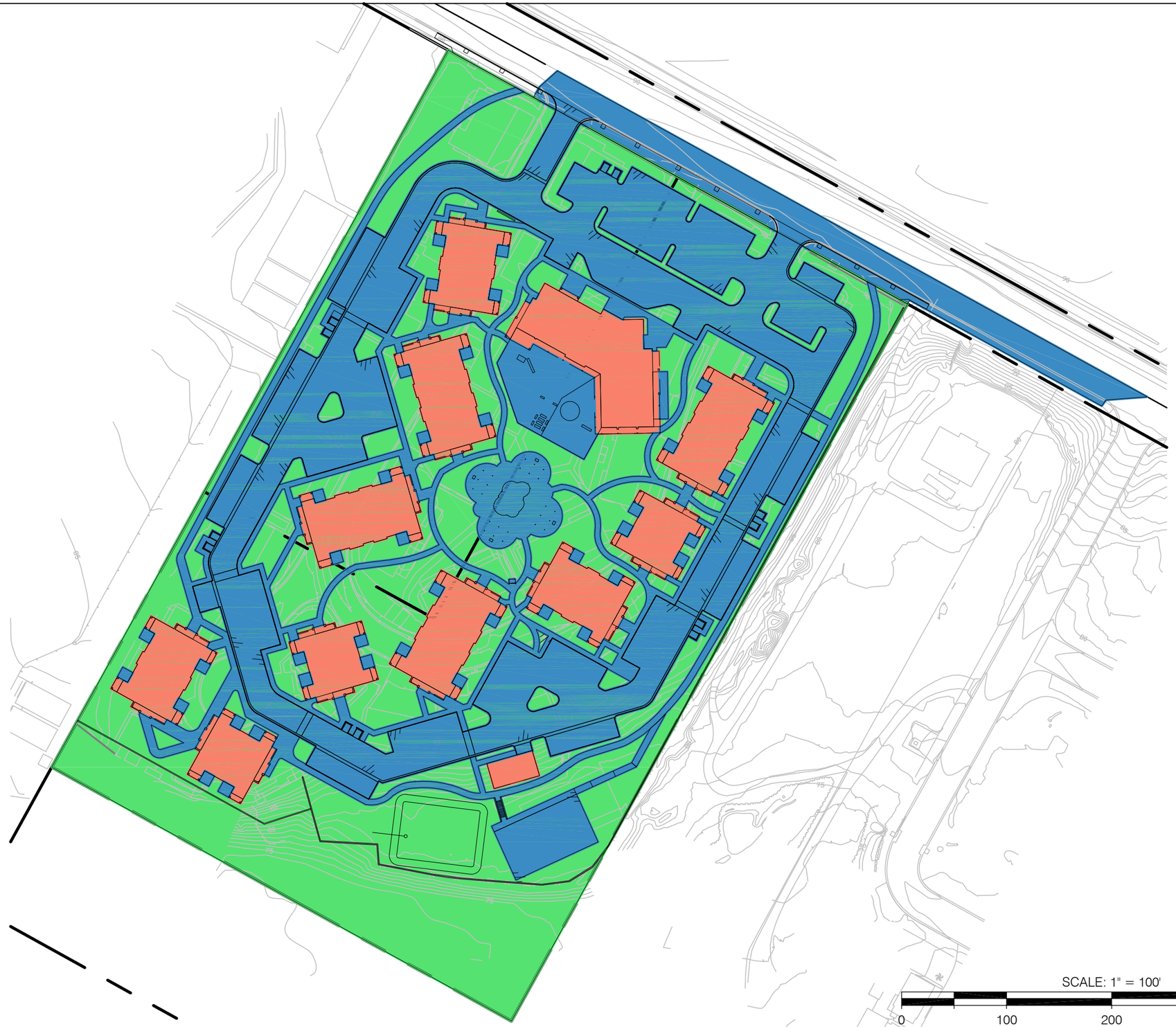
CIVIL • STRUCTURAL

JOB NO. 19021



63,511 SF - IMPERVIOUS ROOF AREA

154,071 SF - IMPERVIOUS PAVEMENT AREA

172,740 SF - LANDSCAPE AREA

390,322 SF - TOTAL ONSITE AREA

19,710 SF - IMPERVIOUS PAVEMENT AREA

0 SF - LANDSCAPE AREA

19,710 SF - TOTAL OFFSITE AREA

SCALE: 1" = 100'

0 100 200 300 400

DRAINAGE EXHIBIT
POST-PROJECT
ESCALANTE MEADOWS

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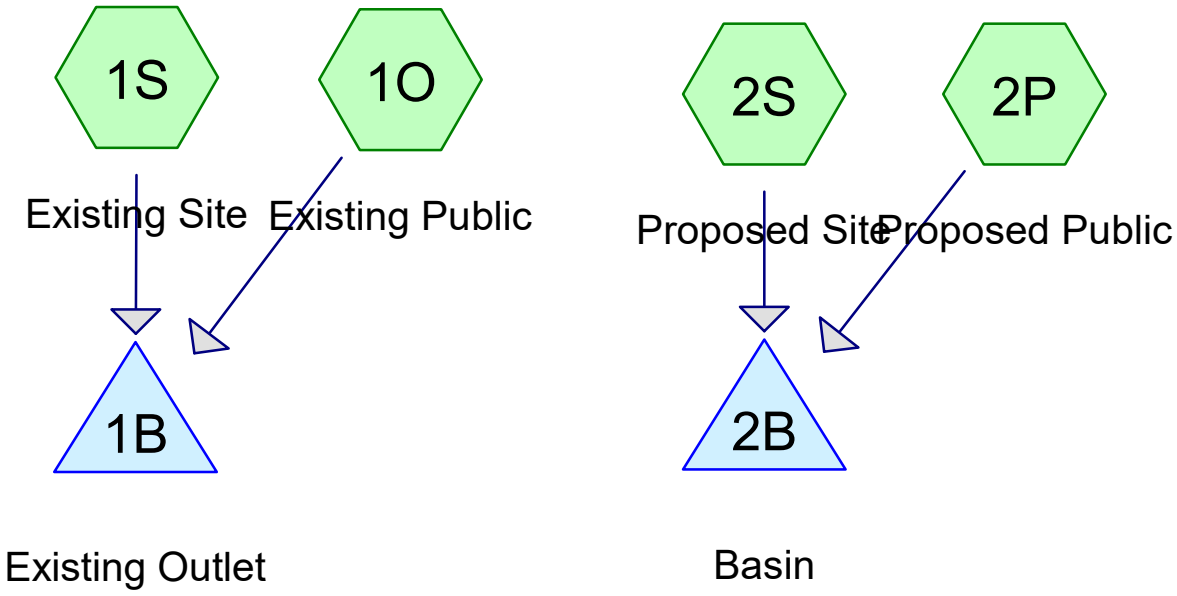


Subcat Reach Pond Link

Routing Diagram for 19021-HydroCAD
Prepared by {enter your company name here}, Printed 4/12/2019

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
8.767	74	>75% Grass cover, Good, HSG C (1O, 1S, 2S)
6.895	98	Paved parking, HSG C (1O, 1S, 2P, 2S)
2.544	98	Roofs, HSG C (1S, 2S)
18.206	**86**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
18.206	HSG C	1O, 1S, 2P, 2S
0.000	HSG D	
0.000	Other	
18.206		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	8.767	0.000	0.000	8.767	>75% Grass cover, Good	1O, 1S, 2S
0.000	0.000	6.895	0.000	0.000	6.895	Paved parking	1O, 1S, 2P, 2S
0.000	0.000	2.544	0.000	0.000	2.544	Roofs	1S, 2S
0.000	**0.000**	**18.206**	**0.000**	**0.000**	**18.206**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1O: Existing Public Runoff Area=19,710 sf 93.93% Impervious Runoff Depth=1.51"
Tc=24.0 min CN=74/98 Runoff=0.27 cfs 0.057 af

Subcatchment 1S: Existing Site Runoff Area=390,322 sf 46.73% Impervious Runoff Depth=0.88"
Tc=12.0 min CN=74/98 Runoff=3.91 cfs 0.659 af

Subcatchment 2P: Proposed Public Runoff Area=19,710 sf 100.00% Impervious Runoff Depth=1.59"
Tc=24.0 min CN=0/98 Runoff=0.29 cfs 0.060 af

Subcatchment 2S: Proposed Site Runoff Area=363,322 sf 52.46% Impervious Runoff Depth=0.96"
Tc=12.0 min CN=74/98 Runoff=4.05 cfs 0.666 af

Pond 1B: Existing Outlet Inflow=4.19 cfs 0.716 af
Primary=4.19 cfs 0.716 af

Pond 2B: Basin Peak Elev=92.63' Storage=0.285 af Inflow=4.34 cfs 0.726 af
Primary=0.60 cfs 0.674 af Secondary=0.00 cfs 0.000 af Outflow=0.60 cfs 0.674 af

Total Runoff Area = 18.206 ac Runoff Volume = 1.442 af Average Runoff Depth = 0.95"
48.15% Pervious = 8.767 ac 51.85% Impervious = 9.439 ac

Summary for Subcatchment 1O: Existing Public

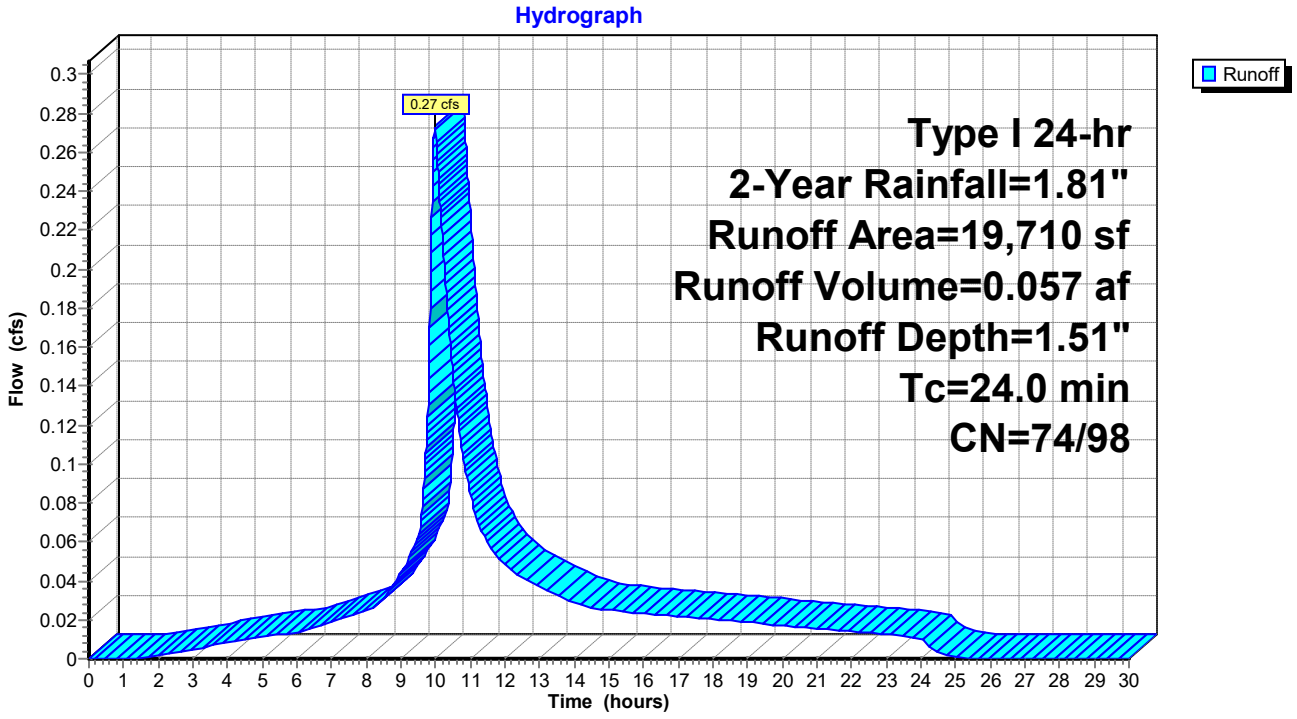
Runoff = 0.27 cfs @ 9.98 hrs, Volume= 0.057 af, Depth= 1.51"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 2-Year Rainfall=1.81"

Area (sf)	CN	Description
18,514	98	Paved parking, HSG C
1,196	74	>75% Grass cover, Good, HSG C
19,710	97	Weighted Average
1,196	74	6.07% Pervious Area
18,514	98	93.93% Impervious Area

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

Subcatchment 1O: Existing Public



Summary for Subcatchment 1S: Existing Site

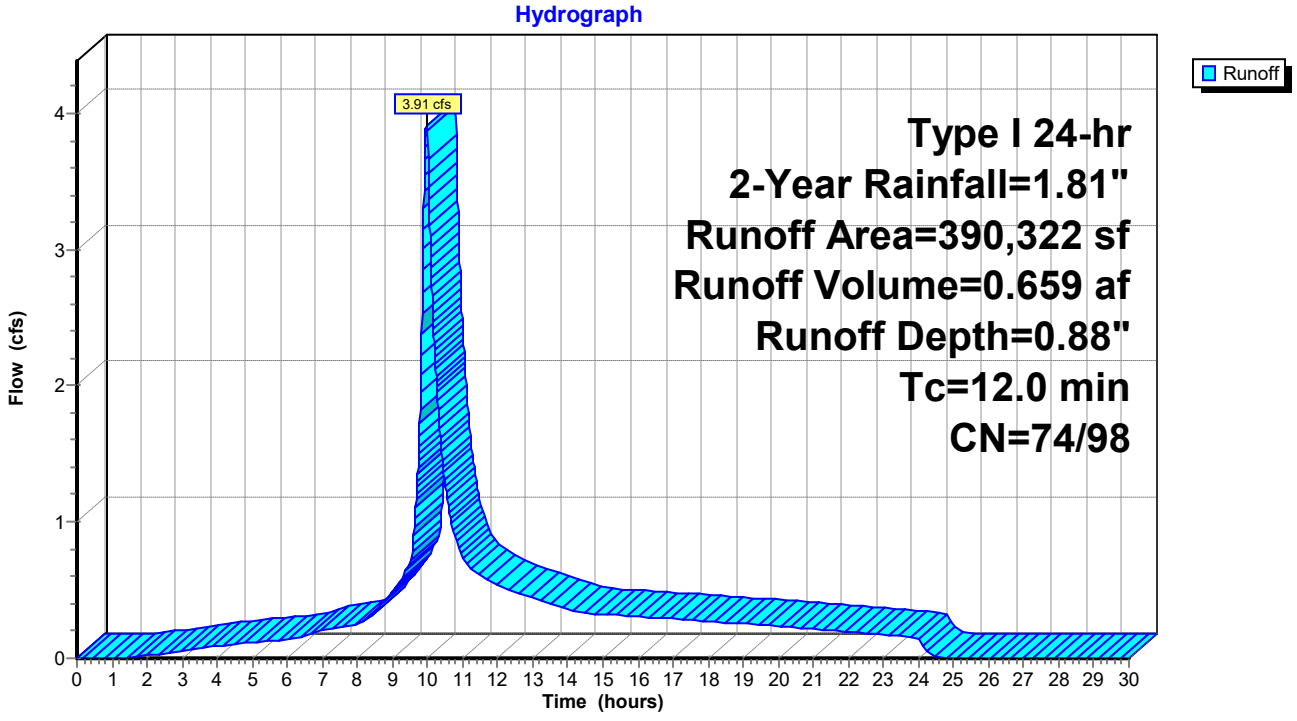
Runoff = 3.91 cfs @ 9.97 hrs, Volume= 0.659 af, Depth= 0.88"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 2-Year Rainfall=1.81"

Area (sf)	CN	Description
74,307	98	Roofs, HSG C
108,071	98	Paved parking, HSG C
207,944	74	>75% Grass cover, Good, HSG C
390,322	85	Weighted Average
207,944	74	53.27% Pervious Area
182,378	98	46.73% Impervious Area

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

Subcatchment 1S: Existing Site



Summary for Subcatchment 2P: Proposed Public

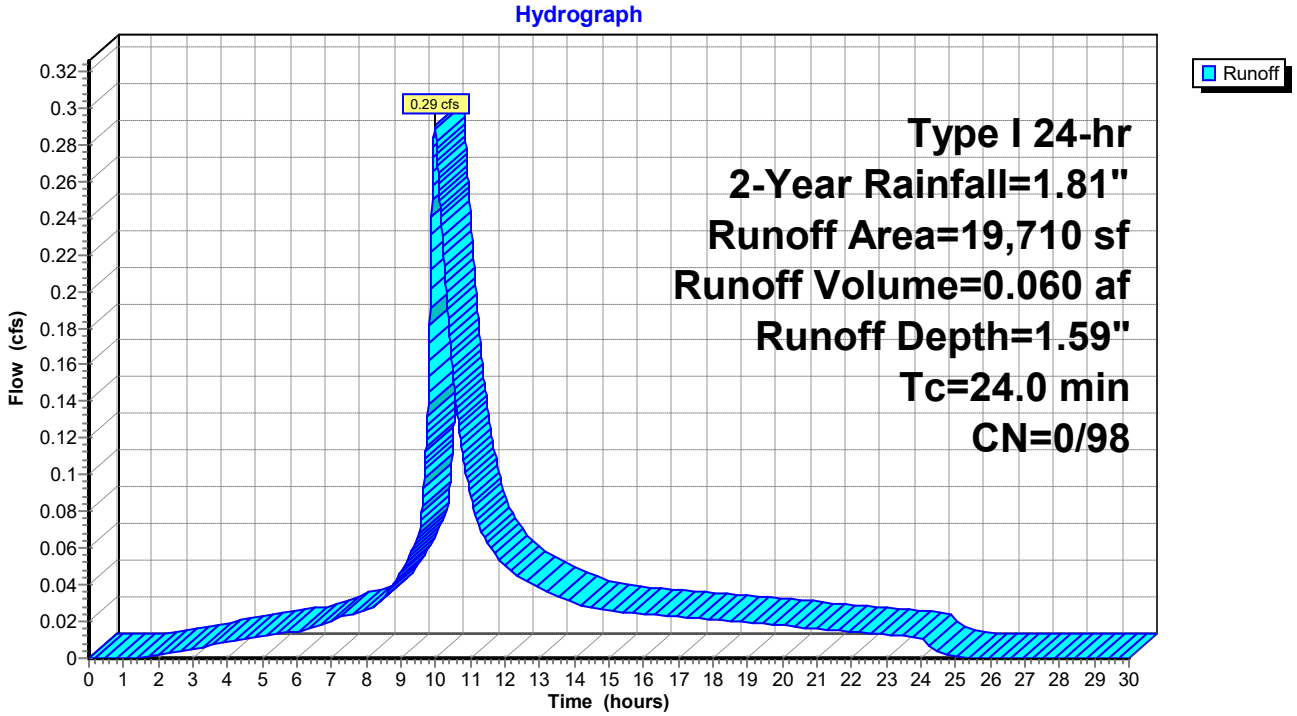
Runoff = 0.29 cfs @ 9.98 hrs, Volume= 0.060 af, Depth= 1.59"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 2-Year Rainfall=1.81"

Area (sf)	CN	Description
19,710	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
19,710	98	Weighted Average
19,710	98	100.00% Impervious Area

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

Subcatchment 2P: Proposed Public



Summary for Subcatchment 2S: Proposed Site

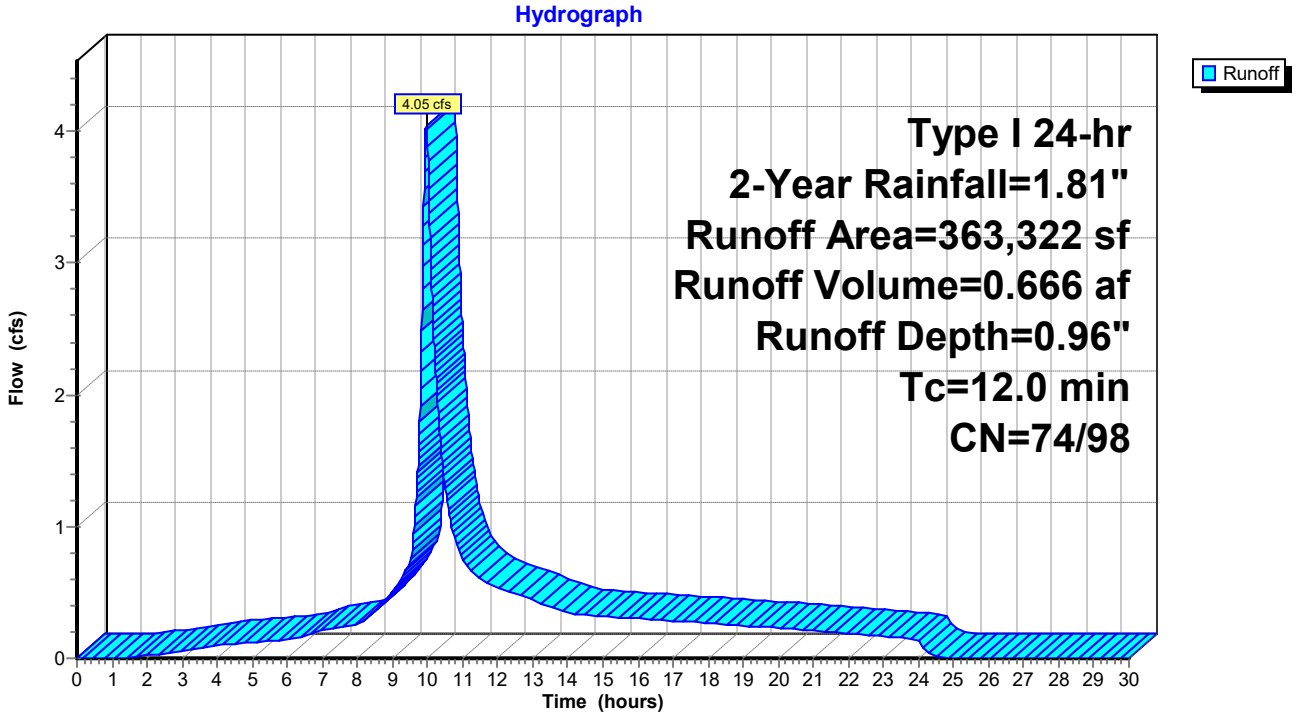
Runoff = 4.05 cfs @ 9.97 hrs, Volume= 0.666 af, Depth= 0.96"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 2-Year Rainfall=1.81"

Area (sf)	CN	Description
36,511	98	Roofs, HSG C
154,071	98	Paved parking, HSG C
172,740	74	>75% Grass cover, Good, HSG C
363,322	87	Weighted Average
172,740	74	47.54% Pervious Area
190,582	98	52.46% Impervious Area

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

Subcatchment 2S: Proposed Site



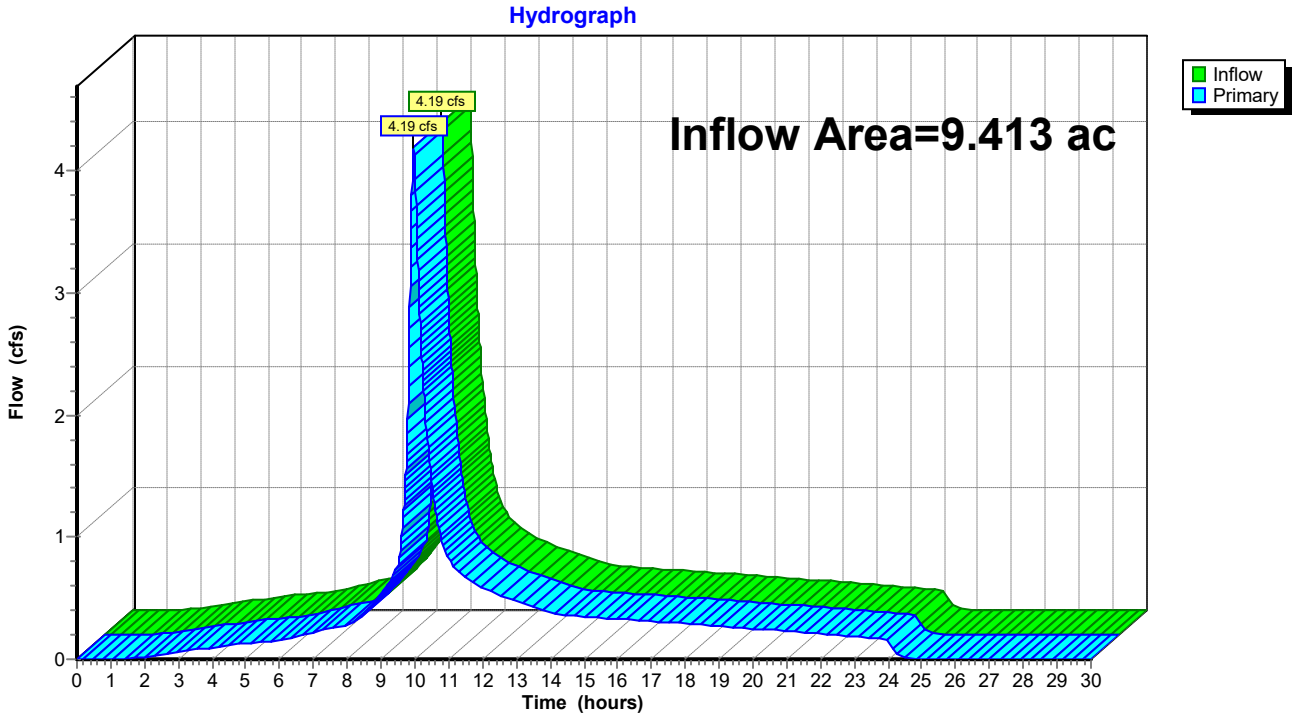
Summary for Pond 1B: Existing Outlet

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

Inflow Area = 9.413 ac, 48.99% Impervious, Inflow Depth = 0.91" for 2-Year event
Inflow = 4.19 cfs @ 9.97 hrs, Volume= 0.716 af
Primary = 4.19 cfs @ 9.97 hrs, Volume= 0.716 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond 1B: Existing Outlet



Summary for Pond 2B: Basin

Inflow Area = 8.793 ac, 54.90% Impervious, Inflow Depth = 0.99" for 2-Year event
Inflow = 4.34 cfs @ 9.97 hrs, Volume= 0.726 af
Outflow = 0.60 cfs @ 11.91 hrs, Volume= 0.674 af, Atten= 86%, Lag= 116.6 min
Primary = 0.60 cfs @ 11.91 hrs, Volume= 0.674 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 92.63' @ 11.91 hrs Surf.Area= 0.125 ac Storage= 0.285 af

Plug-Flow detention time= 291.9 min calculated for 0.674 af (93% of inflow)
Center-of-Mass det. time= 246.6 min (1,001.0 - 754.5)

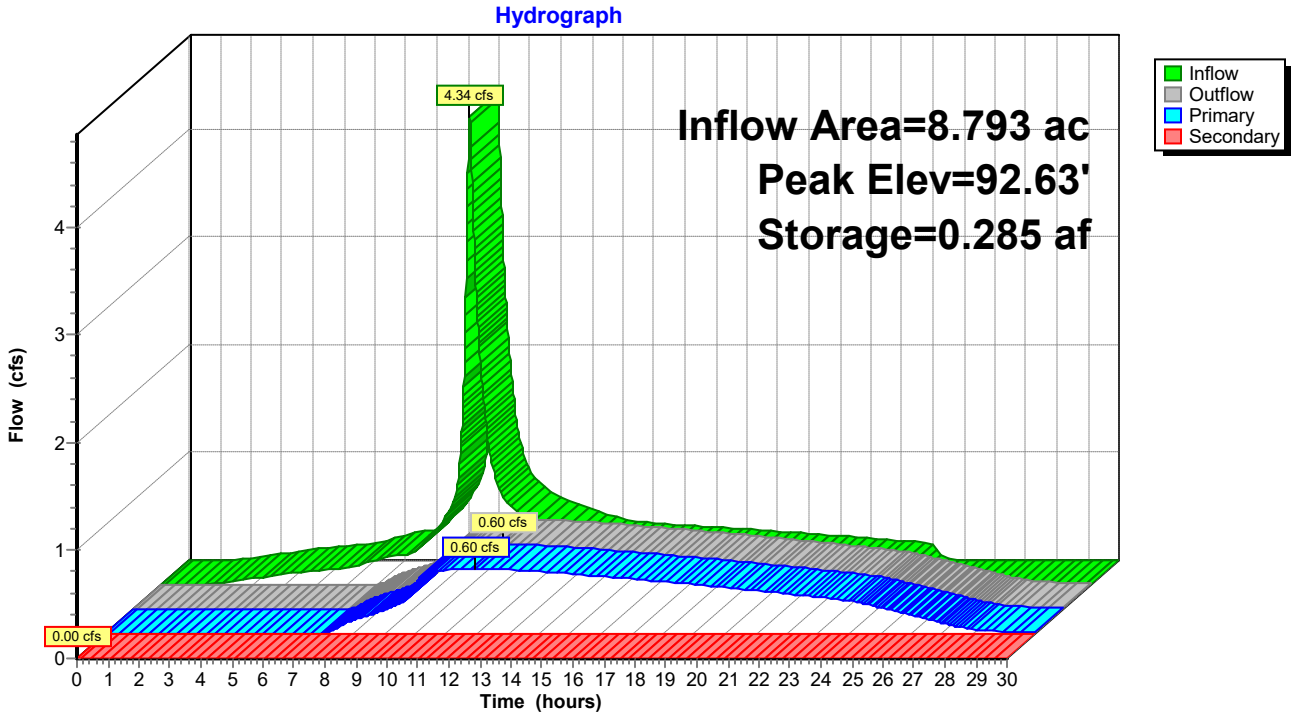
Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	0.398 af	**54.00'W x 74.00'L x 3.50'H Prismatoid Z=2.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	90.50'	**2.0" Vert. Orifice/Grate X 4.00** C= 0.600
#2	Secondary	92.75'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.60 cfs @ 11.91 hrs HW=92.63' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.60 cfs @ 6.90 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.00' (Free Discharge)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 2B: Basin



Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1O: Existing Public Runoff Area=19,710 sf 93.93% Impervious Runoff Depth=2.29"
Tc=24.0 min CN=74/98 Runoff=0.41 cfs 0.086 af

Subcatchment 1S: Existing Site Runoff Area=390,322 sf 46.73% Impervious Runoff Depth=1.48"
Tc=12.0 min CN=74/98 Runoff=6.76 cfs 1.103 af

Subcatchment 2P: Proposed Public Runoff Area=19,710 sf 100.00% Impervious Runoff Depth=2.39"
Tc=24.0 min CN=0/98 Runoff=0.43 cfs 0.090 af

Subcatchment 2S: Proposed Site Runoff Area=363,322 sf 52.46% Impervious Runoff Depth=1.58"
Tc=12.0 min CN=74/98 Runoff=6.80 cfs 1.095 af

Pond 1B: Existing Outlet Inflow=7.17 cfs 1.189 af
Primary=7.17 cfs 1.189 af

Pond 2B: Basin Peak Elev=92.98' Storage=0.329 af Inflow=7.23 cfs 1.185 af
Primary=0.65 cfs 0.897 af Secondary=3.38 cfs 0.231 af Outflow=4.03 cfs 1.128 af

Total Runoff Area = 18.206 ac Runoff Volume = 2.375 af Average Runoff Depth = 1.57"
48.15% Pervious = 8.767 ac 51.85% Impervious = 9.439 ac

Summary for Subcatchment 1O: Existing Public

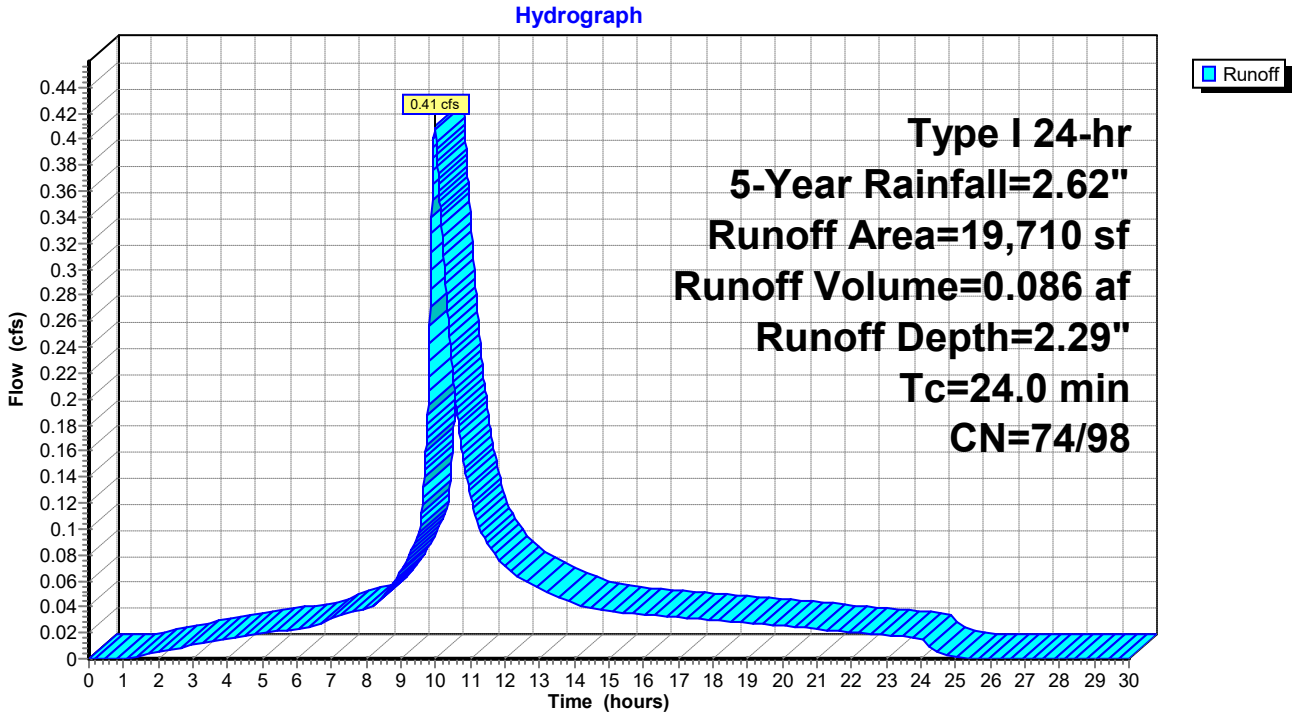
Runoff = 0.41 cfs @ 9.98 hrs, Volume= 0.086 af, Depth= 2.29"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 5-Year Rainfall=2.62"

Area (sf)	CN	Description
18,514	98	Paved parking, HSG C
1,196	74	>75% Grass cover, Good, HSG C
19,710	97	Weighted Average
1,196	74	6.07% Pervious Area
18,514	98	93.93% Impervious Area

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

Subcatchment 1O: Existing Public



Summary for Subcatchment 1S: Existing Site

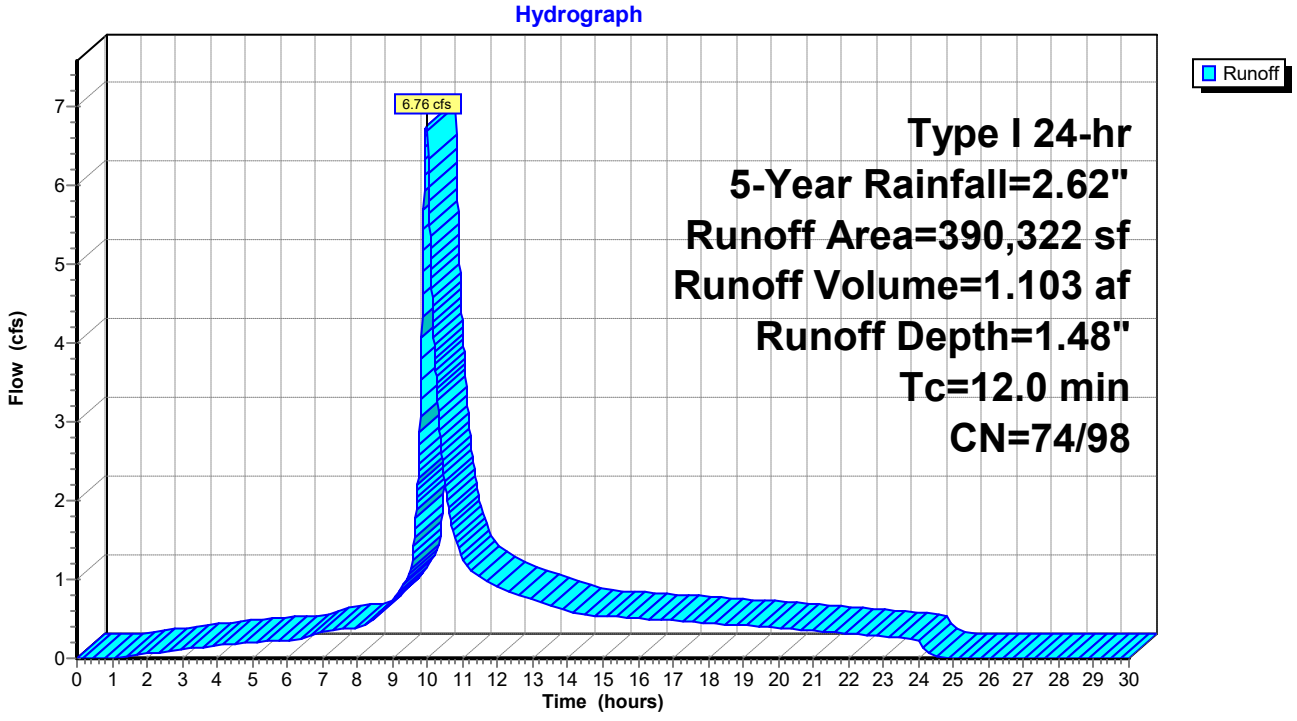
Runoff = 6.76 cfs @ 9.97 hrs, Volume= 1.103 af, Depth= 1.48"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 5-Year Rainfall=2.62"

Area (sf)	CN	Description
74,307	98	Roofs, HSG C
108,071	98	Paved parking, HSG C
207,944	74	>75% Grass cover, Good, HSG C
390,322	85	Weighted Average
207,944	74	53.27% Pervious Area
182,378	98	46.73% Impervious Area

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

Subcatchment 1S: Existing Site



Summary for Subcatchment 2P: Proposed Public

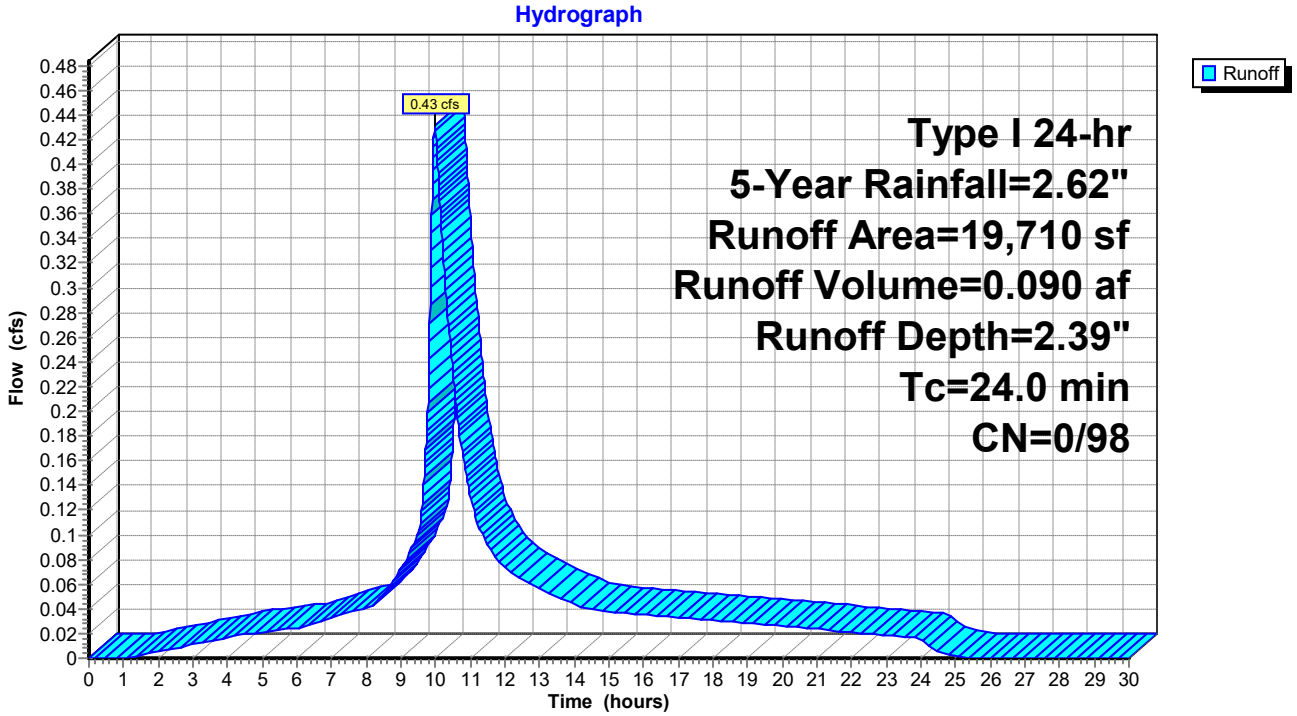
Runoff = 0.43 cfs @ 9.98 hrs, Volume= 0.090 af, Depth= 2.39"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 5-Year Rainfall=2.62"

Area (sf)	CN	Description
19,710	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
19,710	98	Weighted Average
19,710	98	100.00% Impervious Area

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

Subcatchment 2P: Proposed Public



Summary for Subcatchment 2S: Proposed Site

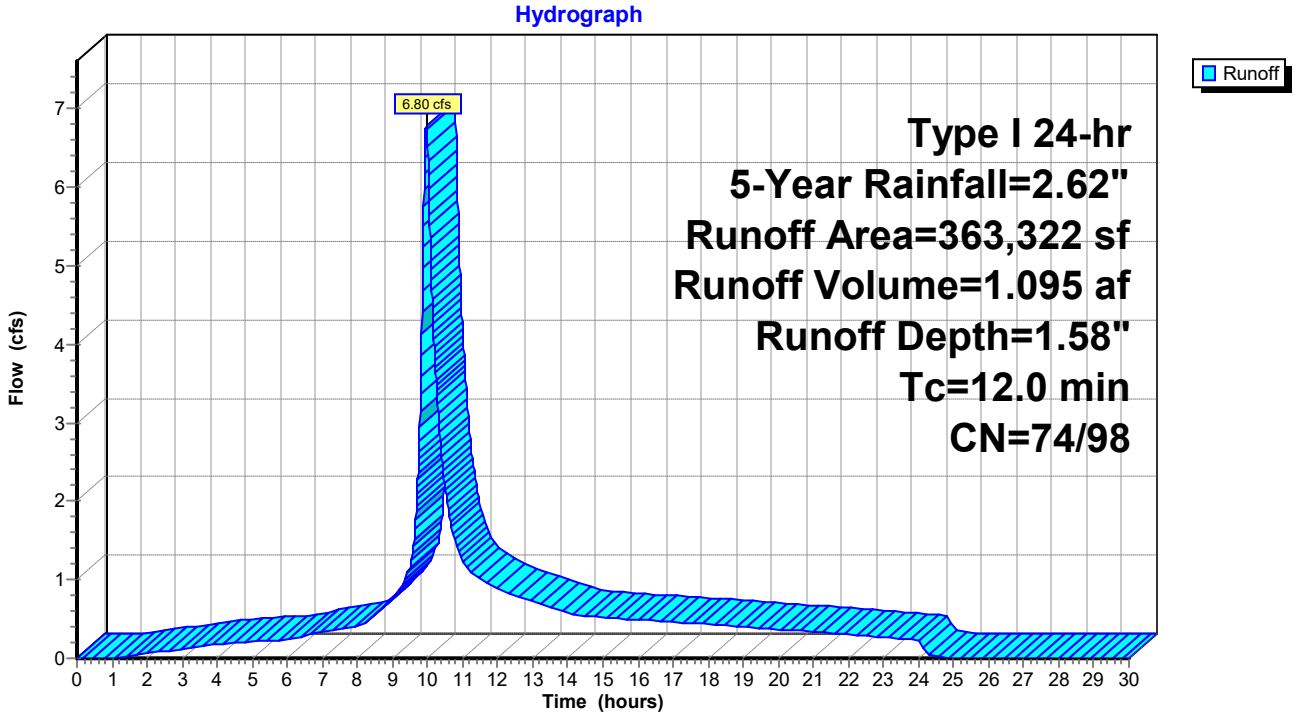
Runoff = 6.80 cfs @ 9.97 hrs, Volume= 1.095 af, Depth= 1.58"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 5-Year Rainfall=2.62"

Area (sf)	CN	Description
36,511	98	Roofs, HSG C
154,071	98	Paved parking, HSG C
172,740	74	>75% Grass cover, Good, HSG C
363,322	87	Weighted Average
172,740	74	47.54% Pervious Area
190,582	98	52.46% Impervious Area

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

Subcatchment 2S: Proposed Site



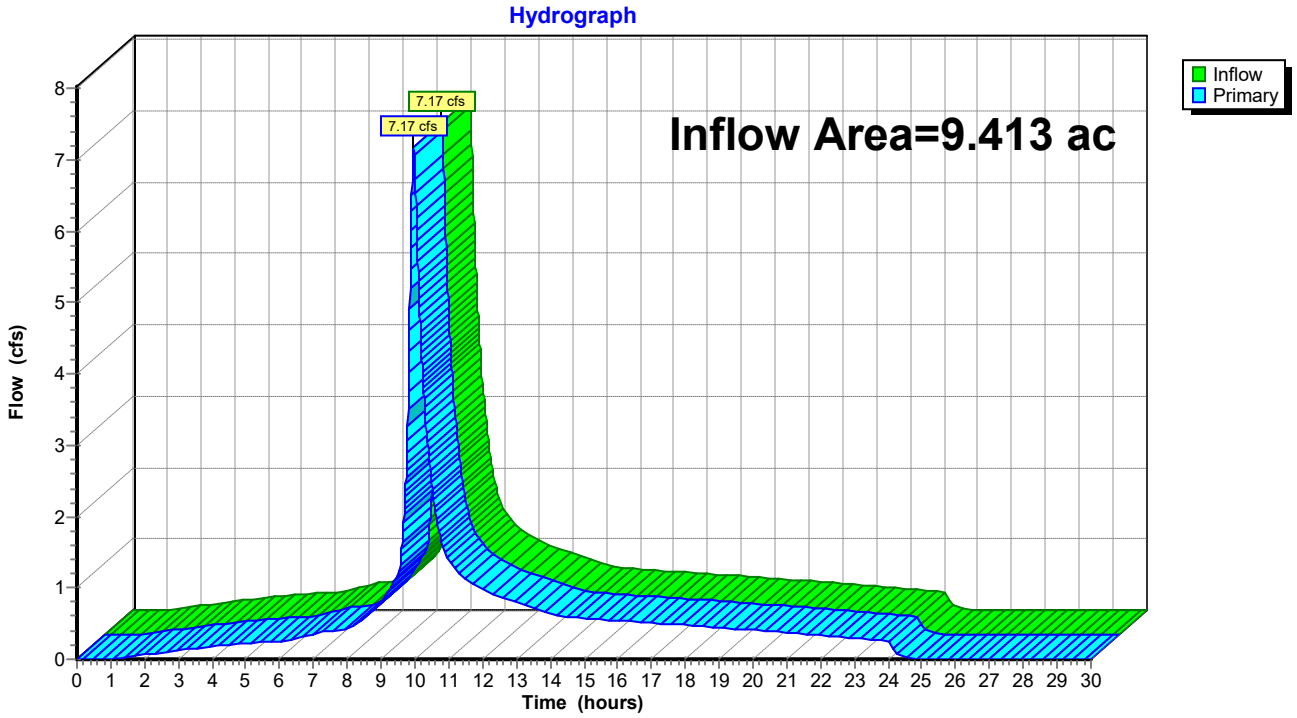
Summary for Pond 1B: Existing Outlet

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

Inflow Area = 9.413 ac, 48.99% Impervious, Inflow Depth = 1.52" for 5-Year event
Inflow = 7.17 cfs @ 9.97 hrs, Volume= 1.189 af
Primary = 7.17 cfs @ 9.97 hrs, Volume= 1.189 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond 1B: Existing Outlet



Summary for Pond 2B: Basin

Inflow Area = 8.793 ac, 54.90% Impervious, Inflow Depth = 1.62" for 5-Year event
Inflow = 7.23 cfs @ 9.97 hrs, Volume= 1.185 af
Outflow = 4.03 cfs @ 10.22 hrs, Volume= 1.128 af, Atten= 44%, Lag= 15.3 min
Primary = 0.65 cfs @ 10.22 hrs, Volume= 0.897 af
Secondary = 3.38 cfs @ 10.22 hrs, Volume= 0.231 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 92.98' @ 10.22 hrs Surf.Area= 0.130 ac Storage= 0.329 af

Plug-Flow detention time= 242.0 min calculated for 1.128 af (95% of inflow)
Center-of-Mass det. time= 210.1 min (959.1 - 749.0)

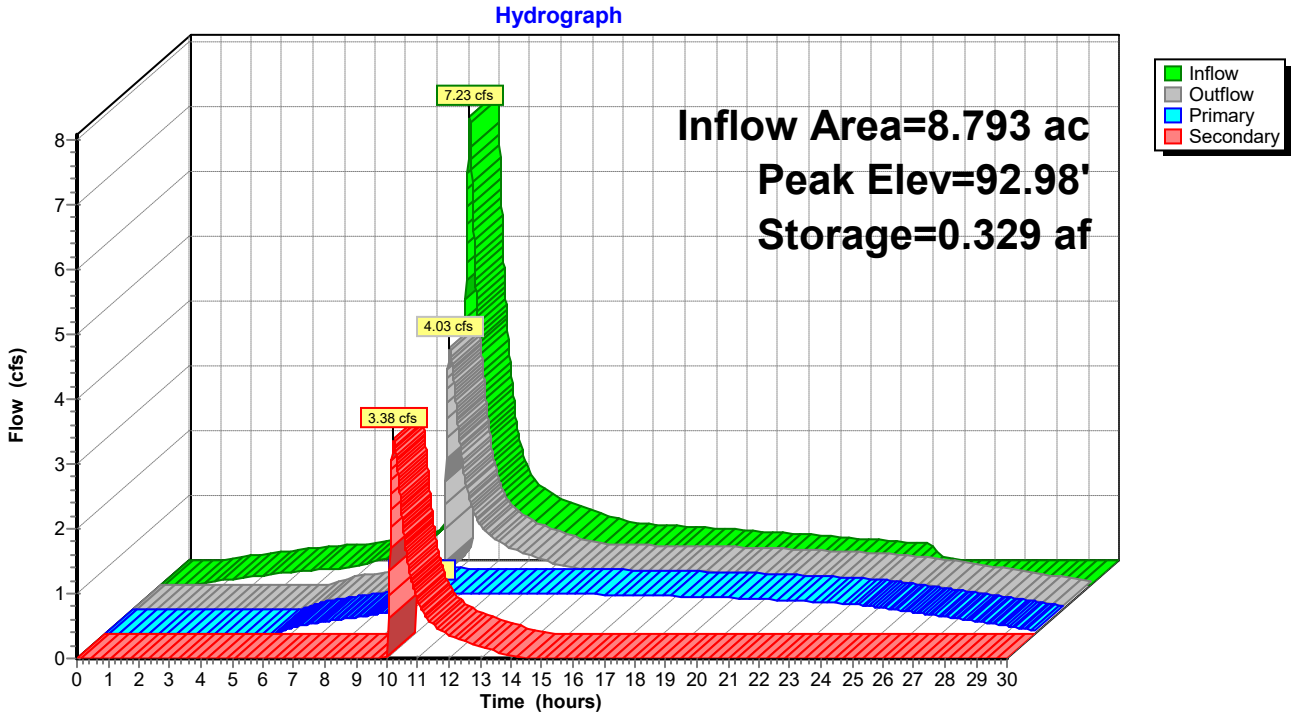
Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	0.398 af	**54.00'W x 74.00'L x 3.50'H Prismatoid Z=2.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	90.50'	**2.0" Vert. Orifice/Grate X 4.00** C= 0.600
#2	Secondary	92.75'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.65 cfs @ 10.22 hrs HW=92.98' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.65 cfs @ 7.45 fps)

Secondary OutFlow Max=3.38 cfs @ 10.22 hrs HW=92.98' (Free Discharge)
└**2=Orifice/Grate** (Weir Controls 3.38 cfs @ 1.57 fps)

Pond 2B: Basin



Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1O: Existing Public Runoff Area=19,710 sf 93.93% Impervious Runoff Depth=2.80"
Tc=24.0 min CN=74/98 Runoff=0.50 cfs 0.106 af

Subcatchment 1S: Existing Site Runoff Area=390,322 sf 46.73% Impervious Runoff Depth=1.90"
Tc=12.0 min CN=74/98 Runoff=8.83 cfs 1.418 af

Subcatchment 2P: Proposed Public Runoff Area=19,710 sf 100.00% Impervious Runoff Depth=2.92"
Tc=24.0 min CN=0/98 Runoff=0.52 cfs 0.110 af

Subcatchment 2S: Proposed Site Runoff Area=363,322 sf 52.46% Impervious Runoff Depth=2.01"
Tc=12.0 min CN=74/98 Runoff=8.76 cfs 1.396 af

Pond 1B: Existing Outlet Inflow=9.33 cfs 1.523 af
Primary=9.33 cfs 1.523 af

Pond 2B: Basin Peak Elev=93.11' Storage=0.345 af Inflow=9.28 cfs 1.506 af
Primary=0.67 cfs 0.994 af Secondary=6.55 cfs 0.446 af Outflow=7.21 cfs 1.440 af

Total Runoff Area = 18.206 ac Runoff Volume = 3.029 af Average Runoff Depth = 2.00"
48.15% Pervious = 8.767 ac 51.85% Impervious = 9.439 ac

Summary for Subcatchment 1O: Existing Public

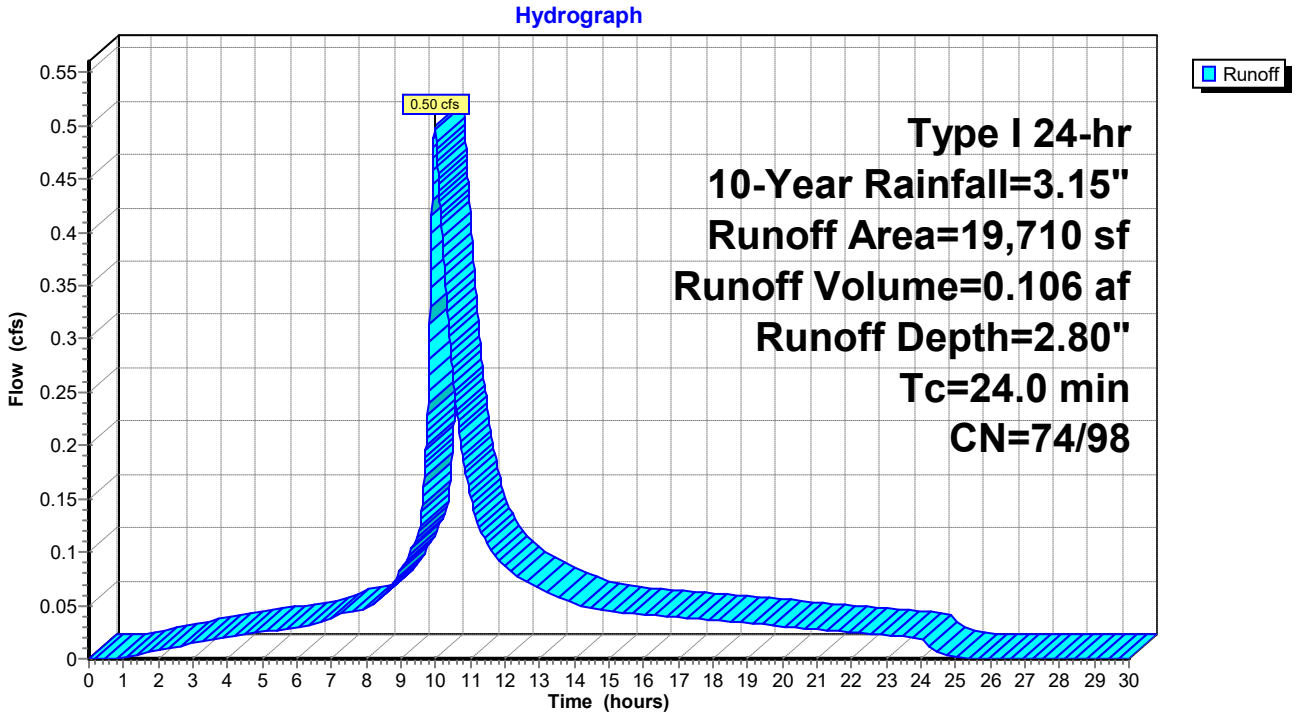
Runoff = 0.50 cfs @ 9.98 hrs, Volume= 0.106 af, Depth= 2.80"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 10-Year Rainfall=3.15"

Area (sf)	CN	Description
18,514	98	Paved parking, HSG C
1,196	74	>75% Grass cover, Good, HSG C
19,710	97	Weighted Average
1,196	74	6.07% Pervious Area
18,514	98	93.93% Impervious Area

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

Subcatchment 1O: Existing Public



Summary for Subcatchment 1S: Existing Site

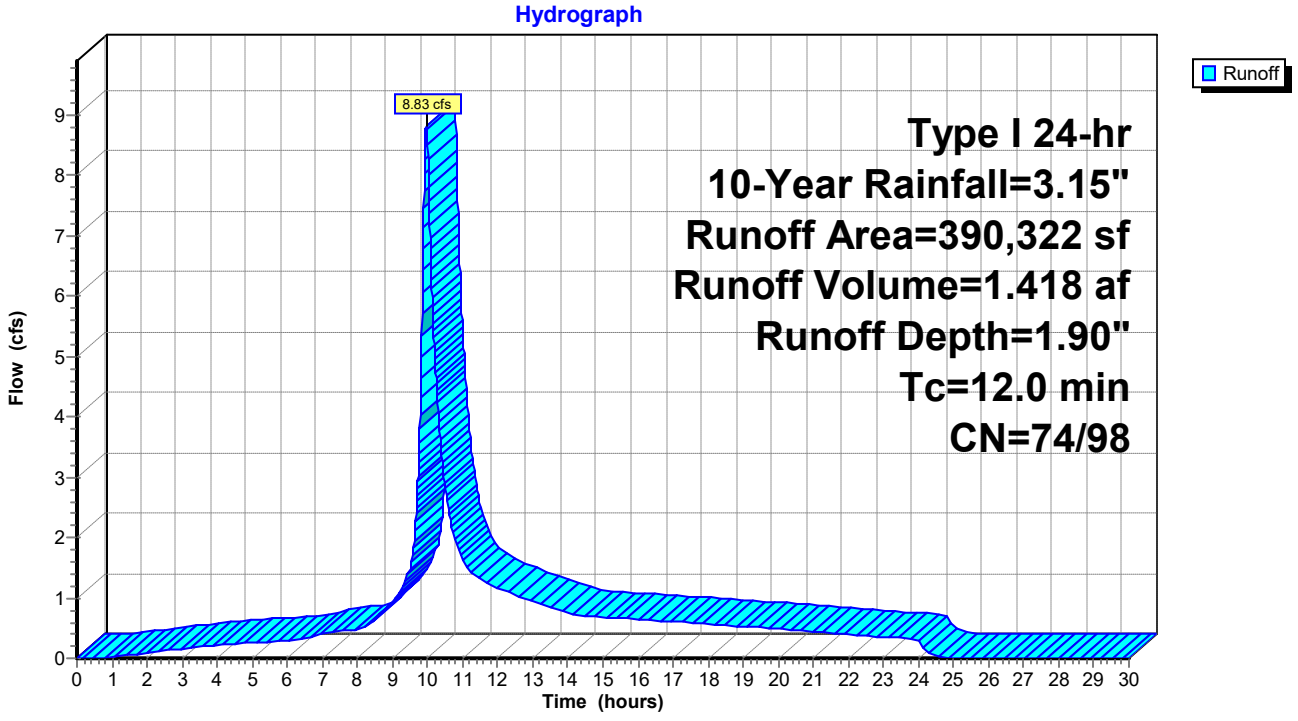
Runoff = 8.83 cfs @ 9.97 hrs, Volume= 1.418 af, Depth= 1.90"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 10-Year Rainfall=3.15"

Area (sf)	CN	Description
74,307	98	Roofs, HSG C
108,071	98	Paved parking, HSG C
207,944	74	>75% Grass cover, Good, HSG C
390,322	85	Weighted Average
207,944	74	53.27% Pervious Area
182,378	98	46.73% Impervious Area

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

Subcatchment 1S: Existing Site



Summary for Subcatchment 2P: Proposed Public

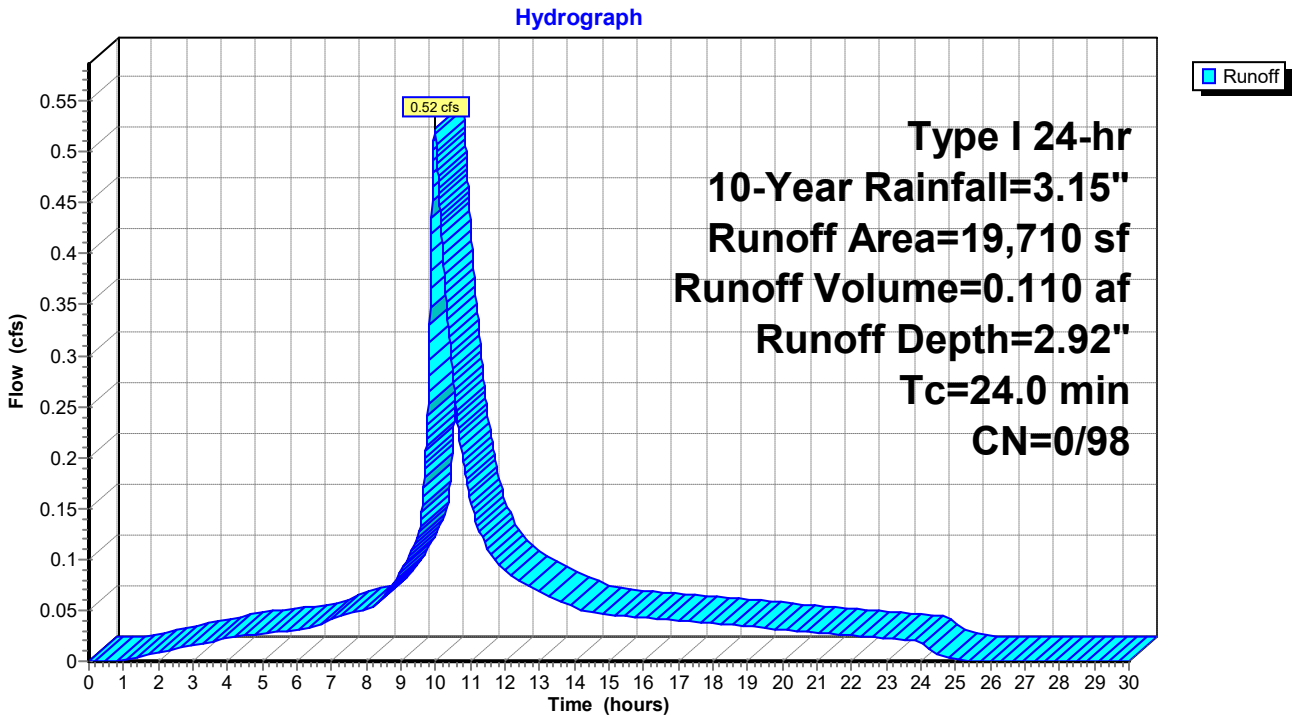
Runoff = 0.52 cfs @ 9.98 hrs, Volume= 0.110 af, Depth= 2.92"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 10-Year Rainfall=3.15"

Area (sf)	CN	Description
19,710	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
19,710	98	Weighted Average
19,710	98	100.00% Impervious Area

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

Subcatchment 2P: Proposed Public



Summary for Subcatchment 2S: Proposed Site

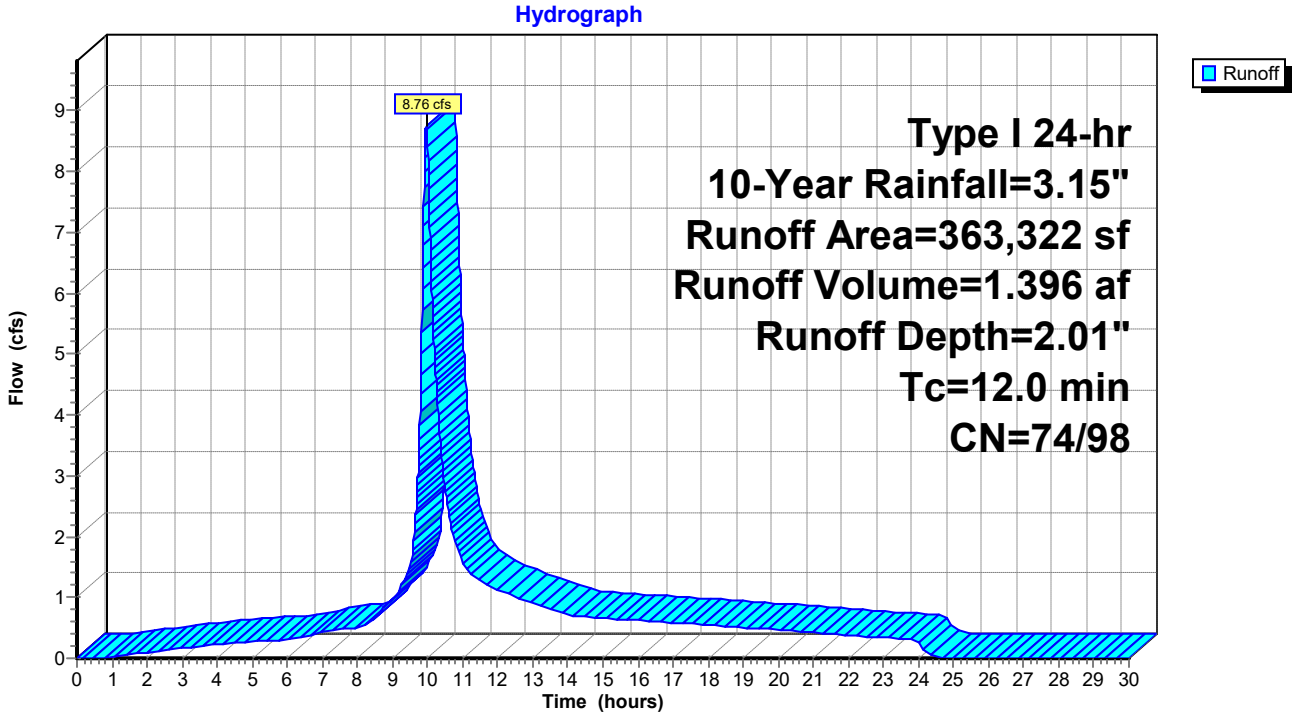
Runoff = 8.76 cfs @ 9.97 hrs, Volume= 1.396 af, Depth= 2.01"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 10-Year Rainfall=3.15"

Area (sf)	CN	Description
36,511	98	Roofs, HSG C
154,071	98	Paved parking, HSG C
172,740	74	>75% Grass cover, Good, HSG C
363,322	87	Weighted Average
172,740	74	47.54% Pervious Area
190,582	98	52.46% Impervious Area

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

Subcatchment 2S: Proposed Site



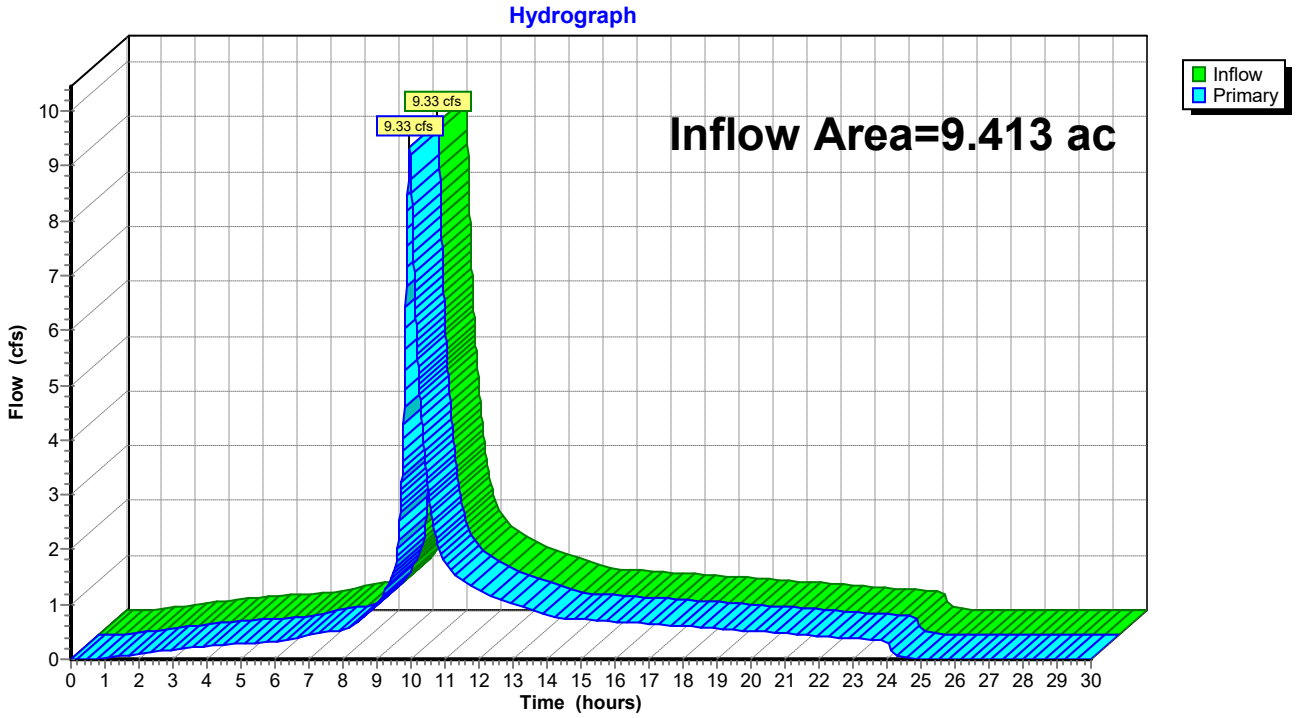
Summary for Pond 1B: Existing Outlet

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

Inflow Area = 9.413 ac, 48.99% Impervious, Inflow Depth = 1.94" for 10-Year event
Inflow = 9.33 cfs @ 9.97 hrs, Volume= 1.523 af
Primary = 9.33 cfs @ 9.97 hrs, Volume= 1.523 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond 1B: Existing Outlet



Summary for Pond 2B: Basin

Inflow Area = 8.793 ac, 54.90% Impervious, Inflow Depth = 2.05" for 10-Year event
Inflow = 9.28 cfs @ 9.97 hrs, Volume= 1.506 af
Outflow = 7.21 cfs @ 10.08 hrs, Volume= 1.440 af, Atten= 22%, Lag= 6.7 min
Primary = 0.67 cfs @ 10.08 hrs, Volume= 0.994 af
Secondary = 6.55 cfs @ 10.08 hrs, Volume= 0.446 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 93.11' @ 10.08 hrs Surf.Area= 0.132 ac Storage= 0.345 af

Plug-Flow detention time= 211.6 min calculated for 1.440 af (96% of inflow)
Center-of-Mass det. time= 182.6 min (928.6 - 745.9)

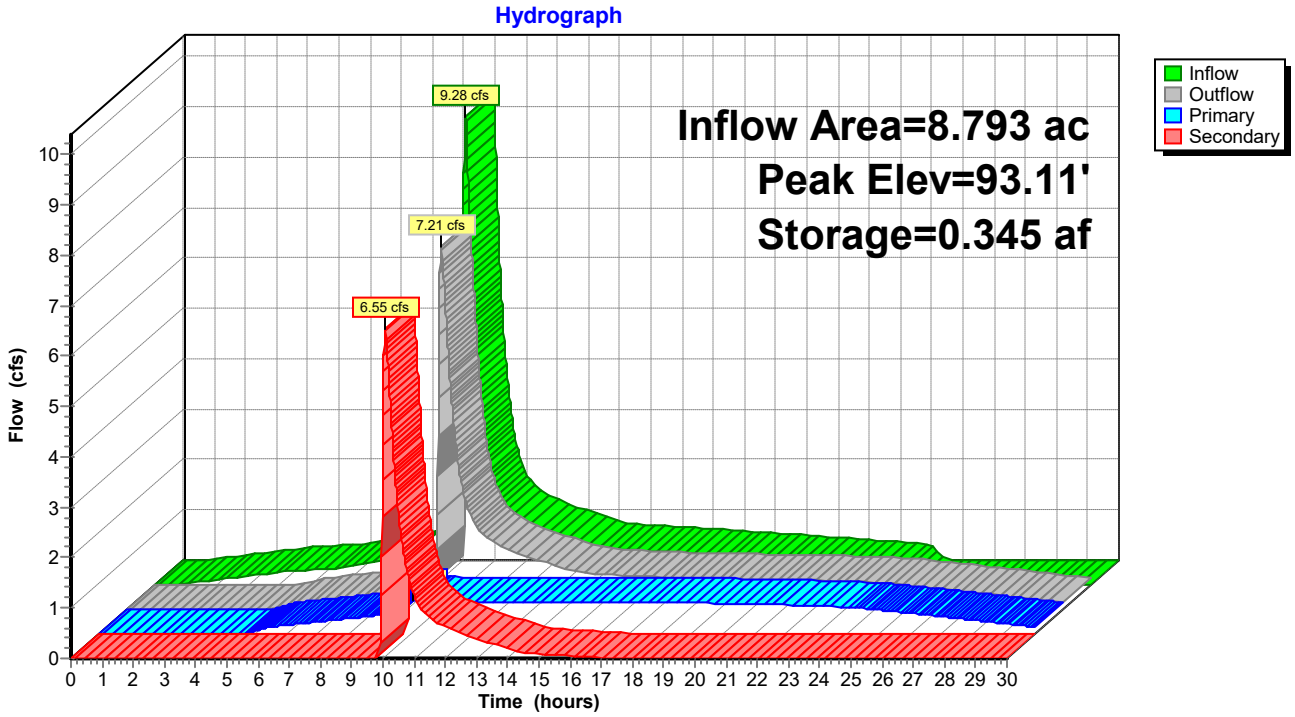
Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	0.398 af	**54.00'W x 74.00'L x 3.50'H Prismatoid Z=2.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	90.50'	**2.0" Vert. Orifice/Grate X 4.00** C= 0.600
#2	Secondary	92.75'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.67 cfs @ 10.08 hrs HW=93.11' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.67 cfs @ 7.65 fps)

Secondary OutFlow Max=6.54 cfs @ 10.08 hrs HW=93.11' (Free Discharge)
└**2=Orifice/Grate** (Weir Controls 6.54 cfs @ 1.95 fps)

Pond 2B: Basin



Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1O: Existing Public Runoff Area=19,710 sf 93.93% Impervious Runoff Depth=3.45"
Tc=24.0 min CN=74/98 Runoff=0.61 cfs 0.130 af

Subcatchment 1S: Existing Site Runoff Area=390,322 sf 46.73% Impervious Runoff Depth=2.45"
Tc=12.0 min CN=74/98 Runoff=11.55 cfs 1.828 af

Subcatchment 2P: Proposed Public Runoff Area=19,710 sf 100.00% Impervious Runoff Depth=3.58"
Tc=24.0 min CN=0/98 Runoff=0.64 cfs 0.135 af

Subcatchment 2S: Proposed Site Runoff Area=363,322 sf 52.46% Impervious Runoff Depth=2.57"
Tc=12.0 min CN=74/98 Runoff=11.33 cfs 1.786 af

Pond 1B: Existing Outlet Inflow=12.15 cfs 1.958 af
Primary=12.15 cfs 1.958 af

Pond 2B: Basin Peak Elev=93.23' Storage=0.362 af Inflow=11.96 cfs 1.920 af
Primary=0.68 cfs 1.070 af Secondary=10.33 cfs 0.774 af Outflow=11.01 cfs 1.843 af

Total Runoff Area = 18.206 ac Runoff Volume = 3.878 af Average Runoff Depth = 2.56"
48.15% Pervious = 8.767 ac 51.85% Impervious = 9.439 ac

Summary for Subcatchment 1O: Existing Public

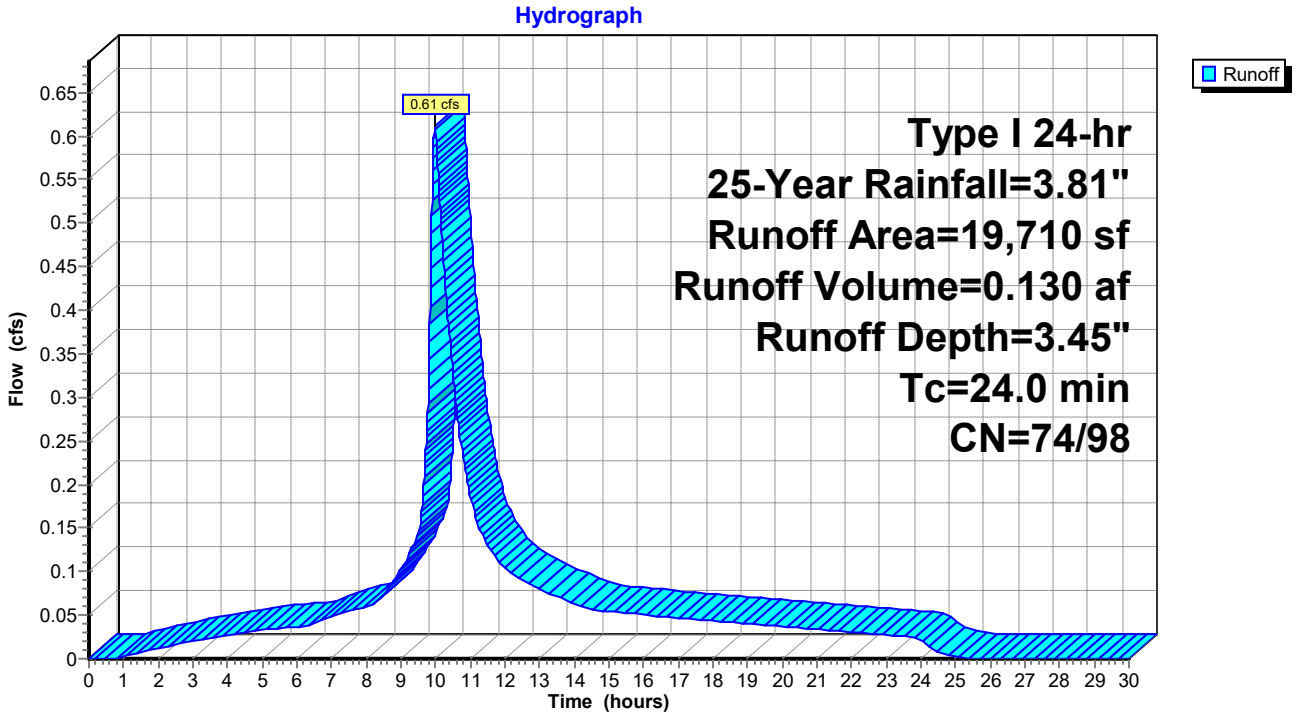
Runoff = 0.61 cfs @ 9.98 hrs, Volume= 0.130 af, Depth= 3.45"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 25-Year Rainfall=3.81"

Area (sf)	CN	Description
18,514	98	Paved parking, HSG C
1,196	74	>75% Grass cover, Good, HSG C
19,710	97	Weighted Average
1,196	74	6.07% Pervious Area
18,514	98	93.93% Impervious Area

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

Subcatchment 1O: Existing Public



Summary for Subcatchment 1S: Existing Site

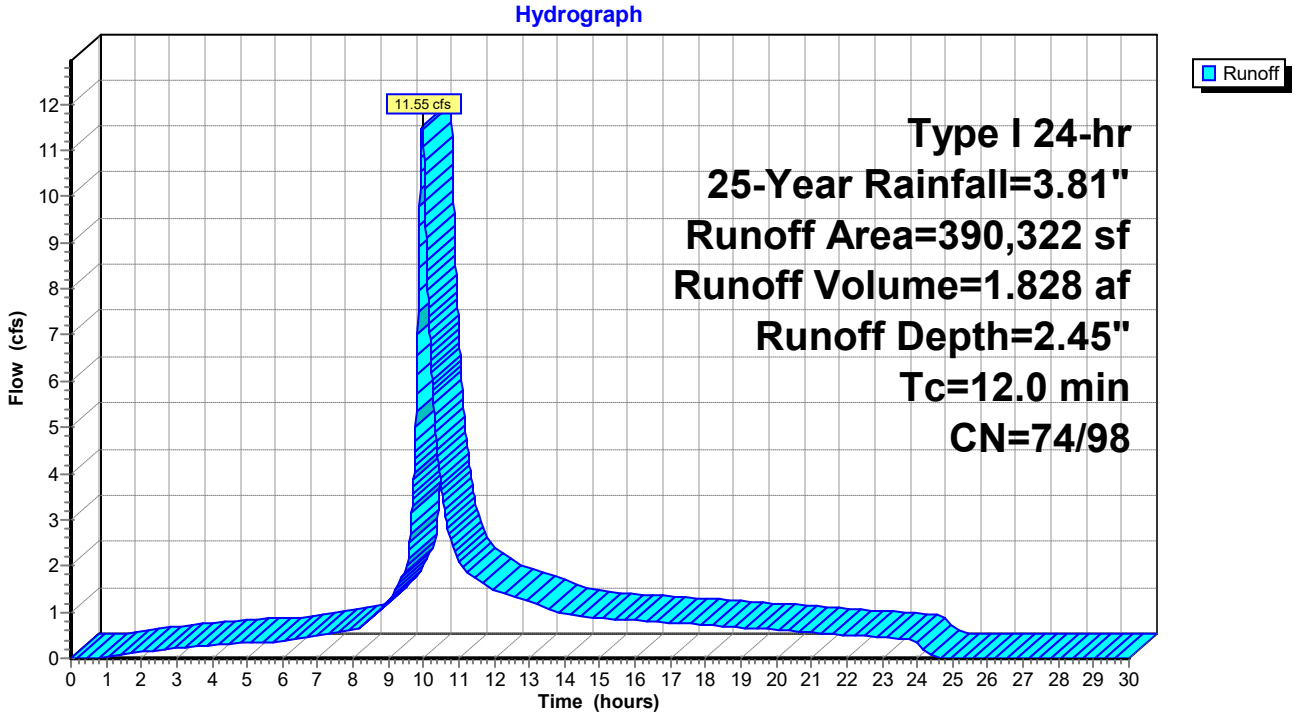
Runoff = 11.55 cfs @ 9.97 hrs, Volume= 1.828 af, Depth= 2.45"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 25-Year Rainfall=3.81"

Area (sf)	CN	Description
74,307	98	Roofs, HSG C
108,071	98	Paved parking, HSG C
207,944	74	>75% Grass cover, Good, HSG C
390,322	85	Weighted Average
207,944	74	53.27% Pervious Area
182,378	98	46.73% Impervious Area

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

Subcatchment 1S: Existing Site



Summary for Subcatchment 2P: Proposed Public

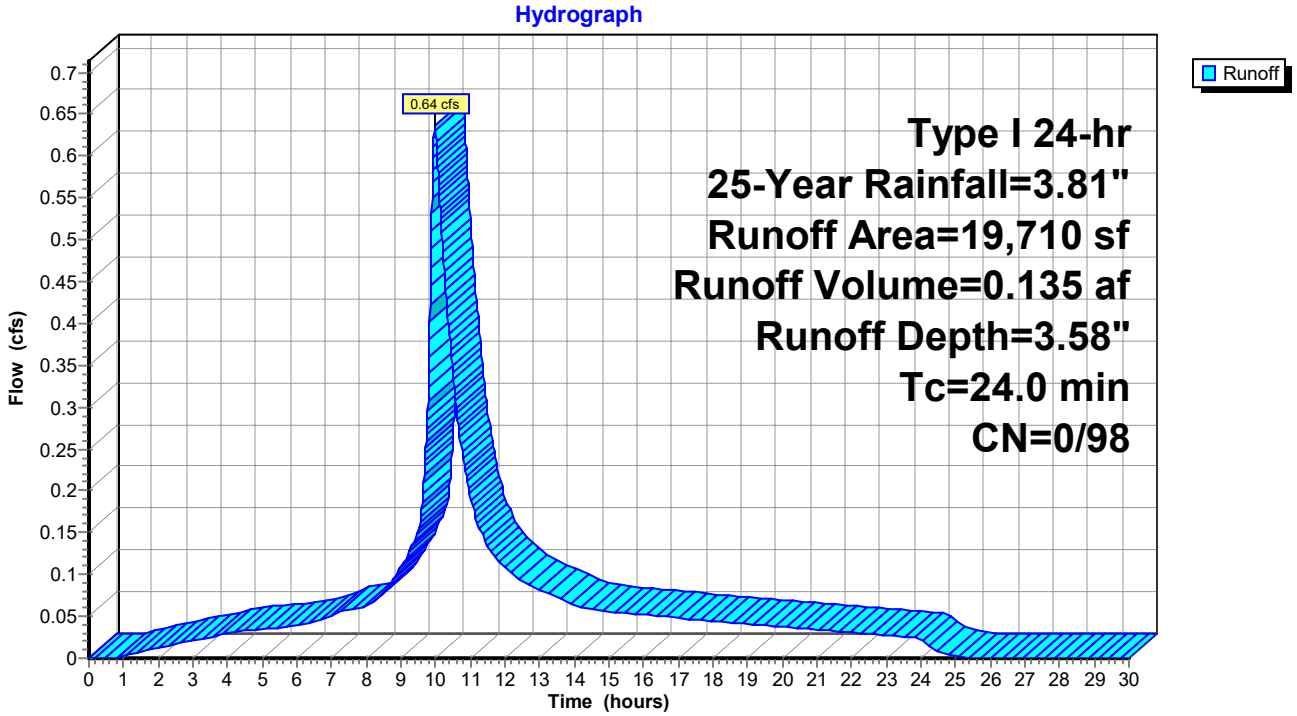
Runoff = 0.64 cfs @ 9.98 hrs, Volume= 0.135 af, Depth= 3.58"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 25-Year Rainfall=3.81"

Area (sf)	CN	Description
19,710	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
19,710	98	Weighted Average
19,710	98	100.00% Impervious Area

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

Subcatchment 2P: Proposed Public



Summary for Subcatchment 2S: Proposed Site

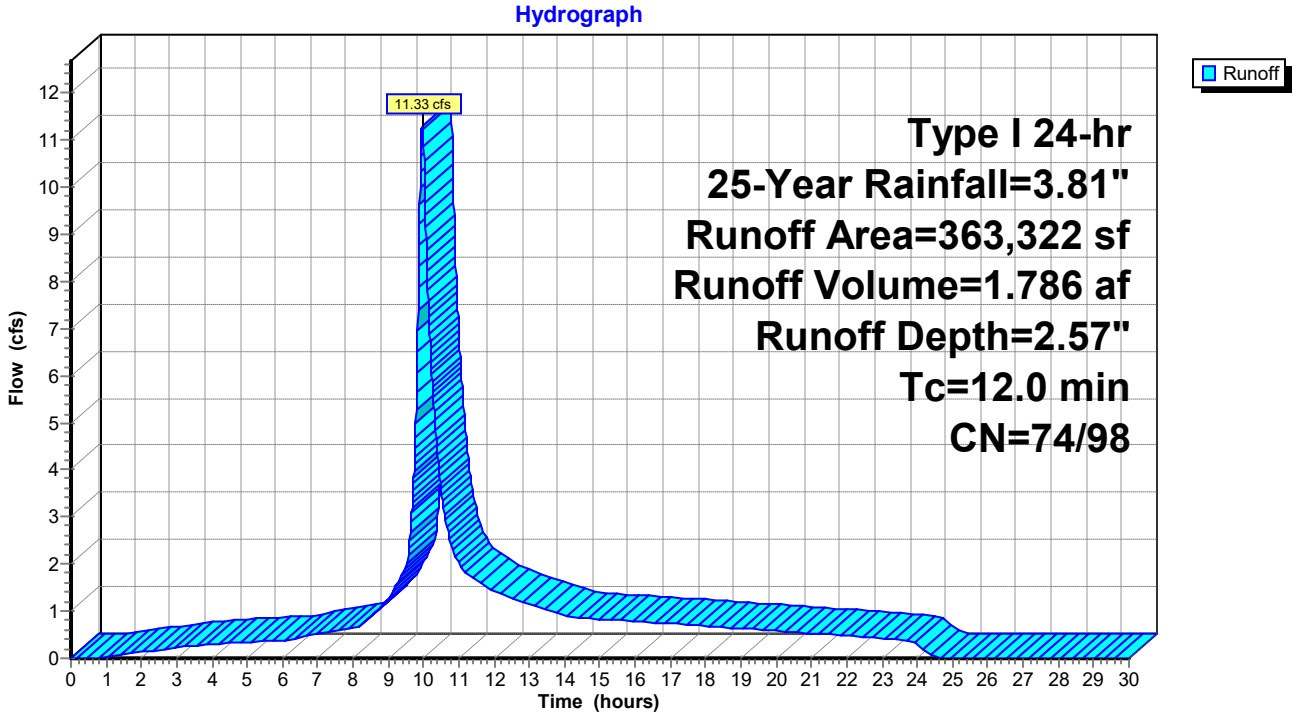
Runoff = 11.33 cfs @ 9.97 hrs, Volume= 1.786 af, Depth= 2.57"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 25-Year Rainfall=3.81"

Area (sf)	CN	Description
36,511	98	Roofs, HSG C
154,071	98	Paved parking, HSG C
172,740	74	>75% Grass cover, Good, HSG C
363,322	87	Weighted Average
172,740	74	47.54% Pervious Area
190,582	98	52.46% Impervious Area

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

Subcatchment 2S: Proposed Site



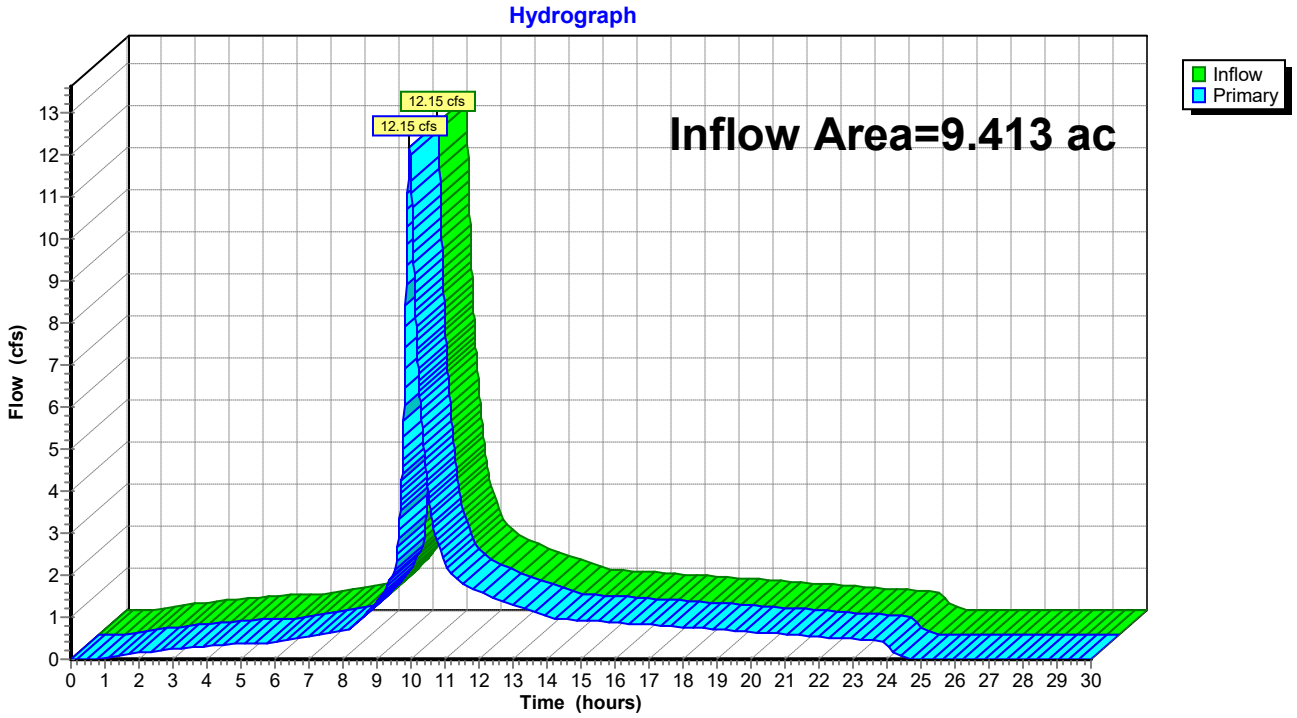
Summary for Pond 1B: Existing Outlet

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

Inflow Area = 9.413 ac, 48.99% Impervious, Inflow Depth = 2.50" for 25-Year event
Inflow = 12.15 cfs @ 9.97 hrs, Volume= 1.958 af
Primary = 12.15 cfs @ 9.97 hrs, Volume= 1.958 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond 1B: Existing Outlet



Summary for Pond 2B: Basin

Inflow Area = 8.793 ac, 54.90% Impervious, Inflow Depth = 2.62" for 25-Year event
Inflow = 11.96 cfs @ 9.97 hrs, Volume= 1.920 af
Outflow = 11.01 cfs @ 10.02 hrs, Volume= 1.843 af, Atten= 8%, Lag= 3.0 min
Primary = 0.68 cfs @ 10.02 hrs, Volume= 1.070 af
Secondary = 10.33 cfs @ 10.02 hrs, Volume= 0.774 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 93.23' @ 10.02 hrs Surf.Area= 0.134 ac Storage= 0.362 af

Plug-Flow detention time= 178.2 min calculated for 1.843 af (96% of inflow)
Center-of-Mass det. time= 151.3 min (893.9 - 742.6)

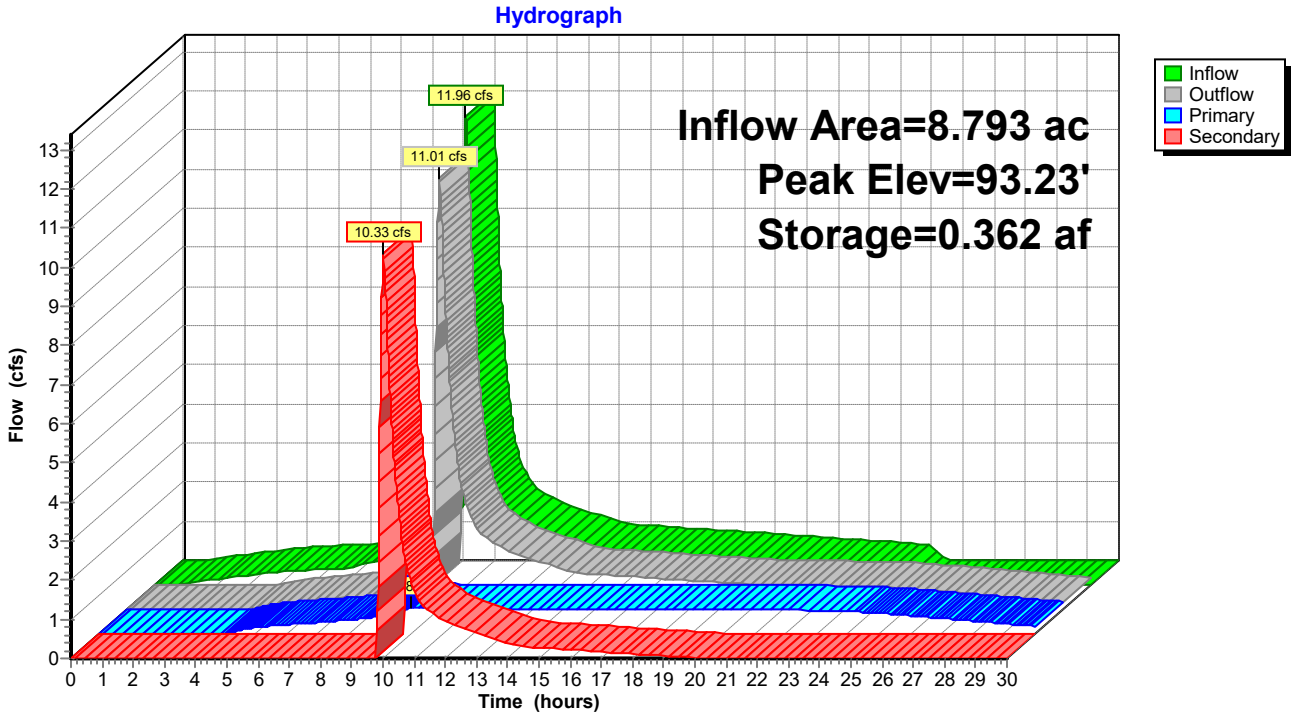
Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	0.398 af	**54.00'W x 74.00'L x 3.50'H Prismatoid Z=2.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	90.50'	**2.0" Vert. Orifice/Grate X 4.00** C= 0.600
#2	Secondary	92.75'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.68 cfs @ 10.02 hrs HW=93.23' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.68 cfs @ 7.84 fps)

Secondary OutFlow Max=10.32 cfs @ 10.02 hrs HW=93.23' (Free Discharge)
└**2=Orifice/Grate** (Weir Controls 10.32 cfs @ 2.27 fps)

Pond 2B: Basin



Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1O: Existing Public Runoff Area=19,710 sf 93.93% Impervious Runoff Depth=3.92"
Tc=24.0 min CN=74/98 Runoff=0.69 cfs 0.148 af

Subcatchment 1S: Existing Site Runoff Area=390,322 sf 46.73% Impervious Runoff Depth=2.86"
Tc=12.0 min CN=74/98 Runoff=13.59 cfs 2.136 af

Subcatchment 2P: Proposed Public Runoff Area=19,710 sf 100.00% Impervious Runoff Depth=4.05"
Tc=24.0 min CN=0/98 Runoff=0.72 cfs 0.153 af

Subcatchment 2S: Proposed Site Runoff Area=363,322 sf 52.46% Impervious Runoff Depth=2.99"
Tc=12.0 min CN=74/98 Runoff=13.25 cfs 2.077 af

Pond 1B: Existing Outlet Inflow=14.28 cfs 2.283 af
Primary=14.28 cfs 2.283 af

Pond 2B: Basin Peak Elev=93.30' Storage=0.371 af Inflow=13.97 cfs 2.230 af
Primary=0.69 cfs 1.109 af Secondary=12.46 cfs 1.038 af Outflow=13.15 cfs 2.147 af

Total Runoff Area = 18.206 ac Runoff Volume = 4.513 af Average Runoff Depth = 2.97"
48.15% Pervious = 8.767 ac 51.85% Impervious = 9.439 ac

Summary for Subcatchment 1O: Existing Public

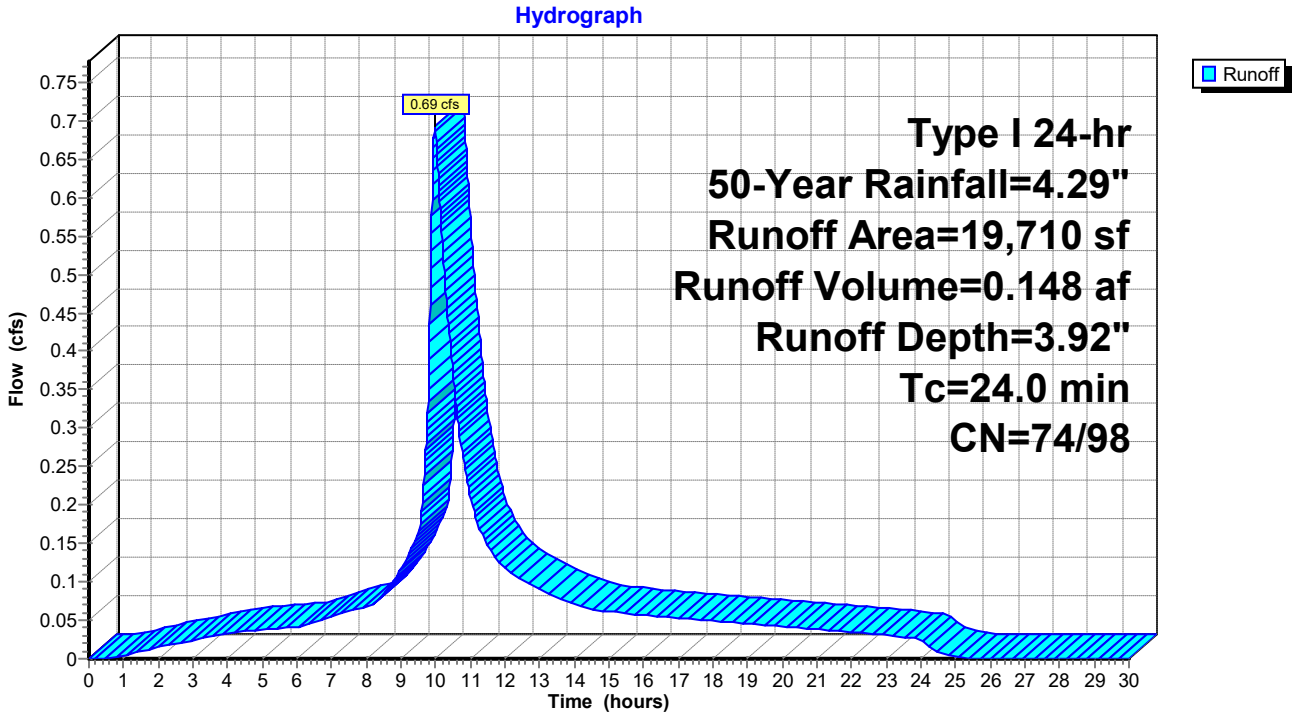
Runoff = 0.69 cfs @ 9.98 hrs, Volume= 0.148 af, Depth= 3.92"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 50-Year Rainfall=4.29"

Area (sf)	CN	Description
18,514	98	Paved parking, HSG C
1,196	74	>75% Grass cover, Good, HSG C
19,710	97	Weighted Average
1,196	74	6.07% Pervious Area
18,514	98	93.93% Impervious Area

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

Subcatchment 1O: Existing Public



Summary for Subcatchment 1S: Existing Site

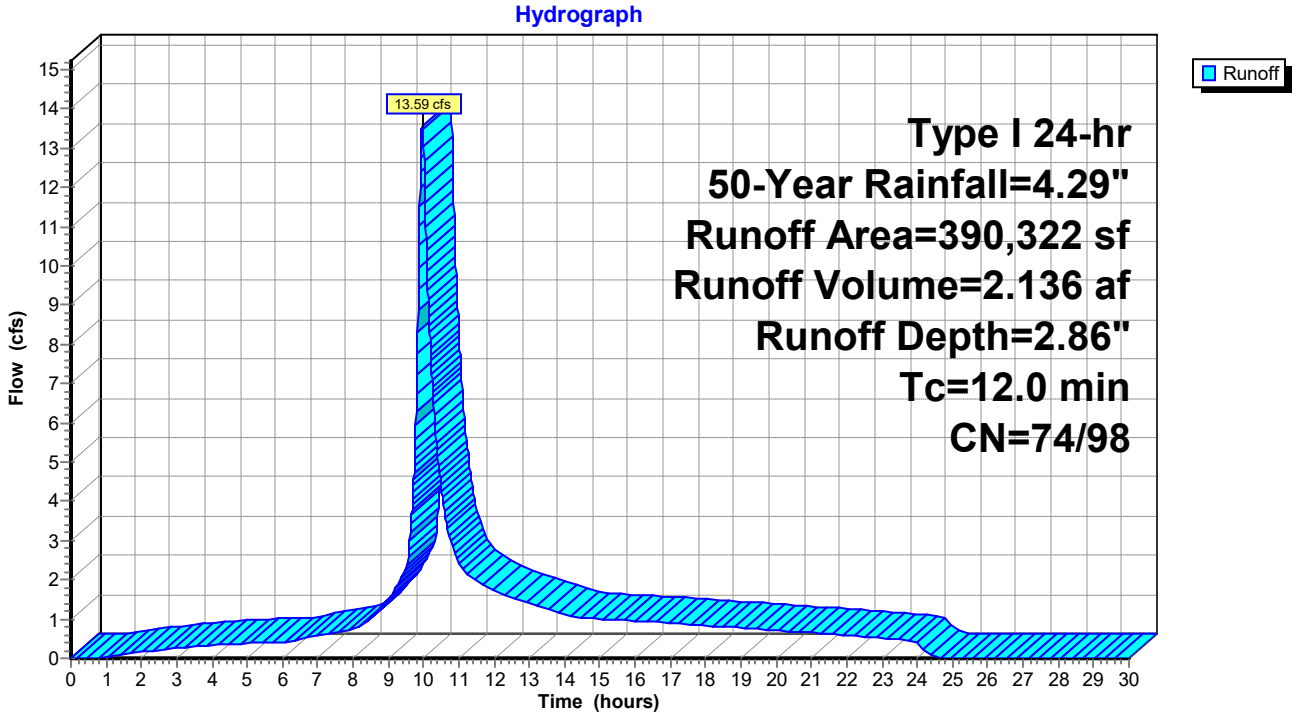
Runoff = 13.59 cfs @ 9.97 hrs, Volume= 2.136 af, Depth= 2.86"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 50-Year Rainfall=4.29"

Area (sf)	CN	Description
74,307	98	Roofs, HSG C
108,071	98	Paved parking, HSG C
207,944	74	>75% Grass cover, Good, HSG C
390,322	85	Weighted Average
207,944	74	53.27% Pervious Area
182,378	98	46.73% Impervious Area

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

Subcatchment 1S: Existing Site



Summary for Subcatchment 2P: Proposed Public

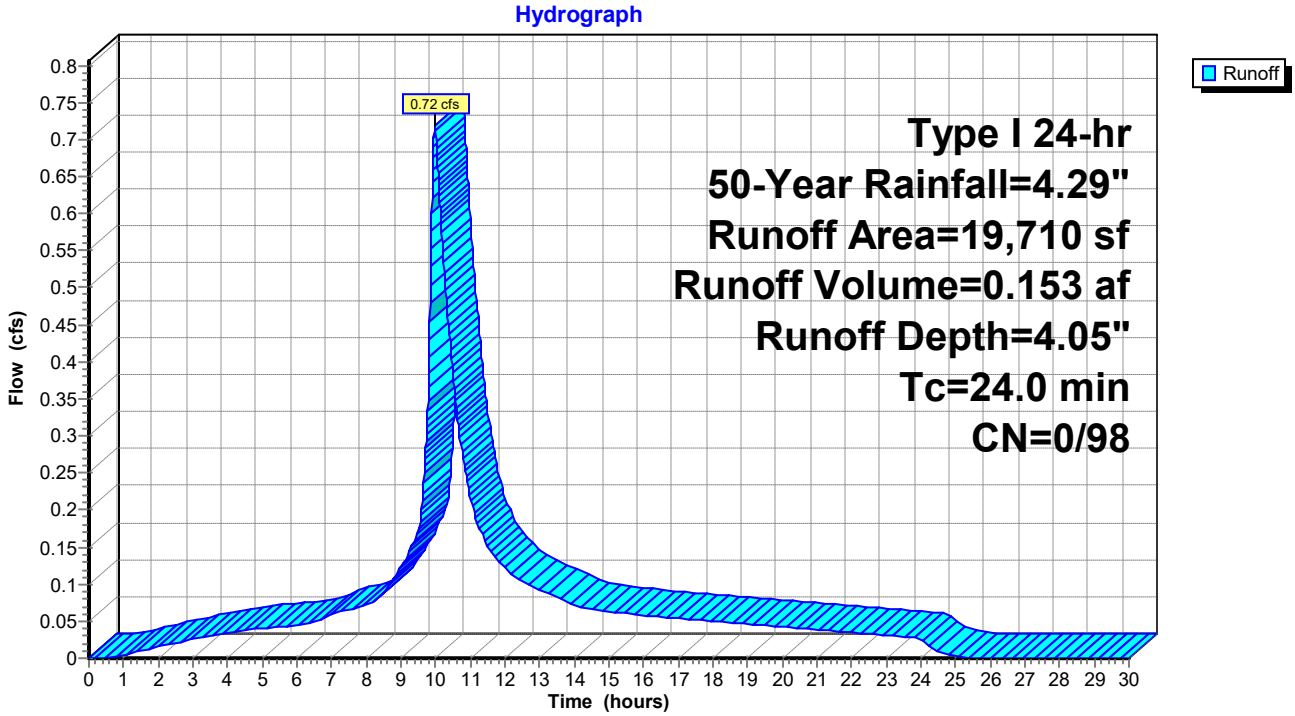
Runoff = 0.72 cfs @ 9.98 hrs, Volume= 0.153 af, Depth= 4.05"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 50-Year Rainfall=4.29"

Area (sf)	CN	Description
19,710	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
19,710	98	Weighted Average
19,710	98	100.00% Impervious Area

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

Subcatchment 2P: Proposed Public



Summary for Subcatchment 2S: Proposed Site

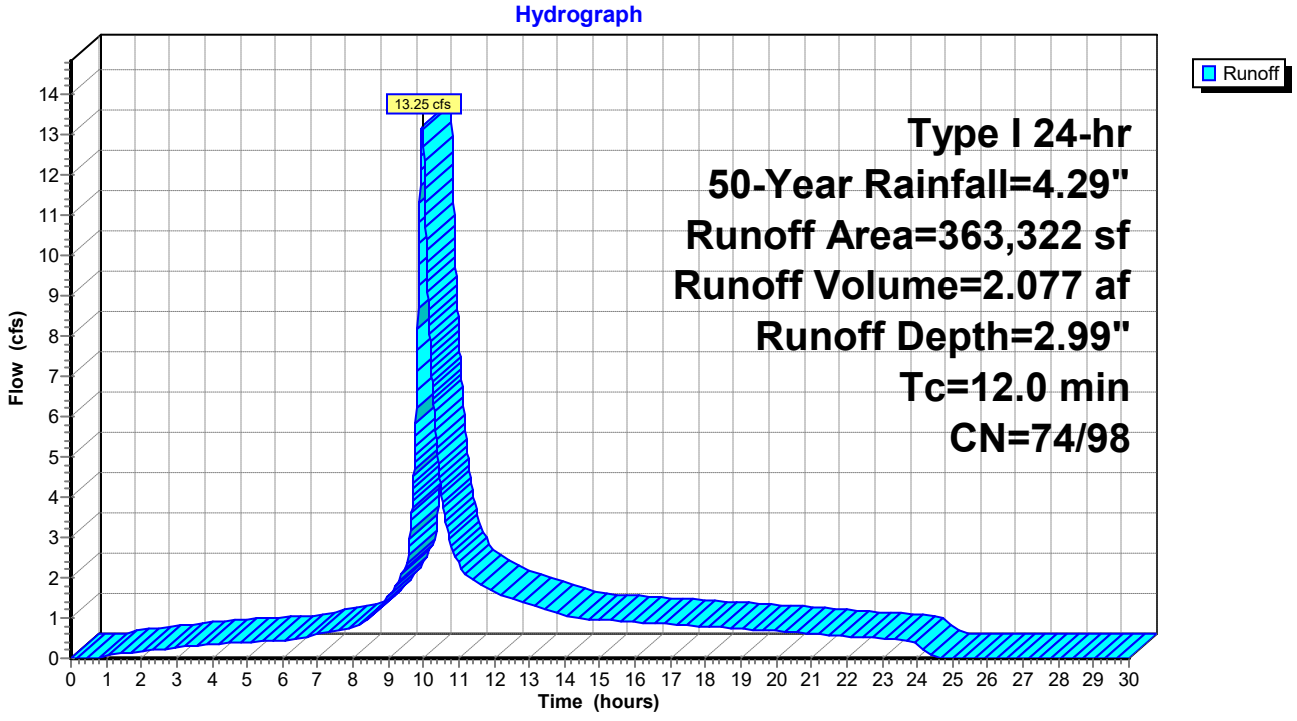
Runoff = 13.25 cfs @ 9.97 hrs, Volume= 2.077 af, Depth= 2.99"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 50-Year Rainfall=4.29"

Area (sf)	CN	Description
36,511	98	Roofs, HSG C
154,071	98	Paved parking, HSG C
172,740	74	>75% Grass cover, Good, HSG C
363,322	87	Weighted Average
172,740	74	47.54% Pervious Area
190,582	98	52.46% Impervious Area

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

Subcatchment 2S: Proposed Site



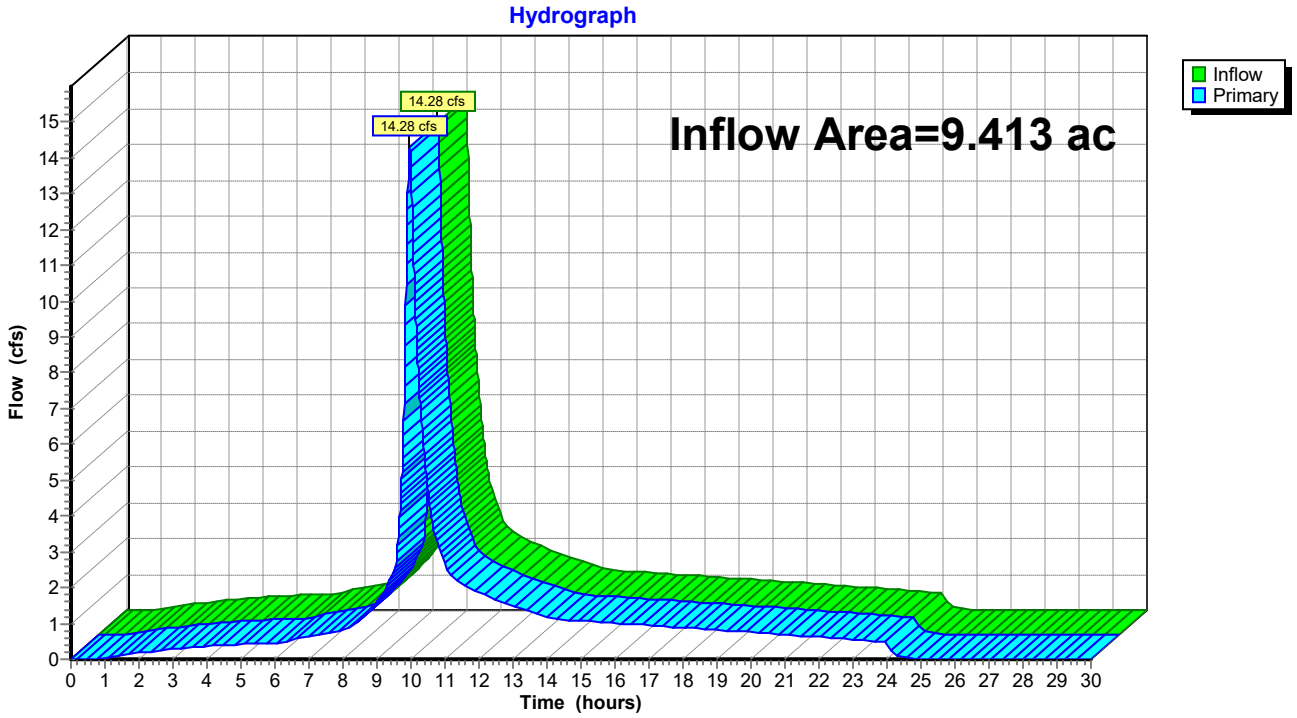
Summary for Pond 1B: Existing Outlet

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

Inflow Area = 9.413 ac, 48.99% Impervious, Inflow Depth = 2.91" for 50-Year event
Inflow = 14.28 cfs @ 9.97 hrs, Volume= 2.283 af
Primary = 14.28 cfs @ 9.97 hrs, Volume= 2.283 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond 1B: Existing Outlet



Summary for Pond 2B: Basin

Inflow Area = 8.793 ac, 54.90% Impervious, Inflow Depth = 3.04" for 50-Year event
Inflow = 13.97 cfs @ 9.97 hrs, Volume= 2.230 af
Outflow = 13.15 cfs @ 10.01 hrs, Volume= 2.147 af, Atten= 6%, Lag= 2.5 min
Primary = 0.69 cfs @ 10.01 hrs, Volume= 1.109 af
Secondary = 12.46 cfs @ 10.01 hrs, Volume= 1.038 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 93.30' @ 10.01 hrs Surf.Area= 0.134 ac Storage= 0.371 af

Plug-Flow detention time= 158.7 min calculated for 2.146 af (96% of inflow)
Center-of-Mass det. time= 133.7 min (874.1 - 740.4)

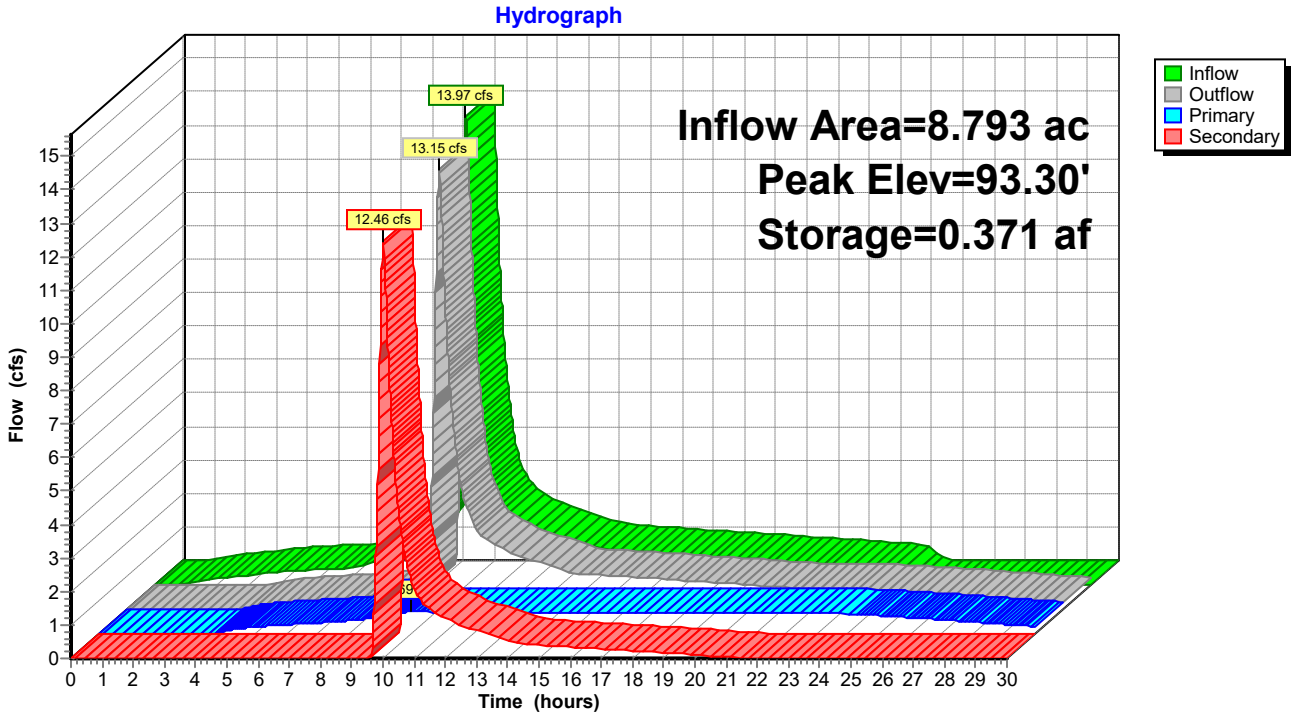
Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	0.398 af	**54.00'W x 74.00'L x 3.50'H Prismatoid Z=2.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	90.50'	**2.0" Vert. Orifice/Grate X 4.00** C= 0.600
#2	Secondary	92.75'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.69 cfs @ 10.01 hrs HW=93.30' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.69 cfs @ 7.93 fps)

Secondary OutFlow Max=12.45 cfs @ 10.01 hrs HW=93.30' (Free Discharge)
└**2=Orifice/Grate** (Weir Controls 12.45 cfs @ 2.42 fps)

Pond 2B: Basin



Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 1O: Existing Public Runoff Area=19,710 sf 93.93% Impervious Runoff Depth=4.38"
Tc=24.0 min CN=74/98 Runoff=0.77 cfs 0.165 af

Subcatchment 1S: Existing Site Runoff Area=390,322 sf 46.73% Impervious Runoff Depth=3.27"
Tc=12.0 min CN=74/98 Runoff=15.64 cfs 2.443 af

Subcatchment 2P: Proposed Public Runoff Area=19,710 sf 100.00% Impervious Runoff Depth=4.52"
Tc=24.0 min CN=0/98 Runoff=0.80 cfs 0.171 af

Subcatchment 2S: Proposed Site Runoff Area=363,322 sf 52.46% Impervious Runoff Depth=3.41"
Tc=12.0 min CN=74/98 Runoff=15.17 cfs 2.368 af

Pond 1B: Existing Outlet Inflow=16.41 cfs 2.608 af
Primary=16.41 cfs 2.608 af

Pond 2B: Basin Peak Elev=93.35' Storage=0.378 af Inflow=15.97 cfs 2.538 af
Primary=0.70 cfs 1.140 af Secondary=14.42 cfs 1.312 af Outflow=15.12 cfs 2.452 af

Total Runoff Area = 18.206 ac Runoff Volume = 5.147 af Average Runoff Depth = 3.39"
48.15% Pervious = 8.767 ac 51.85% Impervious = 9.439 ac

Summary for Subcatchment 1O: Existing Public

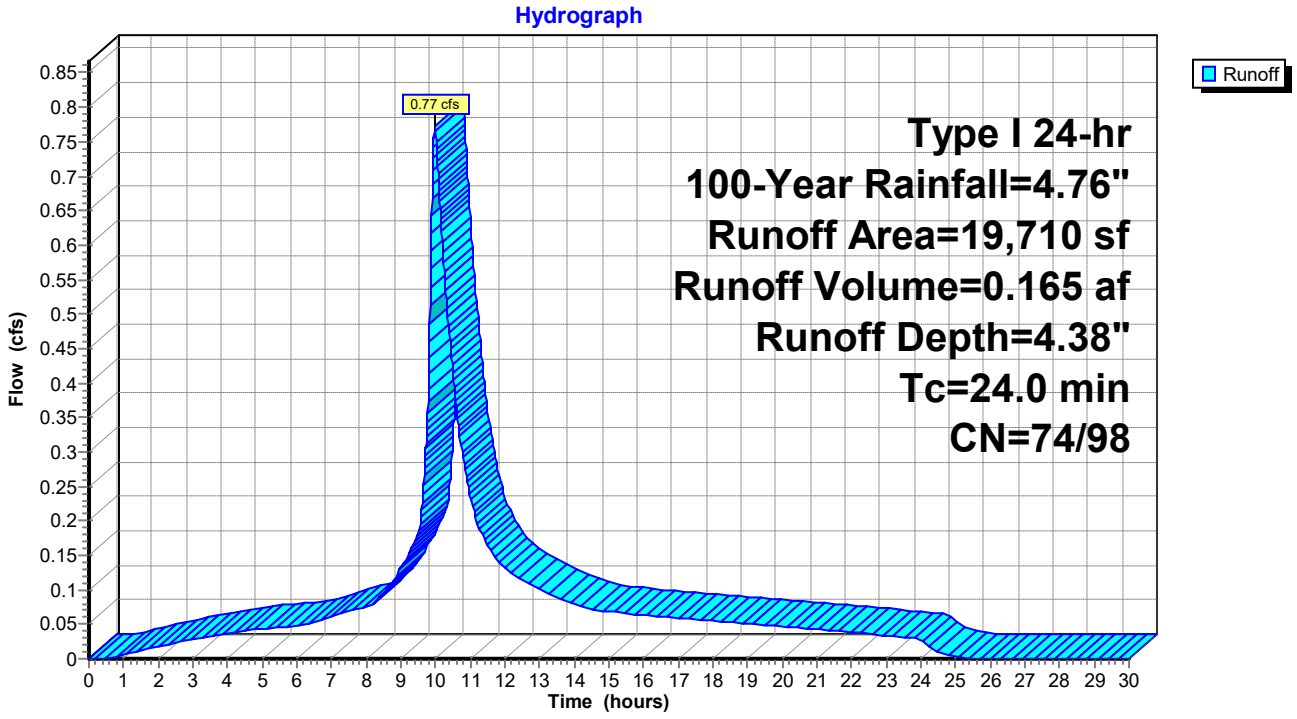
Runoff = 0.77 cfs @ 9.98 hrs, Volume= 0.165 af, Depth= 4.38"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 100-Year Rainfall=4.76"

Area (sf)	CN	Description
18,514	98	Paved parking, HSG C
1,196	74	>75% Grass cover, Good, HSG C
19,710	97	Weighted Average
1,196	74	6.07% Pervious Area
18,514	98	93.93% Impervious Area

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

Subcatchment 1O: Existing Public



Summary for Subcatchment 1S: Existing Site

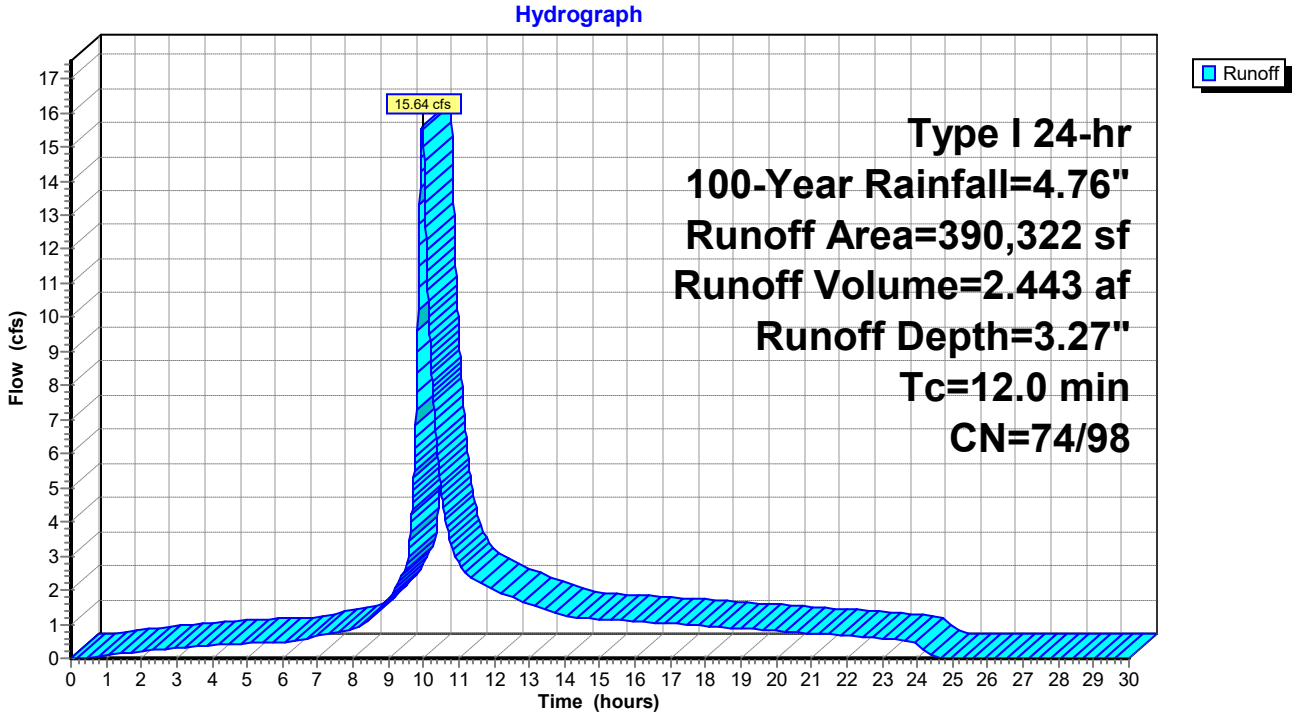
Runoff = 15.64 cfs @ 9.97 hrs, Volume= 2.443 af, Depth= 3.27"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 100-Year Rainfall=4.76"

Area (sf)	CN	Description
74,307	98	Roofs, HSG C
108,071	98	Paved parking, HSG C
207,944	74	>75% Grass cover, Good, HSG C
390,322	85	Weighted Average
207,944	74	53.27% Pervious Area
182,378	98	46.73% Impervious Area

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

Subcatchment 1S: Existing Site



Summary for Subcatchment 2P: Proposed Public

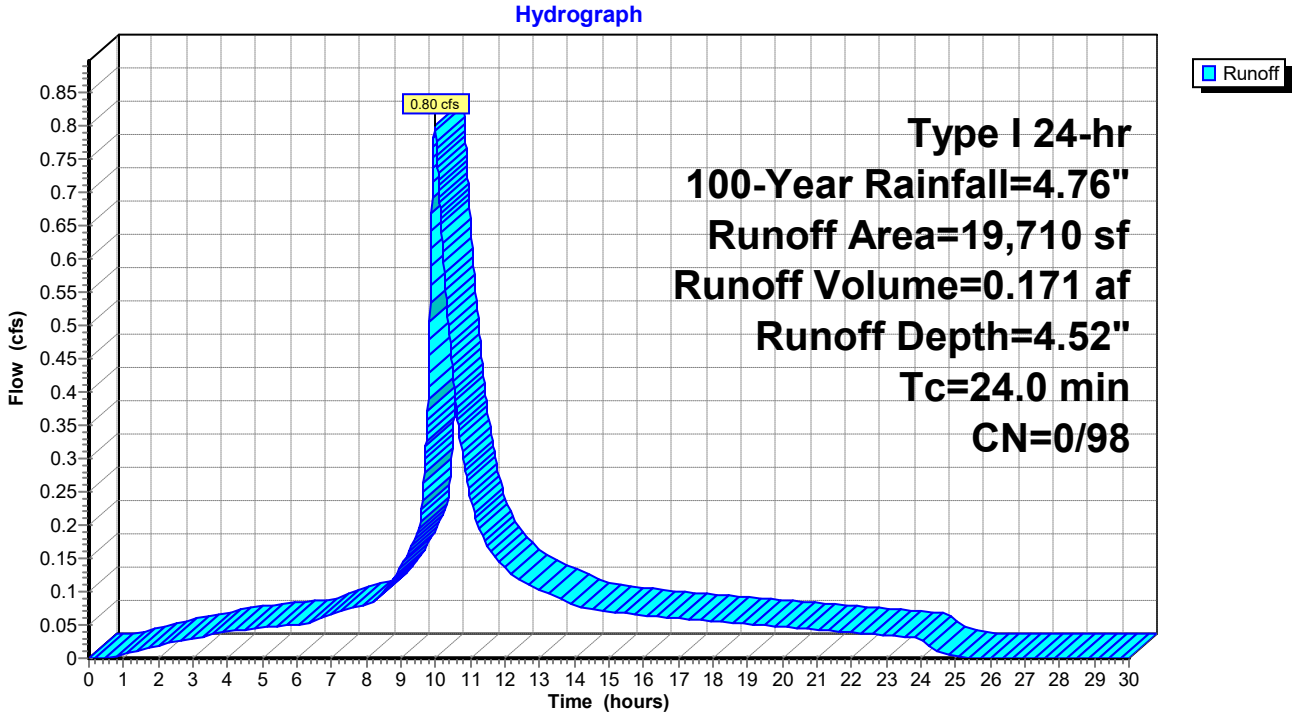
Runoff = 0.80 cfs @ 9.98 hrs, Volume= 0.171 af, Depth= 4.52"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 100-Year Rainfall=4.76"

Area (sf)	CN	Description
19,710	98	Paved parking, HSG C
0	74	>75% Grass cover, Good, HSG C
19,710	98	Weighted Average
19,710	98	100.00% Impervious Area

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

Subcatchment 2P: Proposed Public



Summary for Subcatchment 2S: Proposed Site

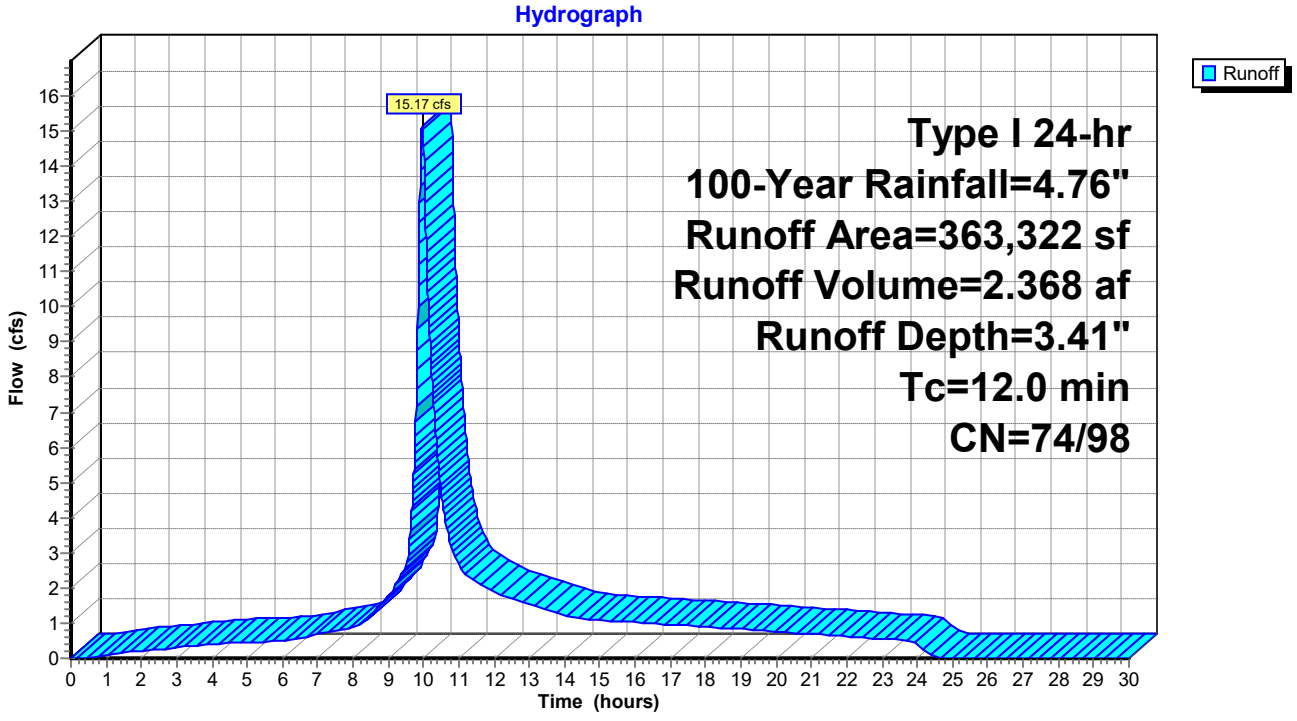
Runoff = 15.17 cfs @ 9.96 hrs, Volume= 2.368 af, Depth= 3.41"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type I 24-hr 100-Year Rainfall=4.76"

Area (sf)	CN	Description
36,511	98	Roofs, HSG C
154,071	98	Paved parking, HSG C
172,740	74	>75% Grass cover, Good, HSG C
363,322	87	Weighted Average
172,740	74	47.54% Pervious Area
190,582	98	52.46% Impervious Area

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

Subcatchment 2S: Proposed Site



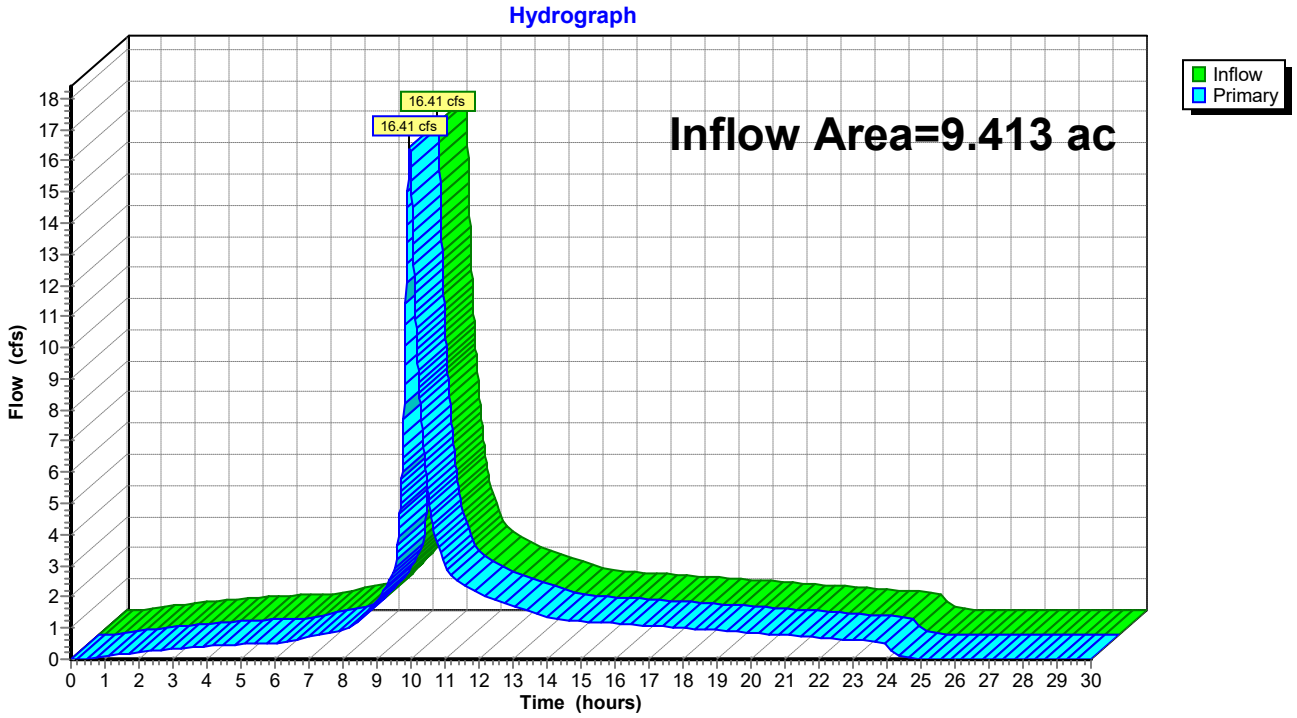
Summary for Pond 1B: Existing Outlet

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

Inflow Area = 9.413 ac, 48.99% Impervious, Inflow Depth = 3.33" for 100-Year event
Inflow = 16.41 cfs @ 9.97 hrs, Volume= 2.608 af
Primary = 16.41 cfs @ 9.97 hrs, Volume= 2.608 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond 1B: Existing Outlet



Summary for Pond 2B: Basin

Inflow Area = 8.793 ac, 54.90% Impervious, Inflow Depth = 3.46" for 100-Year event
Inflow = 15.97 cfs @ 9.97 hrs, Volume= 2.538 af
Outflow = 15.12 cfs @ 10.01 hrs, Volume= 2.452 af, Atten= 5%, Lag= 2.4 min
Primary = 0.70 cfs @ 10.01 hrs, Volume= 1.140 af
Secondary = 14.42 cfs @ 10.01 hrs, Volume= 1.312 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 93.35' @ 10.01 hrs Surf.Area= 0.135 ac Storage= 0.378 af

Plug-Flow detention time= 143.3 min calculated for 2.452 af (97% of inflow)
Center-of-Mass det. time= 120.1 min (858.5 - 738.4)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	0.398 af	**54.00'W x 74.00'L x 3.50'H Prismatoid Z=2.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	90.50'	**2.0" Vert. Orifice/Grate X 4.00** C= 0.600
#2	Secondary	92.75'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.70 cfs @ 10.01 hrs HW=93.35' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.70 cfs @ 8.01 fps)

Secondary OutFlow Max=14.41 cfs @ 10.01 hrs HW=93.35' (Free Discharge)
└**2=Orifice/Grate** (Weir Controls 14.41 cfs @ 2.54 fps)

Pond 2B: Basin