

STORMWATER DESIGN PLAN

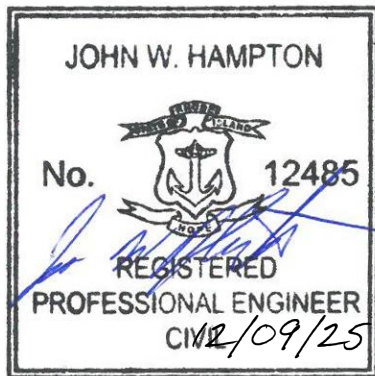
For

Proposed Storage Condo Units

At Land on Tiogue Avenue

Coventry, RI 02816

AP 28 / Lot 49



Prepared for:

Dante Real Estate II, LLC

2289 Flat River Road

Coventry, Rhode Island 02816

Dated May 2, 2025

REVISED December 9, 2025

Prepared by:

Coventry Survey Design Group

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Appendix D	Proposed Hydro-CAD
Appendix E	Test Pit Information
Appendix F	Web Soil Survey



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Drainage Report

1.0 Introduction:

This report demonstrates that the proposed infiltration basins will offset the additional runoff generated by the proposed development and will treat the required water quality volume. The proposed development consists of a 10,000 SF building, new parking lot, and access drive. The design will utilize low-impact development best management practice (BMP) techniques to mitigate onsite stormwater. These techniques will consist of two pea gravel diaphragms for pretreatment, and two infiltration basin for recharge and water quality volume. All stormwater runoff will discharge towards the existing wetland area associated with the Mishnock River.

2.0 Methodology

This stormwater analysis is based on the computational algorithm using the *Soil Conservation Service Technical Release 55 Urban Hydrology for Small Watersheds* published June, 1986. These computations use the Type III distribution hydrograph. Pre and post-development hydrograph conditions and detention basin design computations are based on the 1, 10, 25, and 100-year storm events. These storm events correspond to 24-hour rainfall depths of 2.7, 4.8, 6.2 and 8.7 inches respectively, based on the *Rhode Island Storm Water Design Manual*. This report will show that proposed runoff, as computed, will be at or below existing discharge rates as measured at the point of discharge using the above-mentioned BMPs onsite.

3.0 Existing Conditions:

The site is approximately 3.83 acres and is located on the south side of Tiogue Avenue. The site was previously developed in the 1970's, but there is currently no building on site. The site drains from east to west to the Mishnock River located on the adjacent property. There is a large wetland area located on south westerly side of the property. The predominant soil is well draining, poorly graded, sandy gravel. The lot to the northeast of the site is a McDonald's and the lot south of the site is a mobile home park. Both lots are fully developed. The McDonald has a deeded drainage easement that crosses the frontage of the subject site.

Figure 1



CSDG

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There are two main sub catchment areas for the site. Sub catchment area #1 consists of the proposed site, a small area of land to the south and east of the site, and the area between the site and the river.

There are currently no conveyance or stormwater management systems located on the site. Sub catchment area #2 consists of the water that drains into the McDonald's pipe network located adjacent to the property.

Design Point 1

Woods (forest):	258,839 SF
Grass (lawn):	76,123 SF
Roof	7,105 SF
Asphalt (parking lot and drive way)	34,186 SF
TOTAL	376,253 SF

4.0 Proposed Conditions

The proposed sitework consists of a 10,000 SF building, and 26,774 SF of paved area. The additional runoff will be treated by Infiltration Basins #1 and #2 for water quality and an underground Cultec system for detention of the 10 and 100- year storm events.

Design Point 1

Woods (forest):	222,861 SF
Grass (lawn):	75,526 SF
Roof	17,105 SF
Asphalt	60,760 SF
TOTAL	376,252 SF



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5.0 Stormwater Standards Compliance

As outlined in the Rhode Island Stormwater Design Manual, the eleven stormwater management criteria are applied to this project following the Wetlands Protection Bylaw, the Department of Environmental Management (DEM) Stormwater Management Policy. The requirements and compliance measures are listed below:

5.1 Minimum Standard 1: LID Site Planning and Design Strategies

The proposed site will use low-impact design elements per the *Rhode Island Stormwater Design Manual*. The proposed stormwater design meets all stormwater management requirements and the stormwater management plan checklist.

5.2 Minimum Standard 2: Ground Water Recharge

The proposed additional impervious areas for the site are listed below.

Sub Catchment #3 (Infiltration Basin #1)

New paved parking lot:	16,551 SF
New storage building:	10,000 SF
Total impervious area:	26,551 SF

Required water recharge volume $26,551 \text{ SF} \times 1 \text{ inch} \times (1 \text{ FT} / 12 \text{ IN}) \times (0.60) = 1,327.55 \text{ CF}$

Provided static storage volume = 2,703 CF

Per Appendix "D" page 64 of the stormwater report

Provided static storage volume > required static storage volume



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Sub Catchment #4 (Infiltration Basin #2)

New paved parking lot: 10,023 SF

Total impervious area: 10,023 SF

Required water recharge volume $10,023 \text{ SF} \times 1 \text{ inch} \times (1 \text{ FT} / 12 \text{ IN}) \times (0.60) = 501 \text{ CF}$

Provided static storage volume = 948 CF

Per Appendix "D" page 67 of the stormwater report

Provided static storage volume > required static storage volume

5.3 Minimum Standard 3: Water Quality

Sub Catchment #3 (Infiltration Basin #1)

WQV from HydroCAD for the 1.2" Storm Event 2,179 CF. See Appendix D page 62 of the storm water report

Pretreatment Calculation

25% of (532 CF) = 133 CF

Pea gravel diaphragm area = $166 \times 2 = 332 \text{ SF}$

$332 \times 2' \text{ depth} \times .333 \text{ void ratio} = 221 \text{ CF}$

221 CF > 133 CF, OK

Provided Storage Volume

75% of (2,179 CF) = 1,546.5 CF

Provided static storage @ elev. 253.50 = 3,151 CF

Per Appendix D page 64 of the storm water report

3,151 CF > 1546.5 CF OK



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Sub Catchment #4 (Infiltration Basin #2)

WQV from HydroCAD for the 1.2" Storm Event 823 CF. See Appendix D page 65 of the storm water report

Pretreatment calculation

25% of (823 CF) = 206 CF

Pea gravel diaphragm area = 778 SF

360' * 2.0' depth * .333 void ratio = 240 CF

240 CF > 206 CF, OK

Provided Storage Volume

75% of (823 CF) = 617 CF

Provided static storage @ elev 245.50 = 1,517 CF

Per Appendix D page 67 of the storm water report

1,517 CF > 617 CF, OK

5.4 Minimum Standard 4: Conveyance and Natural Channel Protection

$$V_s = 0.65 * V_r$$

V_s for Sub catchment #1 9,466 CF

See HydroCAD Appendix B Page 9

$$V_s = 0.65(9,466\text{CF}) = 6152.9 \text{ CF}$$

$$= 6152.9 \text{ CF} / 24 \text{ hour} / 60 \text{ min} / 60 \text{ sec} = 0.0712 \text{ CFS}$$

Sub catchment #2 7,027 CF

See HydroCAD Appendix B page 11



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$V_s = 0.65(7,027\text{CF}) = 4,567.55 \text{ CF}$
4567.55CF /24 hour /60 min /60 sec 0.053 cfs

Provided flow on the 1-year storm event

Both infiltration basins infiltrate the 1-year storm events. Therefore the V_s provided is 0 CFS for both sub catchment areas.

5.5 Minimum Standard 5: Overbank Flood Protection

Peak flow for the 1, 10, 25 and 100-year storm events are based on HydroCAD calculations provided in Appendix “B” and Appendix “D”. The tables below compares the peak flows and volumes of the existing and proposed conditions.

TABLE 5-1: PEAK STORMWATER COMPARISON TABLE Design Point #1*

Benchmark Storm Event	Existing Conditions (CFS)	Proposed Conditions (CFS)
1-Year Storm	3.45	3.45
10-Year Storm	10.49	10.42
25-year Storm	16.92	16.07
100-Year Storm	30.18	29.65

* Please note the HydroCAD model is shows a slight increase in the peak flow in sub catchment #1 for both the 1.2 inch storm event and the 1 Year storm event in the “Composite CN Method” because some land had been removed from it. Since is not physically possible, HydroCAD was calculated using the “Separated CN Method” as opposed to a “Composite CN Method” to correct for this.

TABLE 5-2: TOTAL STORMWATER RUNOFF COMPARISON TABLE Design Point# 1

Benchmark Storm Event	Existing Conditions (CF)	Proposed Conditions (CF)
1-Year Storm	16,473	15,909
10-Year Storm	46,763	45,812
25-year Storm	72,575	68,832
100-Year Storm	125,970	120,047

5.6 Minimum Standard 6: Redevelopment and Infill Project

The site does meet the requirements for a redevelopment or infill project.



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5.7 Minimum Standard 7: Pollution Prevention Plan

An operation and maintenance plan and long-term pollution prevention plan are included as a separate report in this submission.

5.8 Minimum Standard 8: Land Uses with Higher Potential Pollutant Loads (LUHPPL's)

The site is not a LUHPPL.

5.9 Minimum Standard 9: Illicit Discharges

No illicit discharges are proposed on the site.

5.10 Minimum Standard 10: soil erosion and construction pollution prevention plan

A soil erosion and construction pollution prevention plan has been developed and included as a separate report in this submission.

6.0 conclusion

The proposed site design meets all the minimum standards. Due to the high infiltration rate of the soil infiltration basins were chosen for the design as this will mimic existing conditions and infiltrate most of the water leaving the site.



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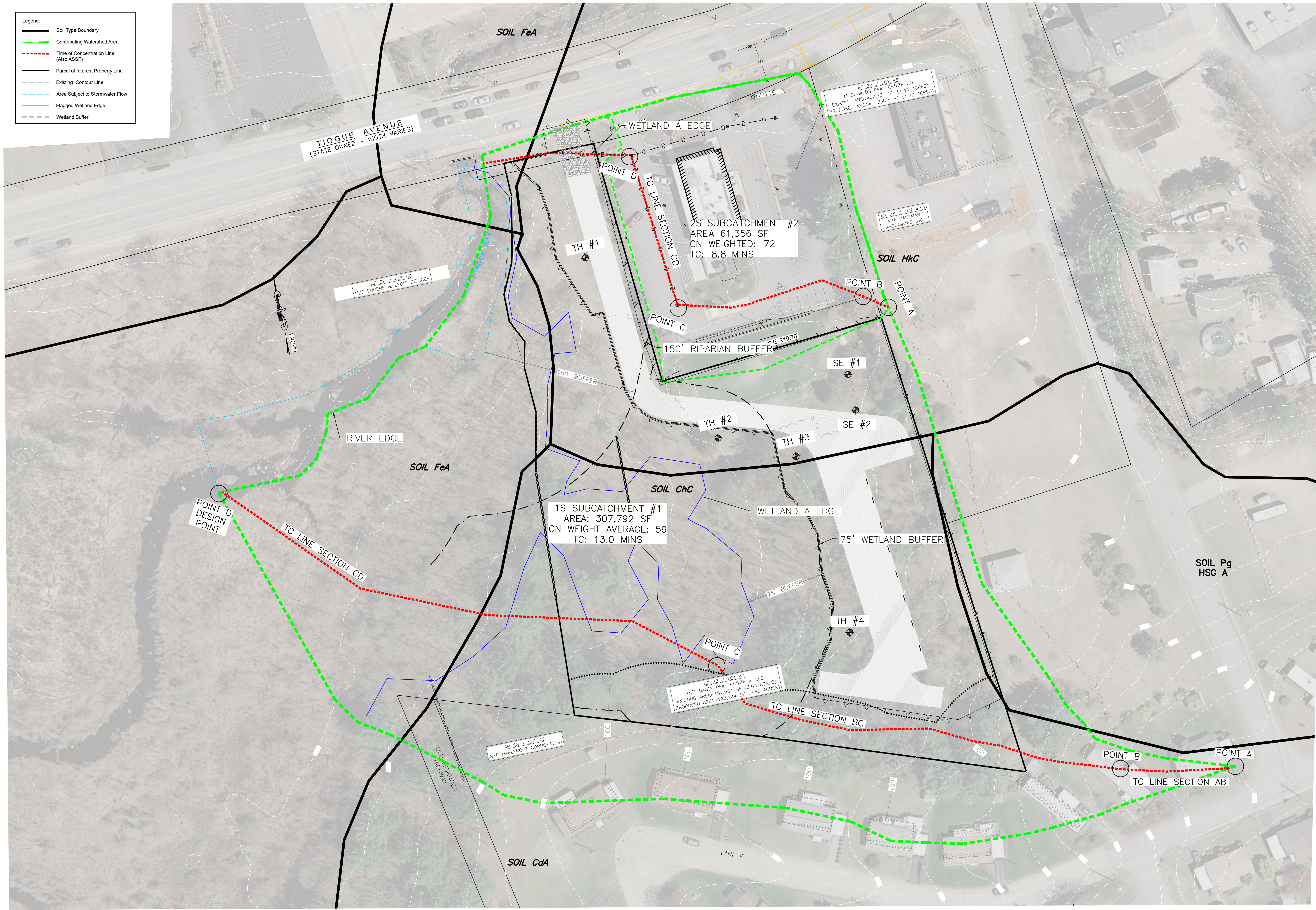
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STORMWATER REPORT APPENDIX - A

EXISTING WATERSHED MAP

Legend:

- Soil Type Boundary
- Contributing Watershed Area
- Time of Concentration Line (Also ASSF)
- Parcel of Interest Property Line
- Existing Contour Line
- Area Subject to Stormwater Flow
- Flagged Wetland Edge
- Wetland Buffer



Scale in feet: 1"=40'

Graphic Scale

Revisions:

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DANTE PLAT
EXISTING WATERSHED MAP
OF LAND ON TIOQUE AVENUE
IN THE TOWN OF COVENTRY, RHODE ISLAND
ASSESSOR'S PLAT 28 / LOTS 48 & 49
PREPARED FOR: MICHAEL SACCOCIA
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401-439-5005 | msaccocia@cox.net

DRAWN BY: JWH
APPROVED BY: JWH
APPROVED BY: JWH

DATE
01-28-2025

SHEET 1 OF 12



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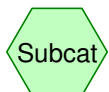
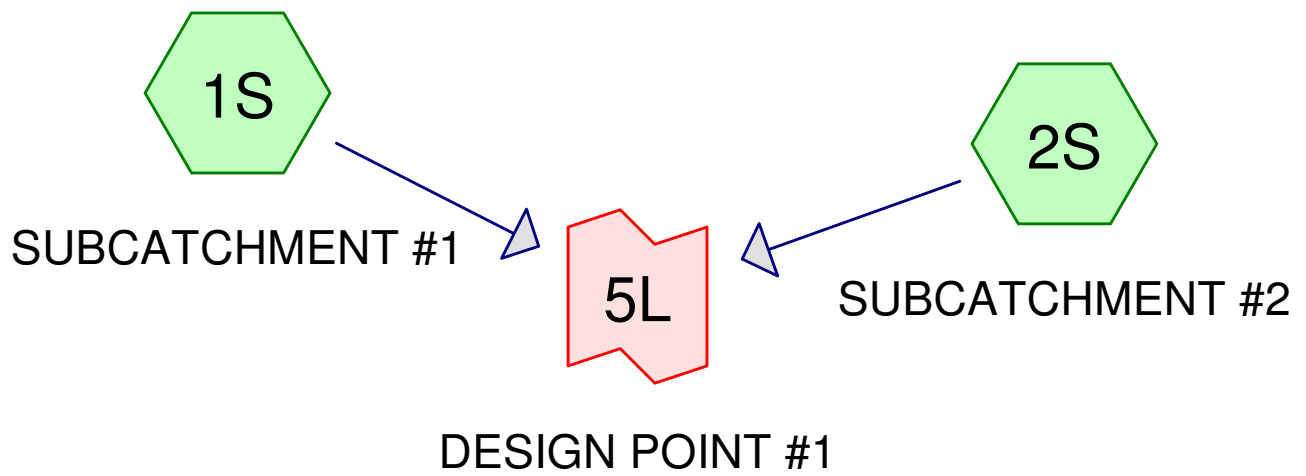
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STORMWATER REPORT APPENDIX - B

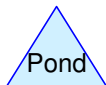
EXISTING HYDROCAD MODELING



Subcat



Reach



Pond



Link

Routing Diagram for existing conditions

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existing conditions

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Project Notes

Rainfall events imported from "EXISTING CONDITIONS PLAN.hcp"

existing conditions

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1YEAR	Type III 24-hr		Default	24.00	1	2.70	2
2	10-YEAR	Type III 24-hr		Default	24.00	1	4.80	2
3	25-YEAR	Type III 24-hr		Default	24.00	1	6.20	2
4	100-YEAR	Type III 24-hr		Default	24.00	1	8.70	2
5	wqv	Type III 24-hr		Default	24.00	1	1.20	2

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
41,495	39	>75% Grass cover, Good, HSG A (1S, 2S)
34,034	61	>75% Grass cover, Good, HSG B (1S)
594	80	>75% Grass cover, Good, HSG D (1S)
34,186	98	Paved parking, HSG B (2S)
7,105	98	Roofs, HSG B (1S)
34,363	30	Woods, Good, HSG A (1S)
144,945	55	Woods, Good, HSG B (1S)
79,531	77	Woods, Good, HSG D (1S)
376,253	61	TOTAL AREA

existing conditions

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
75,858	HSG A	1S, 2S
220,270	HSG B	1S, 2S
0	HSG C	
80,125	HSG D	1S
0	Other	
376,253		TOTAL AREA

existing conditions

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
41,495	34,034	0	594	0	76,123	>75% Grass cover, Good
0	34,186	0	0	0	34,186	Paved parking
0	7,105	0	0	0	7,105	Roofs
34,363	144,945	0	79,531	0	258,839	Woods, Good
75,858	220,270	0	80,125	0	376,253	TOTAL AREA

existing conditions

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	2S	0.00	0.00	150.0	0.0100	0.013	0.0	12.0	0.0
2	2S	0.00	0.00	50.0	0.0250	0.013	0.0	18.0	0.0

existing conditions*Type III 24-hr 1YEAR Rainfall=2.70"*

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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-Q

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

Subcatchment 1S: SUBCATCHMENT #1 Runoff Area=314,897 sf 2.26% Impervious Runoff Depth>0.36"
Flow Length=861' Tc=13.0 min CN=WQ Runoff=1.79 cfs 9,446 cf

Subcatchment 2S: SUBCATCHMENT #2 Runoff Area=61,356 sf 55.72% Impervious Runoff Depth>1.37"
Flow Length=375' Tc=10.1 min CN=WQ Runoff=1.77 cfs 7,027 cf

Link 5L: DESIGN POINT #1

Inflow=3.46 cfs 16,473 cf

Primary=3.46 cfs 16,473 cf

Total Runoff Area = 376,253 sf Runoff Volume = 16,473 cf Average Runoff Depth = 0.53"
89.03% Pervious = 334,962 sf 10.97% Impervious = 41,291 sf

existing conditions

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Type III 24-hr 1YEAR Rainfall=2.70"

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Summary for Subcatchment 1S: SUBCATCHMENT #1

Runoff = 1.79 cfs @ 12.20 hrs, Volume= 9,446 cf, Depth> 0.36"
 Routed to Link 5L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 1YEAR Rainfall=2.70"

Area (sf)	CN	Description
34,034	61	>75% Grass cover, Good, HSG B
595	98	Roofs, HSG B
1,549	98	Roofs, HSG B
661	98	Roofs, HSG B
816	98	Roofs, HSG B
1,145	98	Roofs, HSG B
654	98	Roofs, HSG B
136,422	55	Woods, Good, HSG B
8,523	55	Woods, Good, HSG B
594	80	>75% Grass cover, Good, HSG D
79,531	77	Woods, Good, HSG D
34,363	30	Woods, Good, HSG A
14,325	39	>75% Grass cover, Good, HSG A
816	98	Roofs, HSG B
529	98	Roofs, HSG B
340	98	Roofs, HSG B
314,897		Weighted Average
307,792	58	97.74% Pervious Area
7,105	98	2.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.4	340	0.0625	4.03		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.8	421	0.0250	2.55		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.0	861	Total			

existing conditions

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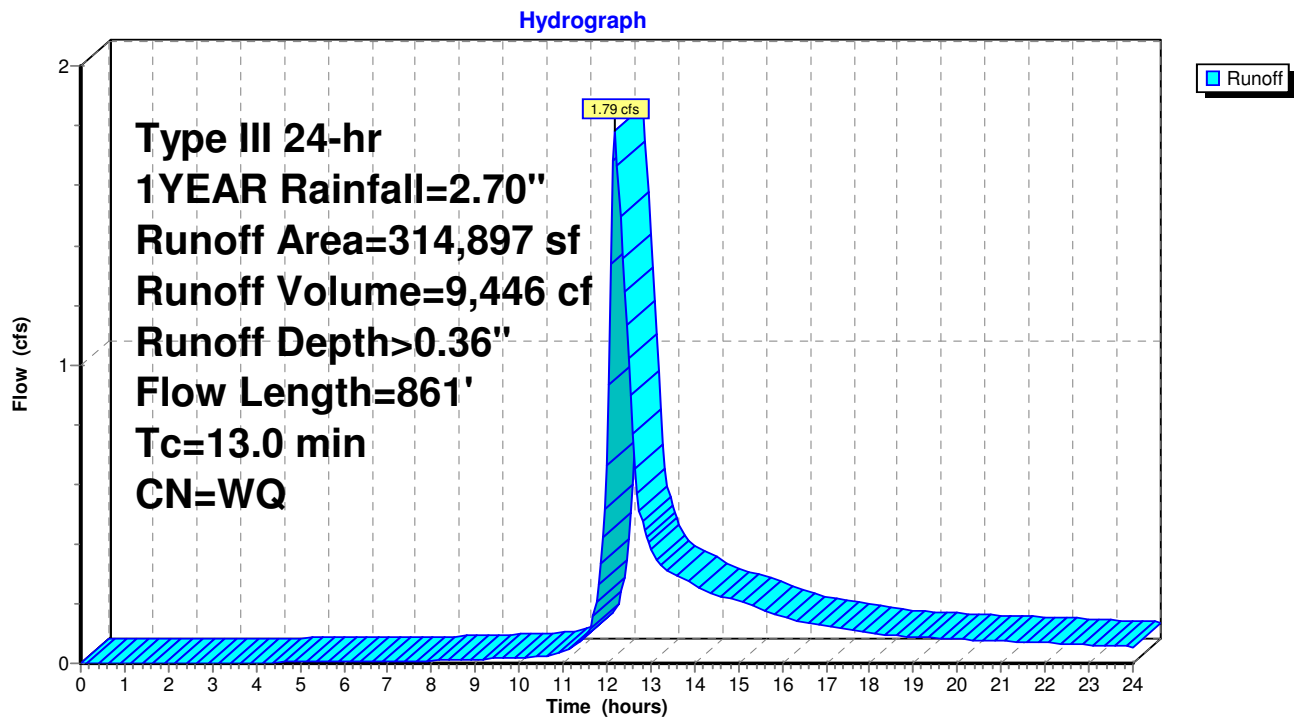
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Type III 24-hr 1YEAR Rainfall=2.70"

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Subcatchment 1S: SUBCATCHMENT #1



existing conditions

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Type III 24-hr 1YEAR Rainfall=2.70"

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Summary for Subcatchment 2S: SUBCATCHMENT #2

Runoff = 1.77 cfs @ 12.14 hrs, Volume= 7,027 cf, Depth> 1.37"
 Routed to Link 5L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 1YEAR Rainfall=2.70"

Area (sf)	CN	Description
2,432	39	>75% Grass cover, Good, HSG A
34,186	98	Paved parking, HSG B
17,480	39	>75% Grass cover, Good, HSG A
4,187	39	>75% Grass cover, Good, HSG A
3,071	39	>75% Grass cover, Good, HSG A
61,356		Weighted Average
27,170	39	44.28% Pervious Area
34,186	98	55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	50	0.0450	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.7	125	0.0210	2.94		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	150	0.0100	4.54	3.56	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.1	50	0.0250	9.40	16.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
10.1	375	Total			

existing conditions

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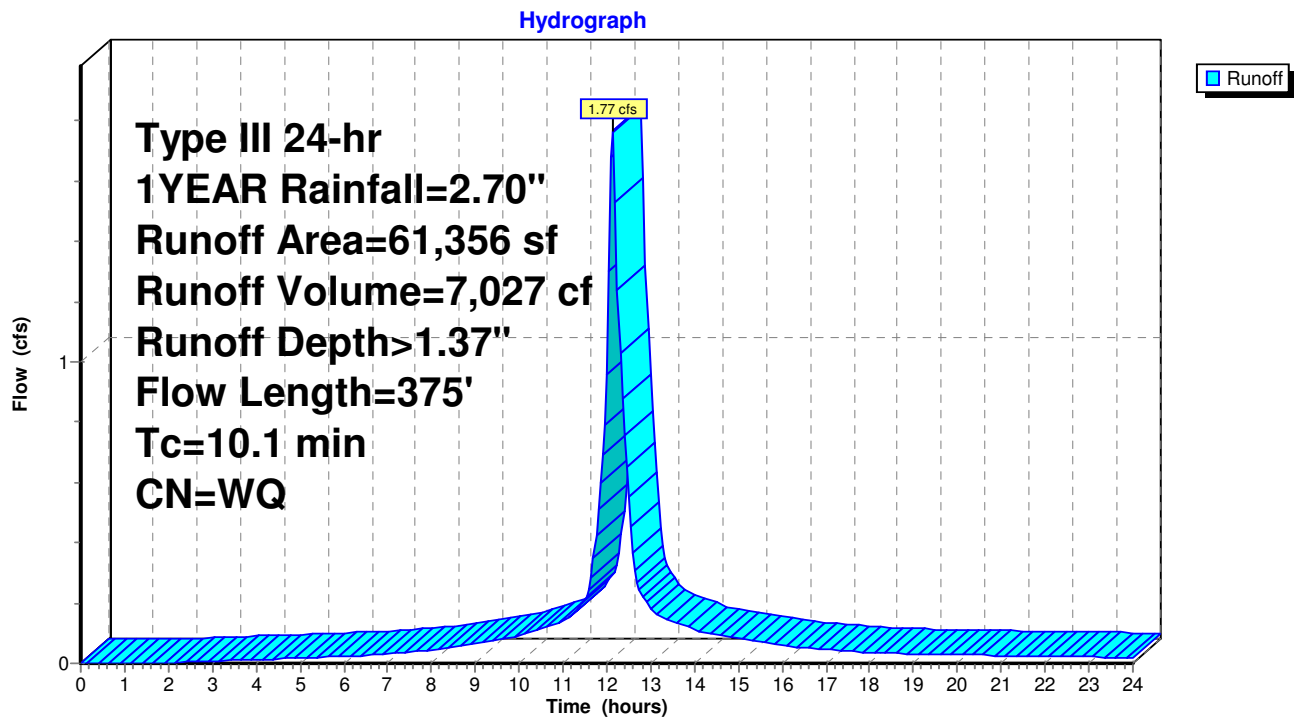
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Type III 24-hr 1YEAR Rainfall=2.70"

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Subcatchment 2S: SUBCATCHMENT #2



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Type III 24-hr 1YEAR Rainfall=2.70"

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Summary for Link 5L: DESIGN POINT #1

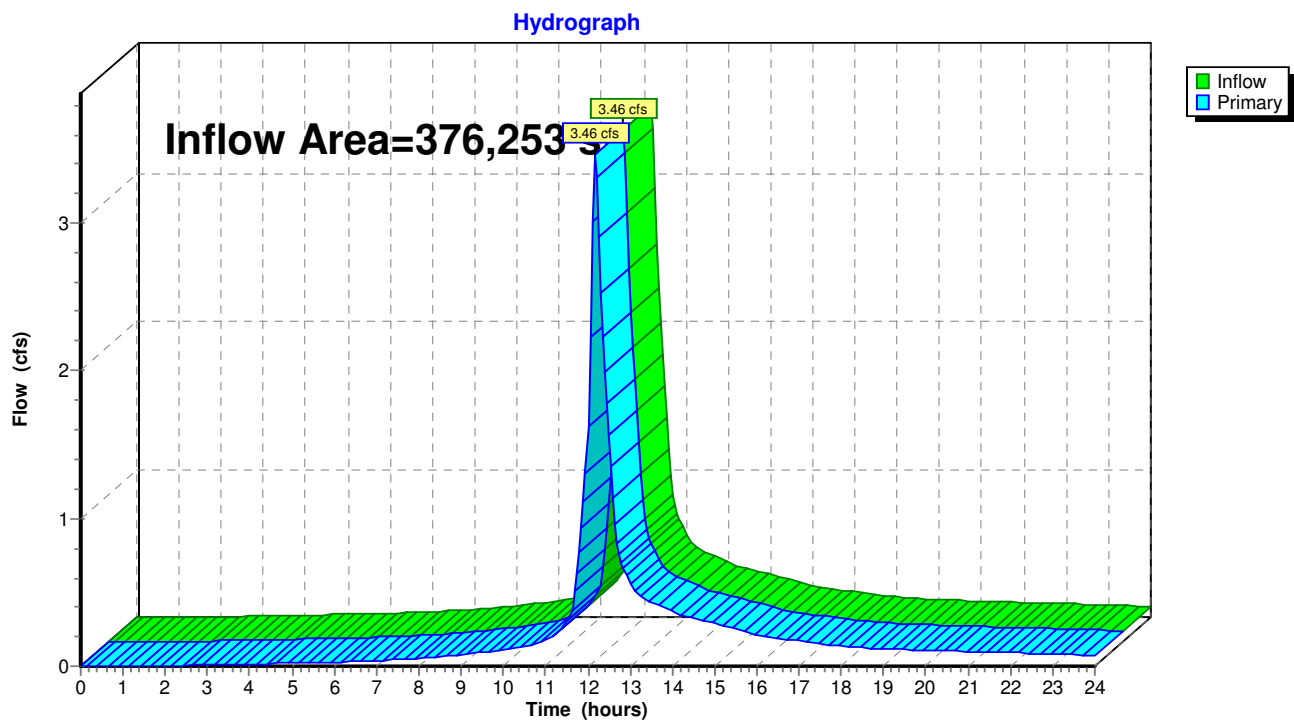
Inflow Area = 376,253 sf, 10.97% Impervious, Inflow Depth > 0.53" for 1YEAR event

Inflow = 3.46 cfs @ 12.16 hrs, Volume= 16,473 cf

Primary = 3.46 cfs @ 12.16 hrs, Volume= 16,473 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 5L: DESIGN POINT #1



existing conditions*Type III 24-hr 10-YEAR Rainfall=4.80"*

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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-Q

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

Subcatchment 1S: SUBCATCHMENT #1 Runoff Area=314,897 sf 2.26% Impervious Runoff Depth>1.27"
Flow Length=861' Tc=13.0 min CN=WQ Runoff=7.62 cfs 33,415 cf

Subcatchment 2S: SUBCATCHMENT #2 Runoff Area=61,356 sf 55.72% Impervious Runoff Depth>2.61"
Flow Length=375' Tc=10.1 min CN=WQ Runoff=3.18 cfs 13,348 cf

Link 5L: DESIGN POINT #1

Inflow=10.49 cfs 46,763 cf

Primary=10.49 cfs 46,763 cf

Total Runoff Area = 376,253 sf Runoff Volume = 46,763 cf Average Runoff Depth = 1.49"
89.03% Pervious = 334,962 sf 10.97% Impervious = 41,291 sf

existing conditions

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Type III 24-hr 10-YEAR Rainfall=4.80"

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Summary for Subcatchment 1S: SUBCATCHMENT #1

Runoff = 7.62 cfs @ 12.20 hrs, Volume= 33,415 cf, Depth> 1.27"
 Routed to Link 5L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YEAR Rainfall=4.80"

Area (sf)	CN	Description
34,034	61	>75% Grass cover, Good, HSG B
595	98	Roofs, HSG B
1,549	98	Roofs, HSG B
661	98	Roofs, HSG B
816	98	Roofs, HSG B
1,145	98	Roofs, HSG B
654	98	Roofs, HSG B
136,422	55	Woods, Good, HSG B
8,523	55	Woods, Good, HSG B
594	80	>75% Grass cover, Good, HSG D
79,531	77	Woods, Good, HSG D
34,363	30	Woods, Good, HSG A
14,325	39	>75% Grass cover, Good, HSG A
816	98	Roofs, HSG B
529	98	Roofs, HSG B
340	98	Roofs, HSG B
314,897		Weighted Average
307,792	58	97.74% Pervious Area
7,105	98	2.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.4	340	0.0625	4.03		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.8	421	0.0250	2.55		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.0	861	Total			

existing conditions

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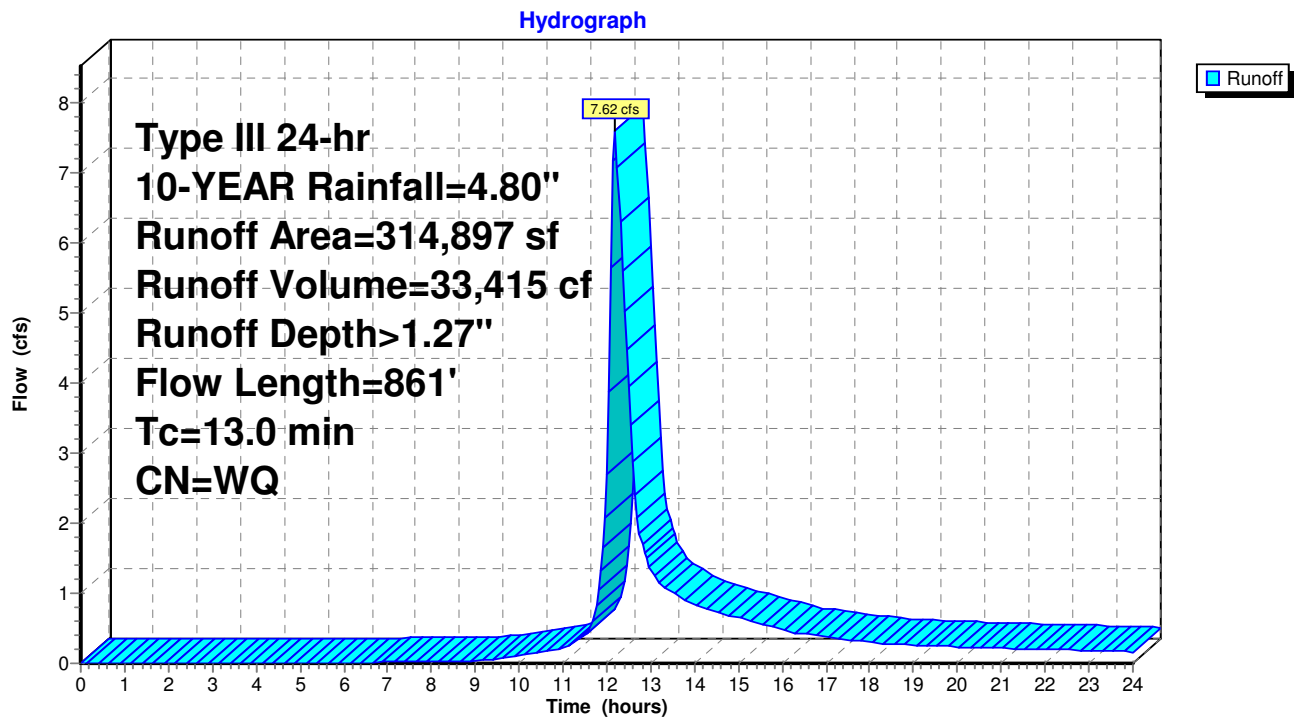
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Type III 24-hr 10-YEAR Rainfall=4.80"

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Subcatchment 1S: SUBCATCHMENT #1



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Type III 24-hr 10-YEAR Rainfall=4.80"

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Summary for Subcatchment 2S: SUBCATCHMENT #2

Runoff = 3.18 cfs @ 12.14 hrs, Volume= 13,348 cf, Depth> 2.61"
 Routed to Link 5L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YEAR Rainfall=4.80"

Area (sf)	CN	Description
2,432	39	>75% Grass cover, Good, HSG A
34,186	98	Paved parking, HSG B
17,480	39	>75% Grass cover, Good, HSG A
4,187	39	>75% Grass cover, Good, HSG A
3,071	39	>75% Grass cover, Good, HSG A
61,356		Weighted Average
27,170	39	44.28% Pervious Area
34,186	98	55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	50	0.0450	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.7	125	0.0210	2.94		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	150	0.0100	4.54	3.56	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.1	50	0.0250	9.40	16.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
10.1	375	Total			

existing conditions

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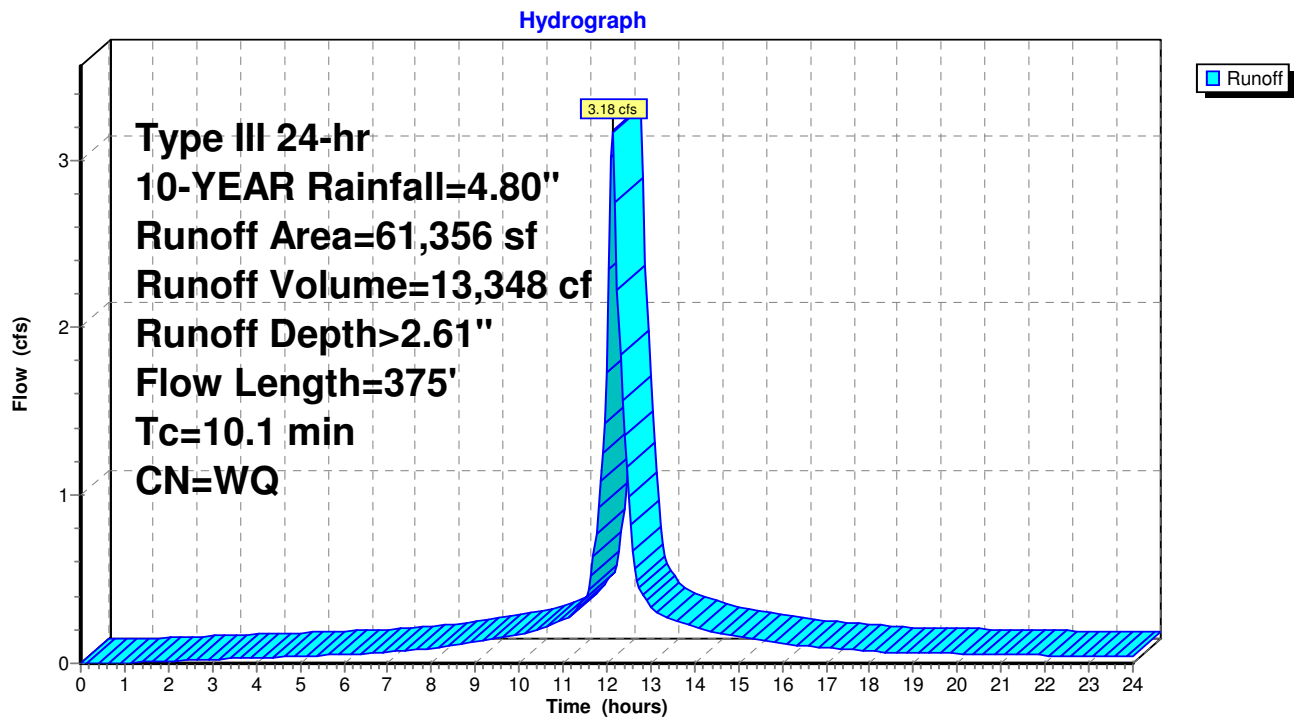
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Type III 24-hr 10-YEAR Rainfall=4.80"

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Subcatchment 2S: SUBCATCHMENT #2



existing conditions

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Type III 24-hr 10-YEAR Rainfall=4.80"

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Summary for Link 5L: DESIGN POINT #1

Inflow Area = 376,253 sf, 10.97% Impervious, Inflow Depth > 1.49" for 10-YEAR event

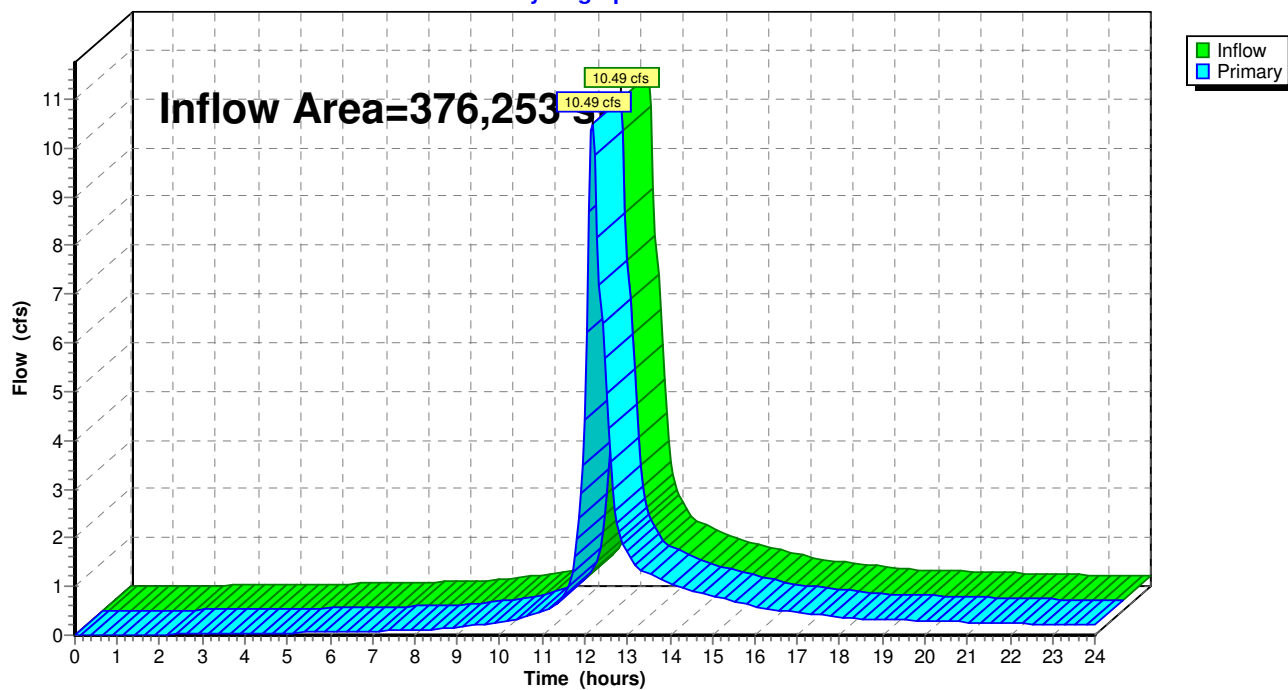
Inflow = 10.49 cfs @ 12.18 hrs, Volume= 46,763 cf

Primary = 10.49 cfs @ 12.18 hrs, Volume= 46,763 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 5L: DESIGN POINT #1

Hydrograph



existing conditions*Type III 24-hr 25-YEAR Rainfall=6.20"*

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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-Q

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

Subcatchment 1S: SUBCATCHMENT #1 Runoff Area=314,897 sf 2.26% Impervious Runoff Depth>2.08"
Flow Length=861' Tc=13.0 min CN=WQ Runoff=12.99 cfs 54,474 cf

Subcatchment 2S: SUBCATCHMENT #2 Runoff Area=61,356 sf 55.72% Impervious Runoff Depth>3.54"
Flow Length=375' Tc=10.1 min CN=WQ Runoff=4.16 cfs 18,101 cf

Link 5L: DESIGN POINT #1

Inflow=16.92 cfs 72,575 cf

Primary=16.92 cfs 72,575 cf

Total Runoff Area = 376,253 sf Runoff Volume = 72,575 cf Average Runoff Depth = 2.31"
89.03% Pervious = 334,962 sf 10.97% Impervious = 41,291 sf

existing conditions

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Type III 24-hr 25-YEAR Rainfall=6.20"

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Summary for Subcatchment 1S: SUBCATCHMENT #1

Runoff = 12.99 cfs @ 12.19 hrs, Volume= 54,474 cf, Depth> 2.08"
 Routed to Link 5L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-YEAR Rainfall=6.20"

Area (sf)	CN	Description
34,034	61	>75% Grass cover, Good, HSG B
595	98	Roofs, HSG B
1,549	98	Roofs, HSG B
661	98	Roofs, HSG B
816	98	Roofs, HSG B
1,145	98	Roofs, HSG B
654	98	Roofs, HSG B
136,422	55	Woods, Good, HSG B
8,523	55	Woods, Good, HSG B
594	80	>75% Grass cover, Good, HSG D
79,531	77	Woods, Good, HSG D
34,363	30	Woods, Good, HSG A
14,325	39	>75% Grass cover, Good, HSG A
816	98	Roofs, HSG B
529	98	Roofs, HSG B
340	98	Roofs, HSG B
314,897		Weighted Average
307,792	58	97.74% Pervious Area
7,105	98	2.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.4	340	0.0625	4.03		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.8	421	0.0250	2.55		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.0	861	Total			

existing conditions

Prepared by Arthur R Cripps, Jr, PE

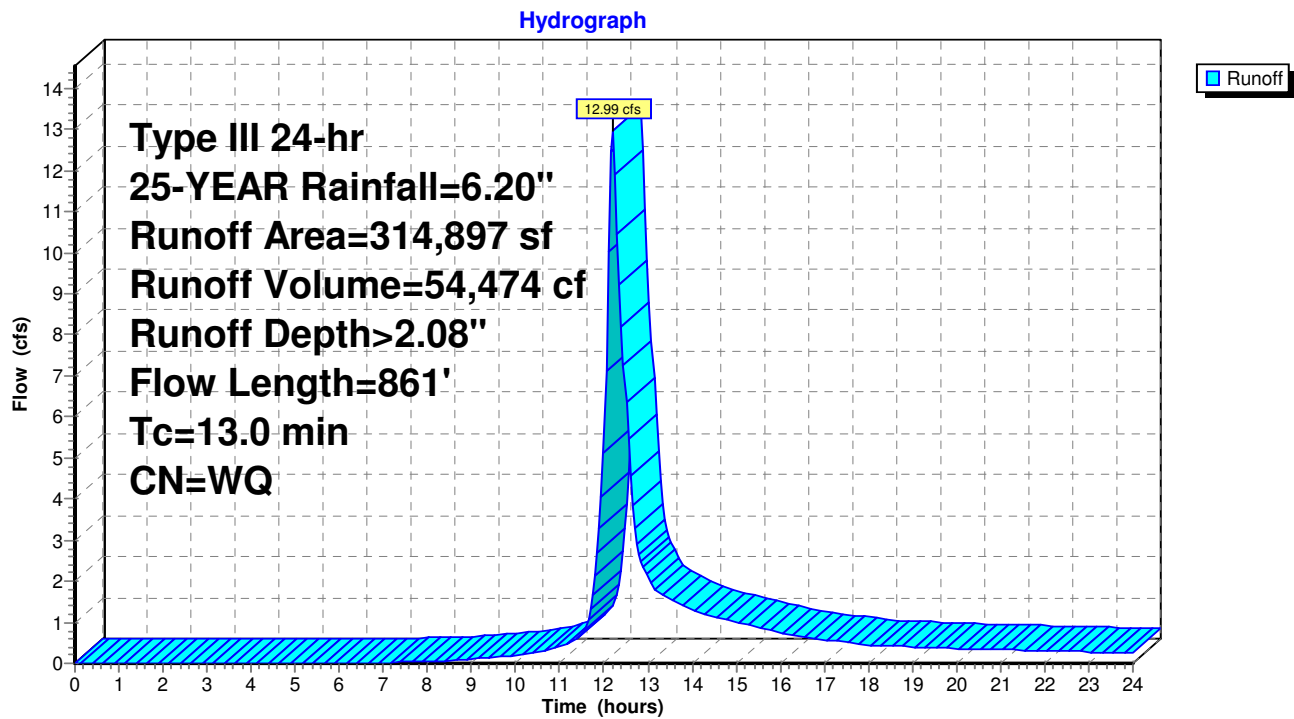
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Type III 24-hr 25-YEAR Rainfall=6.20"

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Subcatchment 1S: SUBCATCHMENT #1



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Type III 24-hr 25-YEAR Rainfall=6.20"

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Summary for Subcatchment 2S: SUBCATCHMENT #2

[47] Hint: Peak is 117% of capacity of segment #3

Runoff = 4.16 cfs @ 12.14 hrs, Volume= 18,101 cf, Depth> 3.54"
 Routed to Link 5L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-YEAR Rainfall=6.20"

Area (sf)	CN	Description
2,432	39	>75% Grass cover, Good, HSG A
34,186	98	Paved parking, HSG B
17,480	39	>75% Grass cover, Good, HSG A
4,187	39	>75% Grass cover, Good, HSG A
3,071	39	>75% Grass cover, Good, HSG A
61,356		Weighted Average
27,170	39	44.28% Pervious Area
34,186	98	55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	50	0.0450	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.7	125	0.0210	2.94		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	150	0.0100	4.54	3.56	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.1	50	0.0250	9.40	16.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
10.1	375	Total			

existing conditions

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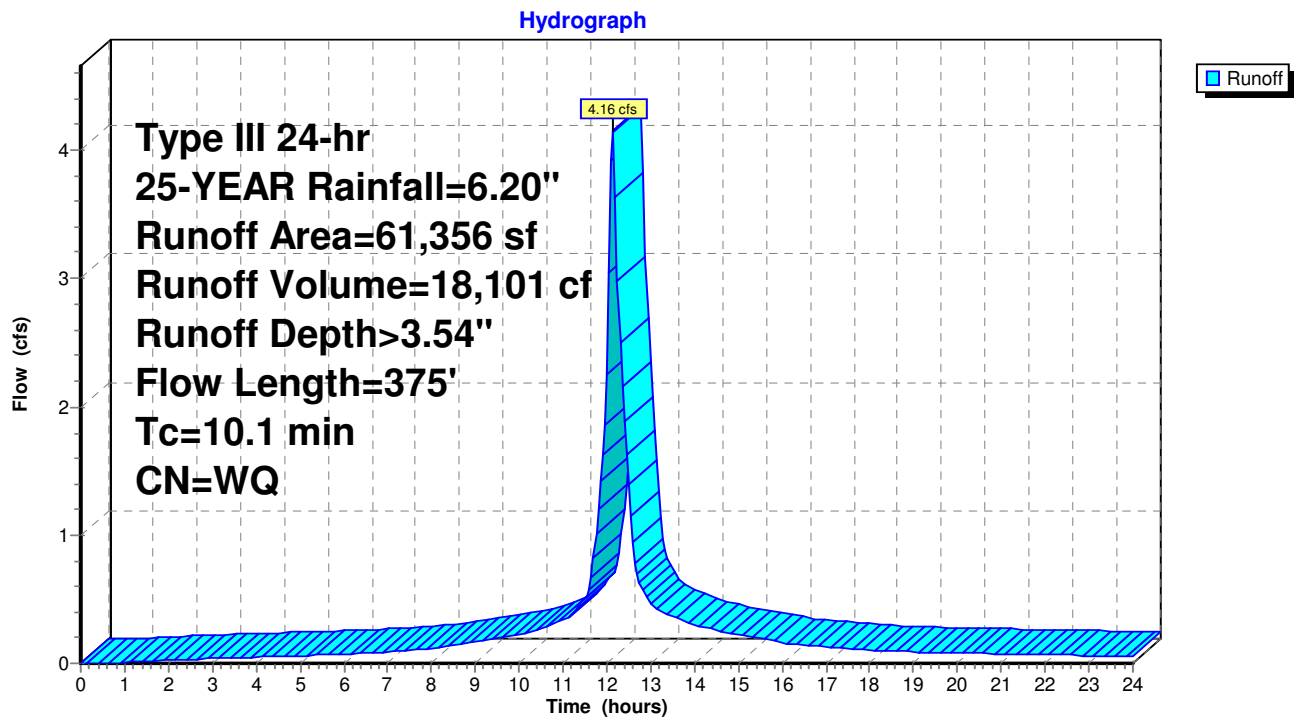
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Type III 24-hr 25-YEAR Rainfall=6.20"

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Subcatchment 2S: SUBCATCHMENT #2



existing conditions

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Type III 24-hr 25-YEAR Rainfall=6.20"

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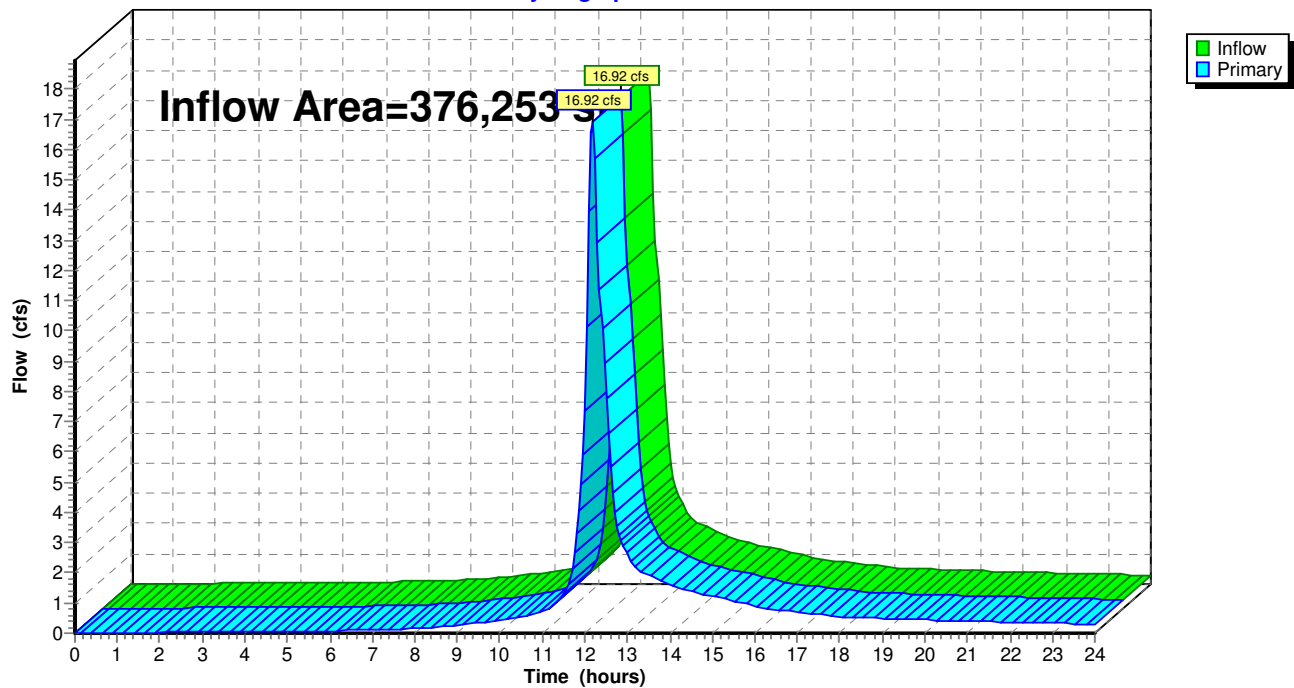
Summary for Link 5L: DESIGN POINT #1

Inflow Area = 376,253 sf, 10.97% Impervious, Inflow Depth > 2.31" for 25-YEAR event
Inflow = 16.92 cfs @ 12.17 hrs, Volume= 72,575 cf
Primary = 16.92 cfs @ 12.17 hrs, Volume= 72,575 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 5L: DESIGN POINT #1

Hydrograph



existing conditions*Type III 24-hr 100-YEAR Rainfall=8.70"*

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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-Q

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

Subcatchment 1S: SUBCATCHMENT #1 Runoff Area=314,897 sf 2.26% Impervious Runoff Depth>3.76"
Flow Length=861' Tc=13.0 min CN=WQ Runoff=24.05 cfs 98,594 cf

Subcatchment 2S: SUBCATCHMENT #2 Runoff Area=61,356 sf 55.72% Impervious Runoff Depth>5.35"
Flow Length=375' Tc=10.1 min CN=WQ Runoff=6.41 cfs 27,376 cf

Link 5L: DESIGN POINT #1

Inflow=30.24 cfs 125,970 cf
Primary=30.24 cfs 125,970 cf

Total Runoff Area = 376,253 sf Runoff Volume = 125,970 cf Average Runoff Depth = 4.02"
89.03% Pervious = 334,962 sf 10.97% Impervious = 41,291 sf

existing conditions

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Type III 24-hr 100-YEAR Rainfall=8.70"

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Summary for Subcatchment 1S: SUBCATCHMENT #1

Runoff = 24.05 cfs @ 12.19 hrs, Volume= 98,594 cf, Depth> 3.76"
 Routed to Link 5L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-YEAR Rainfall=8.70"

Area (sf)	CN	Description
34,034	61	>75% Grass cover, Good, HSG B
595	98	Roofs, HSG B
1,549	98	Roofs, HSG B
661	98	Roofs, HSG B
816	98	Roofs, HSG B
1,145	98	Roofs, HSG B
654	98	Roofs, HSG B
136,422	55	Woods, Good, HSG B
8,523	55	Woods, Good, HSG B
594	80	>75% Grass cover, Good, HSG D
79,531	77	Woods, Good, HSG D
34,363	30	Woods, Good, HSG A
14,325	39	>75% Grass cover, Good, HSG A
816	98	Roofs, HSG B
529	98	Roofs, HSG B
340	98	Roofs, HSG B
314,897		Weighted Average
307,792	58	97.74% Pervious Area
7,105	98	2.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.4	340	0.0625	4.03		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.8	421	0.0250	2.55		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.0	861	Total			

existing conditions

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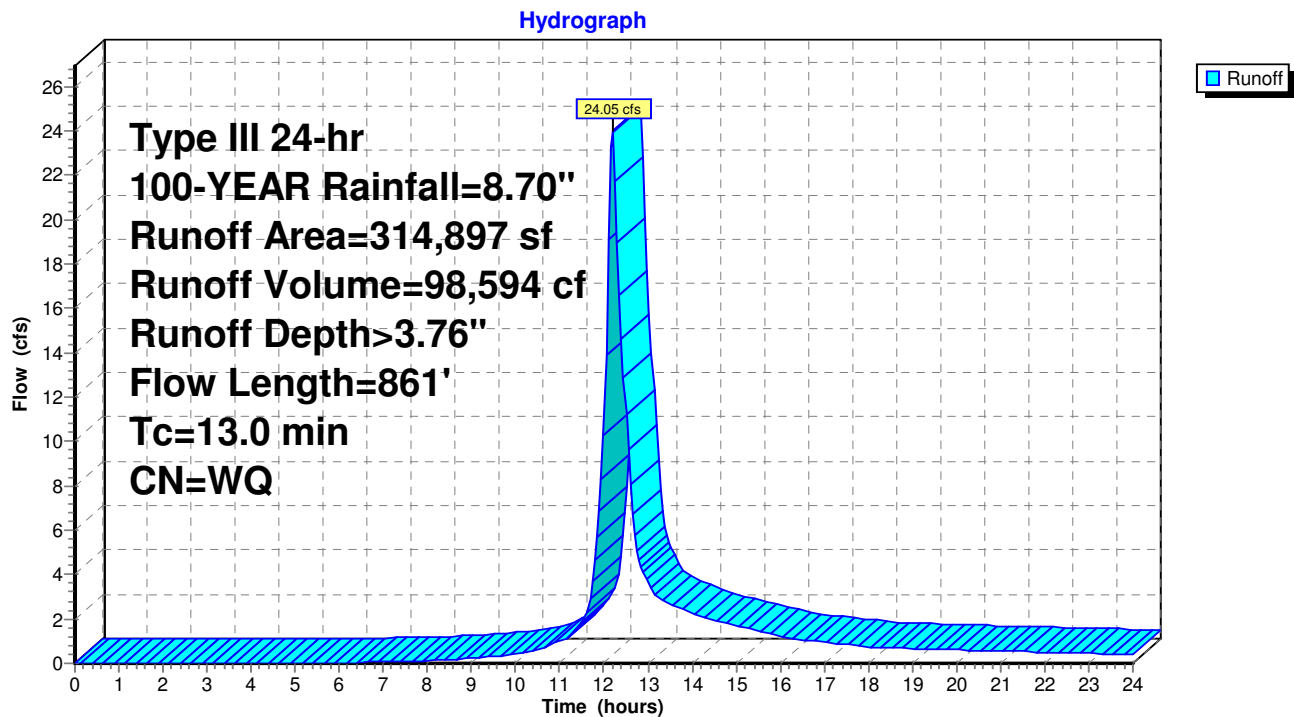
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Type III 24-hr 100-YEAR Rainfall=8.70"

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Subcatchment 1S: SUBCATCHMENT #1



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Type III 24-hr 100-YEAR Rainfall=8.70"

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Summary for Subcatchment 2S: SUBCATCHMENT #2

[47] Hint: Peak is 180% of capacity of segment #3

Runoff = 6.41 cfs @ 12.14 hrs, Volume= 27,376 cf, Depth> 5.35"
 Routed to Link 5L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-YEAR Rainfall=8.70"

Area (sf)	CN	Description
2,432	39	>75% Grass cover, Good, HSG A
34,186	98	Paved parking, HSG B
17,480	39	>75% Grass cover, Good, HSG A
4,187	39	>75% Grass cover, Good, HSG A
3,071	39	>75% Grass cover, Good, HSG A
61,356		Weighted Average
27,170	39	44.28% Pervious Area
34,186	98	55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	50	0.0450	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.7	125	0.0210	2.94		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	150	0.0100	4.54	3.56	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.1	50	0.0250	9.40	16.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
10.1	375	Total			

existing conditions

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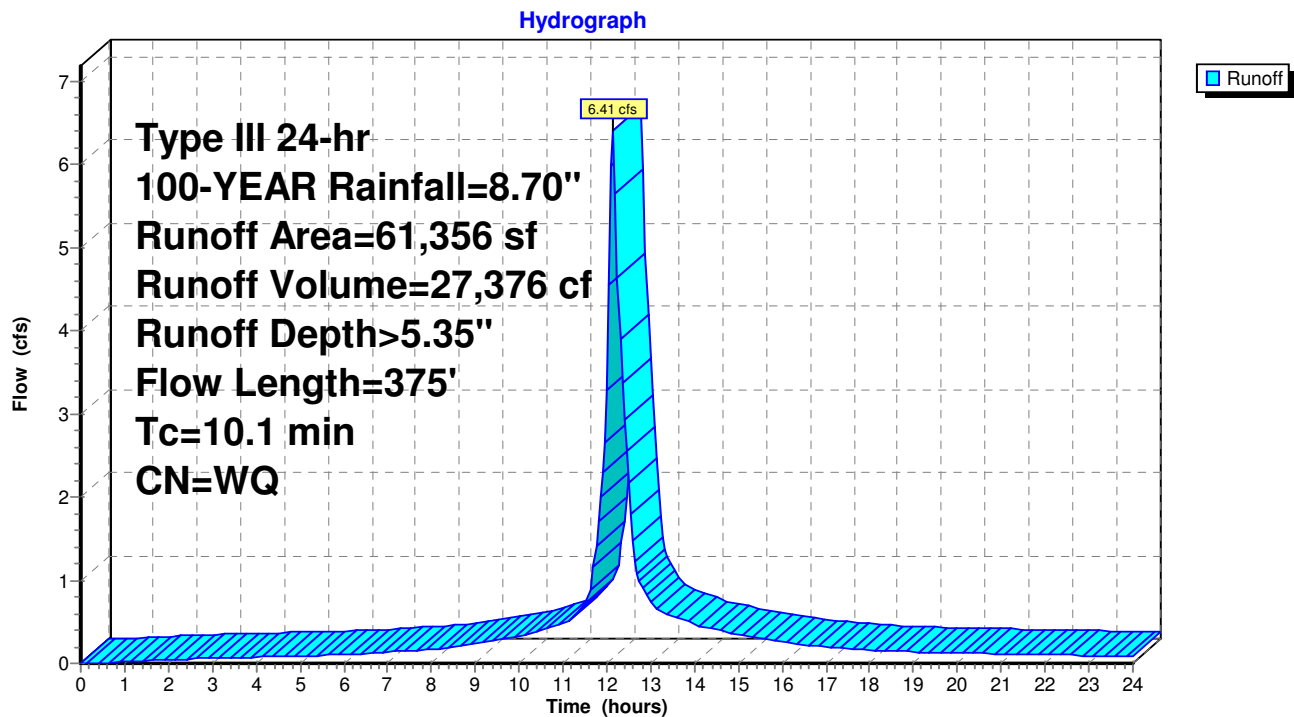
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Type III 24-hr 100-YEAR Rainfall=8.70"

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Subcatchment 2S: SUBCATCHMENT #2



existing conditions

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Type III 24-hr 100-YEAR Rainfall=8.70"

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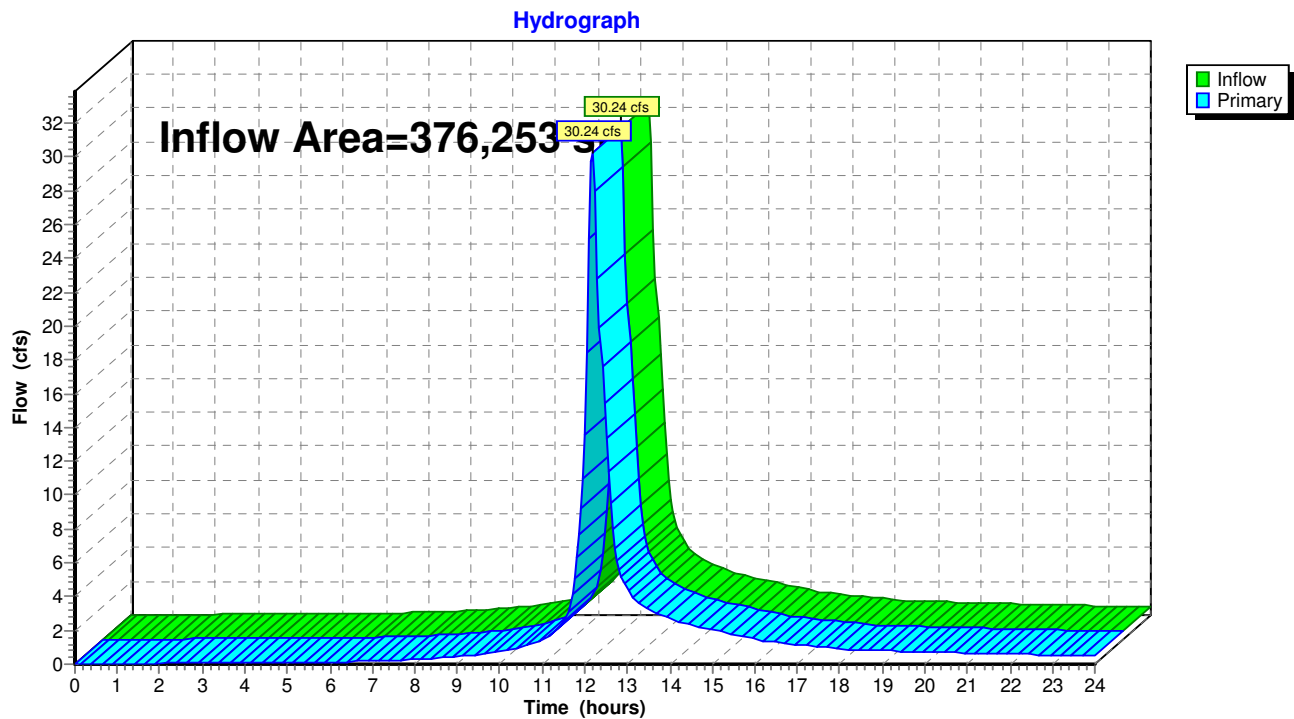
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Summary for Link 5L: DESIGN POINT #1

Inflow Area = 376,253 sf, 10.97% Impervious, Inflow Depth > 4.02" for 100-YEAR event
Inflow = 30.24 cfs @ 12.17 hrs, Volume= 125,970 cf
Primary = 30.24 cfs @ 12.17 hrs, Volume= 125,970 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 5L: DESIGN POINT #1



existing conditions

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Type III 24-hr wqv Rainfall=1.20"

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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-Q

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

Subcatchment 1S: SUBCATCHMENT #1 Runoff Area=314,897 sf 2.26% Impervious Runoff Depth>0.05"
Flow Length=861' Tc=13.0 min CN=WQ Runoff=0.18 cfs 1,257 cf

Subcatchment 2S: SUBCATCHMENT #2 Runoff Area=61,356 sf 55.72% Impervious Runoff Depth>0.55"
Flow Length=375' Tc=10.1 min CN=WQ Runoff=0.74 cfs 2,804 cf

Link 5L: DESIGN POINT #1

Inflow=0.90 cfs 4,061 cf

Primary=0.90 cfs 4,061 cf

Total Runoff Area = 376,253 sf Runoff Volume = 4,061 cf Average Runoff Depth = 0.13"
89.03% Pervious = 334,962 sf 10.97% Impervious = 41,291 sf

existing conditions

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Type III 24-hr wqv Rainfall=1.20"

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Summary for Subcatchment 1S: SUBCATCHMENT #1

Runoff = 0.18 cfs @ 12.22 hrs, Volume= 1,257 cf, Depth> 0.05"
 Routed to Link 5L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr wqv Rainfall=1.20"

Area (sf)	CN	Description
34,034	61	>75% Grass cover, Good, HSG B
595	98	Roofs, HSG B
1,549	98	Roofs, HSG B
661	98	Roofs, HSG B
816	98	Roofs, HSG B
1,145	98	Roofs, HSG B
654	98	Roofs, HSG B
136,422	55	Woods, Good, HSG B
8,523	55	Woods, Good, HSG B
594	80	>75% Grass cover, Good, HSG D
79,531	77	Woods, Good, HSG D
34,363	30	Woods, Good, HSG A
14,325	39	>75% Grass cover, Good, HSG A
816	98	Roofs, HSG B
529	98	Roofs, HSG B
340	98	Roofs, HSG B
314,897		Weighted Average
307,792	58	97.74% Pervious Area
7,105	98	2.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.4	340	0.0625	4.03		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.8	421	0.0250	2.55		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.0	861	Total			

existing conditions

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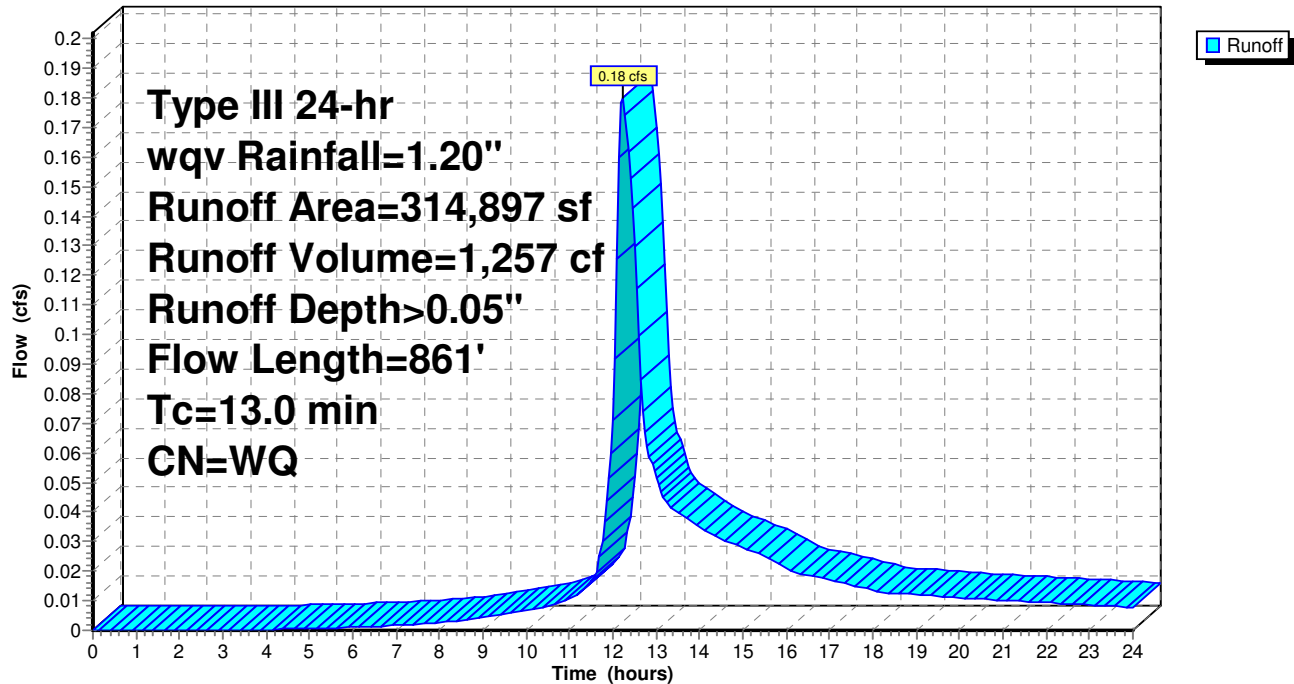
Type III 24-hr wqv Rainfall=1.20"

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Subcatchment 1S: SUBCATCHMENT #1

Hydrograph



existing conditions

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Type III 24-hr wqv Rainfall=1.20"

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Summary for Subcatchment 2S: SUBCATCHMENT #2

Runoff = 0.74 cfs @ 12.14 hrs, Volume= 2,804 cf, Depth> 0.55"
 Routed to Link 5L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr wqv Rainfall=1.20"

Area (sf)	CN	Description
2,432	39	>75% Grass cover, Good, HSG A
34,186	98	Paved parking, HSG B
17,480	39	>75% Grass cover, Good, HSG A
4,187	39	>75% Grass cover, Good, HSG A
3,071	39	>75% Grass cover, Good, HSG A
61,356		Weighted Average
27,170	39	44.28% Pervious Area
34,186	98	55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	50	0.0450	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.7	125	0.0210	2.94		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	150	0.0100	4.54	3.56	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.1	50	0.0250	9.40	16.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
10.1	375	Total			

existing conditions

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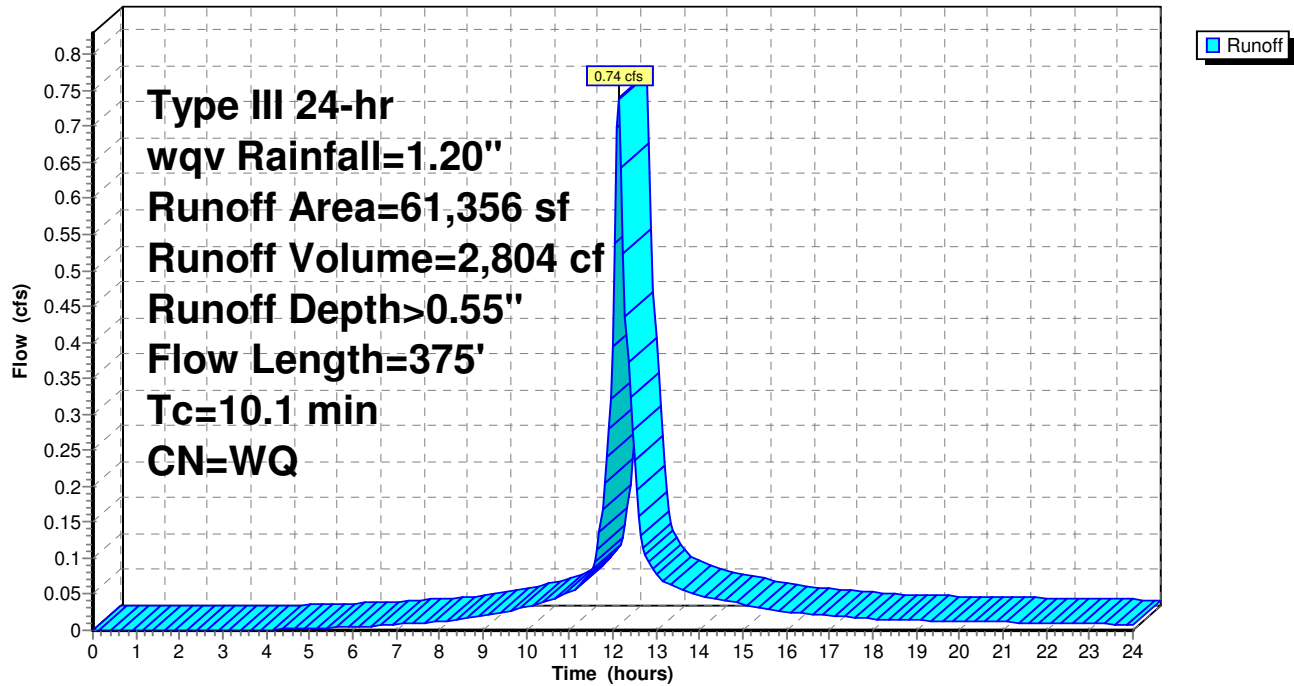
Type III 24-hr wqv Rainfall=1.20"

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Subcatchment 2S: SUBCATCHMENT #2

Hydrograph



existing conditions

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Type III 24-hr wqv Rainfall=1.20"

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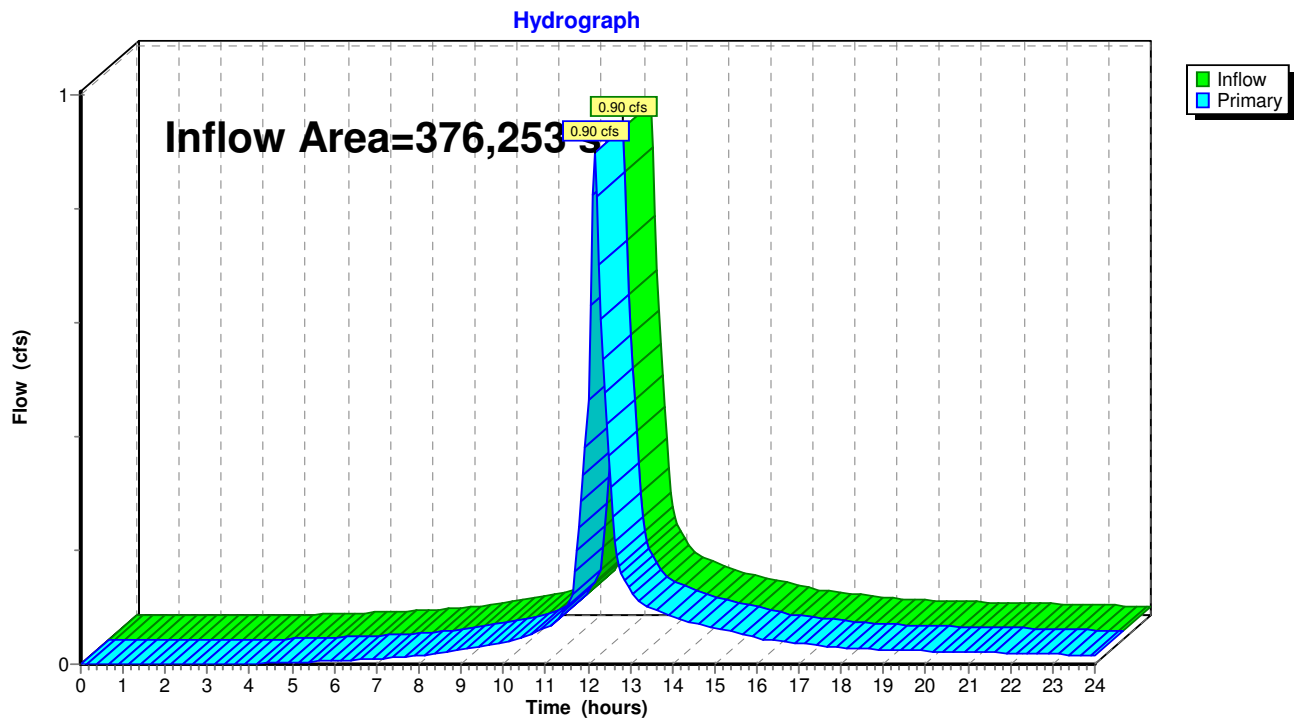
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Summary for Link 5L: DESIGN POINT #1

Inflow Area = 376,253 sf, 10.97% Impervious, Inflow Depth > 0.13" for wqv event
Inflow = 0.90 cfs @ 12.15 hrs, Volume= 4,061 cf
Primary = 0.90 cfs @ 12.15 hrs, Volume= 4,061 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 5L: DESIGN POINT #1





Coventry Survey Design Group

46 South Main Street

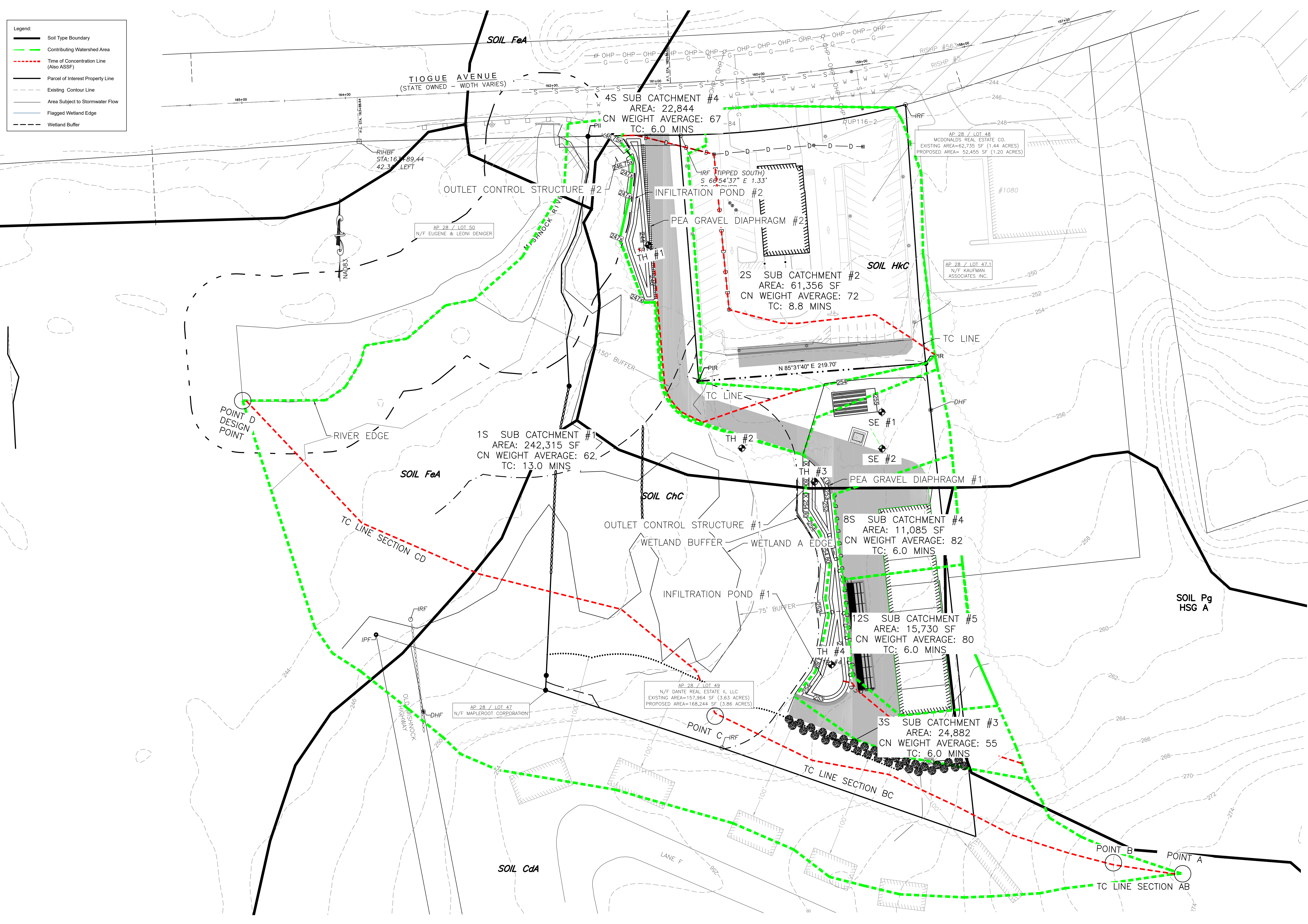
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STORMWATER REPORT APPENDIX - C

PROPOSED WATERSHED MAP





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46 South Main Street

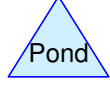
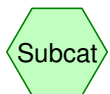
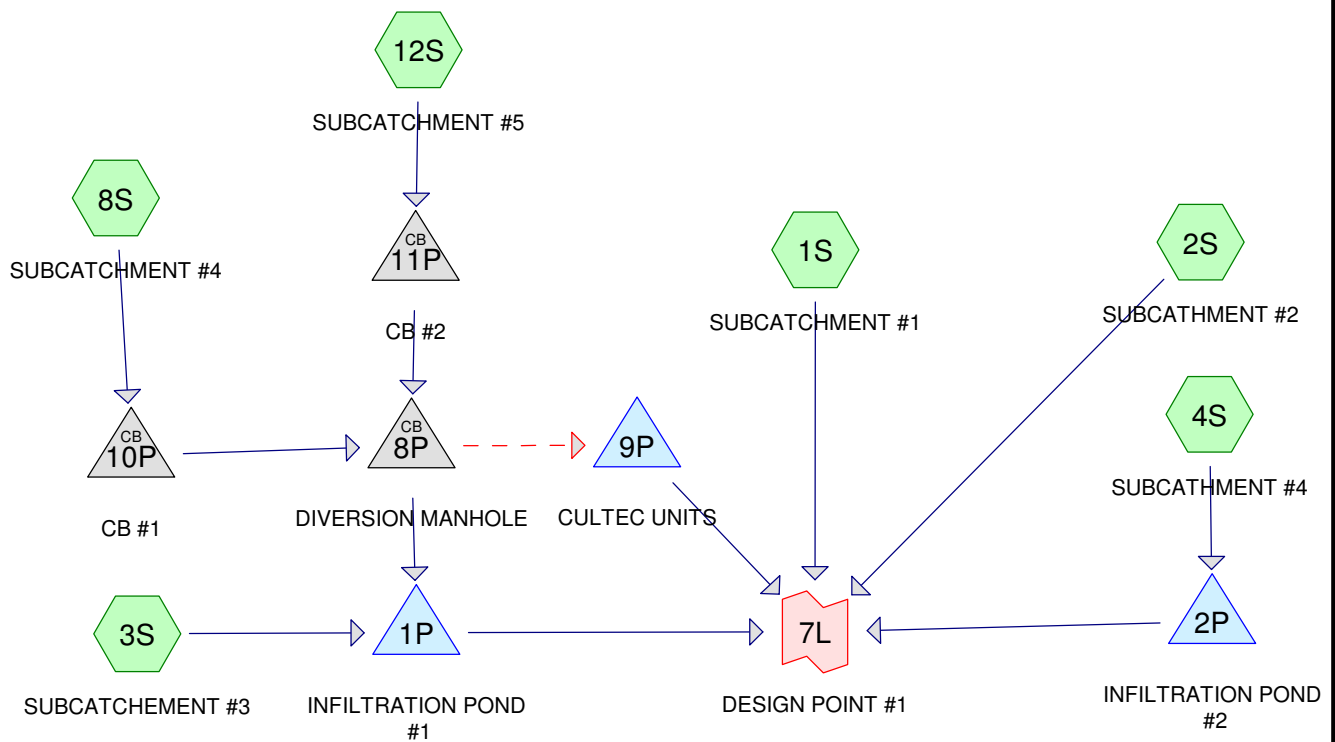
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STORMWATER REPORT APPENDIX - D

PROPOSED HYDROCAD MODELING



Routing Diagram for Proposed conditions
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Project Notes

Rainfall events imported from "EXISTINGhydrocad .hcp"

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1 -YEAR	Type III 24-hr		Default	24.00	1	2.70	2
2	10 -YEAR	Type III 24-hr		Default	24.00	1	4.90	2
3	25-YEAR	Type III 24-hr		Default	24.00	1	6.20	2
4	100-YEAR	Type III 24-hr		Default	24.00	1	8.70	2
5	WQV	Type III 24-hr		Default	24.00	1	1.20	2

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
44,032	39	>75% Grass cover, Good, HSG A (2S, 3S, 4S)
29,494	61	>75% Grass cover, Good, HSG B (1S)
21,290	98	Paved parking, HSG A (3S, 4S, 12S)
39,470	98	Paved parking, HSG B (2S, 8S)
10,000	98	Roofs, HSG A (8S, 12S)
7,105	98	Roofs, HSG B (1S)
36,754	30	Woods, Good, HSG A (1S, 3S, 8S, 12S)
108,576	55	Woods, Good, HSG B (1S, 3S)
79,531	77	Woods, Good, HSG D (1S)
376,252	65	TOTAL AREA

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
112,076	HSG A	1S, 2S, 3S, 4S, 8S, 12S
184,645	HSG B	1S, 2S, 3S, 8S
0	HSG C	
79,531	HSG D	1S
0	Other	
376,252		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
44,032	29,494	0	0	0	73,526	>75% Grass cover, Good
21,290	39,470	0	0	0	60,760	Paved parking
10,000	7,105	0	0	0	17,105	Roofs
36,754	108,576	0	79,531	0	224,861	Woods, Good
112,076	184,645	0	79,531	0	376,252	TOTAL AREA

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	2S	0.00	0.00	150.0	0.0100	0.013	0.0	12.0	0.0
2	2S	0.00	0.00	50.0	0.0250	0.013	0.0	18.0	0.0
3	8P	252.00	252.00	50.0	0.0000	0.013	0.0	6.0	0.0
4	8P	252.00	252.00	10.0	0.0000	0.013	0.0	12.0	0.0
5	9P	252.00	252.00	4.0	0.0000	0.013	0.0	6.0	0.0
6	10P	252.35	252.00	70.0	0.0050	0.013	0.0	12.0	0.0
7	11P	252.35	252.00	70.0	0.0050	0.013	0.0	12.0	0.0

Proposed conditions

Type III 24-hr 1 -YEAR Rainfall=2.70"

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

Subcatchment 1S: SUBCATCHMENT #1 Runoff Area=242,315 sf 2.93% Impervious Runoff Depth>0.44"
Flow Length=861' Tc=13.0 min CN=WQ Runoff=1.77 cfs 8,882 cf

Subcatchment 2S: SUBCATHMENT #2 Runoff Area=61,356 sf 55.72% Impervious Runoff Depth>1.37"
Flow Length=375' Tc=10.1 min CN=WQ Runoff=1.77 cfs 7,027 cf

Subcatchment 3S: SUBCATCHMENT #3 Runoff Area=24,882 sf 26.06% Impervious Runoff Depth>0.67"
Tc=6.0 min CN=WQ Runoff=0.38 cfs 1,382 cf

Subcatchment 4S: SUBCATHMENT #4 Runoff Area=20,884 sf 47.99% Impervious Runoff Depth>1.18"
Flow Length=357' Slope=0.0250 '/' Tc=6.7 min CN=WQ Runoff=0.58 cfs 2,061 cf

Subcatchment 8S: SUBCATCHMENT #4 Runoff Area=11,085 sf 75.86% Impervious Runoff Depth>1.87"
Tc=6.0 min CN=WQ Runoff=0.49 cfs 1,730 cf

Subcatchment 12S: SUBCATCHMENT #5 Runoff Area=15,730 sf 74.11% Impervious Runoff Depth>1.83"
Tc=6.0 min CN=WQ Runoff=0.68 cfs 2,398 cf

Pond 1P: INFILTRATION POND #1 Peak Elev=253.08' Storage=1,984 cf Inflow=1.12 cfs 5,331 cf
Discarded=0.17 cfs 5,325 cf Primary=0.00 cfs 0 cf Outflow=0.17 cfs 5,325 cf

Pond 2P: INFILTRATION POND #2 Peak Elev=244.59' Storage=394 cf Inflow=0.58 cfs 2,061 cf
Discarded=0.20 cfs 2,060 cf Primary=0.00 cfs 0 cf Outflow=0.20 cfs 2,060 cf

Pond 8P: DIVERSION MANHOLE Peak Elev=253.80' Inflow=1.17 cfs 4,127 cf
Primary=0.74 cfs 3,949 cf Secondary=0.43 cfs 179 cf Outflow=1.17 cfs 4,127 cf

Pond 9P: CULTEC UNITS Peak Elev=251.79' Storage=179 cf Inflow=0.43 cfs 179 cf
6.0" Round Culvert n=0.013 L=4.0' S=0.0000 '/' Outflow=0.00 cfs 0 cf

Pond 10P: CB #1 Peak Elev=252.77' Inflow=0.49 cfs 1,730 cf
12.0" Round Culvert n=0.013 L=70.0' S=0.0050 '/' Outflow=0.49 cfs 1,730 cf

Pond 11P: CB #2 Peak Elev=252.85' Inflow=0.68 cfs 2,398 cf
12.0" Round Culvert n=0.013 L=70.0' S=0.0050 '/' Outflow=0.68 cfs 2,398 cf

Link 7L: DESIGN POINT #1 Inflow=3.45 cfs 15,909 cf
Primary=3.45 cfs 15,909 cf

Total Runoff Area = 376,252 sf Runoff Volume = 23,479 cf Average Runoff Depth = 0.75"
79.31% Pervious = 298,387 sf 20.69% Impervious = 77,865 sf

Proposed conditions

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Type III 24-hr 1 -YEAR Rainfall=2.70"

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Summary for Subcatchment 1S: SUBCATCHMENT #1

Runoff = 1.77 cfs @ 12.20 hrs, Volume= 8,882 cf, Depth> 0.44"
 Routed to Link 7L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 1 -YEAR Rainfall=2.70"

Area (sf)	CN	Description
1,306	30	Woods, Good, HSG A
103,810	55	Woods, Good, HSG B
79,531	77	Woods, Good, HSG D
21,069	30	Woods, Good, HSG A
29,494	61	>75% Grass cover, Good, HSG B
595	98	Roofs, HSG B
1,549	98	Roofs, HSG B
661	98	Roofs, HSG B
816	98	Roofs, HSG B
529	98	Roofs, HSG B
856	98	Roofs, HSG B
1,445	98	Roofs, HSG B
654	98	Roofs, HSG B
242,315		Weighted Average
235,210	61	97.07% Pervious Area
7,105	98	2.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.4	340	0.0625	4.03		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.8	421	0.0250	2.55		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.0	861	Total			

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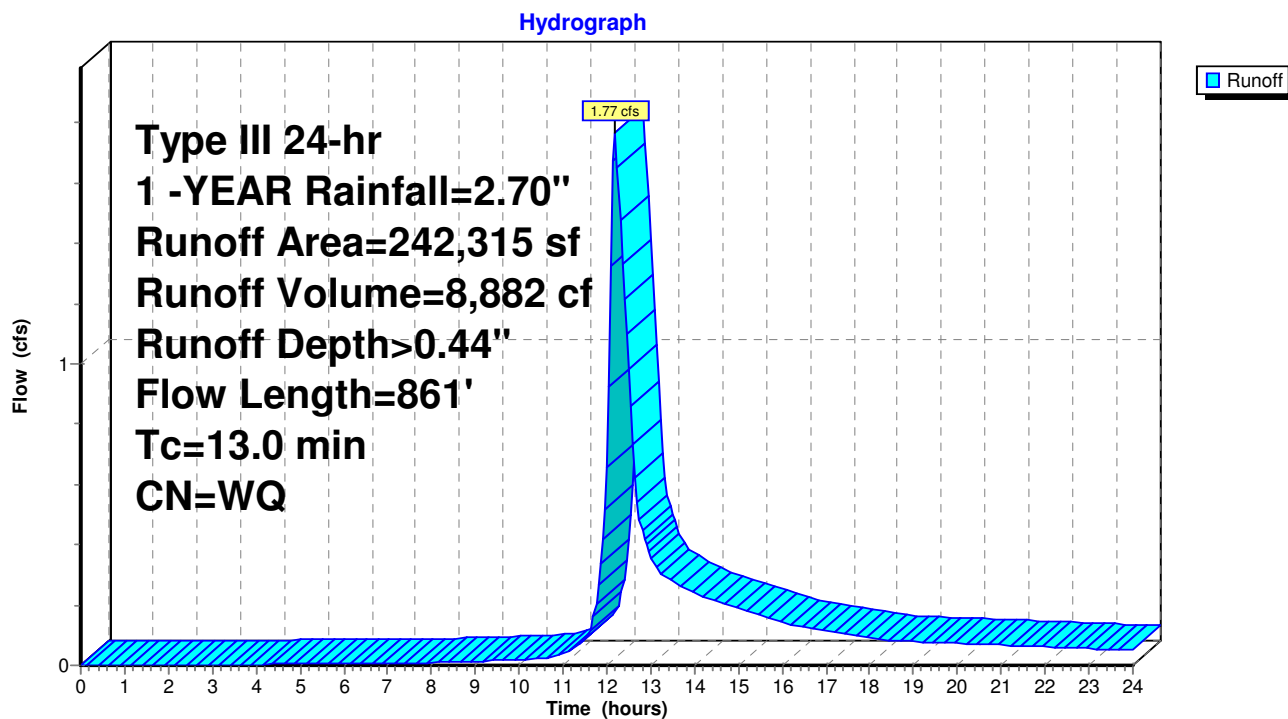
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Subcatchment 1S: SUBCATCHMENT #1



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Type III 24-hr 1 -YEAR Rainfall=2.70"

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Summary for Subcatchment 2S: SUBCATHMENT #2

Runoff = 1.77 cfs @ 12.14 hrs, Volume= 7,027 cf, Depth> 1.37"
 Routed to Link 7L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 1 -YEAR Rainfall=2.70"

Area (sf)	CN	Description
2,432	39	>75% Grass cover, Good, HSG A
34,186	98	Paved parking, HSG B
17,480	39	>75% Grass cover, Good, HSG A
4,187	39	>75% Grass cover, Good, HSG A
3,071	39	>75% Grass cover, Good, HSG A
61,356		Weighted Average
27,170	39	44.28% Pervious Area
34,186	98	55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	50	0.0450	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.7	125	0.0210	2.94		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	150	0.0100	4.54	3.56	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.1	50	0.0250	9.40	16.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
10.1	375	Total			

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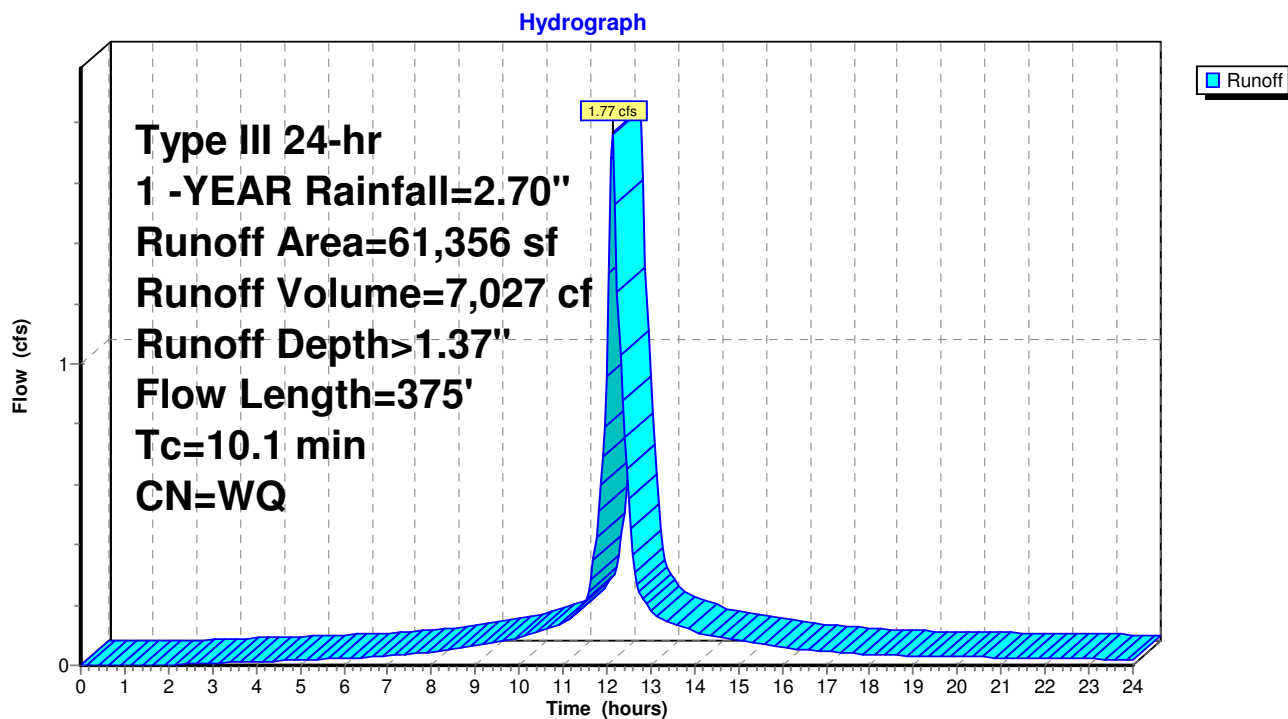
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Type III 24-hr 1 -YEAR Rainfall=2.70"

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Subcatchment 2S: SUBCATHMENT #2



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Type III 24-hr 1 -YEAR Rainfall=2.70"

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Summary for Subcatchment 3S: SUBCATCHEMENT #3

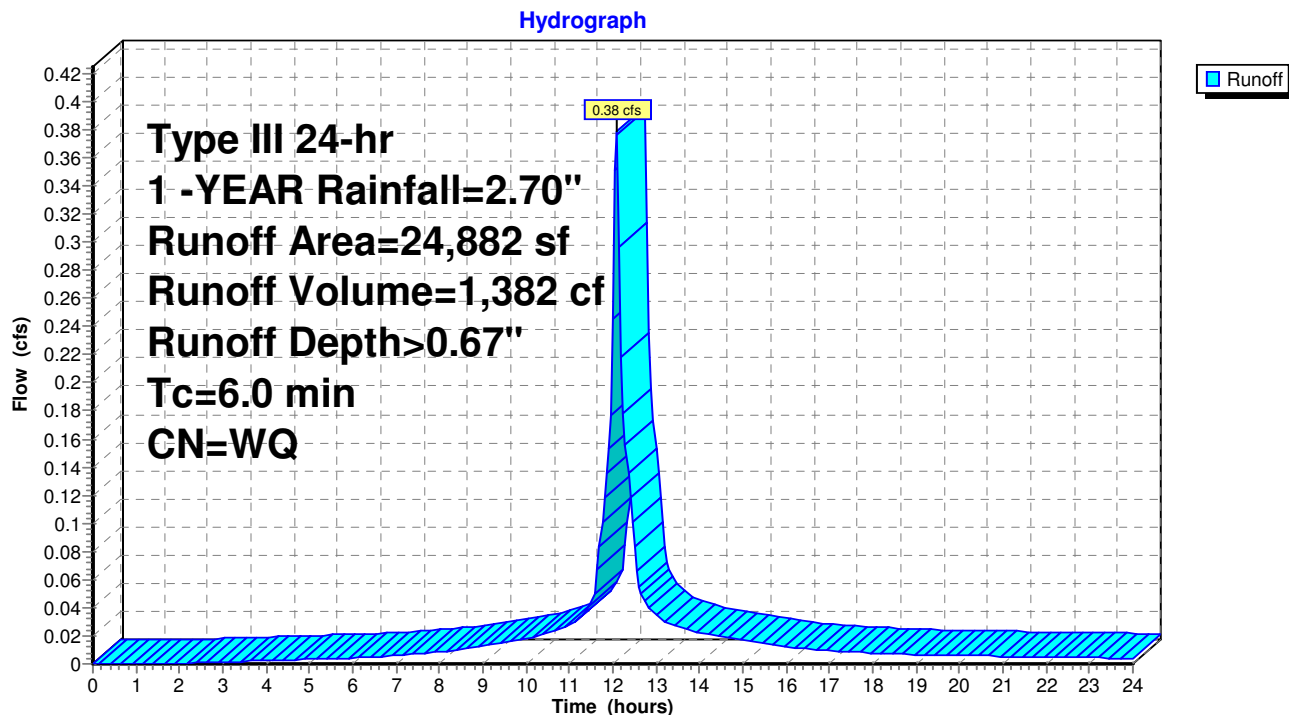
Runoff = 0.38 cfs @ 12.09 hrs, Volume= 1,382 cf, Depth> 0.67"
Routed to Pond 1P : INFILTRATION POND #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 -YEAR Rainfall=2.70"

Area (sf)	CN	Description
5,209	30	Woods, Good, HSG A
4,766	55	Woods, Good, HSG B
4,088	39	>75% Grass cover, Good, HSG A
6,484	98	Paved parking, HSG A
1,913	39	>75% Grass cover, Good, HSG A
2,422	30	Woods, Good, HSG A
24,882		Weighted Average
18,398	39	73.94% Pervious Area
6,484	98	26.06% Impervious Area

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

Subcatchment 3S: SUBCATCHEMENT #3



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Summary for Subcatchment 4S: SUBCATHMENT #4

Runoff = 0.58 cfs @ 12.09 hrs, Volume= 2,061 cf, Depth> 1.18"
Routed to Pond 2P : INFILTRATION POND #2

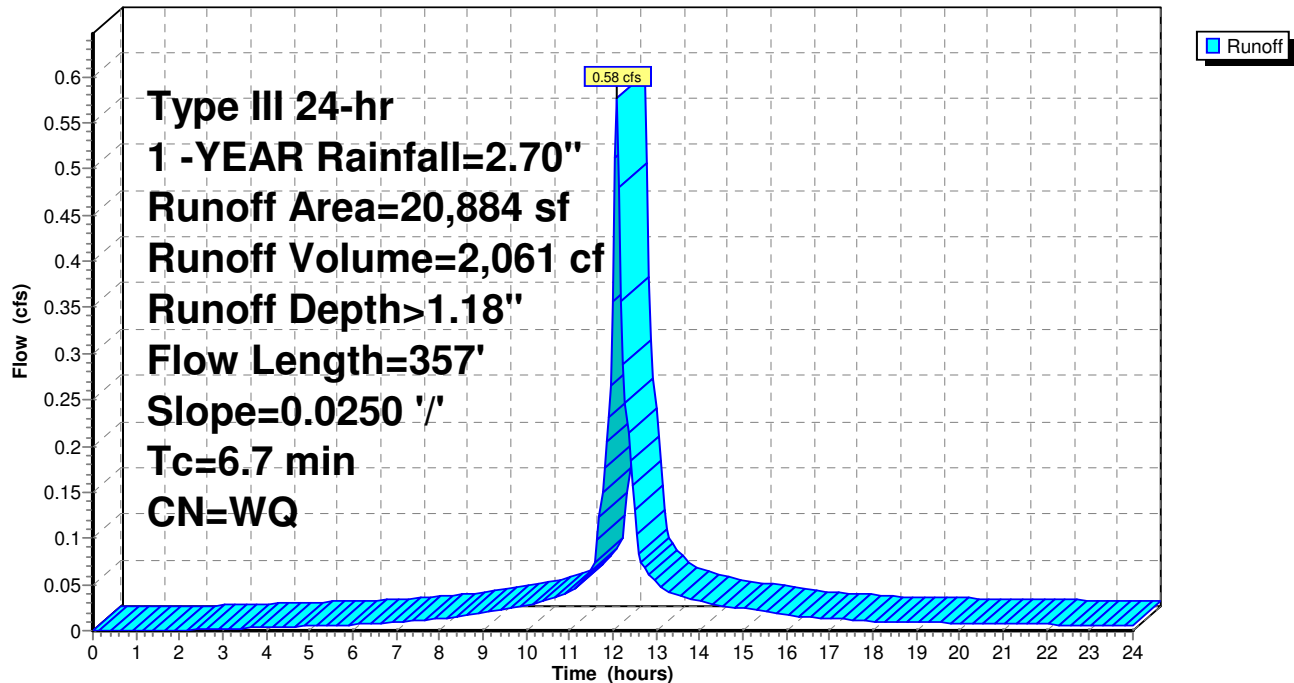
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 -YEAR Rainfall=2.70"

Area (sf)	CN	Description
3,589	39	>75% Grass cover, Good, HSG A
10,023	98	Paved parking, HSG A
7,272	39	>75% Grass cover, Good, HSG A
20,884		Weighted Average
10,861	39	52.01% Pervious Area
10,023	98	47.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0250	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.6	307	0.0250	3.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
6.7	357	Total			

Subcatchment 4S: SUBCATHMENT #4

Hydrograph



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Summary for Subcatchment 8S: SUBCATCHMENT #4

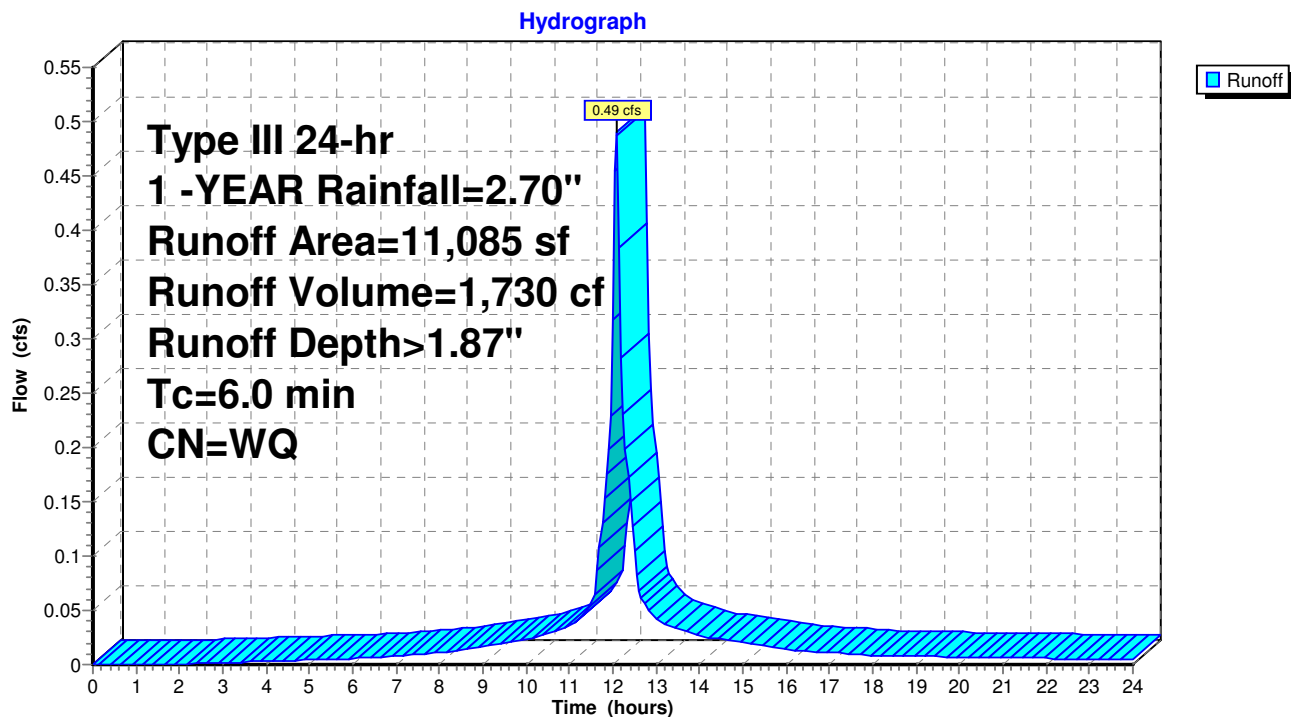
Runoff = 0.49 cfs @ 12.09 hrs, Volume= 1,730 cf, Depth> 1.87"
Routed to Pond 10P : CB #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 -YEAR Rainfall=2.70"

Area (sf)	CN	Description
5,284	98	Paved parking, HSG B
2,676	30	Woods, Good, HSG A
3,125	98	Roofs, HSG A
11,085		Weighted Average
2,676	30	24.14% Pervious Area
8,409	98	75.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, MIN OF 6 MINS

Subcatchment 8S: SUBCATCHMENT #4



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Type III 24-hr 1 -YEAR Rainfall=2.70"

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Summary for Subcatchment 12S: SUBCATCHMENT #5

Runoff = 0.68 cfs @ 12.09 hrs, Volume= 2,398 cf, Depth> 1.83"
Routed to Pond 11P : CB #2

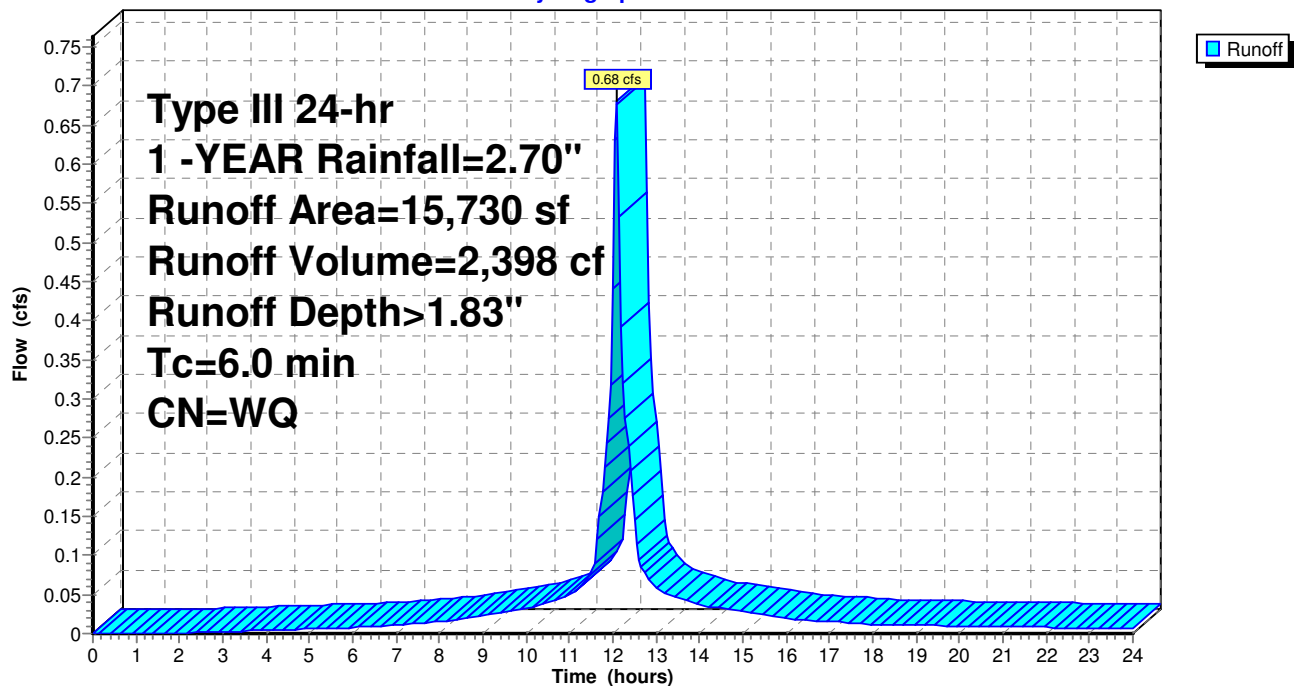
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 -YEAR Rainfall=2.70"

Area (sf)	CN	Description
4,783	98	Paved parking, HSG A
6,875	98	Roofs, HSG A
4,072	30	Woods, Good, HSG A
15,730		Weighted Average
4,072	30	25.89% Pervious Area
11,658	98	74.11% Impervious Area

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

Subcatchment 12S: SUBCATCHMENT #5

Hydrograph



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Type III 24-hr 1 -YEAR Rainfall=2.70"

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Summary for Pond 1P: INFILTRATION POND #1

[81] Warning: Exceeded Pond 8P by 0.74' @ 13.15 hrs

Inflow Area = 51,697 sf, 51.36% Impervious, Inflow Depth > 1.24" for 1 -YEAR event
Inflow = 1.12 cfs @ 12.09 hrs, Volume= 5,331 cf
Outflow = 0.17 cfs @ 12.81 hrs, Volume= 5,325 cf, Atten= 85%, Lag= 43.4 min
Discarded = 0.17 cfs @ 12.81 hrs, Volume= 5,325 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 7L : DESIGN POINT #1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 253.08' @ 12.81 hrs Surf.Area= 2,480 sf Storage= 1,984 cf

Plug-Flow detention time= 109.4 min calculated for 5,314 cf (100% of inflow)
Center-of-Mass det. time= 108.5 min (871.6 - 763.0)

Volume	Invert	Avail.Storage	Storage Description
#1	252.00'	4,868 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
252.00	1,213	0	0
253.00	2,366	1,790	1,790
254.00	3,791	3,079	4,868

Device	Routing	Invert	Outlet Devices
#1	Discarded	252.00'	2.410 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 248.00'
#2	Primary	253.50'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Discarded OutFlow Max=0.17 cfs @ 12.81 hrs HW=253.08' (Free Discharge)
↑**1=Exfiltration** (Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=252.00' (Free Discharge)
↑**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

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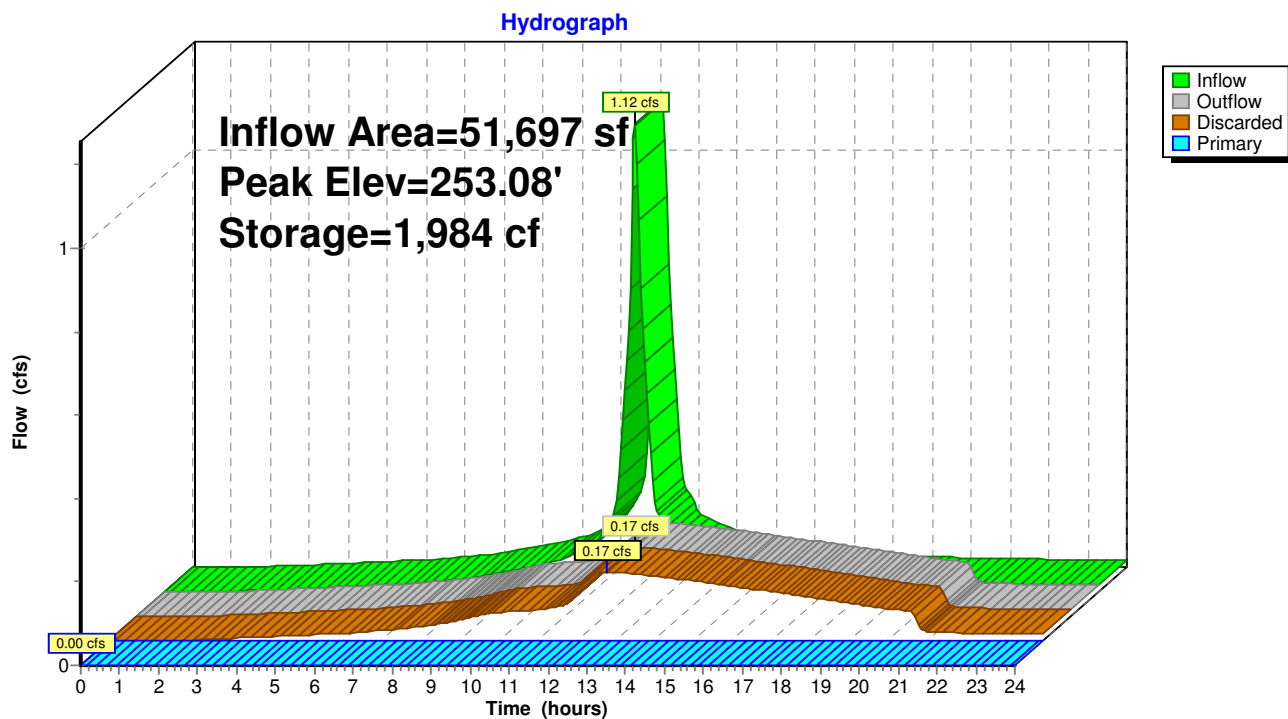
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Type III 24-hr 1 -YEAR Rainfall=2.70"

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Pond 1P: INFILTRATION POND #1



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Type III 24-hr 1 -YEAR Rainfall=2.70"

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Stage-Area-Storage for Pond 1P: INFILTRATION POND #1

Elevation (feet)	Surface (sq-ft)	Horizontal (sq-ft)	Storage (cubic-feet)
252.00	1,213	1,213	0
252.05	1,271	1,271	62
252.10	1,328	1,328	127
252.15	1,386	1,386	195
252.20	1,444	1,444	266
252.25	1,501	1,501	339
252.30	1,559	1,559	416
252.35	1,617	1,617	495
252.40	1,674	1,674	577
252.45	1,732	1,732	663
252.50	1,790	1,790	751
252.55	1,847	1,847	842
252.60	1,905	1,905	935
252.65	1,962	1,962	1,032
252.70	2,020	2,020	1,132
252.75	2,078	2,078	1,234
252.80	2,135	2,135	1,339
252.85	2,193	2,193	1,448
252.90	2,251	2,251	1,559
252.95	2,308	2,308	1,673
253.00	2,366	2,366	1,790
253.05	2,437	2,437	1,910
253.10	2,508	2,508	2,033
253.15	2,580	2,580	2,160
253.20	2,651	2,651	2,291
253.25	2,722	2,722	2,426
253.30	2,794	2,794	2,563
253.35	2,865	2,865	2,705
253.40	2,936	2,936	2,850
253.45	3,007	3,007	2,998
253.50	3,079	3,079	3,151
253.55	3,150	3,150	3,306
253.60	3,221	3,221	3,466
253.65	3,292	3,292	3,628
253.70	3,363	3,363	3,795
253.75	3,435	3,435	3,965
253.80	3,506	3,506	4,138
253.85	3,577	3,577	4,315
253.90	3,649	3,649	4,496
253.95	3,720	3,720	4,680
254.00	3,791	3,791	4,868

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Summary for Pond 2P: INFILTRATION POND #2

Inflow Area = 20,884 sf, 47.99% Impervious, Inflow Depth > 1.18" for 1 -YEAR event
 Inflow = 0.58 cfs @ 12.09 hrs, Volume= 2,061 cf
 Outflow = 0.20 cfs @ 12.37 hrs, Volume= 2,060 cf, Atten= 65%, Lag= 16.3 min
 Discarded = 0.20 cfs @ 12.37 hrs, Volume= 2,060 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link 7L : DESIGN POINT #1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 244.59' @ 12.37 hrs Surf.Area= 880 sf Storage= 394 cf

Plug-Flow detention time= 12.4 min calculated for 2,056 cf (100% of inflow)
 Center-of-Mass det. time= 12.1 min (772.4 - 760.2)

Volume	Invert	Avail.Storage	Storage Description
#1	244.00'	5,113 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
244.00	455	0	0
245.00	1,174	815	815
246.00	2,101	1,638	2,452
247.00	3,221	2,661	5,113

Device	Routing	Invert	Outlet Devices
#1	Discarded	244.00'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 242.00'
#2	Primary	245.00'	60.0 deg x 0.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.53 (C= 3.16)
#3	Primary	245.50'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Discarded OutFlow Max=0.20 cfs @ 12.37 hrs HW=244.59' (Free Discharge)

↑ **1=Exfiltration** (Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=244.00' (Free Discharge)

↑ **2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

↑ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Proposed conditions

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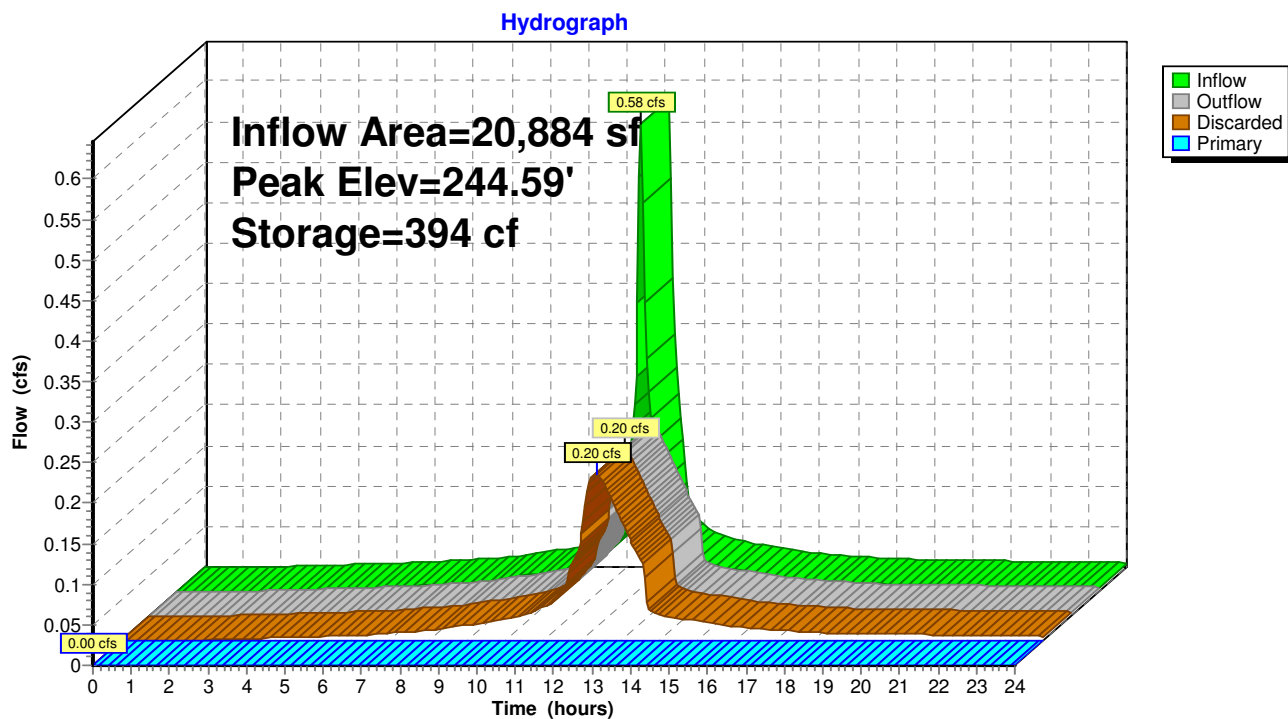
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Type III 24-hr 1 -YEAR Rainfall=2.70"

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Pond 2P: INFILTRATION POND #2



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Stage-Area-Storage for Pond 2P: INFILTRATION POND #2

Elevation (feet)	Surface (sq-ft)	Horizontal (sq-ft)	Storage (cubic-feet)
244.00	455	455	0
244.10	527	527	49
244.20	599	599	105
244.30	671	671	169
244.40	743	743	240
244.50	815	815	317
244.60	886	886	402
244.70	958	958	495
244.80	1,030	1,030	594
244.90	1,102	1,102	701
245.00	1,174	1,174	815
245.10	1,267	1,267	937
245.20	1,359	1,359	1,068
245.30	1,452	1,452	1,208
245.40	1,545	1,545	1,358
245.50	1,638	1,638	1,517
245.60	1,730	1,730	1,686
245.70	1,823	1,823	1,863
245.80	1,916	1,916	2,050
245.90	2,008	2,008	2,247
246.00	2,101	2,101	2,452
246.10	2,213	2,213	2,668
246.20	2,325	2,325	2,895
246.30	2,437	2,437	3,133
246.40	2,549	2,549	3,382
246.50	2,661	2,661	3,643
246.60	2,773	2,773	3,914
246.70	2,885	2,885	4,197
246.80	2,997	2,997	4,491
246.90	3,109	3,109	4,797
247.00	3,221	3,221	5,113

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Summary for Pond 8P: DIVERSION MANHOLE

[57] Hint: Peaked at 253.80' (Flood elevation advised)

[81] Warning: Exceeded Pond 10P by 1.04' @ 12.15 hrs

[81] Warning: Exceeded Pond 11P by 0.98' @ 12.00 hrs

Inflow Area = 26,815 sf, 74.83% Impervious, Inflow Depth > 1.85" for 1 -YEAR event
Inflow = 1.17 cfs @ 12.09 hrs, Volume= 4,127 cf
Outflow = 1.17 cfs @ 12.09 hrs, Volume= 4,127 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.74 cfs @ 12.09 hrs, Volume= 3,949 cf
Routed to Pond 1P : INFILTRATION POND #1
Secondary = 0.43 cfs @ 12.09 hrs, Volume= 179 cf
Routed to Pond 9P : CULTEC UNITS

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

Peak Elev= 253.80' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	252.00'	6.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.00' / 252.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#2	Device 3	252.00'	12.0" Round Culvert L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.00' / 252.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Secondary	253.70'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.74 cfs @ 12.09 hrs HW=253.80' (Free Discharge)

↑ **1=Culvert** (Barrel Controls 0.74 cfs @ 3.78 fps)

Secondary OutFlow Max=0.40 cfs @ 12.09 hrs HW=253.80' (Free Discharge)

↑ **3=Sharp-Crested Rectangular Weir** (Weir Controls 0.40 cfs @ 1.02 fps)

↑ **2=Culvert** (Passes 0.40 cfs of 0.93 cfs potential flow)

Proposed conditions

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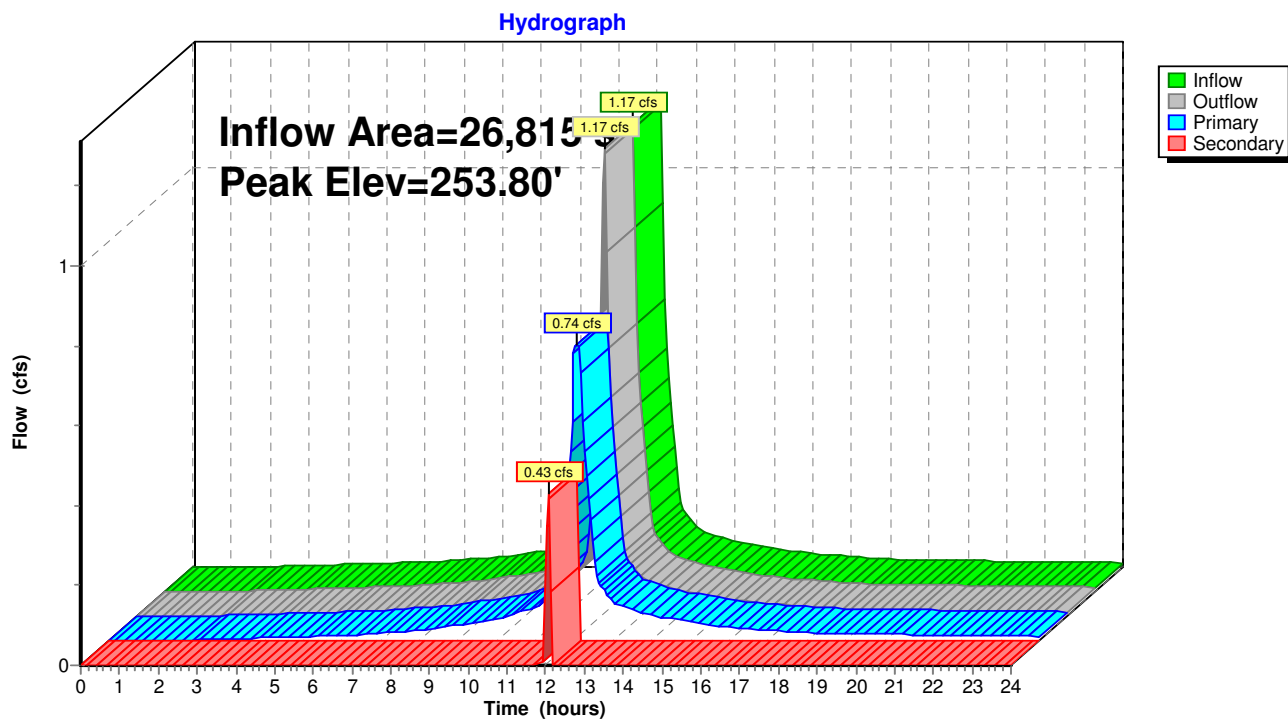
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Pond 8P: DIVERSION MANHOLE



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Type III 24-hr 1 -YEAR Rainfall=2.70"

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Stage-Area-Storage for Pond 8P: DIVERSION MANHOLE

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
252.00	0	253.04	0
252.02	0	253.06	0
252.04	0	253.08	0
252.06	0	253.10	0
252.08	0	253.12	0
252.10	0	253.14	0
252.12	0	253.16	0
252.14	0	253.18	0
252.16	0	253.20	0
252.18	0	253.22	0
252.20	0	253.24	0
252.22	0	253.26	0
252.24	0	253.28	0
252.26	0	253.30	0
252.28	0	253.32	0
252.30	0	253.34	0
252.32	0	253.36	0
252.34	0	253.38	0
252.36	0	253.40	0
252.38	0	253.42	0
252.40	0	253.44	0
252.42	0	253.46	0
252.44	0	253.48	0
252.46	0	253.50	0
252.48	0	253.52	0
252.50	0	253.54	0
252.52	0	253.56	0
252.54	0	253.58	0
252.56	0	253.60	0
252.58	0	253.62	0
252.60	0	253.64	0
252.62	0	253.66	0
252.64	0	253.68	0
252.66	0	253.70	0
252.68	0	253.72	0
252.70	0	253.74	0
252.72	0	253.76	0
252.74	0	253.78	0
252.76	0	253.80	0
252.78	0		
252.80	0		
252.82	0		
252.84	0		
252.86	0		
252.88	0		
252.90	0		
252.92	0		
252.94	0		
252.96	0		
252.98	0		
253.00	0		
253.02	0		

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Type III 24-hr 1 -YEAR Rainfall=2.70"

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Summary for Pond 9P: CULTEC UNITS

Inflow = 0.43 cfs @ 12.09 hrs, Volume= 179 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link 7L : DESIGN POINT #1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 251.79' @ 12.20 hrs Surf.Area= 1,864 sf Storage= 179 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	252.00'	1,368 cf	Cultec R-150XLHD x 50 Inside #2 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 5 rows
#2	251.50'	1,701 cf	105.00'W x 17.75'L x 3.50'H Prismatic 6,523 cf Overall - 1,368 cf Embedded = 5,156 cf x 33.0% Voids
		3,069 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	252.00'	6.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 252.00' / 252.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=251.50' (Free Discharge)

↑ **1=Culvert** (Controls 0.00 cfs)

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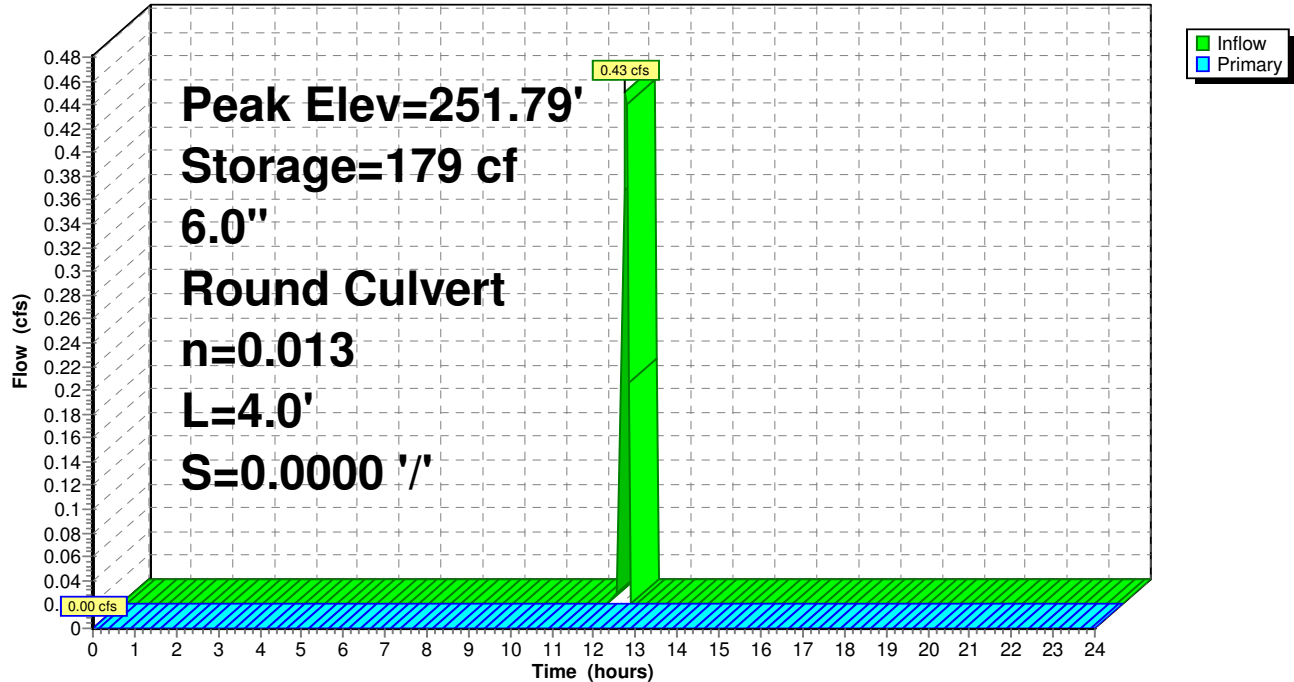
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Pond 9P: CULTEC UNITS

Hydrograph



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Stage-Area-Storage for Pond 9P: CULTEC UNITS

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
251.50	0	254.10	2,515
251.55	31	254.15	2,546
251.60	62	254.20	2,577
251.65	92	254.25	2,608
251.70	123	254.30	2,638
251.75	154	254.35	2,669
251.80	185	254.40	2,700
251.85	215	254.45	2,731
251.90	246	254.50	2,761
251.95	277	254.55	2,792
252.00	308	254.60	2,823
252.05	381	254.65	2,854
252.10	454	254.70	2,884
252.15	526	254.75	2,915
252.20	597	254.80	2,946
252.25	668	254.85	2,977
252.30	739	254.90	3,007
252.35	810	254.95	3,038
252.40	880	255.00	3,069
252.45	950		
252.50	1,020		
252.55	1,089		
252.60	1,157		
252.65	1,225		
252.70	1,292		
252.75	1,358		
252.80	1,423		
252.85	1,488		
252.90	1,551		
252.95	1,613		
253.00	1,673		
253.05	1,732		
253.10	1,789		
253.15	1,845		
253.20	1,898		
253.25	1,949		
253.30	1,996		
253.35	2,039		
253.40	2,077		
253.45	2,113		
253.50	2,146		
253.55	2,177		
253.60	2,208		
253.65	2,239		
253.70	2,269		
253.75	2,300		
253.80	2,331		
253.85	2,362		
253.90	2,392		
253.95	2,423		
254.00	2,454		
254.05	2,485		

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Summary for Pond 10P: CB #1

[57] Hint: Peaked at 252.77' (Flood elevation advised)

Inflow Area = 11,085 sf, 75.86% Impervious, Inflow Depth > 1.87" for 1 -YEAR event
Inflow = 0.49 cfs @ 12.09 hrs, Volume= 1,730 cf
Outflow = 0.49 cfs @ 12.09 hrs, Volume= 1,730 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.49 cfs @ 12.09 hrs, Volume= 1,730 cf
Routed to Pond 8P : DIVERSION MANHOLE

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

Peak Elev= 252.77' @ 12.09 hrs

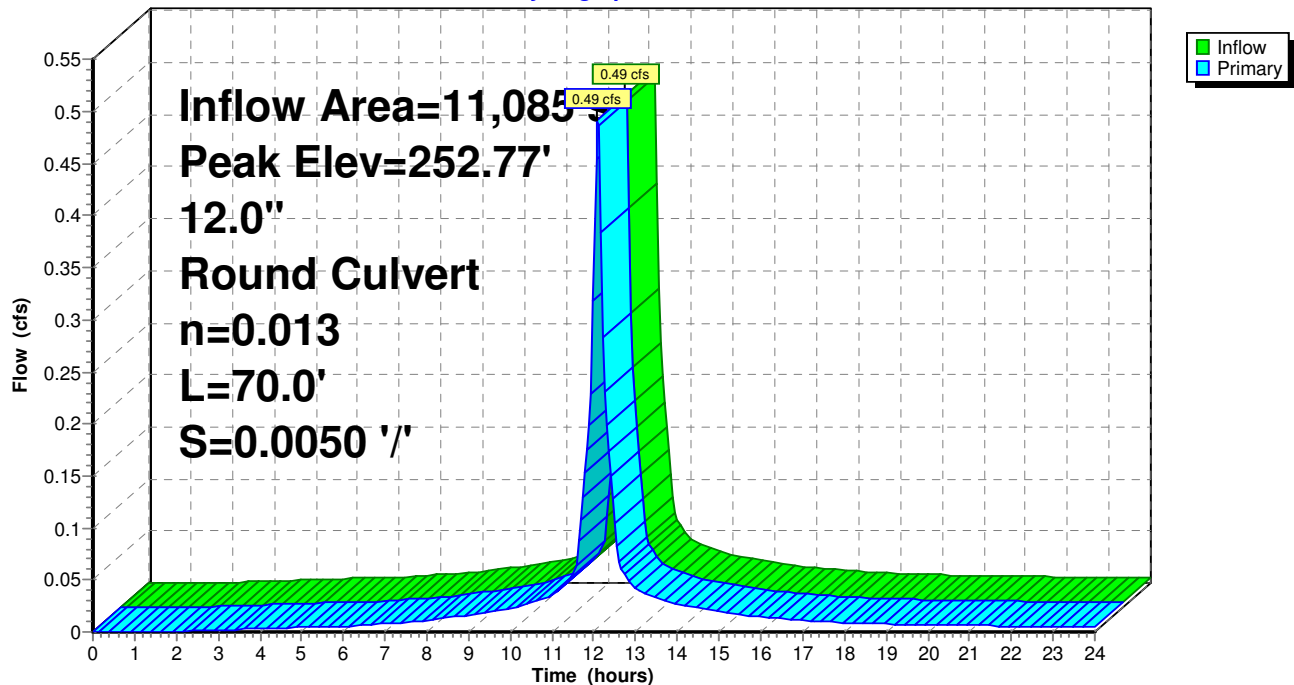
Device	Routing	Invert	Outlet Devices
#1	Primary	252.35'	12.0" Round Culvert L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.35' / 252.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.48 cfs @ 12.09 hrs HW=252.76' (Free Discharge)

↑1=Culvert (Barrel Controls 0.48 cfs @ 2.32 fps)

Pond 10P: CB #1

Hydrograph



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Type III 24-hr 1 -YEAR Rainfall=2.70"

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Stage-Area-Storage for Pond 10P: CB #1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
252.35	0	252.87	0
252.36	0	252.88	0
252.37	0	252.89	0
252.38	0	252.90	0
252.39	0	252.91	0
252.40	0	252.92	0
252.41	0	252.93	0
252.42	0	252.94	0
252.43	0	252.95	0
252.44	0	252.96	0
252.45	0	252.97	0
252.46	0	252.98	0
252.47	0	252.99	0
252.48	0	253.00	0
252.49	0	253.01	0
252.50	0	253.02	0
252.51	0	253.03	0
252.52	0	253.04	0
252.53	0	253.05	0
252.54	0	253.06	0
252.55	0	253.07	0
252.56	0	253.08	0
252.57	0	253.09	0
252.58	0	253.10	0
252.59	0	253.11	0
252.60	0	253.12	0
252.61	0	253.13	0
252.62	0	253.14	0
252.63	0	253.15	0
252.64	0	253.16	0
252.65	0	253.17	0
252.66	0	253.18	0
252.67	0	253.19	0
252.68	0	253.20	0
252.69	0	253.21	0
252.70	0	253.22	0
252.71	0	253.23	0
252.72	0	253.24	0
252.73	0	253.25	0
252.74	0	253.26	0
252.75	0	253.27	0
252.76	0	253.28	0
252.77	0	253.29	0
252.78	0	253.30	0
252.79	0	253.31	0
252.80	0	253.32	0
252.81	0	253.33	0
252.82	0	253.34	0
252.83	0	253.35	0
252.84	0		
252.85	0		
252.86	0		

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Summary for Pond 11P: CB #2

[57] Hint: Peaked at 252.85' (Flood elevation advised)

Inflow Area = 15,730 sf, 74.11% Impervious, Inflow Depth > 1.83" for 1 -YEAR event
Inflow = 0.68 cfs @ 12.09 hrs, Volume= 2,398 cf
Outflow = 0.68 cfs @ 12.09 hrs, Volume= 2,398 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.68 cfs @ 12.09 hrs, Volume= 2,398 cf
Routed to Pond 8P : DIVERSION MANHOLE

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

Peak Elev= 252.85' @ 12.09 hrs

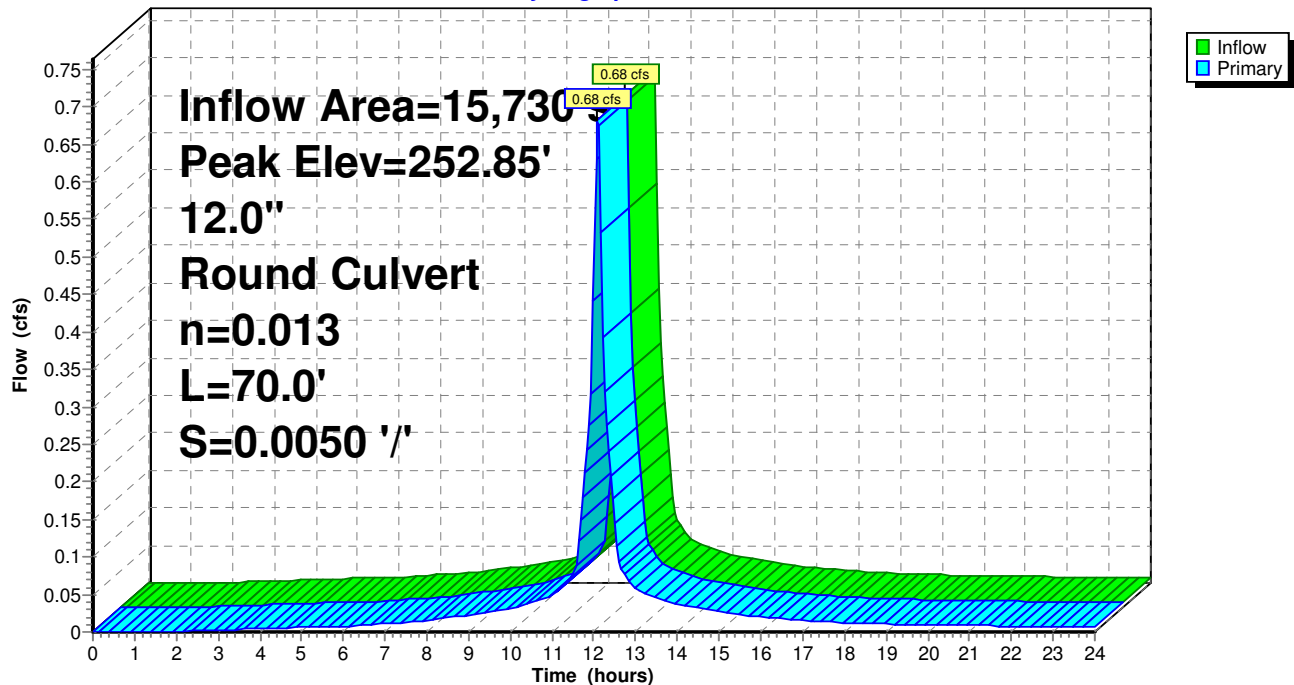
Device	Routing	Invert	Outlet Devices
#1	Primary	252.35'	12.0" Round Culvert L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.35' / 252.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.66 cfs @ 12.09 hrs HW=252.84' (Free Discharge)

↑1=Culvert (Barrel Controls 0.66 cfs @ 2.51 fps)

Pond 11P: CB #2

Hydrograph



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Stage-Area-Storage for Pond 11P: CB #2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
252.35	0	252.87	0
252.36	0	252.88	0
252.37	0	252.89	0
252.38	0	252.90	0
252.39	0	252.91	0
252.40	0	252.92	0
252.41	0	252.93	0
252.42	0	252.94	0
252.43	0	252.95	0
252.44	0	252.96	0
252.45	0	252.97	0
252.46	0	252.98	0
252.47	0	252.99	0
252.48	0	253.00	0
252.49	0	253.01	0
252.50	0	253.02	0
252.51	0	253.03	0
252.52	0	253.04	0
252.53	0	253.05	0
252.54	0	253.06	0
252.55	0	253.07	0
252.56	0	253.08	0
252.57	0	253.09	0
252.58	0	253.10	0
252.59	0	253.11	0
252.60	0	253.12	0
252.61	0	253.13	0
252.62	0	253.14	0
252.63	0	253.15	0
252.64	0	253.16	0
252.65	0	253.17	0
252.66	0	253.18	0
252.67	0	253.19	0
252.68	0	253.20	0
252.69	0	253.21	0
252.70	0	253.22	0
252.71	0	253.23	0
252.72	0	253.24	0
252.73	0	253.25	0
252.74	0	253.26	0
252.75	0	253.27	0
252.76	0	253.28	0
252.77	0	253.29	0
252.78	0	253.30	0
252.79	0	253.31	0
252.80	0	253.32	0
252.81	0	253.33	0
252.82	0	253.34	0
252.83	0	253.35	0
252.84	0		
252.85	0		
252.86	0		

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Summary for Link 7L: DESIGN POINT #1

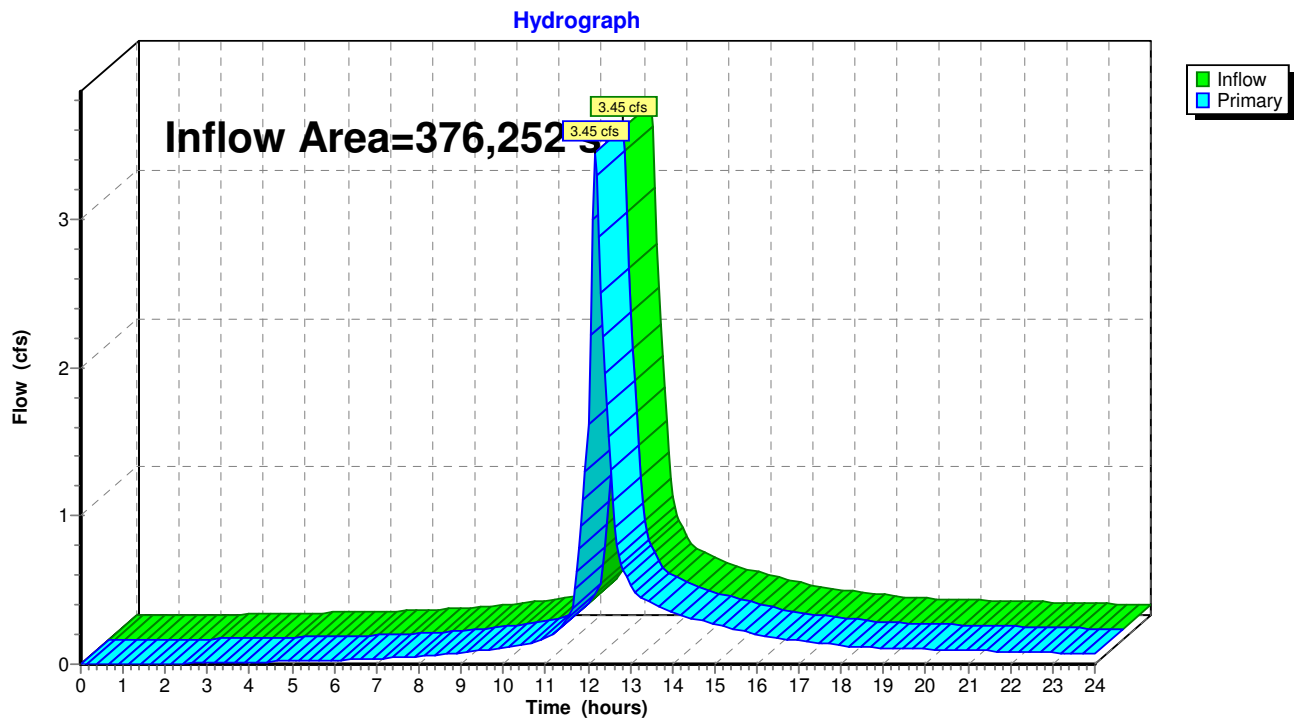
Inflow Area = 376,252 sf, 20.69% Impervious, Inflow Depth > 0.51" for 1 -YEAR event

Inflow = 3.45 cfs @ 12.16 hrs, Volume= 15,909 cf

Primary = 3.45 cfs @ 12.16 hrs, Volume= 15,909 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 7L: DESIGN POINT #1



Proposed conditions

Type III 24-hr 10 -YEAR Rainfall=4.90"

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

Subcatchment 1S: SUBCATCHMENT #1 Runoff Area=242,315 sf 2.93% Impervious Runoff Depth>1.52"
Flow Length=861' Tc=13.0 min CN=WQ Runoff=7.21 cfs 30,778 cf

Subcatchment 2S: SUBCATHMENT #2 Runoff Area=61,356 sf 55.72% Impervious Runoff Depth>2.67"
Flow Length=375' Tc=10.1 min CN=WQ Runoff=3.25 cfs 13,675 cf

Subcatchment 3S: SUBCATCHMENT #3 Runoff Area=24,882 sf 26.06% Impervious Runoff Depth>1.44"
Tc=6.0 min CN=WQ Runoff=0.79 cfs 2,979 cf

Subcatchment 4S: SUBCATHMENT #4 Runoff Area=20,884 sf 47.99% Impervious Runoff Depth>2.33"
Flow Length=357' Slope=0.0250 '/' Tc=6.7 min CN=WQ Runoff=1.06 cfs 4,055 cf

Subcatchment 8S: SUBCATCHMENT #4 Runoff Area=11,085 sf 75.86% Impervious Runoff Depth>3.54"
Tc=6.0 min CN=WQ Runoff=0.90 cfs 3,266 cf

Subcatchment 12S: SUBCATCHMENT #5 Runoff Area=15,730 sf 74.11% Impervious Runoff Depth>3.45"
Tc=6.0 min CN=WQ Runoff=1.25 cfs 4,528 cf

Pond 1P: INFILTRATION POND #1 Peak Elev=253.61' Storage=3,488 cf Inflow=1.56 cfs 9,770 cf
Discarded=0.23 cfs 8,875 cf Primary=0.34 cfs 699 cf Outflow=0.57 cfs 9,574 cf

Pond 2P: INFILTRATION POND #2 Peak Elev=245.08' Storage=908 cf Inflow=1.06 cfs 4,055 cf
Discarded=0.32 cfs 4,051 cf Primary=0.00 cfs 2 cf Outflow=0.32 cfs 4,053 cf

Pond 8P: DIVERSION MANHOLE Peak Elev=253.93' Inflow=2.16 cfs 7,795 cf
Primary=0.78 cfs 6,791 cf Secondary=1.38 cfs 1,003 cf Outflow=2.16 cfs 7,795 cf

Pond 9P: CULTEC UNITS Peak Elev=252.39' Storage=863 cf Inflow=1.38 cfs 1,003 cf
6.0" Round Culvert n=0.013 L=4.0' S=0.0000 '/' Outflow=0.22 cfs 659 cf

Pond 10P: CB #1 Peak Elev=252.94' Inflow=0.90 cfs 3,266 cf
12.0" Round Culvert n=0.013 L=70.0' S=0.0050 '/' Outflow=0.90 cfs 3,266 cf

Pond 11P: CB #2 Peak Elev=253.06' Inflow=1.25 cfs 4,528 cf
12.0" Round Culvert n=0.013 L=70.0' S=0.0050 '/' Outflow=1.25 cfs 4,528 cf

Link 7L: DESIGN POINT #1 Inflow=10.42 cfs 45,812 cf
Primary=10.42 cfs 45,812 cf

Total Runoff Area = 376,252 sf Runoff Volume = 59,281 cf Average Runoff Depth = 1.89"
79.31% Pervious = 298,387 sf 20.69% Impervious = 77,865 sf

Proposed conditions

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Type III 24-hr 10 -YEAR Rainfall=4.90"

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Summary for Subcatchment 1S: SUBCATCHMENT #1

Runoff = 7.21 cfs @ 12.19 hrs, Volume= 30,778 cf, Depth> 1.52"
 Routed to Link 7L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 -YEAR Rainfall=4.90"

Area (sf)	CN	Description
1,306	30	Woods, Good, HSG A
103,810	55	Woods, Good, HSG B
79,531	77	Woods, Good, HSG D
21,069	30	Woods, Good, HSG A
29,494	61	>75% Grass cover, Good, HSG B
595	98	Roofs, HSG B
1,549	98	Roofs, HSG B
661	98	Roofs, HSG B
816	98	Roofs, HSG B
529	98	Roofs, HSG B
856	98	Roofs, HSG B
1,445	98	Roofs, HSG B
654	98	Roofs, HSG B
242,315		Weighted Average
235,210	61	97.07% Pervious Area
7,105	98	2.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.4	340	0.0625	4.03		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.8	421	0.0250	2.55		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.0	861	Total			

Proposed conditions

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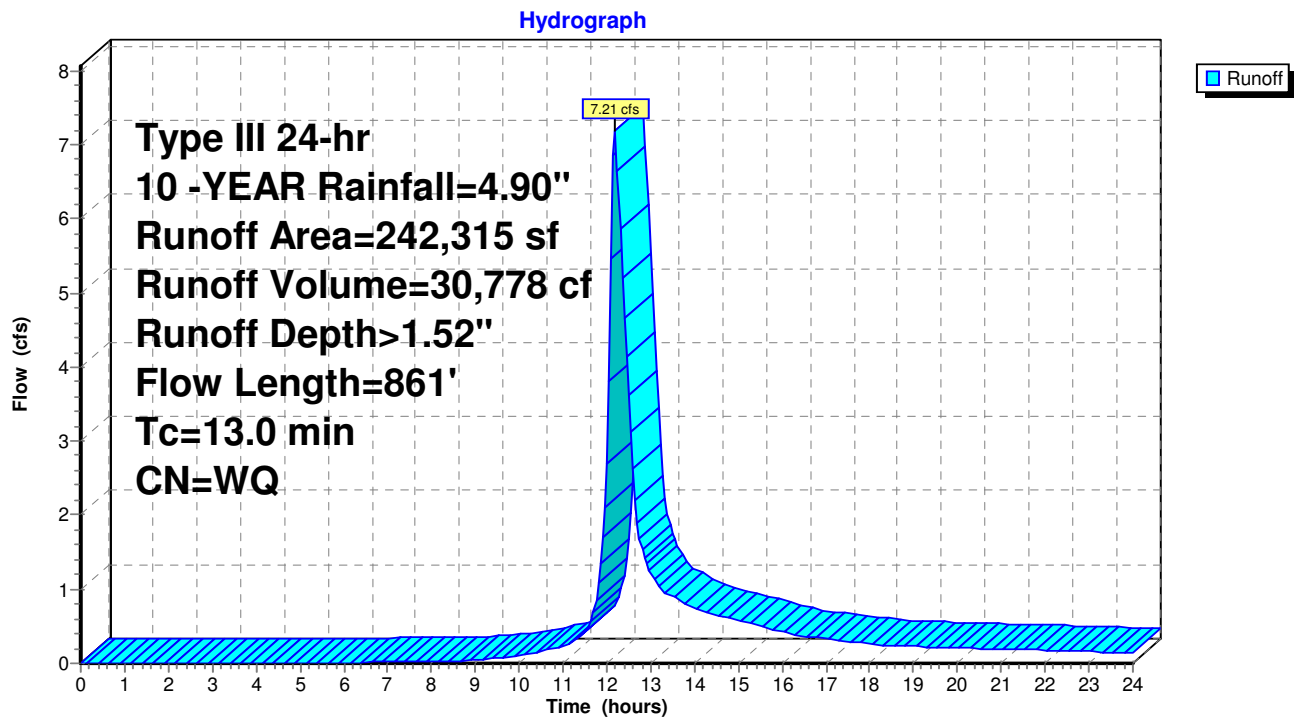
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Subcatchment 1S: SUBCATCHMENT #1



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Type III 24-hr 10 -YEAR Rainfall=4.90"

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Summary for Subcatchment 2S: SUBCATHMENT #2

Runoff = 3.25 cfs @ 12.14 hrs, Volume= 13,675 cf, Depth> 2.67"
 Routed to Link 7L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 -YEAR Rainfall=4.90"

Area (sf)	CN	Description
2,432	39	>75% Grass cover, Good, HSG A
34,186	98	Paved parking, HSG B
17,480	39	>75% Grass cover, Good, HSG A
4,187	39	>75% Grass cover, Good, HSG A
3,071	39	>75% Grass cover, Good, HSG A
61,356		Weighted Average
27,170	39	44.28% Pervious Area
34,186	98	55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	50	0.0450	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.7	125	0.0210	2.94		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	150	0.0100	4.54	3.56	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.1	50	0.0250	9.40	16.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
10.1	375	Total			

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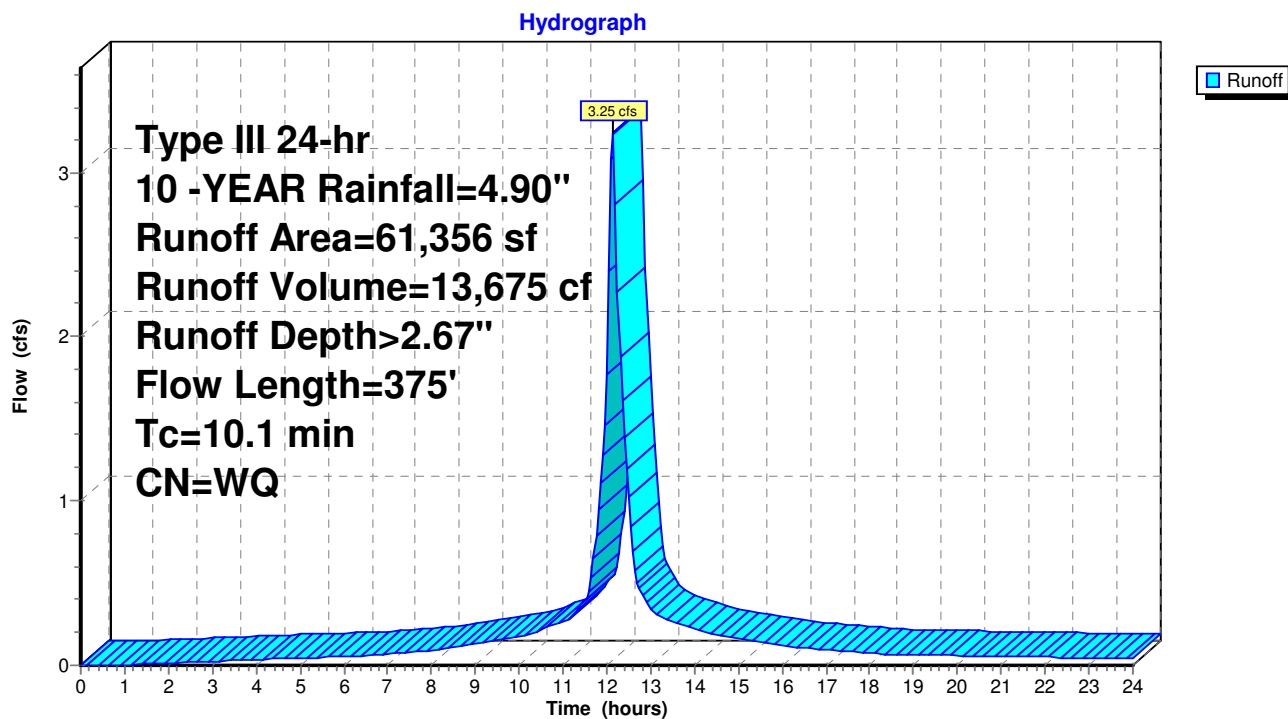
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Type III 24-hr 10 -YEAR Rainfall=4.90"

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Subcatchment 2S: SUBCATHMENT #2



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Type III 24-hr 10 -YEAR Rainfall=4.90"

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Summary for Subcatchment 3S: SUBCATCHEMENT #3

Runoff = 0.79 cfs @ 12.09 hrs, Volume= 2,979 cf, Depth> 1.44"
Routed to Pond 1P : INFILTRATION POND #1

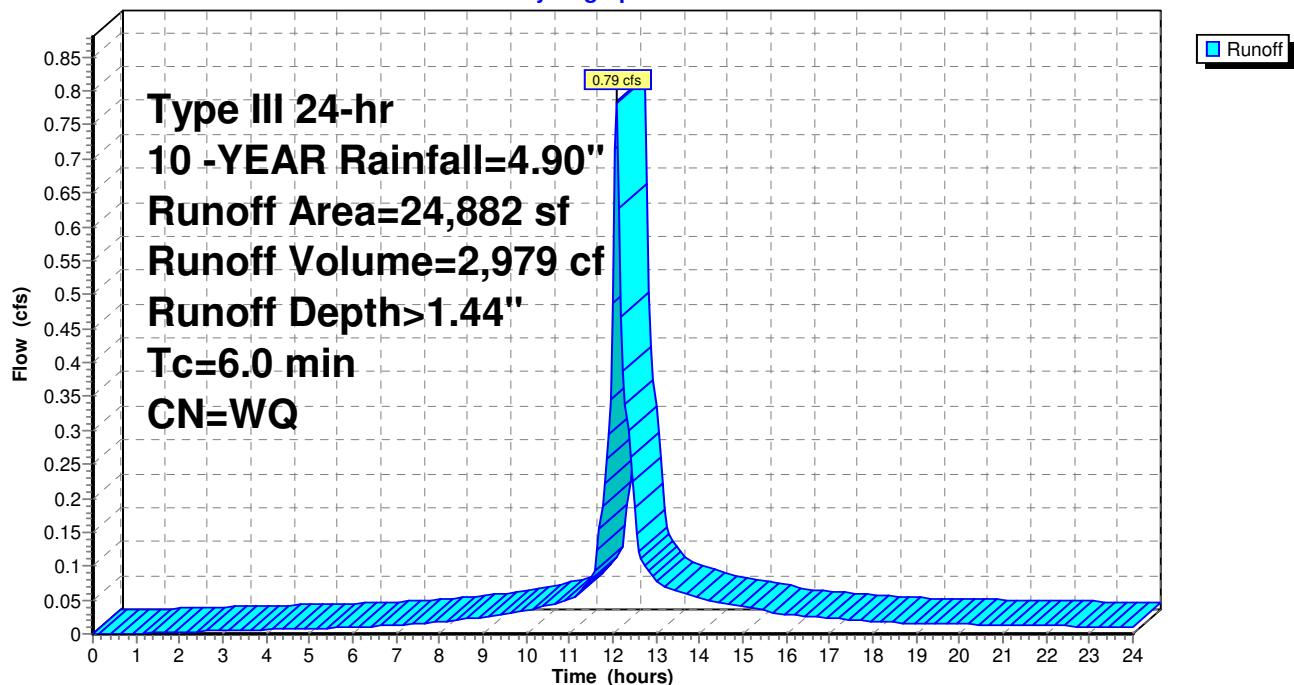
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 -YEAR Rainfall=4.90"

Area (sf)	CN	Description
5,209	30	Woods, Good, HSG A
4,766	55	Woods, Good, HSG B
4,088	39	>75% Grass cover, Good, HSG A
6,484	98	Paved parking, HSG A
1,913	39	>75% Grass cover, Good, HSG A
2,422	30	Woods, Good, HSG A
24,882		Weighted Average
18,398	39	73.94% Pervious Area
6,484	98	26.06% Impervious Area

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

Subcatchment 3S: SUBCATCHEMENT #3

Hydrograph



Proposed conditions

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Type III 24-hr 10 -YEAR Rainfall=4.90"

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Summary for Subcatchment 4S: SUBCATHMENT #4

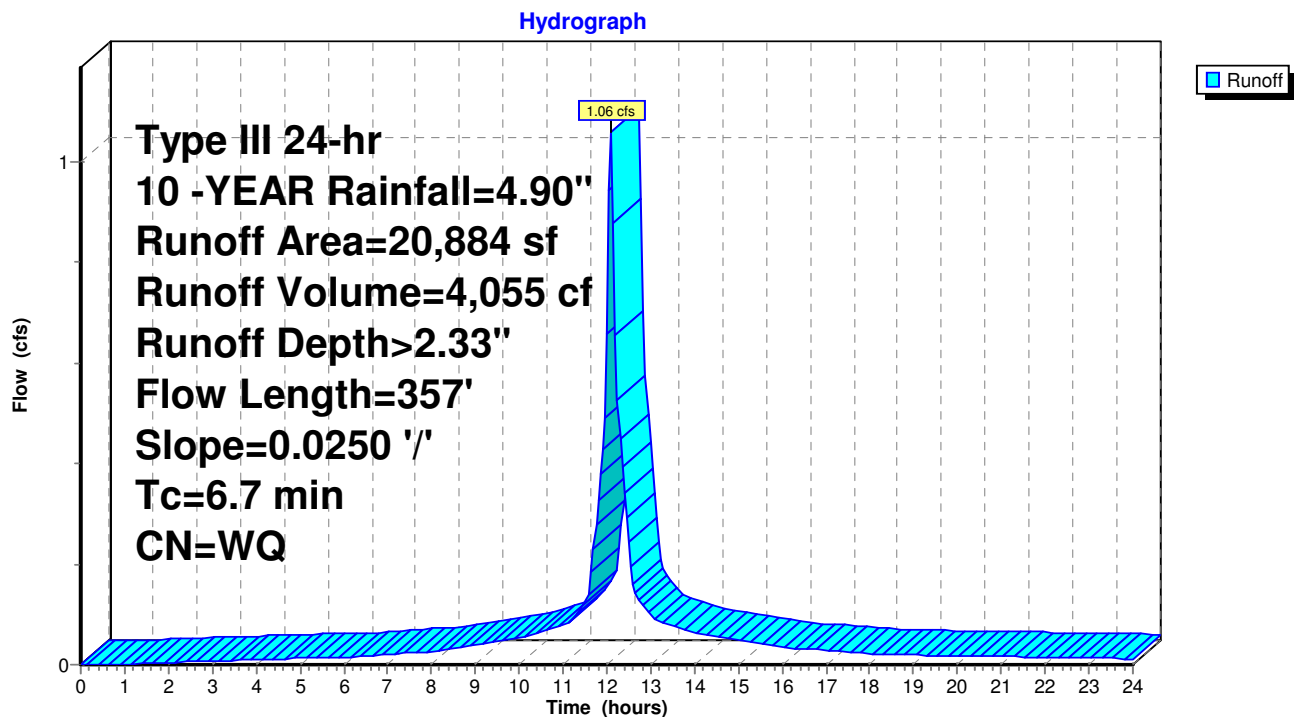
Runoff = 1.06 cfs @ 12.09 hrs, Volume= 4,055 cf, Depth> 2.33"
Routed to Pond 2P : INFILTRATION POND #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 -YEAR Rainfall=4.90"

Area (sf)	CN	Description
3,589	39	>75% Grass cover, Good, HSG A
10,023	98	Paved parking, HSG A
7,272	39	>75% Grass cover, Good, HSG A
20,884		Weighted Average
10,861	39	52.01% Pervious Area
10,023	98	47.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0250	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.6	307	0.0250	3.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
6.7	357	Total			

Subcatchment 4S: SUBCATHMENT #4



Summary for Subcatchment 8S: SUBCATCHMENT #4

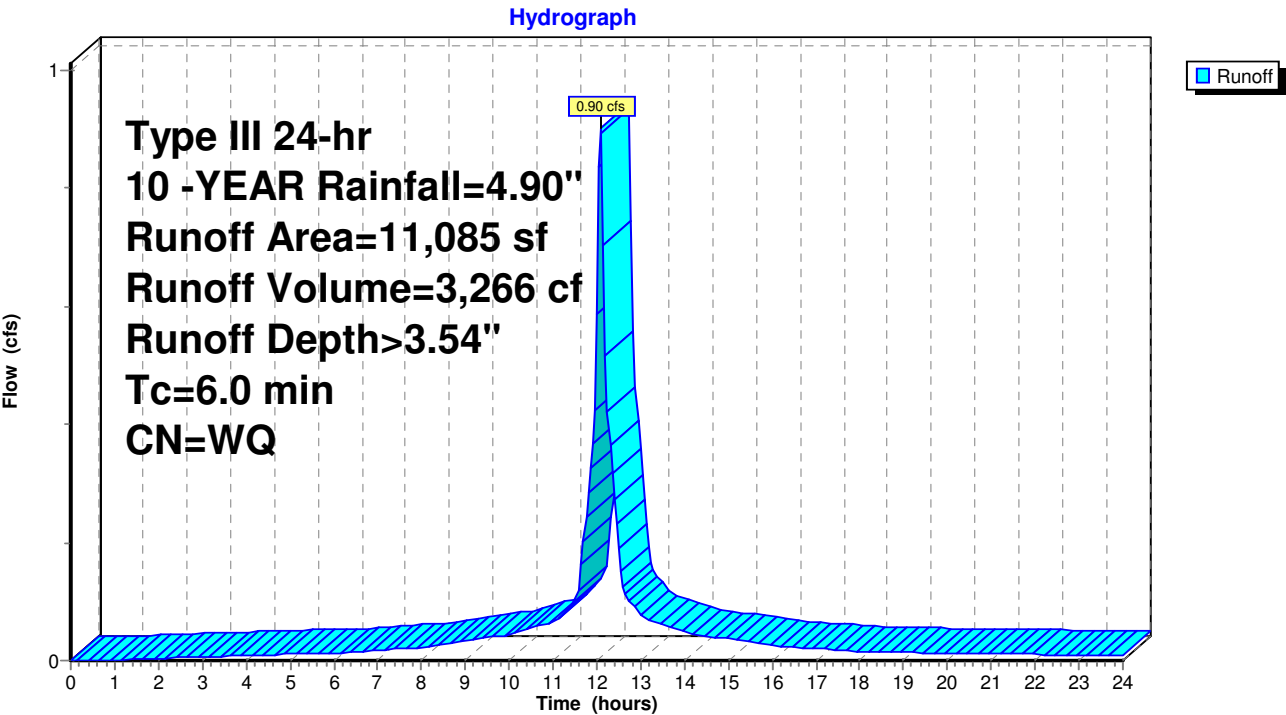
Runoff = 0.90 cfs @ 12.09 hrs, Volume= 3,266 cf, Depth> 3.54"
Routed to Pond 10P : CB #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 -YEAR Rainfall=4.90"

Area (sf)	CN	Description
5,284	98	Paved parking, HSG B
2,676	30	Woods, Good, HSG A
3,125	98	Roofs, HSG A
11,085		Weighted Average
2,676	30	24.14% Pervious Area
8,409	98	75.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, MIN OF 6 MINS

Subcatchment 8S: SUBCATCHMENT #4



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Type III 24-hr 10 -YEAR Rainfall=4.90"
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Summary for Subcatchment 12S: SUBCATCHMENT #5

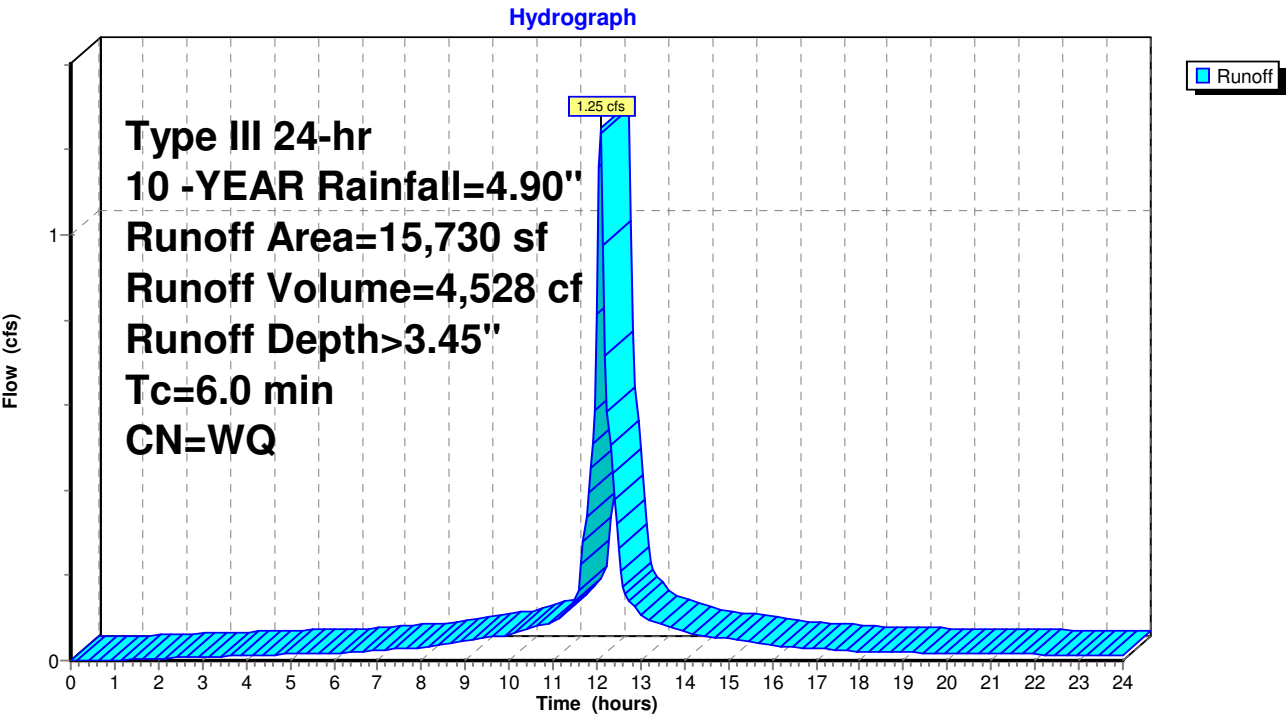
Runoff = 1.25 cfs @ 12.09 hrs, Volume= 4,528 cf, Depth> 3.45"
Routed to Pond 11P : CB #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 -YEAR Rainfall=4.90"

Area (sf)	CN	Description
4,783	98	Paved parking, HSG A
6,875	98	Roofs, HSG A
4,072	30	Woods, Good, HSG A
15,730		Weighted Average
4,072	30	25.89% Pervious Area
11,658	98	74.11% Impervious Area

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

Subcatchment 12S: SUBCATCHMENT #5



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Type III 24-hr 10 -YEAR Rainfall=4.90"

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Summary for Pond 1P: INFILTRATION POND #1

[81] Warning: Exceeded Pond 8P by 1.13' @ 14.10 hrs

Inflow Area = 51,697 sf, 51.36% Impervious, Inflow Depth > 2.27" for 10 -YEAR event
 Inflow = 1.56 cfs @ 12.09 hrs, Volume= 9,770 cf
 Outflow = 0.57 cfs @ 12.53 hrs, Volume= 9,574 cf, Atten= 64%, Lag= 26.4 min
 Discarded = 0.23 cfs @ 12.53 hrs, Volume= 8,875 cf
 Primary = 0.34 cfs @ 12.53 hrs, Volume= 699 cf
 Routed to Link 7L : DESIGN POINT #1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 253.61' @ 12.53 hrs Surf.Area= 3,231 sf Storage= 3,488 cf

Plug-Flow detention time= 148.0 min calculated for 9,554 cf (98% of inflow)
 Center-of-Mass det. time= 135.0 min (893.3 - 758.4)

Volume	Invert	Avail.Storage	Storage Description
#1	252.00'	4,868 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
252.00	1,213	0	0
253.00	2,366	1,790	1,790
254.00	3,791	3,079	4,868

Device	Routing	Invert	Outlet Devices
#1	Discarded	252.00'	2.410 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 248.00'
#2	Primary	253.50'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Discarded OutFlow Max=0.23 cfs @ 12.53 hrs HW=253.61' (Free Discharge)
 ↑ **1=Exfiltration** (Controls 0.23 cfs)

Primary OutFlow Max=0.34 cfs @ 12.53 hrs HW=253.61' (Free Discharge)
 ↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 0.34 cfs @ 1.07 fps)

Proposed conditions

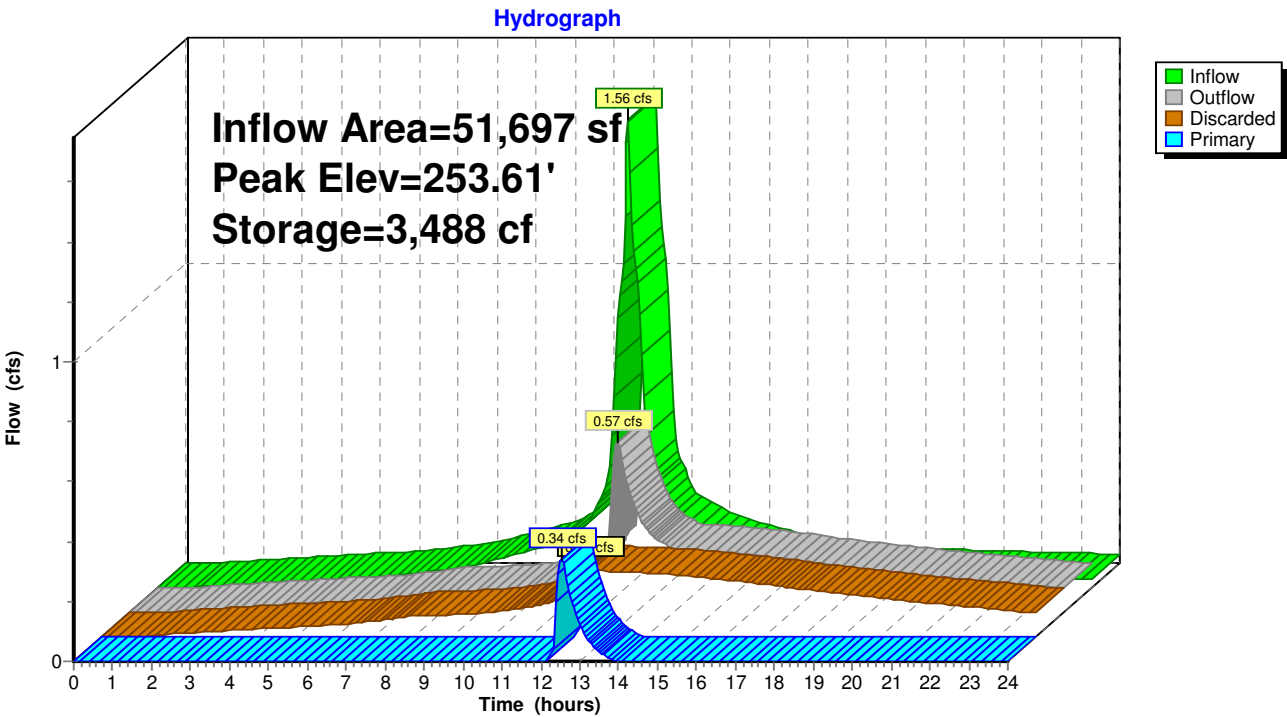
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Pond 1P: INFILTRATION POND #1



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Type III 24-hr 10 -YEAR Rainfall=4.90"

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Stage-Area-Storage for Pond 1P: INFILTRATION POND #1

Elevation (feet)	Surface (sq-ft)	Horizontal (sq-ft)	Storage (cubic-feet)
252.00	1,213	1,213	0
252.05	1,271	1,271	62
252.10	1,328	1,328	127
252.15	1,386	1,386	195
252.20	1,444	1,444	266
252.25	1,501	1,501	339
252.30	1,559	1,559	416
252.35	1,617	1,617	495
252.40	1,674	1,674	577
252.45	1,732	1,732	663
252.50	1,790	1,790	751
252.55	1,847	1,847	842
252.60	1,905	1,905	935
252.65	1,962	1,962	1,032
252.70	2,020	2,020	1,132
252.75	2,078	2,078	1,234
252.80	2,135	2,135	1,339
252.85	2,193	2,193	1,448
252.90	2,251	2,251	1,559
252.95	2,308	2,308	1,673
253.00	2,366	2,366	1,790
253.05	2,437	2,437	1,910
253.10	2,508	2,508	2,033
253.15	2,580	2,580	2,160
253.20	2,651	2,651	2,291
253.25	2,722	2,722	2,426
253.30	2,794	2,794	2,563
253.35	2,865	2,865	2,705
253.40	2,936	2,936	2,850
253.45	3,007	3,007	2,998
253.50	3,079	3,079	3,151
253.55	3,150	3,150	3,306
253.60	3,221	3,221	3,466
253.65	3,292	3,292	3,628
253.70	3,363	3,363	3,795
253.75	3,435	3,435	3,965
253.80	3,506	3,506	4,138
253.85	3,577	3,577	4,315
253.90	3,649	3,649	4,496
253.95	3,720	3,720	4,680
254.00	3,791	3,791	4,868

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Type III 24-hr 10 -YEAR Rainfall=4.90"

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Summary for Pond 2P: INFILTRATION POND #2

Inflow Area = 20,884 sf, 47.99% Impervious, Inflow Depth > 2.33" for 10 -YEAR event
Inflow = 1.06 cfs @ 12.09 hrs, Volume= 4,055 cf
Outflow = 0.32 cfs @ 12.42 hrs, Volume= 4,053 cf, Atten= 70%, Lag= 19.7 min
Discarded = 0.32 cfs @ 12.42 hrs, Volume= 4,051 cf
Primary = 0.00 cfs @ 12.42 hrs, Volume= 2 cf
Routed to Link 7L : DESIGN POINT #1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 245.08' @ 12.42 hrs Surf.Area= 1,246 sf Storage= 908 cf

Plug-Flow detention time= 20.0 min calculated for 4,053 cf (100% of inflow)
Center-of-Mass det. time= 19.7 min (779.0 - 759.2)

Volume	Invert	Avail.Storage	Storage Description
#1	244.00'	5,113 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
244.00	455	0	0
245.00	1,174	815	815
246.00	2,101	1,638	2,452
247.00	3,221	2,661	5,113

Device	Routing	Invert	Outlet Devices
#1	Discarded	244.00'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 242.00'
#2	Primary	245.00'	60.0 deg x 0.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.53 (C= 3.16)
#3	Primary	245.50'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Discarded OutFlow Max=0.32 cfs @ 12.42 hrs HW=245.08' (Free Discharge)

↑ **1=Exfiltration** (Controls 0.32 cfs)

Primary OutFlow Max=0.00 cfs @ 12.42 hrs HW=245.08' (Free Discharge)

↑ **2=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.00 cfs @ 0.70 fps)

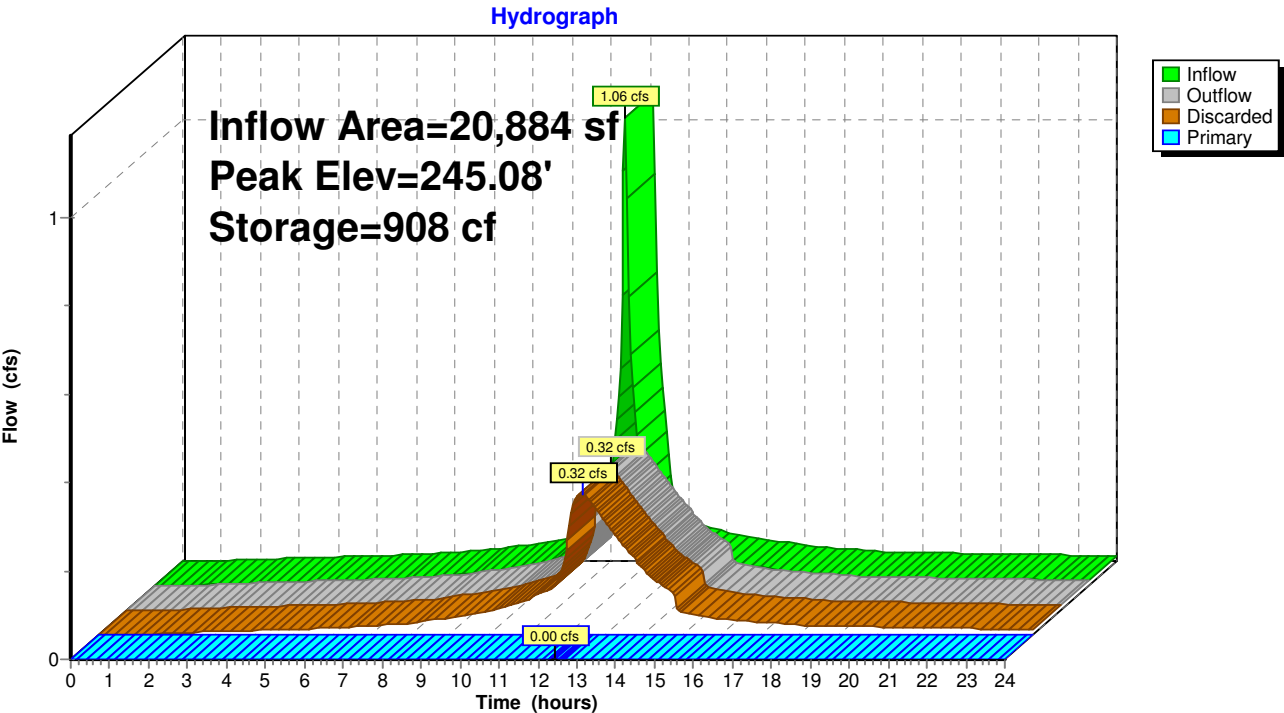
↑ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

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Pond 2P: INFILTRATION POND #2



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Stage-Area-Storage for Pond 2P: INFILTRATION POND #2

Elevation (feet)	Surface (sq-ft)	Horizontal (sq-ft)	Storage (cubic-feet)
244.00	455	455	0
244.10	527	527	49
244.20	599	599	105
244.30	671	671	169
244.40	743	743	240
244.50	815	815	317
244.60	886	886	402
244.70	958	958	495
244.80	1,030	1,030	594
244.90	1,102	1,102	701
245.00	1,174	1,174	815
245.10	1,267	1,267	937
245.20	1,359	1,359	1,068
245.30	1,452	1,452	1,208
245.40	1,545	1,545	1,358
245.50	1,638	1,638	1,517
245.60	1,730	1,730	1,686
245.70	1,823	1,823	1,863
245.80	1,916	1,916	2,050
245.90	2,008	2,008	2,247
246.00	2,101	2,101	2,452
246.10	2,213	2,213	2,668
246.20	2,325	2,325	2,895
246.30	2,437	2,437	3,133
246.40	2,549	2,549	3,382
246.50	2,661	2,661	3,643
246.60	2,773	2,773	3,914
246.70	2,885	2,885	4,197
246.80	2,997	2,997	4,491
246.90	3,109	3,109	4,797
247.00	3,221	3,221	5,113

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Summary for Pond 8P: DIVERSION MANHOLE

[57] Hint: Peaked at 253.93' (Flood elevation advised)

[81] Warning: Exceeded Pond 10P by 1.04' @ 11.90 hrs

[81] Warning: Exceeded Pond 11P by 0.98' @ 11.85 hrs

Inflow Area = 26,815 sf, 74.83% Impervious, Inflow Depth > 3.49" for 10 -YEAR event
Inflow = 2.16 cfs @ 12.09 hrs, Volume= 7,795 cf
Outflow = 2.16 cfs @ 12.09 hrs, Volume= 7,795 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.78 cfs @ 12.09 hrs, Volume= 6,791 cf
Routed to Pond 1P : INFILTRATION POND #1
Secondary = 1.38 cfs @ 12.09 hrs, Volume= 1,003 cf
Routed to Pond 9P : CULTEC UNITS

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

Peak Elev= 253.93' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	252.00'	6.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.00' / 252.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#2	Device 3	252.00'	12.0" Round Culvert L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.00' / 252.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Secondary	253.70'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.78 cfs @ 12.09 hrs HW=253.92' (Free Discharge)

↑**1=Culvert** (Barrel Controls 0.78 cfs @ 3.95 fps)

Secondary OutFlow Max=1.32 cfs @ 12.09 hrs HW=253.92' (Free Discharge)

↑**3=Sharp-Crested Rectangular Weir** (Weir Controls 1.32 cfs @ 1.53 fps)

↑**2=Culvert** (Passes 1.32 cfs of 1.40 cfs potential flow)

Proposed conditions

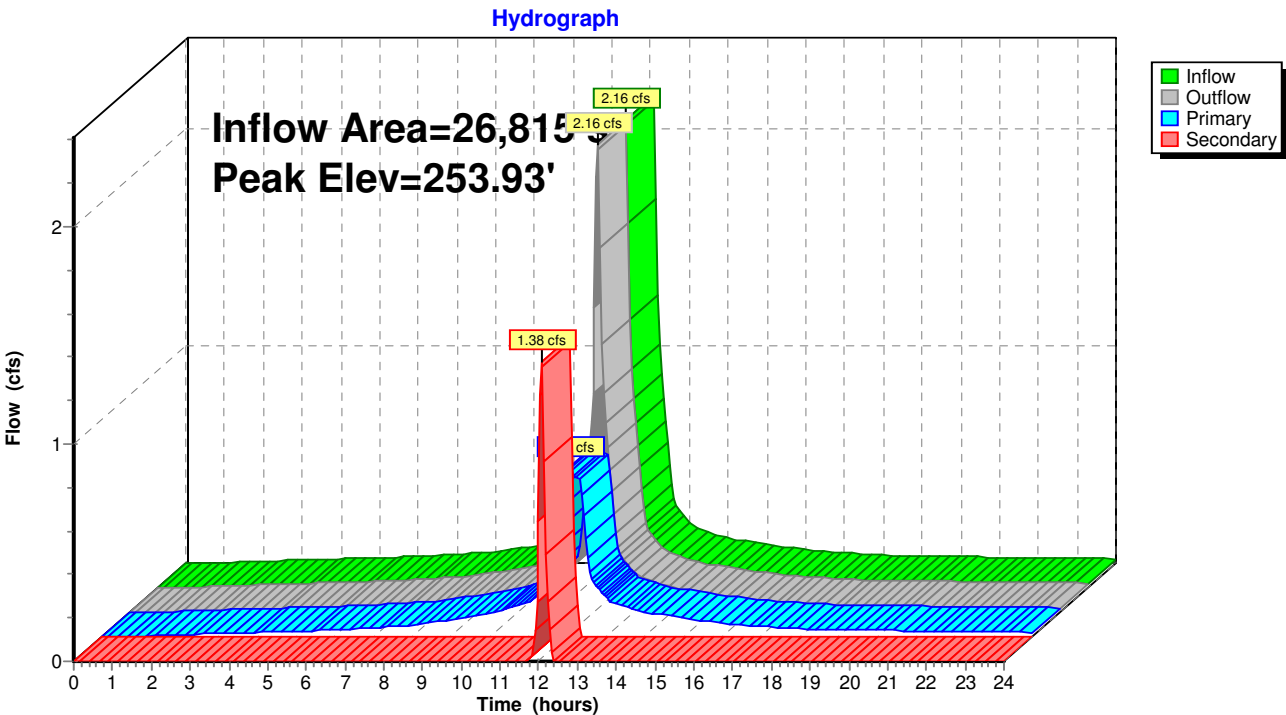
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Pond 8P: DIVERSION MANHOLE



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Stage-Area-Storage for Pond 8P: DIVERSION MANHOLE

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
252.00	0	253.04	0
252.02	0	253.06	0
252.04	0	253.08	0
252.06	0	253.10	0
252.08	0	253.12	0
252.10	0	253.14	0
252.12	0	253.16	0
252.14	0	253.18	0
252.16	0	253.20	0
252.18	0	253.22	0
252.20	0	253.24	0
252.22	0	253.26	0
252.24	0	253.28	0
252.26	0	253.30	0
252.28	0	253.32	0
252.30	0	253.34	0
252.32	0	253.36	0
252.34	0	253.38	0
252.36	0	253.40	0
252.38	0	253.42	0
252.40	0	253.44	0
252.42	0	253.46	0
252.44	0	253.48	0
252.46	0	253.50	0
252.48	0	253.52	0
252.50	0	253.54	0
252.52	0	253.56	0
252.54	0	253.58	0
252.56	0	253.60	0
252.58	0	253.62	0
252.60	0	253.64	0
252.62	0	253.66	0
252.64	0	253.68	0
252.66	0	253.70	0
252.68	0	253.72	0
252.70	0	253.74	0
252.72	0	253.76	0
252.74	0	253.78	0
252.76	0	253.80	0
252.78	0	253.82	0
252.80	0	253.84	0
252.82	0	253.86	0
252.84	0	253.88	0
252.86	0	253.90	0
252.88	0	253.92	0
252.90	0	253.94	0
252.92	0		
252.94	0		
252.96	0		
252.98	0		
253.00	0		
253.02	0		

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Type III 24-hr 10 -YEAR Rainfall=4.90"

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Summary for Pond 9P: CULTEC UNITS

Inflow = 1.38 cfs @ 12.09 hrs, Volume= 1,003 cf
 Outflow = 0.22 cfs @ 12.27 hrs, Volume= 659 cf, Atten= 84%, Lag= 11.1 min
 Primary = 0.22 cfs @ 12.27 hrs, Volume= 659 cf
 Routed to Link 7L : DESIGN POINT #1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 252.39' @ 12.27 hrs Surf.Area= 1,864 sf Storage= 863 cf

Plug-Flow detention time= 79.5 min calculated for 658 cf (66% of inflow)
 Center-of-Mass det. time= 77.7 min (803.2 - 725.6)

Volume	Invert	Avail.Storage	Storage Description
#1	252.00'	1,368 cf	Cultec R-150XLHD x 50 Inside #2 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 5 rows
#2	251.50'	1,701 cf	105.00'W x 17.75'L x 3.50'H Prismatic 6,523 cf Overall - 1,368 cf Embedded = 5,156 cf x 33.0% Voids
		3,069 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	252.00'	6.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 252.00' / 252.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf

Primary OutFlow Max=0.22 cfs @ 12.27 hrs HW=252.38' (Free Discharge)

↑**1=Culvert** (Barrel Controls 0.22 cfs @ 1.86 fps)

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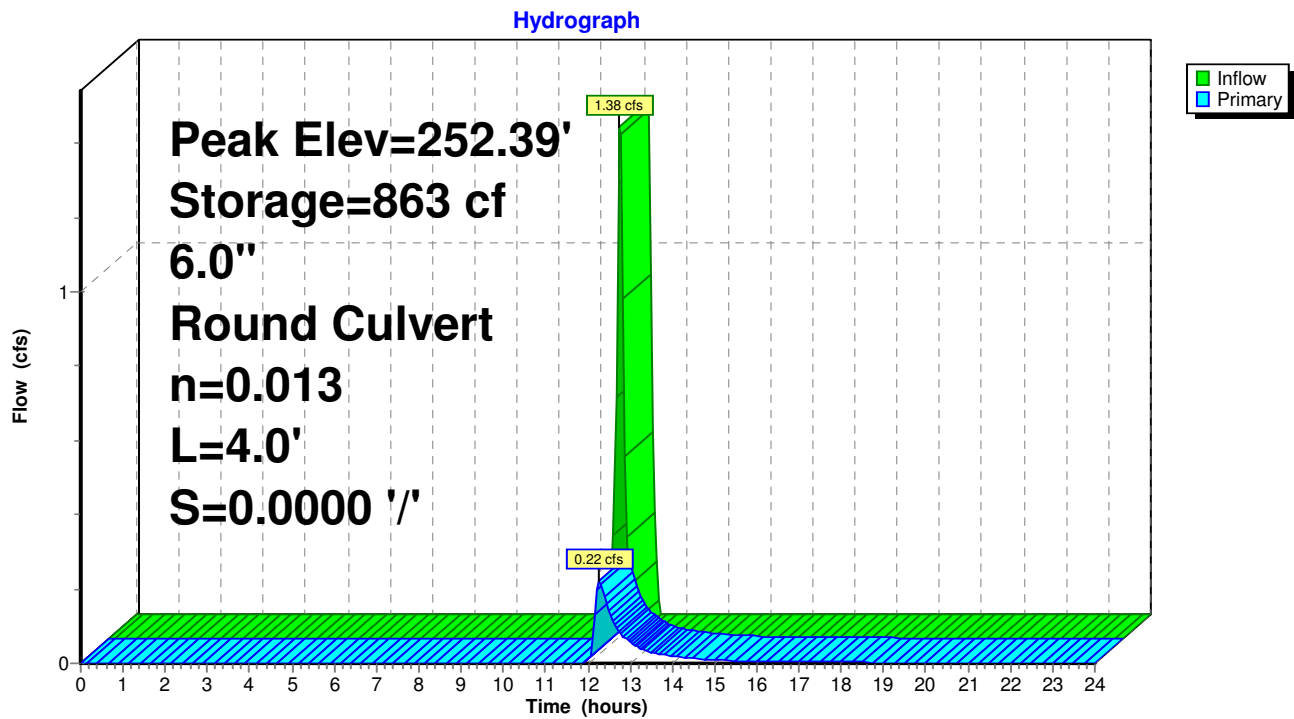
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Pond 9P: CULTEC UNITS



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Stage-Area-Storage for Pond 9P: CULTEC UNITS

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
251.50	0	254.10	2,515
251.55	31	254.15	2,546
251.60	62	254.20	2,577
251.65	92	254.25	2,608
251.70	123	254.30	2,638
251.75	154	254.35	2,669
251.80	185	254.40	2,700
251.85	215	254.45	2,731
251.90	246	254.50	2,761
251.95	277	254.55	2,792
252.00	308	254.60	2,823
252.05	381	254.65	2,854
252.10	454	254.70	2,884
252.15	526	254.75	2,915
252.20	597	254.80	2,946
252.25	668	254.85	2,977
252.30	739	254.90	3,007
252.35	810	254.95	3,038
252.40	880	255.00	3,069
252.45	950		
252.50	1,020		
252.55	1,089		
252.60	1,157		
252.65	1,225		
252.70	1,292		
252.75	1,358		
252.80	1,423		
252.85	1,488		
252.90	1,551		
252.95	1,613		
253.00	1,673		
253.05	1,732		
253.10	1,789		
253.15	1,845		
253.20	1,898		
253.25	1,949		
253.30	1,996		
253.35	2,039		
253.40	2,077		
253.45	2,113		
253.50	2,146		
253.55	2,177		
253.60	2,208		
253.65	2,239		
253.70	2,269		
253.75	2,300		
253.80	2,331		
253.85	2,362		
253.90	2,392		
253.95	2,423		
254.00	2,454		
254.05	2,485		

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Type III 24-hr 10 -YEAR Rainfall=4.90"

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Summary for Pond 10P: CB #1

[57] Hint: Peaked at 252.94' (Flood elevation advised)

Inflow Area = 11,085 sf, 75.86% Impervious, Inflow Depth > 3.54" for 10 -YEAR event
Inflow = 0.90 cfs @ 12.09 hrs, Volume= 3,266 cf
Outflow = 0.90 cfs @ 12.09 hrs, Volume= 3,266 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.90 cfs @ 12.09 hrs, Volume= 3,266 cf
Routed to Pond 8P : DIVERSION MANHOLE

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

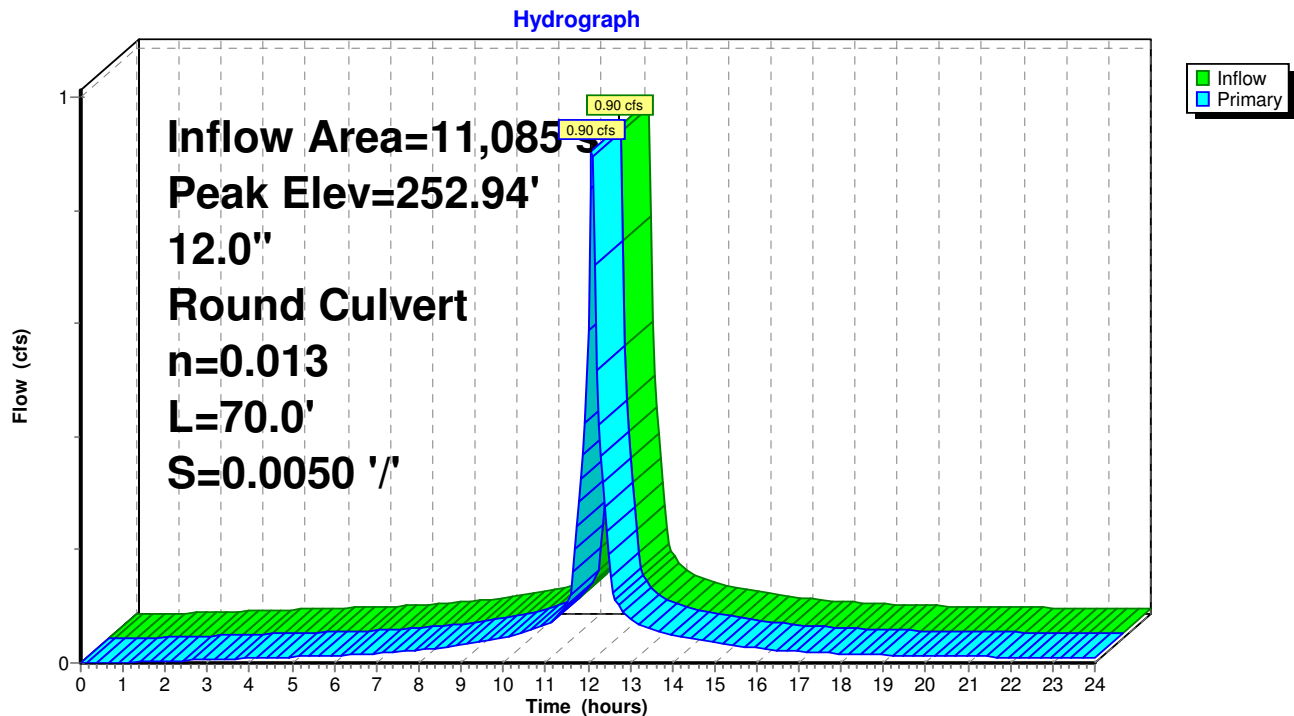
Peak Elev= 252.94' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	252.35'	12.0" Round Culvert L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.35' / 252.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.88 cfs @ 12.09 hrs HW=252.93' (Free Discharge)

↑1=Culvert (Barrel Controls 0.88 cfs @ 2.69 fps)

Pond 10P: CB #1



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Type III 24-hr 10 -YEAR Rainfall=4.90"

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Stage-Area-Storage for Pond 10P: CB #1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
252.35	0	252.87	0
252.36	0	252.88	0
252.37	0	252.89	0
252.38	0	252.90	0
252.39	0	252.91	0
252.40	0	252.92	0
252.41	0	252.93	0
252.42	0	252.94	0
252.43	0	252.95	0
252.44	0	252.96	0
252.45	0	252.97	0
252.46	0	252.98	0
252.47	0	252.99	0
252.48	0	253.00	0
252.49	0	253.01	0
252.50	0	253.02	0
252.51	0	253.03	0
252.52	0	253.04	0
252.53	0	253.05	0
252.54	0	253.06	0
252.55	0	253.07	0
252.56	0	253.08	0
252.57	0	253.09	0
252.58	0	253.10	0
252.59	0	253.11	0
252.60	0	253.12	0
252.61	0	253.13	0
252.62	0	253.14	0
252.63	0	253.15	0
252.64	0	253.16	0
252.65	0	253.17	0
252.66	0	253.18	0
252.67	0	253.19	0
252.68	0	253.20	0
252.69	0	253.21	0
252.70	0	253.22	0
252.71	0	253.23	0
252.72	0	253.24	0
252.73	0	253.25	0
252.74	0	253.26	0
252.75	0	253.27	0
252.76	0	253.28	0
252.77	0	253.29	0
252.78	0	253.30	0
252.79	0	253.31	0
252.80	0	253.32	0
252.81	0	253.33	0
252.82	0	253.34	0
252.83	0	253.35	0
252.84	0		
252.85	0		
252.86	0		

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Type III 24-hr 10 -YEAR Rainfall=4.90"

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Summary for Pond 11P: CB #2

[57] Hint: Peaked at 253.06' (Flood elevation advised)

Inflow Area = 15,730 sf, 74.11% Impervious, Inflow Depth > 3.45" for 10 -YEAR event
Inflow = 1.25 cfs @ 12.09 hrs, Volume= 4,528 cf
Outflow = 1.25 cfs @ 12.09 hrs, Volume= 4,528 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.25 cfs @ 12.09 hrs, Volume= 4,528 cf
Routed to Pond 8P : DIVERSION MANHOLE

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

Peak Elev= 253.06' @ 12.09 hrs

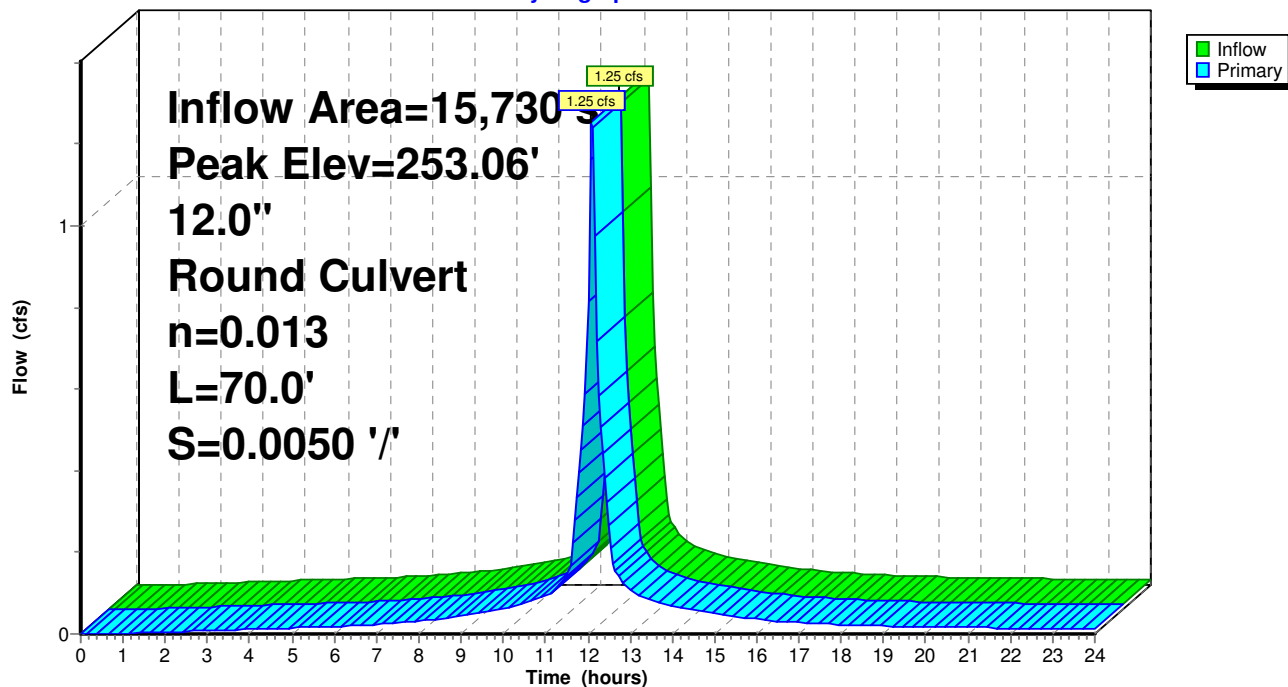
Device	Routing	Invert	Outlet Devices
#1	Primary	252.35'	12.0" Round Culvert L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.35' / 252.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.22 cfs @ 12.09 hrs HW=253.05' (Free Discharge)

↑1=Culvert (Barrel Controls 1.22 cfs @ 2.91 fps)

Pond 11P: CB #2

Hydrograph



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Type III 24-hr 10 -YEAR Rainfall=4.90"

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Stage-Area-Storage for Pond 11P: CB #2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
252.35	0	252.87	0
252.36	0	252.88	0
252.37	0	252.89	0
252.38	0	252.90	0
252.39	0	252.91	0
252.40	0	252.92	0
252.41	0	252.93	0
252.42	0	252.94	0
252.43	0	252.95	0
252.44	0	252.96	0
252.45	0	252.97	0
252.46	0	252.98	0
252.47	0	252.99	0
252.48	0	253.00	0
252.49	0	253.01	0
252.50	0	253.02	0
252.51	0	253.03	0
252.52	0	253.04	0
252.53	0	253.05	0
252.54	0	253.06	0
252.55	0	253.07	0
252.56	0	253.08	0
252.57	0	253.09	0
252.58	0	253.10	0
252.59	0	253.11	0
252.60	0	253.12	0
252.61	0	253.13	0
252.62	0	253.14	0
252.63	0	253.15	0
252.64	0	253.16	0
252.65	0	253.17	0
252.66	0	253.18	0
252.67	0	253.19	0
252.68	0	253.20	0
252.69	0	253.21	0
252.70	0	253.22	0
252.71	0	253.23	0
252.72	0	253.24	0
252.73	0	253.25	0
252.74	0	253.26	0
252.75	0	253.27	0
252.76	0	253.28	0
252.77	0	253.29	0
252.78	0	253.30	0
252.79	0	253.31	0
252.80	0	253.32	0
252.81	0	253.33	0
252.82	0	253.34	0
252.83	0	253.35	0
252.84	0		
252.85	0		
252.86	0		

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Type III 24-hr 10 -YEAR Rainfall=4.90"

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Summary for Link 7L: DESIGN POINT #1

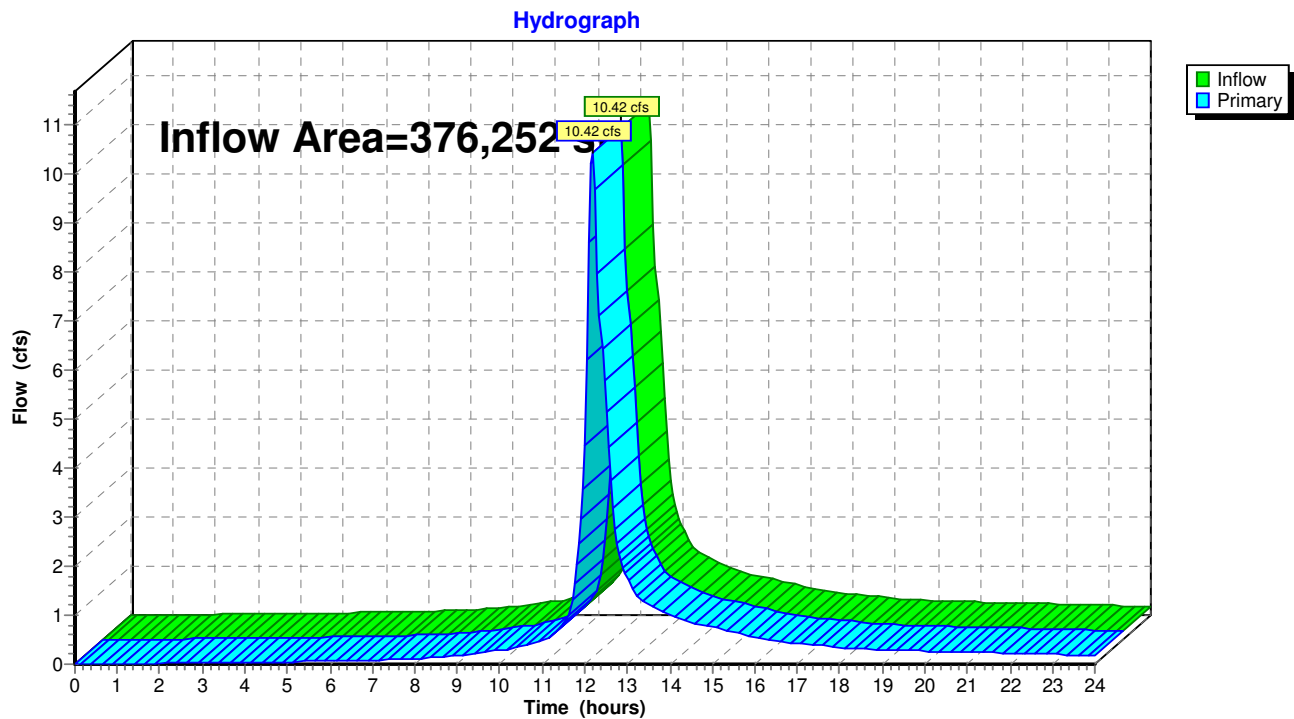
Inflow Area = 376,252 sf, 20.69% Impervious, Inflow Depth > 1.46" for 10 -YEAR event

Inflow = 10.42 cfs @ 12.17 hrs, Volume= 45,812 cf

Primary = 10.42 cfs @ 12.17 hrs, Volume= 45,812 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 7L: DESIGN POINT #1



Proposed conditions*Type III 24-hr 25-YEAR Rainfall=6.20"*

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

Subcatchment 1S: SUBCATCHMENT #1 Runoff Area=242,315 sf 2.93% Impervious Runoff Depth>2.34"
Flow Length=861' Tc=13.0 min CN=WQ Runoff=11.44 cfs 47,196 cf

Subcatchment 2S: SUBCATHMENT #2 Runoff Area=61,356 sf 55.72% Impervious Runoff Depth>3.54"
Flow Length=375' Tc=10.1 min CN=WQ Runoff=4.16 cfs 18,101 cf

Subcatchment 3S: SUBCATCHMENT #3 Runoff Area=24,882 sf 26.06% Impervious Runoff Depth>2.02"
Tc=6.0 min CN=WQ Runoff=1.08 cfs 4,179 cf

Subcatchment 4S: SUBCATHMENT #4 Runoff Area=20,884 sf 47.99% Impervious Runoff Depth>3.12"
Flow Length=357' Slope=0.0250 '/' Tc=6.7 min CN=WQ Runoff=1.36 cfs 5,431 cf

Subcatchment 8S: SUBCATCHMENT #4 Runoff Area=11,085 sf 75.86% Impervious Runoff Depth>4.54"
Tc=6.0 min CN=WQ Runoff=1.15 cfs 4,196 cf

Subcatchment 12S: SUBCATCHMENT #5 Runoff Area=15,730 sf 74.11% Impervious Runoff Depth>4.44"
Tc=6.0 min CN=WQ Runoff=1.59 cfs 5,820 cf

Pond 1P: INFILTRATION POND #1 Peak Elev=253.69' Storage=3,774 cf Inflow=1.90 cfs 12,517 cf
Discarded=0.24 cfs 9,915 cf Primary=0.83 cfs 2,076 cf Outflow=1.06 cfs 11,990 cf

Pond 2P: INFILTRATION POND #2 Peak Elev=245.31' Storage=1,228 cf Inflow=1.36 cfs 5,431 cf
Discarded=0.39 cfs 5,303 cf Primary=0.08 cfs 126 cf Outflow=0.47 cfs 5,429 cf

Pond 8P: DIVERSION MANHOLE Peak Elev=254.10' Inflow=2.73 cfs 10,016 cf
Primary=0.82 cfs 8,338 cf Secondary=1.91 cfs 1,678 cf Outflow=2.73 cfs 10,016 cf

Pond 9P: CULTEC UNITS Peak Elev=252.67' Storage=1,257 cf Inflow=1.91 cfs 1,678 cf
6.0" Round Culvert n=0.013 L=4.0' S=0.0000 '/' Outflow=0.49 cfs 1,334 cf

Pond 10P: CB #1 Peak Elev=253.03' Inflow=1.15 cfs 4,196 cf
12.0" Round Culvert n=0.013 L=70.0' S=0.0050 '/' Outflow=1.15 cfs 4,196 cf

Pond 11P: CB #2 Peak Elev=253.18' Inflow=1.59 cfs 5,820 cf
12.0" Round Culvert n=0.013 L=70.0' S=0.0050 '/' Outflow=1.59 cfs 5,820 cf

Link 7L: DESIGN POINT #1 Inflow=16.07 cfs 68,832 cf
Primary=16.07 cfs 68,832 cf

Total Runoff Area = 376,252 sf Runoff Volume = 84,924 cf Average Runoff Depth = 2.71"
79.31% Pervious = 298,387 sf 20.69% Impervious = 77,865 sf

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Type III 24-hr 25-YEAR Rainfall=6.20"

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Summary for Subcatchment 1S: SUBCATCHMENT #1

Runoff = 11.44 cfs @ 12.19 hrs, Volume= 47,196 cf, Depth> 2.34"
 Routed to Link 7L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-YEAR Rainfall=6.20"

Area (sf)	CN	Description
1,306	30	Woods, Good, HSG A
103,810	55	Woods, Good, HSG B
79,531	77	Woods, Good, HSG D
21,069	30	Woods, Good, HSG A
29,494	61	>75% Grass cover, Good, HSG B
595	98	Roofs, HSG B
1,549	98	Roofs, HSG B
661	98	Roofs, HSG B
816	98	Roofs, HSG B
529	98	Roofs, HSG B
856	98	Roofs, HSG B
1,445	98	Roofs, HSG B
654	98	Roofs, HSG B
242,315		Weighted Average
235,210	61	97.07% Pervious Area
7,105	98	2.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.4	340	0.0625	4.03		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.8	421	0.0250	2.55		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.0	861	Total			

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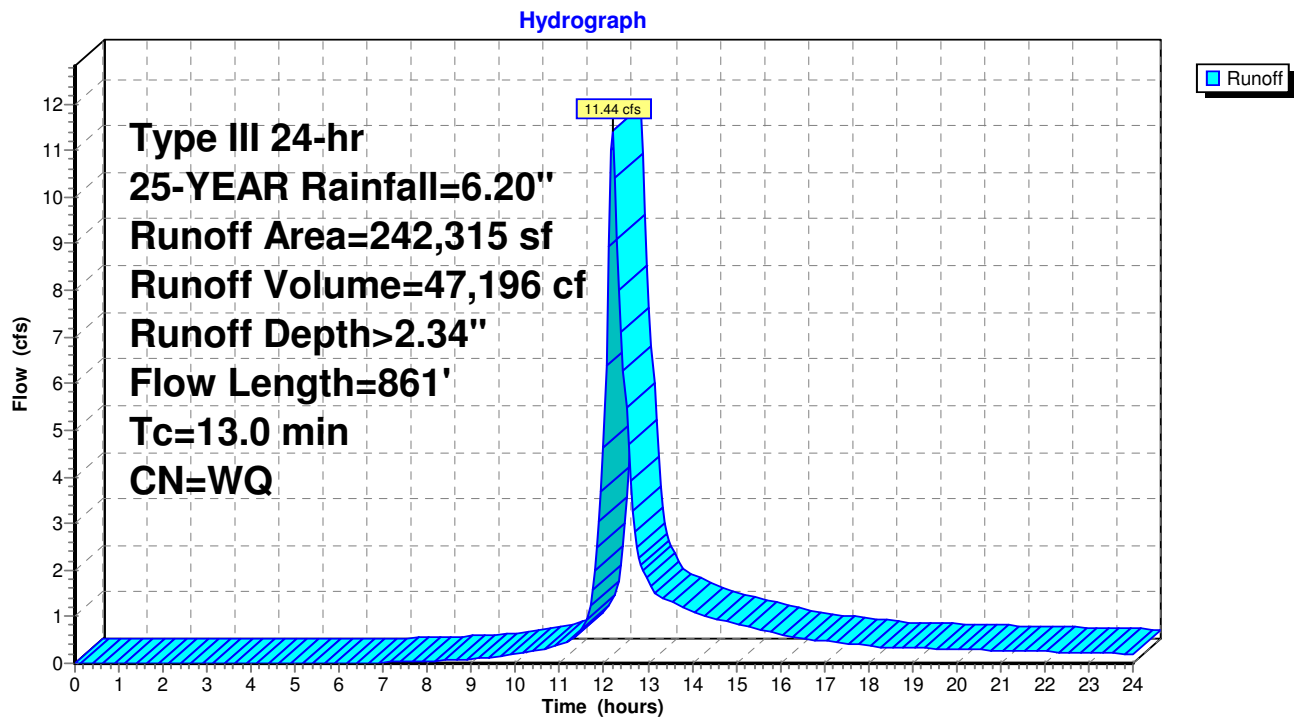
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Subcatchment 1S: SUBCATCHMENT #1



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Type III 24-hr 25-YEAR Rainfall=6.20"

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Summary for Subcatchment 2S: SUBCATHMENT #2

[47] Hint: Peak is 117% of capacity of segment #3

Runoff = 4.16 cfs @ 12.14 hrs, Volume= 18,101 cf, Depth> 3.54"
 Routed to Link 7L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-YEAR Rainfall=6.20"

Area (sf)	CN	Description
2,432	39	>75% Grass cover, Good, HSG A
34,186	98	Paved parking, HSG B
17,480	39	>75% Grass cover, Good, HSG A
4,187	39	>75% Grass cover, Good, HSG A
3,071	39	>75% Grass cover, Good, HSG A
61,356		Weighted Average
27,170	39	44.28% Pervious Area
34,186	98	55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	50	0.0450	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.7	125	0.0210	2.94		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	150	0.0100	4.54	3.56	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.1	50	0.0250	9.40	16.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
10.1	375	Total			

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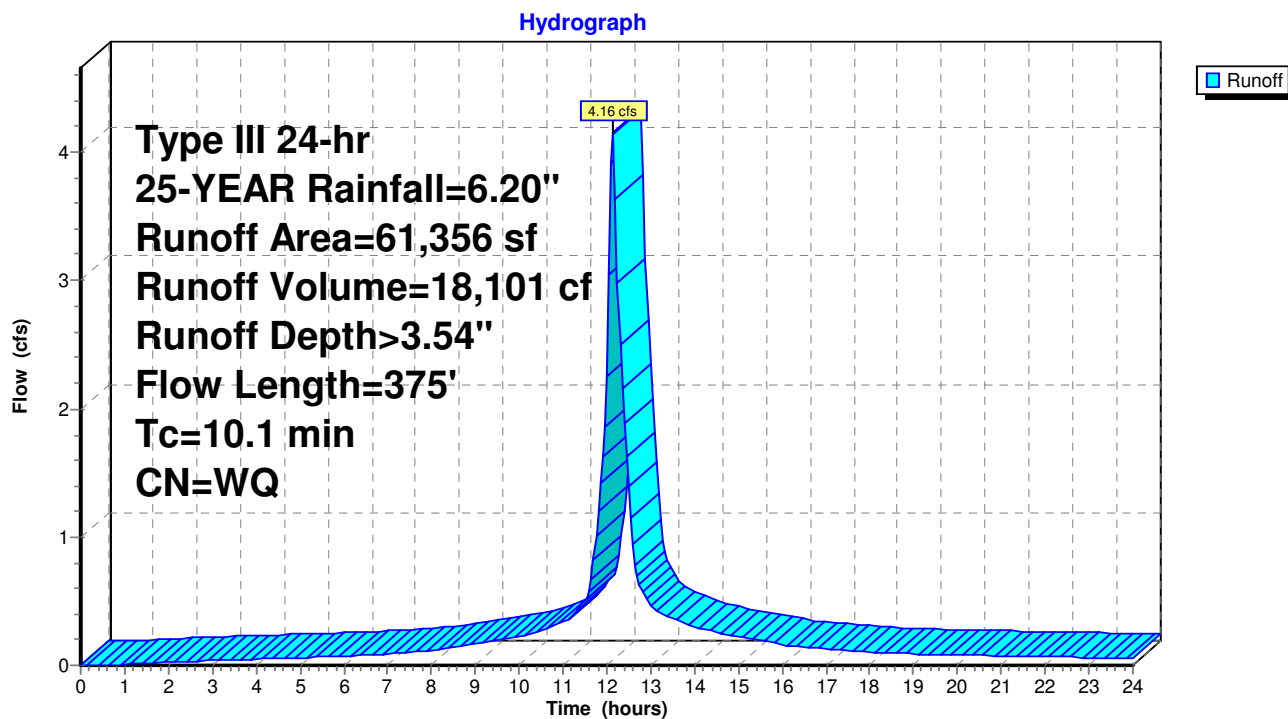
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Subcatchment 2S: SUBCATHMENT #2



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Summary for Subcatchment 3S: SUBCATCHEMENT #3

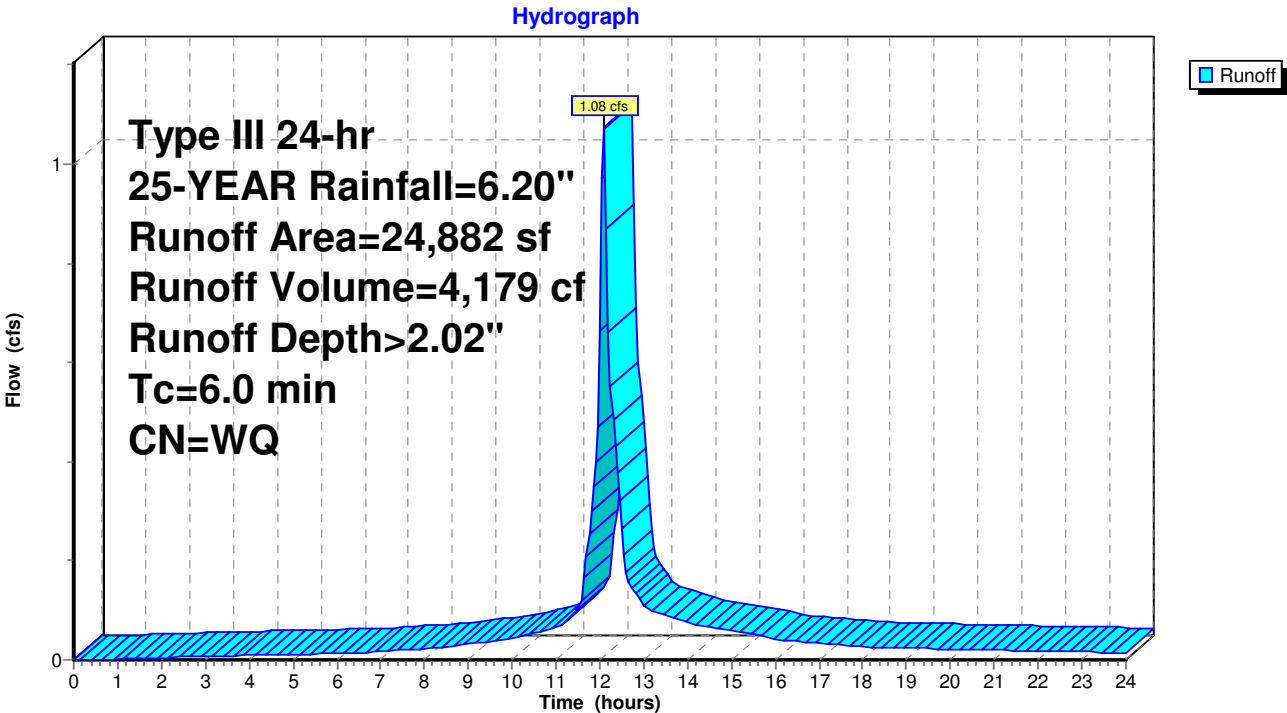
Runoff = 1.08 cfs @ 12.09 hrs, Volume= 4,179 cf, Depth> 2.02"
Routed to Pond 1P : INFILTRATION POND #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.20"

Area (sf)	CN	Description
5,209	30	Woods, Good, HSG A
4,766	55	Woods, Good, HSG B
4,088	39	>75% Grass cover, Good, HSG A
6,484	98	Paved parking, HSG A
1,913	39	>75% Grass cover, Good, HSG A
2,422	30	Woods, Good, HSG A
24,882		Weighted Average
18,398	39	73.94% Pervious Area
6,484	98	26.06% Impervious Area

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

Subcatchment 3S: SUBCATCHEMENT #3



Proposed conditions

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Type III 24-hr 25-YEAR Rainfall=6.20"

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Summary for Subcatchment 4S: SUBCATHMENT #4

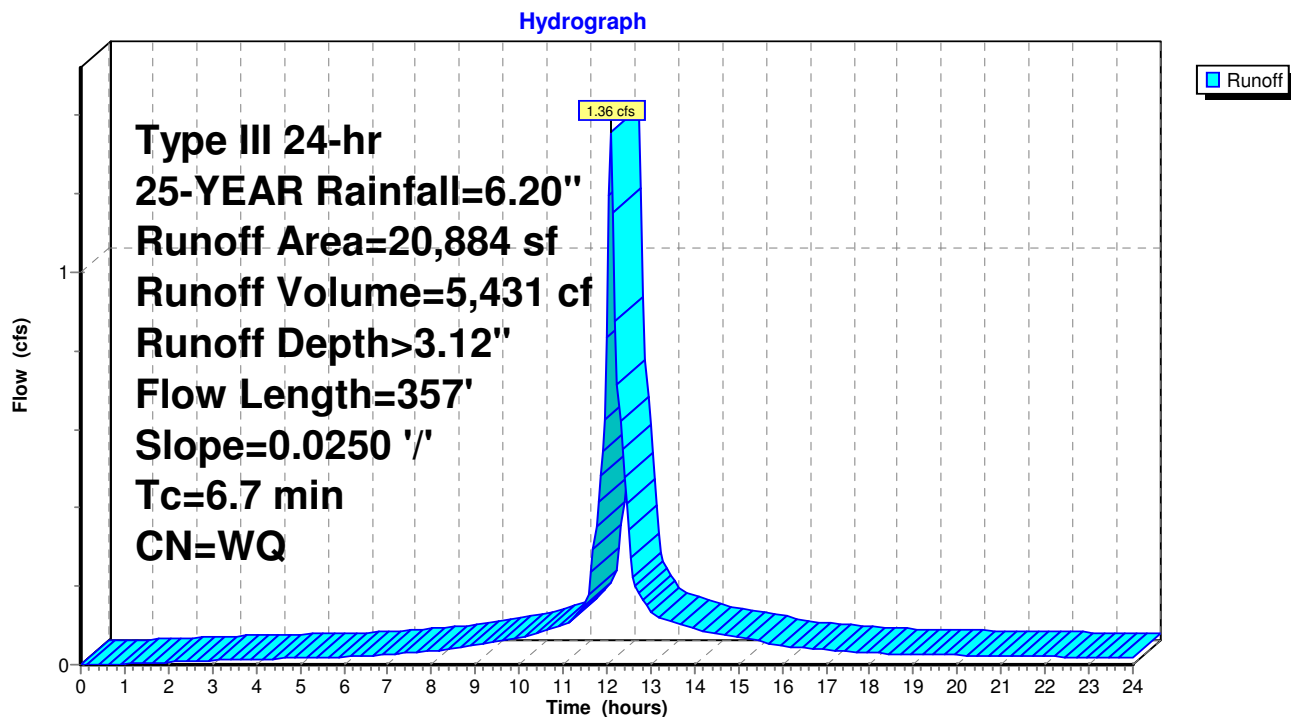
Runoff = 1.36 cfs @ 12.10 hrs, Volume= 5,431 cf, Depth> 3.12"
Routed to Pond 2P : INFILTRATION POND #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.20"

Area (sf)	CN	Description
3,589	39	>75% Grass cover, Good, HSG A
10,023	98	Paved parking, HSG A
7,272	39	>75% Grass cover, Good, HSG A
20,884		Weighted Average
10,861	39	52.01% Pervious Area
10,023	98	47.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0250	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.6	307	0.0250	3.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
6.7	357	Total			

Subcatchment 4S: SUBCATHMENT #4



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Summary for Subcatchment 8S: SUBCATCHMENT #4

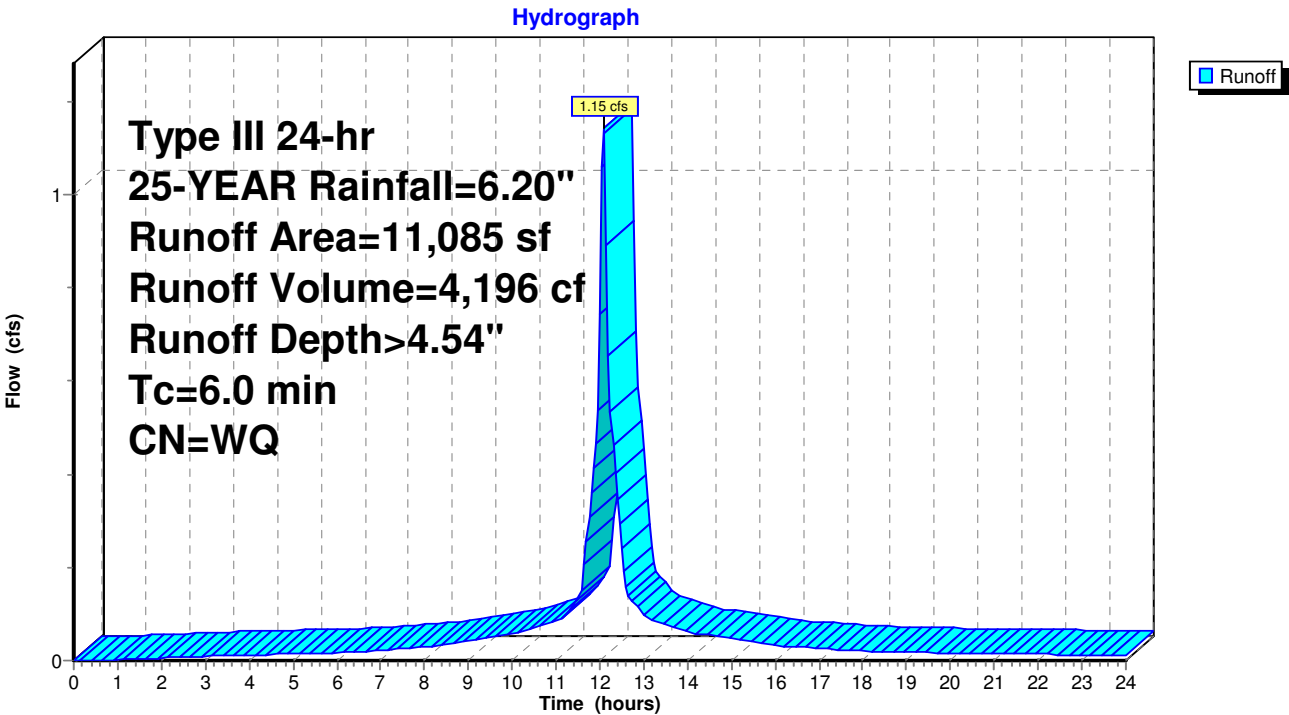
Runoff = 1.15 cfs @ 12.09 hrs, Volume= 4,196 cf, Depth> 4.54"
Routed to Pond 10P : CB #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.20"

Area (sf)	CN	Description
5,284	98	Paved parking, HSG B
2,676	30	Woods, Good, HSG A
3,125	98	Roofs, HSG A
11,085		Weighted Average
2,676	30	24.14% Pervious Area
8,409	98	75.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, MIN OF 6 MINS

Subcatchment 8S: SUBCATCHMENT #4



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Type III 24-hr 25-YEAR Rainfall=6.20"
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Summary for Subcatchment 12S: SUBCATCHMENT #5

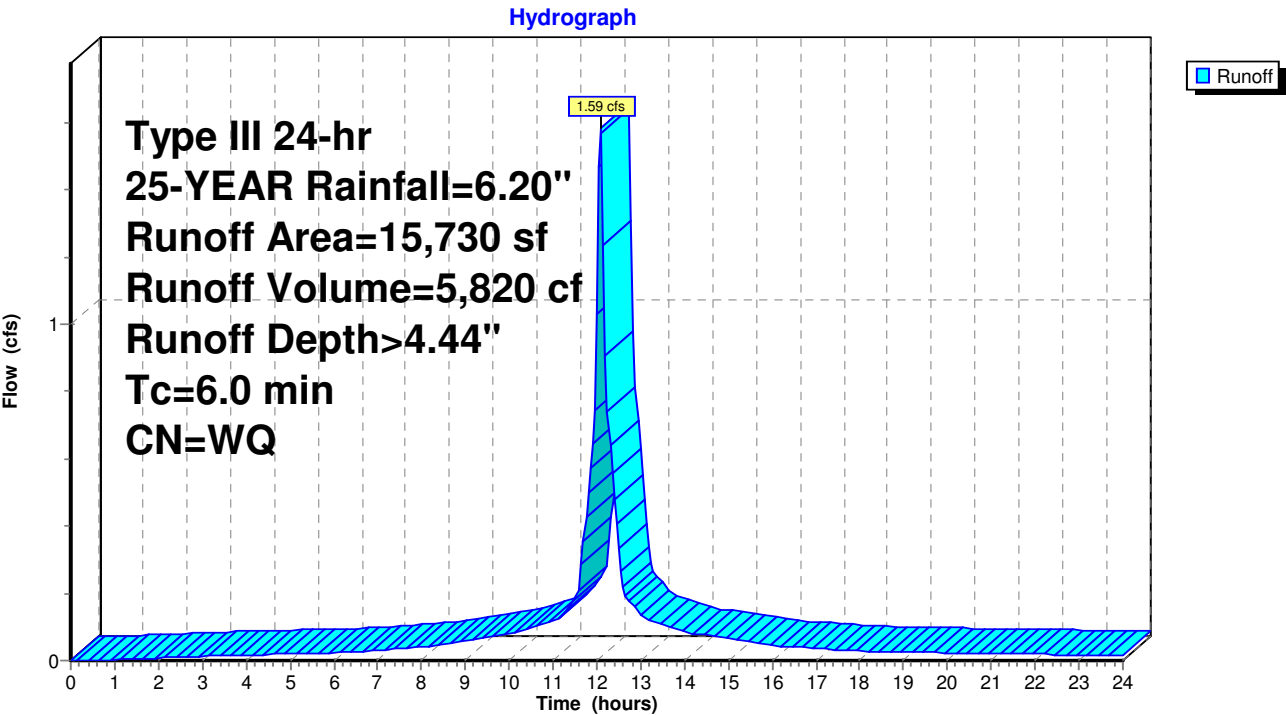
Runoff = 1.59 cfs @ 12.09 hrs, Volume= 5,820 cf, Depth> 4.44"
Routed to Pond 11P : CB #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.20"

Area (sf)	CN	Description
4,783	98	Paved parking, HSG A
6,875	98	Roofs, HSG A
4,072	30	Woods, Good, HSG A
15,730		Weighted Average
4,072	30	25.89% Pervious Area
11,658	98	74.11% Impervious Area

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

Subcatchment 12S: SUBCATCHMENT #5



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Type III 24-hr 25-YEAR Rainfall=6.20"

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Summary for Pond 1P: INFILTRATION POND #1

[81] Warning: Exceeded Pond 8P by 1.12' @ 15.15 hrs

Inflow Area = 51,697 sf, 51.36% Impervious, Inflow Depth > 2.91" for 25-YEAR event
Inflow = 1.90 cfs @ 12.09 hrs, Volume= 12,517 cf
Outflow = 1.06 cfs @ 12.43 hrs, Volume= 11,990 cf, Atten= 44%, Lag= 20.2 min
Discarded = 0.24 cfs @ 12.43 hrs, Volume= 9,915 cf
Primary = 0.83 cfs @ 12.43 hrs, Volume= 2,076 cf
Routed to Link 7L : DESIGN POINT #1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 253.69' @ 12.43 hrs Surf.Area= 3,354 sf Storage= 3,774 cf

Plug-Flow detention time= 138.7 min calculated for 11,990 cf (96% of inflow)
Center-of-Mass det. time= 113.0 min (873.8 - 760.8)

Volume	Invert	Avail.Storage	Storage Description
#1	252.00'	4,868 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
252.00	1,213	0	0
253.00	2,366	1,790	1,790
254.00	3,791	3,079	4,868

Device	Routing	Invert	Outlet Devices
#1	Discarded	252.00'	2.410 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 248.00'
#2	Primary	253.50'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Discarded OutFlow Max=0.24 cfs @ 12.43 hrs HW=253.69' (Free Discharge)
↑ **1=Exfiltration** (Controls 0.24 cfs)

Primary OutFlow Max=0.82 cfs @ 12.43 hrs HW=253.69' (Free Discharge)
↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 0.82 cfs @ 1.44 fps)

Proposed conditions

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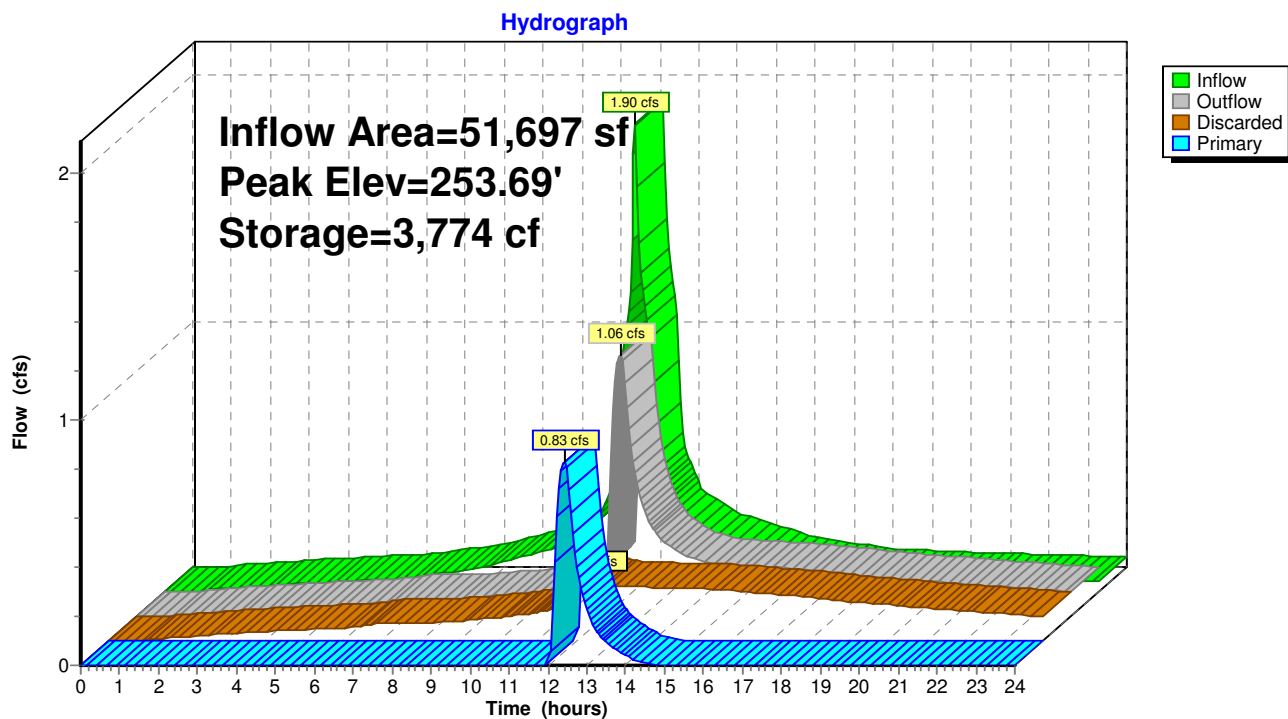
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Pond 1P: INFILTRATION POND #1



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Stage-Area-Storage for Pond 1P: INFILTRATION POND #1

Elevation (feet)	Surface (sq-ft)	Horizontal (sq-ft)	Storage (cubic-feet)
252.00	1,213	1,213	0
252.05	1,271	1,271	62
252.10	1,328	1,328	127
252.15	1,386	1,386	195
252.20	1,444	1,444	266
252.25	1,501	1,501	339
252.30	1,559	1,559	416
252.35	1,617	1,617	495
252.40	1,674	1,674	577
252.45	1,732	1,732	663
252.50	1,790	1,790	751
252.55	1,847	1,847	842
252.60	1,905	1,905	935
252.65	1,962	1,962	1,032
252.70	2,020	2,020	1,132
252.75	2,078	2,078	1,234
252.80	2,135	2,135	1,339
252.85	2,193	2,193	1,448
252.90	2,251	2,251	1,559
252.95	2,308	2,308	1,673
253.00	2,366	2,366	1,790
253.05	2,437	2,437	1,910
253.10	2,508	2,508	2,033
253.15	2,580	2,580	2,160
253.20	2,651	2,651	2,291
253.25	2,722	2,722	2,426
253.30	2,794	2,794	2,563
253.35	2,865	2,865	2,705
253.40	2,936	2,936	2,850
253.45	3,007	3,007	2,998
253.50	3,079	3,079	3,151
253.55	3,150	3,150	3,306
253.60	3,221	3,221	3,466
253.65	3,292	3,292	3,628
253.70	3,363	3,363	3,795
253.75	3,435	3,435	3,965
253.80	3,506	3,506	4,138
253.85	3,577	3,577	4,315
253.90	3,649	3,649	4,496
253.95	3,720	3,720	4,680
254.00	3,791	3,791	4,868

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Type III 24-hr 25-YEAR Rainfall=6.20"

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Summary for Pond 2P: INFILTRATION POND #2

Inflow Area = 20,884 sf, 47.99% Impervious, Inflow Depth > 3.12" for 25-YEAR event
 Inflow = 1.36 cfs @ 12.10 hrs, Volume= 5,431 cf
 Outflow = 0.47 cfs @ 12.41 hrs, Volume= 5,429 cf, Atten= 66%, Lag= 18.8 min
 Discarded = 0.39 cfs @ 12.41 hrs, Volume= 5,303 cf
 Primary = 0.08 cfs @ 12.41 hrs, Volume= 126 cf
 Routed to Link 7L : DESIGN POINT #1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 245.31' @ 12.41 hrs Surf.Area= 1,465 sf Storage= 1,228 cf

Plug-Flow detention time= 23.0 min calculated for 5,429 cf (100% of inflow)
 Center-of-Mass det. time= 22.7 min (784.8 - 762.2)

Volume	Invert	Avail.Storage	Storage Description
#1	244.00'	5,113 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
244.00	455	0	0
245.00	1,174	815	815
246.00	2,101	1,638	2,452
247.00	3,221	2,661	5,113

Device	Routing	Invert	Outlet Devices
#1	Discarded	244.00'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 242.00'
#2	Primary	245.00'	60.0 deg x 0.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.53 (C= 3.16)
#3	Primary	245.50'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Discarded OutFlow Max=0.39 cfs @ 12.41 hrs HW=245.31' (Free Discharge)

↑ **1=Exfiltration** (Controls 0.39 cfs)

Primary OutFlow Max=0.08 cfs @ 12.41 hrs HW=245.31' (Free Discharge)

↑ **2=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.08 cfs @ 1.41 fps)

↑ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Proposed conditions

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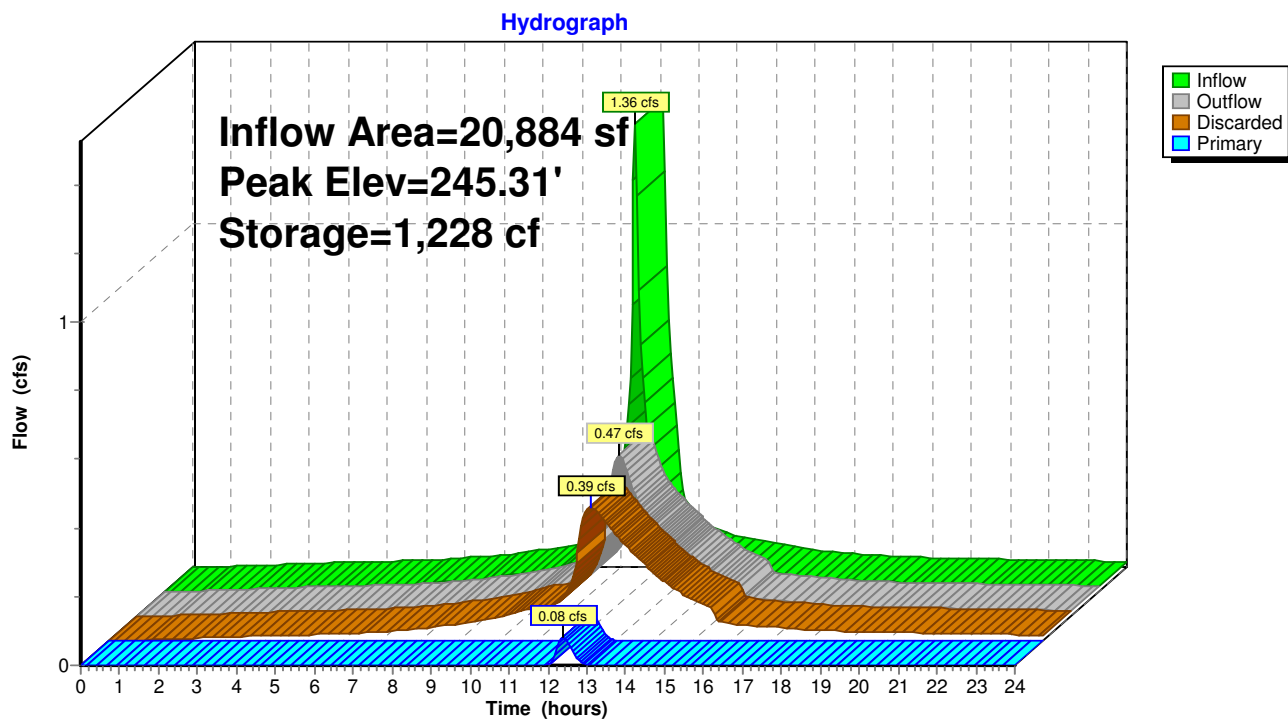
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Pond 2P: INFILTRATION POND #2



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Stage-Area-Storage for Pond 2P: INFILTRATION POND #2

Elevation (feet)	Surface (sq-ft)	Horizontal (sq-ft)	Storage (cubic-feet)
244.00	455	455	0
244.10	527	527	49
244.20	599	599	105
244.30	671	671	169
244.40	743	743	240
244.50	815	815	317
244.60	886	886	402
244.70	958	958	495
244.80	1,030	1,030	594
244.90	1,102	1,102	701
245.00	1,174	1,174	815
245.10	1,267	1,267	937
245.20	1,359	1,359	1,068
245.30	1,452	1,452	1,208
245.40	1,545	1,545	1,358
245.50	1,638	1,638	1,517
245.60	1,730	1,730	1,686
245.70	1,823	1,823	1,863
245.80	1,916	1,916	2,050
245.90	2,008	2,008	2,247
246.00	2,101	2,101	2,452
246.10	2,213	2,213	2,668
246.20	2,325	2,325	2,895
246.30	2,437	2,437	3,133
246.40	2,549	2,549	3,382
246.50	2,661	2,661	3,643
246.60	2,773	2,773	3,914
246.70	2,885	2,885	4,197
246.80	2,997	2,997	4,491
246.90	3,109	3,109	4,797
247.00	3,221	3,221	5,113

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Type III 24-hr 25-YEAR Rainfall=6.20"

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Summary for Pond 8P: DIVERSION MANHOLE

[57] Hint: Peaked at 254.10' (Flood elevation advised)

[81] Warning: Exceeded Pond 10P by 1.08' @ 12.10 hrs

[81] Warning: Exceeded Pond 11P by 0.98' @ 12.40 hrs

Inflow Area = 26,815 sf, 74.83% Impervious, Inflow Depth > 4.48" for 25-YEAR event
Inflow = 2.73 cfs @ 12.09 hrs, Volume= 10,016 cf
Outflow = 2.73 cfs @ 12.09 hrs, Volume= 10,016 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.82 cfs @ 12.09 hrs, Volume= 8,338 cf
Routed to Pond 1P : INFILTRATION POND #1
Secondary = 1.91 cfs @ 12.09 hrs, Volume= 1,678 cf
Routed to Pond 9P : CULTEC UNITS

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

Peak Elev= 254.10' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	252.00'	6.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.00' / 252.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#2	Device 3	252.00'	12.0" Round Culvert L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.00' / 252.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Secondary	253.70'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.82 cfs @ 12.09 hrs HW=254.08' (Free Discharge)

↑ **1=Culvert** (Barrel Controls 0.82 cfs @ 4.17 fps)

Secondary OutFlow Max=1.84 cfs @ 12.09 hrs HW=254.08' (Free Discharge)

↑ **3=Sharp-Crested Rectangular Weir** (Passes 1.84 cfs of 3.01 cfs potential flow)

↑ **2=Culvert** (Inlet Controls 1.84 cfs @ 2.35 fps)

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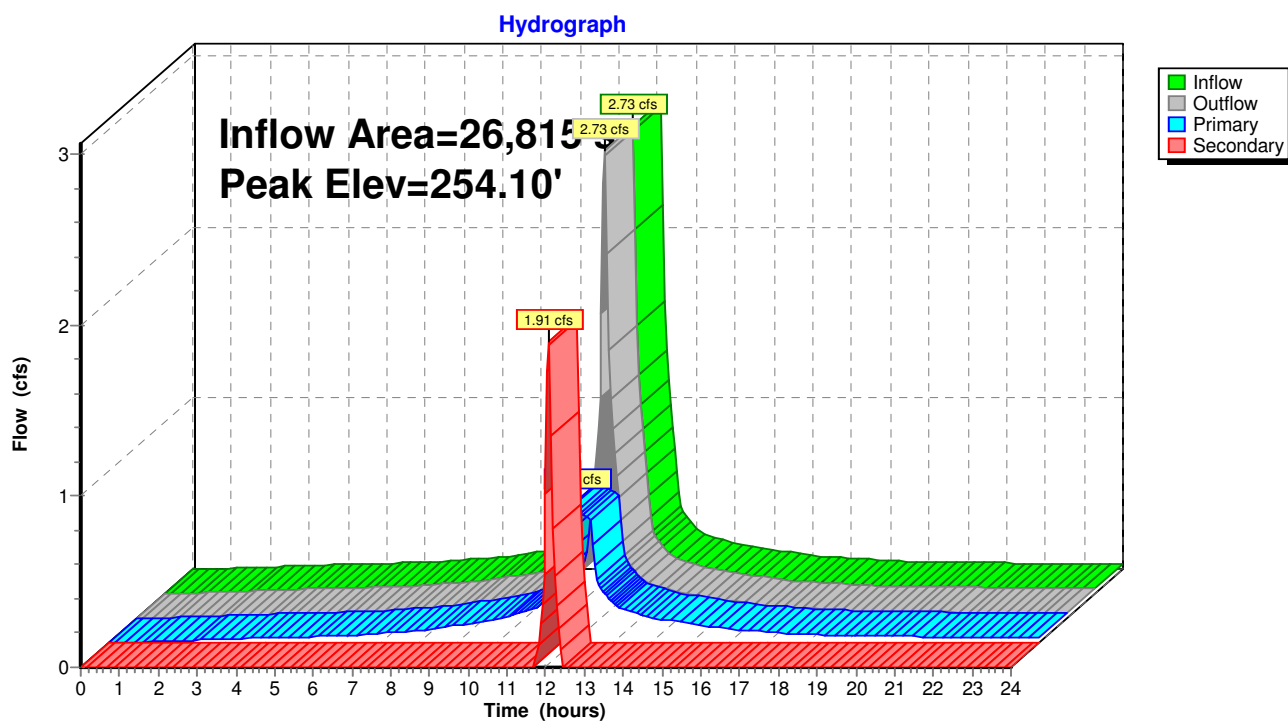
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Pond 8P: DIVERSION MANHOLE



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Stage-Area-Storage for Pond 8P: DIVERSION MANHOLE

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
252.00	0	253.04	0	254.08	0
252.02	0	253.06	0	254.10	0
252.04	0	253.08	0		
252.06	0	253.10	0		
252.08	0	253.12	0		
252.10	0	253.14	0		
252.12	0	253.16	0		
252.14	0	253.18	0		
252.16	0	253.20	0		
252.18	0	253.22	0		
252.20	0	253.24	0		
252.22	0	253.26	0		
252.24	0	253.28	0		
252.26	0	253.30	0		
252.28	0	253.32	0		
252.30	0	253.34	0		
252.32	0	253.36	0		
252.34	0	253.38	0		
252.36	0	253.40	0		
252.38	0	253.42	0		
252.40	0	253.44	0		
252.42	0	253.46	0		
252.44	0	253.48	0		
252.46	0	253.50	0		
252.48	0	253.52	0		
252.50	0	253.54	0		
252.52	0	253.56	0		
252.54	0	253.58	0		
252.56	0	253.60	0		
252.58	0	253.62	0		
252.60	0	253.64	0		
252.62	0	253.66	0		
252.64	0	253.68	0		
252.66	0	253.70	0		
252.68	0	253.72	0		
252.70	0	253.74	0		
252.72	0	253.76	0		
252.74	0	253.78	0		
252.76	0	253.80	0		
252.78	0	253.82	0		
252.80	0	253.84	0		
252.82	0	253.86	0		
252.84	0	253.88	0		
252.86	0	253.90	0		
252.88	0	253.92	0		
252.90	0	253.94	0		
252.92	0	253.96	0		
252.94	0	253.98	0		
252.96	0	254.00	0		
252.98	0	254.02	0		
253.00	0	254.04	0		
253.02	0	254.06	0		

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Summary for Pond 9P: CULTEC UNITS

Inflow = 1.91 cfs @ 12.09 hrs, Volume= 1,678 cf
 Outflow = 0.49 cfs @ 12.26 hrs, Volume= 1,334 cf, Atten= 75%, Lag= 10.4 min
 Primary = 0.49 cfs @ 12.26 hrs, Volume= 1,334 cf
 Routed to Link 7L : DESIGN POINT #1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 252.67' @ 12.27 hrs Surf.Area= 1,864 sf Storage= 1,257 cf

Plug-Flow detention time= 56.1 min calculated for 1,331 cf (79% of inflow)
 Center-of-Mass det. time= 54.7 min (780.3 - 725.6)

Volume	Invert	Avail.Storage	Storage Description
#1	252.00'	1,368 cf	Cultec R-150XLHD x 50 Inside #2 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 5 rows
#2	251.50'	1,701 cf	105.00'W x 17.75'L x 3.50'H Prismatic 6,523 cf Overall - 1,368 cf Embedded = 5,156 cf x 33.0% Voids
		3,069 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	252.00'	6.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 252.00' / 252.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf

Primary OutFlow Max=0.48 cfs @ 12.26 hrs HW=252.67' (Free Discharge)

↑**1=Culvert** (Barrel Controls 0.48 cfs @ 2.47 fps)

Proposed conditions

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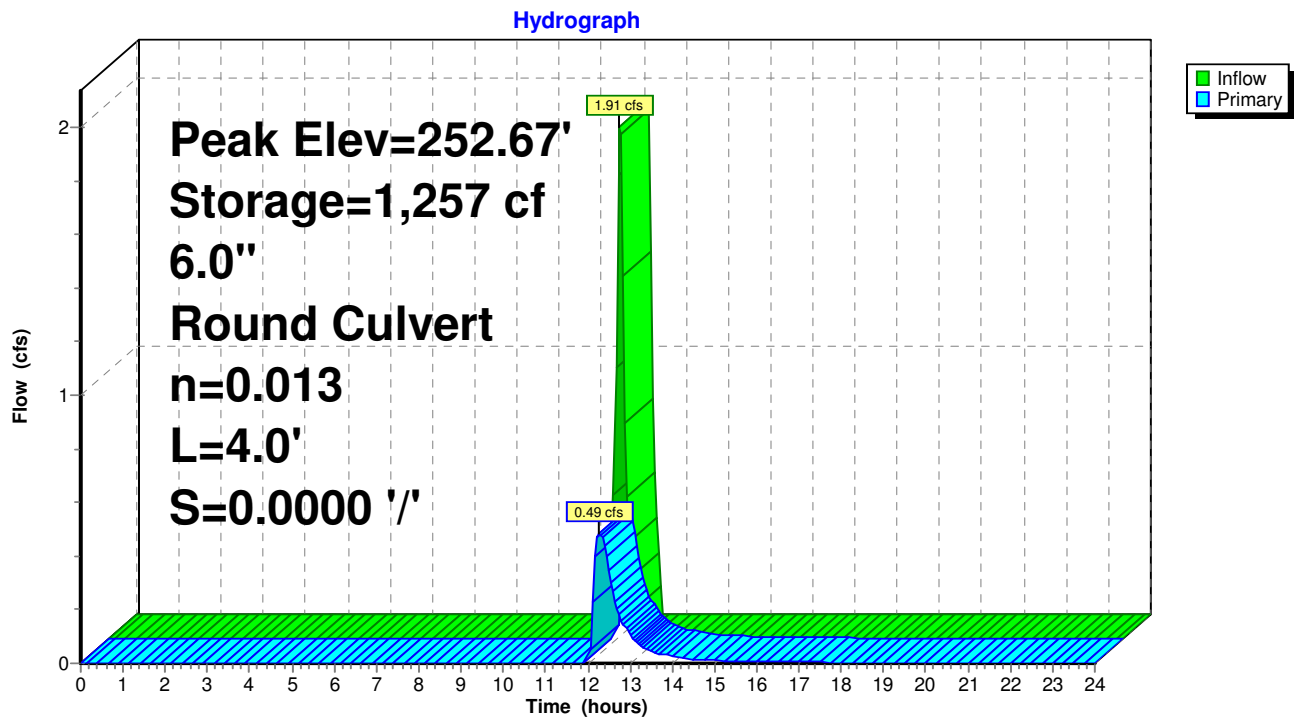
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Pond 9P: CULTEC UNITS



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Stage-Area-Storage for Pond 9P: CULTEC UNITS

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
251.50	0	254.10	2,515
251.55	31	254.15	2,546
251.60	62	254.20	2,577
251.65	92	254.25	2,608
251.70	123	254.30	2,638
251.75	154	254.35	2,669
251.80	185	254.40	2,700
251.85	215	254.45	2,731
251.90	246	254.50	2,761
251.95	277	254.55	2,792
252.00	308	254.60	2,823
252.05	381	254.65	2,854
252.10	454	254.70	2,884
252.15	526	254.75	2,915
252.20	597	254.80	2,946
252.25	668	254.85	2,977
252.30	739	254.90	3,007
252.35	810	254.95	3,038
252.40	880	255.00	3,069
252.45	950		
252.50	1,020		
252.55	1,089		
252.60	1,157		
252.65	1,225		
252.70	1,292		
252.75	1,358		
252.80	1,423		
252.85	1,488		
252.90	1,551		
252.95	1,613		
253.00	1,673		
253.05	1,732		
253.10	1,789		
253.15	1,845		
253.20	1,898		
253.25	1,949		
253.30	1,996		
253.35	2,039		
253.40	2,077		
253.45	2,113		
253.50	2,146		
253.55	2,177		
253.60	2,208		
253.65	2,239		
253.70	2,269		
253.75	2,300		
253.80	2,331		
253.85	2,362		
253.90	2,392		
253.95	2,423		
254.00	2,454		
254.05	2,485		

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Type III 24-hr 25-YEAR Rainfall=6.20"

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Summary for Pond 10P: CB #1

[57] Hint: Peaked at 253.03' (Flood elevation advised)

Inflow Area = 11,085 sf, 75.86% Impervious, Inflow Depth > 4.54" for 25-YEAR event
Inflow = 1.15 cfs @ 12.09 hrs, Volume= 4,196 cf
Outflow = 1.15 cfs @ 12.09 hrs, Volume= 4,196 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.15 cfs @ 12.09 hrs, Volume= 4,196 cf
Routed to Pond 8P : DIVERSION MANHOLE

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

Peak Elev= 253.03' @ 12.09 hrs

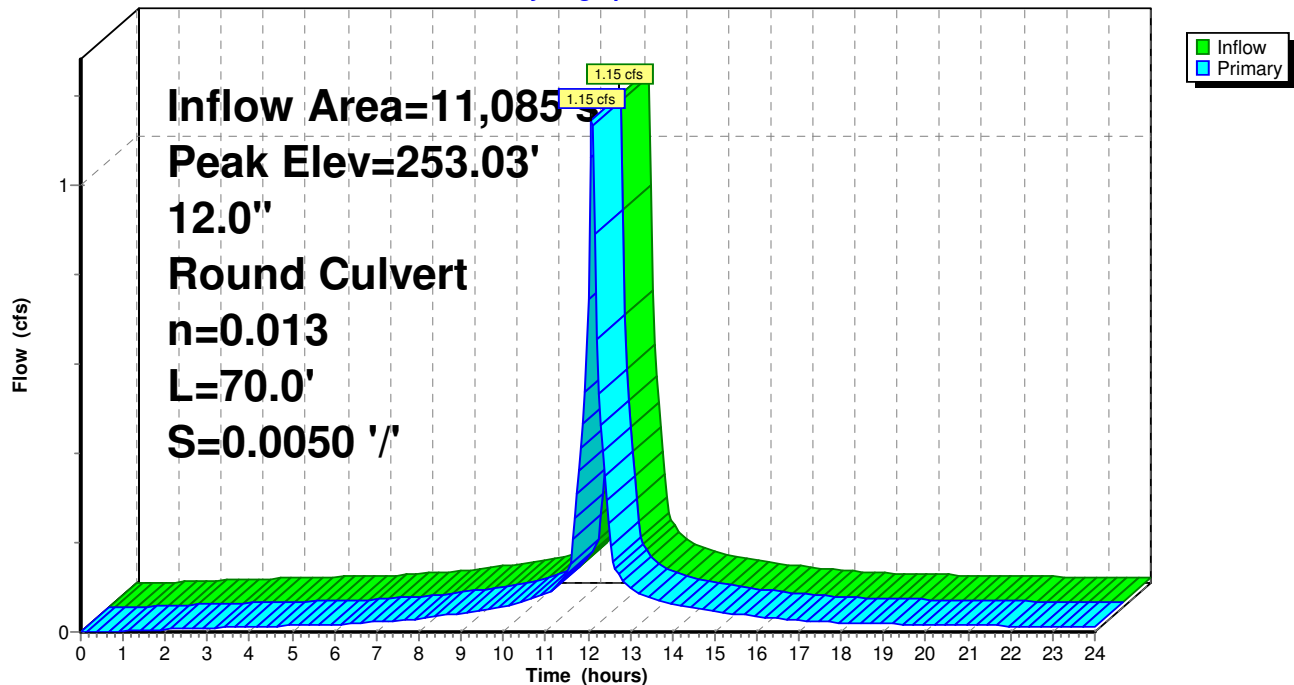
Device	Routing	Invert	Outlet Devices
#1	Primary	252.35'	12.0" Round Culvert L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.35' / 252.00' S= 0.0050 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.11 cfs @ 12.09 hrs HW=253.02' (Free Discharge)

↑1=Culvert (Barrel Controls 1.11 cfs @ 2.85 fps)

Pond 10P: CB #1

Hydrograph



Proposed conditions

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Type III 24-hr 25-YEAR Rainfall=6.20"

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Stage-Area-Storage for Pond 10P: CB #1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
252.35	0	252.87	0
252.36	0	252.88	0
252.37	0	252.89	0
252.38	0	252.90	0
252.39	0	252.91	0
252.40	0	252.92	0
252.41	0	252.93	0
252.42	0	252.94	0
252.43	0	252.95	0
252.44	0	252.96	0
252.45	0	252.97	0
252.46	0	252.98	0
252.47	0	252.99	0
252.48	0	253.00	0
252.49	0	253.01	0
252.50	0	253.02	0
252.51	0	253.03	0
252.52	0	253.04	0
252.53	0	253.05	0
252.54	0	253.06	0
252.55	0	253.07	0
252.56	0	253.08	0
252.57	0	253.09	0
252.58	0	253.10	0
252.59	0	253.11	0
252.60	0	253.12	0
252.61	0	253.13	0
252.62	0	253.14	0
252.63	0	253.15	0
252.64	0	253.16	0
252.65	0	253.17	0
252.66	0	253.18	0
252.67	0	253.19	0
252.68	0	253.20	0
252.69	0	253.21	0
252.70	0	253.22	0
252.71	0	253.23	0
252.72	0	253.24	0
252.73	0	253.25	0
252.74	0	253.26	0
252.75	0	253.27	0
252.76	0	253.28	0
252.77	0	253.29	0
252.78	0	253.30	0
252.79	0	253.31	0
252.80	0	253.32	0
252.81	0	253.33	0
252.82	0	253.34	0
252.83	0	253.35	0
252.84	0		
252.85	0		
252.86	0		

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Summary for Pond 11P: CB #2

[57] Hint: Peaked at 253.18' (Flood elevation advised)

Inflow Area = 15,730 sf, 74.11% Impervious, Inflow Depth > 4.44" for 25-YEAR event
Inflow = 1.59 cfs @ 12.09 hrs, Volume= 5,820 cf
Outflow = 1.59 cfs @ 12.09 hrs, Volume= 5,820 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.59 cfs @ 12.09 hrs, Volume= 5,820 cf
Routed to Pond 8P : DIVERSION MANHOLE

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

Peak Elev= 253.18' @ 12.09 hrs

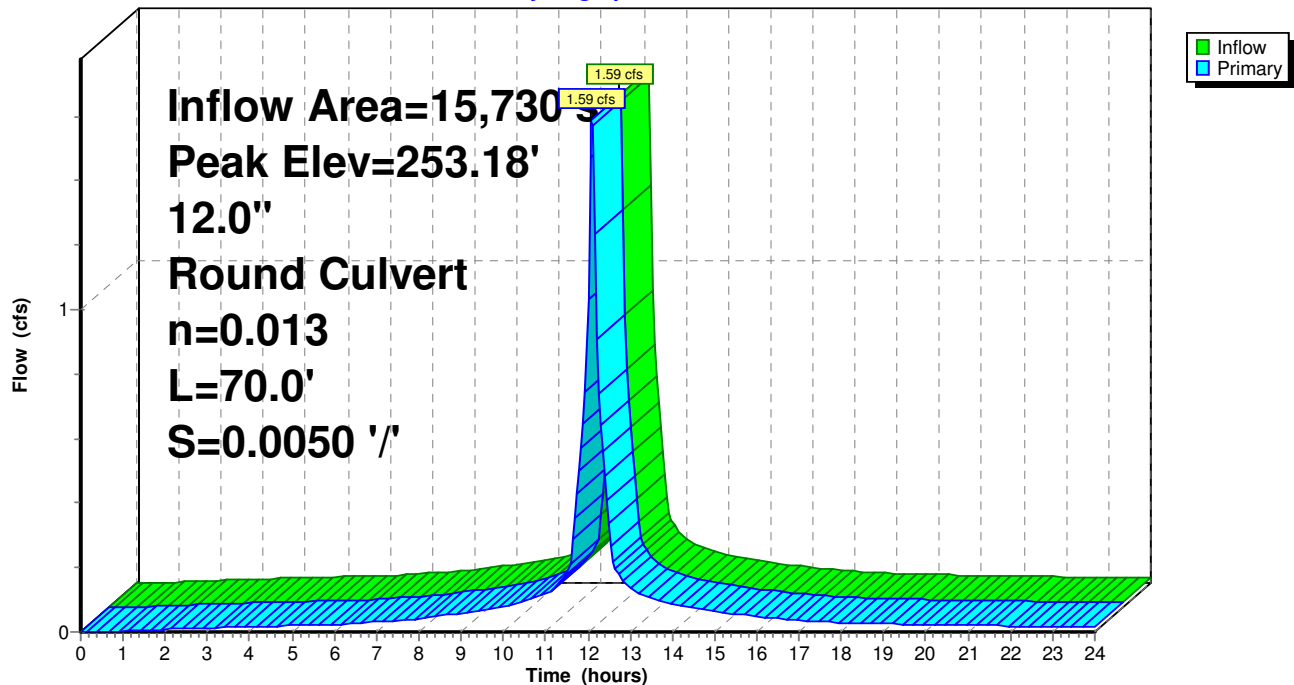
Device	Routing	Invert	Outlet Devices
#1	Primary	252.35'	12.0" Round Culvert L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.35' / 252.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.55 cfs @ 12.09 hrs HW=253.17' (Free Discharge)

↑1=Culvert (Barrel Controls 1.55 cfs @ 3.07 fps)

Pond 11P: CB #2

Hydrograph



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Stage-Area-Storage for Pond 11P: CB #2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
252.35	0	252.87	0
252.36	0	252.88	0
252.37	0	252.89	0
252.38	0	252.90	0
252.39	0	252.91	0
252.40	0	252.92	0
252.41	0	252.93	0
252.42	0	252.94	0
252.43	0	252.95	0
252.44	0	252.96	0
252.45	0	252.97	0
252.46	0	252.98	0
252.47	0	252.99	0
252.48	0	253.00	0
252.49	0	253.01	0
252.50	0	253.02	0
252.51	0	253.03	0
252.52	0	253.04	0
252.53	0	253.05	0
252.54	0	253.06	0
252.55	0	253.07	0
252.56	0	253.08	0
252.57	0	253.09	0
252.58	0	253.10	0
252.59	0	253.11	0
252.60	0	253.12	0
252.61	0	253.13	0
252.62	0	253.14	0
252.63	0	253.15	0
252.64	0	253.16	0
252.65	0	253.17	0
252.66	0	253.18	0
252.67	0	253.19	0
252.68	0	253.20	0
252.69	0	253.21	0
252.70	0	253.22	0
252.71	0	253.23	0
252.72	0	253.24	0
252.73	0	253.25	0
252.74	0	253.26	0
252.75	0	253.27	0
252.76	0	253.28	0
252.77	0	253.29	0
252.78	0	253.30	0
252.79	0	253.31	0
252.80	0	253.32	0
252.81	0	253.33	0
252.82	0	253.34	0
252.83	0	253.35	0
252.84	0		
252.85	0		
252.86	0		

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Type III 24-hr 25-YEAR Rainfall=6.20"

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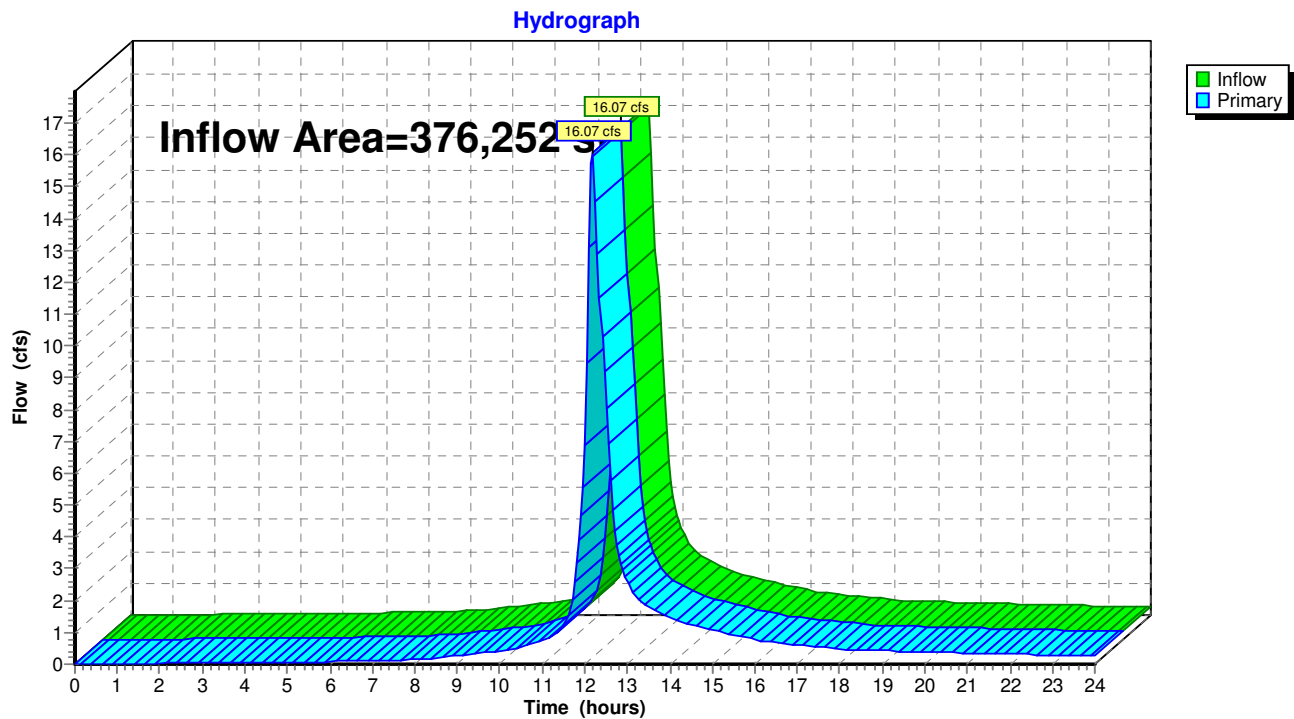
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Summary for Link 7L: DESIGN POINT #1

Inflow Area = 376,252 sf, 20.69% Impervious, Inflow Depth > 2.20" for 25-YEAR event
Inflow = 16.07 cfs @ 12.18 hrs, Volume= 68,832 cf
Primary = 16.07 cfs @ 12.18 hrs, Volume= 68,832 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 7L: DESIGN POINT #1



Proposed conditions*Type III 24-hr 100-YEAR Rainfall=8.70"*

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

Subcatchment 1S: SUBCATCHMENT #1 Runoff Area=242,315 sf 2.93% Impervious Runoff Depth>4.12"
Flow Length=861' Tc=13.0 min CN=WQ Runoff=20.50 cfs 83,262 cf

Subcatchment 2S: SUBCATHMENT #2 Runoff Area=61,356 sf 55.72% Impervious Runoff Depth>5.35"
Flow Length=375' Tc=10.1 min CN=WQ Runoff=6.41 cfs 27,376 cf

Subcatchment 3S: SUBCATCHMENT #3 Runoff Area=24,882 sf 26.06% Impervious Runoff Depth>3.36"
Tc=6.0 min CN=WQ Runoff=1.81 cfs 6,975 cf

Subcatchment 4S: SUBCATHMENT #4 Runoff Area=20,884 sf 47.99% Impervious Runoff Depth>4.82"
Flow Length=357' Slope=0.0250 '/' Tc=6.7 min CN=WQ Runoff=2.18 cfs 8,383 cf

Subcatchment 8S: SUBCATCHMENT #4 Runoff Area=11,085 sf 75.86% Impervious Runoff Depth>6.56"
Tc=6.0 min CN=WQ Runoff=1.61 cfs 6,057 cf

Subcatchment 12S: SUBCATCHMENT #5 Runoff Area=15,730 sf 74.11% Impervious Runoff Depth>6.42"
Tc=6.0 min CN=WQ Runoff=2.23 cfs 8,415 cf

Pond 1P: INFILTRATION POND #1 Peak Elev=253.83' Storage=4,229 cf Inflow=2.76 cfs 18,287 cf
Discarded=0.25 cfs 11,541 cf Primary=1.78 cfs 5,589 cf Outflow=2.04 cfs 17,129 cf

Pond 2P: INFILTRATION POND #2 Peak Elev=245.62' Storage=1,728 cf Inflow=2.18 cfs 8,383 cf
Discarded=0.48 cfs 7,373 cf Primary=0.65 cfs 1,006 cf Outflow=1.13 cfs 8,379 cf

Pond 8P: DIVERSION MANHOLE Peak Elev=254.63' Inflow=3.85 cfs 14,472 cf
Primary=0.95 cfs 11,312 cf Secondary=2.89 cfs 3,160 cf Outflow=3.85 cfs 14,472 cf

Pond 9P: CULTEC UNITS Peak Elev=253.32' Storage=2,012 cf Inflow=2.89 cfs 3,160 cf
6.0" Round Culvert n=0.013 L=4.0' S=0.0000 '/' Outflow=0.98 cfs 2,814 cf

Pond 10P: CB #1 Peak Elev=253.19' Inflow=1.61 cfs 6,057 cf
12.0" Round Culvert n=0.013 L=70.0' S=0.0050 '/' Outflow=1.61 cfs 6,057 cf

Pond 11P: CB #2 Peak Elev=253.41' Inflow=2.23 cfs 8,415 cf
12.0" Round Culvert n=0.013 L=70.0' S=0.0050 '/' Outflow=2.23 cfs 8,415 cf

Link 7L: DESIGN POINT #1 Inflow=29.65 cfs 120,047 cf
Primary=29.65 cfs 120,047 cf

Total Runoff Area = 376,252 sf Runoff Volume = 140,468 cf Average Runoff Depth = 4.48"
79.31% Pervious = 298,387 sf 20.69% Impervious = 77,865 sf

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Type III 24-hr 100-YEAR Rainfall=8.70"

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Summary for Subcatchment 1S: SUBCATCHMENT #1

Runoff = 20.50 cfs @ 12.18 hrs, Volume= 83,262 cf, Depth> 4.12"
 Routed to Link 7L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-YEAR Rainfall=8.70"

Area (sf)	CN	Description
1,306	30	Woods, Good, HSG A
103,810	55	Woods, Good, HSG B
79,531	77	Woods, Good, HSG D
21,069	30	Woods, Good, HSG A
29,494	61	>75% Grass cover, Good, HSG B
595	98	Roofs, HSG B
1,549	98	Roofs, HSG B
661	98	Roofs, HSG B
816	98	Roofs, HSG B
529	98	Roofs, HSG B
856	98	Roofs, HSG B
1,445	98	Roofs, HSG B
654	98	Roofs, HSG B
242,315		Weighted Average
235,210	61	97.07% Pervious Area
7,105	98	2.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.4	340	0.0625	4.03		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.8	421	0.0250	2.55		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.0	861	Total			

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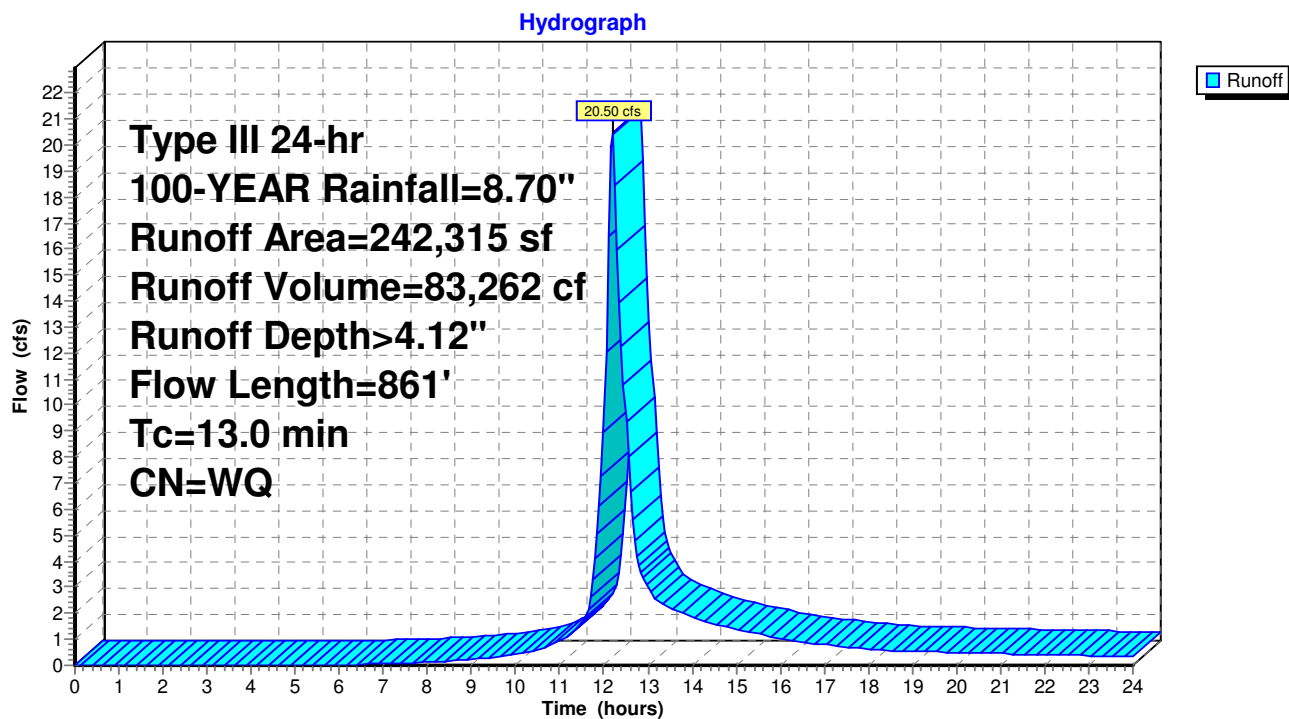
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Subcatchment 1S: SUBCATCHMENT #1



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Summary for Subcatchment 2S: SUBCATHMENT #2

[47] Hint: Peak is 180% of capacity of segment #3

Runoff = 6.41 cfs @ 12.14 hrs, Volume= 27,376 cf, Depth> 5.35"
 Routed to Link 7L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-YEAR Rainfall=8.70"

Area (sf)	CN	Description
2,432	39	>75% Grass cover, Good, HSG A
34,186	98	Paved parking, HSG B
17,480	39	>75% Grass cover, Good, HSG A
4,187	39	>75% Grass cover, Good, HSG A
3,071	39	>75% Grass cover, Good, HSG A
61,356		Weighted Average
27,170	39	44.28% Pervious Area
34,186	98	55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	50	0.0450	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.7	125	0.0210	2.94		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	150	0.0100	4.54	3.56	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.1	50	0.0250	9.40	16.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
10.1	375	Total			

Proposed conditions

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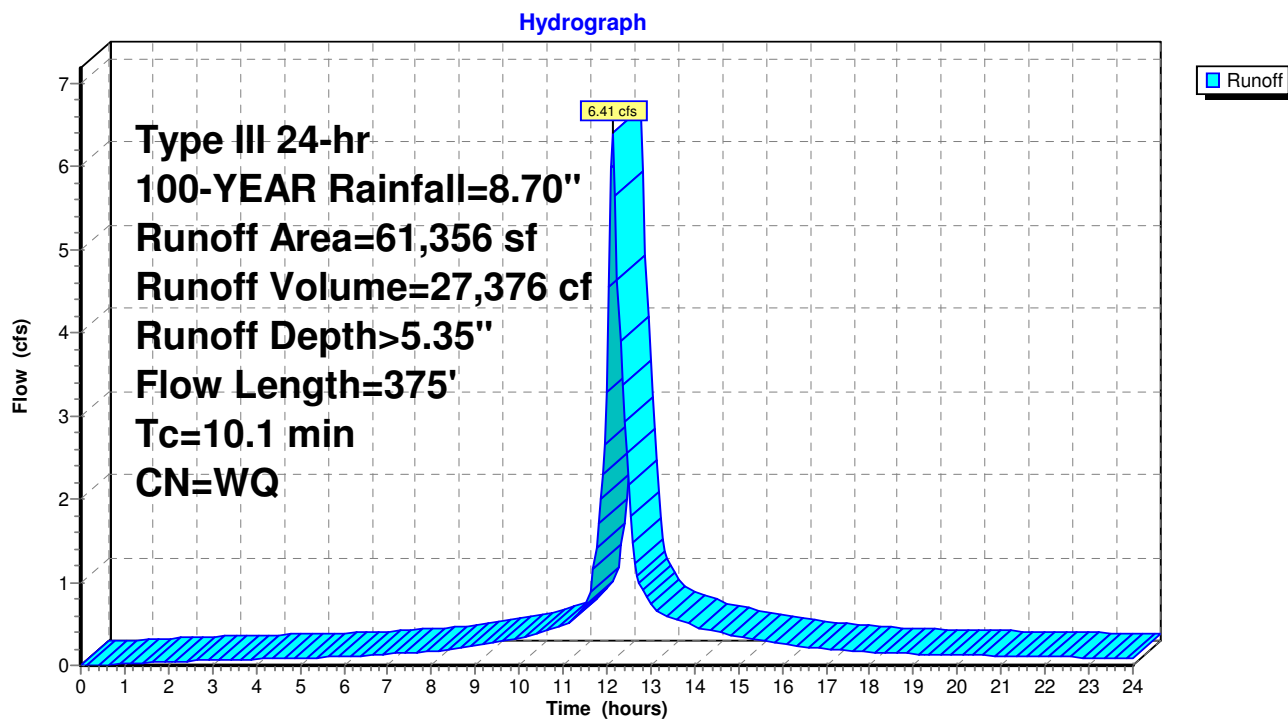
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Type III 24-hr 100-YEAR Rainfall=8.70"

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Subcatchment 2S: SUBCATHMENT #2



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Type III 24-hr 100-YEAR Rainfall=8.70"

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Summary for Subcatchment 3S: SUBCATCHEMENT #3

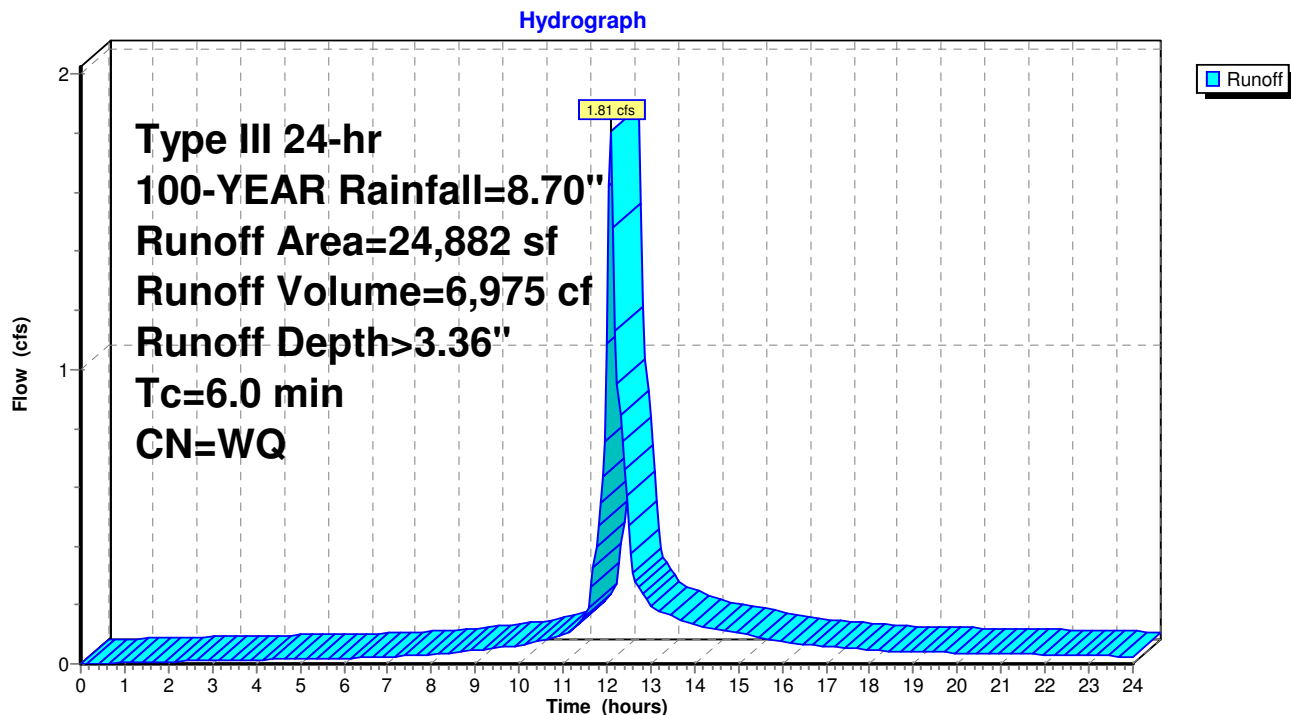
Runoff = 1.81 cfs @ 12.09 hrs, Volume= 6,975 cf, Depth> 3.36"
Routed to Pond 1P : INFILTRATION POND #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.70"

Area (sf)	CN	Description
5,209	30	Woods, Good, HSG A
4,766	55	Woods, Good, HSG B
4,088	39	>75% Grass cover, Good, HSG A
6,484	98	Paved parking, HSG A
1,913	39	>75% Grass cover, Good, HSG A
2,422	30	Woods, Good, HSG A
24,882		Weighted Average
18,398	39	73.94% Pervious Area
6,484	98	26.06% Impervious Area

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

Subcatchment 3S: SUBCATCHEMENT #3



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Summary for Subcatchment 4S: SUBCATHMENT #4

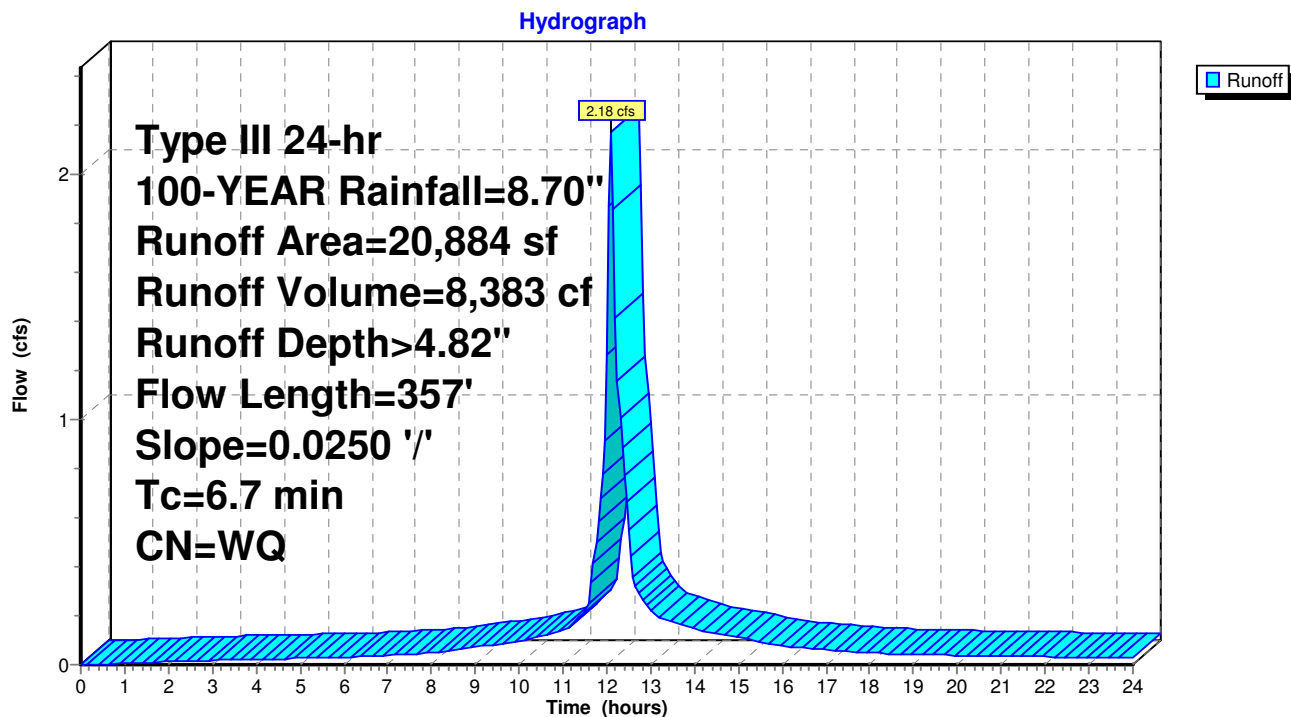
Runoff = 2.18 cfs @ 12.10 hrs, Volume= 8,383 cf, Depth> 4.82"
Routed to Pond 2P : INFILTRATION POND #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.70"

Area (sf)	CN	Description
3,589	39	>75% Grass cover, Good, HSG A
10,023	98	Paved parking, HSG A
7,272	39	>75% Grass cover, Good, HSG A
20,884		Weighted Average
10,861	39	52.01% Pervious Area
10,023	98	47.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0250	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.6	307	0.0250	3.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
6.7	357	Total			

Subcatchment 4S: SUBCATHMENT #4



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Summary for Subcatchment 8S: SUBCATCHMENT #4

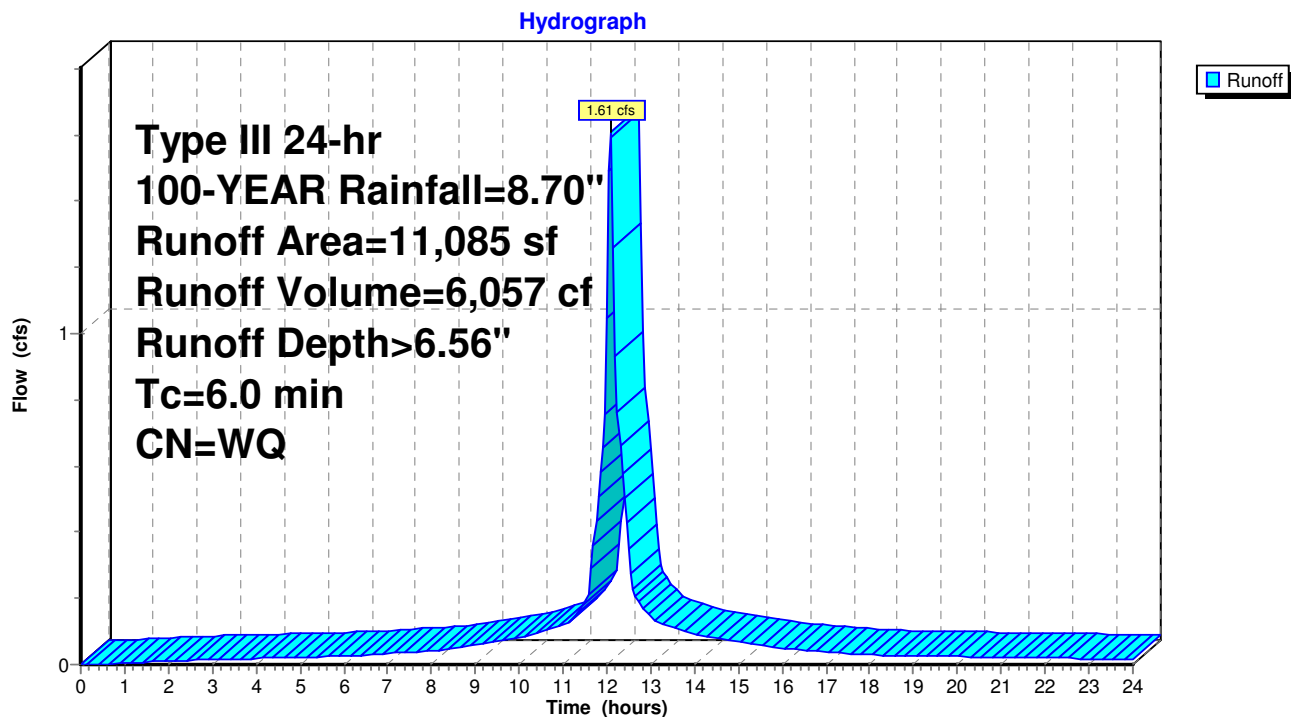
Runoff = 1.61 cfs @ 12.09 hrs, Volume= 6,057 cf, Depth> 6.56"
Routed to Pond 10P : CB #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.70"

Area (sf)	CN	Description
5,284	98	Paved parking, HSG B
2,676	30	Woods, Good, HSG A
3,125	98	Roofs, HSG A
11,085		Weighted Average
2,676	30	24.14% Pervious Area
8,409	98	75.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, MIN OF 6 MINS

Subcatchment 8S: SUBCATCHMENT #4



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Type III 24-hr 100-YEAR Rainfall=8.70"

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Summary for Subcatchment 12S: SUBCATCHMENT #5

Runoff = 2.23 cfs @ 12.09 hrs, Volume= 8,415 cf, Depth> 6.42"
Routed to Pond 11P : CB #2

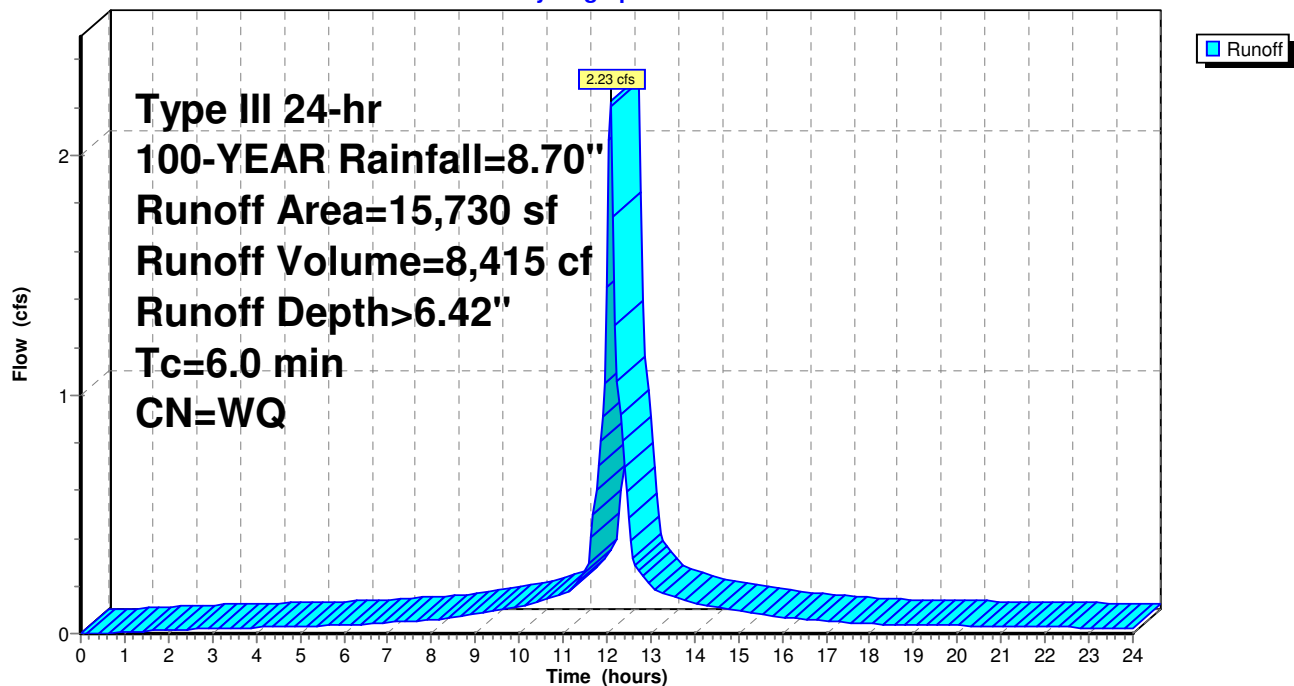
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.70"

Area (sf)	CN	Description
4,783	98	Paved parking, HSG A
6,875	98	Roofs, HSG A
4,072	30	Woods, Good, HSG A
15,730		Weighted Average
4,072	30	25.89% Pervious Area
11,658	98	74.11% Impervious Area

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

Subcatchment 12S: SUBCATCHMENT #5

Hydrograph



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Summary for Pond 1P: INFILTRATION POND #1

[81] Warning: Exceeded Pond 8P by 1.14' @ 16.15 hrs

Inflow Area = 51,697 sf, 51.36% Impervious, Inflow Depth > 4.24" for 100-YEAR event
 Inflow = 2.76 cfs @ 12.09 hrs, Volume= 18,287 cf
 Outflow = 2.04 cfs @ 12.19 hrs, Volume= 17,129 cf, Atten= 26%, Lag= 6.1 min
 Discarded = 0.25 cfs @ 12.19 hrs, Volume= 11,541 cf
 Primary = 1.78 cfs @ 12.19 hrs, Volume= 5,589 cf
 Routed to Link 7L : DESIGN POINT #1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 253.83' @ 12.19 hrs Surf.Area= 3,543 sf Storage= 4,229 cf

Plug-Flow detention time= 119.0 min calculated for 17,129 cf (94% of inflow)
 Center-of-Mass det. time= 82.1 min (847.5 - 765.4)

Volume	Invert	Avail.Storage	Storage Description
#1	252.00'	4,868 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
252.00	1,213	0	0
253.00	2,366	1,790	1,790
254.00	3,791	3,079	4,868

Device	Routing	Invert	Outlet Devices
#1	Discarded	252.00'	2.410 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 248.00'
#2	Primary	253.50'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Discarded OutFlow Max=0.25 cfs @ 12.19 hrs HW=253.82' (Free Discharge)
 ↑ **1=Exfiltration** (Controls 0.25 cfs)

Primary OutFlow Max=1.78 cfs @ 12.19 hrs HW=253.82' (Free Discharge)
 ↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 1.78 cfs @ 1.86 fps)

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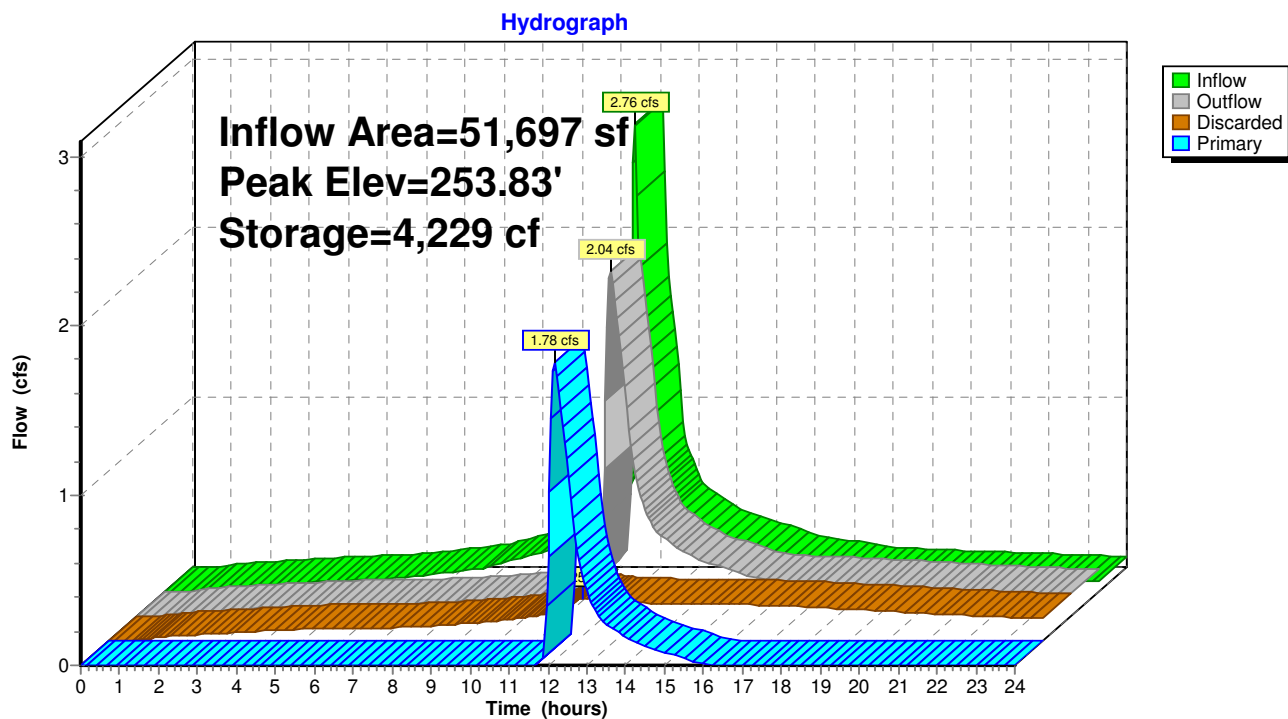
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Pond 1P: INFILTRATION POND #1



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Stage-Area-Storage for Pond 1P: INFILTRATION POND #1

Elevation (feet)	Surface (sq-ft)	Horizontal (sq-ft)	Storage (cubic-feet)
252.00	1,213	1,213	0
252.05	1,271	1,271	62
252.10	1,328	1,328	127
252.15	1,386	1,386	195
252.20	1,444	1,444	266
252.25	1,501	1,501	339
252.30	1,559	1,559	416
252.35	1,617	1,617	495
252.40	1,674	1,674	577
252.45	1,732	1,732	663
252.50	1,790	1,790	751
252.55	1,847	1,847	842
252.60	1,905	1,905	935
252.65	1,962	1,962	1,032
252.70	2,020	2,020	1,132
252.75	2,078	2,078	1,234
252.80	2,135	2,135	1,339
252.85	2,193	2,193	1,448
252.90	2,251	2,251	1,559
252.95	2,308	2,308	1,673
253.00	2,366	2,366	1,790
253.05	2,437	2,437	1,910
253.10	2,508	2,508	2,033
253.15	2,580	2,580	2,160
253.20	2,651	2,651	2,291
253.25	2,722	2,722	2,426
253.30	2,794	2,794	2,563
253.35	2,865	2,865	2,705
253.40	2,936	2,936	2,850
253.45	3,007	3,007	2,998
253.50	3,079	3,079	3,151
253.55	3,150	3,150	3,306
253.60	3,221	3,221	3,466
253.65	3,292	3,292	3,628
253.70	3,363	3,363	3,795
253.75	3,435	3,435	3,965
253.80	3,506	3,506	4,138
253.85	3,577	3,577	4,315
253.90	3,649	3,649	4,496
253.95	3,720	3,720	4,680
254.00	3,791	3,791	4,868

Proposed conditions

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Type III 24-hr 100-YEAR Rainfall=8.70"

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Summary for Pond 2P: INFILTRATION POND #2

Inflow Area = 20,884 sf, 47.99% Impervious, Inflow Depth > 4.82" for 100-YEAR event
 Inflow = 2.18 cfs @ 12.10 hrs, Volume= 8,383 cf
 Outflow = 1.13 cfs @ 12.27 hrs, Volume= 8,379 cf, Atten= 48%, Lag= 10.2 min
 Discarded = 0.48 cfs @ 12.27 hrs, Volume= 7,373 cf
 Primary = 0.65 cfs @ 12.27 hrs, Volume= 1,006 cf
 Routed to Link 7L : DESIGN POINT #1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 245.62' @ 12.27 hrs Surf.Area= 1,753 sf Storage= 1,728 cf

Plug-Flow detention time= 23.9 min calculated for 8,379 cf (100% of inflow)
 Center-of-Mass det. time= 23.6 min (789.4 - 765.8)

Volume	Invert	Avail.Storage	Storage Description
#1	244.00'	5,113 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
244.00	455	0	0
245.00	1,174	815	815
246.00	2,101	1,638	2,452
247.00	3,221	2,661	5,113

Device	Routing	Invert	Outlet Devices
#1	Discarded	244.00'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 242.00'
#2	Primary	245.00'	60.0 deg x 0.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.53 (C= 3.16)
#3	Primary	245.50'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Discarded OutFlow Max=0.48 cfs @ 12.27 hrs HW=245.62' (Free Discharge)

↑ **1=Exfiltration** (Controls 0.48 cfs)

Primary OutFlow Max=0.63 cfs @ 12.27 hrs HW=245.62' (Free Discharge)

↑ **2=Sharp-Crested Vee/Trap Weir** (Orifice Controls 0.36 cfs @ 2.49 fps)

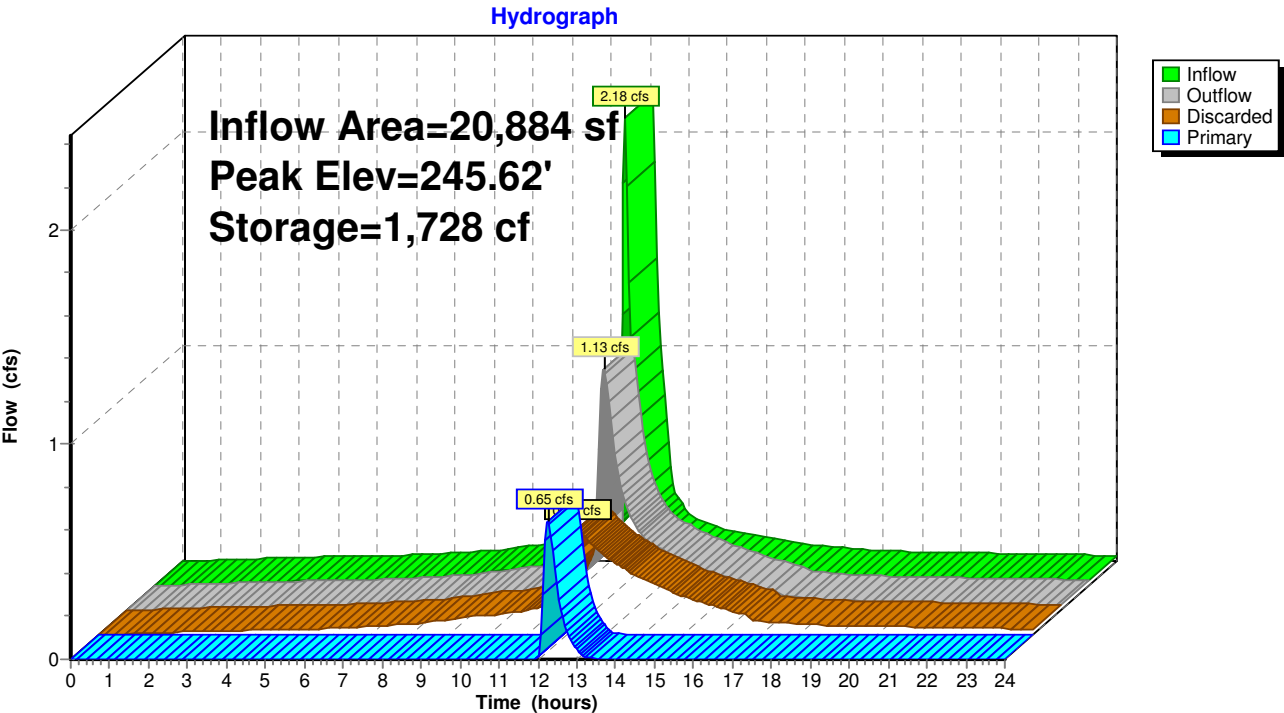
↑ **3=Sharp-Crested Rectangular Weir** (Weir Controls 0.27 cfs @ 1.14 fps)

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Pond 2P: INFILTRATION POND #2



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Stage-Area-Storage for Pond 2P: INFILTRATION POND #2

Elevation (feet)	Surface (sq-ft)	Horizontal (sq-ft)	Storage (cubic-feet)
244.00	455	455	0
244.10	527	527	49
244.20	599	599	105
244.30	671	671	169
244.40	743	743	240
244.50	815	815	317
244.60	886	886	402
244.70	958	958	495
244.80	1,030	1,030	594
244.90	1,102	1,102	701
245.00	1,174	1,174	815
245.10	1,267	1,267	937
245.20	1,359	1,359	1,068
245.30	1,452	1,452	1,208
245.40	1,545	1,545	1,358
245.50	1,638	1,638	1,517
245.60	1,730	1,730	1,686
245.70	1,823	1,823	1,863
245.80	1,916	1,916	2,050
245.90	2,008	2,008	2,247
246.00	2,101	2,101	2,452
246.10	2,213	2,213	2,668
246.20	2,325	2,325	2,895
246.30	2,437	2,437	3,133
246.40	2,549	2,549	3,382
246.50	2,661	2,661	3,643
246.60	2,773	2,773	3,914
246.70	2,885	2,885	4,197
246.80	2,997	2,997	4,491
246.90	3,109	3,109	4,797
247.00	3,221	3,221	5,113

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Summary for Pond 8P: DIVERSION MANHOLE

[57] Hint: Peaked at 254.63' (Flood elevation advised)

[81] Warning: Exceeded Pond 10P by 1.43' @ 12.10 hrs

[81] Warning: Exceeded Pond 11P by 1.21' @ 12.10 hrs

Inflow Area = 26,815 sf, 74.83% Impervious, Inflow Depth > 6.48" for 100-YEAR event
Inflow = 3.85 cfs @ 12.09 hrs, Volume= 14,472 cf
Outflow = 3.85 cfs @ 12.09 hrs, Volume= 14,472 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.95 cfs @ 12.09 hrs, Volume= 11,312 cf
Routed to Pond 1P : INFILTRATION POND #1
Secondary = 2.89 cfs @ 12.09 hrs, Volume= 3,160 cf
Routed to Pond 9P : CULTEC UNITS

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

Peak Elev= 254.63' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	252.00'	6.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.00' / 252.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#2	Device 3	252.00'	12.0" Round Culvert L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.00' / 252.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Secondary	253.70'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.94 cfs @ 12.09 hrs HW=254.58' (Free Discharge)

↑**1=Culvert** (Barrel Controls 0.94 cfs @ 4.79 fps)

Secondary OutFlow Max=2.80 cfs @ 12.09 hrs HW=254.58' (Free Discharge)

↑**3=Sharp-Crested Rectangular Weir** (Passes 2.80 cfs of 10.37 cfs potential flow)

↑**2=Culvert** (Inlet Controls 2.80 cfs @ 3.57 fps)

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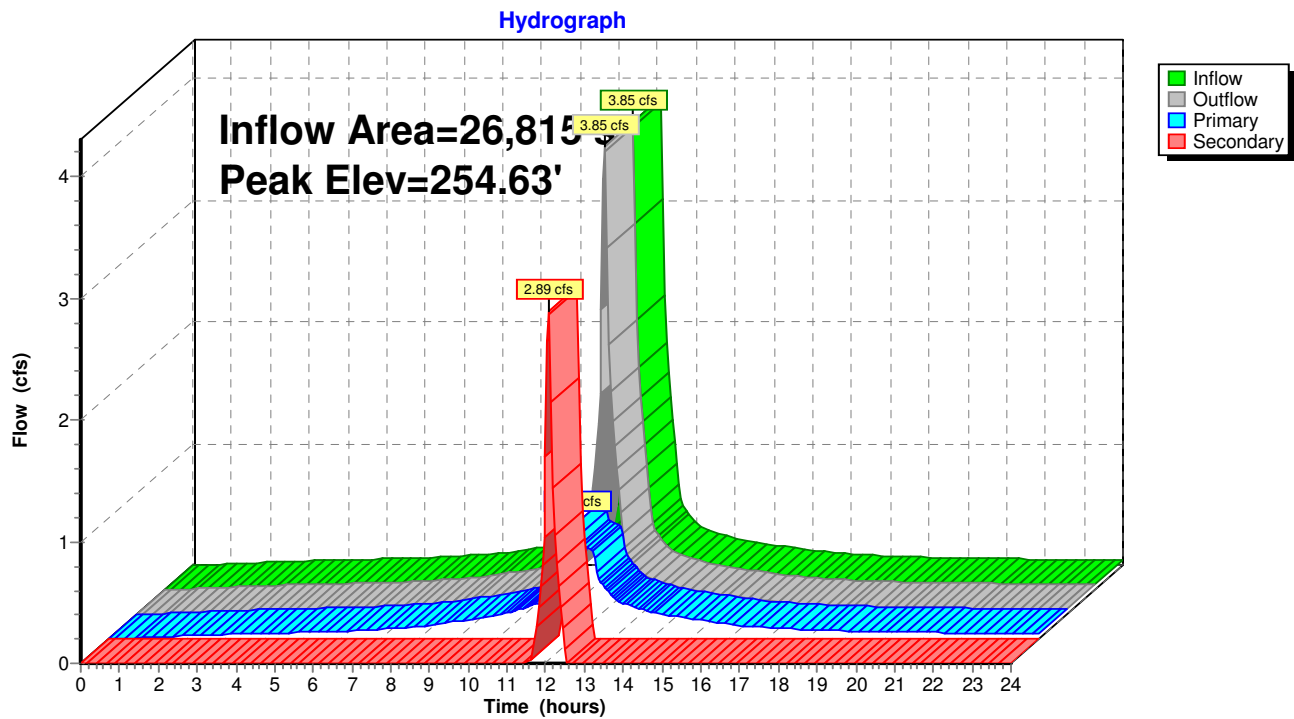
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Pond 8P: DIVERSION MANHOLE



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Stage-Area-Storage for Pond 8P: DIVERSION MANHOLE

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
252.00	0	253.04	0	254.08	0
252.02	0	253.06	0	254.10	0
252.04	0	253.08	0	254.12	0
252.06	0	253.10	0	254.14	0
252.08	0	253.12	0	254.16	0
252.10	0	253.14	0	254.18	0
252.12	0	253.16	0	254.20	0
252.14	0	253.18	0	254.22	0
252.16	0	253.20	0	254.24	0
252.18	0	253.22	0	254.26	0
252.20	0	253.24	0	254.28	0
252.22	0	253.26	0	254.30	0
252.24	0	253.28	0	254.32	0
252.26	0	253.30	0	254.34	0
252.28	0	253.32	0	254.36	0
252.30	0	253.34	0	254.38	0
252.32	0	253.36	0	254.40	0
252.34	0	253.38	0	254.42	0
252.36	0	253.40	0	254.44	0
252.38	0	253.42	0	254.46	0
252.40	0	253.44	0	254.48	0
252.42	0	253.46	0	254.50	0
252.44	0	253.48	0	254.52	0
252.46	0	253.50	0	254.54	0
252.48	0	253.52	0	254.56	0
252.50	0	253.54	0	254.58	0
252.52	0	253.56	0	254.60	0
252.54	0	253.58	0	254.62	0
252.56	0	253.60	0		
252.58	0	253.62	0		
252.60	0	253.64	0		
252.62	0	253.66	0		
252.64	0	253.68	0		
252.66	0	253.70	0		
252.68	0	253.72	0		
252.70	0	253.74	0		
252.72	0	253.76	0		
252.74	0	253.78	0		
252.76	0	253.80	0		
252.78	0	253.82	0		
252.80	0	253.84	0		
252.82	0	253.86	0		
252.84	0	253.88	0		
252.86	0	253.90	0		
252.88	0	253.92	0		
252.90	0	253.94	0		
252.92	0	253.96	0		
252.94	0	253.98	0		
252.96	0	254.00	0		
252.98	0	254.02	0		
253.00	0	254.04	0		
253.02	0	254.06	0		

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Summary for Pond 9P: CULTEC UNITS

Inflow = 2.89 cfs @ 12.09 hrs, Volume= 3,160 cf
 Outflow = 0.98 cfs @ 12.27 hrs, Volume= 2,814 cf, Atten= 66%, Lag= 11.0 min
 Primary = 0.98 cfs @ 12.27 hrs, Volume= 2,814 cf
 Routed to Link 7L : DESIGN POINT #1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 253.32' @ 12.27 hrs Surf.Area= 1,864 sf Storage= 2,012 cf

Plug-Flow detention time= 41.8 min calculated for 2,808 cf (89% of inflow)
 Center-of-Mass det. time= 41.0 min (766.8 - 725.8)

Volume	Invert	Avail.Storage	Storage Description
#1	252.00'	1,368 cf	Cultec R-150XLHD x 50 Inside #2 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 5 rows
#2	251.50'	1,701 cf	105.00'W x 17.75'L x 3.50'H Prismatic 6,523 cf Overall - 1,368 cf Embedded = 5,156 cf x 33.0% Voids
		3,069 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	252.00'	6.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 252.00' / 252.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf

Primary OutFlow Max=0.97 cfs @ 12.27 hrs HW=253.31' (Free Discharge)

↑ **1=Culvert** (Inlet Controls 0.97 cfs @ 4.96 fps)

Proposed conditions

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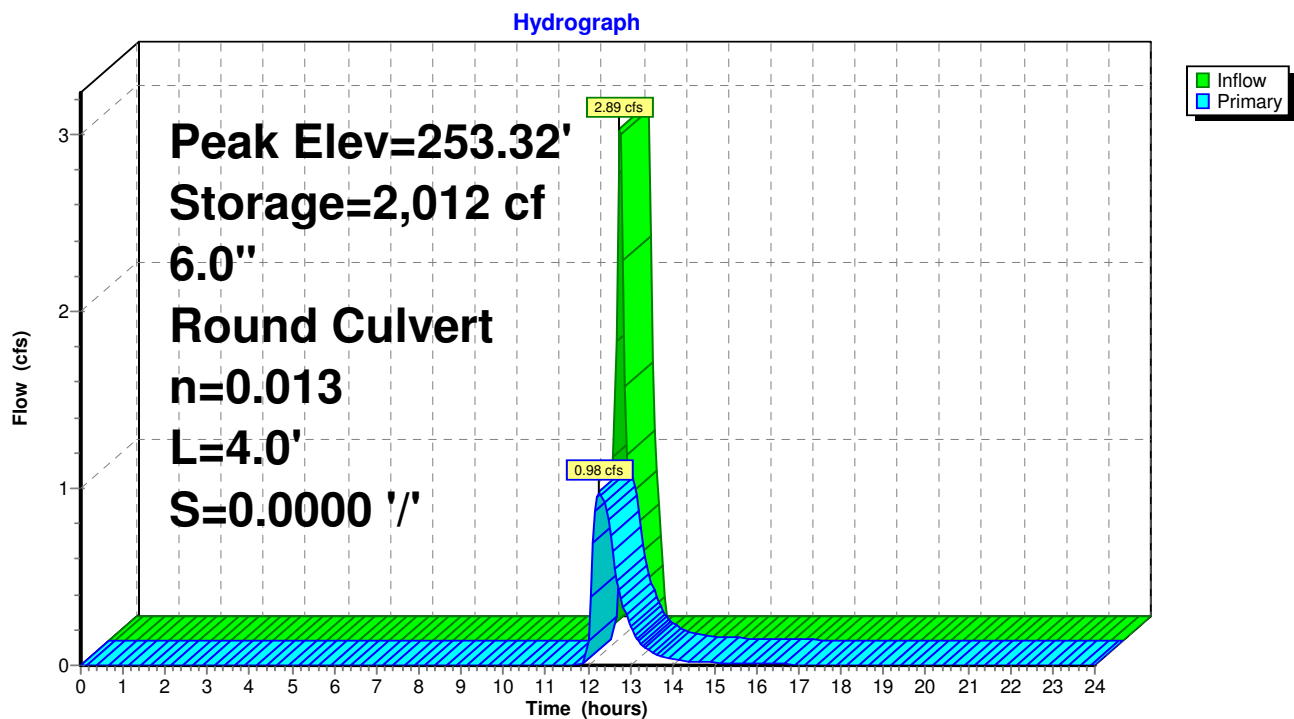
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Pond 9P: CULTEC UNITS



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Stage-Area-Storage for Pond 9P: CULTEC UNITS

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
251.50	0	254.10	2,515
251.55	31	254.15	2,546
251.60	62	254.20	2,577
251.65	92	254.25	2,608
251.70	123	254.30	2,638
251.75	154	254.35	2,669
251.80	185	254.40	2,700
251.85	215	254.45	2,731
251.90	246	254.50	2,761
251.95	277	254.55	2,792
252.00	308	254.60	2,823
252.05	381	254.65	2,854
252.10	454	254.70	2,884
252.15	526	254.75	2,915
252.20	597	254.80	2,946
252.25	668	254.85	2,977
252.30	739	254.90	3,007
252.35	810	254.95	3,038
252.40	880	255.00	3,069
252.45	950		
252.50	1,020		
252.55	1,089		
252.60	1,157		
252.65	1,225		
252.70	1,292		
252.75	1,358		
252.80	1,423		
252.85	1,488		
252.90	1,551		
252.95	1,613		
253.00	1,673		
253.05	1,732		
253.10	1,789		
253.15	1,845		
253.20	1,898		
253.25	1,949		
253.30	1,996		
253.35	2,039		
253.40	2,077		
253.45	2,113		
253.50	2,146		
253.55	2,177		
253.60	2,208		
253.65	2,239		
253.70	2,269		
253.75	2,300		
253.80	2,331		
253.85	2,362		
253.90	2,392		
253.95	2,423		
254.00	2,454		
254.05	2,485		

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Summary for Pond 10P: CB #1

[57] Hint: Peaked at 253.19' (Flood elevation advised)

Inflow Area = 11,085 sf, 75.86% Impervious, Inflow Depth > 6.56" for 100-YEAR event
Inflow = 1.61 cfs @ 12.09 hrs, Volume= 6,057 cf
Outflow = 1.61 cfs @ 12.09 hrs, Volume= 6,057 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.61 cfs @ 12.09 hrs, Volume= 6,057 cf
Routed to Pond 8P : DIVERSION MANHOLE

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

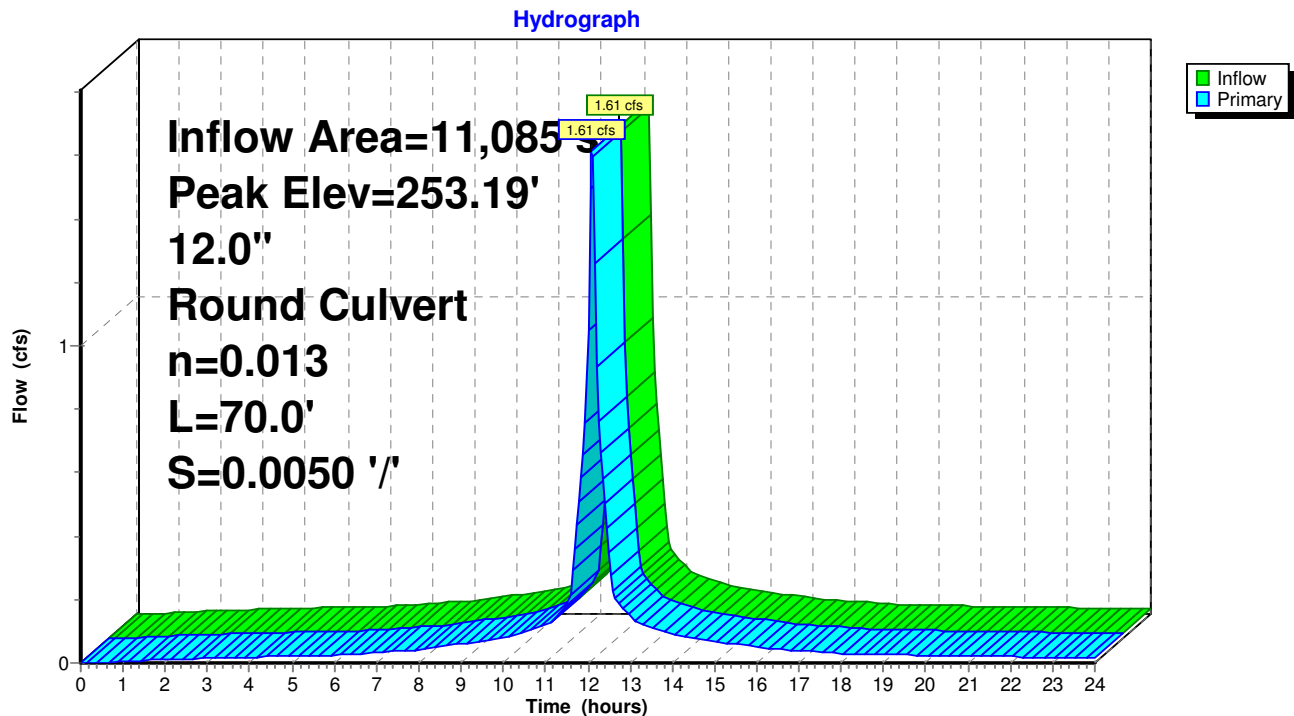
Peak Elev= 253.19' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	252.35'	12.0" Round Culvert L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.35' / 252.00' S= 0.0050 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.57 cfs @ 12.09 hrs HW=253.17' (Free Discharge)

↑1=Culvert (Barrel Controls 1.57 cfs @ 3.08 fps)

Pond 10P: CB #1



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Stage-Area-Storage for Pond 10P: CB #1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
252.35	0	252.87	0
252.36	0	252.88	0
252.37	0	252.89	0
252.38	0	252.90	0
252.39	0	252.91	0
252.40	0	252.92	0
252.41	0	252.93	0
252.42	0	252.94	0
252.43	0	252.95	0
252.44	0	252.96	0
252.45	0	252.97	0
252.46	0	252.98	0
252.47	0	252.99	0
252.48	0	253.00	0
252.49	0	253.01	0
252.50	0	253.02	0
252.51	0	253.03	0
252.52	0	253.04	0
252.53	0	253.05	0
252.54	0	253.06	0
252.55	0	253.07	0
252.56	0	253.08	0
252.57	0	253.09	0
252.58	0	253.10	0
252.59	0	253.11	0
252.60	0	253.12	0
252.61	0	253.13	0
252.62	0	253.14	0
252.63	0	253.15	0
252.64	0	253.16	0
252.65	0	253.17	0
252.66	0	253.18	0
252.67	0	253.19	0
252.68	0	253.20	0
252.69	0	253.21	0
252.70	0	253.22	0
252.71	0	253.23	0
252.72	0	253.24	0
252.73	0	253.25	0
252.74	0	253.26	0
252.75	0	253.27	0
252.76	0	253.28	0
252.77	0	253.29	0
252.78	0	253.30	0
252.79	0	253.31	0
252.80	0	253.32	0
252.81	0	253.33	0
252.82	0	253.34	0
252.83	0	253.35	0
252.84	0		
252.85	0		
252.86	0		

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Summary for Pond 11P: CB #2

[57] Hint: Peaked at 253.41' (Flood elevation advised)

Inflow Area = 15,730 sf, 74.11% Impervious, Inflow Depth > 6.42" for 100-YEAR event
Inflow = 2.23 cfs @ 12.09 hrs, Volume= 8,415 cf
Outflow = 2.23 cfs @ 12.09 hrs, Volume= 8,415 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.23 cfs @ 12.09 hrs, Volume= 8,415 cf
Routed to Pond 8P : DIVERSION MANHOLE

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

Peak Elev= 253.41' @ 12.09 hrs

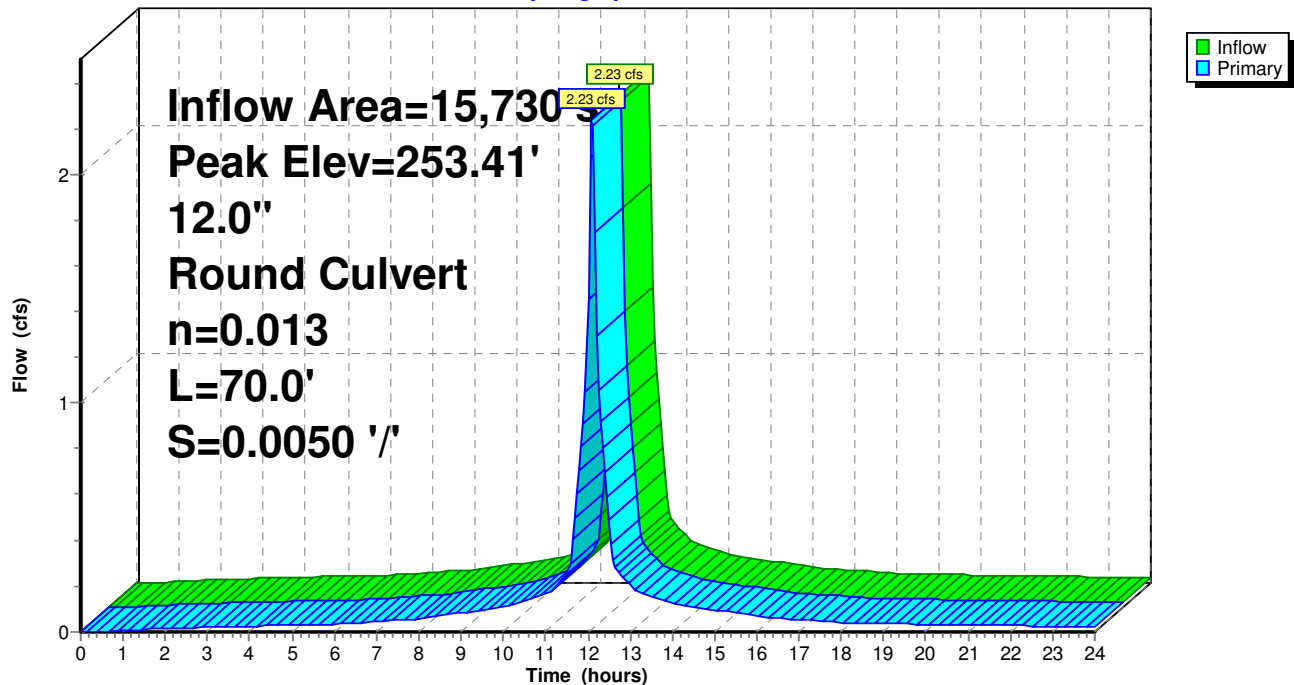
Device	Routing	Invert	Outlet Devices
#1	Primary	252.35'	12.0" Round Culvert L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.35' / 252.00' S= 0.0050 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=2.18 cfs @ 12.09 hrs HW=253.39' (Free Discharge)

↑1=Culvert (Barrel Controls 2.18 cfs @ 3.31 fps)

Pond 11P: CB #2

Hydrograph



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Type III 24-hr 100-YEAR Rainfall=8.70"

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Stage-Area-Storage for Pond 11P: CB #2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
252.35	0	252.87	0	253.39	0
252.36	0	252.88	0	253.40	0
252.37	0	252.89	0	253.41	0
252.38	0	252.90	0		
252.39	0	252.91	0		
252.40	0	252.92	0		
252.41	0	252.93	0		
252.42	0	252.94	0		
252.43	0	252.95	0		
252.44	0	252.96	0		
252.45	0	252.97	0		
252.46	0	252.98	0		
252.47	0	252.99	0		
252.48	0	253.00	0		
252.49	0	253.01	0		
252.50	0	253.02	0		
252.51	0	253.03	0		
252.52	0	253.04	0		
252.53	0	253.05	0		
252.54	0	253.06	0		
252.55	0	253.07	0		
252.56	0	253.08	0		
252.57	0	253.09	0		
252.58	0	253.10	0		
252.59	0	253.11	0		
252.60	0	253.12	0		
252.61	0	253.13	0		
252.62	0	253.14	0		
252.63	0	253.15	0		
252.64	0	253.16	0		
252.65	0	253.17	0		
252.66	0	253.18	0		
252.67	0	253.19	0		
252.68	0	253.20	0		
252.69	0	253.21	0		
252.70	0	253.22	0		
252.71	0	253.23	0		
252.72	0	253.24	0		
252.73	0	253.25	0		
252.74	0	253.26	0		
252.75	0	253.27	0		
252.76	0	253.28	0		
252.77	0	253.29	0		
252.78	0	253.30	0		
252.79	0	253.31	0		
252.80	0	253.32	0		
252.81	0	253.33	0		
252.82	0	253.34	0		
252.83	0	253.35	0		
252.84	0	253.36	0		
252.85	0	253.37	0		
252.86	0	253.38	0		

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Type III 24-hr 100-YEAR Rainfall=8.70"

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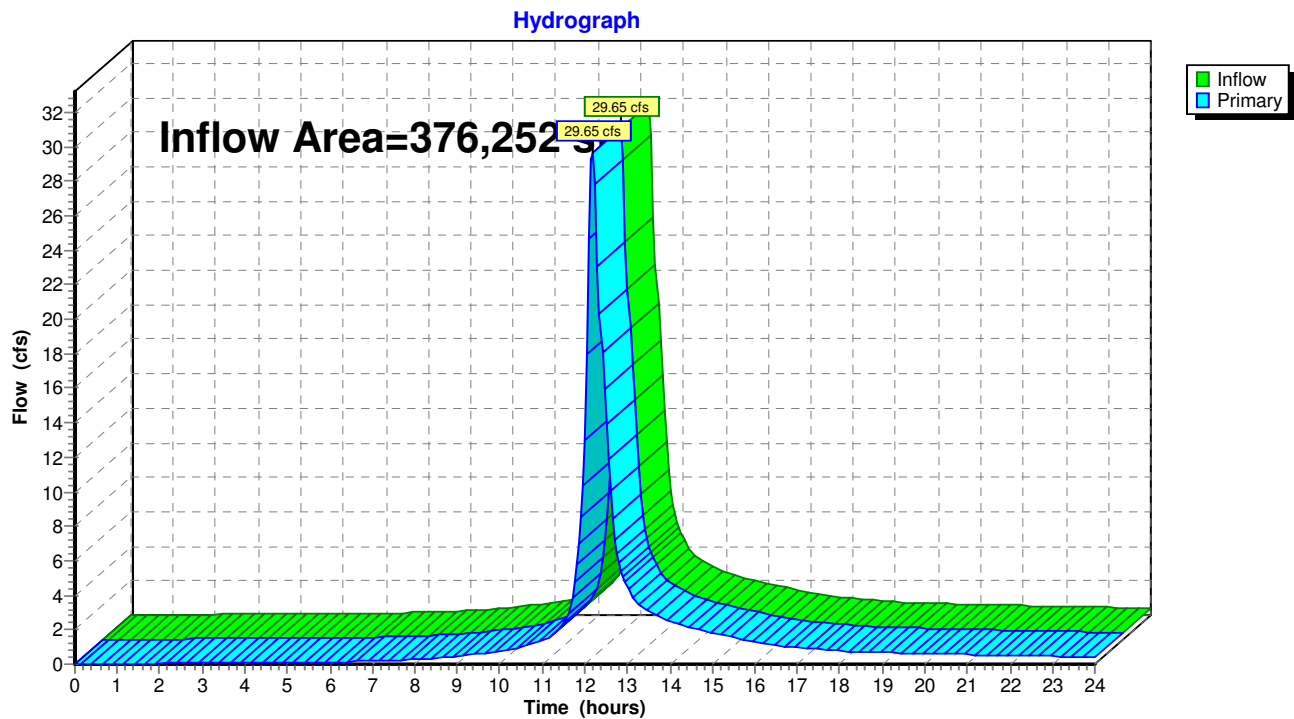
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Summary for Link 7L: DESIGN POINT #1

Inflow Area = 376,252 sf, 20.69% Impervious, Inflow Depth > 3.83" for 100-YEAR event
Inflow = 29.65 cfs @ 12.18 hrs, Volume= 120,047 cf
Primary = 29.65 cfs @ 12.18 hrs, Volume= 120,047 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 7L: DESIGN POINT #1



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Type III 24-hr WQV Rainfall=1.20"

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

Subcatchment 1S: SUBCATCHMENT #1 Runoff Area=242,315 sf 2.93% Impervious Runoff Depth>0.06"
Flow Length=861' Tc=13.0 min CN=WQ Runoff=0.18 cfs 1,249 cf

Subcatchment 2S: SUBCATHMENT #2 Runoff Area=61,356 sf 55.72% Impervious Runoff Depth>0.55"
Flow Length=375' Tc=10.1 min CN=WQ Runoff=0.74 cfs 2,804 cf

Subcatchment 3S: SUBCATCHMENT #3 Runoff Area=24,882 sf 26.06% Impervious Runoff Depth>0.26"
Tc=6.0 min CN=WQ Runoff=0.16 cfs 532 cf

Subcatchment 4S: SUBCATHMENT #4 Runoff Area=20,884 sf 47.99% Impervious Runoff Depth>0.47"
Flow Length=357' Slope=0.0250 '/' Tc=6.7 min CN=WQ Runoff=0.24 cfs 823 cf

Subcatchment 8S: SUBCATCHMENT #4 Runoff Area=11,085 sf 75.86% Impervious Runoff Depth>0.75"
Tc=6.0 min CN=WQ Runoff=0.21 cfs 690 cf

Subcatchment 12S: SUBCATCHMENT #5 Runoff Area=15,730 sf 74.11% Impervious Runoff Depth>0.73"
Tc=6.0 min CN=WQ Runoff=0.29 cfs 957 cf

Pond 1P: INFILTRATION POND #1 Peak Elev=252.47' Storage=689 cf Inflow=0.65 cfs 2,179 cf
Discarded=0.11 cfs 2,177 cf Primary=0.00 cfs 0 cf Outflow=0.11 cfs 2,177 cf

Pond 2P: INFILTRATION POND #2 Peak Elev=244.18' Storage=92 cf Inflow=0.24 cfs 823 cf
Discarded=0.12 cfs 822 cf Primary=0.00 cfs 0 cf Outflow=0.12 cfs 822 cf

Pond 8P: DIVERSION MANHOLE Peak Elev=253.07' Inflow=0.49 cfs 1,647 cf
Primary=0.49 cfs 1,647 cf Secondary=0.00 cfs 0 cf Outflow=0.49 cfs 1,647 cf

Pond 9P: CULTEC UNITS Peak Elev=251.50' Storage=0 cf Inflow=0.00 cfs 0 cf
6.0" Round Culvert n=0.013 L=4.0' S=0.0000 '/' Outflow=0.00 cfs 0 cf

Pond 10P: CB #1 Peak Elev=252.62' Inflow=0.21 cfs 690 cf
12.0" Round Culvert n=0.013 L=70.0' S=0.0050 '/' Outflow=0.21 cfs 690 cf

Pond 11P: CB #2 Peak Elev=252.66' Inflow=0.29 cfs 957 cf
12.0" Round Culvert n=0.013 L=70.0' S=0.0050 '/' Outflow=0.29 cfs 957 cf

Link 7L: DESIGN POINT #1 Inflow=0.90 cfs 4,053 cf
Primary=0.90 cfs 4,053 cf

Total Runoff Area = 376,252 sf Runoff Volume = 7,055 cf Average Runoff Depth = 0.23"
79.31% Pervious = 298,387 sf 20.69% Impervious = 77,865 sf

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Type III 24-hr WQV Rainfall=1.20"

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Summary for Subcatchment 1S: SUBCATCHMENT #1

Runoff = 0.18 cfs @ 12.22 hrs, Volume= 1,249 cf, Depth> 0.06"
 Routed to Link 7L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr WQV Rainfall=1.20"

Area (sf)	CN	Description
1,306	30	Woods, Good, HSG A
103,810	55	Woods, Good, HSG B
79,531	77	Woods, Good, HSG D
21,069	30	Woods, Good, HSG A
29,494	61	>75% Grass cover, Good, HSG B
595	98	Roofs, HSG B
1,549	98	Roofs, HSG B
661	98	Roofs, HSG B
816	98	Roofs, HSG B
529	98	Roofs, HSG B
856	98	Roofs, HSG B
1,445	98	Roofs, HSG B
654	98	Roofs, HSG B
242,315		Weighted Average
235,210	61	97.07% Pervious Area
7,105	98	2.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.4	340	0.0625	4.03		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
2.8	421	0.0250	2.55		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.0	861	Total			

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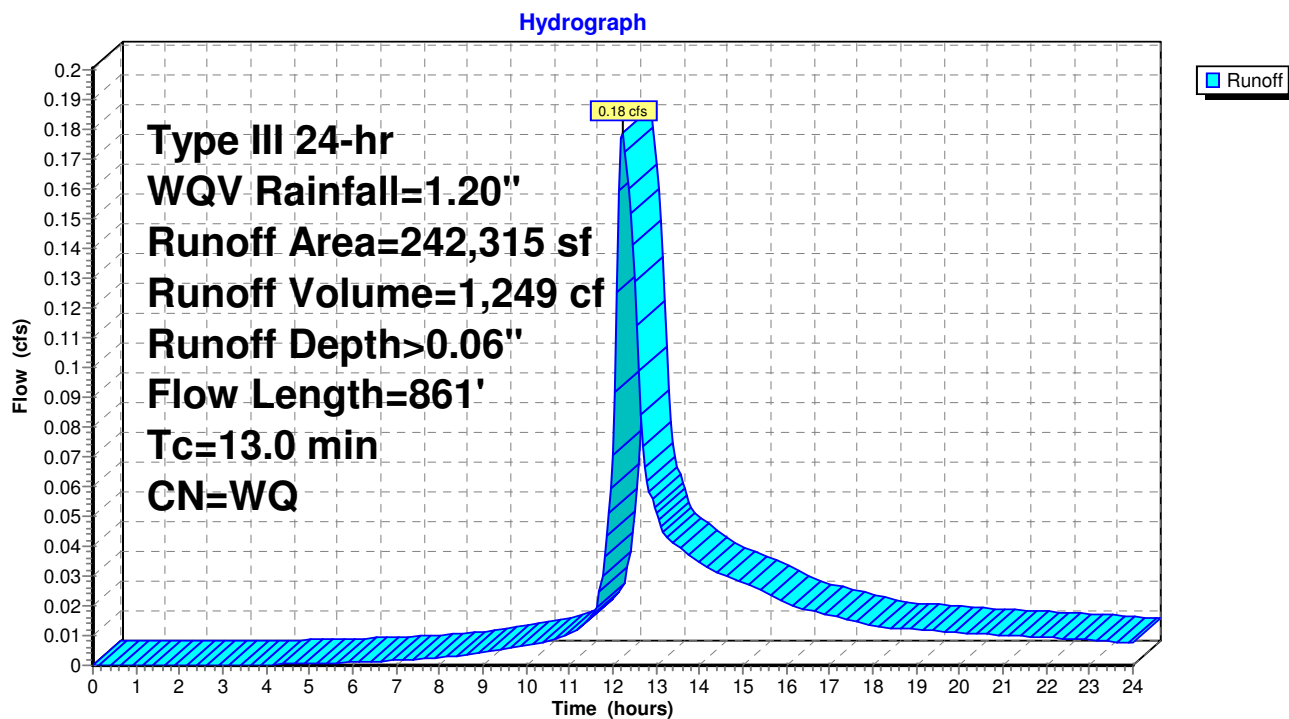
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Subcatchment 1S: SUBCATCHMENT #1



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Type III 24-hr WQV Rainfall=1.20"

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Summary for Subcatchment 2S: SUBCATHMENT #2

Runoff = 0.74 cfs @ 12.14 hrs, Volume= 2,804 cf, Depth> 0.55"
 Routed to Link 7L : DESIGN POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr WQV Rainfall=1.20"

Area (sf)	CN	Description
2,432	39	>75% Grass cover, Good, HSG A
34,186	98	Paved parking, HSG B
17,480	39	>75% Grass cover, Good, HSG A
4,187	39	>75% Grass cover, Good, HSG A
3,071	39	>75% Grass cover, Good, HSG A
61,356		Weighted Average
27,170	39	44.28% Pervious Area
34,186	98	55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	50	0.0450	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.30"
0.7	125	0.0210	2.94		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	150	0.0100	4.54	3.56	Pipe Channel, RCP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
0.1	50	0.0250	9.40	16.61	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
10.1	375	Total			

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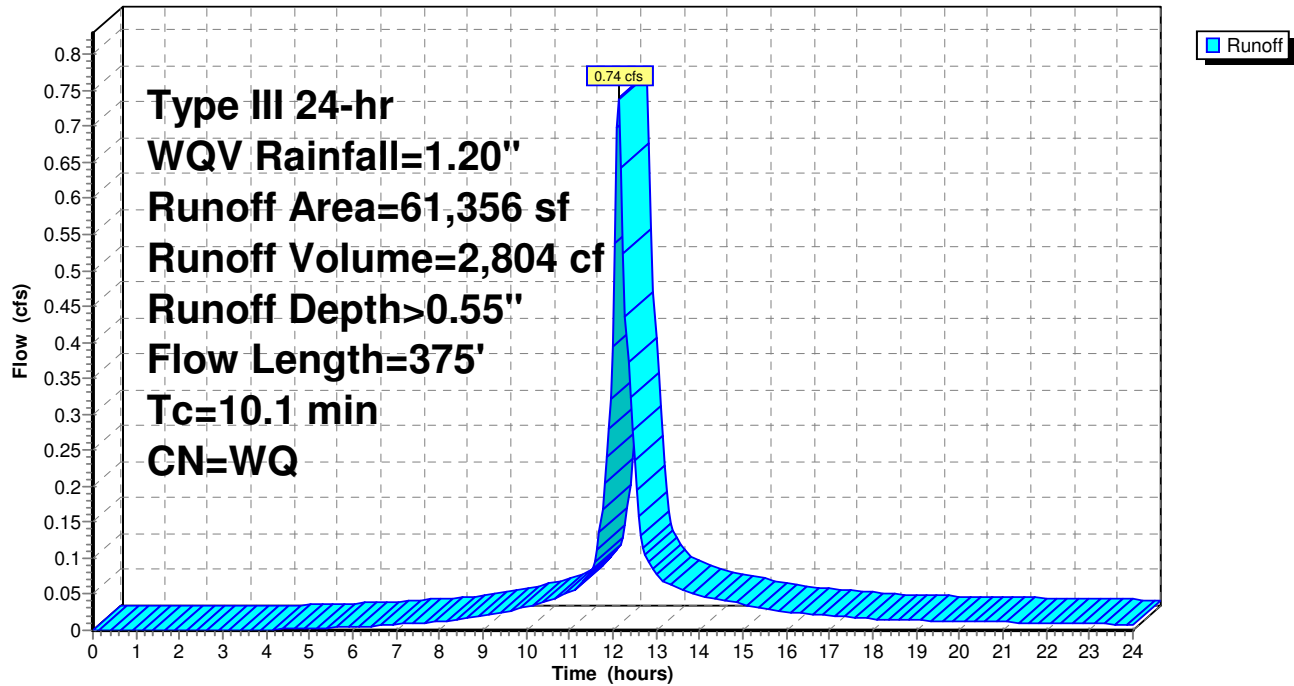
Type III 24-hr WQV Rainfall=1.20"

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Subcatchment 2S: SUBCATHMENT #2

Hydrograph



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Type III 24-hr WQV Rainfall=1.20"

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Summary for Subcatchment 3S: SUBCATCHEMENT #3

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 532 cf, Depth> 0.26"
Routed to Pond 1P : INFILTRATION POND #1

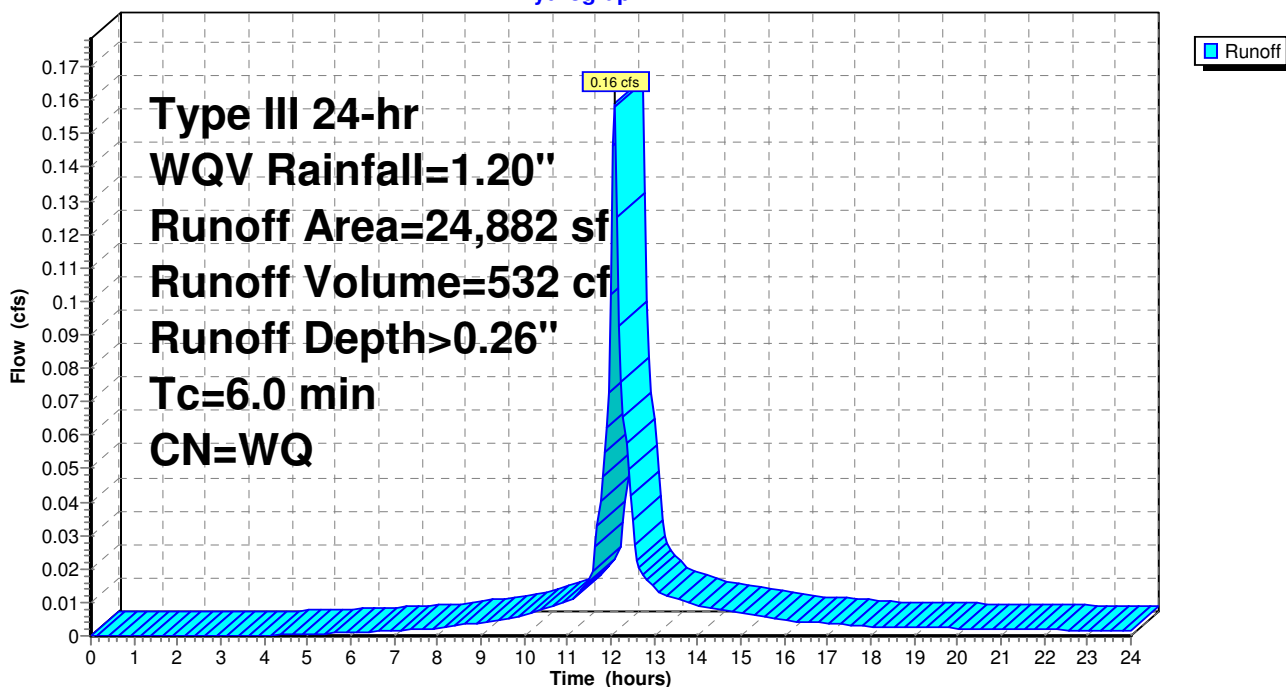
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQV Rainfall=1.20"

Area (sf)	CN	Description
5,209	30	Woods, Good, HSG A
4,766	55	Woods, Good, HSG B
4,088	39	>75% Grass cover, Good, HSG A
6,484	98	Paved parking, HSG A
1,913	39	>75% Grass cover, Good, HSG A
2,422	30	Woods, Good, HSG A
24,882		Weighted Average
18,398	39	73.94% Pervious Area
6,484	98	26.06% Impervious Area

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

Subcatchment 3S: SUBCATCHEMENT #3

Hydrograph



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Type III 24-hr WQV Rainfall=1.20"

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Summary for Subcatchment 4S: SUBCATHMENT #4

Runoff = 0.24 cfs @ 12.10 hrs, Volume= 823 cf, Depth> 0.47"
Routed to Pond 2P : INFILTRATION POND #2

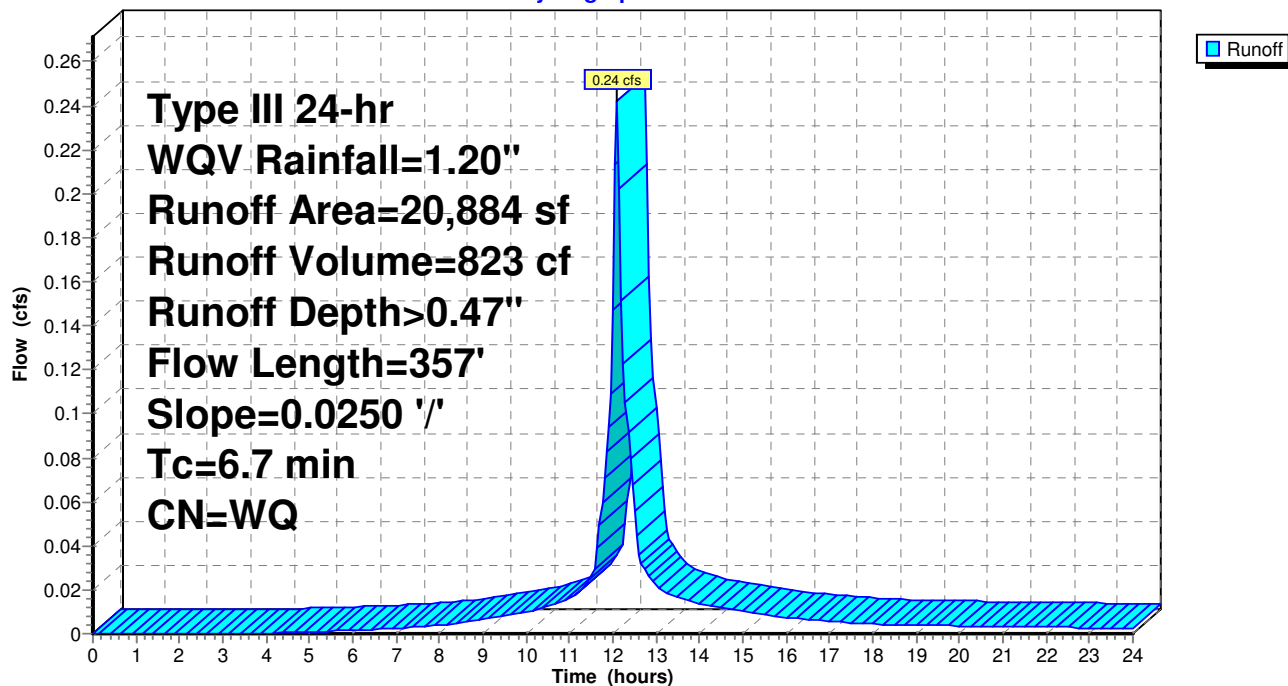
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQV Rainfall=1.20"

Area (sf)	CN	Description
3,589	39	>75% Grass cover, Good, HSG A
10,023	98	Paved parking, HSG A
7,272	39	>75% Grass cover, Good, HSG A
20,884		Weighted Average
10,861	39	52.01% Pervious Area
10,023	98	47.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0250	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"
1.6	307	0.0250	3.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
6.7	357	Total			

Subcatchment 4S: SUBCATHMENT #4

Hydrograph



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Type III 24-hr WQV Rainfall=1.20"

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Summary for Subcatchment 8S: SUBCATCHMENT #4

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 690 cf, Depth> 0.75"
Routed to Pond 10P : CB #1

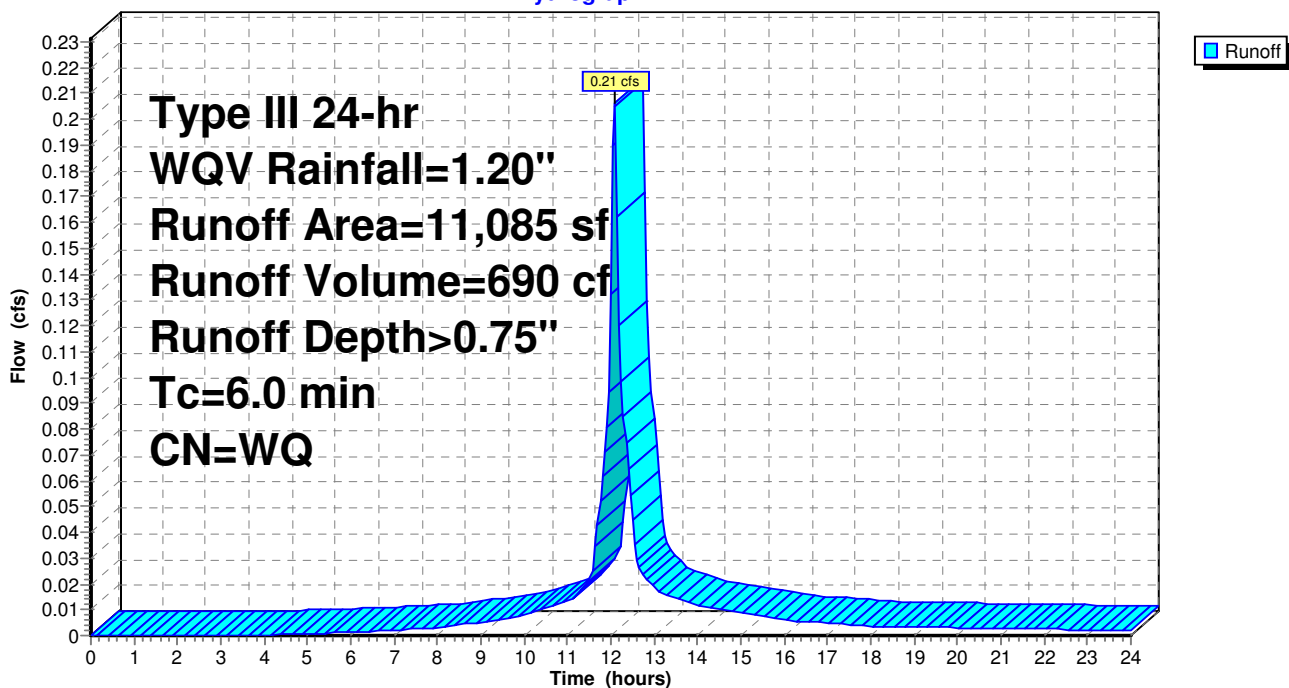
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQV Rainfall=1.20"

Area (sf)	CN	Description
5,284	98	Paved parking, HSG B
2,676	30	Woods, Good, HSG A
3,125	98	Roofs, HSG A
11,085		Weighted Average
2,676	30	24.14% Pervious Area
8,409	98	75.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, MIN OF 6 MINS

Subcatchment 8S: SUBCATCHMENT #4

Hydrograph



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Type III 24-hr WQV Rainfall=1.20"

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Summary for Subcatchment 12S: SUBCATCHMENT #5

Runoff = 0.29 cfs @ 12.09 hrs, Volume= 957 cf, Depth> 0.73"
Routed to Pond 11P : CB #2

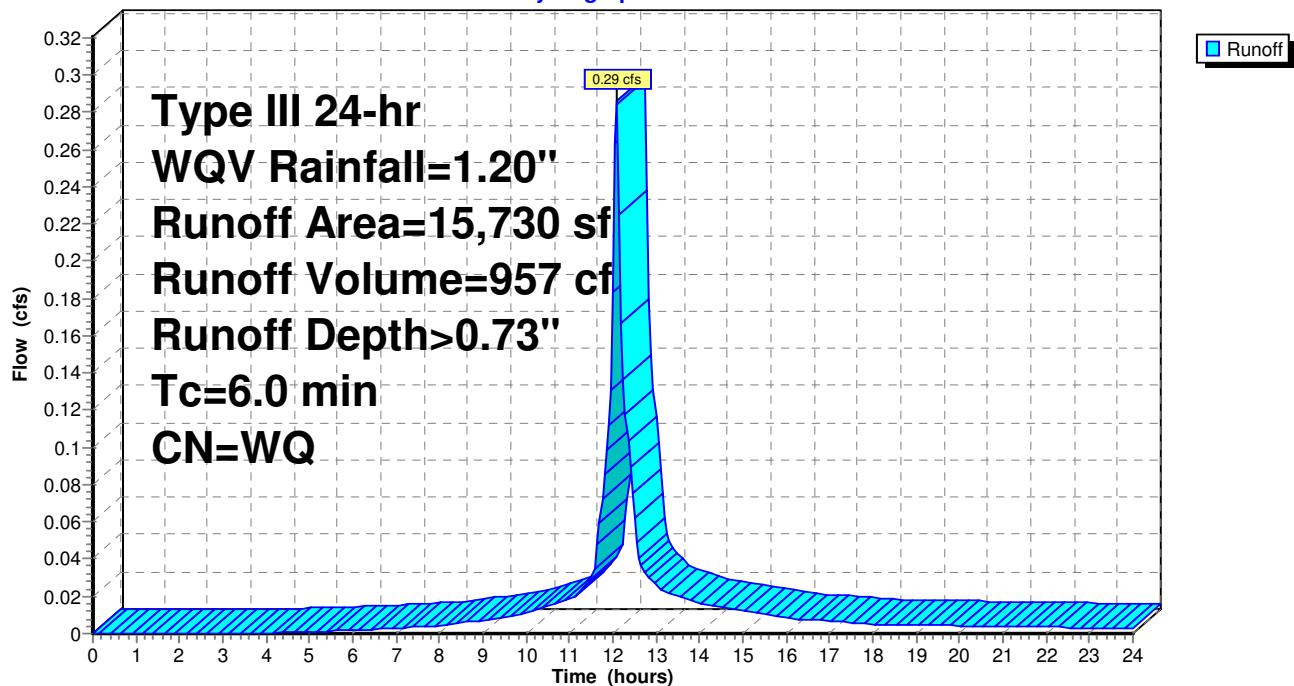
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr WQV Rainfall=1.20"

Area (sf)	CN	Description
4,783	98	Paved parking, HSG A
6,875	98	Roofs, HSG A
4,072	30	Woods, Good, HSG A
15,730		Weighted Average
4,072	30	25.89% Pervious Area
11,658	98	74.11% Impervious Area

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

Subcatchment 12S: SUBCATCHMENT #5

Hydrograph



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Type III 24-hr WQV Rainfall=1.20"

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Summary for Pond 1P: INFILTRATION POND #1

[81] Warning: Exceeded Pond 8P by 0.20' @ 13.05 hrs

Inflow Area = 51,697 sf, 51.36% Impervious, Inflow Depth > 0.51" for WQV event
Inflow = 0.65 cfs @ 12.09 hrs, Volume= 2,179 cf
Outflow = 0.11 cfs @ 12.56 hrs, Volume= 2,177 cf, Atten= 84%, Lag= 28.6 min
Discarded = 0.11 cfs @ 12.56 hrs, Volume= 2,177 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 7L : DESIGN POINT #1

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 252.47' @ 12.56 hrs Surf.Area= 1,749 sf Storage= 689 cf

Plug-Flow detention time= 47.9 min calculated for 2,177 cf (100% of inflow)
Center-of-Mass det. time= 47.2 min (828.8 - 781.6)

Volume	Invert	Avail.Storage	Storage Description
#1	252.00'	4,868 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
252.00	1,213	0	0
253.00	2,366	1,790	1,790
254.00	3,791	3,079	4,868

Device	Routing	Invert	Outlet Devices
#1	Discarded	252.00'	2.410 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 248.00'
#2	Primary	253.50'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Discarded OutFlow Max=0.11 cfs @ 12.56 hrs HW=252.46' (Free Discharge)
↑1=Exfiltration (Controls 0.11 cfs)

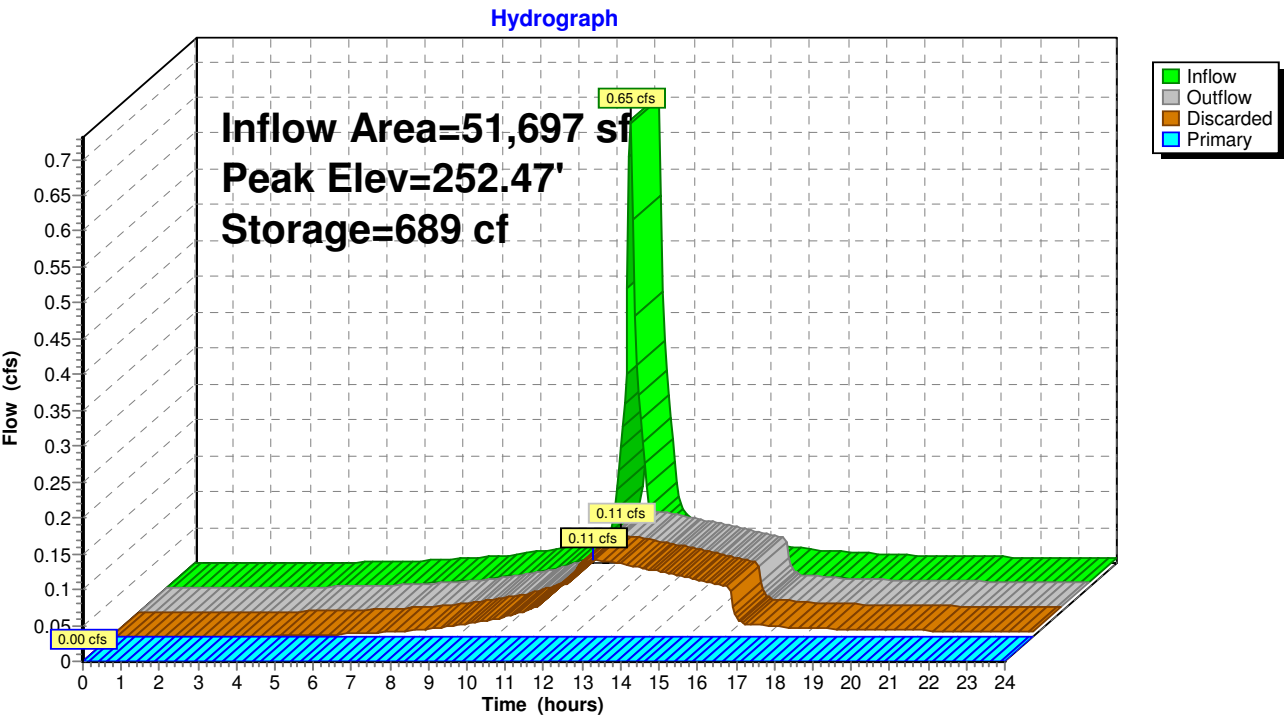
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=252.00' (Free Discharge)
↑2=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

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Pond 1P: INFILTRATION POND #1



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Type III 24-hr WQV Rainfall=1.20"

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Stage-Area-Storage for Pond 1P: INFILTRATION POND #1

Elevation (feet)	Surface (sq-ft)	Horizontal (sq-ft)	Storage (cubic-feet)
252.00	1,213	1,213	0
252.05	1,271	1,271	62
252.10	1,328	1,328	127
252.15	1,386	1,386	195
252.20	1,444	1,444	266
252.25	1,501	1,501	339
252.30	1,559	1,559	416
252.35	1,617	1,617	495
252.40	1,674	1,674	577
252.45	1,732	1,732	663
252.50	1,790	1,790	751
252.55	1,847	1,847	842
252.60	1,905	1,905	935
252.65	1,962	1,962	1,032
252.70	2,020	2,020	1,132
252.75	2,078	2,078	1,234
252.80	2,135	2,135	1,339
252.85	2,193	2,193	1,448
252.90	2,251	2,251	1,559
252.95	2,308	2,308	1,673
253.00	2,366	2,366	1,790
253.05	2,437	2,437	1,910
253.10	2,508	2,508	2,033
253.15	2,580	2,580	2,160
253.20	2,651	2,651	2,291
253.25	2,722	2,722	2,426
253.30	2,794	2,794	2,563
253.35	2,865	2,865	2,705
253.40	2,936	2,936	2,850
253.45	3,007	3,007	2,998
253.50	3,079	3,079	3,151
253.55	3,150	3,150	3,306
253.60	3,221	3,221	3,466
253.65	3,292	3,292	3,628
253.70	3,363	3,363	3,795
253.75	3,435	3,435	3,965
253.80	3,506	3,506	4,138
253.85	3,577	3,577	4,315
253.90	3,649	3,649	4,496
253.95	3,720	3,720	4,680
254.00	3,791	3,791	4,868

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Type III 24-hr WQV Rainfall=1.20"

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Summary for Pond 2P: INFILTRATION POND #2

Inflow Area = 20,884 sf, 47.99% Impervious, Inflow Depth > 0.47" for WQV event
 Inflow = 0.24 cfs @ 12.10 hrs, Volume= 823 cf
 Outflow = 0.12 cfs @ 12.26 hrs, Volume= 822 cf, Atten= 50%, Lag= 10.0 min
 Discarded = 0.12 cfs @ 12.26 hrs, Volume= 822 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link 7L : DESIGN POINT #1

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

Peak Elev= 244.18' @ 12.26 hrs Surf.Area= 583 sf Storage= 92 cf

Plug-Flow detention time= 5.0 min calculated for 822 cf (100% of inflow)

Center-of-Mass det. time= 4.7 min (786.8 - 782.1)

Volume	Invert	Avail.Storage	Storage Description
#1	244.00'	5,113 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
244.00	455	0	0
245.00	1,174	815	815
246.00	2,101	1,638	2,452
247.00	3,221	2,661	5,113

Device	Routing	Invert	Outlet Devices
#1	Discarded	244.00'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 242.00'
#2	Primary	245.00'	60.0 deg x 0.50' rise Sharp-Crested Vee/Trap Weir Cv= 2.53 (C= 3.16)
#3	Primary	245.50'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Discarded OutFlow Max=0.12 cfs @ 12.26 hrs HW=244.18' (Free Discharge)↑ **1=Exfiltration** (Controls 0.12 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=244.00' (Free Discharge)↑ **2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)↑ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

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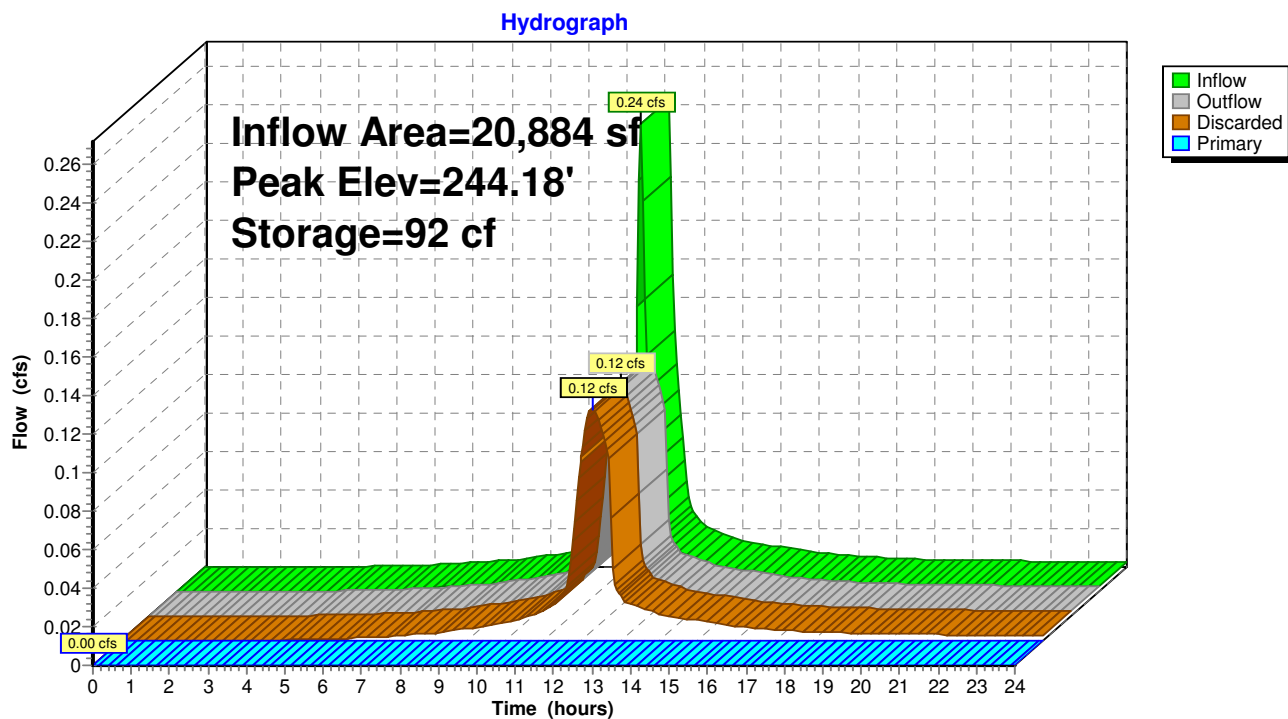
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Pond 2P: INFILTRATION POND #2



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Stage-Area-Storage for Pond 2P: INFILTRATION POND #2

Elevation (feet)	Surface (sq-ft)	Horizontal (sq-ft)	Storage (cubic-feet)
244.00	455	455	0
244.10	527	527	49
244.20	599	599	105
244.30	671	671	169
244.40	743	743	240
244.50	815	815	317
244.60	886	886	402
244.70	958	958	495
244.80	1,030	1,030	594
244.90	1,102	1,102	701
245.00	1,174	1,174	815
245.10	1,267	1,267	937
245.20	1,359	1,359	1,068
245.30	1,452	1,452	1,208
245.40	1,545	1,545	1,358
245.50	1,638	1,638	1,517
245.60	1,730	1,730	1,686
245.70	1,823	1,823	1,863
245.80	1,916	1,916	2,050
245.90	2,008	2,008	2,247
246.00	2,101	2,101	2,452
246.10	2,213	2,213	2,668
246.20	2,325	2,325	2,895
246.30	2,437	2,437	3,133
246.40	2,549	2,549	3,382
246.50	2,661	2,661	3,643
246.60	2,773	2,773	3,914
246.70	2,885	2,885	4,197
246.80	2,997	2,997	4,491
246.90	3,109	3,109	4,797
247.00	3,221	3,221	5,113

Proposed conditions

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Type III 24-hr WQV Rainfall=1.20"

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Summary for Pond 8P: DIVERSION MANHOLE

[57] Hint: Peaked at 253.07' (Flood elevation advised)

[81] Warning: Exceeded Pond 10P by 0.45' @ 12.10 hrs

[81] Warning: Exceeded Pond 11P by 0.40' @ 12.10 hrs

Inflow Area = 26,815 sf, 74.83% Impervious, Inflow Depth > 0.74" for WQV event
Inflow = 0.49 cfs @ 12.09 hrs, Volume= 1,647 cf
Outflow = 0.49 cfs @ 12.09 hrs, Volume= 1,647 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.49 cfs @ 12.09 hrs, Volume= 1,647 cf
Routed to Pond 1P : INFILTRATION POND #1
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond 9P : CULTEC UNITS

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

Peak Elev= 253.07' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	252.00'	6.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.00' / 252.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#2	Device 3	252.00'	12.0" Round Culvert L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.00' / 252.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Secondary	253.70'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.48 cfs @ 12.09 hrs HW=253.04' (Free Discharge)

↑ **1=Culvert** (Barrel Controls 0.48 cfs @ 2.45 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=252.00' (Free Discharge)

↑ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

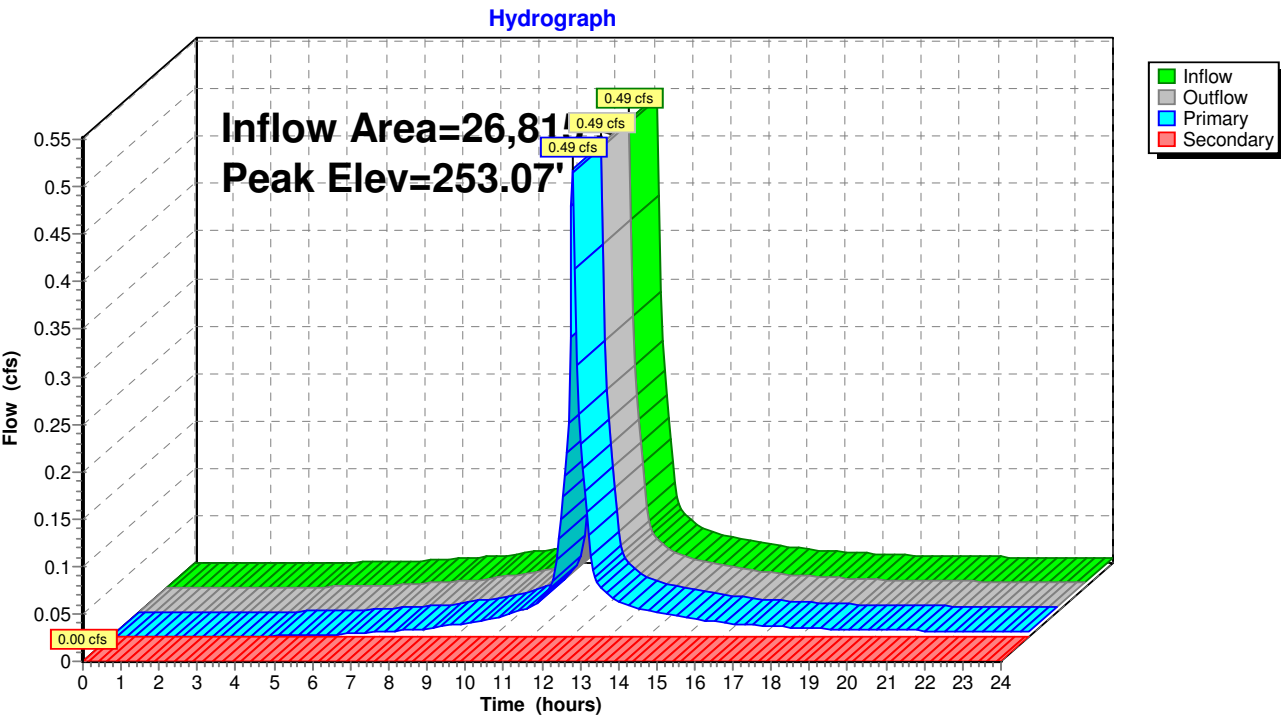
↑ **2=Culvert** (Controls 0.00 cfs)

Proposed conditions

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Type III 24-hr WQV Rainfall=1.20"
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Pond 8P: DIVERSION MANHOLE



Proposed conditions

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Type III 24-hr WQV Rainfall=1.20"

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Stage-Area-Storage for Pond 8P: DIVERSION MANHOLE

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
252.00	0	253.04	0
252.02	0	253.06	0
252.04	0	253.08	0
252.06	0	253.10	0
252.08	0	253.12	0
252.10	0	253.14	0
252.12	0	253.16	0
252.14	0	253.18	0
252.16	0	253.20	0
252.18	0	253.22	0
252.20	0	253.24	0
252.22	0	253.26	0
252.24	0	253.28	0
252.26	0	253.30	0
252.28	0	253.32	0
252.30	0	253.34	0
252.32	0	253.36	0
252.34	0	253.38	0
252.36	0	253.40	0
252.38	0	253.42	0
252.40	0	253.44	0
252.42	0	253.46	0
252.44	0	253.48	0
252.46	0	253.50	0
252.48	0	253.52	0
252.50	0	253.54	0
252.52	0	253.56	0
252.54	0	253.58	0
252.56	0	253.60	0
252.58	0	253.62	0
252.60	0	253.64	0
252.62	0	253.66	0
252.64	0	253.68	0
252.66	0	253.70	0
252.68	0		
252.70	0		
252.72	0		
252.74	0		
252.76	0		
252.78	0		
252.80	0		
252.82	0		
252.84	0		
252.86	0		
252.88	0		
252.90	0		
252.92	0		
252.94	0		
252.96	0		
252.98	0		
253.00	0		
253.02	0		

Proposed conditions

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Type III 24-hr WQV Rainfall=1.20"

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Summary for Pond 9P: CULTEC UNITS

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link 7L : DESIGN POINT #1

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

Peak Elev= 251.50' @ 0.00 hrs Surf.Area= 1,864 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	252.00'	1,368 cf	Cultec R-150XLHD x 50 Inside #2 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 5 rows
#2	251.50'	1,701 cf	105.00'W x 17.75'L x 3.50'H Prismatic 6,523 cf Overall - 1,368 cf Embedded = 5,156 cf x 33.0% Voids
		3,069 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	252.00'	6.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 252.00' / 252.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=251.50' (Free Discharge)↑**1=Culvert** (Controls 0.00 cfs)

Proposed conditions

Prepared by Arthur R Cripps, Jr, PE

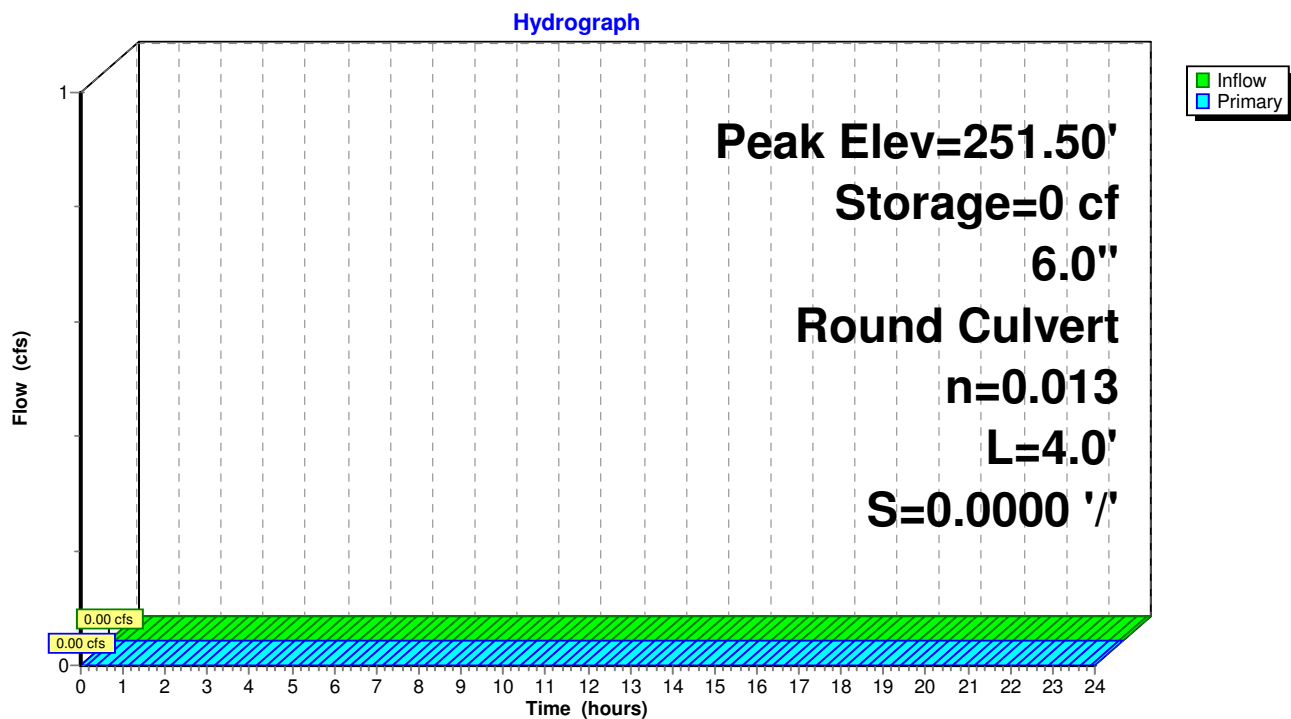
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Type III 24-hr WQV Rainfall=1.20"

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Pond 9P: CULTEC UNITS



Proposed conditions

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Type III 24-hr WQV Rainfall=1.20"

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Stage-Area-Storage for Pond 9P: CULTEC UNITS

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
251.50	0	254.10	2,515
251.55	31	254.15	2,546
251.60	62	254.20	2,577
251.65	92	254.25	2,608
251.70	123	254.30	2,638
251.75	154	254.35	2,669
251.80	185	254.40	2,700
251.85	215	254.45	2,731
251.90	246	254.50	2,761
251.95	277	254.55	2,792
252.00	308	254.60	2,823
252.05	381	254.65	2,854
252.10	454	254.70	2,884
252.15	526	254.75	2,915
252.20	597	254.80	2,946
252.25	668	254.85	2,977
252.30	739	254.90	3,007
252.35	810	254.95	3,038
252.40	880	255.00	3,069
252.45	950		
252.50	1,020		
252.55	1,089		
252.60	1,157		
252.65	1,225		
252.70	1,292		
252.75	1,358		
252.80	1,423		
252.85	1,488		
252.90	1,551		
252.95	1,613		
253.00	1,673		
253.05	1,732		
253.10	1,789		
253.15	1,845		
253.20	1,898		
253.25	1,949		
253.30	1,996		
253.35	2,039		
253.40	2,077		
253.45	2,113		
253.50	2,146		
253.55	2,177		
253.60	2,208		
253.65	2,239		
253.70	2,269		
253.75	2,300		
253.80	2,331		
253.85	2,362		
253.90	2,392		
253.95	2,423		
254.00	2,454		
254.05	2,485		

Proposed conditions

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Type III 24-hr WQV Rainfall=1.20"

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Summary for Pond 10P: CB #1

[57] Hint: Peaked at 252.62' (Flood elevation advised)

Inflow Area = 11,085 sf, 75.86% Impervious, Inflow Depth > 0.75" for WQV event
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 690 cf
Outflow = 0.21 cfs @ 12.09 hrs, Volume= 690 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.21 cfs @ 12.09 hrs, Volume= 690 cf
Routed to Pond 8P : DIVERSION MANHOLE

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

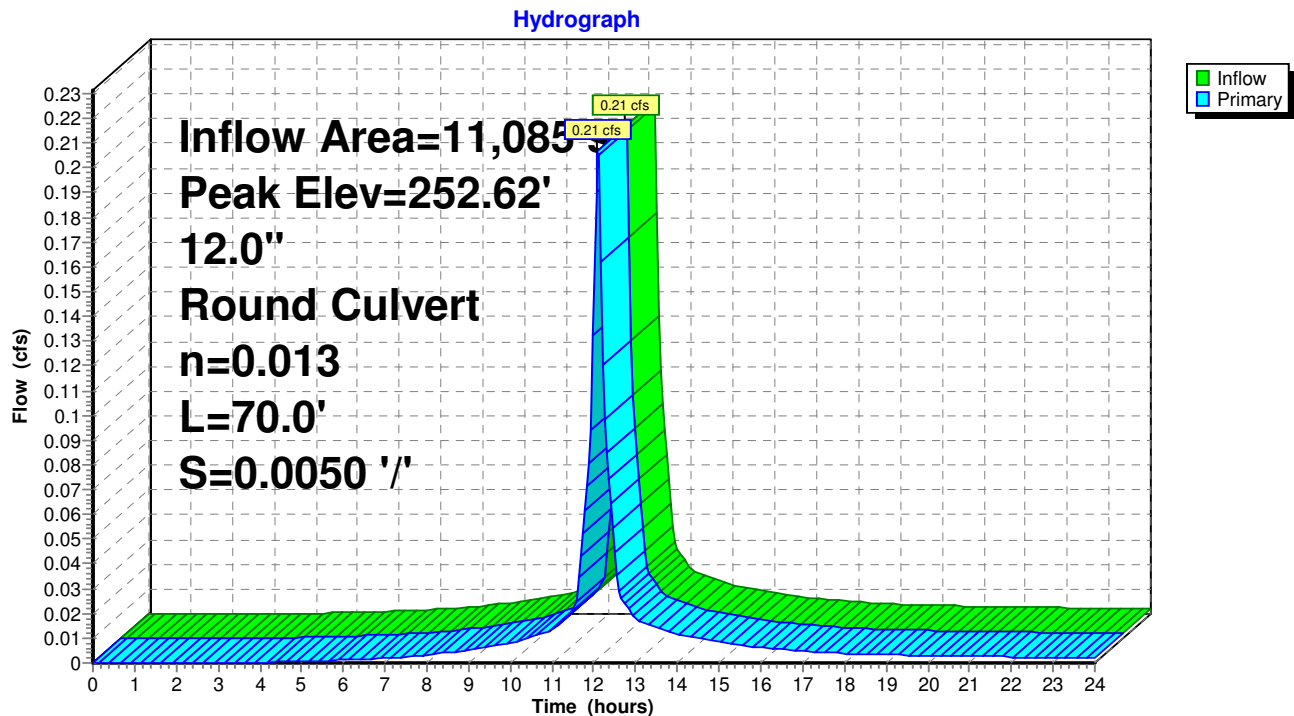
Peak Elev= 252.62' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	252.35'	12.0" Round Culvert L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.35' / 252.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.20 cfs @ 12.09 hrs HW=252.61' (Free Discharge)

↑1=Culvert (Barrel Controls 0.20 cfs @ 1.85 fps)

Pond 10P: CB #1



Proposed conditions

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Type III 24-hr WQV Rainfall=1.20"

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Stage-Area-Storage for Pond 10P: CB #1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
252.35	0	252.87	0
252.36	0	252.88	0
252.37	0	252.89	0
252.38	0	252.90	0
252.39	0	252.91	0
252.40	0	252.92	0
252.41	0	252.93	0
252.42	0	252.94	0
252.43	0	252.95	0
252.44	0	252.96	0
252.45	0	252.97	0
252.46	0	252.98	0
252.47	0	252.99	0
252.48	0	253.00	0
252.49	0	253.01	0
252.50	0	253.02	0
252.51	0	253.03	0
252.52	0	253.04	0
252.53	0	253.05	0
252.54	0	253.06	0
252.55	0	253.07	0
252.56	0	253.08	0
252.57	0	253.09	0
252.58	0	253.10	0
252.59	0	253.11	0
252.60	0	253.12	0
252.61	0	253.13	0
252.62	0	253.14	0
252.63	0	253.15	0
252.64	0	253.16	0
252.65	0	253.17	0
252.66	0	253.18	0
252.67	0	253.19	0
252.68	0	253.20	0
252.69	0	253.21	0
252.70	0	253.22	0
252.71	0	253.23	0
252.72	0	253.24	0
252.73	0	253.25	0
252.74	0	253.26	0
252.75	0	253.27	0
252.76	0	253.28	0
252.77	0	253.29	0
252.78	0	253.30	0
252.79	0	253.31	0
252.80	0	253.32	0
252.81	0	253.33	0
252.82	0	253.34	0
252.83	0	253.35	0
252.84	0		
252.85	0		
252.86	0		

Proposed conditions

Prepared by Arthur R Cripps, Jr, PE

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Type III 24-hr WQV Rainfall=1.20"

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Summary for Pond 11P: CB #2

[57] Hint: Peaked at 252.66' (Flood elevation advised)

Inflow Area = 15,730 sf, 74.11% Impervious, Inflow Depth > 0.73" for WQV event
Inflow = 0.29 cfs @ 12.09 hrs, Volume= 957 cf
Outflow = 0.29 cfs @ 12.09 hrs, Volume= 957 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.29 cfs @ 12.09 hrs, Volume= 957 cf
Routed to Pond 8P : DIVERSION MANHOLE

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

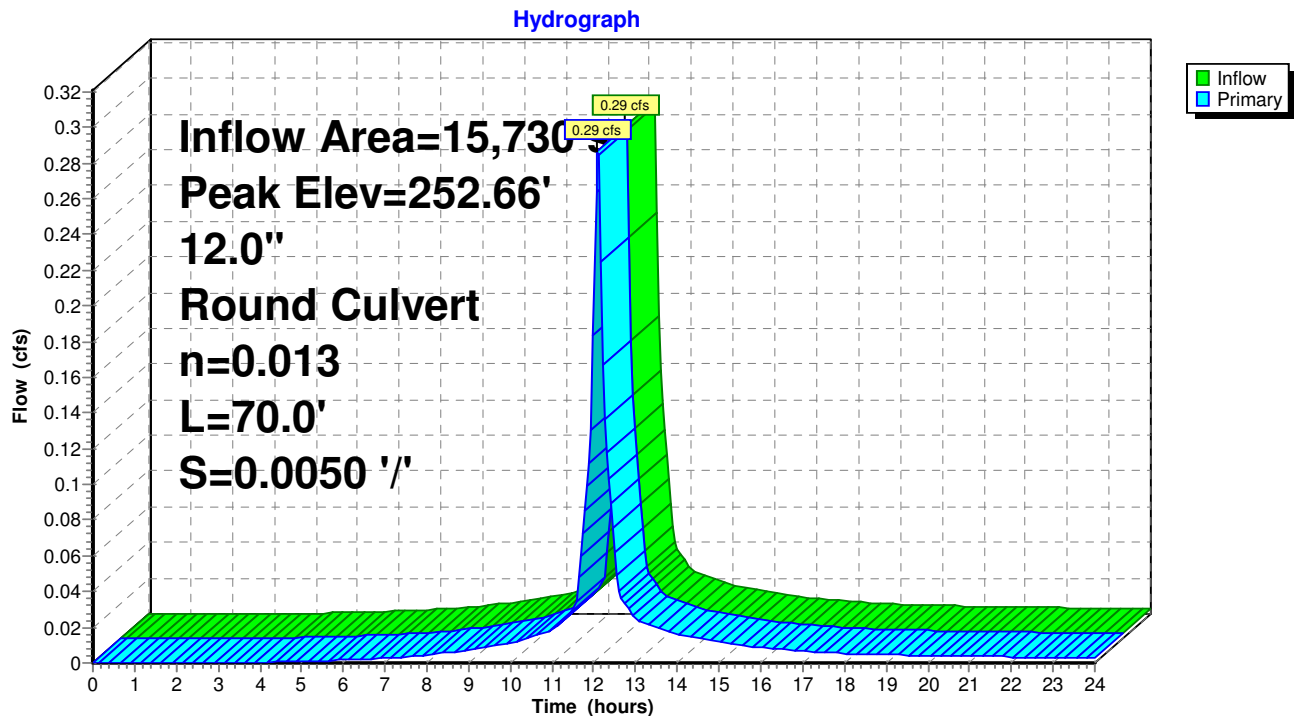
Peak Elev= 252.66' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	252.35'	12.0" Round Culvert L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 252.35' / 252.00' S= 0.0050 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.28 cfs @ 12.09 hrs HW=252.66' (Free Discharge)

↑1=Culvert (Barrel Controls 0.28 cfs @ 2.02 fps)

Pond 11P: CB #2



Proposed conditions

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Stage-Area-Storage for Pond 11P: CB #2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
252.35	0	252.87	0
252.36	0	252.88	0
252.37	0	252.89	0
252.38	0	252.90	0
252.39	0	252.91	0
252.40	0	252.92	0
252.41	0	252.93	0
252.42	0	252.94	0
252.43	0	252.95	0
252.44	0	252.96	0
252.45	0	252.97	0
252.46	0	252.98	0
252.47	0	252.99	0
252.48	0	253.00	0
252.49	0	253.01	0
252.50	0	253.02	0
252.51	0	253.03	0
252.52	0	253.04	0
252.53	0	253.05	0
252.54	0	253.06	0
252.55	0	253.07	0
252.56	0	253.08	0
252.57	0	253.09	0
252.58	0	253.10	0
252.59	0	253.11	0
252.60	0	253.12	0
252.61	0	253.13	0
252.62	0	253.14	0
252.63	0	253.15	0
252.64	0	253.16	0
252.65	0	253.17	0
252.66	0	253.18	0
252.67	0	253.19	0
252.68	0	253.20	0
252.69	0	253.21	0
252.70	0	253.22	0
252.71	0	253.23	0
252.72	0	253.24	0
252.73	0	253.25	0
252.74	0	253.26	0
252.75	0	253.27	0
252.76	0	253.28	0
252.77	0	253.29	0
252.78	0	253.30	0
252.79	0	253.31	0
252.80	0	253.32	0
252.81	0	253.33	0
252.82	0	253.34	0
252.83	0	253.35	0
252.84	0		
252.85	0		
252.86	0		

Proposed conditions

Prepared by Arthur R Cripps, Jr, PE

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Type III 24-hr WQV Rainfall=1.20"

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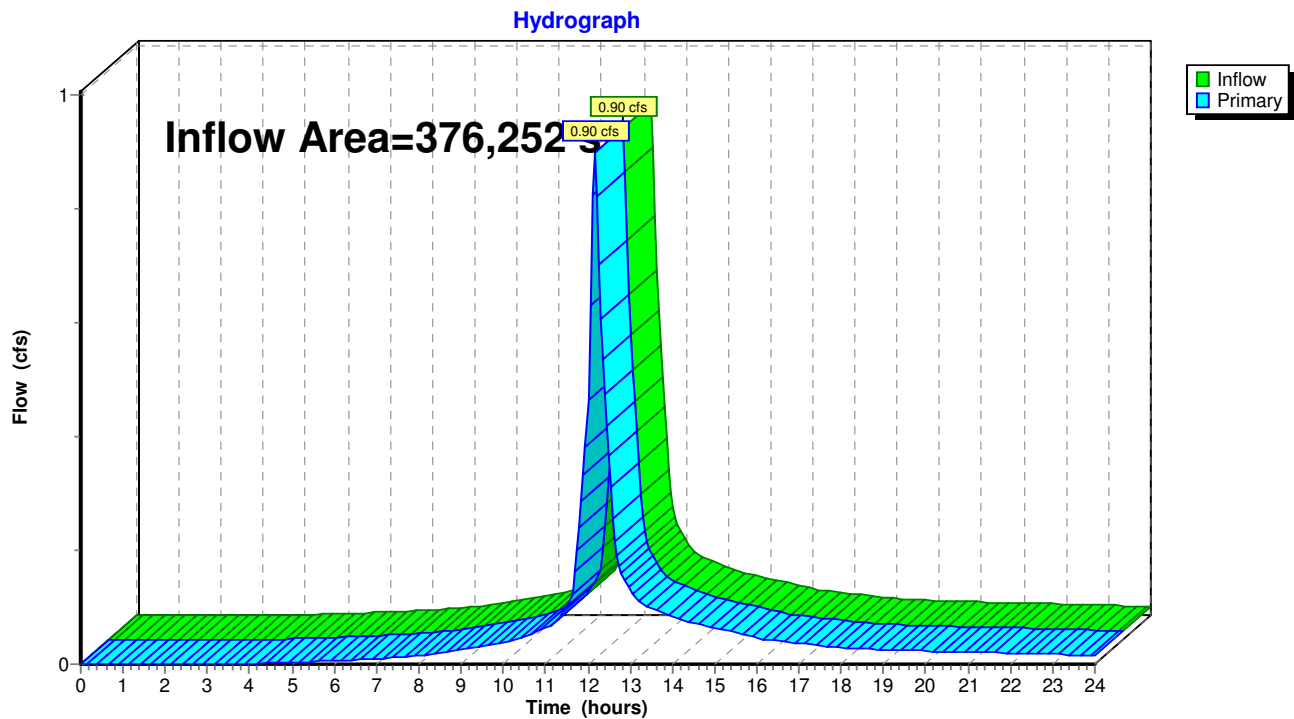
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Summary for Link 7L: DESIGN POINT #1

Inflow Area = 376,252 sf, 20.69% Impervious, Inflow Depth > 0.13" for WQV event
Inflow = 0.90 cfs @ 12.15 hrs, Volume= 4,053 cf
Primary = 0.90 cfs @ 12.15 hrs, Volume= 4,053 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 7L: DESIGN POINT #1





Coventry Survey Design Group

46 South Main Street

Coventry, RI 02816

401-823-5028

coventrystudy.com

STORMWATER REPORT APPENDIX - E

TEST PIT LOGS



STATE OF RHODE ISLAND
 Department of Environmental Management
 Office of Water Resources
 Email: dem.OWTS@dem.ri.gov
 Site Evaluation Form



Part A - Soil Profile Description

Application Number DRAINAGE ONLY

Property Owner: DANTE REAL ESTATES II

Property Location: TIOGUE AVENUE

Plat:

Lot:

Date of Test Hole: 11/21/24

Weather:

Shaded: Yes ☐ No ☒

Time: 11:30 AM

Soil Evaluator: SAM SIVUSA

License Number: D 4087

Soil Evaluator email address: SAM@COUNTRY SURVEY.COM

TH#1 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox		Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S. Contr.				
F11	55-0	A	S	7.5YR 7/3				SL	OM	VFR	3
B	0-12	A	S	10YR 4/6				SL	IFGR	FR	3
C	12-49			10YR 8/1	2.5YR 5/8	FPD		GS	OM	FR	1
TH Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox		Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S. Contr.				
A	0-8	A	S	10YR 3/3				SL	IFGR	FR	3
Bw	8-32	A	S	10YR 4/6				SL	IFGR	FR	3
C	32-84			10YR 8/1	2.5YR 5/8	FPD		GS	OM	FR	1

TH #2 Soil Class 1 Total Depth 103 Impervious/Limiting Layer Depth _____ (og) GW Seepage Depth 17' SHWT 12 (og)

TH #2 Soil Class 1 Total Depth 96 Impervious/Limiting Layer Depth _____ (og) GW Seepage Depth 72' SHWT 60 (og)

Comments: _____



STATE OF RHODE ISLAND
 Department of Environmental Management
 Office of Water Resources
 Email: dem.OWTS@dem.ri.gov
 Site Evaluation Form



Part A - Soil Profile Description

Application Number DRAINAGE ONLY

Property Owner: DANTE REAL ESTATES

Property Location: 1106 W. AVENUE

Date of Test Hole: 11/21/24

Weather: _____

Plat: _____

Lot: _____

Shaded: Yes ☐ No ☐

Time: 1:30pm

Soil Evaluator: SAM SOURSA

License Number: D 4087

Soil Evaluator email address: SAM@CONVENTRYSURVEY.COM

TH #3 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox		Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S. Contr.				
A	0-8	A	S	10YR 3/3				SL	1 Fgr	FR	3
B	8-36	A	S	10YR 4/6				SL	1 Fgr	FR	3
C	36-96'			10YR 8/1	2.5YR 5/8	FFD		GS	GM	FR	1
TH #4 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox		Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S. Contr.				
A	0-8	A	S	40YR 3/3				SL	1 Fgr	FR	3
B	8-34	A	S	10YR 4/6				SL	1 Fgn	FR	3
C	34-120			10YR 8/1	2.5YR 5/8	FFD		GS	GM	FR	1

TH #3 Soil Class 1 Total Depth 96 Impervious/Limiting Layer Depth _____ (og) GW Seepage Depth 94' SHWT 60" (og)

TH #4 Soil Class 1 Total Depth 120 Impervious/Limiting Layer Depth _____ (og) GW Seepage Depth 96 SHWT 72" (og)

Comments: _____



Coventry Survey Design Group

46 South Main Street

Coventry, RI 02816

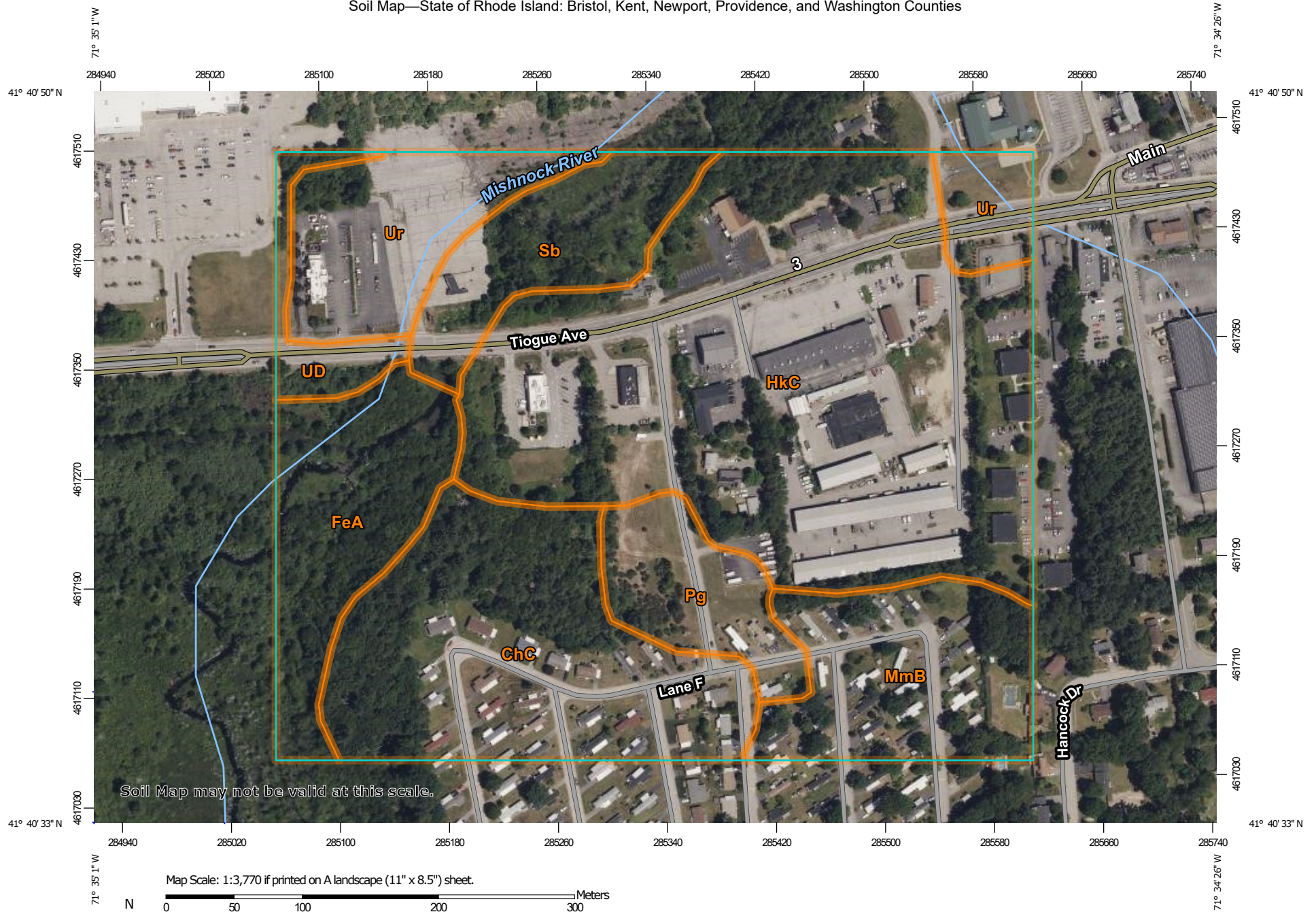
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coventrysurvey.com

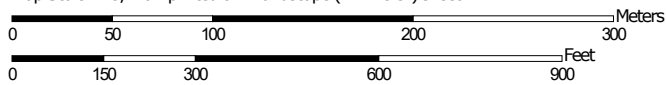
STORMWATER REPORT APPENDIX - F

WEB SOIL SURVEY

Soil Map—State of Rhode Island: Bristol, Kent, Newport, Providence, and Washington Counties



Map Scale: 1:3,770 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge ticks: UTM Zone 19N WGS84



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

1/3/2025
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: State of Rhode Island: Bristol, Kent, Newport, Providence, and Washington Counties

Survey Area Data: Version 24, Aug 30, 2024

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

Date(s) aerial images were photographed: Jun 14, 2022—Jul 1, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
ChC	Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony	10.8	17.7%
FeA	Freetown muck, 0 to 1 percent slopes	5.5	9.0%
HkC	Hinckley loamy sand, 8 to 15 percent slopes	24.6	40.1%
MmB	Merrimac fine sandy loam, 3 to 8 percent slopes	5.8	9.5%
Pg	Pits, gravel	3.2	5.2%
Sb	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	4.1	6.7%
UD	Udorthents-Urban land complex	1.4	2.2%
Ur	Urban land	5.9	9.6%
Totals for Area of Interest		61.3	100.0%



Coventry Survey Design Group

46 South Main Street

Coventry, RI 02816

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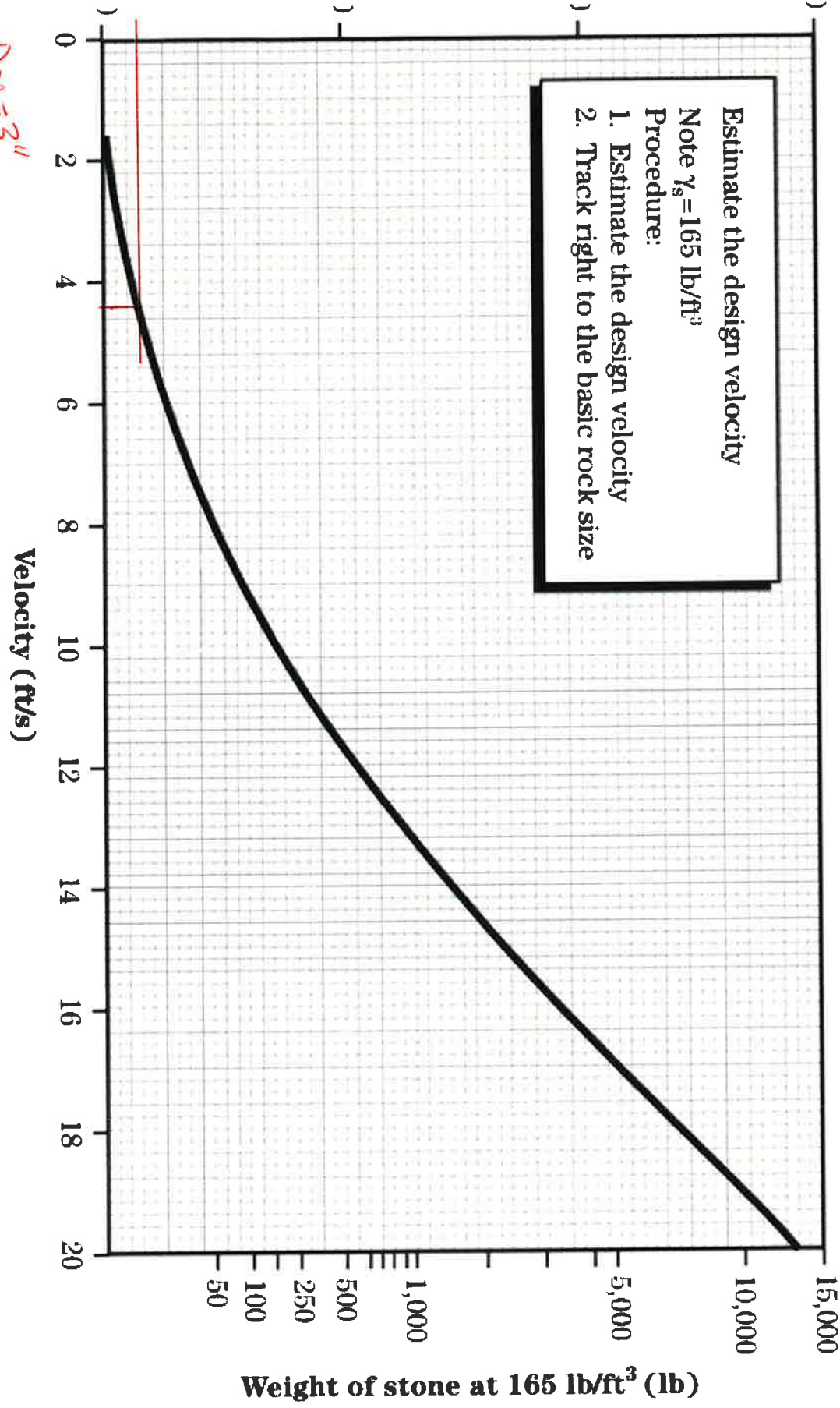
coventrysurvey.com

STORMWATER REPORT APPENDIX - G

ISBASH CURVE CALCULATION

re TS14C-5 Rock size based on Isbash curve

Estimate the design velocity
Note $\gamma_s = 165 \text{ lb/ft}^3$
Procedure:
1. Estimate the design velocity
2. Track right to the basic rock size



$D_{50} = 3''$
MAX velocity 4.4 F/S
Fram Hydro MAX velocity 2.44 F/S
OK



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STORMWATER REPORT APPENDIX - H

UNDERGROUD MOUNDING ANALYSIS

Input Values

8.27
0.150
8.27
4.000
25.000
24.00
50.00

<i>R</i>	Recharge rate (permeability rate) (in/hr) Specific yield, <i>Sy</i> (dimensionless)
<i>Sy</i>	default value is 0.15; max value is 0.2 provided that a lab test data is submitted
<i>Kh</i>	Horizontal hydraulic conductivity (in/hr) $Kh = 5 \times \text{Recharge Rate } (R) \text{ in the coastal plain; } Kh=R \text{ outside the coastal plain}$
<i>x</i>	1/2 length of basin (x direction, in feet)
<i>y</i>	1/2 width of basin (y direction, in feet)
<i>t</i>	Duration of infiltration period (hours)
<i>hi(0)</i>	Initial thickness of saturated zone (feet)

52.955
2.955

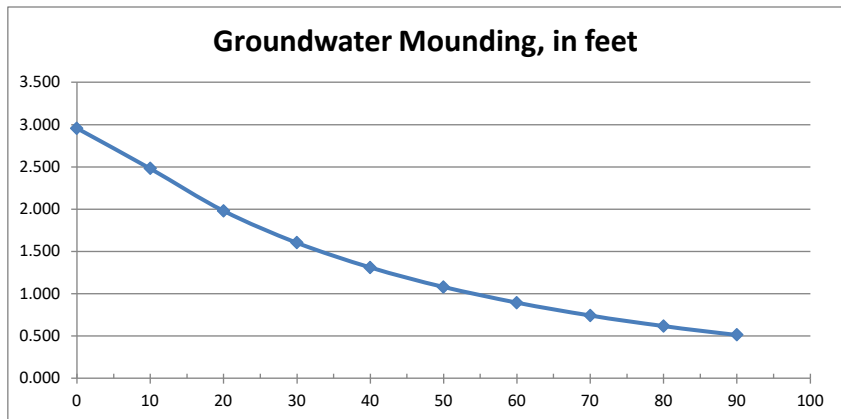
<i>h(max)</i>	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
$\Delta h(max)$	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Distance from
Ground-water center of basin in x
Mounding, in feet direction, in feet

2.955	0
2.479	10
1.978	20
1.600	30
1.309	40
1.078	50
0.892	60
0.739	70
0.614	80
0.510	90



Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.