

STORMWATER MANAGEMENT REPORT

PREPARED FOR

LINDO CONSTRUCTION, LLC

90 Maple Ave.
Montville, Conn.

BY

WENTWORTH CIVIL ENGINEERS, LLC

177 WEST TOWN STREET
LEBANON, CONNECTICUT 06249

DATE: 4-06-20

REV. 11-09-20

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Hydrology Studio v 3.0.0.14

05-20-2020

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STORMWATER MANAGEMENT REPORT

Project & Site

The site lies on the western side of Maple Avenue at the intersection of Pequot Road. This parcel consists of 20+ acres of land and is currently vacant. A multifamily development of 87 apartments in 11 buildings with associated access driveway and parking is proposed.

Drainage Evaluation, Methodology and References

Pre vs. Post development analysis and proposed detention basin were analyzed and designed using the NRCS TR-55 drainage design manual for 2, 10, 25, 50 & 100 year Type III storm events. The detention basin will also act as an infiltration basin and was sized and designed to treat the first 1" rainfall storm event (Water Quality Volume) as per CT DEEP 2004 Stormwater Quality Manual.

Current Drainage Patterns

The site slopes westward, up from Maple Avenue. Site drains to the road frontage via an intermittent watercourse that dissipates at the toe of slope and infiltrates most storm events into Hinckley sand & gravel near Maple Avenue. Larger storm events discharge into an existing catch basin located in the west side of Maple Avenue.

Proposed Drainage Patterns

Developed site will utilize the same drainage patterns as exist currently. The site will drain via a catch basin and pipe system to a proposed infiltration / detention basin located in the sand & gravel soils at the Maple Avenue road frontage.

The developed onsite storm water treatment design includes the following:

- Onsite detention of peak storm water flows for 2 through 100 year storm events.
- Treatment of 1” Water Quality Volume through infiltration / detention basin into groundwater.
- Maximize infiltration through infiltration into sand & gravel soils therefore maintaining storm volumes for storm events up to 25 years.

Developed Conditions

- Stormwater Quality:

The site was designed to minimize impervious surfaces and maximize travel time and infiltration of developed storm water flows. All onsite parking and driveway areas drain into a combination infiltration / detention basin. Roof drains also discharge into basin for additional groundwater recharge. The basin has a sediment fore bay that discharges through a filter berm and into the main body of the basin. Travel distance is maximized through the basin to encourage pollutant and sediment treatment and infiltration time during smaller storm events.

The basin has been sized to retain the first flush 1” storm event that compromise about 85 – 90% of annual storms (water quality volume or WQV). This volume will infiltrate through the bottom of the basin during all periods of the year.

- Pre vs. Post Development Analysis and Large Storm Peak Flow Attenuation:

The site was analyzed for pre vs. post development conditions for 2, 10, 25, 50 & 100 year Type III storm events. The majority of the developed site stormwater will be intercepted and discharged to the proposed infiltration / water quality basin. The detention basin has been designed to keep post development peak flow rates approximately the same or reduced relative to existing conditions. The resulting peak flows are as follows:

		<u>2yr</u>	<u>10 yr</u>	<u>25yr</u>	<u>100yr</u>
Exist.	Point A	0.6 cfs	4.9 cfs	5.0 cfs	16.5 cfs
Dev.	Point A	0.6 cfs	4.8 cfs	4.9 cfs	13.0 cfs

Maintenance of Water Recharge Potential

Open space areas of 85% are being maintained on the site. Post developed landscape design include large portion of open space to remain wooded (62% wooded), lawn and landscaped. Infiltration basin will recharge groundwater for entire water quality volume and maximize rainwater infiltration for all storm events.

Erosion & Sedimentation Control

Design plans include site specific erosion and sedimentation control design measures. Site specific design plans and notes are provided to minimize short term impacts during construction of the project.

Maintenance and Operation

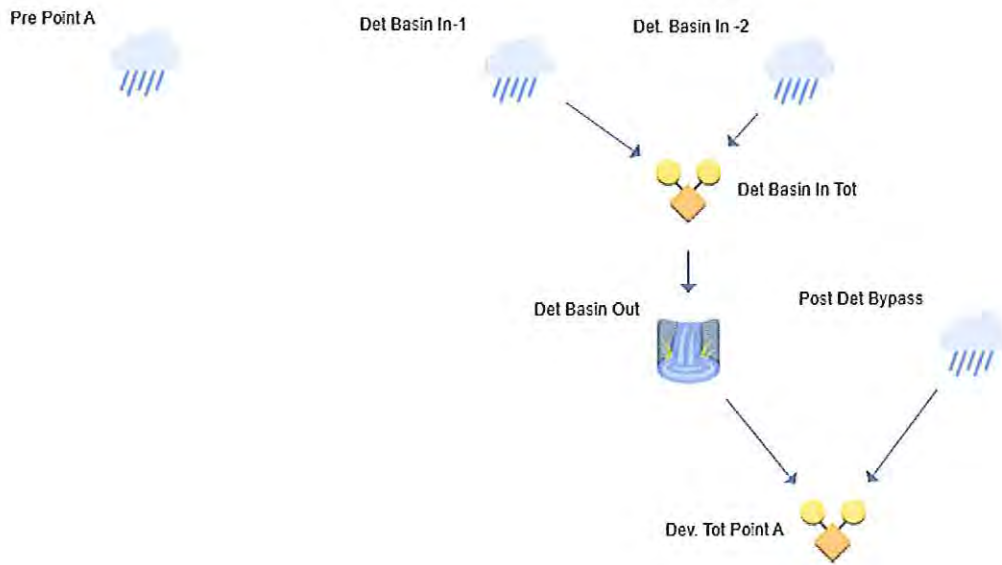
Maintenance and operation of notes for privately owned onsite drainage facilities have been included as part of design plans.

Basin Model

Hydrology Studio v 3.0.0.16

Project Name:

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Hydrograph by Return Period

Project Name:

12-11-2020

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Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Outflow (cfs)							
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
1	NRCS Runoff	Pre Point A		0.556			4.895	5.045		16.50
2	NRCS Runoff	Det Basin In-1		9.696			17.91	19.62		29.95
3	NRCS Runoff	Det. Basin In -2		0.018			0.286	0.288		1.101
4	Junction	Det Basin In Tot		9.697			18.20	19.89		31.01
5	Pond Route	Det Basin Out		0.478			1.872	1.902		6.912
6	NRCS Runoff	Post Det Bypass		0.509			3.618	3.682		10.89
7	Junction	Dev. Tot Point A		0.633			4.775	4.914		13.02

Hydrograph 2-yr Summary

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Pre Point A	0.556	12.50	7,170	----		
2	NRCS Runoff	Det Basin In-1	9.696	12.17	29,555	----		
3	NRCS Runoff	Det. Basin In -2	0.018	12.47	313	----		
4	Junction	Det Basin In Tot	9.697	12.17	29,869	2, 3		
5	Pond Route	Det Basin Out	0.478	14.13	10,177	4	111.40	17,662
6	NRCS Runoff	Post Det Bypass	0.509	12.37	4,807	----		
7	Junction	Dev. Tot Point A	0.633	13.87	14,984	5, 6		

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

Pre Point A

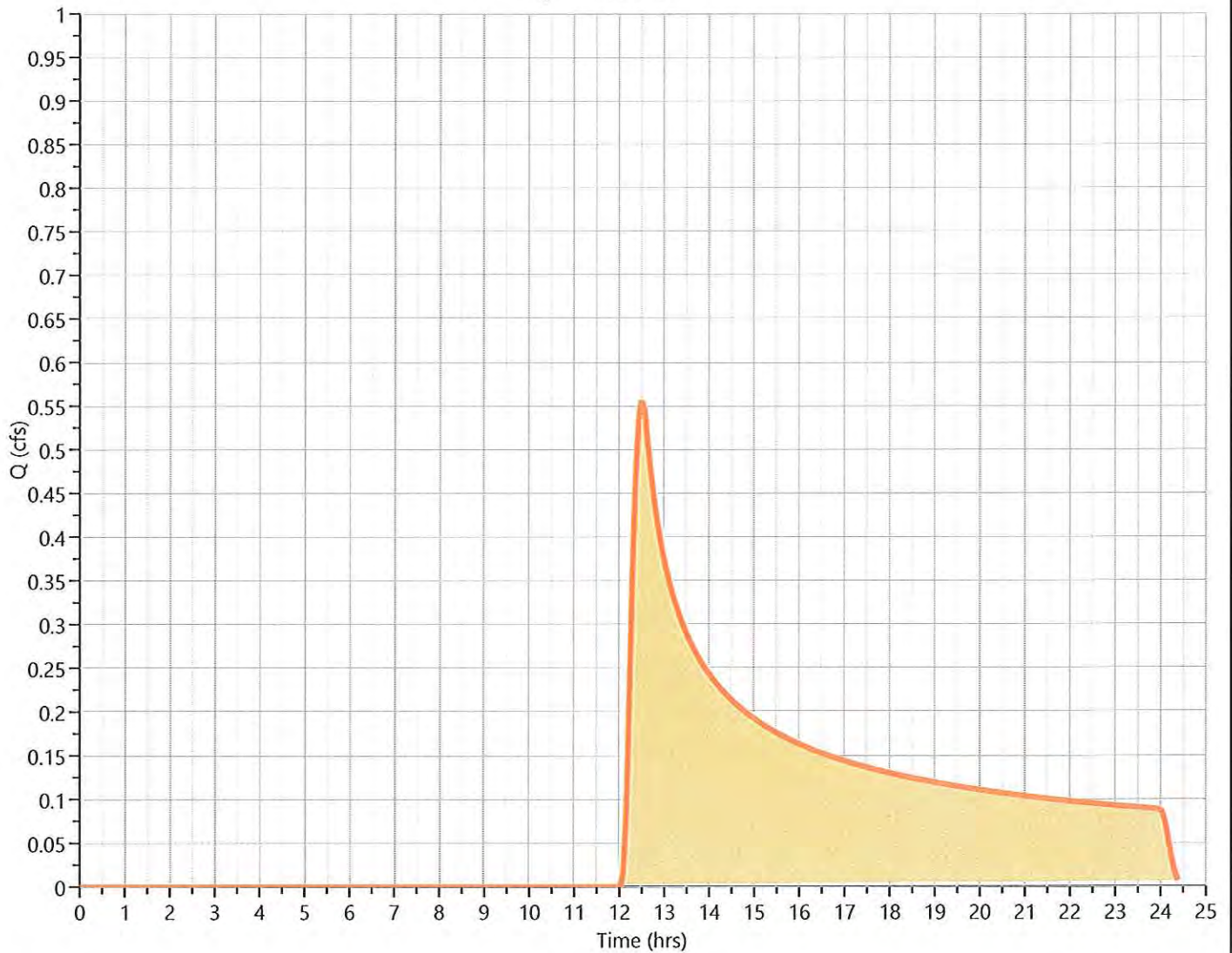
Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.556 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.50 hrs
Time Interval	= 2 min	Runoff Volume	= 7,170 cuft
Drainage Area	= 13.68 ac	Curve Number	= 56*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 16.82 min
Total Rainfall	= 2.71 in	Design Storm	= Synthetic
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.21	98	Bit / Roofs / Drives
0.42	30	Brush - Soil A
13.05	56	Woods - Soil B
13.68	56	Weighted CN Method Employed

Qp = 0.56 cfs



Tc by TR55 Worksheet

Project Name:

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12-11-2020

Point A NRCS Runoff

Hyd. No. 1

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.150	0.013	0.013	
Flow Length (ft)	100			
2-yr, 24-hr Precip. (in)	2.280000	2.280000	2.280000	
Land Slope (%)	3.6			
Travel Time (min)	9.18	0.00	0.00	9.18
Shallow Concentrated Flow				
Flow Length (ft)	1170			
Watercourse Slope (%)	5.9			
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	3.92			
Travel Time (min)	4.98	0.00	0.00	4.98
Channel Flow				
X-sectional Flow Area (sqft)	3			
Wetted Perimeter (ft)	5			
Channel Slope (%)	7.9			
Manning's n	0.050	0.013	0.013	
Velocity (ft/s)	5.95			
Flow Length (ft)	950			
Travel Time (min)	2.66	0.00	0.00	2.66
Total Travel Time				16.82 min

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

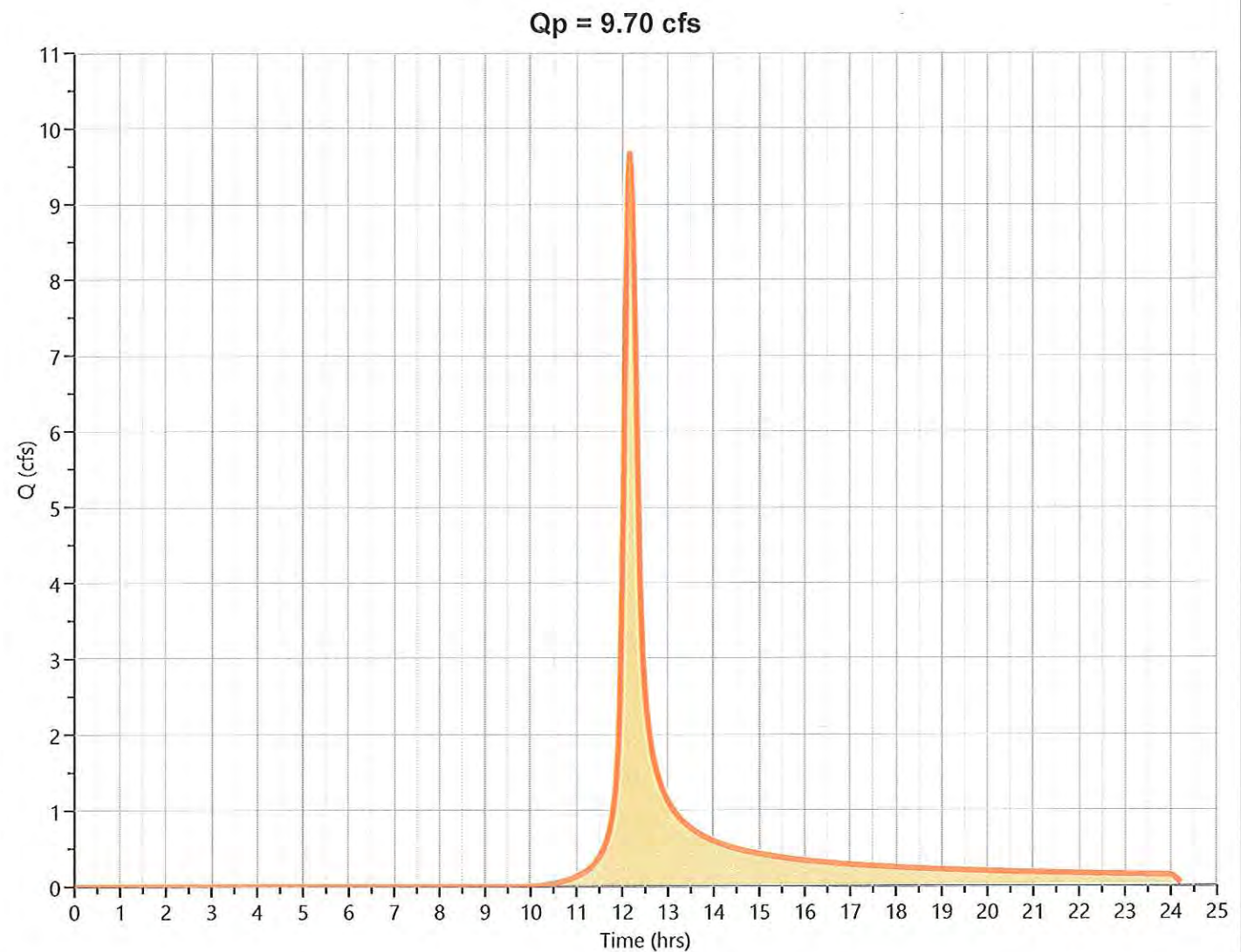
Det Basin In-1

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 9.696 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 29,555 cuft
Drainage Area	= 7.62 ac	Curve Number	= 81*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 14.07 min
Total Rainfall	= 2.71 in	Design Storm	= Synthetic
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA(ac)	CN	DESCRIPTION
2.95	98	Bit / Roofs / Walks
0.42	39	Lawn - Soil A
3.36	61	Lawn - Soil B
0.89	55	Woods - Soil B
7.62	81	Weighted CN Method Employed



Tc by TR55 Worksheet

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

Det Basin In-1 NRCS Runoff

Hyd. No. 2

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.150	0.013	0.013	
Flow Length (ft)	100			
2-yr, 24-hr Precip. (in)	2.280000	2.280000	2.280000	
Land Slope (%)	3			
Travel Time (min)	9.87	0.00	0.00	9.87
Shallow Concentrated Flow				
Flow Length (ft)	310			
Watercourse Slope (%)	1.3			
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	1.84			
Travel Time (min)	2.81	0.00	0.00	2.81
Channel Flow				
X-sectional Flow Area (sqft)	1.7			
Wetted Perimeter (ft)	4.7			
Channel Slope (%)	6.7			
Manning's n	0.013	0.013	0.013	
Velocity (ft/s)	15.01			
Flow Length (ft)	1250			
Travel Time (min)	1.39	0.00	0.00	1.39
Total Travel Time				14.07 min

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

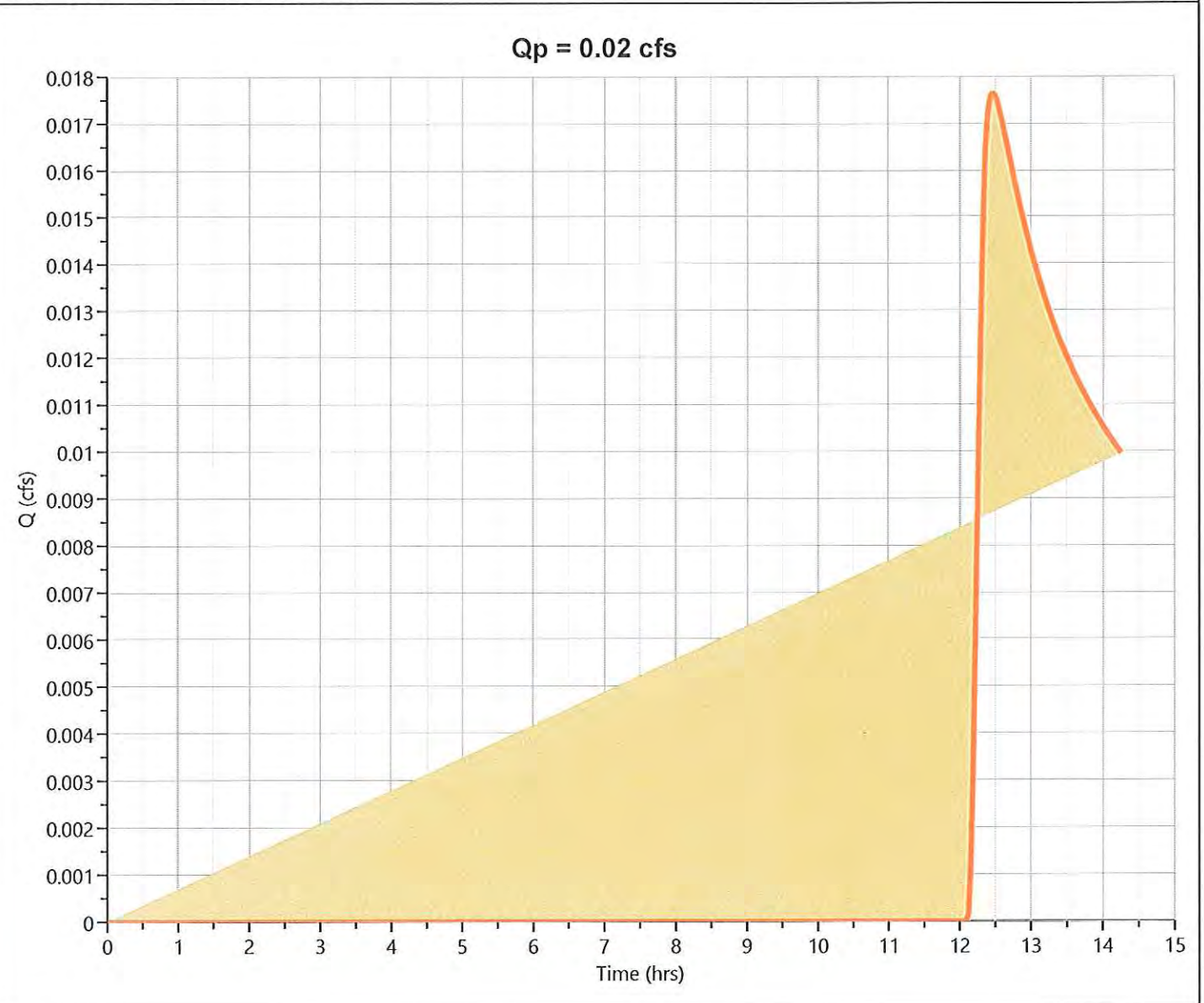
Det. Basin In -2

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.018 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.47 hrs
Time Interval	= 2 min	Runoff Volume	= 313 cuft
Drainage Area	= 0.81 ac	Curve Number	= 54*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.69 min
Total Rainfall	= 2.71 in	Design Storm	= Synthetic
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA(ac)	CN	DESCRIPTION
0.42	39	Lawn - Soil A
0.39	55	Woods - Soil B
0.81	54	Weighted CN Method Employed



Tc by TR55 Worksheet

Project Name:

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12-11-2020

Det. Basin In -2 NRCS Runoff

Hyd. No. 3

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.400	0.013	0.013	
Flow Length (ft)	50			
2-yr, 24-hr Precip. (in)	2.280000	2.280000	2.280000	
Land Slope (%)	8			
Travel Time (min)	8.39	0.00	0.00	8.39
Shallow Concentrated Flow				
Flow Length (ft)	100			
Watercourse Slope (%)	12			
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	5.59			
Travel Time (min)	0.30	0.00	0.00	0.30
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.013	0.013	0.013	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				8.69 min

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

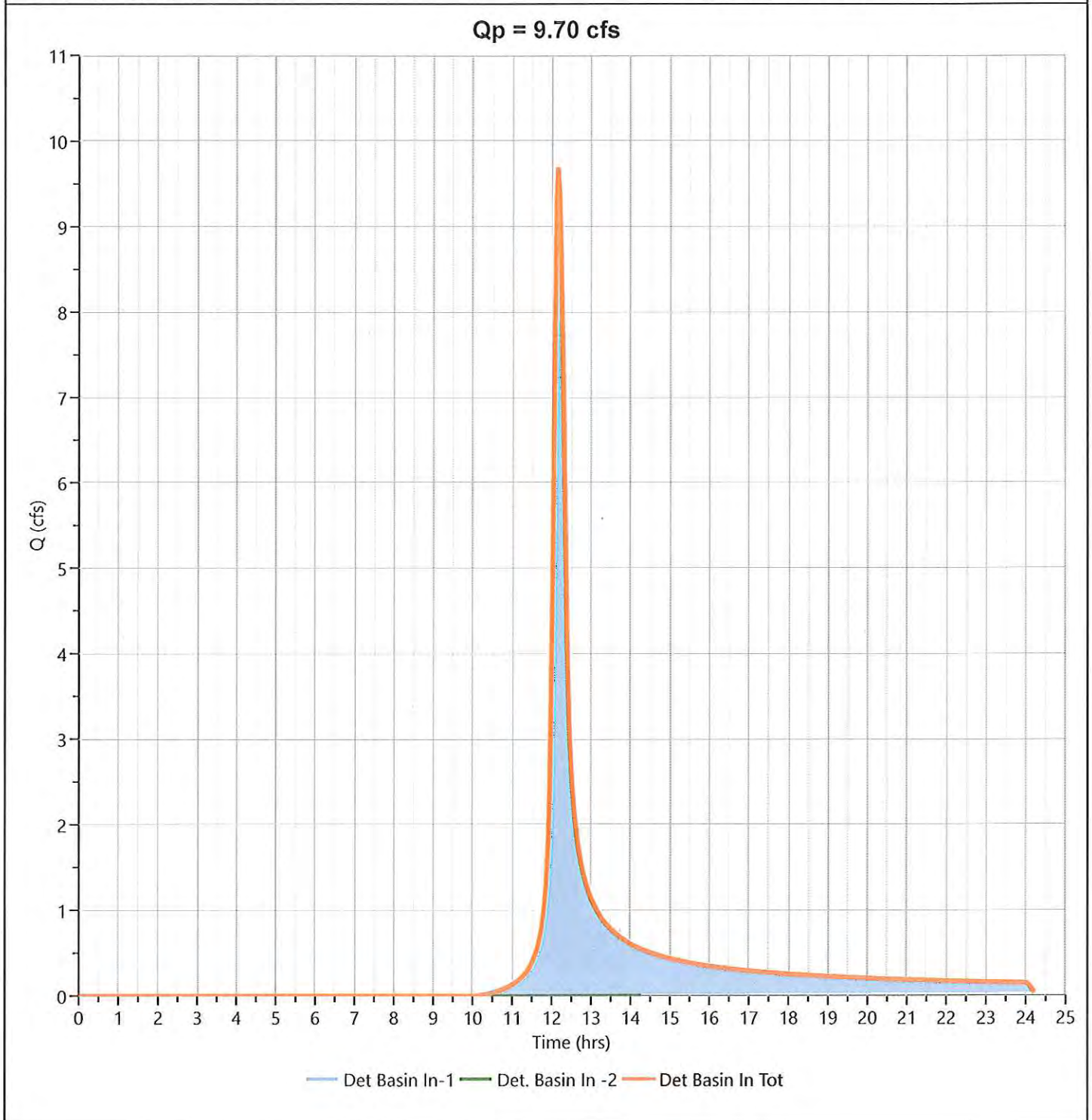
12-11-2020

Det Basin In Tot

Hyd. No. 4

Hydrograph Type = Junction
Storm Frequency = 2-yr
Time Interval = 2 min
Inflow Hydrographs = 2, 3

Peak Flow = 9.697 cfs
Time to Peak = 12.17 hrs
Hydrograph Volume = 29,869 cuft
Total Contrib. Area = 8.43 ac



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

Det Basin Out

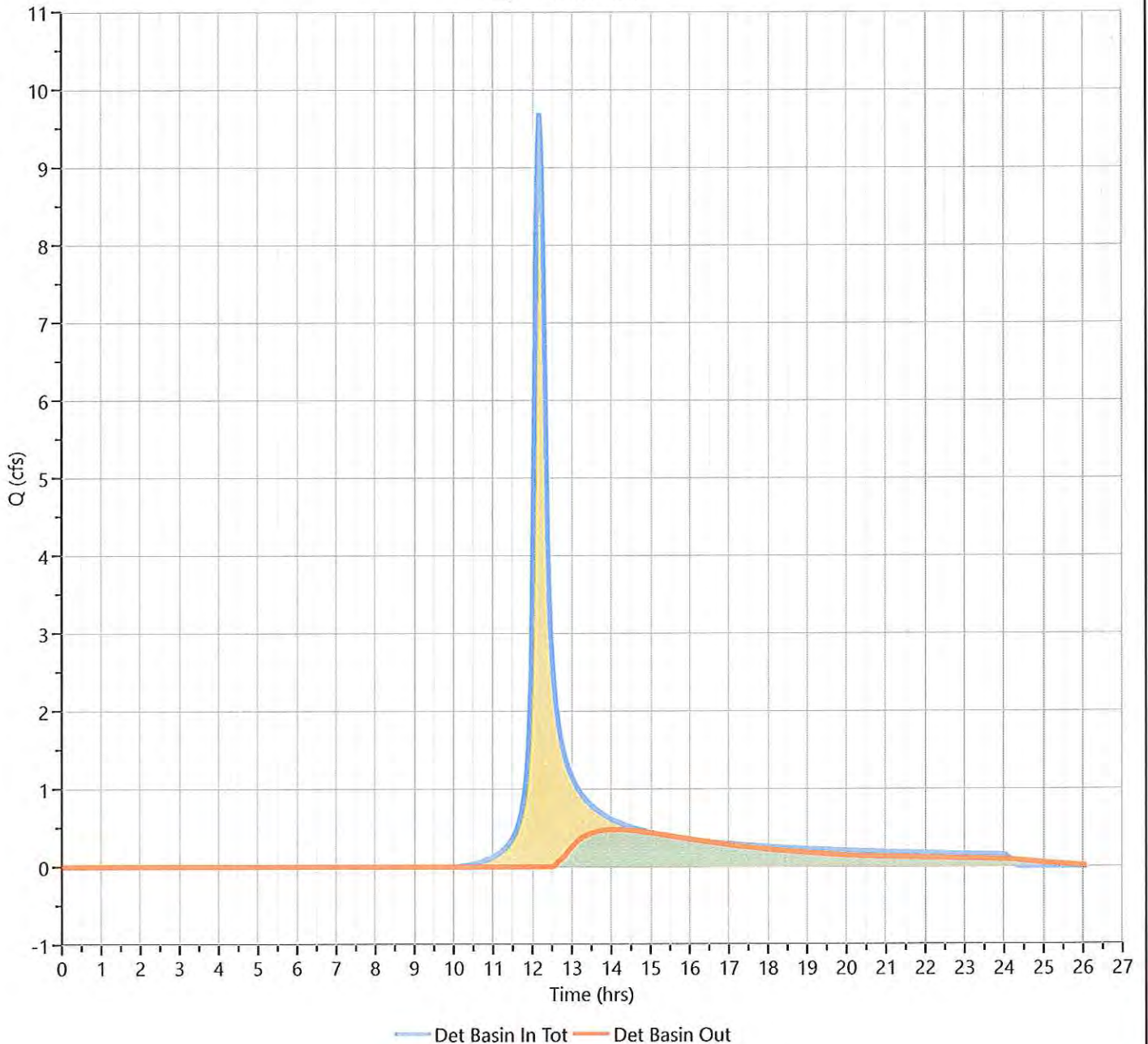
Hyd. No. 5

Hydrograph Type	= Pond Route	Peak Flow	= 0.478 cfs
Storm Frequency	= 2-yr	Time to Peak	= 14.13 hrs
Time Interval	= 2 min	Hydrograph Volume	= 10,177 cuft
Inflow Hydrograph	= 4 - Det Basin In Tot	Max. Elevation	= 111.40 ft
Pond Name	= Basin A	Max. Storage	= 17,662 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 2.93 hrs

Qp = 0.48 cfs



Pond Report

Project Name:

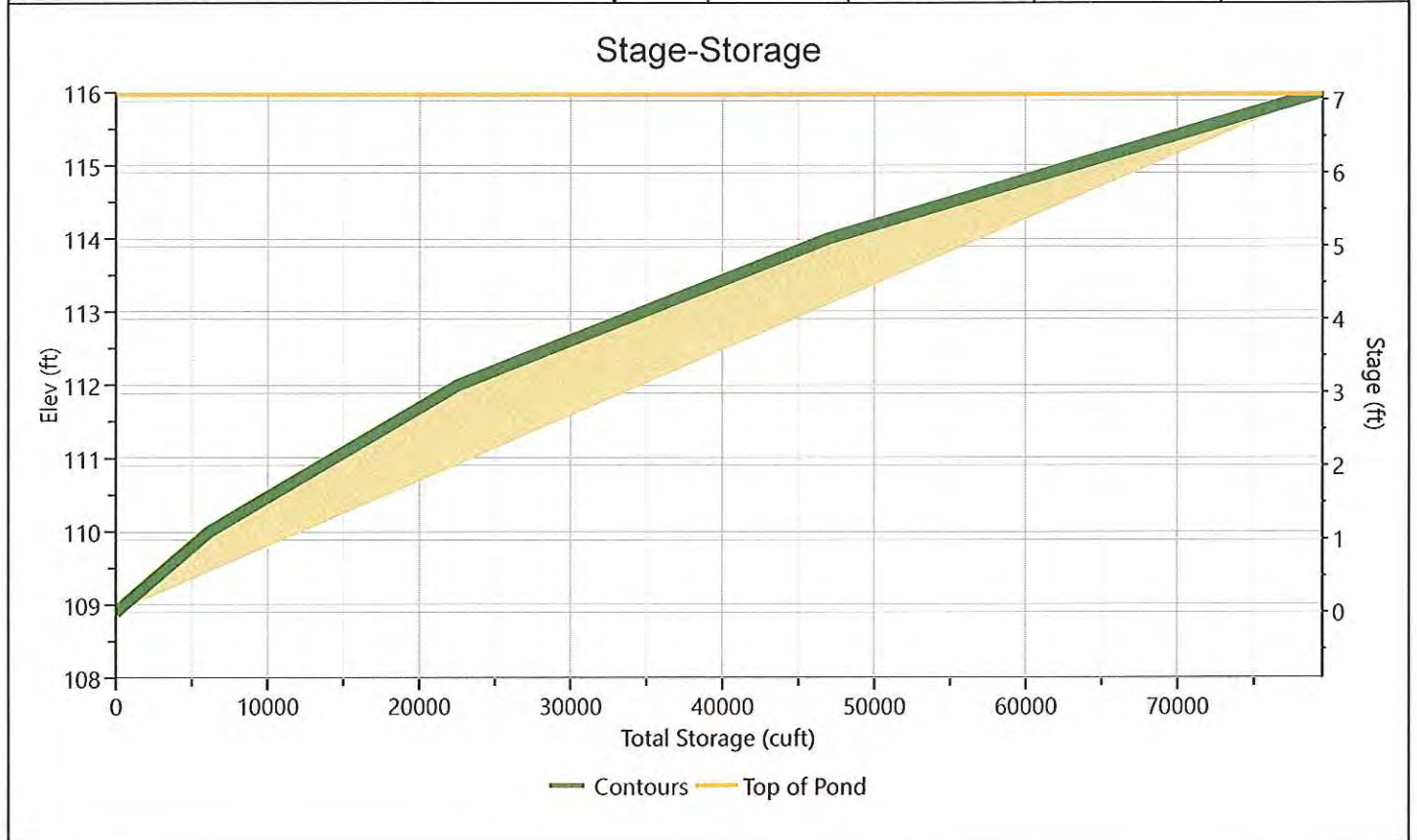
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12-11-2020

Basin A

Stage-Storage

User Defined Contours		Stage / Storage Table				
Description	Input	Stage (ft)	Elevation (ft)	Contour Area (sqft)	Incr. Storage (cuft)	Total Storage (cuft)
Bottom Elevation, ft	108.90	0.00	108.90	5,000	0.000	0.000
Voids (%)	100.00	1.10	110.00	6,200	6,160	6,160
Volume Calc	None	3.10	112.00	10,200	16,400	22,560
		5.10	114.00	14,200	24,400	46,960
		7.10	116.00	18,300	32,500	79,460



Pond Report

Project Name:

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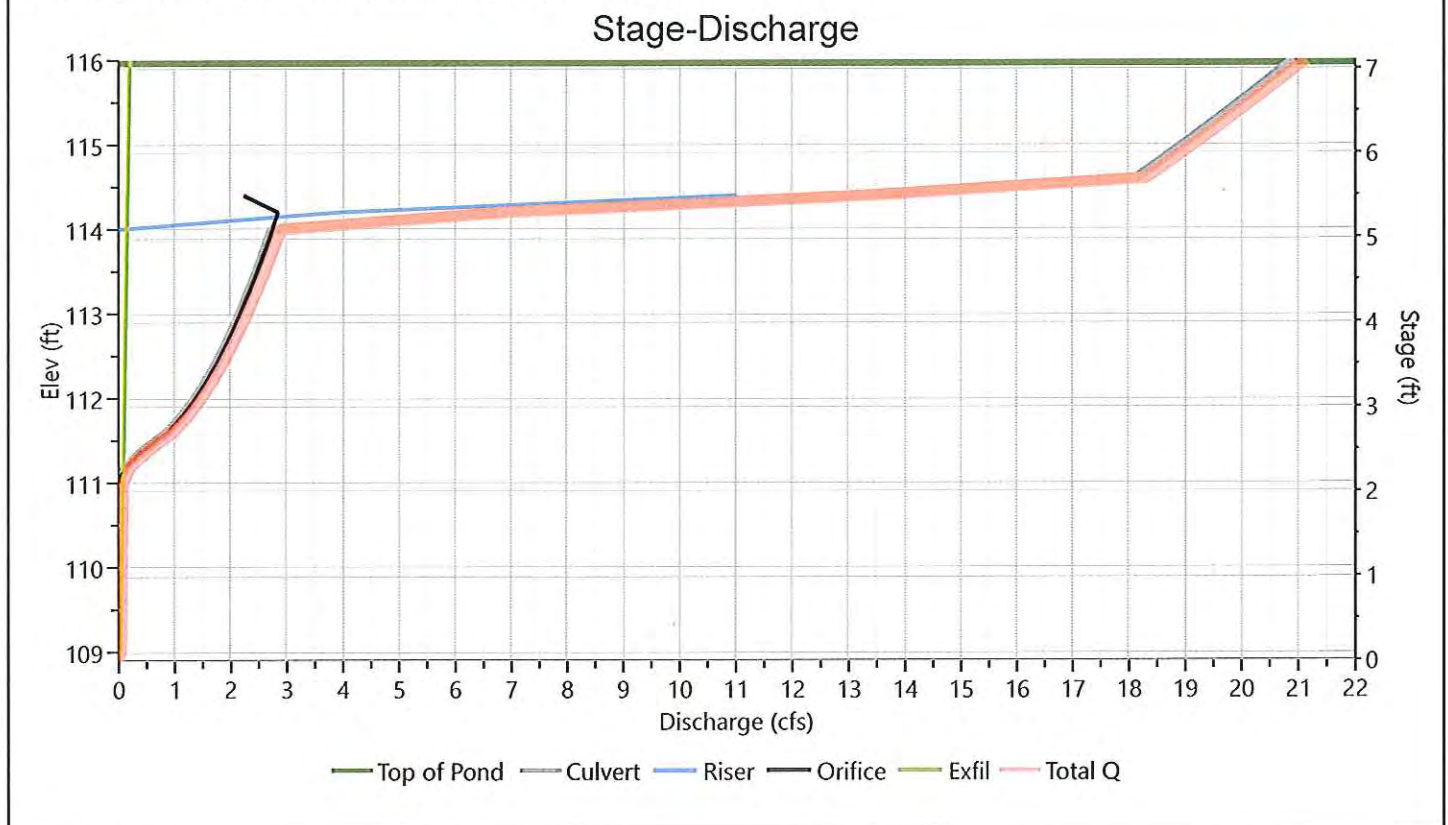
12-11-2020

Basin A

Stage-Discharge

Culvert / Orifices	Culvert	Orifices			Orifice Plate		
		1*	2	3	Orifice Dia, in	No. Orifices	
Rise, in	18	8			Invert Elevation, ft		
Span, in	18	8			Height, ft		
No. Barrels	1	1			Orifice Coefficient, Co		
Invert Elevation, ft	108.90	111.00					
Orifice Coefficient, Co	0.60	0.60					
Length, ft	60						
Barrel Slope, %	.05						
N-Value, n	0.013						
Weirs		Riser*	Weirs			Ancillary	
			1	2	3	Exfiltration, in/hr	0.50**
Shape / Type	Box						
Crest Elevation, ft	114						
Crest Length, ft	13.2						
Angle, deg							
Weir Coefficient, Cw	3.3						

*Routes through Culvert. **Exfiltration extracted from outflow hydrograph. Rate applied to contours.



Pond Report

Project Name:

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Basin A

Stage-Storage-Discharge Summary

Stage (ft)	Elev. (ft)	Storage (cuft)	Culvert (cfs)	Orifices, cfs			Riser (cfs)	Weirs, cfs			Pf Riser (cfs)	Exfil (cfs)	User (cfs)	Total (cfs)
				1	2	3		1	2	3				
0.00	108.90	0.000	0.000	0.000			0.000				0.000		0.000	
1.10	110.00	6,160	0.000	0.000			0.000				0.072		0.072	
3.10	112.00	22,560	1.372 oc	1.372			0.000				0.118		1.490	
5.10	114.00	46,960	2.744 oc	2.744			0.000				0.164		2.909	
7.10	116.00	79,460	20.93 oc	0.000			0.000				0.212		21.14	

Basin A

Pond Drawdown



Hydrograph Report

Project Name:

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Post Det Bypass

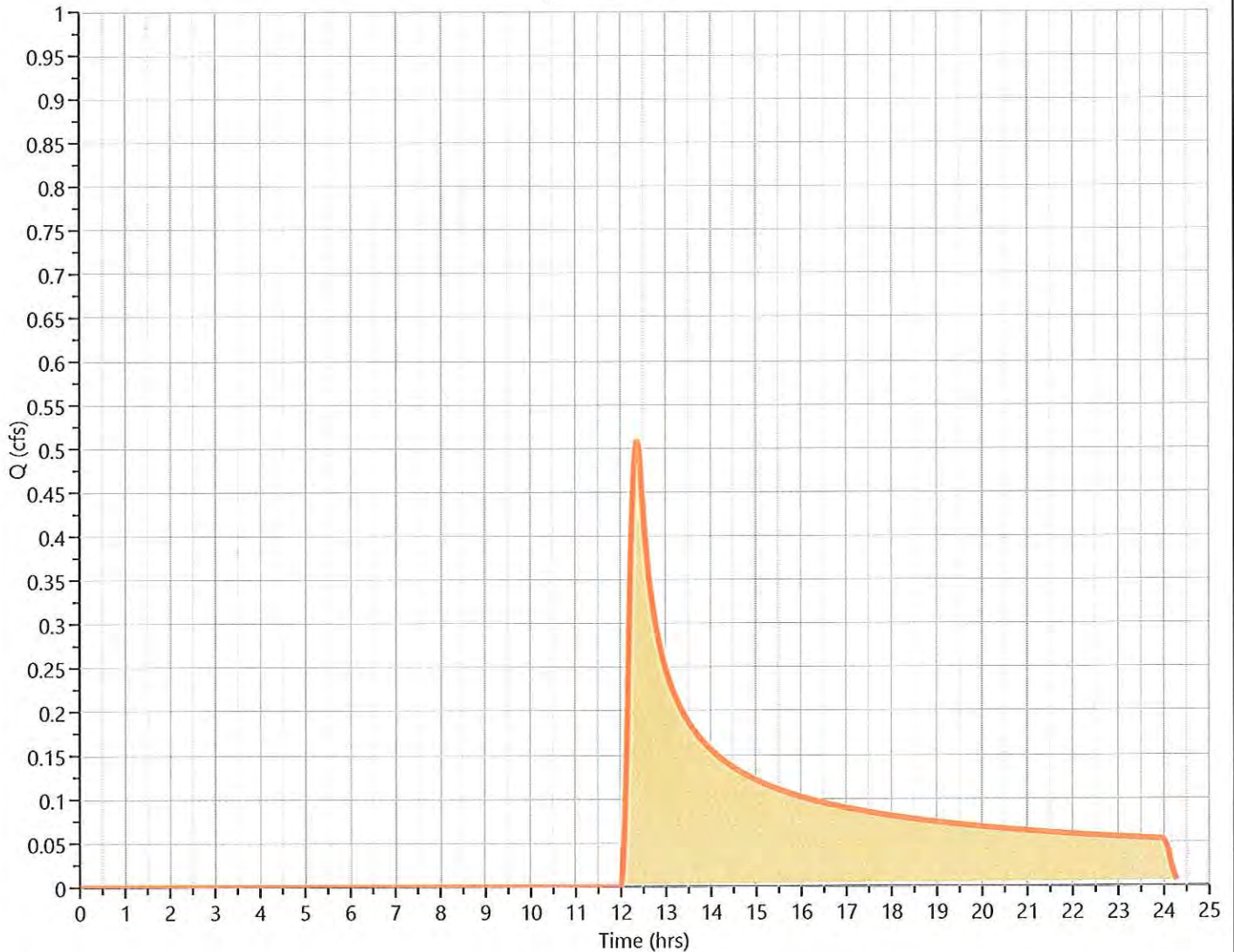
Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.509 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.37 hrs
Time Interval	= 2 min	Runoff Volume	= 4,807 cuft
Drainage Area	= 7.48 ac	Curve Number	= 57.75*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 15.97 min
Total Rainfall	= 2.71 in	Design Storm	= Synthetic
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.35	98	Bit/Roofs/Drives
0.92	61	Lawn - Soil B
6.21	55	Woods - Soil B
7.48	58	Weighted CN Method Employed

Qp = 0.51 cfs



Tc by TR55 Worksheet

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

Post Det Bypass NRCS Runoff

Hyd. No. 6

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.150	0.013	0.013	
Flow Length (ft)	100			
2-yr, 24-hr Precip. (in)	2.280000	2.280000	2.280000	
Land Slope (%)	3.6			
Travel Time (min)	9.18	0.00	0.00	9.18
Shallow Concentrated Flow				
Flow Length (ft)	970			
Watercourse Slope (%)	5.9			
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	3.92			
Travel Time (min)	4.13	0.00	0.00	4.13
Channel Flow				
X-sectional Flow Area (sqft)	3			
Wetted Perimeter (ft)	5			
Channel Slope (%)	7.9			
Manning's n	0.050	0.013	0.013	
Velocity (ft/s)	5.95			
Flow Length (ft)	950			
Travel Time (min)	2.66	0.00	0.00	2.66
Total Travel Time				15.97 min

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

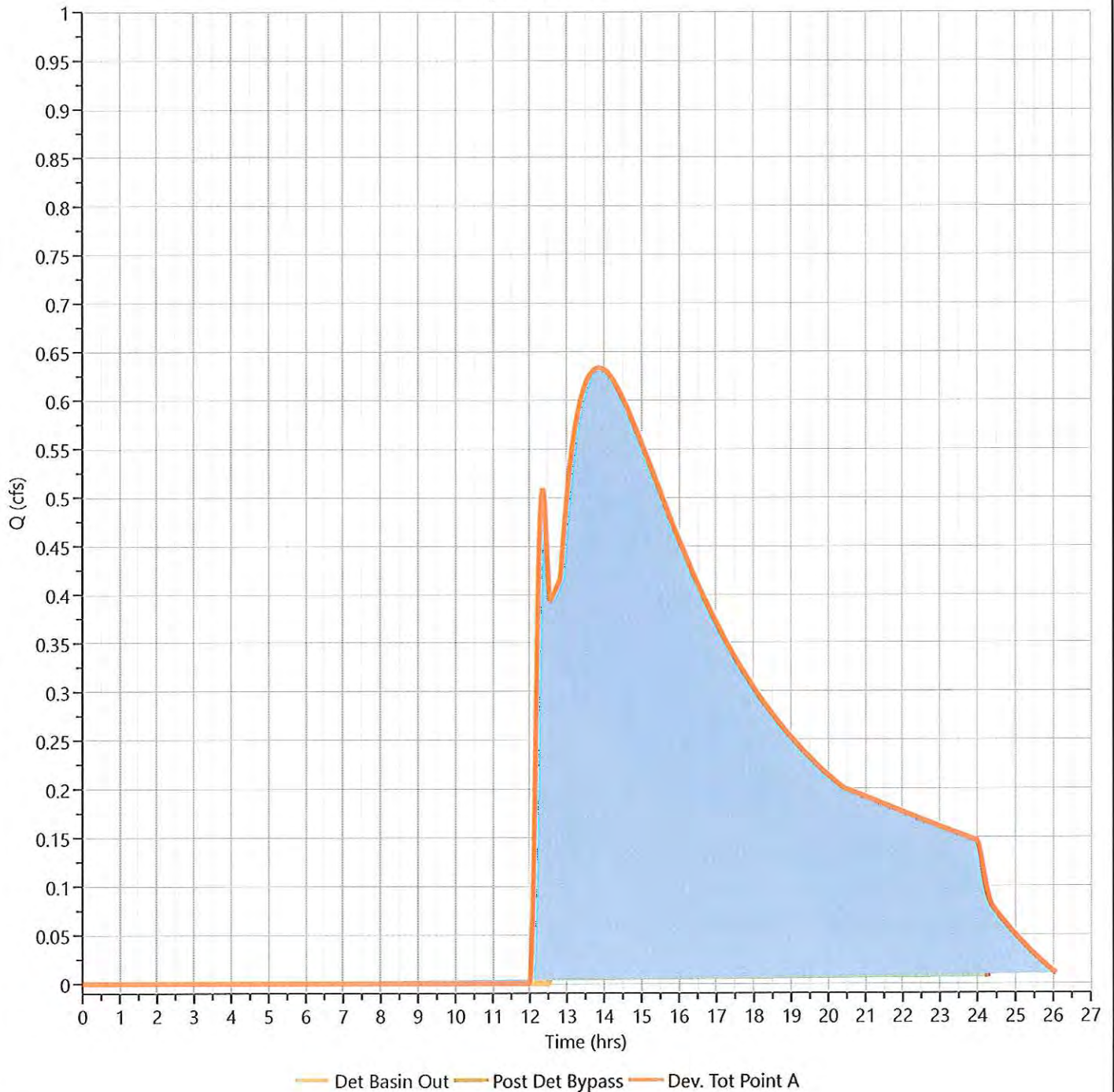
Dev. Tot Point A

Hyd. No. 7

Hydrograph Type = Junction
Storm Frequency = 2-yr
Time Interval = 2 min
Inflow Hydrographs = 5, 6

Peak Flow = 0.633 cfs
Time to Peak = 13.87 hrs
Hydrograph Volume = 14,984 cuft
Total Contrib. Area = 7.48 ac

Qp = 0.63 cfs

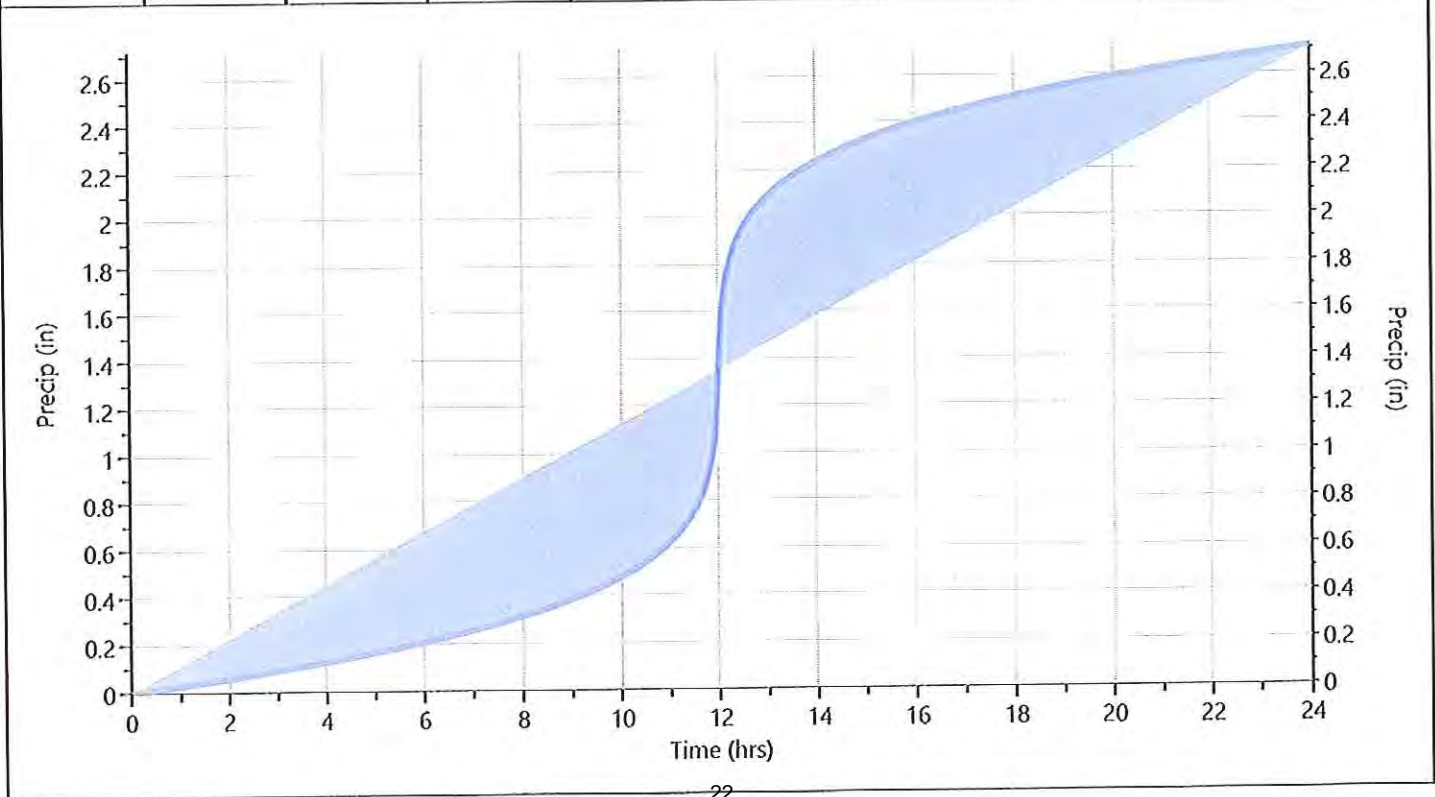


Design Storm Report

Storm Distribution: IDF Based - Synthetic

Storm Duration	Total Rainfall Volume (in)							
	1-yr	✓ 2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
24 hrs	0	2.71	0	2.84	3.84	3.56	4.56	5.38

Incremental Rainfall Distribution, 2-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.660753	11.37	0.984359	11.73	2.148765	12.10	5.790168	12.47	1.336384
11.03	0.680304	11.40	1.032746	11.77	2.424985	12.13	4.437953	12.50	1.253068
11.07	0.701201	11.43	1.086664	11.80	2.785379	12.17	3.588307	12.53	1.180232
11.10	0.723589	11.47	1.147139	11.83	3.273708	12.20	3.009748	12.57	1.116014
11.13	0.747645	11.50	1.215470	11.87	3.969002	12.23	2.592474	12.60	1.058948
11.17	0.773573	11.53	1.293278	11.90	5.028093	12.27	2.278274	12.63	1.007915
11.20	0.801575	11.57	1.382709	11.93	6.806308	12.30	2.033633	12.67	0.961983
11.23	0.831938	11.60	1.486576	11.97	10.284390	12.33	1.838005	12.70	0.920415
11.27	0.864983	11.63	1.608670	12.00	19.250550	12.37	1.678109	12.73	0.882638
11.30	0.901091	11.67	1.754224	12.03	13.541520	12.40	1.545060	12.77	0.848115
11.33	0.940704	11.70	1.930654	12.07	8.217419	12.43	1.432621	12.80	0.816441



Hydrograph 10-yr Summary

Project Name:

12-11-2020

Hydrology Studio v 3.0.0.16

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Pre Point A	4.895	12.30	25,194	----		
2	NRCS Runoff	Det Basin In-1	17.91	12.17	53,561	----		
3	NRCS Runoff	Det. Basin In -2	0.286	12.17	1,257	----		
4	Junction	Det Basin In Tot	18.20	12.17	54,818	2, 3		
5	Pond Route	Det Basin Out	1.872	13.03	34,249	4	112.57	29,573
6	NRCS Runoff	Post Det Bypass	3.618	12.23	15,403	----		
7	Junction	Dev. Tot Point A	4.775	12.30	49,652	5, 6		

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

Pre Point A

Hyd. No. 1

Hydrograph Type = NRCS Runoff

Peak Flow = 4.895 cfs

Storm Frequency = 10-yr

Time to Peak = 12.30 hrs

Time Interval = 2 min

Runoff Volume = 25,194 cuft

Drainage Area = 13.68 ac

Curve Number = 56*

Tc Method = TR55 (See Worksheet)

Time of Conc. (Tc) = 16.82 min

Total Rainfall = 3.84 in

Design Storm = Synthetic

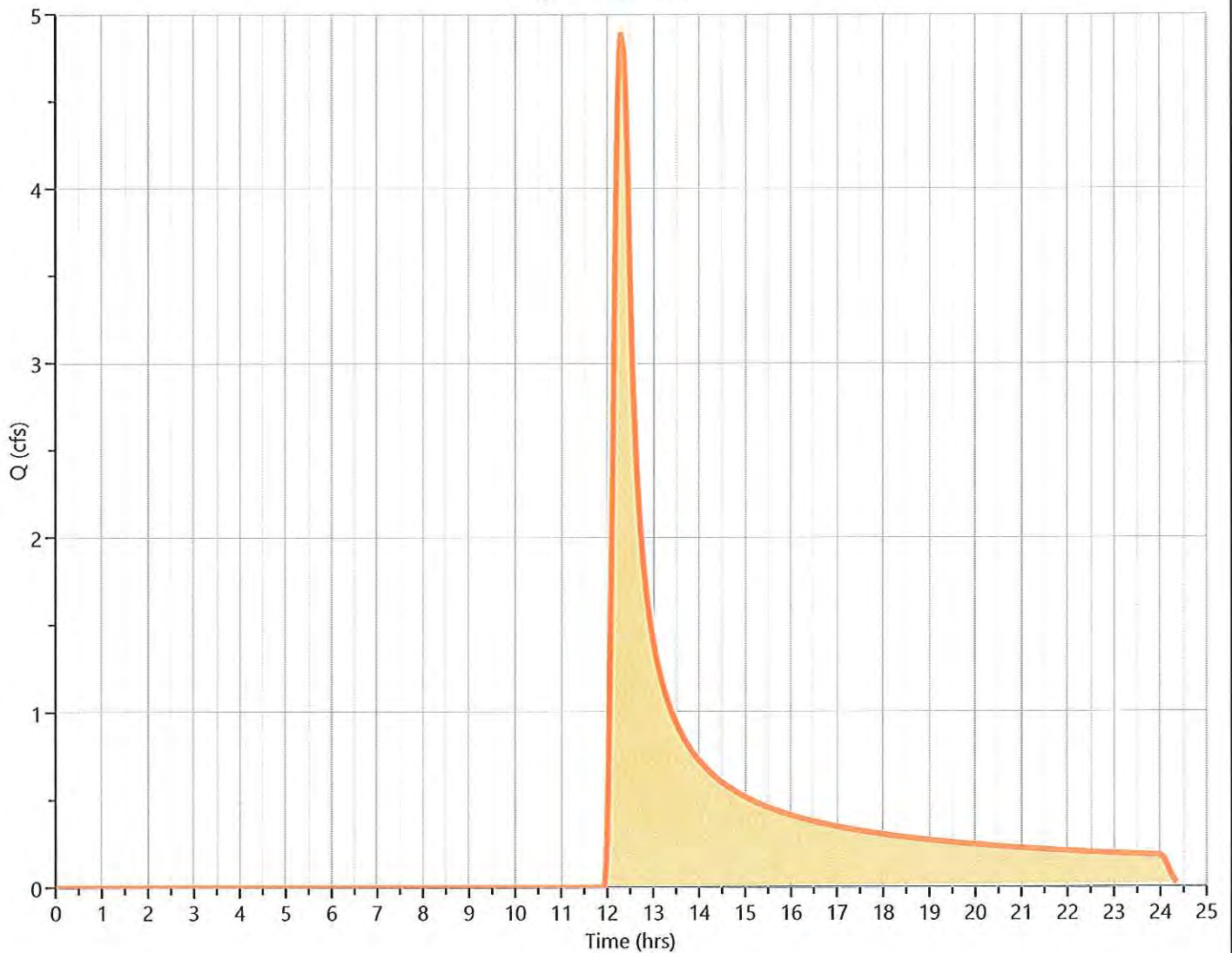
Storm Duration = 24 hrs

Shape Factor = 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.21	98	Bit / Roofs / Drives
0.42	30	Brush - Soil A
13.05	56	Woods - Soil B
13.68	56	Weighted CN Method Employed

Qp = 4.89 cfs



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

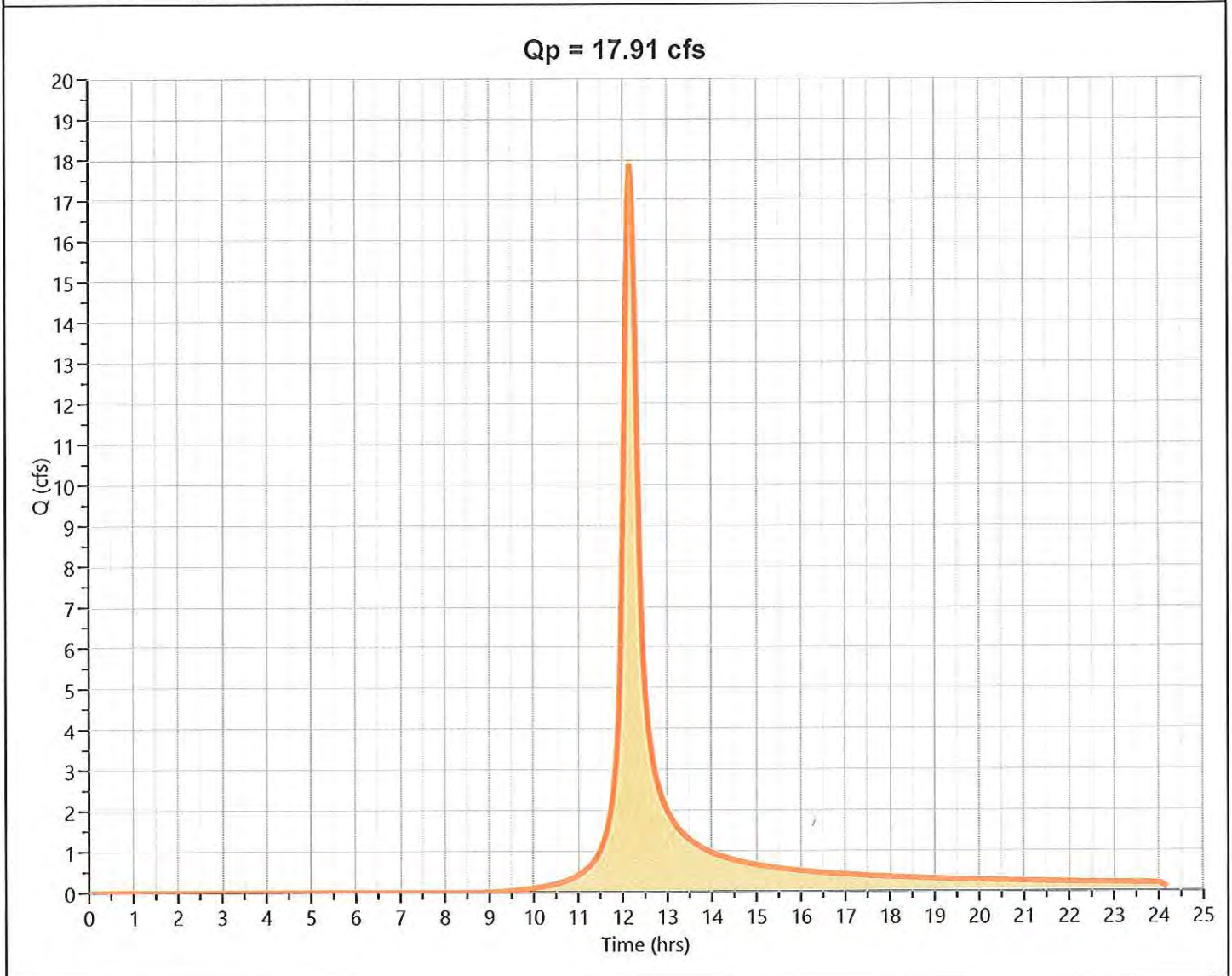
Det Basin In-1

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 17.91 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 53,561 cuft
Drainage Area	= 7.62 ac	Curve Number	= 81*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 14.07 min
Total Rainfall	= 3.84 in	Design Storm	= Synthetic
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
2.95	98	Bit / Roofs / Walks
0.42	39	Lawn - Soil A
3.36	61	Lawn - Soil B
0.89	55	Woods - Soil B
7.62	81	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

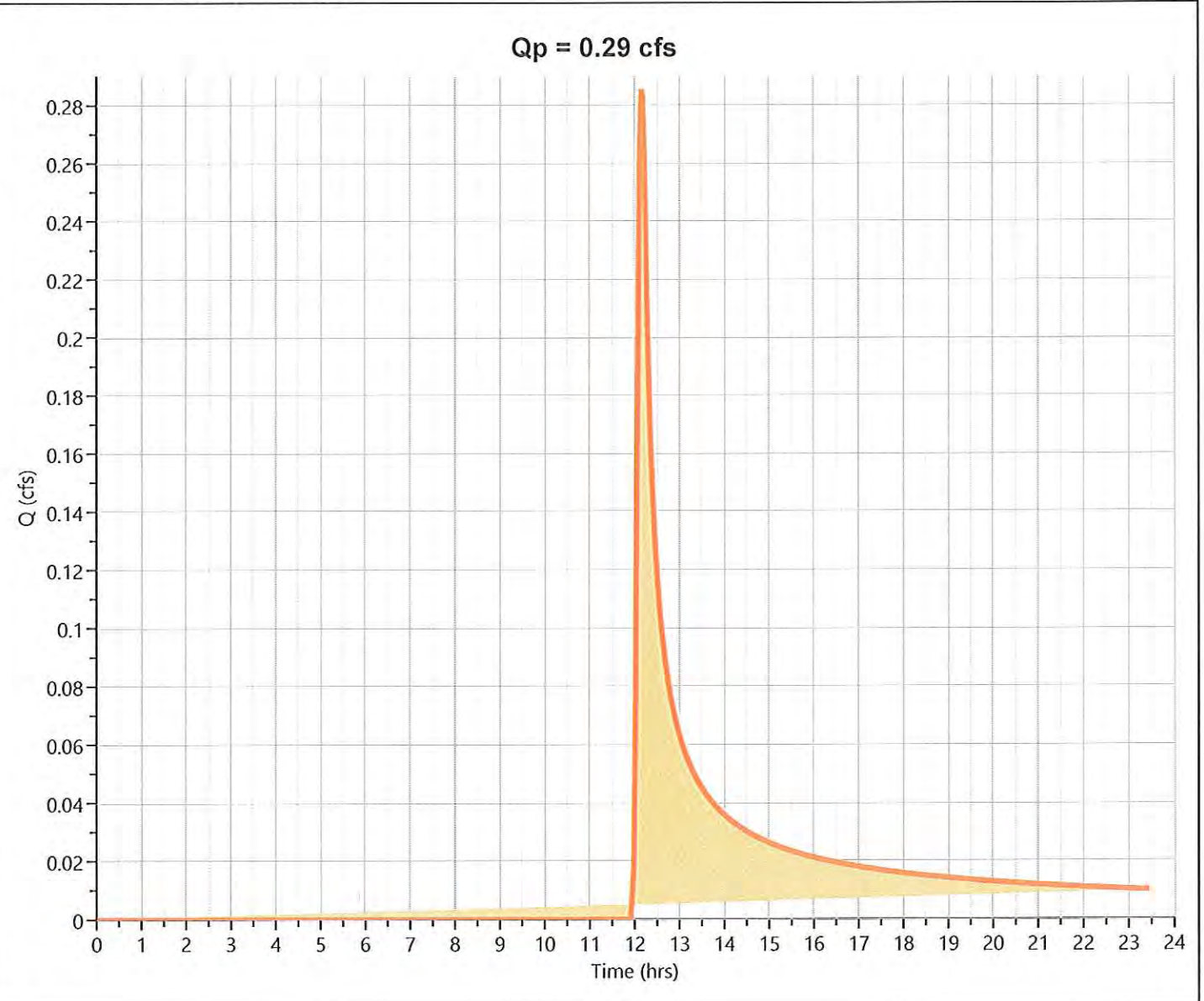
Det. Basin In -2

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.286 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 1,257 cuft
Drainage Area	= 0.81 ac	Curve Number	= 54*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.69 min
Total Rainfall	= 3.84 in	Design Storm	= Synthetic
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.42	39	Lawn - Soil A
0.39	55	Woods - Soil B
0.81	54	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

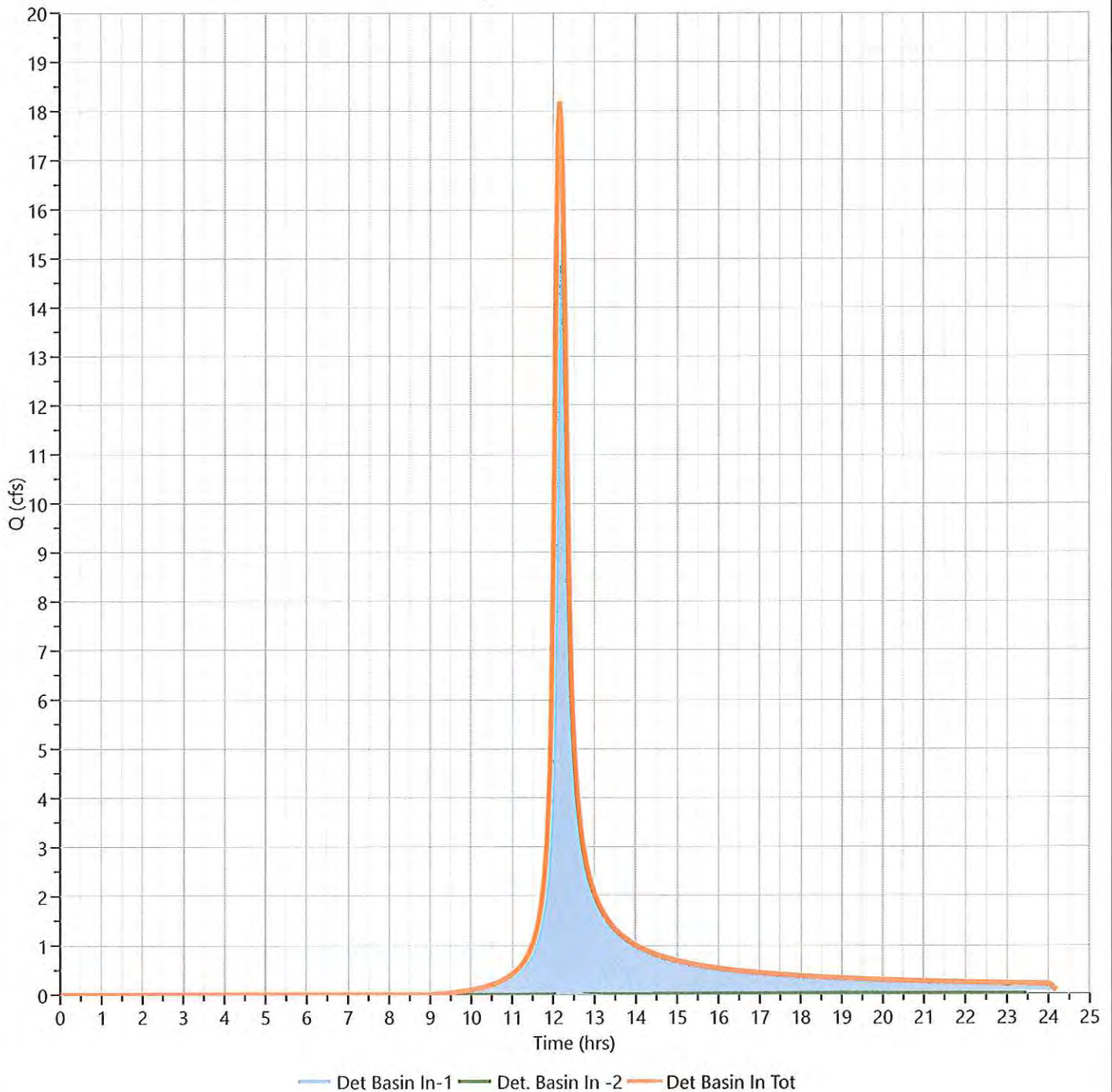
Det Basin In Tot

Hyd. No. 4

Hydrograph Type = Junction
Storm Frequency = 10-yr
Time Interval = 2 min
Inflow Hydrographs = 2, 3

Peak Flow = 18.20 cfs
Time to Peak = 12.17 hrs
Hydrograph Volume = 54,818 cuft
Total Contrib. Area = 8.43 ac

Qp = 18.20 cfs



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

Det Basin Out

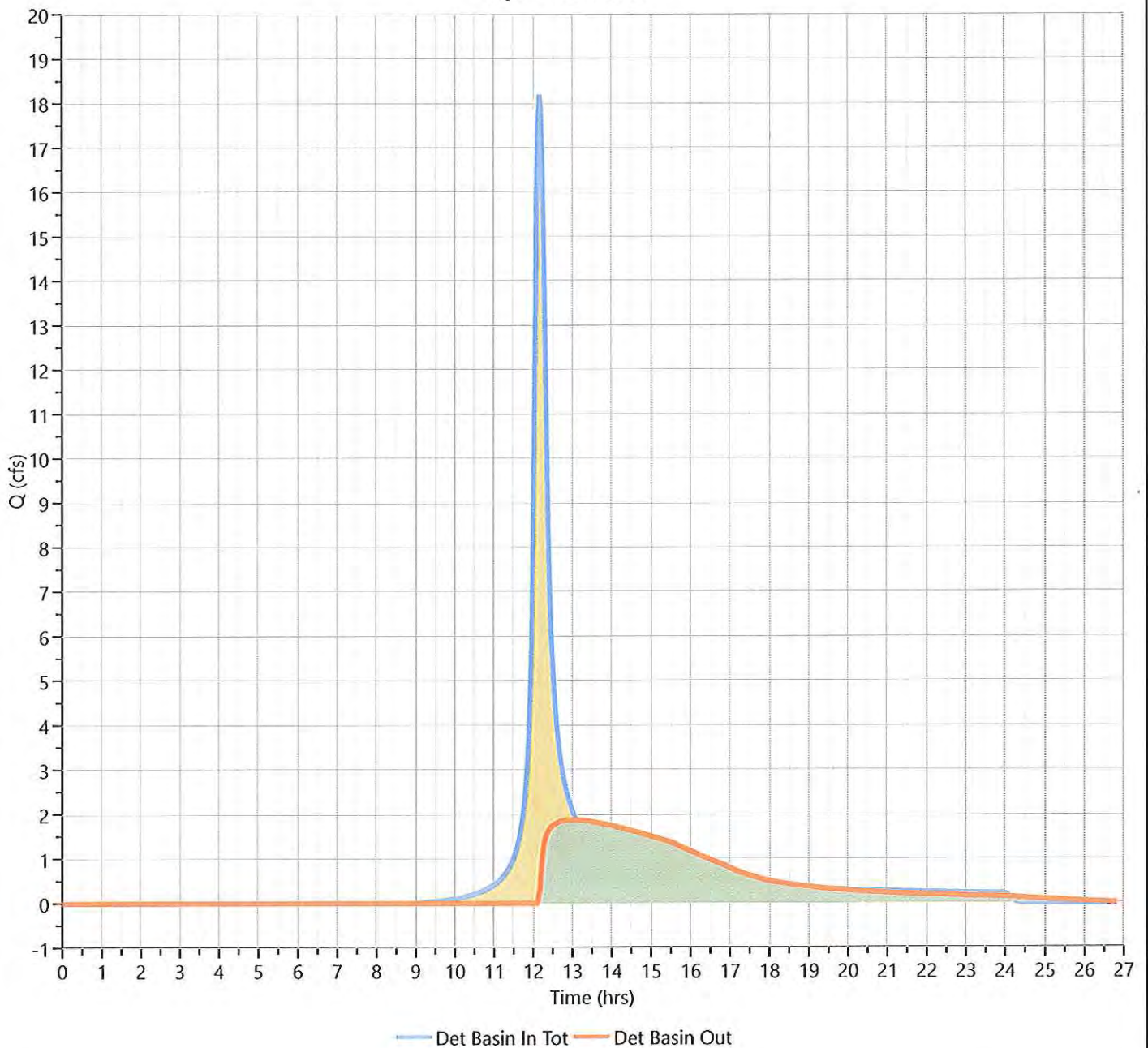
Hyd. No. 5

Hydrograph Type	= Pond Route	Peak Flow	= 1.872 cfs
Storm Frequency	= 10-yr	Time to Peak	= 13.03 hrs
Time Interval	= 2 min	Hydrograph Volume	= 34,249 cuft
Inflow Hydrograph	= 4 - Det Basin In Tot	Max. Elevation	= 112.57 ft
Pond Name	= Basin A	Max. Storage	= 29,573 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 1.97 hrs

Qp = 1.87 cfs



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

Post Det Bypass

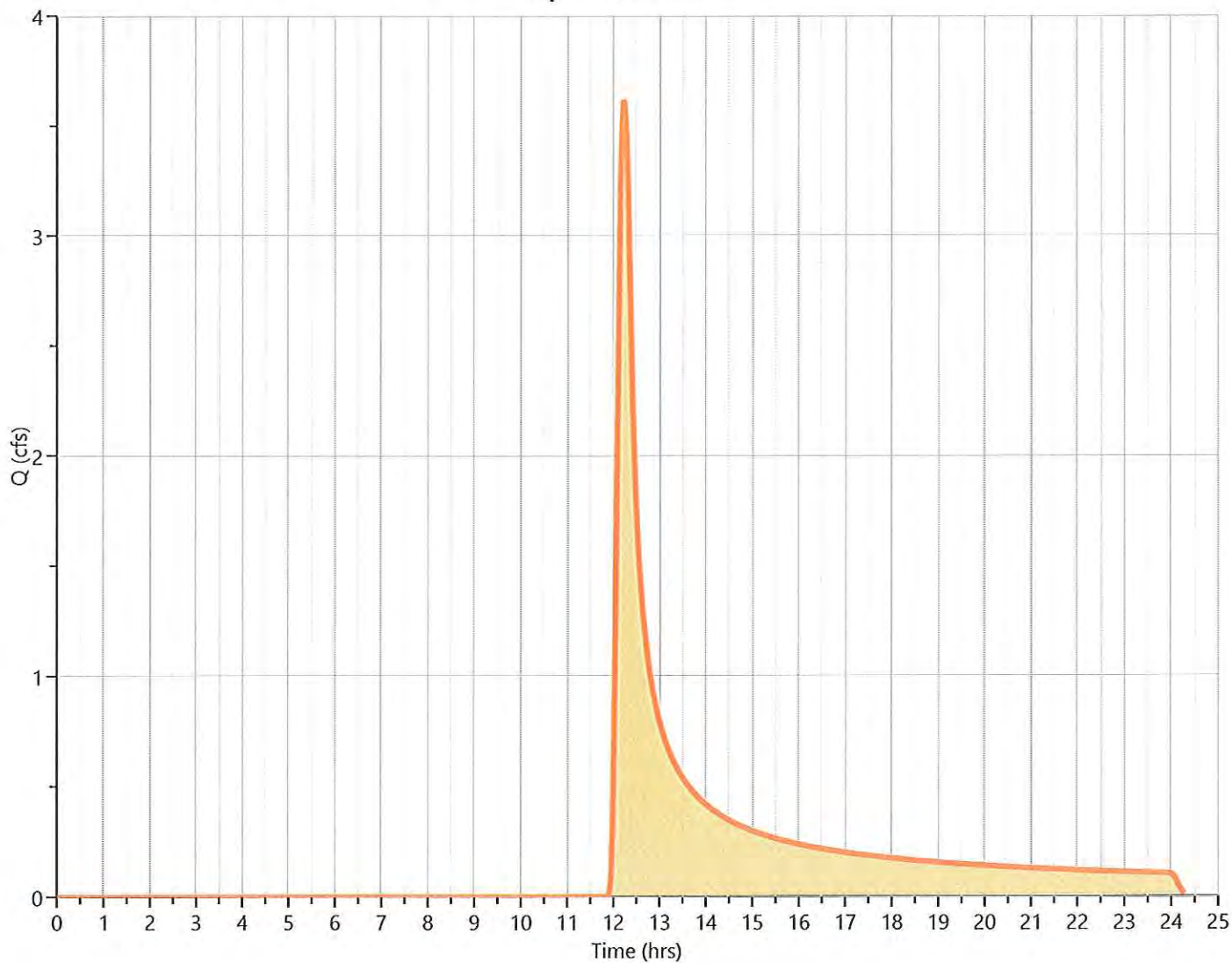
Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 3.618 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.23 hrs
Time Interval	= 2 min	Runoff Volume	= 15,403 cuft
Drainage Area	= 7.48 ac	Curve Number	= 57.75*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 15.97 min
Total Rainfall	= 3.84 in	Design Storm	= Synthetic
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA(ac)	CN	DESCRIPTION
0.35	98	Bit/Roofs/Drives
0.92	61	Lawn - Soil B
6.21	55	Woods - Soil B
7.48	58	Weighted CN Method Employed

Qp = 3.62 cfs



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

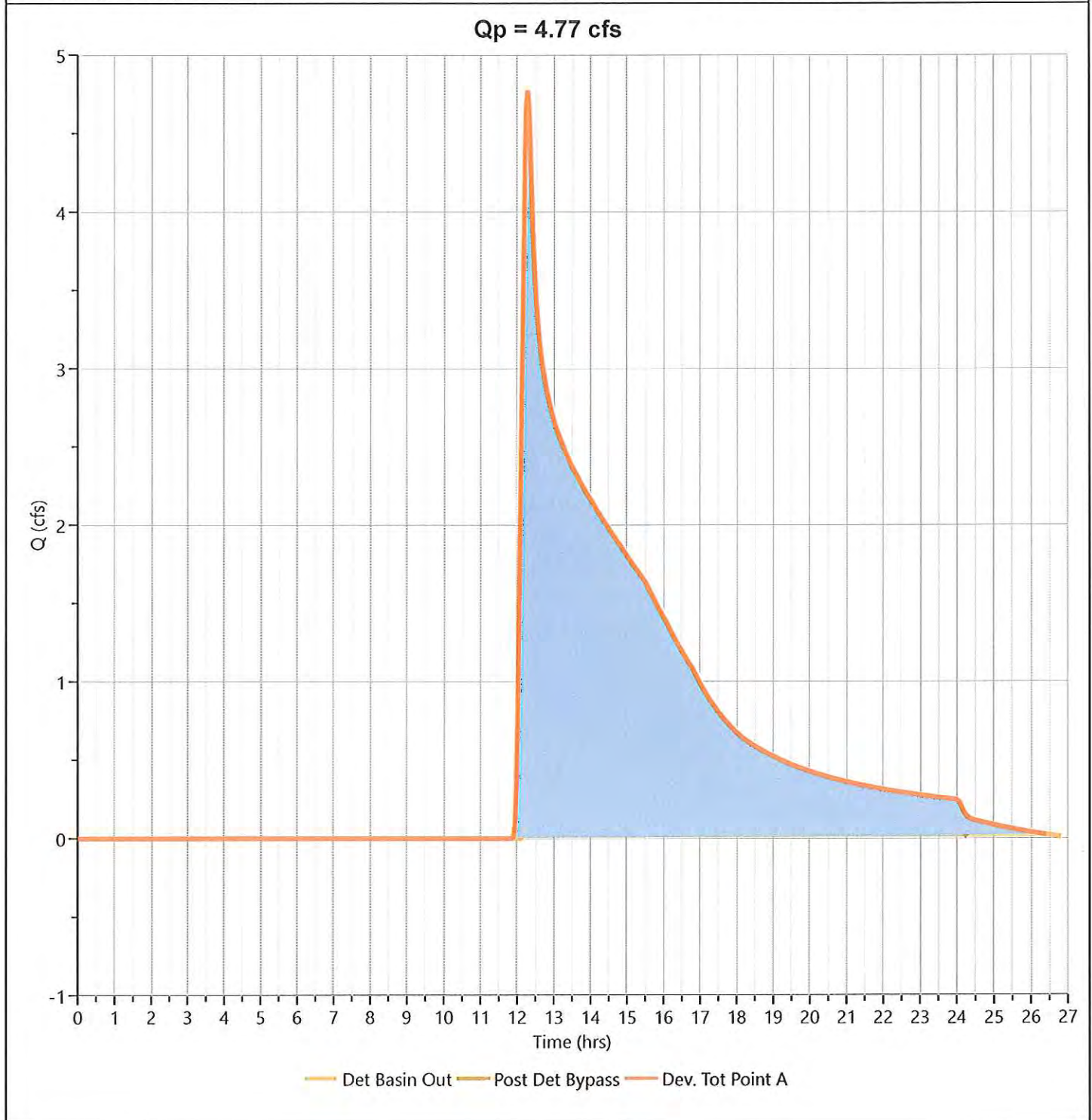
12-11-2020

Dev. Tot Point A

Hyd. No. 7

Hydrograph Type = Junction
Storm Frequency = 10-yr
Time Interval = 2 min
Inflow Hydrographs = 5, 6

Peak Flow = 4.775 cfs
Time to Peak = 12.30 hrs
Hydrograph Volume = 49,652 cuft
Total Contrib. Area = 7.48 ac

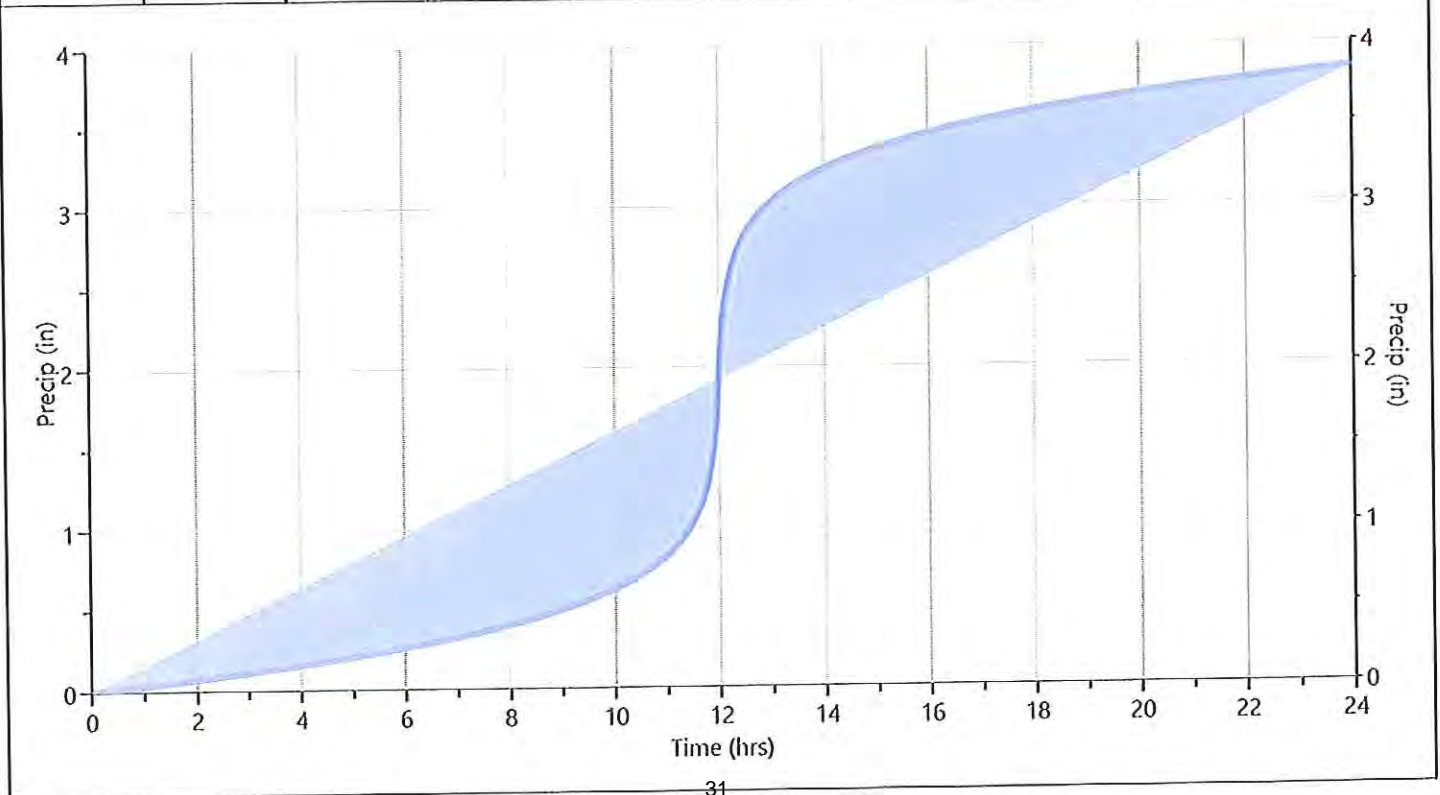


Design Storm Report

Storm Distribution: IDF Based - Synthetic

Storm Duration	Total Rainfall Volume (in)							
	1-yr	2-yr	3-yr	5-yr	✓ 10-yr	25-yr	50-yr	100-yr
24 hrs	0	2.71	0	2.84	3.84	3.56	4.56	5.38

Incremental Rainfall Distribution, 10-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.962806	11.37	1.499665	11.73	3.493011	12.10	9.198534	12.47	2.099669
11.03	0.994587	11.40	1.581466	11.77	3.961182	12.13	7.202607	12.50	1.956868
11.07	1.028633	11.43	1.672935	11.80	4.564631	12.17	5.873907	12.53	1.832330
11.10	1.065278	11.47	1.775885	11.83	5.366981	12.20	4.935575	12.57	1.722848
11.13	1.104760	11.50	1.892543	11.87	6.476521	12.23	4.242742	12.60	1.625884
11.17	1.147461	11.53	2.025747	11.90	8.091158	12.27	3.713059	12.63	1.539445
11.20	1.193786	11.57	2.179193	11.93	10.608870	12.30	3.296649	12.67	1.461935
11.23	1.244187	11.60	2.357697	11.97	14.942430	12.33	2.961695	12.70	1.392043
11.27	1.299238	11.63	2.567673	12.00	23.638020	12.37	2.687085	12.73	1.328731
11.30	1.359642	11.67	2.817881	12.03	18.444110	12.40	2.458262	12.77	1.271129
11.33	1.426101	11.70	3.120506	12.07	12.452720	12.43	2.264953	12.80	1.218462



Hydrograph 25-yr Summary

Project Name:

12-11-2020

Hydrology Studio v 3.0.0.16

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Pre Point A	5.045	12.33	19,880	----		
2	NRCS Runoff	Det Basin In-1	19.62	12.17	47,316	----		
3	NRCS Runoff	Det. Basin In -2	0.288	12.20	969	----		
4	Junction	Det Basin In Tot	19.89	12.17	48,285	2, 3		
5	Pond Route	Det Basin Out	1.902	12.97	28,553	4	112.61	30,056
6	NRCS Runoff	Post Det Bypass	3.682	12.27	12,321	----		
7	Junction	Dev. Tot Point A	4.914	12.33	40,874	5, 6		

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

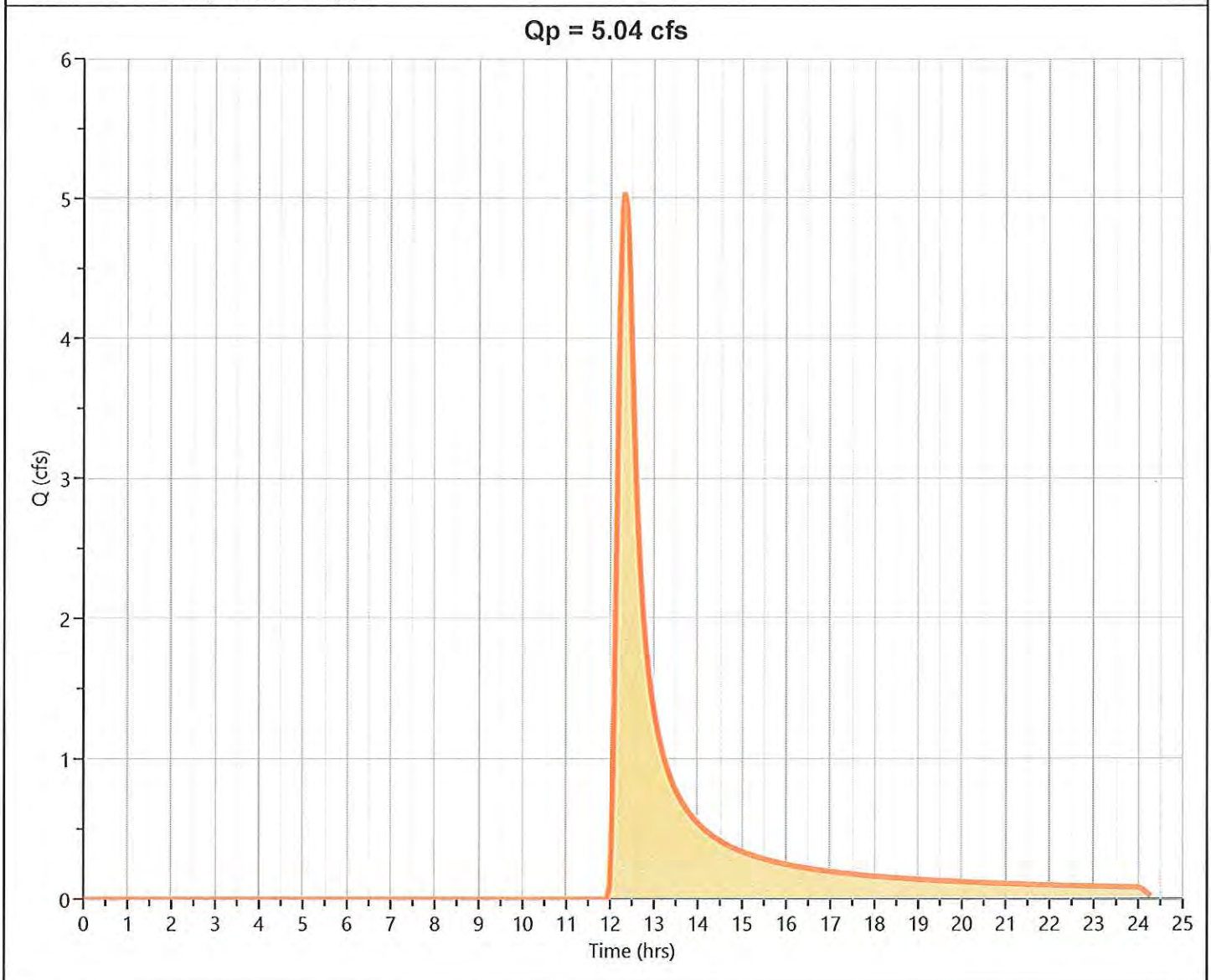
Pre Point A

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 5.045 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.33 hrs
Time Interval	= 2 min	Runoff Volume	= 19,880 cuft
Drainage Area	= 13.68 ac	Curve Number	= 56*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 16.82 min
Total Rainfall	= 3.56 in	Design Storm	= Synthetic
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.21	98	Bit / Roofs / Drives
0.42	30	Brush - Soil A
13.05	56	Woods - Soil B
13.68	56	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

Det Basin In-1

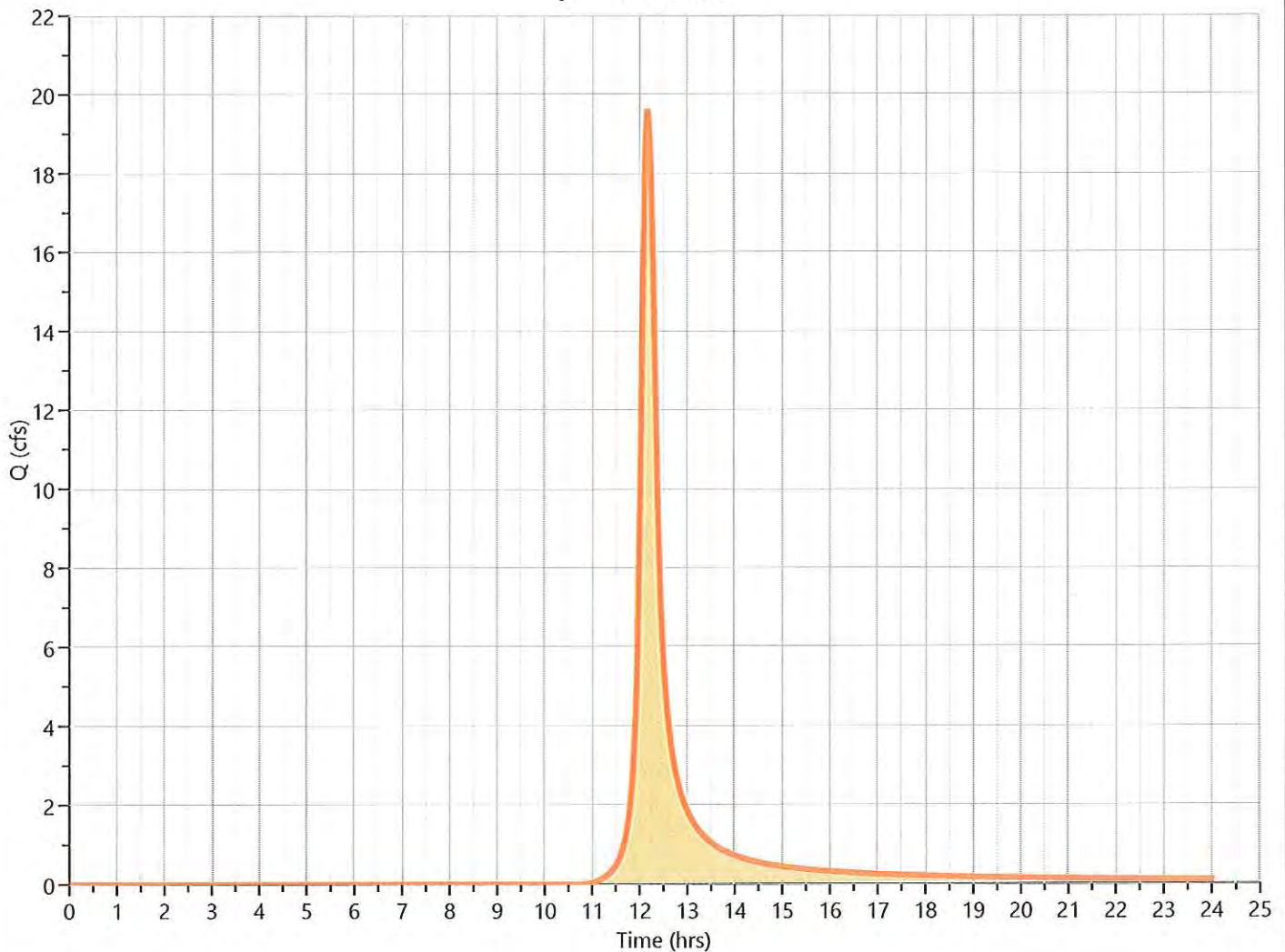
Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 19.62 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 47,316 cuft
Drainage Area	= 7.62 ac	Curve Number	= 81*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 14.07 min
Total Rainfall	= 3.56 in	Design Storm	= Synthetic
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA(ac)	CN	DESCRIPTION
2.95	98	Bit / Roofs / Walks
0.42	39	Lawn - Soil A
3.36	61	Lawn - Soil B
0.89	55	Woods - Soil B
7.62	81	Weighted CN Method Employed

Qp = 19.62 cfs



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

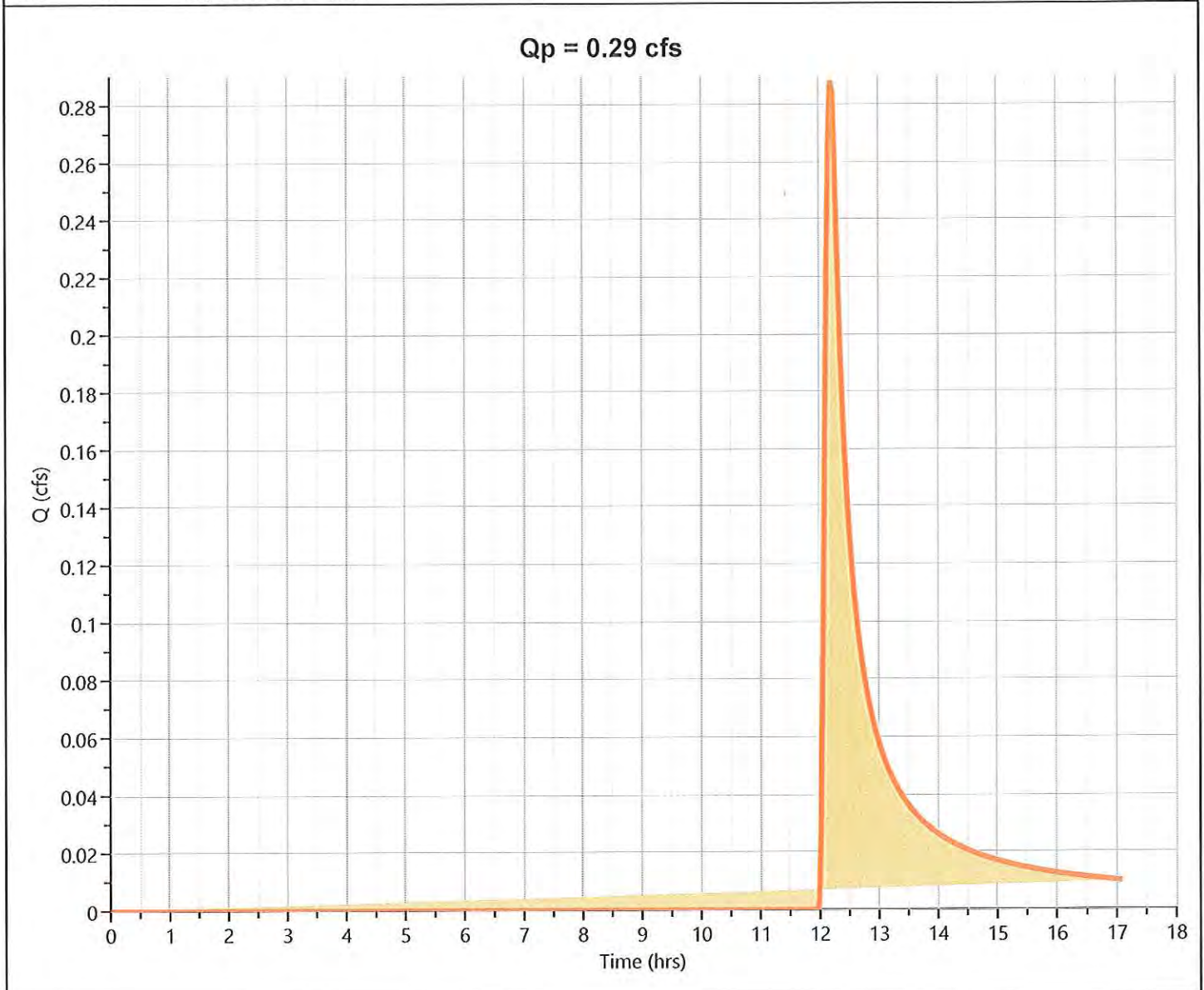
Det. Basin In -2

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.288 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.20 hrs
Time Interval	= 2 min	Runoff Volume	= 969 cuft
Drainage Area	= 0.81 ac	Curve Number	= 54*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.69 min
Total Rainfall	= 3.56 in	Design Storm	= Synthetic
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.42	39	Lawn - Soil A
0.39	55	Woods - Soil B
0.81	54	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

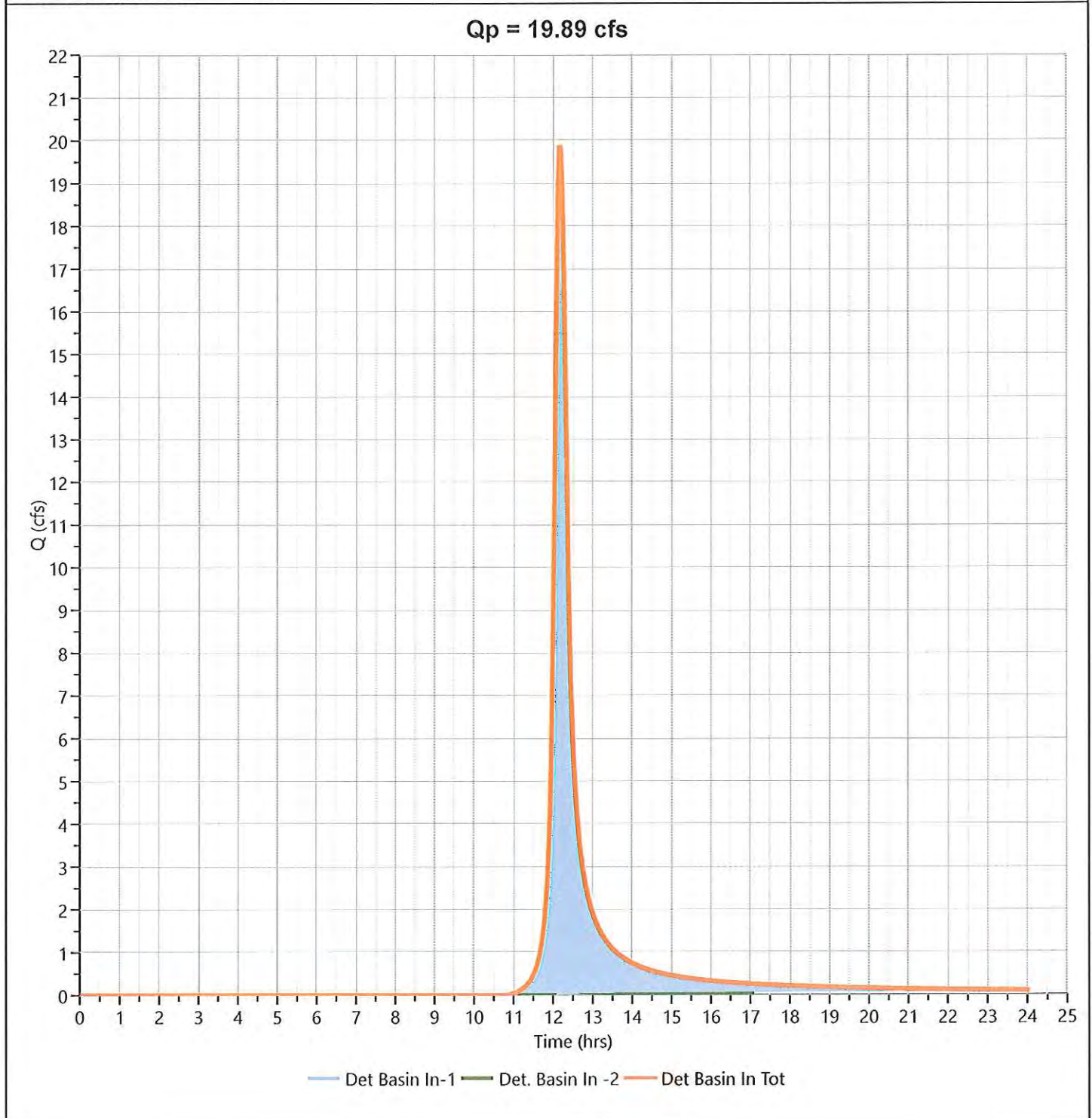
12-11-2020

Det Basin In Tot

Hyd. No. 4

Hydrograph Type = Junction
Storm Frequency = 25-yr
Time Interval = 2 min
Inflow Hydrographs = 2, 3

Peak Flow = 19.89 cfs
Time to Peak = 12.17 hrs
Hydrograph Volume = 48,285 cuft
Total Contrib. Area = 8.43 ac



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

Det Basin Out

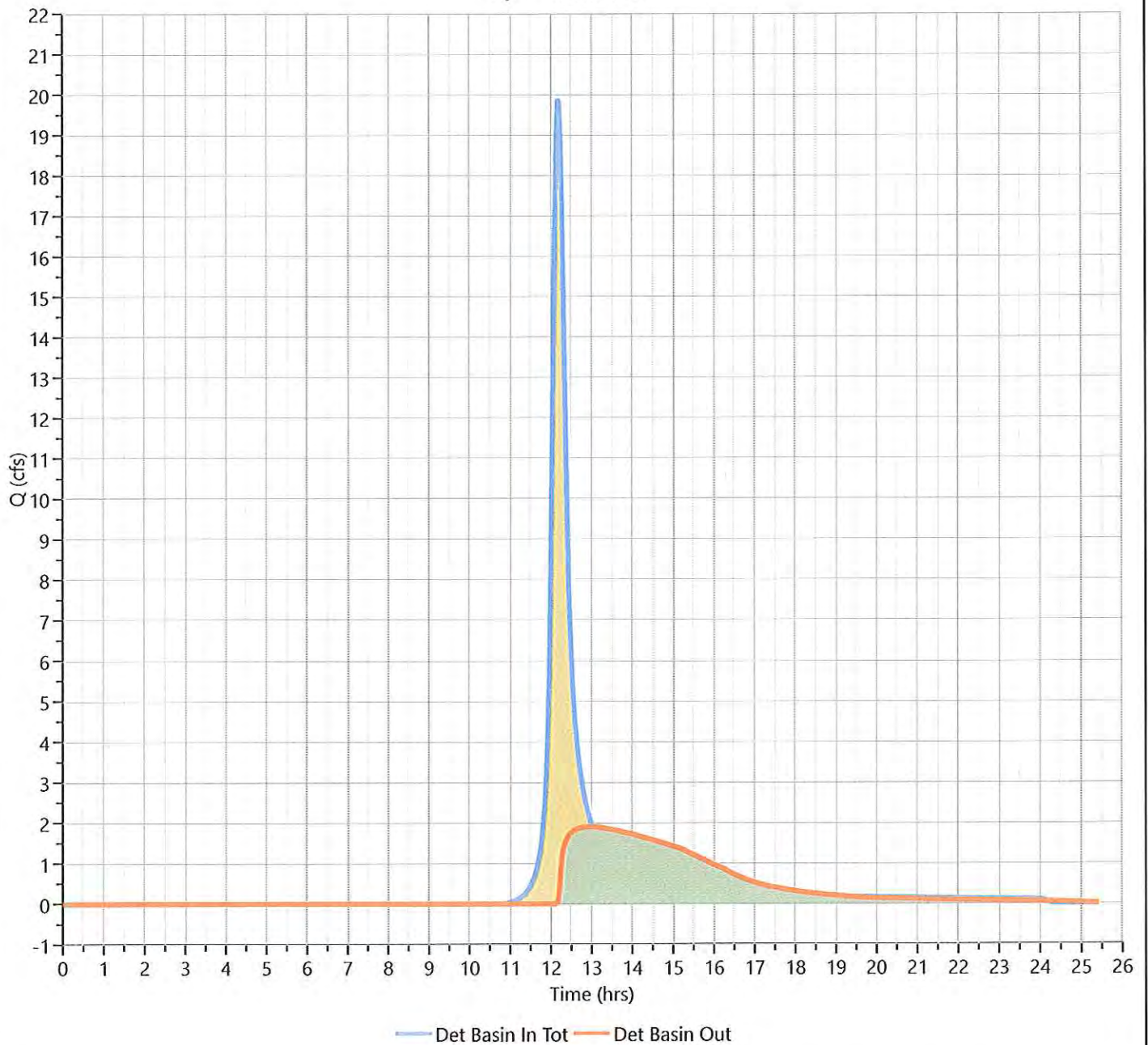
Hyd. No. 5

Hydrograph Type	= Pond Route	Peak Flow	= 1.902 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.97 hrs
Time Interval	= 2 min	Hydrograph Volume	= 28,553 cuft
Inflow Hydrograph	= 4 - Det Basin In Tot	Max. Elevation	= 112.61 ft
Pond Name	= Basin A	Max. Storage	= 30,056 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 2.26 hrs

Qp = 1.90 cfs



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

Post Det Bypass

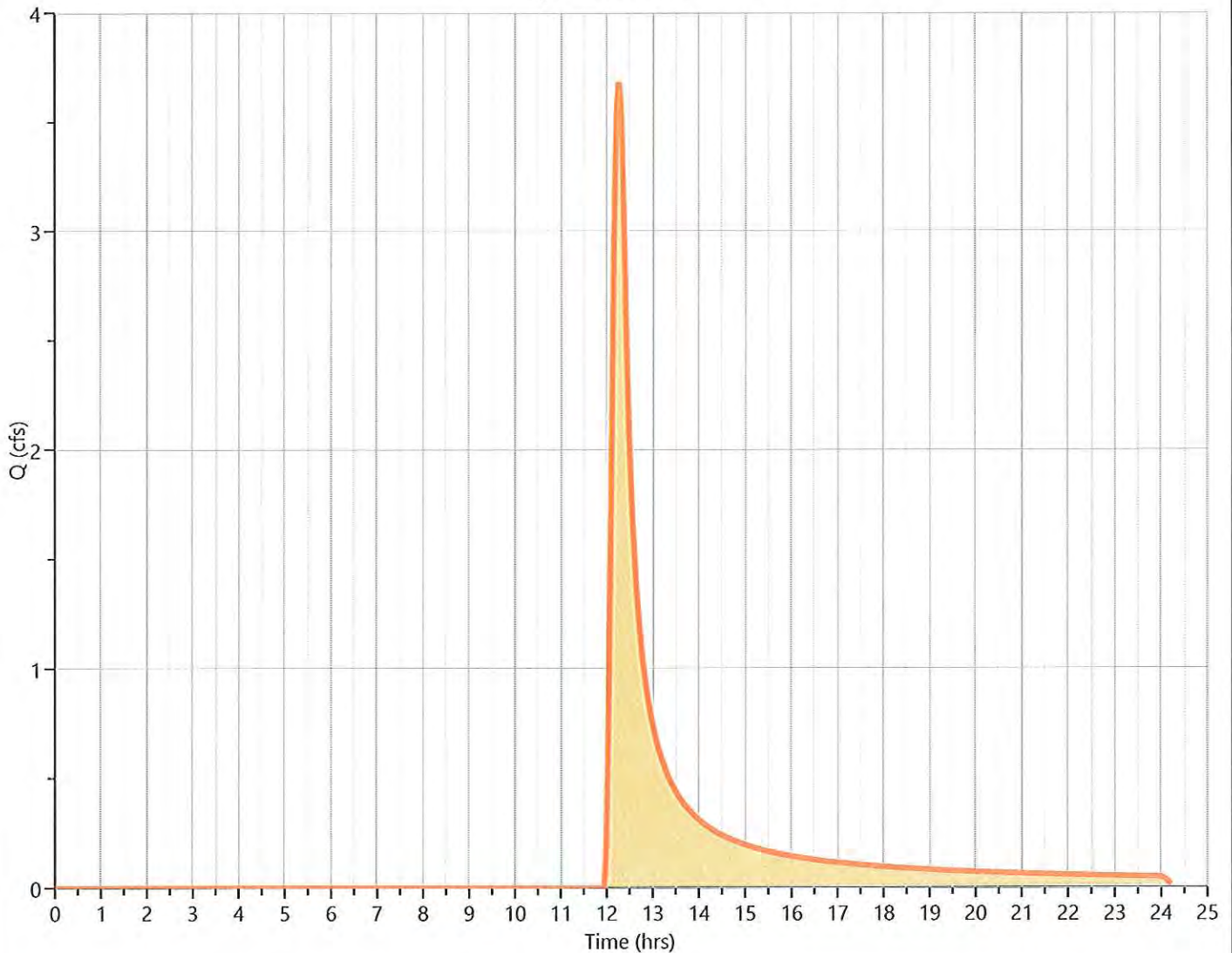
Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 3.682 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.27 hrs
Time Interval	= 2 min	Runoff Volume	= 12,321 cuft
Drainage Area	= 7.48 ac	Curve Number	= 57.75*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 15.97 min
Total Rainfall	= 3.56 in	Design Storm	= Synthetic
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.35	98	Bit/Roofs/Drives
0.92	61	Lawn - Soil B
6.21	55	Woods - Soil B
7.48	58	Weighted CN Method Employed

Qp = 3.68 cfs



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

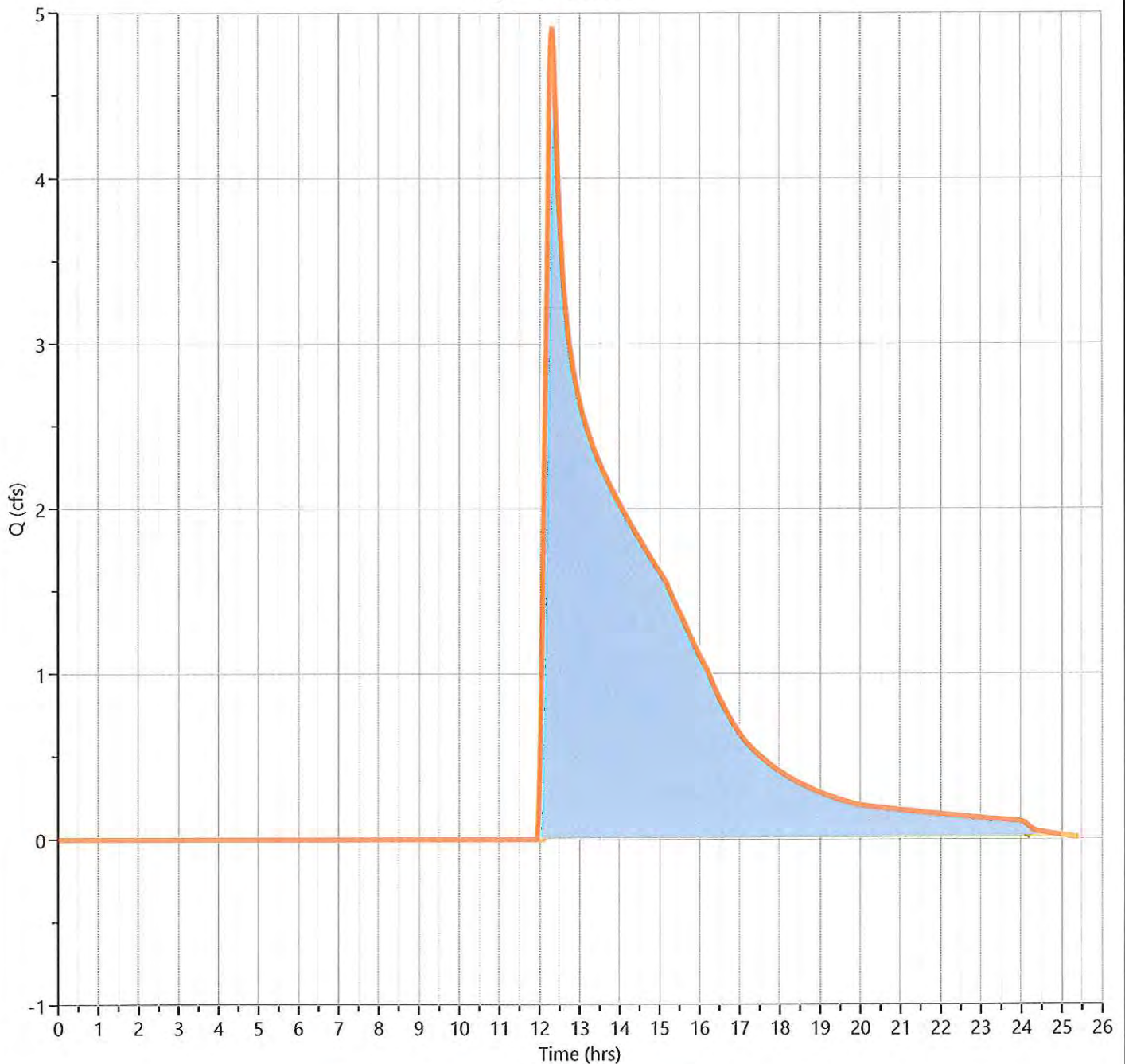
Dev. Tot Point A

Hyd. No. 7

Hydrograph Type = Junction
Storm Frequency = 25-yr
Time Interval = 2 min
Inflow Hydrographs = 5, 6

Peak Flow = 4.914 cfs
Time to Peak = 12.33 hrs
Hydrograph Volume = 40,874 cuft
Total Contrib. Area = 7.48 ac

Qp = 4.91 cfs



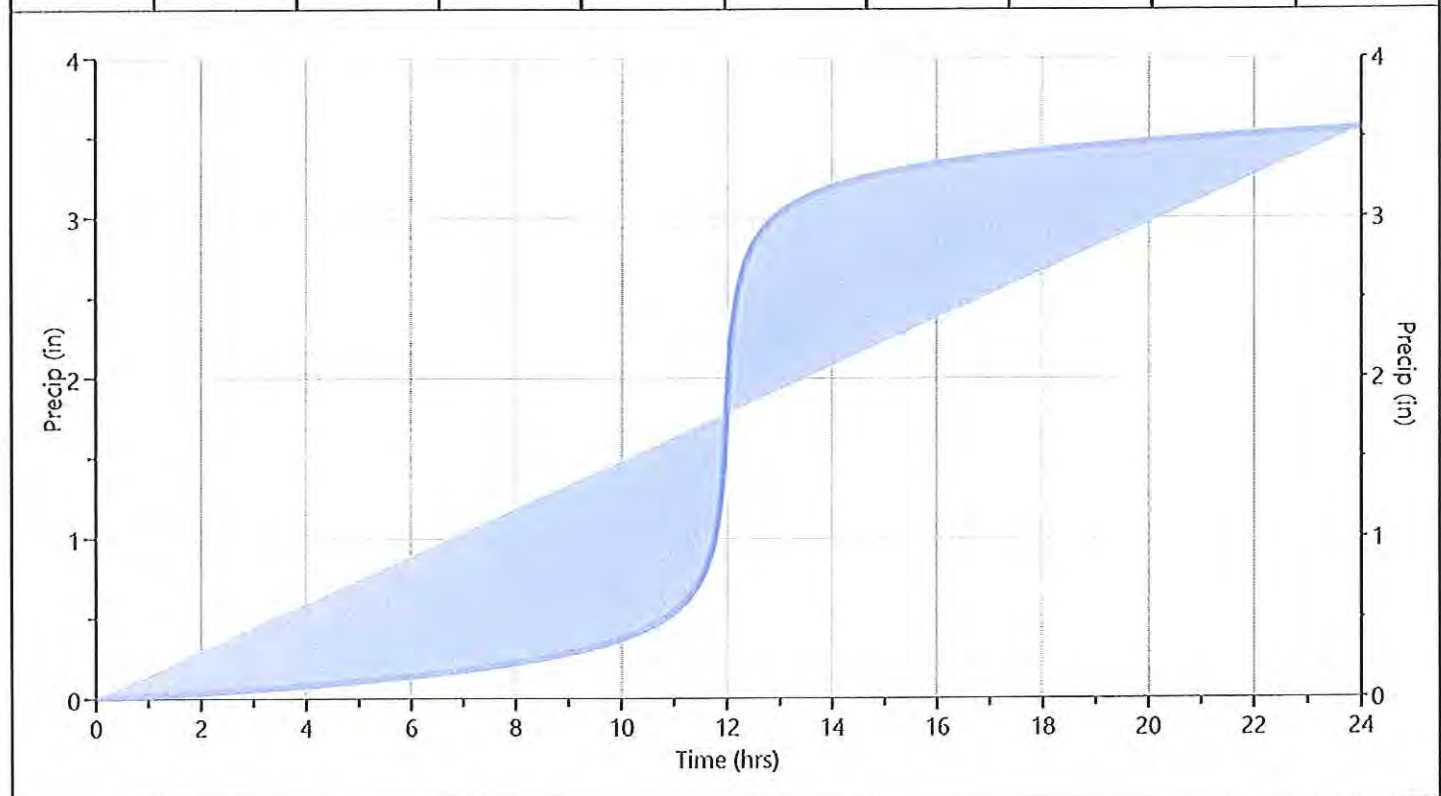
— Det Basin Out — Post Det Bypass — Dev. Tot Point A

Design Storm Report

Storm Distribution: IDF Based - Synthetic

Storm Duration	Total Rainfall Volume (in)								
	1-yr	2-yr	3-yr	5-yr	10-yr	✓ 25-yr	50-yr	100-yr	
24 hrs	0	2.71	0	2.84	3.84	3.56	4.56	5.38	

Incremental Rainfall Distribution, 25-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.851083	11.37	1.492405	11.73	4.088593	12.10	11.252180	12.47	2.255821
11.03	0.887251	11.40	1.594377	11.77	4.706013	12.13	8.849597	12.50	2.071404
11.07	0.926375	11.43	1.709342	11.80	5.497015	12.17	7.184911	12.53	1.911759
11.10	0.968742	11.47	1.839805	11.83	6.536627	12.20	5.979574	12.57	1.772475
11.13	1.014805	11.50	1.988769	11.87	7.946289	12.23	5.075920	12.60	1.650095
11.17	1.065016	11.53	2.160192	11.90	9.933758	12.27	4.379106	12.63	1.541877
11.20	1.119924	11.57	2.359009	11.93	12.879990	12.30	3.829134	12.67	1.445651
11.23	1.180172	11.60	2.591801	11.97	17.549860	12.33	3.386474	12.70	1.359606
11.27	1.246572	11.63	2.867126	12.00	25.681110	12.37	3.024232	12.73	1.282310
11.30	1.319957	11.67	3.196645	12.03	21.001600	12.40	2.723491	12.77	1.212573
11.33	1.401448	11.70	3.596306	12.07	14.925490	12.43	2.470684	12.80	1.149368



Hydrograph 100-yr Summary

Project Name:

12-11-2020

Hydrology Studio v 3.0.0.16

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Pre Point A	16.50	12.27	61,815	----		
2	NRCS Runoff	Det Basin In-1	29.95	12.17	89,694	----		
3	NRCS Runoff	Det. Basin In -2	1.101	12.13	3,263	----		
4	Junction	Det Basin In Tot	31.01	12.17	92,957	2, 3		
5	Pond Route	Det Basin Out	6.912	12.63	71,347	4	114.21	50,295
6	NRCS Runoff	Post Det Bypass	10.89	12.20	36,197	----		
7	Junction	Dev. Tot Point A	13.02	12.23	107,544	5, 6		

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

Pre Point A

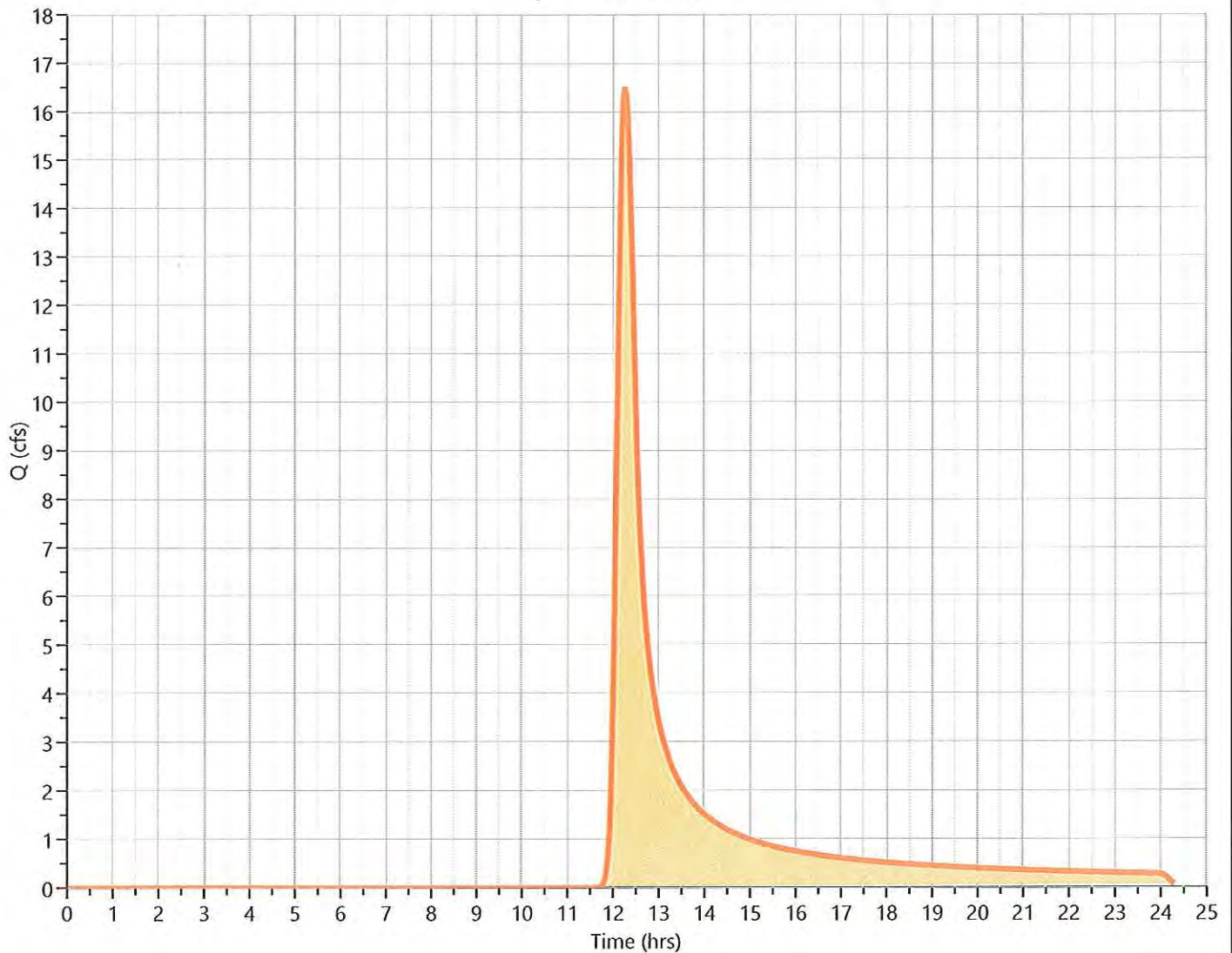
Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 16.50 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.27 hrs
Time Interval	= 2 min	Runoff Volume	= 61,815 cuft
Drainage Area	= 13.68 ac	Curve Number	= 56*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 16.82 min
Total Rainfall	= 5.38 in	Design Storm	= Synthetic
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.21	98	Bit / Roofs / Drives
0.42	30	Brush - Soil A
13.05	56	Woods - Soil B
13.68	56	Weighted CN Method Employed

Qp = 16.50 cfs



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

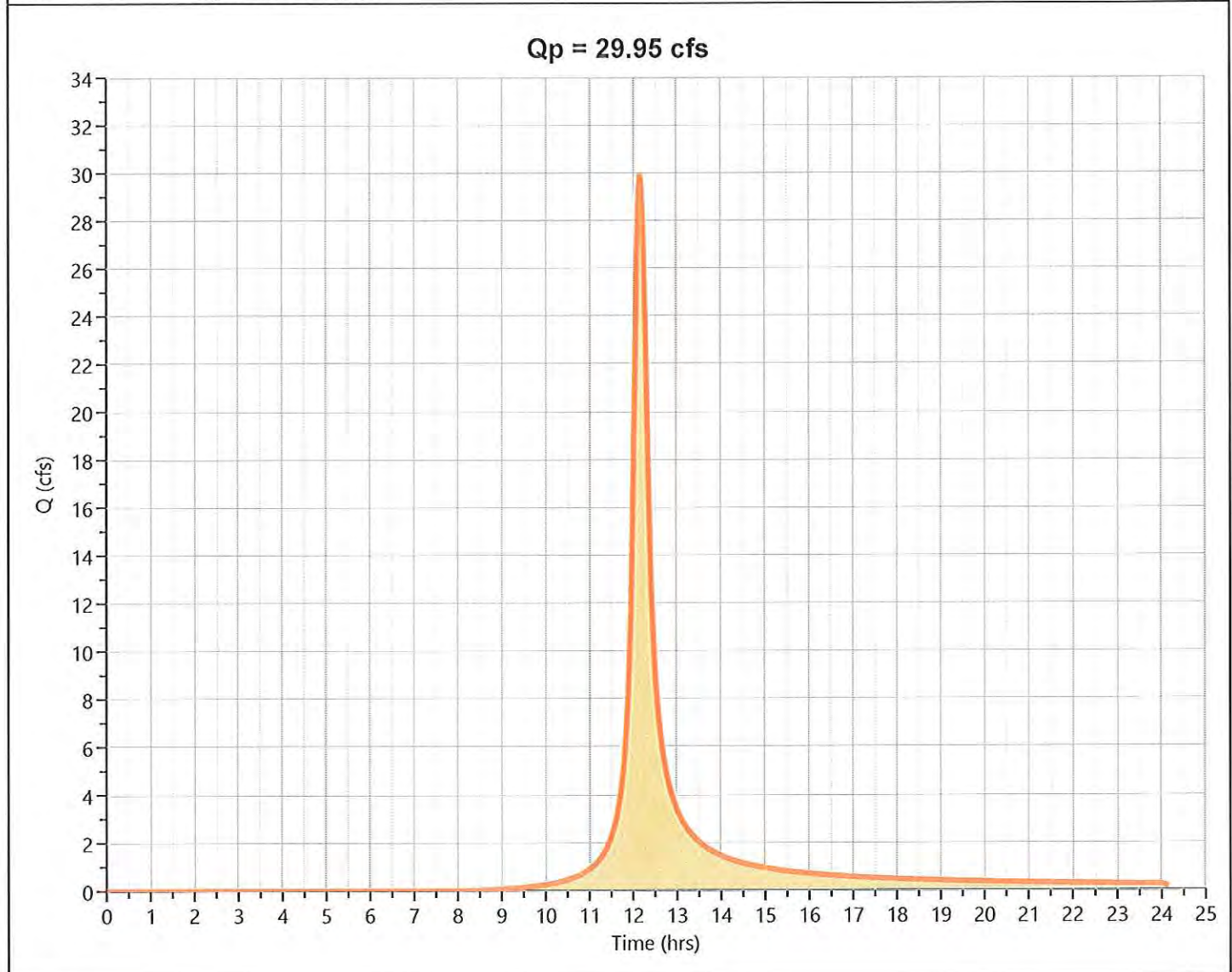
Det Basin In-1

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 29.95 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 89,694 cuft
Drainage Area	= 7.62 ac	Curve Number	= 81*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 14.07 min
Total Rainfall	= 5.38 in	Design Storm	= Synthetic
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
2.95	98	Bit / Roofs / Walks
0.42	39	Lawn - Soil A
3.36	61	Lawn - Soil B
0.89	55	Woods - Soil B
7.62	81	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

Det. Basin In -2

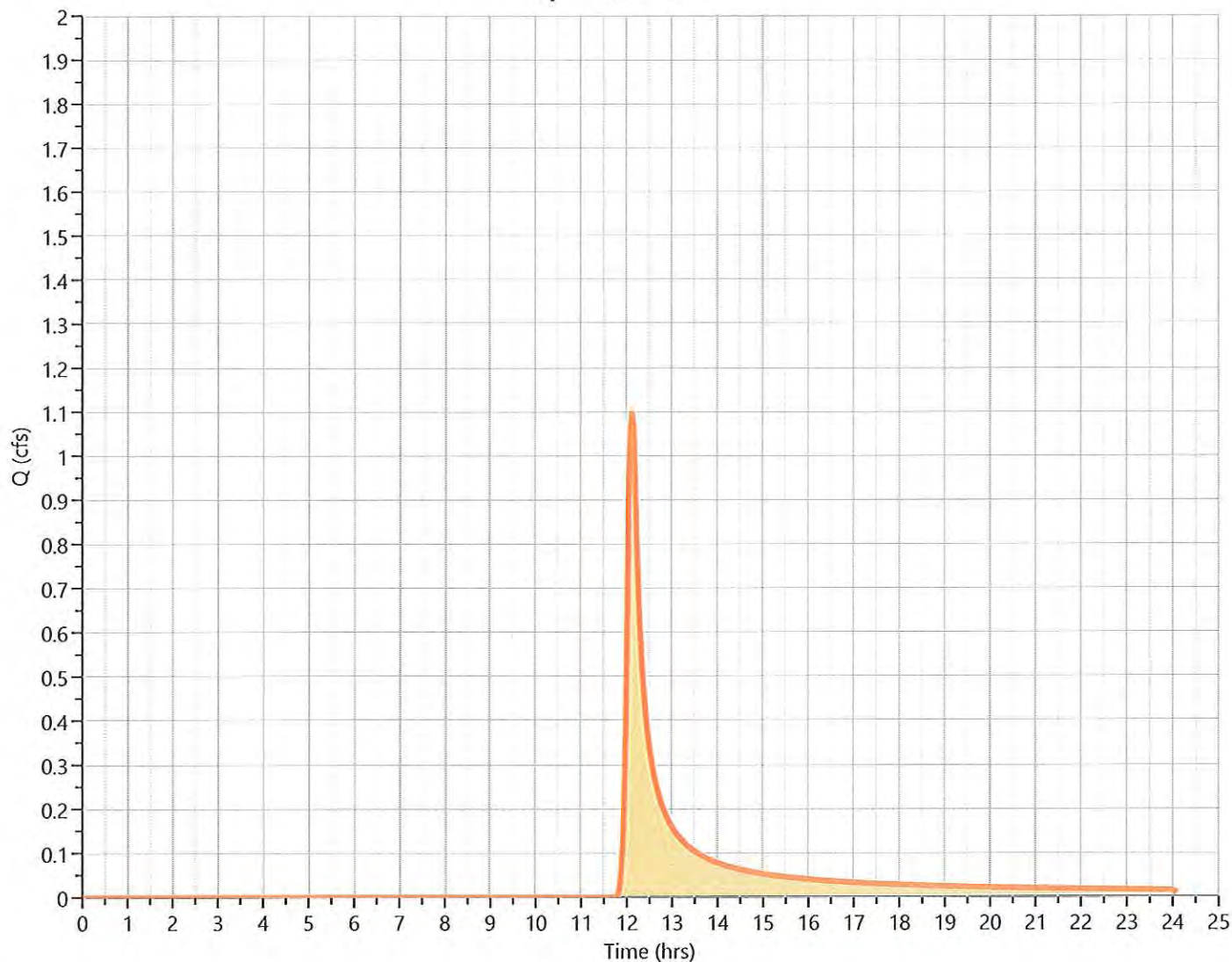
Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 1.101 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.13 hrs
Time Interval	= 2 min	Runoff Volume	= 3,263 cuft
Drainage Area	= 0.81 ac	Curve Number	= 54*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.69 min
Total Rainfall	= 5.38 in	Design Storm	= Synthetic
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.42	39	Lawn - Soil A
0.39	55	Woods - Soil B
0.81	54	Weighted CN Method Employed

Qp = 1.10 cfs



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

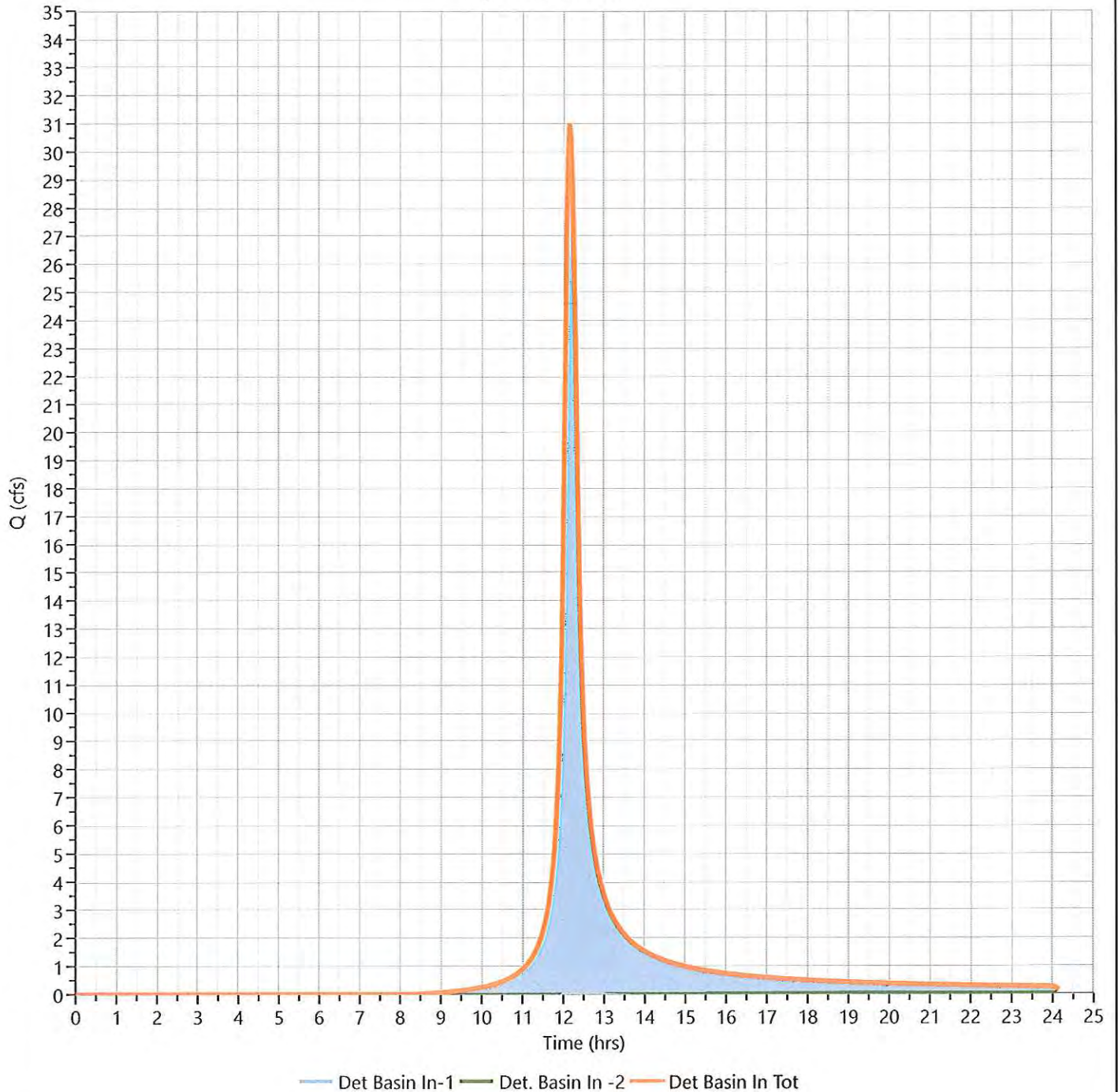
Det Basin In Tot

Hyd. No. 4

Hydrograph Type = Junction
Storm Frequency = 100-yr
Time Interval = 2 min
Inflow Hydrographs = 2, 3

Peak Flow = 31.01 cfs
Time to Peak = 12.17 hrs
Hydrograph Volume = 92,957 cuft
Total Contrib. Area = 8.43 ac

Qp = 31.01 cfs



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

Det Basin Out

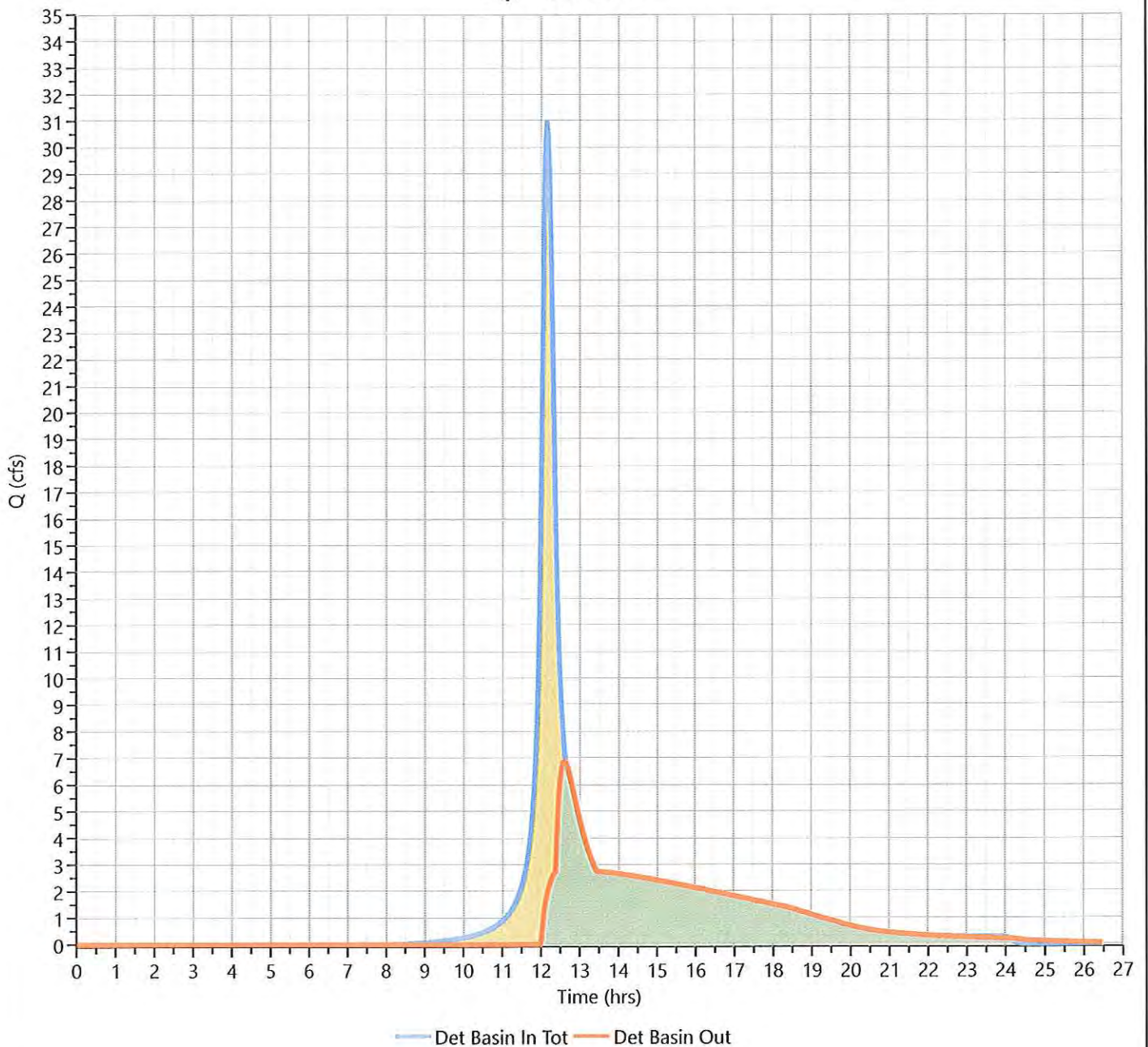
Hyd. No. 5

Hydrograph Type	= Pond Route	Peak Flow	= 6.912 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.63 hrs
Time Interval	= 2 min	Hydrograph Volume	= 71,347 cuft
Inflow Hydrograph	= 4 - Det Basin In Tot	Max. Elevation	= 114.21 ft
Pond Name	= Basin A	Max. Storage	= 50,295 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 2.43 hrs

Qp = 6.91 cfs



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

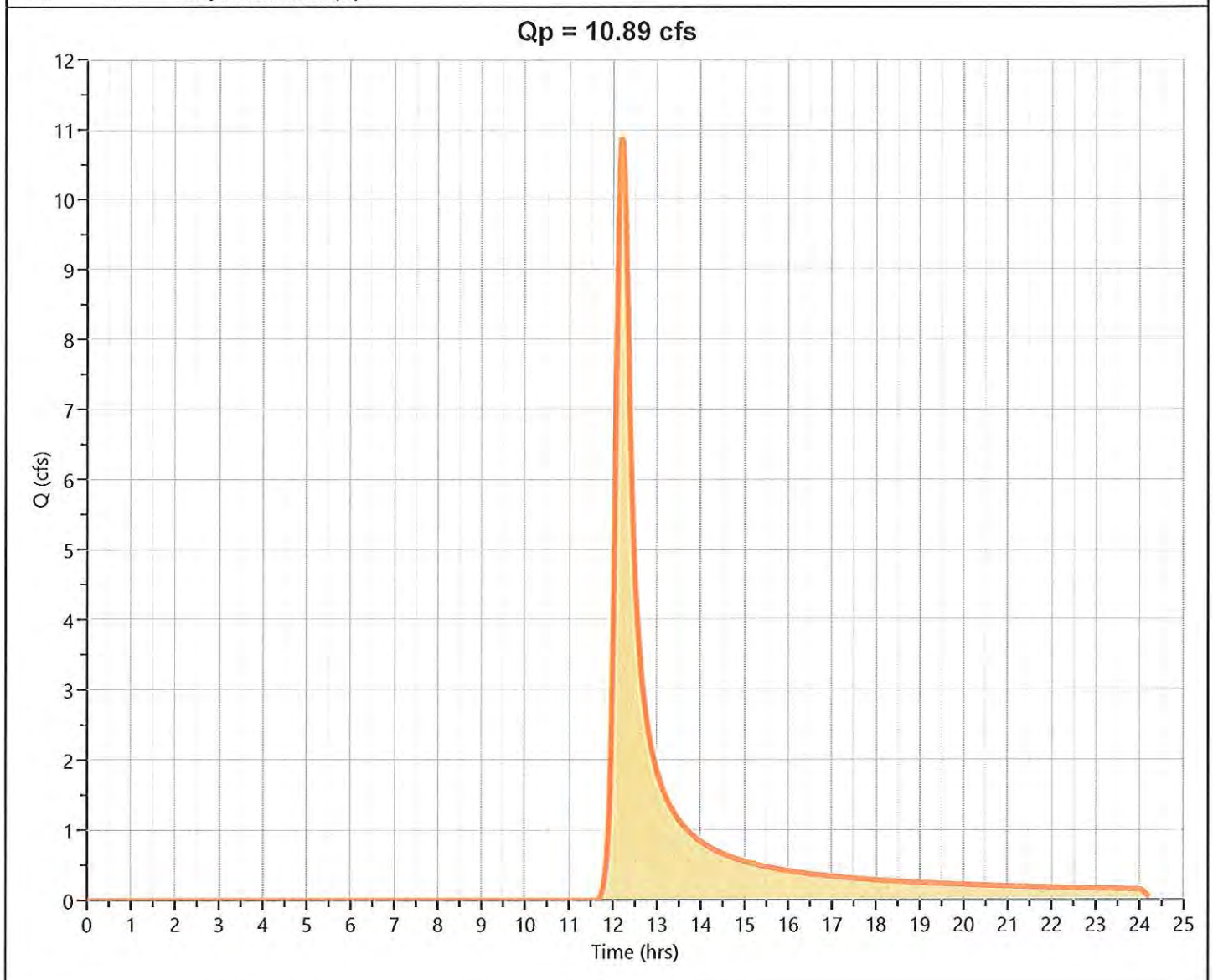
Post Det Bypass

Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 10.89 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.20 hrs
Time Interval	= 2 min	Runoff Volume	= 36,197 cuft
Drainage Area	= 7.48 ac	Curve Number	= 57.75*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 15.97 min
Total Rainfall	= 5.38 in	Design Storm	= Synthetic
Storm Duration	= 24 hrs	Shape Factor	= 484

* Composite CN Worksheet

AREA(ac)	CN	DESCRIPTION
0.35	98	Bit/Roofs/Drives
0.92	61	Lawn - Soil B
6.21	55	Woods - Soil B
7.48	58	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.16

12-11-2020

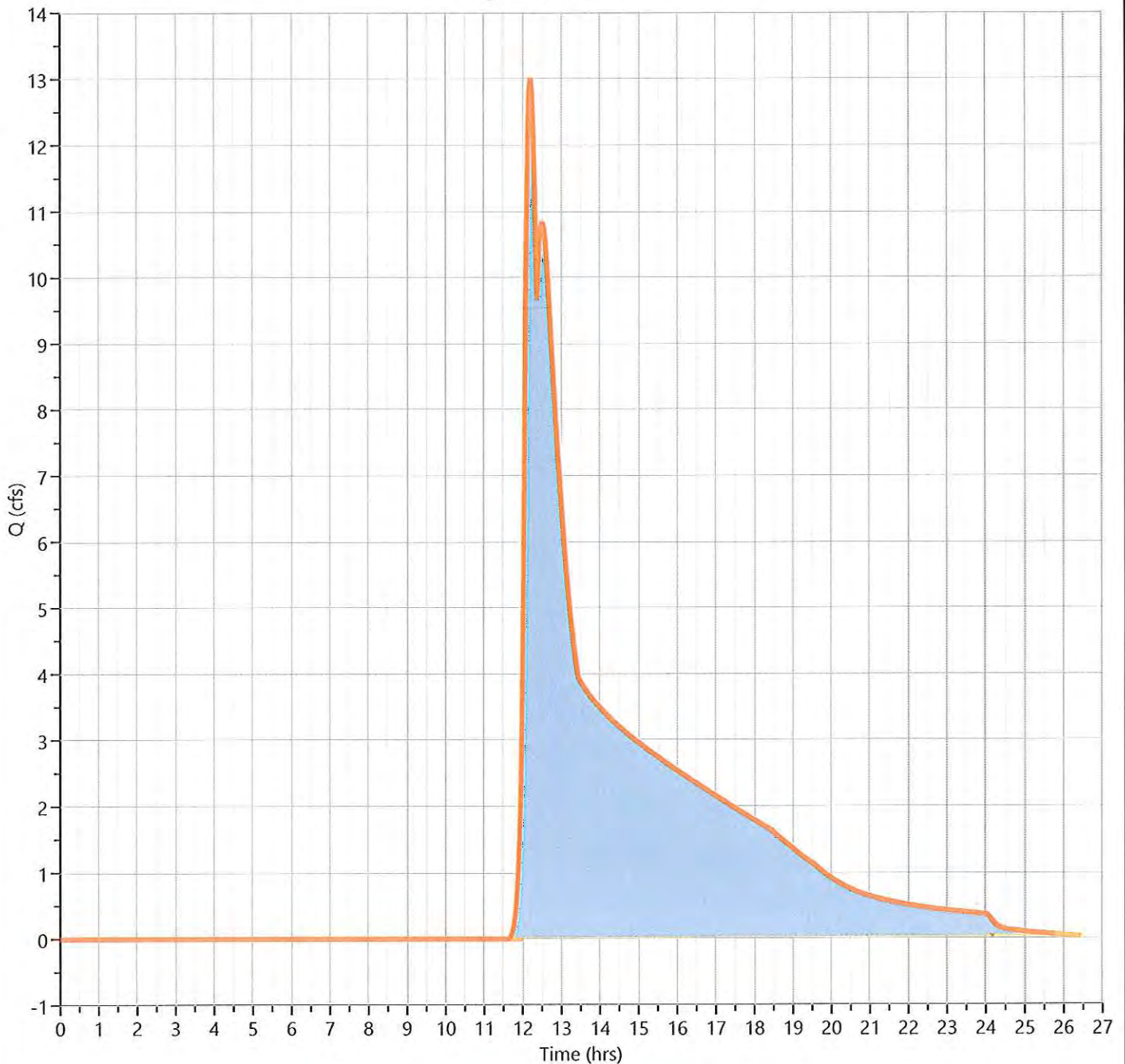
Dev. Tot Point A

Hyd. No. 7

Hydrograph Type = Junction
Storm Frequency = 100-yr
Time Interval = 2 min
Inflow Hydrographs = 5, 6

Peak Flow = 13.02 cfs
Time to Peak = 12.23 hrs
Hydrograph Volume = 107,544 cuft
Total Contrib. Area = 7.48 ac

Qp = 13.02 cfs



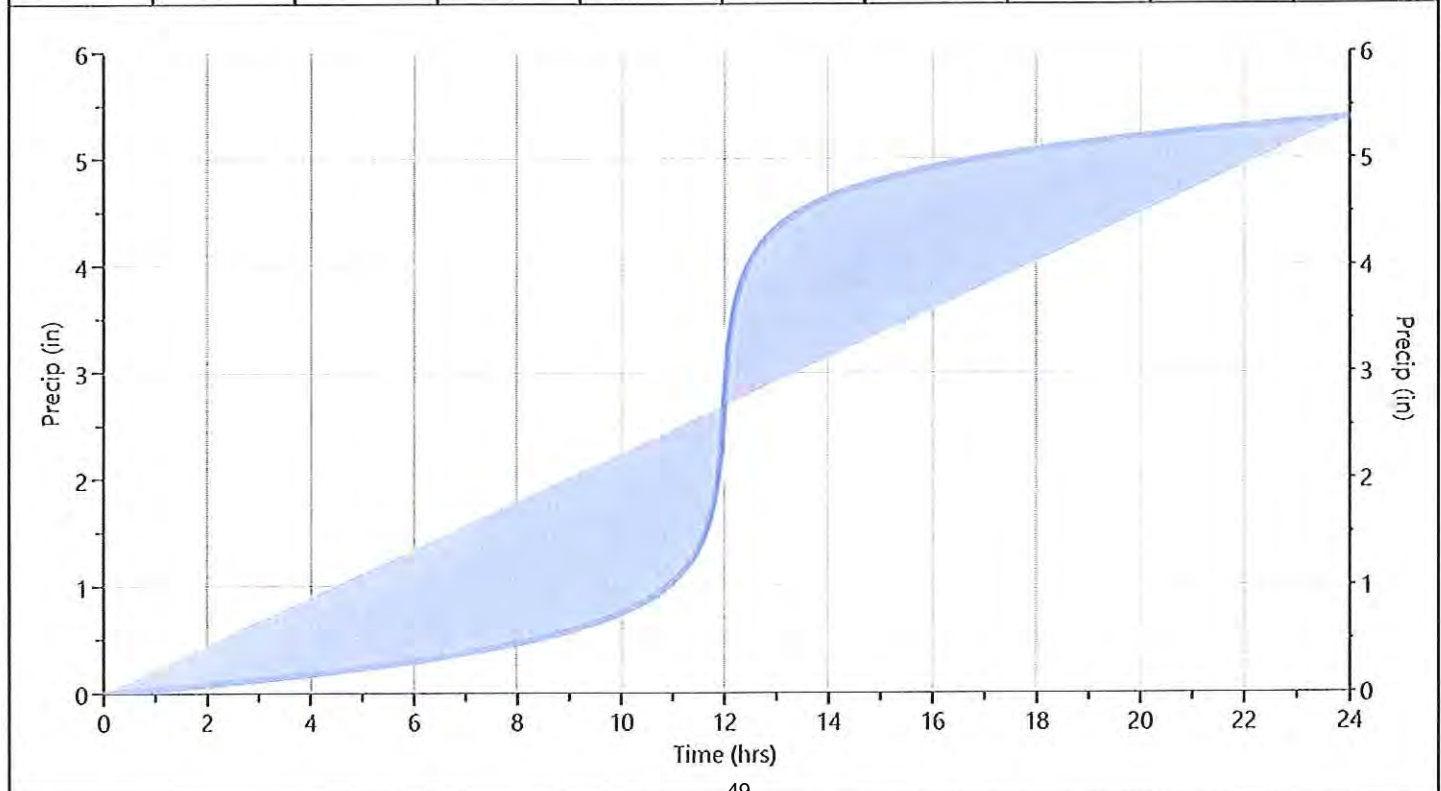
— Det Basin Out — Post Det Bypass — Dev. Tot Point A

Design Storm Report

Storm Distribution: IDF Based - Synthetic

Storm Duration	Total Rainfall Volume (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	✓ 100-yr
24 hrs	0	2.71	0	2.84	3.84	3.56	4.56	5.38

Incremental Rainfall Distribution, 100-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	1.417494	11.37	2.332711	11.73	5.727625	12.10	14.154890	12.47	3.368759
11.03	1.470757	11.40	2.473807	11.77	6.494975	12.13	11.423600	12.50	3.122377
11.07	1.528049	11.43	2.631783	11.80	7.463074	12.17	9.482395	12.53	2.907228
11.10	1.589823	11.47	2.809691	11.83	8.713555	12.20	8.046377	12.57	2.718019
11.13	1.656675	11.50	3.011274	11.87	10.375800	12.23	6.949651	12.60	2.550507
11.17	1.729131	11.53	3.241277	11.90	12.665450	12.27	6.090069	12.63	2.401304
11.20	1.807952	11.57	3.505778	11.93	15.965770	12.30	5.401659	12.67	2.267694
11.23	1.893973	11.60	3.812528	11.97	21.016290	12.33	4.840255	12.70	2.147460
11.27	1.988173	11.63	4.171801	12.00	29.411120	12.37	4.375243	12.73	2.038717
11.30	2.091742	11.67	4.597187	12.03	24.634530	12.40	3.984880	12.77	1.940012
11.33	2.206016	11.70	5.107236	12.07	18.202410	12.43	3.653312	12.80	1.850033





**WENTWORTH CIVIL
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WATER QUALITY VOLUME CALCULATIONS

PREPARED FOR LINDO CONSTRUCTION, LLC
90 MAPLE AVE.
MONTVILLE, CT
DATE: 5-20-20
REV. 2-03-21

AREA = 339,607 SF

IMPERVIOUS AREA = 128,502 SF : I = .38

$WQV = 1''((.05 + (.9)(.38)) \times 339,607 \text{ sf} / 12'' = 11,094 \text{ cf}$

FROM STORMWATER CALCULATION POND DESIGN:

DEPTH OF WQV (MINIMUM BASIN BOTTOM TO LOW FLOW
OUTLET): 1.7 ft

VOLUME PROVIDED BELOW LOW LEVEL OUTLET: 14,000 cf

VOLUME PROVIDED ABOVE LOW LEVEL OUTLET AND BELOW
OUTLET STRUCTURE TOP OF FRAME: 40,000 cf

SEDIMENT FOREBAY (10% WQV): 1,109 cf (MIN.)

SEDIMENT FOREBAY VOLUME PROVIDED: 2,500 cf

Treatment methods of first 1" rainfall from impervious areas (WQV) that falls on proposed roof, walk and pavement areas will be collected by drainage system and discharged to the onsite Infiltration / Detention Basin and stored during small storms of 1" or less. This volume of water will percolate into the bottom of the infiltration basin over a period up to 24 hours.

Composite C Worksheet

SuzhfwQöp h#k3IP dsöHjDyh1

Wæp z dñuHxg Ir f5353 j/f5.B.B.54

4504405353

Line No	Description	Drainage Area (ac)	Runoff Coeff (C)	C x A	Composite (C)	Structure ID
1	Bit / Roof	0.030	0.90	0.027	0.59	CB 212
	Grass	0.040	0.35	0.014		
	Totals	0.070		0.041		
2	Bit / Roof	0.090	0.90	0.081	0.60	CB 214
	Grass	0.110	0.35	0.039		
	Totals	0.200		0.120		
3	Bit / Roof	0.020	0.90	0.018	0.57	CB 213
	Grass	0.030	0.35	0.011		
	Totals	0.050		0.029		
4	Bit. / Roof	0.040	0.90	0.036	0.29	CB 215
	Grass	0.100	0.35	0.035		
	Woods	0.350	0.20	0.070		
Totals	0.490		0.141			
5	Bit / Roof	0.070	0.90	0.063	0.35	CB 217
	Grass	0.130	0.35	0.046		
	Woods	0.250	0.20	0.050		
Totals	0.450		0.159			
6	Bit / Roof	0.040	0.90	0.036	0.49	CB 219
	Grass	0.120	0.35	0.042		
	Totals	0.160		0.078		
7	Bit / Roof	0.260	0.90	0.234	0.60	CB221
	Grass	0.180	0.17	0.031		
	Totals	0.440		0.265		
8	Bit / Roof	0.070	0.90	0.063	0.50	CB 223
	Grass	0.190	0.35	0.067		
	Totals	0.260		0.130		

Composite C Worksheet

SuzhfwQ dp h#k3iP dsd#Dyh1

Wrup z dwhu#Mxg Ir #5353#y#B B B 54

4504405353

Line No	Description	Drainage Area (ac)	Runoff Coeff (C)	C x A	Composite (C)	Structure ID
9	Bit / Roof	0.170	0.90	0.153	0.68	CB 241
	Grass	0.080	0.22	0.018		
	Totals	0.250		0.171		
10	Bit / Roof	0.120	0.90	0.108	0.55	CB 237
	Grass	0.130	0.22	0.029		
	Totals	0.250		0.137		
11	Bit / Roof	0.130	0.90	0.117	0.57	CB 235
	Grass	0.120	0.22	0.026		
	Totals	0.250		0.143		
12	Bit / Roof	0.230	0.90	0.207	0.62	CB 233
	Grass	0.160	0.22	0.035		
	Totals	0.390		0.242		
13	Bit / Roof	0.270	0.90	0.243	0.72	CB 234
	Grass	0.100	0.22	0.022		
	Totals	0.370		0.265		
14	Bit / Roof	0.110	0.90	0.099	0.64	CB 232
	Grass	0.070	0.22	0.015		
	Totals	0.180		0.114		
15	Bit / Roof	0.020	0.90	0.018	0.57	CB 211
	Grass	0.030	0.35	0.011		
	Totals	0.050		0.029		
16	Grass	0.200	0.35	0.070	0.23	CB 241
	Woods	0.800	0.20	0.160		
	Totals	1.000		0.230		

Composite C Worksheet

SuzhfwQ dQ h#k3IP dsdihDyñ1

Vwzup z dwhufMxg zrf5353#y#6B B 54

4504405353

Line No	Description	Drainage Area (ac)	Runoff Coeff (C)	C x A	Composite (C)	Structure ID
17	Bit / Roof	0.090	0.90	0.081	0.59	CB 220
	Grass	0.120	0.35	0.042		
	Totals	0.210		0.123		
18	Bit / Roof	0.130	0.90	0.117	0.55	CB 225
	Grass	0.140	0.22	0.031		
	Totals	0.270		0.148		
19	Bit / Roof	0.140	0.90	0.126	0.48	CB 226
	Grass	0.230	0.22	0.051		
	Totals	0.370		0.177		
20	Bit / Roofs	0.230	0.90	0.207	0.35	CB 239
	Grass	1.010	0.22	0.222		
	Totals	1.240		0.429		
21	Bit / Roof	0.050	0.90	0.045	0.53	CB 238
	Grass	0.050	0.17	0.009		
	Totals	0.100		0.054		
22	Bit / Roof	0.270	0.90	0.243	0.62	CB 236
	Grass	0.190	0.22	0.042		
	Totals	0.460		0.285		
24	Bit.	0.120	0.90	0.108	0.58	EXIST CB (S)
	Grass	0.140	0.30	0.042		
	Totals	0.260		0.150		
27	Bit	0.030	0.90	0.027	0.90	CB 110
	Grass	0.040	0.90	0.036		
	Totals	0.070		0.063		

Composite C Worksheet

Line No	Description	Drainage Area (ac)	Runoff Coeff (C)	C x A	Composite (C)	Structure ID
28	Bit	0.030	0.90	0.027		CB 111
	Grass	0.040	0.30	0.012		
	Totals	0.070		0.039	0.56	

Inlet Report

Stormwater Studio 2020 v 3.0.0.21

Project Name: 90 Maple Ave.

12-11-2020

Line No	Inlet		Q				Curb		Grate			Gutter							Inlet			Byp Line No				
	Id	Type	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Ht (in)	L (ft)	L (ft)	W (ft)	Area (sqft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depth (ft)		Spread (ft)	Depth (ft)	Spread (ft)	Depth (ft)
1	CB 212	Combination	0.27	0.00	0.27	0.00	4.0	3.20	3.20	3.20	-	0.070	11.00	0.032	0.032	0.013	0.07	2.12	0.07	2.12	0.07	2.12	0.07	2.12	0.07	0.0
2	CB 214	Combination	0.78	0.00	0.78	0.00	4.0	3.20	3.20	1.60	-	0.070	11.00	0.032	0.032	0.013	0.10	3.19	0.10	3.19	0.10	3.19	0.10	3.19	0.10	0.0
3	CB 213	Combination	0.19	0.00	0.19	0.00	4.0	3.20	3.20	1.60	-	0.070	11.00	0.032	0.032	0.013	0.06	1.87	0.06	1.87	0.06	1.87	0.06	1.87	0.06	0.0
4	CB 215	Combination	0.93	0.00	0.93	0.00	4.0	3.20	3.20	1.60	-	0.075	11.00	0.032	0.032	0.013	0.11	3.34	0.11	3.34	0.11	3.34	0.11	3.34	0.11	0.0
5	CB 217	Combination	1.03	0.00	1.03	0.00	4.0	3.20	3.20	1.60	-	0.075	11.00	0.032	0.032	0.013	0.11	3.47	0.11	3.47	0.11	3.47	0.11	3.47	0.11	0.0
6	CB 219	Combination	0.51	0.00	0.51	0.00	4.0	3.20	3.20	1.60	-	0.100	11.00	0.032	0.032	0.013	0.08	2.53	0.08	2.53	0.08	2.53	0.08	2.53	0.08	0.0
7	CB221	Combination	1.72	0.00	1.72	0.00	4.0	3.20	3.20	1.60	-	0.070	11.00	0.032	0.032	0.013	0.14	4.25	0.14	4.25	0.14	4.25	0.14	4.25	0.14	0.0
8	CB 223	Combination	0.85	0.00	0.85	0.00	4.0	3.20	3.20	1.60	5.12	Seg	11.00	0.032	0.032	0.013	0.16	4.86	0.16	4.86	0.16	4.86	0.16	4.86	0.16	0.0
9	CB 241	Combination	1.11	0.00	1.11	0.00	4.0	3.20	3.20	1.60	-	0.020	11.00	0.032	0.032	0.013	0.15	4.56	0.15	4.56	0.15	4.56	0.15	4.56	0.15	0.0
10	CB 237	Combination	0.90	0.00	0.90	0.00	4.0	3.20	3.20	1.60	-	0.014	11.00	0.032	0.032	0.013	0.14	4.50	0.14	4.50	0.14	4.50	0.14	4.50	0.14	0.0
11	CB 235	Combination	0.93	0.00	0.93	0.00	4.0	3.20	3.20	1.60	-	0.020	11.00	0.032	0.032	0.013	0.14	4.28	0.14	4.28	0.14	4.28	0.14	4.28	0.14	0.0
12	CB 233	Combination	1.58	0.00	1.58	0.00	4.0	3.20	3.20	1.60	-	0.020	11.00	0.032	0.032	0.013	0.17	5.22	0.17	5.22	0.17	5.22	0.17	5.22	0.17	0.0
13	CB 234	Combination	1.74	0.00	1.74	0.00	4.0	3.20	3.20	1.60	5.12	Seg	11.00	0.032	0.032	0.013	0.24	7.36	0.24	7.36	0.24	7.36	0.24	7.36	0.24	0.0
14	CB 232	Combination	0.75	0.00	0.75	0.00	4.0	3.20	3.20	1.60	-	0.010	11.00	0.032	0.032	0.013	0.14	4.50	0.14	4.50	0.14	4.50	0.14	4.50	0.14	0.0
15	CB 211	Combination	0.19	0.00	0.19	0.00	4.0	3.20	3.20	3.20	-	0.070	11.00	0.032	0.032	0.013	0.06	1.87	0.06	1.87	0.06	1.87	0.06	1.87	0.06	0.0
16	CB 241	Drop Grate	1.50	0.00	1.50	0.00	-	-	-	1.60	5.12	Seg	11.00	0.032	0.032	0.013	0.14	19.72	0.14	19.72	0.14	19.72	0.14	19.72	0.14	0.0
17	CB 220	Combination	0.81	0.00	0.81	0.00	4.0	3.20	3.20	1.60	-	0.100	11.00	0.032	0.032	0.013	0.10	3.00	0.10	3.00	0.10	3.00	0.10	3.00	0.10	0.0
18	CB 225	Combination	0.97	0.00	0.97	0.00	4.0	3.20	3.20	1.60	-	0.090	11.00	0.032	0.032	0.013	0.11	3.28	0.11	3.28	0.11	3.28	0.11	3.28	0.11	0.0
19	CB 226	Combination	1.16	0.00	1.16	0.00	4.0	3.20	3.20	1.60	-	0.090	11.00	0.032	0.032	0.013	0.11	3.50	0.11	3.50	0.11	3.50	0.11	3.50	0.11	0.0
20	CB 239	Drop Grate	2.56	0.00	2.56	0.00	-	-	-	1.60	5.12	Seg	11.00	0.032	0.032	0.013	0.20	23.45	0.20	23.45	0.20	23.45	0.20	23.45	0.20	0.0
21	CB 238	Combination	0.35	0.00	0.35	0.00	4.0	3.20	3.20	1.60	-	0.014	11.00	0.032	0.032	0.013	0.10	3.16	0.10	3.16	0.10	3.16	0.10	3.16	0.10	0.0
22	CB 236	Combination	1.86	0.00	1.86	0.00	4.0	3.20	3.20	1.60	-	0.020	11.00	0.032	0.032	0.013	0.18	5.53	0.18	5.53	0.18	5.53	0.18	5.53	0.18	0.0

Notes: Return Period = 10-yrs. All curb inlets are Horiz throat.

Project File: Pipe Design.sws

Inlet Report

Stormwater Studio 2020 v 3.0.0.21

Project Name: 90 Maple Ave.

12-11-2020

Line No	Inlet		Q				Curb		Grate			Gutter							Inlet			Byp Line No		
	Id	Type	Catch (cfs)	Carry (cfs)	Capt (cfs)	Byp (cfs)	Ht (in)	L (ft)	L (ft)	W (ft)	Area (sqft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depth (ft)		Spread (ft)	Depr (in)
23	EXIST CB (N)	Combination	0.53	0.00	0.53	0.00	4.0	3.20	3.20	1.60	2.56	Sag	11.00	0.030	0.030	0.013	0.12	4.13	0.12	4.13	0.12	4.13	0.0	0
24	EXIST CB (S)	Combination	0.99	0.00	0.99	0.00	4.0	3.20	3.20	1.60	2.56	Sag	11.00	0.030	0.030	0.013	0.16	5.47	0.16	5.47	0.16	5.47	0.0	23
25	CB 112	Grate	3.62	0.00	3.62	0.00	-	-	3.20	1.60	2.56	Sag	11.00	0.030	0.030	0.013	0.35	11.75	0.35	11.75	0.35	11.75	0.0	24
26	DET BASIN OUT	Grate	1.87	0.00	1.87	0.00	-	-	3.20	1.60	2.56	Sag	11.00	0.030	0.030	0.013	0.24	7.85	0.24	7.85	0.24	7.85	0.0	25
27	CB 110	Combination	0.41	0.00	0.41	0.00	4.0	3.20	3.20	1.60	-	0.030	11.00	0.030	0.030	0.013	0.09	3.03	0.09	3.03	0.09	3.03	0.0	24
28	CB 111	Combination	0.26	0.00	0.26	0.00	4.0	3.20	3.20	1.60	-	0.030	11.00	0.030	0.030	0.013	0.08	2.57	0.08	2.57	0.08	2.57	0.0	24

Notes: Return Period = 10-yrs. All curb inlets are Horiz throat.

Project File: Pipe Design.sws

Storm Sewer Tabulation

Stormwater Studio 2020 v 3.0.0.21

Project Name: 90 Maple Ave.

12-11-2020

Line ID	Length (ft)	Drng Area (ac)		Rational (C)	C x A		Tc (min)		Intensity (in/hr)	Total Q (cfs)	Capacity (cfs)	Velocity (ft/s)	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr (ac)	Total (ac)		Incr	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
212-210	100.00	0.070	7.510	0.59	3.52	0.04	5.0	13.96	5.73	20.16	18.92	6.42	24	0.70	112.10	111.40	114.20	113.40	116.48	111.40	1
214-212	133.24	0.200	6.390	0.60	3.22	0.12	5.0	13.84	5.76	18.51	30.62	13.70	18	8.50	123.43	112.10	124.89	112.99	127.25	116.48	2
213-214	18.52	0.050	6.190	0.57	3.10	0.03	5.0	13.81	5.76	17.84	13.37	10.10	18	1.62	123.75	123.45	126.21	125.67	127.25	127.25	3
215-213	104.61	0.490	6.140	0.29	3.07	0.14	8.0	13.70	5.78	17.73	29.04	10.09	18	7.65	131.75	123.75	133.20	127.17	135.25	127.25	4
217-215	103.60	0.450	5.650	0.35	2.93	0.16	5.0	13.60	5.80	16.97	28.25	9.67	18	7.24	139.25	131.75	140.69	133.94	142.95	135.25	5
219-217	147.05	0.160	5.200	0.49	2.77	0.08	5.0	13.45	5.82	16.12	29.68	12.66	18	7.99	151.50	139.75	152.93	140.58	156.75	142.95	6
221-219	141.42	0.440	4.830	0.60	2.57	0.26	5.0	13.33	5.85	15.00	34.83	13.13	18	11.00	169.11	153.55	170.51	154.28	172.30	156.75	7
223-221	31.43	0.260	4.390	0.50	2.30	0.13	5.0	13.29	5.85	13.48	22.08	9.37	18	4.42	170.19	168.80	171.56	169.80	173.69	172.30	8
241-223	139.42	0.250	3.490	0.68	1.85	0.17	5.0	13.10	5.89	10.87	22.18	6.51	18	4.46	176.71	170.49	177.97	172.40	180.21	173.69	9
237-241	213.88	0.250	2.000	0.55	1.24	0.14	5.0	6.55	6.53	8.11	12.72	5.25	18	1.47	179.85	176.71	180.94	178.50	183.36	180.21	10
235-237	187.69	0.250	1.650	0.57	1.05	0.14	5.0	6.17	6.53	6.87	9.34	5.92	15	2.09	183.78	179.85	184.83	181.19	187.28	183.36	11
233-235	190.84	0.390	0.940	0.62	0.62	0.24	5.0	5.83	6.53	4.07	12.82	4.09	15	3.94	191.30	183.78	192.11	185.33	194.50	187.28	12
234-233	26.08	0.370	0.550	0.72	0.38	0.27	5.0	5.75	6.53	2.49	8.19	4.50	15	1.61	191.72	191.30	192.36	191.83	195.60	194.50	13
232-234	158.88	0.180	0.180	0.64	0.12	0.12	5.0	5.00	6.53	0.75	6.44	1.71	15	0.99	193.30	191.72	193.65	192.73	196.50	195.60	14
211-212	20.00	0.050	1.050	0.57	0.26	0.03	5.0	5.28	6.53	1.69	7.91	1.38	15	1.50	112.98	112.68	114.96	114.95	116.48	116.48	15
241-211	65.53	1.000	1.000	0.23	0.23	0.23	5.0	5.00	6.53	1.50	5.70	1.22	15	0.78	113.49	112.98	115.02	114.98	118.50	116.48	16
220-219	18.44	0.210	0.210	0.59	0.12	0.12	5.0	5.00	6.53	0.81	8.24	0.95	15	1.63	153.55	153.25	154.26	154.26	156.75	156.75	17
225-223	134.12	0.270	0.640	0.55	0.33	0.15	5.0	5.08	6.53	2.13	21.52	2.76	15	11.11	185.39	170.49	185.97	172.72	188.79	173.69	18
226-225	18.64	0.370	0.370	0.48	0.18	0.18	5.0	5.00	6.53	1.16	6.69	1.78	15	1.07	185.59	185.39	186.16	186.18	188.79	188.79	19
239-241	70.19	1.240	1.240	0.35	0.43	0.43	13.0	13.00	5.91	2.56	20.95	3.07	15	10.53	184.10	176.71	184.74	178.66	187.30	180.21	20
238-237	18.53	0.100	0.100	0.53	0.05	0.05	5.0	5.00	6.53	0.35	8.35	0.28	15	1.67	180.16	179.85	181.48	181.48	183.36	183.36	21
236-235	18.48	0.460	0.460	0.62	0.29	0.29	5.0	5.00	6.53	1.86	8.23	1.52	15	1.62	184.08	183.78	185.43	185.41	187.28	187.28	22

Project File: Pipe Design.sws

Notes: IDF File = SampleIDF.idf, Return Period = 10-yrs.

Storm Sewer Tabulation

Stormwater Studio 2020 v 3.0.0.21

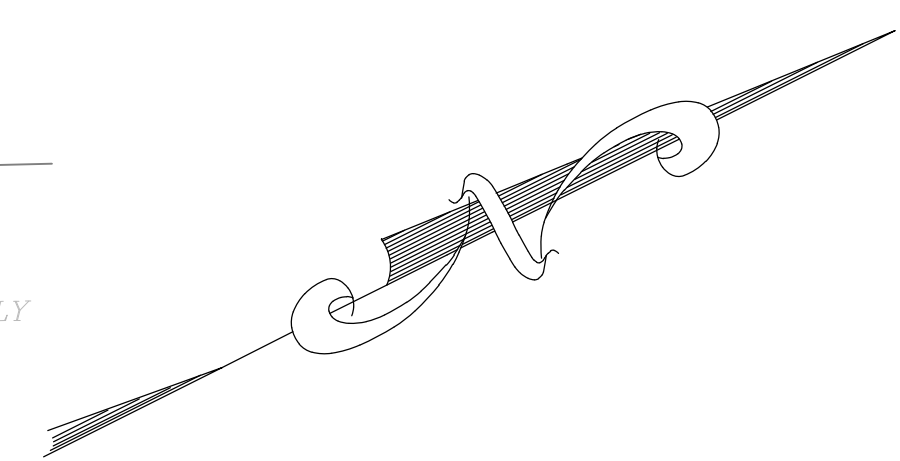
Project Name: 90 Maple Ave.

12-11-2020

Line ID	Length (ft)	Drng Area (ac)		Rational (C)	C x A		Tc (min)		Intensity (in/hr)	Total Q (cfs)	Capacity (cfs)	Velocity (ft/s)	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
EXIST CB N - OUT	118.77	0.090	0.490	0.90	0.08	0.33	10.0	16.19	5.38	7.29	12.41	4.88	107.35	102.60	108.38	104.10	110.50	90.00			23
EXIST CB S-EXIST CB N	38.97	0.260	0.400	0.58	0.15	0.25	10.0	16.09	5.39	6.85	11.41	5.81	107.86	107.40	108.86	108.31	110.10	110.50			24
112-EX CB S	30.87	0.000	0.140	0.00	0.00	0.10	16.0	16.00	5.41	6.04	8.97	4.05	108.16	107.86	109.24	109.19	110.60	110.10			25
Det Out - 112	76.18	0.000	0.000	0.00	0.00	0.00	0.0	0.00	6.53	1.87	8.97	1.49	108.90	108.16	109.71	109.68	116.50	110.60			26
111-112	27.67	0.070	0.140	0.90	0.06	0.10	10.0	10.14	6.50	0.66	3.10	0.85	108.44	108.16	109.70	109.69	110.58	110.60			27
111-110	20.05	0.070	0.070	0.56	0.04	0.04	10.0	10.00	6.53	0.26	3.08	0.33	108.64	108.44	109.71	109.71	110.58	110.58			28

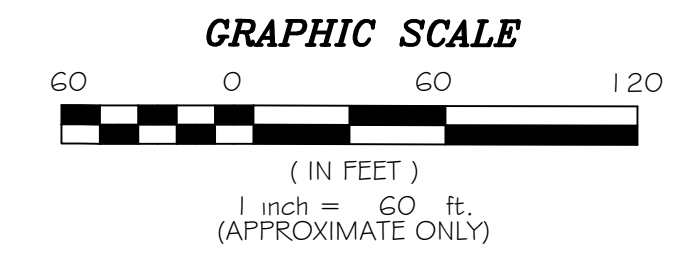
Notes: IDF File = SampleIDF.idf, Return Period = 10-ys.

Project File: Pipe Design.sws



WARNING: THESE PLANS NOT TO BE USED FOR LOCATION OF UNDERGROUND UTILITIES.
CALL BEFORE YOU DIG 1-800-922-4455 TWO WORKING DAYS BEFORE YOU DIG.

LOCATION OF EXISTING FEATURES TAKEN FROM TOWN GIS MAPS & FIELD SKETCHES.
THIS PLAN IS NOT TO BE CONSTRUED AS AN ACCURATE SURVEY OR USED BEYOND INTENDED PURPOSES
OF PROJECT FEASIBILITY PURPOSES.



APPENDIX A

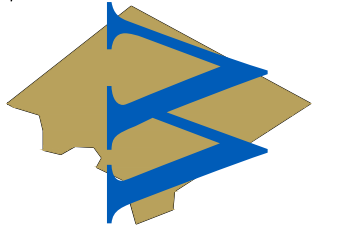
CATCH BASIN DRAINAGE AREA MAP
90 MAPLE AVE

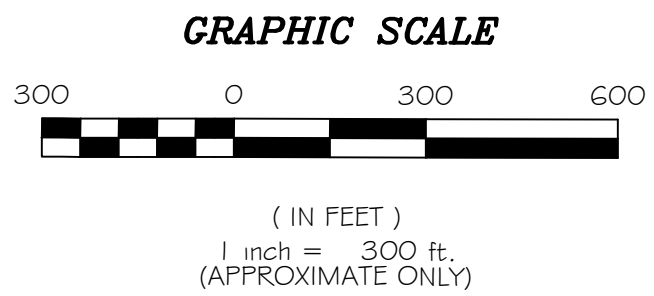
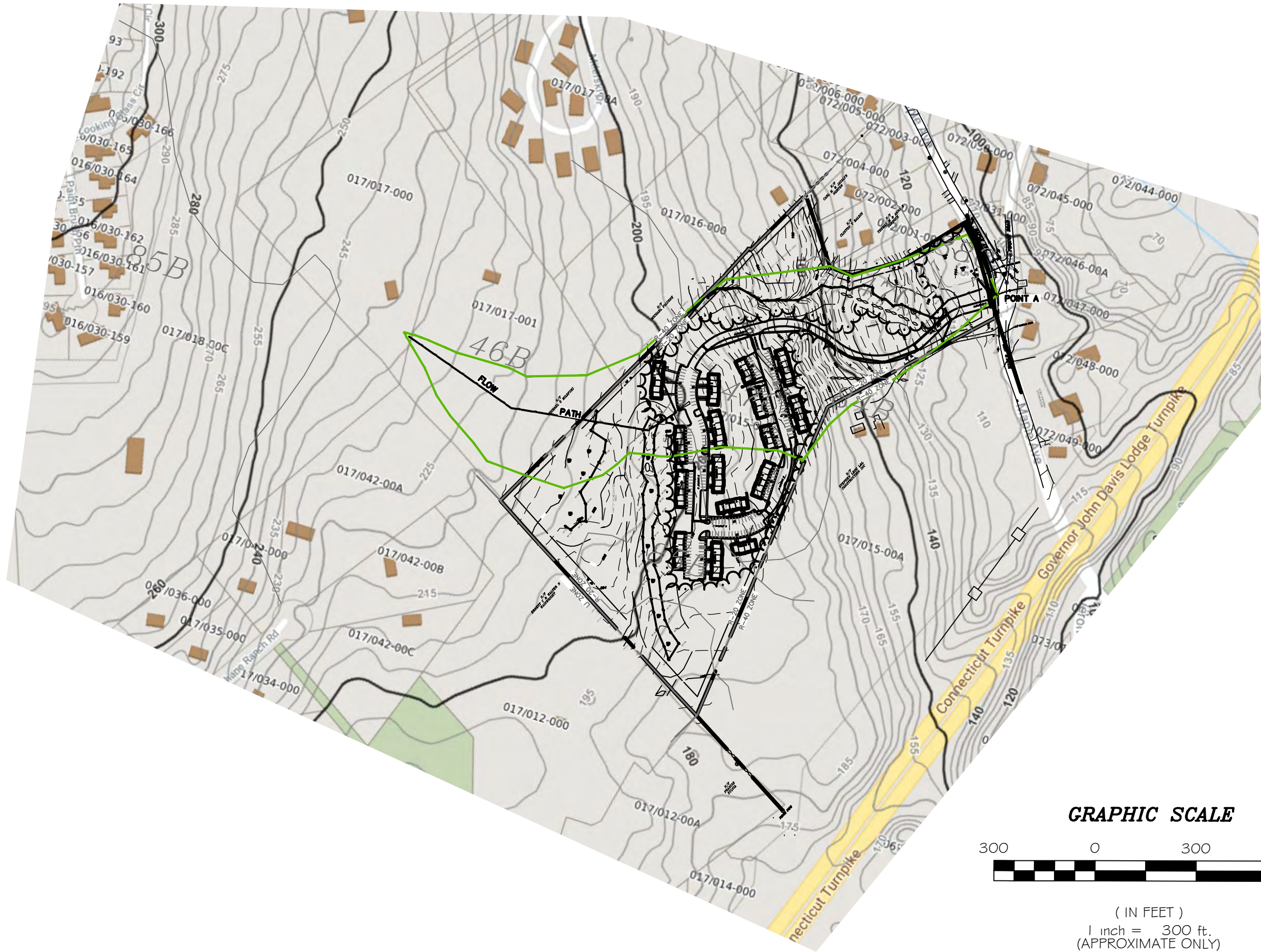
PREPARED FOR
LINDO CONSTRUCTION, LLC
MONTVILLE, CONNECTICUT

DATE: 4-06-20
SCALE: 1"=60'
SHEET 1 OF 1
MAP NO. 18-003-1CB

**WENTWORTH CIVIL
ENGINEERS LLC**

177 WEST TOWN ST.
LEBANON, CT 06249
TEL: (860) 642-7755
FAX: (860) 642-4794
web: wentworthcivil.com





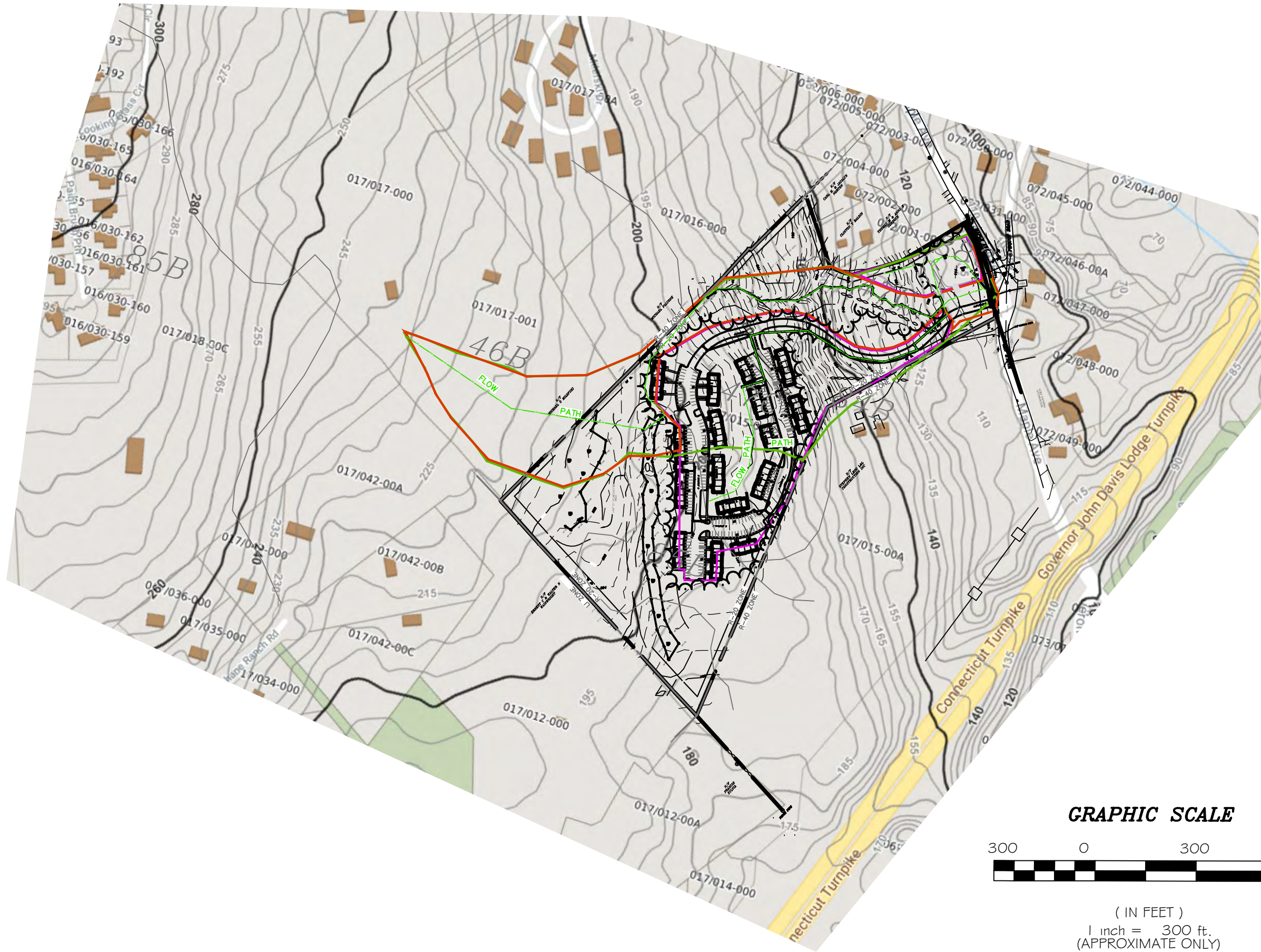
APPENDIX B

EXISTING CONDITIONS
OVERALL DRAINAGE MAP
90 MAPLE AVE
PREPARED FOR
LINDO CONSTRUCTION, LLC
MONTVILLE, CONNECTICUT

REV. 11-09-20

DATE:	4-06-20
SCALE:	1"=300'
SHEET	1 OF 1
MAP NO.	18-003-1DE

**WENTWORTH CIVIL
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GRAPHIC SCALE



(IN FEET)
 1 inch = 300 ft.
 (APPROXIMATE ONLY)

APPENDIX C

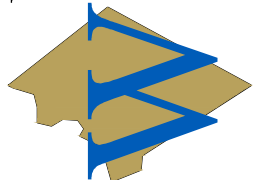
DEVELOPED CONDITIONS
 OVERALL DRAINAGE MAP

90 MAPLE AVE

PREPARED FOR

LINDO CONSTRUCTION, LLC

MONTVILLE, CONNECTICUT



**WENTWORTH CIVIL
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REV. 11-09-20

DATE: 4-06-20

SCALE: 1"=300'

SHEET 1 OF 1

MAP NO. 18-003-1DD