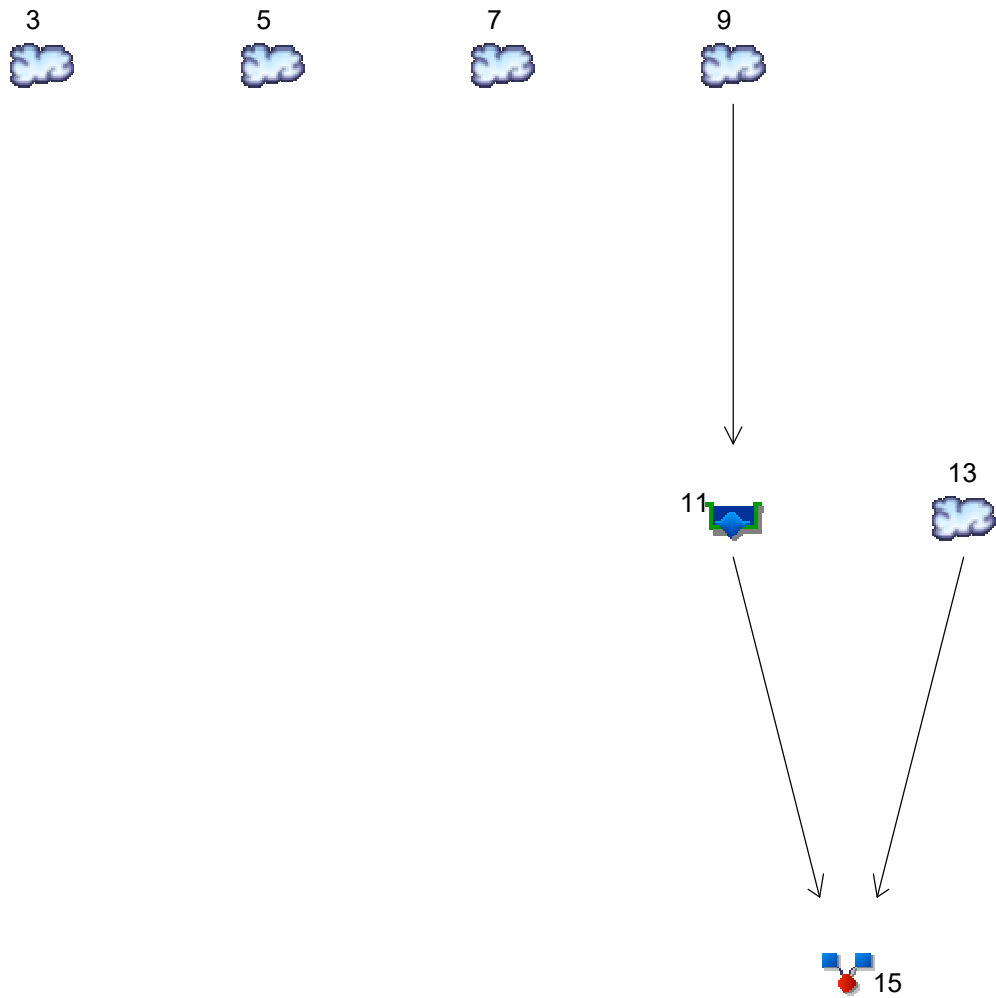


Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020



Legend

Hyd.	Origin	Description
3	SCS Runoff	Existing to POI 1
5	SCS Runoff	Proposed to POI 1
7	SCS Runoff	Existing to POI 2
9	SCS Runoff	Prop to Detention Pond
11	Reservoir	Detention Pond
13	SCS Runoff	Remainder Prop to POI 2
15	Combine	Total to POI 2

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
3	SCS Runoff	-----	-----	2.343	-----	-----	4.214	-----	-----	7.681	Existing to POI 1
5	SCS Runoff	-----	-----	2.248	-----	-----	3.714	-----	-----	6.376	Proposed to POI 1
7	SCS Runoff	-----	-----	5.230	-----	-----	10.99	-----	-----	22.65	Existing to POI 2
9	SCS Runoff	-----	-----	4.086	-----	-----	6.926	-----	-----	12.10	Prop to Detention Pond
11	Reservoir	9	-----	0.000	-----	-----	0.000	-----	-----	0.287	Detention Pond
13	SCS Runoff	-----	-----	3.543	-----	-----	7.442	-----	-----	15.34	Remainder Prop to POI 2
15	Combine	11, 13,	-----	3.543	-----	-----	7.442	-----	-----	15.34	Total to POI 2
Proj. file: Detention_KAC.gpw										Friday, 04 / 9 / 2021	

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

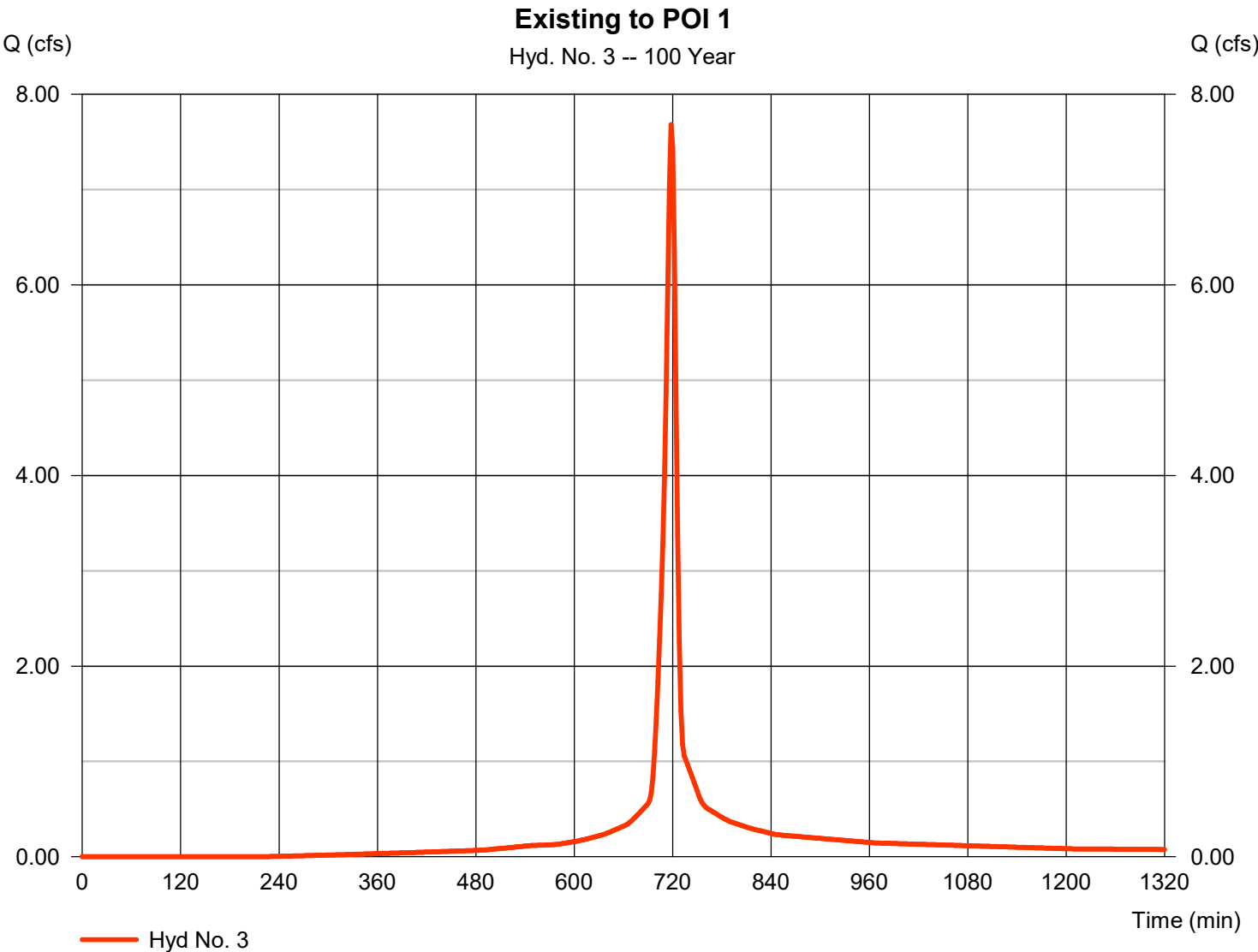
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
3	SCS Runoff	7.681	2	718	18,565	-----	-----	-----	Existing to POI 1
5	SCS Runoff	6.376	2	716	14,329	-----	-----	-----	Proposed to POI 1
7	SCS Runoff	22.65	2	718	52,590	-----	-----	-----	Existing to POI 2
9	SCS Runoff	12.10	2	716	26,780	-----	-----	-----	Prop to Detention Pond
11	Reservoir	0.287	2	834	3,803	9	1015.71	20,106	Detention Pond
13	SCS Runoff	15.34	2	718	35,625	-----	-----	-----	Remainder Prop to POI 2
15	Combine	15.34	2	718	39,428	11, 13,	-----	-----	Total to POI 2
Detention_KAC.gpw					Return Period: 100 Year			Friday, 04 / 9 / 2021	

Hydrograph Report

Hyd. No. 3

Existing to POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 7.681 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 18,565 cuft
Drainage area	= 0.708 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.60 min
Total precip.	= 9.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Hyd. No. 3

Existing to POI 1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.150	0.011	0.011				
Flow length (ft)	= 100.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.68	0.00	0.00				
Land slope (%)	= 2.24	0.00	0.00				
Travel Time (min)	= 8.73	+	0.00	+	0.00	=	8.73
Shallow Concentrated Flow							
Flow length (ft)	= 100.00	0.00	0.00				
Watercourse slope (%)	= 1.50	0.00	0.00				
Surface description	= Unpaved	Paved	Paved				
Average velocity (ft/s)	=1.98	0.00	0.00				
Travel Time (min)	= 0.84	+	0.00	+	0.00	=	0.84
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.015	0.015	0.015				
Velocity (ft/s)	=0.00	0.00	0.00				
Flow length (ft)	(0)0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc				9.60 min			

Hydrograph Report

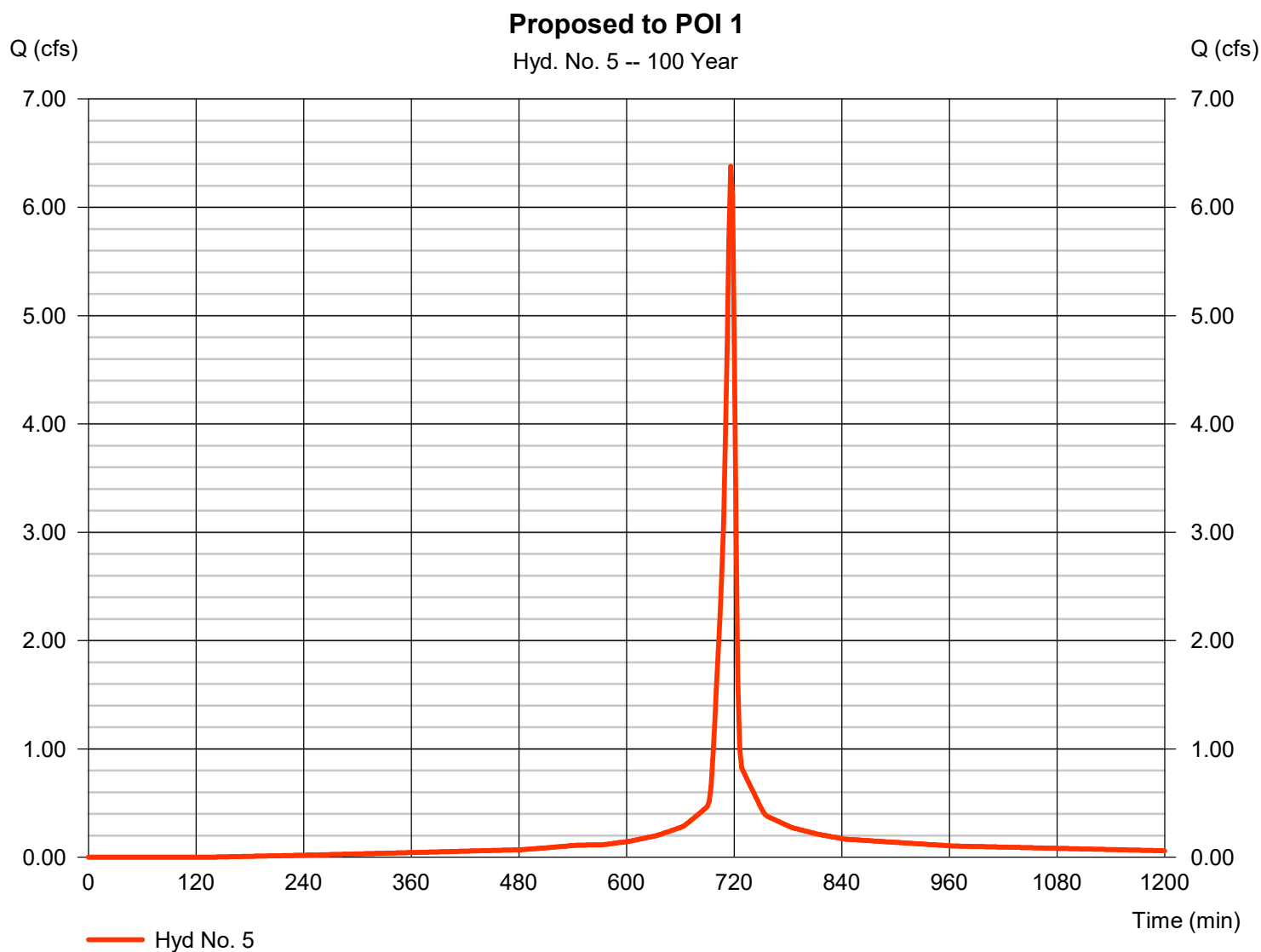
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Friday, 04 / 9 / 2021

Hyd. No. 5

Proposed to POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 6.376 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 14,329 cuft
Drainage area	= 0.529 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 9.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

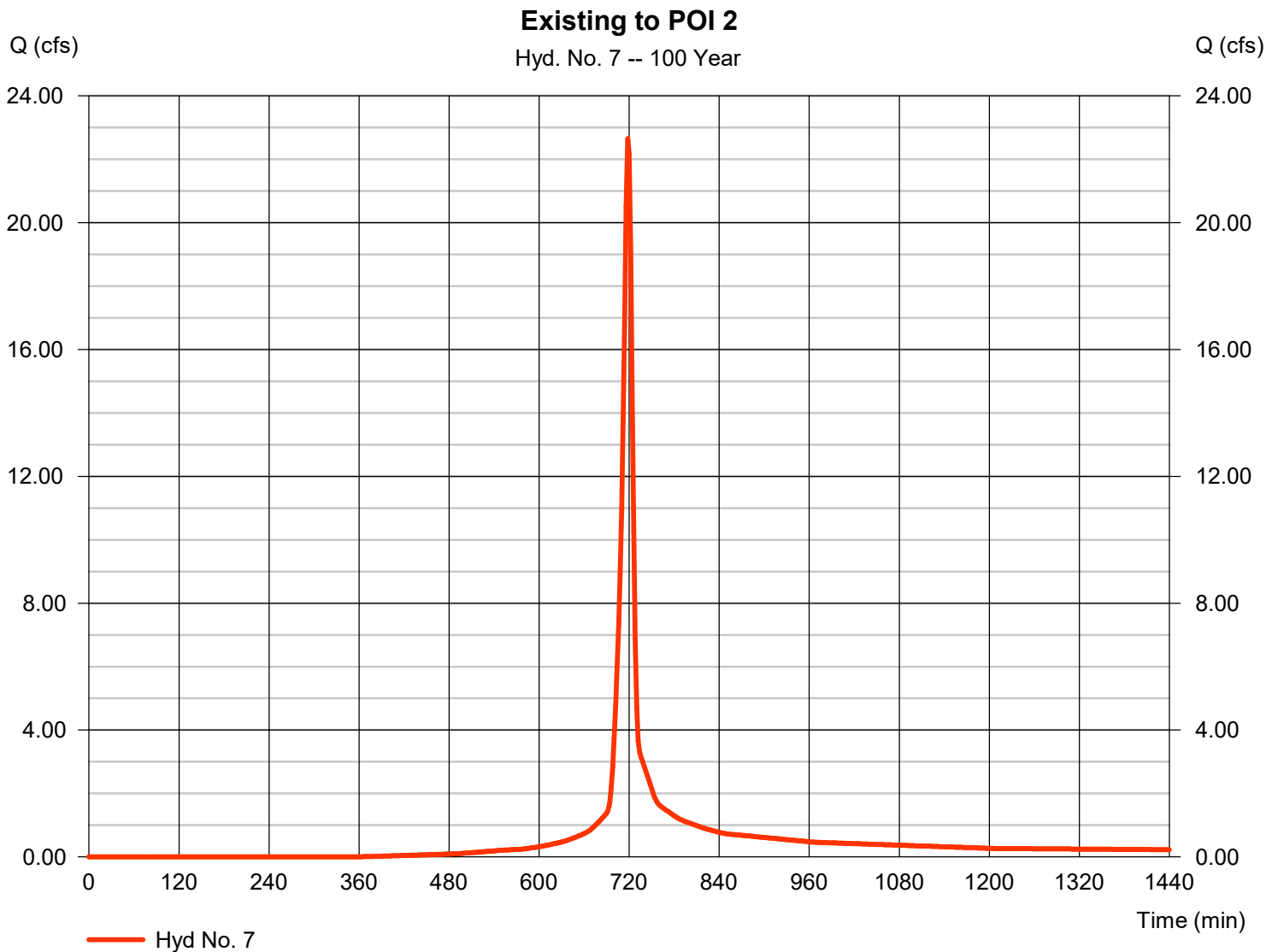
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 04 / 9 / 2021

Hyd. No. 7

Existing to POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 22.65 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 52,590 cuft
Drainage area	= 2.421 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.80 min
Total precip.	= 9.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

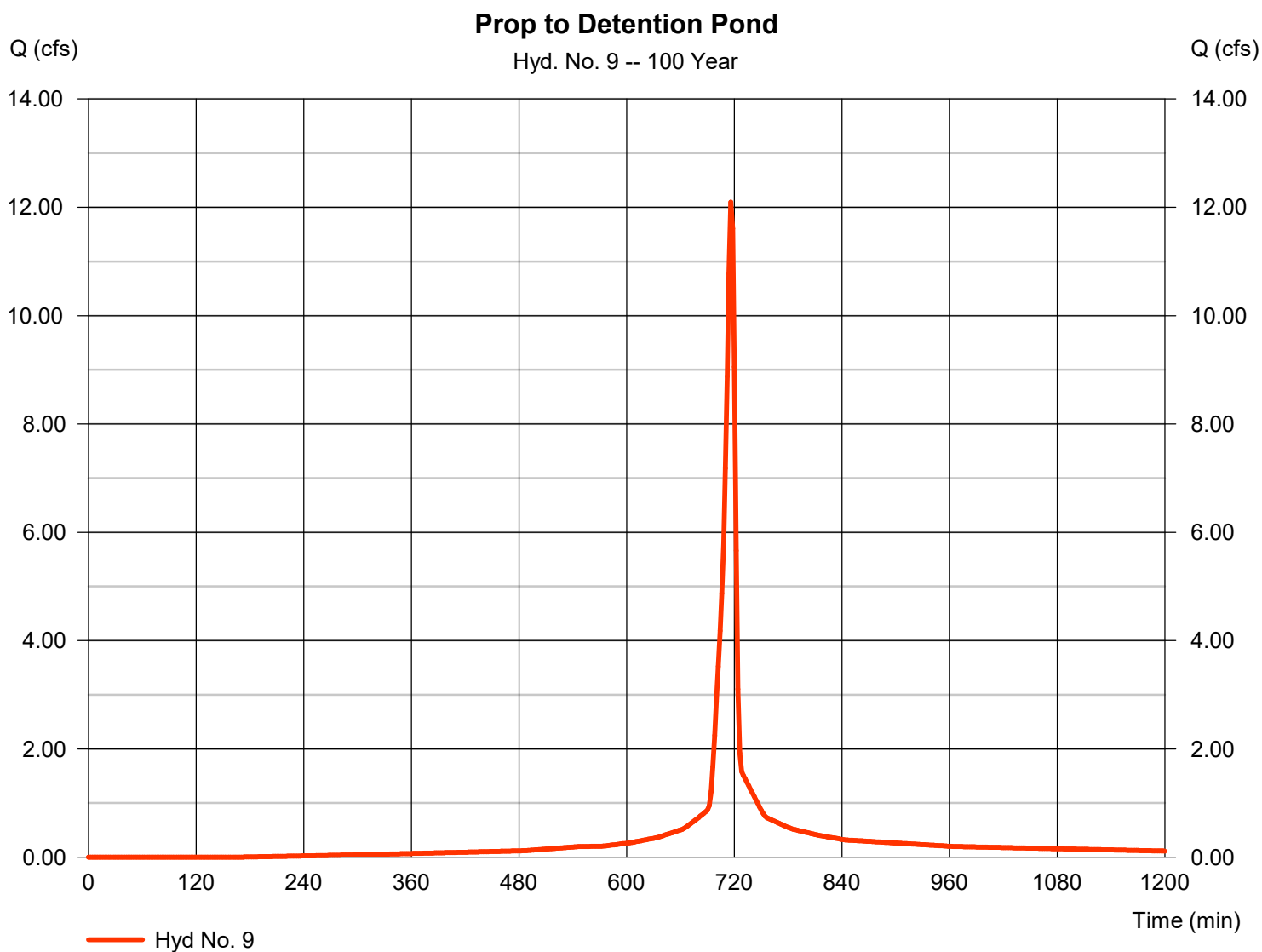
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 04 / 9 / 2021

Hyd. No. 9

Prop to Detention Pond

Hydrograph type	= SCS Runoff	Peak discharge	= 12.10 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 26,780 cuft
Drainage area	= 1.020 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 9.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

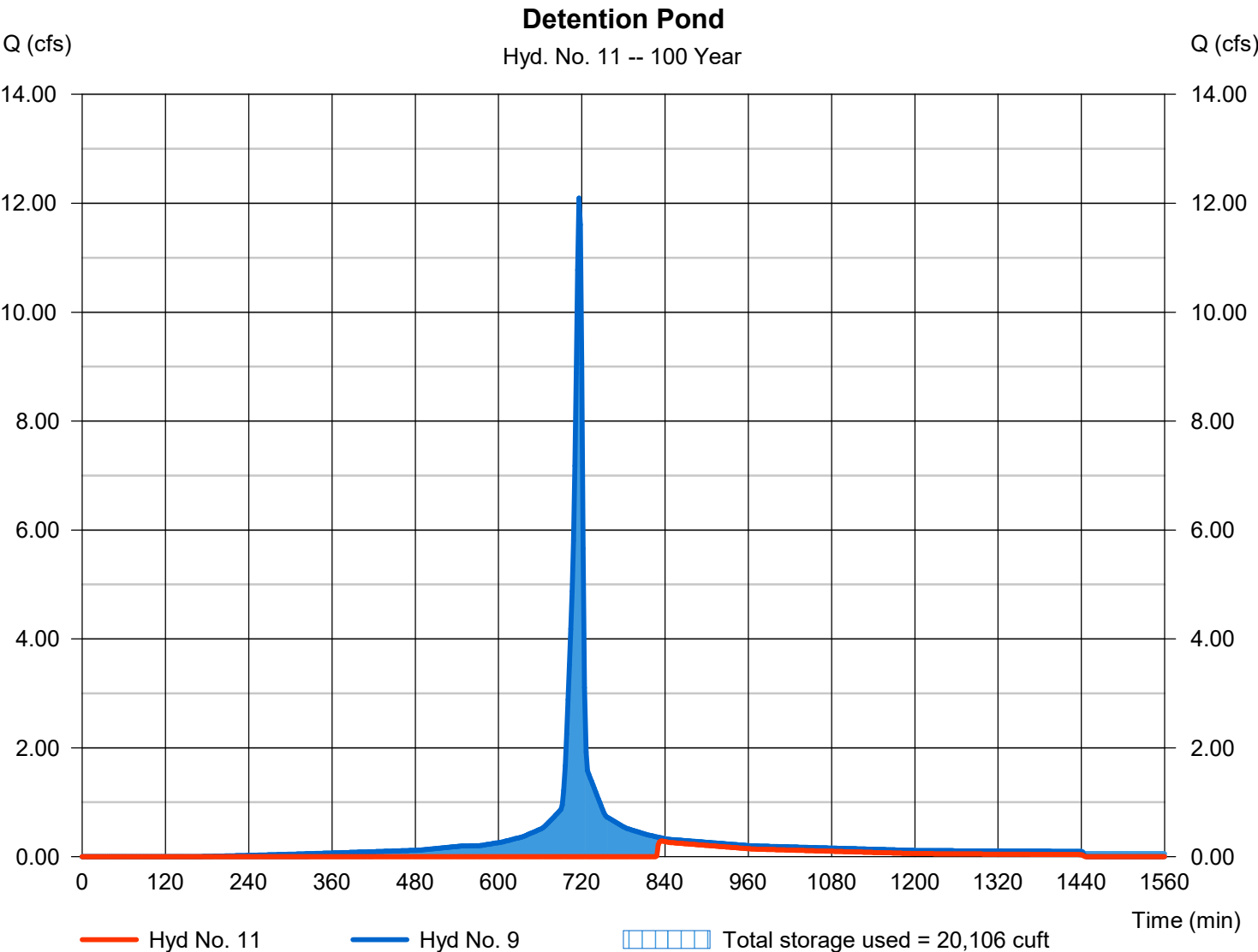
Friday, 04 / 9 / 2021

Hyd. No. 11

Detention Pond

Hydrograph type	= Reservoir	Peak discharge	= 0.287 cfs
Storm frequency	= 100 yrs	Time to peak	= 834 min
Time interval	= 2 min	Hyd. volume	= 3,803 cuft
Inflow hyd. No.	= 9 - Prop to Detention Pond	Max. Elevation	= 1015.71 ft
Reservoir name	= Detention Pond	Max. Storage	= 20,106 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

10

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 04 / 9 / 2021

Pond No. 1 - Detention Pond

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 1010.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1010.00	951	0	0
1.00	1011.00	2,085	1,518	1,518
2.00	1012.00	2,776	2,431	3,949
3.00	1013.00	3,504	3,140	7,089
4.00	1014.00	4,409	3,957	11,046
5.00	1015.00	5,525	4,967	16,013
6.00	1016.00	6,079	5,802	21,815

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	0.00	0.00
Span (in)	= 12.00	1.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 1010.57	1010.54	0.00	0.00
Length (ft)	= 34.34	0.50	0.00	0.00
Slope (%)	= 1.08	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	50.00	Inactive	Inactive
Crest El. (ft)	= 1015.29	1015.70	1014.57	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Ciplti	Rect	---
Multi-Stage	= Yes	No	Yes	No
Exfil.(in/hr)	= 0.420 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	1010.00	0.00	0.00	---	---	0.00	0.00	0.00	---	0.000	---	0.000
1.00	1,518	1011.00	0.00	0.00	---	---	0.00	0.00	0.00	---	0.020	---	0.020
2.00	3,949	1012.00	0.00	0.00	---	---	0.00	0.00	0.00	---	0.027	---	0.027
3.00	7,089	1013.00	0.00	0.00	---	---	0.00	0.00	0.00	---	0.034	---	0.034
4.00	11,046	1014.00	0.00	0.00	---	---	0.00	0.00	0.00	---	0.043	---	0.043
5.00	16,013	1015.00	0.00	0.00	---	---	0.00	0.00	0.00	---	0.054	---	0.054
6.00	21,815	1016.00	0.00	0.00	---	---	0.00	27.36	0.00	---	0.059	---	27.42

Hydrograph Report

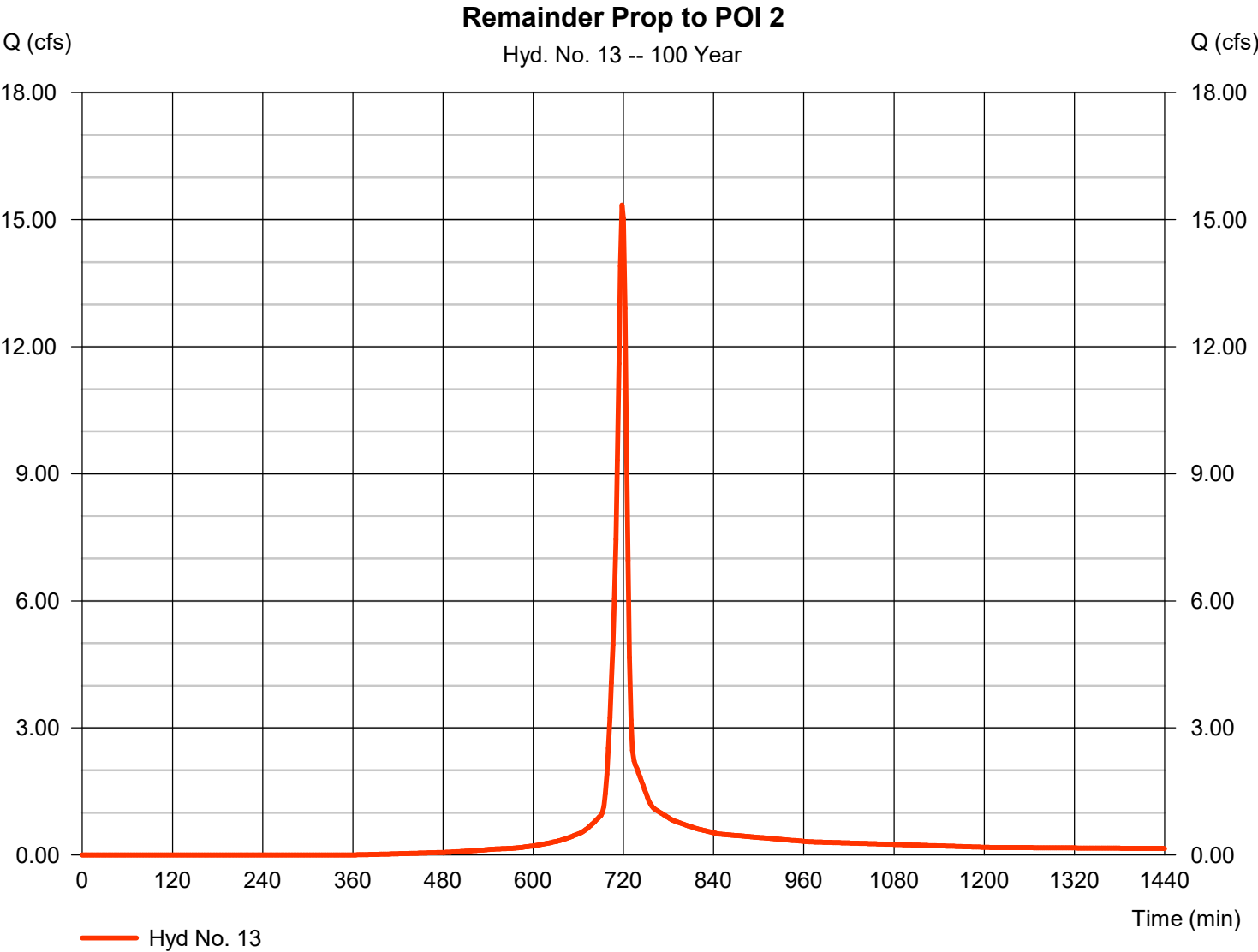
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Friday, 04 / 9 / 2021

Hyd. No. 13

Remainder Prop to POI 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	15.34 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	35,625 cuft
Drainage area	=	1.640 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.80 min
Total precip.	=	9.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

Hyd. No. 15

Total to POI 2

Hydrograph type	= Combine	Peak discharge	= 15.34 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 39,428 cuft
Inflow hyds.	= 11, 13	Contrib. drain. area	= 1.640 ac

