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# Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 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	
1	SCS Runoff	-----	-----	23.41	-----	31.24	37.42	43.77	49.02	54.83	Post Construction
2	SCS Runoff	-----	-----	25.89	-----	34.79	41.85	49.08	55.09	61.73	Pre-Construction

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 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
1	SCS Runoff	23.41	2	722	66,179	----	----	----	Post Construction
2	SCS Runoff	25.89	2	720	67,533	----	----	----	Pre-Construction
AirportDrainage.gpw					Return Period: 2 Year			Monday, 05 / 17 / 2021	

# Hydrograph Report

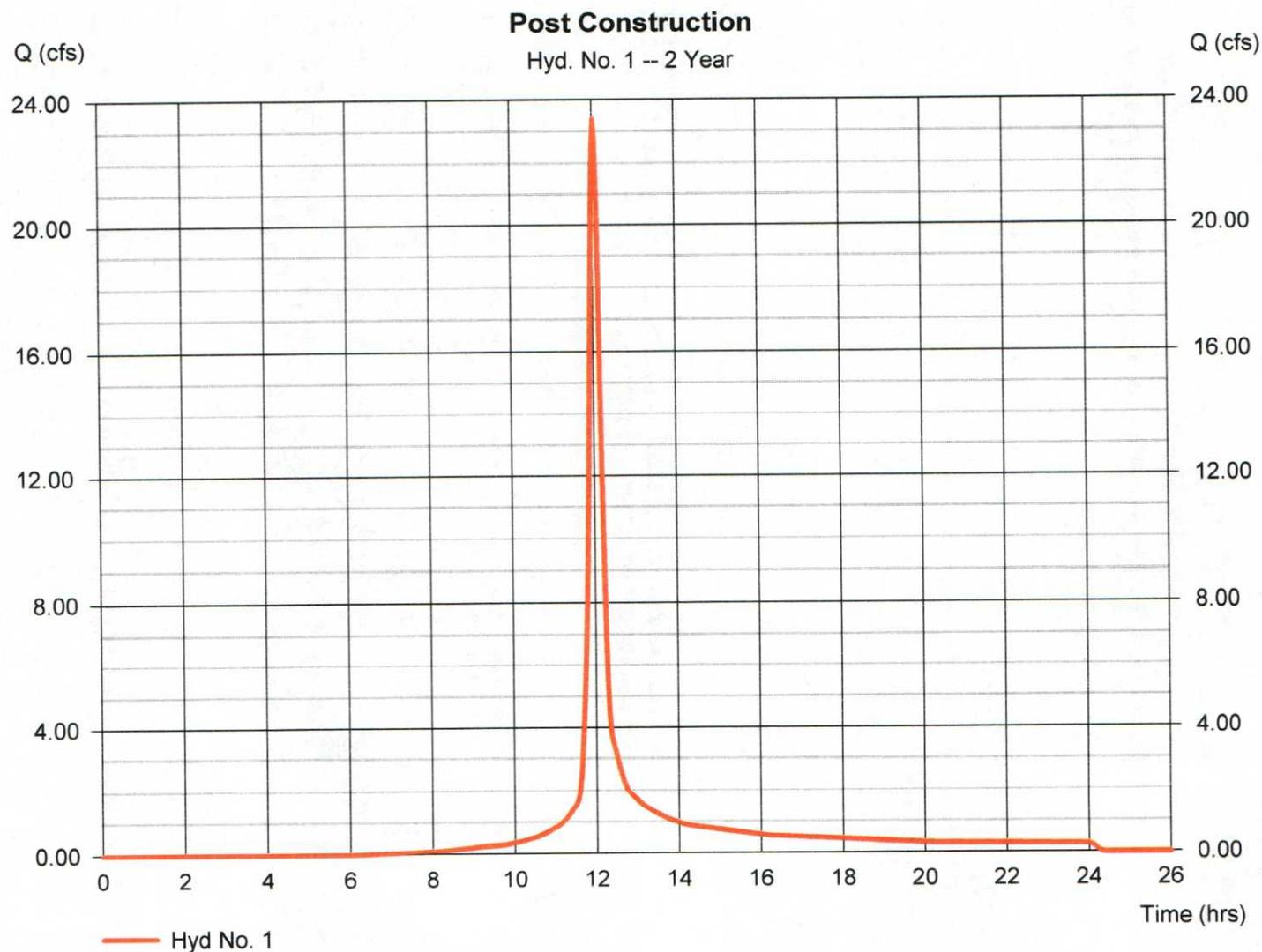
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Monday, 05 / 17 / 2021

## Hyd. No. 1

### Post Construction

Hydrograph type	= SCS Runoff	Peak discharge	= 23.41 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 66,179 cuft
Drainage area	= 7,400 ac	Curve number	= 87
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.30 min
Total precip.	= 3.88 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

## Hyd. No. 1

Post Construction

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
<b>Sheet Flow</b>				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 100.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.88	0.00	0.00	
Land slope (%)	= 2.20	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 12.47</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 12.47</b>
<b>Shallow Concentrated Flow</b>				
Flow length (ft)	= 133.00	286.00	0.00	
Watercourse slope (%)	= 2.20	1.50	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=2.39	2.49	0.00	
<b>Travel Time (min)</b>	<b>= 0.93</b>	<b>+ 1.91</b>	<b>+ 0.00</b>	<b>= 2.84</b>
<b>Channel Flow</b>				
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	
<b>Travel Time (min)</b>	<b>= 0.00</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 0.00</b>
<b>Total Travel Time, Tc .....</b>				<b>15.30 min</b>

# Hydrograph Report

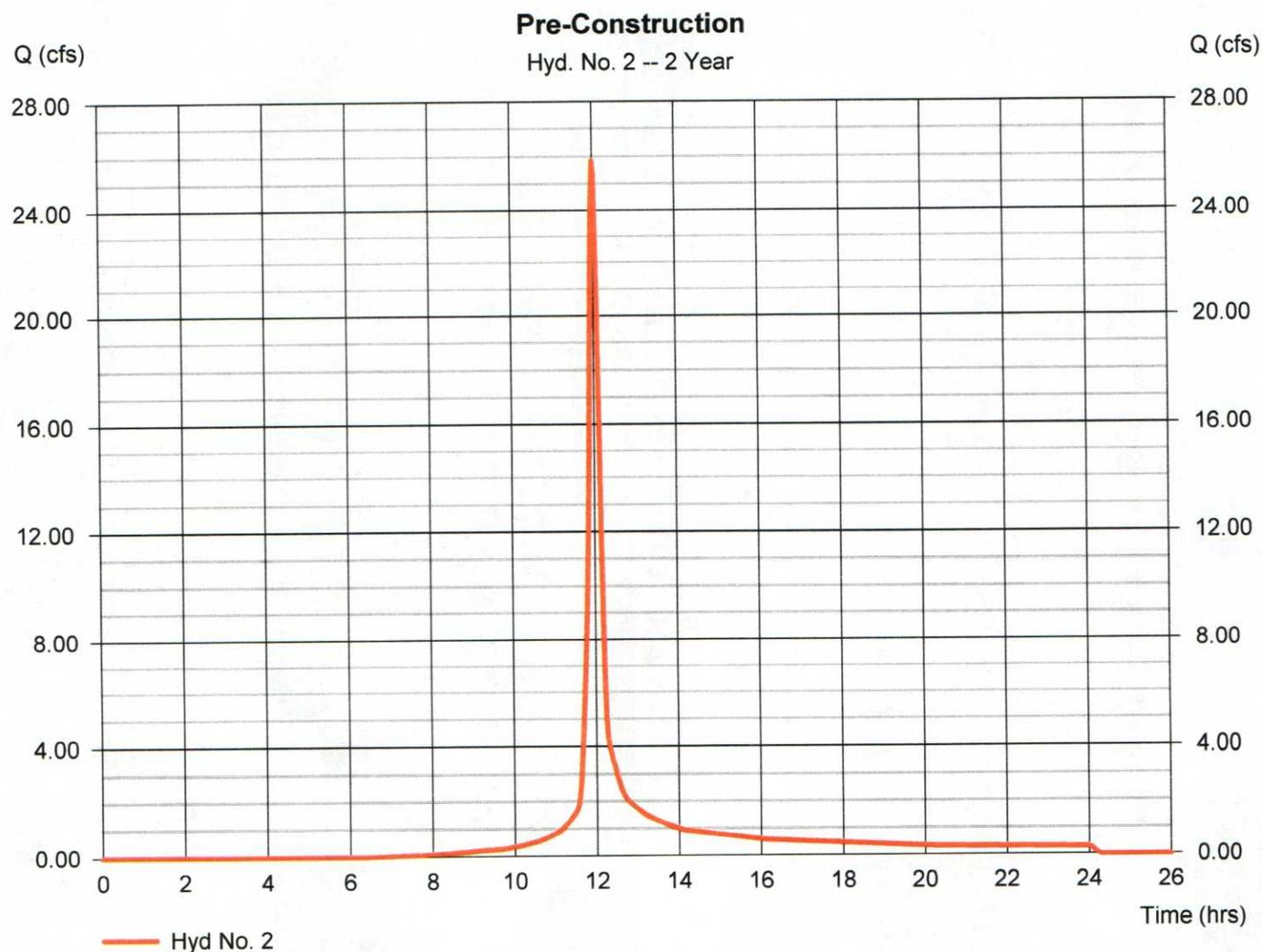
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Monday, 05 / 17 / 2021

## Hyd. No. 2

Pre-Construction

Hydrograph type	= SCS Runoff	Peak discharge	= 25.89 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 67,533 cuft
Drainage area	= 7.400 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 3.88 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

## Hyd. No. 2

Pre-Construction

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
<b>Sheet Flow</b>				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 100.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.88	0.00	0.00	
Land slope (%)	= 4.00	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 9.82</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 9.82</b>
<b>Shallow Concentrated Flow</b>				
Flow length (ft)	= 268.00	0.00	0.00	
Watercourse slope (%)	= 4.00	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=3.23	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 1.38</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 1.38</b>
<b>Channel Flow</b>				
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	
<b>Travel Time (min)</b>	<b>= 0.00</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 0.00</b>
<b>Total Travel Time, Tc .....</b>				<b>11.20 min</b>

# Hydrograph Summary Report

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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
1	SCS Runoff	31.24	2	722	89,243	----	----	----	Post Construction
2	SCS Runoff	34.79	2	720	91,655	----	----	----	Pre-Construction
AirportDrainage.gpw					Return Period: 5 Year			Monday, 05 / 17 / 2021	

# Hydrograph Report

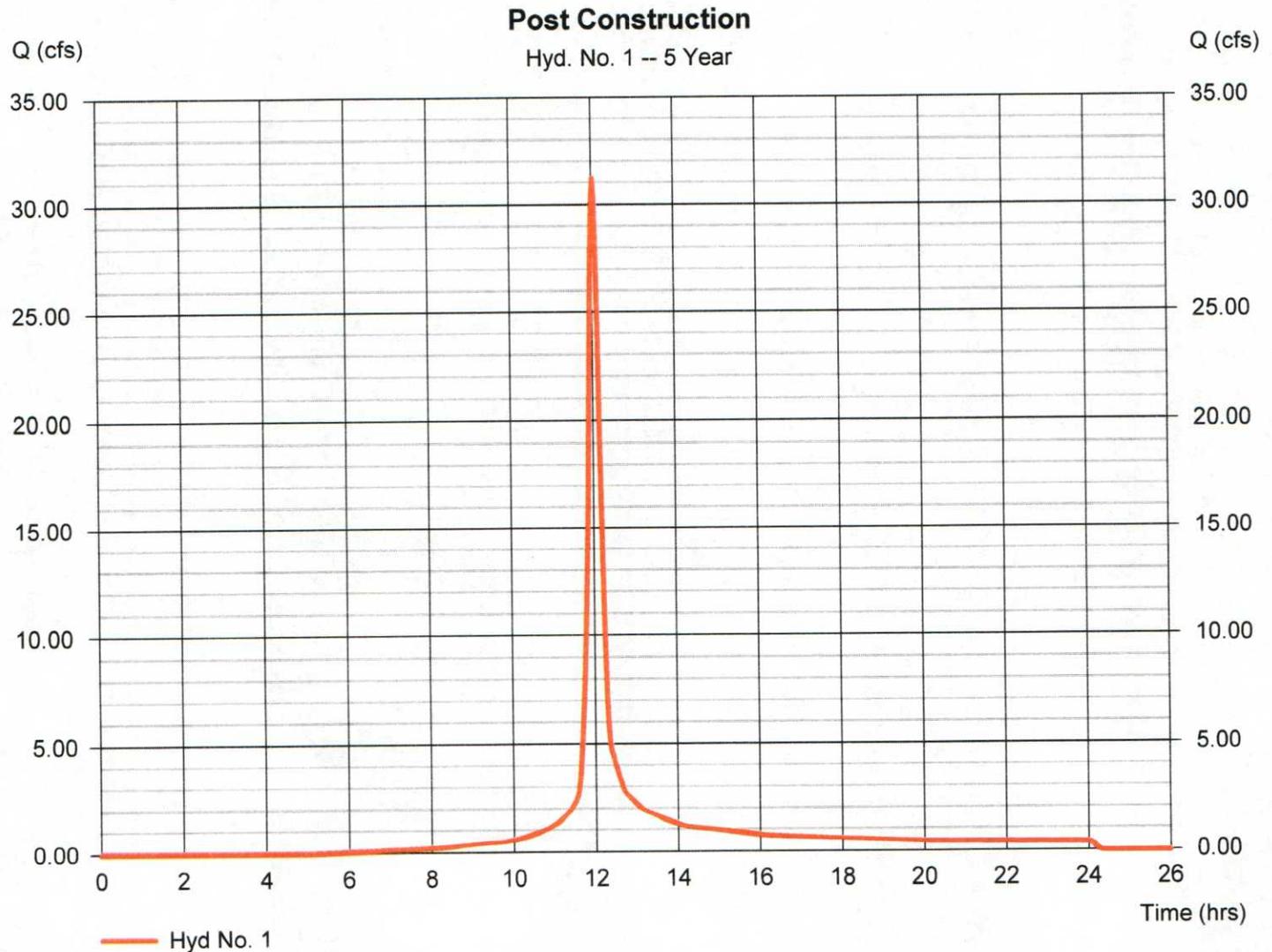
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Monday, 05 / 17 / 2021

## Hyd. No. 1

### Post Construction

Hydrograph type	= SCS Runoff	Peak discharge	= 31.24 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 89,243 cuft
Drainage area	= 7.400 ac	Curve number	= 87
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.30 min
Total precip.	= 4.83 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

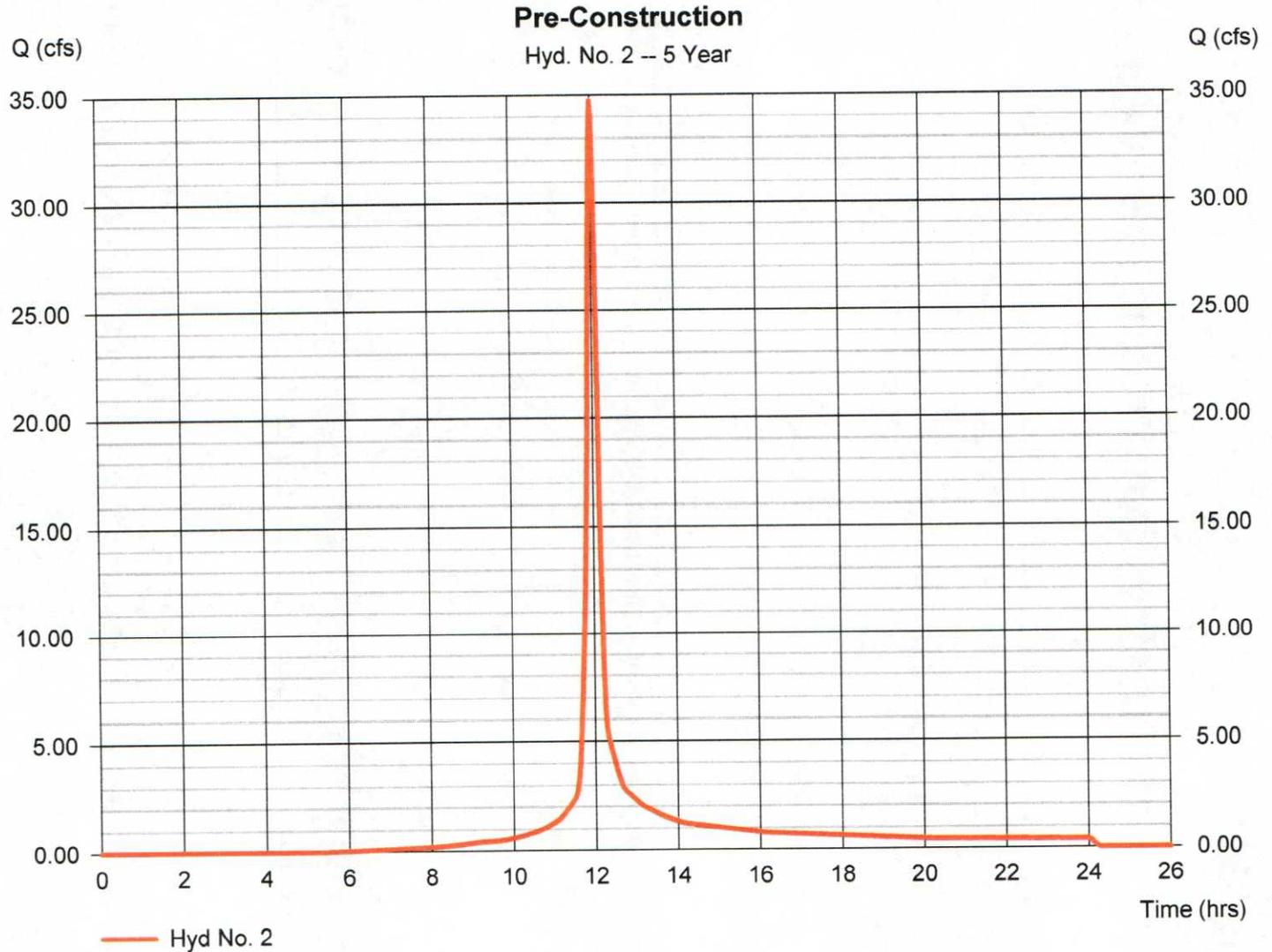
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Monday, 05 / 17 / 2021

## Hyd. No. 2

Pre-Construction

Hydrograph type	= SCS Runoff	Peak discharge	= 34.79 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 91,655 cuft
Drainage area	= 7.400 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 4.83 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 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
1	SCS Runoff	37.42	2	722	107,811	----	----	----	Post Construction
2	SCS Runoff	41.85	2	720	111,126	----	----	----	Pre-Construction
AirportDrainage.gpw					Return Period: 10 Year			Monday, 05 / 17 / 2021	

# Hydrograph Report

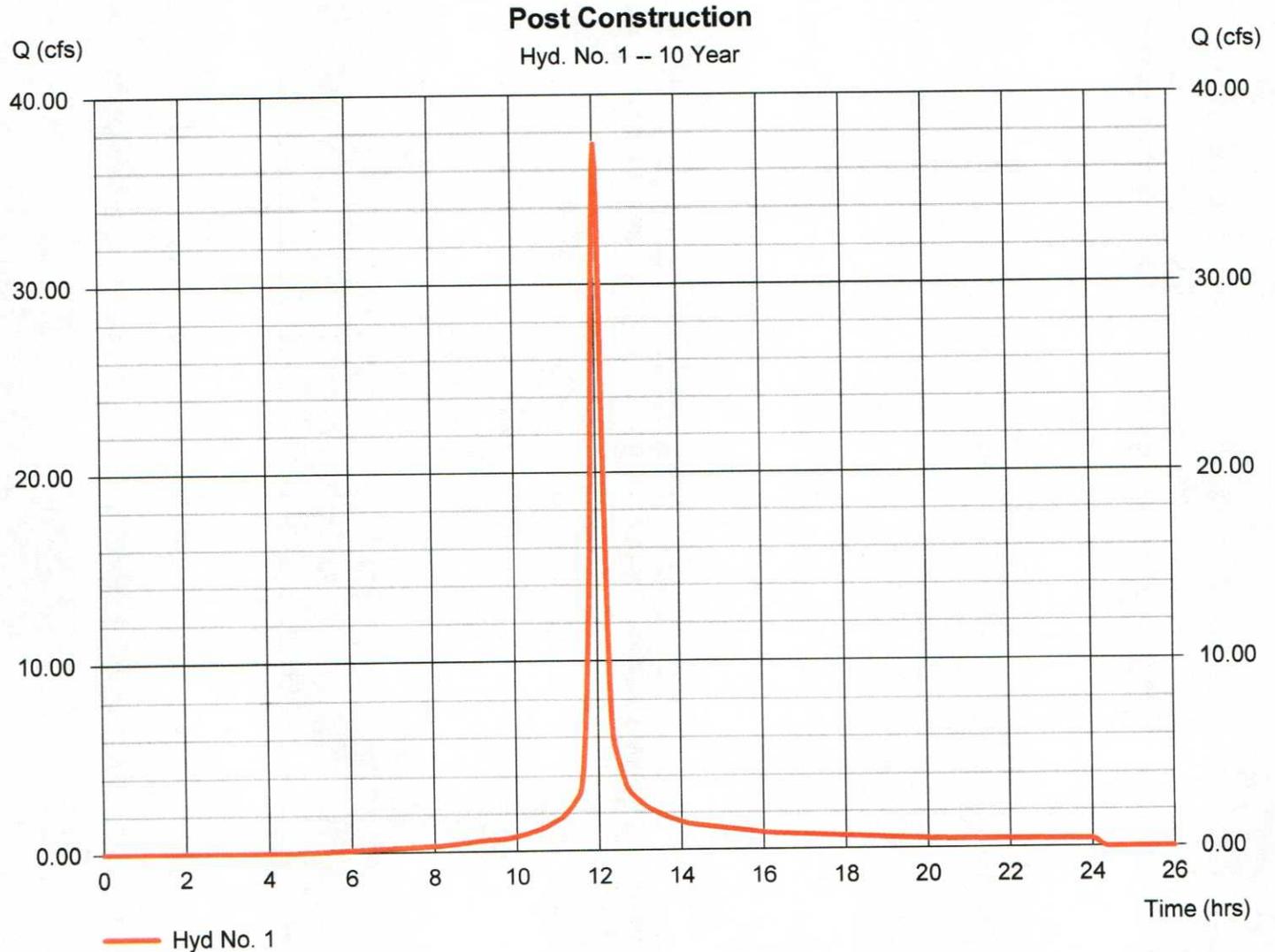
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Monday, 05 / 17 / 2021

## Hyd. No. 1

Post Construction

Hydrograph type	= SCS Runoff	Peak discharge	= 37.42 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 107,811 cuft
Drainage area	= 7.400 ac	Curve number	= 87
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.30 min
Total precip.	= 5.58 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

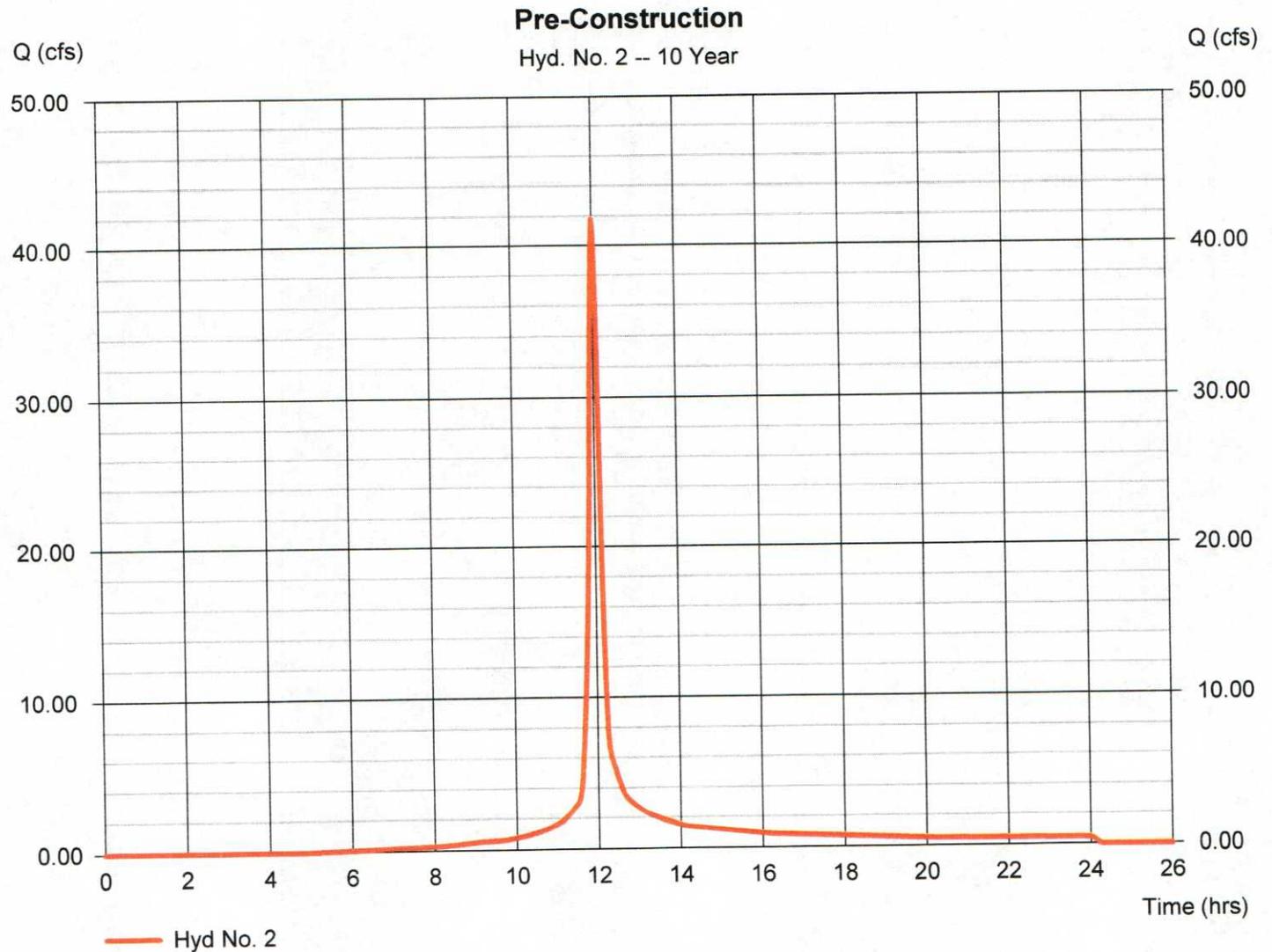
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Monday, 05 / 17 / 2021

## Hyd. No. 2

Pre-Construction

Hydrograph type	= SCS Runoff	Peak discharge	= 41.85 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 111,126 cuft
Drainage area	= 7.400 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 5.58 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 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
1	SCS Runoff	43.77	2	722	127,097	----	----	----	Post Construction
2	SCS Runoff	49.08	2	720	131,383	----	----	----	Pre-Construction
AirportDrainage.gpw					Return Period: 25 Year			Monday, 05 / 17 / 2021	

# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Monday, 05 / 17 / 2021

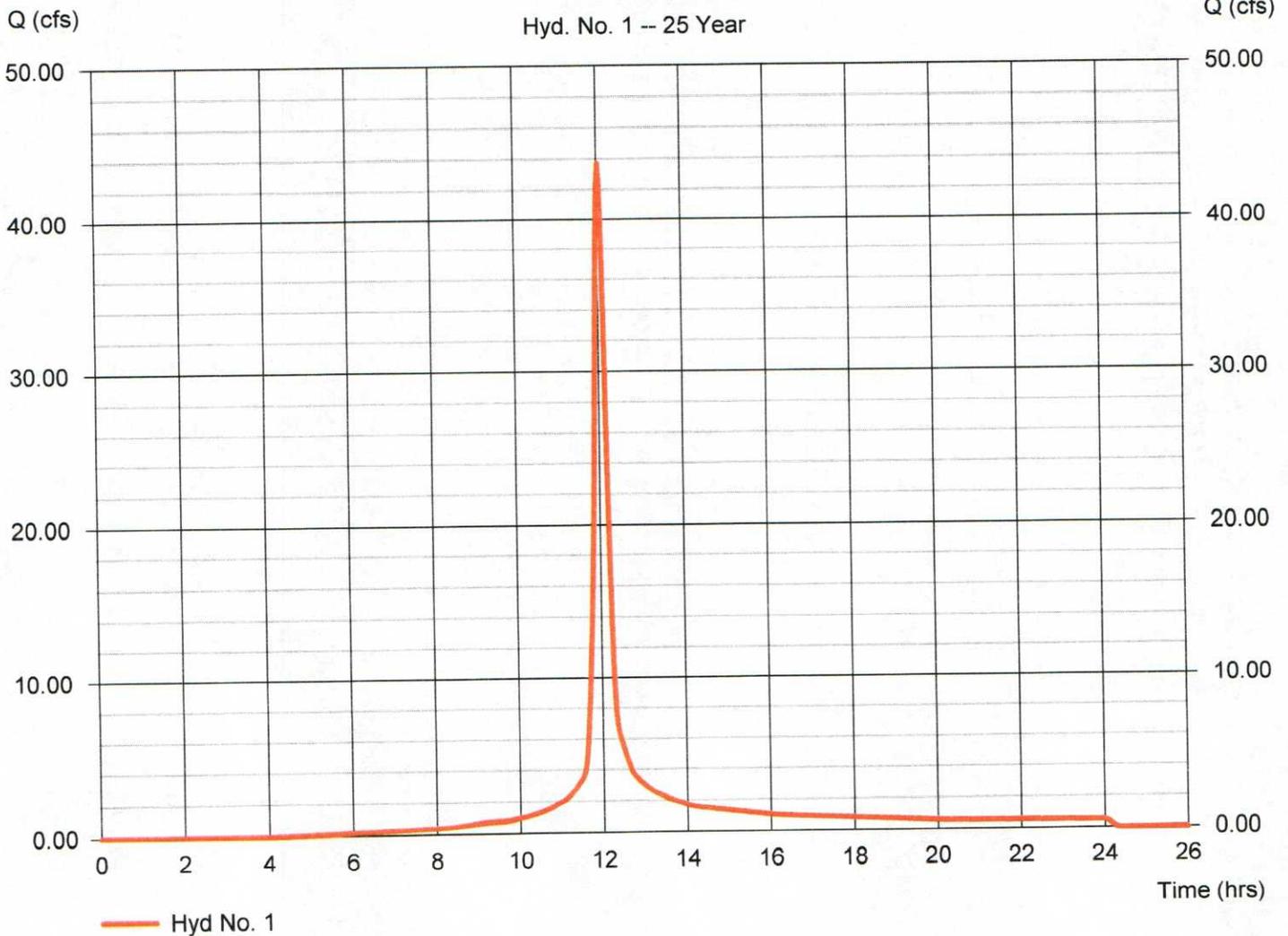
## Hyd. No. 1

### Post Construction

Hydrograph type	= SCS Runoff	Peak discharge	= 43.77 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 127,097 cuft
Drainage area	= 7.400 ac	Curve number	= 87
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.30 min
Total precip.	= 6.35 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

### Post Construction

Hyd. No. 1 -- 25 Year



# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Monday, 05 / 17 / 2021

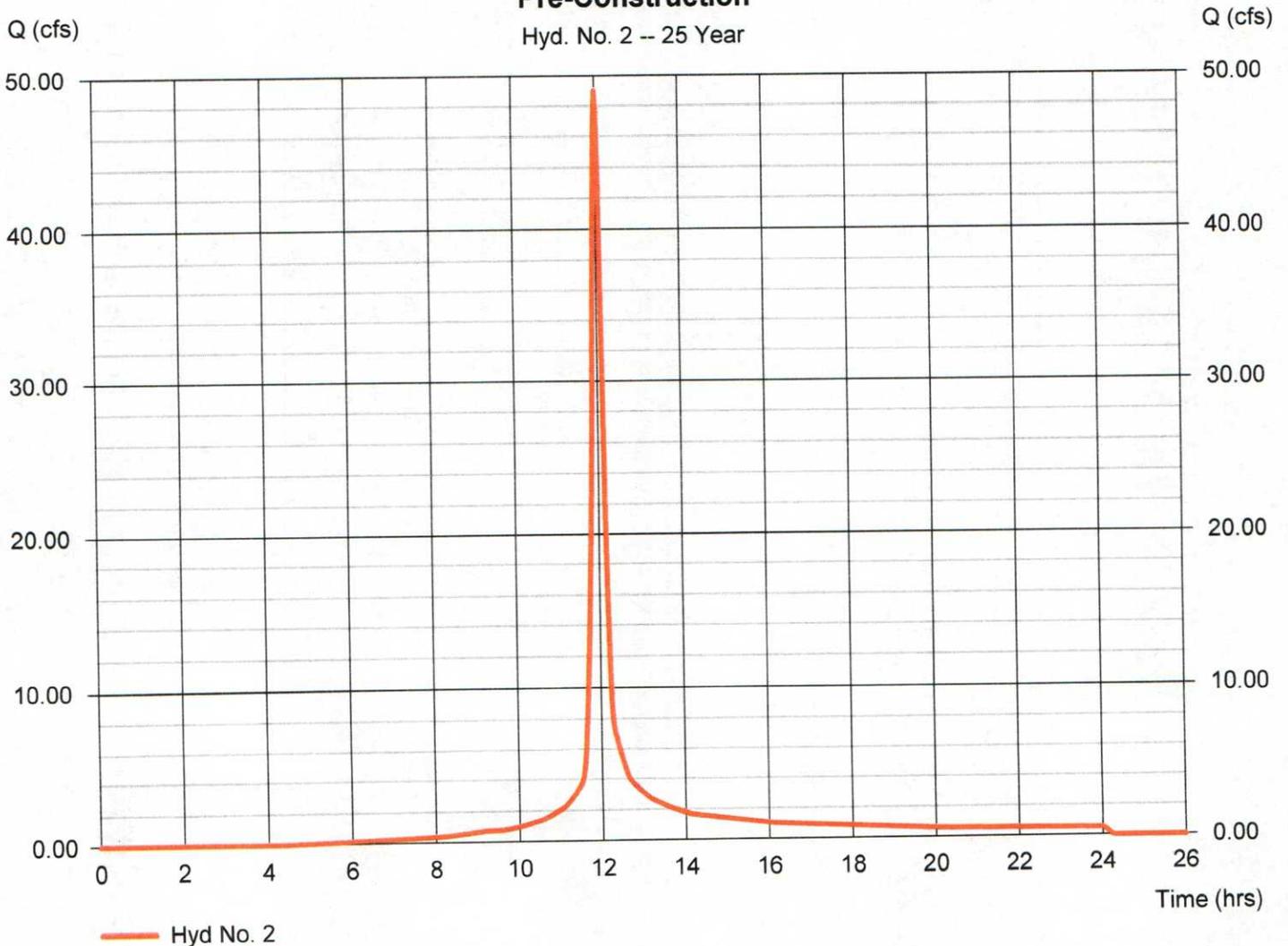
## Hyd. No. 2

Pre-Construction

Hydrograph type	= SCS Runoff	Peak discharge	= 49.08 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 131,383 cuft
Drainage area	= 7.400 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 6.35 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

### Pre-Construction

Hyd. No. 2 -- 25 Year



# Hydrograph Summary Report

Hydroflow Hydrographs Extension for Autodesk® Civil 3D® 2019 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
1	SCS Runoff	49.02	2	722	143,253	----	----	----	Post Construction
2	SCS Runoff	55.09	2	720	148,371	----	----	----	Pre-Construction
AirportDrainage.gpw					Return Period: 50 Year			Monday, 05 / 17 / 2021	

# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Monday, 05 / 17 / 2021

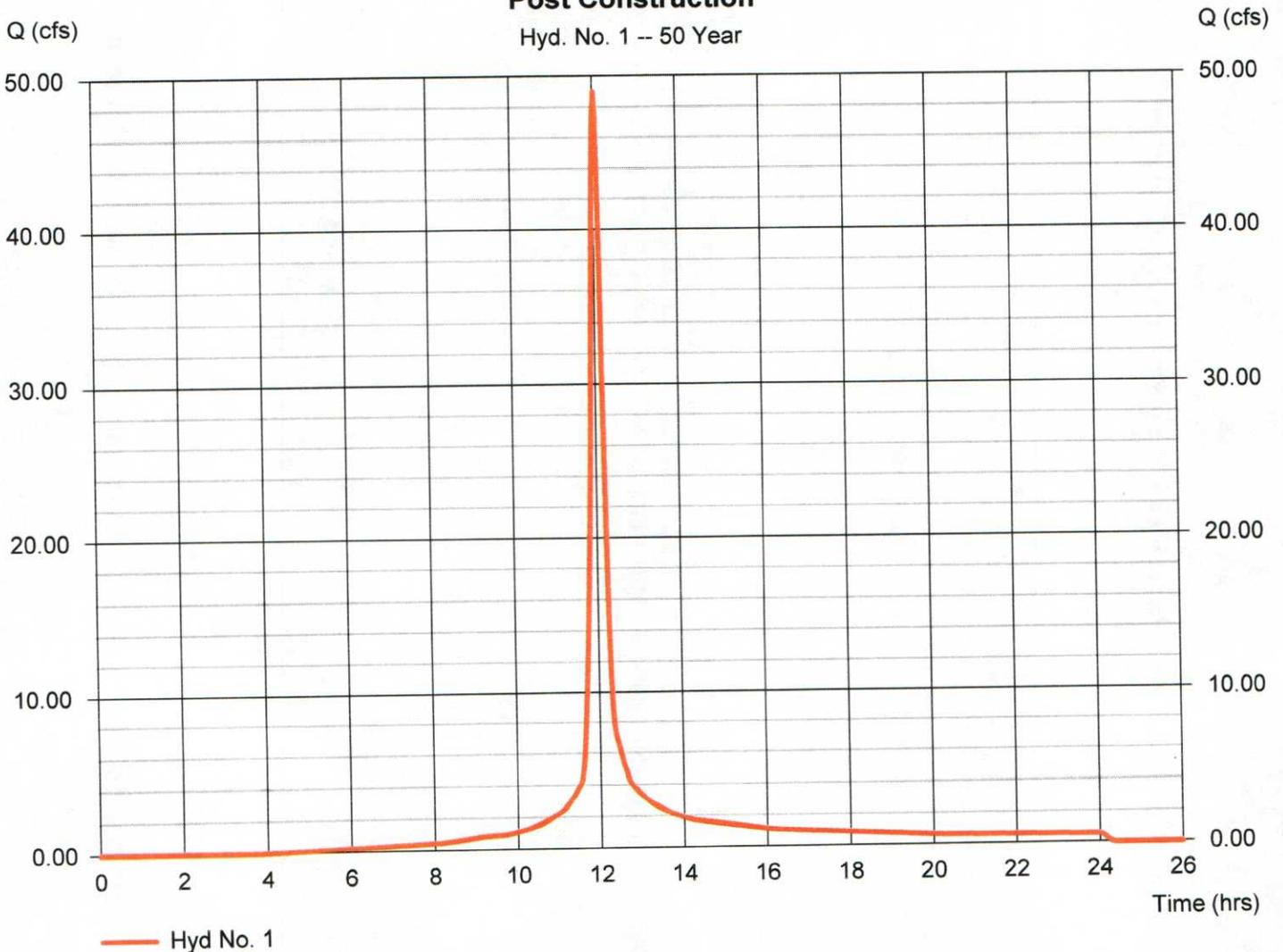
## Hyd. No. 1

### Post Construction

Hydrograph type	= SCS Runoff	Peak discharge	= 49.02 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 143,253 cuft
Drainage area	= 7.400 ac	Curve number	= 87
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.30 min
Total precip.	= 6.99 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

### Post Construction

Hyd. No. 1 -- 50 Year



# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Monday, 05 / 17 / 2021

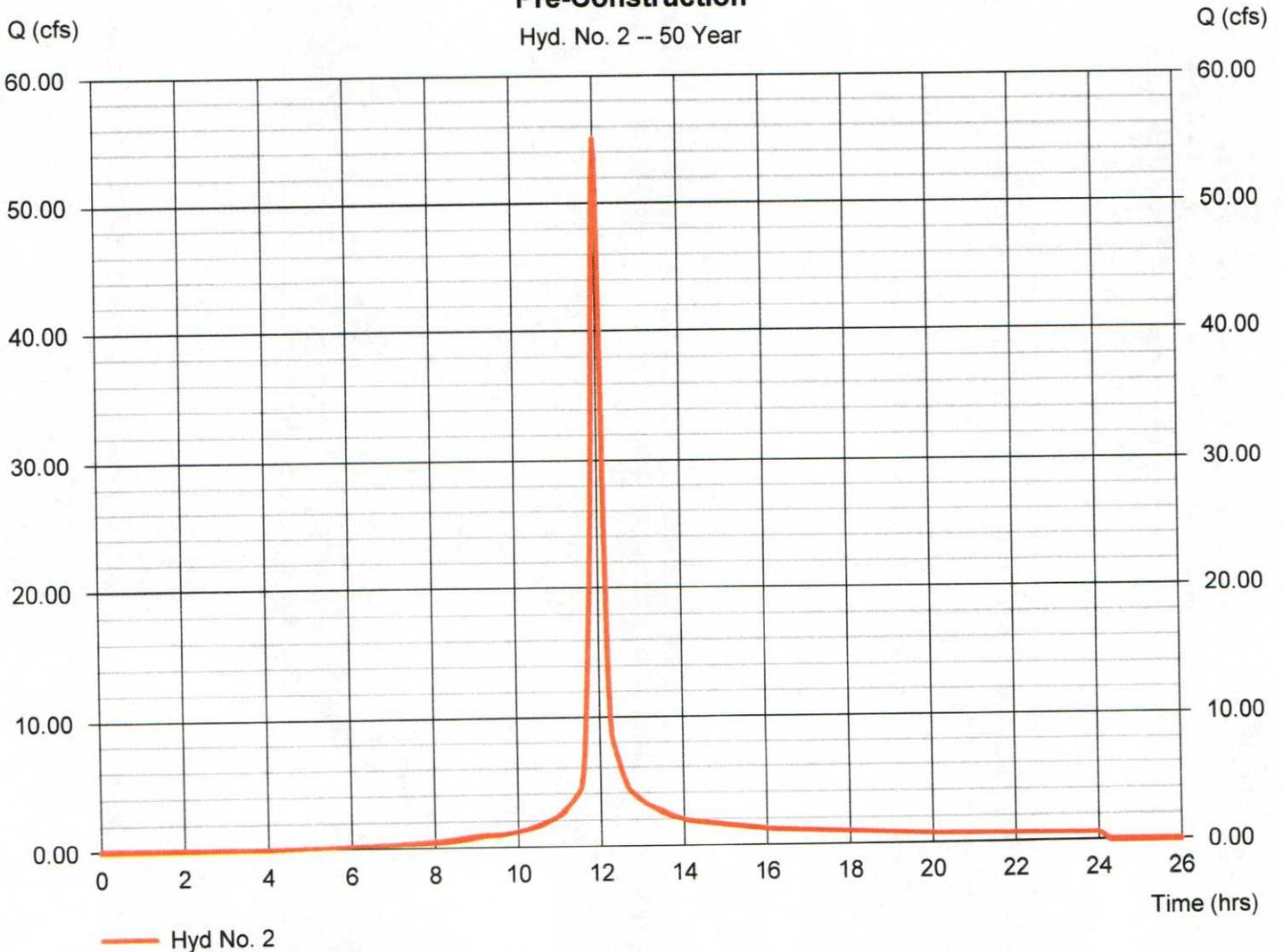
## Hyd. No. 2

Pre-Construction

Hydrograph type	= SCS Runoff	Peak discharge	= 55.09 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 148,371 cuft
Drainage area	= 7.400 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 6.99 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

### Pre-Construction

Hyd. No. 2 -- 50 Year



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 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
1	SCS Runoff	54.83	2	722	161,278	----	----	----	Post Construction
2	SCS Runoff	61.73	2	720	167,341	----	----	----	Pre-Construction
AirportDrainage.gpw					Return Period: 100 Year		Monday, 05 / 17 / 2021		

# Hydrograph Report

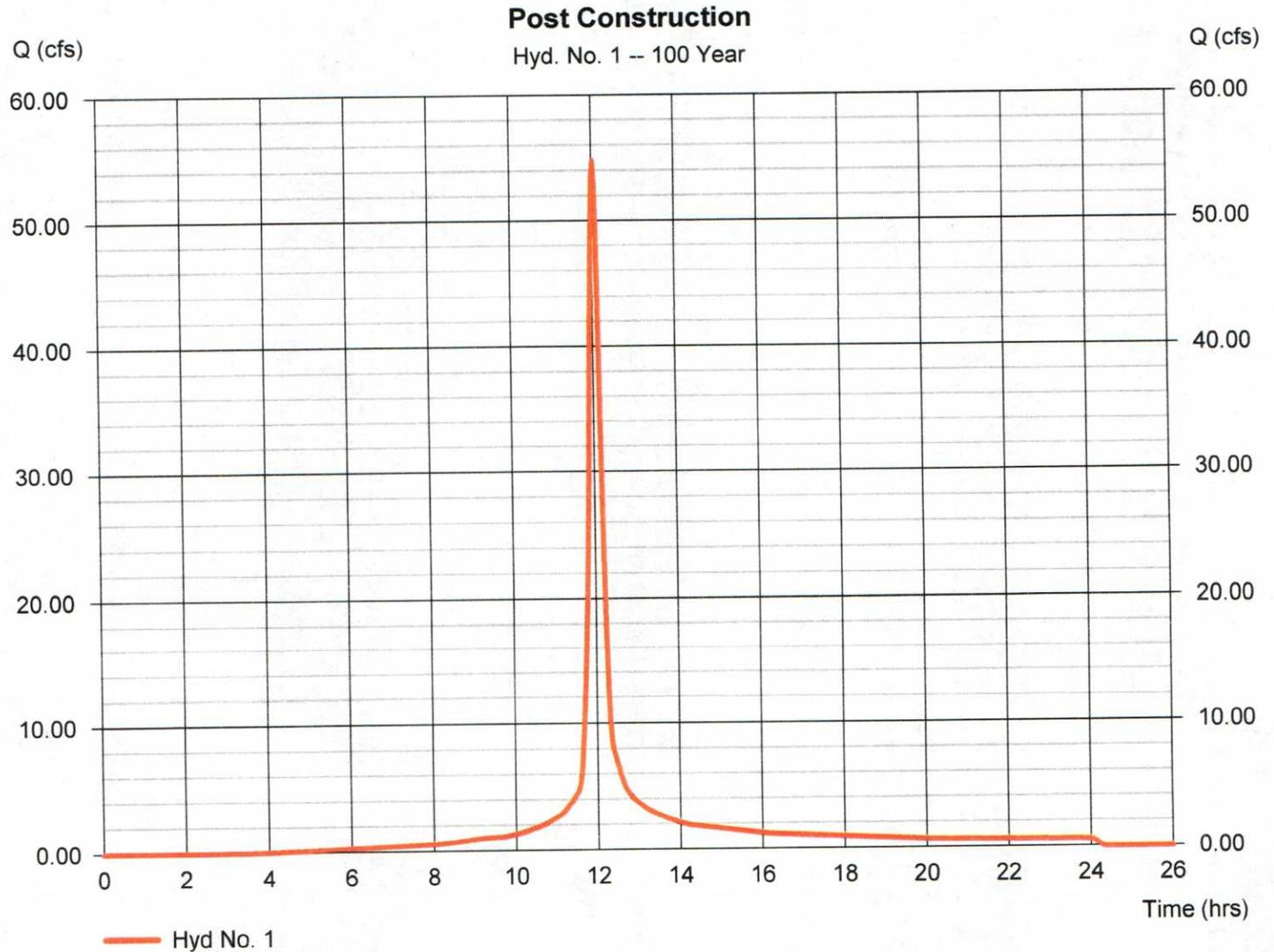
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Monday, 05 / 17 / 2021

## Hyd. No. 1

Post Construction

Hydrograph type	= SCS Runoff	Peak discharge	= 54.83 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 161,278 cuft
Drainage area	= 7.400 ac	Curve number	= 87
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.30 min
Total precip.	= 7.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Monday, 05 / 17 / 2021

## Hyd. No. 2

Pre-Construction

Hydrograph type	= SCS Runoff	Peak discharge	= 61.73 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 167,341 cuft
Drainage area	= 7.400 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 7.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

