



Indigo Land Design, LLC
40 Elm Street, 2nd Floor
Old Saybrook, CT 06475

860.388.9343 Phone
860.391.8854 Fax
jwren@Indigo-Land.com E-mail
www.Indigo-Land.com

April 4, 2024

Re: 52 Spencer Plains Road (CT Route 166) (Map 25 Lot 21)
Old Saybrook, CT 06475

DRAINAGE REPORT

This project involves the construction of a 23,820 square foot medical office building, a parking lot with landscaping, and low impact development (LID) measures as shown on the site plan, and other associated improvements. The subject property is currently a vacant wooded lot.

The proposed development will be located between the main wetlands area along the east side of the property and Spencer Plains Road to the west of the property. A small 0.13 acre area along the southwest property line drains to Design Point #1 along the southwest property line. The larger southwest portion of the site drains to the proposed "Southwest Wetland Pocket" via overland flow/swales. The Southwest Wetland Pocket and the rest of the developed portion of the site generally drain to the Stormwater Management Basin and are directed to the basin via a network of catch basins. The basin and the remainder of the site, totaling 6.61 acres, drain to Design Point # 2 along the southern and western edge of the north/east wetlands.

The underlying upland soils on the property consist of Timakwa and Natchaug soils, Agawam Fine Sandy loam, Woodbridge fine sandy loam, Paxton and Montauk fine sandy loams, Udorthents-Pits complex as shown on the drainage area map.

Permeability samples were taken near the proposed basin. The permeability of the underlying soils is 0.52 ft./day (or 0.26 in./hour) minimum. An exfiltration rate of 0.13 in./hour, which provides a factor of safety of 2.0, was used in the design of the proposed Stormwater Management Basin. These parameters are ultra-conservative since the soil along the bottom of the basin will be replaced and/or augmented with a well-draining sand/compost mix.

The proposed project includes several BMP and LID techniques and measures to mitigate impacts of stormwater runoff and reduce the pollutant content of stormwater discharge. The proposed methods include, but are not limited to: breaking up areas of impervious surfaces and avoiding combined concentrated point discharges (roof/parking lot), inhibiting erosion by using pre-formed scour holes at pipe outfalls, promoting infiltration by reducing impervious areas with proposed substantial landscaping, introducing wetlands buffer plantings, and a stormwater management basin with a sand/compost mix, plantings along the bottom, and a water quality volume (WQV) forebay. Additionally, all proposed catch basins have 2' deep sumps and the final catch basin prior to discharging to the stormwater management basin has a 4' deep sump and an outlet hood.

The NRCS TR-55 methodology was utilized to evaluate existing and proposed stormwater runoff conditions with the AutoCAD embedded HydraFlow Hydrographs computer program. All times of concentration were computed using the TR-55 methodology as recommended by the ConnDOT Drainage Manual. The 24-hour NRCS Type III rainfall distribution was used for all storms. All rainfall amounts used in this analysis were taken from the Hydrometeorological Design Studies Center of the National Oceanic and Atmospheric Administration (NOAA) National Weather Service and published in NOAA Atlas 14 Volume 10: Precipitation-Frequency Atlas of the United States, Northeastern States, last revised on September 30, 2015. Refer to the plan entitled "Drainage Area Map" enclosed within this report for all watershed information.

Included with this report are HydraFlow supporting computations and hydrographs for the existing conditions and proposed conditions for both Design Point #1 and Design Point #2. Detailed summaries of the computational results for the 2, 10, 25, 50 and 100-year storms are also included.

The proposed peak rate and volume of runoff of Design Point #1 will have a slight increase from existing conditions due to slight changes in land cover; however, all discharges are minor at less than 0.7 cfs. The proposed peak rate of runoff of Design Point #2 decreases for the 2-year through 100-year storms. The proposed volume of runoff of Design Point #2 increases slightly for the 2-year through 100-year storms with the 25-year storm remaining within 10% of the existing conditions. See tables attached herewith. On a previous application for the subject property, it was advised that volumes should be maintained and not reduced for the benefit of the eastern wetland.

The Stormwater Management Basin provides a minimum of 1-foot of freeboard to the top of the berm for the 100-year storm. The 25-year design storm water surface elevation is equal to the outlet structure grate overflow elevation. The forebay in the basin exceeds the minimum required WQV volume. The basin is proposed to capture, attenuate, and enhance the runoff generated from the proposed site improvements. The outlet control structure will meter the volume and rate of runoff and allow the proposed hydrology to mimic the existing hydrology as closely as possible. The basin outlet was designed so that any remaining stormwater that is not discharged from the outlet control structure will completely drain from the basin via infiltration within 72 hours. Refer to the attached summary tables for tabulated results for peak rates of runoff, volume of runoff and water surface elevations for the pre- and post-development conditions.

DESIGN POINT #1 (SOUTHWEST PROPERTY LINE)

PEAK RATE OF RUNOFF		
STORM	PEAK RATE OF RUNOFF (CFS)	
	EXISTING	PROPOSED
2-YEAR	0.1	0.2
10-YEAR	0.3	0.4
25-YEAR	0.4	0.5
50-YEAR	0.5	0.6
100-YEAR	0.6	0.7

VOLUME OF RUNOFF		
STORM	VOLUME OF RUNOFF (CF)	
	EXISTING	PROPOSED
2-YEAR	598	620
10-YEAR	1,252	1,669
25-YEAR	1,699	1,996
50-YEAR	2,041	2,353
100-YEAR	2,418	2,780

DESIGN POINT #2 (SOUTH & WESTERN
EDGE OF NORTH/EAST WETLANDS)

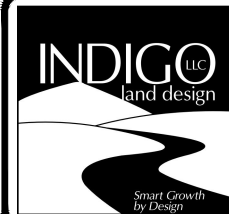
PEAK RATE OF RUNOFF		
STORM	PEAK RATE OF RUNOFF (CFS)	
	EXISTING	PROPOSED
2-YEAR	4.1	1.9
10-YEAR	9.8	6.1
25-YEAR	13.7	7.4
50-YEAR	16.8	10.4
100-YEAR	20.1	14.1

VOLUME OF RUNOFF		
STORM	VOLUME OF RUNOFF (CF)	
	EXISTING	PROPOSED
2-YEAR	25,207	25,743
10-YEAR	56,350	70,145
25-YEAR	78,144	83,831
50-YEAR	95,063	98,626
100-YEAR	113,749	116,287

DATE: APRIL 4, 2024	SCALE: N/A
DRAWN BY: MGA	CHKD BY: JW
DWG. NO.: DDS-1	SHEET NO.: 1 of 3

DRAINAGE DISCHARGE SUMMARY

PREPARED FOR ORTHO SAYBROOK, LLC
52 SPENCER PLAIN ROAD (CT ROUTE 166)
MAP 145 LOT 2871
OLD SAYBROOK, CONNECTICUT



PLAN PREPARED BY:
INDIGO LAND DESIGN, LLC
JOSEPH WREN, P.E.
CT REG. NO. 21090
40 ELM STREET, 2ND FLOOR
OLD SAYBROOK, CT 06475
PHONE: (860) 388-9343
WEB: INDIGO-LAND.COM

**WATER SURFACE ELEVATION
IN PROPOSED BASIN #1**

STORM	ELEVATION
2-YEAR	23.71
10-YEAR	24.77
25-YEAR	25.05
50-YEAR	25.26
100-YEAR	25.42 (1.58' OF FREEBOARD)

BASIN GRADE ELEVATIONS:
 BASIN TOP OF BERM ELEV. = 27.00
 BASIN BOTTOM ELEV. = 22.00

OUTLET CONTROL STRUCTURE ELEVATIONS:
 TOP OF GRATE ELEV. = 25.1
 4" H X 8" W HIGH LEVEL OPENING ELEV. = 24.1
 3" DIAMETER LOW LEVEL OPENING ELEV. = 22.75
 12" HDPE INV. OUT ELEV. = 22.00

**WATER SURFACE ELEVATION
IN SOUTHWEST WETLAND POCKET**

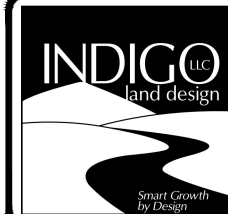
STORM	ELEVATION
2-YEAR	24.34
10-YEAR	24.95
25-YEAR	25.09
50-YEAR	25.21
100-YEAR	25.36

OVERFLOW GRATE ELEV. = 26.2

DATE: APRIL 4, 2024	SCALE: N/A
DRAWN BY: MGA	CHKD BY: JW
DWG. NO.: DES-1	SHEET NO.: 2 of 3

DRAINAGE ELEVATION SUMMARY

PREPARED FOR ORTHO SAYBROOK, LLC
 52 SPENCER PLAIN ROAD (CT ROUTE 166)
 MAP 145 LOT 2871
 OLD SAYBROOK, CONNECTICUT



PLAN PREPARED BY:
 INDIGO LAND DESIGN, LLC
 JOSEPH WREN, P.E.
 CT REG. NO. 21090
 40 ELM STREET, 2ND FLOOR
 OLD SAYBROOK, CT 06475
 PHONE: (860) 388-9343
 WEB: INDIGO-LAND.COM

REFERENCE: "SECTION 7.4.1: WATER QUALITY VOLUME (WQV)" OF
 THE 2004 CONNECTICUT STORMWATER QUALITY MANUAL BY THE
 CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

FIRST INCH OF RAINFALL
 $WQV = (1)(R)(A) / 12$
 WHERE: R = 0.05 + 0.009 x % IMPERVIOUS
 A = DRAINAGE AREA IN ACRES

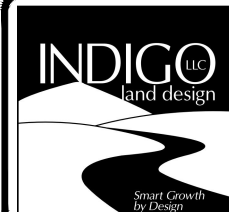
WATER QUALITY VOLUME DATA FOR PROPOSED FOREBAY IN BASIN #1						
DRAINAGE AREA (ACRES)	IMPERVIOUS AREA (ARCES)	PERCENT IMPERVIOUS AREA (%)	R (INCHES)	WQV REQ'D (ACRE-FT)	WQV REQ'D (CU. FT.)	WQV PROVIDED (CU. FT.)
3.80	1.97	51.80	0.516	0.163	7,115	7,538

*WQV PROVIDED BASED ON RIPRAP FOREBAY (STORAGE VOLUME UP TO TOP OF RIPRAP = 7,538± C.F.)

DATE: APRIL 4, 2024	SCALE: N/A
DRAWN BY: MGA	CHKD BY: JW
DWG. NO.: WQV-1	SHEET NO.: 3 of 3

WATER QUALITY VOLUME CALCULATIONS

PREPARED FOR ORTHO SAYBROOK, LLC
 52 SPENCER PLAIN ROAD (CT ROUTE 166)
 MAP 145 LOT 2871
 OLD SAYBROOK, CONNECTICUT



PLAN PREPARED BY:
 INDIGO LAND DESIGN, LLC
 JOSEPH WREN, P.E.
 CT REG. NO. 21090
 40 ELM STREET, 2ND FLOOR
 OLD SAYBROOK, CT 06475
 PHONE: (860) 388-9343
 WEB: INDIGO-LAND.COM

Watershed Model Schematic.....	1
Hydrograph Return Period Recap.....	2
2 - Year	
Summary Report.....	3
Hydrograph Reports.....	4
Hydrograph No. 1, SCS Runoff, Shed A / DP1.....	4
TR-55 Tc Worksheet.....	5
Hydrograph No. 2, SCS Runoff, Shed B / DP2.....	6
TR-55 Tc Worksheet.....	7
10 - Year	
Summary Report.....	8
Hydrograph Reports.....	9
Hydrograph No. 1, SCS Runoff, Shed A / DP1.....	9
Hydrograph No. 2, SCS Runoff, Shed B / DP2.....	10
25 - Year	
Summary Report.....	11
Hydrograph Reports.....	12
Hydrograph No. 1, SCS Runoff, Shed A / DP1.....	12
Hydrograph No. 2, SCS Runoff, Shed B / DP2.....	13
50 - Year	
Summary Report.....	14
Hydrograph Reports.....	15
Hydrograph No. 1, SCS Runoff, Shed A / DP1.....	15
Hydrograph No. 2, SCS Runoff, Shed B / DP2.....	16
100 - Year	
Summary Report.....	17
Hydrograph Reports.....	18
Hydrograph No. 1, SCS Runoff, Shed A / DP1.....	18
Hydrograph No. 2, SCS Runoff, Shed B / DP2.....	19

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022



Legend

<u>Hyd.</u>	<u>Origin</u>	<u>Description</u>
1	SCS Runoff	Shed A / DP1
2	SCS Runoff	Shed B / DP2

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

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	-----	-----	0.146	-----	-----	0.318	0.432	0.519	0.613	Shed A / DP1
2	SCS Runoff	-----	-----	4.130	-----	-----	9.810	13.74	16.76	20.07	Shed B / DP2

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

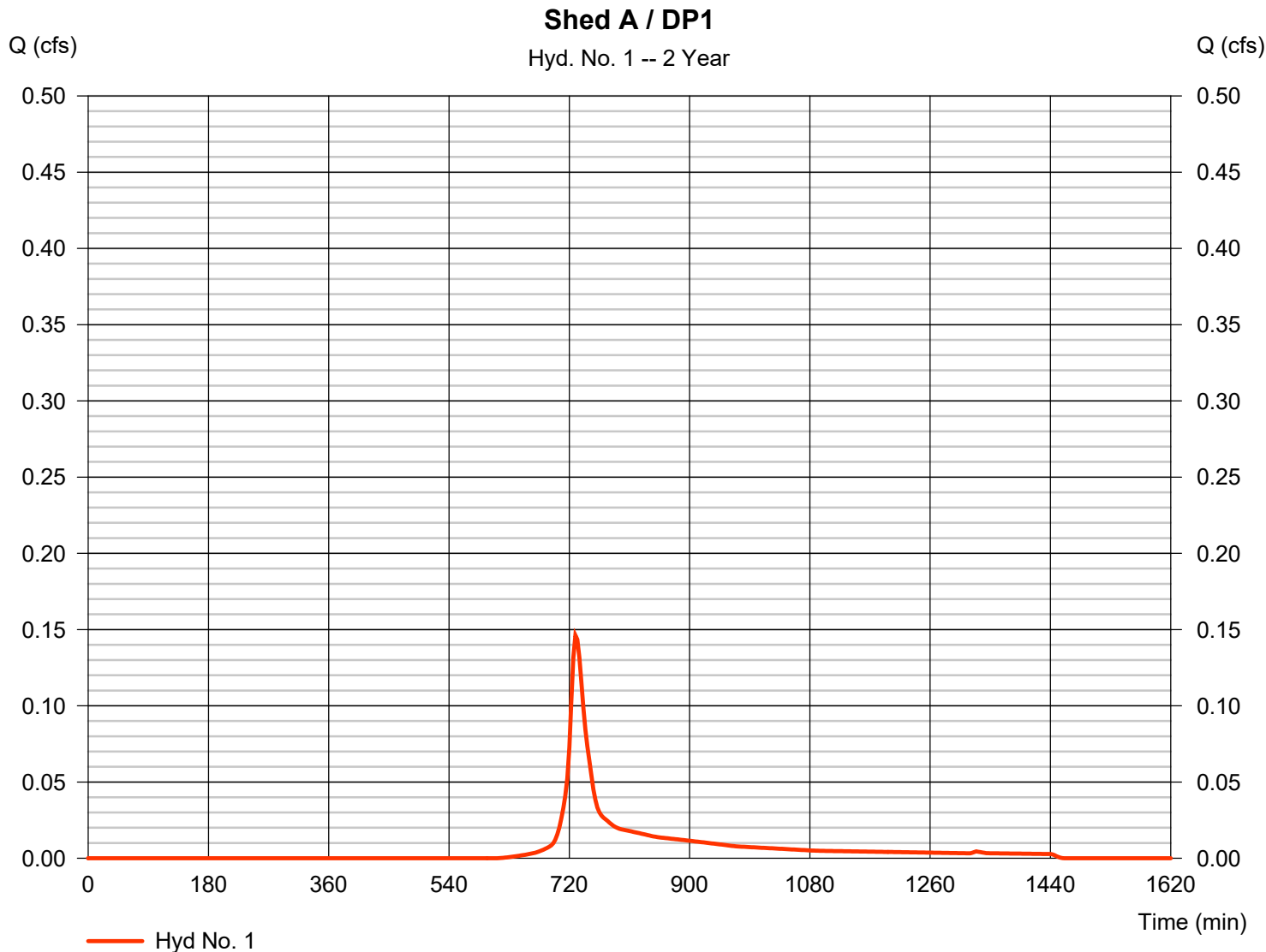
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.146	3	729	598	-----	-----	-----	Shed A / DP1
2	SCS Runoff	4.130	3	747	25,207	-----	-----	-----	Shed B / DP2

Hydrograph Report

Hyd. No. 1

Shed A / DP1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.146 cfs
Storm frequency	= 2 yrs	Time to peak	= 729 min
Time interval	= 3 min	Hyd. volume	= 598 cuft
Drainage area	= 0.130 ac	Curve number	= 75
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 14.30 min
Total precip.	= 3.45 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No. 1

Shed A / DP1

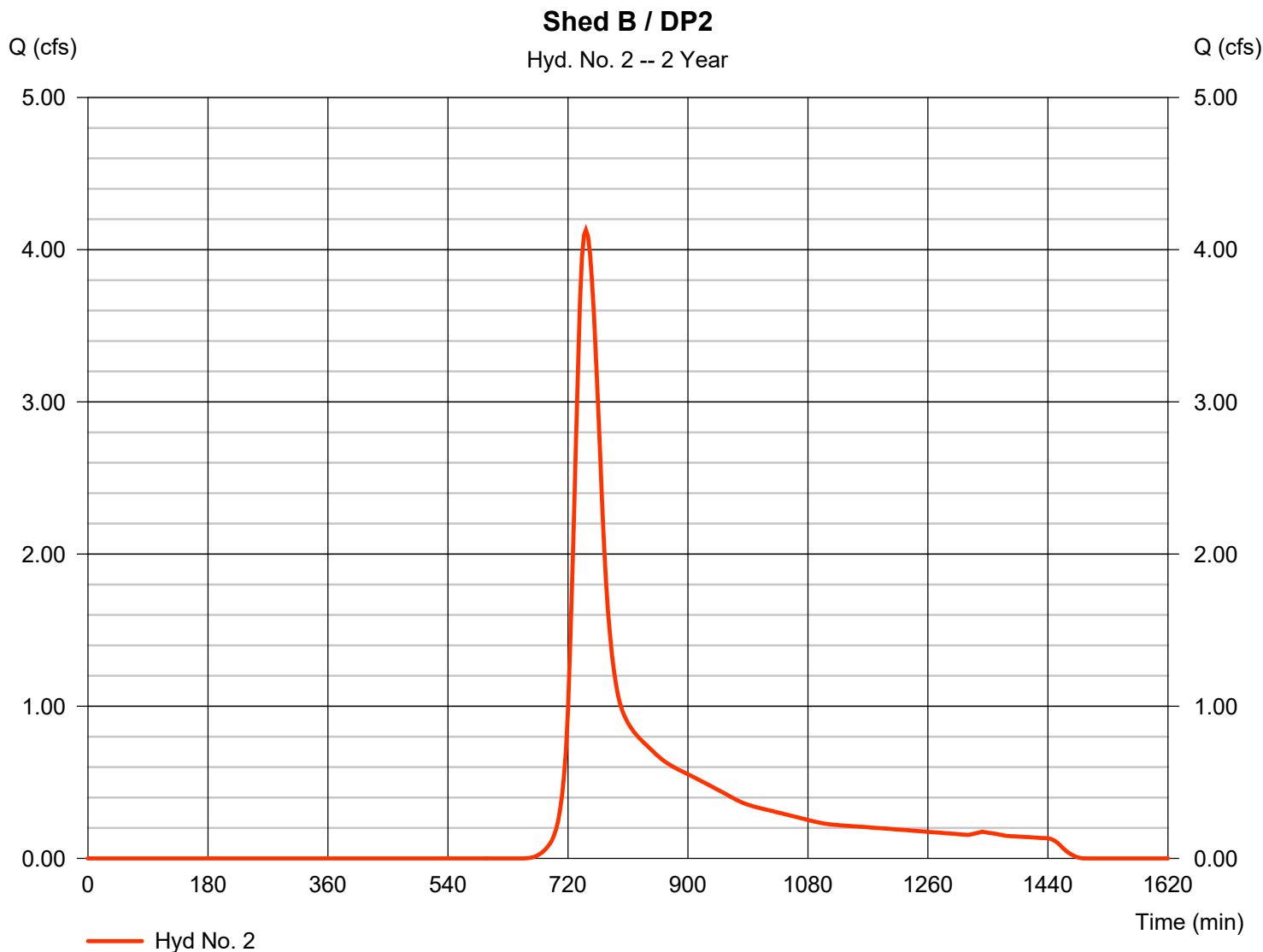
<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.600	0.011	
Flow length (ft)	= 58.0	40.0	0.0	
Two-year 24-hr precip. (in)	= 3.45	3.45	3.45	
Land slope (%)	= 30.00	3.30	0.00	
Travel Time (min)	= 3.01	+	11.25	+
				0.00
				= 14.26
Shallow Concentrated Flow				
Flow length (ft)	= 0.00	0.00	0.00	
Watercourse slope (%)	= 0.00	0.00	0.00	
Surface description	= Unpaved	Unpaved	Unpaved	
Average velocity (ft/s)	=0.00	0.00	0.00	
Travel Time (min)	= 0.00	+	0.00	+
				0.00
				= 0.00
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	
Travel Time (min)	= 0.00	+	0.00	+
				0.00
				= 0.00
Total Travel Time, Tc				14.30 min

Hydrograph Report

Hyd. No. 2

Shed B / DP2

Hydrograph type	= SCS Runoff	Peak discharge	= 4.130 cfs
Storm frequency	= 2 yrs	Time to peak	= 747 min
Time interval	= 3 min	Hyd. volume	= 25,207 cuft
Drainage area	= 6.610 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.10 min
Total precip.	= 3.45 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No. 2

Shed B / DP2

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.600	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.45	3.45	3.45	
Land slope (%)	= 4.00	0.00	0.00	
Travel Time (min)	= 29.99	+ 0.00	+ 0.00	= 29.99
Shallow Concentrated Flow				
Flow length (ft)	= 286.00	0.00	0.00	
Watercourse slope (%)	= 2.00	0.00	0.00	
Surface description	= Unpaved	Unpaved	Unpaved	
Average velocity (ft/s)	=2.28	0.00	0.00	
Travel Time (min)	= 2.09	+ 0.00	+ 0.00	= 2.09
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	
Travel Time (min)	= 0.00	+ 0.00	+ 0.00	= 0.00
Total Travel Time, Tc				32.10 min

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

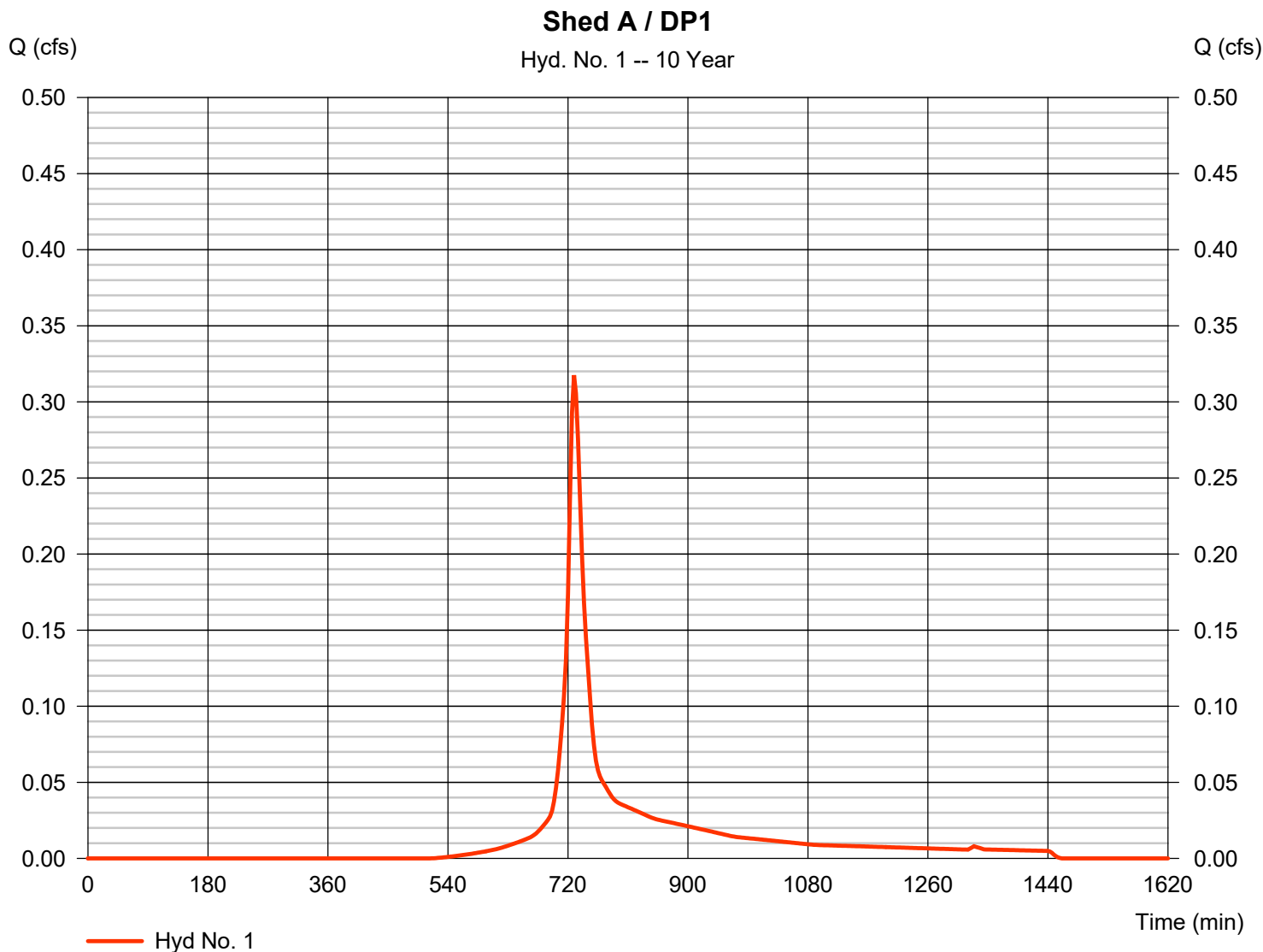
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.318	3	729	1,252	-----	-----	-----	Shed A / DP1
2	SCS Runoff	9.810	3	744	56,350	-----	-----	-----	Shed B / DP2

Hydrograph Report

Hyd. No. 1

Shed A / DP1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.318 cfs
Storm frequency	= 10 yrs	Time to peak	= 729 min
Time interval	= 3 min	Hyd. volume	= 1,252 cuft
Drainage area	= 0.130 ac	Curve number	= 75
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 14.30 min
Total precip.	= 5.25 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

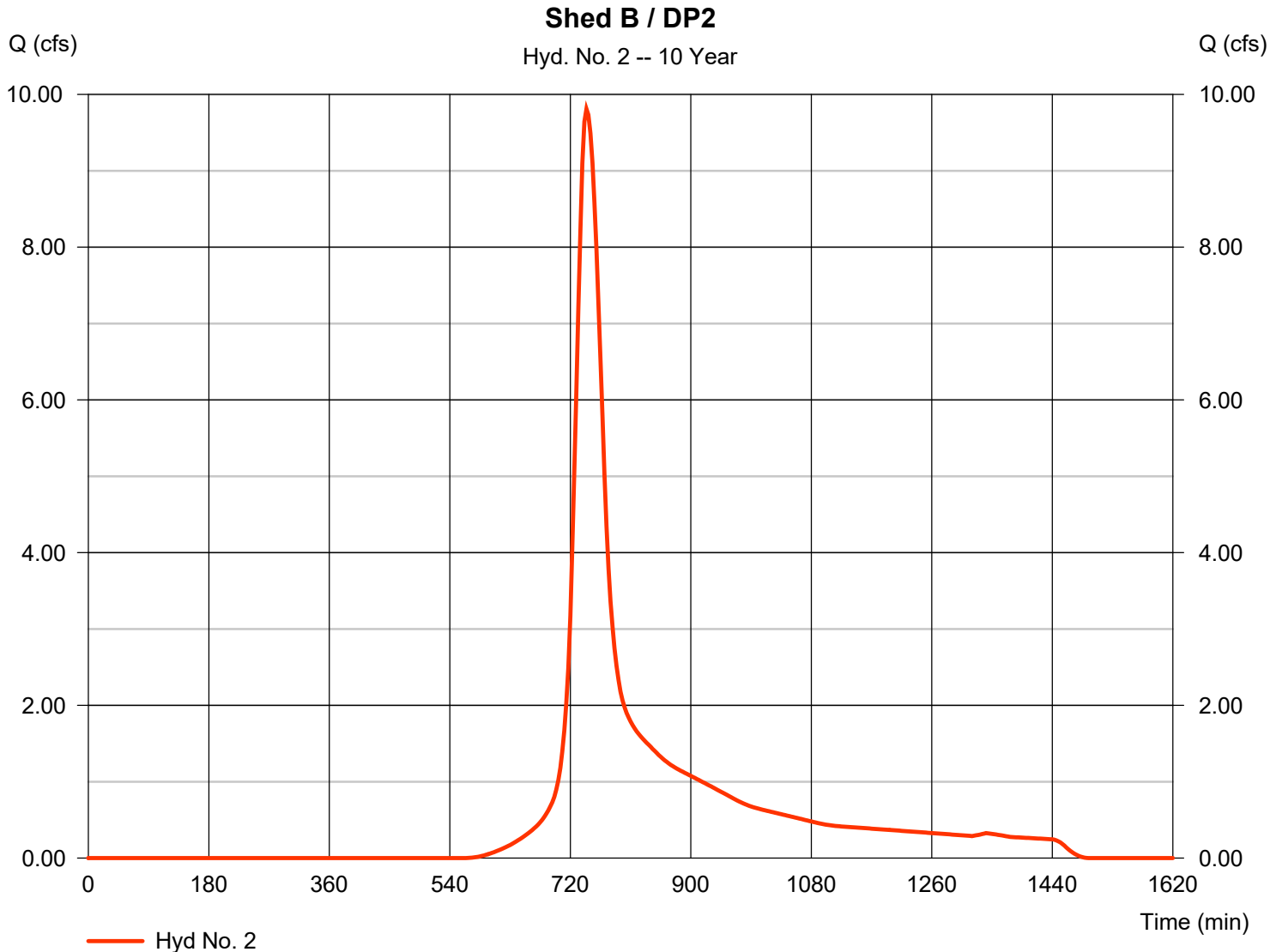
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 2

Shed B / DP2

Hydrograph type	= SCS Runoff	Peak discharge	= 9.810 cfs
Storm frequency	= 10 yrs	Time to peak	= 744 min
Time interval	= 3 min	Hyd. volume	= 56,350 cuft
Drainage area	= 6.610 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.10 min
Total precip.	= 5.25 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

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	0.432	3	729	1,699	-----	-----	-----	Shed A / DP1
2	SCS Runoff	13.74	3	744	78,144	-----	-----	-----	Shed B / DP2
Existing 52SPR Apr0424.gpw					Return Period: 25 Year		Thursday, 04 / 4 / 2024		

Hydrograph Report

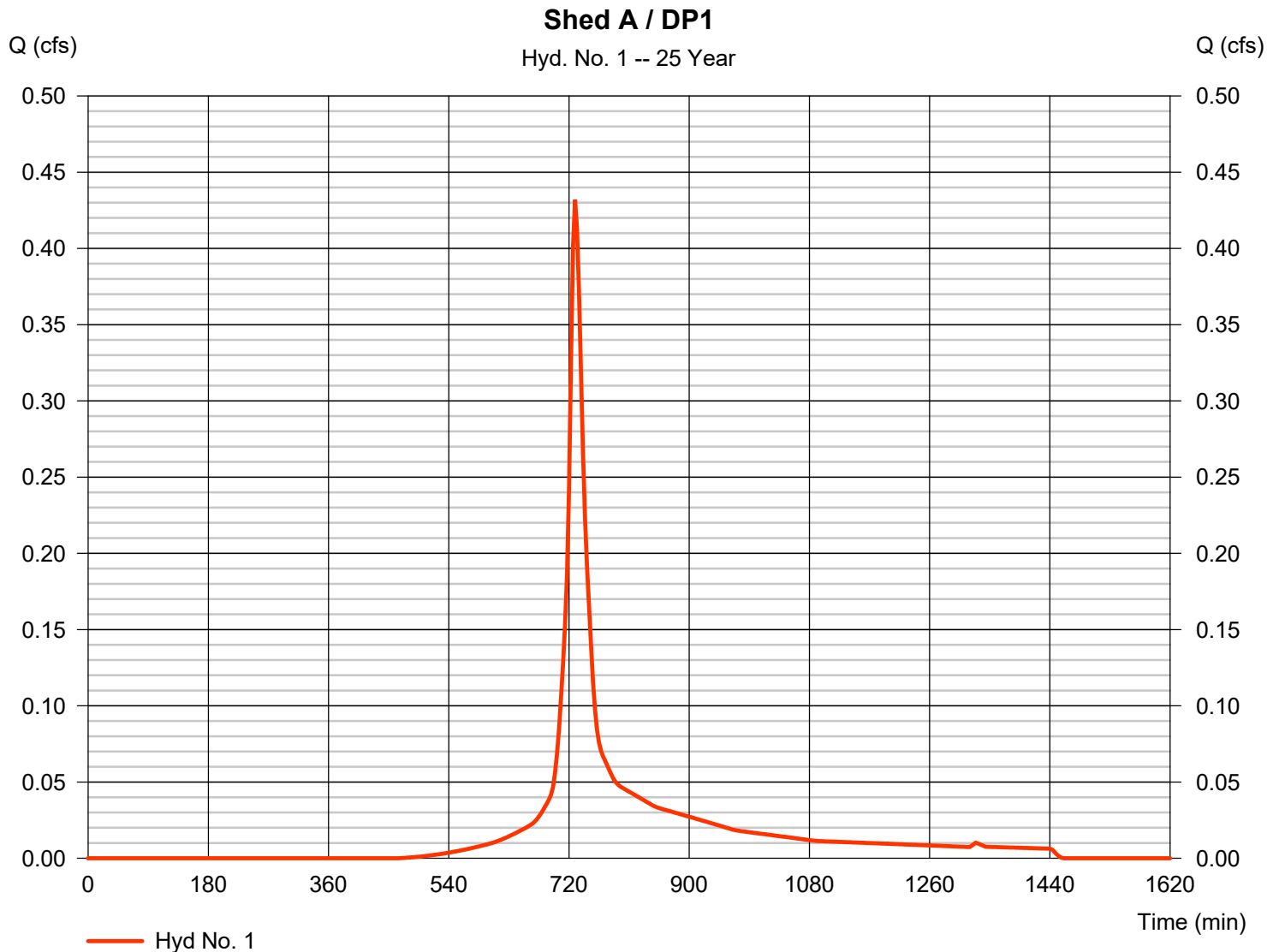
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 1

Shed A / DP1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.432 cfs
Storm frequency	= 25 yrs	Time to peak	= 729 min
Time interval	= 3 min	Hyd. volume	= 1,699 cuft
Drainage area	= 0.130 ac	Curve number	= 75
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 14.30 min
Total precip.	= 6.37 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

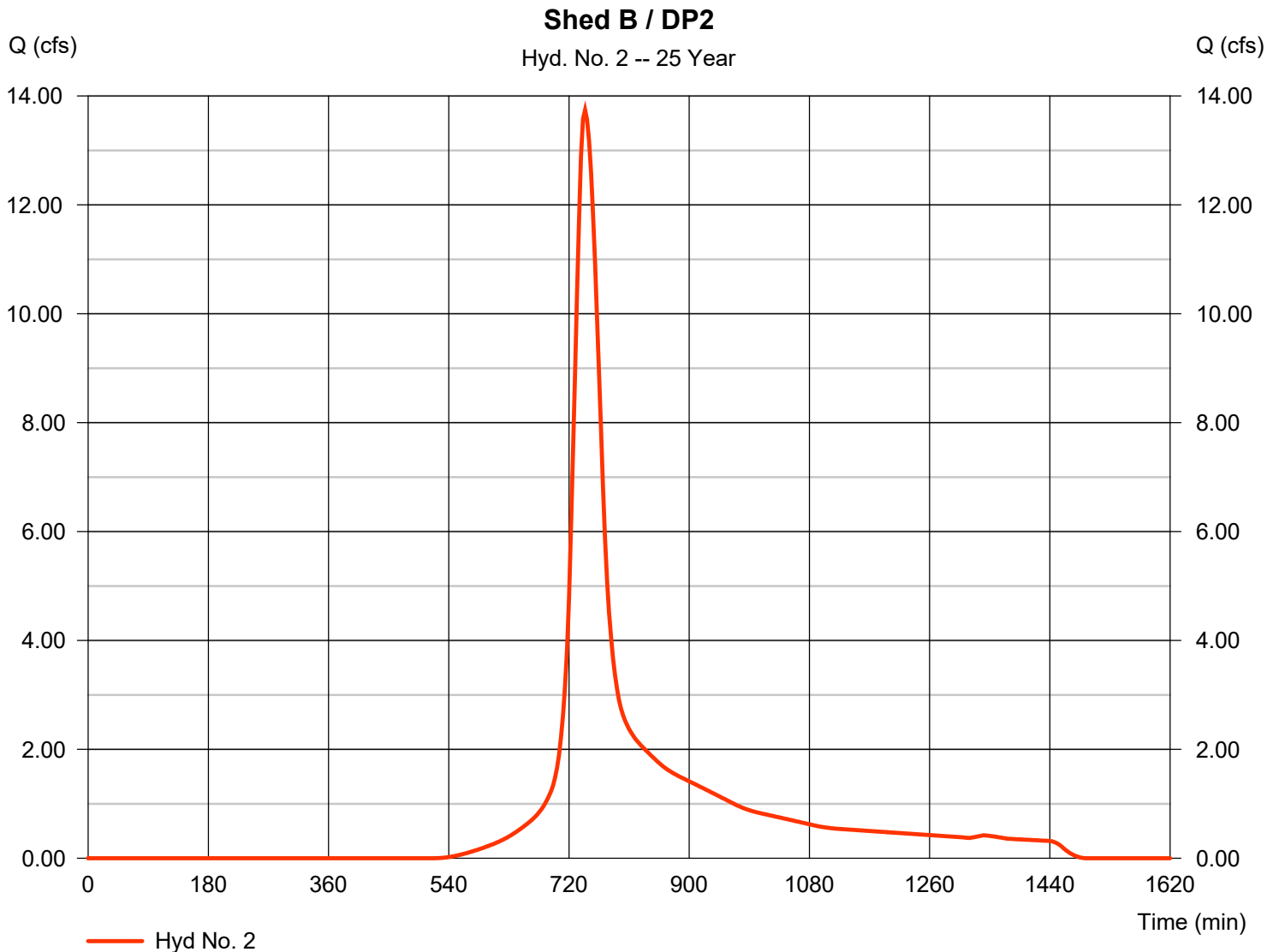
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 2

Shed B / DP2

Hydrograph type	= SCS Runoff	Peak discharge	= 13.74 cfs
Storm frequency	= 25 yrs	Time to peak	= 744 min
Time interval	= 3 min	Hyd. volume	= 78,144 cuft
Drainage area	= 6.610 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.10 min
Total precip.	= 6.37 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

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	0.519	3	729	2,041	-----	-----	-----	Shed A / DP1
2	SCS Runoff	16.76	3	744	95,063	-----	-----	-----	Shed B / DP2
Existing 52SPR Apr0424.gpw					Return Period: 50 Year		Thursday, 04 / 4 / 2024		

Hydrograph Report

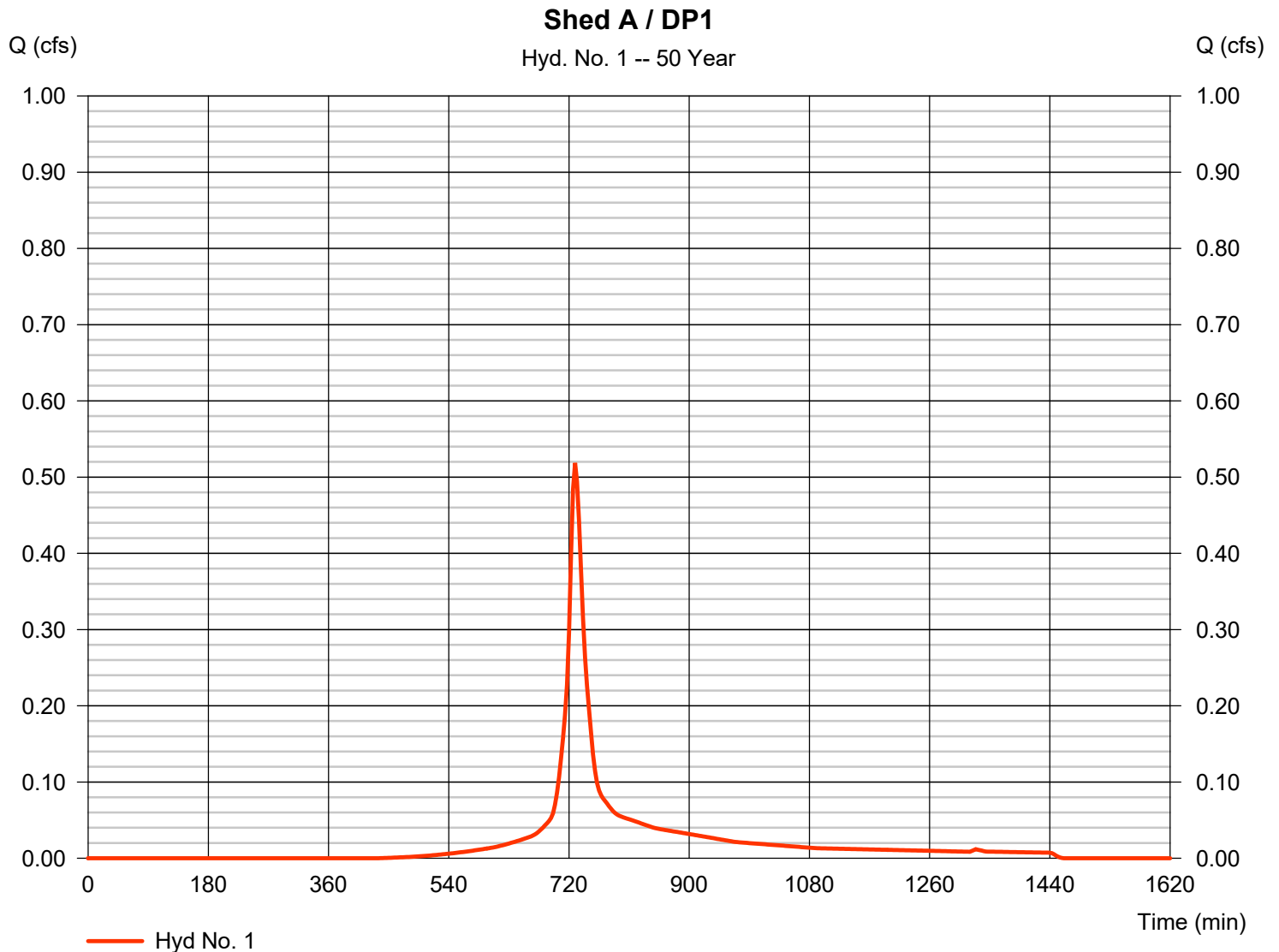
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 1

Shed A / DP1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.519 cfs
Storm frequency	= 50 yrs	Time to peak	= 729 min
Time interval	= 3 min	Hyd. volume	= 2,041 cuft
Drainage area	= 0.130 ac	Curve number	= 75
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 14.30 min
Total precip.	= 7.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

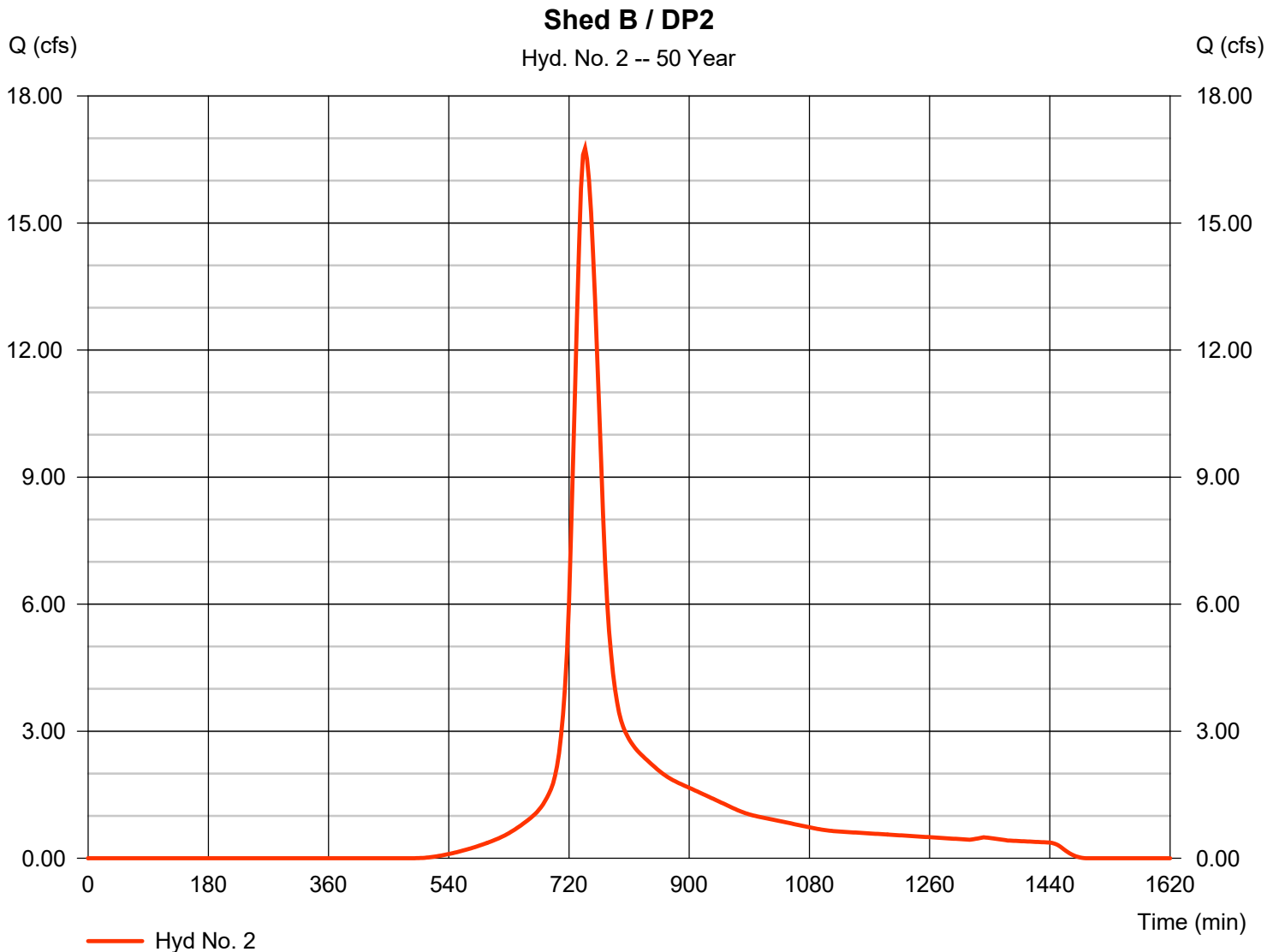
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 2

Shed B / DP2

Hydrograph type	= SCS Runoff	Peak discharge	= 16.76 cfs
Storm frequency	= 50 yrs	Time to peak	= 744 min
Time interval	= 3 min	Hyd. volume	= 95,063 cuft
Drainage area	= 6.610 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.10 min
Total precip.	= 7.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

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	0.613	3	729	2,418	-----	-----	-----	Shed A / DP1
2	SCS Runoff	20.07	3	744	113,749	-----	-----	-----	Shed B / DP2
Existing 52SPR Apr0424.gpw					Return Period: 100 Year		Thursday, 04 / 4 / 2024		

Hydrograph Report

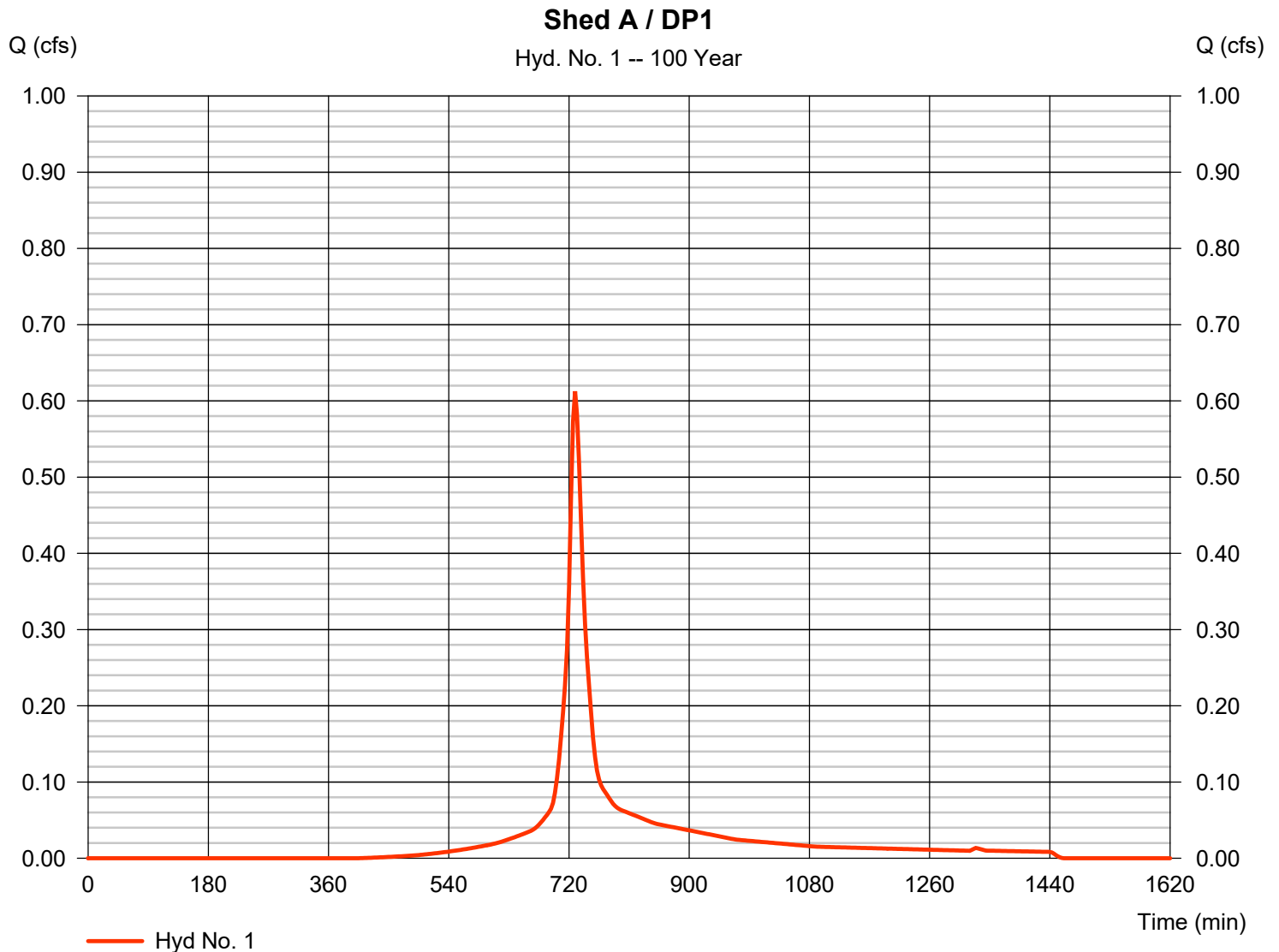
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 1

Shed A / DP1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.613 cfs
Storm frequency	= 100 yrs	Time to peak	= 729 min
Time interval	= 3 min	Hyd. volume	= 2,418 cuft
Drainage area	= 0.130 ac	Curve number	= 75
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 14.30 min
Total precip.	= 8.09 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

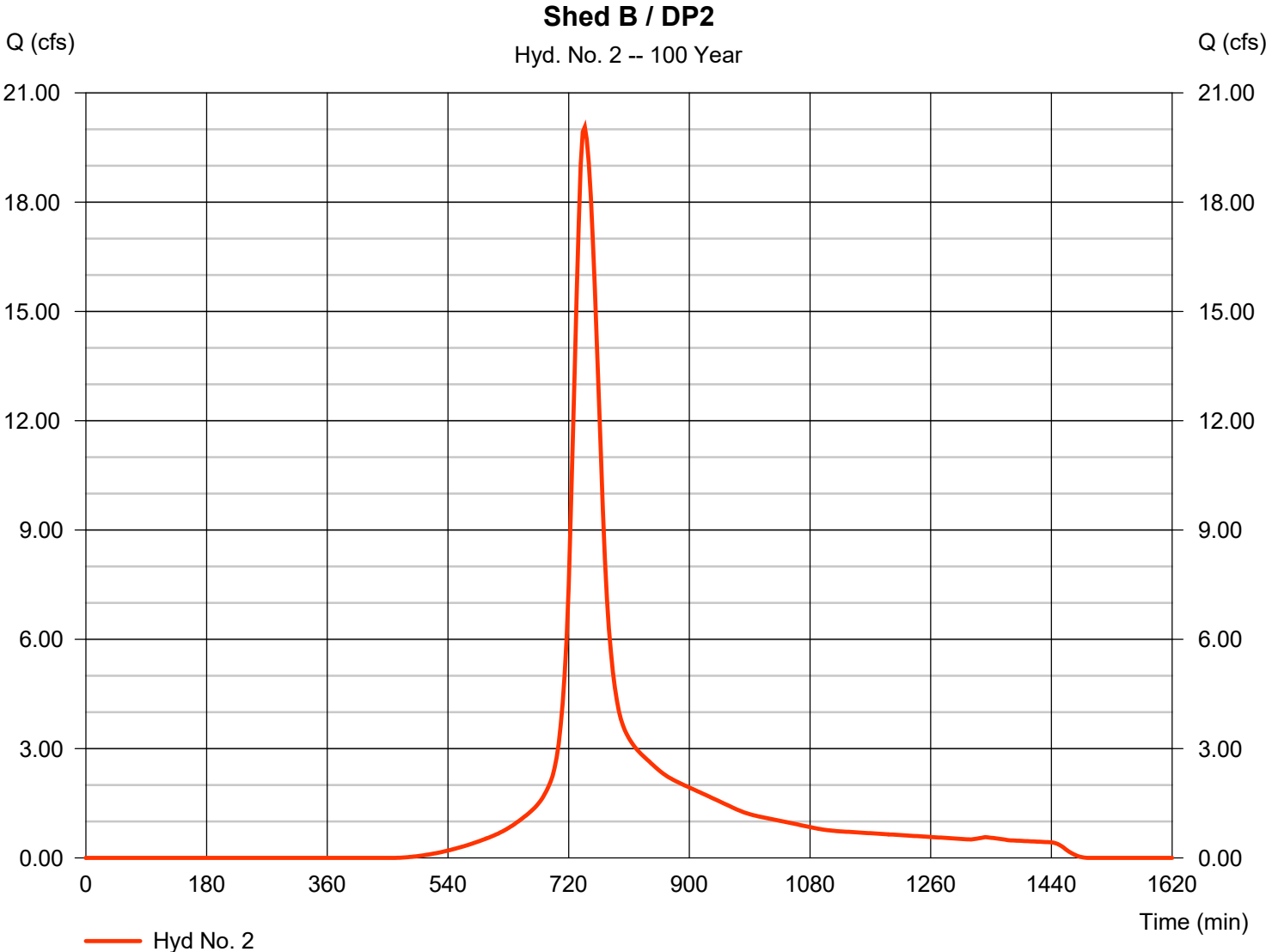


Hydrograph Report

Hyd. No. 2

Shed B / DP2

Hydrograph type	= SCS Runoff	Peak discharge	= 20.07 cfs
Storm frequency	= 100 yrs	Time to peak	= 744 min
Time interval	= 3 min	Hyd. volume	= 113,749 cuft
Drainage area	= 6.610 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.10 min
Total precip.	= 8.09 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydraflow Table of Contents

Watershed Model Schematic.....	1
Hydrograph Return Period Recap.....	2
2 - Year	
Summary Report.....	3
Hydrograph Reports.....	4
Hydrograph No. 1, SCS Runoff, SHED A.....	4
Hydrograph No. 2, SCS Runoff, SHED B.....	5
TR-55 Tc Worksheet.....	6
Hydrograph No. 3, SCS Runoff, SHED C.....	7
Hydrograph No. 4, SCS Runoff, SHED D.....	8
TR-55 Tc Worksheet.....	9
Hydrograph No. 5, Reservoir, SW WETLAND POCKET.....	10
Pond Report - SW WETLAND.....	11
Hydrograph No. 6, Combine, COMBO #1.....	12
Hydrograph No. 7, Reservoir, BASIN.....	13
Pond Report - BASIN #1.....	14
Hydrograph No. 8, Combine, DESIGN POINT.....	15
10 - Year	
Summary Report.....	16
Hydrograph Reports.....	17
Hydrograph No. 1, SCS Runoff, SHED A.....	17
Hydrograph No. 2, SCS Runoff, SHED B.....	18
Hydrograph No. 3, SCS Runoff, SHED C.....	19
Hydrograph No. 4, SCS Runoff, SHED D.....	20
Hydrograph No. 5, Reservoir, SW WETLAND POCKET.....	21
Hydrograph No. 6, Combine, COMBO #1.....	22
Hydrograph No. 7, Reservoir, BASIN.....	23
Hydrograph No. 8, Combine, DESIGN POINT.....	24
25 - Year	
Summary Report.....	25
Hydrograph Reports.....	26
Hydrograph No. 1, SCS Runoff, SHED A.....	26
Hydrograph No. 2, SCS Runoff, SHED B.....	27
Hydrograph No. 3, SCS Runoff, SHED C.....	28
Hydrograph No. 4, SCS Runoff, SHED D.....	29
Hydrograph No. 5, Reservoir, SW WETLAND POCKET.....	30
Hydrograph No. 6, Combine, COMBO #1.....	31
Hydrograph No. 7, Reservoir, BASIN.....	32
Hydrograph No. 8, Combine, DESIGN POINT.....	33
50 - Year	
Summary Report.....	34
Hydrograph Reports.....	35
Hydrograph No. 1, SCS Runoff, SHED A.....	35

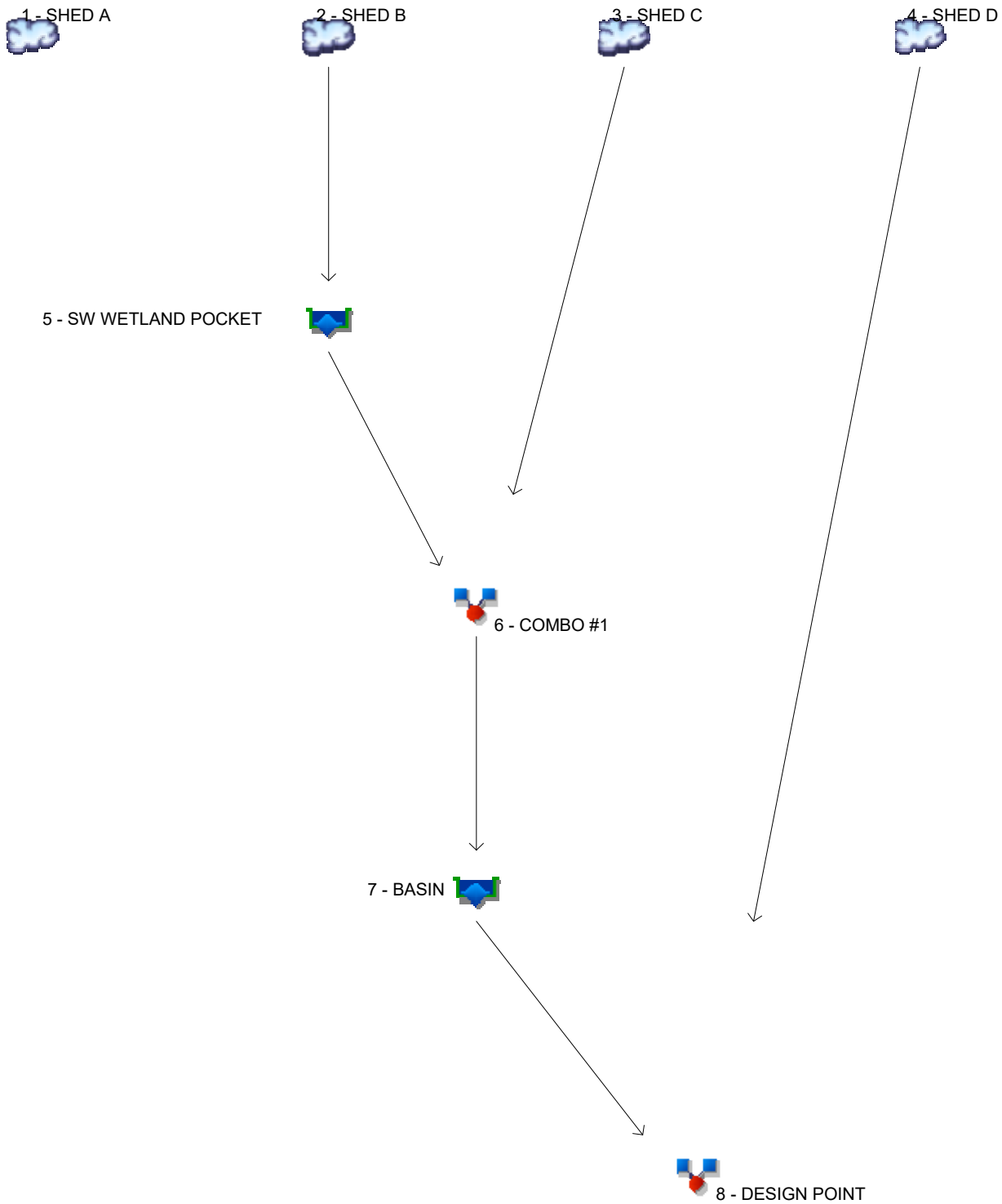
Hydrograph No. 2, SCS Runoff, SHED B.....	36
Hydrograph No. 3, SCS Runoff, SHED C.....	37
Hydrograph No. 4, SCS Runoff, SHED D.....	38
Hydrograph No. 5, Reservoir, SW WETLAND POCKET.....	39
Hydrograph No. 6, Combine, COMBO #1.....	40
Hydrograph No. 7, Reservoir, BASIN.....	41
Hydrograph No. 8, Combine, DESIGN POINT.....	42

100 - Year

Summary Report.....	43
Hydrograph Reports.....	44
Hydrograph No. 1, SCS Runoff, SHED A.....	44
Hydrograph No. 2, SCS Runoff, SHED B.....	45
Hydrograph No. 3, SCS Runoff, SHED C.....	46
Hydrograph No. 4, SCS Runoff, SHED D.....	47
Hydrograph No. 5, Reservoir, SW WETLAND POCKET.....	48
Hydrograph No. 6, Combine, COMBO #1.....	49
Hydrograph No. 7, Reservoir, BASIN.....	50
Hydrograph No. 8, Combine, DESIGN POINT.....	51

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022



Legend

<u>Hyd.</u>	<u>Origin</u>	<u>Description</u>
1	SCS Runoff	SHED A
2	SCS Runoff	SHED B
3	SCS Runoff	SHED C
4	SCS Runoff	SHED D
5	Reservoir	SW WETLAND POCKET
6	Combine	COMBO #1
7	Reservoir	BASIN
8	Combine	DESIGN POINT

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

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	-----	-----	0.153	-----	-----	0.424	0.507	0.596	0.701	SHED A
2	SCS Runoff	-----	-----	0.768	-----	-----	2.259	2.724	3.226	3.824	SHED B
3	SCS Runoff	-----	-----	5.684	-----	-----	10.99	12.50	14.09	15.97	SHED C
4	SCS Runoff	-----	-----	1.722	-----	-----	5.057	6.095	7.216	8.552	SHED D
5	Reservoir	2	-----	0.000	-----	-----	0.000	0.000	0.000	0.000	SW WETLAND POCKET
6	Combine	3, 5	-----	5.684	-----	-----	10.99	12.50	14.09	15.97	COMBO #1
7	Reservoir	6	-----	0.215	-----	-----	1.085	1.521	3.190	5.579	BASIN
8	Combine	4, 7	-----	1.901	-----	-----	6.058	7.360	10.35	14.08	DESIGN POINT

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

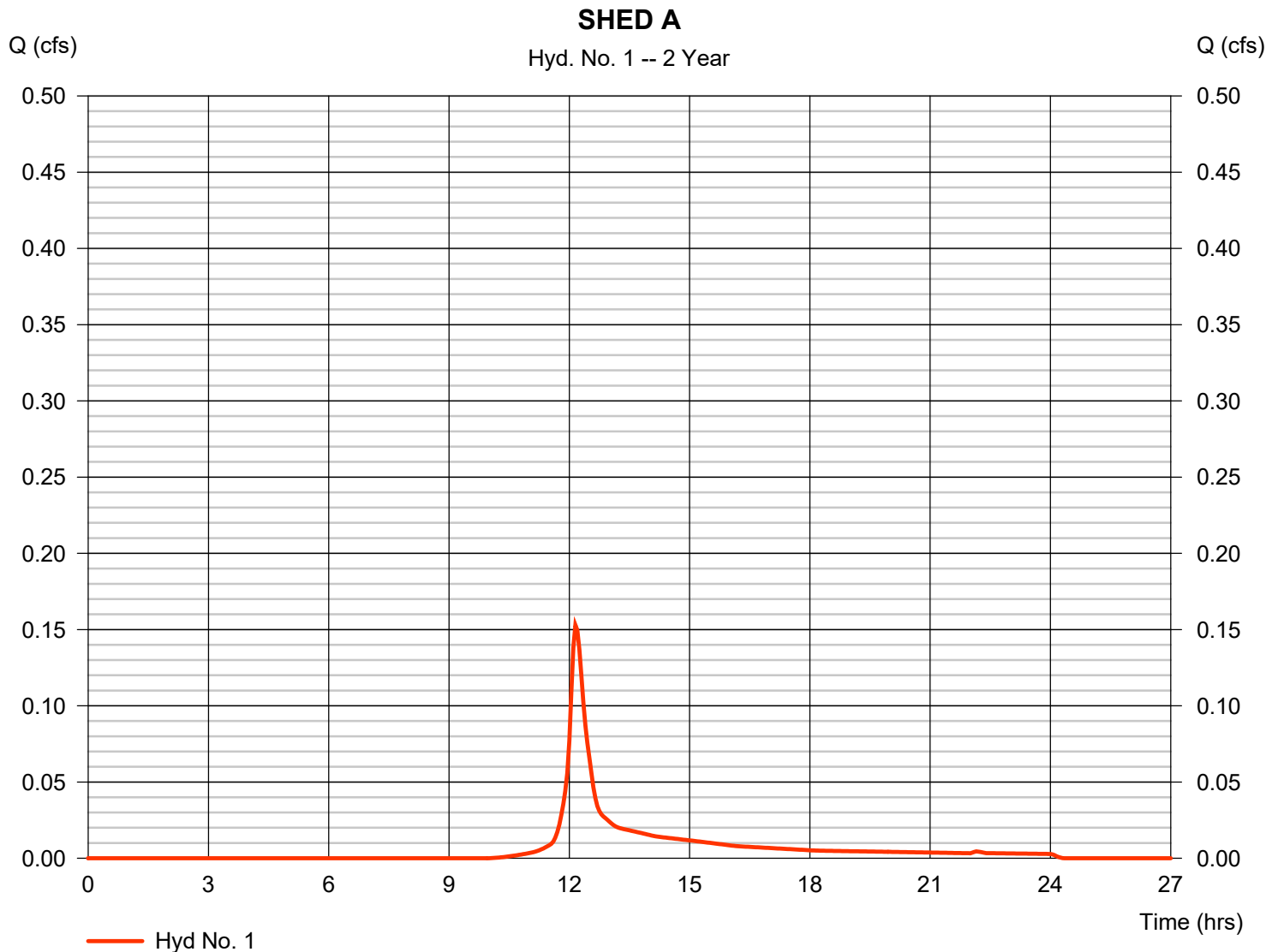
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.153	3	729	620	-----	-----	-----	SHED A
2	SCS Runoff	0.768	3	762	6,100	-----	-----	-----	SHED B
3	SCS Runoff	5.684	3	729	23,141	-----	-----	-----	SHED C
4	SCS Runoff	1.722	3	756	12,353	-----	-----	-----	SHED D
5	Reservoir	0.000	3	n/a	0	2	24.34	6,100	SW WETLAND POCKET
6	Combine	5.684	3	729	23,141	3, 5	-----	-----	COMBO #1
7	Reservoir	0.215	3	942	13,389	6	23.71	16,556	BASIN
8	Combine	1.901	3	756	25,743	4, 7	-----	-----	DESIGN POINT

Hydrograph Report

Hyd. No. 1

SHED A

Hydrograph type	= SCS Runoff	Peak discharge	= 0.153 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.15 hrs
Time interval	= 3 min	Hyd. volume	= 620 cuft
Drainage area	= 0.130 ac	Curve number	= 76
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.43 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

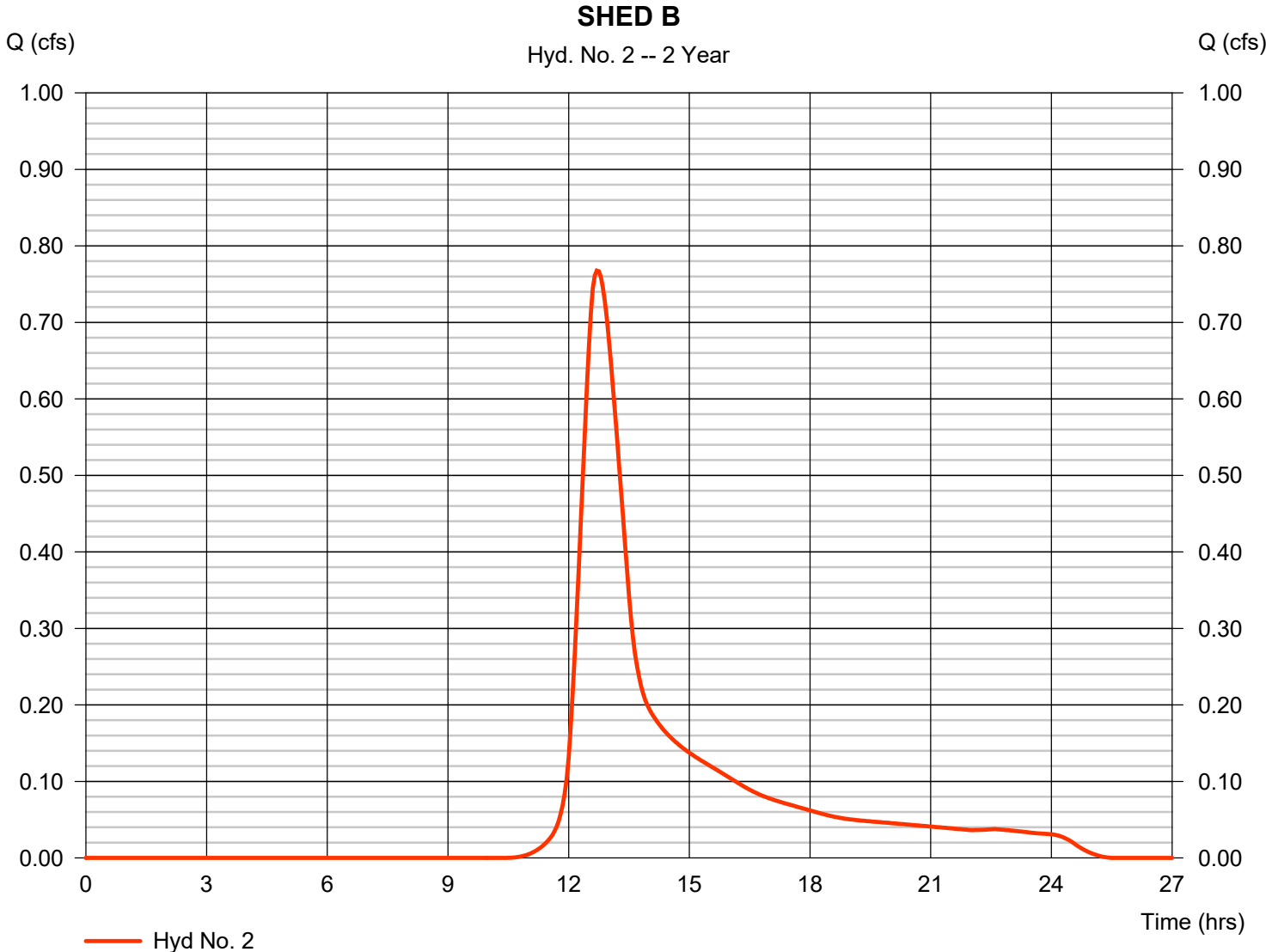


Hydrograph Report

Hyd. No. 2

SHED B

Hydrograph type	= SCS Runoff	Peak discharge	= 0.768 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.70 hrs
Time interval	= 3 min	Hyd. volume	= 6,100 cuft
Drainage area	= 1.410 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 57.10 min
Total precip.	= 3.43 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No. 2

SHED B

<u>Description</u>	<u>A</u>		<u>B</u>		<u>C</u>		<u>Totals</u>
Sheet Flow							
Manning's n-value	= 0.240		0.600		0.011		
Flow length (ft)	= 11.0		150.0		0.0		
Two-year 24-hr precip. (in)	= 3.45		3.45		0.00		
Land slope (%)	= 0.50		1.00		0.00		
Travel Time (min)	= 4.09	+	52.21	+	0.00	=	56.30
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		82.00		0.00		
Watercourse slope (%)	= 0.00		1.20		0.00		
Surface description	= Paved		Unpaved		Paved		
Average velocity (ft/s)	=0.00		1.77		0.00		
Travel Time (min)	= 0.00	+	0.77	+	0.00	=	0.77
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							57.10 min

Hydrograph Report

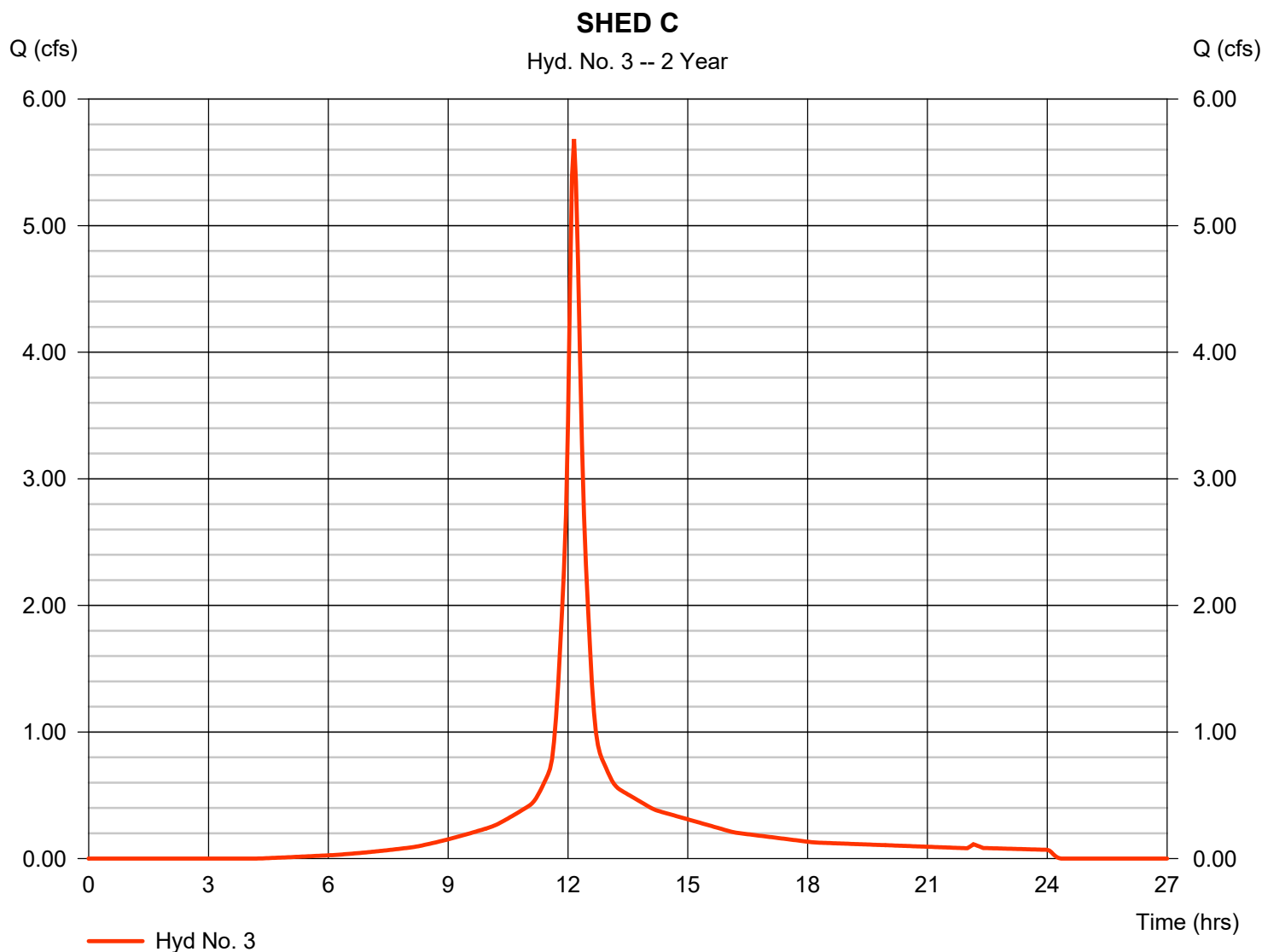
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 3

SHED C

Hydrograph type	= SCS Runoff	Peak discharge	= 5.684 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.15 hrs
Time interval	= 3 min	Hyd. volume	= 23,141 cuft
Drainage area	= 2.390 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.43 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

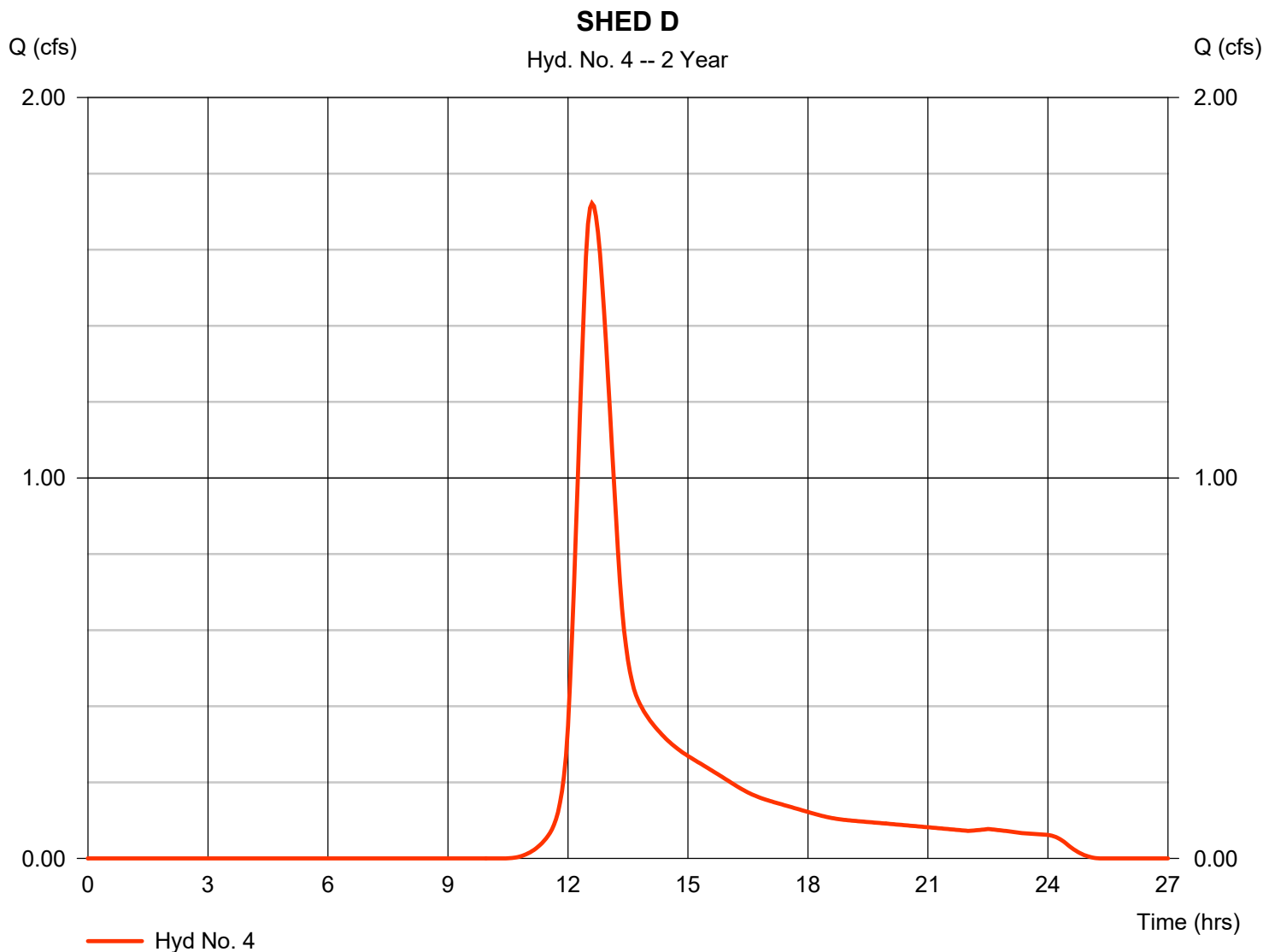
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 4

SHED D

Hydrograph type	= SCS Runoff	Peak discharge	= 1.722 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.60 hrs
Time interval	= 3 min	Hyd. volume	= 12,353 cuft
Drainage area	= 2.820 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 46.30 min
Total precip.	= 3.43 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No. 4

SHED D

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.011	0.240	0.600	
Flow length (ft)	= 18.0	39.0	163.0	
Two-year 24-hr precip. (in)	= 3.45	3.45	3.45	
Land slope (%)	= 22.20	33.30	1.80	
Travel Time (min)	= 0.11	+ 2.10	+ 44.11	= 46.32
Shallow Concentrated Flow				
Flow length (ft)	= 0.00	0.00	0.00	
Watercourse slope (%)	= 0.00	0.00	0.00	
Surface description	= Paved	Paved	Unpaved	
Average velocity (ft/s)	=0.00	0.00	0.00	
Travel Time (min)	= 0.00	+ 0.00	+ 0.00	= 0.00
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	
Travel Time (min)	= 0.00	+ 0.00	+ 0.00	= 0.00
Total Travel Time, Tc				46.30 min

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

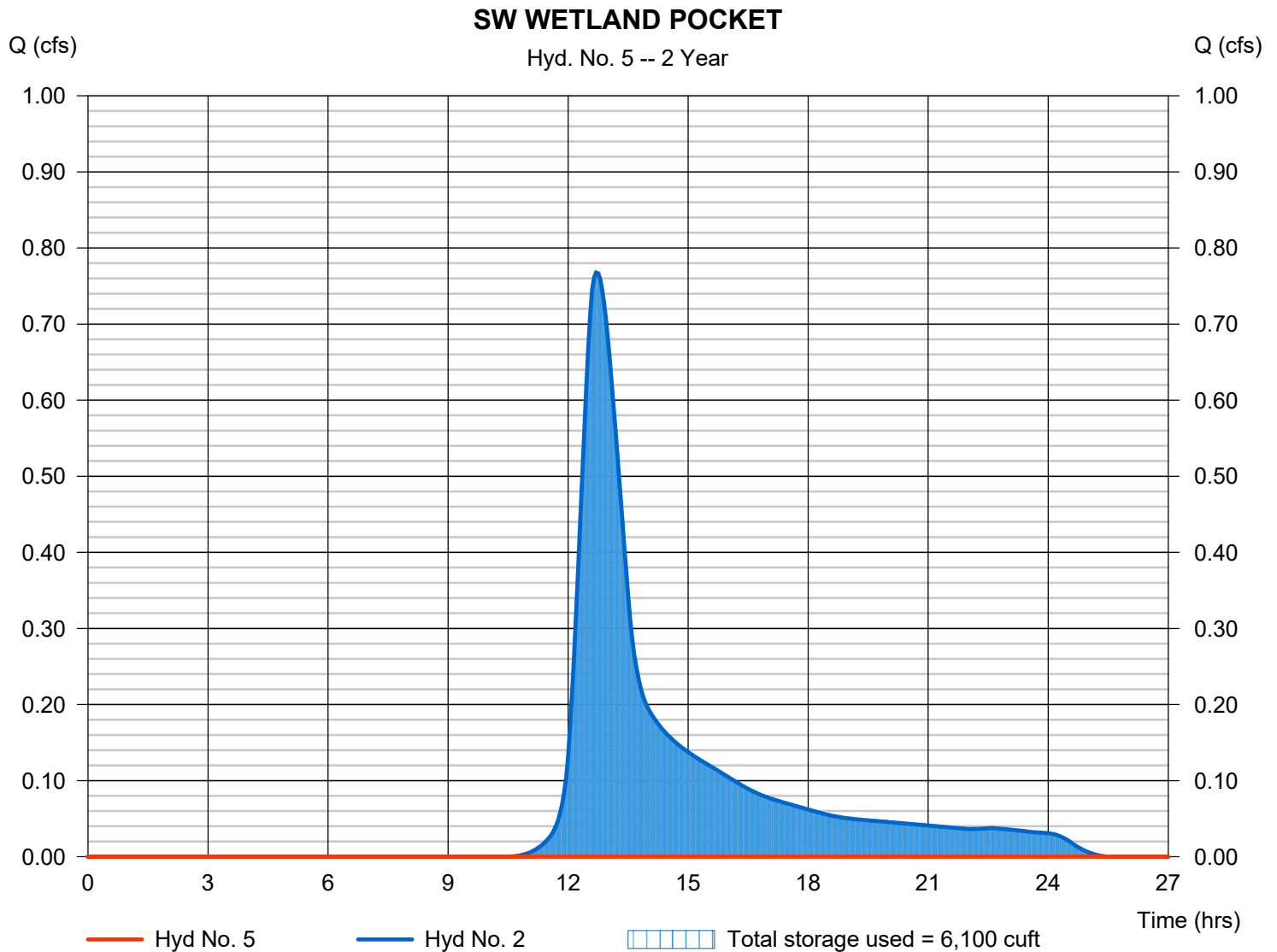
Thursday, 04 / 4 / 2024

Hyd. No. 5

SW WETLAND POCKET

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= n/a
Time interval	= 3 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 2 - SHED B	Max. Elevation	= 24.34 ft
Reservoir name	= SW WETLAND	Max. Storage	= 6,100 cuft

Storage Indication method used.



Pond No. 2 - SW WETLAND

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 24.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	24.00	11,371	0	0
1.00	25.00	25,455	17,945	17,945
2.00	26.00	34,917	30,059	48,003
3.00	27.00	41,072	37,949	85,952
3.50	27.50	41,992	20,763	106,716

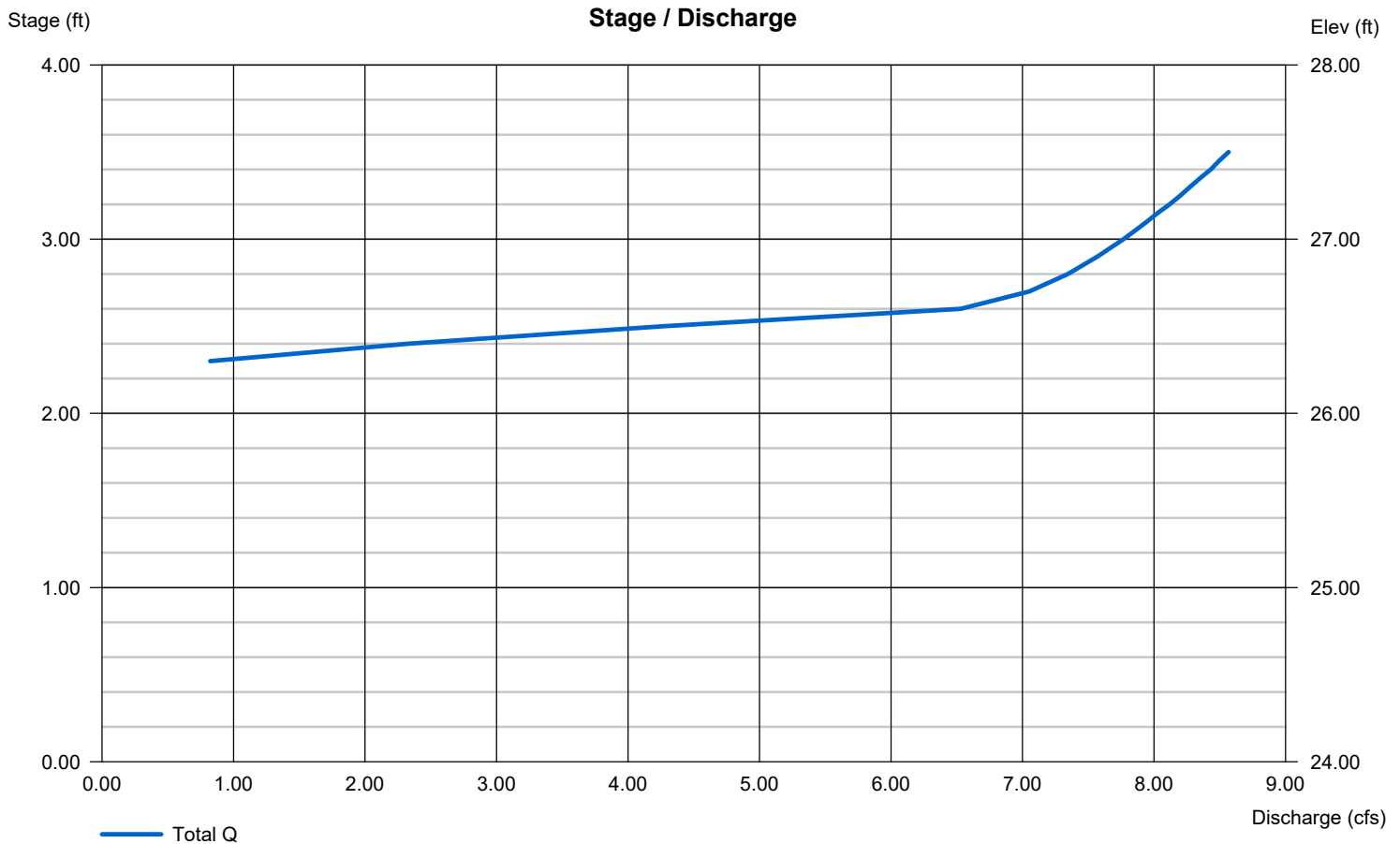
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	0.00	0.00	0.00
Span (in)	= 15.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 23.80	0.00	0.00	0.00
Length (ft)	= 105.00	0.00	0.00	0.00
Slope (%)	= 0.52	0.00	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)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 26.20	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
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).



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

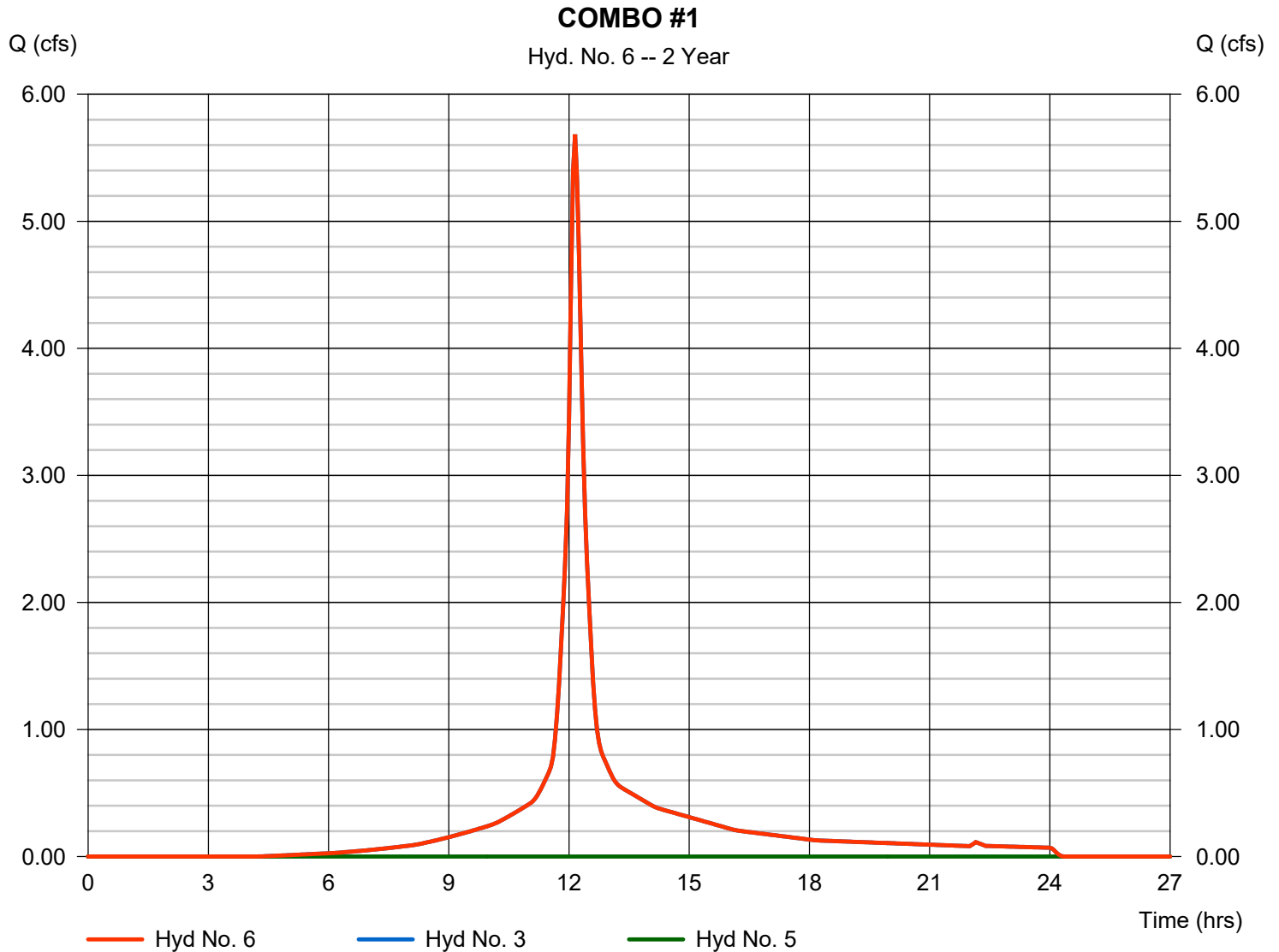
Thursday, 04 / 4 / 2024

Hyd. No. 6

COMBO #1

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 3 min
Inflow hyds. = 3, 5

Peak discharge = 5.684 cfs
Time to peak = 12.15 hrs
Hyd. volume = 23,141 cuft
Contrib. drain. area = 2.390 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

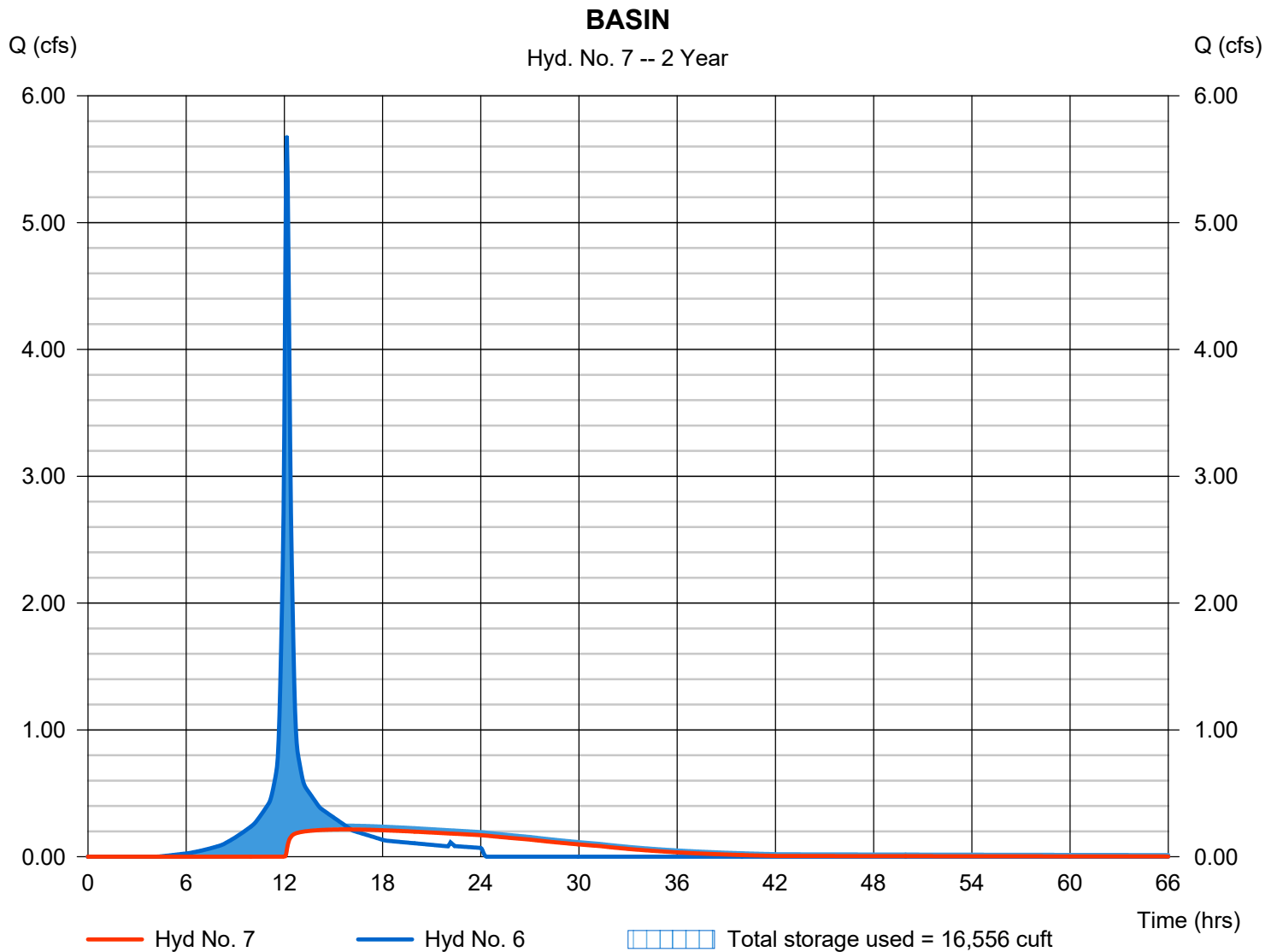
Thursday, 04 / 4 / 2024

Hyd. No. 7

BASIN

Hydrograph type	= Reservoir	Peak discharge	= 0.215 cfs
Storm frequency	= 2 yrs	Time to peak	= 15.70 hrs
Time interval	= 3 min	Hyd. volume	= 13,389 cuft
Inflow hyd. No.	= 6 - COMBO #1	Max. Elevation	= 23.71 ft
Reservoir name	= BASIN #1	Max. Storage	= 16,556 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 1 - BASIN #1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 22.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	22.00	8,028	0	0
2.00	24.00	11,447	19,372	19,372
4.00	26.00	14,223	25,617	44,990
5.00	27.00	15,566	14,888	59,877

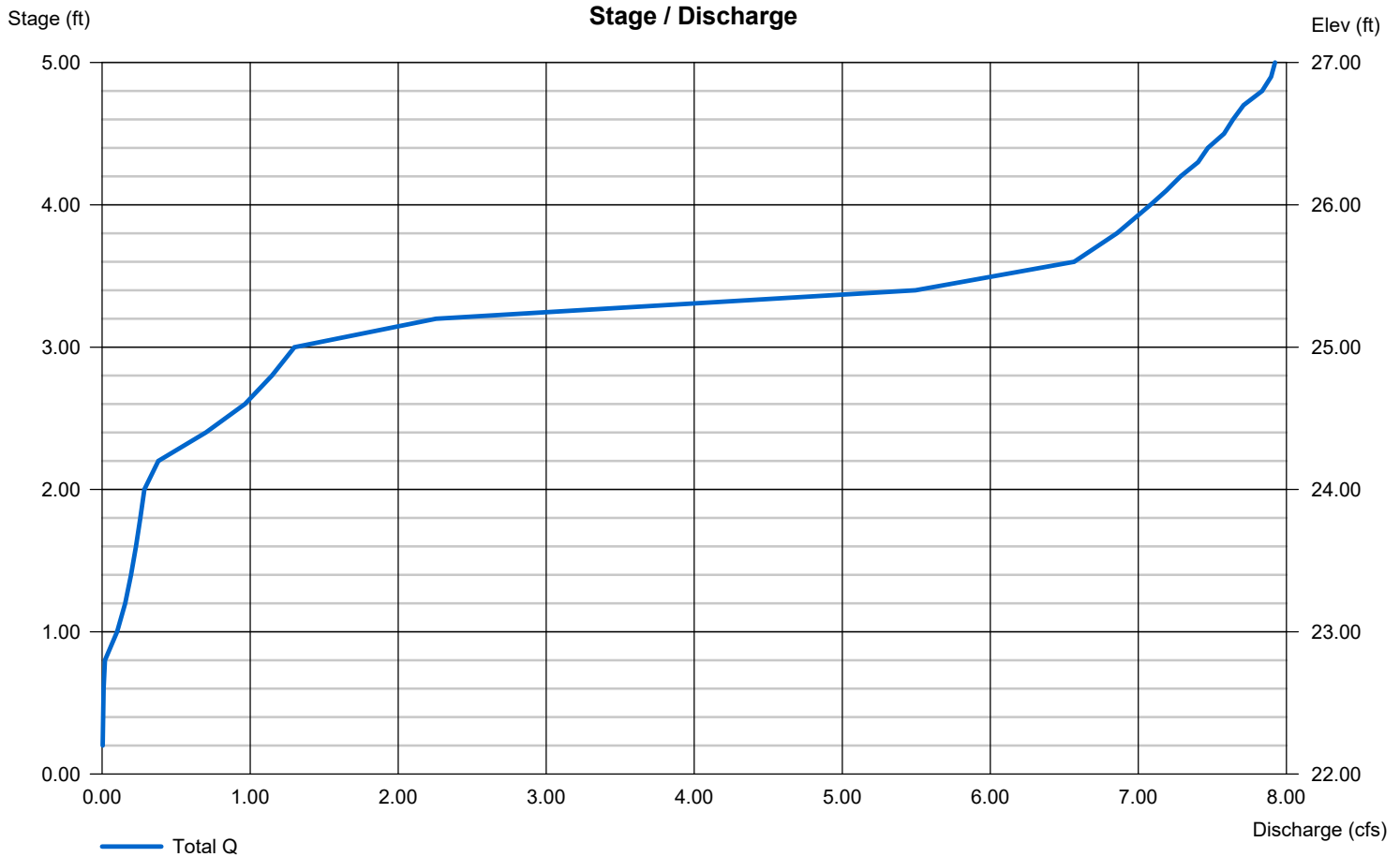
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	4.00	3.00	0.00
Span (in)	= 12.00	8.00	3.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 22.00	24.10	22.75	0.00
Length (ft)	= 41.00	1.00	1.00	0.00
Slope (%)	= 8.50	1.00	1.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	10.00	0.00	0.00
Crest El. (ft)	= 25.10	26.10	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= Yes	Yes	No	No
Exfil.(in/hr)	= 0.130 (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).



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

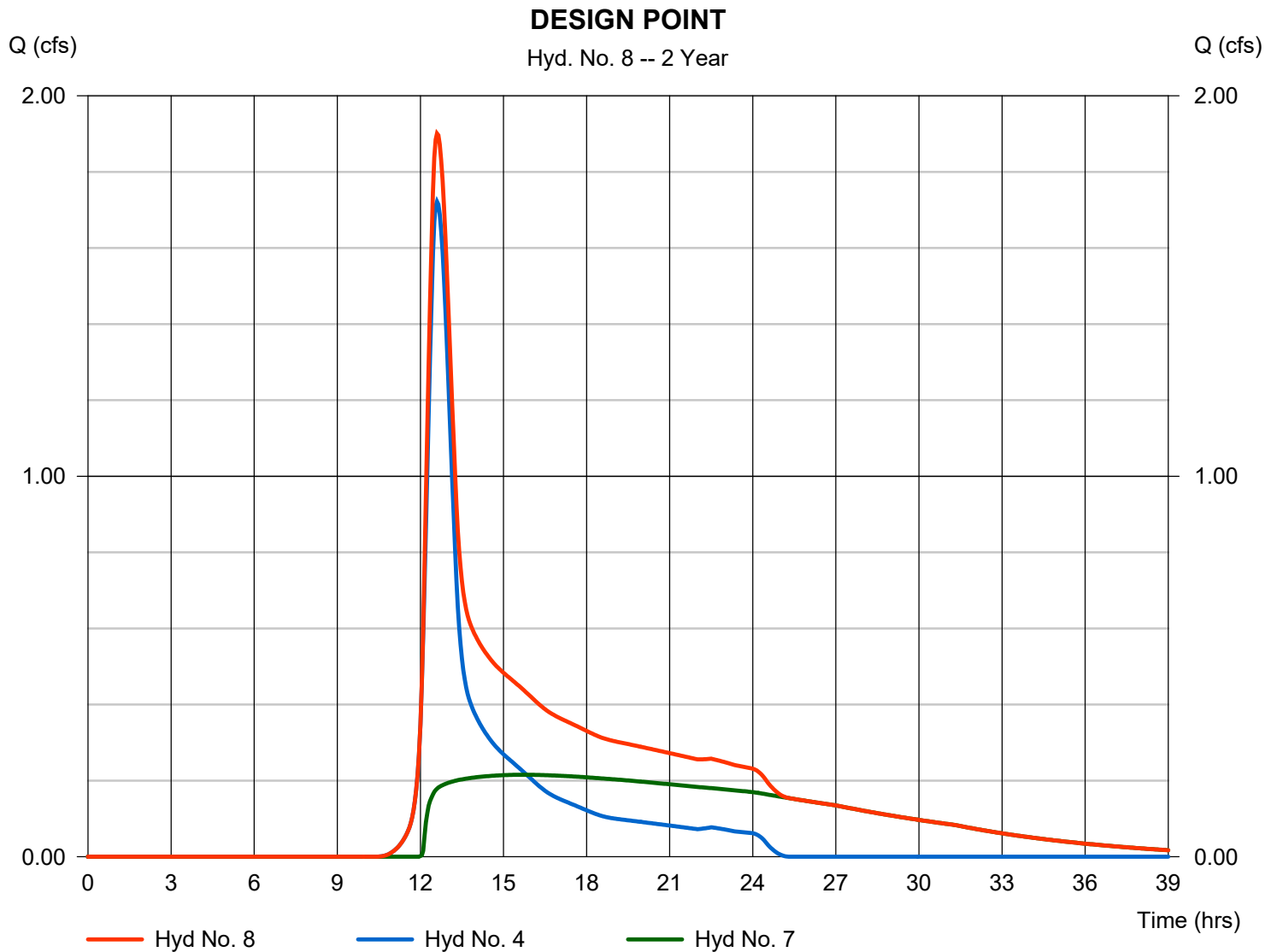
Thursday, 04 / 4 / 2024

Hyd. No. 8

DESIGN POINT

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 3 min
Inflow hyds. = 4, 7

Peak discharge = 1.901 cfs
Time to peak = 12.60 hrs
Hyd. volume = 25,743 cuft
Contrib. drain. area = 2.820 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

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	0.424	3	729	1,669	-----	-----	-----	SHED A
2	SCS Runoff	2.259	3	759	17,079	-----	-----	-----	SHED B
3	SCS Runoff	10.99	3	729	46,504	-----	-----	-----	SHED C
4	SCS Runoff	5.057	3	753	34,585	-----	-----	-----	SHED D
5	Reservoir	0.000	3	n/a	0	2	24.95	17,079	SW WETLAND POCKET
6	Combine	10.99	3	729	46,504	3, 5	-----	-----	COMBO #1
7	Reservoir	1.085	3	789	35,560	6	24.77	29,279	BASIN
8	Combine	6.058	3	753	70,145	4, 7	-----	-----	DESIGN POINT

Hydrograph Report

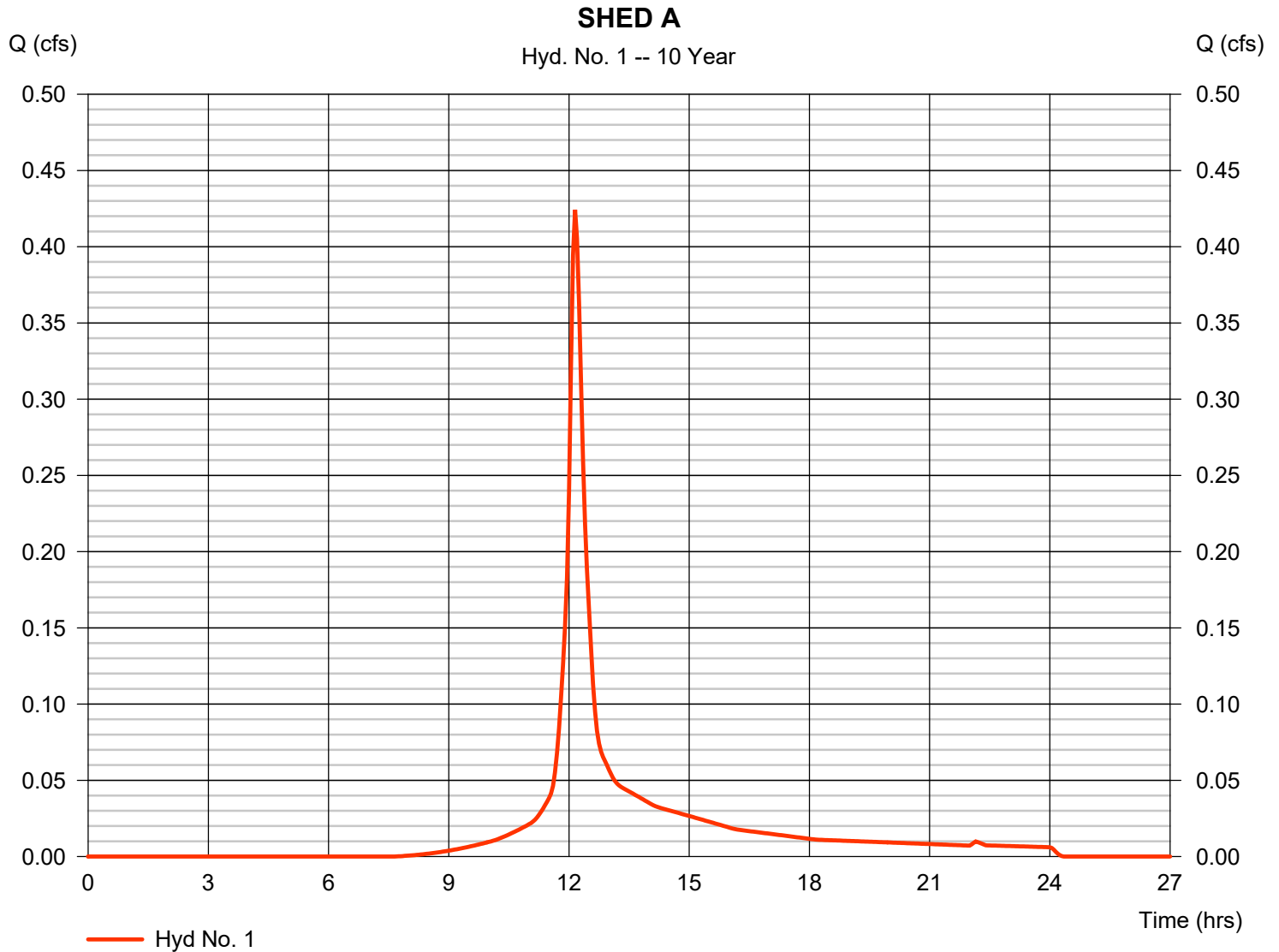
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 1

SHED A

Hydrograph type	= SCS Runoff	Peak discharge	= 0.424 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.15 hrs
Time interval	= 3 min	Hyd. volume	= 1,669 cuft
Drainage area	= 0.130 ac	Curve number	= 76
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 6.18 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

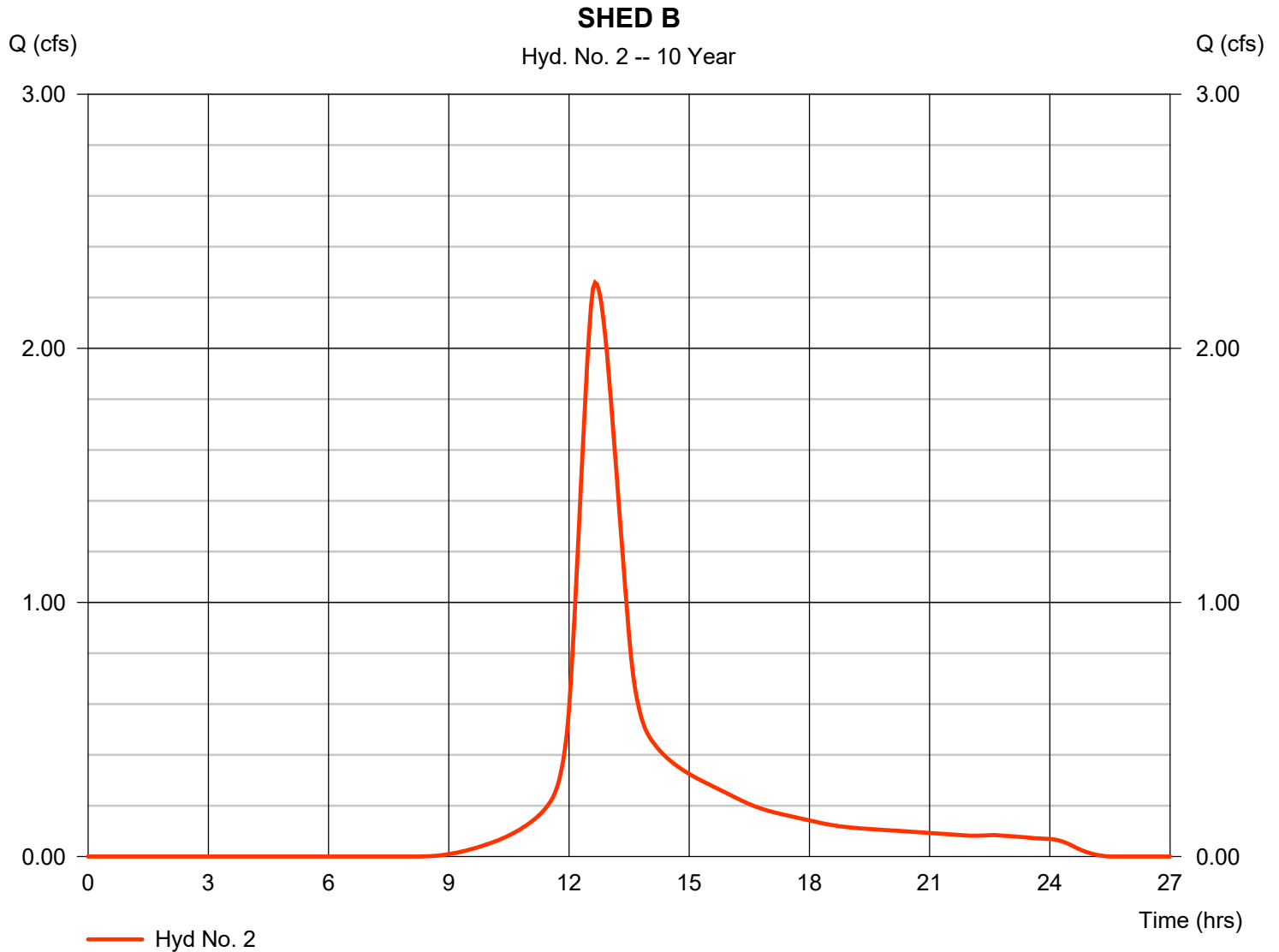
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 2

SHED B

Hydrograph type	= SCS Runoff	Peak discharge	= 2.259 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.65 hrs
Time interval	= 3 min	Hyd. volume	= 17,079 cuft
Drainage area	= 1.410 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 57.10 min
Total precip.	= 6.18 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

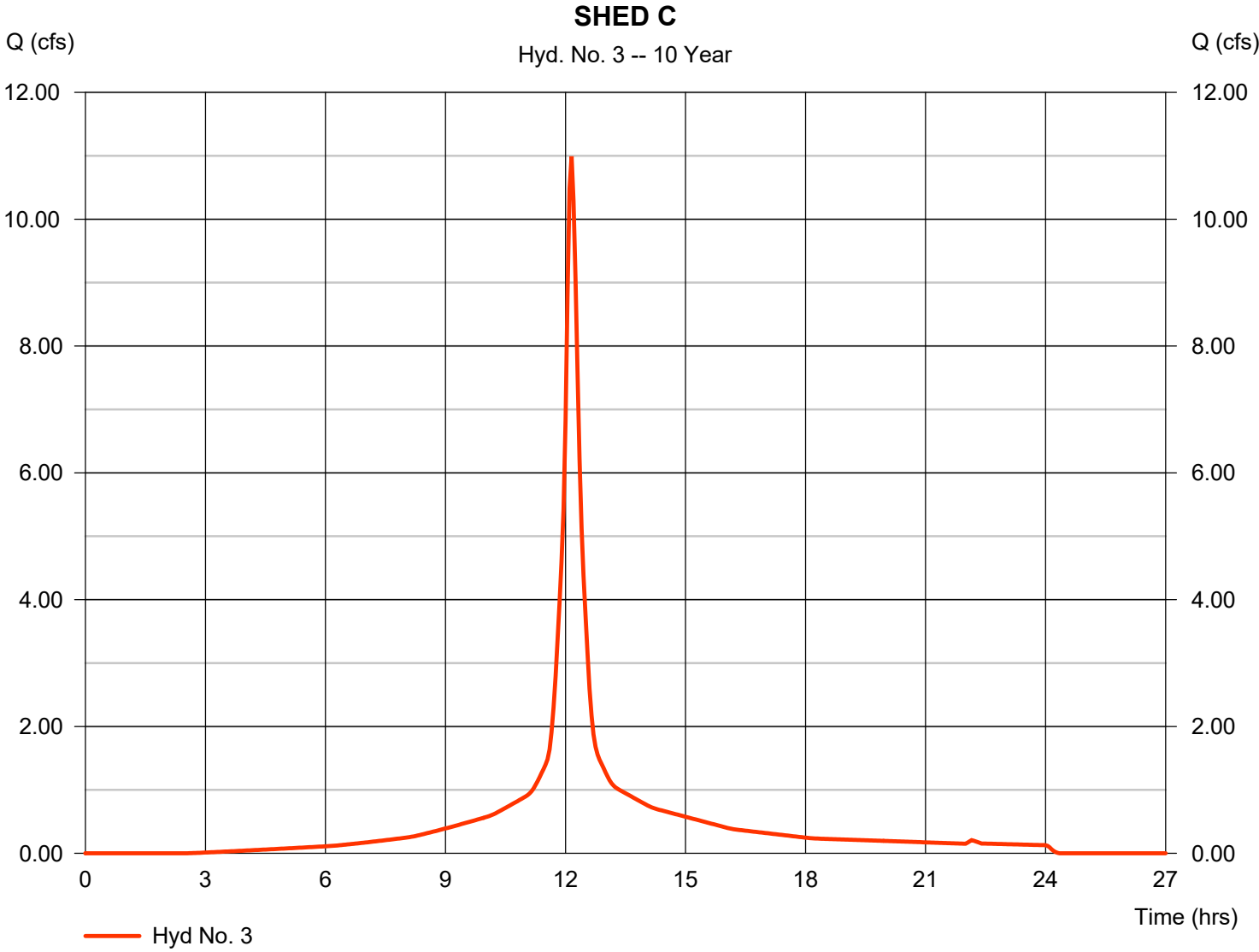
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 3

SHED C

Hydrograph type	= SCS Runoff	Peak discharge	= 10.99 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.15 hrs
Time interval	= 3 min	Hyd. volume	= 46,504 cuft
Drainage area	= 2.390 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 6.18 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

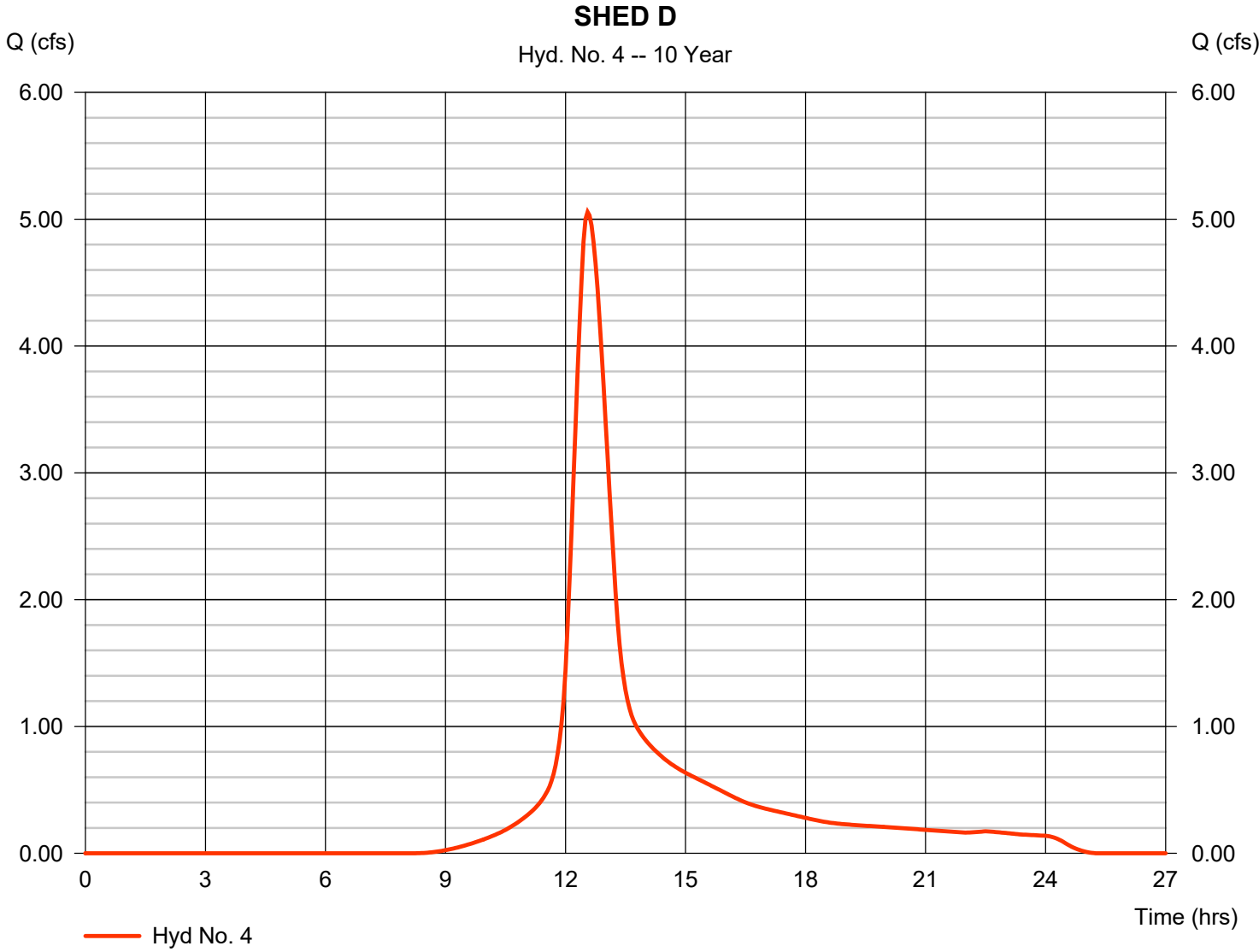
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 4

SHED D

Hydrograph type	= SCS Runoff	Peak discharge	= 5.057 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.55 hrs
Time interval	= 3 min	Hyd. volume	= 34,585 cuft
Drainage area	= 2.820 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 46.30 min
Total precip.	= 6.18 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

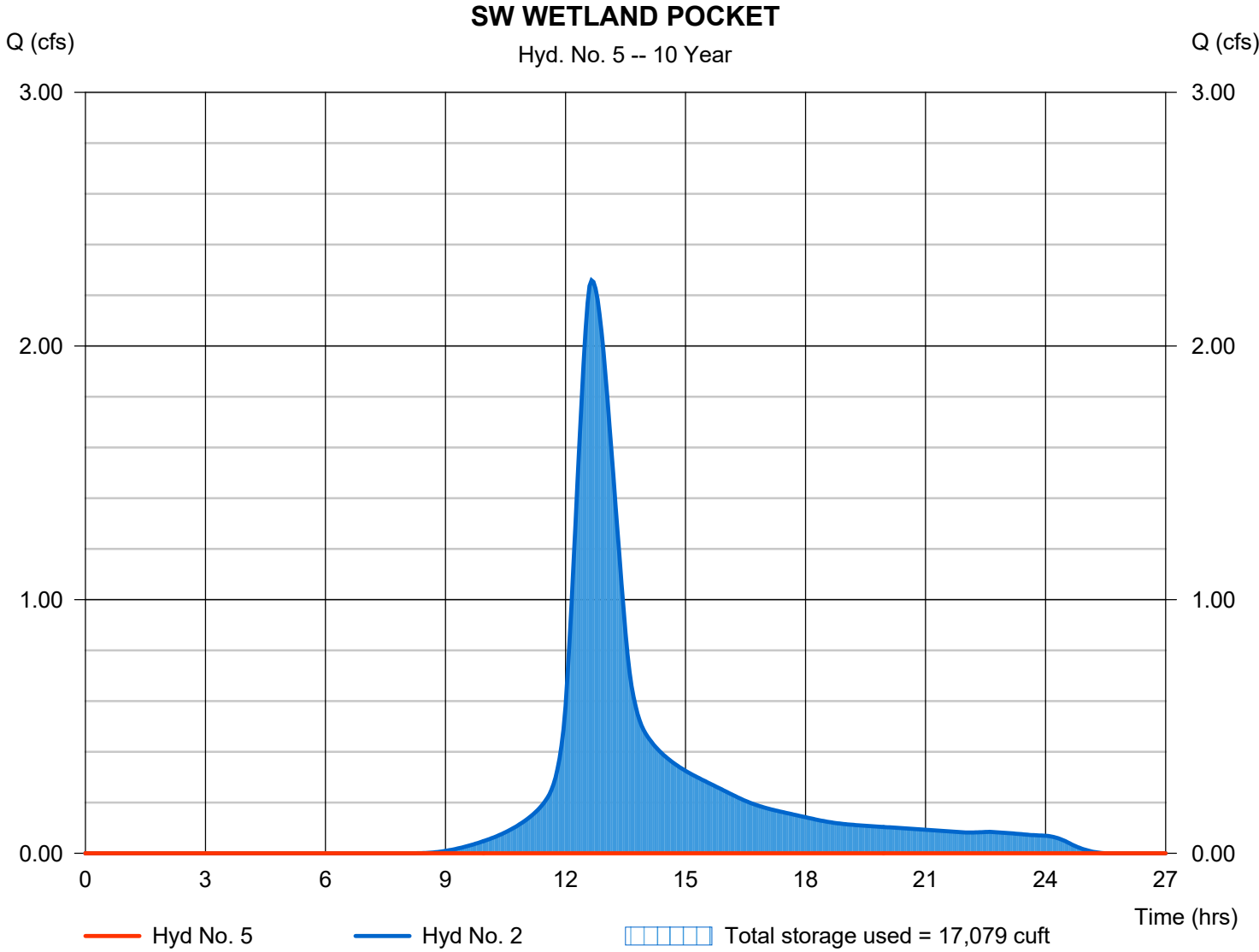
Thursday, 04 / 4 / 2024

Hyd. No. 5

SW WETLAND POCKET

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= n/a
Time interval	= 3 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 2 - SHED B	Max. Elevation	= 24.95 ft
Reservoir name	= SW WETLAND	Max. Storage	= 17,079 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

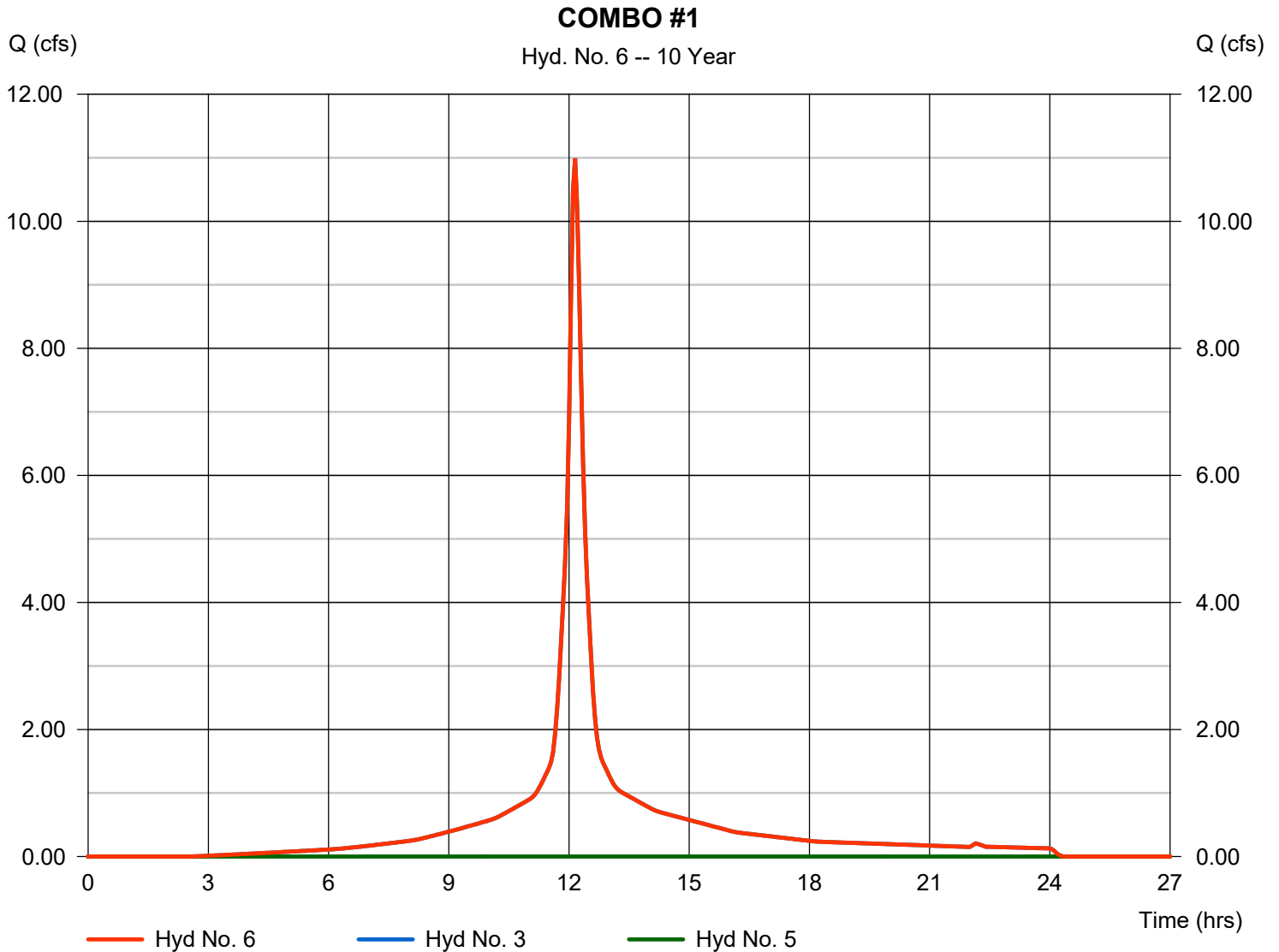
Thursday, 04 / 4 / 2024

Hyd. No. 6

COMBO #1

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 3 min
Inflow hyds. = 3, 5

Peak discharge = 10.99 cfs
Time to peak = 12.15 hrs
Hyd. volume = 46,504 cuft
Contrib. drain. area = 2.390 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

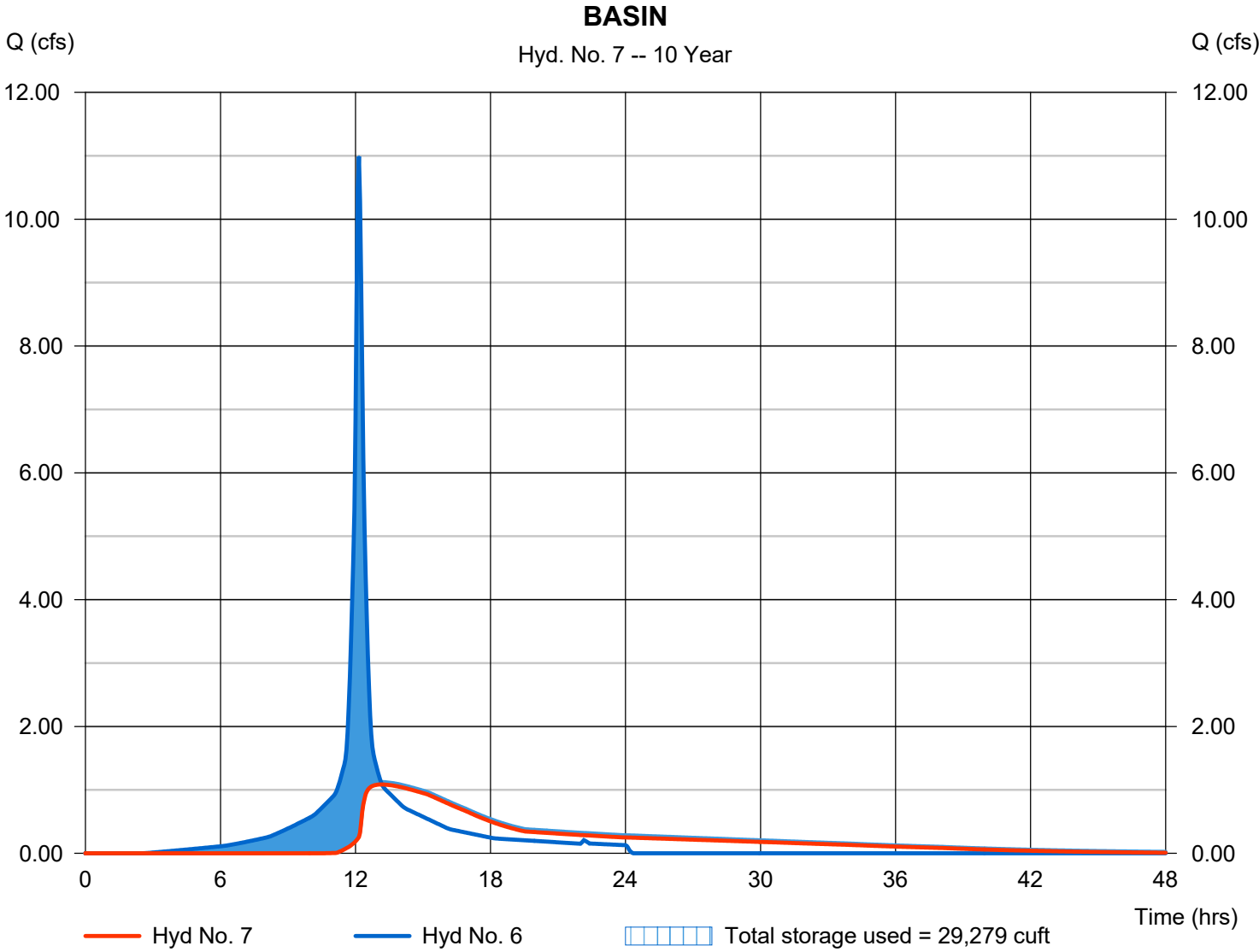
Thursday, 04 / 4 / 2024

Hyd. No. 7

BASIN

Hydrograph type	= Reservoir	Peak discharge	= 1.085 cfs
Storm frequency	= 10 yrs	Time to peak	= 13.15 hrs
Time interval	= 3 min	Hyd. volume	= 35,560 cuft
Inflow hyd. No.	= 6 - COMBO #1	Max. Elevation	= 24.77 ft
Reservoir name	= BASIN #1	Max. Storage	= 29,279 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

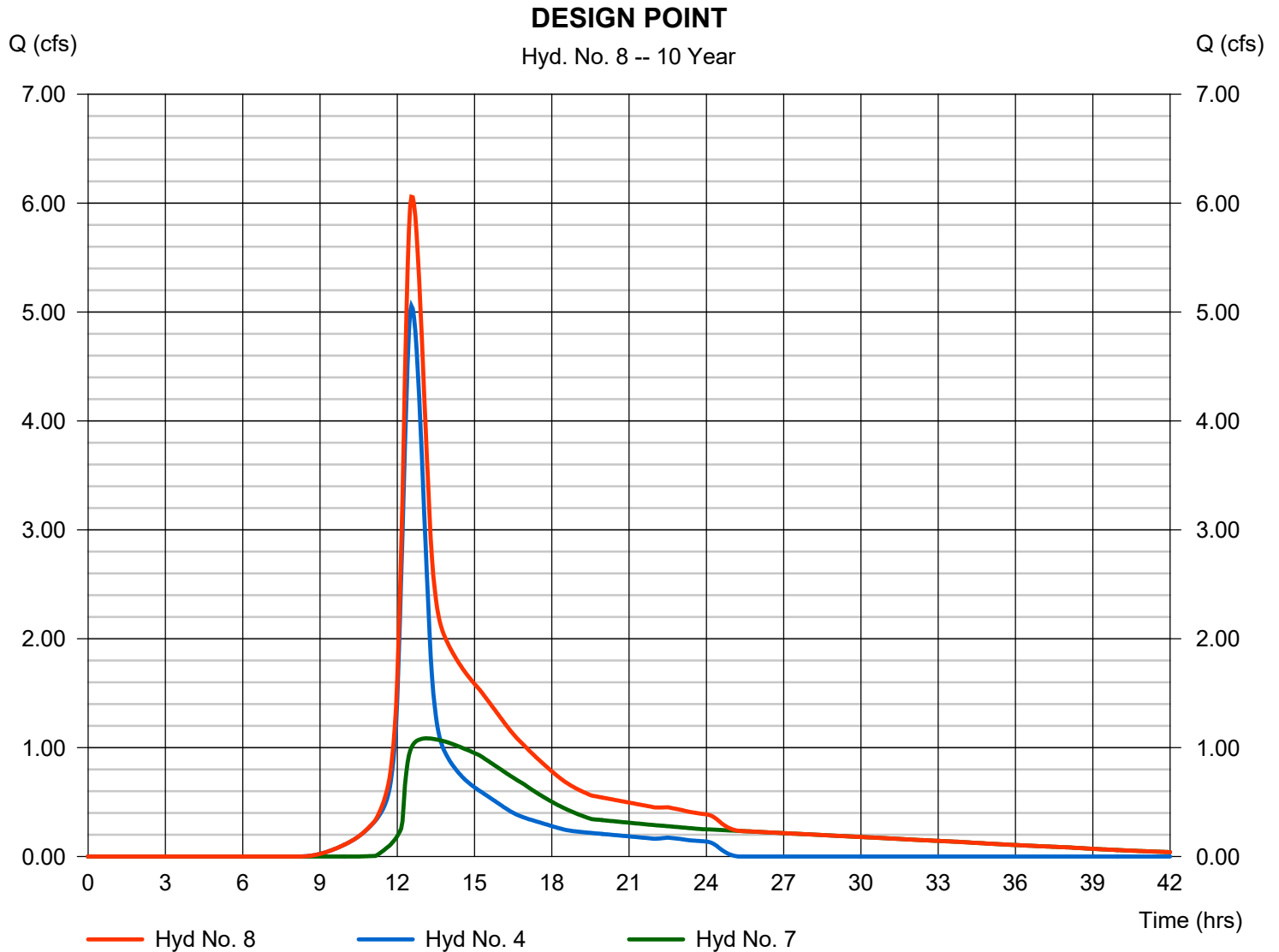
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 8

DESIGN POINT

Hydrograph type	= Combine	Peak discharge	= 6.058 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.55 hrs
Time interval	= 3 min	Hyd. volume	= 70,145 cuft
Inflow hyds.	= 4, 7	Contrib. drain. area	= 2.820 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

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	0.507	3	729	1,996	-----	-----	-----	SHED A
2	SCS Runoff	2.724	3	759	20,555	-----	-----	-----	SHED B
3	SCS Runoff	12.50	3	729	53,283	-----	-----	-----	SHED C
4	SCS Runoff	6.095	3	753	41,623	-----	-----	-----	SHED D
5	Reservoir	0.000	3	n/a	0	2	25.09	20,555	SW WETLAND POCKET
6	Combine	12.50	3	729	53,283	3, 5	-----	-----	COMBO #1
7	Reservoir	1.521	3	774	42,208	6	25.05	32,880	BASIN
8	Combine	7.360	3	756	83,831	4, 7	-----	-----	DESIGN POINT

Hydrograph Report

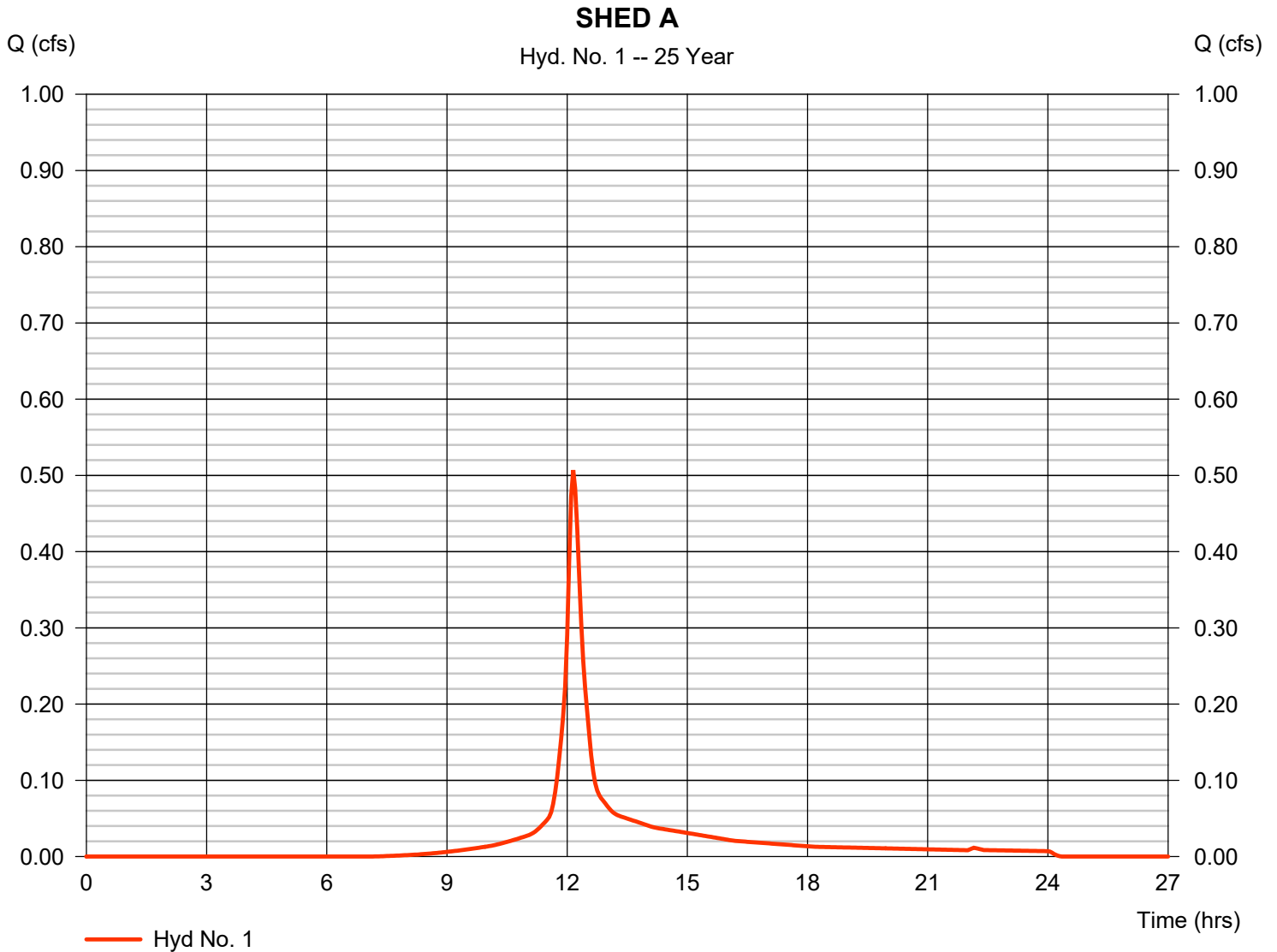
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 1

SHED A

Hydrograph type	= SCS Runoff	Peak discharge	= 0.507 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.15 hrs
Time interval	= 3 min	Hyd. volume	= 1,996 cuft
Drainage area	= 0.130 ac	Curve number	= 76
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 6.97 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

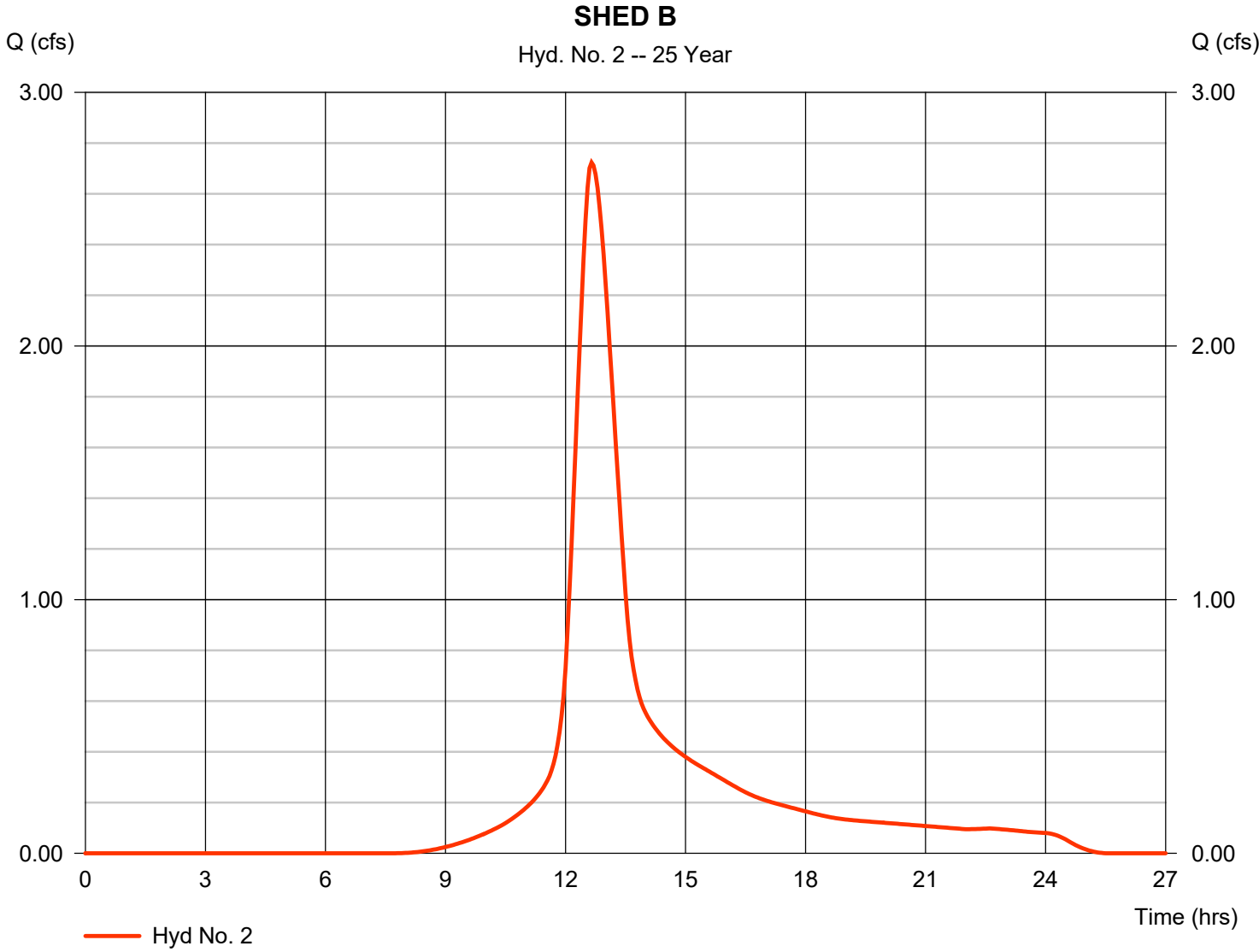
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 2

SHED B

Hydrograph type	= SCS Runoff	Peak discharge	= 2.724 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.65 hrs
Time interval	= 3 min	Hyd. volume	= 20,555 cuft
Drainage area	= 1.410 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 57.10 min
Total precip.	= 6.97 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

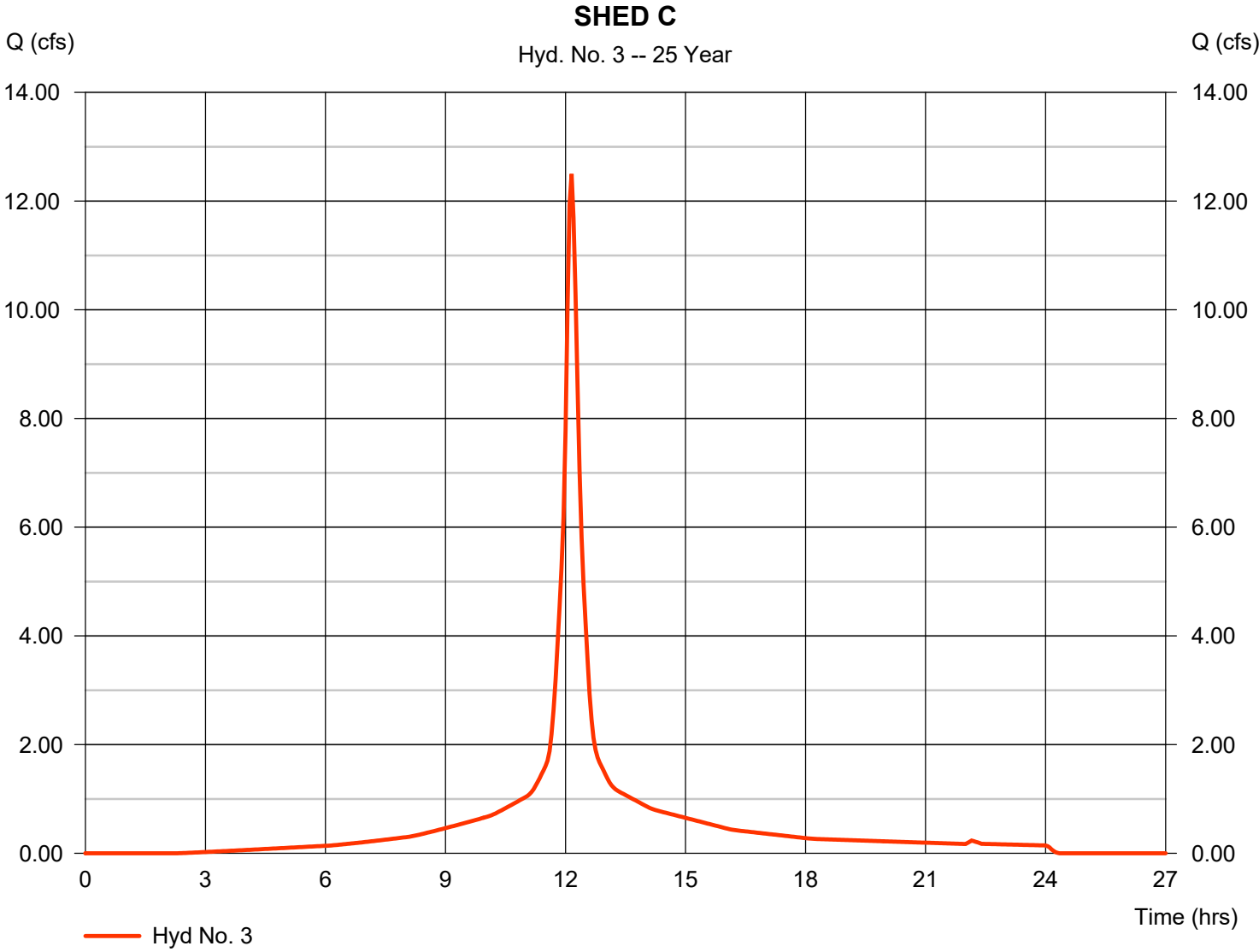
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 3

SHED C

Hydrograph type	= SCS Runoff	Peak discharge	= 12.50 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.15 hrs
Time interval	= 3 min	Hyd. volume	= 53,283 cuft
Drainage area	= 2.390 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 6.97 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

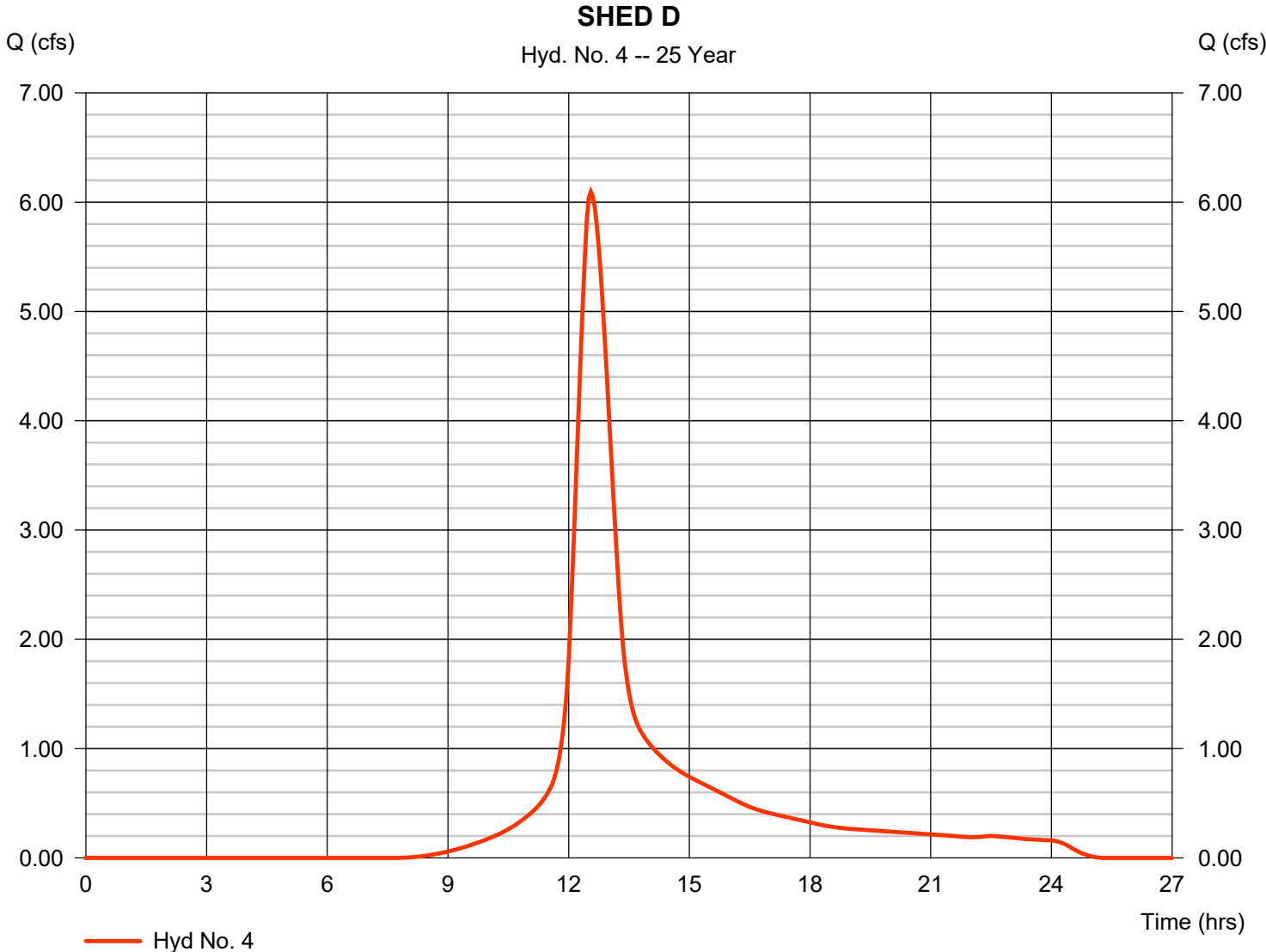


Hydrograph Report

Hyd. No. 4

SHED D

Hydrograph type	= SCS Runoff	Peak discharge	= 6.095 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.55 hrs
Time interval	= 3 min	Hyd. volume	= 41,623 cuft
Drainage area	= 2.820 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 46.30 min
Total precip.	= 6.97 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

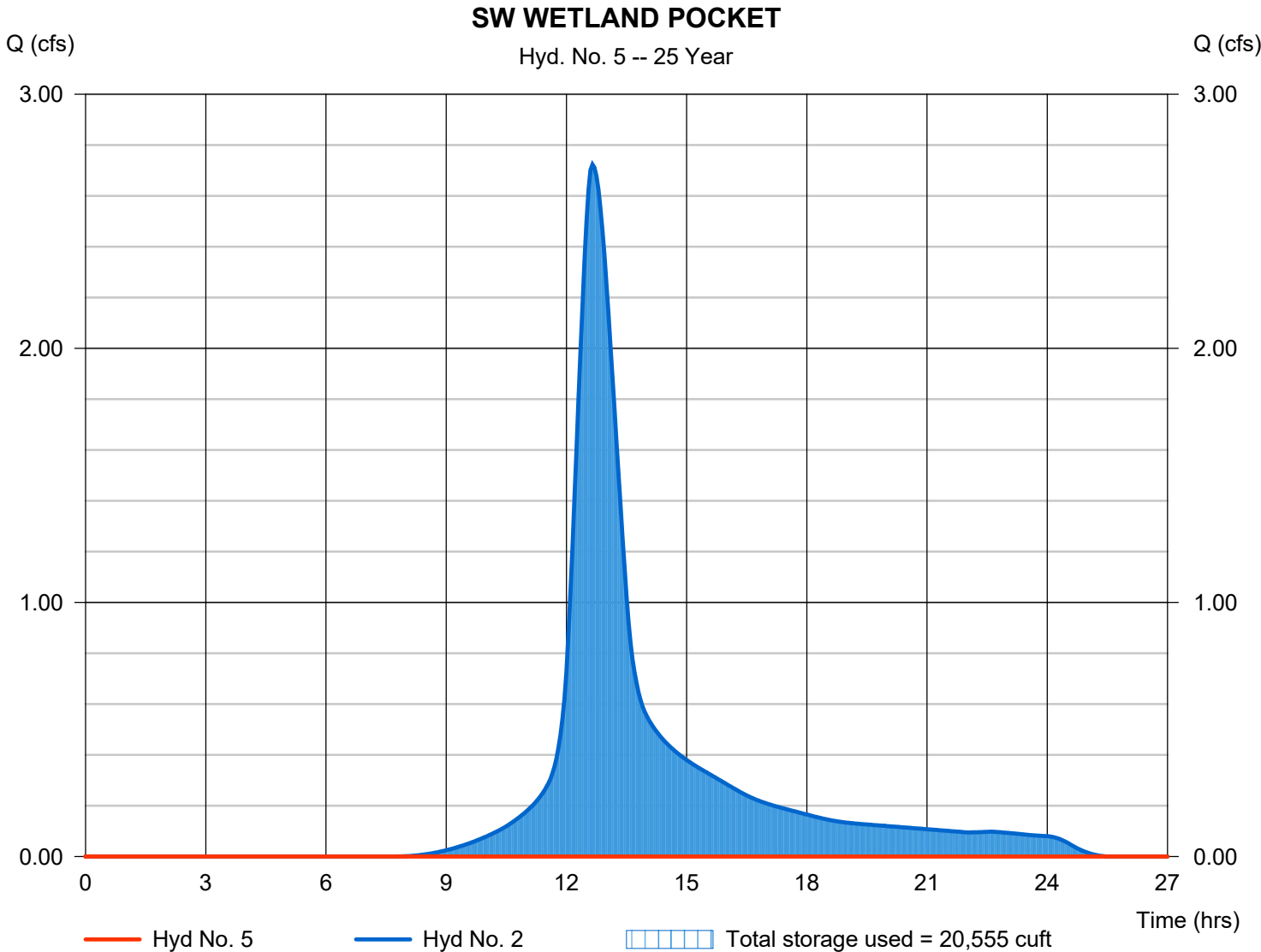
Thursday, 04 / 4 / 2024

Hyd. No. 5

SW WETLAND POCKET

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= n/a
Time interval	= 3 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 2 - SHED B	Max. Elevation	= 25.09 ft
Reservoir name	= SW WETLAND	Max. Storage	= 20,555 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

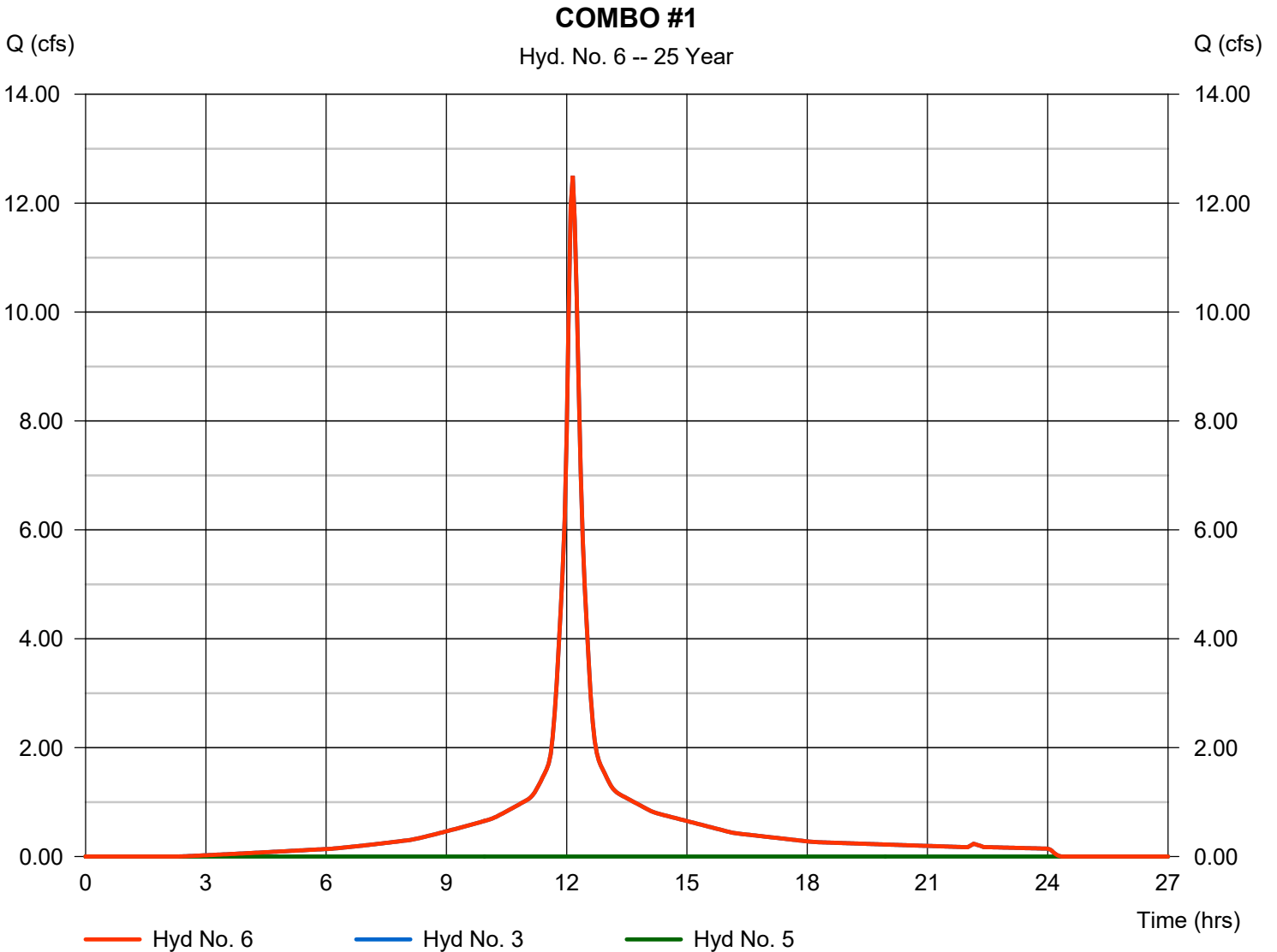
Thursday, 04 / 4 / 2024

Hyd. No. 6

COMBO #1

Hydrograph type = Combine
Storm frequency = 25 yrs
Time interval = 3 min
Inflow hyds. = 3, 5

Peak discharge = 12.50 cfs
Time to peak = 12.15 hrs
Hyd. volume = 53,283 cuft
Contrib. drain. area = 2.390 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

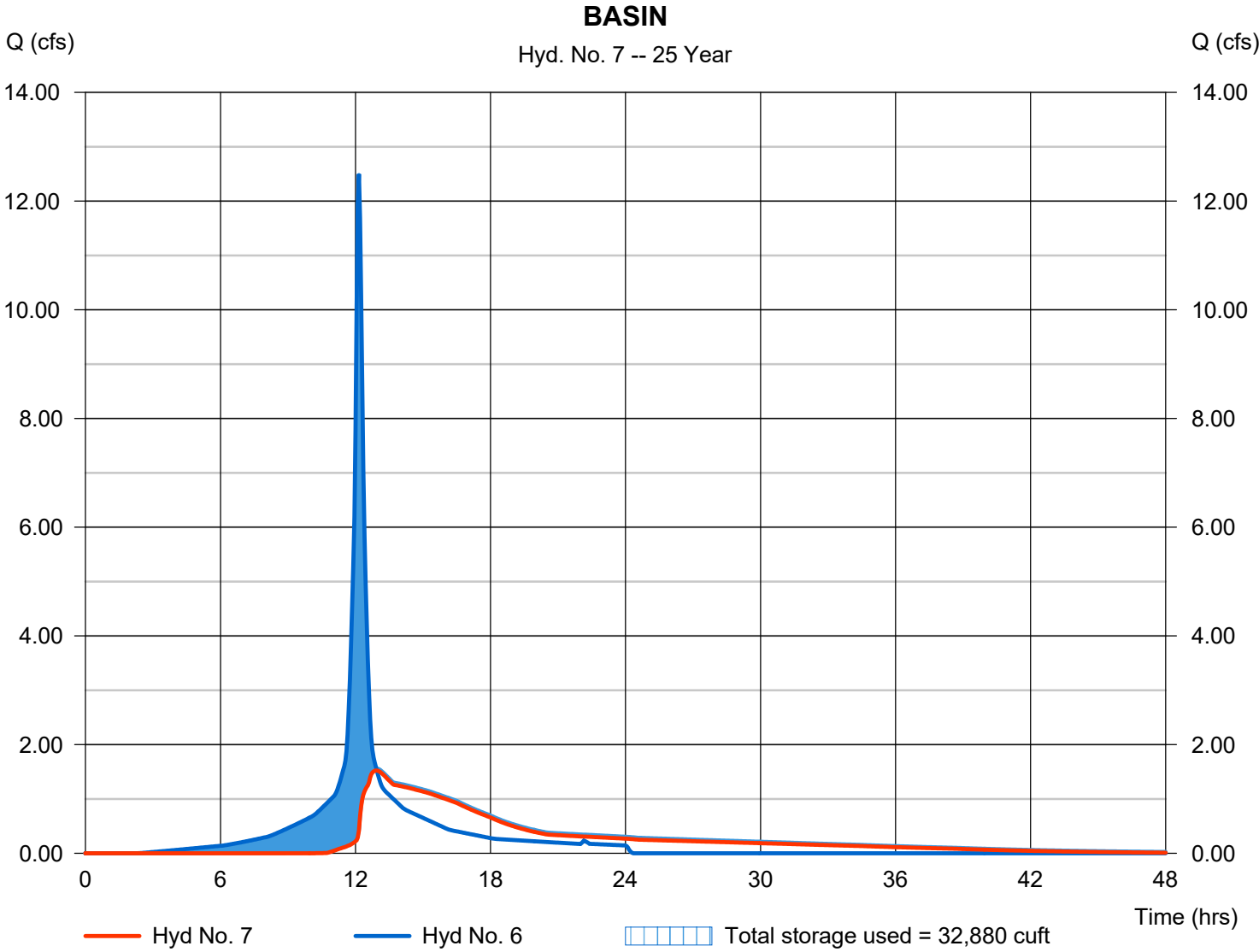
Thursday, 04 / 4 / 2024

Hyd. No. 7

BASIN

Hydrograph type	= Reservoir	Peak discharge	= 1.521 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.90 hrs
Time interval	= 3 min	Hyd. volume	= 42,208 cuft
Inflow hyd. No.	= 6 - COMBO #1	Max. Elevation	= 25.05 ft
Reservoir name	= BASIN #1	Max. Storage	= 32,880 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

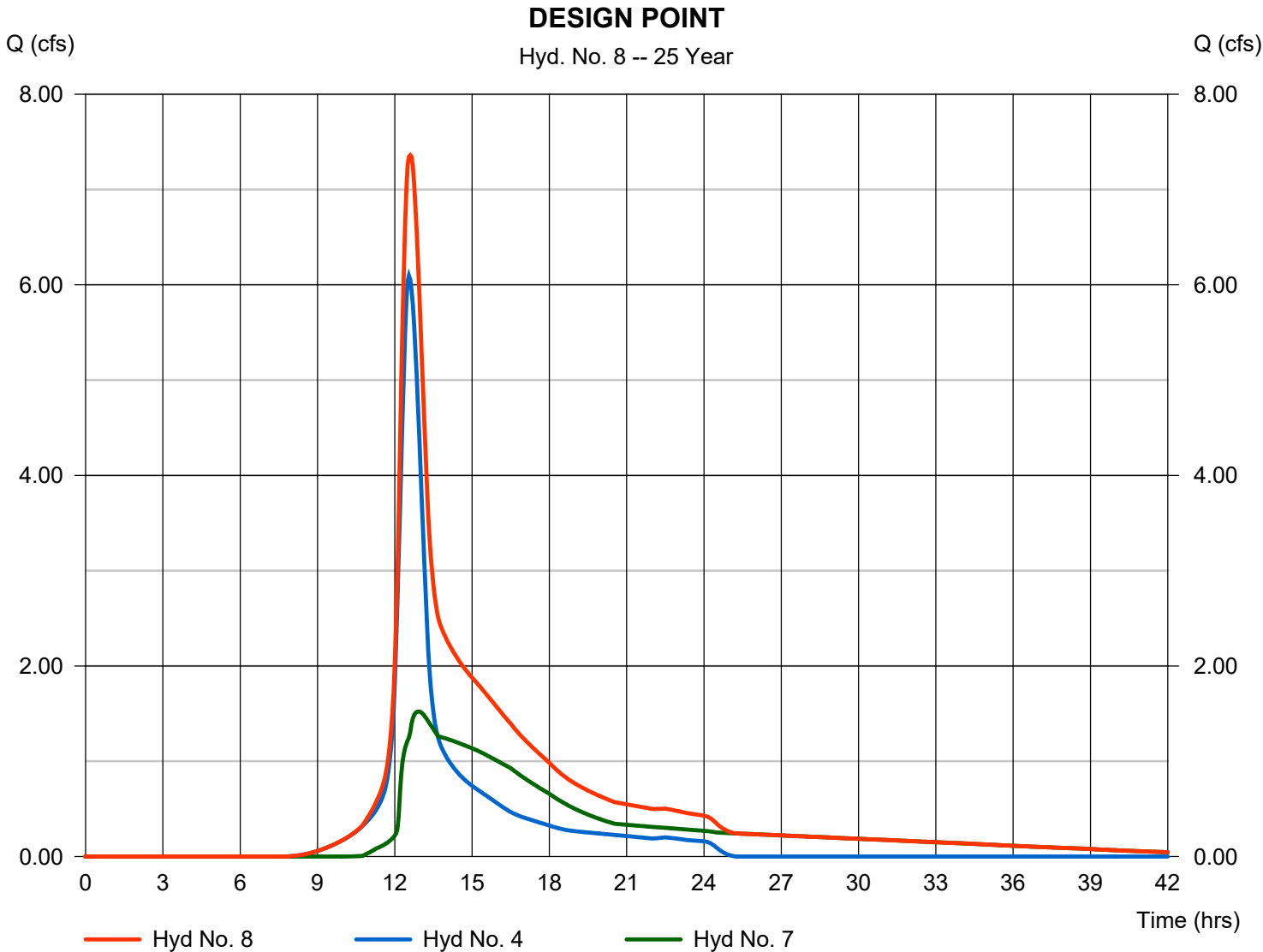
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 8

DESIGN POINT

Hydrograph type	= Combine	Peak discharge	= 7.360 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.60 hrs
Time interval	= 3 min	Hyd. volume	= 83,831 cuft
Inflow hyds.	= 4, 7	Contrib. drain. area	= 2.820 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

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	0.596	3	729	2,353	-----	-----	-----	SHED A
2	SCS Runoff	3.226	3	759	24,343	-----	-----	-----	SHED B
3	SCS Runoff	14.09	3	729	60,505	-----	-----	-----	SHED C
4	SCS Runoff	7.216	3	753	49,295	-----	-----	-----	SHED D
5	Reservoir	0.000	3	n/a	0	2	25.21	24,343	SW WETLAND POCKET
6	Combine	14.09	3	729	60,505	3, 5	-----	-----	COMBO #1
7	Reservoir	3.190	3	756	49,332	6	25.26	35,513	BASIN
8	Combine	10.35	3	756	98,626	4, 7	-----	-----	DESIGN POINT

Hydrograph Report

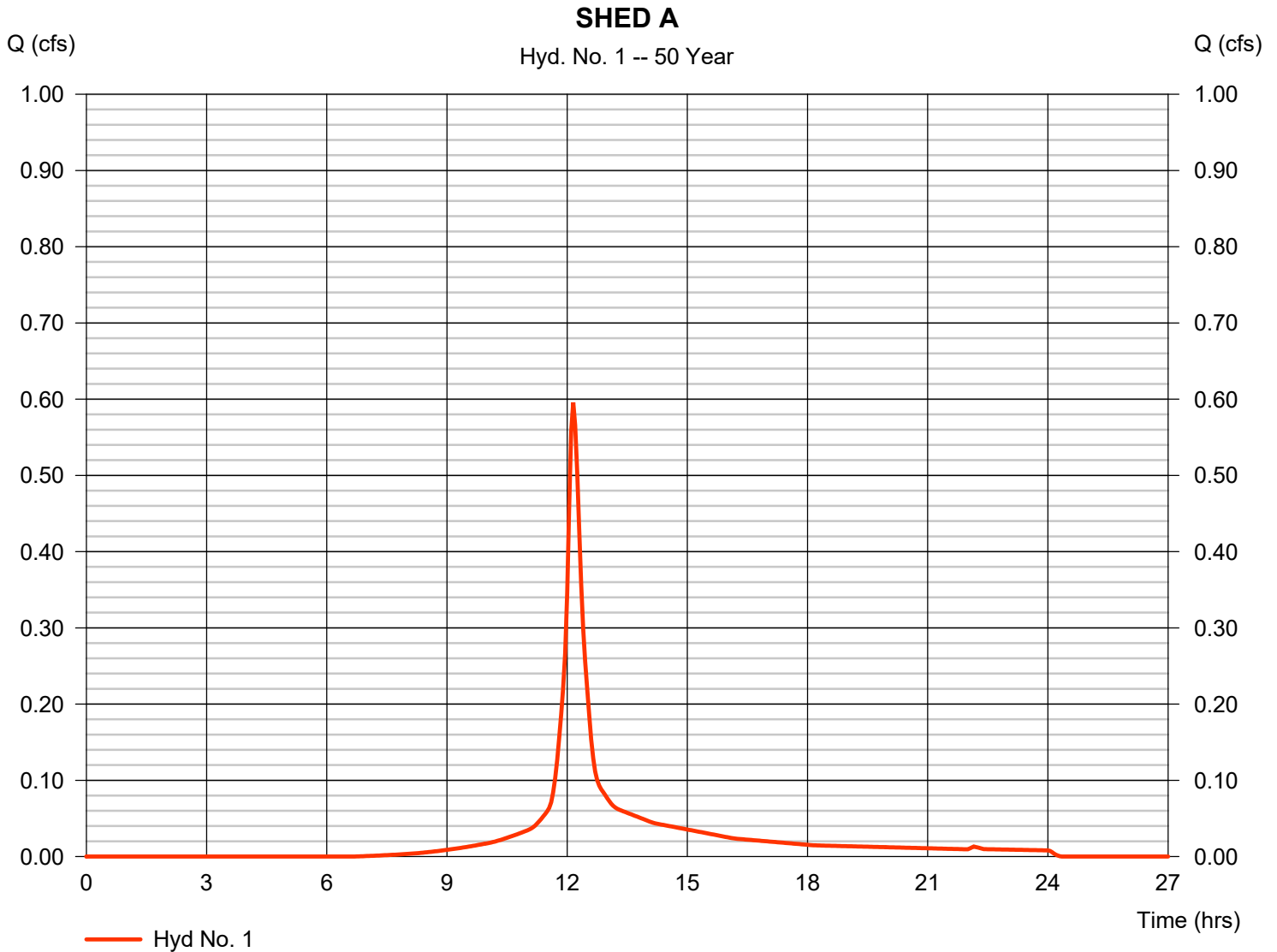
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 1

SHED A

Hydrograph type	= SCS Runoff	Peak discharge	= 0.596 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.15 hrs
Time interval	= 3 min	Hyd. volume	= 2,353 cuft
Drainage area	= 0.130 ac	Curve number	= 76
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 7.81 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

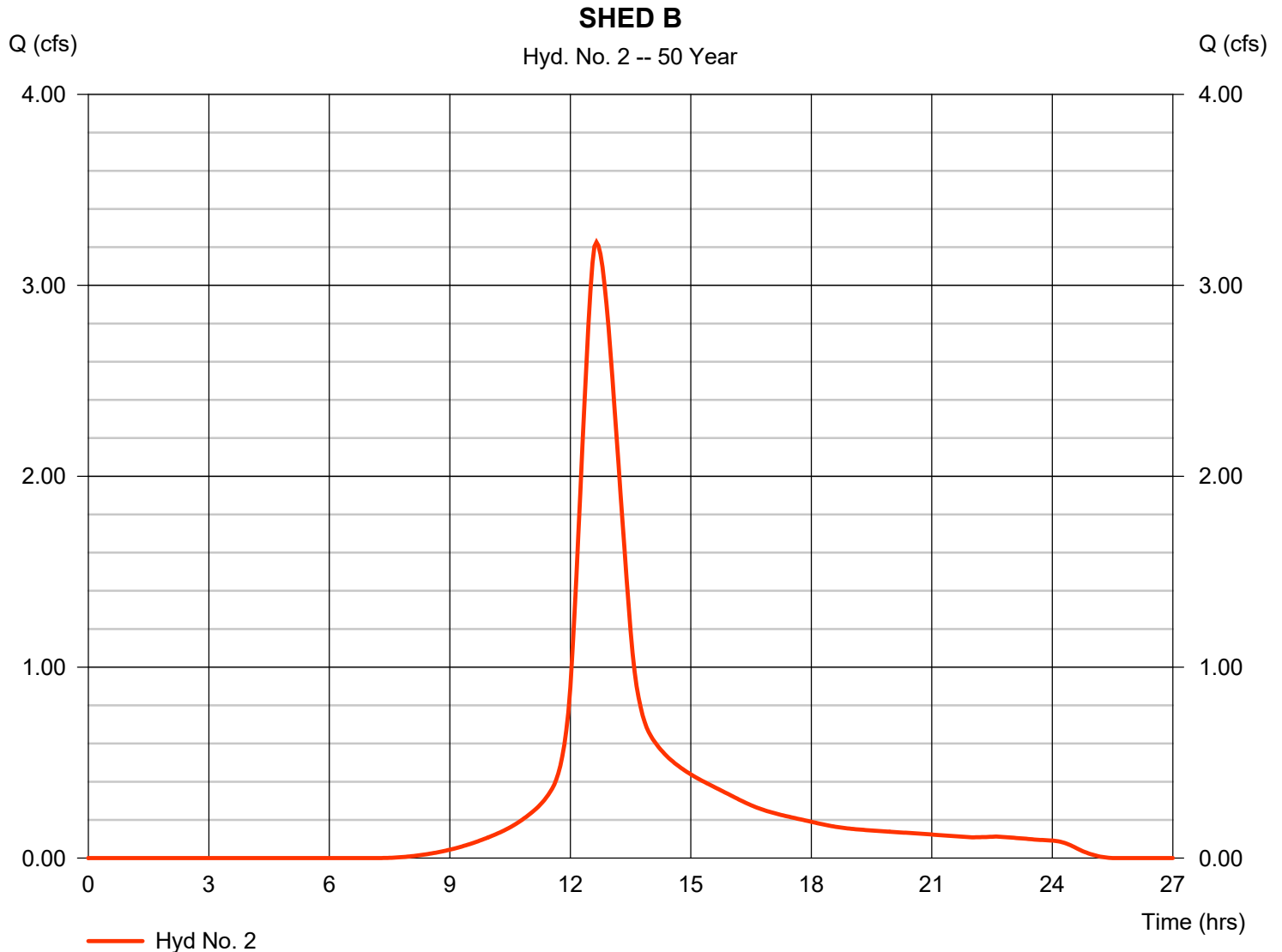
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 2

SHED B

Hydrograph type	= SCS Runoff	Peak discharge	= 3.226 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.65 hrs
Time interval	= 3 min	Hyd. volume	= 24,343 cuft
Drainage area	= 1.410 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 57.10 min
Total precip.	= 7.81 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

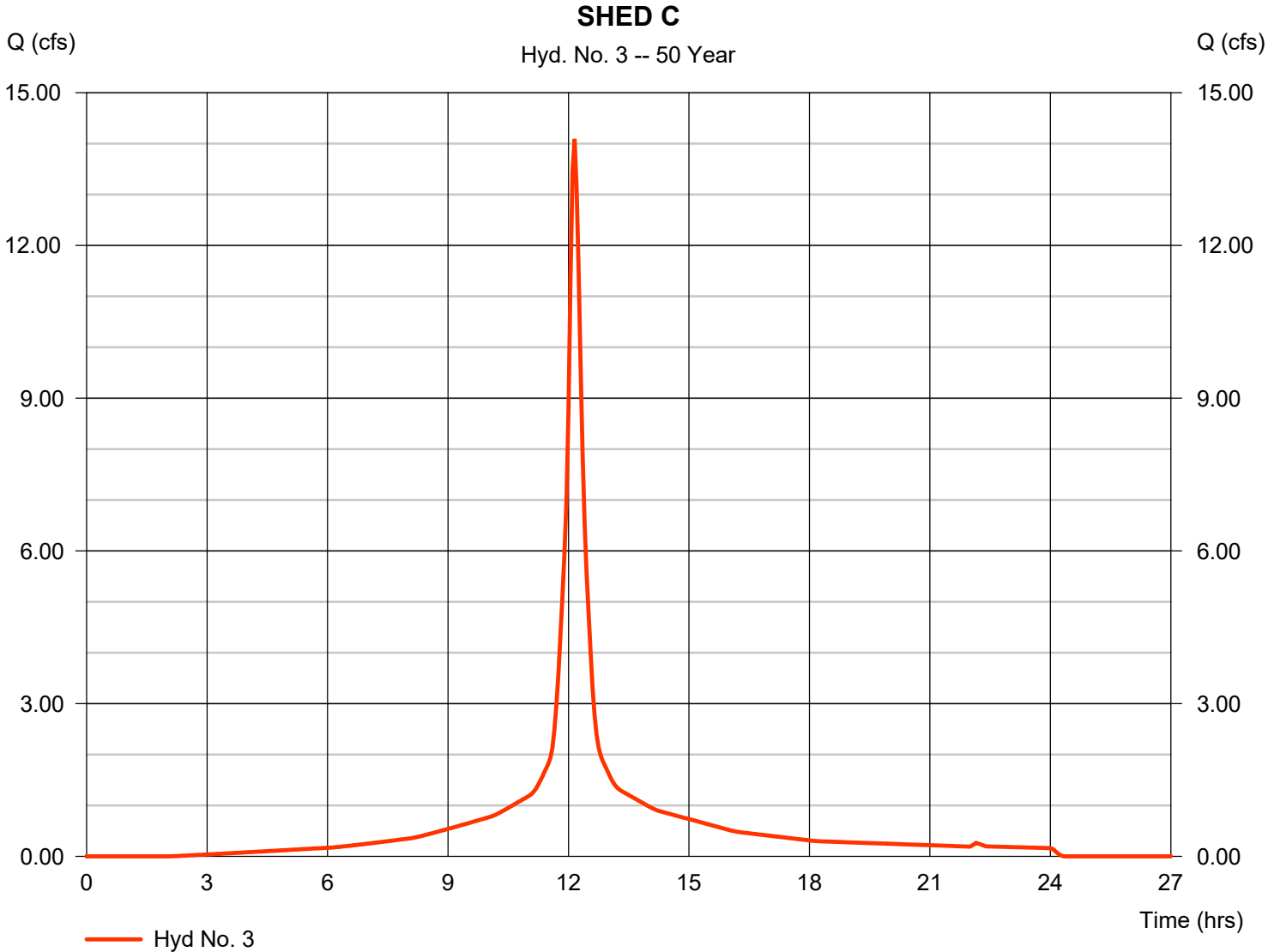
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 3

SHED C

Hydrograph type	= SCS Runoff	Peak discharge	= 14.09 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.15 hrs
Time interval	= 3 min	Hyd. volume	= 60,505 cuft
Drainage area	= 2.390 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 7.81 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

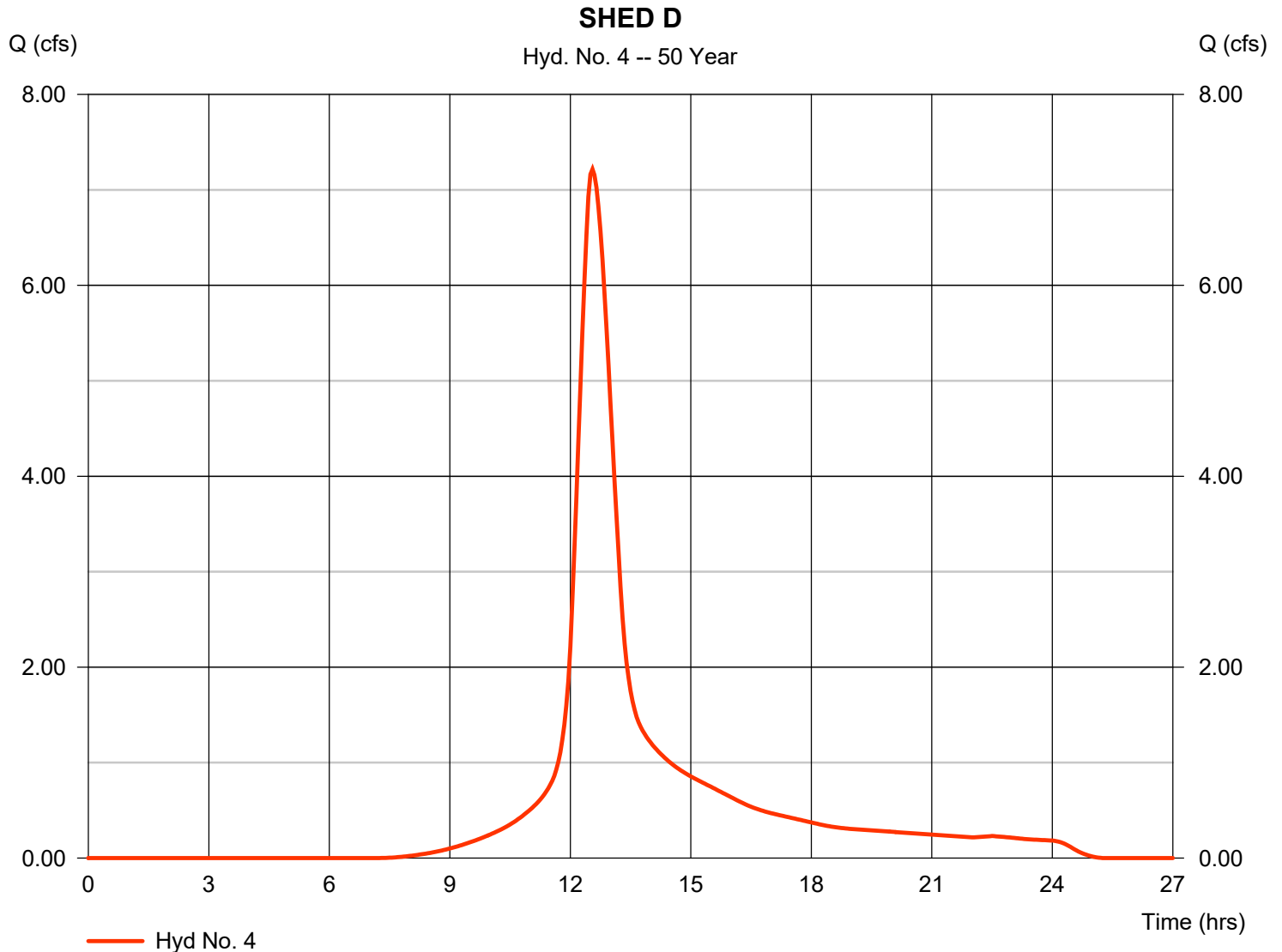


Hydrograph Report

Hyd. No. 4

SHED D

Hydrograph type	= SCS Runoff	Peak discharge	= 7.216 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.55 hrs
Time interval	= 3 min	Hyd. volume	= 49,295 cuft
Drainage area	= 2.820 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 46.30 min
Total precip.	= 7.81 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

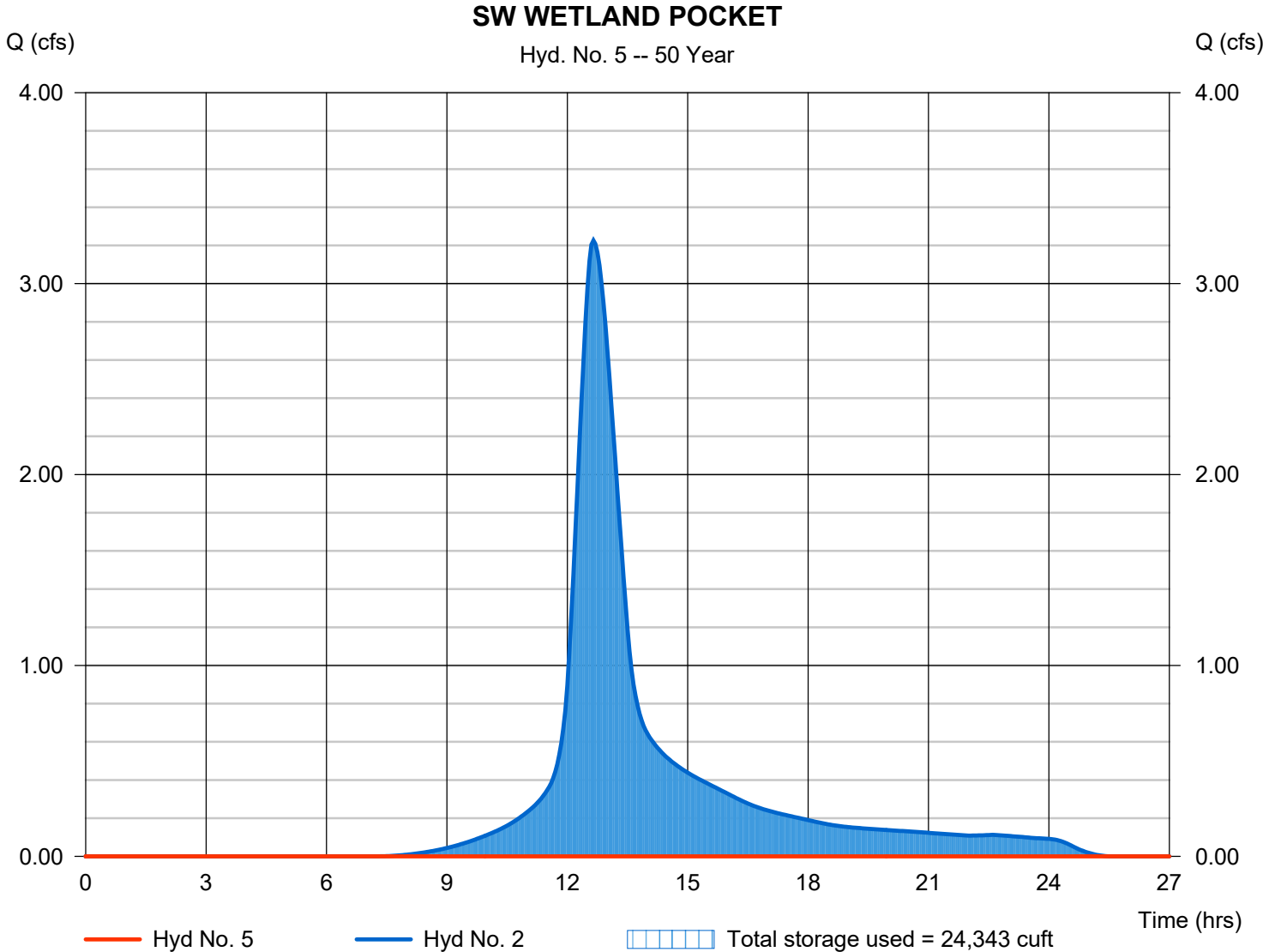
Thursday, 04 / 4 / 2024

Hyd. No. 5

SW WETLAND POCKET

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 50 yrs	Time to peak	= n/a
Time interval	= 3 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 2 - SHED B	Max. Elevation	= 25.21 ft
Reservoir name	= SW WETLAND	Max. Storage	= 24,343 cuft

Storage Indication method used.



Hydrograph Report

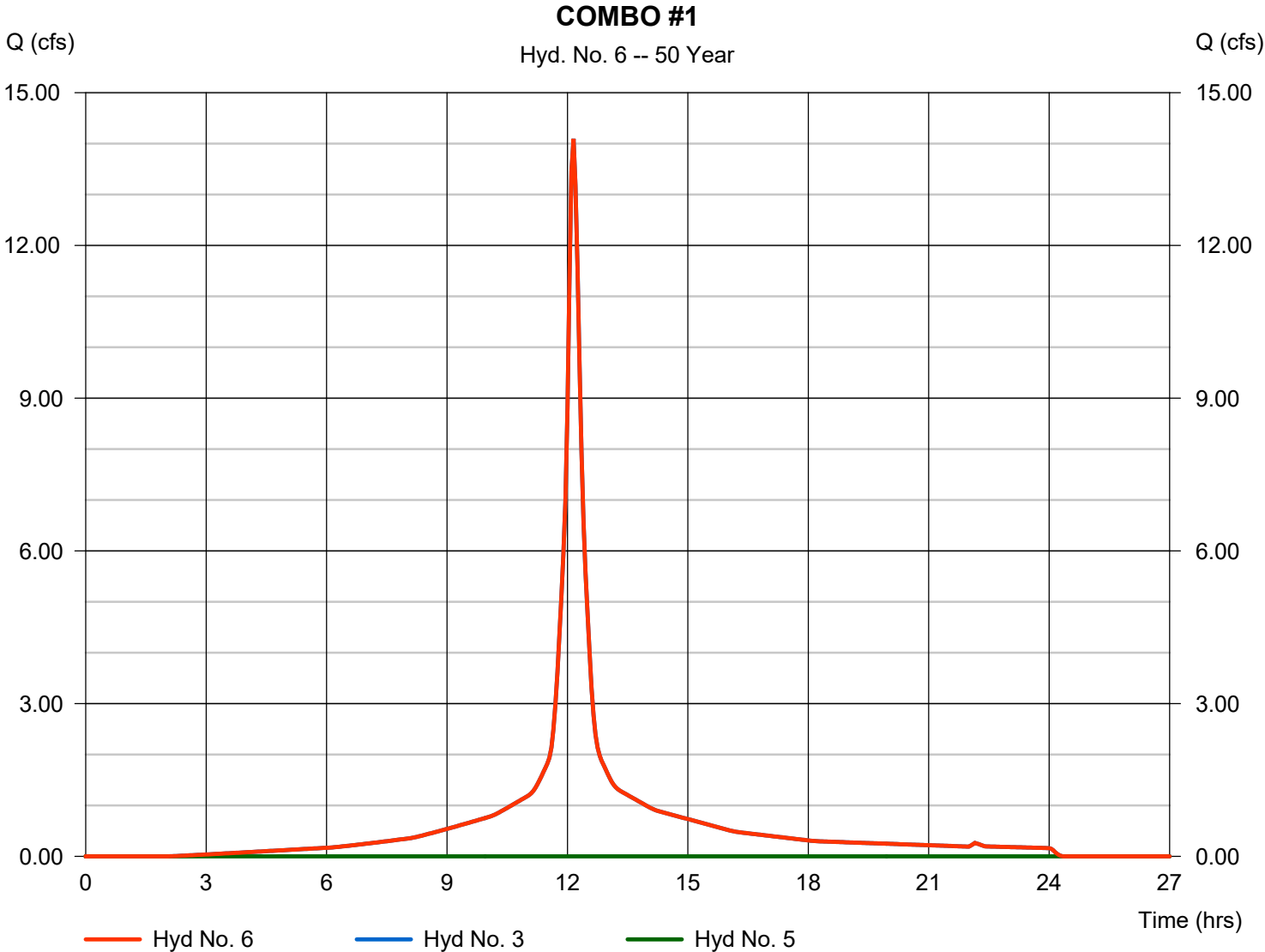
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 6

COMBO #1

Hydrograph type	= Combine	Peak discharge	= 14.09 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.15 hrs
Time interval	= 3 min	Hyd. volume	= 60,505 cuft
Inflow hyds.	= 3, 5	Contrib. drain. area	= 2.390 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

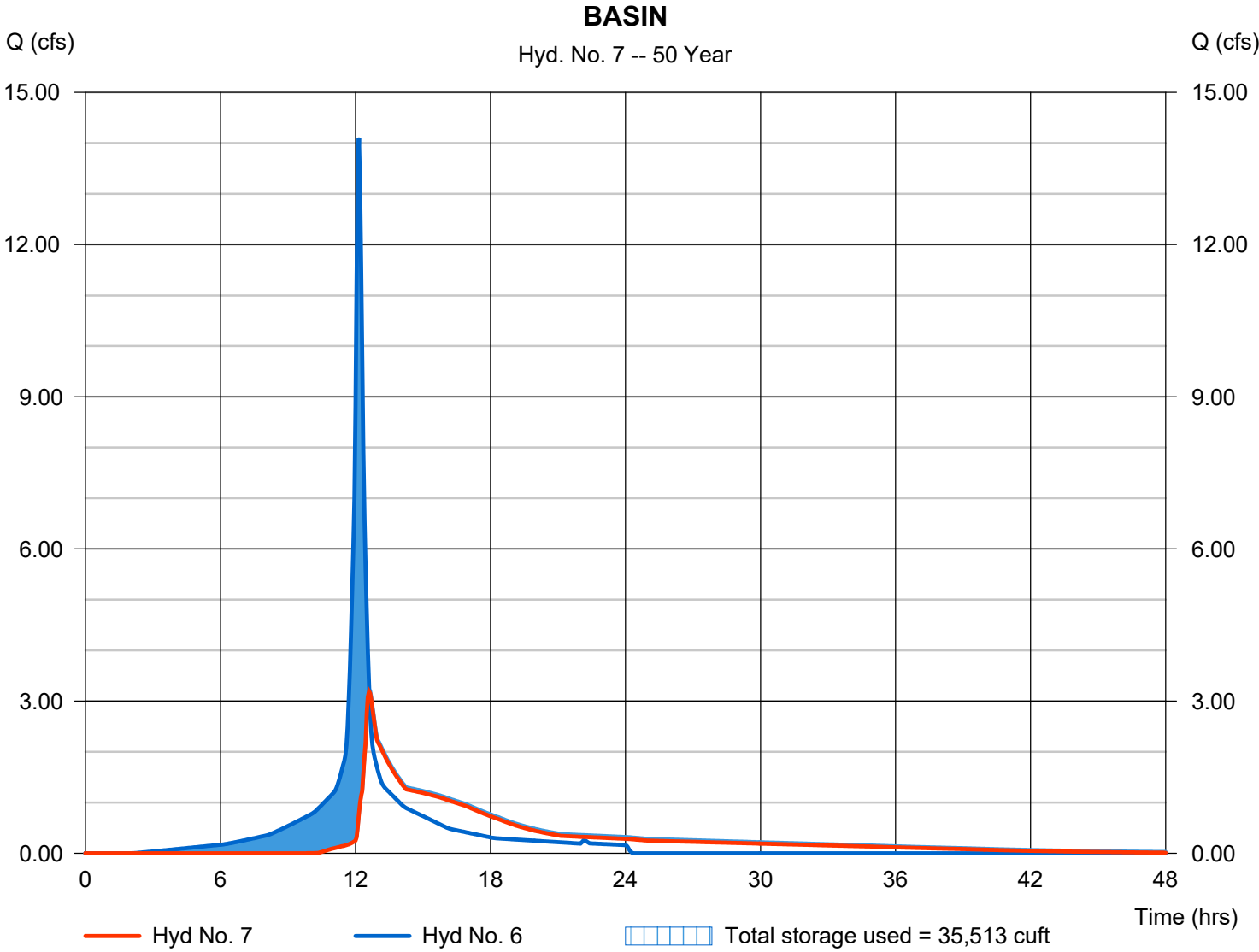
Thursday, 04 / 4 / 2024

Hyd. No. 7

BASIN

Hydrograph type	= Reservoir	Peak discharge	= 3.190 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.60 hrs
Time interval	= 3 min	Hyd. volume	= 49,332 cuft
Inflow hyd. No.	= 6 - COMBO #1	Max. Elevation	= 25.26 ft
Reservoir name	= BASIN #1	Max. Storage	= 35,513 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

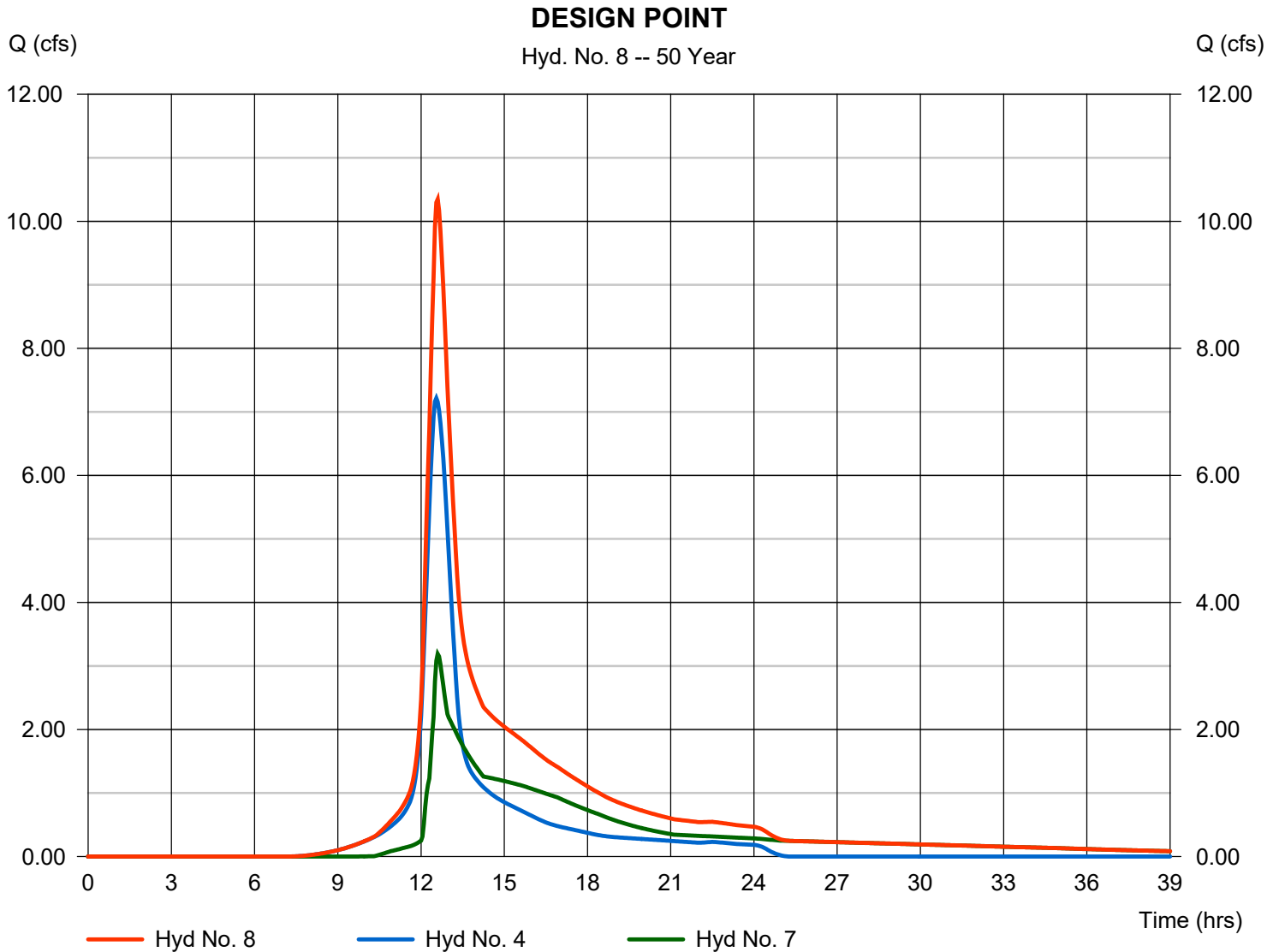
Thursday, 04 / 4 / 2024

Hyd. No. 8

DESIGN POINT

Hydrograph type = Combine
Storm frequency = 50 yrs
Time interval = 3 min
Inflow hyds. = 4, 7

Peak discharge = 10.35 cfs
Time to peak = 12.60 hrs
Hyd. volume = 98,626 cuft
Contrib. drain. area = 2.820 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

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	0.701	3	729	2,780	-----	-----	-----	SHED A
2	SCS Runoff	3.824	3	759	28,903	-----	-----	-----	SHED B
3	SCS Runoff	15.97	3	729	69,033	-----	-----	-----	SHED C
4	SCS Runoff	8.552	3	753	58,529	-----	-----	-----	SHED D
5	Reservoir	0.000	3	n/a	0	2	25.36	28,903	SW WETLAND POCKET
6	Combine	15.97	3	729	69,033	3, 5	-----	-----	COMBO #1
7	Reservoir	5.579	3	750	57,758	6	25.42	37,601	BASIN
8	Combine	14.08	3	753	116,287	4, 7	-----	-----	DESIGN POINT

Hydrograph Report

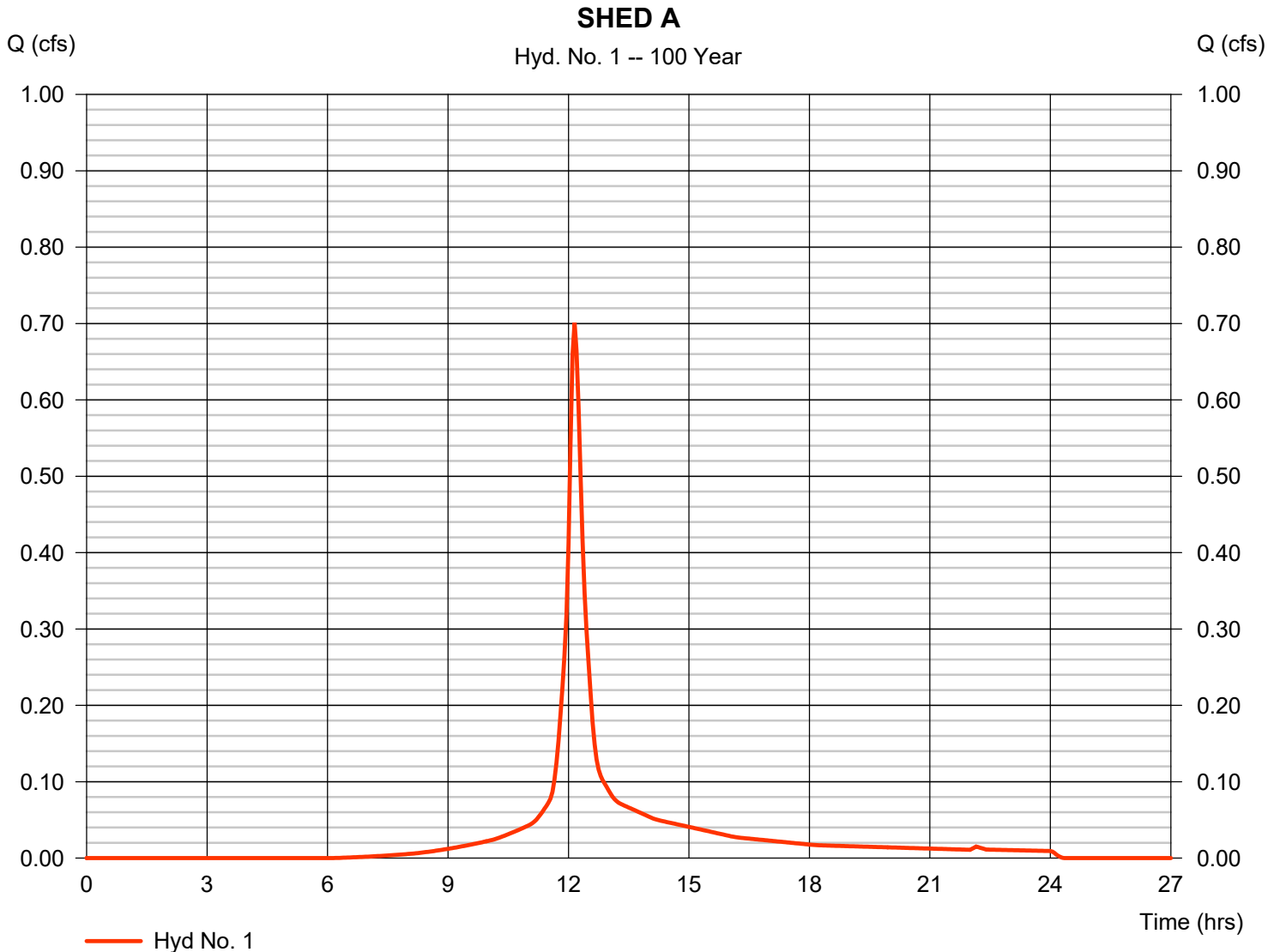
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 1

SHED A

Hydrograph type	= SCS Runoff	Peak discharge	= 0.701 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.15 hrs
Time interval	= 3 min	Hyd. volume	= 2,780 cuft
Drainage area	= 0.130 ac	Curve number	= 76
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.80 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

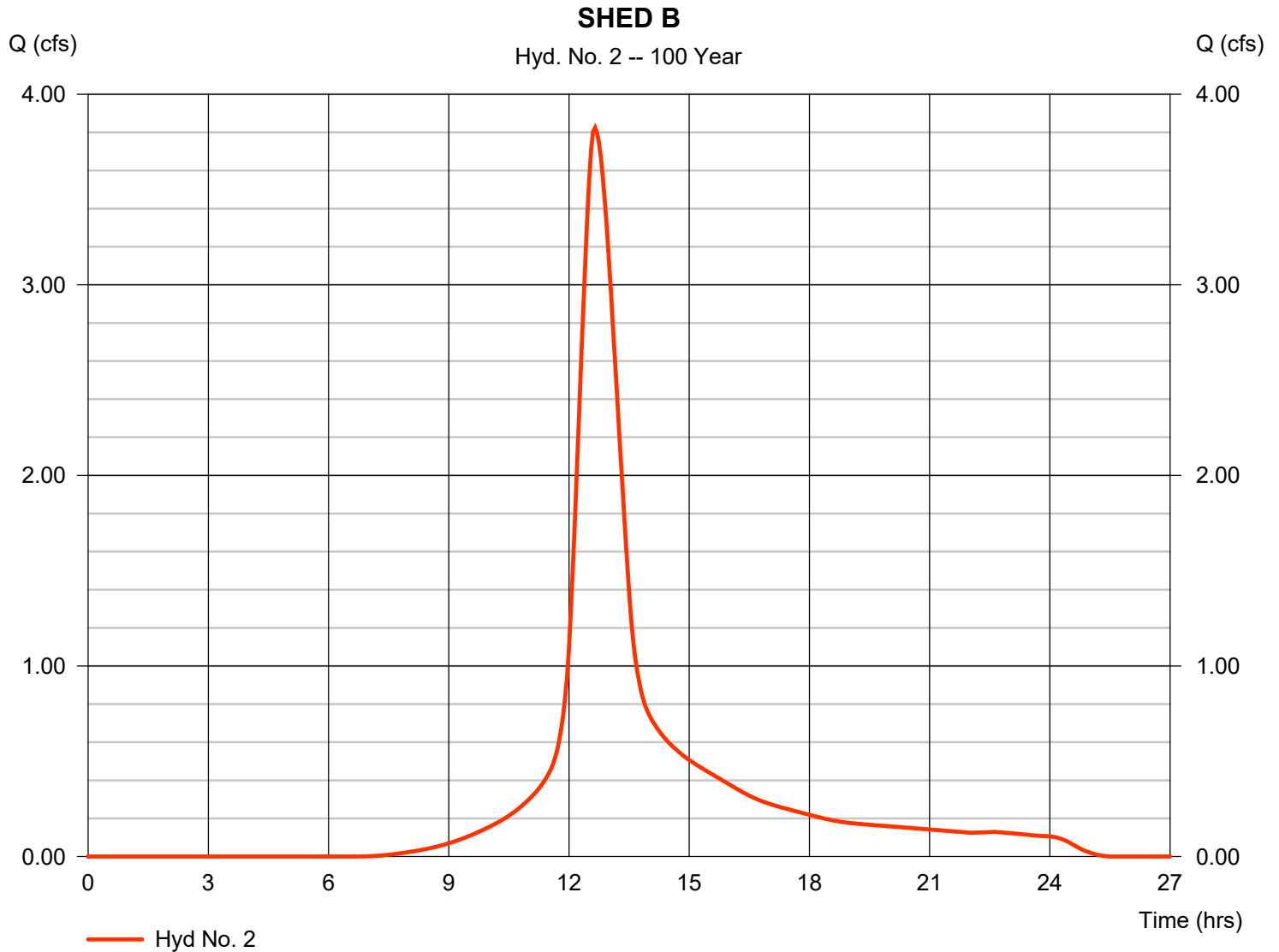
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 2

SHED B

Hydrograph type	= SCS Runoff	Peak discharge	= 3.824 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.65 hrs
Time interval	= 3 min	Hyd. volume	= 28,903 cuft
Drainage area	= 1.410 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 57.10 min
Total precip.	= 8.80 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

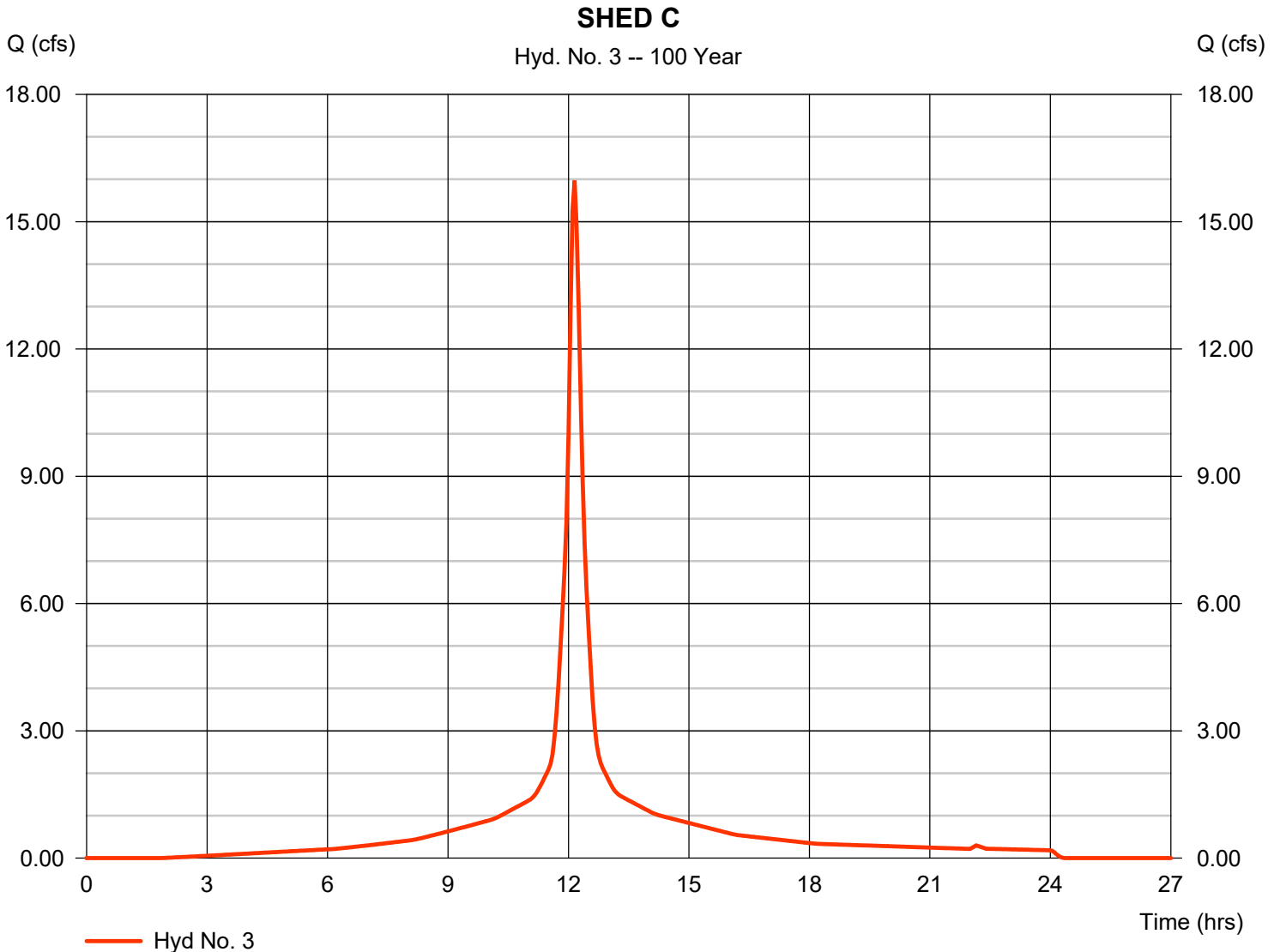
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 3

SHED C

Hydrograph type	= SCS Runoff	Peak discharge	= 15.97 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.15 hrs
Time interval	= 3 min	Hyd. volume	= 69,033 cuft
Drainage area	= 2.390 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.80 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

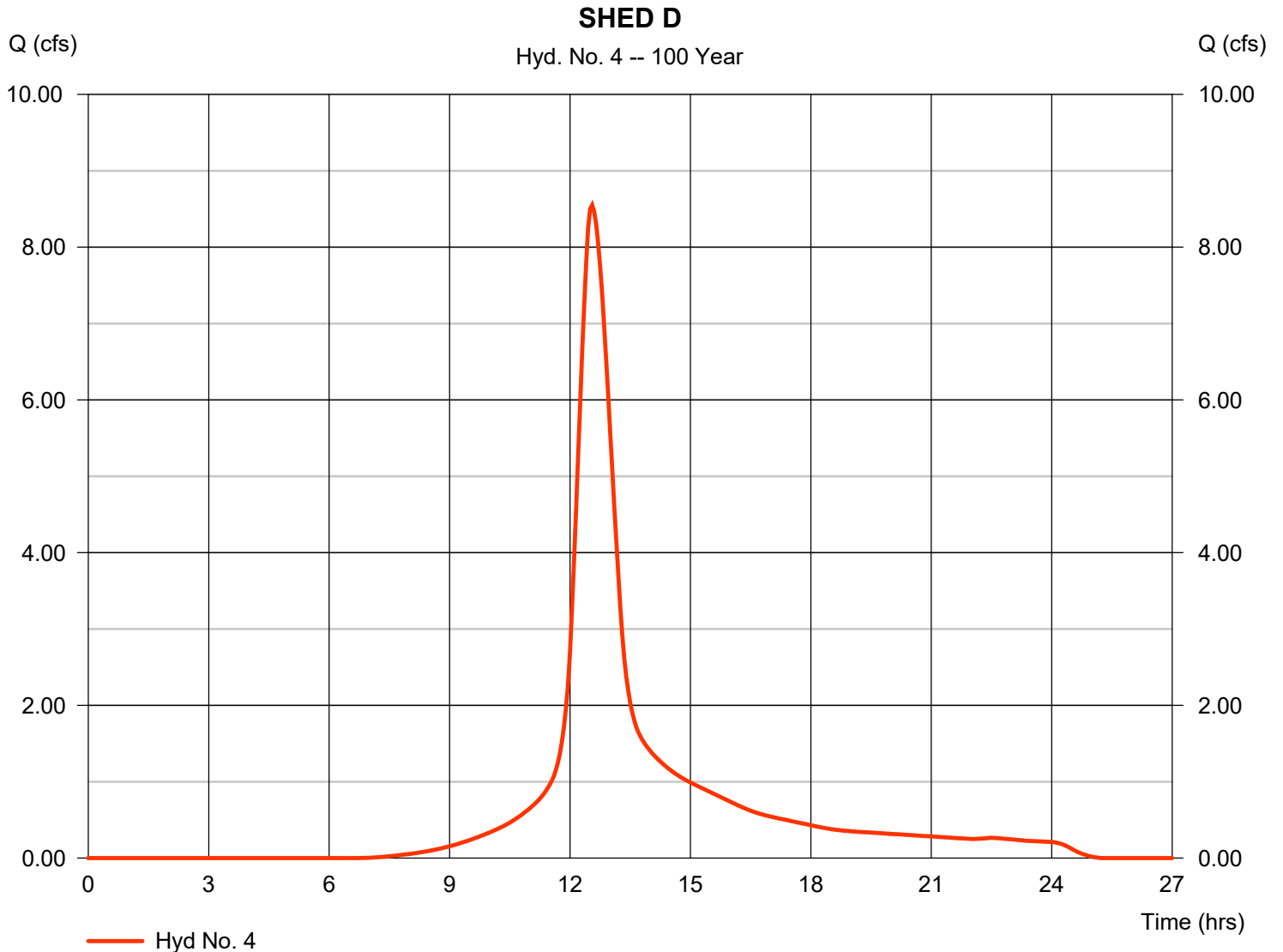
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 4

SHED D

Hydrograph type	= SCS Runoff	Peak discharge	= 8.552 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.55 hrs
Time interval	= 3 min	Hyd. volume	= 58,529 cuft
Drainage area	= 2.820 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 46.30 min
Total precip.	= 8.80 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

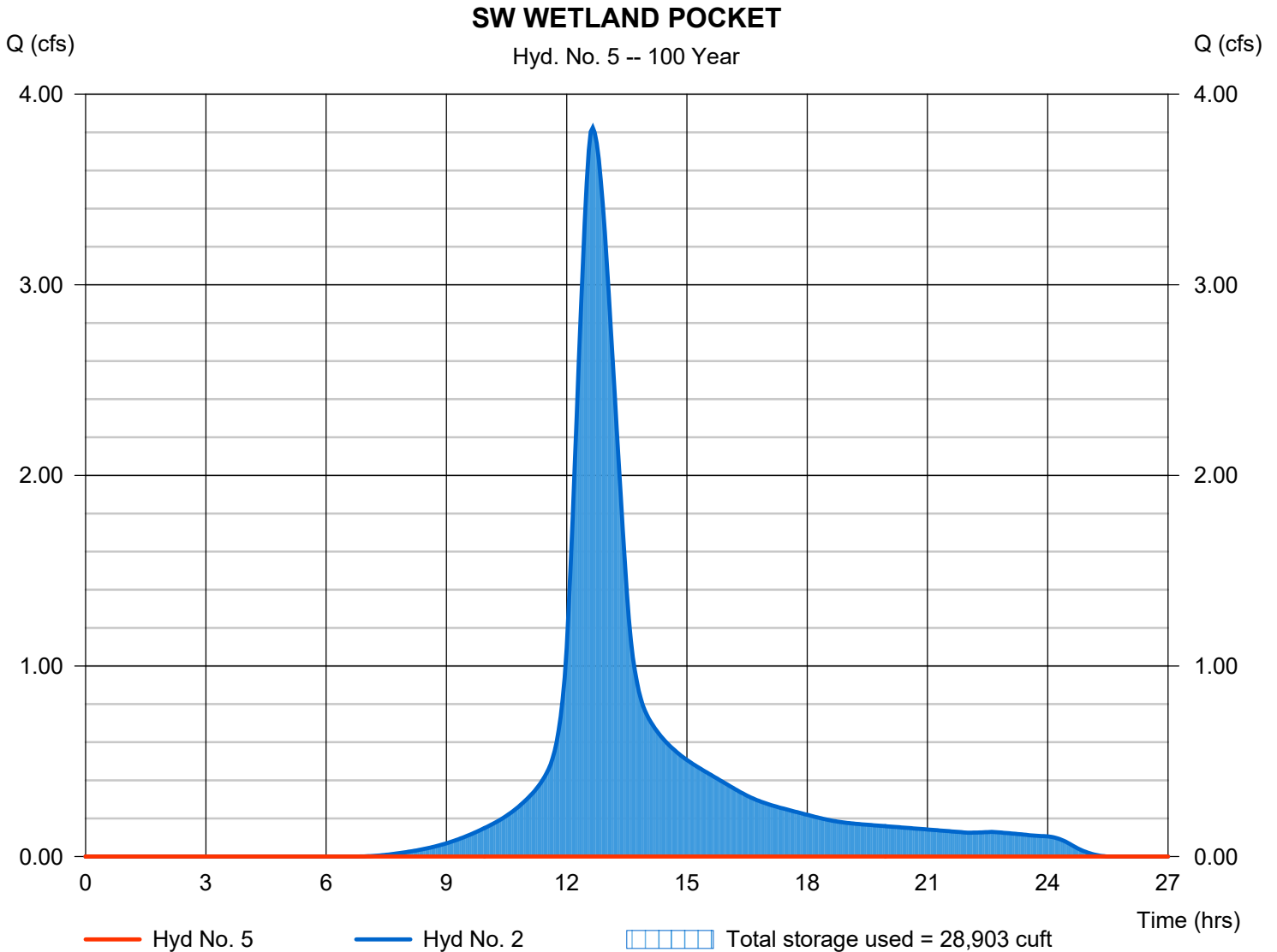
Thursday, 04 / 4 / 2024

Hyd. No. 5

SW WETLAND POCKET

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 100 yrs	Time to peak	= n/a
Time interval	= 3 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 2 - SHED B	Max. Elevation	= 25.36 ft
Reservoir name	= SW WETLAND	Max. Storage	= 28,903 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

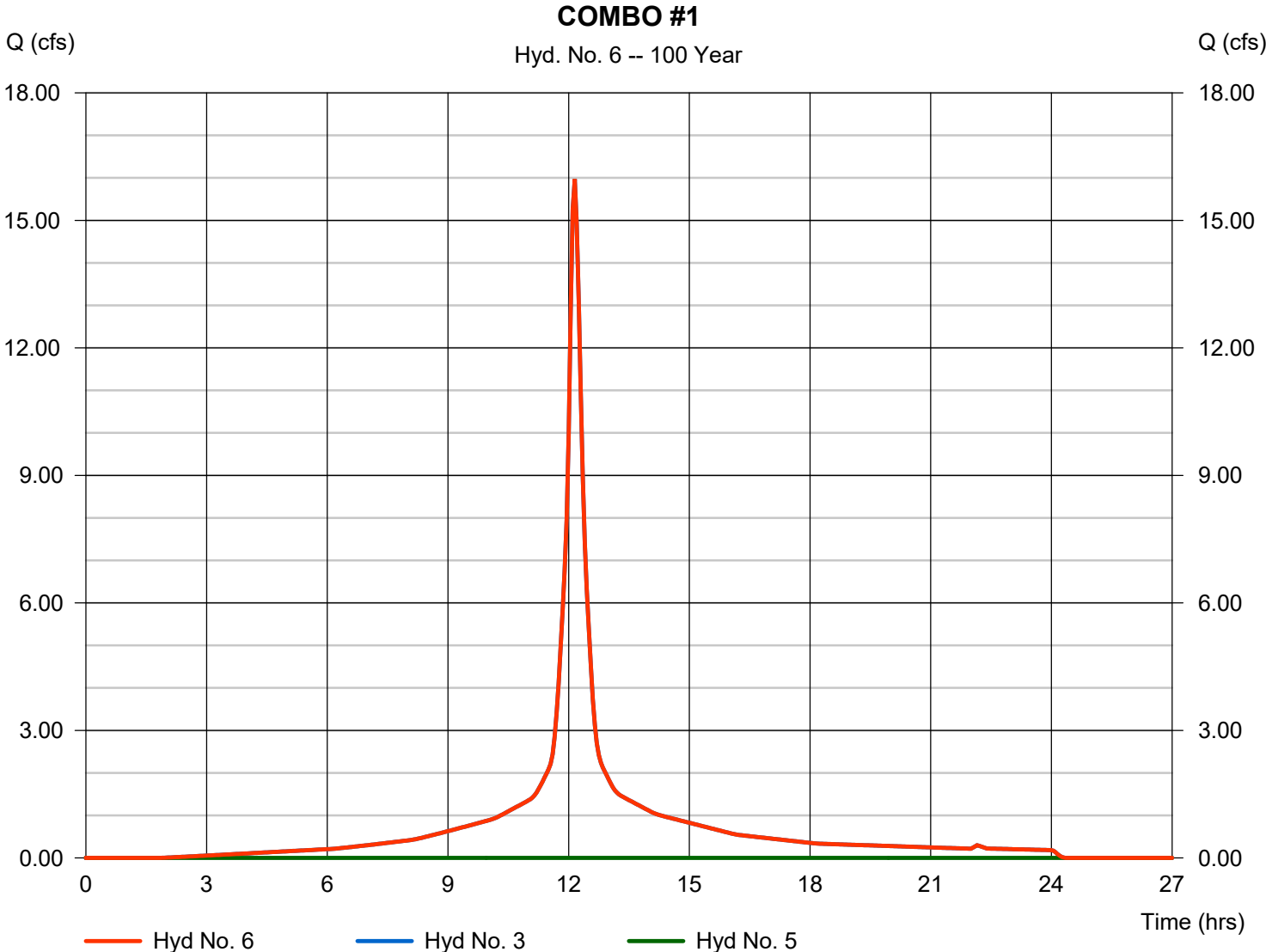
Thursday, 04 / 4 / 2024

Hyd. No. 6

COMBO #1

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 3 min
Inflow hyds. = 3, 5

Peak discharge = 15.97 cfs
Time to peak = 12.15 hrs
Hyd. volume = 69,033 cuft
Contrib. drain. area = 2.390 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

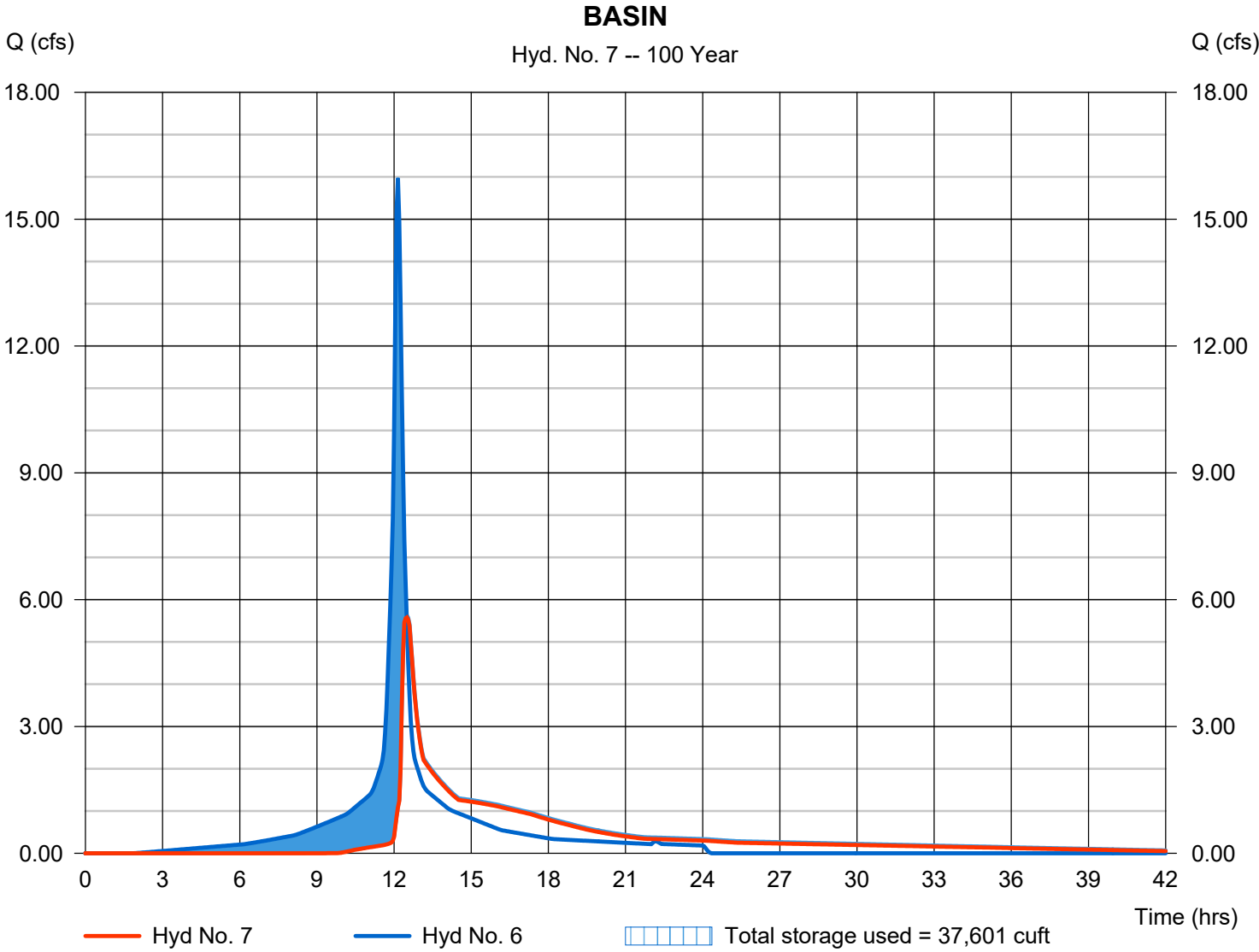
Thursday, 04 / 4 / 2024

Hyd. No. 7

BASIN

Hydrograph type	= Reservoir	Peak discharge	= 5.579 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.50 hrs
Time interval	= 3 min	Hyd. volume	= 57,758 cuft
Inflow hyd. No.	= 6 - COMBO #1	Max. Elevation	= 25.42 ft
Reservoir name	= BASIN #1	Max. Storage	= 37,601 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 04 / 4 / 2024

Hyd. No. 8

DESIGN POINT

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 3 min
Inflow hyds. = 4, 7

Peak discharge = 14.08 cfs
Time to peak = 12.55 hrs
Hyd. volume = 116,287 cuft
Contrib. drain. area = 2.820 ac

