

## Preliminary Stormwater Design Report

# The Distillery

State Route 752, Village of Ashville, Ohio  
November 23, 2022

Prepared by:

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Civil Engineering and Surveying

## **Executive Summary**

The proposed project consists of the development of ten 3-story apartment buildings with a total of 232 units (76 - 1 bedroom, 132 - 2 bedroom, and 24 - 3 bedroom units and a clubhouse) on a 21.416 acre parcel of land that is currently row crop agricultural land. Construction activities will include construction of said apartment buildings, clubhouse, parking lot, trash collection facilities, a retention pond and associated utilities.

## **Existing Site**

Pre-Developed area "A" consists of 12.76 acres of row crop agricultural use that drains from the east side of the property to the northwest corner of the property where runoff enters an existing swale on the CSXT Railroad property and combines with an Offsite Tributary that consists of 1.80 acres (Labeled as Offsite Tributary to EX CB on the predeveloped tributary map) and enters a catch basin within the Right-of Way on the south side of State Route 752. This area in general and the underpass in particular are known to be an extreme flooding issue with no immediately feasible means of remedy. It is our understanding that during the Development Plan approval process, it was stipulated by the Village and agreed to by the owner, that the stormwater design would need to provide a more robust solution than is typically required by the Village.

Based on field observations the capacity of the existing catch basin grate and 10" outlet pipe are as follows: with the open area of the catch basin grate being 2.4 Sq. Ft. and the maximum depth of ponding to the existing edge of pavement being <2" the capacity of this grate is 1.75 CFS, furthermore the existing 10" storm sewer has a capacity of 3.424 CFS at 2.07% slope.

Pre-Developed area B flows to the south and Pre-Developed Areas C and D flow to the East then south along an existing gravel drive that leads to the Wastewater Treatment Plant.

The existing soils on the site are class C hydrologic group. Additionally, 96.8% of the soils are Crosby Silt Loam (CrA) with a small portion of the site near the southwest corner being Kokomo Silty Clay Loam and Miamian-Kendallville Silt Loam. All curve numbers were assigned using the class C hydrologic soil group.

## **Quantity Control Design Approach**

The proposed grading scheme is designed to direct the Stormwater to the proposed retention pond located at the Northwest corner of the site. This area is labeled as Post-Developed A on the Post-Developed tributary map. Post-Developed B is a direct discharge of a fringe area that is unable to be detained in the retention pond.

Based on the discussion above, our design proposes to replace the existing catch basin with an ODOT CB No 5 catch basin and connect it directly to the existing 24" storm sewer. With the open area in the grate being 5.72 Sq. Ft. and a ponding depth of just over 7 inches without ponding into the roadway, the new catch basin will have a capacity of 14.5 CFS. See mass grading plan sheet 5 for details of this catch basin. An inlet report for the proposed catch basin can be found on the following pages.

The design will capture the runoff from the Post-Developed A 100 year storm and release it at a rate that when combined with Post-Developed B and the Offsite Tributary to the existing catch basin is less than the 14.5 CFS capacity of the proposed catch basin mentioned above. This overdesign will result in some mitigation to the historic flooding problem at the underpass.

Based on this approach we have not included any Critical Storm calculations since it is no longer applicable to this project. The outlet structure is designed to restrict the rate of runoff from the improved

area such that the total release rate from the site in each Post-Developed event up to and including the 100 Year Storm, would be less than the peak rate from the 1 year Pre-Developed storm. The outlet control structure will consist of a 4'x4' concrete catch basin with a 24" sump (705.00) to collect sediment and a 6" orifice (706.00) in the side of the outlet control structure to control the Water Quality Volume Details can be found on Sheet 5 of the Mass Grading Plans. The top of the catch basin (708.25) will be the second and final stage of the outlet control structure which will not receive flows unless the 6" orifice is clogged or if there is a storm event greater than the 100-year storm.

Post-Developed area C is the direct discharge from the fringe area that will be released to the south. Per the calculations and the summary table below The direct runoff from the 100-year storm event of Post-Developed area C is less than the runoff of the 1-year storm event of Pre-Developed areas B, C and D Combined.

### Discharge Summary to Existing CB

	Predeveloped A (Hydro #1)	Offsite Tributary to Proposed CB 34 (Hydro #10)	Allowable Release to Proposed CB 34	Postdeveloped A Routed (Hydro #9)	Ponding Elevation	Storage Volume	Direct Release From Postdeveloped B (Hydro #7)	Actual Release Rate and Offsite Tributary to Proposed CB 34 (Hydro #11)
Year	CFS	CFS	CFS	CFS	Feet	C.F.	CFS	CFS
1	12.570	1.762	14.500	0.447	706.55	46676	0.300	2.128
2	17.280	2.505	14.500	0.553	706.73	64018	0.501	3.181
5	24.090	3.698	14.500	0.703	706.99	90694	0.823	4.810
10	29.800	4.746	14.500	0.813	707.22	113920	1.111	6.223
25	38.260	6.265	14.500	0.956	707.56	147718	1.543	8.221
50	45.150	7.553	14.500	1.064	707.85	176629	1.922	9.924
100	52.520	8.925	14.500	1.622	708.10	202026	2.333	11.730

### Direct Discharge Summary to South

	Predeveloped B, C, D Combined (Hydro #5)	Allowable Release	Postdeveloped C (Hydro #8)
Year	CFS	CFS	CFS
1	7.828	7.828	1.076
2	10.760	7.828	1.679
5	15.140	7.828	2.626
10	18.840	7.828	3.459
25	24.120	7.828	4.704
50	28.550	7.828	5.783
100	33.240	7.828	6.944

## Water Quality

The project will disturb well over 1 acre warranting coverage under the statewide general permit for construction stormwater. In accordance with permit, the design proposes a wet extended detention basin as the post construction BMP. The WQv will be detained by the 6" orifice in the outlet structure. The WQv design was developed using the OEPA Compliance Worksheet which is included on the follow pages.

## Storm Sewer

The internal storm sewer is designed using a 2 year flow and 5 year hydraulic grade line check. As previously discussed, the vast majority of the site is graded to be tributary to one of the catch basins or other inlets. The storm sewer network is directed to discharge to one of two forebays within retention pond through one of three headwalls with rock channel protection to dissipate flow and reduce erosion. The storm sewer design calculations are shown on the computation sheet which is included herein.

## Temporary Sediment Basin

The proposed retention pond will be used as a temporary sediment basin during the construction phase of this project. The sediment basin was developed using the OEPA Sediment Basin Sizing and Dewatering Compliance Tool which is included on the following pages. Per the OEPA Sediment Basin Sizing and Dewatering Compliance Tool, below is a screenshot of the Faircloth Skimmer sizing results.

11/23/22, 1:02 PM

Skimmer Sizing – Faircloth Skimmer

Holiday Hours: We are closed for Thanksgiving November 24-25, Christmas Dec 23-27, and New Years Jan 1-2. Got it!

Post Office Box 789, Hillsborough, North Carolina 27278 Phone: 919-732-1244 Post Office Box 789, Hillsborough, North Carolina 27278



CONTACT US  
(919) 732-1244

HOME TECHNICAL INFO SKIMMER SIZING ORDER SKIMMER CONTACT

## SKIMMER SIZING

Home / Skimmer Sizing

### ONLINE CALCULATORS

#### CALCULATE FAIRCLOTH SKIMMER® SIZE

Required Basin volume in cubic feet	Days to Drain	
<input type="text" value="32858"/>	<input type="text" value="2"/>	
The required basin volume is the actual volume you intend to drain, not the provided or total volume which is often larger. If a pool of water is to be maintained between storms, do not include that volume. In some cases a sediment basin may be larger than required because it will be used as a permanent stormwater pond.	Number of Days to drain is usually determined by local or state regulations. Where there is no requirement 3 days is recommended. Keep in mind the quicker the basin is to drain the larger the skimmer required. In NC, assume 3 days to drain.	
SKIMMER SIZE	ORIFICE RADIUS	ORIFICE DIAMETER
4.0 inches	1.8 inches	3.6 inches

#### BASIN VOLUME CALCULATOR

If you do not know the basin's volume but you do know the dimensions and depth of a square or rectangular basin, use this calculator to estimate the volume.

#### TECHNICAL SIZING INSTRUCTIONS

Determining the Skimmer Size and the Required Orifice for the Faircloth Skimmer® Surface Drain (click here to open document)

#### DETERMINING SKIMMER SIZE

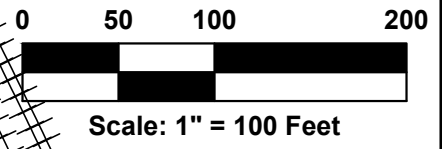
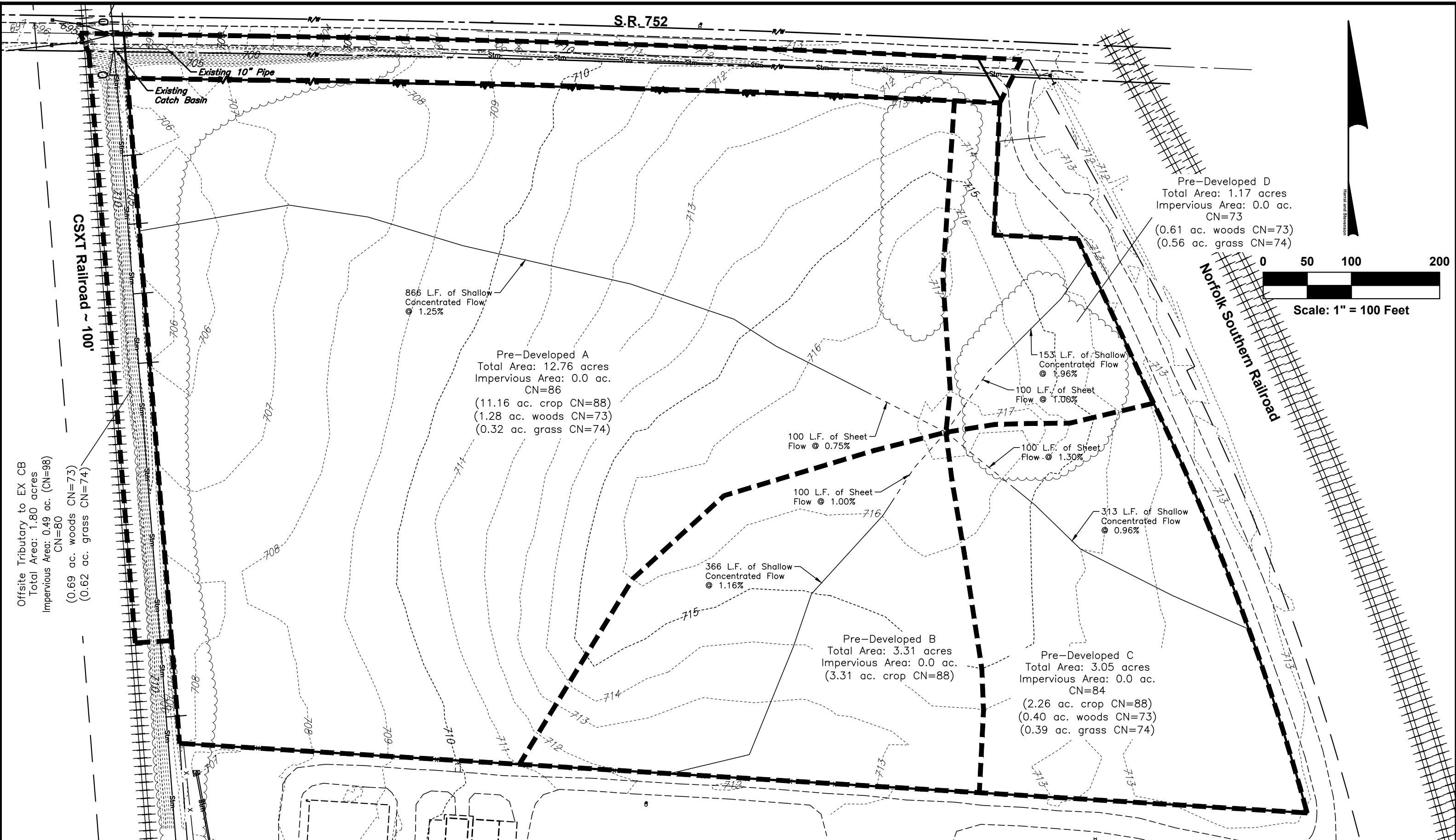
- Eight sizes available, ranging from 1½" for small sediment traps to 8" for very large basins.
- Size refers to the maximum diameter of the inlet. For example, a 4" Faircloth Skimmer® has a 4" maximum orifice size.
- Each Faircloth Skimmer® includes a plug and adjustable cutter for making an orifice (hole) smaller than the inlet to customize the flow rate for the particular basin.

#### METHOD USED

The flow rates used in the calculator and listed in the chart are theoretical rates calculated using the orifice equation and the head on the inlet for each size skimmer. (Note that the head is different for each size skimmer.)

https://fairclothskimmer.com/skimmer-sizing/

1/3



Pre-Developed D  
 Total Area: 1.17 acres  
 Impervious Area: 0.0 ac.  
 CN=73  
 (0.61 ac. woods CN=73)  
 (0.56 ac. grass CN=74)

Pre-Developed A  
 Total Area: 12.76 acres  
 Impervious Area: 0.0 ac.  
 CN=86  
 (11.16 ac. crop CN=88)  
 (1.28 ac. woods CN=73)  
 (0.32 ac. grass CN=74)

Pre-Developed B  
 Total Area: 3.31 acres  
 Impervious Area: 0.0 ac.  
 (3.31 ac. crop CN=88)

Pre-Developed C  
 Total Area: 3.05 acres  
 Impervious Area: 0.0 ac.  
 CN=84  
 (2.26 ac. crop CN=88)  
 (0.40 ac. woods CN=73)  
 (0.39 ac. grass CN=74)

Offsite Tributary to EX CB  
 Total Area: 1.80 acres  
 Impervious Area: 0.49 ac. (CN=98)  
 CN=80  
 (0.69 ac. woods CN=73)  
 (0.62 ac. grass CN=74)

CSXT Railroad ~ 100'

S.R. 752

Existing Catch Basin

Existing 10" Pipe

866 L.F. of Shallow Concentrated Flow @ 1.25%

153 L.F. of Shallow Concentrated Flow @ 1.96%

100 L.F. of Sheet Flow @ 1.00%

100 L.F. of Sheet Flow @ 1.30%

100 L.F. of Sheet Flow @ 0.75%

100 L.F. of Sheet Flow @ 1.00%

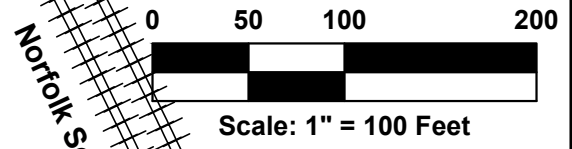
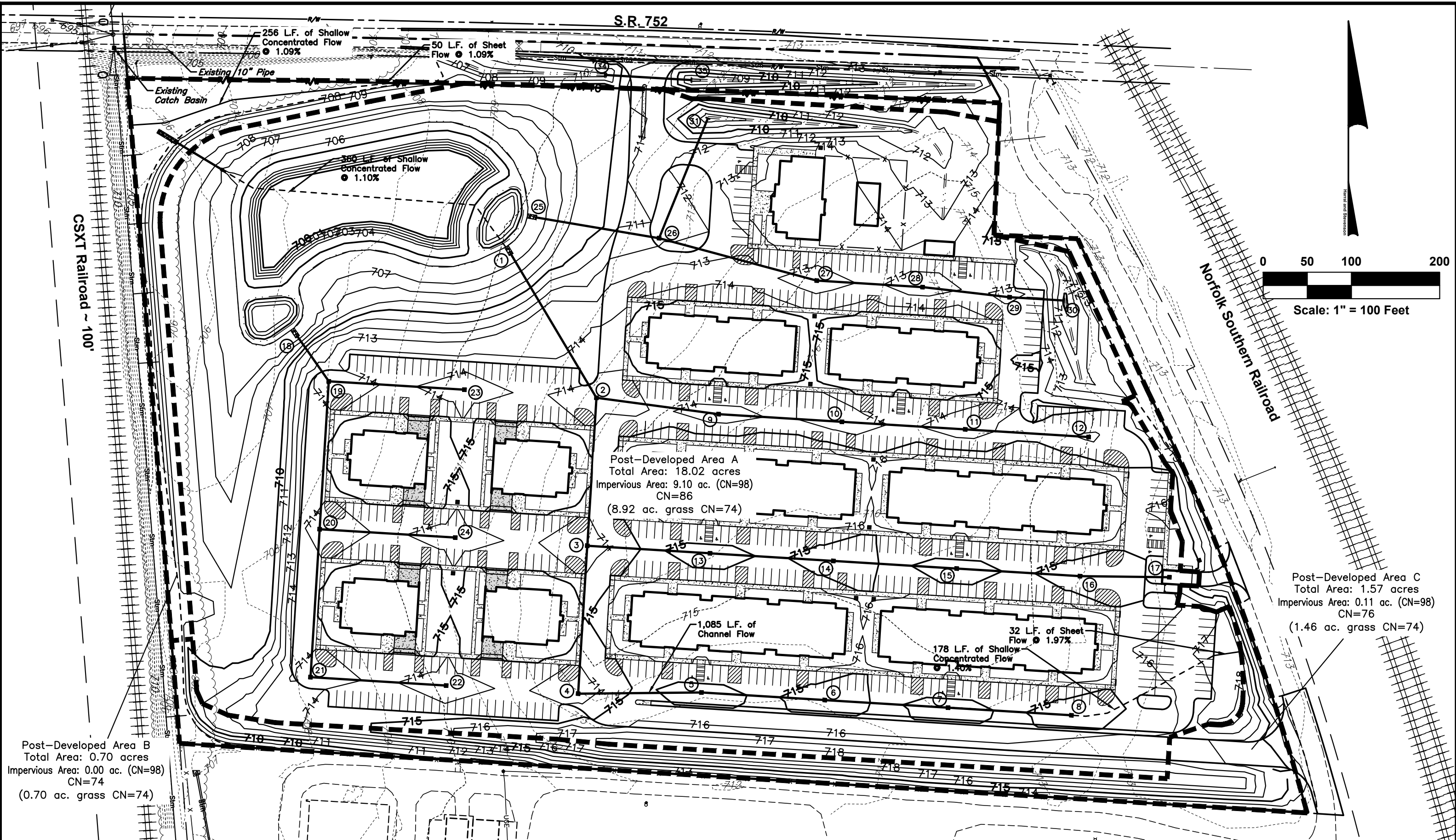
366 L.F. of Shallow Concentrated Flow @ 1.16%

313 L.F. of Shallow Concentrated Flow @ 0.96%

**Harral and Stevenson**  
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 2869 North Court Street  
 Circleville, Ohio 43113  
 Ph: 740.497.4432  
 www.harralstevenson.com

Date: 11/21/22  
 Scale: 1"=100'  
 Drawn By: DLS  
 Project: E221073  
 Client:

VILLAGE OF ASHVILLE, PICKAWAY COUNTY, OHIO  
 THE DISTILLERY  
**PRE-DEVELOPED**  
 TRIBUTARY AREA MAP



Post-Developed Area B  
 Total Area: 0.70 acres  
 Impervious Area: 0.00 ac. (CN=98)  
 CN=74  
 (0.70 ac. grass CN=74)

Post-Developed Area A  
 Total Area: 18.02 acres  
 Impervious Area: 9.10 ac. (CN=98)  
 CN=86  
 (8.92 ac. grass CN=74)

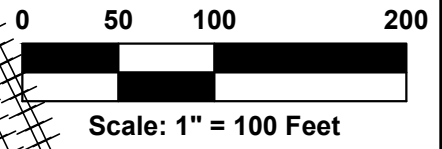
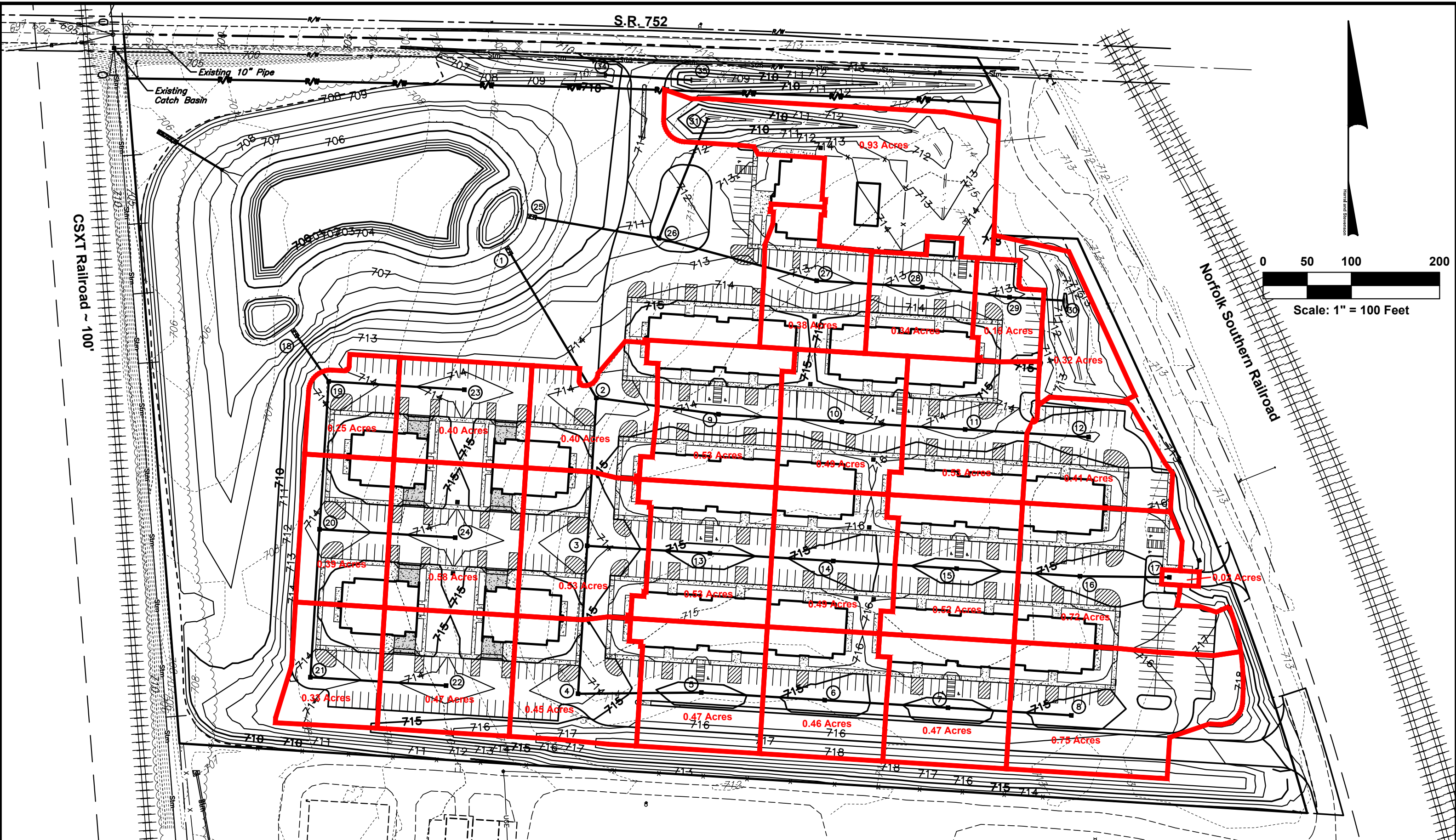
Post-Developed Area C  
 Total Area: 1.57 acres  
 Impervious Area: 0.11 ac. (CN=98)  
 CN=76  
 (1.46 ac. grass CN=74)

**HS** **Harral and Stevenson**  
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 THE DISTILLERY  
**POST-DEVELOPED**  
 TRIBUTARY AREA MAP






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VILLAGE OF ASHVILLE, PICKAWAY COUNTY, OHIO  
 THE DISTILLERY  
**STORM SEWER**  
 TRIBUTARY AREA MAP







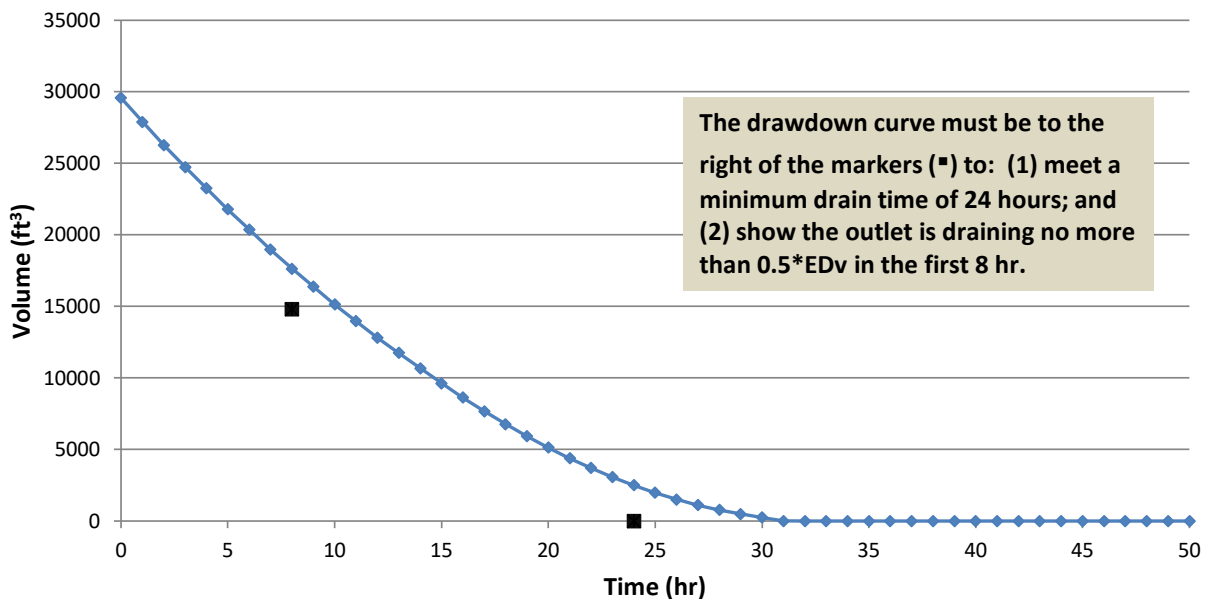
### Step 4 - Outlet Elevations and Storage Volumes

WQ Orifice Invert Elevation =	706.00	
Elevation of Top of EDv =	706.50	
Secondary Outlet Invert Elevation =	708.25	OKAY
WQ Treatment Volume Provided, $V_{\text{treatment}}$ =	177,423	$\text{ft}^3$
Treatment Vol Provided Relative to EDv, $V_{\text{treatment}}/\text{EDv}$ =	6.00	= 600% OKAY
Permanent Pool Volume Provided, PPv =	196,149	$\text{ft}^3$
Ratio PPv Provided to PPv Required =	5.53	= 553% OKAY

### Step 5 - Outlet (Orifice) Sizing

Maximum Hydraulic Head, $H_{\text{max}}$ =	0.50	ft	
Orifice Coefficient, $C$ =	0.6		
Target (Minimum) Draw-down Time, $T_d$ =	24	hr	
Target Average Discharge, $Q_{\text{avg}}$ =	0.34	cfs	
Average Hydraulic Head, $H_{\text{avg}}$ =	0.25	ft	
Estimated Orifice Area, $A_{\text{orifice}}$ =	20.44	$\text{in}^2$	= 0.142 $\text{ft}^2$
Estimated Orifice Diameter, $D_{\text{orifice}}$ =	5.10	in	= 0.43 ft
Design Orifice Diameter, $D_{\text{orifice}}$ =	6.00	in	= 0.50 ft
Design Orifice Area, $A_{\text{orifice}}$ =	28.09	$\text{in}^2$	= 0.195 $\text{ft}^2$
Time to Completely Drain EDv, $T_d$ =	32	hr	must be $\geq 24$ hr OKAY
Volume Drained in First 8 hr =	11,940	$\text{ft}^3$	
% of EDv =	40.4	%	must be $\leq 50\%$ OKAY

### Wet Basin - EDv Drawdown vs Time





**Step 3 - Outlet Elevations and Storage Volumes**

Skimmer Outlet Invert/Skimmer Stop Elevation = **706.00** ft  
 Secondary Outlet Invert Elevation = **708.10** ft

**OKAY**  
**OKAY**

Provided Sediment Storage Volume = **121,603** ft<sup>3</sup>  
 Provided Dewatering Volume = **123,869** ft<sup>3</sup>

**OKAY**  
**OKAY**

The invert of the Skimmer Outlet/Skimmer Stop (e.g. stone pad) corresponds to the top of the sediment storage zone/permanent pool and the bottom of the Dewatering Volume. It cannot be below the bottom of the pond.  
 The invert elevation for the next (usually peak discharge or flood control) outlet. This elevation must exceed that of the Skimmer Outlet Invert Elevation and be below the top of the pond. \*Check - The difference between the skimmer outlet invert/skimmer stop elevation and the secondary outlet invert elevation (dewatering zone depth) must not exceed 5ft.  
 The Sediment Storage Volume must exceed the requirement listed above in Step 1  
 The Dewatering Volume must exceed the requirement listed above in Step 1  
 \*ERROR\* Check - The Step 2 Stage Storage Table above must include the exact Skimmer Outlet/Skimmer Stop Elevation and the Secondary Outlet Invert Elevation provided in Step 3

**Step 4 - Skimmer-Type Outlet Sizing**

Select Skimmer Type or Manufacturer: Faircloth Skimmer

Faircloth Skimmer Sizing Calculator: [Click Here For Link to Online Calculator](#)

Orifice Size Selected: **4** in  
 Dewatering Drawdown Time: **48** hrs

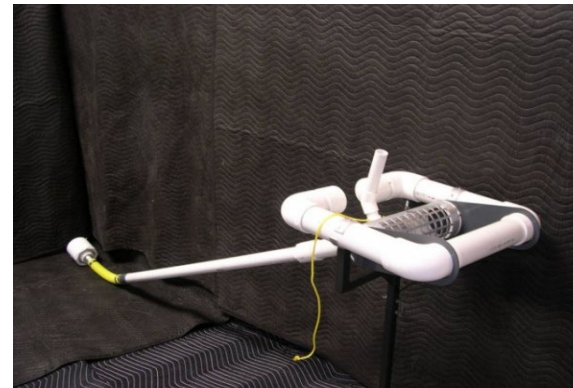
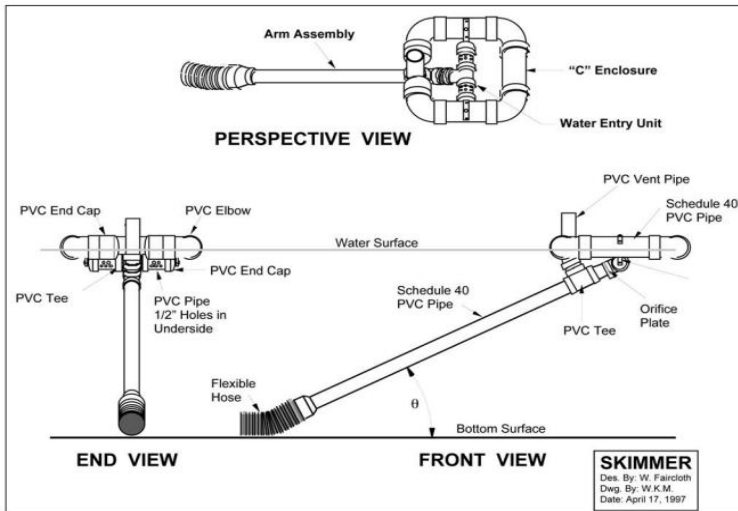
Follow directions on webpage to calculate exact skimmer size and model, include screenshot of results in SWP3. \*Note\* Input requir

Check to ensure that orifice sizing calculation is done using required, NOT provided dewatering volume  
 Check that dewatering drawdown time is greater than 2 days and less than 7 days

**Example Faircloth Float Spec Sheet**

**Faircloth Float Photo**

Please note the drawing and image shown below are provided solely to assist with identification of the skimmer type and its associated componants. The drawing and photo below does not necessarily depict an installation that complies with the General Permit or Rainwater & Land Development specification, especially where the sediment storage zone in omitted.





# Inlet Report

## Proposed Catch Basin 34

### Drop Grate Inlet

Location	= Sag
Curb Length (ft)	= -0-
Throat Height (in)	= -0-
Grate Area (sqft)	= 5.72
Grate Width (ft)	= 2.67
Grate Length (ft)	= 2.67

### Gutter

Slope, Sw (ft/ft)	= 0.290
Slope, Sx (ft/ft)	= 0.290
Local Depr (in)	= -0-
Gutter Width (ft)	= 4.00
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

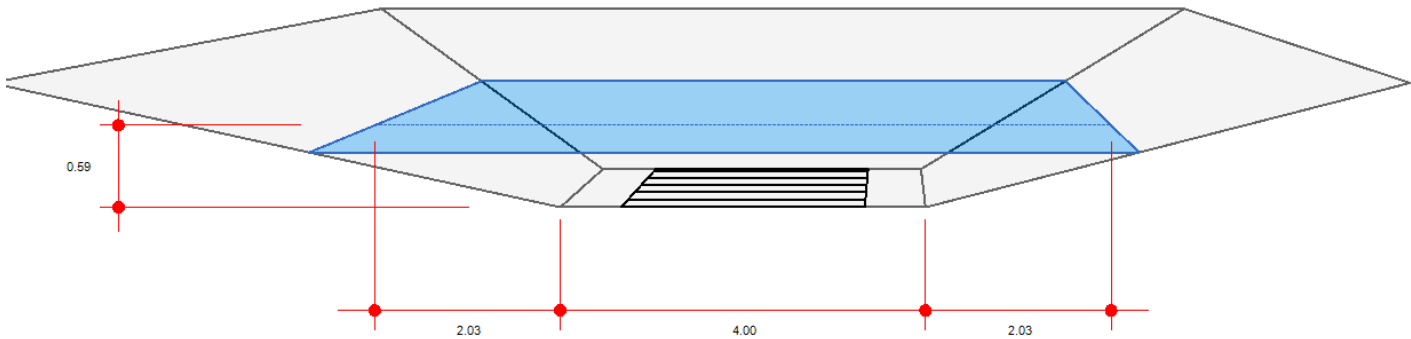
### Calculations

Compute by:	Q vs Depth
Max Depth (in)	= 7

### Highlighted

Q Total (cfs)	= 14.50
Q Capt (cfs)	= 14.50
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 7.07
Efficiency (%)	= 100
Gutter Spread (ft)	= 8.06
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-

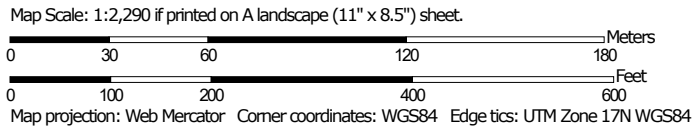
All dimensions in feet



Hydrologic Soil Group—Pickaway County, Ohio



Soil Map may not be valid at this scale.



## MAP LEGEND

### Area of Interest (AOI)









 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons





 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Lines


 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Points






 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available

### Water Features

 Streams and Canals

### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

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

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

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Pickaway County, Ohio  
 Survey Area Data: Version 22, Sep 10, 2021

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

Date(s) aerial images were photographed: Oct 8, 2020—Nov 7, 2020

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

## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CrA	Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	C/D	20.7	96.8%
Ko	Kokomo silty clay loam, 0 to 2 percent slopes	C/D	0.7	3.1%
MkB	Miamian-Kendallville silt loams, 2 to 6 percent slopes	C	0.0	0.1%
<b>Totals for Area of Interest</b>			<b>21.4</b>	<b>100.0%</b>



## Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher

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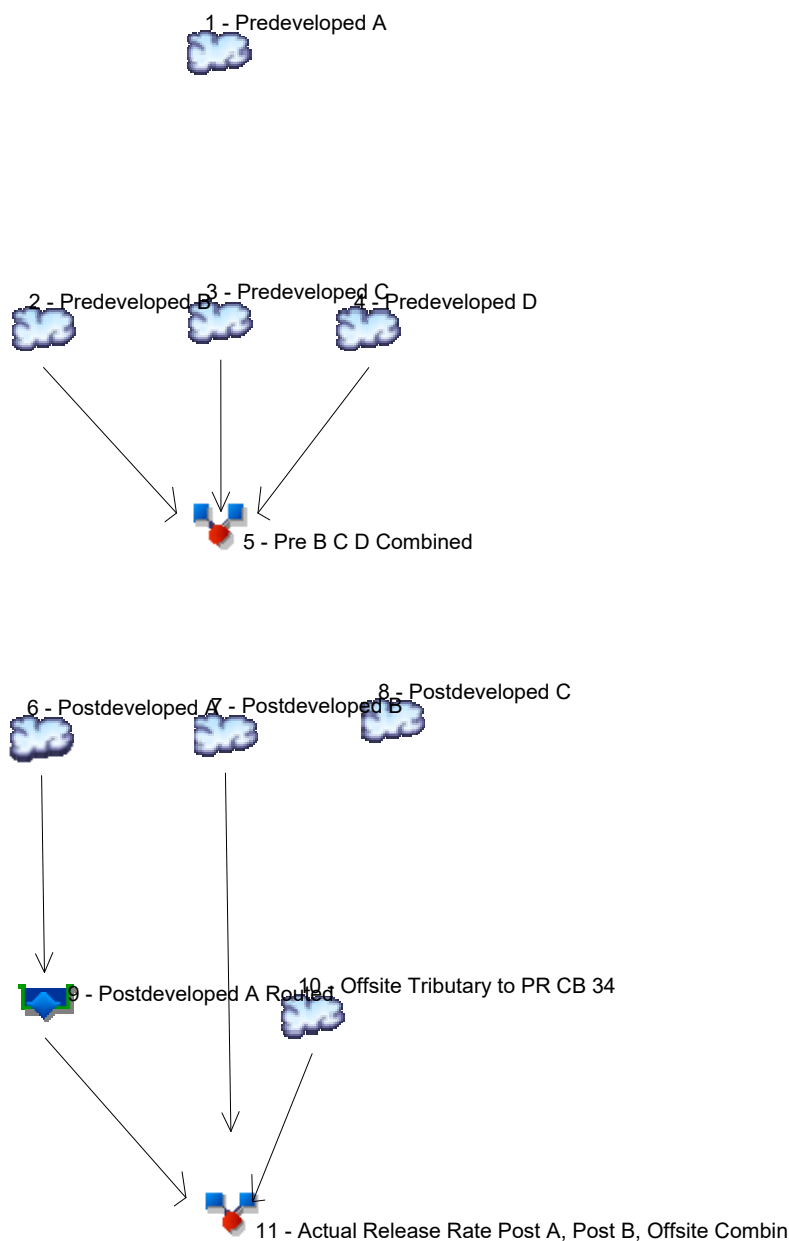
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# Watershed Model Schematic

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



## Legend

Hyd.	Origin	Description
1	SCS Runoff	Predeveloped A
2	SCS Runoff	Predeveloped B
3	SCS Runoff	Predeveloped C
4	SCS Runoff	Predeveloped D
5	Combine	Pre B C D Combined
6	SCS Runoff	Postdeveloped A
7	SCS Runoff	Postdeveloped B
8	SCS Runoff	Postdeveloped C
9	Reservoir	Postdeveloped A Routed
10	SCS Runoff	Offsite Tributary to PR CB 34
11	Combine	Actual Release Rate Post A, Post B, Offsite Combin

# 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	-----	12.30	16.72	-----	23.24	28.71	36.47	42.95	49.77	Predeveloped A
2	SCS Runoff	-----	4.329	5.739	-----	7.791	9.494	11.89	13.88	15.97	Predeveloped B
3	SCS Runoff	-----	3.076	4.277	-----	6.071	7.591	9.760	11.58	13.50	Predeveloped C
4	SCS Runoff	-----	0.446	0.769	-----	1.292	1.761	2.467	3.091	3.768	Predeveloped D
5	Combine	2, 3, 4	7.828	10.76	-----	15.14	18.84	24.12	28.55	33.24	Pre B C D Combined
6	SCS Runoff	-----	22.69	30.71	-----	42.51	52.38	66.36	78.00	90.26	Postdeveloped A
7	SCS Runoff	-----	0.300	0.501	-----	0.823	1.111	1.543	1.922	2.333	Postdeveloped B
8	SCS Runoff	-----	1.076	1.679	-----	2.626	3.459	4.704	5.783	6.944	Postdeveloped C
9	Reservoir	6	0.447	0.553	-----	0.703	0.813	0.956	1.064	1.622	Postdeveloped A Routed
10	SCS Runoff	-----	1.726	2.505	-----	3.698	4.746	6.265	7.553	8.925	Offsite Tributary to PR CB 34
11	Combine	7, 9, 10	2.128	3.181	-----	4.810	6.223	8.221	9.924	11.73	Actual Release Rate Post A, Post B,

# 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	12.30	2	728	45,740	-----	-----	-----	Predeveloped A
2	SCS Runoff	4.329	2	724	13,561	-----	-----	-----	Predeveloped B
3	SCS Runoff	3.076	2	724	9,838	-----	-----	-----	Predeveloped C
4	SCS Runoff	0.446	2	726	1,756	-----	-----	-----	Predeveloped D
5	Combine	7.828	2	724	25,155	2, 3, 4	-----	-----	Pre B C D Combined
6	SCS Runoff	22.69	2	722	63,980	-----	-----	-----	Postdeveloped A
7	SCS Runoff	0.300	2	726	1,137	-----	-----	-----	Postdeveloped B
8	SCS Runoff	1.076	2	722	3,059	-----	-----	-----	Postdeveloped C
9	Reservoir	0.447	2	1164	57,903	6	706.55	46,676	Postdeveloped A Routed
10	SCS Runoff	1.726	2	722	4,637	-----	-----	-----	Offsite Tributary to PR CB 34
11	Combine	2.128	2	722	63,676	7, 9, 10	-----	-----	Actual Release Rate Post A, Post B,
E221073 Hydro.gpw					Return Period: 1 Year			Wednesday, 11 / 23 / 2022	

# Hydrograph Report

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

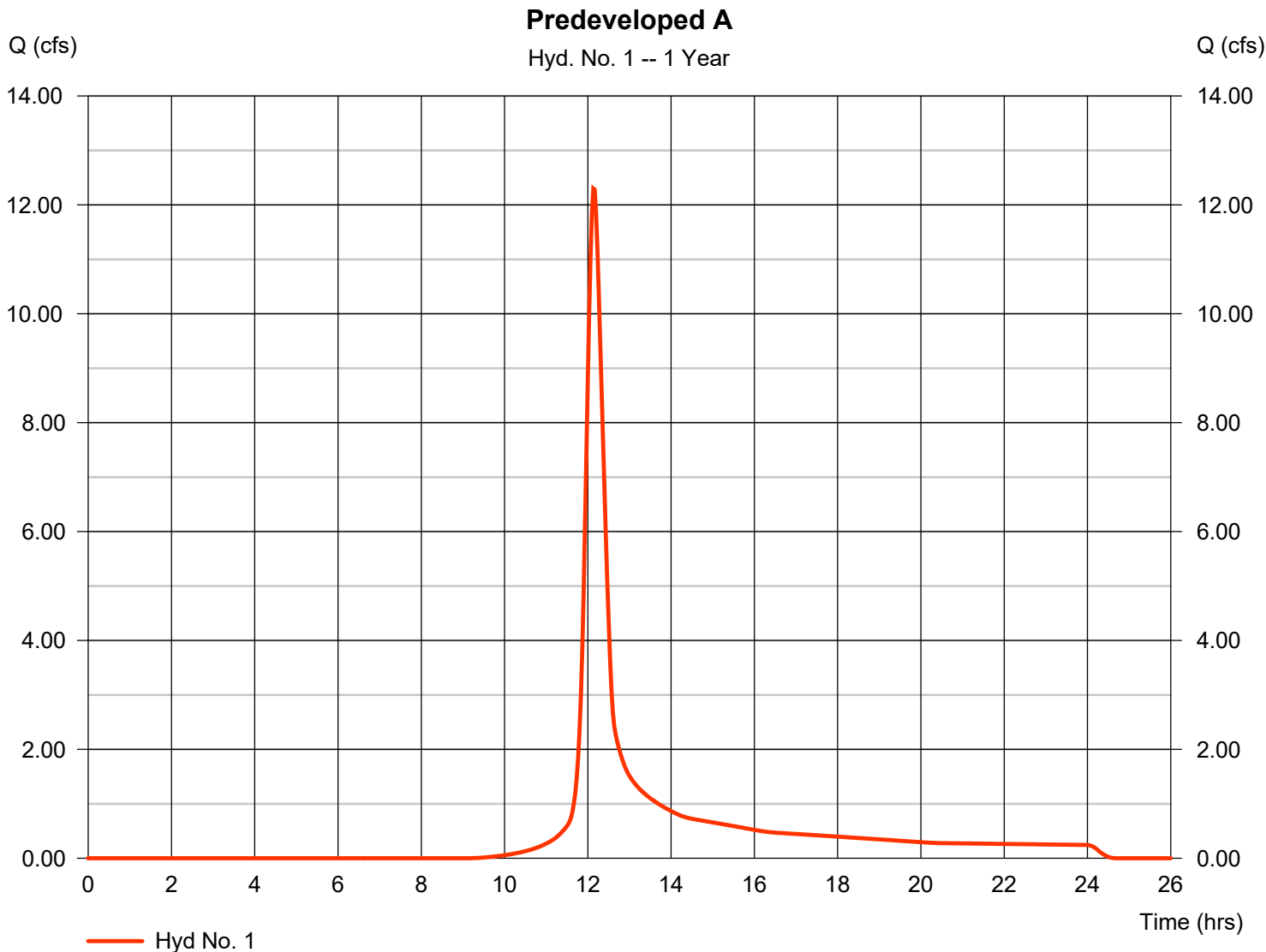
Wednesday, 11 / 23 / 2022

## Hyd. No. 1

Predeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 12.30 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 45,740 cuft
Drainage area	= 12.760 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 25.70 min
Total precip.	= 2.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(11.160 x 88) + (0.320 x 74) + (1.280 x 73)] / 12.760





# TR55 Tc Worksheet

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

## Hyd. No. 1

Predeveloped A

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
<b>Sheet Flow</b>				
Manning's n-value	= 0.170	0.011	0.011	
Flow length (ft)	= 100.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.62	0.00	0.00	
Land slope (%)	= 0.75	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 17.72</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 17.72</b>
<b>Shallow Concentrated Flow</b>				
Flow length (ft)	= 866.00	0.00	0.00	
Watercourse slope (%)	= 1.25	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=1.80	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 8.00</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 8.00</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>25.70 min</b>

# Hydrograph Report

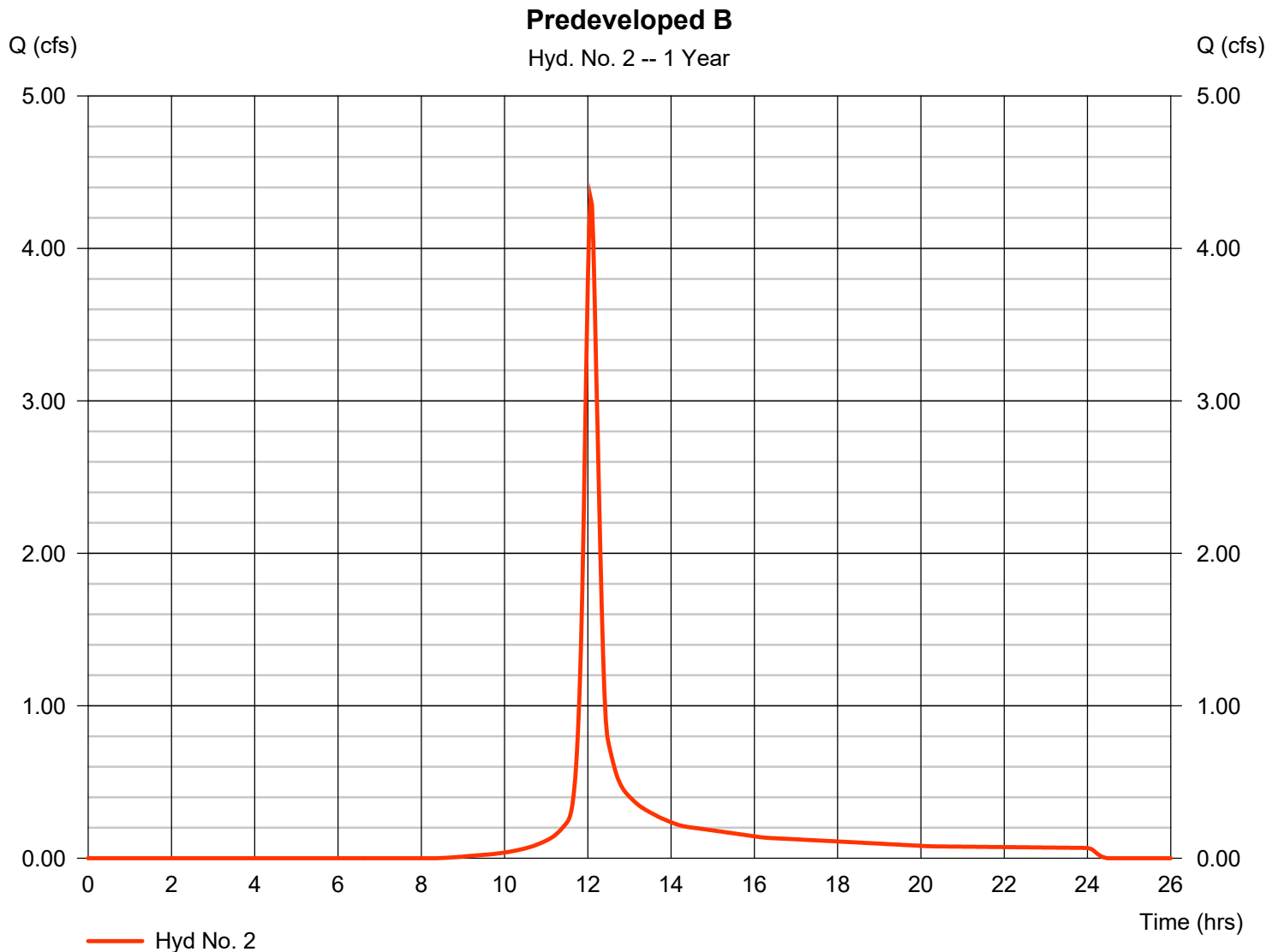
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Wednesday, 11 / 23 / 2022

## Hyd. No. 2

Predeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 4.329 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 13,561 cuft
Drainage area	= 3.310 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.30 min
Total precip.	= 2.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# TR55 Tc Worksheet

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

## Hyd. No. 2

Predeveloped B

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
<b>Sheet Flow</b>				
Manning's n-value	= 0.170	0.011	0.011	
Flow length (ft)	= 100.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.62	0.00	0.00	
Land slope (%)	= 1.00	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 15.79</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 15.79</b>
<b>Shallow Concentrated Flow</b>				
Flow length (ft)	= 366.00	0.00	0.00	
Watercourse slope (%)	= 1.16	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=1.74	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 3.51</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 3.51</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>19.30 min</b>

# Hydrograph Report

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

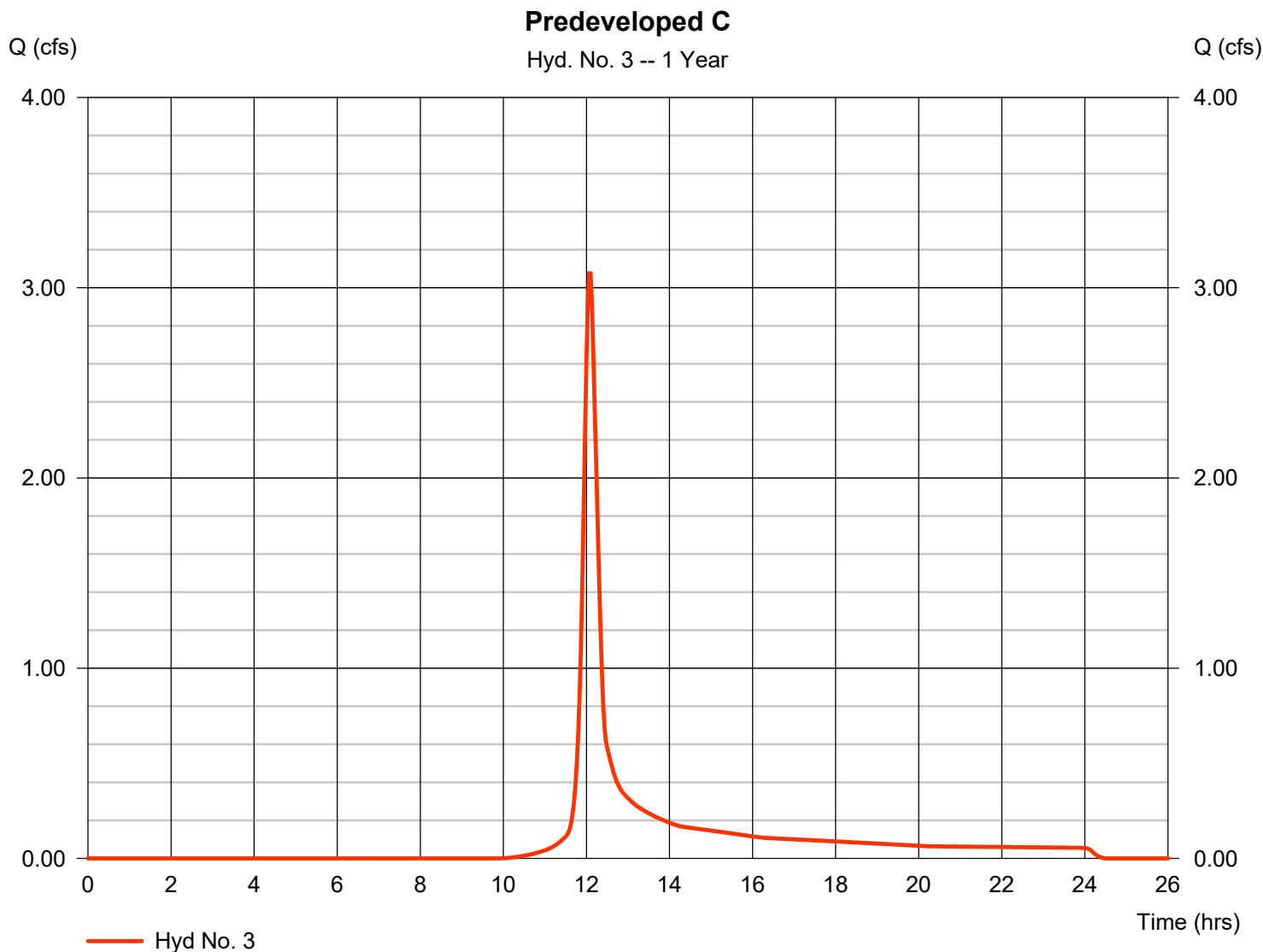
Wednesday, 11 / 23 / 2022

## Hyd. No. 3

Predeveloped C

Hydrograph type	= SCS Runoff	Peak discharge	= 3.076 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 9,838 cuft
Drainage area	= 3.050 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 17.50 min
Total precip.	= 2.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(2.260 x 88) + (0.400 x 73) + (0.390 x 74)] / 3.050



# TR55 Tc Worksheet

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

## Hyd. No. 3

Predeveloped C

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
<b>Sheet Flow</b>				
Manning's n-value	= 0.170	0.011	0.011	
Flow length (ft)	= 100.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.62	0.00	0.00	
Land slope (%)	= 1.30	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 14.22</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 14.22</b>
<b>Shallow Concentrated Flow</b>				
Flow length (ft)	= 313.00	0.00	0.00	
Watercourse slope (%)	= 0.98	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=1.60	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 3.27</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 3.27</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>17.50 min</b>

# Hydrograph Report

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

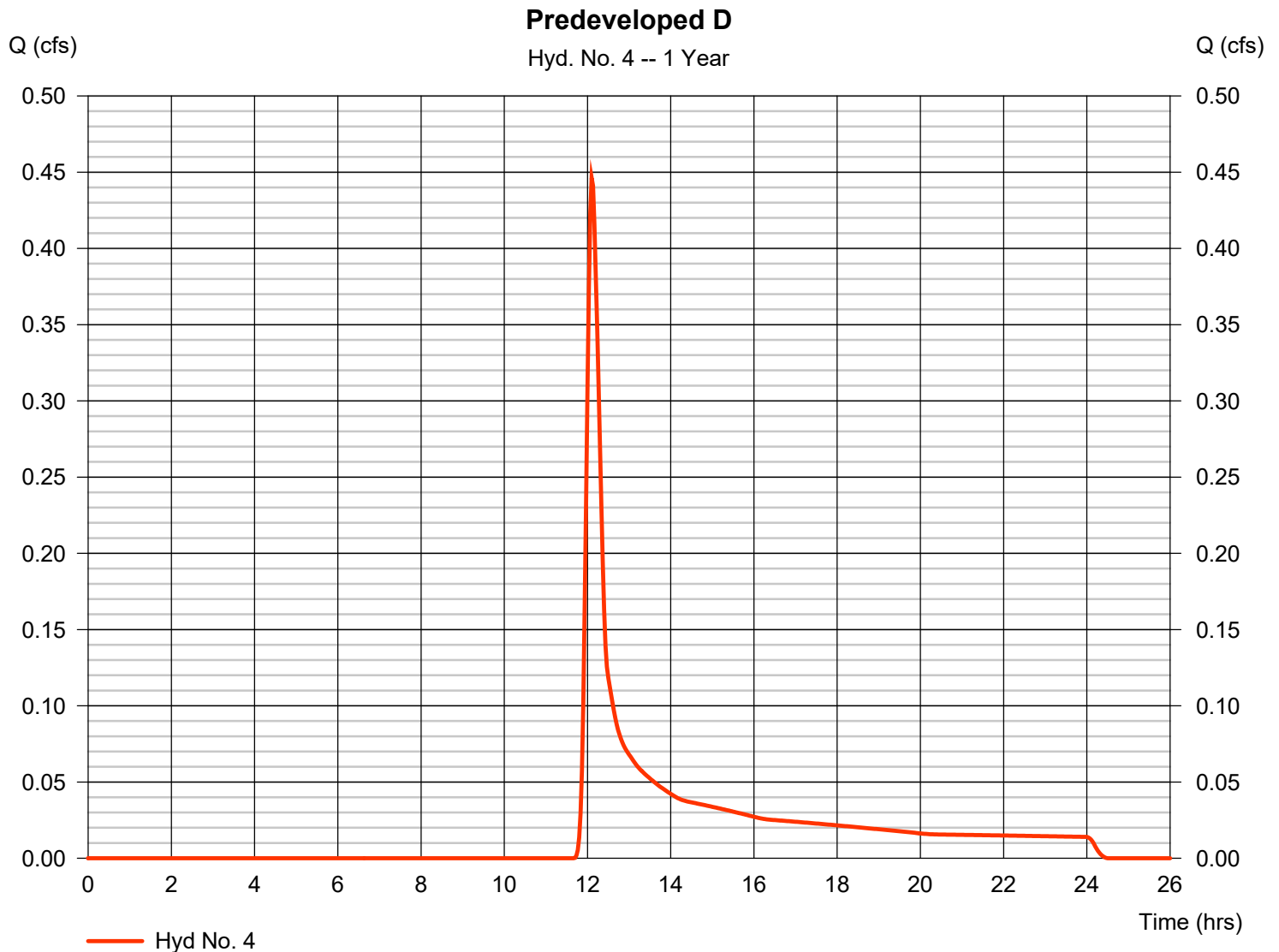
Wednesday, 11 / 23 / 2022

## Hyd. No. 4

Predeveloped D

Hydrograph type	= SCS Runoff	Peak discharge	= 0.446 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 1,756 cuft
Drainage area	= 1.170 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 16.90 min
Total precip.	= 2.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.610 x 73) + (0.560 x 74)] / 1.170





# TR55 Tc Worksheet

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

## Hyd. No. 4

Predeveloped D

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
<b>Sheet Flow</b>				
Manning's n-value	= 0.170	0.011	0.011	
Flow length (ft)	= 100.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.62	0.00	0.00	
Land slope (%)	= 1.00	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 15.79</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 15.79</b>
<b>Shallow Concentrated Flow</b>				
Flow length (ft)	= 155.00	0.00	0.00	
Watercourse slope (%)	= 1.96	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=2.26	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 1.14</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 1.14</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>16.90 min</b>

# Hydrograph Report

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

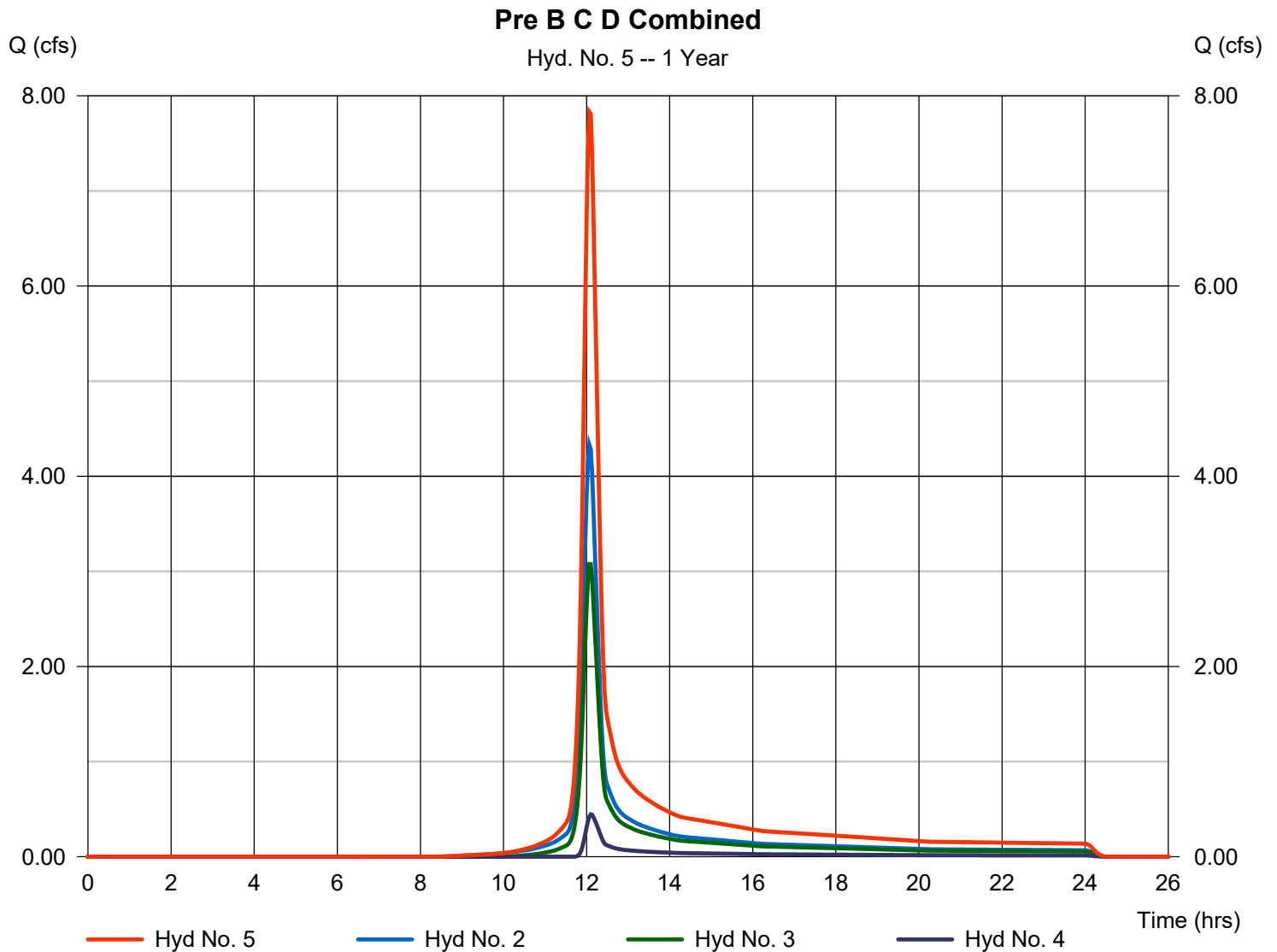
Wednesday, 11 / 23 / 2022

## Hyd. No. 5

Pre B C D Combined

Hydrograph type = Combine  
Storm frequency = 1 yrs  
Time interval = 2 min  
Inflow hyds. = 2, 3, 4

Peak discharge = 7.828 cfs  
Time to peak = 12.07 hrs  
Hyd. volume = 25,155 cuft  
Contrib. drain. area = 7.530 ac



# Hydrograph Report

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

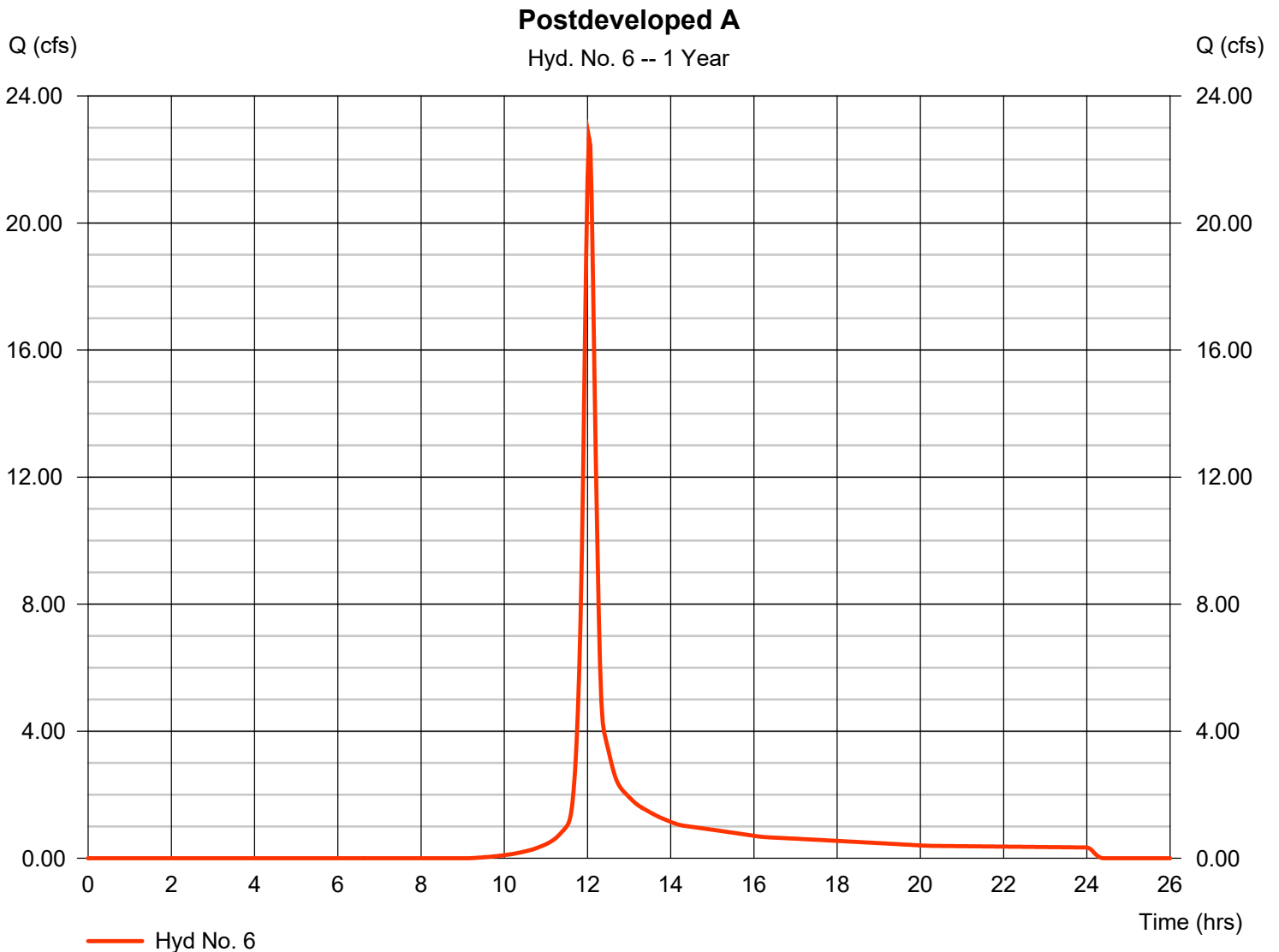
Wednesday, 11 / 23 / 2022

## Hyd. No. 6

Postdeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 22.69 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 63,980 cuft
Drainage area	= 18.020 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(9.100 x 98) + (8.920 x 74)] / 18.020



# TR55 Tc Worksheet

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

## Hyd. No. 6

Postdeveloped A

<u>Description</u>	<u>A</u>		<u>B</u>		<u>C</u>		<u>Totals</u>
<b>Sheet Flow</b>							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 32.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 2.62		0.00		0.00		
Land slope (%)	= 1.97		0.00		0.00		
<b>Travel Time (min)</b>	<b>= 4.38</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>4.38</b>
<b>Shallow Concentrated Flow</b>							
Flow length (ft)	= 178.00		360.00		0.00		
Watercourse slope (%)	= 1.40		1.10		0.00		
Surface description	= Paved		Unpaved		Paved		
Average velocity (ft/s)	=2.41		1.69		0.00		
<b>Travel Time (min)</b>	<b>= 1.23</b>	<b>+</b>	<b>3.55</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>4.78</b>
<b>Channel Flow</b>							
X sectional flow area (sqft)	= 0.79		0.00		0.00		
Wetted perimeter (ft)	= 2.21		0.00		0.00		
Channel slope (%)	= 0.25		0.00		0.00		
Manning's n-value	= 0.012		0.015		0.015		
Velocity (ft/s)	=3.12		0.00		0.00		
Flow length (ft)	{{0}}1085.0		0.0		0.0		
<b>Travel Time (min)</b>	<b>= 5.80</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>5.80</b>
<b>Total Travel Time, Tc .....</b>							<b>15.00 min</b>

# Hydrograph Report

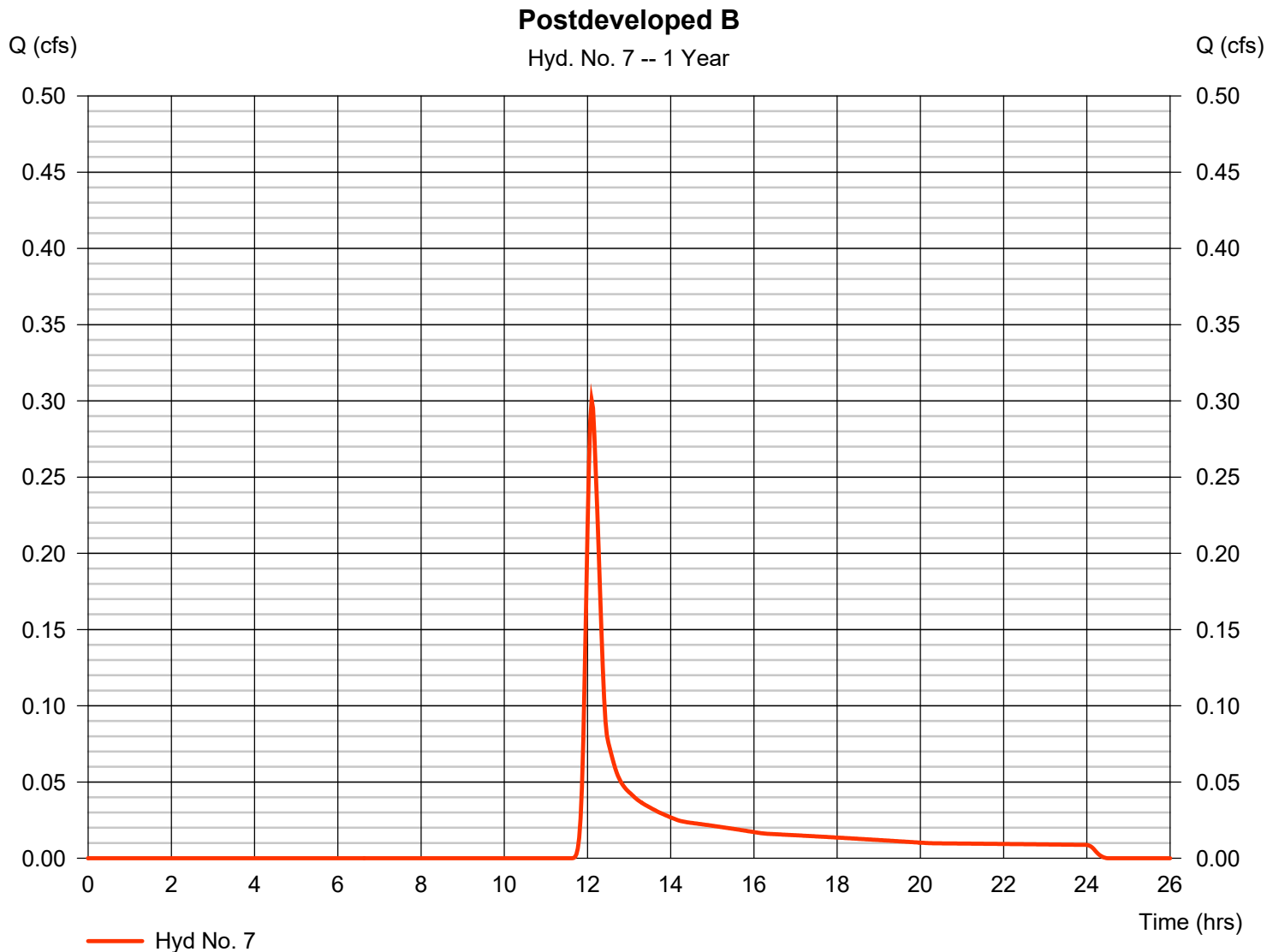
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Wednesday, 11 / 23 / 2022

## Hyd. No. 7

Postdeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 0.300 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 1,137 cuft
Drainage area	= 0.700 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.90 min
Total precip.	= 2.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# TR55 Tc Worksheet

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

## Hyd. No. 7

Postdeveloped B

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
<b>Sheet Flow</b>				
Manning's n-value	= 0.400	0.011	0.011	
Flow length (ft)	= 50.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.63	0.00	0.00	
Land slope (%)	= 1.09	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 17.34</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 17.34</b>
<b>Shallow Concentrated Flow</b>				
Flow length (ft)	= 256.00	0.00	0.00	
Watercourse slope (%)	= 1.09	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=1.68	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 2.53</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 2.53</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>19.90 min</b>

# Hydrograph Report

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

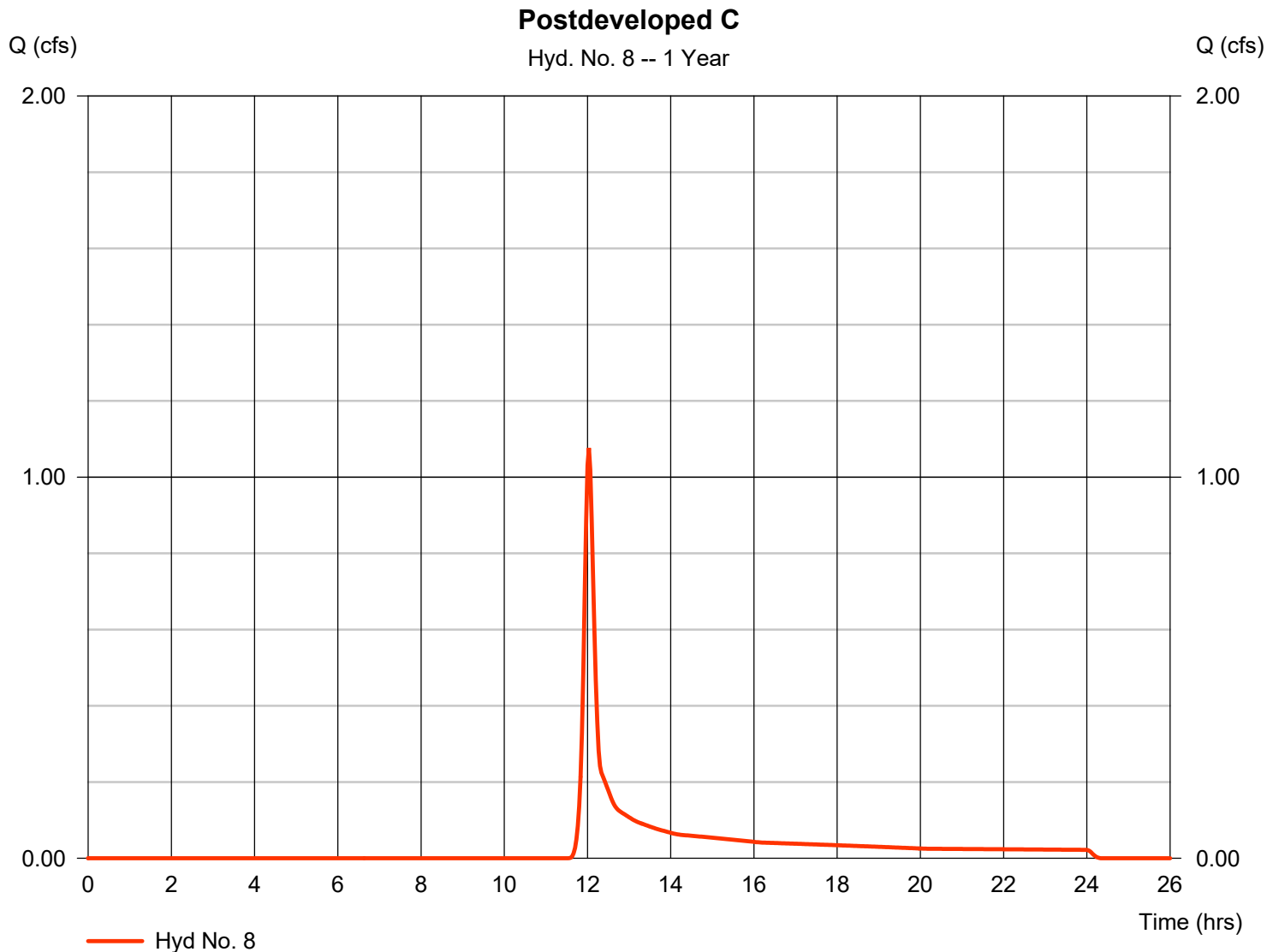
Wednesday, 11 / 23 / 2022

## Hyd. No. 8

Postdeveloped C

Hydrograph type	= SCS Runoff	Peak discharge	= 1.076 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 3,059 cuft
Drainage area	= 1.570 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 2.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.110 x 98) + (1.460 x 74)] / 1.570





# Hydrograph Report

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

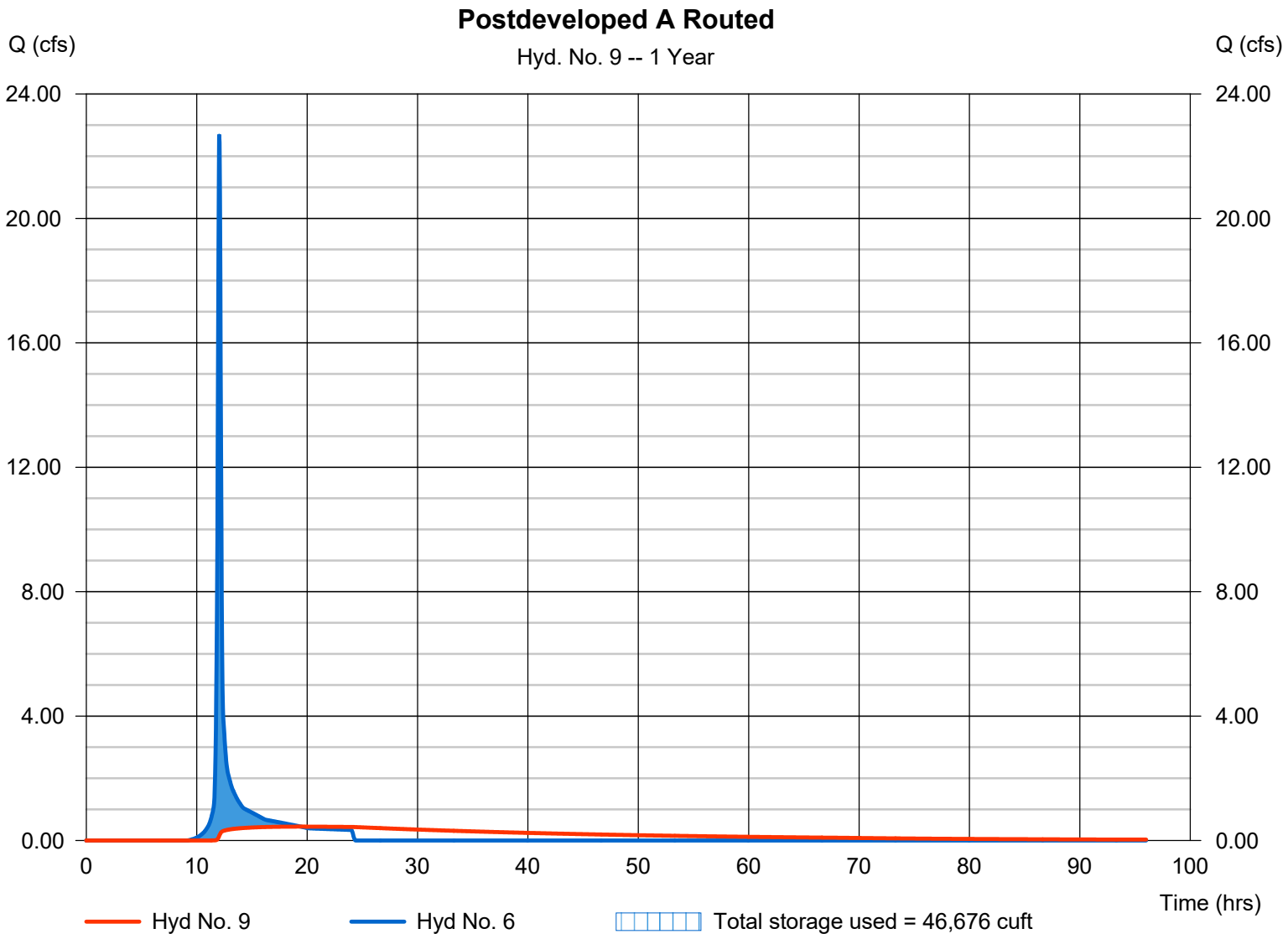
Wednesday, 11 / 23 / 2022

## Hyd. No. 9

Postdeveloped A Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.447 cfs
Storm frequency	= 1 yrs	Time to peak	= 19.40 hrs
Time interval	= 2 min	Hyd. volume	= 57,903 cuft
Inflow hyd. No.	= 6 - Postdeveloped A	Max. Elevation	= 706.55 ft
Reservoir name	= Proposed Retention Pond	Max. Storage	= 46,676 cuft

Storage Indication method used.



## Pond No. 1 - Proposed Retention Pond

### Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 706.00 ft

### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	706.00	50,193	0	0
0.20	706.20	60,567	11,059	11,059
3.85	709.85	146,680	366,787	377,846

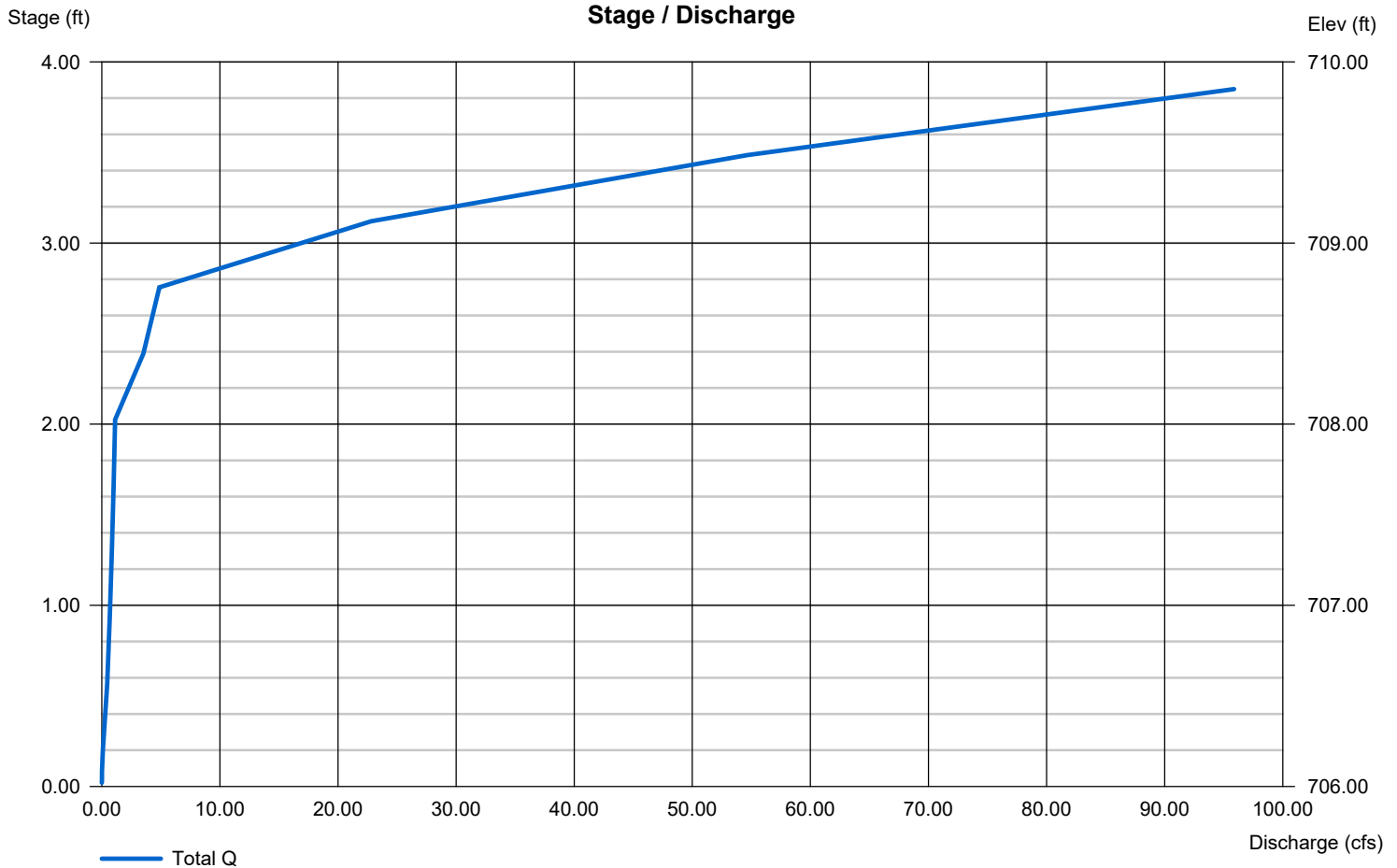
### Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	6.00	0.00	0.00
Span (in)	= 12.00	6.00	0.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 706.00	706.00	0.00	0.00
Length (ft)	= 60.00	0.00	0.00	0.00
Slope (%)	= 0.42	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	Yes	Yes	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	30.00	0.00	0.00
Crest El. (ft)	= 708.25	708.75	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Rect	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

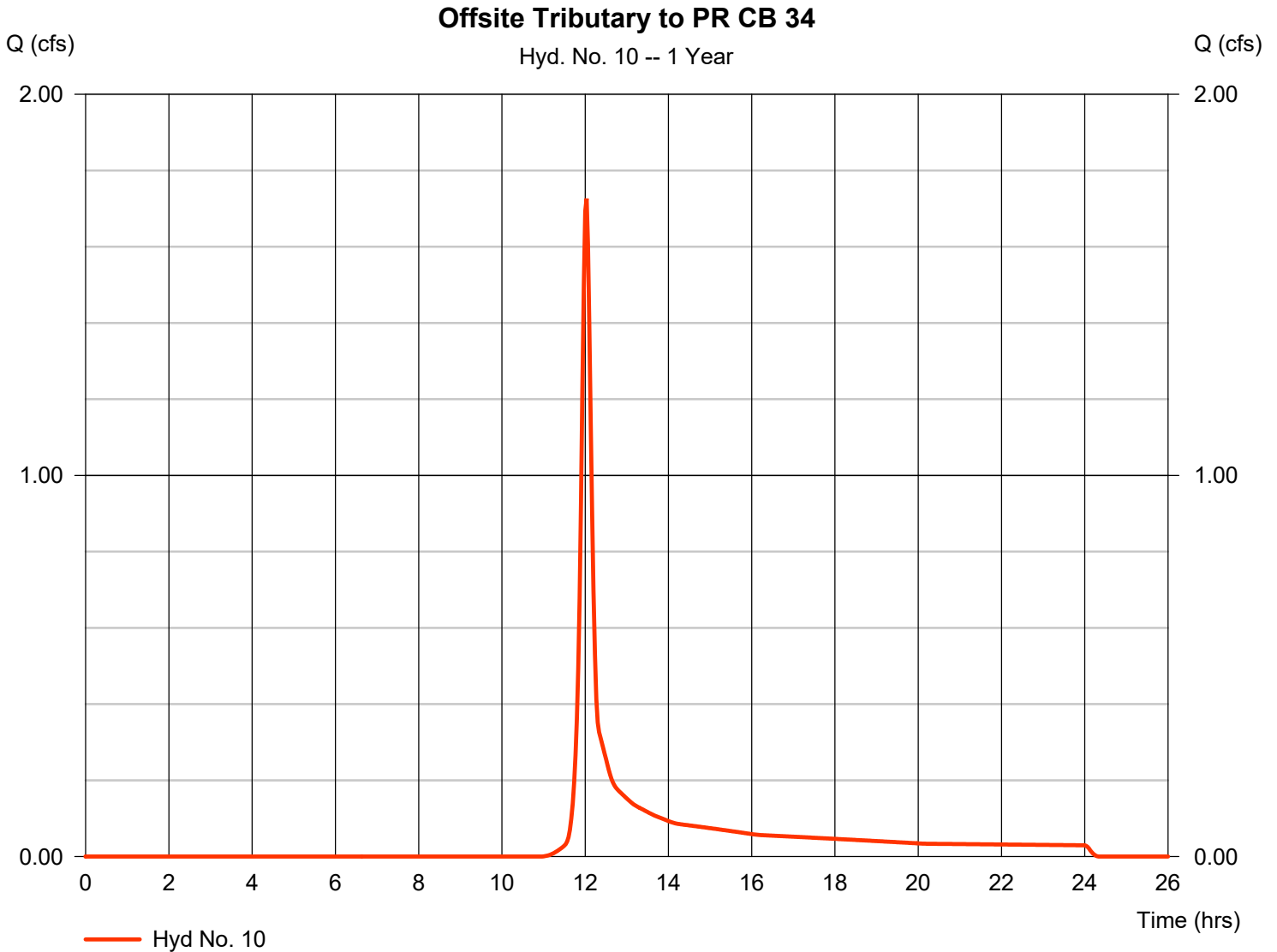
Wednesday, 11 / 23 / 2022

## Hyd. No. 10

Offsite Tributary to PR CB 34

Hydrograph type	= SCS Runoff	Peak discharge	= 1.726 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 4,637 cuft
Drainage area	= 1.800 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 2.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.490 x 98) + (0.690 x 73) + (0.620 x 74)] / 1.800



# Hydrograph Report

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

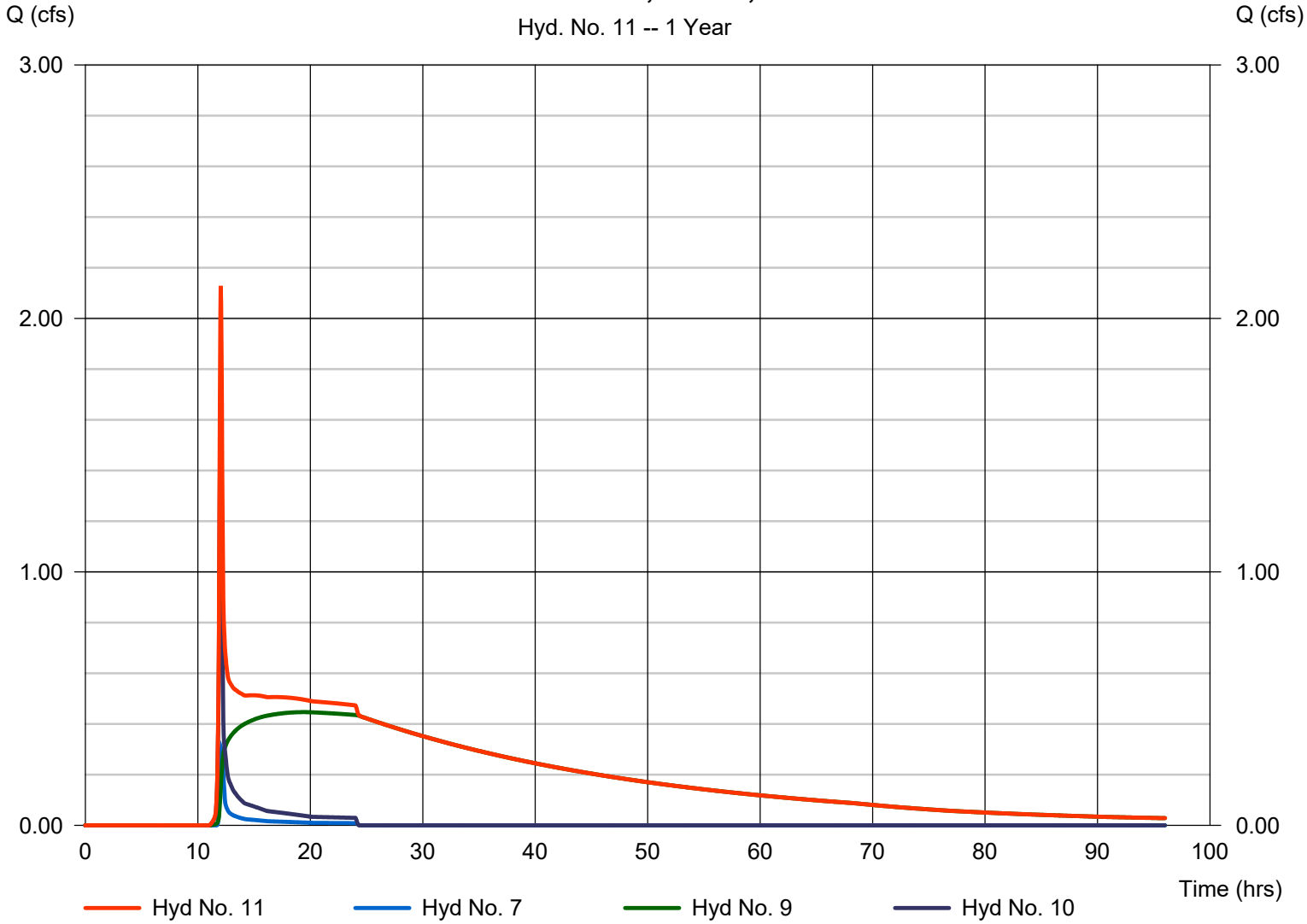
Wednesday, 11 / 23 / 2022

## Hyd. No. 11

Actual Release Rate Post A, Post B, Offsite Combin

Hydrograph type	= Combine	Peak discharge	= 2.128 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 63,676 cuft
Inflow hyds.	= 7, 9, 10	Contrib. drain. area	= 2.500 ac

Actual Release Rate Post A, Post B, Offsite Combin



# 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	16.72	2	728	61,573	-----	-----	-----	Predeveloped A
2	SCS Runoff	5.739	2	724	17,943	-----	-----	-----	Predeveloped B
3	SCS Runoff	4.277	2	724	13,482	-----	-----	-----	Predeveloped C
4	SCS Runoff	0.769	2	726	2,715	-----	-----	-----	Predeveloped D
5	Combine	10.76	2	724	34,141	2, 3, 4	-----	-----	Pre B C D Combined
6	SCS Runoff	30.71	2	722	86,127	-----	-----	-----	Postdeveloped A
7	SCS Runoff	0.501	2	726	1,735	-----	-----	-----	Postdeveloped B
8	SCS Runoff	1.679	2	722	4,552	-----	-----	-----	Postdeveloped C
9	Reservoir	0.553	2	1174	78,890	6	706.73	64,018	Postdeveloped A Routed
10	SCS Runoff	2.505	2	722	6,603	-----	-----	-----	Offsite Tributary to PR CB 34
11	Combine	3.181	2	722	87,227	7, 9, 10	-----	-----	Actual Release Rate Post A, Post B,
E221073 Hydro.gpw					Return Period: 2 Year			Wednesday, 11 / 23 / 2022	

# Hydrograph Report

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

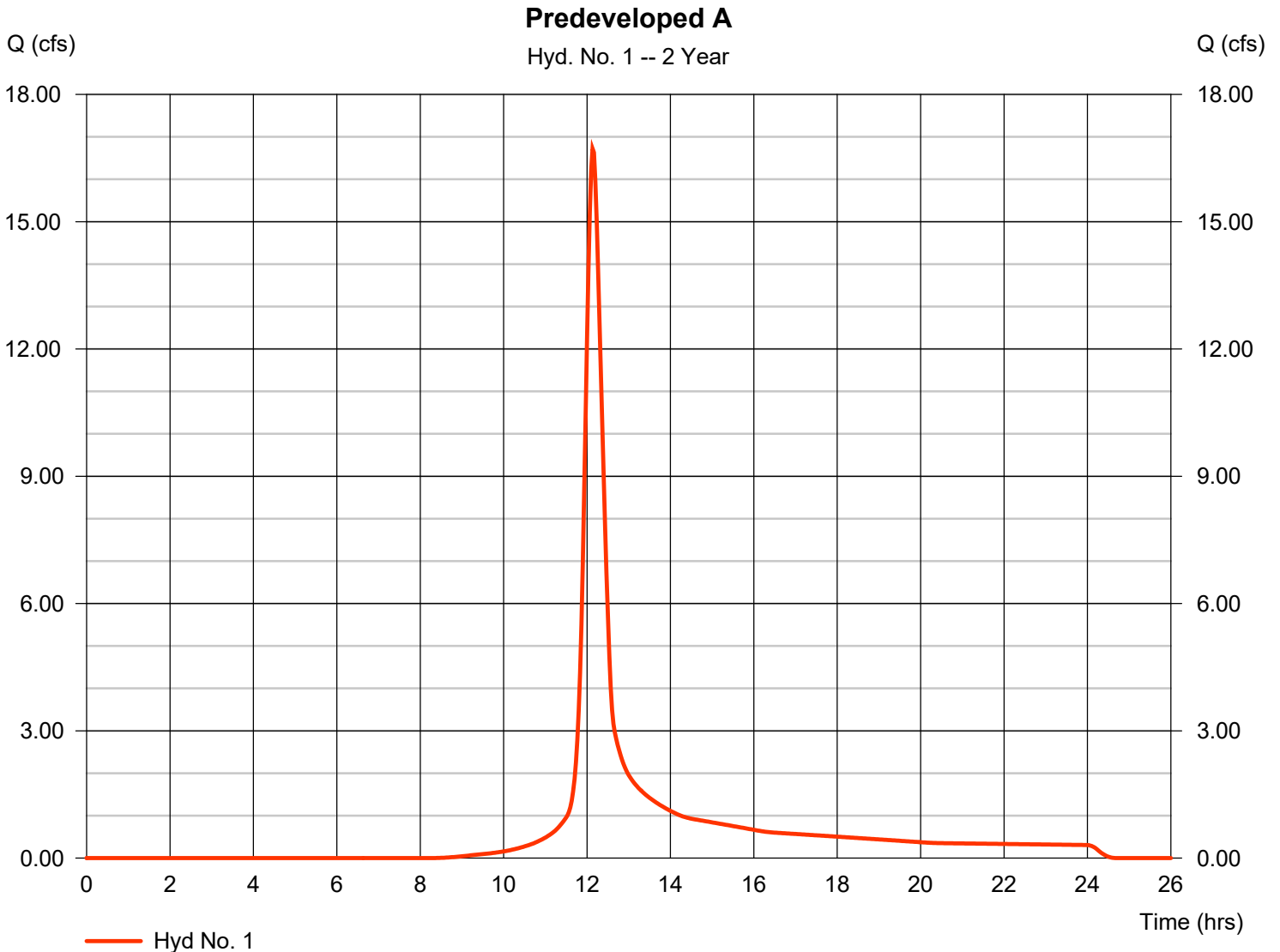
Wednesday, 11 / 23 / 2022

## Hyd. No. 1

Predeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 16.72 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 61,573 cuft
Drainage area	= 12.760 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 25.70 min
Total precip.	= 2.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(11.160 x 88) + (0.320 x 74) + (1.280 x 73)] / 12.760



# Hydrograph Report

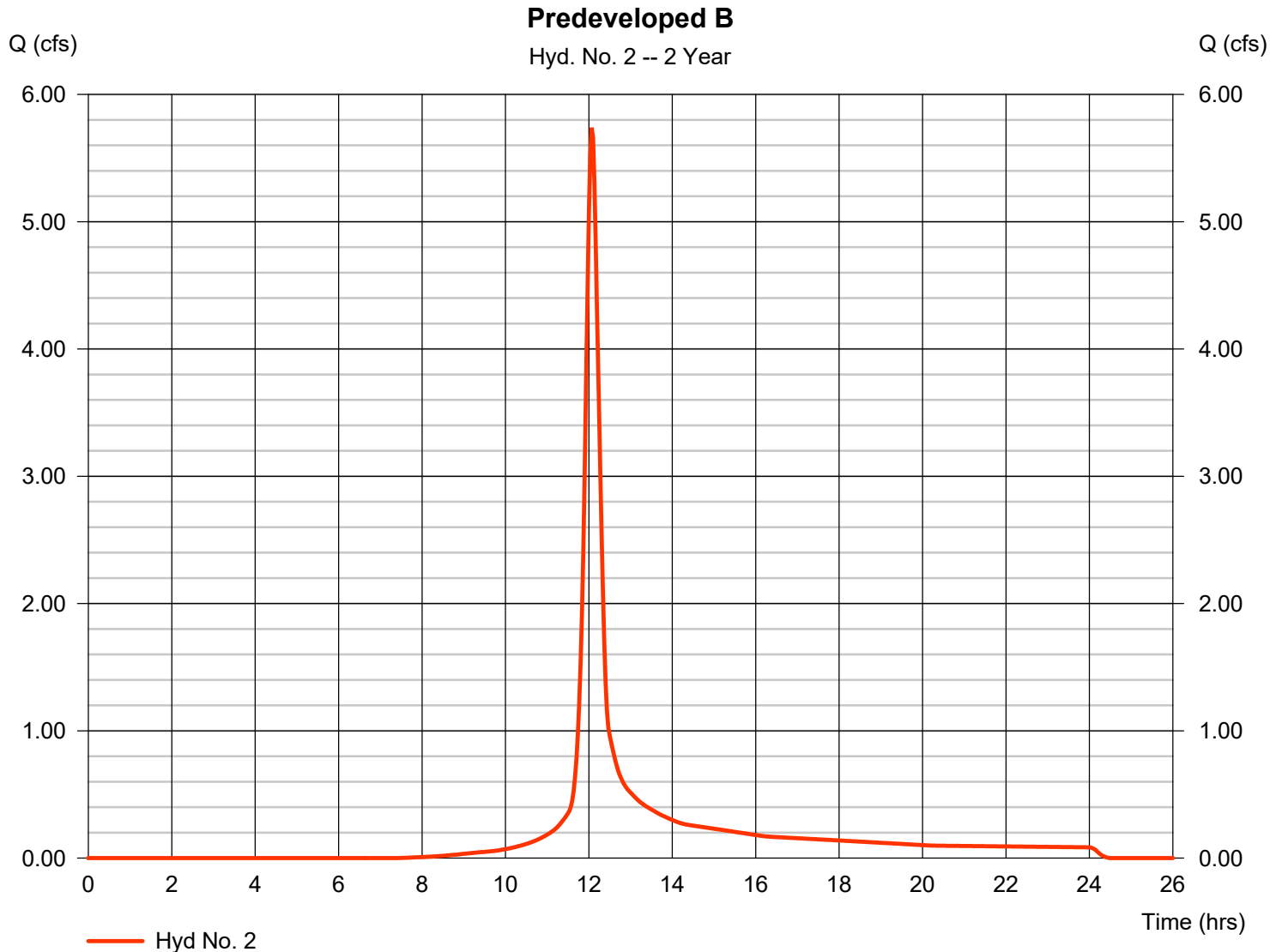
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Wednesday, 11 / 23 / 2022

## Hyd. No. 2

Predeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 5.739 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 17,943 cuft
Drainage area	= 3.310 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.30 min
Total precip.	= 2.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484





# Hydrograph Report

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

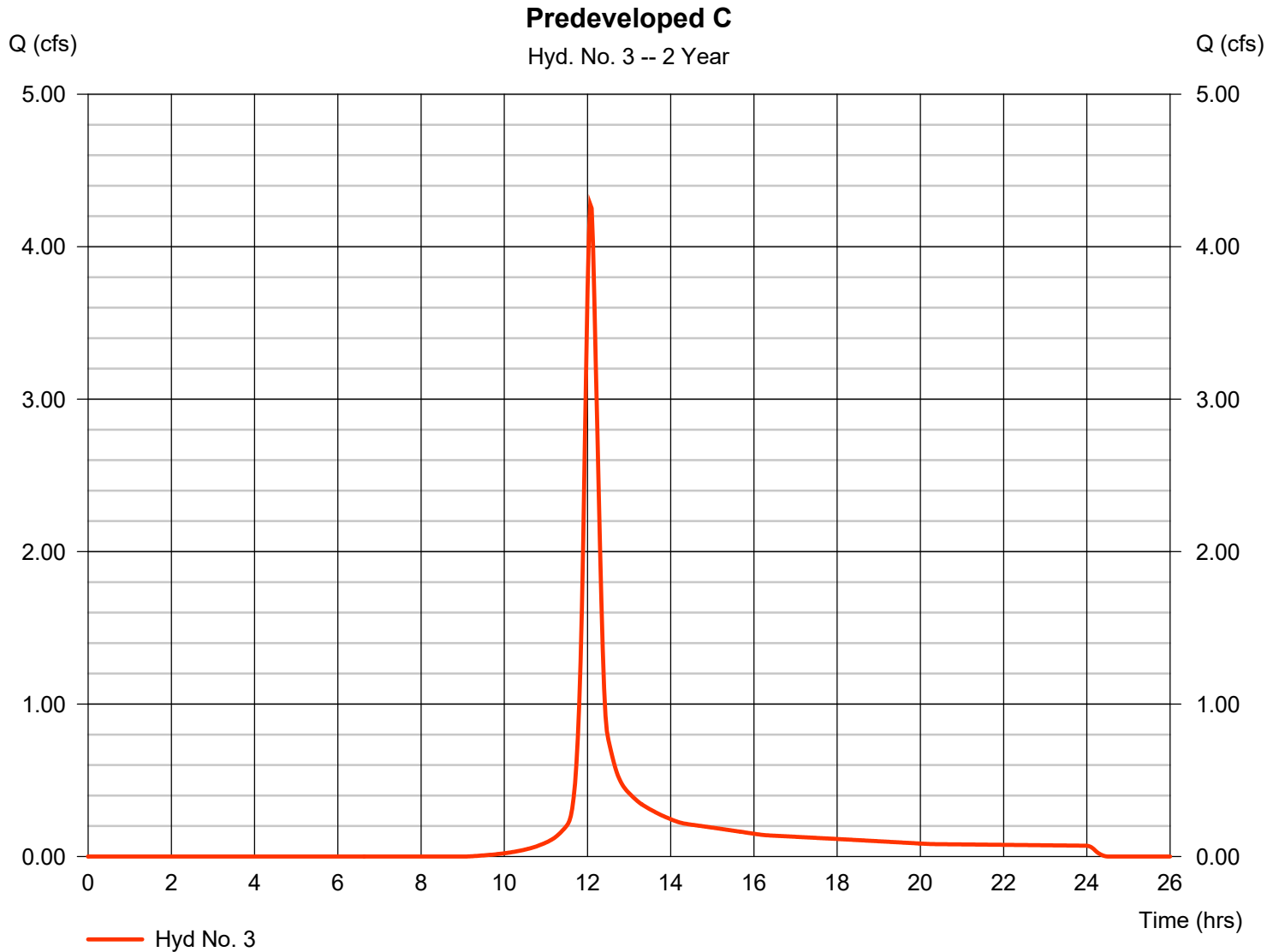
Wednesday, 11 / 23 / 2022

## Hyd. No. 3

Predeveloped C

Hydrograph type	= SCS Runoff	Peak discharge	= 4.277 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 13,482 cuft
Drainage area	= 3.050 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 17.50 min
Total precip.	= 2.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(2.260 x 88) + (0.400 x 73) + (0.390 x 74)] / 3.050



# Hydrograph Report

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

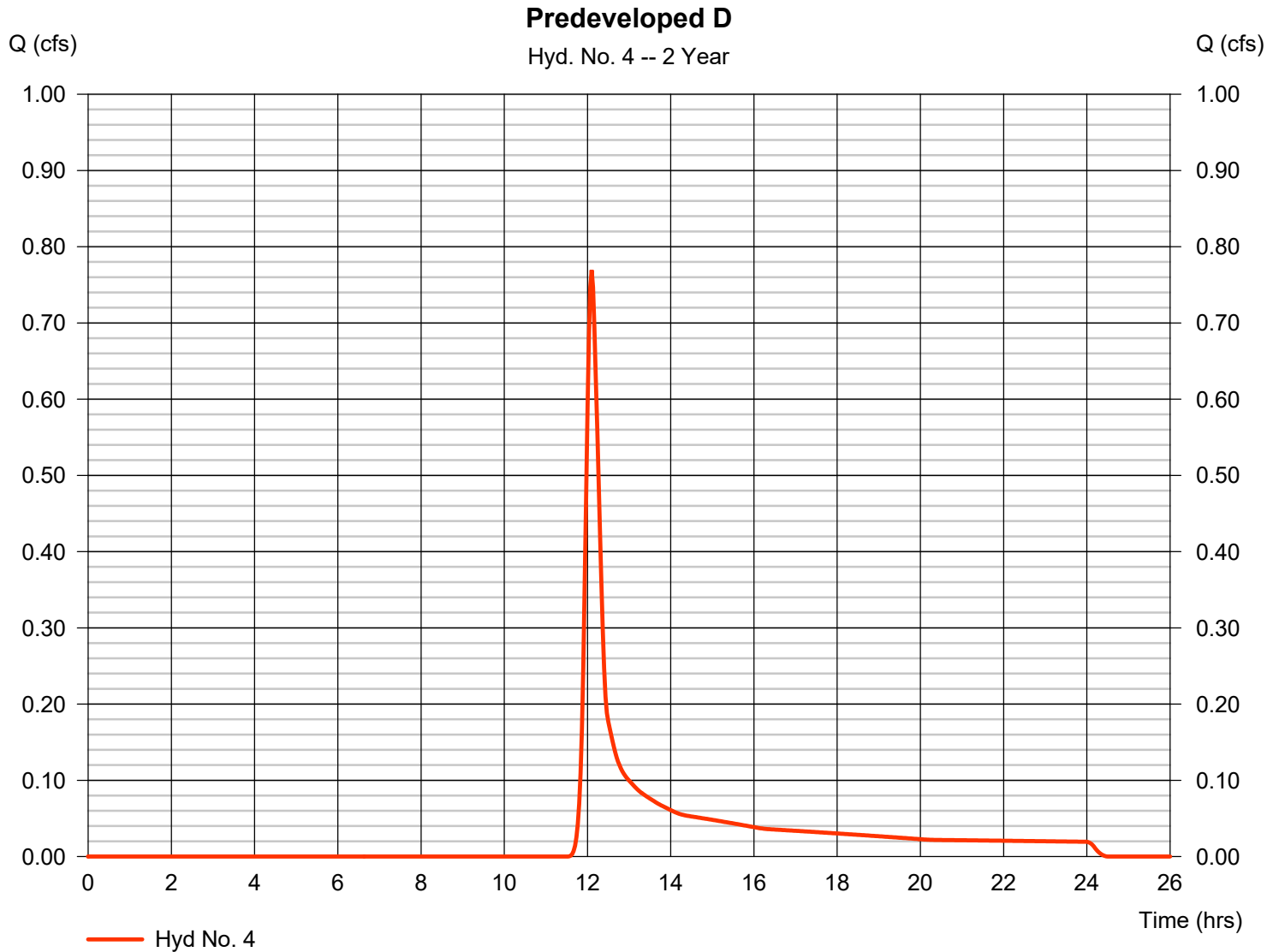
Wednesday, 11 / 23 / 2022

## Hyd. No. 4

Predeveloped D

Hydrograph type	= SCS Runoff	Peak discharge	= 0.769 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 2,715 cuft
Drainage area	= 1.170 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 16.90 min
Total precip.	= 2.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.610 x 73) + (0.560 x 74)] / 1.170



# Hydrograph Report

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

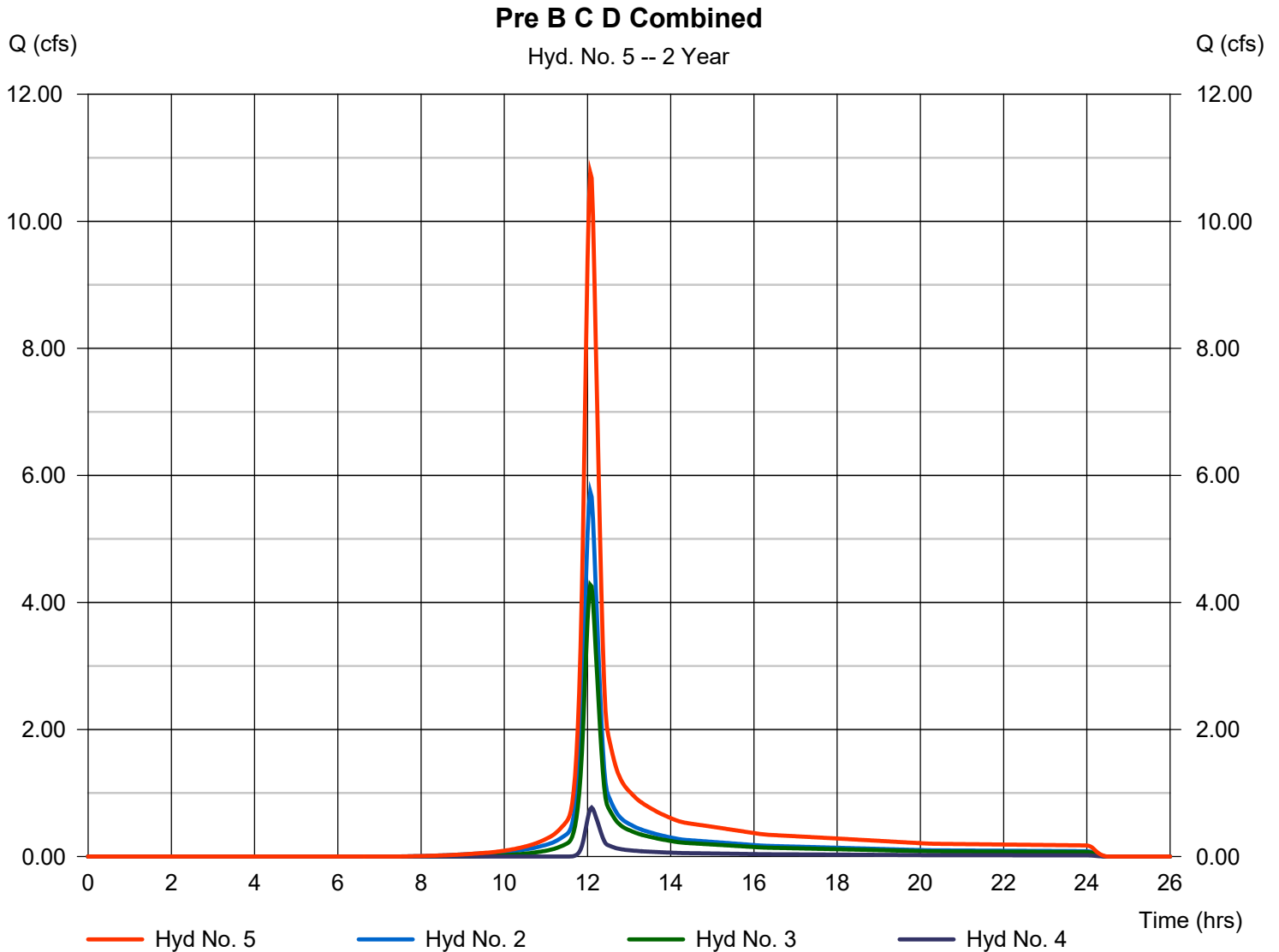
Wednesday, 11 / 23 / 2022

## Hyd. No. 5

Pre B C D Combined

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

Peak discharge = 10.76 cfs  
Time to peak = 12.07 hrs  
Hyd. volume = 34,141 cuft  
Contrib. drain. area = 7.530 ac



# Hydrograph Report

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

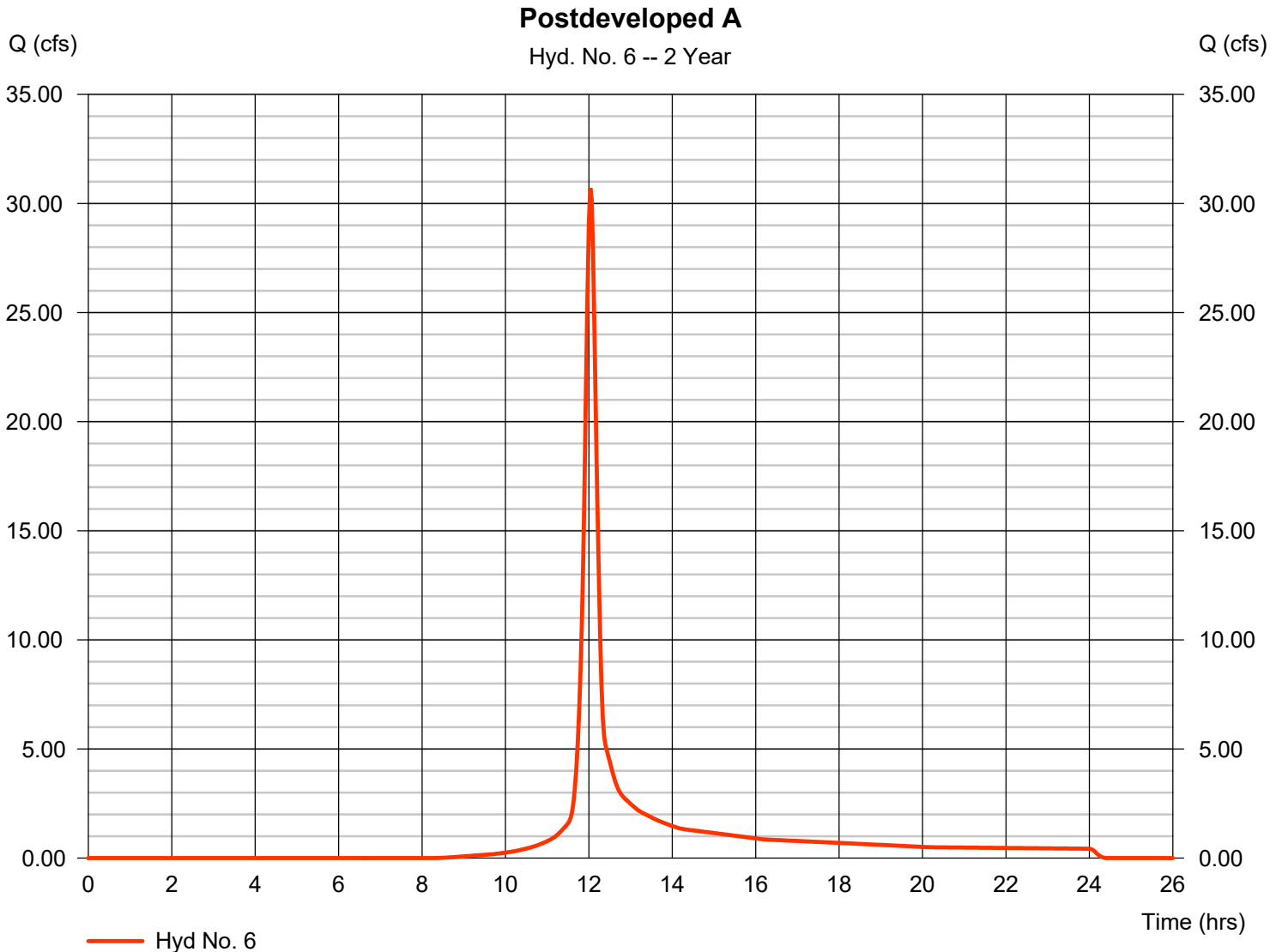
Wednesday, 11 / 23 / 2022

## Hyd. No. 6

Postdeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 30.71 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 86,127 cuft
Drainage area	= 18.020 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(9.100 x 98) + (8.920 x 74)] / 18.020

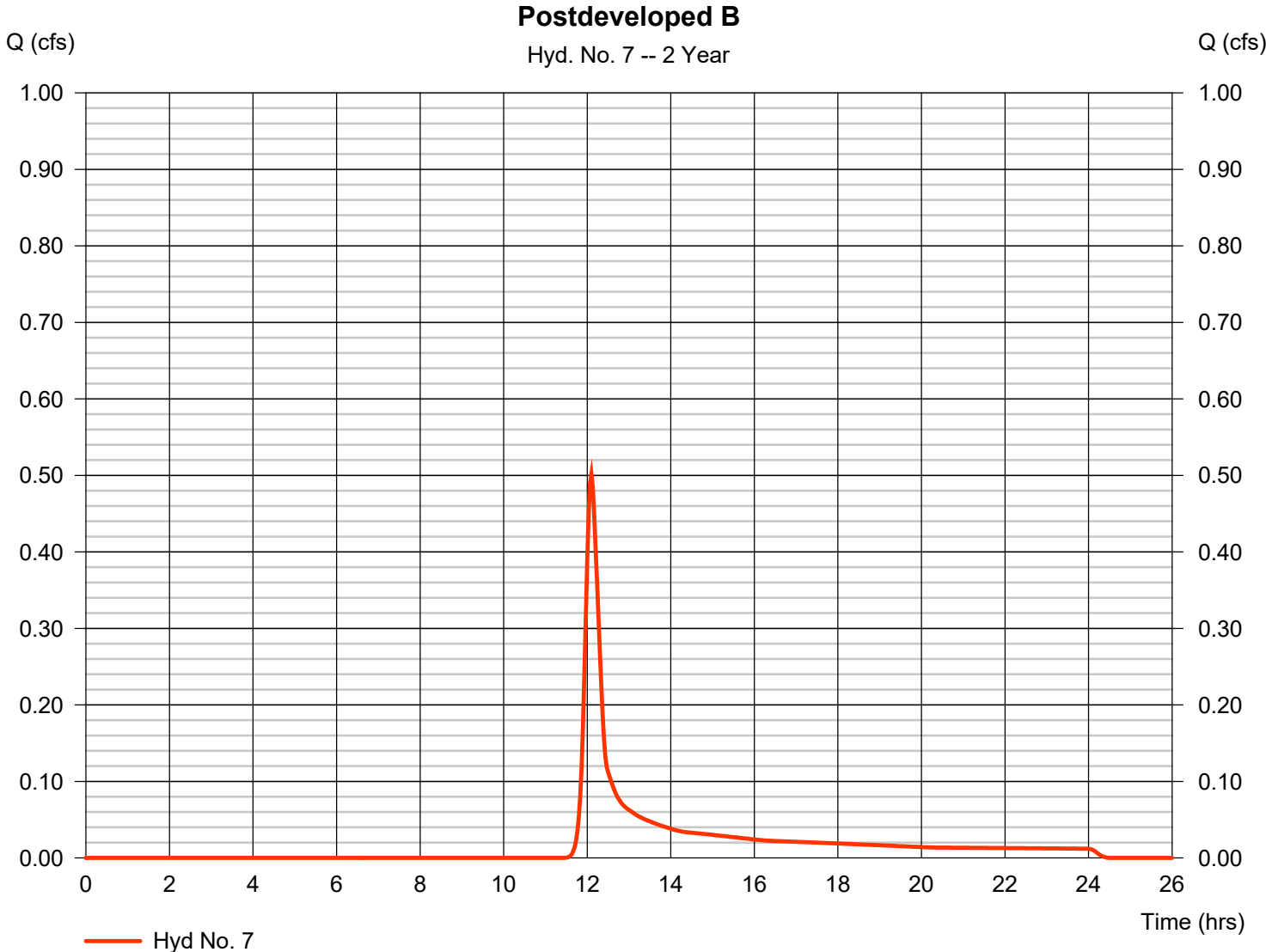


# Hydrograph Report

## Hyd. No. 7

Postdeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 0.501 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 1,735 cuft
Drainage area	= 0.700 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.90 min
Total precip.	= 2.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

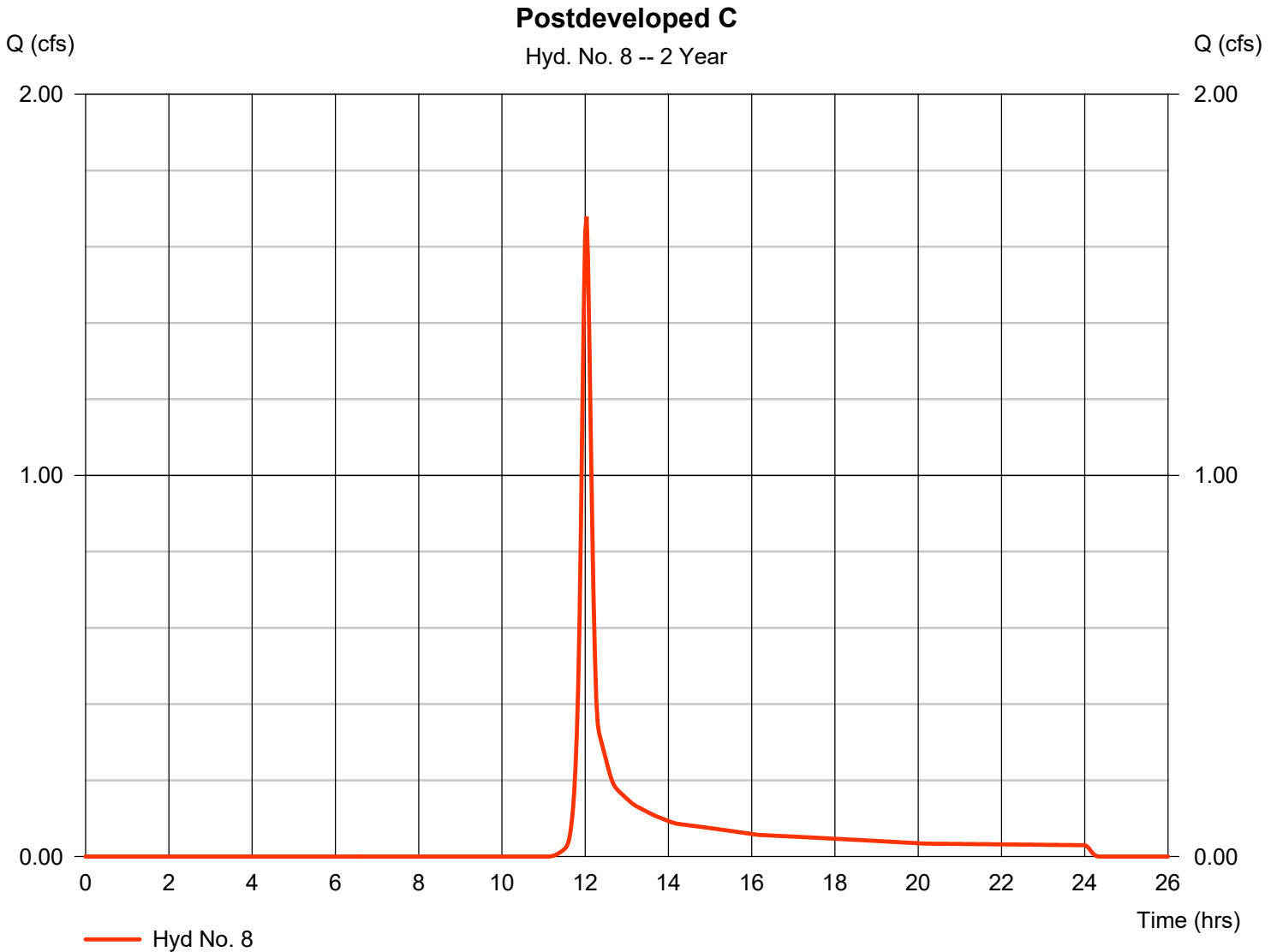
Wednesday, 11 / 23 / 2022

## Hyd. No. 8

Postdeveloped C

Hydrograph type	= SCS Runoff	Peak discharge	= 1.679 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 4,552 cuft
Drainage area	= 1.570 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 2.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.110 x 98) + (1.460 x 74)] / 1.570



# Hydrograph Report

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

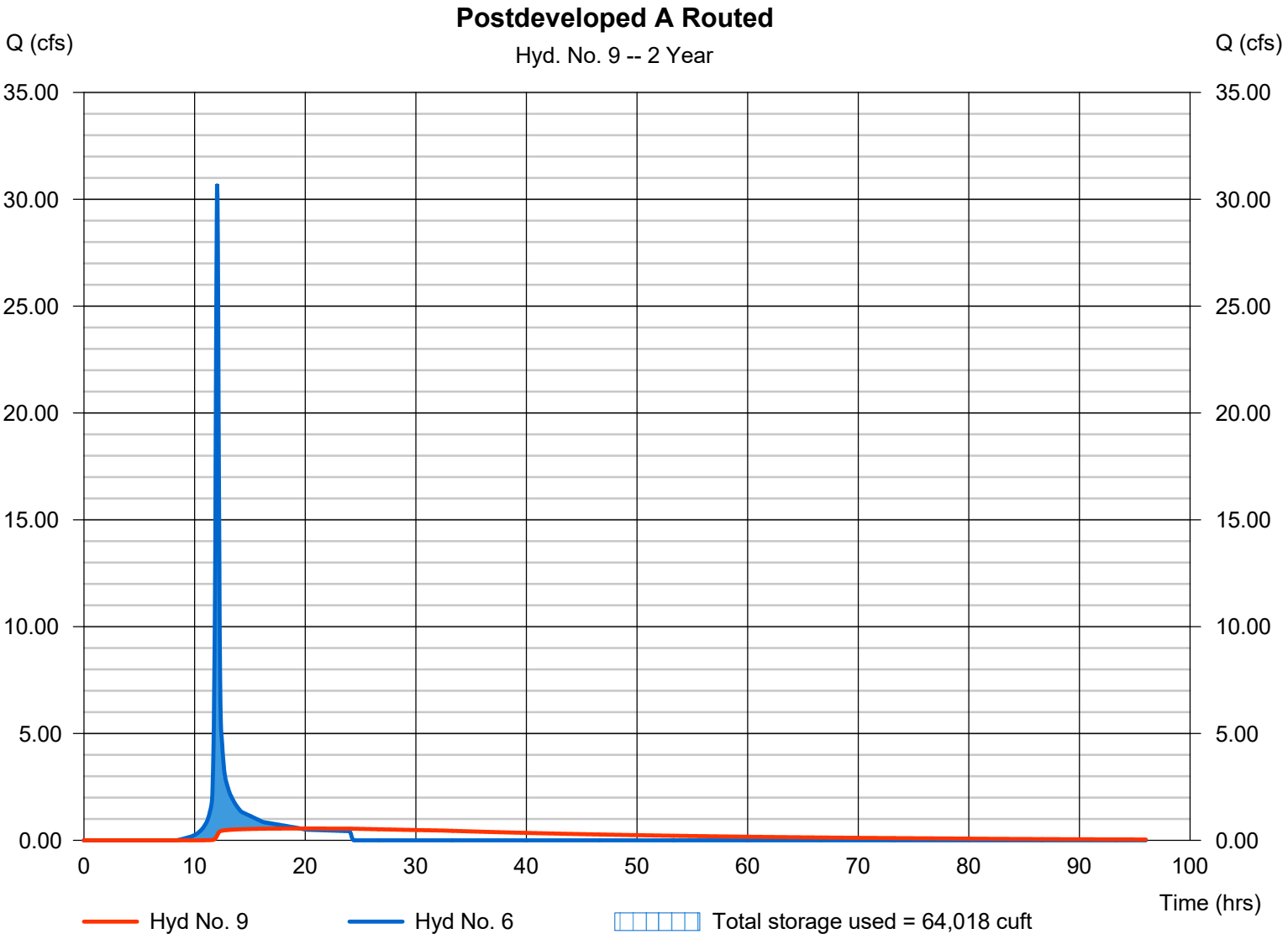
Wednesday, 11 / 23 / 2022

## Hyd. No. 9

Postdeveloped A Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.553 cfs
Storm frequency	= 2 yrs	Time to peak	= 19.57 hrs
Time interval	= 2 min	Hyd. volume	= 78,890 cuft
Inflow hyd. No.	= 6 - Postdeveloped A	Max. Elevation	= 706.73 ft
Reservoir name	= Proposed Retention Pond	Max. Storage	= 64,018 cuft

Storage Indication method used.





# Hydrograph Report

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

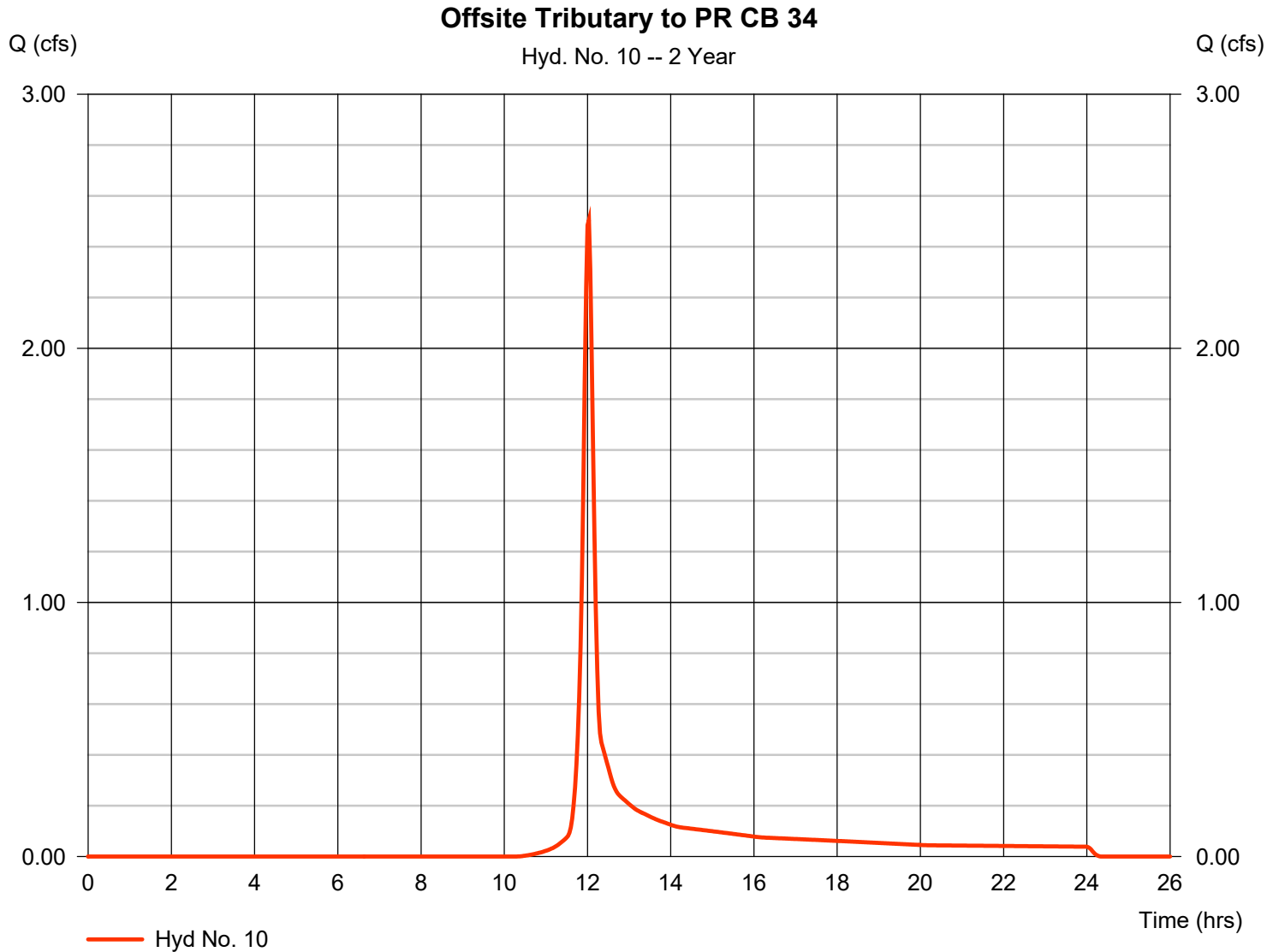
Wednesday, 11 / 23 / 2022

## Hyd. No. 10

Offsite Tributary to PR CB 34

Hydrograph type	= SCS Runoff	Peak discharge	= 2.505 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 6,603 cuft
Drainage area	= 1.800 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 2.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.490 x 98) + (0.690 x 73) + (0.620 x 74)] / 1.800



# Hydrograph Report

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

Wednesday, 11 / 23 / 2022

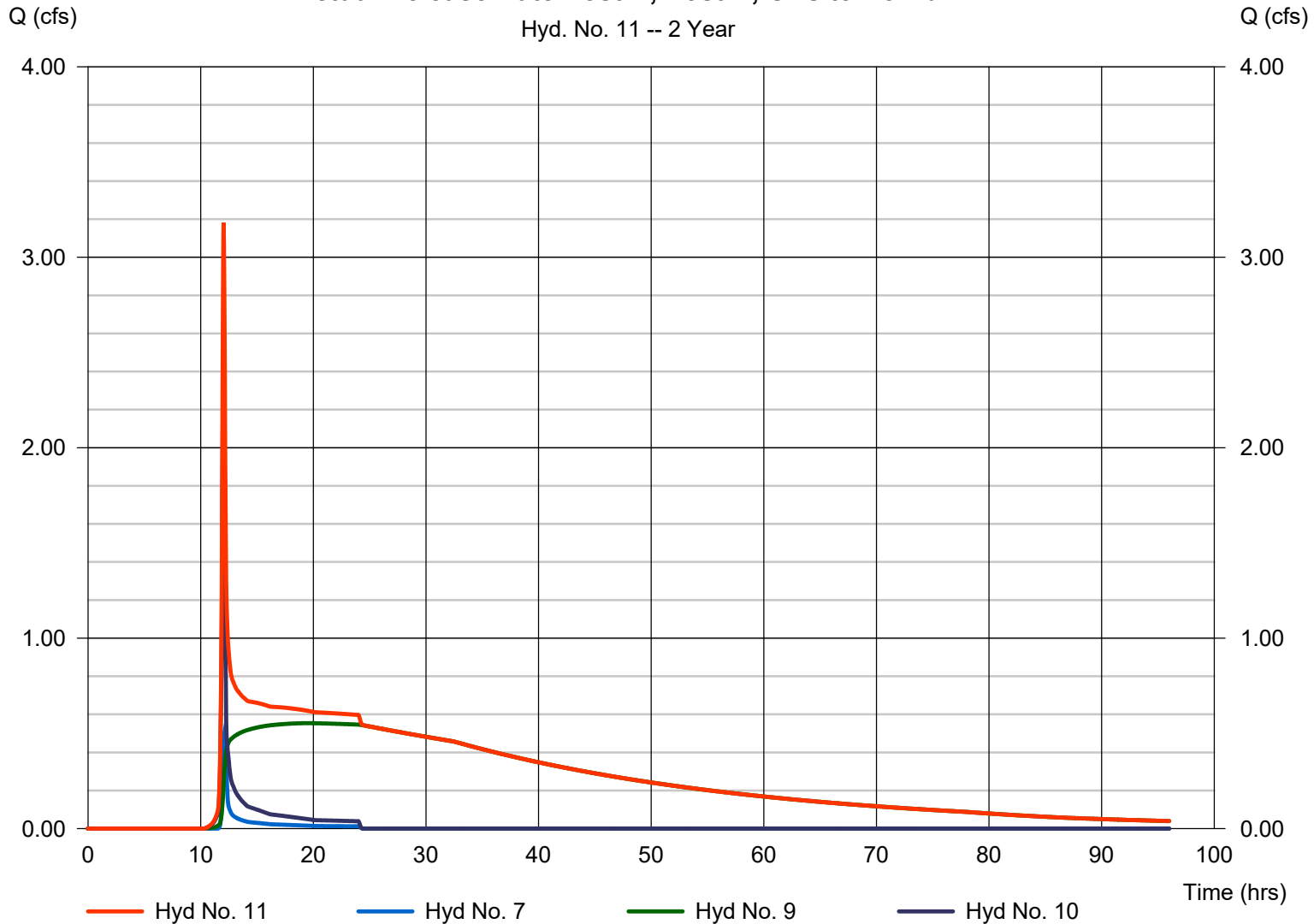
## Hyd. No. 11

Actual Release Rate Post A, Post B, Offsite Combin

Hydrograph type	= Combine	Peak discharge	= 3.181 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 87,227 cuft
Inflow hyds.	= 7, 9, 10	Contrib. drain. area	= 2.500 ac

Actual Release Rate Post A, Post B, Offsite Combin

Hyd. No. 11 -- 2 Year



# 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	23.24	2	728	85,260	-----	-----	-----	Predeveloped A
2	SCS Runoff	7.791	2	724	24,427	-----	-----	-----	Predeveloped B
3	SCS Runoff	6.071	2	724	18,997	-----	-----	-----	Predeveloped C
4	SCS Runoff	1.292	2	726	4,283	-----	-----	-----	Predeveloped D
5	Combine	15.14	2	724	47,708	2, 3, 4	-----	-----	Pre B C D Combined
6	SCS Runoff	42.51	2	722	119,259	-----	-----	-----	Postdeveloped A
7	SCS Runoff	0.823	2	726	2,704	-----	-----	-----	Postdeveloped B
8	SCS Runoff	2.626	2	722	6,935	-----	-----	-----	Postdeveloped C
9	Reservoir	0.703	2	1182	109,865	6	706.99	90,694	Postdeveloped A Routed
10	SCS Runoff	3.698	2	720	9,654	-----	-----	-----	Offsite Tributary to PR CB 34
11	Combine	4.810	2	722	122,223	7, 9, 10	-----	-----	Actual Release Rate Post A, Post B,
E221073 Hydro.gpw					Return Period: 5 Year			Wednesday, 11 / 23 / 2022	

# Hydrograph Report

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

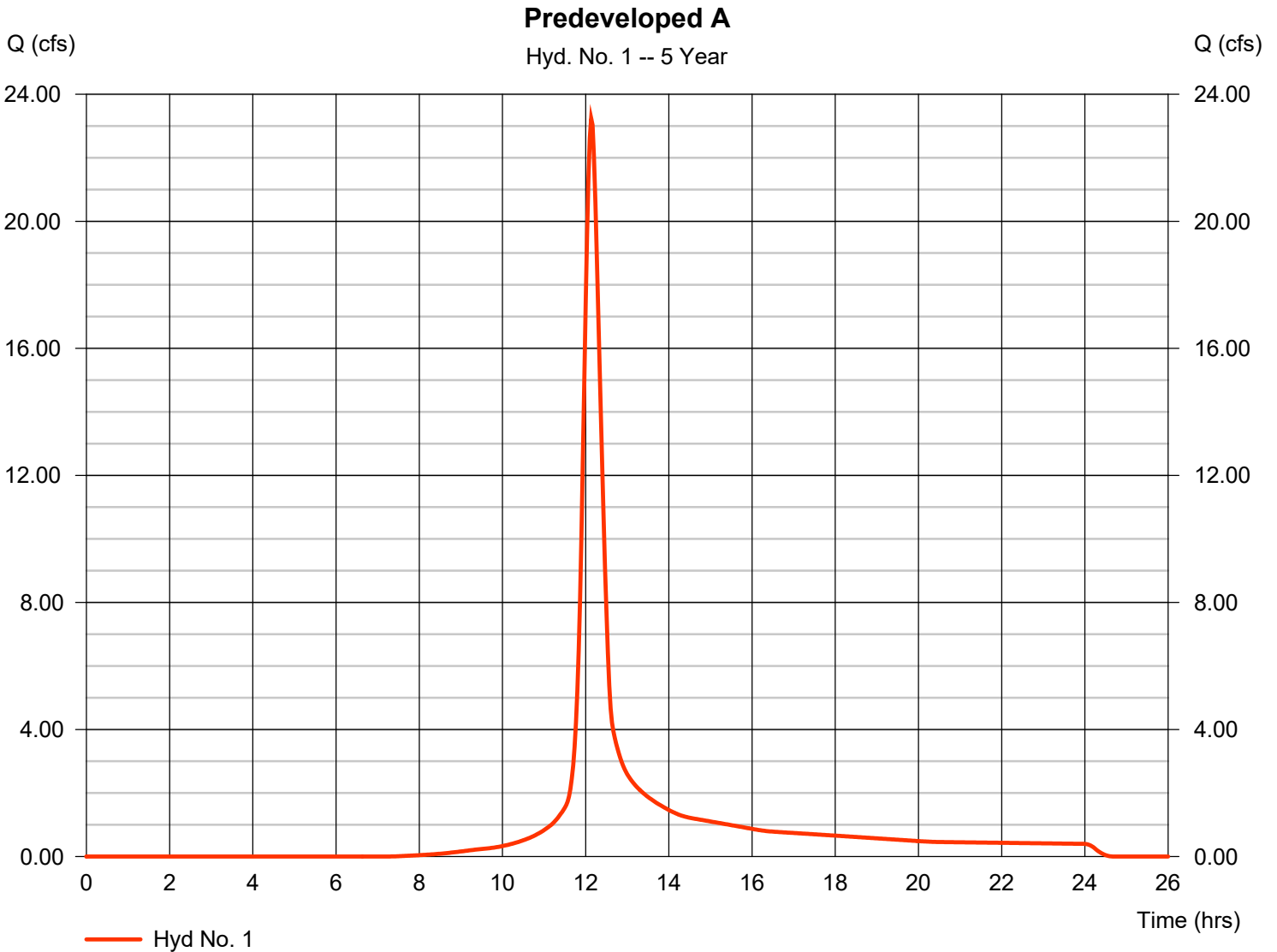
Wednesday, 11 / 23 / 2022

## Hyd. No. 1

Predeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 23.24 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 85,260 cuft
Drainage area	= 12.760 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 25.70 min
Total precip.	= 3.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(11.160 x 88) + (0.320 x 74) + (1.280 x 73)] / 12.760



# Hydrograph Report

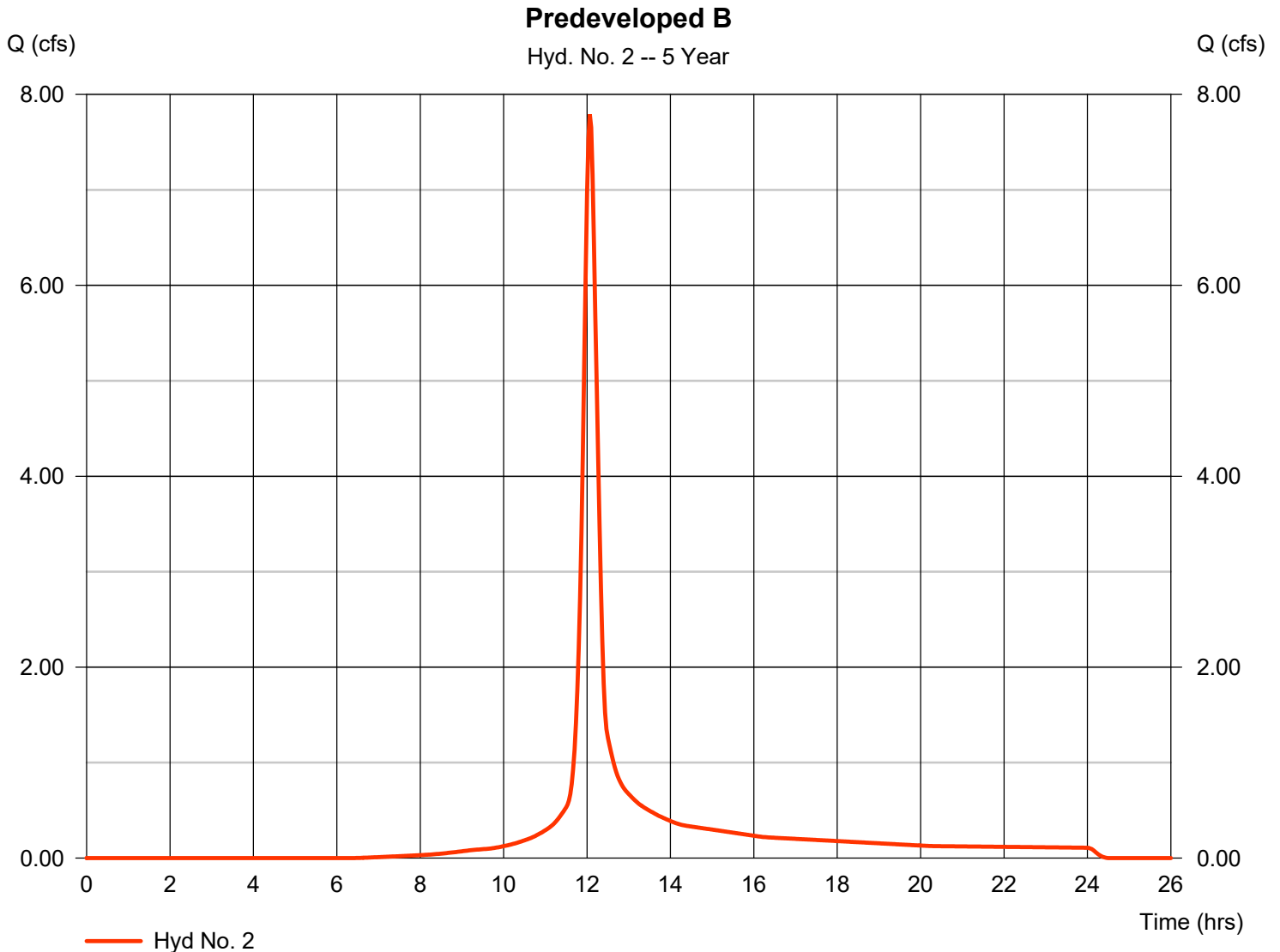
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Wednesday, 11 / 23 / 2022

## Hyd. No. 2

Predeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 7.791 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 24,427 cuft
Drainage area	= 3.310 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.30 min
Total precip.	= 3.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

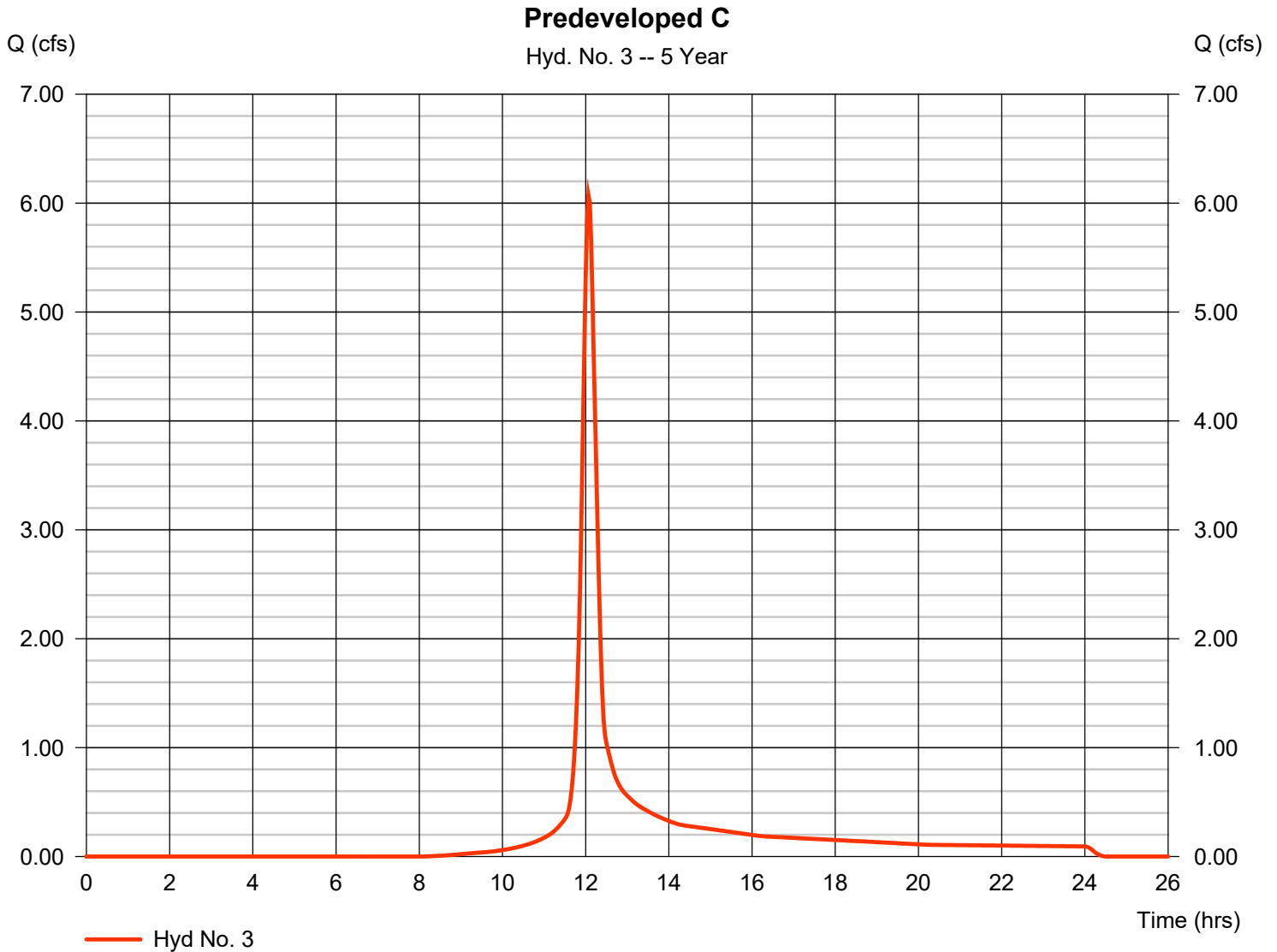
Wednesday, 11 / 23 / 2022

## Hyd. No. 3

Predeveloped C

Hydrograph type	= SCS Runoff	Peak discharge	= 6.071 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 18,997 cuft
Drainage area	= 3.050 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 17.50 min
Total precip.	= 3.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(2.260 x 88) + (0.400 x 73) + (0.390 x 74)] / 3.050



# Hydrograph Report

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

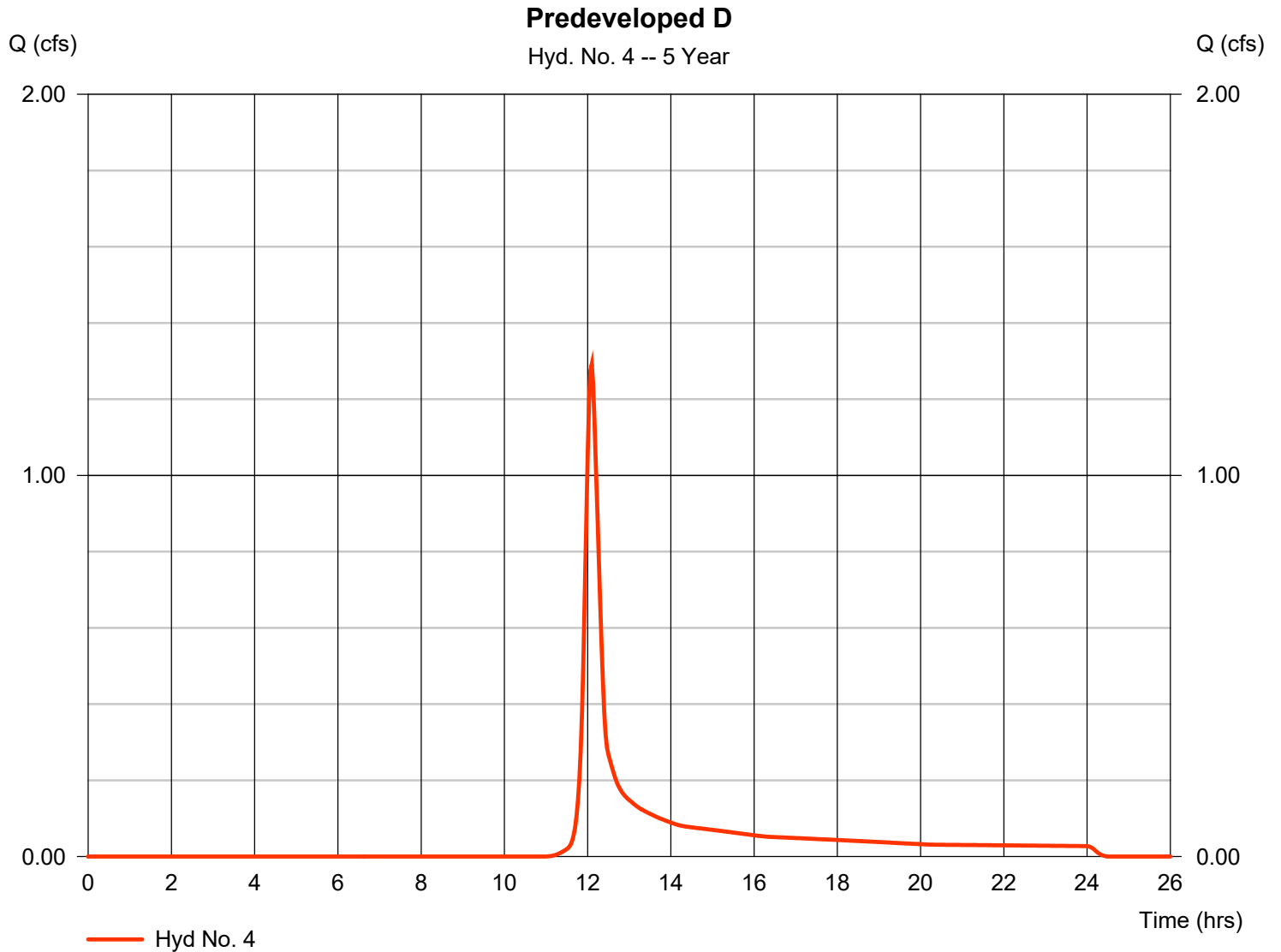
Wednesday, 11 / 23 / 2022

## Hyd. No. 4

Predeveloped D

Hydrograph type	= SCS Runoff	Peak discharge	= 1.292 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 4,283 cuft
Drainage area	= 1.170 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 16.90 min
Total precip.	= 3.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.610 x 73) + (0.560 x 74)] / 1.170



# Hydrograph Report

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

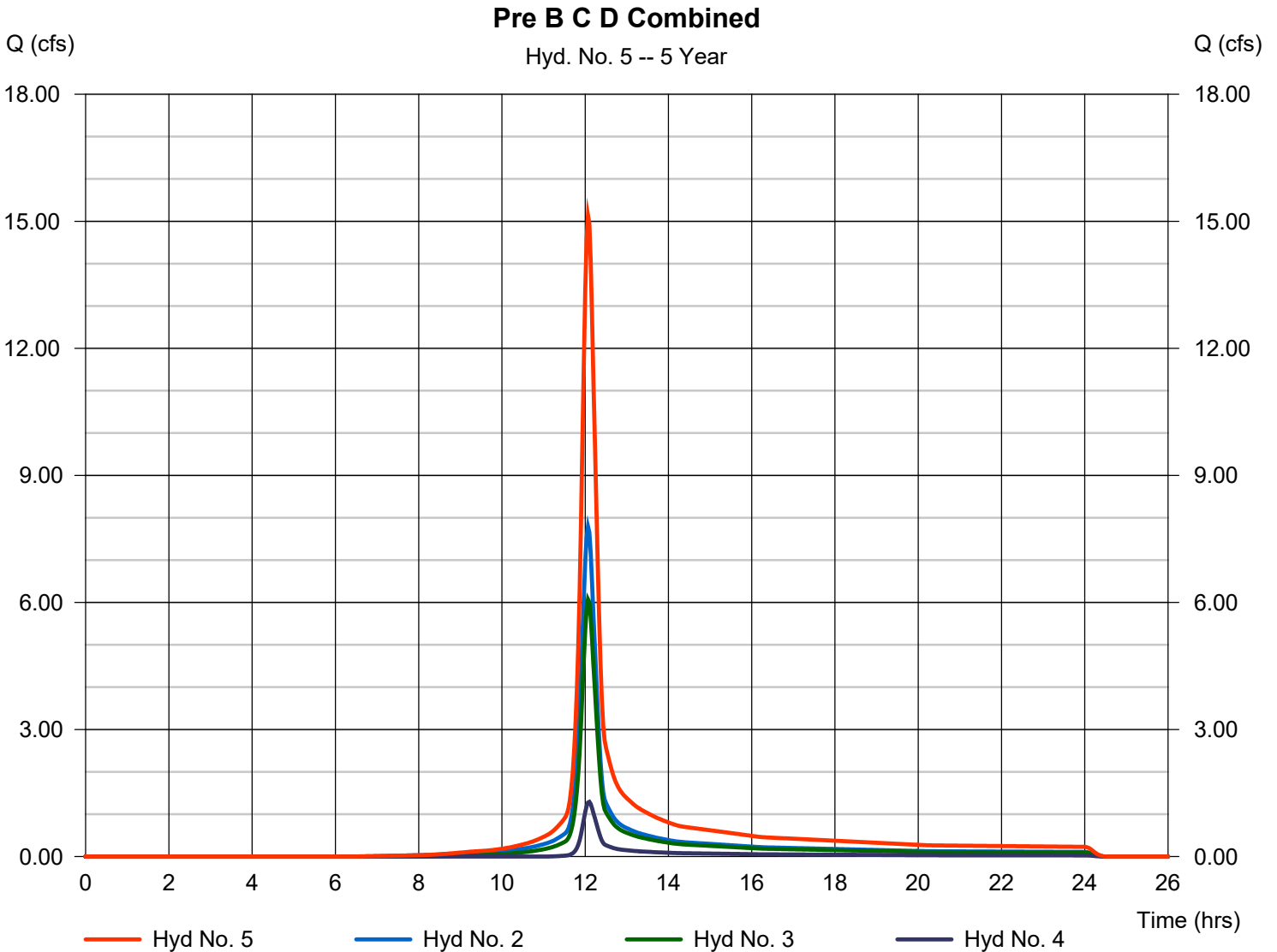
Wednesday, 11 / 23 / 2022

## Hyd. No. 5

Pre B C D Combined

Hydrograph type = Combine  
Storm frequency = 5 yrs  
Time interval = 2 min  
Inflow hyds. = 2, 3, 4

Peak discharge = 15.14 cfs  
Time to peak = 12.07 hrs  
Hyd. volume = 47,708 cuft  
Contrib. drain. area = 7.530 ac





# Hydrograph Report

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

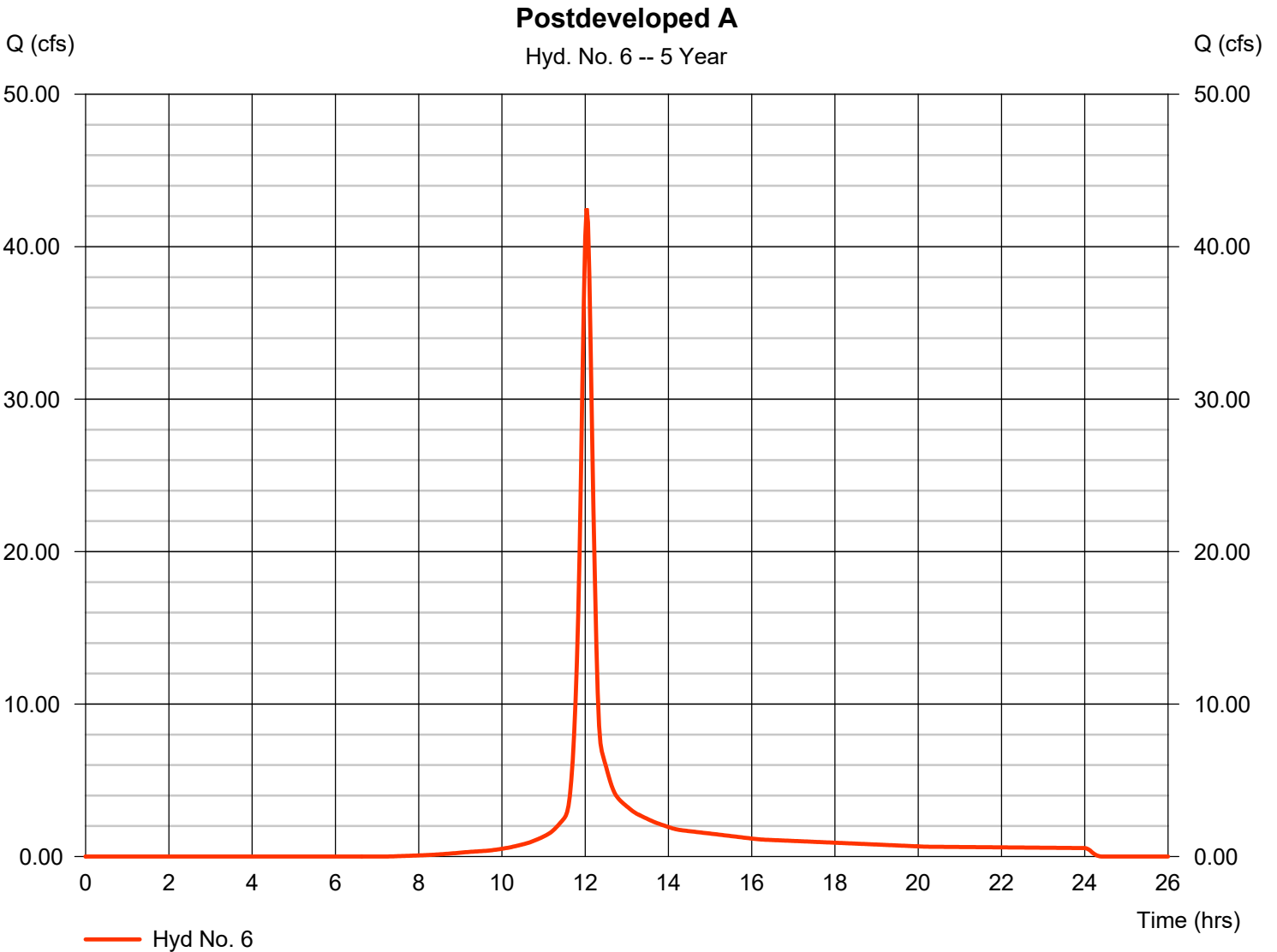
Wednesday, 11 / 23 / 2022

## Hyd. No. 6

Postdeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 42.51 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 119,259 cuft
Drainage area	= 18.020 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(9.100 x 98) + (8.920 x 74)] / 18.020

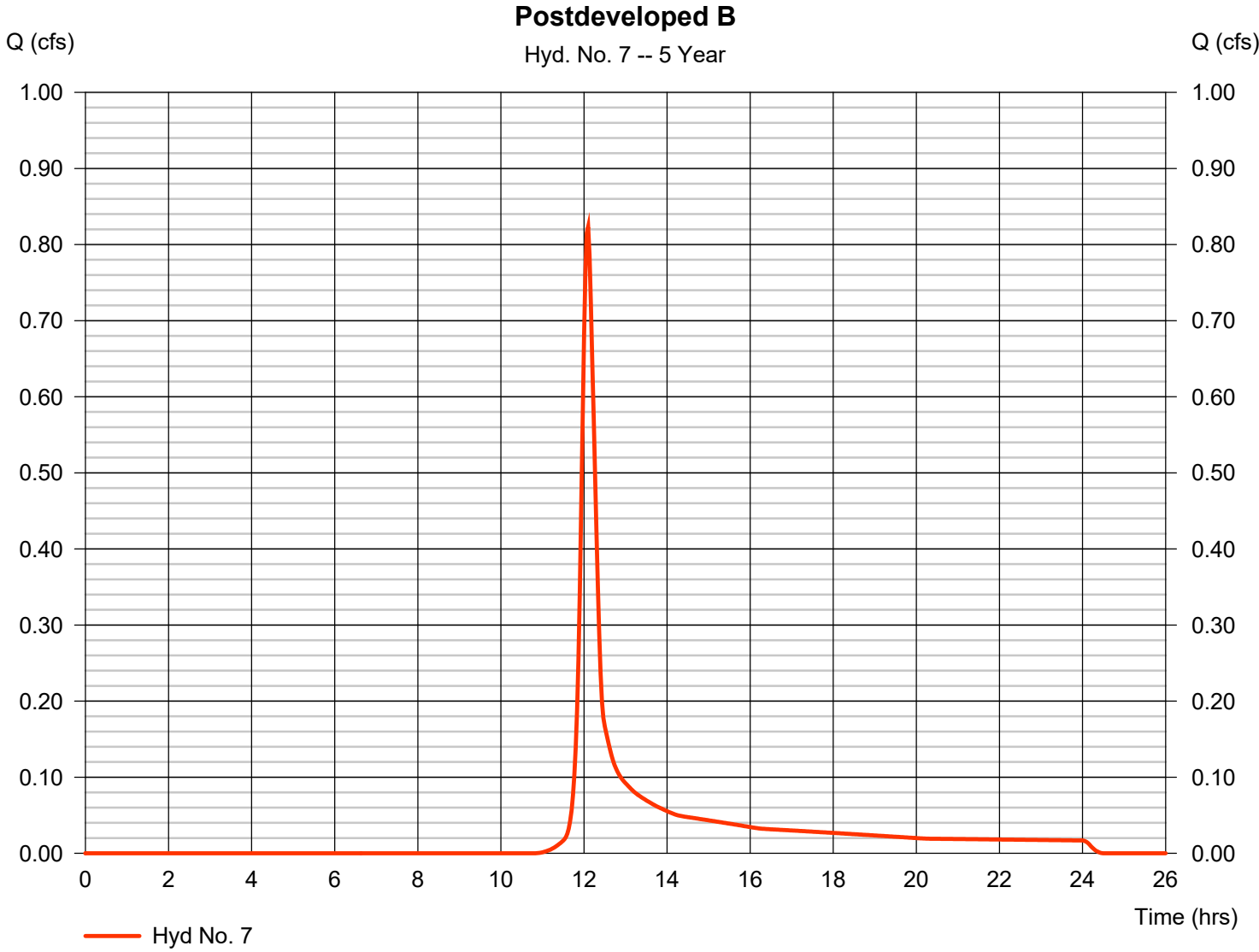


# Hydrograph Report

## Hyd. No. 7

Postdeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 0.823 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 2,704 cuft
Drainage area	= 0.700 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.90 min
Total precip.	= 3.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

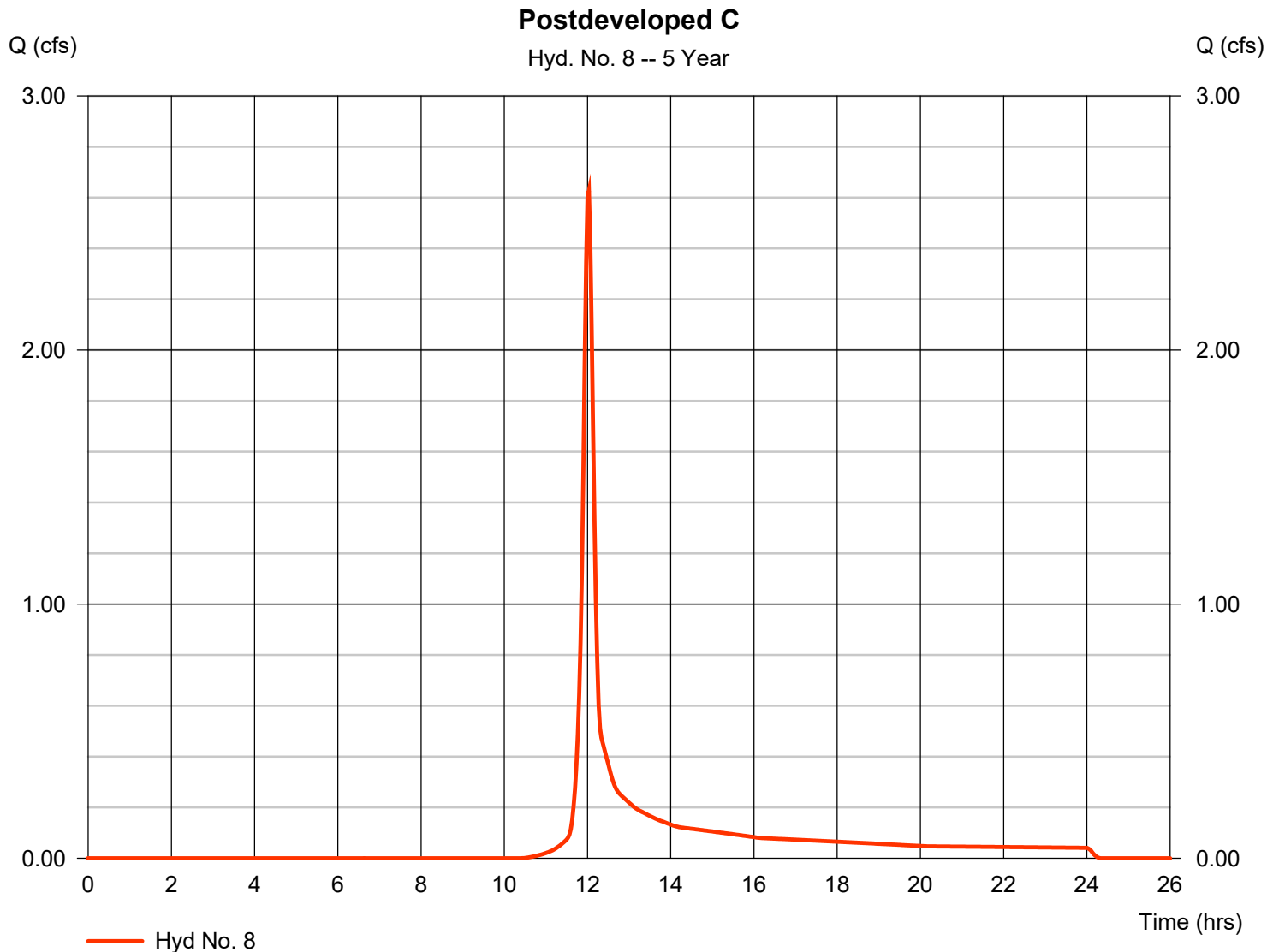
Wednesday, 11 / 23 / 2022

## Hyd. No. 8

Postdeveloped C

Hydrograph type	= SCS Runoff	Peak discharge	= 2.626 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 6,935 cuft
Drainage area	= 1.570 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.110 x 98) + (1.460 x 74)] / 1.570



# Hydrograph Report

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

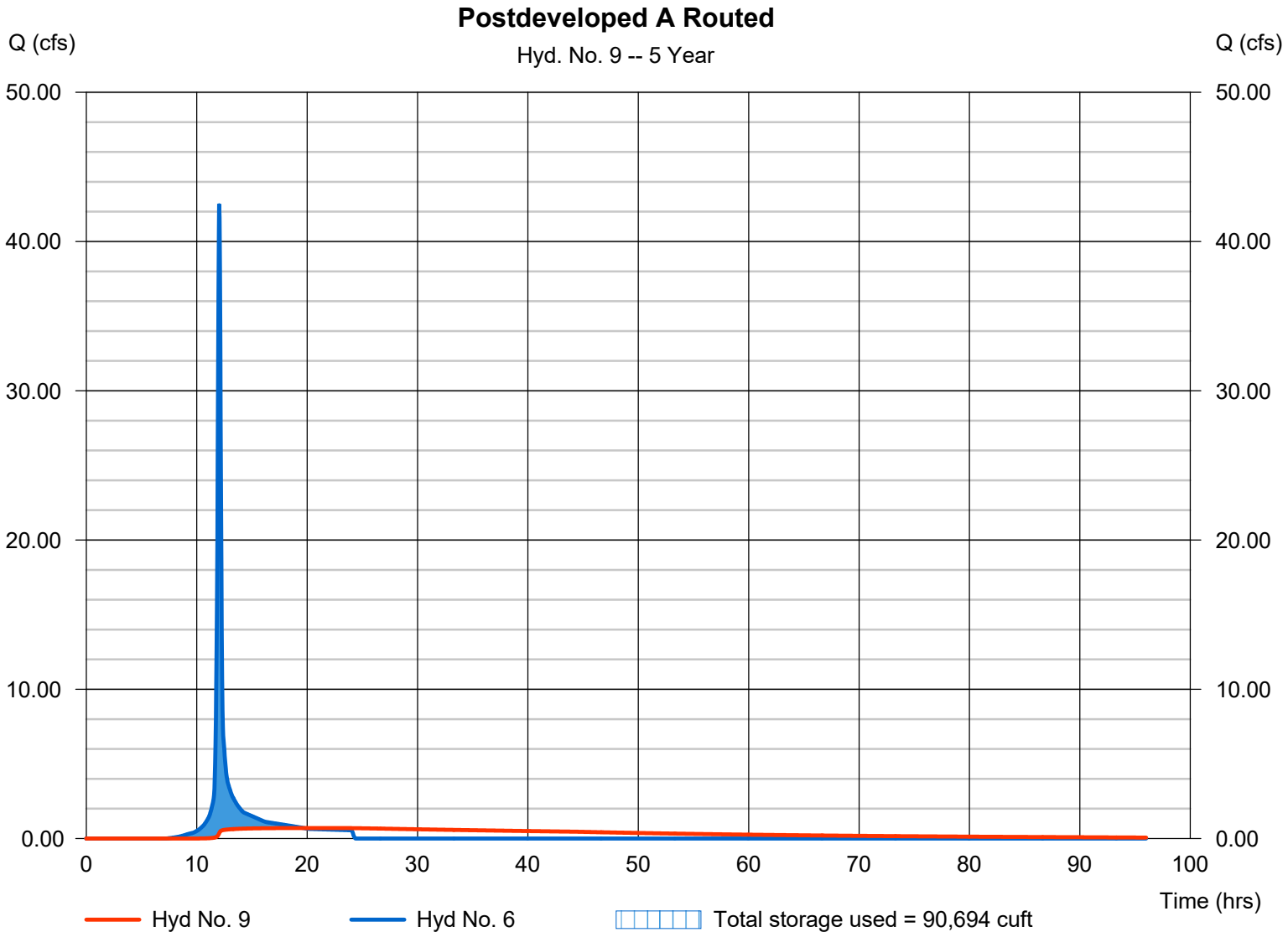
Wednesday, 11 / 23 / 2022

## Hyd. No. 9

Postdeveloped A Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.703 cfs
Storm frequency	= 5 yrs	Time to peak	= 19.70 hrs
Time interval	= 2 min	Hyd. volume	= 109,865 cuft
Inflow hyd. No.	= 6 - Postdeveloped A	Max. Elevation	= 706.99 ft
Reservoir name	= Proposed Retention Pond	Max. Storage	= 90,694 cuft

Storage Indication method used.



# Hydrograph Report

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

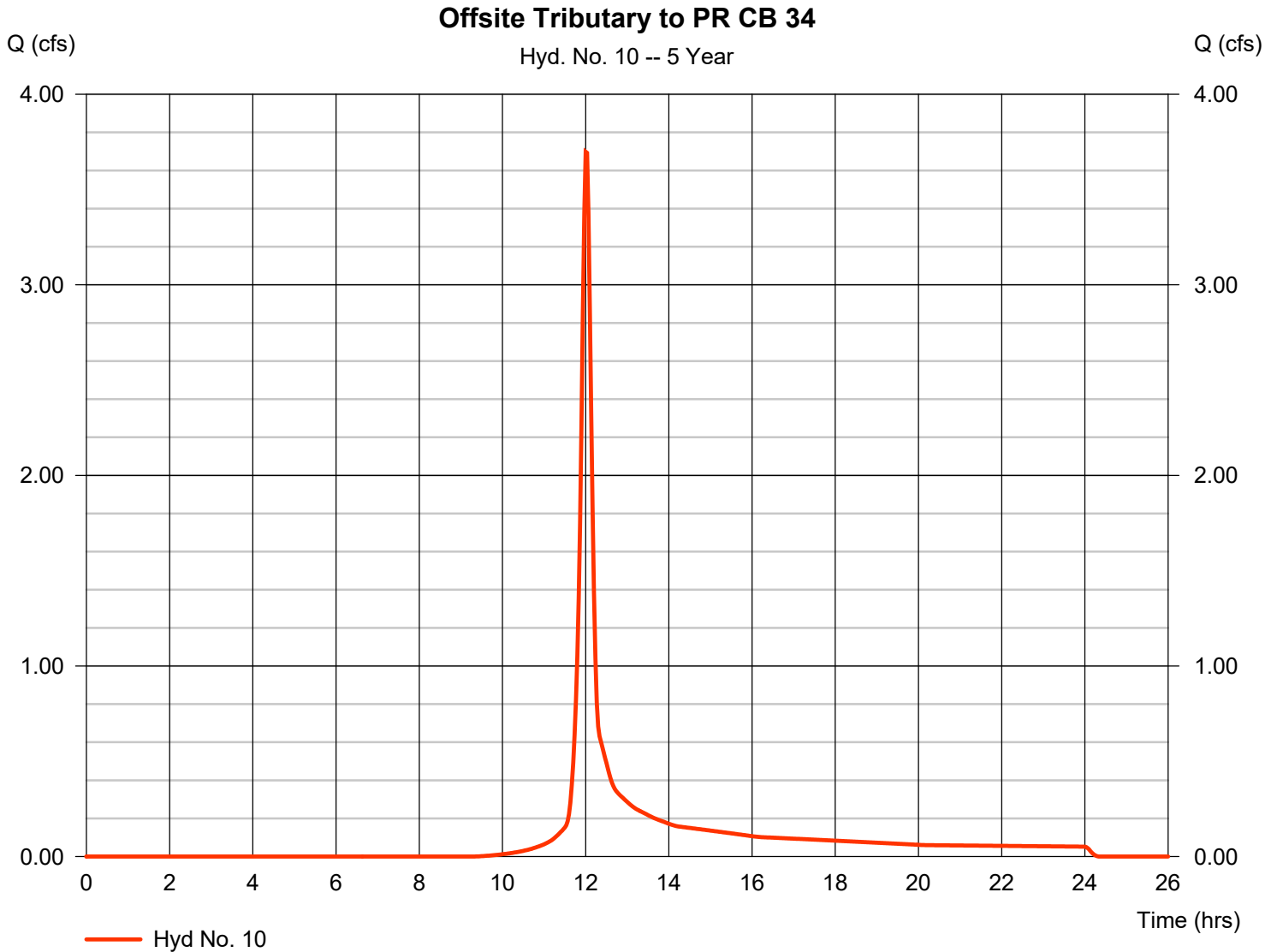
Wednesday, 11 / 23 / 2022

## Hyd. No. 10

Offsite Tributary to PR CB 34

Hydrograph type	= SCS Runoff	Peak discharge	= 3.698 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 9,654 cuft
Drainage area	= 1.800 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.490 x 98) + (0.690 x 73) + (0.620 x 74)] / 1.800



# Hydrograph Report

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

Wednesday, 11 / 23 / 2022

## Hyd. No. 11

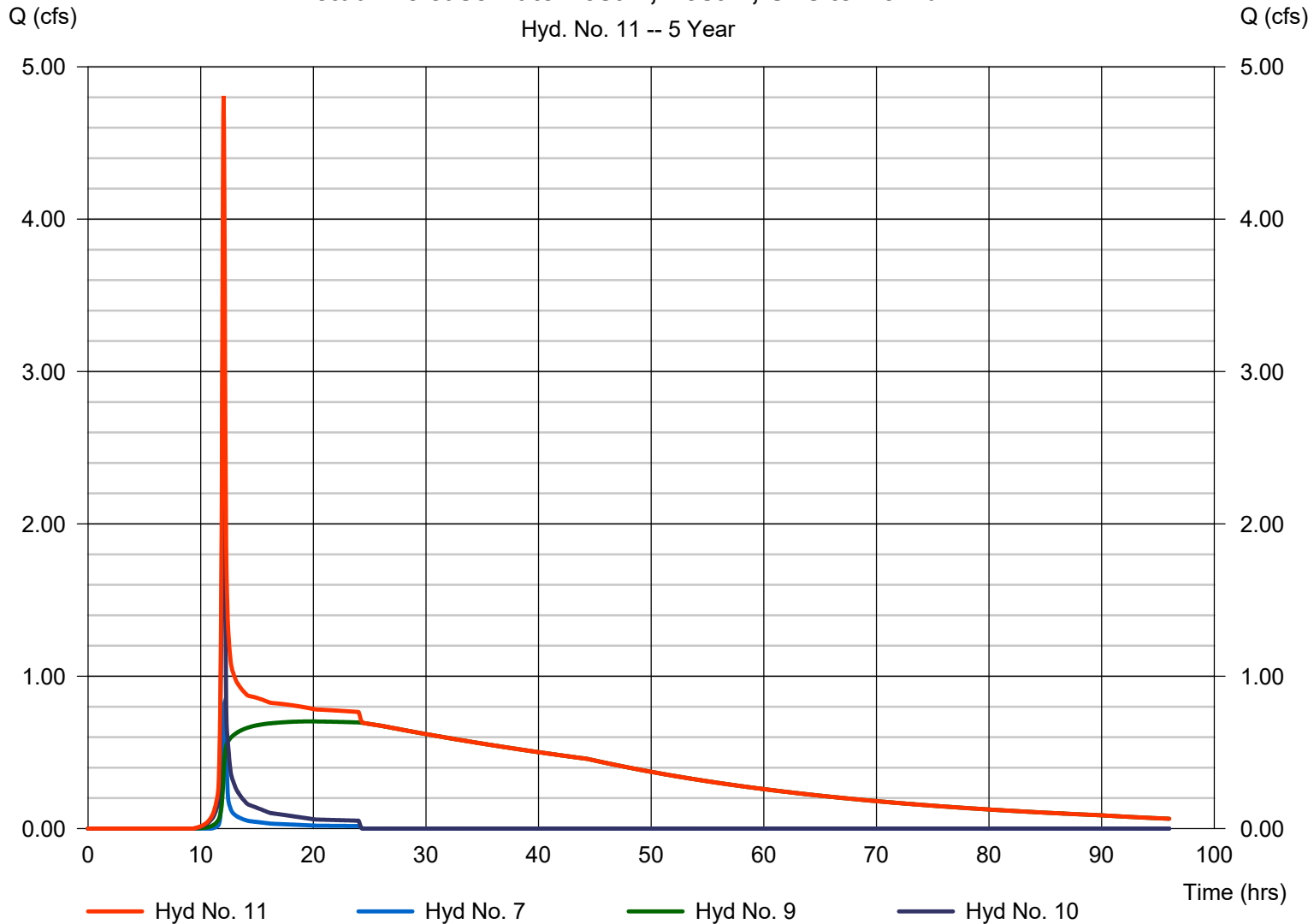
Actual Release Rate Post A, Post B, Offsite Combin

Hydrograph type = Combine  
Storm frequency = 5 yrs  
Time interval = 2 min  
Inflow hyds. = 7, 9, 10

Peak discharge = 4.810 cfs  
Time to peak = 12.03 hrs  
Hyd. volume = 122,223 cuft  
Contrib. drain. area = 2.500 ac

### Actual Release Rate Post A, Post B, Offsite Combin

Hyd. No. 11 -- 5 Year



# 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	28.71	2	728	105,419	-----	-----	-----	Predeveloped A
2	SCS Runoff	9.494	2	724	29,901	-----	-----	-----	Predeveloped B
3	SCS Runoff	7.591	2	724	23,732	-----	-----	-----	Predeveloped C
4	SCS Runoff	1.761	2	726	5,707	-----	-----	-----	Predeveloped D
5	Combine	18.84	2	724	59,340	2, 3, 4	-----	-----	Pre B C D Combined
6	SCS Runoff	52.38	2	722	147,458	-----	-----	-----	Postdeveloped A
7	SCS Runoff	1.111	2	726	3,578	-----	-----	-----	Postdeveloped B
8	SCS Runoff	3.459	2	722	9,062	-----	-----	-----	Postdeveloped C
9	Reservoir	0.813	2	1190	135,577	6	707.22	113,920	Postdeveloped A Routed
10	SCS Runoff	4.746	2	720	12,323	-----	-----	-----	Offsite Tributary to PR CB 34
11	Combine	6.223	2	722	151,478	7, 9, 10	-----	-----	Actual Release Rate Post A, Post B,
E221073 Hydro.gpw					Return Period: 10 Year			Wednesday, 11 / 23 / 2022	

# Hydrograph Report

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

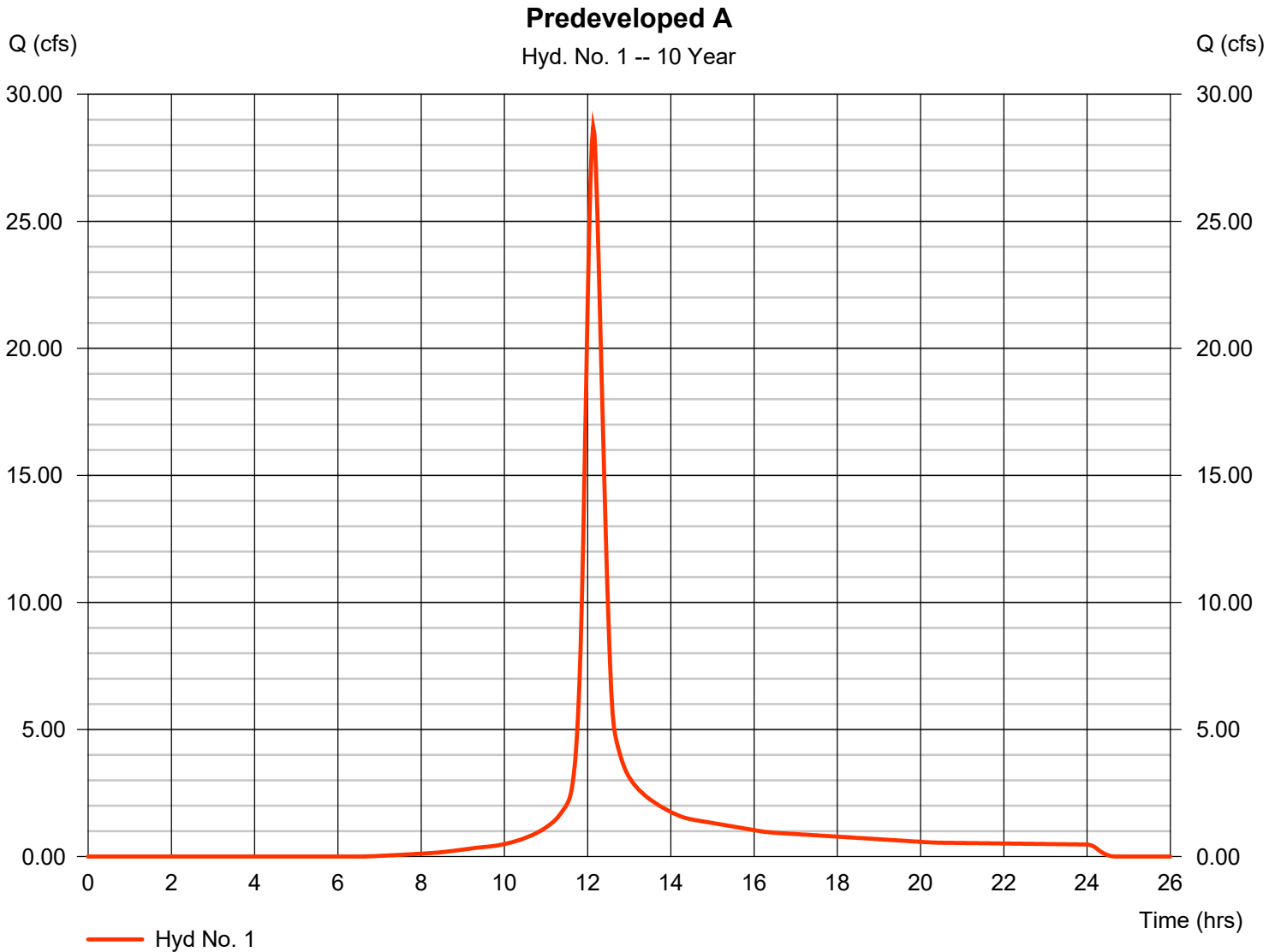
Wednesday, 11 / 23 / 2022

## Hyd. No. 1

Predeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 28.71 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 105,419 cuft
Drainage area	= 12.760 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 25.70 min
Total precip.	= 3.74 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(11.160 x 88) + (0.320 x 74) + (1.280 x 73)] / 12.760





# Hydrograph Report

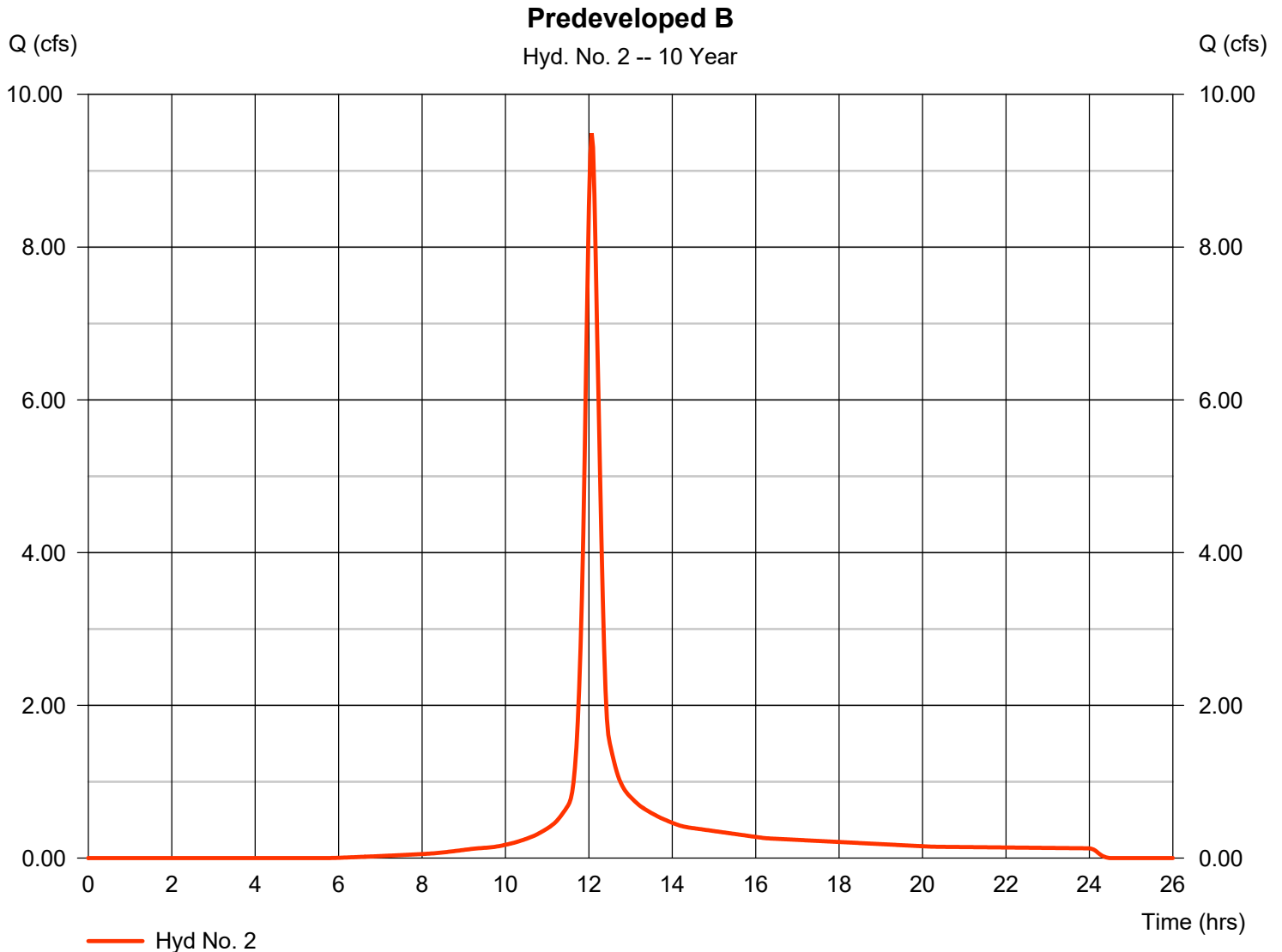
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Wednesday, 11 / 23 / 2022

## Hyd. No. 2

Predeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 9.494 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 29,901 cuft
Drainage area	= 3.310 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.30 min
Total precip.	= 3.74 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

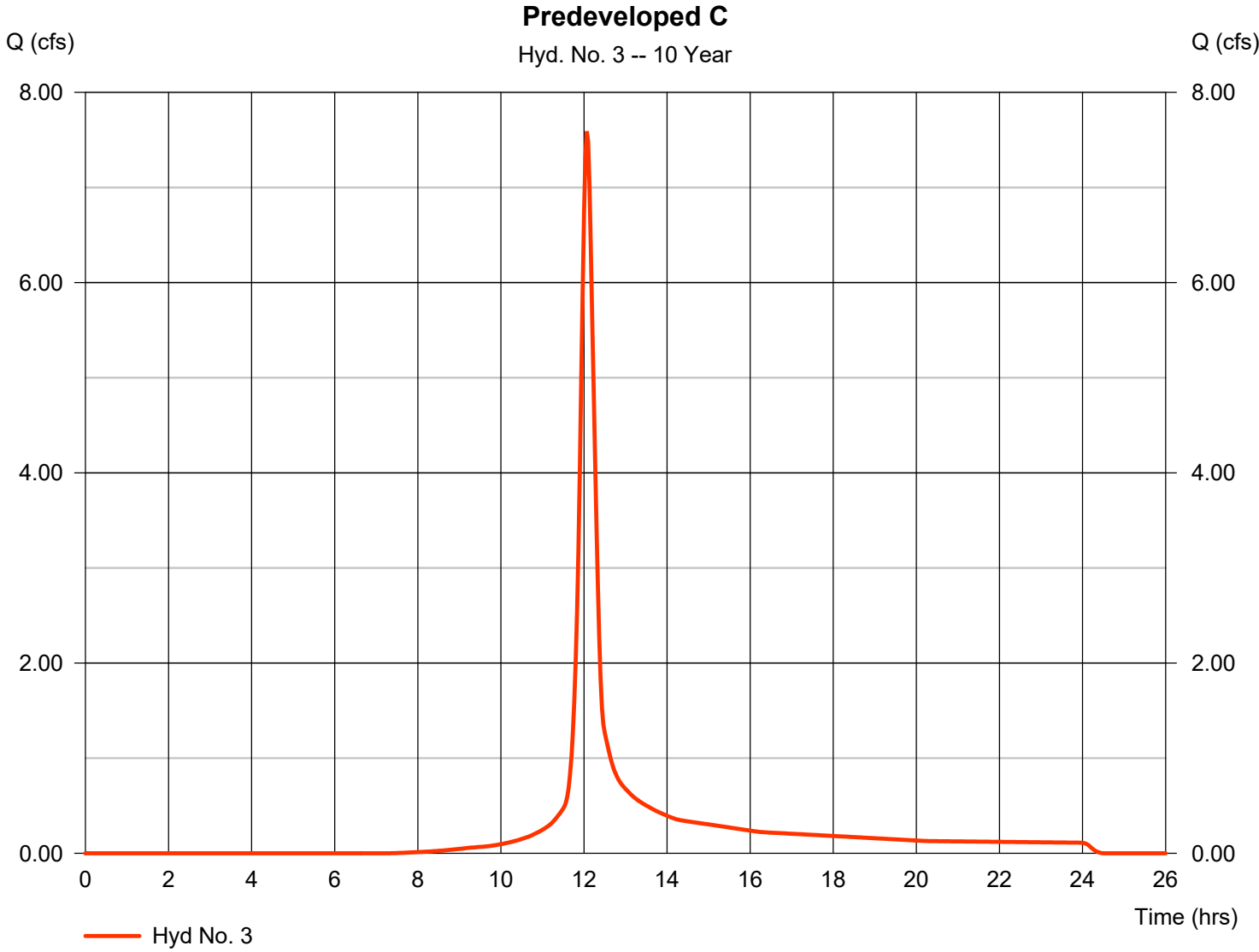
Wednesday, 11 / 23 / 2022

## Hyd. No. 3

Predeveloped C

Hydrograph type	= SCS Runoff	Peak discharge	= 7.591 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 23,732 cuft
Drainage area	= 3.050 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 17.50 min
Total precip.	= 3.74 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(2.260 x 88) + (0.400 x 73) + (0.390 x 74)] / 3.050



# Hydrograph Report

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

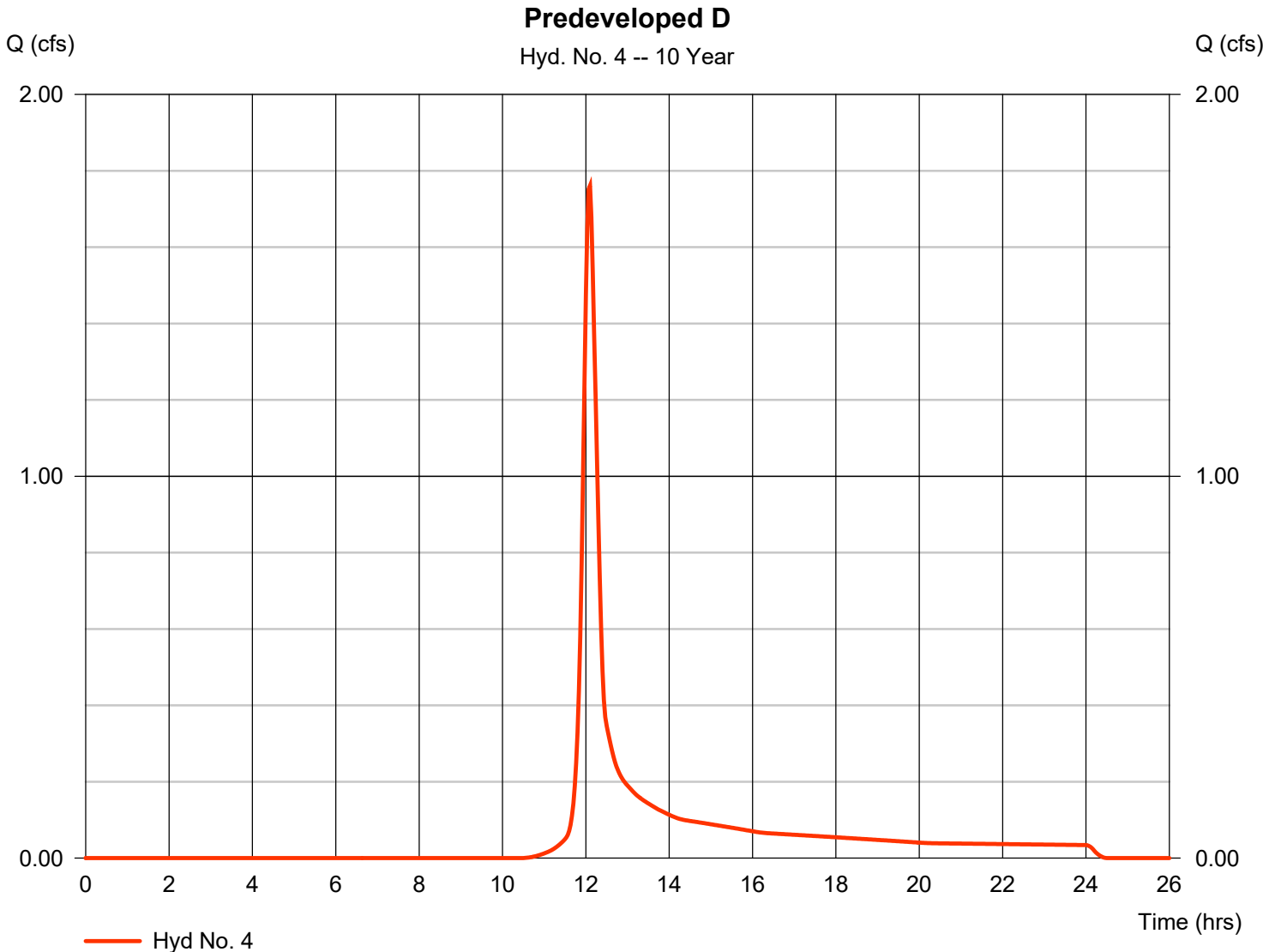
Wednesday, 11 / 23 / 2022

## Hyd. No. 4

Predeveloped D

Hydrograph type	= SCS Runoff	Peak discharge	= 1.761 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 5,707 cuft
Drainage area	= 1.170 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 16.90 min
Total precip.	= 3.74 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.610 x 73) + (0.560 x 74)] / 1.170



# Hydrograph Report

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

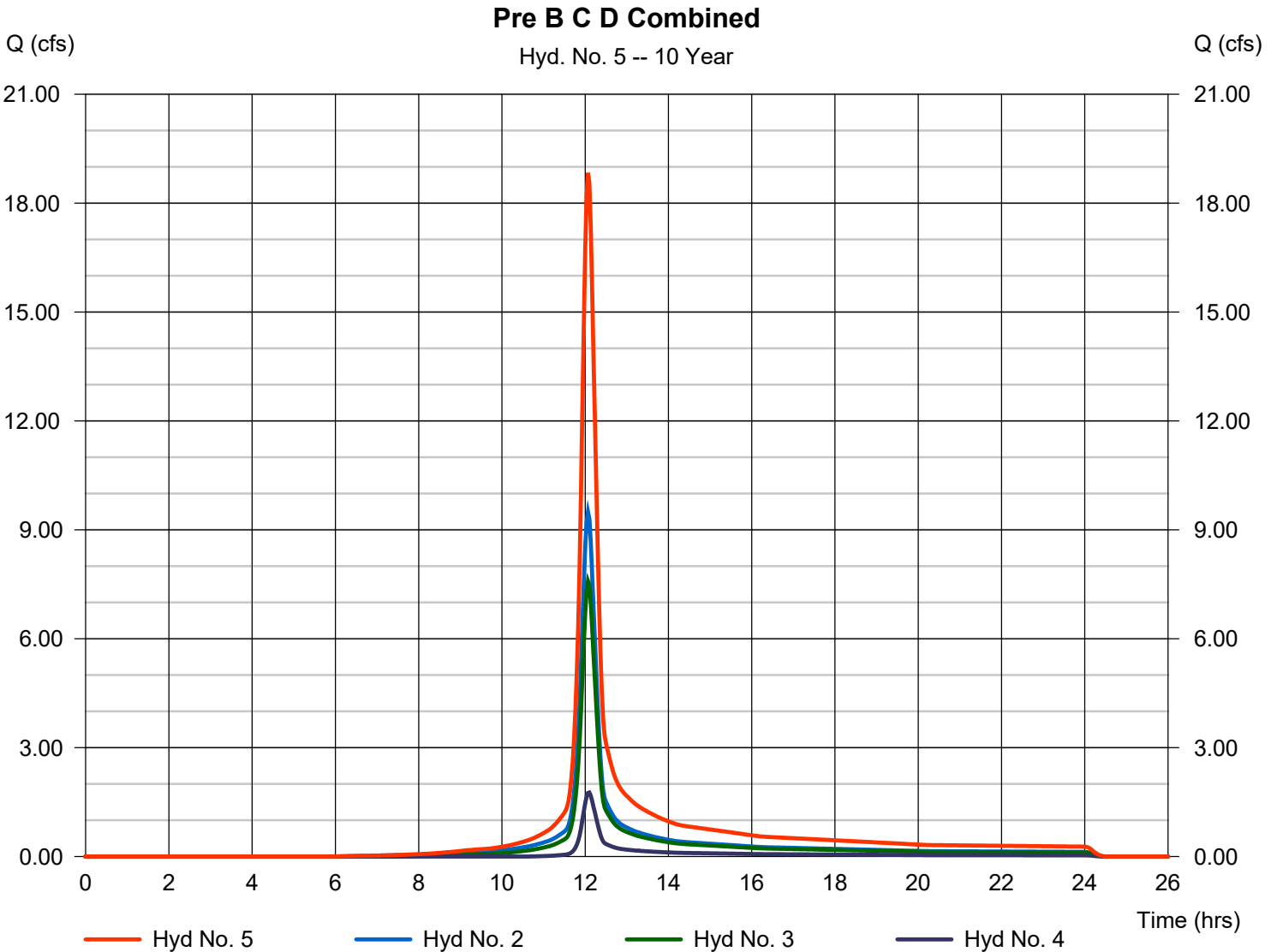
Wednesday, 11 / 23 / 2022

## Hyd. No. 5

Pre B C D Combined

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 2 min  
Inflow hyds. = 2, 3, 4

Peak discharge = 18.84 cfs  
Time to peak = 12.07 hrs  
Hyd. volume = 59,340 cuft  
Contrib. drain. area = 7.530 ac



# Hydrograph Report

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

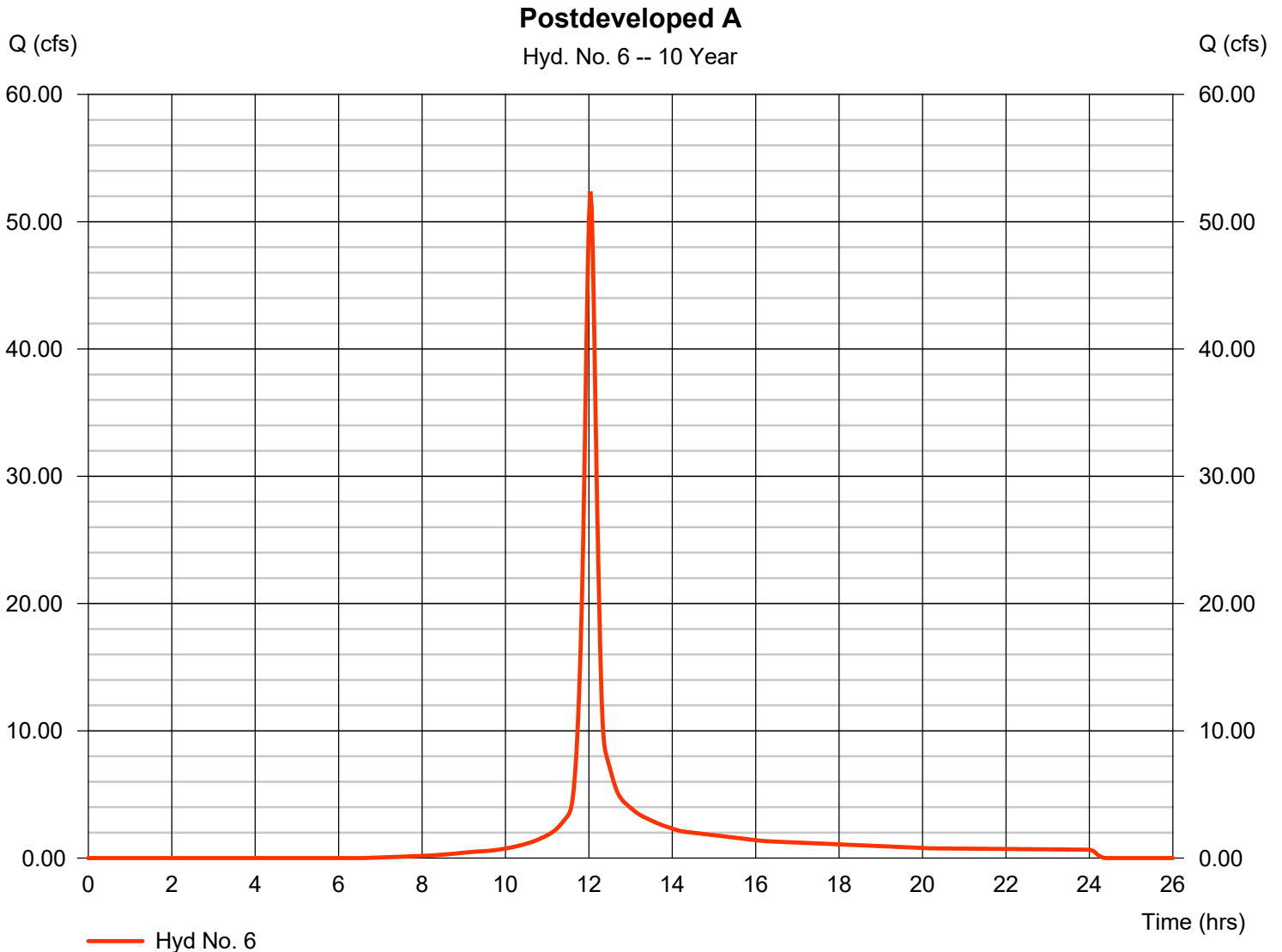
Wednesday, 11 / 23 / 2022

## Hyd. No. 6

Postdeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 52.38 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 147,458 cuft
Drainage area	= 18.020 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.74 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(9.100 x 98) + (8.920 x 74)] / 18.020



# Hydrograph Report

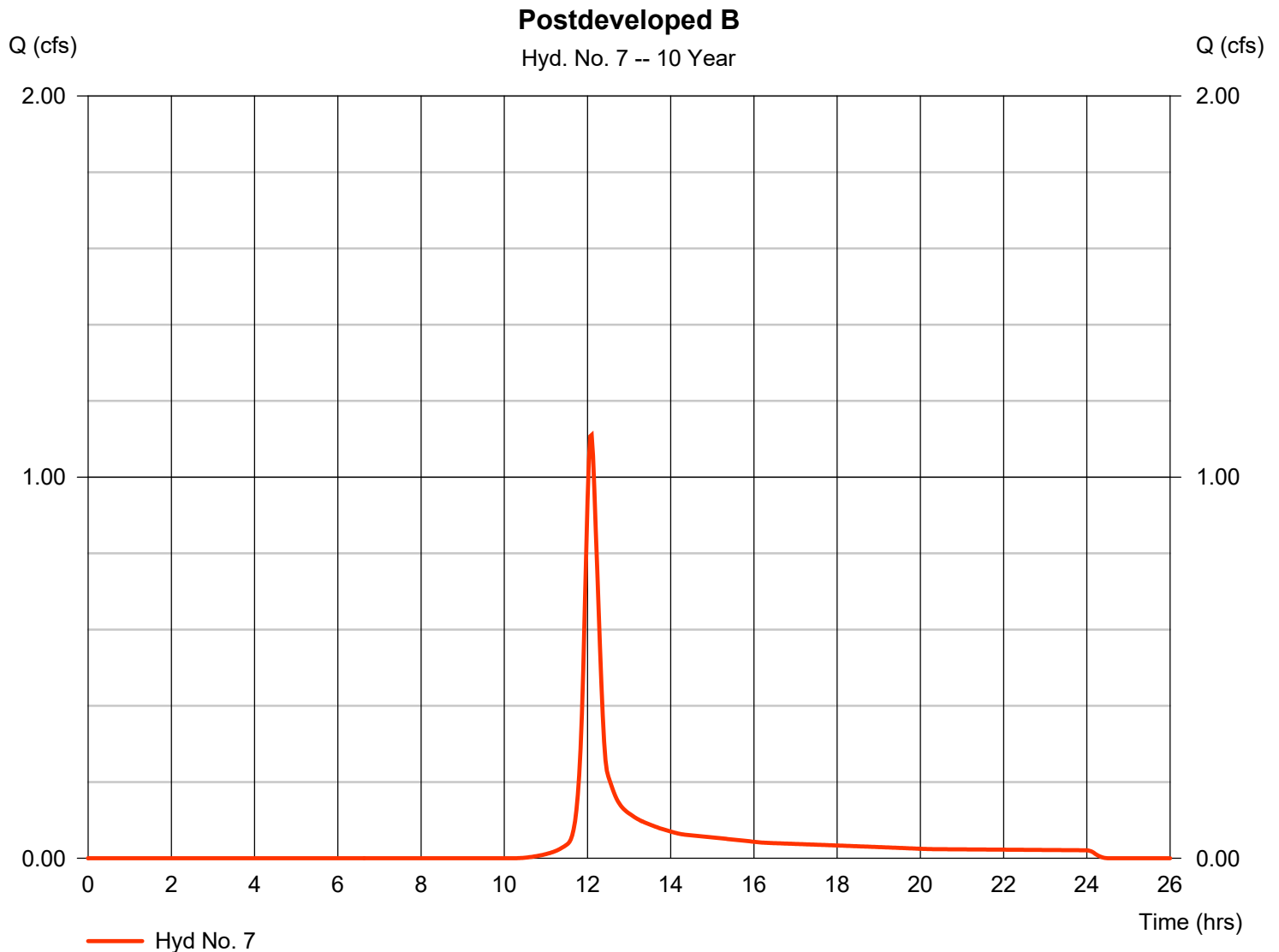
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Wednesday, 11 / 23 / 2022

## Hyd. No. 7

Postdeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 1.111 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 3,578 cuft
Drainage area	= 0.700 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.90 min
Total precip.	= 3.74 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

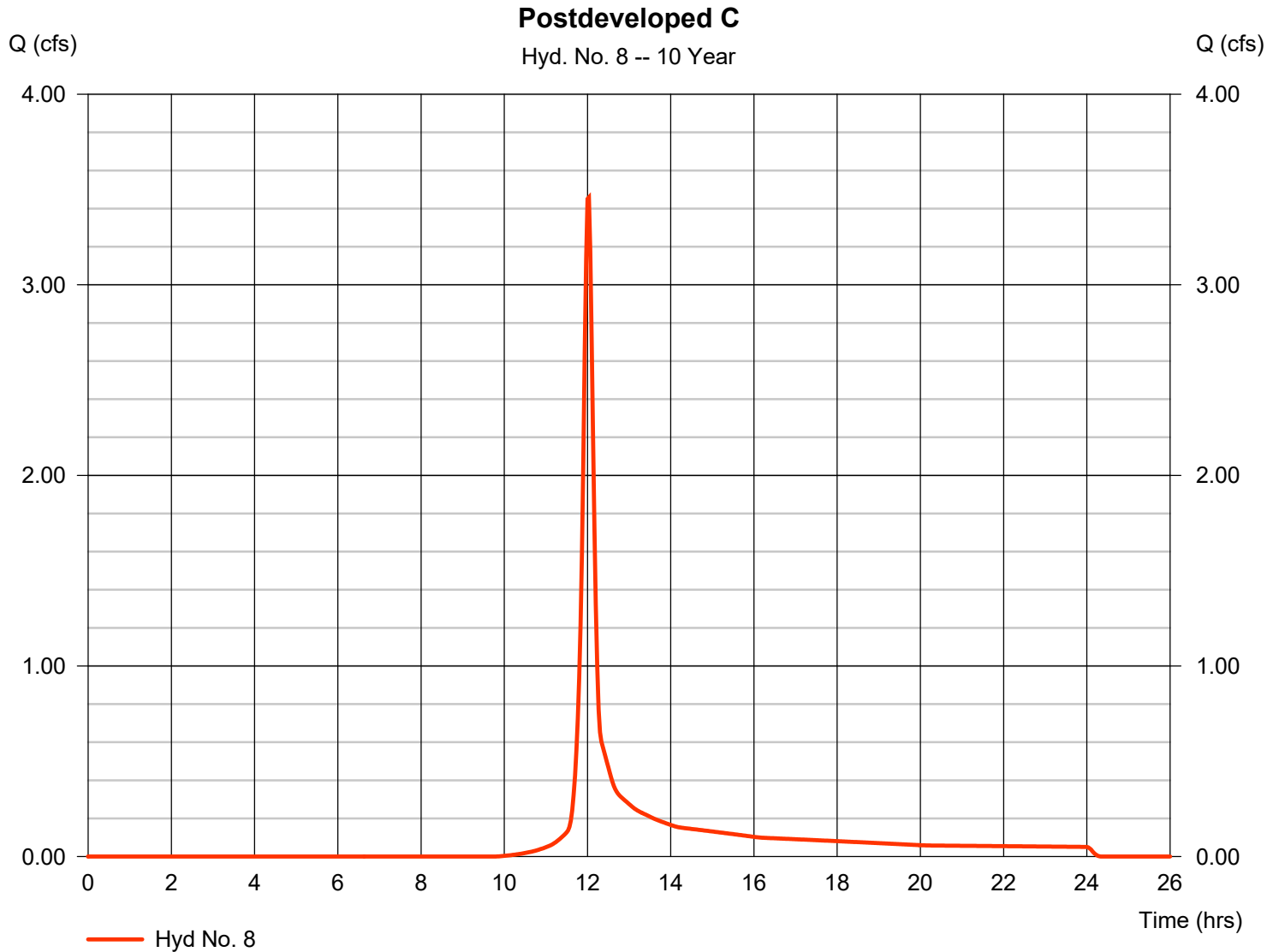
Wednesday, 11 / 23 / 2022

## Hyd. No. 8

Postdeveloped C

Hydrograph type	= SCS Runoff	Peak discharge	= 3.459 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 9,062 cuft
Drainage area	= 1.570 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.74 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.110 x 98) + (1.460 x 74)] / 1.570



# Hydrograph Report

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

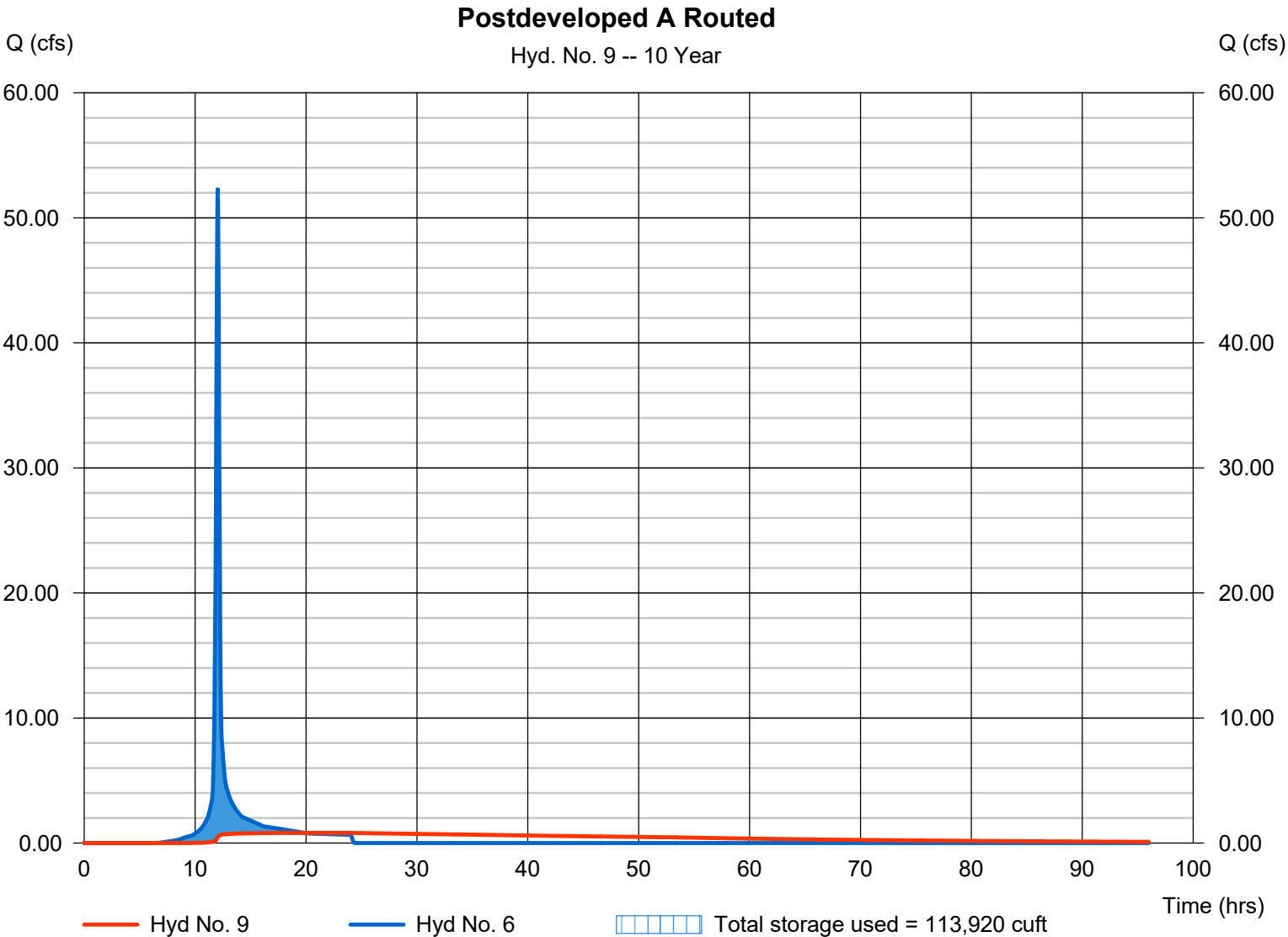
Wednesday, 11 / 23 / 2022

## Hyd. No. 9

Postdeveloped A Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.813 cfs
Storm frequency	= 10 yrs	Time to peak	= 19.83 hrs
Time interval	= 2 min	Hyd. volume	= 135,577 cuft
Inflow hyd. No.	= 6 - Postdeveloped A	Max. Elevation	= 707.22 ft
Reservoir name	= Proposed Retention Pond	Max. Storage	= 113,920 cuft

Storage Indication method used.





# Hydrograph Report

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

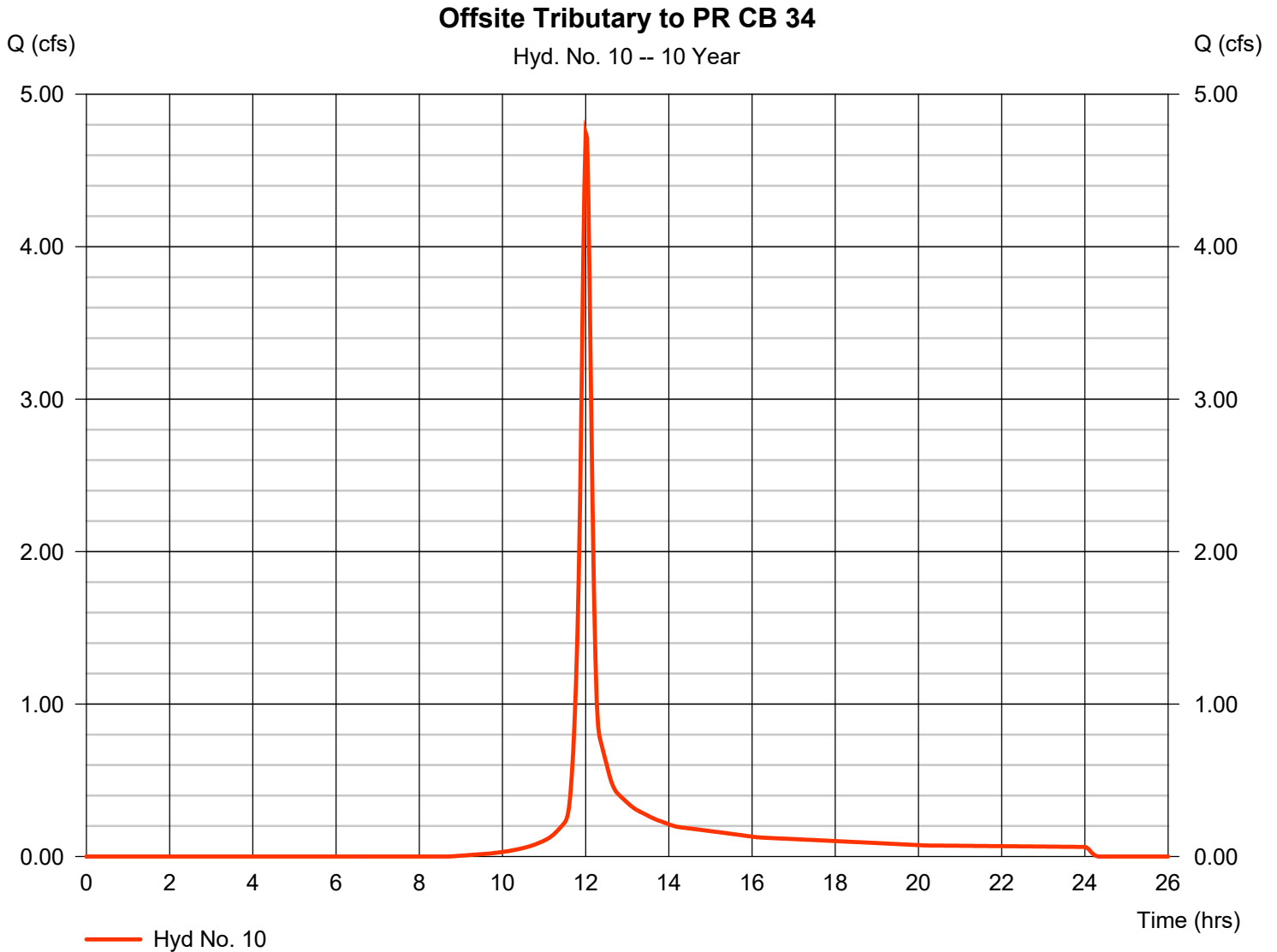
Wednesday, 11 / 23 / 2022

## Hyd. No. 10

Offsite Tributary to PR CB 34

Hydrograph type	= SCS Runoff	Peak discharge	= 4.746 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 12,323 cuft
Drainage area	= 1.800 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.74 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.490 x 98) + (0.690 x 73) + (0.620 x 74)] / 1.800



# Hydrograph Report

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

Wednesday, 11 / 23 / 2022

## Hyd. No. 11

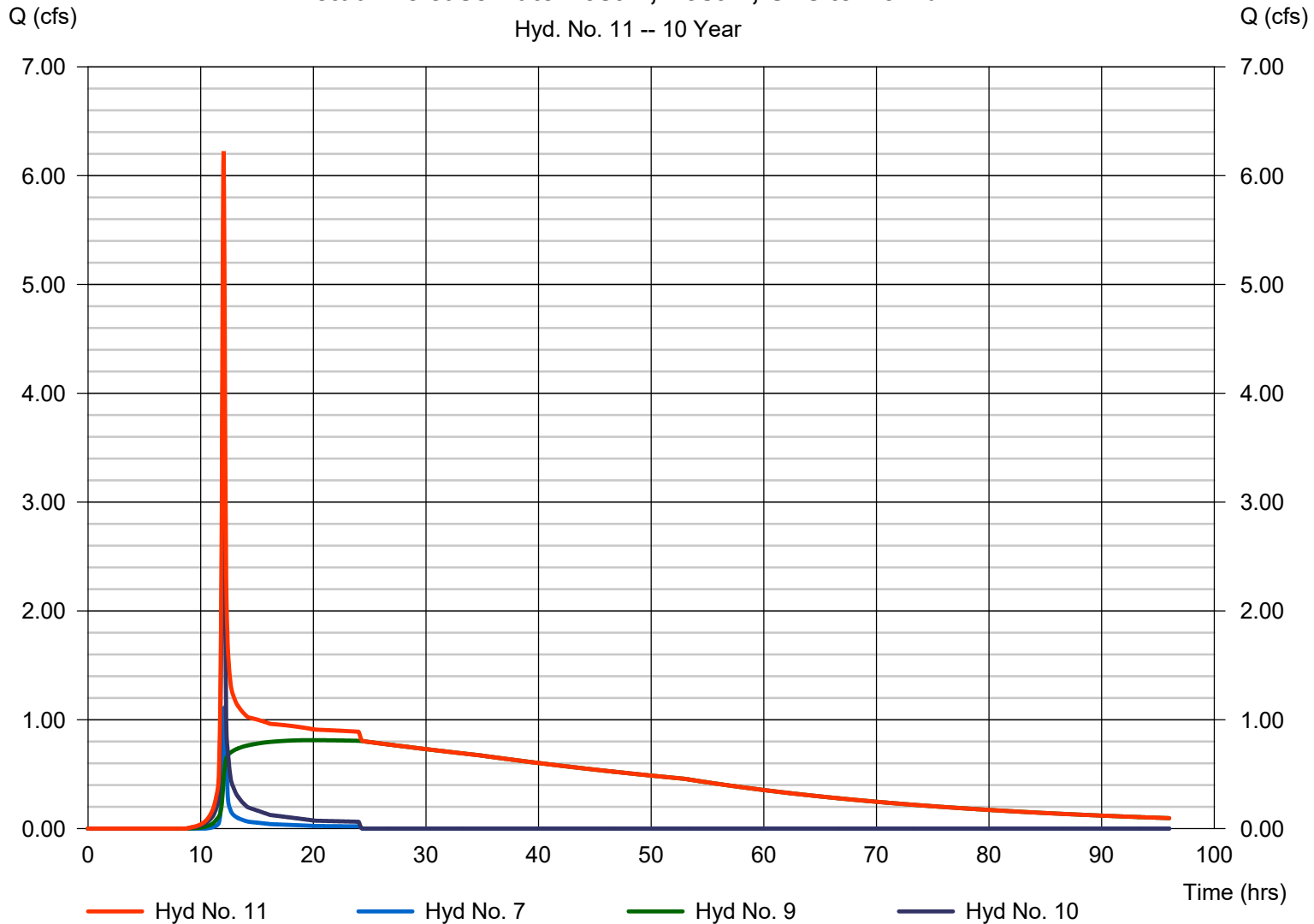
Actual Release Rate Post A, Post B, Offsite Combin

Hydrograph type = Combine  
 Storm frequency = 10 yrs  
 Time interval = 2 min  
 Inflow hyds. = 7, 9, 10

Peak discharge = 6.223 cfs  
 Time to peak = 12.03 hrs  
 Hyd. volume = 151,478 cuft  
 Contrib. drain. area = 2.500 ac

**Actual Release Rate Post A, Post B, Offsite Combin**

Hyd. No. 11 -- 10 Year



# 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	36.47	2	728	134,415	-----	-----	-----	Predeveloped A
2	SCS Runoff	11.89	2	724	37,726	-----	-----	-----	Predeveloped B
3	SCS Runoff	9.760	2	724	30,587	-----	-----	-----	Predeveloped C
4	SCS Runoff	2.467	2	724	7,859	-----	-----	-----	Predeveloped D
5	Combine	24.12	2	724	76,172	2, 3, 4	-----	-----	Pre B C D Combined
6	SCS Runoff	66.36	2	722	188,016	-----	-----	-----	Postdeveloped A
7	SCS Runoff	1.543	2	724	4,895	-----	-----	-----	Postdeveloped B
8	SCS Runoff	4.704	2	720	12,236	-----	-----	-----	Postdeveloped C
9	Reservoir	0.956	2	1204	171,598	6	707.56	147,718	Postdeveloped A Routed
10	SCS Runoff	6.265	2	720	16,242	-----	-----	-----	Offsite Tributary to PR CB 34
11	Combine	8.221	2	722	192,735	7, 9, 10	-----	-----	Actual Release Rate Post A, Post B,
E221073 Hydro.gpw					Return Period: 25 Year			Wednesday, 11 / 23 / 2022	

# Hydrograph Report

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

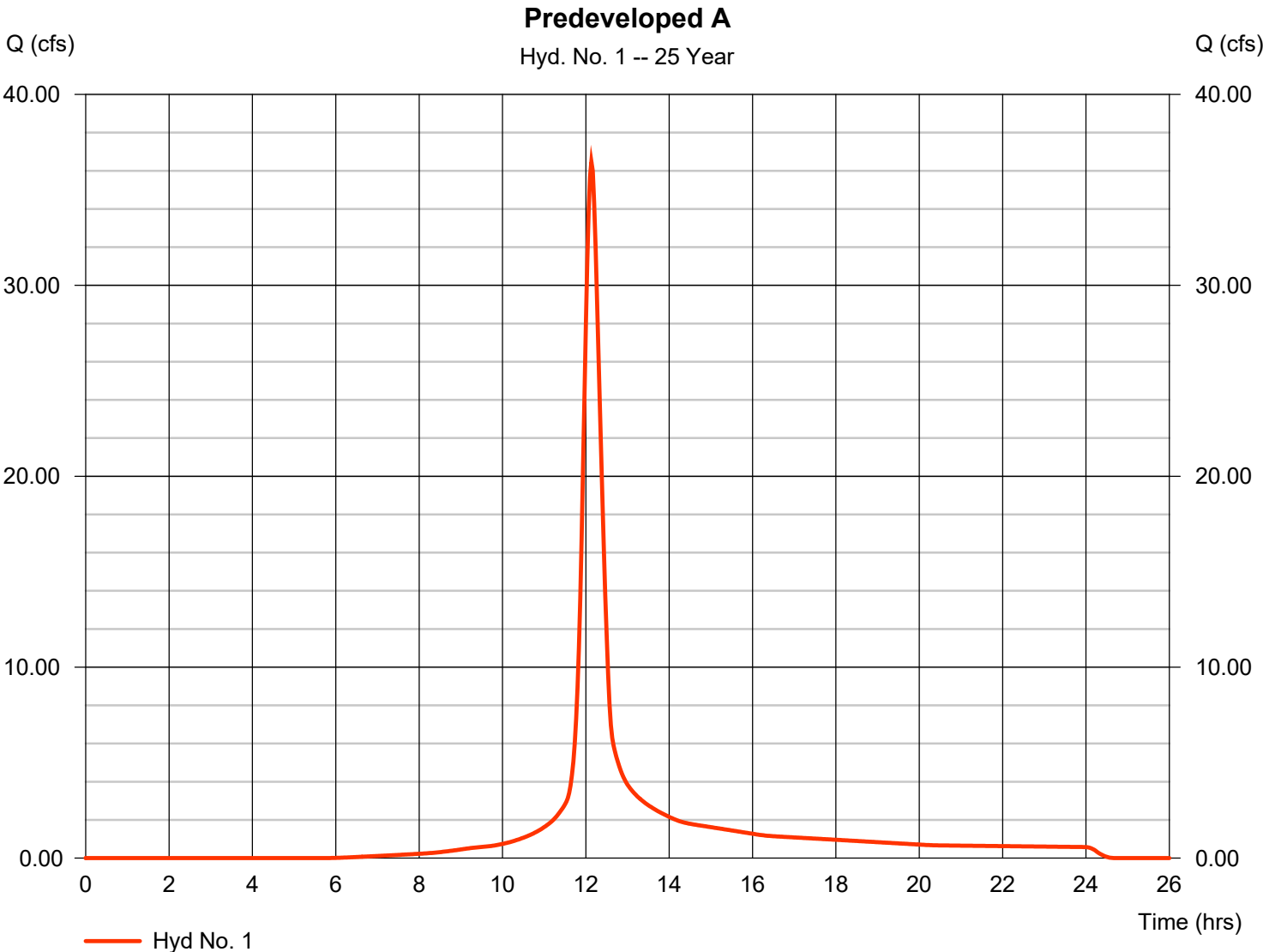
Wednesday, 11 / 23 / 2022

## Hyd. No. 1

Predeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 36.47 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 134,415 cuft
Drainage area	= 12.760 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 25.70 min
Total precip.	= 4.44 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(11.160 x 88) + (0.320 x 74) + (1.280 x 73)] / 12.760



# Hydrograph Report

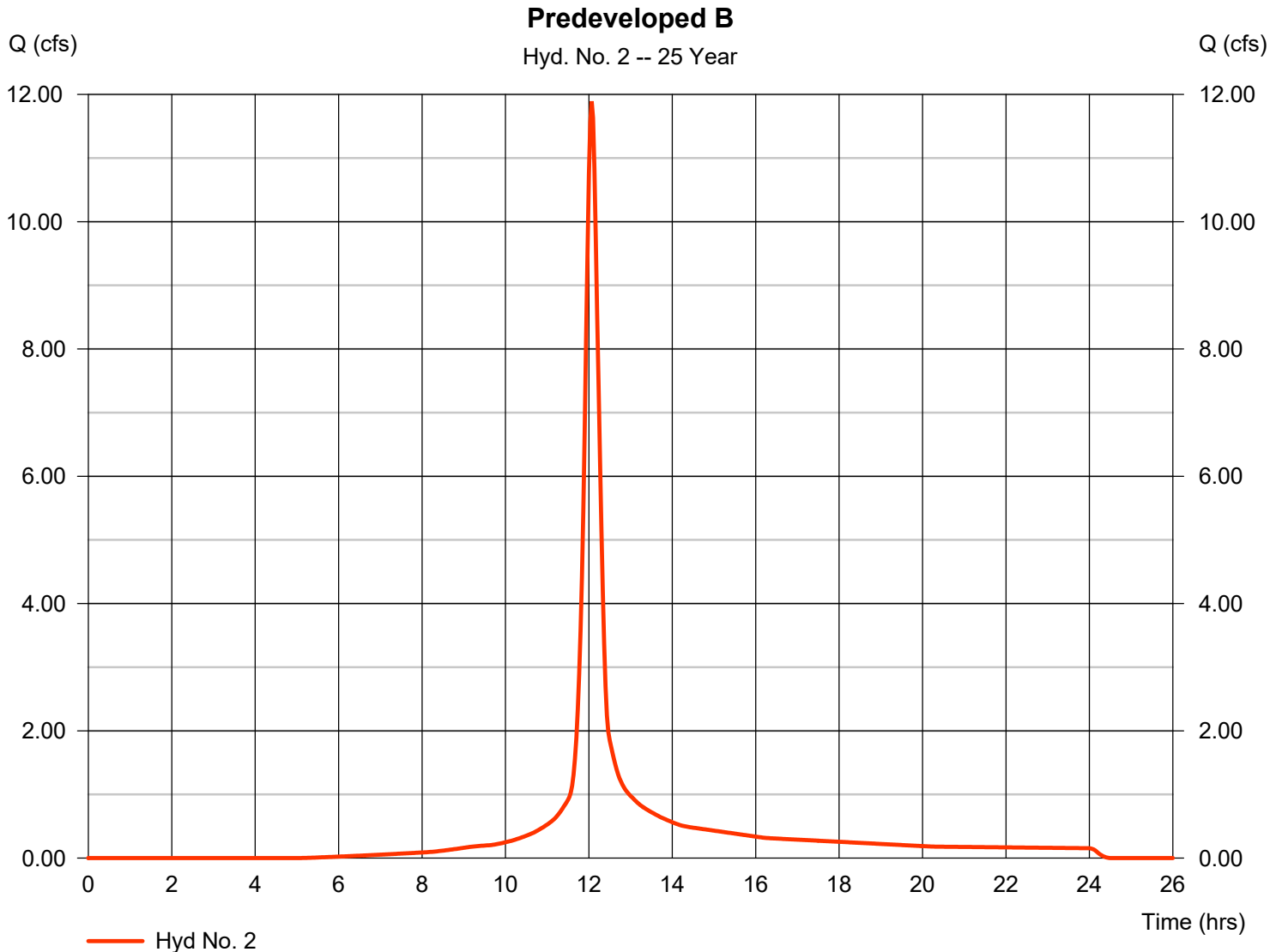
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Wednesday, 11 / 23 / 2022

## Hyd. No. 2

Predeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 11.89 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 37,726 cuft
Drainage area	= 3.310 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.30 min
Total precip.	= 4.44 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

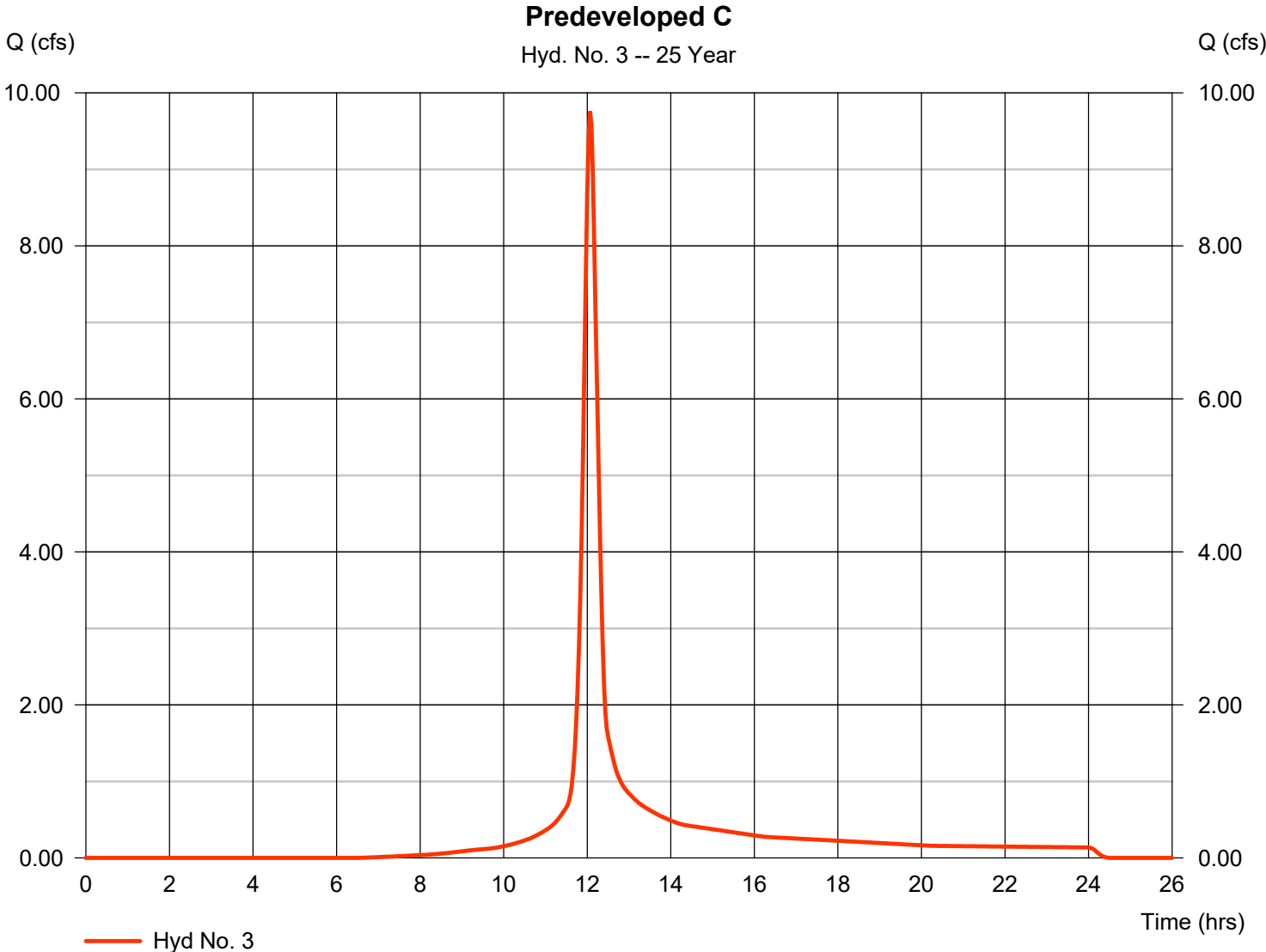
Wednesday, 11 / 23 / 2022

## Hyd. No. 3

Predeveloped C

Hydrograph type	= SCS Runoff	Peak discharge	= 9.760 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 30,587 cuft
Drainage area	= 3.050 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 17.50 min
Total precip.	= 4.44 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(2.260 x 88) + (0.400 x 73) + (0.390 x 74)] / 3.050



# Hydrograph Report

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

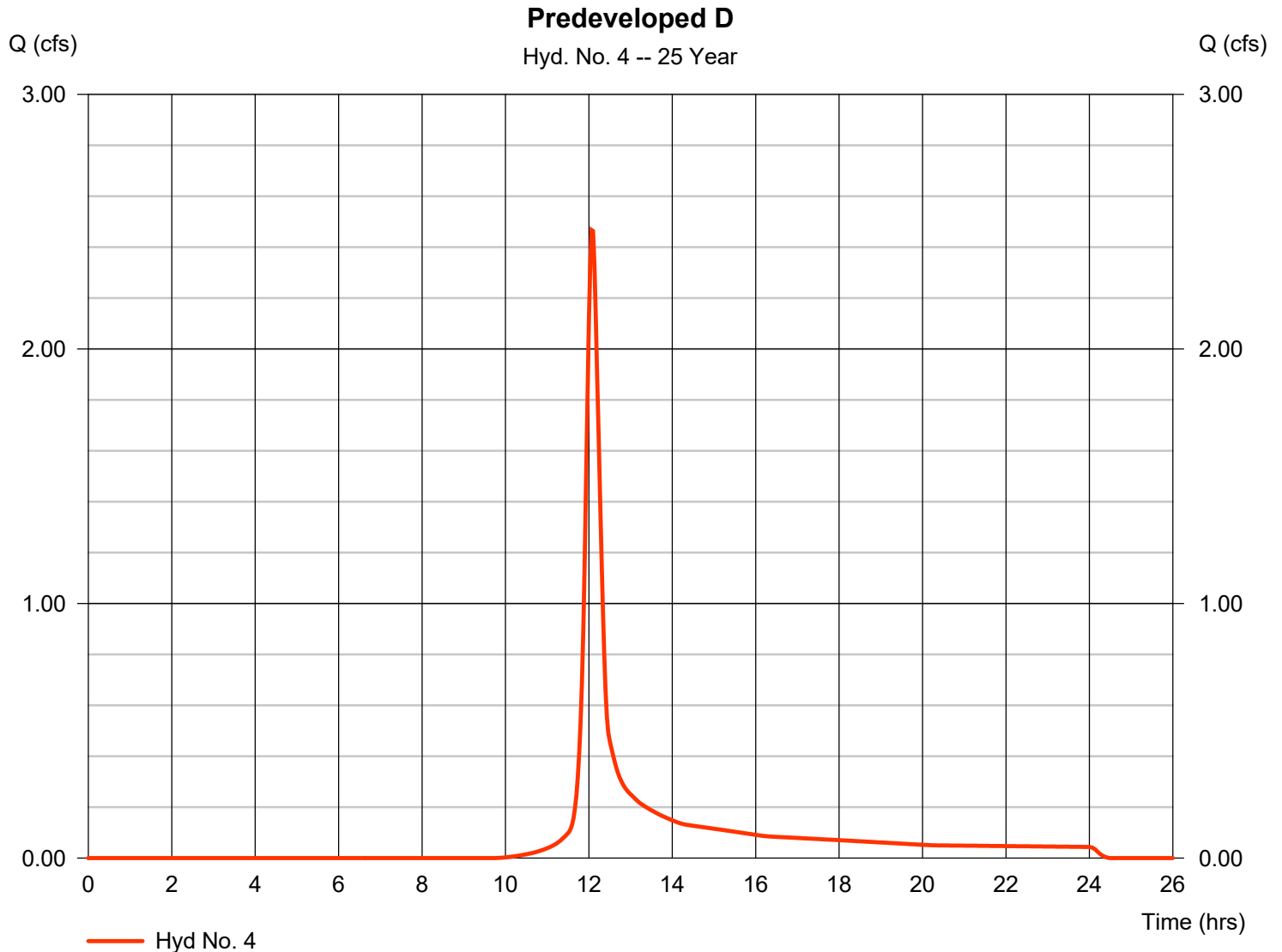
Wednesday, 11 / 23 / 2022

## Hyd. No. 4

Predeveloped D

Hydrograph type	= SCS Runoff	Peak discharge	= 2.467 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 7,859 cuft
Drainage area	= 1.170 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 16.90 min
Total precip.	= 4.44 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.610 x 73) + (0.560 x 74)] / 1.170



# Hydrograph Report

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

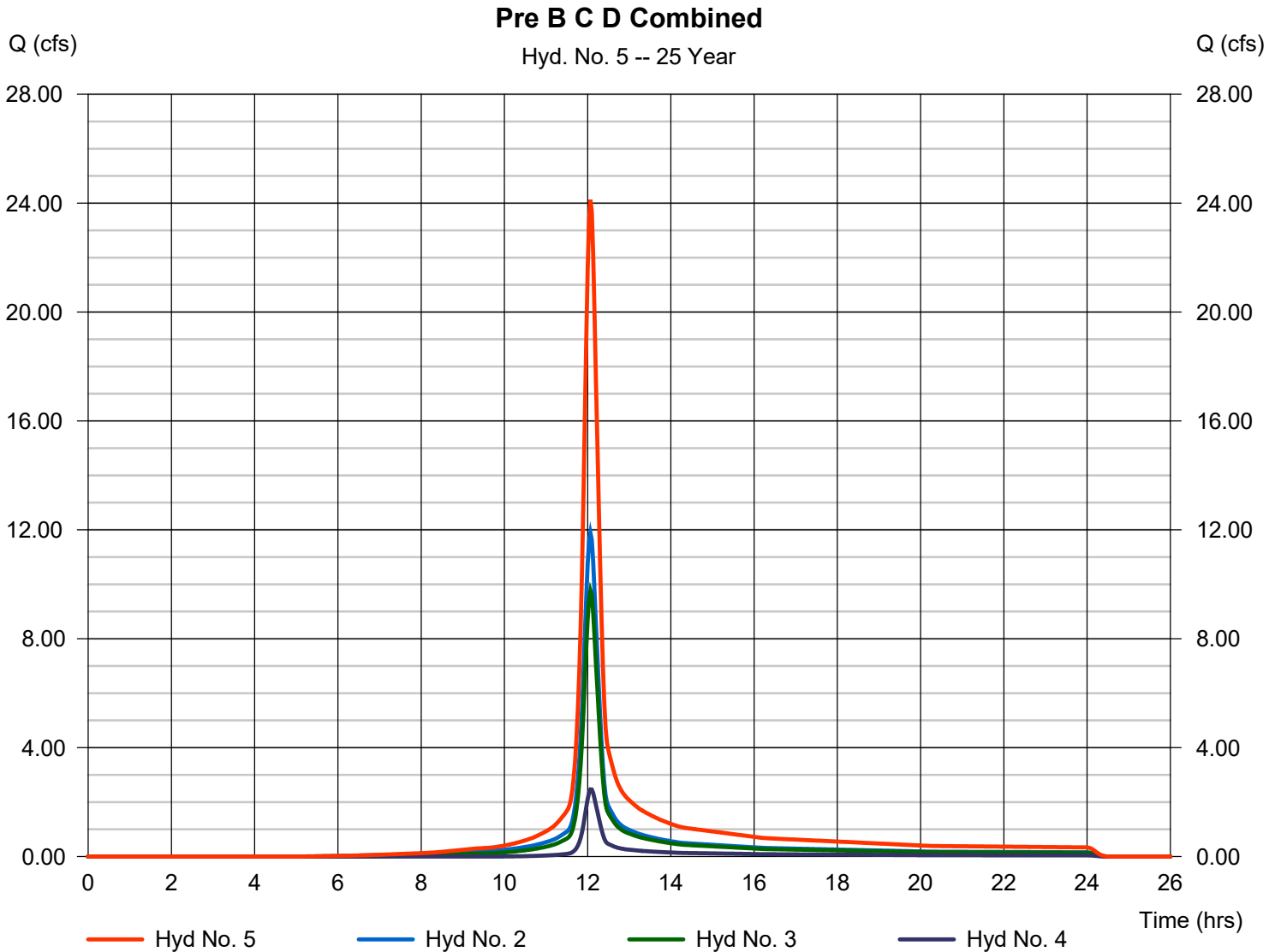
Wednesday, 11 / 23 / 2022

## Hyd. No. 5

Pre B C D Combined

Hydrograph type = Combine  
Storm frequency = 25 yrs  
Time interval = 2 min  
Inflow hyds. = 2, 3, 4

Peak discharge = 24.12 cfs  
Time to peak = 12.07 hrs  
Hyd. volume = 76,172 cuft  
Contrib. drain. area = 7.530 ac





# Hydrograph Report

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

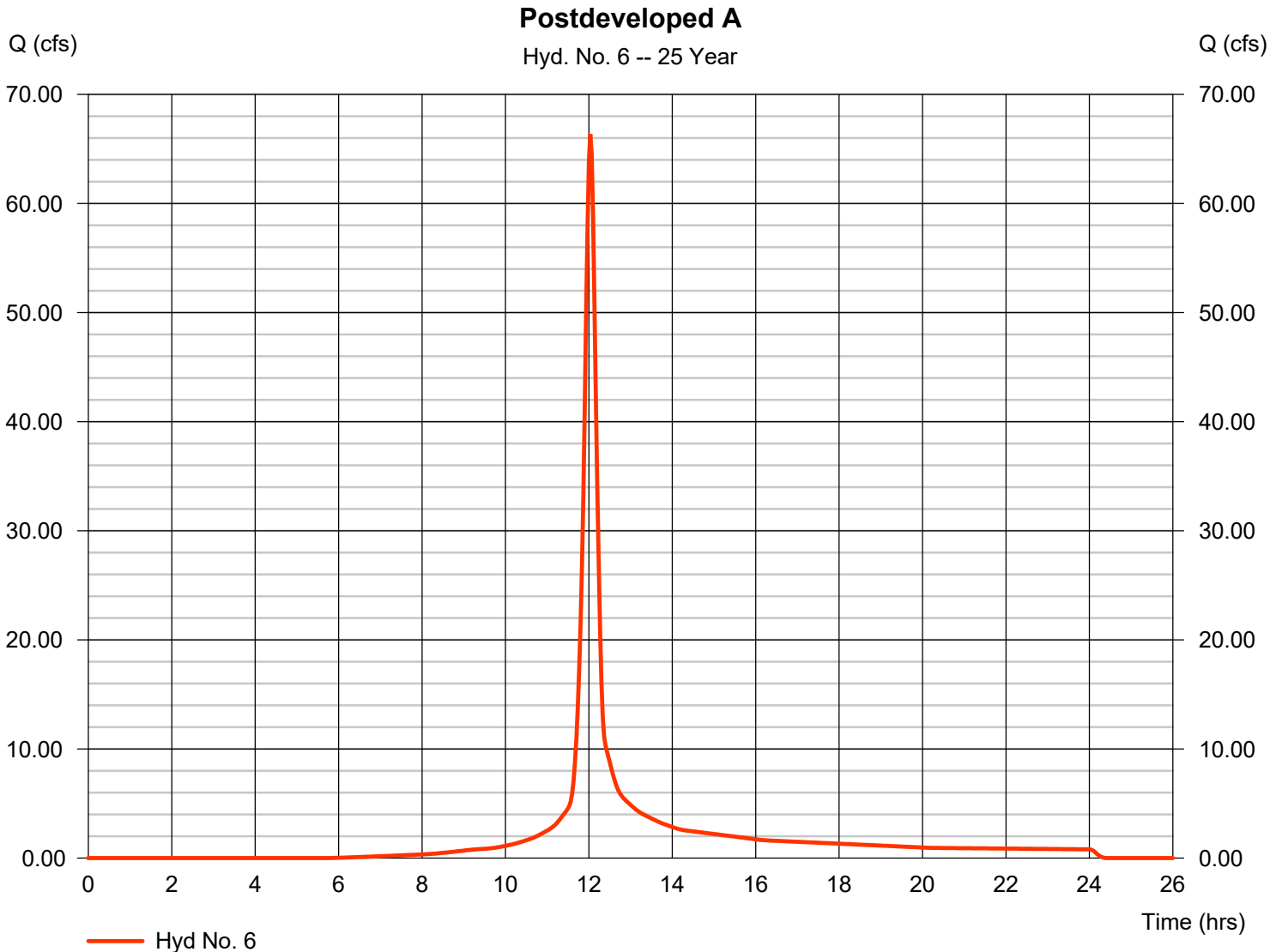
Wednesday, 11 / 23 / 2022

## Hyd. No. 6

Postdeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 66.36 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 188,016 cuft
Drainage area	= 18.020 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.44 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(9.100 x 98) + (8.920 x 74)] / 18.020



# Hydrograph Report

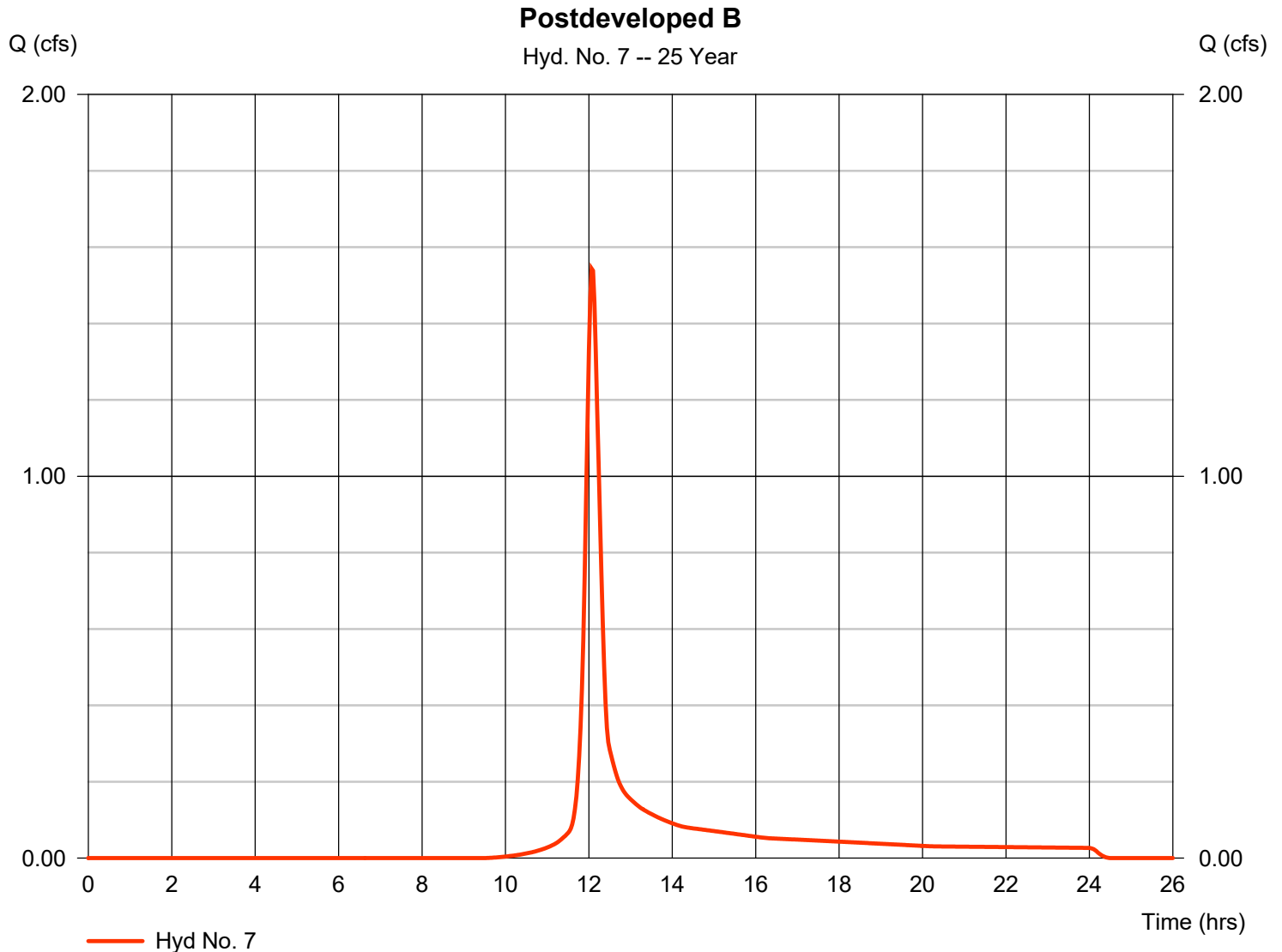
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Wednesday, 11 / 23 / 2022

## Hyd. No. 7

Postdeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 1.543 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 4,895 cuft
Drainage area	= 0.700 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.90 min
Total precip.	= 4.44 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

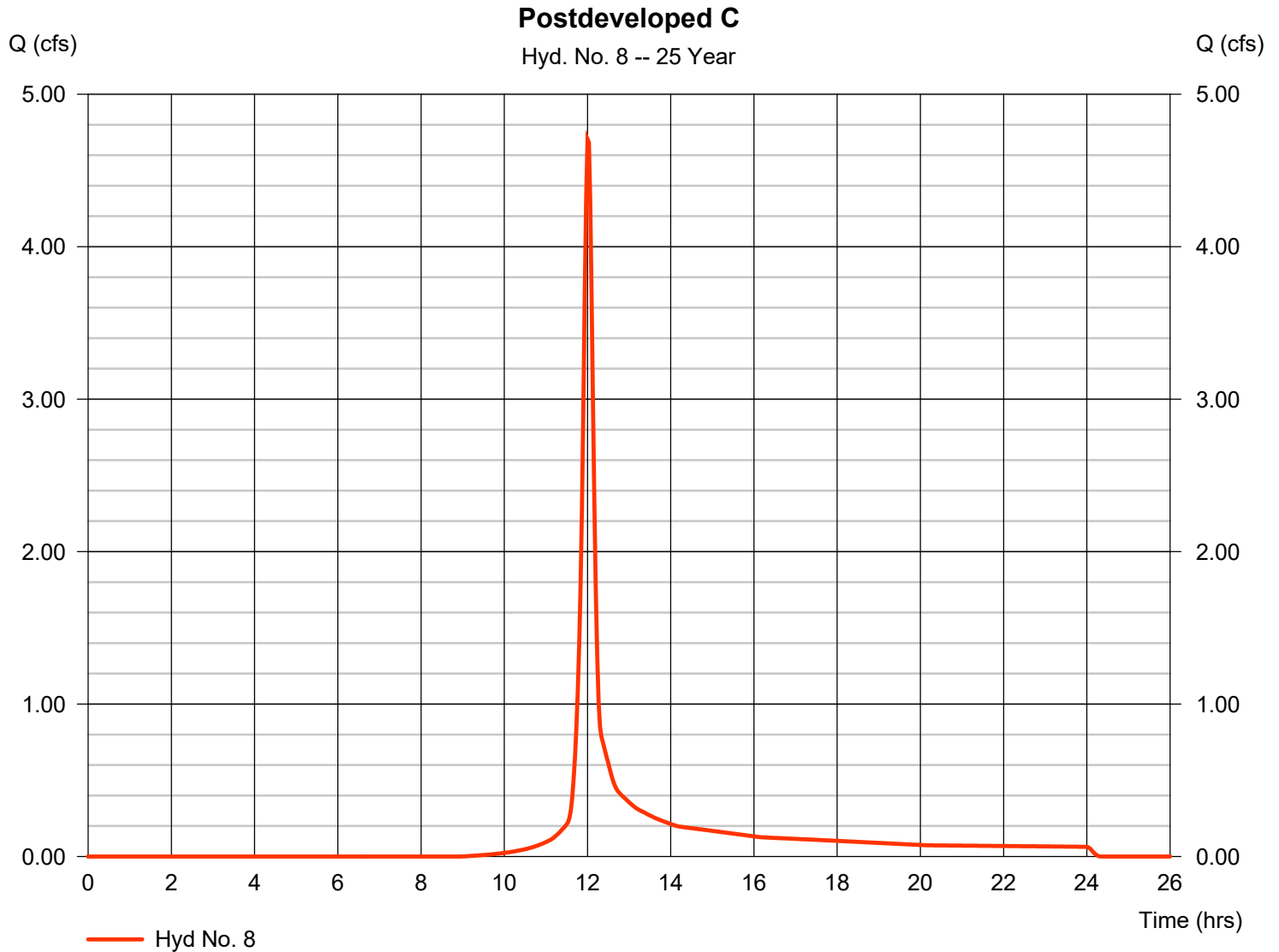
Wednesday, 11 / 23 / 2022

## Hyd. No. 8

Postdeveloped C

Hydrograph type	= SCS Runoff	Peak discharge	= 4.704 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 12,236 cuft
Drainage area	= 1.570 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.44 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.110 x 98) + (1.460 x 74)] / 1.570



# Hydrograph Report

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

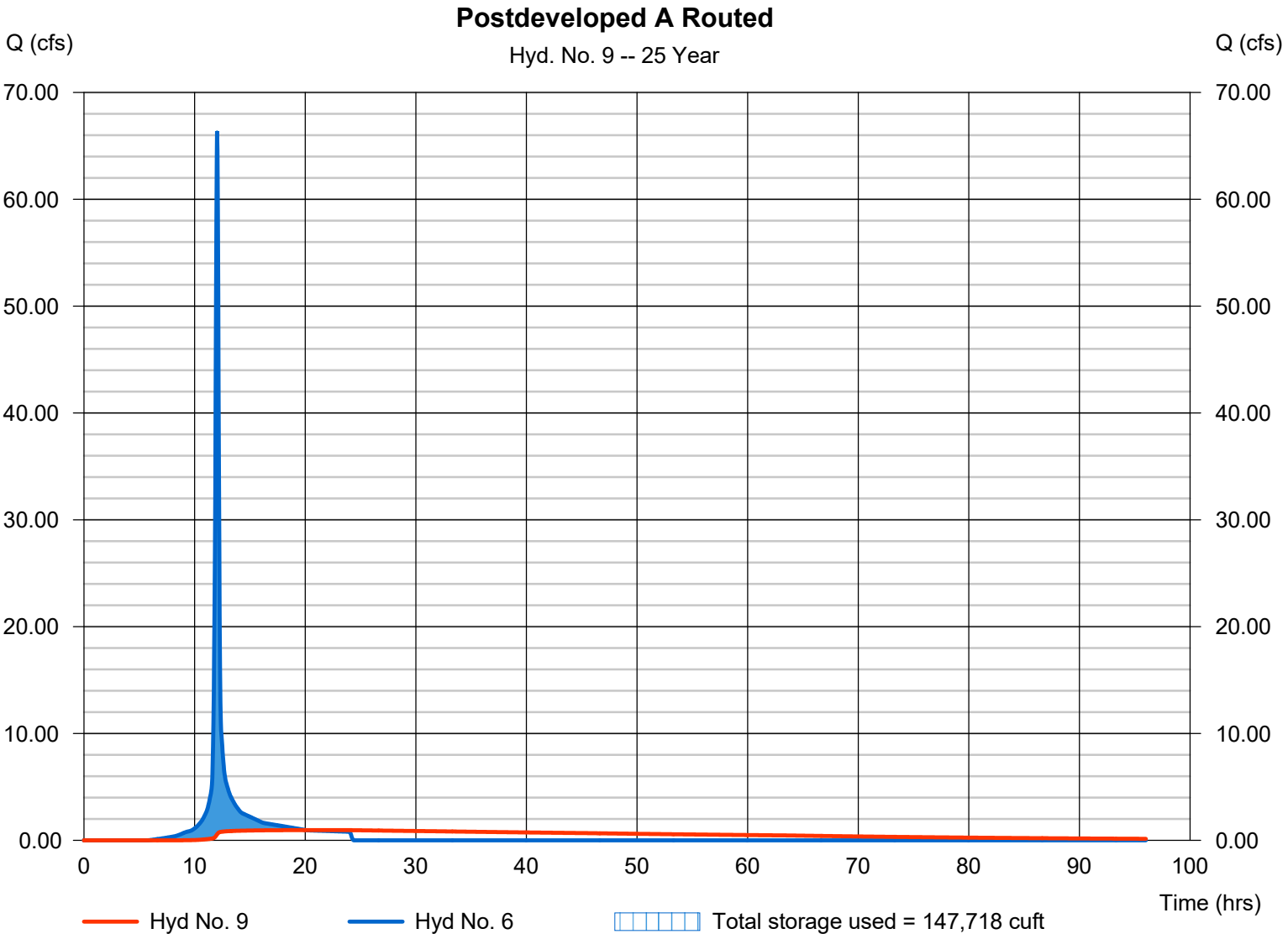
Wednesday, 11 / 23 / 2022

## Hyd. No. 9

Postdeveloped A Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.956 cfs
Storm frequency	= 25 yrs	Time to peak	= 20.07 hrs
Time interval	= 2 min	Hyd. volume	= 171,598 cuft
Inflow hyd. No.	= 6 - Postdeveloped A	Max. Elevation	= 707.56 ft
Reservoir name	= Proposed Retention Pond	Max. Storage	= 147,718 cuft

Storage Indication method used.



# Hydrograph Report

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

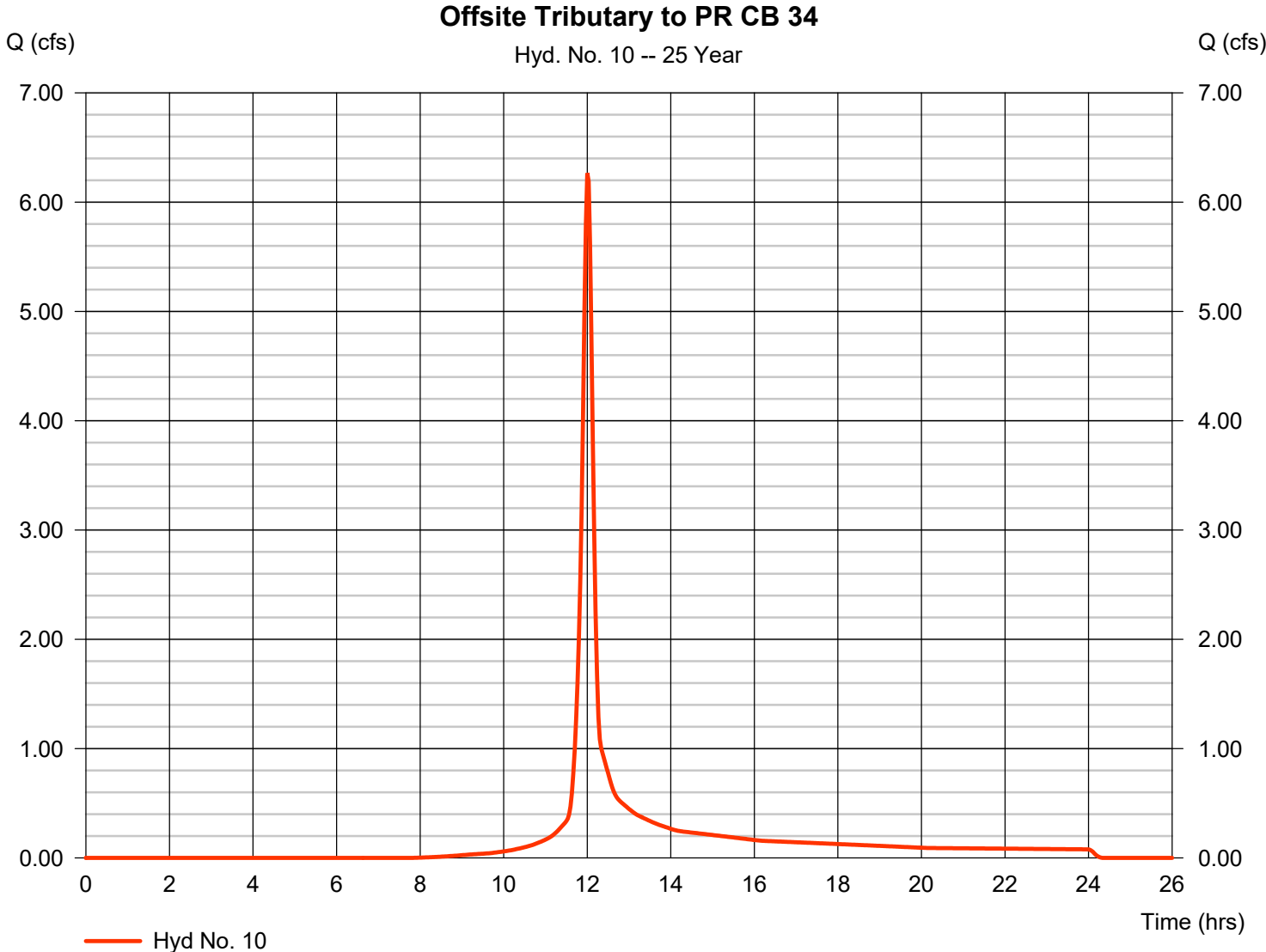
Wednesday, 11 / 23 / 2022

## Hyd. No. 10

Offsite Tributary to PR CB 34

Hydrograph type	= SCS Runoff	Peak discharge	= 6.265 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 16,242 cuft
Drainage area	= 1.800 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.44 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.490 x 98) + (0.690 x 73) + (0.620 x 74)] / 1.800



# Hydrograph Report

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

Wednesday, 11 / 23 / 2022

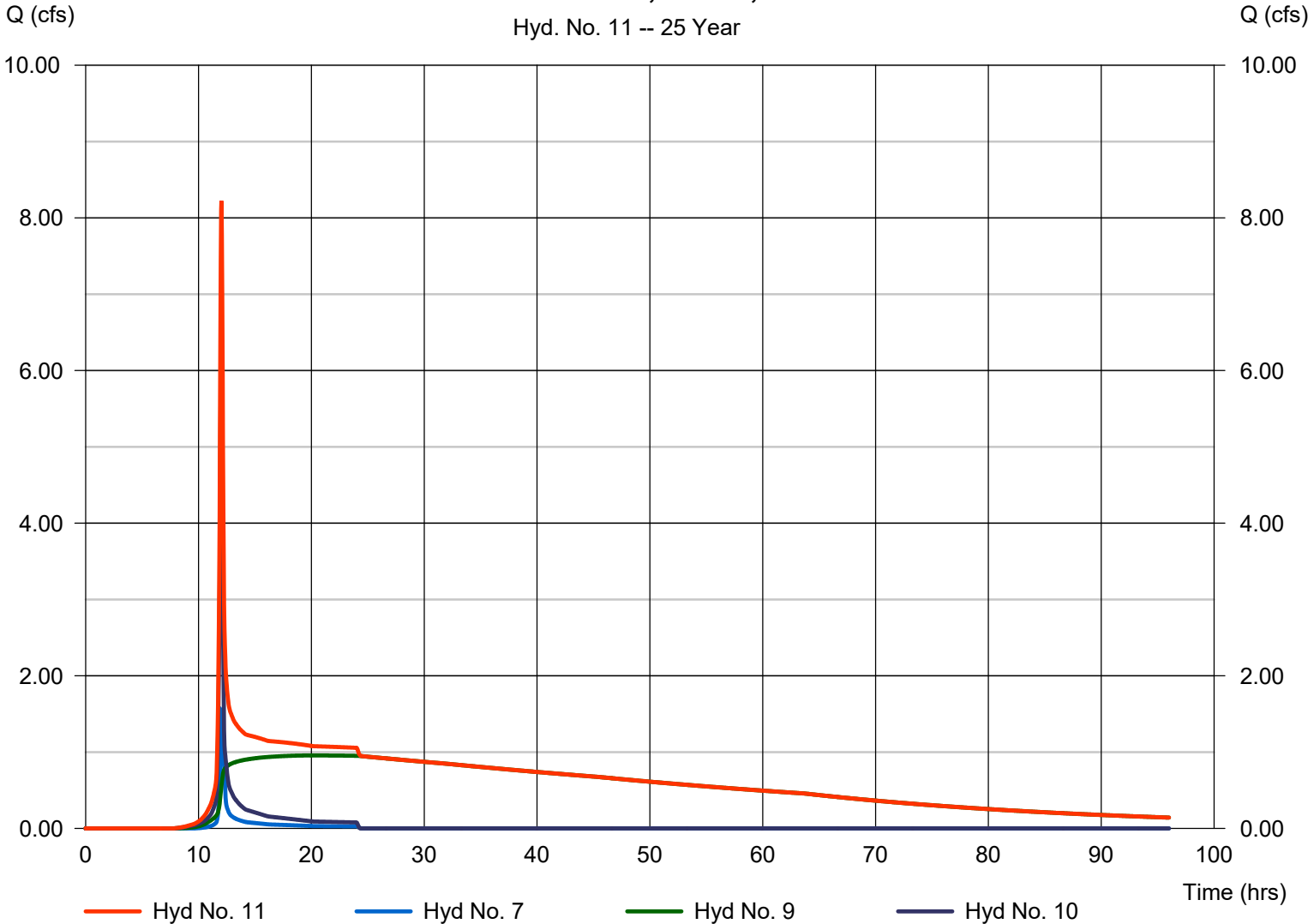
## Hyd. No. 11

Actual Release Rate Post A, Post B, Offsite Combin

Hydrograph type = Combine  
Storm frequency = 25 yrs  
Time interval = 2 min  
Inflow hyds. = 7, 9, 10

Peak discharge = 8.221 cfs  
Time to peak = 12.03 hrs  
Hyd. volume = 192,735 cuft  
Contrib. drain. area = 2.500 ac

Actual Release Rate Post A, Post B, Offsite Combin



# 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	42.95	2	728	158,930	-----	-----	-----	Predeveloped A
2	SCS Runoff	13.88	2	724	44,312	-----	-----	-----	Predeveloped B
3	SCS Runoff	11.58	2	724	36,411	-----	-----	-----	Predeveloped C
4	SCS Runoff	3.091	2	724	9,752	-----	-----	-----	Predeveloped D
5	Combine	28.55	2	724	90,475	2, 3, 4	-----	-----	Pre B C D Combined
6	SCS Runoff	78.00	2	722	222,307	-----	-----	-----	Postdeveloped A
7	SCS Runoff	1.922	2	724	6,048	-----	-----	-----	Postdeveloped B
8	SCS Runoff	5.783	2	720	14,999	-----	-----	-----	Postdeveloped C
9	Reservoir	1.064	2	1224	201,119	6	707.85	176,629	Postdeveloped A Routed
10	SCS Runoff	7.553	2	720	19,610	-----	-----	-----	Offsite Tributary to PR CB 34
11	Combine	9.924	2	722	226,778	7, 9, 10	-----	-----	Actual Release Rate Post A, Post B,
E221073 Hydro.gpw					Return Period: 50 Year			Wednesday, 11 / 23 / 2022	

# Hydrograph Report

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

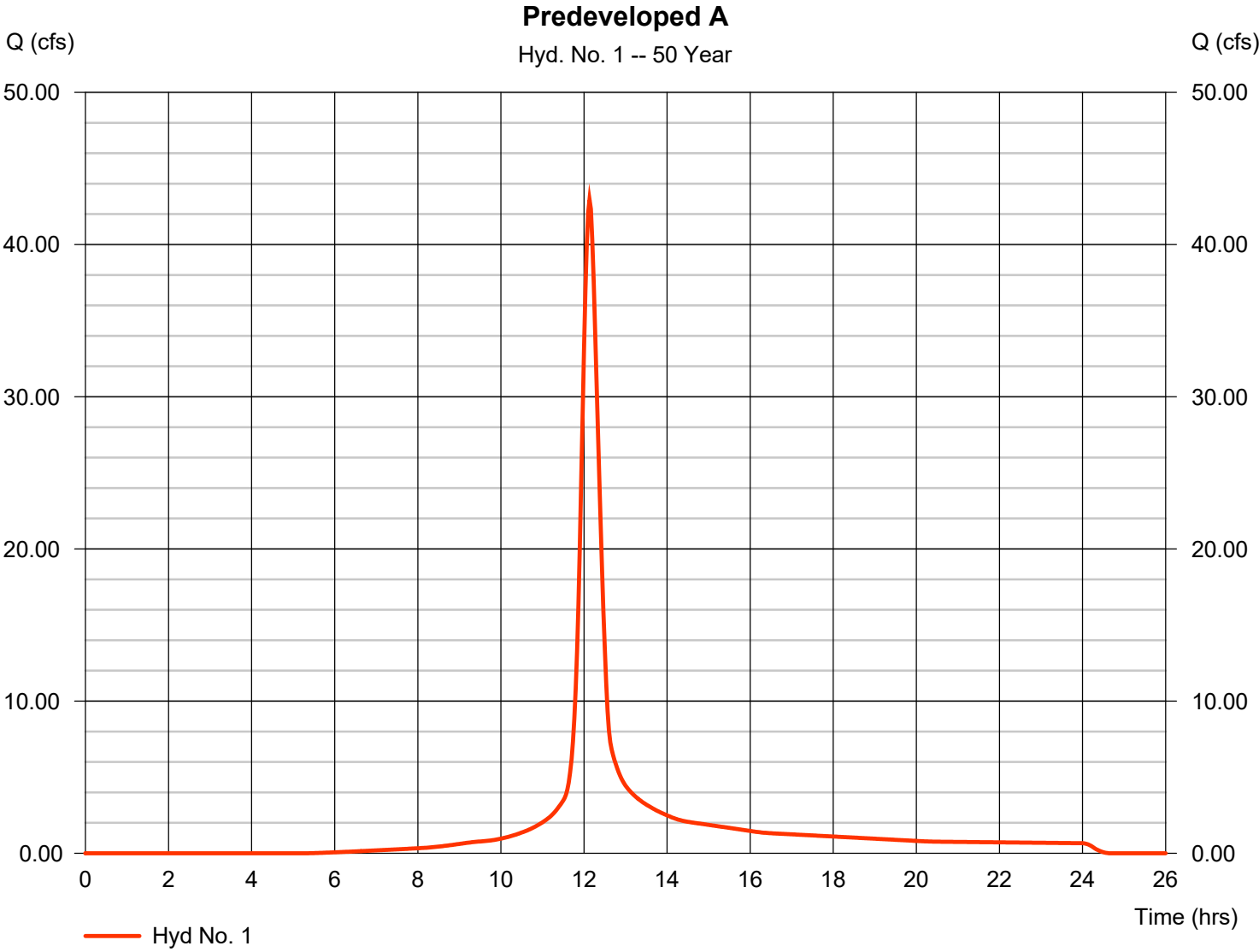
Wednesday, 11 / 23 / 2022

## Hyd. No. 1

Predeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 42.95 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 158,930 cuft
Drainage area	= 12.760 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 25.70 min
Total precip.	= 5.02 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(11.160 x 88) + (0.320 x 74) + (1.280 x 73)] / 12.760





# Hydrograph Report

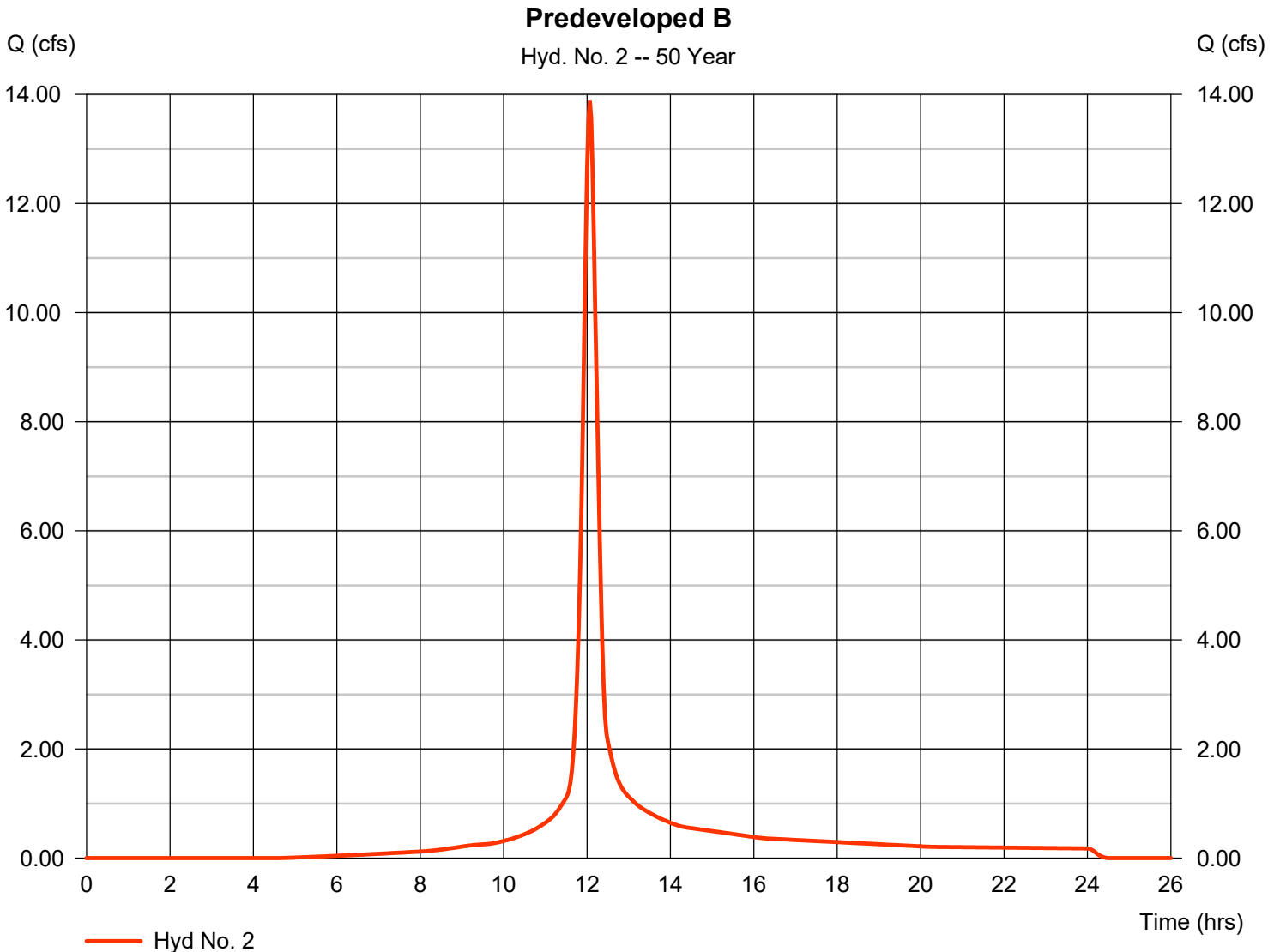
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Wednesday, 11 / 23 / 2022

## Hyd. No. 2

Predeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 13.88 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 44,312 cuft
Drainage area	= 3.310 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.30 min
Total precip.	= 5.02 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

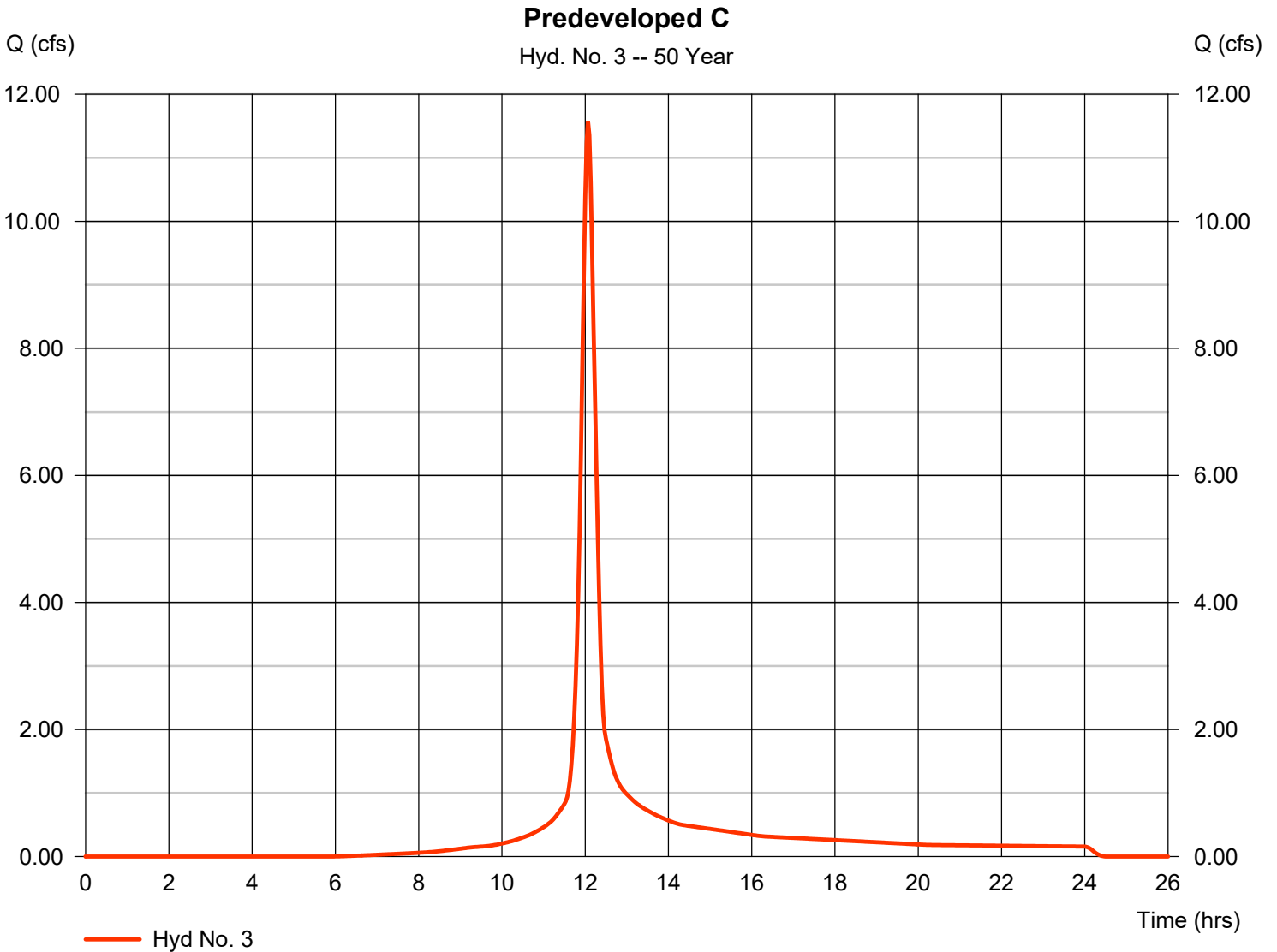
Wednesday, 11 / 23 / 2022

## Hyd. No. 3

Predeveloped C

Hydrograph type	= SCS Runoff	Peak discharge	= 11.58 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 36,411 cuft
Drainage area	= 3.050 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 17.50 min
Total precip.	= 5.02 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(2.260 x 88) + (0.400 x 73) + (0.390 x 74)] / 3.050



# Hydrograph Report

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

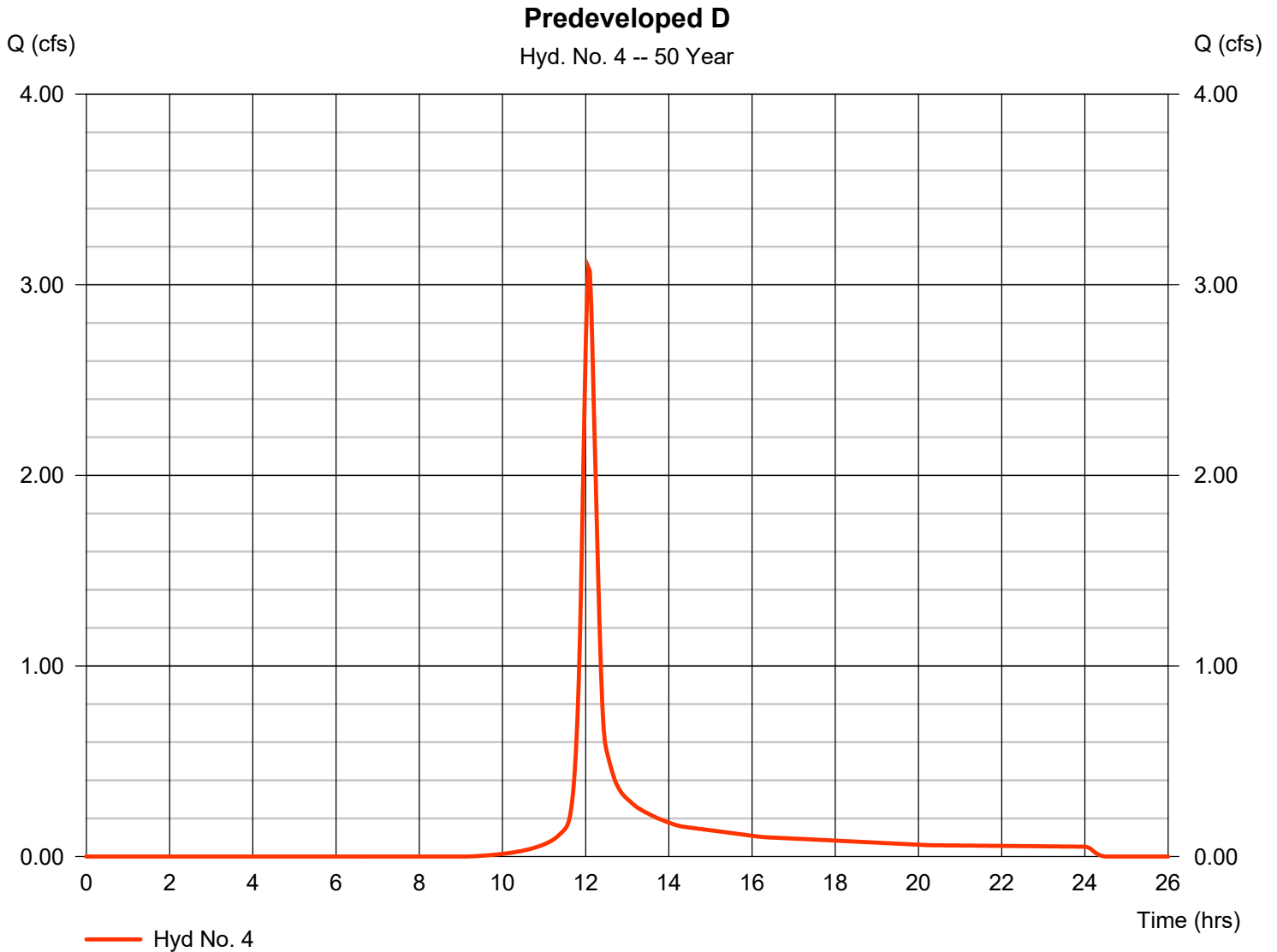
Wednesday, 11 / 23 / 2022

## Hyd. No. 4

Predeveloped D

Hydrograph type	= SCS Runoff	Peak discharge	= 3.091 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 9,752 cuft
Drainage area	= 1.170 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 16.90 min
Total precip.	= 5.02 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.610 x 73) + (0.560 x 74)] / 1.170



# Hydrograph Report

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

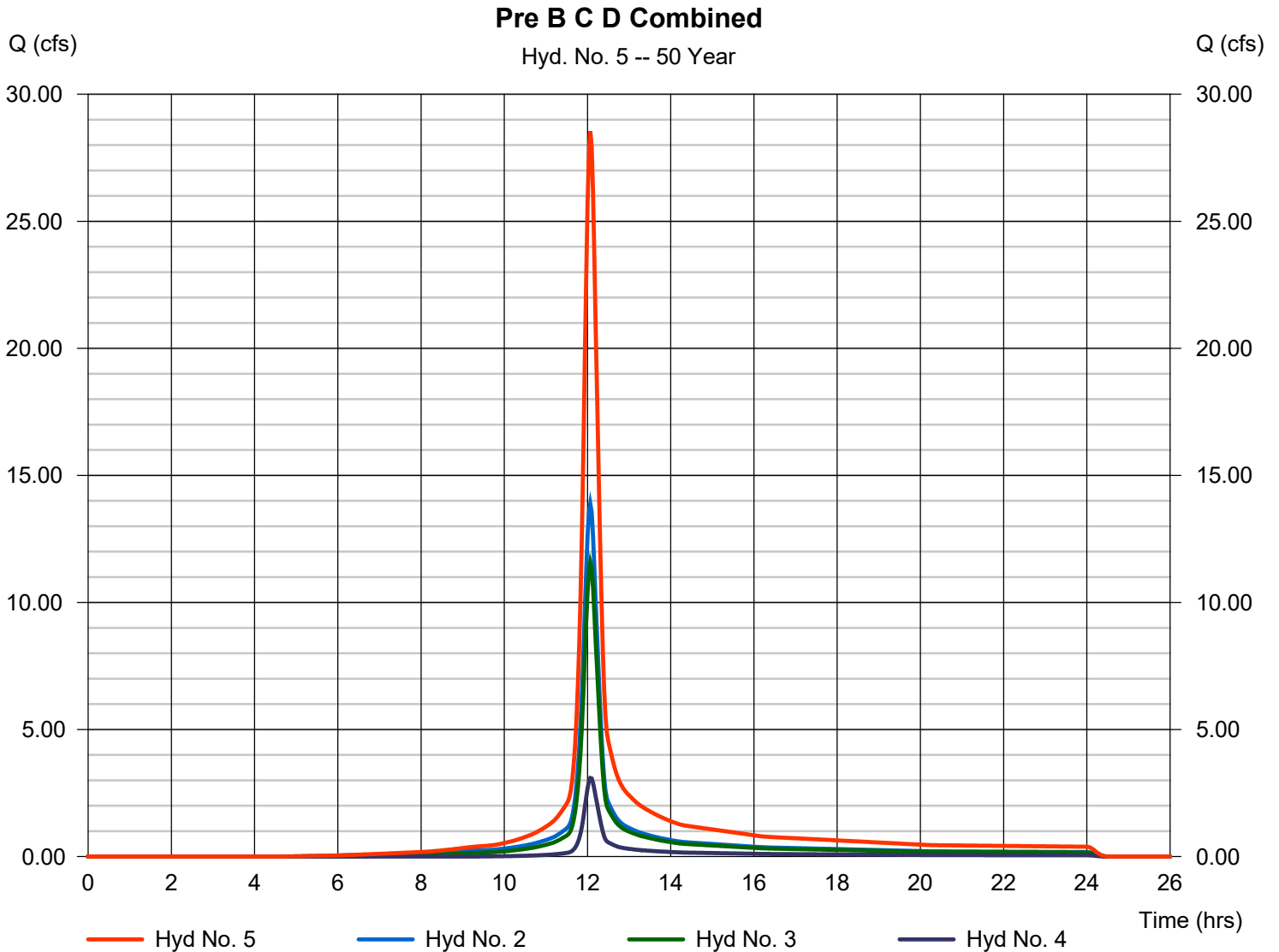
Wednesday, 11 / 23 / 2022

## Hyd. No. 5

Pre B C D Combined

Hydrograph type = Combine  
Storm frequency = 50 yrs  
Time interval = 2 min  
Inflow hyds. = 2, 3, 4

Peak discharge = 28.55 cfs  
Time to peak = 12.07 hrs  
Hyd. volume = 90,475 cuft  
Contrib. drain. area = 7.530 ac



# Hydrograph Report

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

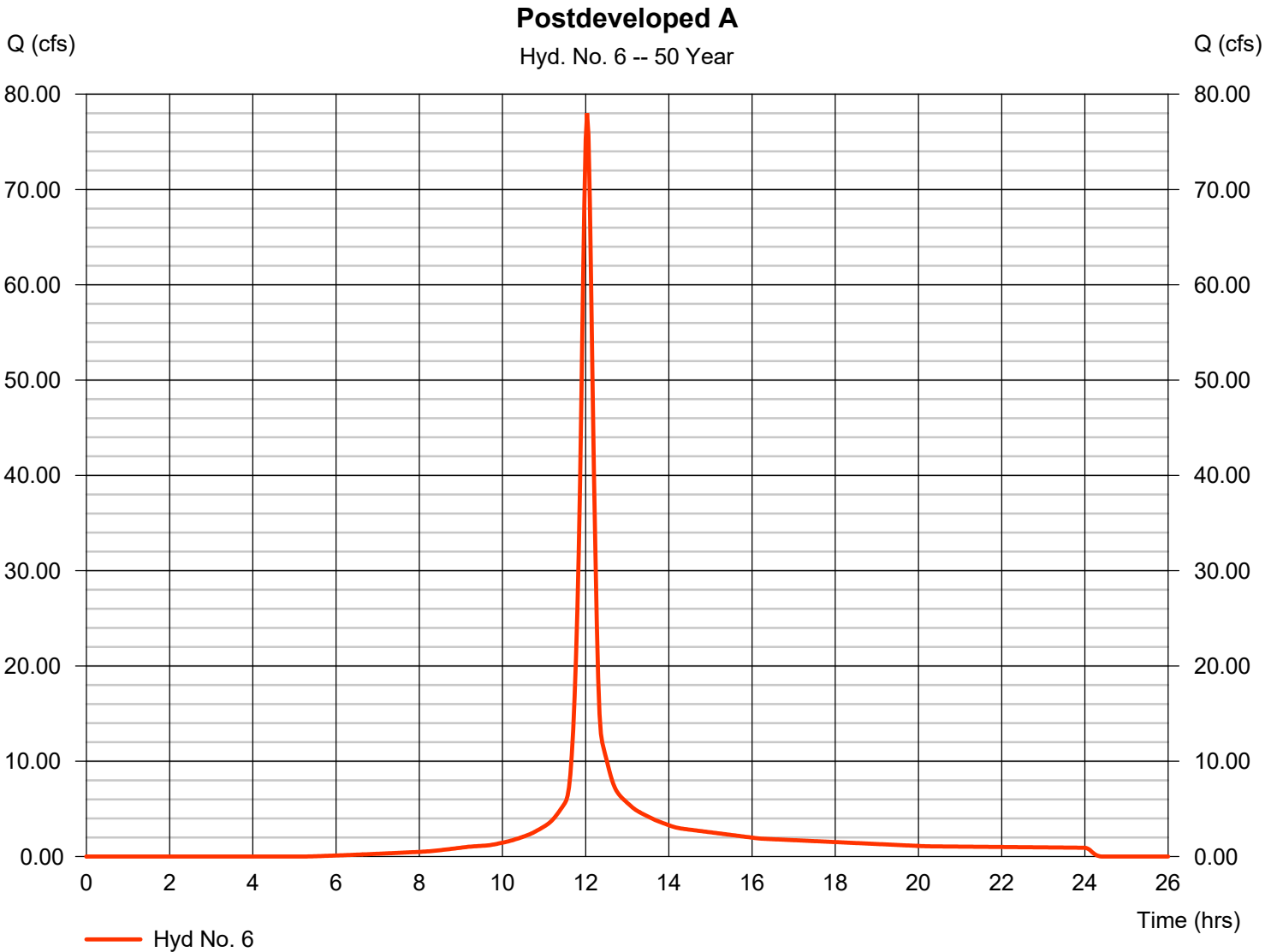
Wednesday, 11 / 23 / 2022

## Hyd. No. 6

Postdeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 78.00 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 222,307 cuft
Drainage area	= 18.020 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.02 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(9.100 x 98) + (8.920 x 74)] / 18.020



# Hydrograph Report

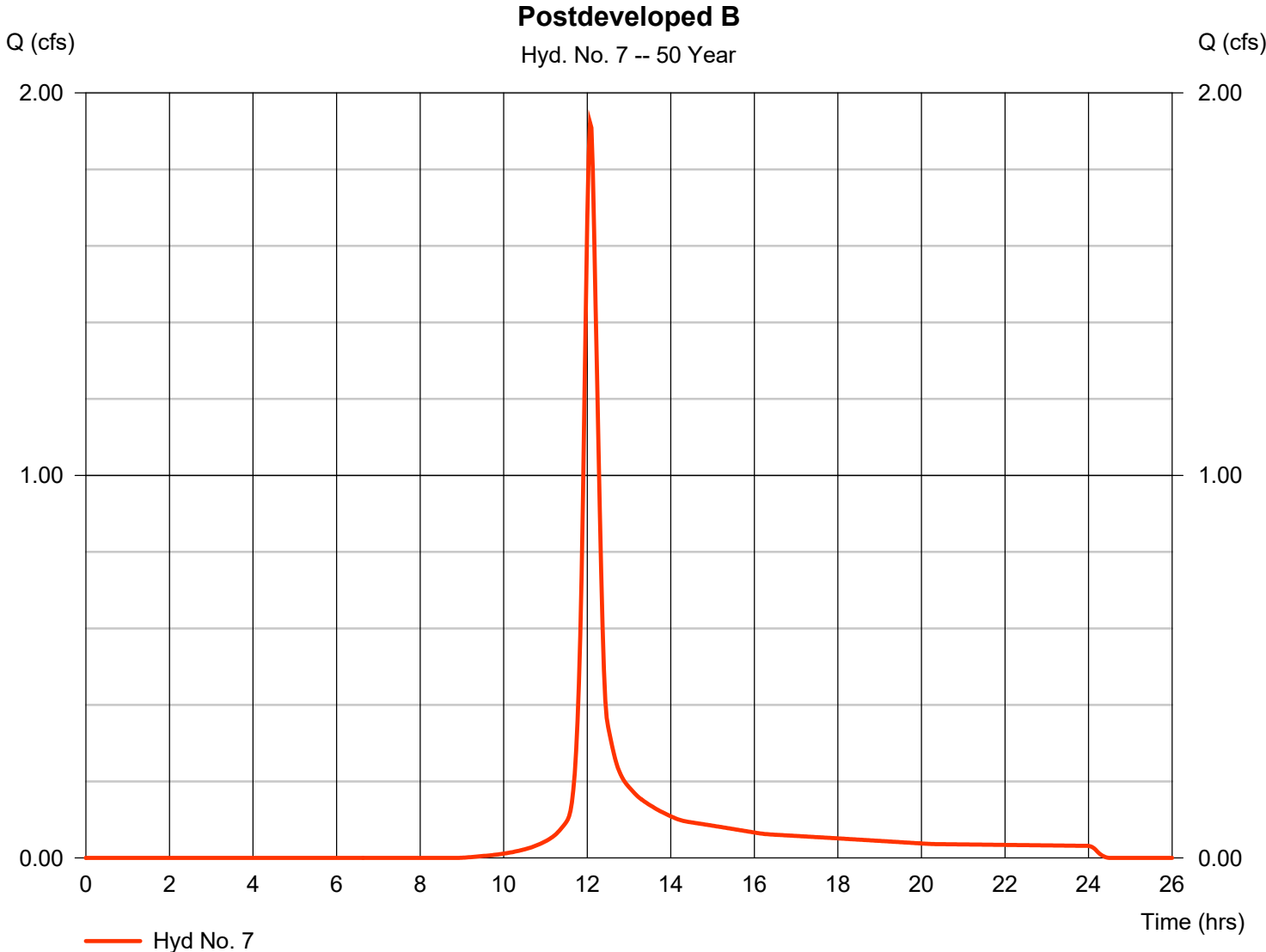
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Wednesday, 11 / 23 / 2022

## Hyd. No. 7

Postdeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 1.922 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 6,048 cuft
Drainage area	= 0.700 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.90 min
Total precip.	= 5.02 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

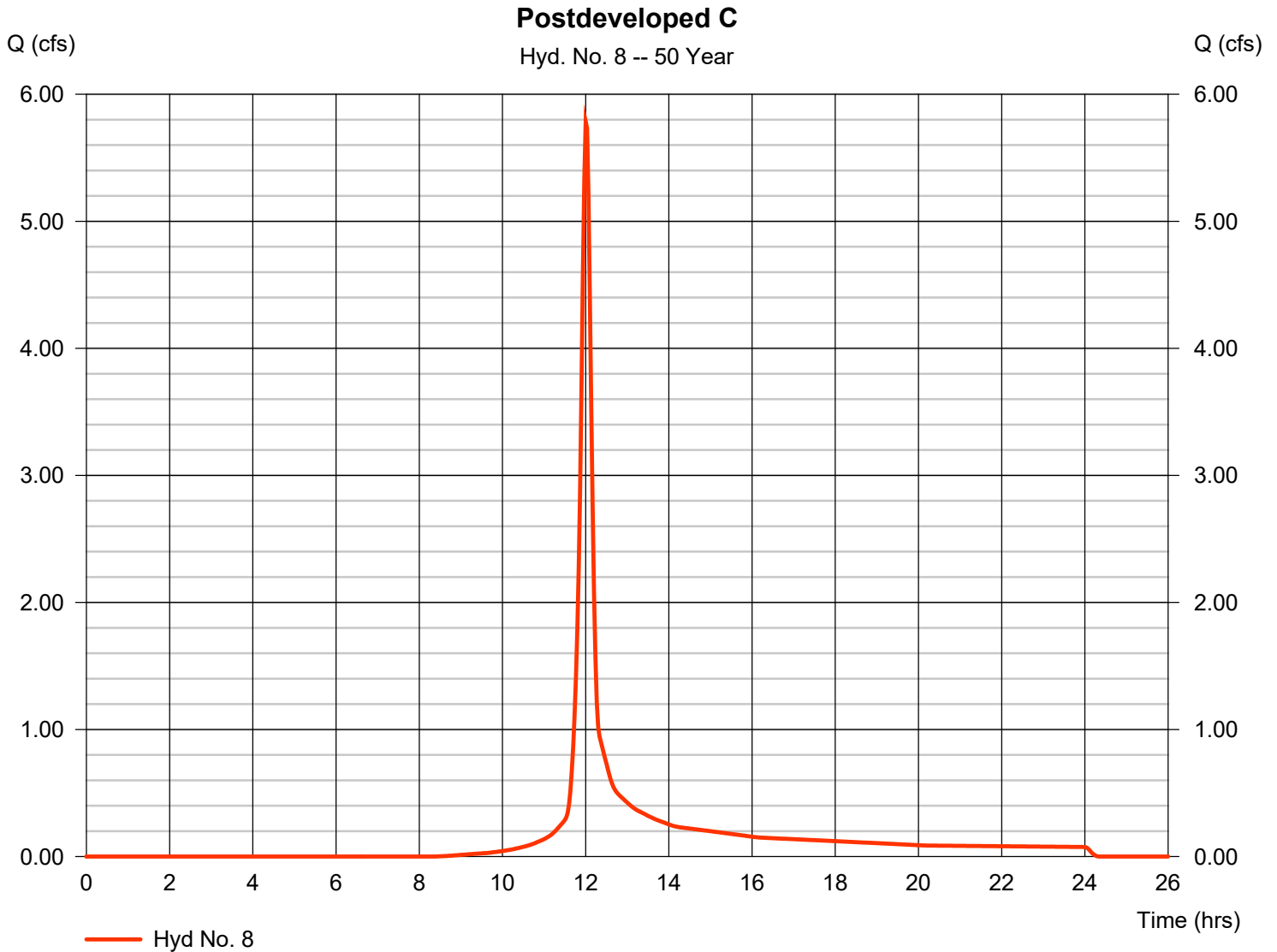
Wednesday, 11 / 23 / 2022

## Hyd. No. 8

Postdeveloped C

Hydrograph type	= SCS Runoff	Peak discharge	= 5.783 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 14,999 cuft
Drainage area	= 1.570 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.02 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.110 x 98) + (1.460 x 74)] / 1.570



# Hydrograph Report

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

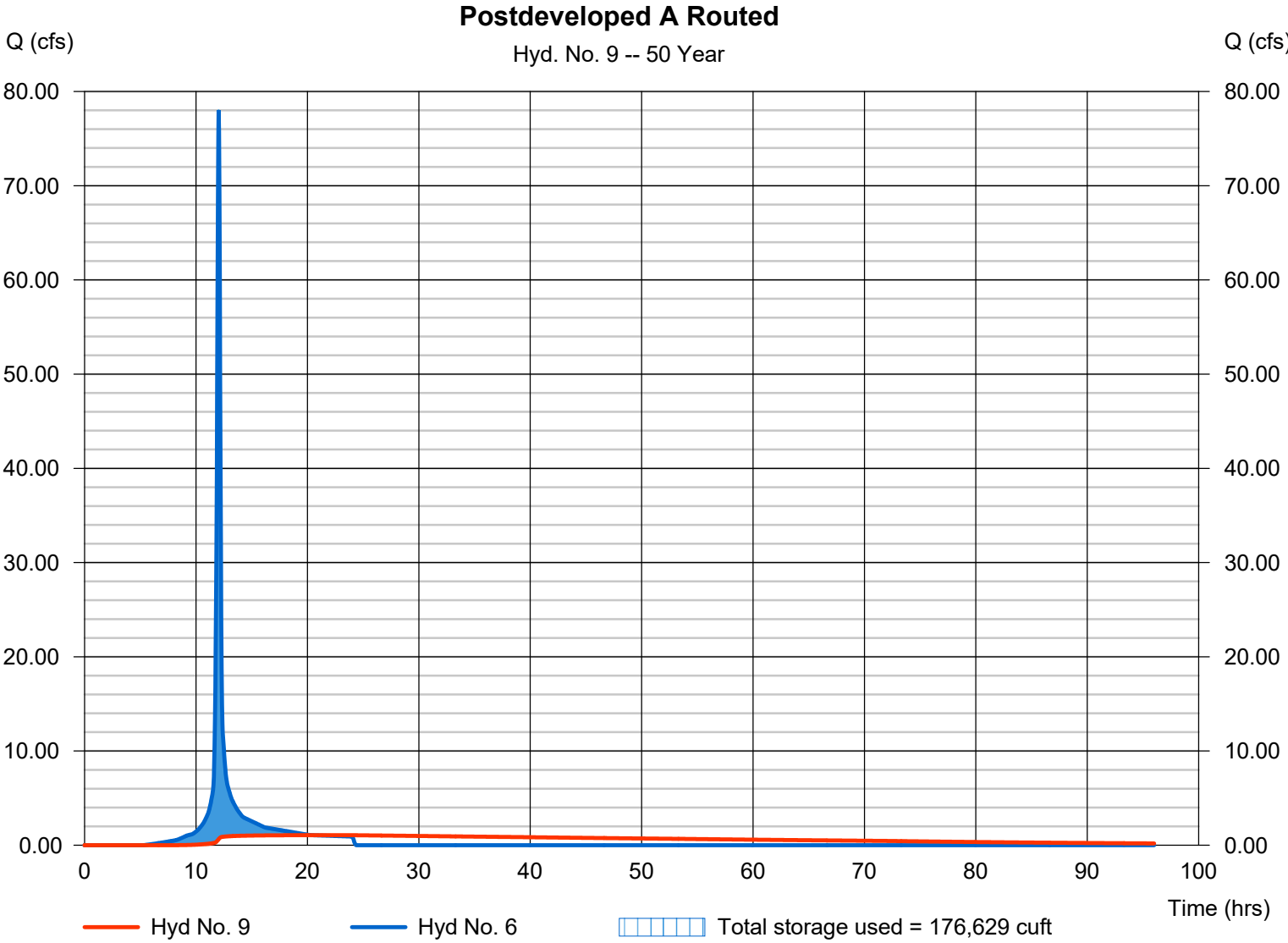
Wednesday, 11 / 23 / 2022

## Hyd. No. 9

Postdeveloped A Routed

Hydrograph type	= Reservoir	Peak discharge	= 1.064 cfs
Storm frequency	= 50 yrs	Time to peak	= 20.40 hrs
Time interval	= 2 min	Hyd. volume	= 201,119 cuft
Inflow hyd. No.	= 6 - Postdeveloped A	Max. Elevation	= 707.85 ft
Reservoir name	= Proposed Retention Pond	Max. Storage	= 176,629 cuft

Storage Indication method used.





# Hydrograph Report

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

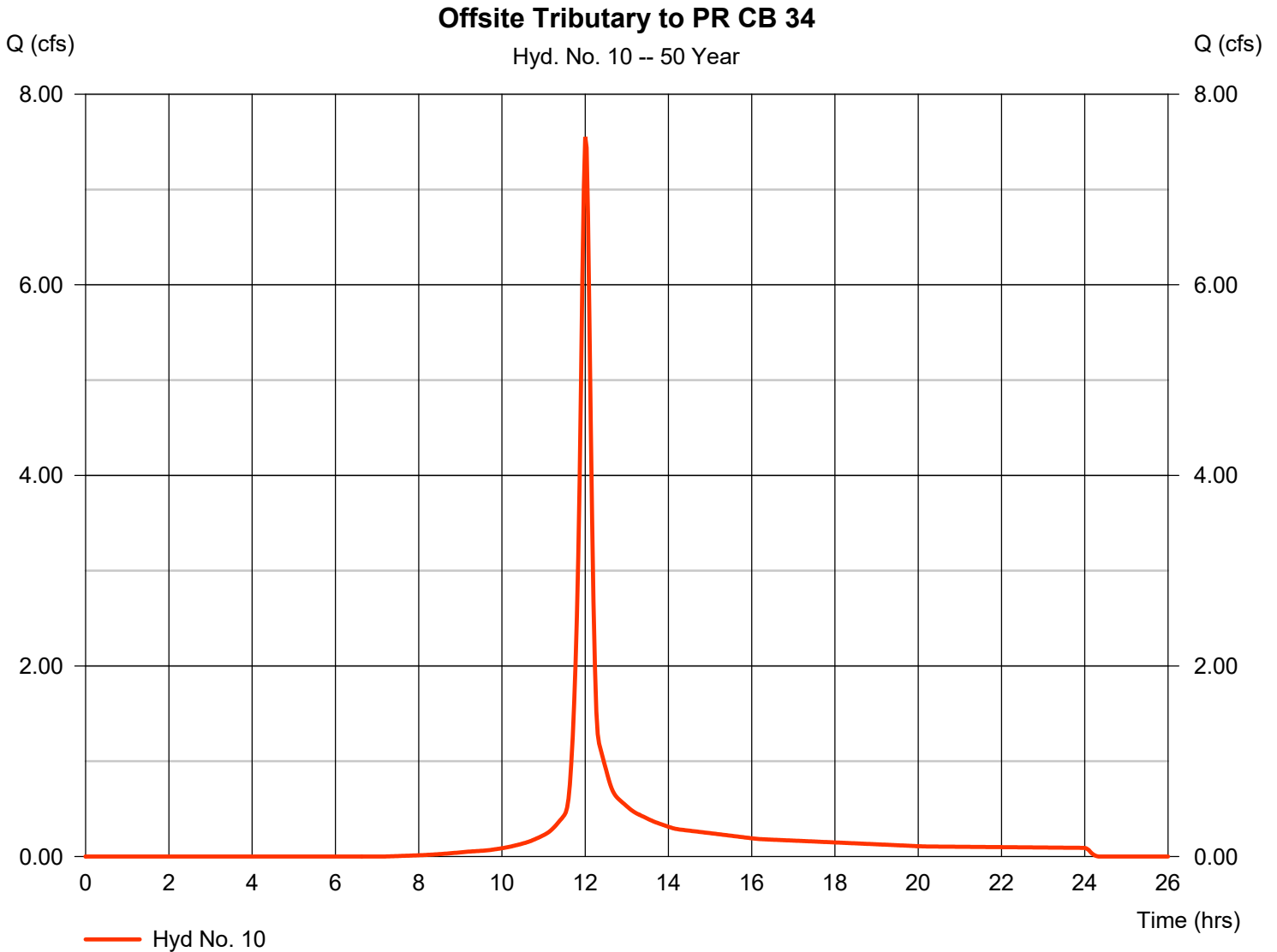
Wednesday, 11 / 23 / 2022

## Hyd. No. 10

Offsite Tributary to PR CB 34

Hydrograph type	= SCS Runoff	Peak discharge	= 7.553 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 19,610 cuft
Drainage area	= 1.800 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.02 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.490 x 98) + (0.690 x 73) + (0.620 x 74)] / 1.800



# Hydrograph Report

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

Wednesday, 11 / 23 / 2022

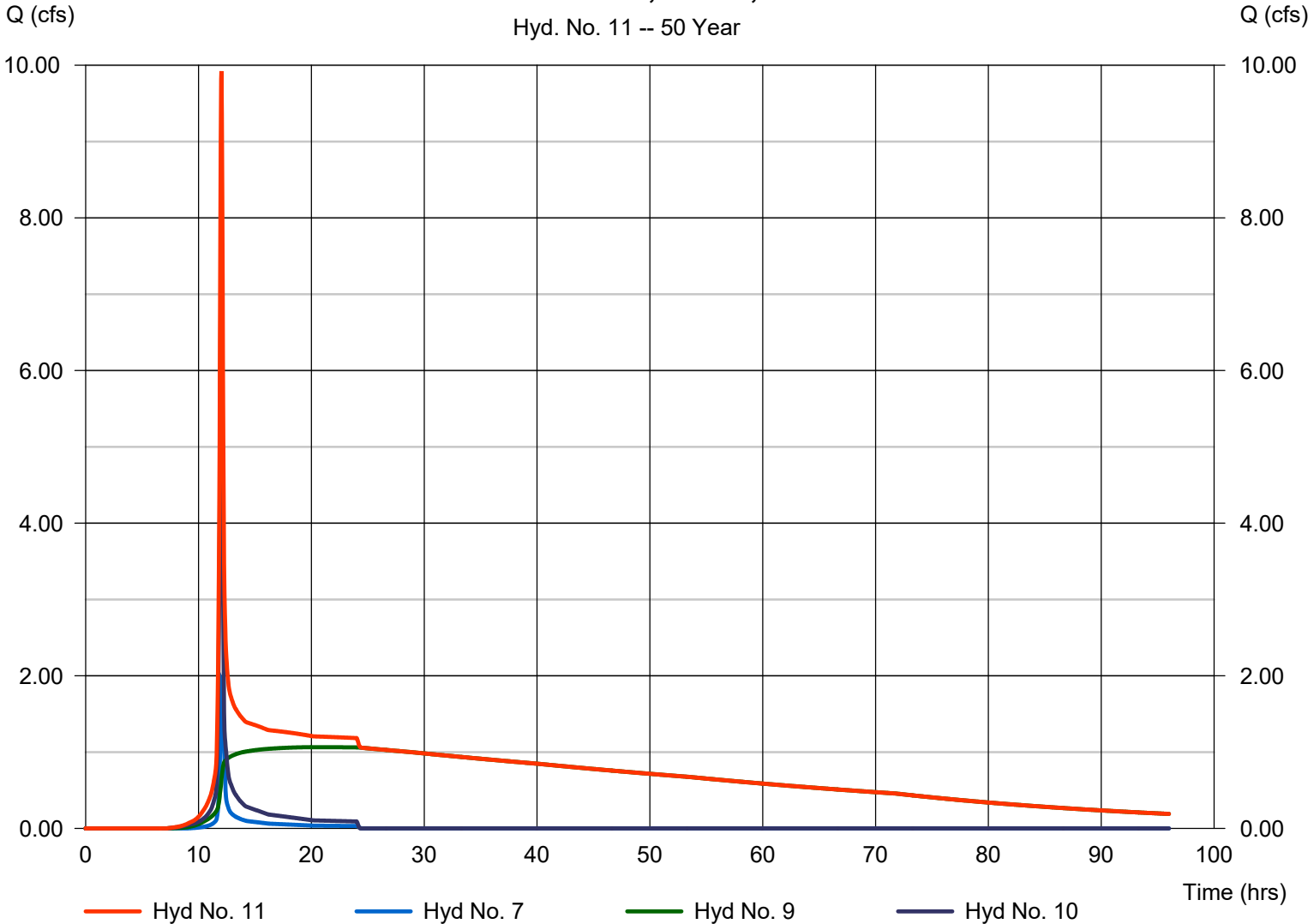
## Hyd. No. 11

Actual Release Rate Post A, Post B, Offsite Combin

Hydrograph type = Combine  
Storm frequency = 50 yrs  
Time interval = 2 min  
Inflow hyds. = 7, 9, 10

Peak discharge = 9.924 cfs  
Time to peak = 12.03 hrs  
Hyd. volume = 226,778 cuft  
Contrib. drain. area = 2.500 ac

Actual Release Rate Post A, Post B, Offsite Combin



# 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	49.77	2	728	185,061	-----	-----	-----	Predeveloped A
2	SCS Runoff	15.97	2	724	51,309	-----	-----	-----	Predeveloped B
3	SCS Runoff	13.50	2	724	42,641	-----	-----	-----	Predeveloped C
4	SCS Runoff	3.768	2	724	11,826	-----	-----	-----	Predeveloped D
5	Combine	33.24	2	724	105,776	2, 3, 4	-----	-----	Pre B C D Combined
6	SCS Runoff	90.26	2	722	258,859	-----	-----	-----	Postdeveloped A
7	SCS Runoff	2.333	2	724	7,309	-----	-----	-----	Postdeveloped B
8	SCS Runoff	6.944	2	720	18,003	-----	-----	-----	Postdeveloped C
9	Reservoir	1.622	2	1106	233,650	6	708.10	202,026	Postdeveloped A Routed
10	SCS Runoff	8.925	2	720	23,241	-----	-----	-----	Offsite Tributary to PR CB 34
11	Combine	11.73	2	722	264,200	7, 9, 10	-----	-----	Actual Release Rate Post A, Post B,
E221073 Hydro.gpw					Return Period: 100 Year			Wednesday, 11 / 23 / 2022	

# Hydrograph Report

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

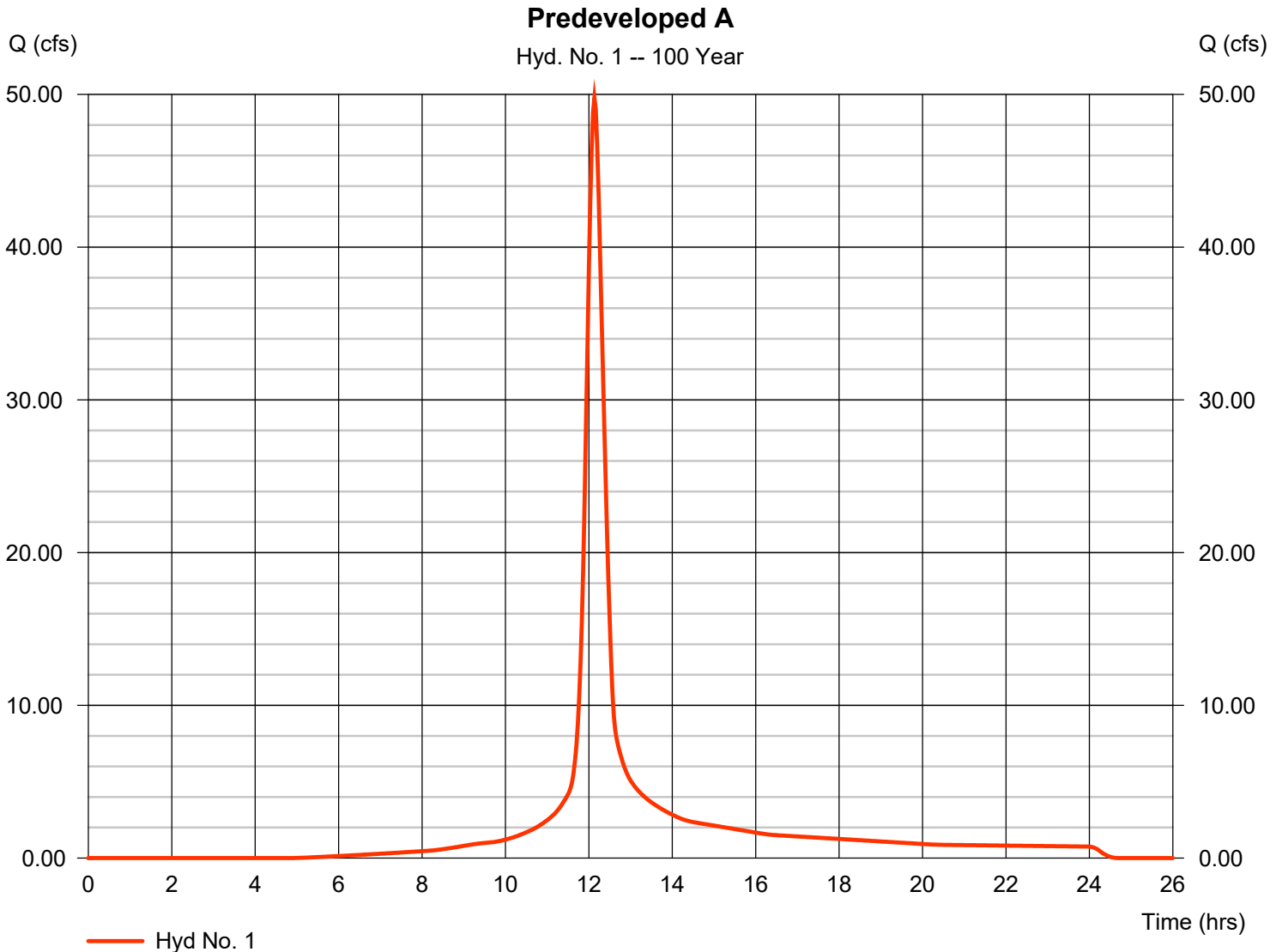
Wednesday, 11 / 23 / 2022

## Hyd. No. 1

Predeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 49.77 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 185,061 cuft
Drainage area	= 12.760 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 25.70 min
Total precip.	= 5.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(11.160 x 88) + (0.320 x 74) + (1.280 x 73)] / 12.760



# Hydrograph Report

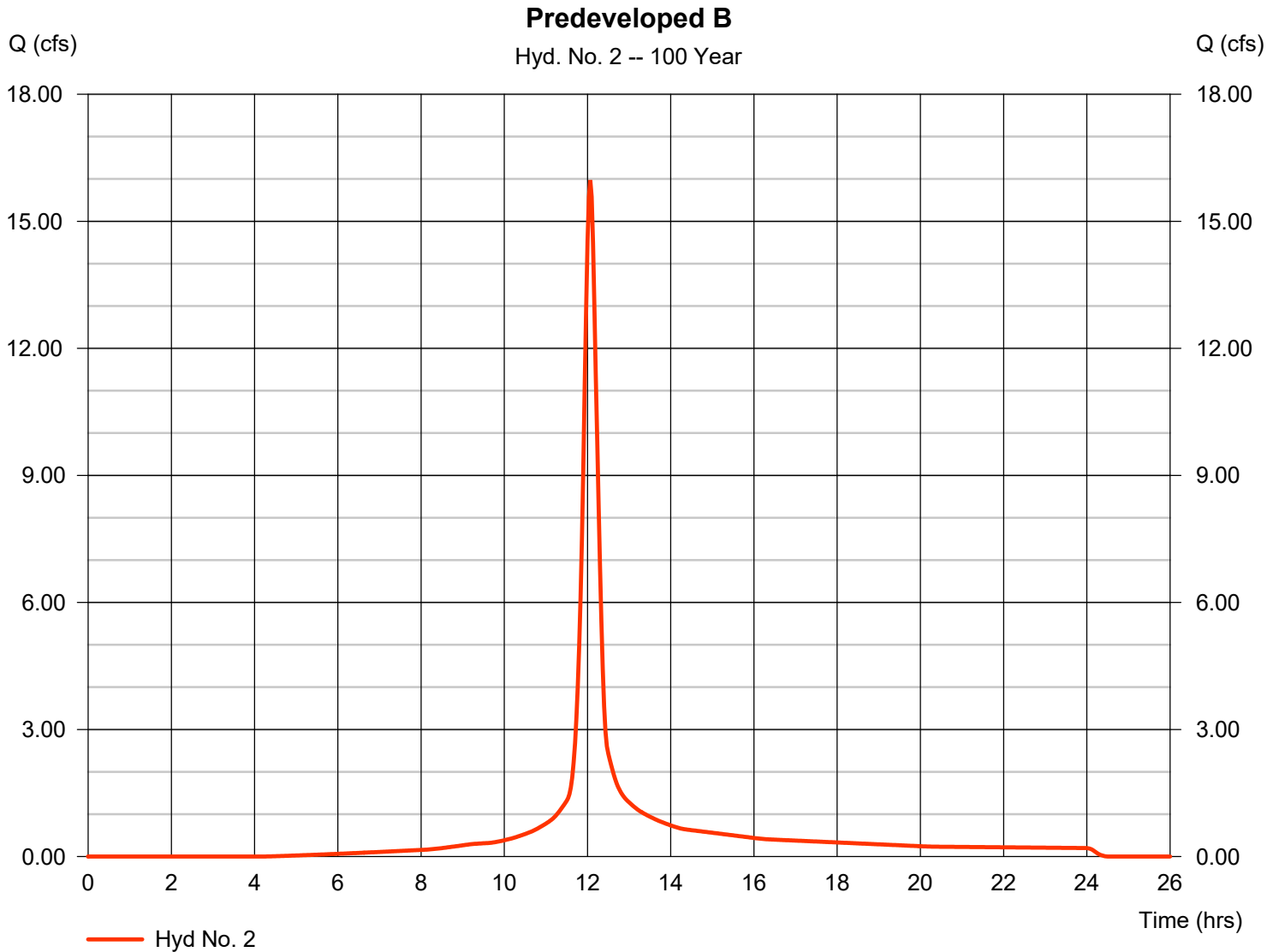
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Wednesday, 11 / 23 / 2022

## Hyd. No. 2

Predeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 15.97 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 51,309 cuft
Drainage area	= 3.310 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.30 min
Total precip.	= 5.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

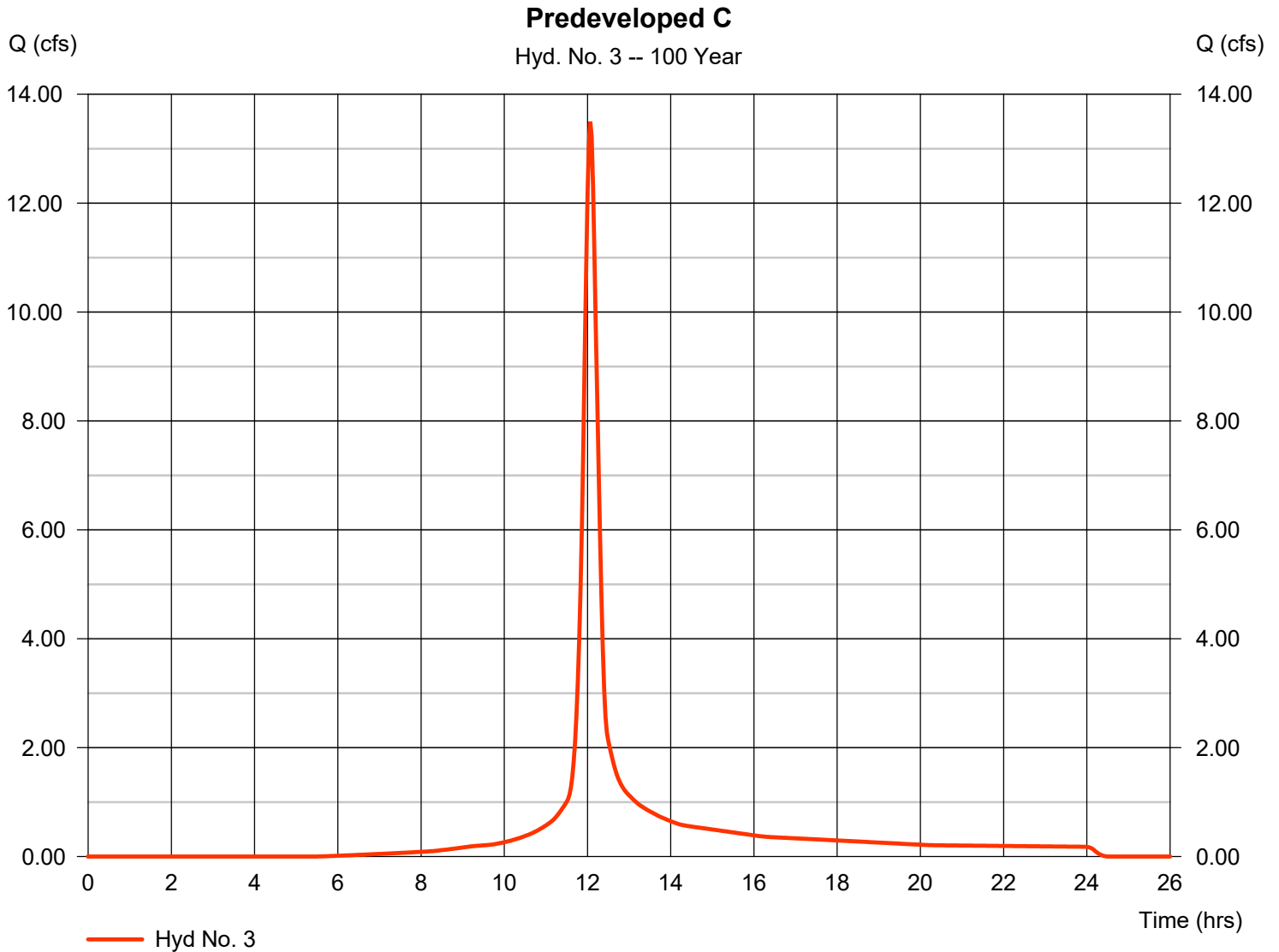
Wednesday, 11 / 23 / 2022

## Hyd. No. 3

Predeveloped C

Hydrograph type	= SCS Runoff	Peak discharge	= 13.50 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 42,641 cuft
Drainage area	= 3.050 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 17.50 min
Total precip.	= 5.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(2.260 x 88) + (0.400 x 73) + (0.390 x 74)] / 3.050



# Hydrograph Report

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

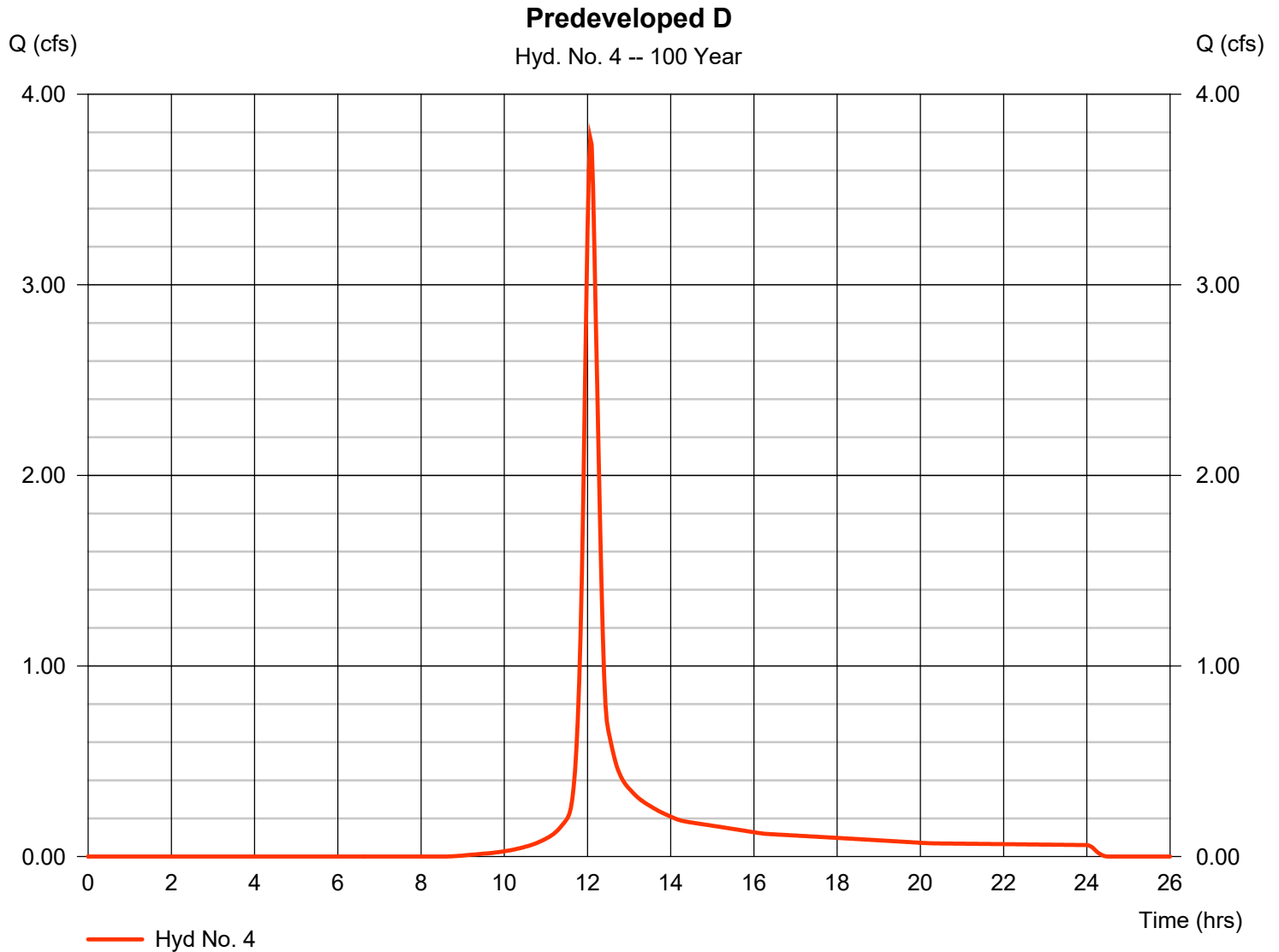
Wednesday, 11 / 23 / 2022

## Hyd. No. 4

Predeveloped D

Hydrograph type	= SCS Runoff	Peak discharge	= 3.768 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 11,826 cuft
Drainage area	= 1.170 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 16.90 min
Total precip.	= 5.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.610 x 73) + (0.560 x 74)] / 1.170



# Hydrograph Report

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

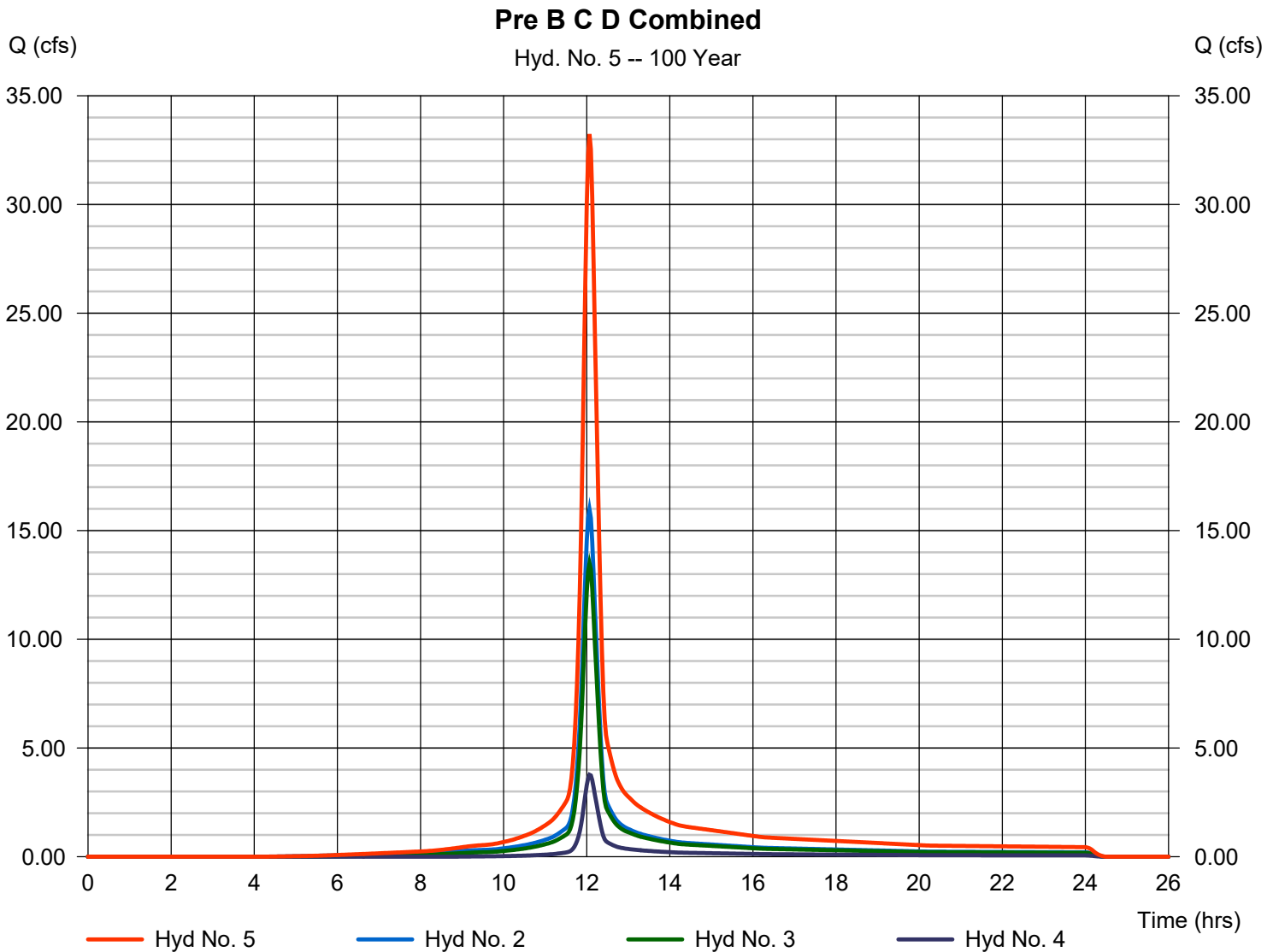
Wednesday, 11 / 23 / 2022

## Hyd. No. 5

Pre B C D Combined

Hydrograph type = Combine  
Storm frequency = 100 yrs  
Time interval = 2 min  
Inflow hyds. = 2, 3, 4

Peak discharge = 33.24 cfs  
Time to peak = 12.07 hrs  
Hyd. volume = 105,776 cuft  
Contrib. drain. area = 7.530 ac





# Hydrograph Report

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

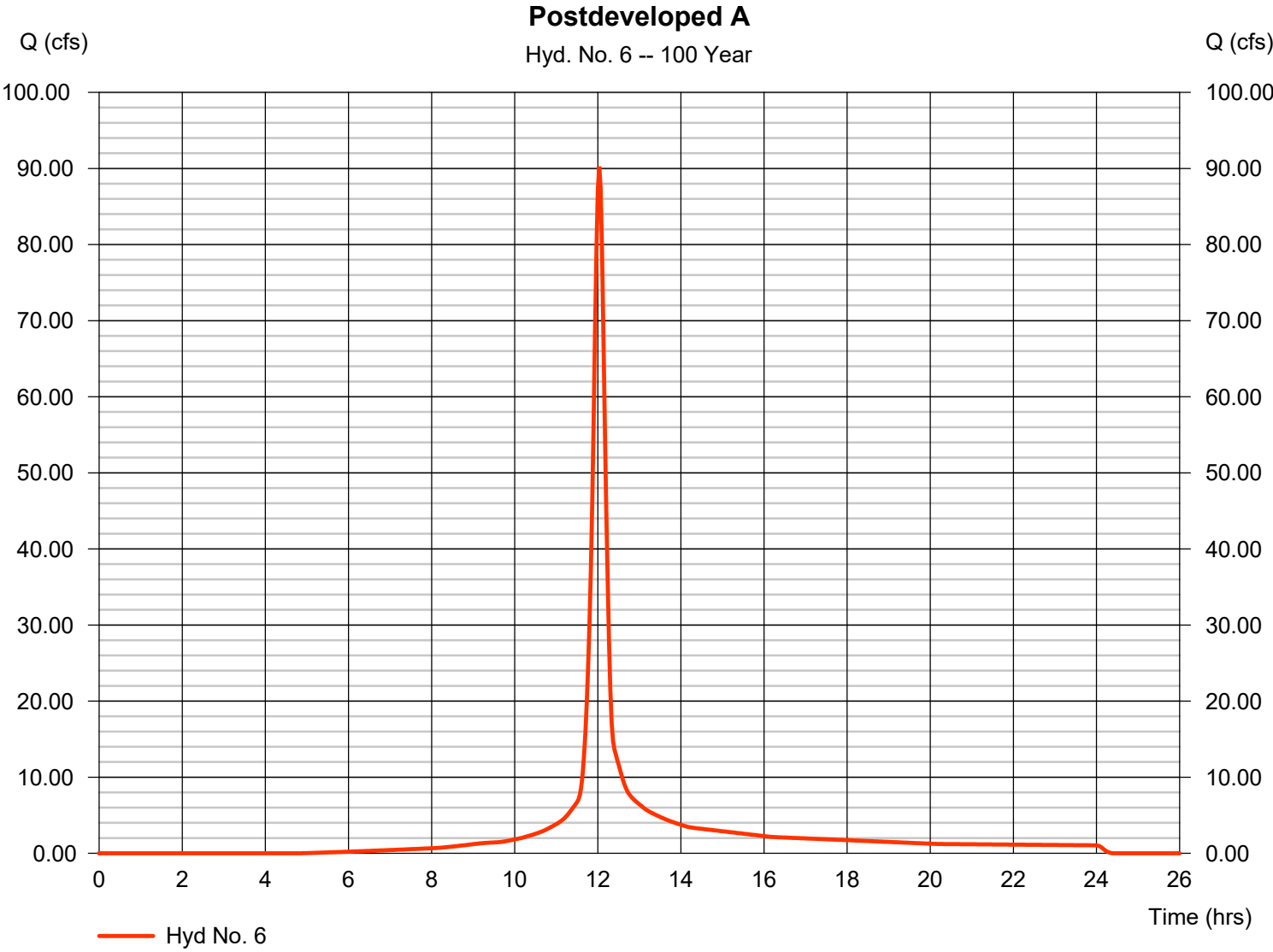
Wednesday, 11 / 23 / 2022

## Hyd. No. 6

Postdeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 90.26 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 258,859 cuft
Drainage area	= 18.020 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(9.100 x 98) + (8.920 x 74)] / 18.020

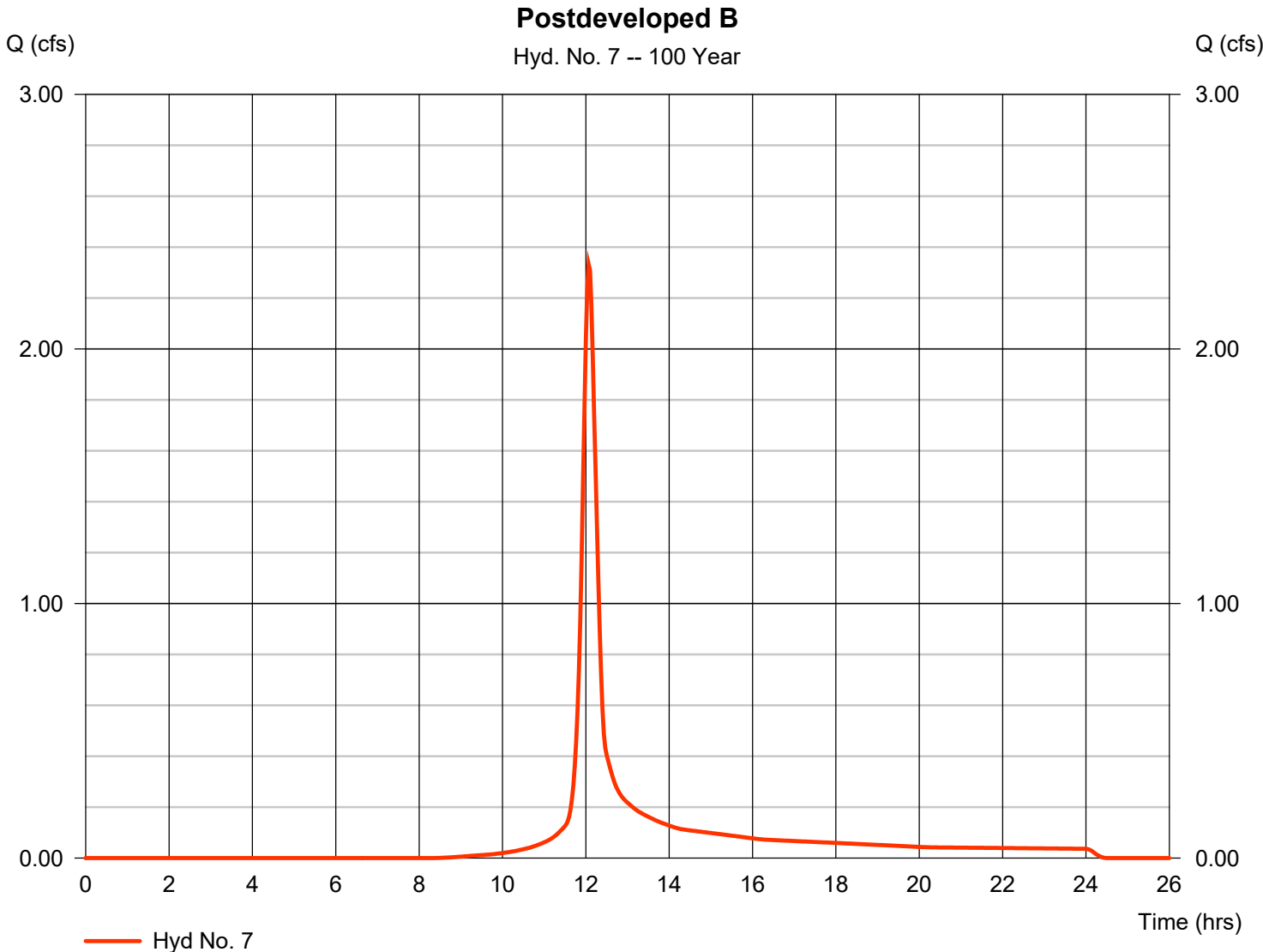


# Hydrograph Report

## Hyd. No. 7

Postdeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 2.333 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 7,309 cuft
Drainage area	= 0.700 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.90 min
Total precip.	= 5.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

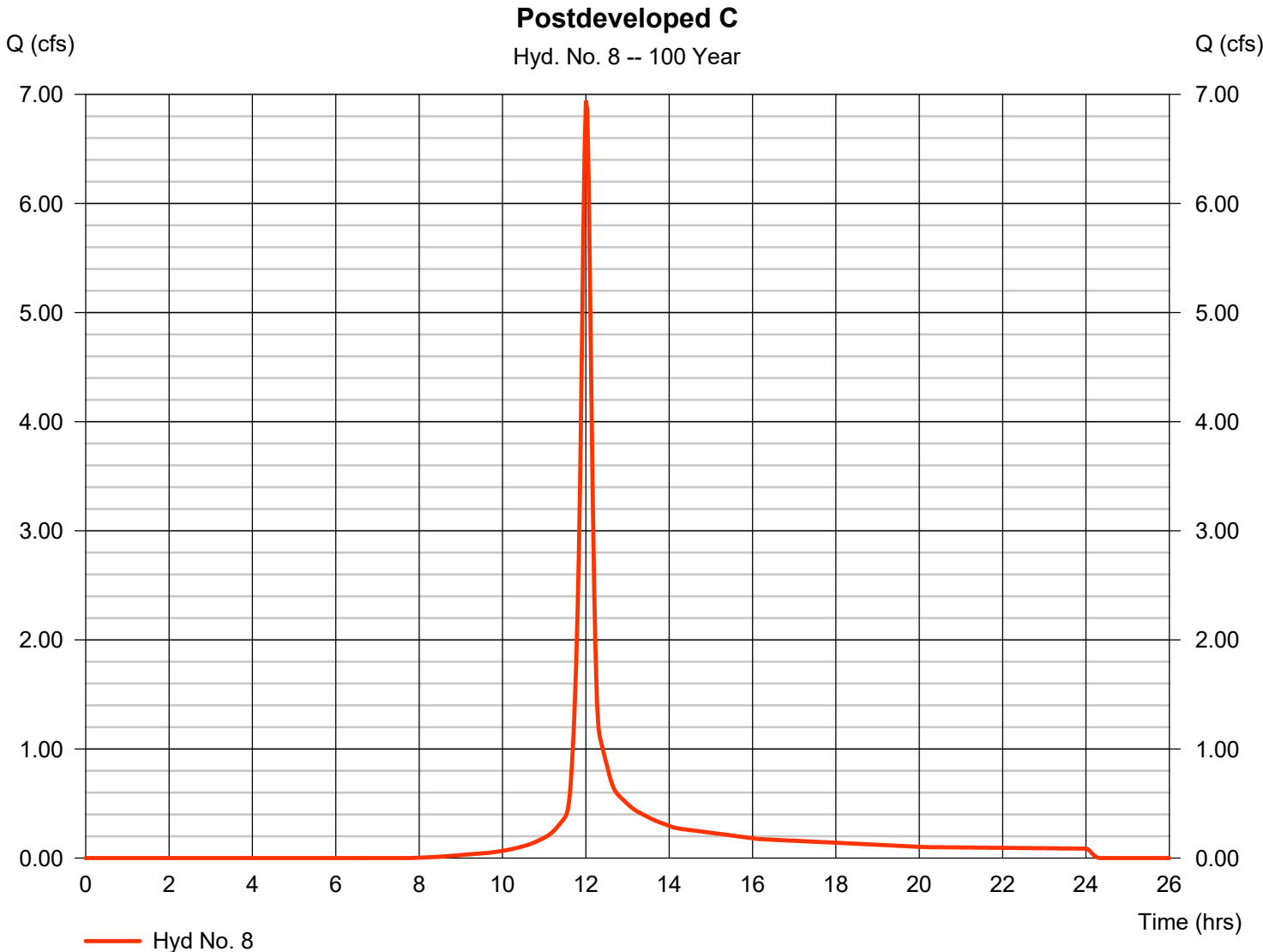
Wednesday, 11 / 23 / 2022

## Hyd. No. 8

Postdeveloped C

Hydrograph type	= SCS Runoff	Peak discharge	= 6.944 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 18,003 cuft
Drainage area	= 1.570 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.110 x 98) + (1.460 x 74)] / 1.570



# Hydrograph Report

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

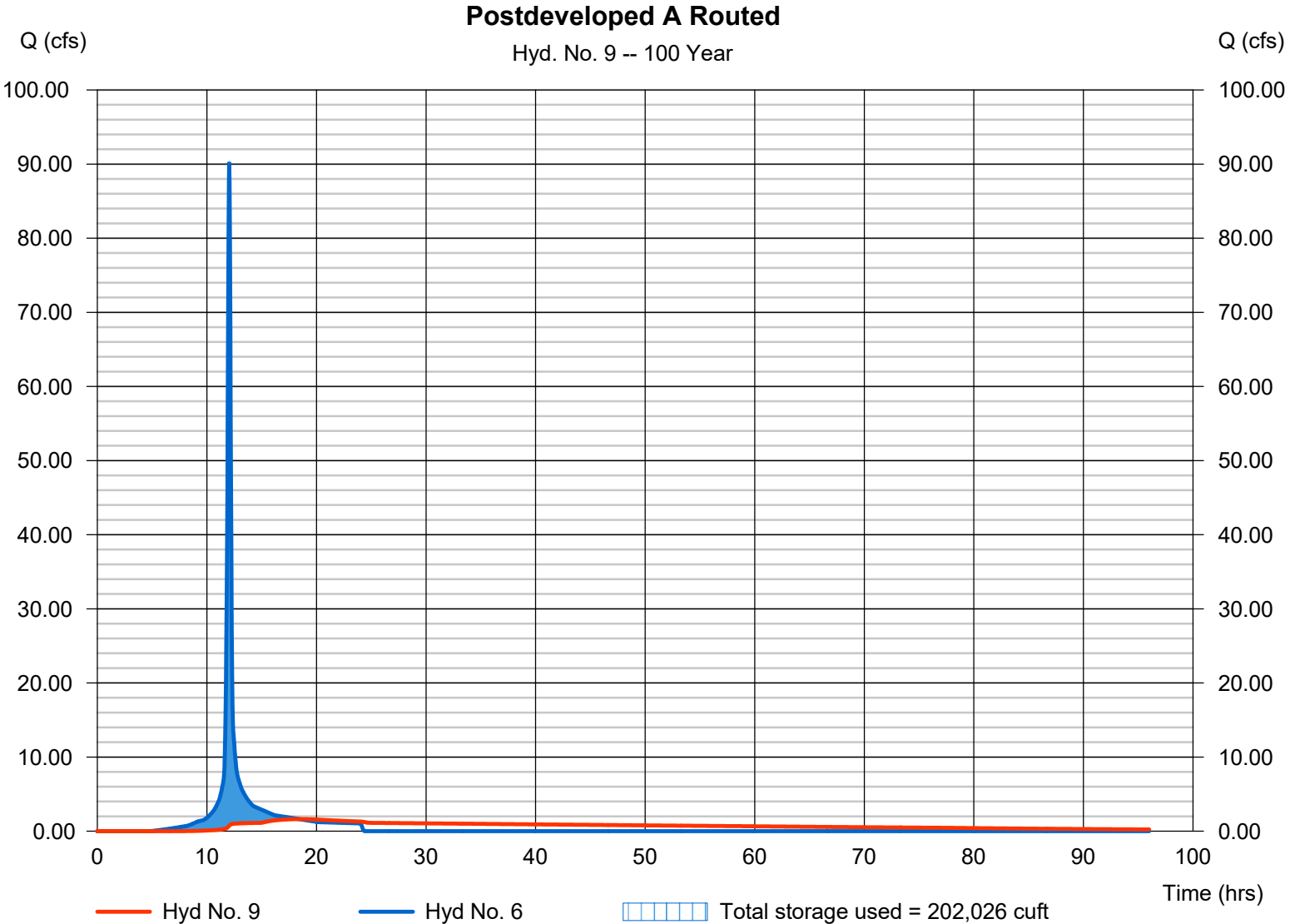
Wednesday, 11 / 23 / 2022

## Hyd. No. 9

Postdeveloped A Routed

Hydrograph type	= Reservoir	Peak discharge	= 1.622 cfs
Storm frequency	= 100 yrs	Time to peak	= 18.43 hrs
Time interval	= 2 min	Hyd. volume	= 233,650 cuft
Inflow hyd. No.	= 6 - Postdeveloped A	Max. Elevation	= 708.10 ft
Reservoir name	= Proposed Retention Pond	Max. Storage	= 202,026 cuft

Storage Indication method used.



# Hydrograph Report

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

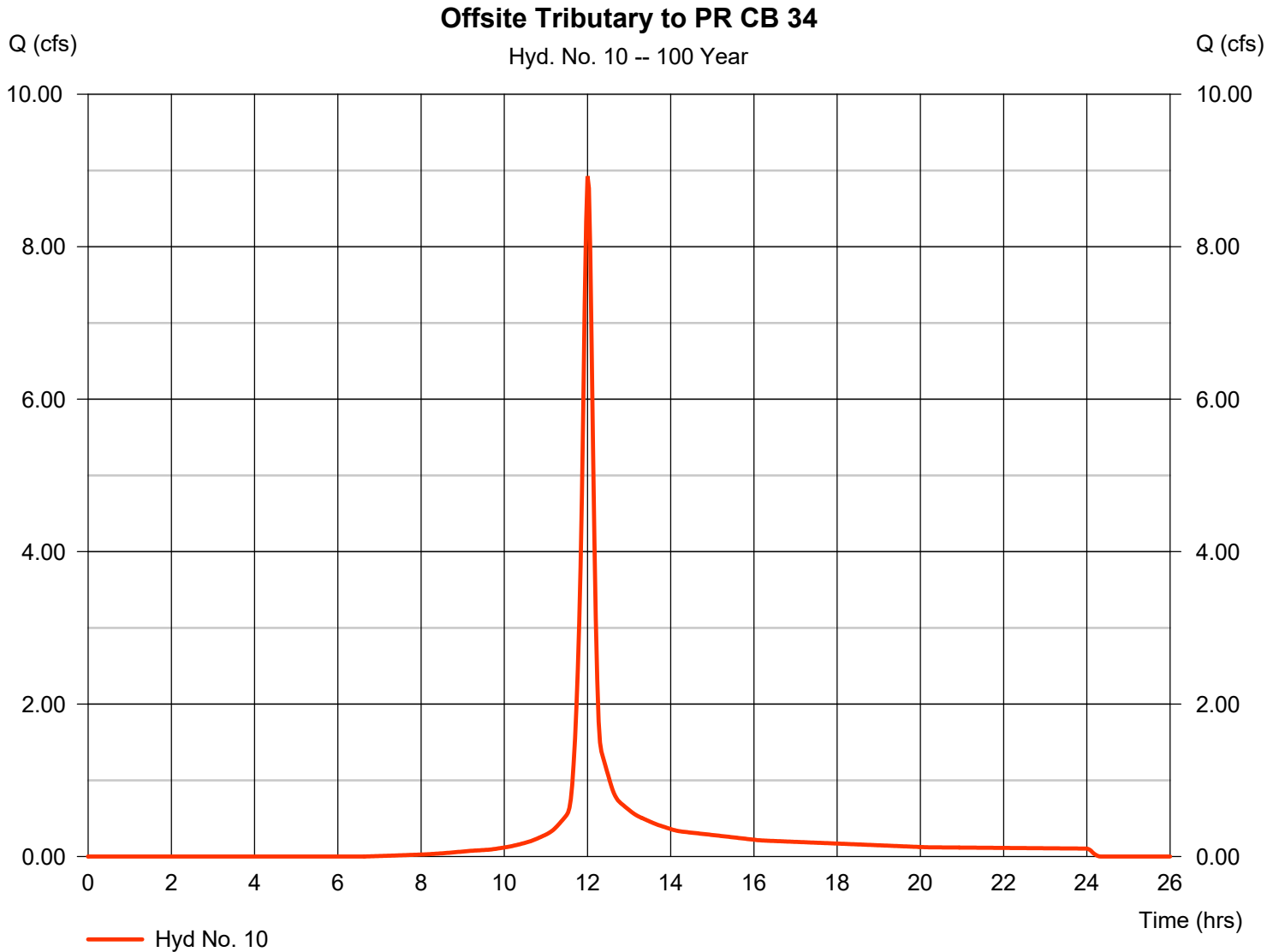
Wednesday, 11 / 23 / 2022

## Hyd. No. 10

Offsite Tributary to PR CB 34

Hydrograph type	= SCS Runoff	Peak discharge	= 8.925 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 23,241 cuft
Drainage area	= 1.800 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(0.490 x 98) + (0.690 x 73) + (0.620 x 74)] / 1.800



# Hydrograph Report

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

Wednesday, 11 / 23 / 2022

## Hyd. No. 11

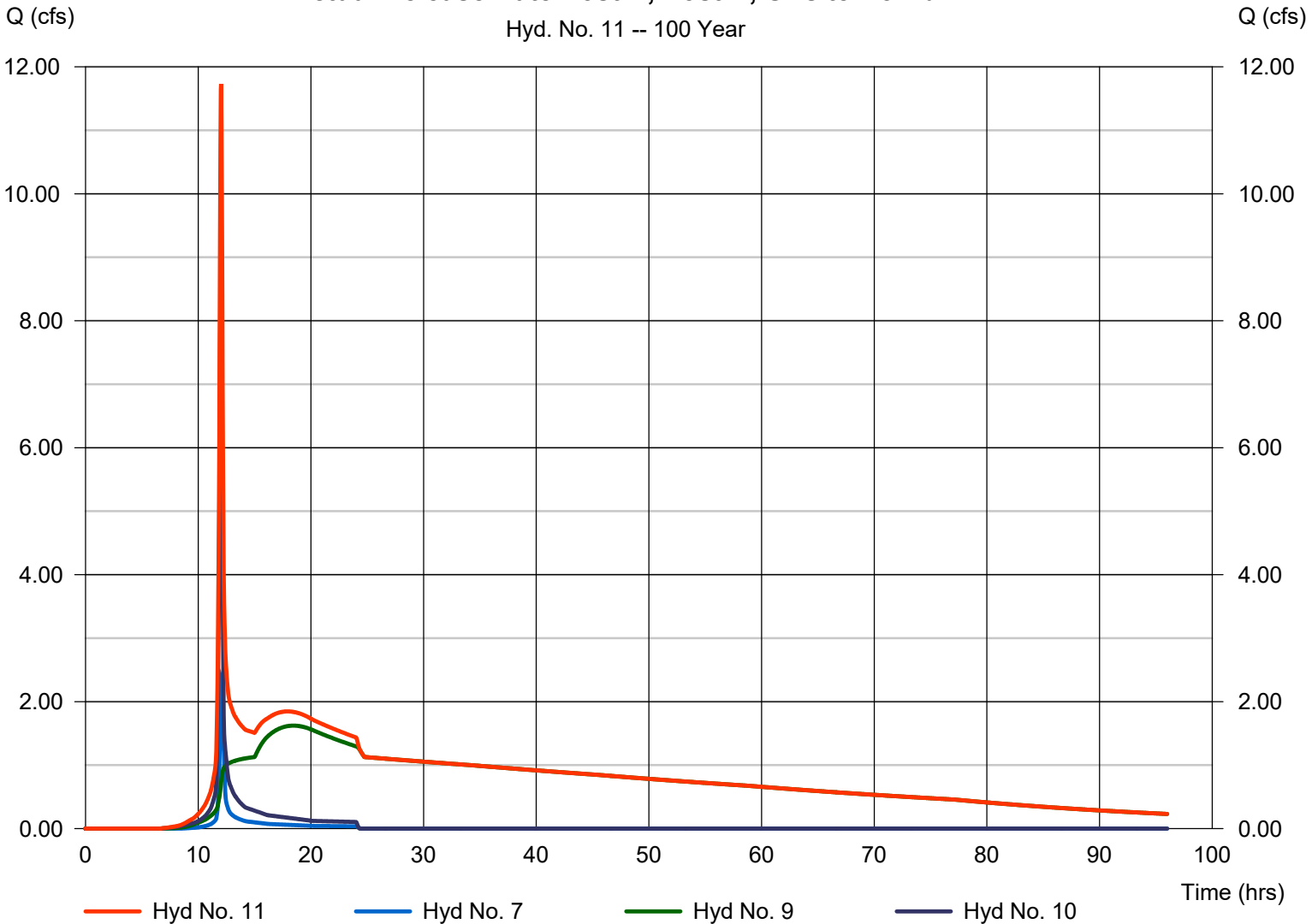
Actual Release Rate Post A, Post B, Offsite Combin

Hydrograph type = Combine  
Storm frequency = 100 yrs  
Time interval = 2 min  
Inflow hyds. = 7, 9, 10

Peak discharge = 11.73 cfs  
Time to peak = 12.03 hrs  
Hyd. volume = 264,200 cuft  
Contrib. drain. area = 2.500 ac

Actual Release Rate Post A, Post B, Offsite Combin

Hyd. No. 11 -- 100 Year



# Hydraflow Rainfall Report

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

Wednesday, 11 / 23 / 2022

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	-----
2	69.8703	13.1000	0.8658	-----
3	0.0000	0.0000	0.0000	-----
5	79.2597	14.6000	0.8369	-----
10	88.2351	15.5000	0.8279	-----
25	102.6072	16.5000	0.8217	-----
50	114.8193	17.2000	0.8199	-----
100	127.1596	17.8000	0.8186	-----

File name: Franklin Co.IDF

$$\text{Intensity} = B / (T_c + D)^E$$

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

T<sub>c</sub> = time in minutes. Values may exceed 60.

Precip. file name: O:\Support\Autocad\Drainage SCS Tables\Columbus.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.20	2.63	0.00	3.24	3.74	4.44	5.02	5.63
SCS 6-Hr	1.61	1.94	0.00	2.42	2.82	3.40	3.89	4.42
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10