Harral and Stevenson
Civil Engineering and Surveying

Stormwater Design Report

Ashville Concourse

State Route 752, Village of Ashville, Ohio
July 26, 2023

Need to use City of Columbus rainfall data.

Critical storm can be applied to entire site by either:
a) on-site pre (CN=79) vs on-site post (CN=95) applied to entire tributary area, or;
b) basin tributary pre (all CN=79) vs basin tributary post (CN=actual post)

Allowable release for the basin is based on the entire basin tributary pre of 79. Allowable release should be controlled from the 100 year post to 10 year pre.

This site will not have a free outfall as modeled. Basin must model the downstream tailwater conditions. For this site, assume the 5-year tailwater is the 30" pipe flowing full and the 100-year tailwater is the top of casting at the tie-in structure. Other tailwater elevations can be interpolated from these values. Show tailwater elevations in a table in the report. Re-check the tie-in structure elevations. The plan elevations show a structure depth of 3.25', while the survey shows 4.75'. Also the inverts on the plans do not make sense as the 30" is higher than the incoming pipes. In short, the basin model must accurately represent the actual developed conditions.

Provide sediment basin details and calculations in the report. Dewatering elevations, sediment depths, skimmer design, etc.

Sediment basin spreadsheet has been added with the skimmer sizing calculations.

Prepared by:

Craig E. Stevenson PE, PS
Harral and Stevenson
Civil Engineering and Surveying

Reviewed
08/18/2023
Christopher M. Tebbe, P.E.

You are mixing flows from offsite areas and removing an existing basin. The flows from these offsite areas must be included in the calculations and sizing of the detention facility.

The offsite and on site areas have been combined as one. Reference updated trib maps for new design.

Provide response to comments on this pdf. Use a different color to differentiate original comments and responses.

Noted.

Executive Summary

The proposed project consists of the development of 3-stoarge buildings on a 4.42-acre parcel of land that is currently a grass field. Construction activities will include construction of said storage buildings, parking lot, and a detention pond and associated utilities.

The design of the detention basin is based on the proposed layout as well as future impervious area, as shown in the Post Developed Tributary Map. The future additions are assumed to be majority impervious, so the design of the basin has accounted for all future area.

Existing Site

Pre-Developed area “A” consists of 4.42 acres of grass that drains from the east side of the property to the west side of the property where runoff sheet drains across the site and then enters an existing storm sewer on the west side of the property. This area combines with an Offsite Tributary that consists of 4.54 acres (Labeled as Pre-Developed B on the predeveloped tributary map) and enters an existing dry detention basin. The dry-detention basin then outlets into an existing ditch that runs north and south.

The existing soils on the site are class C hydrologic group. Additionally, 100.00% of the soil is Crosby Silt Loam (CrA). 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 detention pond located at the west corner of the site. This area is labeled as Post-Developed A on the Post-Developed tributary map. Post-Developed B (off site) is also designed that it will continue its existing flow path which will route through the proposed pond. Post-Developed C is a direct discharge of a fringe area that is unable to be detained in the detention pond.

Based on the discussion above, our design proposes to add two storm sewer runs, one along the north side and one along the south side of the property. Both will run east to west. After the Stormwater makes its way through the pipes it will be discharged into a detention basin. From there the Stormwater will outlet into an existing catch basin in the northwest corner of the property.

Our design also accounts for all future additions. Post-Developed A on the Post-Developed tributary map accounts for 3.13 acres of impervious area which includes all future impervious area.

By comparing the 1 year predeveloped vs. post developed runoff volumes we determined there to be a 38.2% increase which indicates a 5 year critical storm event.

Critical Storm Combined		1 Year Volume C.F.
Predeveloped		28308
Postdeveloped		39122
	% increase	38.2%
	Critical Storm	5 Year

See cover for critical storm options. The predeveloped condition of area B must be based on the conditions before development (CN=79).

The layout of the trib maps have been updated. Reference them for new layout and design.

100 post to 10 pre

This sentence has been changed to add the 100 year post has to be less than the 10 year pre.

The outlet structure is designed to detain runoff from the improved area such that the total release rate from the site in each postdeveloped event up to and including the 5 year storm would in less than the peak rate from the 1 year predeveloped storm. Higher year events are restricted to the equivalent predeveloped storm event. The outlet control structure will consist of a PVC pipe extended into the basin from the adjacent catch basin and protected by a gravel filter with the orifice inside the structure to control the Water Quality Volume. The second stage will consist of a 1.5" Orifice cast into the outlet control structure wall with at trash rack to prevent clogging from debris. The top of the catch basin will act as an overflow weir that will release storm events greater than the 5 year storm and finally the emergency overflow weir will direct flow from the basin to the existing ditch along the west side of the property if the system becomes temporarily restricted for some reason. Please note that the "Actual Release Rate" shown in the chart below includes the direct discharge from the small fringe areas of the site that sheet drain off rather than going into the basin. This ensures that the total runoff from the site is effectively controlled.

Add column for undetained area. This should be represented separate from the basin release.

Detention Chart

	Predeveloped Combined	Postdeveloped Combined	Total Allowable Release	Actual Release Rate	Pond Elevation	Volume
Year	CFS	CFS	CFS	CFS	Feet	C.F.
1	5.074	11.240	5.074	2.327	707.02	19682
2	6.002	12.470	5.074	2.853	707.16	20954
5	9.993	17.410	5.074	4.943	707.84	27277
10	12.100	19.890	12.100	6.149	708.11	30083
25	15.370	23.620	15.370	7.862	708.67	36554
50	17.590	26.100	17.590	9.045	709.06	41270
100	18.710	27.340	18.710	9.621	709.13	42298

This column has been added.

The total allowable release from the 10 year to the 100 year now shows the 10 year pre.

100 year post must be controlled by the 10 year pre. See City of Columbus design manual.

Water Quality

The project will disturb well over 1 acre warranting coverage under the s construction stormwater. In accordance with the permit, the design prop basin as the post construction BMP. The WQv will be detained by the orifice in the outlet structure for ease of maintenance. A micropool and forebay are proposed with each contributing an additional 10% of the WQv for sediment storage. The WQv design was developed using the OEPA Compliance Worksheet which is included on the following 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 detention pond through one of two 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.

Forebays

The proposed detention pond will have two forebays to help collect sediment for ease of removal. Per the Ohio Rainwater Manual Section 2.6.3 Forebay(S) the forebays are to occupy 8%-25% of the normal pool area and shall have a depth of at least 3 feet. The area provided for both forebays is 1,674 C.F., which is roughly 10% of the Normal pool area of the Proposed Detention Pond (10,087 C.F.). Details of the Forebays can be found in the Plot Grade and Utility Plans.

The forebays and micropools should be designed based on the EPA general permit of 10% X WQ for each. The two forebays should be prorated in size based on the incoming tributary areas.

This paragraph has been included in the Water Quality section. Both forebays are now sized to their respective size based on the incoming tributary areas.

Pre-Developed A (On-Site)
Total Area: 4.42 acres
Impervious Area: 0.055 ac.
CN=79
(0.055 ac. asphalt CN=98)
(4.365 ac. grass CN=79)

Time of Concentration Path

Time of Concentration Path

In the build-out condition, Post B TC will begin pipe flow at this point.

Reference updated pre-developed trib map. There is no more on vs off site.

Pre-Developed B (Off-Site)
Total Area: 4.54 acres
Impervious Area: 1.46 ac.
CN=85
(1.46 ac. asphalt CN=98)
(3.08 ac. grass CN=79)

The design of the trib maps have changed. Reference new trib maps.

For purposes of critical storm and allowable site release, this area must be considered CN=79.

Need to show the existing impervious areas within the tributary area.

The existing impervious areas are now shown on both pre and post developed trib maps.

0 40 80 160

Scale: 1" = 80 Feet

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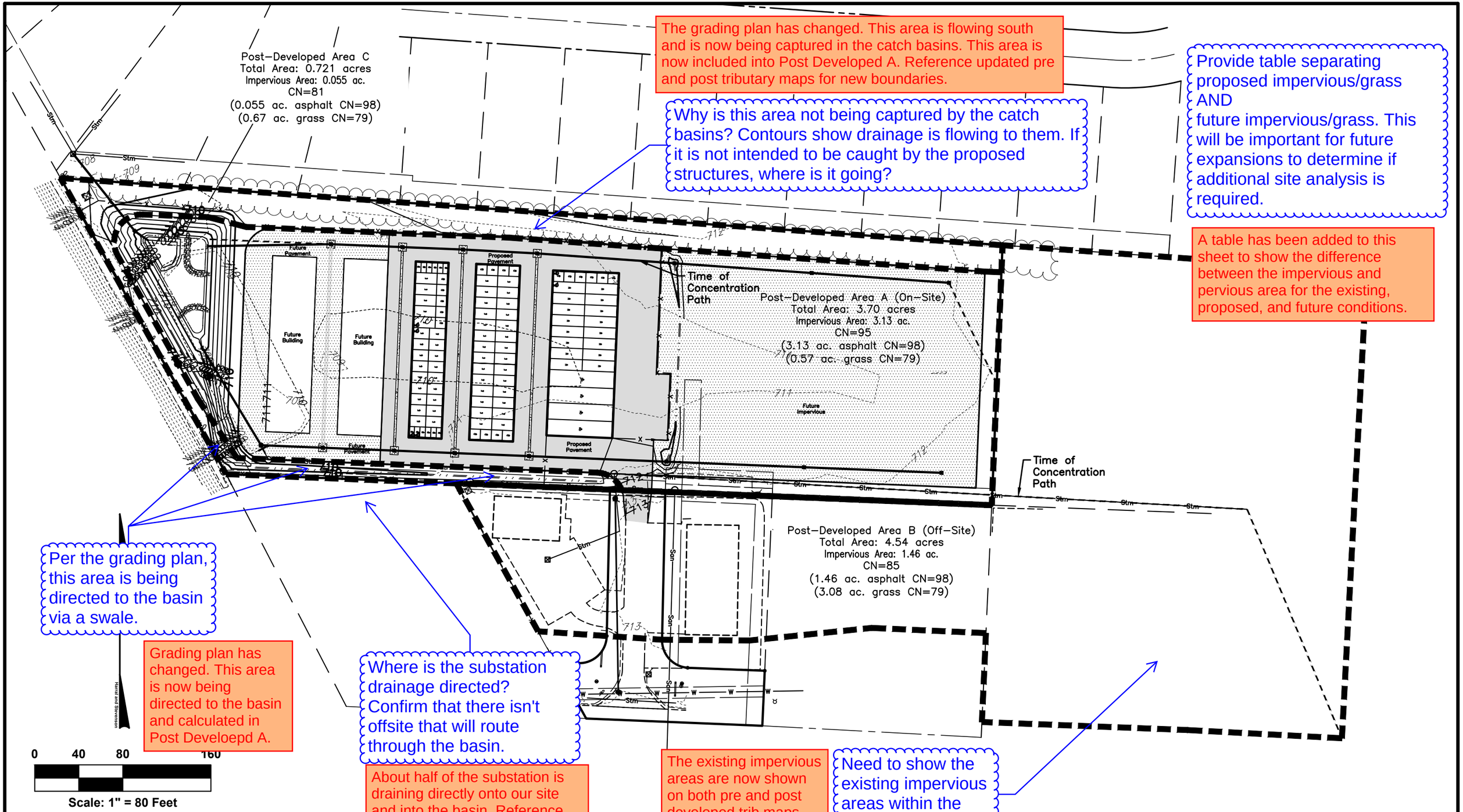
Date:	07/26/23
Scale:	1"=80'
Drawn By:	NSC
Project:	E231032
Client:	

VILLAGE OF ASHVILLE, PICKAWAY COUNTY, OHIO
ASHVILLE CONCOURSE

PRE-DEVELOPED

TRIBUTARY AREA MAP



The grading plan has changed. This area is flowing south and is now being captured in the catch basins. This area is now included into Post Developed A. Reference updated pre and post tributary maps for new boundaries.

Why is this area not being captured by the catch basins? Contours show drainage is flowing to them. If it is not intended to be caught by the proposed structures, where is it going?

Provide table separating proposed impervious/grass AND future impervious/grass. This will be important for future expansions to determine if additional site analysis is required.

A table has been added to this sheet to show the difference between the impervious and pervious area for the existing, proposed, and future conditions.

Per the grading plan, this area is being directed to the basin via a swale.

Grading plan has changed. This area is now being directed to the basin and calculated in Post Develoepd A.

Where is the substation drainage directed? Confirm that there isn't offsite that will route through the basin.

About half of the substation is draining directly onto our site and into the basin. Reference updated pre and post trib maps for new boundary.

The existing impervious areas are now shown on both pre and post developed trib maps.

Need to show the existing impervious areas within the tributary area.

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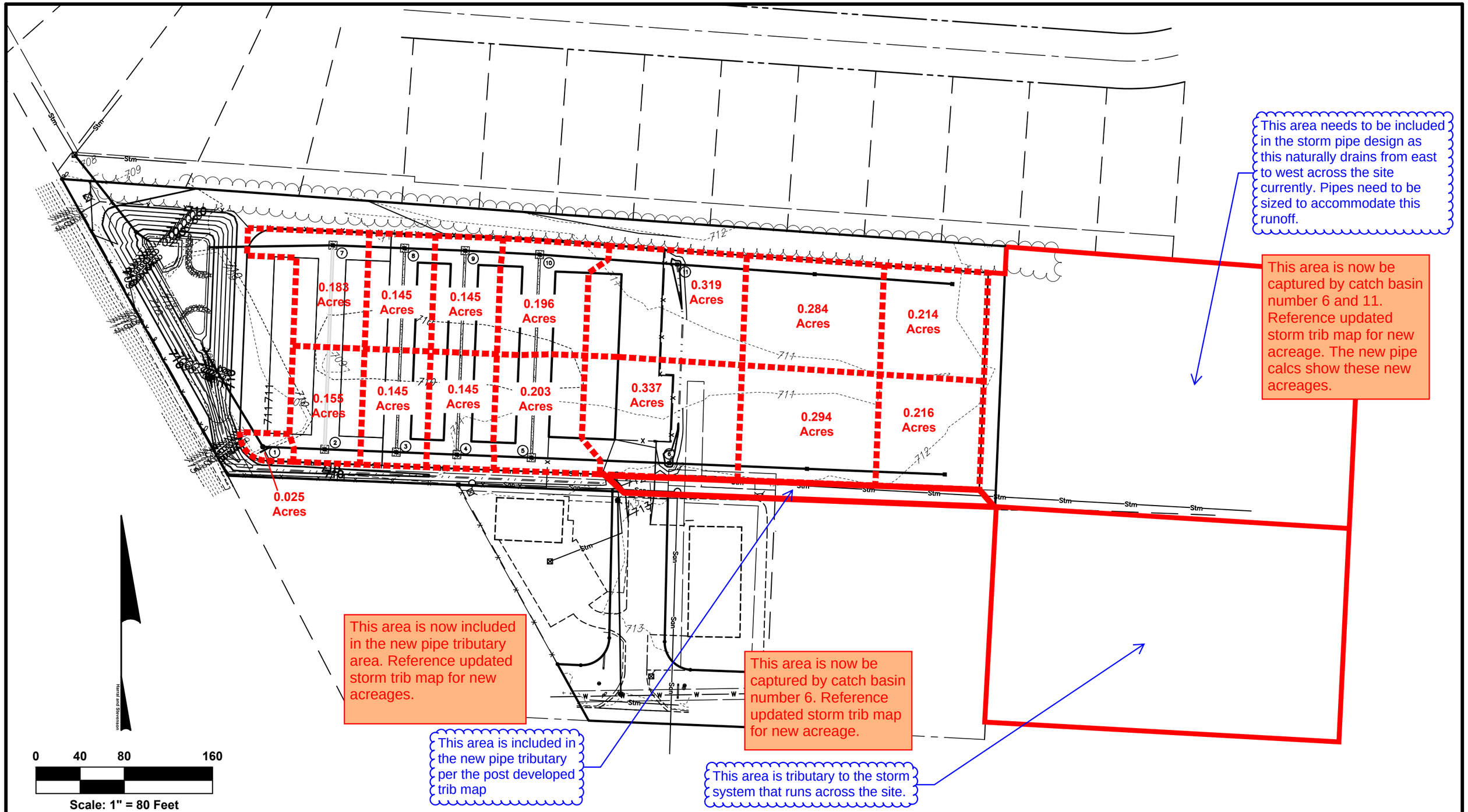
VILLAGE OF ASHVILLE, PICKAWAY COUNTY, OHIO
ASHVILLE CONCOURSE

POST-DEVELOPED
TRIBUTARY AREA MAP



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Project:	E231032
Client:	

VILLAGE OF ASHVILLE, PICKAWAY COUNTY, OHIO
ASHVILLE CONCOURSE

STORM SEWER

TRIBUTARY AREA MAP

Dry Extended Detention Basin WQv Compliance Tool

version 3.1 2018-10-25

Project Summary

Water quality for this site should include entire tributary area to the basin.

The total drainage area has been increased to include the entire tributary area.

Project Name: Ashville Concourse
Subwatershed ID/Label:
Submitted by:
Date:

hed Drainage Area, A_{total} =	4.42	acres	=	192,535	ft2
ed Impervious Area, A_{imp} =	3.19	acres	=	138,739	ft2
perviousness fraction, i =	0.72			72	%
r Quality Volume, WQv =	10,087	ft^3	=	0.23	ac-ft

Step 1 - Soil Suitability

Soil Series: CrA HSG: C

Step 2 - Dry ED Basin Volume Requirements

Extended Detention Volume, EDv =	10087	ft^3
Minimum Sediment Storage Volume, $V_{sediment}$ =	2017	ft^3
Minimum Forebay Volume, $V_{forebay}$ =	1009	ft^3
Minimum Permanent Micropool Volume, $V_{micropool}$ =	1009	ft^3

Step 3 - Basin Stage-Storage Relationship

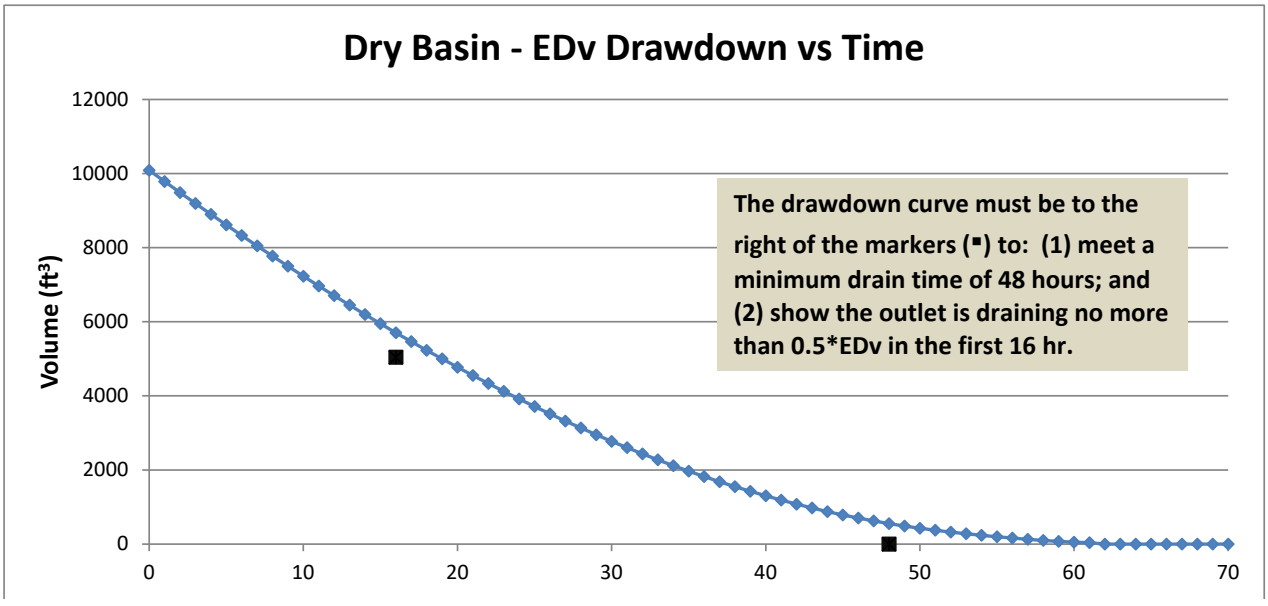
	Elevation ft	Area ft^2		Incremental Volume ft^3	Cumulative Volume ft^3
Bottom of Permanent Micropool = (include forebay area if below EDv)	702.00	422			
	703.00	705		557	557
	704.00	3,485		1,919	2,476
	705.00	4,795		4,123	6,599
	706.00	6,345		5,552	12,151
	707.00	8,295		7,298	19,449
	708.00	10,474		9,363	28,813
	709.00	12,837		11,635	40,448
	710.00	15,981		14,380	54,828

Step 4 - Outlet Elevations and Storage Volumes

WQ Orifice Invert Elevation =	703.90				
Elevation of Top of EDv =	706.02				
Secondary Outlet Invert Elevation =	706.25				OKAY
WQ Treatment Volume Provided, $V_{treatment}$ =	11,648	ft^3			
Treatment Vol Provided Relative to EDv, $V_{treatment}/EDv$ =	1.15		=	115%	OKAY
Permanent Pool Volume Provided, PPv =	2,147	ft^3			
Forebay Volume Provided, $V_{forebay}$ =	1,025	ft^3	=	1.02	
Is forebay volume below WQ outlet? (Yes or No)	Yes		=	102%	OKAY
Permanent Micropool Volume Provided, $V_{micropool}$ =	1,122	ft^3			
Ratio $V_{micropool}$ Provided to $V_{micropool}$ Required =	1.11		=	111%	OKAY
Sediment Storage Volume Provided, $V_{sediment}$ =	2,147	ft^3			
Ratio $V_{sediment}$ Provided to $V_{sediment}$ Required =	1.06		=	106%	OKAY

Step 5 - Outlet (Orifice) Sizing

Maximum Hydraulic Head, Hmax =	2.12	ft			
Orifice Coefficient, C =	0.6				
Target (Minimum) Draw-down Time, T_d =	48	hr			
Target Average Discharge, Q_{avg} =	0.06	cfs			
Average Hydraulic Head, H_{avg} =	1.06	ft			
Estimated Orifice Area, $A_{orifice}$ =	1.70	in^2	=	0.012	ft^2
Estimated Orifice Diameter, $D_{orifice}$ =	1.47	in	=	0.12	ft
Design Orifice Diameter, $D_{orifice}$ =	1.50	in	=	0.13	ft
Design Orifice Area, $A_{orifice}$ =	1.76	in^2	=	0.012	ft^2
Time to Completely Drain EDv, T_d =	62	hr	must be ≥ 48 hr		OKAY
Volume Drained in First 16 hr =	4,383	ft^3			
% of EDv =	43.4	%	must be ≤ 50%		OKAY



Time (hr)

This should include the area to the east as shown on the tributary map.
Verify capacity of the system based on new area.

Noted. This area has increased and now captures the area to the east. Reference new storm trib map for the new area.

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STORM SEWER COMPUTATION SHEET

Project: **Goldtree Ventures, LLC**
Job No.: **E231032**
Intensity Reference: **Columbus**
Date: 07/26/23
By: NSC
Checked: CES
Revised:

2 Year Design Storm N= 0.013

Structure	Station	Drainage Area				Time		Intensity (in/hr)	Des Q (CFS)	Length (ft.)	Dia. (in.)	Slope (%)	Velocity (ft./sec.)	Cap. Flowing Full	Out	In	T.C.	Cover (ft.)	5 YEAR HYDRAULIC GRADE LINE			
		Trib.	Cumul.	C	Cumul. CA	Delta t (min.)	Sum t (min.)												5 Yr. Rainfall Intensity	Discharge Q (CFS)	Slope (%)	5 Yr. HGL
6	472	0.337	0.337	0.90	0.303	0.00	10.00	3.81	**1.156**	125.00	15	0.35	3.12	**3.832**	706.46	706.71	709.55	1.84	4.63	**1.404**	0.05	707.46
5	347	0.203	0.540	0.90	0.486	0.67	10.67	3.70	**1.798**	67.50	15	0.35	3.12	**3.832**	705.92	706.02	710.32	3.15	4.52	**2.197**	0.12	706.92
4	280	0.145	0.685	0.90	0.617	0.36	11.03	3.70	**2.281**	55.00	15	0.40	3.34	**4.097**	705.58	705.68	710.32	3.49	4.52	**2.787**	0.19	706.58
3	225	0.145	0.830	0.90	0.747	0.27	11.30	3.70	**2.764**	65.00	15	0.45	3.54	**4.345**	705.26	705.36	710.32	3.81	4.52	**3.376**	0.27	706.26
2	160	0.155	0.985	0.90	0.887	0.31	11.61	3.58	**3.174**	56.07	15	0.55	3.91	**4.804**	704.87	704.97	710.32	4.20	4.4	**3.901**	0.36	705.87
1	104	0.025	1.010	0.90	0.909	0.24	11.85	3.58	**3.254**	103.67	18	0.30	3.26	**5.769**	704.31	704.56	710.32	4.51	4.4	**4.000**	0.14	705.51
HW1																704.00						704.00
11	424	0.319	0.319	0.90	0.287	0.00	10.00	3.81	**1.094**	125.00	15	0.35	3.12	**3.832**	706.20	706.45	709.55	2.10	4.63	**1.329**	0.04	707.20
10	299	0.196	0.515	0.90	0.464	0.67	10.67	3.70	**1.715**	67.50	15	0.35	3.12	**3.832**	705.66	705.76	710.32	3.41	4.52	**2.095**	0.10	706.66
9	232	0.145	0.660	0.90	0.594	0.36	11.03	3.70	**2.198**	55.00	15	0.40	3.34	**4.097**	705.33	705.43	710.32	3.74	4.52	**2.685**	0.17	706.33
8	177	0.145	0.805	0.90	0.725	0.27	11.30	3.70	**2.681**	65.00	15	0.45	3.54	**4.345**	705.01	705.11	710.32	4.06	4.52	**3.275**	0.26	706.01
7	112	0.183	0.988	0.90	0.889	0.31	11.61	3.58	**3.183**	111.68	15	0.55	3.91	**4.804**	704.61	704.71	710.32	4.46	4.4	**3.912**	0.37	705.61
HW2																704.00						704.00

This should include the area to the east as shown on the tributary map.
Verify capacity of the system based on new area.

Noted. This area has increased and now captures the area to the east. Reference new storm trib map for the new area.

5-yr HGL should start with the elevation of the basin during the 5 year event, not the invert of the outlet pipe.

The start of the 5 year HGL has been updated to match the elevation of the basin at the 5 year event.

Map Scale: 1:1,440 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

= 3.9788

Not rated or not available

Soil Rating Lines

= 3.9788

Not rated or not available

Soil Rating Points

= 3.9788

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 23, Sep 9, 2022

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.

Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
CrA	Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	3.9788	4.3	100.0%
Totals for Area of Interest			**4.3**	**100.0%**

Description

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Rating Options

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 6

Bottom Depth: 60

Units of Measure: Inches

Map Scale: 1:1,440 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

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

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Web Soil Survey URL:
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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	4.3	100.0%
Totals for Area of Interest			**4.3**	**100.0%**

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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E231032 Hydro.gpw

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Wednesday, 07 / 26 / 2023

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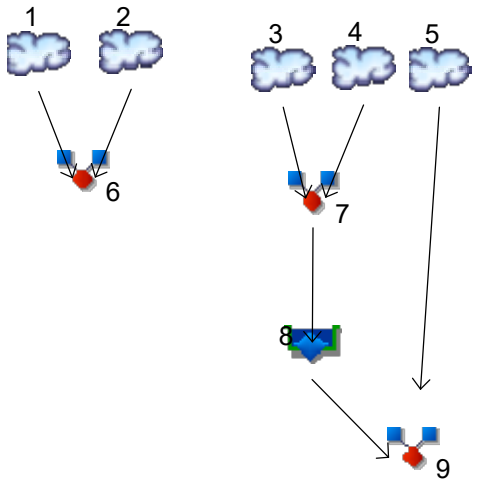
Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	Predeveloped A
2	SCS Runoff	Predeveloped B
3	SCS Runoff	Postdeveloped A
4	SCS Runoff	Postdeveloped B
5	SCS Runoff	Postdeveloped C
6	Combine	Combined Predeveloped A&B
7	Combine	Post A and B Combined
8	Reservoir	Basin
9	Combine	Post Developed Outflow

Hydrograph Return Period Recap

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	------	2.445	2.959	-------	5.200	6.399	8.262	9.543	10.19	Predeveloped A
2	SCS Runoff	------	2.912	3.384	-------	5.358	6.379	7.939	8.992	9.521	Predeveloped B
3	SCS Runoff	------	10.41	11.47	-------	15.69	17.78	20.90	22.97	24.00	Postdeveloped A
4	SCS Runoff	------	2.912	3.384	-------	5.358	6.379	7.939	8.992	9.521	Postdeveloped B
5	SCS Runoff	------	0.921	1.089	-------	1.802	2.180	2.775	3.179	3.383	Postdeveloped C
6	Combine	1, 2,	5.074	6.002	-------	9.993	12.10	15.37	17.59	18.71	Combined Predeveloped A&B
7	Combine	3, 4,	11.24	12.47	-------	17.41	19.89	23.62	26.10	27.34	Post A and B Combined
8	Reservoir	7	2.265	2.779	-------	4.820	5.999	6.545	7.776	9.392	Basin
9	Combine	5, 8	2.327	2.853	-------	4.943	6.149	7.862	9.045	9.621	Post Developed Outflow

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	2.445	2	734	11,476	------	------	------	Predeveloped A
2	SCS Runoff	2.912	2	744	16,832	------	------	------	Predeveloped B
3	SCS Runoff	10.41	2	716	22,290	------	------	------	Postdeveloped A
4	SCS Runoff	2.912	2	744	16,832	------	------	------	Postdeveloped B
5	SCS Runoff	0.921	2	718	1,846	------	------	------	Postdeveloped C
6	Combine	5.074	2	740	28,308	1, 2,	------	------	Combined Predeveloped A&B
7	Combine	11.24	2	716	39,122	3, 4,	------	------	Post A and B Combined
8	Reservoir	2.265	2	772	36,822	7	707.02	19,682	Basin
9	Combine	2.327	2	772	38,668	5, 8	------	------	Post Developed Outflow

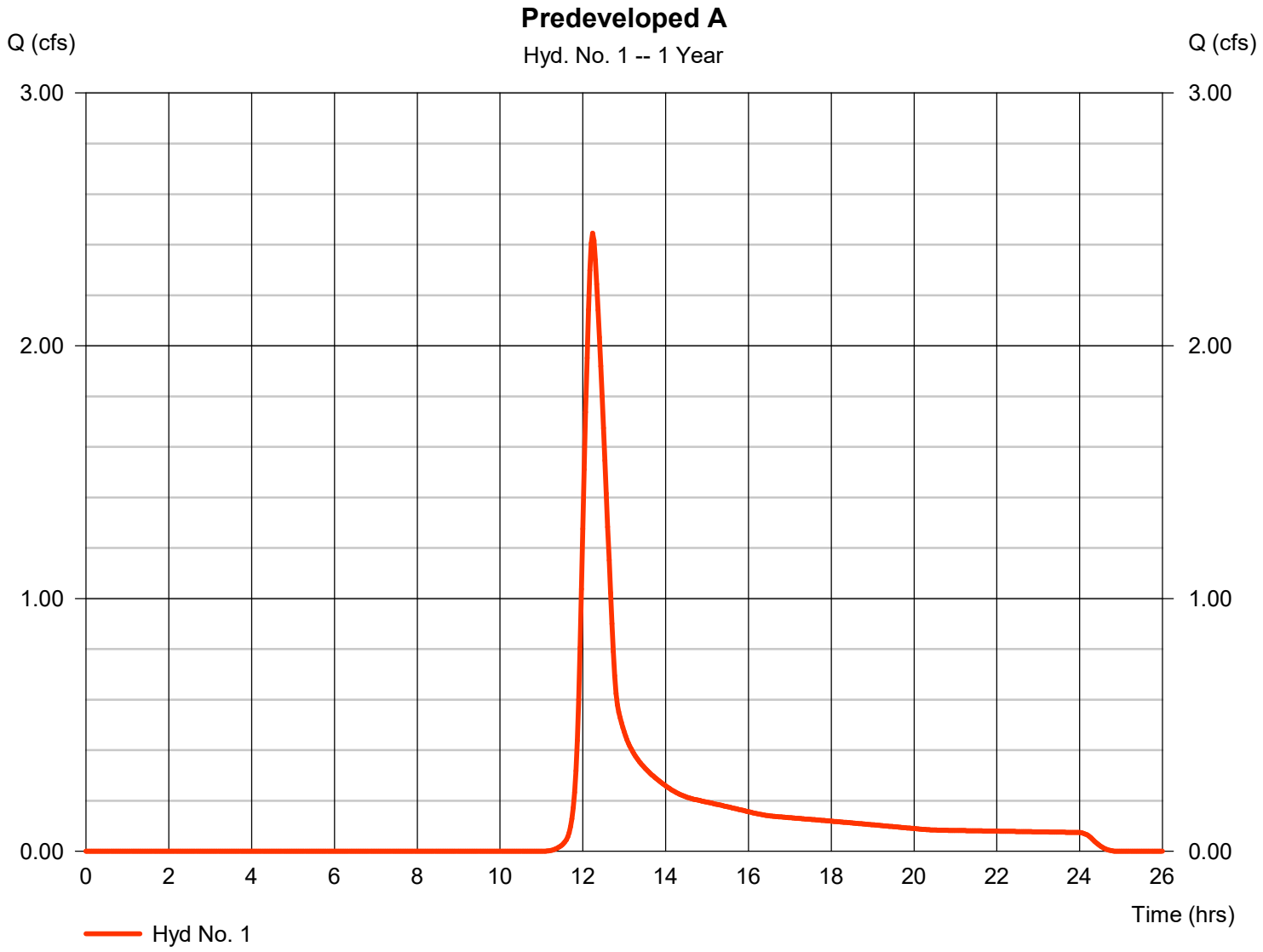
Hydrograph Report

Hyd. No. 1

Predeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 2.445 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.23 hrs
Time interval	= 2 min	Hyd. volume	= 11,476 cuft
Drainage area	= 4.420 ac	Curve number	= 79*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 30.90 min
Total precip.	= 2.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.055 x 98) + (4.365 x 79)] / 4.420



TR55 Tc Worksheet

Hyd. No. 1

Predeveloped A

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.200		0.011		0.011		
Flow length (ft)	= 150.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 2.50		0.00		0.00		
Land slope (%)	= 1.33		0.00		0.00		
Travel Time (min)	**= 22.72**	**+**	**0.00**	**+**	**0.00**	**=**	**22.72**
Shallow Concentrated Flow							
Flow length (ft)	= 536.00		0.00		0.00		
Watercourse slope (%)	= 0.56		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.21		0.00		0.00		
Travel Time (min)	**= 7.40**	**+**	**0.00**	**+**	**0.00**	**=**	**7.40**
Channel Flow							
X sectional flow area (sqft)	= 0.79		0.00		0.00		
Wetted perimeter (ft)	= 3.14		0.00		0.00		
Channel slope (%)	= 0.09		0.00		0.00		
Manning's n-value	= 0.023		0.015		0.015		
Velocity (ft/s)	=0.79						
			0.00				
					0.00		
Flow length (ft)	({0})38.0		0.0		0.0		
Travel Time (min)	**= 0.80**	**+**	**0.00**	**+**	**0.00**	**=**	**0.80**

Total Travel Time, Tc ..... 30.90 min

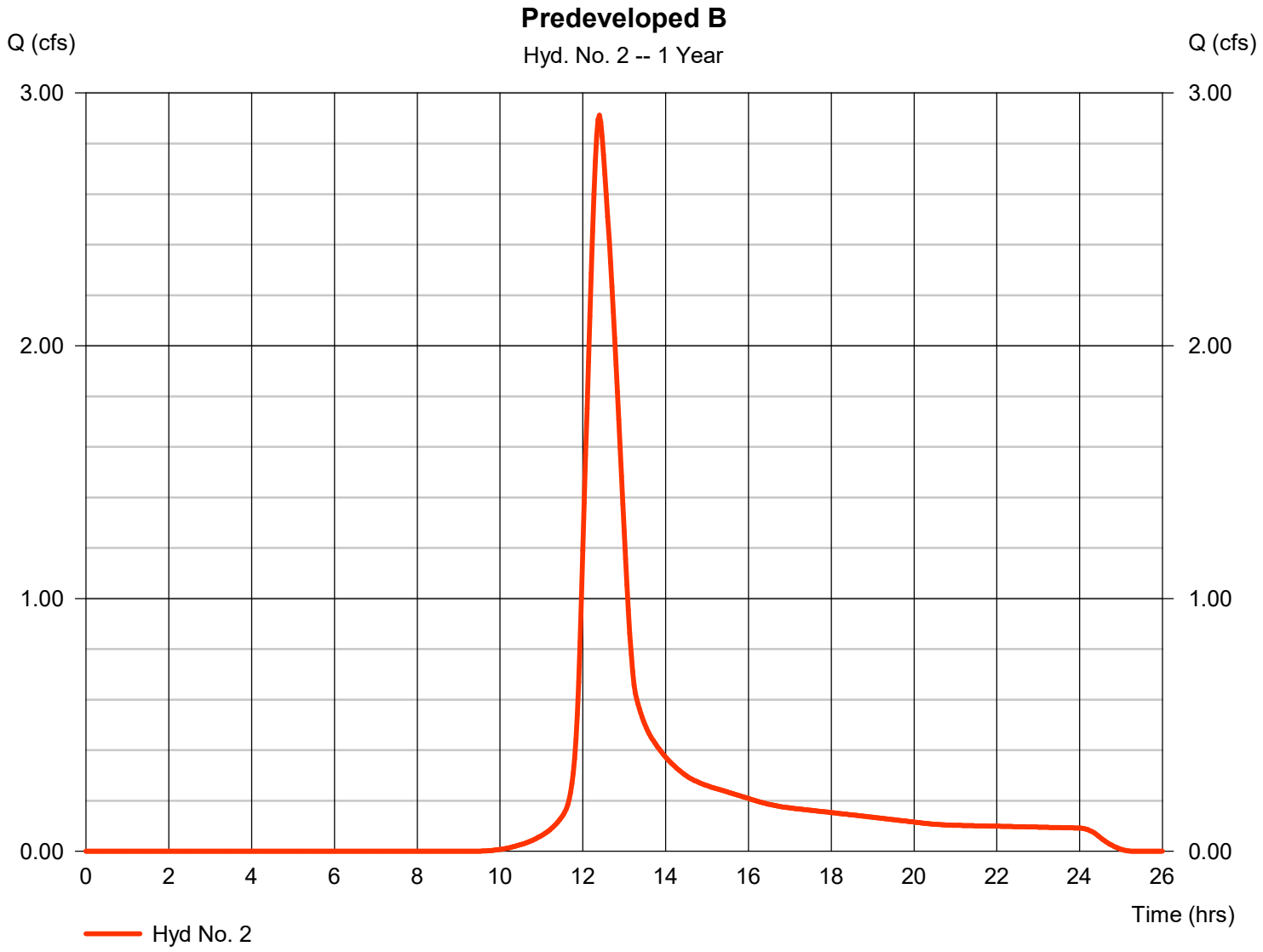
Hydrograph Report

Hyd. No. 2

Predeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 2.912 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.40 hrs
Time interval	= 2 min	Hyd. volume	= 16,832 cuft
Drainage area	= 4.540 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 49.90 min
Total precip.	= 2.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.460 x 98) + (3.080 x 79)] / 4.540



TR55 Tc Worksheet

Hyd. No. 2

Predeveloped B

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.200		0.011		0.011		
Flow length (ft)	= 150.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 2.50		0.00		0.00		
Land slope (%)	= 0.67		0.00		0.00		
Travel Time (min)	**= 29.89**	**+**	**0.00**	**+**	**0.00**	**=**	**29.89**
Shallow Concentrated Flow							
Flow length (ft)	= 75.00		0.00		0.00		
Watercourse slope (%)	= 0.67		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.32		0.00		0.00		
Travel Time (min)	**= 0.95**	**+**	**0.00**	**+**	**0.00**	**=**	**0.95**
Channel Flow							
X sectional flow area (sqft)	= 0.79		0.00		0.00		
Wetted perimeter (ft)	= 3.14		0.00		0.00		
Channel slope (%)	= 0.09		0.00		0.00		
Manning's n-value	= 0.023		0.015		0.015		
Velocity (ft/s)	=0.79						
			0.00				
					0.00		
Flow length (ft)	({0})901.0		0.0		0.0		
Travel Time (min)	**= 19.04**	**+**	**0.00**	**+**	**0.00**	**=**	**19.04**

Total Travel Time, Tc ..... 49.90 min

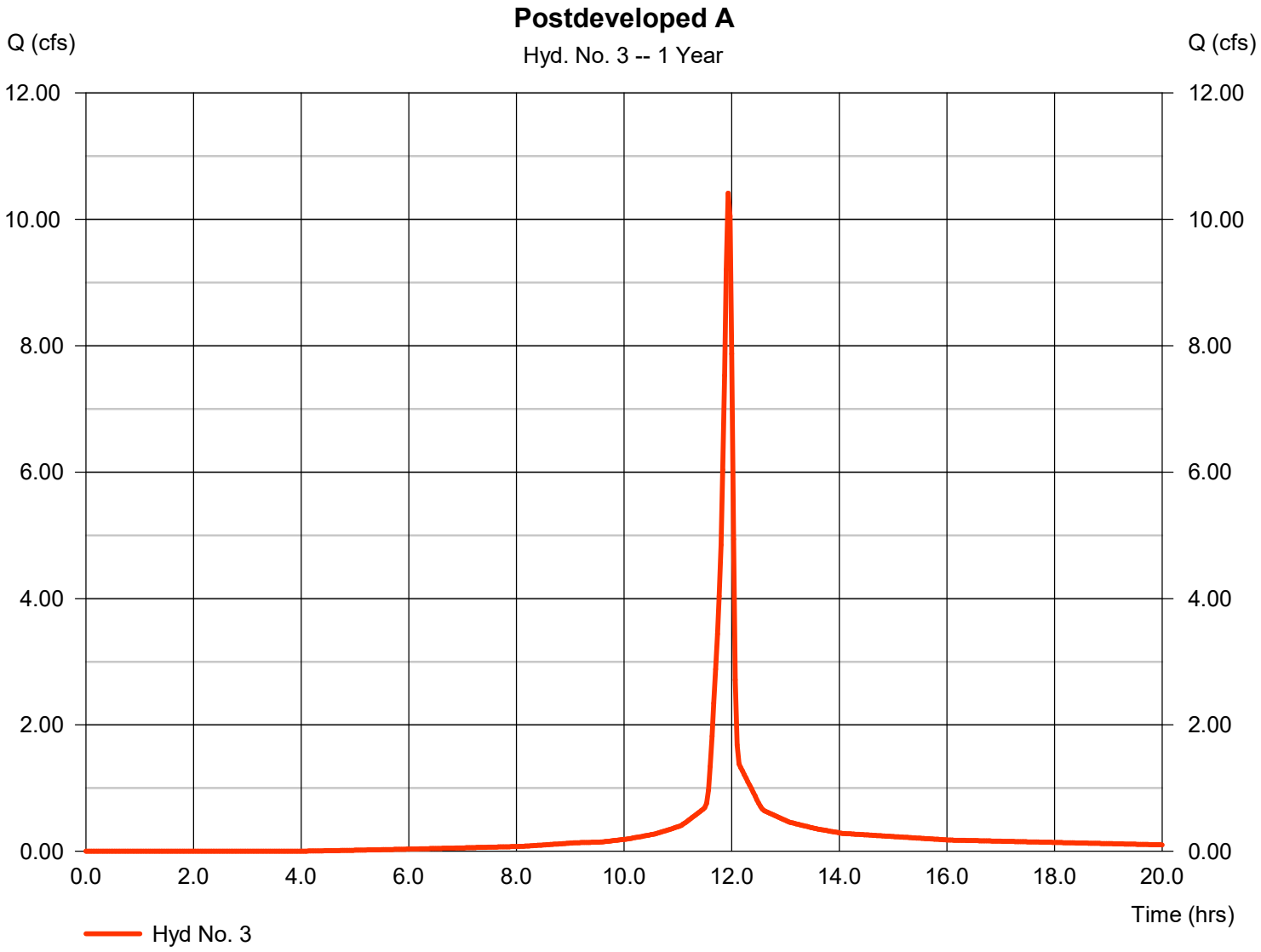
Hydrograph Report

Hyd. No. 3

Postdeveloped A

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.41 cfs
Storm frequency	=	1 yrs	Time to peak	=	11.93 hrs
Time interval	=	2 min	Hyd. volume	=	22,290 cuft
Drainage area	=	3.700 ac	Curve number	=	95*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	5.30 min
Total precip.	=	2.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(3.130 x 98) + (0.570 x 79)] / 3.700



TR55 Tc Worksheet

Hyd. No. 3

Postdeveloped A

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.011		0.011		
Flow length (ft)	= 102.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 2.50		0.00		0.00		
Land slope (%)	= 0.49		0.00		0.00		
Travel Time (min)	**= 2.44**	**+**	**0.00**	**+**	**0.00**	**=**	**2.44**
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		0.00		0.00		
Watercourse slope (%)	= 0.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow							
X sectional flow area (sqft)	= 0.79		0.00		0.00		
Wetted perimeter (ft)	= 3.14		0.00		0.00		
Channel slope (%)	= 0.45		0.00		0.00		
Manning's n-value	= 0.010		0.015		0.015		
Velocity (ft/s)	=3.95						
			0.00				
					0.00		
Flow length (ft)	({0})673.0		0.0		0.0		
Travel Time (min)	**= 2.84**	**+**	**0.00**	**+**	**0.00**	**=**	**2.84**

Total Travel Time, Tc ..... 5.30 min

Storm design sheets call for 10 min tc.

This time of concentration has chnaged because of the new pre and post developed trib maps.

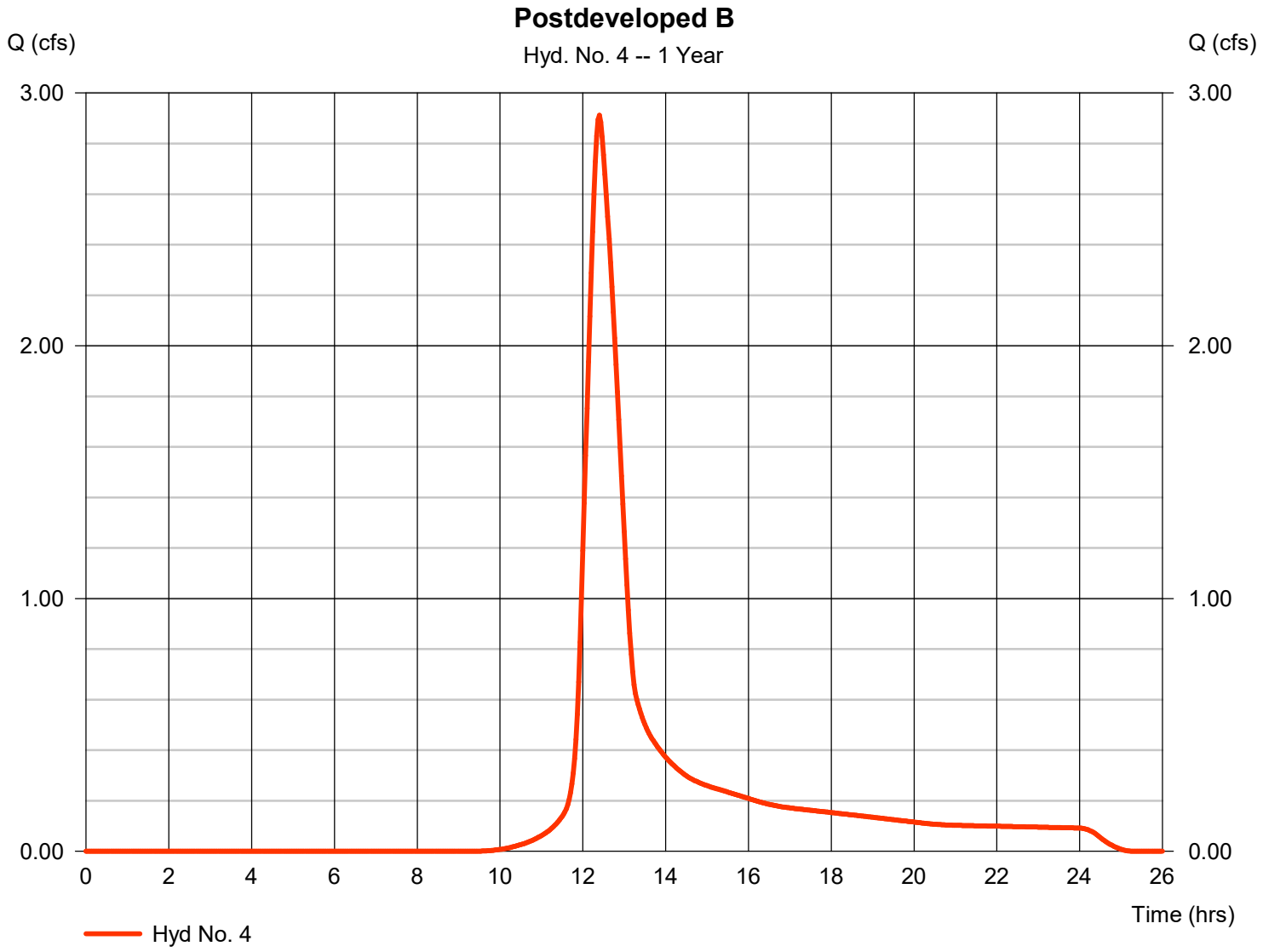
Hydrograph Report

Hyd. No. 4

Postdeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 2.912 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.40 hrs
Time interval	= 2 min	Hyd. volume	= 16,832 cuft
Drainage area	= 4.540 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 49.90 min
Total precip.	= 2.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.460 x 98) + (3.080 x 79)] / 4.540



TR55 Tc Worksheet

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

Hyd. No. 4

Postdeveloped B

Description	A	B	C	Totals
Sheet Flow				
Manning's n-value	= 0.200	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.50	0.00	0.00	
Land slope (%)	= 0.67	0.00	0.00	
Travel Time (min)	**= 29.89 +**	**0.00 +**	**0.00 =**	**29.89**
Shallow Concentrated Flow				
Flow length (ft)	= 75.00	0.00	0.00	
Watercourse slope (%)	= 0.67	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=1.32	0.00	0.00	
Travel Time (min)	**= 0.95 +**	**0.00 +**	**0.00 =**	**0.95**
Channel Flow				
X sectional flow area (sqft)	= 0.79	0.00	0.00	
Wetted perimeter (ft)	= 3.14	0.00	0.00	
Channel slope (%)	= 0.09	0.00	0.00	
Manning's n-value	= 0.023	0.015	0.015	
Velocity (ft/s)	=0.79			
		0.00		
			0.00	
Flow length (ft)	({0})901.0	0.0	0.0	
Travel Time (min)	**= 19.04 +**	**0.00 +**	**0.00 =**	**19.04**
Total Travel Time, Tc				**49.90 min**

This will be pipe flow
See post trib map comments

The pre and post developed trib maps have changed.

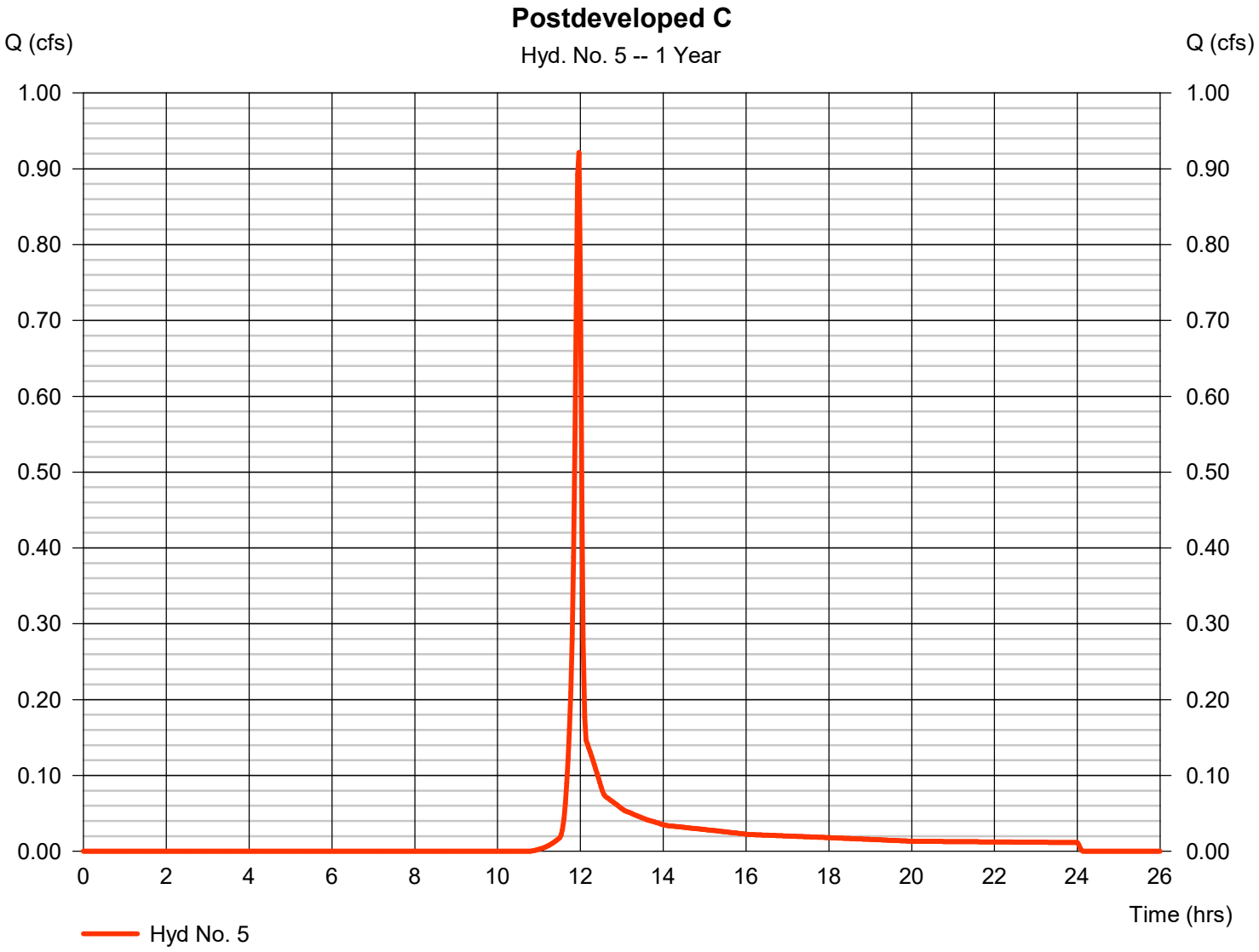
Hydrograph Report

Hyd. No. 5

Postdeveloped C

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.921 cfs
Storm frequency	=	1 yrs	Time to peak	=	11.97 hrs
Time interval	=	2 min	Hyd. volume	=	1,846 cuft
Drainage area	=	0.720 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.050 x 98) + (0.670 x 79)] / 0.720

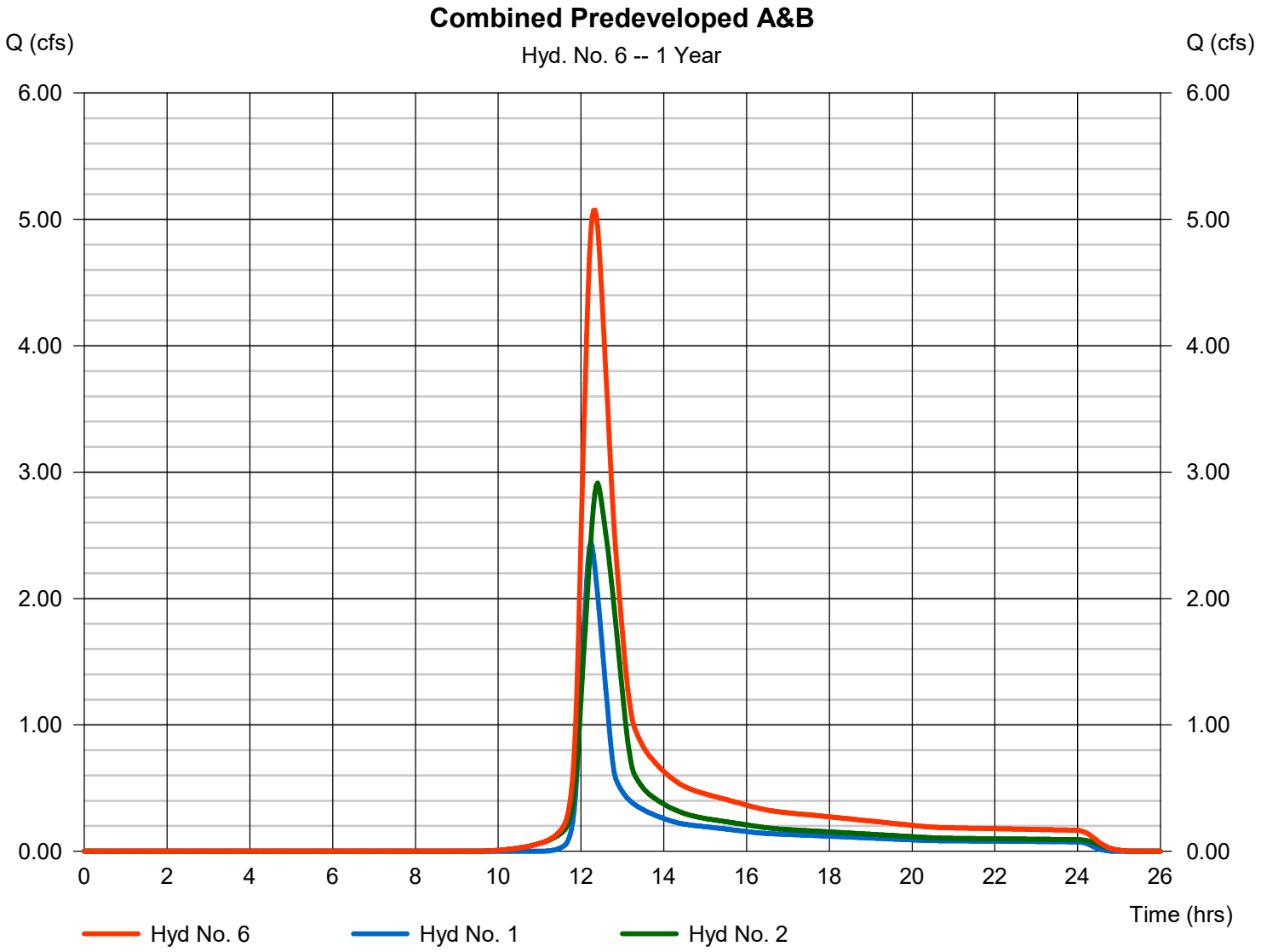


Hydrograph Report

Hyd. No. 6

Combined Predeveloped A&B

Hydrograph type	= Combine	Peak discharge	= 5.074 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.33 hrs
Time interval	= 2 min	Hyd. volume	= 28,308 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 8.960 ac

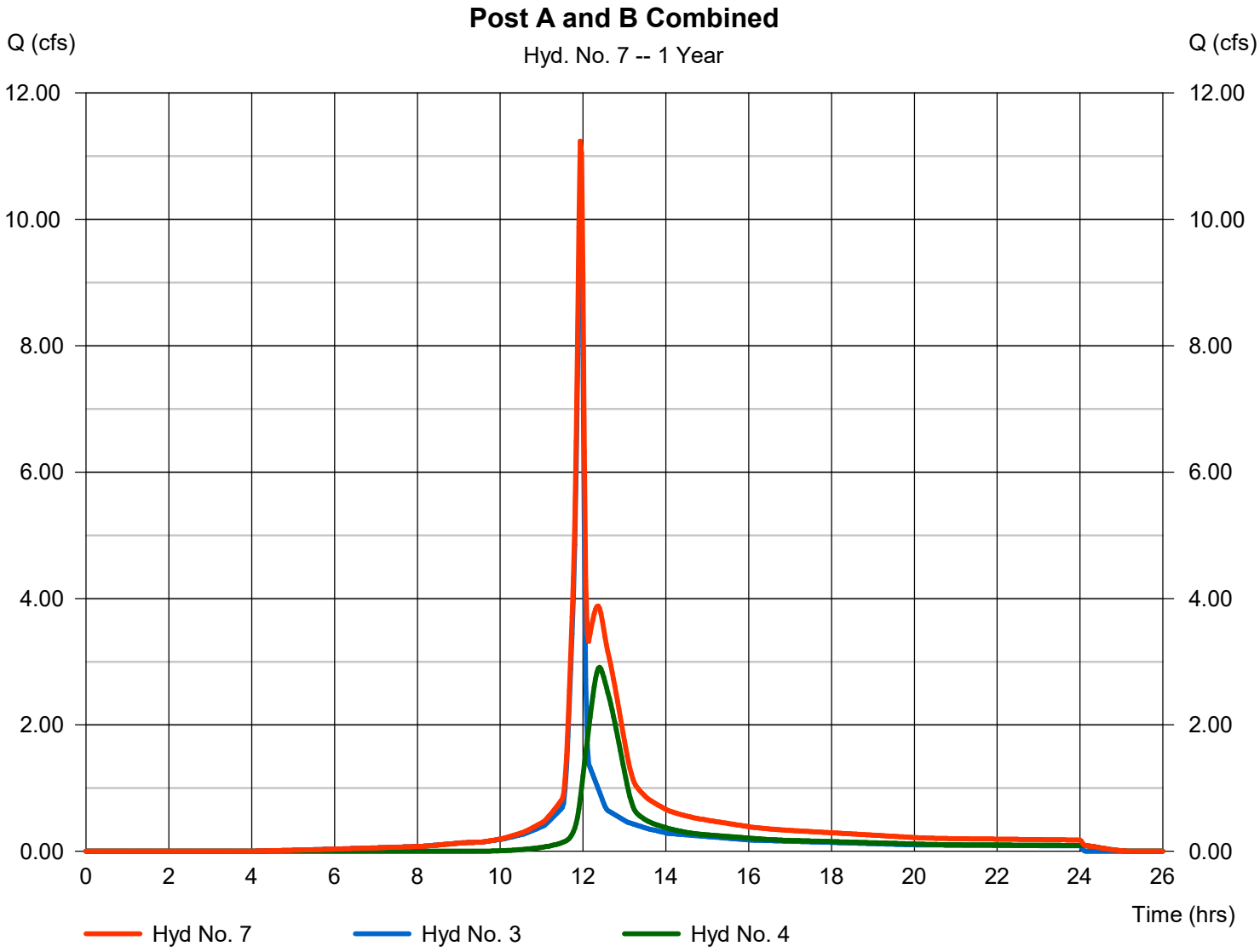


Hydrograph Report

Hyd. No. 7

Post A and B Combined

Hydrograph type	= Combine	Peak discharge	= 11.24 cfs
Storm frequency	= 1 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 39,122 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 8.240 ac



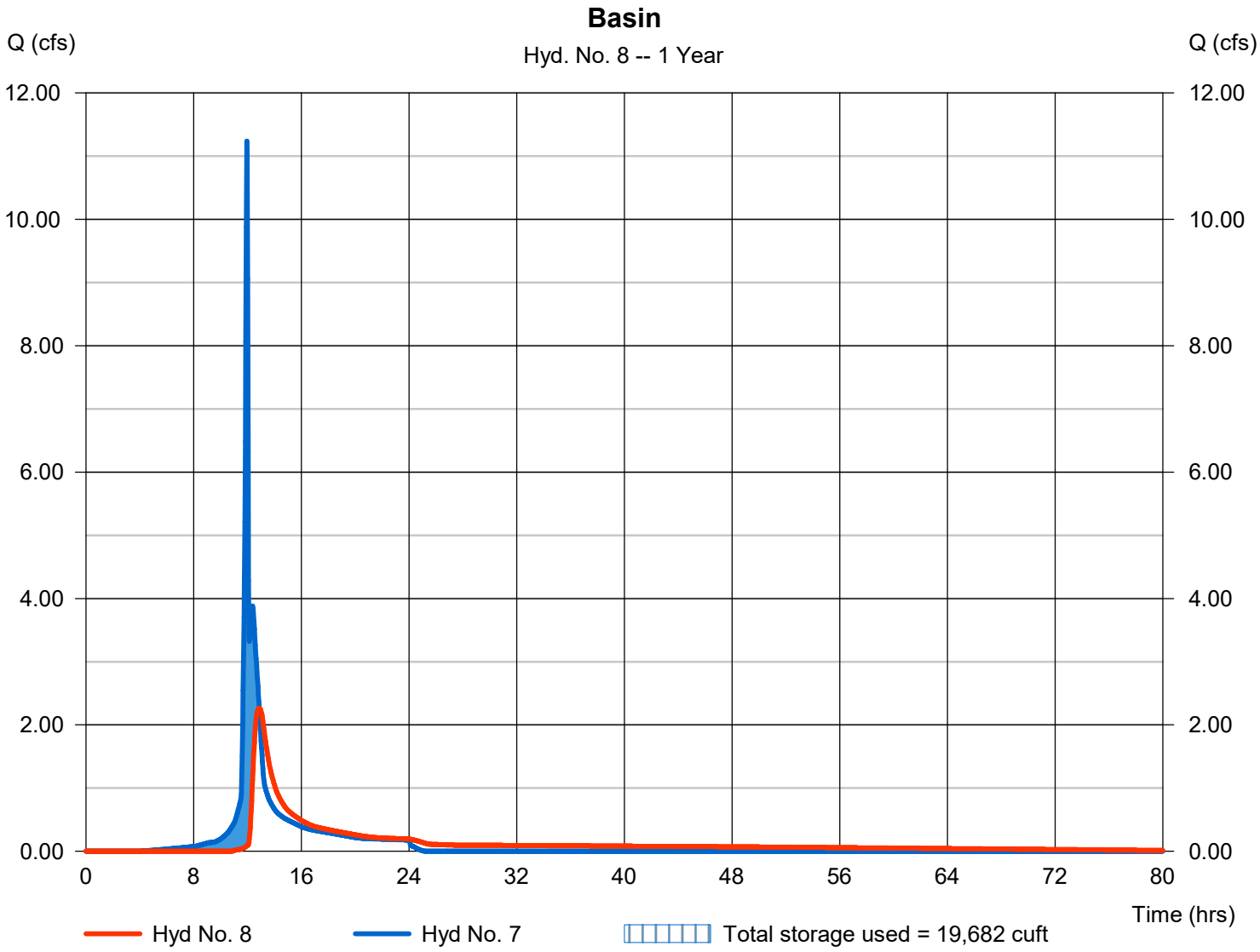
Hydrograph Report

Hyd. No. 8

Basin

Hydrograph type	=	Reservoir	Peak discharge	=	2.265 cfs
Storm frequency	=	1 yrs	Time to peak	=	12.87 hrs
Time interval	=	2 min	Hyd. volume	=	36,822 cuft
Inflow hyd. No.	=	7 - Post A and B Combined	Max. Elevation	=	707.02 ft
Reservoir name	=	Detention Basin	Max. Storage	=	19,682 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Detention Basin

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 702.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	702.00	422	0	0
1.00	703.00	705	557	557
2.00	704.00	3,485	1,919	2,476
3.00	705.00	4,795	4,122	6,599
4.00	706.00	6,345	5,551	12,150
5.00	707.00	8,295	7,298	19,448
6.00	708.00	10,474	9,362	28,810
7.00	709.00	12,837	11,634	40,444
8.00	710.00	15,981	14,379	54,823

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	1.50	12.00	0.00
Span (in)	= 12.00	1.50	12.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 703.45	703.90	706.25	0.00
Length (ft)	= 90.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.66	0.66	0.66	0.66
Multi-Stage	= n/a	Yes	Yes	No

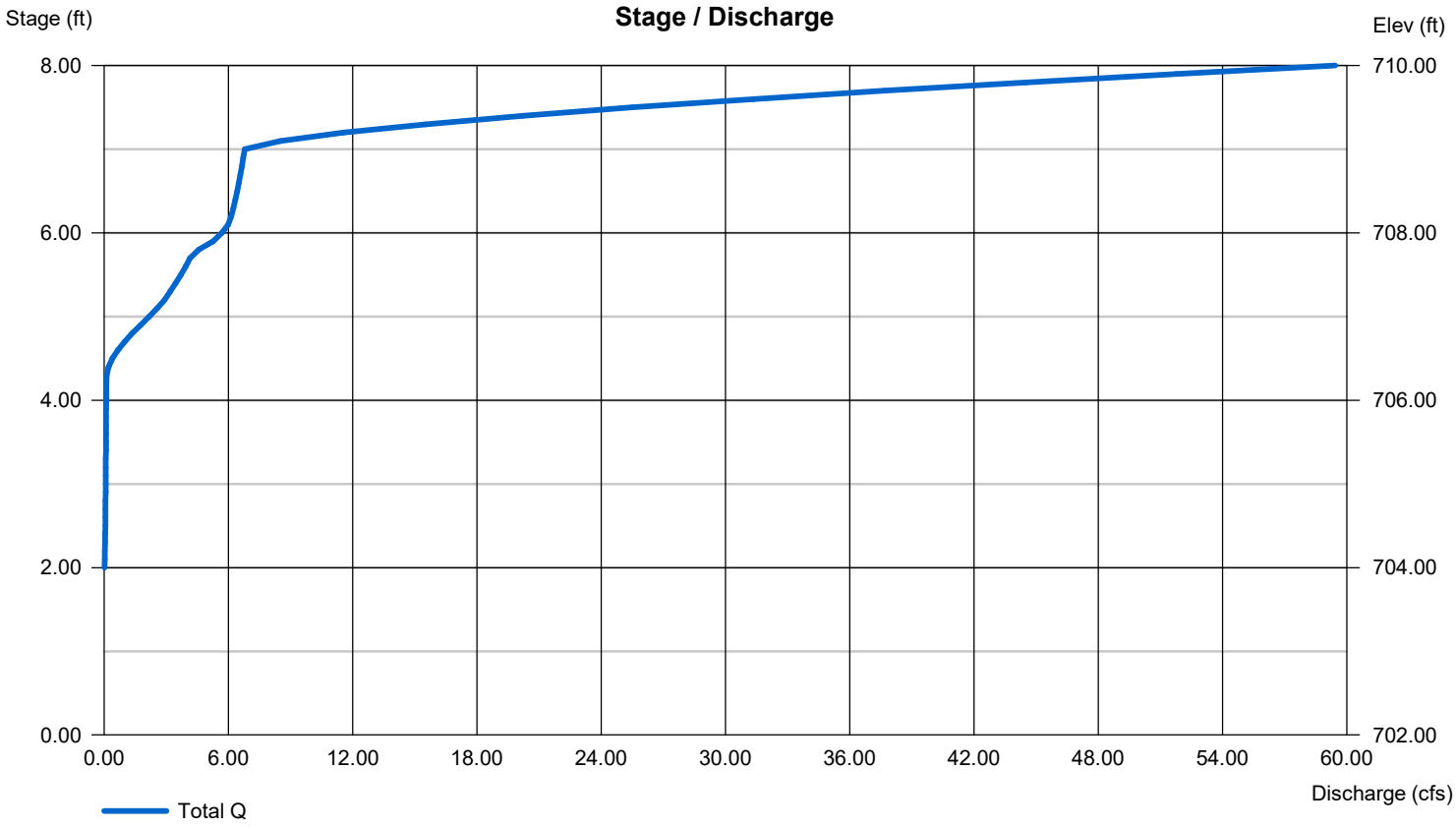
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	8.00	0.00	0.00
Crest El. (ft)	= 709.00	707.75	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= No	Yes	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).

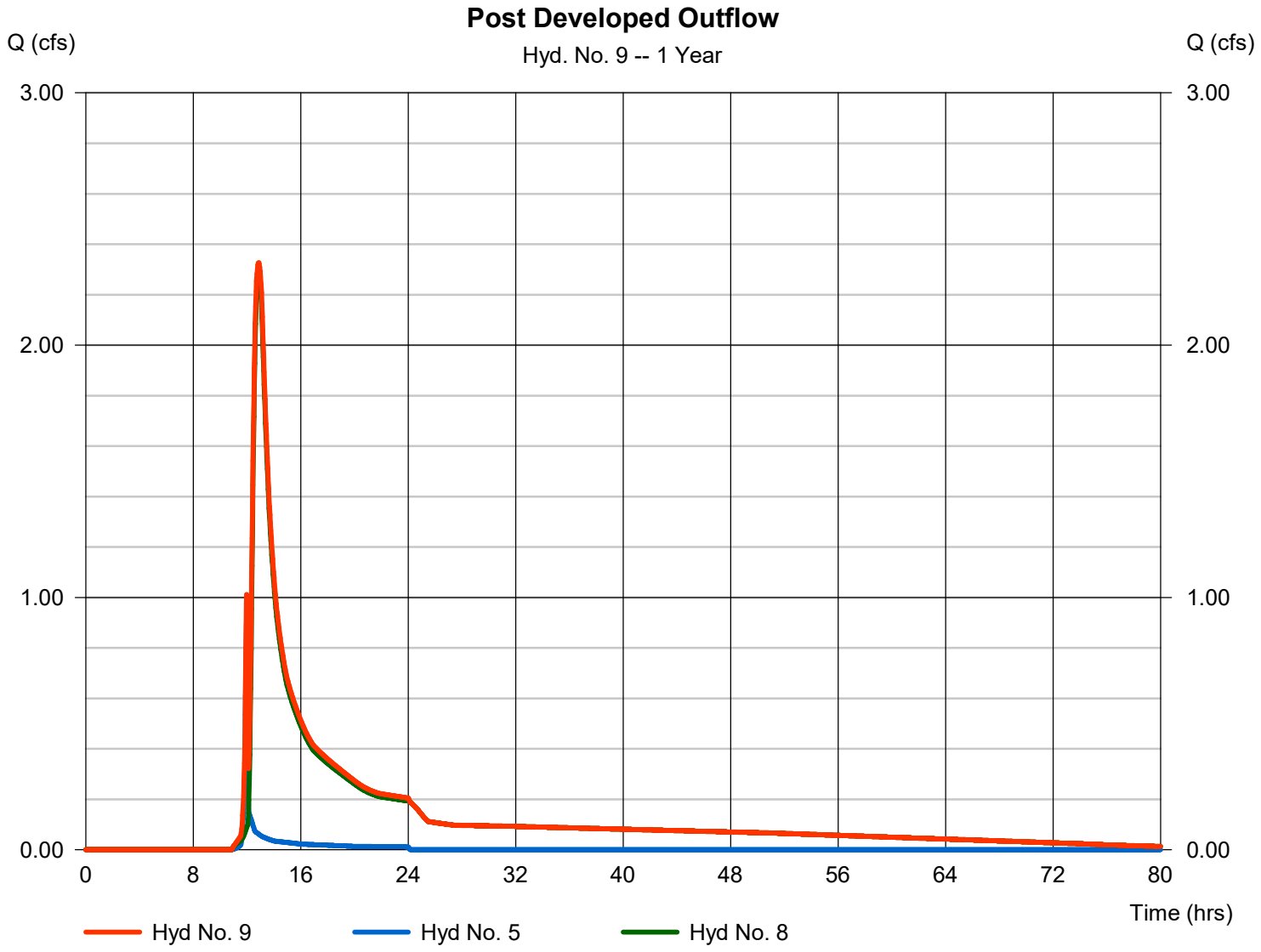


Hydrograph Report

Hyd. No. 9

Post Developed Outflow

Hydrograph type	= Combine	Peak discharge	= 2.327 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.87 hrs
Time interval	= 2 min	Hyd. volume	= 38,668 cuft
Inflow hyds.	= 5, 8	Contrib. drain. area	= 0.720 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.959	2	734	13,604	------	------	------	Predeveloped A
2	SCS Runoff	3.384	2	744	19,421	------	------	------	Predeveloped B
3	SCS Runoff	11.47	2	716	24,720	------	------	------	Postdeveloped A
4	SCS Runoff	3.384	2	744	19,421	------	------	------	Postdeveloped B
5	SCS Runoff	1.089	2	718	2,178	------	------	------	Postdeveloped C
6	Combine	6.002	2	738	33,025	1, 2,	------	------	Combined Predeveloped A&B
7	Combine	12.47	2	716	44,142	3, 4,	------	------	Post A and B Combined
8	Reservoir	2.779	2	768	41,842	7	707.16	20,954	Basin
9	Combine	2.853	2	768	44,020	5, 8	------	------	Post Developed Outflow

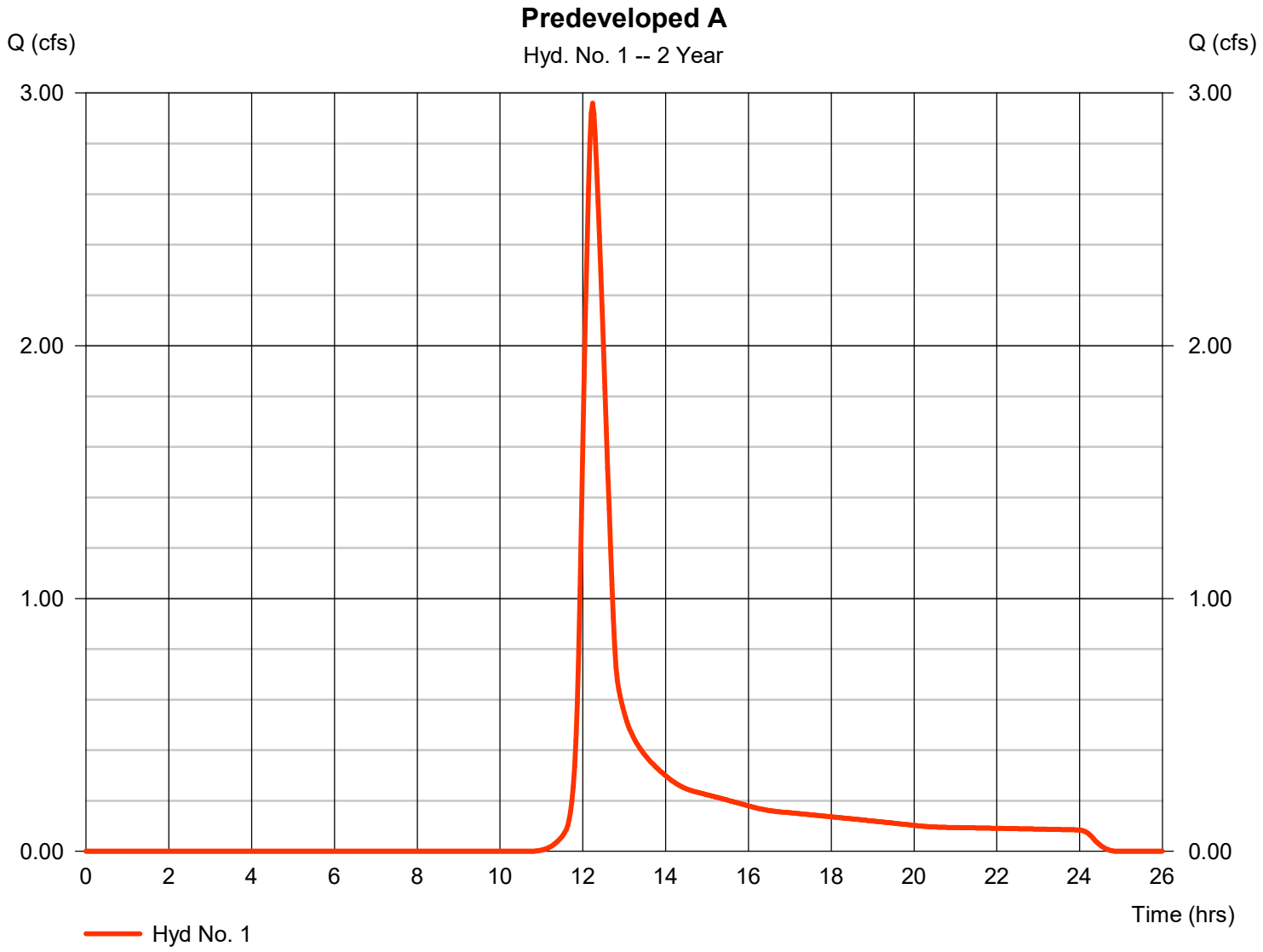
Hydrograph Report

Hyd. No. 1

Predeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 2.959 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.23 hrs
Time interval	= 2 min	Hyd. volume	= 13,604 cuft
Drainage area	= 4.420 ac	Curve number	= 79*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 30.90 min
Total precip.	= 2.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.055 x 98) + (4.365 x 79)] / 4.420



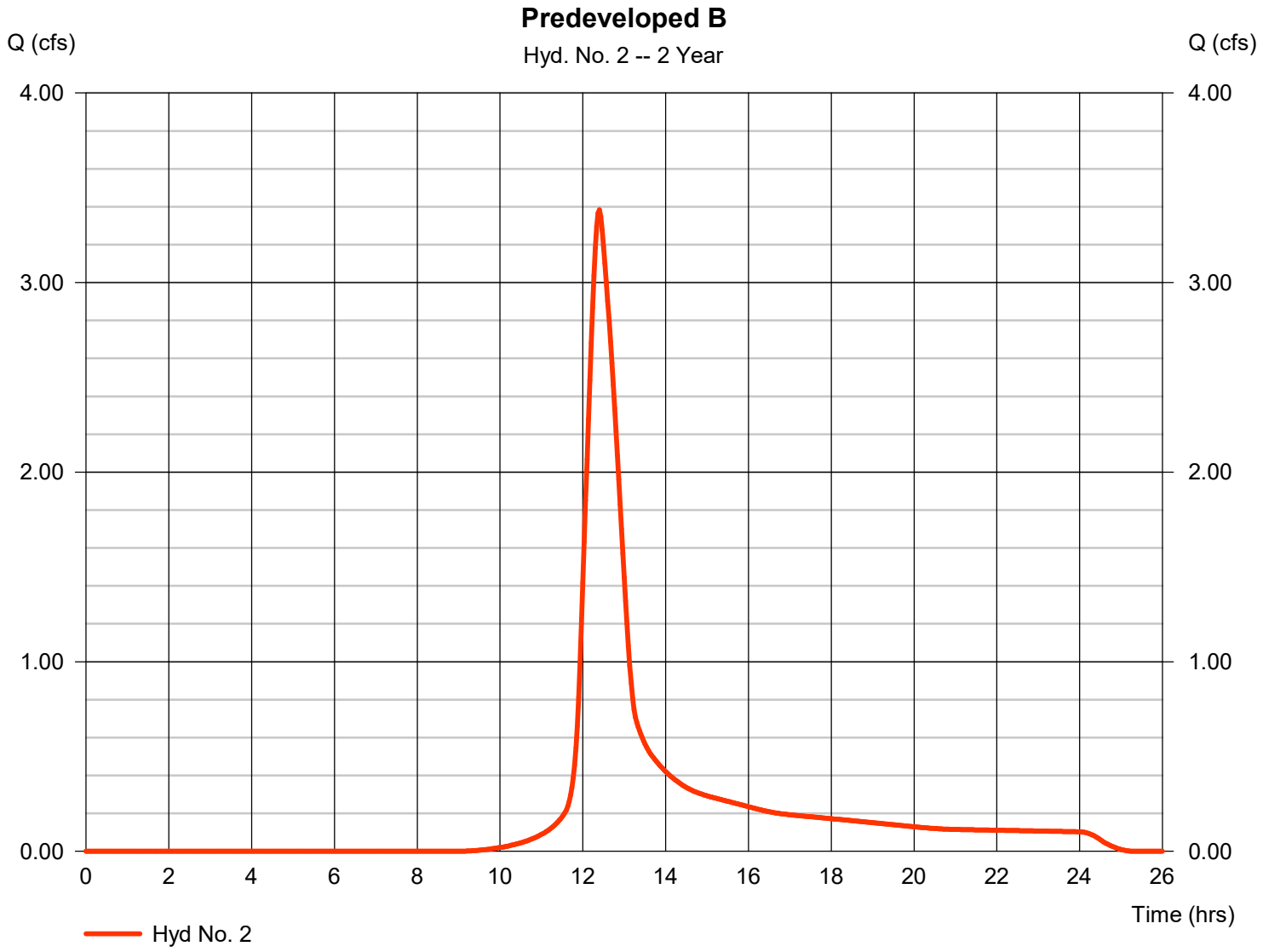
Hydrograph Report

Hyd. No. 2

Predeveloped B

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.384 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.40 hrs
Time interval	=	2 min	Hyd. volume	=	19,421 cuft
Drainage area	=	4.540 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	49.90 min
Total precip.	=	2.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.460 x 98) + (3.080 x 79)] / 4.540



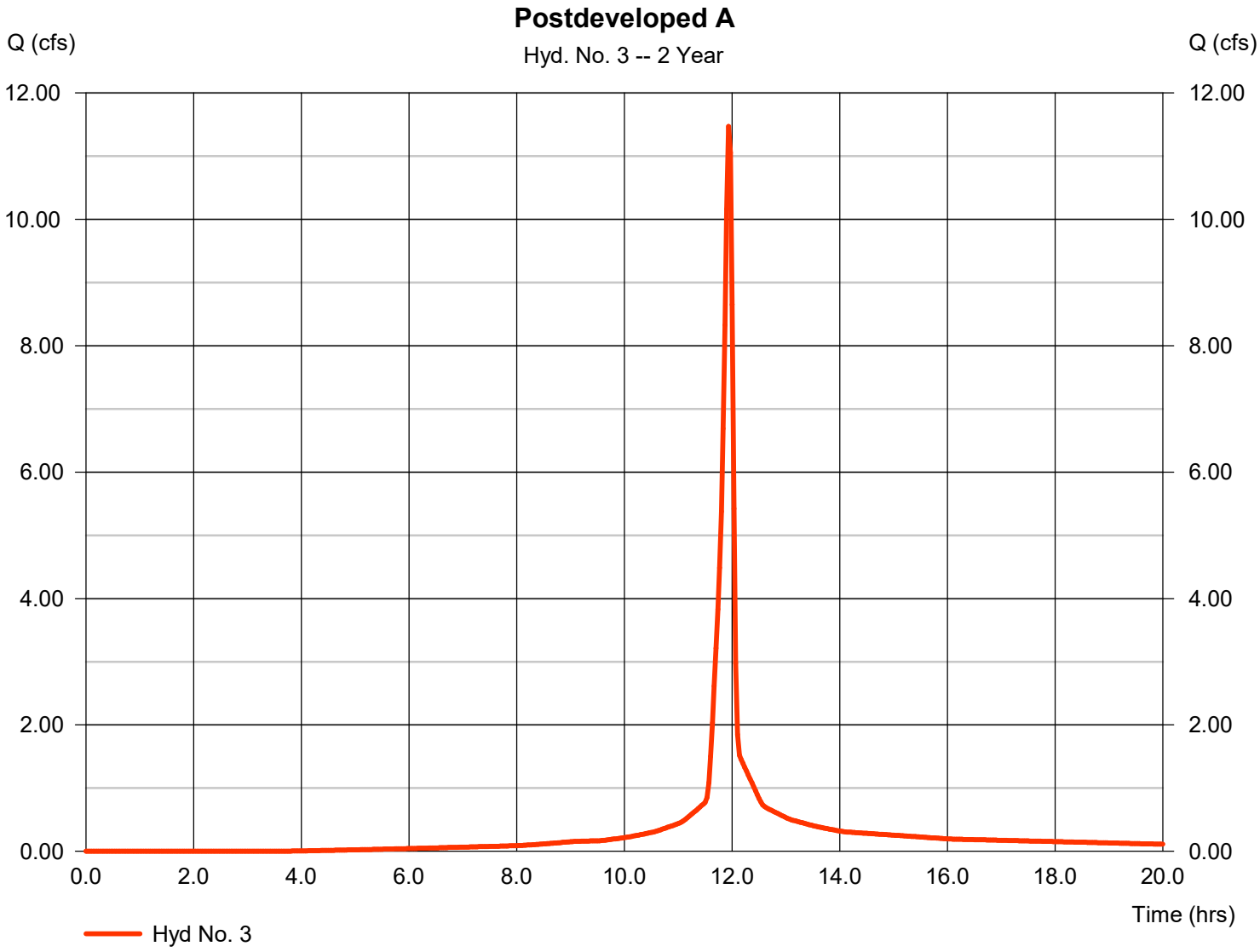
Hydrograph Report

Hyd. No. 3

Postdeveloped A

Hydrograph type	=	SCS Runoff	Peak discharge	=	11.47 cfs
Storm frequency	=	2 yrs	Time to peak	=	11.93 hrs
Time interval	=	2 min	Hyd. volume	=	24,720 cuft
Drainage area	=	3.700 ac	Curve number	=	95*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	5.30 min
Total precip.	=	2.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(3.130 x 98) + (0.570 x 79)] / 3.700



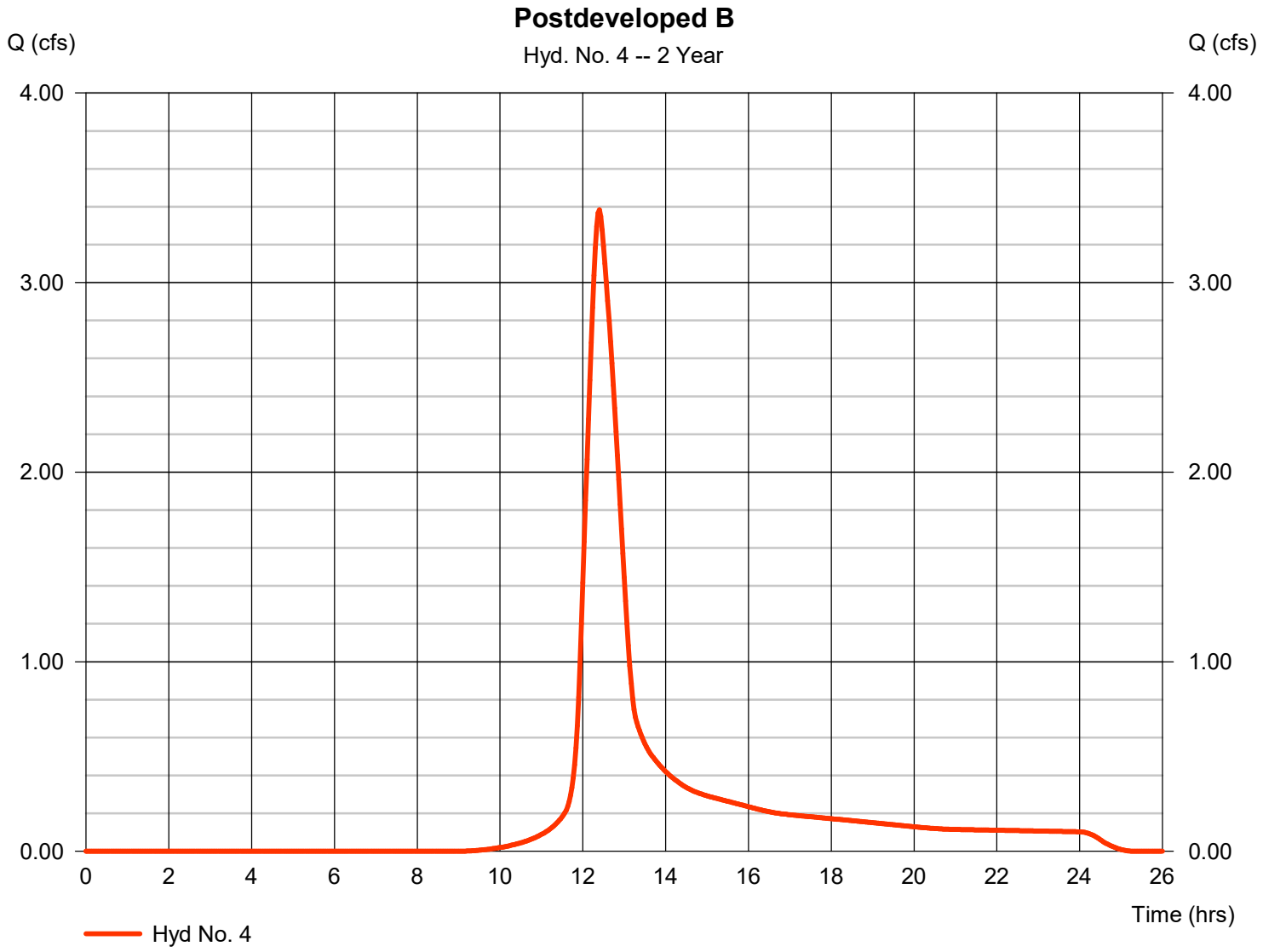
Hydrograph Report

Hyd. No. 4

Postdeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 3.384 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.40 hrs
Time interval	= 2 min	Hyd. volume	= 19,421 cuft
Drainage area	= 4.540 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 49.90 min
Total precip.	= 2.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.460 x 98) + (3.080 x 79)] / 4.540



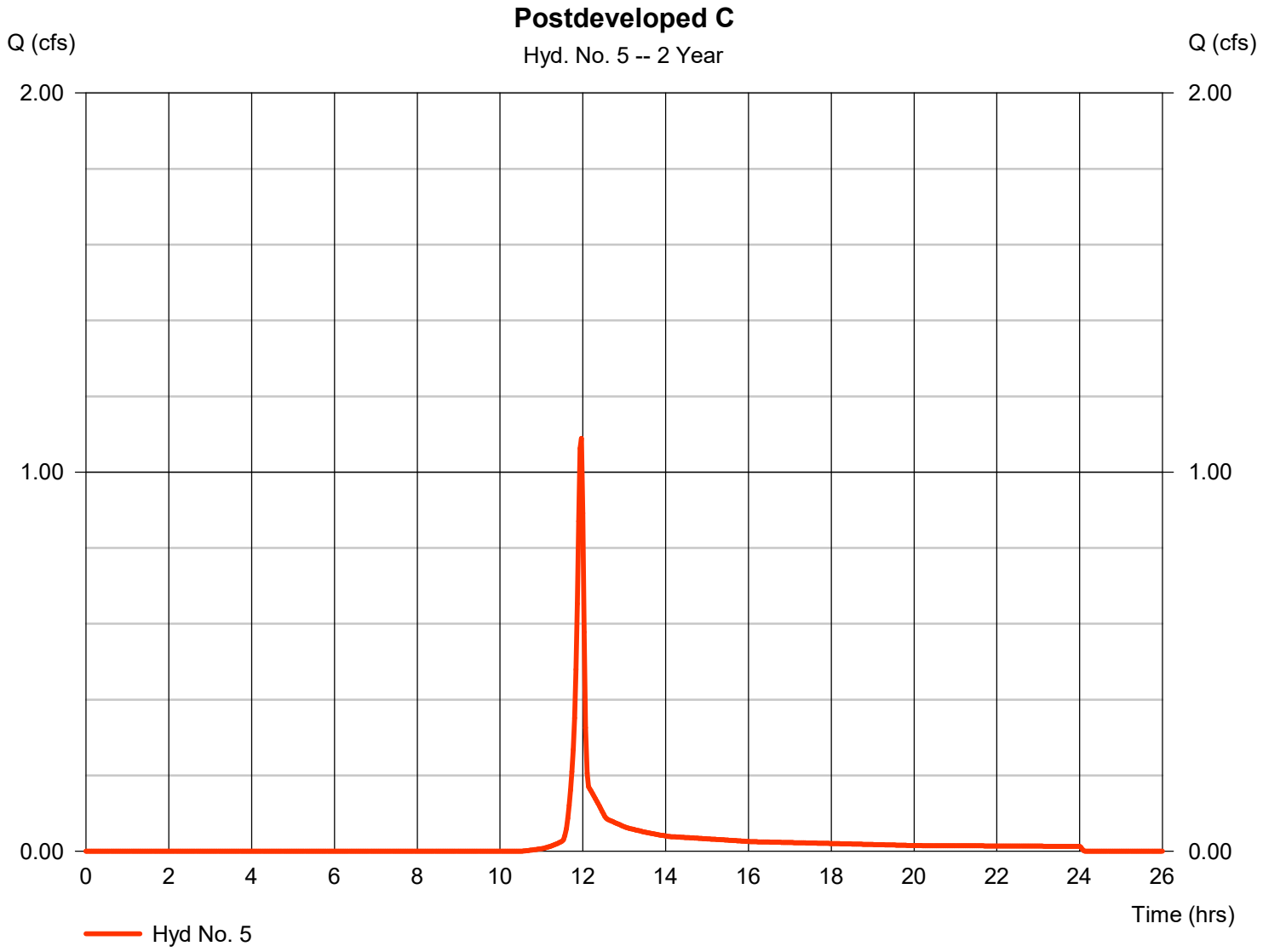
Hydrograph Report

Hyd. No. 5

Postdeveloped C

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.089 cfs
Storm frequency	=	2 yrs	Time to peak	=	11.97 hrs
Time interval	=	2 min	Hyd. volume	=	2,178 cuft
Drainage area	=	0.720 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.050 x 98) + (0.670 x 79)] / 0.720

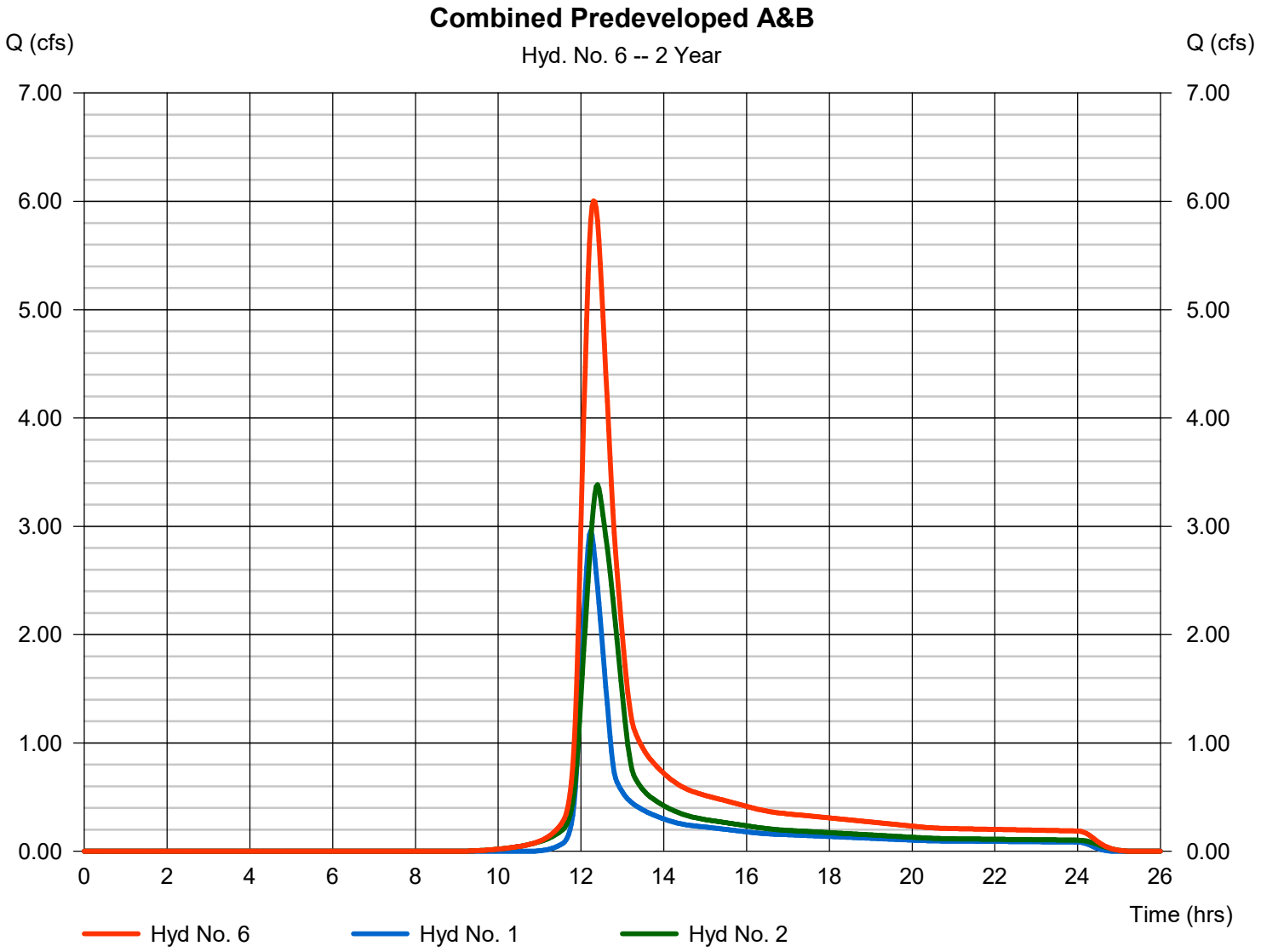


Hydrograph Report

Hyd. No. 6

Combined Predeveloped A&B

Hydrograph type	= Combine	Peak discharge	= 6.002 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.30 hrs
Time interval	= 2 min	Hyd. volume	= 33,025 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 8.960 ac

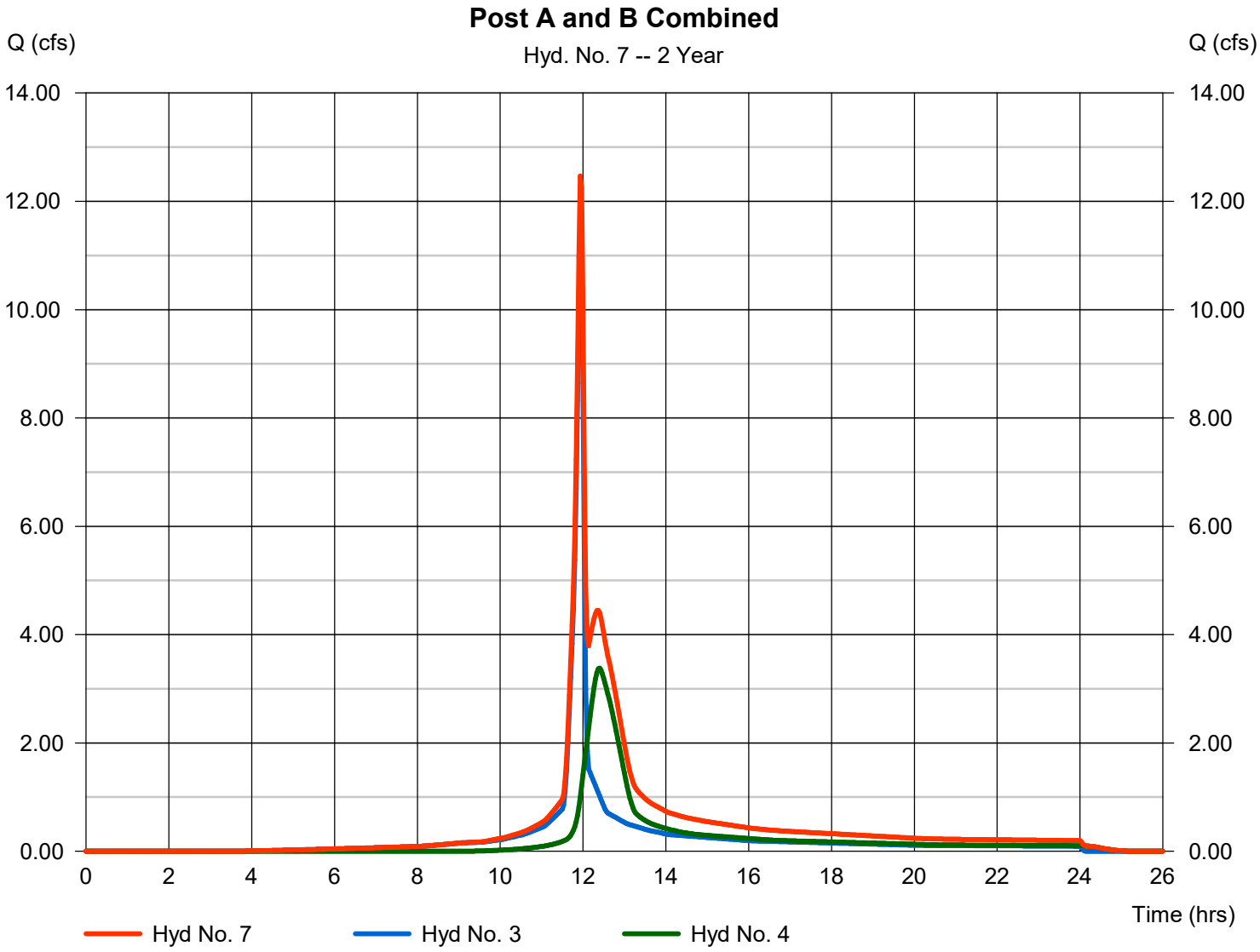


Hydrograph Report

Hyd. No. 7

Post A and B Combined

Hydrograph type	= Combine	Peak discharge	= 12.47 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 44,142 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 8.240 ac



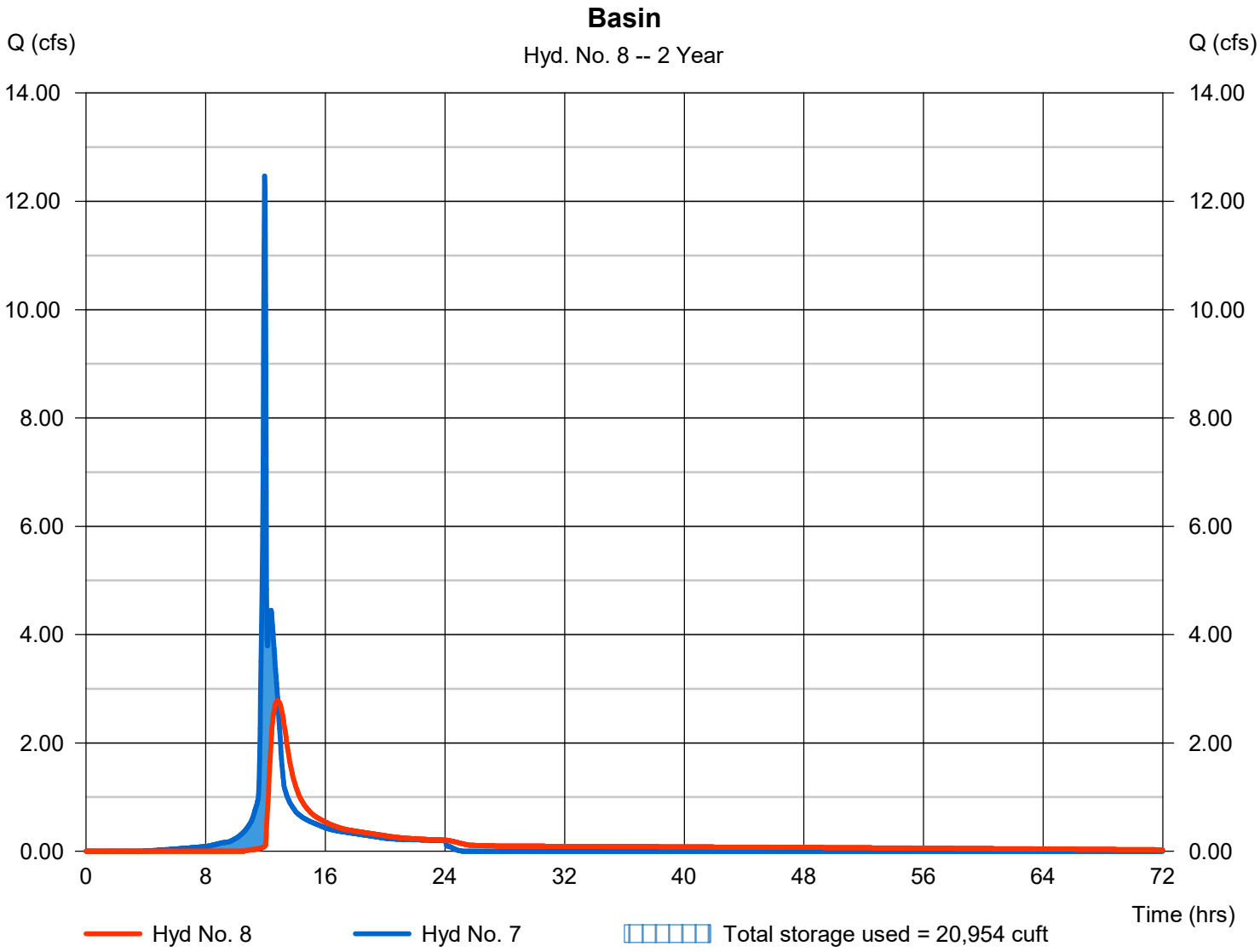
Hydrograph Report

Hyd. No. 8

Basin

Hydrograph type	=	Reservoir	Peak discharge	=	2.779 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.80 hrs
Time interval	=	2 min	Hyd. volume	=	41,842 cuft
Inflow hyd. No.	=	7 - Post A and B Combined	Max. Elevation	=	707.16 ft
Reservoir name	=	Detention Basin	Max. Storage	=	20,954 cuft

Storage Indication method used.

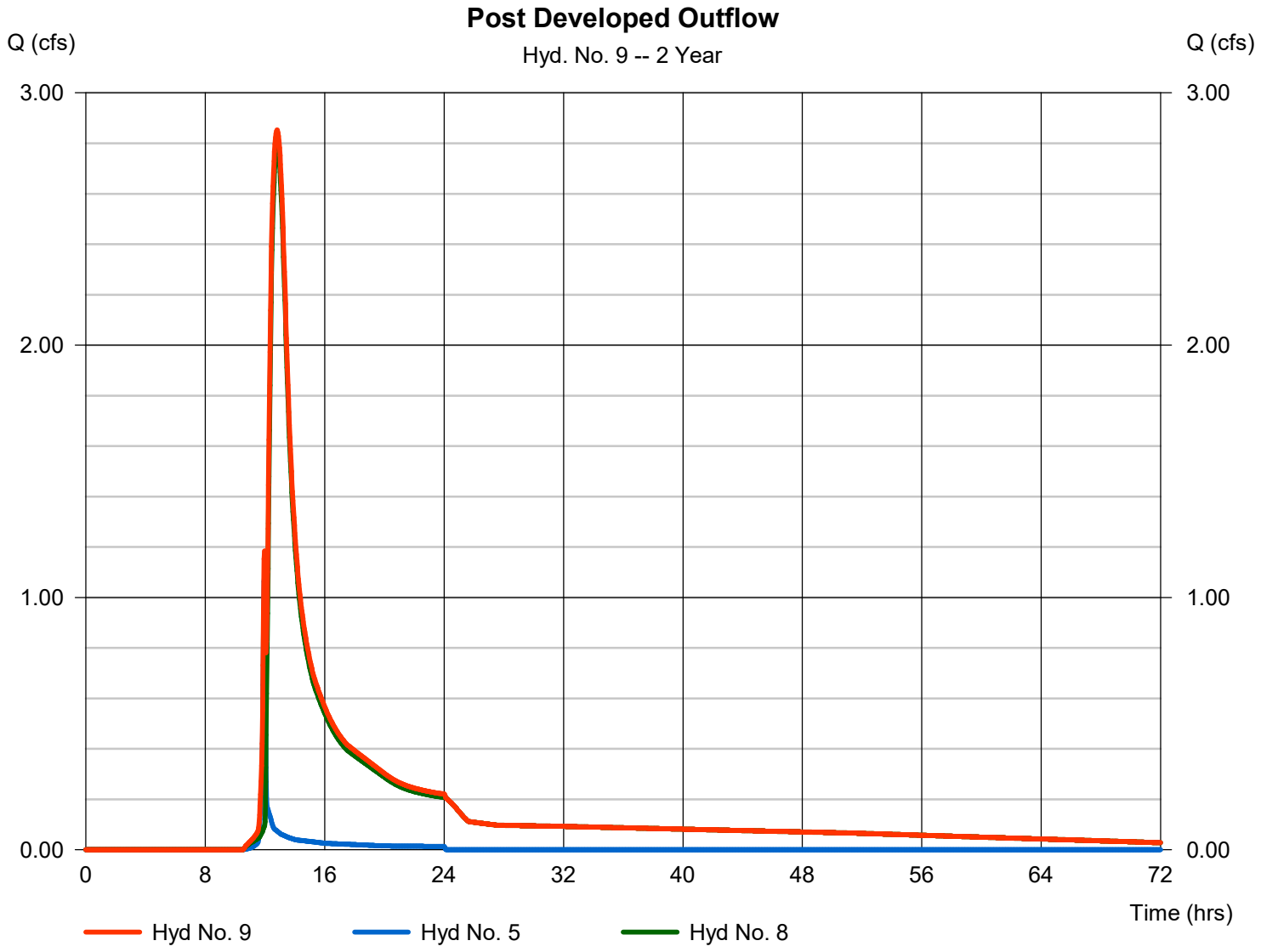


Hydrograph Report

Hyd. No. 9

Post Developed Outflow

Hydrograph type	= Combine	Peak discharge	= 2.853 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.80 hrs
Time interval	= 2 min	Hyd. volume	= 44,020 cuft
Inflow hyds.	= 5, 8	Contrib. drain. area	= 0.720 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	5.200	2	734	22,943	------	------	------	Predeveloped A
2	SCS Runoff	5.358	2	744	30,378	------	------	------	Predeveloped B
3	SCS Runoff	15.69	2	716	34,537	------	------	------	Postdeveloped A
4	SCS Runoff	5.358	2	744	30,378	------	------	------	Postdeveloped B
5	SCS Runoff	1.802	2	718	3,625	------	------	------	Postdeveloped C
6	Combine	9.993	2	738	53,320	1, 2,	------	------	Combined Predeveloped A&B
7	Combine	17.41	2	716	64,915	3, 4,	------	------	Post A and B Combined
8	Reservoir	4.820	2	762	62,615	7	707.84	27,277	Basin
9	Combine	4.943	2	762	66,239	5, 8	------	------	Post Developed Outflow

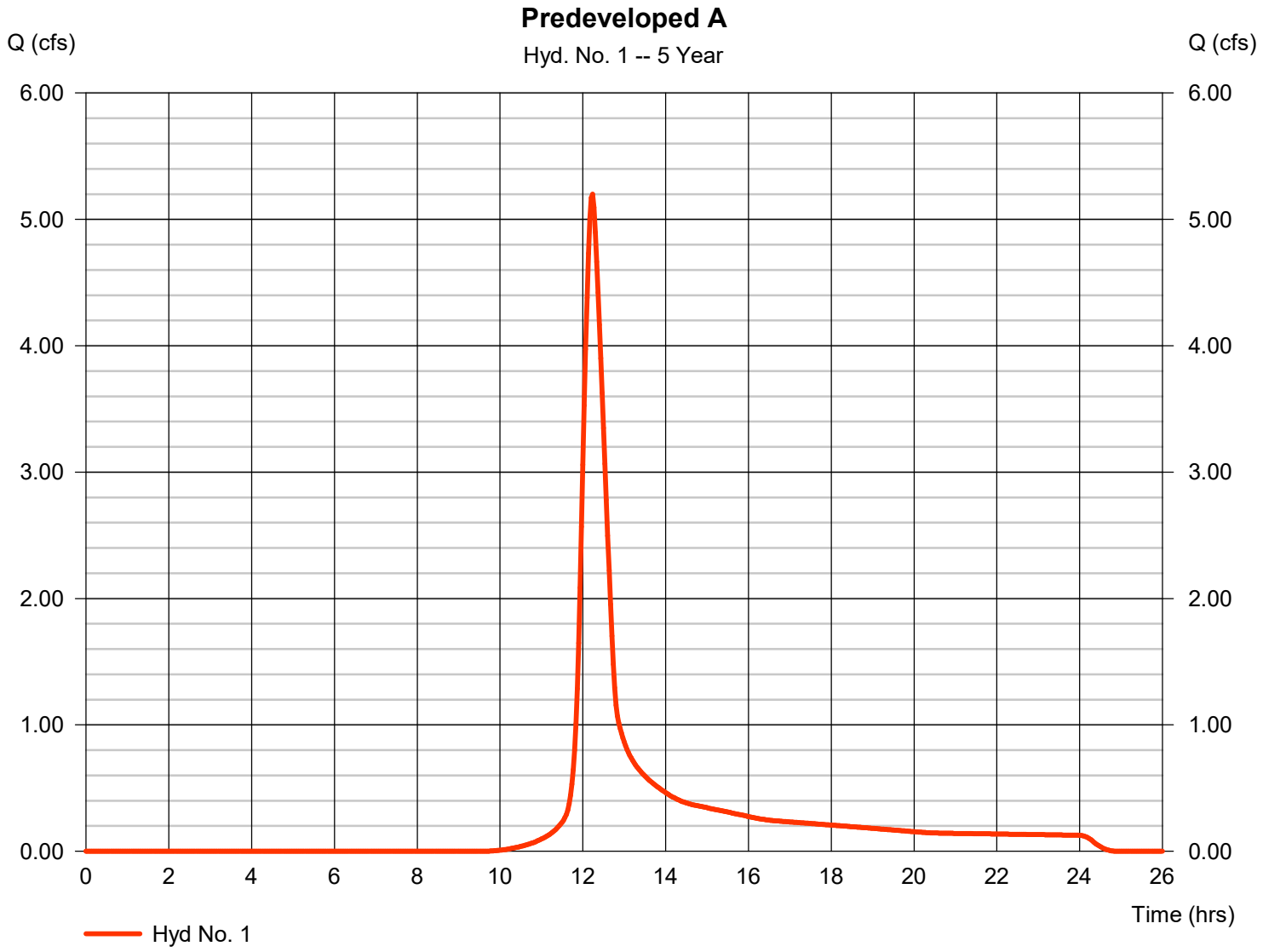
Hydrograph Report

Hyd. No. 1

Predeveloped A

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.200 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.23 hrs
Time interval	=	2 min	Hyd. volume	=	22,943 cuft
Drainage area	=	4.420 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	30.90 min
Total precip.	=	3.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.055 x 98) + (4.365 x 79)] / 4.420



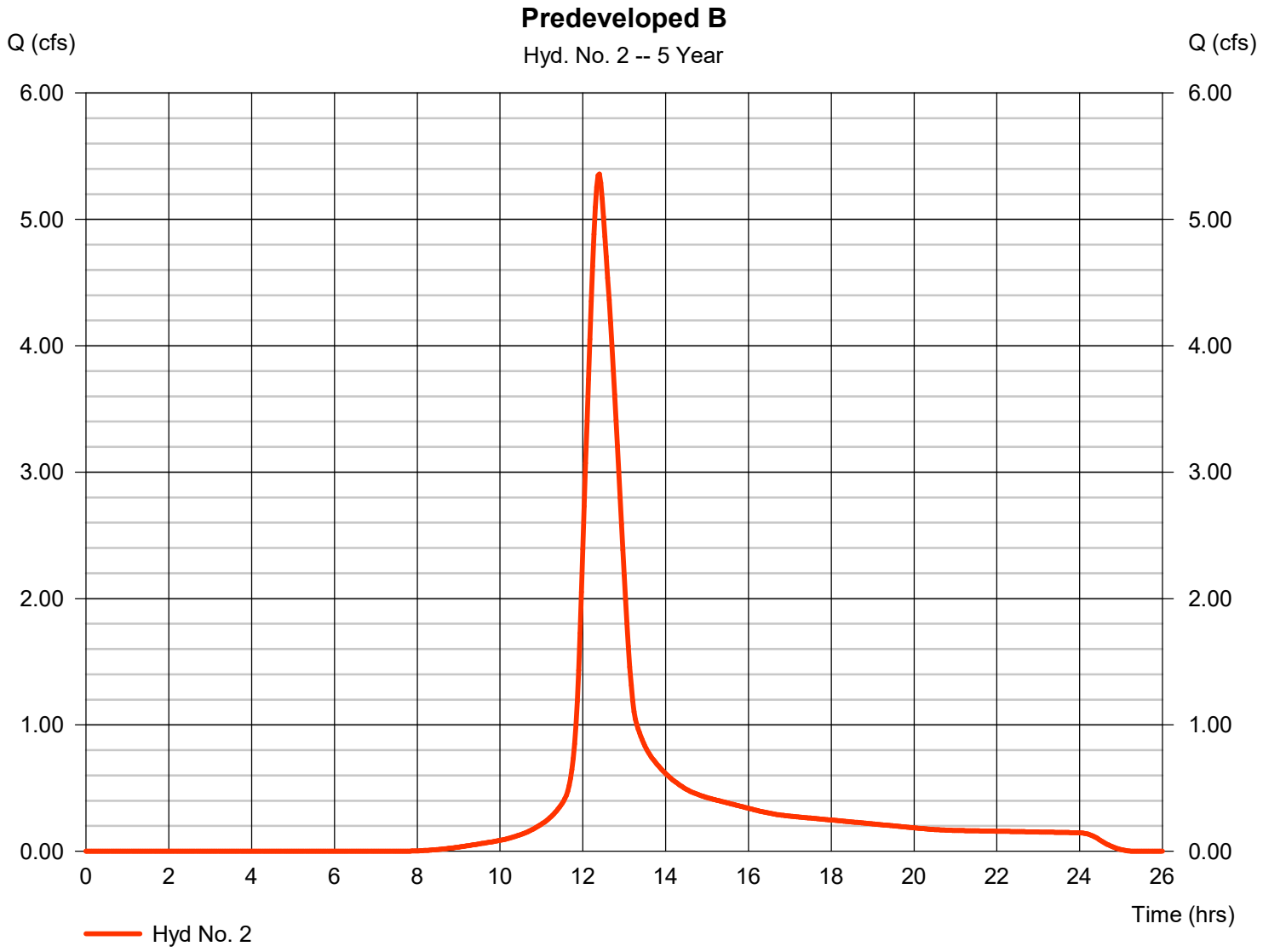
Hydrograph Report

Hyd. No. 2

Predeveloped B

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.358 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.40 hrs
Time interval	=	2 min	Hyd. volume	=	30,378 cuft
Drainage area	=	4.540 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	49.90 min
Total precip.	=	3.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.460 x 98) + (3.080 x 79)] / 4.540



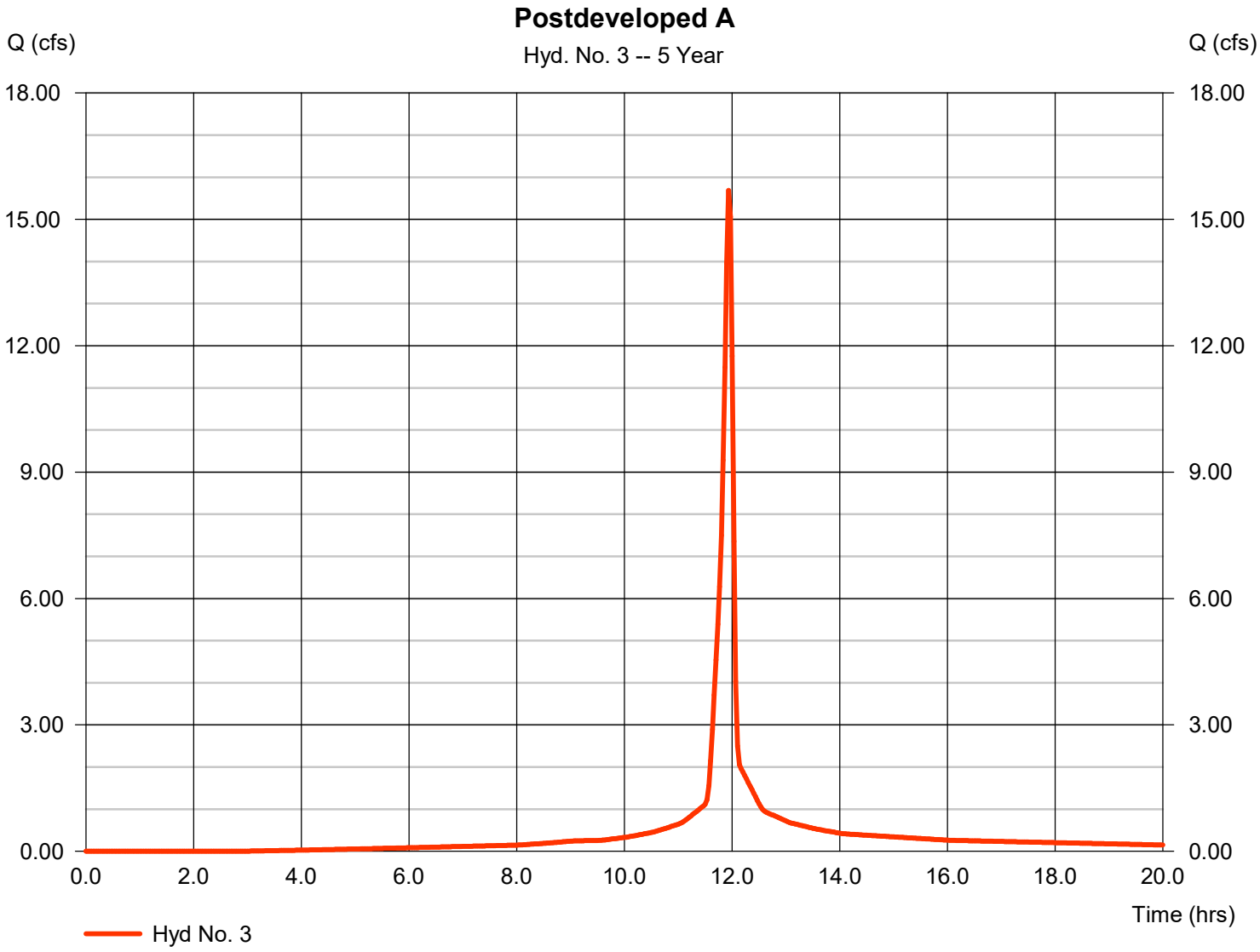
Hydrograph Report

Hyd. No. 3

Postdeveloped A

Hydrograph type	=	SCS Runoff	Peak discharge	=	15.69 cfs
Storm frequency	=	5 yrs	Time to peak	=	11.93 hrs
Time interval	=	2 min	Hyd. volume	=	34,537 cuft
Drainage area	=	3.700 ac	Curve number	=	95*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	5.30 min
Total precip.	=	3.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(3.130 x 98) + (0.570 x 79)] / 3.700



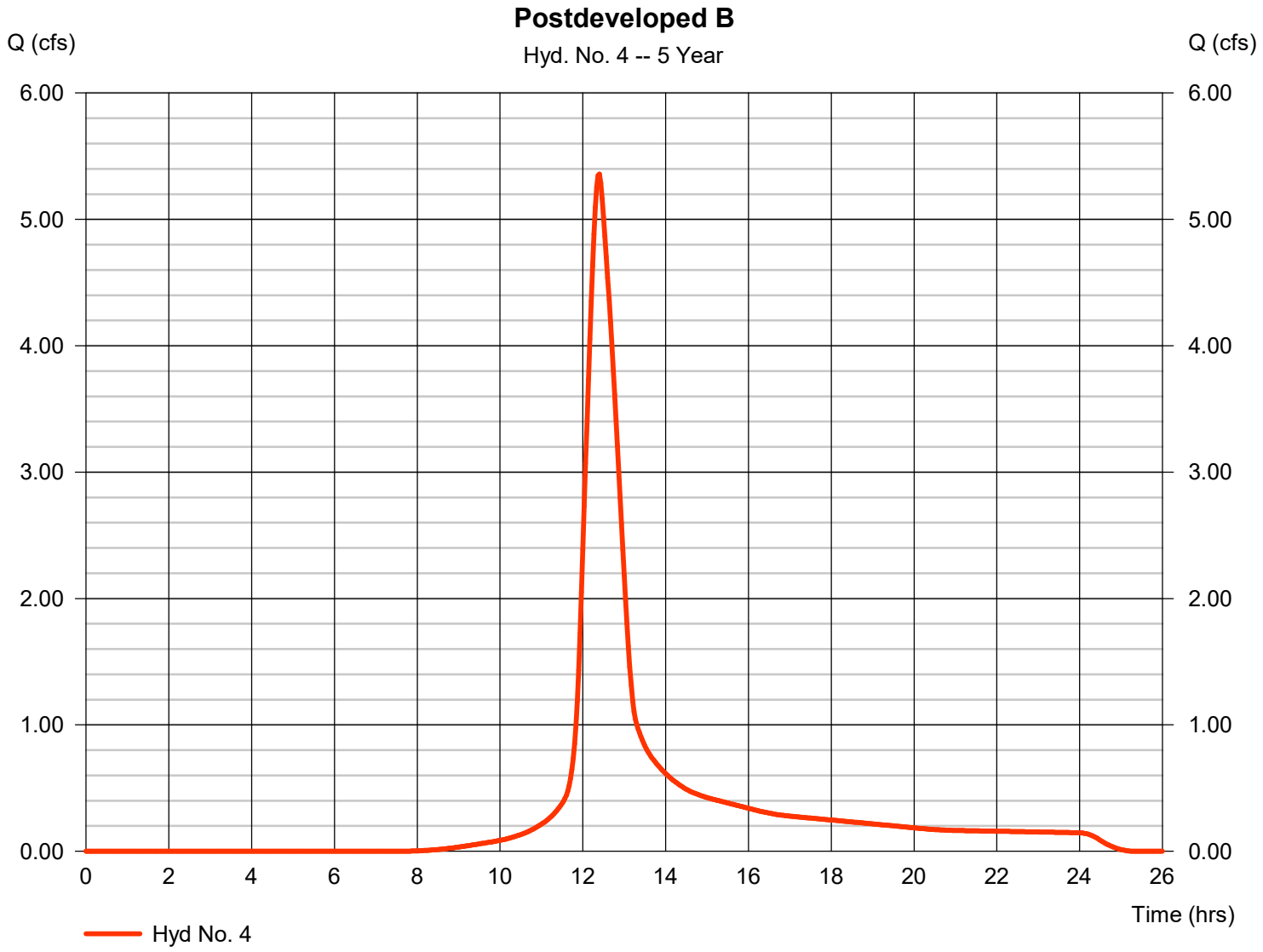
Hydrograph Report

Hyd. No. 4

Postdeveloped B

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.358 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.40 hrs
Time interval	=	2 min	Hyd. volume	=	30,378 cuft
Drainage area	=	4.540 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	49.90 min
Total precip.	=	3.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.460 x 98) + (3.080 x 79)] / 4.540



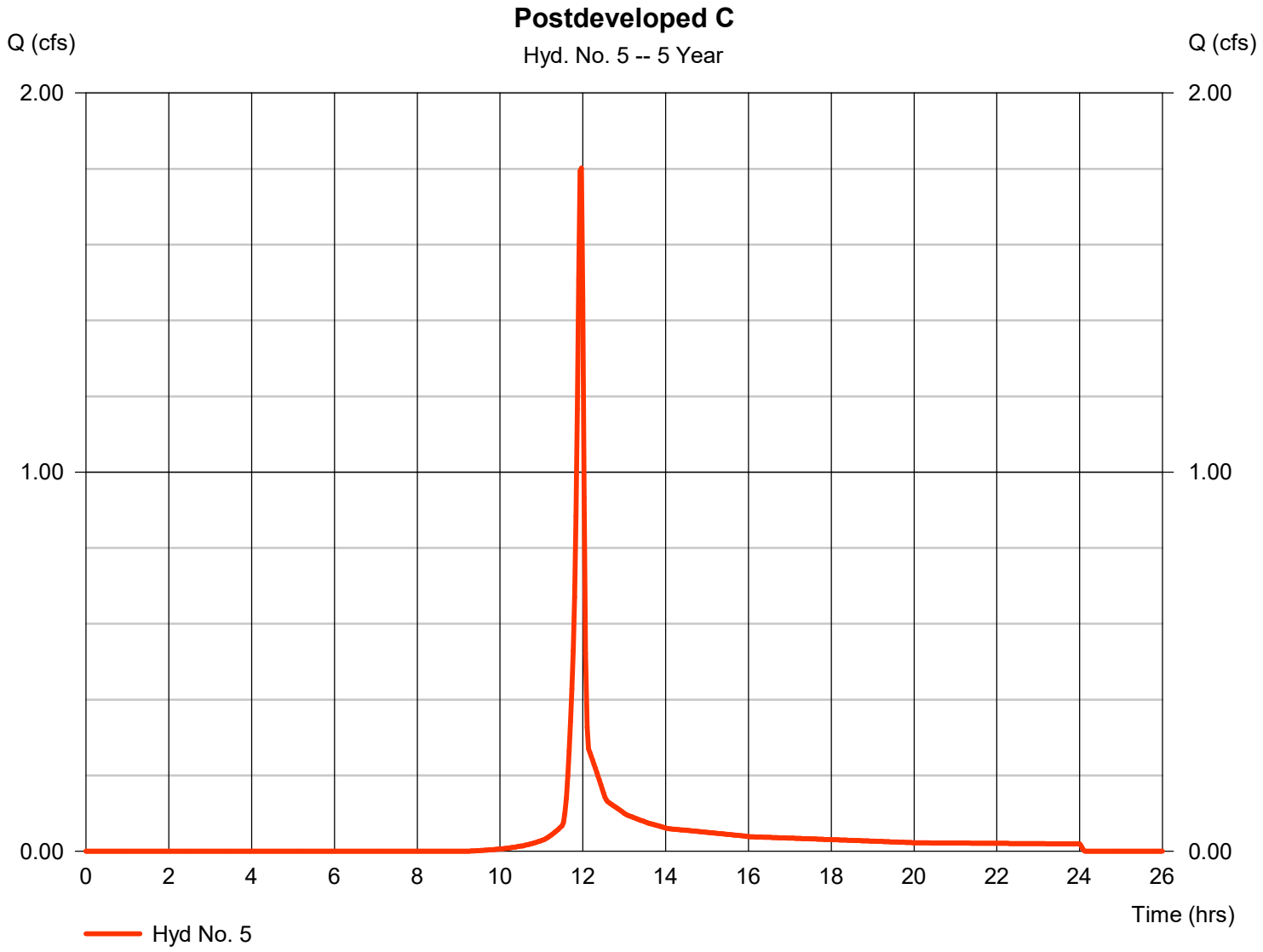
Hydrograph Report

Hyd. No. 5

Postdeveloped C

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.802 cfs
Storm frequency	=	5 yrs	Time to peak	=	11.97 hrs
Time interval	=	2 min	Hyd. volume	=	3,625 cuft
Drainage area	=	0.720 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.050 x 98) + (0.670 x 79)] / 0.720

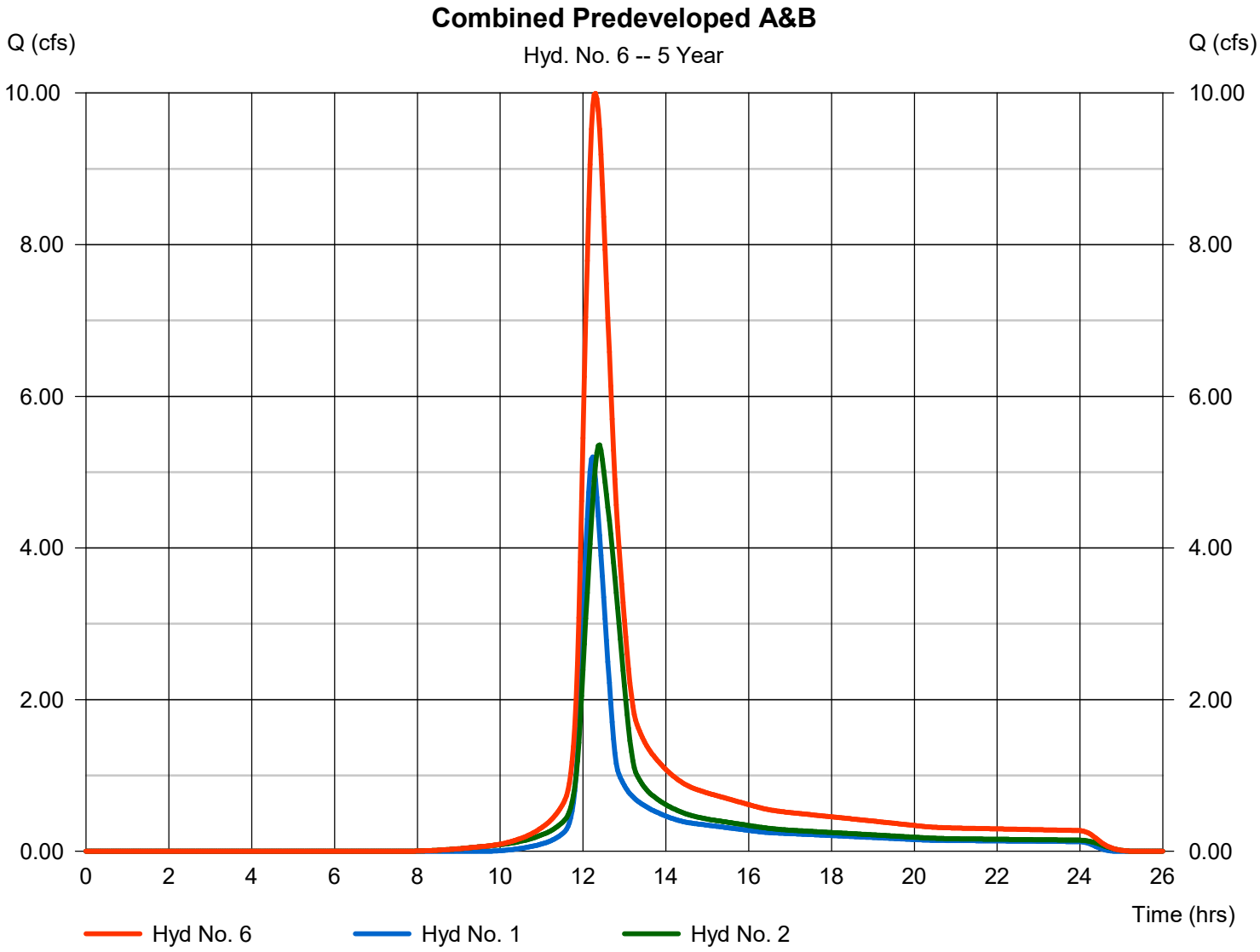


Hydrograph Report

Hyd. No. 6

Combined Predeveloped A&B

Hydrograph type	= Combine	Peak discharge	= 9.993 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.30 hrs
Time interval	= 2 min	Hyd. volume	= 53,320 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 8.960 ac

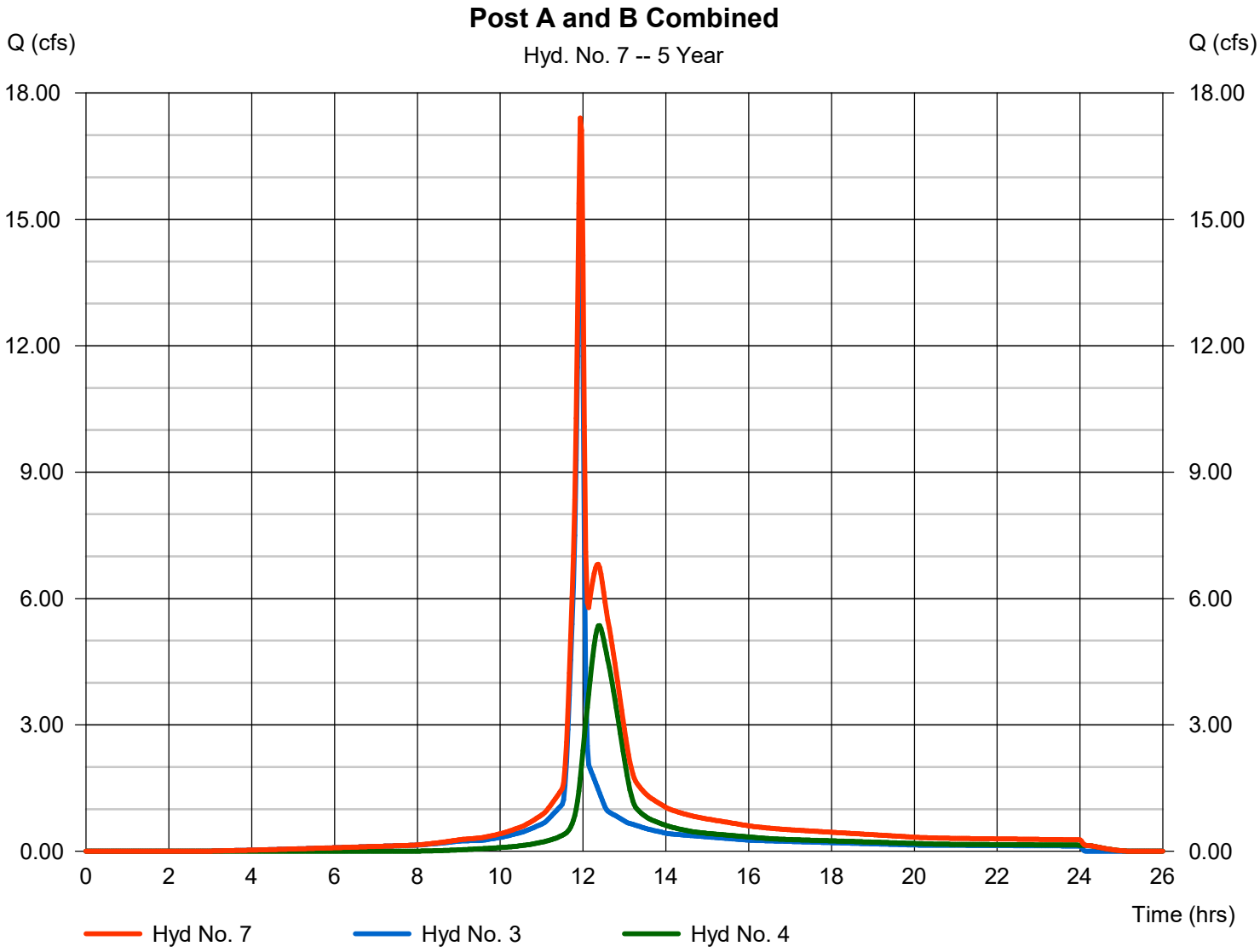


Hydrograph Report

Hyd. No. 7

Post A and B Combined

Hydrograph type	= Combine	Peak discharge	= 17.41 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 64,915 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 8.240 ac



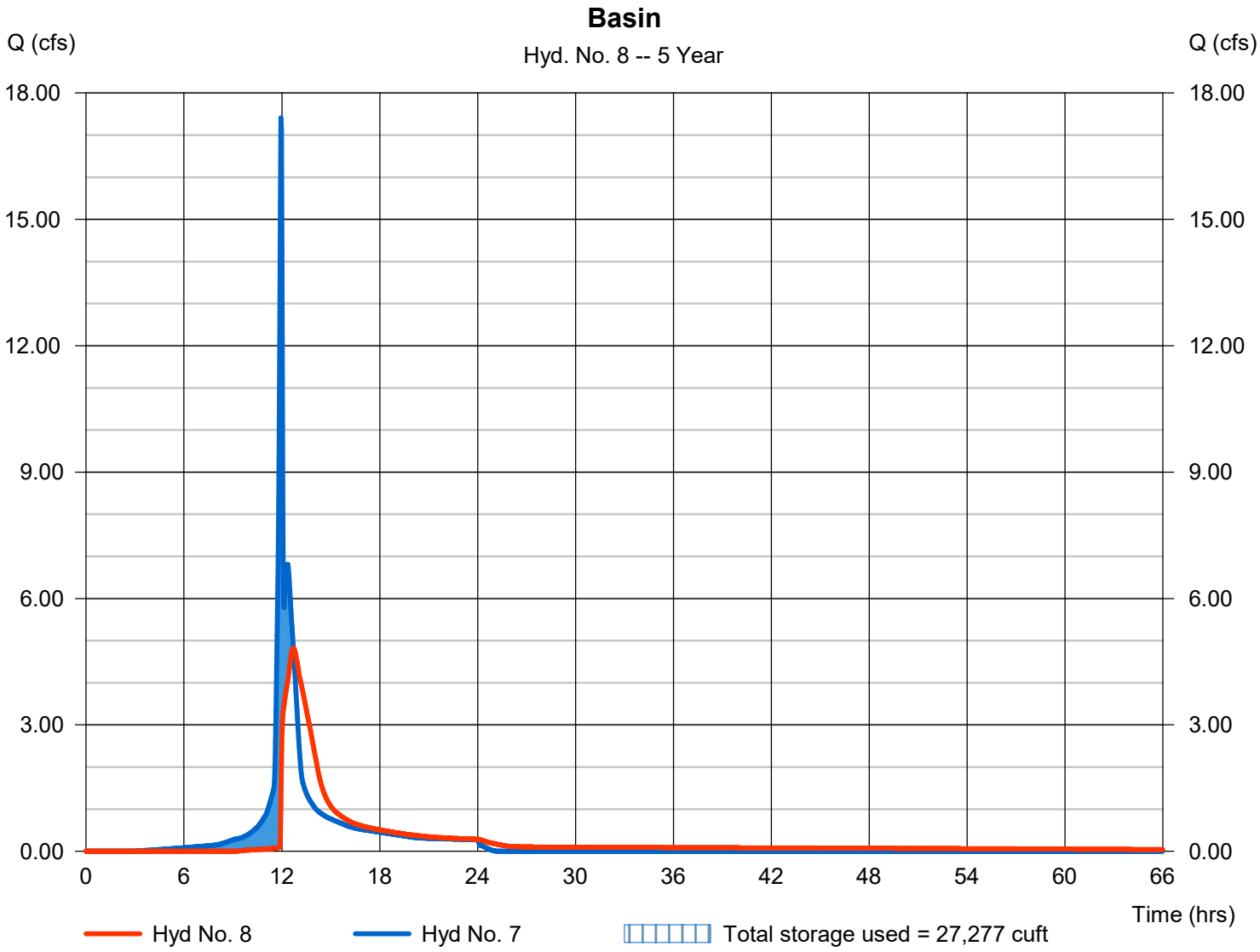
Hydrograph Report

Hyd. No. 8

Basin

Hydrograph type	=	Reservoir	Peak discharge	=	4.820 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.70 hrs
Time interval	=	2 min	Hyd. volume	=	62,615 cuft
Inflow hyd. No.	=	7 - Post A and B Combined	Max. Elevation	=	707.84 ft
Reservoir name	=	Detention Basin	Max. Storage	=	27,277 cuft

Storage Indication method used.

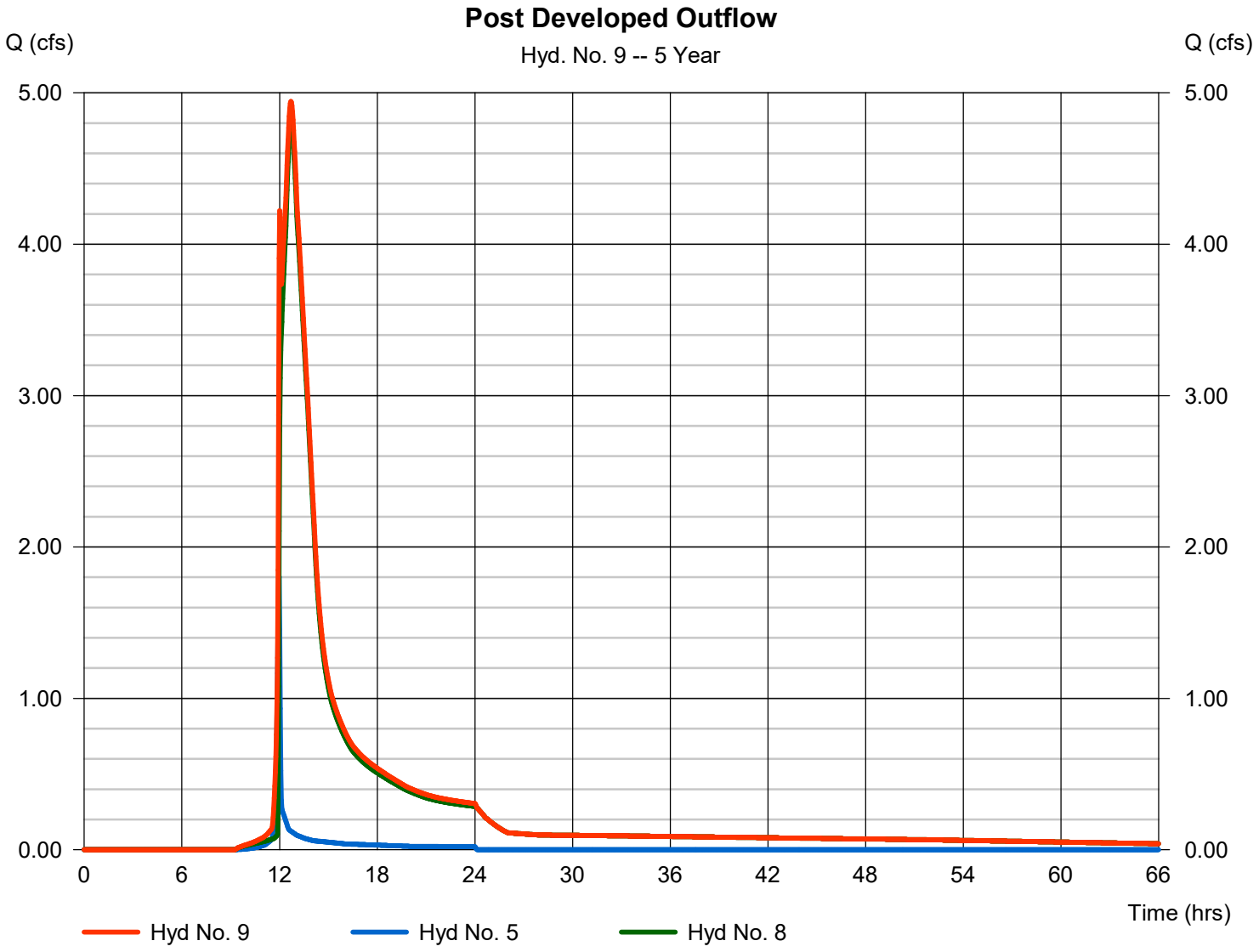


Hydrograph Report

Hyd. No. 9

Post Developed Outflow

Hydrograph type	= Combine	Peak discharge	= 4.943 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.70 hrs
Time interval	= 2 min	Hyd. volume	= 66,239 cuft
Inflow hyds.	= 5, 8	Contrib. drain. area	= 0.720 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	6.399	2	734	27,988	------	------	------	Predeveloped A
2	SCS Runoff	6.379	2	744	36,118	------	------	------	Predeveloped B
3	SCS Runoff	17.78	2	716	39,483	------	------	------	Postdeveloped A
4	SCS Runoff	6.379	2	744	36,118	------	------	------	Postdeveloped B
5	SCS Runoff	2.180	2	716	4,402	------	------	------	Postdeveloped C
6	Combine	12.10	2	736	64,106	1, 2,	------	------	Combined Predeveloped A&B
7	Combine	19.89	2	716	75,600	3, 4,	------	------	Post A and B Combined
8	Reservoir	5.999	2	760	73,300	7	708.11	30,083	Basin
9	Combine	6.149	2	758	77,702	5, 8	------	------	Post Developed Outflow

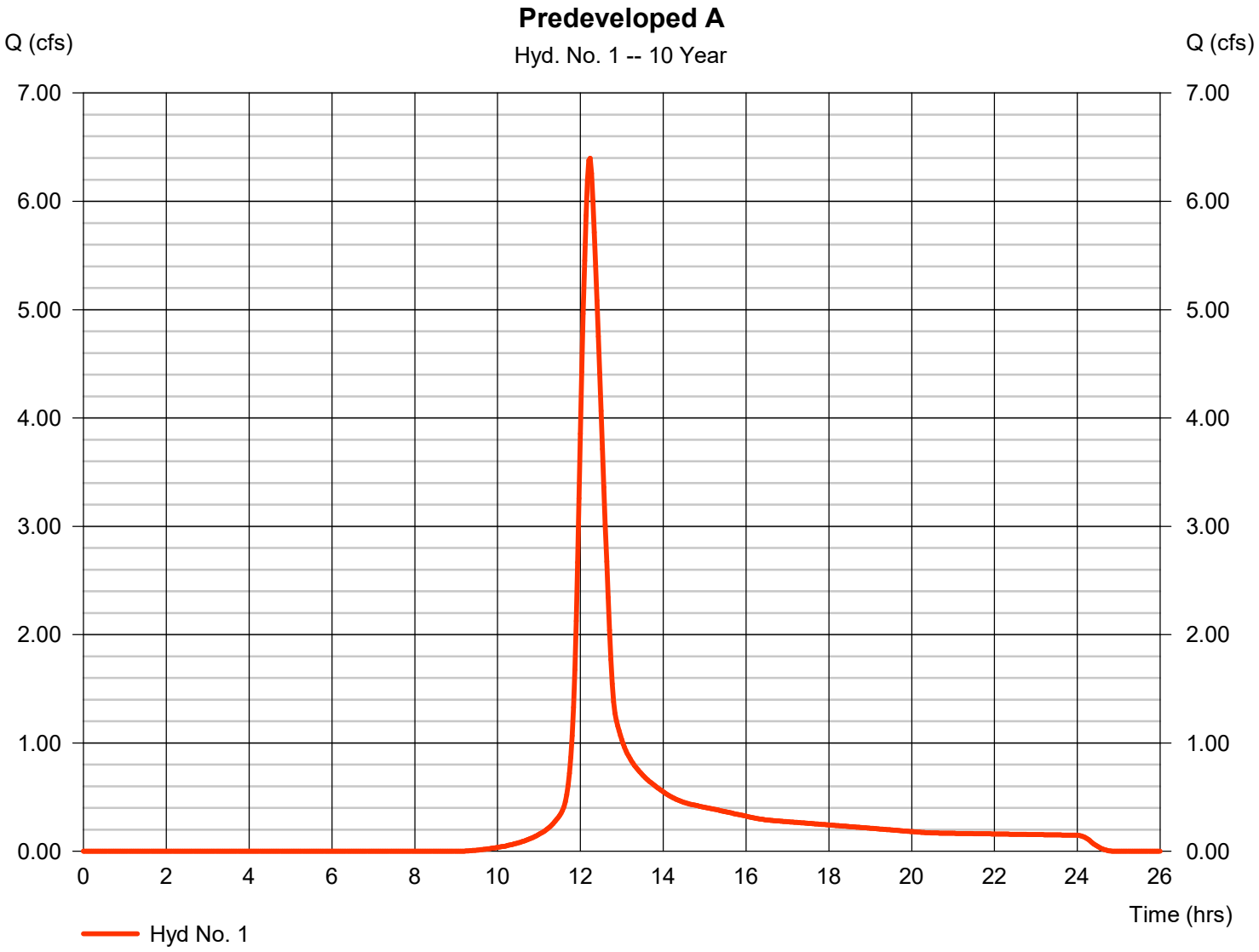
Hydrograph Report

Hyd. No. 1

Predeveloped A

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.399 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.23 hrs
Time interval	=	2 min	Hyd. volume	=	27,988 cuft
Drainage area	=	4.420 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	30.90 min
Total precip.	=	3.70 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.055 x 98) + (4.365 x 79)] / 4.420



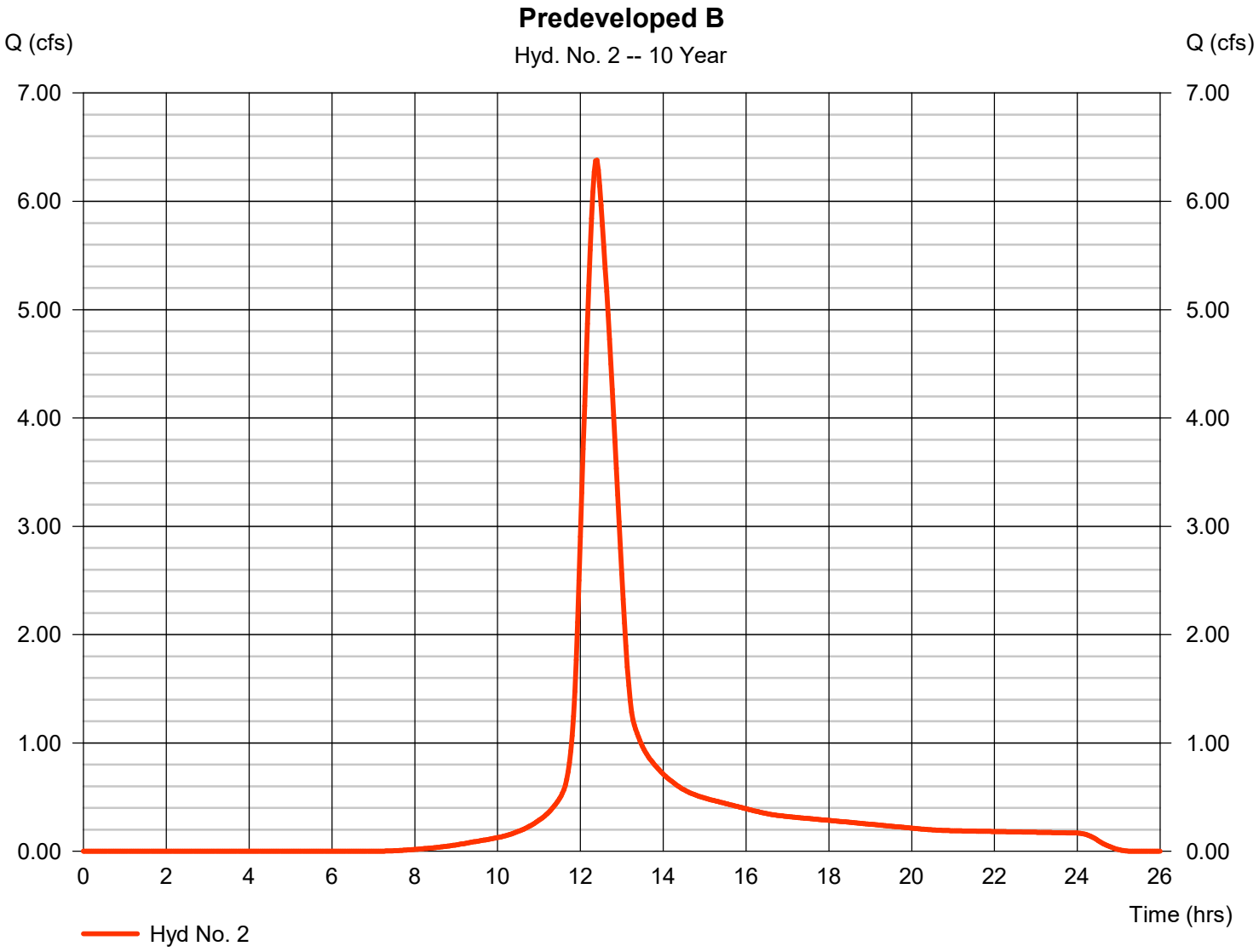
Hydrograph Report

Hyd. No. 2

Predeveloped B

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.379 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.40 hrs
Time interval	=	2 min	Hyd. volume	=	36,118 cuft
Drainage area	=	4.540 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	49.90 min
Total precip.	=	3.70 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.460 x 98) + (3.080 x 79)] / 4.540



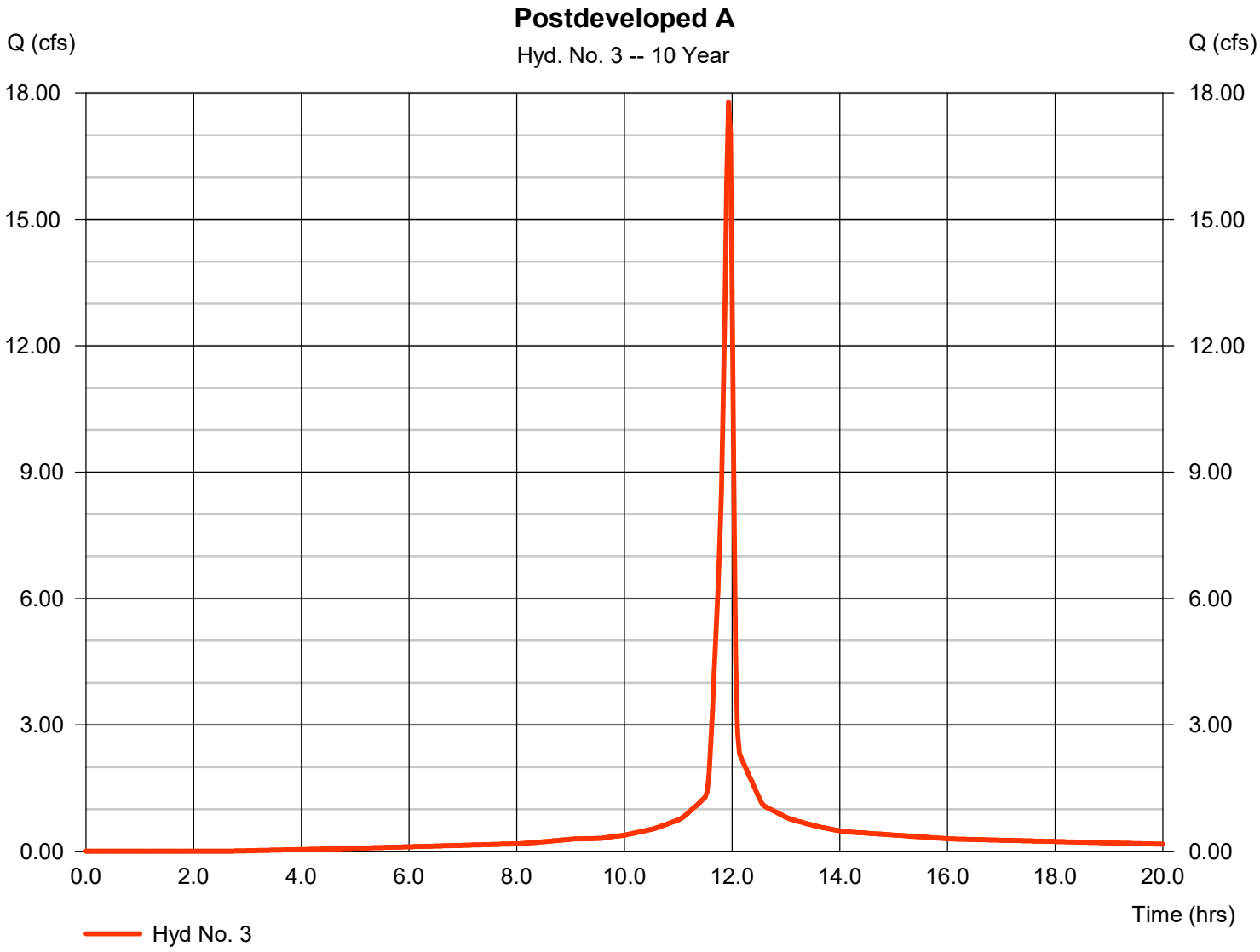
Hydrograph Report

Hyd. No. 3

Postdeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 17.78 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 39,483 cuft
Drainage area	= 3.700 ac	Curve number	= 95*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.30 min
Total precip.	= 3.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(3.130 x 98) + (0.570 x 79)] / 3.700



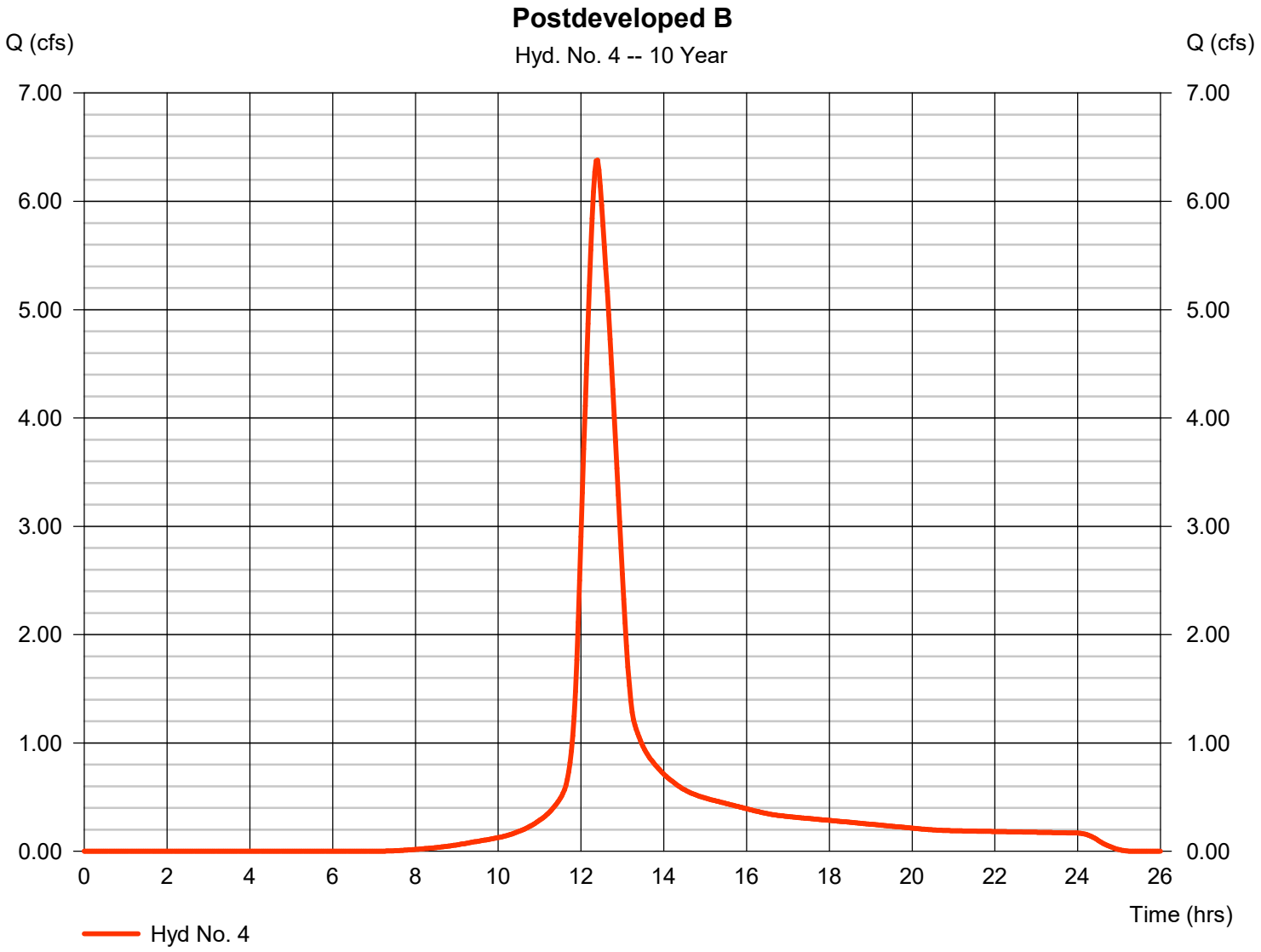
Hydrograph Report

Hyd. No. 4

Postdeveloped B

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.379 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.40 hrs
Time interval	=	2 min	Hyd. volume	=	36,118 cuft
Drainage area	=	4.540 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	49.90 min
Total precip.	=	3.70 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.460 x 98) + (3.080 x 79)] / 4.540



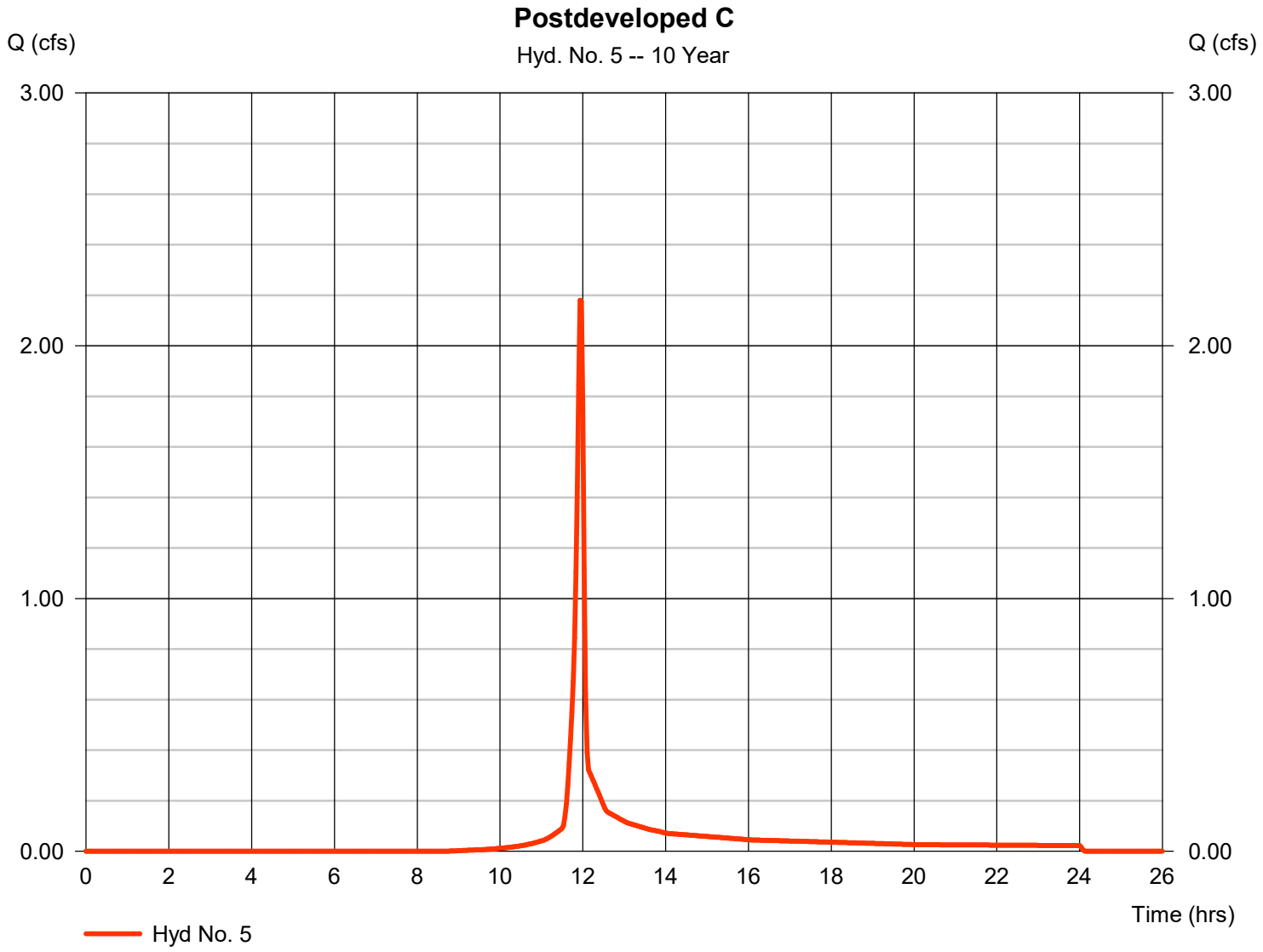
Hydrograph Report

Hyd. No. 5

Postdeveloped C

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.180 cfs
Storm frequency	=	10 yrs	Time to peak	=	11.93 hrs
Time interval	=	2 min	Hyd. volume	=	4,402 cuft
Drainage area	=	0.720 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.70 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.050 x 98) + (0.670 x 79)] / 0.720

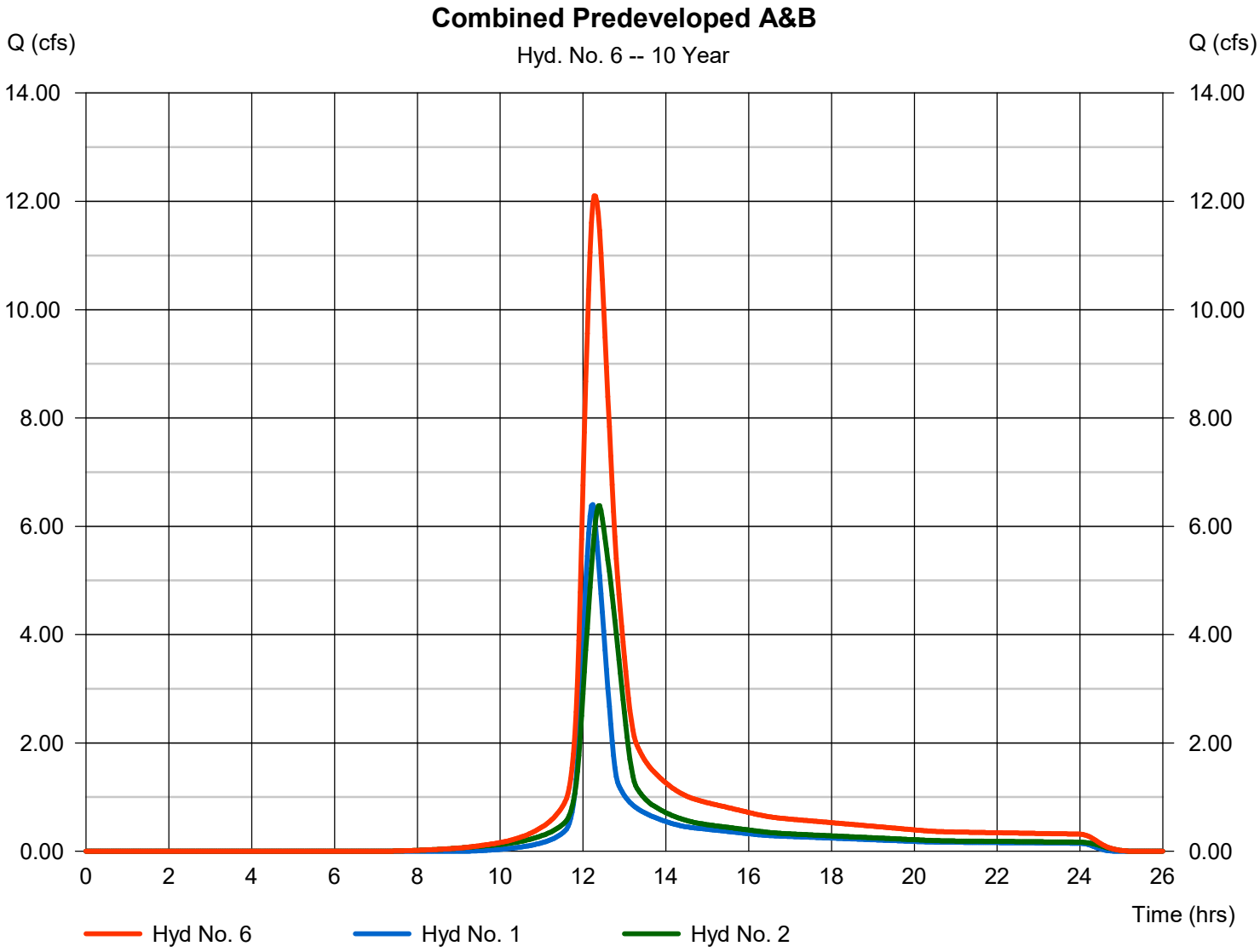


Hydrograph Report

Hyd. No. 6

Combined Predeveloped A&B

Hydrograph type	= Combine	Peak discharge	= 12.10 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.27 hrs
Time interval	= 2 min	Hyd. volume	= 64,106 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 8.960 ac

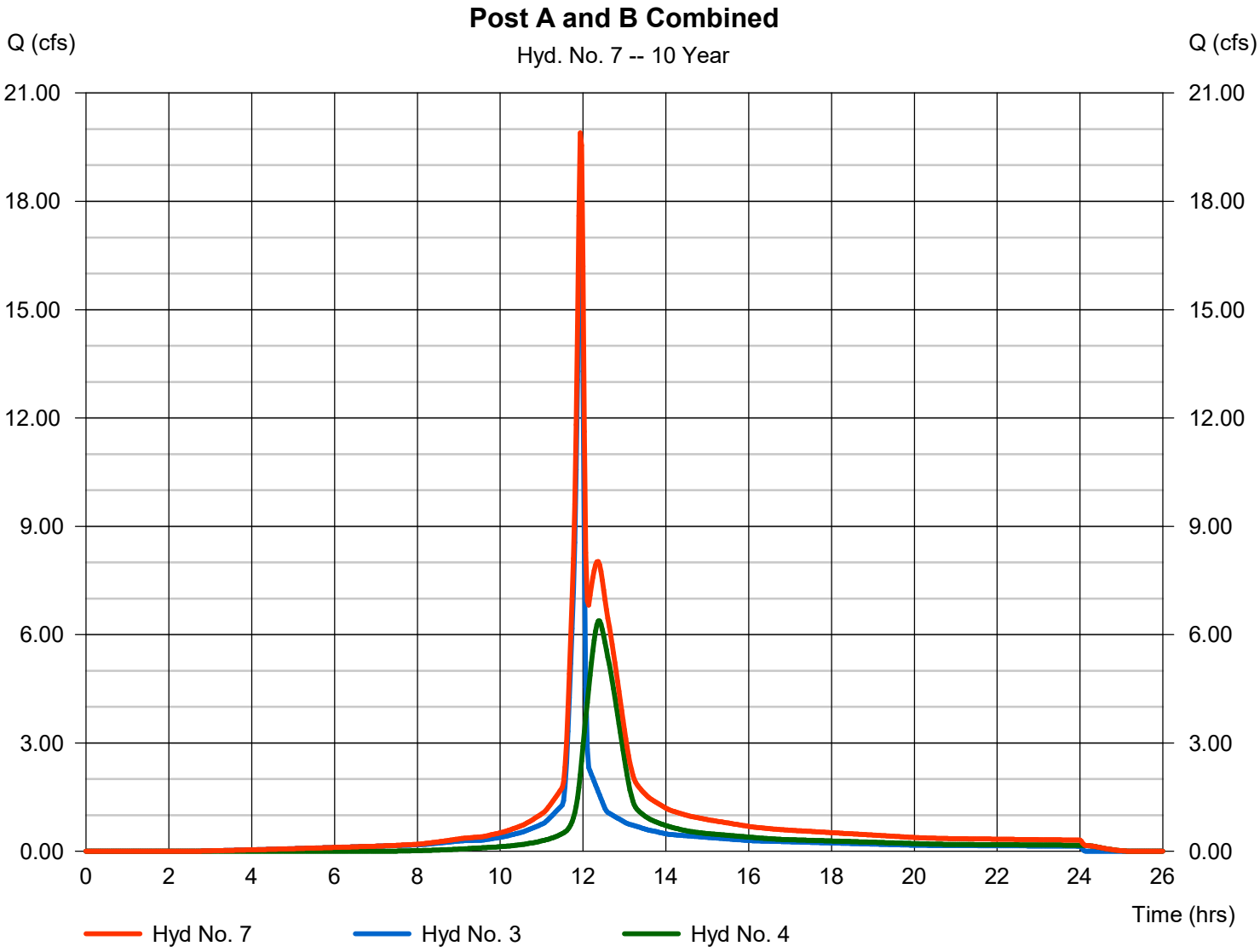


Hydrograph Report

Hyd. No. 7

Post A and B Combined

Hydrograph type	= Combine	Peak discharge	= 19.89 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 75,600 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 8.240 ac



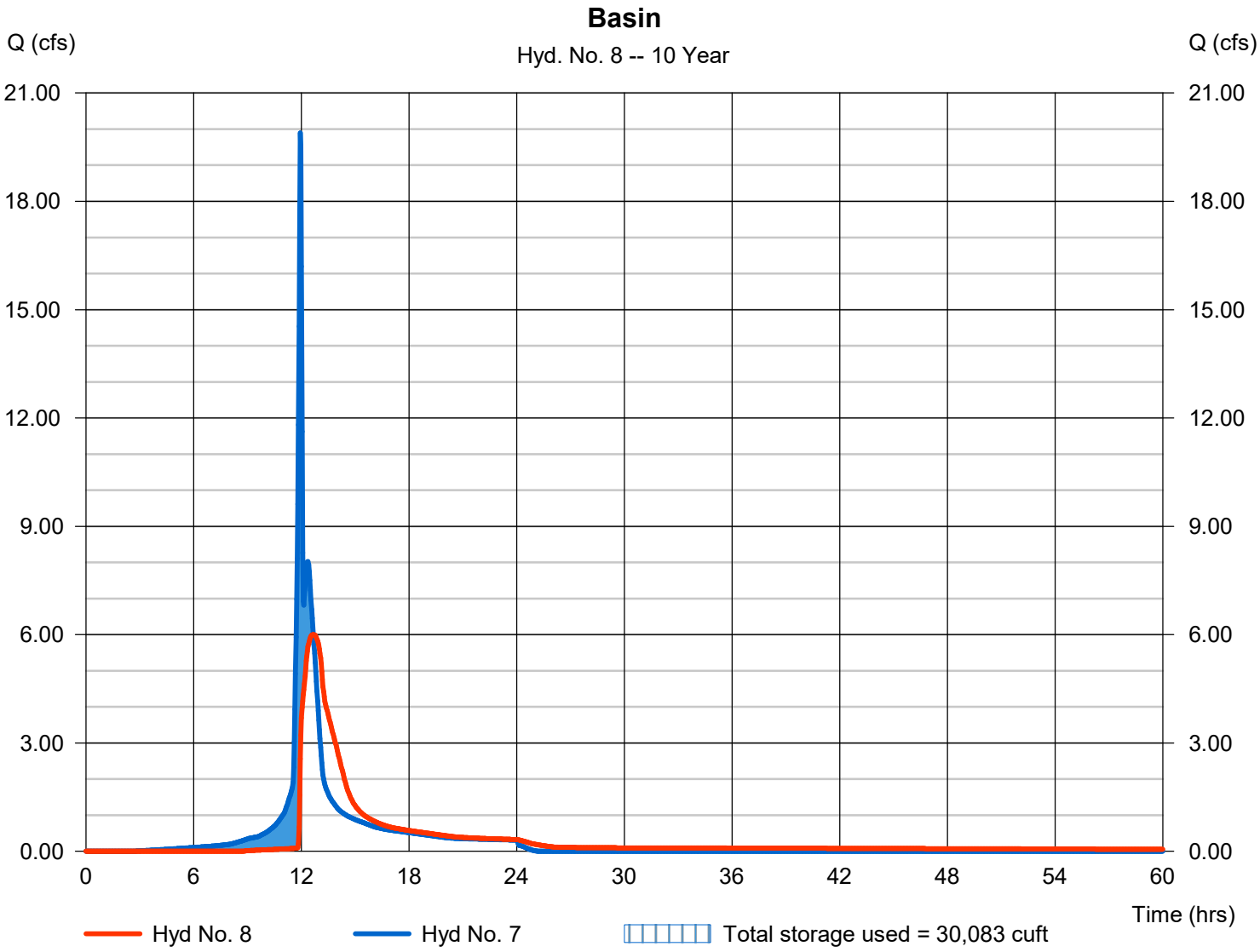
Hydrograph Report

Hyd. No. 8

Basin

Hydrograph type	=	Reservoir	Peak discharge	=	5.999 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.67 hrs
Time interval	=	2 min	Hyd. volume	=	73,300 cuft
Inflow hyd. No.	=	7 - Post A and B Combined	Max. Elevation	=	708.11 ft
Reservoir name	=	Detention Basin	Max. Storage	=	30,083 cuft

Storage Indication method used.

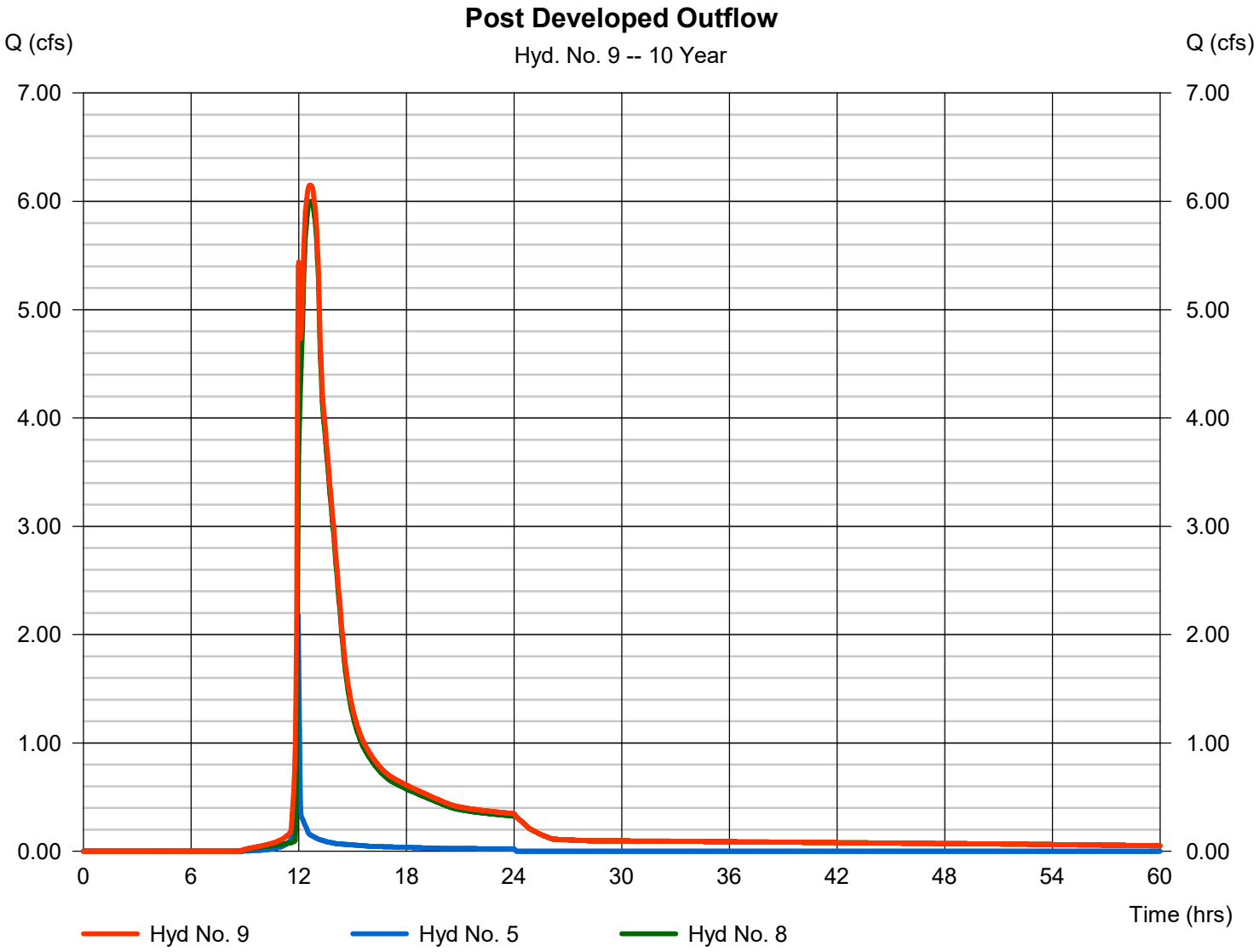


Hydrograph Report

Hyd. No. 9

Post Developed Outflow

Hydrograph type	= Combine	Peak discharge	= 6.149 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.63 hrs
Time interval	= 2 min	Hyd. volume	= 77,702 cuft
Inflow hyds.	= 5, 8	Contrib. drain. area	= 0.720 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	8.262	2	734	35,896	------	------	------	Predeveloped A
2	SCS Runoff	7.939	2	742	44,951	------	------	------	Predeveloped B
3	SCS Runoff	20.90	2	716	46,930	------	------	------	Postdeveloped A
4	SCS Runoff	7.939	2	742	44,951	------	------	------	Postdeveloped B
5	SCS Runoff	2.775	2	716	5,616	------	------	------	Postdeveloped C
6	Combine	15.37	2	736	80,847	1, 2,	------	------	Combined Predeveloped A&B
7	Combine	23.62	2	716	91,881	3, 4,	------	------	Post A and B Combined
8	Reservoir	6.545	2	764	89,581	7	708.67	36,554	Basin
9	Combine	7.862	2	720	95,197	5, 8	------	------	Post Developed Outflow

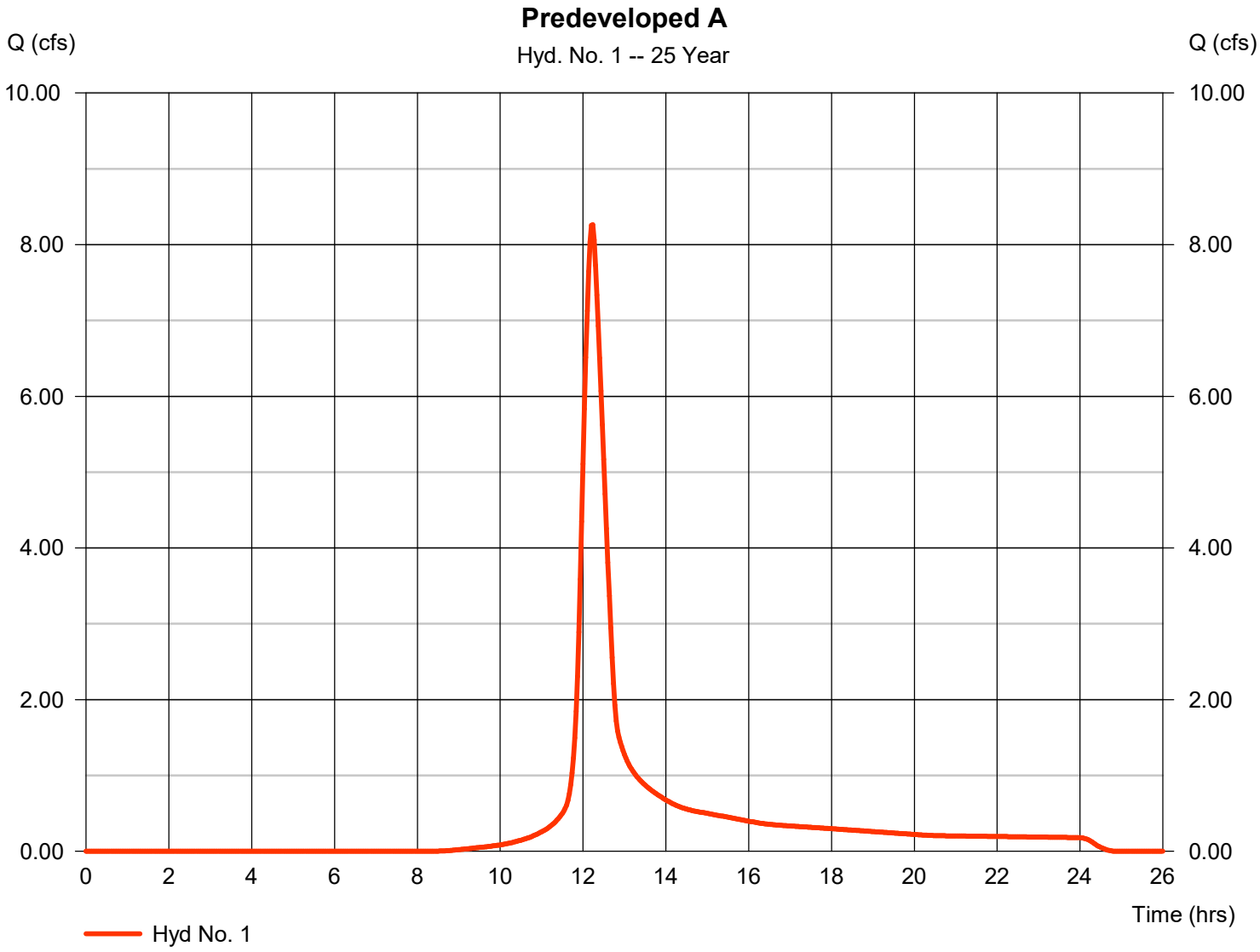
Hydrograph Report

Hyd. No. 1

Predeveloped A

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.262 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.23 hrs
Time interval	=	2 min	Hyd. volume	=	35,896 cuft
Drainage area	=	4.420 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	30.90 min
Total precip.	=	4.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.055 x 98) + (4.365 x 79)] / 4.420



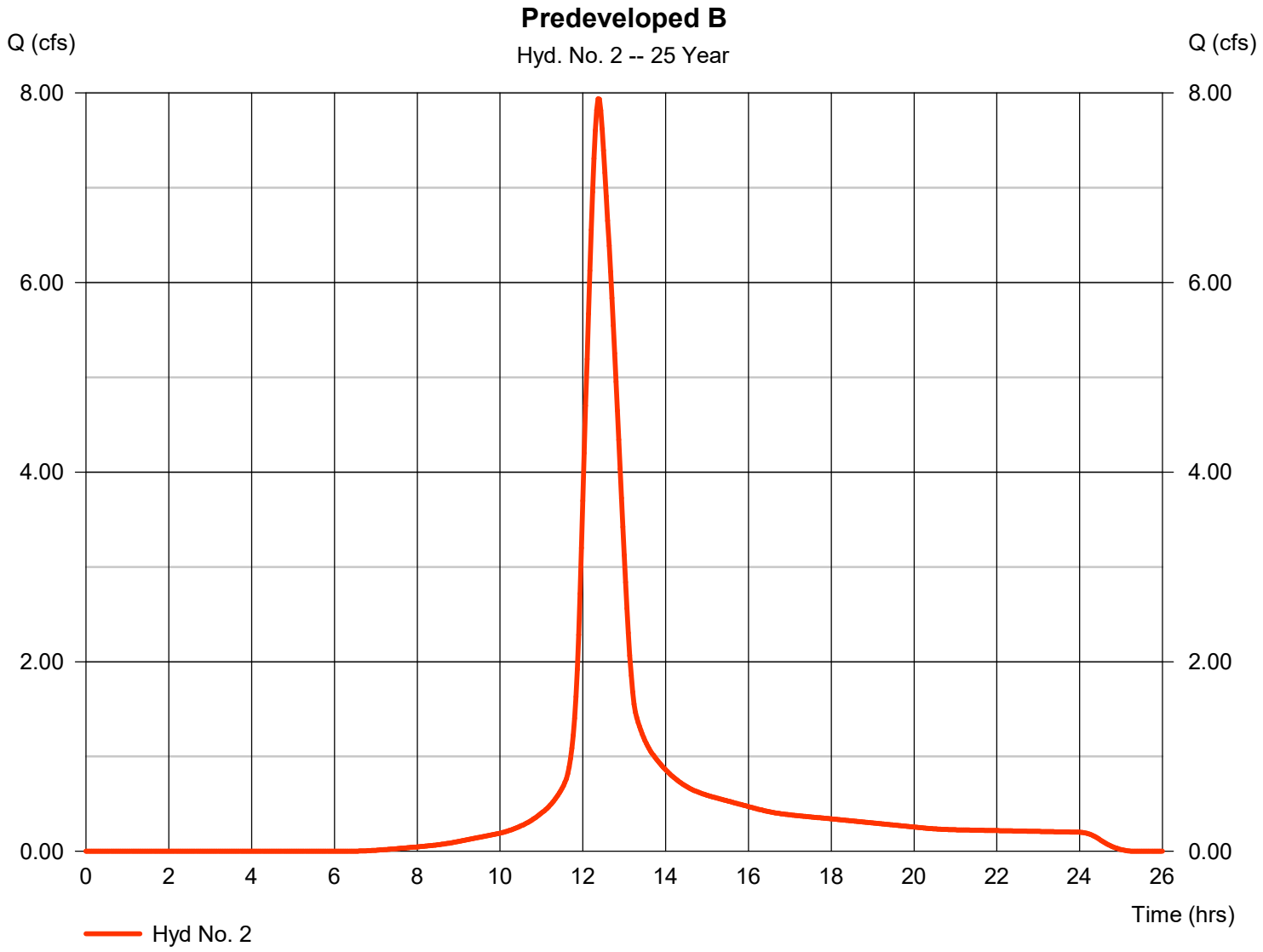
Hydrograph Report

Hyd. No. 2

Predeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 7.939 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.37 hrs
Time interval	= 2 min	Hyd. volume	= 44,951 cuft
Drainage area	= 4.540 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 49.90 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.460 x 98) + (3.080 x 79)] / 4.540



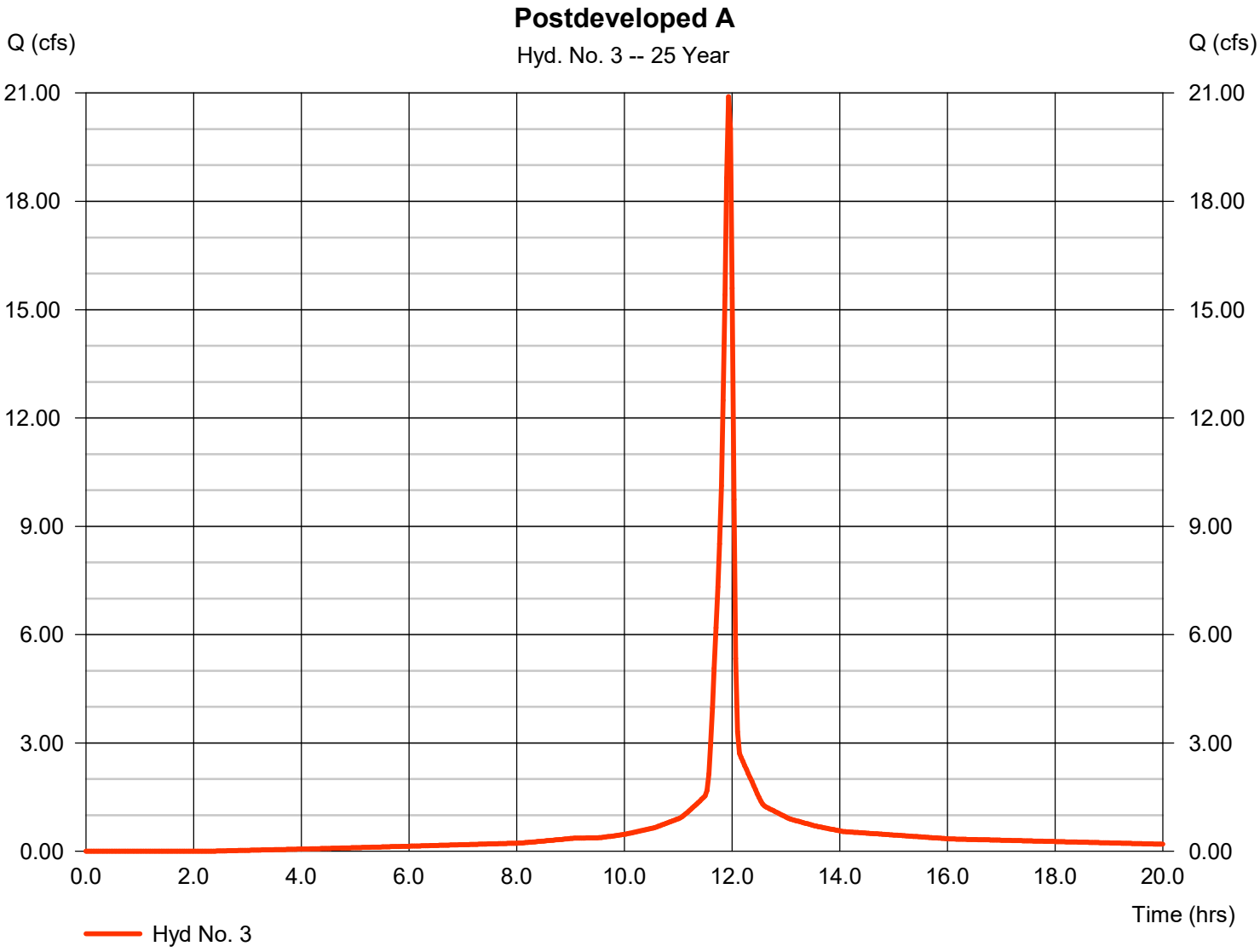
Hydrograph Report

Hyd. No. 3

Postdeveloped A

Hydrograph type	=	SCS Runoff	Peak discharge	=	20.90 cfs
Storm frequency	=	25 yrs	Time to peak	=	11.93 hrs
Time interval	=	2 min	Hyd. volume	=	46,930 cuft
Drainage area	=	3.700 ac	Curve number	=	95*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	5.30 min
Total precip.	=	4.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(3.130 x 98) + (0.570 x 79)] / 3.700



Hydrograph Report

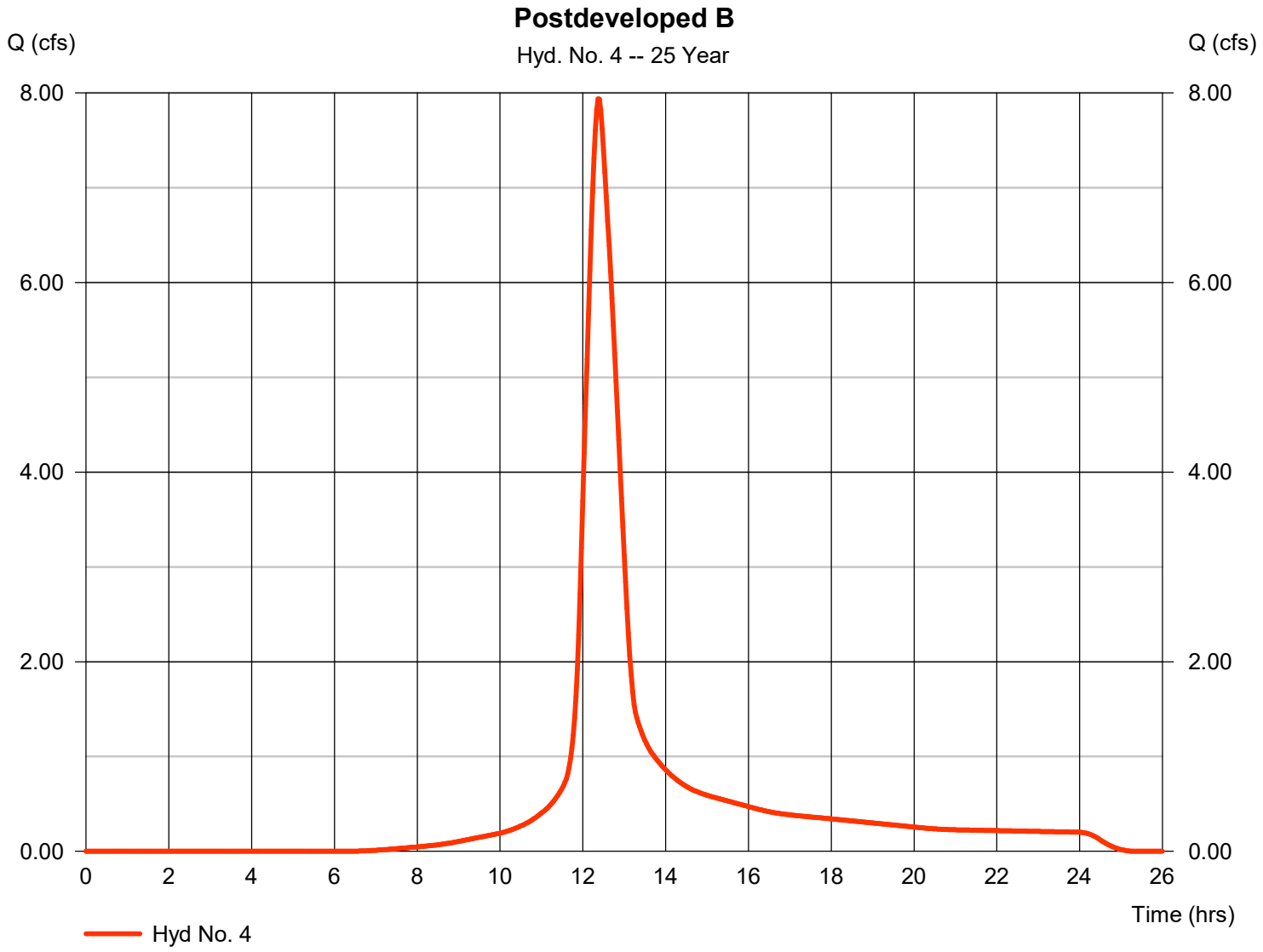
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Wednesday, 07 / 26 / 2023

Hyd. No. 4

Postdeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 7.939 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.37 hrs
Time interval	= 2 min	Hyd. volume	= 44,951 cuft
Drainage area	= 4.540 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 49.90 min
Total precip.	= 4.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.460 x 98) + (3.080 x 79)] / 4.540



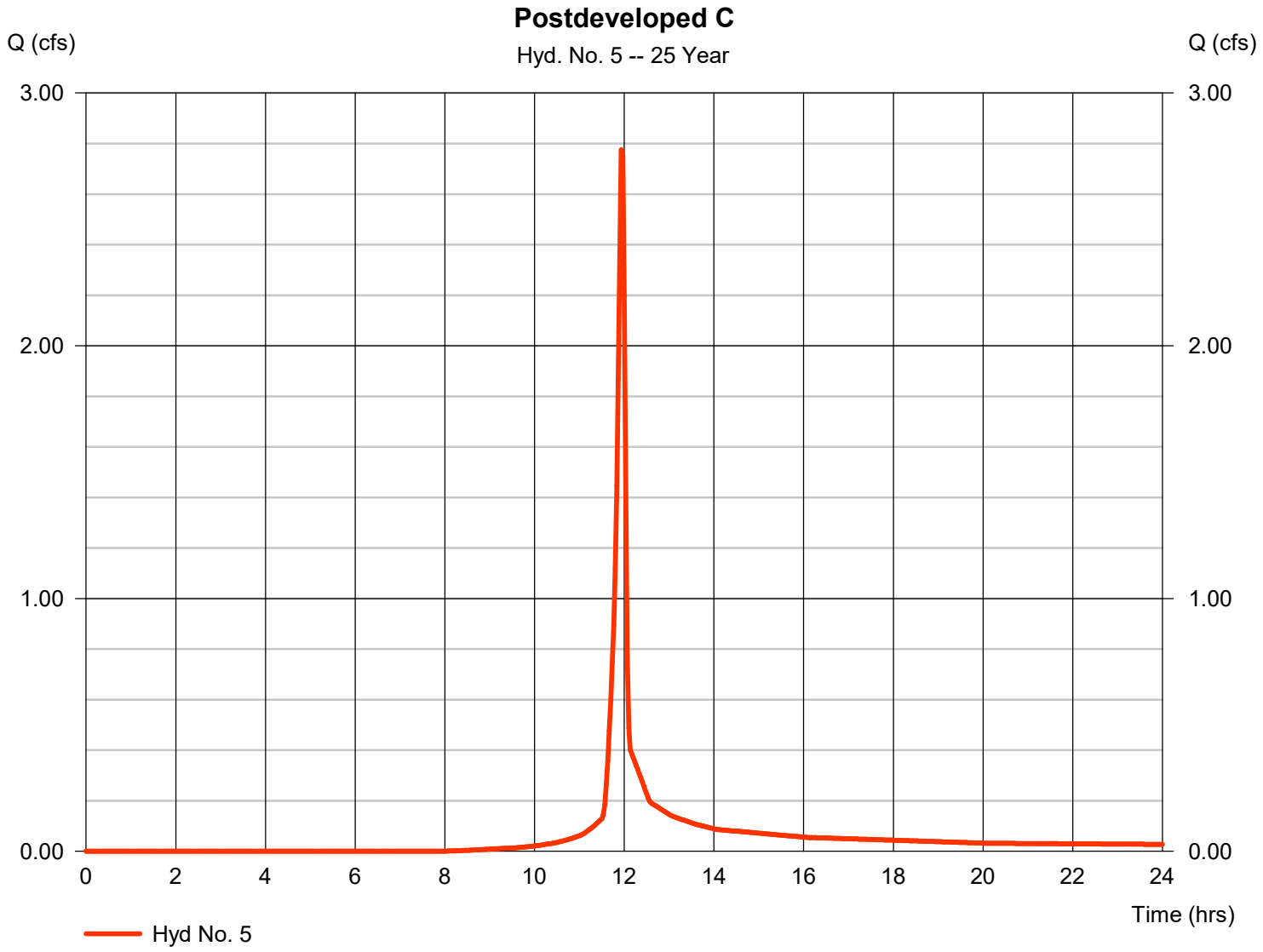
Hydrograph Report

Hyd. No. 5

Postdeveloped C

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.775 cfs
Storm frequency	=	25 yrs	Time to peak	=	11.93 hrs
Time interval	=	2 min	Hyd. volume	=	5,616 cuft
Drainage area	=	0.720 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	4.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.050 x 98) + (0.670 x 79)] / 0.720

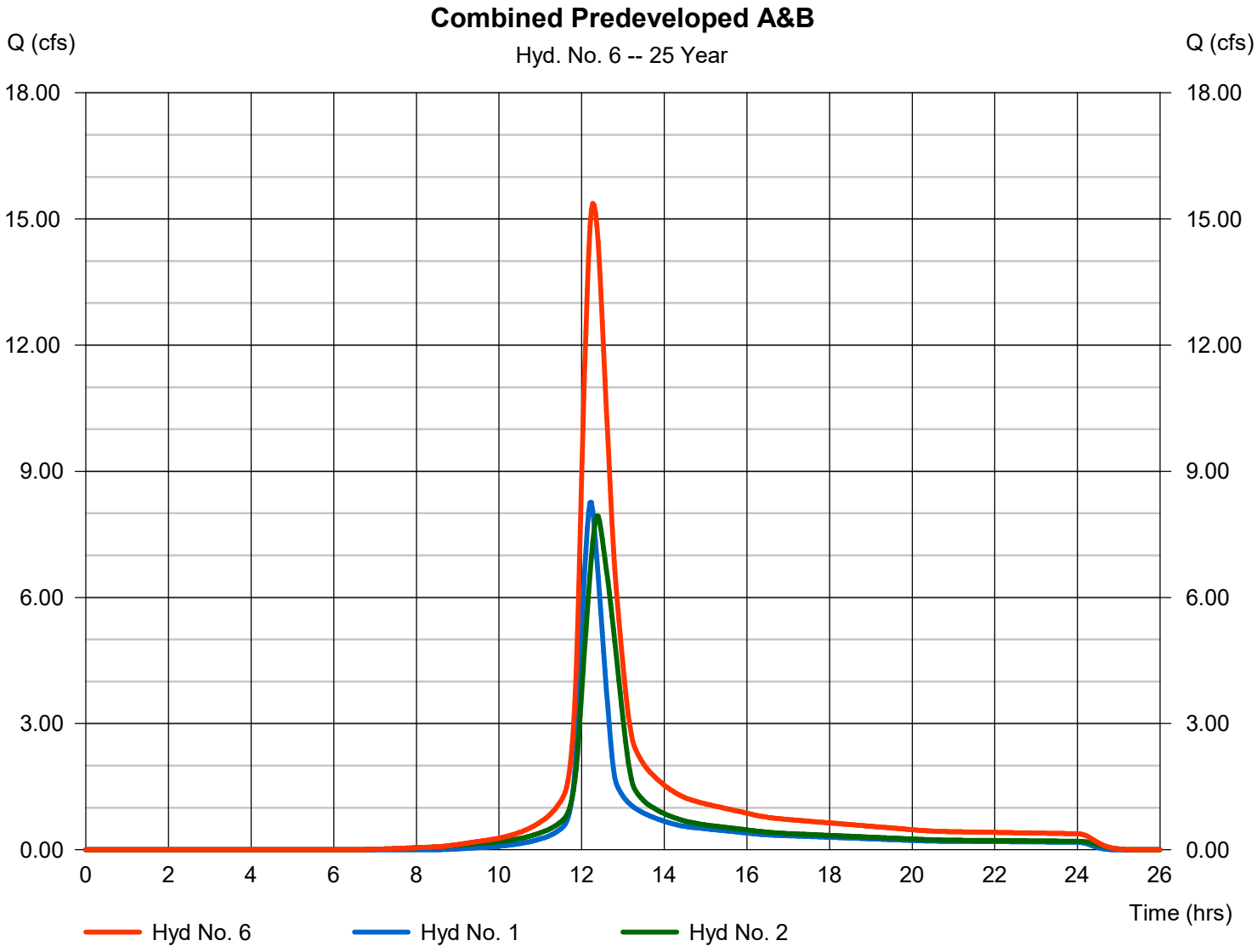


Hydrograph Report

Hyd. No. 6

Combined Predeveloped A&B

Hydrograph type	= Combine	Peak discharge	= 15.37 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.27 hrs
Time interval	= 2 min	Hyd. volume	= 80,847 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 8.960 ac

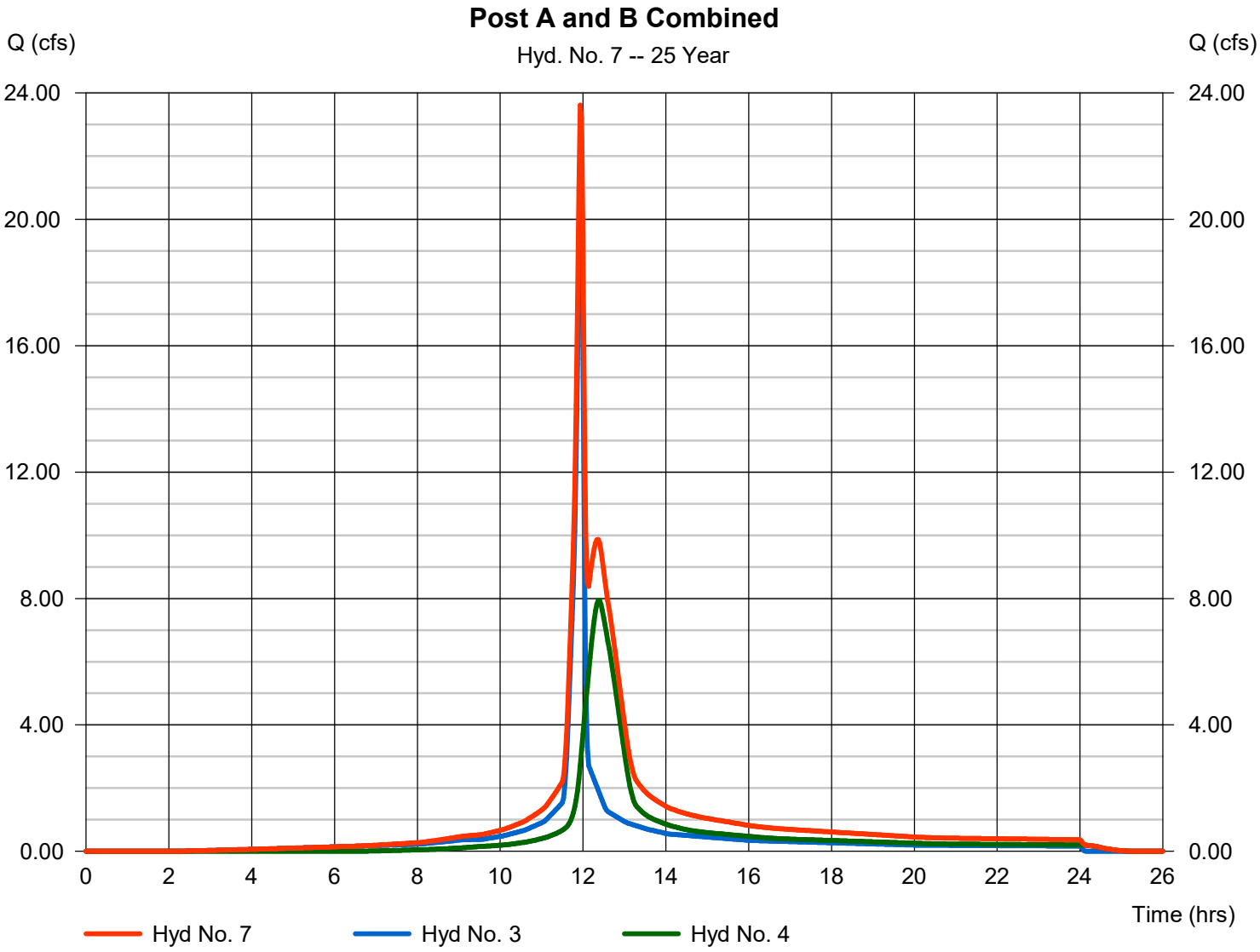


Hydrograph Report

Hyd. No. 7

Post A and B Combined

Hydrograph type	= Combine	Peak discharge	= 23.62 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 91,881 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 8.240 ac



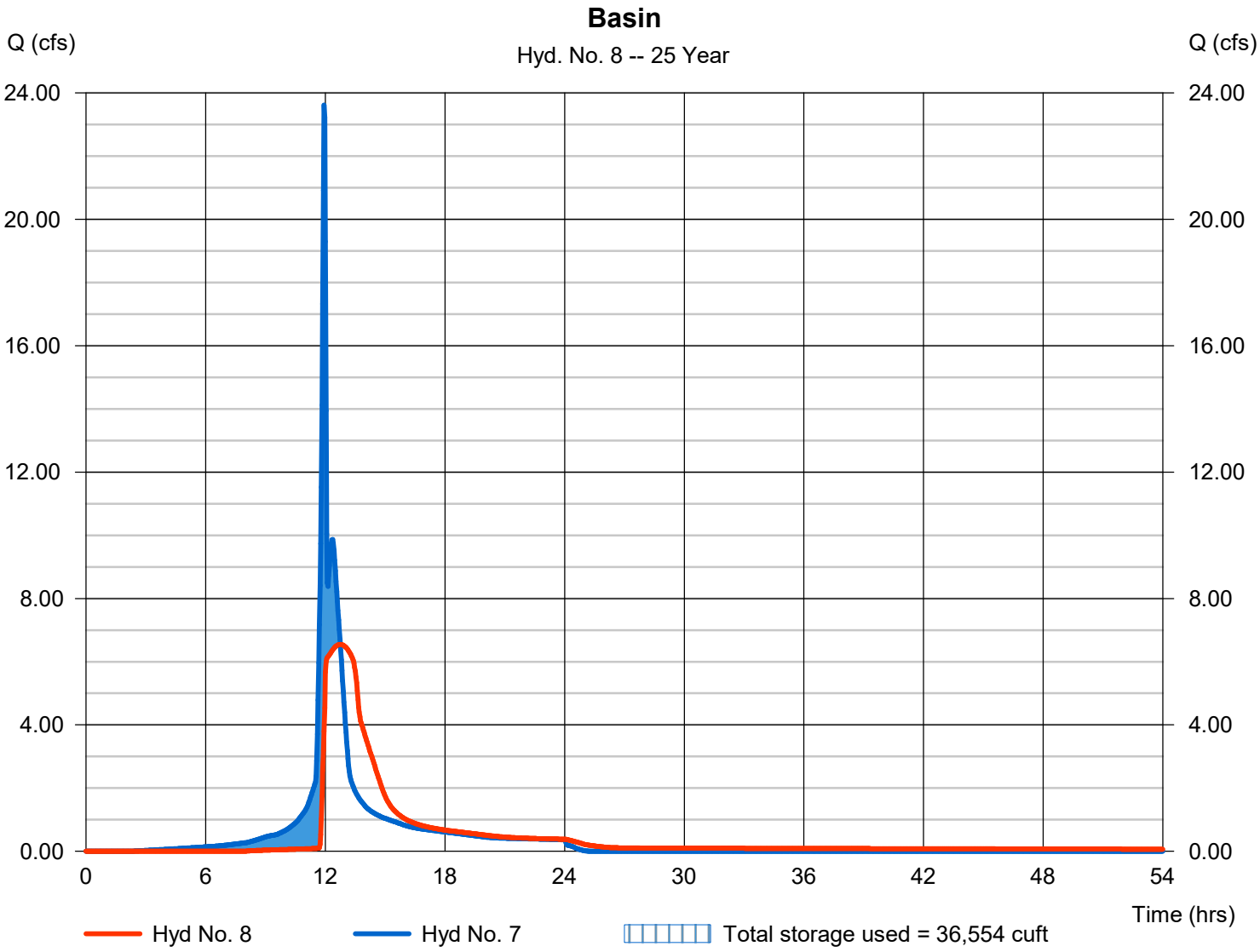
Hydrograph Report

Hyd. No. 8

Basin

Hydrograph type	=	Reservoir	Peak discharge	=	6.545 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.73 hrs
Time interval	=	2 min	Hyd. volume	=	89,581 cuft
Inflow hyd. No.	=	7 - Post A and B Combined	Max. Elevation	=	708.67 ft
Reservoir name	=	Detention Basin	Max. Storage	=	36,554 cuft

Storage Indication method used.

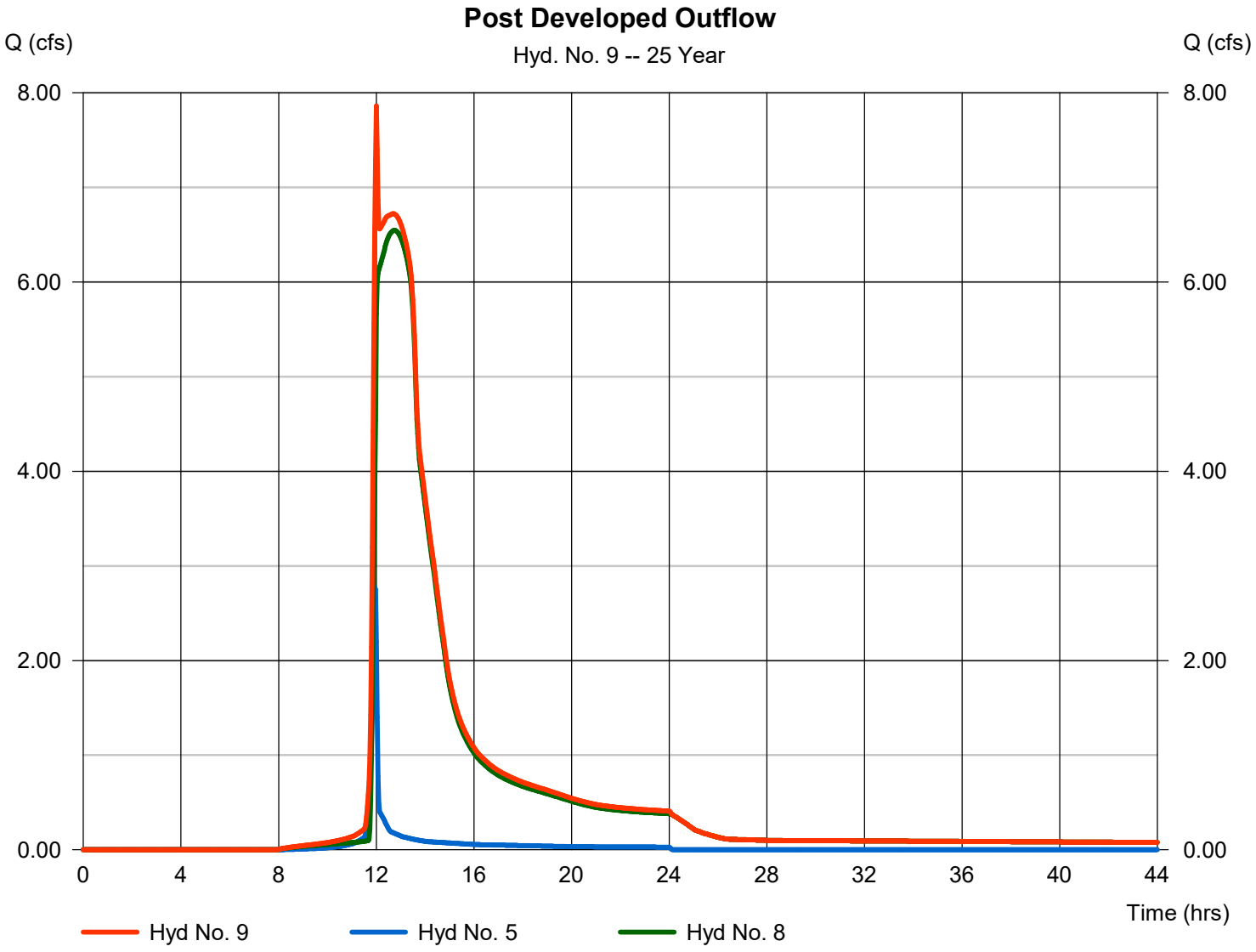


Hydrograph Report

Hyd. No. 9

Post Developed Outflow

Hydrograph type	= Combine	Peak discharge	= 7.862 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 95,197 cuft
Inflow hyds.	= 5, 8	Contrib. drain. area	= 0.720 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	9.543	2	732	41,348	------	------	------	Predeveloped A
2	SCS Runoff	8.992	2	742	50,955	------	------	------	Predeveloped B
3	SCS Runoff	22.97	2	716	51,909	------	------	------	Postdeveloped A
4	SCS Runoff	8.992	2	742	50,955	------	------	------	Postdeveloped B
5	SCS Runoff	3.179	2	716	6,451	------	------	------	Postdeveloped C
6	Combine	17.59	2	736	92,303	1, 2,	------	------	Combined Predeveloped A&B
7	Combine	26.10	2	716	102,864	3, 4,	------	------	Post A and B Combined
8	Reservoir	7.776	2	762	100,564	7	709.06	41,270	Basin
9	Combine	9.045	2	718	107,015	5, 8	------	------	Post Developed Outflow

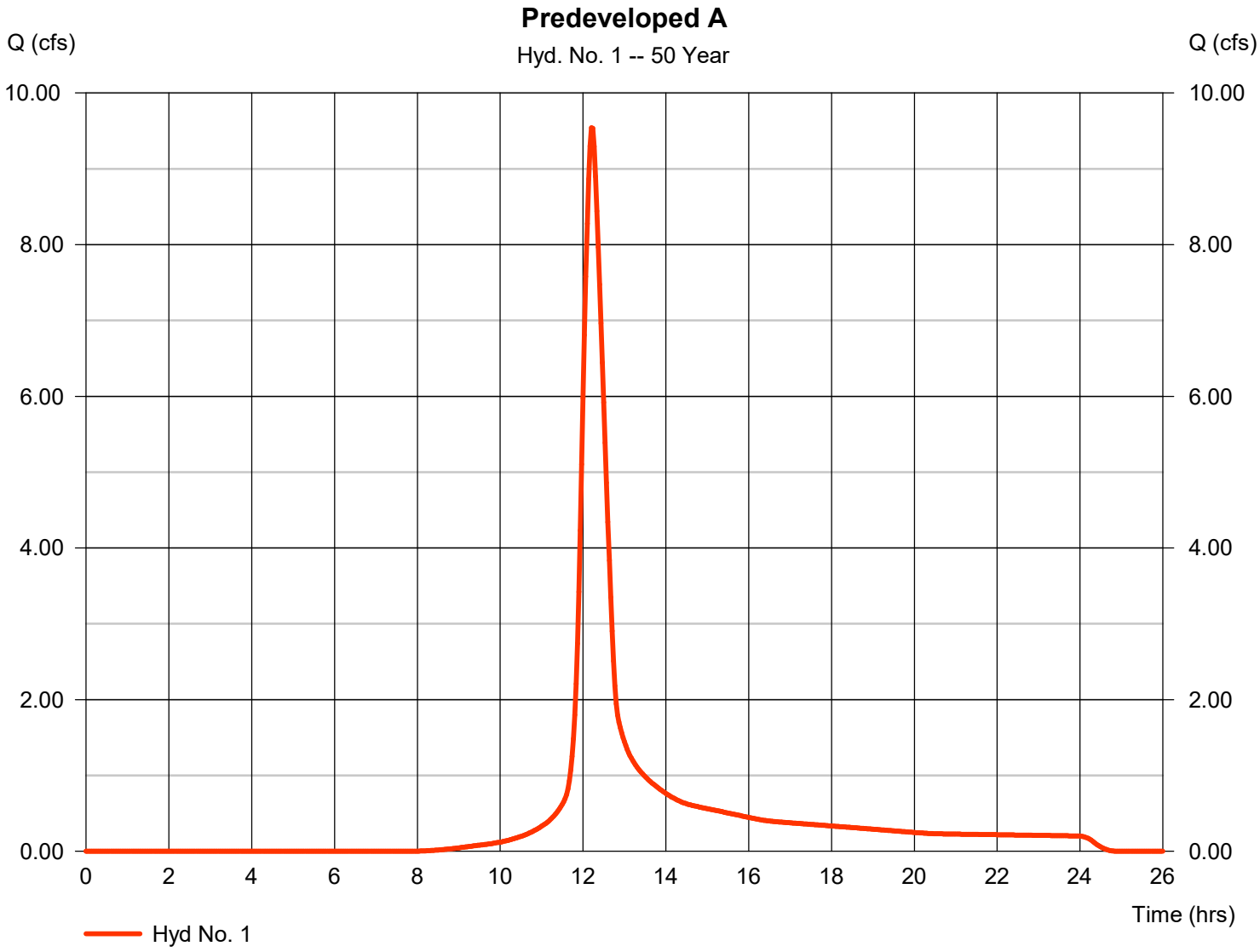
Hydrograph Report

Hyd. No. 1

Predeveloped A

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.543 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.20 hrs
Time interval	=	2 min	Hyd. volume	=	41,348 cuft
Drainage area	=	4.420 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	30.90 min
Total precip.	=	4.70 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.055 x 98) + (4.365 x 79)] / 4.420



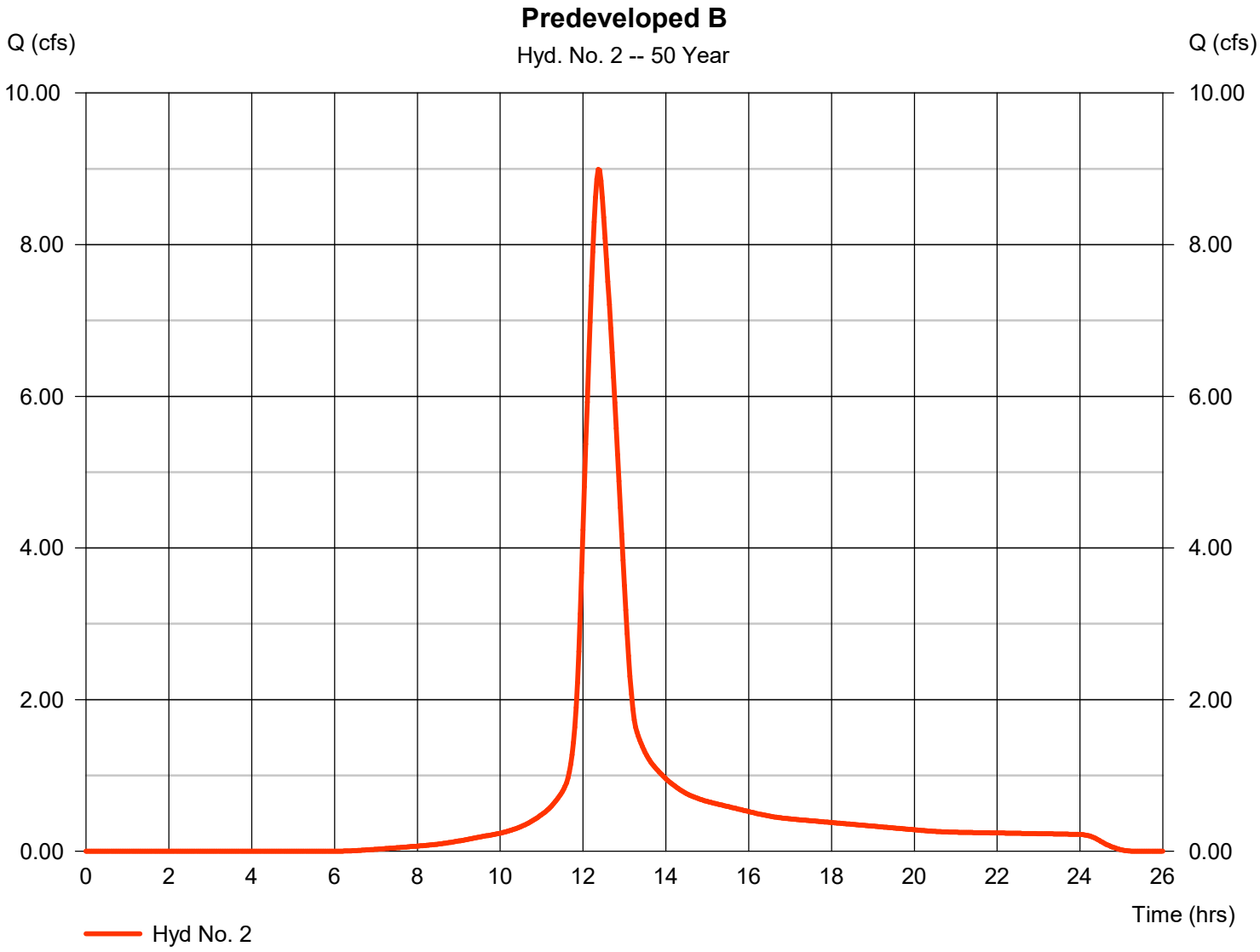
Hydrograph Report

Hyd. No. 2

Predeveloped B

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.992 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.37 hrs
Time interval	=	2 min	Hyd. volume	=	50,955 cuft
Drainage area	=	4.540 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	49.90 min
Total precip.	=	4.70 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.460 x 98) + (3.080 x 79)] / 4.540



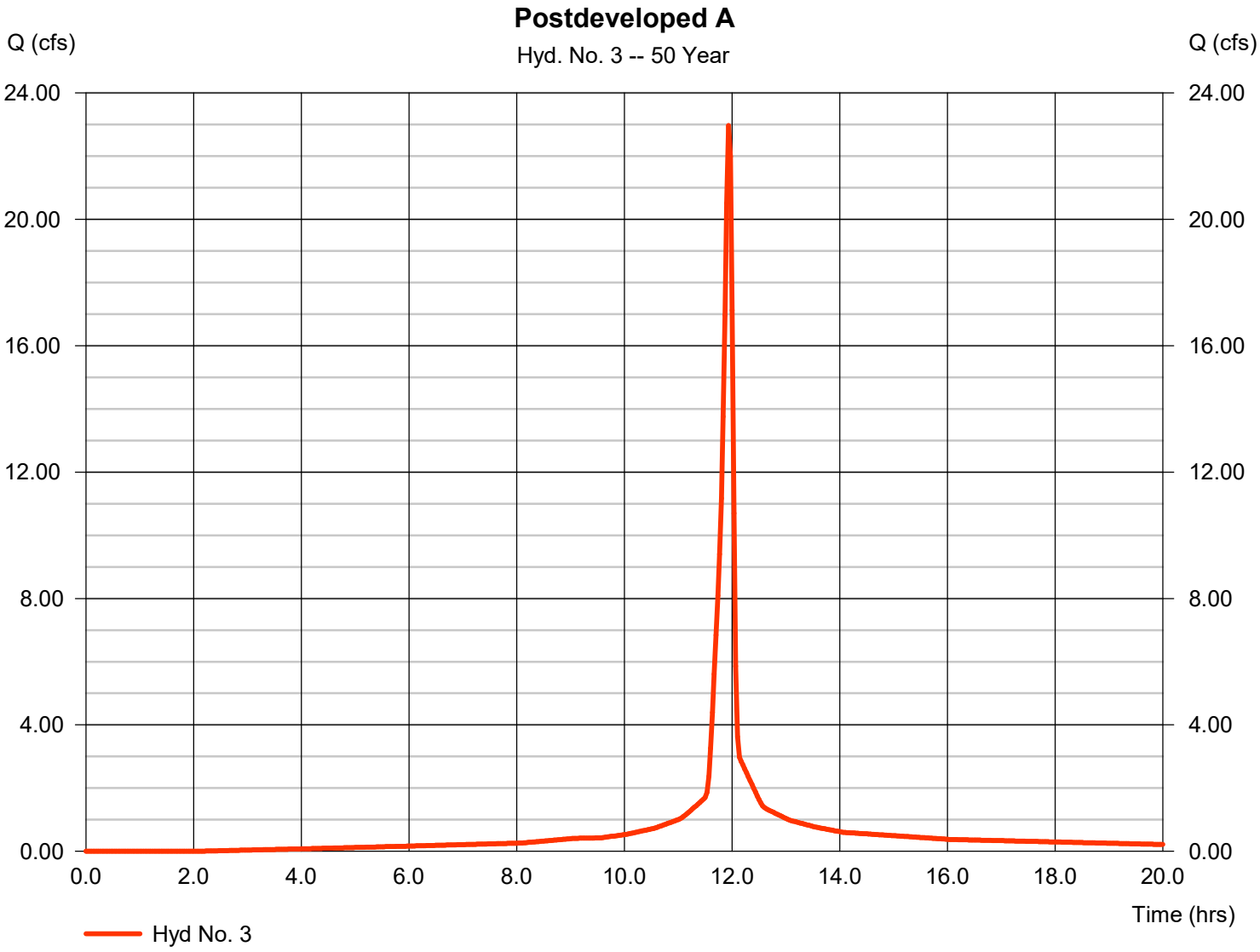
Hydrograph Report

Hyd. No. 3

Postdeveloped A

Hydrograph type	=	SCS Runoff	Peak discharge	=	22.97 cfs
Storm frequency	=	50 yrs	Time to peak	=	11.93 hrs
Time interval	=	2 min	Hyd. volume	=	51,909 cuft
Drainage area	=	3.700 ac	Curve number	=	95*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	5.30 min
Total precip.	=	4.70 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(3.130 x 98) + (0.570 x 79)] / 3.700



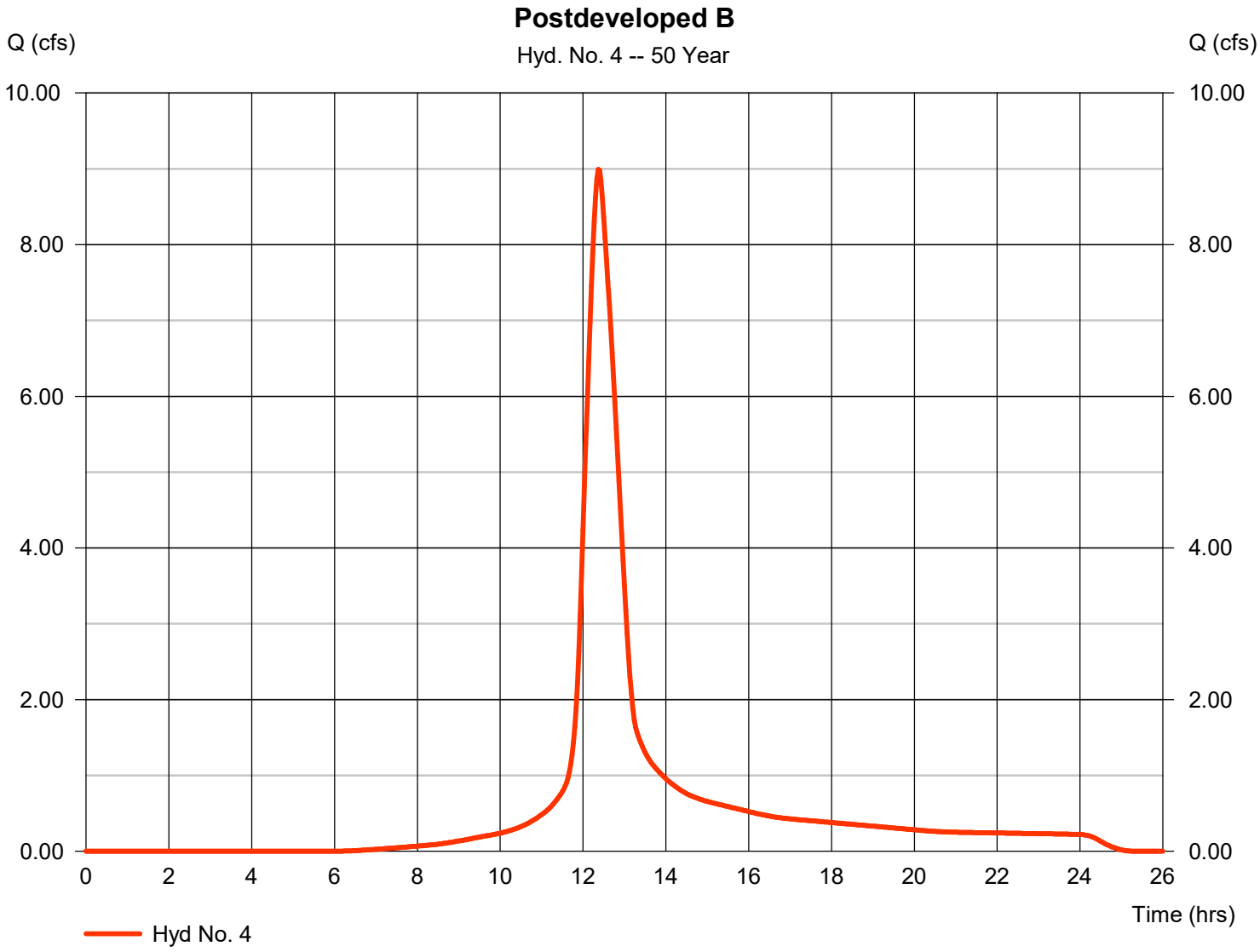
Hydrograph Report

Hyd. No. 4

Postdeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 8.992 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.37 hrs
Time interval	= 2 min	Hyd. volume	= 50,955 cuft
Drainage area	= 4.540 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 49.90 min
Total precip.	= 4.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.460 x 98) + (3.080 x 79)] / 4.540



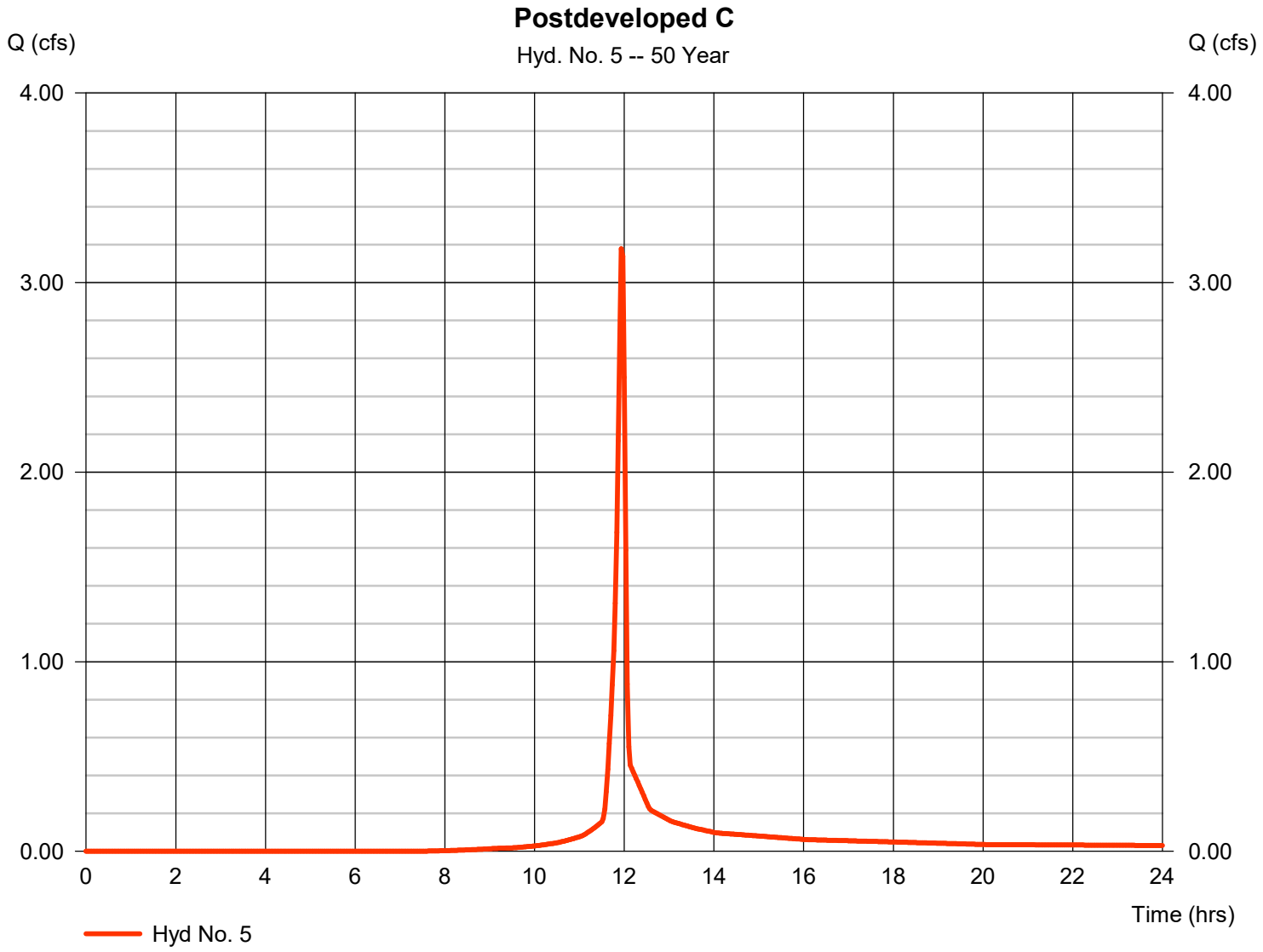
Hydrograph Report

Hyd. No. 5

Postdeveloped C

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.179 cfs
Storm frequency	=	50 yrs	Time to peak	=	11.93 hrs
Time interval	=	2 min	Hyd. volume	=	6,451 cuft
Drainage area	=	0.720 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	4.70 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.050 x 98) + (0.670 x 79)] / 0.720

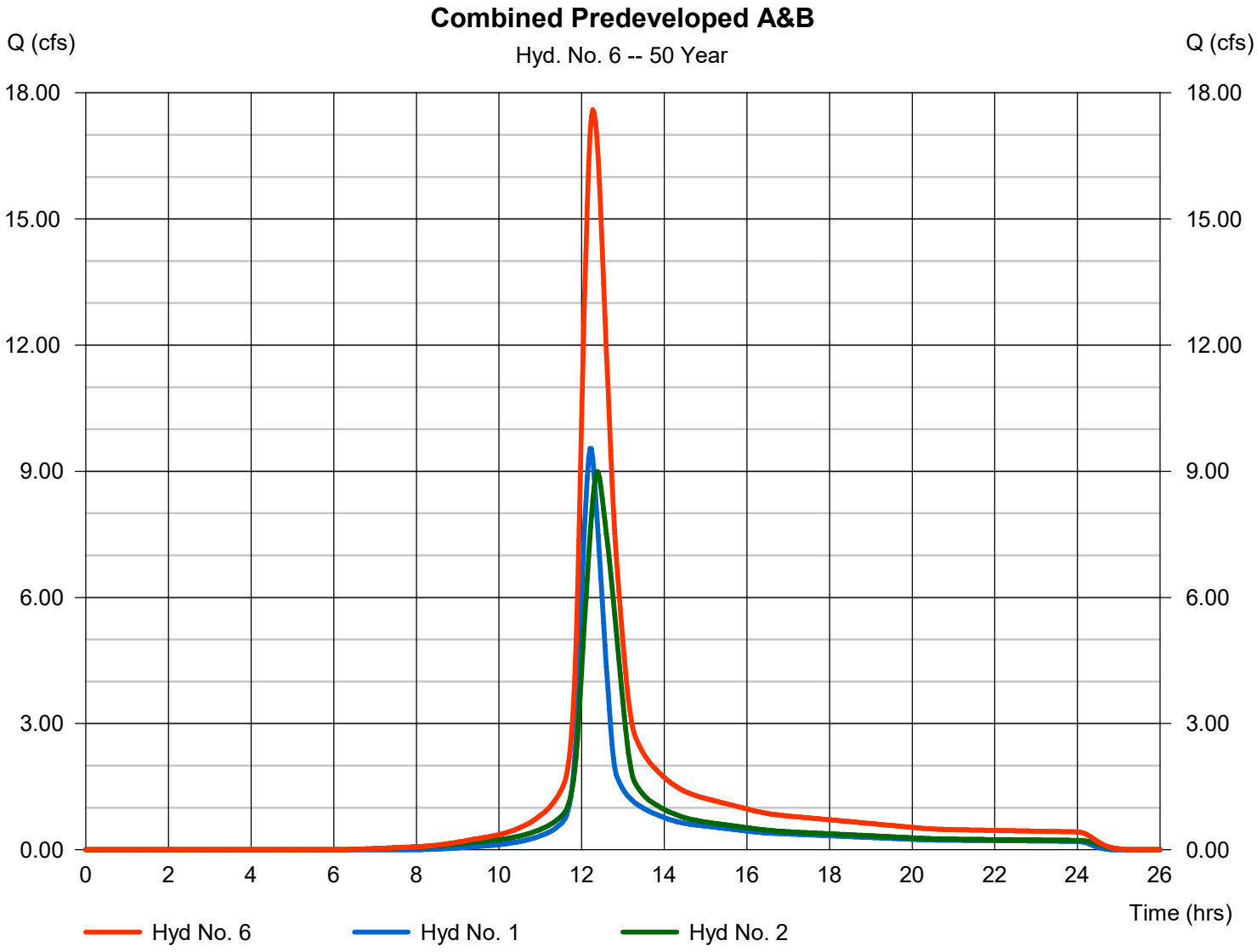


Hydrograph Report

Hyd. No. 6

Combined Predeveloped A&B

Hydrograph type	= Combine	Peak discharge	= 17.59 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.27 hrs
Time interval	= 2 min	Hyd. volume	= 92,303 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 8.960 ac

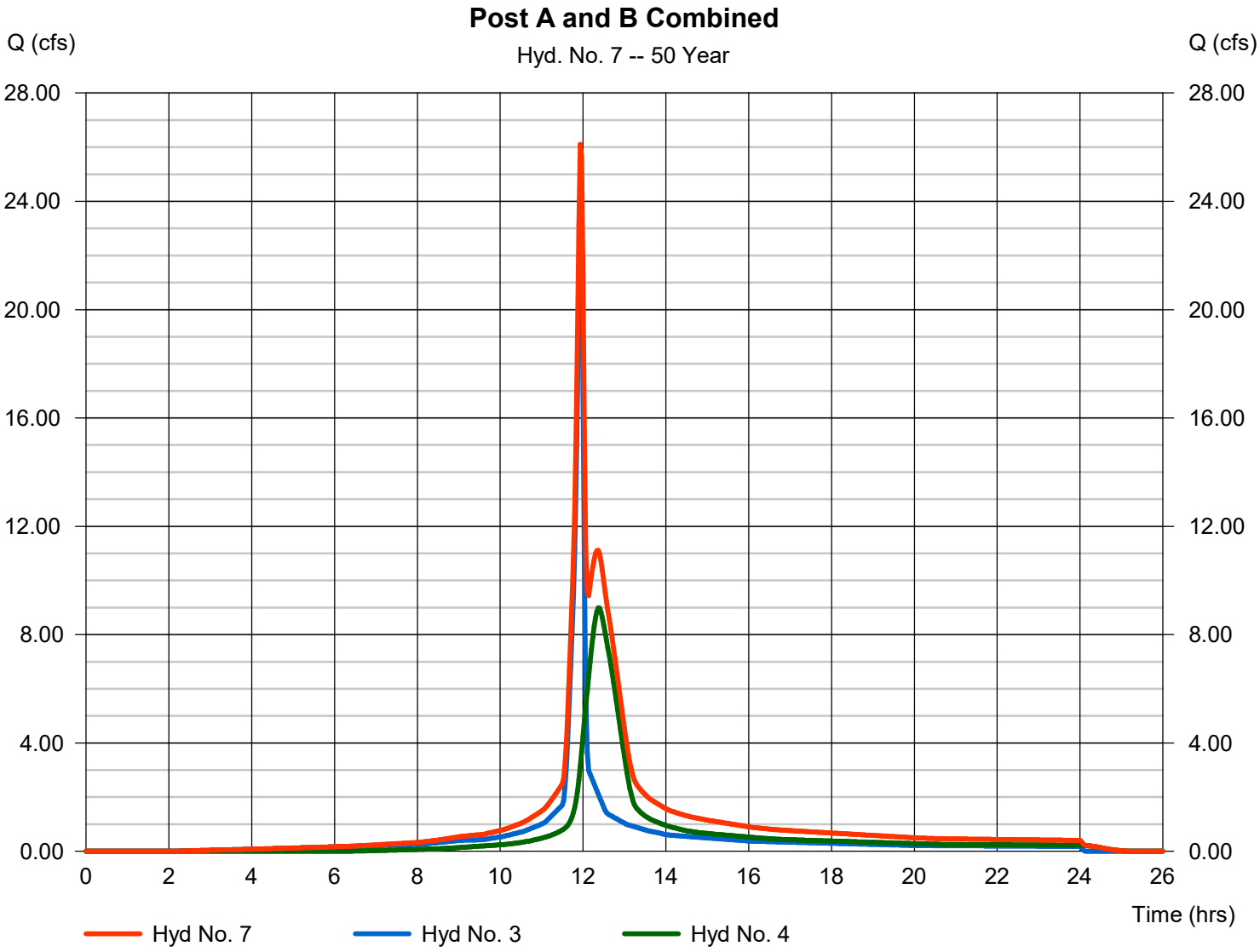


Hydrograph Report

Hyd. No. 7

Post A and B Combined

Hydrograph type	=	Combine	Peak discharge	=	26.10 cfs
Storm frequency	=	50 yrs	Time to peak	=	11.93 hrs
Time interval	=	2 min	Hyd. volume	=	102,864 cuft
Inflow hyds.	=	3, 4	Contrib. drain. area	=	8.240 ac



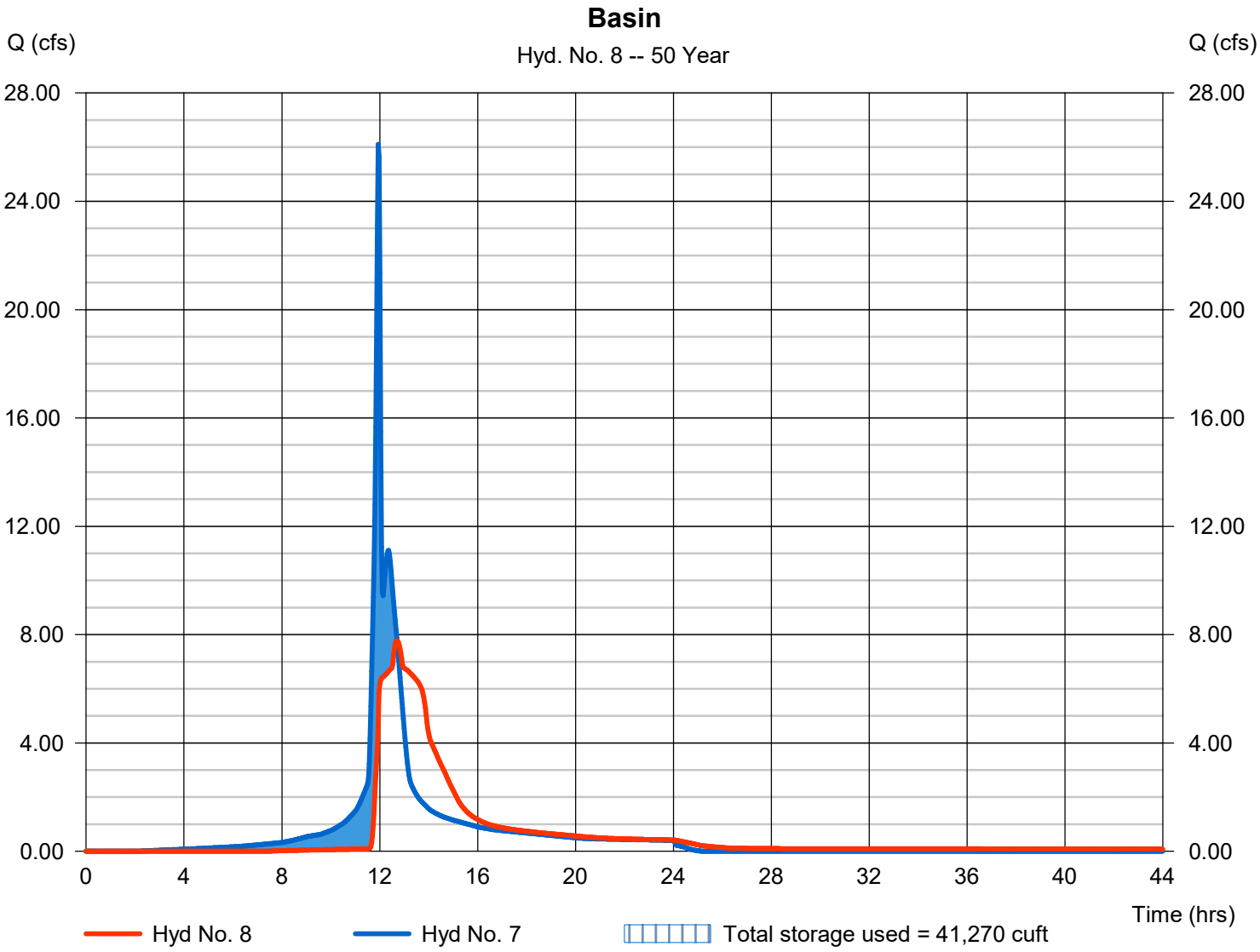
Hydrograph Report

Hyd. No. 8

Basin

Hydrograph type	=	Reservoir	Peak discharge	=	7.776 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.70 hrs
Time interval	=	2 min	Hyd. volume	=	100,564 cuft
Inflow hyd. No.	=	7 - Post A and B Combined	Max. Elevation	=	709.06 ft
Reservoir name	=	Detention Basin	Max. Storage	=	41,270 cuft

Storage Indication method used.

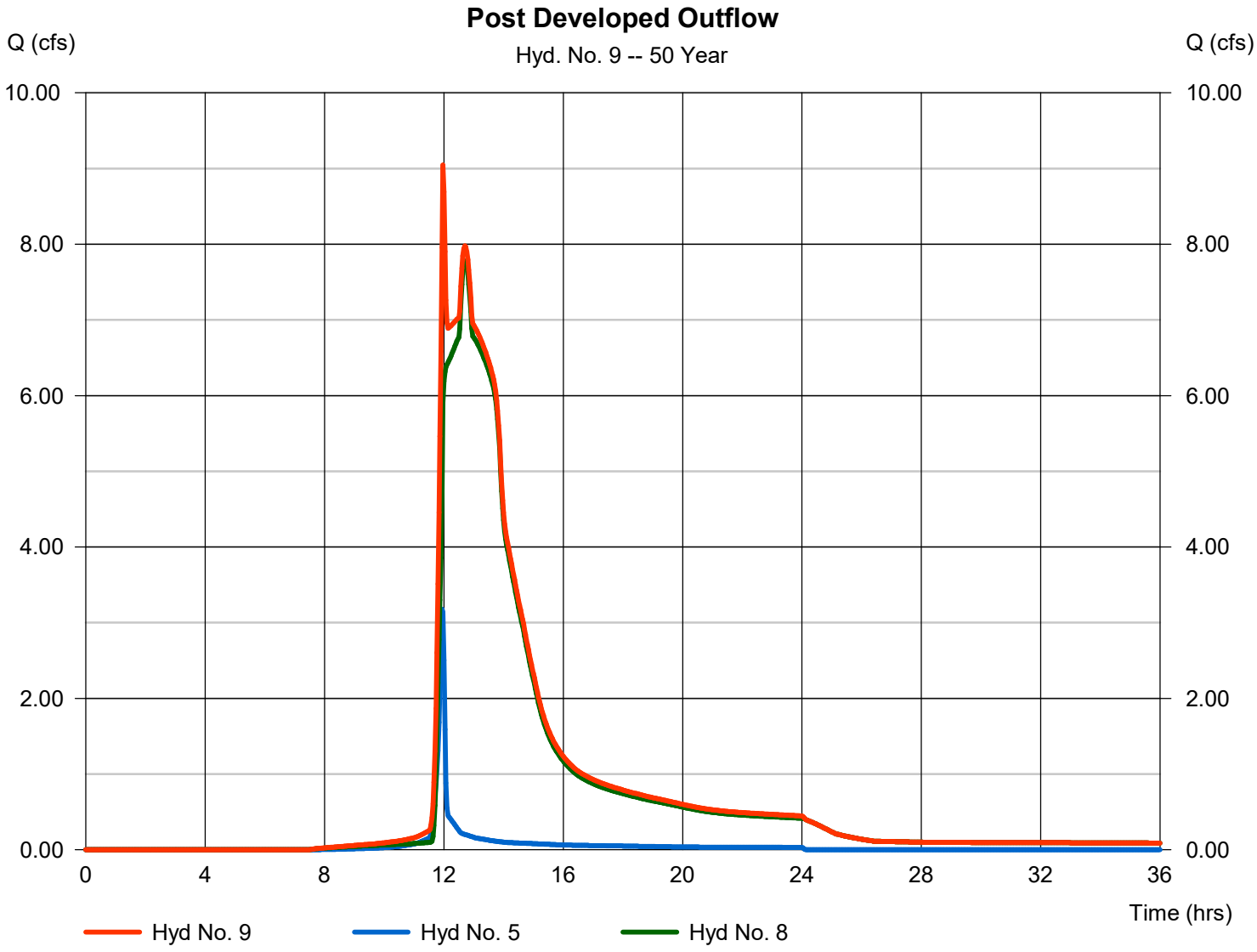


Hydrograph Report

Hyd. No. 9

Post Developed Outflow

Hydrograph type	=	Combine	Peak discharge	=	9.045 cfs
Storm frequency	=	50 yrs	Time to peak	=	11.97 hrs
Time interval	=	2 min	Hyd. volume	=	107,015 cuft
Inflow hyds.	=	5, 8	Contrib. drain. area	=	0.720 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	10.19	2	732	44,118	------	------	------	Predeveloped A
2	SCS Runoff	9.521	2	742	53,985	------	------	------	Predeveloped B
3	SCS Runoff	24.00	2	716	54,402	------	------	------	Postdeveloped A
4	SCS Runoff	9.521	2	742	53,985	------	------	------	Postdeveloped B
5	SCS Runoff	3.383	2	716	6,875	------	------	------	Postdeveloped C
6	Combine	18.71	2	736	98,103	1, 2,	------	------	Combined Predeveloped A&B
7	Combine	27.34	2	716	108,387	3, 4,	------	------	Post A and B Combined
8	Reservoir	9.392	2	756	106,087	7	709.13	42,298	Basin
9	Combine	9.621	2	756	112,961	5, 8	------	------	Post Developed Outflow

Hydrograph Report

Hyd. No. 1

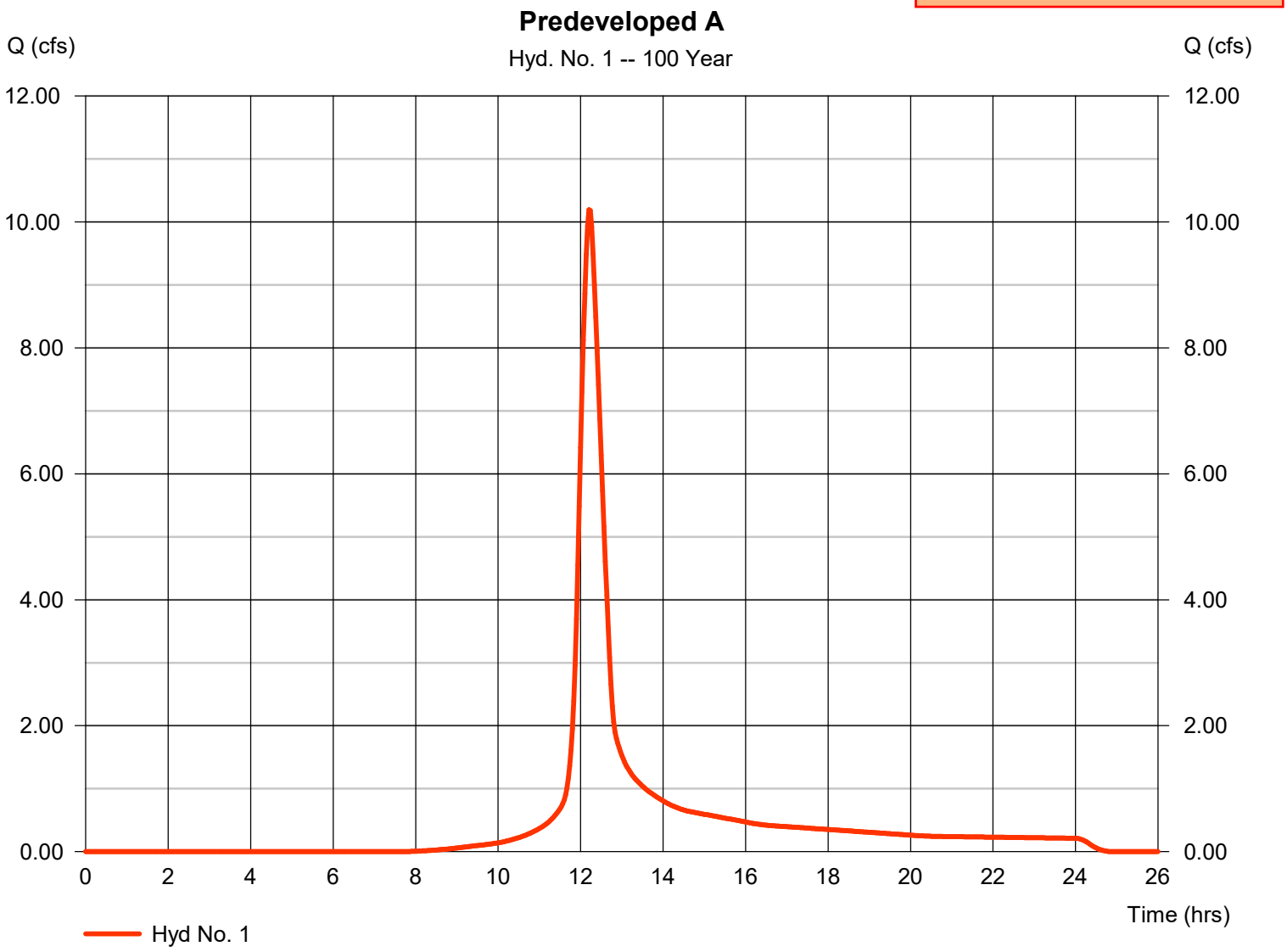
Predeveloped A

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.19 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	2 min	Hyd. volume	=	44,118 cuft
Drainage area	=	4.420 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	30.90 min
Total precip.	=	4.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.055 x 98) + (4.365 x 79)] / 4.420

Use City of Columbus rainfall

City of Columbus is now being used.



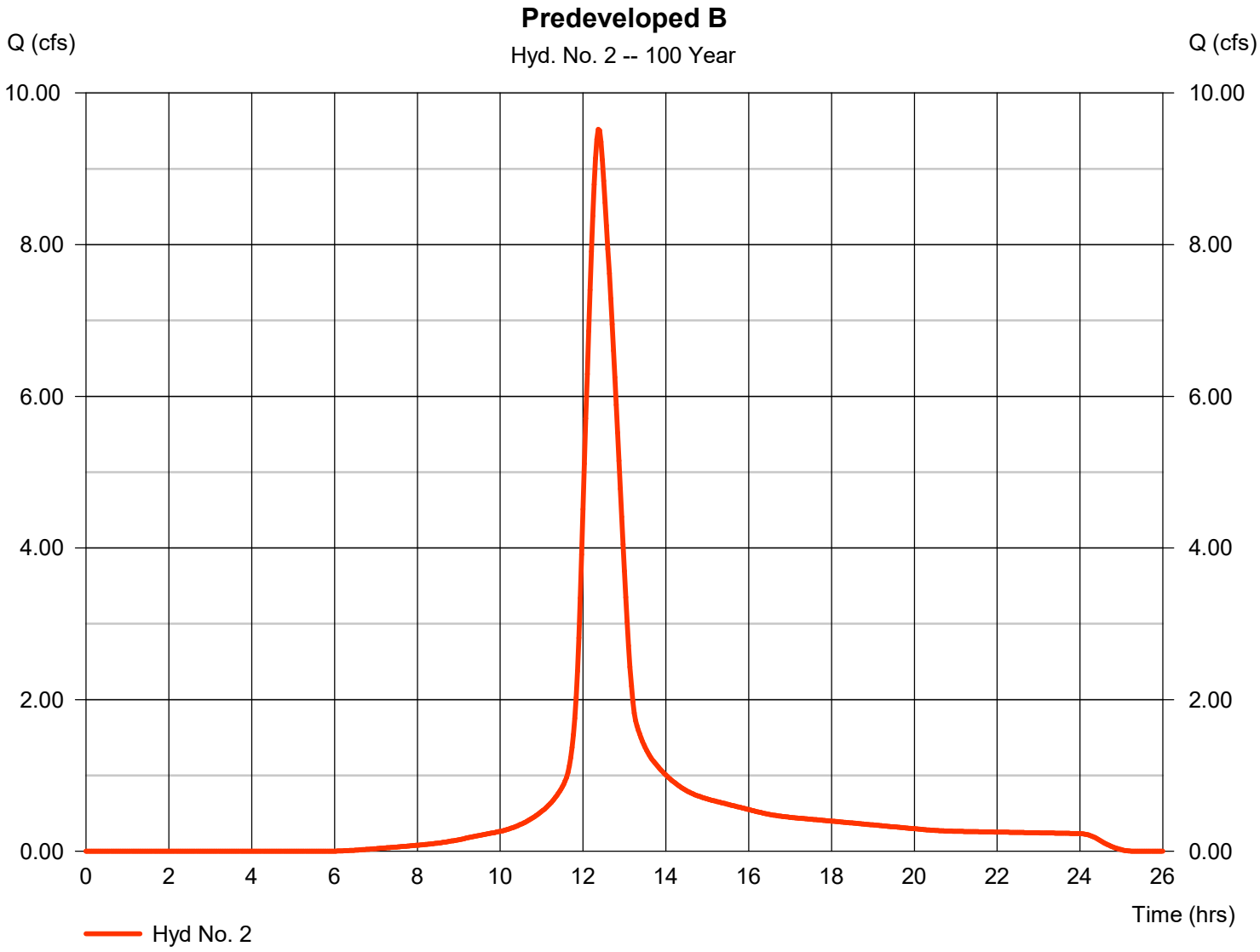
Hydrograph Report

Hyd. No. 2

Predeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 9.521 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.37 hrs
Time interval	= 2 min	Hyd. volume	= 53,985 cuft
Drainage area	= 4.540 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 49.90 min
Total precip.	= 4.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.460 x 98) + (3.080 x 79)] / 4.540



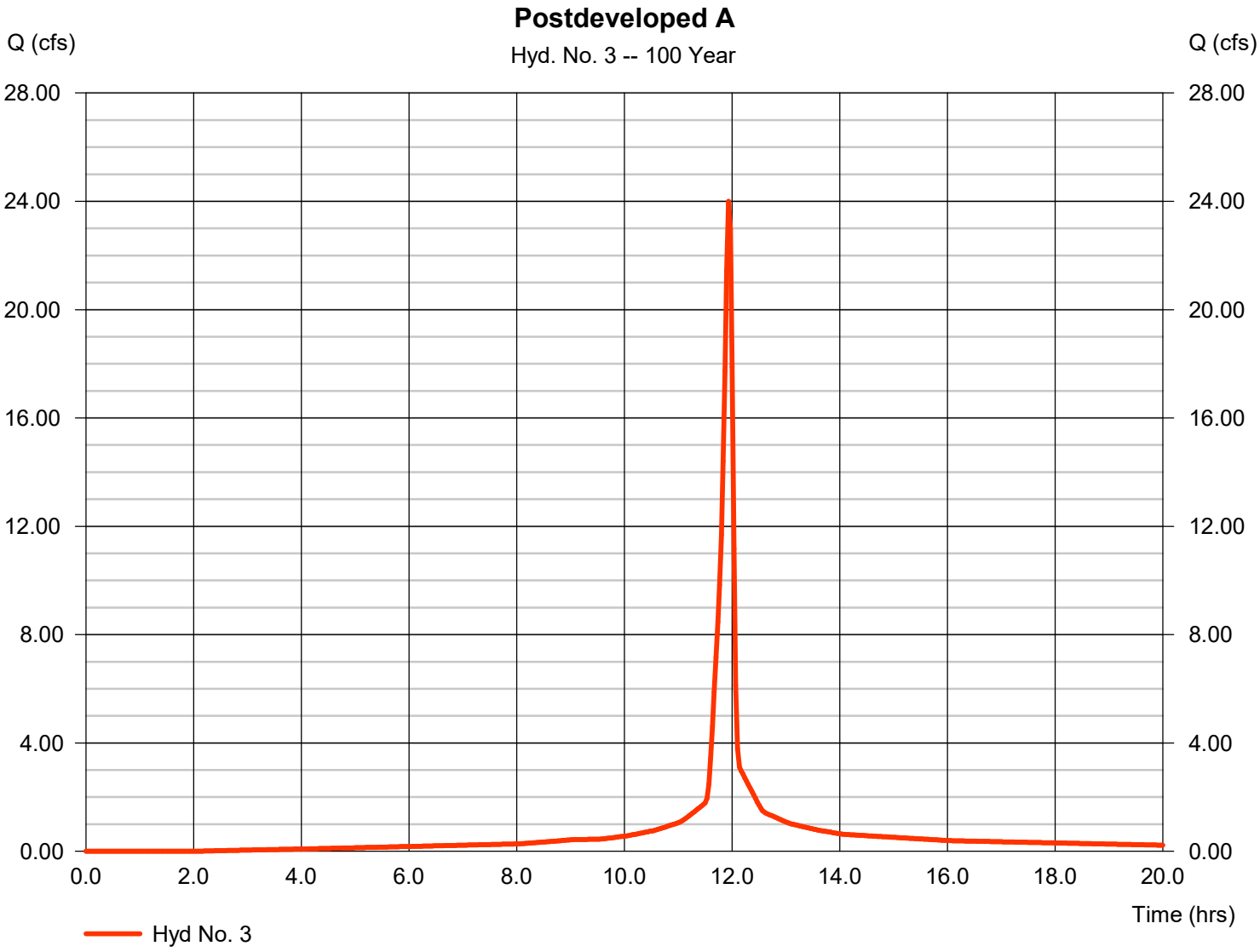
Hydrograph Report

Hyd. No. 3

Postdeveloped A

Hydrograph type	= SCS Runoff	Peak discharge	= 24.00 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 54,402 cuft
Drainage area	= 3.700 ac	Curve number	= 95*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.30 min
Total precip.	= 4.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(3.130 x 98) + (0.570 x 79)] / 3.700



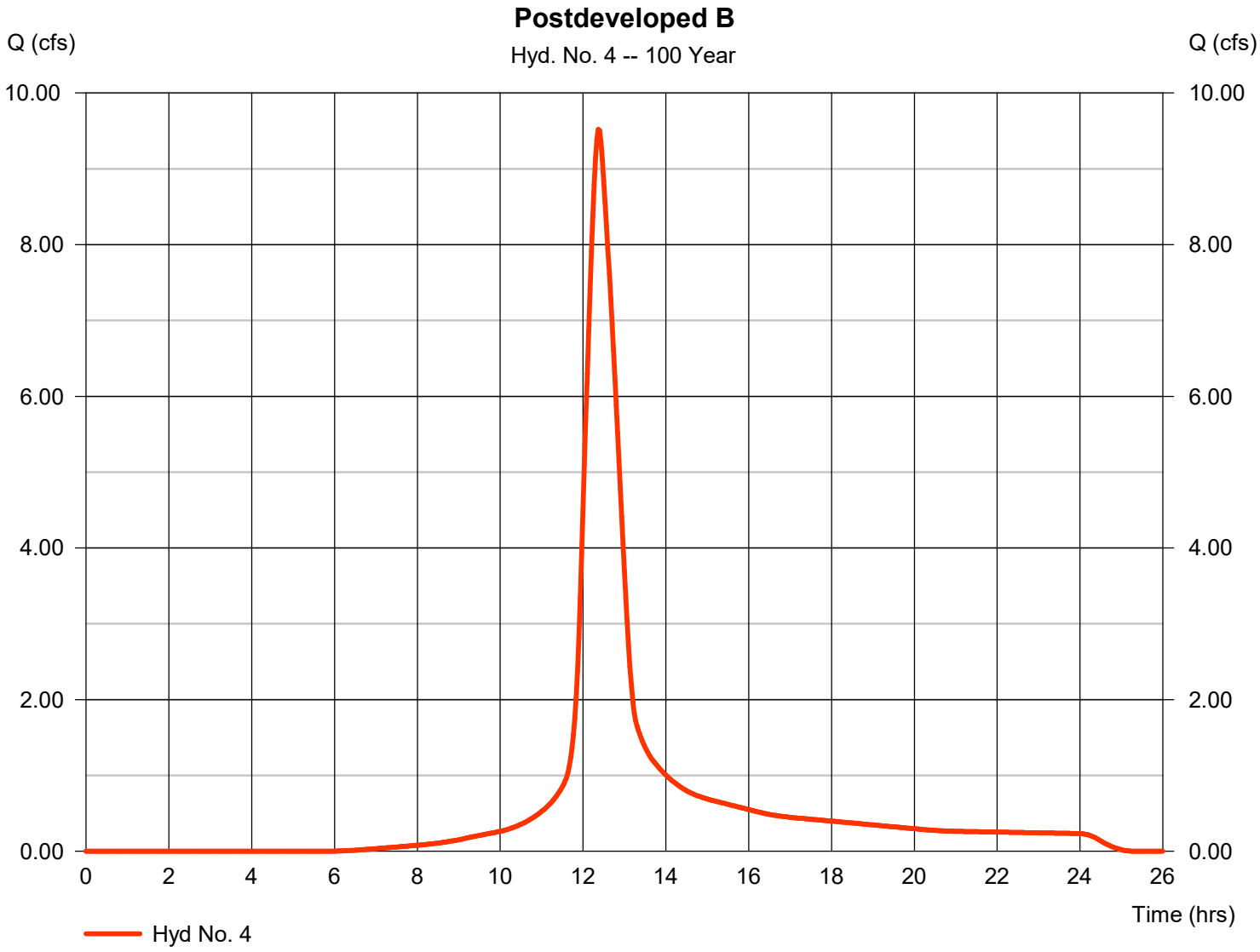
Hydrograph Report

Hyd. No. 4

Postdeveloped B

Hydrograph type	= SCS Runoff	Peak discharge	= 9.521 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.37 hrs
Time interval	= 2 min	Hyd. volume	= 53,985 cuft
Drainage area	= 4.540 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 49.90 min
Total precip.	= 4.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.460 x 98) + (3.080 x 79)] / 4.540



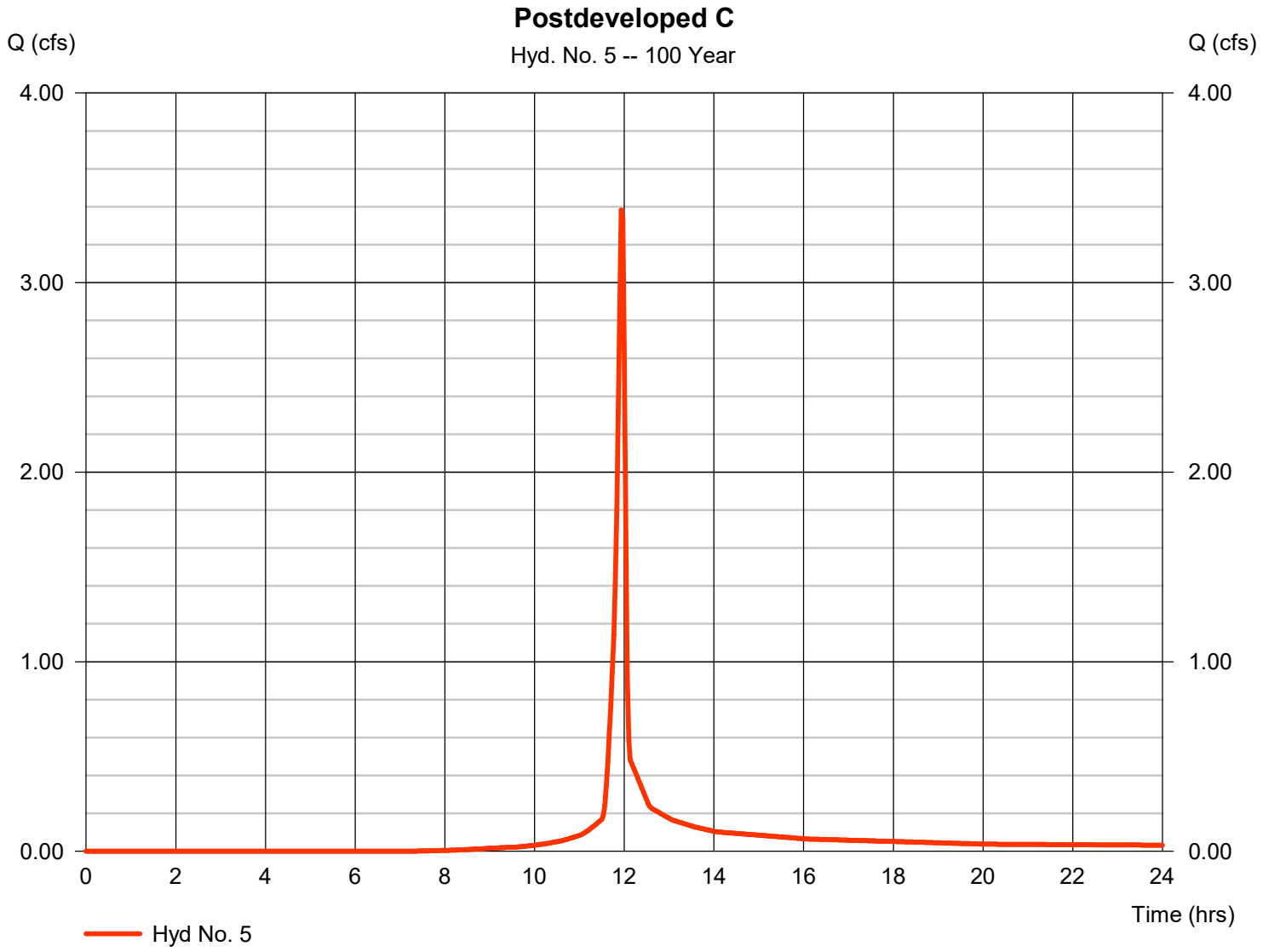
Hydrograph Report

Hyd. No. 5

Postdeveloped C

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.383 cfs
Storm frequency	=	100 yrs	Time to peak	=	11.93 hrs
Time interval	=	2 min	Hyd. volume	=	6,875 cuft
Drainage area	=	0.720 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	4.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.050 x 98) + (0.670 x 79)] / 0.720

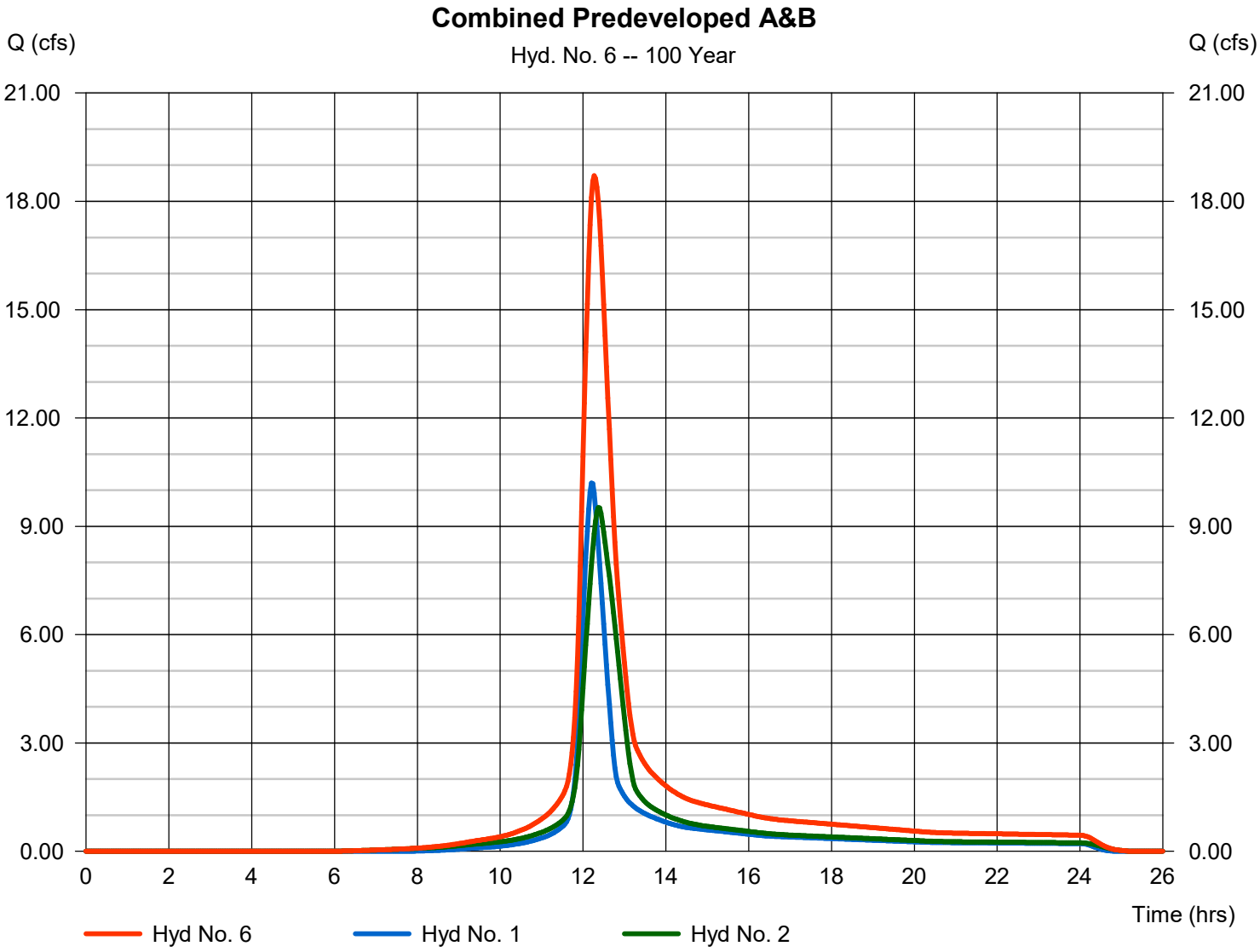


Hydrograph Report

Hyd. No. 6

Combined Predeveloped A&B

Hydrograph type	= Combine	Peak discharge	= 18.71 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.27 hrs
Time interval	= 2 min	Hyd. volume	= 98,103 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 8.960 ac

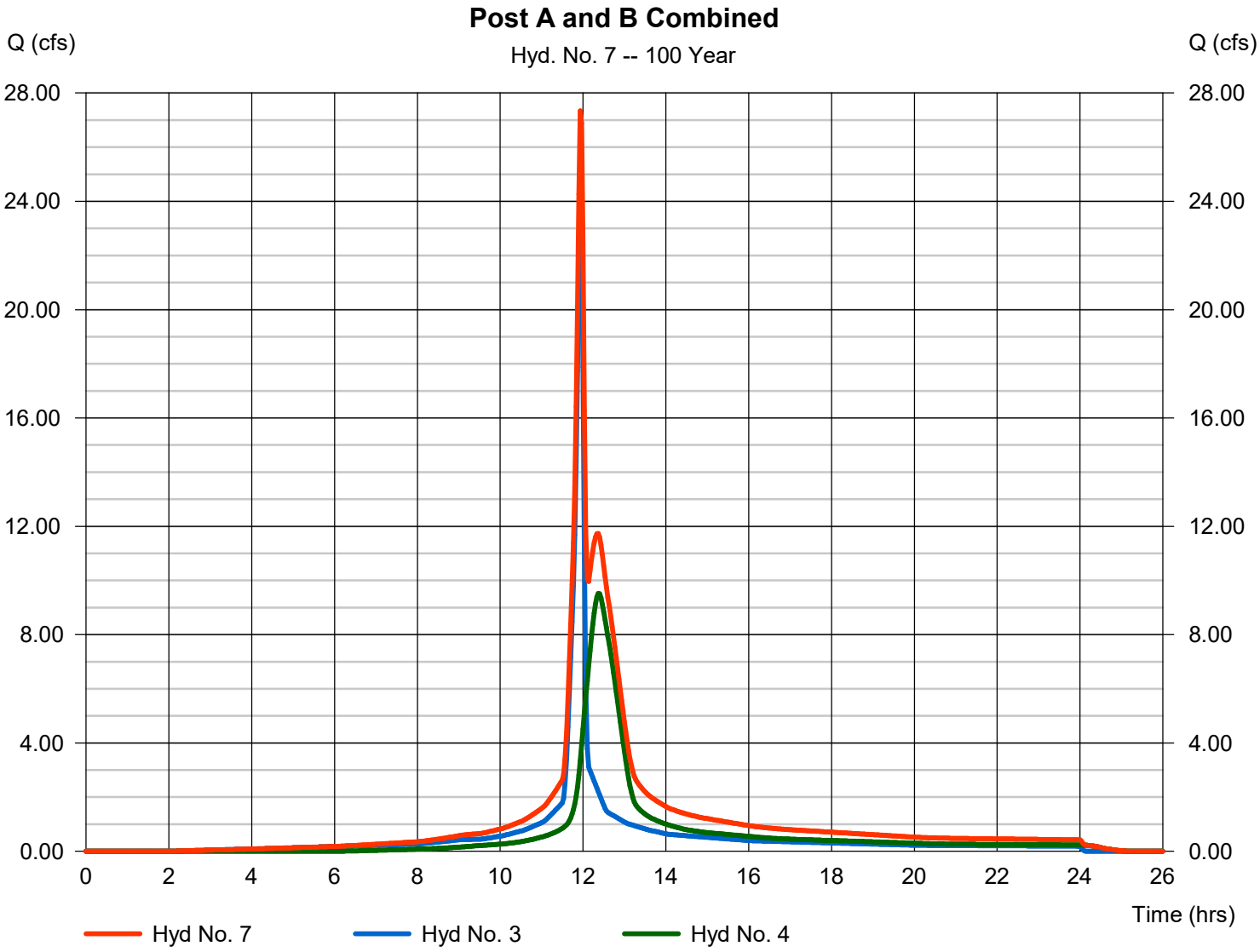


Hydrograph Report

Hyd. No. 7

Post A and B Combined

Hydrograph type	= Combine	Peak discharge	= 27.34 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 108,387 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 8.240 ac



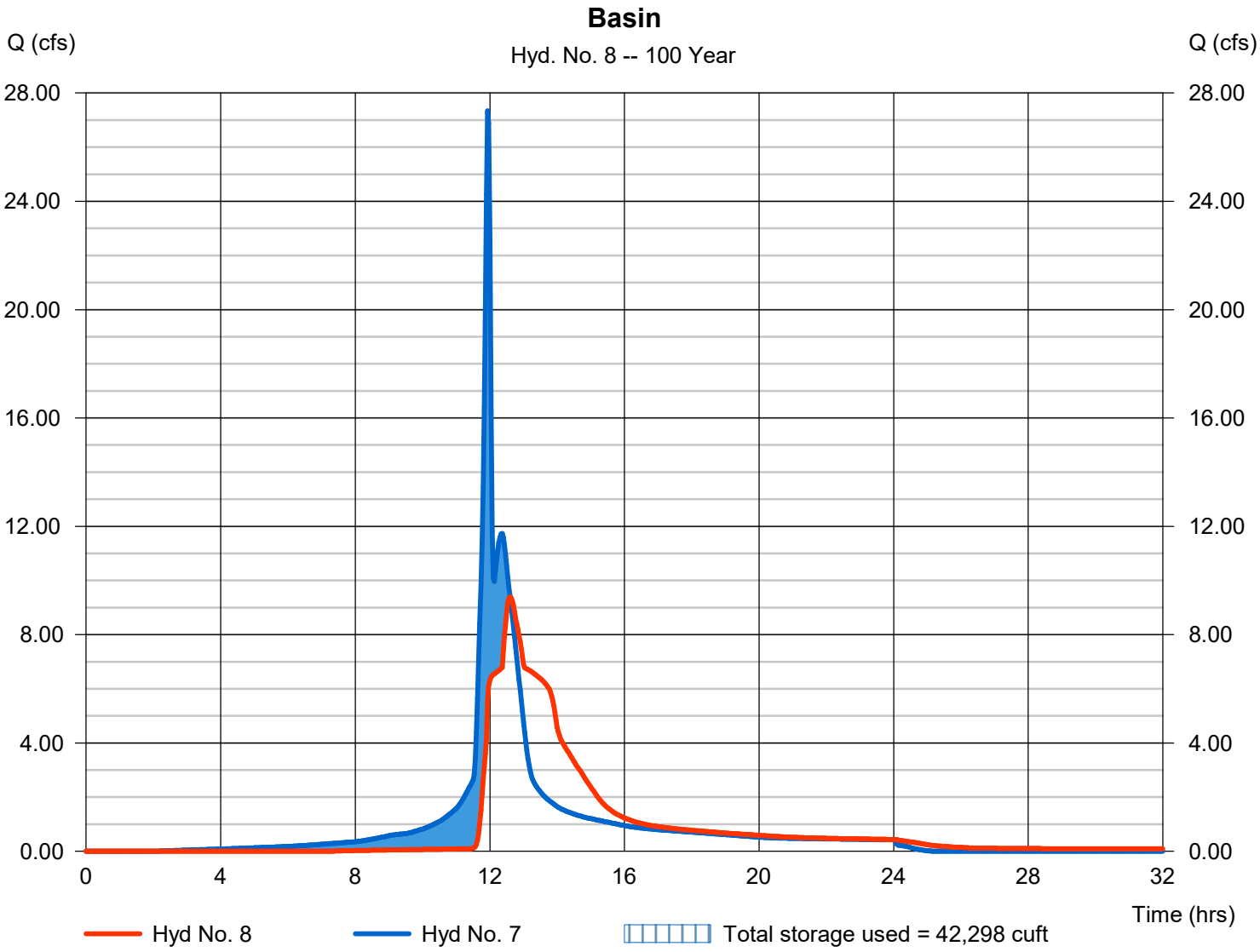
Hydrograph Report

Hyd. No. 8

Basin

Hydrograph type	=	Reservoir	Peak discharge	=	9.392 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.60 hrs
Time interval	=	2 min	Hyd. volume	=	106,087 cuft
Inflow hyd. No.	=	7 - Post A and B Combined	Max. Elevation	=	709.13 ft
Reservoir name	=	Detention Basin	Max. Storage	=	42,298 cuft

Storage Indication method used.

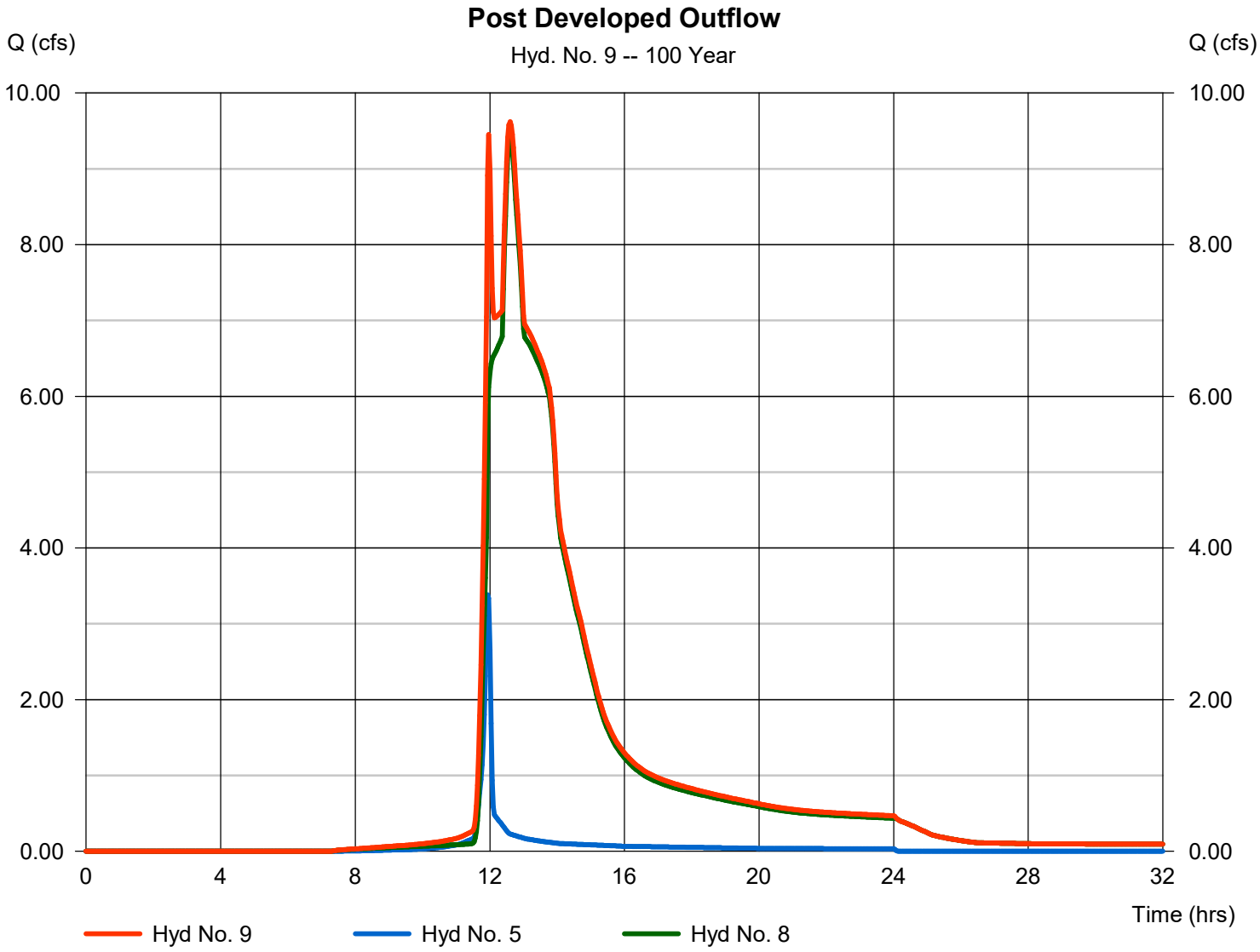


Hydrograph Report

Hyd. No. 9

Post Developed Outflow

Hydrograph type	=	Combine	Peak discharge	=	9.621 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.60 hrs
Time interval	=	2 min	Hyd. volume	=	112,961 cuft
Inflow hyds.	=	5, 8	Contrib. drain. area	=	0.720 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	40.9319	9.8000	0.8767	--------
2	45.5761	9.6000	0.8553	--------
3	0.0000	0.0000	0.0000	--------
5	51.8623	9.6000	0.8320	--------
10	48.5688	8.5000	0.7836	--------
25	45.2702	7.3000	0.7295	--------
50	43.8185	6.5000	0.6970	--------
100	41.7893	5.7000	0.6627	--------

File name: Pickaway Co.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	3.86	2.99	2.45	2.09	1.82	1.62	1.46	1.33	1.22	1.13	1.06	0.99
2	4.60	3.58	2.95	2.51	2.20	1.96	1.77	1.62	1.49	1.38	1.29	1.21
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	5.57	4.36	3.61	3.10	2.72	2.43	2.20	2.01	1.86	1.73	1.62	1.52
10	6.32	4.94	4.09	3.52	3.10	2.78	2.53	2.32	2.15	2.00	1.88	1.77
25	7.26	5.66	4.70	4.06	3.59	3.23	2.95	2.72	2.52	2.36	2.22	2.10
50	7.99	6.21	5.16	4.46	3.96	3.57	3.26	3.02	2.81	2.63	2.48	2.35
100	8.69	6.74	5.61	4.86	4.32	3.91	3.58	3.32	3.10	2.91	2.75	2.61

Tc = time in minutes. Values may exceed 60.

Precip. file name: T:\Support\Drainage SCS Tables\Fairfield Co Precipitation.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	2.30	2.50	0.00	3.30	3.70	4.30	4.70	4.90
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Use City of Columbus rainfall data.

City of Columbus is now being used.