Associated Engineering, LLC

103 S. Church Street – P.O. Box 1462 – Jonesboro, AR 72403 – Phone: (870) 932-3594 – Fax: (870) 935-1263

March 20, 2024

Mr. Michael Morris, PE
City Engineering Department
City of Jonesboro
300 South Church Street
Jonesboro, AR 72401

Re: Drainage Report – Farmer Hills Commercial Development
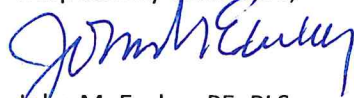   Southwest Drive
        Jonesboro, Arkansas

Dear Mr. Morris:

Attached is the Storm Water Analysis for the above referenced project. The site is located along Southwest Drive, across from the Southern Hills development. The site is currently a vacant commercial tract. The development is a C-3, Commercial Development.

Storm water runoff from on-site is collected and diverted to a drainage basin located along the west side of the project site and reduces the developed runoff to offset an increase of runoff to the east. By use of detention on the west side, peak storm water runoff is reduced from its previous condition to be 18% for the 10-year storm frequency event and 23% for the 100-year storm frequency event. Stormwater mitigation for each lot will be the responsibility of the future developer.

Should you have any questions or require additional information, please contact me.

Respectfully submitted,

John M. Easley, PE, PLS
Project Engineer

Hydrograph Calculations

For

Farmer Hills
A Proposed Commercial Development
Jonesboro, AR

Prepared by
Associated Engineering, LLC
John M. Easley, PE, PLS

March 19, 2024

Drainage Report
Farmer Hills
A Proposed Commercial Development
Jonesboro, Arkansas
March 19, 2024

Purpose:
The purpose of this report is to determine the storm drainage characteristics for a proposed commercial development located along Southwest Drive, across from the Southern Hills development. The site is currently a vacant wooded parcel.

Location:
The proposed development is located along Southwest Drive, across from the Southern Hills development. The site is currently a vacant commercial site.

Scope of Work:
Storm water runoff rates were computed using the United States Department of Interior's (USDI) Soil Conservation Service (SCS) 24-Hour Hydrograph Method. The method of calculation is computer generated using Hydroflow software. Maps of the site including off-site runoff onto the property were reviewed to provide data input for the computer program. Topographic information gathered from the field by Associated Engineering, LLC was used to determine these characteristics for the development.

The detention structure was reviewed for storage capabilities during the 2, 10, 25, 50 and 100-year storm frequency events. The detention configurations were also reviewed to determine any increase and/or decrease in the peak discharge of the associated storm events from the developed conditions. Storage routing of the developed hydrographs through the detention area were calculated by computer using Hydrograph software. The project site was reviewed for its runoff characteristics during the 2-year through 100-year storm frequency events for both existing and developed conditions.

Overall Design:
The project site is approximately 10 acres that is currently vacant and located on the west side of Southwest Drive. The development is currently wooded with a clear area for a overhead 69kv electric line (Entergy). The development will consist of three lots, two commercial lots adjacent to the proposed street and a third larger lot on the west end of the site. Future plans for the large lot have not been determined at this time. Drainage management and erosion control for the two commercial lots will be the responsibility of each lot. Stormwater mitigation for the proposed street will be constructed as part of initial development and a part of this design report. A detention basin will be placed on the west side of the site, near the end of the proposed street.

The general slope of the site is from the southeast corner to the northwest with site drainage leaving midway of the north line.

Pre-Developed Flows:

Calculations for the pre-developed flows for the 2-year through the 100-year storm frequency events are shown within Appendix "A". The basin is predominately Brandon-Saffell association - Hydrologic Soil Group "B". A summary of the input data and results are shown below:

       Existing Basin:
           Area = 7.2 acres
           CN   = 55   7.2 acres @ 55 = Woods
           Tc   = 13.6 minutes

Post-Developed Flows:

Calculations for the post-developed flows for the 2-year through the 100-year storm frequency events are shown within Appendix "A". A summary of the input data and results are shown below:

       Developed Basin:
           Area = 7.2 acres
           CN   = 58 6.7 acres @ 55 = Woods
                             0.5 acres @ 58 = Commercial
           Tc   = 13.6 minutes

Computative analyses for the existing and developed conditions are shown within Appendix "A". A summary of the existing and combined developed data is shown below:

Frequency (year)	Pre-developed Flows (cfs)	Post-developed Flows (cfs)	Percent Change in flows (cfs)
2-year	2.77	2.81	0%
5-year	6.65	5.86	12%
10-year	10.35	8.52	18%
25-year	14.53	11.62	20%
50-year	18.24	14.13	23%
100-year	22.57	17.39	23%

3

Detention Facility:

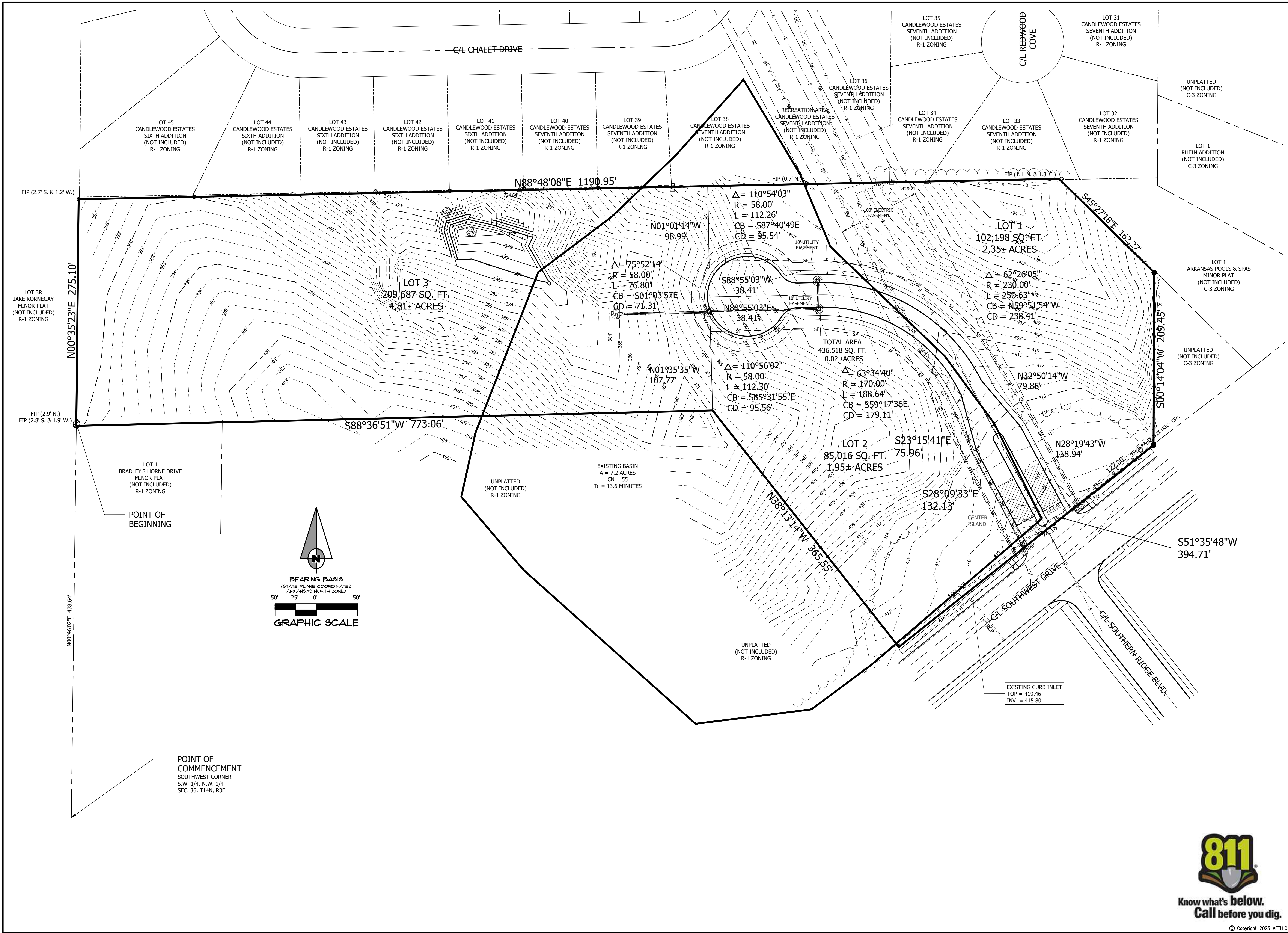|	
Basin Bottom:	377.00
Basin Top:	381.00
Outlet:	15° "V"Notch Weir

Conclusions:

Based on and limited to the data and analysis and their applicability presented herein, the development, with the current structures, does not appear to endanger life or property, public or private.

Appendix A

BASIN MAPS – EXISTING AND DEVELOPED

SOILS SURVEY PRINTOUT

HYDROGRAPH SUMMARY REPORT FOR PROPOSED COMMERCIAL DEVELOPMENT – FAMER HILLS: EXISTING AND DEVELOPED CONDITIONS FOR 2, 5, 10, 25, 50 AND 100-YEAR FREQUENCY EVENTS.

C/L CHALET DRIVE

LOT 35
CANDLEWOOD ESTATES
SEVENTH ADDITION
(NOT INCLUDED)
R-1 ZONING

C/L REDWOOD COVE

LOT 31
CANDLEWOOD ESTATES
SEVENTH ADDITION
(NOT INCLUDED)
R-1 ZONING

LOT 45
CANDLEWOOD ESTATES
SIXTH ADDITION
(NOT INCLUDED)
R-1 ZONING

LOT 44
CANDLEWOOD ESTATES
SIXTH ADDITION
(NOT INCLUDED)
R-1 ZONING

LOT 43
CANDLEWOOD ESTATES
SIXTH ADDITION
(NOT INCLUDED)
R-1 ZONING

LOT 42
CANDLEWOOD ESTATES
SIXTH ADDITION
(NOT INCLUDED)
R-1 ZONING

LOT 41
CANDLEWOOD ESTATES
SIXTH ADDITION
(NOT INCLUDED)
R-1 ZONING

LOT 40
CANDLEWOOD ESTATES
SEVENTH ADDITION
(NOT INCLUDED)
R-1 ZONING

LOT 39
CANDLEWOOD ESTATES
SEVENTH ADDITION
(NOT INCLUDED)
R-1 ZONING

LOT 38
CANDLEWOOD ESTATES
SEVENTH ADDITION
(NOT INCLUDED)
R-1 ZONING

RECREATION AREA
CANDLEWOOD ESTATES
SEVENTH ADDITION
(NOT INCLUDED)
R-1 ZONING

LOT 36
CANDLEWOOD ESTATES
SEVENTH ADDITION
(NOT INCLUDED)
R-1 ZONING

LOT 34
CANDLEWOOD ESTATES
SEVENTH ADDITION
(NOT INCLUDED)
R-1 ZONING

LOT 33
CANDLEWOOD ESTATES
SEVENTH ADDITION
(NOT INCLUDED)
R-1 ZONING

LOT 32
CANDLEWOOD ESTATES
SEVENTH ADDITION
(NOT INCLUDED)
R-1 ZONING

UNPLATTED
(NOT INCLUDED)
C-3 ZONING

LOT 1
RHEIN ADDITION
(NOT INCLUDED)
C-3 ZONING

FIP (2.7' S. & 1.2' W.)
FIP (0.7' N.)
FIP (1.1' N. & 1.8' E.)

N88°48'08"E 1190.95'

S45°27'18"E 162.27'

$\triangle$ = 110°54'03"
R = 58.00'
L = 112.26'
CB = S87°40'49E
CD = 95.54'

N01°01'14"W
98.99'

100' ELECTRIC
EASEMENT

10' UTILITY
EASEMENT

LOT 1
102,198 SQ. FT.
2.35± ACRES

N00°35'23"E 275.10'

LOT 3
209,687 SQ. FT.
4.81± ACRES

$\triangle$ = 75°52'14"
R = 58.00'
L = 76.80'
CB = S01°03'57E
CD = 71.31'

S88°55'03"W
38.41'

10' UTILITY
EASEMENT

$\triangle$ = 62°26'05"
R = 230.00'
L = 250.63'
CB = N59°51'54"W
CD = 238.41'

N88°55'03"E
38.41'

N32°50'14"W
79.85'

LOT 3R
JAKE KORNEGAY
MINOR PLAT
(NOT INCLUDED)
R-1 ZONING

TOTAL AREA
436,518 SQ. FT.
10.02 ±ACRES

$\triangle$ = 110°56'02"
R = 58.00'
L = 112.30'
CB = S85°31'55"E
CD = 95.56'

$\triangle$ = 63°34'40"
R = 170.00'
L = 188.64'
CB = S59°17'36E
CD = 179.11'

N01°35'35"W
107.77'

N28°19'43"W
118.94'

FIP (2.9' N.)
FIP (2.8' S. & 1.9' W.)

S88°36'51"W 773.06'

LOT 2
85,016 SQ. FT.
1.95± ACRES

S23°15'41"E
75.96

EXISTING BASIN
A = 7.2 ACRES
CN = 55
Tc = 13.6 MINUTES

LOT 1
BRADLEY'S HORNE DRIVE
MINOR PLAT
(NOT INCLUDED)
R-1 ZONING

POINT OF
BEGINNING

N00°46'02"E 478.64'

S00°14'04"W 209.45'

UNPLATTED
(NOT INCLUDED)
C-3 ZONING

LOT 1
ARKANSAS POOLS & SPAS
MINOR PLAT
(NOT INCLUDED)
C-3 ZONING

N36°13'14"W 365.55'

S28°09'33"E
132.13'

CENTER
ISLAND

S51°35'48"W
394.71'

UNPLATTED
(NOT INCLUDED)
R-1 ZONING

BEARING BASIS
(STATE PLANE COORDINATES
ARKANSAS NORTH ZONE)

50'   25'   0'   50'

GRAPHIC SCALE

N

POINT OF
COMMENCEMENT
SOUTHWEST CORNER
S.W. 1/4, N.W. 1/4
SEC. 36, T14N, R3E

C/L SOUTHWEST DRIVE

C/L SOUTHERN RIDGE BLVD.

EXISTING CURB INLET
TOP = 419.46
INV. = 415.80

811
Know what's below.
Call before you dig.

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CERTIFICATE OF AUTHORIZATION
Associated
Engineering &
Testing, LLC
NO. 299

STATE OF
ARKANSAS
REGISTERED
PROFESSIONAL
ENGINEER
JOHN M. EASLEY
No. 9815

NO.	DESCRIPTION	DATE
3.	COJ COMMENTS	09/08/24

BASIN
MAP

DATE: 03/20/2024	DRAWN: CCH
CADD FILE: 21104-SDP	CHECKED: JME
DWG#: XXXXXXX.XXXX	SHEET
SCALE: 1" = 60'	1 OF 1

Soil Map may not be valid at this scale.

Map Scale: 1:2,920 if printed on A landscape (11" x 8.5") sheet.

Meters
0   40   80   160   240

Feet
0   100   200   400   600

Map projection: Web Mercator   Corner coordinates: WGS84   Edge tics: UTM Zone 15N WGS84

N

USDA **Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

2/14/2024
Page 1 of 4

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 1:20,000.

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: Craighead County, Arkansas
Survey Area Data: Version 23, Sep 8, 2023

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

Date(s) aerial images were photographed: Feb 13, 2023—Feb 28, 2023

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
5	Brandon-Saffell association, moderately sloping	B	0.5	1.3%
6	Brandon-Saffell association, moderately steep	B	16.2	36.8%
11	Collins silt loam, 0 to 1 percent slopes, occasionally flooded, brief duration	C	4.2	9.6%
30	Loring silt loam, 3 to 8 percent slopes, west, upland phase	C	7.5	17.1%
31	Loring silt loam, 8 to 12 percent slopes, west	C/D	1.1	2.4%
32	Memphis silt loam, 12 to 40 percent slopes	B	14.4	32.9%
Totals for Area of Interest			**43.9**	**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

Hydraflow Table of Contents

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	------	-------	1.545	-------	2.983	4.261	5.672	6.906	8.327	Lot 1
2	SCS Runoff	------	-------	0.736	-------	0.919	1.063	1.211	1.333	1.469	SOTH HALF STREET
3	SCS Runoff	------	-------	0.191	-------	0.451	0.687	0.953	1.188	1.461	NORTH HALF 3
5	SCS Runoff	------	-------	2.770	-------	6.650	10.35	14.53	18.24	22.57	Existing Basin
6	SCS Runoff	------	-------	4.132	-------	8.603	12.63	17.12	21.07	25.67	Existing Basini w Street
7	Reservoir	6	-------	2.807	-------	5.856	8.521	11.62	14.13	17.39	<no description>

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.545	2	720	4,173	------	------	------	Lot 1
2	SCS Runoff	0.736	2	716	1,737	------	------	------	SOTH HALF STREET
3	SCS Runoff	0.191	2	720	631	------	------	------	NORTH HALF 3
5	SCS Runoff	2.770	2	726	12,300	------	------	------	Existing Basin
6	SCS Runoff	4.132	2	724	15,578	------	------	------	Existing Basini w Street
7	Reservoir	2.807	2	732	15,563	6	378.34	1,709	<no description>

21104.gpw	Return Period: 2 Year	Tuesday, 03 / 19 / 2024

Hydrograph Report

Hyd. No. 5

Existing Basin

Hydrograph type	= SCS Runoff		Peak discharge	= 2.770 cfs
Storm frequency	= 2 yrs		Time to peak	= 726 min
Time interval	= 2 min		Hyd. volume	= 12,300 cuft
Drainage area	= 7.200 ac		Curve number	= 55
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= TR55		Time of conc. (Tc)	= 13.60 min
Total precip.	= 3.88 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Existing Basin

Hyd. No. 5 -- 2 Year
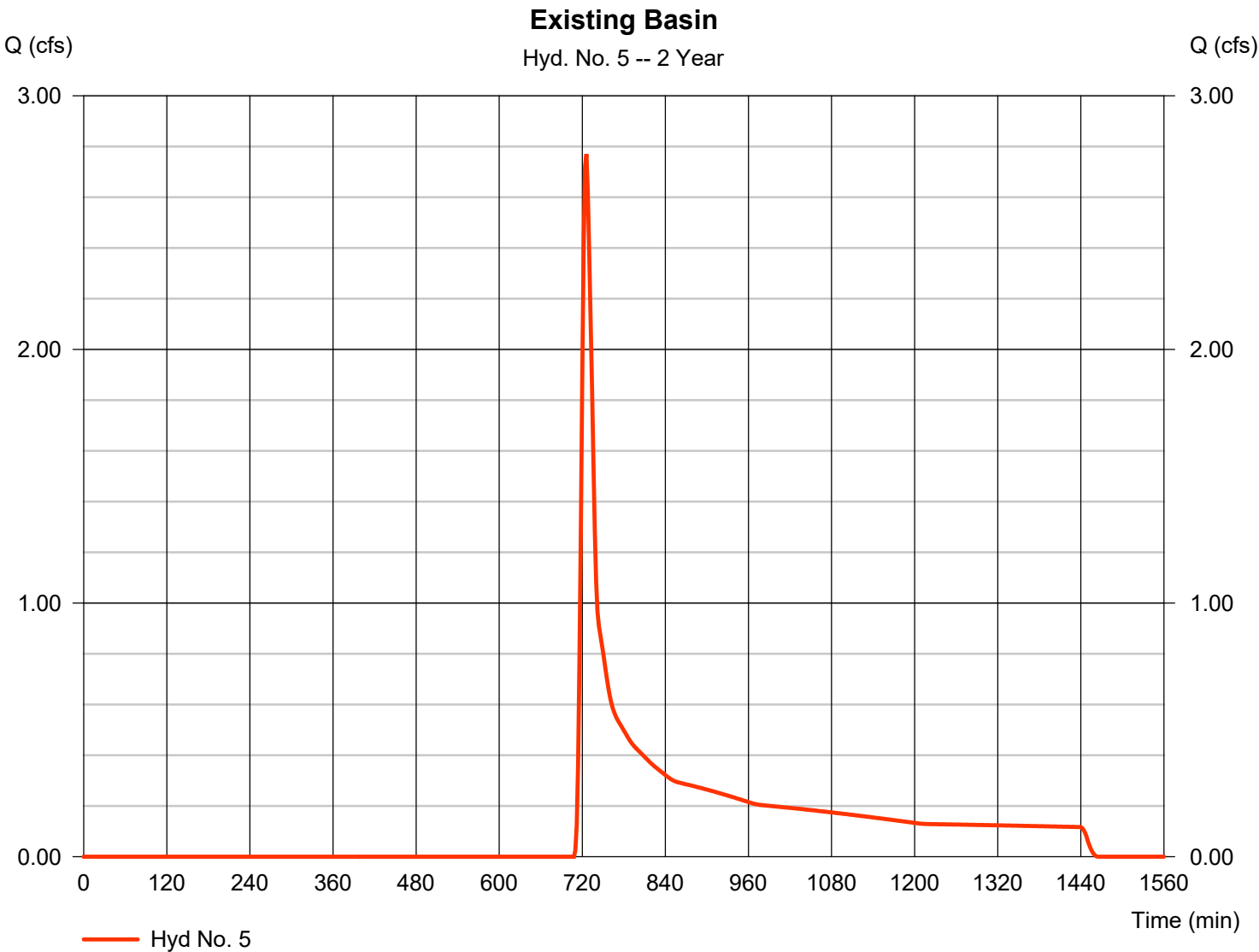
Hyd No. 5

TR55 Tc Worksheet

Hyd. No. 5

Existing Basin

Description	A	B	C	Totals
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 100.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.88	3.88	3.88	
Land slope (%)	= 3.00	0.00	0.00	
Travel Time (min)	**= 11.02 +**	**0.00 +**	**0.00 =**	**11.02**
Shallow Concentrated Flow				
Flow length (ft)	= 185.00	415.00	0.00	
Watercourse slope (%)	= 8.00	5.00	0.00	
Surface description	= Unpaved	Unpaved	Paved	
Average velocity (ft/s)	=4.56	3.61	0.00	
Travel Time (min)	**= 0.68 +**	**1.92 +**	**0.00 =**	**2.59**
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00			
		0.00		
			0.00	
Flow length (ft)	({0})0.0	0.0	0.0	
Travel Time (min)	**= 0.00 +**	**0.00 +**	**0.00 =**	**0.00**
Total Travel Time, Tc				**13.60 min**

Hydrograph Report

Hyd. No. 6

Existing Basini w Street

Hydrograph type	= SCS Runoff		Peak discharge	= 4.132 cfs
Storm frequency	= 2 yrs		Time to peak	= 724 min
Time interval	= 2 min		Hyd. volume	= 15,578 cuft
Drainage area	= 7.200 ac		Curve number	= 58*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= TR55		Time of conc. (Tc)	= 13.60 min
Total precip.	= 3.88 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.500 x 92) + (6.700 x 55)] / 7.200

Existing Basini w Street

Hyd. No. 6 -- 2 Year
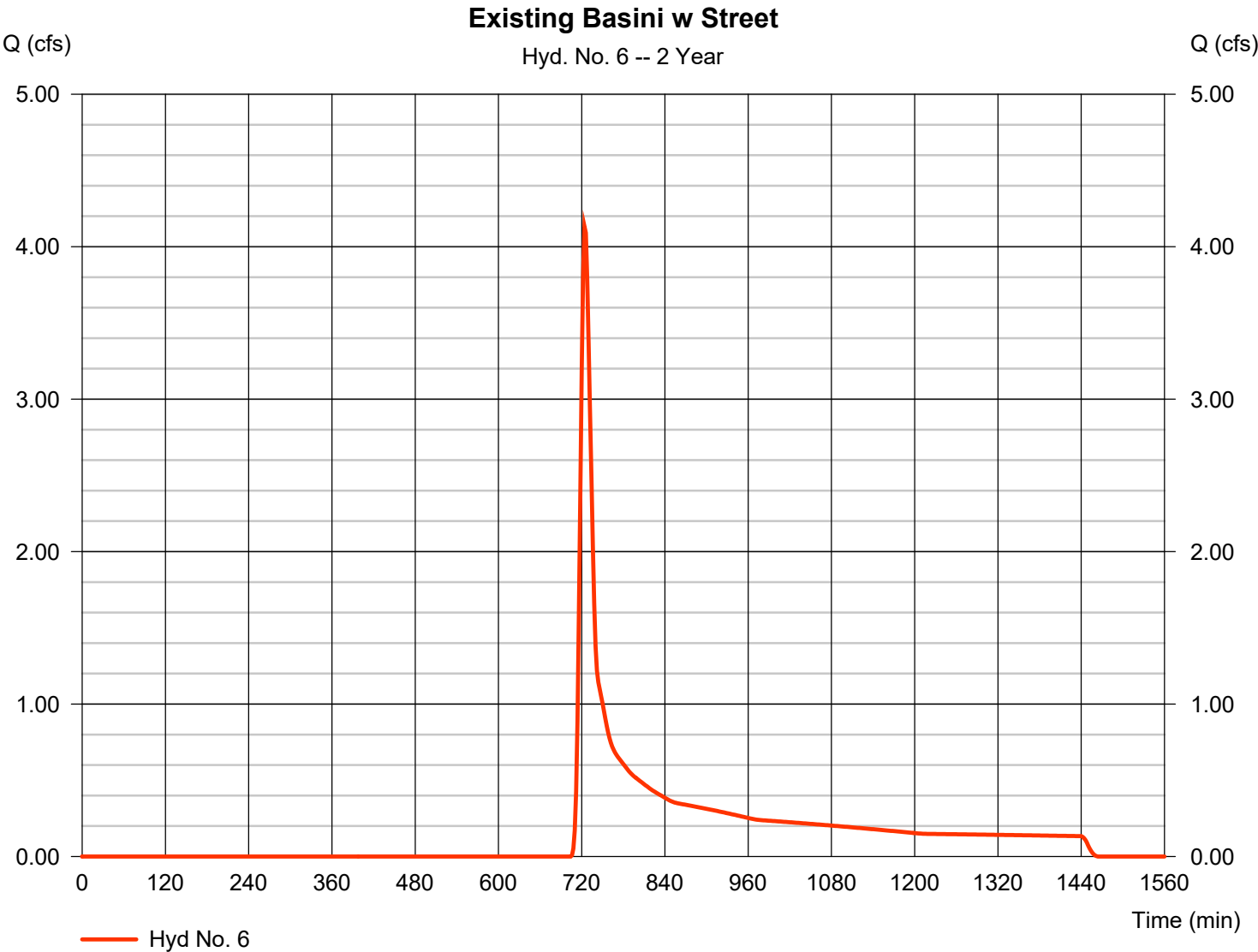
TR55 Tc Worksheet

Hyd. No. 6

Existing Basini w Street

Description	A	B	C	Totals
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 100.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.88	3.88	3.88	
Land slope (%)	= 3.00	0.00	0.00	
Travel Time (min)	**= 11.02 +**	**0.00 +**	**0.00 =**	**11.02**
Shallow Concentrated Flow				
Flow length (ft)	= 185.00	415.00	0.00	
Watercourse slope (%)	= 8.00	5.00	0.00	
Surface description	= Unpaved	Unpaved	Paved	
Average velocity (ft/s)	=4.56	3.61	0.00	
Travel Time (min)	**= 0.68 +**	**1.92 +**	**0.00 =**	**2.59**
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00			
		0.00		
			0.00	
Flow length (ft)	({0})0.0	0.0	0.0	
Travel Time (min)	**= 0.00 +**	**0.00 +**	**0.00 =**	**0.00**
Total Travel Time, Tc				**13.60 min**

Hydrograph Report

Tuesday, 03 / 19 / 2024

Hyd. No. 7

<no description>

Hydrograph type	= Reservoir	Peak discharge	= 2.807 cfs
Storm frequency	= 2 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 15,563 cuft
Inflow hyd. No.	= 6 - Existing Basini w Street	Max. Elevation	= 378.34 ft
Reservoir name	= POND 2	Max. Storage	= 1,709 cuft

Storage Indication method used.

<no description>

Hyd. No. 7 -- 2 Year

Q (cfs)

Hyd No. 7 —— Hyd No. 6 —— Total storage used = 1,709 cuft

Time (min)
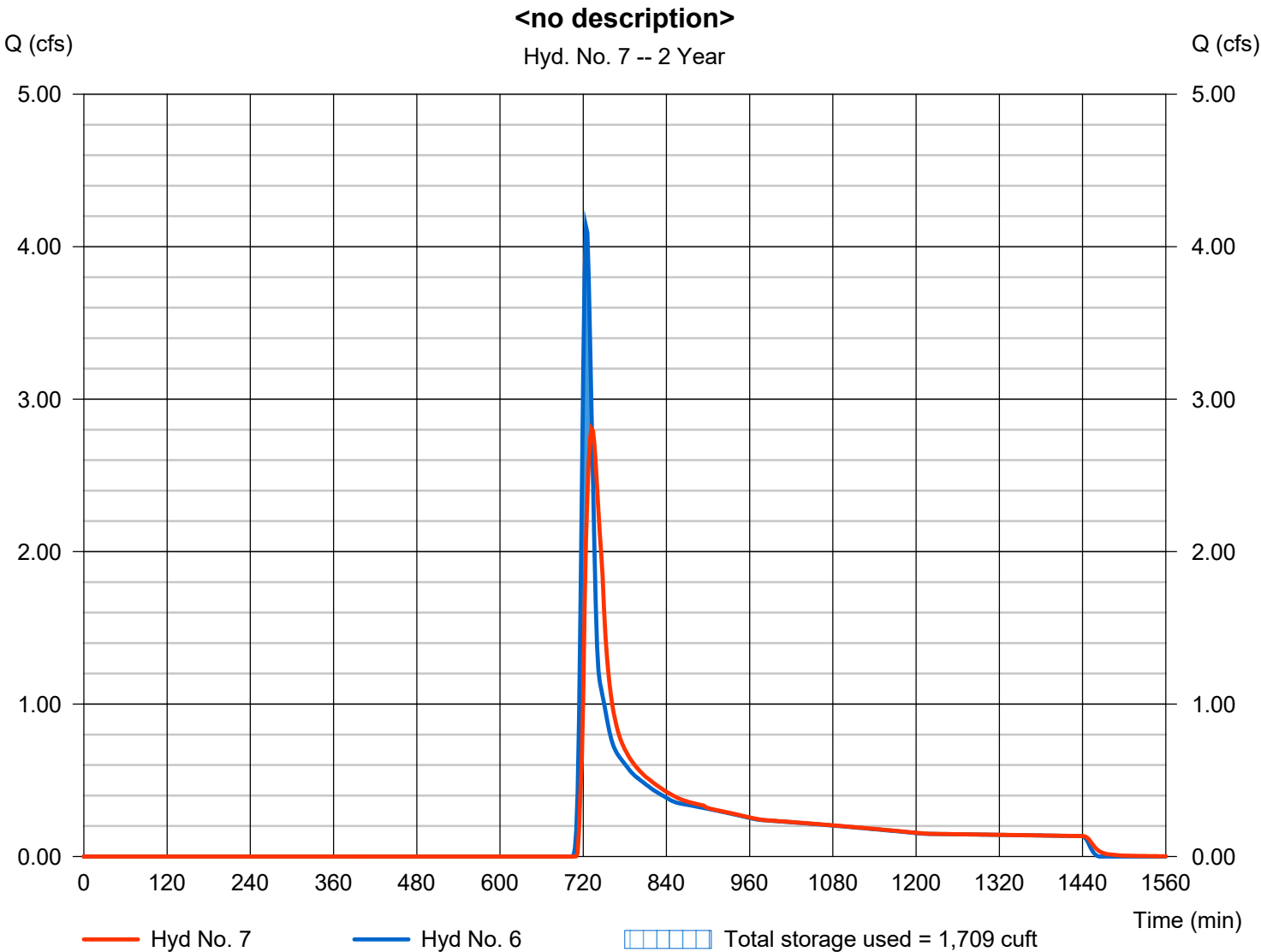
Pond No. 3 - POND 2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 376.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	376.00	10	0	0
1.00	377.00	387	153	153
2.00	378.00	1,380	833	986
3.00	379.00	2,944	2,113	3,099
4.00	380.00	5,006	3,929	7,028
5.00	381.00	7,608	6,261	13,289

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 376.00	0.00	0.00	0.00
Weir Coeff.	= 0.33	3.33	3.33	3.33
Weir Type	= 15 degV	---	---	---
Multi-Stage	= No	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).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	376.00	---	---	---	---	---	---	---	---	---	---	0.000
1.00	153	377.00	---	---	---	---	0.33	---	---	---	---	---	0.334
2.00	986	378.00	---	---	---	---	1.89	---	---	---	---	---	1.889
3.00	3,099	379.00	---	---	---	---	5.21	---	---	---	---	---	5.207
4.00	7,028	380.00	---	---	---	---	10.69	---	---	---	---	---	10.69
5.00	13,289	381.00	---	---	---	---	18.67	---	---	---	---	---	18.67

Hydrograph Summary Report

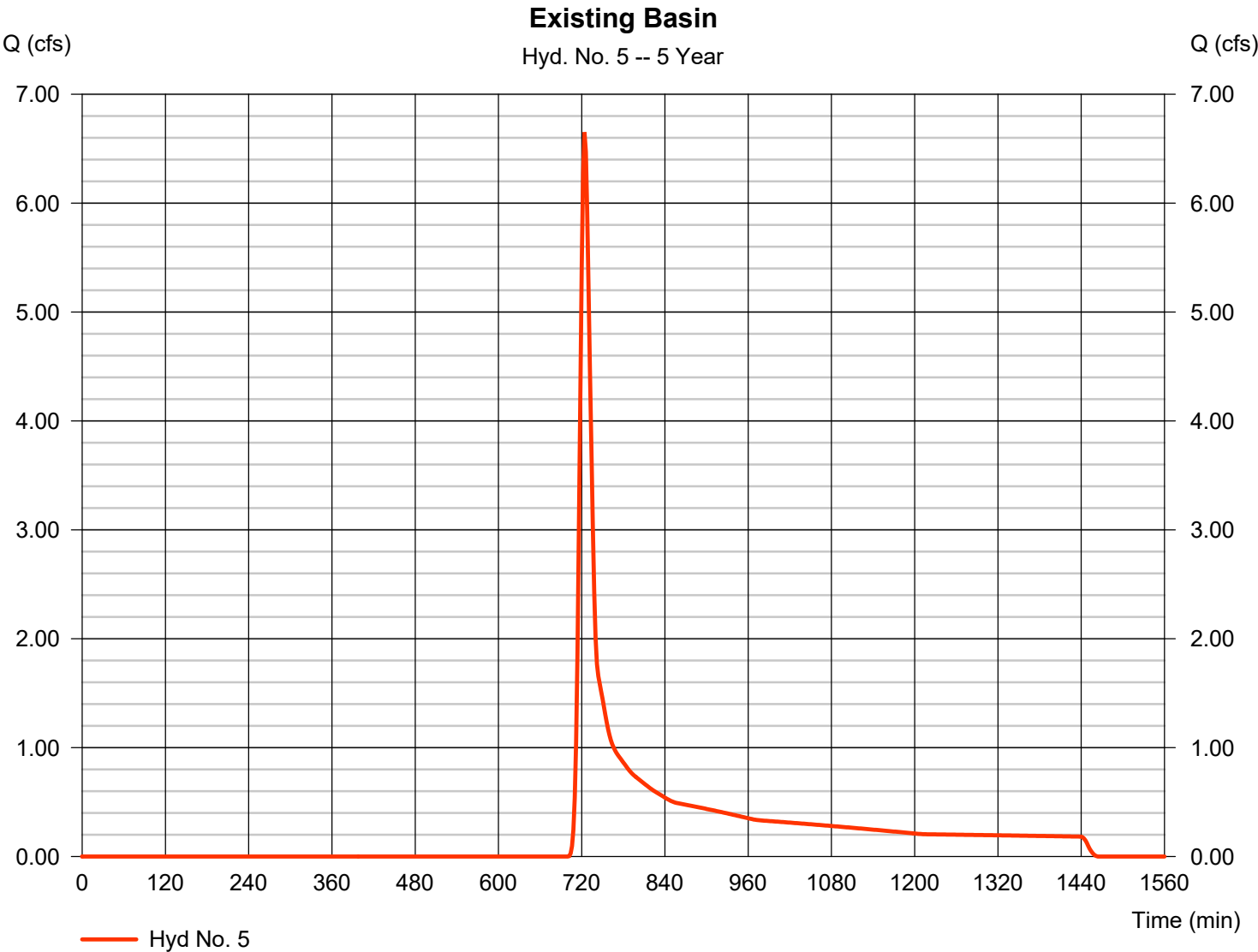Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.983	2	720	7,236	------	------	------	Lot 1
2	SCS Runoff	0.919	2	716	2,188	------	------	------	SOTH HALF STREET
3	SCS Runoff	0.451	2	720	1,172	------	------	------	NORTH HALF 3
5	SCS Runoff	6.650	2	724	22,847	------	------	------	Existing Basin
6	SCS Runoff	8.603	2	724	27,432	------	------	------	Existing Basini w Street
7	Reservoir	5.856	2	732	27,417	6	379.14	3,664	<no description>

| 21104.gpw | Return Period: 5 Year | Tuesday, 03 / 19 / 2024 |

Hydrograph Report

Hyd. No. 5

Existing Basin

Hydrograph type	= SCS Runoff		Peak discharge	= 6.650 cfs
Storm frequency	= 5 yrs		Time to peak	= 724 min
Time interval	= 2 min		Hyd. volume	= 22,847 cuft
Drainage area	= 7.200 ac		Curve number	= 55
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= TR55		Time of conc. (Tc)	= 13.60 min
Total precip.	= 4.83 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Existing Basin

Hyd. No. 5 -- 5 Year

Hyd No. 5

Hydrograph Report

Tuesday, 03 / 19 / 2024

Hyd. No. 6

Existing Basini w Street

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.603 cfs
Storm frequency	=	5 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	27,432 cuft
Drainage area	=	7.200 ac	Curve number	=	58*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.60 min
Total precip.	=	4.83 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.500 x 92) + (6.700 x 55)] / 7.200

Existing Basini w Street

Hyd. No. 6 -- 5 Year

— Hyd No. 6

Hydrograph Report

Tuesday, 03 / 19 / 2024

Hyd. No. 7

<no description>
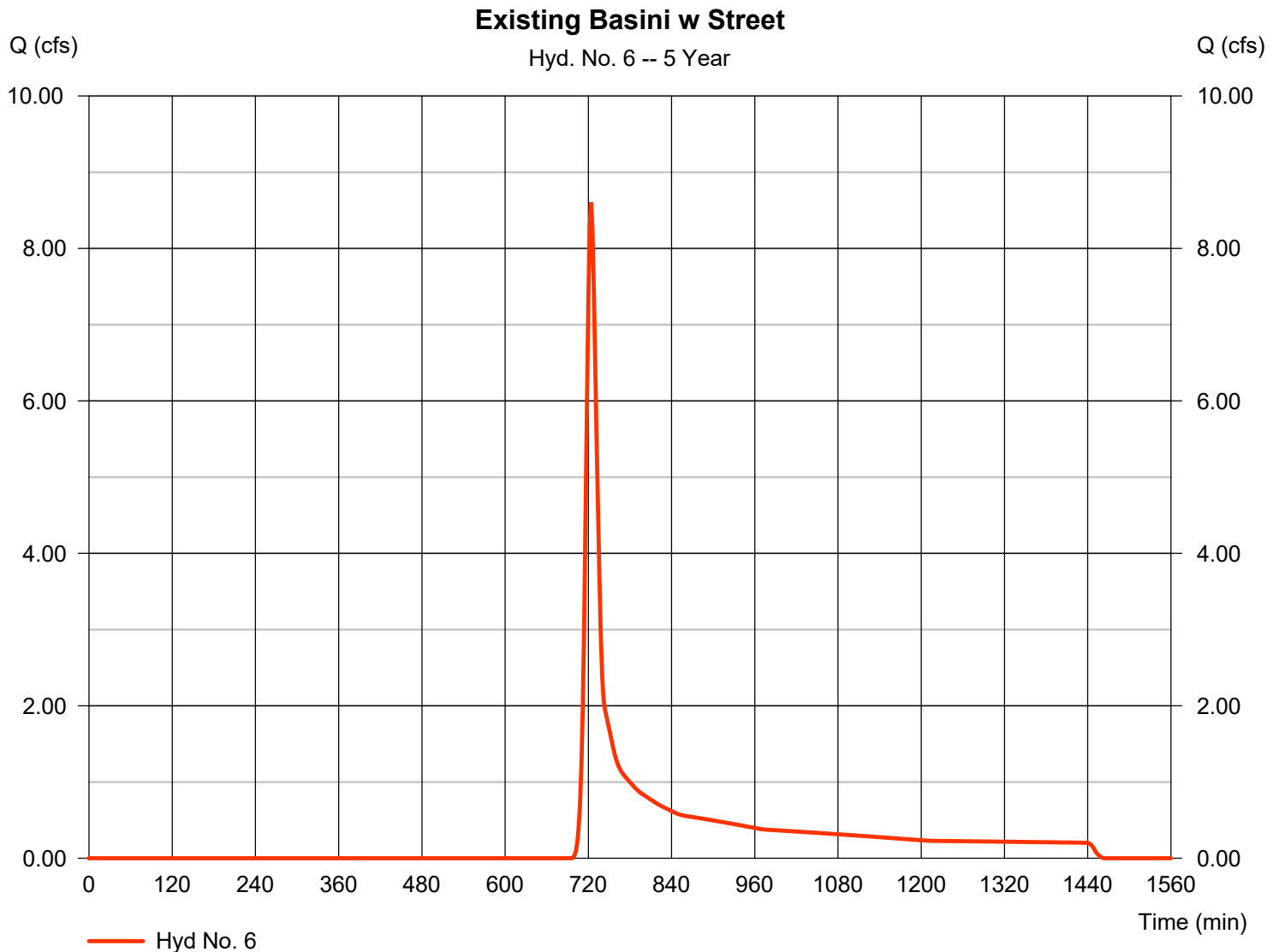
Hydrograph type	= Reservoir	Peak discharge	= 5.856 cfs
Storm frequency	= 5 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 27,417 cuft
Inflow hyd. No.	= 6 - Existing Basini w Street	Max. Elevation	= 379.14 ft
Reservoir name	= POND 2	Max. Storage	= 3,664 cuft

Storage Indication method used.
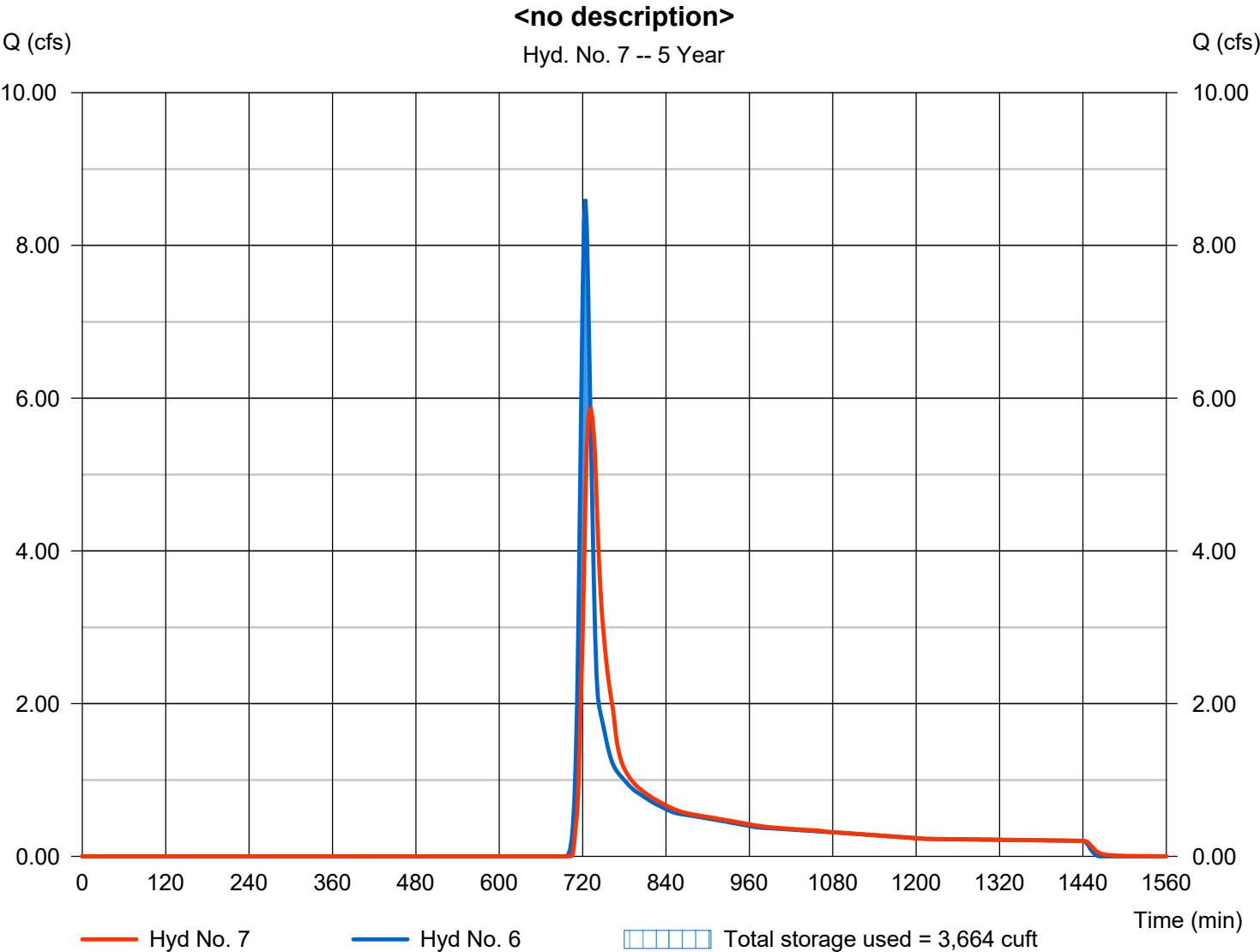
<no description>
Hyd. No. 7 -- 5 Year

Hyd No. 7   Hyd No. 6   Total storage used = 3,664 cuft

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	4.261	2	720	10,013	------	------	------	Lot 1
2	SCS Runoff	1.063	2	716	2,545	------	------	------	SOTH HALF STREET
3	SCS Runoff	0.687	2	720	1,676	------	------	------	NORTH HALF 3
5	SCS Runoff	10.35	2	724	32,683	------	------	------	Existing Basin
6	SCS Runoff	12.63	2	724	38,249	------	------	------	Existing Basini w Street
7	Reservoir	8.521	2	730	38,235	6	379.65	5,664	<no description>

21104.gpw	Return Period: 10 Year	Tuesday, 03 / 19 / 2024

Hydrograph Report

Tuesday, 03 / 19 / 2024

Hyd. No. 5

Existing Basin

Hydrograph type	= SCS Runoff	Peak discharge	= 10.35 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 32,683 cuft
Drainage area	= 7.200 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.60 min
Total precip.	= 5.58 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Existing Basin

Hyd. No. 5 -- 10 Year
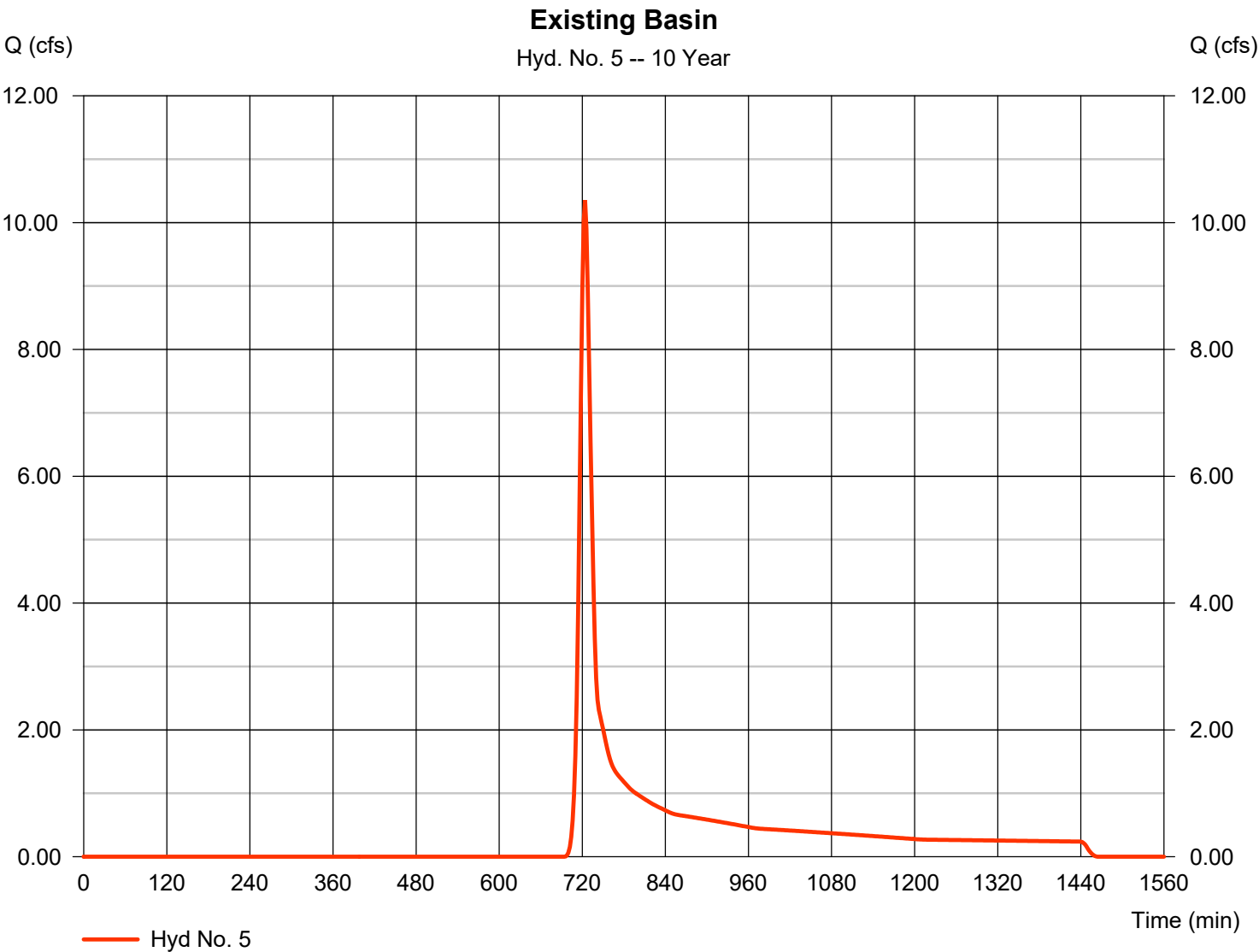
Hyd No. 5

Hydrograph Report

Hyd. No. 6

Existing Basini w Street

Hydrograph type	= SCS Runoff		Peak discharge	= 12.63 cfs
Storm frequency	= 10 yrs		Time to peak	= 724 min
Time interval	= 2 min		Hyd. volume	= 38,249 cuft
Drainage area	= 7.200 ac		Curve number	= 58*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= TR55		Time of conc. (Tc)	= 13.60 min
Total precip.	= 5.58 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.500 x 92) + (6.700 x 55)] / 7.200

Existing Basini w Street

Hyd. No. 6 -- 10 Year

Hyd No. 6

Hydrograph Report

Hyd. No. 7

<no description>
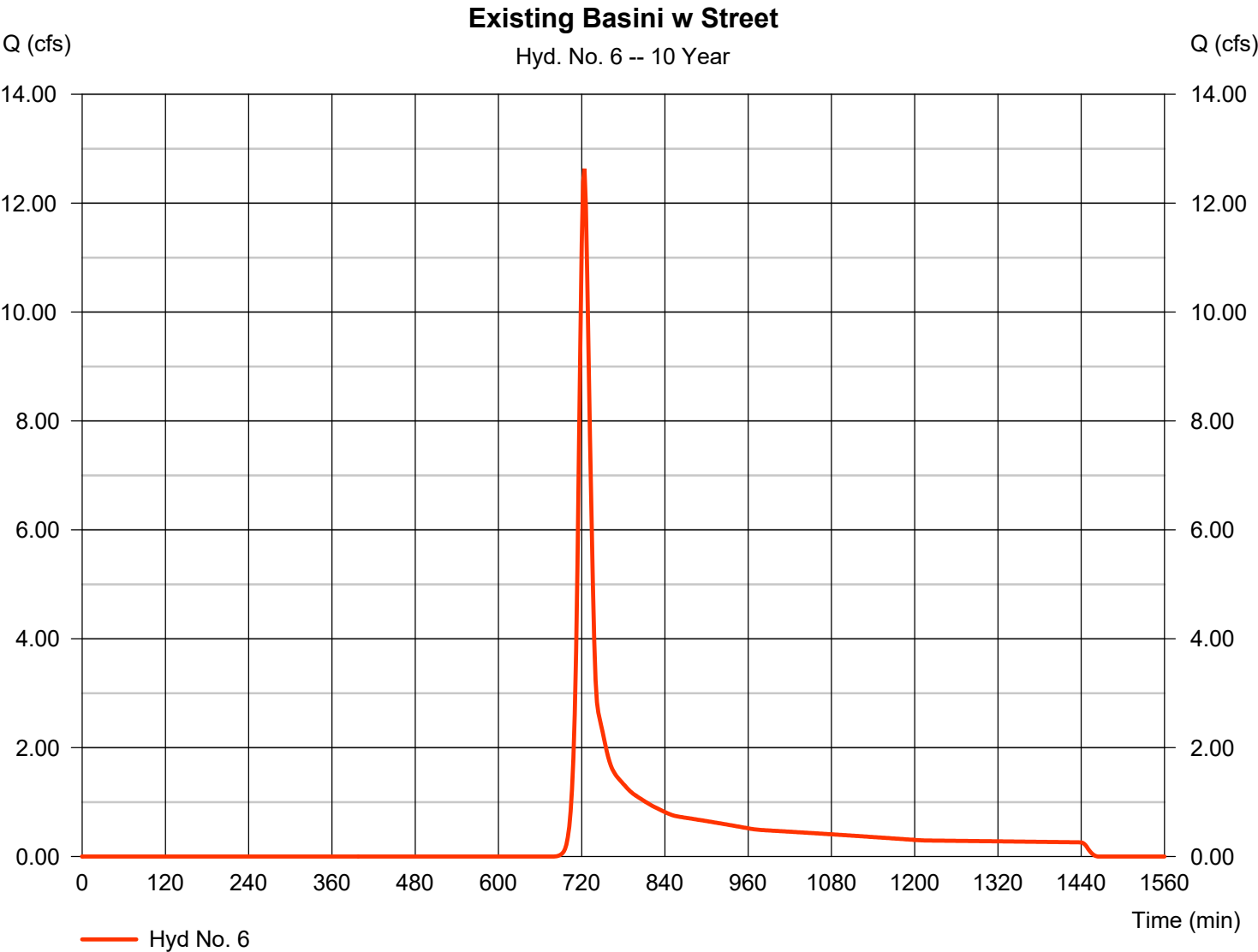
Hydrograph type	= Reservoir	Peak discharge	= 8.521 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 38,235 cuft
Inflow hyd. No.	= 6 - Existing Basini w Street	Max. Elevation	= 379.65 ft
Reservoir name	= POND 2	Max. Storage	= 5,664 cuft

Storage Indication method used.
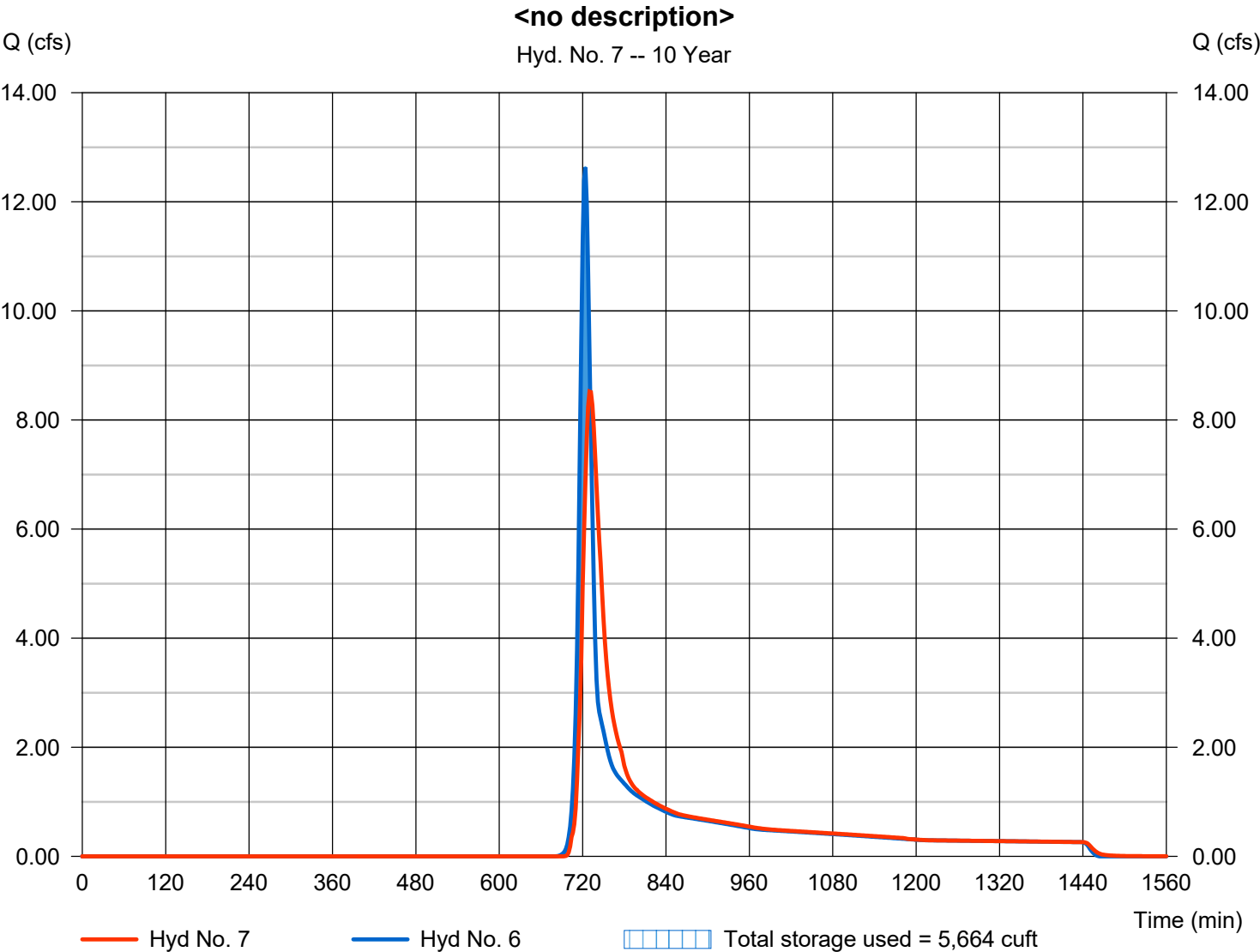
<no description>

Hyd. No. 7 -- 10 Year

Hyd No. 7   Hyd No. 6   Total storage used = 5,664 cuft

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	5.672	2	720	13,124	------	------	------	Lot 1
2	SCS Runoff	1.211	2	716	2,912	------	------	------	SOTH HALF STREET
3	SCS Runoff	0.953	2	720	2,252	------	------	------	NORTH HALF 3
5	SCS Runoff	14.53	2	724	43,906	------	------	------	Existing Basin
6	SCS Runoff	17.12	2	724	50,421	------	------	------	Existing Basini w Street
7	Reservoir	11.62	2	730	50,407	6	380.14	7,879	<no description>

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Hydrograph Report

Tuesday, 03 / 19 / 2024

Hyd. No. 5

Existing Basin

Hydrograph type	= SCS Runoff	Peak discharge	= 14.53 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 43,906 cuft
Drainage area	= 7.200 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.60 min
Total precip.	= 6.35 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Existing Basin

Hyd. No. 5 -- 25 Year
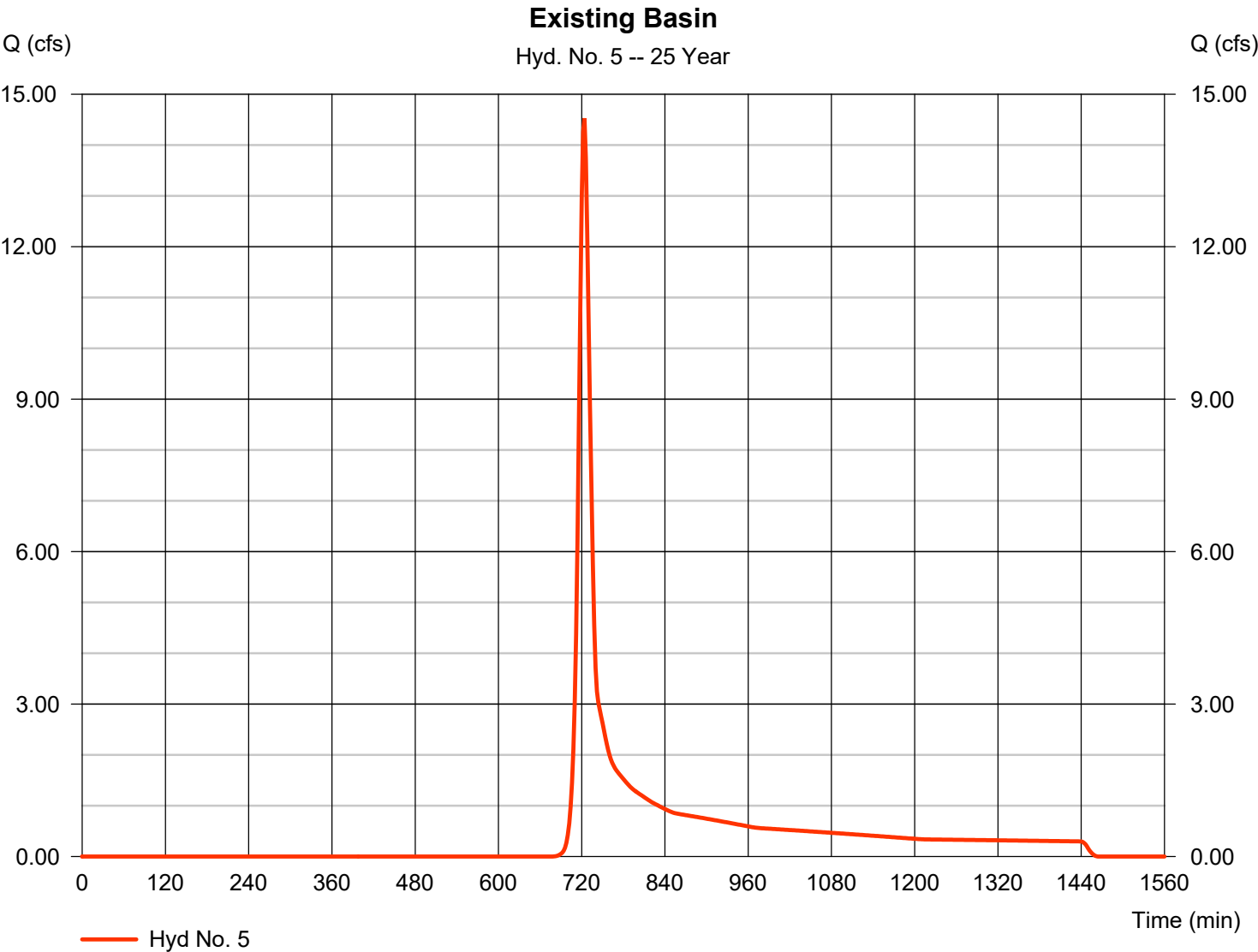
— Hyd No. 5

Hydrograph Report

Hyd. No. 6

Existing Basini w Street

Hydrograph type	= SCS Runoff	Peak discharge	= 17.12 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 50,421 cuft
Drainage area	= 7.200 ac	Curve number	= 58*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.60 min
Total precip.	= 6.35 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.500 x 92) + (6.700 x 55)] / 7.200

Existing Basini w Street
Hyd. No. 6 -- 25 Year

Hyd No. 6

Hydrograph Report

Tuesday, 03 / 19 / 2024

Hyd. No. 7

<no description>
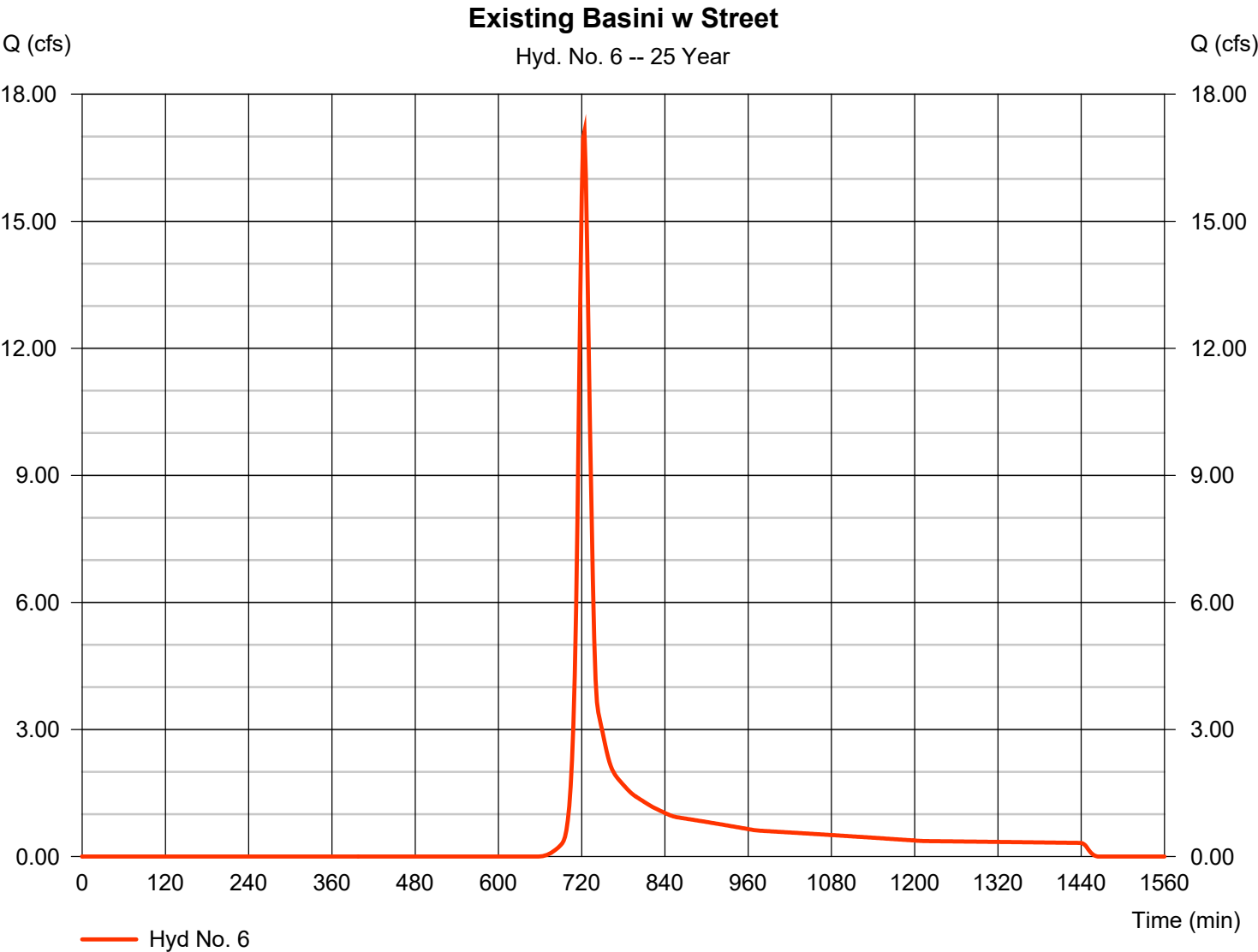
Hydrograph type	= Reservoir	Peak discharge	= 11.62 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 50,407 cuft
Inflow hyd. No.	= 6 - Existing Basini w Street	Max. Elevation	= 380.14 ft
Reservoir name	= POND 2	Max. Storage	= 7,879 cuft

Storage Indication method used.
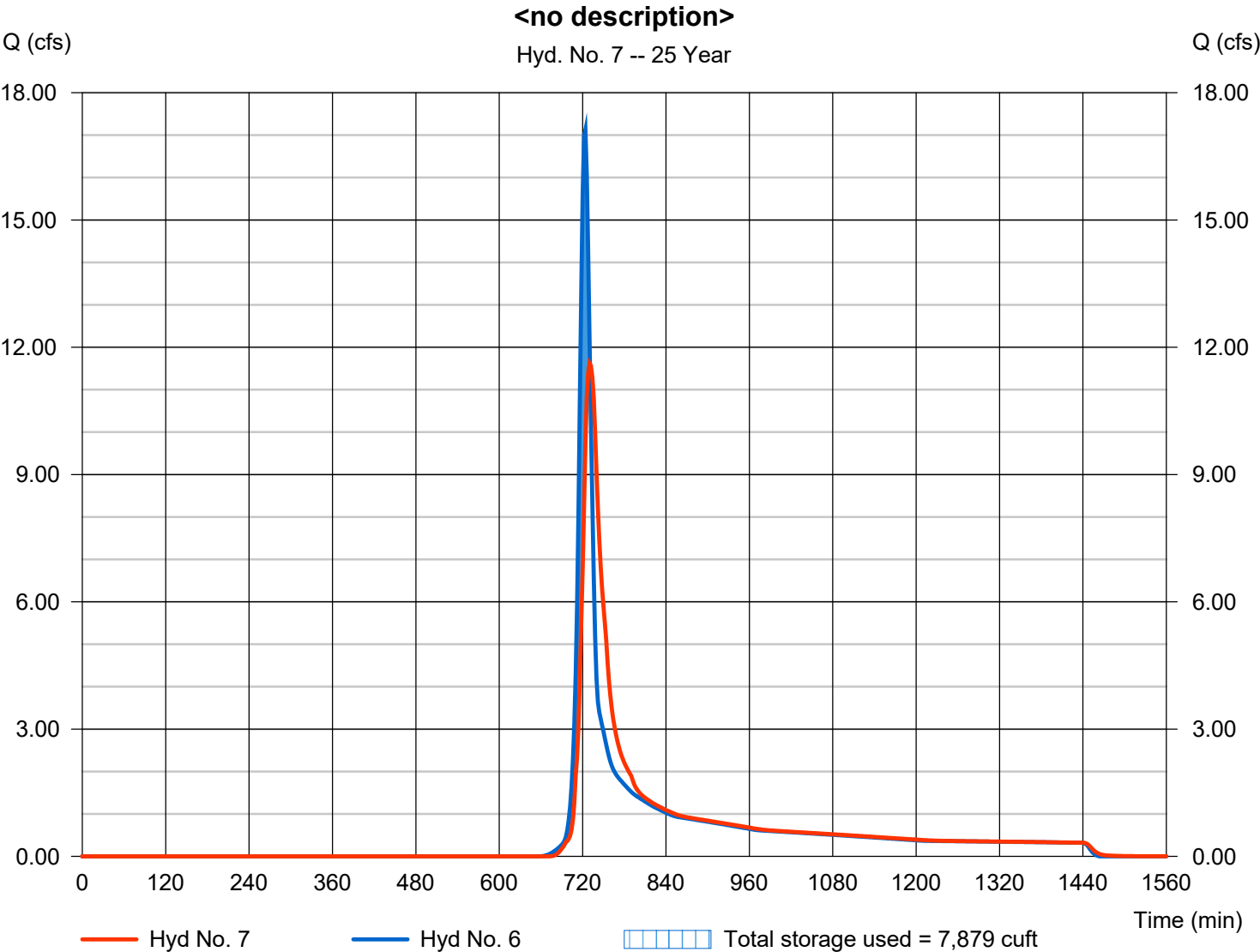
<no description>

Hyd. No. 7 -- 25 Year

Hyd No. 7   Hyd No. 6   Total storage used = 7,879 cuft

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	6.906	2	720	15,875	------	------	------	Lot 1
2	SCS Runoff	1.333	2	716	3,216	------	------	------	SOTH HALF STREET
3	SCS Runoff	1.188	2	720	2,767	------	------	------	NORTH HALF 3
5	SCS Runoff	18.24	2	724	53,959	------	------	------	Existing Basin
6	SCS Runoff	21.07	2	724	61,221	------	------	------	Existing Basini w Street
7	Reservoir	14.13	2	730	61,206	6	380.47	9,987	<no description>

21104.gpw	Return Period: 50 Year	Tuesday, 03 / 19 / 2024

Hydrograph Report

Hyd. No. 5

Existing Basin

Hydrograph type	= SCS Runoff		Peak discharge	= 18.24 cfs
Storm frequency	= 50 yrs		Time to peak	= 724 min
Time interval	= 2 min		Hyd. volume	= 53,959 cuft
Drainage area	= 7.200 ac		Curve number	= 55
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= TR55		Time of conc. (Tc)	= 13.60 min
Total precip.	= 6.99 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Existing Basin

Hyd. No. 5 -- 50 Year
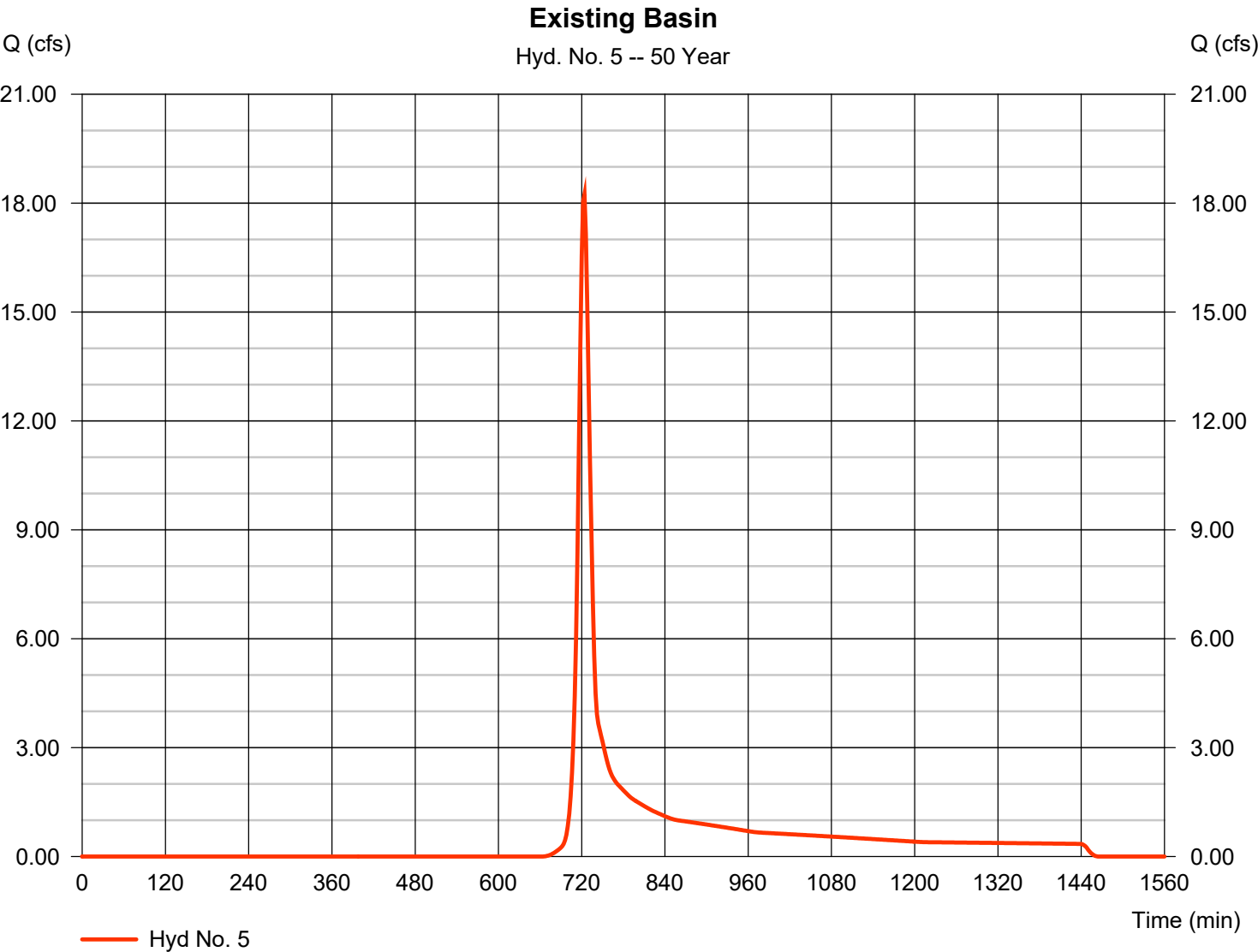
Hydrograph Report

Tuesday, 03 / 19 / 2024

Hyd. No. 6

Existing Basini w Street

Hydrograph type	= SCS Runoff		Peak discharge	= 21.07 cfs
Storm frequency	= 50 yrs		Time to peak	= 724 min
Time interval	= 2 min		Hyd. volume	= 61,221 cuft
Drainage area	= 7.200 ac		Curve number	= 58*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= TR55		Time of conc. (Tc)	= 13.60 min
Total precip.	= 6.99 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.500 x 92) + (6.700 x 55)] / 7.200

Existing Basini w Street
Hyd. No. 6 -- 50 Year

Hydrograph Report

Hyd. No. 7

<no description>
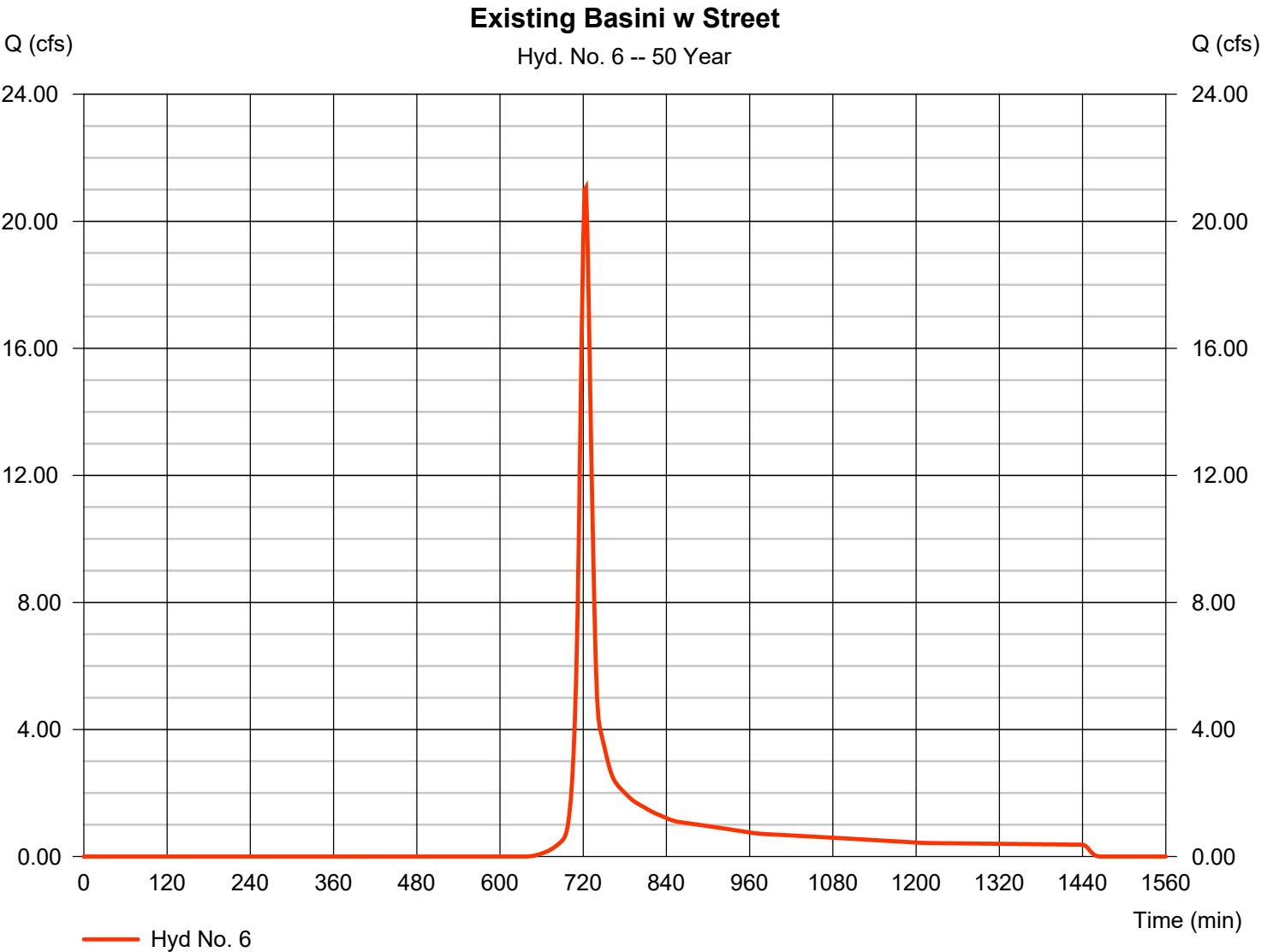
Hydrograph type	= Reservoir	Peak discharge	= 14.13 cfs
Storm frequency	= 50 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 61,206 cuft
Inflow hyd. No.	= 6 - Existing Basini w Street	Max. Elevation	= 380.47 ft
Reservoir name	= POND 2	Max. Storage	= 9,987 cuft

Storage Indication method used.
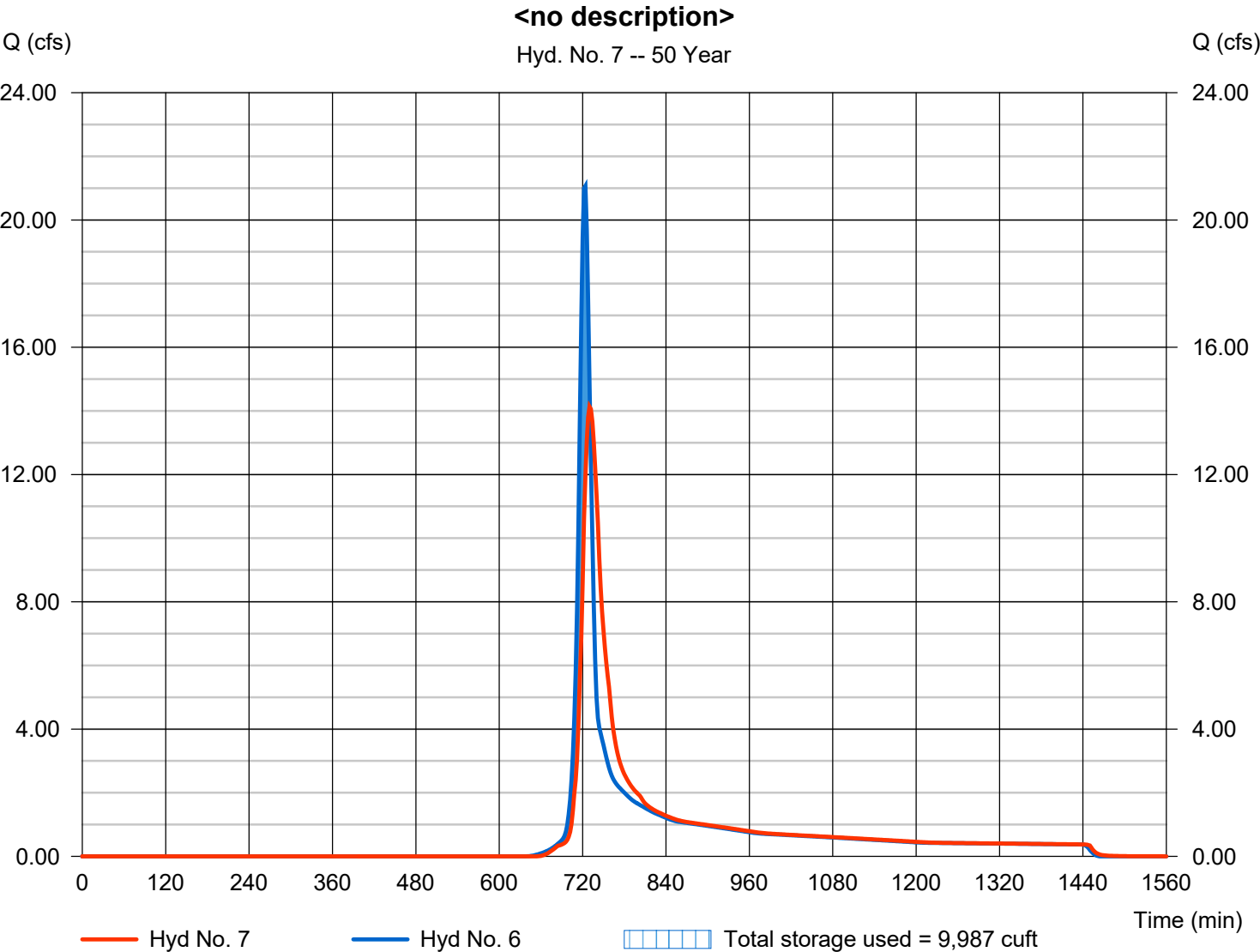
<no description>

Hyd. No. 7 -- 50 Year

Hyd No. 7   Hyd No. 6   Total storage used = 9,987 cuft

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	8.327	2	720	19,077	------	------	------	Lot 1
2	SCS Runoff	1.469	2	716	3,554	------	------	------	SOTH HALF STREET
3	SCS Runoff	1.461	2	720	3,373	------	------	------	NORTH HALF 3
5	SCS Runoff	22.57	2	724	65,771	------	------	------	Existing Basin
6	SCS Runoff	25.67	2	722	73,813	------	------	------	Existing Basini w Street
7	Reservoir	17.39	2	730	73,798	6	380.86	12,409	<no description>

Hydrograph Report

Hyd. No. 5

Existing Basin

Hydrograph type	= SCS Runoff	Peak discharge	= 22.57 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 65,771 cuft
Drainage area	= 7.200 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.60 min
Total precip.	= 7.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Existing Basin

Hyd. No. 5 -- 100 Year
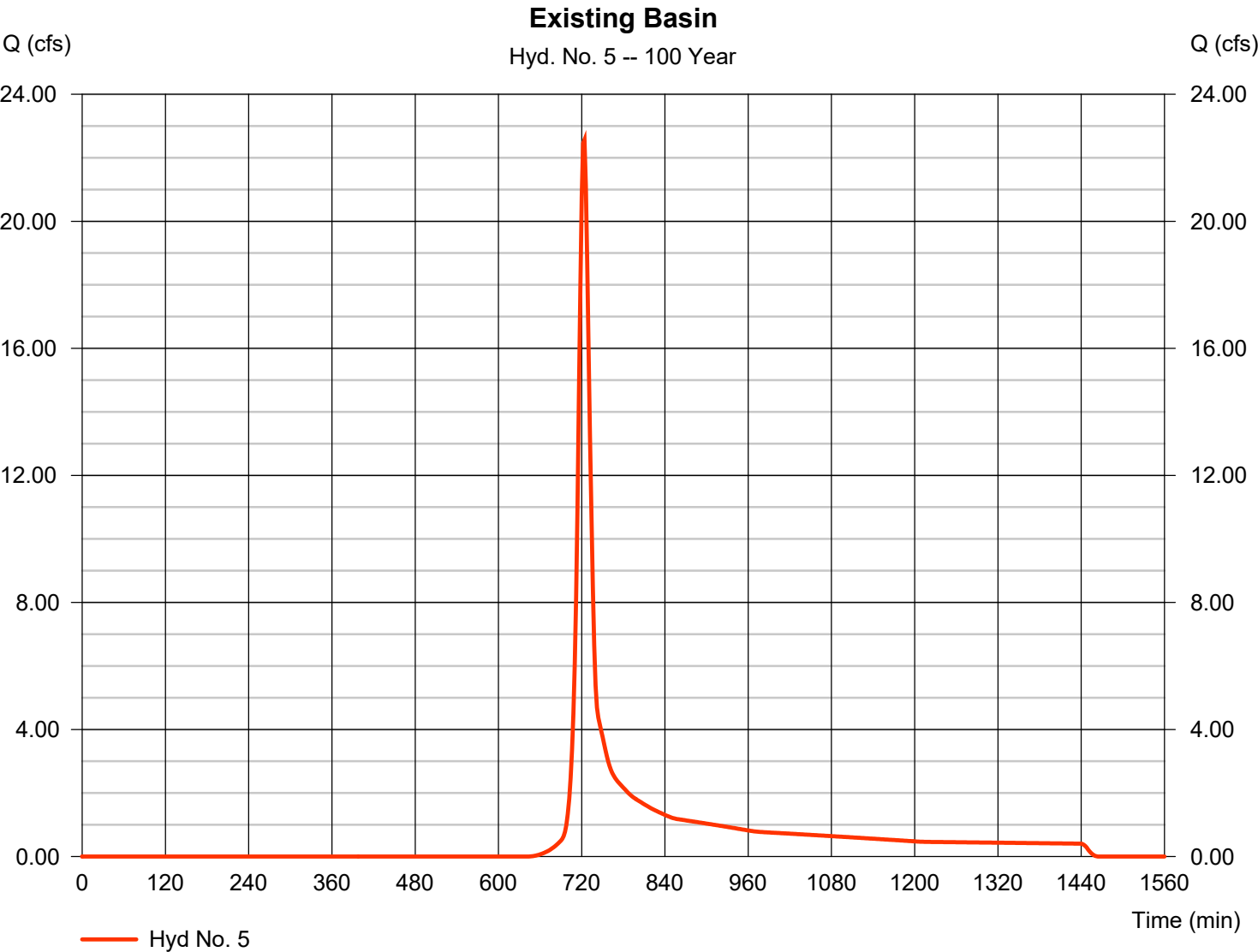
Hyd No. 5

Hydrograph Report

Hyd. No. 6

Existing Basini w Street

Hydrograph type	= SCS Runoff		Peak discharge	= 25.67 cfs
Storm frequency	= 100 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 73,813 cuft
Drainage area	= 7.200 ac		Curve number	= 58*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= TR55		Time of conc. (Tc)	= 13.60 min
Total precip.	= 7.70 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.500 x 92) + (6.700 x 55)] / 7.200

Existing Basini w Street

Hyd. No. 6 -- 100 Year

─── Hyd No. 6

Hydrograph Report

Hyd. No. 7

<no description>
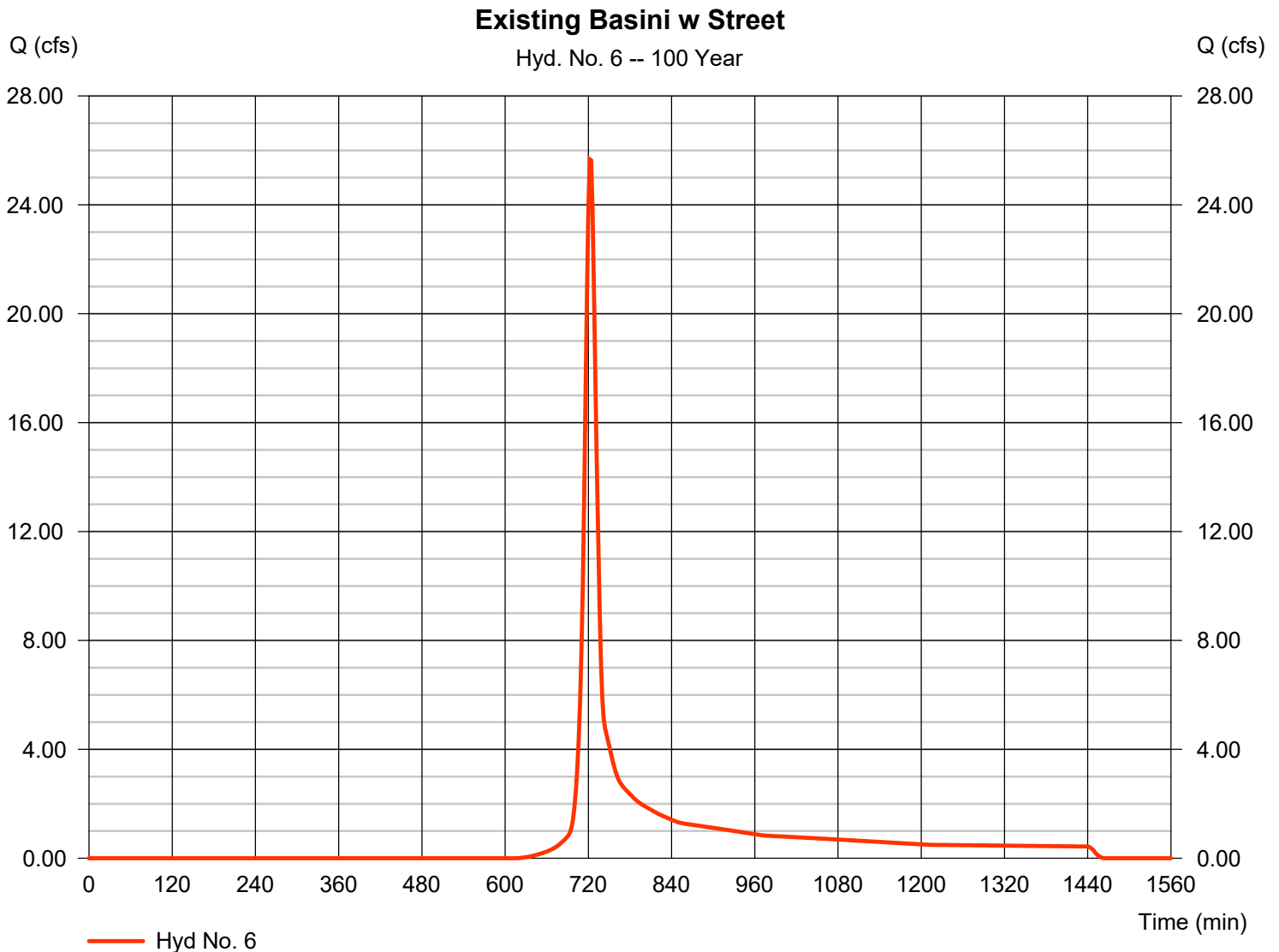
Hydrograph type	= Reservoir	Peak discharge	= 17.39 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 73,798 cuft
Inflow hyd. No.	= 6 - Existing Basini w Street	Max. Elevation	= 380.86 ft
Reservoir name	= POND 2	Max. Storage	= 12,409 cuft

Storage Indication method used.

<no description>

Hyd. No. 7 -- 100 Year

Q (cfs)

Q (cfs)

Time (min)

Hyd No. 7   Hyd No. 6   Total storage used = 12,409 cuft