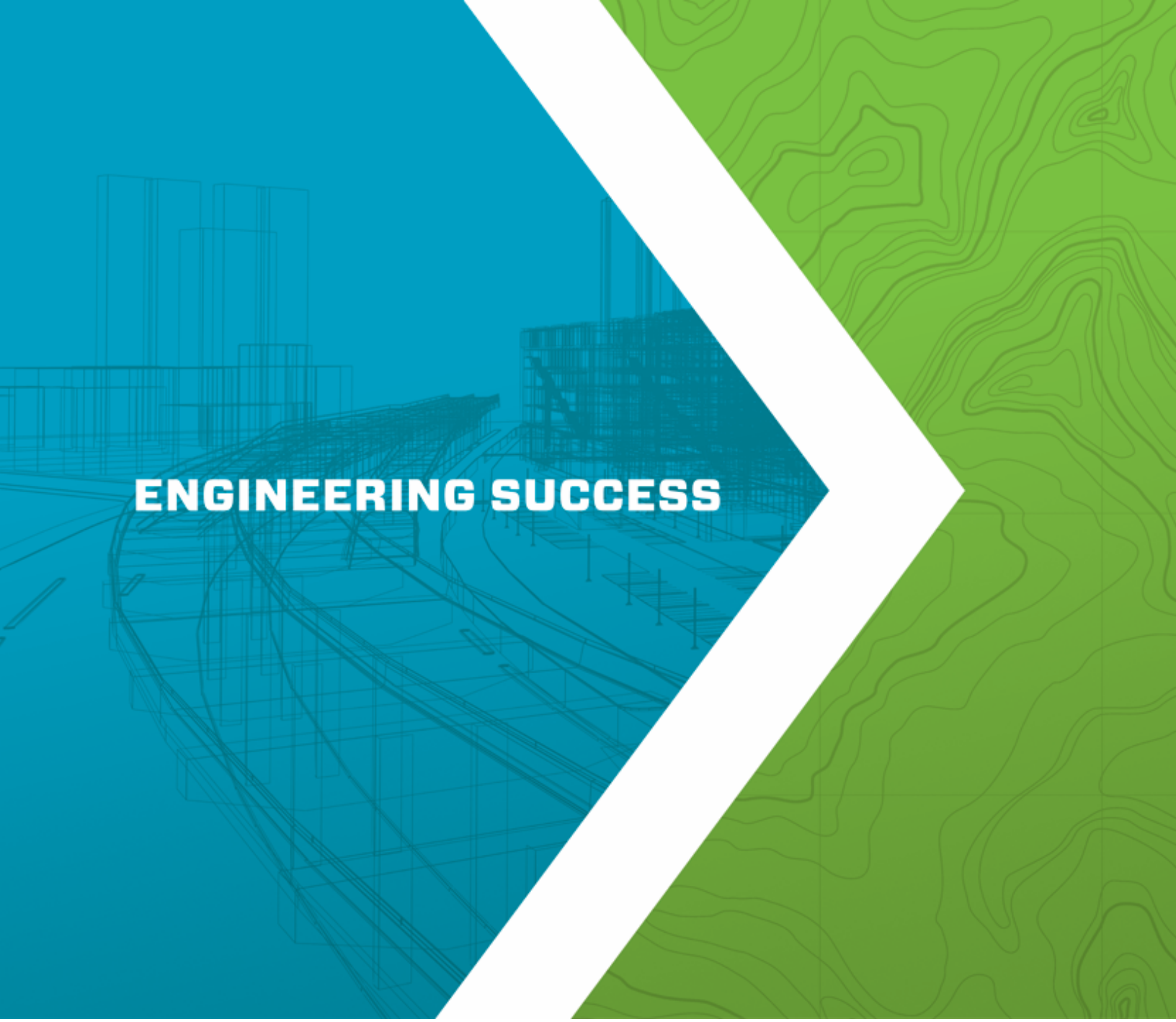


FINAL MICRO STORM DRAINAGE STUDY FOR

Smithville Transportation Facility
645 S Commercial Ave.
Smithville, Missouri 64089

PROJECT NUMBER: 2202010849
DATE: June 2023

MKEC

11827 W. 112th Street
Overland Park, KS 66210
913.3179390

Table of Contents

General Information

Purpose

The purpose of this report is to evaluate drainage conditions for the proposed Smithville Transportation Facility development. This report reviews existing drainage conditions and evaluates proposed drainage conditions because of the proposed improvements to the site and its conformance with the City requirements for managing stormwater runoff. This drainage report is included with the site plan submittal for the facility.

Location

The Smithville Transportation Facility will be constructed on the Smithville School District campus located at 645 S Commercial Ave. in Smithville, Clay County, Missouri. The site for the Transportation Facility is approximately 5.3 acres. The site location is in Section 26, Township 53 North, Range 33 West and is shown on the USGS Quadrangle, Appendix A and Aerial Photograph, Appendix B. The site is located in the Wilkerson Creek Watershed and the total disturbed area by this project is 5.8 acres as a portion of the disturbed area extends onto additional school district property.

Development

The Smithville Transportation Facility site is currently undeveloped farm land and will be developed to include a new transportation facility building, bus parking, car parking, a loading dock, and a detention facility. The site plan is included as Appendix C. The overall hydrologic parameters of the site are similar in both existing and proposed conditions.

Datum

The site survey uses NAVD 88 datum.

Soils

The drainage areas on site are comprised of the following soil types according to the Natural Resources Conservation Service (NRCS) Soil Survey, Appendix D:

- Sharpsburg Silt Loam, 9 to 14 percent slopes, eroded, HSG “D”
- Sharpsburg Silt Loam, 5 to 9 percent slopes, eroded, HSG “C”

The Hydraulic Soil Group (HSG) for selection of runoff curve numbers (CN) is HSG “D”.

Flood Insurance Rate Map (FIRM)

The site is shown on FEMA FIRM Panels 29047C0102E, effective August 3rd, 2015, Appendix E. The site is located in Zone X Floodplain, areas outside of the 0.2% annual chance flood zone.

Drainage Patterns

Hydrologic Methods

The existing and proposed drainage areas were modeled using Hydraflow Hydrographs by AutoCAD, Appendix F. The SCS Method was used in calculations with rainfall depths determined from the NOAA Atlas 14 Kansas City MCI Airport, as shown in Table 1. Time of concentration was calculated using the TR-55 Method in Hydraflow Hydrographs, Appendix F. The proposed detention facility will mitigate the increased site volume by providing volume larger than what was required to control peak runoff from the site and mitigate the increased volume.

Table 1. Rainfall Depths (Inches) for 24-Hour Design Storms.

	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
MCI Airport	3.6	4.5	5.3	6.5	7.0	7.7

Drainage Conditions

Existing Conditions

Under existing conditions, the Smithville Transportation Facility site drains to the northeast. The existing watershed that drains to the northeast is approximately 13.9 acres. Runoff from this watershed reaches a low point just west of the Smithville District Campus private drive and is piped through 72" RCP to the east side of the private drive where it continues to flow east in a drainage channel. This existing watershed includes a portion of Highway 92 as well as undeveloped land. This drainage area has a curve number of 75 to represent the existing land use.

For this report, we have analyzed the total flow rate from the site including offsite runoff. The existing drainage area is shown in Appendix G. The existing flow rates from the site can be found in Table 2.

Table 2. Existing Drainage Conditions.

	Area (acres)	Tc (min)	CN	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)
Existing Site	13.9	9.6	75	29.4	59.8	103.9

Proposed Conditions

Under proposed conditions, the Smithville Transportation Facility site will continue to drain to the northeast, matching existing drainage patterns. The proposed site improvements include a new transportation facility building, bus parking, car parking, a loading dock, and a detention facility. The proposed improvements will increase the impervious area on site by 3.0 acres. The proposed drainage areas are shown in Appendix H. Table 3 below describes the proposed drainage area conditions.

Proposed Drainage Area 1 includes runoff from a majority of the proposed improvements as well as some offsite runoff from the west. This drainage area is collected in a series of inlets and is piped to an above ground detention facility on the northeast corner of the site. This drainage area includes 6.7 acres and has a curve number of 88 to represent the increase in impervious area within the watershed. The detention facility will outfall through 15" and 18" outlet pipes where storm water is then piped to the existing low point on the northeast corner of the site. From here, runoff will flow under the private drive through the 72" RCP, similar to existing drainage patterns. The stormwater detention facility will be constructed for the proposed improvements on the site due to the increase in impervious area and will provide enough storage volume to reduce peak flows from the site. See Appendix C for the proposed detention facility location. The detention basin and allowable release rates are designed in conformance with the APWA 5600 Storm Drainage Systems & Facilities, dated February 15, 2006. Details for the proposed detention facility are shown in Table 4.

Proposed Drainage Area 2 includes offsite runoff from the south as well as a portion of onsite runoff. This drainage area sheet flows to a swale south of the proposed transportation facility and is collected in an inlet south of the proposed drive entrance to the site. Runoff is then piped into the proposed storm sewer system downstream of the detention facility. This drainage area includes 7.2 acres and has a curve number of 82 to represent the site development within this watershed.

Table 5 compares the total flow from the site in the existing and proposed conditions. The total proposed flow from the site shown in Table 5 is not a straight mathematical addition due to timing of the flows from the detention facility and undetained site areas. Hydraflow Hydrographs accounts for the different time of concentrations from each watershed, Appendix F.

Table 3. Proposed Drainage Conditions.

	Area (acres)	Tc (min)	CN	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)
Proposed 1 (To Detention)	6.7	6.0	88	25.6	42.7	65.3
Proposed 2 (Undetained)	7.2	14.2	82	16.6	30.5	49.5

Table 4. Detention Facility Conditions.

	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)
Flow In (cfs)	25.6	42.7	65.3
Flow Out (cfs)	12.3	23.5	31.4
Storage Vol. (ac-ft)	0.2	0.4	0.7
Water Sur. Elev. (ft)	895.40	897.11	899.01
Outlet Structures	15" at 891.00' & 18" at 895.00'		

Table 5. Total Flow Rate

	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)
Existing Peak Flow	29.4	59.8	103.9
Proposed Peak Flow	28.9	54.0	80.9
Decrease	1.7%	9.7%	22.1%

Utilities

Stormwater Sewer

Proposed stormwater sewer lines will convey runoff from a portion of the proposed site improvements to the proposed stormwater detention facility.

The storm sewer system will be designed using APWA 5600 design criteria. These systems will be sized for a minimum of a 100-year design storm with escape routes for emergency conditions.

Permitting

U.S. Army Corps of Engineers (USACE)

Since there are no potential wetlands on the site and there is no blue line stream on the site, permitting through the U.S. Army Corps of Engineers will not be required.

Federal Emergency Management Agency (FEMA)

There are no FEMA floodplains on the site; permitting through FEMA will not be required.

Missouri Department of Natural Resources (MoDNR)

The site disturbs more than 1.0 acre; therefore, a Land Disturbance Permit and Storm Water Pollution Prevention Plan (SWPPP) will be prepared.

Water Appropriations

A water appropriations permit will not be required.

Missouri Department of Conservation (MDC)

The MDC will be contacted during the MoDNR Land Disturbance permitting process. It is not anticipated that there will be any concerns.

Missouri Historical Society (MHS)

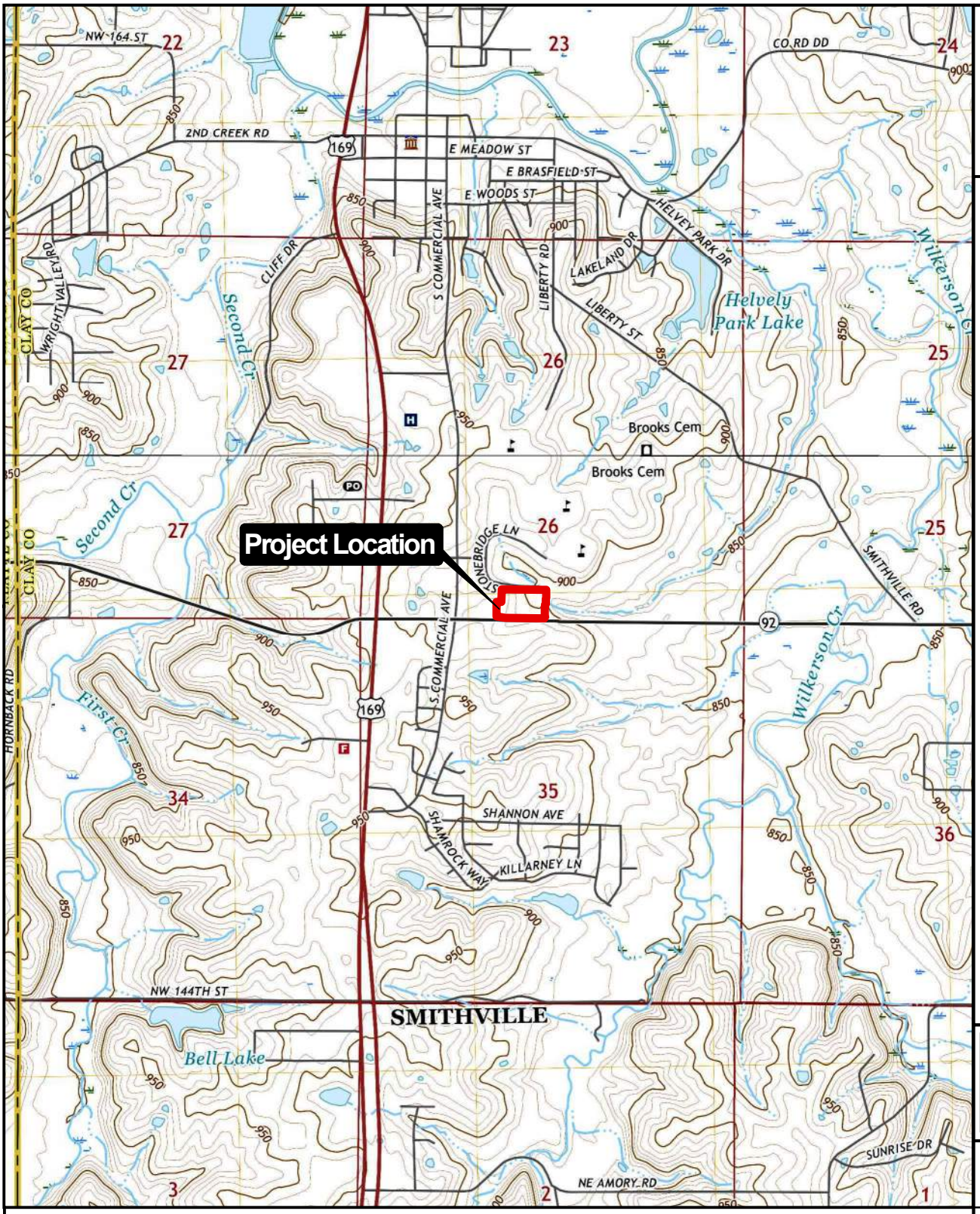
The MHS will be contacted during the Land Disturbance permitting process. Since there are no historical buildings on site, it is not anticipated that there will be any concerns.

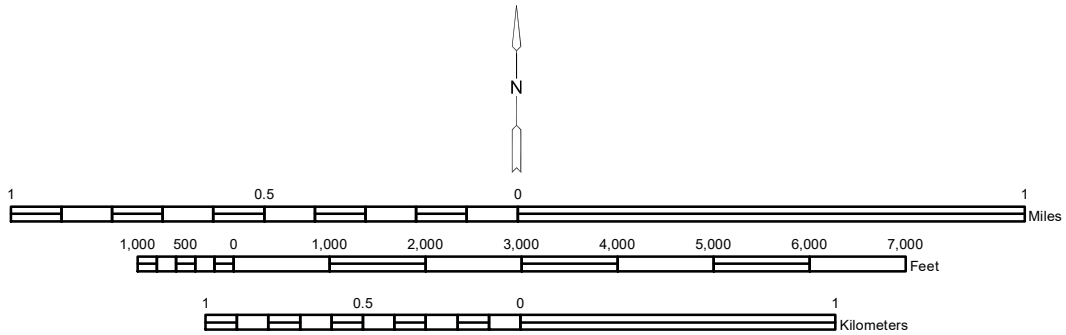
Summary

The Smithville Transportation Facility improvements will include a proposed transportation building, bus parking, car parking, a loading dock, and a detention facility. The site of the proposed improvements is previously undeveloped land. A proposed stormwater detention facility, located on the northeast corner of the site, will provide detention for the increased impervious surface and increase volume due to the increased impervious area. The storm sewer system will be designed using APWA 5600 design criteria. These systems will be sized for a minimum of a 100-year design storm.

In conclusion, the site improvements do not increase peak runoff from the site in any design storm and will provide adequate detention storage volume for the site. The decreased peak flow rates will improve the downstream conditions.

Appendix A – USGS Quadrangle





MKEC
Overland Park, KS · 913.317.9390

USGS QUAD EXHIBIT
SMITHVILLE SCHOOL CAMPUS - TRANSPORTATION FACILITY
655 S COMMERCIAL AVENUE, SMITHVILLE, MISSOURI

SEC: 26
TWP: T53N
RNG: R33W

PROJECT NO.	2302010101
DATE	May 2023
SCALE	1"=2000'

DESIGNED	DRAWN	CHECKED
LES	LES	KLA

NO.	REVISION	DATE

SHEET NO.
1 OF 1

Path: U:\PROJECTS\2022\2202010849_DLR_Smithville Transportation Facility\05 Civil\GIS\USGS Quad Exhibit-KC.mxd - Date: 5/16/2023

Appendix B – Aerial Photograph

SEC: 26
TWP: T53N
RNG: R33W

1 "=400 ' / 1:4800

0 100 200 400

MKEC
Overland Park, KS - 913.317.9390

AERIAL EXHIBIT
SMITHVILLE SCHOOL CAMPUS TRANSPORTATION FACILITY

PROJECT NO.	DATE	SHEET NO.
2202010849	May 2023	1 OF 1

DRAWN BY:	DESIGNED BY:	APPROVED BY:
LES	LES	KLA

Path: U:\PROJECTS\2022\202010849_DLR_Smithville Transportation Facility\05 Civil\GIS\Aerial Exhibit-KC.mxd - Date: 5/16/2023

Appendix C – Site Plan

STONEBRIDGE LANE

ASPHALT

STORM WATER DETENTION FACILITY

BUS PARKING

PROPOSED BUILDING

OVERHEAD DOOR

LOADING DOCK

DOCK RETAINING WALL

TRASH ENCLOSURE

SLIDING GATE

FUEL TANK (BY OWNER)

MONUMENT SIGN

PRIVATE DRIVE

HIGHWAY 92

R/W

35 MPH

STOP

PAVING LEGEND

- 5" CONCRETE SIDEWALK
- 8" CONCRETE SECTION
- 7" ASPHALT SECTION
- DRY CURB
- CURB TRANSITION
- R – RAMP
- L – LANDING

N

SCALE: 1"=30'

0 30 60

MKEC
11627 W. 112th Street, Suite 200
Overland Park, KS 66210
9 1 3 . 3 1 7 . 9 3 9 0
Engineering No. 2001009384
Landscape No. 2006027139
Surveying No. 2006027138

SMITHVILLE TRANSPORTATION

645 S COMMERCIAL AVE, SMITHVILLE, MO 64089

SITE PLAN

SITE PLAN

PROJECT NO.	2202010849
DATE	06.16.2023
SCALE	1"=30'

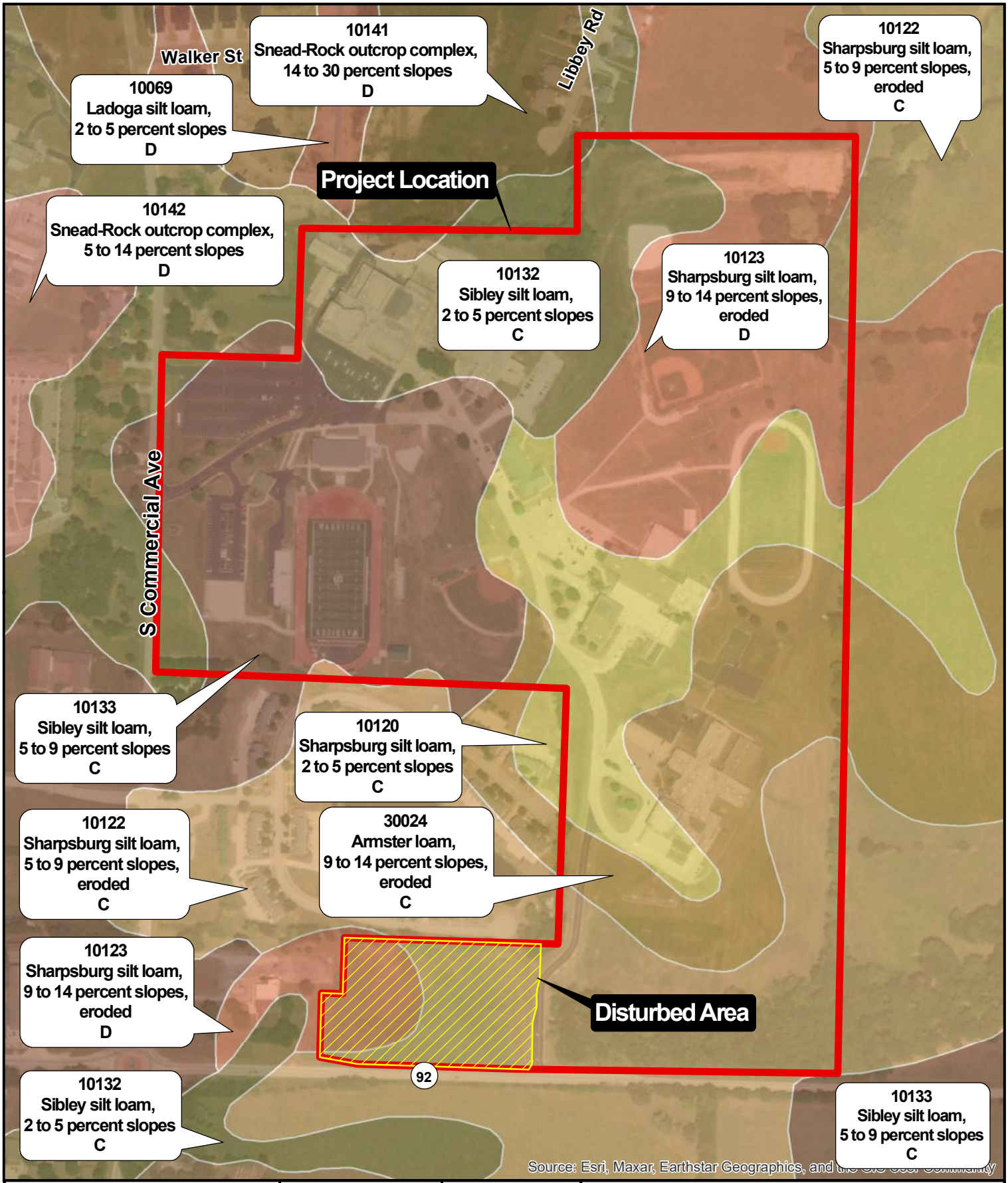
DESIGNED	DRAWN	CHECKED
JLB	SEK	BLT

NO.	REVISION	DATE
#	#	#
#	#	#
#	#	#
#	#	#
#	#	#

SHEET NO.

1 OF 1

Appendix D – NRCS Soil Survey



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Overland Park, KS - 913.317.9390

NRCS SOIL SURVEY EXHIBIT
SMITHVILLE SCHOOL CAMPUS TRANSPORTATION FACILITY

PROJECT NO.	DATE	SHEET NO.
2202010849	May 2023	1 OF 1

DRAWN BY:	DESIGNED BY:	APPROVED BY:
LES	LES	KLA

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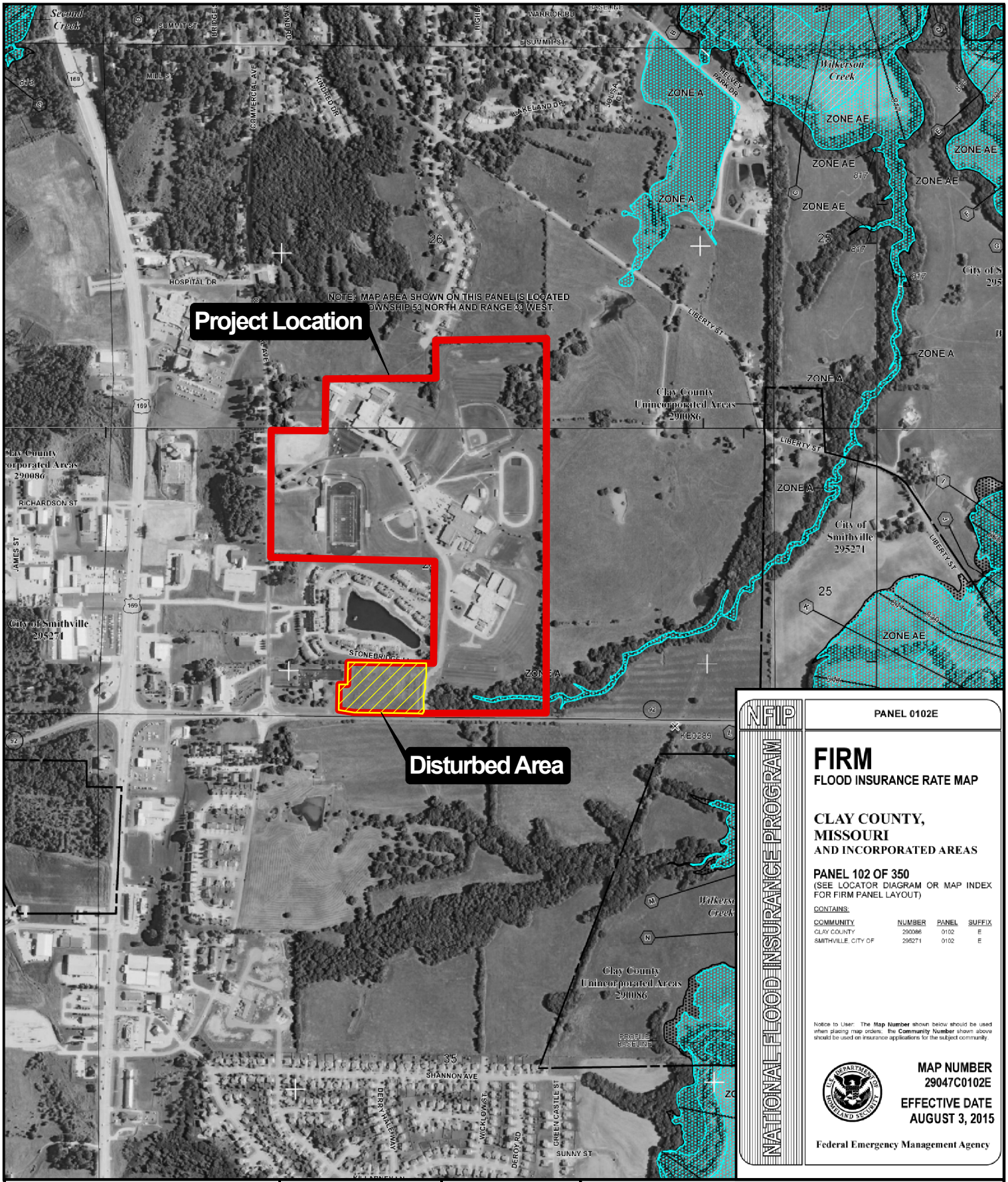
Appendix E – FEMA FIRM Panel



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MKEC
Overland Park, KS - 913.317.9390

FEMA FIRM EXHIBIT
SMITHVILLE SCHOOL CAMPUS TRANSPORTATION FACILITY

PROJECT NO.	DATE	SHEET NO.
2202010849	May 2023	1 OF 1

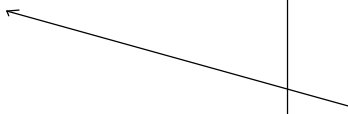
DRAWN BY:	DESIGNED BY:	APPROVED BY:
LES	LES	KLA

Path: U:\PROJECTS\2022\2202010849_DLR_Smithville Transportation Facility\05 Civil\GIS\FEMA FIRM Exhibit-KC.mxd - Date: 5/16/2023

Appendix F – Hydraflow Hydrographs

Watershed Model Schematic

5



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	29.42	2	720	67,477	------	------	------	Existing Conditions
2	SCS Runoff	25.59	2	716	52,769	------	------	------	Proposed Drainage Area 1
3	Reservoir	12.29	2	722	52,767	2	895.40	10,631	Detention Outflow
4	SCS Runoff	16.62	2	722	46,609	------	------	------	Proposed Drainage Area 2
5	Combine	28.91	2	722	99,376	3, 4	------	------	Total Proposed

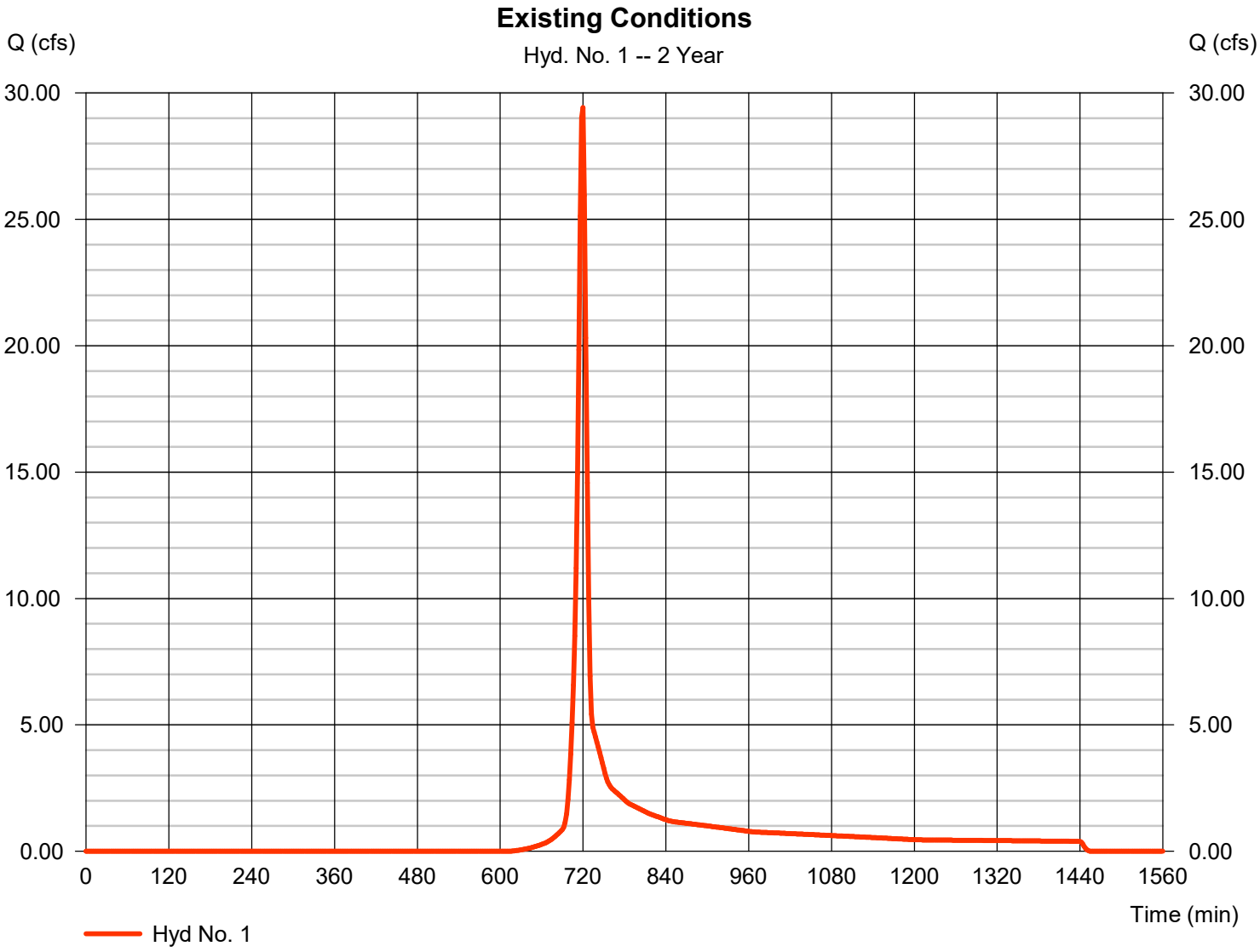
Hydrograph Report

Hyd. No. 1

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	29.42 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	67,477 cuft
Drainage area	=	13.900 ac	Curve number	=	75*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.60 min
Total precip.	=	3.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(13.300 x 74) + (0.600 x 98)] / 13.900



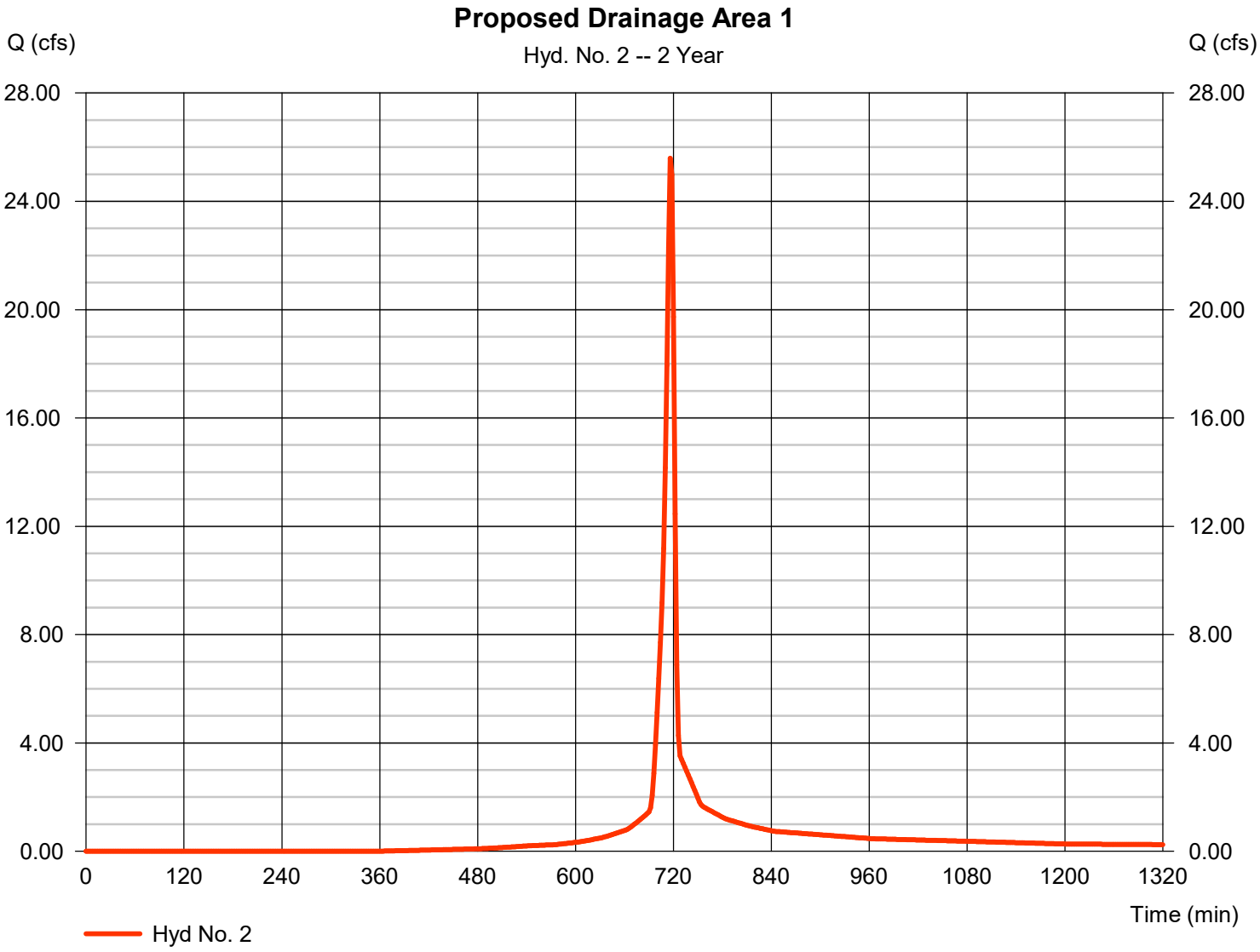
Hydrograph Report

Hyd. No. 2

Proposed Drainage Area 1

Hydrograph type	= SCS Runoff	Peak discharge	= 25.59 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 52,769 cuft
Drainage area	= 6.700 ac	Curve number	= 88*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.55 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(2.800 x 98) + (3.900 x 80)] / 6.700



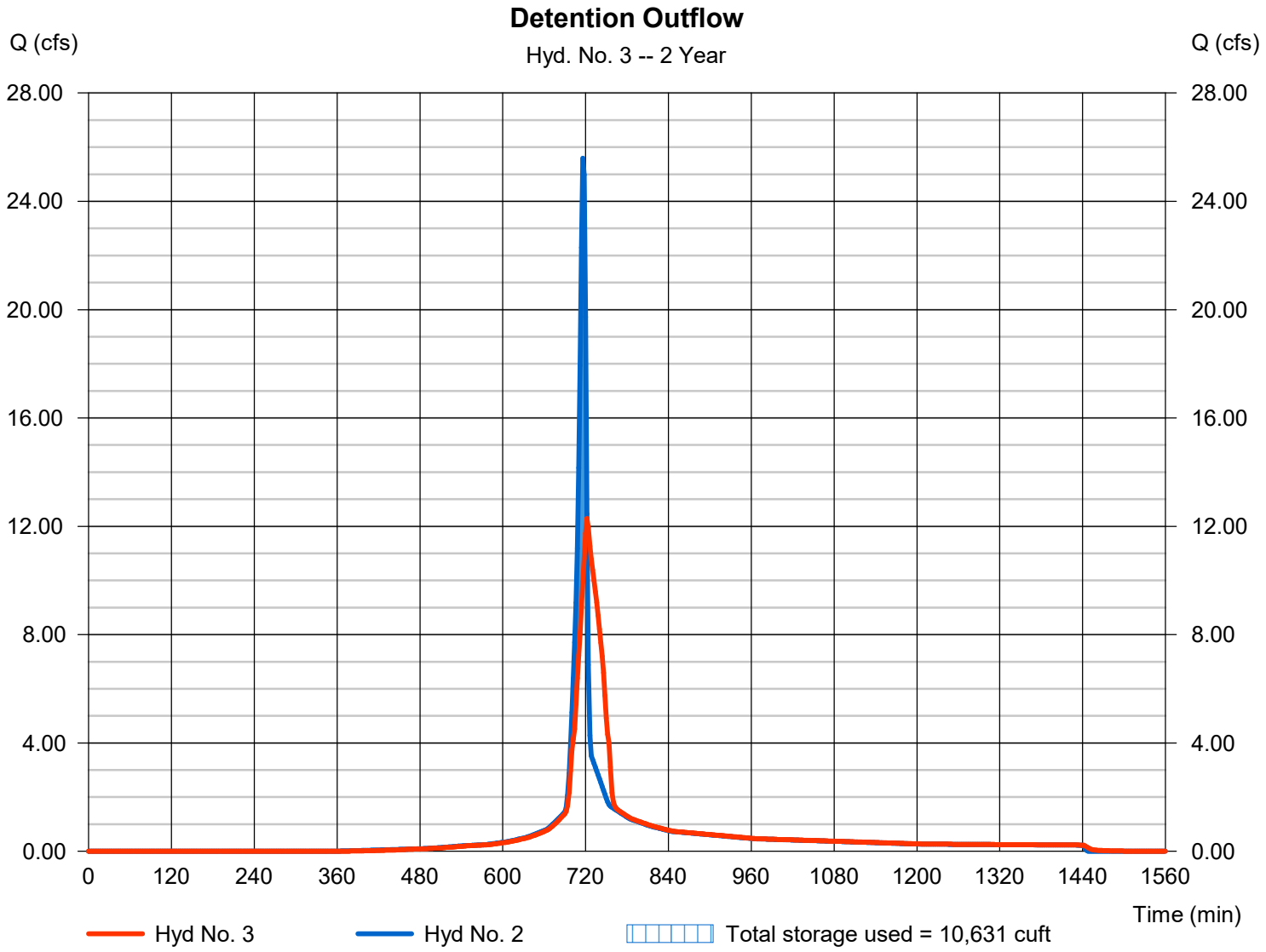
Hydrograph Report

Hyd. No. 3

Detention Outflow

Hydrograph type	=	Reservoir	Peak discharge	=	12.29 cfs
Storm frequency	=	2 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	52,767 cuft
Inflow hyd. No.	=	2 - Proposed Drainage Area 1	Max. Elevation	=	895.40 ft
Reservoir name	=	Detention Facility	Max. Storage	=	10,631 cuft

Storage Indication method used.



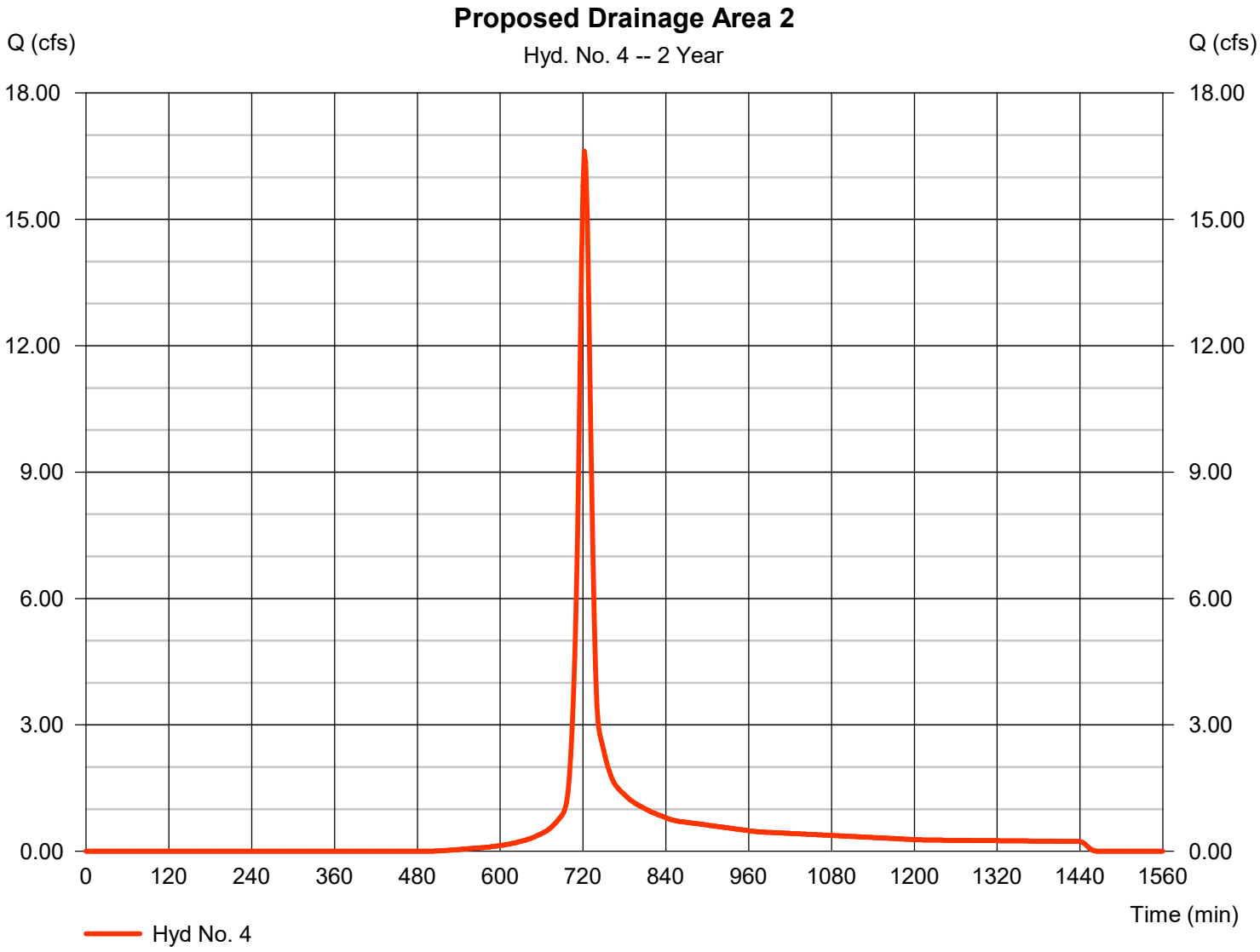
Hydrograph Report

Hyd. No. 4

Proposed Drainage Area 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	16.62 cfs
Storm frequency	=	2 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	46,609 cuft
Drainage area	=	7.220 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.20 min
Total precip.	=	3.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.730 x 98) + (6.490 x 80)] / 7.220

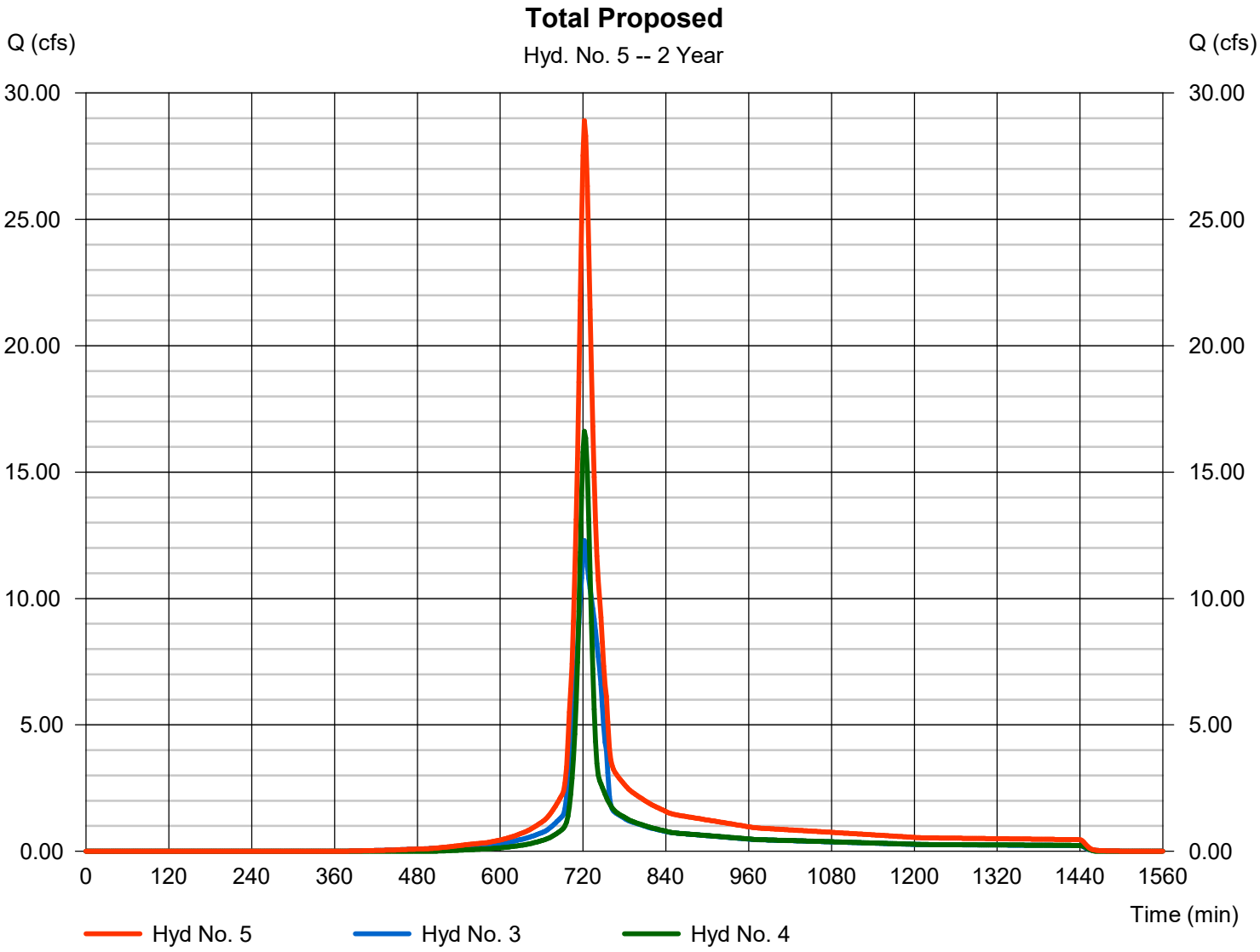


Hydrograph Report

Hyd. No. 5

Total Proposed

Hydrograph type	= Combine	Peak discharge	= 28.91 cfs
Storm frequency	= 2 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 99,376 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 7.220 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	59.80	2	718	136,799	------	------	------	Existing Conditions
2	SCS Runoff	42.70	2	716	90,604	------	------	------	Proposed Drainage Area 1
3	Reservoir	23.47	2	722	90,603	2	897.11	19,116	Detention Outflow
4	SCS Runoff	30.51	2	722	86,034	------	------	------	Proposed Drainage Area 2
5	Combine	53.98	2	722	176,636	3, 4	------	------	Total Proposed

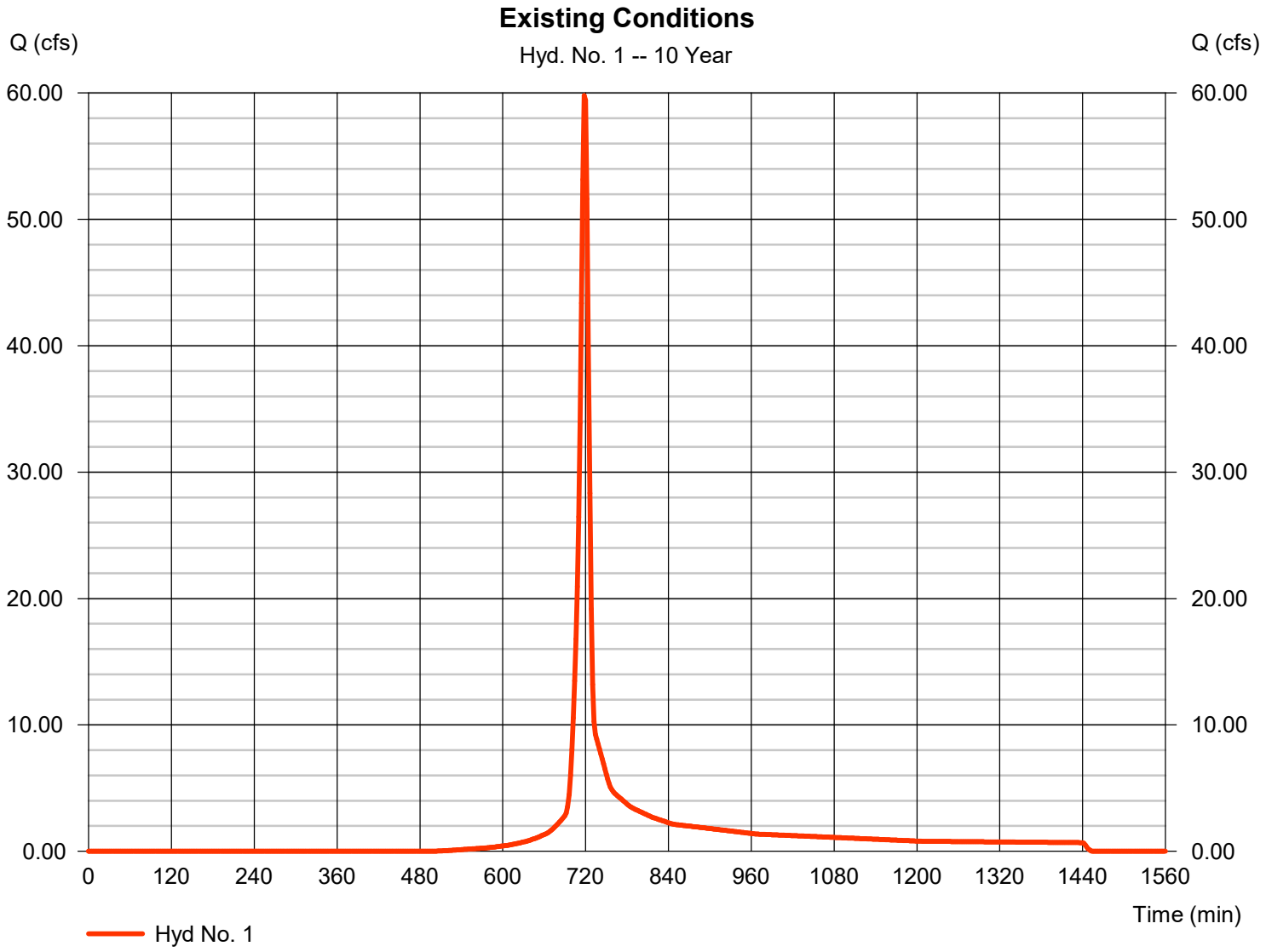
Hydrograph Report

Hyd. No. 1

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	59.80 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	136,799 cuft
Drainage area	=	13.900 ac	Curve number	=	75*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.60 min
Total precip.	=	5.32 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(13.300 x 74) + (0.600 x 98)] / 13.900



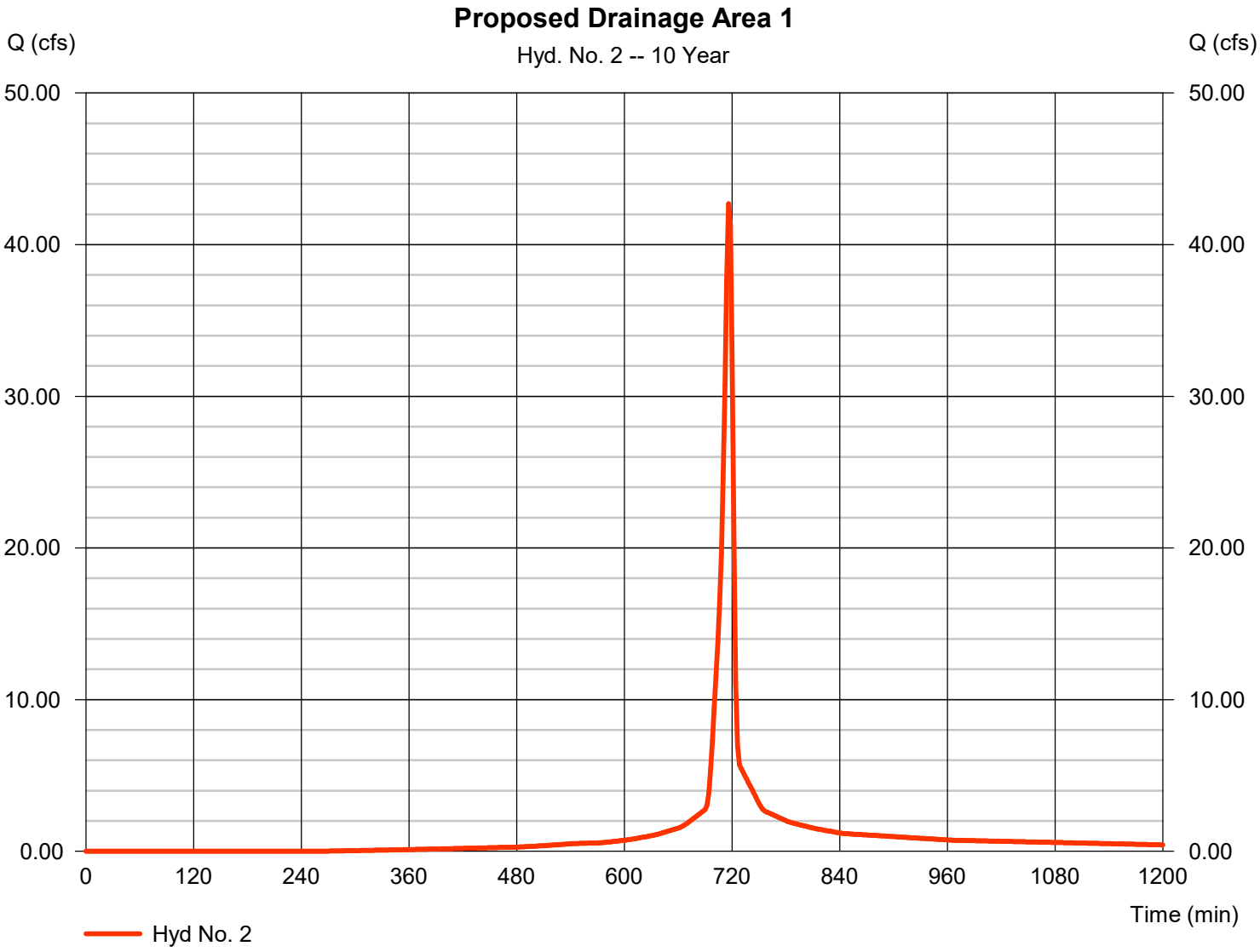
Hydrograph Report

Hyd. No. 2

Proposed Drainage Area 1

Hydrograph type	= SCS Runoff	Peak discharge	= 42.70 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 90,604 cuft
Drainage area	= 6.700 ac	Curve number	= 88*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 5.32 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(2.800 x 98) + (3.900 x 80)] / 6.700



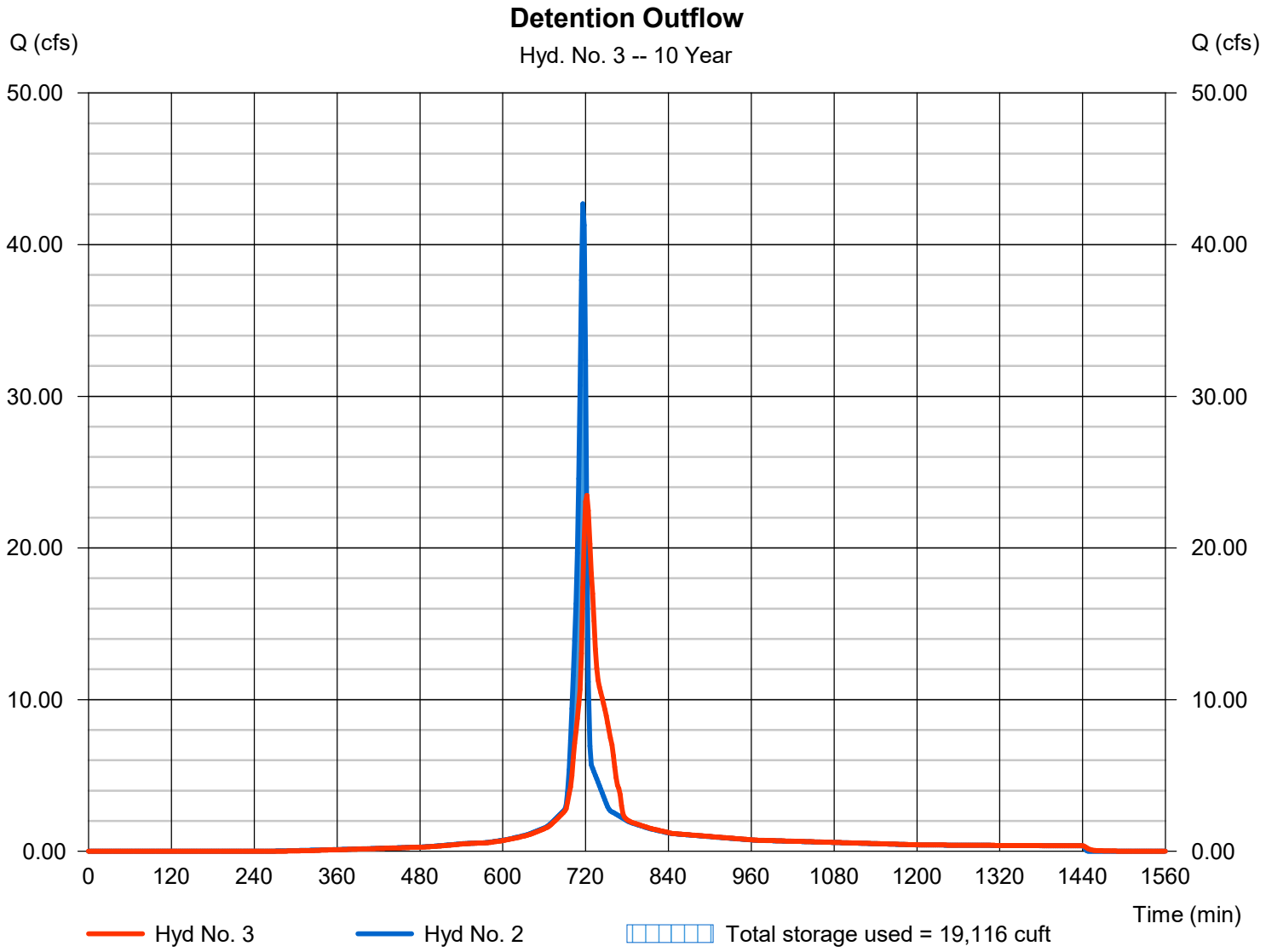
Hydrograph Report

Hyd. No. 3

Detention Outflow

Hydrograph type	=	Reservoir	Peak discharge	=	23.47 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	90,603 cuft
Inflow hyd. No.	=	2 - Proposed Drainage Area 1	Max. Elevation	=	897.11 ft
Reservoir name	=	Detention Facility	Max. Storage	=	19,116 cuft

Storage Indication method used.



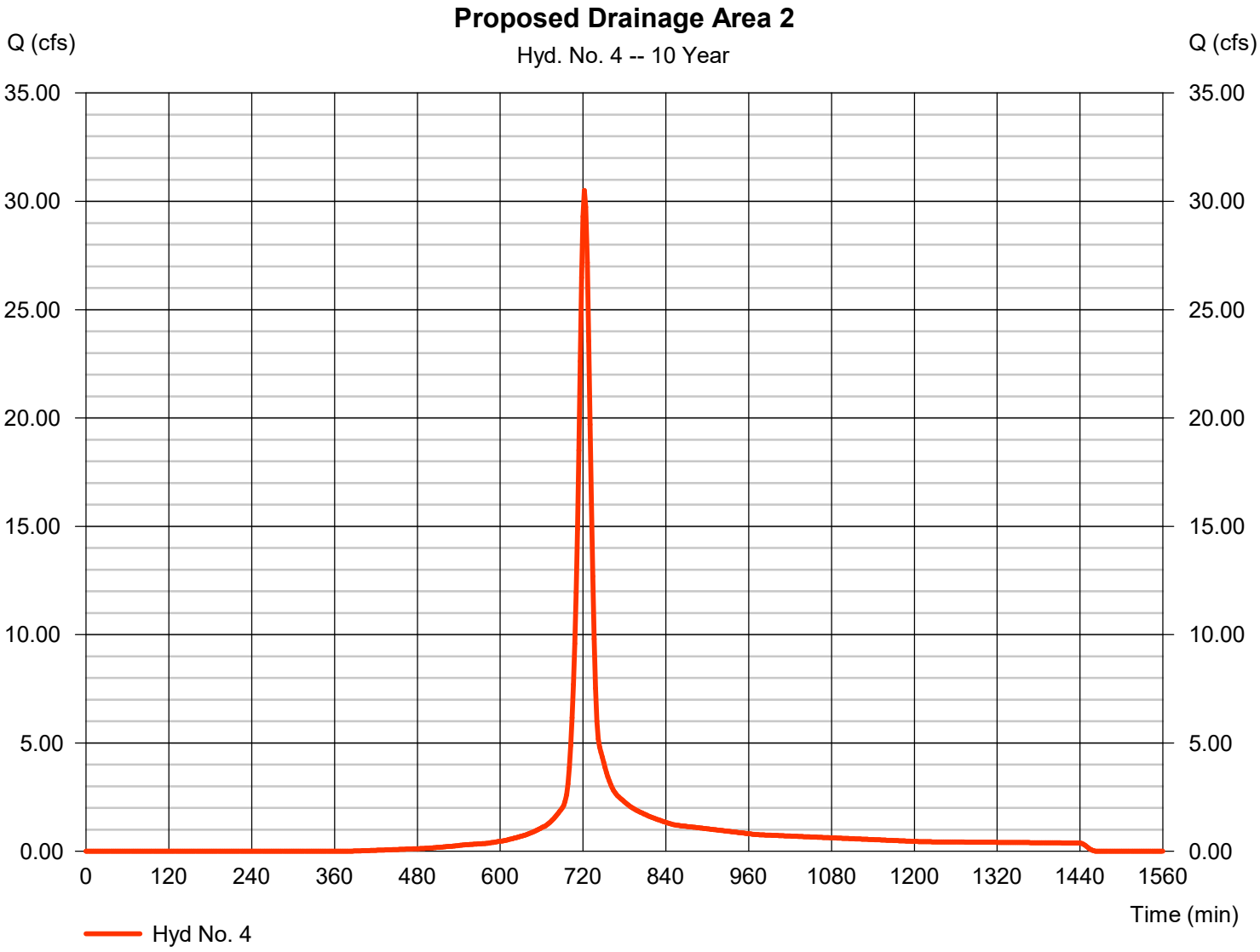
Hydrograph Report

Hyd. No. 4

Proposed Drainage Area 2

Hydrograph type	= SCS Runoff	Peak discharge	= 30.51 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 86,034 cuft
Drainage area	= 7.220 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 14.20 min
Total precip.	= 5.32 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.730 x 98) + (6.490 x 80)] / 7.220

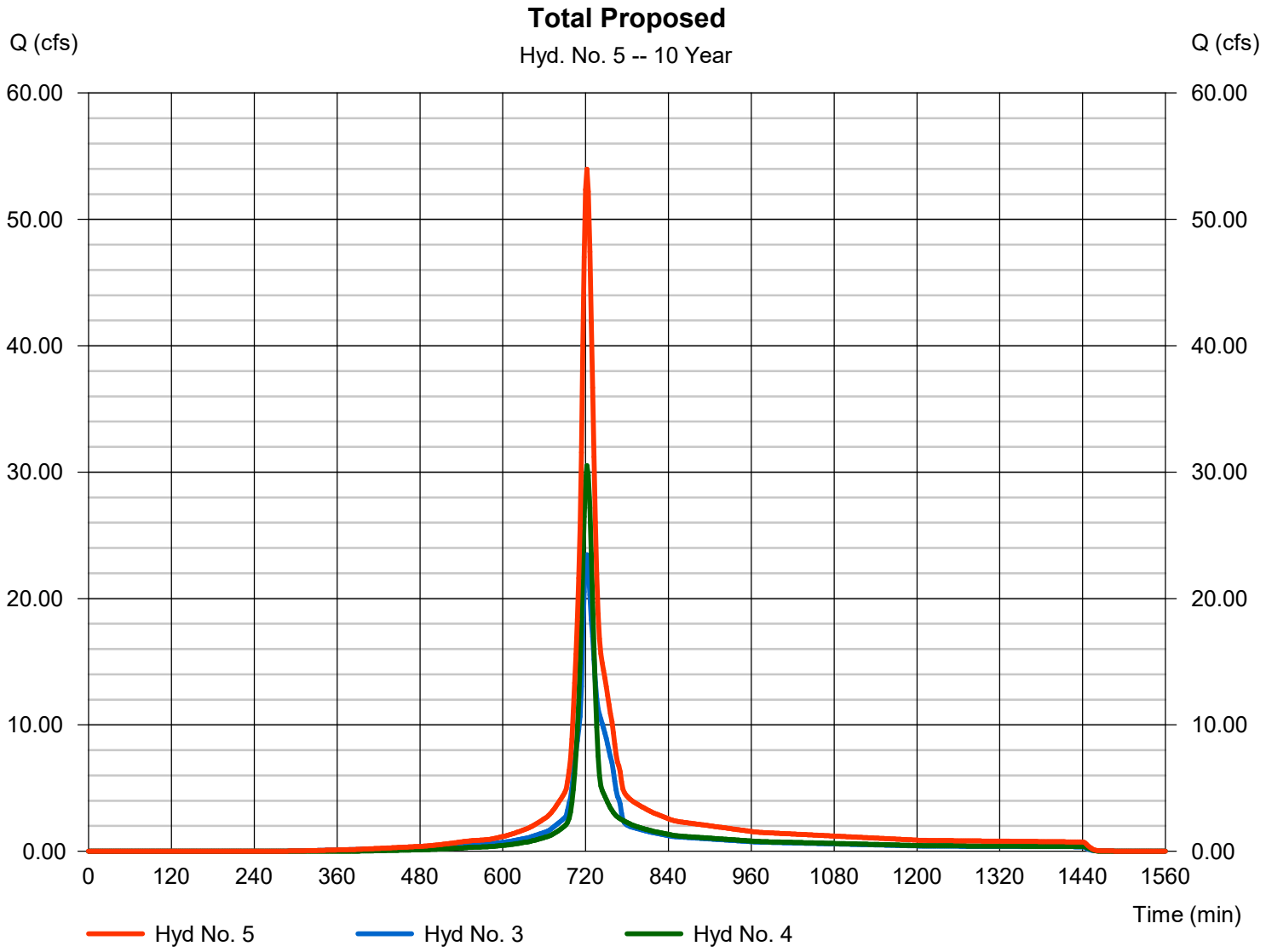


Hydrograph Report

Hyd. No. 5

Total Proposed

Hydrograph type	= Combine	Peak discharge	= 53.98 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 176,636 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 7.220 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	103.93	2	718	239,867	------	------	------	Existing Conditions
2	SCS Runoff	65.32	2	716	142,635	------	------	------	Proposed Drainage Area 1
3	Reservoir	31.41	2	722	142,633	2	899.01	31,857	Detention Outflow
4	SCS Runoff	49.48	2	722	141,988	------	------	------	Proposed Drainage Area 2
5	Combine	80.88	2	722	284,621	3, 4	------	------	Total Proposed

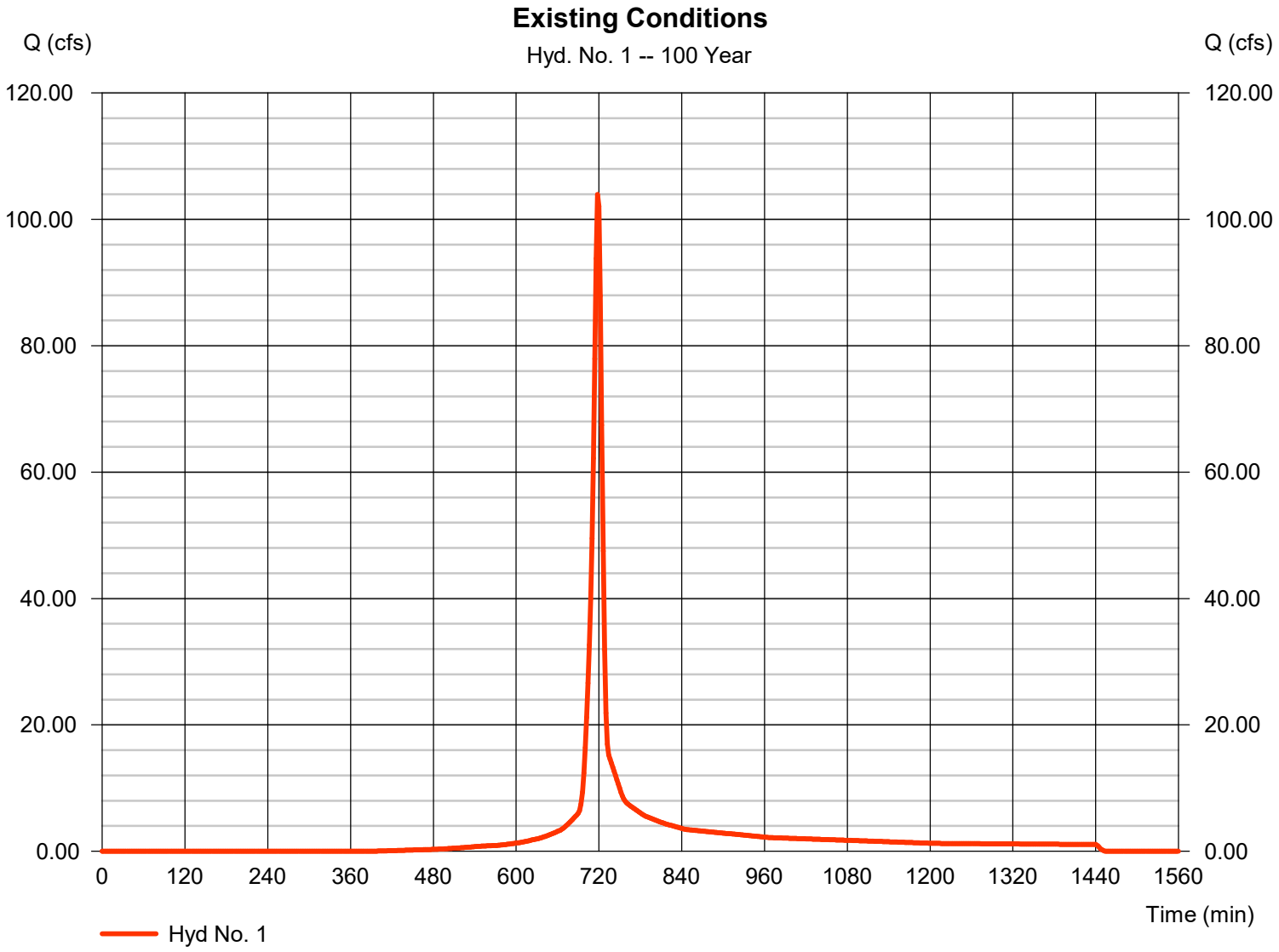
Hydrograph Report

Hyd. No. 1

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	103.93 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	239,867 cuft
Drainage area	=	13.900 ac	Curve number	=	75*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.60 min
Total precip.	=	7.68 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(13.300 x 74) + (0.600 x 98)] / 13.900



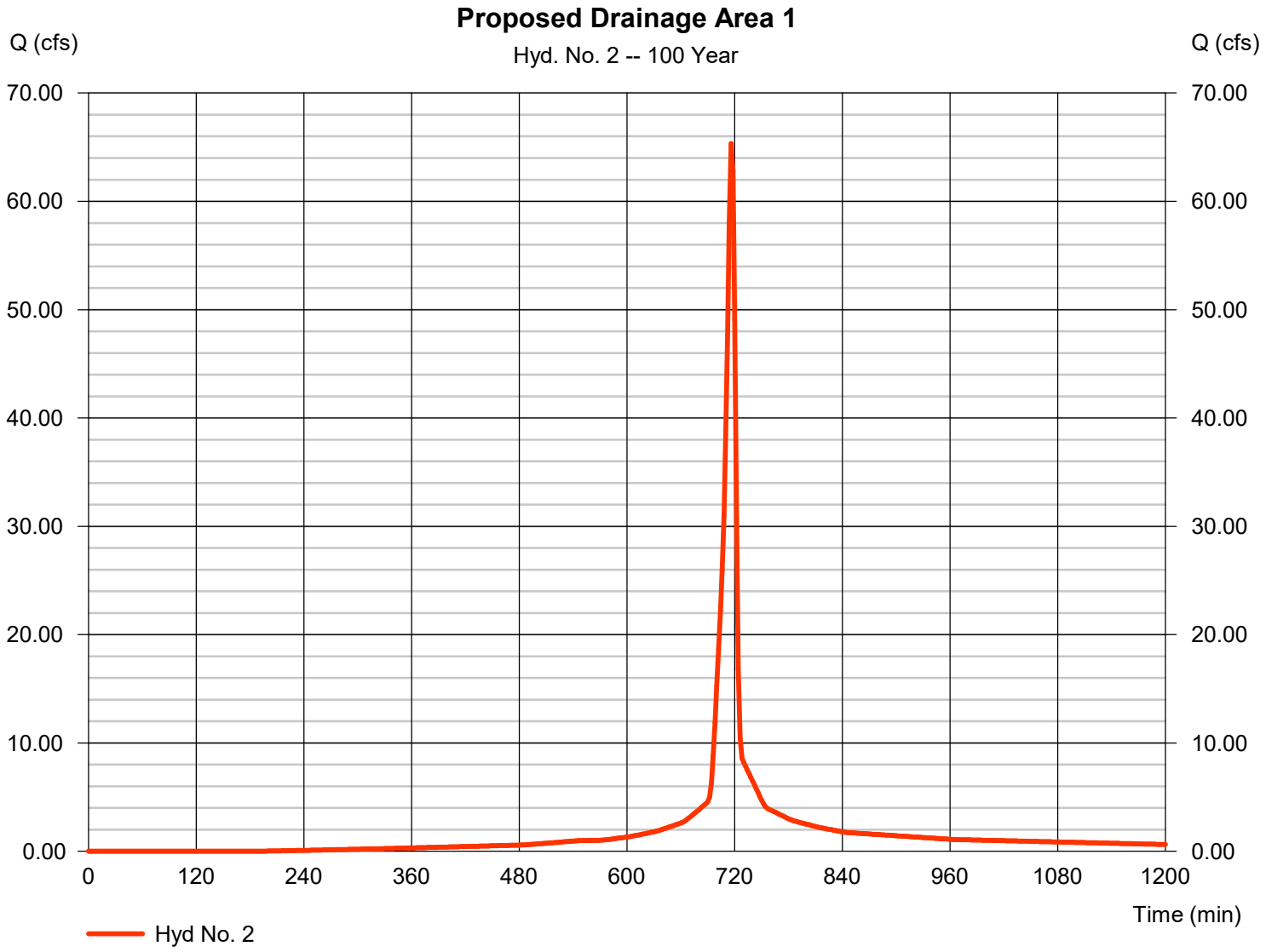
Hydrograph Report

Hyd. No. 2

Proposed Drainage Area 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	65.32 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	142,635 cuft
Drainage area	=	6.700 ac	Curve number	=	88*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	7.68 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.800 x 98) + (3.900 x 80)] / 6.700



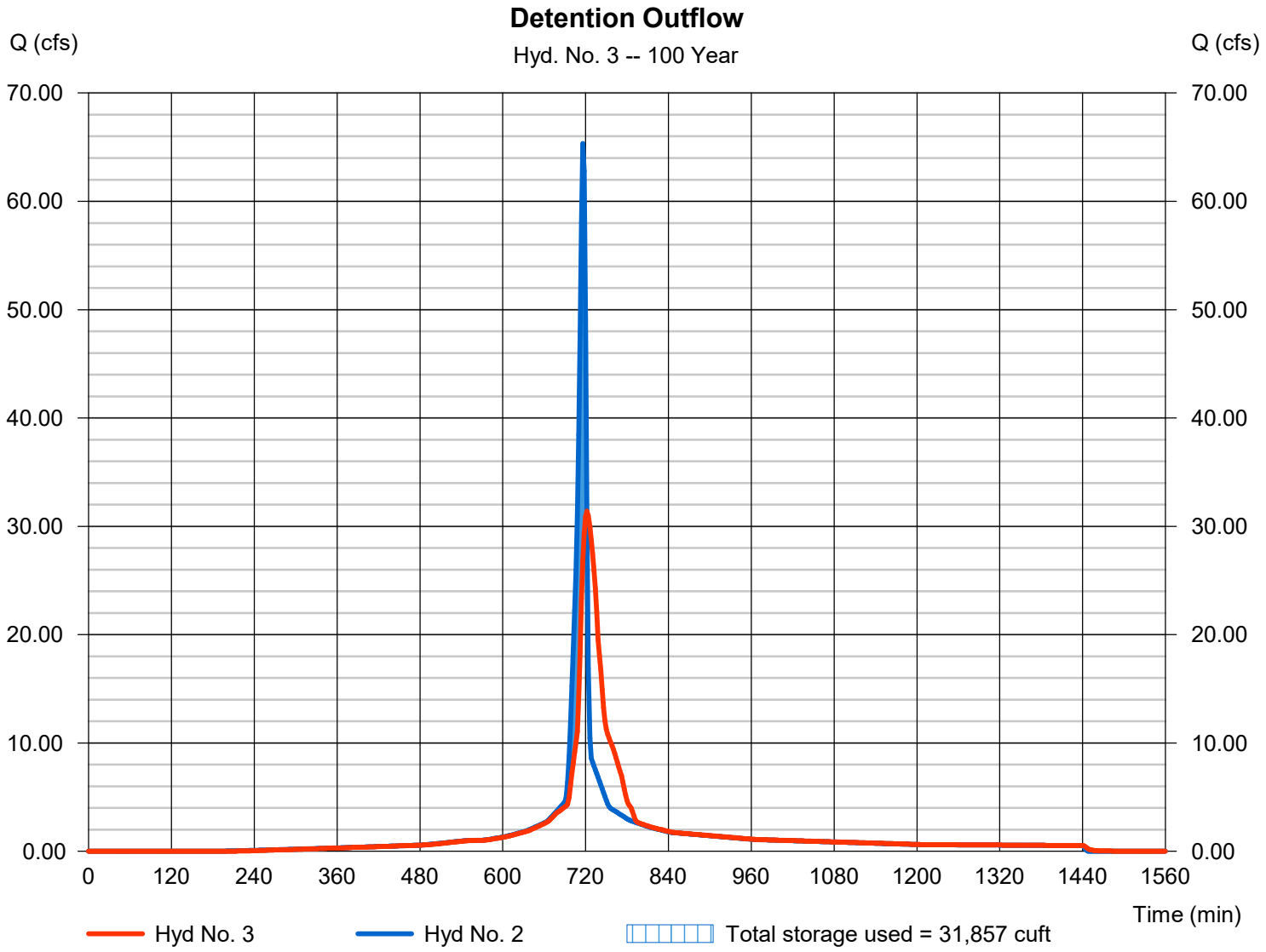
Hydrograph Report

Hyd. No. 3

Detention Outflow

Hydrograph type	=	Reservoir	Peak discharge	=	31.41 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	142,633 cuft
Inflow hyd. No.	=	2 - Proposed Drainage Area 1	Max. Elevation	=	899.01 ft
Reservoir name	=	Detention Facility	Max. Storage	=	31,857 cuft

Storage Indication method used.



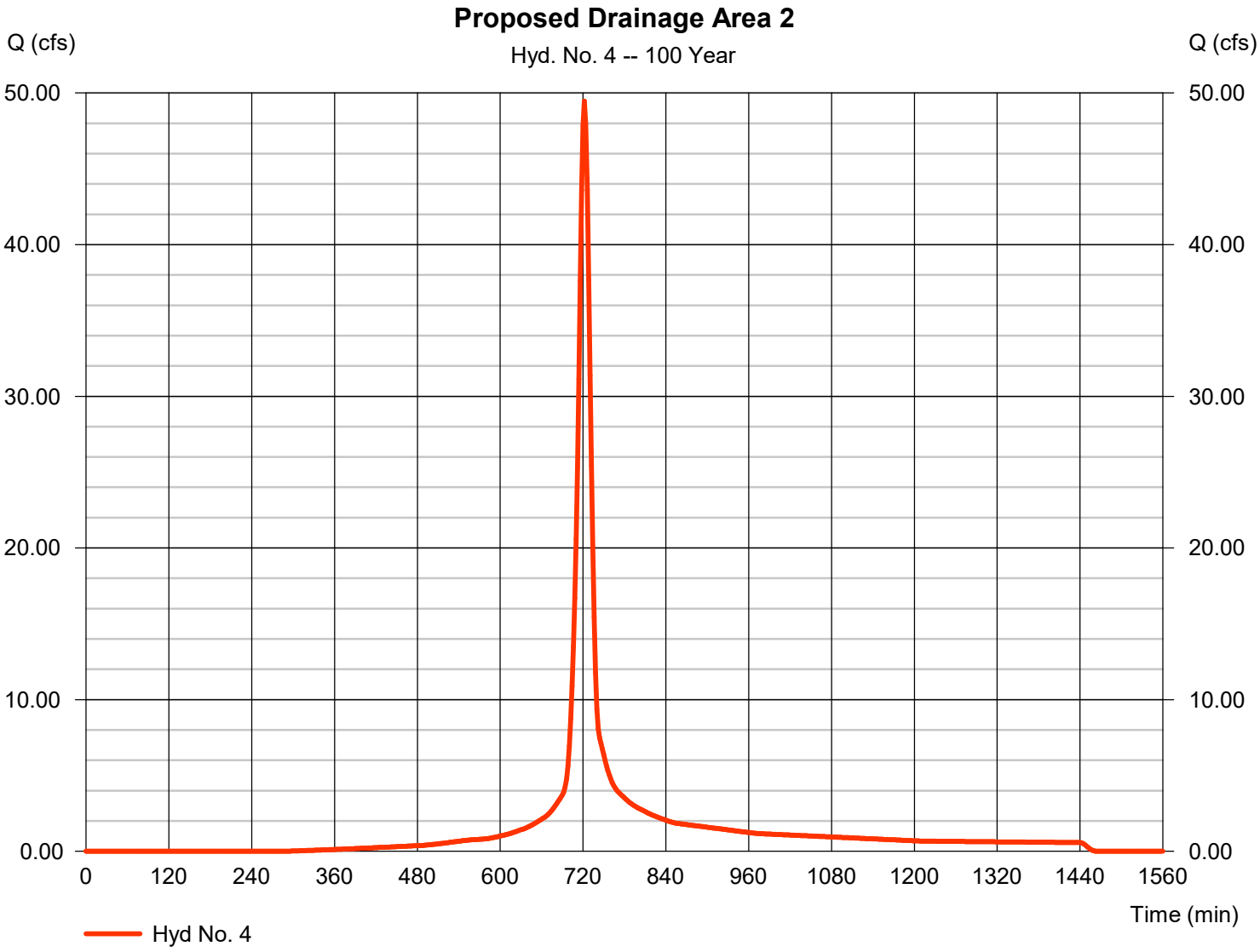
Hydrograph Report

Hyd. No. 4

Proposed Drainage Area 2

Hydrograph type	= SCS Runoff	Peak discharge	= 49.48 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 141,988 cuft
Drainage area	= 7.220 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 14.20 min
Total precip.	= 7.68 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.730 x 98) + (6.490 x 80)] / 7.220

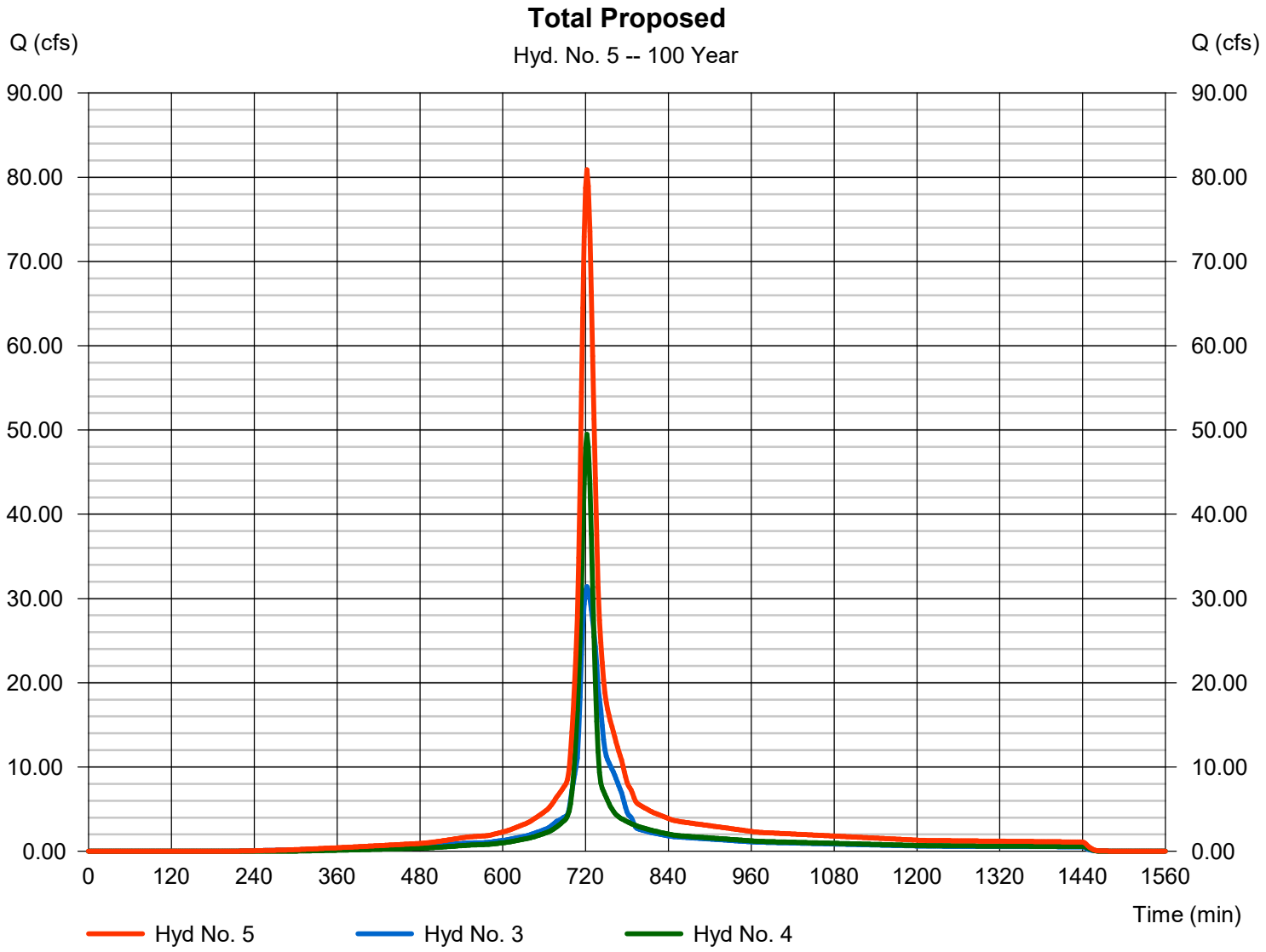


Hydrograph Report

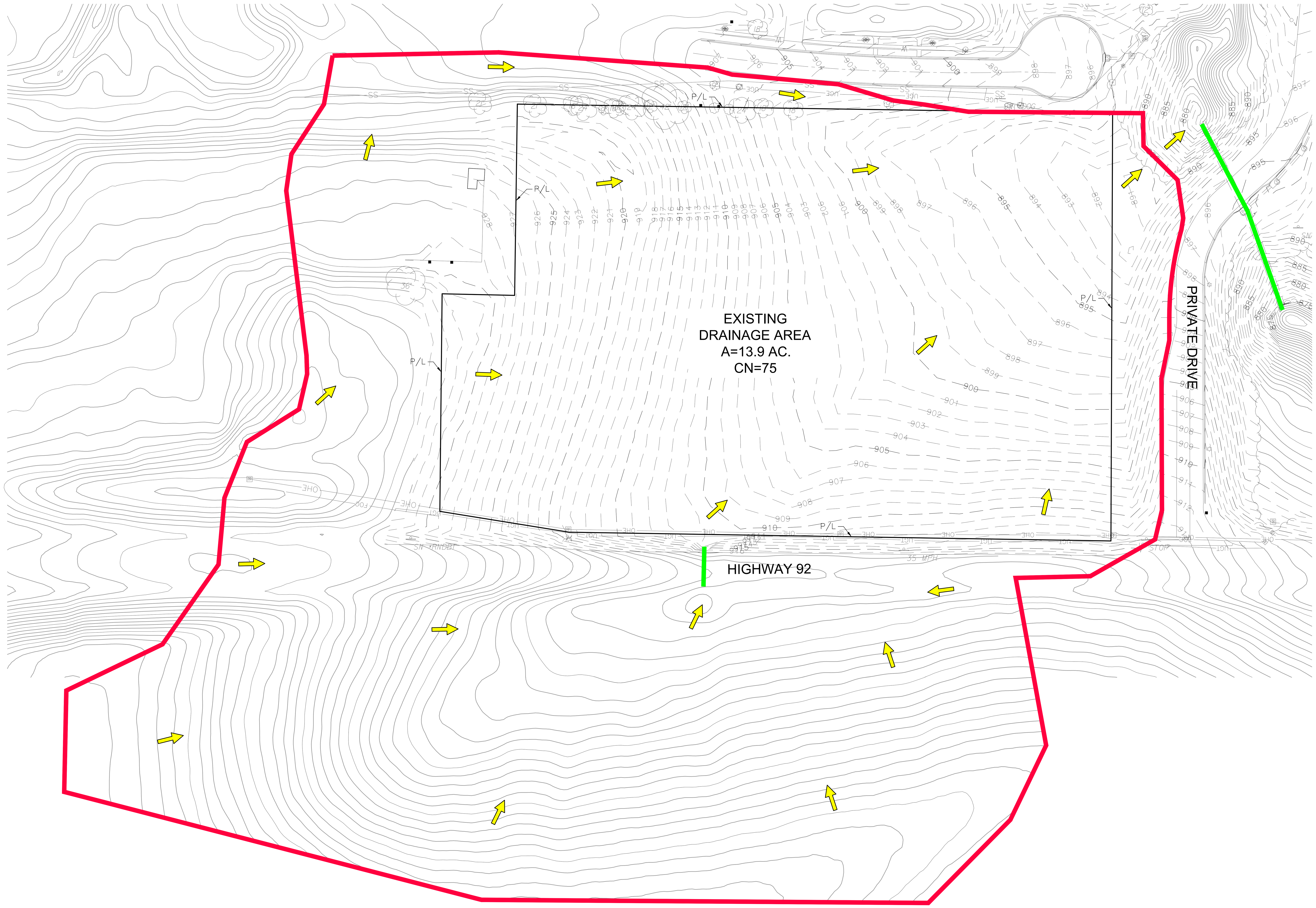
Hyd. No. 5

Total Proposed

Hydrograph type	= Combine	Peak discharge	= 80.88 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 284,621 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 7.220 ac



Appendix G – Existing Drainage Map



LEGEND

- FLOW ARROW
- DRAINAGE AREAS
- EXISTING STORM SEWER

N

SCALE: 1"=50'

0 50 100

MKEC

11827 W. 112th Street, Suite 200
Overland Park, KS 66210
913.317.9390
Engineering No. 2001009364
Landscape No. 2006027139
Surveying No. 2006027138

EXISTING DRAINGE MAP

SMITHVILLE TRANSPORTATION

645 S COMMERCIAL AVE, SMITHVILLE, MO 64089

EXISTING DRAINAGE MAP

PROJECT NO.	2202010849
DATE	06.16.2023
SCALE	1"=50'

DESIGNED	DRAWN	CHECKED
SEK	SEK	BLT

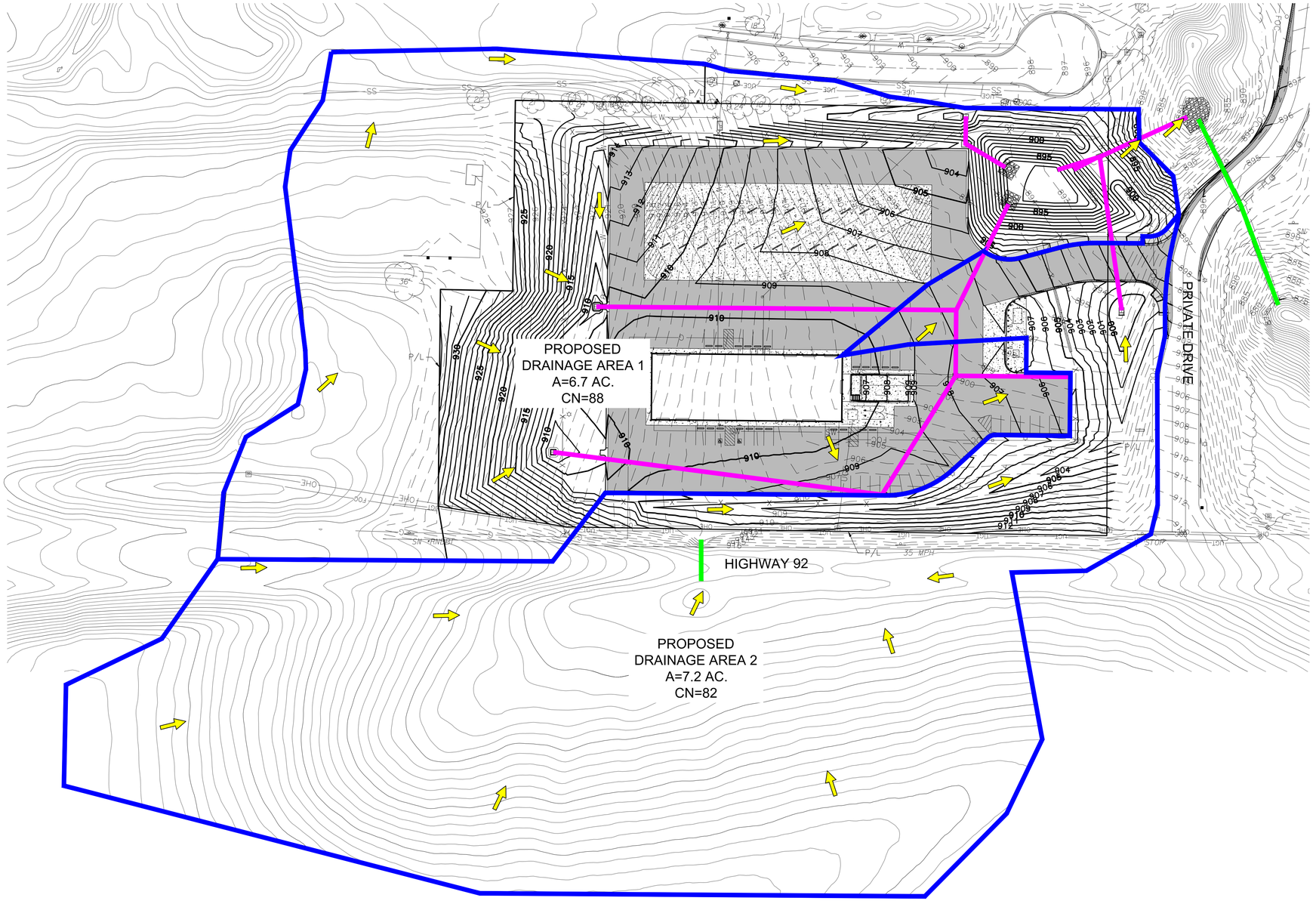
NO.	REVISION	DATE
#	#	#
#	#	#
#	#	#
#	#	#
#	#	#

SHEET NO.

1 OF 1

P:\PROJECTS\2022\2202010849_DLR_SMITHVILLE TRANSPORTATION FACILITY\00 220849 CAD\SHTS\05 CIVIL\DRAINAGE EXHIBITS\220849-05-EXIST DA.DWG

Appendix H – Proposed Drainage Map



LEGEND

- FLOW ARROW
- DRAINAGE AREAS
- EXISTING STORM SEWER
- PROPOSED STORM SEWER

N

SCALE: 1"=50'

0 50 100

MKEC
11627 W. 112th Street, Suite 200
Overland Park, KS 66210
9 1 3 . 7 9 3 . 5 9 9 0
Engineering No. 2001009364
Landscape No. 2006027139
Surveying No. 2006027138

PROPOSED DRAINGE MAP

SMITHVILLE TRANSPORTATION

645 S COMMERCIAL AVE, SMITHVILLE, MO 64089

PROPOSED
DRAINAGE MAP

PROJECT NO.	2202010849
DATE	06.16.2023
SCALE	1"=50'

DESIGNED	DRAWN	CHECKED
SEK	SEK	BLT

NO.	REVISION	DATE
#	#	#
#	#	#
#	#	#
#	#	#
#	#	#

SHEET NO.

1 OF 1