STORMWATER IMPACT ANALYSIS

Reserve @ Mitchell Mill

Town of Rolesville

Wake County, NC

Prepared by:
Thomas Taylor

Reviewed by:
Chris Thompson, PE

The **STRONG**ROCK Engineering Group, PLLC
305 Church at North Hills St. Suite 1110
Raleigh, NC 27609
984.200.1932 (o)
833.241.3773 (f)
Company License #: P-2166

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1. Narrative

1.1. Project Data

Name:	Reserve at Mitchell Mill
Parent Pin:	1757571035
Address:	Jonesville Road & Mitchell Mill Rd, Rolesville NC
Property Boundary:	138.69 AC
Proposed Open Space:	2,999,482 SF (68.86 AC)
Proposed Impervious Area:	2,113,531 SF (48.52 AC)
Proposed Impervious Percentage:	34.98 %

1.2. Site History & Project Description

The project is 138.69-acres that includes undeveloped and grassed areas. The development proposes 390 residential lots and all the associated infrastructure including roadways, sidewalks, and public utilities needed to facilitate the development.

Structural and non-structural BMPs shall be used to ensure there is no net increase in peak flow leaving the site from the pre-development conditions for 1-, 10- and 100-year & 24-hour storm events. Seven (7) stormwater wet ponds with a curb and gutter/rolled curb storm network system have been proposed to meet the requirements.

1.3. Calculation Methodology

- Rainfall data for this area in Wake, NC region is obtained from NOAA website. This data contains a depth-duration-frequency (DDF) table describing rainfall depth versus time for varying return periods in the area. These rainfall depths are input into the meteorological model for peak flow rate calculations.

- Using WebSoil Survey, the on-site soils were determined to be of Hydrological Soil Groups ‘B’, ‘C’, and ‘D’. Since the method chosen to compute pre- and post-development peak flow rates and runoff volumes is dependent upon the soil type, care was taken when selecting the appropriate Soil Conservation Service Curve Number (SCS CN).

- The time of concentration was calculated using SCS TR-55 (Segmental Approach, 1986).

- The SA/DA method was used for sizing the pond. AutoCAD Civil 3D, AutoCAD Sanitary Storm Analysis, and Excel Calculation Spreadsheets have been utilized in determining the pre- & post-development peak flow rates for the 1-, 2-, and 10-year storm events, as well as the Total Suspended Solids (TSS).

1.4. Results

The SA/DA method was used for sizing the wet ponds. Based on the results, implementation of the eight designed wet ponds satisfies the minimum requirements for water quality volume, permanent pool volume, and forebay volume based on NCDEQ wet pond design criteria.

Table 1.4.1 Point of Analysis Comparison

Storm Event	Pre-Development POI 1	Post Development POI 1
1	312.38 CFS	260.92 CFS
10	1017.83 CFS	871.65 CFS
100	1972.73 CFS	1791.92 CFS

2. Stormwater Impact Analysis

2.1. Rainfall Data

NOAA Atlas 14, Volume 2, Version 3
Location name: Wake Forest, North Carolina, USA*
Latitude: 35.8853°, Longitude: -78.4782°
Elevation: 235 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**4.84** (4.43-5.30)	**5.63** (5.16-6.16)	**6.42** (5.88-7.01)	**7.20** (6.59-7.86)	**7.99** (7.27-8.71)	**8.62** (7.81-9.38)	**9.17** (8.27-9.98)	**9.66** (8.65-10.5)	**10.2** (9.07-11.1)	**10.7** (9.42-11.7)
10-min	**3.86** (3.54-4.23)	**4.50** (4.13-4.92)	**5.14** (4.71-5.61)	**5.76** (5.27-6.28)	**6.37** (5.80-6.94)	**6.86** (6.22-7.48)	**7.28** (6.56-7.93)	**7.66** (6.86-8.35)	**8.07** (7.17-8.81)	**8.41** (7.42-9.20)
15-min	**3.22** (2.95-3.53)	**3.77** (3.46-4.12)	**4.34** (3.97-4.73)	**4.86** (4.44-5.30)	**5.38** (4.90-5.86)	**5.79** (5.25-6.31)	**6.14** (5.53-6.68)	**6.44** (5.77-7.02)	**6.77** (6.02-7.39)	**7.04** (6.21-7.70)
30-min	**2.21** (2.02-2.42)	**2.60** (2.39-2.85)	**3.08** (2.82-3.36)	**3.52** (3.22-3.84)	**3.98** (3.63-4.34)	**4.36** (3.95-4.75)	**4.70** (4.24-5.12)	**5.01** (4.49-5.47)	**5.39** (4.79-5.88)	**5.70** (5.03-6.24)
60-min	**1.38** (1.26-1.51)	**1.63** (1.50-1.79)	**1.97** (1.81-2.15)	**2.29** (2.10-2.50)	**2.65** (2.42-2.89)	**2.95** (2.68-3.22)	**3.24** (2.92-3.53)	**3.52** (3.15-3.83)	**3.86** (3.44-4.22)	**4.16** (3.67-4.55)
2-hr	**0.805** (0.731-0.889)	**0.958** (0.875-1.05)	**1.17** (1.06-1.28)	**1.37** (1.25-1.51)	**1.61** (1.46-1.77)	**1.82** (1.64-2.00)	**2.03** (1.81-2.22)	**2.23** (1.98-2.44)	**2.50** (2.20-2.74)	**2.74** (2.38-3.00)
3-hr	**0.568** (0.516-0.629)	**0.676** (0.618-0.746)	**0.829** (0.754-0.915)	**0.980** (0.889-1.08)	**1.16** (1.05-1.28)	**1.33** (1.19-1.46)	**1.49** (1.32-1.63)	**1.66** (1.46-1.82)	**1.88** (1.64-2.06)	**2.09** (1.80-2.29)
6-hr	**0.341** (0.312-0.377)	**0.407** (0.373-0.448)	**0.499** (0.456-0.549)	**0.591** (0.538-0.648)	**0.704** (0.637-0.771)	**0.807** (0.724-0.881)	**0.909** (0.809-0.992)	**1.02** (0.896-1.11)	**1.16** (1.01-1.27)	**1.30** (1.11-1.41)
12-hr	**0.200** (0.183-0.220)	**0.238** (0.219-0.261)	**0.294** (0.269-0.322)	**0.349** (0.319-0.383)	**0.420** (0.380-0.458)	**0.484** (0.435-0.526)	**0.549** (0.488-0.596)	**0.618** (0.544-0.671)	**0.714** (0.618-0.775)	**0.803** (0.685-0.872)
24-hr	**0.119** (0.111-0.128)	**0.144** (0.134-0.155)	**0.181** (0.168-0.195)	**0.210** (0.195-0.226)	**0.250** (0.232-0.270)	**0.283** (0.261-0.304)	**0.316** (0.290-0.340)	**0.350** (0.320-0.377)	**0.397** (0.362-0.429)	**0.435** (0.394-0.470)
2-day	**0.069** (0.064-0.074)	**0.083** (0.077-0.089)	**0.103** (0.096-0.111)	**0.120** (0.111-0.129)	**0.142** (0.131-0.153)	**0.159** (0.147-0.172)	**0.178** (0.163-0.191)	**0.196** (0.180-0.212)	**0.222** (0.202-0.240)	**0.242** (0.220-0.262)
3-day	**0.048** (0.045-0.052)	**0.058** (0.054-0.063)	**0.072** (0.068-0.078)	**0.084** (0.078-0.090)	**0.099** (0.092-0.106)	**0.111** (0.103-0.119)	**0.124** (0.114-0.133)	**0.137** (0.125-0.147)	**0.154** (0.141-0.166)	**0.168** (0.153-0.182)
4-day	**0.038** (0.036-0.041)	**0.046** (0.043-0.049)	**0.057** (0.053-0.061)	**0.066** (0.061-0.070)	**0.078** (0.072-0.083)	**0.087** (0.081-0.093)	**0.097** (0.089-0.104)	**0.107** (0.098-0.115)	**0.121** (0.110-0.130)	**0.132** (0.120-0.142)
7-day	**0.025** (0.024-0.027)	**0.030** (0.028-0.032)	**0.037** (0.035-0.039)	**0.042** (0.039-0.045)	**0.050** (0.046-0.053)	**0.056** (0.052-0.059)	**0.062** (0.057-0.066)	**0.068** (0.062-0.073)	**0.076** (0.070-0.082)	**0.083** (0.076-0.089)
10-day	**0.020** (0.019-0.021)	**0.024** (0.022-0.025)	**0.029** (0.027-0.031)	**0.033** (0.031-0.035)	**0.038** (0.035-0.041)	**0.042** (0.039-0.045)	**0.046** (0.043-0.050)	**0.051** (0.047-0.054)	**0.057** (0.052-0.061)	**0.061** (0.056-0.066)
20-day	**0.013** (0.012-0.014)	**0.016** (0.015-0.017)	**0.019** (0.018-0.020)	**0.021** (0.020-0.022)	**0.024** (0.023-0.026)	**0.027** (0.025-0.029)	**0.029** (0.027-0.031)	**0.032** (0.030-0.034)	**0.035** (0.033-0.038)	**0.038** (0.035-0.041)
30-day	**0.011** (0.010-0.012)	**0.013** (0.012-0.014)	**0.015** (0.014-0.016)	**0.017** (0.016-0.018)	**0.019** (0.018-0.020)	**0.021** (0.019-0.022)	**0.023** (0.021-0.024)	**0.024** (0.023-0.026)	**0.027** (0.025-0.028)	**0.028** (0.026-0.030)
45-day	**0.009** (0.009-0.010)	**0.011** (0.010-0.011)	**0.012** (0.012-0.013)	**0.014** (0.013-0.015)	**0.015** (0.015-0.016)	**0.017** (0.016-0.018)	**0.018** (0.017-0.019)	**0.019** (0.018-0.020)	**0.021** (0.019-0.022)	**0.022** (0.020-0.023)
60-day	**0.008** (0.008-0.009)	**0.010** (0.009-0.010)	**0.011** (0.010-0.012)	**0.012** (0.011-0.013)	**0.013** (0.013-0.014)	**0.014** (0.014-0.015)	**0.015** (0.014-0.016)	**0.016** (0.015-0.017)	**0.018** (0.016-0.019)	**0.018** (0.017-0.020)

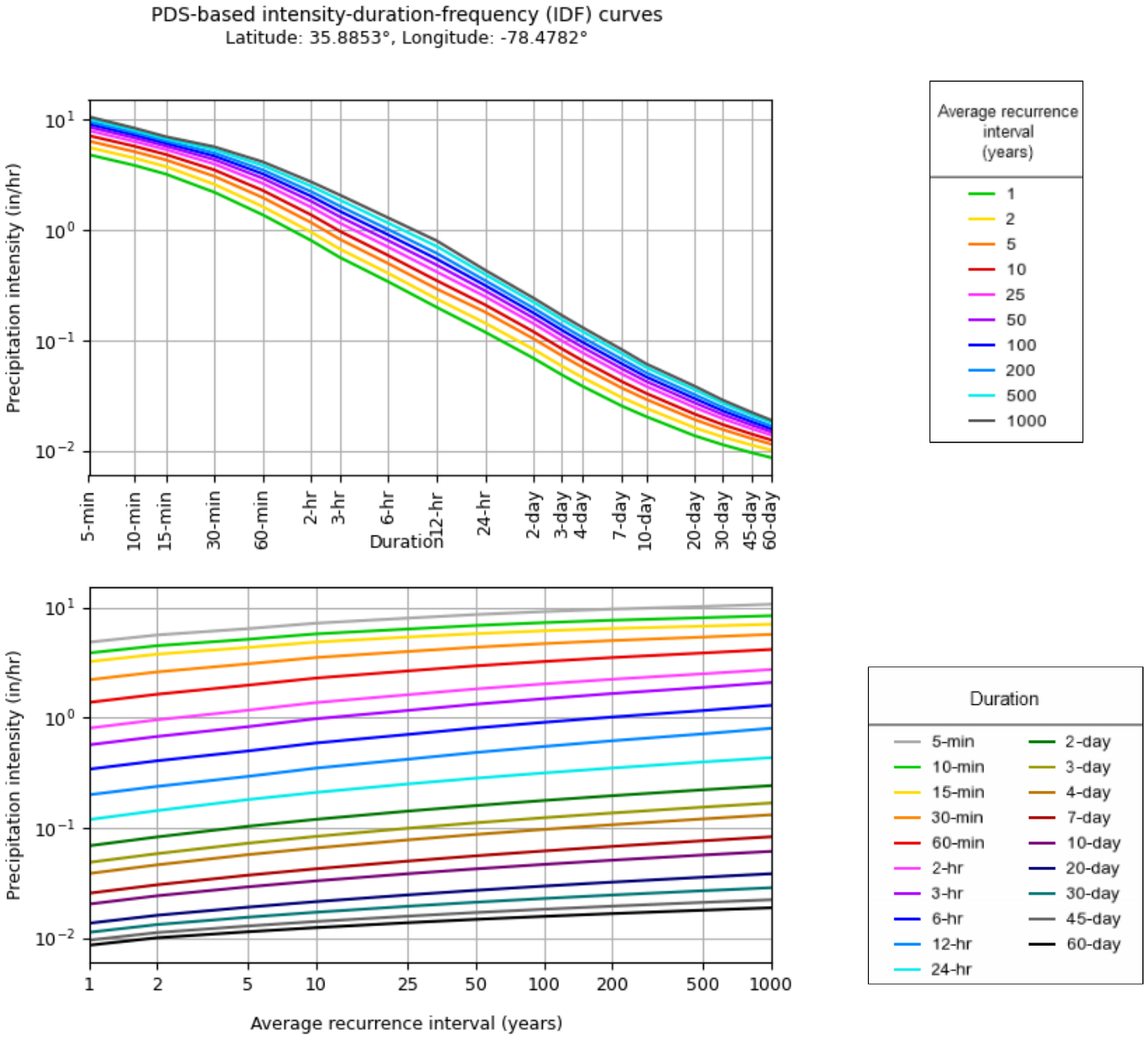
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical



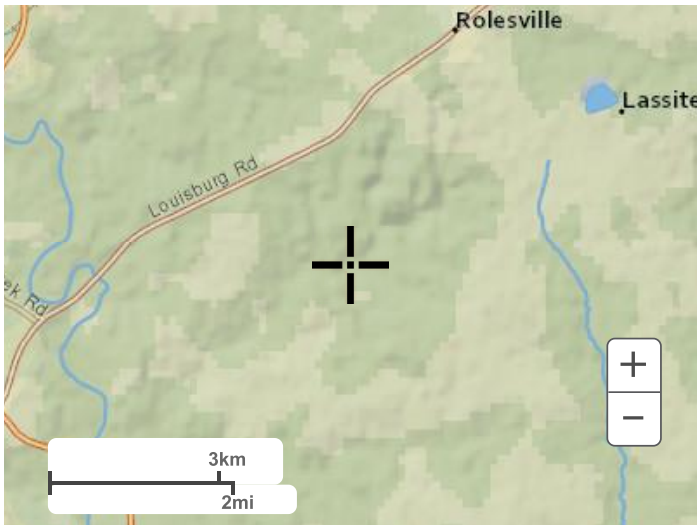
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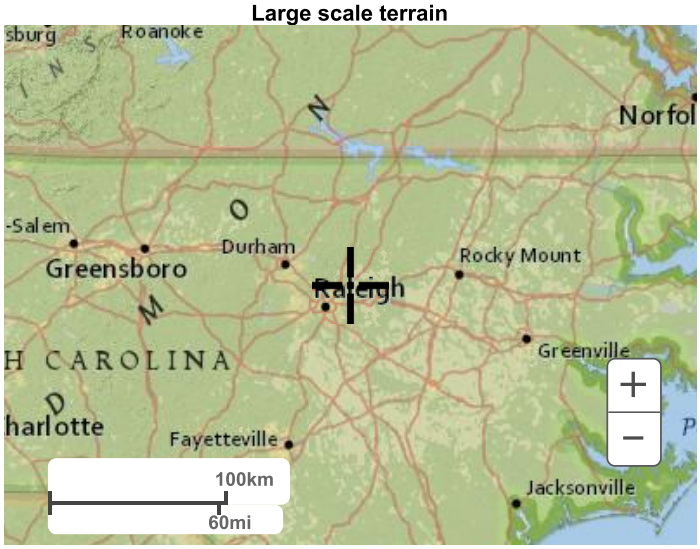
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Maps & aerials

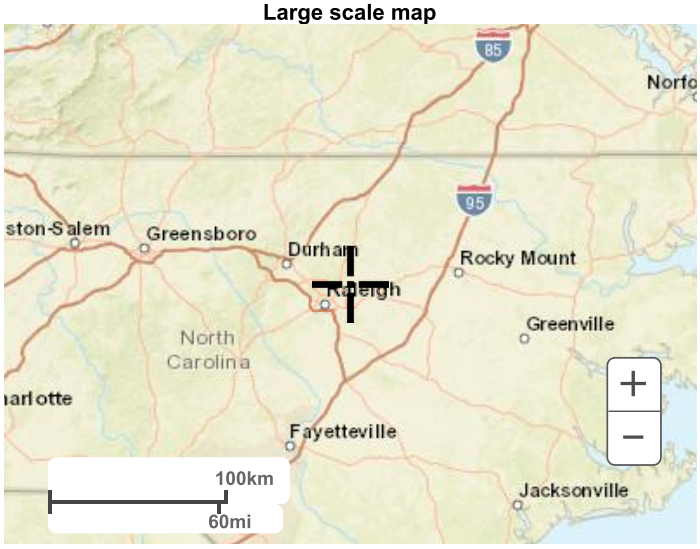
Small scale terrain



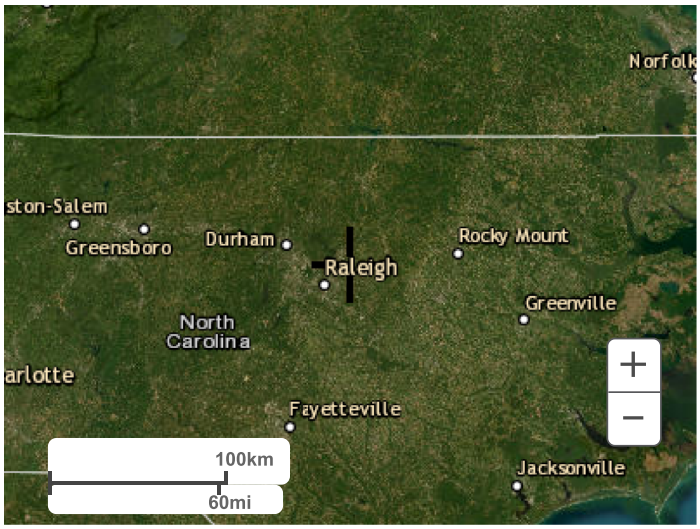
Large scale terrain



Large scale map



Large scale aerial



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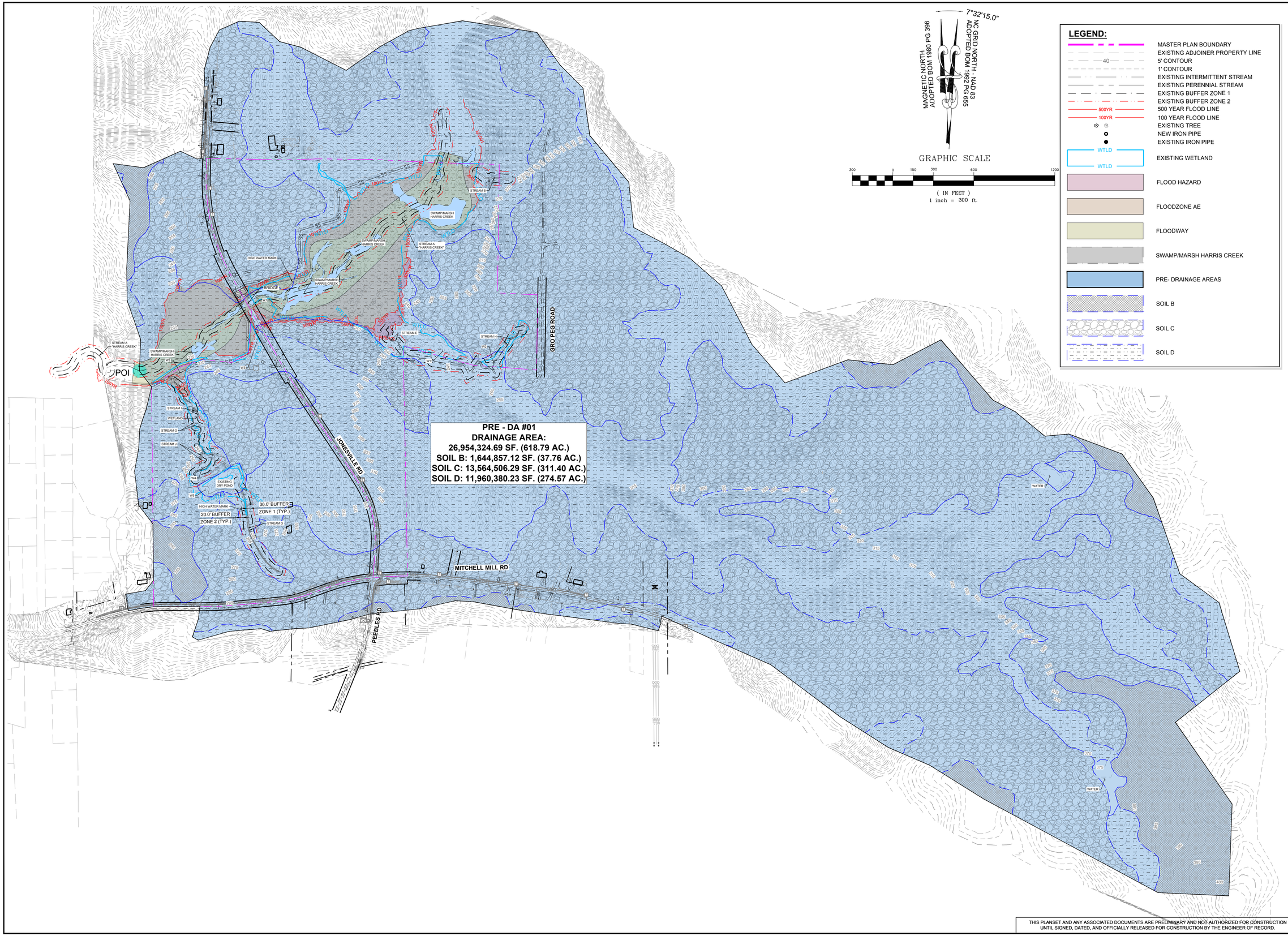
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

2.2. Drainage Area Delineation Pre- & Post-Development

2.3 Pre-Development

PROGRESS PLOT DATE: 10/01/2024



LEGEND:

- MASTER PLAN BOUNDARY
- EXISTING ADJOINER PROPERTY LINE
- 5' CONTOUR
- 1' CONTOUR
- EXISTING INTERMITTENT STREAM
- EXISTING PERENNIAL STREAM
- EXISTING BUFFER ZONE 1
- EXISTING BUFFER ZONE 2
- 500 YEAR FLOOD LINE
- 100 YEAR FLOOD LINE
- EXISTING TREE
- NEW IRON PIPE
- EXISTING IRON PIPE
- EXISTING WETLAND
- FLOOD HAZARD
- FLOODZONE AE
- FLOODWAY
- SWAMP/MARSH HARRIS CREEK
- PRE- DRAINAGE AREAS
- SOIL B
- SOIL C
- SOIL D

THIS PLANSET AND ANY ASSOCIATED DOCUMENTS ARE PRELIMINARY AND NOT AUTHORIZED FOR CONSTRUCTION UNTIL SIGNED, DATED, AND OFFICIALLY RELEASED FOR CONSTRUCTION BY THE ENGINEER OF RECORD.

No.	REVISIONS	DATE	BY

STRONGROCK
ENGINEERING GROUP

STRONG ROCK ENGINEERING GROUP, PLLC | COMPANY LICENSE # P-2166
305 CHURCH AT NORTH HILLS STREET, SUITE 1110 RALEIGH, NC 27609 | INFORMATION@STRONGROCKGROUP.COM

STRONG ROCK PROJECT	PSP-23-03
NOT FOR CONSTRUCTION	
SCALE	AS SHOWN
DESIGNED BY	JWL
DRAWN BY	SRG
CHECKED BY	JWL

RESERVE @ MITCHELL MILL
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

THE PRE - DRAINAGE AREA MAP

DRAWING SHEET
EXH-01

01 OF 04

Project:
Reserve @ Mitchell Mill

Calculated By:
TT
Date:
10/28/24

Weighted CN Coefficient Worksheet (PRE-Development)

Pre POI 1					
Weighted CN Value					
HSG	Category	Land Use	CN_i	A_i	$CN_i \times A_i$
A	Pervious	Managed Open Space	39		0.00
		Woods	30		0.00
B	Pervious	Managed Open Space	61	10.97	669.17
		Woods	55	24.22	1332.10
C	Pervious	Managed Open Space	74	96.30	7126.20
		Woods	70	205.54	14387.80
D	Pervious	Managed Open Space	80	84.82	6785.60
		Woods	77	181.13	13947.01
Open Water		Ponds, Lakes, Rivers, Etc.	100	9.08	908.00
Impervious		Road, Roof, Sidewalk, Etc.	98	6.75	661.50
				618.81	45817.38
				CN Value	74

STRONGROCK ENGINEERING GROUP

TIME OF CONCENTRATION INFORMATION

Project:	**Reserve at Mitchell Mill**
Subcatchment:	**Sub #1**

Location:	**0**
Date:	**6/4/2024**

Segment 1: Sheet Flow (Overland Flow)

Length =	50	ft
Top Elev =	402.5	ft
Bot Elev =	402	ft
Height =	0.5	ft
Slope =	0.010	ft/ft
Surface Type =	Light Woods	
Manning's n =	0.4	
P (2-year/24-hour) =	3.46	inch
Tt =	0.26	hour
Tt =	**15.65**	**minutes**

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

Segment 2: Shallow Concentrated Flow

Length =	857	ft
Top Elev =	402	ft
Bot Elev =	380	ft
Height =	22	ft
Slope =	0.026	ft/ft
Surface Type =	Unpaved	
Average Velocity =	2.59	ft/s
Tt =	0.09	hour
Tt =	**5.53**	**minutes**

$$T_t = \frac{L}{3600V}$$

Segment 3: Channel Flow

Length =	10000	ft
Top Elev =	380	ft
Bot Elev =	229.46	ft
Height =	150.54	ft
Slope =	0.015	ft/ft
Surface Type =	Grass	
Manning's n =	0.035	
Flow Area =	15	sf (5'w*3'h channel)
Wetted Perimeter =	11	ft (5'w*3'h channel)
Hydraulic Radius =	1.36	ft
Velocity =	6.42	ft/s
Tt =	0.43	hour
Tt =	**25.95**	**minutes**

$$T_t = \frac{L}{3600V} \qquad V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$$

Time of Concentration (Tc)

Tc =	**47.1 minutes**
SCS lag Time =	28.27 minutes
Time Increment =	8.20 minutes

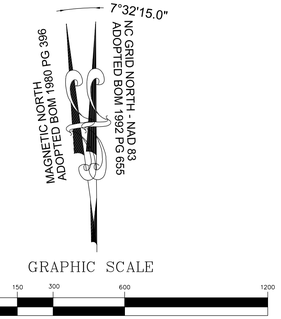
Discharge point :		
Reach to point:		
Reach:		
Distance =		ft

2.4 Post-Development

PROGRESS PLOT DATE: 05/21/2025

TOWNHOME NOTES:

STATES INTERNAL TOWNHOME DRIVEWAYS ARE PRIVATE EASEMENTS AS PER CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT



LEGEND:

- STORM DRAIN LINE
- FLARED END SECTION
- YARD INLET
- CATCH BASIN
- EX. MAJOR CONTOURS
- EX. MINOR CONTOURS
- 280 PROP. MAJOR CONTOURS
- PROP. MINOR CONTOURS
- PERVIOUS DRAINAGE AREA 1
- PERVIOUS DRAINAGE AREA 2 (ONSITE)
- PERVIOUS DRAINAGE AREA 2 (OFFSITE)
- PERVIOUS DRAINAGE AREA 3
- PERVIOUS DRAINAGE AREA 4
- PERVIOUS DRAINAGE AREA 5
- PERVIOUS DRAINAGE AREA 6
- PERVIOUS DRAINAGE AREA 7
- PERVIOUS DRAINAGE AREA 8
- PERVIOUS DRAINAGE AREA 9
- PERVIOUS DRAINAGE AREA 10
- IMPERVIOUS AREA
- BYPASS AREA
- EXISTING DRAINAGE AREA 1
- EXISTING DRAINAGE AREA 2
- EXISTING DRAINAGE AREA 3
- EXISTING DRAINAGE AREA 4
- SOIL B
- SOIL C
- SOIL D

DA #6
DRAINAGE AREA:
TOTAL: 659,400 SF. (15.14 AC.)
IMPERVIOUS: 364,035 SF. (8.36 AC.)
SOIL C: 467,116 SF. (10.72 AC.)
SOIL D: 191,553 SF. (4.40 AC.)

DA #5
DRAINAGE AREA:
TOTAL: 150,129 SF. (3.45 AC.)
IMPERVIOUS: 76,376 SF. (1.75 AC.)
SOIL C: 93,372 SF. (2.14 AC.)
SOIL D: 56,757 SF. (1.30 AC.)

EXISTING DA 3
DRAINAGE AREA:
TOTAL: 1,085,551 SF. (24.92 AC.)

DA - NCDOT
DRAINAGE AREA:
TOTAL: 77,629 SF. (1.78 AC.)
IMPERVIOUS: 30,242 SF. (0.69 AC.)
SOIL C: 77,629 SF. (1.78 AC.)

DA #4
DRAINAGE AREA:
TOTAL: 446,369 SF. (10.25 AC.)
IMPERVIOUS: 276,660 SF. (6.35 AC.)
SOIL C: 348,578 SF. (8.00 AC.)
SOIL D: 98,364 SF. (2.26 AC.)

DA #7
DRAINAGE AREA:
TOTAL: 612,372 SF. (14.06 AC.)
IMPERVIOUS: 367,613 SF. (8.44 AC.)
SOIL C: 275,843 SF. (6.33 AC.)
SOIL D: 336,471 SF. (7.72 AC.)

DA #3
DRAINAGE AREA:
TOTAL: 825,566 SF. (18.95 AC.)
IMPERVIOUS: 423,118 SF. (9.71 AC.)
SOIL C: 208,146 SF. (4.78 AC.)
SOIL D: 624,817 SF. (14.34 AC.)

EXISTING DA 4
DRAINAGE AREA:
TOTAL: 83,756 SF. (1.92 AC.)

DA #8
DRAINAGE AREA:
TOTAL: 286,784 SF. (6.58 AC.)
IMPERVIOUS: 164,151 SF. (3.77 AC.)
SOIL B: 75,705 SF. (1.74 AC.)
SOIL C: 42,095 SF. (0.97 AC.)
SOIL D: 153,678 SF. (3.53 AC.)

EXISTING DA 2
DRAINAGE AREA:
TOTAL: 18,503,194 SF. (424.77 AC.)

DA #2 (ONSITE)
DRAINAGE AREA:
TOTAL: 675,467 SF. (15.51 AC.)
IMPERVIOUS: 79,849 SF. (1.83 AC.)
SOIL C: 98,304 SF. (2.26 AC.)
SOIL D: 27,424 SF. (0.63 AC.)

DA #9
DRAINAGE AREA:
TOTAL: 16,875 SF. (0.39 AC.)
IMPERVIOUS: 9,074 SF. (0.21 AC.)
SOIL B: 1,077 SF. (0.02 AC.)
SOIL C: 14,991 SF. (0.34 AC.)

DA #1
DRAINAGE AREA:
TOTAL: 423,587 SF. (9.72 AC.)
IMPERVIOUS: 232,280 SF. (5.33 AC.)
SOIL B: 67,343 SF. (1.55 AC.)
SOIL C: 295,931 SF. (6.79 AC.)
SOIL D: 57,245 SF. (1.31 AC.)

EXISTING DA 1
DRAINAGE AREA:
TOTAL: 858,950 SF. (19.72 AC.)

PROPERTY LINE
GRO PEG ROAD (67' PRIVATE R/W, RECORDED BOOK OF MAPS 1999 PAGE 384)
FUTURE DAYS WAY
JONESVILLE RD
SUPERSONIC WAY
CORNELL GARDEN STREET
SUPERSONIC WAY
LUKIN LANE
LIGHTNING BOLT LANE
PARACHUTE PLACE
LIGHTNING BOLT LANE
COUNTER STREET
LIGHTNING BOLT LANE
MONKEYWRENCH STREET
MOOKIE ALLEY
BETTERMAN DRIVE
JONESVILLE RD
VEDDER LANE
UNPLUGGED AVENUE
GUARANTEED ALLEY
MCCREADY COURT
PENDULUM STREET
DARK MATTER ALLEY
CAMERON SOUND ALLEY
PENDULUM STREET
EVEN FLOW LANE
YELLOW MOON COURT
MITCHELL MILL RD. (60' PUBLIC R/W)
PEEBLES RD. (80' PUBLIC R/W)
POI
POI #1
POI #2
POI #3
POI #4
POI #5
POI #6
POI #7
POI #8
POI #9
POI #10
ELEV. 233.08

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No.	REVISIONS	DATE	BY

SEAL:

STRONGROCK
ENGINEERING GROUP
STRONG ROCK ENGINEERING GROUP, PLLC | COMPANY LICENSE # P-2166
305 CHURCH AT NORTH HILLS STREET, SUITE 1110 RALEIGH, NC 27609 | INFORMATION@STRONGROCKGROUP.COM

STRONG ROCK PROJECT	PSP-23-03		
NOT FOR CONSTRUCTION			
SCALE	AS SHOWN	DESIGNED BY	SRG
		DRAWN BY	SRG
		CHECKED BY	SRG

RESERVE @ MITCHELL MILL
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

POST DA MAP

DRAWING SHEET

EXH-03

03 OF 04

PROGRESS PLOT DATE: 05/14/2025

ADJOINER INFORMATION

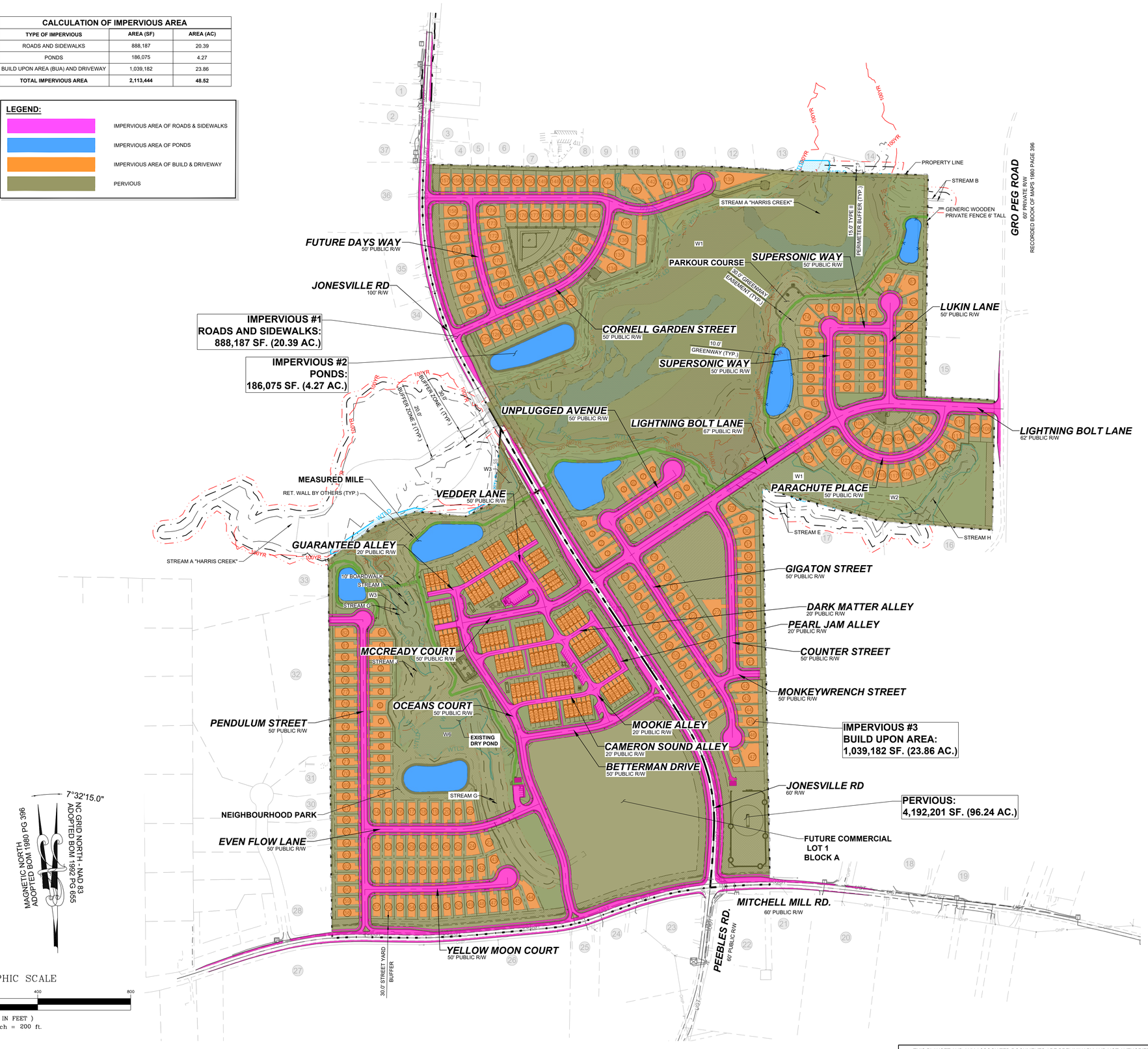
1	CHARLES E. FERRELL AND WIFE GRETTA LOUISE FERRELL PIN: 1757481951 DB 1813 PG 421 ZONING: R-30 (WC) USE: SF	20	CECIL L. GOODNIGHT AND WIFE, JUDY J. GOODNIGHT PIN: 1757650296 DB 5344 PG 819 ZONING: R-30 (WC) USE: SF
2	ABRAHAM T.BURNHAM ANDKYLA L. BURNHAM PIN: 1757481832 DB 19140 PG 734 ZONING: R-30 (WC) USE: SF	21	CECIL L. GOODNIGHT AND WIFE, JUDY J. GOODNIGHT PIN: 1757641415 DB 5344 PG 819 ZONING: R-30 (WC) USE: VA
3	JOE L. GREEN PIN: 1757483799 DB 15-E PG 2691 ZONING: R-30 (WC) USE: SF	22	CHRISTOPHER GHOLSON AND WIFE, KELLY GAITHER GHOLSON PIN: 1757556361 DB 17855 PG 457 LOT 4 - BM 2018 PG 1333 ZONING: R-30 (WC) USE: SF
4	CHARLES ALFONSA JONES AND WIFE ALLIE V.JONES PIN: 1757484609 DB 2305 PG 673 ZONING: R-30 (WC) USE: SF	23	ABAHOR ELIAS AND SPOUSE, SUSAN ELIAS PIN: 1757553215 DB 17220 PG 2509 LOT 3 - BM 2018 PG 1333 ZONING: R-30 (WC) USE: SF
5	BENJAMIN FERRELL PIN: 1757485713 DB 1697 PG 465 ZONING: R-30 (WC) USE: SF	24	TODD KENDALL HONEYCUTT PIN: 1757551202 DB 13474 PG 1974 LOT 2 - BM 2018 PG 1333 ZONING: R-30 (WC) USE: SF
6	ALESHIA FERRELL & ARRON WALKER PIN: 1757486733 DB 6374 PG 89 BM 1996 PG 00524 ZONING: R-30 (WC) USE: SF	25	CURTIS L. HONEYCUTT AND WIFE TODD KENDALL PIN: 1757540996 DB 19269 PG 2474 LOT 1 - BM 2018 PG 1333 ZONING: R-30 (WC) USE: SF
7	CHRIST HOLINESS CHURCH #1 PIN: 1757487783 DB 2928 PG 328 ZONING: R-30 (WC) USE: CH	26	PHETIS JONES BRADSHER PIN: 1757349473 DB 15208 PG 2320 BM 2013 PG 868 ZONING: R-30 (WC) USE: FO
8	CHRIST HOLINESS CHURCH #1 PIN: 1757489733 DB 4321 PG 788 ZONING: R-30 (WC) USE: VA	27	PHETIS JONES BRADSHER PIN: 1757349473 DB 15208 PG 2320 ZONING: R-30 (WC) USE: FO
9	CHRIST HOLINESS CHURCH #1 PIN: 1757580764 DB 9467 PG 430 ZONING: R-30 (WC) USE: VA	28	PERRY Y.ELWOOD RYAN PIN: 1757357582 DB 19292 PG 2780 ZONING: R-30 (WC) USE: MO
10	ALICIA BROWN & CARL T. JONES PIN: 1757582714 DB 16128 PG 183 ZONING: R-30 (WC) USE: SF	29	TOUTLOFF, KENNETH S. TOUTLOFF, BILLIE ANNE PIN: 1757357764 DB 9236 PG 2229 LOT 3 - BM 1990 PG 956 ZONING: R-30 (WC) USE: SF
11	RS RENTAL II LLC PIN: 1757584724 DB 18703 PG 2414 BM 1981 PG 894 ZONING: R-30 (WC) USE: SF	30	BERNARD MILLER PIN: 1757357865 DB 15416 PG 1651 LOT 4 - BM 1990 PG 956 ZONING: R-30 (WC) USE: SF
12	KAREN E. BASS PIN: 1757586704 DB 12560 PG 1626 BM 1984 PG 943 ZONING: R-30 (WC) USE: SF	31	MARCIE L. HOLDEN PIN: 1757358908 DB 15599 PG 1003 LOT 5 - BM 1990 PG 956 ZONING: R-30 (WC) USE: SF
13	JAMES K. WILLIAMS PIN: 1757588784 DB 16784 PG 1013 BM 1989 PG 01474 ZONING: R-30 (WC) USE: VA	32	MEGAN KULAWIAK PIN: 1757367367 DB 16226 PG 1133 LOT 6 BM 1990 PG 00387 ZONING: R-30 (WC) USE: VA
14	GRO PEG PROPERTIES LLC PIN: 1757684697 DB 18359 PG 1707 LOT 5 - BM 1980 PG 00396 ZONING: R-30 (WC) USE: VA	33	KENNETH INVESTMENT LLC. PIN: 1757368816 DB 19248 PG 1884 ZONING: R-30 (WC) USE: VA
15	SCOTT & THERESA CARLE PIN: 1757675786 DB 14863 PG 2493 LOT 4A- BM 1980 PG 00396 ZONING: R-30 (WC) USE: VA	34	KENNETH INVESTMENT LLC PIN: 1757471559 DB 19248 PG 1884 LOT - BM 2007 PG 01224 ZONING: R-30 (WC) USE: VA
16	GRO PEG PROPERTIES PIN: 1757664956 DB 19081 PG 2786 LOT 2A- BM 1982 PG 00581 ZONING: R-30 (WC) USE: VA	35	HENRY ALSTON PIN: 1757481376 DB 19248 PG 984 BM 1982 PG 721 ZONING: R-30 (WC) USE: SF
17	MT. CALVARY HOLINESS CHURCH OF WAKE CO. INC PIN: 1757660324 DB 10124 PG 2778 LOT 1- BM 2002 PG 991 ZONING: R-30 (WC) USE: VA	36	UNIVERSAL CHURCH OF PRAYER PIN: 1757388408 DB 19555 PG 1723 LOT - BM 2002 PG 00667 ZONING: R-30 (WC) USE: CH
18	G.ARCHIE UNDERHILL, JR. AND WIFE, TERESSA C. UNDERHILL PIN: 1757653765 DB 8443 PG 2129 BM 1999 PG 1357 ZONING: R-30 (WC) USE: SF	37	ROZELIA J. HARTSFIELD HEIRS PIN: 1757481740 DB 10-E PG 1220 ZONING: R-30 (WC) USE: VA
19	GENADIUS MAC PREDDY AND WIFE, MATTIE F. PREDDY PIN: 1757656586 DB 1882 PG 342 ZONING: R-30 (WC) USE: SF		

CALCULATION OF IMPERVIOUS AREA

TYPE OF IMPERVIOUS	AREA (SF)	AREA (AC)
ROADS AND SIDEWALKS	888,187	20.39
PONDS	186,075	4.27
BUILD UPON AREA (BUA) AND DRIVEWAY	1,039,182	23.86
TOTAL IMPERVIOUS AREA	**2,113,444**	**48.52**

LEGEND:

- IMPERVIOUS AREA OF ROADS & SIDEWALKS
- IMPERVIOUS AREA OF PONDS
- IMPERVIOUS AREA OF BUILD & DRIVEWAY
- PERVIOUS



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No.	REVISIONS	DATE	BY

SEAL:

STRONGROCK ENGINEERING GROUP
STRONG ROCK ENGINEERING GROUP, PLLC | COMPANY LICENSE # P-2165
305 CHURCH AT NORTH HILLS STREET, SUITE 1110 RALEIGH, NC 27609 | INFORMATION@STRONGROCKGROUP.COM

STRONG ROCK PROJECT	PSP-23-03
NOT FOR CONSTRUCTION	
SCALE	AS SHOWN
DESIGNED BY	SRG
DRAWN BY	SRG
CHECKED BY	SRG

RESERVE @ MITCHELL MILL
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

THE IMPERVIOUS MAP

DRAWING SHEET
EXH-02

02 OF 04

Project:
Reserve @ Mitchell Mill

Calculated By:
TT
Date:
05/21/25

Weighted CN Coefficient Worksheet (POST-Development)

Post DA 1					
Weighted CN Value					
HSG	Category	Land Use	CN_i	A_i	$CN_i \times A_i$
A	Pervious	Managed Open Space	39		0.00
		Woods	30		0.00
B	Pervious	Managed Open Space	61	1.02	62.22
		Woods	55		0.00
C	Pervious	Managed Open Space	74	2.99	221.26
		Woods	70		0.00
D	Pervious	Managed Open Space	80	0.38	30.40
		Woods	77		0.00
Open Water		Ponds, Lakes, Rivers, Etc.	100	0.85	85.00
Impervious		Road, Roof, Sidewalk, Etc.	98	4.48	439.04
				9.72	837.92
				CN Value	86

Post DA 2					
Weighted CN Value					
HSG	Category	Land Use	CN_i	A_i	$CN_i \times A_i$
A	Pervious	Managed Open Space	39		0.00
		Woods	30		0.00
B	Pervious	Managed Open Space	61		0.00
		Woods	55		0.00
C	Pervious	Managed Open Space	74	8.39	620.86
		Woods	70		0.00
D	Pervious	Managed Open Space	80	5.29	423.20
		Woods	77		0.00
Open Water		Ponds, Lakes, Rivers, Etc.	100		0.00
Impervious		Road, Roof, Sidewalk, Etc.	98	1.83	179.34
				15.51	1223.40
				CN Value	79

Post DA 3					
Weighted CN Value					
HSG	Category	Land Use	CN_i	A_i	$CN_i \times A_i$
A	Pervious	Managed Open Space	39		0.00
		Woods	30		0.00
B	Pervious	Managed Open Space	61		0.00
		Woods	55		0.00
C	Pervious	Managed Open Space	74	2.73	201.65
		Woods	70		0.00
D	Pervious	Managed Open Space	80	6.52	521.20
		Woods	77		0.00
Open Water		Ponds, Lakes, Rivers, Etc.	100	0.85	85.00
Impervious		Road, Roof, Sidewalk, Etc.	98	8.86	868.28
				18.95	1676.13
				CN Value	88

Post DA 4					
Weighted CN Value					
HSG	Category	Land Use	CN_i	A_i	$CN_i \times A_i$
A	Pervious	Managed Open Space	39		0.00
		Woods	30		0.00
B	Pervious	Managed Open Space	61		0.00
		Woods	55		0.00
C	Pervious	Managed Open Space	74	2.98	220.15
		Woods	70		0.00
D	Pervious	Managed Open Space	80	0.93	74.00
		Woods	77		0.00
Open Water		Ponds, Lakes, Rivers, Etc.	100	0.79	79.00
Impervious		Road, Roof, Sidewalk, Etc.	98	5.56	544.88
				10.25	918.03
				CN Value	90

Post DA 5					
Weighted CN Value					
HSG	Category	Land Use	CN_i	A_i	$CN_i \times A_i$
A	Pervious	Managed Open Space	39		0.00
		Woods	30		0.00
B	Pervious	Managed Open Space	61		0.00
		Woods	55		0.00
C	Pervious	Managed Open Space	74	1.08	79.92
		Woods	70		0.00
D	Pervious	Managed Open Space	80	0.62	49.60
		Woods	77		0.00
Open Water		Ponds, Lakes, Rivers, Etc.	100	0.41	41.00
Impervious		Road, Roof, Sidewalk, Etc.	98	1.34	131.32
				3.45	301.84
				CN Value	87

Post DA 6					
Weighted CN Value					
HSG	Category	Land Use	CN_i	A_i	$CN_i \times A_i$
A	Pervious	Managed Open Space	39		0.00
		Woods	30		0.00
B	Pervious	Managed Open Space	61		0.00
		Woods	55		0.00
C	Pervious	Managed Open Space	74	5.79	428.46
		Woods	70		0.00
D	Pervious	Managed Open Space	80	0.99	79.20
		Woods	77		0.00
Open Water		Ponds, Lakes, Rivers, Etc.	100	0.66	66.00
Impervious		Road, Roof, Sidewalk, Etc.	98	7.70	754.60
				15.14	1328.26
				CN Value	88

Post DA 7					
Weighted CN Value					
HSG	Category	Land Use	CN_i	A_i	$CN_i \times A_i$
A	Pervious	Managed Open Space	39		0.00
		Woods	30		0.00
B	Pervious	Managed Open Space	61		0.00
		Woods	55		0.00
C	Pervious	Managed Open Space	74	2.50	185.07
		Woods	70		0.00
D	Pervious	Managed Open Space	80	3.12	249.20
		Woods	77		0.00
Open Water		Ponds, Lakes, Rivers, Etc.	100	0.82	82.00
Impervious		Road, Roof, Sidewalk, Etc.	98	7.62	746.76
				14.06	1263.03
				CN Value	90

Post DA 8					
Weighted CN Value					
HSG	Category	Land Use	CN_i	A_i	$CN_i \times A_i$
A	Pervious	Managed Open Space	39		0.00
		Woods	30		0.00
B	Pervious	Managed Open Space	61	0.45	27.45
		Woods	55		0.00
C	Pervious	Managed Open Space	74	0.48	35.52
		Woods	70		0.00
D	Pervious	Managed Open Space	80	1.88	150.40
		Woods	77		0.00
Open Water		Ponds, Lakes, Rivers, Etc.	100	0.33	33.00
Impervious		Road, Roof, Sidewalk, Etc.	98	3.44	337.12
				6.58	583.49
				CN Value	89

Post DA NCDOT					
Weighted CN Value					
HSG	Category	Land Use	CN_i	A_i	$CN_i \times A_i$
A	Pervious	Managed Open Space	39		0.00
		Woods	30		0.00
B	Pervious	Managed Open Space	61		0.00
		Woods	55		0.00
C	Pervious	Managed Open Space	74	1.09	80.66
		Woods	70		0.00
D	Pervious	Managed Open Space	80		0.00
		Woods	77		0.00
Open Water		Ponds, Lakes, Rivers, Etc.	100		0.00
Impervious		Road, Roof, Sidewalk, Etc.	98	0.69	67.62
				1.78	148.28
				CN Value	83

STRONGROCK ENGINEERING GROUP

TIME OF CONCENTRATION INFORMATION

Project:	**Reserve at Mitchell Mill**
Subcatchment:	**Post DA 1**

Date:	**10/31/2024**

Segment 1: Sheet Flow (Overland Flow)

Length =	30	ft
Top Elev =	291.43	ft
Bot Elev =	291	ft
Height =	0.43	ft
Slope =	0.014	ft/ft
Surface Type =	Paved	
Manning's n =	0.011	
P (2-year/24-hour) =	3.46	inch
Tt =	0.01	hour
Tt =	**0.51**	**minutes**

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

Segment 2: Shallow Concentrated Flow

Length =	930	ft
Top Elev =	291	ft
Bot Elev =	272.71	ft
Height =	18.29	ft
Slope =	0.020	ft/ft
Surface Type =	Paved	
Average Velocity =	2.85	ft/s
Tt =	0.09	hour
Tt =	**5.44**	**minutes**

$$T_t = \frac{L}{3600V}$$

Segment 3: Channel Flow

Length =	473	ft
Top Elev =	272.71	ft
Bot Elev =	262	ft
Height =	10.71	ft
Slope =	0.023	ft/ft
Surface Type =	Concrete finished	
Manning's n =	0.012	
Flow Area =	7.07	sf (36" pipe)
Wetted Perimeter =	9.42	ft (36" pipe)
Hydraulic Radius =	0.75	ft
Velocity =	15.42	ft/s
Tt =	0.01	hour
Tt =	**0.51**	**minutes**

$$T_t = \frac{L}{3600V} \qquad V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$$

Time of Concentration (Tc)

Tc = 6.5 minutes

SCS lag Time =	3.87	minutes
Time Increment =	1.12	minutes

Discharge point :		
Reach to point:		
Reach:		
Distance =		ft

STRONGROCK ENGINEERING GROUP

TIME OF CONCENTRATION INFORMATION

Project:	**Reserve at Mitchell Mill**
Subcatchment:	**Post DA 3**

Date:	**10/31/2024**

Segment 1: Sheet Flow (Overland Flow)

Length =	50	ft
Top Elev =	311.54	ft
Bot Elev =	311	ft
Height =	0.54	ft
Slope =	0.011	ft/ft
Surface Type =	Paved	
Manning's n =	0.011	
P (2-year/24-hour) =	3.46	inch
Tt =	0.01	hour
Tt =	**0.86**	**minutes**

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

Segment 2: Shallow Concentrated Flow

Length =	1515	ft
Top Elev =	311	ft
Bot Elev =	250	ft
Height =	61	ft
Slope =	0.040	ft/ft
Surface Type =	Paved	
Average Velocity =	4.08	ft/s
Tt =	0.10	hour
Tt =	**6.19**	**minutes**

$$T_t = \frac{L}{3600V}$$

Segment 3: Channel Flow

Length =	314	ft
Top Elev =	250	ft
Bot Elev =	242	ft
Height =	8	ft
Slope =	0.025	ft/ft
Surface Type =	Concrete finished	
Manning's n =	0.012	
Flow Area =	7.07	sf (36" pipe)
Wetted Perimeter =	9.42	ft (36" pipe)
Hydraulic Radius =	0.75	ft
Velocity =	16.36	ft/s
Tt =	0.01	hour
Tt =	**0.32**	**minutes**

$$T_t = \frac{L}{3600V} \qquad V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$$

Time of Concentration (Tc)

Tc =	**7.4**	**minutes**
SCS lag Time =	4.42	minutes
Time Increment =	1.28	minutes

Discharge point :		
Reach to point:		
Reach:		
Distance =		ft

STRONGROCK ENGINEERING GROUP

TIME OF CONCENTRATION INFORMATION

Project:	**Reserve at Mitchell Mill**
Subcatchment:	**Post DA 4**

Date:	**10/31/2024**

Segment 1: Sheet Flow (Overland Flow)

Length =	60	ft
Top Elev =	288.66	ft
Bot Elev =	288	ft
Height =	0.66	ft
Slope =	0.011	ft/ft
Surface Type =	Paved	
Manning's n =	0.011	
P (2-year/24-hour) =	3.46	inch
Tt =	0.02	hour
Tt =	**0.98**	**minutes**

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

Segment 2: Shallow Concentrated Flow

Length =	1000	ft
Top Elev =	288	ft
Bot Elev =	250	ft
Height =	38	ft
Slope =	0.038	ft/ft
Surface Type =	Paved	
Average Velocity =	3.96	ft/s
Tt =	0.07	hour
Tt =	**4.21**	**minutes**

$$T_t = \frac{L}{3600V}$$

Segment 3: Channel Flow

Length =	207	ft
Top Elev =	250	ft
Bot Elev =	238.5	ft
Height =	11.5	ft
Slope =	0.056	ft/ft
Surface Type =	Concrete finished	
Manning's n =	0.012	
Flow Area =	7.07	sf (36" pipe)
Wetted Perimeter =	9.42	ft (36" pipe)
Hydraulic Radius =	0.75	ft
Velocity =	24.16	ft/s
Tt =	0.00	hour
Tt =	**0.14**	**minutes**

$$T_t = \frac{L}{3600V} \qquad V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$$

Time of Concentration (Tc)

Tc = 5.3 minutes

SCS lag Time =	3.20	minutes
Time Increment =	0.93	minutes

Discharge point :		
Reach to point:		
Reach:		
Distance =		ft

STRONGROCK ENGINEERING GROUP

TIME OF CONCENTRATION INFORMATION

Project:	**Reserve at Mitchell Mill**
Subcatchment:	**Post DA 5**

Date:	**10/31/2024**

Segment 1: Sheet Flow (Overland Flow)

Length =	43	ft
Top Elev =	263.91	ft
Bot Elev =	263	ft
Height =	0.91	ft
Slope =	0.021	ft/ft
Surface Type =	Paved	
Manning's n =	0.011	
P (2-year/24-hour) =	3.46	inch
Tt =	0.01	hour
Tt =	**0.58**	**minutes**

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

Segment 2: Shallow Concentrated Flow

Length =	300	ft
Top Elev =	263	ft
Bot Elev =	260.24	ft
Height =	2.76	ft
Slope =	0.009	ft/ft
Surface Type =	Paved	
Average Velocity =	1.95	ft/s
Tt =	0.04	hour
Tt =	**2.56**	**minutes**

$$T_t = \frac{L}{3600V}$$

Segment 3: Channel Flow

Length =	167	ft
Top Elev =	260.24	ft
Bot Elev =	250	ft
Height =	10.24	ft
Slope =	0.061	ft/ft
Surface Type =	Concrete finished	
Manning's n =	0.012	
Flow Area =	4.91	sf (30" pipe)
Wetted Perimeter =	7.85	ft (30" pipe)
Hydraulic Radius =	0.63	ft
Velocity =	22.48	ft/s
Tt =	0.00	hour
Tt =	**0.12**	**minutes**

$$T_t = \frac{L}{3600V} \qquad V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$$

Time of Concentration (Tc)

Tc =	**5.0** **minutes**
SCS lag Time =	3.00 minutes
Time Increment =	0.87 minutes

Discharge point :		
Reach to point:		
Reach:		
Distance =		ft

STRONGROCK ENGINEERING GROUP

TIME OF CONCENTRATION INFORMATION

Project:	**Reserve at Mitchell Mill**
Subcatchment:	**Post DA 6**

Date:	**10/31/2024**

Segment 1: Sheet Flow (Overland Flow)

Length =	60	ft
Top Elev =	260.54	ft
Bot Elev =	260	ft
Height =	0.54	ft
Slope =	0.009	ft/ft
Surface Type =	Paved	
Manning's n =	0.011	
P (2-year/24-hour) =	3.46	inch
Tt =	0.02	hour
Tt =	**1.07**	**minutes**

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

Segment 2: Shallow Concentrated Flow

Length =	1700	ft
Top Elev =	260	ft
Bot Elev =	241.93	ft
Height =	18.07	ft
Slope =	0.011	ft/ft
Surface Type =	Paved	
Average Velocity =	2.10	ft/s
Tt =	0.23	hour
Tt =	**13.52**	**minutes**

$$T_t = \frac{L}{3600V}$$

Segment 3: Channel Flow

Length =	199	ft
Top Elev =	241.93	ft
Bot Elev =	234	ft
Height =	7.93	ft
Slope =	0.040	ft/ft
Surface Type =	Concrete finished	
Manning's n =	0.012	
Flow Area =	4.91	sf (30" pipe)
Wetted Perimeter =	7.85	ft (30" pipe)
Hydraulic Radius =	0.63	ft
Velocity =	18.12	ft/s
Tt =	0.00	hour
Tt =	**0.18**	**minutes**

$$T_t = \frac{L}{3600V} \qquad V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$$

Time of Concentration (Tc)

Tc = 14.8 minutes

SCS lag Time =	8.86	minutes
Time Increment =	2.57	minutes

Discharge point :		
Reach to point:		
Reach:		
Distance =		ft

STRONGROCK ENGINEERING GROUP

TIME OF CONCENTRATION INFORMATION

Project:	**Reserve at Mitchell Mill**
Subcatchment:	**Post DA 7**

Date:	**10/31/2024**

Segment 1: Sheet Flow (Overland Flow)

Length =	21	ft
Top Elev =	310.25	ft
Bot Elev =	310	ft
Height =	0.25	ft
Slope =	0.012	ft/ft
Surface Type =	Paved	
Manning's n =	0.011	
P (2-year/24-hour) =	3.46	inch
Tt =	0.01	hour
Tt =	**0.41**	**minutes**

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

Segment 2: Shallow Concentrated Flow

Length =	1400	ft
Top Elev =	310	ft
Bot Elev =	248.75	ft
Height =	61.25	ft
Slope =	0.044	ft/ft
Surface Type =	Paved	
Average Velocity =	4.25	ft/s
Tt =	0.09	hour
Tt =	**5.49**	**minutes**

$$T_t = \frac{L}{3600V}$$

Segment 3: Channel Flow

Length =	313	ft
Top Elev =	248.75	ft
Bot Elev =	239	ft
Height =	9.75	ft
Slope =	0.031	ft/ft
Surface Type =	Concrete finished	
Manning's n =	0.012	
Flow Area =	9.62	sf (42" pipe)
Wetted Perimeter =	11.00	ft (42" pipe)
Hydraulic Radius =	0.88	ft
Velocity =	20.05	ft/s
Tt =	0.00	hour
Tt =	**0.26**	**minutes**

$$T_t = \frac{L}{3600V} \qquad V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$$

Time of Concentration (Tc)

Tc = 6.2 minutes

SCS lag Time =	3.70	minutes
Time Increment =	1.07	minutes

Discharge point :		
Reach to point:		
Reach:		
Distance =		ft

STRONGROCK ENGINEERING GROUP

TIME OF CONCENTRATION INFORMATION

Project:	**Reserve at Mitchell Mill**
Subcatchment:	**Post DA 8**

Date:	**10/31/2024**

Segment 1: Sheet Flow (Overland Flow)

Length =	33	ft
Top Elev =	280.57	ft
Bot Elev =	280	ft
Height =	0.57	ft
Slope =	0.017	ft/ft
Surface Type =	Paved	
Manning's n =	0.011	
P (2-year/24-hour) =	3.46	inch
Tt =	0.01	hour
Tt = 0.51		**minutes**

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

Segment 2: Shallow Concentrated Flow

Length =	850	ft
Top Elev =	280	ft
Bot Elev =	269.18	ft
Height =	10.82	ft
Slope =	0.013	ft/ft
Surface Type =	Paved	
Average Velocity =	2.29	ft/s
Tt =	0.10	hour
Tt = 6.18		**minutes**

$$T_t = \frac{L}{3600V}$$

Segment 3: Channel Flow

Length =	248	ft
Top Elev =	269.18	ft
Bot Elev =	238.72	ft
Height =	30.46	ft
Slope =	0.123	ft/ft
Surface Type =	Concrete finished	
Manning's n =	0.012	
Flow Area =	4.91	sf (36" pipe)
Wetted Perimeter =	7.85	ft (36" pipe)
Hydraulic Radius =	0.63	ft
Velocity =	31.81	ft/s
Tt =	0.00	hour
Tt = 0.13		**minutes**

$$T_t = \frac{L}{3600V} \qquad V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$$

Time of Concentration (Tc)

Tc = 6.8 minutes

SCS lag Time =	4.09 minutes
Time Increment =	1.19 minutes

Discharge point :		
Reach to point:		
Reach:		
Distance =		ft

STRONGROCK ENGINEERING GROUP

TIME OF CONCENTRATION INFORMATION

Project:	**Reserve at Mitchell Mill**
Subcatchment:	**Existing DA 1**

Date:	**10/31/2024**

Segment 1: Sheet Flow (Overland Flow)

Length =	40	ft
Top Elev =	300	ft
Bot Elev =	298	ft
Height =	2	ft
Slope =	0.050	ft/ft
Surface Type =	Dense Woods	
Manning's n =	0.8	
P (2-year/24-hour) =	3.46	inch
Tt =	0.20	hour
Tt =	**11.97**	**minutes**

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

Segment 2: Shallow Concentrated Flow

Length =	192	ft
Top Elev =	298	ft
Bot Elev =	290.13	ft
Height =	7.87	ft
Slope =	0.041	ft/ft
Surface Type =	Unpaved	
Average Velocity =	3.27	ft/s
Tt =	0.02	hour
Tt =	**0.98**	**minutes**

$$T_t = \frac{L}{3600V}$$

Segment 3: Channel Flow

Length =	556	ft
Top Elev =	290.13	ft
Bot Elev =	274.65	ft
Height =	15.48	ft
Slope =	0.028	ft/ft
Surface Type =	Grass	
Manning's n =	0.035	
Flow Area =	15	sf (5'w*3'h channel)
Wetted Perimeter =	11	ft (5'w*3'h channel)
Hydraulic Radius =	1.36	ft
Velocity =	8.74	ft/s
Tt =	0.02	hour
Tt =	**1.06**	**minutes**

$$T_t = \frac{L}{3600V} \qquad V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$$

Time of Concentration (Tc)

Tc = 14.0 minutes

SCS lag Time =	8.41	minutes
Time Increment =	2.44	minutes

Discharge point :		
Reach to point:		
Reach:		
Distance =		ft

STRONGROCK ENGINEERING GROUP

TIME OF CONCENTRATION INFORMATION

Project:	**Reserve at Mitchell Mill**
Subcatchment:	**Existing DA 2**

Date:	**10/31/2024**

Segment 1: Sheet Flow (Overland Flow)

Length =	50	ft
Top Elev =	402.5	ft
Bot Elev =	402	ft
Height =	0.5	ft
Slope =	0.010	ft/ft
Surface Type =	Light Woods	
Manning's n =	0.4	
P (2-year/24-hour) =	3.46	inch
Tt =	0.26	hour
Tt =	**15.65**	**minutes**

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

Segment 2: Shallow Concentrated Flow

Length =	857	ft
Top Elev =	402	ft
Bot Elev =	380	ft
Height =	22	ft
Slope =	0.026	ft/ft
Surface Type =	Unpaved	
Average Velocity =	2.59	ft/s
Tt =	0.09	hour
Tt =	**5.53**	**minutes**

$$T_t = \frac{L}{3600V}$$

Segment 3: Channel Flow

Length =	7515	ft
Top Elev =	380	ft
Bot Elev =	229.46	ft
Height =	150.54	ft
Slope =	0.020	ft/ft
Surface Type =	Grass	
Manning's n =	0.035	
Flow Area =	15	sf (5'w*3'h channel)
Wetted Perimeter =	11	ft (5'w*3'h channel)
Hydraulic Radius =	1.36	ft
Velocity =	7.41	ft/s
Tt =	0.28	hour
Tt =	**16.90**	**minutes**

$$T_t = \frac{L}{3600V} \qquad V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$$

Time of Concentration (Tc)

Tc = 38.1 minutes

SCS lag Time =	22.85	minutes
Time Increment =	6.63	minutes

Discharge point :		
Reach to point:		
Reach:		
Distance =		ft

STRONGROCK ENGINEERING GROUP

TIME OF CONCENTRATION INFORMATION

Project:	**Reserve at Mitchell Mill**
Subcatchment:	**Existing DA 3**

Date:	**10/31/2024**

Segment 1: Sheet Flow (Overland Flow)

Length =	65	ft
Top Elev =	286.5	ft
Bot Elev =	286	ft
Height =	0.5	ft
Slope =	0.008	ft/ft
Surface Type =	Dense Grass	
Manning's n =	0.24	
P (2-year/24-hour) =	3.46	inch
Tt =	0.24	hour
Tt =	**14.25**	**minutes**

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

Segment 2: Shallow Concentrated Flow

Length =	825	ft
Top Elev =	286	ft
Bot Elev =	249.9	ft
Height =	36.1	ft
Slope =	0.044	ft/ft
Surface Type =	Unpaved	
Average Velocity =	3.38	ft/s
Tt =	0.07	hour
Tt =	**4.07**	**minutes**

$$T_t = \frac{L}{3600V}$$

Segment 3: Channel Flow

Length =	663	ft
Top Elev =	249.9	ft
Bot Elev =	231.48	ft
Height =	18.42	ft
Slope =	0.028	ft/ft
Surface Type =	Grass	
Manning's n =	0.035	
Flow Area =	15	sf (5'w*3'h channel)
Wetted Perimeter =	11	ft (5'w*3'h channel)
Hydraulic Radius =	1.36	ft
Velocity =	8.73	ft/s
Tt =	0.02	hour
Tt =	**1.27**	**minutes**

$$T_t = \frac{L}{3600V} \qquad V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$$

Time of Concentration (Tc)

Tc = 19.6 minutes

SCS lag Time =	11.75	minutes
Time Increment =	3.41	minutes

Discharge point :		
Reach to point:		
Reach:		
Distance =		ft

STRONGROCK ENGINEERING GROUP

TIME OF CONCENTRATION INFORMATION

Project:	**Reserve at Mitchell Mill**
Subcatchment:	**Existing DA 4**

Date:	**10/31/2024**

Segment 1: Sheet Flow (Overland Flow)

Length =	73	ft
Top Elev =	296.5	ft
Bot Elev =	296	ft
Height =	0.5	ft
Slope =	0.007	ft/ft
Surface Type =	Light Woods	
Manning's n =	0.4	
P (2-year/24-hour) =	3.46	inch
Tt =	0.41	hour
Tt =	**24.65**	**minutes**

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

Segment 2: Shallow Concentrated Flow

Length =	456	ft
Top Elev =	296	ft
Bot Elev =	250	ft
Height =	46	ft
Slope =	0.101	ft/ft
Surface Type =	Unpaved	
Average Velocity =	5.12	ft/s
Tt =	0.02	hour
Tt =	**1.48**	**minutes**

$$T_t = \frac{L}{3600V}$$

Segment 3: Channel Flow

Length =	125	ft
Top Elev =	250	ft
Bot Elev =	232.53	ft
Height =	17.47	ft
Slope =	0.140	ft/ft
Surface Type =	Grass	
Manning's n =	0.035	
Flow Area =	15	sf (5'w*3'h channel)
Wetted Perimeter =	11	ft (5'w*3'h channel)
Hydraulic Radius =	1.36	ft
Velocity =	19.57	ft/s
Tt =	0.00	hour
Tt =	**0.11**	**minutes**

$$T_t = \frac{L}{3600V} \qquad V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$$

Time of Concentration (Tc)

Tc = 26.2 minutes

SCS lag Time =	15.74	minutes
Time Increment =	4.57	minutes

Discharge point :		
Reach to point:		
Reach:		
Distance =		ft

STRONGROCK ENGINEERING GROUP

TIME OF CONCENTRATION INFORMATION

Project:	**Reserve at Mitchell Mill**
Subcatchment:	**Culvert 1**

Date:	**10/31/2024**

Segment 1: Sheet Flow (Overland Flow)

Length =	46	ft
Top Elev =	402.5	ft
Bot Elev =	402	ft
Height =	0.5	ft
Slope =	0.011	ft/ft
Surface Type =	Light Woods	
Manning's n =	0.4	
P (2-year/24-hour) =	3.46	inch
Tt =	0.24	hour
Tt =	**14.16**	**minutes**

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

Segment 2: Shallow Concentrated Flow

Length =	331	ft
Top Elev =	402	ft
Bot Elev =	382	ft
Height =	20	ft
Slope =	0.060	ft/ft
Surface Type =	Unpaved	
Average Velocity =	3.97	ft/s
Tt =	0.02	hour
Tt =	**1.39**	**minutes**

$$T_t = \frac{L}{3600V}$$

Segment 3: Channel Flow

Length =	8084	ft
Top Elev =	382	ft
Bot Elev =	238.99	ft
Height =	143.01	ft
Slope =	0.018	ft/ft
Surface Type =	Grass	
Manning's n =	0.035	
Flow Area =	15	sf (5'w*3'h channel)
Wetted Perimeter =	11	ft (5'w*3'h channel)
Hydraulic Radius =	1.36	ft
Velocity =	6.96	ft/s
Tt =	0.32	hour
Tt =	**19.35**	**minutes**

$$T_t = \frac{L}{3600V} \qquad V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$$

Time of Concentration (Tc)

Tc =	**34.9 minutes**
SCS lag Time =	20.94 minutes
Time Increment =	6.07 minutes

Discharge point :		
Reach to point:		
Reach:		
Distance =		ft

STRONGROCK ENGINEERING GROUP

TIME OF CONCENTRATION INFORMATION

Project:	**Reserve at Mitchell Mill**
Subcatchment:	**Culvert 3**

Date:	**10/31/2024**

Segment 1: Sheet Flow (Overland Flow)

Length =	11	ft
Top Elev =	276	ft
Bot Elev =	275.5	ft
Height =	0.5	ft
Slope =	0.045	ft/ft
Surface Type =	Short Grass	
Manning's n =	0.15	
P (2-year/24-hour) =	3.46	inch
Tt =	0.02	hour
Tt = 1.16		**minutes**

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

Segment 2: Shallow Concentrated Flow

Length =	134	ft
Top Elev =	275.5	ft
Bot Elev =	269.88	ft
Height =	5.62	ft
Slope =	0.042	ft/ft
Surface Type =	Unpaved	
Average Velocity =	3.30	ft/s
Tt =	0.01	hour
Tt = 0.68		**minutes**

$$T_t = \frac{L}{3600V}$$

Segment 3: Channel Flow

Length =	270	ft
Top Elev =	269.88	ft
Bot Elev =	263.1	ft
Height =	6.78	ft
Slope =	0.025	ft/ft
Surface Type =	Grass	
Manning's n =	0.035	
Flow Area =	15	sf (5'w*3'h channel)
Wetted Perimeter =	11	ft (5'w*3'h channel)
Hydraulic Radius =	1.36	ft
Velocity =	8.30	ft/s
Tt =	0.01	hour
Tt = 0.54		**minutes**

$$T_t = \frac{L}{3600V} \qquad V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$$

Time of Concentration (Tc)

Tc = 5.0 minutes

SCS lag Time =	3.00	minutes
Time Increment =	0.87	minutes

Discharge point :		
Reach to point:		
Reach:		
Distance =		ft

PROGRESS PLOT DATE: 05/21/2025

LEGEND:

- STORM DRAIN LINE
- FLARED END SECTION
- YARD INLET
- CATCH BASIN
- EX. MAJOR CONTOURS
- EX. MINOR CONTOURS
- 280 — PROP. MAJOR CONTOURS
- PROP. MINOR CONTOURS
- CULVERT DRAINAGE AREA 1
- CULVERT DRAINAGE AREA 2
- CULVERT DRAINAGE AREA 3

BALLFIELD
POI #5
SCM #5 WET POND
SUPERSONIC WAY
FUTURE DAYS WAY
CORNELL GARDEN STREET
LUKIN LANE
POI #4
POI #6
JONESVILLE RD
SUPERSONIC WAY
SCM #6 WET POND
POI #7
SCM #4 WET POND
SCM #3 WET POND
POI #3
LIGHTNING BOLT LANE
LIGHTNING BOLT LANE
VEDDER LANE
POI #8
GUARANTEED ALLEY
SMALL IPEMA PLAYGROUND
SCM #7 WET POND
UNPLUGGED AVENUE
PARACHUTE PLACE
POI #9
LIGHTNING BOLT LANE
SCM #8 WET POND
COUNTER STREET
PENDULUM STREET
AMENITY CENTER
GIGATON STREET
MCCREADY COURT
MONKEYWRENCH STREET
DARK MATTER ALLEY
CAMERON SOUND ALLEY
POI #1
MOOKIE ALLEY
PENDULUM STREET
BETTERMAN DRIVE
CRICKET PITCH
SCM #1 WET POND
JONESVILLE RD
EVEN FLOW LANE
YELLOW MOON COURT
MITCHELL MILL RD. 60' PUBLIC R/W
PEEBLES RD. 60' PUBLIC R/W
POI #10

CULVERT DA #1
15,537,578 SF. (356.69 AC.)
i=7.99
C=0.45
Q=1,282 (CFS)

CULVERT DA #3
68,642 SF. (1.58 AC.)
i=7.99
C=0.15
Q=1.89 (CFS)

7°32'15.0"
MAGNETIC NORTH
ADOPTED BOM 1980 PG 396
NC GRID NORTH - NAD 83
ADOPTED BOM 1992 PG 655

GRAPHIC SCALE
300 0 150 300 600 1200
(IN FEET)
1 inch = 300 ft.

TOWNHOME NOTES:
STATES INTERNAL TOWNHOME DRIVEWAYS ARE PRIVATE EASEMENTS AS PER CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT

THIS PLANSET AND ANY ASSOCIATED DOCUMENTS ARE PRELIMINARY AND NOT AUTHORIZED FOR CONSTRUCTION UNTIL SIGNED, DATED, AND OFFICIALLY RELEASED FOR CONSTRUCTION BY THE ENGINEER OF RECORD.

No.	REVISIONS	DATE	BY

SEAL:

STRONGROCK
ENGINEERING GROUP
STRONG ROCK ENGINEERING GROUP, PLLC | COMPANY LICENSE # P-2166
305 CHURCH AT NORTH HILLS STREET, SUITE 1110 RALEIGH, NC 27609 | INFORMATION@STRONGROCKGROUP.COM

STRONG ROCK PROJECT	PSP-23-03
	NOT FOR CONSTRUCTION
SCALE	AS SHOWN
DESIGNED BY	SRG
DRAWN BY	SRG
CHECKED BY	SRG

RESERVE @ MITCHELL MILL
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

CULVERT DA MAP

DRAWING SHEET
EXH-04

04 OF 04

Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Oct 31 2024

Culvert 1 - 25 year

Invert Elev Dn (ft)	=	237.63
Pipe Length (ft)	=	74.00
Slope (%)	=	0.50
Invert Elev Up (ft)	=	238.00
Rise (in)	=	73.0
Shape	=	Elliptical
Span (in)	=	228.0
No. Barrels	=	1
n-Value	=	0.012
Culvert Type	=	Horizontal Ellipse Concrete
Culvert Entrance	=	Square edge w/headwall (H)
Coeff. K,M,c,Y,k	=	0.01, 2, 0.0398, 0.67, 0.5

Embankment

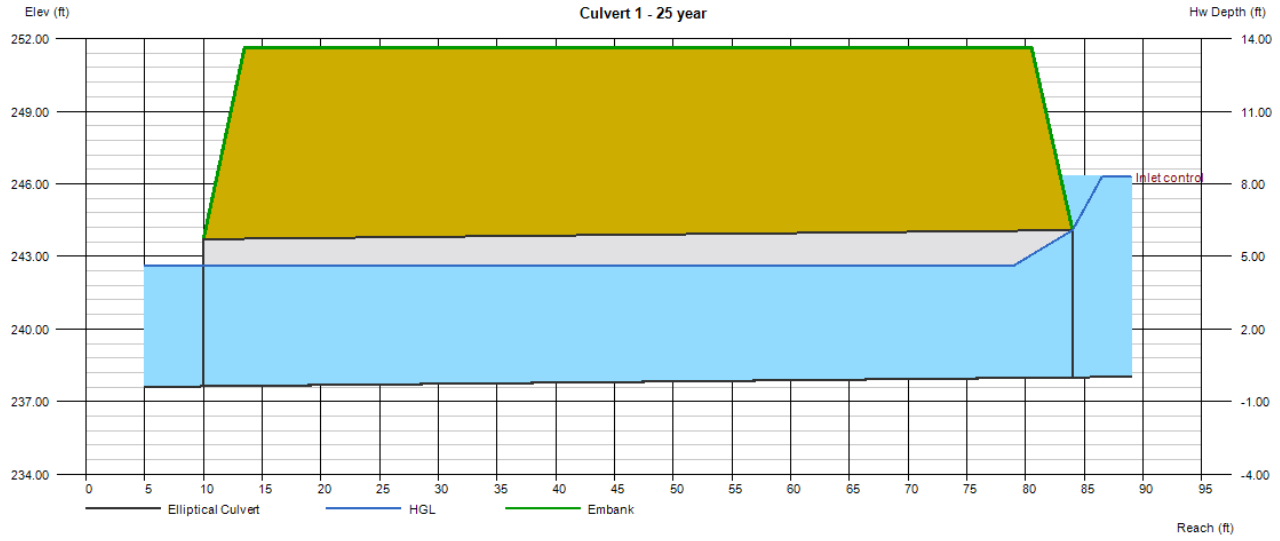
Top Elevation (ft)	=	251.65
Top Width (ft)	=	67.00
Crest Width (ft)	=	10.00

Calculations

Qmin (cfs)	=	932.87
Qmax (cfs)	=	932.87
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	932.87
Qpipe (cfs)	=	932.87
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	11.36
Veloc Up (ft/s)	=	12.31
HGL Dn (ft)	=	242.62
HGL Up (ft)	=	242.62
Hw Elev (ft)	=	246.28
Hw/D (ft)	=	1.36
Flow Regime	=	Inlet Control



Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Oct 31 2024

Culvert 3 - 25 year

Invert Elev Dn (ft)	=	261.40
Pipe Length (ft)	=	42.00
Slope (%)	=	0.50
Invert Elev Up (ft)	=	261.61
Rise (in)	=	36.0
Shape	=	Circular
Span (in)	=	36.0
No. Barrels	=	1
n-Value	=	0.012
Culvert Type	=	Circular Concrete
Culvert Entrance	=	Square edge w/headwall (C)
Coeff. K,M,c,Y,k	=	0.0098, 2, 0.0398, 0.67, 0.5

Embankment

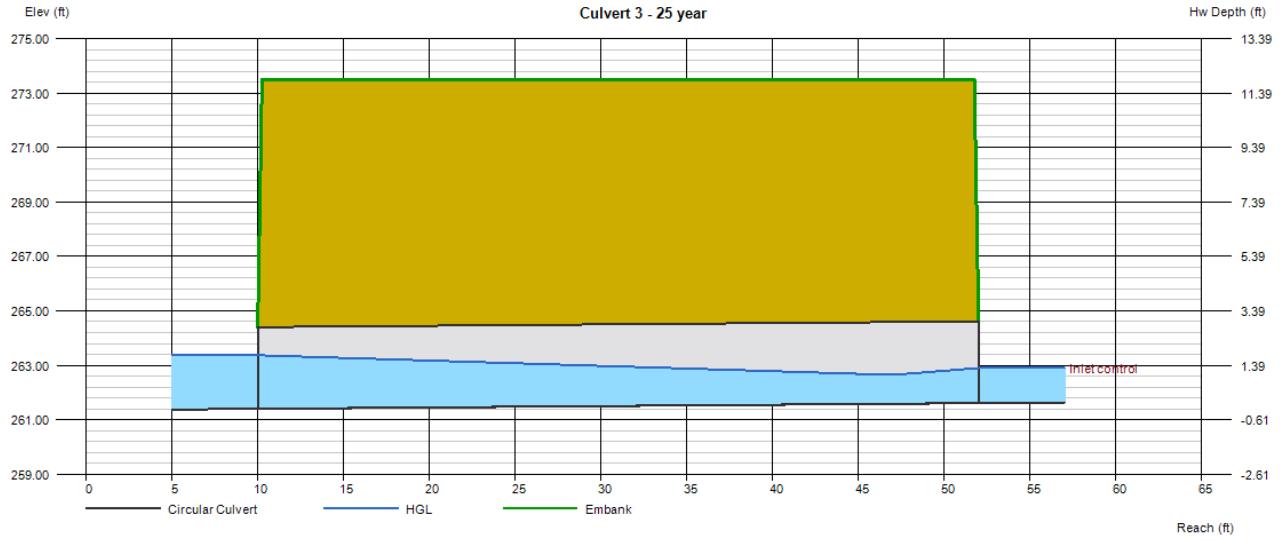
Top Elevation (ft)	=	273.50
Top Width (ft)	=	41.50
Crest Width (ft)	=	10.00

Calculations

Qmin (cfs)	=	8.85
Qmax (cfs)	=	8.85
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	8.85
Qpipe (cfs)	=	8.85
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	1.80
Veloc Up (ft/s)	=	4.68
HGL Dn (ft)	=	263.37
HGL Up (ft)	=	262.55
Hw Elev (ft)	=	262.90
Hw/D (ft)	=	0.43
Flow Regime	=	Inlet Control



3. SCM and Other Design Calculations

3.1. WetPond #1

STRONGROCK ENGINEERING GROUP

Project: Reserve @ Mitchell Mill
Calculated By: TOM T
Date: 5/20/2025

Wet Pond Design Calculations

SCM 1

Pollutant / Nutrient Removal

Total Suspended Solids (TSS)	85%
Nitrogen	30%
Phosphorus	40%

Basin Characteristics

Post-Development Drainage Area

Area to Pond

Description	Acres
Impervious Lots	2.87
Impervious R/W	1.62
Managed Pervious	4.39
Impervious Other	0.85
Total to Pond (AC)	9.72
Pond Basin C	0.68

Estimated Impervious

Lots

Description		Imp (SF)	Total Imp Area
BUA		124900	2.87
			0.00
			0.00
			0.00
			0.00
			0.00
Subtotal	**0**	**-**	**2.87**

Streets and SW

Description		Imp (SF)	Total Imp Area
Roads & Sidewalks		70432	1.62
			0.00
			0.00
			0.00
			0.00
			0.00
Subtotal			**1.62**

Other

Ponds		36842	0.85
			0.00

Grand Total Impervious Area (AC): 5.33

Surface Area to Drainage Area Ratio for Permanent Pool Sizing

Drainage Area to SCM

Impervious Area	Acres
Offsite Impervious Area	0.00
Onsite Impervious Area	5.33
Total Impervious Area	5.33
Total Drainage Area To SCM	9.72
Percent Impervious Area	55%

Required Surface Area of Permanent Pool

Average Depth (ft) =	4.0
SA/DA Ratio =	1.64
Required SA (ft2) =	6,944
SA as Shown (ft2) =	12,681

SA/DA Ratio from latest NCDENR BMP Manual

SA / DA Pond Volumes and Areas (Below Permanent / Normal Pool)

Elevation (ft)	Main Area (sf)	Forebay Area (sf)	Depth (ft)	Main Inc. Vol (cf)	Forebay Inc. Vol (cf)	Total Vol (cf)
256.0				Bottom of Sediment Storage		
257.0	8,117	1,184	0.0	Top of Sediment Storage		
258.0	8,980	1,517	1.0	8,549	1,351	9,899
259.0	9,867	1,876	2.0	9,424	1,697	21,019
260.0	10,780	2,259	3.0	10,324	2,068	33,410
261.0	11,718	2,668	4.0	11,249	2,464	47,123
262.0	12,681	3,101	5.0	12,200	2,885	62,207
263.0	0	0				
264.0	0	0				
265.0	0	0				
266.0	0	0				
Total			5.0	51,744	10,463	62,207
Verify the Forebay Volume Is Approximately (15% - 20%) of the Permanent Pool Volume.						**20%**

Water Quality and Quantity Volumes (Above Permanent / Normal Pool)

Elevation (ft)	Main Area (sf)	Forebay Area (sf)	Depth (ft)	Inc Total Vol (cf)	Accum' Total Vol (cf)	
262.0	12,681	3,101	0.00	Permanent Pool Elevation		Notes
263.0	19,562	-	1.00	16,122	16,122	
263.16	19,851	-	1.16	3,055	19,177	WQE / TPE
264.0	21,426	-	2.00	17,439	36,616	
265.0	23,347	-	3.00	22,387	59,003	
266.0	25,323	-	4.00	24,335	83,338	
267.0	27,357	-	5.00	26,340	109,678	
268.0	29,462	-	6.00	28,410	138,088	
269.0	0	-				
270.0	0	-				

Verify the Average Depth of Pool (D_{avg}) - Equation 3.

$d_{avg} = [V_{perm\ pool} - [0.5 \times Depth_{max\ over\ shelf} \times Perimeter_{perm\ pool} \times Width_{submerged\ part\ of\ shelf}] / A_{bottom\ of\ shelf}$

V_{perm} =	51,744	C.F. (Main Pond)
$A_{bottom\ shelf}$ =	12,681	S.F. (Main Pond)
Depth of Water $_{over\ shelf}$ =	0.00	FT
Perimeter $_{perm\ pool}$ =	488	L.F. (Main Pond)
Width $_{submerged\ part\ of\ shelf}$ =	0.0	FT
D_{avg} =	4.08	FT
Depth for SA/DA =	**4.00**	**FT (Round D_{av} down to nearest 0.5 ft)**

1.0" Water Quality Runoff Volume Calculation

Using the runoff volume calculations in the "Simple Method" as described by Schueler (1987)

Where: Rv = Runoff Coefficient, in/in

I = Percent Impervious	I=	54.8%
Rv = 0.05 + 0.009(I)	Rv =	0.544

1.0 inch runoff volume (Required)

Runoff volume, S=(Design rainfall) (Rv) (Drainage Area)

Design Rainfall =	1.0	inch
Drainage Area =	9.72	acres
Storage Required =	**19,177**	**cu. ft.**

Volume Storage For 1.0" Runoff Above Permanent Pool (Provided)

Depth	PPE SA (SF)	Top Temp Pool SA (SF)	Volume (CF)	Elevation
1.16	12,681	19,851	19,177	263.16

Size Water Quality Orifice for (2-5) Day Drawdown for 1" Runoff Volume	
$Q_{1"} = CdA(2gh)^{1/2}$	(Orifice Equation; Cd=0.60; h = Ho/3)
2.00	Orifice Diameter (inches)
1.07	Ho (Driving Head to Centroid of Orifice) (ft)
0.36	Ho / 3 (Per orifice equation recommendation in NCDEQ SWM Design Manual, Part B)
0.06	Q1.0" Drawdown Rate (cfs)
19,177	Water Quality Volume (V_{WQ})
V_{WQ}/(Q1" x 86,400)	Drawdown Time (days)
3.5	**Drawdown Time (days) (2 - 5 days)**

Pond / Riser Data & Elevations				
Pond Type	Wet Pond			
TSS Removal	85%			
Top of Pond / Berm	268.00 ft			
Secondary Spillway Width	30.00 ft			
Bottom of Secondary Spillway	266.50 ft			
Top of Riser	265.20 ft	(at least 1' Above TPE)		
Riser Type / Size	4x4 ft			
Top of Water Quality / Temp Pool Elev	263.16 ft	(1" Runoff)		
Top of Veg. Shelf	263.00 ft			
Permanent Pool Elevation (Normal Pool)	262.00 ft			
Water Quality Orifice Elevation & Size	262.00 ft		2.00 in	
Secondary Orifice Elevation & Size (Rise & Span)	263.16 ft		12.00 inch	12.00 inch
Bottom of Veg. Shelf	262.00 ft		^ Rise	^ Span
Top of Sediment Storage / Pond Bottom	257.00 ft			
Bottom of Sediment Storage	256.00 ft	(Min 1 ft)		
Invert Out of Riser	262.00 ft			
Outlet Pipe Size	24.00 in	Diameter RCP		
Outlet Pipe Length & Slope	47.96 ft		0.97 %	
Downstream Outlet Elevation	261.54 ft			
1 Yr Water Surface Elev / Peak Flow (CFS)	263.65 ft		1.06 CFS	
2 Yr Water Surface Elev Peak Flow (CFS)	264.00 ft		2.34 CFS	
10 Yr Water Surface Elev Peak Flow (CFS)	265.21 ft		5.07 CFS	
25 Yr Water Surface Elev Peak Flow (CFS)	265.68 ft		20.77 CFS	
100 Yr Water Surface Elev Peak Flow (CFS)	266.52 ft		28.29 CFS	

Anti-Bouyancy Calculations for the Riser Structure

Riser Dimensions		Weight of Structure			Displaced Volume	
Outside Width	5.00 ft	Walls =	12,420	LBS	V = LxWx(HT) = C.F.	
Inside Width	4.00 ft	Base =	3,675	LBS		
Outside Length	5.00 ft	FILL =	13,200	lbs	Displaced Water =	
Inside Length	4.00 ft				C.F. * 62.4 PCF = LBS	
Height	9.20 ft	Outlet Pipe =	236	LBS		
Base Thick' (ft)	0.50 ft	WQ Orifice =	2	LBS	Add 15% Factor of Safety	
Wall Thick' (ft)	0.50 ft					
Ext Base (ft)	1.00 ft	Weir #1 =	75	LBS	V =	230 C.F.
Areas removed from Riser		Weir #2 =	0	LBS	Disp. Water =	14,352 LBS
Outlet Pipe	3.14 ft	Weir #3 =	0	LBS	15% F.S. =	2,153 LBS
WQ Orifice	0.02 ft	Weir #4 =	0	LBS		
Orifice #1	1.00 ft	Other #1 =	0	LBS	Safety Factor	1.76
Orifice #2	0.00 ft					
Orifice #3	0.00 ft	**Weight =**	**28,983**	**LBS**	**Weight =**	**16,505 LBS**
Orifice #4	0.00 ft	**Precast Concrete Riser Structure to be 4 ft x 4 ft x 9.2 ft Tall, With a 0.5 ft Thick Precast Extended Base**				
Other	0.00 ft					

3.2. WetPond #3

STRONGROCK ENGINEERING GROUP

Project: Reserve @ Mitchell Mill
Calculated By: TOM T
Date: 5/20/2025

Wet Pond Design Calculations

SCM 3

Pollutant / Nutrient Removal

Total Suspended Solids (TSS)	85%
Nitrogen	30%
Phosphorus	40%

Basin Characteristics

Post-Development Drainage Area

Area to Pond

Description	Acres
Impervious Lots	4.42
Impervious R/W	4.33
Managed Pervious	9.35
Impervious Other	0.85
Total to Pond (AC)	18.95
Pond Basin C	0.65

Estimated Impervious

Lots

Description	Qty (# of Lots)	Imp / Lot (SF)	Total Imp Area
BUA		192447	4.42
			0.00
			0.00
			0.00
			0.00
			0.00
Subtotal	**0**	**-**	**4.42**

Streets and SW

Description	Length (LF)	Imp (SF) / LF	Total Imp Area
Roads & Sidewalks		188638	4.33
			0.00
			0.00
			0.00
			0.00
			0.00
Subtotal			**4.33**

Other

Ponds		37224	0.85
			0.00

Grand Total Impervious Area (AC): 9.60

Surface Area to Drainage Area Ratio for Permanent Pool Sizing

Drainage Area to SCM

Impervious Area	Acres
Offsite Impervious Area	0.00
Onsite Impervious Area	9.60
Total Impervious Area	9.60
Total Drainage Area To SCM	18.95
Percent Impervious Area	51%

Required Surface Area of Permanent Pool

Average Depth (ft) =	4.0
SA/DA Ratio =	1.54
Required SA (ft2) =	12,712
SA as Shown (ft2) =	15,525

SA/DA Ratio from latest NCDENR BMP Manual

SA / DA Pond Volumes and Areas (Below Permanent / Normal Pool)

Elevation (ft)	Main Area (sf)	Forebay Area (sf)	Depth (ft)	Main Inc. Vol (cf)	Forebay Inc. Vol (cf)	Total Vol (cf)
234.0				Bottom of Sediment Storage		
235.0	10,673	0	0.0	Top of Sediment Storage		
236.0	11,591	1,268	1.0	11,132	634	11,766
237.0	12,535	1,691	2.0	12,063	1,480	25,309
238.0	13,506	2,195	3.0	13,021	1,943	40,272
239.0	14,502	2,781	4.0	14,004	2,488	56,764
240.0	15,525	3,446	5.0	15,014	3,114	74,891
241.0	0	0				
242.0	0	0				
243.0	0	0				
244.0	0	0				
Total			5.0	65,233	9,658	74,891
Verify the Forebay Volume Is Approximately (15% - 20%) of the Permanent Pool Volume.						**15%**

Water Quality and Quantity Volumes (Above Permanent / Normal Pool)

Elevation (ft)	Main Area (sf)	Forebay Area (sf)	Depth (ft)	Inc Total Vol (cf)	Accum' Total Vol (cf)	
240.0	15,525	3,446	0.00	Permanent Pool Elevation		Notes
241.0	23,227	-	1.00	19,376	19,376	
241.64	24,612	-	1.64	15,386	34,762	WQE / TPE
242.0	25,380	-	2.00	8,917	43,679	
243.0	27,615	-	3.00	26,498	70,177	
244.0	29,929	-	4.00	28,772	98,949	
245.0	32,303	-	5.00	31,116	130,065	
246.0	34,732	-	6.00	33,518	163,583	
247.0	37,224	-	7.00	35,978	199,561	
248.0	0	-				

Verify the Average Depth of Pool (D_{avg}) - Equation 3.

$d_{avg} = [V_{perm\ pool} - [0.5 \times Depth_{max\ over\ shelf} \times Perimeter_{perm\ pool} \times Width_{submerged\ part\ of\ shelf}] / A_{bottom\ of\ shelf}$

V_{perm} =	65,233	C.F. (Main Pond)
$A_{bottom\ shelf}$ =	15,525	S.F. (Main Pond)
Depth of Water $_{over\ shelf}$ =	0.00	FT
Perimeter $_{perm\ pool}$ =	518	L.F. (Main Pond)
Width $_{submerged\ part\ of\ shelf}$ =	0.0	FT
D_{avg} =	4.20	FT
Depth for SA/DA =	**4.00**	**FT (Round D_{av} down to nearest 0.5 ft)**

1.0" Water Quality Runoff Volume Calculation

Using the runoff volume calculations in the "Simple Method" as described by Schueler (1987)

Where: Rv = Runoff Coefficient, in/in

I = Percent Impervious	I=	50.7%
Rv = 0.05 + 0.009(I)	Rv =	0.506

1.0 inch runoff volume (Required)

Runoff volume, S=(Design rainfall) (Rv) (Drainage Area)

Design Rainfall =	1.0	inch
Drainage Area =	18.95	acres
Storage Required =	**34,813**	**cu. ft.**

Volume Storage For 1.0" Runoff Above Permanent Pool (Provided)

Depth	PPE SA (SF)	Top Temp Pool SA (SF)	Volume (CF)	Elevation
1.64	15,525	24,612	34,813	241.64

Size Water Quality Orifice for (2-5) Day Drawdown for 1" Runoff Volume	
$Q_{1"} = CdA(2gh)^{1/2}$	(Orifice Equation; Cd=0.60; h = Ho/3)
2.50	Orifice Diameter (inches)
1.54	Ho (Driving Head to Centroid of Orifice) (ft)
0.51	Ho / 3 (Per orifice equation recommendation in NCDEQ SWM Design Manual, Part B)
0.12	Q1.0" Drawdown Rate (cfs)
34,813	Water Quality Volume (V_{WQ})
V_{WQ}/(Q1" x 86,400)	Drawdown Time (days)
3.4	**Drawdown Time (days) (2 - 5 days)**

Pond / Riser Data & Elevations				
Pond Type	Wet Pond			
TSS Removal	85%			
Top of Pond / Berm	247.00 ft			
Secondary Spillway Width	60.00 ft			
Bottom of Secondary Spillway	245.50 ft			
Top of Riser	244.25 ft	(at least 1' Above TPE)		
Riser Type / Size	4x4 ft			
Top of Water Quality / Temp Pool Elev	241.64 ft	(1" Runoff)		
Top of Veg. Shelf	241.00 ft			
Permanent Pool Elevation (Normal Pool)	240.00 ft			
Water Quality Orifice Elevation & Size	240.00 ft		2.50	in
Secondary Orifice Elevation & Size (Rise & Span)	241.64 ft		24.00 inch	24.00 inch
Bottom of Veg. Shelf	240.00 ft		^ Rise	^ Span
Top of Sediment Storage / Pond Bottom	235.00 ft			
Bottom of Sediment Storage	234.00 ft	(Min 1 ft)		
Invert Out of Riser	239.00 ft			
Outlet Pipe Size	36.00 in	Diameter RCP		
Outlet Pipe Length & Slope	74.00 ft		0.42	%
Downstream Outlet Elevation	238.69 ft			
1 Yr Water Surface Elev / Peak Flow (CFS)	242.74 ft		6.65	CFS
2 Yr Water Surface Elev Peak Flow (CFS)	243.36 ft		13.07	CFS
10 Yr Water Surface Elev Peak Flow (CFS)	244.84 ft		45.12	CFS
25 Yr Water Surface Elev Peak Flow (CFS)	245.40 ft		69.59	CFS
100 Yr Water Surface Elev Peak Flow (CFS)	245.99 ft		130.87	CFS

Anti-Bouyancy Calculations for the Riser Structure

Riser Dimensions		Weight of Structure		Displaced Volume	
Outside Width	5.00 ft	Walls =	13,838 LBS	V = LxWx(HT) = C.F.	
Inside Width	4.00 ft	Base =	3,675 LBS		
Outside Length	5.00 ft	FILL =	10,800 lbs	Displaced Water =	
Inside Length	4.00 ft			C.F. * 62.4 PCF = LBS	
Height	10.25 ft	Outlet Pipe =	530 LBS		
Base Thick' (ft)	0.50 ft	WQ Orifice =	3 LBS	Add 15% Factor of Safety	
Wall Thick' (ft)	0.50 ft				
Ext Base (ft)	1.00 ft	Weir #1 =	300 LBS	V =	256 C.F.
Areas removed from Riser		Weir #2 =	0 LBS	Disp. Water =	15,990 LBS
Outlet Pipe	7.07 ft	Weir #3 =	0 LBS	15% F.S. =	2,399 LBS
WQ Orifice	0.03 ft	Weir #4 =	0 LBS		
Orifice #1	4.00 ft	Other #1 =	0 LBS	Safety Factor	1.49
Orifice #2	0.00 ft				
Orifice #3	0.00 ft	**Weight =**	**27,480 LBS**	**Weight =**	**18,389 LBS**
Orifice #4	0.00 ft	**Precast Concrete Riser Structure to be 4 ft x 4 ft x 10.25 ft Tall, With a 0.5 ft Thick Precast Extended Base**			
Other	0.00 ft				

3.3. Wet Pond #4

STRONGROCK ENGINEERING GROUP

Project: Reserve @ Mitchell Mill
Calculated By: TOM T
Date: 5/20/2025

Wet Pond Design Calculations

SCM 4

Pollutant / Nutrient Removal

Total Suspended Solids (TSS)	85%
Nitrogen	30%
Phosphorus	40%

Basin Characteristics

Post-Development Drainage Area

Area to Pond

Description	Acres
Impervious Lots	2.90
Impervious R/W	2.86
Managed Pervious	3.70
Impervious Other	0.79
Total to Pond (AC)	10.25
Pond Basin C	0.73

Estimated Impervious

Lots

Description	Qty (# of Lots)	Imp / Lot (SF)	Total Imp Area
BUA		126316	2.90
			0.00
			0.00
			0.00
			0.00
			0.00
Subtotal	**0**	**-**	**2.90**

Streets and SW

Description	Length (LF)	Imp (SF) / LF	Total Imp Area
Roads & Sidewalks		124564	2.86
			0.00
			0.00
			0.00
			0.00
			0.00
Subtotal			**2.86**

Other

Ponds		34428	0.79
			0.00

Grand Total Impervious Area (AC): 6.55

Surface Area to Drainage Area Ratio for Permanent Pool Sizing

Drainage Area to SCM

Impervious Area	Acres
Offsite Impervious Area	0.00
Onsite Impervious Area	6.55
Total Impervious Area	6.55
Total Drainage Area To SCM	10.25
Percent Impervious Area	64%

Required Surface Area of Permanent Pool

Average Depth (ft) =	3.5
SA/DA Ratio =	2.08
Required SA (ft2) =	9,287
SA as Shown (ft2) =	10,210

SA/DA Ratio from latest NCDENR BMP Manual

SA / DA Pond Volumes and Areas (Below Permanent / Normal Pool)

Elevation (ft)	Main Area (sf)	Forebay Area (sf)	Depth (ft)	Main Inc. Vol (cf)	Forebay Inc. Vol (cf)	Total Vol (cf)
234.0				Bottom of Sediment Storage		
235.0	5,729	805	0.0	Top of Sediment Storage		
236.0	6,575	1,050	1.0	6,152	928	7,080
237.0	7,446	1,321	2.0	7,011	1,186	15,276
238.0	8,342	1,617	3.0	7,894	1,469	24,639
239.0	9,264	1,938	4.0	8,803	1,778	35,219
240.0	10,210	2,284	5.0	9,737	2,111	47,067
241.0	0	0				
242.0	0	0				
243.0	0	0				
244.0	0	0				
Total			5.0	39,597	7,471	47,067
Verify the Forebay Volume Is Approximately (15% - 20%) of the Permanent Pool Volume.						**19%**

Water Quality and Quantity Volumes (Above Permanent / Normal Pool)

Elevation (ft)	Main Area (sf)	Forebay Area (sf)	Depth (ft)	Inc Total Vol (cf)	Accum' Total Vol (cf)	
240.0	10,210	2,284	0.00	Permanent Pool Elevation		Notes
241.0	16,183	-	1.00	13,197	13,197	
241.60	17,278	-	1.60	10,063	23,260	WQE / TPE
242.0	18,004	-	2.00	7,030	30,290	
243.0	19,881	-	3.00	18,943	49,233	
244.0	21,814	-	4.00	20,848	70,081	
245.0	23,805	-	5.00	22,810	92,891	
246.0	25,851	-	6.00	24,828	117,719	
247.0	0	-				
248.0	0	-				

Verify the Average Depth of Pool (D_{avg}) - Equation 3.

$d_{avg} = [V_{perm\ pool} - [0.5 \times Depth_{max\ over\ shelf} \times Perimeter_{perm\ pool} \times Width_{submerged\ part\ of\ shelf}] / A_{bottom\ of\ shelf}$

V_{perm} =	39,597	C.F. (Main Pond)
$A_{bottom\ shelf}$ =	10,210	S.F. (Main Pond)
Depth of Water $_{over\ shelf}$ =	0.00	FT
Perimeter $_{perm\ pool}$ =	448	L.F. (Main Pond)
Width $_{submerged\ part\ of\ shelf}$ =	0.0	FT
D_{avg} =	3.88	FT
Depth for SA/DA =	**3.50**	**FT (Round D_{av} down to nearest 0.5 ft)**

1.0" Water Quality Runoff Volume Calculation

Using the runoff volume calculations in the "Simple Method" as described by Schueler (1987)

Where: Rv = Runoff Coefficient, in/in

I = Percent Impervious	I=	63.9%
Rv = 0.05 + 0.009(I)	Rv =	0.625

1.0 inch runoff volume (Required)

Runoff volume, S=(Design rainfall) (Rv) (Drainage Area)

Design Rainfall =	1.0	inch
Drainage Area =	10.25	acres
Storage Required =	**23,258**	**cu. ft.**

Volume Storage For 1.0" Runoff Above Permanent Pool (Provided)

Depth	PPE SA (SF)	Top Temp Pool SA (SF)	Volume (CF)	Elevation
1.00	10,210	16,183	23,258	241.00

Size Water Quality Orifice for (2-5) Day Drawdown for 1" Runoff Volume	
$Q_{1"} = CdA(2gh)^{1/2}$	(Orifice Equation; Cd=0.60; h = Ho/3)
2.00	Orifice Diameter (inches)
0.92	Ho (Driving Head to Centroid of Orifice) (ft)
0.31	Ho / 3 (Per orifice equation recommendation in NCDEQ SWM Design Manual, Part B)
0.06	Q1.0" Drawdown Rate (cfs)
23,258	Water Quality Volume (V_{WQ})
V_{WQ}/(Q1" x 86,400)	Drawdown Time (days)
4.6	**Drawdown Time (days) (2 - 5 days)**

Pond / Riser Data & Elevations				
Pond Type	Wet Pond			
TSS Removal	85%			
Top of Pond / Berm	246.00 ft			
Secondary Spillway Width	30.00 ft			
Bottom of Secondary Spillway	244.50 ft			
Top of Riser	243.75 ft	(at least 1' Above TPE)		
Riser Type / Size	4x4 ft			
Top of Water Quality / Temp Pool Elev	241.00 ft	(1" Runoff)		
Top of Veg. Shelf	241.00 ft			
Permanent Pool Elevation (Normal Pool)	240.00 ft			
Water Quality Orifice Elevation & Size	240.00 ft		2.00	in
Secondary Orifice Elevation & Size (Rise & Span)	241.60 ft	24.00 inch	24.00 inch	
Bottom of Veg. Shelf	240.00 ft	^ Rise	^ Span	
Top of Sediment Storage / Pond Bottom	235.00 ft			
Bottom of Sediment Storage	234.00 ft	(Min 1 ft)		
Invert Out of Riser	240.00 ft			
Outlet Pipe Size	36.00 in	Diameter RCP		
Outlet Pipe Length & Slope	70.50 ft		2.13	%
Downstream Outlet Elevation	238.50 ft			
1 Yr Water Surface Elev / Peak Flow (CFS)	242.27 ft		2.73	CFS
2 Yr Water Surface Elev Peak Flow (CFS)	242.70 ft		6.58	CFS
10 Yr Water Surface Elev Peak Flow (CFS)	243.90 ft		20.48	CFS
25 Yr Water Surface Elev Peak Flow (CFS)	244.34 ft		41.63	CFS
100 Yr Water Surface Elev Peak Flow (CFS)	244.80 ft		74.12	CFS

Anti-Bouyancy Calculations for the Riser Structure

Riser Dimensions		Weight of Structure		Displaced Volume	
Outside Width	5.00 ft	Walls =	13,163 LBS	V = LxWx(HT) = C.F.	
Inside Width	4.00 ft	Base =	3,675 LBS		
Outside Length	5.00 ft	FILL =	13,200 lbs	Displaced Water =	
Inside Length	4.00 ft			C.F. * 62.4 PCF = LBS	
Height	9.75 ft	Outlet Pipe =	530 LBS		
Base Thick' (ft)	0.50 ft	WQ Orifice =	2 LBS	Add 15% Factor of Safety	
Wall Thick' (ft)	0.50 ft				
Ext Base (ft)	1.00 ft	Weir #1 =	300 LBS	V =	244 C.F.
Areas removed from Riser		Weir #2 =	0 LBS	Disp. Water =	15,210 LBS
Outlet Pipe	7.07 ft	Weir #3 =	0 LBS	15% F.S. =	2,282 LBS
WQ Orifice	0.02 ft	Weir #4 =	0 LBS		
Orifice #1	4.00 ft	Other #1 =	0 LBS	Safety Factor	1.67
Orifice #2	0.00 ft				
Orifice #3	0.00 ft	**Weight =**	**29,206 LBS**	**Weight =**	**17,492 LBS**
Orifice #4	0.00 ft	**Precast Concrete Riser Structure to be 4 ft x 4 ft x 9.75 ft Tall, With a 0.5 ft Thick Precast Extended Base**			
Other	0.00 ft				

3.4. Wet Pond #5

STRONGROCK ENGINEERING GROUP

Project: Reserve @ Mitchell Mill
Calculated By: TOM T
Date: 5/20/2025

Wet Pond Design Calculations

SCM 5

Pollutant / Nutrient Removal

Total Suspended Solids (TSS)	85%
Nitrogen	30%
Phosphorus	40%

Basin Characteristics

Post-Development Drainage Area

Area to Pond

Description	Acres
Impervious Lots	0.97
Impervious R/W	0.49
Managed Pervious	1.57
Impervious Other	0.41
Total to Pond (AC)	3.45
Pond Basin C	0.68

Estimated Impervious

Lots

Description	Qty (# of Lots)	Imp / Lot (SF)	Total Imp Area
BUA		42342	0.97
			0.00
			0.00
			0.00
			0.00
			0.00
Subtotal	**0**	**-**	**0.97**

Streets and SW

Description	Length (LF)	Imp (SF) / LF	Total Imp Area
Roads & Sidewalks		21409	0.49
			0.00
			0.00
			0.00
			0.00
			0.00
Subtotal			**0.49**

Other

Ponds		17957	0.41
			0.00

Grand Total Impervious Area (AC): 1.88

Surface Area to Drainage Area Ratio for Permanent Pool Sizing

Drainage Area to SCM

Impervious Area	Acres
Offsite Impervious Area	0.00
Onsite Impervious Area	1.88
Total Impervious Area	1.88
Total Drainage Area To SCM	3.45
Percent Impervious Area	54%

Required Surface Area of Permanent Pool

Average Depth (ft) =	3.0
SA/DA Ratio =	1.91
Required SA (ft2) =	2,870
SA as Shown (ft2) =	3,648

SA/DA Ratio from latest NCDENR BMP Manual

SA / DA Pond Volumes and Areas (Below Permanent / Normal Pool)

Elevation (ft)	Main Area (sf)	Forebay Area (sf)	Depth (ft)	Main Inc. Vol (cf)	Forebay Inc. Vol (cf)	Total Vol (cf)
244.0				Bottom of Sediment Storage		
245.0	851	60	0.0	Top of Sediment Storage		
246.0	1,360	178	1.0	1,106	119	1,225
247.0	1,895	320	2.0	1,628	249	3,101
248.0	2,454	488	3.0	2,175	404	5,680
249.0	3,038	682	4.0	2,746	585	9,011
250.0	3,648	900	5.0	3,343	791	13,145
251.0	0	0				
252.0	0	0				
253.0	0	0				
254.0	0	0				
Total			5.0	10,997	2,148	13,145
Verify the Forebay Volume Is Approximately (15% - 20%) of the Permanent Pool Volume.						**20%**

Water Quality and Quantity Volumes (Above Permanent / Normal Pool)

Elevation (ft)	Main Area (sf)	Forebay Area (sf)	Depth (ft)	Inc Total Vol (cf)	Accum' Total Vol (cf)	
250.0	3,648	900	0.00	Permanent Pool Elevation		Notes
251.0	7,131	-	1.00	5,390	5,390	
251.19	7,367	-	1.19	1,366	6,756	WQE / TPE
252.0	8,382	-	2.00	6,390	13,146	
253.0	9,690	-	3.00	9,036	22,182	
254.0	11,054	-	4.00	10,372	32,554	
255.0	12,475	-	5.00	11,765	44,319	
256.0	0	-				
257.0	0	-				
258.0	0	-				

Verify the Average Depth of Pool (D_{avg}) - Equation 3.

$d_{avg} = [V_{perm\ pool} - [0.5 \times Depth_{max\ over\ shelf} \times Perimeter_{perm\ pool} \times Width_{submerged\ part\ of\ shelf}] / A_{bottom\ of\ shelf}$

V_{perm} =	10,997	C.F. (Main Pond)
$A_{bottom\ shelf}$ =	3,648	S.F. (Main Pond)
Depth of Water $_{over\ shelf}$ =	0.00	FT
Perimeter $_{perm\ pool}$ =	311	L.F. (Main Pond)
Width $_{submerged\ part\ of\ shelf}$ =	0.0	FT
D_{avg} =	3.01	FT
Depth for SA/DA =	**3.00**	**FT (Round D_{av} down to nearest 0.5 ft)**

1.0" Water Quality Runoff Volume Calculation

Using the runoff volume calculations in the "Simple Method" as described by Schueler (1987)

Where: Rv = Runoff Coefficient, in/in

I = Percent Impervious	I=	54.4%
Rv = 0.05 + 0.009(I)	Rv =	0.539

1.0 inch runoff volume (Required)

Runoff volume, S=(Design rainfall) (Rv) (Drainage Area)

Design Rainfall =	1.0	inch
Drainage Area =	3.45	acres
Storage Required =	**6,754**	**cu. ft.**

Volume Storage For 1.0" Runoff Above Permanent Pool (Provided)

Depth	PPE SA (SF)	Top Temp Pool SA (SF)	Volume (CF)	Elevation
1.00	3,648	7,131	6,754	251.00

Size Water Quality Orifice for (2-5) Day Drawdown for 1" Runoff Volume	
$Q_{1"} = CdA(2gh)^{1/2}$	(Orifice Equation; Cd=0.60; h = Ho/3)
1.25	Orifice Diameter (inches)
0.95	Ho (Driving Head to Centroid of Orifice) (ft)
0.32	Ho / 3 (Per orifice equation recommendation in NCDEQ SWM Design Manual, Part B)
0.02	Q1.0" Drawdown Rate (cfs)
6,754	Water Quality Volume (V_{WQ})
V_{WQ}/(Q1" x 86,400)	Drawdown Time (days)
3.4	**Drawdown Time (days) (2 - 5 days)**

Pond / Riser Data & Elevations				
Pond Type	Wet Pond			
TSS Removal	85%			
Top of Pond / Berm	255.00 ft			
Secondary Spillway Width	30.00 ft			
Bottom of Secondary Spillway	253.50 ft			
Top of Riser	253.00 ft	(at least 1' Above TPE)		
Riser Type / Size	4x4 ft			
Top of Water Quality / Temp Pool Elev	251.00 ft	(1" Runoff)		
Top of Veg. Shelf	251.00 ft			
Permanent Pool Elevation (Normal Pool)	250.00 ft			
Water Quality Orifice Elevation & Size	250.00 ft		1.25	in
Secondary Orifice Elevation & Size (Rise & Span)	251.19 ft	12.00 inch	12.00 inch	
Bottom of Veg. Shelf	250.00 ft	^ Rise	^ Span	
Top of Sediment Storage / Pond Bottom	245.00 ft			
Bottom of Sediment Storage	244.00 ft	(Min 1 ft)		
Invert Out of Riser	246.50 ft			
Outlet Pipe Size	18.00 in	Diameter RCP		
Outlet Pipe Length & Slope	106.00 ft		6.93	%
Downstream Outlet Elevation	239.15 ft			
1 Yr Water Surface Elev / Peak Flow (CFS)	251.60 ft		0.72	CFS
2 Yr Water Surface Elev Peak Flow (CFS)	251.91 ft		1.83	CFS
10 Yr Water Surface Elev Peak Flow (CFS)	252.88 ft		4.19	CFS
25 Yr Water Surface Elev Peak Flow (CFS)	253.26 ft		12.17	CFS
100 Yr Water Surface Elev Peak Flow (CFS)	253.59 ft		23.34	CFS

Anti-Bouyancy Calculations for the Riser Structure

Riser Dimensions		Weight of Structure			Displaced Volume	
Outside Width	5.00 ft	Walls =	12,150	LBS	V = LxWx(HT) = C.F.	
Inside Width	4.00 ft	Base =	3,675	LBS		
Outside Length	5.00 ft	FILL =	4,800	lbs	Displaced Water =	
Inside Length	4.00 ft				C.F. * 62.4 PCF = LBS	
Height	9.00 ft	Outlet Pipe =	132	LBS		
Base Thick' (ft)	0.50 ft	WQ Orifice =	1	LBS	Add 15% Factor of Safety	
Wall Thick' (ft)	0.50 ft					
Ext Base (ft)	1.00 ft	Weir #1 =	75	LBS	V =	225 C.F.
Areas removed from Riser		Weir #2 =	0	LBS	Disp. Water =	14,040 LBS
Outlet Pipe	1.77 ft	Weir #3 =	0	LBS	15% F.S. =	2,106 LBS
WQ Orifice	0.01 ft	Weir #4 =	0	LBS		
Orifice #1	1.00 ft	Other #1 =	0	LBS	Safety Factor	1.26
Orifice #2	0.00 ft					
Orifice #3	0.00 ft	**Weight =**	**20,417**	**LBS**	**Weight =**	**16,146 LBS**
Orifice #4	0.00 ft	**Precast Concrete Riser Structure to be 4 ft x 4 ft x 9 ft Tall, With a 0.5 ft Thick Precast Extended Base**				
Other	0.00 ft					

3.5. Wet Pond #6

STRONGROCK ENGINEERING GROUP

Project: Reserve @ Mitchell Mill
Calculated By: TOM T
Date: 5/20/2025

Wet Pond Design Calculations

SCM 6

Pollutant / Nutrient Removal

Total Suspended Solids (TSS)	85%
Nitrogen	30%
Phosphorus	40%

Basin Characteristics

Post-Development Drainage Area

Area to Pond

Description	Acres
Impervious Lots	4.45
Impervious R/W	2.78
Managed Pervious	7.25
Impervious Other	0.66
Total to Pond (AC)	15.14
Pond Basin C	0.66

Estimated Impervious

Lots

Description	Qty (# of Lots)	Imp / Lot (SF)	Total Imp Area
BUA		193724	4.45
			0.00
			0.00
			0.00
			0.00
			0.00
Subtotal	**0**	**-**	**4.45**

Streets and SW

Description	Length (LF)	Imp (SF) / LF	Total Imp Area
Roads & Sidewalks		120973	2.78
			0.00
			0.00
			0.00
			0.00
			0.00
Subtotal			**2.78**

Other

Ponds		28783	0.66
			0.00

Grand Total Impervious Area (AC): 7.89

Surface Area to Drainage Area Ratio for Permanent Pool Sizing

Drainage Area to SCM

Impervious Area	Acres
Offsite Impervious Area	0.00
Onsite Impervious Area	7.89
Total Impervious Area	7.89
Total Drainage Area To SCM	15.14
Percent Impervious Area	52%

Required Surface Area of Permanent Pool

Average Depth (ft) =	3.5
SA/DA Ratio =	1.71
Required SA (ft2) =	11,277
SA as Shown (ft2) =	12,552

SA/DA Ratio from latest NCDENR BMP Manual

SA / DA Pond Volumes and Areas (Below Permanent / Normal Pool)

Elevation (ft)	Main Area (sf)	Forebay Area (sf)	Depth (ft)	Main Inc. Vol (cf)	Forebay Inc. Vol (cf)	Total Vol (cf)
231.0				Bottom of Sediment Storage		
232.0	7,220	892	0.0	Top of Sediment Storage		
233.0	8,236	1,218	1.0	7,728	1,055	8,783
234.0	9,278	1,569	2.0	8,757	1,394	18,934
235.0	10,344	1,946	3.0	9,811	1,758	30,502
236.0	11,435	2,347	4.0	10,890	2,147	43,538
237.0	12,552	2,774	5.0	11,994	2,561	58,092
238.0	0	0				
239.0	0	0				
240.0	0	0				
241.0	0	0				
Total			5.0	49,179	8,913	58,092
Verify the Forebay Volume Is Approximately (15% - 20%) of the Permanent Pool Volume.						**18%**

Water Quality and Quantity Volumes (Above Permanent / Normal Pool)

Elevation (ft)	Main Area (sf)	Forebay Area (sf)	Depth (ft)	Inc Total Vol (cf)	Accum' Total Vol (cf)	
237.0	12,552	2,774	0.00	Permanent Pool Elevation		Notes
238.0	19,637	-	1.00	16,095	16,095	
238.61	21,044	-	1.61	12,312	28,407	WQE / TPE
239.0	21,961	-	2.00	8,487	36,894	
240.0	24,342	-	3.00	23,152	60,046	
241.0	26,780	-	4.00	25,561	85,607	
242.0	29,274	-	5.00	28,027	113,634	
243.0	31,825	-	6.00	30,550	144,184	
244.0	34,432	-	7.00	33,129	177,312	
245.0	0	-				

Verify the Average Depth of Pool (D_{avg}) - Equation 3.

$d_{avg} = [V_{perm\ pool} - [0.5 \times Depth_{max\ over\ shelf} \times Perimeter_{perm\ pool} \times Width_{submerged\ part\ of\ shelf}] / A_{bottom\ of\ shelf}$

V_{perm} =	49,179	C.F. (Main Pond)
$A_{bottom\ shelf}$ =	12,552	S.F. (Main Pond)
Depth of Water $_{over\ shelf}$ =	0.00	FT
Perimeter $_{perm\ pool}$ =	562	L.F. (Main Pond)
Width $_{submerged\ part\ of\ shelf}$ =	0.0	FT
D_{avg} =	3.92	FT
Depth for SA/DA =	**3.50**	**FT (Round D_{av} down to nearest 0.5 ft)**

1.0" Water Quality Runoff Volume Calculation

Using the runoff volume calculations in the "Simple Method" as described by Schueler (1987)

Where: Rv = Runoff Coefficient, in/in

I = Percent Impervious	I=	52.1%
Rv = 0.05 + 0.009(I)	Rv =	0.519

1.0 inch runoff volume (Required)

Runoff volume, S=(Design rainfall) (Rv) (Drainage Area)

Design Rainfall =	1.0	inch
Drainage Area =	15.14	acres
Storage Required =	**28,509**	**cu. ft.**

Volume Storage For 1.0" Runoff Above Permanent Pool (Provided)

Depth	PPE SA (SF)	Top Temp Pool SA (SF)	Volume (CF)	Elevation
1.61	12,552	21,044	28,509	238.61

Size Water Quality Orifice for (2-5) Day Drawdown for 1" Runoff Volume	
$Q_{1"} = CdA(2gh)^{1/2}$	(Orifice Equation; Cd=0.60; h = Ho/3)
2.50	Orifice Diameter (inches)
1.50	Ho (Driving Head to Centroid of Orifice) (ft)
0.50	Ho / 3 (Per orifice equation recommendation in NCDEQ SWM Design Manual, Part B)
0.12	Q1.0" Drawdown Rate (cfs)
28,509	Water Quality Volume (V_{WQ})
V_{WQ}/(Q1" x 86,400)	Drawdown Time (days)
2.8	**Drawdown Time (days) (2 - 5 days)**

Pond / Riser Data & Elevations				
Pond Type	Wet Pond			
TSS Removal	85%			
Top of Pond / Berm	244.00 ft			
Secondary Spillway Width	30.00 ft			
Bottom of Secondary Spillway	242.50 ft			
Top of Riser	241.25 ft	(at least 1' Above TPE)		
Riser Type / Size	4x4 ft			
Top of Water Quality / Temp Pool Elev	238.61 ft	(1" Runoff)		
Top of Veg. Shelf	238.00 ft			
Permanent Pool Elevation (Normal Pool)	237.00 ft			
Water Quality Orifice Elevation & Size	237.00 ft		2.50	in
Secondary Orifice Elevation & Size (Rise & Span)	238.61 ft		18.00 inch	18.00 inch
Bottom of Veg. Shelf	237.00 ft		^ Rise	^ Span
Top of Sediment Storage / Pond Bottom	232.00 ft			
Bottom of Sediment Storage	231.00 ft	(Min 1 ft)		
Invert Out of Riser	237.00 ft			
Outlet Pipe Size	18.00 in	Diameter RCP		
Outlet Pipe Length & Slope	100.00 ft		0.50	%
Downstream Outlet Elevation	236.50 ft			
1 Yr Water Surface Elev / Peak Flow (CFS)	239.42 ft		3.19	CFS
2 Yr Water Surface Elev Peak Flow (CFS)	239.95 ft		6.78	CFS
10 Yr Water Surface Elev Peak Flow (CFS)	241.47 ft		17.06	CFS
25 Yr Water Surface Elev Peak Flow (CFS)	242.14 ft		28.51	CFS
100 Yr Water Surface Elev Peak Flow (CFS)	243.00 ft		59.84	CFS

Anti-Bouyancy Calculations for the Riser Structure

Riser Dimensions		Weight of Structure		Displaced Volume	
Outside Width	5.00 ft	Walls =	13,838 LBS	V = LxWx(HT) = C.F.	
Inside Width	4.00 ft	Base =	3,675 LBS		
Outside Length	5.00 ft	FILL =	13,200 lbs	Displaced Water =	
Inside Length	4.00 ft			C.F. * 62.4 PCF = LBS	
Height	10.25 ft	Outlet Pipe =	132 LBS		
Base Thick' (ft)	0.50 ft	WQ Orifice =	3 LBS	Add 15% Factor of Safety	
Wall Thick' (ft)	0.50 ft				
Ext Base (ft)	1.00 ft	Weir #1 =	168.75 LBS	V =	256 C.F.
Areas removed from Riser		Weir #2 =	0 LBS	Disp. Water =	15,990 LBS
Outlet Pipe	1.77 ft	Weir #3 =	0 LBS	15% F.S. =	2,399 LBS
WQ Orifice	0.03 ft	Weir #4 =	0 LBS		
Orifice #1	2.25 ft	Other #1 =	0 LBS	Safety Factor	1.65
Orifice #2	0.00 ft				
Orifice #3	0.00 ft	**Weight =**	**30,409 LBS**	**Weight =**	**18,389 LBS**
Orifice #4	0.00 ft	**Precast Concrete Riser Structure to be 4 ft x 4 ft x 10.25 ft Tall, With a 0.5 ft Thick Precast Extended Base**			
Other	0.00 ft				

3.6. Wet Pond #7

STRONGROCK ENGINEERING GROUP

Project: Reserve @ Mitchell Mill
Calculated By: TOM T
Date: 5/20/2025

Wet Pond Design Calculations

SCM 7

Pollutant / Nutrient Removal

Total Suspended Solids (TSS)	85%
Nitrogen	30%
Phosphorus	40%

Basin Characteristics

Post-Development Drainage Area

Area to Pond

Description	Acres
Impervious Lots	4.11
Impervious R/W	3.79
Managed Pervious	5.34
Impervious Other	0.82
Total to Pond (AC)	14.06
Pond Basin C	0.72

Estimated Impervious

Lots

Description	Qty (# of Lots)	Imp / Lot (SF)	Total Imp Area
BUA		178974	4.11
			0.00
			0.00
			0.00
			0.00
			0.00
Subtotal	**0**	**-**	**4.11**

Streets and SW

Description	Length (LF)	Imp (SF) / LF	Total Imp Area
Roads & Sidewalks		165281	3.79
			0.00
			0.00
			0.00
			0.00
			0.00
Subtotal			**3.79**

Other

Ponds		35790	0.82
			0.00

Grand Total Impervious Area (AC): 8.72

Surface Area to Drainage Area Ratio for Permanent Pool Sizing

Drainage Area to SCM

Impervious Area	Acres
Offsite Impervious Area	0.00
Onsite Impervious Area	8.72
Total Impervious Area	8.72
Total Drainage Area To SCM	14.06
Percent Impervious Area	62%

Required Surface Area of Permanent Pool

Average Depth (ft) =	4.0
SA/DA Ratio =	1.83
Required SA (ft2) =	11,208
SA as Shown (ft2) =	13,755

SA/DA Ratio from latest NCDENR BMP Manual

SA / DA Pond Volumes and Areas (Below Permanent / Normal Pool)

Elevation (ft)	Main Area (sf)	Forebay Area (sf)	Depth (ft)	Main Inc. Vol (cf)	Forebay Inc. Vol (cf)	Total Vol (cf)
233.0				Bottom of Sediment Storage		
234.0	8,900	1,299	0.0	Top of Sediment Storage		
235.0	9,821	1,590	1.0	9,361	1,445	10,805
236.0	10,767	1,906	2.0	10,294	1,748	22,847
237.0	11,738	2,247	3.0	11,253	2,077	36,176
238.0	12,734	2,614	4.0	12,236	2,431	50,843
239.0	13,755	3,006	5.0	13,245	2,810	66,897
240.0	0	0				
241.0	0	0				
242.0	0	0				
243.0	0	0				
Total			5.0	56,388	10,510	66,897
Verify the Forebay Volume Is Approximately (15% - 20%) of the Permanent Pool Volume.						**19%**

Water Quality and Quantity Volumes (Above Permanent / Normal Pool)

Elevation (ft)	Main Area (sf)	Forebay Area (sf)	Depth (ft)	Inc Total Vol (cf)	Accum' Total Vol (cf)	
239.0	13,755	3,006	0.00	Permanent Pool Elevation		Notes
240.0	20,688	-	1.00	17,222	17,222	
240.65	21,955	-	1.65	13,864	31,086	WQE / TPE
241.0	22,636	-	2.00	7,798	38,884	
242.0	24,642	-	3.00	23,639	62,523	
243.0	26,704	-	4.00	25,673	88,196	
244.0	28,822	-	5.00	27,763	115,959	
245.0	30,997	-	6.00	29,910	145,869	
246.0	33,229	-	7.00	32,113	177,982	
247.0	0	-				

Verify the Average Depth of Pool (D_{avg}) - Equation 3.

$d_{avg} = [V_{perm\ pool} - [0.5 \times Depth_{max\ over\ shelf} \times Perimeter_{perm\ pool} \times Width_{submerged\ part\ of\ shelf}] / A_{bottom\ of\ shelf}$

V_{perm} =	56,388	C.F. (Main Pond)
$A_{bottom\ shelf}$ =	13,755	S.F. (Main Pond)
Depth of Water $_{over\ shelf}$ =	0.00	FT
Perimeter $_{perm\ pool}$ =	514	L.F. (Main Pond)
Width $_{submerged\ part\ of\ shelf}$ =	0.0	FT
D_{avg} =	4.10	FT
Depth for SA/DA =	**4.00**	**FT (Round D_{av} down to nearest 0.5 ft)**

1.0" Water Quality Runoff Volume Calculation

Using the runoff volume calculations in the "Simple Method" as described by Schueler (1987)

Where: Rv = Runoff Coefficient, in/in

I = Percent Impervious	I=	62.1%
Rv = 0.05 + 0.009(I)	Rv =	0.608

1.0 inch runoff volume (Required)

Runoff volume, S=(Design rainfall) (Rv) (Drainage Area)

Design Rainfall =	1.0	inch
Drainage Area =	14.06	acres
Storage Required =	**31,055**	**cu. ft.**

Volume Storage For 1.0" Runoff Above Permanent Pool (Provided)

Depth	PPE SA (SF)	Top Temp Pool SA (SF)	Volume (CF)	Elevation
1.00	13,755	20,688	31,055	240.00

Size Water Quality Orifice for (2-5) Day Drawdown for 1" Runoff Volume	
$Q_{1"} = CdA(2gh)^{1/2}$	(Orifice Equation; Cd=0.60; h = Ho/3)
2.50	Orifice Diameter (inches)
0.90	Ho (Driving Head to Centroid of Orifice) (ft)
0.30	Ho / 3 (Per orifice equation recommendation in NCDEQ SWM Design Manual, Part B)
0.09	Q1.0" Drawdown Rate (cfs)
31,055	Water Quality Volume (V_{WQ})
V_{WQ}/(Q1" x 86,400)	Drawdown Time (days)
4.0	**Drawdown Time (days) (2 - 5 days)**

Pond / Riser Data & Elevations				
Pond Type	Wet Pond			
TSS Removal	85%			
Top of Pond / Berm	246.00 ft			
Secondary Spillway Width	30.00 ft			
Bottom of Secondary Spillway	244.50 ft			
Top of Riser	243.25 ft	(at least 1' Above TPE)		
Riser Type / Size	4x4 ft			
Top of Water Quality / Temp Pool Elev	240.00 ft	(1" Runoff)		
Top of Veg. Shelf	240.00 ft			
Permanent Pool Elevation (Normal Pool)	239.00 ft			
Water Quality Orifice Elevation & Size	239.00 ft		2.50	in
Secondary Orifice Elevation & Size (Rise & Span)	240.65 ft	24.00 inch	24.00 inch	
Bottom of Veg. Shelf	239.00 ft	^ Rise	^ Span	
Top of Sediment Storage / Pond Bottom	234.00 ft			
Bottom of Sediment Storage	233.00 ft	(Min 1 ft)		
Invert Out of Riser	239.00 ft			
Outlet Pipe Size	24.00 in	Diameter RCP		
Outlet Pipe Length & Slope	108.00 ft		3.29	%
Downstream Outlet Elevation	235.45 ft			
1 Yr Water Surface Elev / Peak Flow (CFS)	241.42 ft		3.56	CFS
2 Yr Water Surface Elev Peak Flow (CFS)	241.90 ft		8.19	CFS
10 Yr Water Surface Elev Peak Flow (CFS)	243.29 ft		19.75	CFS
25 Yr Water Surface Elev Peak Flow (CFS)	244.02 ft		29.66	CFS
100 Yr Water Surface Elev Peak Flow (CFS)	244.95 ft		57.54	CFS

Anti-Bouyancy Calculations for the Riser Structure

Riser Dimensions		Weight of Structure		Displaced Volume	
Outside Width	5.00 ft	Walls =	13,838 LBS	V = LxWx(HT) = C.F.	
Inside Width	4.00 ft	Base =	3,675 LBS		
Outside Length	5.00 ft	FILL =	13,200 lbs	Displaced Water =	
Inside Length	4.00 ft			C.F. * 62.4 PCF = LBS	
Height	10.25 ft	Outlet Pipe =	236 LBS		
Base Thick' (ft)	0.50 ft	WQ Orifice =	3 LBS	Add 15% Factor of Safety	
Wall Thick' (ft)	0.50 ft				
Ext Base (ft)	1.00 ft	Weir #1 =	300 LBS	V =	256 C.F.
Areas removed from Riser		Weir #2 =	0 LBS	Disp. Water =	15,990 LBS
Outlet Pipe	3.14 ft	Weir #3 =	0 LBS	15% F.S. =	2,399 LBS
WQ Orifice	0.03 ft	Weir #4 =	0 LBS		
Orifice #1	4.00 ft	Other #1 =	0 LBS	Safety Factor	1.64
Orifice #2	0.00 ft				
Orifice #3	0.00 ft	**Weight =**	**30,174 LBS**	**Weight =**	**18,389 LBS**
Orifice #4	0.00 ft	**Precast Concrete Riser Structure to be 4 ft x 4 ft x 10.25 ft Tall, With a 0.5 ft Thick Precast Extended Base**			
Other	0.00 ft				

3.7. Wet Pond #8

STRONGROCK ENGINEERING GROUP

Project: Reserve @ Mitchell Mill
Calculated By: TOM T
Date: 5/20/2025

Wet Pond Design Calculations

SCM 8

Pollutant / Nutrient Removal

Total Suspended Solids (TSS)	85%
Nitrogen	30%
Phosphorus	40%

Basin Characteristics

Post-Development Drainage Area

Area to Pond

Description	Acres
Impervious Lots	2.13
Impervious R/W	1.04
Managed Pervious	3.08
Impervious Other	0.33
Total to Pond (AC)	6.58
Pond Basin C	0.67

Estimated Impervious

Lots

Description	Qty (# of Lots)	Imp / Lot (SF)	Total Imp Area
BUA		92978	2.13
			0.00
			0.00
			0.00
			0.00
			0.00
Subtotal	**0**	**-**	**2.13**

Streets and SW

Description	Length (LF)	Imp (SF) / LF	Total Imp Area
Roads & Sidewalks		45447	1.04
			0.00
			0.00
			0.00
			0.00
			0.00
Subtotal			**1.04**

Other

Ponds		14234	0.33
			0.00

Grand Total Impervious Area (AC): 3.50

Surface Area to Drainage Area Ratio for Permanent Pool Sizing

Drainage Area to SCM

Impervious Area	Acres
Offsite Impervious Area	0.00
Onsite Impervious Area	3.50
Total Impervious Area	3.50
Total Drainage Area To SCM	6.58
Percent Impervious Area	53%

Required Surface Area of Permanent Pool

Average Depth (ft) =	3.5
SA/DA Ratio =	1.73
Required SA (ft2) =	4,959
SA as Shown (ft2) =	4,976

SA/DA Ratio from latest NCDENR BMP Manual

SA / DA Pond Volumes and Areas (Below Permanent / Normal Pool)

Elevation (ft)	Main Area (sf)	Forebay Area (sf)	Depth (ft)	Main Inc. Vol (cf)	Forebay Inc. Vol (cf)	Total Vol (cf)
234.0				Bottom of Sediment Storage		
235.0	2,375	191	0.0	Top of Sediment Storage		
236.0	2,845	353	1.0	2,610	272	2,882
237.0	3,340	542	2.0	3,093	448	6,422
238.0	3,860	756	3.0	3,600	649	10,671
239.0	4,406	996	4.0	4,133	876	15,680
240.0	4,976	1,260	5.0	4,691	1,128	21,499
241.0	0	0				
242.0	0	0				
243.0	0	0				
244.0	0	0				
Total			5.0	18,127	3,373	21,499
Verify the Forebay Volume Is Approximately (15% - 20%) of the Permanent Pool Volume.						**19%**

Water Quality and Quantity Volumes (Above Permanent / Normal Pool)

Elevation (ft)	Main Area (sf)	Forebay Area (sf)	Depth (ft)	Inc Total Vol (cf)	Accum' Total Vol (cf)	
240.0	4,976	1,260	0.00	Permanent Pool Elevation		Notes
241.0	8,549	-	1.00	6,763	6,763	
241.66	9,274	-	1.66	5,881	12,644	WQE / TPE
242.0	9,648	-	2.00	3,217	15,861	
243.0	10,804	-	3.00	10,226	26,087	
244.0	12,016	-	4.00	11,410	37,497	
245.0	13,285	-	5.00	12,651	50,148	
246.0	0	-				
247.0	0	-				
248.0	0	-				

Verify the Average Depth of Pool (D_{avg}) - Equation 3.

$d_{avg} = [V_{perm\ pool} - [0.5 \times Depth_{max\ over\ shelf} \times Perimeter_{perm\ pool} \times Width_{submerged\ part\ of\ shelf}] / A_{bottom\ of\ shelf}$

V_{perm} =	18,127	C.F. (Main Pond)
$A_{bottom\ shelf}$ =	4,976	S.F. (Main Pond)
Depth of Water $_{over\ shelf}$ =	0.00	FT
Perimeter $_{perm\ pool}$ =	288	L.F. (Main Pond)
Width $_{submerged\ part\ of\ shelf}$ =	0.0	FT
D_{avg} =	3.64	FT
Depth for SA/DA =	**3.50**	**FT (Round D_{av} down to nearest 0.5 ft)**

1.0" Water Quality Runoff Volume Calculation

Using the runoff volume calculations in the "Simple Method" as described by Schueler (1987)

Where: Rv = Runoff Coefficient, in/in

I = Percent Impervious	I=	53.3%
Rv = 0.05 + 0.009(I)	Rv =	0.529

1.0 inch runoff volume (Required)

Runoff volume, S=(Design rainfall) (Rv) (Drainage Area)

Design Rainfall =	1.0	inch
Drainage Area =	6.58	acres
Storage Required =	**12,644**	**cu. ft.**

Volume Storage For 1.0" Runoff Above Permanent Pool (Provided)

Depth	PPE SA (SF)	Top Temp Pool SA (SF)	Volume (CF)	Elevation
1.66	4,976	9,274	12,644	241.66

Size Water Quality Orifice for (2-5) Day Drawdown for 1" Runoff Volume	
$Q_{1"} = CdA(2gh)^{1/2}$	(Orifice Equation; Cd=0.60; h = Ho/3)
1.50	Orifice Diameter (inches)
1.60	Ho (Driving Head to Centroid of Orifice) (ft)
0.53	Ho / 3 (Per orifice equation recommendation in NCDEQ SWM Design Manual, Part B)
0.04	Q1.0" Drawdown Rate (cfs)
12,644	Water Quality Volume (V_{WQ})
V_{WQ}/(Q1" x 86,400)	Drawdown Time (days)
3.4	**Drawdown Time (days) (2 - 5 days)**

Pond / Riser Data & Elevations				
Pond Type	Wet Pond			
TSS Removal	85%			
Top of Pond / Berm	245.00 ft			
Secondary Spillway Width	30.00 ft			
Bottom of Secondary Spillway	244.50 ft			
Top of Riser	244.00 ft	(at least 1' Above TPE)		
Riser Type / Size	4x4 ft			
Top of Water Quality / Temp Pool Elev	241.66 ft	(1" Runoff)		
Top of Veg. Shelf	241.00 ft			
Permanent Pool Elevation (Normal Pool)	240.00 ft			
Water Quality Orifice Elevation & Size	240.00 ft		1.50	in
Secondary Orifice Elevation & Size (Rise & Span)	241.66 ft		24.00 inch	24.00 inch
Bottom of Veg. Shelf	240.00 ft		^ Rise	^ Span
Top of Sediment Storage / Pond Bottom	235.00 ft			
Bottom of Sediment Storage	234.00 ft	(Min 1 ft)		
Invert Out of Riser	237.00 ft			
Outlet Pipe Size	24.00 in	Diameter RCP		
Outlet Pipe Length & Slope	58.00 ft		5.17	%
Downstream Outlet Elevation	234.00 ft			
1 Yr Water Surface Elev / Peak Flow (CFS)	242.39 ft		3.18	CFS
2 Yr Water Surface Elev Peak Flow (CFS)	242.87 ft		7.55	CFS
10 Yr Water Surface Elev Peak Flow (CFS)	243.97 ft		17.45	CFS
25 Yr Water Surface Elev Peak Flow (CFS)	244.36 ft		31.29	CFS
100 Yr Water Surface Elev Peak Flow (CFS)	244.77 ft		49.33	CFS

Anti-Bouyancy Calculations for the Riser Structure

Riser Dimensions		Weight of Structure		Displaced Volume	
Outside Width	5.00 ft	Walls =	13,500 LBS	V = LxWx(HT) = C.F.	
Inside Width	4.00 ft	Base =	3,675 LBS		
Outside Length	5.00 ft	FILL =	6,000 lbs	Displaced Water =	
Inside Length	4.00 ft			C.F. * 62.4 PCF = LBS	
Height	10.00 ft	Outlet Pipe =	236 LBS		
Base Thick' (ft)	0.50 ft	WQ Orifice =	1 LBS	Add 15% Factor of Safety	
Wall Thick' (ft)	0.50 ft				
Ext Base (ft)	1.00 ft	Weir #1 =	300 LBS	V =	250 C.F.
Areas removed from Riser		Weir #2 =	0 LBS	Disp. Water =	15,600 LBS
Outlet Pipe	3.14 ft	Weir #3 =	0 LBS	15% F.S. =	2,340 LBS
WQ Orifice	0.01 ft	Weir #4 =	0 LBS		
Orifice #1	4.00 ft	Other #1 =	0 LBS	Safety Factor	1.26
Orifice #2	0.00 ft				
Orifice #3	0.00 ft	**Weight =**	**22,639 LBS**	**Weight =**	**17,940 LBS**
Orifice #4	0.00 ft	**Precast Concrete Riser Structure to be 4 ft x 4 ft x 10 ft Tall, With a 0.5 ft Thick Precast Extended Base**			
Other	0.00 ft				

4. Hydraulic Grade Line and Gutter Spread Analysis

4.1. 2 Year Gutter Spread Analysis

2-YEAR RETURN PERIOD

GUTTER SPREAD ANALYSIS

RESERVE @ MITCHELL MILL

5109 MITCHELL MILL ROAD, TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

PREPARED BY: TOM TAYLOR
STRONG ROCK ENGINEERING GROUP, PLLC | COMPANY LICENSE # P-2166
305 CHURCH AT NORTH HILLS STREET, SUITE 1110 RALEIGH, NC 27609 |
INFORMATION@STRONGROCKGROUP.COM

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STUDY DESCRIPTION.

This study utilized:

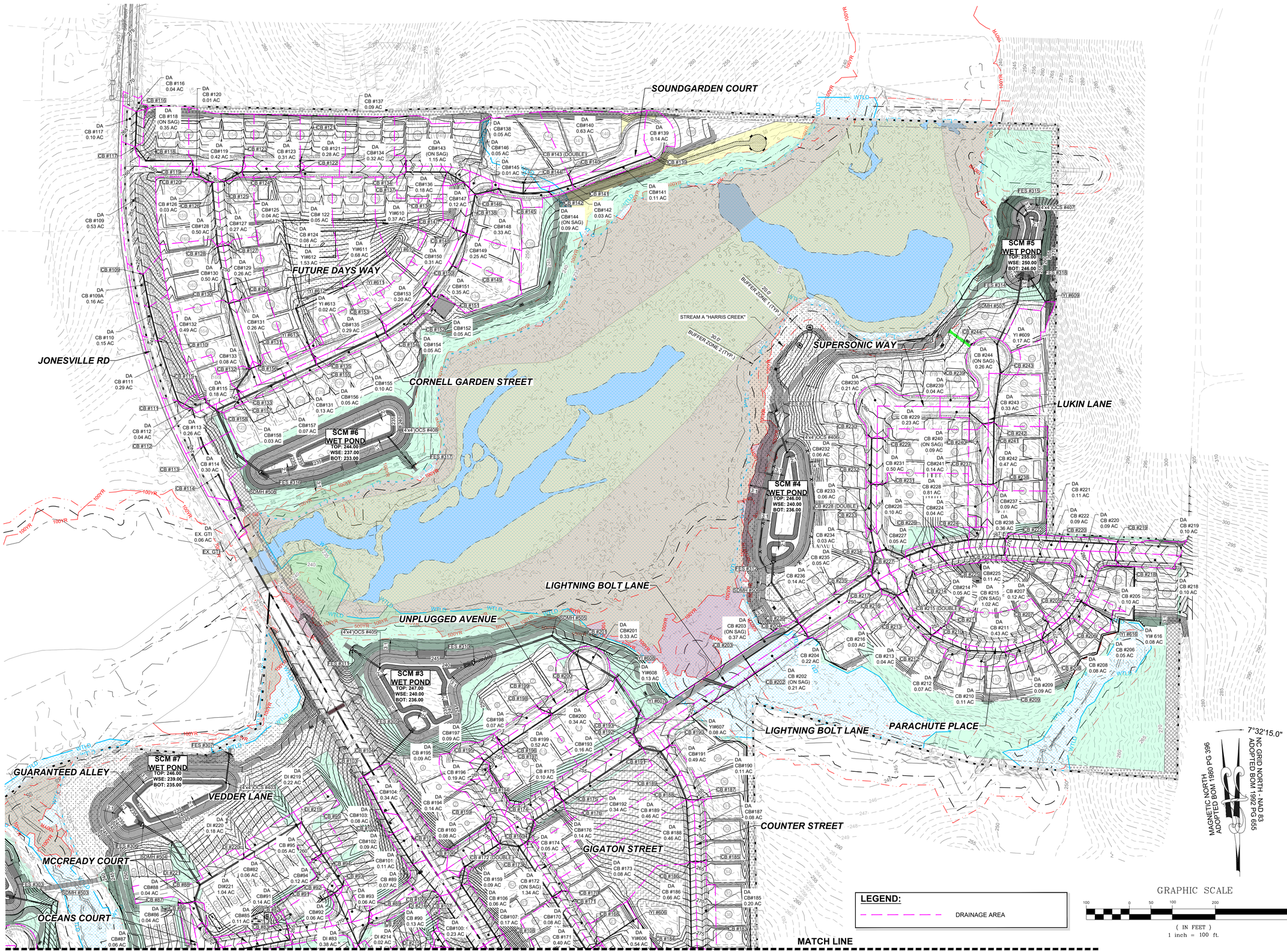
- Auto Desk Storm and Sanitary Analysis Program for analyzing and designing stormwater sewers.

Calculation requirements:

- For the Gutter Spread Analysis, the standard NCDOT intensity measurement is 4 in/ hr.
- Gutter Spread can be up to half a lane width.

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DRAINAGE MAP



No.	REVISIONS	DATE	BY
01	CONSTRUCTION INFRASTRUCTURE DRAWINGS CID-24-04	06/04/2024	SREG
02	TOWN OF ROLESVILLE CID-24-04 V2	11/01/2024	SREG
03	TOWN OF ROLESVILLE CID-24-04 V3	02/01/2024	SREG
04	TOWN OF ROLESVILLE CID-24-04 V4	05/01/2025	SREG

SEAL:

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STRONG ROCK PROJECT	P&P-23-03
NOT FOR CONSTRUCTION	
SCALE	AS SHOWN
DESIGNED BY	SRG
DRAWN BY	SRG
CHECKED BY	SRG

RESERVE @ MITCHELL MILL
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

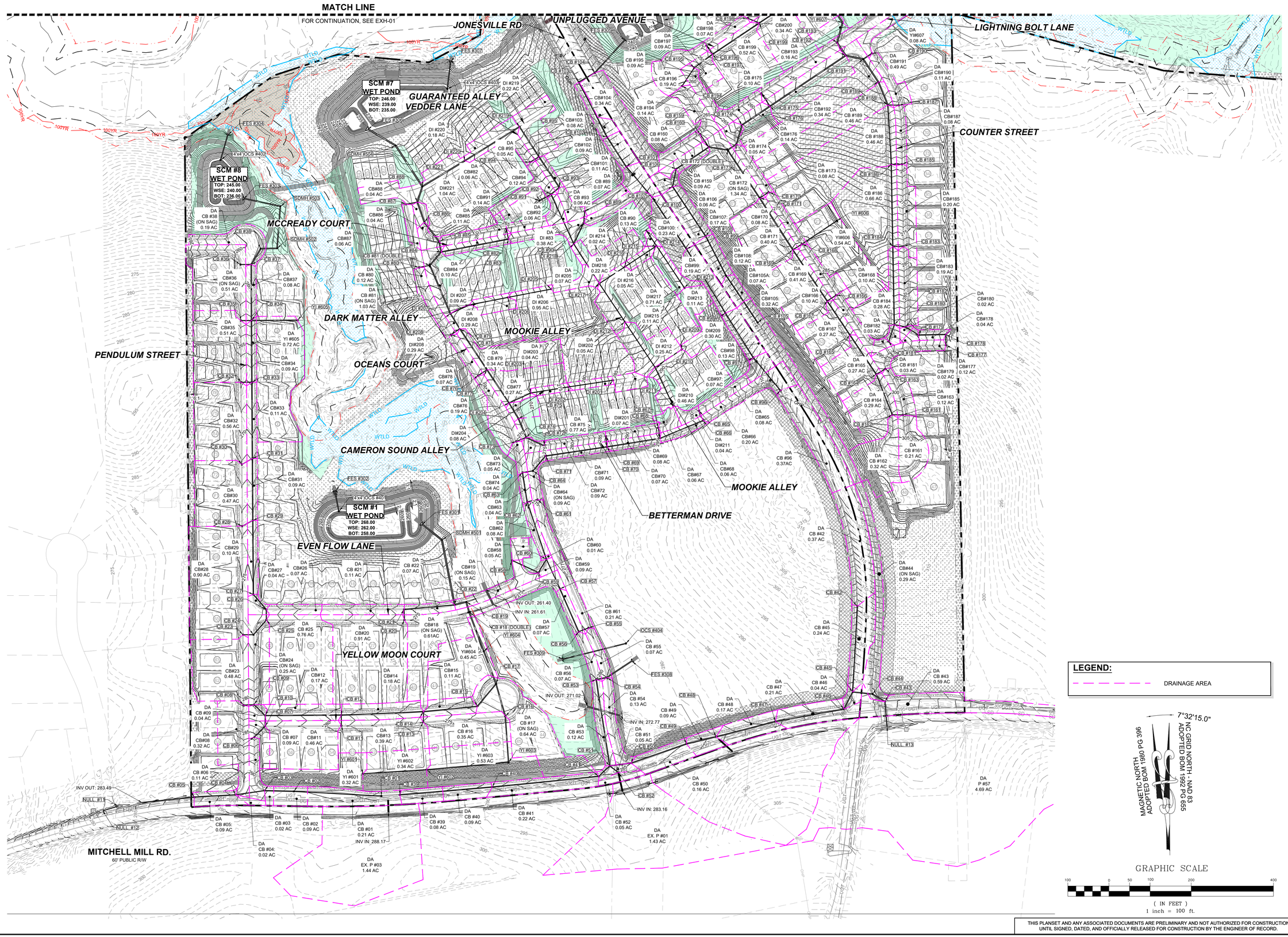
CONSTRUCTION PLANS
THE DRAINAGE MAP
EXHIBIT - 01

DRAWING SHEET
EX-01

01 OF 02

THIS PLANSET AND ANY ASSOCIATED DOCUMENTS ARE PRELIMINARY AND NOT AUTHORIZED FOR CONSTRUCTION UNTIL SIGNED, DATED, AND OFFICIALLY RELEASED FOR CONSTRUCTION BY THE ENGINEER OF RECORD.

PROGRESS PLOT DATE: 05/29/25



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TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA
CONSTRUCTION PLANS

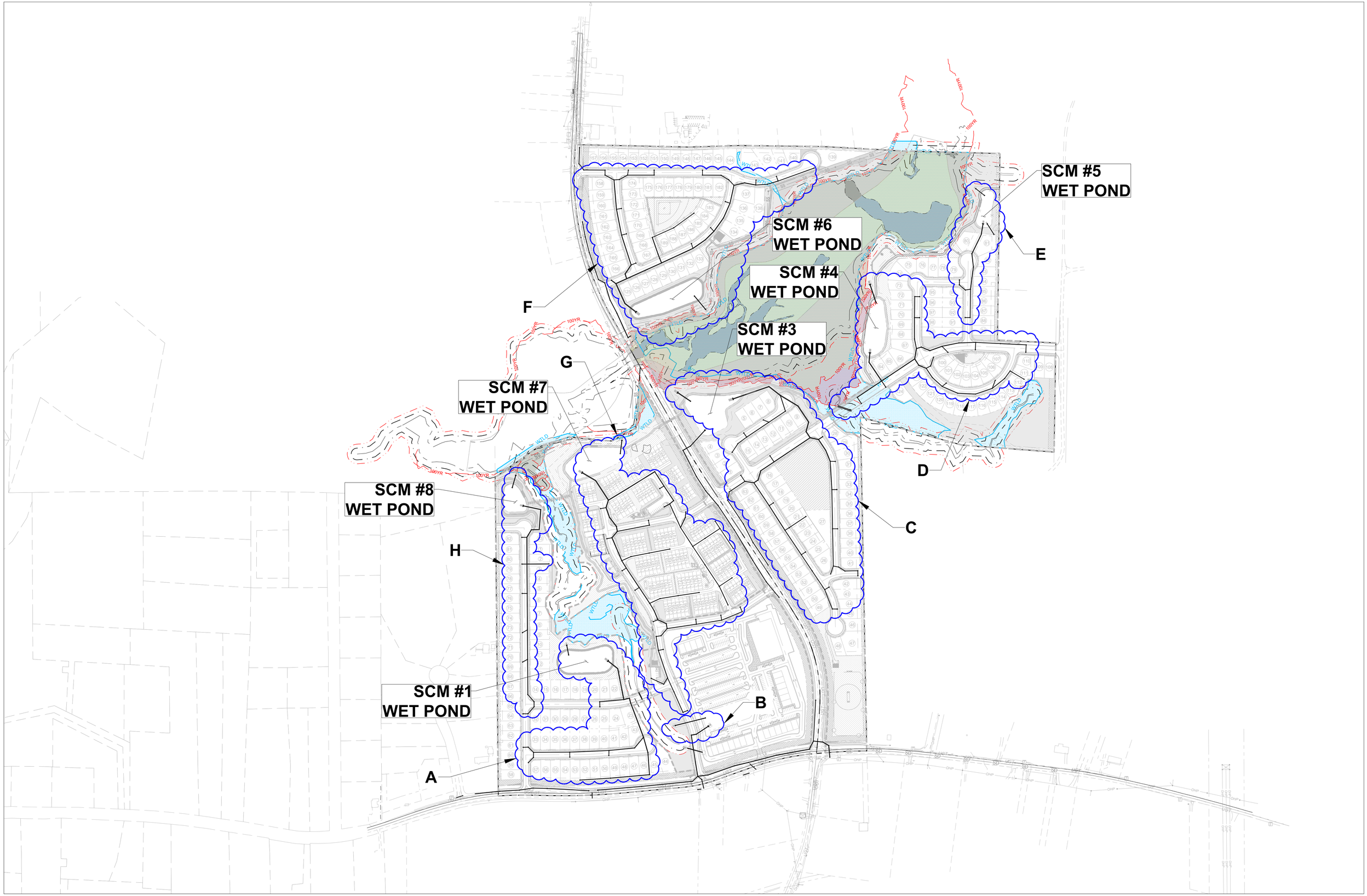
THE DRAINAGE MAP
EXHIBIT - 02

DRAWING SHEET

EX-02

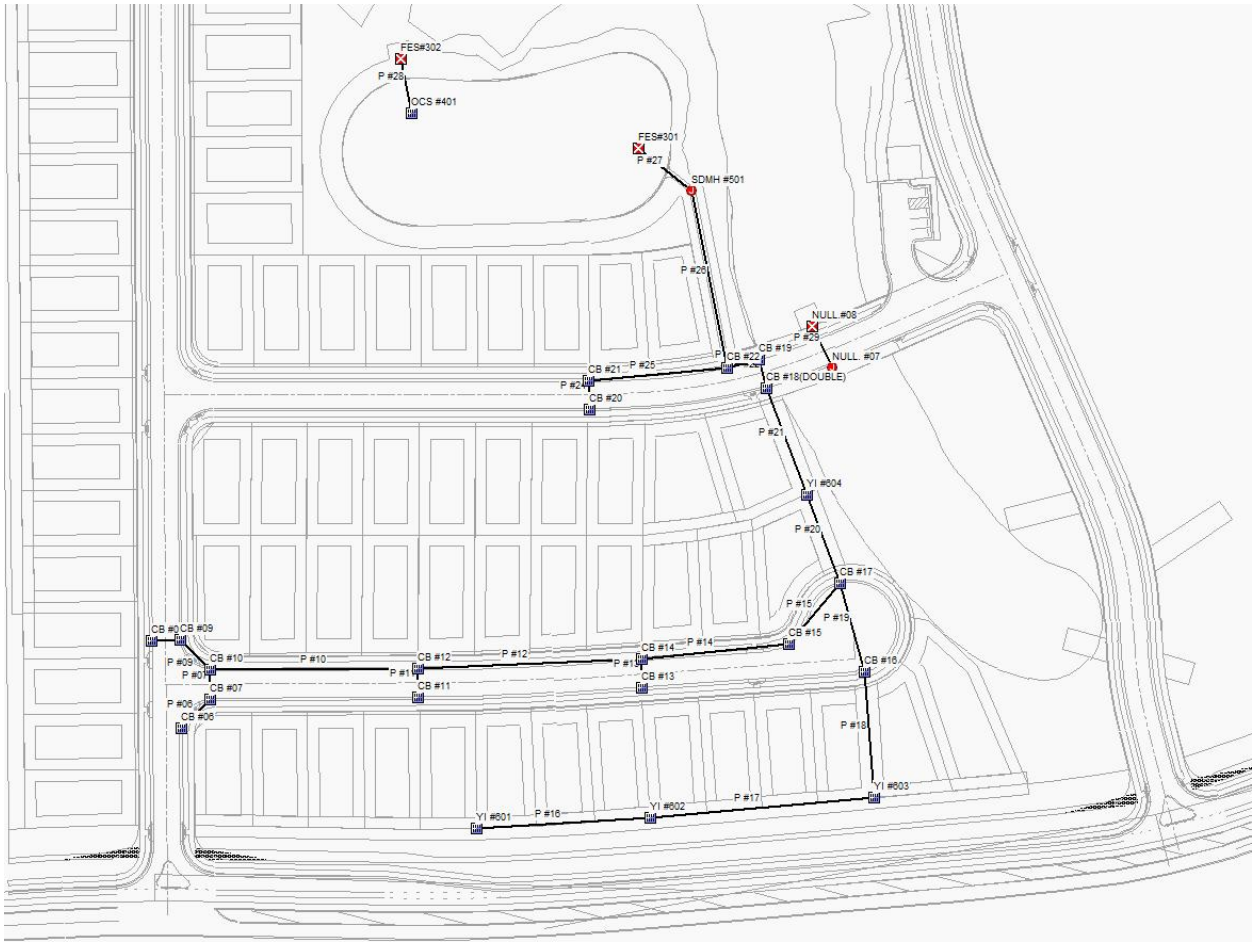
02 OF 02

THE TABLE OF GUTTER SPREAD, THE TABLE OF DRAINAGE AREA


SCM #5
WET POND
SCM #6
WET POND
SCM #4
WET POND
SCM #3
WET POND
SCM #7
WET POND
SCM #8
WET POND
SCM #1
WET POND
E
F
G
D
C
H
B
A

S T O R M W A T E R AREA " A "

2-YEAR RETURN PERIOD FOR GUTTER SPREAD



PLAN VIEW

DRAINAGE AREA

SN	Element ID	Area (acres)	Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
1	Sub-CB#06	0.11	CB #06	0.8300	0.33	0.28	0.37	4.000	0 00:05:00
2	Sub-CB#07	0.09	CB #07	0.5900	0.33	0.20	0.21	4.000	0 00:05:00
3	Sub-CB#08	0.32	CB #08	0.5800	0.33	0.19	0.74	4.000	0 00:05:00
4	Sub-CB#09	0.04	CB #09	0.8300	0.33	0.28	0.13	4.000	0 00:05:00
5	Sub-CB#10	0.01	CB #10	0.7000	0.33	0.23	0.03	4.000	0 00:05:00
6	Sub-CB#11	0.46	CB #11	0.7300	0.33	0.24	1.34	4.000	0 00:05:00
7	Sub-CB#12	0.17	CB #12	0.8700	0.33	0.29	0.59	4.000	0 00:05:00
8	Sub-CB#13	0.39	CB #13	0.6300	0.33	0.21	0.98	4.000	0 00:05:00
9	Sub-CB#14	0.18	CB #14	0.8700	0.33	0.29	0.63	4.000	0 00:05:00
10	Sub-CB#15	0.11	CB #15	0.8700	0.33	0.29	0.38	4.000	0 00:05:00
11	Sub-CB#16	0.35	CB #16	0.6300	0.33	0.21	0.88	4.000	0 00:05:00
12	Sub-CB#17	0.64	CB #17	0.7100	0.33	0.24	1.82	4.000	0 00:05:00
13	Sub-CB#18	0.60	CB #18(DOUBLE)	0.7300	0.33	0.24	1.75	4.000	0 00:05:00
14	Sub-CB#19	0.15	CB #19	0.8300	0.33	0.28	0.50	4.000	0 00:05:00
15	Sub-CB#20	0.91	CB #20	0.7300	0.33	0.24	2.66	4.000	0 00:05:00
16	Sub-CB#21	0.11	CB #21	0.8700	0.33	0.29	0.38	4.000	0 00:05:00
17	Sub-CB#22	0.07	CB #22	0.8700	0.33	0.29	0.24	4.000	0 00:05:00

MODEL INPUT														MODEL OUTPUT									
SN	Element ID	Inlet Location	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft^2)	Grate Clogging Factor (%)	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (inches)	Surface Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Total Peak Flow (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Allowable Spread (ft)	Check	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Maximum Depth Occurrence (days hh:mm)
1	CB #06	On Grade	280.95	285.49	280.95	N/A	0.00	0.0616	0.0208	0.0130	0.0600	2.00	1.4400	0.37	0.36	0.00	0.36	100.00	1.64	8.00	YES	285.59	0.10	0 00:05
2	CB #07	On Grade	277.96	282.70	277.96	N/A	0.00	0.0170	0.0208	0.0130	0.0600	2.00	1.4400	0.21	0.21	0.00	0.21	100.00	1.70	8.00	YES	282.80	0.10	0 00:05
3	CB #08	On Grade	276.33	280.77	276.33	N/A	0.00	0.0616	0.0208	0.0130	0.0600	2.00	1.4400	0.74	0.01	0.73	0.74	1.23	2.14	8.00	YES	280.81	0.04	0 00:05
4	CB #09	On Grade	276.00	280.68	276.00	N/A	0.00	0.0616	0.0208	0.0130	0.0600	2.00	1.4400	0.13	0.13	0.00	0.13	100.00	1.13	8.00	YES	280.75	0.07	0 00:05
5	CB #10	On Sag	275.61	282.20	275.61	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	0.03	N/A	N/A	0.03	N/A	1.20	8.00	YES	282.31	0.10	0 00:06
6	CB #11	On Grade	274.85	279.29	274.85	N/A	0.00	0.0170	0.0208	0.0130	0.0600	2.00	1.4400	1.34	1.12	0.22	1.34	83.78	5.58	8.00	YES	279.48	0.19	0 00:05
7	CB #12	On Grade	274.34	279.28	274.34	N/A	0.00	0.0170	0.0208	0.0130	0.0600	2.00	1.4400	0.59	0.02	0.57	0.59	3.13	2.49	8.00	YES	279.33	0.05	0 00:06
8	CB #13	On Grade	271.48	275.92	271.48	N/A	0.00	0.0170	0.0208	0.0130	0.0600	2.00	1.4400	0.98	1.03	0.16	1.19	86.30	5.20	8.00	YES	276.11	0.19	0 00:05
9	CB #14	On Grade	270.88	275.87	270.88	N/A	0.00	0.0170	0.0208	0.0130	0.0600	2.00	1.4400	0.63	0.60	0.02	0.63	96.48	3.54	8.00	YES	276.03	0.15	0 00:05
10	CB #15	On Grade	267.91	273.37	267.91	N/A	0.00	0.0170	0.0208	0.0130	0.0600	2.00	1.4400	0.38	0.01	0.37	0.38	3.85	2.13	8.00	YES	273.42	0.04	0 00:05
11	CB #16	On Grade	267.09	273.22	267.09	N/A	0.00	0.0170	0.0208	0.0130	0.0600	2.00	1.4400	0.88	0.88	0.10	0.98	89.82	4.68	8.00	YES	273.40	0.18	0 00:05
12	CB #17	On Sag	265.90	272.30	265.90	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	1.82	N/A	N/A	1.88	N/A	8.72	22.00	YES	272.56	0.26	0 00:06
13	CB #18(DOUBLE)	On Sag	264.42	272.97	264.42	12.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	1.75	N/A	N/A	2.51	N/A	3.52	8.00	YES	273.12	0.15	0 00:06
14	CB #19	On Sag	264.09	272.95	264.09	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	0.50	N/A	N/A	0.50	N/A	2.37	8.00	YES	273.08	0.13	0 00:06
15	CB #20	On Grade	270.89	275.32	270.89	N/A	0.00	0.0191	0.0208	0.0130	0.0600	2.00	1.4400	2.66	1.88	0.77	2.65	70.83	7.52	8.00	YES	275.56	0.23	0 00:05
16	CB #21	On Grade	270.56	275.34	270.56	N/A	0.00	0.0191	0.0208	0.0130	0.0600	2.00	1.4400	0.38	0.01	0.37	0.38	3.53	2.08	8.00	YES	275.39	0.04	0 00:05
17	CB #22	On Grade	263.74	273.10	263.74	N/A	0.00	0.0191	0.0208	0.0130	0.0600	2.00	1.4400	0.24	0.24	0.00	0.24	100.00	1.76	8.00	YES	273.20	0.11	0 00:06

S T O R M W A T E R AREA " C "

2-YEAR RETURN PERIOD FOR GUTTER SPREAD



PLAN VIEW

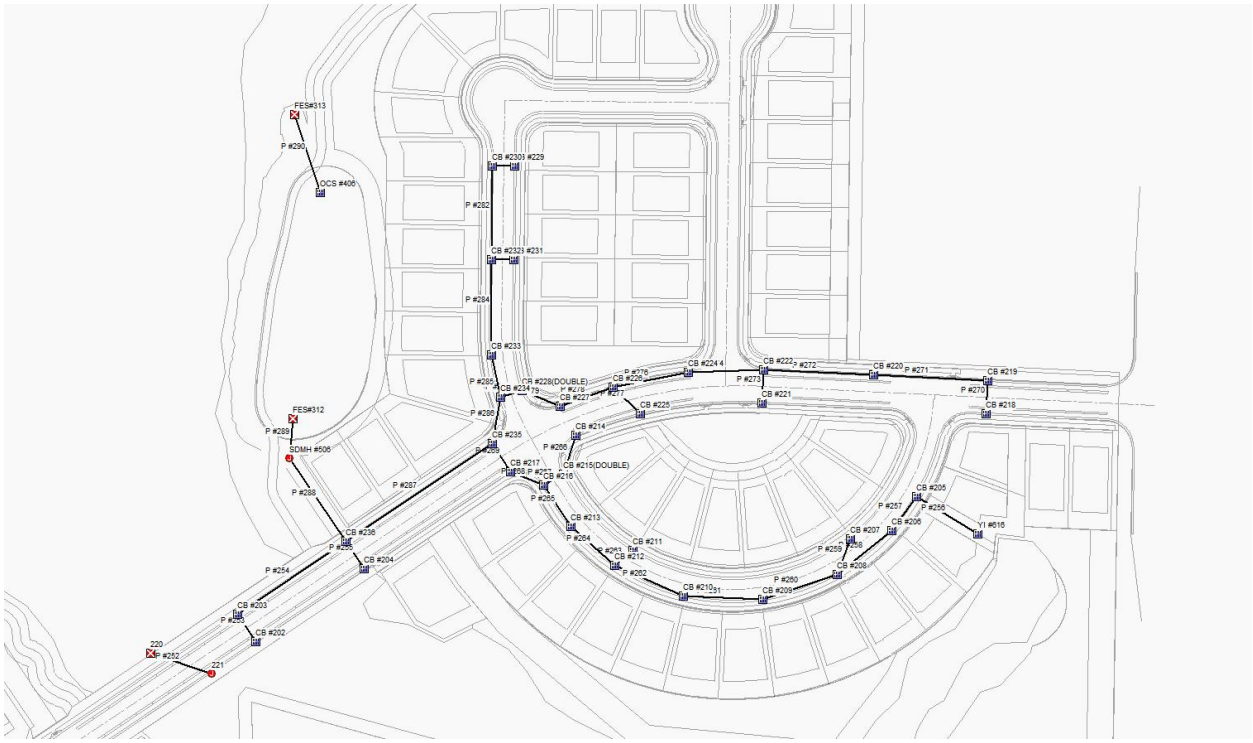
DRAINAGE AREA

SN	Element ID	Area (acres)	Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
1	Sub-CB#106	0.06	CB #106	0.8300	0.33	0.28	0.20	4.000	0 00:05:00
2	Sub-CB#159	0.09	CB #159	0.8300	0.33	0.28	0.30	4.000	0 00:05:00
3	Sub-CB#160	0.08	CB #160	0.8300	0.33	0.28	0.27	4.000	0 00:05:00
4	Sub-CB#161	0.21	CB #161	0.8700	0.33	0.29	0.73	4.000	0 00:05:00
5	Sub-CB#162	0.32	CB #162	0.7500	0.33	0.25	0.96	4.000	0 00:05:00
6	Sub-CB#163	0.12	CB #163	0.8700	0.33	0.29	0.42	4.000	0 00:05:00
7	Sub-CB#164	0.29	CB #164	0.6100	0.33	0.20	0.71	4.000	0 00:05:00
8	Sub-CB#165	0.27	CB #165	0.7300	0.33	0.24	0.79	4.000	0 00:05:00
9	Sub-CB#166	0.10	CB #166	0.8700	0.33	0.29	0.35	4.000	0 00:05:00
10	Sub-CB#167	0.27	CB #167	0.7300	0.33	0.24	0.79	4.000	0 00:05:00
11	Sub-CB#168	0.10	CB #168	0.8700	0.33	0.29	0.35	4.000	0 00:05:00
12	Sub-CB#169	0.41	CB #169	0.7300	0.33	0.24	1.20	4.000	0 00:05:00
13	Sub-CB#170	0.08	CB #170	0.8700	0.33	0.29	0.28	4.000	0 00:05:00
14	Sub-CB#171	0.40	CB #171	0.8300	0.33	0.28	1.33	4.000	0 00:05:00
15	Sub-CB#172	1.34	CB #172(DOUBLE)	0.7100	0.33	0.24	3.81	4.000	0 00:05:00
16	Sub-CB#173	0.08	CB #173	0.8700	0.33	0.29	0.28	4.000	0 00:05:00
17	Sub-CB#174	0.05	CB #174	0.8300	0.33	0.28	0.17	4.000	0 00:05:00
18	Sub-CB#175	0.10	CB #175	0.8300	0.33	0.28	0.33	4.000	0 00:05:00
19	Sub-CB#176	0.14	CB #176	0.5900	0.33	0.20	0.33	4.000	0 00:05:00
20	Sub-CB#177	0.12	CB #177	0.8300	0.33	0.28	0.40	4.000	0 00:05:00
21	Sub-CB#178	0.04	CB #178	0.8300	0.33	0.28	0.13	4.000	0 00:05:00
22	Sub-CB#179	0.02	CB #179	0.8300	0.33	0.28	0.07	4.000	0 00:05:00
23	Sub-CB#180	0.02	CB #180	0.8300	0.33	0.28	0.07	4.000	0 00:05:00
24	Sub-CB#181	0.03	CB #181	0.8300	0.33	0.28	0.10	4.000	0 00:05:00
25	Sub-CB#182	0.03	CB #182	0.8300	0.33	0.28	0.10	4.000	0 00:05:00
26	Sub-CB#183	0.19	CB #183	0.8700	0.33	0.29	0.66	4.000	0 00:05:00
27	Sub-CB#184	0.28	CB #184	0.8300	0.33	0.28	0.93	4.000	0 00:05:00
28	Sub-CB#185	0.20	CB #185	0.8700	0.33	0.29	0.70	4.000	0 00:05:00
29	Sub-CB#186	0.66	CB #186	0.7100	0.33	0.24	1.87	4.000	0 00:05:00
30	Sub-CB#187	0.08	CB #187	0.8700	0.33	0.29	0.28	4.000	0 00:05:00
31	Sub-CB#188	0.90	CB #188	0.6100	0.33	0.20	2.20	4.000	0 00:05:00
32	Sub-CB#189	0.46	CB #189	0.5100	0.33	0.17	0.94	4.000	0 00:05:00
33	Sub-CB#190	0.11	CB #190	0.8700	0.33	0.29	0.38	4.000	0 00:05:00
34	Sub-CB#191	0.49	CB #191	0.5100	0.33	0.17	1.00	4.000	0 00:05:00
35	Sub-CB#192	0.34	CB #192	0.7100	0.33	0.24	0.97	4.000	0 00:05:00
36	Sub-CB#193	0.16	CB #193	0.8300	0.33	0.28	0.53	4.000	0 00:05:00
37	Sub-CB#194	0.14	CB #194	0.8700	0.33	0.29	0.49	4.000	0 00:05:00
38	Sub-CB#195	0.19	CB #195	0.8300	0.33	0.28	0.63	4.000	0 00:05:00
39	Sub-CB#196	0.09	CB #196	0.8700	0.33	0.29	0.31	4.000	0 00:05:00
40	Sub-CB#197	0.09	CB #197	0.6300	0.33	0.21	0.23	4.000	0 00:05:00
41	Sub-CB#198	0.07	CB #198	0.8700	0.33	0.29	0.24	4.000	0 00:05:00
42	Sub-CB#199	0.52	CB #199	0.6100	0.33	0.20	1.27	4.000	0 00:05:00
43	Sub-CB#200	0.34	CB #200	0.6100	0.33	0.20	0.83	4.000	0 00:05:00
44	Sub-CB#201	0.33	CB #201	0.8700	0.33	0.29	1.15	4.000	0 00:05:00

MODEL INPUT														MODEL OUTPUT									
SN	Element ID	Inlet Location	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft^2)	Grate Clogging Factor (%)	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (inches)	Surface Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Total Peak Flow (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Allowable Spread (ft)	Check	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Maximum Depth Occurrence (days hh:mm)
1	CB #106	On Grade	268.00	272.71	268.00	N/A	0.00	0.0691	0.0208	0.0130	0.0600	2.00	1.4400	0.20	0.20	0.00	0.20	100.00	1.28	11.00	YES	272.78	0.08	0 00:05
2	CB #159	On Grade	264.61	269.05	264.61	N/A	0.00	0.0691	0.0208	0.0130	0.0600	2.00	1.4400	0.30	0.30	0.00	0.30	100.00	1.49	11.00	YES	269.14	0.09	0 00:05
3	CB #160	On Grade	263.53	269.07	263.53	N/A	0.00	0.0691	0.0208	0.0130	0.0600	2.00	1.4400	0.27	0.27	0.00	0.27	100.00	1.42	11.00	YES	269.16	0.09	0 00:05
4	CB #161	On Grade	297.92	302.36	297.92	N/A	0.00	0.0450	0.0208	0.0130	0.0600	2.00	1.4400	0.73	0.01	0.72	0.73	1.52	2.26	8.00	YES	302.40	0.05	0 00:05
5	CB #162	On Grade	297.47	302.20	297.47	N/A	0.00	0.0450	0.0208	0.0130	0.0600	2.00	1.4400	0.96	0.01	0.95	0.96	1.33	2.49	8.00	YES	302.25	0.05	0 00:05
6	CB #163	On Grade	292.57	297.00	292.57	N/A	0.00	0.0450	0.0208	0.0130	0.0600	2.00	1.4400	0.42	0.42	0.00	0.42	100.00	1.84	8.00	YES	297.11	0.11	0 00:05
7	CB #164	On Grade	292.24	297.13	292.24	N/A	0.00	0.0450	0.0208	0.0130	0.0600	2.00	1.4400	0.71	0.01	0.70	0.71	1.53	2.23	8.00	YES	297.18	0.05	0 00:05
8	CB #165	On Grade	287.29	291.92	287.29	N/A	0.00	0.0450	0.0208	0.0130	0.0600	2.00	1.4400	0.79	0.01	0.78	0.79	1.45	2.31	8.00	YES	291.97	0.05	0 00:05
9	CB #166	On Grade	283.04	287.47	283.04	N/A	0.00	0.0450	0.0208	0.0130	0.0600	2.00	1.4400	0.35	0.35	0.00	0.35	100.00	1.70	8.00	YES	287.58	0.10	0 00:05
10	CB #167	On Grade	282.71	287.47	282.71	N/A	0.00	0.0450	0.0208	0.0130	0.0600	2.00	1.4400	0.79	0.01	0.78	0.79	1.45	2.31	8.00	YES	287.51	0.05	0 00:05
11	CB #168	On Grade	269.45	280.18	269.45	N/A	0.00	0.0497	0.0208	0.0130	0.0600	2.00	1.4400	0.35	0.35	0.00	0.35	100.00	1.67	8.00	YES	280.28	0.10	0 00:05
12	CB #169	On Grade	269.12	280.14	269.12	N/A	0.00	0.0497	0.0208	0.0130	0.0600	2.00	1.4400	1.20	1.13	0.07	1.20	94.43	3.81	8.00	YES	280.29	0.16	0 00:05
13	CB #170	On Grade	268.52	272.92	268.52	N/A	0.00	0.0497	0.0208	0.0130	0.0600	2.00	1.4400	0.28	0.28	0.00	0.28	100.00	1.54	8.00	YES	273.01	0.09	0 00:05
14	CB #171	On Grade	267.55	272.95	267.55	N/A	0.00	0.0497	0.0208	0.0130	0.0600	2.00	1.4400	1.33	1.23	0.10	1.33	92.82	4.07	8.00	YES	273.11	0.16	0 00:06
15	CB #172(DOUBLE)	On Sag	261.83	267.62	261.83	12.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	3.81	N/A	N/A	3.83	N/A	3.82	8.00	YES	267.78	0.16	0 00:05
16	CB #173	On Grade	260.77	266.76	260.77	N/A	0.00	0.0405	0.0208	0.0130	0.0600	2.00	1.4400	0.28	0.28	0.00	0.28	100.00	1.60	8.00	YES	266.85	0.10	0 00:05
17	CB #174	On Grade	256.52	262.74	256.52	N/A	0.00	0.0691	0.0208	0.0130	0.0600	2.00	1.4400	0.17	0.17	0.00	0.17	100.00	1.20	11.00	YES	262.82	0.07	0 00:05
18	CB #175	On Grade	253.31	257.74	253.31	N/A	0.00	0.0691	0.0208	0.0130	0.0600	2.00	1.4400	0.33	0.33	0.00	0.33	100.00	1.55	11.00	YES	257.84	0.09	0 00:05
19	CB #176	On Grade	250.53	257.73	250.53	N/A	0.00	0.0691	0.0208	0.0130	0.0600	2.00	1.4400	0.33	0.33	0.00	0.33	100.00	1.54	11.00	YES	257.82	0.09	0 00:05
20	CB #177	On Grade	281.55	285.94	281.55	N/A	0.00	0.0640	0.0208	0.0130	0.0600	2.00	1.4400	0.40	0.40	0.00	0.40	100.00	1.69	8.00	YES	286.04	0.10	0 00:05
21	CB #178	On Grade	281.23	285.94	281.23	N/A	0.00	0.0640	0.0208	0.0130	0.0600	2.00	1.4400	0.13	0.13	0.00	0.13	100.00	1.11	8.00	YES	286.01	0.07	0 00:05
22	CB #179	On Grade	280.70	289.74	280.70	N/A	0.00	0.0431	0.0208	0.0130	0.0600	2.00	1.4400	0.07	0.07	0.00	0.07	100.00	0.93	8.00	YES	289.80	0.06	0 00:05
23	CB #180	On Grade	280.31	289.80	280.31	N/A	0.00	0.0657	0.0208	0.0130	0.0600	2.00	1.4400	0.07	0.07	0.00	0.07	100.00	0.86	8.00	YES	289.85	0.05	0 00:06
24	CB #181	On Grade	285.50	292.77	285.50	N/A	0.00	0.0431	0.0208	0.0130	0.0600	2.00	1.4400	0.10	0.10	0.00	0.10	100.00	1.08	8.00	YES	292.84	0.06	0 00:05
25	CB #182	On Grade	279.97	289.88	279.97	N/A	0.00	0.0657	0.0208	0.0130	0.0600	2.00	1.4400	0.10	0.10	0.00	0.10	100.00	1.00	8.00	YES	289.94	0.06	0 00:06
26	CB #183	On Grade	272.10	277.06	272.10	N/A	0.00	0.0657	0.0208	0.0130	0.0600	2.00	1.4400	0.66	0.01	0.65	0.66	1.22	2.02	8.00	YES	277.10	0.04	0 00:05
27	CB #184	On Grade	271.77	277.02	271.77	N/A	0.00	0.0657	0.0208	0.0130	0.0600	2.00	1.4400	0.93	0.01	0.92	0.93	1.06	2.30	8.00	YES	277.07	0.05	0 00:05
28	CB #185	On Grade	258.91	263.88	258.91	N/A	0.00	0.0657	0.0208	0.0130	0.0600	2.00	1.4400	0.70	0.01	0.69	0.70	1.21	2.07	8.00	YES	263.93	0.04	0 00:05
29	CB #186	On Grade	256.28	263.89	256.28	N/A	0.00	0.0657	0.0208	0.0130	0.0600	2.00	1.4400	1.87	1.67	0.20	1.87	89.12	4.58	8.00	YES	264.06	0.17	0 00:05
30	CB #187	On Grade	250.85	255.29	250.85	N/A	0.00	0.0657	0.0208	0.0130	0.0600	2.00	1.4400	0.28	0.00	0.28	0.28	0.00	1.47	8.00	YES	255.38	0.09	0 00:05
31	CB #188	On Grade	248.38	254.98	247.38	N/A	0.00	0.0657	0.0208	0.0130	0.0600	2.00	1.4400	2.20	1.98	0.36	2.34	84.48	5.20	8.00	YES	255.17	0.19	0 00:05
32	CB #189	On Grade	246.66	252.83	246.66	N/A	0.00	0.0201	0.0208	0.0130	0.0600	2.00	1.4400	0.94	1.07	0.16	1.23	86.99	5.06	8.00	YES	253.02	0.18	0 00:05
33	CB #190	On Grade	246.85	251.46	246.85	N/A	0.00	0.0201	0.0208	0.0130	0.0600	2.00	1.4400	0.38	0.01	0.37	0.38	3.45	2.06	8.00	YES	251.50	0.04	0 00:05
34	CB #191	On Sag	245.28	251.46	245.28	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	1.00	N/A	N/A	1.06	N/A	5.66	8.00	YES	251.66	0.20	0 00:06
35	CB #192	On Grade	244.86	251.78	244.86	N/A	0.00	0.0228	0.0208	0.0130	0.0600	2.00	1.4400	0.97	0.89	0.07	0.96	92.31	4.23	11.00	YES	251.95	0.17	0 00:06
36	CB #193	On Grade	244.48	251.77	244.48	N/A	0.00	0.0228	0.0208	0.0130	0.0600	2.00	1.4400	0.53	0.01	0.52	0.53	2.77	2.28	11.00	YES	251.82	0.05	0 00:06
37	CB #194	On Grade	255.95	260.39	255.95	N/A	0.00	0.0600	0.0208	0.0130	0.0600	2.00	1.4400	0.49	0.49	0.00	0.49	100.00	1.84	8.00	YES	260.50	0.11	0 00:05
38	CB #195	On Grade	252.55	257.19	252.55	N/A	0.00	0.0600	0.0208	0.0130	0.0600	2.00	1.4400	0.63	0.01	0.62	0.63	1.32	2.01	8.00	YES	257.23	0.04	0 00:05
39	CB #196	On Grade	249.07	253.50	249.07	N/A	0.00	0.0600	0.0208	0.0130	0.0600	2.00	1.4400	0.31	0.00	0.31	0.31	0.00	1.56	8.00	YES	253.60	0.09	0 00:05
40	CB #197	On Grade	248.03	253.47	248.03	N/A	0.00	0.0600	0.0208	0.0130	0.0600	2.00	1.4400	0.23	0.23	0.00	0.23	100.00	1.38	8.00	YES	253.56	0.08	0 00:05
41	CB #198	On Grade	246.61	251.05	246.61	N/A	0.00	0.0137	0.0208	0.0130	0.0600	2.00	1.4400	0.24	0.00	0.24	0.24	0.00	1.87	8.00	YES	251.16	0.11	0 00:05
42	CB #199	On Grade	245.73	250.80	245.73	N/A	0.00	0.0137	0.0208	0.0130	0.0600	2.00	1.4400	1.27	1.06	0.21	1.27	83.52	5.70	8.00	YES	251.00	0.20	0 00:05
43	CB #200	On Grade	244.83	249.74	244.83	N/A	0.00	0.0137	0.0208	0.0130	0.0600	2.00	1.4400	0.83	0.85	0.11	0.96	88.71	4.91	8.00	YES	249.92	0.18	0 00:05
44	CB #201	On Sag	242.10	248.69	242.10	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	1.15	N/A	N/A	1.19	N/A	6.19	8.00	YES	248.90	0.21	0 00:06

S T O R M W A T E R AREA “ D ”

2-YEAR RETURN PERIOD FOR GUTTER SPREAD



PLAN VIEW

DRAINAGE AREA

SN	Element ID	Area (acres)	Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
1	Sub-CB#202	0.22	CB #202	0.8300	0.33	0.28	0.73	4.000	0 00:05:00
2	Sub-CB#203	0.37	CB #203	0.7100	0.33	0.24	1.05	4.000	0 00:05:00
3	Sub-CB#204	0.22	CB #204	0.5900	0.33	0.20	0.52	4.000	0 00:05:00
4	Sub-CB#205	0.10	CB #205	0.8700	0.33	0.29	0.35	4.000	0 00:05:00
5	Sub-CB#206	0.05	CB #206	0.8700	0.33	0.29	0.17	4.000	0 00:05:00
6	Sub-CB#207	0.12	CB #207	0.8700	0.33	0.29	0.42	4.000	0 00:05:00
7	Sub-CB#208	0.08	CB #208	0.8700	0.33	0.29	0.28	4.000	0 00:05:00
8	Sub-CB#209	0.09	CB #209	0.8700	0.33	0.29	0.31	4.000	0 00:05:00
9	Sub-CB#210	0.07	CB #210	0.8700	0.33	0.29	0.24	4.000	0 00:05:00
10	Sub-CB#211	0.43	CB #211	0.6300	0.33	0.21	1.08	4.000	0 00:05:00
11	Sub-CB#212	0.11	CB #212	0.8700	0.33	0.29	0.38	4.000	0 00:05:00
12	Sub-CB#213	0.04	CB #213	0.8700	0.33	0.29	0.14	4.000	0 00:05:00
13	Sub-CB#214	0.05	CB #214	0.8300	0.33	0.28	0.17	4.000	0 00:05:00
14	Sub-CB#215	1.02	CB #215(DOUBLE)	0.6100	0.33	0.20	2.49	4.000	0 00:05:00
15	Sub-CB#216	0.03	CB #216	0.8700	0.33	0.29	0.10	4.000	0 00:05:00
16	Sub-CB#217	0.04	CB #217	0.8300	0.33	0.28	0.13	4.000	0 00:05:00
17	Sub-CB#218	0.10	CB #218	0.8700	0.33	0.29	0.35	4.000	0 00:05:00
18	Sub-CB#219	0.10	CB #219	0.7900	0.33	0.26	0.32	4.000	0 00:05:00
19	Sub-CB#220	0.09	CB #220	0.8300	0.33	0.28	0.30	4.000	0 00:05:00
20	Sub-CB#221	0.11	CB #221	0.8300	0.33	0.28	0.37	4.000	0 00:05:00
21	Sub-CB#222	0.09	CB #222	0.8300	0.33	0.28	0.30	4.000	0 00:05:00
22	Sub-CB#224	0.04	CB #224	0.7100	0.33	0.24	0.11	4.000	0 00:05:00
23	Sub-CB#225	0.11	CB #225	0.8300	0.33	0.28	0.37	4.000	0 00:05:00
24	Sub-CB#226	0.10	CB #226	0.7100	0.33	0.24	0.28	4.000	0 00:05:00
25	Sub-CB#227	0.05	CB #227	0.8300	0.33	0.28	0.17	4.000	0 00:05:00
26	Sub-CB#228	0.81	CB #228(DOUBLE)	0.6100	0.33	0.20	1.98	4.000	0 00:05:00
27	Sub-CB#229	0.23	CB #229	0.6300	0.33	0.21	0.58	4.000	0 00:05:00
28	Sub-CB#230	0.21	CB #230	0.8700	0.33	0.29	0.73	4.000	0 00:05:00
29	Sub-CB#231	0.50	CB #231	0.7300	0.33	0.24	1.46	4.000	0 00:05:00
30	Sub-CB#232	0.06	CB #232	0.8700	0.33	0.29	0.21	4.000	0 00:05:00
31	Sub-CB#233	0.06	CB #233	0.8700	0.33	0.29	0.21	4.000	0 00:05:00
32	Sub-CB#234	0.03	CB #234	0.8700	0.33	0.29	0.10	4.000	0 00:05:00
33	Sub-CB#235	0.05	CB #235	0.8300	0.33	0.28	0.17	4.000	0 00:05:00
34	Sub-CB#236	0.14	CB #236	0.8700	0.33	0.29	0.49	4.000	0 00:05:00

MODEL INPUT														MODEL OUTPUT									
SN	Element ID	Inlet Location	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft²)	Grate Clogging Factor (%)	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (inches)	Surface Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Total Peak Flow (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Allowable Spread (ft)	Check	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Maximum Depth Occurrence (days hh:mm)
1	CB #202	On Sag	242.68	248.07	242.68	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	0.73	N/A	N/A	0.76	N/A	2.82	11.00	YES	248.21	0.14	0 00:06
2	CB #203	On Sag	242.29	248.08	242.29	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	1.05	N/A	N/A	1.05	N/A	5.64	11.00	YES	248.27	0.20	0 00:06
3	CB #204	On Grade	242.24	248.76	242.24	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.52	0.48	0.04	0.52	92.81	4.61	11.00	YES	248.93	0.17	0 00:06
4	CB #205	On Grade	267.46	274.79	267.46	N/A	0.00	0.0553	0.0208	0.0130	0.0600	2.00	1.4400	0.35	0.35	0.00	0.35	100.00	1.64	8.00	YES	274.89	0.10	0 00:05
5	CB #206	On Grade	267.02	272.31	267.02	N/A	0.00	0.0553	0.0208	0.0130	0.0600	2.00	1.4400	0.17	0.17	0.00	0.17	100.00	1.26	8.00	YES	272.38	0.08	0 00:05
6	CB #207	On Grade	265.56	270.00	265.56	N/A	0.00	0.0553	0.0208	0.0130	0.0600	2.00	1.4400	0.42	0.42	0.00	0.42	100.00	1.76	8.00	YES	270.10	0.11	0 00:05
7	CB #208	On Grade	263.41	268.05	263.41	N/A	0.00	0.0553	0.0208	0.0130	0.0600	2.00	1.4400	0.28	0.28	0.00	0.28	100.00	1.51	8.00	YES	268.14	0.09	0 00:05
8	CB #209	On Grade	258.57	263.28	258.57	N/A	0.00	0.0553	0.0208	0.0130	0.0600	2.00	1.4400	0.31	0.31	0.00	0.31	100.00	1.58	8.00	YES	263.37	0.10	0 00:05
9	CB #210	On Grade	253.41	258.50	253.41	N/A	0.00	0.0553	0.0208	0.0130	0.0600	2.00	1.4400	0.24	0.24	0.00	0.24	100.00	1.44	8.00	YES	258.58	0.09	0 00:05
10	CB #211	On Grade	250.74	255.30	250.74	N/A	0.00	0.0148	0.0208	0.0130	0.0600	2.00	1.4400	1.08	0.94	0.14	1.08	86.94	5.16	8.00	YES	255.49	0.19	0 00:05
11	CB #212	On Grade	249.92	255.05	249.92	N/A	0.00	0.0148	0.0208	0.0130	0.0600	2.00	1.4400	0.38	0.02	0.37	0.38	4.19	2.18	8.00	YES	255.09	0.05	0 00:05
12	CB #213	On Grade	248.91	253.82	248.91	N/A	0.00	0.0148	0.0208	0.0130	0.0600	2.00	1.4400	0.14	0.14	0.00	0.14	100.00	1.49	8.00	YES	253.91	0.09	0 00:05
13	CB #214	On Grade	249.79	254.64	249.79	N/A	0.00	0.0384	0.0208	0.0130	0.0600	2.00	1.4400	0.17	0.17	0.00	0.17	100.00	1.34	8.00	YES	254.72	0.08	0 00:05
14	CB #215(DOUBLE)	On Sag	246.00	253.02	246.00	12.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	2.49	N/A	N/A	2.62	N/A	3.55	8.00	YES	253.17	0.15	0 00:05
15	CB #216	On Grade	245.67	253.01	245.67	N/A	0.00	0.0148	0.0208	0.0130	0.0600	2.00	1.4400	0.10	0.10	0.00	0.10	100.00	1.34	8.00	YES	253.09	0.08	0 00:05
16	CB #217	On Grade	243.55	251.42	243.55	N/A	0.00	0.0384	0.0208	0.0130	0.0600	2.00	1.4400	0.13	0.13	0.00	0.13	100.00	1.22	11.00	YES	251.50	0.07	0 00:05
17	CB #218	On Grade	278.85	283.28	278.85	N/A	0.00	0.0487	0.0208	0.0130	0.0600	2.00	1.4400	0.35	0.35	0.00	0.35	100.00	1.69	11.00	YES	283.39	0.10	0 00:05
18	CB #219	On Grade	278.46	283.28	278.46	N/A	0.00	0.0487	0.0208	0.0130	0.0600	2.00	1.4400	0.32	0.32	0.00	0.32	100.00	1.62	11.00	YES	283.38	0.10	0 00:05
19	CB #220	On Grade	272.13	277.04	272.13	N/A	0.00	0.0487	0.0208	0.0130	0.0600	2.00	1.4400	0.30	0.30	0.00	0.30	100.00	1.59	11.00	YES	277.14	0.10	0 00:05
20	CB #221	On Grade	264.59	269.03	264.59	N/A	0.00	0.0787	0.0208	0.0130	0.0600	2.00	1.4400	0.37	0.36	0.00	0.36	100.00	1.57	11.00	YES	269.12	0.09	0 00:05
21	CB #222	On Grade	264.13	269.03	264.13	N/A	0.00	0.0787	0.0208	0.0130	0.0600	2.00	1.4400	0.30	0.30	0.00	0.30	100.00	1.45	11.00	YES	269.12	0.09	0 00:05
22	CB #224	On Grade	257.53	262.54	257.53	N/A	0.00	0.0787	0.0208	0.0130	0.0600	2.00	1.4400	0.11	0.11	0.00	0.11	100.00	1.01	11.00	YES	262.60	0.06	0 00:05
23	CB #225	On Grade	253.94	258.37	253.94	N/A	0.00	0.0384	0.0208	0.0130	0.0600	2.00	1.4400	0.37	0.36	0.00	0.36	100.00	1.79	11.00	YES	258.48	0.11	0 00:05
24	CB #226	On Grade	251.96	257.21	251.96	N/A	0.00	0.0384	0.0208	0.0130	0.0600	2.00	1.4400	0.28	0.28	0.00	0.28	100.00	1.63	11.00	YES	257.31	0.10	0 00:05
25	CB #227	On Grade	248.69	254.48	248.69	N/A	0.00	0.0384	0.0208	0.0130	0.0600	2.00	1.4400	0.17	0.17	0.00	0.17	100.00	1.34	11.00	YES	254.56	0.08	0 00:05
26	CB #228(DOUBLE)	On Sag	247.58	253.10	247.58	12.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	1.98	N/A	N/A	2.18	N/A	3.45	8.00	YES	253.25	0.15	0 00:05
27	CB #229	On Grade	254.05	258.48	254.05	N/A	0.00	0.0249	0.0208	0.0130	0.0600	2.00	1.4400	0.58	0.01	0.56	0.58	2.47	2.31	8.00	YES	258.53	0.05	0 00:05
28	CB #230	On Grade	253.72	258.49	253.72	N/A	0.00	0.0249	0.0208	0.0130	0.0600	2.00	1.4400	0.73	0.71	0.02	0.73	96.71	3.45	8.00	YES	258.64	0.15	0 00:05
29	CB #231	On Grade	251.39	255.83	251.39	N/A	0.00	0.0249	0.0208	0.0130	0.0600	2.00	1.4400	1.46	1.24	0.22	1.46	85.27	5.25	8.00	YES	256.01	0.19	0 00:05
30	CB #232	On Grade	251.00	255.83	251.00	N/A	0.00	0.0249	0.0208	0.0130	0.0600	2.00	1.4400	0.21	0.21	0.00	0.21	100.00	1.59	8.00	YES	255.92	0.10	0 00:05
31	CB #233	On Grade	248.87	253.83	248.87	N/A	0.00	0.0155	0.0208	0.0130	0.0600	2.00	1.4400	0.21	0.21	0.00	0.21	100.00	1.72	8.00	YES	253.94	0.10	0 00:05
32	CB #234	On Grade	247.16	253.10	247.16	N/A	0.00	0.0155	0.0208	0.0130	0.0600	2.00	1.4400	0.10	0.10	0.00	0.10	100.00	1.32	8.00	YES	253.18	0.08	0 00:05
33	CB #235	On Grade	243.15	251.40	243.15	N/A	0.00	0.0384	0.0208	0.0130	0.0600	2.00	1.4400	0.17	0.17	0.00	0.17	100.00	1.34	11.00	YES	251.48	0.08	0 00:06
34	CB #236	On Grade	241.14	248.75	241.14	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.49	0.46	0.03	0.49	93.64	4.44	11.00	YES	248.92	0.17	0 00:06

S T O R M W A T E R AREA " E "

2-YEAR RETURN PERIOD FOR GUTTER SPREAD



PLAN VIEW

DRAINAGE AREA								
SN	Element ID	Area (acres)	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
1	Sub-CB#237	0.09	0.8700	0.33	0.29	0.31	4.000	0 00:05:00
2	Sub-CB#238	0.36	0.7300	0.33	0.24	1.05	4.000	0 00:05:00
3	Sub-CB#239	0.04	0.8700	0.33	0.29	0.14	4.000	0 00:05:00
4	Sub-CB#240	0.09	0.8300	0.33	0.28	0.30	4.000	0 00:05:00
5	Sub-CB#241	0.14	0.8700	0.33	0.29	0.49	4.000	0 00:05:00
6	Sub-CB#242	0.47	0.7300	0.33	0.24	1.37	4.000	0 00:05:00
7	Sub-CB#243	0.14	0.7300	0.33	0.24	0.41	4.000	0 00:05:00
8	Sub-CB#244	0.26	0.8700	0.33	0.29	0.91	4.000	0 00:05:00

MODEL INPUT														MODEL OUTPUT									
SN	Element ID	Inlet Location	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft^2)	Grate Clogging Factor (%)	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (inches)	Surface Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Total Peak Flow (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Allowable Spread (ft)	Check	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Maximum Depth Occurrence (days hh:mm)
1	CB #237	On Grade	259.08	263.52	259.08	N/A	0.00	0.0088	0.0208	0.0130	0.0600	2.00	1.4400	0.31	0.02	0.29	0.31	6.33	2.23	8.00	YES	263.57	0.05	0 00:05
2	CB #238	On Grade	258.76	263.52	258.76	N/A	0.00	0.0088	0.0208	0.0130	0.0600	2.00	1.4400	1.05	0.89	0.16	1.05	84.35	5.79	8.00	YES	263.72	0.20	0 00:05
3	CB #239	On Grade	257.69	262.13	257.69	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.14	0.14	0.00	0.14	100.00	1.82	8.00	YES	262.23	0.11	0 00:05
4	CB #240	On Sag	257.36	262.12	257.36	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	0.30	N/A	N/A	0.32	N/A	2.02	8.00	YES	262.24	0.12	0 00:05
5	CB #241	On Grade	256.96	262.28	256.96	N/A	0.00	0.0088	0.0208	0.0130	0.0600	2.00	1.4400	0.49	0.48	0.02	0.50	95.91	3.77	8.00	YES	262.43	0.16	0 00:05
6	CB #242	On Grade	256.62	262.21	256.62	N/A	0.00	0.0088	0.0208	0.0130	0.0600	2.00	1.4400	1.37	1.17	0.34	1.51	77.42	6.95	8.00	YES	262.43	0.22	0 00:05
7	CB #243	On Grade	255.76	261.01	255.76	N/A	0.00	0.0088	0.0208	0.0130	0.0600	2.00	1.4400	0.41	0.55	0.04	0.59	93.75	4.21	8.00	YES	261.18	0.17	0 00:06
8	CB #244	On Sag	254.86	260.40	254.86	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	0.91	N/A	N/A	0.92	N/A	5.08	8.00	YES	260.58	0.18	0 00:06

S T O R M W A T E R AREA " F "

2-YEAR RETURN PERIOD FOR GUTTER SPREAD



PLAN VIEW

DRAINAGE AREA

SN	Element ID	Area (acres)	Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
1	Sub-CB#115	0.18	CB #115	0.5800	0.33	0.19	0.42	4.000	0 00:05:00
2	Sub-CB#118	0.35	CB #118	0.6100	0.33	0.20	0.85	4.000	0 00:05:00
3	Sub-CB#119	0.42	CB #119	0.7300	0.33	0.24	1.23	4.000	0 00:05:00
4	Sub-CB#120	0.01	CB #120	0.8300	0.33	0.28	0.03	4.000	0 00:05:00
5	Sub-CB#121	0.28	CB #121	0.7300	0.33	0.24	0.82	4.000	0 00:05:00
6	Sub-CB#122	0.05	CB #122	0.8700	0.33	0.29	0.17	4.000	0 00:05:00
7	Sub-CB#123	0.31	CB #123	0.7300	0.33	0.24	0.91	4.000	0 00:05:00
8	Sub-CB#124	0.08	CB #124	0.8700	0.33	0.29	0.28	4.000	0 00:05:00
9	Sub-CB#125	0.04	CB #125	0.8300	0.33	0.28	0.13	4.000	0 00:05:00
10	Sub-CB#126	0.03	CB #126	0.8300	0.33	0.28	0.10	4.000	0 00:05:00
11	Sub-CB#127	0.27	CB #127	0.5800	0.33	0.19	0.63	4.000	0 00:05:00
12	Sub-CB#128	0.50	CB #128	0.7300	0.33	0.24	1.46	4.000	0 00:05:00
13	Sub-CB#129	0.26	CB #129	0.5800	0.33	0.19	0.60	4.000	0 00:05:00
14	Sub-CB#130	0.50	CB #130	0.7300	0.33	0.24	1.46	4.000	0 00:05:00
15	Sub-CB#131	0.13	CB #131	0.5800	0.33	0.19	0.30	4.000	0 00:05:00
16	Sub-CB#132	0.49	CB #132	0.6600	0.33	0.22	1.29	4.000	0 00:05:00
17	Sub-CB#133	0.08	CB #133	0.4900	0.33	0.16	0.16	4.000	0 00:05:00
18	Sub-CB#134	0.32	CB #134	0.7300	0.33	0.24	0.93	4.000	0 00:05:00
19	Sub-CB#135	0.29	CB #135	0.6300	0.33	0.21	0.73	4.000	0 00:05:00
20	Sub-CB#136	0.18	CB #136	0.4600	0.33	0.15	0.33	4.000	0 00:05:00
21	Sub-CB#137	0.09	CB #137	0.8700	0.33	0.29	0.31	4.000	0 00:05:00
22	Sub-CB#138	0.05	CB #138	0.8300	0.33	0.28	0.17	4.000	0 00:05:00
23	Sub-CB#139	0.14	CB #139	0.7500	0.33	0.25	0.42	4.000	0 00:05:00
24	Sub-CB#140	0.63	CB #140	0.6100	0.33	0.20	1.54	4.000	0 00:05:00
25	Sub-CB#141	0.11	CB #141	0.8300	0.33	0.28	0.37	4.000	0 00:05:00
26	Sub-CB#142	0.03	CB #142	0.8300	0.33	0.28	0.10	4.000	0 00:05:00
27	Sub-CB#143	1.15	CB #143(DOUBLE)	0.6100	0.33	0.20	2.81	4.000	0 00:05:00
28	Sub-CB#144	0.09	CB #144	0.8700	0.33	0.29	0.31	4.000	0 00:05:00
29	Sub-CB#145	0.01	CB #145	0.8300	0.33	0.28	0.03	4.000	0 00:05:00
30	Sub-CB#146	0.05	CB #146	0.8300	0.33	0.28	0.17	4.000	0 00:05:00
31	Sub-CB#147	0.12	CB #147	0.6300	0.33	0.21	0.30	4.000	0 00:05:00
32	Sub-CB#148	0.33	CB #148	0.7300	0.33	0.24	0.96	4.000	0 00:05:00
33	Sub-CB#149	0.25	CB #149	0.6300	0.33	0.21	0.63	4.000	0 00:05:00
34	Sub-CB#150	0.31	CB #150	0.4600	0.33	0.15	0.57	4.000	0 00:05:00
35	Sub-CB#151	0.35	CB #151	0.6100	0.33	0.20	0.85	4.000	0 00:05:00
36	Sub-CB#152	0.05	CB #152	0.7100	0.33	0.24	0.14	4.000	0 00:05:00
37	Sub-CB#153	0.20	CB #153	0.5800	0.33	0.19	0.46	4.000	0 00:05:00
38	Sub-CB#154	0.05	CB #154	0.8700	0.33	0.29	0.17	4.000	0 00:05:00
39	Sub-CB#155	0.10	CB #155	0.8700	0.33	0.29	0.35	4.000	0 00:05:00
40	Sub-CB#156	0.05	CB #156	0.8700	0.33	0.29	0.17	4.000	0 00:05:00
41	Sub-CB#157	0.07	CB #157	0.8700	0.33	0.29	0.24	4.000	0 00:05:00
42	Sub-CB#158	0.03	CB #158	0.8700	0.33	0.29	0.10	4.000	0 00:05:00

MODEL INPUT														MODEL OUTPUT									
SN	Element ID	Inlet Location	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft^2)	Grate Clogging Factor (%)	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (inches)	Surface Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Total Peak Flow (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Allowable Spread (ft)	Check	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Maximum Depth Occurrence (days hh:mm)
1	CB #115	On Grade	238.45	242.65	238.45	N/A	0.00	0.0488	0.0208	0.0130	0.0600	2.00	1.4400	0.42	0.43	0.00	0.43	100.00	1.82	8.00	YES	242.76	0.11	0 00:07
2	CB #118	On Sag	255.23	259.95	255.23	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	0.85	N/A	N/A	1.07	N/A	5.73	8.00	YES	260.15	0.20	0 00:05
3	CB #119	On Grade	252.62	260.48	252.62	N/A	0.00	0.0062	0.0208	0.0130	0.0600	2.00	1.4400	1.23	1.06	0.30	1.36	78.00	7.17	8.00	YES	260.71	0.23	0 00:05
4	CB #120	On Grade	252.29	260.46	252.29	N/A	0.00	0.0062	0.0208	0.0130	0.0600	2.00	1.4400	0.03	0.03	0.00	0.03	100.00	1.03	8.00	YES	260.52	0.06	0 00:06
5	CB #121	On Grade	259.37	263.81	259.37	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.82	0.70	0.11	0.82	86.05	5.91	8.00	YES	264.01	0.20	0 00:05
6	CB #122	On Grade	258.96	263.81	258.96	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.17	0.17	0.00	0.17	100.00	1.99	8.00	YES	263.93	0.12	0 00:05
7	CB #123	On Grade	256.83	261.26	256.83	N/A	0.00	0.0062	0.0208	0.0130	0.0600	2.00	1.4400	0.91	0.85	0.17	1.02	83.11	6.26	8.00	YES	261.47	0.21	0 00:05
8	CB #124	On Grade	256.50	261.23	256.50	N/A	0.00	0.0062	0.0208	0.0130	0.0600	2.00	1.4400	0.28	0.02	0.26	0.28	8.34	2.29	8.00	YES	261.28	0.05	0 00:05
9	CB #125	On Grade	254.72	259.72	254.72	N/A	0.00	0.0376	0.0208	0.0130	0.0600	2.00	1.4400	0.13	0.14	0.00	0.14	100.00	1.26	8.00	YES	259.79	0.08	0 00:05
10	CB #126	On Grade	251.83	259.47	251.83	N/A	0.00	0.0376	0.0208	0.0130	0.0600	2.00	1.4400	0.10	0.10	0.00	0.10	100.00	1.10	8.00	YES	259.53	0.07	0 00:06
11	CB #127	On Grade	248.13	252.57	248.13	N/A	0.00	0.0522	0.0208	0.0130	0.0600	2.00	1.4400	0.63	0.01	0.62	0.63	1.47	2.07	8.00	YES	252.61	0.04	0 00:05
12	CB #128	On Grade	246.63	252.53	246.63	N/A	0.00	0.0522	0.0208	0.0130	0.0600	2.00	1.4400	1.46	1.34	0.12	1.46	91.68	4.23	8.00	YES	252.70	0.17	0 00:05
13	CB #129	On Grade	242.72	247.16	242.72	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.60	0.55	0.06	0.60	90.68	5.04	8.00	YES	247.34	0.18	0 00:05
14	CB #130	On Grade	241.25	247.15	241.25	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	1.46	1.16	0.38	1.55	75.17	7.99	8.00	YES	247.39	0.24	0 00:06
15	CB #131	On Sag	241.31	245.74	241.31	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	0.30	N/A	N/A	0.45	N/A	2.28	8.00	YES	245.87	0.13	0 00:06
16	CB #132	On Grade	239.98	245.81	239.98	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	1.29	1.13	0.36	1.49	75.89	7.82	8.00	YES	246.05	0.24	0 00:06
17	CB #133	On Grade	238.93	245.08	238.93	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.16	0.42	0.02	0.44	94.78	4.20	8.00	YES	245.24	0.17	0 00:07
18	CB #134	On Grade	255.98	260.42	255.98	N/A	0.00	0.0445	0.0208	0.0130	0.0600	2.00	1.4400	0.93	0.01	0.92	0.93	1.37	2.48	8.00	YES	260.47	0.05	0 00:05
19	CB #135	On Grade	240.34	246.44	240.34	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.73	0.66	0.10	0.76	87.19	5.69	8.00	YES	246.63	0.20	0 00:07
20	CB #136	On Grade	251.24	256.14	251.24	N/A	0.00	0.0445	0.0208	0.0130	0.0600	2.00	1.4400	0.33	0.33	0.00	0.33	100.00	1.69	8.00	YES	256.24	0.10	0 00:05
21	CB #137	On Grade	255.65	260.42	255.65	N/A	0.00	0.0445	0.0208	0.0130	0.0600	2.00	1.4400	0.31	0.31	0.00	0.31	100.00	1.64	8.00	YES	260.52	0.10	0 00:05
22	CB #138	On Grade	248.00	253.01	248.00	N/A	0.00	0.0427	0.0208	0.0130	0.0600	2.00	1.4400	0.17	0.17	0.00	0.17	100.00	1.30	8.00	YES	253.09	0.08	0 00:05
23	CB #139	On Grade	248.00	252.45	248.00	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.42	0.40	0.02	0.42	95.48	4.03	8.00	YES	252.61	0.16	0 00:05
24	CB #140	On Grade	247.01	251.44	247.01	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	1.54	1.16	0.38	1.53	75.29	7.97	8.00	YES	251.69	0.24	0 00:05
25	CB #141	On Grade	246.68	251.44	246.68	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.37	0.36	0.01	0.37	96.66	3.74	8.00	YES	251.60	0.16	0 00:05
26	CB #142	On Grade	246.19	251.17	246.19	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.10	0.11	0.00	0.11	100.00	1.67	8.00	YES	251.27	0.10	0 00:06
27	CB #143(DOUBLE)	On Sag	246.21	250.92	246.21	12.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	2.81	N/A	N/A	3.19	N/A	3.67	8.00	YES	251.07	0.15	0 00:05
28	CB #144	On Sag	245.69	250.92	245.69	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	0.31	N/A	N/A	0.31	N/A	2.01	8.00	YES	251.04	0.12	0 00:05
29	CB #145	On Grade	245.21	251.46	245.21	N/A	0.00	0.0445	0.0208	0.0130	0.0600	2.00	1.4400	0.03	0.03	0.00	0.03	100.00	0.71	8.00	YES	251.50	0.04	0 00:05
30	CB #146	On Grade	244.73	251.28	244.73	N/A	0.00	0.0427	0.0208	0.0130	0.0600	2.00	1.4400	0.17	0.17	0.00	0.17	100.00	1.30	8.00	YES	251.36	0.08	0 00:06
31	CB #147	On Grade	244.43	248.95	244.43	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.30	0.03	0.27	0.30	9.26	2.45	8.00	YES	249.00	0.05	0 00:05
32	CB #148	On Grade	243.41	248.95	243.41	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.96	0.80	0.16	0.96	83.34	6.42	8.00	YES	249.16	0.21	0 00:06
33	CB #149	On Grade	242.80	248.38	242.80	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.63	0.64	0.09	0.73	87.81	5.59	8.00	YES	248.58	0.19	0 00:06
34	CB #150	On Grade	243.56	248.00	243.56	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.57	0.54	0.05	0.59	91.13	4.94	8.00	YES	248.18	0.18	0 00:05
35	CB #151	On Grade	242.18	247.98	242.18	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.85	0.75	0.13	0.88	84.85	6.12	8.00	YES	248.19	0.21	0 00:06
36	CB #152	On Grade	241.68	247.68	241.68	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.14	0.02	0.19	0.21	10.51	2.15	8.00	YES	247.72	0.04	0 00:06
37	CB #153	On Grade	242.90	247.34	242.90	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.46	0.47	0.04	0.51	93.07	4.56	8.00	YES	247.51	0.17	0 00:05
38	CB #154	On Grade	241.09	247.31	241.09	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.17	0.17	0.00	0.17	100.00	1.99	8.00	YES	247.43	0.12	0 00:06
39	CB #155	On Grade	240.01	246.44	240.01	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.35	0.34	0.01	0.35	97.35	3.56	8.00	YES	246.59	0.15	0 00:07
40	CB #156	On Grade	239.41	246.06	239.41	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.17	0.18	0.00	0.18	100.00	2.00	8.00	YES	246.18	0.12	0 00:07
41	CB #157	On Grade	238.60	245.03	238.60	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.24	0.02	0.22	0.25	9.97	2.26	8.00	YES	245.08	0.05	0 00:07
42	CB #158	On Grade	238.10	243.21	238.10	N/A	0.00	0.0488	0.0208	0.0130	0.0600	2.00	1.4400	0.10	0.11	0.00	0.11	100.00	1.08	8.00	YES	243.27	0.06	0 00:07

S T O R M W A T E R AREA “ G ”

2-YEAR RETURN PERIOD FOR GUTTER SPREAD



PLAN VIEW

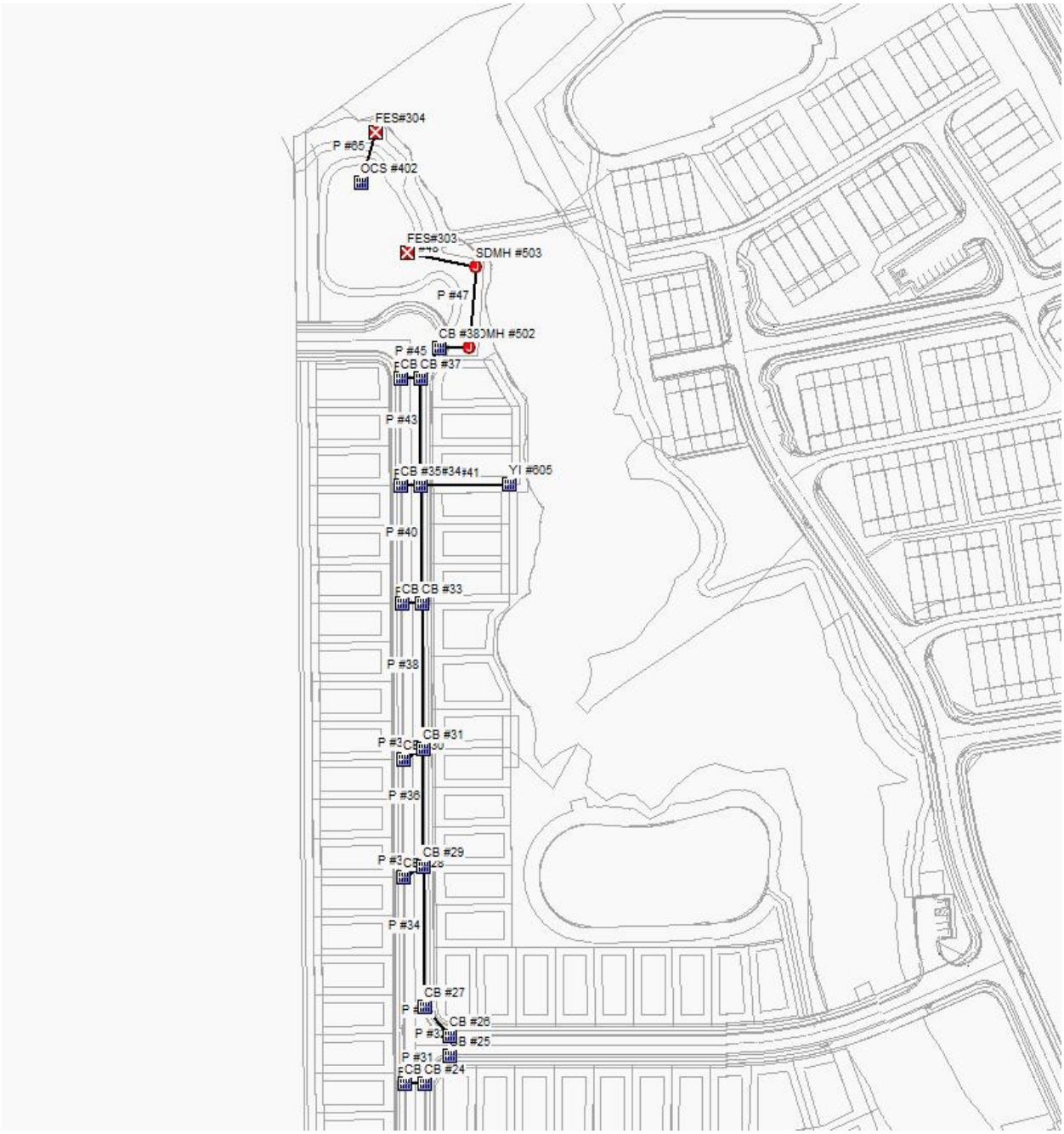
DRAINAGE AREA

SN	Element ID	Area (acres)	Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
1	Sub-CB#55	0.07	CB #55	0.8300	0.33	0.28	0.23	4.000	0 00:05:00
2	Sub-CB#56	0.07	CB #56	0.8300	0.33	0.28	0.23	4.000	0 00:05:00
3	Sub-CB#57	0.07	CB #57	0.8300	0.33	0.28	0.23	4.000	0 00:05:00
4	Sub-CB#58	0.05	CB #58	0.7900	0.33	0.26	0.16	4.000	0 00:05:00
5	Sub-CB#59	0.09	CB #59	0.7100	0.33	0.24	0.26	4.000	0 00:05:00
6	Sub-CB#60	0.01	CB #60	0.8300	0.33	0.28	0.03	4.000	0 00:05:00
7	Sub-CB#61	0.21	CB #61	0.8300	0.33	0.28	0.70	4.000	0 00:05:00
8	Sub-CB#62	0.08	CB #62	0.8300	0.33	0.28	0.27	4.000	0 00:05:00
9	Sub-CB#63	0.04	CB #63	0.8300	0.33	0.28	0.13	4.000	0 00:05:00
10	Sub-CB#64	0.09	CB #64	0.8300	0.33	0.28	0.30	4.000	0 00:05:00
11	Sub-CB#65	0.08	CB #65	0.8300	0.33	0.28	0.27	4.000	0 00:05:00
12	Sub-CB#66	0.17	CB #66	0.8300	0.33	0.28	0.56	4.000	0 00:05:00
13	Sub-CB#67	0.06	CB #67	0.7100	0.33	0.24	0.17	4.000	0 00:05:00
14	Sub-CB#68	0.06	CB #68	0.8300	0.33	0.28	0.20	4.000	0 00:05:00
15	Sub-CB#69	0.08	CB #69	0.8300	0.33	0.28	0.27	4.000	0 00:05:00
16	Sub-CB#70	0.07	CB #70	0.8300	0.33	0.28	0.23	4.000	0 00:05:00
17	Sub-CB#71	0.09	CB #71	0.8300	0.33	0.28	0.30	4.000	0 00:05:00
18	Sub-CB#72	0.09	CB #72	0.8300	0.33	0.28	0.30	4.000	0 00:05:00
19	Sub-CB#73	0.09	CB #73	0.7100	0.33	0.24	0.26	4.000	0 00:05:00
20	Sub-CB#74	0.04	CB #74	0.8300	0.33	0.28	0.13	4.000	0 00:05:00
21	Sub-CB#75	0.77	CB #75	0.7100	0.33	0.24	2.19	4.000	0 00:05:00
22	Sub-CB#76	0.19	CB #76	0.7100	0.33	0.24	0.54	4.000	0 00:05:00
23	Sub-CB#77	0.27	CB #77	0.5100	0.33	0.17	0.55	4.000	0 00:05:00
24	Sub-CB#78	0.07	CB #78	0.8300	0.33	0.28	0.23	4.000	0 00:05:00
25	Sub-CB#79	0.34	CB #79	0.4700	0.33	0.16	0.64	4.000	0 00:05:00
26	Sub-CB#80	0.12	CB #80	0.8300	0.33	0.28	0.40	4.000	0 00:05:00
27	Sub-CB#81	1.03	CB #81(DOUBLE)	0.7100	0.33	0.24	2.93	4.000	0 00:05:00
28	Sub-CB#82	0.12	CB #82	0.8300	0.33	0.28	0.40	4.000	0 00:05:00
29	Sub-CB#83	0.38	CB #83	0.4700	0.33	0.16	0.71	4.000	0 00:05:00
30	Sub-CB#84	0.10	CB #84	0.8300	0.33	0.28	0.33	4.000	0 00:05:00
31	Sub-CB#85	0.11	CB #85	0.8300	0.33	0.28	0.37	4.000	0 00:05:00
32	Sub-CB#86	0.05	CB #86	0.8300	0.33	0.28	0.17	4.000	0 00:05:00
33	Sub-CB#87	0.06	CB #87	0.8300	0.33	0.28	0.20	4.000	0 00:05:00
34	Sub-CB#88	0.04	CB #88	0.8300	0.33	0.28	0.13	4.000	0 00:05:00
35	Sub-CB#89	0.07	CB #89	0.8300	0.33	0.28	0.23	4.000	0 00:05:00
36	Sub-CB#90	0.17	CB #90	0.7100	0.33	0.24	0.48	4.000	0 00:05:00
37	Sub-CB#91	0.14	CB #91	0.7100	0.33	0.24	0.40	4.000	0 00:05:00
38	Sub-CB#92	0.06	CB #92	0.8300	0.33	0.28	0.20	4.000	0 00:05:00
39	Sub-CB#93	0.06	CB #93	0.8700	0.33	0.29	0.21	4.000	0 00:05:00
40	Sub-CB#94	0.12	CB #94	0.8300	0.33	0.28	0.40	4.000	0 00:05:00
41	Sub-CB#95	0.05	CB #95	0.8700	0.33	0.29	0.17	4.000	0 00:05:00

MODEL INPUT														MODEL OUTPUT									
SN	Element ID	Inlet Location	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft²)	Grate Clogging Factor (%)	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (inches)	Surface Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Total Peak Flow (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Allowable Spread (ft)	Check	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Maximum Depth Occurrence (days hh:mm)
1	CB #55	On Grade	273.34	277.77	273.34	N/A	0.00	0.0058	0.0208	0.0130	0.0600	2.00	1.4400	0.23	0.02	0.21	0.23	9.27	2.15	8.00	YES	277.82	0.04	0 00:05
2	CB #56	On Grade	272.52	277.77	272.52	N/A	0.00	0.0058	0.0208	0.0130	0.0600	2.00	1.4400	0.23	0.02	0.21	0.23	9.27	2.15	8.00	YES	277.81	0.04	0 00:05
3	CB #57	On Grade	269.40	277.10	269.40	N/A	0.00	0.0058	0.0208	0.0130	0.0600	2.00	1.4400	0.23	0.02	0.21	0.23	9.18	2.16	8.00	YES	277.14	0.04	0 00:05
4	CB #58	On Grade	271.03	275.69	271.03	N/A	0.00	0.0188	0.0208	0.0130	0.0600	2.00	1.4400	0.16	0.16	0.00	0.16	100.00	1.49	8.00	YES	275.78	0.09	0 00:05
5	CB #59	On Sag	270.47	275.98	270.47	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	0.26	N/A	N/A	0.26	N/A	1.88	8.00	YES	276.10	0.12	0 00:05
6	CB #60	On Sag	268.80	276.48	268.80	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	0.03	N/A	N/A	0.03	N/A	1.23	8.00	YES	276.59	0.10	0 00:06
7	CB #61	On Grade	270.09	274.66	270.09	N/A	0.00	0.0316	0.0208	0.0130	0.0600	2.00	1.4400	0.70	0.01	0.70	0.71	1.94	2.38	8.00	YES	274.71	0.05	0 00:05
8	CB #62	On Grade	267.87	274.68	267.87	N/A	0.00	0.0316	0.0208	0.0130	0.0600	2.00	1.4400	0.27	0.27	0.00	0.27	100.00	1.65	8.00	YES	274.78	0.10	0 00:05
9	CB #63	On Grade	266.52	272.51	266.52	N/A	0.00	0.0316	0.0208	0.0130	0.0600	2.00	1.4400	0.13	0.13	0.00	0.13	100.00	1.27	8.00	YES	272.59	0.08	0 00:06
10	CB #64	On Sag	266.19	272.51	266.19	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	0.30	N/A	N/A	0.31	N/A	2.00	8.00	YES	272.63	0.12	0 00:06
11	CB #65	On Grade	296.53	300.97	296.53	N/A	0.00	0.0500	0.0208	0.0130	0.0600	2.00	1.4400	0.27	0.27	0.00	0.27	100.00	1.51	8.00	YES	301.06	0.09	0 00:05
12	CB #66	On Grade	296.14	300.78	296.14	N/A	0.00	0.0500	0.0208	0.0130	0.0600	2.00	1.4400	0.56	0.01	0.55	0.56	1.58	2.00	8.00	YES	300.82	0.04	0 00:05
13	CB #67	On Grade	290.78	295.22	290.78	N/A	0.00	0.0500	0.0208	0.0130	0.0600	2.00	1.4400	0.17	0.17	0.00	0.17	100.00	1.28	8.00	YES	295.30	0.08	0 00:05
14	CB #68	On Grade	290.45	295.12	290.45	N/A	0.00	0.0500	0.0208	0.0130	0.0600	2.00	1.4400	0.20	0.20	0.00	0.20	100.00	1.36	8.00	YES	295.20	0.08	0 00:05
15	CB #69	On Grade	280.66	286.02	280.66	N/A	0.00	0.0742	0.0208	0.0130	0.0600	2.00	1.4400	0.27	0.27	0.00	0.27	100.00	1.40	8.00	YES	286.10	0.08	0 00:05
16	CB #70	On Grade	280.33	285.92	280.33	N/A	0.00	0.0742	0.0208	0.0130	0.0600	2.00	1.4400	0.23	0.23	0.00	0.23	100.00	1.34	8.00	YES	286.00	0.08	0 00:05
17	CB #71	On Grade	265.76	274.74	265.76	N/A	0.00	0.0742	0.0208	0.0130	0.0600	2.00	1.4400	0.30	0.30	0.00	0.30	100.00	1.47	8.00	YES	274.83	0.09	0 00:06
18	CB #72	On Grade	265.43	274.59	265.43	N/A	0.00	0.0742	0.0208	0.0130	0.0600	2.00	1.4400	0.30	0.30	0.00	0.30	100.00	1.47	8.00	YES	274.67	0.09	0 00:06
19	CB #73	On Grade	265.47	270.01	265.47	N/A	0.00	0.0316	0.0208	0.0130	0.0600	2.00	1.4400	0.26	0.26	0.00	0.26	100.00	1.62	8.00	YES	270.11	0.10	0 00:05
20	CB #74	On Grade	264.84	271.18	264.84	N/A	0.00	0.0316	0.0208	0.0130	0.0600	2.00	1.4400	0.13	0.13	0.00	0.13	100.00	1.27	8.00	YES	271.26	0.08	0 00:06
21	CB #75	On Grade	262.86	268.45	262.86	N/A	0.00	0.0316	0.0208	0.0130	0.0600	2.00	1.4400	2.19	1.72	0.46	2.18	78.93	6.09	8.00	YES	268.66	0.21	0 00:06
22	CB #76	On Grade	259.59	264.03	259.59	N/A	0.00	0.0316	0.0208	0.0130	0.0600	2.00	1.4400	0.54	0.01	0.53	0.54	2.18	2.15	8.00	YES	264.07	0.04	0 00:05
23	CB #77	On Grade	258.48	264.03	258.48	N/A	0.00	0.0316	0.0208	0.0130	0.0600	2.00	1.4400	0.55	0.01	0.54	0.55	2.15	2.16	8.00	YES	264.07	0.04	0 00:06
24	CB #78	On Grade	255.44	259.87	255.44	N/A	0.00	0.0410	0.0208	0.0130	0.0600	2.00	1.4400	0.23	0.23	0.00	0.23	100.00	1.49	8.00	YES	259.96	0.09	0 00:05
25	CB #79	On Grade	254.43	259.98	254.43	N/A	0.00	0.0410	0.0208	0.0130	0.0600	2.00	1.4400	0.64	0.01	0.63	0.64	1.71	2.18	8.00	YES	260.03	0.05	0 00:06
26	CB #80	On Grade	249.04	253.46	249.04	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.40	0.38	0.02	0.40	95.99	3.92	8.00	YES	253.62	0.16	0 00:05
27	CB #81(DOUBLE)	On Sag	246.83	253.45	246.83	12.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	2.93	N/A	N/A	2.92	N/A	3.73	8.00	YES	253.60	0.16	0 00:05
28	CB #82	On Grade	259.78	264.22	259.78	N/A	0.00	0.0584	0.0208	0.0130	0.0600	2.00	1.4400	0.40	0.40	0.00	0.40	100.00	1.71	8.00	YES	264.32	0.10	0 00:05
29	CB #83	On Grade	259.13	264.21	259.13	N/A	0.00	0.0584	0.0208	0.0130	0.0600	2.00	1.4400	0.71	0.01	0.70	0.71	1.30	2.13	8.00	YES	264.25	0.04	0 00:05
30	CB #84	On Grade	245.39	255.07	245.39	N/A	0.00	0.0396	0.0208	0.0130	0.0600	2.00	1.4400	0.33	0.33	0.00	0.33	100.00	1.72	8.00	YES	255.17	0.10	0 00:05
31	CB #85	On Grade	244.78	255.07	244.78	N/A	0.00	0.0396	0.0208	0.0130	0.0600	2.00	1.4400	0.37	0.36	0.00	0.36	100.00	1.78	8.00	YES	255.17	0.11	0 00:06
32	CB #86	On Grade	244.28	252.67	244.28	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.17	0.17	0.00	0.17	100.00	1.95	8.00	YES	252.79	0.12	0 00:06
33	CB #87	On Grade	245.92	252.75	245.92	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.20	0.02	0.18	0.20	10.75	2.08	8.00	YES	252.80	0.04	0 00:05
34	CB #88	On Grade	243.82	252.65	243.82	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.13	0.13	0.00	0.13	100.00	1.80	8.00	YES	252.76	0.11	0 00:06
35	CB #89	On Grade	267.14	271.91	267.14	N/A	0.00	0.0255	0.0208	0.0130	0.0600	2.00	1.4400	0.23	0.23	0.00	0.23	100.00	1.64	8.00	YES	272.01	0.10	0 00:05
36	CB #90	On Grade	266.80	271.77	266.80	N/A	0.00	0.0255	0.0208	0.0130	0.0600	2.00	1.4400	0.48	0.01	0.47	0.48	2.65	2.15	8.00	YES	271.81	0.04	0 00:05
37	CB #91	On Sag	260.52	264.85	260.52	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	0.40	N/A	N/A	0.40	N/A	2.18	8.00	YES	264.98	0.12	0 00:06
38	CB #92	On Grade	260.16	267.26	260.16	N/A	0.00	0.0632	0.0208	0.0130	0.0600	2.00	1.4400	0.20	0.20	0.00	0.20	100.00	1.30	8.00	YES	267.34	0.08	0 00:06
39	CB #93	On Grade	259.34	267.11	259.34	N/A	0.00	0.0632	0.0208	0.0130	0.0600	2.00	1.4400	0.21	0.21	0.00	0.21	100.00	1.32	8.00	YES	267.19	0.08	0 00:06
40	CB #94	On Grade	257.04	261.48	257.04	N/A	0.00	0.0632	0.0208	0.0130	0.0600	2.00	1.4400	0.40	0.40	0.00	0.40	100.00	1.69	8.00	YES	261.58	0.10	0 00:05
41	CB #95	On Grade	255.76	261.55	255.76	N/A	0.00	0.0632	0.0208	0.0130	0.0600	2.00	1.4400	0.17	0.17	0.00	0.17	100.00	1.24	8.00	YES	261.63	0.07	0 00:06

S T O R M W A T E R AREA " H "

2-YEAR RETURN PERIOD FOR GUTTER SPREAD



PLAN VIEW

DRAINAGE AREA

SN	Element ID	Area (acres)	Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
1	Sub-CB#23	0.48	CB #23	0.7300	0.33	0.24	1.40	4.000	0 00:05:00
2	Sub-CB#24	0.25	CB #24	0.5900	0.33	0.20	0.59	4.000	0 00:05:00
3	Sub-CB#25	0.63	CB #25	0.7300	0.33	0.24	1.84	4.000	0 00:05:00
4	Sub-CB#26	0.07	CB #26	0.8700	0.33	0.29	0.24	4.000	0 00:05:00
5	Sub-CB#27	0.04	CB #27	0.8300	0.33	0.28	0.13	4.000	0 00:05:00
6	Sub-CB#28	0.90	CB #28	0.6900	0.33	0.23	2.48	4.000	0 00:05:00
7	Sub-CB#29	0.10	CB #29	0.8700	0.33	0.29	0.35	4.000	0 00:05:00
8	Sub-CB#30	0.47	CB #30	0.8300	0.33	0.28	1.56	4.000	0 00:05:00
9	Sub-CB#31	0.09	CB #31	0.8700	0.33	0.29	0.31	4.000	0 00:05:00
10	Sub-CB#32	0.56	CB #32	0.8300	0.33	0.28	1.86	4.000	0 00:05:00
11	Sub-CB#33	0.11	CB #33	0.8700	0.33	0.29	0.38	4.000	0 00:05:00
12	Sub-CB#34	0.09	CB #34	0.8700	0.33	0.29	0.31	4.000	0 00:05:00
13	Sub-CB#35	0.51	CB #35	0.7300	0.33	0.24	1.49	4.000	0 00:05:00
14	Sub-CB#36	0.51	CB #36	0.7300	0.33	0.24	1.49	4.000	0 00:05:00
15	Sub-CB#37	0.08	CB #37	0.8700	0.33	0.29	0.28	4.000	0 00:05:00
16	Sub-CB#38	0.19	CB #38	0.8300	0.33	0.28	0.63	4.000	0 00:05:00

MODEL INPUT														MODEL OUTPUT									
SN	Element ID	Inlet Location	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft^2)	Grate Clogging Factor (%)	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (inches)	Surface Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Total Peak Flow (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Allowable Spread (ft)	Check	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Maximum Depth Occurrence (days hh:mm)
1	CB #23	On Grade	271.15	275.59	271.15	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	1.40	1.08	0.32	1.40	76.94	7.63	8.00	YES	275.82	0.24	0 00:05
2	CB #24	On Sag	270.81	275.59	270.81	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	0.59	N/A	N/A	0.92	N/A	5.07	8.00	YES	275.77	0.18	0 00:05
3	CB #25	On Grade	270.37	276.27	270.37	N/A	0.00	0.0270	0.0208	0.0130	0.0600	2.00	1.4400	1.84	1.49	0.34	1.84	81.33	5.79	8.00	YES	276.47	0.20	0 00:05
4	CB #26	On Grade	270.04	276.12	270.04	N/A	0.00	0.0270	0.0208	0.0130	0.0600	2.00	1.4400	0.24	0.24	0.00	0.24	100.00	1.64	8.00	YES	276.22	0.10	0 00:05
5	CB #27	On Grade	269.60	275.10	269.60	N/A	0.00	0.0050	0.0208	0.0130	0.0600	2.00	1.4400	0.13	0.13	0.00	0.13	100.00	1.80	8.00	YES	275.21	0.11	0 00:06
6	CB #28	On Grade	268.87	273.58	268.87	N/A	0.00	0.0165	0.0208	0.0130	0.0600	2.00	1.4400	2.48	1.92	0.88	2.80	68.68	7.98	8.00	YES	273.83	0.24	0 00:05
7	CB #29	On Grade	268.45	273.36	268.45	N/A	0.00	0.0165	0.0208	0.0130	0.0600	2.00	1.4400	0.35	0.01	0.33	0.35	4.08	2.06	8.00	YES	273.40	0.04	0 00:05
8	CB #30	On Grade	265.80	271.12	265.80	N/A	0.00	0.0165	0.0208	0.0130	0.0600	2.00	1.4400	1.56	1.65	0.61	2.26	73.01	7.25	8.00	YES	271.35	0.23	0 00:05
9	CB #31	On Grade	264.45	270.88	264.45	N/A	0.00	0.0165	0.0208	0.0130	0.0600	2.00	1.4400	0.31	0.31	0.00	0.31	100.00	1.99	8.00	YES	271.00	0.12	0 00:06
10	CB #32	On Grade	263.37	267.81	263.37	N/A	0.00	0.0165	0.0208	0.0130	0.0600	2.00	1.4400	1.86	1.62	0.58	2.20	73.80	7.11	8.00	YES	268.04	0.23	0 00:05
11	CB #33	On Grade	262.36	267.81	262.36	N/A	0.00	0.0165	0.0208	0.0130	0.0600	2.00	1.4400	0.38	0.01	0.37	0.38	3.91	2.14	8.00	YES	267.86	0.04	0 00:06
12	CB #34	On Grade	254.00	262.31	254.00	N/A	0.00	0.0450	0.0208	0.0130	0.0600	2.00	1.4400	0.31	0.31	0.00	0.31	100.00	1.64	8.00	YES	262.40	0.10	0 00:06
13	CB #35	On Grade	254.43	262.31	254.43	N/A	0.00	0.0450	0.0208	0.0130	0.0600	2.00	1.4400	1.49	1.63	0.29	1.91	84.98	5.18	8.00	YES	262.49	0.19	0 00:06
14	CB #36	On Sag	254.92	260.03	254.92	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	1.49	N/A	N/A	1.63	N/A	7.86	8.00	YES	260.27	0.24	0 00:05
15	CB #37	On Grade	253.12	259.29	253.12	N/A	0.00	0.0312	0.0208	0.0130	0.0600	2.00	1.4400	0.28	0.28	0.00	0.28	100.00	1.69	8.00	YES	259.39	0.10	0 00:06
16	CB #38	On Sag	250.84	258.76	250.84	6.00	0.00	N/A	0.0208	0.0130	0.0600	2.00	1.4400	0.63	N/A	N/A	0.63	N/A	2.61	8.00	YES	258.89	0.13	0 00:06

4.2. 10 Year Storm Pipe Analysis & HGL Reports

10-YEAR RETURN PERIOD

STORM PIPE ANALYSIS

RESERVE @ MITCHELL MILL

5109 MITCHELL MILL ROAD, TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

PREPARED BY: TOM TAYLOR
STRONG ROCK ENGINEERING GROUP, PLLC | COMPANY LICENSE # P-2166
305 CHURCH AT NORTH HILLS STREET, SUITE 1110 RALEIGH, NC 27609 |
INFORMATION@STRONGROCKGROUP.COM

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STUDY DESCRIPTION.

This study utilized:

- Auto Desk Storm and Sanitary Analysis Program for analyzing and designing stormwater sewers.

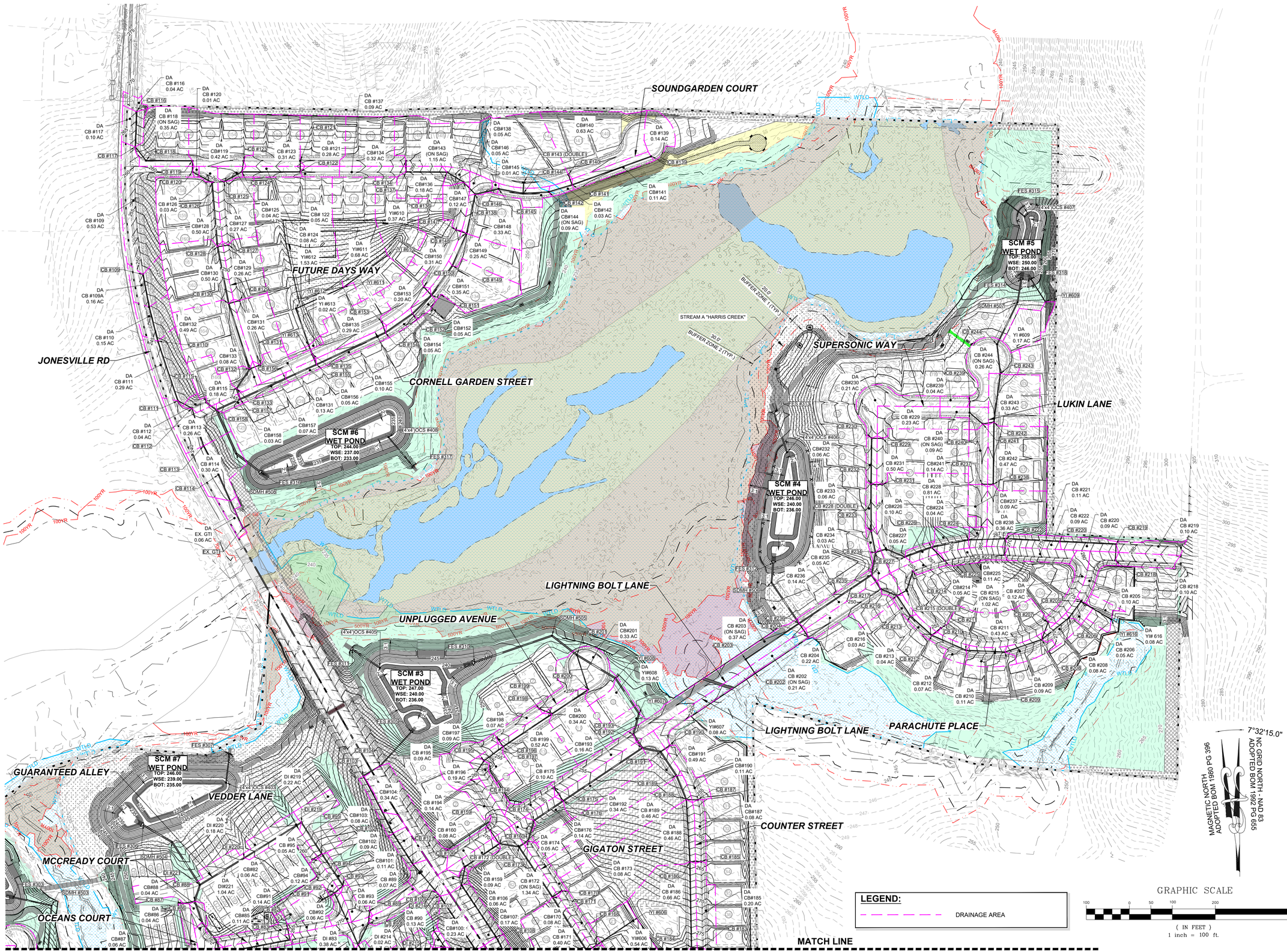
Calculation requirements:

- Auto Desk Storm and Sanitary Analysis Program for analyzing and designing stormwater sewers.
- The program used to model the storm sewer system utilizes the rational method for the quantity of stormwater input.

The results of the storm sewer analysis shows that the 10-year event stays within the pipe and the 25-year event does not top the structures.

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DRAINAGE MAP



No.	REVISIONS	DATE	BY
01	CONSTRUCTION INFRASTRUCTURE DRAWINGS CID-24-04	06/04/2024	SREG
02	TOWN OF ROLESVILLE CID-24-04 V2	11/01/2024	SREG
03	TOWN OF ROLESVILLE CID-24-04 V3	02/01/2024	SREG
04	TOWN OF ROLESVILLE CID-24-04 V4	05/01/2025	SREG

SEAL:

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STRONG ROCK PROJECT	P&P-23-03
NOT FOR CONSTRUCTION	
SCALE	AS SHOWN
DESIGNED BY	SRG
DRAWN BY	SRG
CHECKED BY	SRG

RESERVE @ MITCHELL MILL
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

CONSTRUCTION PLANS
THE DRAINAGE MAP
EXHIBIT - 01

DRAWING SHEET
EX-01

01 OF 02

THIS PLANSET AND ANY ASSOCIATED DOCUMENTS ARE PRELIMINARY AND NOT AUTHORIZED FOR CONSTRUCTION UNTIL SIGNED, DATED, AND OFFICIALLY RELEASED FOR CONSTRUCTION BY THE ENGINEER OF RECORD.

PROGRESS PLOT DATE: 05/29/25

MATCH LINE
FOR CONTINUATION, SEE EXH-01

JONESVILLE RD
UNPLUGGED AVENUE
LIGHTNING BOLT LANE
GUARANTEED ALLEY
VEDDER LANE
COUNTER STREET
MCCREADY COURT
DARK MATTER ALLEY
MOOKIE ALLEY
PENDULUM STREET
OCEANS COURT
CAMERON SOUND ALLEY
BETTERMAN DRIVE
EVEN FLOW LANE
YELLOW MOON COURT
MITCHELL MILL RD.
60' PUBLIC R/W

SCM #7
WET POND
TOP: 246.00
WSE: 239.00
BOT: 235.00

SCM #8
WET POND
TOP: 245.00
WSE: 240.00
BOT: 236.00

SCM #1
WET POND
TOP: 268.00
WSE: 262.00
BOT: 258.00

LEGEND:
DRAINAGE AREA

7°32'15.0"
MAGNETIC NORTH
ADOPTED BOM 1980 PG 396
NC GRID NORTH - NAD 83
ADOPTED BOM 1992 PG 655

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

THIS PLANSET AND ANY ASSOCIATED DOCUMENTS ARE PRELIMINARY AND NOT AUTHORIZED FOR CONSTRUCTION UNTIL SIGNED, DATED, AND OFFICIALLY RELEASED FOR CONSTRUCTION BY THE ENGINEER OF RECORD.

No.	REVISIONS	DATE	BY
01	CONSTRUCTION INFRASTRUCTURE DRAWINGS CID-24-04	06/04/2024	SREG
02	TOWN OF ROLESVILLE CID-24-04 V2	11/01/2024	SREG
03	TOWN OF ROLESVILLE CID-24-04 V3	02/01/2024	SREG
04	TOWN OF ROLESVILLE CID-24-04 V4	05/01/2025	SREG

SEAL:

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STRONG ROCK PROJECT	PSP-23-03
	NOT FOR CONSTRUCTION
SCALE	AS SHOWN
DESIGNED BY	SRG
DRAWN BY	SRG
CHECKED BY	SRG

RESERVE @ MITCHELL MILL
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA
CONSTRUCTION PLANS
THE DRAINAGE MAP
EXHIBIT - 02

DRAWING SHEET
EX-02

02 OF 02

RAINFALL DATA

NOAA Atlas 14, Volume 2, Version 3
Location name: Wake Forest, North Carolina, USA*
Latitude: 35.8807°, Longitude: -78.4771°
Elevation: 282 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**4.85** (4.44-5.30)	**5.63** (5.16-6.16)	**6.42** (5.89-7.01)	**7.21** (6.59-7.86)	**7.99** (7.28-8.71)	**8.62** (7.81-9.40)	**9.17** (8.27-10.0)	**9.66** (8.66-10.5)	**10.2** (9.07-11.1)	**10.7** (9.43-11.7)
10-min	**3.87** (3.55-4.24)	**4.50** (4.13-4.92)	**5.14** (4.72-5.61)	**5.76** (5.27-6.29)	**6.37** (5.80-6.94)	**6.86** (6.22-7.48)	**7.29** (6.57-7.94)	**7.66** (6.86-8.35)	**8.07** (7.18-8.81)	**8.42** (7.42-9.21)
15-min	**3.22** (2.95-3.53)	**3.77** (3.46-4.12)	**4.34** (3.98-4.73)	**4.86** (4.44-5.30)	**5.38** (4.90-5.87)	**5.79** (5.25-6.31)	**6.14** (5.54-6.69)	**6.44** (5.78-7.03)	**6.77** (6.02-7.40)	**7.04** (6.21-7.71)
30-min	**2.21** (2.02-2.42)	**2.61** (2.39-2.85)	**3.08** (2.82-3.36)	**3.52** (3.22-3.84)	**3.99** (3.63-4.35)	**4.36** (3.96-4.75)	**4.70** (4.24-5.12)	**5.02** (4.49-5.47)	**5.39** (4.79-5.88)	**5.70** (5.03-6.24)
60-min	**1.38** (1.26-1.51)	**1.64** (1.50-1.79)	**1.98** (1.81-2.16)	**2.29** (2.10-2.50)	**2.65** (2.42-2.89)	**2.96** (2.68-3.22)	**3.24** (2.92-3.53)	**3.52** (3.15-3.84)	**3.87** (3.44-4.22)	**4.16** (3.67-4.56)
2-hr	**0.806** (0.732-0.889)	**0.959** (0.875-1.05)	**1.17** (1.07-1.29)	**1.38** (1.25-1.51)	**1.62** (1.46-1.77)	**1.83** (1.64-2.00)	**2.03** (1.81-2.22)	**2.24** (1.98-2.44)	**2.50** (2.20-2.74)	**2.74** (2.38-3.00)
3-hr	**0.568** (0.516-0.629)	**0.677** (0.618-0.747)	**0.830** (0.755-0.915)	**0.981** (0.890-1.08)	**1.16** (1.05-1.28)	**1.33** (1.19-1.46)	**1.49** (1.32-1.63)	**1.66** (1.46-1.82)	**1.88** (1.64-2.06)	**2.09** (1.80-2.30)
6-hr	**0.342** (0.312-0.377)	**0.407** (0.373-0.448)	**0.500** (0.456-0.549)	**0.591** (0.538-0.648)	**0.705** (0.637-0.771)	**0.807** (0.725-0.882)	**0.909** (0.810-0.992)	**1.02** (0.897-1.11)	**1.16** (1.01-1.27)	**1.30** (1.11-1.42)
12-hr	**0.200** (0.183-0.220)	**0.238** (0.219-0.262)	**0.294** (0.269-0.322)	**0.350** (0.319-0.383)	**0.420** (0.380-0.459)	**0.484** (0.435-0.527)	**0.549** (0.488-0.597)	**0.619** (0.544-0.672)	**0.715** (0.619-0.776)	**0.804** (0.685-0.873)
24-hr	**0.119** (0.111-0.128)	**0.144** (0.134-0.155)	**0.181** (0.168-0.195)	**0.211** (0.195-0.227)	**0.251** (0.232-0.270)	**0.283** (0.261-0.305)	**0.316** (0.290-0.341)	**0.351** (0.321-0.378)	**0.398** (0.363-0.430)	**0.436** (0.395-0.472)
2-day	**0.069** (0.064-0.074)	**0.083** (0.077-0.089)	**0.103** (0.096-0.112)	**0.120** (0.111-0.129)	**0.142** (0.131-0.153)	**0.160** (0.147-0.172)	**0.178** (0.163-0.192)	**0.197** (0.180-0.212)	**0.222** (0.203-0.241)	**0.243** (0.220-0.263)
3-day	**0.048** (0.045-0.052)	**0.058** (0.054-0.063)	**0.073** (0.068-0.078)	**0.084** (0.078-0.090)	**0.099** (0.092-0.106)	**0.111** (0.103-0.120)	**0.124** (0.114-0.133)	**0.137** (0.126-0.147)	**0.155** (0.141-0.167)	**0.169** (0.153-0.182)
4-day	**0.038** (0.036-0.041)	**0.046** (0.043-0.049)	**0.057** (0.053-0.061)	**0.066** (0.061-0.070)	**0.078** (0.072-0.083)	**0.087** (0.081-0.093)	**0.097** (0.089-0.104)	**0.107** (0.098-0.115)	**0.121** (0.110-0.130)	**0.132** (0.120-0.142)
7-day	**0.025** (0.024-0.027)	**0.030** (0.028-0.032)	**0.037** (0.035-0.039)	**0.042** (0.040-0.045)	**0.050** (0.046-0.053)	**0.056** (0.052-0.059)	**0.062** (0.057-0.066)	**0.068** (0.063-0.073)	**0.076** (0.070-0.082)	**0.083** (0.076-0.089)
10-day	**0.020** (0.019-0.021)	**0.024** (0.022-0.025)	**0.029** (0.027-0.031)	**0.033** (0.031-0.035)	**0.038** (0.036-0.041)	**0.042** (0.039-0.045)	**0.046** (0.043-0.050)	**0.051** (0.047-0.054)	**0.057** (0.052-0.061)	**0.061** (0.056-0.066)
20-day	**0.013** (0.012-0.014)	**0.016** (0.015-0.017)	**0.019** (0.018-0.020)	**0.021** (0.020-0.022)	**0.024** (0.023-0.026)	**0.027** (0.025-0.029)	**0.029** (0.027-0.031)	**0.032** (0.030-0.034)	**0.035** (0.033-0.038)	**0.038** (0.035-0.041)
30-day	**0.011** (0.010-0.012)	**0.013** (0.012-0.014)	**0.015** (0.014-0.016)	**0.017** (0.016-0.018)	**0.019** (0.018-0.020)	**0.021** (0.019-0.022)	**0.023** (0.021-0.024)	**0.024** (0.023-0.026)	**0.027** (0.025-0.028)	**0.028** (0.026-0.030)
45-day	**0.009** (0.009-0.010)	**0.011** (0.010-0.011)	**0.012** (0.012-0.013)	**0.014** (0.013-0.015)	**0.015** (0.015-0.016)	**0.017** (0.016-0.018)	**0.018** (0.017-0.019)	**0.019** (0.018-0.020)	**0.021** (0.019-0.022)	**0.022** (0.020-0.023)
60-day	**0.008** (0.008-0.009)	**0.010** (0.009-0.010)	**0.011** (0.010-0.012)	**0.012** (0.011-0.013)	**0.013** (0.013-0.014)	**0.014** (0.014-0.015)	**0.015** (0.014-0.016)	**0.016** (0.015-0.017)	**0.018** (0.016-0.019)	**0.018** (0.017-0.020)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

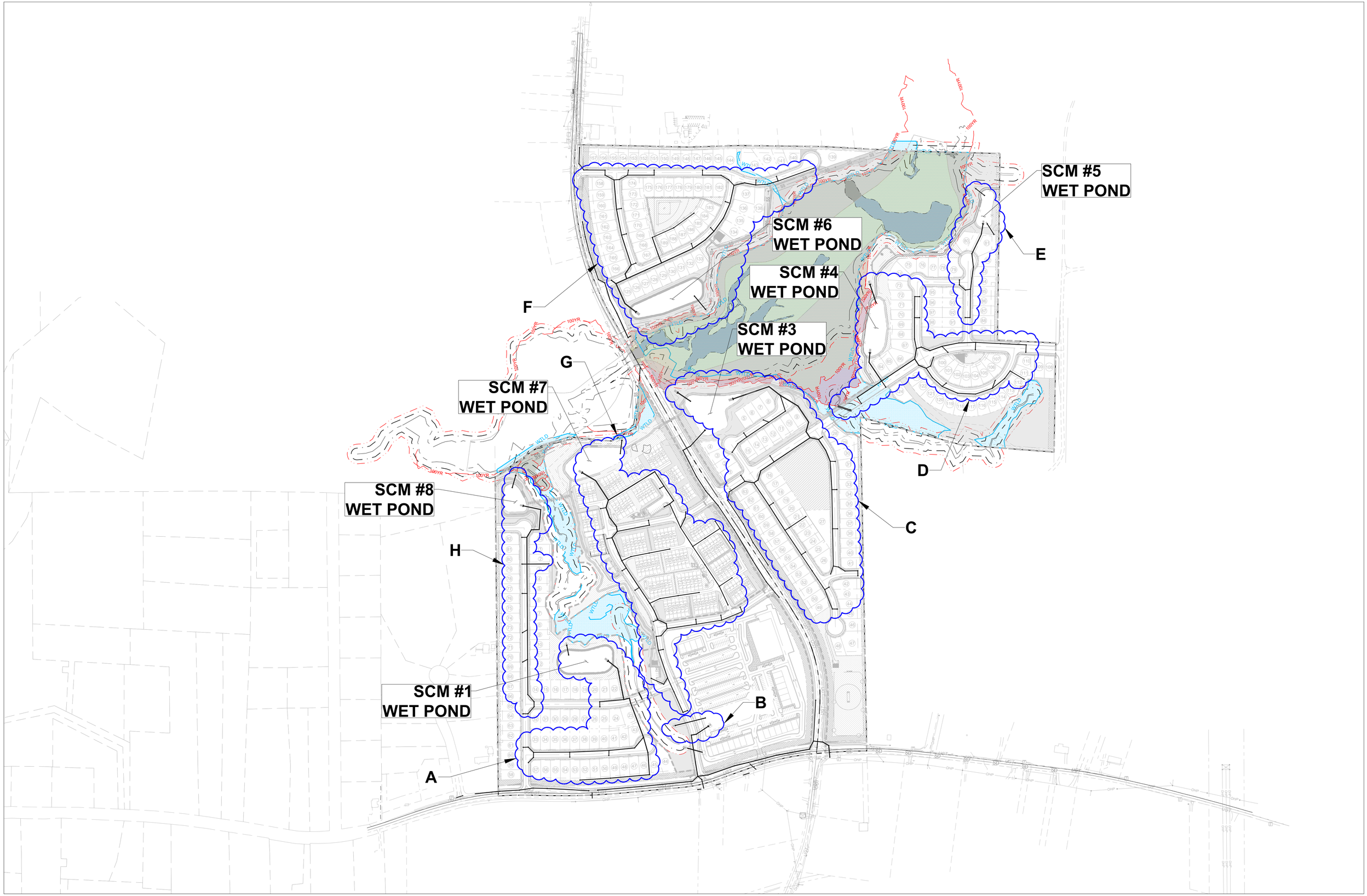
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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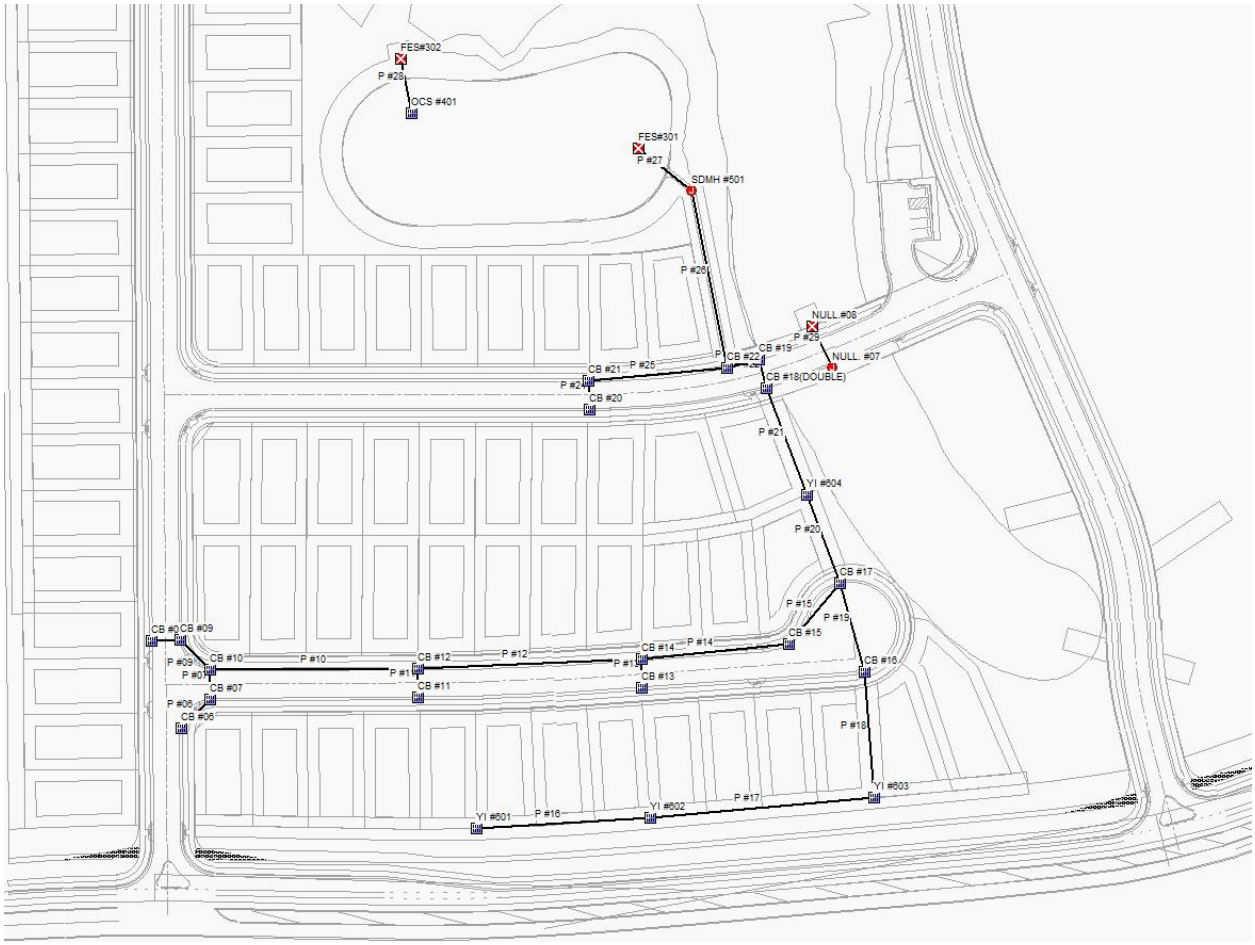
PF graphical

THE TABLE REPORT & PROFILE HGL OUTPUTS


SCM #5
WET POND
SCM #6
WET POND
SCM #4
WET POND
SCM #3
WET POND
SCM #7
WET POND
SCM #8
WET POND
SCM #1
WET POND
E
F
G
D
C
H
B
A

S T O R M W A T E R AREA " A "

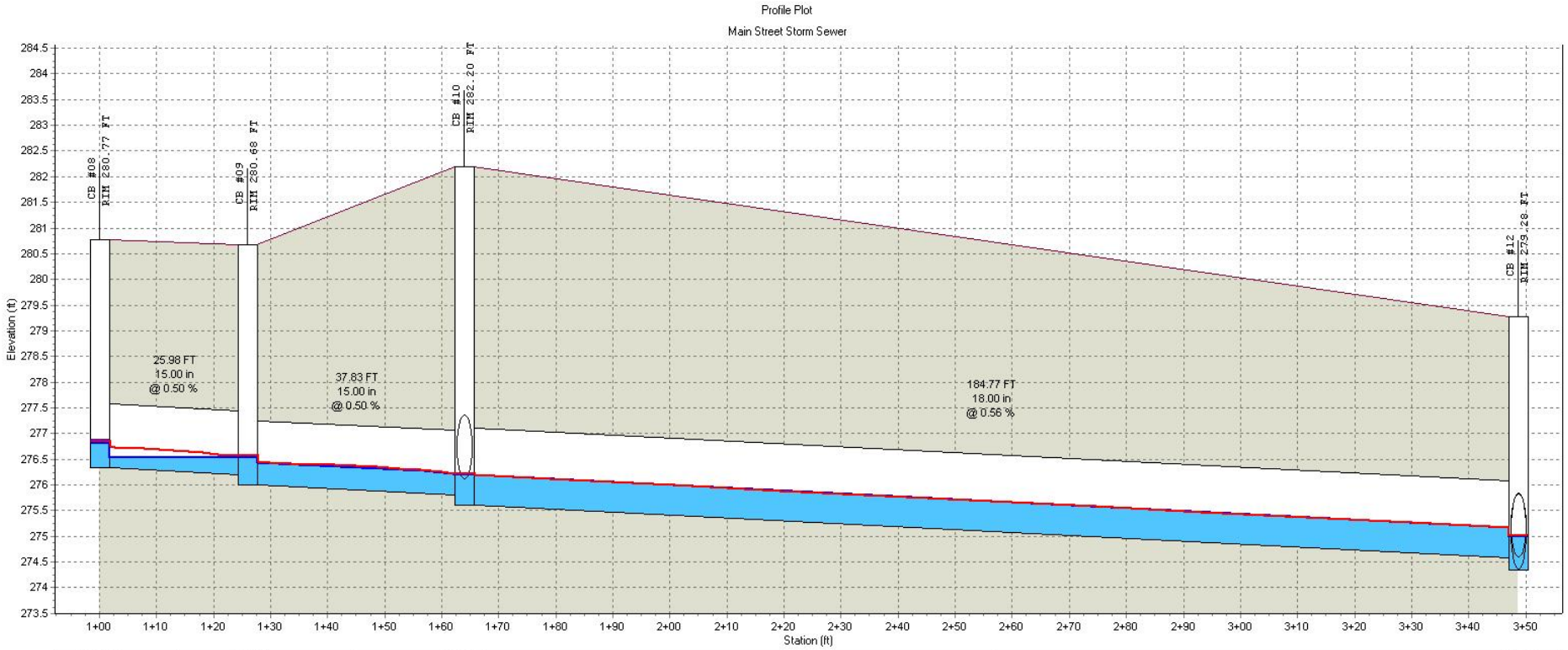
STORMWATER PIPING AND HYDRAULIC GRADE LINE FOR 10-YR STORM



PLAN VIEW

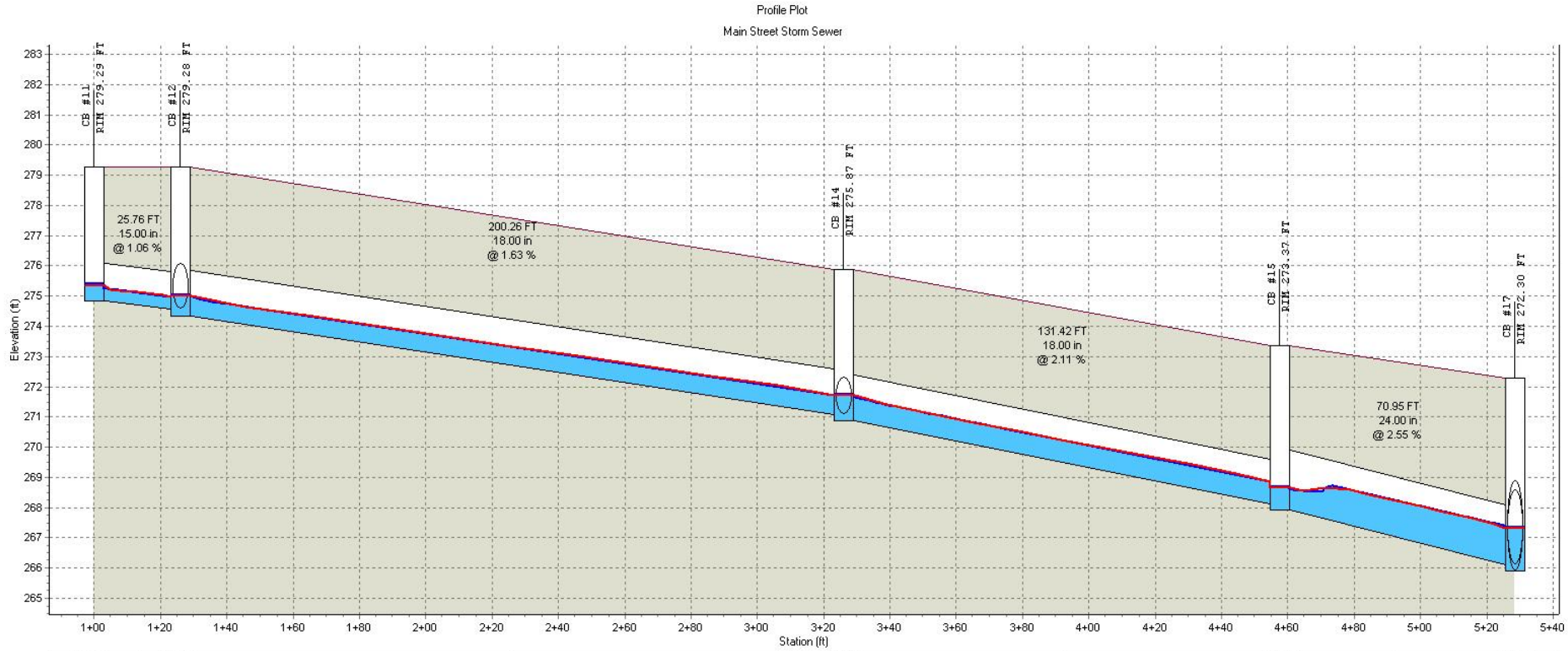
DRAINAGE AREA									
SN	Element ID	Area (acres)	Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
1	Sub-CB#06	0.11	CB #06	0.8300	0.60	0.50	0.66	7.210	0 00:05:00
2	Sub-CB#07	0.09	CB #07	0.5900	0.60	0.35	0.38	7.210	0 00:05:00
3	Sub-CB#08	0.32	CB #08	0.5800	0.60	0.35	1.34	7.210	0 00:05:00
4	Sub-CB#09	0.04	CB #09	0.8300	0.60	0.50	0.24	7.210	0 00:05:00
5	Sub-CB#10	0.01	CB #10	0.7000	0.60	0.42	0.05	7.210	0 00:05:00
6	Sub-CB#11	0.46	CB #11	0.7300	0.60	0.44	2.42	7.210	0 00:05:00
7	Sub-CB#12	0.17	CB #12	0.8700	0.60	0.52	1.07	7.210	0 00:05:00
8	Sub-CB#13	0.39	CB #13	0.6300	0.60	0.38	1.77	7.210	0 00:05:00
9	Sub-CB#14	0.18	CB #14	0.8700	0.60	0.52	1.13	7.210	0 00:05:00
10	Sub-CB#15	0.11	CB #15	0.8700	0.60	0.52	0.69	7.210	0 00:05:00
11	Sub-CB#16	0.35	CB #16	0.6300	0.60	0.38	1.59	7.210	0 00:05:00
12	Sub-CB#17	0.64	CB #17	0.7100	0.60	0.43	3.28	7.210	0 00:05:00
13	Sub-CB#18	0.60	CB #18(DOUBLE)	0.7300	0.60	0.44	3.16	7.210	0 00:05:00
14	Sub-CB#19	0.15	CB #19	0.8300	0.60	0.50	0.90	7.210	0 00:05:00
15	Sub-CB#20	0.91	CB #20	0.7300	0.60	0.44	4.79	7.210	0 00:05:00
16	Sub-CB#21	0.11	CB #21	0.8700	0.60	0.52	0.69	7.210	0 00:05:00
17	Sub-CB#22	0.07	CB #22	0.8700	0.60	0.52	0.44	7.210	0 00:05:00
18	Sub-YI#601	0.32	YI #601	0.2300	0.60	0.14	0.53	7.210	0 00:05:00
19	Sub-YI#602	0.34	YI #602	0.2300	0.60	0.14	0.56	7.210	0 00:05:00
20	Sub-YI#603	0.53	YI #603	0.2300	0.60	0.14	0.88	7.210	0 00:05:00
21	Sub-YI#604	0.45	YI #604	0.4500	0.60	0.27	1.46	7.210	0 00:05:00

MODEL INPUT										MODEL OUTPUT									
SN	Element ID	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Manning's Roughness	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Max Flow Velocity (ft/sec)	Travel Time (min)	Design Flow Capacity (cfs)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Total Time Surcharged (min)	Max Flow Depth (ft)	Reported Condition
1	P #06	CB #06	CB #07	36.60	280.95	278.16	7.6300	15.000	0.0130	0.65	0 00:05	6.52	0.09	17.84	0.04	0.13	0.00	0.17	Calculated
2	P #07	CB #07	CB #10	26.38	277.96	276.11	7.0000	15.000	0.0130	1.02	0 00:05	6.93	0.06	17.10	0.06	0.18	0.00	0.22	Calculated
3	P #08	CB #08	CB #09	25.98	276.33	276.20	0.5000	15.000	0.0130	1.24	0 00:05	2.83	0.15	4.57	0.27	0.39	0.00	0.48	Calculated
4	P #09	CB #09	CB #10	37.83	276.00	275.81	0.5000	15.000	0.0130	1.46	0 00:05	3.01	0.21	4.57	0.32	0.42	0.00	0.52	Calculated
5	P #10	CB #10	CB #12	184.77	275.61	274.57	0.5600	18.000	0.0130	2.38	0 00:06	3.75	0.82	7.86	0.30	0.39	0.00	0.58	Calculated
6	P #11	CB #11	CB #12	25.76	274.85	274.57	1.0600	15.000	0.0130	1.73	0 00:05	3.97	0.11	6.66	0.26	0.39	0.00	0.48	Calculated
7	P #12	CB #12	CB #14	200.26	274.34	271.08	1.6300	18.000	0.0130	4.85	0 00:05	6.53	0.51	13.40	0.36	0.44	0.00	0.66	Calculated
8	P #13	CB #13	CB #14	25.81	271.48	271.08	1.5400	15.000	0.0130	2.01	0 00:05	4.01	0.11	8.01	0.25	0.47	0.00	0.59	Calculated
9	P #14	CB #14	CB #15	131.42	270.88	268.11	2.1100	18.000	0.0130	7.56	0 00:06	7.93	0.28	15.26	0.50	0.53	0.00	0.80	Calculated
10	P #15	CB #15	CB #17	70.95	267.91	266.10	2.5500	24.000	0.0130	8.21	0 00:06	5.56	0.21	36.11	0.23	0.50	0.00	0.99	Calculated
11	P #16	YI #601	YI #602	155.38	273.46	271.48	1.2700	15.000	0.0130	0.49	0 00:05	3.30	0.78	7.29	0.07	0.18	0.00	0.22	Calculated
12	P #17	YI #602	YI #603	200.03	271.28	268.64	1.3200	18.000	0.0130	0.97	0 00:06	4.02	0.83	12.09	0.08	0.19	0.00	0.29	Calculated
13	P #18	YI #603	CB #16	112.93	268.44	267.29	1.0100	24.000	0.0130	1.73	0 00:06	4.08	0.46	22.75	0.08	0.19	0.00	0.39	Calculated
14	P #19	CB #16	CB #17	81.60	267.09	266.10	1.2100	30.000	0.0130	3.26	0 00:05	2.99	0.45	45.18	0.07	0.33	0.00	0.83	Calculated
15	P #20	CB #17	YI #604	84.60	265.90	265.48	0.5000	36.000	0.0130	14.47	0 00:06	4.85	0.29	47.16	0.31	0.44	0.00	1.33	Calculated
16	P #21	YI #604	CB #18(DOUBLE)	101.87	265.28	264.62	0.6500	36.000	0.0130	15.54	0 00:06	4.14	0.41	53.84	0.29	0.53	0.00	1.60	Calculated
17	P #22	CB #18(DOUBLE)	CB #19	25.79	264.42	264.29	0.5000	36.000	0.0130	19.35	0 00:06	4.40	0.10	47.16	0.41	0.60	0.00	1.79	Calculated
18	P #23	CB #19	CB #22	29.26	264.09	263.94	0.5000	36.000	0.0130	20.09	0 00:06	5.11	0.10	47.16	0.43	0.55	0.00	1.64	Calculated
19	P #24	CB #20	CB #21	25.83	270.89	270.76	0.5000	15.000	0.0130	2.80	0 00:05	3.54	0.12	4.57	0.61	0.61	0.00	0.77	Calculated
20	P #25	CB #21	CB #22	123.37	270.56	264.74	4.7200	18.000	0.0130	3.50	0 00:05	8.59	0.24	22.81	0.15	0.34	0.00	0.51	Calculated
21	P #26	CB #22	SDMH #501	160.90	263.74	262.67	0.6700	36.000	0.0130	23.52	0 00:06	6.31	0.42	54.46	0.43	0.52	0.00	1.57	Calculated
22	P #27	SDMH #501	FES#301	61.07	262.47	262.00	0.7700	36.000	0.0130	23.53	0 00:06	6.61	0.15	58.40	0.40	0.50	0.00	1.51	Calculated



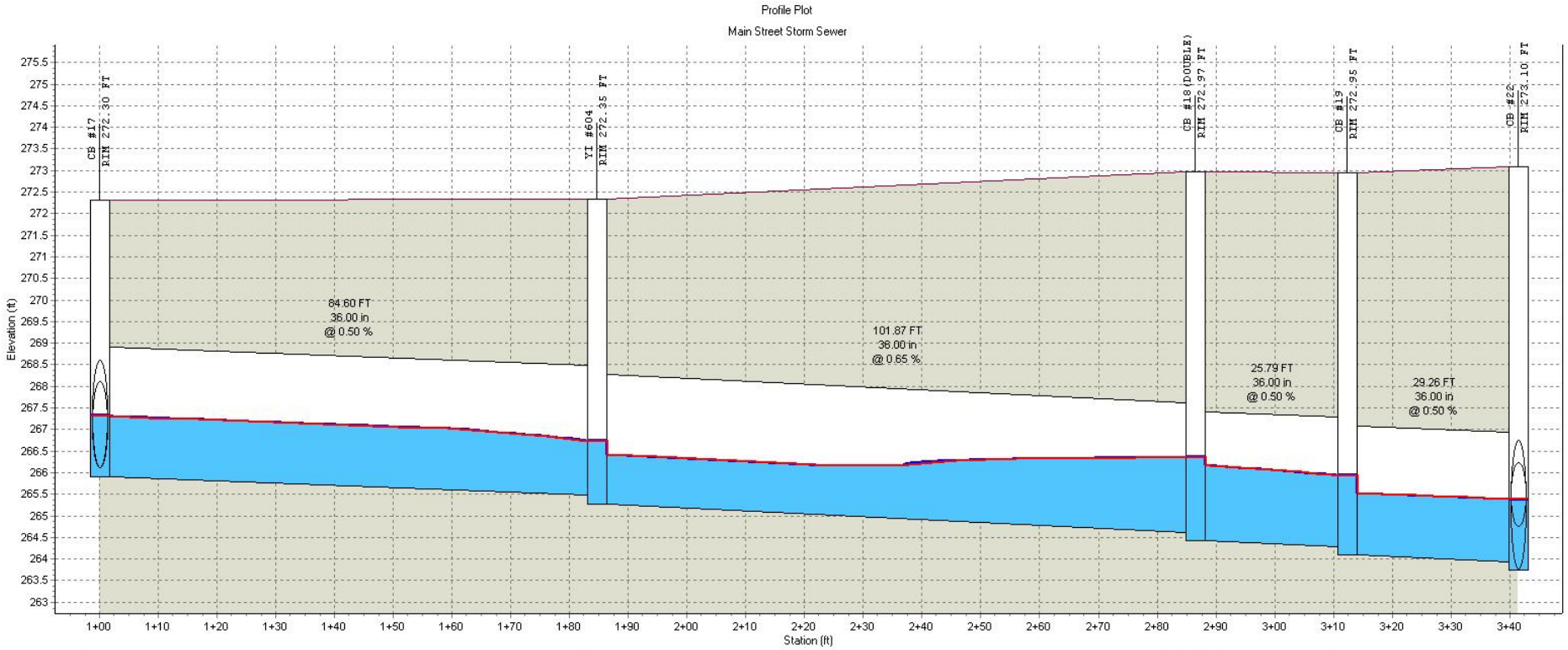
:	CB #08	CB #09	CB #10	CB #12
RIM (FT):	280.77	280.68	282.20	279.28
Invert (ft):	276.33	276.00	275.61	274.34
Min Pipe Cover (ft):				
Max HGL (ft):	276.85	276.56	276.21	275.01

Link ID:	P #08	P #09	P #10
(FT):	25.98	37.83	184.77
(in):	15.00	15.00	18.00
@ (%):	0.50	0.50	0.56
Up Invert (ft):	276.33	276.00	275.61
Dn Invert (ft):	276.20	275.81	274.57
Max Q (cfs):	1.24	1.46	2.38
Max Vel (ft/s):	2.83	3.01	3.75
Max Depth (ft):	0.48	0.52	0.58



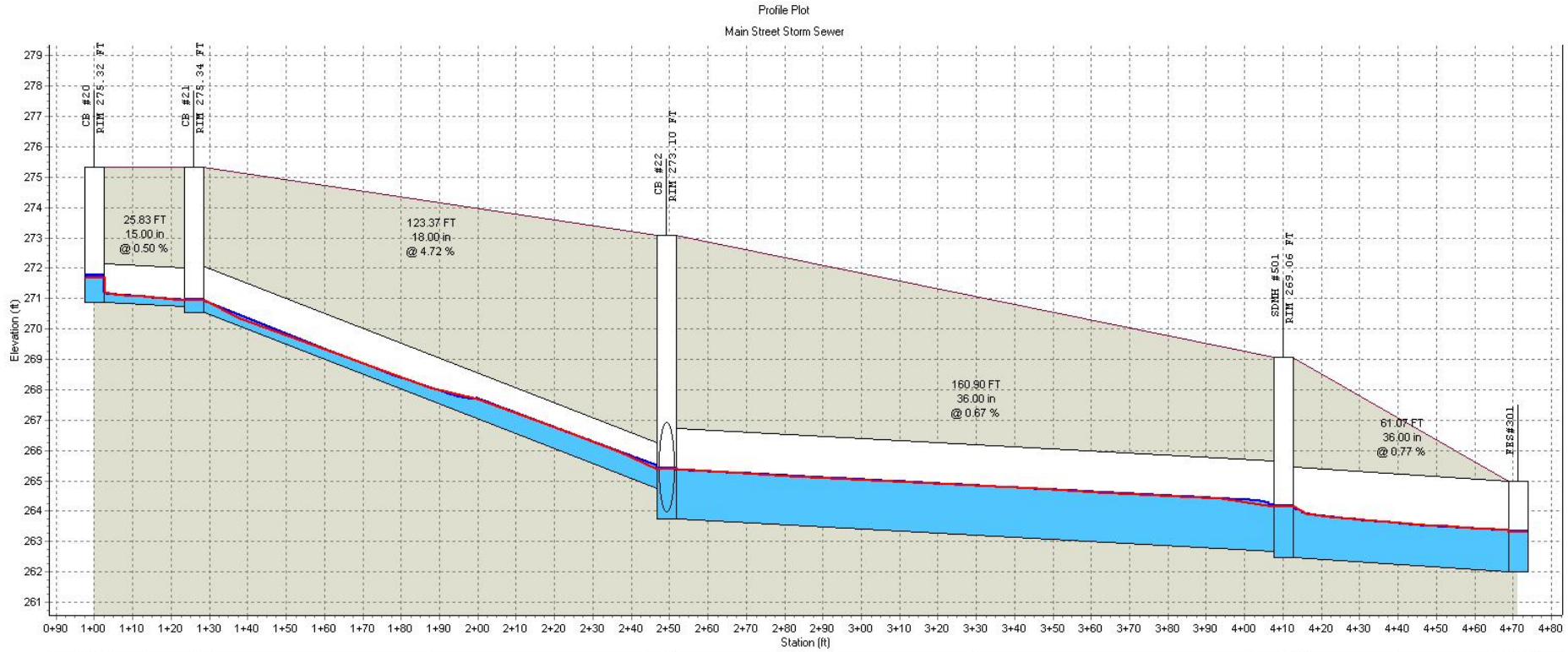
	CB #11	CB #12	CB #14	CB #15	CB #17
RIM (FT):	279.29	279.28	275.87	273.37	272.30
Invert (ft):	274.85	274.34	270.88	267.91	265.90
Min Pipe Cover (ft):					
Max HGL (ft):	275.38	275.01	271.73	268.68	267.32

Link ID:	P #11	P #12	P #14	P #15
(FT):	25.76	200.26	131.42	70.95
(in):	15.00	18.00	18.00	24.00
@ (%):	1.06	1.63	2.11	2.55
Up Invert (ft):	274.85	274.34	270.88	267.91
Dn Invert (ft):	274.57	271.08	268.11	266.10
Max Q (cfs):	1.73	4.85	7.56	8.21
Max Vel (ft/s):	3.97	6.53	7.93	5.56
Max Depth (ft):	0.48	0.66	0.80	0.99



	CB #17	YI #604	CB #18(DOUBLE)	CB #19	CB #22
RIM (FT):	272.30	272.35	272.97	272.95	273.10
Invert (ft):	265.90	265.28	264.42	264.09	263.74
Min Pipe Cover (ft):					
Max HGL (ft):	267.32	266.73	266.36	265.93	265.38

Link ID:	P #20	P #21	P #22	P #23
(FT):	84.60	101.87	25.79	29.26
(in):	36.00	36.00	36.00	36.00
@ (%):	0.50	0.65	0.50	0.50
Up Invert (ft):	265.90	265.28	264.42	264.09
Dn Invert (ft):	265.48	264.62	264.29	263.94
Max Q (cfs):	14.47	15.54	19.35	20.09
Max Vel (ft/s):	4.85	4.14	4.40	5.11
Max Depth (ft):	1.33	1.60	1.79	1.64



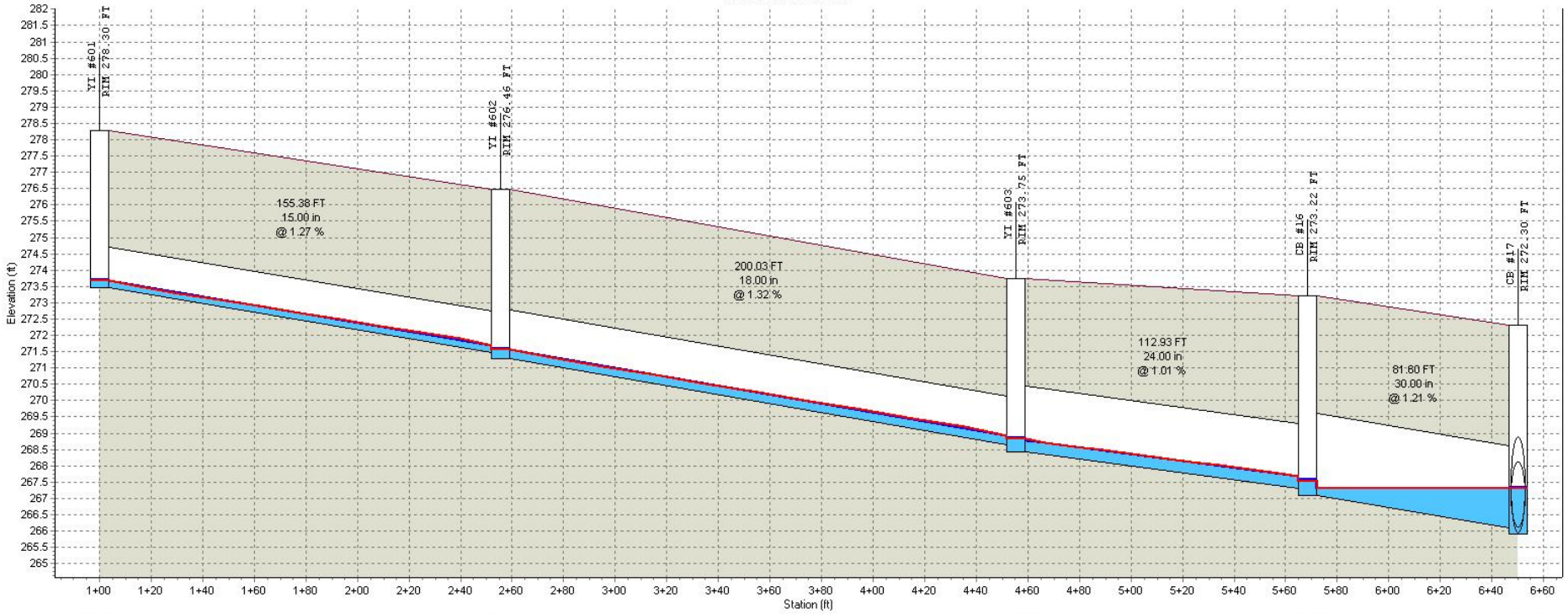
:	CB #20	CB #21	CB #22	SDMH #501	FES#301
RIM (FT):	275.32	275.34	273.10	269.06	
Invert (ft):	270.89	270.56	263.74	262.47	262.00
Min Pipe Cover (ft):				3.39	
Max HGL (ft):	271.75	270.96	265.38	264.16	263.33

Link ID:	P #24	P #25	P #26	P #27
(FT):	25.83	123.37	160.90	61.07
(in):	15.00	18.00	36.00	36.00
@ (%):	0.50	4.72	0.67	0.77
Up Invert (ft):	270.89	270.56	263.74	262.47
Dn Invert (ft):	270.76	264.74	262.67	262.00
Max Q (cfs):	2.80	3.50	23.52	23.53
Max Vel (ft/s):	3.54	8.59	6.31	6.61
Max Depth (ft):	0.77	0.51	1.57	1.51

HGL

Profile Plot

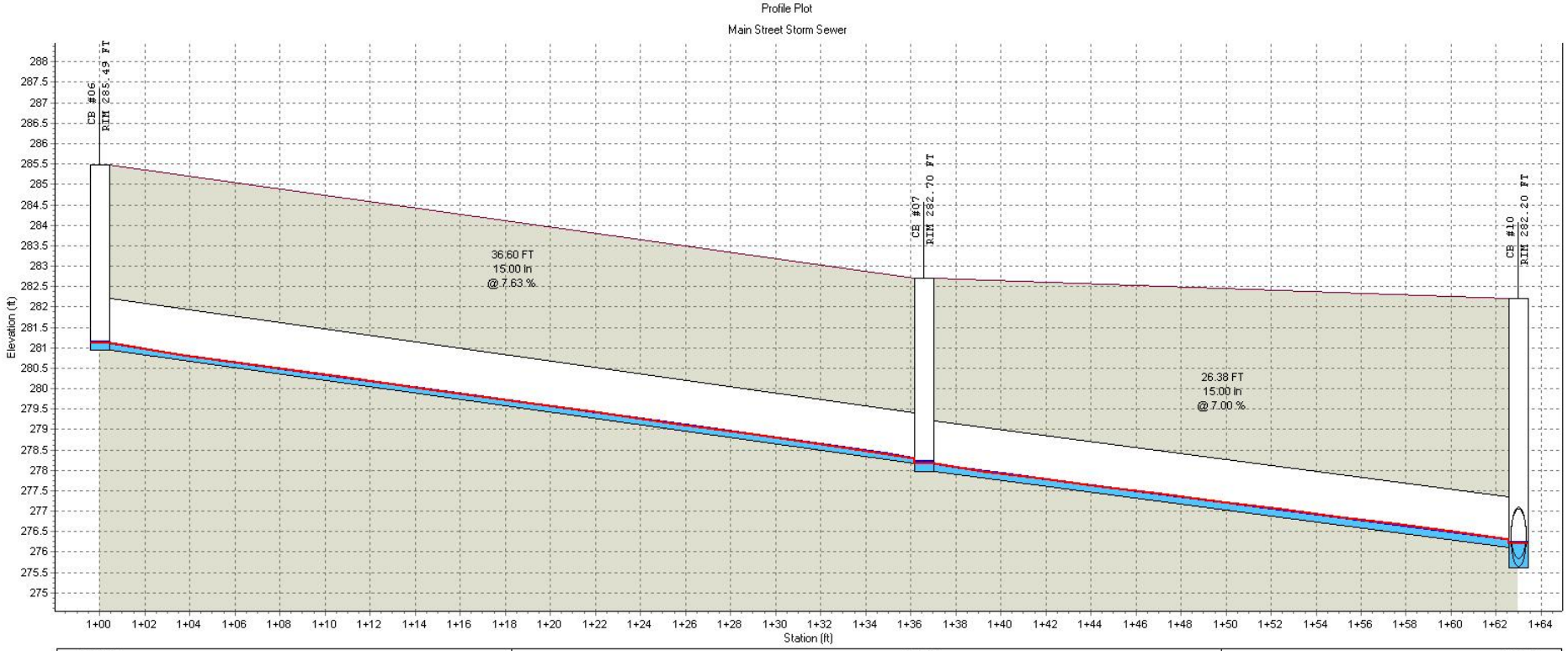
Main Street Storm Sewer



:	YI #601	YI #602	YI #603	CB #16	CB #17
RIM (FT):	278.30	276.46	273.75	273.22	272.30
Invert (ft):	273.46	271.28	268.44	267.09	265.90
Min Pipe Cover (ft):					
Max HGL (ft):	273.69	271.58	268.83	267.55	267.32

Link ID:	P #16	P #17	P #18	P #19
(FT):	155.38	200.03	112.93	81.60
(in):	15.00	18.00	24.00	30.00
@ (%):	1.27	1.32	1.01	1.21
Up Invert (ft):	273.46	271.28	268.44	267.09
Dn Invert (ft):	271.48	268.64	267.29	266.10
Max Q (cfs):	0.49	0.97	1.73	3.26
Max Vel (ft/s):	3.30	4.02	4.08	2.99
Max Depth (ft):	0.22	0.29	0.39	0.83

HGL



:	CB #06		CB #07		CB #10
RIM (FT):	285.49		282.70		282.20
Invert (ft):	280.95		277.96		275.61
Min Pipe Cover (ft):					
Max HGL (ft):	281.12		278.19		276.21
Link ID:		P #06		P #07	
(FT):		36.60		26.38	
(in):		15.00		15.00	
@ (%):		7.63		7.00	
Up Invert (ft):		280.95		277.96	
Dn Invert (ft):		278.16		276.11	
Max Q (cfs):		0.65		1.02	
Max Vel (ft/s):		6.52		6.93	
Max Depth (ft):		0.17		0.22	

HGL

S T O R M W A T E R AREA " C "

STORMWATER PIPING AND HYDRAULIC GRADE LINE FOR 10-YR STORM



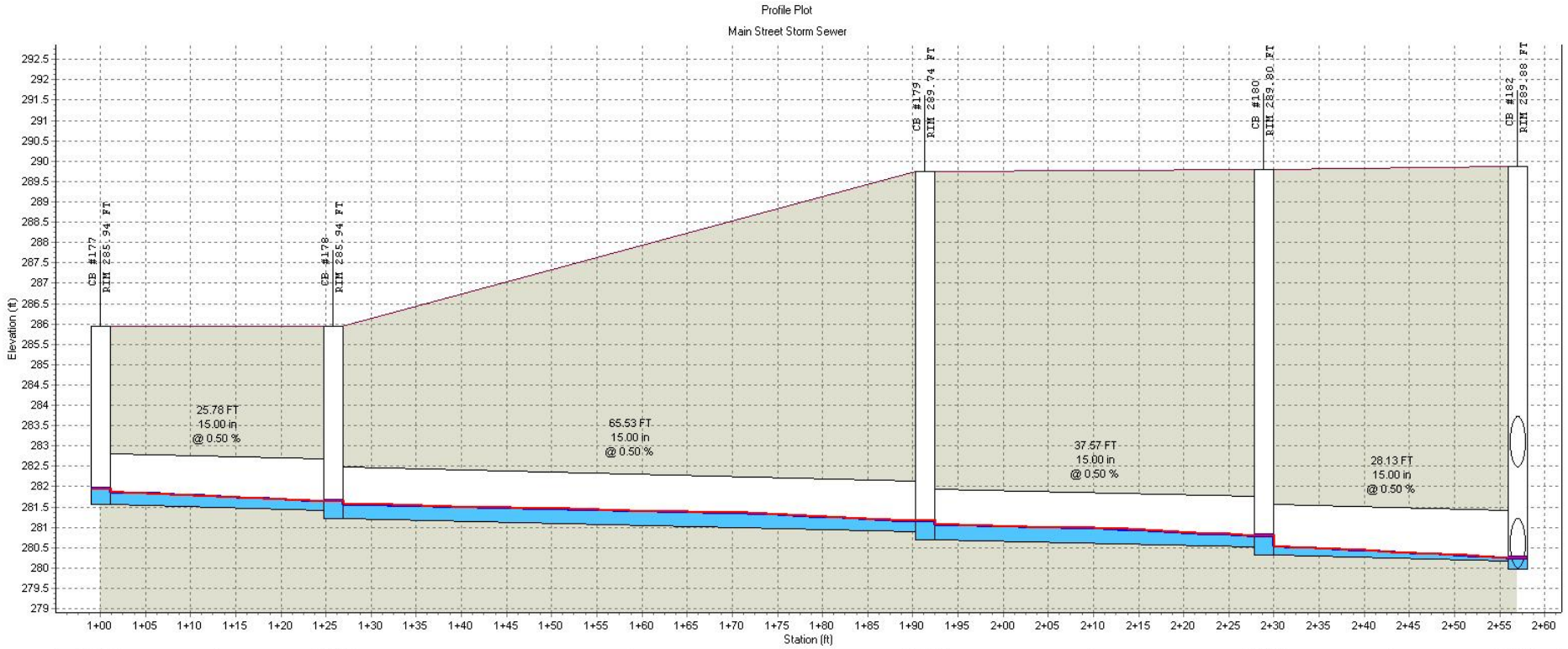
PLAN VIEW

DRAINAGE AREA

SN	Element ID	Area (acres)	Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
1	Sub-CB#106	0.06	CB #106	0.8300	0.60	0.50	0.36	7.210	0 00:05:00
2	Sub-CB#159	0.09	CB #159	0.8300	0.60	0.50	0.54	7.210	0 00:05:00
3	Sub-CB#160	0.08	CB #160	0.8300	0.60	0.50	0.48	7.210	0 00:05:00
4	Sub-CB#161	0.21	CB #161	0.8700	0.60	0.52	1.32	7.210	0 00:05:00
5	Sub-CB#162	0.32	CB #162	0.7500	0.60	0.45	1.73	7.210	0 00:05:00
6	Sub-CB#163	0.12	CB #163	0.8700	0.60	0.52	0.75	7.210	0 00:05:00
7	Sub-CB#164	0.29	CB #164	0.6100	0.60	0.37	1.28	7.210	0 00:05:00
8	Sub-CB#165	0.27	CB #165	0.7300	0.60	0.44	1.42	7.210	0 00:05:00
9	Sub-CB#166	0.10	CB #166	0.8700	0.60	0.52	0.63	7.210	0 00:05:00
10	Sub-CB#167	0.27	CB #167	0.7300	0.60	0.44	1.42	7.210	0 00:05:00
11	Sub-CB#168	0.10	CB #168	0.8700	0.60	0.52	0.63	7.210	0 00:05:00
12	Sub-CB#169	0.41	CB #169	0.7300	0.60	0.44	2.16	7.210	0 00:05:00
13	Sub-CB#170	0.08	CB #170	0.8700	0.60	0.52	0.50	7.210	0 00:05:00
14	Sub-CB#171	0.40	CB #171	0.8300	0.60	0.50	2.39	7.210	0 00:05:00
15	Sub-CB#172	1.34	CB #172(DOUBLE)	0.7100	0.60	0.43	6.86	7.210	0 00:05:00
16	Sub-CB#173	0.08	CB #173	0.8700	0.60	0.52	0.50	7.210	0 00:05:00
17	Sub-CB#174	0.05	CB #174	0.8300	0.60	0.50	0.30	7.210	0 00:05:00
18	Sub-CB#175	0.10	CB #175	0.8300	0.60	0.50	0.60	7.210	0 00:05:00
19	Sub-CB#176	0.14	CB #176	0.5900	0.60	0.35	0.60	7.210	0 00:05:00
20	Sub-CB#177	0.12	CB #177	0.8300	0.60	0.50	0.72	7.210	0 00:05:00
21	Sub-CB#178	0.04	CB #178	0.8300	0.60	0.50	0.24	7.210	0 00:05:00
22	Sub-CB#179	0.02	CB #179	0.8300	0.60	0.50	0.12	7.210	0 00:05:00
23	Sub-CB#180	0.02	CB #180	0.8300	0.60	0.50	0.12	7.210	0 00:05:00
24	Sub-CB#181	0.03	CB #181	0.8300	0.60	0.50	0.18	7.210	0 00:05:00
25	Sub-CB#182	0.03	CB #182	0.8300	0.60	0.50	0.18	7.210	0 00:05:00
26	Sub-CB#183	0.19	CB #183	0.8700	0.60	0.52	1.19	7.210	0 00:05:00
27	Sub-CB#184	0.28	CB #184	0.8300	0.60	0.50	1.68	7.210	0 00:05:00
28	Sub-CB#185	0.20	CB #185	0.8700	0.60	0.52	1.26	7.210	0 00:05:00
29	Sub-CB#186	0.66	CB #186	0.7100	0.60	0.43	3.38	7.210	0 00:05:00
30	Sub-CB#187	0.08	CB #187	0.8700	0.60	0.52	0.50	7.210	0 00:05:00
31	Sub-CB#188	0.90	CB #188	0.6100	0.60	0.37	3.96	7.210	0 00:05:00
32	Sub-CB#189	0.46	CB #189	0.5100	0.60	0.31	1.69	7.210	0 00:05:00
33	Sub-CB#190	0.11	CB #190	0.8700	0.60	0.52	0.69	7.210	0 00:05:00
34	Sub-CB#191	0.49	CB #191	0.5100	0.60	0.31	1.80	7.210	0 00:05:00
35	Sub-CB#192	0.34	CB #192	0.7100	0.60	0.43	1.74	7.210	0 00:05:00
36	Sub-CB#193	0.16	CB #193	0.8300	0.60	0.50	0.96	7.210	0 00:05:00
37	Sub-CB#194	0.14	CB #194	0.8700	0.60	0.52	0.88	7.210	0 00:05:00
38	Sub-CB#195	0.19	CB #195	0.8300	0.60	0.50	1.14	7.210	0 00:05:00
39	Sub-CB#196	0.09	CB #196	0.8700	0.60	0.52	0.57	7.210	0 00:05:00
40	Sub-CB#197	0.09	CB #197	0.6300	0.60	0.38	0.41	7.210	0 00:05:00
41	Sub-CB#198	0.07	CB #198	0.8700	0.60	0.52	0.44	7.210	0 00:05:00
42	Sub-CB#199	0.52	CB #199	0.6100	0.60	0.37	2.29	7.210	0 00:05:00
43	Sub-CB#200	0.34	CB #200	0.6100	0.60	0.37	1.50	7.210	0 00:05:00
44	Sub-CB#201	0.33	CB #201	0.8700	0.60	0.52	2.07	7.210	0 00:05:00
45	Sub-YI#606	0.54	YI #606	0.5500	0.60	0.33	2.14	7.210	0 00:05:00
46	Sub-YI#607	0.08	YI #607	0.1900	0.60	0.11	0.11	7.210	0 00:05:00
47	Sub-YI#608	0.13	YI #608	0.4500	0.60	0.27	0.42	7.210	0 00:05:00

MODEL INPUT									MODEL OUTPUT									
SN	Element ID	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Manning's Roughness	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Max Flow Velocity (ft/sec)	Travel Time (min)	Design Flow Capacity (cfs)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Total Time Surcharged (min)	Max Flow Depth (ft)	Reported Condition
1	P #204	CB #159	CB #160	37.73	264.61	263.73	2.3400	15.000	0.0130	0.53	0 00:05	3.46	0.18	9.88	0.05	0.19	0.00	0.24	Calculated
2	P #205	CB #160	CB #172(DOUBLE)	46.45	263.53	262.03	3.2200	24.000	0.0130	5.17	0 00:05	3.88	0.20	40.62	0.13	0.49	0.00	0.98	Calculated
3	P #206	CB #161	CB #162	25.78	297.92	297.76	0.6200	15.000	0.0130	1.19	0 00:05	3.00	0.14	5.09	0.23	0.36	0.00	0.45	Calculated
4	P #207	CB #162	CB #164	105.72	297.47	292.44	4.7600	15.000	0.0130	2.67	0 00:05	8.34	0.21	14.09	0.19	0.31	0.00	0.38	Calculated
5	P #208	CB #163	CB #164	25.90	292.57	292.44	0.5000	15.000	0.0130	0.83	0 00:05	2.46	0.18	4.57	0.18	0.32	0.00	0.40	Calculated
6	P #209	CB #164	CB #165	115.44	292.24	287.49	4.1100	15.000	0.0130	4.76	0 00:05	9.21	0.21	13.10	0.36	0.44	0.00	0.55	Calculated
7	P #210	CB #165	CB #167	99.15	287.29	282.91	4.4200	15.000	0.0130	6.00	0 00:05	9.85	0.17	13.58	0.44	0.50	0.00	0.62	Calculated
8	P #211	CB #166	CB #167	25.69	283.04	282.91	0.5000	15.000	0.0130	0.61	0 00:05	2.11	0.20	4.57	0.13	0.30	0.00	0.37	Calculated
9	P #212	CB #167	CB #169	150.16	282.71	271.62	7.3800	18.000	0.0130	7.84	0 00:05	13.03	0.19	28.55	0.27	0.37	0.00	0.56	Calculated
10	P #213	CB #168	CB #169	25.71	269.45	269.32	0.5000	18.000	0.0130	2.53	0 00:05	2.36	0.18	7.44	0.34	0.67	0.00	1.00	Calculated
11	P #214	CB #169	CB #171	149.40	269.12	267.75	0.9200	24.000	0.0130	11.97	0 00:06	6.45	0.39	21.66	0.55	0.57	0.00	1.15	Calculated
12	P #215	CB #170	CB #171	26.09	268.52	267.94	2.2200	15.000	0.0130	0.51	0 00:05	3.32	0.13	9.63	0.05	0.24	0.00	0.29	Calculated
13	P #216	CB #171	CB #172(DOUBLE)	140.40	267.55	262.03	3.9300	24.000	0.0130	14.34	0 00:06	7.85	0.30	44.85	0.32	0.57	0.00	1.14	Calculated
14	P #217	CB #172(DOUBLE)	CB #173	25.67	261.83	261.11	2.8000	30.000	0.0130	25.66	0 00:05	9.29	0.05	68.66	0.37	0.55	0.00	1.37	Calculated
15	P #218	CB #173	CB #174	49.06	260.77	256.72	8.2600	30.000	0.0130	26.10	0 00:05	14.29	0.06	117.91	0.22	0.40	0.00	1.00	Calculated
16	P #219	CB #174	CB #176	81.56	256.52	251.25	6.4600	30.000	0.0130	26.36	0 00:05	14.85	0.09	104.24	0.25	0.39	0.00	0.98	Calculated
17	P #220	YI #606	CB #168	102.16	270.31	269.80	0.5000	18.000	0.0130	2.11	0 00:05	3.23	0.53	7.43	0.28	0.40	0.00	0.60	Calculated
18	P #221	CB #175	CB #176	37.69	253.31	253.03	0.7400	15.000	0.0130	0.58	0 00:05	2.72	0.23	5.54	0.10	0.23	0.00	0.29	Calculated
19	P #222	CB #176	CB #192	221.47	250.53	245.66	2.2000	30.000	0.0130	27.57	0 00:06	8.70	0.42	60.84	0.45	0.70	0.00	1.74	Calculated
20	P #223	CB #177	CB #178	25.78	281.55	281.43	0.5000	15.000	0.0130	0.70	0 00:05	2.46	0.17	4.57	0.15	0.28	0.00	0.35	Calculated
21	P #224	CB #178	CB #179	65.53	281.23	280.90	0.5000	15.000	0.0130	0.91	0 00:05	2.75	0.40	4.57	0.20	0.32	0.00	0.40	Calculated
22	P #225	CB #179	CB #180	37.57	280.70	280.51	0.5000	15.000	0.0130	1.02	0 00:05	2.74	0.23	4.57	0.22	0.34	0.00	0.43	Calculated
23	P #226	CB #180	CB #182	28.13	280.31	280.17	0.5000	15.000	0.0130	1.12	0 00:06	2.77	0.17	4.57	0.24	0.36	0.00	0.45	Calculated
24	P #227	CB #181	CB #182	42.41	285.50	282.47	7.1400	15.000	0.0130	0.18	0 00:05	4.43	0.16	17.27	0.01	0.07	0.00	0.09	Calculated

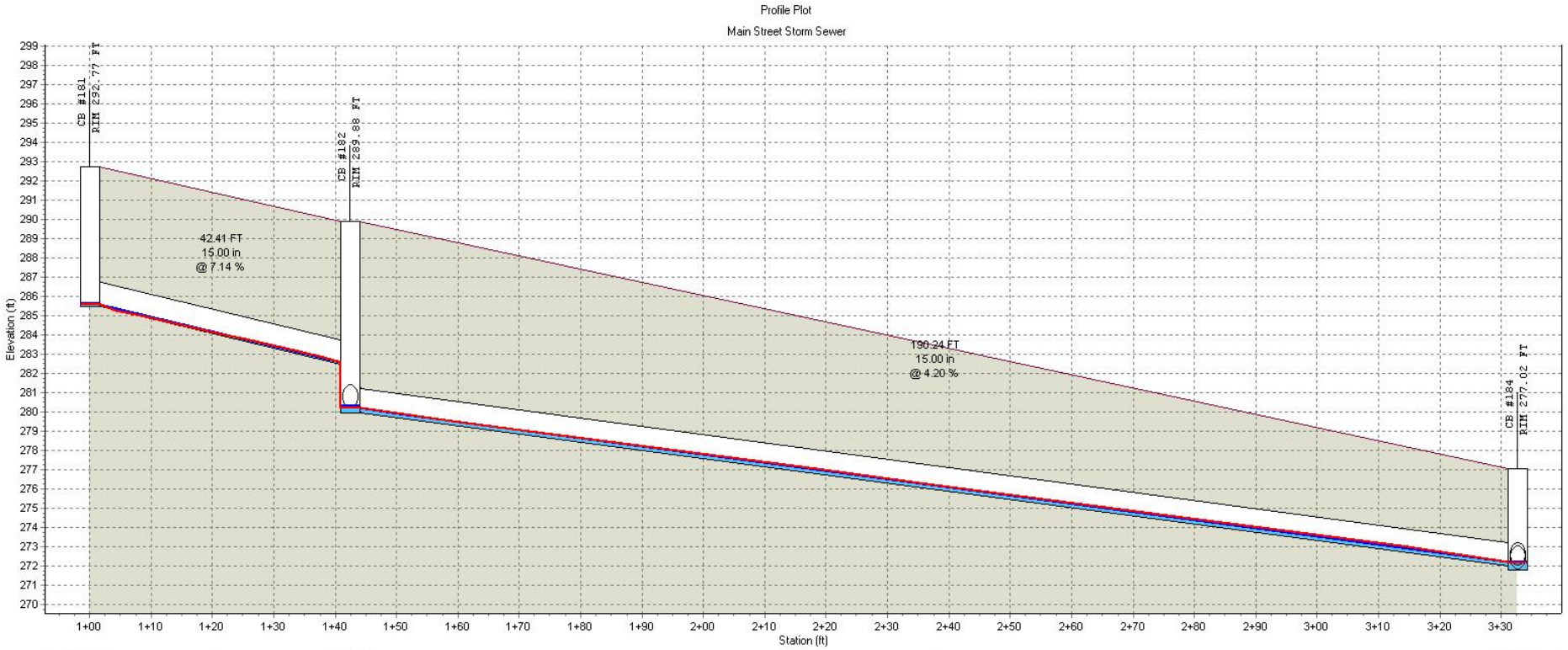
MODEL INPUT										MODEL OUTPUT								
SN	Element ID	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Manning's Roughness	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Max Flow Velocity (ft/sec)	Travel Time (min)	Design Flow Capacity (cfs)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Total Time Surcharged (min)	Max Flow Depth (ft)	Reported Condition
25	P #228	CB #182	CB #184	190.24	279.97	271.97	4.2000	15.000	0.0130	1.40	0 00:06	6.88	0.46	13.24	0.11	0.22	0.00	0.28	Calculated
26	P #229	CB #183	CB #184	25.63	272.10	271.97	0.5000	15.000	0.0130	1.12	0 00:05	2.76	0.15	4.57	0.25	0.37	0.00	0.46	Calculated
27	P #230	CB #184	CB #186	199.91	271.77	256.48	7.6500	15.000	0.0130	3.88	0 00:05	10.63	0.31	17.87	0.22	0.34	0.00	0.42	Calculated
28	P #231	CB #185	CB #186	25.82	258.91	258.78	0.5000	15.000	0.0130	1.21	0 00:05	2.82	0.15	4.57	0.27	0.38	0.00	0.48	Calculated
29	P #232	CB #186	CB #188	144.82	256.28	248.98	5.0400	18.000	0.0130	7.61	0 00:05	11.17	0.22	23.59	0.32	0.41	0.00	0.61	Calculated
30	P #233	CB #187	CB #188	26.65	250.85	249.88	3.6500	15.000	0.0130	0.55	0 00:05	4.68	0.09	12.35	0.04	0.15	0.00	0.19	Calculated
31	P #234	CB #188	CB #189	60.56	248.38	246.86	2.5000	30.000	0.0130	11.57	0 00:05	7.62	0.13	64.98	0.18	0.38	0.00	0.96	Calculated
32	P #235	CB #189	CB #191	66.31	246.66	245.68	1.4800	36.000	0.0130	13.40	0 00:05	5.67	0.19	81.09	0.17	0.59	0.00	1.77	Calculated
33	P #236	CB #190	CB #191	25.73	246.85	246.72	0.5000	24.000	0.0130	0.77	0 00:04	2.11	0.20	16.14	0.05	0.58	0.00	1.15	Calculated
34	P #237	CB #191	CB #192	43.66	245.28	245.06	0.5000	42.000	0.0130	14.97	0 00:05	3.12	0.23	71.09	0.21	0.78	0.00	2.73	Calculated
35	P #238	CB #192	CB #193	37.65	244.86	244.68	0.5000	42.000	0.0130	42.33	0 00:06	5.15	0.12	71.09	0.60	0.81	0.00	2.83	Calculated
36	P #239	CB #193	YI #607	50.50	244.48	244.23	0.5000	42.000	0.0130	42.85	0 00:06	5.71	0.15	71.35	0.60	0.74	0.00	2.60	Calculated
37	P #240	YI #607	YI #608	98.01	244.03	243.54	0.5000	42.000	0.0130	42.91	0 00:06	6.42	0.25	71.43	0.60	0.66	0.00	2.31	Calculated
38	P #241	YI #608	CB #201	105.79	243.34	242.30	0.9800	42.000	0.0130	43.08	0 00:07	6.77	0.26	99.63	0.43	0.65	0.00	2.29	Calculated
39	P #242	CB #194	CB #195	53.21	255.95	252.75	6.0200	15.000	0.0130	0.85	0 00:05	6.56	0.14	15.85	0.05	0.16	0.00	0.20	Calculated
40	P #243	CB #195	CB #197	55.73	252.55	248.23	7.7600	15.000	0.0130	1.94	0 00:05	8.71	0.11	17.99	0.11	0.24	0.00	0.30	Calculated
41	P #244	CB #196	CB #197	26.08	249.07	248.93	0.5000	15.000	0.0130	0.55	0 00:05	2.31	0.19	4.57	0.12	0.25	0.00	0.31	Calculated
42	P #245	CB #197	CB #199	136.75	248.03	245.93	1.5300	18.000	0.0130	2.90	0 00:05	4.50	0.51	12.99	0.22	0.39	0.00	0.59	Calculated
43	P #246	CB #198	CB #199	31.19	246.61	245.93	2.1700	15.000	0.0130	0.42	0 00:05	2.47	0.21	9.52	0.04	0.35	0.00	0.43	Calculated
44	P #247	CB #199	CB #200	101.24	245.73	245.03	0.7000	18.000	0.0130	4.71	0 00:05	4.66	0.36	8.77	0.54	0.56	0.00	0.84	Calculated
45	P #248	CB #200	CB #201	84.98	244.83	243.70	1.3300	18.000	0.0130	6.30	0 00:06	6.20	0.23	12.10	0.52	0.59	0.00	0.88	Calculated
46	P #249	CB #201	SDMH #505	73.06	242.10	241.16	1.3000	42.000	0.0130	50.21	0 00:07	6.89	0.18	114.52	0.44	0.72	0.00	2.51	Calculated
47	P #250	SDMH #505	FES#310	191.19	240.96	240.00	0.5000	42.000	0.0130	50.33	0 00:07	7.07	0.45	71.14	0.71	0.70	0.00	2.43	Calculated
48	P #305	CB #106	CB #160	95.54	268.00	264.36	3.8000	18.000	0.0130	4.24	0 00:05	8.50	0.19	20.49	0.21	0.33	0.00	0.49	Calculated



	CB #177	CB #178	CB #179	CB #180	CB #182
RIM (FT):	285.94	285.94	289.74	289.80	289.88
Invert (ft):	281.55	281.23	280.70	280.31	279.97
Min Pipe Cover (ft):					
Max HGL (ft):	281.94	281.64	281.16	280.80	280.25

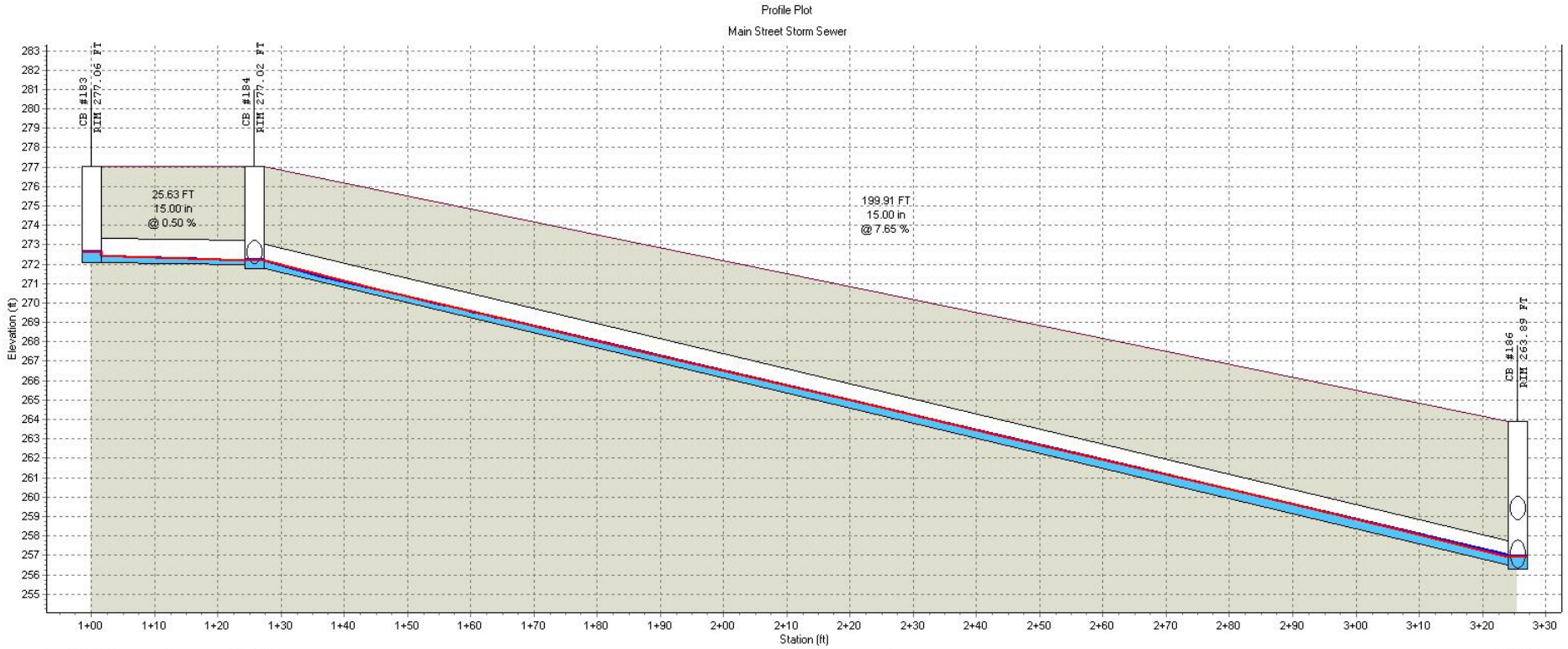
Link ID:	P #223	P #224	P #225	P #226
(FT):	25.78	65.53	37.57	28.13
(in):	15.00	15.00	15.00	15.00
@ (%):	0.50	0.50	0.50	0.50
Up Invert (ft):	281.55	281.23	280.70	280.31
Dn Invert (ft):	281.43	280.90	280.51	280.17
Max Q (cfs):	0.70	0.91	1.02	1.12
Max Vel (ft/s):	2.46	2.75	2.74	2.77
Max Depth (ft):	0.35	0.40	0.43	0.45

HGL



	CB #181		CB #182		CB #184
RIM (FT):	292.77		289.88		277.02
Invert (ft):	285.50		279.97		271.77
Min Pipe Cover (ft):					
Max HGL (ft):	285.59		280.25		272.17
Link ID:		P #227		P #228	
(FT):		42.41		190.24	
(in):		15.00		15.00	
@ (%):		7.14		4.20	
Up Invert (ft):		285.50		279.97	
Dn Invert (ft):		282.47		271.97	
Max Q (cfs):		0.18		1.40	
Max Vel (ft/s):		4.43		6.88	
Max Depth (ft):		0.09		0.28	

HGL

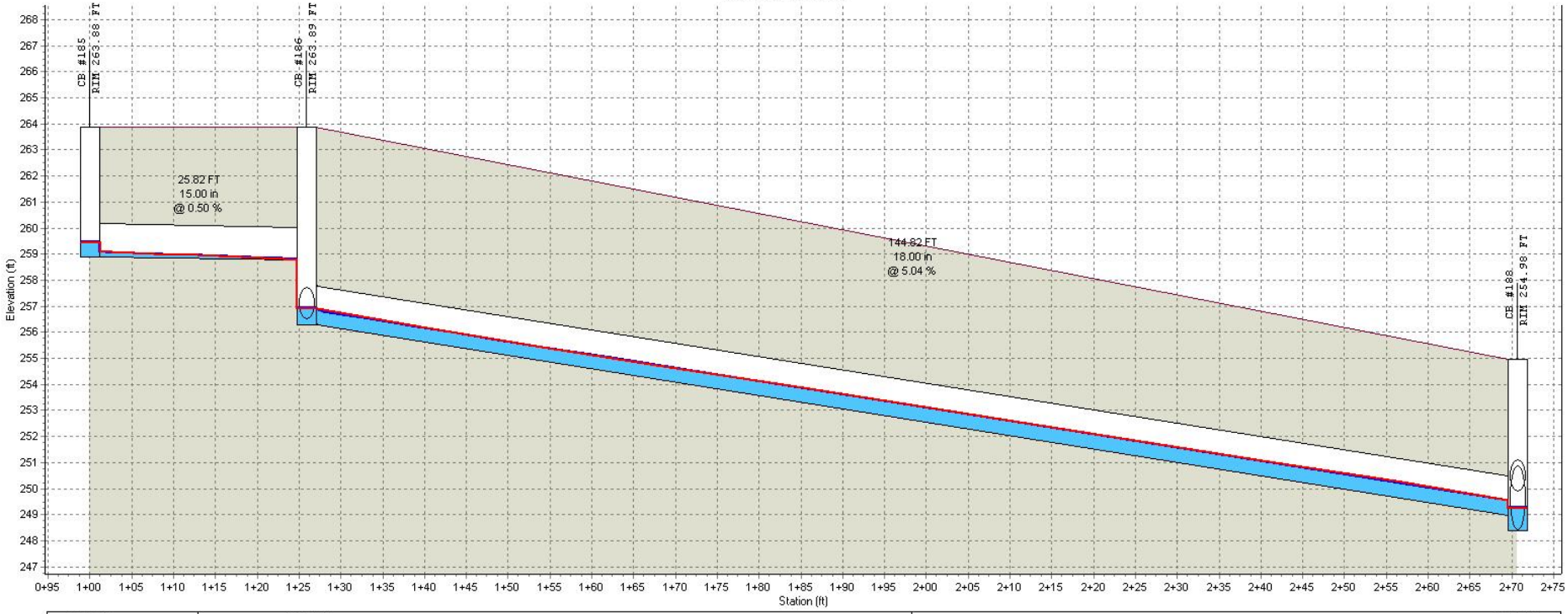


	CB #183	CB #184	CB #186
RIM (FT):	277.06	277.02	263.89
Invert (ft):	272.10	271.77	256.28
Min Pipe Cover (ft):			
Max HGL (ft):	272.60	272.17	256.92

Link ID:	P #229	P #230
(FT):	25.63	199.91
(in):	15.00	15.00
@ (%):	0.50	7.65
Up Invert (ft):	272.10	271.77
Dn Invert (ft):	271.97	256.48
Max Q (cfs):	1.12	3.88
Max Vel (ft/s):	2.76	10.63
Max Depth (ft):	0.46	0.42

Profile Plot

Main Street Storm Sewer



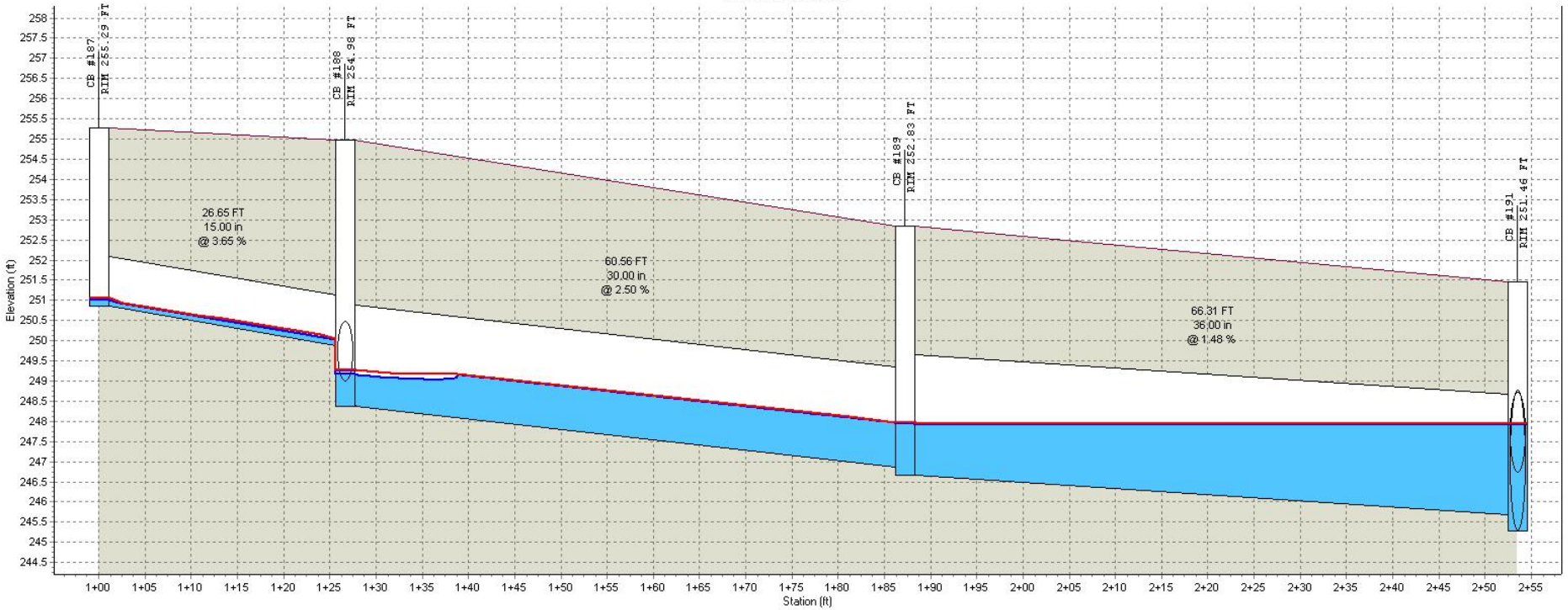
:	CB #185	CB #186	CB #188
RIM (FT):	263.88	263.89	254.98
Invert (ft):	258.91	256.28	248.38
Min Pipe Cover (ft):			
Max HGL (ft):	259.43	256.92	249.27

Link ID:	P #231	P #232
(FT):	25.82	144.82
(in):	15.00	18.00
@ (%):	0.50	5.04
Up Invert (ft):	258.91	256.28
Dn Invert (ft):	258.78	248.98
Max Q (cfs):	1.21	7.61
Max Vel (ft/s):	2.82	11.17
Max Depth (ft):	0.48	0.61

HGL

Profile Plot

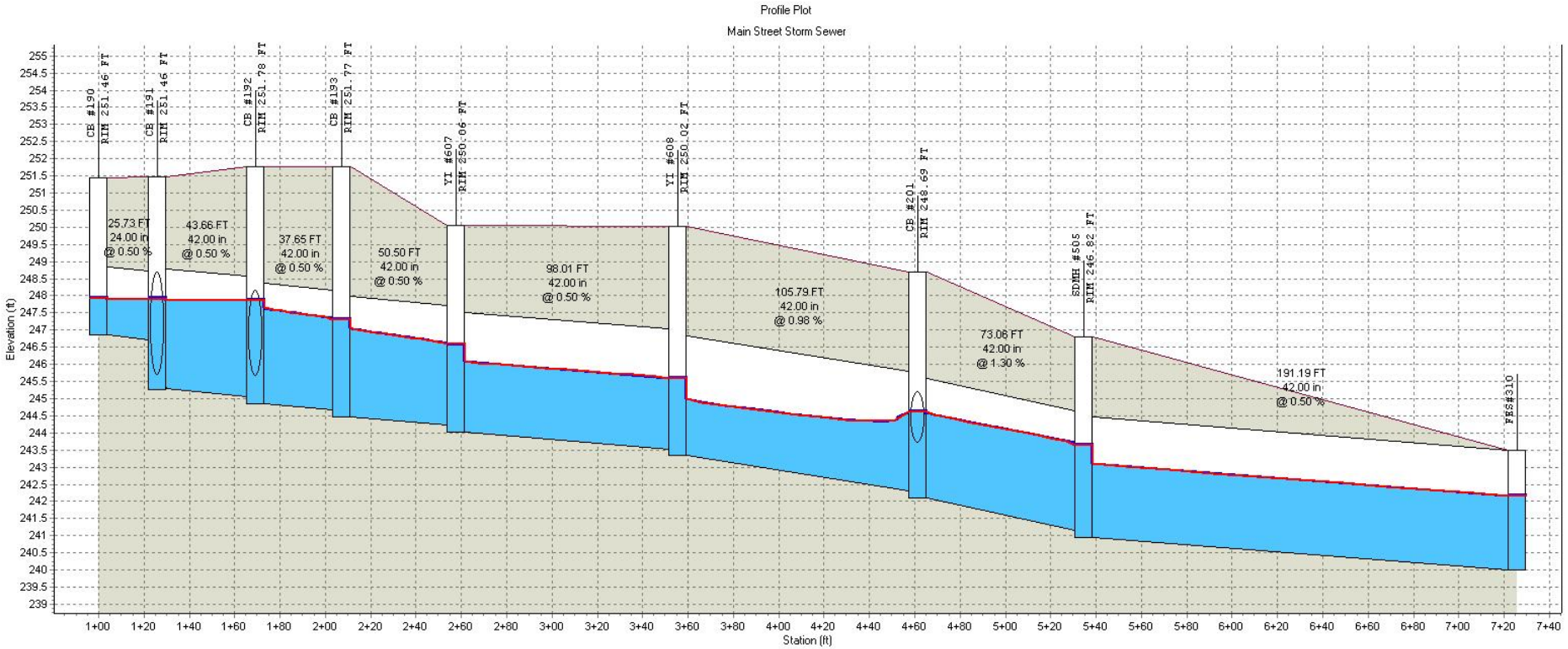
Main Street Storm Sewer



	CB #187	CB #188	CB #189	CB #191
RIM (FT):	255.29	254.98	252.83	251.46
Invert (ft):	250.85	248.38	246.66	245.28
Min Pipe Cover (ft):				
Max HGL (ft):	251.05	249.27	247.96	247.93

Link ID:	P #233	P #234	P #235
(FT):	26.65	60.56	66.31
(in):	15.00	30.00	36.00
@ (%):	3.65	2.50	1.48
Up Invert (ft):	250.85	248.38	246.66
Dn Invert (ft):	249.88	246.86	245.68
Max Q (cfs):	0.55	11.57	13.40
Max Vel (ft/s):	4.68	7.62	5.67
Max Depth (ft):	0.19	0.96	1.77

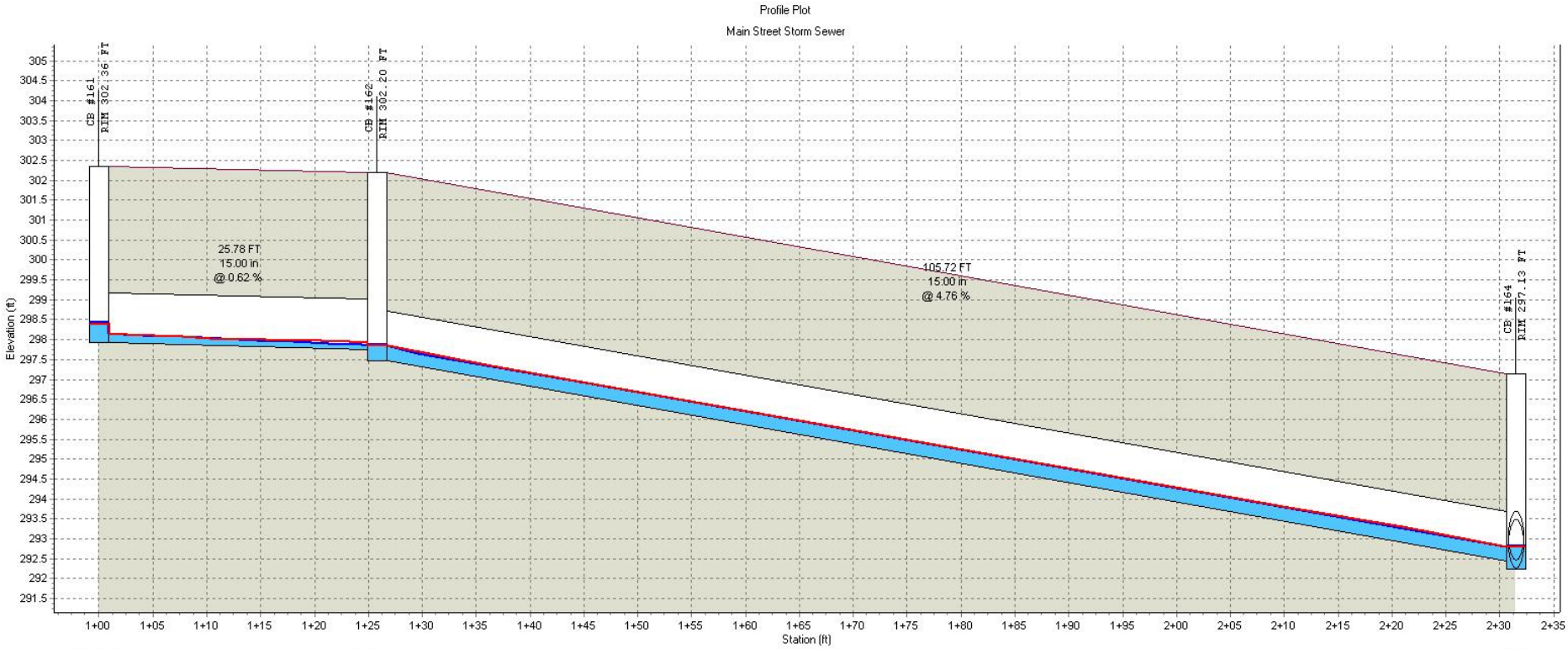
HGL



:	CB #190	CB #191	CB #192	CB #193	YI #607	YI #608	CB #201	SDMH #505	FES#310
RIM (FT):	251.46	251.46	251.78	251.77	250.06	250.02	248.69	246.82	
Invert (ft):	246.85	245.28	244.86	244.48	244.03	243.34	242.10	240.96	240.00
Min Pipe Cover (ft):								2.16	
Max HGL (ft):	247.95	247.93	247.88	247.31	246.59	245.60	244.62	243.65	242.17

Link ID:	P #236	P #237	P #238	P #239	P #240	P #241	P #249	P #250
(FT):	25.73	43.66	37.65	50.50	98.01	105.79	73.06	191.19
(in):	24.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00
@ (%):	0.50	0.50	0.50	0.50	0.50	0.98	1.30	0.50
Up Invert (ft):	246.85	245.28	244.86	244.48	244.03	243.34	242.10	240.96
Dn Invert (ft):	246.72	245.06	244.68	244.23	243.54	242.30	241.16	240.00
Max Q (cfs):	0.77	14.97	42.33	42.85	42.91	43.08	50.21	50.33
Max Vel (ft/s):	2.11	3.12	5.15	5.71	6.42	6.77	6.89	7.07
Max Depth (ft):	1.15	2.73	2.83	2.60	2.31	2.29	2.51	2.43

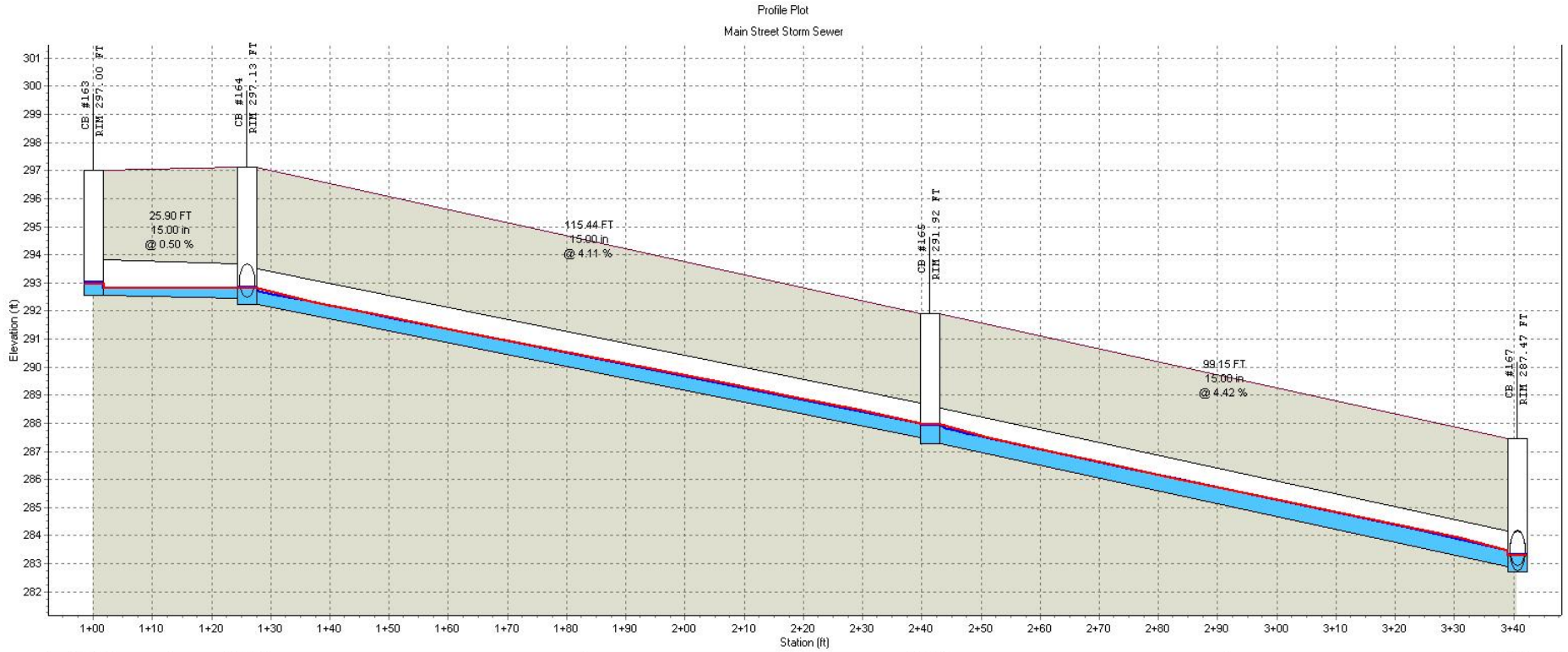
HGL



:	CB #161	CB #162	CB #164
RIM (FT):	302.36	302.20	297.13
Invert (ft):	297.92	297.47	292.24
Min Pipe Cover (ft):			
Max HGL (ft):	298.41	297.87	292.81

Link ID:	P #206	P #207
(FT):	25.78	105.72
(in):	15.00	15.00
@ (%):	0.62	4.76
Up Invert (ft):	297.92	297.47
Dn Invert (ft):	297.76	292.44
Max Q (cfs):	1.19	2.67
Max Vel (ft/s):	3.00	8.34
Max Depth (ft):	0.45	0.38

HGL

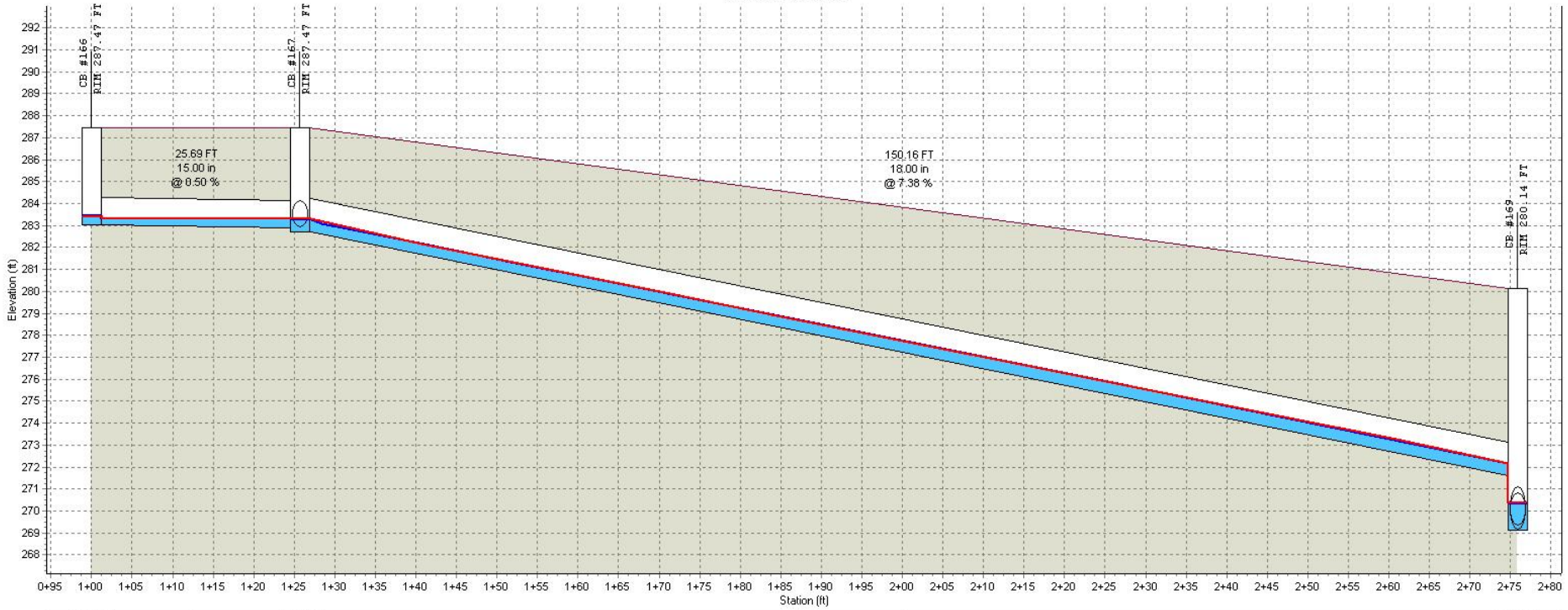


	CB #163	CB #164	CB #165	CB #167
RIM (FT):	297.00	297.13	291.92	287.47
Invert (ft):	292.57	292.24	287.29	282.71
Min Pipe Cover (ft):				
Max HGL (ft):	292.99	292.81	287.95	283.29

Link ID:	P #208	P #209	P #210
(FT):	25.90	115.44	99.15
(in):	15.00	15.00	15.00
@ (%):	0.50	4.11	4.42
Up Invert (ft):	292.57	292.24	287.29
Dn Invert (ft):	292.44	287.49	282.91
Max Q (cfs):	0.83	4.76	6.00
Max Vel (ft/s):	2.46	9.21	9.85
Max Depth (ft):	0.40	0.55	0.62

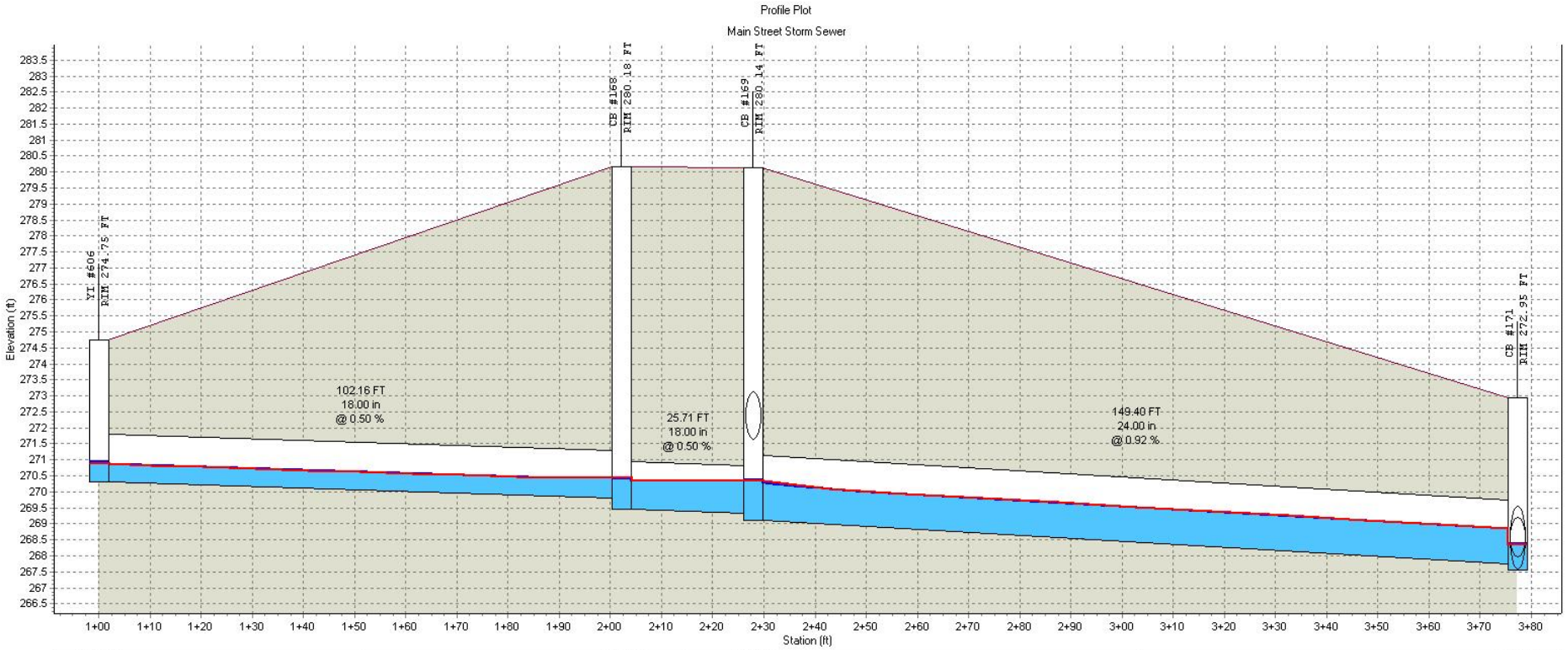
Profile Plot

Main Street Storm Sewer



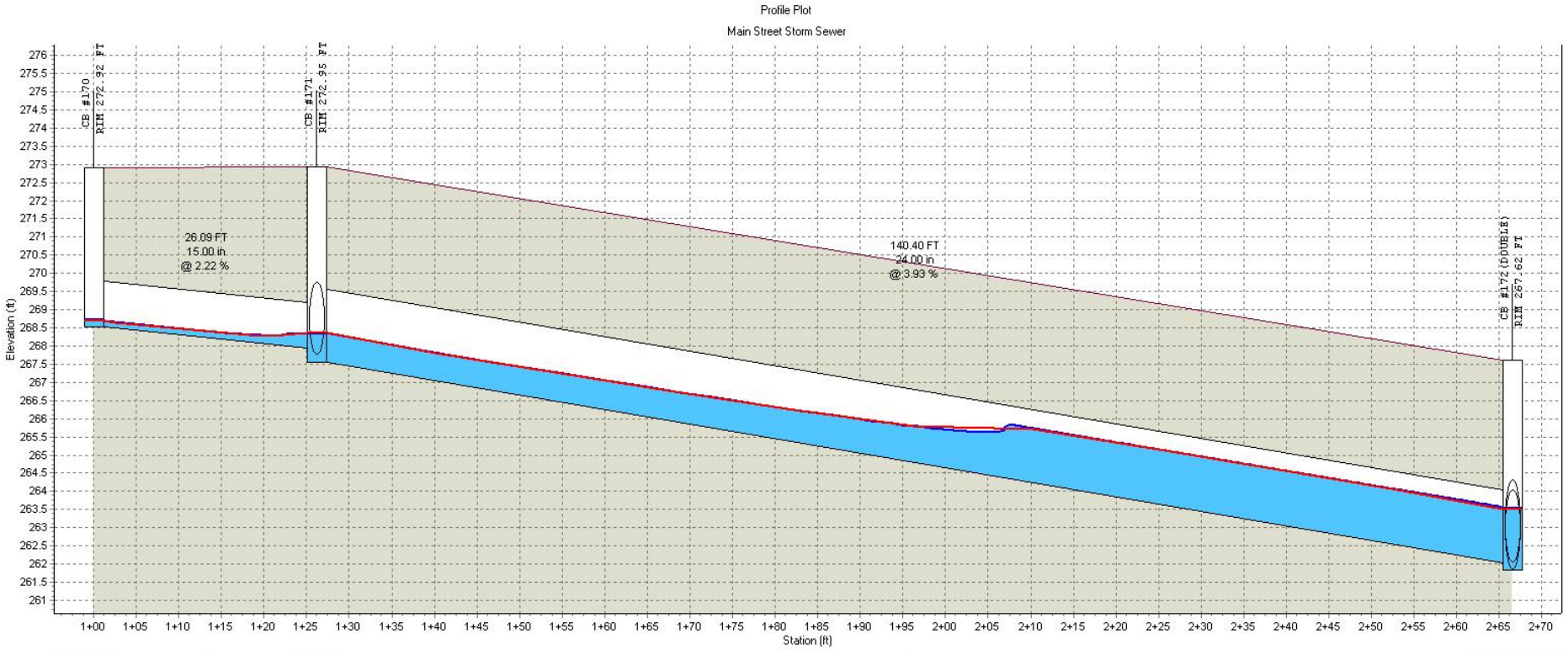
	CB #166		CB #167		CB #169
RIM (FT):	287.47		287.47		280.14
Invert (ft):	283.04		282.71		269.12
Min Pipe Cover (ft):					
Max HGL (ft):	283.40		283.29		270.35
Link ID:		P #211		P #212	
(FT):		25.69		150.16	
(in):		15.00		18.00	
@ (%):		0.50		7.38	
Up Invert (ft):		283.04		282.71	
Dn Invert (ft):		282.91		271.62	
Max Q (cfs):		0.61		7.84	
Max Vel (ft/s):		2.11		13.03	
Max Depth (ft):		0.37		0.56	

HGL



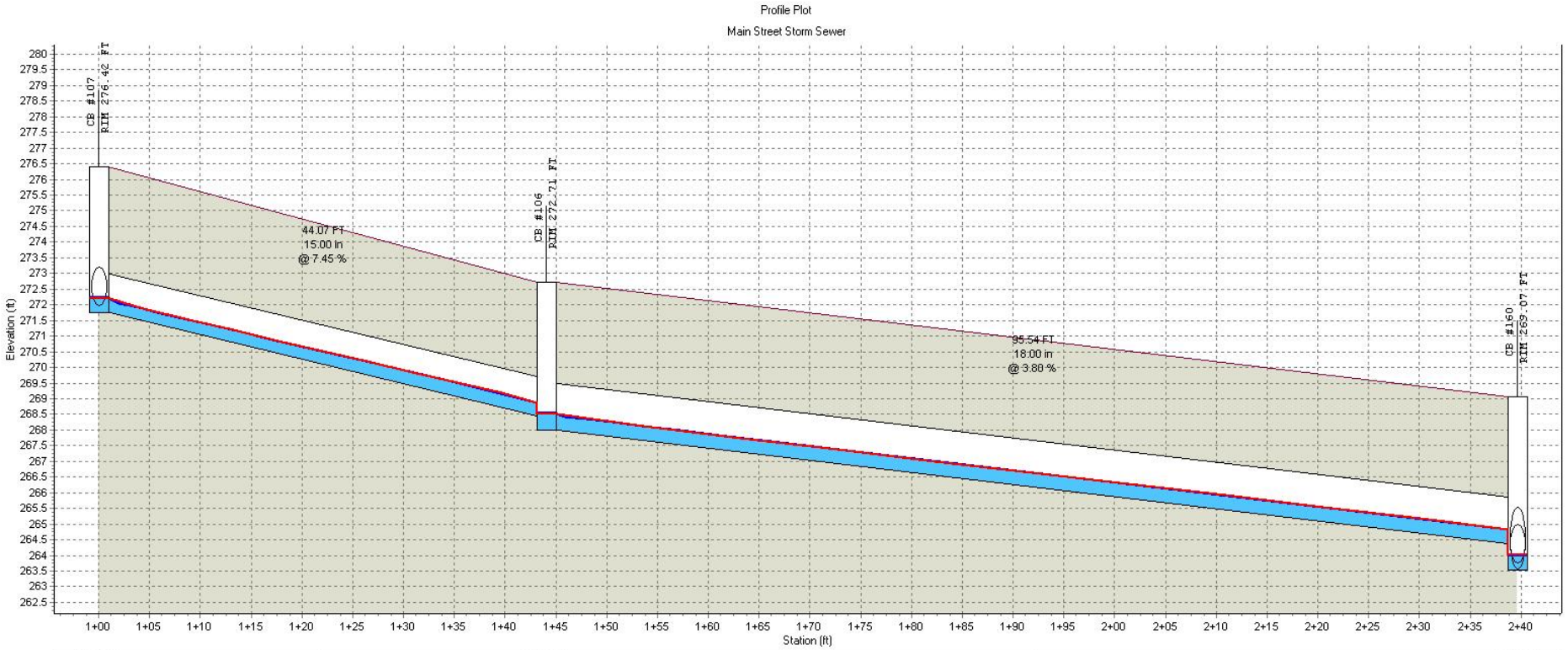
	YI #606		CB #168	CB #169		CB #171
RIM (FT):	274.75		280.18	280.14		272.95
Invert (ft):	270.31		269.45	269.12		267.55
Min Pipe Cover (ft):						
Max HGL (ft):	270.92		270.43	270.35		268.35
Link ID:		P #220	P #213		P #214	
(FT):		102.16	25.71		149.40	
(in):		18.00	18.00		24.00	
@ (%):		0.50	0.50		0.92	
Up Invert (ft):		270.31	269.45		269.12	
Dn Invert (ft):		269.80	269.32		267.75	
Max Q (cfs):		2.11	2.53		11.97	
Max Vel (ft/s):		3.23	2.36		6.45	
Max Depth (ft):		0.60	1.00		1.15	

HGL



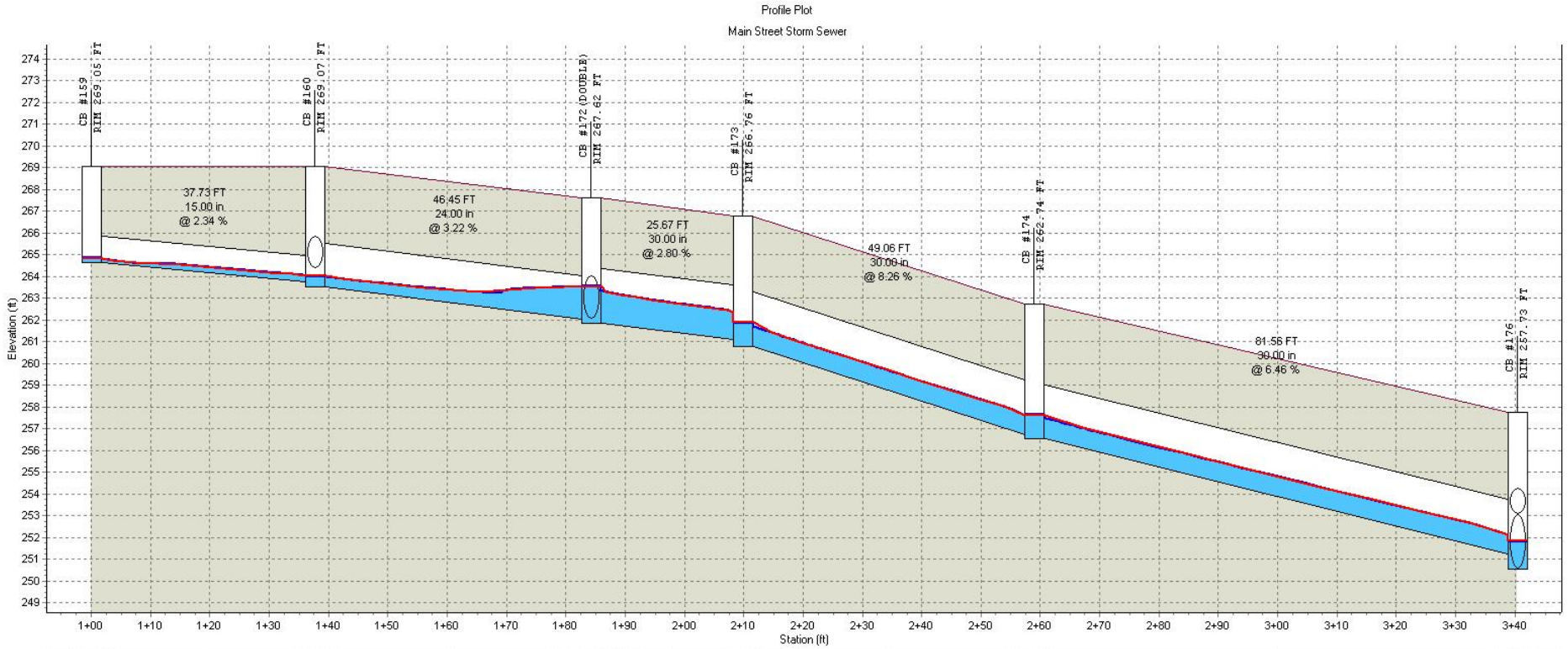
:	CB #170	CB #171	CB #172(DOUBLE)
RIM (FT):	272.92	272.95	267.62
Invert (ft):	268.52	267.55	261.83
Min Pipe Cover (ft):			
Max HGL (ft):	268.72	268.35	263.52

Link ID:	P #215	P #216
(FT):	26.09	140.40
(in):	15.00	24.00
@ (%):	2.22	3.93
Up Invert (ft):	268.52	267.55
Dn Invert (ft):	267.94	262.03
Max Q (cfs):	0.51	14.34
Max Vel (ft/s):	3.32	7.85
Max Depth (ft):	0.29	1.14



:	CB #107	CB #106	CB #160
RIM (FT):	276.42	272.71	269.07
Invert (ft):	271.74	268.00	263.53
Min Pipe Cover (ft):			
Max HGL (ft):	272.22	268.51	264.01

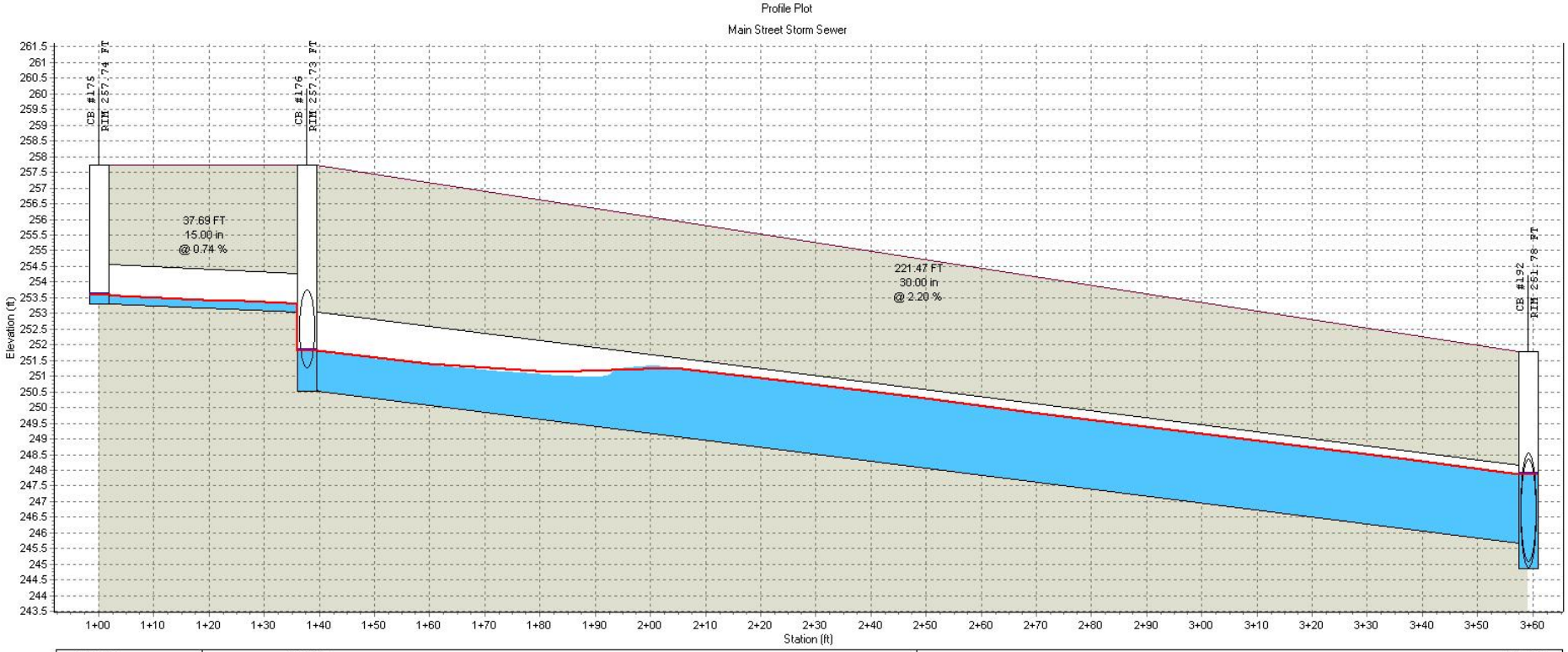
Link ID:	P #304	P #305
(FT):	44.07	95.54
(in):	15.00	18.00
@ (%):	7.45	3.80
Up Invert (ft):	271.74	268.00
Dn Invert (ft):	268.46	264.36
Max Q (cfs):	3.90	4.24
Max Vel (ft/s):	10.18	8.50
Max Depth (ft):	0.44	0.49



	CB #159	CB #160	CB #172(DOUBLE)	CB #173	CB #174	CB #176
RIM (FT):	269.05	269.07	267.62	266.76	262.74	257.73
Invert (ft):	264.61	263.53	261.83	260.77	256.52	250.53
Min Pipe Cover (ft):						
Max HGL (ft):	264.82	264.01	263.52	261.87	257.61	251.82

Link ID:	P #204	P #205	P #217	P #218	P #219
(FT):	37.73	46.45	25.67	49.06	81.56
(in):	15.00	24.00	30.00	30.00	30.00
@ (%):	2.34	3.22	2.80	8.26	6.46
Up Invert (ft):	264.61	263.53	261.83	260.77	256.52
Dn Invert (ft):	263.73	262.03	261.11	256.72	251.25
Max Q (cfs):	0.53	5.17	25.66	26.10	26.36
Max Vel (ft/s):	3.46	3.88	9.29	14.29	14.85
Max Depth (ft):	0.24	0.98	1.37	1.00	0.98

HGL

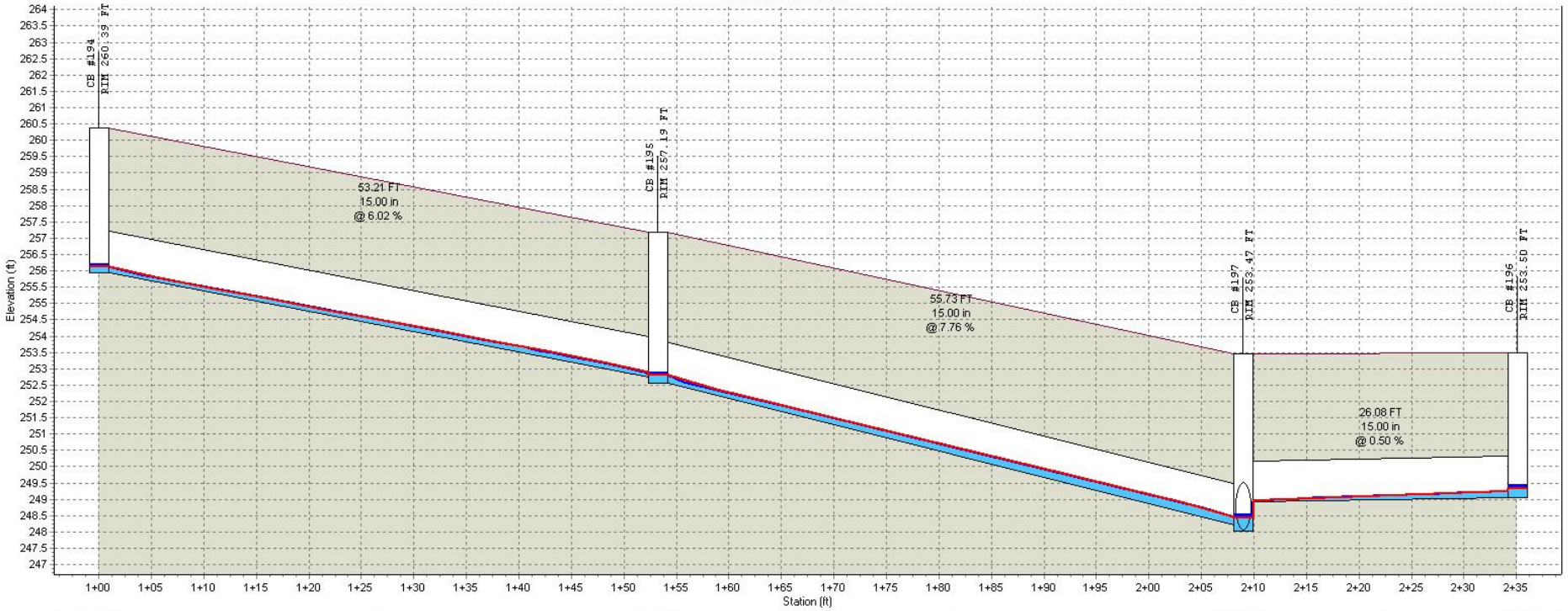


:	CB #175	CB #176	CB #192
RIM (FT):	257.74	257.73	251.78
Invert (ft):	253.31	250.53	244.86
Min Pipe Cover (ft):			
Max HGL (ft):	253.61	251.82	247.88

Link ID:	P #221	P #222
(FT):	37.69	221.47
(in):	15.00	30.00
@ (%):	0.74	2.20
Up Invert (ft):	253.31	250.53
Dn Invert (ft):	253.03	245.66
Max Q (cfs):	0.58	27.57
Max Vel (ft/s):	2.72	8.70
Max Depth (ft):	0.29	1.74

Profile Plot

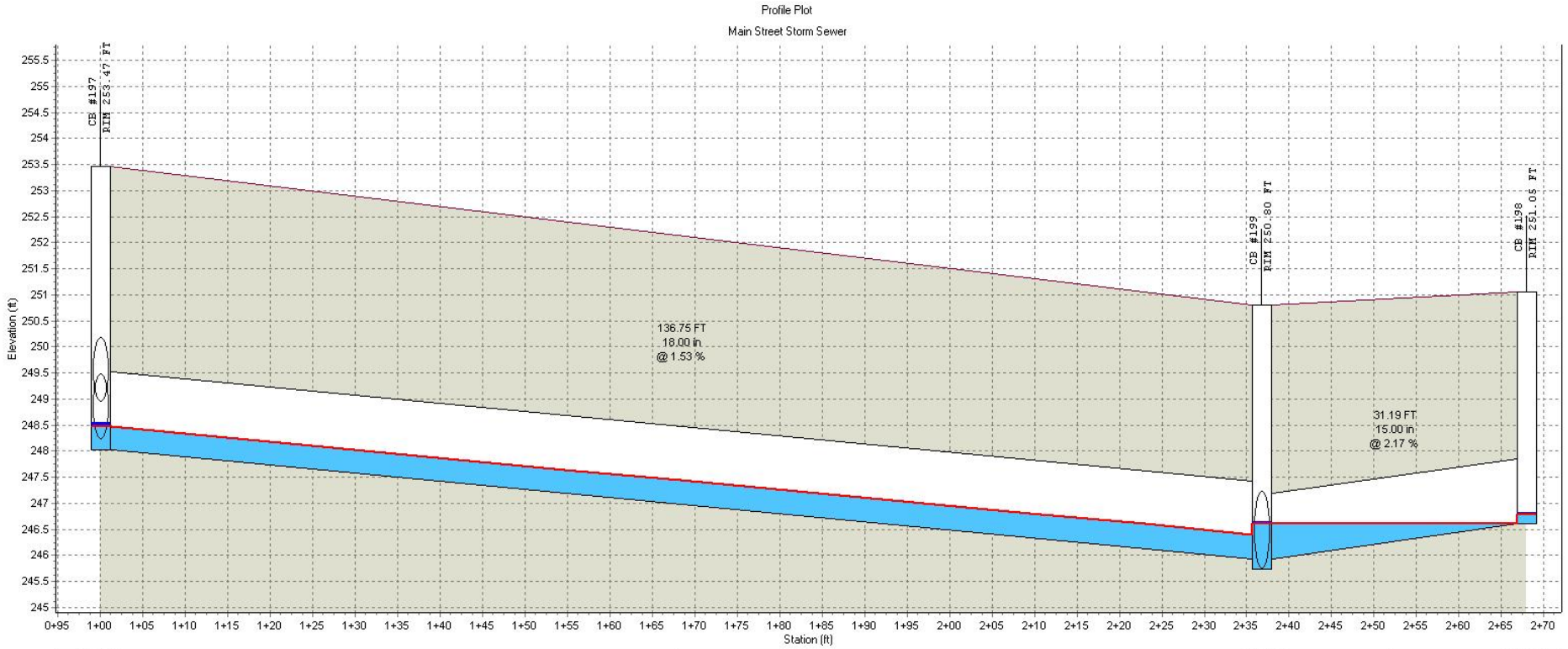
Main Street Storm Sewer



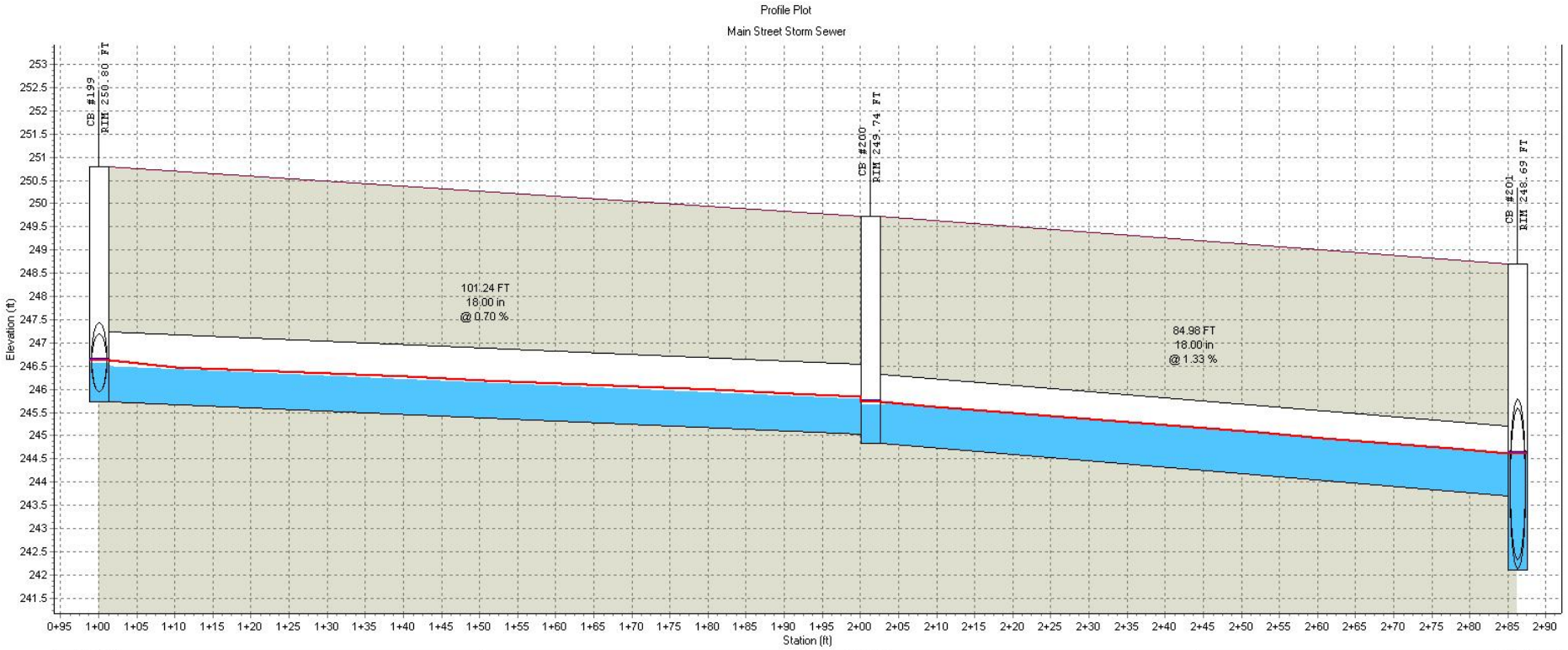
:	CB #194	CB #195	CB #197	CB #196
RIM (FT):	260.39	257.19	253.47	253.50
Invert (ft):	255.95	252.55	248.03	249.07
Min Pipe Cover (ft):				
Max HGL (ft):	256.16	252.85	248.52	249.40

Link ID:	P #242	P #243	P #244
(FT):	53.21	55.73	26.08
(in):	15.00	15.00	15.00
@ (%):	6.02	7.76	0.50
Up Invert (ft):	255.95	252.55	249.07
Dn Invert (ft):	252.75	248.23	248.93
Max Q (cfs):	0.85	1.94	0.55
Max Vel (ft/s):	6.56	8.71	2.31
Max Depth (ft):	0.20	0.30	0.31

HGL



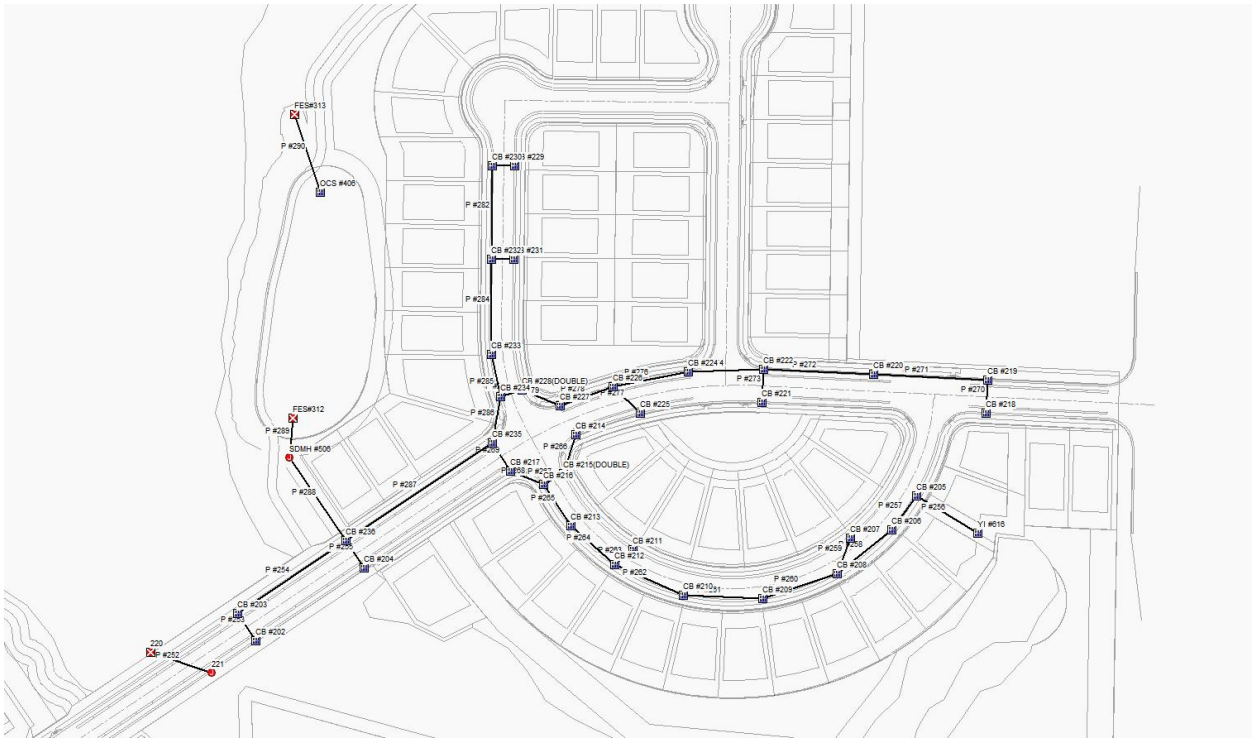
:	CB #197		CB #199	CB #198
RIM (FT):	253.47		250.80	251.05
Invert (ft):	248.03		245.73	246.61
Min Pipe Cover (ft):				
Max HGL (ft):	248.52		246.63	246.79
Link ID:		P #245	P #246	
(FT):		136.75	31.19	
(in):		18.00	15.00	
@ (%):		1.53	2.17	
Up Invert (ft):		248.03	246.61	
Dn Invert (ft):		245.93	245.93	
Max Q (cfs):		2.90	0.42	
Max Vel (ft/s):		4.50	2.47	
Max Depth (ft):		0.59	0.43	



:	CB #199		CB #200		CB #201
RIM (FT):	250.80		249.74		248.69
Invert (ft):	245.73		244.83		242.10
Min Pipe Cover (ft):					
Max HGL (ft):	246.63		245.74		244.62
Link ID:		P #247		P #248	
(FT):		101.24		84.98	
(in):		18.00		18.00	
@ (%):		0.70		1.33	
Up Invert (ft):		245.73		244.83	
Dn Invert (ft):		245.03		243.70	
Max Q (cfs):		4.71		6.30	
Max Vel (ft/s):		4.66		6.20	
Max Depth (ft):		0.84		0.88	

S T O R M W A T E R AREA “ D ”

STORMWATER PIPING AND HYDRAULIC GRADE LINE FOR 10-YR STORM

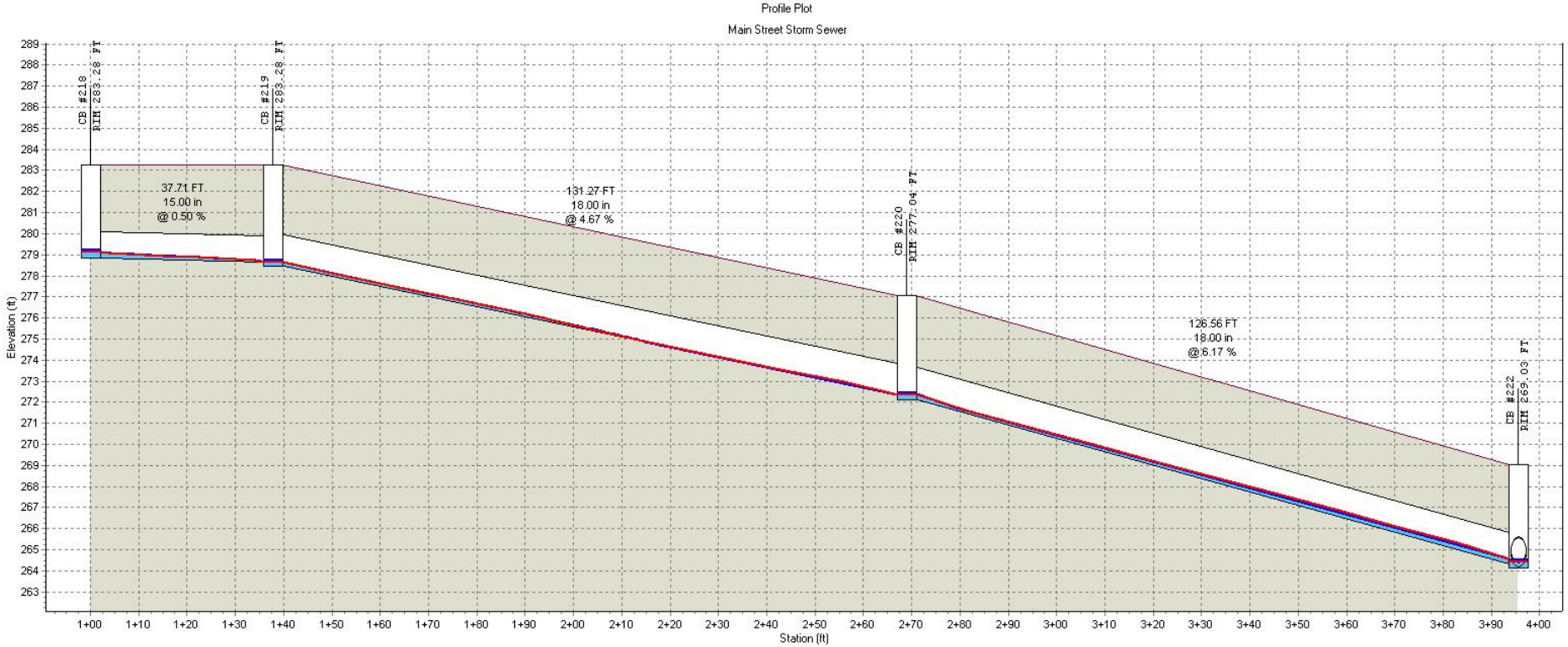


PLAN VIEW

DRAINAGE AREA

SN	Element ID	Area (acres)	Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
1	Sub-CB#202	0.22	CB #202	0.8300	0.60	0.50	1.32	7.210	0 00:05:00
2	Sub-CB#203	0.37	CB #203	0.7100	0.60	0.43	1.89	7.210	0 00:05:00
3	Sub-CB#204	0.22	CB #204	0.5900	0.60	0.35	0.94	7.210	0 00:05:00
4	Sub-CB#205	0.10	CB #205	0.8700	0.60	0.52	0.63	7.210	0 00:05:00
5	Sub-CB#206	0.05	CB #206	0.8700	0.60	0.52	0.31	7.210	0 00:05:00
6	Sub-CB#207	0.12	CB #207	0.8700	0.60	0.52	0.75	7.210	0 00:05:00
7	Sub-CB#208	0.08	CB #208	0.8700	0.60	0.52	0.50	7.210	0 00:05:00
8	Sub-CB#209	0.09	CB #209	0.8700	0.60	0.52	0.57	7.210	0 00:05:00
9	Sub-CB#210	0.07	CB #210	0.8700	0.60	0.52	0.44	7.210	0 00:05:00
10	Sub-CB#211	0.43	CB #211	0.6300	0.60	0.38	1.95	7.210	0 00:05:00
11	Sub-CB#212	0.11	CB #212	0.8700	0.60	0.52	0.69	7.210	0 00:05:00
12	Sub-CB#213	0.04	CB #213	0.8700	0.60	0.52	0.25	7.210	0 00:05:00
13	Sub-CB#214	0.05	CB #214	0.8300	0.60	0.50	0.30	7.210	0 00:05:00
14	Sub-CB#215	1.02	CB #215(DOUBLE)	0.6100	0.60	0.37	4.49	7.210	0 00:05:00
15	Sub-CB#216	0.03	CB #216	0.8700	0.60	0.52	0.19	7.210	0 00:05:00
16	Sub-CB#217	0.04	CB #217	0.8300	0.60	0.50	0.24	7.210	0 00:05:00
17	Sub-CB#218	0.10	CB #218	0.8700	0.60	0.52	0.63	7.210	0 00:05:00
18	Sub-CB#219	0.10	CB #219	0.7900	0.60	0.48	0.57	7.210	0 00:05:00
19	Sub-CB#220	0.09	CB #220	0.8300	0.60	0.50	0.54	7.210	0 00:05:00
20	Sub-CB#221	0.11	CB #221	0.8300	0.60	0.50	0.66	7.210	0 00:05:00
21	Sub-CB#222	0.09	CB #222	0.8300	0.60	0.50	0.54	7.210	0 00:05:00
22	Sub-CB#224	0.04	CB #224	0.7100	0.60	0.43	0.21	7.210	0 00:05:00
23	Sub-CB#225	0.11	CB #225	0.8300	0.60	0.50	0.66	7.210	0 00:05:00
24	Sub-CB#226	0.10	CB #226	0.7100	0.60	0.43	0.51	7.210	0 00:05:00
25	Sub-CB#227	0.05	CB #227	0.8300	0.60	0.50	0.30	7.210	0 00:05:00
26	Sub-CB#228	0.81	CB #228(DOUBLE)	0.6100	0.60	0.37	3.56	7.210	0 00:05:00
27	Sub-CB#229	0.23	CB #229	0.6300	0.60	0.38	1.05	7.210	0 00:05:00
28	Sub-CB#230	0.21	CB #230	0.8700	0.60	0.52	1.32	7.210	0 00:05:00
29	Sub-CB#231	0.50	CB #231	0.7300	0.60	0.44	2.63	7.210	0 00:05:00
30	Sub-CB#232	0.06	CB #232	0.8700	0.60	0.52	0.38	7.210	0 00:05:00
31	Sub-CB#233	0.06	CB #233	0.8700	0.60	0.52	0.38	7.210	0 00:05:00
32	Sub-CB#234	0.03	CB #234	0.8700	0.60	0.52	0.19	7.210	0 00:05:00
33	Sub-CB#235	0.05	CB #235	0.8300	0.60	0.50	0.30	7.210	0 00:05:00
34	Sub-CB#236	0.14	CB #236	0.8700	0.60	0.52	0.88	7.210	0 00:05:00
35	Sub-YI#616	0.08	YI #616	0.3500	0.60	0.21	0.20	7.210	0 00:05:00

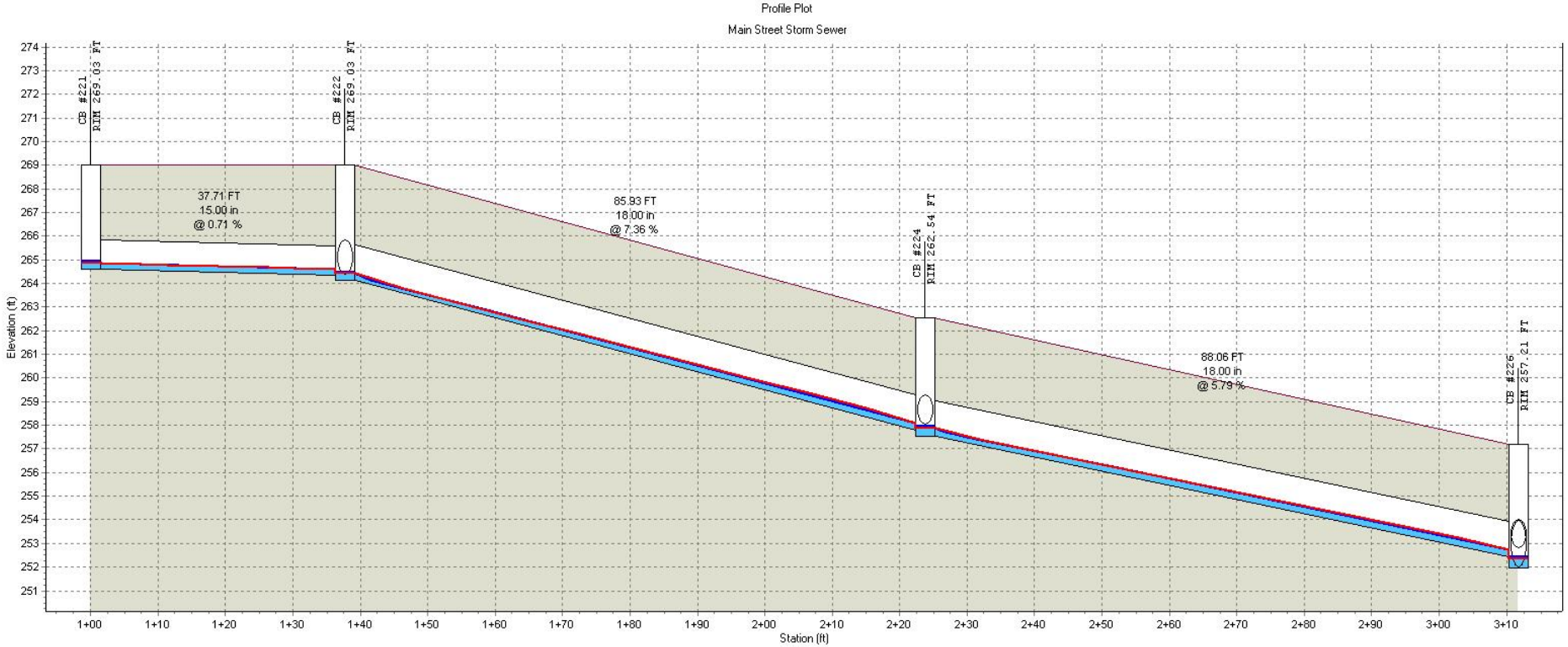
MODEL INPUT									MODEL OUTPUT									
SN	Element ID	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Manning's Roughness	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Max Flow Velocity (ft/sec)	Travel Time (min)	Design Flow Capacity (cfs)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Total Time Surcharged (min)	Max Flow Depth (ft)	Reported Condition
1	P #253	CB #202	CB #203	37.70	242.68	242.49	0.5000	15.000	0.0130	1.41	0 00:05	2.96	0.21	4.57	0.31	0.52	0.00	0.64	Calculated
2	P #254	CB #203	CB #236	149.95	242.29	241.54	0.5000	24.000	0.0130	3.02	0 00:07	2.44	1.02	16.00	0.19	0.63	0.00	1.25	Calculated
3	P #255	CB #204	CB #236	37.73	242.24	241.97	0.7000	18.000	0.0130	0.76	0 00:05	2.56	0.25	8.89	0.09	0.70	0.00	1.05	Calculated
4	P #256	YI #616	CB #205	82.25	268.07	267.66	0.5000	15.000	0.0130	0.20	0 00:05	1.75	0.78	4.57	0.04	0.15	0.00	0.18	Calculated
5	P #257	CB #205	CB #206	47.34	267.46	267.22	0.5000	15.000	0.0130	0.77	0 00:05	2.59	0.30	4.57	0.17	0.29	0.00	0.36	Calculated
6	P #258	CB #206	CB #208	80.82	267.02	263.61	4.2300	15.000	0.0130	1.06	0 00:05	6.22	0.22	13.28	0.08	0.20	0.00	0.24	Calculated
7	P #259	CB #207	CB #208	43.45	265.56	263.61	4.4900	15.000	0.0130	0.73	0 00:05	5.60	0.13	13.69	0.05	0.16	0.00	0.20	Calculated
8	P #260	CB #208	CB #209	90.48	263.41	258.84	5.0500	15.000	0.0130	2.23	0 00:05	8.14	0.19	14.52	0.15	0.28	0.00	0.34	Calculated
9	P #261	CB #209	CB #210	90.74	258.57	253.61	5.4700	18.000	0.0130	2.75	0 00:05	8.70	0.17	24.56	0.11	0.24	0.00	0.35	Calculated
10	P #262	CB #210	CB #212	86.86	253.41	250.12	3.7800	18.000	0.0130	3.16	0 00:05	5.80	0.25	20.43	0.15	0.35	0.00	0.52	Calculated
11	P #263	CB #211	CB #212	27.12	250.74	250.50	0.9000	15.000	0.0130	1.46	0 00:05	3.61	0.13	6.13	0.24	0.36	0.00	0.45	Calculated
12	P #264	CB #212	CB #213	67.29	249.92	249.11	1.2000	18.000	0.0130	5.18	0 00:05	5.64	0.20	11.51	0.45	0.52	0.00	0.77	Calculated
13	P #265	CB #213	CB #216	56.41	248.91	245.87	5.4000	18.000	0.0130	5.41	0 00:05	9.20	0.10	24.41	0.22	0.39	0.00	0.58	Calculated
14	P #266	CB #214	CB #215(DOUBLE)	47.01	249.79	248.18	3.4300	18.000	0.0130	0.29	0 00:05	3.87	0.20	19.46	0.02	0.09	0.00	0.13	Calculated
15	P #267	CB #215(DOUBLE)	CB #216	25.73	246.00	245.87	0.5000	18.000	0.0130	5.19	0 00:05	4.07	0.11	7.43	0.70	0.68	0.00	1.02	Calculated
16	P #268	CB #216	CB #217	40.84	245.67	243.75	4.7000	24.000	0.0130	10.60	0 00:05	7.17	0.09	49.04	0.22	0.55	0.00	1.09	Calculated
17	P #269	CB #217	CB #235	38.89	243.55	243.35	0.5000	30.000	0.0130	10.59	0 00:05	3.77	0.17	29.00	0.37	0.63	0.00	1.56	Calculated
18	P #270	CB #218	CB #219	37.71	278.85	278.66	0.5000	15.000	0.0130	0.60	0 00:05	2.40	0.26	4.57	0.13	0.26	0.00	0.32	Calculated
19	P #271	CB #219	CB #220	131.27	278.46	272.33	4.6700	18.000	0.0130	1.13	0 00:05	6.54	0.33	22.69	0.05	0.15	0.00	0.23	Calculated
20	P #272	CB #220	CB #222	126.56	272.13	264.33	6.1700	18.000	0.0130	1.63	0 00:05	7.97	0.26	26.09	0.06	0.17	0.00	0.26	Calculated
21	P #273	CB #221	CB #222	37.71	264.59	264.33	0.7100	15.000	0.0130	0.64	0 00:05	2.75	0.23	5.43	0.12	0.25	0.00	0.31	Calculated
22	P #274	CB #222	CB #224	85.93	264.13	257.80	7.3600	18.000	0.0130	2.76	0 00:05	9.69	0.15	28.49	0.10	0.22	0.00	0.33	Calculated
23	P #276	CB #224	CB #226	88.06	257.53	252.43	5.7900	18.000	0.0130	2.95	0 00:05	9.03	0.16	25.29	0.12	0.24	0.00	0.36	Calculated
24	P #277	CB #225	CB #226	43.39	253.94	252.77	2.6900	15.000	0.0130	0.63	0 00:05	4.47	0.16	10.59	0.06	0.17	0.00	0.22	Calculated
25	P #278	CB #226	CB #227	65.21	251.96	248.96	4.6000	24.000	0.0130	4.02	0 00:05	8.55	0.13	48.50	0.08	0.21	0.00	0.41	Calculated
26	P #279	CB #227	CB #228(DOUBLE)	47.73	248.69	247.78	1.9200	24.000	0.0130	4.27	0 00:05	3.57	0.22	31.31	0.14	0.41	0.00	0.82	Calculated
27	P #280	CB #228(DOUBLE)	CB #234	25.80	247.58	247.45	0.5000	24.000	0.0130	8.24	0 00:05	4.34	0.10	16.00	0.51	0.58	0.00	1.16	Calculated
28	P #281	CB #229	CB #230	25.60	254.05	253.92	0.5000	15.000	0.0130	0.94	0 00:05	2.64	0.16	4.57	0.21	0.33	0.00	0.42	Calculated
29	P #282	CB #230	CB #232	107.41	253.72	251.20	2.3400	15.000	0.0130	2.07	0 00:05	5.59	0.32	9.89	0.21	0.34	0.00	0.43	Calculated
30	P #283	CB #231	CB #232	25.73	251.39	251.20	0.7300	15.000	0.0130	1.98	0 00:05	3.61	0.12	5.52	0.36	0.46	0.00	0.57	Calculated
31	P #284	CB #232	CB #233	109.56	251.00	249.07	1.7700	18.000	0.0130	4.57	0 00:05	6.02	0.30	13.96	0.33	0.44	0.00	0.67	Calculated
32	P #285	CB #233	CB #234	49.61	248.87	248.39	0.9500	18.000	0.0130	4.86	0 00:05	5.03	0.16	10.25	0.47	0.54	0.00	0.81	Calculated
33	P #286	CB #234	CB #235	53.43	247.16	245.52	3.0800	30.000	0.0130	13.21	0 00:05	9.21	0.10	71.99	0.18	0.33	0.00	0.83	Calculated
34	P #287	CB #235	CB #236	202.80	243.15	241.54	0.8000	30.000	0.0130	24.16	0 00:06	7.05	0.48	36.60	0.66	0.66	0.00	1.66	Calculated
35	P #288	CB #236	SDMH #506	115.05	241.14	240.43	0.6200	36.000	0.0130	26.81	0 00:06	5.51	0.35	52.40	0.51	0.65	0.00	1.96	Calculated
36	P #289	SDMH #506	FES#312	46.01	240.23	240.00	0.5000	36.000	0.0130	26.71	0 00:06	5.78	0.13	47.16	0.57	0.62	0.00	1.87	Calculated



:	CB #218	CB #219	CB #220	CB #222
RIM (FT):	283.28	283.28	277.04	269.03
Invert (ft):	278.85	278.46	272.13	264.13
Min Pipe Cover (ft):				
Max HGL (ft):	279.19	278.69	272.40	264.46

Link ID:	P #270	P #271	P #272
(FT):	37.71	131.27	126.56
(in):	15.00	18.00	18.00
@ (%):	0.50	4.67	6.17
Up Invert (ft):	278.85	278.46	272.13
Dn Invert (ft):	278.66	272.33	264.33
Max Q (cfs):	0.60	1.13	1.63
Max Vel (ft/s):	2.40	6.54	7.97
Max Depth (ft):	0.32	0.23	0.26

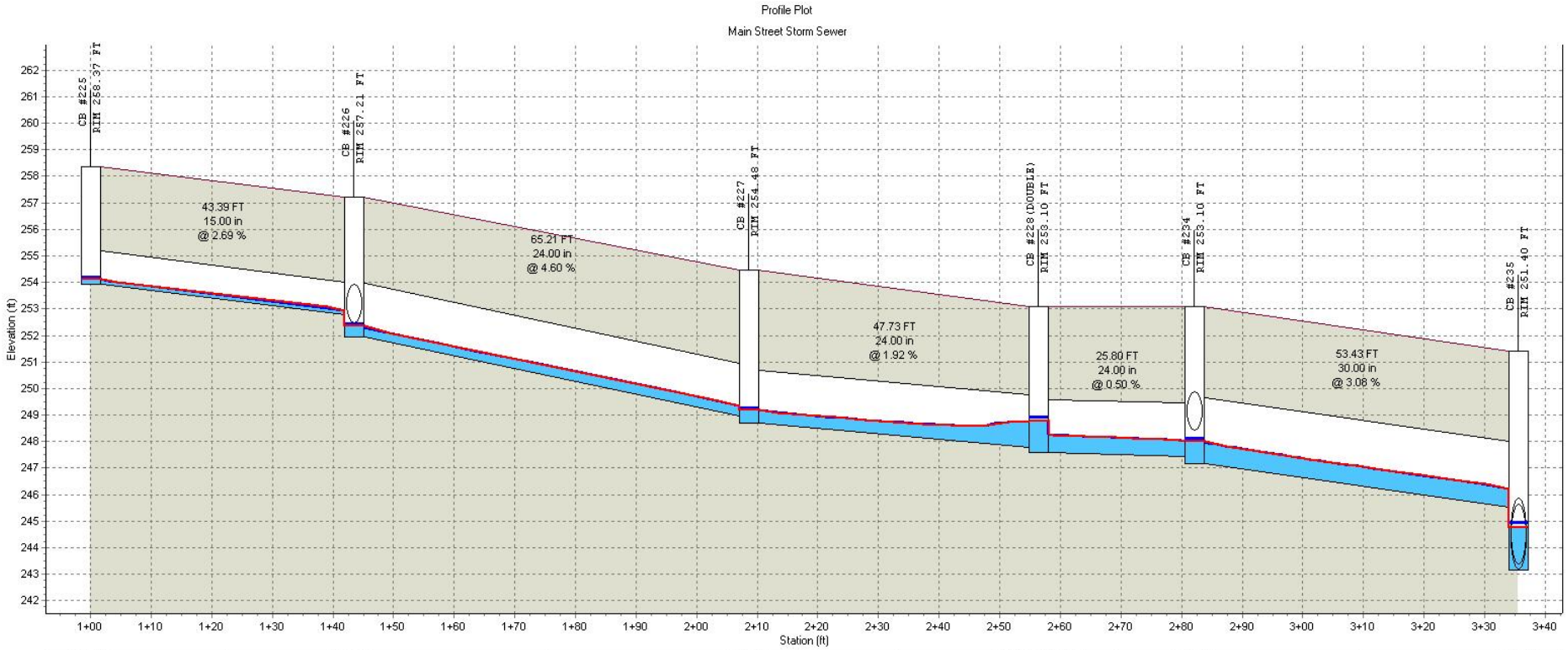
HGL



:	CB #221	CB #222	CB #224	CB #226
RIM (FT):	269.03	269.03	262.54	257.21
Invert (ft):	264.59	264.13	257.53	251.96
Min Pipe Cover (ft):				
Max HGL (ft):	264.91	264.46	257.91	252.40

Link ID:	P #273	P #274	P #276
(FT):	37.71	85.93	88.06
(in):	15.00	18.00	18.00
@ (%):	0.71	7.36	5.79
Up Invert (ft):	264.59	264.13	257.53
Dn Invert (ft):	264.33	257.80	252.43
Max Q (cfs):	0.64	2.76	2.99
Max Vel (ft/s):	2.75	9.69	9.06
Max Depth (ft):	0.31	0.33	0.36

HGL

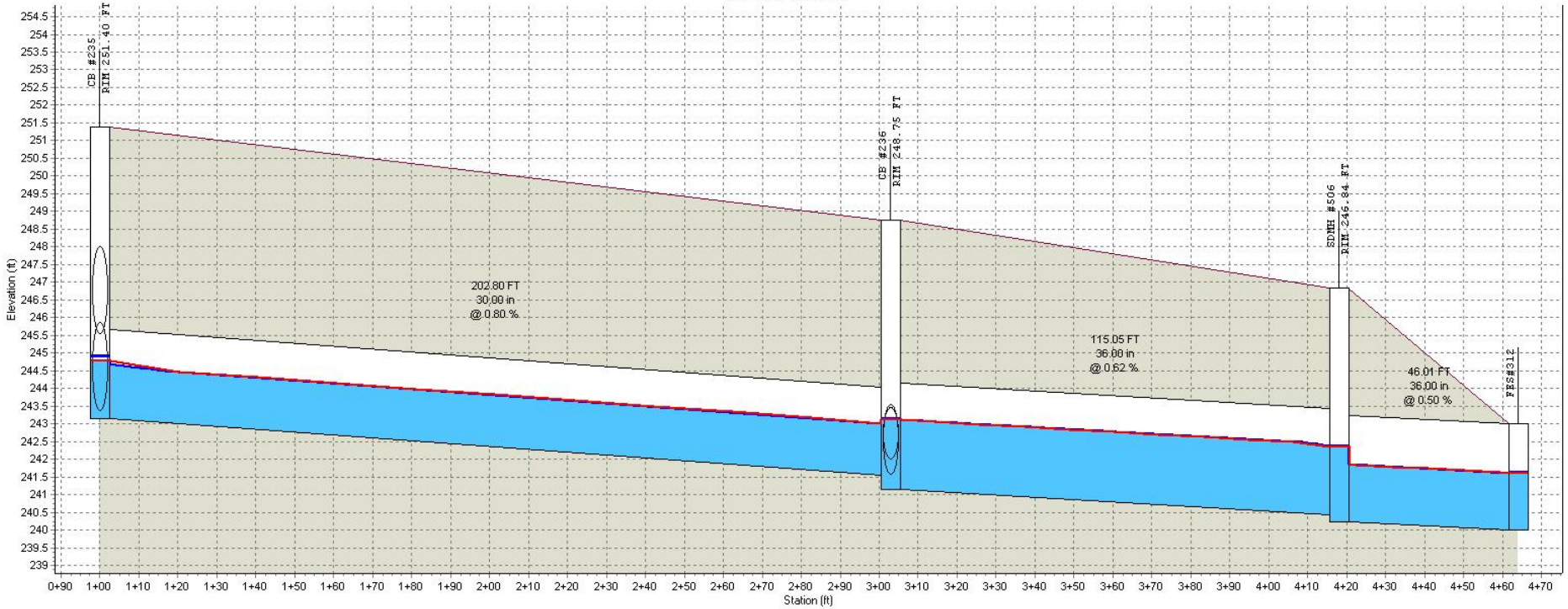


:	CB #225	CB #226	CB #227	CB #228(DOUBLE)	CB #234	CB #235
RIM (FT):	258.37	257.21	254.48	253.10	253.10	251.40
Invert (ft):	253.94	251.96	248.69	247.58	247.16	243.15
Min Pipe Cover (ft):						
Max HGL (ft):	254.16	252.40	249.24	248.90	248.11	244.91

Link ID:	P #277	P #278	P #279	P #280	P #286
(FT):	43.39	65.21	47.73	25.80	53.43
(in):	15.00	24.00	24.00	24.00	30.00
@ (%):	2.69	4.60	1.92	0.50	3.08
Up Invert (ft):	253.94	251.96	248.69	247.58	247.16
Dn Invert (ft):	252.77	248.96	247.78	247.45	245.52
Max Q (cfs):	0.63	4.07	4.32	8.28	13.25
Max Vel (ft/s):	4.47	8.57	3.57	4.35	9.22
Max Depth (ft):	0.22	0.42	0.83	1.17	0.84

Profile Plot

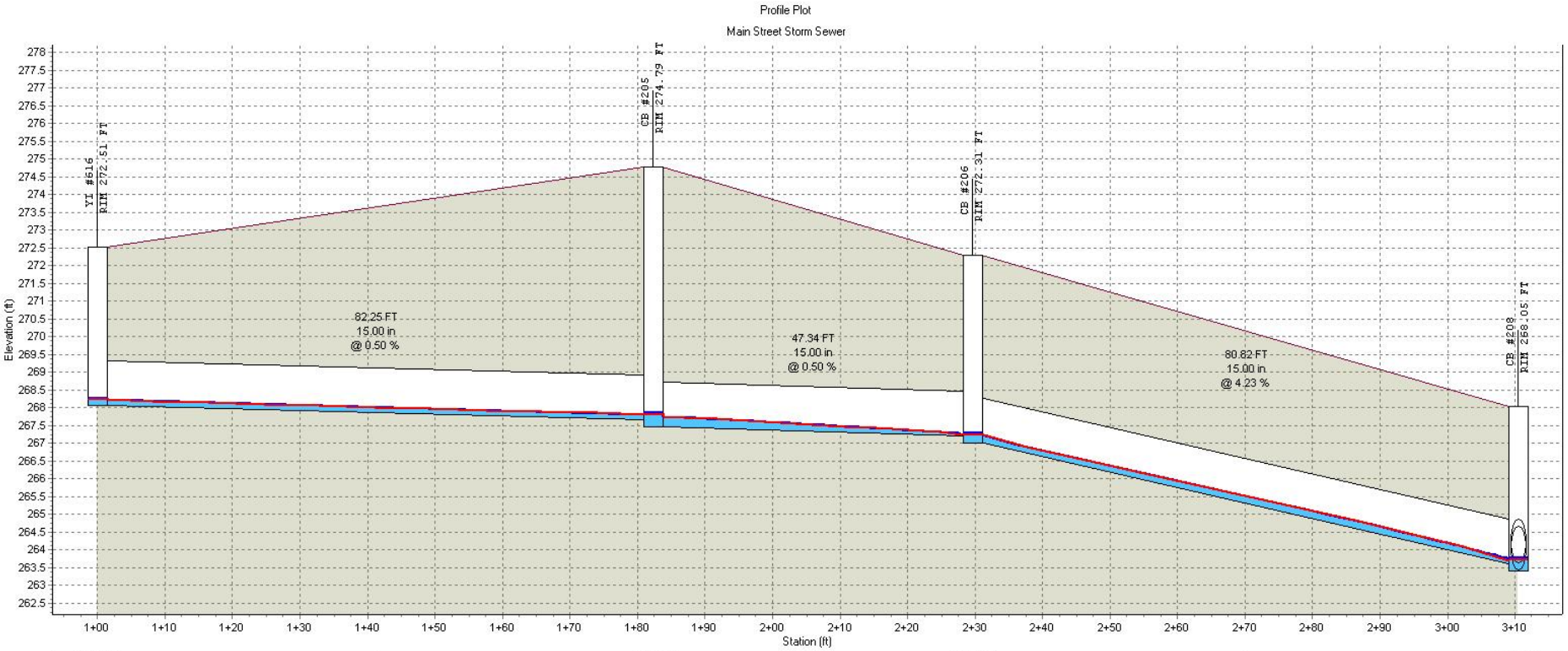
Main Street Storm Sewer



:	CB #235	CB #236	SDMH #506	FES#312
RIM (FT):	251.40	248.75	246.84	
Invert (ft):	243.15	241.14	240.23	240.00
Min Pipe Cover (ft):			3.41	
Max HGL (ft):	244.91	243.14	242.35	241.62

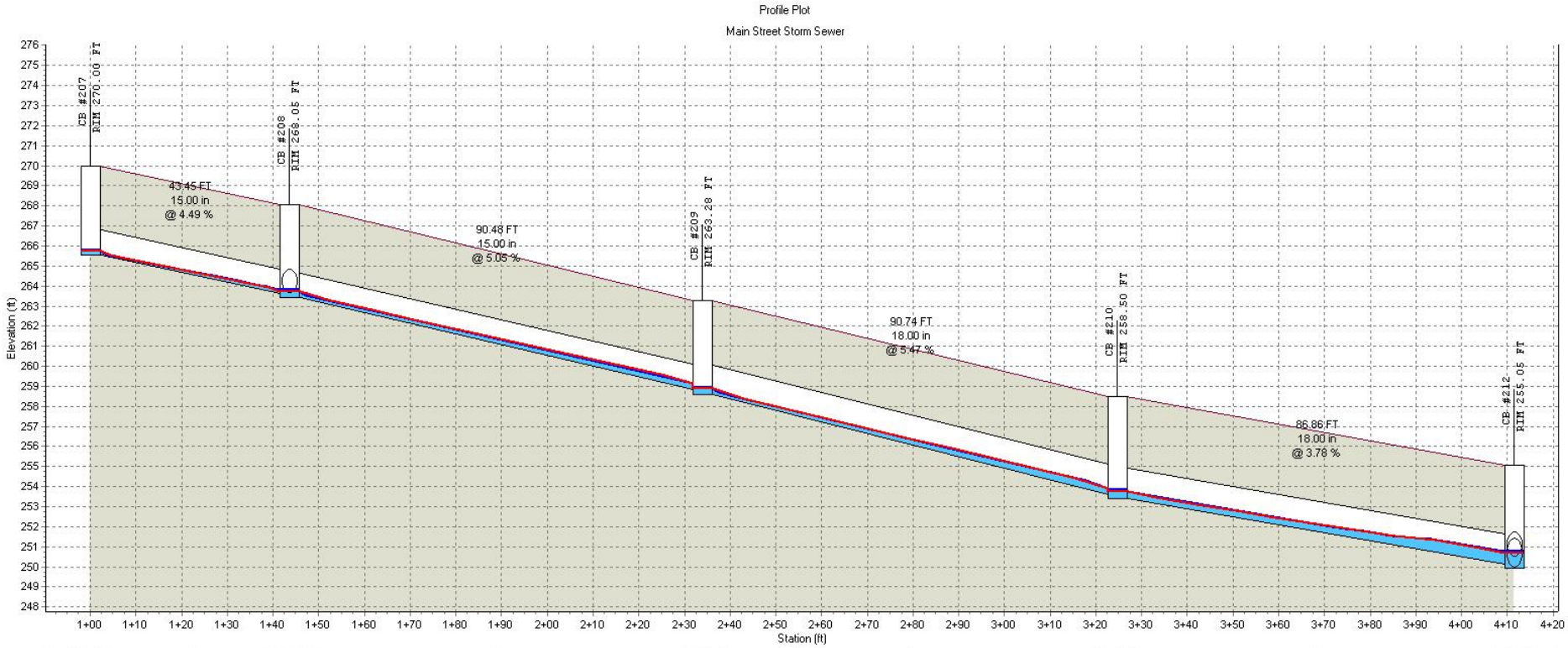
Link ID:	P #287	P #288	P #289
(FT):	202.80	115.05	46.01
(in):	30.00	36.00	36.00
@ (%):	0.80	0.62	0.50
Up Invert (ft):	243.15	241.14	240.23
Dn Invert (ft):	241.54	240.43	240.00
Max Q (cfs):	24.21	26.86	26.75
Max Vel (ft/s):	7.05	5.51	5.78
Max Depth (ft):	1.66	1.96	1.87

HGL



	YI #616	CB #205	CB #206	CB #208
RIM (FT):	272.51	274.79	272.31	268.05
Invert (ft):	268.07	267.46	267.02	263.41
Min Pipe Cover (ft):				
Max HGL (ft):	268.25	267.85	267.28	263.77

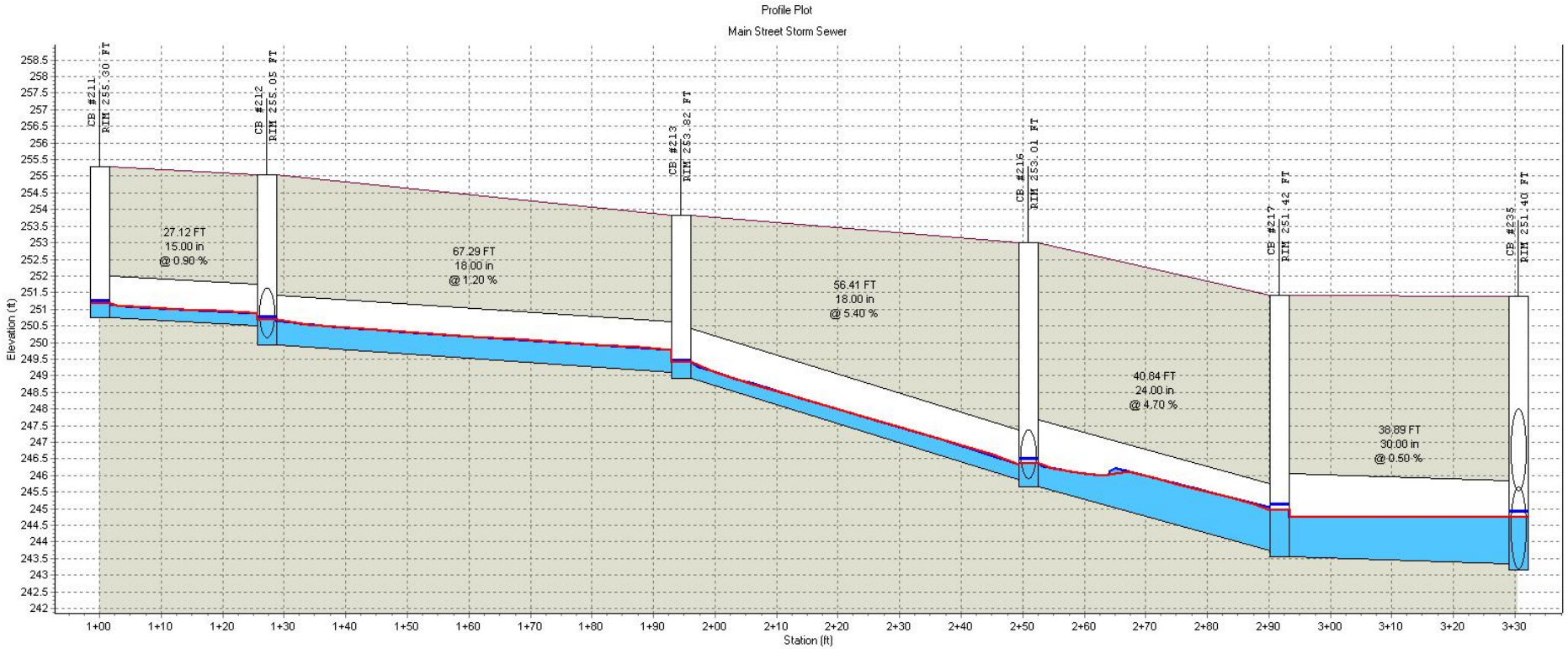
Link ID:	P #256	P #257	P #258
(FT):	82.25	47.34	80.82
(in):	15.00	15.00	15.00
@ (%):	0.50	0.50	4.23
Up Invert (ft):	268.07	267.46	267.02
Dn Invert (ft):	267.66	267.22	263.61
Max Q (cfs):	0.20	0.77	1.06
Max Vel (ft/s):	1.75	2.59	6.22
Max Depth (ft):	0.18	0.36	0.24



	CB #207	CB #208	CB #209	CB #210	CB #212
RIM (FT):	270.00	268.05	263.28	258.50	255.05
Invert (ft):	265.56	263.41	258.57	253.41	249.92
Min Pipe Cover (ft):					
Max HGL (ft):	265.77	263.77	258.93	253.81	250.77

Link ID:	P #259	P #260	P #261	P #262
(FT):	43.45	90.48	90.74	86.86
(in):	15.00	15.00	18.00	18.00
@ (%):	4.49	5.05	5.47	3.78
Up Invert (ft):	265.56	263.41	258.57	253.41
Dn Invert (ft):	263.61	258.84	253.61	250.12
Max Q (cfs):	0.73	2.23	2.75	3.16
Max Vel (ft/s):	5.60	8.14	8.70	5.80
Max Depth (ft):	0.20	0.34	0.35	0.52

HGL



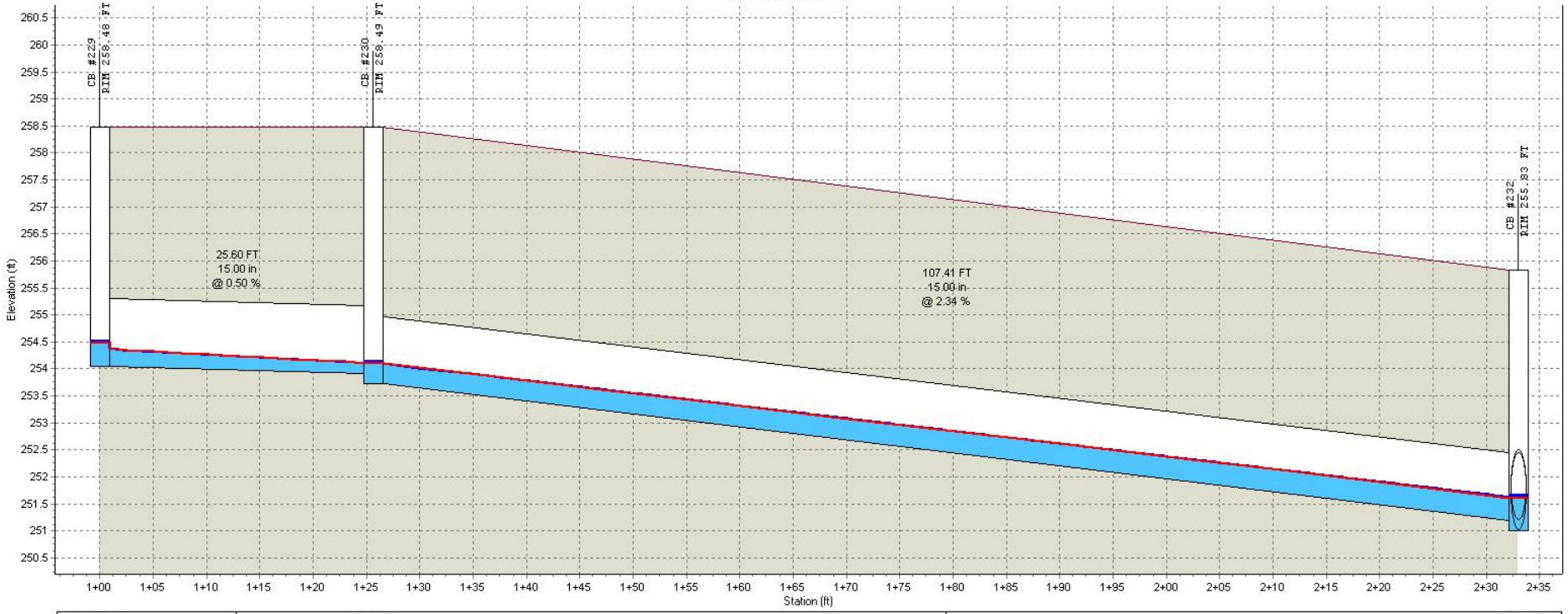
:	CB #211	CB #212	CB #213	CB #216	CB #217	CB #235
RIM (FT):	255.30	255.05	253.82	253.01	251.42	251.40
Invert (ft):	250.74	249.92	248.91	245.67	243.55	243.15
Min Pipe Cover (ft):						
Max HGL (ft):	251.24	250.77	249.46	246.49	245.13	244.91

Link ID:	P #263	P #264	P #265	P #268	P #269
(FT):	27.12	67.29	56.41	40.84	38.89
(in):	15.00	18.00	18.00	24.00	30.00
@ (%):	0.90	1.20	5.40	4.70	0.50
Up Invert (ft):	250.74	249.92	248.91	245.67	243.55
Dn Invert (ft):	250.50	249.11	245.87	243.75	243.35
Max Q (cfs):	1.46	5.18	5.41	10.60	10.59
Max Vel (ft/s):	3.61	5.64	9.20	7.17	3.77
Max Depth (ft):	0.45	0.77	0.58	1.09	1.57

HGL

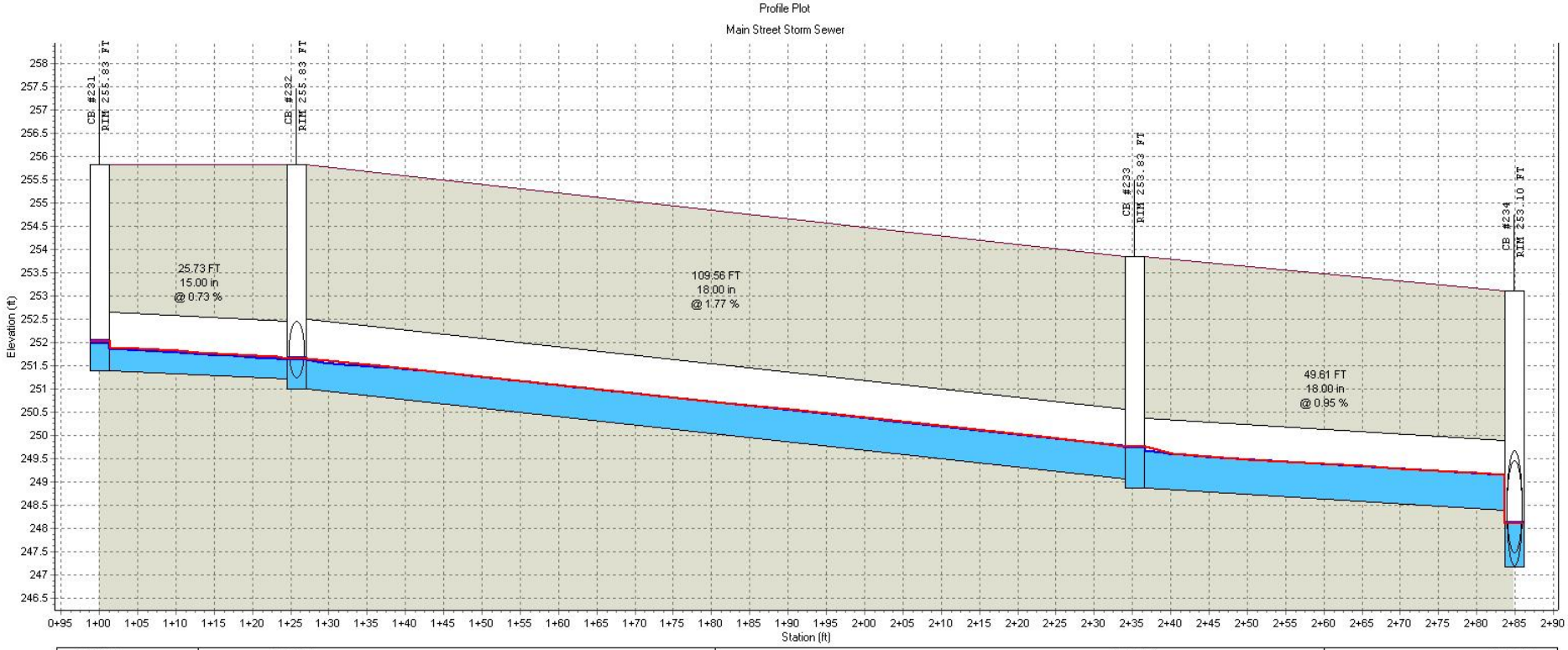
Profile Plot

Main Street Storm Sewer



:	CB #229		CB #230		CB #232
RIM (FT):	258.48		258.49		255.83
Invert (ft):	254.05		253.72		251.00
Min Pipe Cover (ft):					
Max HGL (ft):	254.50		254.13		251.65
Link ID:		P #281		P #282	
(FT):		25.60		107.41	
(in):		15.00		15.00	
@ (%):		0.50		2.34	
Up Invert (ft):		254.05		253.72	
Dn Invert (ft):		253.92		251.20	
Max Q (cfs):		0.94		2.07	
Max Vel (ft/s):		2.64		5.59	
Max Depth (ft):		0.42		0.43	

HGL

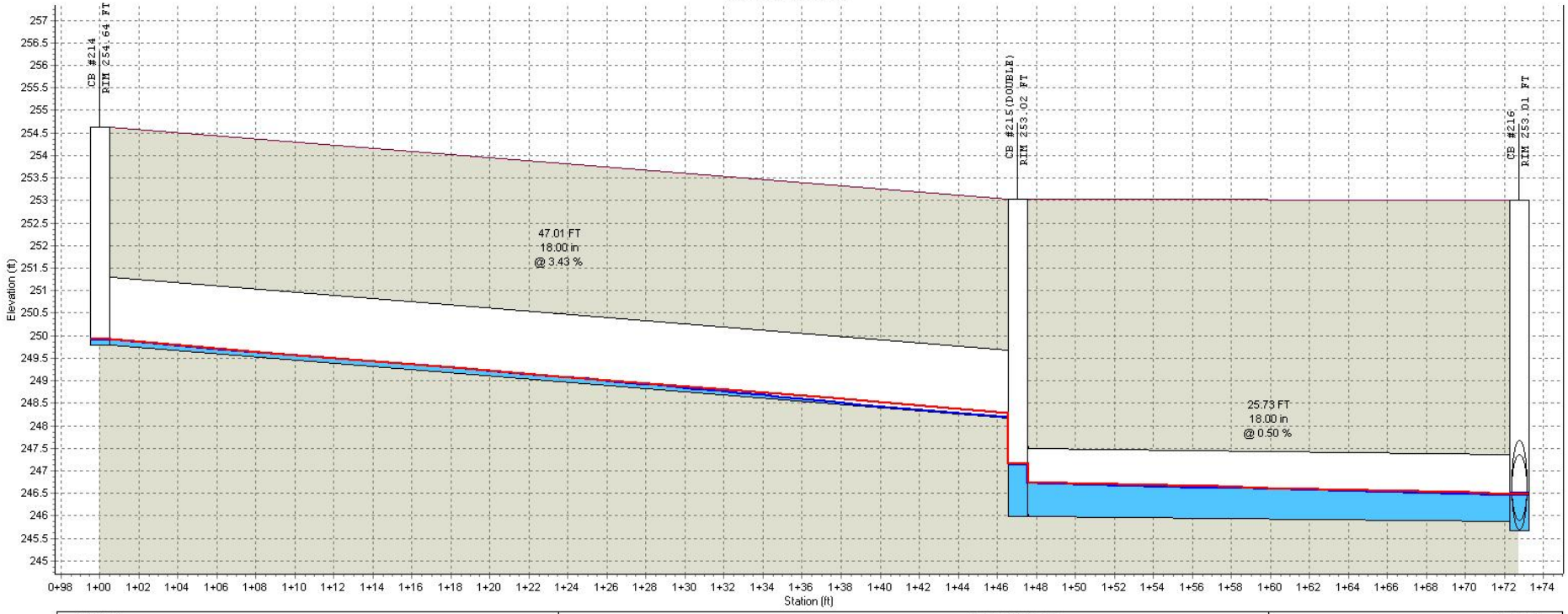


:	CB #231	CB #232	CB #233	CB #234
RIM (FT):	255.83	255.83	253.83	253.10
Invert (ft):	251.39	251.00	248.87	247.16
Min Pipe Cover (ft):				
Max HGL (ft):	252.02	251.65	249.75	248.11

Link ID:	P #283	P #284	P #285
(FT):	25.73	109.56	49.61
(in):	15.00	18.00	18.00
@ (%):	0.73	1.77	0.95
Up Invert (ft):	251.39	251.00	248.87
Dn Invert (ft):	251.20	249.07	248.39
Max Q (cfs):	1.98	4.57	4.86
Max Vel (ft/s):	3.61	6.02	5.03
Max Depth (ft):	0.57	0.67	0.81

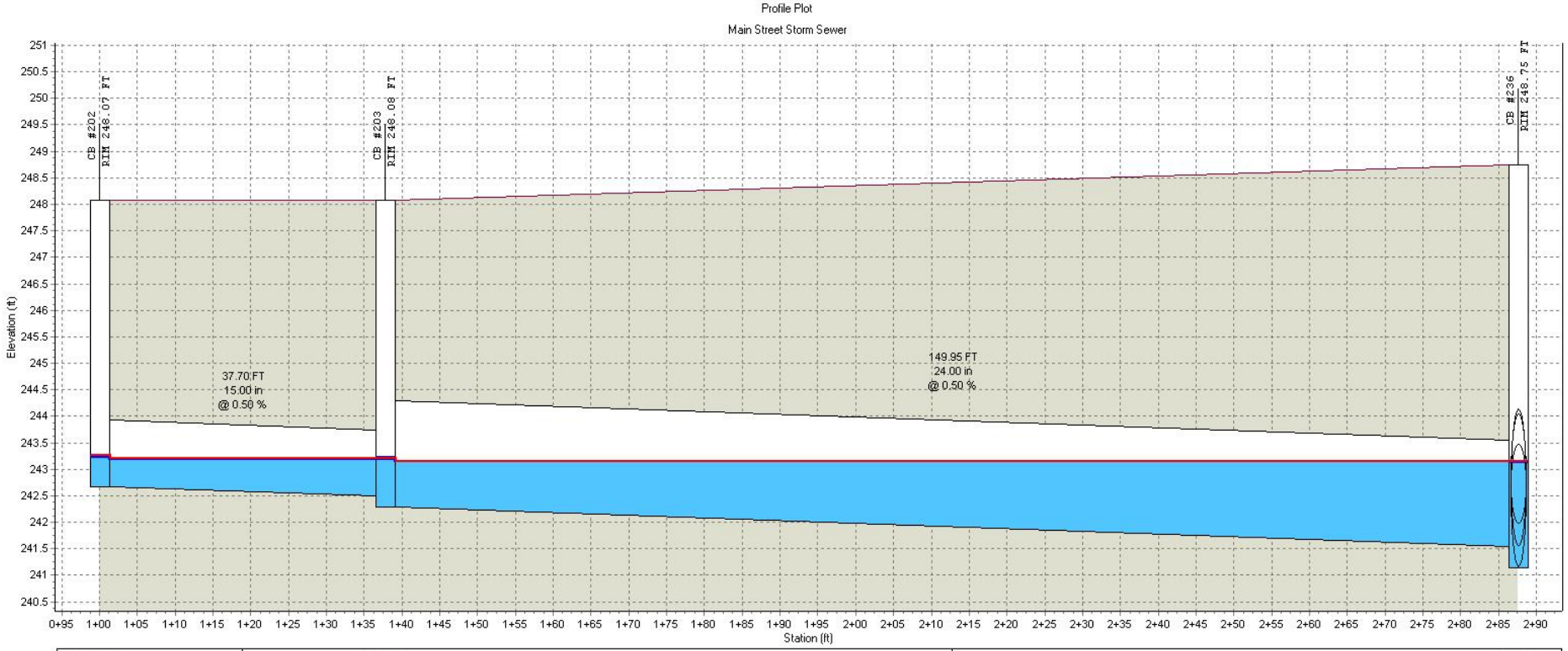
Profile Plot

Main Street Storm Sewer



:	CB #214		CB #215(DOUBLE)		CB #216
RIM (FT):	254.64		253.02		253.01
Invert (ft):	249.79		246.00		245.67
Min Pipe Cover (ft):					
Max HGL (ft):	249.92		247.15		246.49
Link ID:		P #266		P #267	
(FT):		47.01		25.73	
(in):		18.00		18.00	
@ (%):		3.43		0.50	
Up Invert (ft):		249.79		246.00	
Dn Invert (ft):		248.18		245.87	
Max Q (cfs):		0.29		5.19	
Max Vel (ft/s):		3.87		4.07	
Max Depth (ft):		0.13		1.02	

HGL



:	CB #202		CB #203		CB #236
RIM (FT):	248.07		248.08		248.75
Invert (ft):	242.68		242.29		241.14
Min Pipe Cover (ft):					
Max HGL (ft):	243.26		243.21		243.14
Link ID:		P #253		P #254	
(FT):		37.70		149.95	
(in):		15.00		24.00	
@ (%):		0.50		0.50	
Up Invert (ft):		242.68		242.29	
Dn Invert (ft):		242.49		241.54	
Max Q (cfs):		1.41		3.03	
Max Vel (ft/s):		2.96		2.44	
Max Depth (ft):		0.65		1.25	

HGL

S T O R M W A T E R AREA " E "

STORMWATER PIPING AND HYDRAULIC GRADE LINE FOR 10-YR STORM



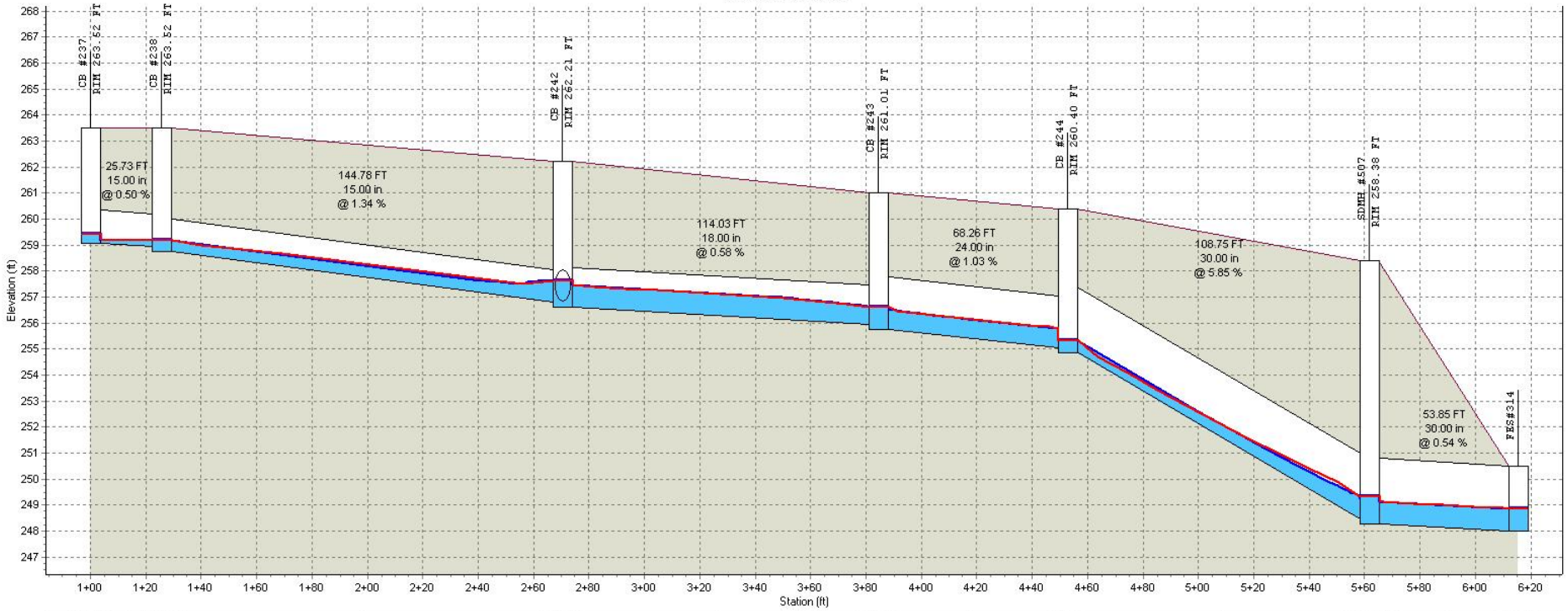
PLAN VIEW

DRAINAGE AREA									
SN	Element ID	Area (acres)	Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
1	Sub-CB#237	0.09	CB #237	0.8700	0.60	0.52	0.57	7.210	0 00:05:00
2	Sub-CB#238	0.36	CB #238	0.7300	0.60	0.44	1.90	7.210	0 00:05:00
3	Sub-CB#239	0.04	CB #239	0.8700	0.60	0.52	0.25	7.210	0 00:05:00
4	Sub-CB#240	0.09	CB #240	0.8300	0.60	0.50	0.54	7.210	0 00:05:00
5	Sub-CB#241	0.14	CB #241	0.8700	0.60	0.52	0.88	7.210	0 00:05:00
6	Sub-CB#242	0.47	CB #242	0.7300	0.60	0.44	2.47	7.210	0 00:05:00
7	Sub-CB#243	0.14	CB #243	0.7300	0.60	0.44	0.74	7.210	0 00:05:00
8	Sub-CB#244	0.26	CB #244	0.8700	0.60	0.52	1.63	7.210	0 00:05:00
9	Sub-YI#609	0.17	YI #609	0.5500	0.60	0.33	0.67	7.210	0 00:05:00

MODEL INPUT										MODEL OUTPUT									
SN	Element ID	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Manning's Roughness	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Max Flow Velocity (ft/sec)	Travel Time (min)	Design Flow Capacity (cfs)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Total Time Surcharged (min)	Max Flow Depth (ft)	Reported Condition
1	P #291	CB #237	CB #238	25.73	259.08	258.96	0.5000	15.000	0.0130	0.52	0 00:05	2.28	0.19	4.57	0.11	0.24	0.00	0.30	Calculated
2	P #292	CB #238	CB #242	144.78	258.76	256.82	1.3400	15.000	0.0130	1.86	0 00:05	3.66	0.66	7.47	0.25	0.49	0.00	0.62	Calculated
3	P #293	CB #239	CB #240	25.77	257.69	257.56	0.5000	15.000	0.0130	0.23	0 00:05	1.77	0.24	4.57	0.05	0.17	0.00	0.22	Calculated
4	P #294	CB #240	CB #241	40.13	257.36	257.16	0.5000	15.000	0.0130	0.82	0 00:05	2.12	0.32	4.57	0.18	0.39	0.00	0.49	Calculated
5	P #295	CB #241	CB #242	26.56	256.96	256.82	0.5200	15.000	0.0130	1.50	0 00:05	2.23	0.20	4.66	0.32	0.63	0.00	0.79	Calculated
6	P #296	CB #242	CB #243	114.03	256.62	255.96	0.5800	18.000	0.0130	5.19	0 00:06	4.42	0.43	7.97	0.65	0.63	0.00	0.95	Calculated
7	P #297	CB #243	CB #244	68.26	255.76	255.06	1.0300	24.000	0.0130	6.40	0 00:06	5.54	0.21	22.99	0.28	0.40	0.00	0.79	Calculated
8	P #298	CB #244	SDMH #507	108.75	254.86	248.49	5.8500	30.000	0.0130	7.94	0 00:06	7.68	0.24	99.24	0.08	0.27	0.00	0.67	Calculated
9	P #299	SDMH #507	FES#314	53.85	248.29	248.00	0.5400	30.000	0.0130	7.96	0 00:06	4.54	0.20	30.22	0.26	0.39	0.00	0.97	Calculated
10	P #300	YI #609	FES#318	62.42	249.76	248.00	2.8200	18.000	0.0130	0.67	0 00:05	4.60	0.23	17.64	0.04	0.14	0.00	0.20	Calculated

Profile Plot

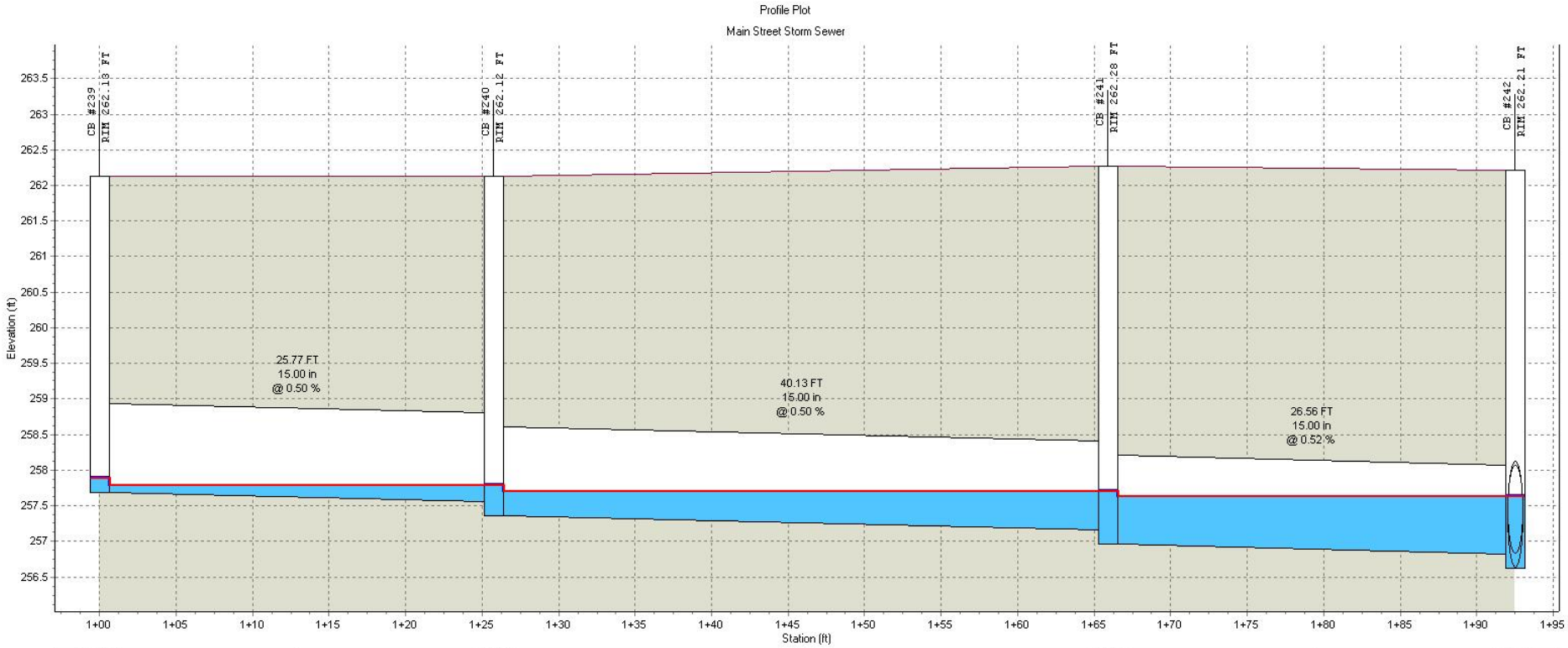
Main Street Storm Sewer



:	CB #237	CB #238	CB #242	CB #243	CB #244	SDMH #507	FES#314
RIM (FT):	263.52	263.52	262.21	261.01	260.40	258.38	
Invert (ft):	259.08	258.76	256.62	255.76	254.86	248.29	248.00
Min Pipe Cover (ft):						7.39	
Max HGL (ft):	259.41	259.18	257.64	256.62	255.34	249.35	248.88

Link ID:	P #291	P #292	P #296	P #297	P #298	P #299
(FT):	25.73	144.78	114.03	68.26	108.75	53.85
(in):	15.00	15.00	18.00	24.00	30.00	30.00
@ (%):	0.50	1.34	0.58	1.03	5.85	0.54
Up Invert (ft):	259.08	258.76	256.62	255.76	254.86	248.29
Dn Invert (ft):	258.96	256.82	255.96	255.06	248.49	248.00
Max Q (cfs):	0.52	1.86	5.19	6.40	7.94	7.96
Max Vel (ft/s):	2.28	3.66	4.42	5.54	7.68	4.54
Max Depth (ft):	0.30	0.62	0.95	0.79	0.67	0.97

HGL



	CB #239		CB #240		CB #241		CB #242
RIM (FT):	262.13		262.12		262.28		262.21
Invert (ft):	257.69		257.36		256.96		256.62
Min Pipe Cover (ft):							
Max HGL (ft):	257.90		257.79		257.71		257.64
Link ID:		P #293		P #294		P #295	
(FT):		25.77		40.13		26.56	
(in):		15.00		15.00		15.00	
@ (%):		0.50		0.50		0.52	
Up Invert (ft):		257.69		257.36		256.96	
Dn Invert (ft):		257.56		257.16		256.82	
Max Q (cfs):		0.23		0.82		1.50	
Max Vel (ft/s):		1.77		2.12		2.23	
Max Depth (ft):		0.22		0.49		0.79	

S T O R M W A T E R AREA " F "

STORMWATER PIPING AND HYDRAULIC GRADE LINE FOR 10-YR STORM



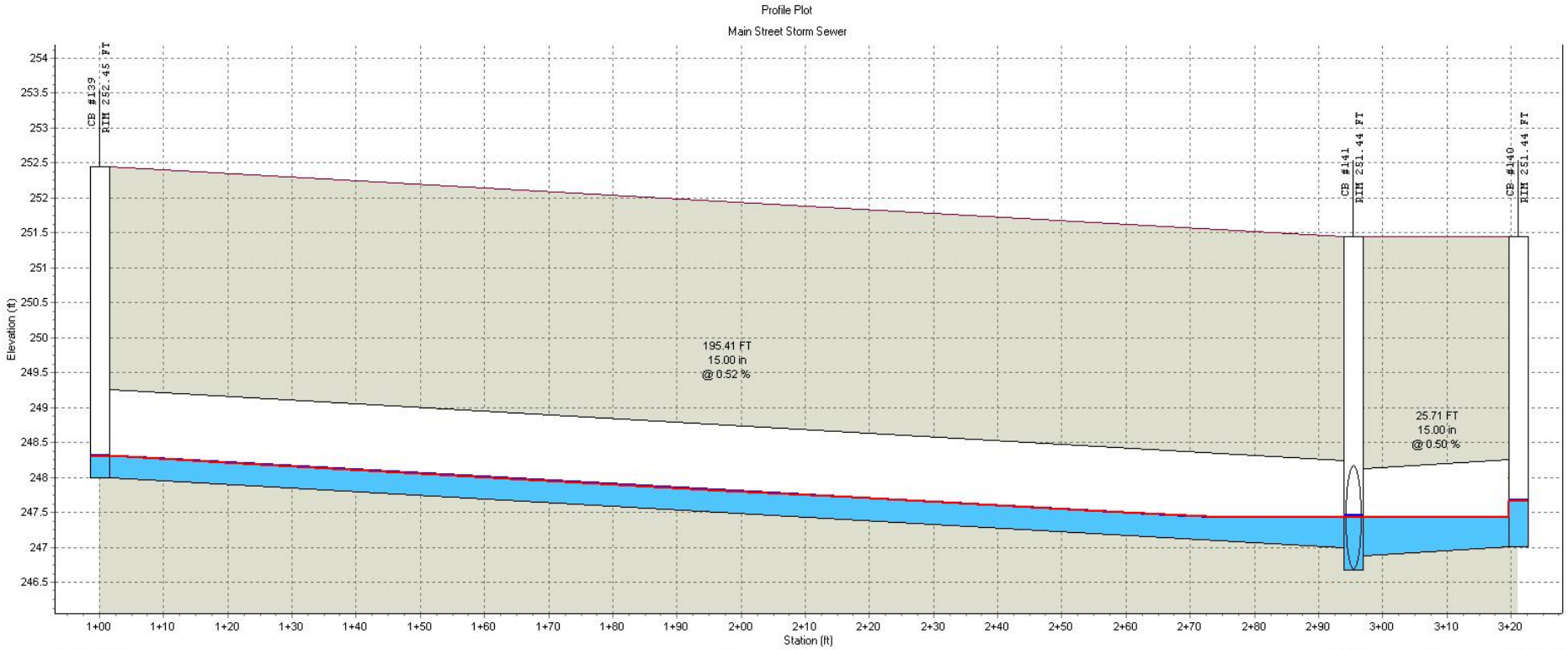
PLAN VIEW

DRAINAGE AREA

SN	Element ID	Area (acres)	Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
1	Sub-CB#115	0.18	CB #115	0.5800	0.60	0.35	0.75	7.210	0 00:05:00
2	Sub-CB#118	0.35	CB #118	0.6100	0.60	0.37	1.54	7.210	0 00:05:00
3	Sub-CB#119	0.42	CB #119	0.7300	0.60	0.44	2.21	7.210	0 00:05:00
4	Sub-CB#120	0.01	CB #120	0.8300	0.60	0.50	0.06	7.210	0 00:05:00
5	Sub-CB#121	0.28	CB #121	0.7300	0.60	0.44	1.47	7.210	0 00:05:00
6	Sub-CB#122	0.05	CB #122	0.8700	0.60	0.52	0.31	7.210	0 00:05:00
7	Sub-CB#123	0.31	CB #123	0.7300	0.60	0.44	1.63	7.210	0 00:05:00
8	Sub-CB#124	0.08	CB #124	0.8700	0.60	0.52	0.50	7.210	0 00:05:00
9	Sub-CB#125	0.04	CB #125	0.8300	0.60	0.50	0.24	7.210	0 00:05:00
10	Sub-CB#126	0.03	CB #126	0.8300	0.60	0.50	0.18	7.210	0 00:05:00
11	Sub-CB#127	0.27	CB #127	0.5800	0.60	0.35	1.13	7.210	0 00:05:00
12	Sub-CB#128	0.50	CB #128	0.7300	0.60	0.44	2.63	7.210	0 00:05:00
13	Sub-CB#129	0.26	CB #129	0.5800	0.60	0.35	1.09	7.210	0 00:05:00
14	Sub-CB#130	0.50	CB #130	0.7300	0.60	0.44	2.63	7.210	0 00:05:00
15	Sub-CB#131	0.13	CB #131	0.5800	0.60	0.35	0.54	7.210	0 00:05:00
16	Sub-CB#132	0.49	CB #132	0.6600	0.60	0.40	2.33	7.210	0 00:05:00
17	Sub-CB#133	0.08	CB #133	0.4900	0.60	0.29	0.28	7.210	0 00:05:00
18	Sub-CB#134	0.32	CB #134	0.7300	0.60	0.44	1.68	7.210	0 00:05:00
19	Sub-CB#135	0.29	CB #135	0.6300	0.60	0.38	1.32	7.210	0 00:05:00
20	Sub-CB#136	0.18	CB #136	0.4600	0.60	0.28	0.60	7.210	0 00:05:00
21	Sub-CB#137	0.09	CB #137	0.8700	0.60	0.52	0.57	7.210	0 00:05:00
22	Sub-CB#138	0.05	CB #138	0.8300	0.60	0.50	0.30	7.210	0 00:05:00
23	Sub-CB#139	0.14	CB #139	0.7500	0.60	0.45	0.76	7.210	0 00:05:00
24	Sub-CB#140	0.63	CB #140	0.6100	0.60	0.37	2.77	7.210	0 00:05:00
25	Sub-CB#141	0.11	CB #141	0.8300	0.60	0.50	0.66	7.210	0 00:05:00
26	Sub-CB#142	0.03	CB #142	0.8300	0.60	0.50	0.18	7.210	0 00:05:00
27	Sub-CB#143	1.15	CB #143(DOUBLE)	0.6100	0.60	0.37	5.06	7.210	0 00:05:00
28	Sub-CB#144	0.09	CB #144	0.8700	0.60	0.52	0.57	7.210	0 00:05:00
29	Sub-CB#145	0.01	CB #145	0.8300	0.60	0.50	0.06	7.210	0 00:05:00
30	Sub-CB#146	0.05	CB #146	0.8300	0.60	0.50	0.30	7.210	0 00:05:00
31	Sub-CB#147	0.12	CB #147	0.6300	0.60	0.38	0.55	7.210	0 00:05:00
32	Sub-CB#148	0.33	CB #148	0.7300	0.60	0.44	1.74	7.210	0 00:05:00
33	Sub-CB#149	0.25	CB #149	0.6300	0.60	0.38	1.14	7.210	0 00:05:00
34	Sub-CB#150	0.31	CB #150	0.4600	0.60	0.28	1.03	7.210	0 00:05:00
35	Sub-CB#151	0.35	CB #151	0.6100	0.60	0.37	1.54	7.210	0 00:05:00
36	Sub-CB#152	0.05	CB #152	0.7100	0.60	0.43	0.26	7.210	0 00:05:00
37	Sub-CB#153	0.20	CB #153	0.5800	0.60	0.35	0.84	7.210	0 00:05:00
38	Sub-CB#154	0.05	CB #154	0.8700	0.60	0.52	0.31	7.210	0 00:05:00
39	Sub-CB#155	0.10	CB #155	0.8700	0.60	0.52	0.63	7.210	0 00:05:00
40	Sub-CB#156	0.05	CB #156	0.8700	0.60	0.52	0.31	7.210	0 00:05:00
41	Sub-CB#157	0.07	CB #157	0.8700	0.60	0.52	0.44	7.210	0 00:05:00
42	Sub-CB#158	0.03	CB #158	0.8700	0.60	0.52	0.19	7.210	0 00:05:00
43	Sub-YI#610	0.37	YI #610	0.2800	0.60	0.17	0.75	7.210	0 00:05:00
44	Sub-YI#611	0.68	YI #611	0.2600	0.60	0.16	1.28	7.210	0 00:05:00
45	Sub-YI#612	1.53	YI #612	0.2800	0.60	0.17	3.09	7.210	0 00:05:00
46	Sub-YI#613	0.02	YI #613	0.2500	0.60	0.15	0.04	7.210	0 00:05:00

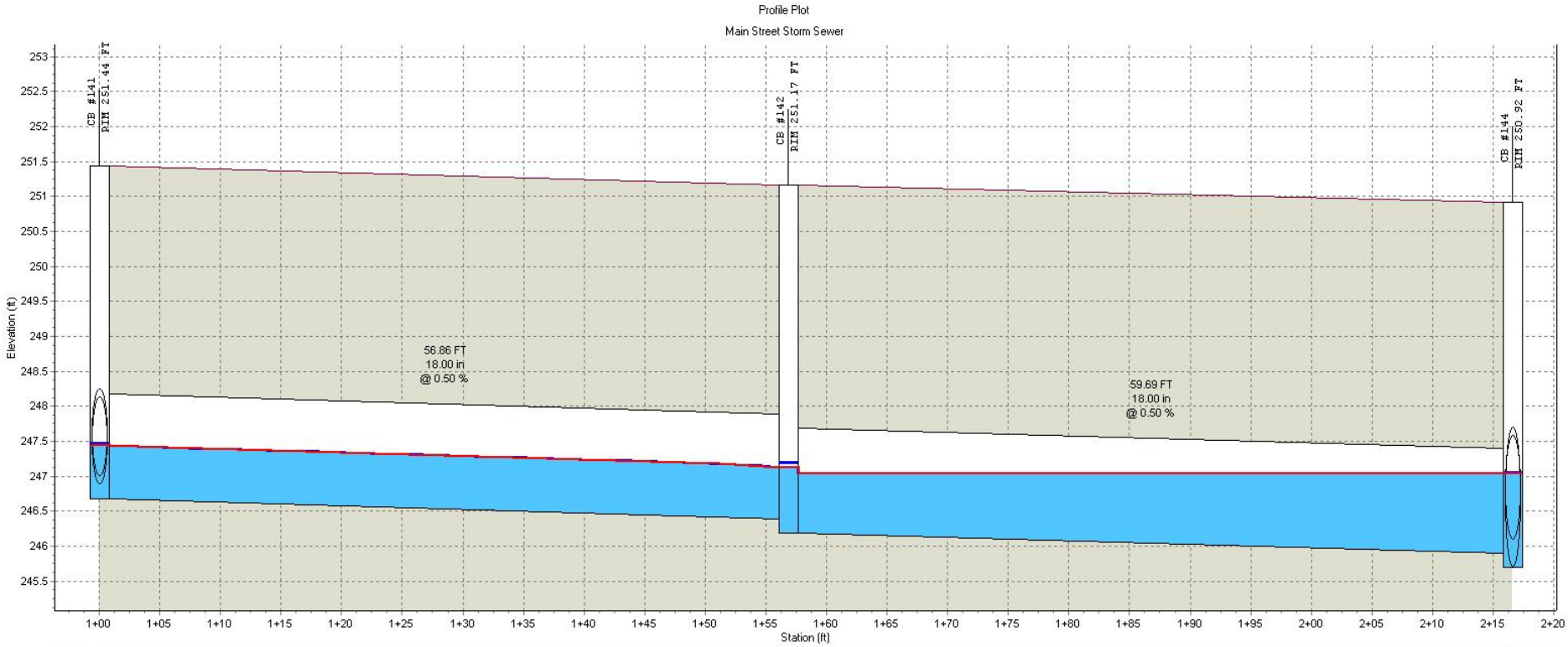
MODEL INPUT										MODEL OUTPUT									
SN	Element ID	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Manning's Roughness	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Max Flow Velocity (ft/sec)	Travel Time (min)	Design Flow Capacity (cfs)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Total Time Surcharged (min)	Max Flow Depth (ft)	Reported Condition
1	P #151	CB #115	CB #158	29.56	238.45	238.30	0.5000	30.000	0.0130	0.99	0 00:05	1.86	0.26	29.00	0.03	0.82	0.00	2.05	Calculated
2	P #154	CB #117	CB #118	40.41	257.48	255.43	5.0900	15.000	0.0130	0.56	0 00:05	4.95	0.14	14.57	0.04	0.17	0.00	0.21	Calculated
3	P #155	CB #118	CB #119	108.34	255.23	252.82	2.2200	15.000	0.0130	2.70	0 00:05	4.21	0.43	9.63	0.28	0.52	0.00	0.65	Calculated
4	P #156	CB #119	CB #120	25.67	252.62	252.49	0.5000	18.000	0.0130	4.46	0 00:05	3.88	0.11	7.43	0.60	0.62	0.00	0.93	Calculated
5	P #157	CB #120	CB #126	51.86	252.29	252.03	0.5000	18.000	0.0130	4.48	0 00:05	3.99	0.22	7.43	0.60	0.61	0.00	0.91	Calculated
6	P #158	CB #126	CB #128	150.37	251.83	246.83	3.3300	24.000	0.0130	8.11	0 00:06	9.56	0.26	41.26	0.20	0.32	0.00	0.63	Calculated
7	P #159	CB #128	CB #130	134.57	246.63	241.45	3.8500	24.000	0.0130	10.95	0 00:05	7.65	0.29	44.39	0.25	0.49	0.00	0.98	Calculated
8	P #160	CB #130	CB #132	159.82	241.25	240.18	0.6700	24.000	0.0130	13.38	0 00:06	5.78	0.46	18.49	0.72	0.70	0.00	1.39	Calculated
9	P #161	CB #132	CB #133	55.08	239.98	239.21	1.4000	30.000	0.0130	15.69	0 00:06	5.58	0.16	48.51	0.32	0.74	0.00	1.84	Calculated
10	P #162	CB #133	CB #157	25.93	238.93	238.80	0.5000	36.000	0.0130	15.92	0 00:06	3.71	0.12	47.23	0.34	0.82	0.00	2.45	Calculated
11	P #163	CB #121	CB #122	25.71	259.37	259.16	0.8200	15.000	0.0130	1.11	0 00:05	3.27	0.13	5.86	0.19	0.32	0.00	0.40	Calculated
12	P #164	CB #122	CB #124	135.79	258.96	256.70	1.6700	15.000	0.0130	1.36	0 00:05	4.83	0.47	8.34	0.16	0.28	0.00	0.35	Calculated
13	P #165	CB #123	CB #124	26.05	256.83	256.70	0.5000	15.000	0.0130	1.52	0 00:05	2.99	0.15	4.57	0.33	0.43	0.00	0.54	Calculated
14	P #166	CB #124	CB #125	47.18	256.50	254.92	3.3500	18.000	0.0130	3.32	0 00:05	7.21	0.11	19.22	0.17	0.31	0.00	0.46	Calculated
15	P #167	CB #125	CB #126	27.75	254.72	252.88	6.6300	18.000	0.0130	3.56	0 00:05	8.91	0.05	27.05	0.13	0.28	0.00	0.42	Calculated
16	P #169	CB #127	CB #128	25.74	248.13	246.83	5.0600	15.000	0.0130	1.07	0 00:05	5.01	0.09	14.53	0.07	0.28	0.00	0.36	Calculated
17	P #170	CB #129	CB #130	25.74	242.72	242.20	2.0400	15.000	0.0130	0.92	0 00:05	4.10	0.10	9.22	0.10	0.31	0.00	0.39	Calculated
18	P #171	CB #131	CB #132	26.17	241.31	241.17	0.5000	15.000	0.0130	0.76	0 00:06	2.50	0.17	4.57	0.17	0.30	0.00	0.37	Calculated
19	P #172	YI #610	YI #611	127.22	242.94	242.30	0.5000	15.000	0.0130	0.73	0 00:05	2.38	0.89	4.57	0.16	0.30	0.00	0.37	Calculated
20	P #173	YI #611	YI #612	119.97	242.10	241.50	0.5000	15.000	0.0130	1.88	0 00:05	3.03	0.66	4.57	0.41	0.51	0.00	0.64	Calculated
21	P #174	YI #612	YI #613	90.63	241.30	240.85	0.5000	24.000	0.0130	4.75	0 00:05	3.74	0.40	16.00	0.30	0.57	0.00	1.13	Calculated
22	P #175	YI #613	CB #135	22.18	240.65	240.54	0.5000	24.000	0.0130	4.02	0 00:05	3.23	0.11	16.00	0.25	0.79	0.00	1.58	Calculated
23	P #176	CB #135	CB #155	25.67	240.34	240.21	0.5000	30.000	0.0130	4.68	0 00:06	3.15	0.14	29.00	0.16	0.75	0.00	1.89	Calculated
24	P #177	CB #134	CB #137	25.70	255.98	255.85	0.5000	15.000	0.0130	1.45	0 00:05	2.95	0.15	4.57	0.32	0.42	0.00	0.53	Calculated

MODEL INPUT										MODEL OUTPUT									
SN	Element ID	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Manning's Roughness	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Max Flow Velocity (ft/sec)	Travel Time (min)	Design Flow Capacity (cfs)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Total Time Surcharged (min)	Max Flow Depth (ft)	Reported Condition
25	P #178	CB #137	CB #136	95.04	255.65	251.44	4.4400	15.000	0.0130	1.98	0 00:05	7.54	0.21	13.61	0.15	0.27	0.00	0.33	Calculated
26	P #179	CB #136	CB #138	45.00	251.24	248.20	6.7300	18.000	0.0130	2.55	0 00:05	8.80	0.09	27.26	0.09	0.22	0.00	0.33	Calculated
27	P #180	CB #138	CB #146	39.27	248.00	244.93	7.8400	18.000	0.0130	2.83	0 00:05	7.58	0.09	29.41	0.10	0.45	0.00	0.68	Calculated
28	P #181	CB #139	CB #141	195.41	248.00	246.99	0.5200	15.000	0.0130	0.61	0 00:05	2.18	1.49	4.64	0.13	0.31	0.00	0.39	Calculated
29	P #182	CB #140	CB #141	25.71	247.01	246.88	0.5000	15.000	0.0130	1.77	0 00:05	3.05	0.14	4.57	0.39	0.49	0.00	0.62	Calculated
30	P #183	CB #141	CB #142	56.86	246.68	246.39	0.5000	18.000	0.0130	2.81	0 00:05	3.35	0.28	7.43	0.38	0.53	0.00	0.79	Calculated
31	P #184	CB #142	CB #144	59.69	246.19	245.89	0.5000	18.000	0.0130	3.09	0 00:06	2.72	0.37	7.43	0.42	0.72	0.00	1.08	Calculated
32	P #185	CB #143(DOUBLE)	CB #144	25.81	246.21	246.08	0.5000	18.000	0.0130	6.16	0 00:05	4.31	0.10	7.43	0.83	0.75	0.00	1.13	Calculated
33	P #186	CB #144	CB #145	57.75	245.69	245.41	0.5000	24.000	0.0130	9.10	0 00:05	4.46	0.22	15.99	0.57	0.63	0.00	1.25	Calculated
34	P #187	CB #145	CB #146	55.89	245.21	244.93	0.5000	24.000	0.0130	9.07	0 00:05	4.58	0.20	16.00	0.57	0.60	0.00	1.21	Calculated
35	P #188	CB #146	CB #148	102.36	244.73	243.61	1.0900	24.000	0.0130	12.06	0 00:06	5.25	0.32	23.65	0.51	0.70	0.00	1.40	Calculated
36	P #189	CB #147	CB #148	25.73	244.43	244.22	0.8200	15.000	0.0130	0.43	0 00:06	2.38	0.18	5.86	0.07	0.67	0.00	0.84	Calculated
37	P #190	CB #148	CB #149	73.35	243.41	243.00	0.5600	24.000	0.0130	13.33	0 00:06	4.99	0.24	17.07	0.78	0.79	0.00	1.59	Calculated
38	P #191	CB #149	CB #151	83.96	242.80	242.38	0.5000	30.000	0.0130	14.33	0 00:06	4.37	0.32	29.15	0.49	0.64	0.00	1.60	Calculated
39	P #192	CB #150	CB #151	25.86	243.56	243.19	1.4300	15.000	0.0130	0.91	0 00:05	3.56	0.12	7.74	0.12	0.46	0.00	0.57	Calculated
40	P #193	CB #151	CB #152	61.50	242.18	241.88	0.5000	30.000	0.0130	15.93	0 00:06	4.73	0.22	28.91	0.55	0.66	0.00	1.64	Calculated
41	P #194	CB #152	CB #154	77.00	241.68	241.29	0.5000	30.000	0.0130	16.26	0 00:06	4.99	0.26	29.00	0.56	0.64	0.00	1.60	Calculated
42	P #195	CB #153	CB #154	26.32	242.90	242.59	1.1600	15.000	0.0130	0.87	0 00:05	3.46	0.13	6.95	0.12	0.26	0.00	0.32	Calculated
43	P #196	CB #154	CB #155	176.62	241.09	240.21	0.5000	30.000	0.0130	16.82	0 00:07	4.61	0.64	29.00	0.58	0.72	0.00	1.81	Calculated
44	P #197	CB #155	CB #156	79.13	240.01	239.61	0.5000	30.000	0.0130	20.41	0 00:07	5.15	0.26	29.00	0.70	0.81	0.00	2.04	Calculated
45	P #198	CB #156	CB #157	116.27	239.41	238.80	0.5200	36.000	0.0130	20.79	0 00:08	4.03	0.48	48.30	0.43	0.77	0.00	2.30	Calculated
46	P #199	CB #157	CB #158	60.41	238.60	238.30	0.5000	36.000	0.0130	35.30	0 00:07	5.87	0.17	47.16	0.75	0.80	0.00	2.39	Calculated
47	P #200	CB #158	SDMH #508	111.86	238.10	237.54	0.5000	42.000	0.0130	35.78	0 00:07	5.66	0.33	71.14	0.50	0.63	0.00	2.19	Calculated
48	P #202	SDMH #508	FES#316	68.05	237.34	237.00	0.5000	42.000	0.0130	35.73	0 00:07	6.27	0.18	71.19	0.50	0.57	0.00	2.01	Calculated

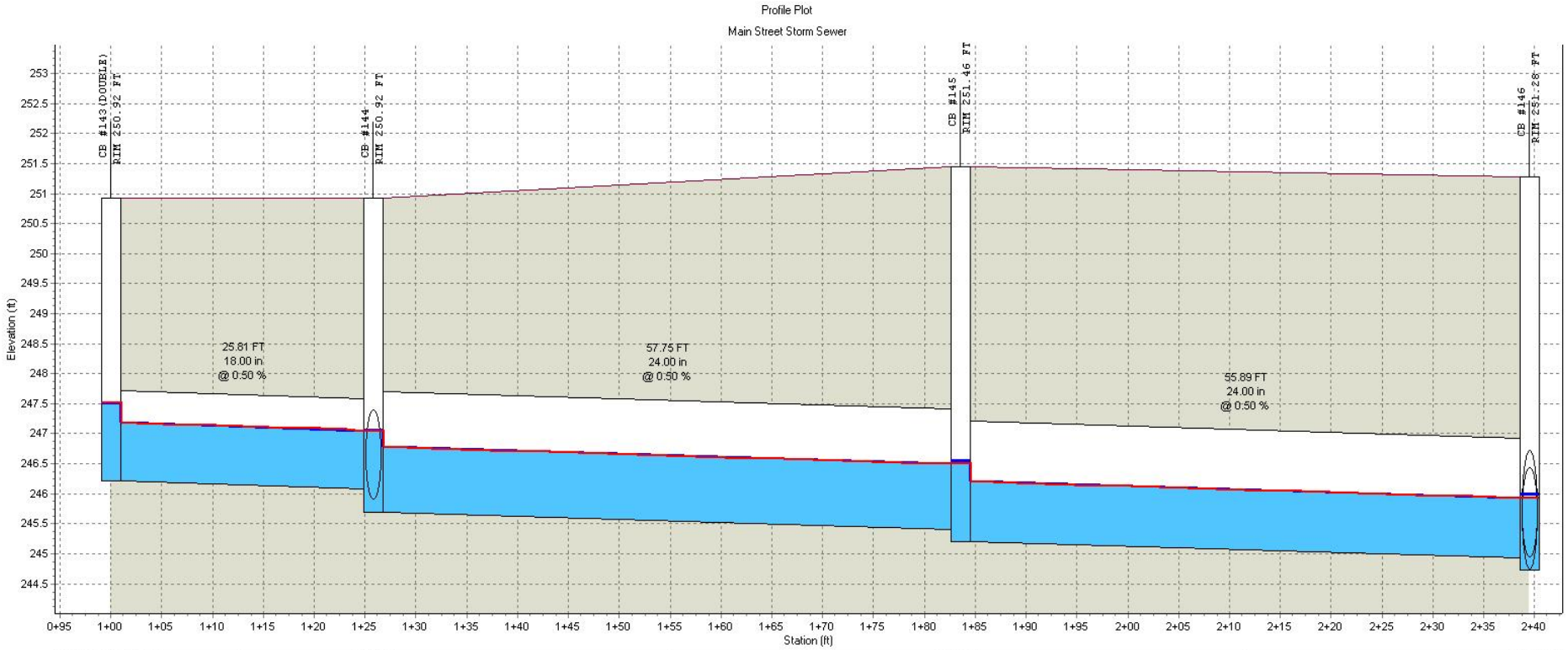


:	CB #139		CB #141	CB #140
RIM (FT):	252.45		251.44	251.44
Invert (ft):	248.00		246.68	247.01
Min Pipe Cover (ft):				
Max HGL (ft):	248.31		247.46	247.67
Link ID:		P #181	P #182	
(FT):		195.41	25.71	
(in):		15.00	15.00	
@ (%):		0.52	0.50	
Up Invert (ft):		248.00	247.01	
Dn Invert (ft):		246.99	246.88	
Max Q (cfs):		0.61	1.77	
Max Vel (ft/s):		2.18	3.05	
Max Depth (ft):		0.39	0.62	

HGL



	CB #141		CB #142		CB #144
RIM (FT):	251.44		251.17		250.92
Invert (ft):	246.68		246.19		245.69
Min Pipe Cover (ft):					
Max HGL (ft):	247.46		247.19		247.05
Link ID:		P #183		P #184	
(FT):		56.86		59.69	
(in):		18.00		18.00	
@ (%):		0.50		0.50	
Up Invert (ft):		246.68		246.19	
Dn Invert (ft):		246.39		245.89	
Max Q (cfs):		2.81		3.09	
Max Vel (ft/s):		3.35		2.72	
Max Depth (ft):		0.79		1.08	

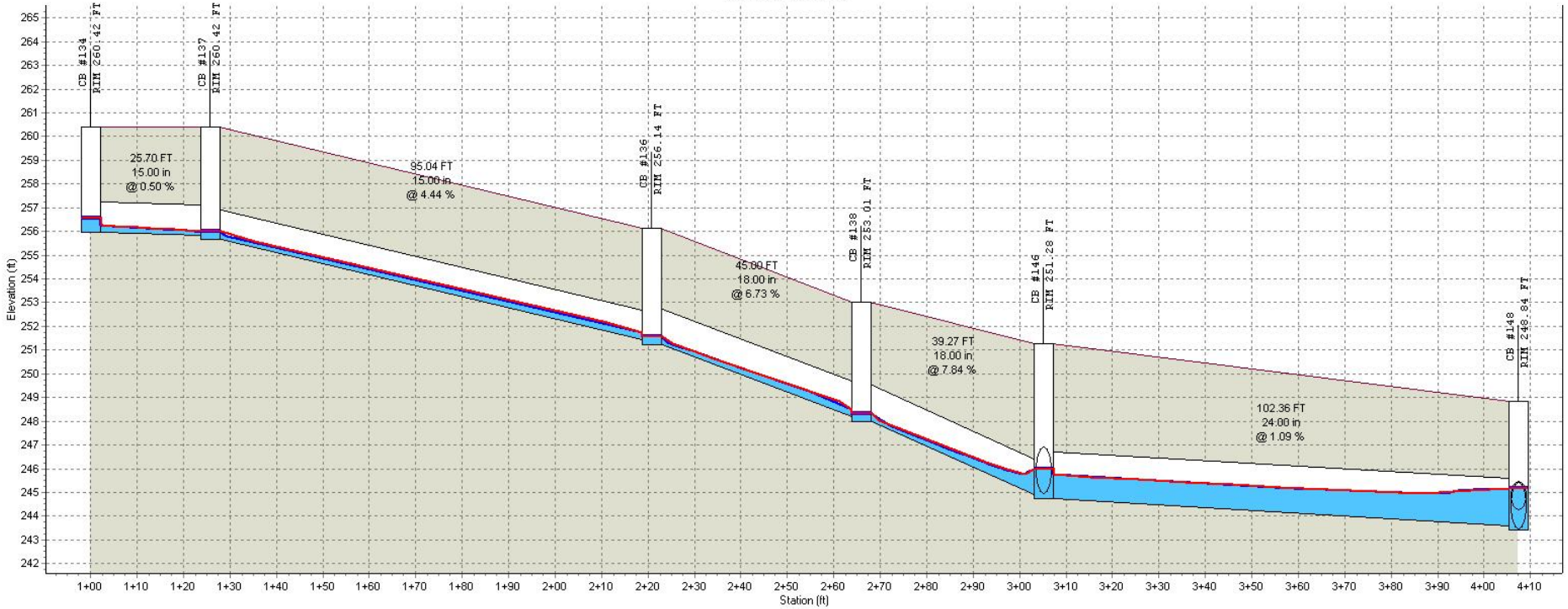


	CB #143(DOUBLE)	CB #144	CB #145	CB #146
RIM (FT):	250.92	250.92	251.46	251.28
Invert (ft):	246.21	245.69	245.21	244.73
Min Pipe Cover (ft):				
Max HGL (ft):	247.51	247.05	246.55	245.98

Link ID:	P #185	P #186	P #187
(FT):	25.81	57.75	55.89
(in):	18.00	24.00	24.00
@ (%):	0.50	0.50	0.50
Up Invert (ft):	246.21	245.69	245.21
Dn Invert (ft):	246.08	245.41	244.93
Max Q (cfs):	6.16	9.10	9.07
Max Vel (ft/s):	4.31	4.46	4.58
Max Depth (ft):	1.13	1.25	1.21

Profile Plot

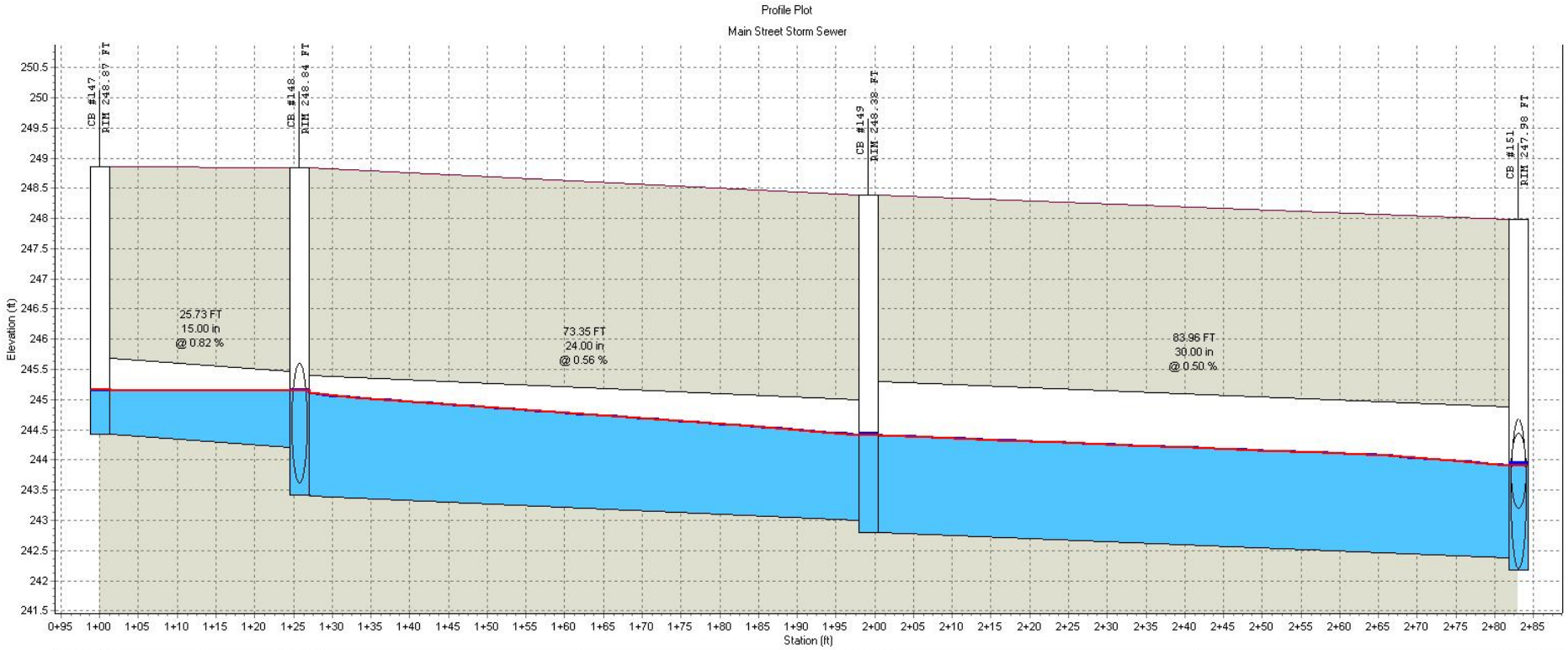
Main Street Storm Sewer



:	CB #134	CB #137	CB #136	CB #138	CB #146	CB #148
RIM (FT):	260.42	260.42	256.14	253.01	251.28	248.84
Invert (ft):	255.98	255.65	251.24	248.00	244.73	243.41
Min Pipe Cover (ft):						
Max HGL (ft):	256.56	256.00	251.59	248.32	245.98	245.16

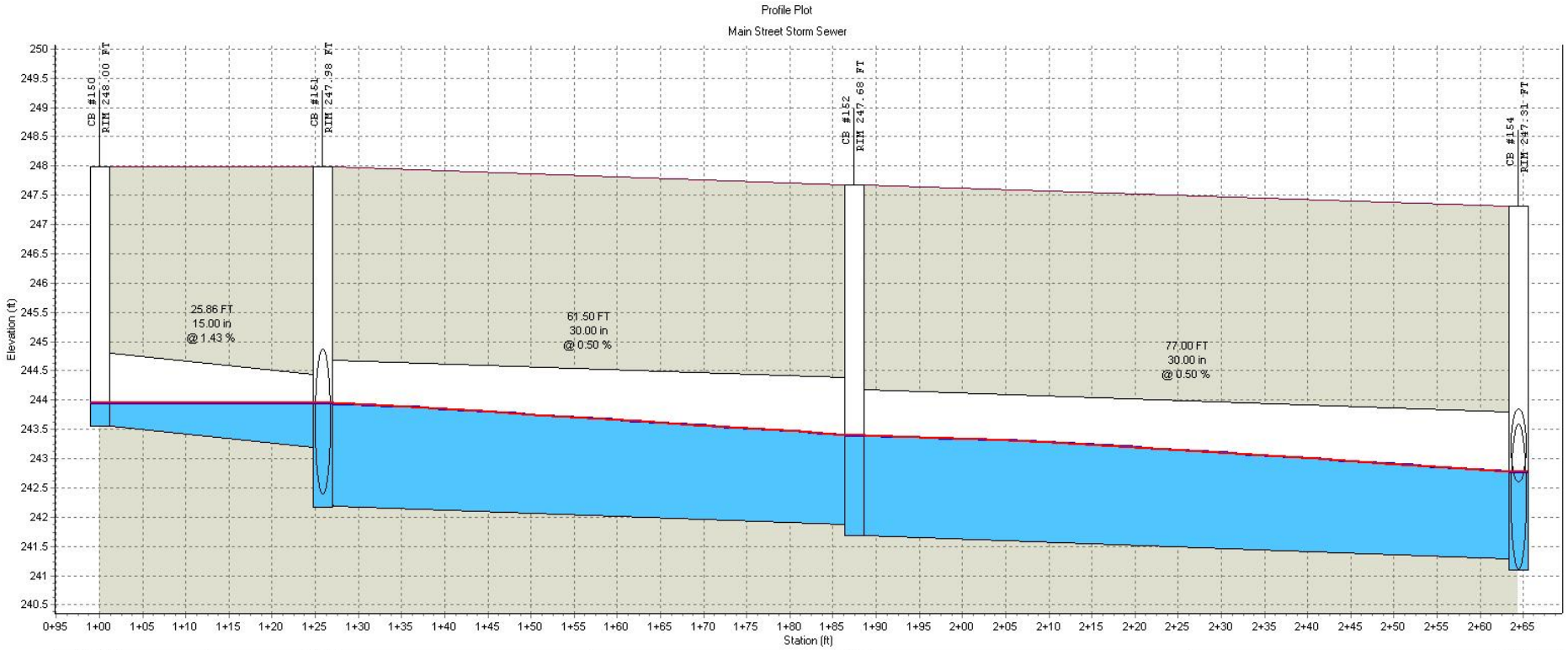
Link ID:	P #177	P #178	P #179	P #180	P #188
(FT):	25.70	95.04	45.00	39.27	102.36
(in):	15.00	15.00	18.00	18.00	24.00
@ (%):	0.50	4.44	6.73	7.84	1.09
Up Invert (ft):	255.98	255.65	251.24	248.00	244.73
Dn Invert (ft):	255.85	251.43	248.20	244.93	243.61
Max Q (cfs):	1.45	1.98	2.55	2.83	12.06
Max Vel (ft/s):	2.95	7.54	8.80	7.58	5.25
Max Depth (ft):	0.53	0.33	0.33	0.68	1.40

HGL



:	CB #147	CB #148	CB #149	CB #151
RIM (FT):	248.87	248.84	248.38	247.98
Invert (ft):	244.43	243.41	242.80	242.18
Min Pipe Cover (ft):				
Max HGL (ft):	245.16	245.16	244.43	243.95

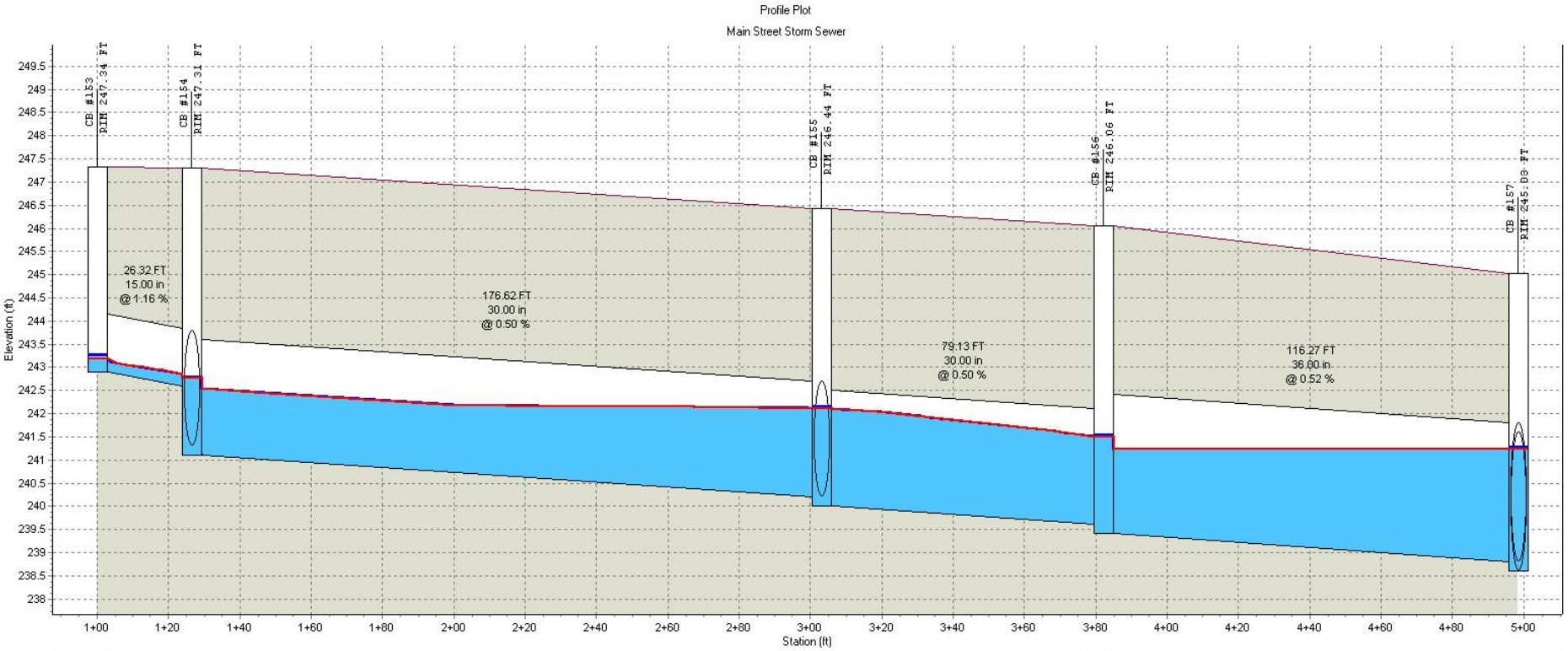
Link ID:	P #189	P #190	P #191
(FT):	25.73	73.35	83.96
(in):	15.00	24.00	30.00
@ (%):	0.82	0.56	0.50
Up Invert (ft):	244.43	243.41	242.80
Dn Invert (ft):	244.22	243.00	242.38
Max Q (cfs):	0.43	13.33	14.33
Max Vel (ft/s):	2.38	4.99	4.37
Max Depth (ft):	0.84	1.59	1.60



:	CB #150	CB #151	CB #152	CB #154
RIM (FT):	248.00	247.98	247.68	247.31
Invert (ft):	243.56	242.18	241.68	241.09
Min Pipe Cover (ft):				
Max HGL (ft):	243.95	243.95	243.40	242.77

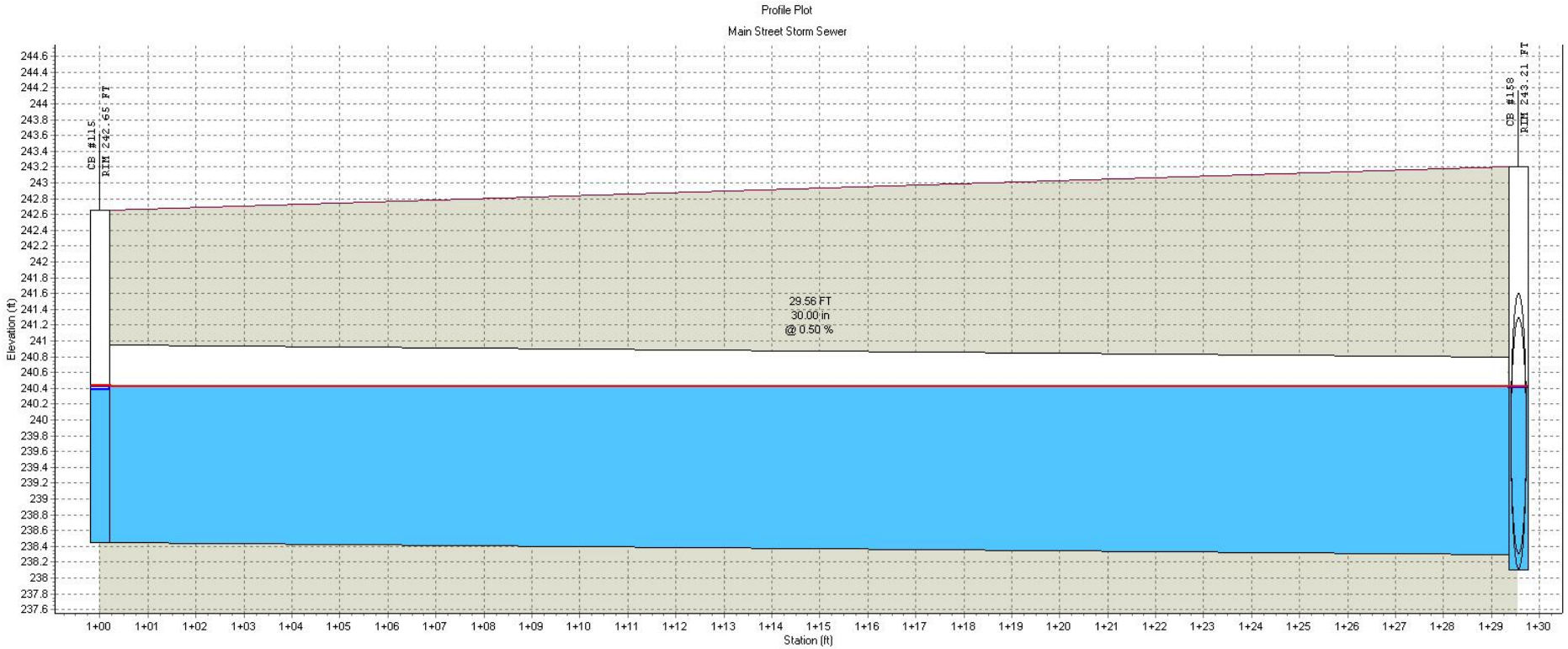
Link ID:	P #192	P #193	P #194
(FT):	25.86	61.50	77.00
(in):	15.00	30.00	30.00
@ (%):	1.43	0.50	0.50
Up Invert (ft):	243.56	242.18	241.68
Dn Invert (ft):	243.19	241.88	241.29
Max Q (cfs):	0.91	15.93	16.26
Max Vel (ft/s):	3.56	4.73	4.99
Max Depth (ft):	0.57	1.64	1.60

HGL



	CB #153	CB #154	CB #155	CB #156	CB #157
RIM (FT):	247.34	247.31	246.44	246.06	245.03
Invert (ft):	242.90	241.09	240.01	239.41	238.60
Min Pipe Cover (ft):					
Max HGL (ft):	243.25	242.77	242.15	241.54	241.27

Link ID:	P #195	P #196	P #197	P #198
(FT):	26.32	176.62	79.13	116.27
(in):	15.00	30.00	30.00	36.00
@ (%):	1.16	0.50	0.50	0.52
Up Invert (ft):	242.90	241.09	240.01	239.41
Dn Invert (ft):	242.59	240.21	239.61	238.80
Max Q (cfs):	0.87	16.82	20.41	20.79
Max Vel (ft/s):	3.46	4.61	5.15	4.03
Max Depth (ft):	0.32	1.81	2.04	2.30

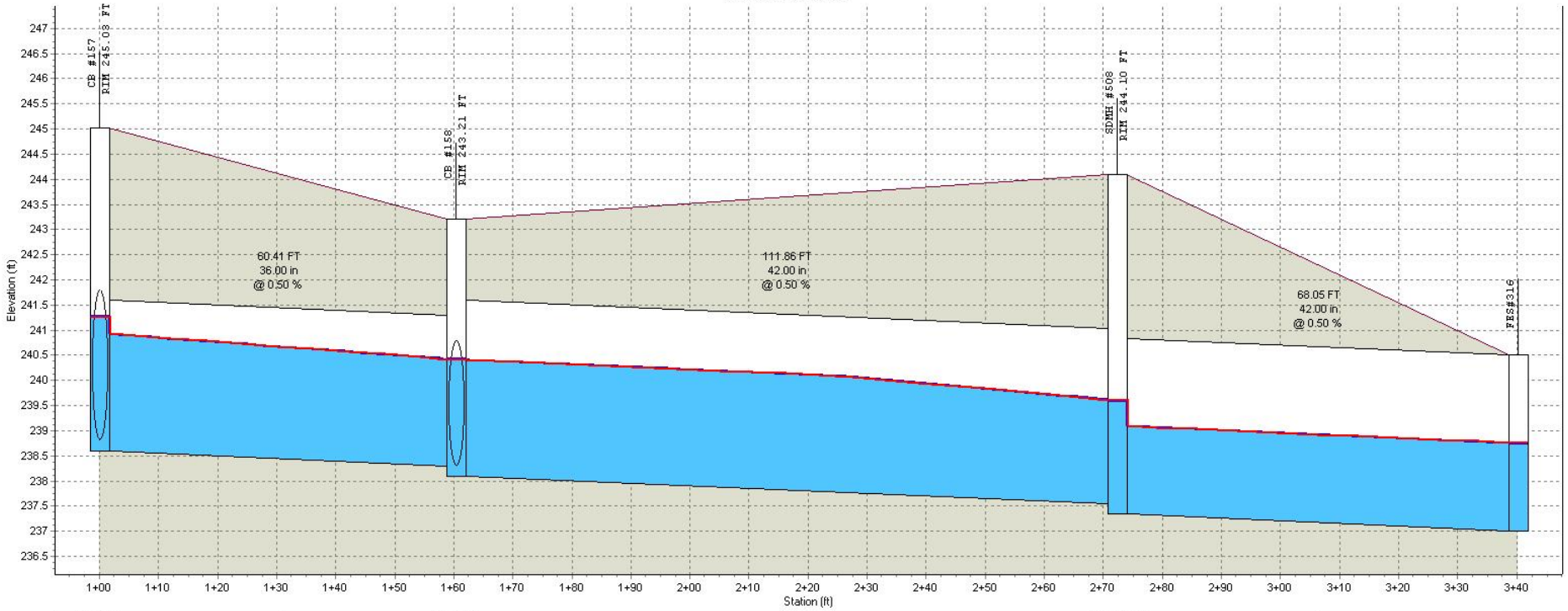


	CB #115		CB #158
RIM (FT):	242.65		243.21
Invert (ft):	238.45		238.10
Min Pipe Cover (ft):			
Max HGL (ft):	240.43		240.42
Link ID:		P #151	
(FT):		29.56	
(in):		30.00	
@ (%):		0.50	
Up Invert (ft):		238.45	
Dn Invert (ft):		238.30	
Max Q (cfs):		0.99	
Max Vel (ft/s):		1.86	
Max Depth (ft):		2.05	

HGL

Profile Plot

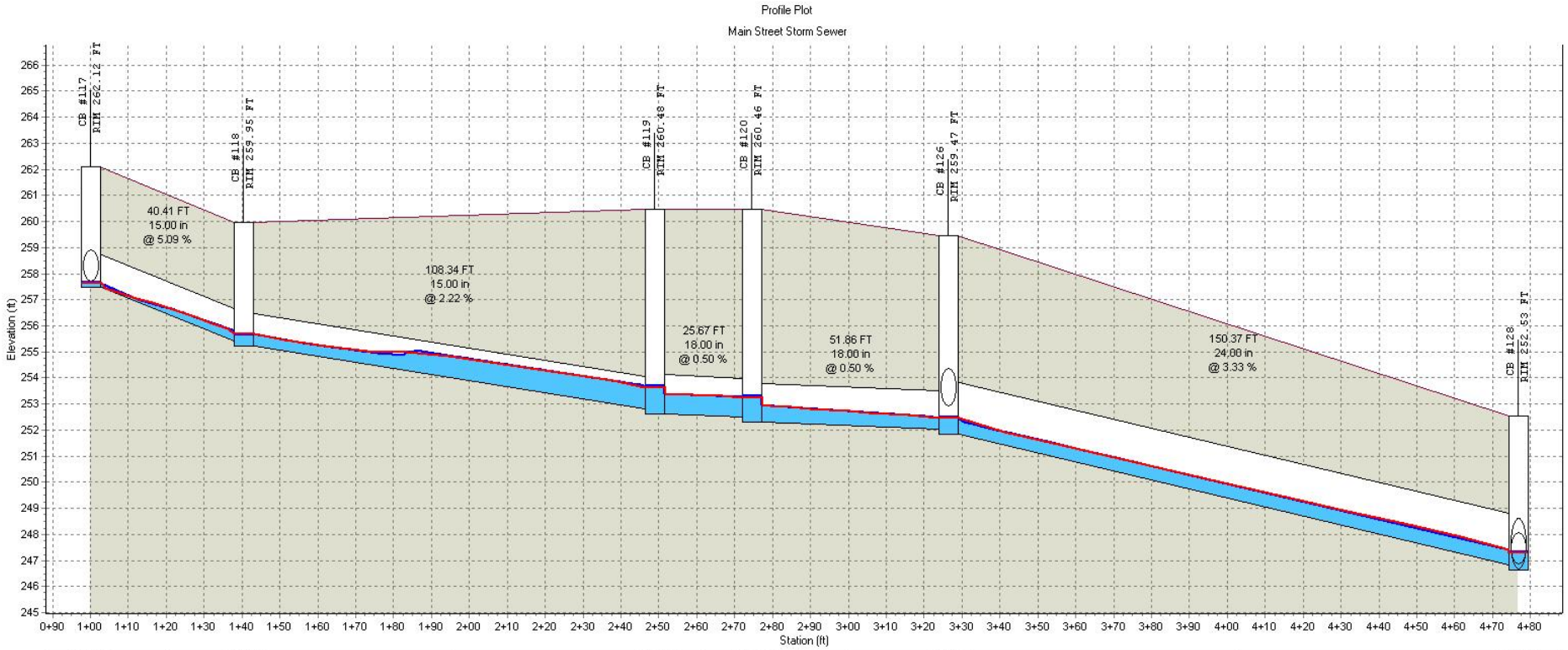
Main Street Storm Sewer



	CB #157	CB #158	SDMH #508	FES#316
RIM (FT):	245.03	243.21	244.10	
Invert (ft):	238.60	238.10	237.34	237.00
Min Pipe Cover (ft):			3.06	
Max HGL (ft):	241.27	240.42	239.60	238.75

Link ID:	P #199	P #200	P #202
(FT):	60.41	111.86	68.05
(in):	36.00	42.00	42.00
@ (%):	0.50	0.50	0.50
Up Invert (ft):	238.60	238.10	237.34
Dn Invert (ft):	238.30	237.54	237.00
Max Q (cfs):	35.30	35.78	35.73
Max Vel (ft/s):	5.87	5.66	6.27
Max Depth (ft):	2.39	2.19	2.01

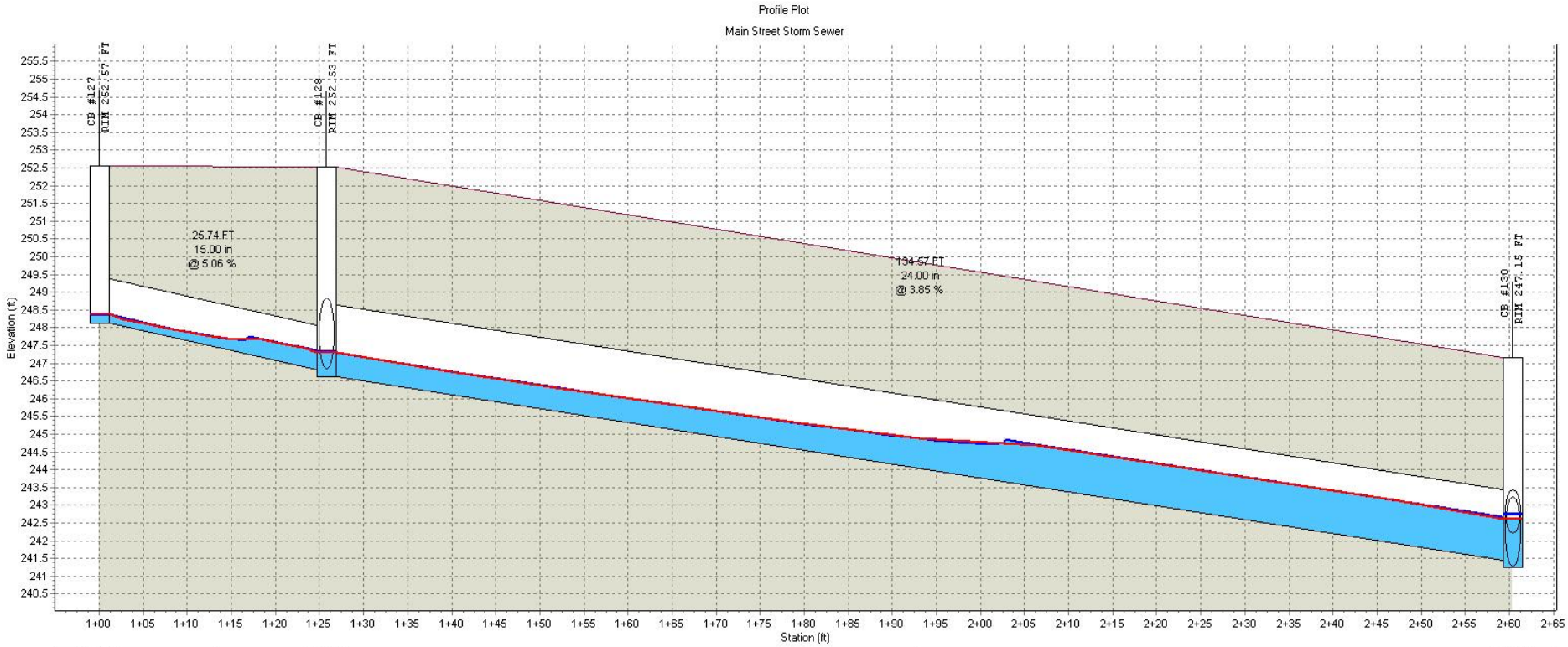
HGL



:	CB #117	CB #118	CB #119	CB #120	CB #126	CB #128
RIM (FT):	262.12	259.95	260.48	260.46	259.47	252.53
Invert (ft):	257.48	255.23	252.62	252.29	251.83	246.63
Min Pipe Cover (ft):						
Max HGL (ft):	257.65	255.68	253.66	253.30	252.49	247.31

Link ID:	P #154	P #155	P #156	P #157	P #158
(FT):	40.41	108.34	25.67	51.86	150.37
(in):	15.00	15.00	18.00	18.00	24.00
@ (%):	5.09	2.22	0.50	0.50	3.33
Up Invert (ft):	257.48	255.23	252.62	252.29	251.83
Dn Invert (ft):	255.43	252.82	252.49	252.03	246.83
Max Q (cfs):	0.56	2.70	4.46	4.48	8.11
Max Vel (ft/s):	4.95	4.21	3.88	3.99	9.56
Max Depth (ft):	0.21	0.65	0.93	0.91	0.63

HGL



	CB #127		CB #128		CB #130
RIM (FT):	252.57		252.53		247.15
Invert (ft):	248.13		246.63		241.25
Min Pipe Cover (ft):					
Max HGL (ft):	248.37		247.31		242.74
Link ID:		P #169		P #159	
(FT):		25.74		134.57	
(in):		15.00		24.00	
@ (%):		5.06		3.85	
Up Invert (ft):		248.13		246.63	
Dn Invert (ft):		246.83		241.45	
Max Q (cfs):		1.07		10.95	
Max Vel (ft/s):		5.01		7.65	
Max Depth (ft):		0.36		0.98	

Profile Plot

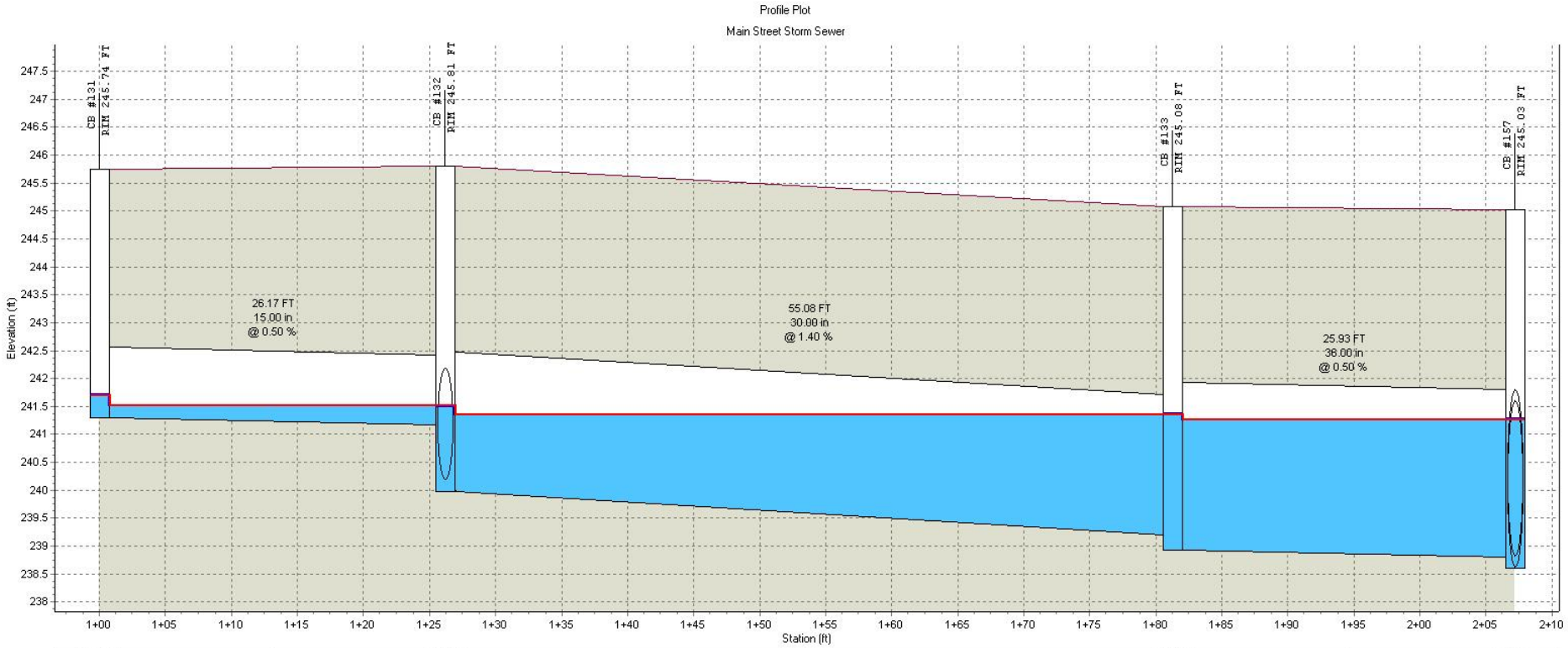
Main Street Storm Sewer



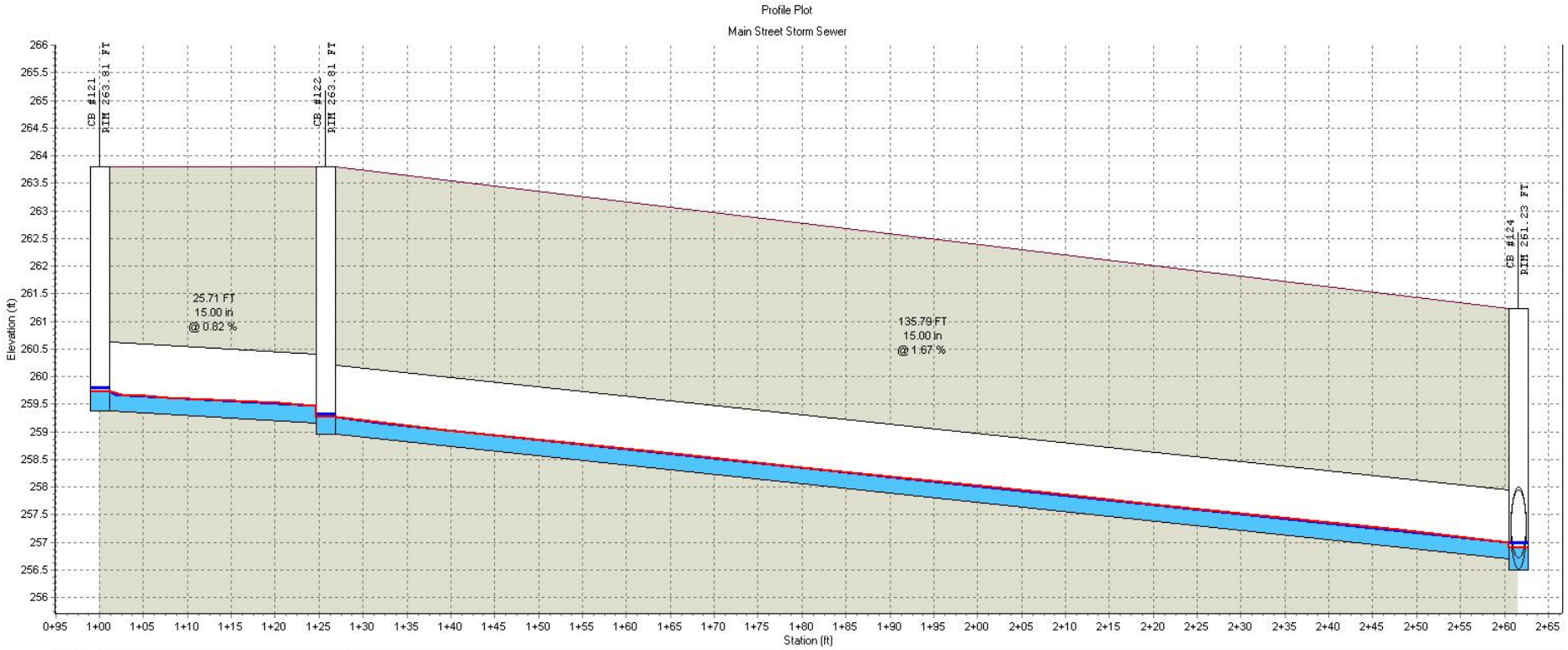
	CB #129		CB #130		CB #132
RIM (FT):	247.16		247.15		245.81
Invert (ft):	242.72		241.25		239.98
Min Pipe Cover (ft):					
Max HGL (ft):	243.03		242.74		241.51
Link ID:		P #170		P #160	
(FT):		25.74		159.82	
(in):		15.00		24.00	
@ (%):		2.04		0.67	
Up Invert (ft):		242.72		241.25	
Dn Invert (ft):		242.20		240.18	
Max Q (cfs):		0.92		13.38	
Max Vel (ft/s):		4.10		5.78	
Max Depth (ft):		0.39		1.39	

HGL

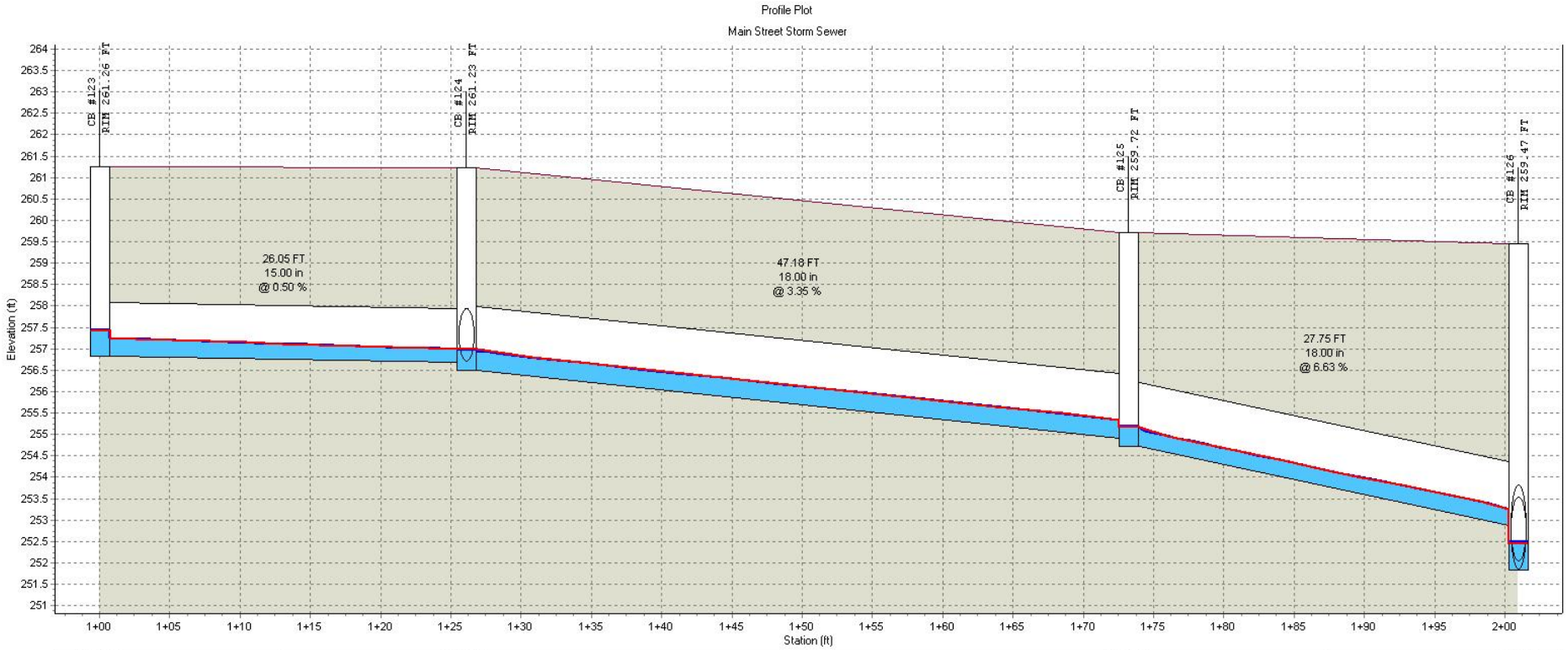
HGL



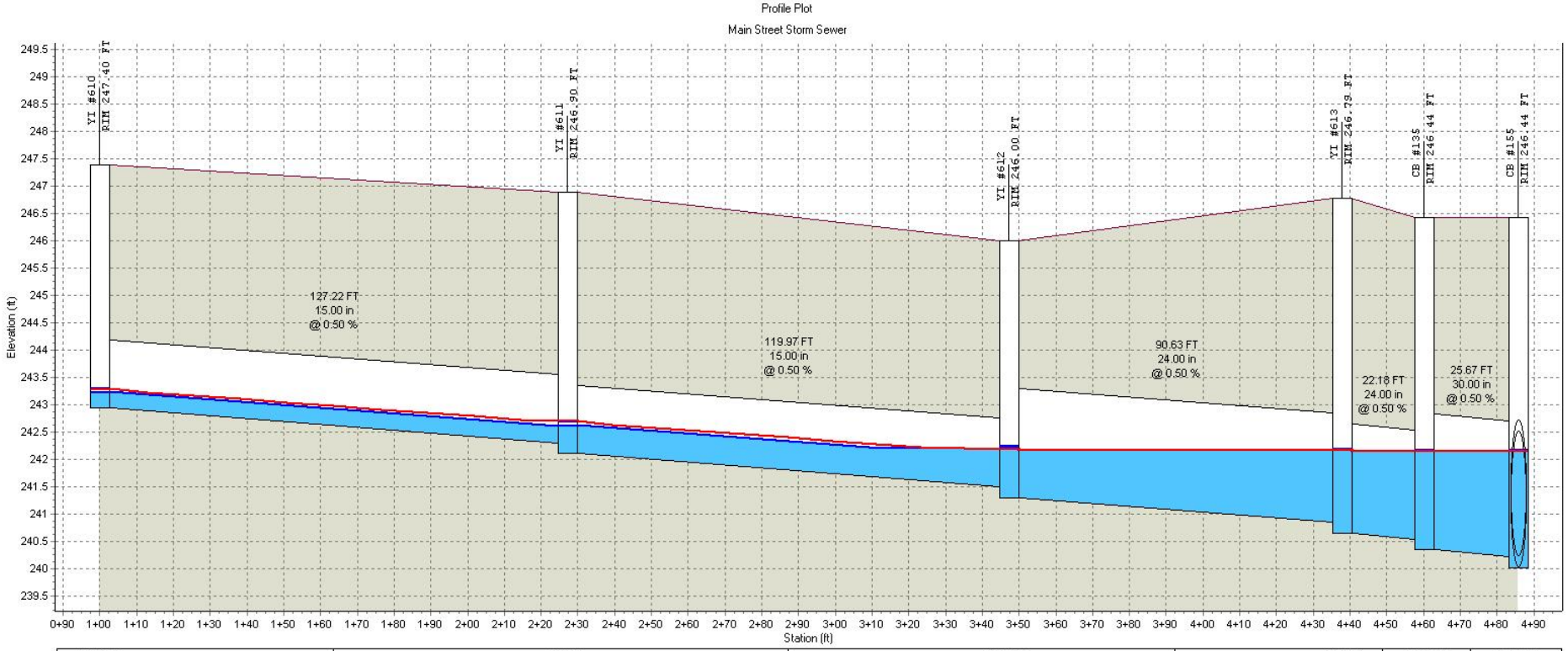
:	CB #131		CB #132		CB #133		CB #157
RIM (FT):	245.74		245.81		245.08		245.03
Invert (ft):	241.31		239.98		238.93		238.60
Min Pipe Cover (ft):							
Max HGL (ft):	241.70		241.51		241.36		241.27
Link ID:		P #171		P #161		P #162	
(FT):		26.17		55.08		25.93	
(in):		15.00		30.00		36.00	
@ (%):		0.50		1.40		0.50	
Up Invert (ft):		241.31		239.98		238.93	
Dn Invert (ft):		241.17		239.21		238.80	
Max Q (cfs):		0.76		15.69		15.92	
Max Vel (ft/s):		2.50		5.58		3.71	
Max Depth (ft):		0.37		1.84		2.45	



	CB #121		CB #122		CB #124
RIM (FT):	263.81		263.81		261.23
Invert (ft):	259.37		258.96		256.50
Min Pipe Cover (ft):					
Max HGL (ft):	259.80		259.32		256.99
Link ID:		P #163		P #164	
(FT):		25.71		135.79	
(in):		15.00		15.00	
@ (%):		0.82		1.67	
Up Invert (ft):		259.37		258.96	
Dn Invert (ft):		259.16		256.70	
Max Q (cfs):		1.11		1.36	
Max Vel (ft/s):		3.27		4.83	
Max Depth (ft):		0.40		0.35	



	CB #123		CB #124		CB #125		CB #126
RIM (FT):	261.26		261.23		259.72		259.47
Invert (ft):	256.83		256.50		254.72		251.83
Min Pipe Cover (ft):							
Max HGL (ft):	257.42		256.99		255.18		252.49
Link ID:		P #165		P #166		P #167	
(FT):		26.05		47.18		27.75	
(in):		15.00		18.00		18.00	
@ (%):		0.50		3.35		6.63	
Up Invert (ft):		256.83		256.50		254.72	
Dn Invert (ft):		256.70		254.92		252.88	
Max Q (cfs):		1.52		3.32		3.56	
Max Vel (ft/s):		2.99		7.21		8.91	
Max Depth (ft):		0.54		0.46		0.42	



:	YI #610	YI #611	YI #612	YI #613	CB #135	CB #155
RIM (FT):	247.40	246.90	246.00	246.79	246.44	246.44
Invert (ft):	242.94	242.10	241.30	240.65	240.34	240.01
Min Pipe Cover (ft):						
Max HGL (ft):	243.28	242.70	242.22	242.18	242.16	242.15

Link ID:	P #172	P #173	P #174	P #175	P #176
(FT):	127.22	119.97	90.63	22.18	25.67
(in):	15.00	15.00	24.00	24.00	30.00
@ (%):	0.50	0.50	0.50	0.50	0.50
Up Invert (ft):	242.94	242.10	241.30	240.65	240.34
Dn Invert (ft):	242.30	241.50	240.85	240.53	240.21
Max Q (cfs):	0.73	1.88	4.75	4.02	4.68
Max Vel (ft/s):	2.38	3.03	3.74	3.23	3.15
Max Depth (ft):	0.37	0.64	1.13	1.58	1.89

S T O R M W A T E R AREA " G "

STORMWATER PIPING AND HYDRAULIC GRADE LINE FOR 10-YR STORM



PLAN VIEW

DRAINAGE AREA

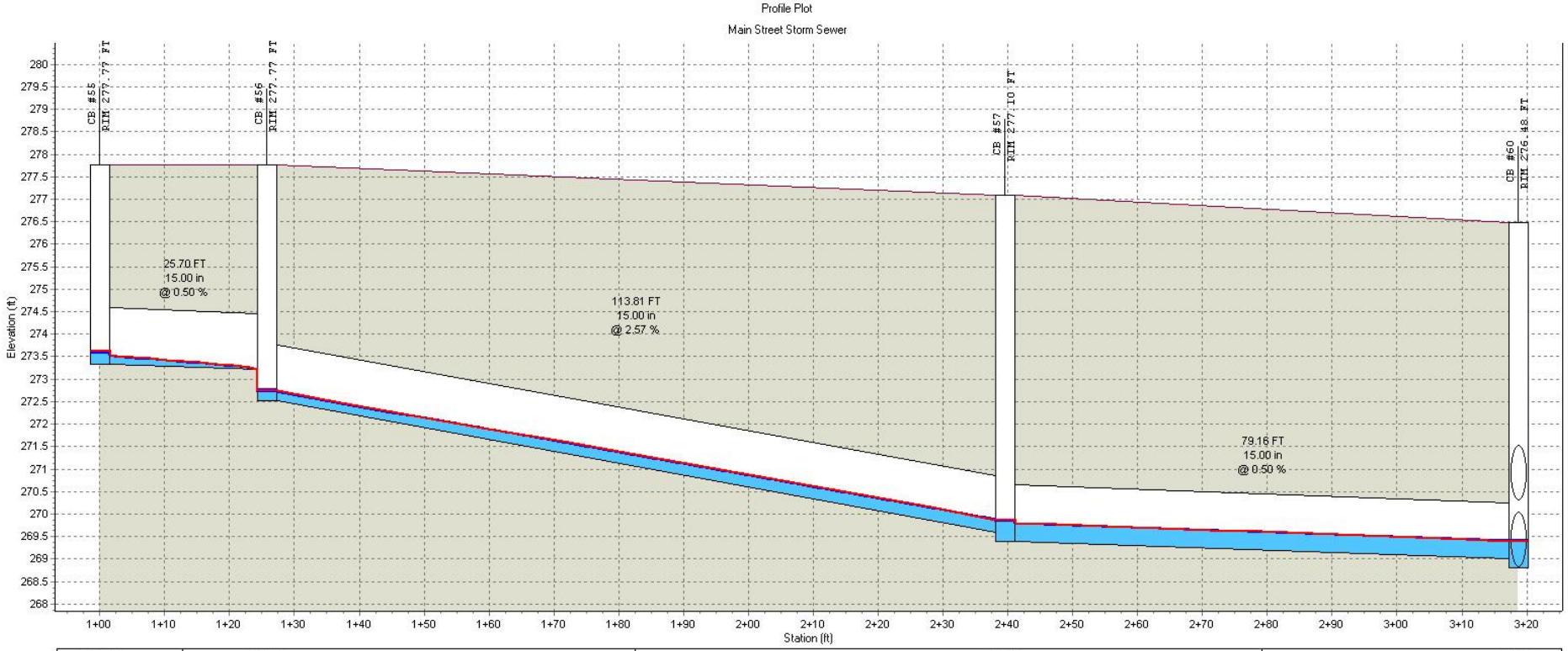
SN	Element ID	Area (acres)	Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
1	Sub-CB#55	0.07	CB #55	0.8300	0.60	0.50	0.42	7.210	0 00:05:00
2	Sub-CB#56	0.07	CB #56	0.8300	0.60	0.50	0.42	7.210	0 00:05:00
3	Sub-CB#57	0.07	CB #57	0.8300	0.60	0.50	0.42	7.210	0 00:05:00
4	Sub-CB#58	0.05	CB #58	0.7900	0.60	0.48	0.29	7.210	0 00:05:00
5	Sub-CB#59	0.09	CB #59	0.7100	0.60	0.43	0.46	7.210	0 00:05:00
6	Sub-CB#60	0.01	CB #60	0.8300	0.60	0.50	0.06	7.210	0 00:05:00
7	Sub-CB#61	0.21	CB #61	0.8300	0.60	0.50	1.26	7.210	0 00:05:00
8	Sub-CB#62	0.08	CB #62	0.8300	0.60	0.50	0.48	7.210	0 00:05:00
9	Sub-CB#63	0.04	CB #63	0.8300	0.60	0.50	0.24	7.210	0 00:05:00
10	Sub-CB#64	0.09	CB #64	0.8300	0.60	0.50	0.54	7.210	0 00:05:00
11	Sub-CB#65	0.08	CB #65	0.8300	0.60	0.50	0.48	7.210	0 00:05:00
12	Sub-CB#66	0.17	CB #66	0.8300	0.60	0.50	1.02	7.210	0 00:05:00
13	Sub-CB#67	0.06	CB #67	0.7100	0.60	0.43	0.31	7.210	0 00:05:00
14	Sub-CB#68	0.06	CB #68	0.8300	0.60	0.50	0.36	7.210	0 00:05:00
15	Sub-CB#69	0.08	CB #69	0.8300	0.60	0.50	0.48	7.210	0 00:05:00
16	Sub-CB#70	0.07	CB #70	0.8300	0.60	0.50	0.42	7.210	0 00:05:00
17	Sub-CB#71	0.09	CB #71	0.8300	0.60	0.50	0.54	7.210	0 00:05:00
18	Sub-CB#72	0.09	CB #72	0.8300	0.60	0.50	0.54	7.210	0 00:05:00
19	Sub-CB#73	0.09	CB #73	0.7100	0.60	0.43	0.46	7.210	0 00:05:00
20	Sub-CB#74	0.04	CB #74	0.8300	0.60	0.50	0.24	7.210	0 00:05:00
21	Sub-CB#75	0.77	CB #75	0.7100	0.60	0.43	3.94	7.210	0 00:05:00
22	Sub-CB#76	0.19	CB #76	0.7100	0.60	0.43	0.97	7.210	0 00:05:00
23	Sub-CB#77	0.27	CB #77	0.5100	0.60	0.31	0.99	7.210	0 00:05:00
24	Sub-CB#78	0.07	CB #78	0.8300	0.60	0.50	0.42	7.210	0 00:05:00
25	Sub-CB#79	0.34	CB #79	0.4700	0.60	0.28	1.15	7.210	0 00:05:00
26	Sub-CB#80	0.12	CB #80	0.8300	0.60	0.50	0.72	7.210	0 00:05:00
27	Sub-CB#81	1.03	CB #81(DOUBLE)	0.7100	0.60	0.43	5.27	7.210	0 00:05:00
28	Sub-CB#82	0.12	CB #82	0.8300	0.60	0.50	0.72	7.210	0 00:05:00
29	Sub-CB#83	0.38	CB #83	0.4700	0.60	0.28	1.29	7.210	0 00:05:00
30	Sub-CB#84	0.10	CB #84	0.8300	0.60	0.50	0.60	7.210	0 00:05:00
31	Sub-CB#85	0.11	CB #85	0.8300	0.60	0.50	0.66	7.210	0 00:05:00

DRAINAGE AREA

SN	Element ID	Area (acres)	Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
32	Sub-CB#86	0.05	CB #86	0.8300	0.60	0.50	0.30	7.210	0 00:05:00
33	Sub-CB#87	0.06	CB #87	0.8300	0.60	0.50	0.36	7.210	0 00:05:00
34	Sub-CB#88	0.04	CB #88	0.8300	0.60	0.50	0.24	7.210	0 00:05:00
35	Sub-CB#89	0.07	CB #89	0.8300	0.60	0.50	0.42	7.210	0 00:05:00
36	Sub-CB#90	0.17	CB #90	0.7100	0.60	0.43	0.87	7.210	0 00:05:00
37	Sub-CB#91	0.14	CB #91	0.7100	0.60	0.43	0.72	7.210	0 00:05:00
38	Sub-CB#92	0.06	CB #92	0.8300	0.60	0.50	0.36	7.210	0 00:05:00
39	Sub-CB#93	0.06	CB #93	0.8700	0.60	0.52	0.38	7.210	0 00:05:00
40	Sub-CB#94	0.12	CB #94	0.8300	0.60	0.50	0.72	7.210	0 00:05:00
41	Sub-CB#95	0.05	CB #95	0.8700	0.60	0.52	0.31	7.210	0 00:05:00
42	Sub-DI#201	0.07	DI #201	0.8300	0.60	0.50	0.42	7.210	0 00:05:00
43	Sub-DI#202	0.05	DI #202	0.7900	0.60	0.48	0.29	7.210	0 00:05:00
44	Sub-DI#203	0.04	DI #203	0.7900	0.60	0.48	0.23	7.210	0 00:05:00
45	Sub-DI#204	0.08	DI #204	0.7100	0.60	0.43	0.41	7.210	0 00:05:00
46	Sub-DI#205	0.07	DI #205	0.7900	0.60	0.48	0.40	7.210	0 00:05:00
47	Sub-DI#206	0.95	DI #206	0.6700	0.60	0.40	4.59	7.210	0 00:05:00
48	Sub-DI#207	0.09	DI #207	0.8300	0.60	0.50	0.54	7.210	0 00:05:00
49	Sub-DI#208	0.29	DI #208	0.7100	0.60	0.43	1.49	7.210	0 00:05:00
50	Sub-DI#209	0.30	DI #209	0.7100	0.60	0.43	1.54	7.210	0 00:05:00
51	Sub-DI#210	0.46	DI #210	0.7100	0.60	0.43	2.36	7.210	0 00:05:00
52	Sub-DI#211	0.04	DI #211	0.8300	0.60	0.50	0.24	7.210	0 00:05:00
53	Sub-DI#212	0.25	DI #212	0.6300	0.60	0.38	1.14	7.210	0 00:05:00
54	Sub-DI#213	0.10	DI #213	0.6700	0.60	0.40	0.48	7.210	0 00:05:00
55	Sub-DI#214	0.02	DI #214	0.7900	0.60	0.48	0.11	7.210	0 00:05:00
56	Sub-DI#215	0.71	DI #215	0.6700	0.60	0.40	3.43	7.210	0 00:05:00
57	Sub-DI#216	0.05	DI #216	0.8300	0.60	0.50	0.30	7.210	0 00:05:00
58	Sub-DI#217	0.71	DI #217	0.6100	0.60	0.37	3.12	7.210	0 00:05:00
59	Sub-DI#218	0.22	DI #218	0.4700	0.60	0.28	0.75	7.210	0 00:05:00
60	Sub-DI#219	0.22	DI #219	0.5100	0.60	0.31	0.81	7.210	0 00:05:00
61	Sub-DI#220	0.18	DI #220	0.7500	0.60	0.45	0.97	7.210	0 00:05:00
62	Sub-DI#221	1.04	DI #221	0.7500	0.60	0.45	5.62	7.210	0 00:05:00

MODEL INPUT										MODEL OUTPUT									
SN	Element ID	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Manning's Roughness	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Max Flow Velocity (ft/sec)	Travel Time (min)	Design Flow Capacity (cfs)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Total Time Surcharged (min)	Max Flow Depth (ft)	Reported Condition
1	P #100	DI #205	DI #206	107.29	266.17	258.26	7.3800	15.000	0.0130	0.39	0 00:05	3.68	0.49	17.55	0.02	0.22	0.00	0.28	Calculated
2	P #101	DI #206	DI #207	94.54	258.06	254.71	3.5400	15.000	0.0130	4.84	0 00:05	8.61	0.18	12.15	0.40	0.47	0.00	0.59	Calculated
3	P #102	DI #207	DI #208	51.61	254.51	251.47	5.9000	15.000	0.0130	5.38	0 00:05	8.20	0.10	15.69	0.34	0.56	0.00	0.70	Calculated
4	P #103	DI #208	CB #81(DOUBLE)	127.55	251.26	247.03	3.3200	30.000	0.0130	22.07	0 00:05	9.15	0.23	74.73	0.30	0.52	0.00	1.30	Calculated
5	P #104	CB #80	CB #81(DOUBLE)	26.62	249.04	248.53	1.9200	15.000	0.0130	0.62	0 00:05	3.81	0.12	8.96	0.07	0.19	0.00	0.24	Calculated
6	P #105	CB #81(DOUBLE)	CB #84	42.63	246.83	245.59	2.9200	30.000	0.0130	27.29	0 00:05	7.09	0.10	70.08	0.39	0.78	0.00	1.94	Calculated
7	P #106	CB #82	CB #83	25.62	259.78	259.33	1.7400	15.000	0.0130	0.70	0 00:05	3.79	0.11	8.53	0.08	0.21	0.00	0.26	Calculated
8	P #107	CB #83	CB #84	166.52	259.13	247.89	6.7500	18.000	0.0130	1.86	0 00:05	8.59	0.32	27.30	0.07	0.18	0.00	0.27	Calculated
9	P #108	CB #84	CB #85	25.74	245.39	244.98	1.5900	36.000	0.0130	29.52	0 00:05	5.17	0.08	83.97	0.35	0.76	0.00	2.28	Calculated
10	P #109	CB #85	CB #86	59.02	244.78	244.48	0.5000	36.000	0.0130	29.95	0 00:05	5.26	0.19	47.23	0.63	0.76	0.00	2.27	Calculated
11	P #110	CB #86	CB #88	51.80	244.28	244.03	0.5000	36.000	0.0130	30.08	0 00:06	5.96	0.14	47.16	0.64	0.67	0.00	2.02	Calculated
12	P #111	CB #87	CB #88	28.32	245.92	245.15	2.7100	15.000	0.0130	0.33	0 00:05	3.51	0.13	10.63	0.03	0.28	0.00	0.36	Calculated
13	P #112	CB #88	DI #221	39.96	243.83	243.17	1.6500	36.000	0.0130	30.52	0 00:06	6.95	0.10	85.72	0.36	0.60	0.00	1.79	Calculated
14	P #113	DI #211	DI #210	104.64	291.78	283.17	8.2300	15.000	0.0130	0.22	0 00:05	3.76	0.46	18.54	0.01	0.14	0.00	0.18	Calculated
15	P #114	DI #209	DI #210	78.10	285.39	283.32	2.6500	15.000	0.0130	1.50	0 00:05	5.76	0.23	10.52	0.14	0.27	0.00	0.33	Calculated
16	P #115	DI #210	DI #212	132.27	282.96	275.48	5.6600	15.000	0.0130	3.97	0 00:05	10.01	0.22	15.37	0.26	0.36	0.00	0.45	Calculated
17	P #116	DI #212	DI #217	112.22	275.28	271.34	3.5100	15.000	0.0130	5.07	0 00:05	7.48	0.25	12.10	0.42	0.55	0.00	0.69	Calculated
18	P #117	DI #213	DI #215	122.71	286.06	278.58	6.0900	15.000	0.0130	0.47	0 00:05	4.24	0.48	15.95	0.03	0.18	0.00	0.23	Calculated
19	P #118	DI #214	DI #215	43.95	278.80	278.58	0.5000	15.000	0.0130	0.11	0 00:05	1.22	0.60	4.57	0.02	0.18	0.00	0.22	Calculated
20	P #119	DI #215	DI #216	91.42	278.38	274.38	4.3800	15.000	0.0130	3.89	0 00:05	8.86	0.17	13.53	0.29	0.39	0.00	0.48	Calculated
21	P #120	DI #216	DI #217	75.06	274.18	271.34	3.7800	15.000	0.0130	4.19	0 00:05	6.59	0.19	12.56	0.33	0.52	0.00	0.65	Calculated
22	P #121	DI #217	DI #218	114.75	271.14	266.51	4.0300	18.000	0.0130	12.24	0 00:05	11.02	0.17	21.09	0.58	0.60	0.00	0.90	Calculated
23	P #122	CB #89	CB #90	28.76	267.14	267.00	0.5000	18.000	0.0130	0.41	0 00:05	1.98	0.24	7.43	0.05	0.22	0.00	0.33	Calculated
24	P #123	CB #90	DI #218	56.37	266.80	266.51	0.5000	18.000	0.0130	1.12	0 00:06	2.03	0.46	7.43	0.15	0.48	0.00	0.72	Calculated
25	P #124	DI #218	CB #92	132.70	266.31	260.97	4.0300	18.000	0.0130	13.77	0 00:05	11.50	0.19	21.09	0.65	0.64	0.00	0.96	Calculated
26	P #125	CB #91	CB #92	32.17	260.52	260.36	0.5000	24.000	0.0130	0.69	0 00:06	1.49	0.36	16.00	0.04	0.54	0.00	1.08	Calculated
27	P #126	CB #92	CB #93	26.11	260.16	259.54	2.3900	24.000	0.0130	14.69	0 00:06	8.04	0.05	35.00	0.42	0.56	0.00	1.13	Calculated
28	P #127	CB #93	CB #95	89.40	259.33	255.96	3.7800	24.000	0.0130	15.01	0 00:06	11.03	0.14	44.00	0.34	0.45	0.00	0.90	Calculated
29	P #128	CB #94	CB #95	25.70	257.04	255.96	4.2300	15.000	0.0130	0.71	0 00:05	4.03	0.11	13.28	0.05	0.36	0.00	0.45	Calculated
30	P #129	CB #95	DI #219	87.13	255.76	251.50	4.8900	24.000	0.0130	15.88	0 00:06	11.55	0.13	50.02	0.32	0.45	0.00	0.90	Calculated
31	P #130	DI #219	DI #220	156.57	251.30	248.47	1.8100	30.000	0.0130	16.45	0 00:06	8.91	0.29	55.16	0.30	0.40	0.00	1.01	Calculated
32	P #131	DI #220	DI #221	120.83	247.65	243.17	3.7100	36.000	0.0130	17.21	0 00:06	6.41	0.31	128.51	0.13	0.41	0.00	1.23	Calculated

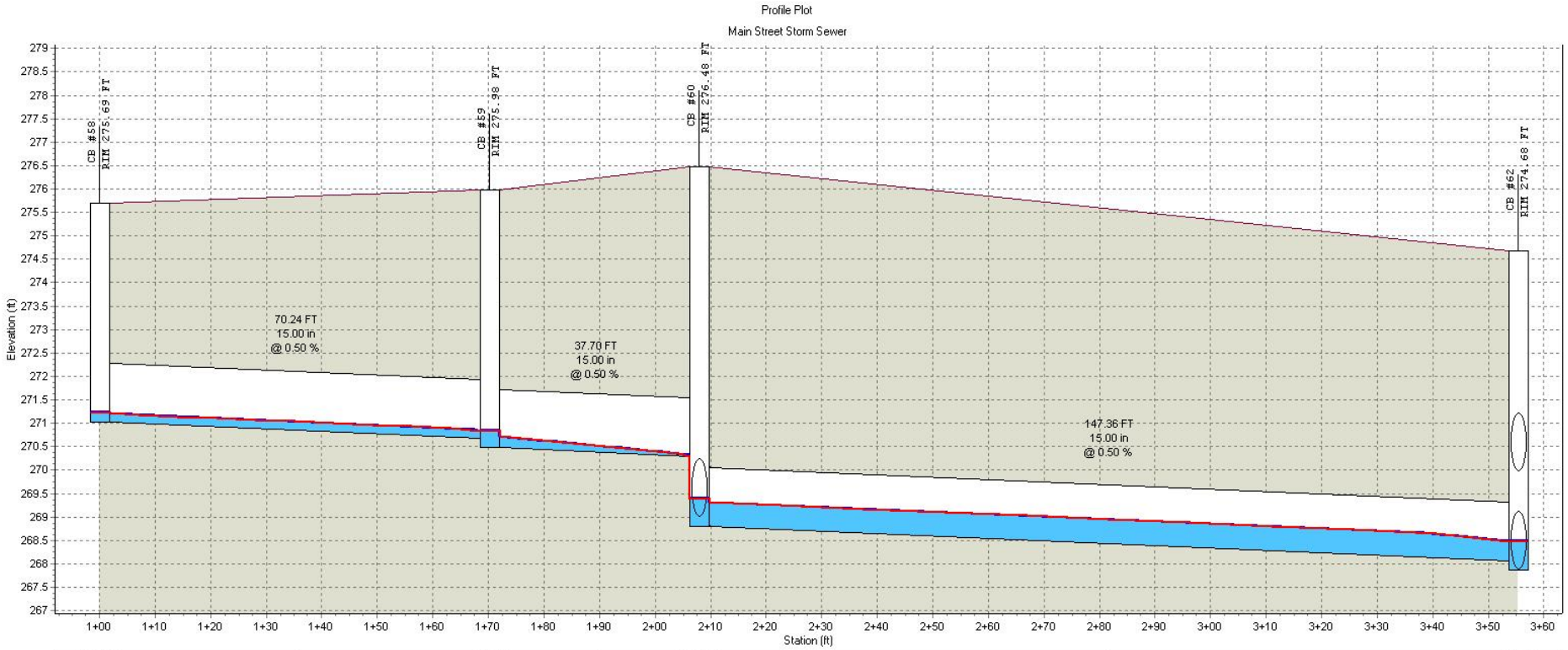
MODEL INPUT										MODEL OUTPUT									
SN	Element ID	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Manning's Roughness	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Max Flow Velocity (ft/sec)	Travel Time (min)	Design Flow Capacity (cfs)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Total Time Surcharged (min)	Max Flow Depth (ft)	Reported Condition
33	P #132	DI #221	SDMH #504	118.84	242.96	240.10	2.4100	42.000	0.0150	52.10	0 00:06	9.43	0.21	135.45	0.38	0.57	0.00	1.99	Calculated
34	P #133	SDMH #504	FES#306	77.61	239.54	239.00	0.6900	42.000	0.0130	52.19	0 00:06	7.71	0.17	83.68	0.62	0.66	0.00	2.33	Calculated
35	P #71	CB #55	CB #56	25.70	273.34	273.21	0.5000	15.000	0.0130	0.38	0 00:05	2.11	0.20	4.57	0.08	0.21	0.00	0.26	Calculated
36	P #72	CB #56	CB #57	113.81	272.52	269.60	2.5700	15.000	0.0130	0.77	0 00:05	4.62	0.41	10.35	0.07	0.20	0.00	0.24	Calculated
37	P #73	CB #57	CB #60	79.16	269.40	269.00	0.5000	15.000	0.0130	1.10	0 00:05	2.91	0.45	4.57	0.24	0.35	0.00	0.44	Calculated
38	P #74	CB #58	CB #59	70.24	271.03	270.67	0.5000	15.000	0.0130	0.26	0 00:05	1.99	0.59	4.57	0.06	0.17	0.00	0.21	Calculated
39	P #75	CB #59	CB #60	37.70	270.47	270.29	0.5000	15.000	0.0130	0.70	0 00:05	2.50	0.25	4.57	0.15	0.28	0.00	0.35	Calculated
40	P #76	CB #60	CB #62	147.36	268.80	268.07	0.5000	15.000	0.0130	1.79	0 00:06	3.38	0.73	4.57	0.39	0.45	0.00	0.56	Calculated
41	P #77	CB #61	CB #62	25.74	270.09	269.96	0.5000	15.000	0.0130	1.13	0 00:05	2.77	0.15	4.57	0.25	0.37	0.00	0.46	Calculated
42	P #78	CB #62	CB #63	72.14	267.87	266.72	1.5800	15.000	0.0130	3.15	0 00:06	4.59	0.26	8.13	0.39	0.57	0.00	0.72	Calculated
43	P #79	CB #63	CB #64	25.72	266.52	266.39	0.5000	15.000	0.0130	3.34	0 00:06	3.52	0.12	4.57	0.73	0.73	0.00	0.91	Calculated
44	P #80	CB #64	CB #71	47.54	266.19	265.96	0.5000	18.000	0.0130	3.90	0 00:06	3.19	0.25	7.43	0.53	0.67	0.00	1.00	Calculated
45	P #81	CB #65	CB #66	26.09	296.53	296.34	0.7300	15.000	0.0130	0.47	0 00:05	2.52	0.17	5.50	0.09	0.21	0.00	0.26	Calculated
46	P #82	CB #66	CB #68	113.04	296.14	290.65	4.8600	15.000	0.0130	1.42	0 00:05	7.18	0.26	14.24	0.10	0.22	0.00	0.27	Calculated
47	P #83	CB #67	CB #68	25.86	290.78	290.65	0.5000	15.000	0.0130	0.30	0 00:05	1.99	0.22	4.57	0.07	0.18	0.00	0.23	Calculated
48	P #84	CB #68	CB #70	131.01	290.45	280.53	7.5700	15.000	0.0130	2.05	0 00:05	9.35	0.23	17.77	0.12	0.23	0.00	0.29	Calculated
49	P #85	CB #69	CB #70	25.76	280.66	280.53	0.5000	15.000	0.0130	0.47	0 00:05	2.22	0.19	4.57	0.10	0.23	0.00	0.29	Calculated
50	P #86	CB #70	CB #71	150.87	280.33	268.26	8.0000	15.000	0.0130	2.89	0 00:05	10.52	0.24	18.27	0.16	0.27	0.00	0.34	Calculated
51	P #87	CB #71	CB #72	25.71	265.76	265.63	0.5000	24.000	0.0130	7.10	0 00:06	4.18	0.10	16.00	0.44	0.53	0.00	1.06	Calculated
52	P #88	CB #72	CB #74	46.88	265.43	265.04	0.8300	24.000	0.0130	7.55	0 00:06	5.22	0.15	20.56	0.37	0.47	0.00	0.94	Calculated
53	P #89	CB #73	CB #74	25.72	265.47	265.04	1.6800	15.000	0.0130	0.46	0 00:05	2.74	0.16	8.36	0.05	0.28	0.00	0.35	Calculated
54	P #90	CB #74	CB #75	49.60	264.84	263.06	3.5800	24.000	0.0130	8.13	0 00:06	7.41	0.11	42.80	0.19	0.39	0.00	0.77	Calculated
55	P #91	CB #75	DI #204	44.55	262.86	261.93	2.1000	24.000	0.0130	10.39	0 00:06	7.58	0.10	32.76	0.32	0.45	0.00	0.90	Calculated
56	P #92	DI #201	DI #202	108.13	280.03	272.06	7.3700	15.000	0.0130	0.41	0 00:05	5.68	0.32	17.54	0.02	0.11	0.00	0.13	Calculated
57	P #93	DI #202	DI #203	93.47	271.86	265.43	6.8900	15.000	0.0130	0.68	0 00:05	6.58	0.24	16.95	0.04	0.14	0.00	0.17	Calculated
58	P #94	DI #203	DI #204	58.16	265.23	261.93	5.6700	15.000	0.0130	0.89	0 00:05	4.06	0.24	15.38	0.06	0.37	0.00	0.46	Calculated
59	P #95	DI #204	CB #77	97.00	261.73	258.68	3.1500	24.000	0.0130	12.62	0 00:06	9.99	0.16	40.12	0.31	0.42	0.00	0.85	Calculated
60	P #96	CB #76	CB #77	24.86	259.59	258.68	3.6700	15.000	0.0130	0.91	0 00:05	4.17	0.10	12.37	0.07	0.39	0.00	0.49	Calculated
61	P #97	CB #77	CB #79	119.40	258.48	254.63	3.2200	24.000	0.0130	14.21	0 00:06	10.56	0.19	40.59	0.35	0.44	0.00	0.89	Calculated
62	P #98	CB #78	CB #79	25.73	255.44	254.63	3.1200	15.000	0.0130	0.47	0 00:05	3.02	0.14	11.41	0.04	0.36	0.00	0.45	Calculated
63	P #99	CB #79	DI #208	43.63	254.43	251.47	6.8100	24.000	0.0130	15.54	0 00:06	11.79	0.06	59.01	0.26	0.44	0.00	0.89	Calculated



:	CB #55	CB #56	CB #57	CB #60
RIM (FT):	277.77	277.77	277.10	276.48
Invert (ft):	273.34	272.52	269.40	268.80
Min Pipe Cover (ft):				
Max HGL (ft):	273.61	272.75	269.86	269.39

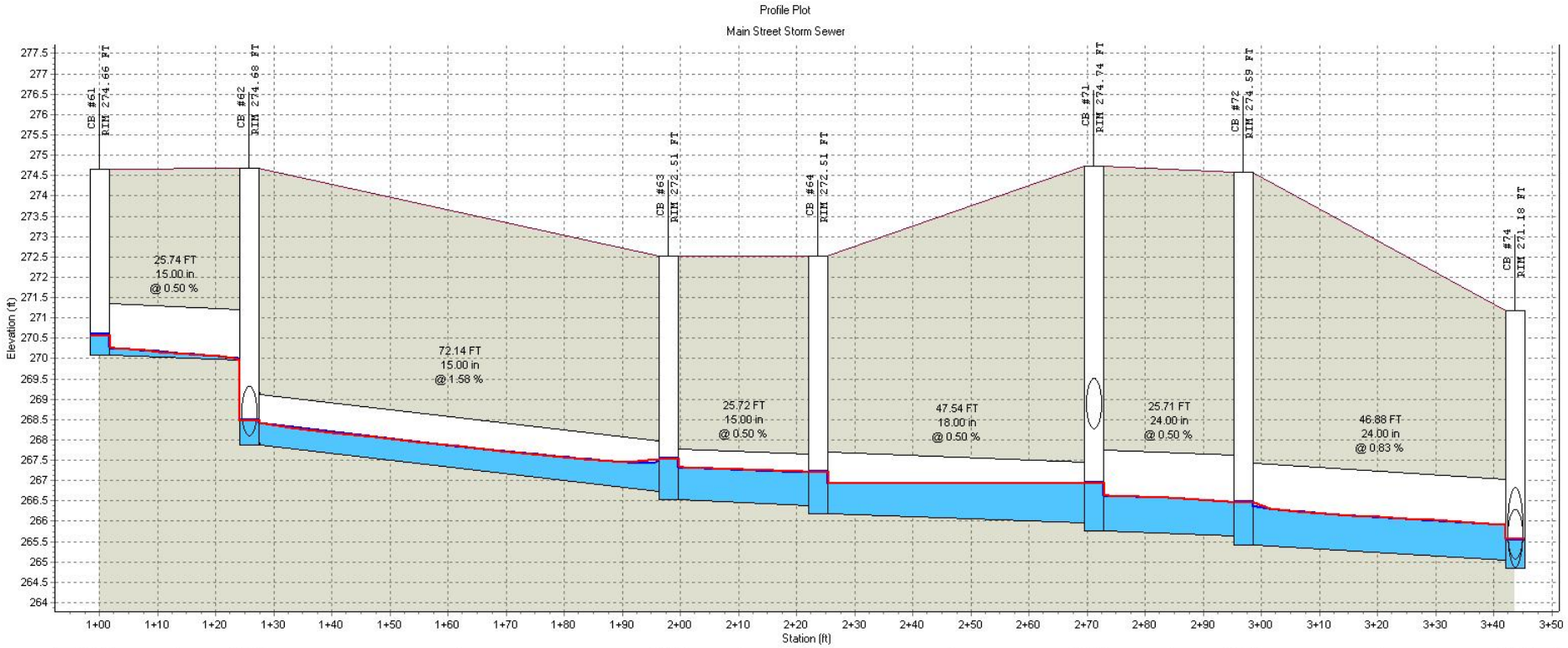
Link ID:	P #71	P #72	P #73
(FT):	25.70	113.81	79.16
(in):	15.00	15.00	15.00
@ (%):	0.50	2.57	0.50
Up Invert (ft):	273.34	272.52	269.40
Dn Invert (ft):	273.21	269.60	269.00
Max Q (cfs):	0.38	0.77	1.10
Max Vel (ft/s):	2.11	4.62	2.91
Max Depth (ft):	0.26	0.24	0.44

HGL



:	CB #58		CB #59		CB #60		CB #62
RIM (FT):	275.69		275.98		276.48		274.68
Invert (ft):	271.03		270.47		268.80		267.87
Min Pipe Cover (ft):							
Max HGL (ft):	271.24		270.85		269.39		268.49
Link ID:	P #74		P #75		P #76		
(FT):	70.24		37.70		147.36		
(in):	15.00		15.00		15.00		
@ (%):	0.50		0.50		0.50		
Up Invert (ft):	271.03		270.47		268.80		
Dn Invert (ft):	270.67		270.29		268.07		
Max Q (cfs):	0.26		0.70		1.79		
Max Vel (ft/s):	1.99		2.50		3.38		
Max Depth (ft):	0.21		0.35		0.56		

HGL

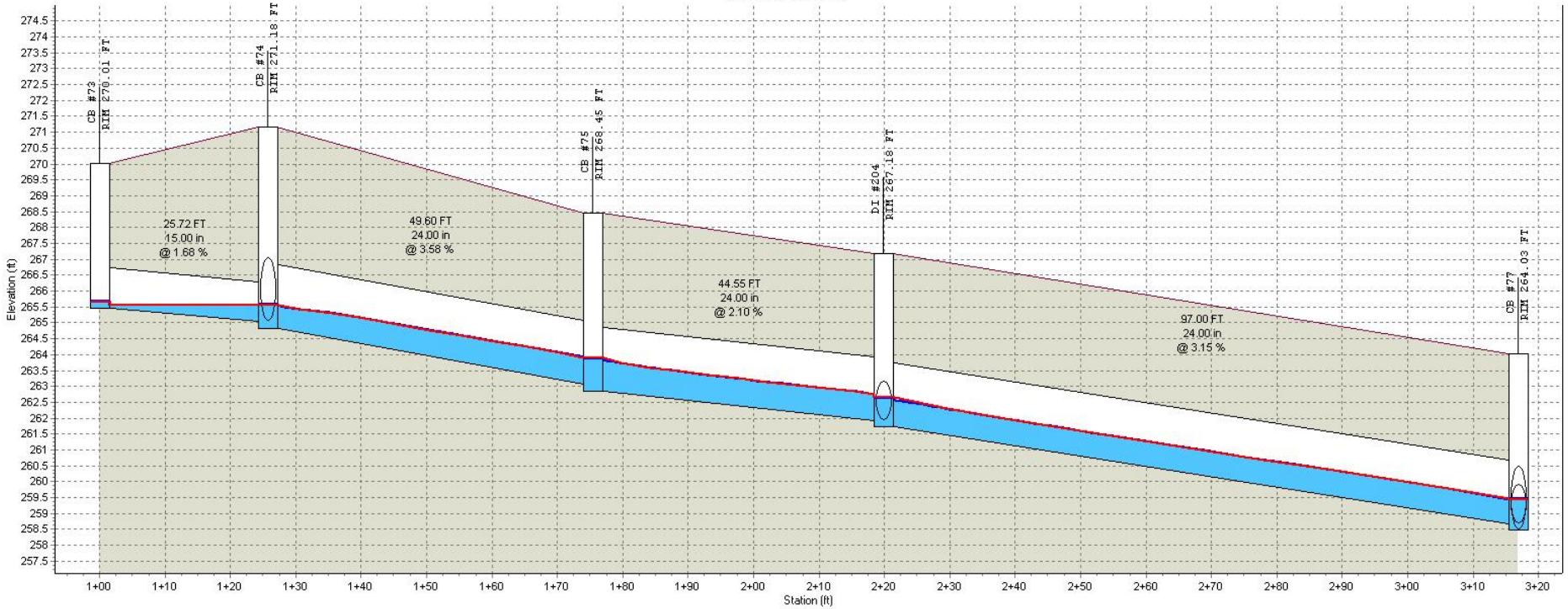


:	CB #61	CB #62	CB #63	CB #64	CB #71	CB #72	CB #74
RIM (FT):	274.66	274.68	272.51	272.51	274.74	274.59	271.18
Invert (ft):	270.09	267.87	266.52	266.19	265.76	265.43	264.84
Min Pipe Cover (ft):							
Max HGL (ft):	270.59	268.49	267.53	267.21	266.95	266.47	265.56

Link ID:	P #77	P #78	P #79	P #80	P #87	P #88
(FT):	25.74	72.14	25.72	47.54	25.71	46.88
(in):	15.00	15.00	15.00	18.00	24.00	24.00
@ (%):	0.50	1.58	0.50	0.50	0.50	0.83
Up Invert (ft):	270.09	267.87	266.52	266.19	265.76	265.43
Dn Invert (ft):	269.96	266.72	266.39	265.96	265.63	265.04
Max Q (cfs):	1.13	3.15	3.34	3.90	7.10	7.55
Max Vel (ft/s):	2.77	4.59	3.52	3.19	4.18	5.22
Max Depth (ft):	0.46	0.72	0.91	1.00	1.06	0.94

Profile Plot

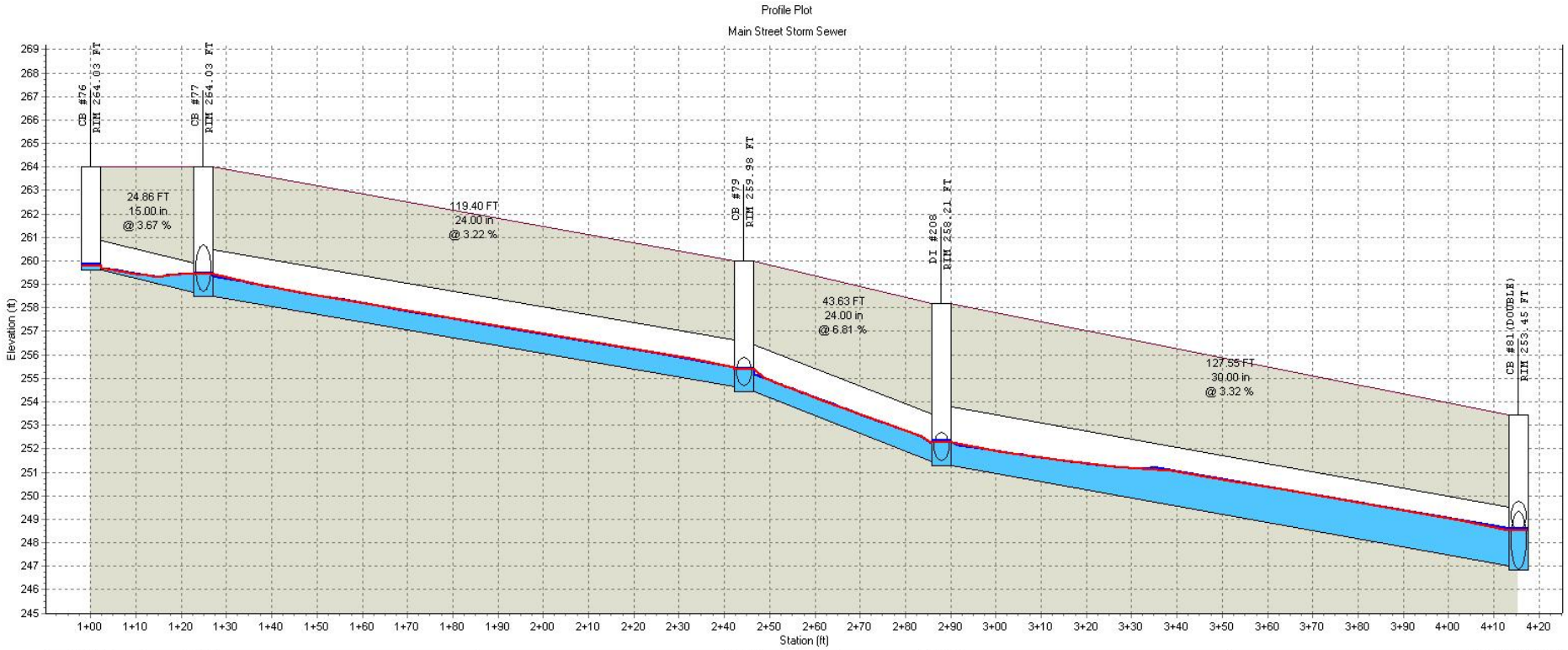
Main Street Storm Sewer



:	CB #73	CB #74	CB #75	DI #204	CB #77
RIM (FT):	270.01	271.18	268.45	267.18	264.03
Invert (ft):	265.47	264.84	262.86	261.73	258.48
Min Pipe Cover (ft):					
Max HGL (ft):	265.67	265.56	263.89	262.65	259.44

Link ID:	P #89	P #90	P #91	P #95
(FT):	25.72	49.60	44.55	97.00
(in):	15.00	24.00	24.00	24.00
@ (%):	1.68	3.58	2.10	3.15
Up Invert (ft):	265.47	264.84	262.86	261.73
Dn Invert (ft):	265.04	263.06	261.93	258.68
Max Q (cfs):	0.46	8.13	10.39	12.62
Max Vel (ft/s):	2.74	7.41	7.59	9.99
Max Depth (ft):	0.35	0.77	0.90	0.85

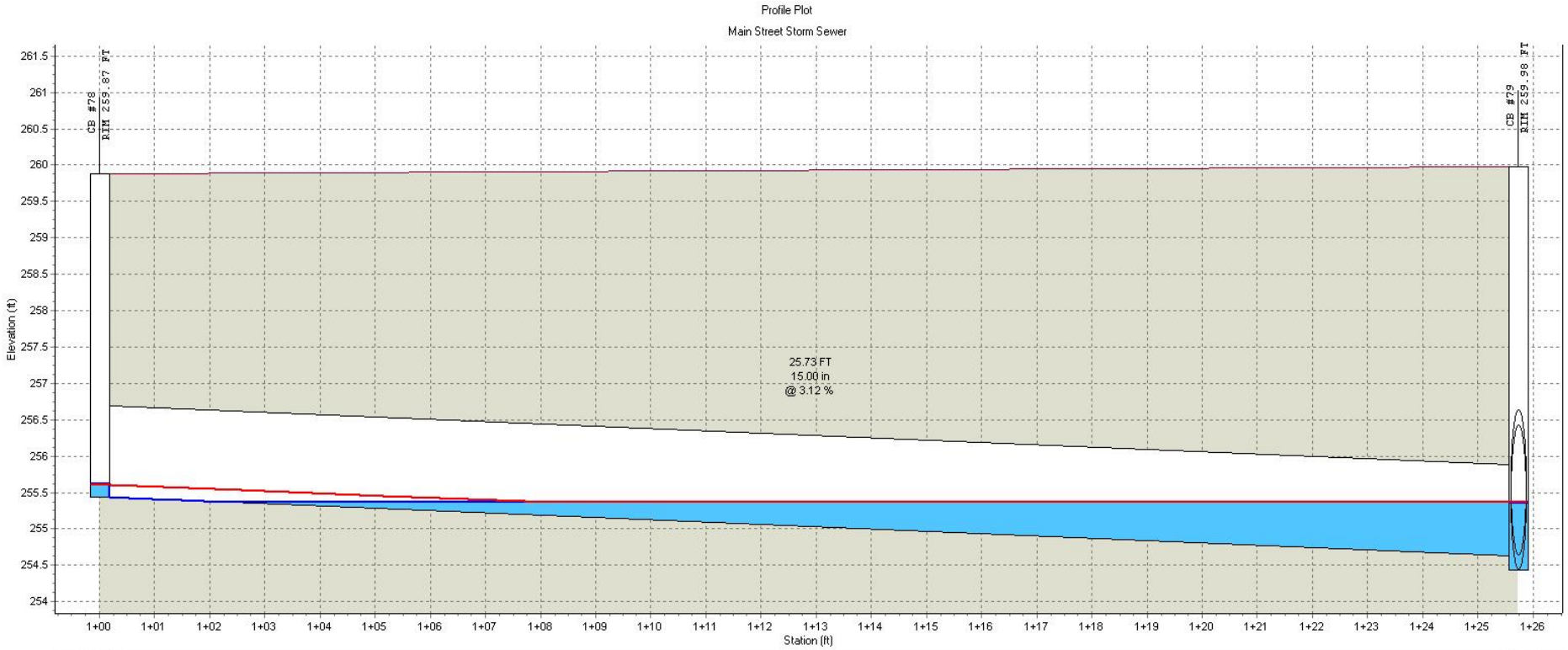
HGL



:	CB #76	CB #77	CB #79	DI #208	CB #81(DOUBLE)
RIM (FT):	264.03	264.03	259.98	258.21	253.45
Invert (ft):	259.59	258.48	254.43	251.26	246.83
Min Pipe Cover (ft):					
Max HGL (ft):	259.82	259.44	255.37	252.31	248.59

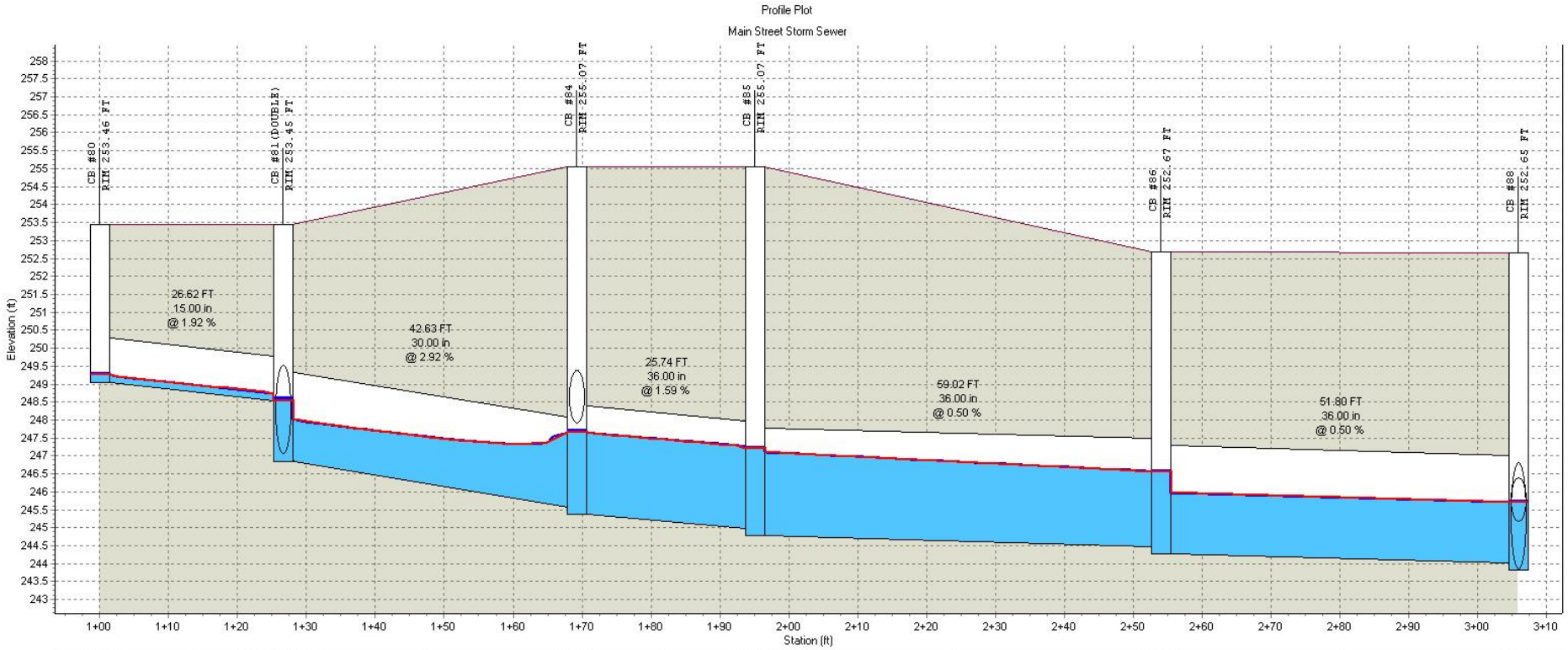
Link ID:	P #96	P #97	P #99	P #103
(FT):	24.86	119.40	43.63	127.55
(in):	15.00	24.00	24.00	30.00
@ (%):	3.67	3.22	6.81	3.32
Up Invert (ft):	259.59	258.48	254.43	251.26
Dn Invert (ft):	258.68	254.63	251.46	247.03
Max Q (cfs):	0.91	14.21	15.54	22.07
Max Vel (ft/s):	4.17	10.56	11.79	9.15
Max Depth (ft):	0.49	0.89	0.89	1.30

HGL



:	CB #78		CB #79
RIM (FT):	259.87		259.98
Invert (ft):	255.44		254.43
Min Pipe Cover (ft):			
Max HGL (ft):	255.61		255.37
Link ID:		P #98	
(FT):		25.73	
(in):		15.00	
@ (%):		3.12	
Up Invert (ft):		255.44	
Dn Invert (ft):		254.63	
Max Q (cfs):		0.47	
Max Vel (ft/s):		3.02	
Max Depth (ft):		0.45	

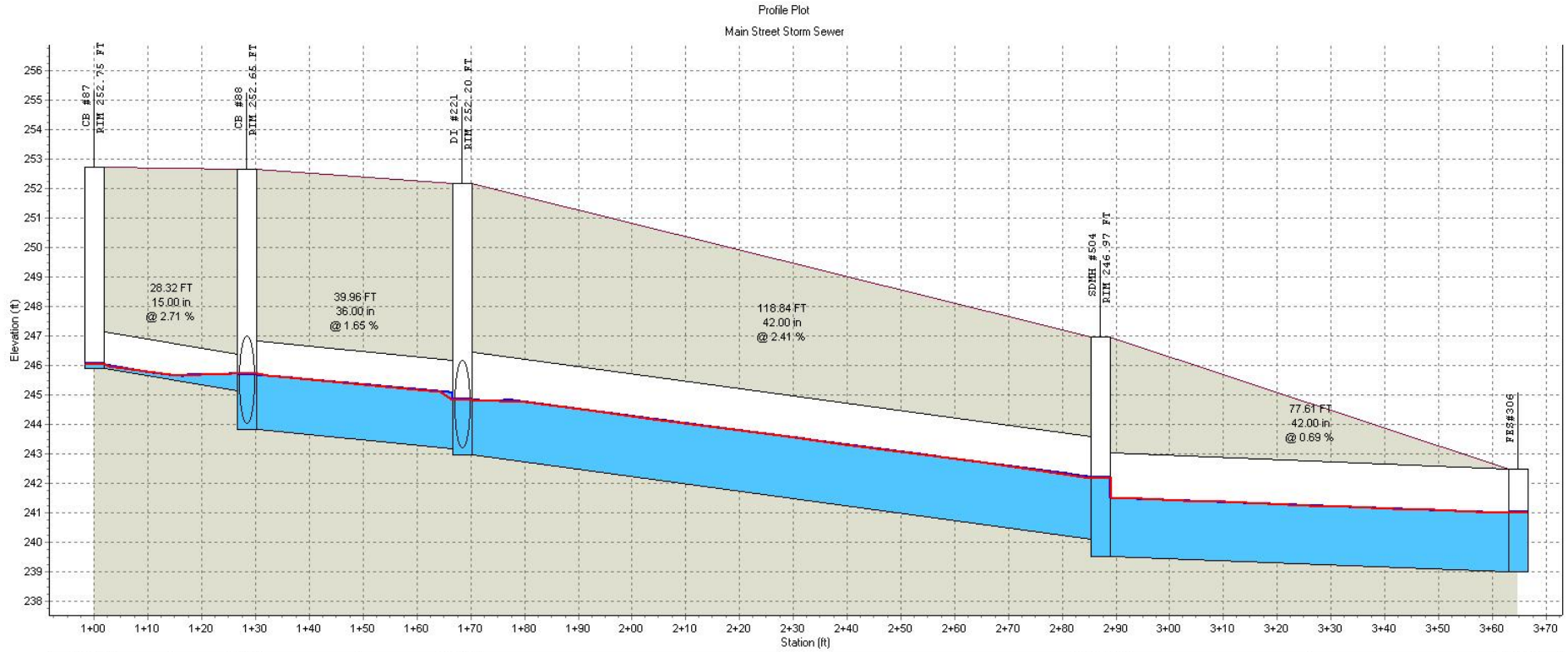
HGL



:	CB #80	CB #81(DOUBLE)	CB #84	CB #85	CB #86	CB #88
RIM (FT):	253.46	253.45	255.07	255.07	252.67	252.65
Invert (ft):	249.04	246.83	245.39	244.78	244.28	243.82
Min Pipe Cover (ft):						
Max HGL (ft):	249.29	248.59	247.71	247.23	246.58	245.72

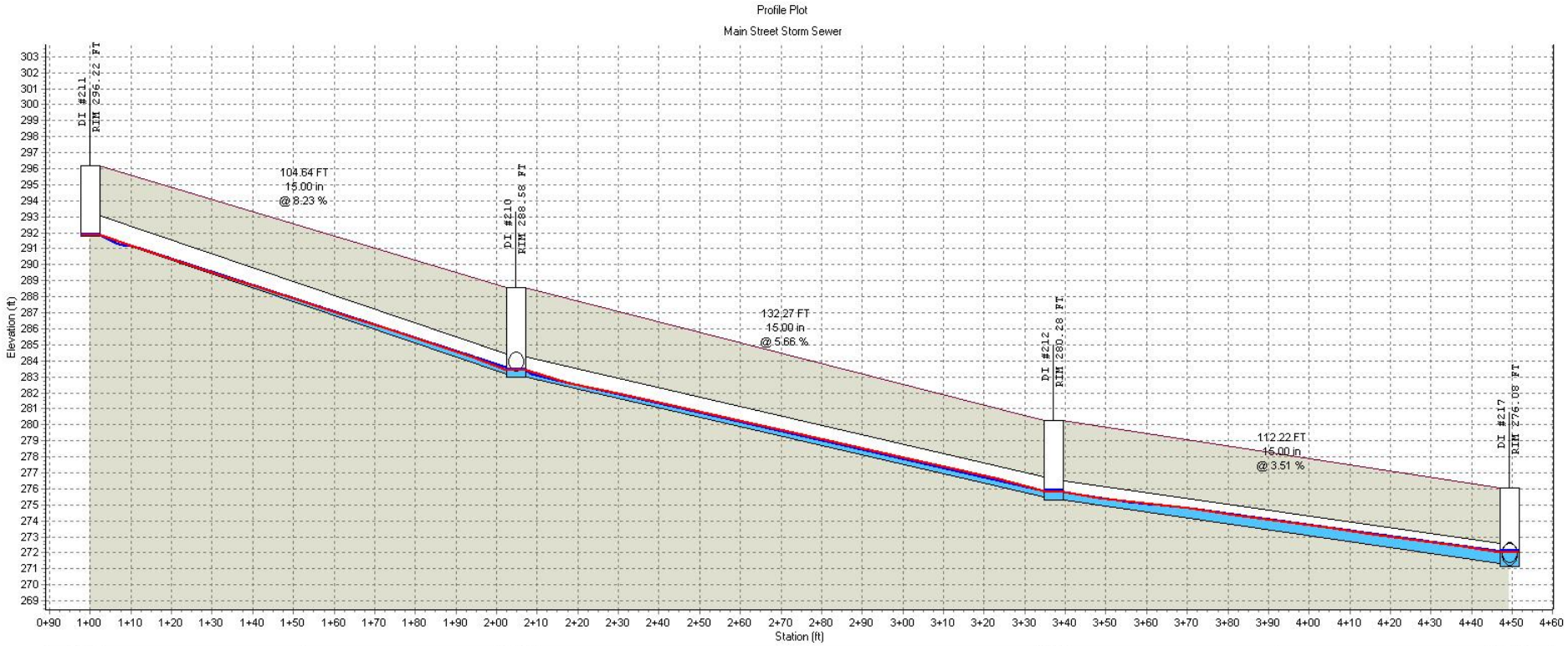
Link ID:	P #104	P #105	P #108	P #109	P #110
(FT):	26.62	42.63	25.74	59.02	51.80
(in):	15.00	30.00	36.00	36.00	36.00
@ (%):	1.92	2.92	1.59	0.50	0.50
Up Invert (ft):	249.04	246.83	245.39	244.78	244.28
Dn Invert (ft):	248.53	245.59	244.98	244.48	244.02
Max Q (cfs):	0.62	27.29	29.52	29.95	30.08
Max Vel (ft/s):	3.81	7.09	5.17	5.26	5.96
Max Depth (ft):	0.24	1.94	2.28	2.27	2.02

HGL



:	CB #87	CB #88	DI #221	SDMH #504	FES#306
RIM (FT):	252.75	252.65	252.20	246.97	
Invert (ft):	245.92	243.82	242.96	239.54	239.00
Min Pipe Cover (ft):				3.38	
Max HGL (ft):	246.07	245.72	244.85	242.19	241.00

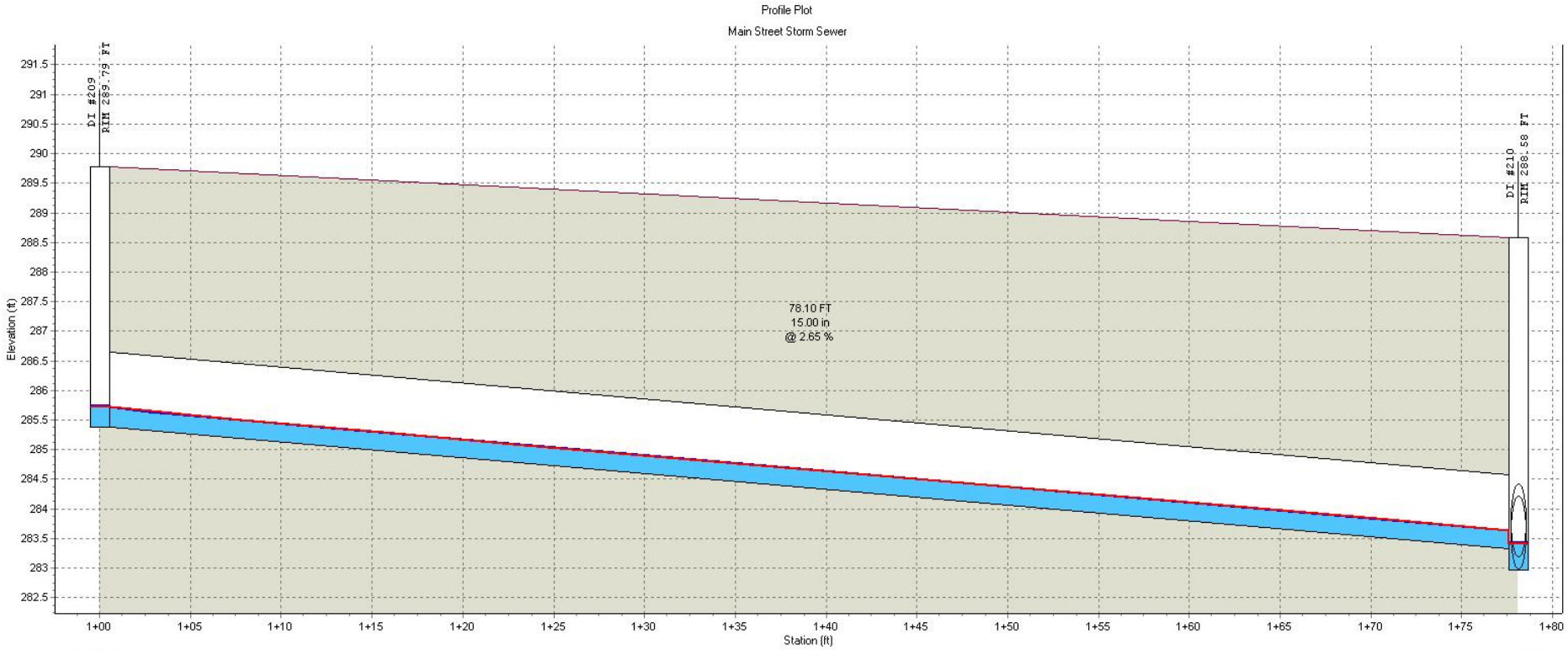
Link ID:	P #111	P #112	P #132	P #133
(FT):	28.32	39.96	118.84	77.61
(in):	15.00	36.00	42.00	42.00
@ (%):	2.71	1.65	2.41	0.69
Up Invert (ft):	245.92	243.82	242.96	239.54
Dn Invert (ft):	245.15	243.16	240.10	239.00
Max Q (cfs):	0.33	30.52	52.10	52.19
Max Vel (ft/s):	3.51	6.95	9.43	7.71
Max Depth (ft):	0.36	1.79	1.99	2.33



:	DI #211	DI #210	DI #212	DI #217
RIM (FT):	296.22	288.58	280.28	276.08
Invert (ft):	291.78	282.96	275.28	271.14
Min Pipe Cover (ft):				
Max HGL (ft):	291.88	283.43	275.87	272.11

Link ID:	P #113	P #115	P #116
(FT):	104.64	132.27	112.22
(in):	15.00	15.00	15.00
@ (%):	8.23	5.66	3.51
Up Invert (ft):	291.78	282.96	275.28
Dn Invert (ft):	283.17	275.48	271.34
Max Q (cfs):	0.22	3.97	5.07
Max Vel (ft/s):	3.76	10.01	7.48
Max Depth (ft):	0.18	0.45	0.69

HGL



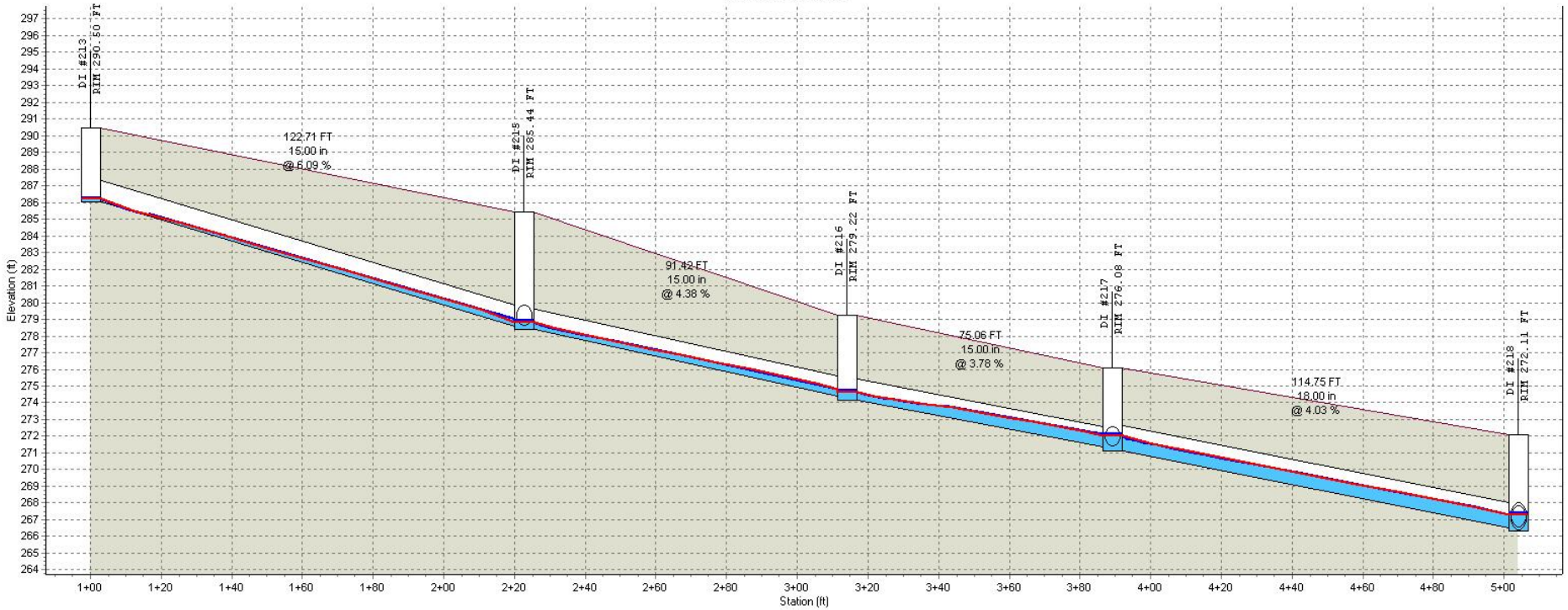
:	DI #209		DI #210
RIM (FT):	289.79		288.58
Invert (ft):	285.39		282.96
Min Pipe Cover (ft):			
Max HGL (ft):	285.73		283.43

Link ID:	P #114
(FT):	78.10
(in):	15.00
@ (%):	2.65
Up Invert (ft):	285.39
Dn Invert (ft):	283.32
Max Q (cfs):	1.50
Max Vel (ft/s):	5.76
Max Depth (ft):	0.33

HGL

Profile Plot

Main Street Storm Sewer



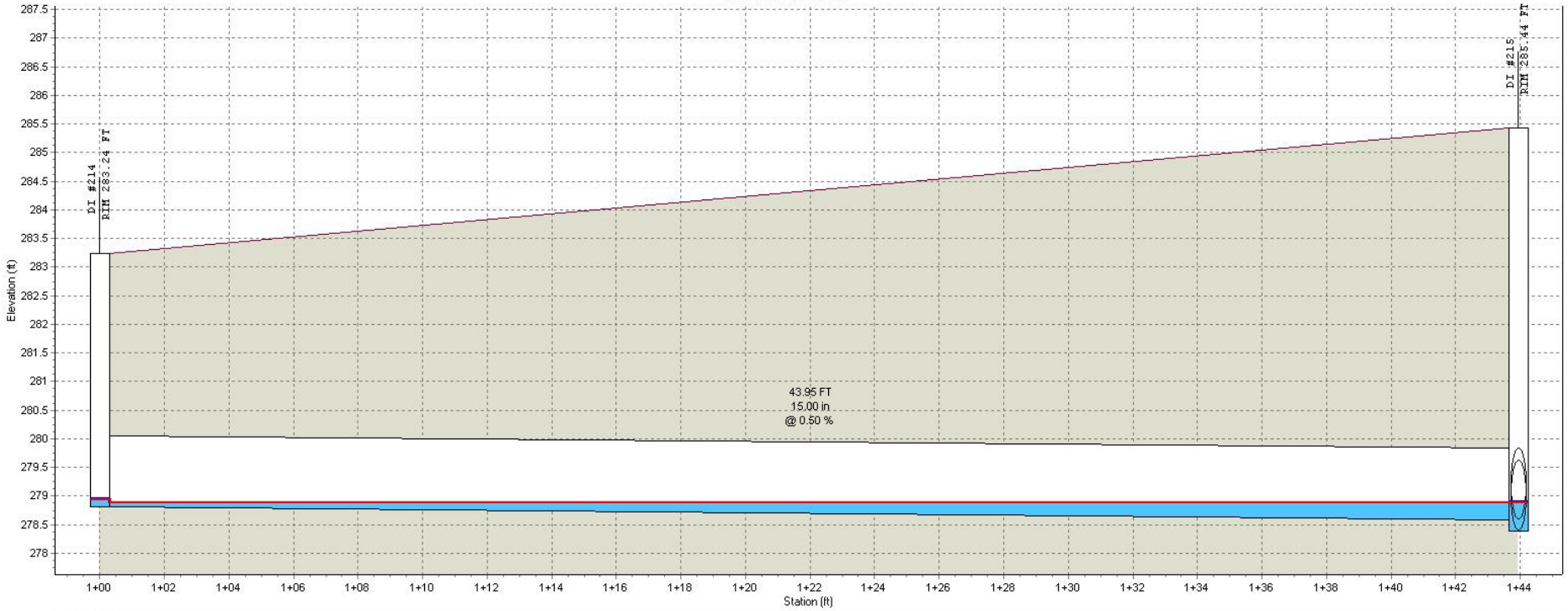
:	DI #213	DI #215	DI #216	DI #217	DI #218
RIM (FT):	290.50	285.44	279.22	276.08	272.11
Invert (ft):	286.06	278.38	274.18	271.14	266.31
Min Pipe Cover (ft):					
Max HGL (ft):	286.21	278.89	274.71	272.11	267.36

Link ID:	P #117	P #119	P #120	P #121
(FT):	122.71	91.42	75.06	114.75
(in):	15.00	15.00	15.00	18.00
@ (%):	6.09	4.38	3.78	4.03
Up Invert (ft):	286.06	278.38	274.18	271.14
Dn Invert (ft):	278.58	274.38	271.34	266.51
Max Q (cfs):	0.47	3.89	4.19	12.24
Max Vel (ft/s):	4.24	8.86	6.59	11.02
Max Depth (ft):	0.23	0.48	0.65	0.90

HGL

Profile Plot

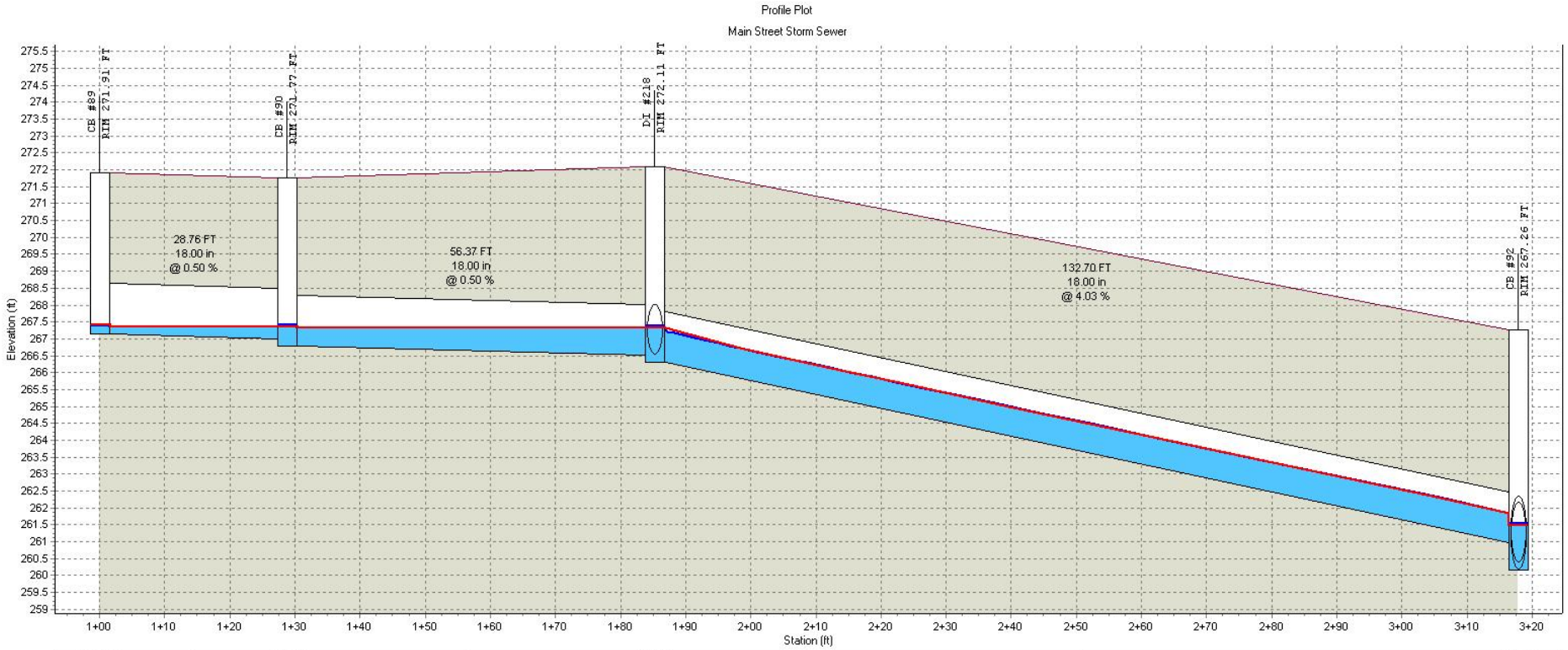
Main Street Storm Sewer



	DI #214		DI #215
RIM (FT):	283.24		285.44
Invert (ft):	278.80		278.38
Min Pipe Cover (ft):			
Max HGL (ft):	278.94		278.89

	P #118
Link ID:	
(FT):	43.95
(in):	15.00
@ (%):	0.50
Up Invert (ft):	278.80
Dn Invert (ft):	278.58
Max Q (cfs):	0.11
Max Vel (ft/s):	1.22
Max Depth (ft):	0.22

HGL



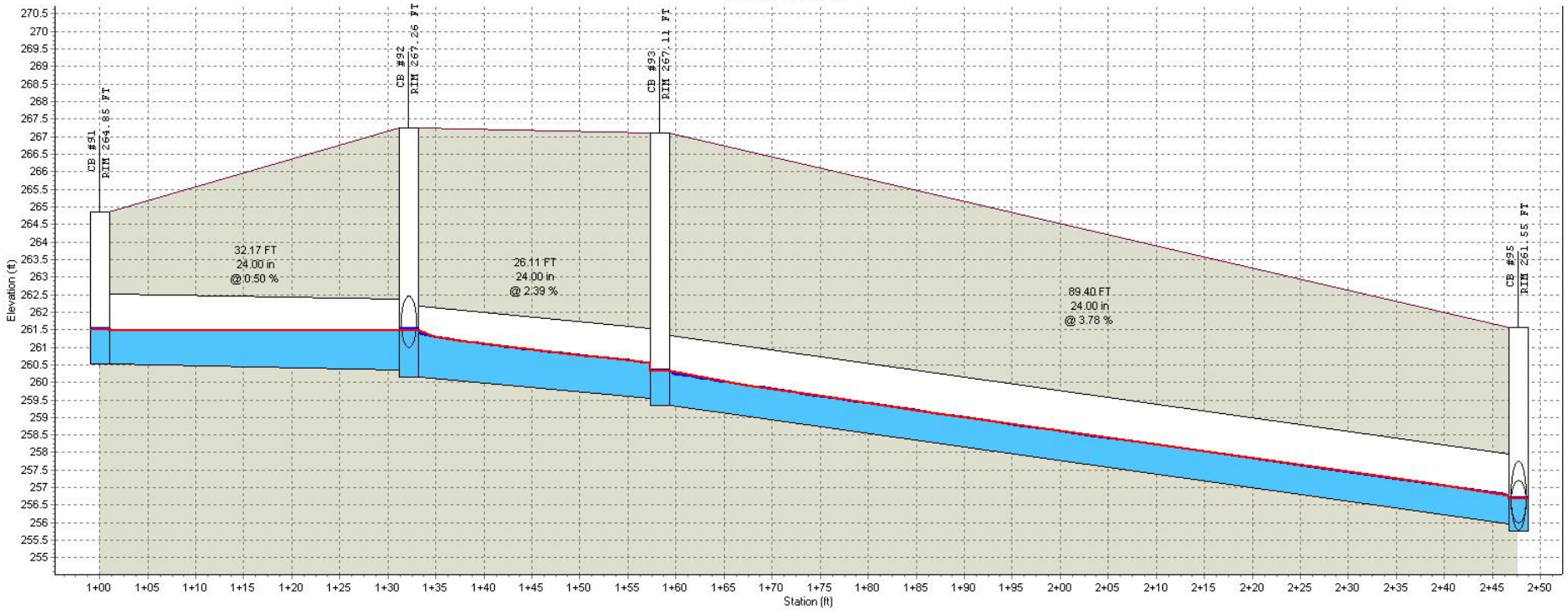
:	CB #89	CB #90	DI #218	CB #92
RIM (FT):	271.91	271.77	272.11	267.26
Invert (ft):	267.14	266.80	266.31	260.16
Min Pipe Cover (ft):				
Max HGL (ft):	267.41	267.39	267.36	261.51

Link ID:	P #122	P #123	P #124
(FT):	28.76	56.37	132.70
(in):	18.00	18.00	18.00
@ (%):	0.50	0.50	4.03
Up Invert (ft):	267.14	266.80	266.31
Dn Invert (ft):	267.00	266.51	260.97
Max Q (cfs):	0.41	1.12	13.77
Max Vel (ft/s):	1.98	2.03	11.50
Max Depth (ft):	0.33	0.72	0.96

HGL

Profile Plot

Main Street Storm Sewer



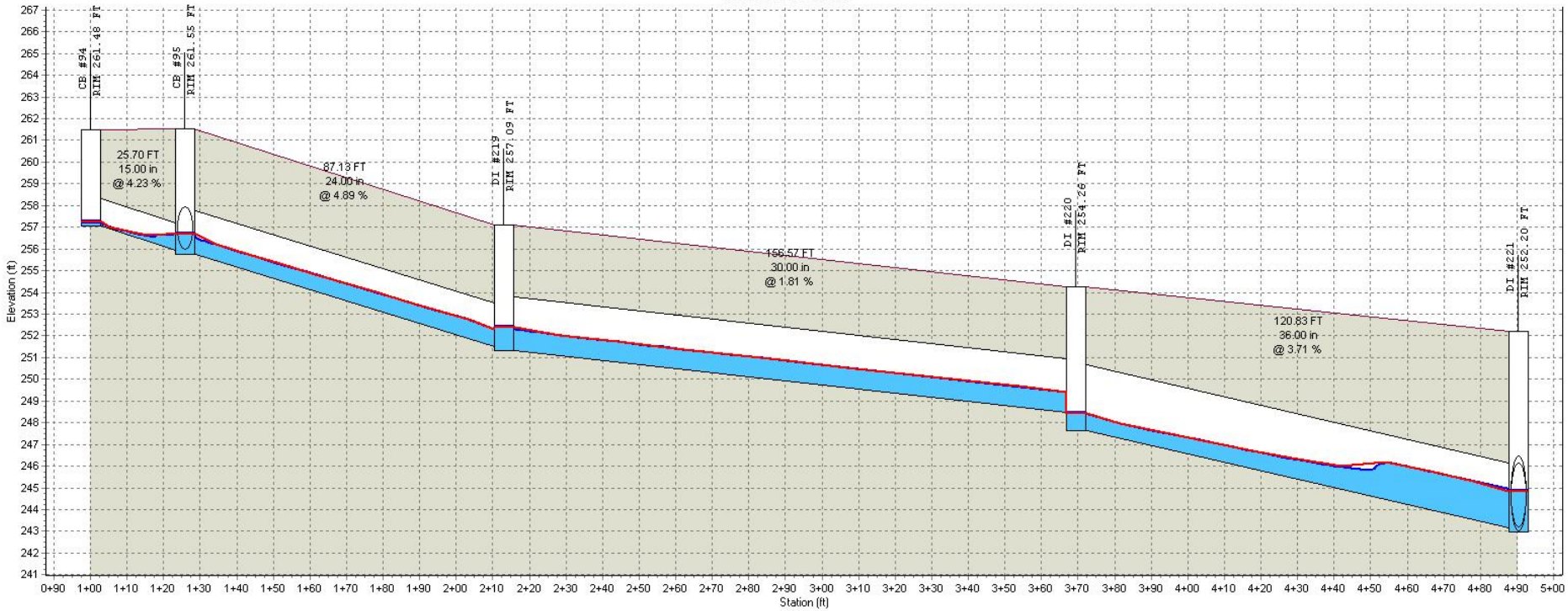
:	CB #91	CB #92	CB #93	CB #95
RIM (FT):	264.85	267.26	267.11	261.55
Invert (ft):	260.52	260.16	259.34	255.76
Min Pipe Cover (ft):				
Max HGL (ft):	261.52	261.51	260.33	256.69

Link ID:	P #125	P #126	P #127
(FT):	32.17	26.11	89.40
(in):	24.00	24.00	24.00
@ (%):	0.50	2.39	3.78
Up Invert (ft):	260.52	260.16	259.34
Dn Invert (ft):	260.36	259.53	255.96
Max Q (cfs):	0.69	14.69	15.01
Max Vel (ft/s):	1.49	8.04	11.03
Max Depth (ft):	1.08	1.13	0.90

HGL

Profile Plot

Main Street Storm Sewer

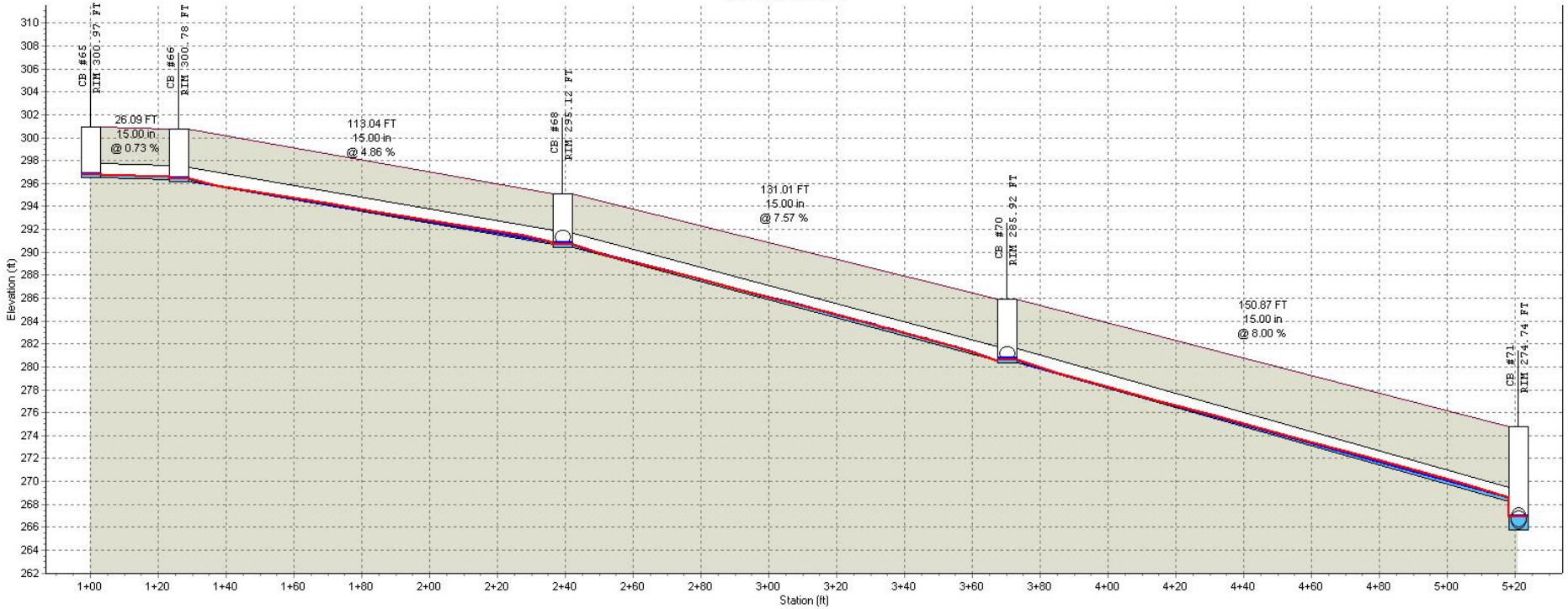


	CB #94	CB #95	DI #219	DI #220	DI #221
RIM (FT):	261.48	261.55	257.09	254.26	252.20
Invert (ft):	257.04	255.76	251.30	247.65	242.96
Min Pipe Cover (ft):					
Max HGL (ft):	257.24	256.69	252.38	248.42	244.85

Link ID:	P #128	P #129	P #130	P #131
(FT):	25.70	87.13	156.57	120.83
(in):	15.00	24.00	30.00	36.00
@ (%):	4.23	4.89	1.81	3.71
Up Invert (ft):	257.04	255.76	251.30	247.65
Dn Invert (ft):	255.96	251.50	248.47	243.16
Max Q (cfs):	0.71	15.88	16.45	17.21
Max Vel (ft/s):	4.03	11.55	8.91	6.41
Max Depth (ft):	0.45	0.90	1.01	1.23

Profile Plot

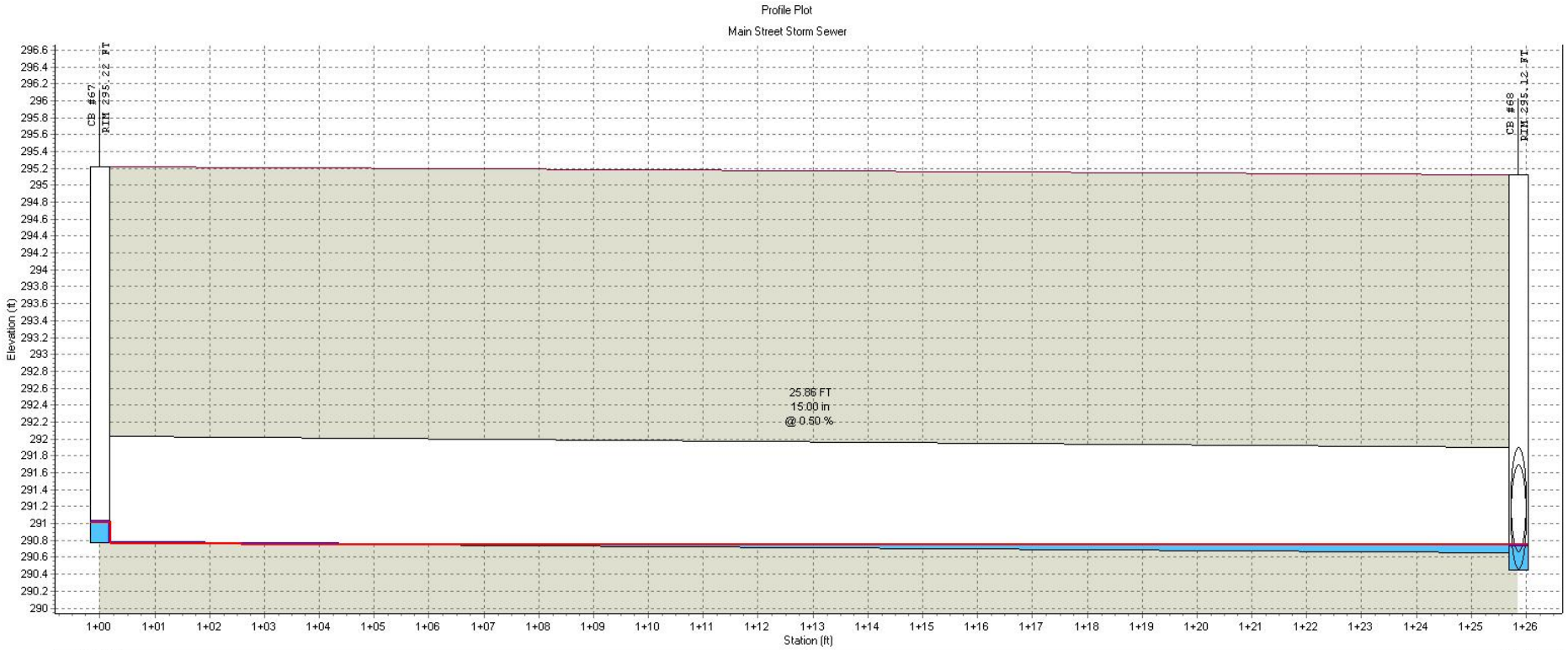
Main Street Storm Sewer



:	CB #65	CB #66	CB #68	CB #70	CB #71
RIM (FT):	300.97	300.78	295.12	285.92	274.74
Invert (ft):	296.53	296.14	290.45	280.33	265.76
Min Pipe Cover (ft):					
Max HGL (ft):	296.81	296.42	290.75	280.68	266.95

Link ID:	P #81	P #82	P #84	P #86
(FT):	26.09	113.04	131.01	150.87
(in):	15.00	15.00	15.00	15.00
@ (%):	0.73	4.86	7.57	8.00
Up Invert (ft):	296.53	296.14	290.45	280.33
Dn Invert (ft):	296.34	290.65	280.53	268.26
Max Q (cfs):	0.47	1.42	2.05	2.89
Max Vel (ft/s):	2.52	7.18	9.35	10.52
Max Depth (ft):	0.26	0.27	0.29	0.34

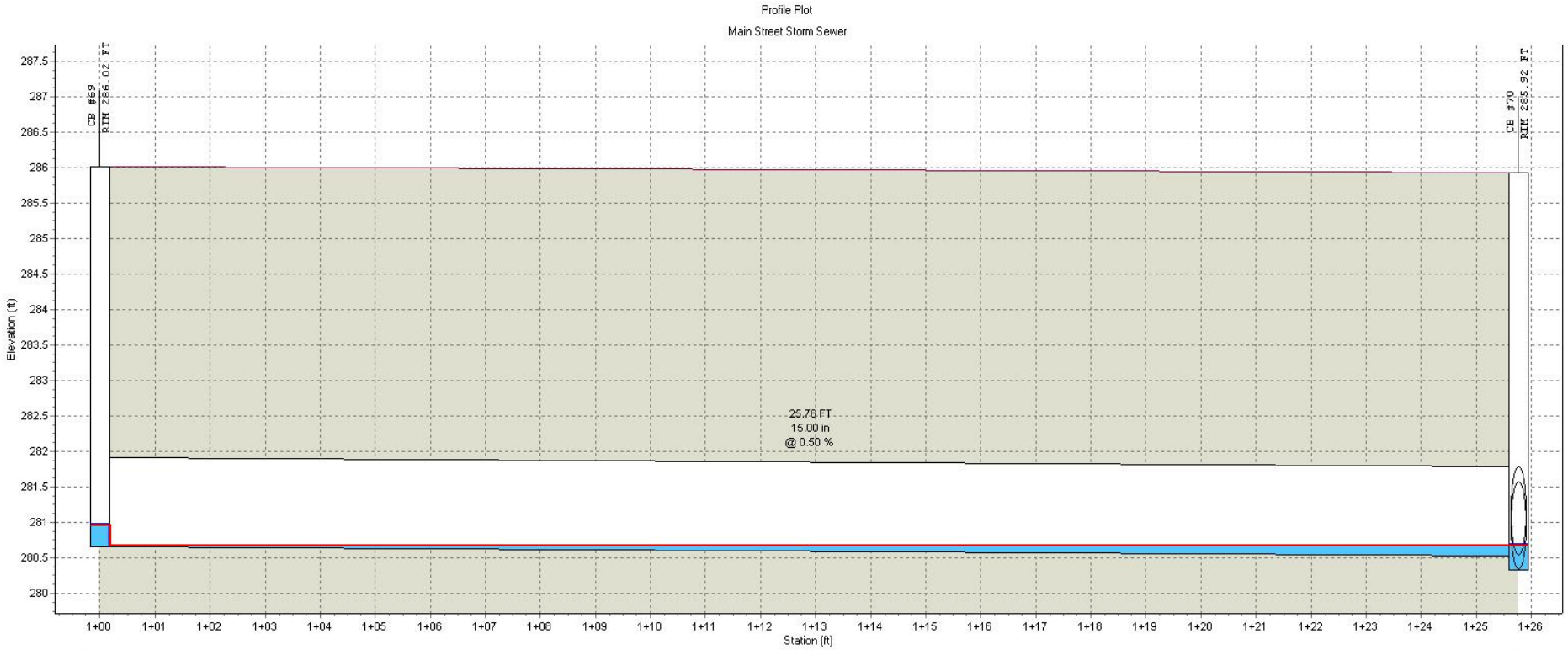
HGL



	CB #67		CB #68
RIM (FT):	295.22		295.12
Invert (ft):	290.78		290.45
Min Pipe Cover (ft):			
Max HGL (ft):	291.02		290.75

Link ID:	P #83
(FT):	25.86
(in):	15.00
@ (%):	0.50
Up Invert (ft):	290.78
Dn Invert (ft):	290.65
Max Q (cfs):	0.30
Max Vel (ft/s):	1.99
Max Depth (ft):	0.23

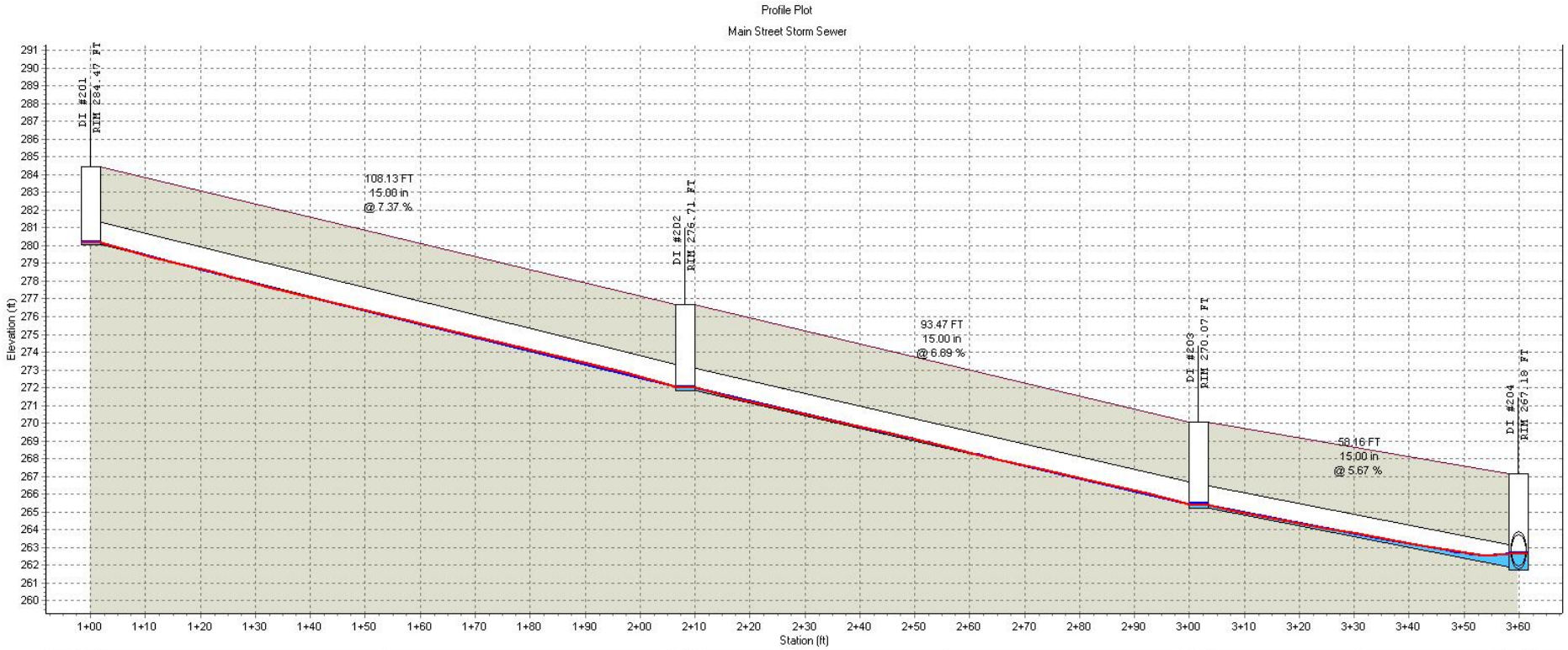
HGL



	CB #69		CB #70
RIM (FT):	286.02		285.92
Invert (ft):	280.66		280.33
Min Pipe Cover (ft):			
Max HGL (ft):	280.96		280.68

Link ID:	P #85
(FT):	25.76
(in):	15.00
@ (%):	0.50
Up Invert (ft):	280.66
Dn Invert (ft):	280.53
Max Q (cfs):	0.47
Max Vel (ft/s):	2.22
Max Depth (ft):	0.29

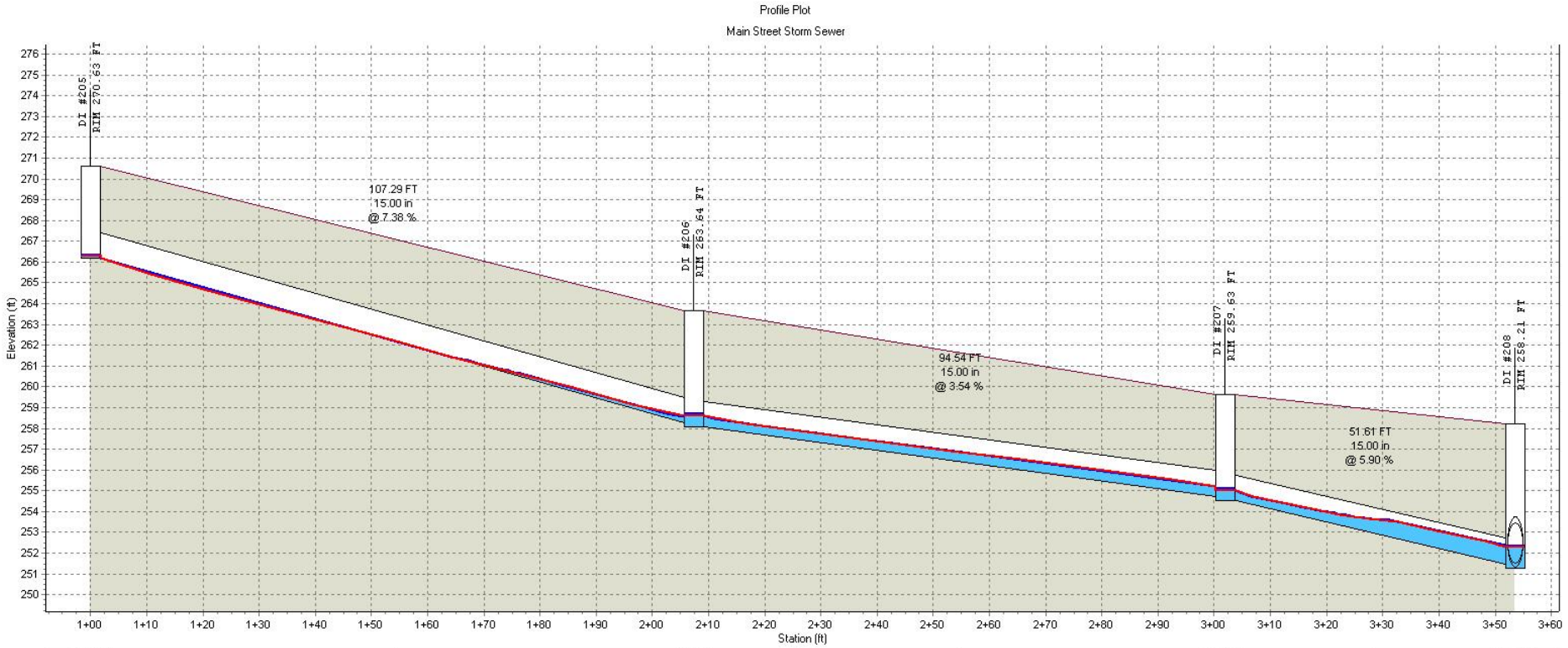
HGL



:	DI #201	DI #202	DI #203	DI #204
RIM (FT):	284.47	276.71	270.07	267.18
Invert (ft):	280.03	271.86	265.23	261.73
Min Pipe Cover (ft):				
Max HGL (ft):	280.16	272.04	265.43	262.65

Link ID:	P #92	P #93	P #94
(FT):	108.13	93.47	58.16
(in):	15.00	15.00	15.00
@ (%):	7.37	6.89	5.67
Up Invert (ft):	280.03	271.86	265.23
Dn Invert (ft):	272.06	265.43	261.93
Max Q (cfs):	0.41	0.68	0.89
Max Vel (ft/s):	5.68	6.58	4.06
Max Depth (ft):	0.13	0.17	0.46

HGL



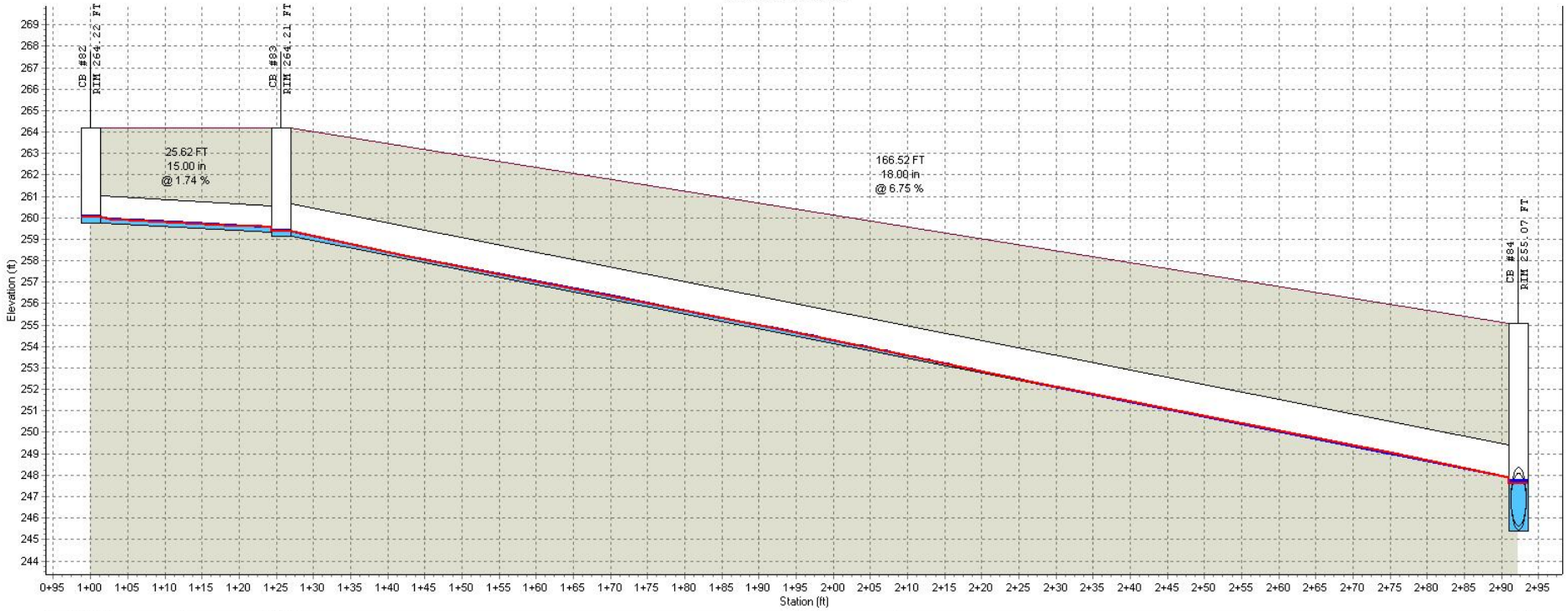
	DI #205	DI #206	DI #207	DI #208
RIM (FT):	270.63	263.64	259.63	258.21
Invert (ft):	266.17	258.06	254.51	251.26
Min Pipe Cover (ft):				
Max HGL (ft):	266.30	258.68	255.08	252.31

Link ID:	P #100	P #101	P #102
(FT):	107.29	94.54	51.61
(in):	15.00	15.00	15.00
@ (%):	7.38	3.54	5.90
Up Invert (ft):	266.17	258.06	254.51
Dn Invert (ft):	258.26	254.71	251.46
Max Q (cfs):	0.39	4.84	5.38
Max Vel (ft/s):	3.68	8.61	8.20
Max Depth (ft):	0.28	0.59	0.70

HGL

Profile Plot

Main Street Storm Sewer



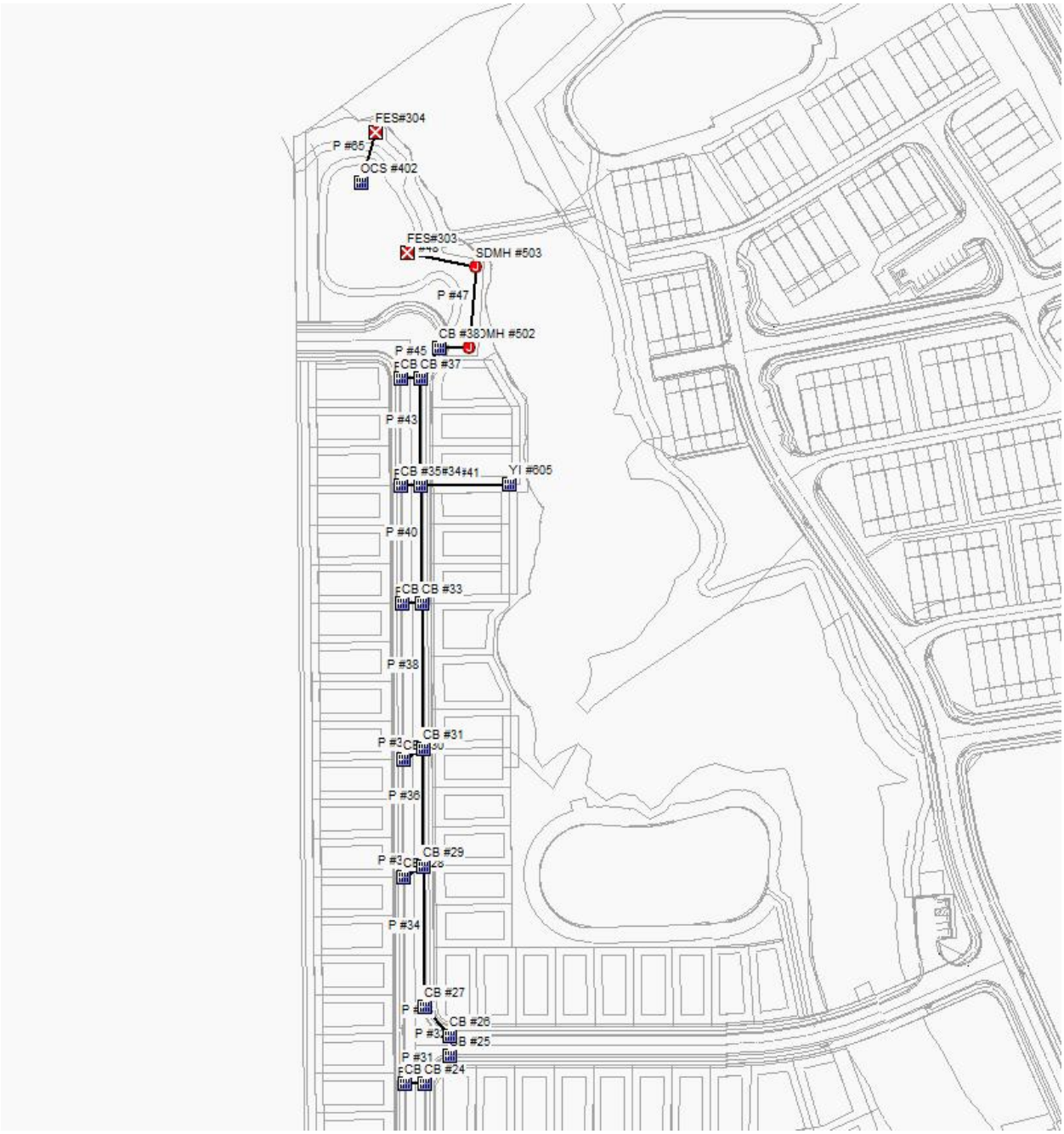
:	CB #82	CB #83	CB #84
RIM (FT):	264.22	264.21	255.07
Invert (ft):	259.78	259.13	245.39
Min Pipe Cover (ft):			
Max HGL (ft):	260.06	259.40	247.71

Link ID:	P #106	P #107
(FT):	25.62	166.52
(in):	15.00	18.00
@ (%):	1.74	6.75
Up Invert (ft):	259.78	259.13
Dn Invert (ft):	259.33	247.89
Max Q (cfs):	0.70	1.86
Max Vel (ft/s):	3.79	8.59
Max Depth (ft):	0.26	0.27

HGL

S T O R M W A T E R AREA " H "

STORMWATER PIPING AND HYDRAULIC GRADE LINE FOR 10-YR STORM

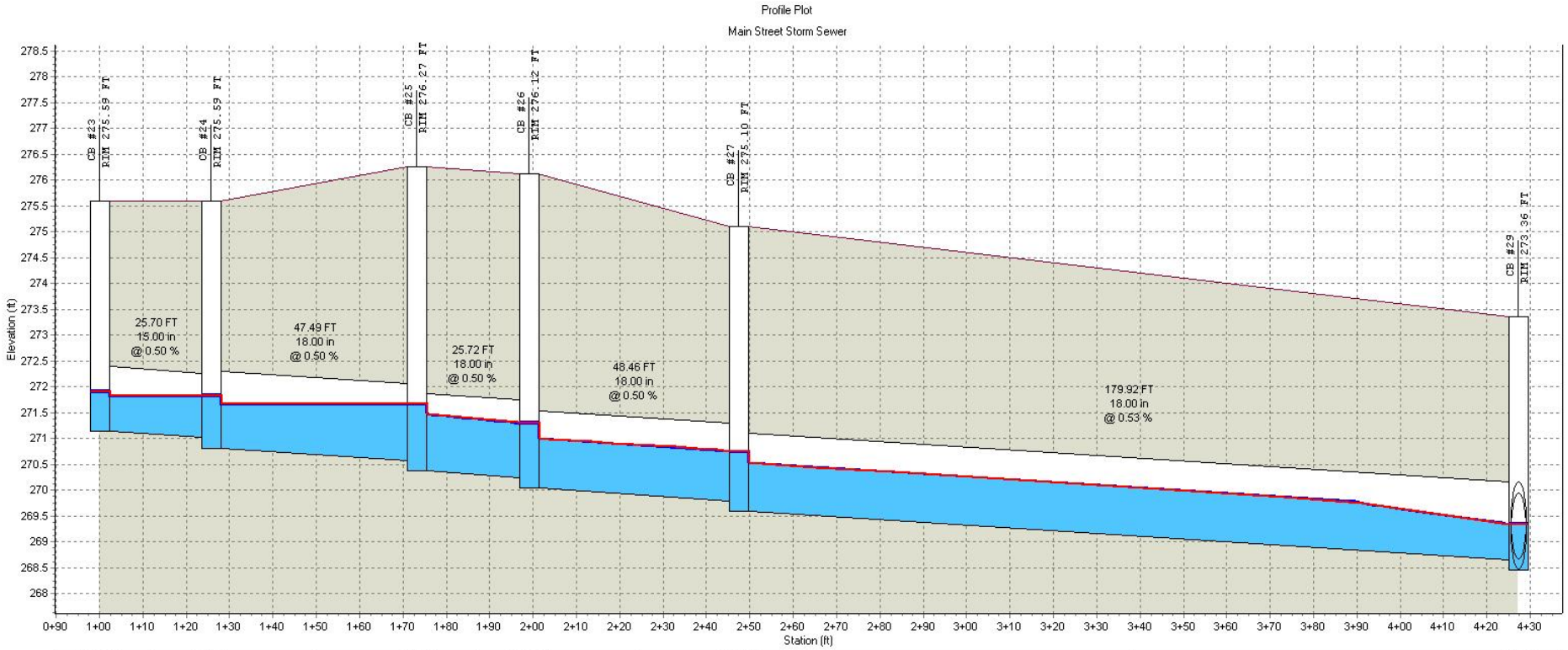


PLAN VIEW

DRAINAGE AREA

SN	Element ID	Area (acres)	Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
1	Sub-CB#23	0.48	CB #23	0.7300	0.60	0.44	2.53	7.210	0 00:05:00
2	Sub-CB#24	0.25	CB #24	0.5900	0.60	0.35	1.06	7.210	0 00:05:00
3	Sub-CB#25	0.63	CB #25	0.7300	0.60	0.44	3.32	7.210	0 00:05:00
4	Sub-CB#26	0.07	CB #26	0.8700	0.60	0.52	0.44	7.210	0 00:05:00
5	Sub-CB#27	0.04	CB #27	0.8300	0.60	0.50	0.24	7.210	0 00:05:00
6	Sub-CB#28	0.90	CB #28	0.6900	0.60	0.42	4.48	7.210	0 00:05:00
7	Sub-CB#29	0.10	CB #29	0.8700	0.60	0.52	0.63	7.210	0 00:05:00
8	Sub-CB#30	0.47	CB #30	0.8300	0.60	0.50	2.81	7.210	0 00:05:00
9	Sub-CB#31	0.09	CB #31	0.8700	0.60	0.52	0.57	7.210	0 00:05:00
10	Sub-CB#32	0.56	CB #32	0.8300	0.60	0.50	3.35	7.210	0 00:05:00
11	Sub-CB#33	0.11	CB #33	0.8700	0.60	0.52	0.69	7.210	0 00:05:00
12	Sub-CB#34	0.09	CB #34	0.8700	0.60	0.52	0.57	7.210	0 00:05:00
13	Sub-CB#35	0.51	CB #35	0.7300	0.60	0.44	2.68	7.210	0 00:05:00
14	Sub-CB#36	0.51	CB #36	0.7300	0.60	0.44	2.68	7.210	0 00:05:00
15	Sub-CB#37	0.08	CB #37	0.8700	0.60	0.52	0.50	7.210	0 00:05:00
16	Sub-CB#38	0.19	CB #38	0.8300	0.60	0.50	1.14	7.210	0 00:05:00
17	Sub-YI#605	0.72	YI #605	0.4300	0.60	0.26	2.23	7.210	0 00:05:00

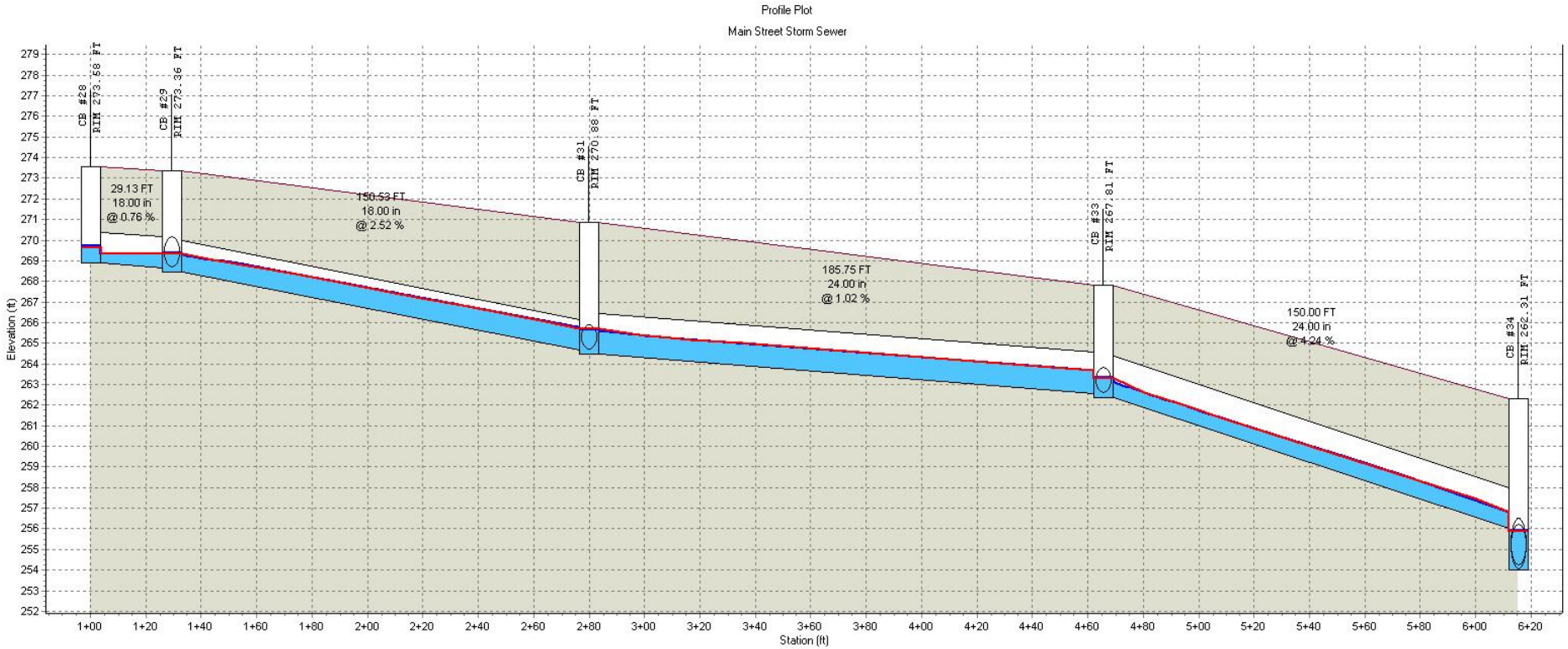
MODEL INPUT										MODEL OUTPUT									
SN	Element ID	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Manning's Roughness	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Max Flow Velocity (ft/sec)	Travel Time (min)	Design Flow Capacity (cfs)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Total Time Surcharged (min)	Max Flow Depth (ft)	Reported Condition
1	P #30	CB #23	CB #24	25.70	271.15	271.02	0.5000	15.000	0.0130	1.61	0 00:05	2.73	0.16	4.57	0.35	0.63	0.00	0.79	Calculated
2	P #31	CB #24	CB #25	47.49	270.81	270.57	0.5000	18.000	0.0130	3.57	0 00:05	2.67	0.30	7.44	0.48	0.71	0.00	1.07	Calculated
3	P #32	CB #25	CB #26	25.72	270.37	270.24	0.5000	18.000	0.0130	5.70	0 00:05	3.84	0.11	7.43	0.77	0.79	0.00	1.18	Calculated
4	P #33	CB #26	CB #27	48.46	270.04	269.80	0.5000	18.000	0.0130	6.06	0 00:05	4.34	0.19	7.43	0.82	0.74	0.00	1.11	Calculated
5	P #34	CB #27	CB #29	179.92	269.60	268.65	0.5300	18.000	0.0130	6.03	0 00:06	4.59	0.65	7.62	0.79	0.70	0.00	1.05	Calculated
6	P #35	CB #28	CB #29	29.13	268.87	268.65	0.7600	18.000	0.0130	3.39	0 00:05	4.06	0.12	9.16	0.37	0.49	0.00	0.73	Calculated
7	P #36	CB #29	CB #31	150.53	268.45	264.65	2.5200	18.000	0.0130	9.43	0 00:06	7.97	0.31	16.69	0.57	0.64	0.00	0.96	Calculated
8	P #37	CB #30	CB #31	29.41	265.80	264.65	3.9200	15.000	0.0130	3.38	0 00:05	6.08	0.08	12.79	0.26	0.61	0.00	0.76	Calculated
9	P #38	CB #31	CB #33	185.75	264.45	262.56	1.0200	24.000	0.0130	12.85	0 00:06	6.90	0.45	22.83	0.56	0.57	0.00	1.15	Calculated
10	P #39	CB #32	CB #33	25.76	263.37	262.56	3.1500	15.000	0.0130	3.27	0 00:05	5.87	0.07	11.46	0.29	0.52	0.00	0.64	Calculated
11	P #40	CB #33	CB #34	150.00	262.36	256.00	4.2400	24.000	0.0130	16.13	0 00:06	12.31	0.20	46.58	0.35	0.44	0.00	0.87	Calculated
12	P #41	YI #605	CB #34	112.15	254.76	254.20	0.5000	24.000	0.0130	1.94	0 00:06	2.17	0.86	16.00	0.12	0.72	0.00	1.44	Calculated
13	P #42	CB #35	CB #34	25.71	254.43	254.20	0.8900	24.000	0.0130	3.11	0 00:05	3.14	0.14	21.33	0.15	0.79	0.00	1.59	Calculated
14	P #43	CB #34	CB #37	136.46	254.00	253.32	0.5000	30.000	0.0130	20.57	0 00:06	5.73	0.40	29.00	0.71	0.69	0.00	1.72	Calculated
15	P #44	CB #36	CB #37	26.45	254.92	254.72	0.7700	15.000	0.0130	3.29	0 00:05	4.12	0.11	5.69	0.58	0.62	0.00	0.77	Calculated
16	P #45	CB #37	CB #38	44.57	253.12	251.04	4.6600	30.000	0.0130	23.50	0 00:06	11.04	0.07	88.58	0.27	0.45	0.00	1.12	Calculated
17	P #46	CB #38	SDMH #502	40.06	250.84	248.04	7.0000	30.000	0.0130	24.44	0 00:06	13.35	0.05	108.52	0.23	0.40	0.00	1.00	Calculated
18	P #47	SDMH #502	SDMH #503	102.68	247.84	240.65	7.0000	30.000	0.0130	24.46	0 00:06	8.65	0.20	108.52	0.23	0.58	0.00	1.44	Calculated
19	P #48	SDMH #503	FES#303	89.73	240.45	240.00	0.5000	30.000	0.0130	24.42	0 00:06	5.91	0.25	29.00	0.84	0.79	0.00	1.96	Calculated



:	CB #23	CB #24	CB #25	CB #26	CB #27	CB #29
RIM (FT):	275.59	275.59	276.27	276.12	275.10	273.36
Invert (ft):	271.15	270.81	270.37	270.04	269.60	268.45
Min Pipe Cover (ft):						
Max HGL (ft):	271.91	271.84	271.67	271.30	270.75	269.34

Link ID:	P #30	P #31	P #32	P #33	P #34
(FT):	25.70	47.49	25.72	48.46	179.92
(in):	15.00	18.00	18.00	18.00	18.00
@ (%):	0.50	0.50	0.50	0.50	0.53
Up Invert (ft):	271.15	270.81	270.37	270.04	269.60
Dn Invert (ft):	271.02	270.57	270.24	269.80	268.65
Max Q (cfs):	1.61	3.57	5.70	6.06	6.03
Max Vel (ft/s):	2.73	2.67	3.84	4.34	4.59
Max Depth (ft):	0.79	1.07	1.18	1.11	1.05

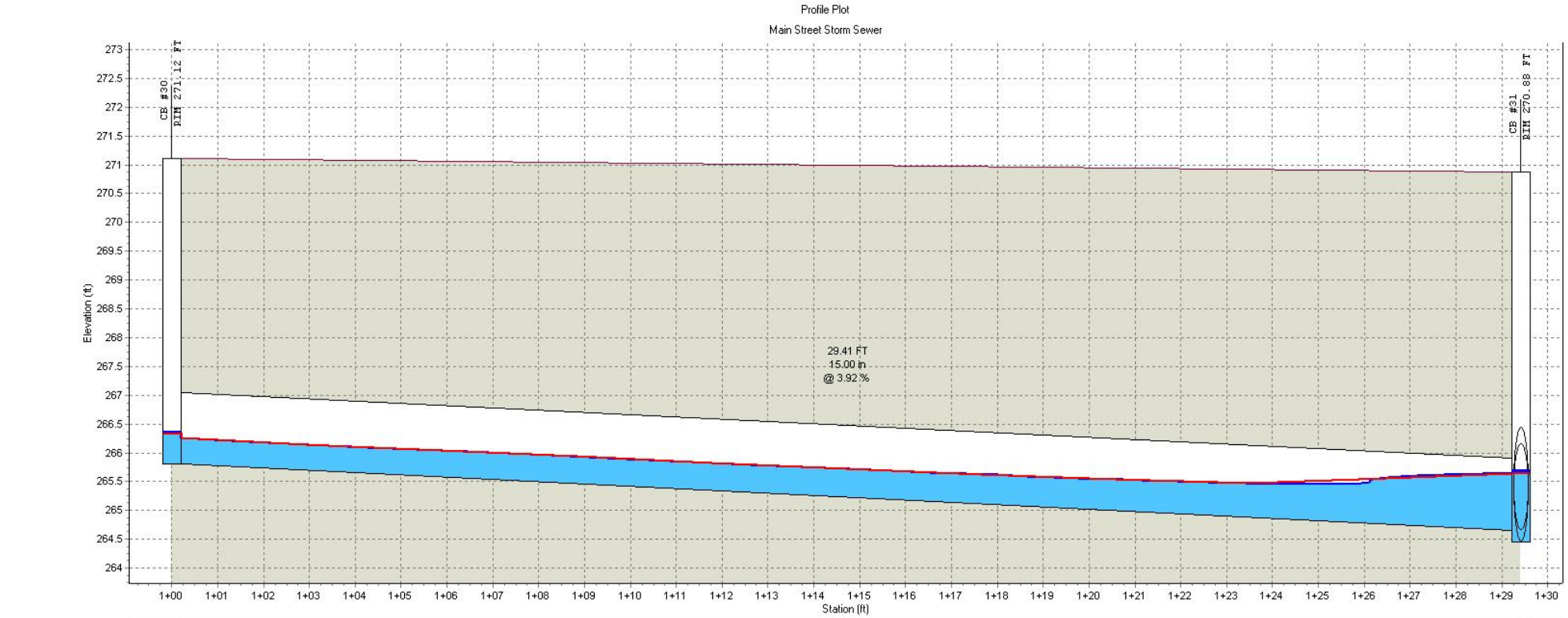
HGL



:	CB #28	CB #29	CB #31	CB #33	CB #34
RIM (FT):	273.58	273.36	270.88	267.81	262.31
Invert (ft):	268.87	268.45	264.45	262.36	254.00
Min Pipe Cover (ft):					
Max HGL (ft):	269.67	269.34	265.68	263.29	255.90

Link ID:	P #35	P #36	P #38	P #40
(FT):	29.13	150.53	185.75	150.00
(in):	18.00	18.00	24.00	24.00
@ (%):	0.76	2.52	1.02	4.24
Up Invert (ft):	268.87	268.45	264.45	262.36
Dn Invert (ft):	268.65	264.65	262.56	256.00
Max Q (cfs):	3.39	9.43	12.85	16.13
Max Vel (ft/s):	4.06	7.97	6.90	12.31
Max Depth (ft):	0.73	0.96	1.15	0.87

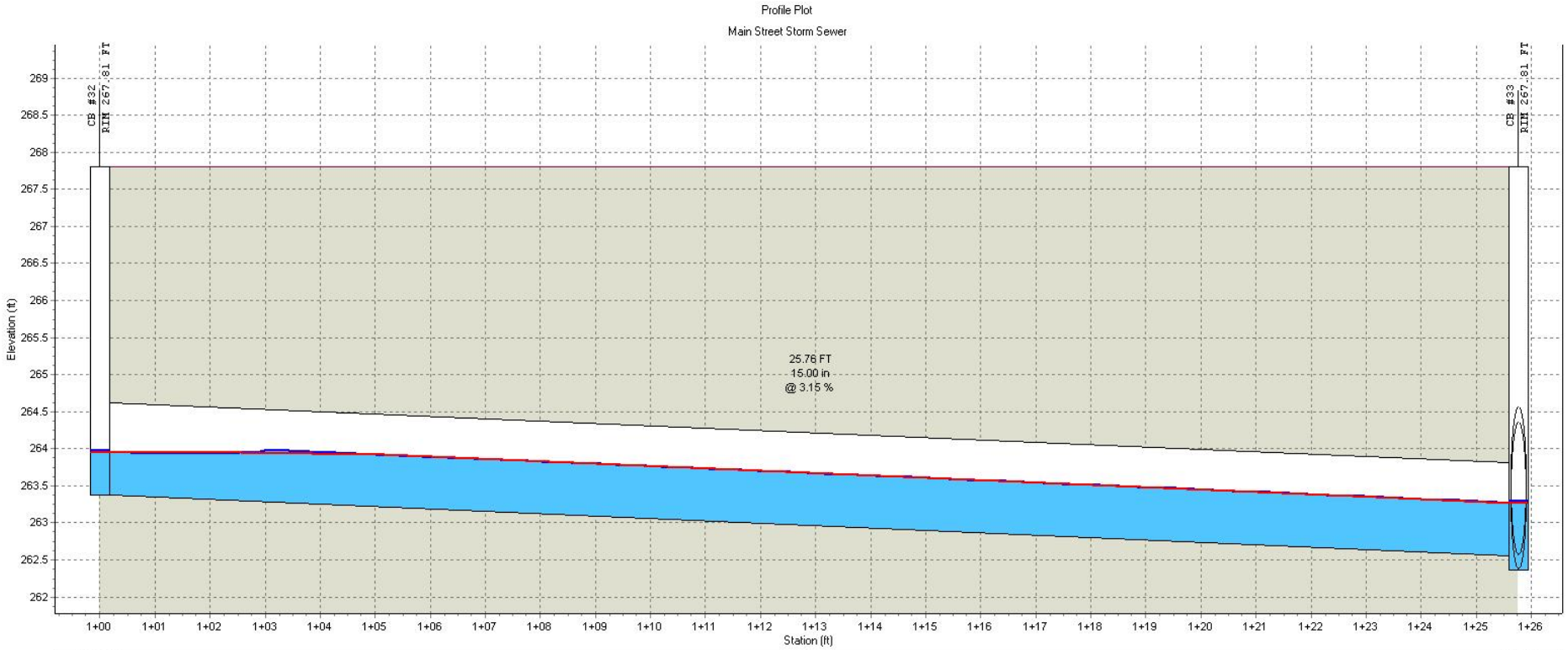
HGL



	CB #30	CB #31
RIM (FT):	271.12	270.88
Invert (ft):	265.80	264.45
Min Pipe Cover (ft):		
Max HGL (ft):	266.36	265.68

Link ID:	P #37
(FT):	29.41
(in):	15.00
@ (%):	3.92
Up Invert (ft):	265.80
Dn Invert (ft):	264.65
Max Q (cfs):	3.38
Max Vel (ft/s):	6.08
Max Depth (ft):	0.76

HGL

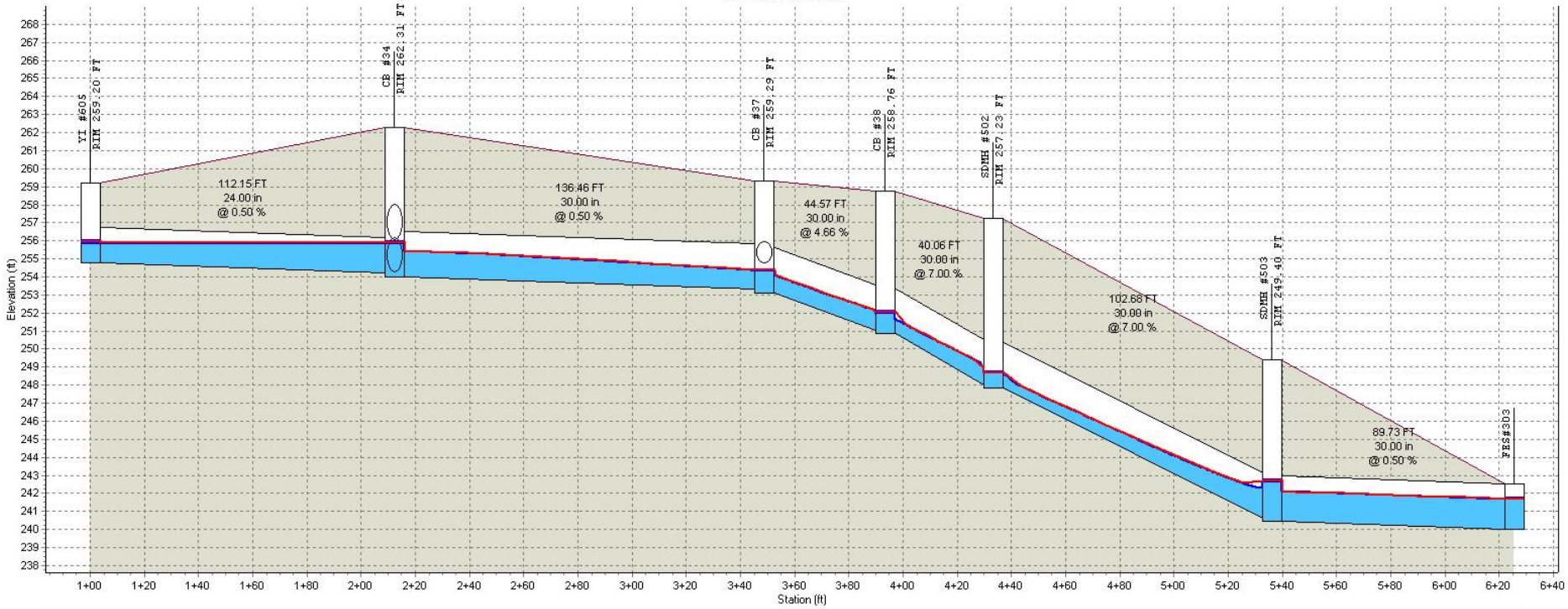


	CB #32		CB #33
RIM (FT):	267.81		267.81
Invert (ft):	263.37		262.36
Min Pipe Cover (ft):			
Max HGL (ft):	263.97		263.29
Link ID:		P #39	
(FT):		25.76	
(in):		15.00	
@ (%):		3.15	
Up Invert (ft):		263.37	
Dn Invert (ft):		262.56	
Max Q (cfs):		3.27	
Max Vel (ft/s):		5.87	
Max Depth (ft):		0.64	

HGL

Profile Plot

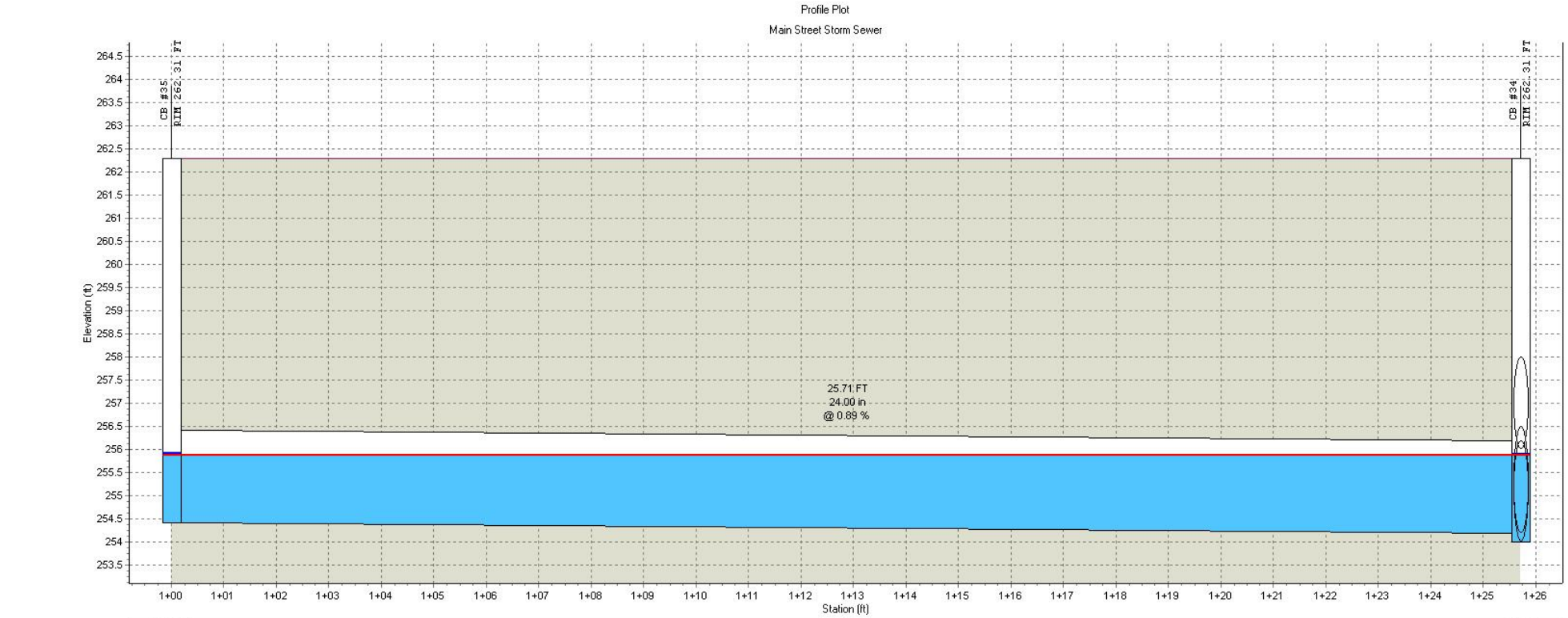
Main Street Storm Sewer



:	YI #605	CB #34	CB #37	CB #38	SDMH #502	SDMH #503	FES#303
RIM (FT):	259.20	262.31	259.29	258.76	257.23	249.40	
Invert (ft):	254.76	254.00	253.12	250.84	247.84	240.45	240.00
Min Pipe Cover (ft):					6.69	6.25	
Max HGL (ft):	255.94	255.90	254.37	252.03	248.68	242.69	241.68

Link ID:	P #41	P #43	P #45	P #46	P #47	P #48
(FT):	112.15	136.46	44.57	40.06	102.68	89.73
(in):	24.00	30.00	30.00	30.00	30.00	30.00
@ (%):	0.50	0.50	4.66	7.00	7.00	0.50
Up Invert (ft):	254.76	254.00	253.12	250.84	247.84	240.45
Dn Invert (ft):	254.20	253.32	251.04	248.04	240.65	240.00
Max Q (cfs):	1.94	20.57	23.50	24.44	24.46	24.42
Max Vel (ft/s):	2.17	5.73	11.04	13.35	8.65	5.91
Max Depth (ft):	1.44	1.72	1.12	1.00	1.44	1.96

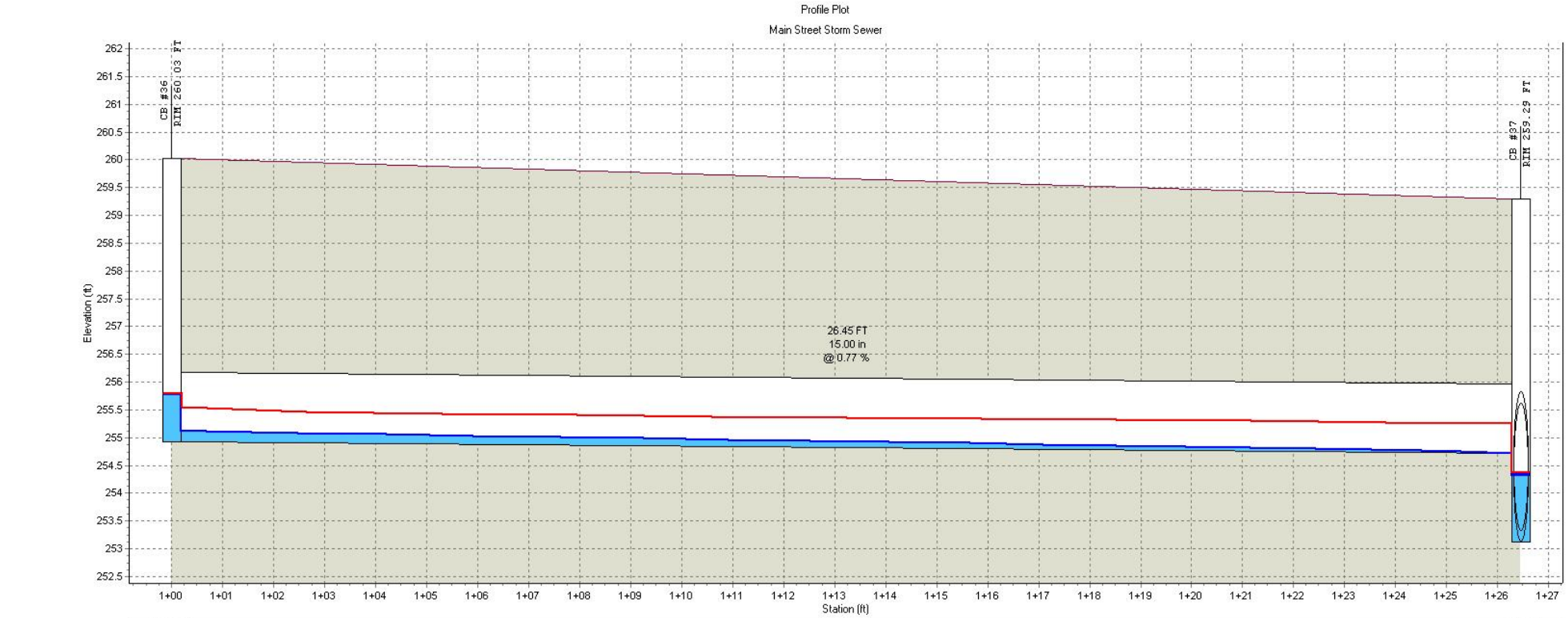
HGL



	CB #35		CB #34
RIM (FT):	262.31		262.31
Invert (ft):	254.43		254.00
Min Pipe Cover (ft):			
Max HGL (ft):	255.91		255.90

Link ID:	P #42
(FT):	25.71
(in):	24.00
@ (%):	0.89
Up Invert (ft):	254.43
Dn Invert (ft):	254.20
Max Q (cfs):	3.11
Max Vel (ft/s):	3.14
Max Depth (ft):	1.59

HGL



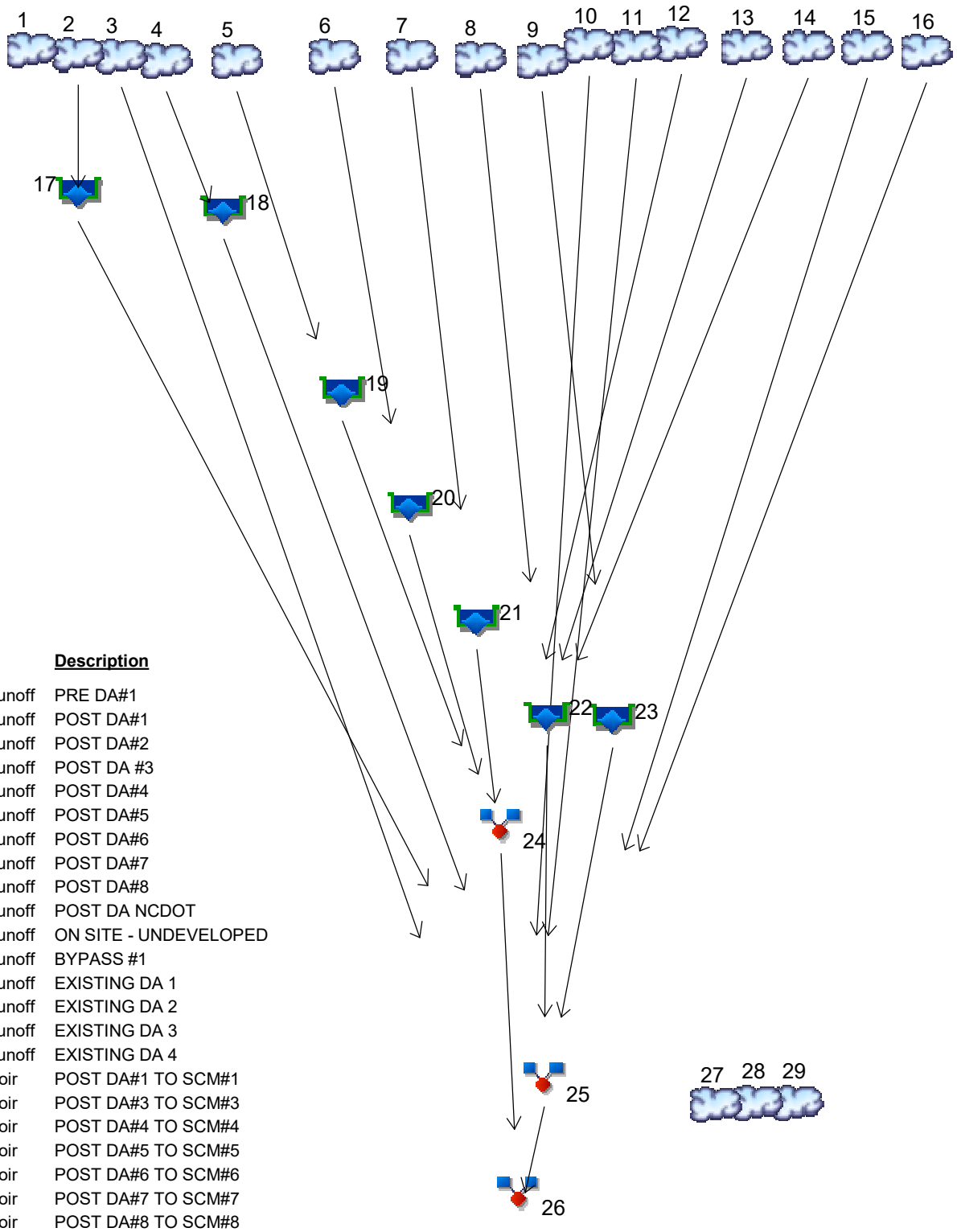
	CB #36		CB #37
RIM (FT):	260.03		259.29
Invert (ft):	254.92		253.12
Min Pipe Cover (ft):			
Max HGL (ft):	255.79		254.37

Link ID:	P #44
(FT):	26.45
(in):	15.00
@ (%):	0.77
Up Invert (ft):	254.92
Dn Invert (ft):	254.72
Max Q (cfs):	3.29
Max Vel (ft/s):	4.12
Max Depth (ft):	0.77

HGL

5. APPENDIX A: Hydrograph Report

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	PRE DA#1
2	SCS Runoff	POST DA#1
3	SCS Runoff	POST DA#2
4	SCS Runoff	POST DA #3
5	SCS Runoff	POST DA#4
6	SCS Runoff	POST DA#5
7	SCS Runoff	POST DA#6
8	SCS Runoff	POST DA#7
9	SCS Runoff	POST DA#8
10	SCS Runoff	POST DA NCDOT
11	SCS Runoff	ON SITE - UNDEVELOPED
12	SCS Runoff	BYPASS #1
13	SCS Runoff	EXISTING DA 1
14	SCS Runoff	EXISTING DA 2
15	SCS Runoff	EXISTING DA 3
16	SCS Runoff	EXISTING DA 4
17	Reservoir	POST DA#1 TO SCM#1
18	Reservoir	POST DA#3 TO SCM#3
19	Reservoir	POST DA#4 TO SCM#4
20	Reservoir	POST DA#5 TO SCM#5
21	Reservoir	POST DA#6 TO SCM#6
22	Reservoir	POST DA#7 TO SCM#7
23	Reservoir	POST DA#8 TO SCM#8
24	Combine	UPSTREAM AOI#1
25	Combine	DOWNSTREAM AOI#2
26	Combine	POI
27	SCS Runoff	CULVERT DA#1
28	SCS Runoff	CULVERT DA #2
29	SCS Runoff	CULVERT DA#3

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	------	312.38	483.47	-------	-------	1017.83	1371.63	-------	1972.73	PRE DA#1
2	SCS Runoff	------	25.62	33.87	-------	-------	56.97	71.14	-------	94.16	POST DA#1
3	SCS Runoff	------	22.92	33.37	-------	-------	65.25	86.13	-------	121.00	POST DA#2
4	SCS Runoff	------	53.63	69.26	-------	-------	112.36	138.58	-------	181.10	POST DA #3
5	SCS Runoff	------	31.86	40.74	-------	-------	65.08	79.86	-------	103.80	POST DA#4
6	SCS Runoff	------	9.498	12.45	-------	-------	20.66	25.68	-------	33.83	POST DA#5
7	SCS Runoff	------	31.40	41.35	-------	-------	69.14	86.18	-------	113.86	POST DA#6
8	SCS Runoff	------	43.70	55.88	-------	-------	89.27	109.54	-------	142.39	POST DA#7
9	SCS Runoff	------	17.87	23.27	-------	-------	38.24	47.37	-------	62.19	POST DA#8
10	SCS Runoff	------	4.079	5.539	-------	-------	9.717	12.31	-------	16.55	POST DA NCDOT
11	SCS Runoff	------	56.27	84.15	-------	-------	169.88	227.10	-------	323.41	ON SITE - UNDEVELOPED
12	SCS Runoff	------	7.210	9.220	-------	-------	14.73	18.07	-------	23.49	BYPASS #1
13	SCS Runoff	------	19.65	29.71	-------	-------	61.50	82.46	-------	117.82	EXISTING DA 1
14	SCS Runoff	------	214.43	331.87	-------	-------	698.67	941.53	-------	1354.14	EXISTING DA 2
15	SCS Runoff	------	22.57	34.34	-------	-------	71.27	95.77	-------	137.16	EXISTING DA 3
16	SCS Runoff	------	1.438	2.203	-------	-------	4.592	6.183	-------	8.874	EXISTING DA 4
17	Reservoir	2	1.058	2.338	-------	-------	5.072	20.77	-------	28.29	POST DA#1 TO SCM#1
18	Reservoir	4	6.650	13.07	-------	-------	45.13	69.59	-------	130.87	POST DA#3 TO SCM#3
19	Reservoir	5	2.732	6.578	-------	-------	20.48	41.63	-------	74.12	POST DA#4 TO SCM#4
20	Reservoir	6	0.720	1.830	-------	-------	4.194	12.18	-------	23.34	POST DA#5 TO SCM#5
21	Reservoir	7	3.193	6.777	-------	-------	17.06	28.51	-------	59.84	POST DA#6 TO SCM#6
22	Reservoir	8	3.559	8.188	-------	-------	19.75	29.66	-------	57.54	POST DA#7 TO SCM#7
23	Reservoir	9	3.183	7.551	-------	-------	17.45	31.29	-------	49.33	POST DA#8 TO SCM#8
24	Combine	12, 13, 14, 19, 20, 21,	225.67	353.19	-------	-------	746.16	1007.45	-------	1444.65	UPSTREAM AOI#1
25	Combine	15, 16, 17, 18, 22, 23,	35.55	66.20	-------	-------	162.21	252.36	-------	407.65	DOWNSTREAM AOI#2
26	Combine	3, 10, 11, 24, 25	260.92	412.82	-------	-------	871.65	1183.47	-------	1791.92	POI
27	SCS Runoff	------	214.51	330.70	-------	-------	692.74	932.87	-------	1341.90	CULVERT DA#1
28	SCS Runoff	------	7.507	11.23	-------	-------	22.66	30.30	-------	43.15	CULVERT DA #2
29	SCS Runoff	------	2.252	3.336	-------	-------	6.637	8.850	-------	12.57	CULVERT DA#3

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

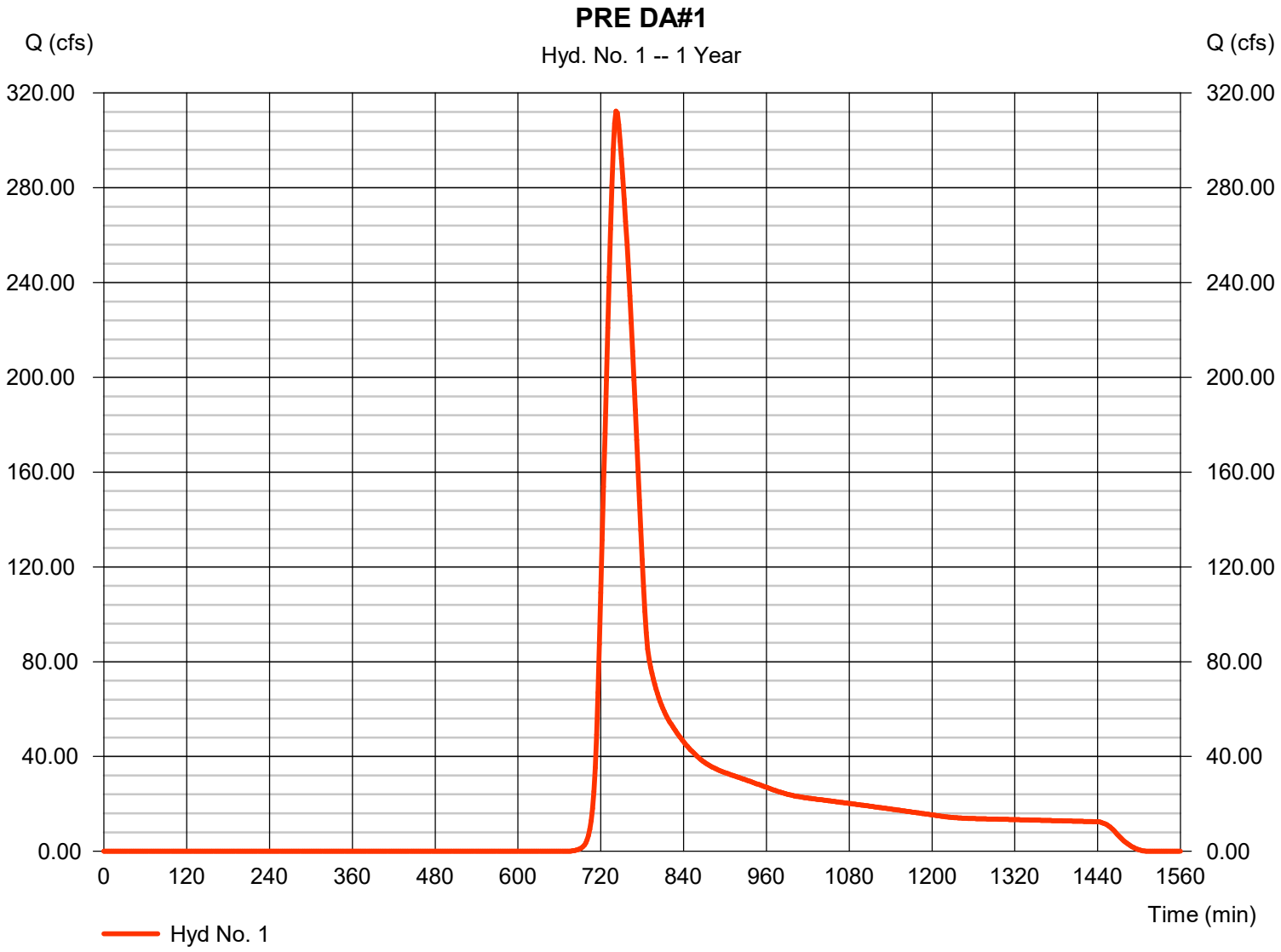
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	312.38	2	742	1,868,306	------	------	------	PRE DA#1
2	SCS Runoff	25.62	2	716	51,888	------	------	------	POST DA#1
3	SCS Runoff	22.92	2	720	53,018	------	------	------	POST DA#2
4	SCS Runoff	53.63	2	718	123,867	------	------	------	POST DA #3
5	SCS Runoff	31.86	2	716	65,696	------	------	------	POST DA#4
6	SCS Runoff	9.498	2	716	19,295	------	------	------	POST DA#5
7	SCS Runoff	31.40	2	722	88,062	------	------	------	POST DA#6
8	SCS Runoff	43.70	2	716	90,115	------	------	------	POST DA#7
9	SCS Runoff	17.87	2	718	41,101	------	------	------	POST DA#8
10	SCS Runoff	4.079	2	718	8,229	------	------	------	POST DA NCDOT
11	SCS Runoff	56.27	2	720	131,756	------	------	------	ON SITE - UNDEVELOPED
12	SCS Runoff	7.210	2	716	14,870	------	------	------	BYPASS #1
13	SCS Runoff	19.65	2	724	58,573	------	------	------	EXISTING DA 1
14	SCS Runoff	214.43	2	742	1,282,461	------	------	------	EXISTING DA 2
15	SCS Runoff	22.57	2	726	75,916	------	------	------	EXISTING DA 3
16	SCS Runoff	1.438	2	730	5,758	------	------	------	EXISTING DA 4
17	Reservoir	1.058	2	808	48,002	2	263.65	31,009	POST DA#1 TO SCM#1
18	Reservoir	6.650	2	742	119,073	4	242.74	64,978	POST DA#3 TO SCM#3
19	Reservoir	2.732	2	746	62,218	5	242.27	36,464	POST DA#4 TO SCM#4
20	Reservoir	0.720	2	752	18,688	6	251.60	10,438	POST DA#5 TO SCM#5
21	Reservoir	3.193	2	762	85,775	7	239.42	47,824	POST DA#6 TO SCM#6
22	Reservoir	3.559	2	748	87,088	8	241.42	50,252	POST DA#7 TO SCM#7
23	Reservoir	3.183	2	732	39,805	9	242.39	20,453	POST DA#8 TO SCM#8
24	Combine	225.67	2	742	1,522,586	12, 13, 14, 19, 20, 21,	------	------	UPSTREAM AOI#1
25	Combine	35.55	2	728	375,642	15, 16, 17, 18, 22, 23,	------	------	DOWNSTREAM AOI#2
26	Combine	260.92	2	742	2,091,230	3, 10, 11, 24, 25	------	------	POI
27	SCS Runoff	214.51	2	736	1,074,329	------	------	------	CULVERT DA#1
28	SCS Runoff	7.507	2	720	17,578	------	------	------	CULVERT DA #2
29	SCS Runoff	2.252	2	718	4,541	------	------	------	CULVERT DA#3

Hydrograph Report

Hyd. No. 1

PRE DA#1

Hydrograph type	=	SCS Runoff	Peak discharge	=	312.38 cfs
Storm frequency	=	1 yrs	Time to peak	=	742 min
Time interval	=	2 min	Hyd. volume	=	1,868,306 cuft
Drainage area	=	618.810 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	47.00 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

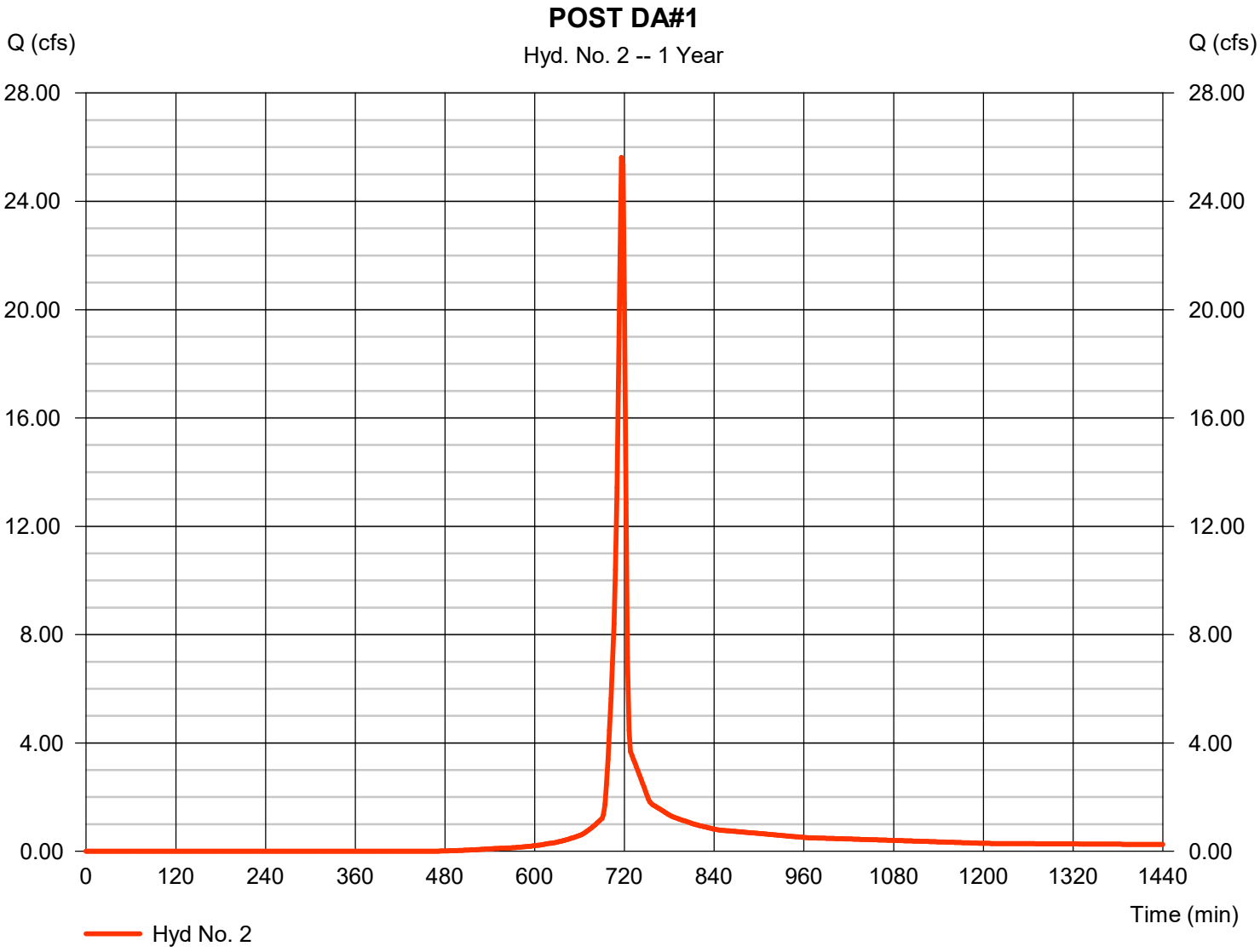


Hydrograph Report

Hyd. No. 2

POST DA#1

Hydrograph type	=	SCS Runoff	Peak discharge	=	25.62 cfs
Storm frequency	=	1 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	51,888 cuft
Drainage area	=	9.720 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.50 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

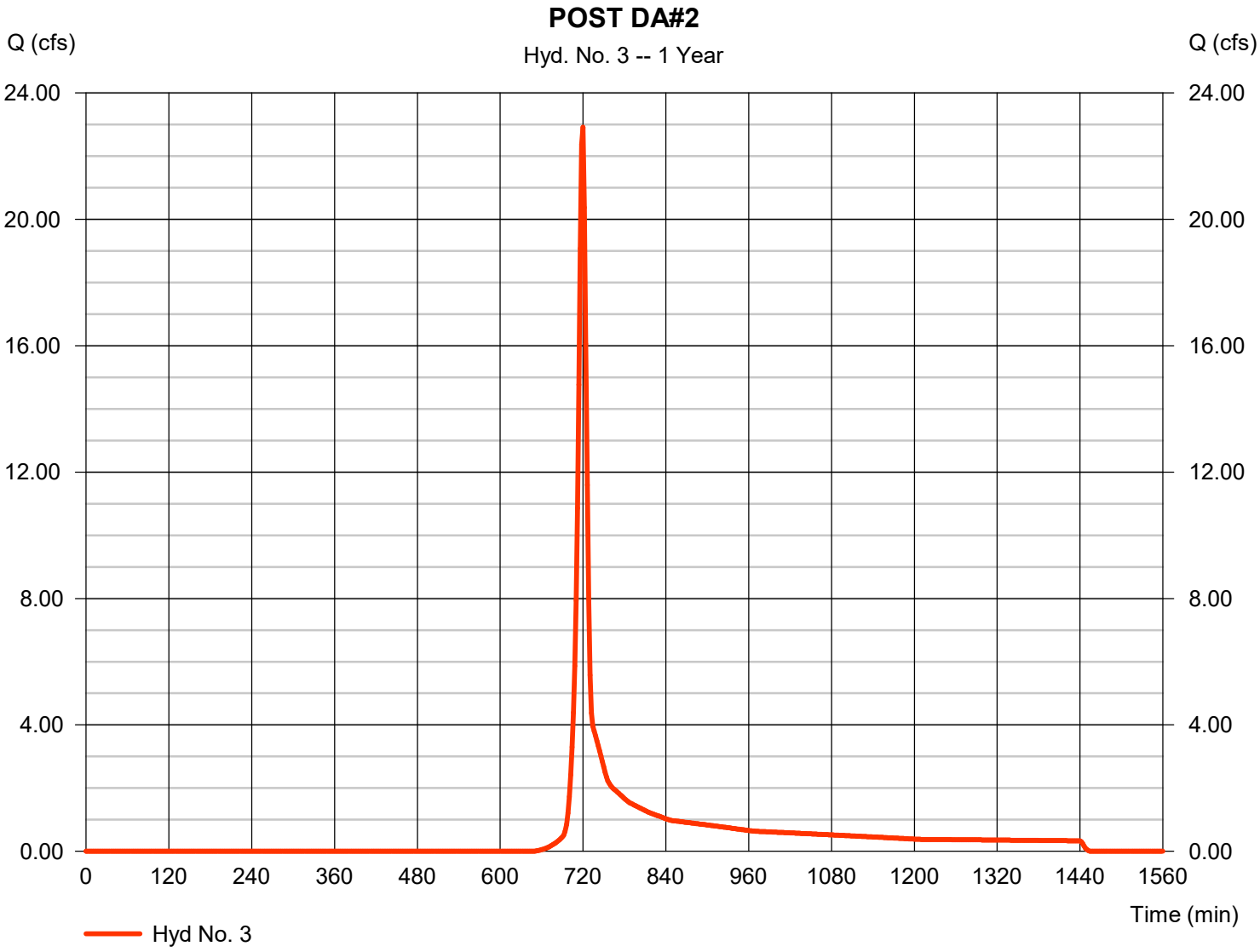


Hydrograph Report

Hyd. No. 3

POST DA#2

Hydrograph type	=	SCS Runoff	Peak discharge	=	22.92 cfs
Storm frequency	=	1 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	53,018 cuft
Drainage area	=	15.510 ac	Curve number	=	76
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.00 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

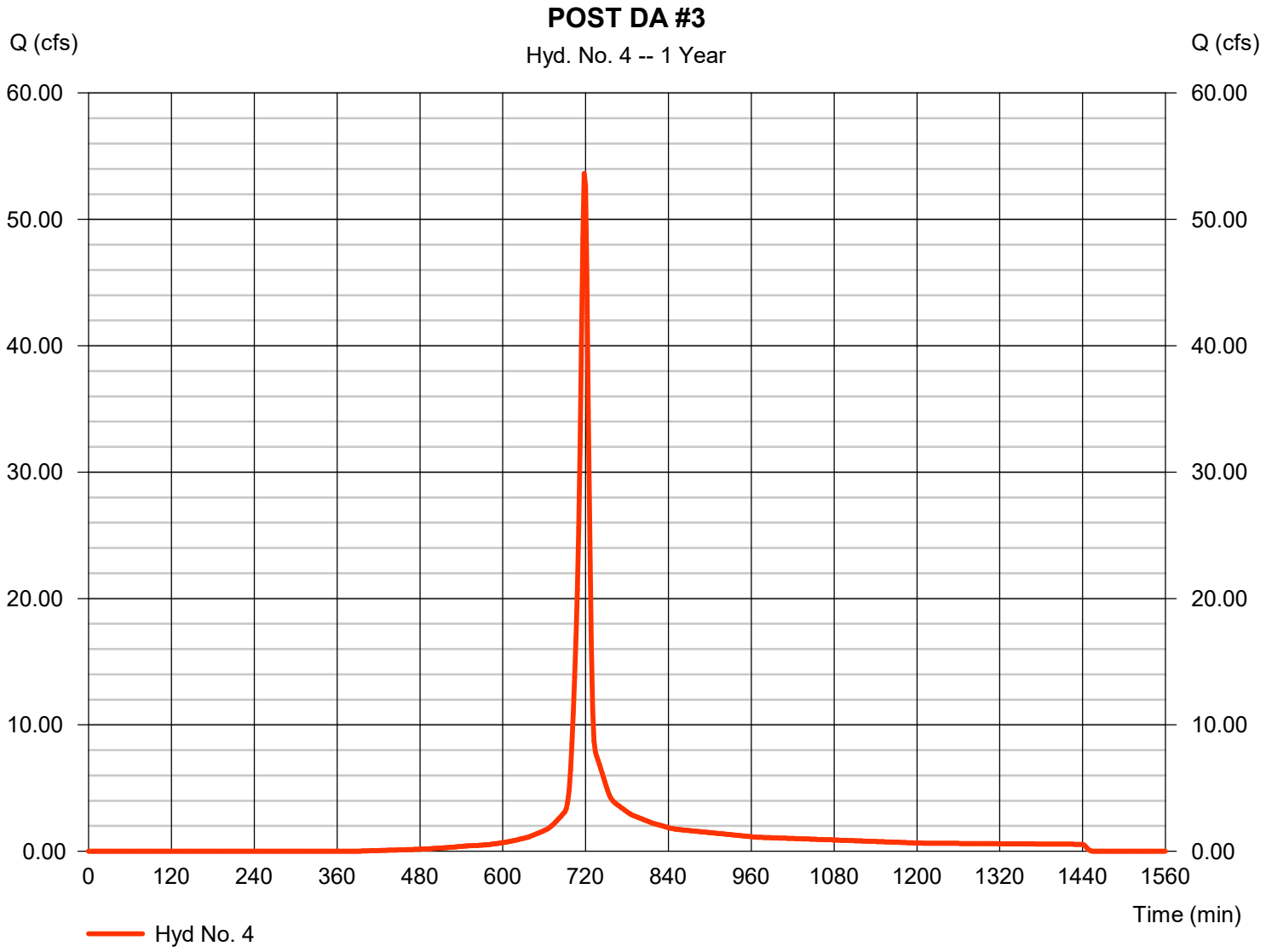


Hydrograph Report

Hyd. No. 4

POST DA #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	53.63 cfs
Storm frequency	=	1 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	123,867 cuft
Drainage area	=	18.950 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.40 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

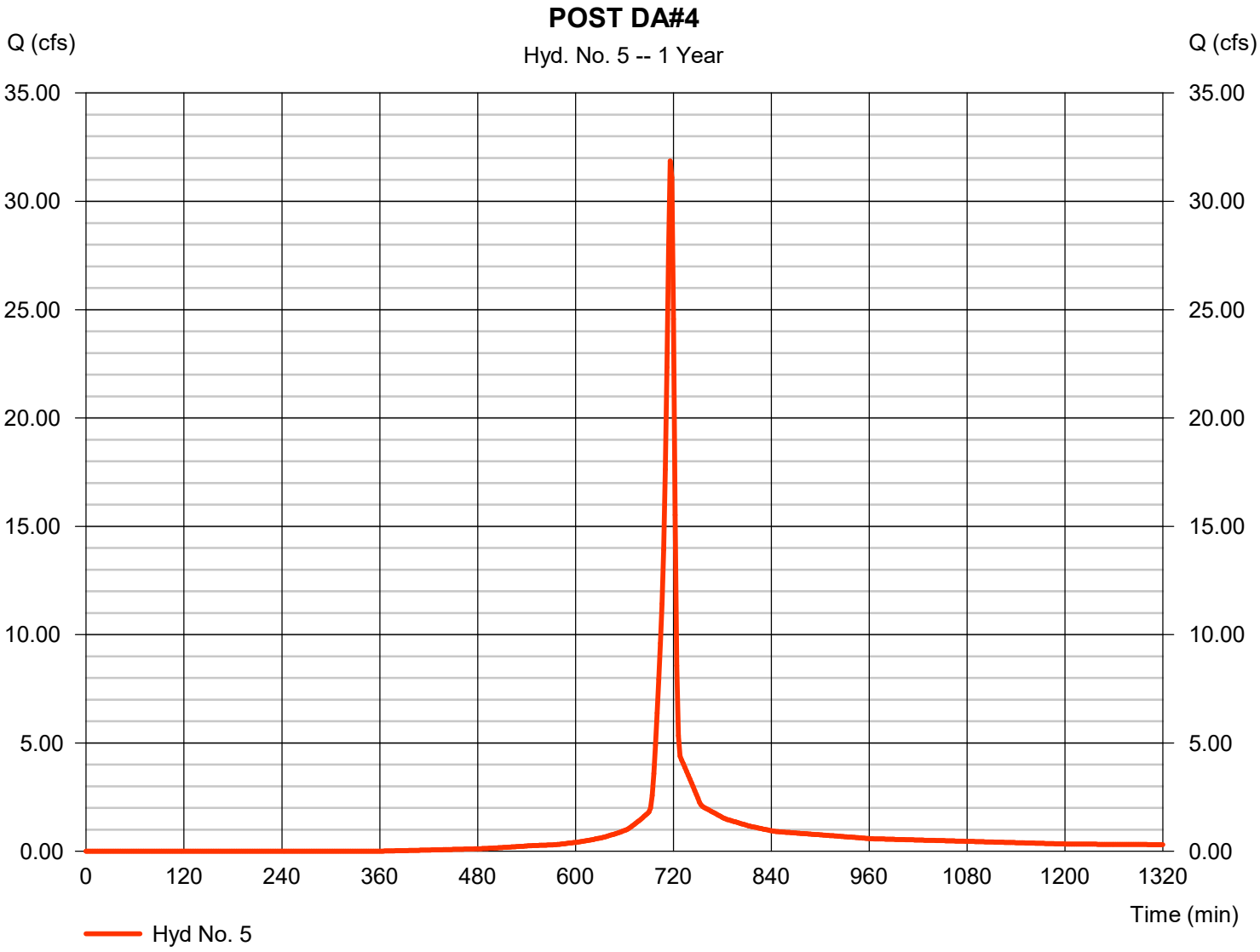


Hydrograph Report

Hyd. No. 5

POST DA#4

Hydrograph type	=	SCS Runoff	Peak discharge	=	31.86 cfs
Storm frequency	=	1 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	65,696 cuft
Drainage area	=	10.250 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.30 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

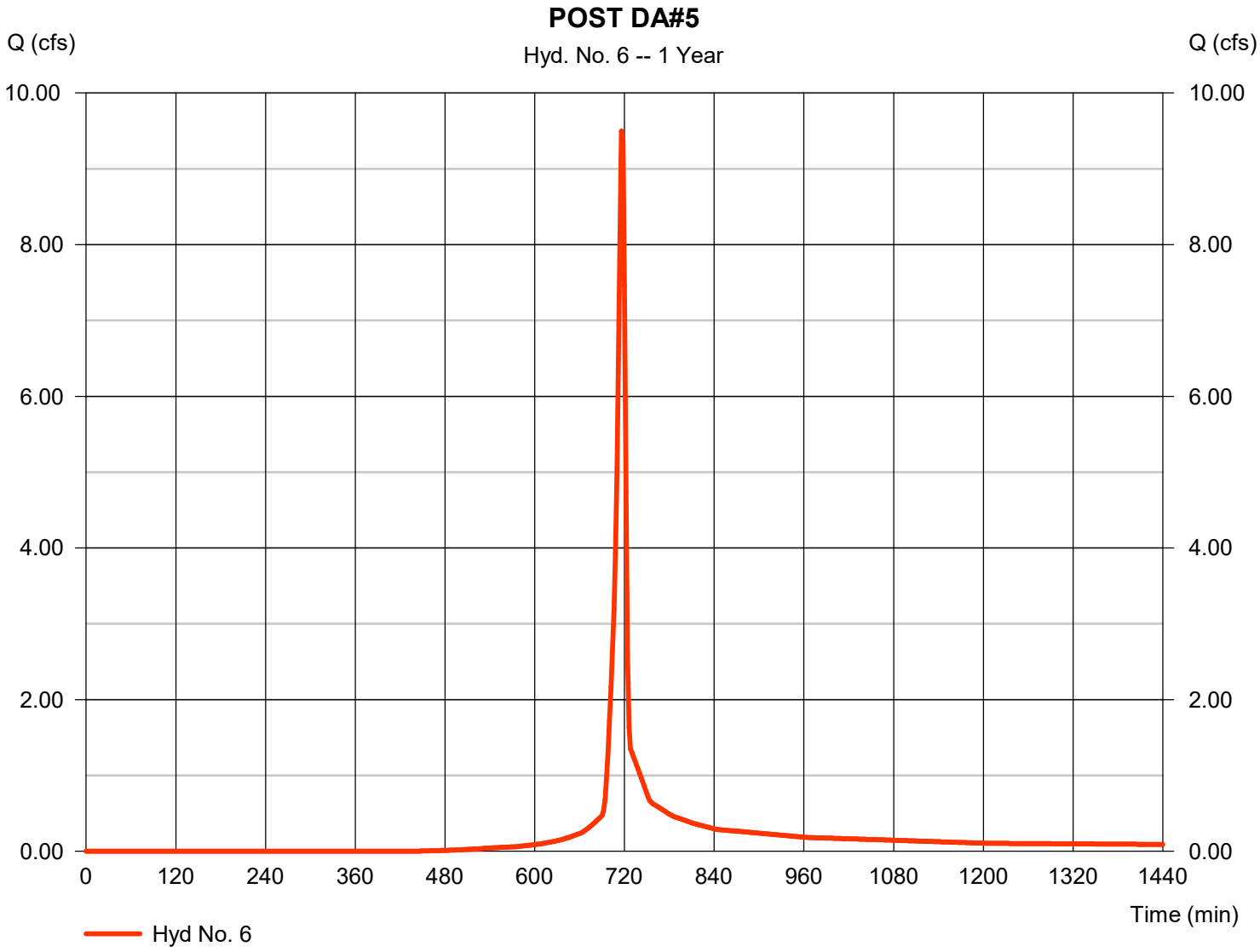


Hydrograph Report

Hyd. No. 6

POST DA#5

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.498 cfs
Storm frequency	=	1 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	19,295 cuft
Drainage area	=	3.450 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

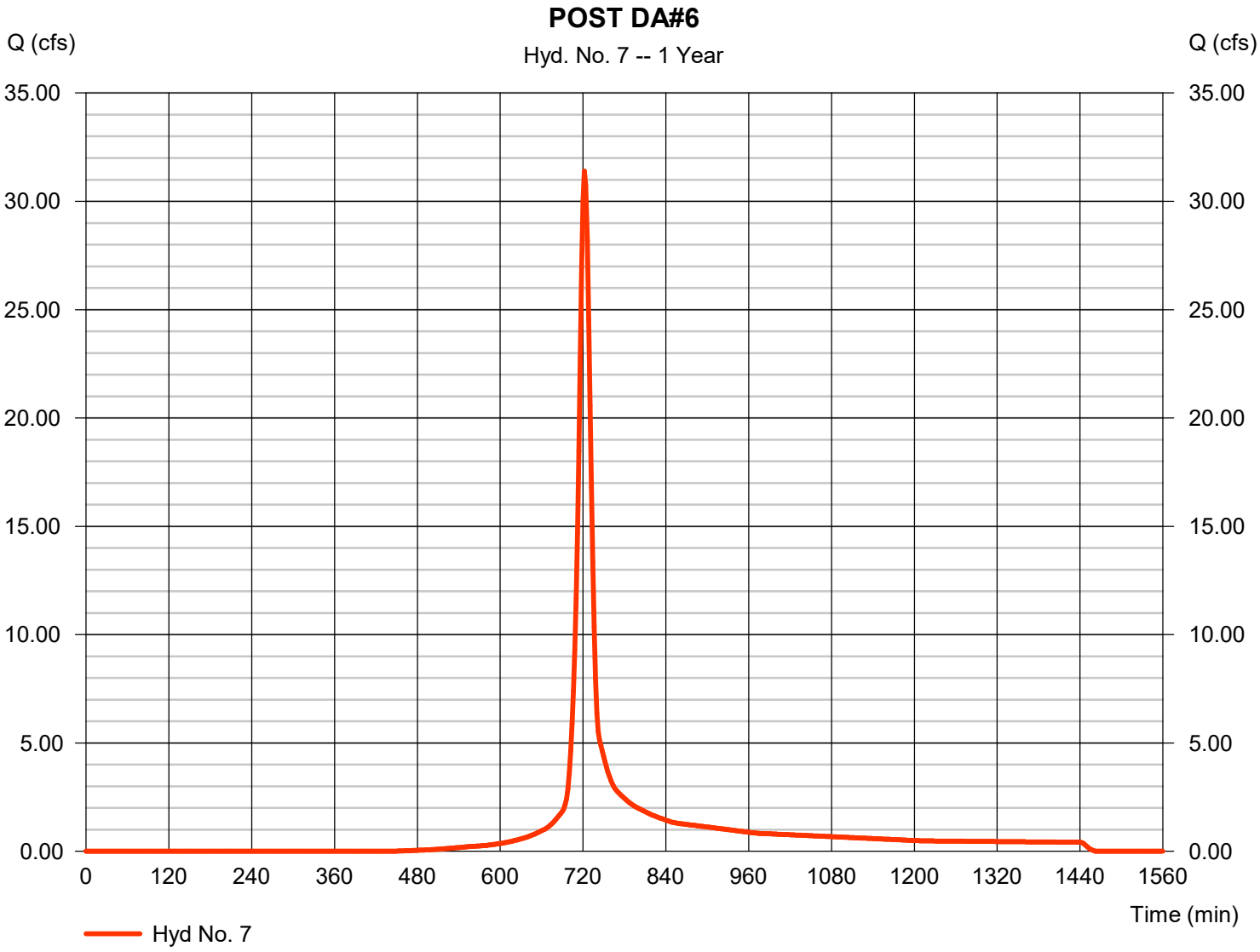


Hydrograph Report

Hyd. No. 7

POST DA#6

Hydrograph type	=	SCS Runoff	Peak discharge	=	31.40 cfs
Storm frequency	=	1 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	88,062 cuft
Drainage area	=	15.140 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	14.80 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

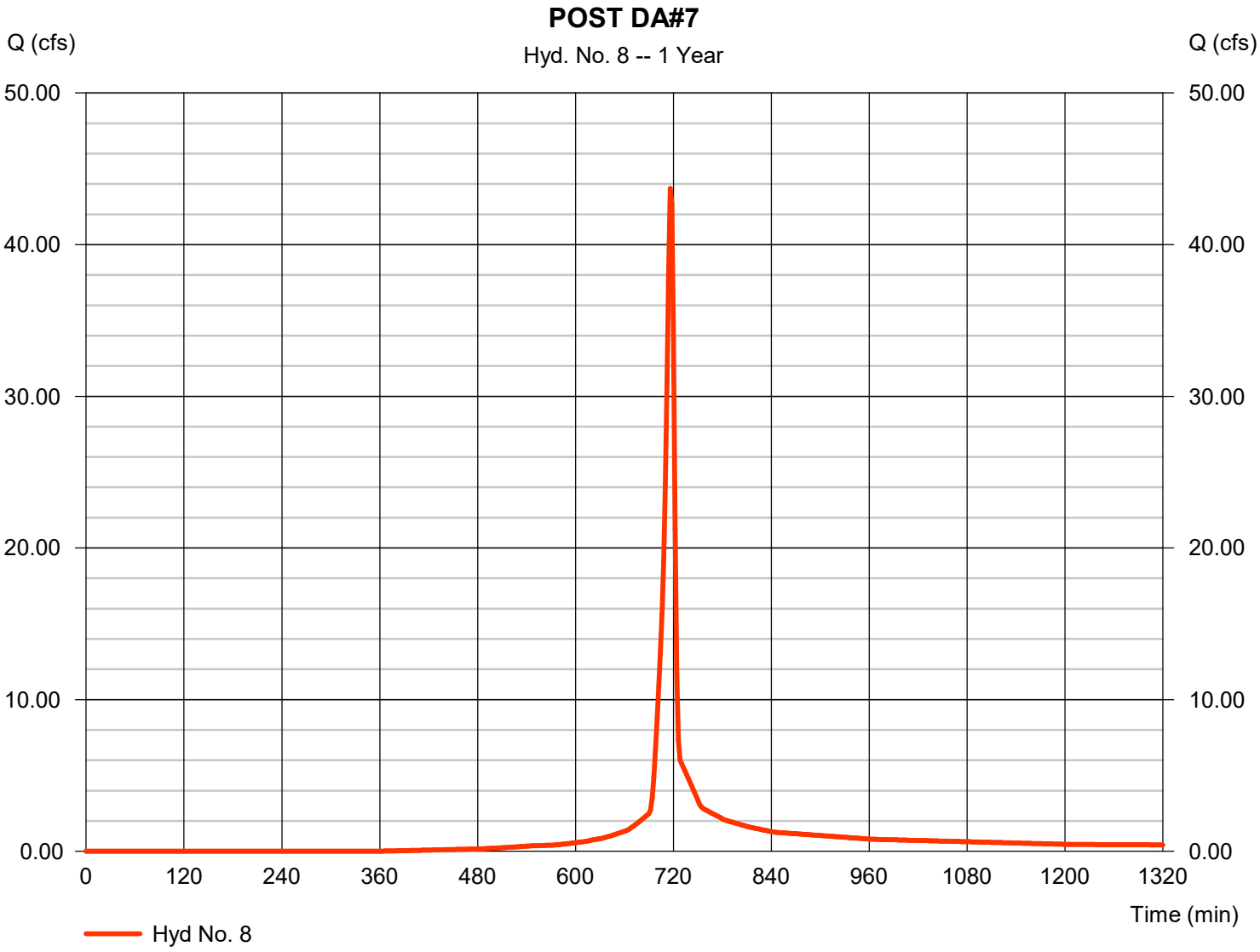


Hydrograph Report

Hyd. No. 8

POST DA#7

Hydrograph type	=	SCS Runoff	Peak discharge	=	43.70 cfs
Storm frequency	=	1 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	90,115 cuft
Drainage area	=	14.060 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.20 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

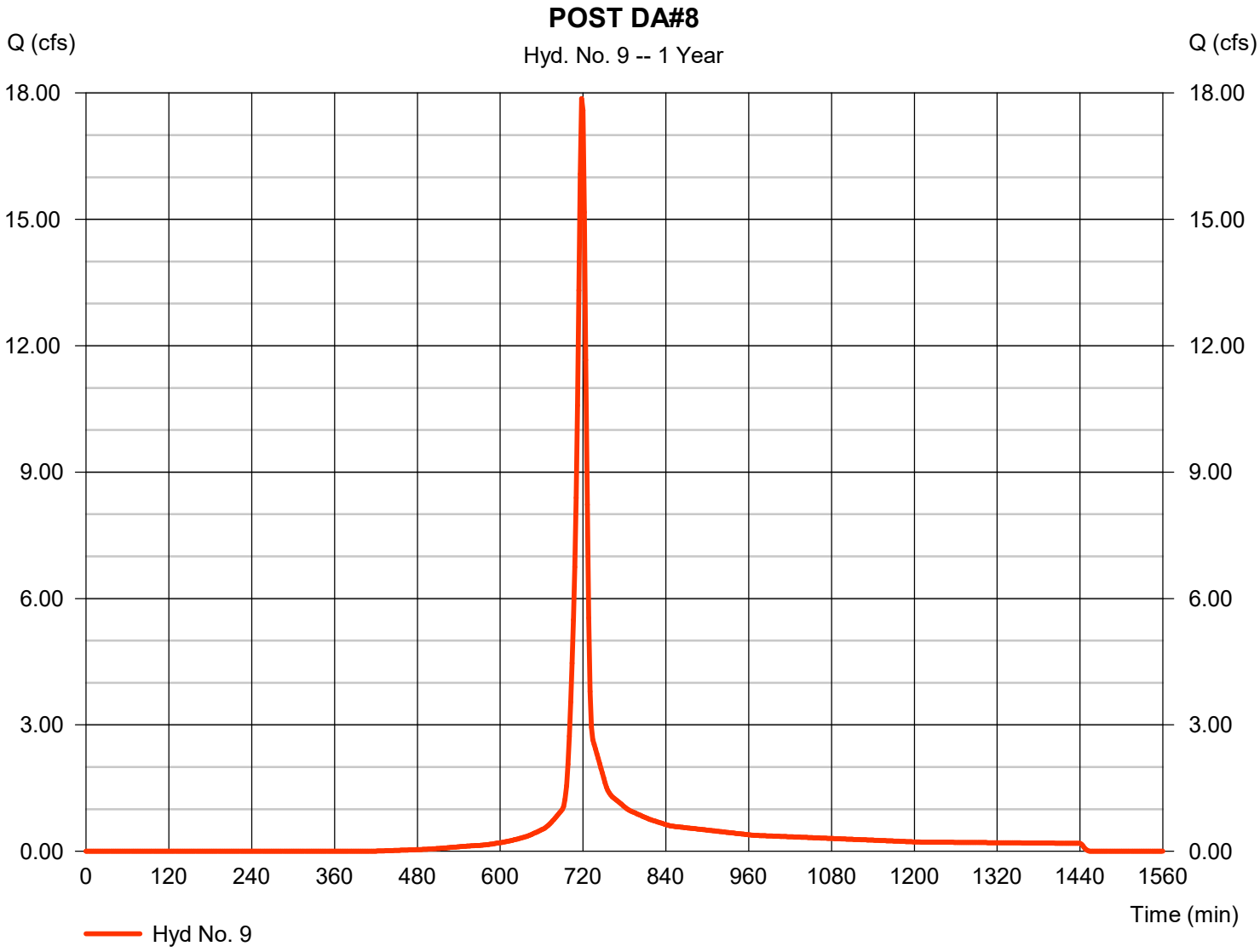


Hydrograph Report

Hyd. No. 9

POST DA#8

Hydrograph type	=	SCS Runoff	Peak discharge	=	17.87 cfs
Storm frequency	=	1 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	41,101 cuft
Drainage area	=	6.580 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.80 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

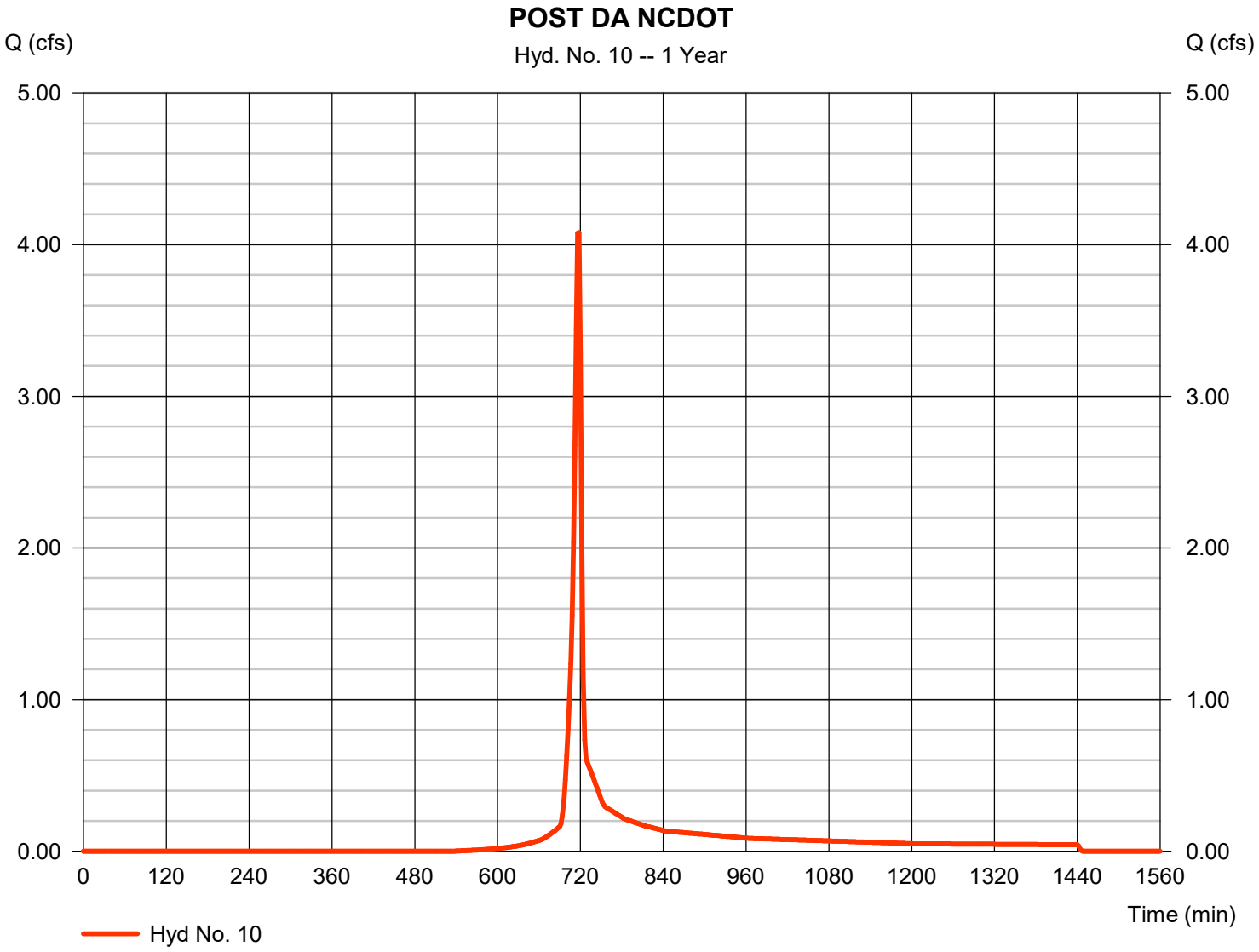


Hydrograph Report

Hyd. No. 10

POST DA NCDOT

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.079 cfs
Storm frequency	=	1 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	8,229 cuft
Drainage area	=	1.780 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

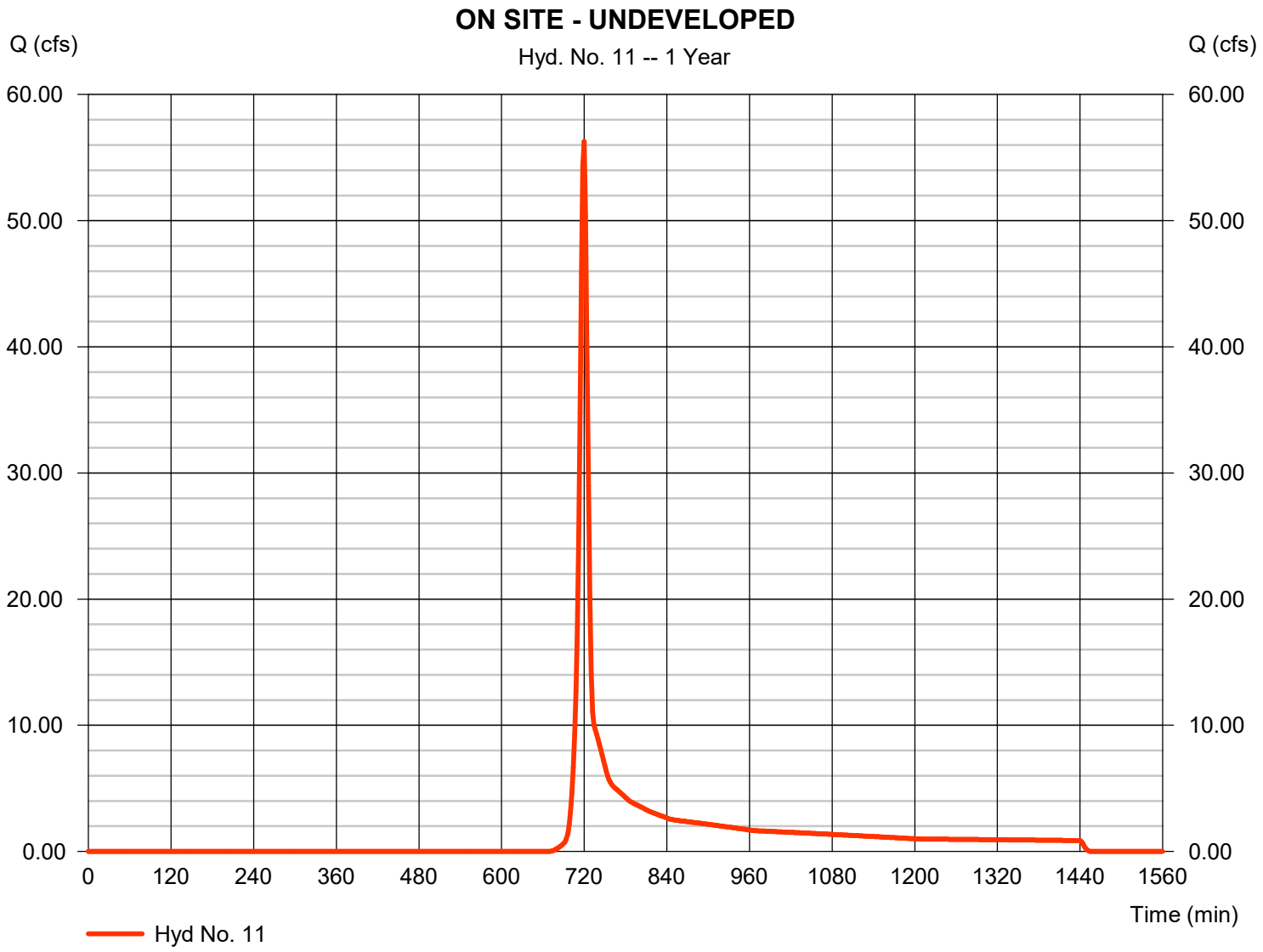


Hydrograph Report

Hyd. No. 11

ON SITE - UNDEVELOPED

Hydrograph type	=	SCS Runoff	Peak discharge	=	56.27 cfs
Storm frequency	=	1 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	131,756 cuft
Drainage area	=	43.250 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.00 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

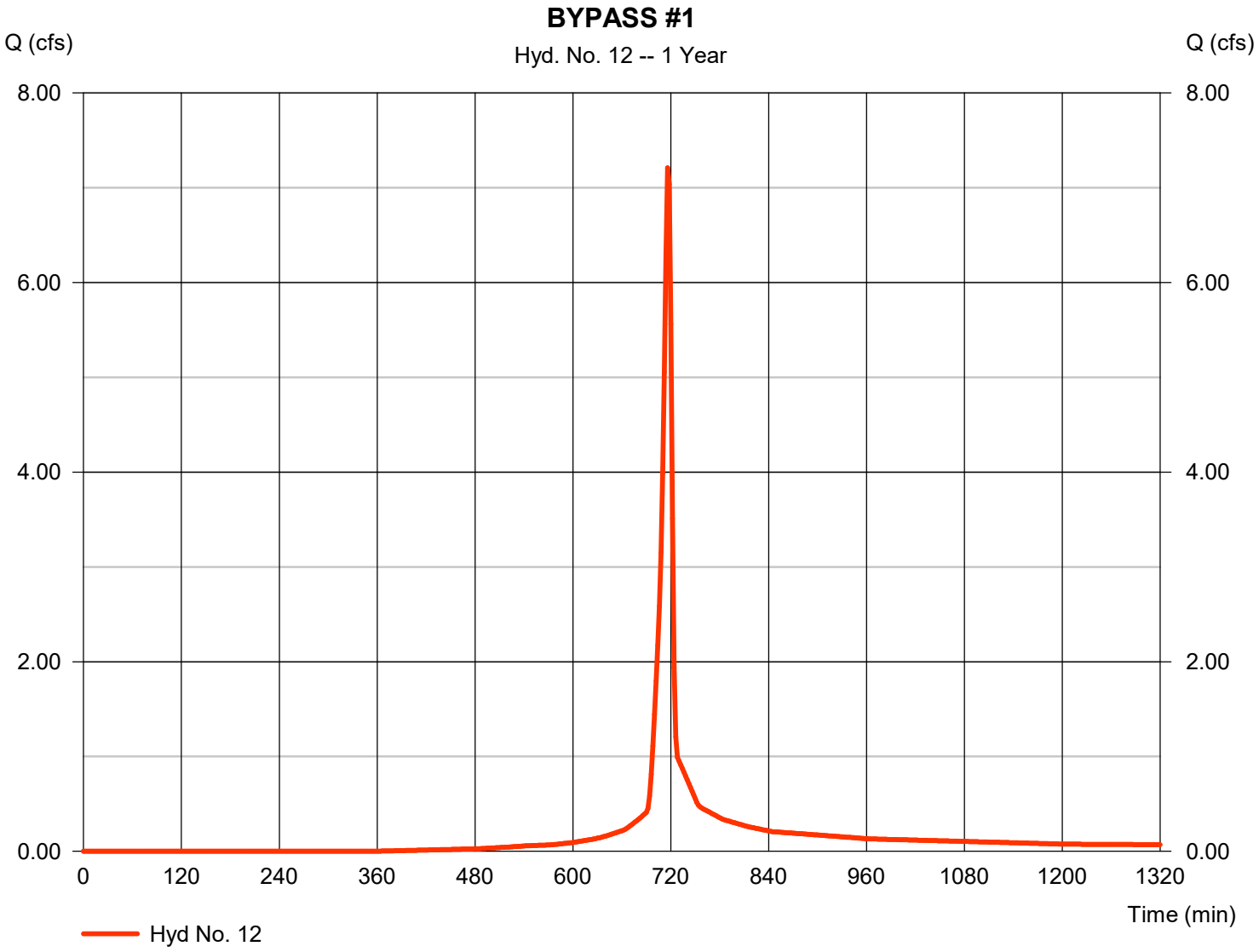


Hydrograph Report

Hyd. No. 12

BYPASS #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.210 cfs
Storm frequency	=	1 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	14,870 cuft
Drainage area	=	2.320 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

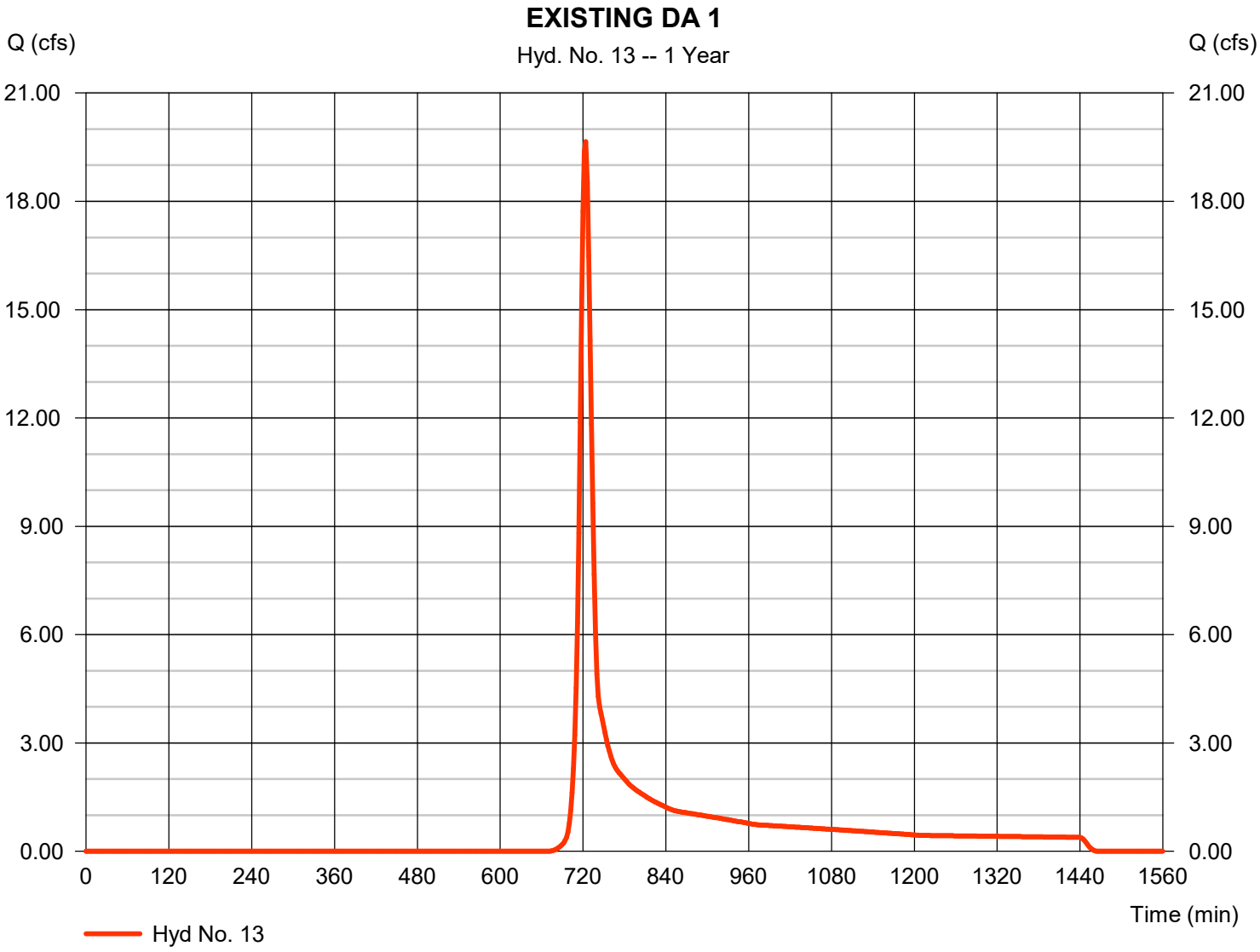


Hydrograph Report

Hyd. No. 13

EXISTING DA 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	19.65 cfs
Storm frequency	=	1 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	58,573 cuft
Drainage area	=	19.720 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	14.00 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

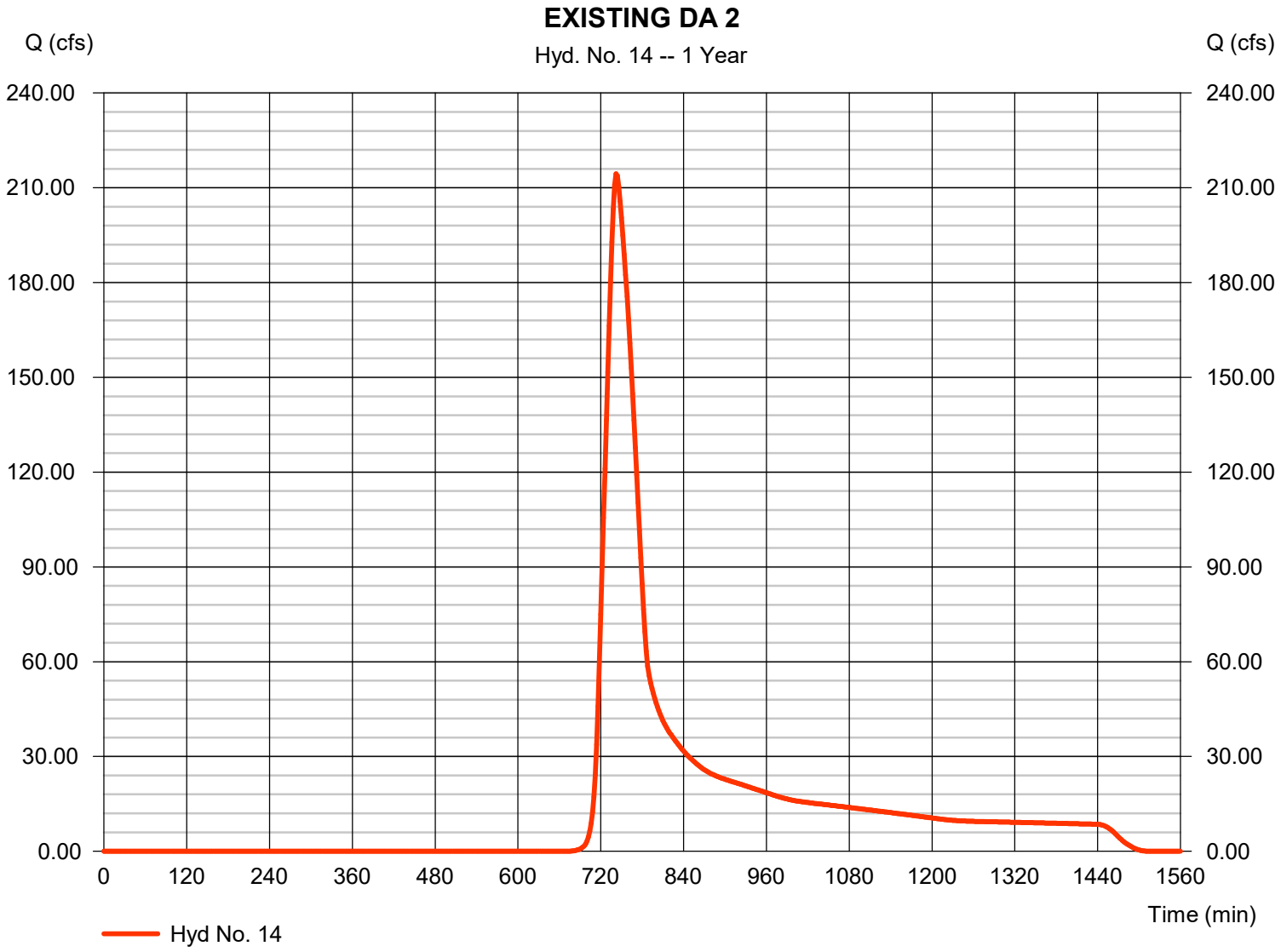


Hydrograph Report

Hyd. No. 14

EXISTING DA 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	214.43 cfs
Storm frequency	=	1 yrs	Time to peak	=	742 min
Time interval	=	2 min	Hyd. volume	=	1,282,461 cuft
Drainage area	=	424.770 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	47.00 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

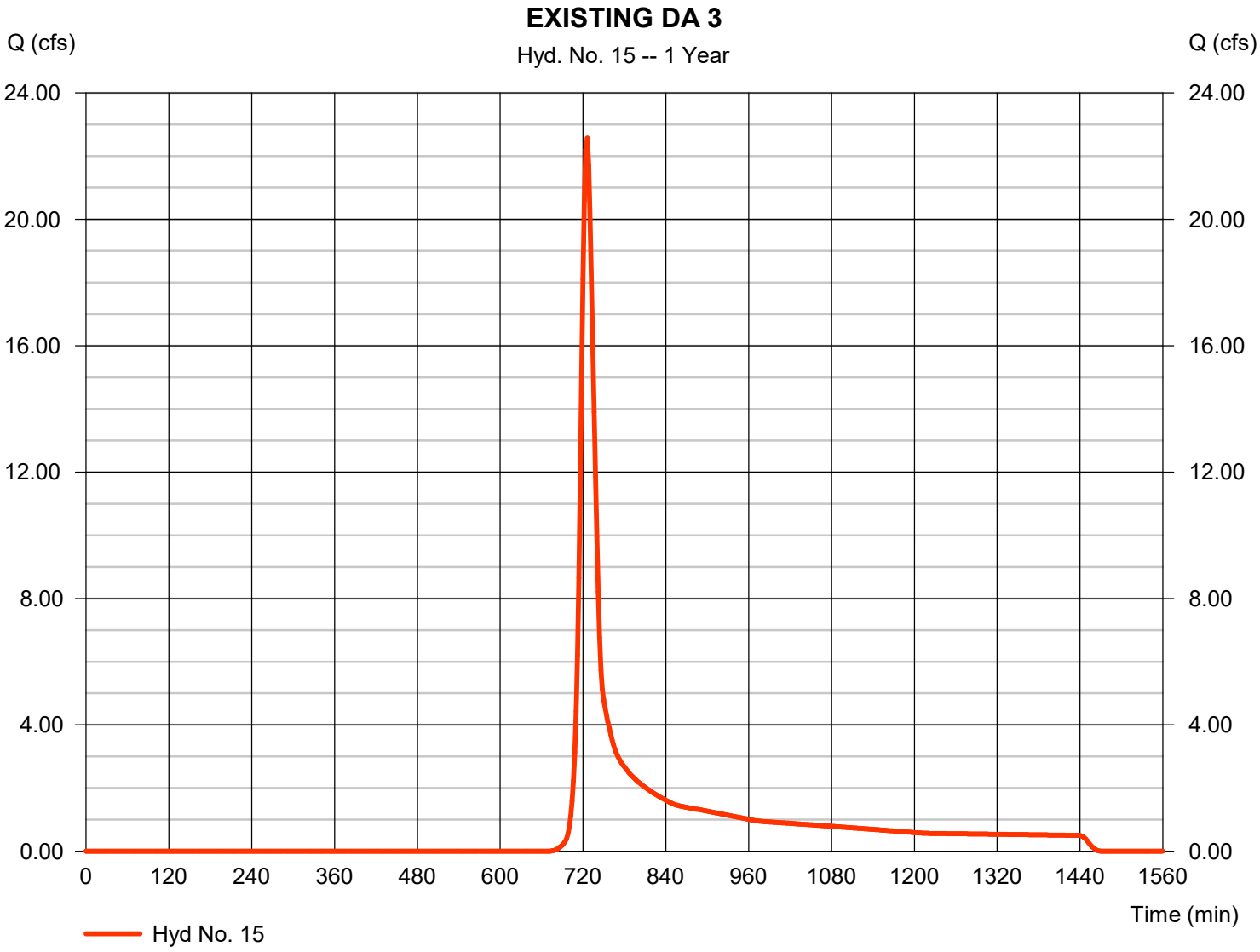


Hydrograph Report

Hyd. No. 15

EXISTING DA 3

Hydrograph type	=	SCS Runoff	Peak discharge	=	22.57 cfs
Storm frequency	=	1 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	75,916 cuft
Drainage area	=	24.920 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	19.60 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

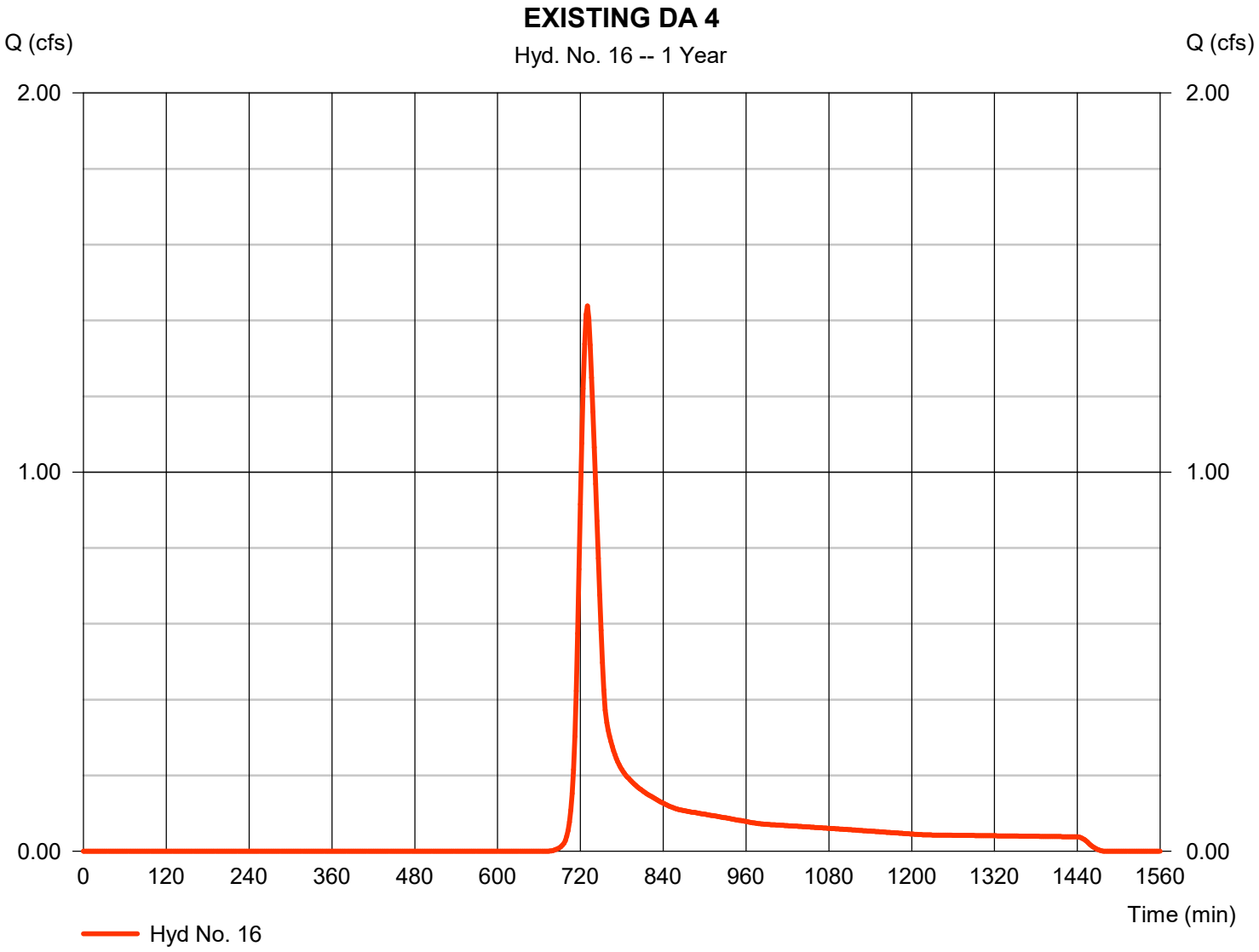


Hydrograph Report

Hyd. No. 16

EXISTING DA 4

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.438 cfs
Storm frequency	=	1 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	5,758 cuft
Drainage area	=	1.920 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	26.20 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



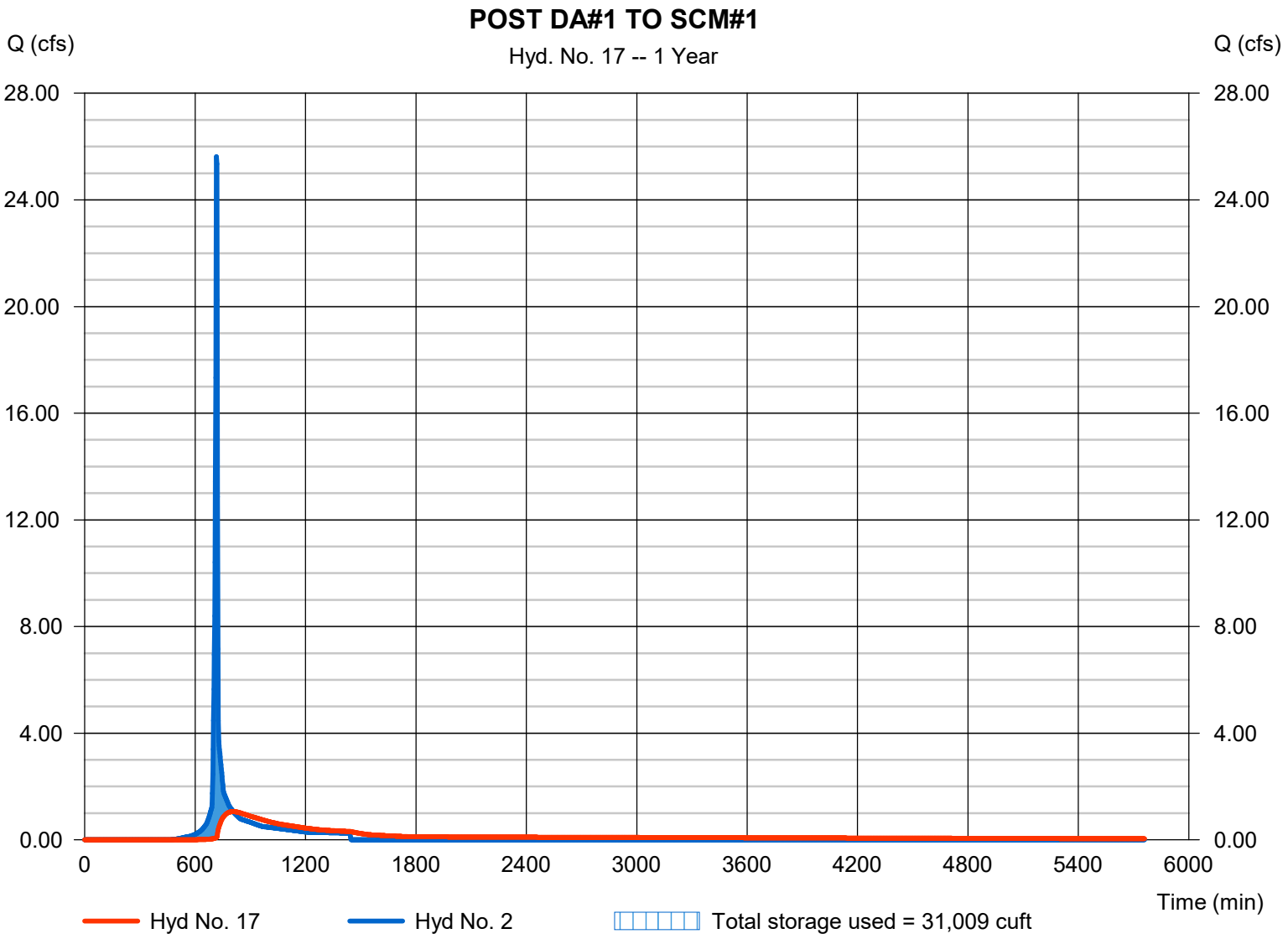
Hydrograph Report

Hyd. No. 17

POST DA#1 TO SCM#1

Hydrograph type	=	Reservoir	Peak discharge	=	1.058 cfs
Storm frequency	=	1 yrs	Time to peak	=	808 min
Time interval	=	2 min	Hyd. volume	=	48,002 cuft
Inflow hyd. No.	=	2 - POST DA#1	Max. Elevation	=	263.65 ft
Reservoir name	=	SCM#1	Max. Storage	=	31,009 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - SCM#1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 262.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	262.00	15,782	0	0
1.00	263.00	19,562	17,636	17,636
2.00	264.00	21,426	20,485	38,121
3.00	265.00	23,347	22,377	60,499
4.00	266.00	25,323	24,326	84,825
5.00	267.00	27,357	26,331	111,155
6.00	268.00	29,462	28,400	139,556

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	2.00	12.00	0.00
Span (in)	= 24.00	2.00	12.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 262.00	262.00	263.16	0.00
Length (ft)	= 45.00	0.00	0.00	0.00
Slope (%)	= 0.96	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	10.00	0.00	0.00
Crest El. (ft)	= 265.20	266.50	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

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	262.00	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
1.00	17,636	263.00	0.11 ic	0.10 ic	0.00	---	0.00	0.00	---	---	---	---	0.098
2.00	38,121	264.00	2.38 ic	0.12 ic	2.20 ic	---	0.00	0.00	---	---	---	---	2.326
3.00	60,499	265.00	4.58 ic	0.15 ic	4.38 ic	---	0.00	0.00	---	---	---	---	4.529
4.00	84,825	266.00	25.46 ic	0.04 ic	1.55 ic	---	23.87 s	0.00	---	---	---	---	25.45
5.00	111,155	267.00	30.15 ic	0.02 ic	0.61 ic	---	29.49 s	9.19	---	---	---	---	39.31
6.00	139,556	268.00	33.79 ic	0.01 ic	0.38 ic	---	33.37 s	47.77	---	---	---	---	81.52

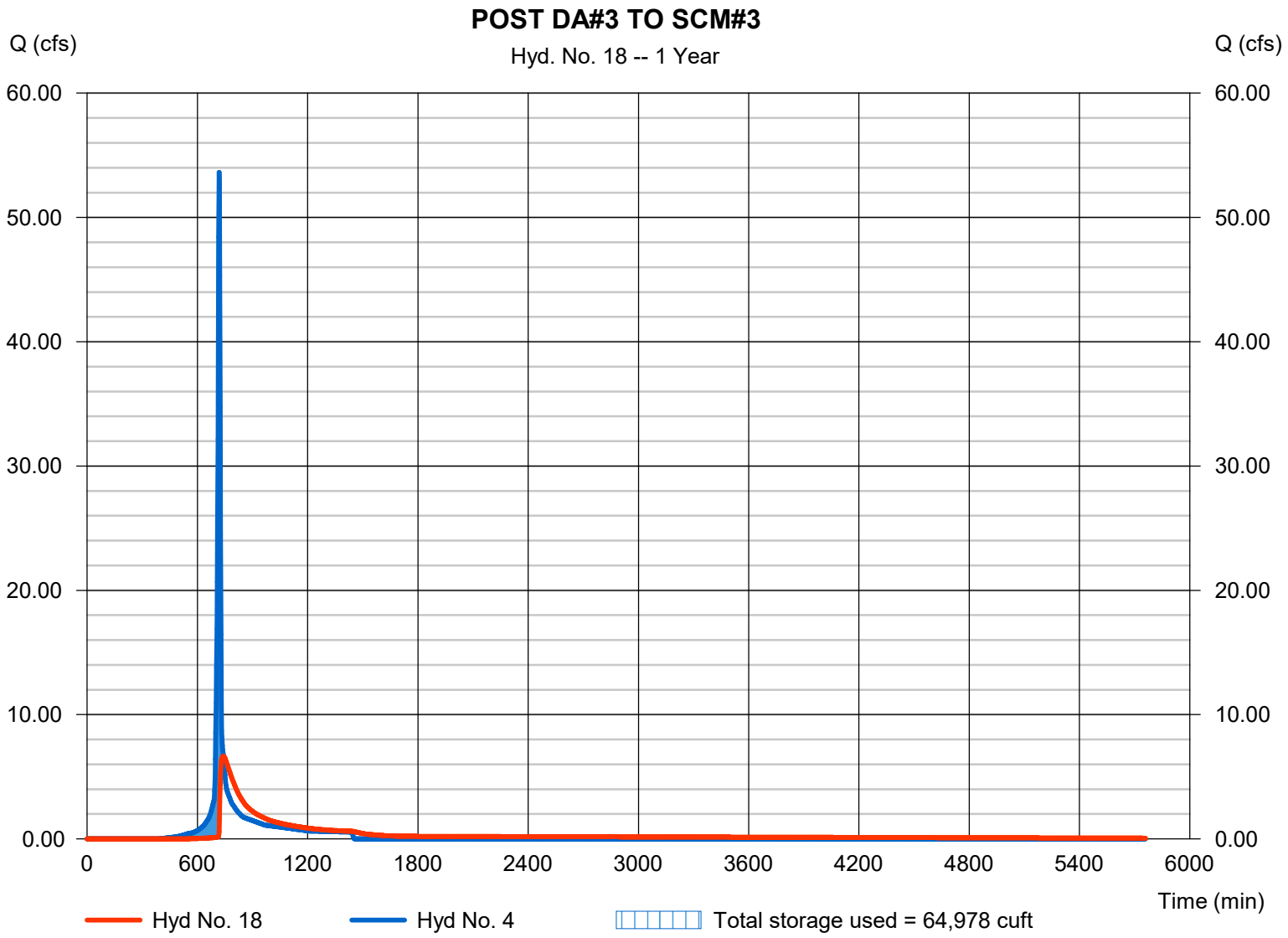
Hydrograph Report

Hyd. No. 18

POST DA#3 TO SCM#3

Hydrograph type	=	Reservoir	Peak discharge	=	6.650 cfs
Storm frequency	=	1 yrs	Time to peak	=	742 min
Time interval	=	2 min	Hyd. volume	=	119,073 cuft
Inflow hyd. No.	=	4 - POST DA #3	Max. Elevation	=	242.74 ft
Reservoir name	=	SCM#3	Max. Storage	=	64,978 cuft

Storage Indication method used.



Pond No. 3 - SCM#3

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 240.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	240.00	18,971	0	0
1.00	241.00	23,227	21,061	21,061
2.00	242.00	25,380	24,293	45,354
3.00	243.00	27,615	26,487	71,841
4.00	244.00	29,929	28,761	100,603
5.00	245.00	32,303	31,105	131,708
6.00	246.00	34,732	33,507	165,215
7.00	247.00	37,224	35,967	201,182

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	2.50	24.00	0.00
Span (in)	= 36.00	2.50	24.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 239.00	240.00	241.64	0.00
Length (ft)	= 77.00	0.00	0.00	0.00
Slope (%)	= 0.42	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	60.00	Inactive	0.00
Crest El. (ft)	= 244.25	245.50	244.20	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	Rect	---
Multi-Stage	= Yes	No	Yes	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	240.00	0.00	0.00	0.00	---	0.00	0.00	0.00	---	---	---	0.000
1.00	21,061	241.00	6.32 oc	0.16 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.155
2.00	45,354	242.00	6.32 oc	0.23 ic	0.79 ic	---	0.00	0.00	0.00	---	---	---	1.020
3.00	71,841	243.00	9.55 oc	0.27 ic	9.09 ic	---	0.00	0.00	0.00	---	---	---	9.362
4.00	100,603	244.00	18.06 oc	0.28 ic	17.64 ic	---	0.00	0.00	0.00	---	---	---	17.91
5.00	131,708	245.00	53.37 oc	0.20 ic	18.56 ic	---	34.61	0.00	0.00	---	---	---	53.37
6.00	165,215	246.00	77.78 ic	0.09 ic	7.95 ic	---	69.74 s	55.15	0.00	---	---	---	132.93
7.00	201,182	247.00	86.05 ic	0.05 ic	4.94 ic	---	81.04 s	286.59	0.00	---	---	---	372.62

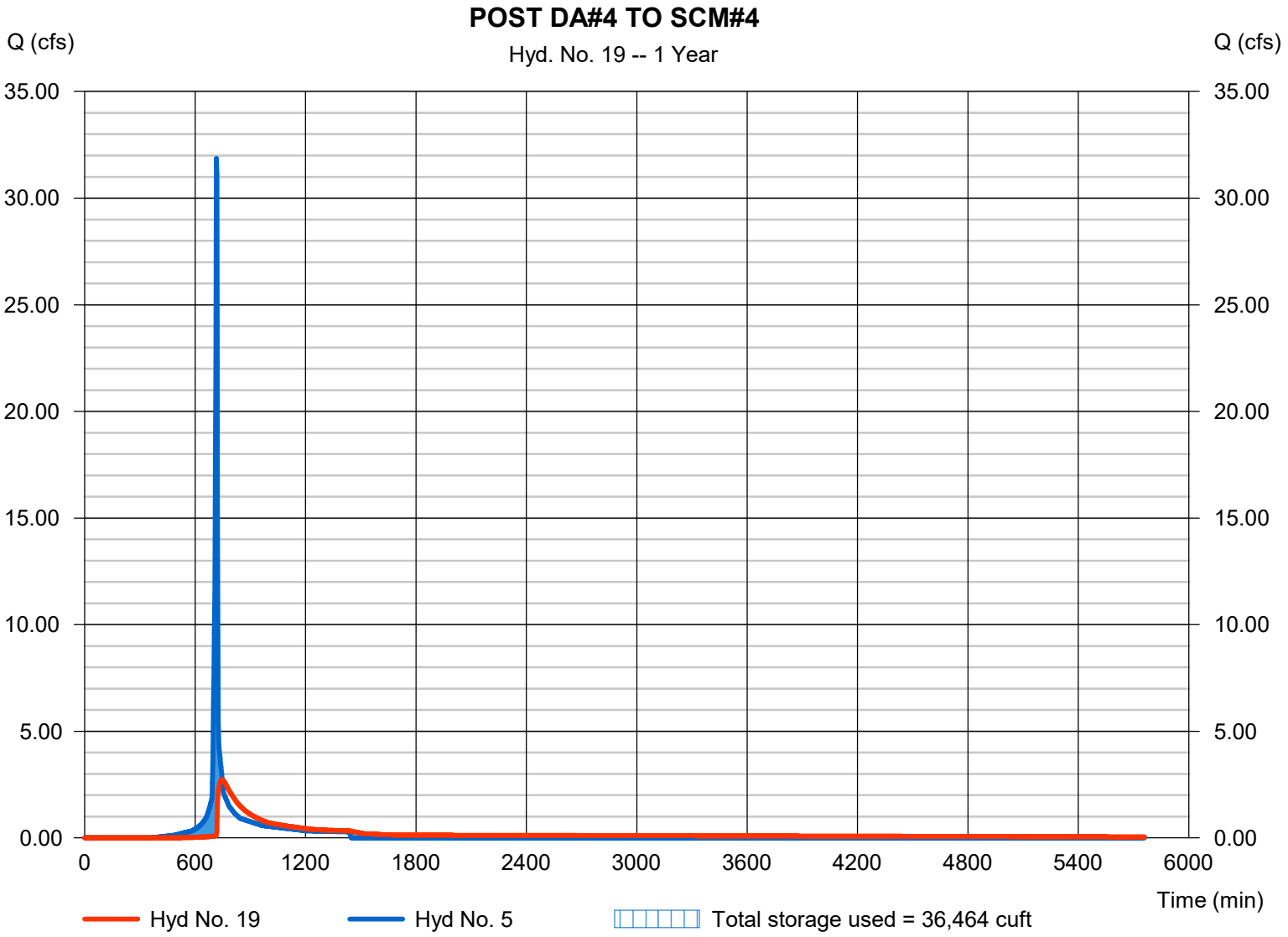
Hydrograph Report

Hyd. No. 19

POST DA#4 TO SCM#4

Hydrograph type	=	Reservoir	Peak discharge	=	2.732 cfs
Storm frequency	=	1 yrs	Time to peak	=	746 min
Time interval	=	2 min	Hyd. volume	=	62,218 cuft
Inflow hyd. No.	=	5 - POST DA#4	Max. Elevation	=	242.27 ft
Reservoir name	=	SCM#4	Max. Storage	=	36,464 cuft

Storage Indication method used.



Pond Report

Pond No. 4 - SCM#4

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 240.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	240.00	12,494	0	0
1.00	241.00	16,183	14,297	14,297
2.00	242.00	18,004	17,084	31,381
3.00	243.00	19,881	18,933	50,314
4.00	244.00	21,814	20,838	71,152
5.00	245.00	23,805	22,800	93,952
6.00	246.00	25,851	24,818	118,770

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	2.00	24.00	0.00
Span (in)	= 36.00	2.00	24.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 240.00	240.00	241.60	0.00
Length (ft)	= 70.50	0.00	0.00	0.00
Slope (%)	= 2.13	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	30.00	0.00	0.00
Crest El. (ft)	= 243.75	244.50	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Rect	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

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	240.00	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
1.00	14,297	241.00	0.10 ic	0.10 ic	0.00	---	0.00	0.00	---	---	---	---	0.099
2.00	31,381	242.00	1.14 ic	0.13 ic	1.01 ic	---	0.00	0.00	---	---	---	---	1.139
3.00	50,314	243.00	9.69 ic	0.14 ic	9.55 ic	---	0.00	0.00	---	---	---	---	9.689
4.00	71,152	244.00	25.00 ic	0.15 ic	17.90 ic	---	6.66	0.00	---	---	---	---	24.70
5.00	93,952	245.00	60.45 ic	0.06 ic	8.88 ic	---	51.50 s	35.32	---	---	---	---	95.76
6.00	118,770	246.00	71.28 ic	0.04 ic	5.09 ic	---	66.15 s	183.53	---	---	---	---	254.80

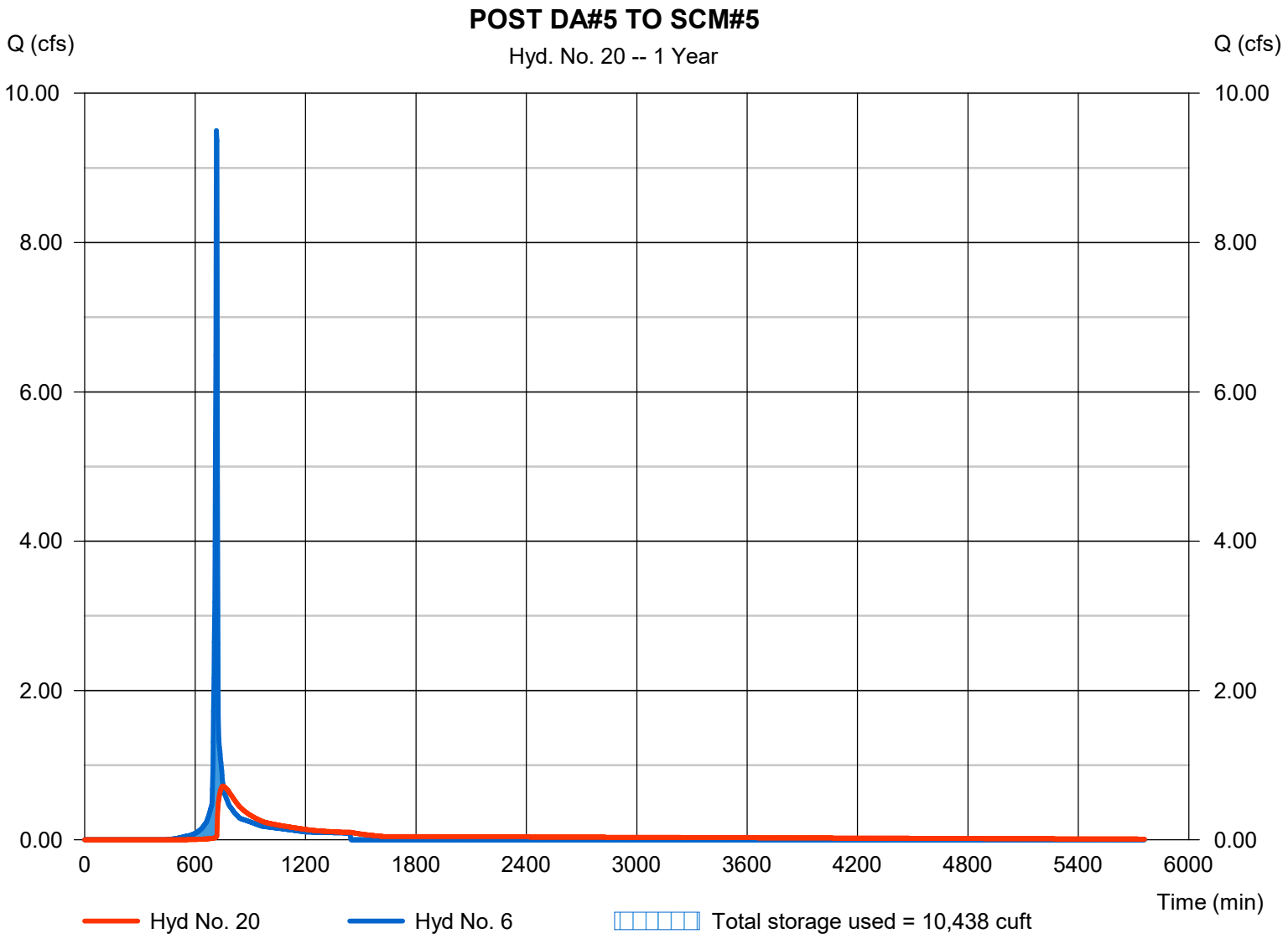
Hydrograph Report

Hyd. No. 20

POST DA#5 TO SCM#5

Hydrograph type	=	Reservoir	Peak discharge	=	0.720 cfs
Storm frequency	=	1 yrs	Time to peak	=	752 min
Time interval	=	2 min	Hyd. volume	=	18,688 cuft
Inflow hyd. No.	=	6 - POST DA#5	Max. Elevation	=	251.60 ft
Reservoir name	=	SCM#5	Max. Storage	=	10,438 cuft

Storage Indication method used.



Pond Report

Pond No. 5 - SCM#5

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 250.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	250.00	4,548	0	0
1.00	251.00	7,131	5,791	5,791
2.00	252.00	8,382	7,747	13,538
3.00	253.00	9,690	9,027	22,565
4.00	254.00	11,054	10,363	32,929
5.00	255.00	12,475	11,756	44,685

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	1.25	12.00	0.00
Span (in)	= 18.00	1.25	12.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 246.50	250.00	251.19	0.00
Length (ft)	= 106.00	0.00	0.00	0.00
Slope (%)	= 6.93	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	30.00	0.00	0.00
Crest El. (ft)	= 253.00	253.50	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

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	250.00	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
1.00	5,791	251.00	14.11 ic	0.04 ic	0.00	---	0.00	0.00	---	---	---	---	0.040
2.00	13,538	252.00	14.11 ic	0.06 ic	2.09 ic	---	0.00	0.00	---	---	---	---	2.152
3.00	22,565	253.00	14.11 ic	0.07 ic	4.33 ic	---	0.00	0.00	---	---	---	---	4.398
4.00	32,929	254.00	22.00 ic	0.01 ic	0.93 ic	---	21.05 s	27.58	---	---	---	---	49.57
5.00	44,685	255.00	23.67 ic	0.00 ic	0.39 ic	---	23.27 s	143.30	---	---	---	---	166.95

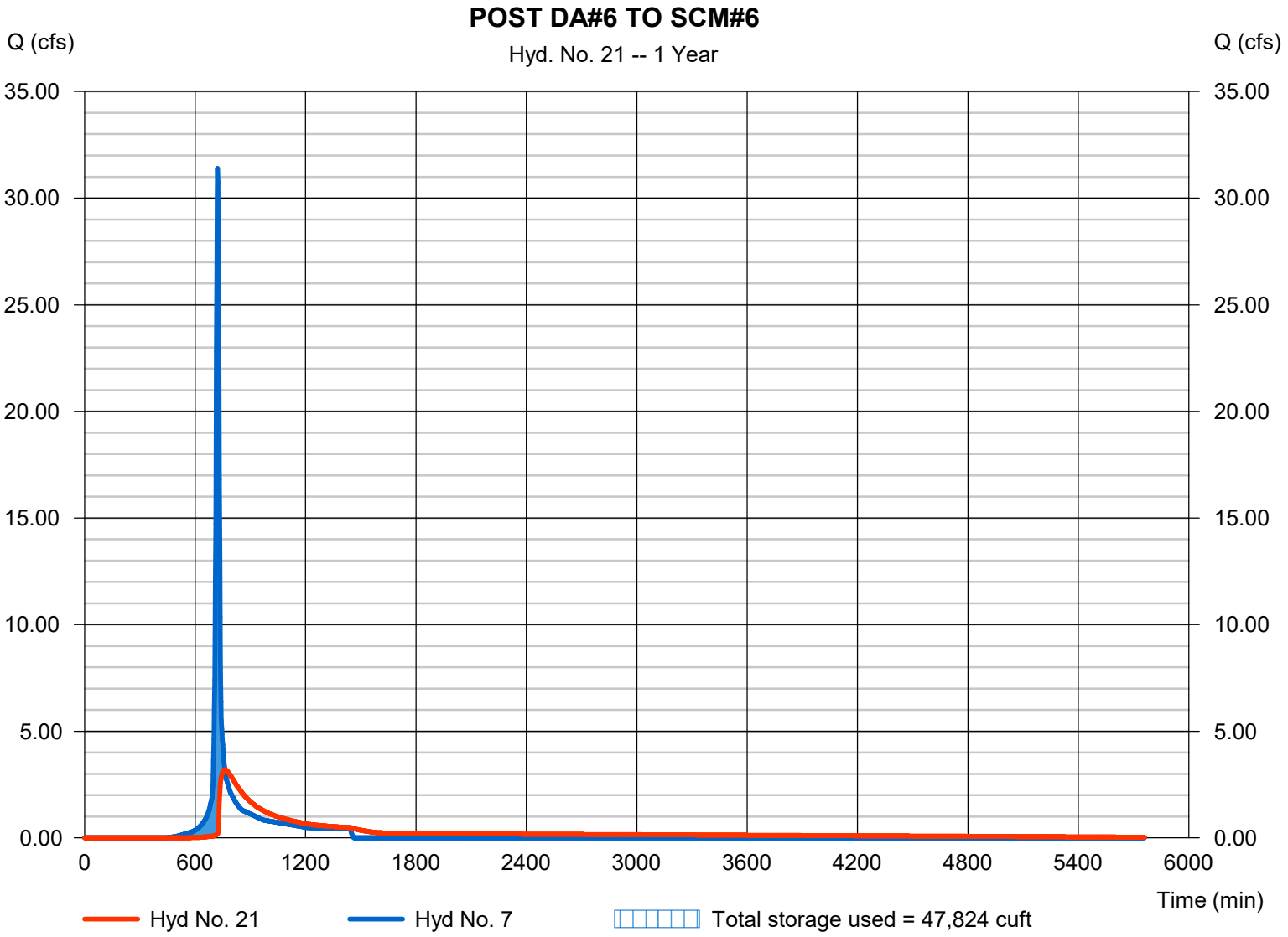
Hydrograph Report

Hyd. No. 21

POST DA#6 TO SCM#6

Hydrograph type	=	Reservoir	Peak discharge	=	3.193 cfs
Storm frequency	=	1 yrs	Time to peak	=	762 min
Time interval	=	2 min	Hyd. volume	=	85,775 cuft
Inflow hyd. No.	=	7 - POST DA#6	Max. Elevation	=	239.42 ft
Reservoir name	=	SCM#6	Max. Storage	=	47,824 cuft

Storage Indication method used.



Pond Report

Pond No. 6 - SCM#6

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 237.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	237.00	15,326	0	0
1.00	238.00	19,637	17,435	17,435
2.00	239.00	21,961	20,786	38,221
3.00	240.00	24,342	23,139	61,360
4.00	241.00	26,780	25,549	86,909
5.00	242.00	29,274	28,015	114,924
6.00	243.00	31,825	30,537	145,462
7.00	244.00	34,432	33,117	178,578

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	2.50	18.00	0.00
Span (in)	= 24.00	2.50	18.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 237.00	237.00	238.61	0.00
Length (ft)	= 100.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	30.00	0.00	0.00
Crest El. (ft)	= 241.25	242.50	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

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	237.00	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
1.00	17,435	238.00	0.15 ic	0.15 ic	0.00	---	0.00	0.00	---	---	---	---	0.151
2.00	38,221	239.00	1.01 ic	0.21 ic	0.80 ic	---	0.00	0.00	---	---	---	---	1.009
3.00	61,360	240.00	7.10 oc	0.22 ic	6.88 ic	---	0.00	0.00	---	---	---	---	7.097
4.00	86,909	241.00	11.13 oc	0.23 ic	10.90 ic	---	0.00	0.00	---	---	---	---	11.13
5.00	114,924	242.00	27.69 oc	0.07 ic	3.83 ic	---	23.78 s	0.00	---	---	---	---	27.69
6.00	145,462	243.00	32.24 oc	0.03 ic	1.51 ic	---	30.69 s	27.58	---	---	---	---	59.81
7.00	178,578	244.00	35.73 oc	0.02 ic	0.92 ic	---	34.71 s	143.30	---	---	---	---	178.94

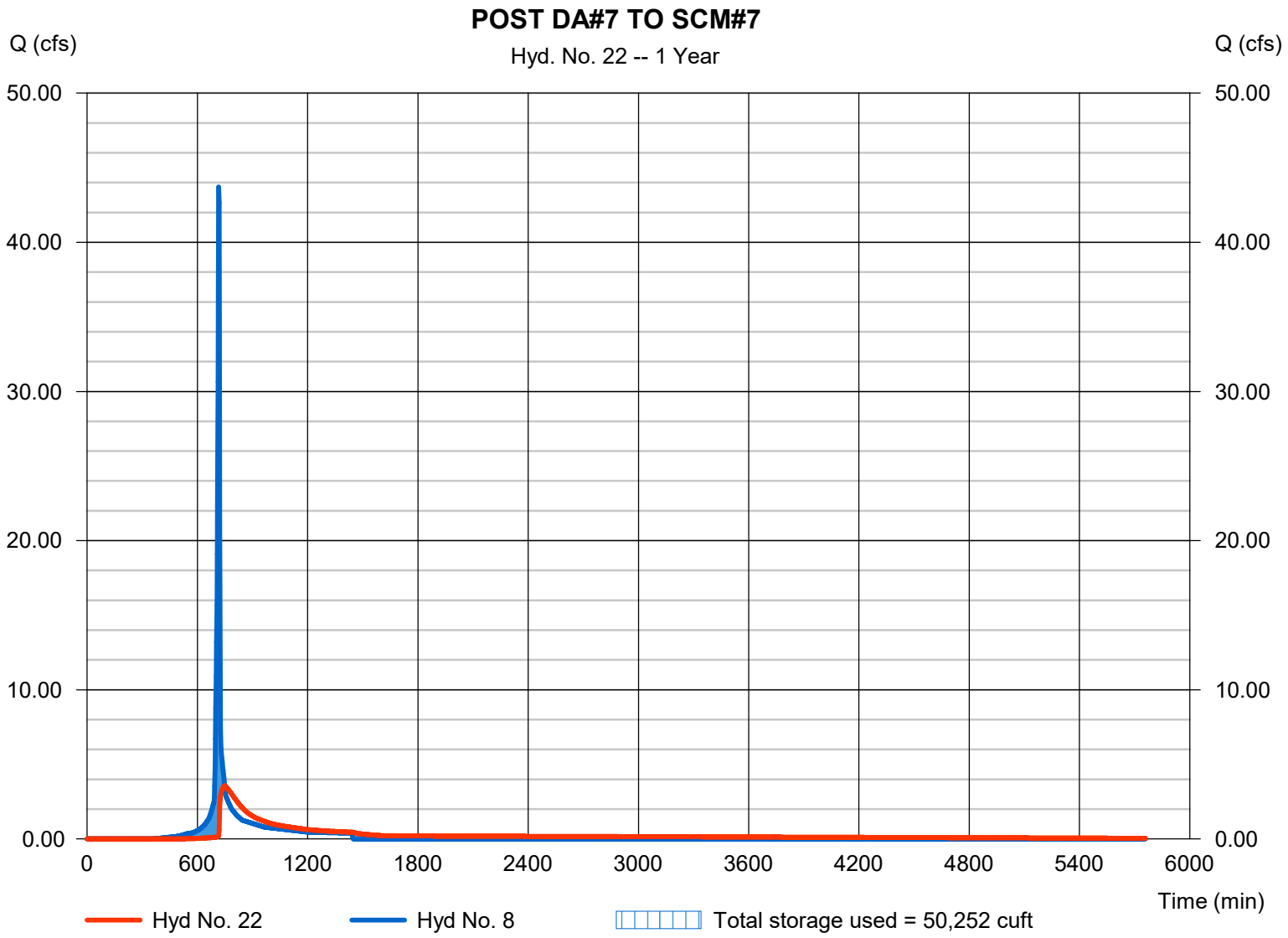
Hydrograph Report

Hyd. No. 22

POST DA#7 TO SCM#7

Hydrograph type	=	Reservoir	Peak discharge	=	3.559 cfs
Storm frequency	=	1 yrs	Time to peak	=	748 min
Time interval	=	2 min	Hyd. volume	=	87,088 cuft
Inflow hyd. No.	=	8 - POST DA#7	Max. Elevation	=	241.42 ft
Reservoir name	=	SCM#7	Max. Storage	=	50,252 cuft

Storage Indication method used.



Pond Report

Pond No. 7 - SCM#7

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 239.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	239.00	16,761	0	0
1.00	240.00	20,688	18,688	18,688
2.00	241.00	22,636	21,653	40,341
3.00	242.00	24,642	23,630	63,970
4.00	243.00	26,704	25,664	89,634
5.00	244.00	28,822	27,753	117,387
6.00	245.00	30,997	29,900	147,287
7.00	246.00	33,229	32,103	179,391

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	2.50	24.00	0.00
Span (in)	= 24.00	2.50	24.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 239.00	239.00	240.65	0.00
Length (ft)	= 108.00	0.00	0.00	0.00
Slope (%)	= 3.29	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	30.00	0.00	0.00
Crest El. (ft)	= 243.25	244.50	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

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	239.00	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
1.00	18,688	240.00	0.15 ic	0.15 ic	0.00	---	0.00	0.00	---	---	---	---	0.151
2.00	40,341	241.00	0.95 ic	0.21 ic	0.75 ic	---	0.00	0.00	---	---	---	---	0.954
3.00	63,970	242.00	9.23 ic	0.21 ic	8.95 ic	---	0.00	0.00	---	---	---	---	9.161
4.00	89,634	243.00	17.78 ic	0.21 ic	17.57 ic	---	0.00	0.00	---	---	---	---	17.78
5.00	117,387	244.00	29.54 ic	0.07 ic	6.50 ic	---	22.98 s	0.00	---	---	---	---	29.54
6.00	147,287	245.00	33.71 ic	0.03 ic	2.72 ic	---	30.96 s	27.58	---	---	---	---	61.28
7.00	179,391	246.00	37.01 ic	0.02 ic	1.67 ic	---	35.30 s	143.30	---	---	---	---	180.28

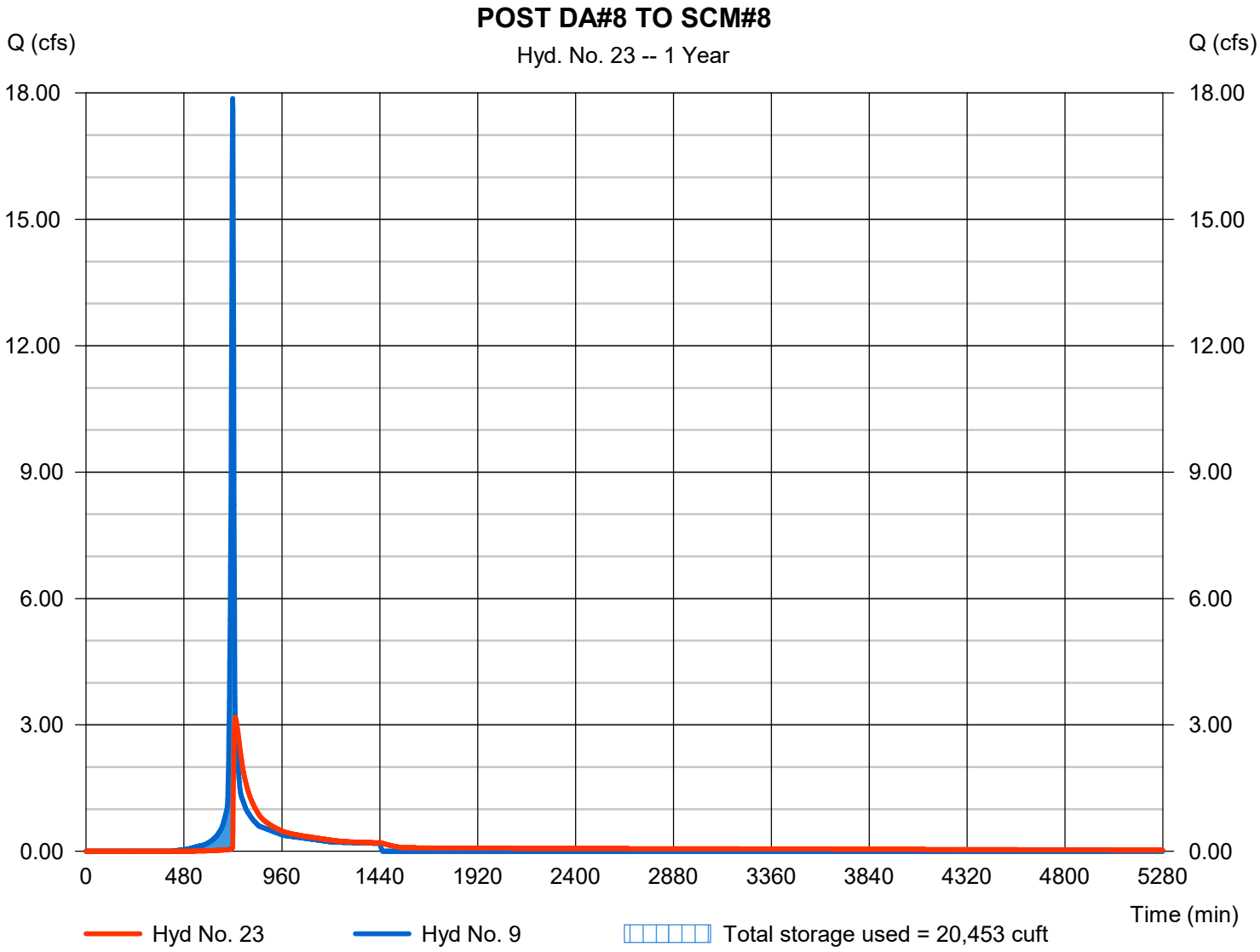
Hydrograph Report

Hyd. No. 23

POST DA#8 TO SCM#8

Hydrograph type	=	Reservoir	Peak discharge	=	3.183 cfs
Storm frequency	=	1 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	39,805 cuft
Inflow hyd. No.	=	9 - POST DA#8	Max. Elevation	=	242.39 ft
Reservoir name	=	SCM#8	Max. Storage	=	20,453 cuft

Storage Indication method used.



Pond No. 8 - SCM#8

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 240.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	240.00	6,236	0	0
1.00	241.00	8,549	7,361	7,361
2.00	242.00	9,648	9,092	16,453
3.00	243.00	10,804	10,220	26,673
4.00	244.00	12,016	11,403	38,077
5.00	245.00	13,285	12,644	50,720
6.00	246.00	14,611	13,941	64,662

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	1.50	24.00	0.00
Span (in)	= 24.00	1.50	24.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 237.00	240.00	241.66	0.00
Length (ft)	= 58.00	0.00	0.00	0.00
Slope (%)	= 5.17	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	30.00	0.00	0.00
Crest El. (ft)	= 244.00	244.50	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

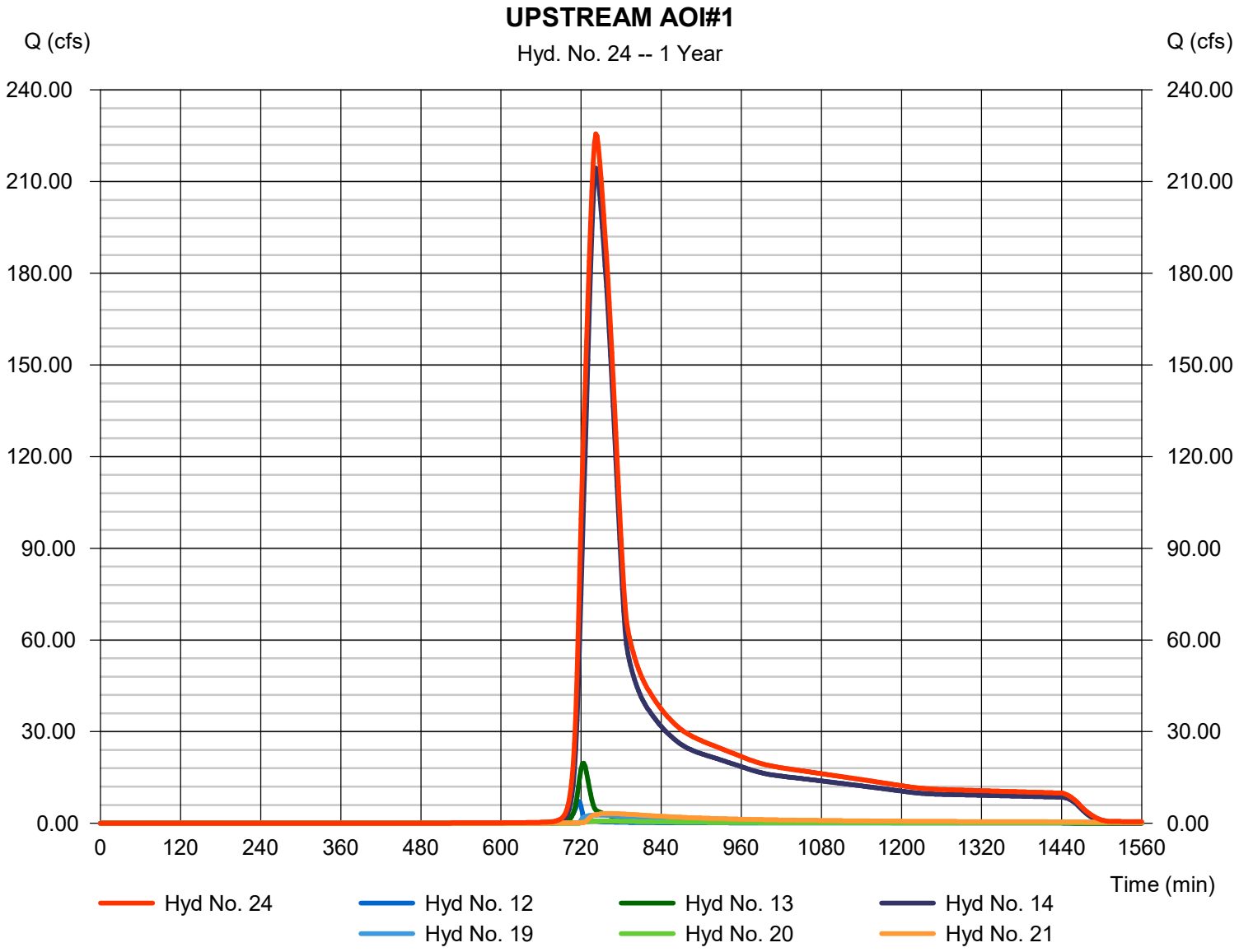
Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	240.00	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
1.00	7,361	241.00	21.39 ic	0.06 ic	0.00	---	0.00	0.00	---	---	---	---	0.057
2.00	16,453	242.00	21.39 ic	0.08 ic	0.73 ic	---	0.00	0.00	---	---	---	---	0.817
3.00	26,673	243.00	21.39 ic	0.10 ic	8.92 ic	---	0.00	0.00	---	---	---	---	9.019
4.00	38,077	244.00	21.39 ic	0.12 ic	17.51 ic	---	0.00	0.00	---	---	---	---	17.63
5.00	50,720	245.00	39.45 ic	0.03 ic	6.72 ic	---	32.69 s	27.58	---	---	---	---	67.02
6.00	64,662	246.00	42.67 ic	0.01 ic	3.08 ic	---	39.54 s	143.30	---	---	---	---	185.92

Hydrograph Report

Hyd. No. 24

UPSTREAM AOI#1

Hydrograph type	= Combine	Peak discharge	= 225.67 cfs
Storm frequency	= 1 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 1,522,586 cuft
Inflow hyds.	= 12, 13, 14, 19, 20, 21	Contrib. drain. area	= 446.810 ac

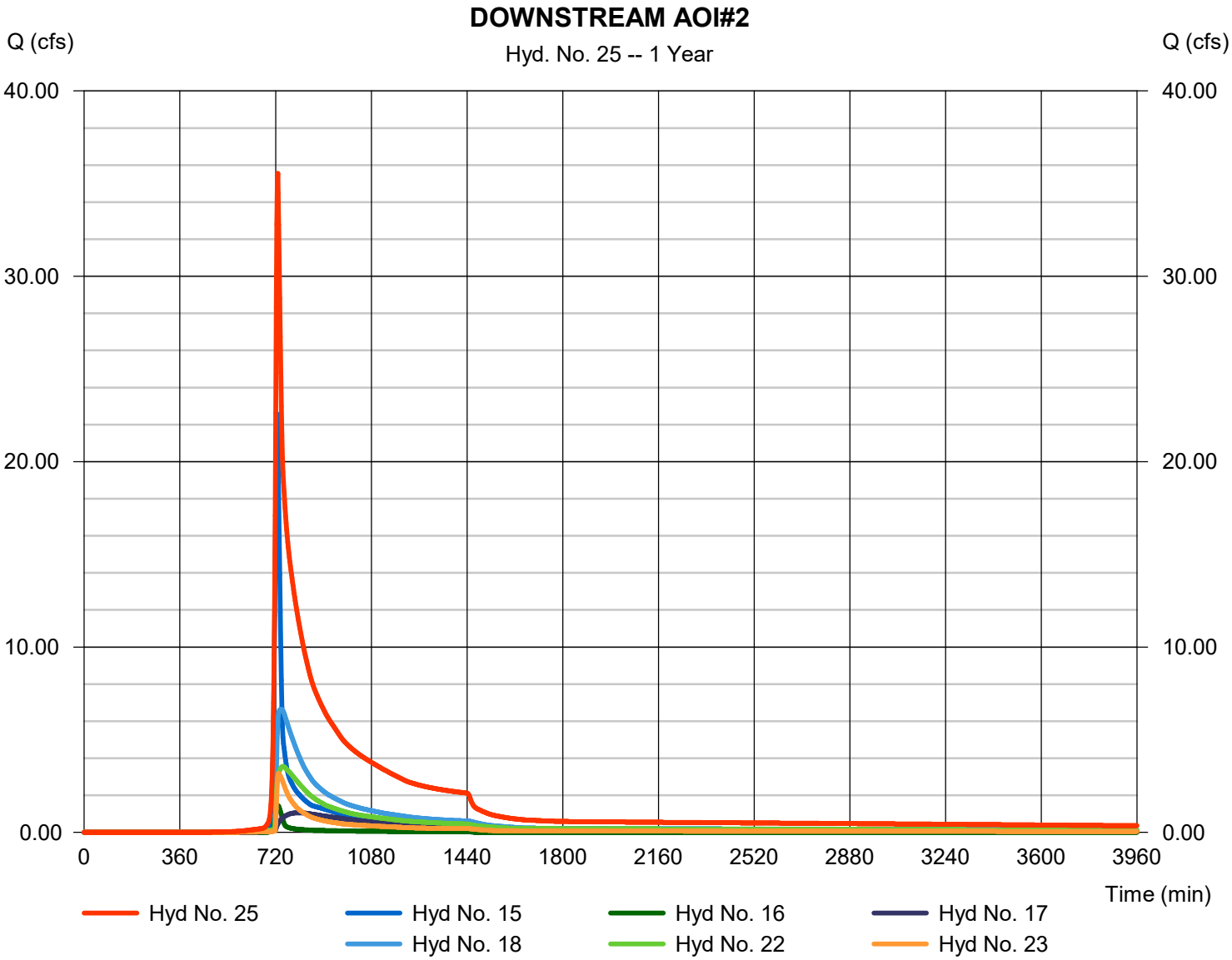


Hydrograph Report

Hyd. No. 25

DOWNSTREAM AOI#2

Hydrograph type	= Combine	Peak discharge	= 35.55 cfs
Storm frequency	= 1 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 375,642 cuft
Inflow hyds.	= 15, 16, 17, 18, 22, 23	Contrib. drain. area	= 26.840 ac

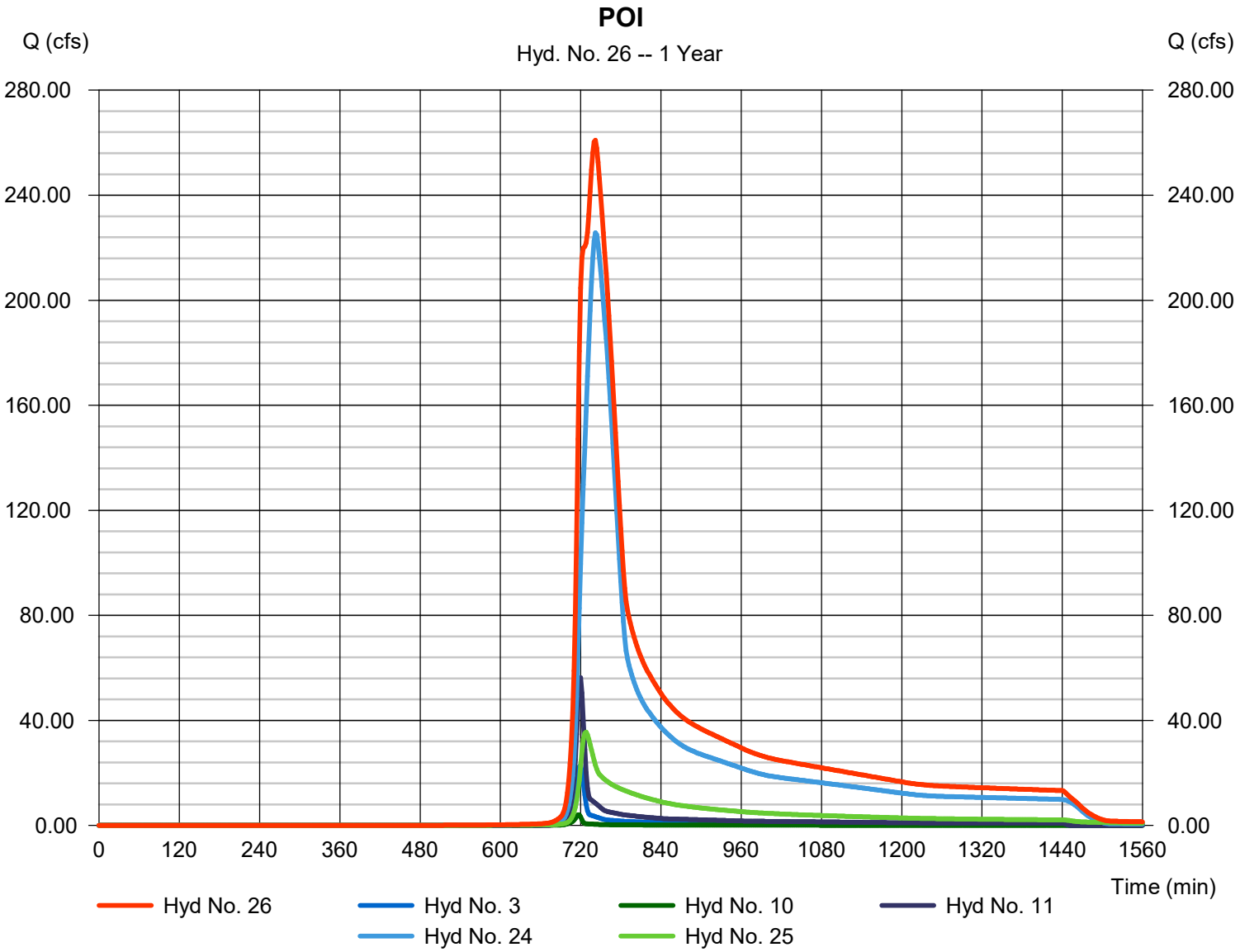


Hydrograph Report

Hyd. No. 26

POI

Hydrograph type	=	Combine	Peak discharge	=	260.92 cfs
Storm frequency	=	1 yrs	Time to peak	=	742 min
Time interval	=	2 min	Hyd. volume	=	2,091,230 cuft
Inflow hyds.	=	3, 10, 11, 24, 25	Contrib. drain. area	=	60.540 ac

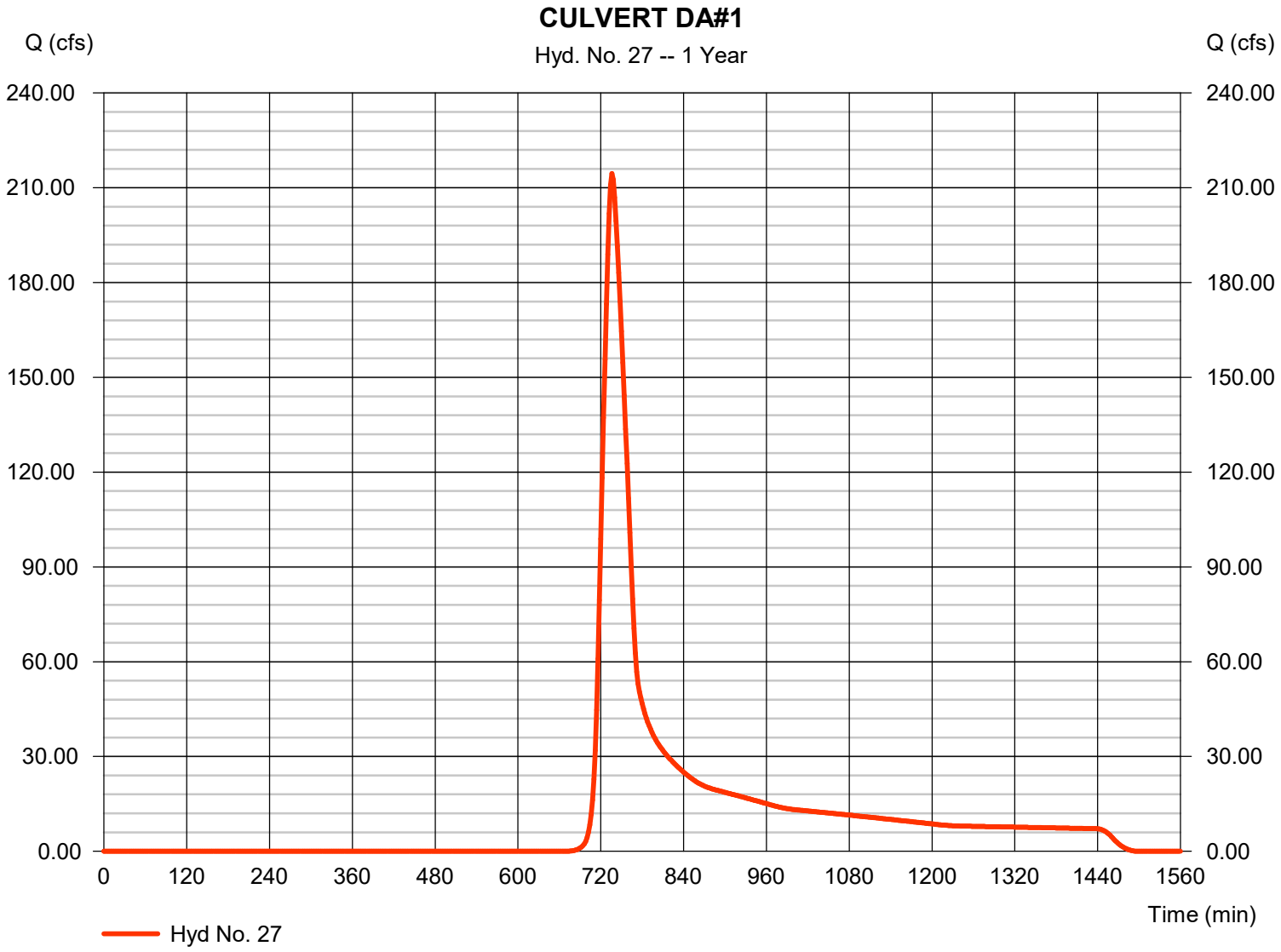


Hydrograph Report

Hyd. No. 27

CULVERT DA#1

Hydrograph type	=	SCS Runoff	Peak discharge	=	214.51 cfs
Storm frequency	=	1 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	1,074,329 cuft
Drainage area	=	356.710 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	34.90 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

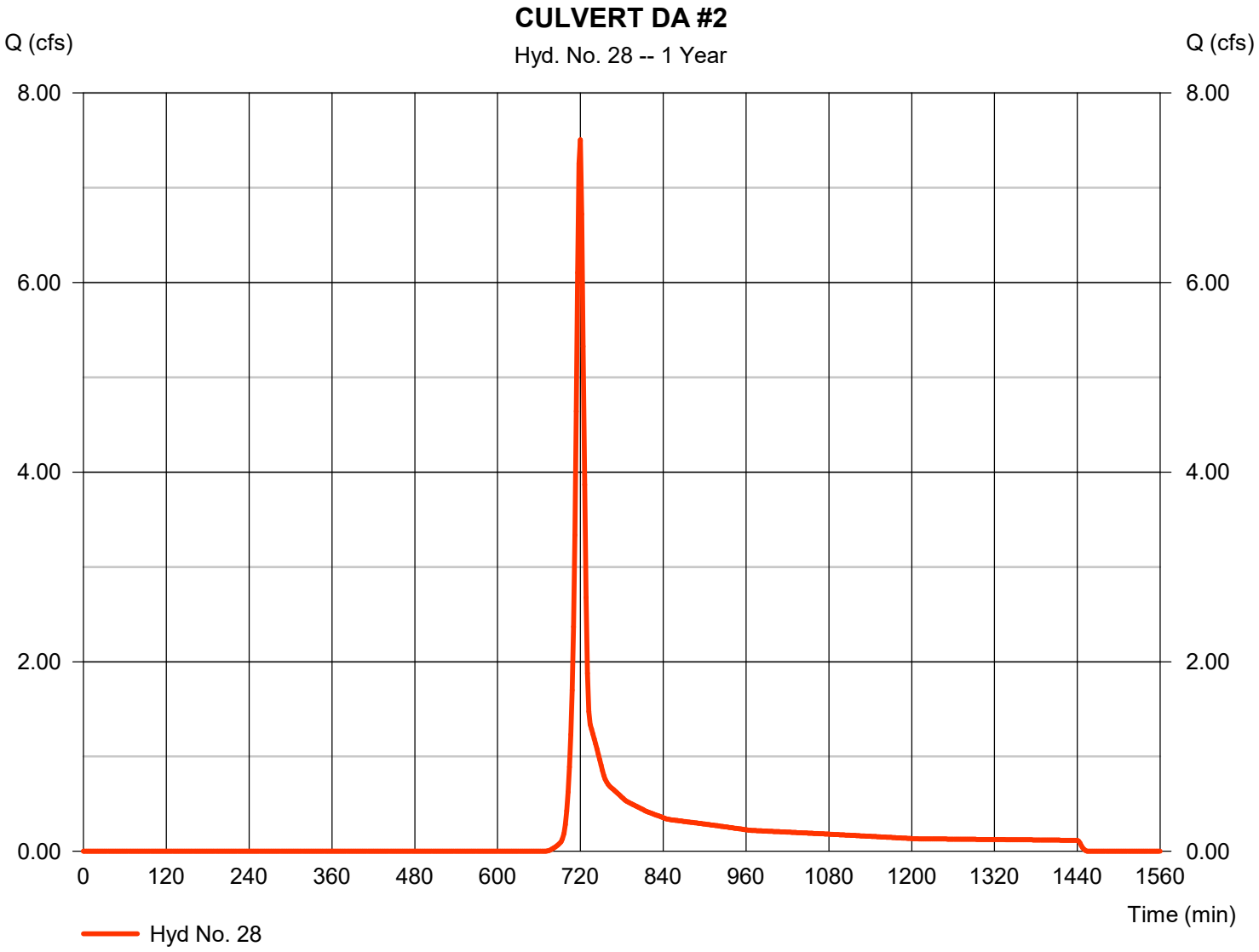


Hydrograph Report

Hyd. No. 28

CULVERT DA #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.507 cfs
Storm frequency	=	1 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	17,578 cuft
Drainage area	=	5.770 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.80 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

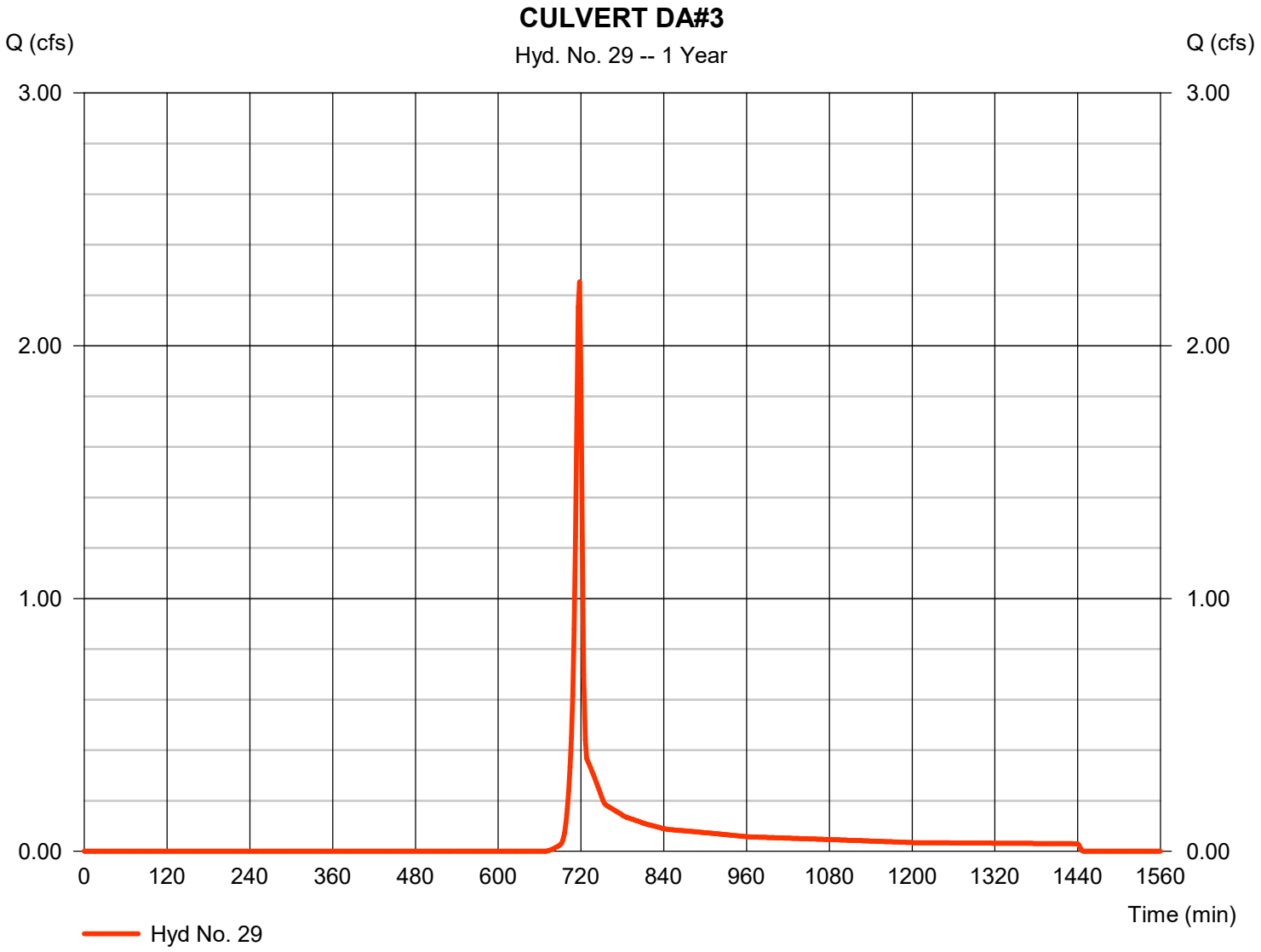


Hydrograph Report

Hyd. No. 29

CULVERT DA#3

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.252 cfs
Storm frequency	=	1 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	4,541 cuft
Drainage area	=	1.590 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

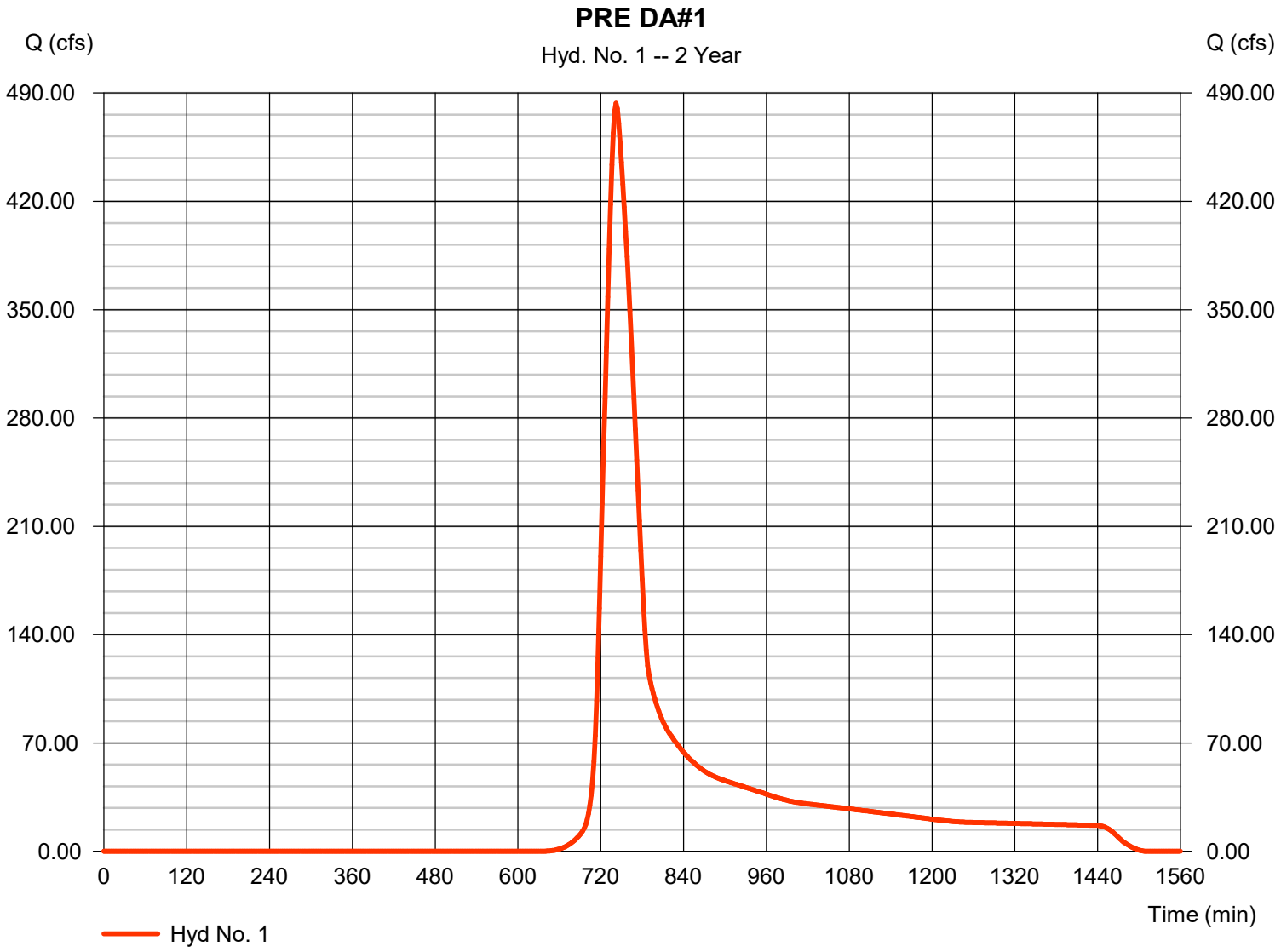
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	483.47	2	742	2,744,974	------	------	------	PRE DA#1
2	SCS Runoff	33.87	2	716	69,117	------	------	------	POST DA#1
3	SCS Runoff	33.37	2	720	76,461	------	------	------	POST DA#2
4	SCS Runoff	69.26	2	718	161,510	------	------	------	POST DA #3
5	SCS Runoff	40.74	2	716	85,063	------	------	------	POST DA#4
6	SCS Runoff	12.45	2	716	25,518	------	------	------	POST DA#5
7	SCS Runoff	41.35	2	722	116,462	------	------	------	POST DA#6
8	SCS Runoff	55.88	2	716	116,682	------	------	------	POST DA#7
9	SCS Runoff	23.27	2	718	53,971	------	------	------	POST DA#8
10	SCS Runoff	5.539	2	716	11,207	------	------	------	POST DA NCDOT
11	SCS Runoff	84.15	2	720	193,581	------	------	------	ON SITE - UNDEVELOPED
12	SCS Runoff	9.220	2	716	19,253	------	------	------	BYPASS #1
13	SCS Runoff	29.71	2	724	86,057	------	------	------	EXISTING DA 1
14	SCS Runoff	331.87	2	742	1,884,234	------	------	------	EXISTING DA 2
15	SCS Runoff	34.34	2	726	111,538	------	------	------	EXISTING DA 3
16	SCS Runoff	2.203	2	730	8,459	------	------	------	EXISTING DA 4
17	Reservoir	2.338	2	754	65,146	2	264.00	38,204	POST DA#1 TO SCM#1
18	Reservoir	13.07	2	730	156,638	4	243.36	82,118	POST DA#3 TO SCM#3
19	Reservoir	6.578	2	726	81,523	5	242.70	44,726	POST DA#4 TO SCM#4
20	Reservoir	1.830	2	728	24,898	6	251.91	12,878	POST DA#5 TO SCM#5
21	Reservoir	6.777	2	744	114,126	7	239.95	60,124	POST DA#6 TO SCM#6
22	Reservoir	8.188	2	728	113,592	8	241.90	61,642	POST DA#7 TO SCM#7
23	Reservoir	7.551	2	728	52,658	9	242.87	25,305	POST DA#8 TO SCM#8
24	Combine	353.19	2	742	2,210,093	12, 13, 14, 19, 20, 21,	------	------	UPSTREAM AOI#1
25	Combine	66.20	2	726	508,032	15, 16, 17, 18, 22, 23,	------	------	DOWNSTREAM AOI#2
26	Combine	412.82	2	740	2,999,375	3, 10, 11, 24, 25	------	------	POI
27	SCS Runoff	330.70	2	736	1,578,438	------	------	------	CULVERT DA#1
28	SCS Runoff	11.23	2	720	25,826	------	------	------	CULVERT DA #2
29	SCS Runoff	3.336	2	718	6,672	------	------	------	CULVERT DA#3

Hydrograph Report

Hyd. No. 1

PRE DA#1

Hydrograph type	=	SCS Runoff	Peak discharge	=	483.47 cfs
Storm frequency	=	2 yrs	Time to peak	=	742 min
Time interval	=	2 min	Hyd. volume	=	2,744,974 cuft
Drainage area	=	618.810 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	47.00 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

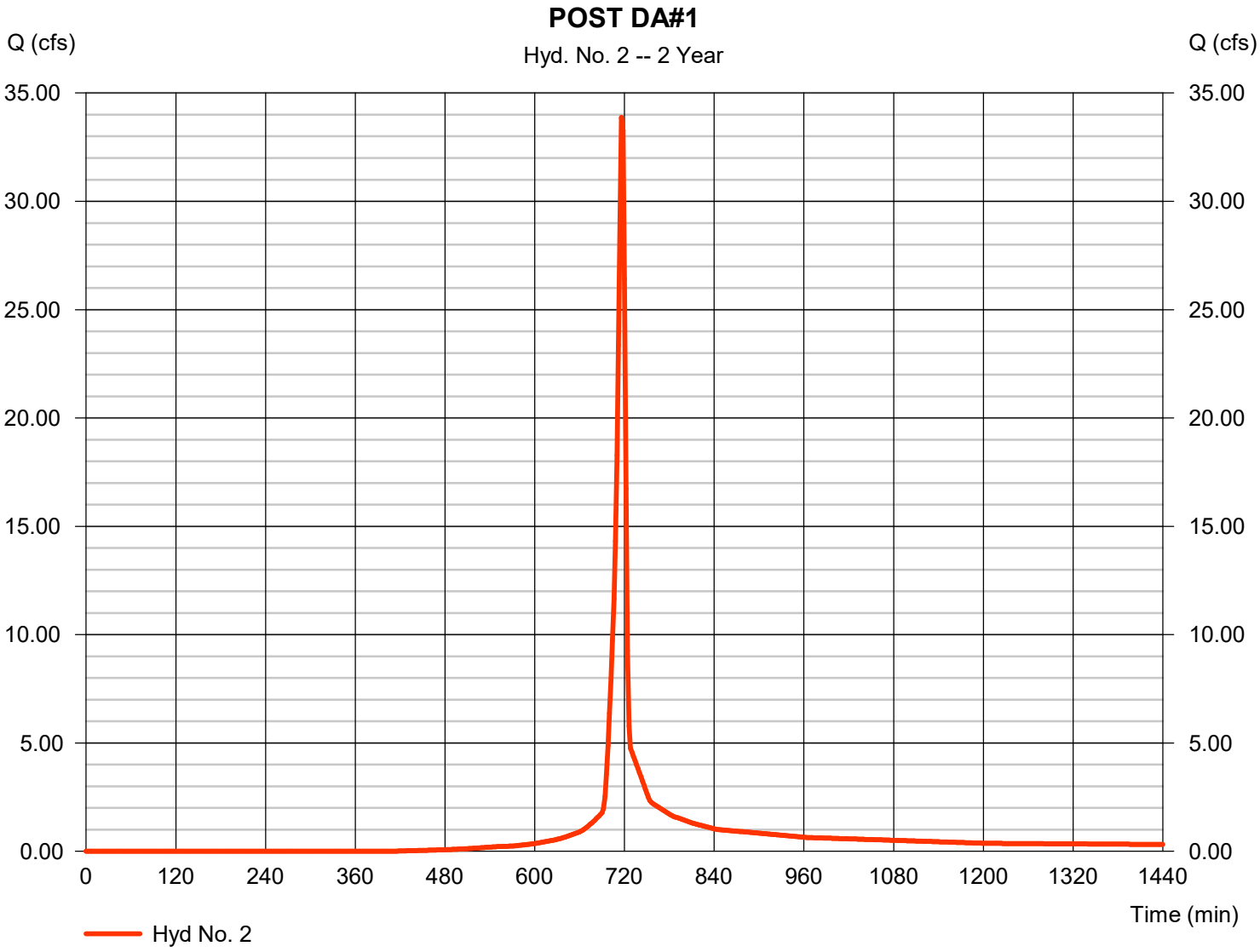


Hydrograph Report

Hyd. No. 2

POST DA#1

Hydrograph type	=	SCS Runoff	Peak discharge	=	33.87 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	69,117 cuft
Drainage area	=	9.720 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.50 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

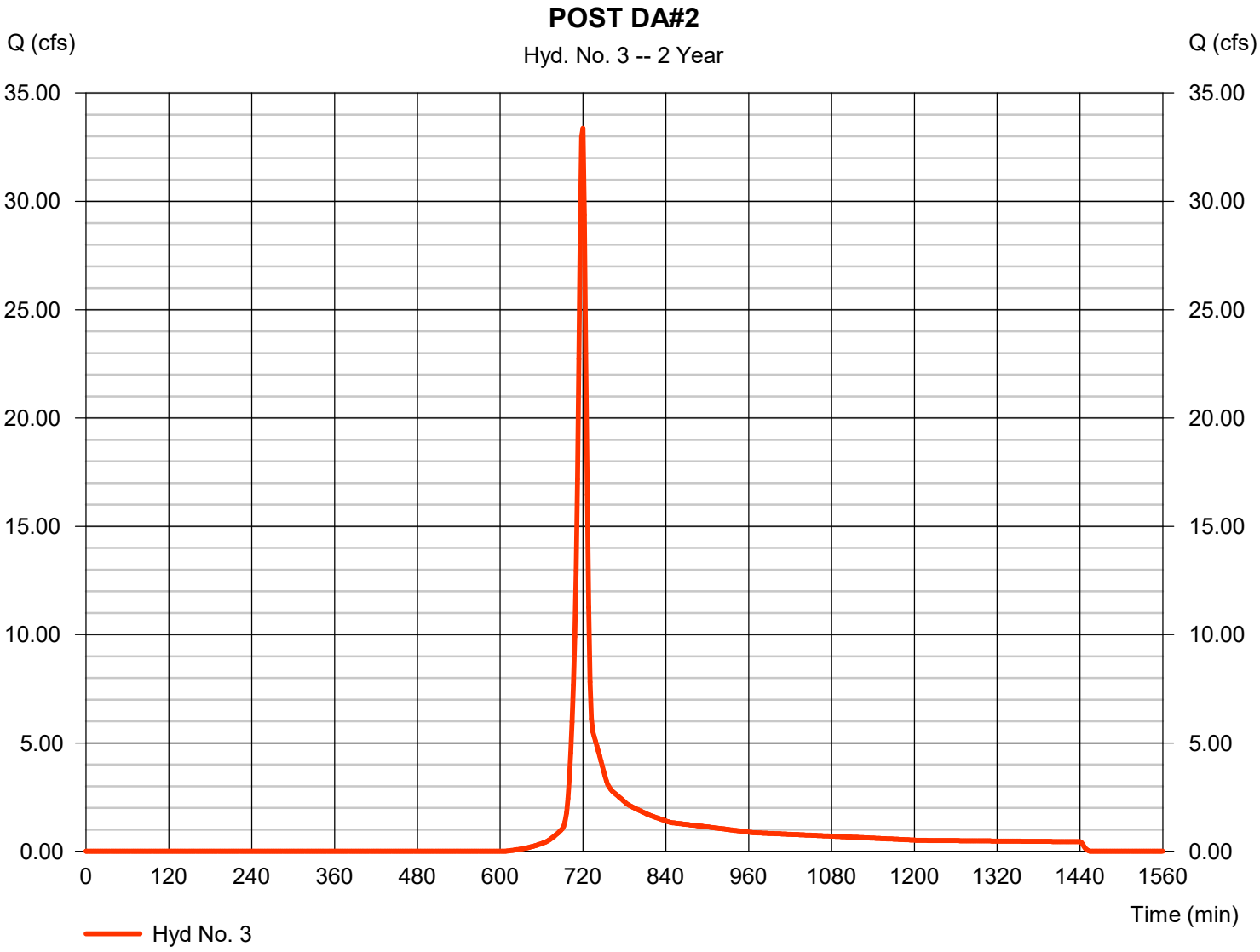


Hydrograph Report

Hyd. No. 3

POST DA#2

Hydrograph type	=	SCS Runoff	Peak discharge	=	33.37 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	76,461 cuft
Drainage area	=	15.510 ac	Curve number	=	76
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.00 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

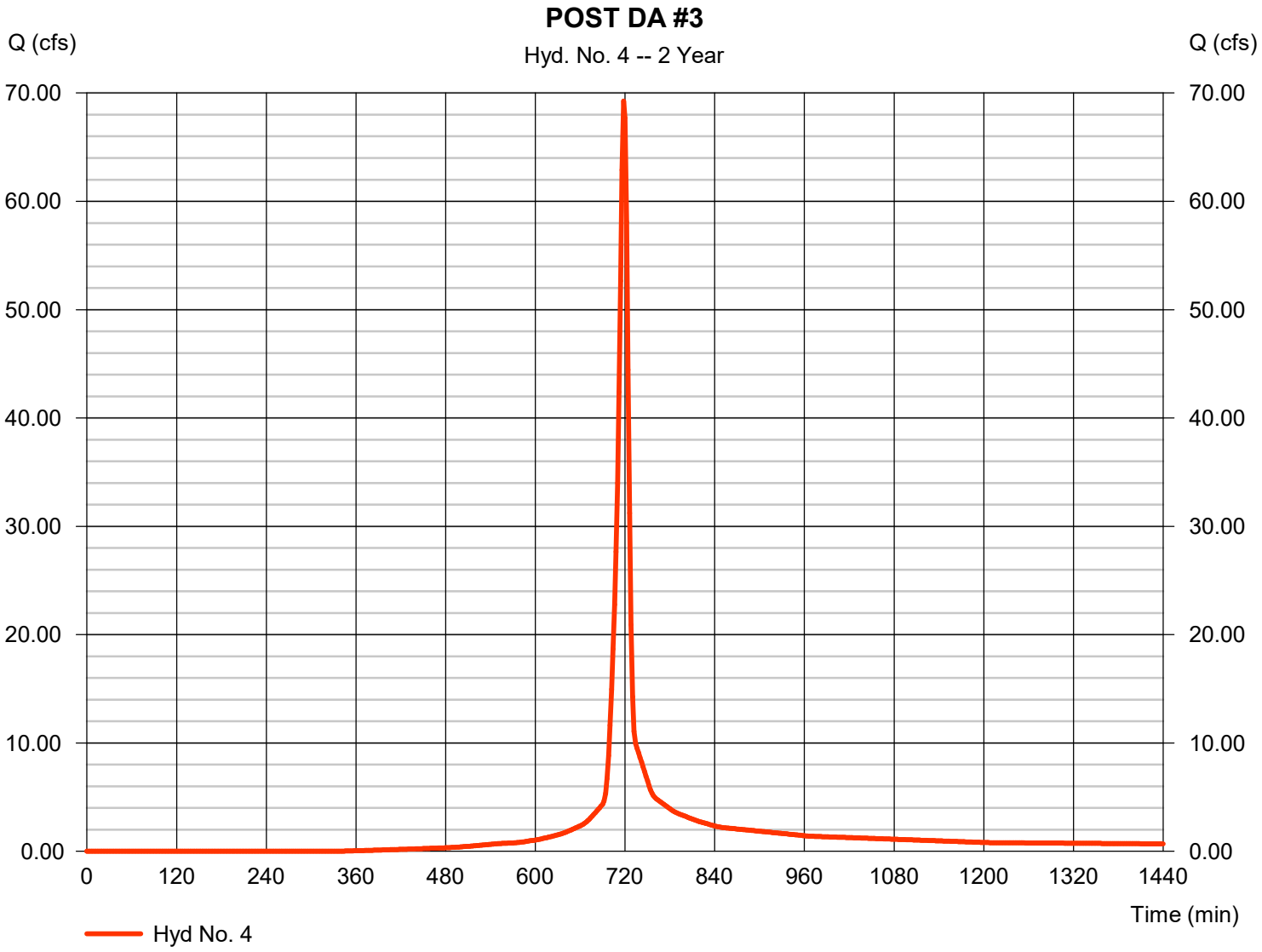


Hydrograph Report

Hyd. No. 4

POST DA #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	69.26 cfs
Storm frequency	=	2 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	161,510 cuft
Drainage area	=	18.950 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.40 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

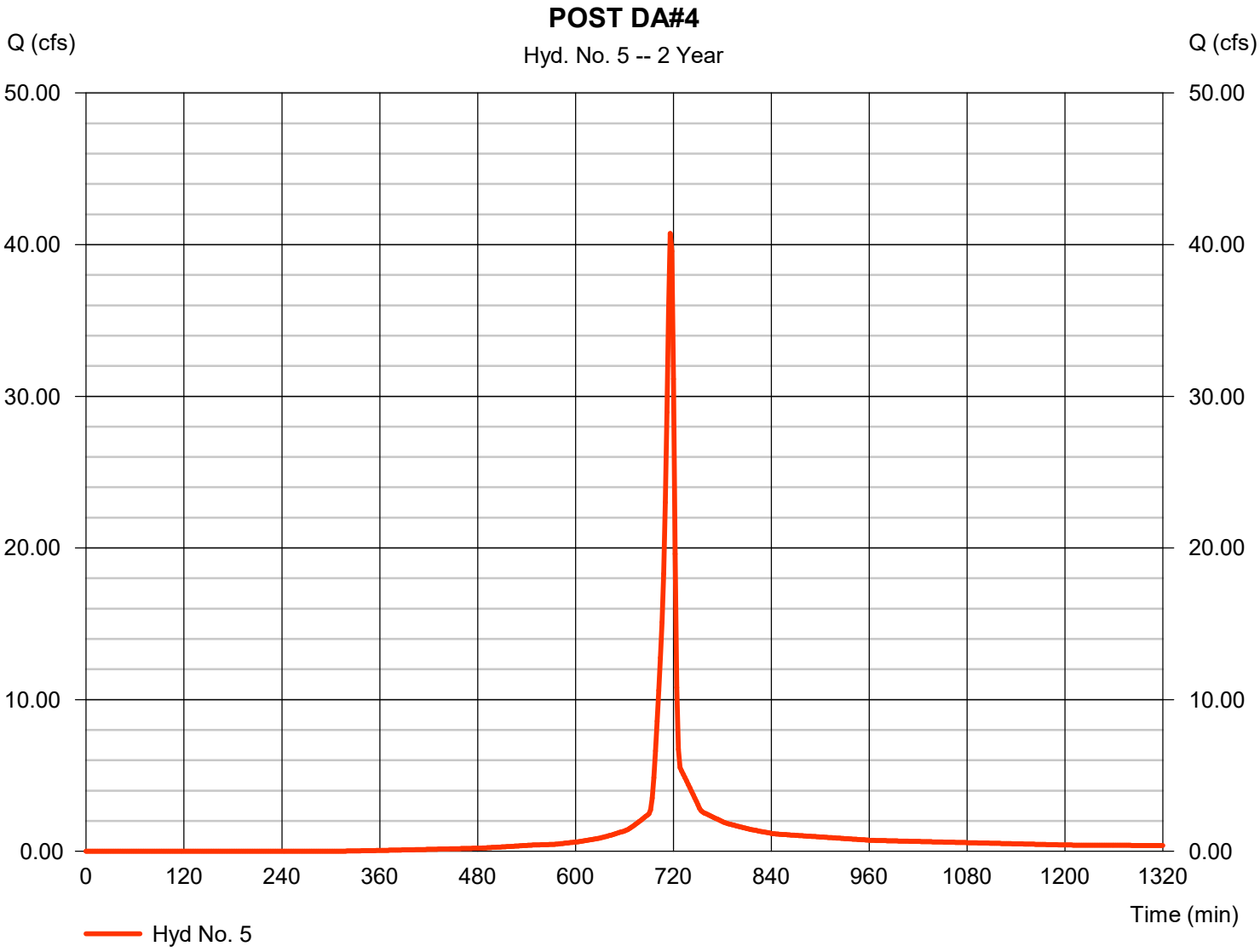


Hydrograph Report

Hyd. No. 5

POST DA#4

Hydrograph type	=	SCS Runoff	Peak discharge	=	40.74 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	85,063 cuft
Drainage area	=	10.250 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.30 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

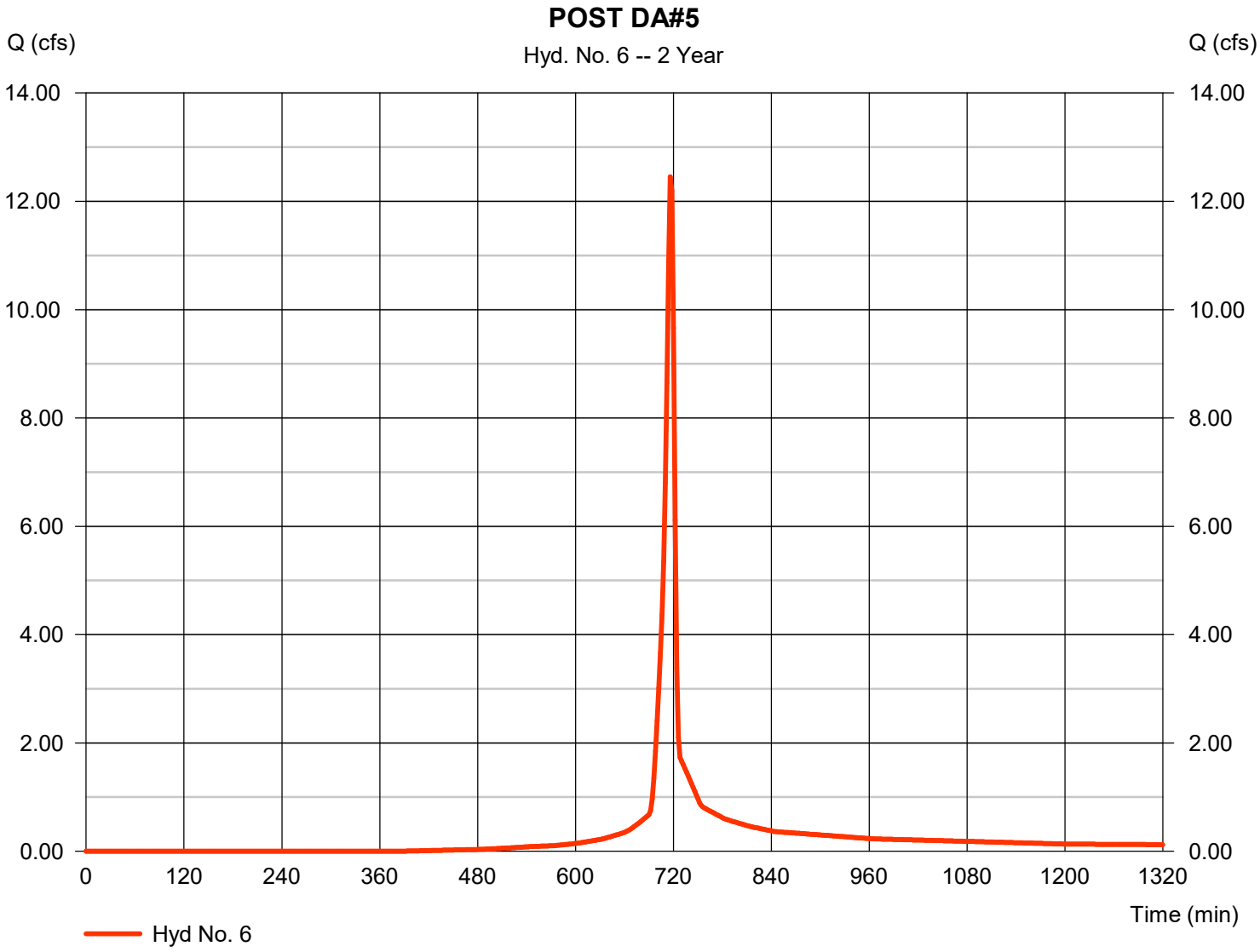


Hydrograph Report

Hyd. No. 6

POST DA#5

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.45 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	25,518 cuft
Drainage area	=	3.450 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

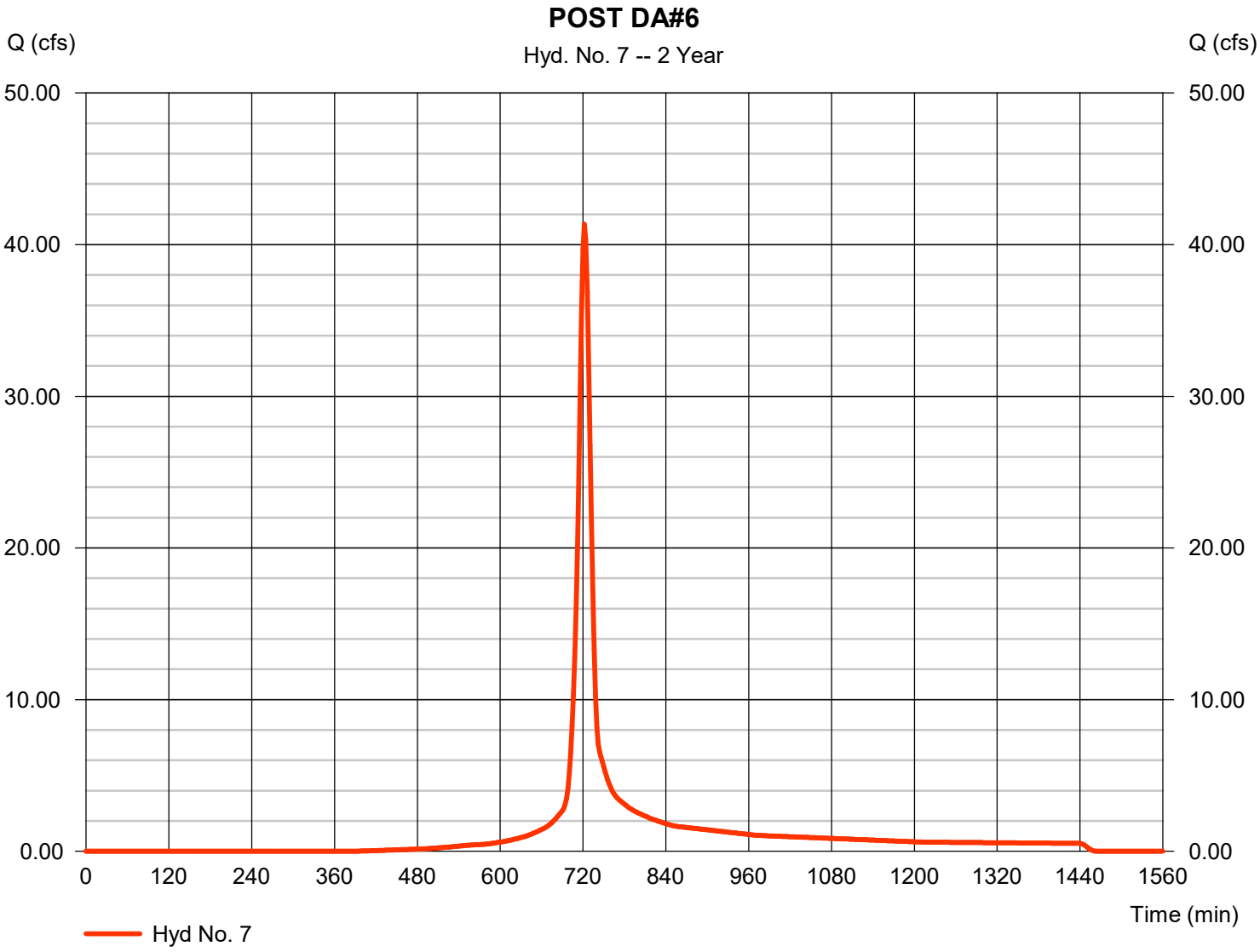


Hydrograph Report

Hyd. No. 7

POST DA#6

Hydrograph type	=	SCS Runoff	Peak discharge	=	41.35 cfs
Storm frequency	=	2 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	116,462 cuft
Drainage area	=	15.140 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	14.80 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

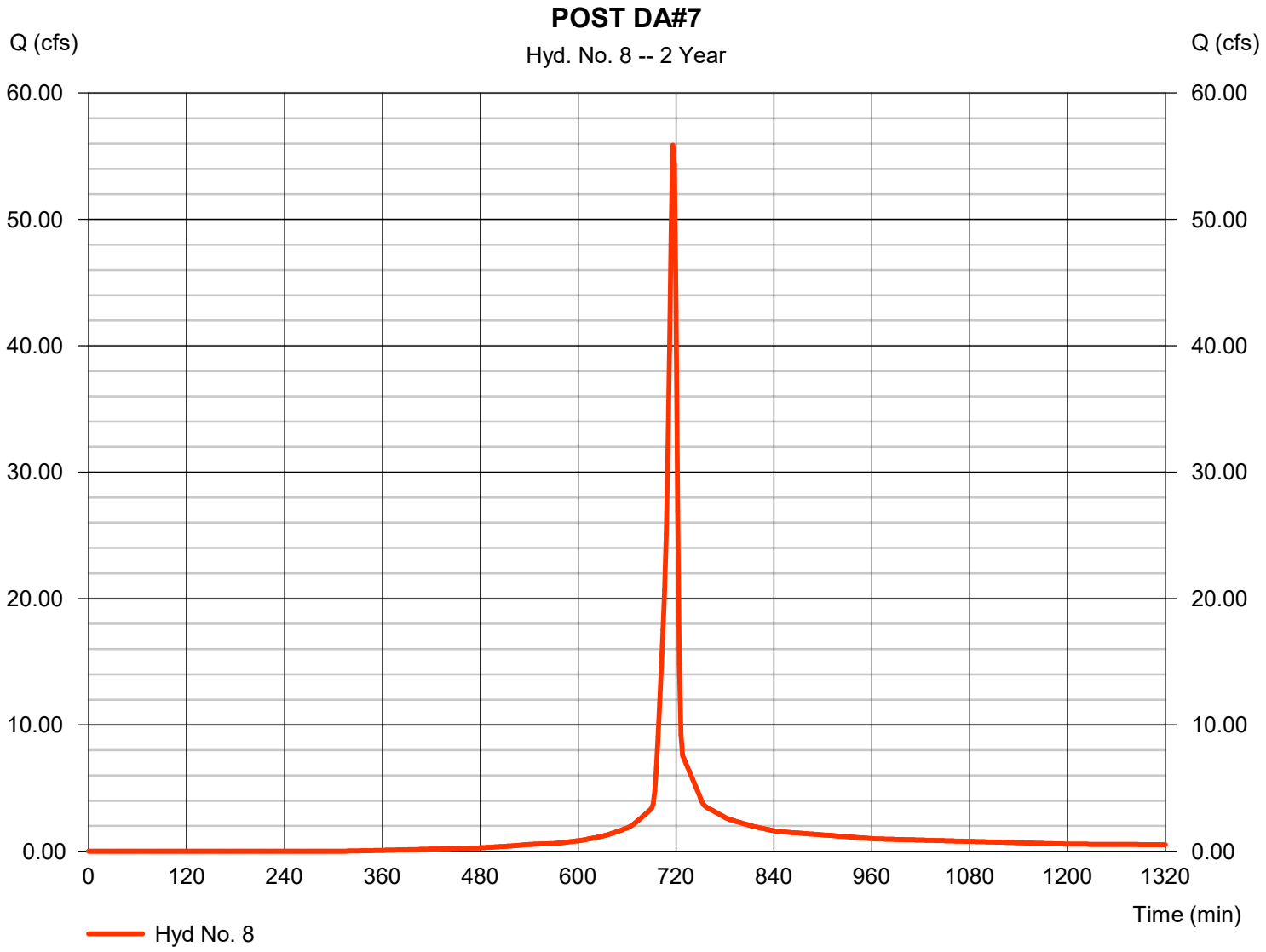


Hydrograph Report

Hyd. No. 8

POST DA#7

Hydrograph type	=	SCS Runoff	Peak discharge	=	55.88 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	116,682 cuft
Drainage area	=	14.060 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.20 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

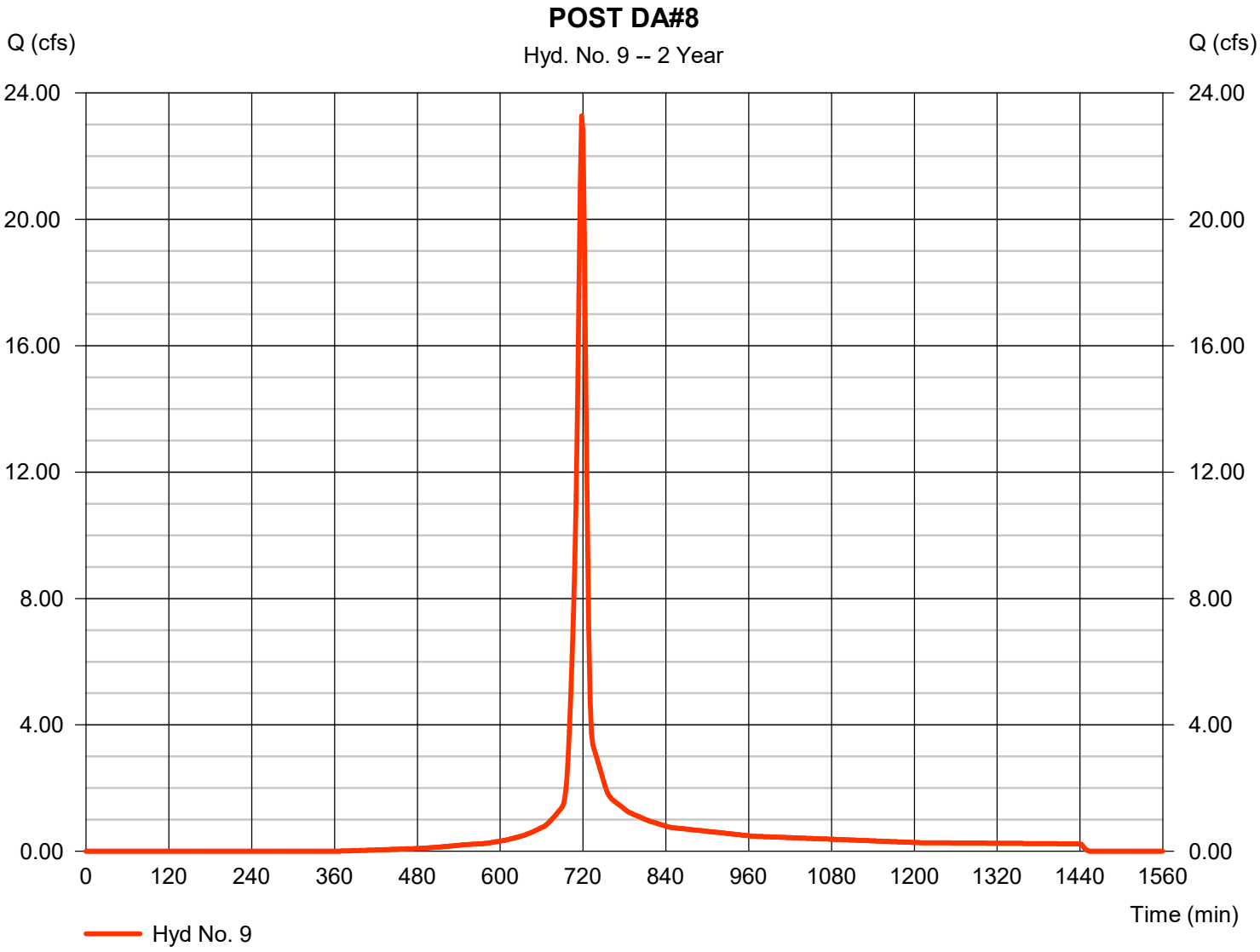


Hydrograph Report

Hyd. No. 9

POST DA#8

Hydrograph type	=	SCS Runoff	Peak discharge	=	23.27 cfs
Storm frequency	=	2 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	53,971 cuft
Drainage area	=	6.580 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.80 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

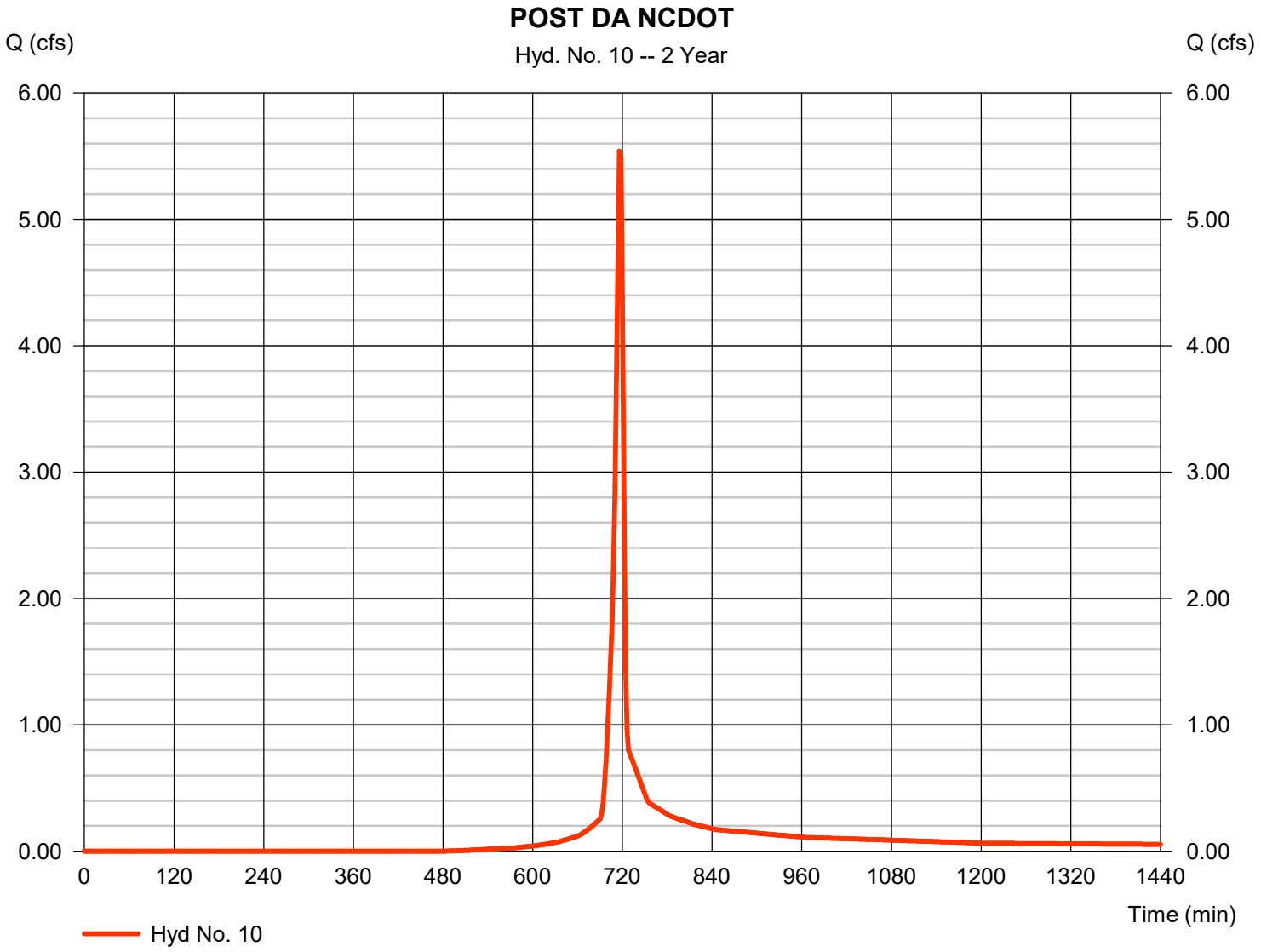


Hydrograph Report

Hyd. No. 10

POST DA NCDOT

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.539 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	11,207 cuft
Drainage area	=	1.780 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

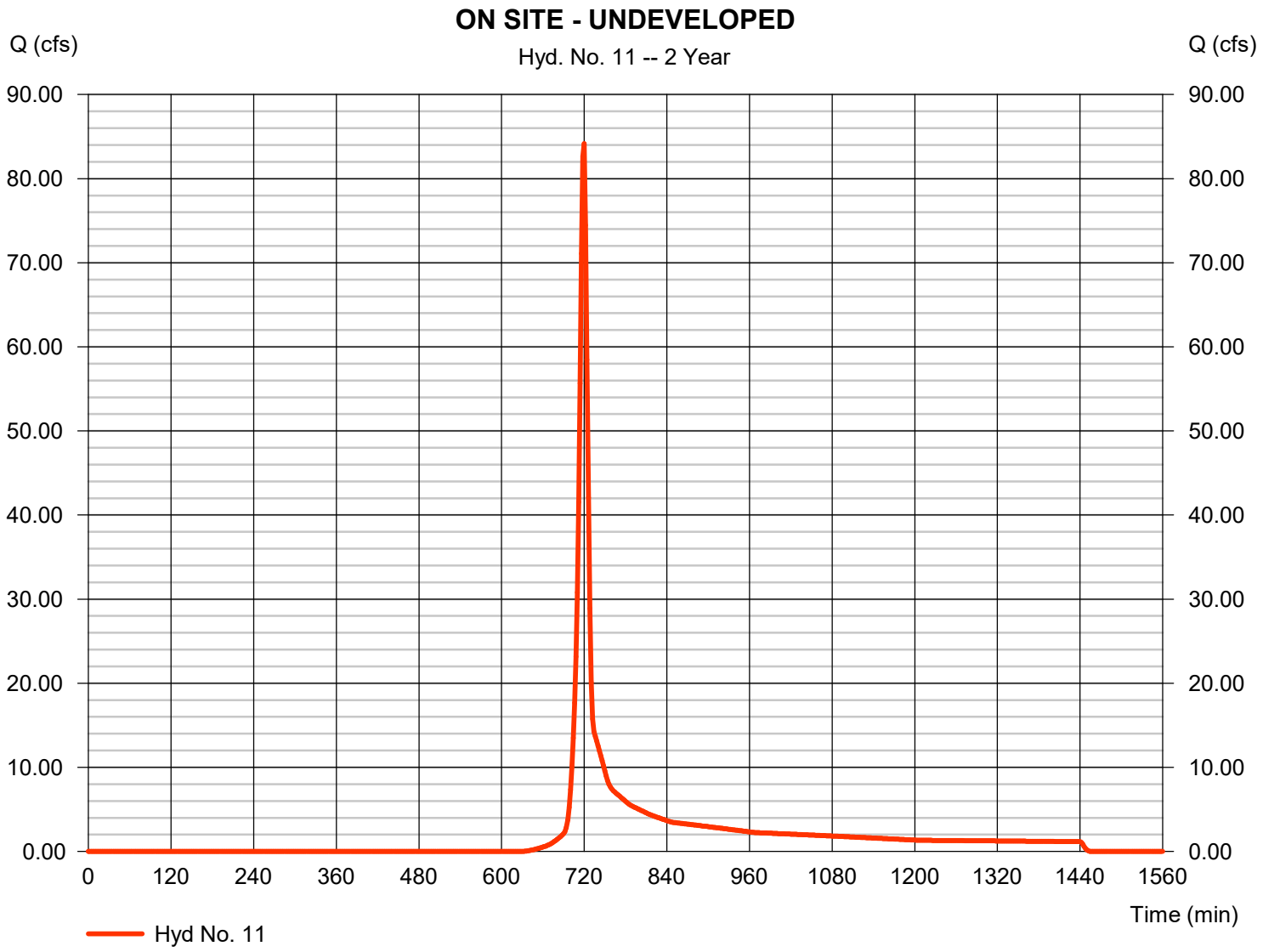


Hydrograph Report

Hyd. No. 11

ON SITE - UNDEVELOPED

Hydrograph type	=	SCS Runoff	Peak discharge	=	84.15 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	193,581 cuft
Drainage area	=	43.250 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.00 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

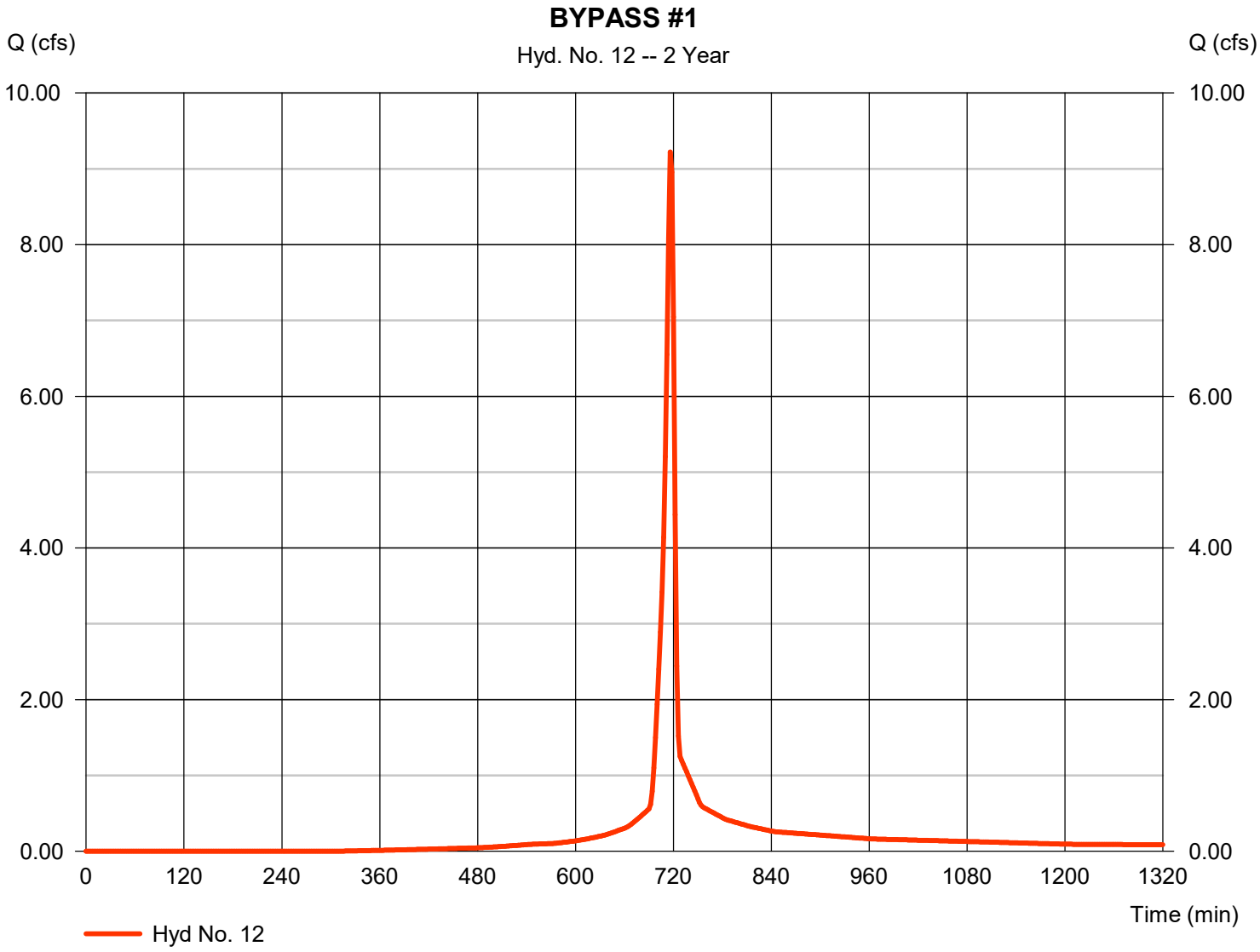


Hydrograph Report

Hyd. No. 12

BYPASS #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.220 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	19,253 cuft
Drainage area	=	2.320 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

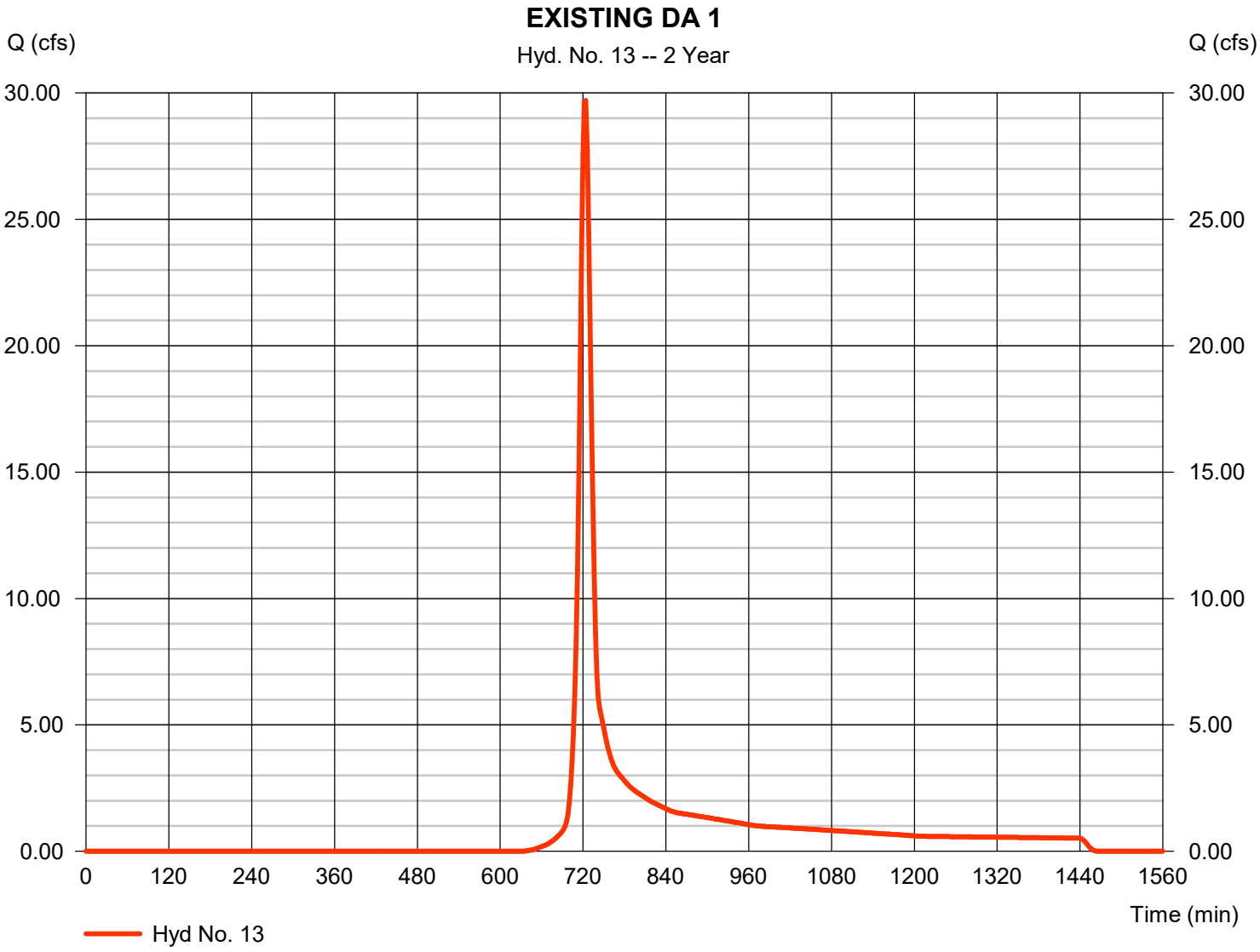


Hydrograph Report

Hyd. No. 13

EXISTING DA 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	29.71 cfs
Storm frequency	=	2 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	86,057 cuft
Drainage area	=	19.720 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	14.00 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

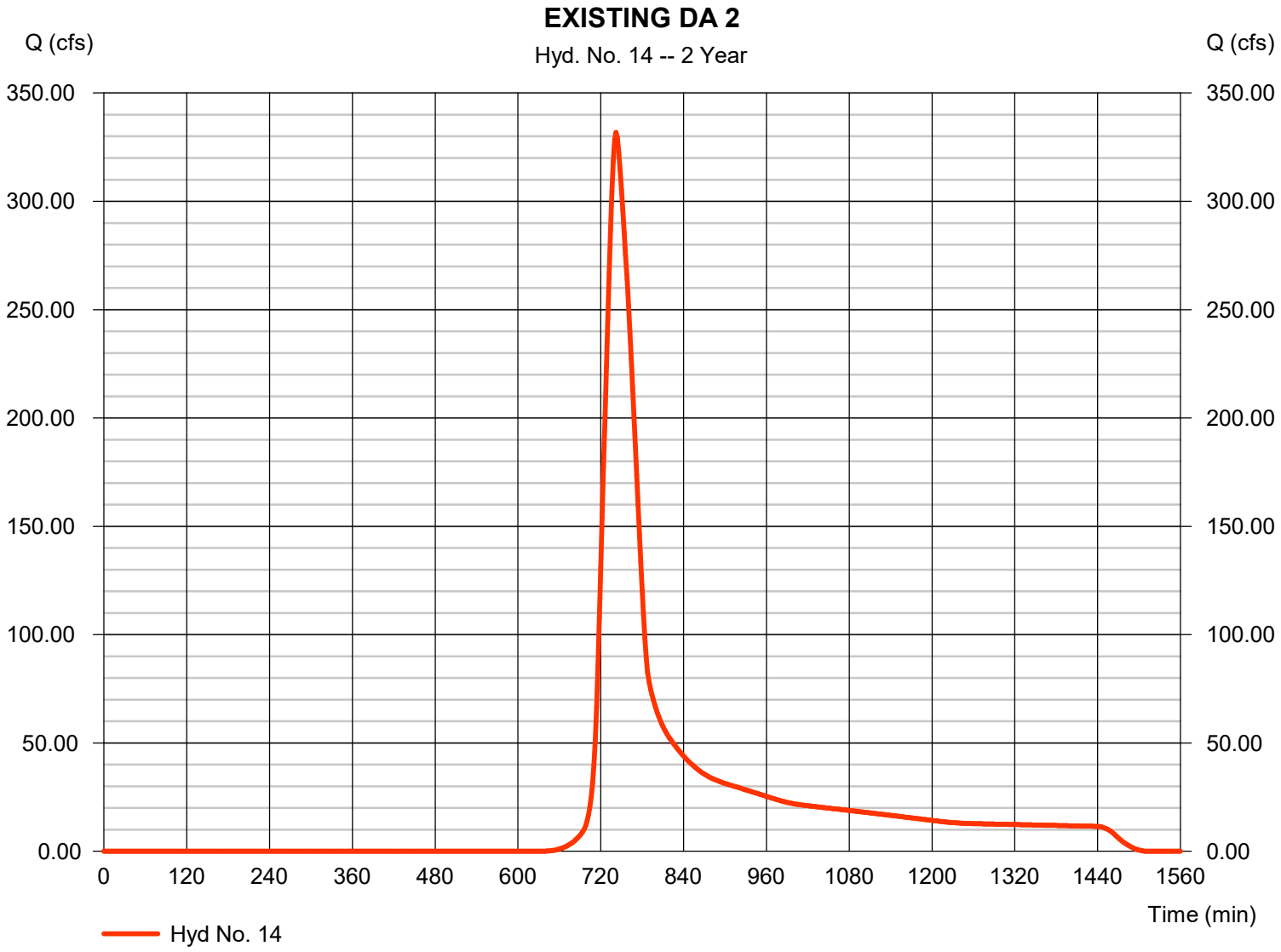


Hydrograph Report

Hyd. No. 14

EXISTING DA 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	331.87 cfs
Storm frequency	=	2 yrs	Time to peak	=	742 min
Time interval	=	2 min	Hyd. volume	=	1,884,234 cuft
Drainage area	=	424.770 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	47.00 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

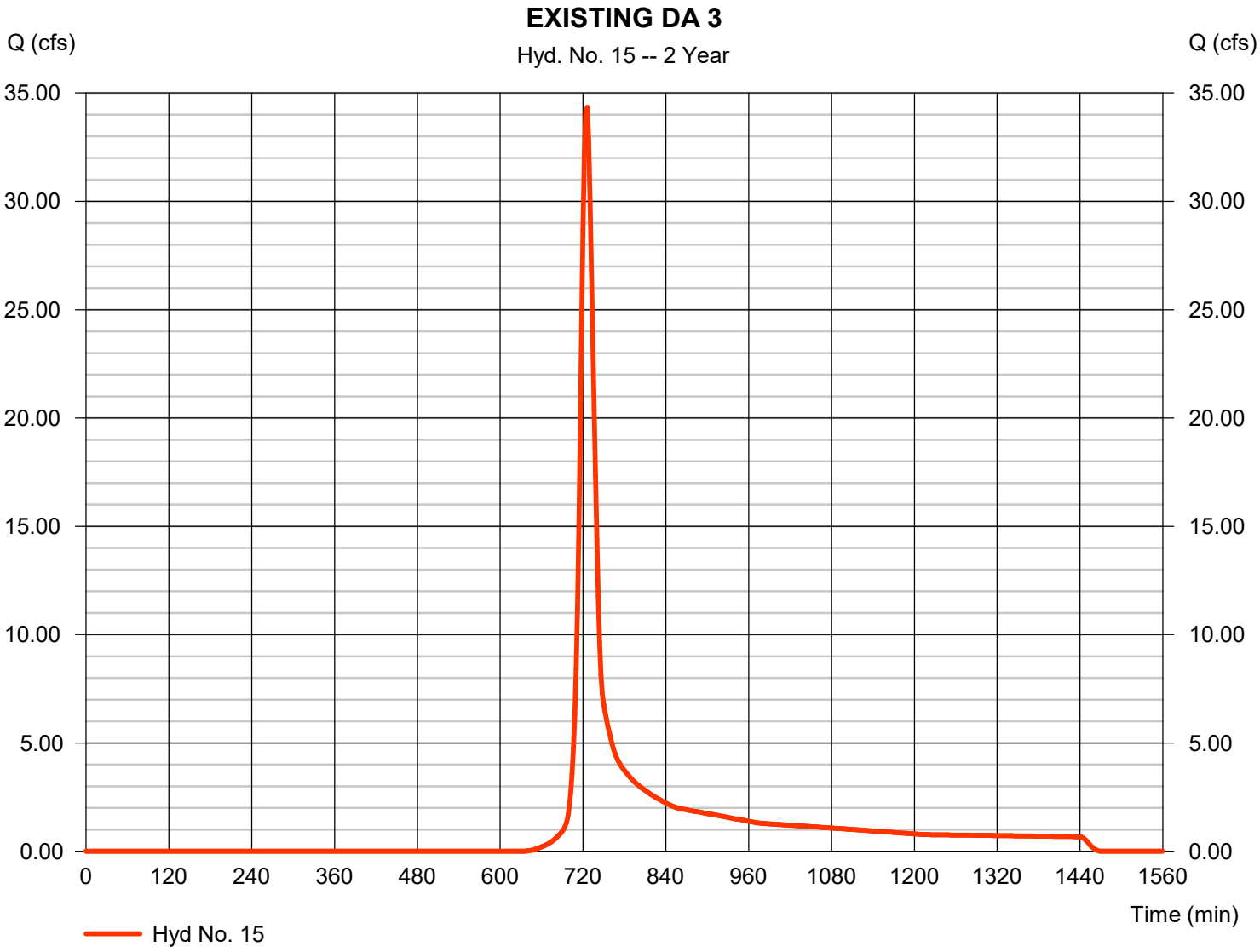


Hydrograph Report

Hyd. No. 15

EXISTING DA 3

Hydrograph type	=	SCS Runoff	Peak discharge	=	34.34 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	111,538 cuft
Drainage area	=	24.920 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	19.60 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

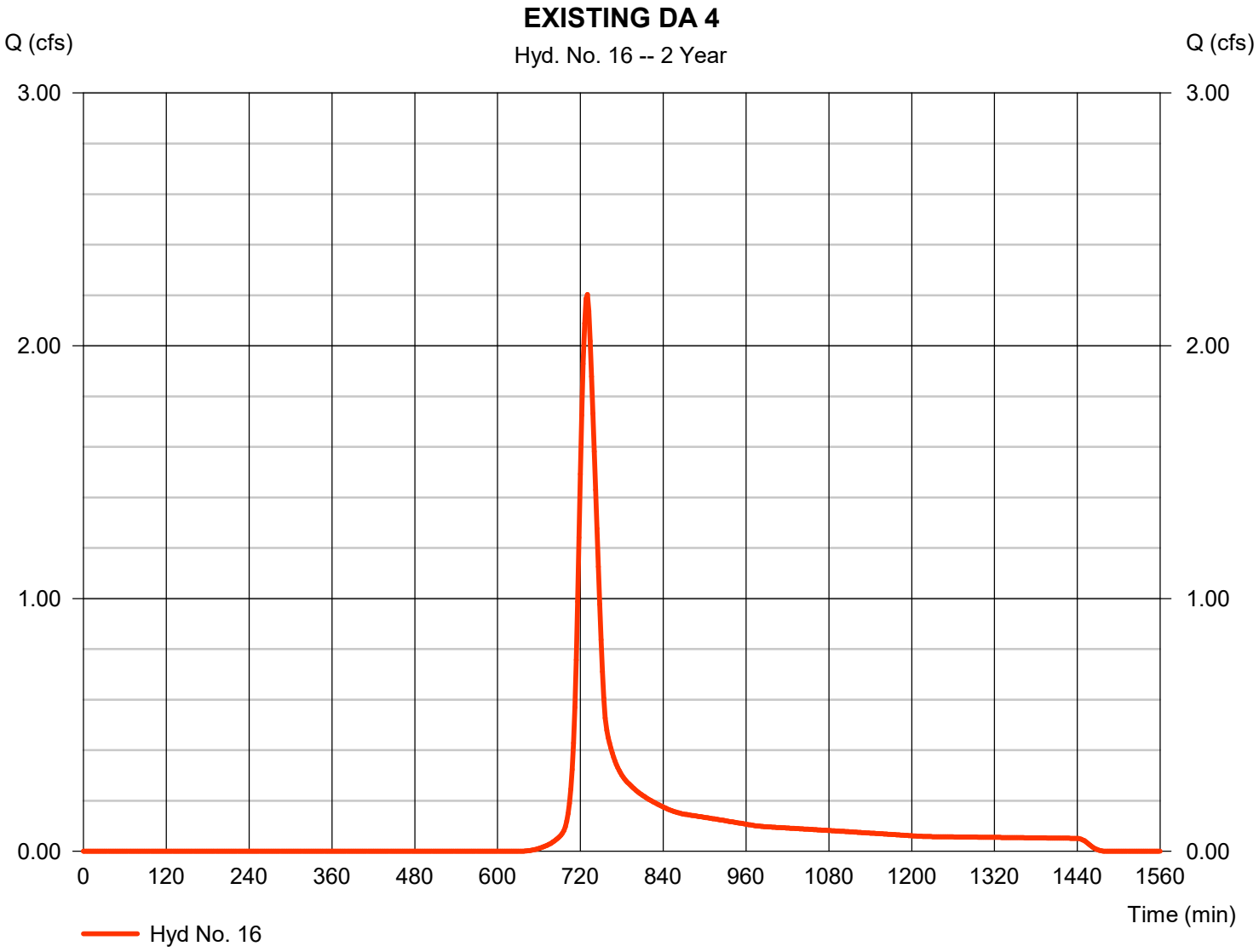


Hydrograph Report

Hyd. No. 16

EXISTING DA 4

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.203 cfs
Storm frequency	=	2 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	8,459 cuft
Drainage area	=	1.920 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	26.20 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



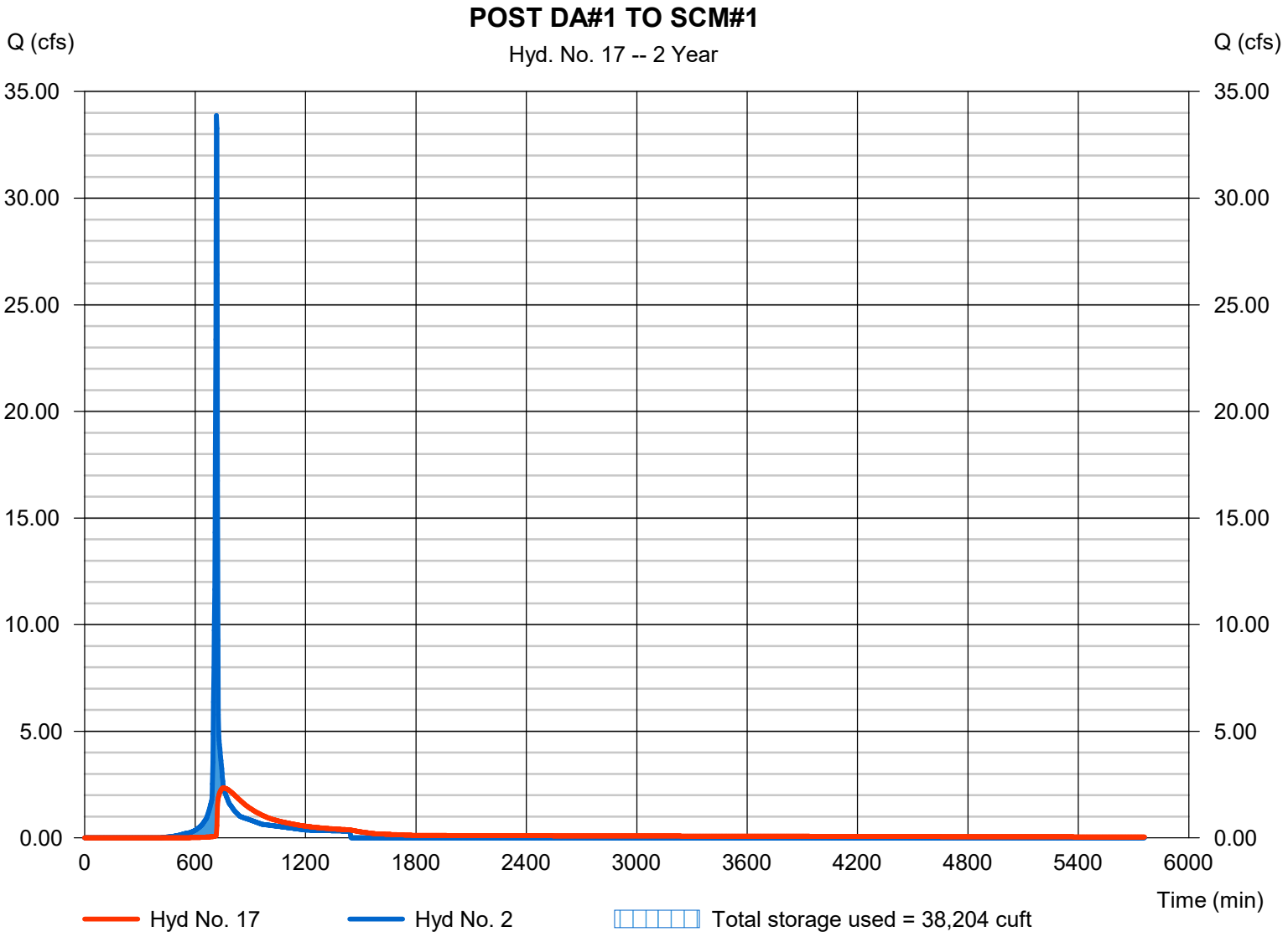
Hydrograph Report

Hyd. No. 17

POST DA#1 TO SCM#1

Hydrograph type	=	Reservoir	Peak discharge	=	2.338 cfs
Storm frequency	=	2 yrs	Time to peak	=	754 min
Time interval	=	2 min	Hyd. volume	=	65,146 cuft
Inflow hyd. No.	=	2 - POST DA#1	Max. Elevation	=	264.00 ft
Reservoir name	=	SCM#1	Max. Storage	=	38,204 cuft

Storage Indication method used.



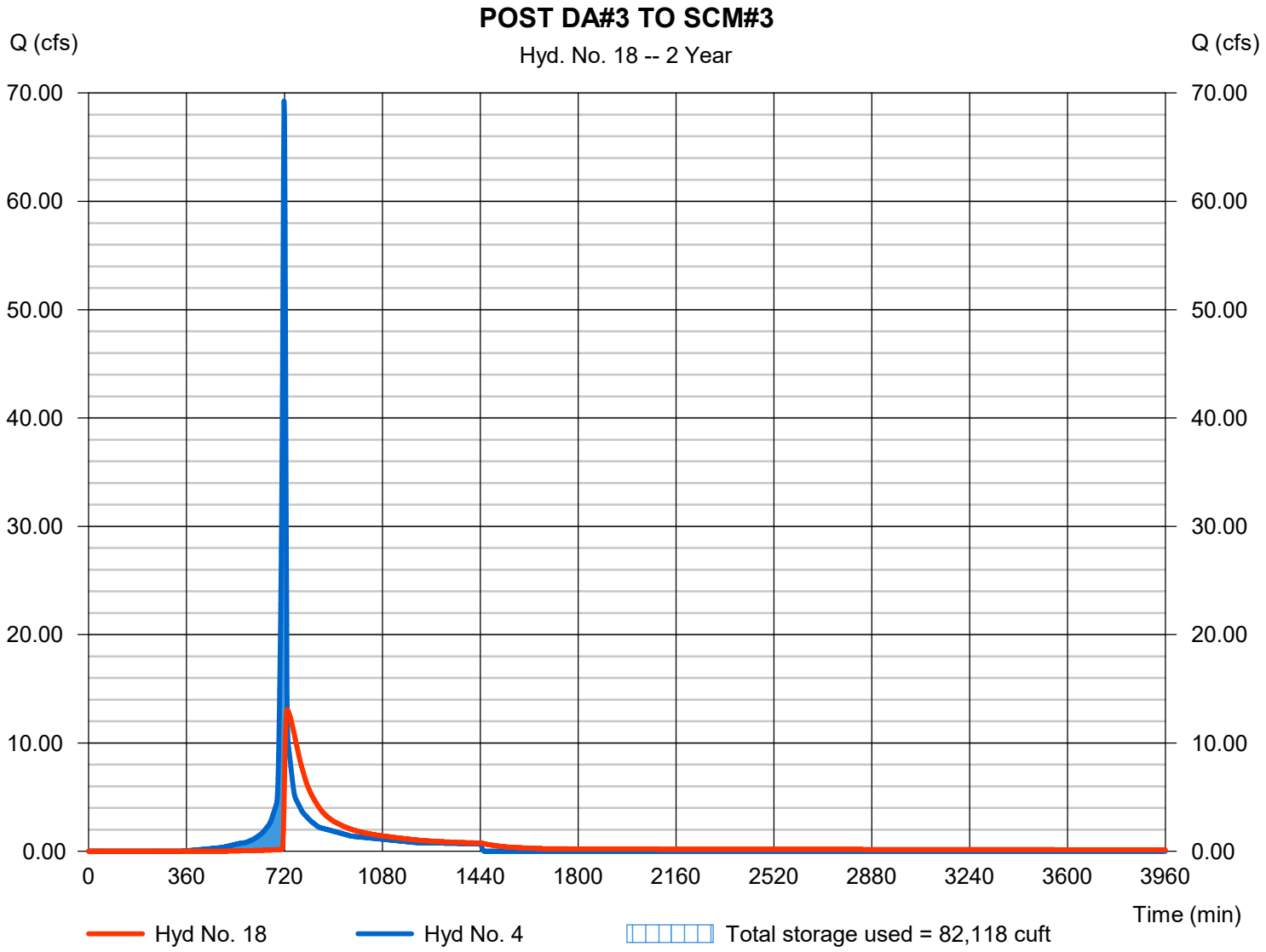
Hydrograph Report

Hyd. No. 18

POST DA#3 TO SCM#3

Hydrograph type	=	Reservoir	Peak discharge	=	13.07 cfs
Storm frequency	=	2 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	156,638 cuft
Inflow hyd. No.	=	4 - POST DA #3	Max. Elevation	=	243.36 ft
Reservoir name	=	SCM#3	Max. Storage	=	82,118 cuft

Storage Indication method used.



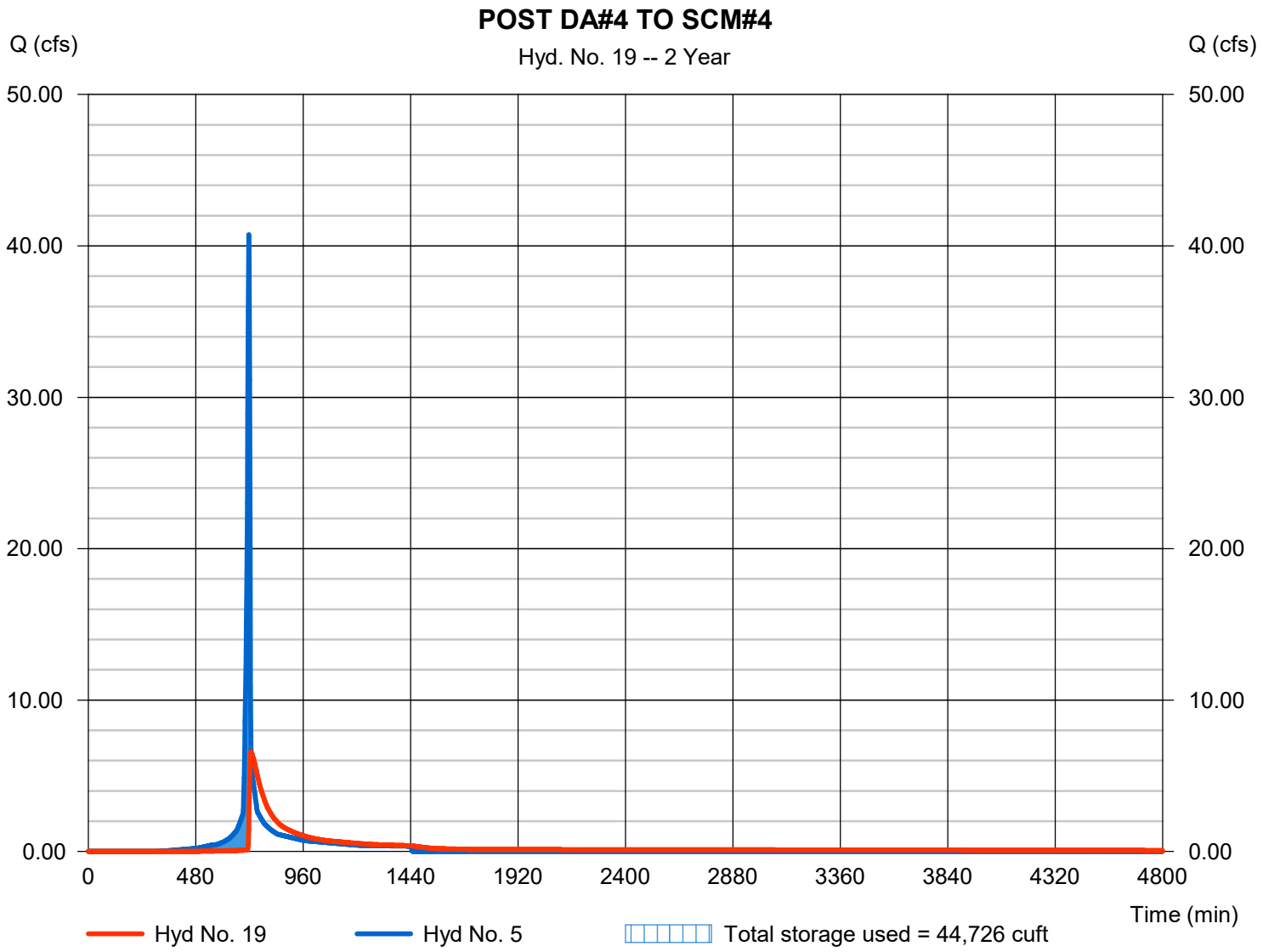
Hydrograph Report

Hyd. No. 19

POST DA#4 TO SCM#4

Hydrograph type	=	Reservoir	Peak discharge	=	6.578 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	81,523 cuft
Inflow hyd. No.	=	5 - POST DA#4	Max. Elevation	=	242.70 ft
Reservoir name	=	SCM#4	Max. Storage	=	44,726 cuft

Storage Indication method used.



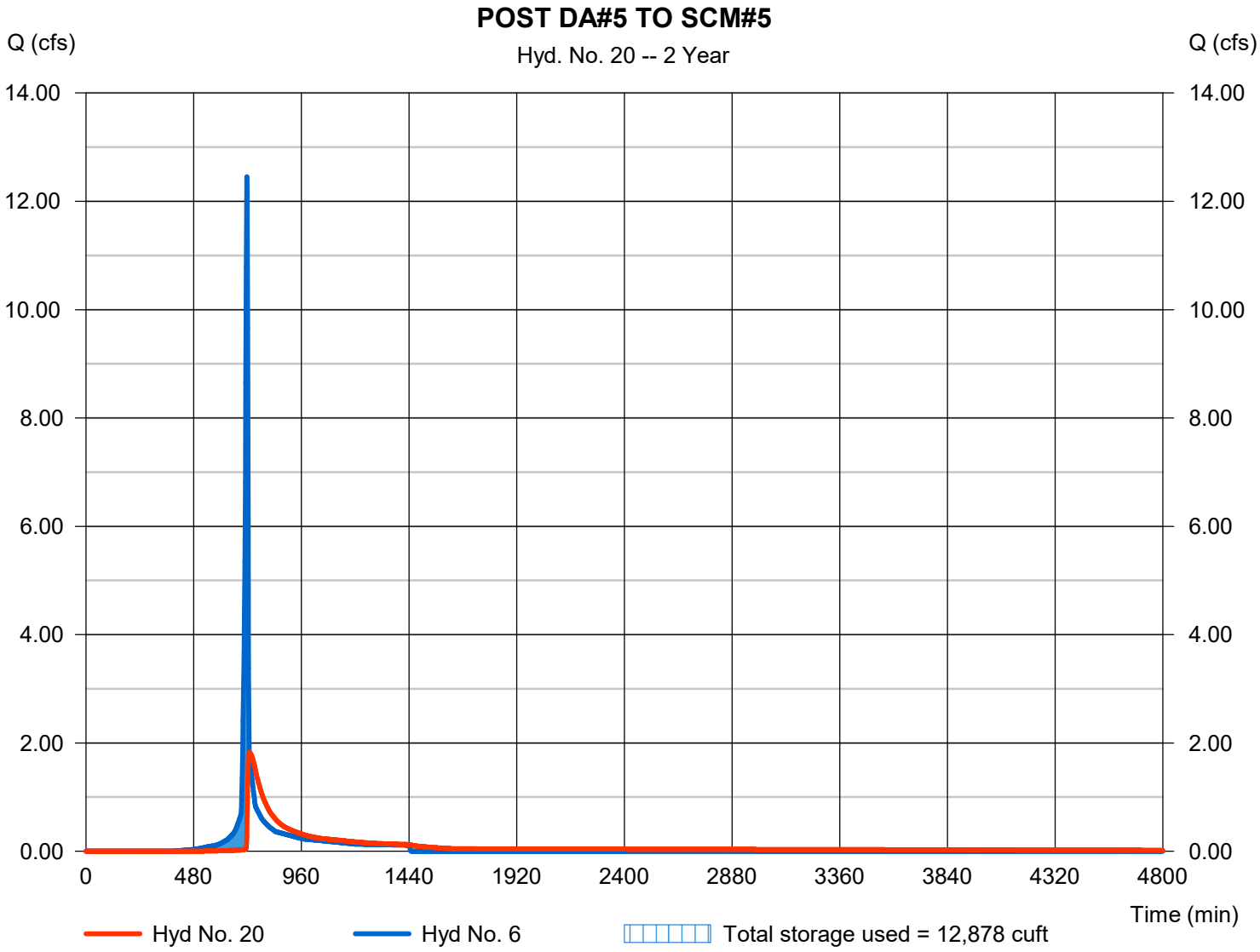
Hydrograph Report

Hyd. No. 20

POST DA#5 TO SCM#5

Hydrograph type	=	Reservoir	Peak discharge	=	1.830 cfs
Storm frequency	=	2 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	24,898 cuft
Inflow hyd. No.	=	6 - POST DA#5	Max. Elevation	=	251.91 ft
Reservoir name	=	SCM#5	Max. Storage	=	12,878 cuft

Storage Indication method used.



Hydrograph Report

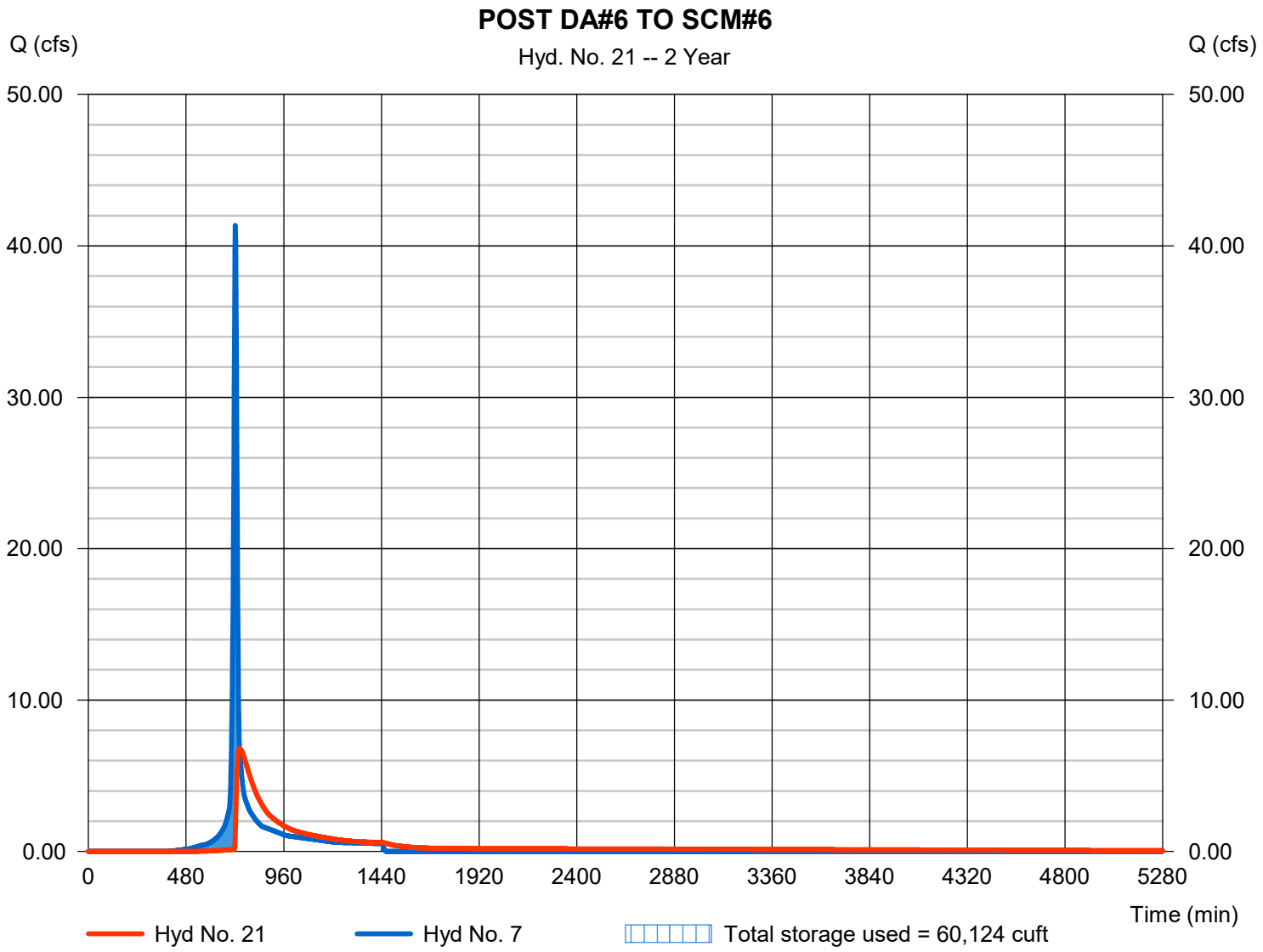
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Thursday, 05 / 22 / 2025

Hyd. No. 21

POST DA#6 TO SCM#6

Hydrograph type	=	Reservoir	Peak discharge	=	6.777 cfs
Storm frequency	=	2 yrs	Time to peak	=	744 min
Time interval	=	2 min	Hyd. volume	=	114,126 cuft
Inflow hyd. No.	=	7 - POST DA#6	Max. Elevation	=	239.95 ft
Reservoir name	=	SCM#6	Max. Storage	=	60,124 cuft

Storage Indication method used.



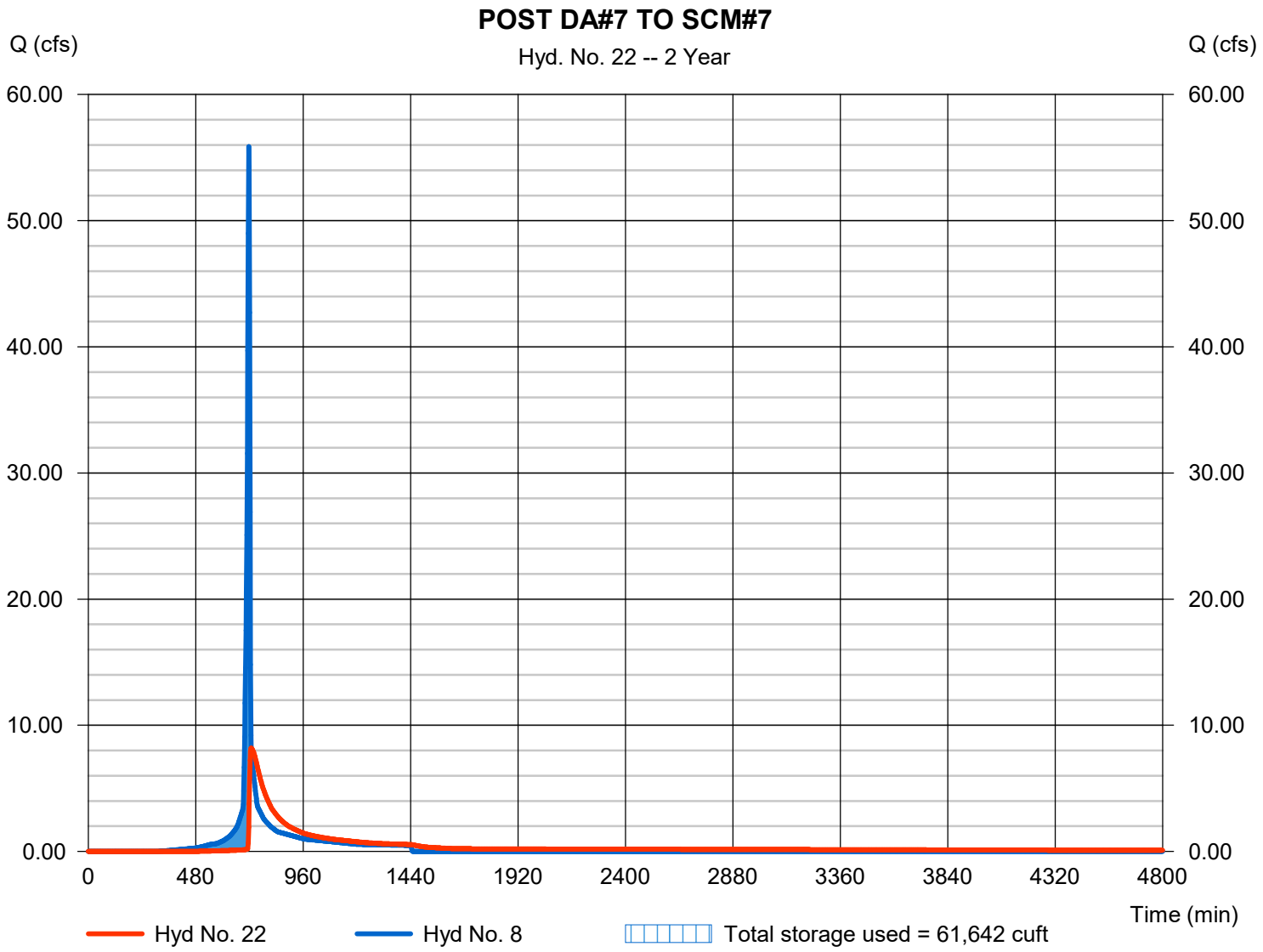
Hydrograph Report

Hyd. No. 22

POST DA#7 TO SCM#7

Hydrograph type	=	Reservoir	Peak discharge	=	8.188 cfs
Storm frequency	=	2 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	113,592 cuft
Inflow hyd. No.	=	8 - POST DA#7	Max. Elevation	=	241.90 ft
Reservoir name	=	SCM#7	Max. Storage	=	61,642 cuft

Storage Indication method used.



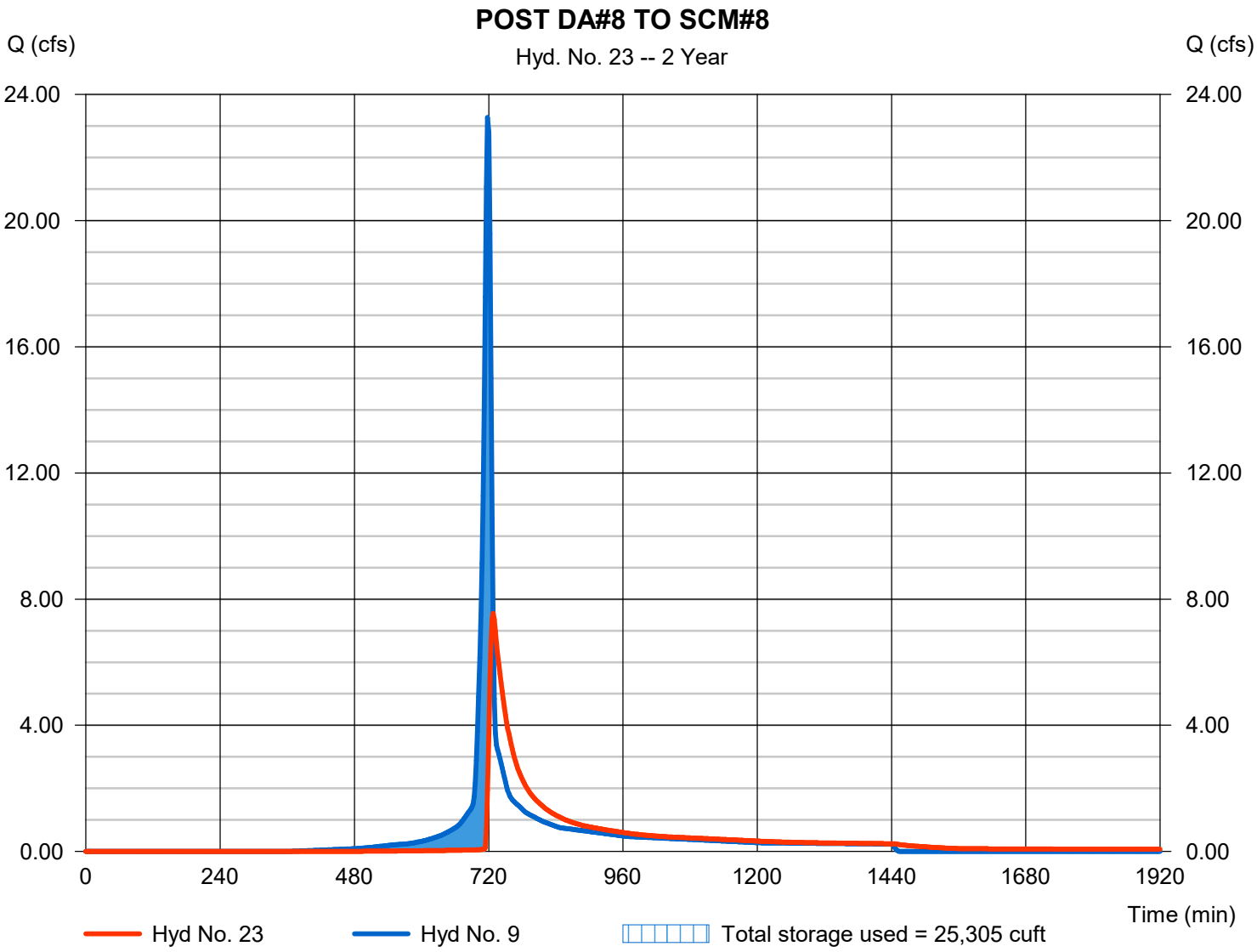
Hydrograph Report

Hyd. No. 23

POST DA#8 TO SCM#8

Hydrograph type	=	Reservoir	Peak discharge	=	7.551 cfs
Storm frequency	=	2 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	52,658 cuft
Inflow hyd. No.	=	9 - POST DA#8	Max. Elevation	=	242.87 ft
Reservoir name	=	SCM#8	Max. Storage	=	25,305 cuft

Storage Indication method used.

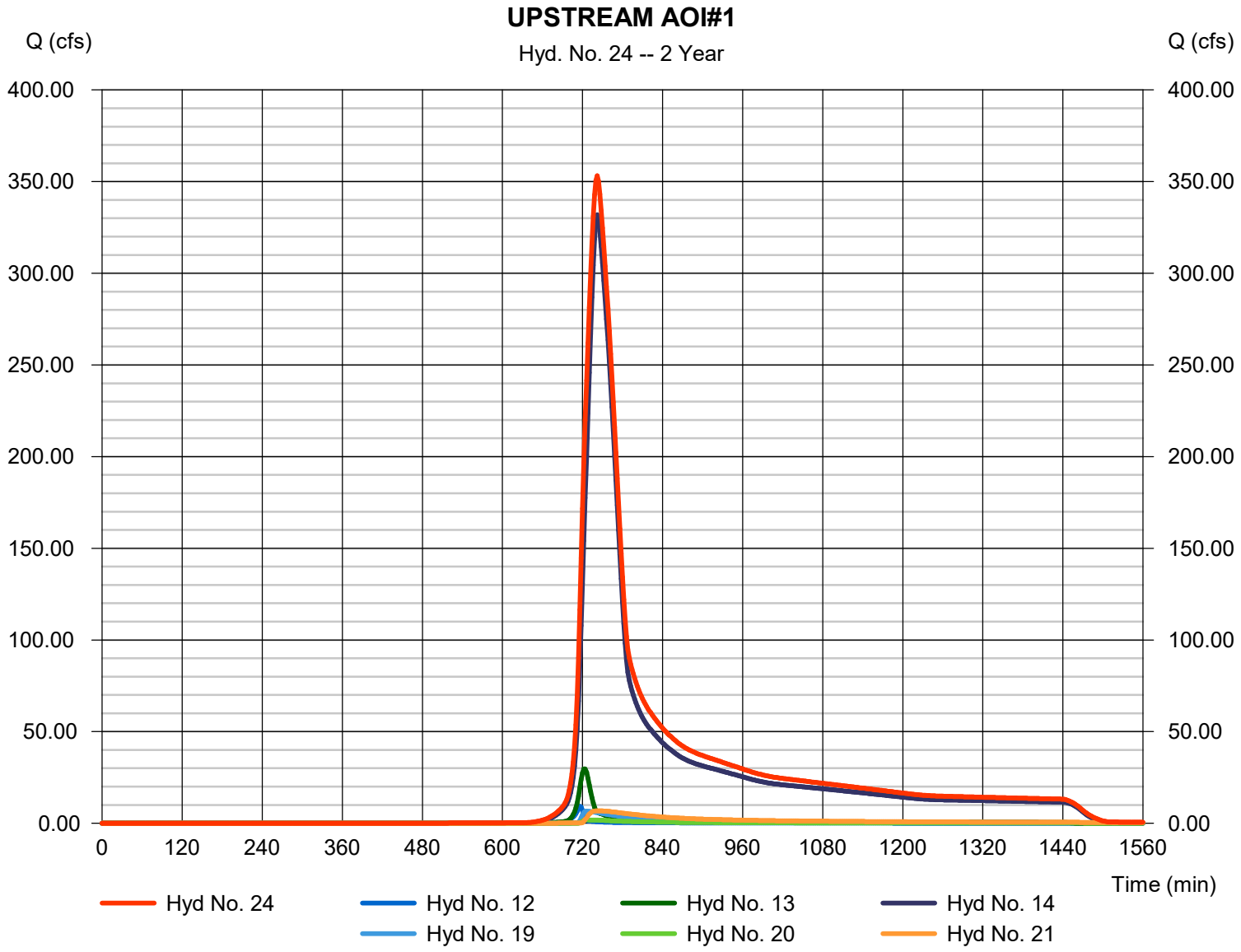


Hydrograph Report

Hyd. No. 24

UPSTREAM AOI#1

Hydrograph type	= Combine	Peak discharge	= 353.19 cfs
Storm frequency	= 2 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 2,210,093 cuft
Inflow hyds.	= 12, 13, 14, 19, 20, 21	Contrib. drain. area	= 446.810 ac

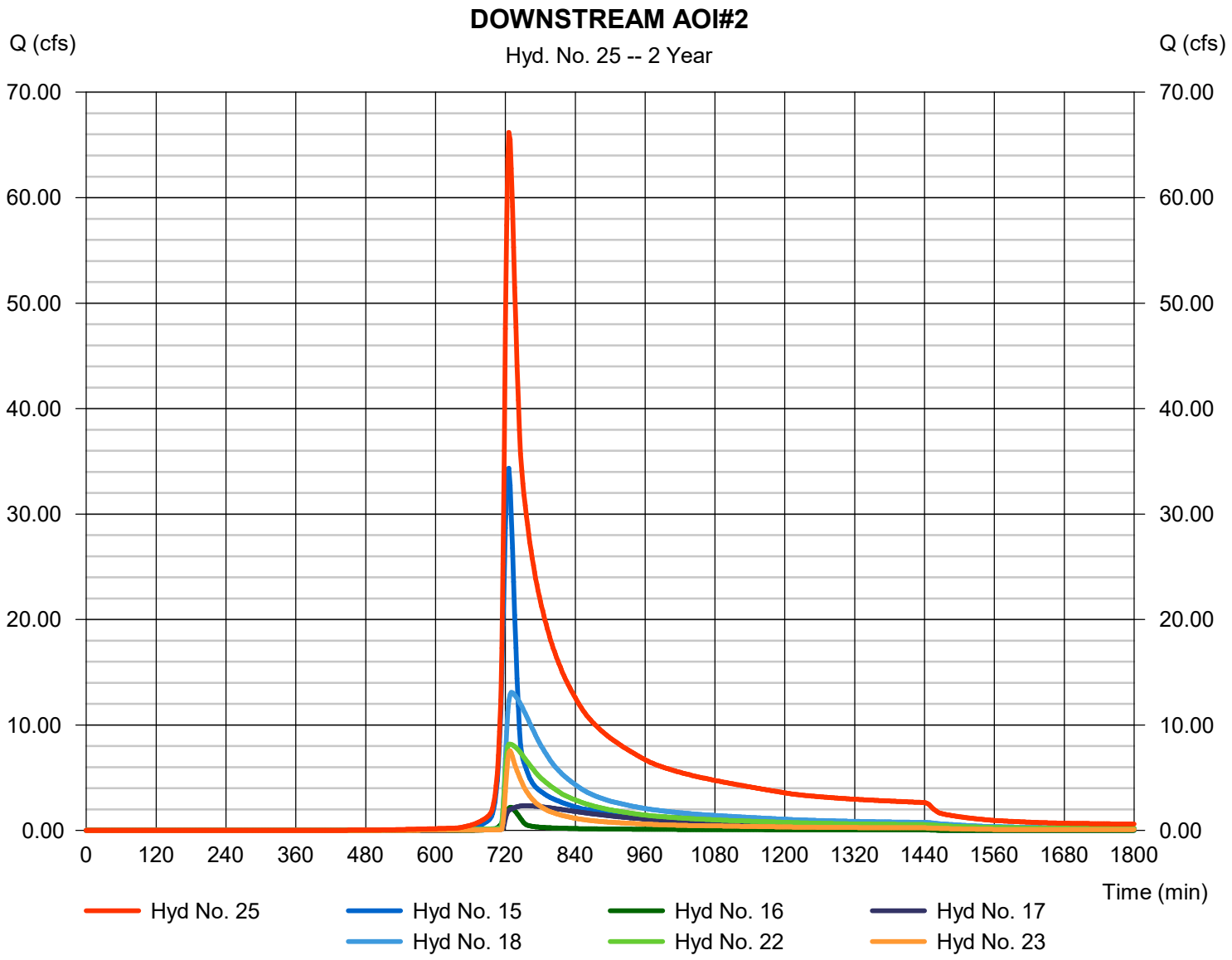


Hydrograph Report

Hyd. No. 25

DOWNSTREAM AOI#2

Hydrograph type	=	Combine	Peak discharge	=	66.20 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	508,032 cuft
Inflow hyds.	=	15, 16, 17, 18, 22, 23	Contrib. drain. area	=	26.840 ac

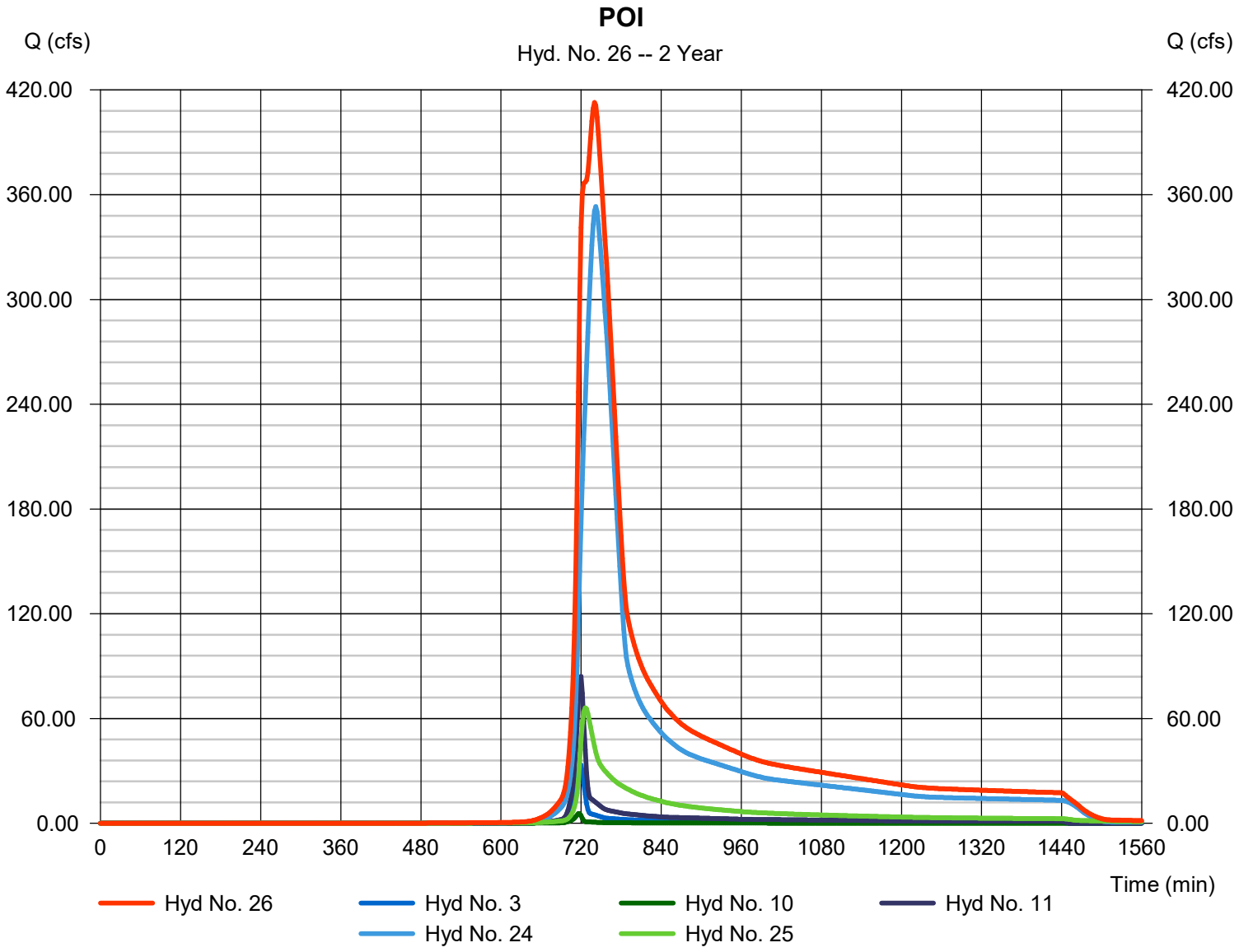


Hydrograph Report

Hyd. No. 26

POI

Hydrograph type	= Combine	Peak discharge	= 412.82 cfs
Storm frequency	= 2 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 2,999,375 cuft
Inflow hyds.	= 3, 10, 11, 24, 25	Contrib. drain. area	= 60.540 ac

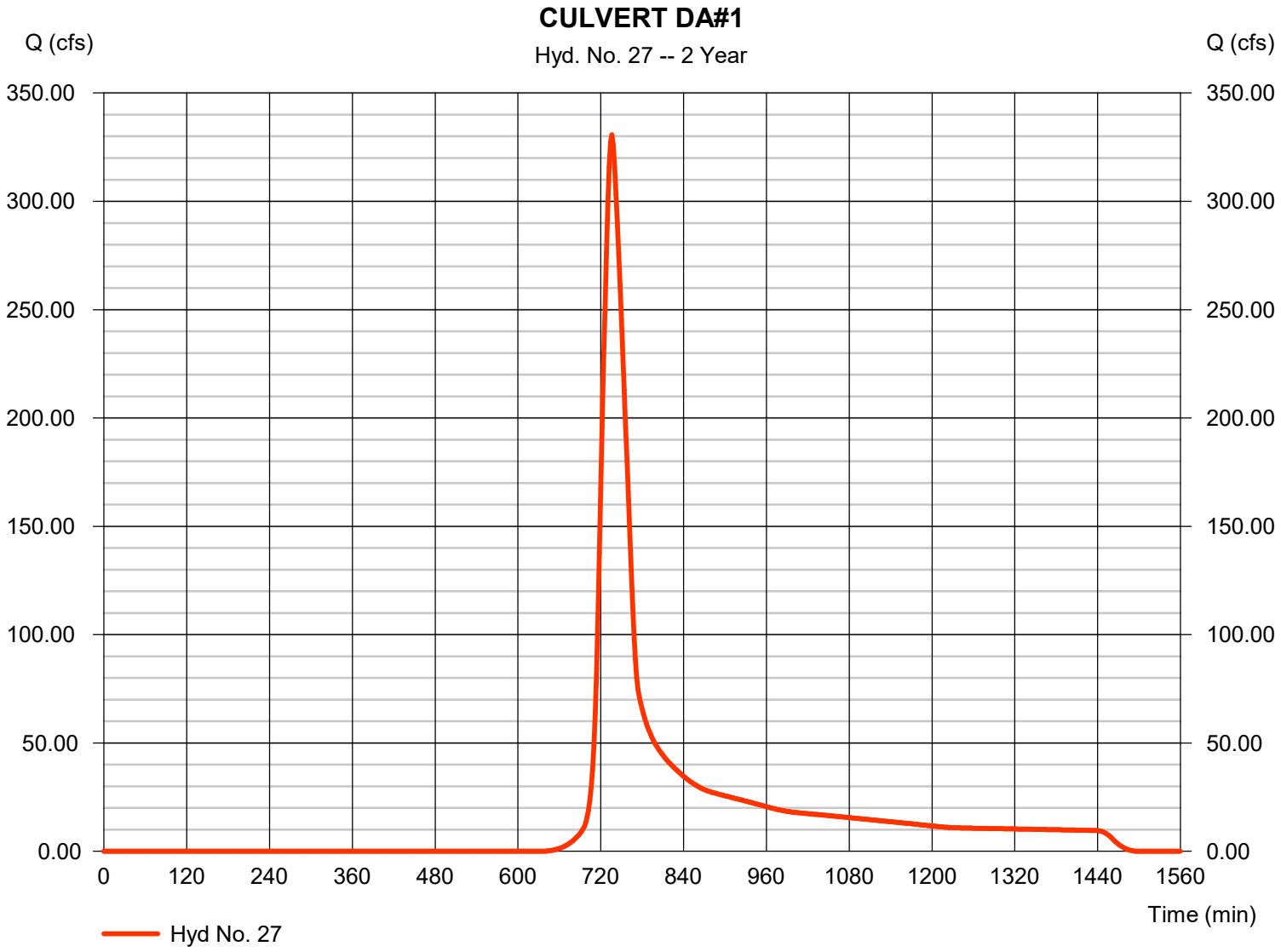


Hydrograph Report

Hyd. No. 27

CULVERT DA#1

Hydrograph type	=	SCS Runoff	Peak discharge	=	330.70 cfs
Storm frequency	=	2 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	1,578,438 cuft
Drainage area	=	356.710 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	34.90 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

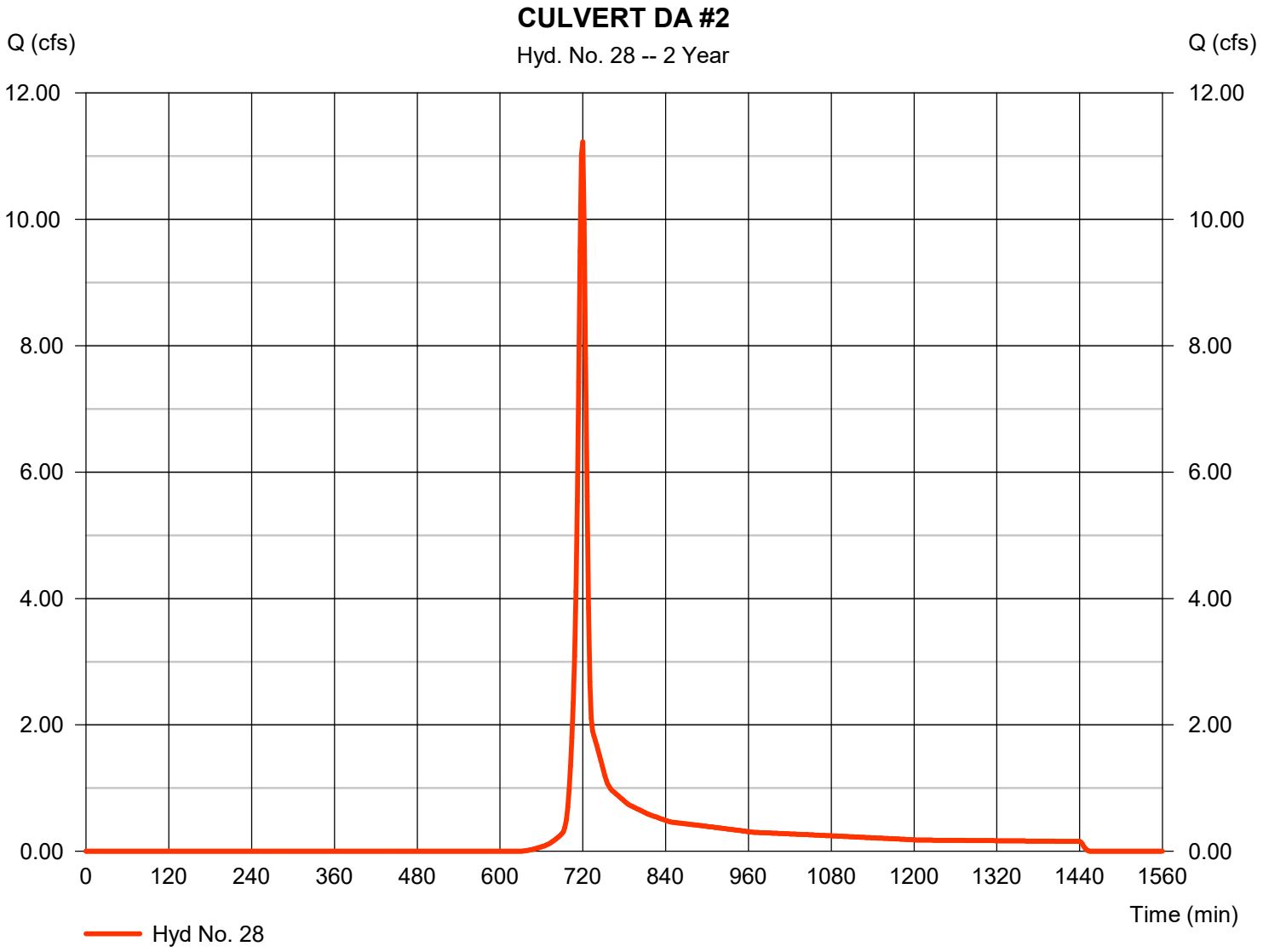


Hydrograph Report

Hyd. No. 28

CULVERT DA #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	11.23 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	25,826 cuft
Drainage area	=	5.770 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.80 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

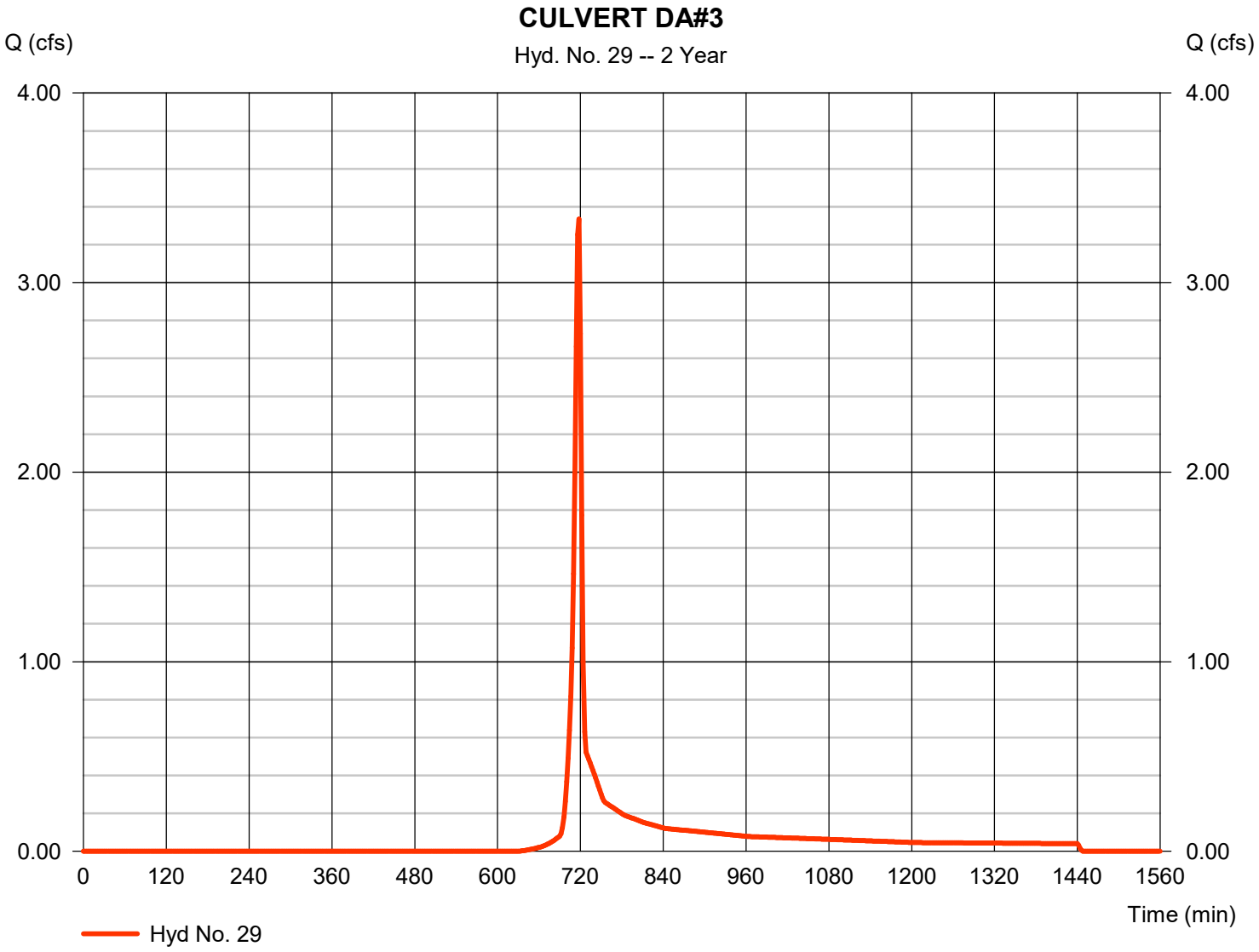


Hydrograph Report

Hyd. No. 29

CULVERT DA#3

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.336 cfs
Storm frequency	=	2 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	6,672 cuft
Drainage area	=	1.590 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.49 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

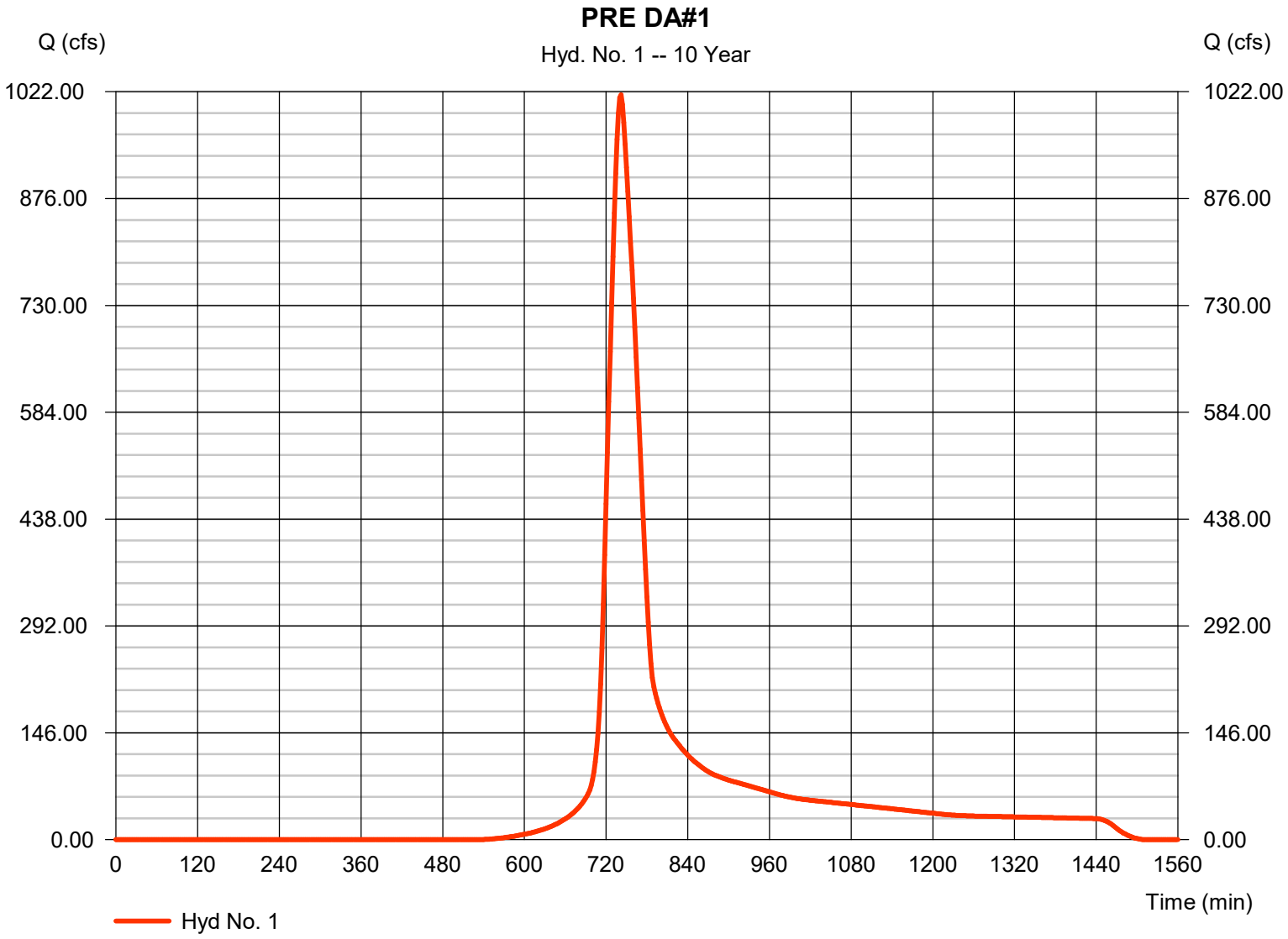
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1017.83	2	742	5,513,080	------	------	------	PRE DA#1
2	SCS Runoff	56.97	2	716	119,012	------	------	------	POST DA#1
3	SCS Runoff	65.25	2	718	149,273	------	------	------	POST DA#2
4	SCS Runoff	112.36	2	718	268,695	------	------	------	POST DA #3
5	SCS Runoff	65.08	2	716	139,927	------	------	------	POST DA#4
6	SCS Runoff	20.66	2	716	43,433	------	------	------	POST DA#5
7	SCS Runoff	69.14	2	722	198,226	------	------	------	POST DA#6
8	SCS Runoff	89.27	2	716	191,939	------	------	------	POST DA#7
9	SCS Runoff	38.24	2	718	90,814	------	------	------	POST DA#8
10	SCS Runoff	9.717	2	716	19,996	------	------	------	POST DA NCDOT
11	SCS Runoff	169.88	2	718	388,793	------	------	------	ON SITE - UNDEVELOPED
12	SCS Runoff	14.73	2	716	31,671	------	------	------	BYPASS #1
13	SCS Runoff	61.50	2	722	172,840	------	------	------	EXISTING DA 1
14	SCS Runoff	698.67	2	742	3,784,349	------	------	------	EXISTING DA 2
15	SCS Runoff	71.27	2	724	224,017	------	------	------	EXISTING DA 3
16	SCS Runoff	4.592	2	728	16,990	------	------	------	EXISTING DA 4
17	Reservoir	5.072	2	744	114,893	2	265.21	65,658	POST DA#1 TO SCM#1
18	Reservoir	45.13	2	726	263,677	4	244.84	126,765	POST DA#3 TO SCM#3
19	Reservoir	20.48	2	724	136,292	5	243.90	69,057	POST DA#4 TO SCM#4
20	Reservoir	4.194	2	726	42,790	6	252.88	21,488	POST DA#5 TO SCM#5
21	Reservoir	17.06	2	738	195,812	7	241.47	100,171	POST DA#6 TO SCM#6
22	Reservoir	19.75	2	724	188,739	8	243.29	97,701	POST DA#7 TO SCM#7
23	Reservoir	17.45	2	726	89,470	9	243.97	37,772	POST DA#8 TO SCM#8
24	Combine	746.16	2	740	4,363,755	12, 13, 14, 19, 20, 21,	------	------	UPSTREAM AOI#1
25	Combine	162.21	2	726	897,786	15, 16, 17, 18, 22, 23,	------	------	DOWNSTREAM AOI#2
26	Combine	871.65	2	740	5,819,602	3, 10, 11, 24, 25	------	------	POI
27	SCS Runoff	692.74	2	736	3,170,181	------	------	------	CULVERT DA#1
28	SCS Runoff	22.66	2	718	51,869	------	------	------	CULVERT DA #2
29	SCS Runoff	6.637	2	716	13,400	------	------	------	CULVERT DA#3

Hydrograph Report

Hyd. No. 1

PRE DA#1

Hydrograph type	= SCS Runoff	Peak discharge	= 1017.83 cfs
Storm frequency	= 10 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 5,513,080 cuft
Drainage area	= 618.810 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 47.00 min
Total precip.	= 5.14 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

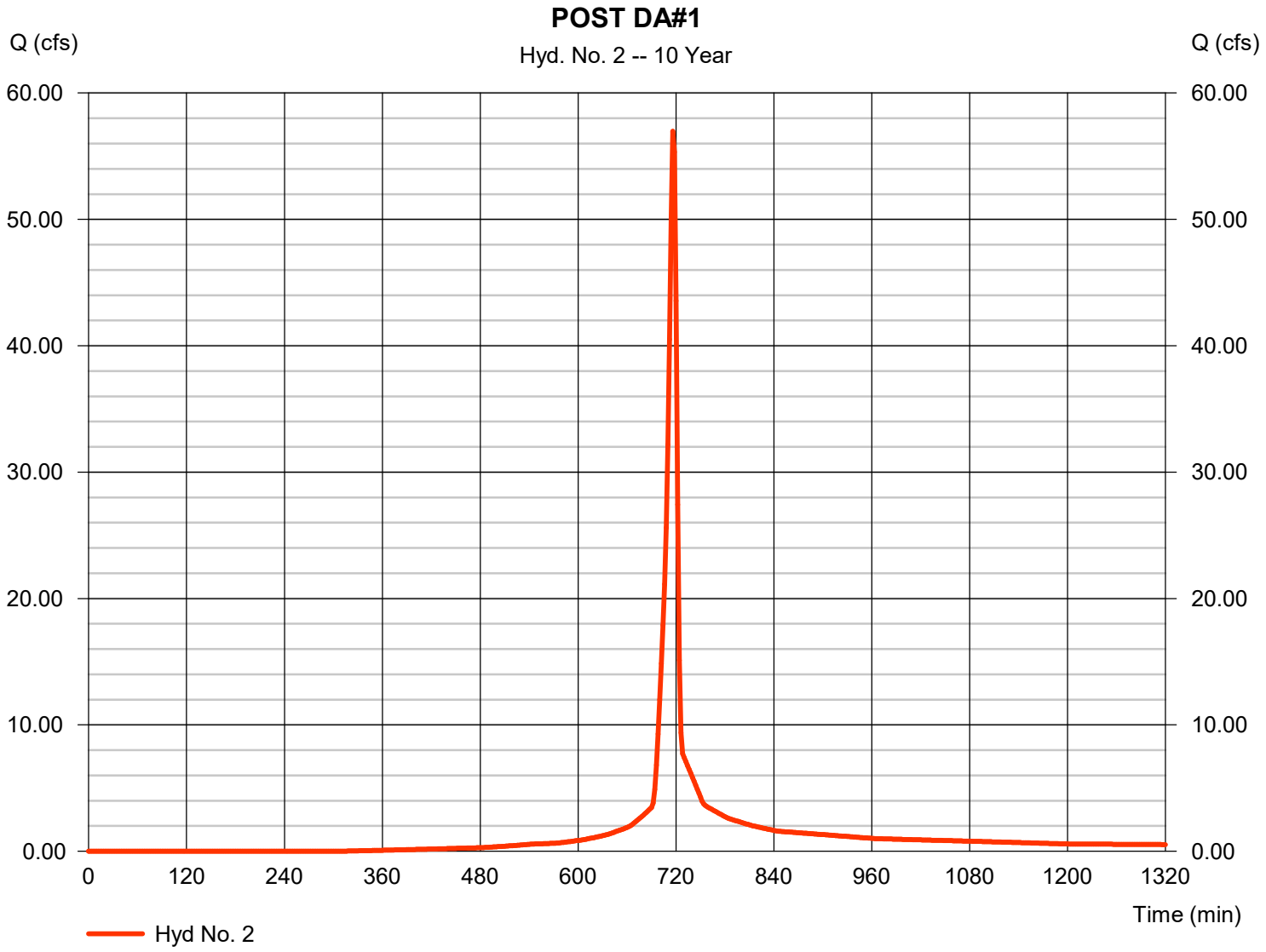


Hydrograph Report

Hyd. No. 2

POST DA#1

Hydrograph type	=	SCS Runoff	Peak discharge	=	56.97 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	119,012 cuft
Drainage area	=	9.720 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.50 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

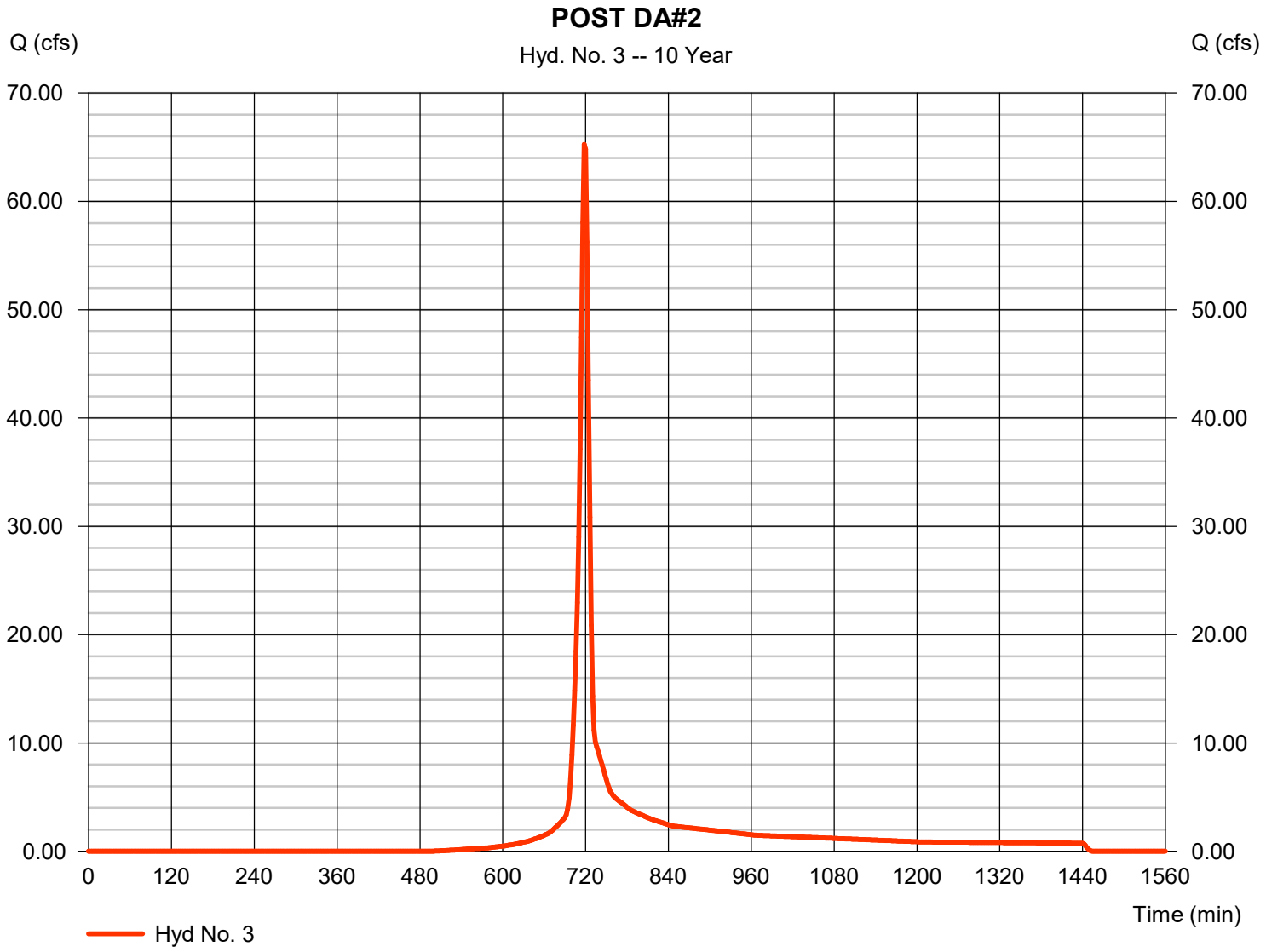


Hydrograph Report

Hyd. No. 3

POST DA#2

Hydrograph type	=	SCS Runoff	Peak discharge	=	65.25 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	149,273 cuft
Drainage area	=	15.510 ac	Curve number	=	76
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.00 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

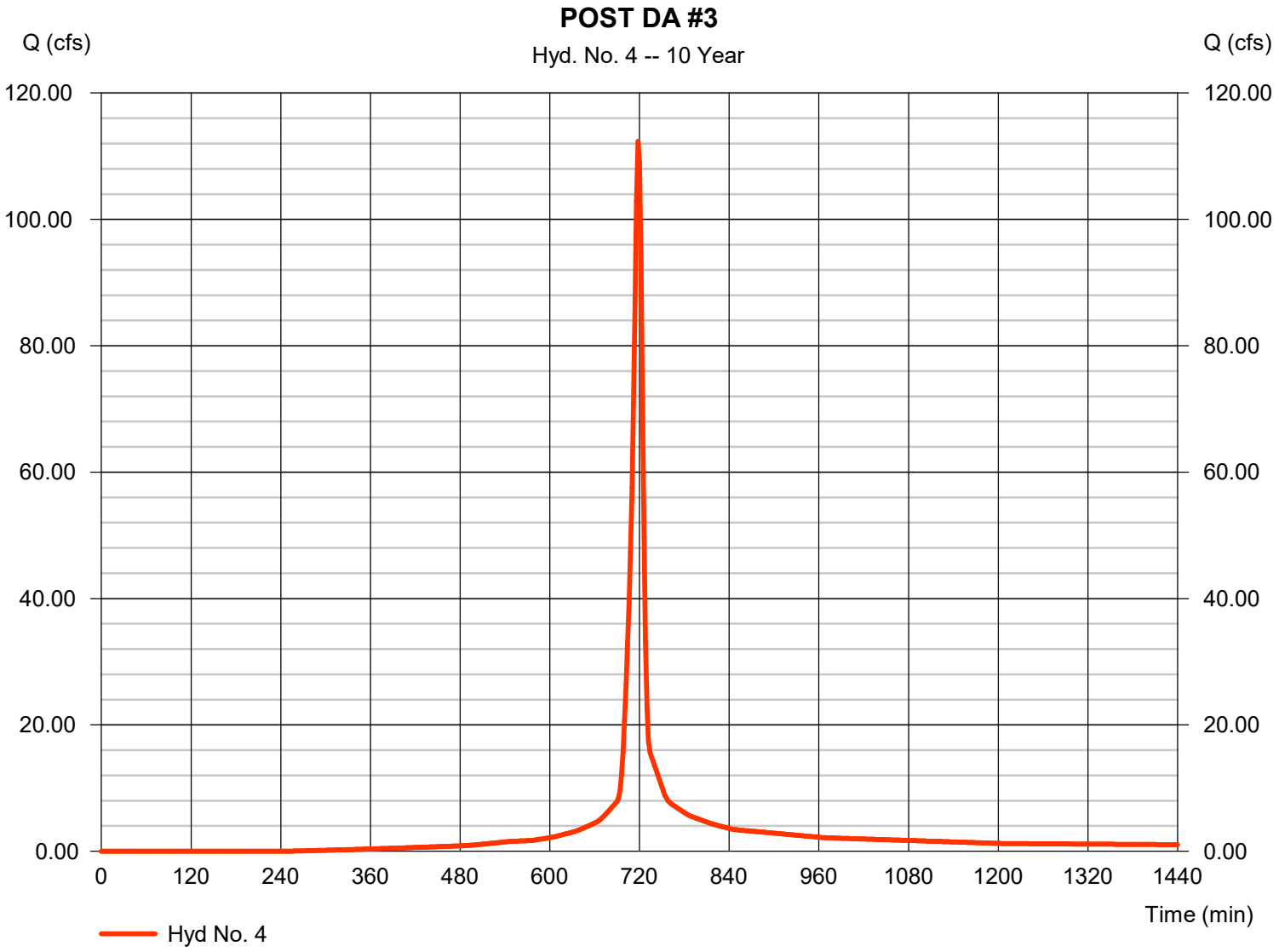


Hydrograph Report

Hyd. No. 4

POST DA #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	112.36 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	268,695 cuft
Drainage area	=	18.950 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.40 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

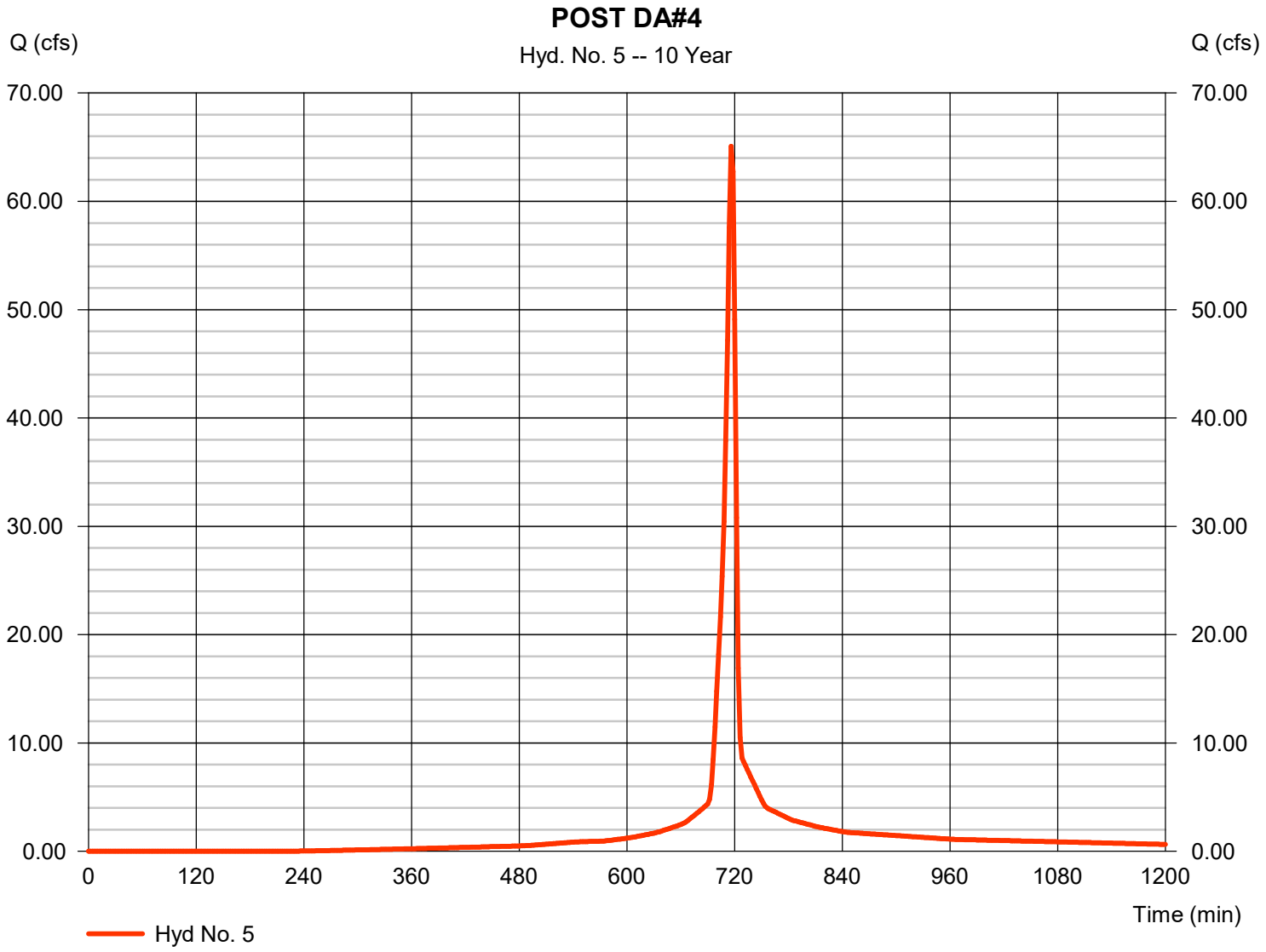


Hydrograph Report

Hyd. No. 5

POST DA#4

Hydrograph type	=	SCS Runoff	Peak discharge	=	65.08 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	139,927 cuft
Drainage area	=	10.250 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.30 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

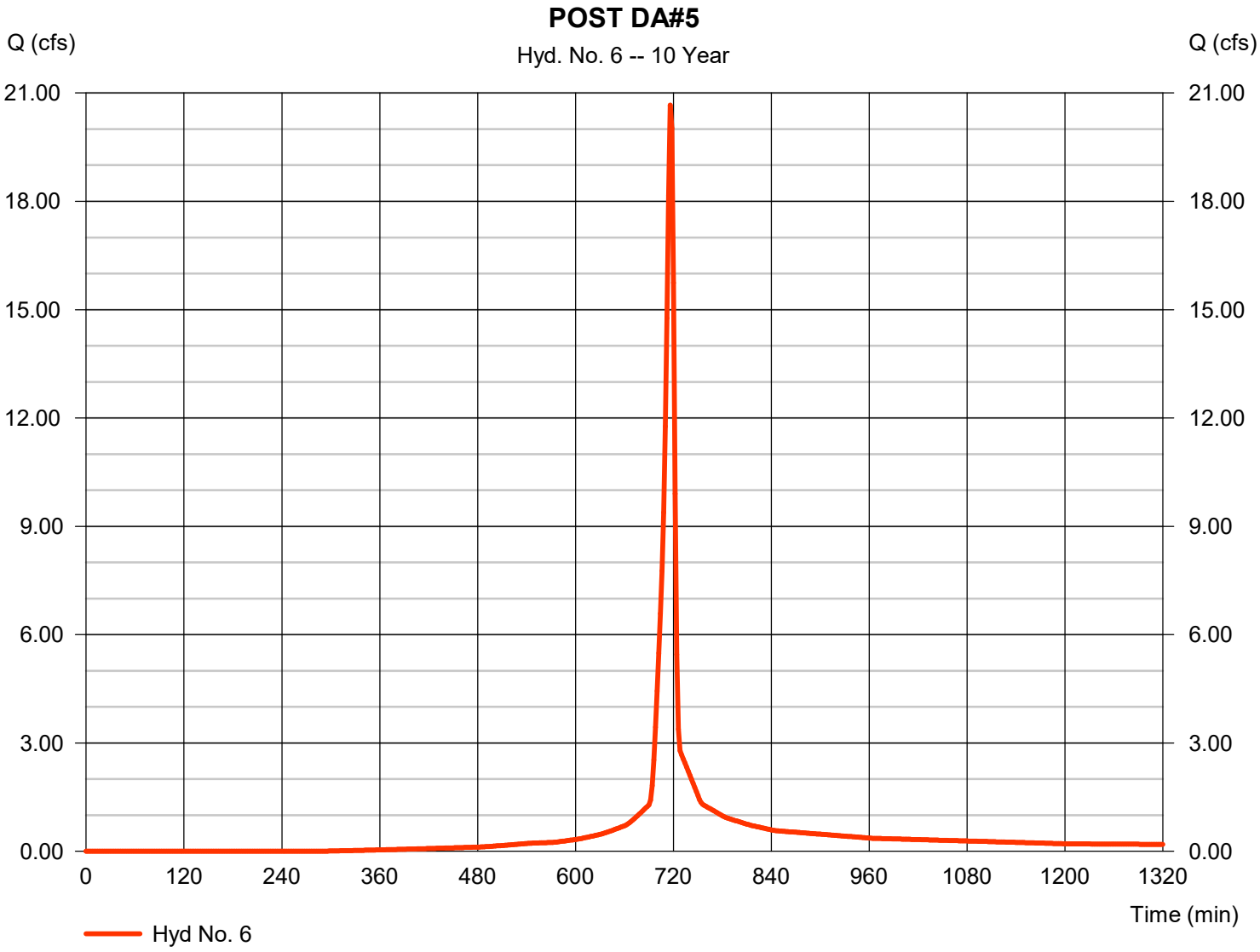


Hydrograph Report

Hyd. No. 6

POST DA#5

Hydrograph type	=	SCS Runoff	Peak discharge	=	20.66 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	43,433 cuft
Drainage area	=	3.450 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

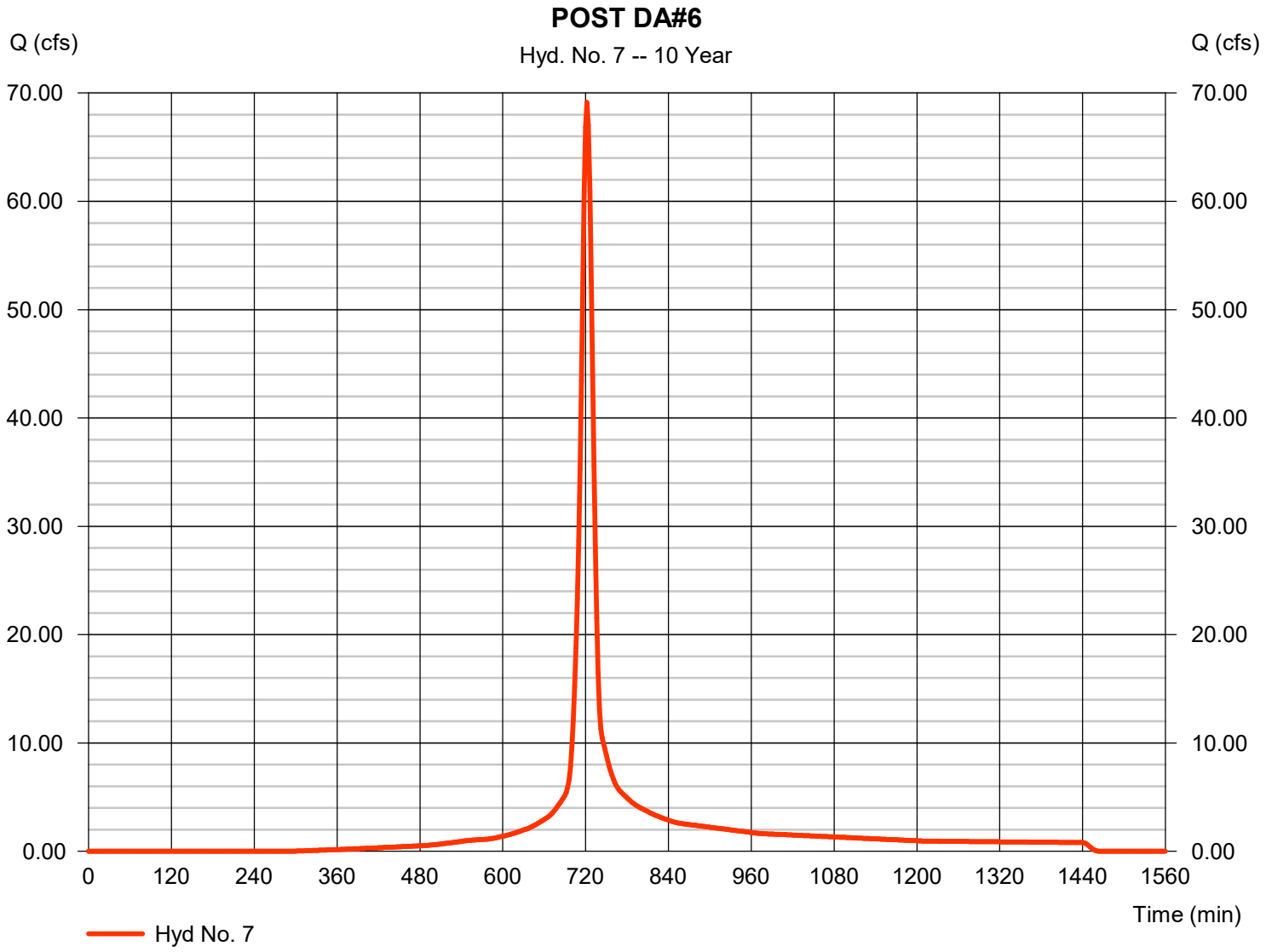


Hydrograph Report

Hyd. No. 7

POST DA#6

Hydrograph type	=	SCS Runoff	Peak discharge	=	69.14 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	198,226 cuft
Drainage area	=	15.140 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	14.80 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

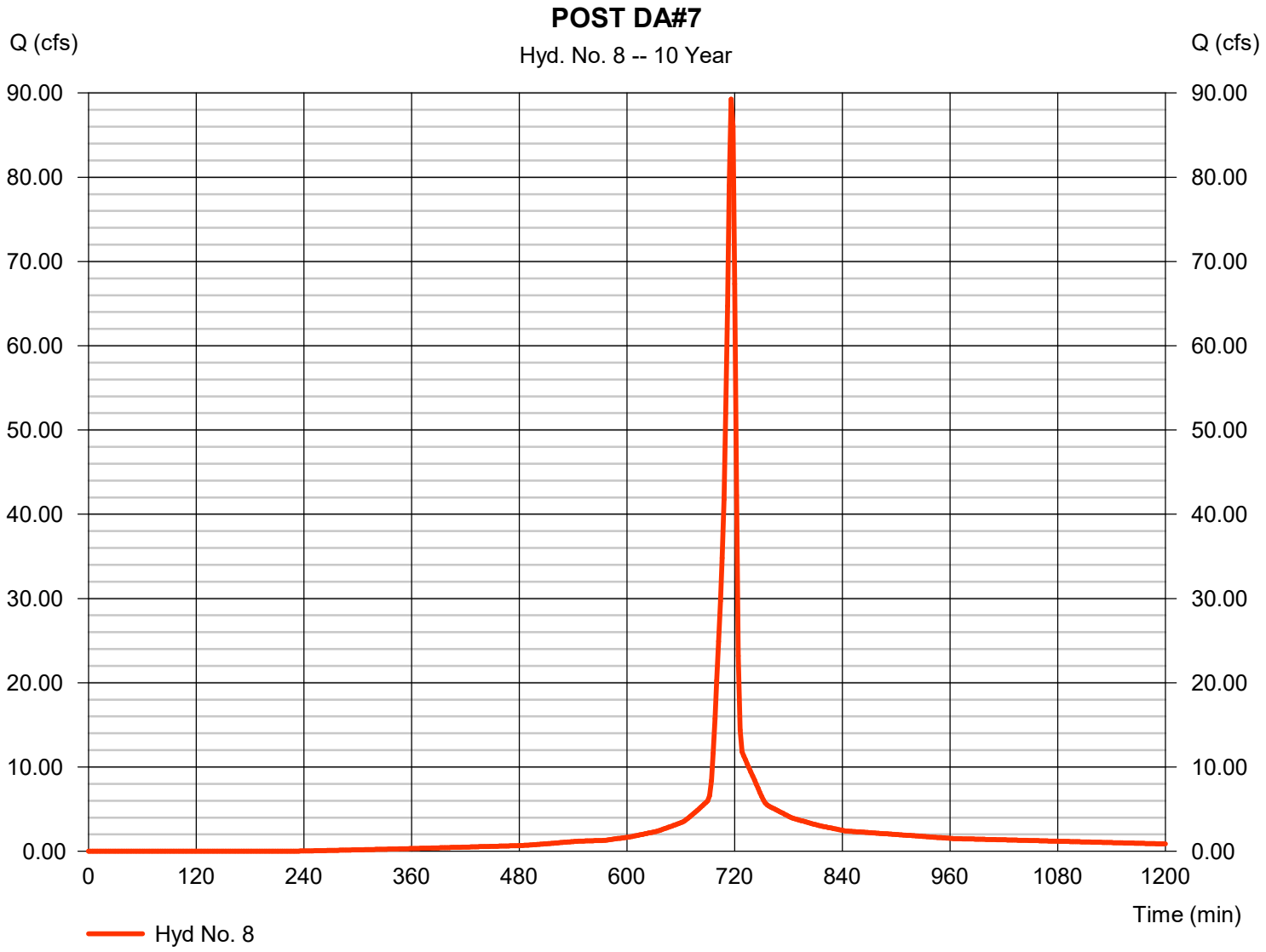


Hydrograph Report

Hyd. No. 8

POST DA#7

Hydrograph type	=	SCS Runoff	Peak discharge	=	89.27 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	191,939 cuft
Drainage area	=	14.060 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.20 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

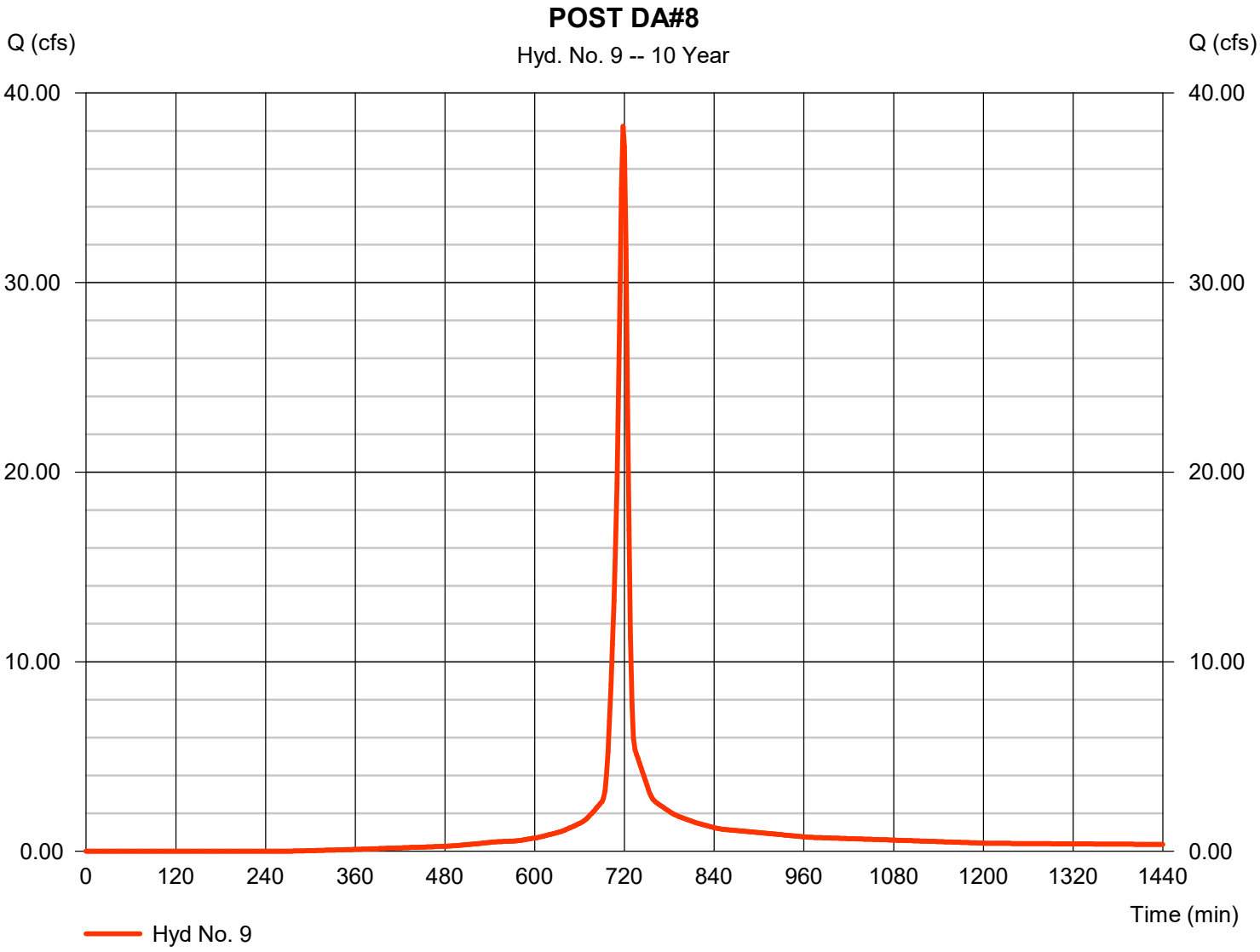


Hydrograph Report

Hyd. No. 9

POST DA#8

Hydrograph type	=	SCS Runoff	Peak discharge	=	38.24 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	90,814 cuft
Drainage area	=	6.580 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.80 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

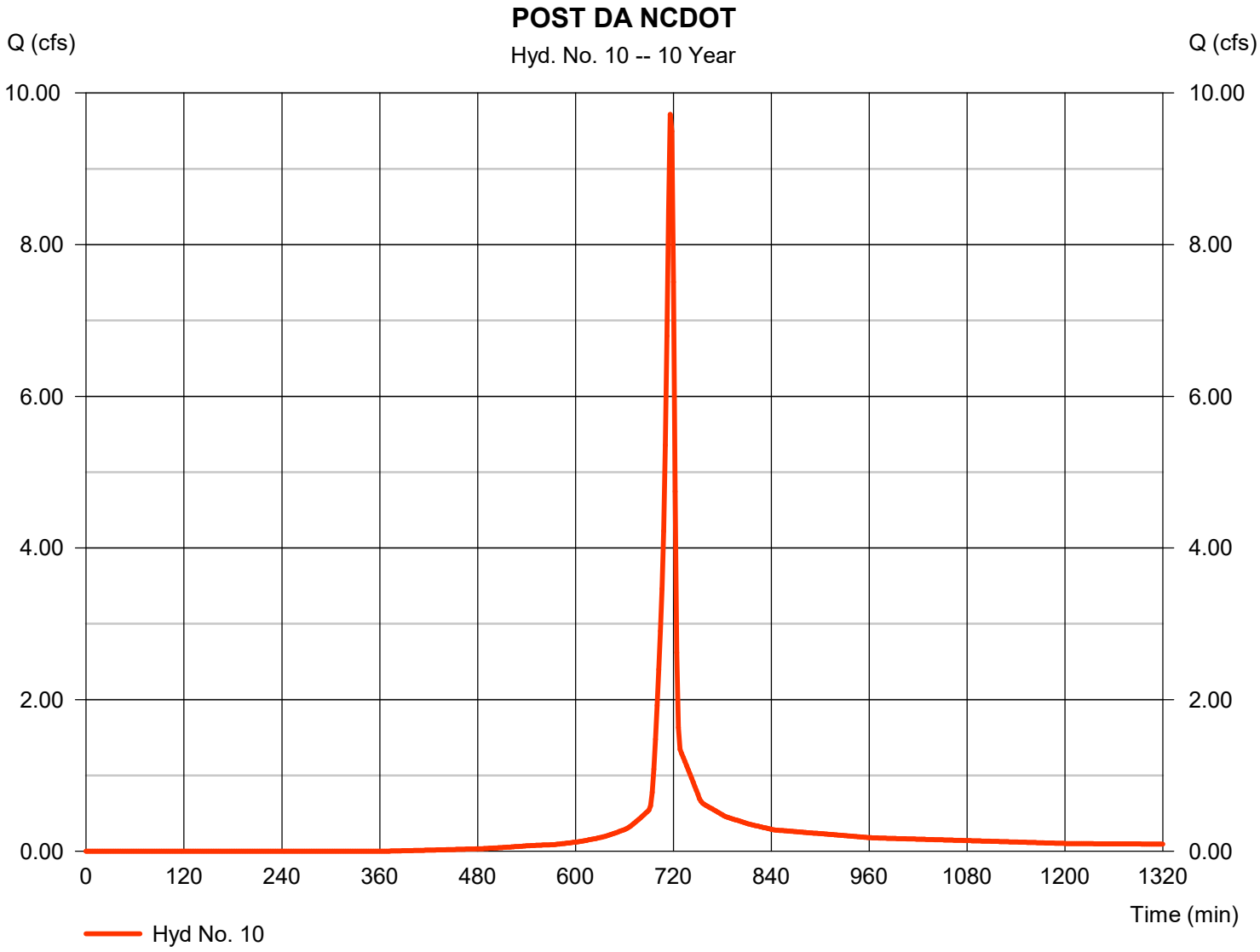


Hydrograph Report

Hyd. No. 10

POST DA NCDOT

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.717 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	19,996 cuft
Drainage area	=	1.780 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

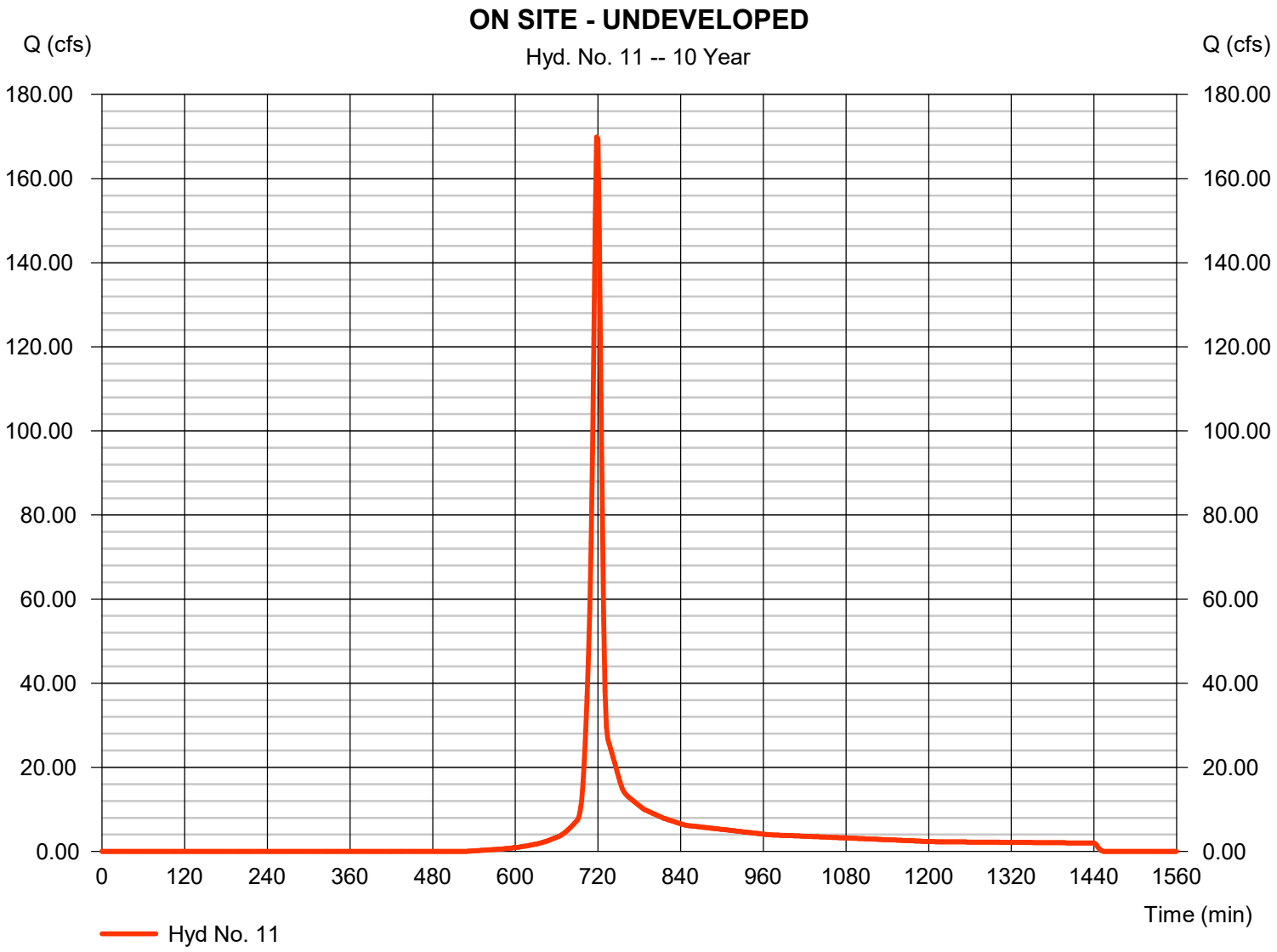


Hydrograph Report

Hyd. No. 11

ON SITE - UNDEVELOPED

Hydrograph type	=	SCS Runoff	Peak discharge	=	169.88 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	388,793 cuft
Drainage area	=	43.250 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.00 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

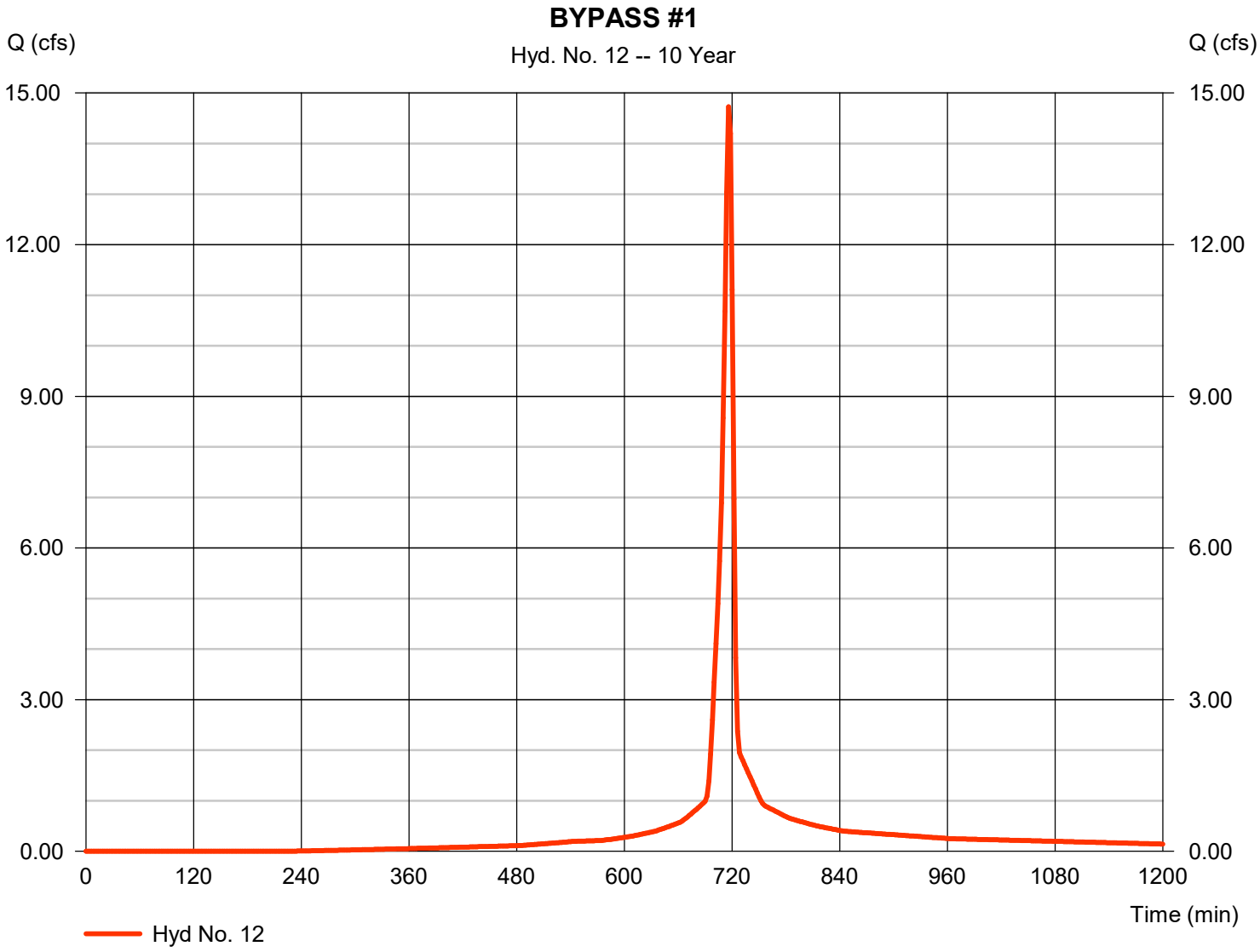


Hydrograph Report

Hyd. No. 12

BYPASS #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	14.73 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	31,671 cuft
Drainage area	=	2.320 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

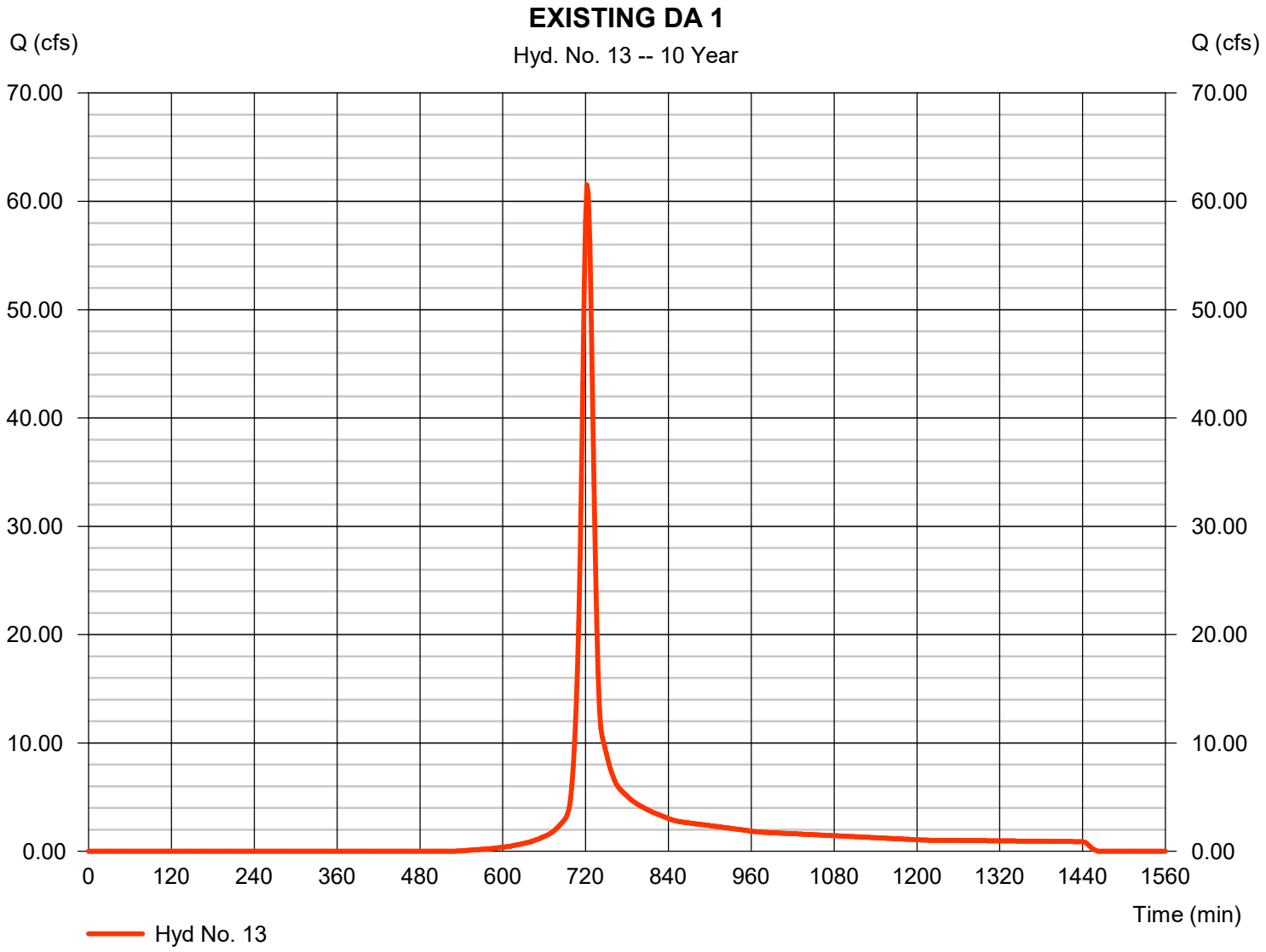


Hydrograph Report

Hyd. No. 13

EXISTING DA 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	61.50 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	172,840 cuft
Drainage area	=	19.720 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	14.00 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

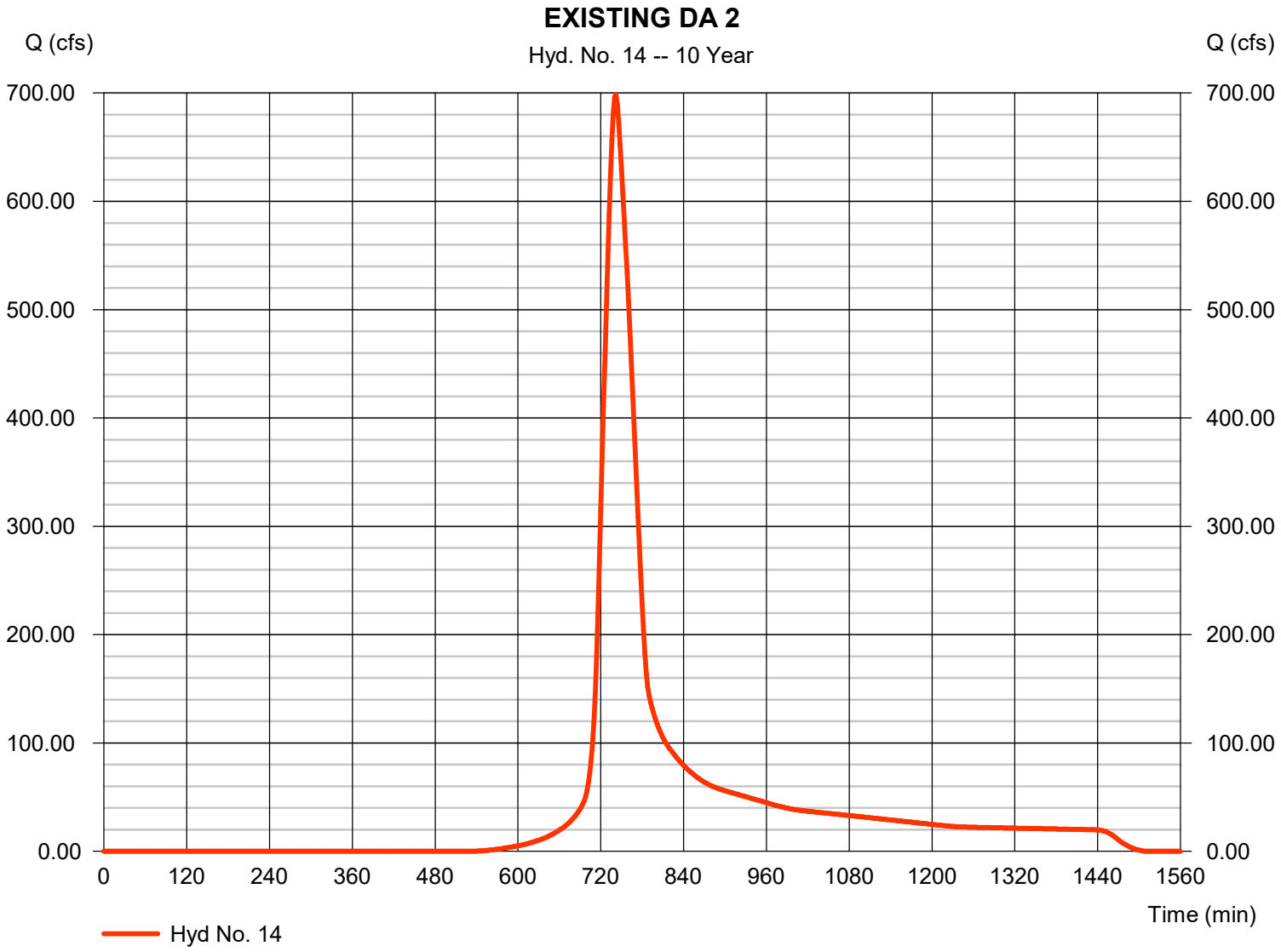


Hydrograph Report

Hyd. No. 14

EXISTING DA 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	698.67 cfs
Storm frequency	=	10 yrs	Time to peak	=	742 min
Time interval	=	2 min	Hyd. volume	=	3,784,349 cuft
Drainage area	=	424.770 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	47.00 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

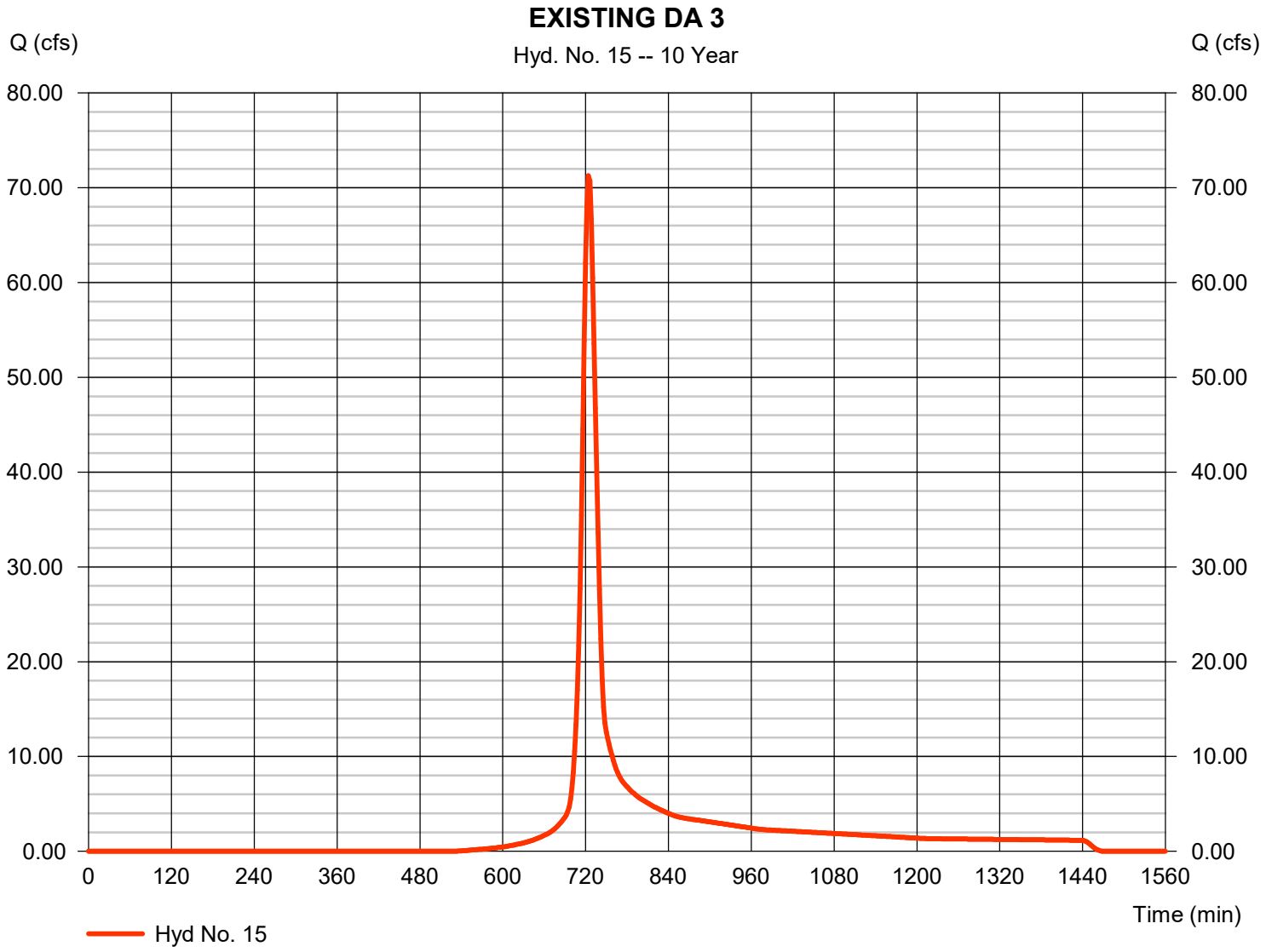


Hydrograph Report

Hyd. No. 15

EXISTING DA 3

Hydrograph type	=	SCS Runoff	Peak discharge	=	71.27 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	224,017 cuft
Drainage area	=	24.920 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	19.60 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

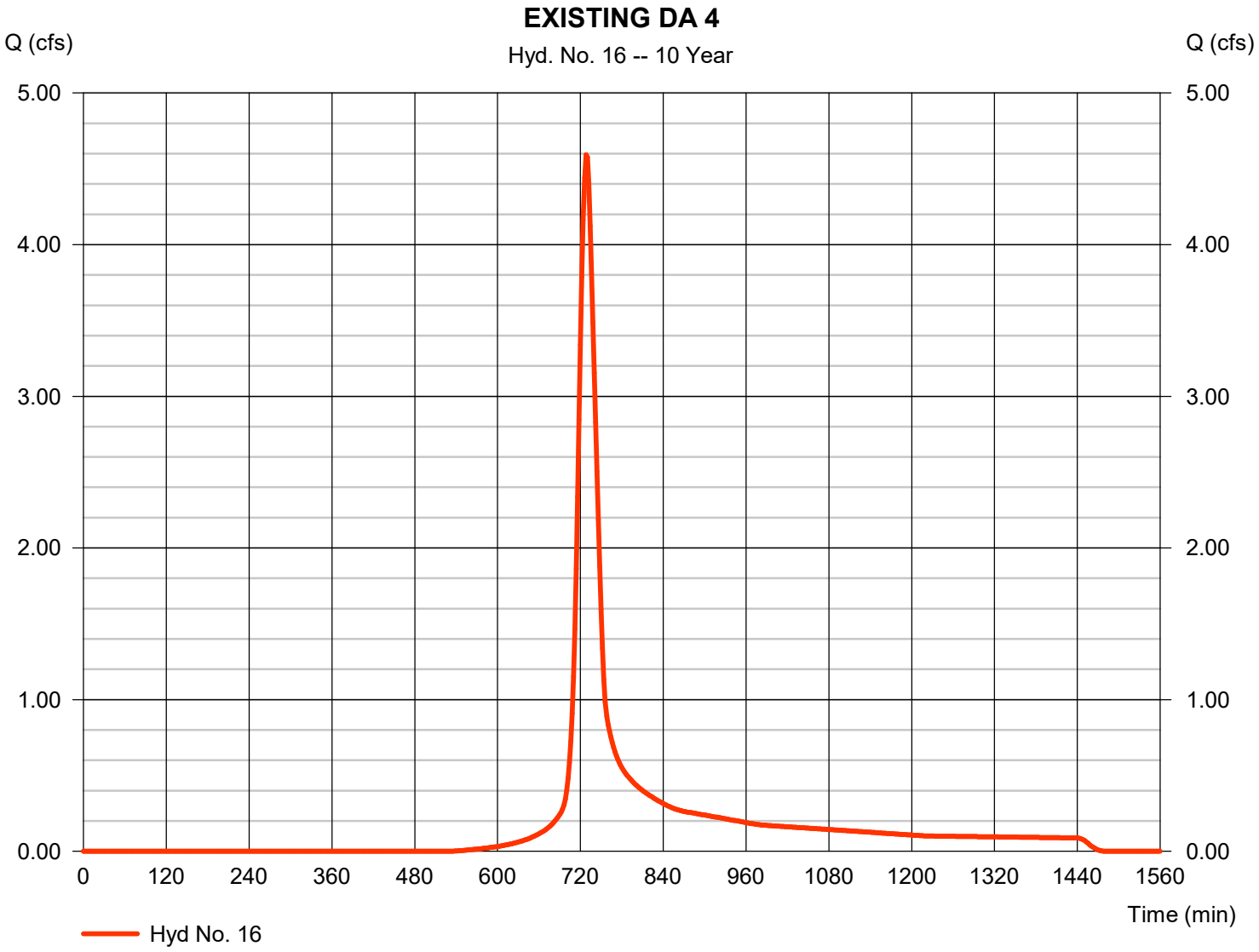


Hydrograph Report

Hyd. No. 16

EXISTING DA 4

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.592 cfs
Storm frequency	=	10 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	16,990 cuft
Drainage area	=	1.920 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	26.20 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



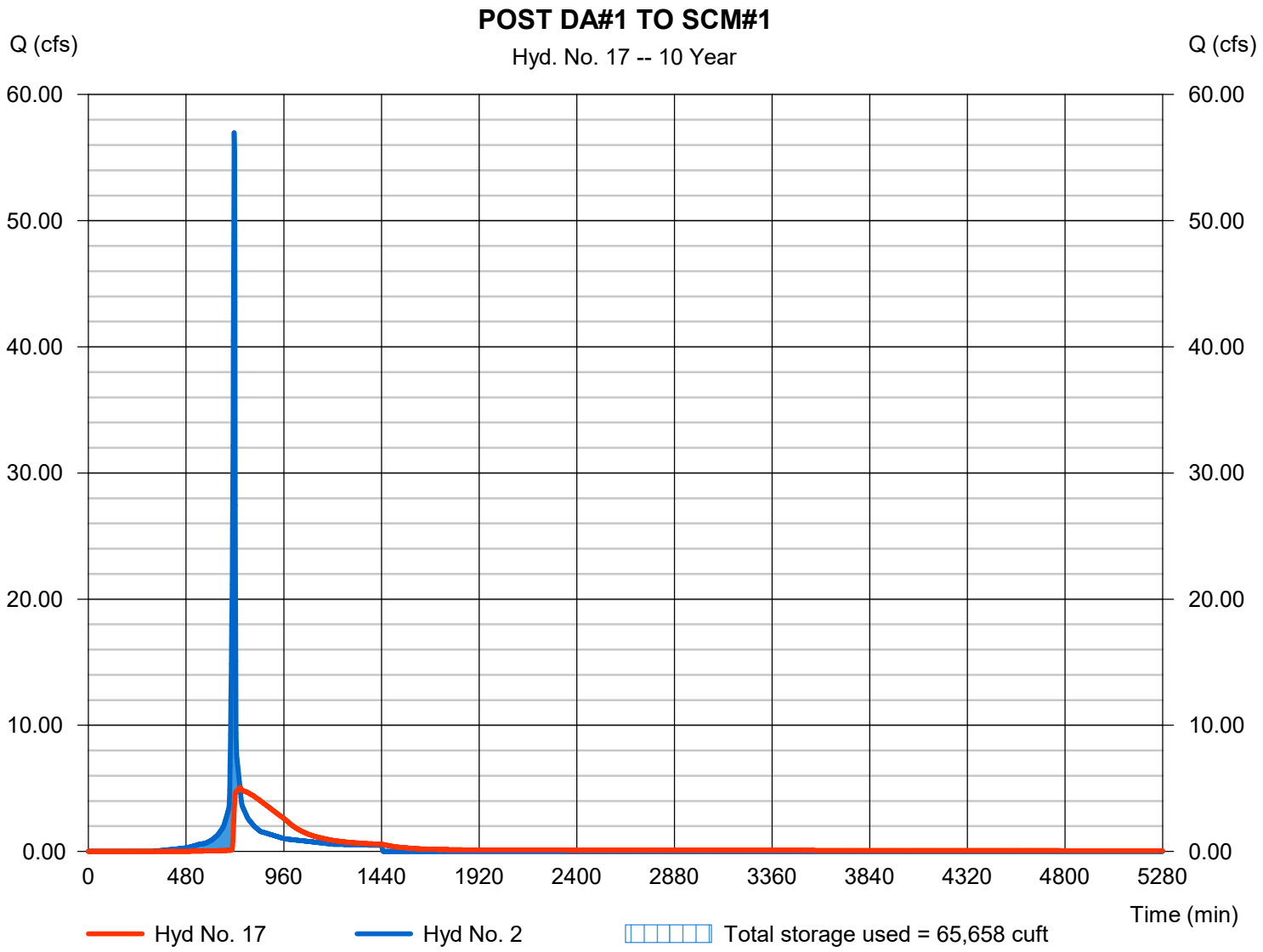
Hydrograph Report

Hyd. No. 17

POST DA#1 TO SCM#1

Hydrograph type	=	Reservoir	Peak discharge	=	5.072 cfs
Storm frequency	=	10 yrs	Time to peak	=	744 min
Time interval	=	2 min	Hyd. volume	=	114,893 cuft
Inflow hyd. No.	=	2 - POST DA#1	Max. Elevation	=	265.21 ft
Reservoir name	=	SCM#1	Max. Storage	=	65,658 cuft

Storage Indication method used.



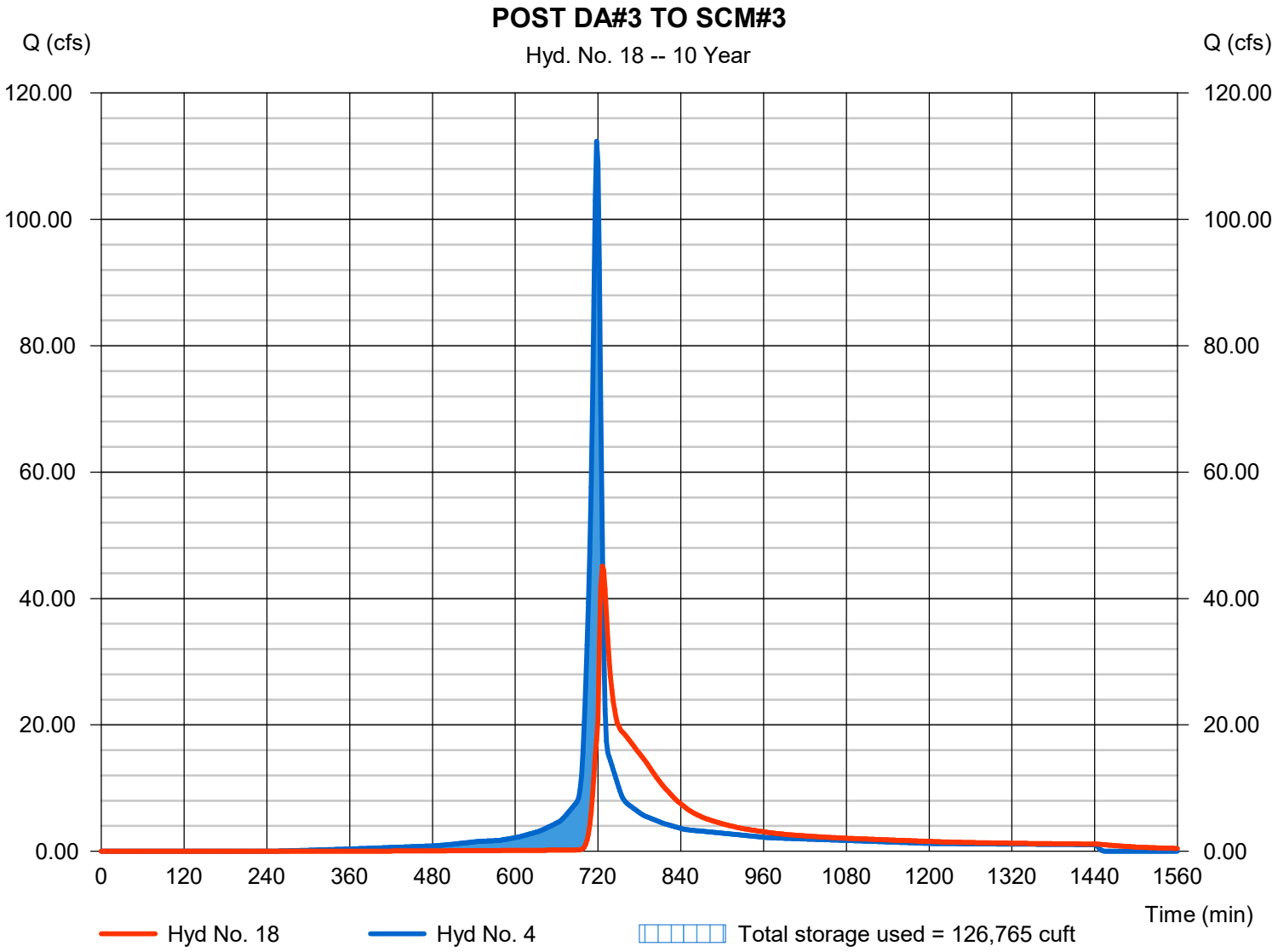
Hydrograph Report

Hyd. No. 18

POST DA#3 TO SCM#3

Hydrograph type	= Reservoir	Peak discharge	= 45.13 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 263,677 cuft
Inflow hyd. No.	= 4 - POST DA #3	Max. Elevation	= 244.84 ft
Reservoir name	= SCM#3	Max. Storage	= 126,765 cuft

Storage Indication method used.



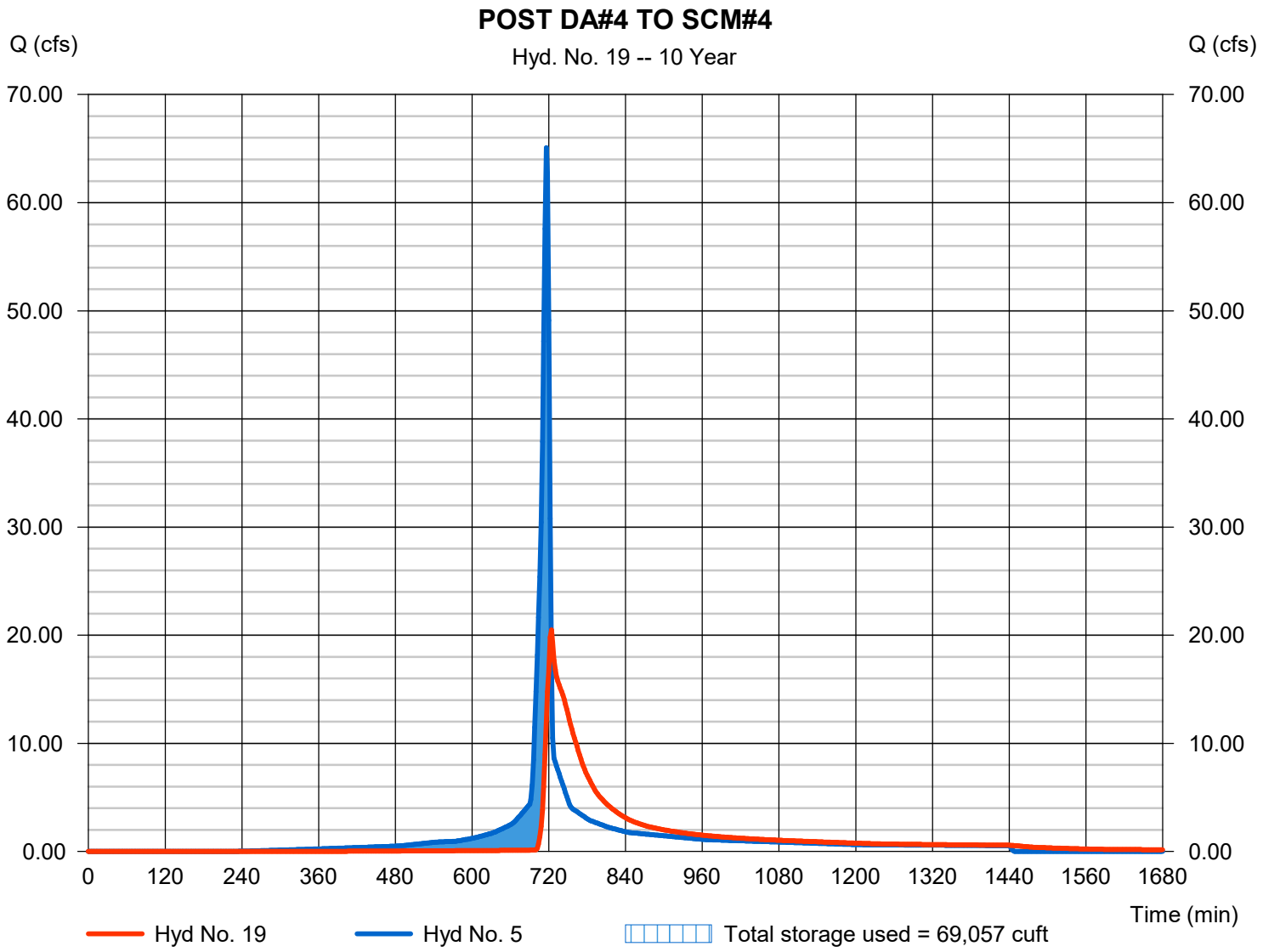
Hydrograph Report

Hyd. No. 19

POST DA#4 TO SCM#4

Hydrograph type	=	Reservoir	Peak discharge	=	20.48 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	136,292 cuft
Inflow hyd. No.	=	5 - POST DA#4	Max. Elevation	=	243.90 ft
Reservoir name	=	SCM#4	Max. Storage	=	69,057 cuft

Storage Indication method used.



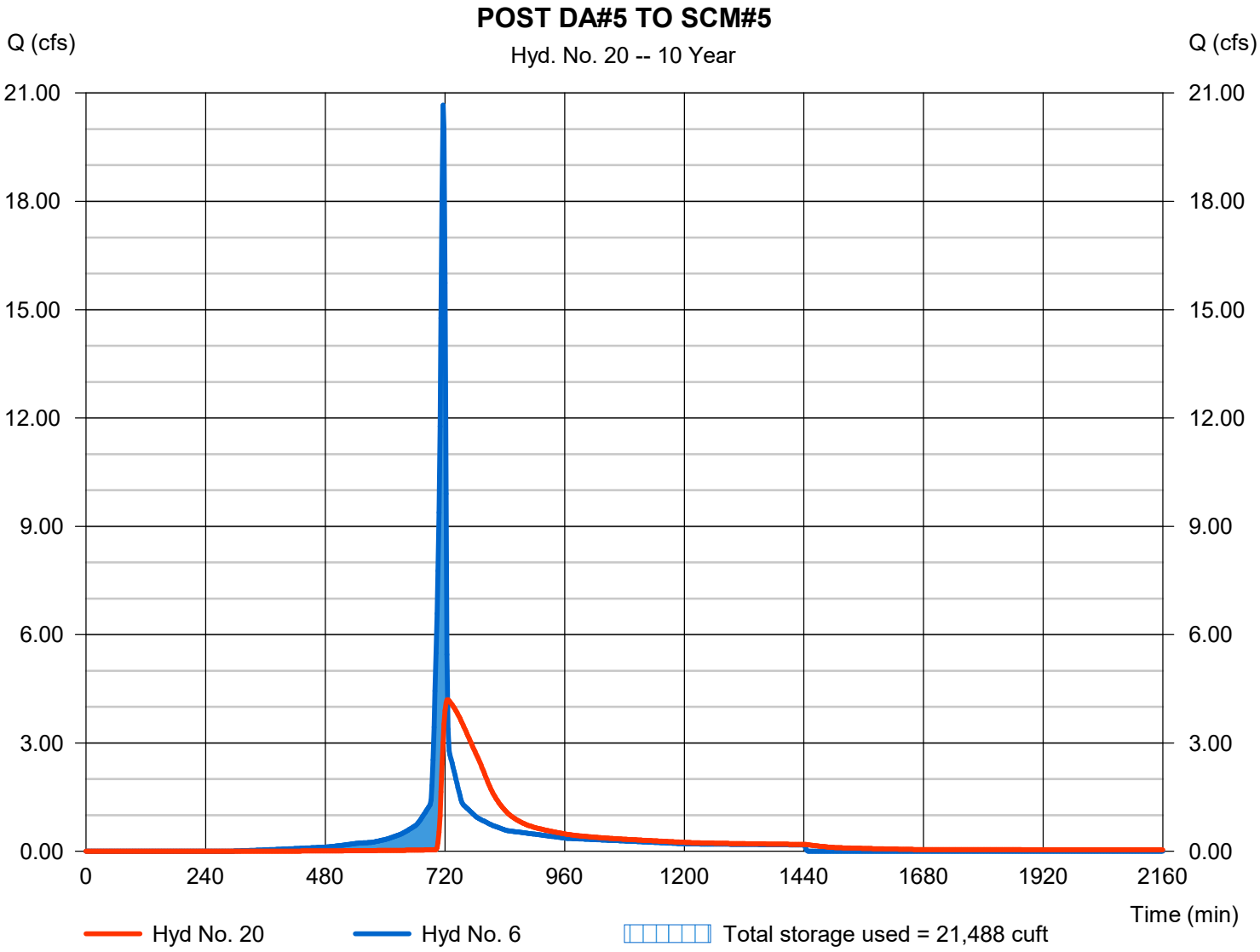
Hydrograph Report

Hyd. No. 20

POST DA#5 TO SCM#5

Hydrograph type	=	Reservoir	Peak discharge	=	4.194 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	42,790 cuft
Inflow hyd. No.	=	6 - POST DA#5	Max. Elevation	=	252.88 ft
Reservoir name	=	SCM#5	Max. Storage	=	21,488 cuft

Storage Indication method used.



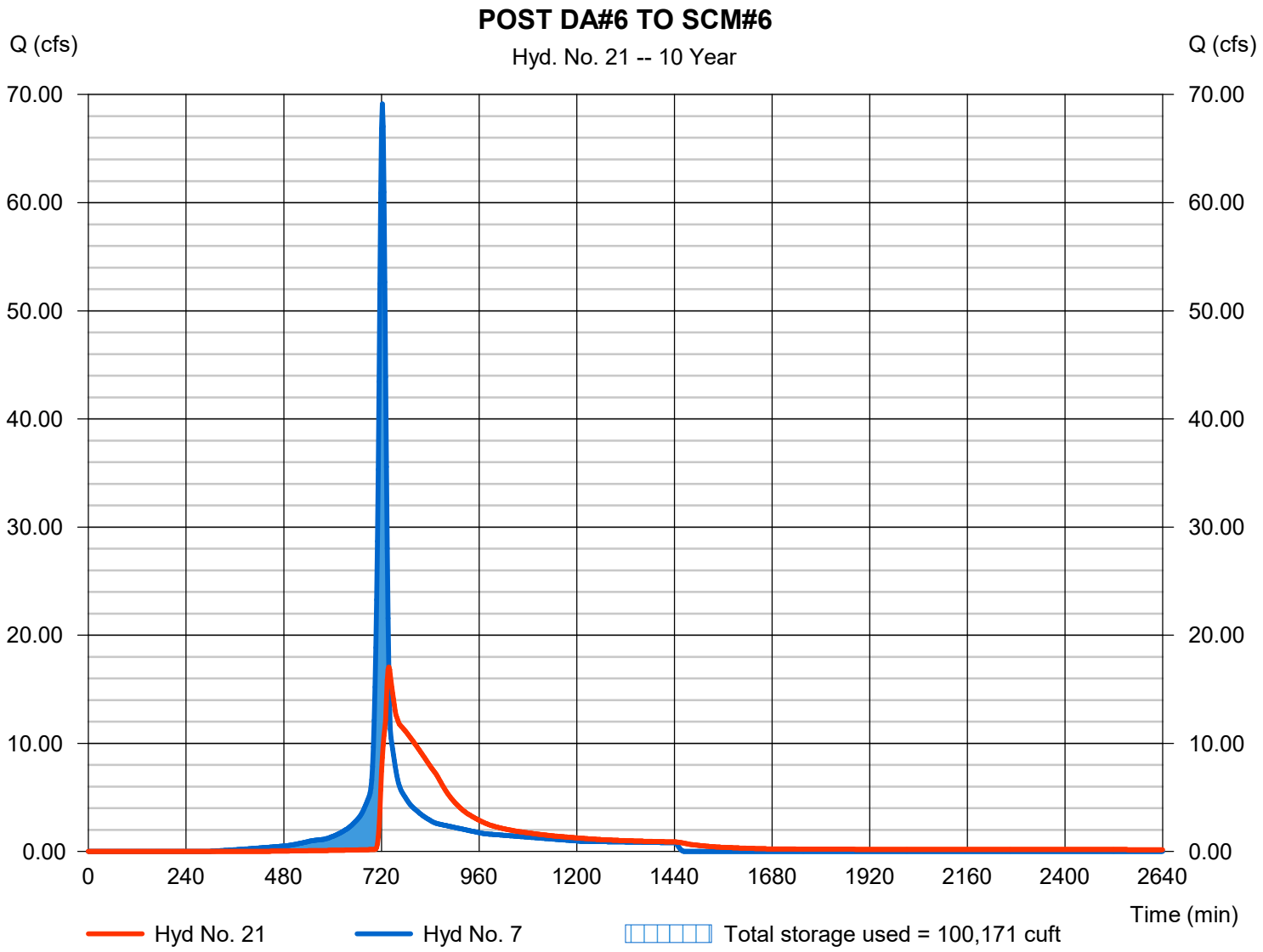
Hydrograph Report

Hyd. No. 21

POST DA#6 TO SCM#6

Hydrograph type	=	Reservoir	Peak discharge	=	17.06 cfs
Storm frequency	=	10 yrs	Time to peak	=	738 min
Time interval	=	2 min	Hyd. volume	=	195,812 cuft
Inflow hyd. No.	=	7 - POST DA#6	Max. Elevation	=	241.47 ft
Reservoir name	=	SCM#6	Max. Storage	=	100,171 cuft

Storage Indication method used.



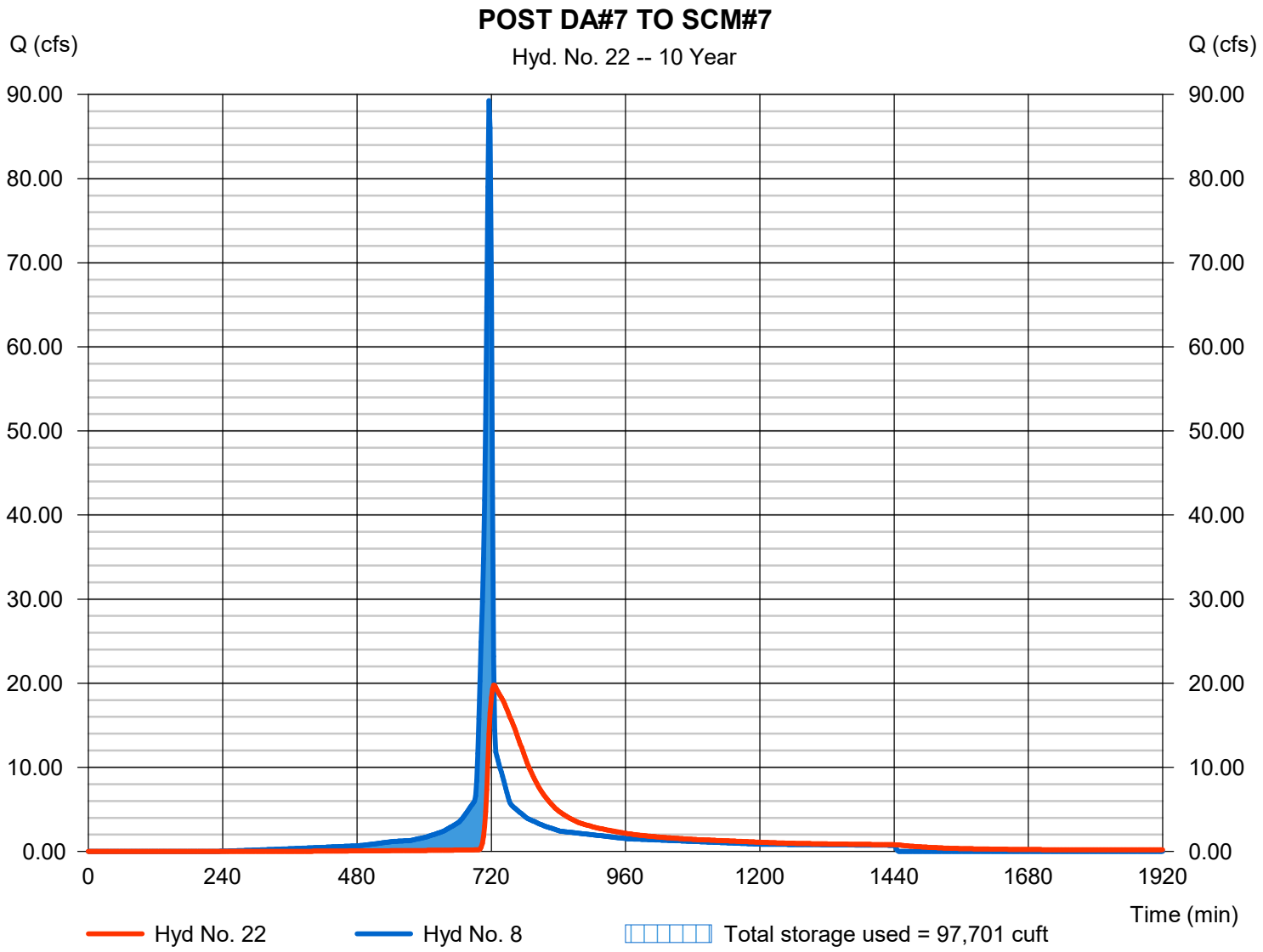
Hydrograph Report

Hyd. No. 22

POST DA#7 TO SCM#7

Hydrograph type	=	Reservoir	Peak discharge	=	19.75 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	188,739 cuft
Inflow hyd. No.	=	8 - POST DA#7	Max. Elevation	=	243.29 ft
Reservoir name	=	SCM#7	Max. Storage	=	97,701 cuft

Storage Indication method used.



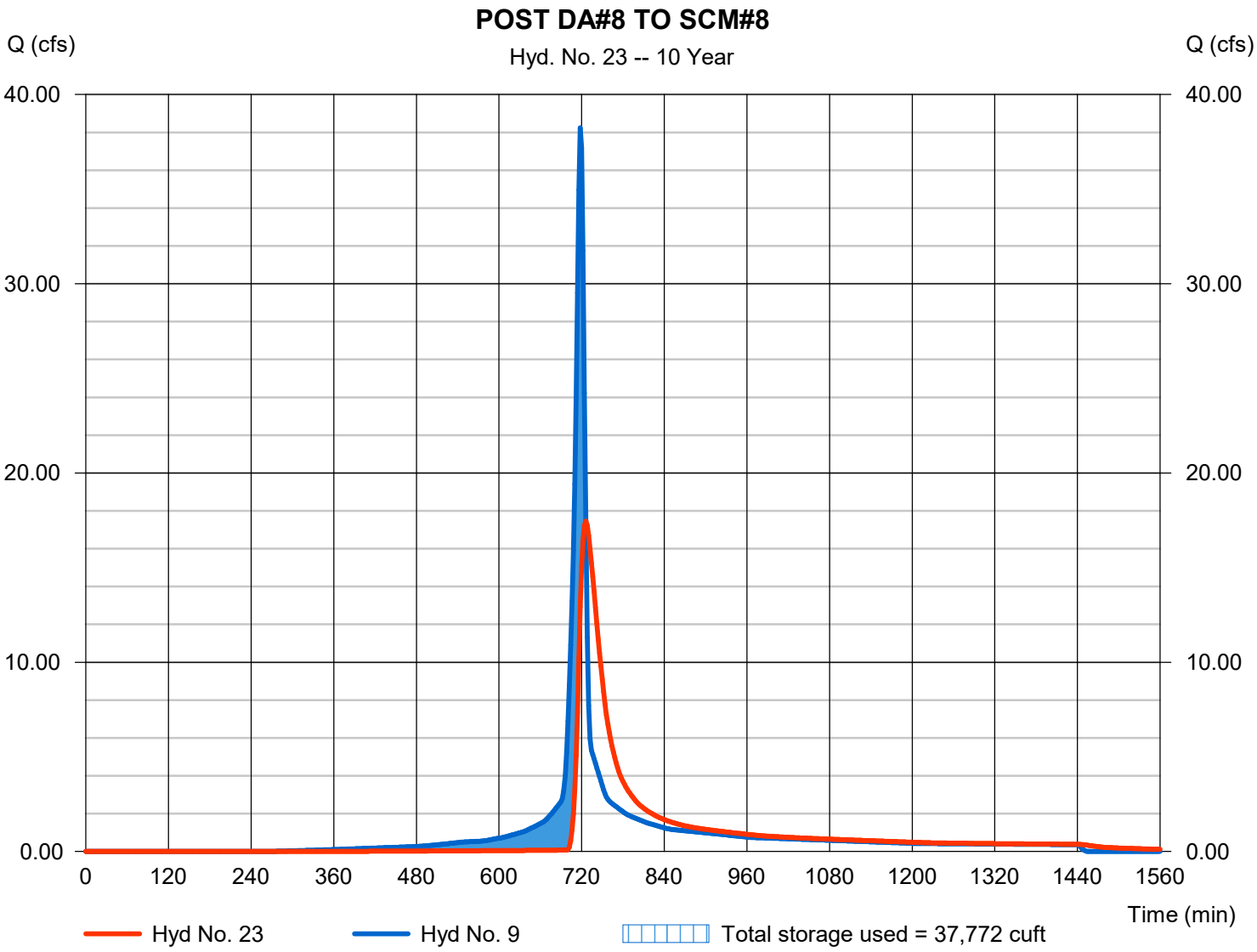
Hydrograph Report

Hyd. No. 23

POST DA#8 TO SCM#8

Hydrograph type	=	Reservoir	Peak discharge	=	17.45 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	89,470 cuft
Inflow hyd. No.	=	9 - POST DA#8	Max. Elevation	=	243.97 ft
Reservoir name	=	SCM#8	Max. Storage	=	37,772 cuft

Storage Indication method used.

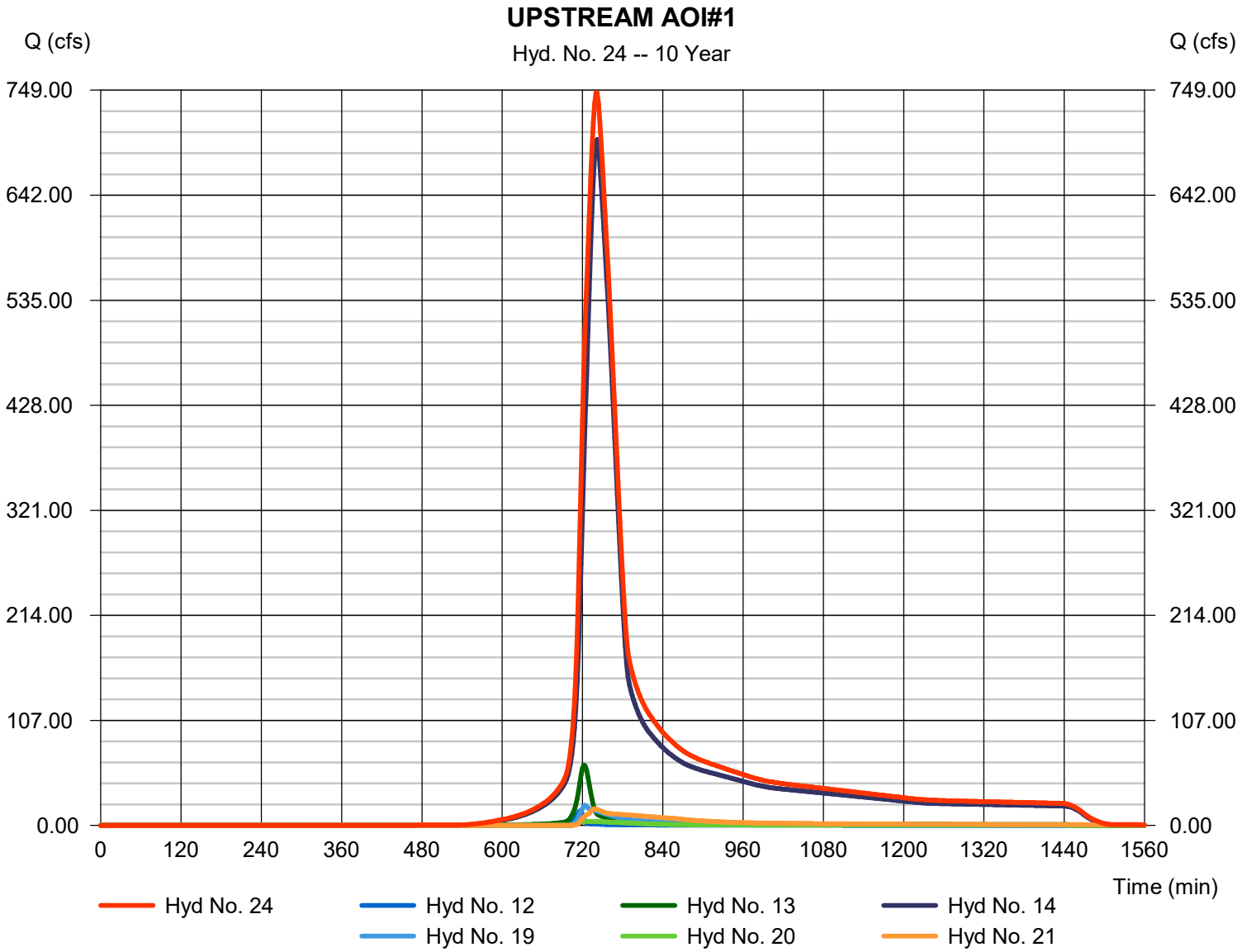


Hydrograph Report

Hyd. No. 24

UPSTREAM AOI#1

Hydrograph type	= Combine	Peak discharge	= 746.16 cfs
Storm frequency	= 10 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 4,363,755 cuft
Inflow hyds.	= 12, 13, 14, 19, 20, 21	Contrib. drain. area	= 446.810 ac

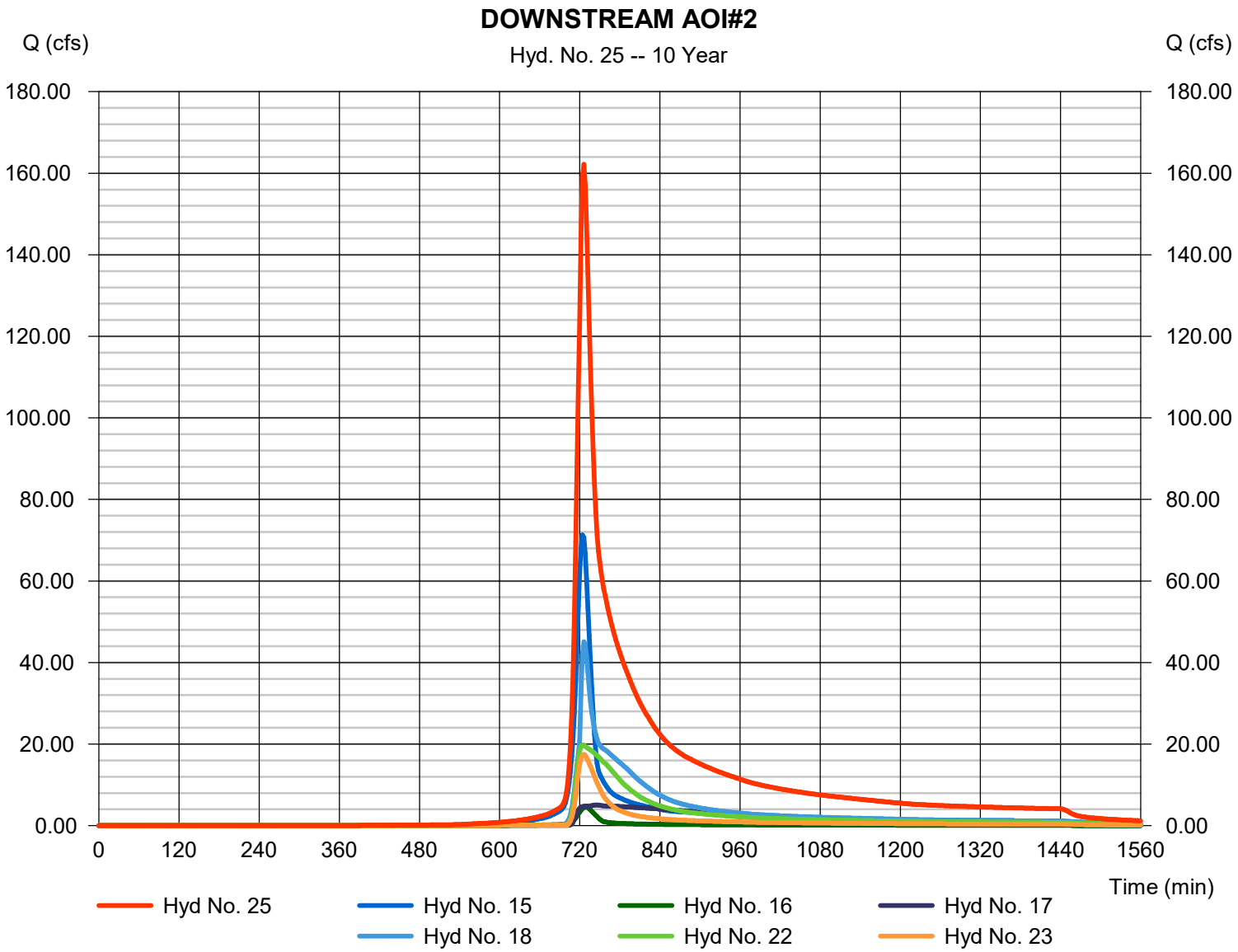


Hydrograph Report

Hyd. No. 25

DOWNSTREAM AOI#2

Hydrograph type	= Combine	Peak discharge	= 162.21 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 897,786 cuft
Inflow hyds.	= 15, 16, 17, 18, 22, 23	Contrib. drain. area	= 26.840 ac

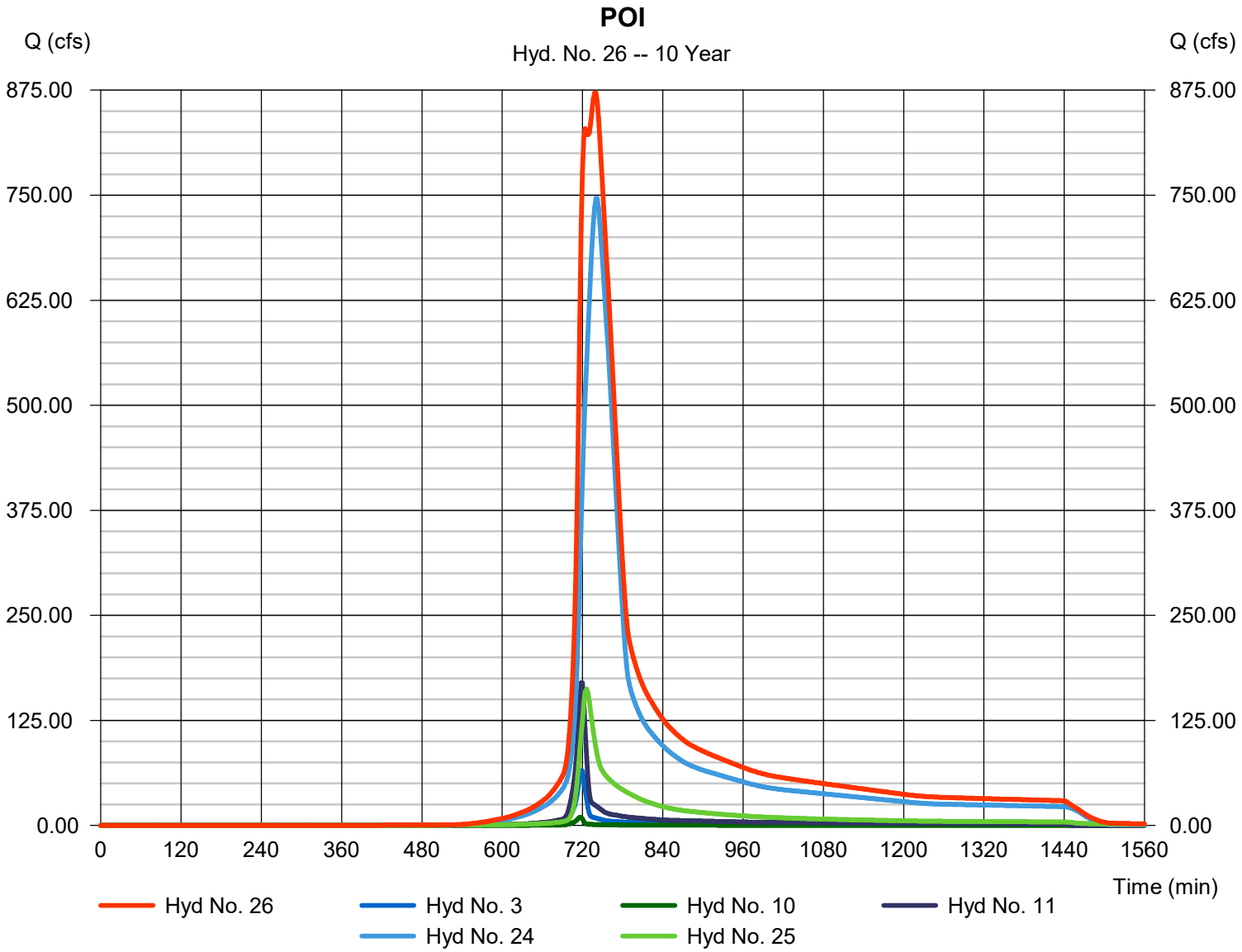


Hydrograph Report

Hyd. No. 26

POI

Hydrograph type	=	Combine	Peak discharge	=	871.65 cfs
Storm frequency	=	10 yrs	Time to peak	=	740 min
Time interval	=	2 min	Hyd. volume	=	5,819,602 cuft
Inflow hyds.	=	3, 10, 11, 24, 25	Contrib. drain. area	=	60.540 ac

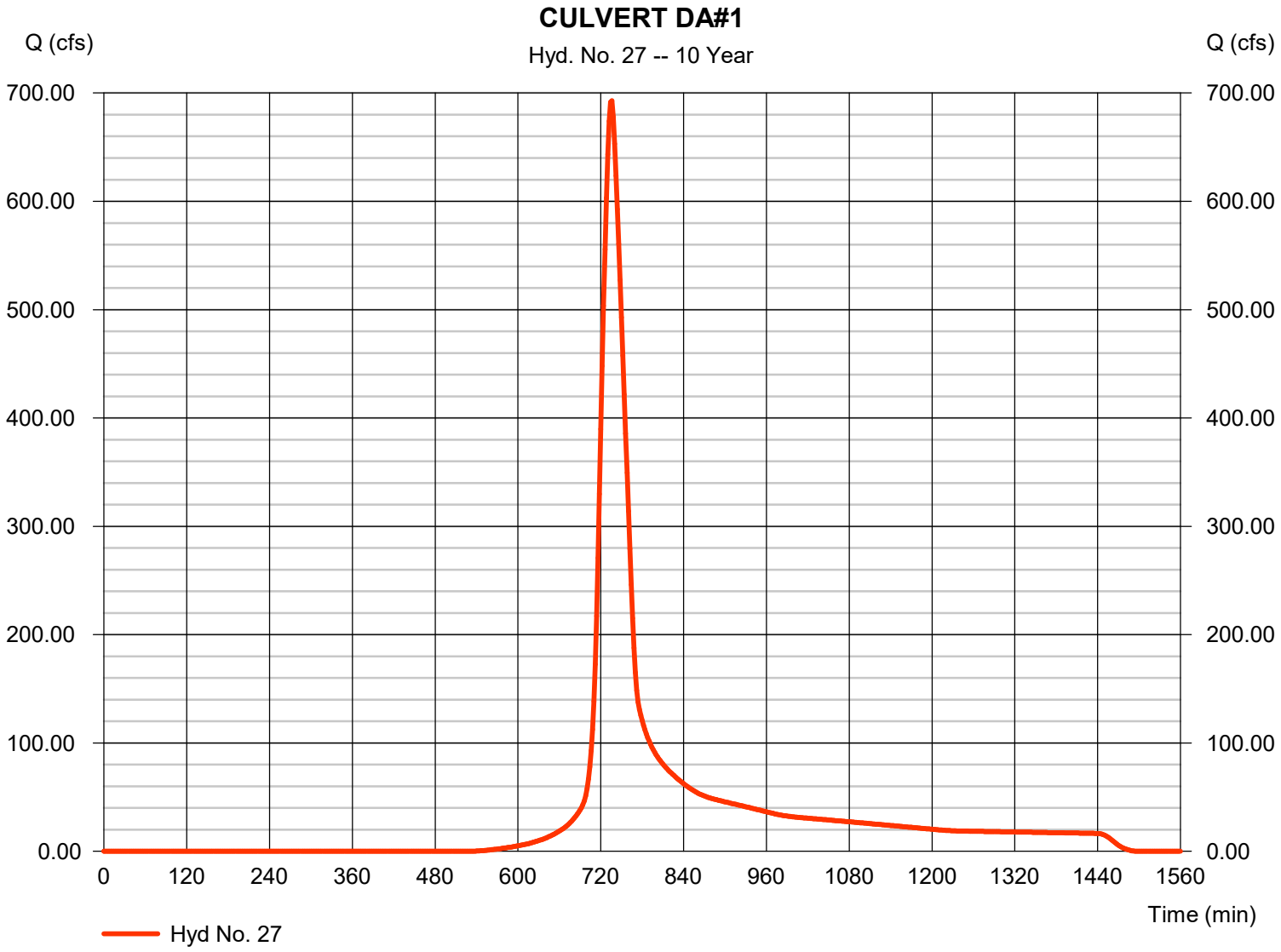


Hydrograph Report

Hyd. No. 27

CULVERT DA#1

Hydrograph type	=	SCS Runoff	Peak discharge	=	692.74 cfs
Storm frequency	=	10 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	3,170,181 cuft
Drainage area	=	356.710 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	34.90 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

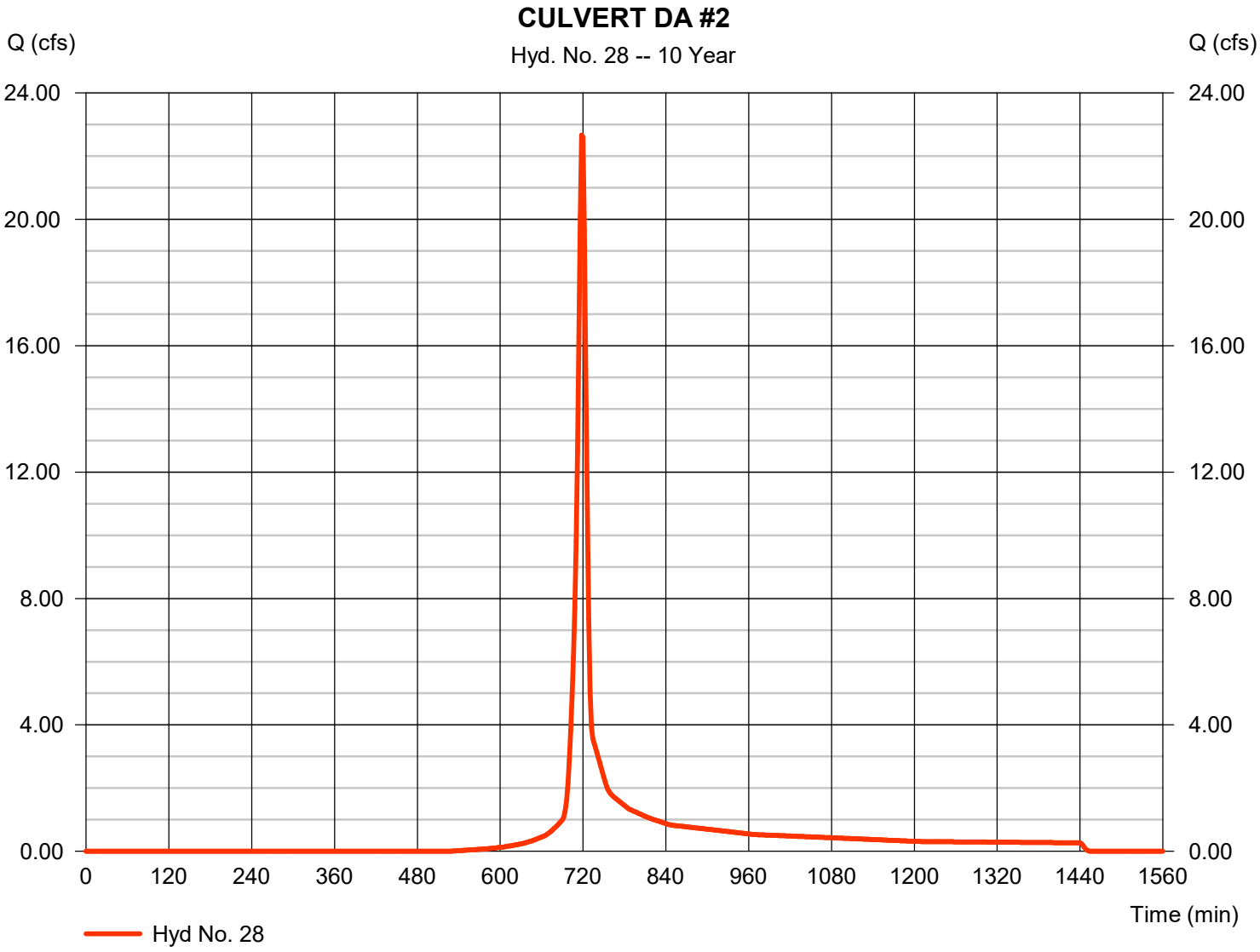


Hydrograph Report

Hyd. No. 28

CULVERT DA #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	22.66 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	51,869 cuft
Drainage area	=	5.770 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.80 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

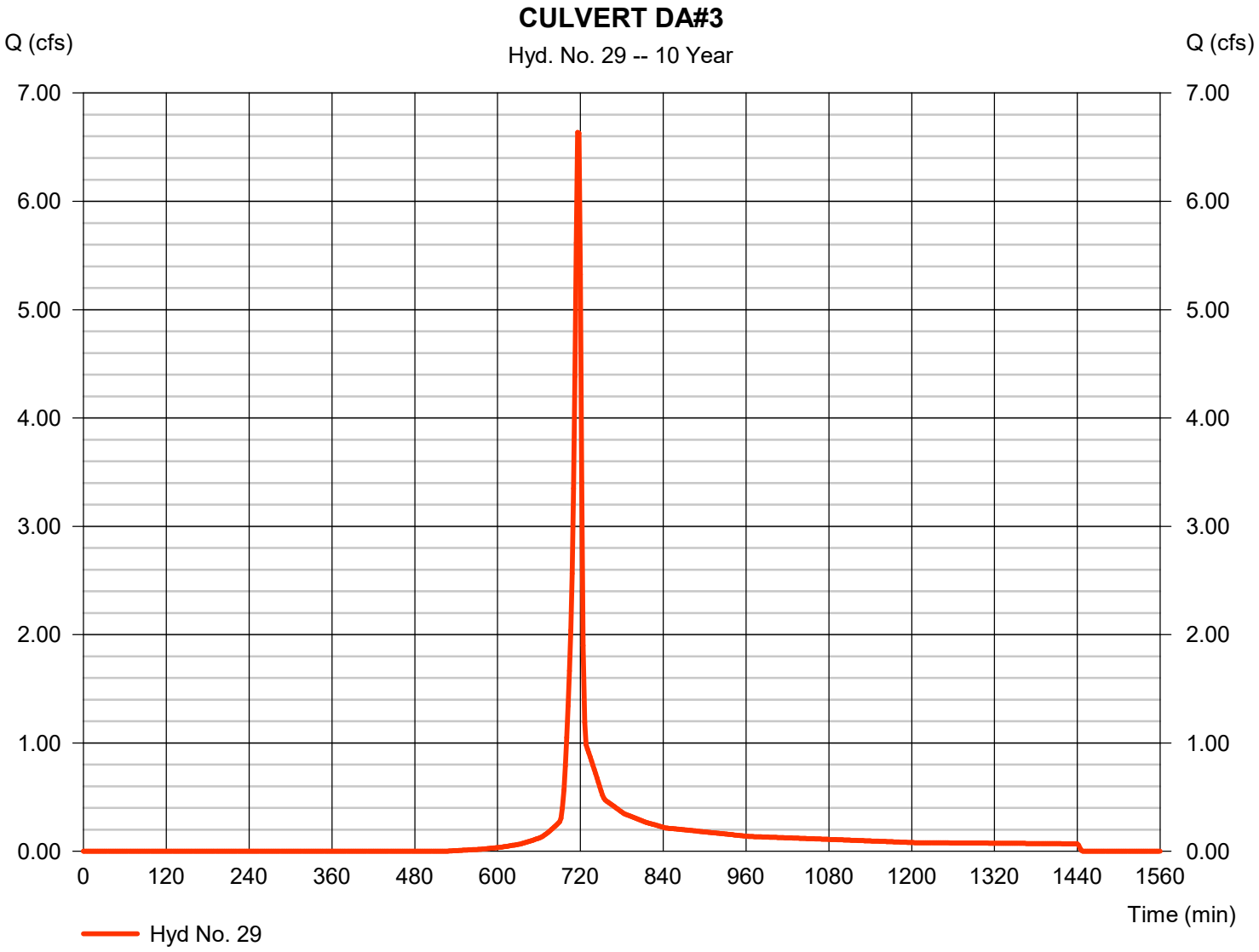


Hydrograph Report

Hyd. No. 29

CULVERT DA#3

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.637 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	13,400 cuft
Drainage area	=	1.590 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

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	1371.63	2	742	7,371,980	------	------	------	PRE DA#1
2	SCS Runoff	71.14	2	716	150,577	------	------	------	POST DA#1
3	SCS Runoff	86.13	2	718	197,612	------	------	------	POST DA#2
4	SCS Runoff	138.58	2	718	335,746	------	------	------	POST DA #3
5	SCS Runoff	79.86	2	716	174,133	------	------	------	POST DA#4
6	SCS Runoff	25.68	2	716	54,722	------	------	------	POST DA#5
7	SCS Runoff	86.18	2	722	249,749	------	------	------	POST DA#6
8	SCS Runoff	109.54	2	716	238,860	------	------	------	POST DA#7
9	SCS Runoff	47.37	2	718	113,944	------	------	------	POST DA#8
10	SCS Runoff	12.31	2	716	25,628	------	------	------	POST DA NCDOT
11	SCS Runoff	227.10	2	718	519,886	------	------	------	ON SITE - UNDEVELOPED
12	SCS Runoff	18.07	2	716	39,414	------	------	------	BYPASS #1
13	SCS Runoff	82.46	2	722	231,118	------	------	------	EXISTING DA 1
14	SCS Runoff	941.53	2	742	5,060,346	------	------	------	EXISTING DA 2
15	SCS Runoff	95.77	2	724	299,550	------	------	------	EXISTING DA 3
16	SCS Runoff	6.183	2	728	22,719	------	------	------	EXISTING DA 4
17	Reservoir	20.77	2	724	146,403	2	265.68	76,940	POST DA#1 TO SCM#1
18	Reservoir	69.59	2	726	330,668	4	245.40	145,203	POST DA#3 TO SCM#3
19	Reservoir	41.63	2	722	170,457	5	244.34	78,806	POST DA#4 TO SCM#4
20	Reservoir	12.18	2	722	54,068	6	253.26	25,311	POST DA#5 TO SCM#5
21	Reservoir	28.51	2	736	247,302	7	242.14	119,168	POST DA#6 TO SCM#6
22	Reservoir	29.66	2	724	235,614	8	244.02	118,050	POST DA#7 TO SCM#7
23	Reservoir	31.29	2	724	112,586	9	244.36	42,687	POST DA#8 TO SCM#8
24	Combine	1007.45	2	740	5,802,706	12, 13, 14, 19, 20, 21,	------	------	UPSTREAM AOI#1
25	Combine	252.36	2	724	1,147,541	15, 16, 17, 18, 22, 23,	------	------	DOWNSTREAM AOI#2
26	Combine	1183.47	2	724	7,693,368	3, 10, 11, 24, 25	------	------	POI
27	SCS Runoff	932.87	2	734	4,239,097	------	------	------	CULVERT DA#1
28	SCS Runoff	30.30	2	718	69,358	------	------	------	CULVERT DA #2
29	SCS Runoff	8.850	2	716	17,918	------	------	------	CULVERT DA#3

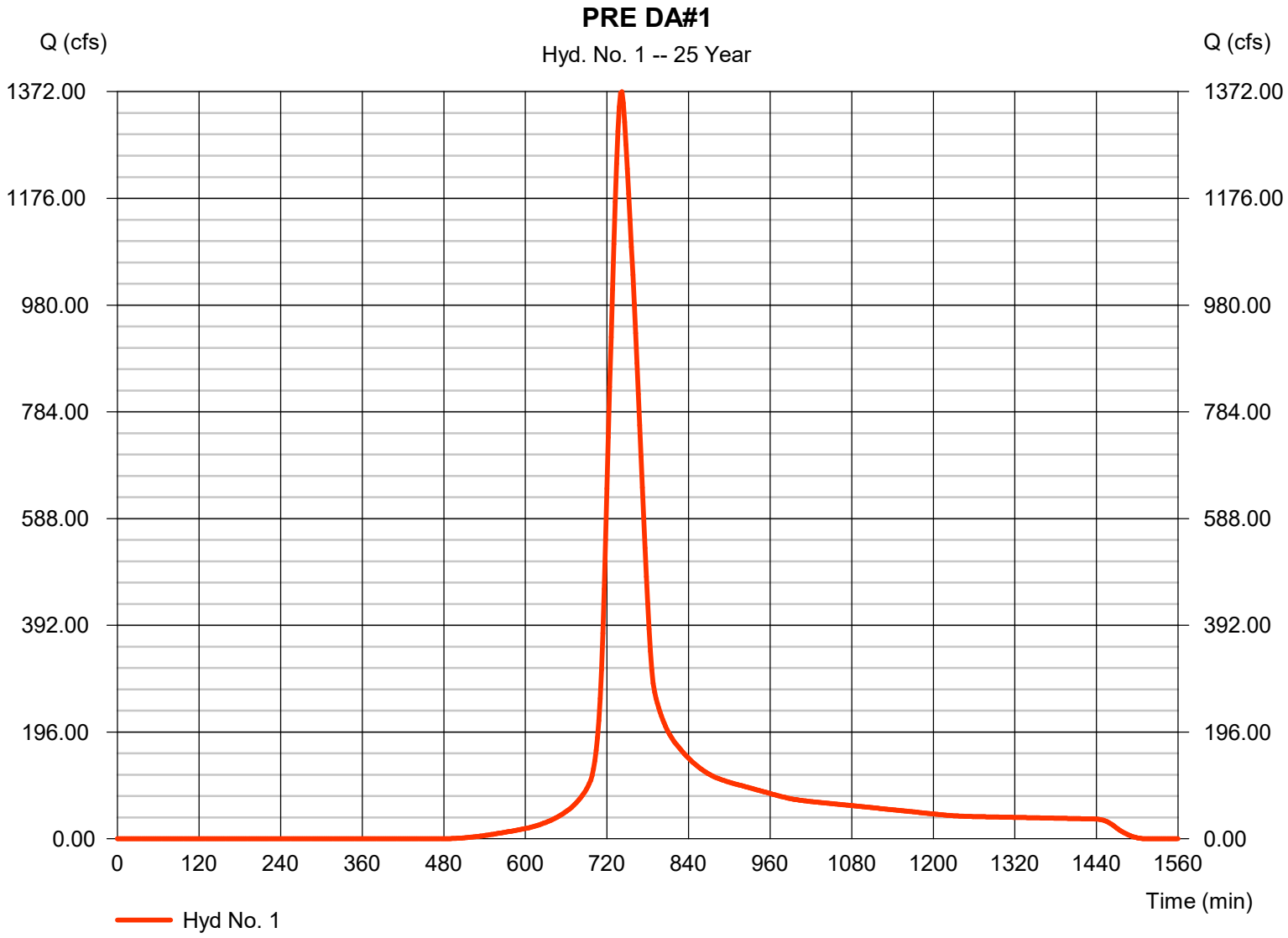
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Thursday, 05 / 22 / 2025

Hyd. No. 1

PRE DA#1

Hydrograph type	= SCS Runoff	Peak discharge	= 1371.63 cfs
Storm frequency	= 25 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 7,371,980 cuft
Drainage area	= 618.810 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 47.00 min
Total precip.	= 6.15 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

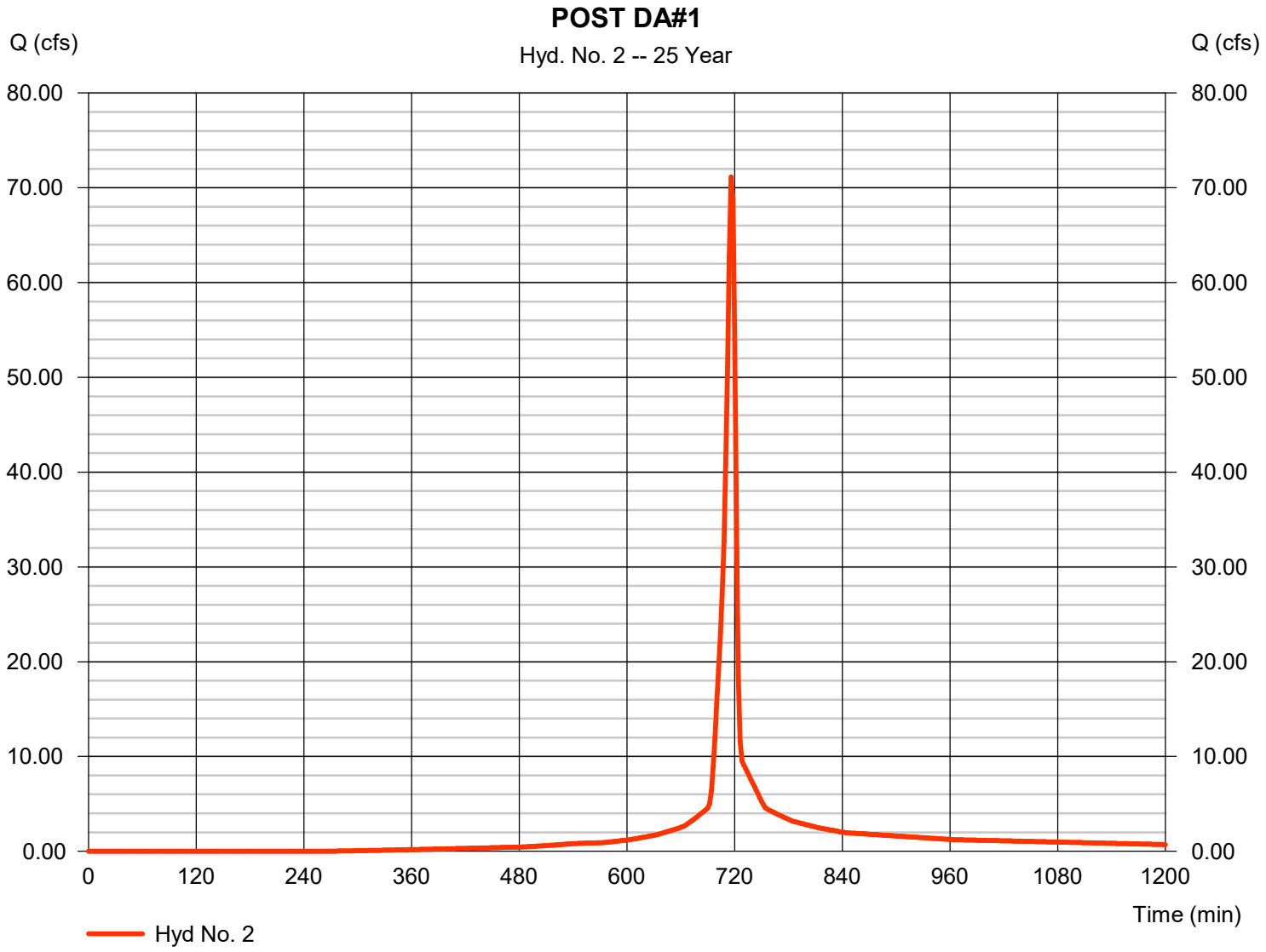


Hydrograph Report

Hyd. No. 2

POST DA#1

Hydrograph type	=	SCS Runoff	Peak discharge	=	71.14 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	150,577 cuft
Drainage area	=	9.720 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.50 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

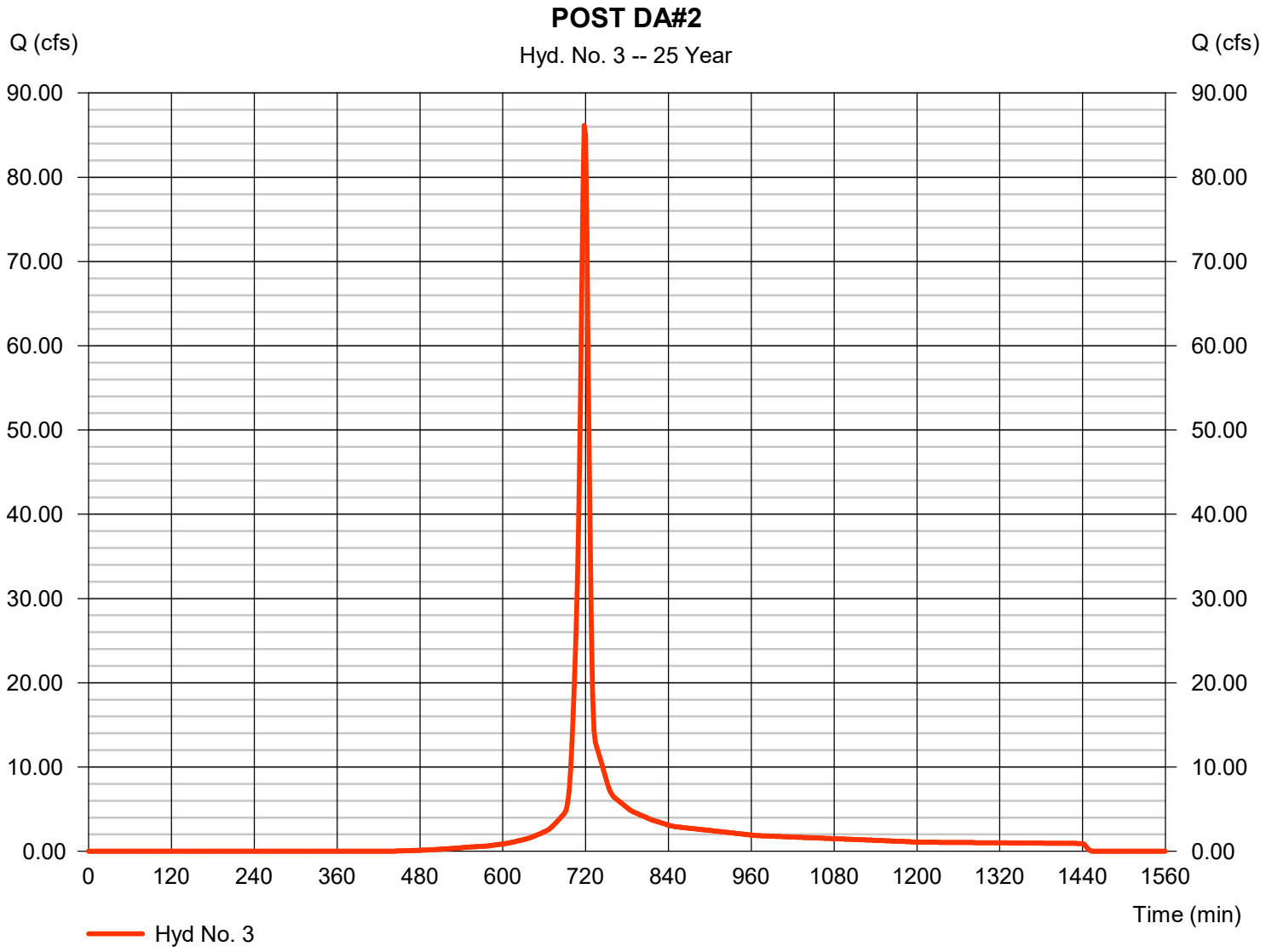


Hydrograph Report

Hyd. No. 3

POST DA#2

Hydrograph type	=	SCS Runoff	Peak discharge	=	86.13 cfs
Storm frequency	=	25 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	197,612 cuft
Drainage area	=	15.510 ac	Curve number	=	76
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.00 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

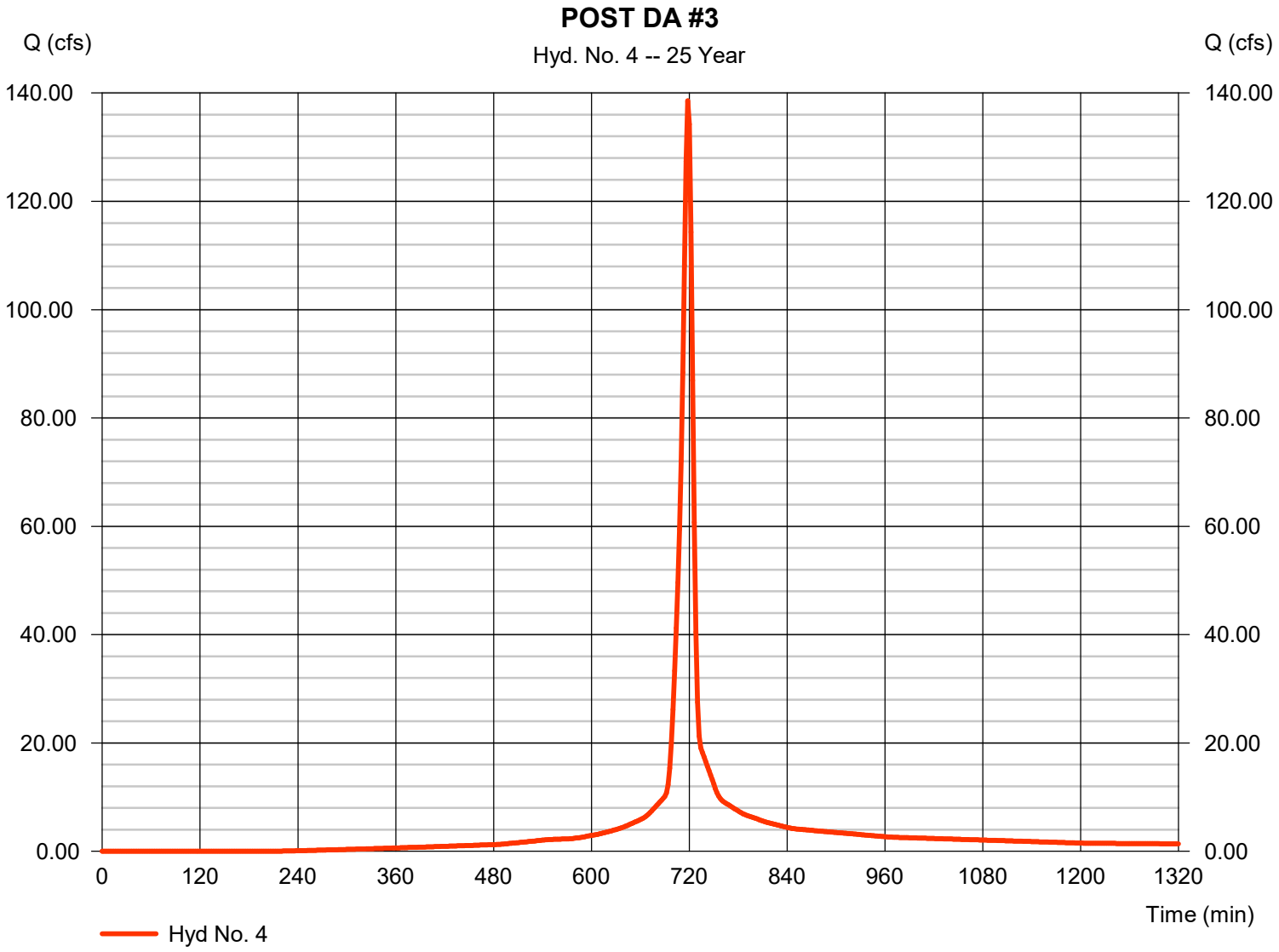


Hydrograph Report

Hyd. No. 4

POST DA #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	138.58 cfs
Storm frequency	=	25 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	335,746 cuft
Drainage area	=	18.950 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.40 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

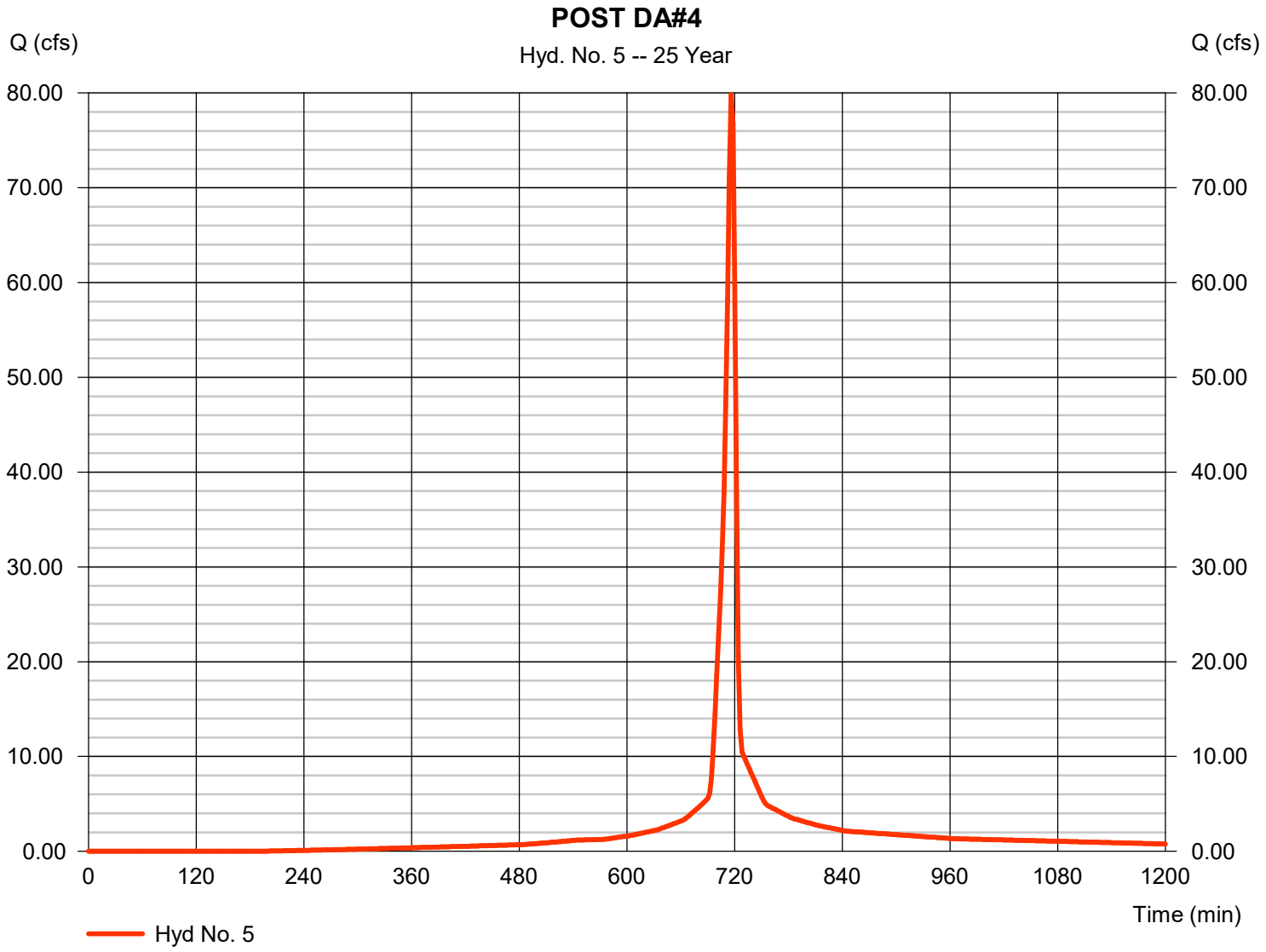


Hydrograph Report

Hyd. No. 5

POST DA#4

Hydrograph type	=	SCS Runoff	Peak discharge	=	79.86 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	174,133 cuft
Drainage area	=	10.250 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.30 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

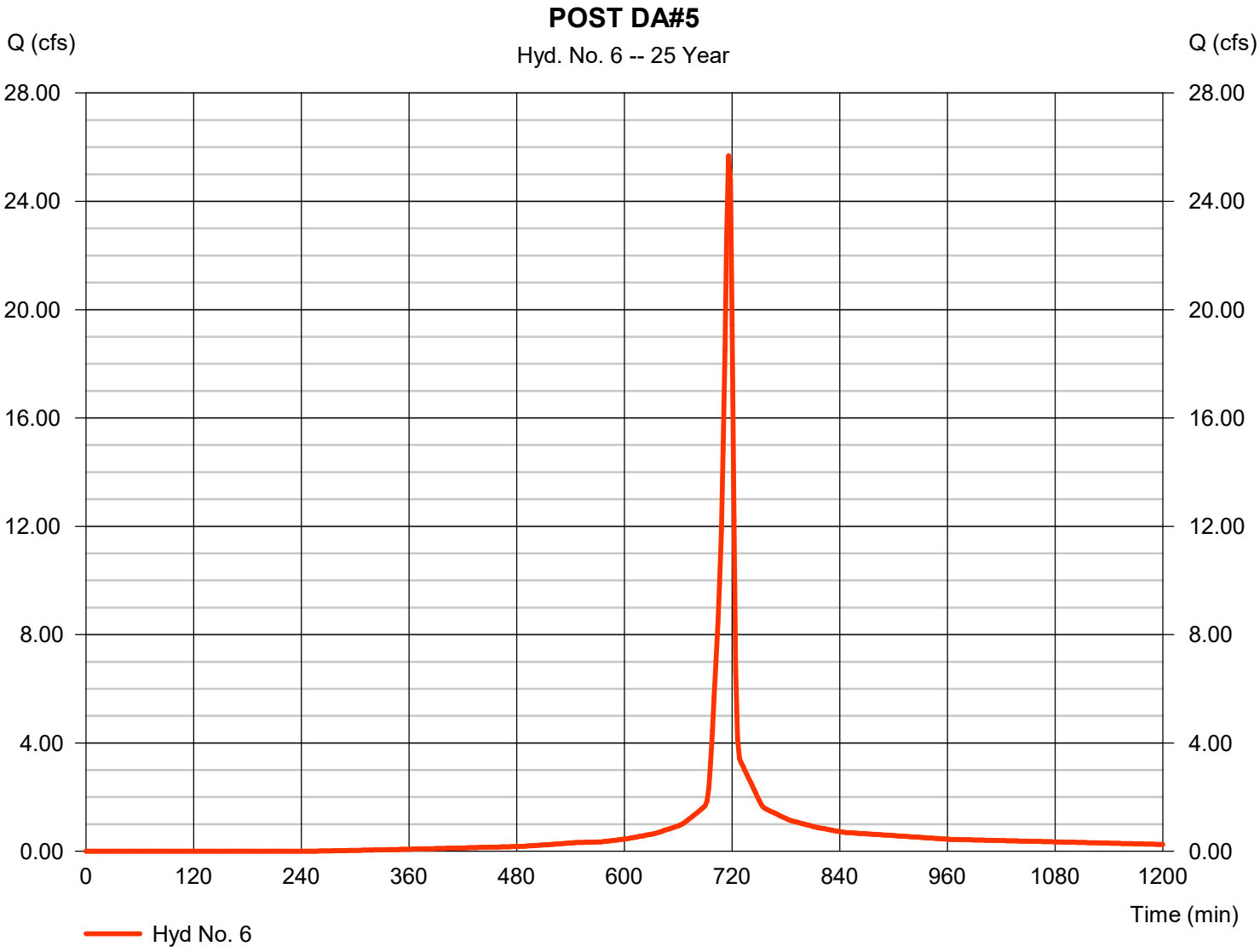


Hydrograph Report

Hyd. No. 6

POST DA#5

Hydrograph type	=	SCS Runoff	Peak discharge	=	25.68 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	54,722 cuft
Drainage area	=	3.450 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

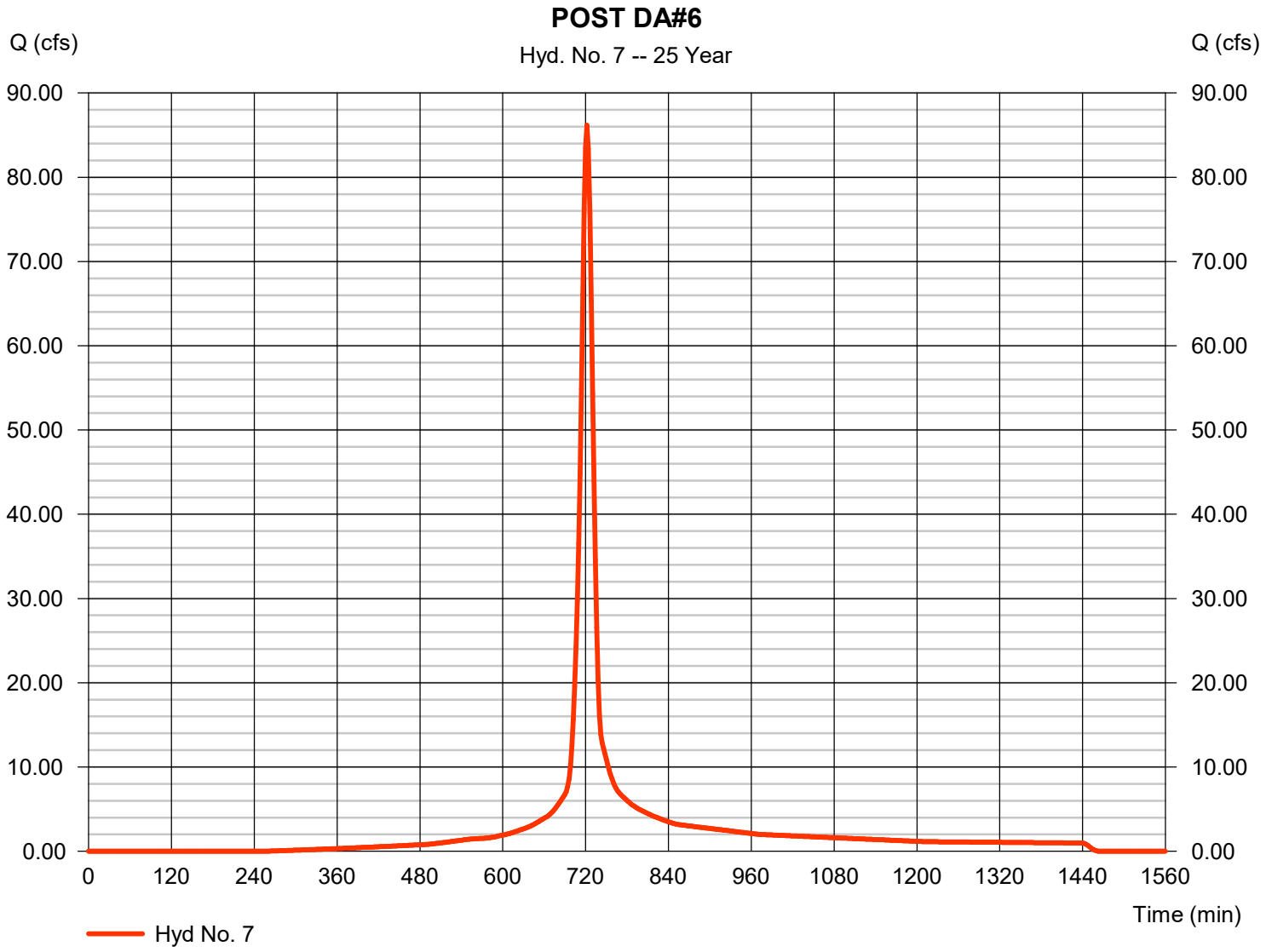


Hydrograph Report

Hyd. No. 7

POST DA#6

Hydrograph type	=	SCS Runoff	Peak discharge	=	86.18 cfs
Storm frequency	=	25 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	249,749 cuft
Drainage area	=	15.140 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	14.80 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

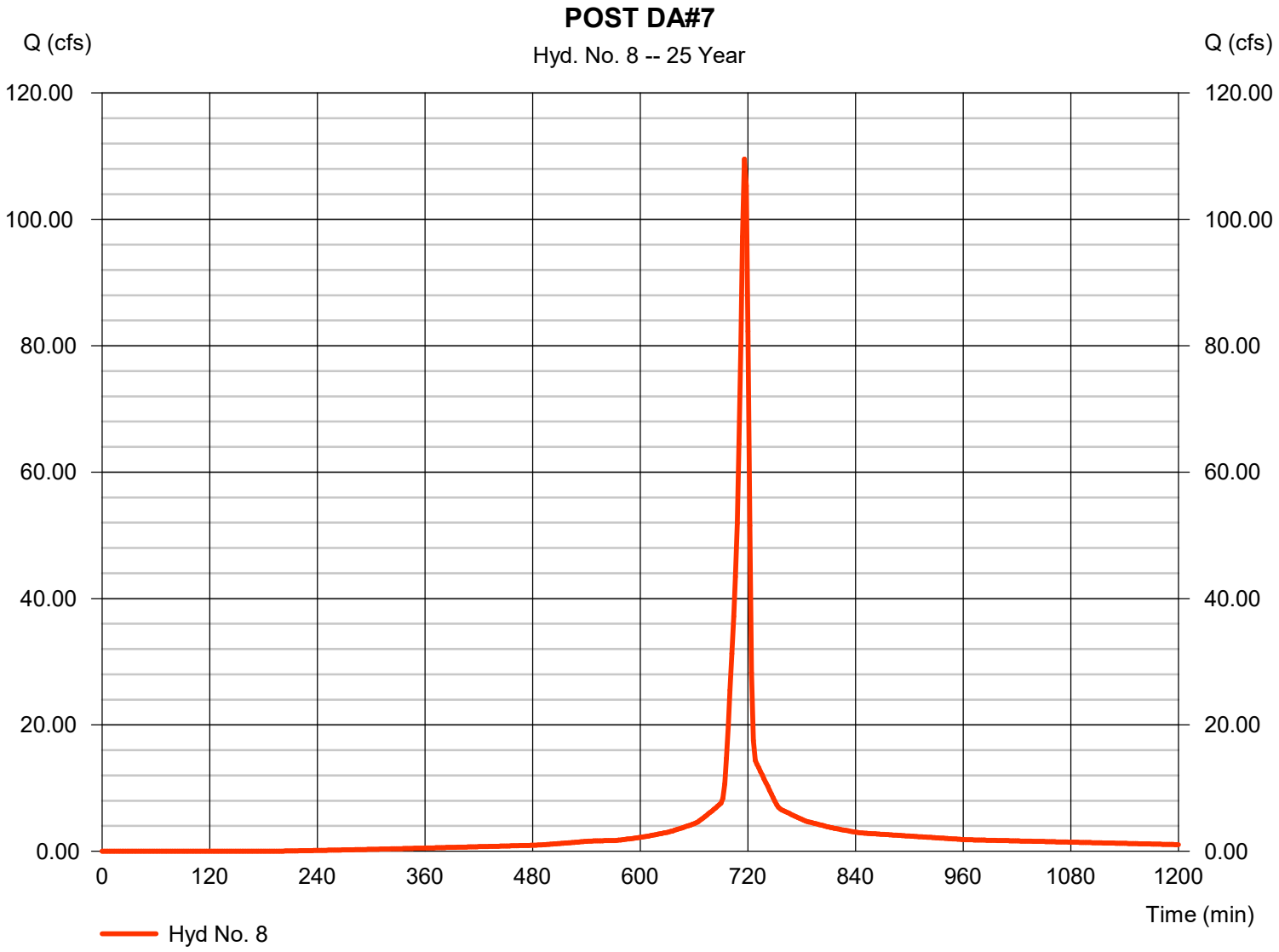


Hydrograph Report

Hyd. No. 8

POST DA#7

Hydrograph type	=	SCS Runoff	Peak discharge	=	109.54 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	238,860 cuft
Drainage area	=	14.060 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.20 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

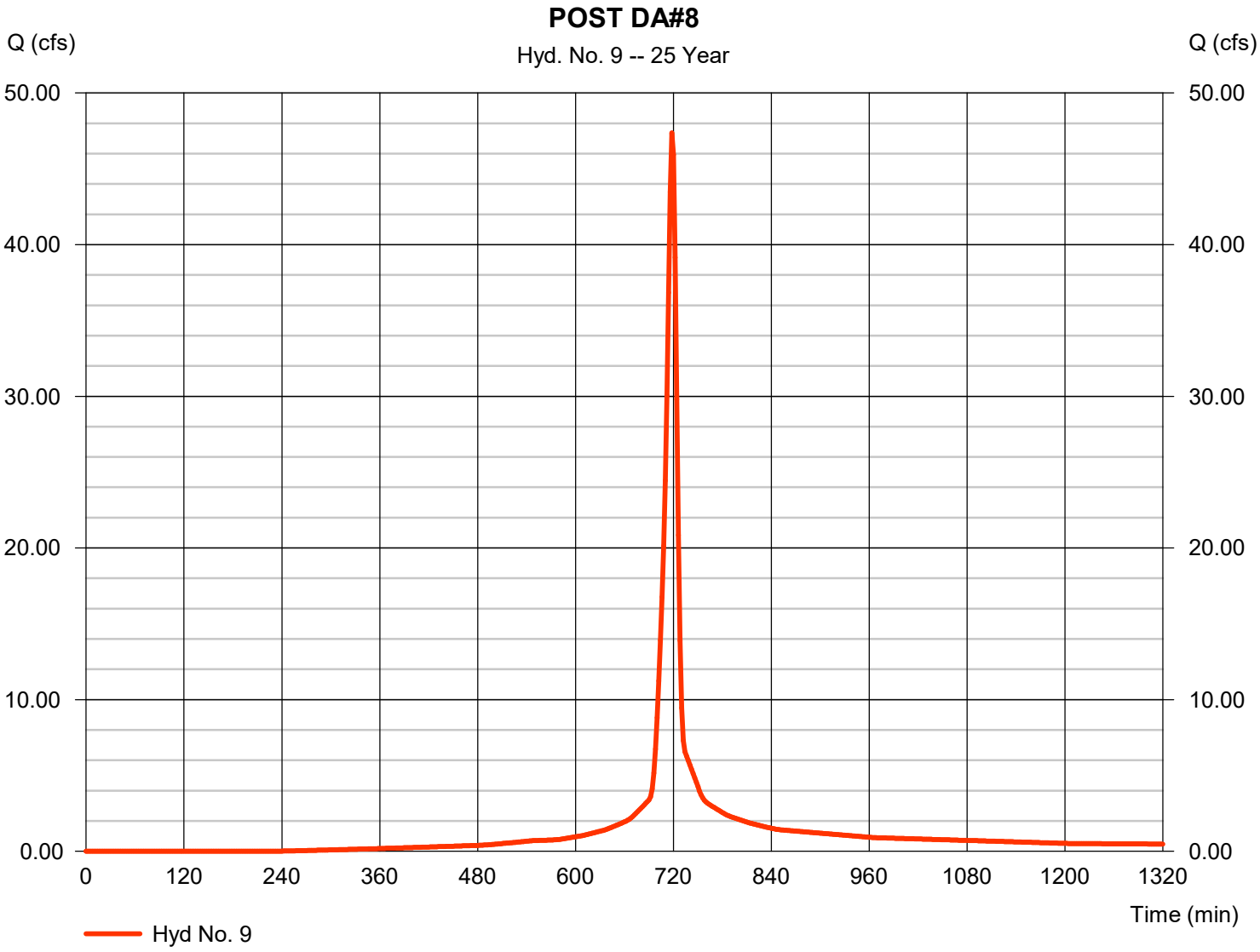


Hydrograph Report

Hyd. No. 9

POST DA#8

Hydrograph type	=	SCS Runoff	Peak discharge	=	47.37 cfs
Storm frequency	=	25 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	113,944 cuft
Drainage area	=	6.580 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.80 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

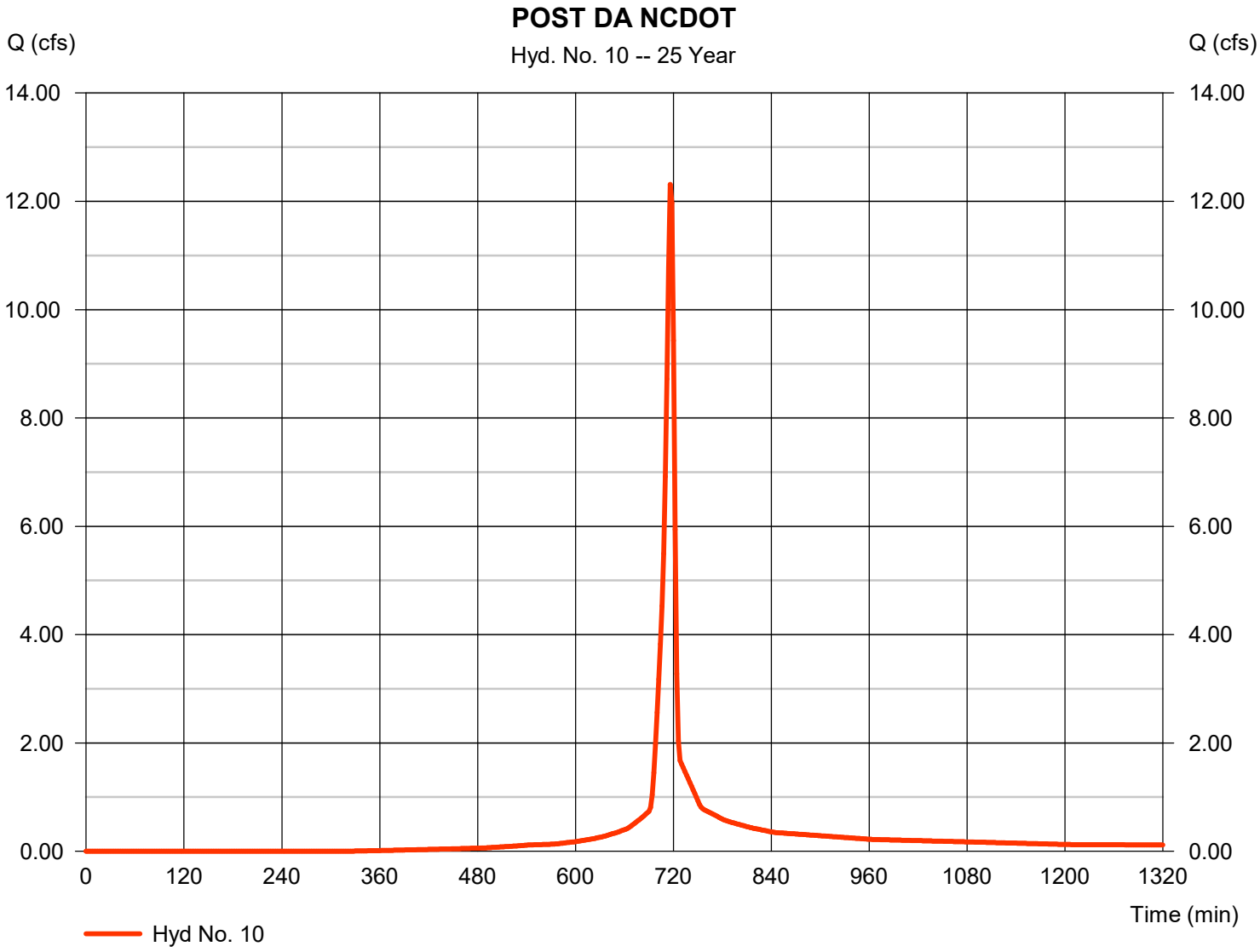


Hydrograph Report

Hyd. No. 10

POST DA NCDOT

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.31 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	25,628 cuft
Drainage area	=	1.780 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



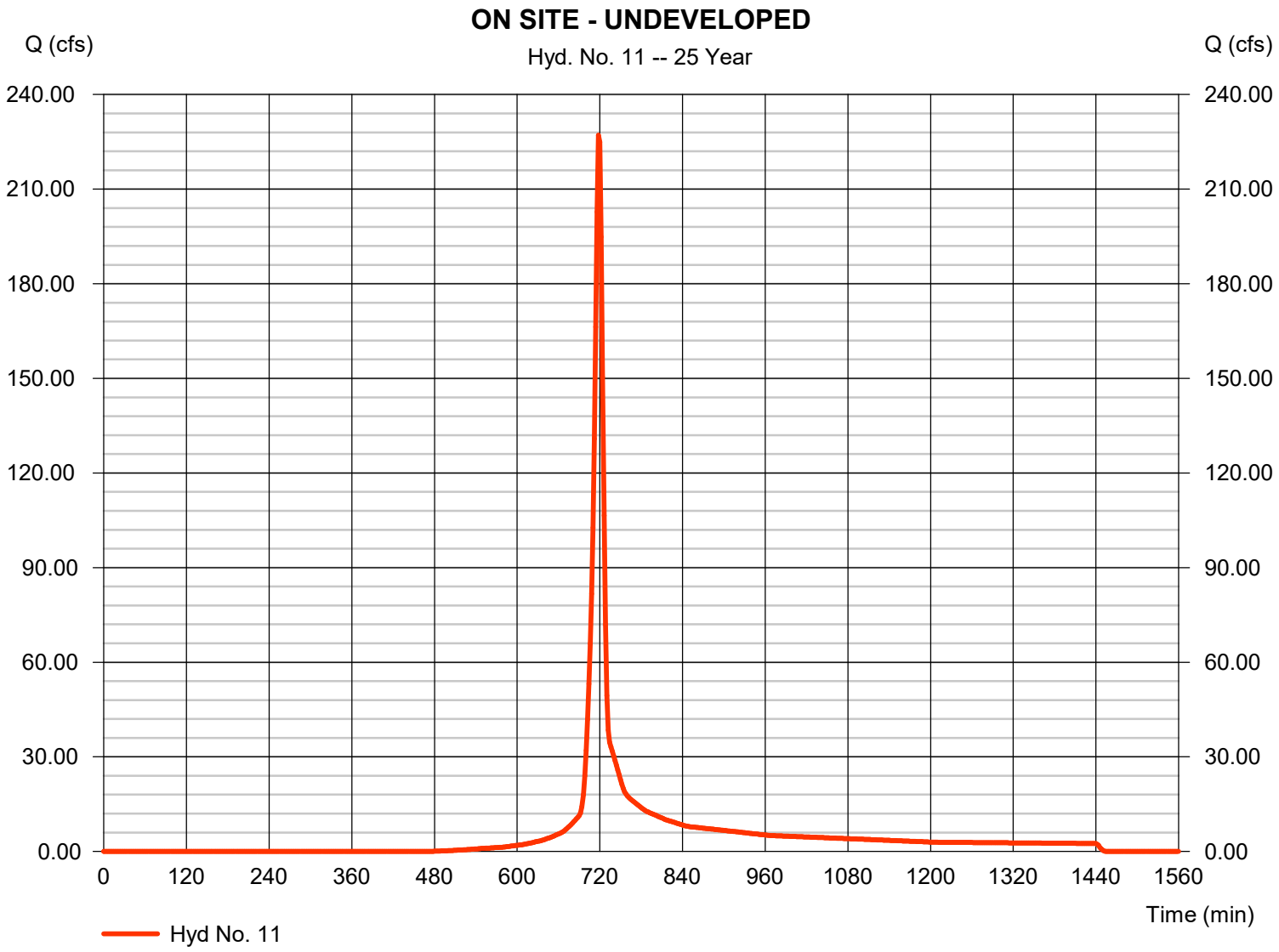
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Thursday, 05 / 22 / 2025

Hyd. No. 11

ON SITE - UNDEVELOPED

Hydrograph type	=	SCS Runoff	Peak discharge	=	227.10 cfs
Storm frequency	=	25 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	519,886 cuft
Drainage area	=	43.250 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.00 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

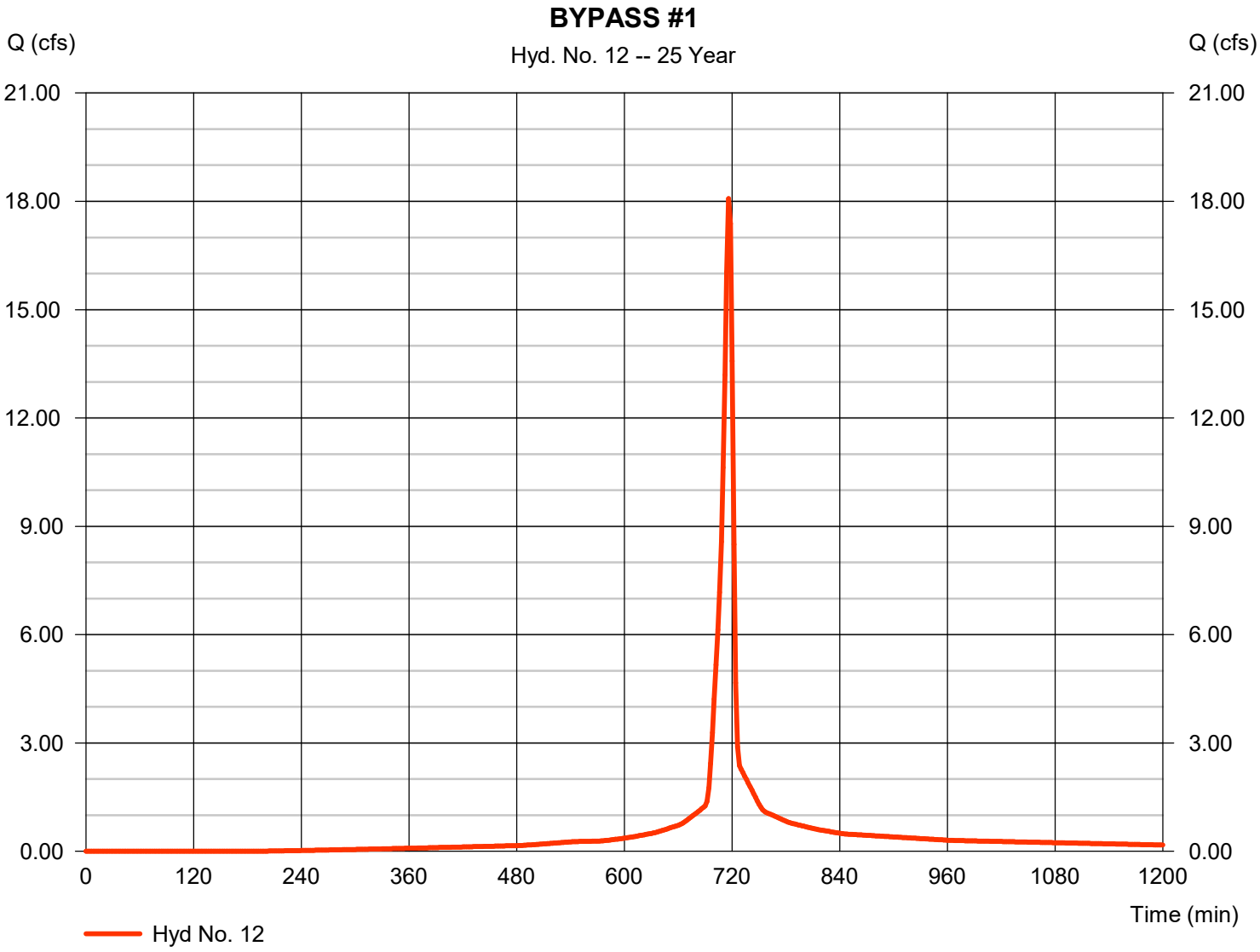


Hydrograph Report

Hyd. No. 12

BYPASS #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	18.07 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	39,414 cuft
Drainage area	=	2.320 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

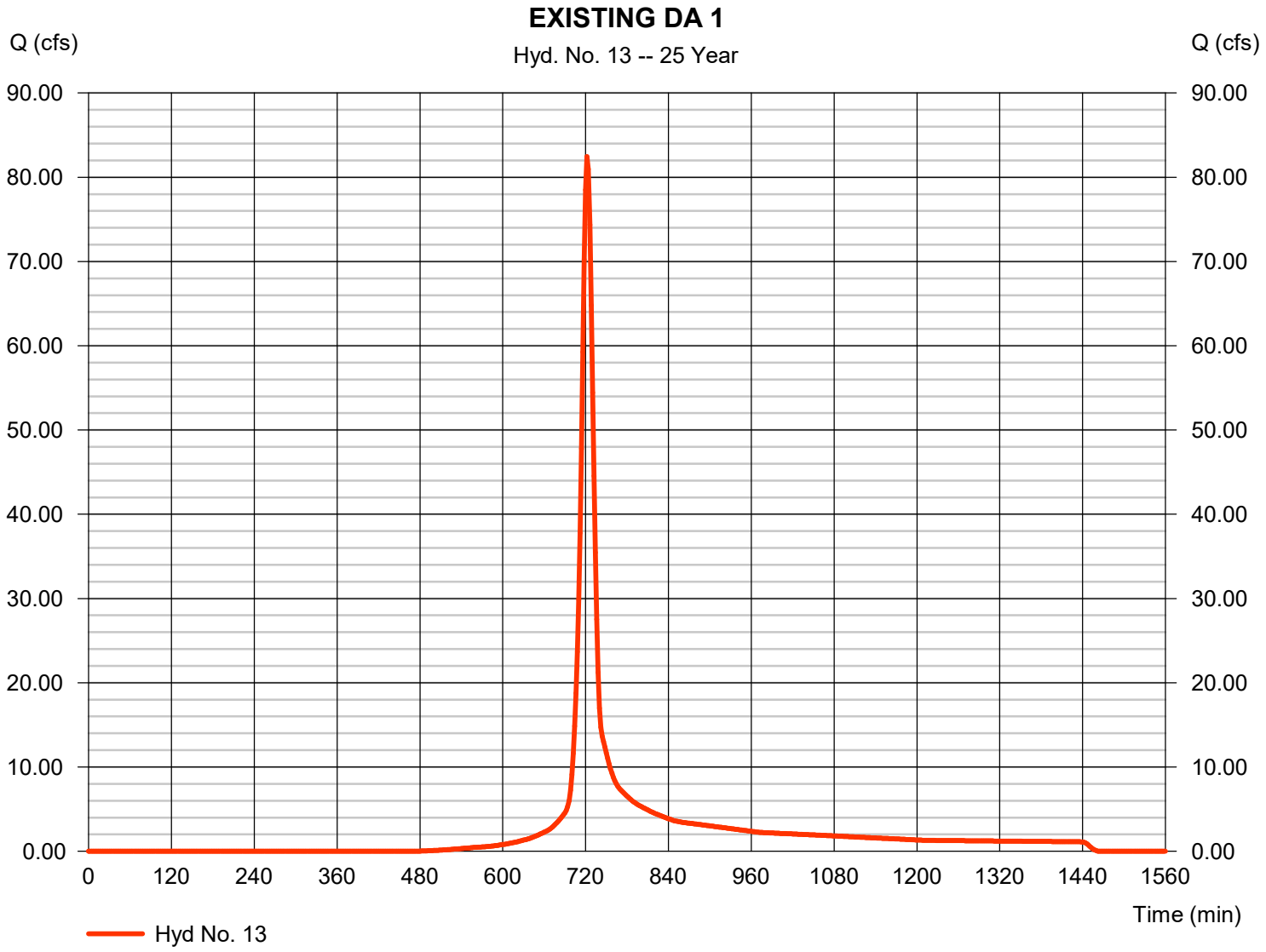


Hydrograph Report

Hyd. No. 13

EXISTING DA 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	82.46 cfs
Storm frequency	=	25 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	231,118 cuft
Drainage area	=	19.720 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	14.00 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

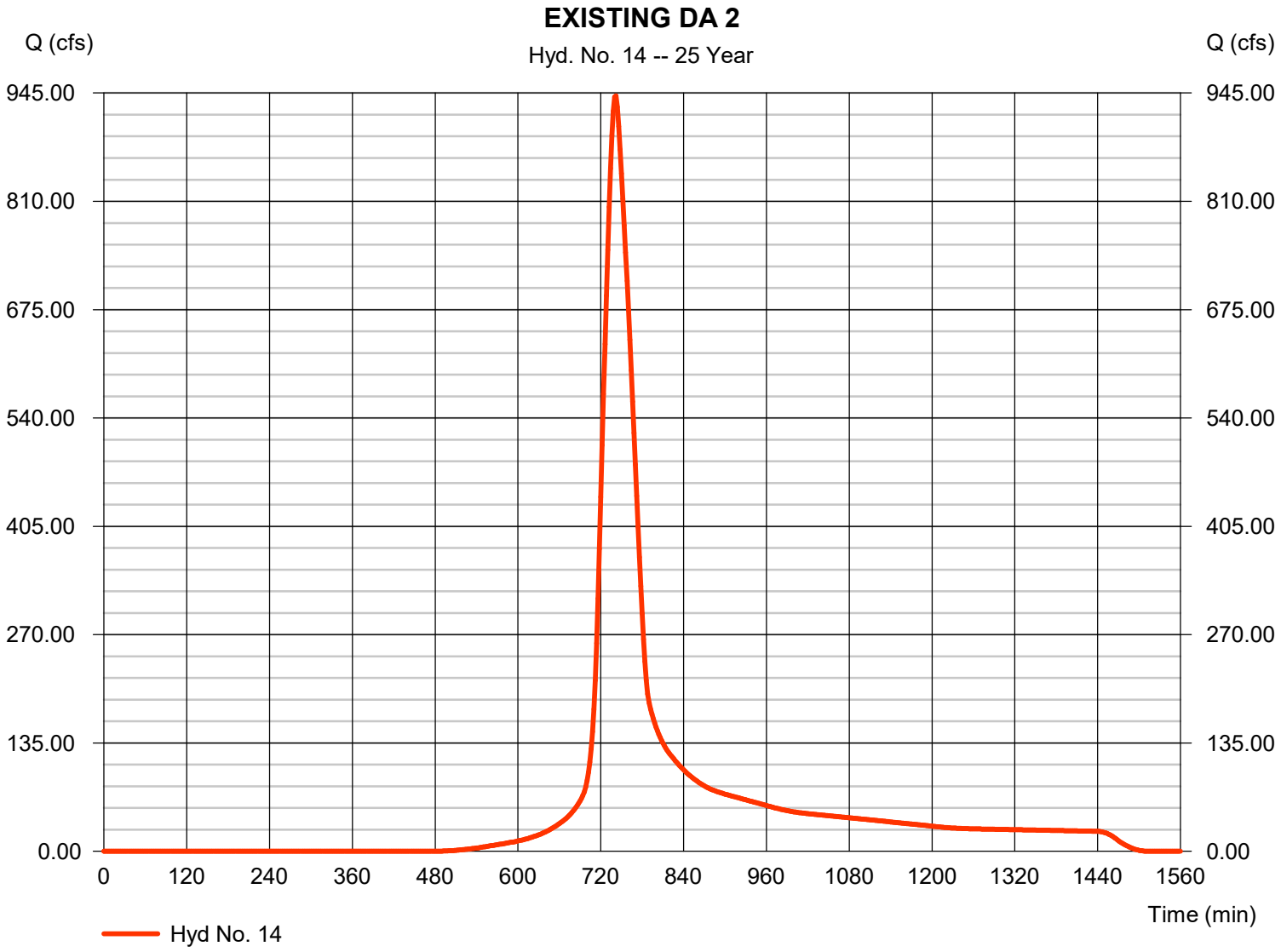


Hydrograph Report

Hyd. No. 14

EXISTING DA 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	941.53 cfs
Storm frequency	=	25 yrs	Time to peak	=	742 min
Time interval	=	2 min	Hyd. volume	=	5,060,346 cuft
Drainage area	=	424.770 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	47.00 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

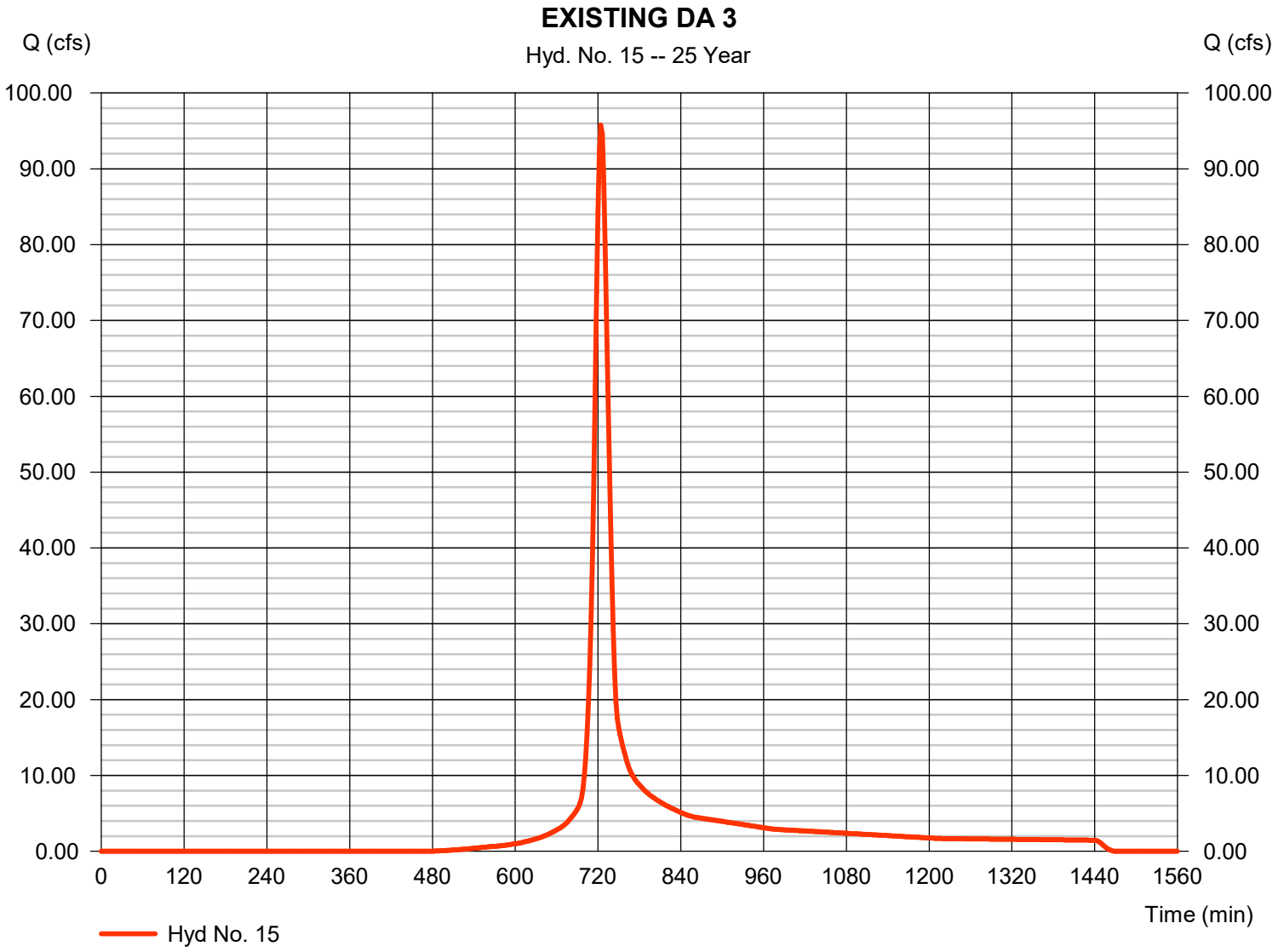


Hydrograph Report

Hyd. No. 15

EXISTING DA 3

Hydrograph type	=	SCS Runoff	Peak discharge	=	95.77 cfs
Storm frequency	=	25 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	299,550 cuft
Drainage area	=	24.920 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	19.60 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

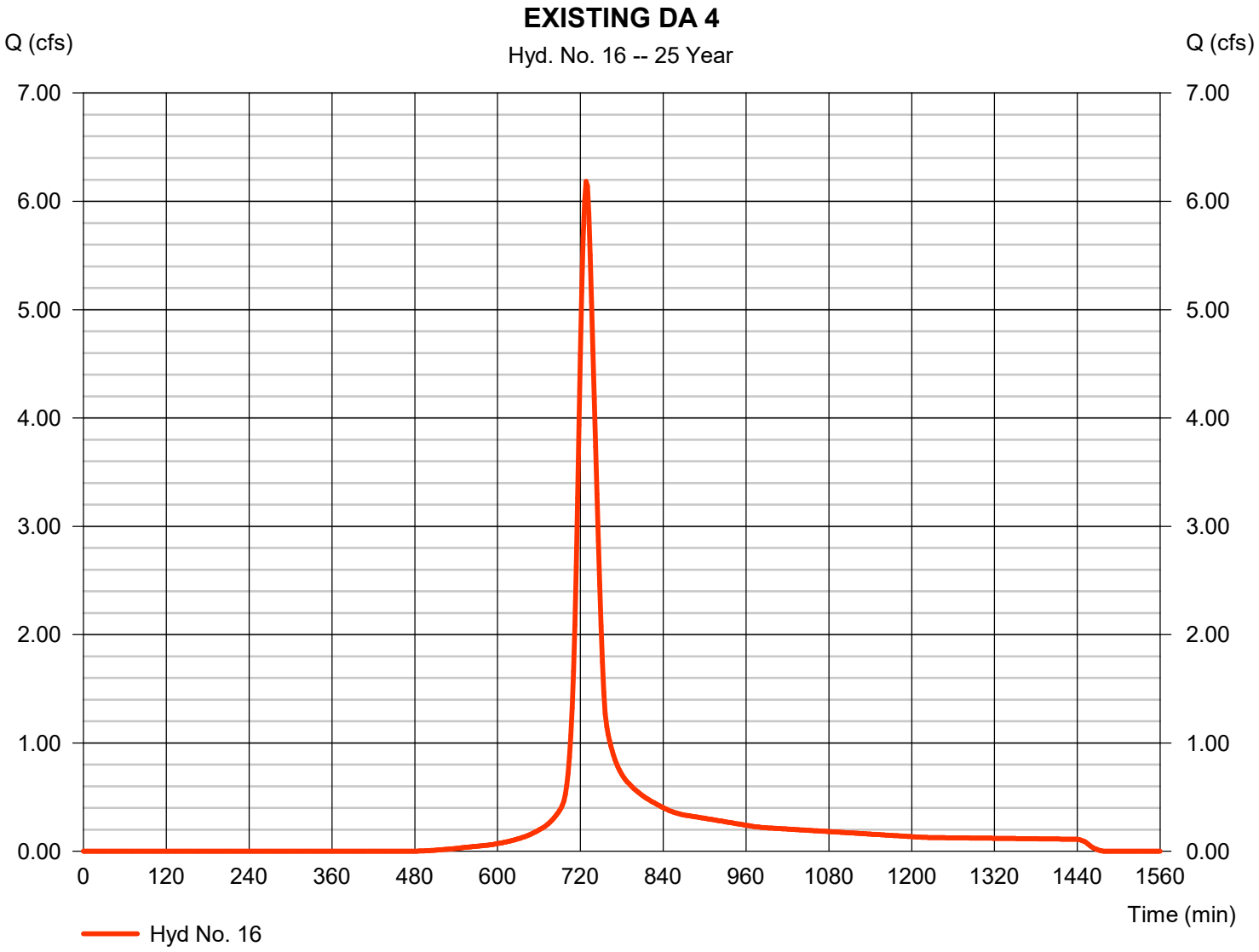


Hydrograph Report

Hyd. No. 16

EXISTING DA 4

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.183 cfs
Storm frequency	=	25 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	22,719 cuft
Drainage area	=	1.920 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	26.20 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



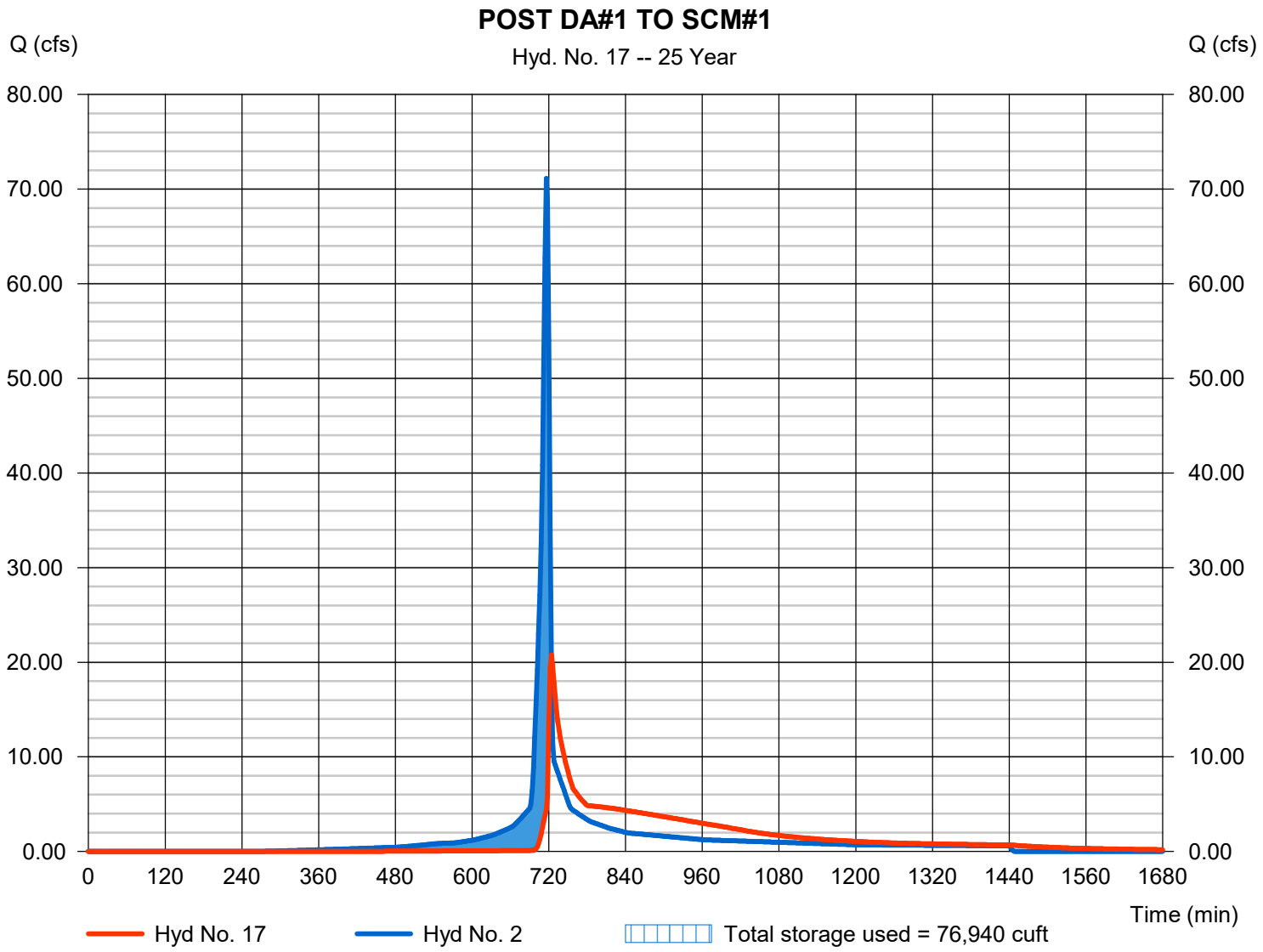
Hydrograph Report

Hyd. No. 17

POST DA#1 TO SCM#1

Hydrograph type	=	Reservoir	Peak discharge	=	20.77 cfs
Storm frequency	=	25 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	146,403 cuft
Inflow hyd. No.	=	2 - POST DA#1	Max. Elevation	=	265.68 ft
Reservoir name	=	SCM#1	Max. Storage	=	76,940 cuft

Storage Indication method used.



Hydrograph Report

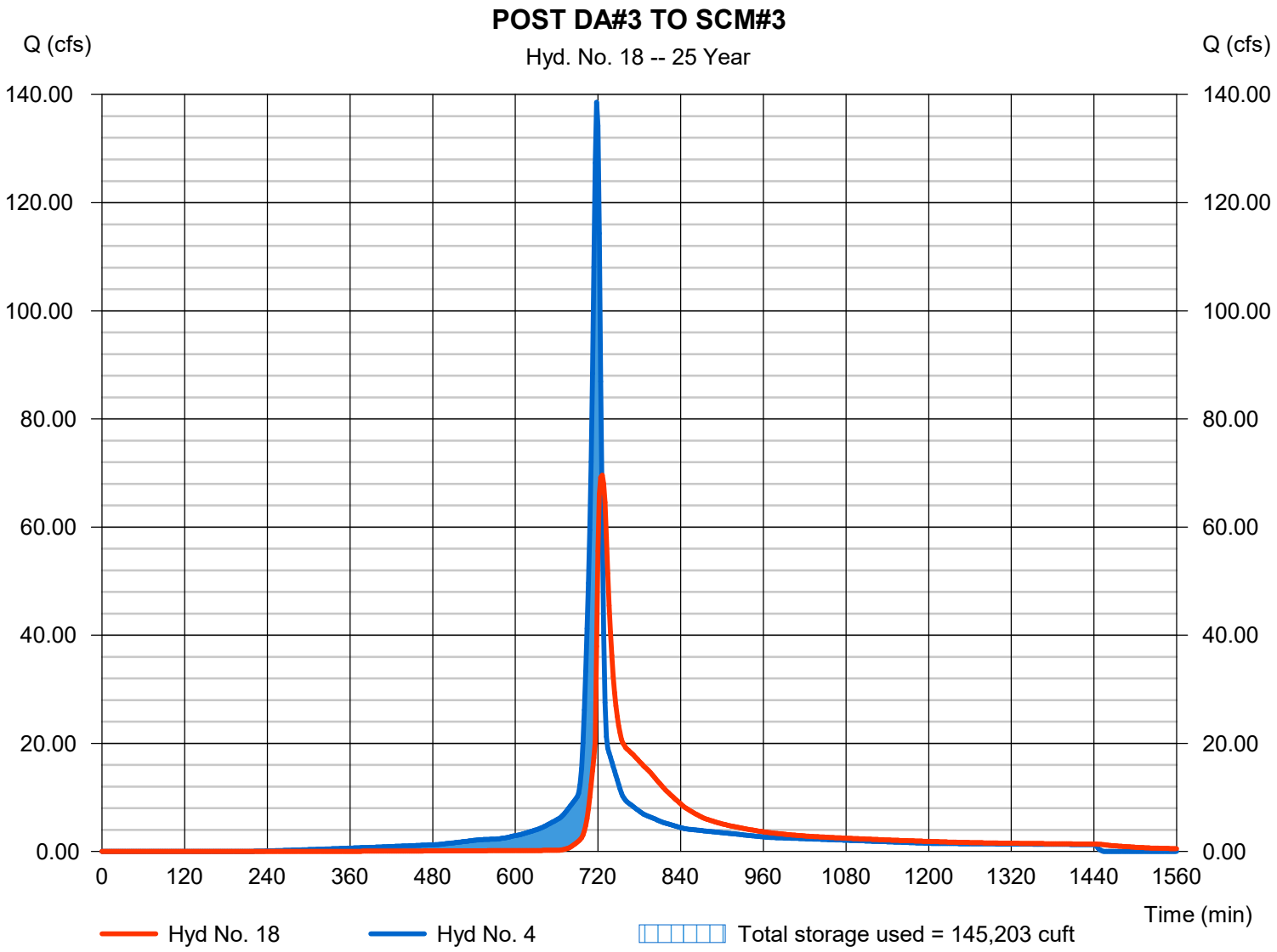
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Thursday, 05 / 22 / 2025

Hyd. No. 18

POST DA#3 TO SCM#3

Hydrograph type	=	Reservoir	Peak discharge	=	69.59 cfs
Storm frequency	=	25 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	330,668 cuft
Inflow hyd. No.	=	4 - POST DA #3	Max. Elevation	=	245.40 ft
Reservoir name	=	SCM#3	Max. Storage	=	145,203 cuft

Storage Indication method used.



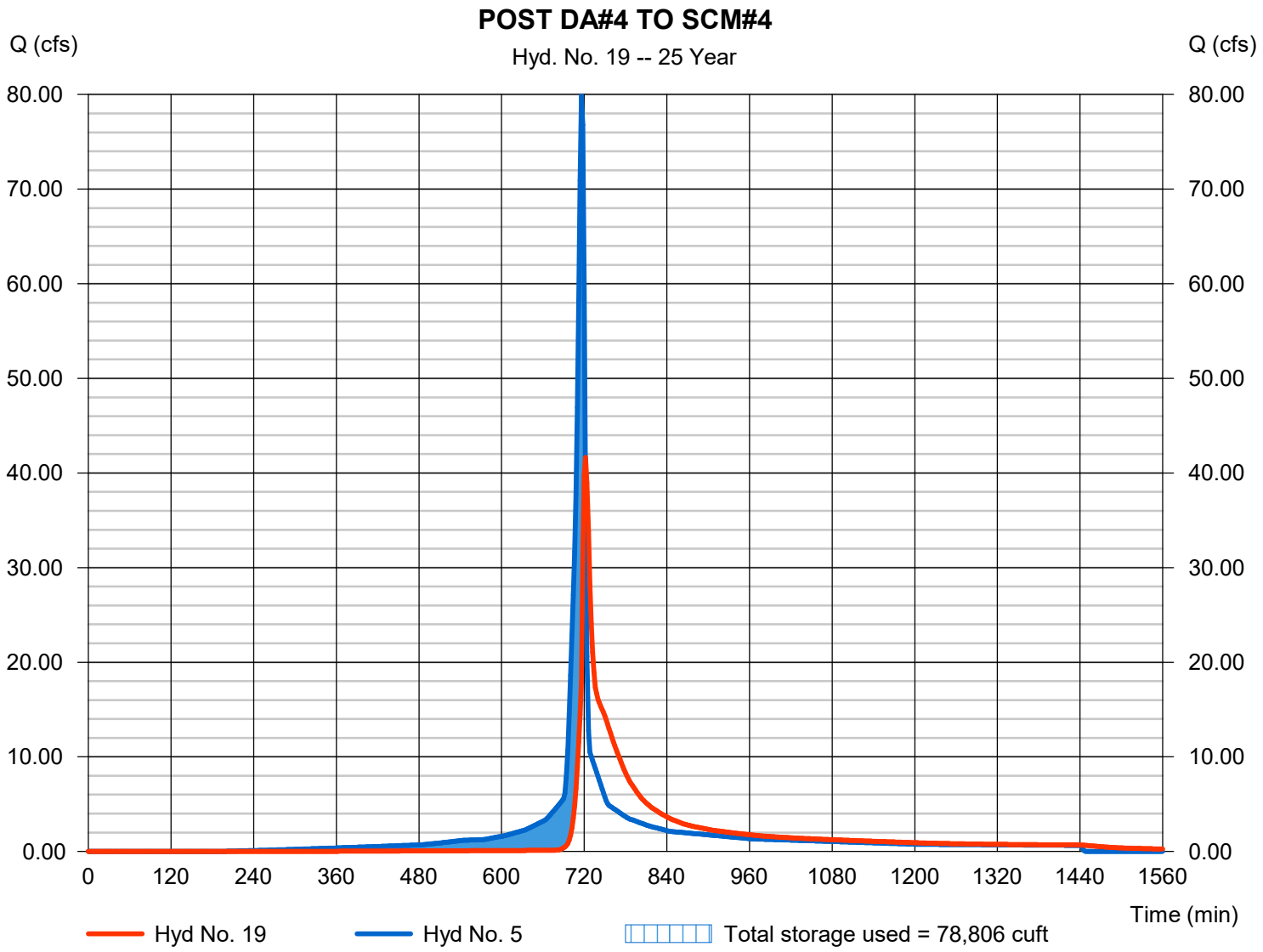
Hydrograph Report

Hyd. No. 19

POST DA#4 TO SCM#4

Hydrograph type	=	Reservoir	Peak discharge	=	41.63 cfs
Storm frequency	=	25 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	170,457 cuft
Inflow hyd. No.	=	5 - POST DA#4	Max. Elevation	=	244.34 ft
Reservoir name	=	SCM#4	Max. Storage	=	78,806 cuft

Storage Indication method used.



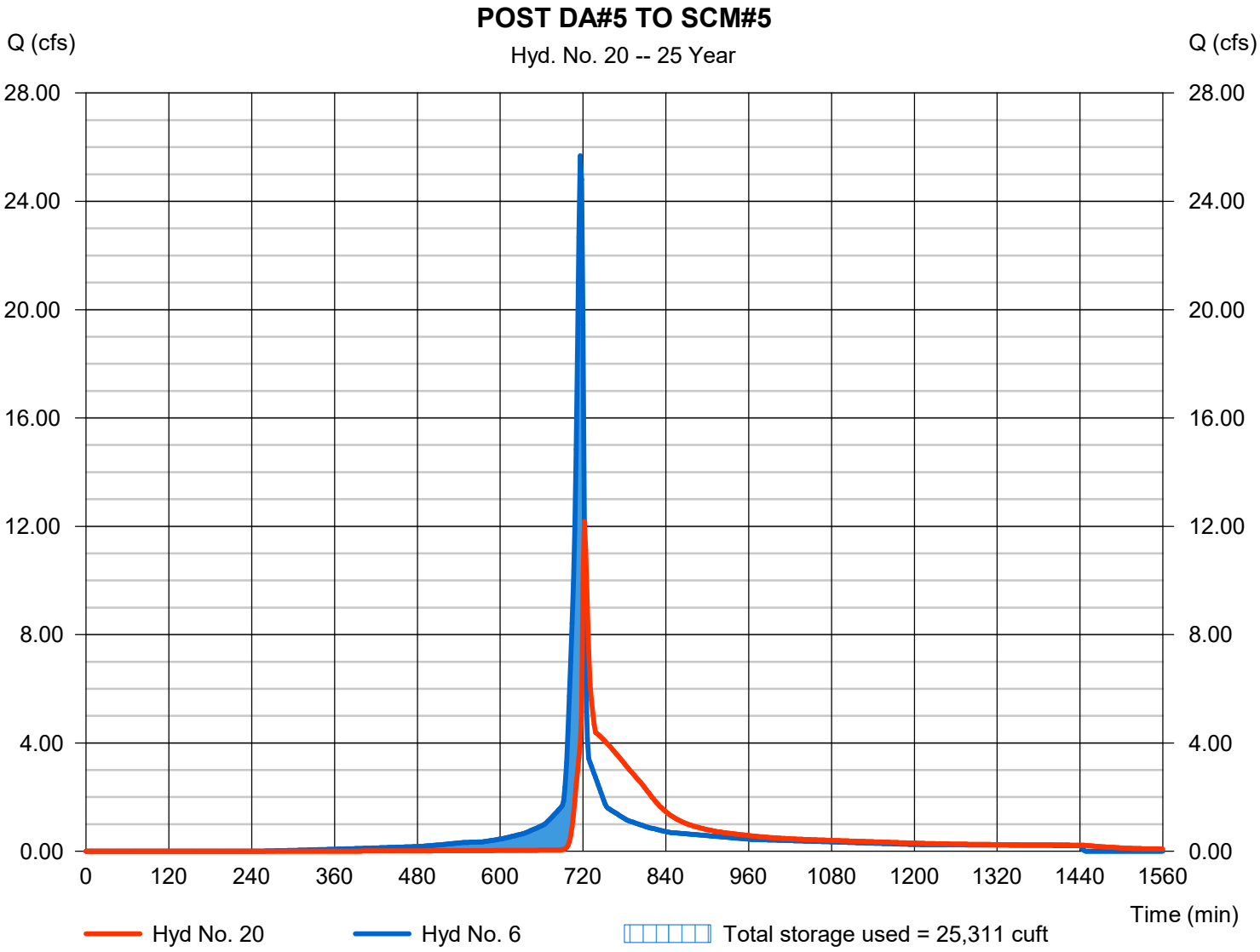
Hydrograph Report

Hyd. No. 20

POST DA#5 TO SCM#5

Hydrograph type	=	Reservoir	Peak discharge	=	12.18 cfs
Storm frequency	=	25 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	54,068 cuft
Inflow hyd. No.	=	6 - POST DA#5	Max. Elevation	=	253.26 ft
Reservoir name	=	SCM#5	Max. Storage	=	25,311 cuft

Storage Indication method used.



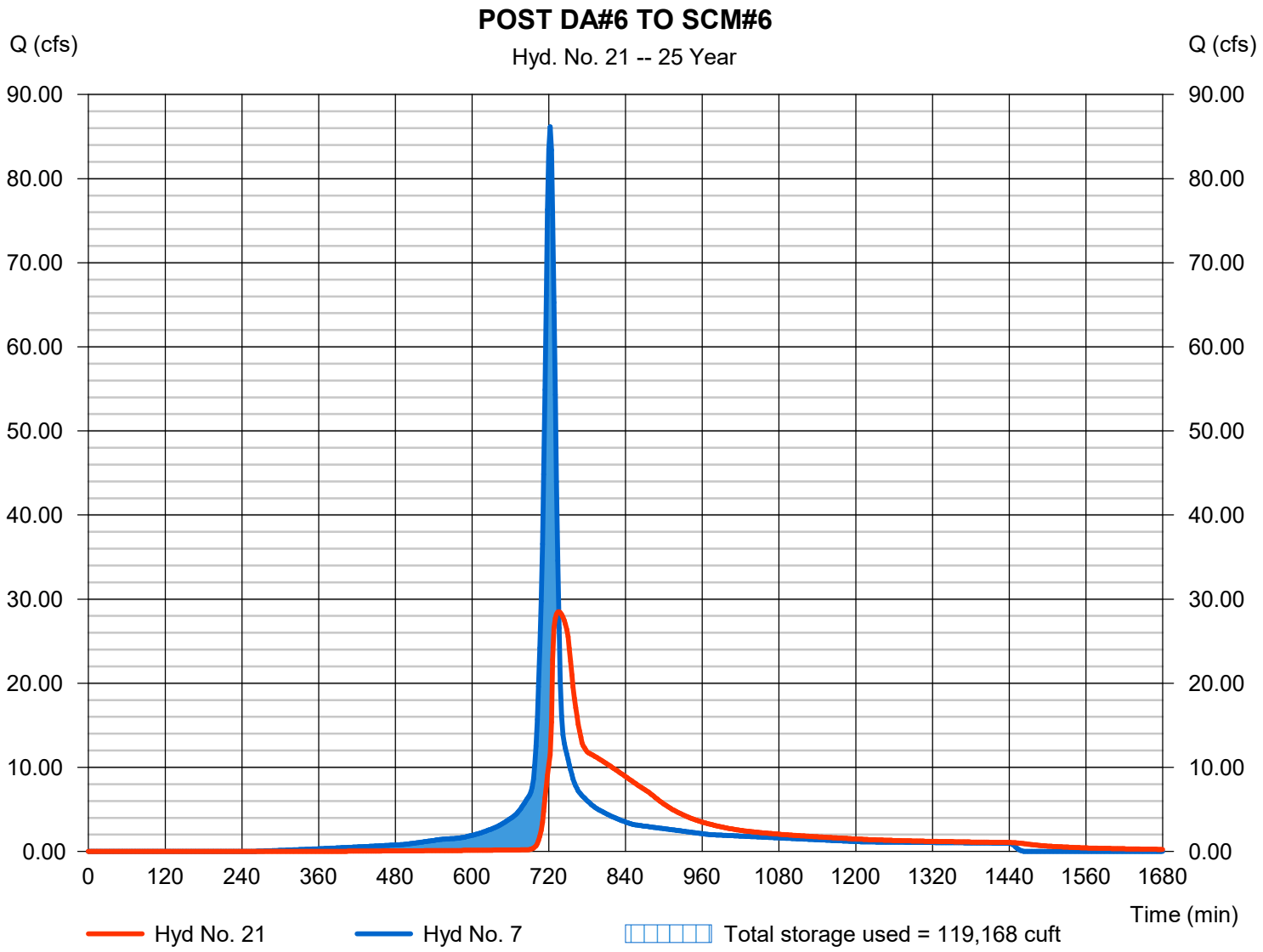
Hydrograph Report

Hyd. No. 21

POST DA#6 TO SCM#6

Hydrograph type	=	Reservoir	Peak discharge	=	28.51 cfs
Storm frequency	=	25 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	247,302 cuft
Inflow hyd. No.	=	7 - POST DA#6	Max. Elevation	=	242.14 ft
Reservoir name	=	SCM#6	Max. Storage	=	119,168 cuft

Storage Indication method used.



Hydrograph Report

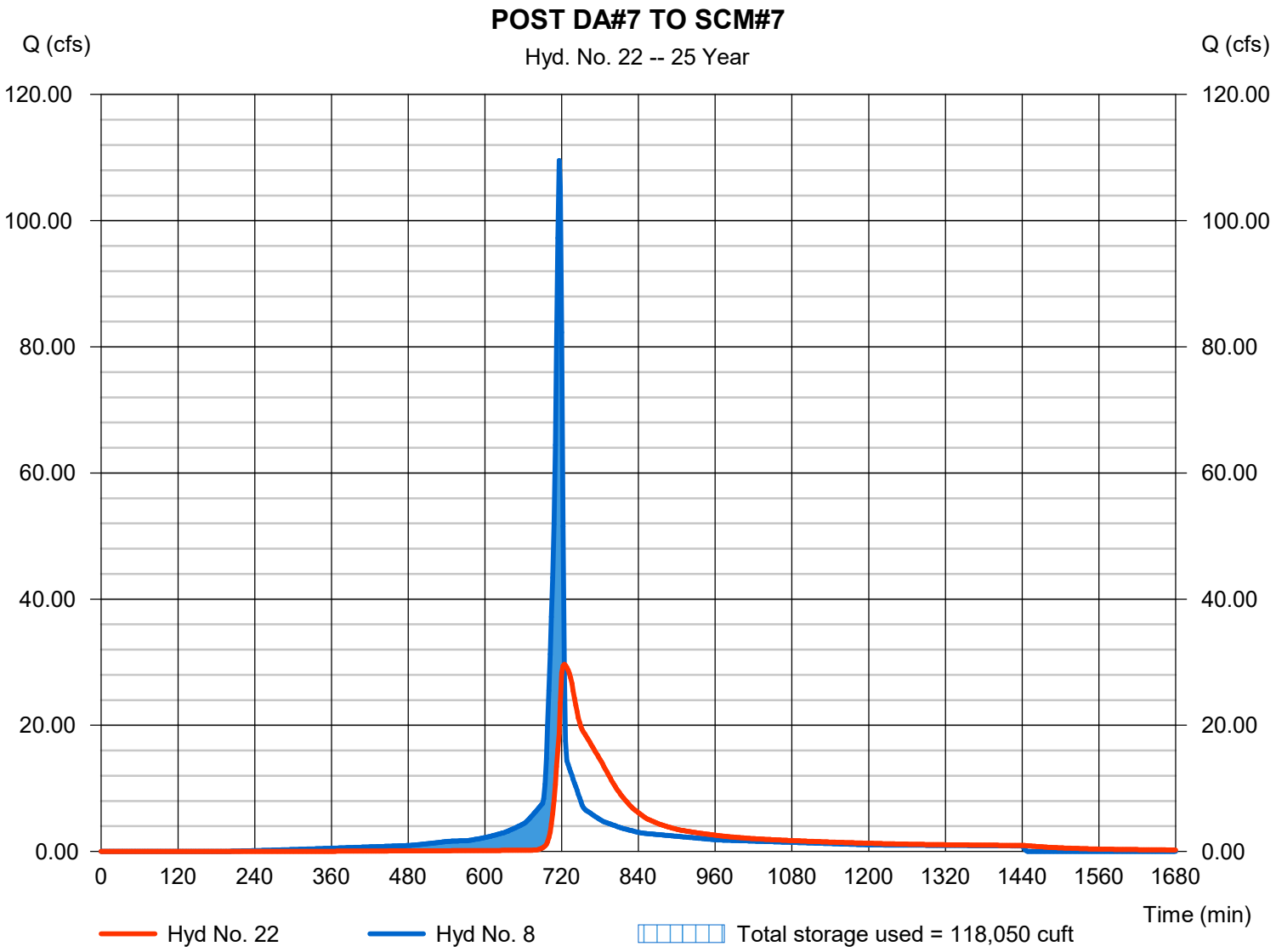
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Thursday, 05 / 22 / 2025

Hyd. No. 22

POST DA#7 TO SCM#7

Hydrograph type	=	Reservoir	Peak discharge	=	29.66 cfs
Storm frequency	=	25 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	235,614 cuft
Inflow hyd. No.	=	8 - POST DA#7	Max. Elevation	=	244.02 ft
Reservoir name	=	SCM#7	Max. Storage	=	118,050 cuft

Storage Indication method used.



Hydrograph Report

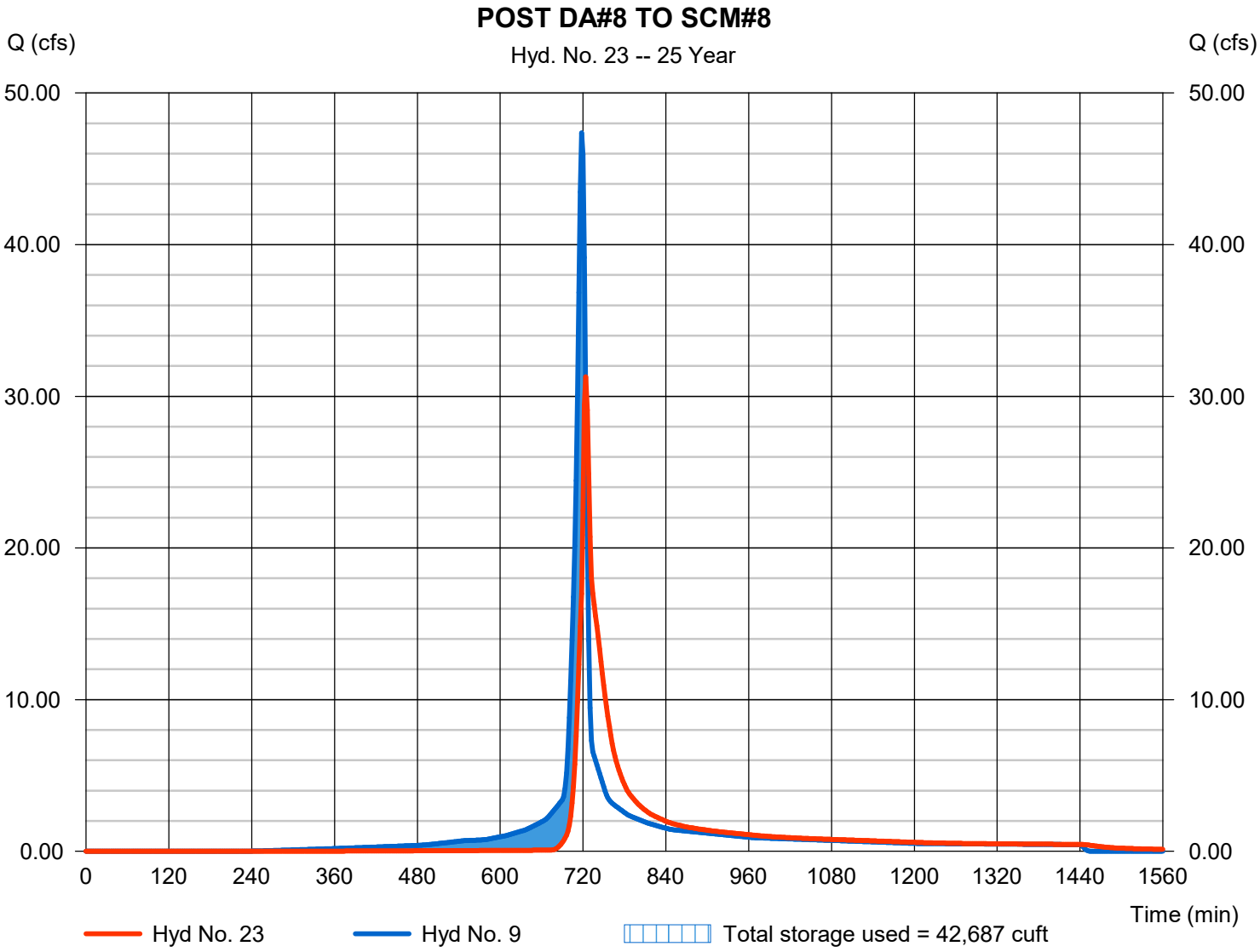
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Thursday, 05 / 22 / 2025

Hyd. No. 23

POST DA#8 TO SCM#8

Hydrograph type	=	Reservoir	Peak discharge	=	31.29 cfs
Storm frequency	=	25 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	112,586 cuft
Inflow hyd. No.	=	9 - POST DA#8	Max. Elevation	=	244.36 ft
Reservoir name	=	SCM#8	Max. Storage	=	42,687 cuft

Storage Indication method used.

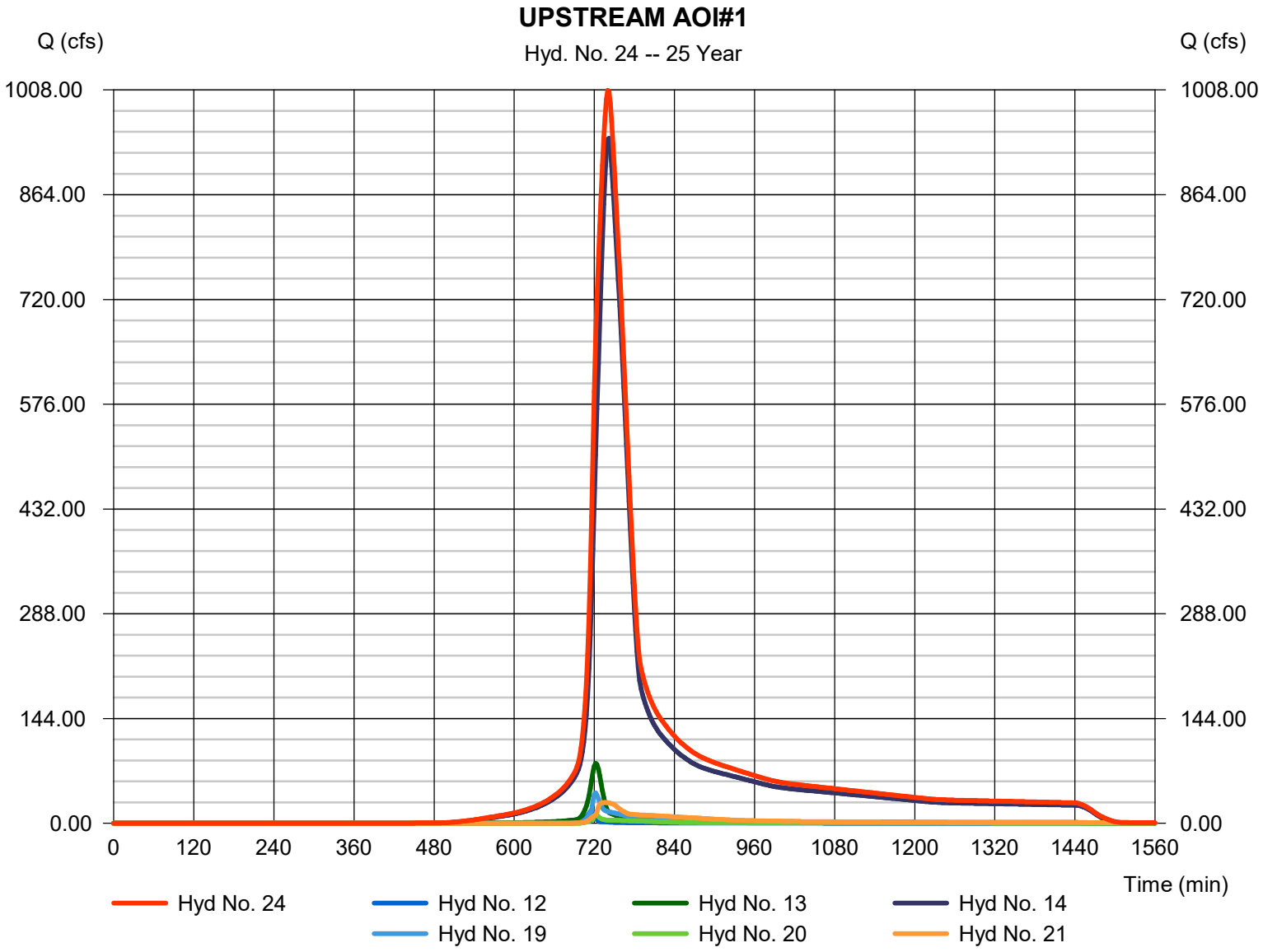


Hydrograph Report

Hyd. No. 24

UPSTREAM AOI#1

Hydrograph type	= Combine	Peak discharge	= 1007.45 cfs
Storm frequency	= 25 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 5,802,706 cuft
Inflow hyds.	= 12, 13, 14, 19, 20, 21	Contrib. drain. area	= 446.810 ac

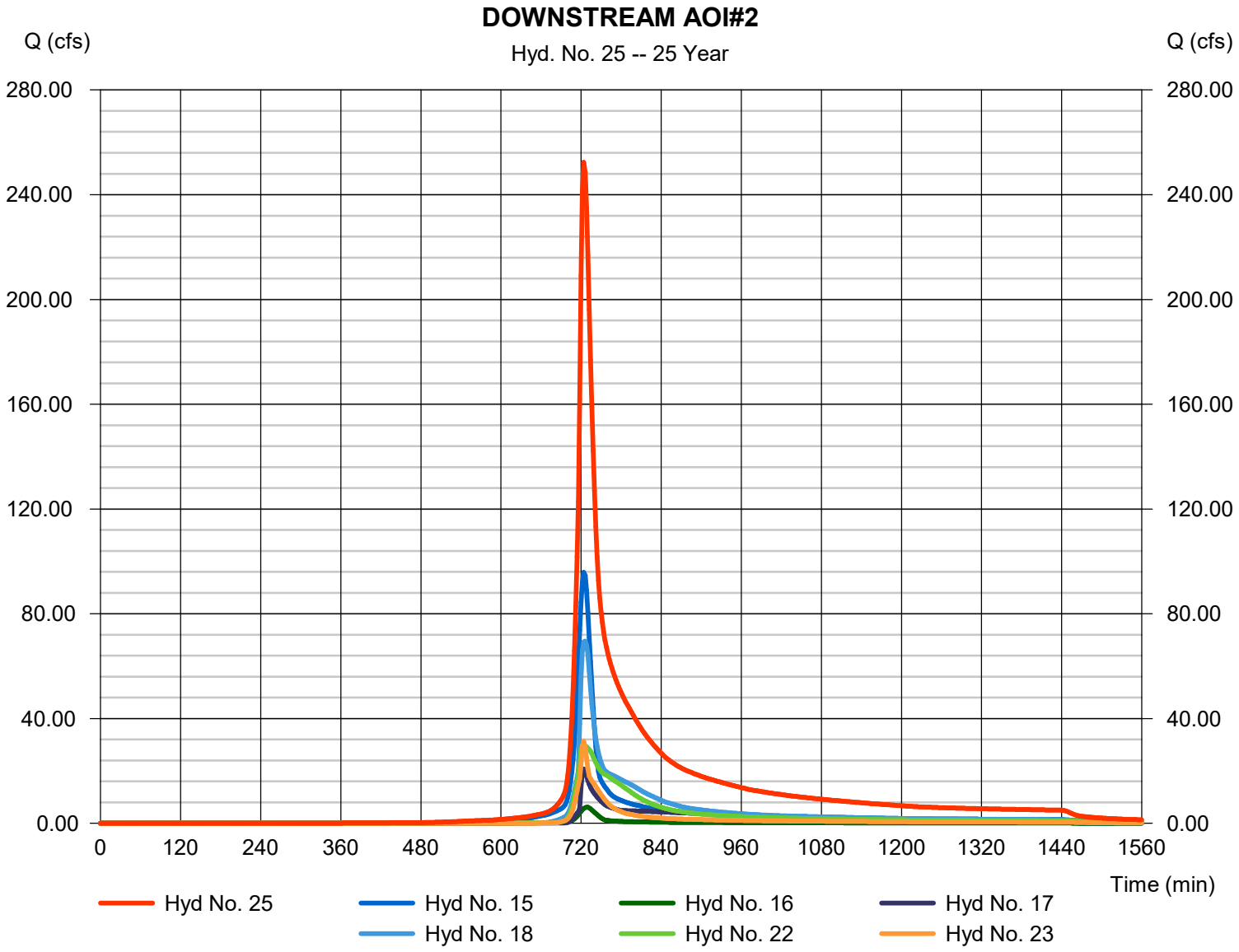


Hydrograph Report

Hyd. No. 25

DOWNSTREAM AOI#2

Hydrograph type	= Combine	Peak discharge	= 252.36 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,147,541 cuft
Inflow hyds.	= 15, 16, 17, 18, 22, 23	Contrib. drain. area	= 26.840 ac

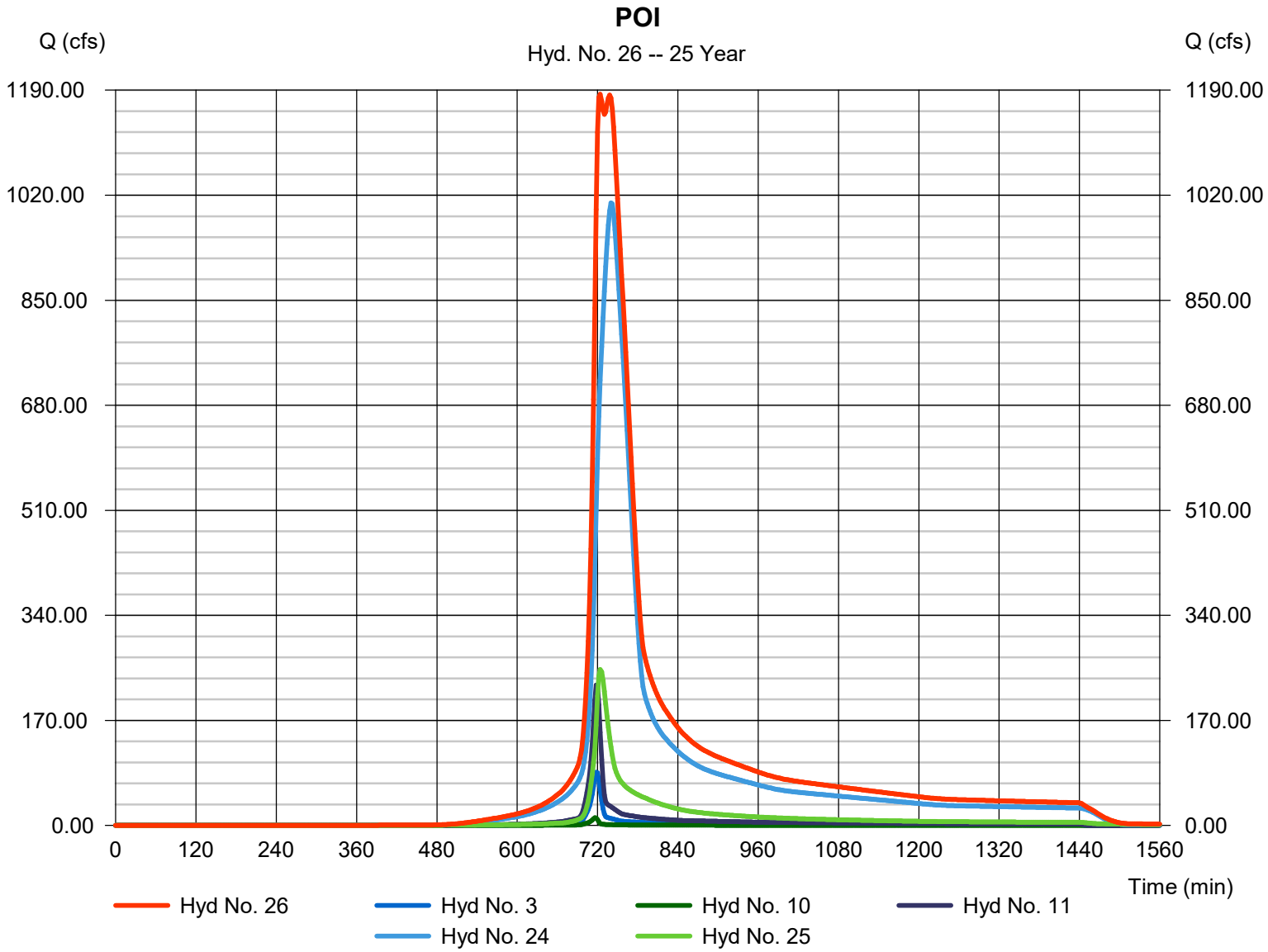


Hydrograph Report

Hyd. No. 26

POI

Hydrograph type	=	Combine	Peak discharge	=	1183.47 cfs
Storm frequency	=	25 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	7,693,368 cuft
Inflow hyds.	=	3, 10, 11, 24, 25	Contrib. drain. area	=	60.540 ac

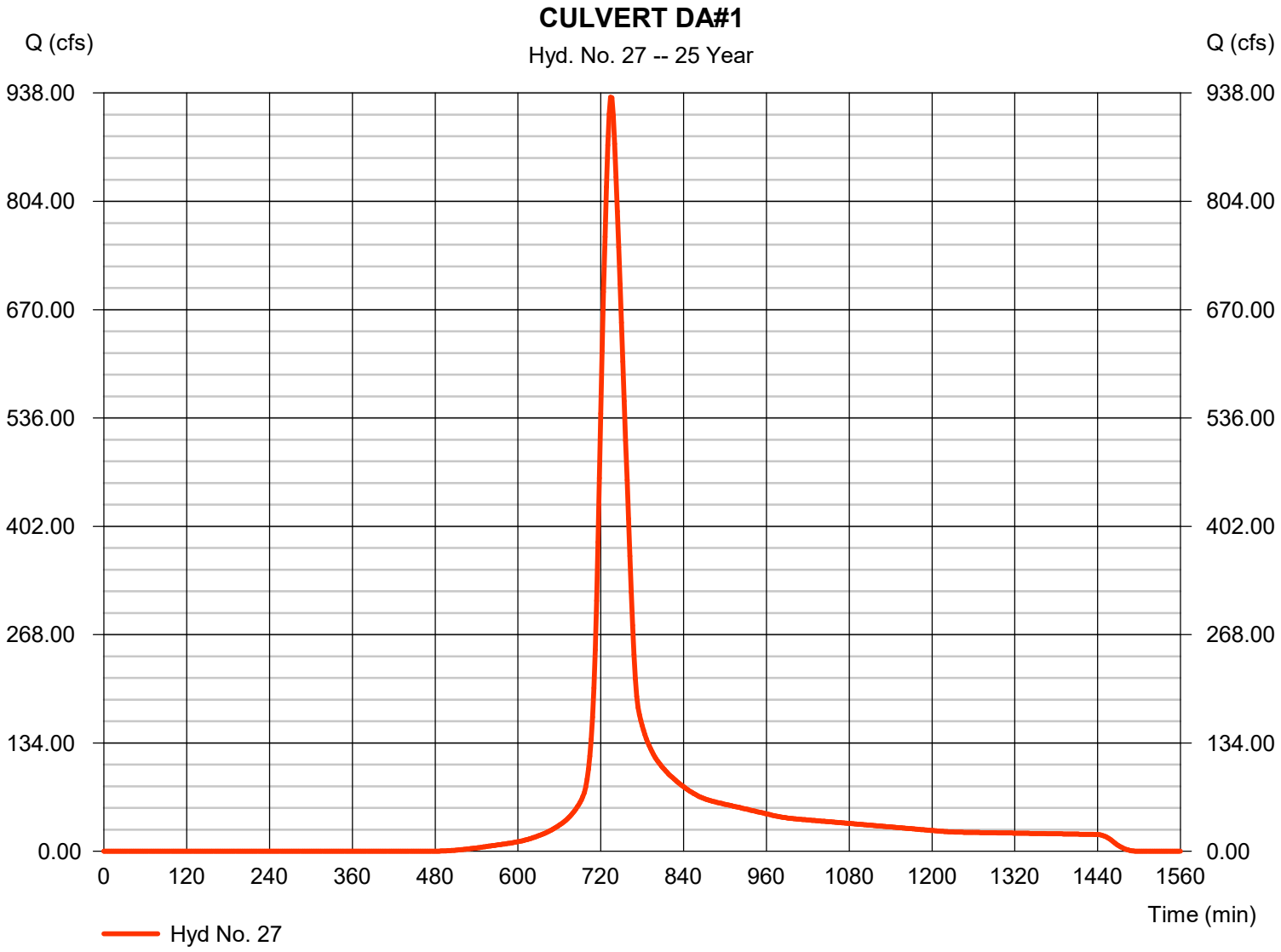


Hydrograph Report

Hyd. No. 27

CULVERT DA#1

Hydrograph type	=	SCS Runoff	Peak discharge	=	932.87 cfs
Storm frequency	=	25 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	4,239,097 cuft
Drainage area	=	356.710 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	34.90 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

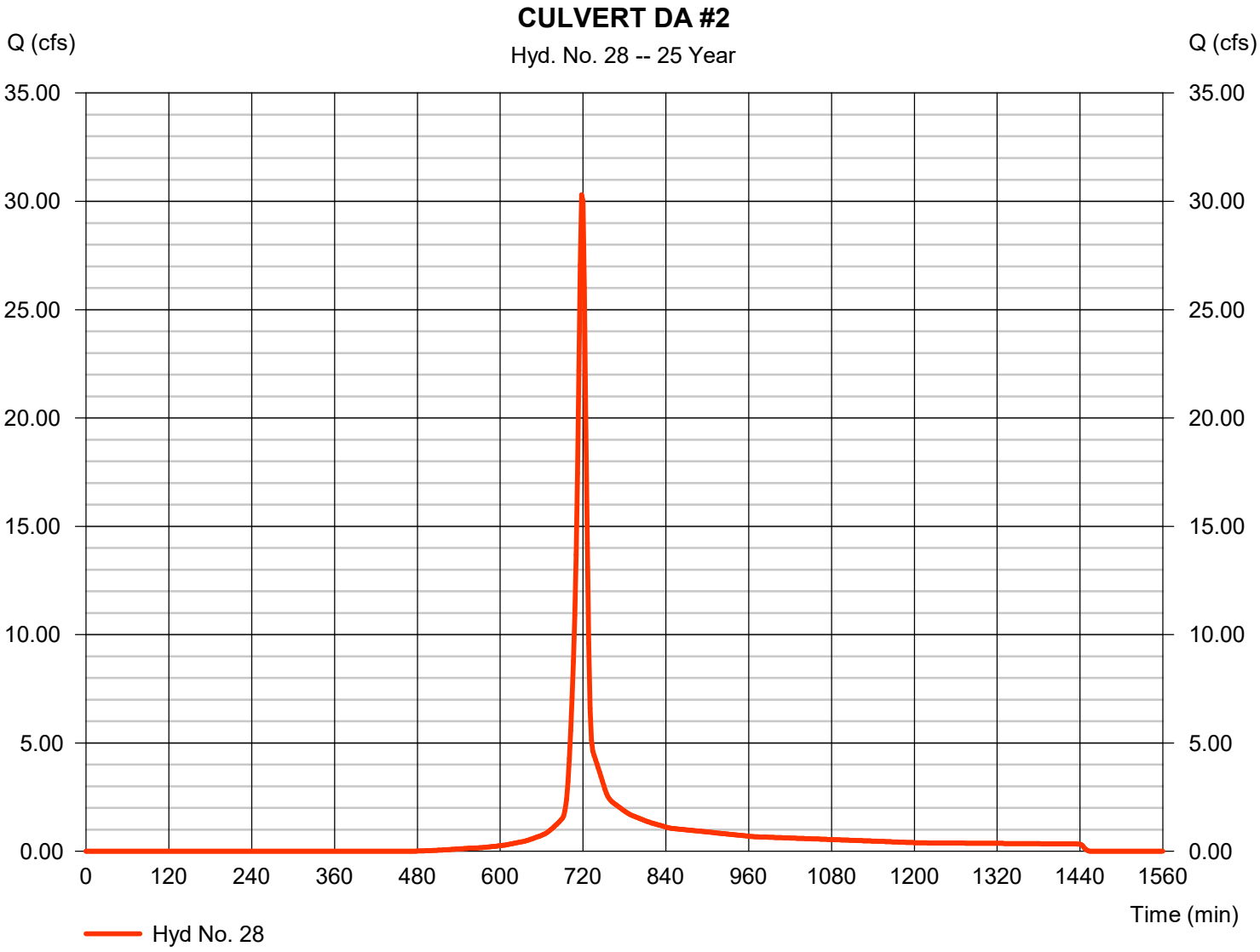


Hydrograph Report

Hyd. No. 28

CULVERT DA #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	30.30 cfs
Storm frequency	=	25 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	69,358 cuft
Drainage area	=	5.770 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.80 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

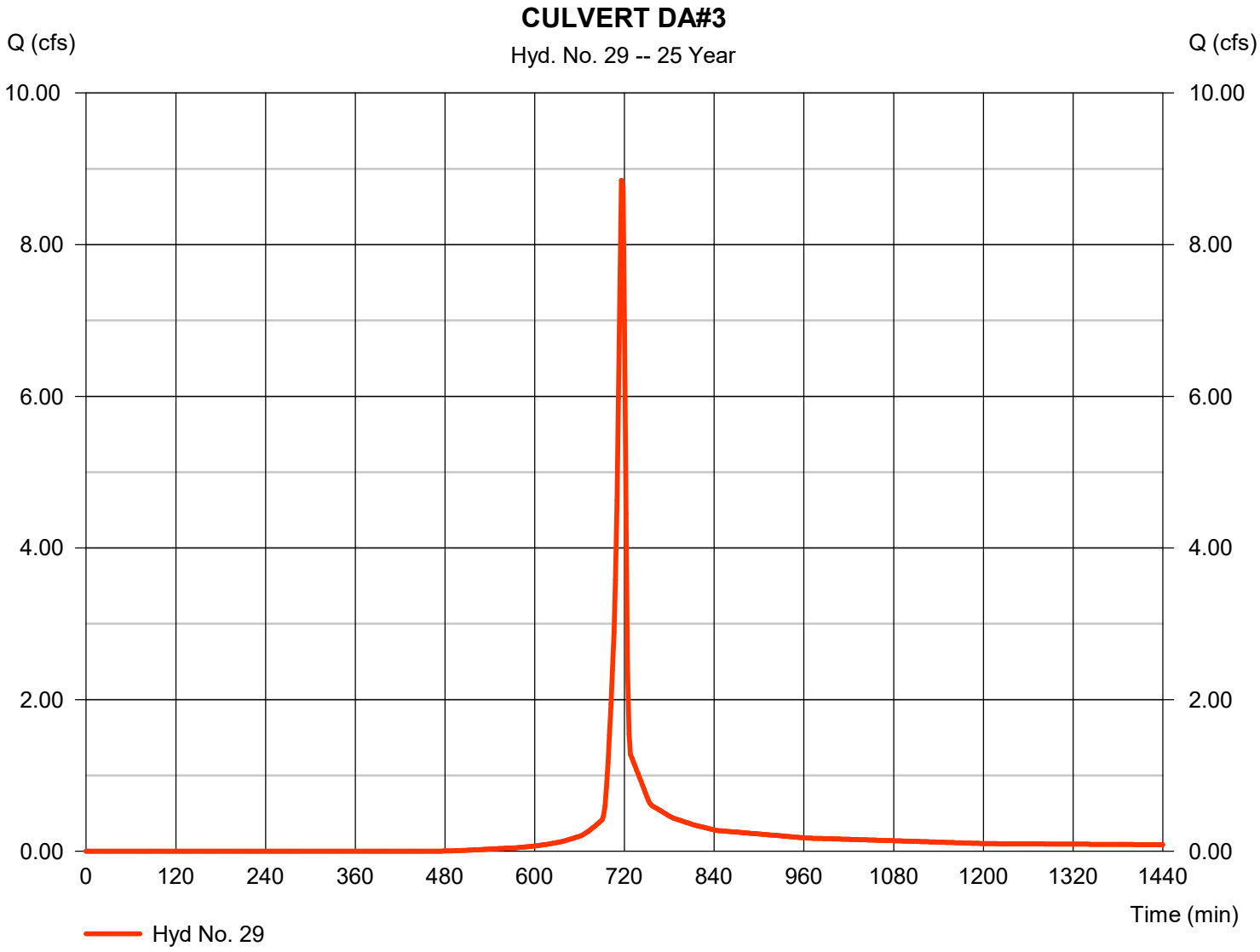


Hydrograph Report

Hyd. No. 29

CULVERT DA#3

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.850 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	17,918 cuft
Drainage area	=	1.590 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.15 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

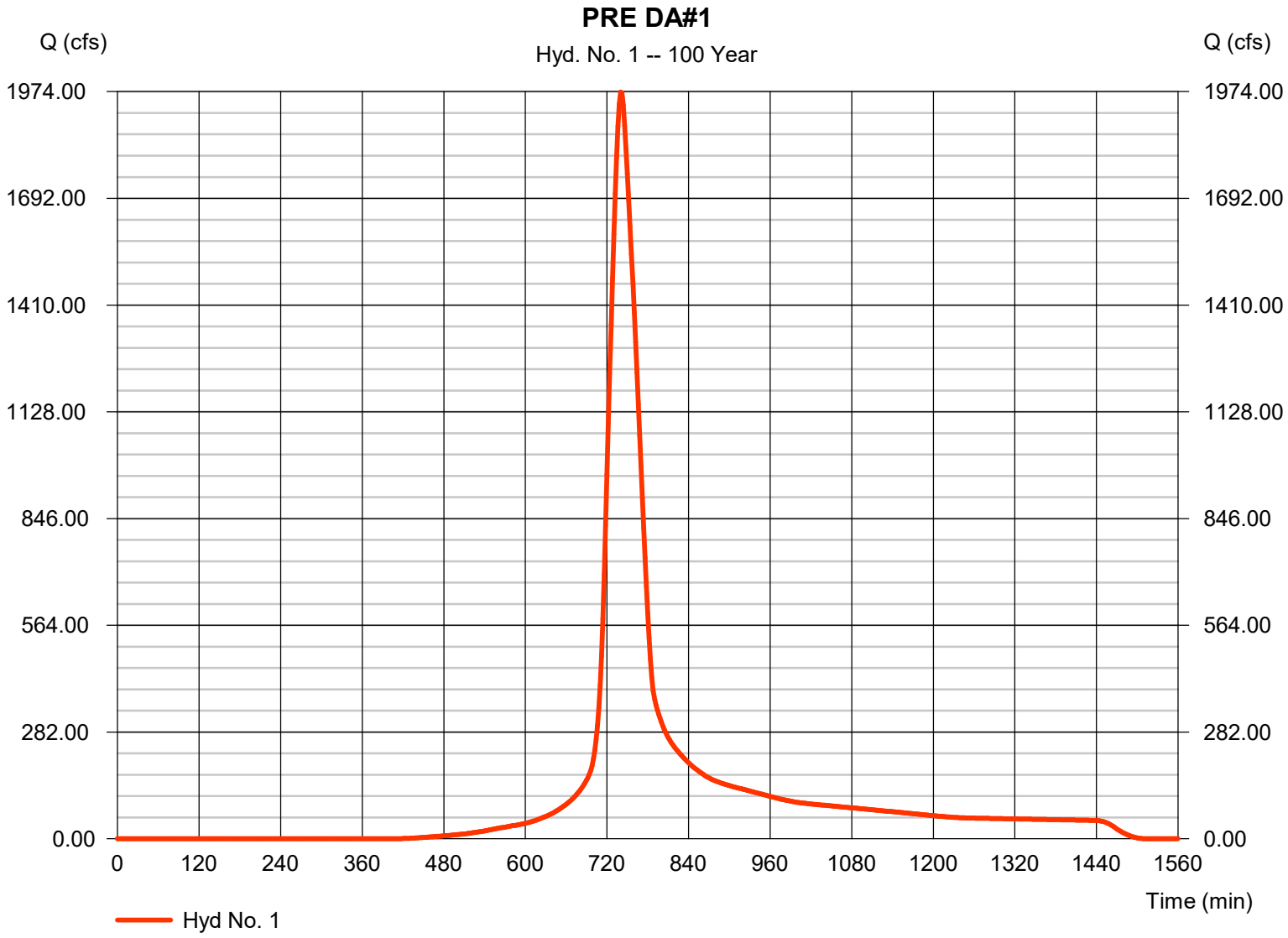
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1972.73	2	740	10,568,323	------	------	------	PRE DA#1
2	SCS Runoff	94.16	2	716	203,024	------	------	------	POST DA#1
3	SCS Runoff	121.00	2	718	280,169	------	------	------	POST DA#2
4	SCS Runoff	181.10	2	718	446,483	------	------	------	POST DA #3
5	SCS Runoff	103.80	2	716	230,527	------	------	------	POST DA#4
6	SCS Runoff	33.83	2	716	73,440	------	------	------	POST DA#5
7	SCS Runoff	113.86	2	722	335,175	------	------	------	POST DA#6
8	SCS Runoff	142.39	2	716	316,215	------	------	------	POST DA#7
9	SCS Runoff	62.19	2	718	152,216	------	------	------	POST DA#8
10	SCS Runoff	16.55	2	716	35,053	------	------	------	POST DA NCDOT
11	SCS Runoff	323.41	2	718	745,298	------	------	------	ON SITE - UNDEVELOPED
12	SCS Runoff	23.49	2	716	52,178	------	------	------	BYPASS #1
13	SCS Runoff	117.82	2	722	331,326	------	------	------	EXISTING DA 1
14	SCS Runoff	1354.14	2	740	7,254,422	------	------	------	EXISTING DA 2
15	SCS Runoff	137.16	2	724	429,430	------	------	------	EXISTING DA 3
16	SCS Runoff	8.874	2	728	32,569	------	------	------	EXISTING DA 4
17	Reservoir	28.29	2	724	198,782	2	266.52	98,453	POST DA#1 TO SCM#1
18	Reservoir	130.87	2	722	441,334	4	245.99	164,801	POST DA#3 TO SCM#3
19	Reservoir	74.12	2	720	226,809	5	244.80	89,492	POST DA#4 TO SCM#4
20	Reservoir	23.34	2	720	72,777	6	253.59	28,722	POST DA#5 TO SCM#5
21	Reservoir	59.84	2	732	332,686	7	243.00	145,474	POST DA#6 TO SCM#6
22	Reservoir	57.54	2	722	312,917	8	244.95	145,926	POST DA#7 TO SCM#7
23	Reservoir	49.33	2	722	150,846	9	244.77	47,801	POST DA#8 TO SCM#8
24	Combine	1444.65	2	740	8,270,196	12, 13, 14, 19, 20, 21,	------	------	UPSTREAM AOI#1
25	Combine	407.65	2	724	1,565,878	15, 16, 17, 18, 22, 23,	------	------	DOWNSTREAM AOI#2
26	Combine	1791.92	2	722	10,896,591	3, 10, 11, 24, 25	------	------	POI
27	SCS Runoff	1341.90	2	734	6,077,089	------	------	------	CULVERT DA#1
28	SCS Runoff	43.15	2	718	99,431	------	------	------	CULVERT DA #2
29	SCS Runoff	12.57	2	716	25,687	------	------	------	CULVERT DA#3

Hydrograph Report

Hyd. No. 1

PRE DA#1

Hydrograph type	=	SCS Runoff	Peak discharge	=	1972.73 cfs
Storm frequency	=	100 yrs	Time to peak	=	740 min
Time interval	=	2 min	Hyd. volume	=	10,568,323 cuft
Drainage area	=	618.810 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	47.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

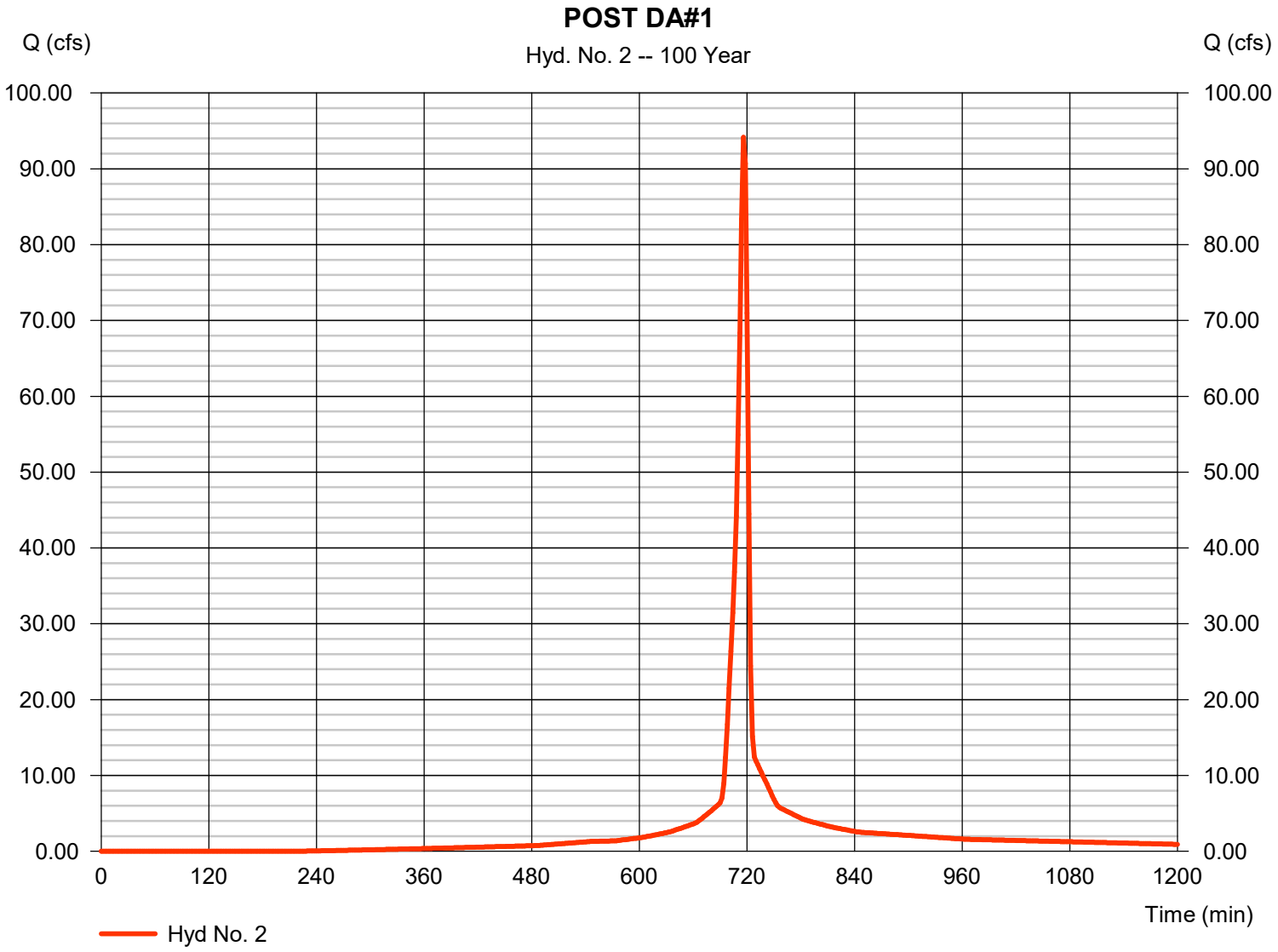


Hydrograph Report

Hyd. No. 2

POST DA#1

Hydrograph type	=	SCS Runoff	Peak discharge	=	94.16 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	203,024 cuft
Drainage area	=	9.720 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.50 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

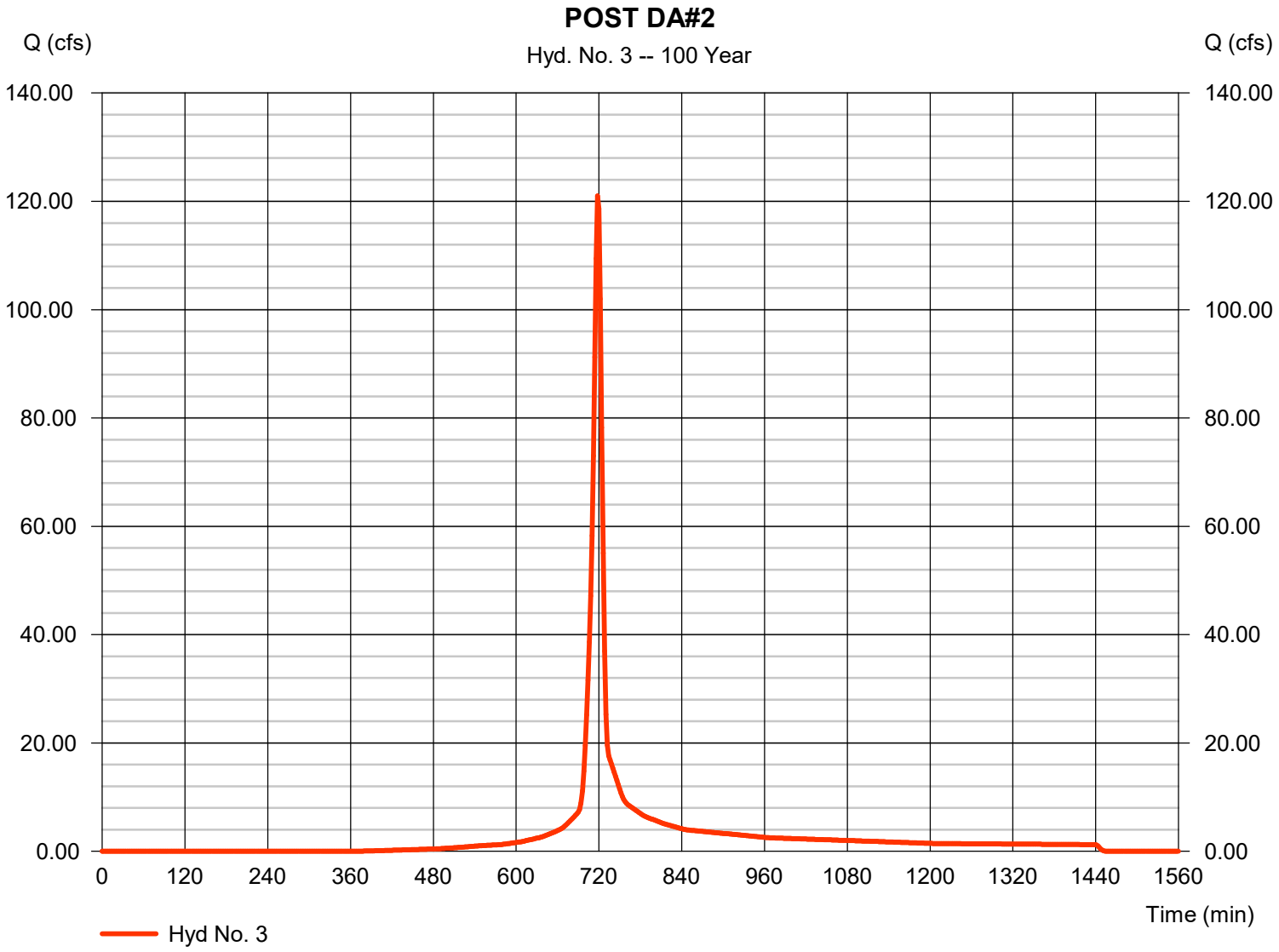


Hydrograph Report

Hyd. No. 3

POST DA#2

Hydrograph type	=	SCS Runoff	Peak discharge	=	121.00 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	280,169 cuft
Drainage area	=	15.510 ac	Curve number	=	76
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

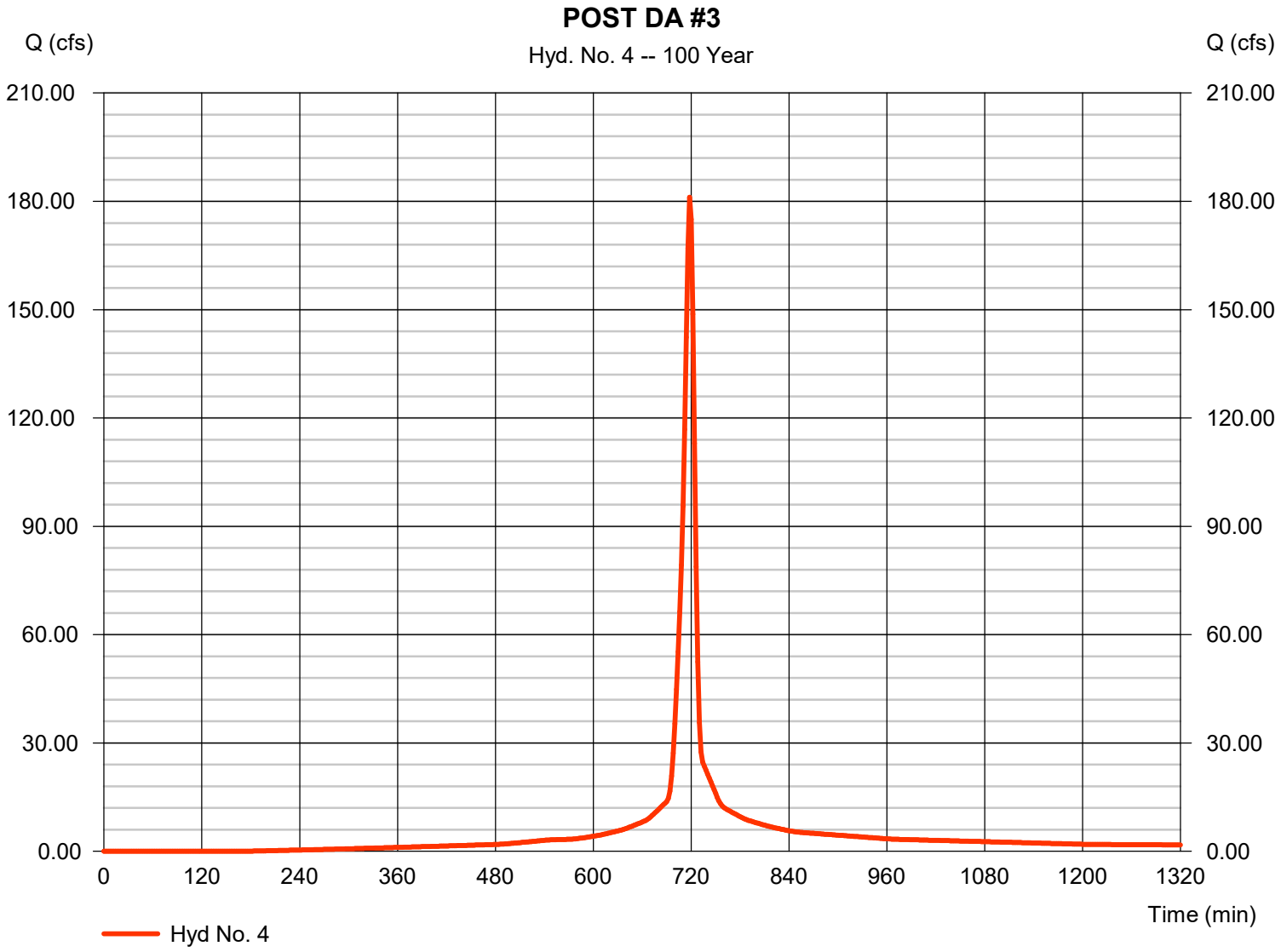


Hydrograph Report

Hyd. No. 4

POST DA #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	181.10 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	446,483 cuft
Drainage area	=	18.950 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.40 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

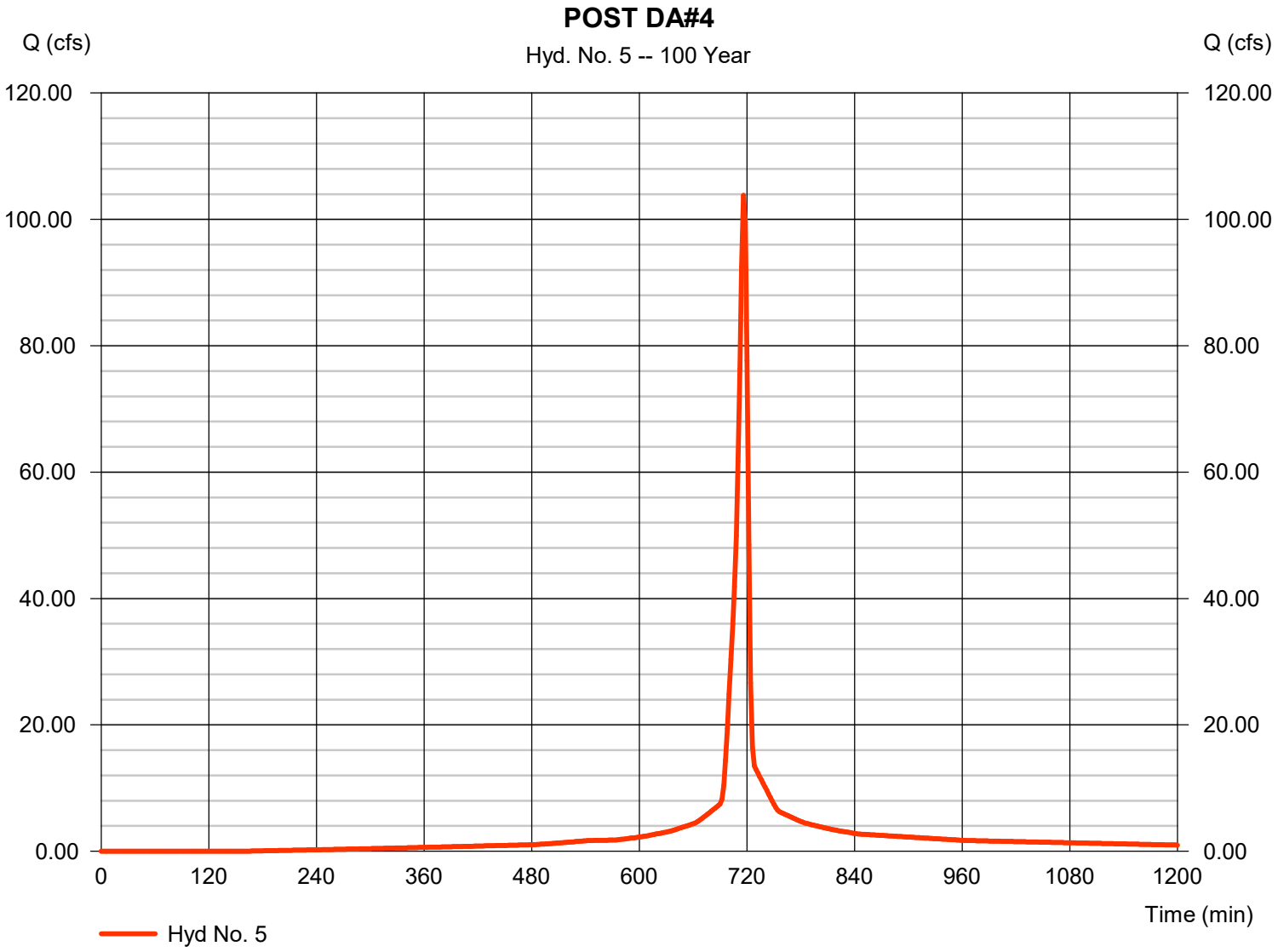


Hydrograph Report

Hyd. No. 5

POST DA#4

Hydrograph type	=	SCS Runoff	Peak discharge	=	103.80 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	230,527 cuft
Drainage area	=	10.250 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.30 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

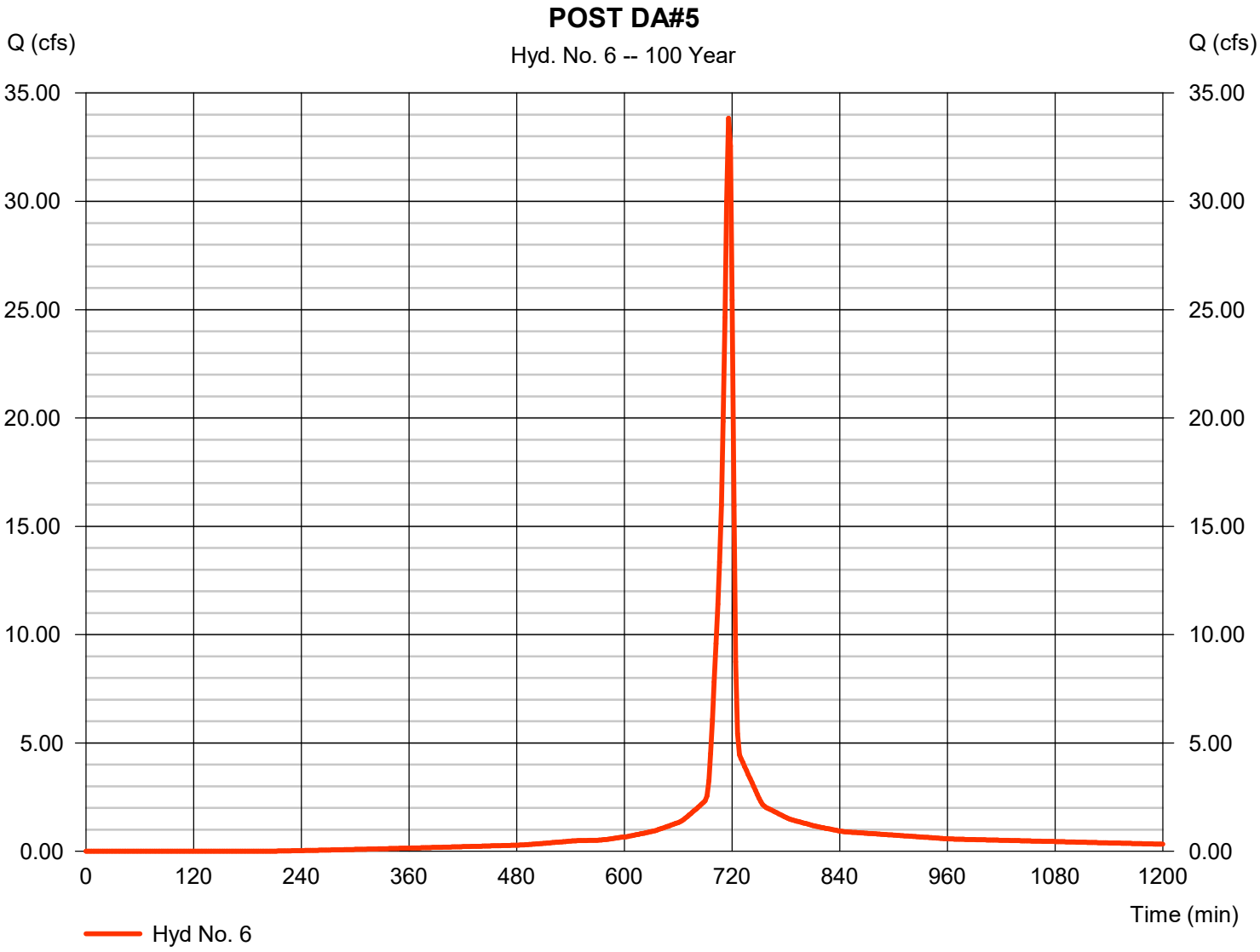


Hydrograph Report

Hyd. No. 6

POST DA#5

Hydrograph type	=	SCS Runoff	Peak discharge	=	33.83 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	73,440 cuft
Drainage area	=	3.450 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

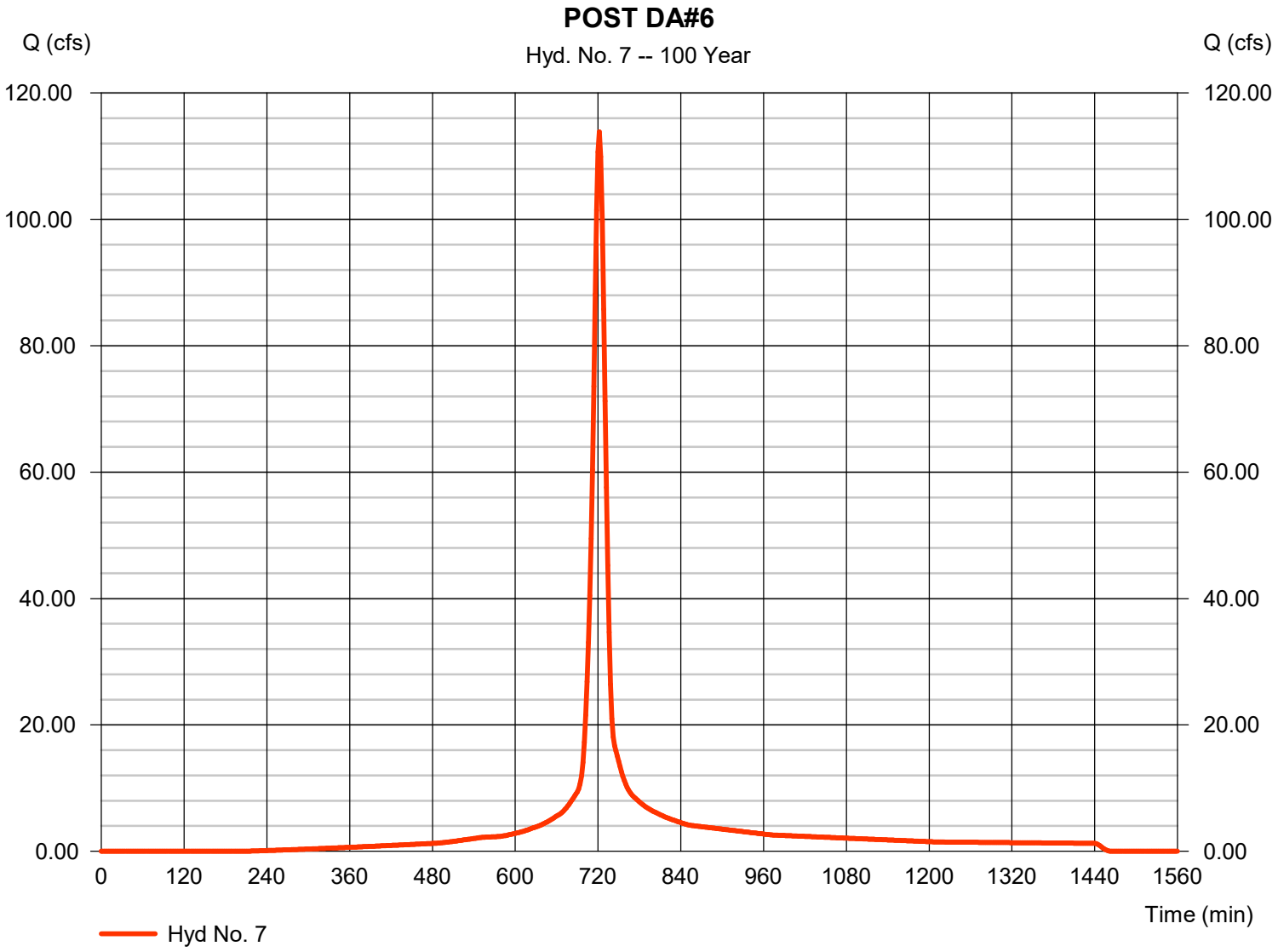


Hydrograph Report

Hyd. No. 7

POST DA#6

Hydrograph type	=	SCS Runoff	Peak discharge	=	113.86 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	335,175 cuft
Drainage area	=	15.140 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	14.80 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

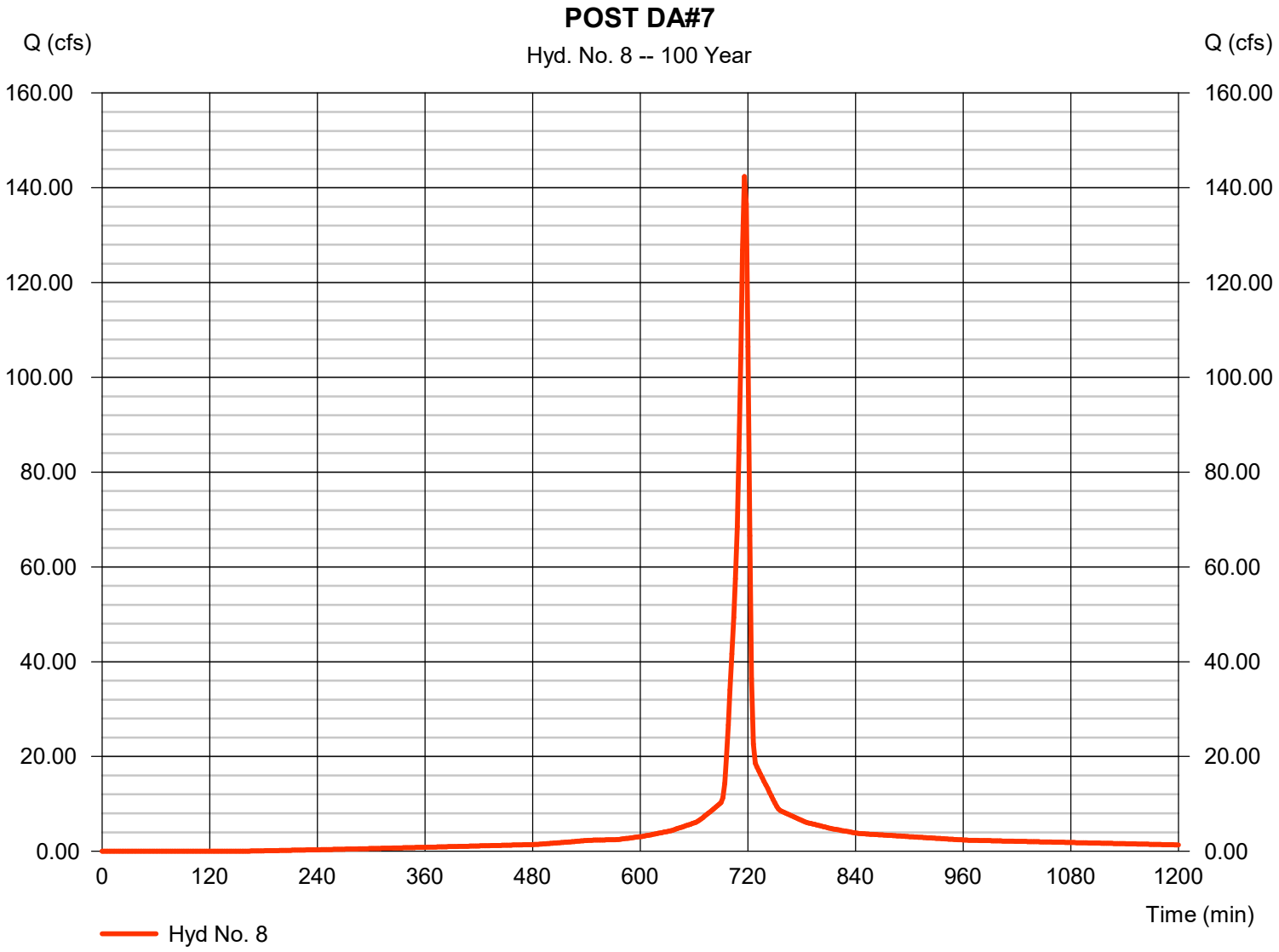


Hydrograph Report

Hyd. No. 8

POST DA#7

Hydrograph type	=	SCS Runoff	Peak discharge	=	142.39 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	316,215 cuft
Drainage area	=	14.060 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.20 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

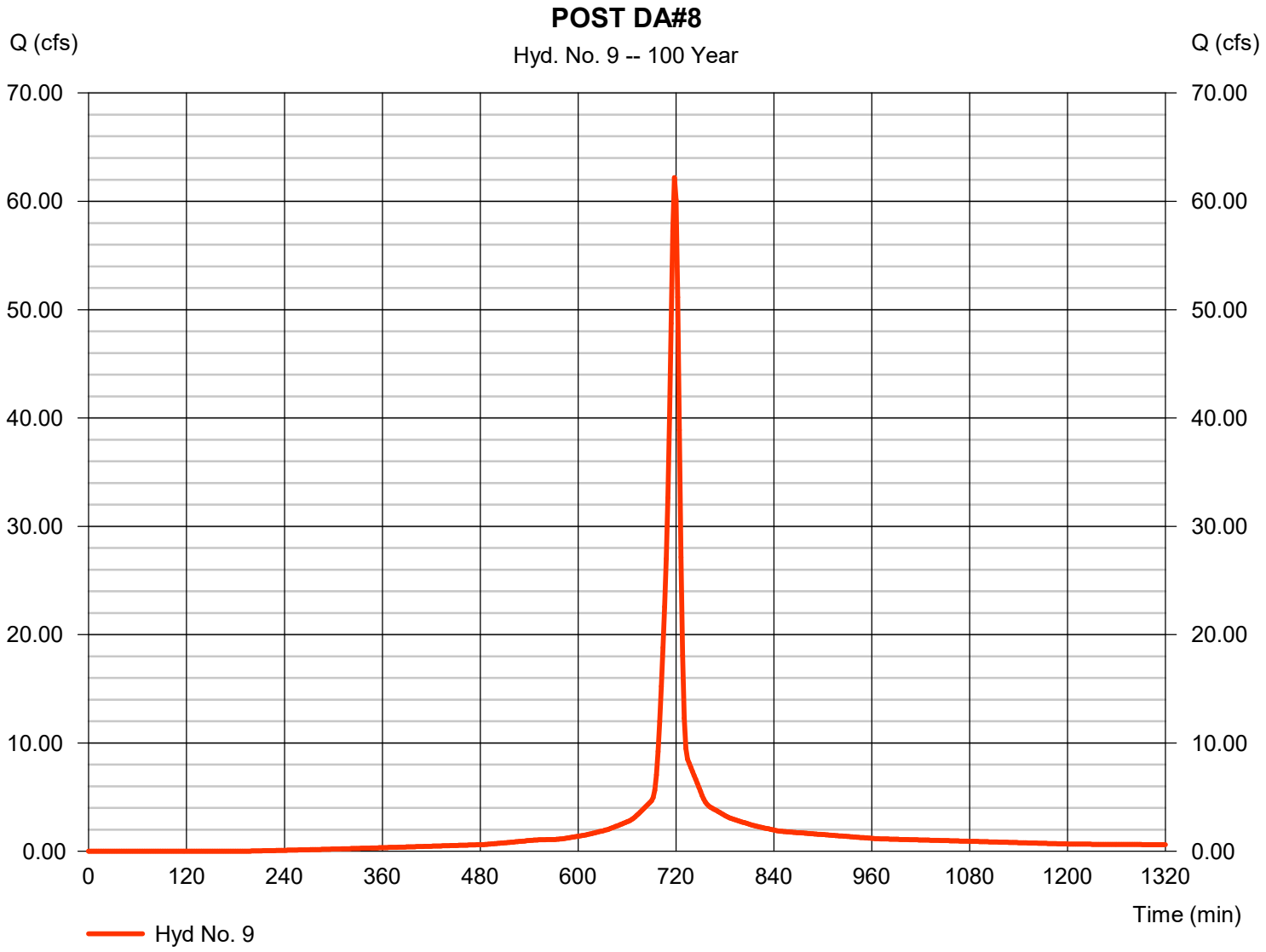


Hydrograph Report

Hyd. No. 9

POST DA#8

Hydrograph type	=	SCS Runoff	Peak discharge	=	62.19 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	152,216 cuft
Drainage area	=	6.580 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.80 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

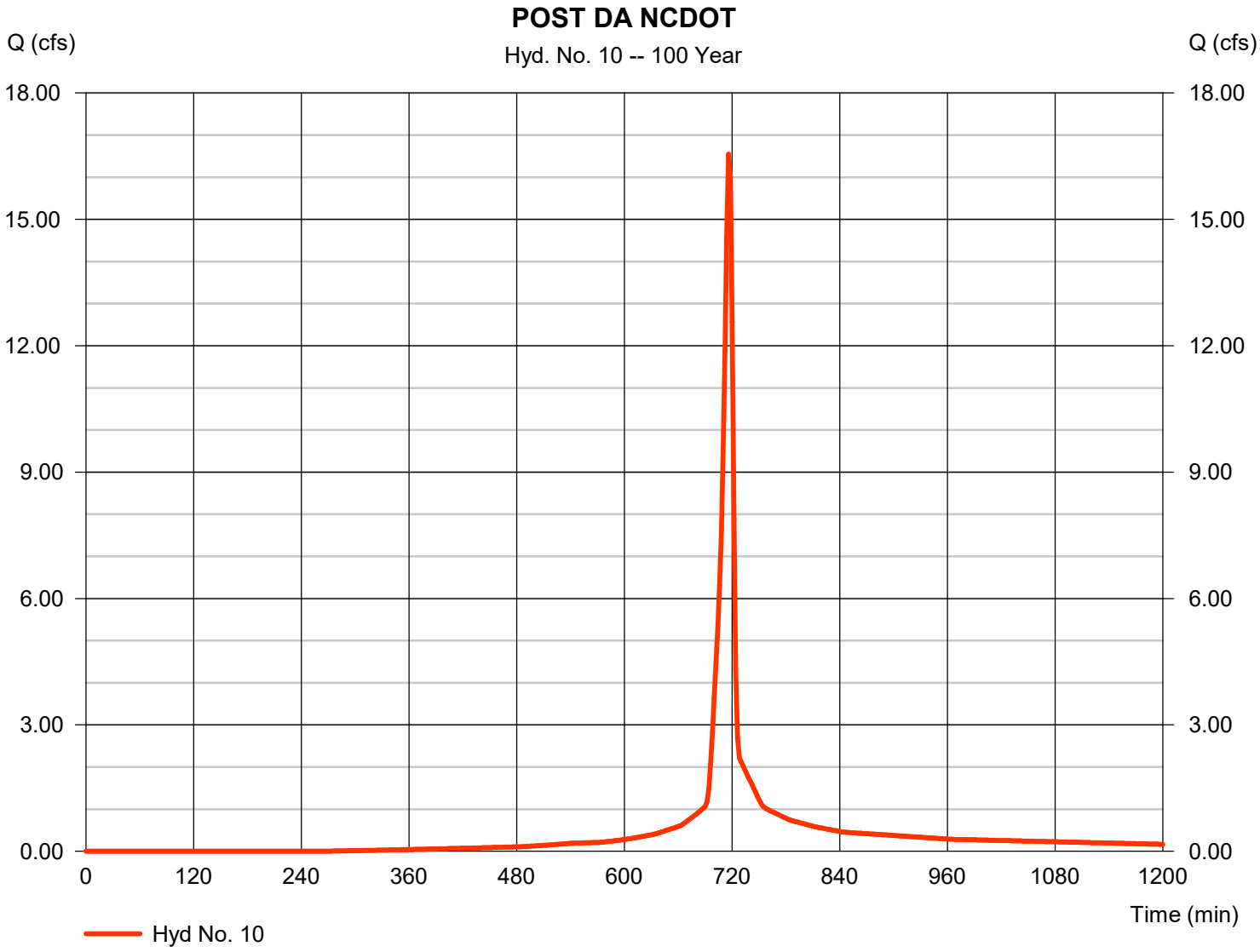


Hydrograph Report

Hyd. No. 10

POST DA NCDOT

Hydrograph type	=	SCS Runoff	Peak discharge	=	16.55 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	35,053 cuft
Drainage area	=	1.780 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

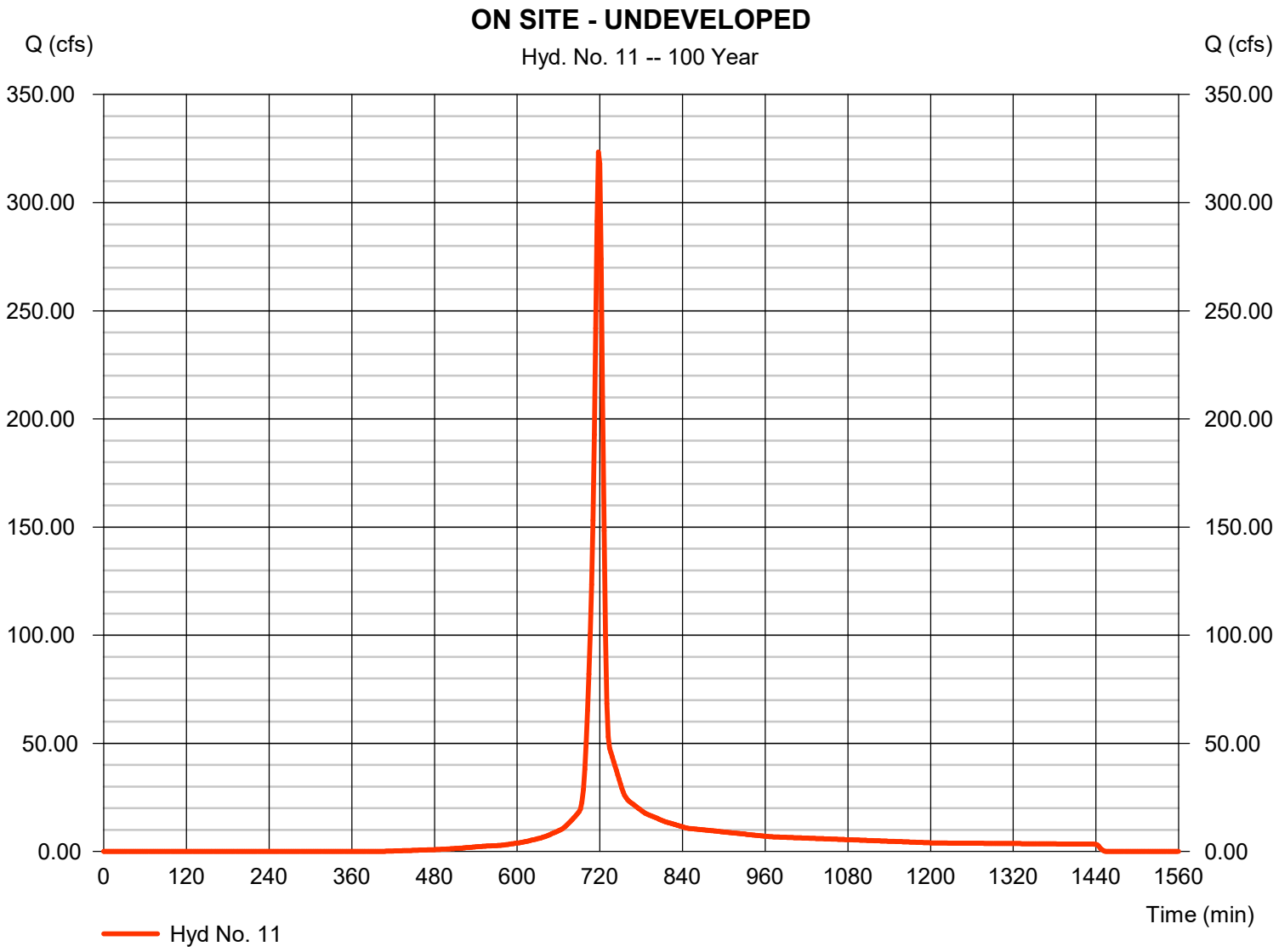


Hydrograph Report

Hyd. No. 11

ON SITE - UNDEVELOPED

Hydrograph type	= SCS Runoff	Peak discharge	= 323.41 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 745,298 cuft
Drainage area	= 43.250 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.00 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

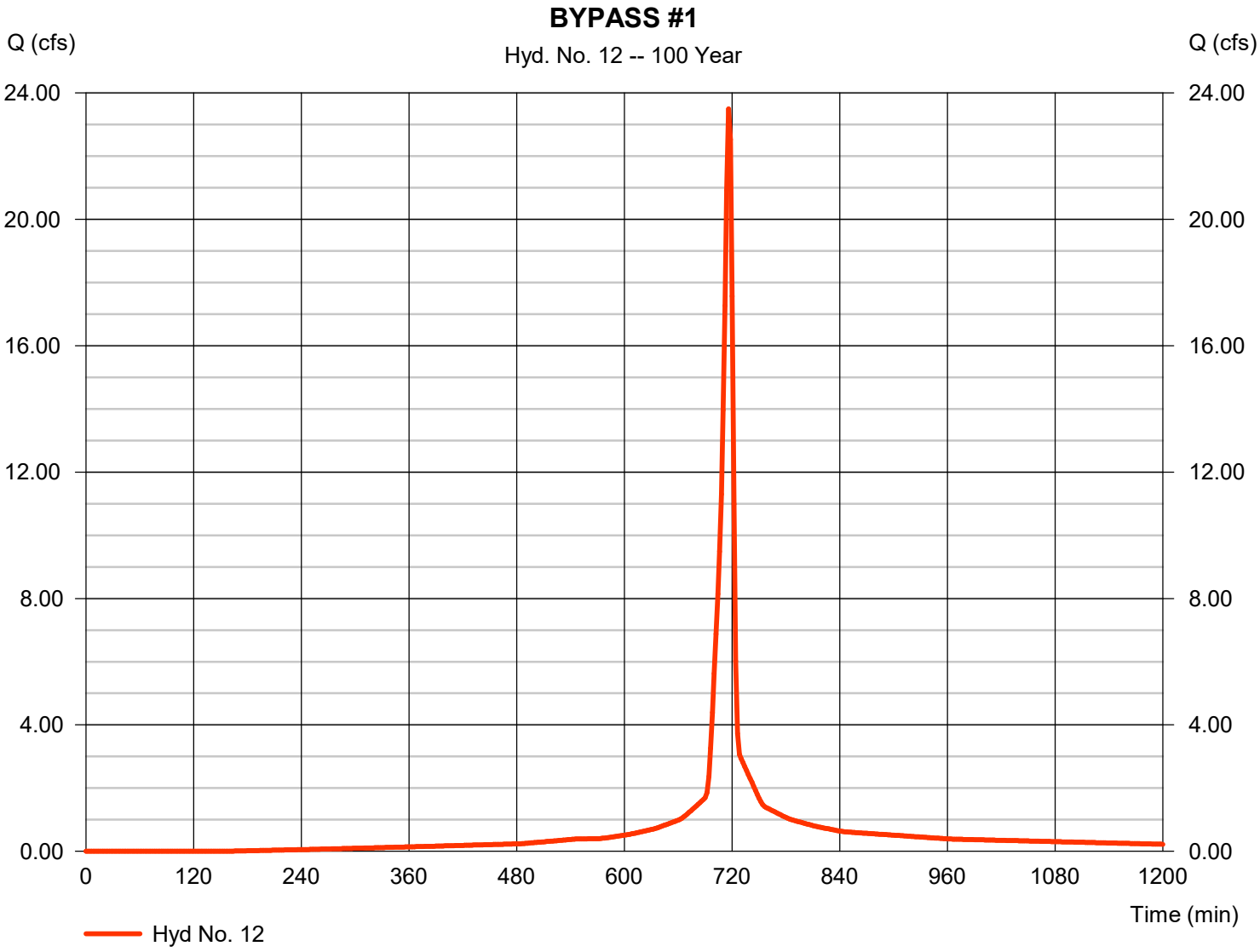


Hydrograph Report

Hyd. No. 12

BYPASS #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	23.49 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	52,178 cuft
Drainage area	=	2.320 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

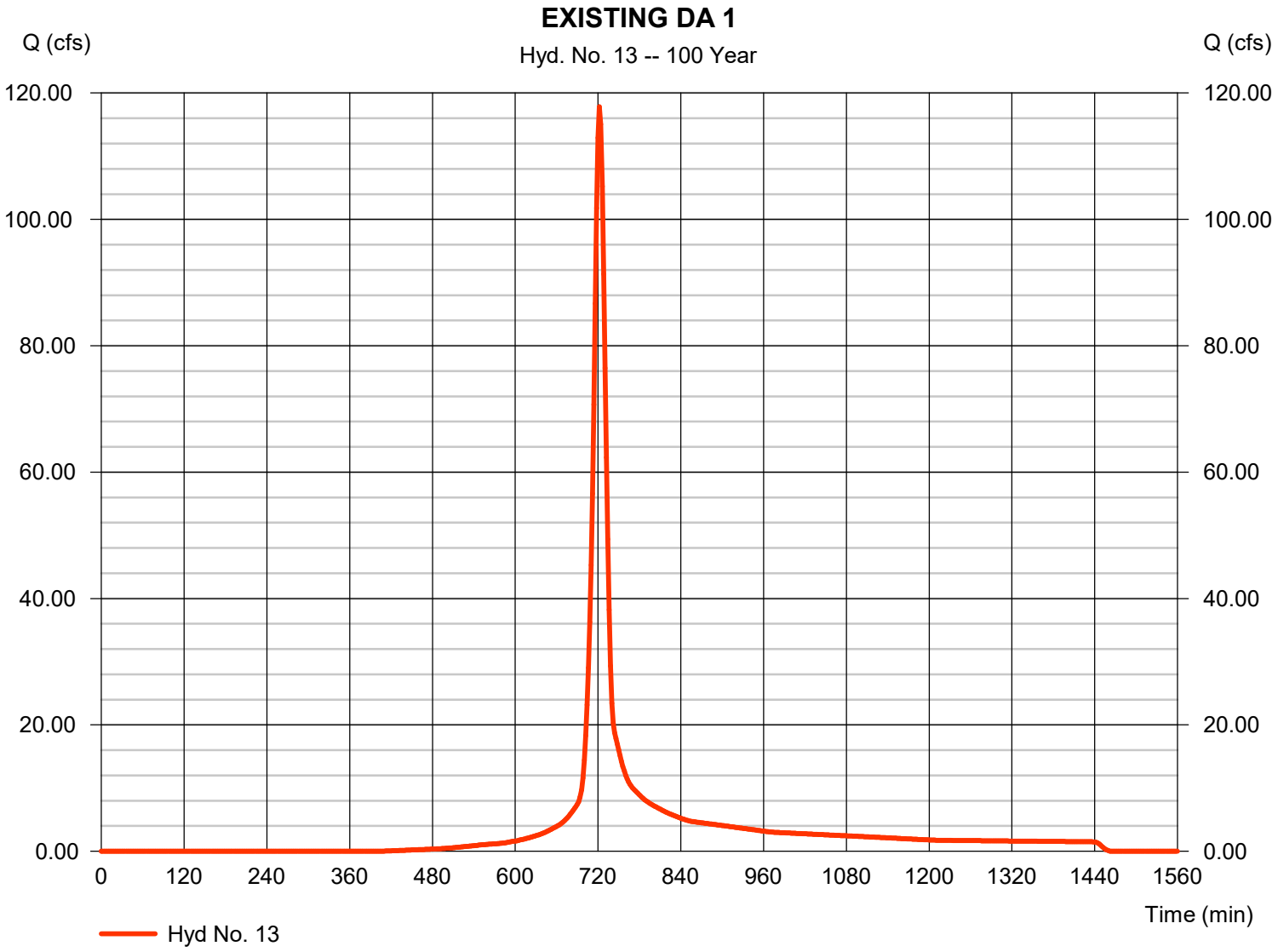


Hydrograph Report

Hyd. No. 13

EXISTING DA 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	117.82 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	331,326 cuft
Drainage area	=	19.720 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	14.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

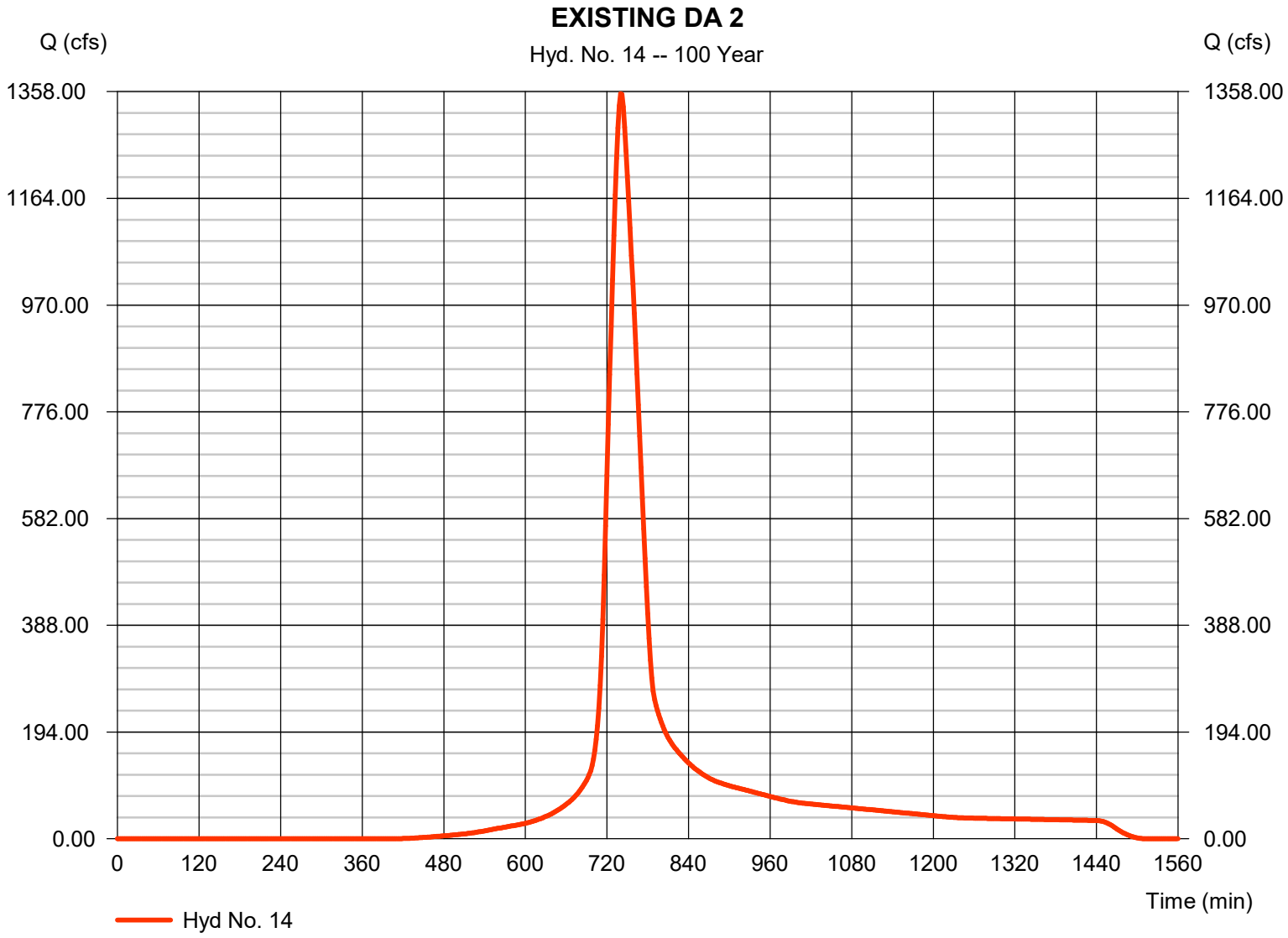


Hydrograph Report

Hyd. No. 14

EXISTING DA 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	1354.14 cfs
Storm frequency	=	100 yrs	Time to peak	=	740 min
Time interval	=	2 min	Hyd. volume	=	7,254,422 cuft
Drainage area	=	424.770 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	47.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

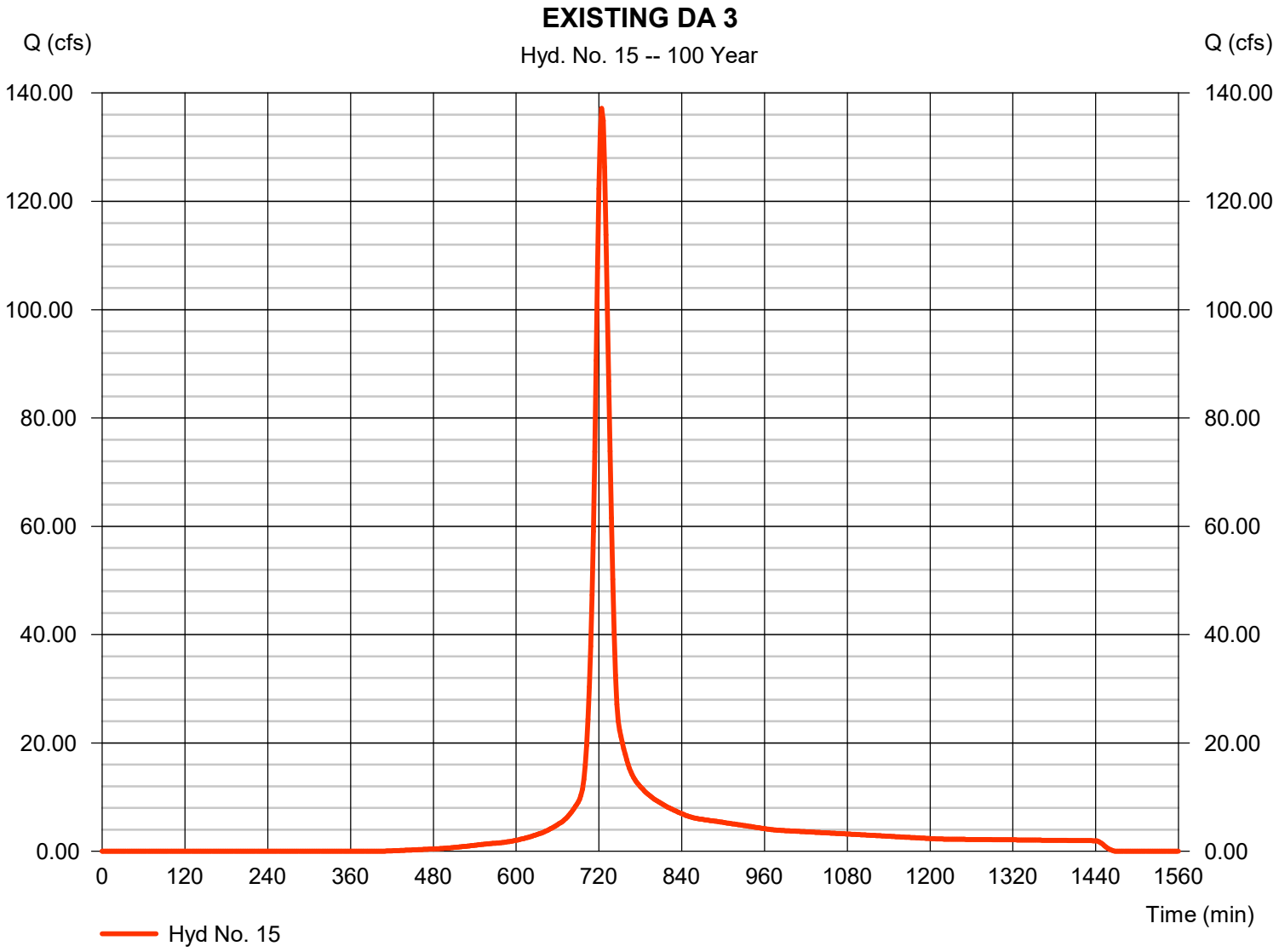


Hydrograph Report

Hyd. No. 15

EXISTING DA 3

Hydrograph type	=	SCS Runoff	Peak discharge	=	137.16 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	429,430 cuft
Drainage area	=	24.920 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	19.60 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

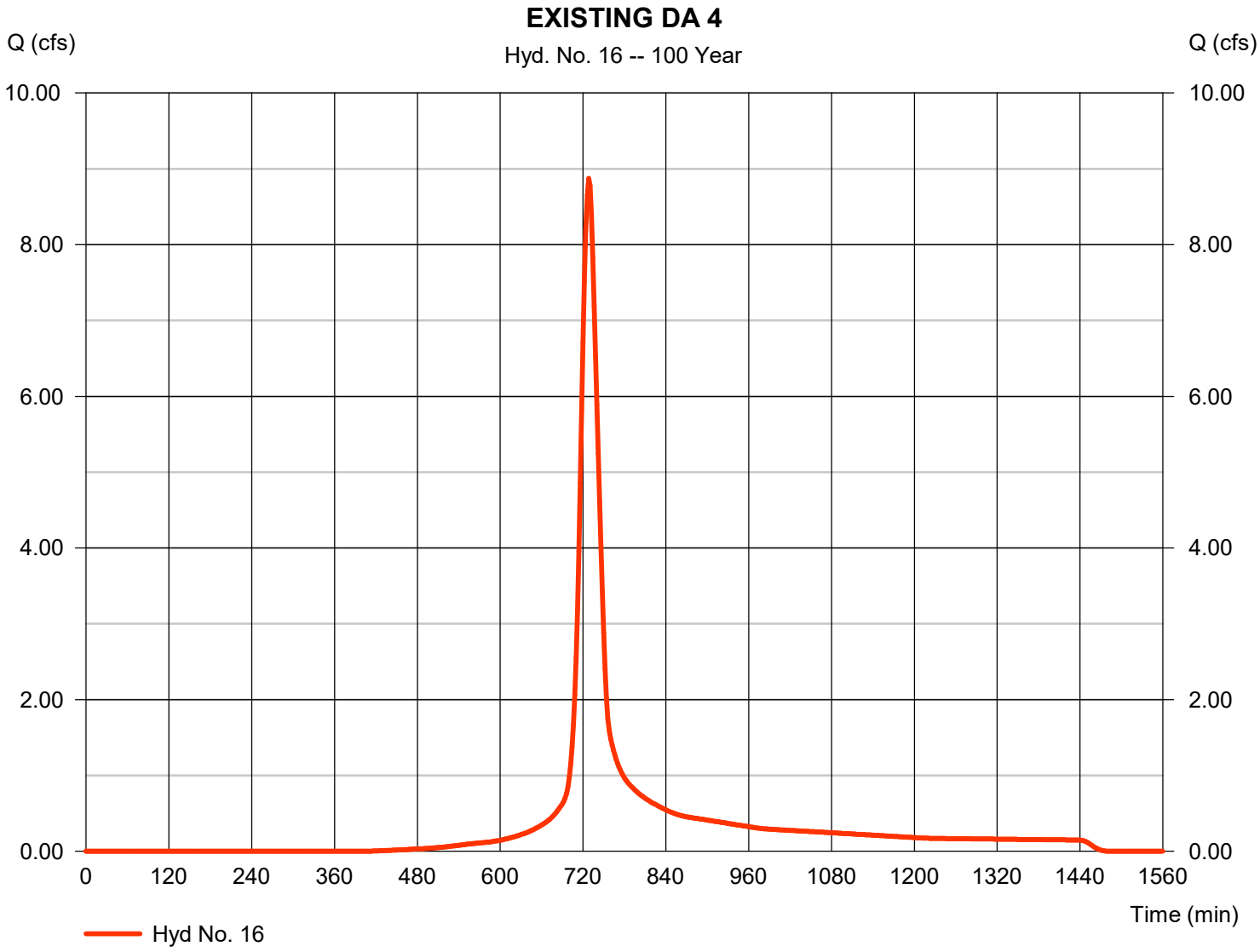


Hydrograph Report

Hyd. No. 16

EXISTING DA 4

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.874 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	32,569 cuft
Drainage area	=	1.920 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	26.20 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

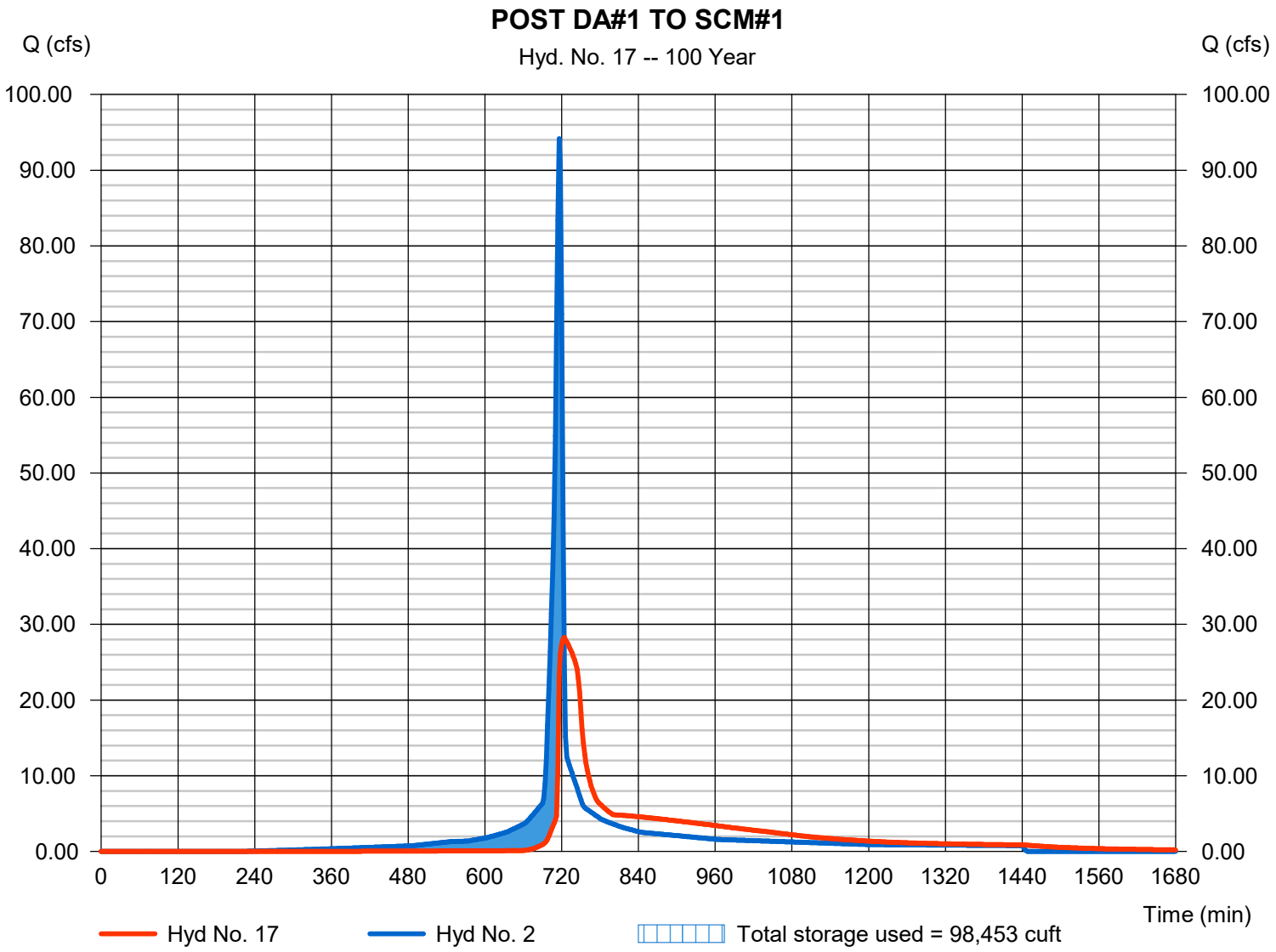
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Thursday, 05 / 22 / 2025

Hyd. No. 17

POST DA#1 TO SCM#1

Hydrograph type	=	Reservoir	Peak discharge	=	28.29 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	198,782 cuft
Inflow hyd. No.	=	2 - POST DA#1	Max. Elevation	=	266.52 ft
Reservoir name	=	SCM#1	Max. Storage	=	98,453 cuft

Storage Indication method used.



Hydrograph Report

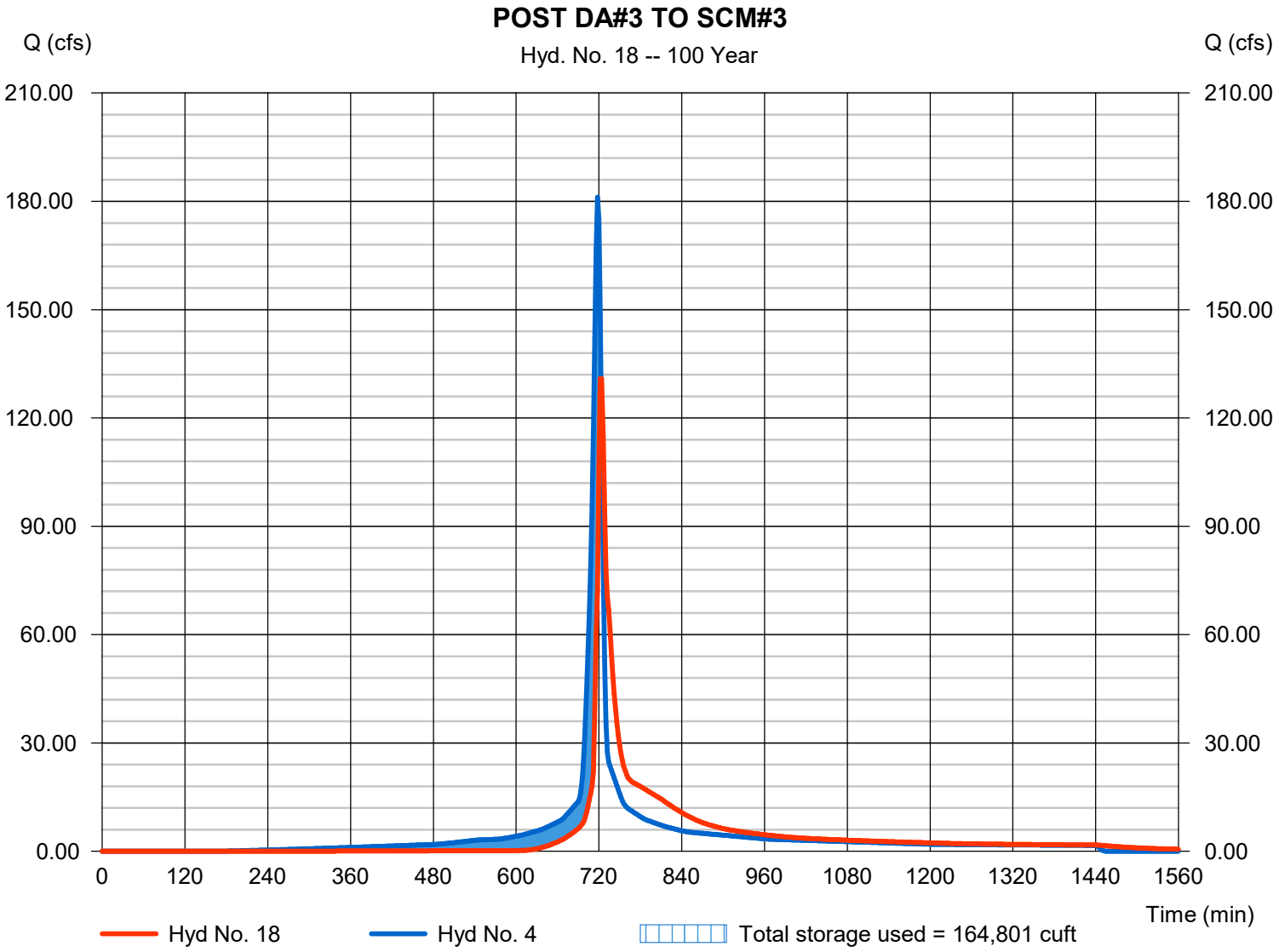
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Thursday, 05 / 22 / 2025

Hyd. No. 18

POST DA#3 TO SCM#3

Hydrograph type	= Reservoir	Peak discharge	= 130.87 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 441,334 cuft
Inflow hyd. No.	= 4 - POST DA #3	Max. Elevation	= 245.99 ft
Reservoir name	= SCM#3	Max. Storage	= 164,801 cuft

Storage Indication method used.



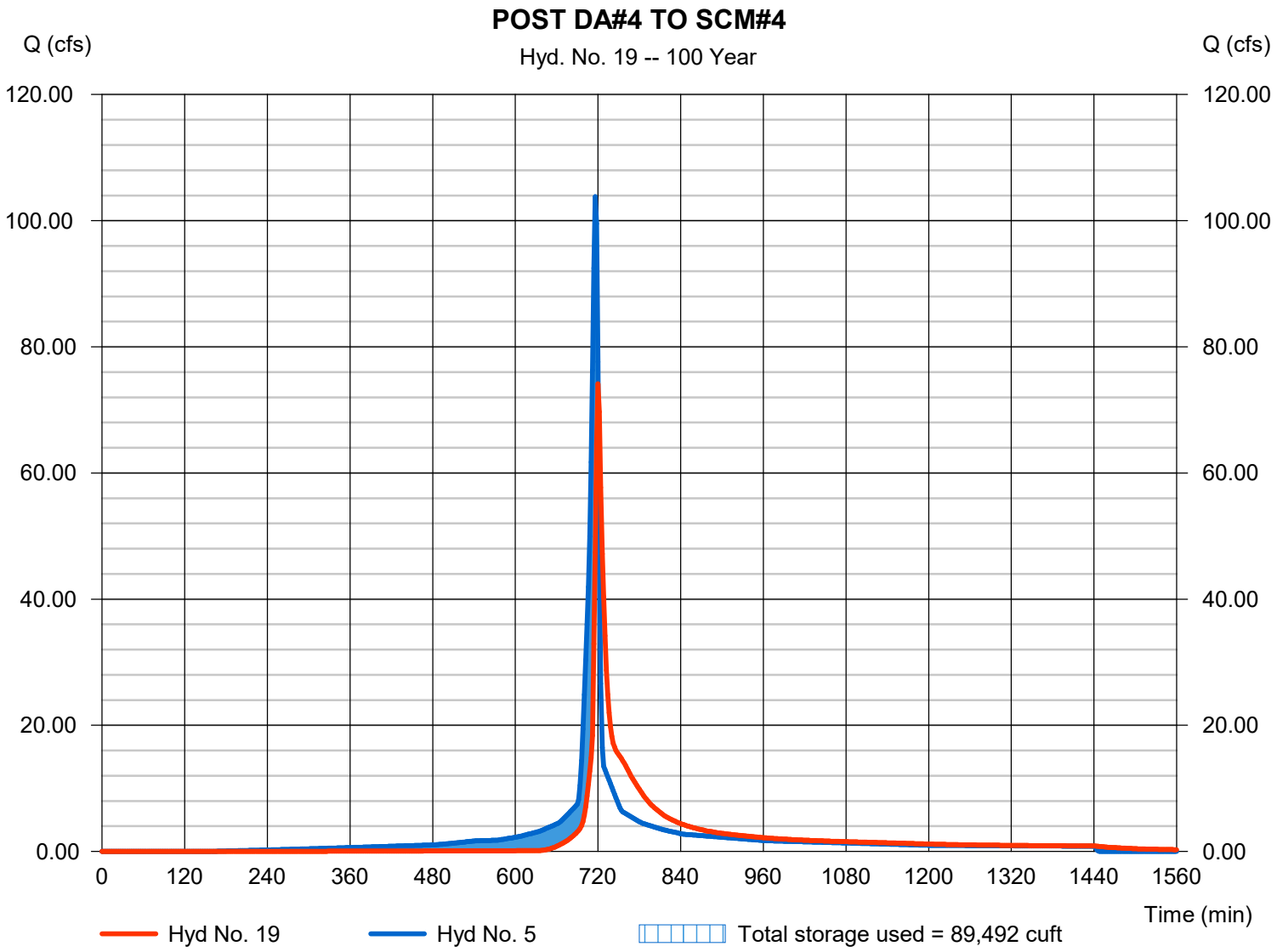
Hydrograph Report

Hyd. No. 19

POST DA#4 TO SCM#4

Hydrograph type	=	Reservoir	Peak discharge	=	74.12 cfs
Storm frequency	=	100 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	226,809 cuft
Inflow hyd. No.	=	5 - POST DA#4	Max. Elevation	=	244.80 ft
Reservoir name	=	SCM#4	Max. Storage	=	89,492 cuft

Storage Indication method used.



Hydrograph Report

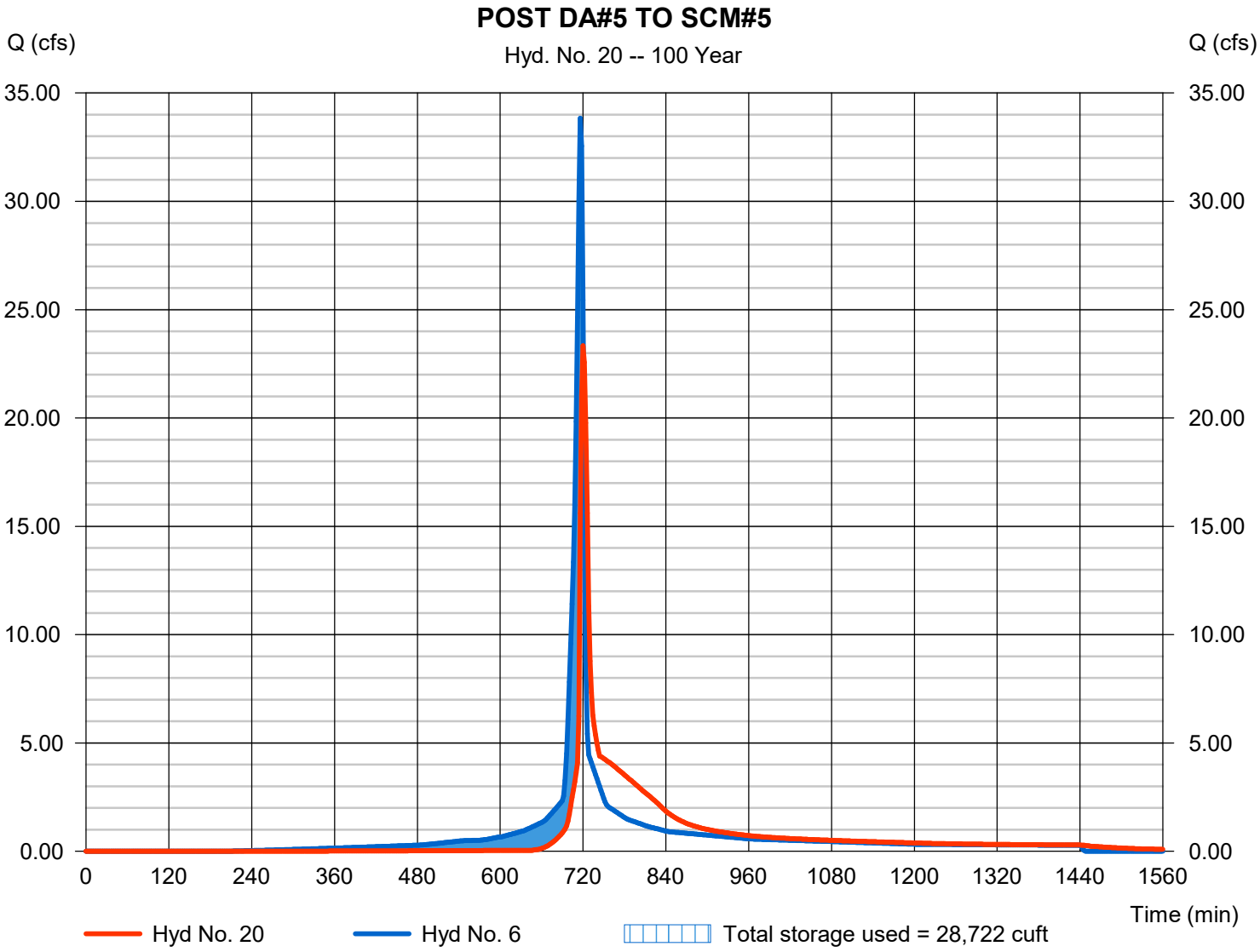
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Thursday, 05 / 22 / 2025

Hyd. No. 20

POST DA#5 TO SCM#5

Hydrograph type	= Reservoir	Peak discharge	= 23.34 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 72,777 cuft
Inflow hyd. No.	= 6 - POST DA#5	Max. Elevation	= 253.59 ft
Reservoir name	= SCM#5	Max. Storage	= 28,722 cuft

Storage Indication method used.



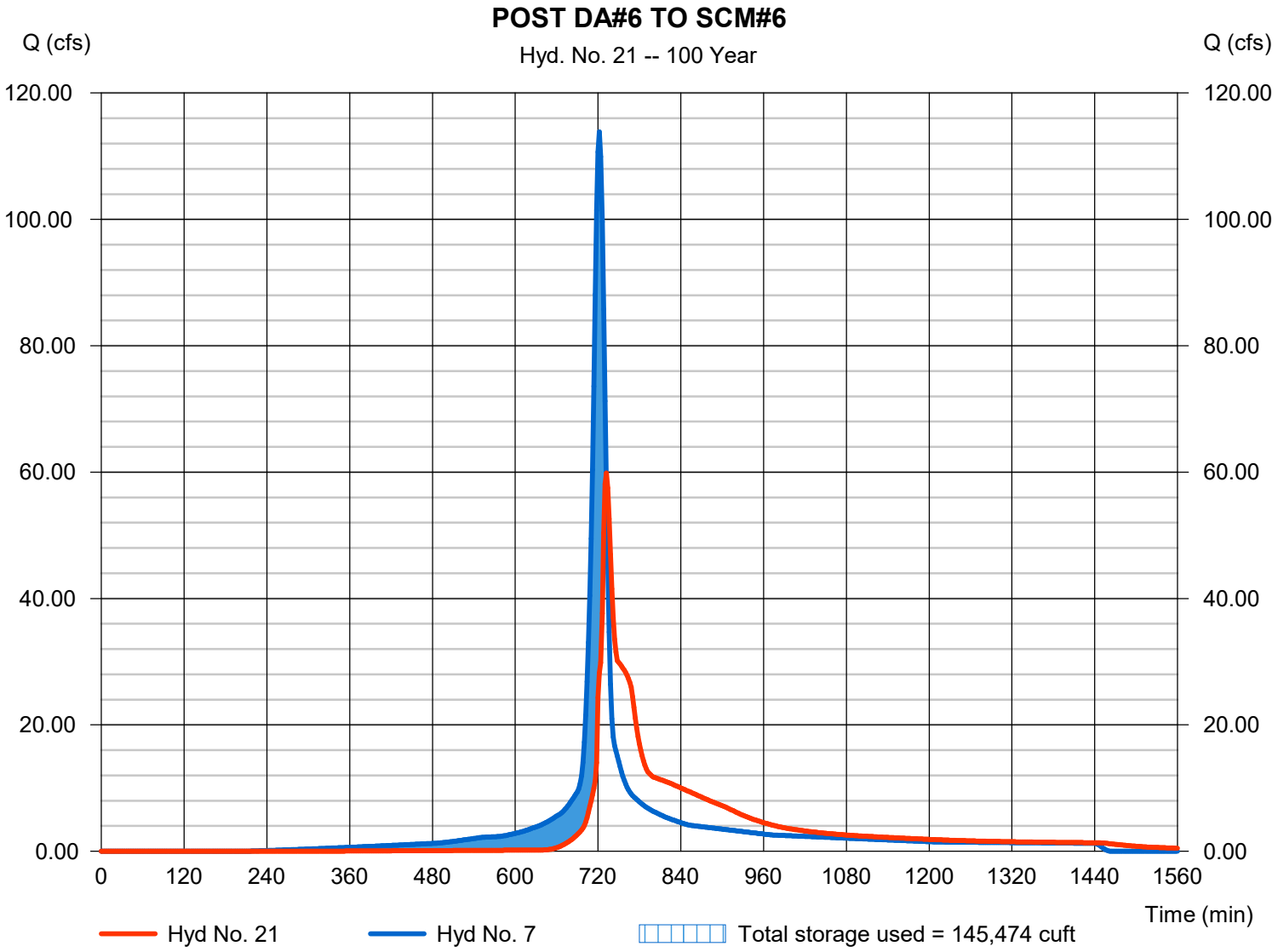
Hydrograph Report

Hyd. No. 21

POST DA#6 TO SCM#6

Hydrograph type	=	Reservoir	Peak discharge	=	59.84 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	332,686 cuft
Inflow hyd. No.	=	7 - POST DA#6	Max. Elevation	=	243.00 ft
Reservoir name	=	SCM#6	Max. Storage	=	145,474 cuft

Storage Indication method used.



Hydrograph Report

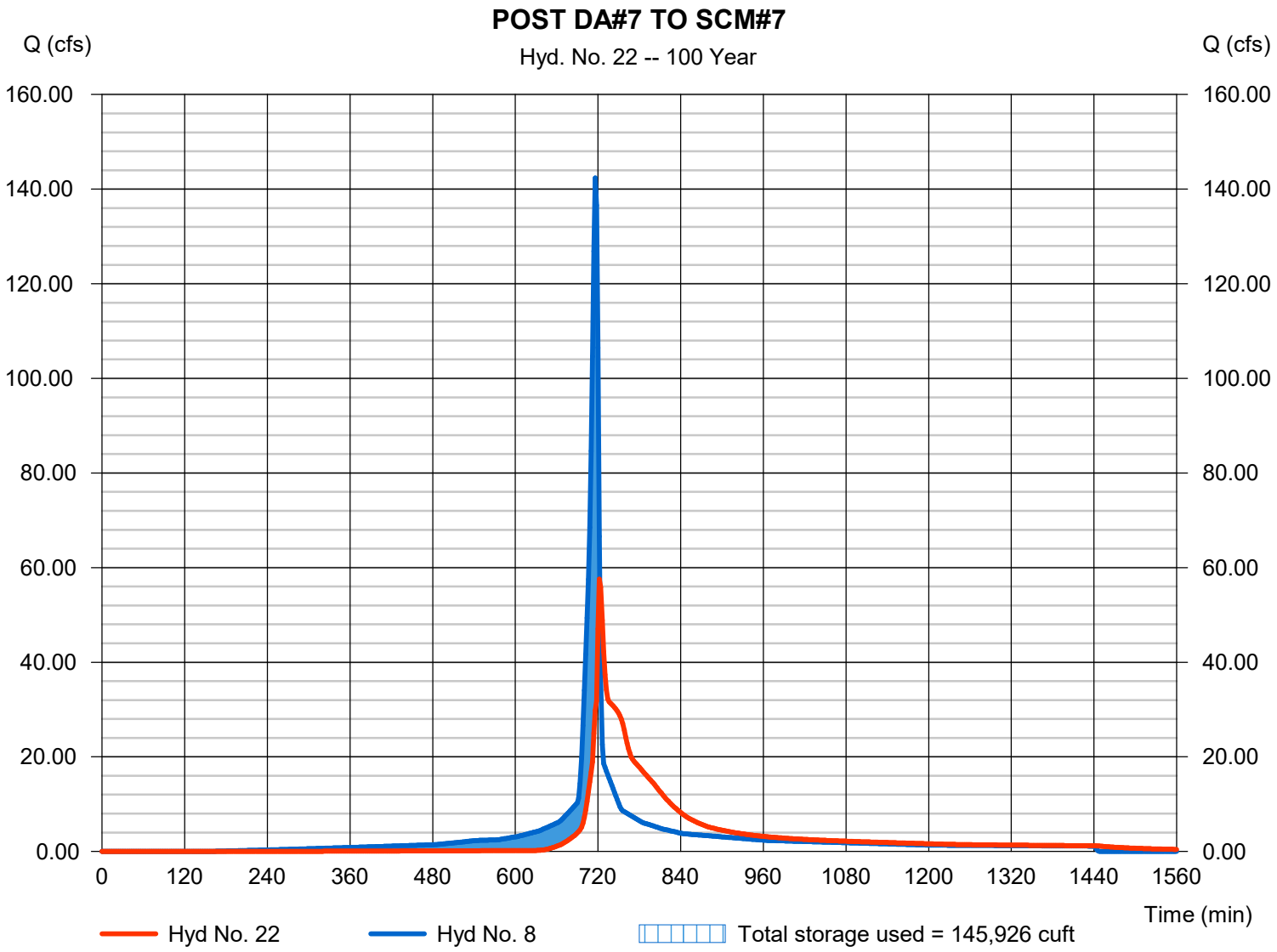
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Thursday, 05 / 22 / 2025

Hyd. No. 22

POST DA#7 TO SCM#7

Hydrograph type	=	Reservoir	Peak discharge	=	57.54 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	312,917 cuft
Inflow hyd. No.	=	8 - POST DA#7	Max. Elevation	=	244.95 ft
Reservoir name	=	SCM#7	Max. Storage	=	145,926 cuft

Storage Indication method used.



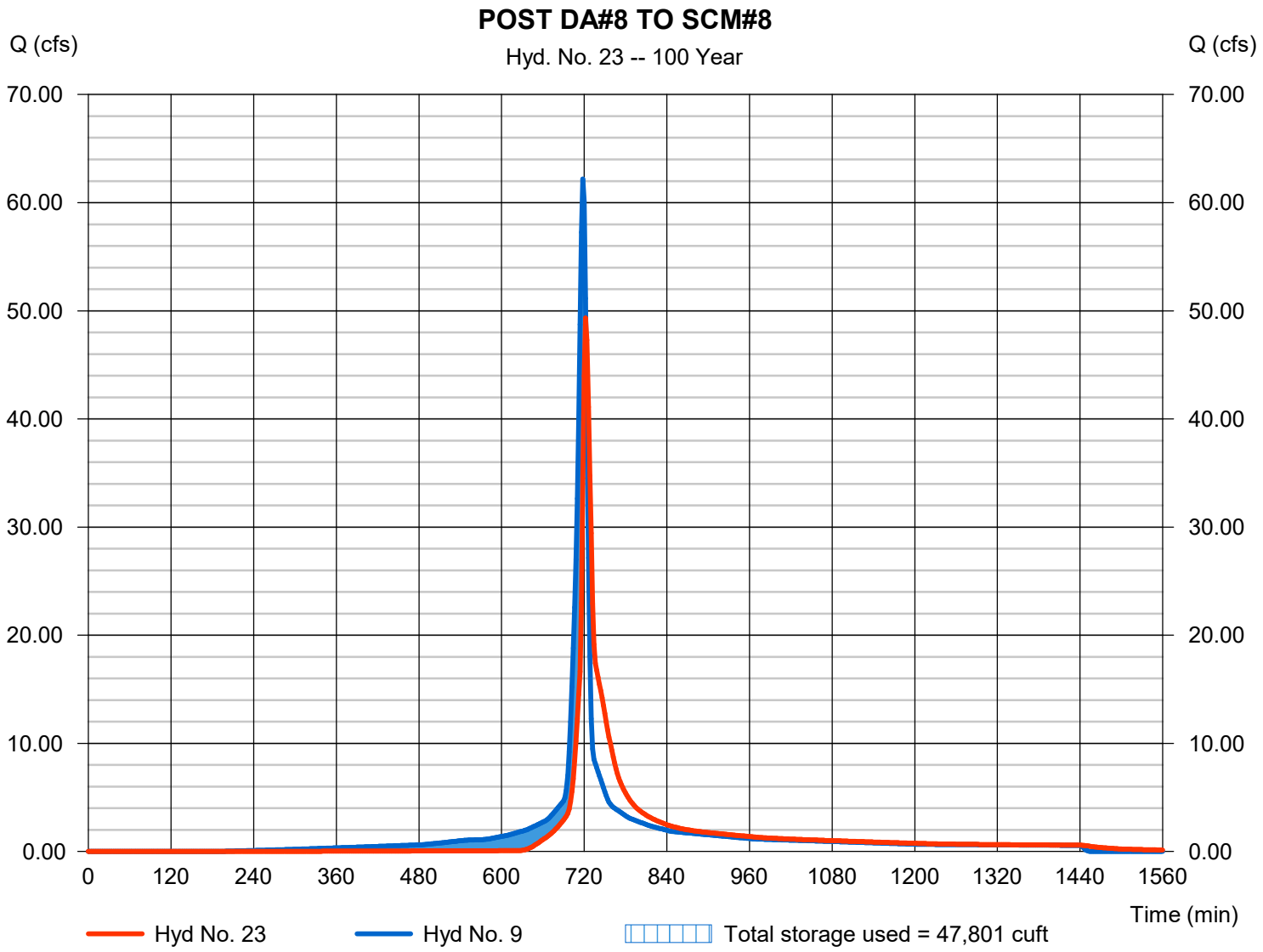
Hydrograph Report

Hyd. No. 23

POST DA#8 TO SCM#8

Hydrograph type	=	Reservoir	Peak discharge	=	49.33 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	150,846 cuft
Inflow hyd. No.	=	9 - POST DA#8	Max. Elevation	=	244.77 ft
Reservoir name	=	SCM#8	Max. Storage	=	47,801 cuft

Storage Indication method used.

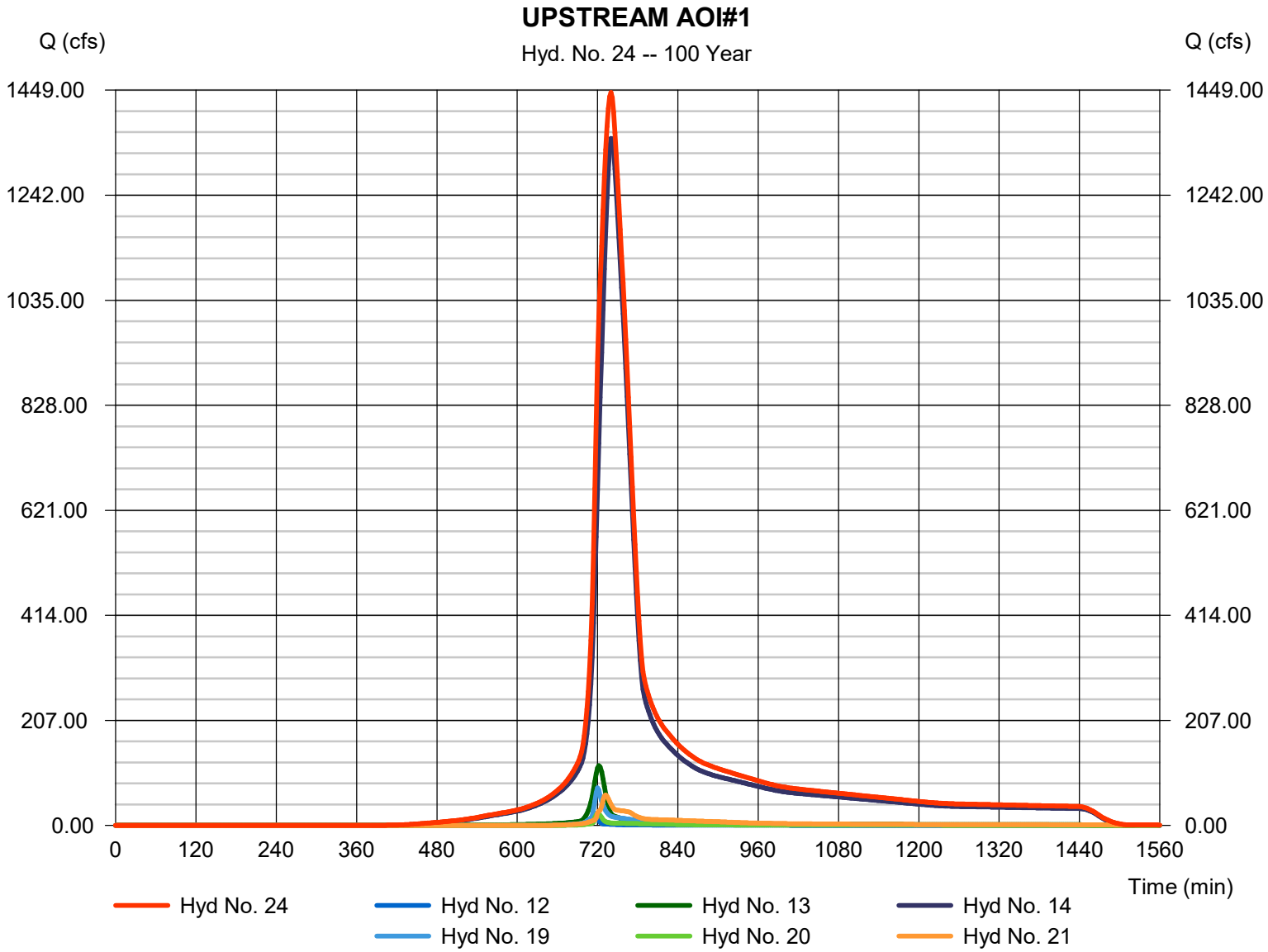


Hydrograph Report

Hyd. No. 24

UPSTREAM AOI#1

Hydrograph type	= Combine	Peak discharge	= 1444.65 cfs
Storm frequency	= 100 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 8,270,196 cuft
Inflow hyds.	= 12, 13, 14, 19, 20, 21	Contrib. drain. area	= 446.810 ac

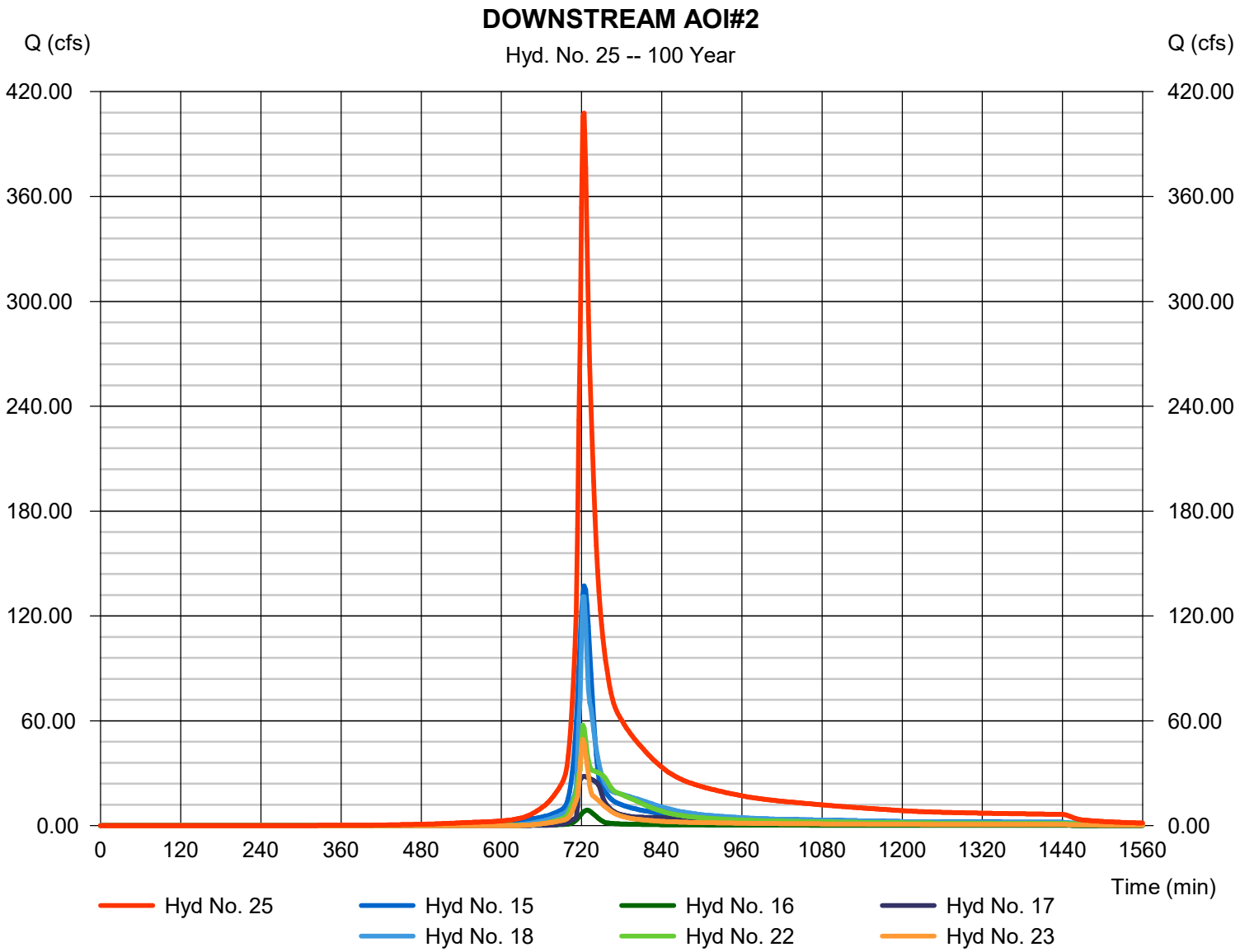


Hydrograph Report

Hyd. No. 25

DOWNSTREAM AOI#2

Hydrograph type	=	Combine	Peak discharge	=	407.65 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	1,565,878 cuft
Inflow hyds.	=	15, 16, 17, 18, 22, 23	Contrib. drain. area	=	26.840 ac

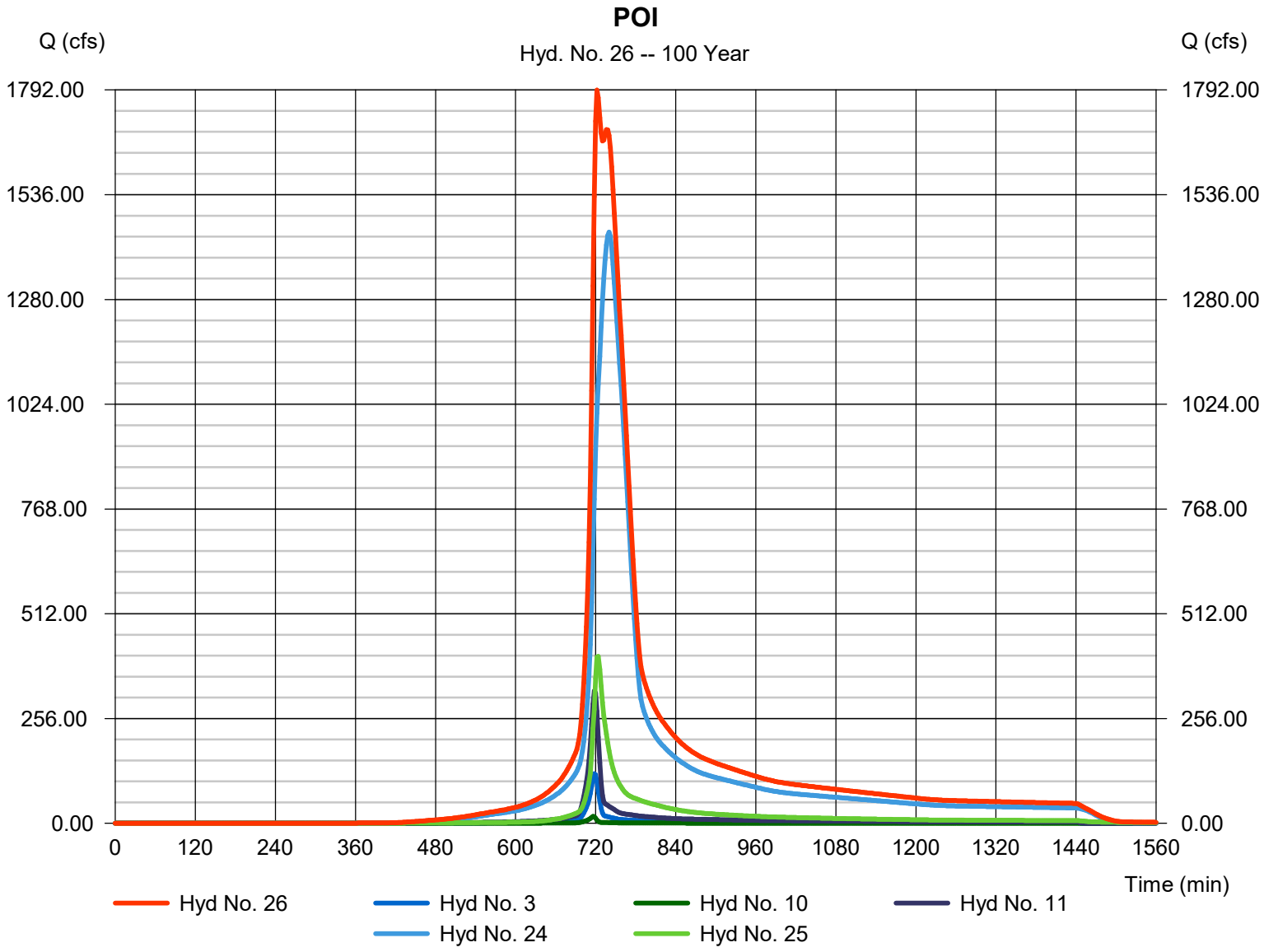


Hydrograph Report

Hyd. No. 26

POI

Hydrograph type	= Combine	Peak discharge	= 1791.92 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 10,896,591 cuft
Inflow hyds.	= 3, 10, 11, 24, 25	Contrib. drain. area	= 60.540 ac

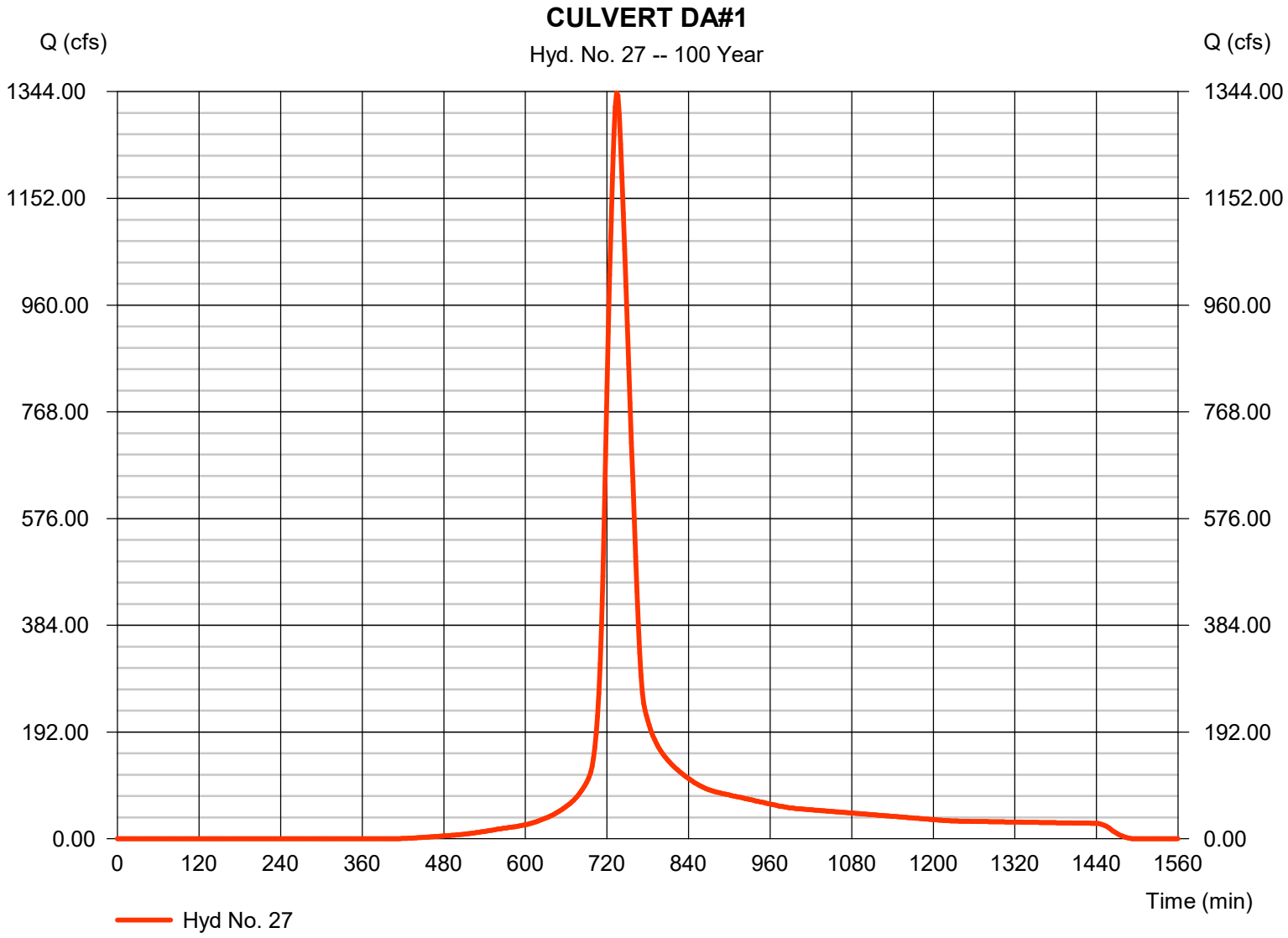


Hydrograph Report

Hyd. No. 27

CULVERT DA#1

Hydrograph type	=	SCS Runoff	Peak discharge	=	1341.90 cfs
Storm frequency	=	100 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	6,077,089 cuft
Drainage area	=	356.710 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	34.90 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

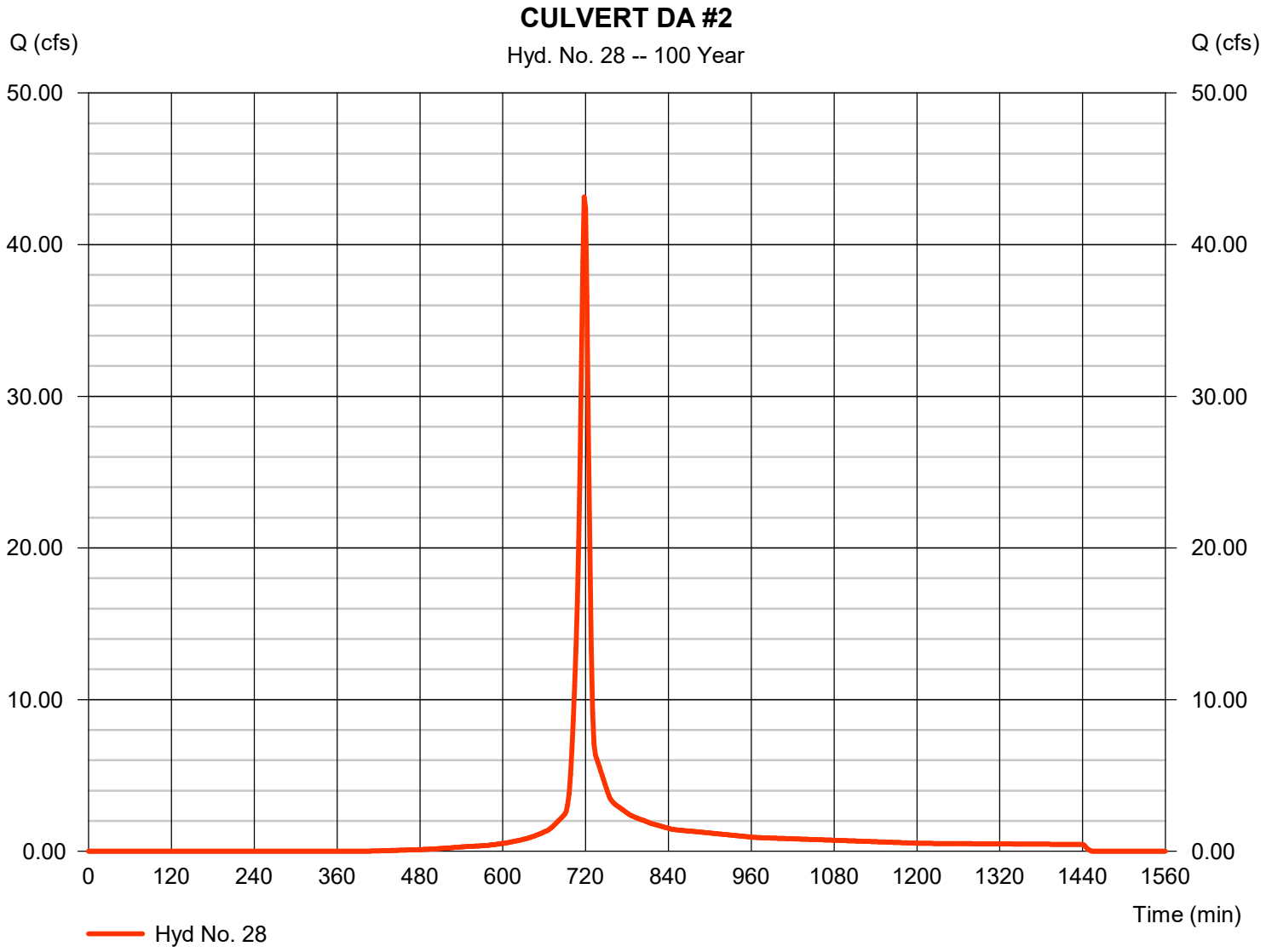


Hydrograph Report

Hyd. No. 28

CULVERT DA #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	43.15 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	99,431 cuft
Drainage area	=	5.770 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.80 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

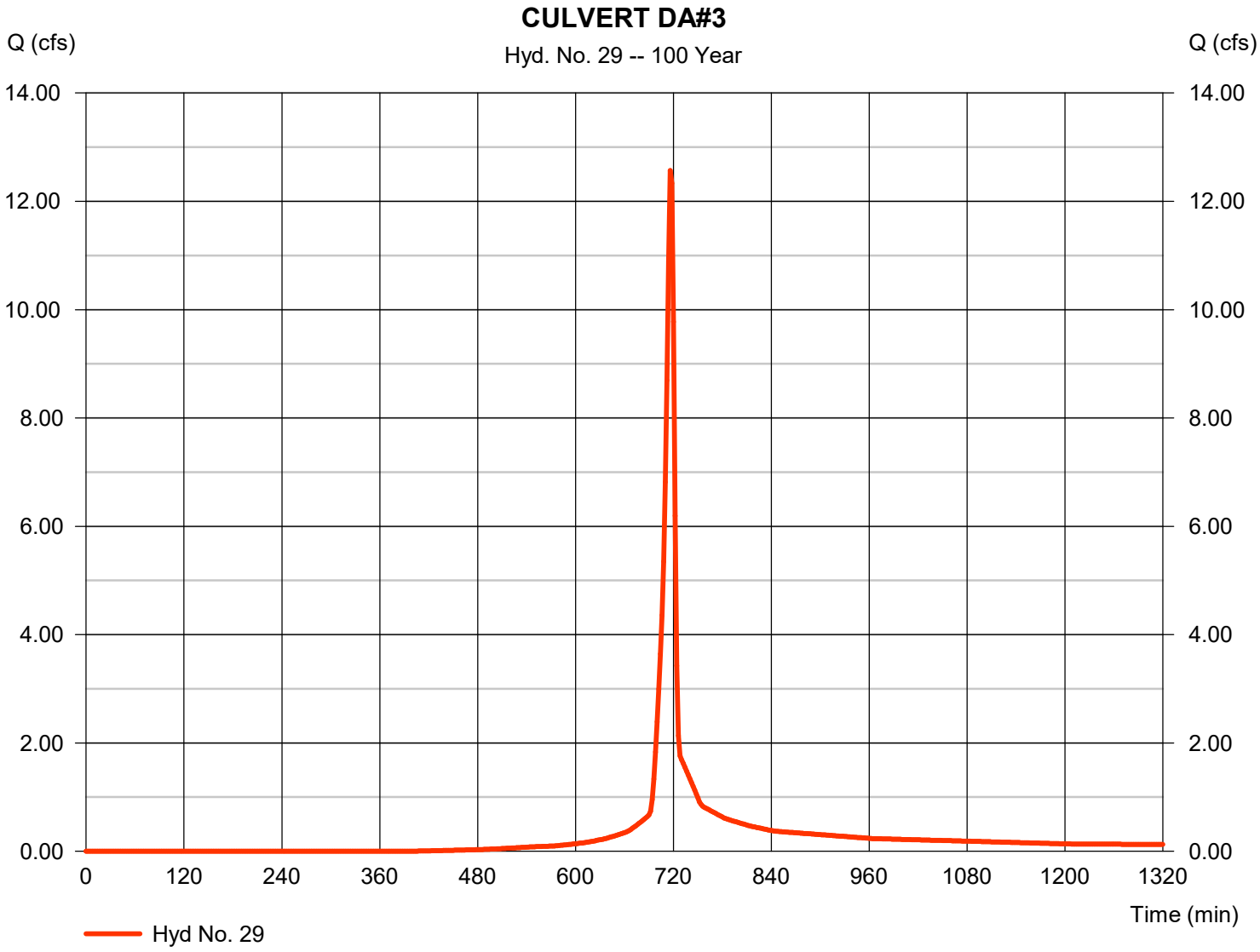


Hydrograph Report

Hyd. No. 29

CULVERT DA#3

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.57 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	25,687 cuft
Drainage area	=	1.590 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	62.6038	12.7000	0.8883	--------
2	71.6708	12.9000	0.8793	--------
3	0.0000	0.0000	0.0000	--------
5	74.8360	13.1000	0.8451	--------
10	71.4402	12.3000	0.8016	--------
25	62.3903	11.0000	0.7384	--------
50	57.7988	10.1000	0.6977	--------
100	52.8915	9.2000	0.6569	--------

File name: Reserve at Mitchell Mill.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	4.88	3.91	3.28	2.83	2.49	2.23	2.02	1.85	1.71	1.59	1.48	1.39
2	5.67	4.57	3.84	3.32	2.93	2.63	2.39	2.19	2.02	1.88	1.76	1.65
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.47	5.27	4.46	3.89	3.45	3.11	2.83	2.61	2.42	2.25	2.11	1.99
10	7.27	5.93	5.04	4.41	3.93	3.55	3.25	2.99	2.78	2.60	2.45	2.31
25	8.05	6.59	5.63	4.94	4.43	4.02	3.69	3.42	3.19	3.00	2.83	2.68
50	8.70	7.12	6.10	5.37	4.83	4.40	4.05	3.77	3.53	3.32	3.14	2.98
100	9.26	7.59	6.52	5.76	5.20	4.75	4.39	4.09	3.84	3.62	3.44	3.27

Tc = time in minutes. Values may exceed 60.

Active Projects\Hopper-Rolesville-Reserve at Mitchell Mill\3. Engineering\Design\HGH\SIA\Reserve at Mitchell Mill.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	2.89	3.49	0.00	0.00	5.14	6.15	6.96	7.80
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

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