DRAINAGE REPORT

Sources for Community Independent Living

Apple Blossom Lane
Little Rock, Pulaski County, Arkansas

May 4, 2025

Prepared for:

BLACK BEAR BUILDERS

Prepared By:

Wholee Associates, Inc.
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Arkansas, 72211 (Tel) 501 123 4567 (Fax) 501 765 4321
engineer@email.com

DRAINAGE REPORT
LIST OF EXHIBITS AND APPENDICES

Drainage Report
for
Sources for Community Independent Living
Apple Blossom Lane
Little Rock, Pulaski County, Arkansas

A. GENERAL

An approximately 13,390 sq ft. 2 story Independent Living Facility is being proposed on the west side of Apple Blossom Lane in Little Rock, Arkansas as shown in Exhibit I. The project also includes new asphalt parking lots and driveways, associated heavy duty concrete driving lanes, associated sidewalk and landscaping, new storm drains and inlets, an underground detention system, as well as other site improvements.

The project area is located outside the FEMA designated floodplain, as shown in Exhibit II.

The targeted primary pollutant for the site is heavy metals and total suspended solids (TSS). Water quality treatment will be provided through bioretention in a parking lot island and additional treatment will be provided in the underground detention system.

Peak stormwater runoff for the collection and conveyance system were calculated, in accordance with the City of Little Rock Drainage Manual using the Rational Method. Detention calculations were performed using the SCS Method. Rainfall intensities and depths were obtained from the Little Rock drainage manual and this hydrological information can be found in Exhibit III.

Hydrologic calculations were conducted using Hydraflow Hydrographs software. Pre- and post-development peak flows were calculated for the 2, 5, 10, 25, and 100-year events. Hydraulic and inlet calculations were done using StormCAD and the systems were evaluated for the 25-year and 100-year storm events. A downstream assessment was performed to determine potential downstream impacts.

B. PRE-DEVELOPED CONDITIONS

As shown on the predeveloped drainage area map, Exhibit IV, the proposed location of development is primarily grass covered with an area of tree cover and brush located on the west side of the site. Additionally, the site drops nearly 30 feet in elevation from the west side of the site to the east where Apple Blossom Lane is located. A majority of the site (approximately 1.79 acres) drains to an existing curb inlet located on Apple Blossom Lane. This curb inlet has been designated as Study Point “A” for the purposes of drainage analysis. The other portion of the site (approximately 0.83 acres) drains to an existing curb inlet just south of the southeast corner of the project site. This inlet has been designated Study Point “B” for the purpose of drainage analysis.

A USGS soils report of the site can be found in Appendix A.

The following runoff coefficients were used to calculate composite coefficients for each catchment:

Table 1: Runoff Coefficients

Surface	Runoff Coefficient
Grass (Average)	69
Pavement/Roof	98

The calculation results for the peak pre-developed flows at the Study Point are contained in Appendix B and summarized in the following table:

Table 2. Pre-developed Peak Flow Summary at the Study Points

Pre-Developed Flow	Q_2 (cfs)	Q_5 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
Study Point A	3.7	5.6	7.2	9.9	14.6
Study Point B	2.1	3.0	3.9	5.1	7.3

C. POST-DEVELOPED CONDITIONS

Stormwater Hydrology

As shown on the Post-Development Drainage Area Map, Exhibit V, most of the site is directed to onsite collection systems that discharges into a proposed underground ground detention system, then to Study Point "A". The remaining runoff will be directed to a proposed storm drain that ties into the existing system on the private drive, thence to Study Point "B". Results of the post-developed hydrologic calculations are included in Appendix B.

Stormwater Quantity

Section 2.1.2 (Downstream Flood Protection) of the Little Rock stormwater drainage manual requires that new developments not increase the peak flow as compared to pre-development conditions. In order to meet this requirement, an underground detention system will be provided. The system will be the Advanced Drainage Systems, Inc. (ADS) Stormtech Chamber. As shown by the technical information in Appendix C, the detention system has a maximum storage volume of 16,380 cubic feet. This exceeds the storage required for the 100-year storm event of 16,277 cubic feet. A 10" orifice in the outlet structure will control the discharge rate from the detention system. The detention system performance results using the modified rational method are included in Appendix B and summarized in Tables 3, 4, and 5 below.

Table 3: Pond Performance Summary

Underground Storage Pond	2-Year	5-Year	10-Year	25-Year	100-Year
Maximum Water Elevation	1,230.34	1,230.67	1,230.97	1,231.24	1,231.70
Maximum Storage (cubic feet)	4,339	6,362	8,237	11,121	16,277
Peak Inflow (cfs)	6.8	8.9	10.8	13.6	18.1
Peak Discharge (cfs)	2.2	2.5	2.6	2.8	3.0
Difference (cfs)	**-4.6**	**-6.4**	**-8.2**	**-10.8**	**-15.1**

Table 4: Pre-developed vs Post-developed Peak Flow Summary at Study Point "A"

Outfall	Q_2 (cfs)	Q_5 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
Pre-Developed	3.7	5.6	7.2	9.9	14.6
Post-Developed	2.7	3.1	3.5	4.1	5.0
Difference (cfs)	**-1.0**	**-2.5**	**-3.7**	**-5.8**	**-9.6**

Table 5: Pre-developed vs Post-developed Peak Flow Summary at Study Point "B"

Outfall	Q_2 (cfs)	Q_5 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
Pre-Developed	2.1	3.0	3.9	5.1	7.3
Post-Developed	2.1	2.9	3.6	4.8	6.7
Difference (cfs)	**0.0**	**-0.1**	**-0.3**	**-0.3**	**-0.6**

As shown in Table 4 and 5, the post-development peak flows are equal to or lower than their pre-development counterparts for all storm events at study point "A" and study point "B", respectively.

D. Water Quality

The ADS System also meets the requirements of Section 2.1.1 (Water Quality) of the Little Rock stormwater drainage manual via the TSS Reduction Method. According to the City of Little Rock Drainage Criteria Manual, the stormwater system shall be designed to be capable of removing at least 80% of TSS from an equivalent onsite impervious area. The detention volume of the ADS Stormtech system is sufficient in holding the Water Quality Volume equal to the first 1.5 inches of rainfall. The total site area is 2.0 acres; the R_v value was determined using 55% impervious cover of the catchment area.

$R_v = 0.05 + 0.009(I)$
$R_v = 0.05 + 0.009(55) = 0.545$
$WQV = (1.5*R_v*A)/12$
$WQV = (1.5*0.545*2.0)/12$
$WQV = 0.136$ acre-ft
WQV = 5,924 cubic ft

The total volume of the Stormtech chambers is 16,380 CF, which is above the WQv of 5,924 CF. The bioretention area, located in the parking lot island, is used as pre-treatment for the underground detention to remove heavy metals from the parking lot, reduce TSS loading, and catch floatables. Specifications for the ADS system can be found in Appendix C.

E. Downstream Analysis

A downstream analysis was completed to determine potential impacts. The site area and the contributing drainage areas to the limit of the zone of influence (10% point) is shown in Exhibit VI. Hydraflow Hydrographs software was used to assess the peak flow and timing of the watershed. Figures 1 and 2 provide the pre-development and post-development hydrographs at the 10% point. The calculations and results for all storm events can be found in Appendix B.

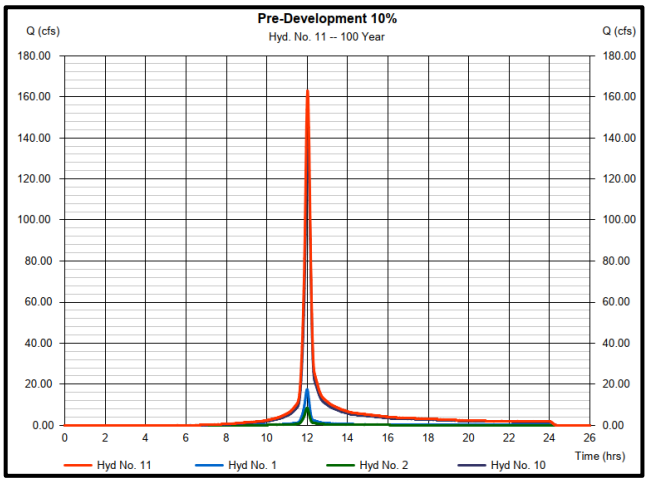


Figure 1: Pre-Development

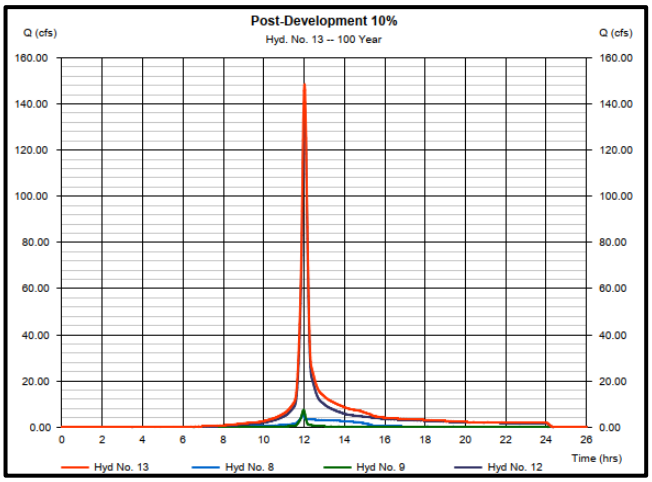


Figure 2: Post Development

F. Storm System Design

Hydraulic calculations for the proposed storm drains were done using Rational Method hydrology and StormCAD software. The contributing drainage areas to the drainage systems are shown in Exhibit VII. The results of the hydraulic and inlet calculations are contained in Appendix D. A summary of the roadway inlets is provided in Table 6. As shown, the storm sewer system is adequate to convey the 25-Year storm event to discharge the points without the surcharge. Analysis of the system under the 100-Year storm event was also completed and can be found in Appendix D.

Table 6: Roadway Inlet Calculations

Inlet	Roadway Classification	Roadway Width (ft)	Allowable Spread	Actual Spread
CB-6	Local	30	10	6.4
CB-7	Local	30	10	4.9
CB-9	Local	30	10	6.1

G. Conclusion

As demonstrated above by the supporting calculations, the proposed drainage system meets the requirements of the City of Little Rock.

I, Stoney Little , Registered Professional Engineer No. 12345 in the State of Arkansas, hereby certify that the drainage studies, reports, calculations, designs, and specifications contained in this report have been prepared in accordance with sound engineering practice and principles, and the requirements of the City of Little Rock. Further, I hereby acknowledge that the review of the drainage studies, reports, calculations, designs, and specifications by the City of Little Rock or its representatives cannot and does not relieve me from any professional responsibility or liability.

WHOLEE Associates, Inc.

Stoney Little, P.E.
Project Manager

Sawyer Pine, E.I.
Project Engineer

Final Drainage Report Template and Checklist

The City of Little Rock, Arkansas

Project name Apple Blossom Development

Engineer of Record _____

Planning Project Number 1 2 3 4

Revision no. 567

Date 5/04/2025

Submittal should include the following:

1. ☒ **PROJECT TITLE & DATE**
2. ☒ **PROJECT LOCATION** - Include street address and Vicinity Map.
3. ☒ **PROJECT DESCRIPTION** - Brief description of the proposed project.
4. ☒ **NAME, ADDRESS, TELEPHONE NUMBER, AND EMAIL** of the owner and developer of the property to be permitted.
5. ☒ **NARRATIVE SUMMARY** - The summary shall include a description of the methods used to meet the conveyance, detention, and water quality requirements. This includes at a minimum a description of the target pollutants and treatment train for water quality and a description of the detention strategy used to meet the downstream flood protection requirement. Also include a description of the off-site areas, onsite areas, condition of the downstream receiving areas, existing problems, changes to flows and flow volume, proposed improvements, detention, areas with potential for high pollutant loading, and final conclusions.
6. ☒ **EXISTING DRAINAGE AREA MAP** – Existing drainage area map on a 1-inch = 200-feet minimum scale plan drawing, with 2 foot contours (1 foot contours on “flat” sites), that includes: study points at property lines, time of concentration path, bar scale, and the following information:
    a. ☐ Aerial photograph of the project vicinity, covering the project area and the total lands that contribute runoff;
    b. ☐ Existing drainage areas and flow patterns to downstream property line, establishing the study points;
    c. ☐ Upstream and downstream drainage flow paths for all areas that contribute runoff to the existing site or receive runoff from the site. The downstream area(s) shall be shown as necessary to document the receiving conveyance system; and
    d. ☐ Existing land use conditions for the drainage areas that contribute runoff.

7. ☒ **SOIL MAP** - Provide the most recent U.S. Soil Conservation Service soils and vegetation information for both the project area and the drainage area that contributes runoff on a separate map from the Existing Drainage Area Map.

8. ☒ **PROPOSED DRAINAGE AREA MAP** – Proposed drainage area site map on a 1-inch = 200-feet minimum scale plan drawing, with 2' contours (1 foot contours on "flat" sites), that include: study points, time of concentration path, bar scale, and the following information:

   a. ☐ Proposed drainage areas and flow patterns and, if applicable, natural feature protection areas, green stormwater practice and infiltration areas;

   b. ☐ Upstream and downstream drainage flow paths for all areas that contribute runoff to the proposed development site or receive runoff from the site. The downstream area(s) shall be shown as necessary to document the receiving conveyance system;

   c. ☐ Proposed land use conditions for the development site and drainage areas that contribute runoff; and

   d. ☐ Proposed locations of grading and placement of fill material within the project area and drainage areas that contribute runoff.

9. ☒ **WATER QUALITY** – Calculations and documentation indicating the target pollutants and the required water quality treatment volume.

   a. ☐ Provide calculations for each structural control indicating the corresponding level of treatment; and,

   b. ☐ Provide a map showing the impervious area and structural controls

10. ☒ **DOWNSTREAM FLOOD PROTECTION** – Provide calculations and documentation indicating that the post-development peak discharge rate does not exceed the pre-development rate for the 2-year, 5-year, 10-year, 25-year, and 100-year, 24-hour storm events. The calculations shall include the following information:

    a. ☐ A summary table of runoff discharge flows for the 2-year, 5-year, 10-year, 25-year, and 100-year, 24- hour storm events for the pre-development and post-development conditions for each study point. The summary shall include the existing and proposed flows along with supporting calculations for all of the discharge points to the receiving system. This includes the flow entering each drainage area and the flow generated within each drainage area on the site (do not separate onsite and offsite flows).

    b. ☐ The effects of the 100-year, 24-hour storm event on the stormwater management system, adjacent property, and downstream facilities and property shall be evaluated. The 100-year flow shall be controlled through the use of structural stormwater controls to protect existing downstream property with no increase in the existing base flood elevation, or calculations shall be provided to

indicate that the on-site conveyance system will safely pass the flow and allow it to discharge into receiving waters where the floodplain is of capacity sufficient to accommodate significant additional discharges without causing damage.

11. ☒ **CHECK FOR EXISTING DOWNSTREAM FLOODING** – Describe the existing downstream capacity of each receiving area (study point). Provide documentation of a downstream assessment using the 10% Rule in accordance with Section 7.5.3. Documentation shall include photographs of the existing structures downstream of the development as well as a map showing the locations and distances of downstream structures from the development.

12. ☒ **STORMWATER DETENTION DESIGN** – If detention is required, include all computations and backup/support data including:

    a. ☐ Detention basin size requirement computations (using an approved method).

    b. ☐ Release structure design computations including design Water Surface Elevations for the 2-year, 5-year, 10-year, 25-year, and 100-year storms.

    c. ☐ Stage-Storage and Stage-Discharge curves for the detention facility.

    d. ☐ A summary hydrograph of the effect of the detention facility for relevant storms, incorporated with bypass.

    e. ☐ Overflow structure(s) size and location(s);

    f. ☐ Outfall structure(s), location(s), and orifice size(s).

    g. ☐ Emergency overflow path.

    h. ☐ Results of downstream analysis.

13. ☒ **PAVEMENT DRAINAGE DESIGN** – Include a table listing street classification, width, allowable spread and actual spread for design storm.

14. ☒ **STORM SEWER INLET DESIGN** - Include all computations for the design storm. Reference Table 4.3 in Chapter 4 for allowable spread and depth.

15. ☒ **INLET DRAINAGE AREA MAP** – Provide a separate map showing the inlet layout and design including the drainage areas. The map should include the proposed design, drainage areas, time of concentrations paths, runoff coefficients, and bar scale.

16. ☒ **STORM SEWER DESIGN** - Include all computations and hydraulic profiles for the design storm and 100-year, 24-hour storm.

17. ☒ **CULVERT DESIGN** - Include all computations, hydraulic profile, and energy transition to channel.

18. ☐ **OPEN CHANNEL FLOW DESIGN** - Include computations for normal depth and

velocity.

19. ☐ **FEDERAL AND STATE REQUIREMENTS** (Answer Yes or No if required).
    a. ☐ Wetlands determination (if wetlands are present on the site).
    b. ☐ 404 permit required (include letter from USACE as an exhibit).
    c. ☐ NPDES Construction Stormwater "Notice of Intent" (ADEQ)(include as an exhibit if required).
    d. ☐ ANRC permit/review for "dams"(required if a stormwater impoundment qualifies as a dam per ANRC regulations).
    e. ☐ Other

20. ☒ **EXHIBITS** – Attach the following exhibits to the final drainage report.
    a. ☒ Grading and drainage construction drawings.
    b. ☐ Landscaping Plan.
    c. ☒ Operations and maintenance plan.
    d. ☐ Letter from USACE if answered Yes to 19.b. above.
    e. ☐ Notice of Coverage (NOC) and completed SWPPP (sites 1 acre or larger).
    f. ☐ Master Drainage Plan (if part of a larger or phased project).

21. ☒ The following paragraph with relevant information included:

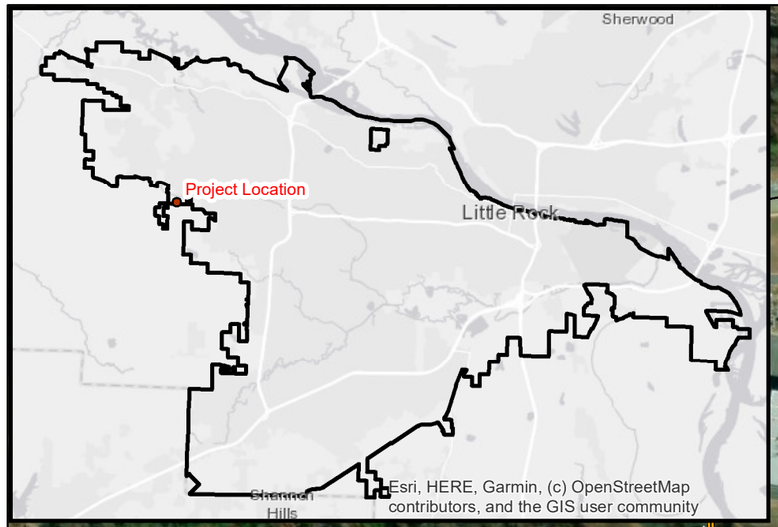
"I, Stoney Little, Registered Professional Engineer No. 12345 in the State of Arkansas, hereby certify that the drainage studies, reports, calculations, designs, and specifications contained in this report have been prepared in accordance with sound engineering practice and principles, and the requirements of the City of Little Rock. Further, I hereby acknowledge that the review of the drainage studies, reports, calculations, designs, and specifications by the City of Little Rock or its representatives cannot and does not relieve me from any professional responsibility or liability."

_____

Signed & Sealed by
Professional Engineer

22. ☐ ARKANSAS REGISTERED ENGINEER SEAL

EXHIBIT I



ChenalPkwy
ChenalPkwy
KirkRd
Delta Trust And Bank
Arvest Bank
Kroger
Little Rock
Highland Valley Church
ChenalPky
Unnamed
ChenalPky
First Arkansas Bank And Trust
Bldg D
Southwest Power Pool
AppleBlossomLn
WorthenDr
EdswoodCt
GauntletLn
LaymanLn
ZanzibarSt
NationSt
Pride ValleyRd

Legend

- Development Site
- Drainage Area
- Roadway
- City Boundary

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community, Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

WHOLEE

1836 Tusk Pkwy
Little Rock, AR 72205

N
W E
S

APPLE BLOSSOM DEVELOPMENT LOCATION MAP

0 5,000 10,000 Feet

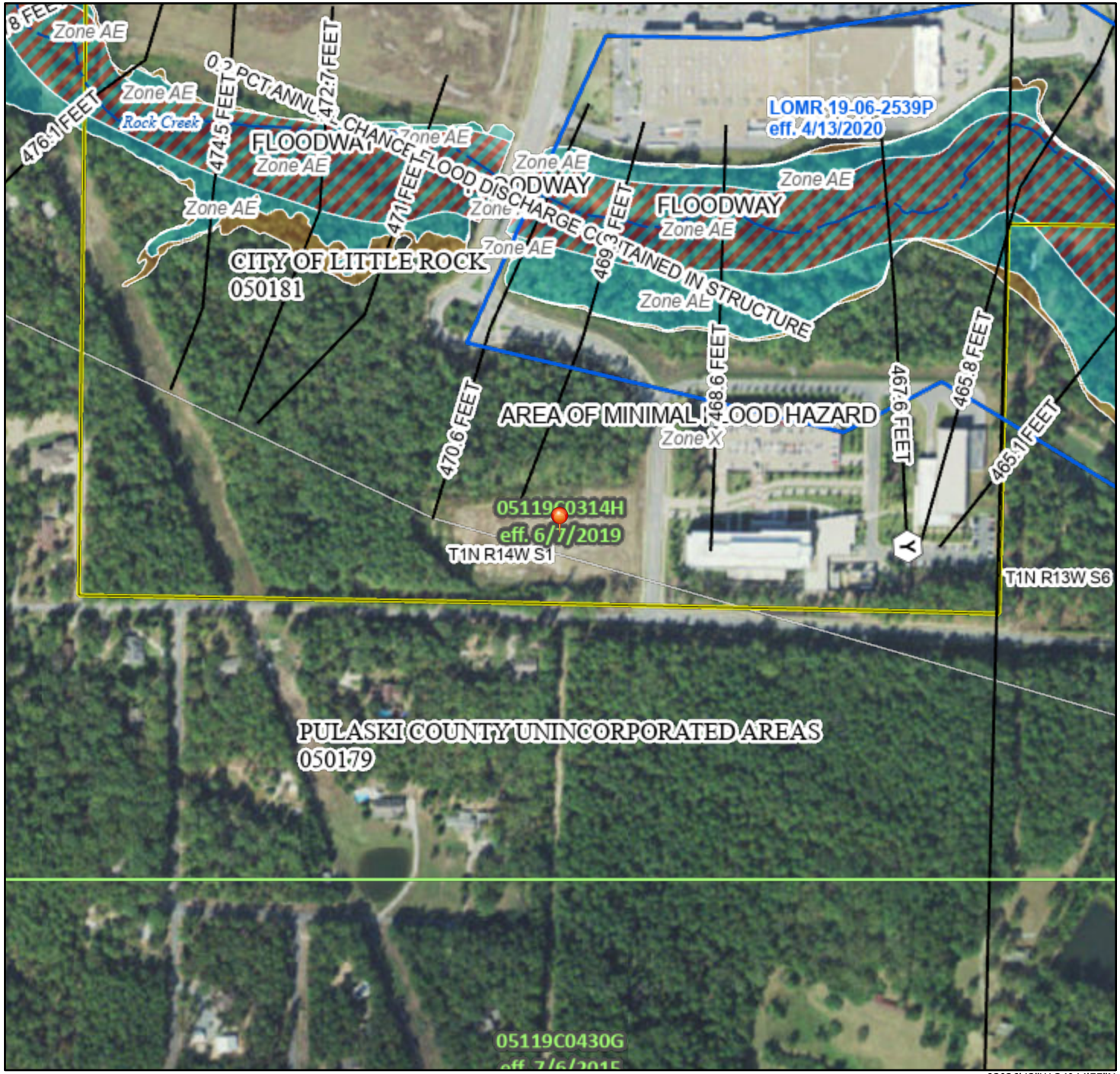
1234.56
Black Bear Builders
Site Drainage

EXHIBIT II

National Flood Hazard Layer FIRMette

FEMA

92°27'21"W 34°45'24"N



92°26'43"W 34°44'55"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/6/2024 at 3:12 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

EXHIBIT III

Table 3.1 Rainfall Depths for 24-hour Duration Storm.

Storm Event	2-year	5-year	10-year	25-year	50-year	100-year
Depth (in)	4.19	5.12	5.94	7.14	8.13	9.17

Table 3.2 e,b,d Variable Coefficients.

Return Period	Variable		
	e	***b***	***d***
2yr	0.625	22.461	3.488
5yr	0.628	27.071	3.592
10yr	0.626	30.302	3.550
25yr	0.620	34.032	3.395
50yr	0.619	37.392	3.507
100yr	0.612	39.450	3.253
500yr	0.598	44.067	2.969

Table 3.3 TR-55 Runoff Curve Numbers1 (CN)

Cover type and hydrologic condition[2]	Average percent impervious area[3]	Curve numbers for hydrologic soil groups[1]			
		A	B	C	D
Cultivated land					
Without conservation treatment		72	81	88	91
With conservation treatment		62	71	78	81
Pasture or range land					
Poor condition		68	79	86	89
Good condition		39	61	74	80
Meadow					
Good condition		30	58	71	78
Wood or forest land					
Thin stand, poor cover		45	66	77	83
Good cover		30	55	70	77
Open space (lawns, parks, golf courses, cemeteries, etc.)[4]					
Poor condition (grass cover <50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads					
Paved; curbs and storm drains (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Urban districts					
Commercial and business	85%	89	92	94	95
Industrial	72%	81	88	91	93
Residential districts by average lot size					
1/8 acre or less (town houses)	65%	77	85	90	92
1/4 acre	38%	61	75	83	87
1/3 acre	30%	57	72	81	86
1/2 acre	25%	54	70	80	85
1 acre	20%	51	68	79	84
2 acres	12%	46	65	77	82
Developing urban areas and newly graded areas (pervious areas only, no vegetation).		77	86	91	94

1. Antecedent Moisture Condition II, and Ia = 0.2S.
2. Areas of compacted earthen fill shall be classified as Hydrologic Soil Group D.
3. The average percent impervious area shown was used to develop the composite CNs.

Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition.

4. CNs shown are equivalent to those of pasture. Composite CNs may be computed for other combinations of open space cover type.

Source: USDA Technical Release 55 (TR-55)

EXHIBIT IV

Predevelopment A
1.79 Acres

Predevelopment B
0.83 Acres

Study Point "A"

Study Point "B"

Apple Blossom Lane

34°44'48"N 92°17'16"W

Existing Chain link Fence

Existing Wall

Existing Sewer Manhole
Rim =1233.18
Inv.(In) =1220.33

Existing Sewer Manhole
Rim =1246.71
Inv.(Out) =1241.68

Existing Sewer Manhole
Rim =1236.28
Inv.(In) =1226.42
Inv.(Out) =1228.07

Existing Sewer Manhole
Rim =1230.38
Inv.(IN) =1221.76
Inv.(Out) =1221.65

Existing Curb Inlet
Rim = 1238.57
Inv. = 1232.58

Existing Curb Inlet
W/18" Extension
Inv. = 1229.42

Existing Curb Inlet
Rim = 1231.28
Inv. = 1225.71

Existing Curb Inlet
W/2-8" Extensions
Rim = 1231.14
Inv. = 1226.82

Existing Curb Inlet
Rim = 1233.45
Inv. = 1226.96

TBM Chiseled X
Elev.=1232.44
NW Corner Of Inlet

24' Access Easement

20' Utility Easement

44' Existing R/W

Blow Off Valve

30' Water & Sewer Esmt.

18"CMP

8"CMP

8"SS

6"SS

Scale In Feet
30 0 30

Revision	By	Date

WHOLEE

Drawn By:	ICF
Approved By:	AD
Date:	05-04-2022
Project No.:	BBD-01

Vertical Scale:	–
Horizontal Scale:	1"=30'
Plotting Scale:	1-1
Drawing Name:	DAM

SOURCES FOR COMMUNITY INDEPENDENT LIVING

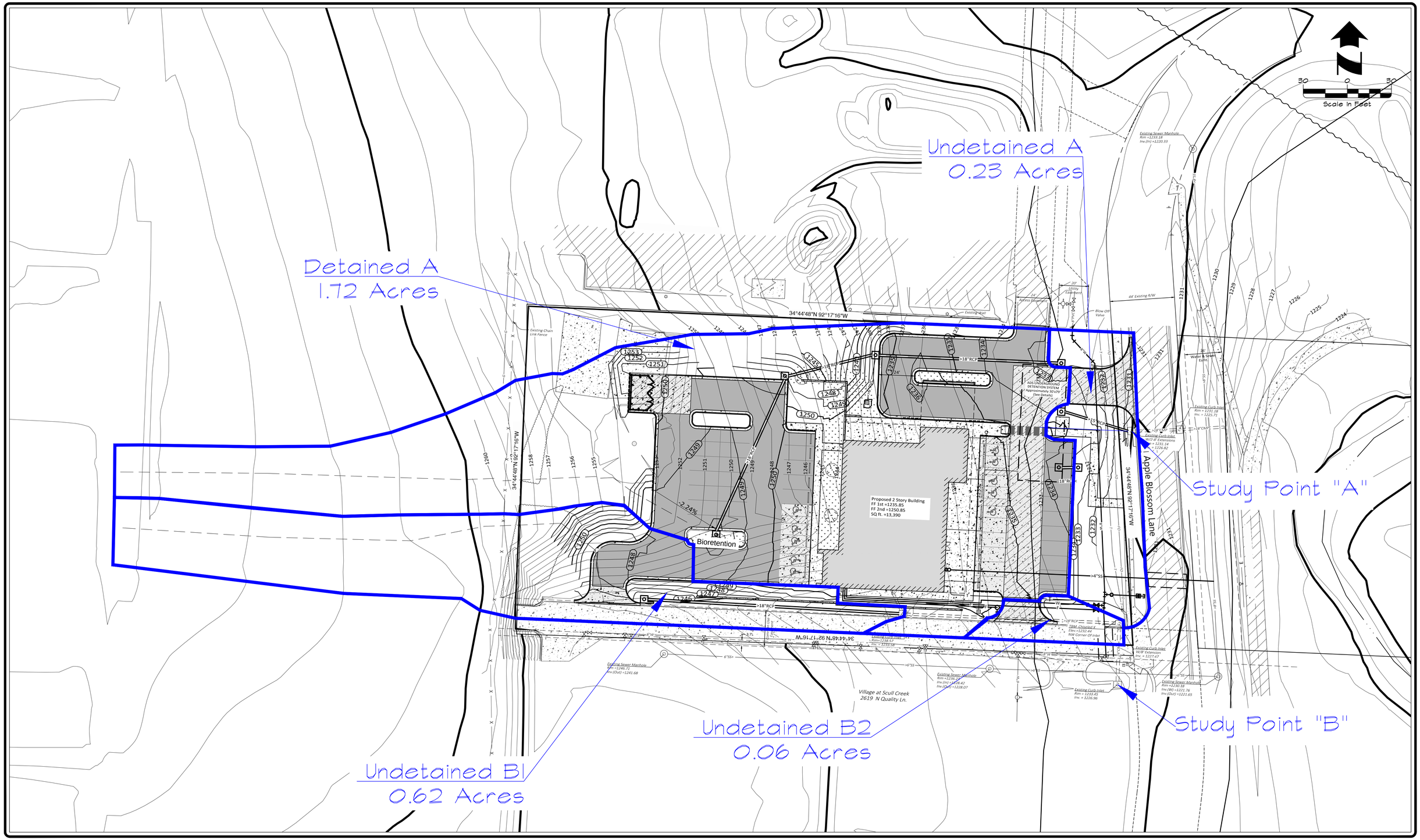
Little Rock, Pulaski County, Arkansas

EXHIBIT IV:
PRE-DEVELOPMENT
DRAINAGE AREA MAP

Issued for Review - 05-04-22

Sheet No.: 1 of 3

EXHIBIT V



Revision	By	Date

WHOLEE

Drawn By:	ICF
Approved By:	AD
Date:	05-04-2022
Project No.:	BBD-01

Vertical Scale:	–
Horizontal Scale:	1"=30'
Plotting Scale:	1-1
Drawing Name:	DAM

SOURCES FOR COMMUNITY INDEPENDENT LIVING

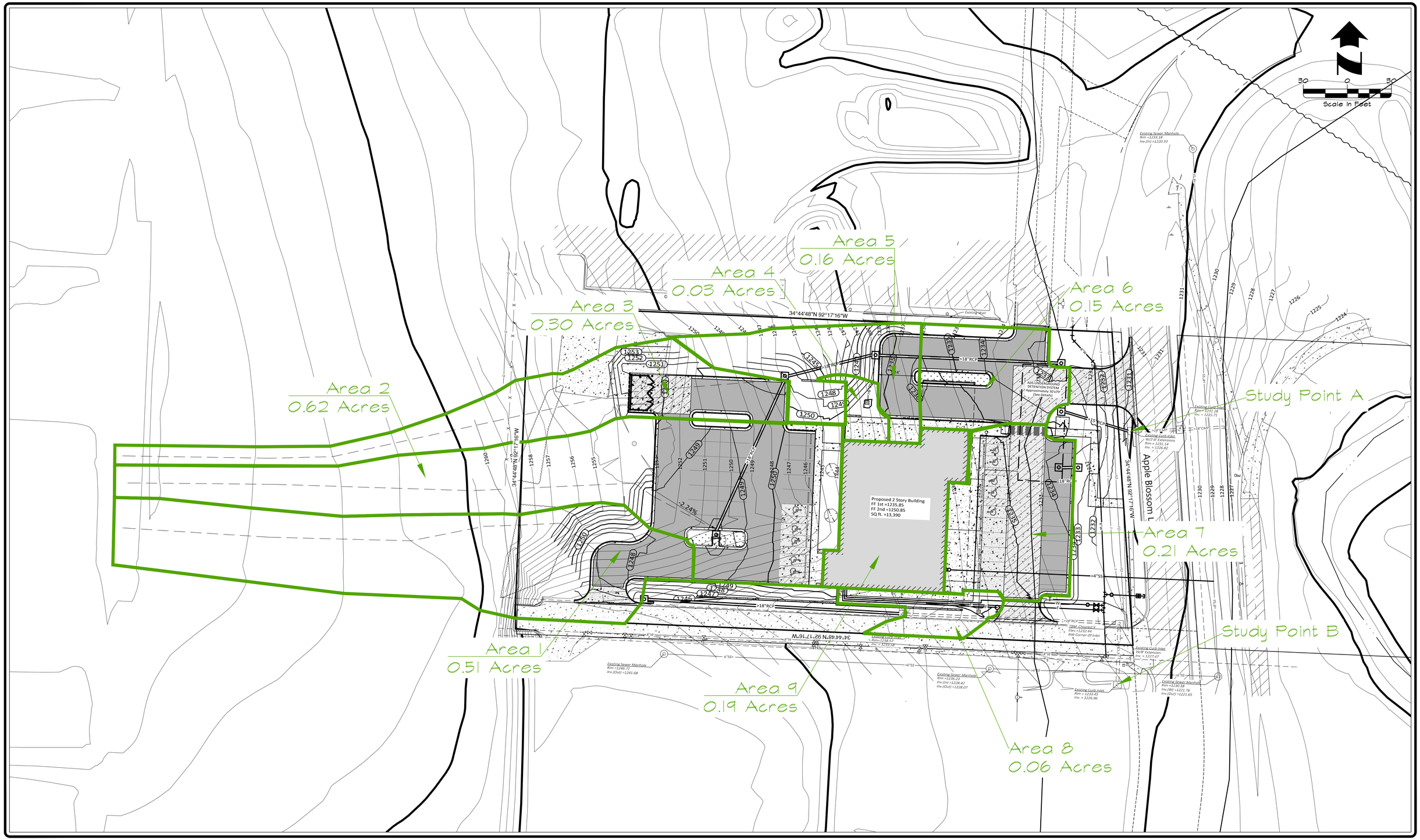
Little Rock, Pulaski County, Arkansas

EXHIBIT V:
POST-DEVELOPMENT
DRAINAGE AREA MAP

Issued for Review - 05.04.22

Sheet No.: 2 of 3

EXHIBIT VI



Revision	By	Date

WHOLEE

Drawn By:	ICF
Approved By:	AD
Date:	05-04-2022
Project No.:	BBD-01

Vertical Scale:	–
Horizontal Scale:	1"=30'
Plotting Scale:	1-1
Drawing Name:	DAM

SOURCES FOR COMMUNITY INDEPENDENT LIVING

Little Rock, Pulaski County, Arkansas

EXHIBIT VI:
SITE DRAINAGE AREA MAP

Issued for Review - 05.04.22

Sheet No.: 3 of 3

APPENDIX A

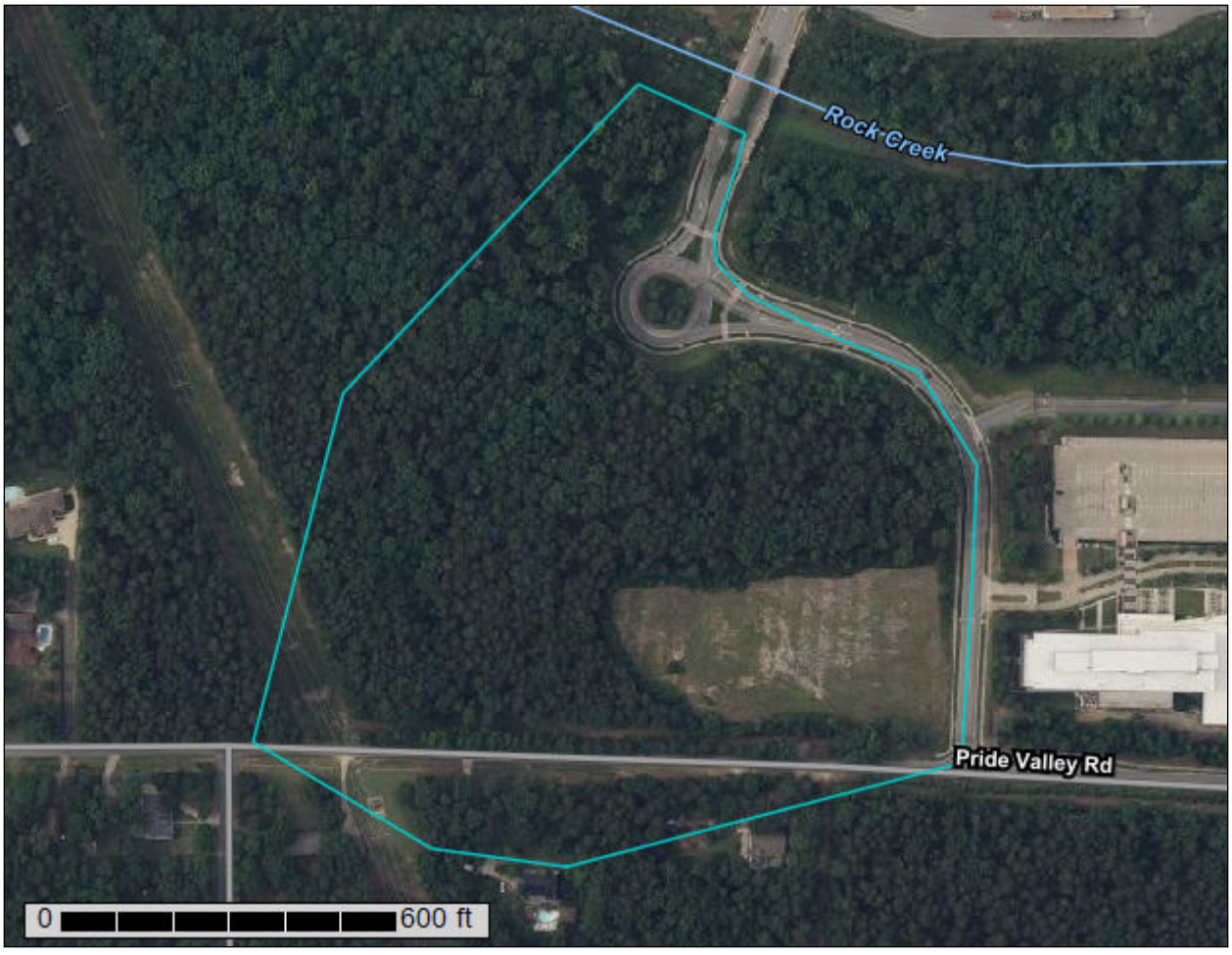
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Pulaski County, Arkansas



May 8, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

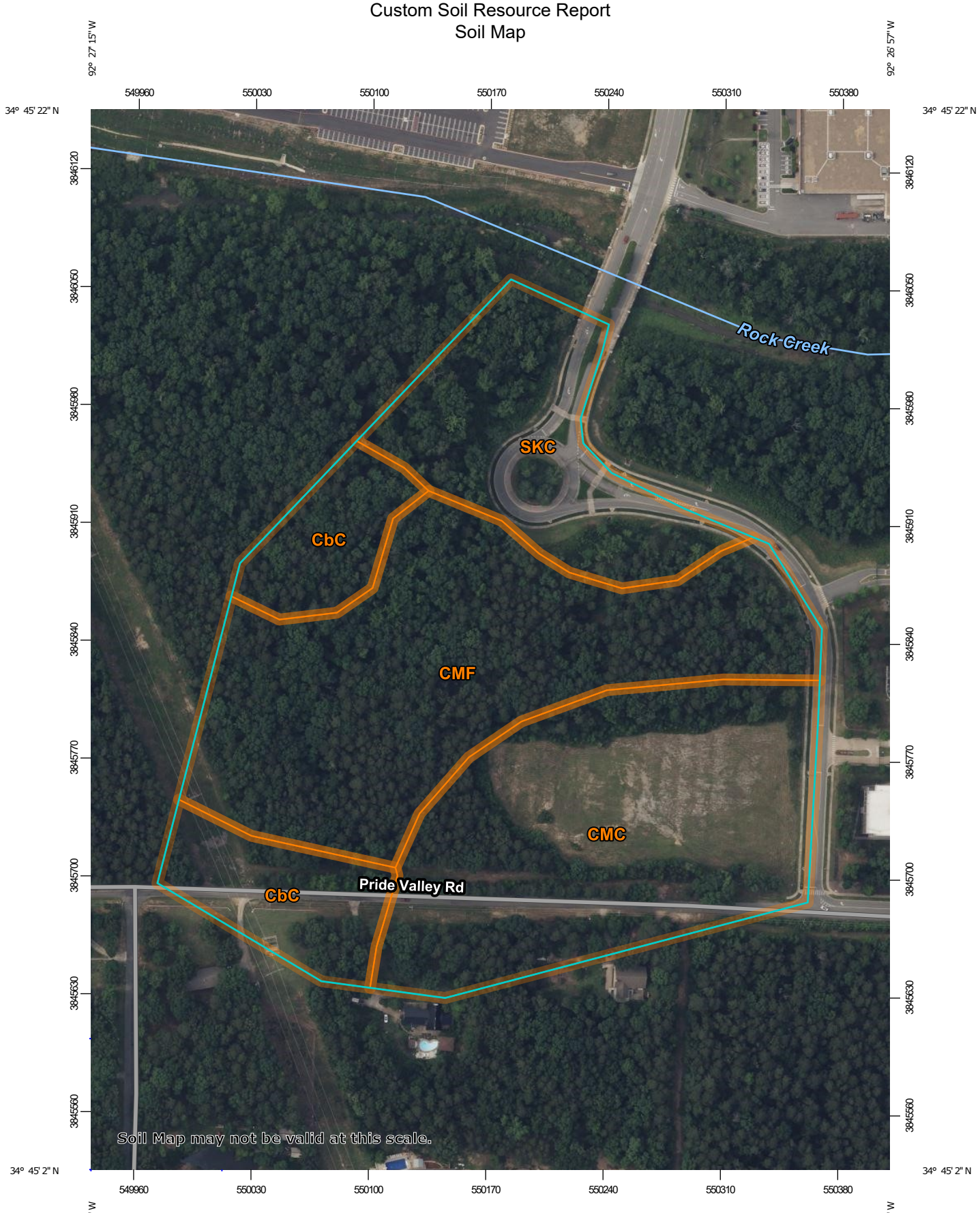
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:3,070 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 100 200 400 600

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

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

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

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

Soil Survey Area: Pulaski County, Arkansas
Survey Area Data: Version 20, Sep 12, 2023

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

Date(s) aerial images were photographed: May 1, 2022—May 29, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CbC	Carnasaw-Urban land complex, 3 to 8 percent slopes	3.8	13.7%
CMC	Carnasaw-Mountainburg association, undulating	8.9	32.5%
CMF	Carnasaw-Mountainburg association, steep	10.2	37.2%
SKC	Sallisaw-Leadvale association, undulating	4.6	16.7%
Totals for Area of Interest		**27.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Pulaski County, Arkansas

CbC—Carnasaw-Urban land complex, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: m04n
Elevation: 500 to 1,800 feet
Mean annual precipitation: 43 to 58 inches
Mean annual air temperature: 50 to 72 degrees F
Frost-free period: 200 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Carnasaw and similar soils: 51 percent
Urban land: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carnasaw

Setting

Landform: Hills
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey residuum weathered from shale

Typical profile

A - 0 to 2 inches: gravelly silt loam
E - 2 to 6 inches: gravelly silt loam
Bt1 - 6 to 38 inches: silty clay
Bt2 - 38 to 49 inches: silty clay loam
Cr - 49 to 52 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F119XY006AR - Clayey Upland
Hydric soil rating: No

Description of Urban Land

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

CMC—Carnasaw-Mountainburg association, undulating

Map Unit Setting

National map unit symbol: m04j
Elevation: 500 to 2,800 feet
Mean annual precipitation: 43 to 58 inches
Mean annual air temperature: 50 to 72 degrees F
Frost-free period: 200 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Carnasaw and similar soils: 65 percent
Mountainburg and similar soils: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carnasaw

Setting

Landform: Mountains
Landform position (three-dimensional): Mountaintop
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Clayey residuum weathered from shale

Typical profile

A - 0 to 2 inches: gravelly silt loam
E - 2 to 6 inches: gravelly silt loam
Bt1 - 6 to 38 inches: silty clay
Bt2 - 38 to 49 inches: silty clay loam
Cr - 49 to 52 inches: bedrock

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C
Ecological site: F119XY006AR - Clayey Upland
Hydric soil rating: No

Description of Mountainburg

Setting

Landform: Mountains
Landform position (three-dimensional): Mountaintop
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Stony, loamy residuum weathered from sandstone

Typical profile

A - 0 to 1 inches: stony fine sandy loam
E - 1 to 6 inches: stony sandy loam
Bt - 6 to 15 inches: very gravelly fine sandy loam
R - 15 to 20 inches: bedrock

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: 12 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F119XY003AR - Shallow Upland
Hydric soil rating: No

Minor Components

Leadvale

Percent of map unit: 10 percent
Ecological site: F119XY007AR - Loamy Upland
Hydric soil rating: No

CMF—Carnasaw-Mountainburg association, steep

Map Unit Setting

National map unit symbol: m04k
Elevation: 500 to 2,800 feet

Mean annual precipitation: 43 to 58 inches
Mean annual air temperature: 50 to 72 degrees F
Frost-free period: 200 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Carnasaw and similar soils: 65 percent
Mountainburg and similar soils: 20 percent
Rock outcrop: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carnasaw

Setting

Landform: Mountains
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from shale

Typical profile

A - 0 to 2 inches: gravelly silt loam
E - 2 to 6 inches: gravelly silt loam
Bt1 - 6 to 38 inches: silty clay
Bt2 - 38 to 49 inches: silty clay loam
Cr - 49 to 52 inches: bedrock

Properties and qualities

Slope: 12 to 40 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F119XY006AR - Clayey Upland
Hydric soil rating: No

Description of Mountainburg

Setting

Landform: Mountains
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Stony, loamy residuum weathered from sandstone

Typical profile

A - 0 to 1 inches: stony fine sandy loam

E - 1 to 6 inches: stony sandy loam
Bt - 6 to 15 inches: very gravelly fine sandy loam
R - 15 to 20 inches: bedrock

Properties and qualities

Slope: 12 to 40 percent
Depth to restrictive feature: 12 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F119XY003AR - Shallow Upland
Hydric soil rating: No

Description of Rock Outcrop

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

SKC—Sallisaw-Leadvale association, undulating

Map Unit Setting

National map unit symbol: m05k
Elevation: 250 to 2,300 feet
Mean annual precipitation: 43 to 58 inches
Mean annual air temperature: 50 to 72 degrees F
Frost-free period: 200 to 260 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Sallisaw and similar soils: 55 percent
Leadvale and similar soils: 45 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sallisaw

Setting

Landform: Stream terraces

Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy and gravelly alluvium

Typical profile

Ap - 0 to 7 inches: silt loam
Bt - 7 to 27 inches: silt loam
2BCt - 27 to 72 inches: very gravelly silt loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F119XY007AR - Loamy Upland
Hydric soil rating: No

Description of Leadvale

Setting

Landform: Valleys
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy pedisediment

Typical profile

Ap - 0 to 7 inches: silt loam
Bt - 7 to 16 inches: silt loam
Btx1 - 16 to 48 inches: silt loam
Btx2 - 48 to 72 inches: silty clay loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 12 to 20 inches to fragipan; 48 to 60 inches to paralithic bedrock
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 16 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F119XY007AR - Loamy Upland
Hydric soil rating: No

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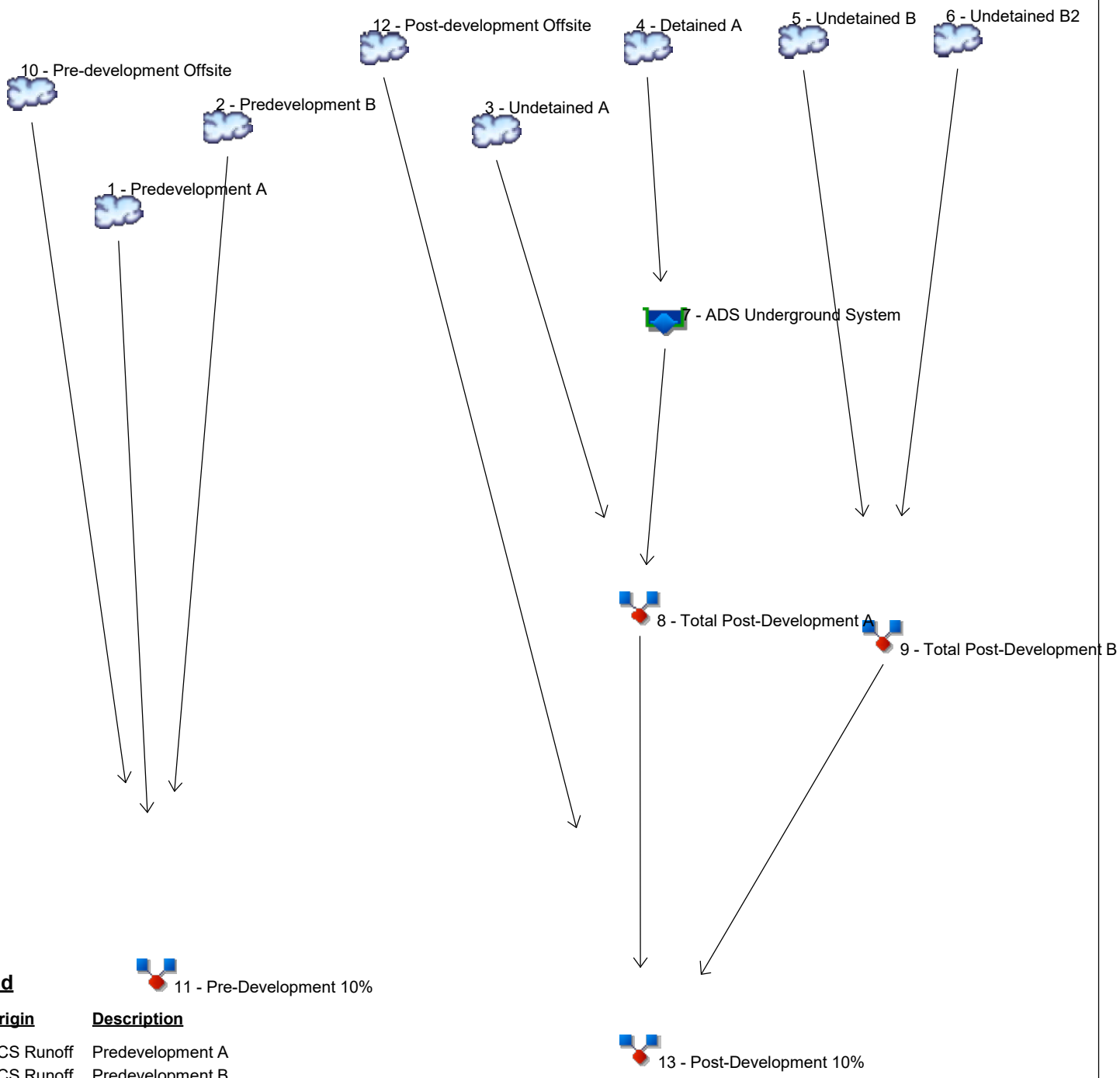
APPENDIX B

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	Predevelopment A
2	SCS Runoff	Predevelopment B
3	SCS Runoff	Undetained A
4	SCS Runoff	Detained A
5	SCS Runoff	Undetained B
6	SCS Runoff	Undetained B2
7	Reservoir	ADS Underground System
8	Combine	Total Post-Development A
9	Combine	Total Post-Development B
10	SCS Runoff	Pre-development Offsite
11	Combine	Pre-Development 10%
12	SCS Runoff	Post-development Offsite
13	Combine	Post-Development 10%

Hydraflow Table of Contents

Hydrograph Summary Report

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

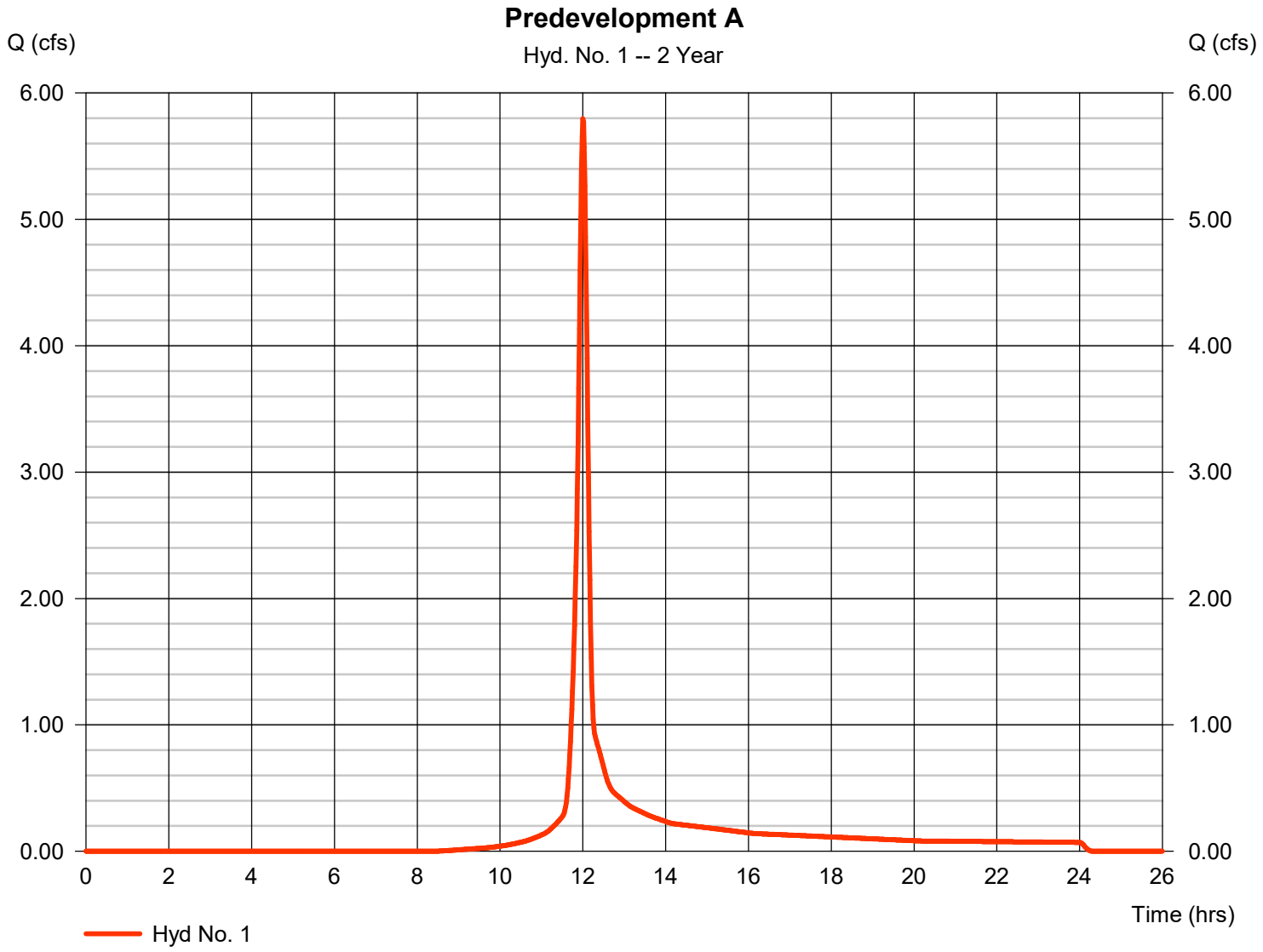
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	5.795	1	720	14,013	------	------	------	Predevelopment A
2	SCS Runoff	2.992	1	720	7,257	------	------	------	Predevelopment B
3	SCS Runoff	0.998	1	717	1,905	------	------	------	Undetained A
4	SCS Runoff	7.835	1	720	19,699	------	------	------	Detained A
5	SCS Runoff	2.422	1	719	5,518	------	------	------	Undetained B
6	SCS Runoff	0.340	1	717	741	------	------	------	Undetained B2
7	Reservoir	2.355	1	731	19,698	4	1230.51	5,373	ADS Underground System
8	Combine	3.026	1	717	21,603	3, 7	------	------	Total Post-Development A
9	Combine	2.738	1	719	6,260	5, 6,	------	------	Total Post-Development B
10	SCS Runoff	38.09	1	723	104,199	------	------	------	Pre-development Offsite
11	Combine	46.49	1	722	125,469	1, 2, 10	------	------	Pre-Development 10%
12	SCS Runoff	38.09	1	723	104,199	------	------	------	Post-development Offsite
13	Combine	42.99	1	722	132,062	8, 9, 12	------	------	Post-Development 10%

Hydrograph Report

Hyd. No. 1

Predevelopment A

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.795 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.00 hrs
Time interval	=	1 min	Hyd. volume	=	14,013 cuft
Drainage area	=	1.790 ac	Curve number	=	79
Basin Slope	=	2.0 %	Hydraulic length	=	130 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.00 min
Total precip.	=	4.19 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 1

Predevelopment A

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 4.19		0.00		0.00		
Land slope (%)	= 2.20		0.00		0.00		
Travel Time (min)	**= 8.24**	**+**	**0.00**	**+**	**0.00**	**=**	**8.24**
Shallow Concentrated Flow							
Flow length (ft)	= 600.00		0.00		0.00		
Watercourse slope (%)	= 5.70		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=3.85		0.00		0.00		
Travel Time (min)	**= 2.60**	**+**	**0.00**	**+**	**0.00**	**=**	**2.60**
Channel Flow							
X sectional flow area (sqft)	= 3.40		0.00		0.00		
Wetted perimeter (ft)	= 14.50		0.00		0.00		
Channel slope (%)	= 0.50		0.00		0.00		
Manning's n-value	= 0.013		0.015		0.015		
Velocity (ft/s)	=3.07						
			0.00				
					0.00		
Flow length (ft)	({0})25.0		0.0		0.0		
Travel Time (min)	**= 0.14**	**+**	**0.00**	**+**	**0.00**	**=**	**0.14**

Total Travel Time, Tc ..... 11.00 min

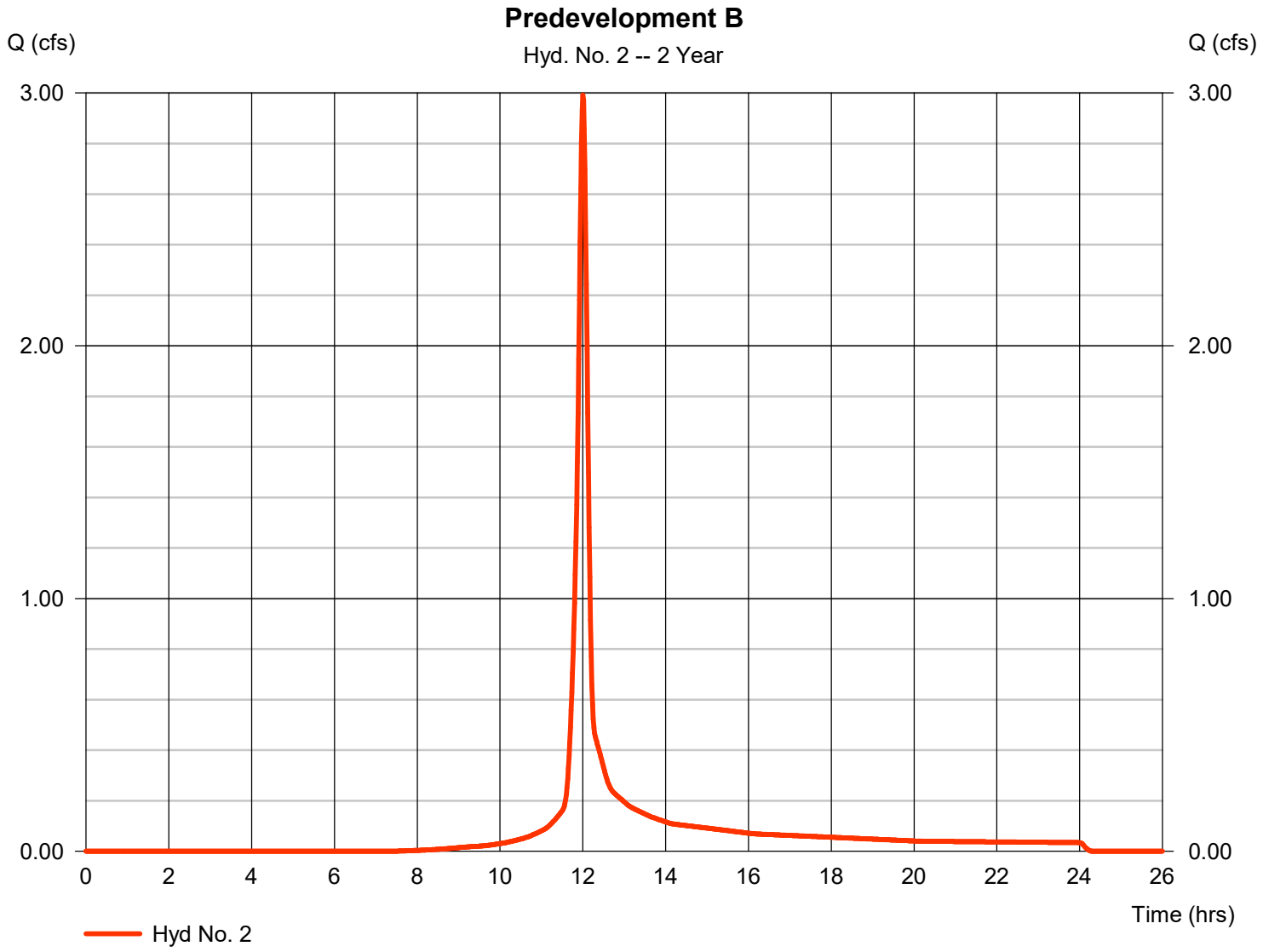
Hydrograph Report

Hyd. No. 2

Predevelopment B

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.992 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.00 hrs
Time interval	=	1 min	Hyd. volume	=	7,257 cuft
Drainage area	=	0.830 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.60 min
Total precip.	=	4.19 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.120 x 98) + (0.710 x 79)] / 0.830



TR55 Tc Worksheet

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

Hyd. No. 2

Predevelopment B

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 4.19		0.00		0.00		
Land slope (%)	= 2.20		0.00		0.00		
Travel Time (min)	**= 8.24**	**+**	**0.00**	**+**	**0.00**	**=**	**8.24**
Shallow Concentrated Flow							
Flow length (ft)	= 170.00		62.00		0.00		
Watercourse slope (%)	= 4.00		26.00		0.00		
Surface description	= Unpaved		Unpaved		Paved		
Average velocity (ft/s)	=3.23		8.23		0.00		
Travel Time (min)	**= 0.88**	**+**	**0.13**	**+**	**0.00**	**=**	**1.00**
Channel Flow							
X sectional flow area (sqft)	= 3.00		1.77		3.14		
Wetted perimeter (ft)	= 12.00		4.71		6.28		
Channel slope (%)	= 3.20		4.20		1.20		
Manning's n-value	= 0.030		0.013		0.012		
Velocity (ft/s)	=3.51						
			12.19				
					8.55		
Flow length (ft)	({0})230.0		147.0		41.0		
Travel Time (min)	**= 1.09**	**+**	**0.20**	**+**	**0.08**	**=**	**1.37**

Total Travel Time, Tc ..... 10.60 min

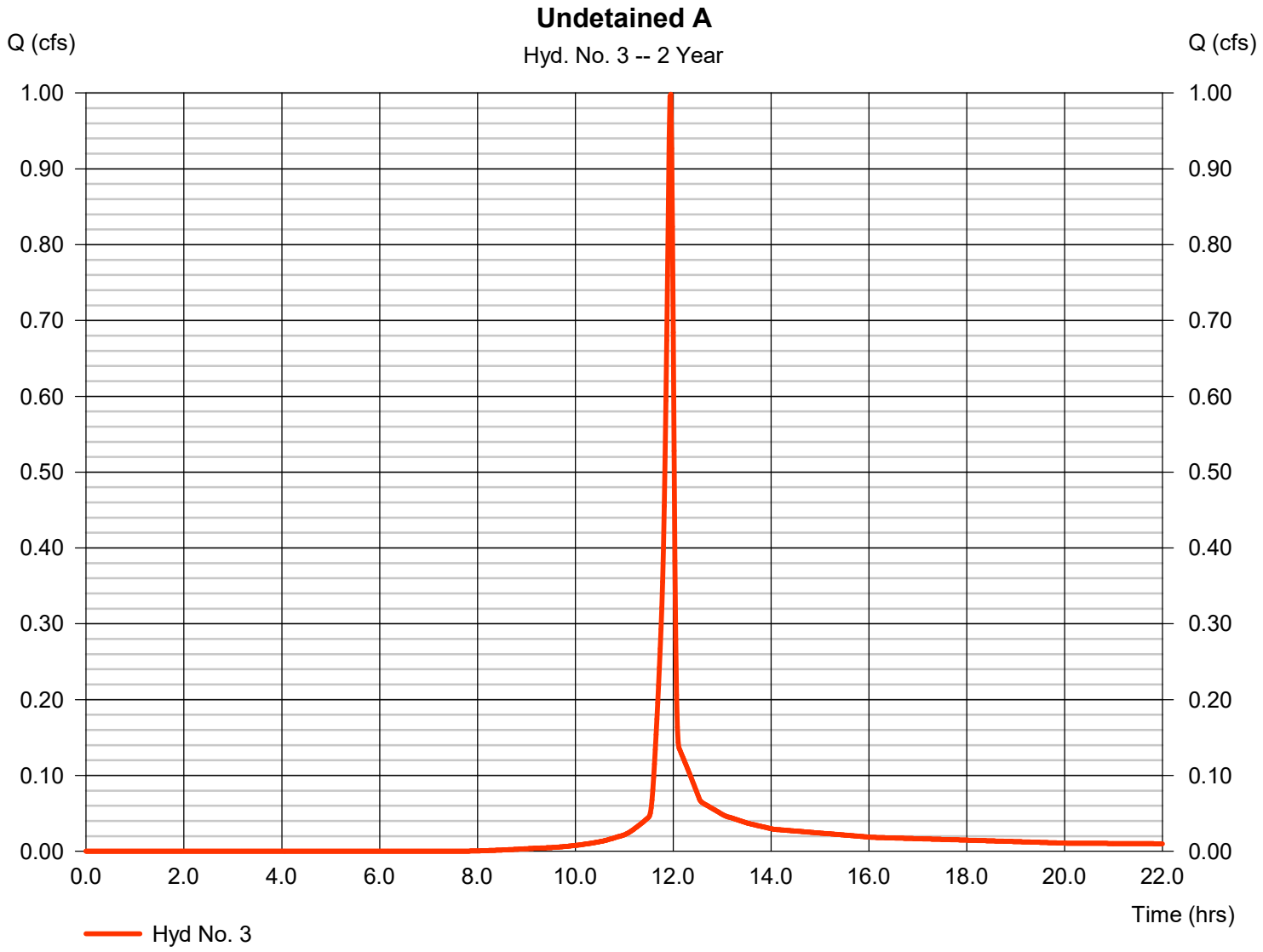
Hydrograph Report

Hyd. No. 3

Undetained A

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.998 cfs
Storm frequency	=	2 yrs	Time to peak	=	11.95 hrs
Time interval	=	1 min	Hyd. volume	=	1,905 cuft
Drainage area	=	0.230 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.40 min
Total precip.	=	4.19 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.200 x 79) + (0.030 x 98)] / 0.230



TR55 Tc Worksheet

Hyd. No. 3

Undetained A

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 37.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 4.19		0.00		0.00		
Land slope (%)	= 2.20		0.00		0.00		
Travel Time (min)	**= 3.72**	**+**	**0.00**	**+**	**0.00**	**=**	**3.72**
Shallow Concentrated Flow							
Flow length (ft)	= 63.00		20.00		0.00		
Watercourse slope (%)	= 4.00		26.50		0.00		
Surface description	= Unpaved		Unpaved		Paved		
Average velocity (ft/s)	=3.23		8.31		0.00		
Travel Time (min)	**= 0.33**	**+**	**0.04**	**+**	**0.00**	**=**	**0.37**
Channel Flow							
X sectional flow area (sqft)	= 1.50		1.77		3.14		
Wetted perimeter (ft)	= 6.10		4.71		6.28		
Channel slope (%)	= 3.20		3.60		1.20		
Manning's n-value	= 0.030		0.013		0.012		
Velocity (ft/s)	=3.47						
			11.29				
					8.55		
Flow length (ft)	({0})18.5		123.0		15.0		
Travel Time (min)	**= 0.09**	**+**	**0.18**	**+**	**0.03**	**=**	**0.30**

Total Travel Time, Tc ..... 4.40 min

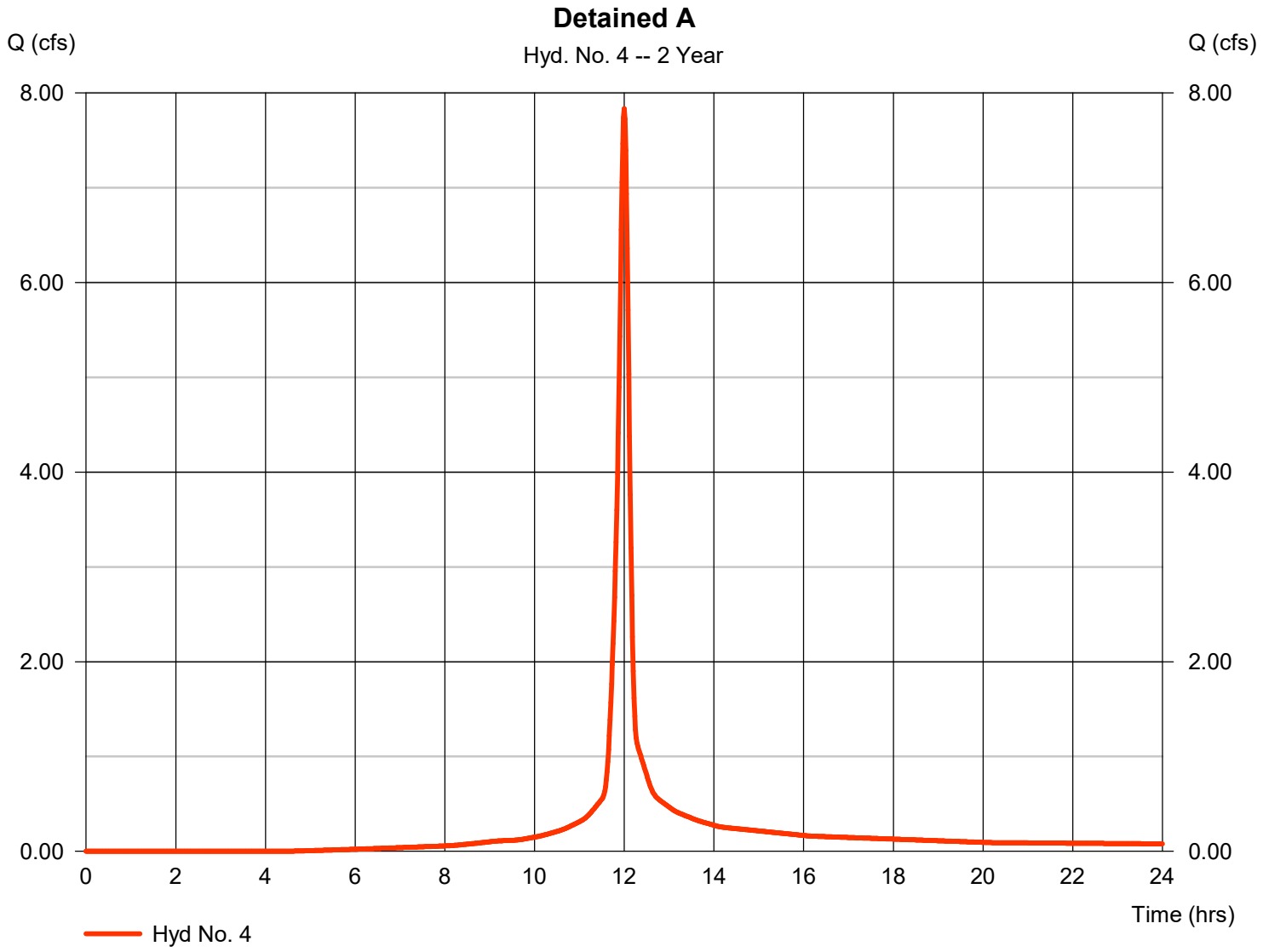
Hydrograph Report

Hyd. No. 4

Detained A

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.835 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.00 hrs
Time interval	=	1 min	Hyd. volume	=	19,699 cuft
Drainage area	=	1.720 ac	Curve number	=	90*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.40 min
Total precip.	=	4.19 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.970 x 98) + (0.750 x 79)] / 1.720



TR55 Tc Worksheet

Hyd. No. 4

Detained A

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 4.19		0.00		0.00		
Land slope (%)	= 2.20		0.00		0.00		
Travel Time (min)	**= 8.24**	**+**	**0.00**	**+**	**0.00**	**=**	**8.24**
Shallow Concentrated Flow							
Flow length (ft)	= 238.00		12.00		104.00		
Watercourse slope (%)	= 4.60		33.00		1.50		
Surface description	= Unpaved		Unpaved		Paved		
Average velocity (ft/s)	=3.46		9.27		2.49		
Travel Time (min)	**= 1.15**	**+**	**0.02**	**+**	**0.70**	**=**	**1.86**
Channel Flow							
X sectional flow area (sqft)	= 1.77		1.77		0.00		
Wetted perimeter (ft)	= 4.71		4.71		0.00		
Channel slope (%)	= 16.00		1.70		0.00		
Manning's n-value	= 0.013		0.013		0.015		
Velocity (ft/s)	=23.80						
			7.76				
					0.00		
Flow length (ft)	({0})61.0		122.0		0.0		
Travel Time (min)	**= 0.04**	**+**	**0.26**	**+**	**0.00**	**=**	**0.30**

Total Travel Time, Tc ..... 10.40 min

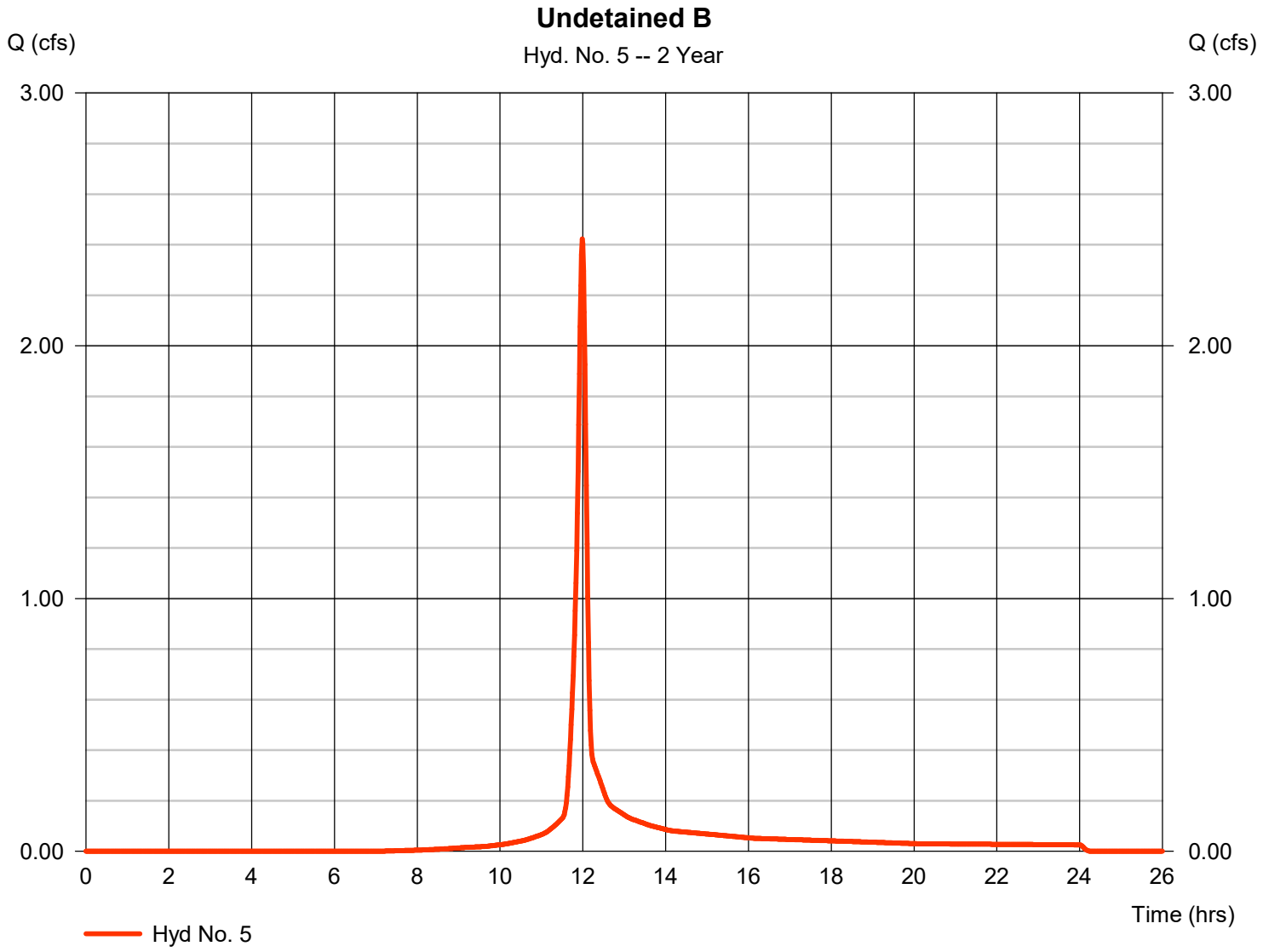
Hydrograph Report

Hyd. No. 5

Undetained B

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.422 cfs
Storm frequency	=	2 yrs	Time to peak	=	11.98 hrs
Time interval	=	1 min	Hyd. volume	=	5,518 cuft
Drainage area	=	0.620 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.00 min
Total precip.	=	4.19 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.130 x 98) + (0.490 x 79)] / 0.620



TR55 Tc Worksheet

Hyd. No. 5

Undetained B

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 4.19		0.00		0.00		
Land slope (%)	= 2.20		0.00		0.00		
Travel Time (min)	**= 8.24**	**+**	**0.00**	**+**	**0.00**	**=**	**8.24**
Shallow Concentrated Flow							
Flow length (ft)	= 170.00		55.00		0.00		
Watercourse slope (%)	= 4.00		26.50		0.00		
Surface description	= Unpaved		Unpaved		Paved		
Average velocity (ft/s)	=3.23		8.31		0.00		
Travel Time (min)	**= 0.88**	**+**	**0.11**	**+**	**0.00**	**=**	**0.99**
Channel Flow							
X sectional flow area (sqft)	= 1.50		1.77		3.14		
Wetted perimeter (ft)	= 6.10		4.71		6.28		
Channel slope (%)	= 3.20		3.60		1.20		
Manning's n-value	= 0.030		0.013		0.012		
Velocity (ft/s)	=3.47						
			11.29				
					8.55		
Flow length (ft)	({0})50.0		333.0		41.0		
Travel Time (min)	**= 0.24**	**+**	**0.49**	**+**	**0.08**	**=**	**0.81**

Total Travel Time, Tc ..... 10.00 min

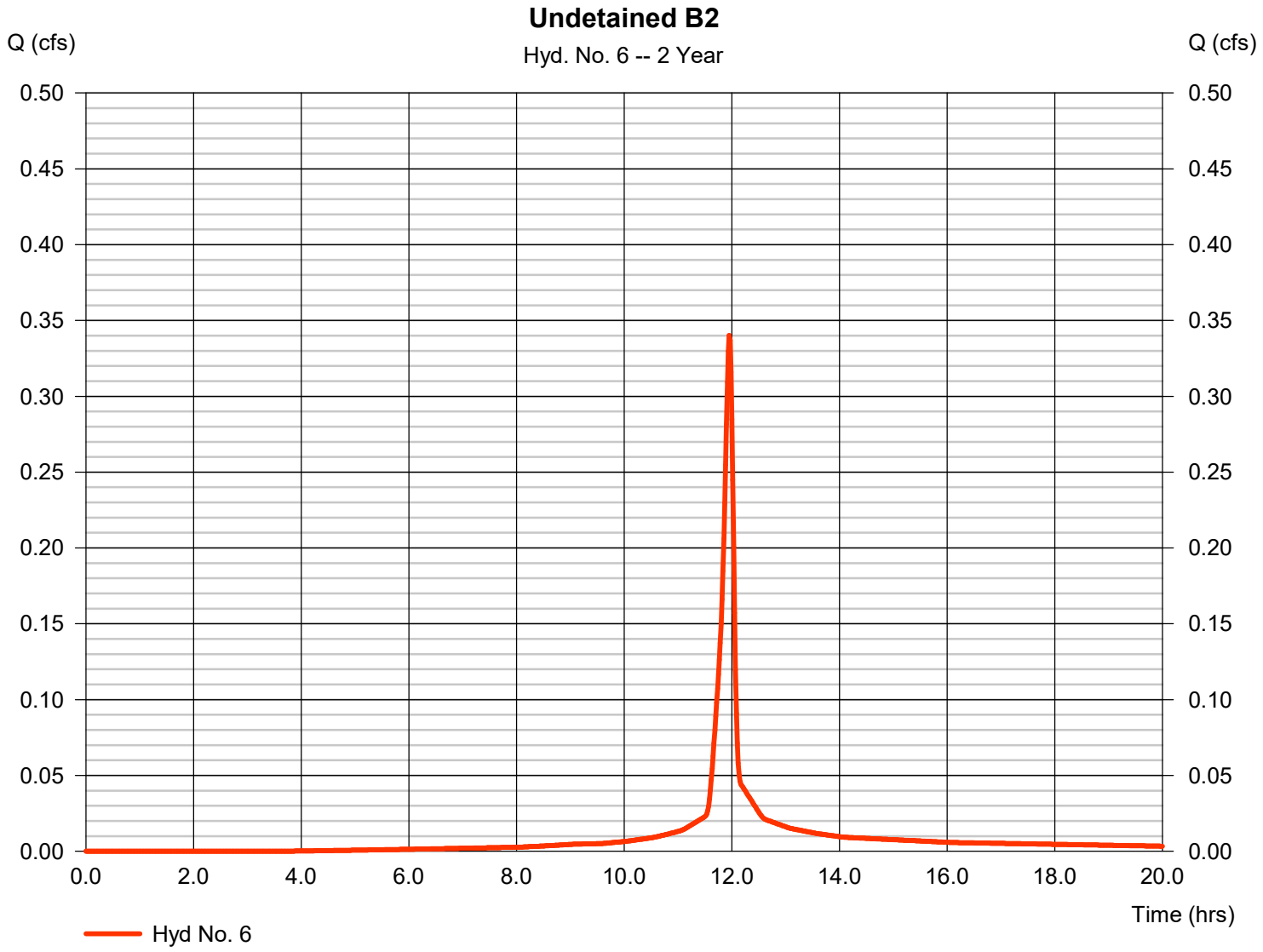
Hydrograph Report

Hyd. No. 6

Undetained B2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.340 cfs
Storm frequency	=	2 yrs	Time to peak	=	11.95 hrs
Time interval	=	1 min	Hyd. volume	=	741 cuft
Drainage area	=	0.060 ac	Curve number	=	92*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	4.19 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.020 x 79) + (0.040 x 98)] / 0.060



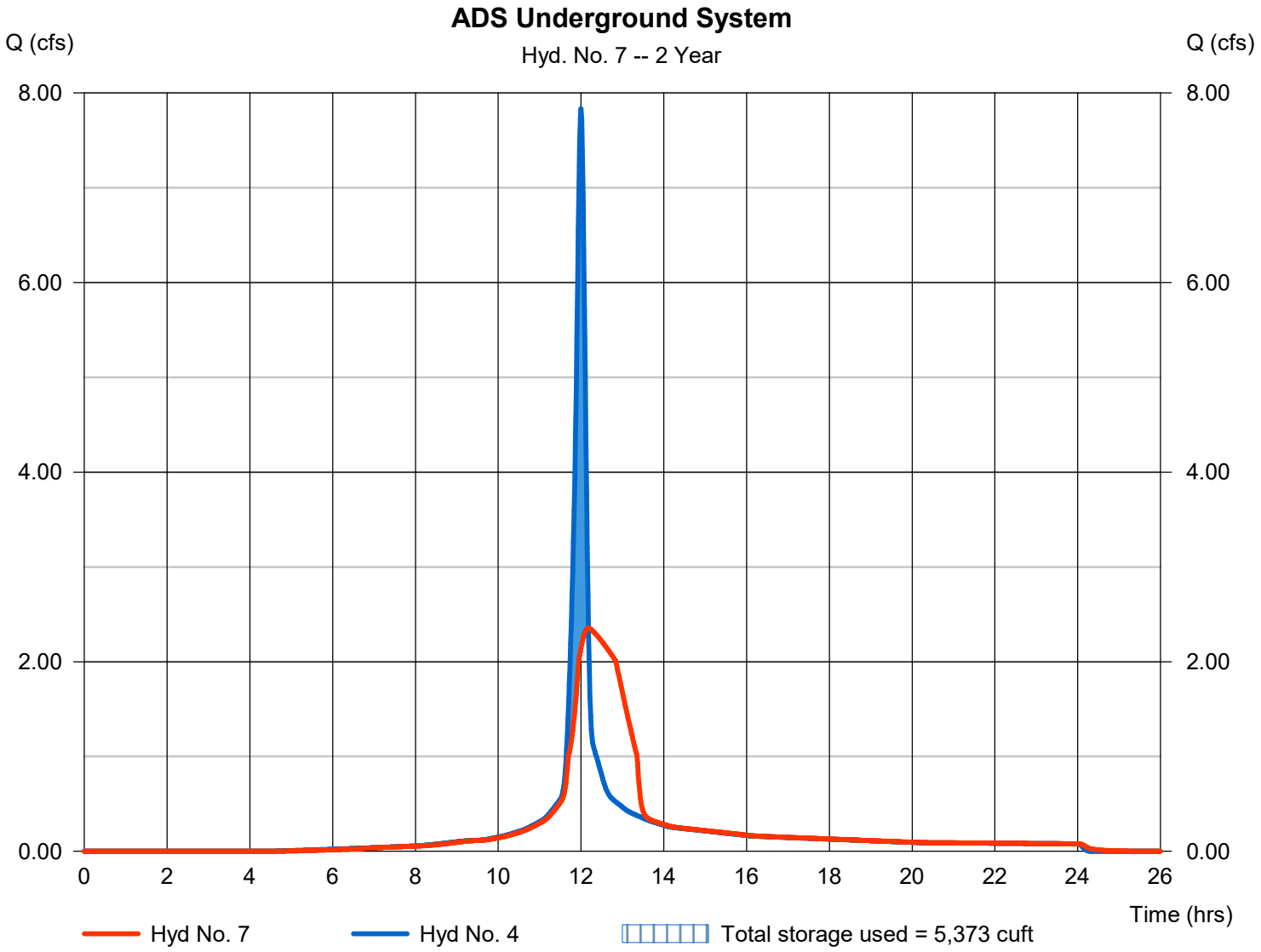
Hydrograph Report

Hyd. No. 7

ADS Underground System

Hydrograph type	=	Reservoir	Peak discharge	=	2.355 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.18 hrs
Time interval	=	1 min	Hyd. volume	=	19,698 cuft
Inflow hyd. No.	=	4 - Detained A	Max. Elevation	=	1230.51 ft
Reservoir name	=	<New Pond>	Max. Storage	=	5,373 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - <New Pond>

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1228.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1228.00	00	0	0
1.00	1229.00	1,000	333	333
2.00	1230.00	3,000	1,910	2,244
3.00	1231.00	10,000	6,158	8,402
4.00	1232.00	12,500	11,226	19,628
5.00	1233.00	15,000	13,730	33,358
6.00	1234.00	17,000	15,988	49,346

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 10.00	10.00	0.00	0.00
Span (in)	= 10.00	10.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 1228.00	1228.00	0.00	0.00
Length (ft)	= 55.00	0.50	0.00	0.00
Slope (%)	= 0.35	0.10	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	No	No

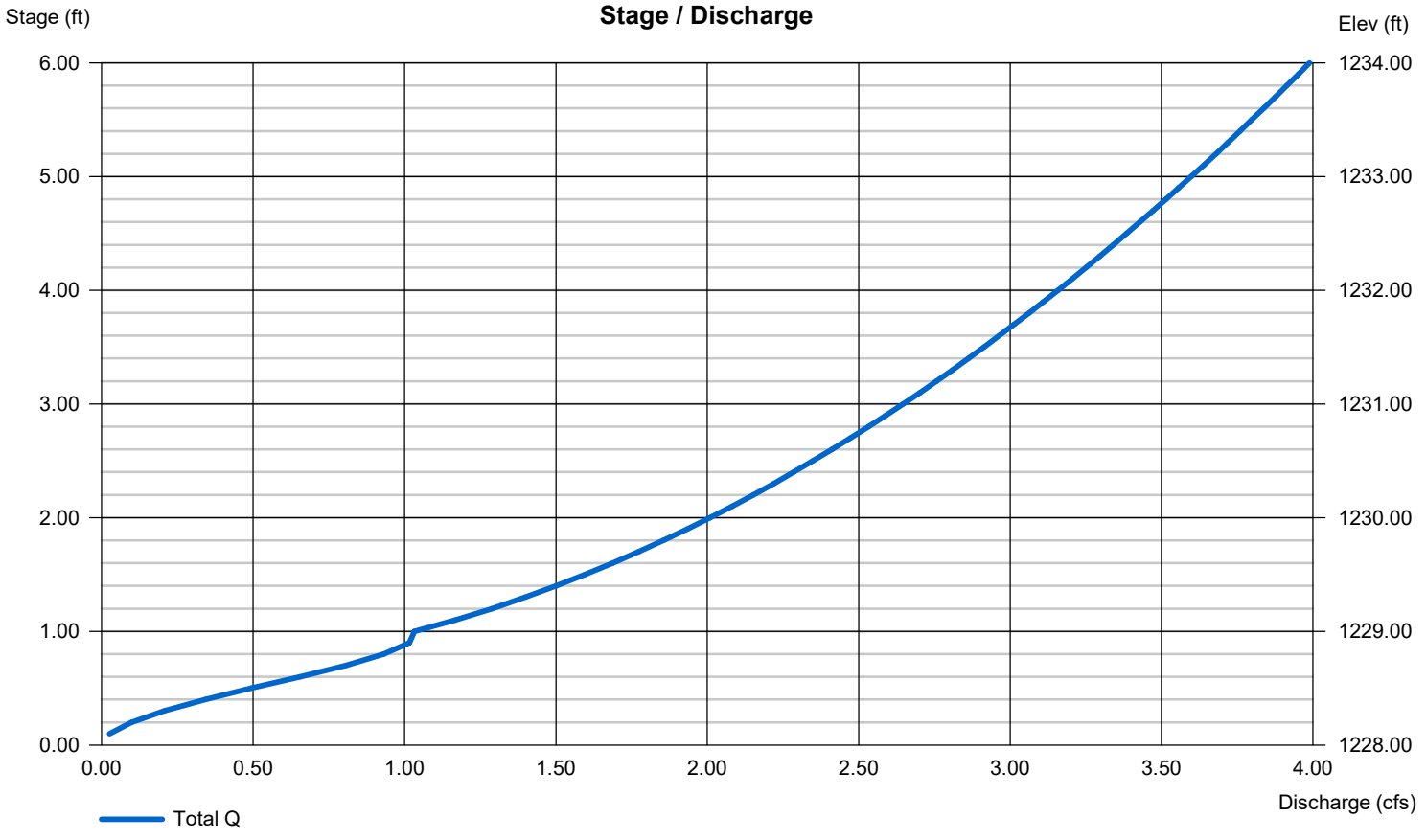
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	0.00	0.00	0.00
Crest El. (ft)	= 1234.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 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).

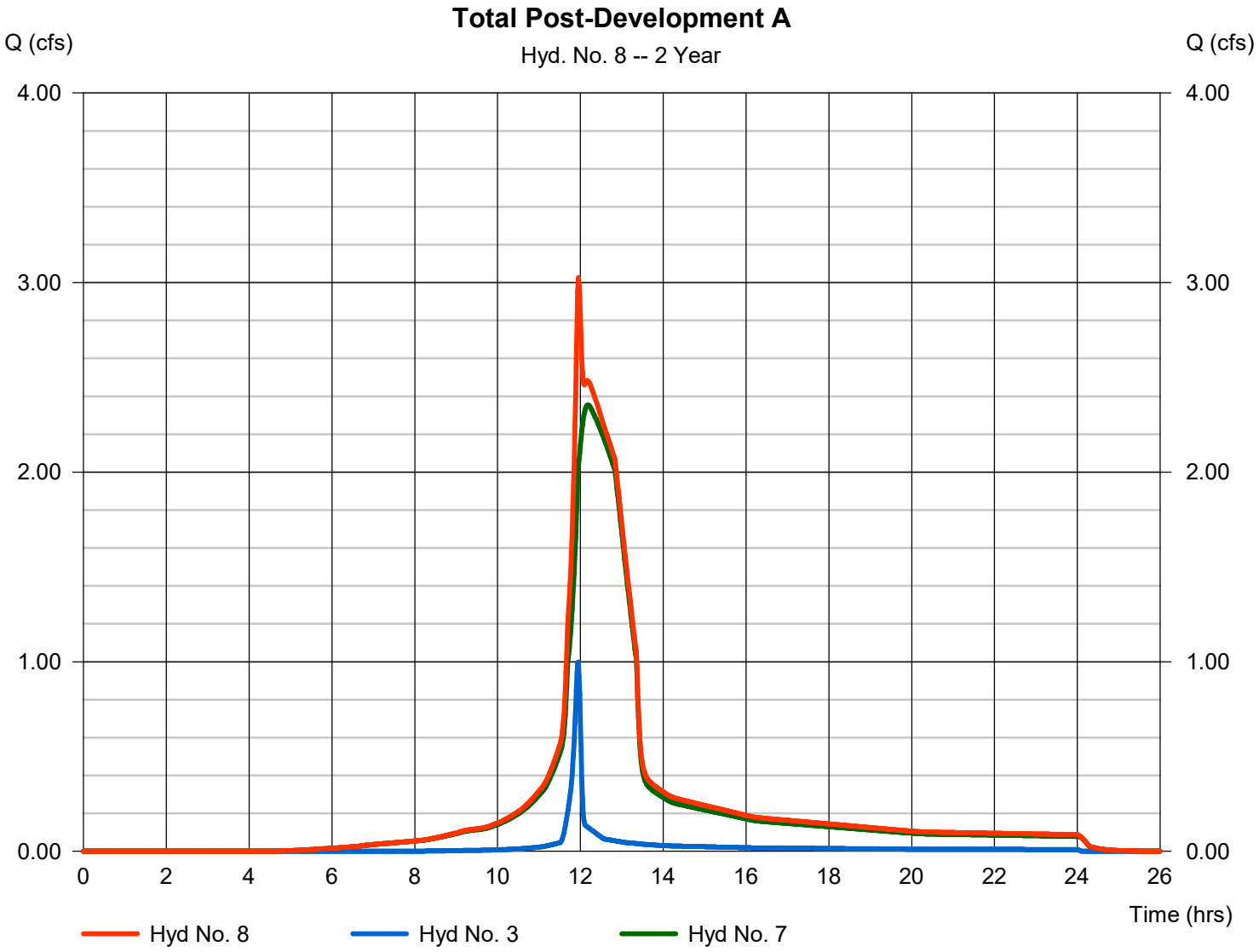


Hydrograph Report

Hyd. No. 8

Total Post-Development A

Hydrograph type	= Combine	Peak discharge	= 3.026 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.95 hrs
Time interval	= 1 min	Hyd. volume	= 21,603 cuft
Inflow hyds.	= 3, 7	Contrib. drain. area	= 0.230 ac

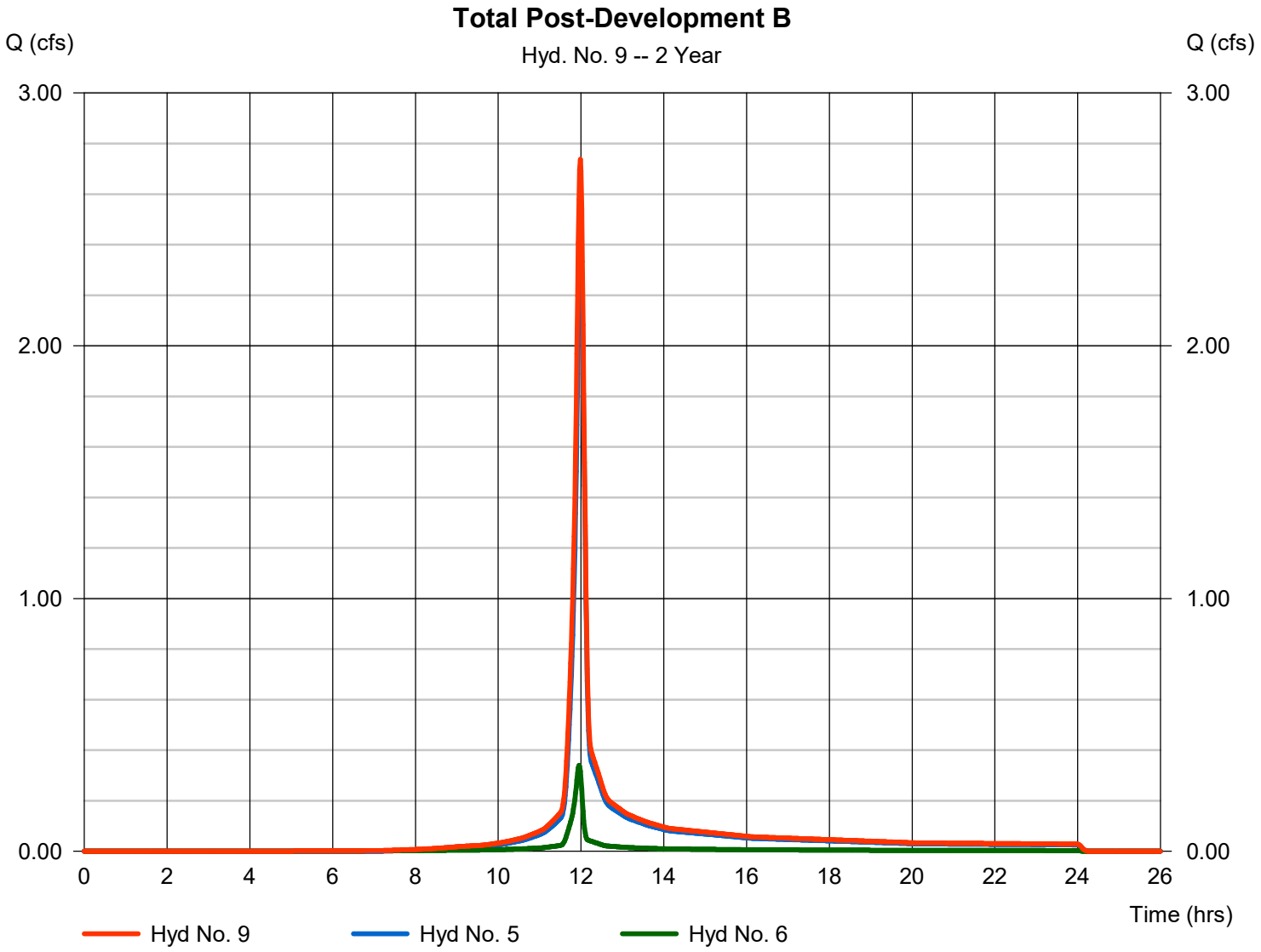


Hydrograph Report

Hyd. No. 9

Total Post-Development B

Hydrograph type	=	Combine	Peak discharge	=	2.738 cfs
Storm frequency	=	2 yrs	Time to peak	=	11.98 hrs
Time interval	=	1 min	Hyd. volume	=	6,260 cuft
Inflow hyds.	=	5, 6	Contrib. drain. area	=	0.680 ac



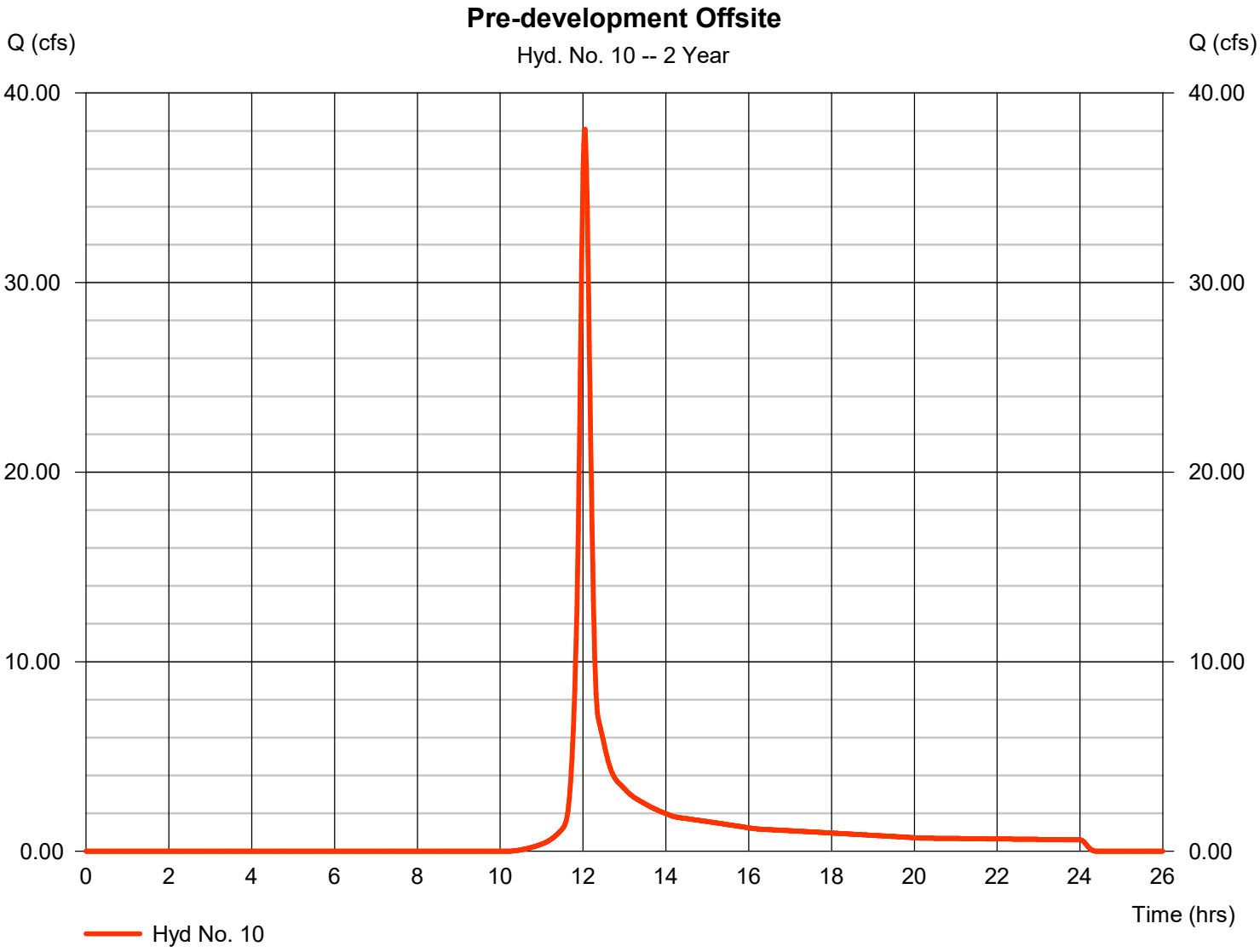
Hydrograph Report

Hyd. No. 10

Pre-development Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	38.09 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.05 hrs
Time interval	=	1 min	Hyd. volume	=	104,199 cuft
Drainage area	=	18.000 ac	Curve number	=	72*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.80 min
Total precip.	=	4.19 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.140 x 79) + (0.560 x 92) + (15.300 x 70)] / 18.000



TR55 Tc Worksheet

Hyd. No. 10

Pre-development Offsite

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 4.19		0.00		0.00		
Land slope (%)	= 9.00		0.00		0.00		
Travel Time (min)	**= 4.69**	**+**	**0.00**	**+**	**0.00**	**=**	**4.69**
Shallow Concentrated Flow							
Flow length (ft)	= 301.00		0.00		0.00		
Watercourse slope (%)	= 8.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=4.56		0.00		0.00		
Travel Time (min)	**= 1.10**	**+**	**0.00**	**+**	**0.00**	**=**	**1.10**
Channel Flow							
X sectional flow area (sqft)	= 4.00		0.00		0.00		
Wetted perimeter (ft)	= 16.00		0.00		0.00		
Channel slope (%)	= 2.70		0.00		0.00		
Manning's n-value	= 0.040		0.015		0.015		
Velocity (ft/s)	=2.42						
			0.00				
					0.00		
Flow length (ft)	({0})1157.0		0.0		0.0		
Travel Time (min)	**= 7.98**	**+**	**0.00**	**+**	**0.00**	**=**	**7.98**

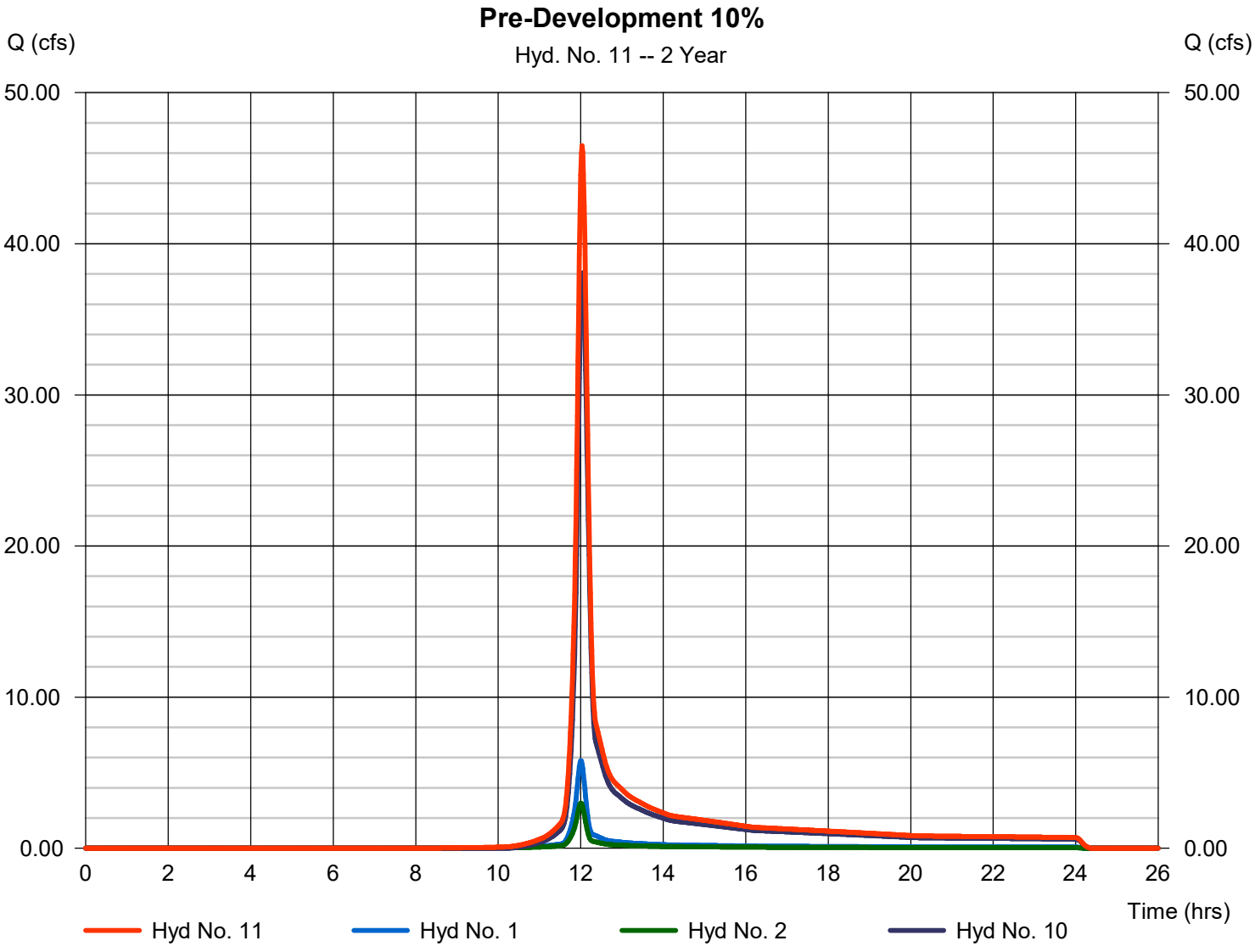
Total Travel Time, Tc ..... 13.80 min

Hydrograph Report

Hyd. No. 11

Pre-Development 10%

Hydrograph type	= Combine	Peak discharge	= 46.49 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.03 hrs
Time interval	= 1 min	Hyd. volume	= 125,469 cuft
Inflow hyds.	= 1, 2, 10	Contrib. drain. area	= 20.620 ac

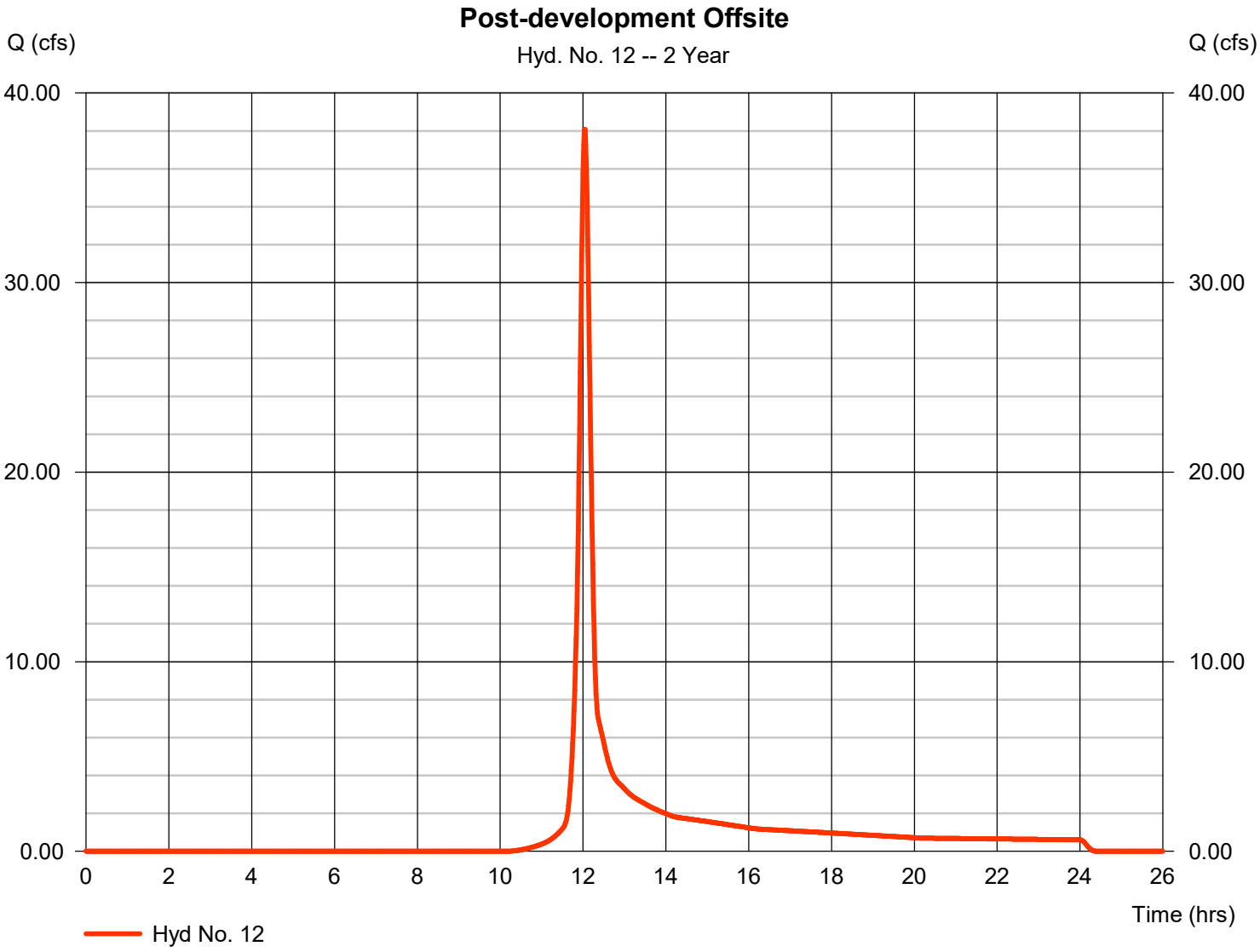


Hydrograph Report

Hyd. No. 12

Post-development Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	38.09 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.05 hrs
Time interval	=	1 min	Hyd. volume	=	104,199 cuft
Drainage area	=	18.000 ac	Curve number	=	72
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.80 min
Total precip.	=	4.19 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 12

Post-development Offsite

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 4.19		0.00		0.00		
Land slope (%)	= 9.00		0.00		0.00		
Travel Time (min)	**= 4.69**	**+**	**0.00**	**+**	**0.00**	**=**	**4.69**
Shallow Concentrated Flow							
Flow length (ft)	= 301.00		0.00		0.00		
Watercourse slope (%)	= 8.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=4.56		0.00		0.00		
Travel Time (min)	**= 1.10**	**+**	**0.00**	**+**	**0.00**	**=**	**1.10**
Channel Flow							
X sectional flow area (sqft)	= 4.00		0.00		0.00		
Wetted perimeter (ft)	= 16.00		0.00		0.00		
Channel slope (%)	= 2.70		0.00		0.00		
Manning's n-value	= 0.040		0.015		0.015		
Velocity (ft/s)	=2.42						
			0.00				
					0.00		
Flow length (ft)	({0})1157.0		0.0		0.0		
Travel Time (min)	**= 7.98**	**+**	**0.00**	**+**	**0.00**	**=**	**7.98**

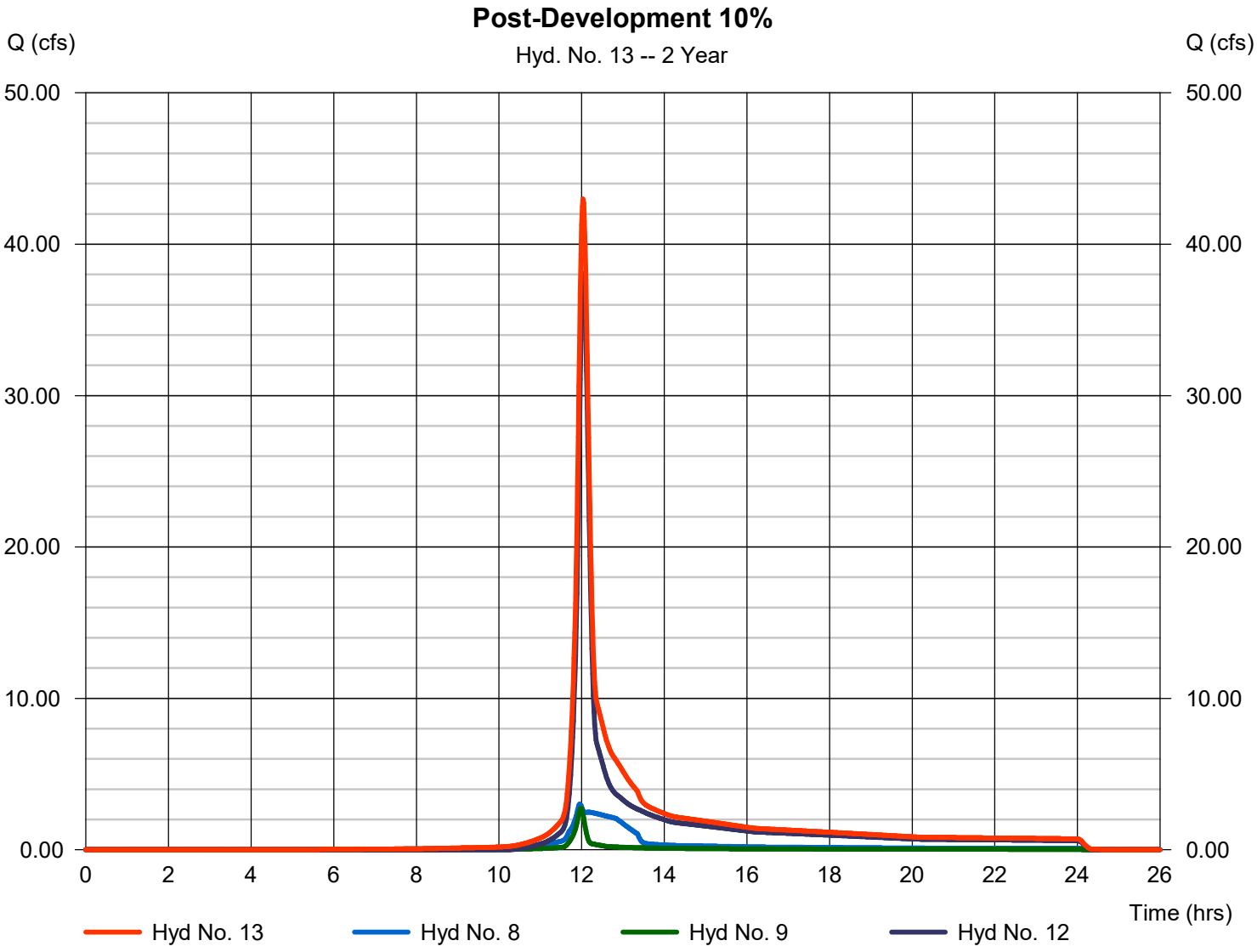
Total Travel Time, Tc ..... 13.80 min

Hydrograph Report

Hyd. No. 13

Post-Development 10%

Hydrograph type	= Combine	Peak discharge	= 42.99 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.03 hrs
Time interval	= 1 min	Hyd. volume	= 132,062 cuft
Inflow hyds.	= 8, 9, 12	Contrib. drain. area	= 18.000 ac



Hydrograph Summary Report

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

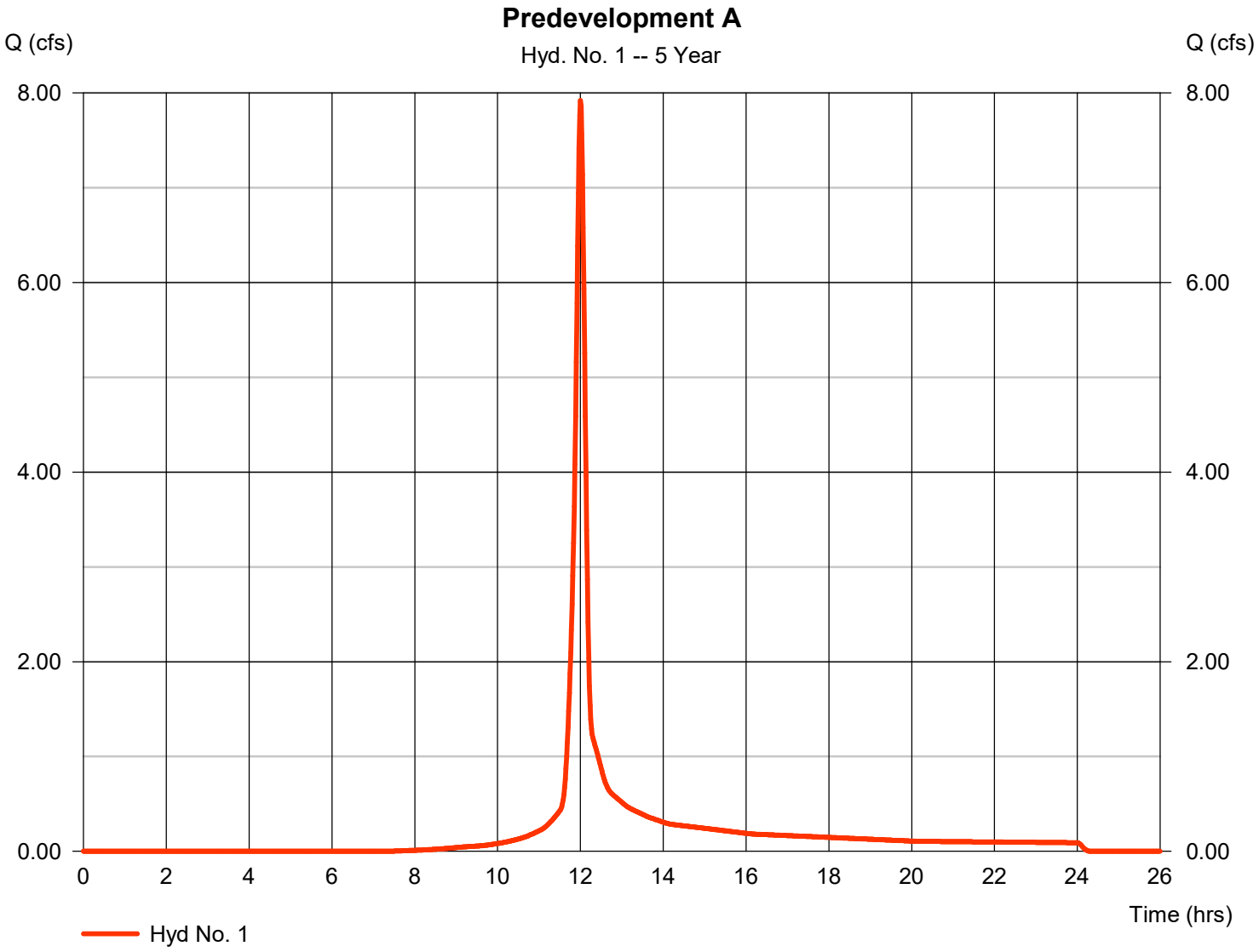
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	7.921	1	720	19,214	------	------	------	Predevelopment A
2	SCS Runoff	4.000	1	720	9,772	------	------	------	Predevelopment B
3	SCS Runoff	1.335	1	716	2,581	------	------	------	Undetained A
4	SCS Runoff	9.947	1	720	25,370	------	------	------	Detained A
5	SCS Runoff	3.212	1	719	7,388	------	------	------	Undetained B
6	SCS Runoff	0.427	1	717	945	------	------	------	Undetained B2
7	Reservoir	2.560	1	732	25,369	4	1230.85	7,469	ADS Underground System
8	Combine	3.470	1	717	27,950	3, 7	------	------	Total Post-Development A
9	Combine	3.607	1	719	8,333	5, 6,	------	------	Total Post-Development B
10	SCS Runoff	55.44	1	722	149,673	------	------	------	Pre-development Offsite
11	Combine	66.81	1	722	178,660	1, 2, 10	------	------	Pre-Development 10%
12	SCS Runoff	55.44	1	722	149,673	------	------	------	Post-development Offsite
13	Combine	61.37	1	722	185,957	8, 9, 12	------	------	Post-Development 10%

Hydrograph Report

Hyd. No. 1

Predevelopment A

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.921 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.00 hrs
Time interval	=	1 min	Hyd. volume	=	19,214 cuft
Drainage area	=	1.790 ac	Curve number	=	79
Basin Slope	=	2.0 %	Hydraulic length	=	130 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.00 min
Total precip.	=	5.12 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



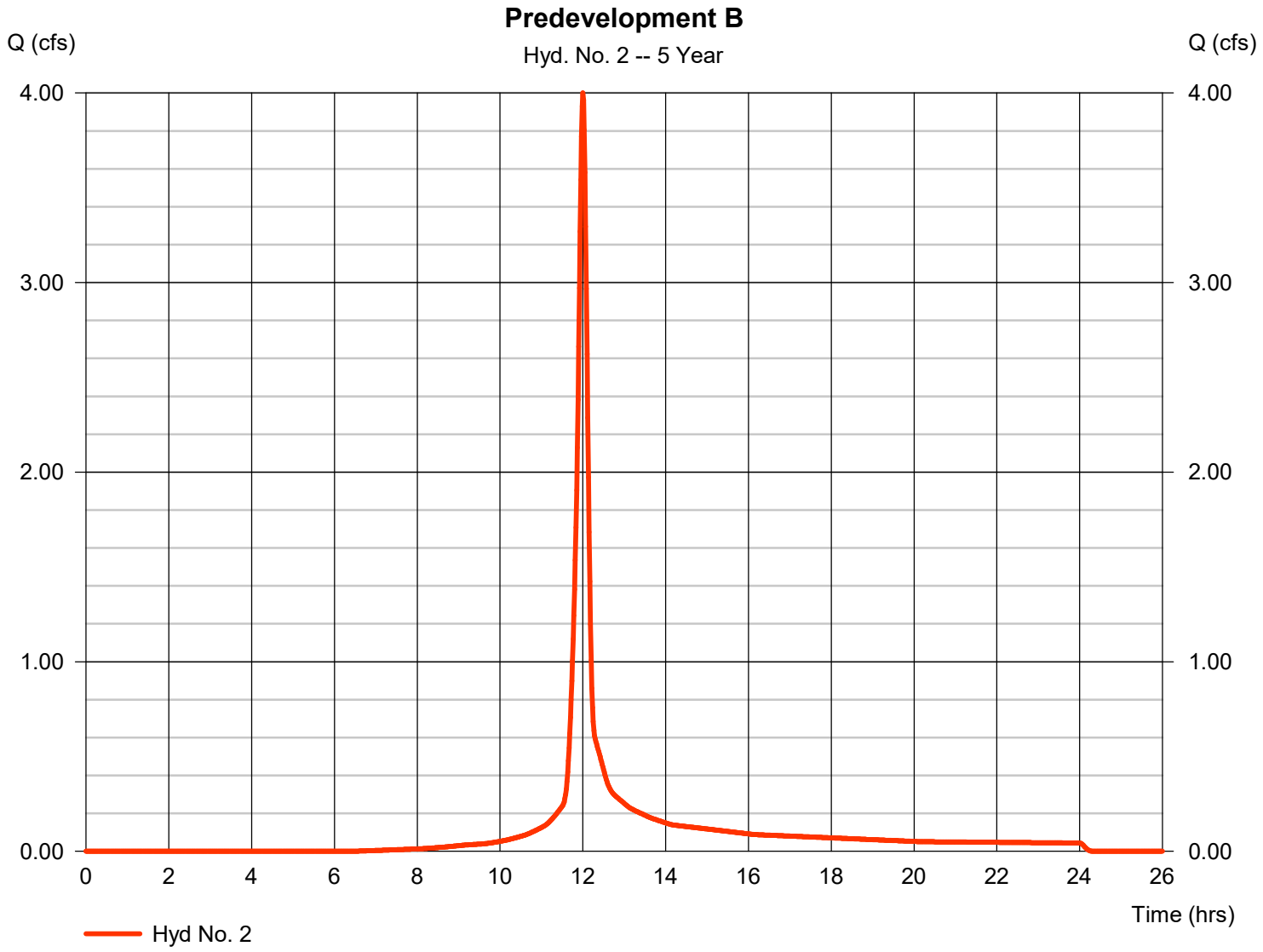
Hydrograph Report

Hyd. No. 2

Predevelopment B

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.000 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.00 hrs
Time interval	=	1 min	Hyd. volume	=	9,772 cuft
Drainage area	=	0.830 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.60 min
Total precip.	=	5.12 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.120 x 98) + (0.710 x 79)] / 0.830



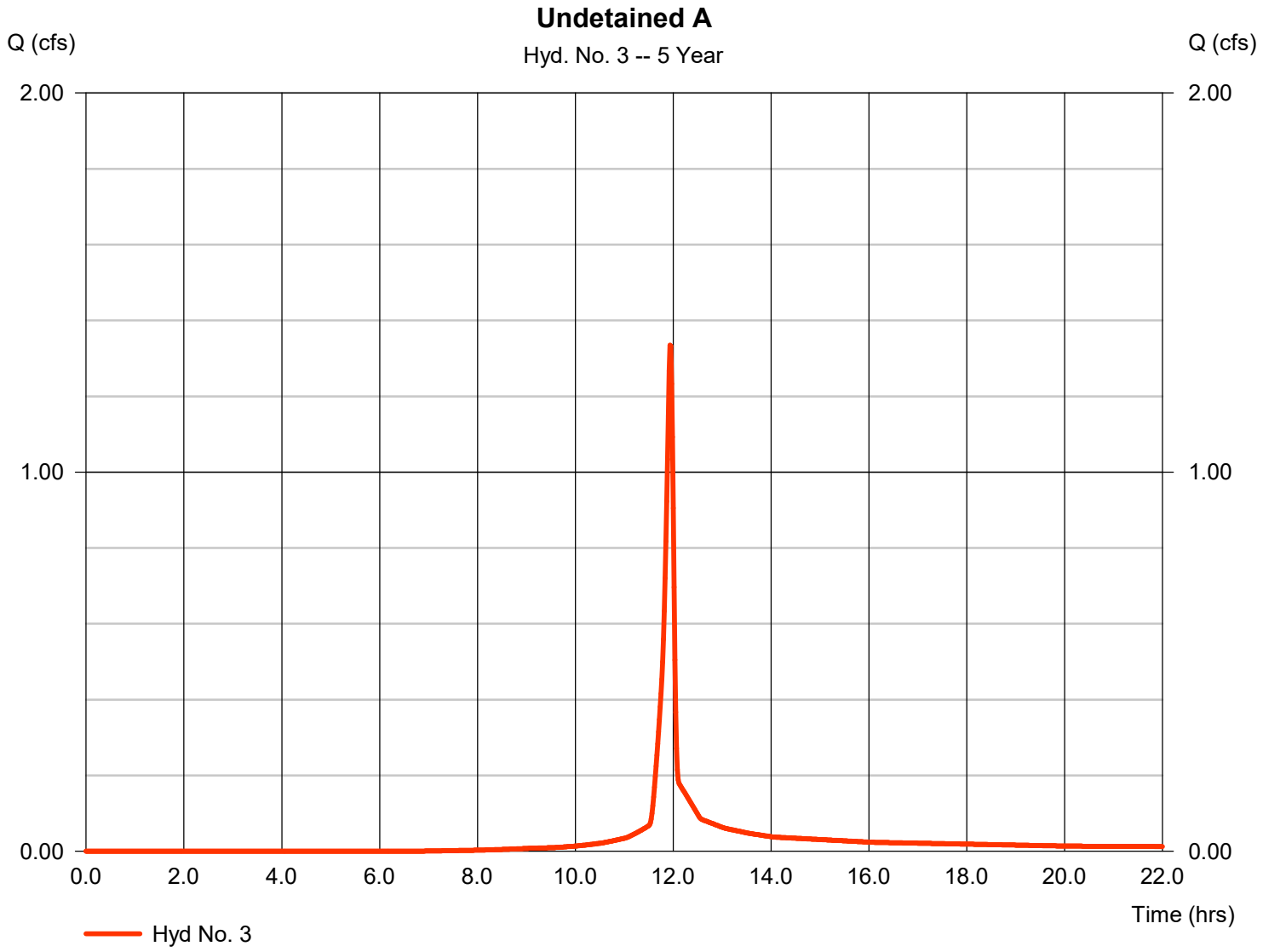
Hydrograph Report

Hyd. No. 3

Undetained A

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.335 cfs
Storm frequency	=	5 yrs	Time to peak	=	11.93 hrs
Time interval	=	1 min	Hyd. volume	=	2,581 cuft
Drainage area	=	0.230 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.40 min
Total precip.	=	5.12 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.200 x 79) + (0.030 x 98)] / 0.230



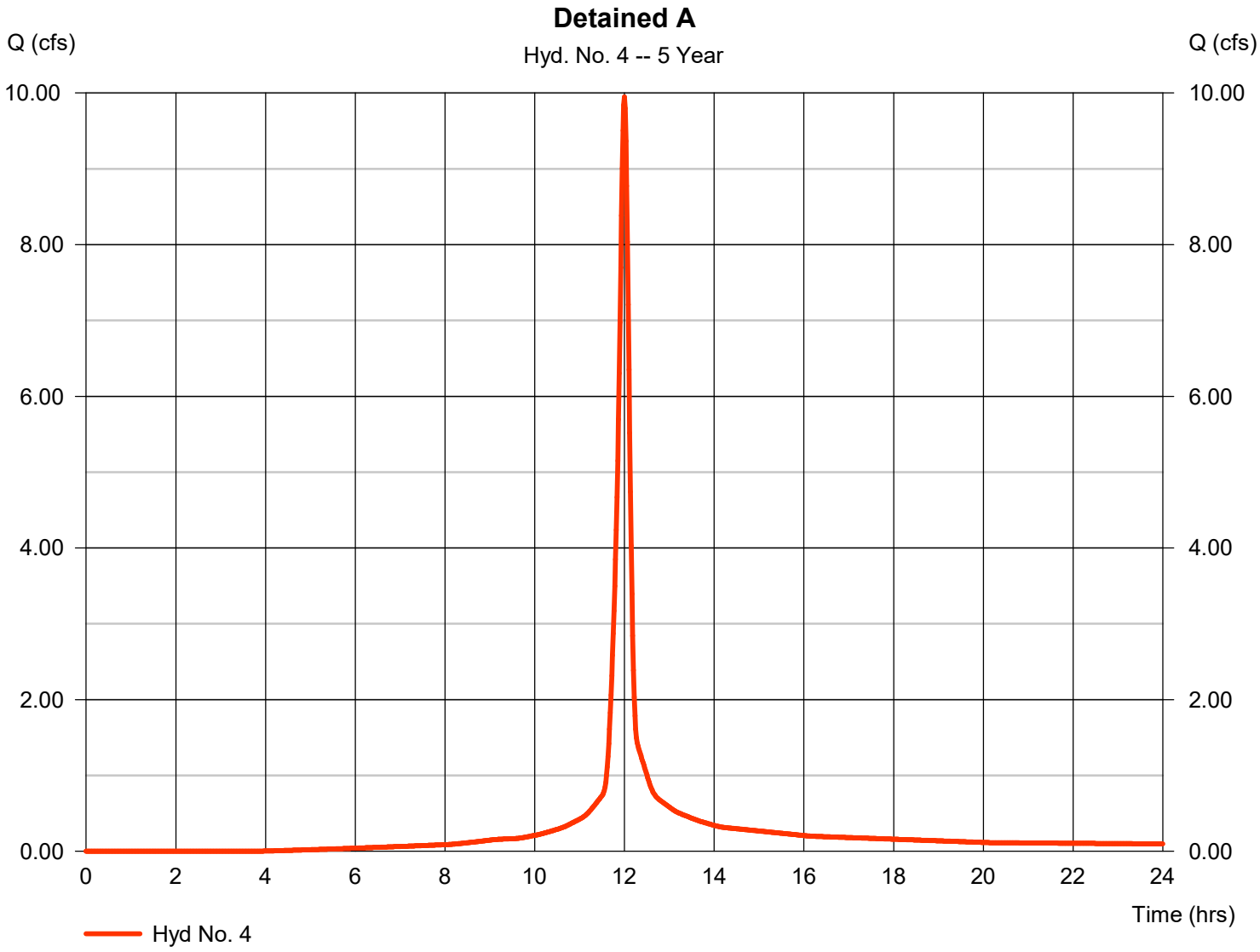
Hydrograph Report

Hyd. No. 4

Detained A

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.947 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.00 hrs
Time interval	=	1 min	Hyd. volume	=	25,370 cuft
Drainage area	=	1.720 ac	Curve number	=	90*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.40 min
Total precip.	=	5.12 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.970 x 98) + (0.750 x 79)] / 1.720



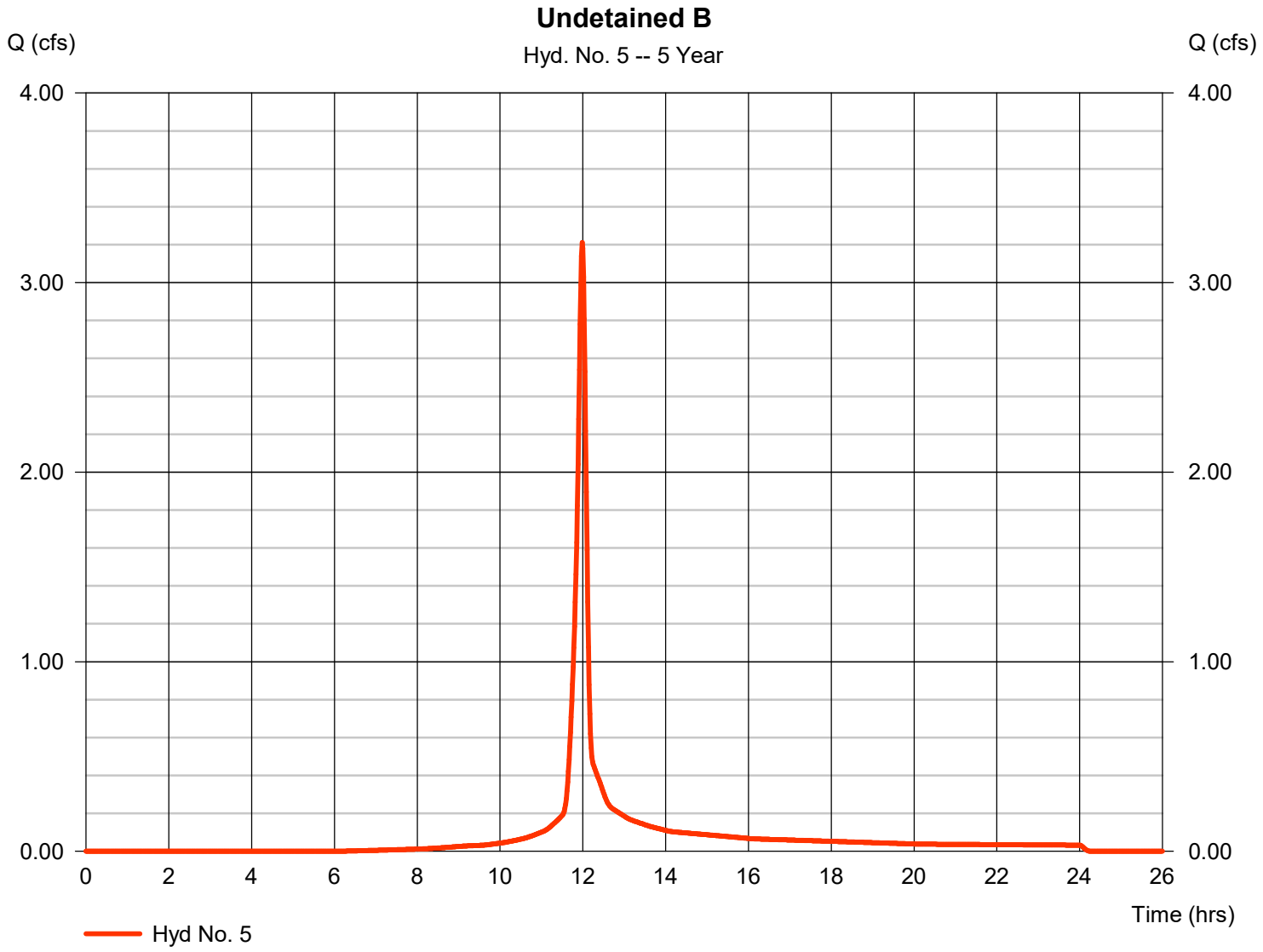
Hydrograph Report

Hyd. No. 5

Undetained B

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.212 cfs
Storm frequency	=	5 yrs	Time to peak	=	11.98 hrs
Time interval	=	1 min	Hyd. volume	=	7,388 cuft
Drainage area	=	0.620 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.00 min
Total precip.	=	5.12 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.130 x 98) + (0.490 x 79)] / 0.620



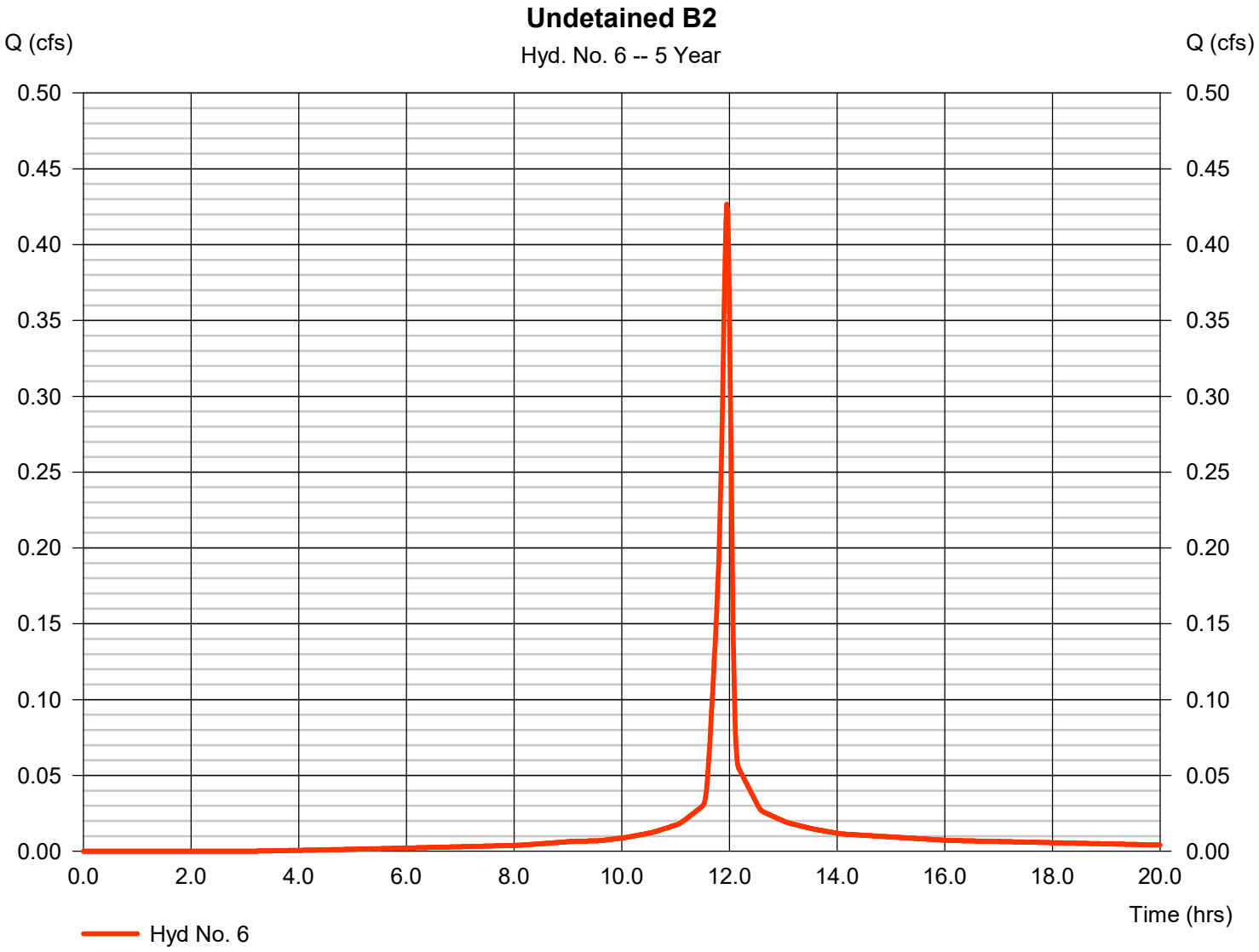
Hydrograph Report

Hyd. No. 6

Undetained B2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.427 cfs
Storm frequency	=	5 yrs	Time to peak	=	11.95 hrs
Time interval	=	1 min	Hyd. volume	=	945 cuft
Drainage area	=	0.060 ac	Curve number	=	92*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.12 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.020 x 79) + (0.040 x 98)] / 0.060



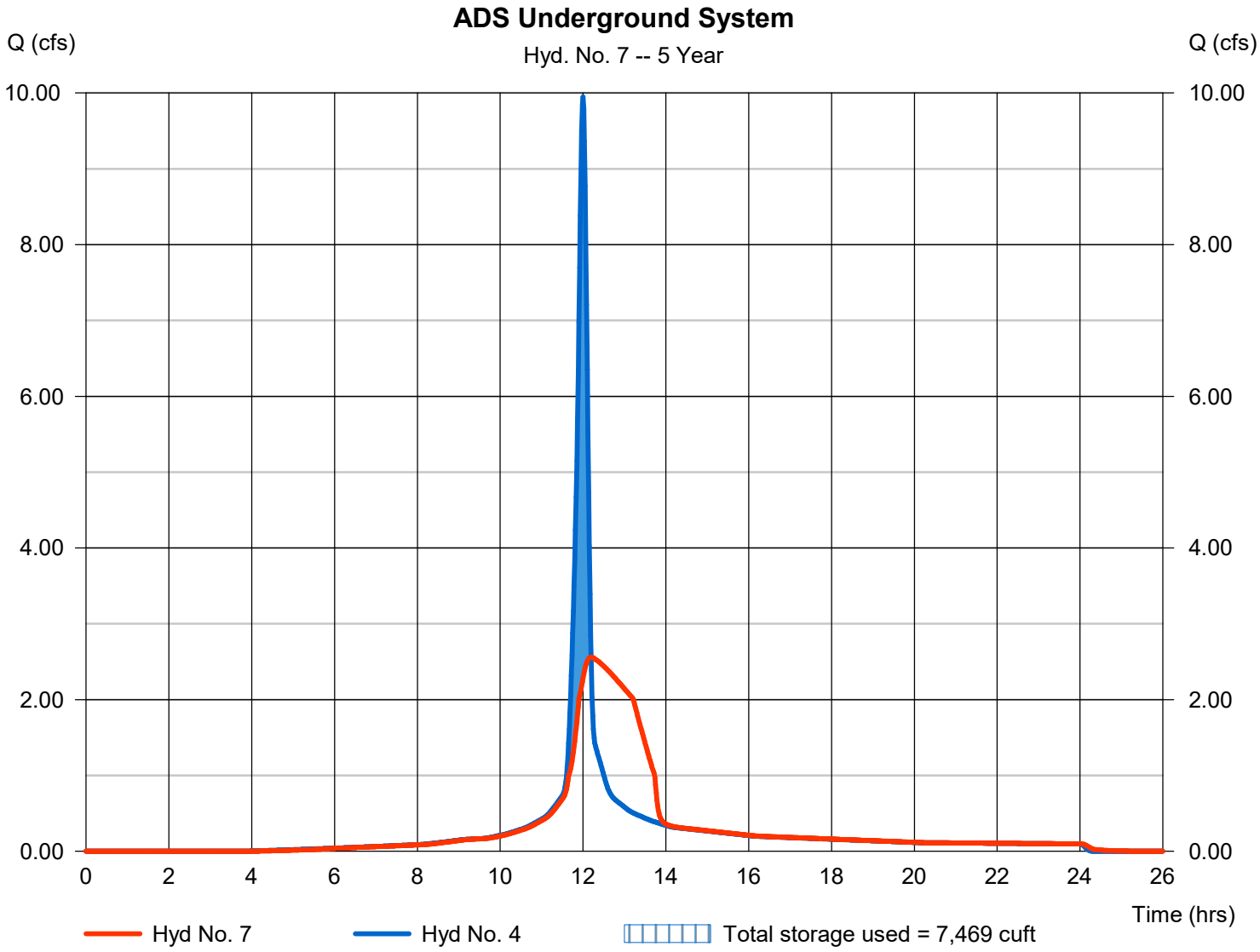
Hydrograph Report

Hyd. No. 7

ADS Underground System

Hydrograph type	=	Reservoir	Peak discharge	=	2.560 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.20 hrs
Time interval	=	1 min	Hyd. volume	=	25,369 cuft
Inflow hyd. No.	=	4 - Detained A	Max. Elevation	=	1230.85 ft
Reservoir name	=	<New Pond>	Max. Storage	=	7,469 cuft

Storage Indication method used.

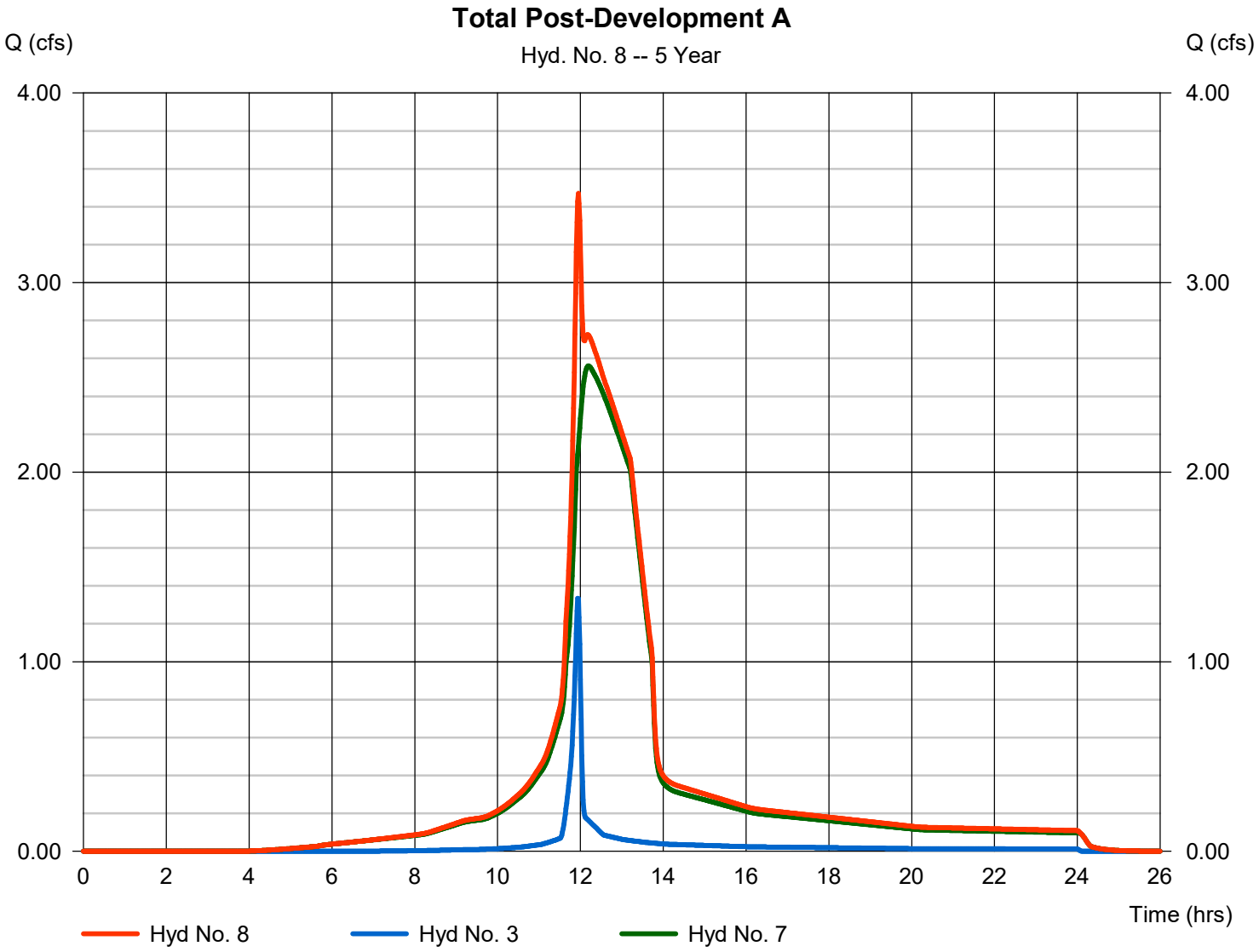


Hydrograph Report

Hyd. No. 8

Total Post-Development A

Hydrograph type	= Combine	Peak discharge	= 3.470 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.95 hrs
Time interval	= 1 min	Hyd. volume	= 27,950 cuft
Inflow hyds.	= 3, 7	Contrib. drain. area	= 0.230 ac

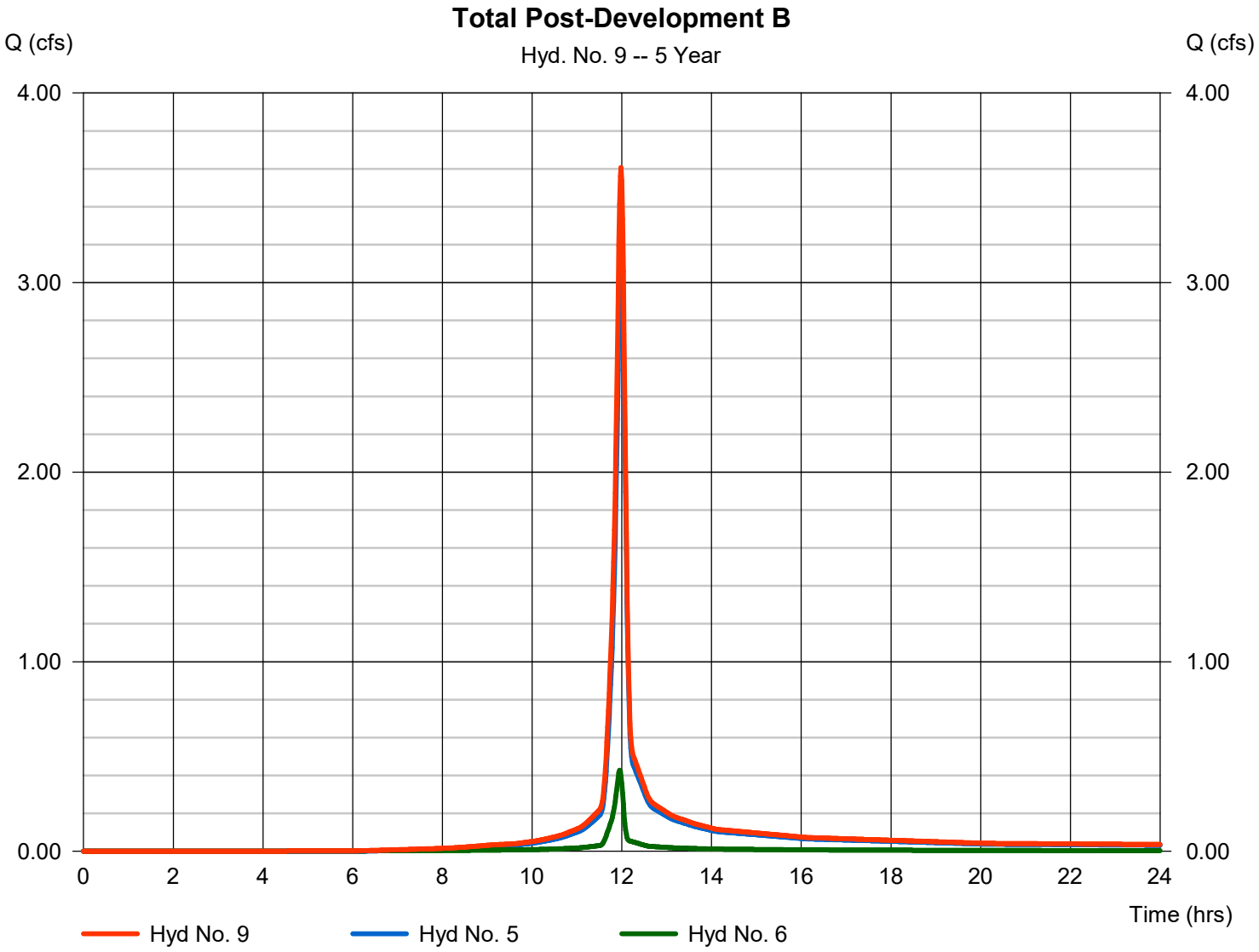


Hydrograph Report

Hyd. No. 9

Total Post-Development B

Hydrograph type	= Combine	Peak discharge	= 3.607 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.98 hrs
Time interval	= 1 min	Hyd. volume	= 8,333 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 0.680 ac



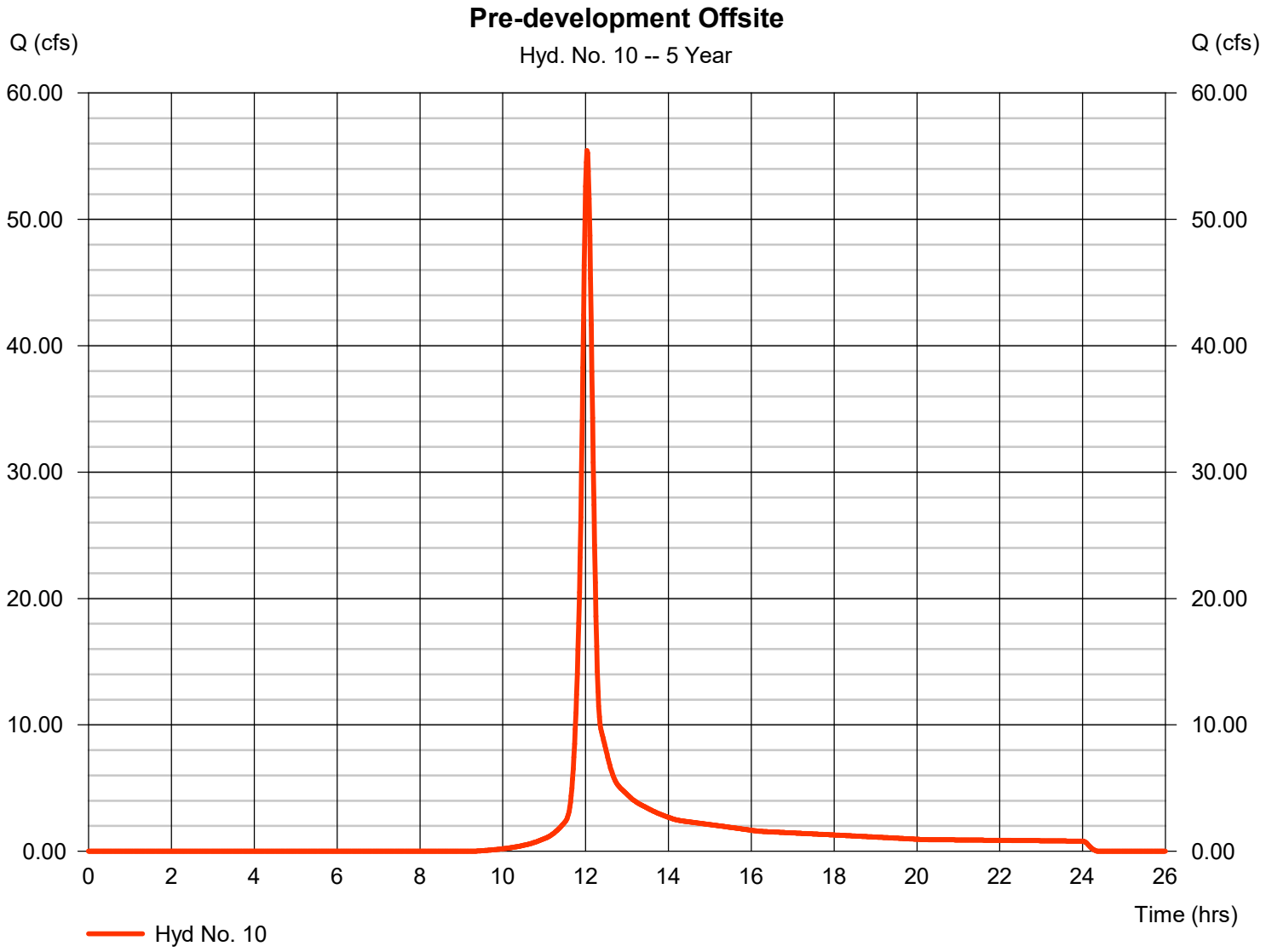
Hydrograph Report

Hyd. No. 10

Pre-development Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	55.44 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.03 hrs
Time interval	=	1 min	Hyd. volume	=	149,673 cuft
Drainage area	=	18.000 ac	Curve number	=	72*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.80 min
Total precip.	=	5.12 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.140 x 79) + (0.560 x 92) + (15.300 x 70)] / 18.000

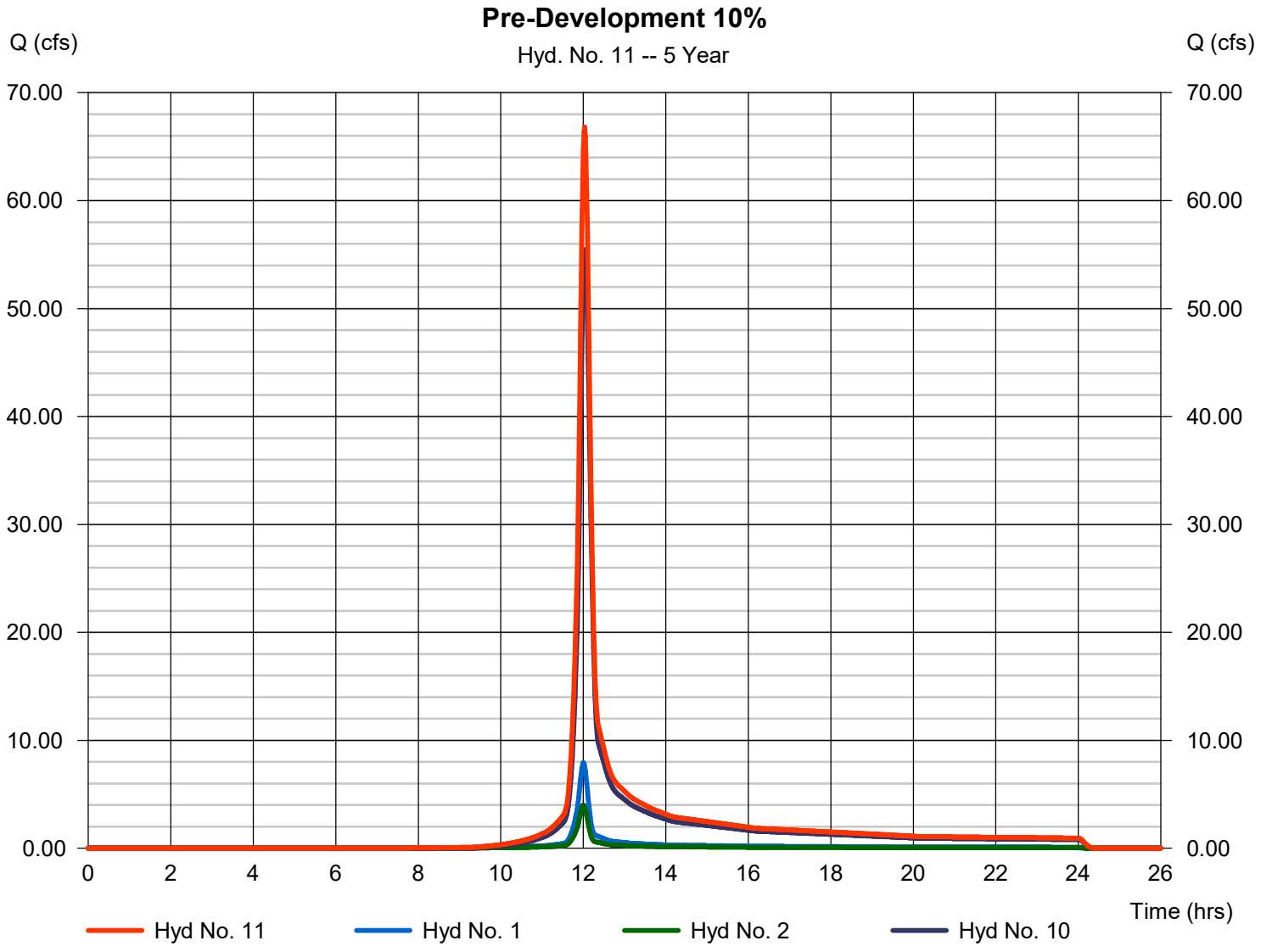


Hydrograph Report

Hyd. No. 11

Pre-Development 10%

Hydrograph type	= Combine	Peak discharge	= 66.81 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.03 hrs
Time interval	= 1 min	Hyd. volume	= 178,660 cuft
Inflow hyds.	= 1, 2, 10	Contrib. drain. area	= 20.620 ac

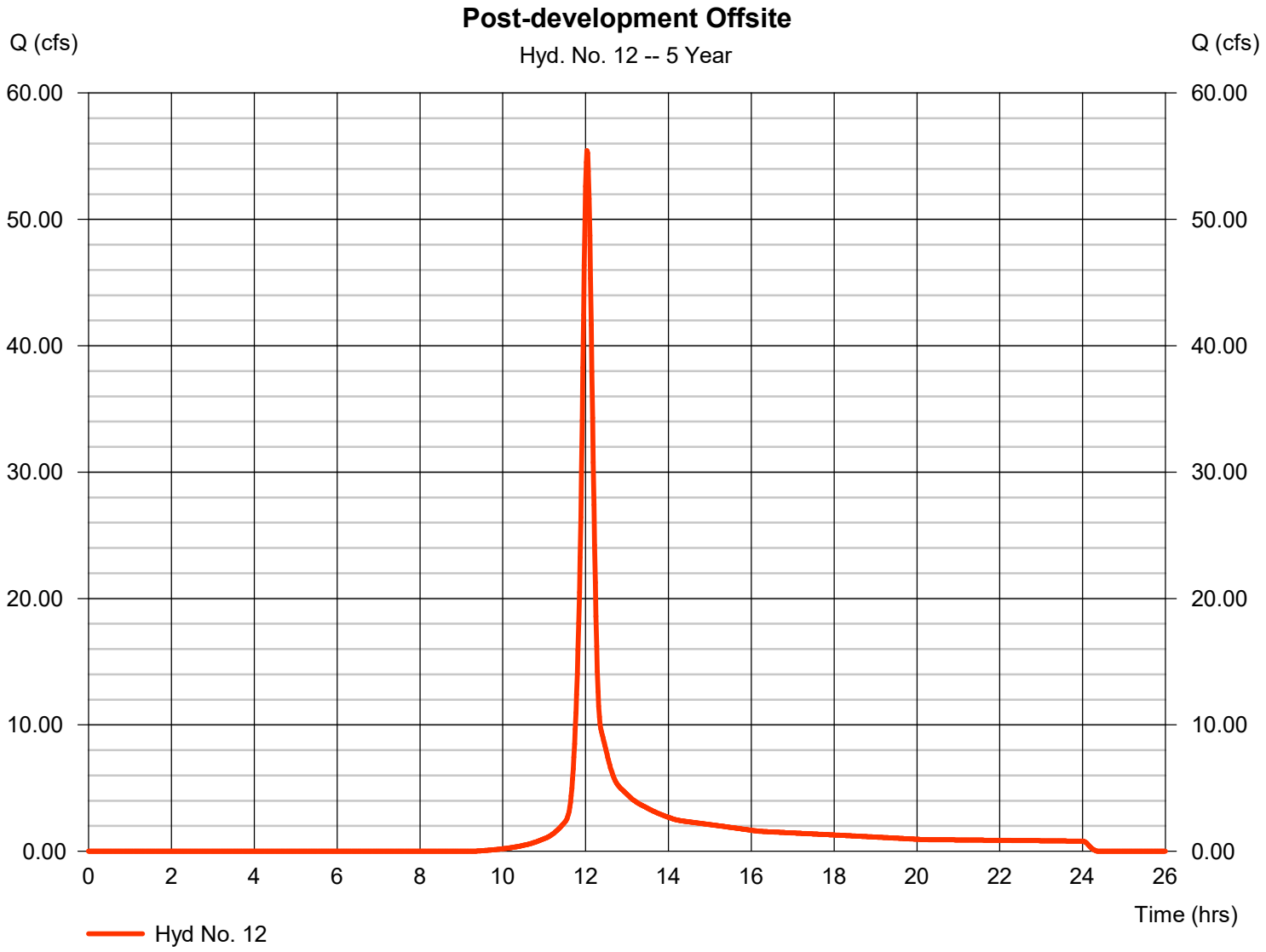


Hydrograph Report

Hyd. No. 12

Post-development Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	55.44 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.03 hrs
Time interval	=	1 min	Hyd. volume	=	149,673 cuft
Drainage area	=	18.000 ac	Curve number	=	72
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.80 min
Total precip.	=	5.12 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

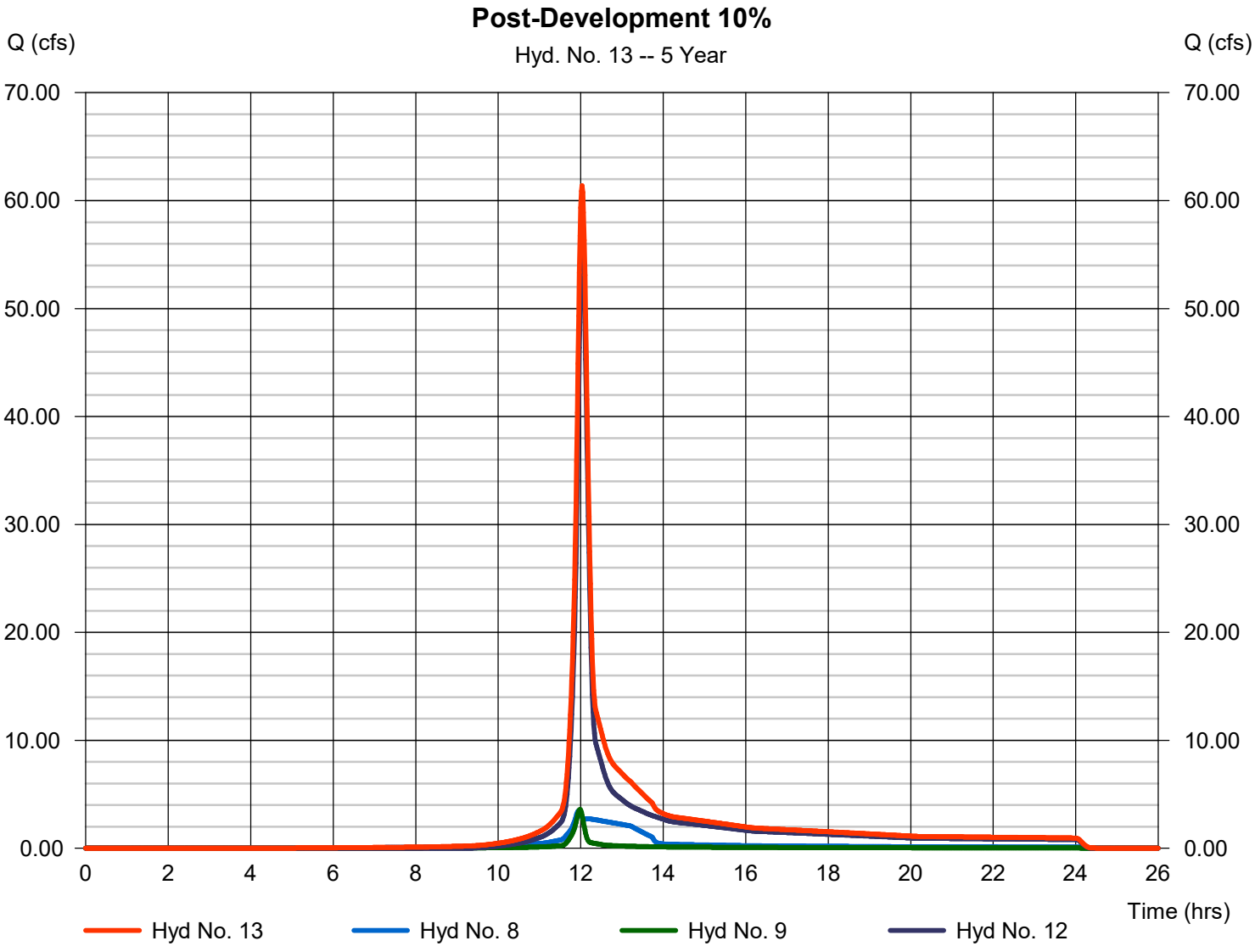


Hydrograph Report

Hyd. No. 13

Post-Development 10%

Hydrograph type	= Combine	Peak discharge	= 61.37 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.03 hrs
Time interval	= 1 min	Hyd. volume	= 185,957 cuft
Inflow hyds.	= 8, 9, 12	Contrib. drain. area	= 18.000 ac



Hydrograph Summary Report

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

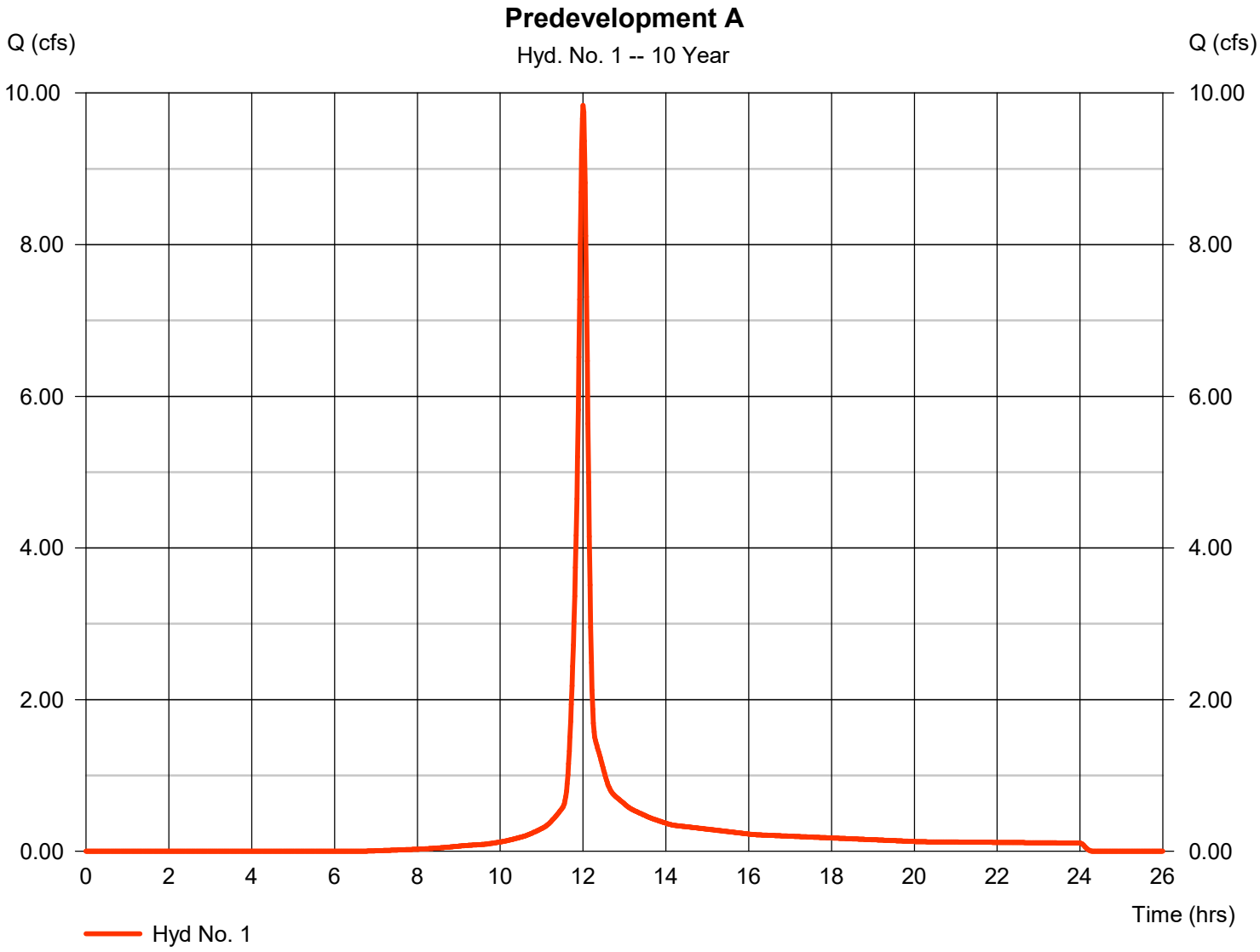
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	9.835	1	720	23,982	------	------	------	Predevelopment A
2	SCS Runoff	4.898	1	720	12,058	------	------	------	Predevelopment B
3	SCS Runoff	1.637	1	716	3,197	------	------	------	Undetained A
4	SCS Runoff	11.80	1	720	30,425	------	------	------	Detained A
5	SCS Runoff	3.913	1	719	9,083	------	------	------	Undetained B
6	SCS Runoff	0.502	1	717	1,125	------	------	------	Undetained B2
7	Reservoir	2.696	1	732	30,423	4	1231.09	9,388	ADS Underground System
8	Combine	3.865	1	717	33,620	3, 7	------	------	Total Post-Development A
9	Combine	4.377	1	719	10,208	5, 6,	------	------	Total Post-Development B
10	SCS Runoff	71.53	1	722	192,376	------	------	------	Pre-development Offsite
11	Combine	85.55	1	722	228,416	1, 2, 10	------	------	Pre-Development 10%
12	SCS Runoff	71.53	1	722	192,376	------	------	------	Post-development Offsite
13	Combine	78.36	1	722	236,204	8, 9, 12	------	------	Post-Development 10%

Hydrograph Report

Hyd. No. 1

Predevelopment A

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.835 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.00 hrs
Time interval	=	1 min	Hyd. volume	=	23,982 cuft
Drainage area	=	1.790 ac	Curve number	=	79
Basin Slope	=	2.0 %	Hydraulic length	=	130 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.00 min
Total precip.	=	5.94 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



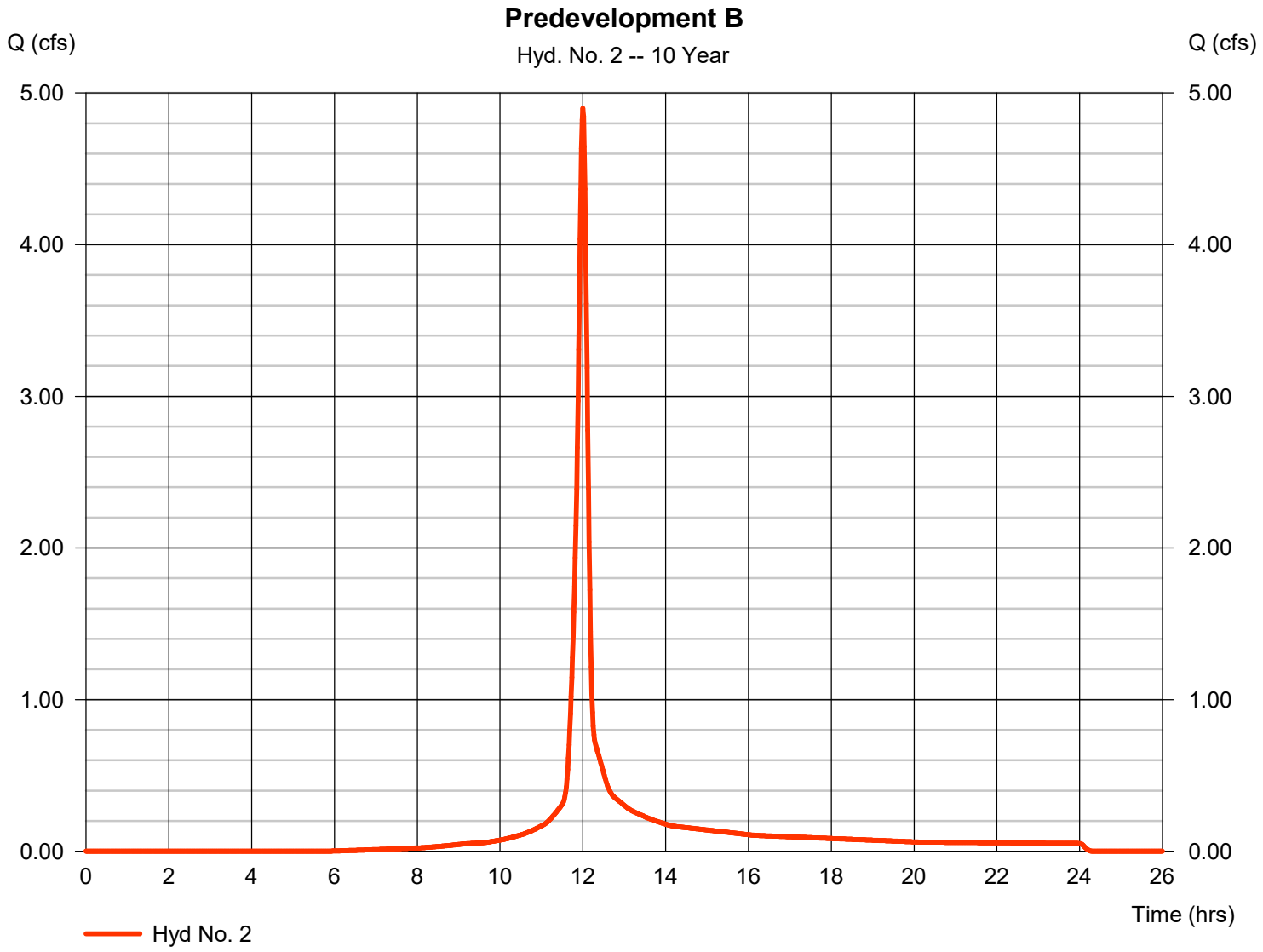
Hydrograph Report

Hyd. No. 2

Predevelopment B

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.898 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.00 hrs
Time interval	=	1 min	Hyd. volume	=	12,058 cuft
Drainage area	=	0.830 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.60 min
Total precip.	=	5.94 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.120 x 98) + (0.710 x 79)] / 0.830



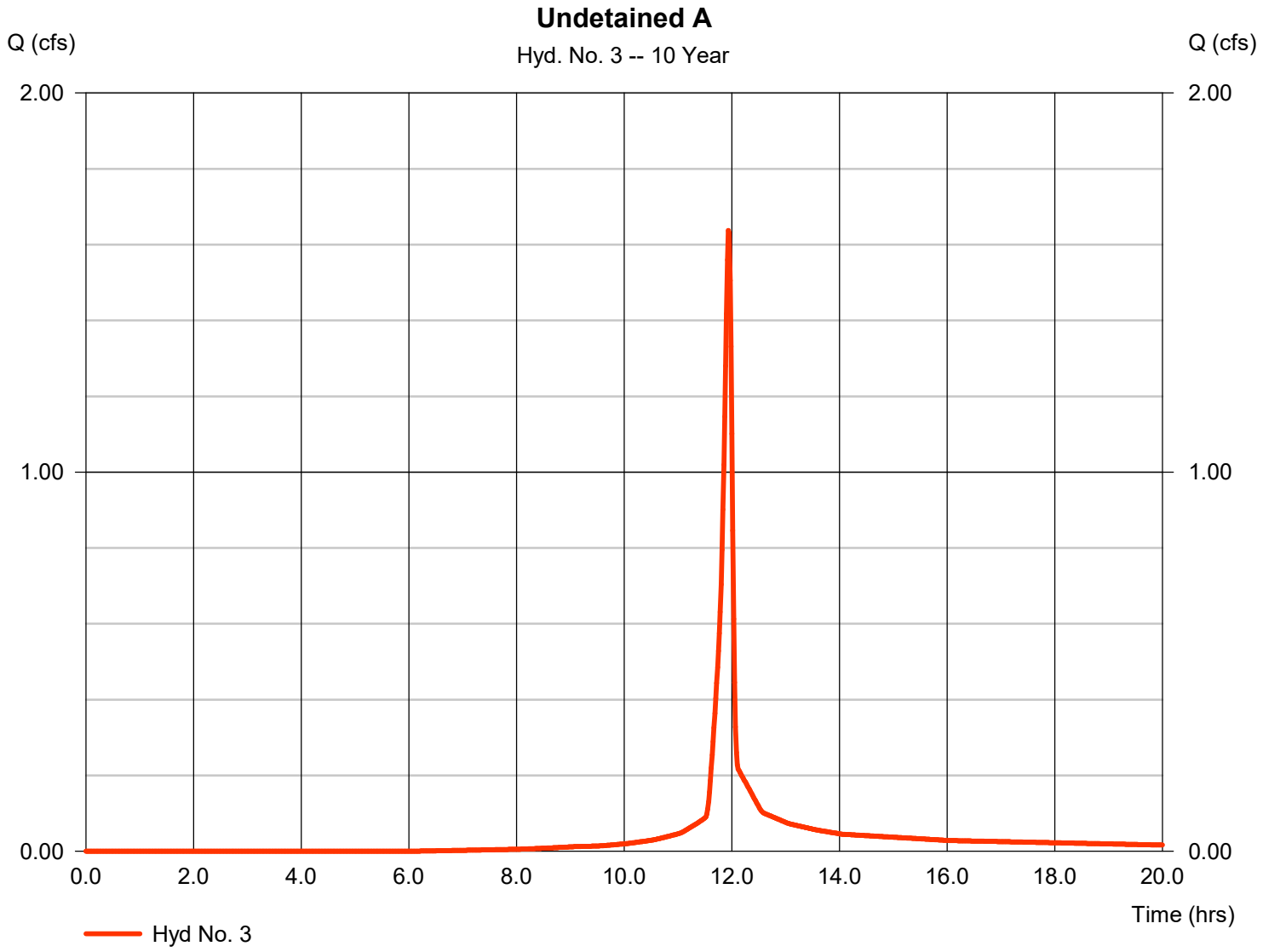
Hydrograph Report

Hyd. No. 3

Undetained A

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.637 cfs
Storm frequency	=	10 yrs	Time to peak	=	11.93 hrs
Time interval	=	1 min	Hyd. volume	=	3,197 cuft
Drainage area	=	0.230 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.40 min
Total precip.	=	5.94 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.200 x 79) + (0.030 x 98)] / 0.230



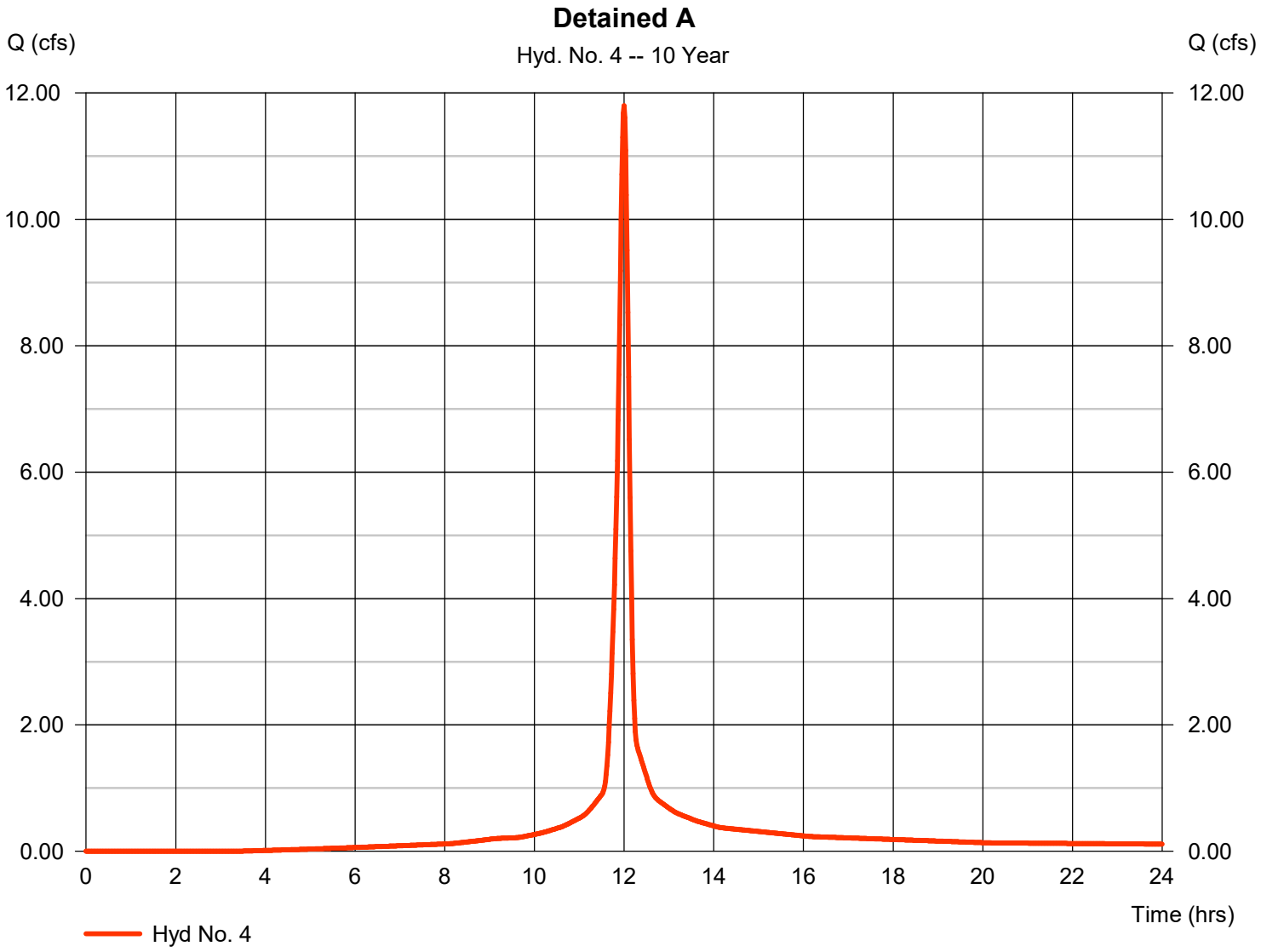
Hydrograph Report

Hyd. No. 4

Detained A

Hydrograph type	=	SCS Runoff	Peak discharge	=	11.80 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.00 hrs
Time interval	=	1 min	Hyd. volume	=	30,425 cuft
Drainage area	=	1.720 ac	Curve number	=	90*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.40 min
Total precip.	=	5.94 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.970 x 98) + (0.750 x 79)] / 1.720



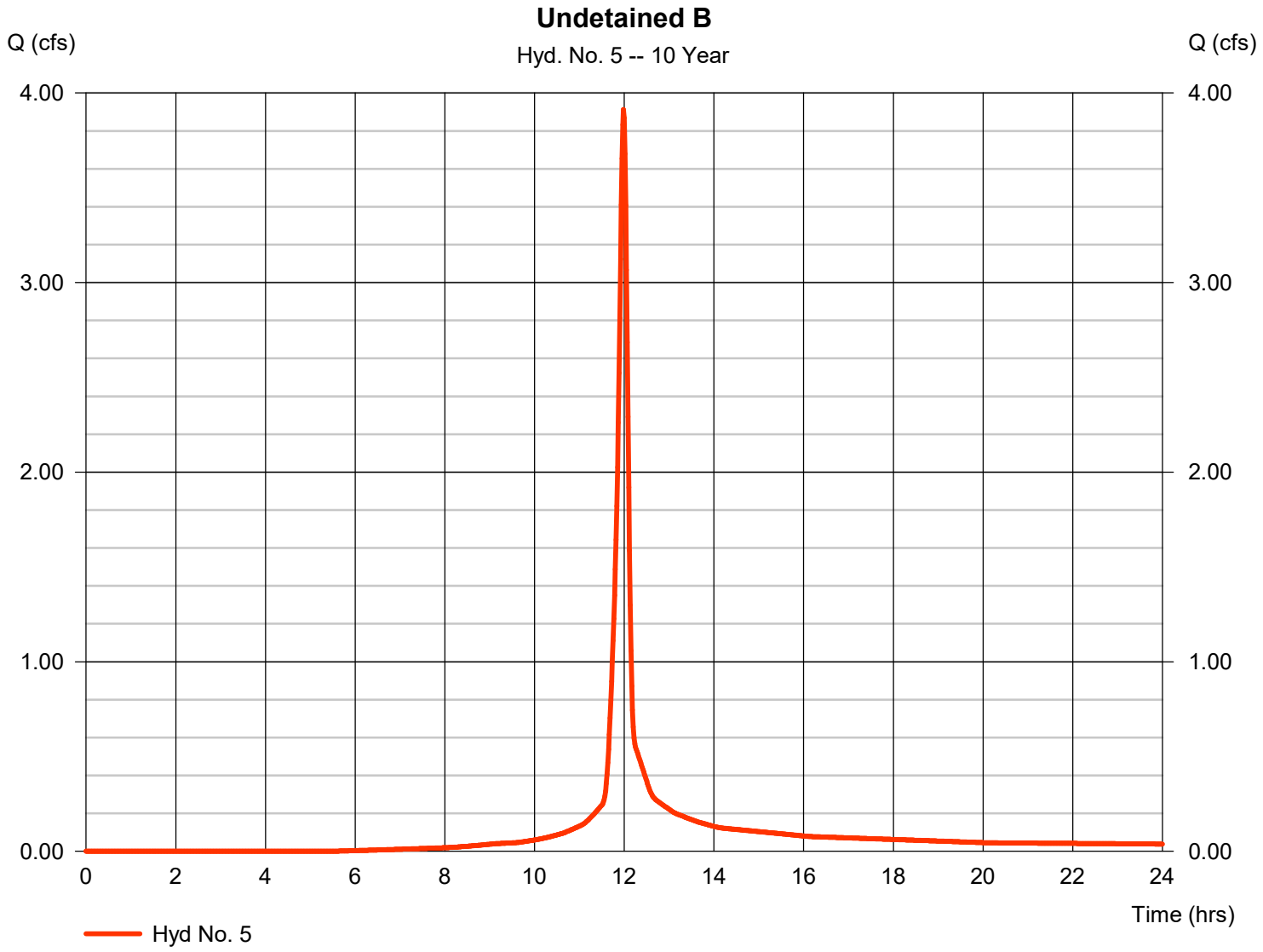
Hydrograph Report

Hyd. No. 5

Undetained B

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.913 cfs
Storm frequency	=	10 yrs	Time to peak	=	11.98 hrs
Time interval	=	1 min	Hyd. volume	=	9,083 cuft
Drainage area	=	0.620 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.00 min
Total precip.	=	5.94 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.130 x 98) + (0.490 x 79)] / 0.620



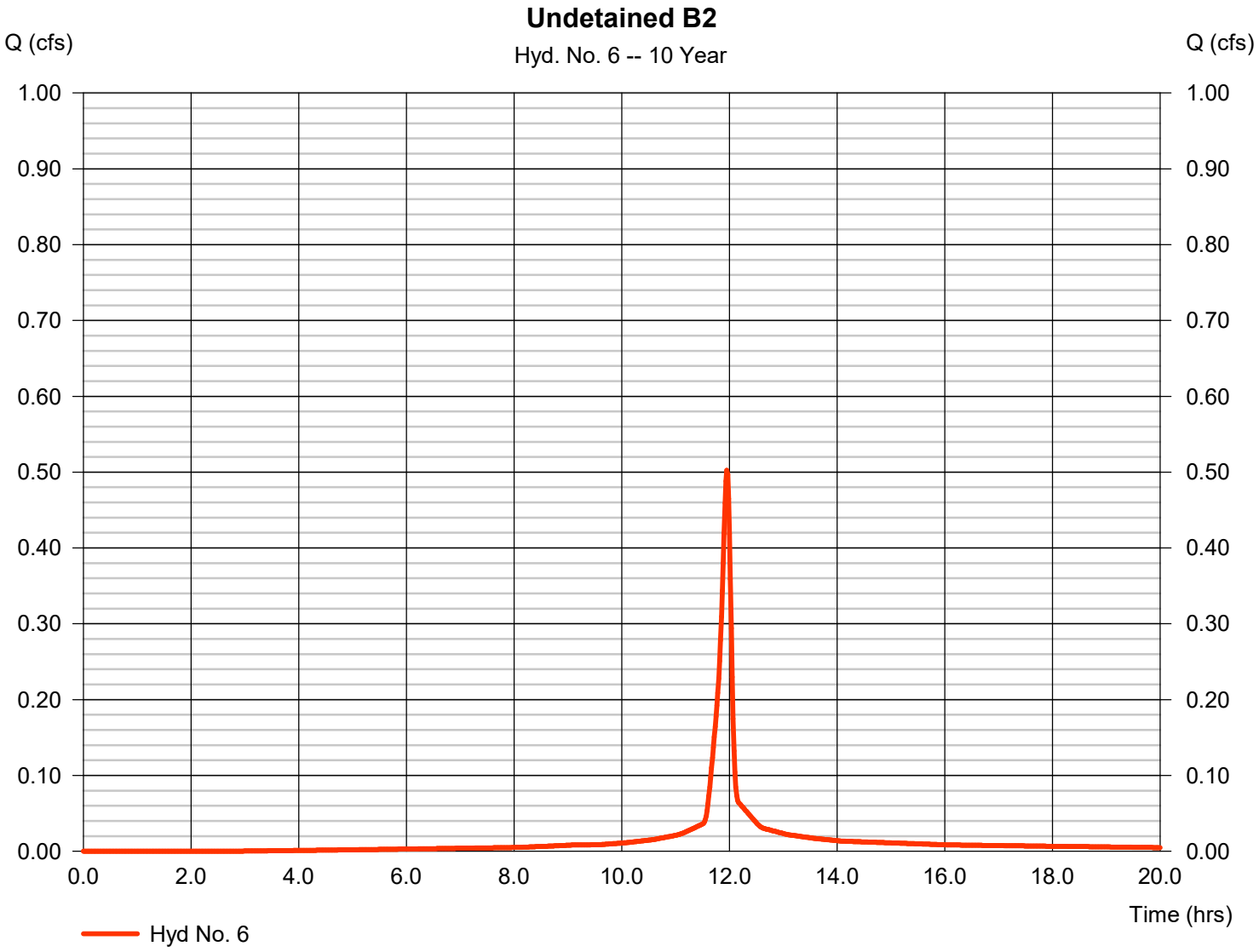
Hydrograph Report

Hyd. No. 6

Undetained B2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.502 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.95 hrs
Time interval	= 1 min	Hyd. volume	= 1,125 cuft
Drainage area	= 0.060 ac	Curve number	= 92*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.94 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 79) + (0.040 x 98)] / 0.060



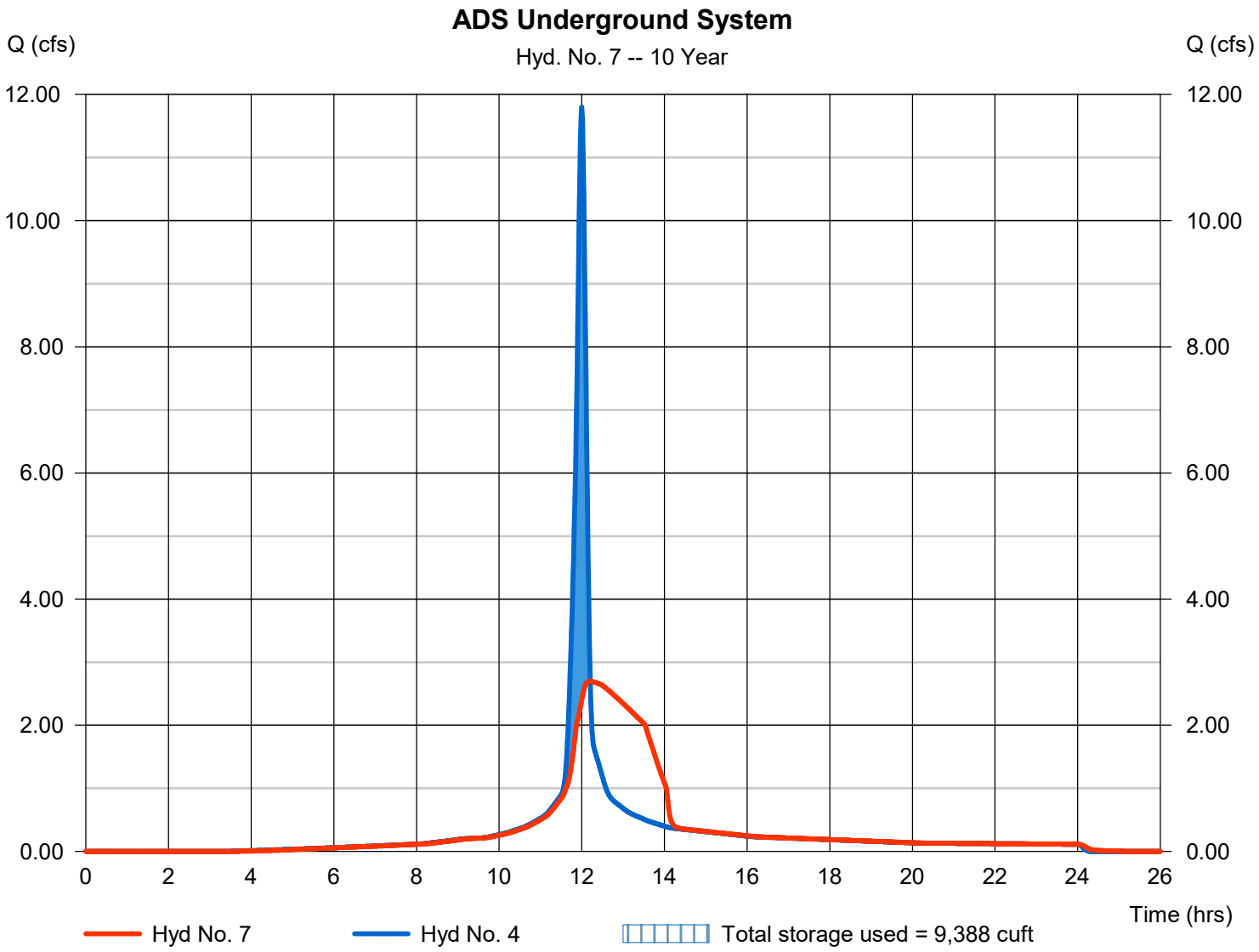
Hydrograph Report

Hyd. No. 7

ADS Underground System

Hydrograph type	=	Reservoir	Peak discharge	=	2.696 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.20 hrs
Time interval	=	1 min	Hyd. volume	=	30,423 cuft
Inflow hyd. No.	=	4 - Detained A	Max. Elevation	=	1231.09 ft
Reservoir name	=	<New Pond>	Max. Storage	=	9,388 cuft

Storage Indication method used.

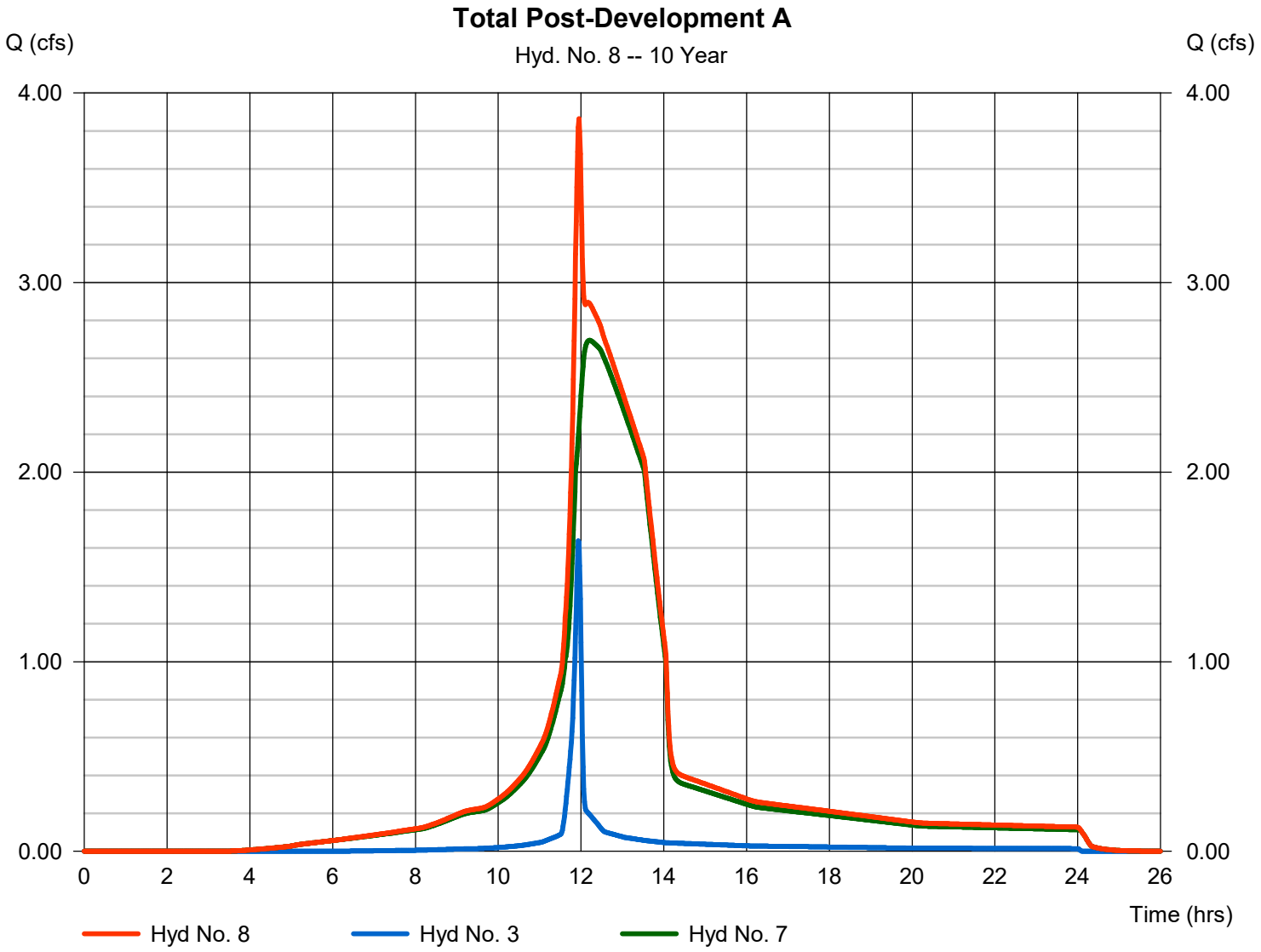


Hydrograph Report

Hyd. No. 8

Total Post-Development A

Hydrograph type	=	Combine	Peak discharge	=	3.865 cfs
Storm frequency	=	10 yrs	Time to peak	=	11.95 hrs
Time interval	=	1 min	Hyd. volume	=	33,620 cuft
Inflow hyds.	=	3, 7	Contrib. drain. area	=	0.230 ac

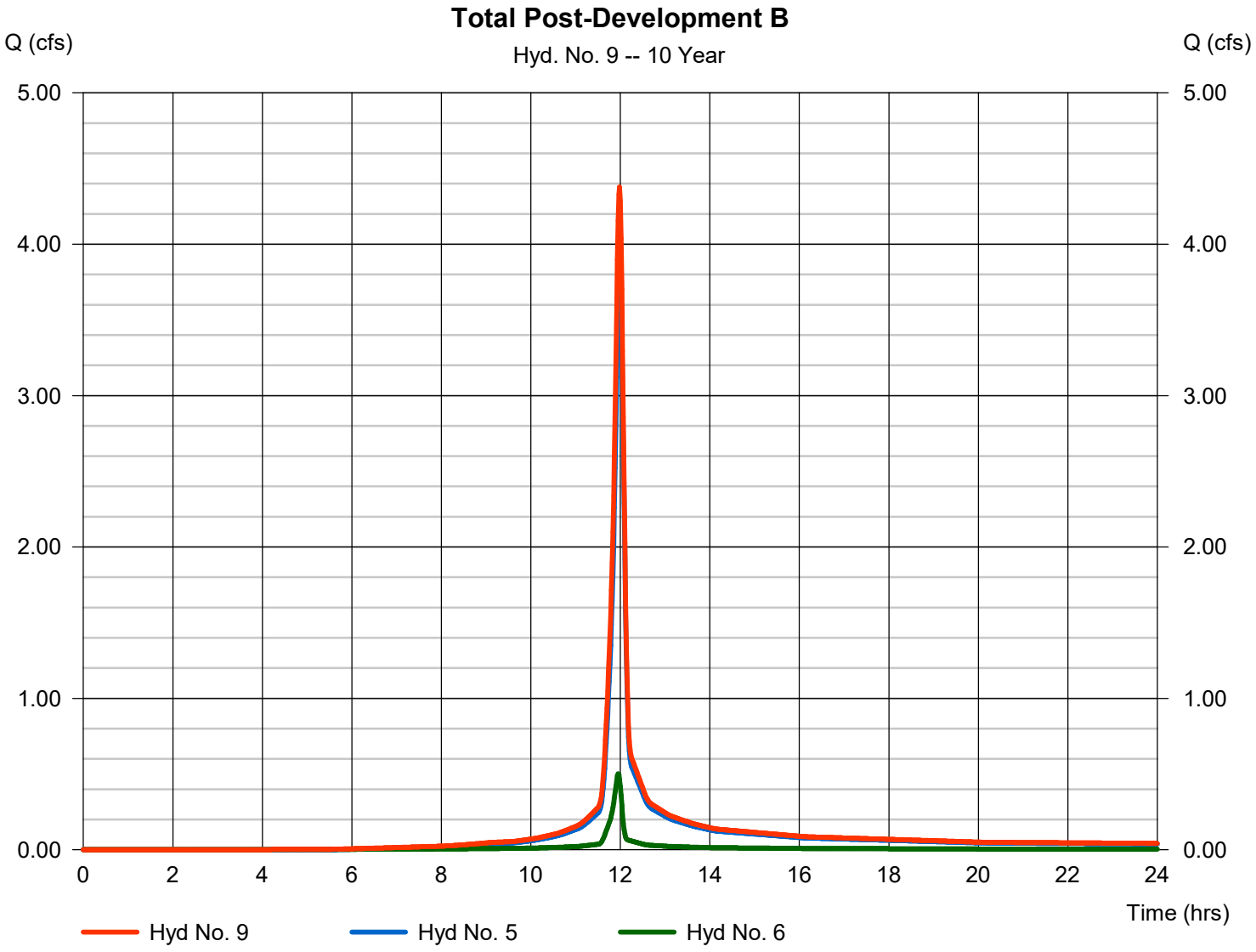


Hydrograph Report

Hyd. No. 9

Total Post-Development B

Hydrograph type	= Combine	Peak discharge	= 4.377 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.98 hrs
Time interval	= 1 min	Hyd. volume	= 10,208 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 0.680 ac



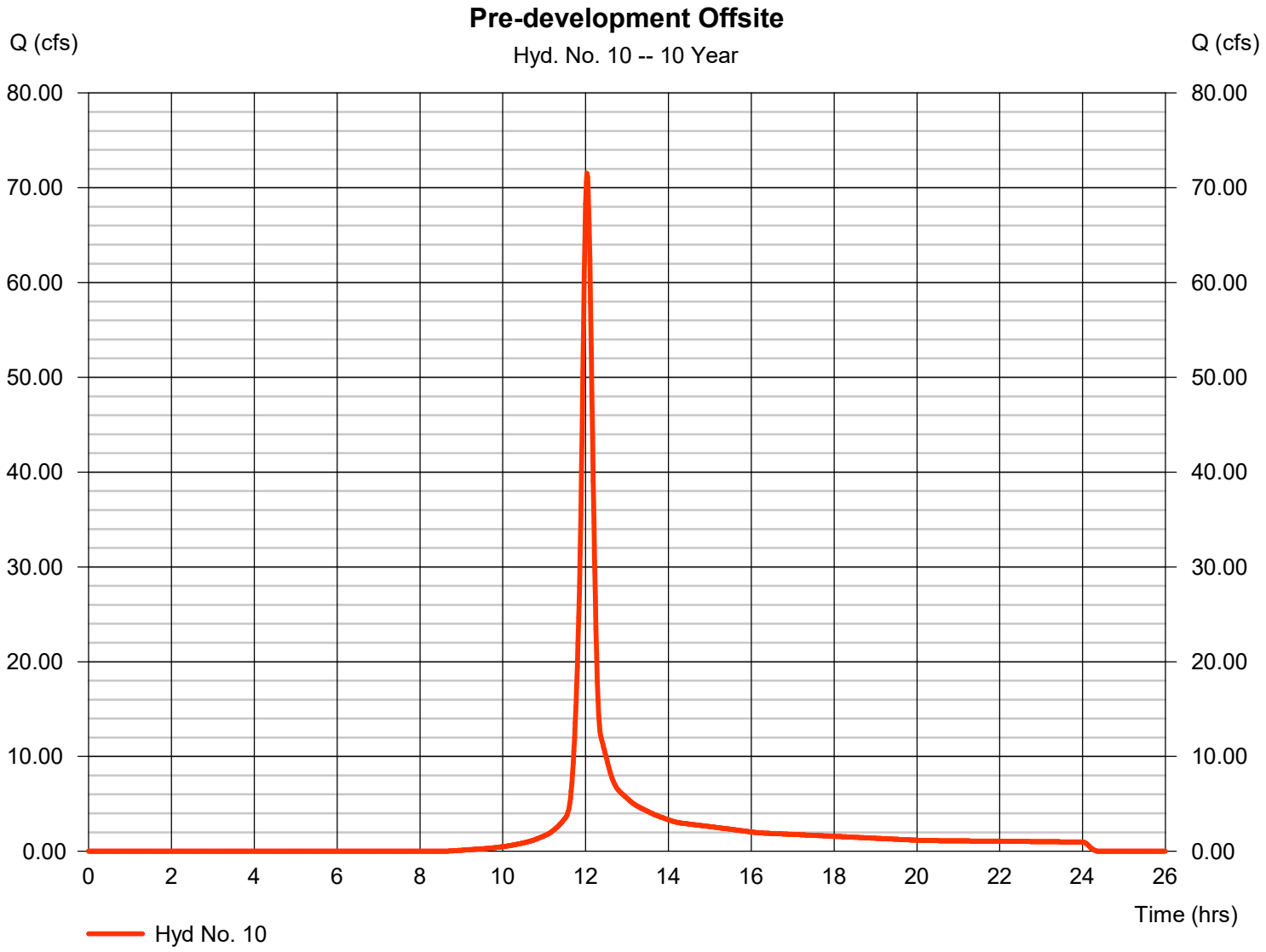
Hydrograph Report

Hyd. No. 10

Pre-development Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 71.53 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.03 hrs
Time interval	= 1 min	Hyd. volume	= 192,376 cuft
Drainage area	= 18.000 ac	Curve number	= 72*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.80 min
Total precip.	= 5.94 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(2.140 x 79) + (0.560 x 92) + (15.300 x 70)] / 18.000

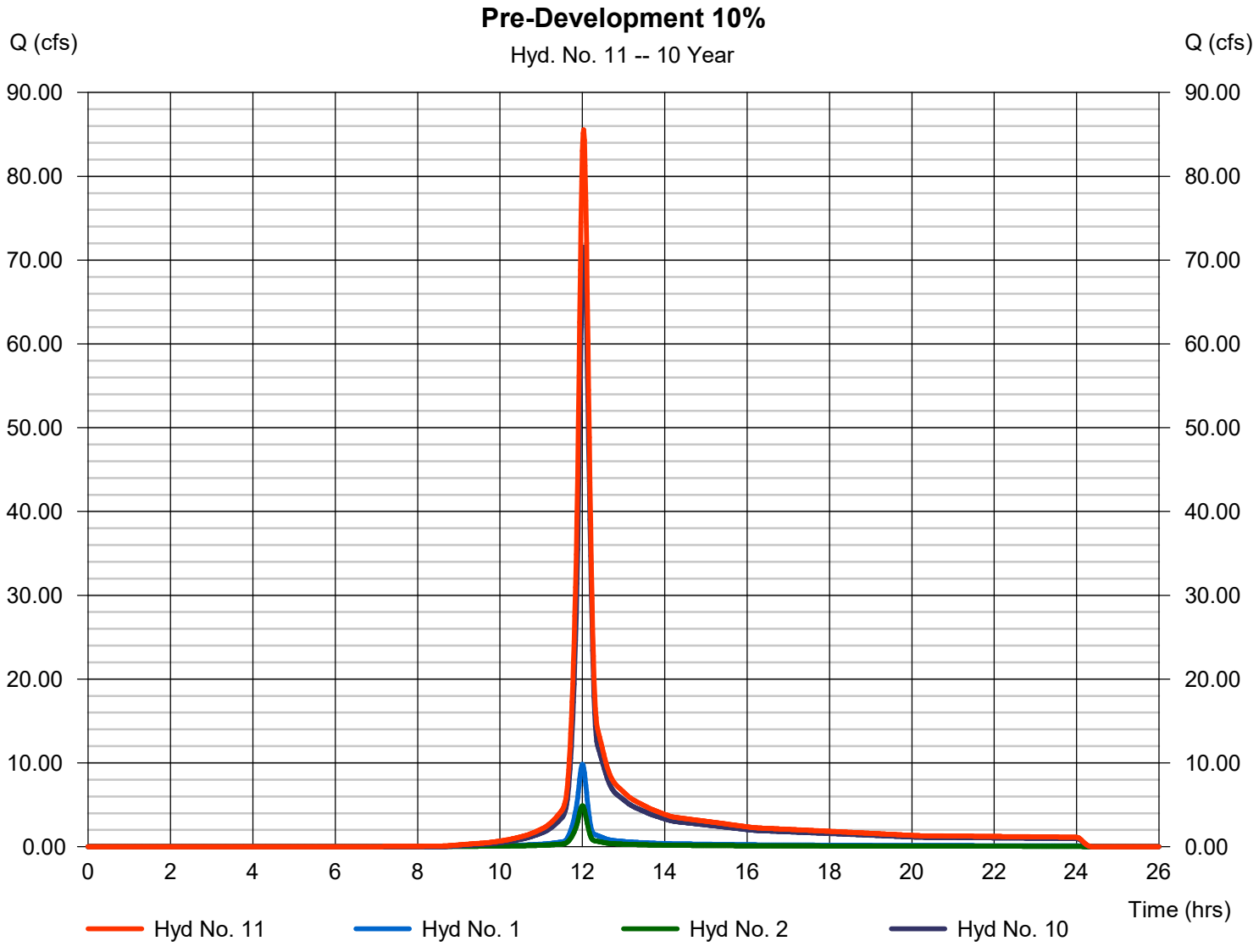


Hydrograph Report

Hyd. No. 11

Pre-Development 10%

Hydrograph type	= Combine	Peak discharge	= 85.55 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.03 hrs
Time interval	= 1 min	Hyd. volume	= 228,416 cuft
Inflow hyds.	= 1, 2, 10	Contrib. drain. area	= 20.620 ac

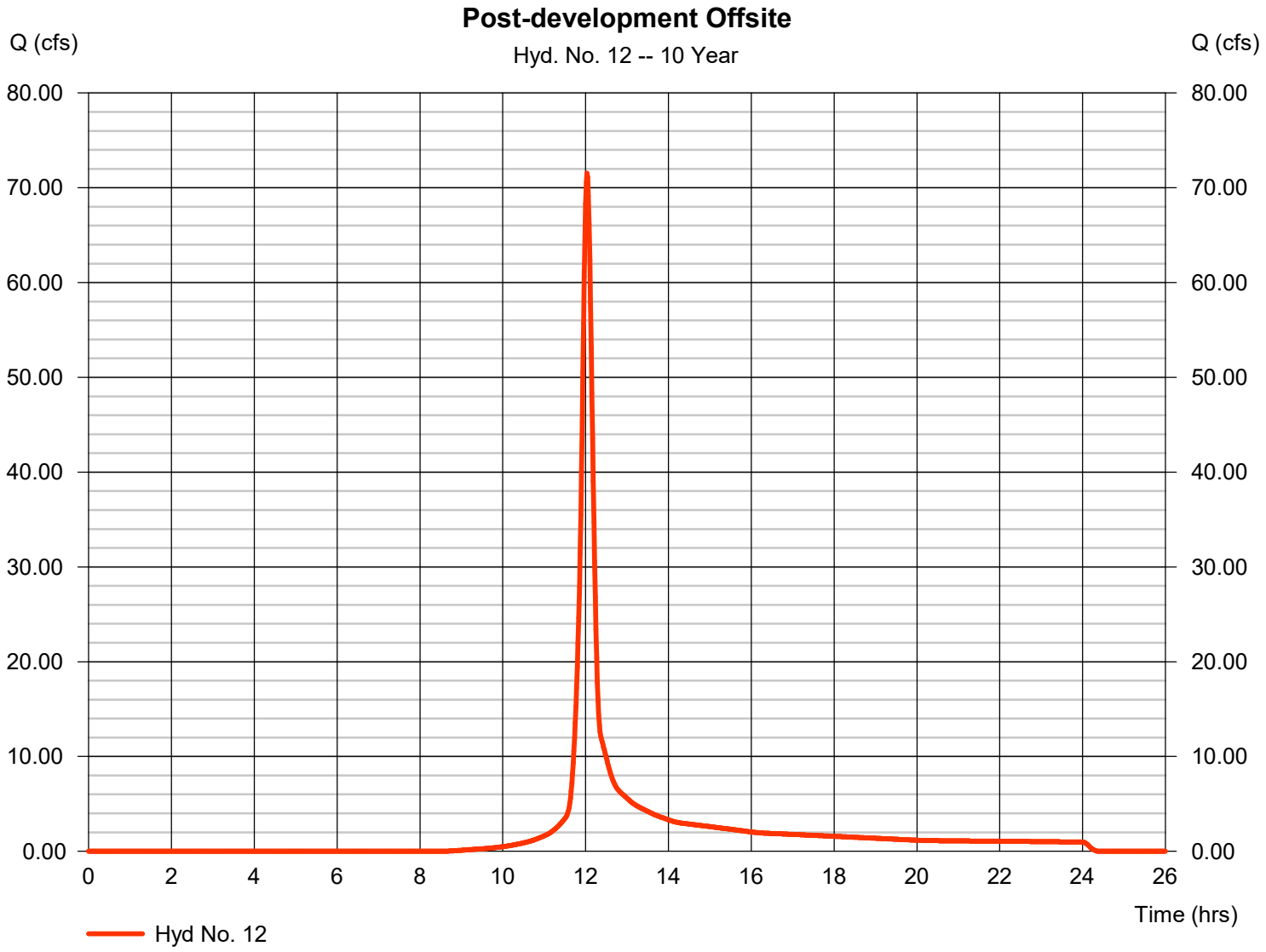


Hydrograph Report

Hyd. No. 12

Post-development Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	71.53 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.03 hrs
Time interval	=	1 min	Hyd. volume	=	192,376 cuft
Drainage area	=	18.000 ac	Curve number	=	72
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.80 min
Total precip.	=	5.94 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

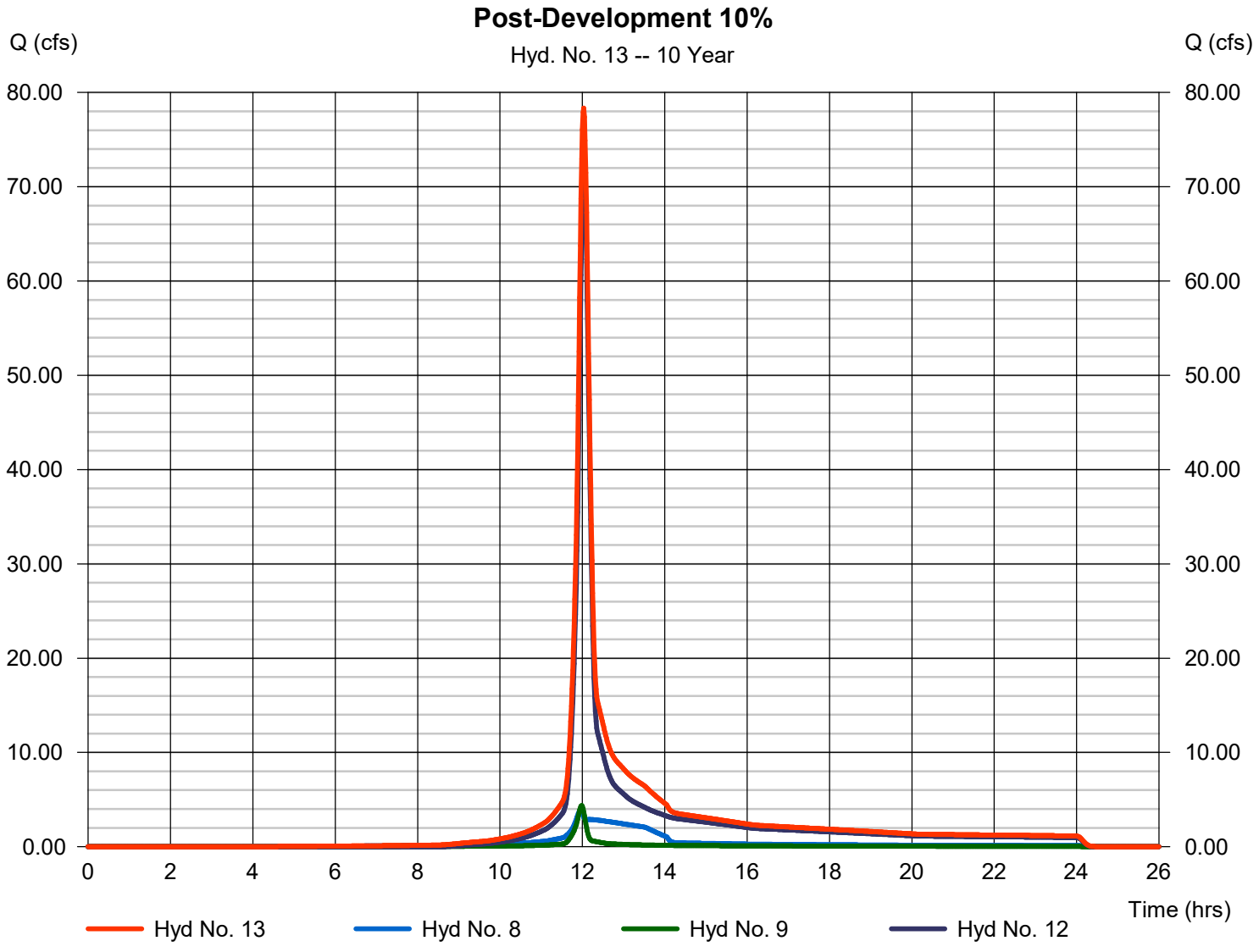


Hydrograph Report

Hyd. No. 13

Post-Development 10%

Hydrograph type	= Combine	Peak discharge	= 78.36 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.03 hrs
Time interval	= 1 min	Hyd. volume	= 236,204 cuft
Inflow hyds.	= 8, 9, 12	Contrib. drain. area	= 18.000 ac



Hydrograph Summary Report

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

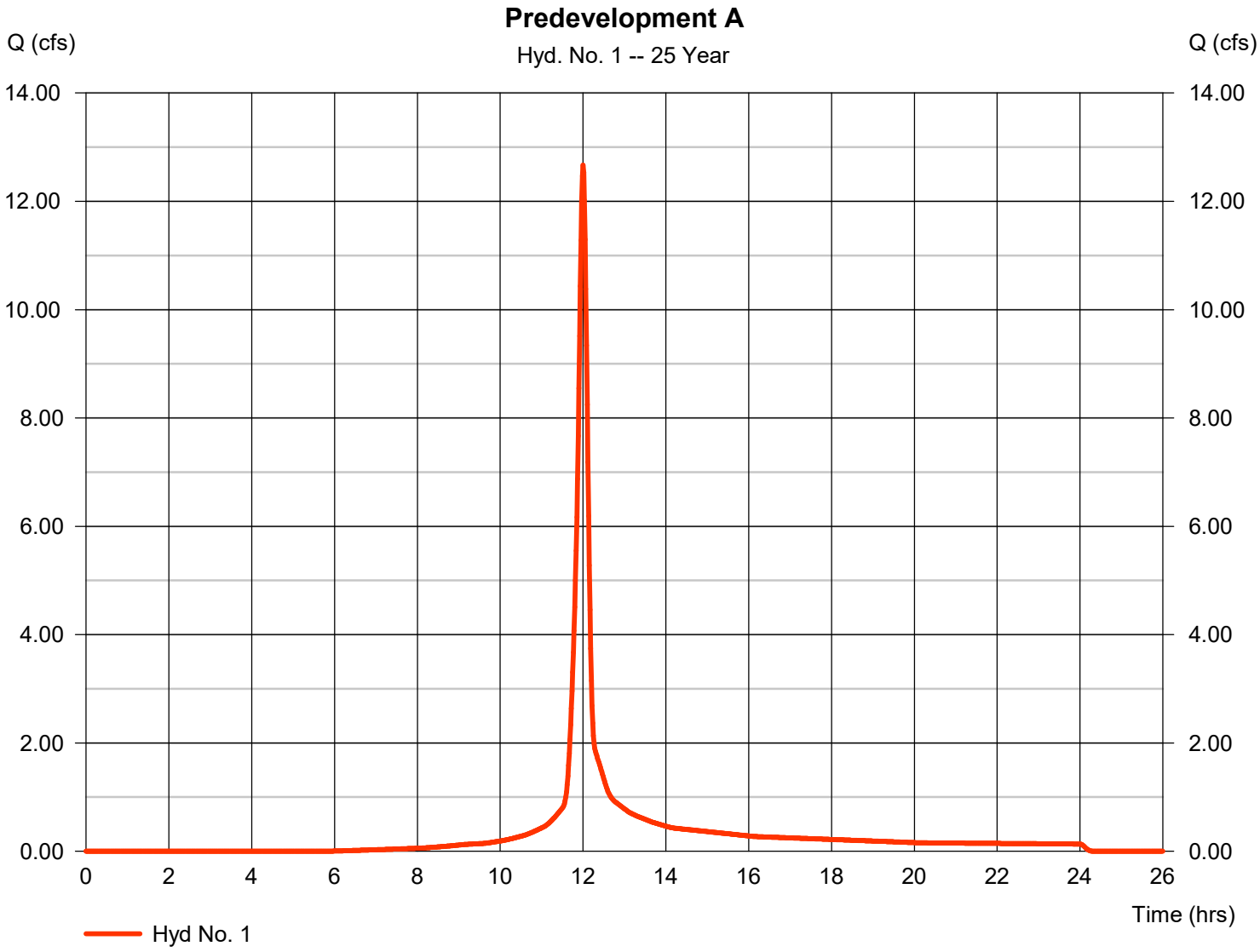
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	12.67	1	720	31,168	------	------	------	Predevelopment A
2	SCS Runoff	6.219	1	720	15,479	------	------	------	Predevelopment B
3	SCS Runoff	2.082	1	716	4,121	------	------	------	Undetained A
4	SCS Runoff	14.49	1	720	37,879	------	------	------	Detained A
5	SCS Runoff	4.941	1	719	11,613	------	------	------	Undetained B
6	SCS Runoff	0.613	1	717	1,391	------	------	------	Undetained B2
7	Reservoir	2.836	1	733	37,878	4	1231.35	12,321	ADS Underground System
8	Combine	4.444	1	717	41,998	3, 7	------	------	Total Post-Development A
9	Combine	5.506	1	719	13,004	5, 6,	------	------	Total Post-Development B
10	SCS Runoff	95.91	1	722	258,004	------	------	------	Pre-development Offsite
11	Combine	113.81	1	722	304,651	1, 2, 10	------	------	Pre-Development 10%
12	SCS Runoff	95.91	1	722	258,004	------	------	------	Post-development Offsite
13	Combine	104.00	1	722	313,006	8, 9, 12	------	------	Post-Development 10%

Hydrograph Report

Hyd. No. 1

Predevelopment A

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.67 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.00 hrs
Time interval	=	1 min	Hyd. volume	=	31,168 cuft
Drainage area	=	1.790 ac	Curve number	=	79
Basin Slope	=	2.0 %	Hydraulic length	=	130 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.00 min
Total precip.	=	7.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



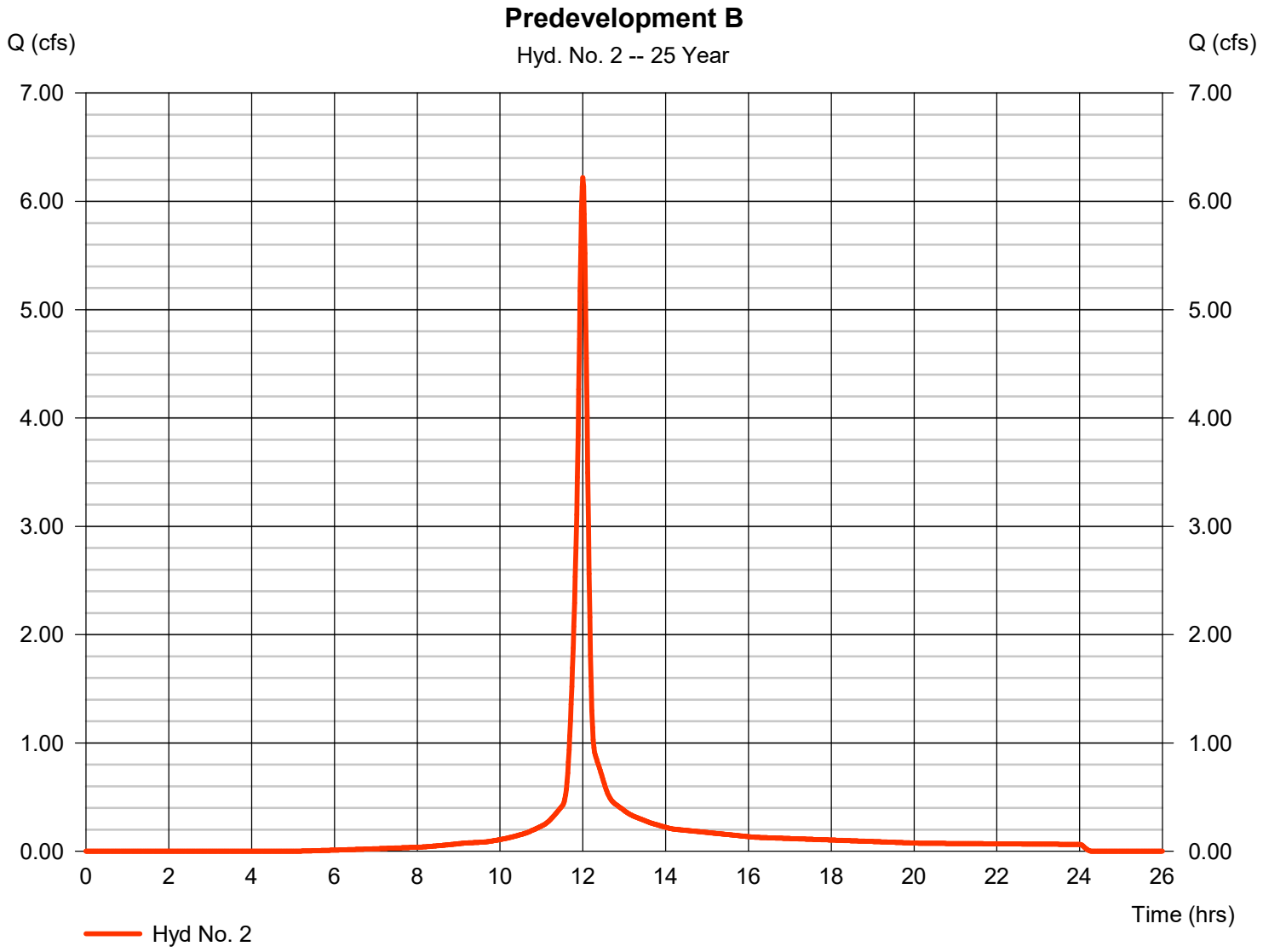
Hydrograph Report

Hyd. No. 2

Predevelopment B

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.219 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.00 hrs
Time interval	=	1 min	Hyd. volume	=	15,479 cuft
Drainage area	=	0.830 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.60 min
Total precip.	=	7.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.120 x 98) + (0.710 x 79)] / 0.830



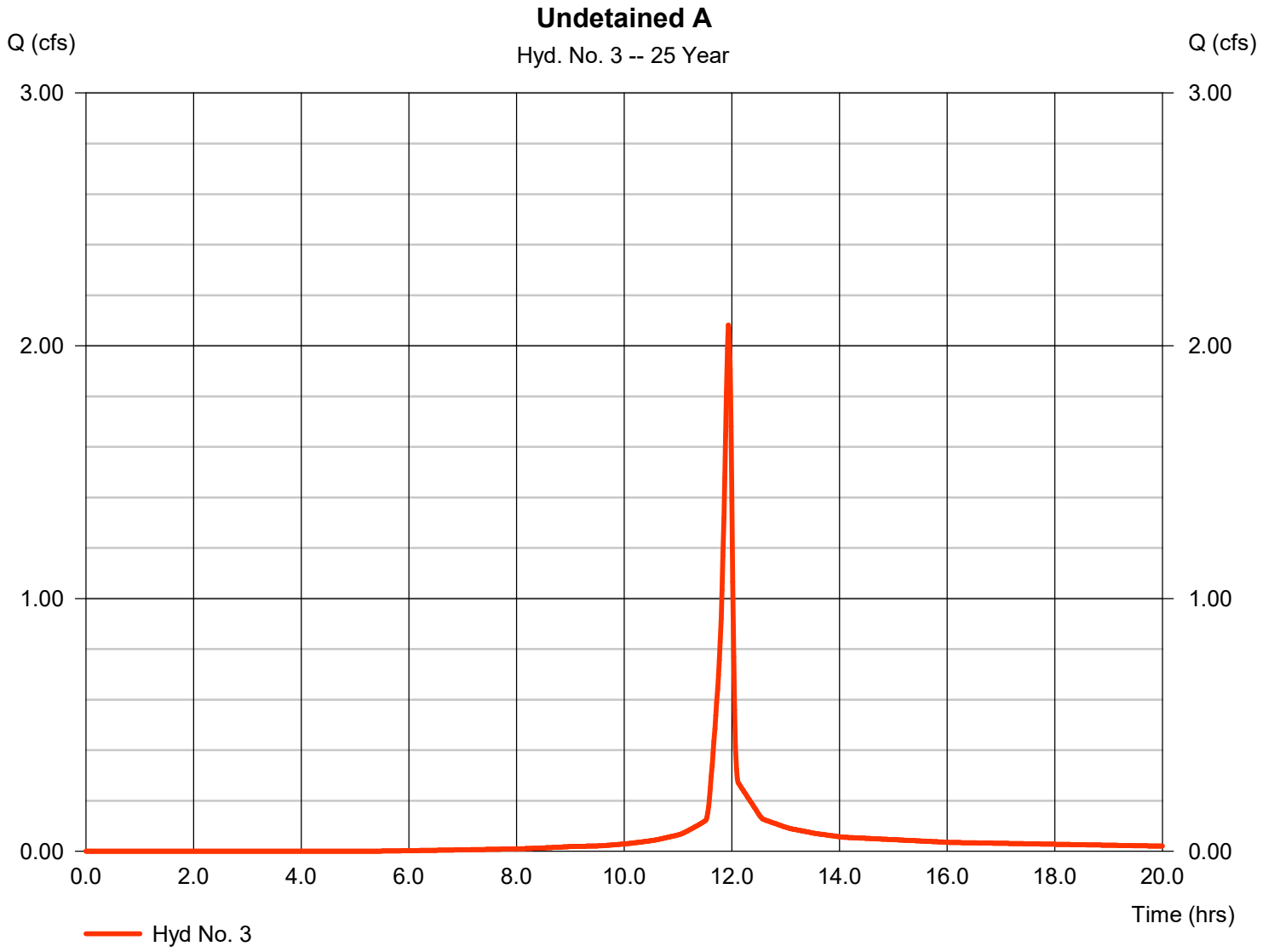
Hydrograph Report

Hyd. No. 3

Undetained A

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.082 cfs
Storm frequency	=	25 yrs	Time to peak	=	11.93 hrs
Time interval	=	1 min	Hyd. volume	=	4,121 cuft
Drainage area	=	0.230 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.40 min
Total precip.	=	7.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.200 x 79) + (0.030 x 98)] / 0.230



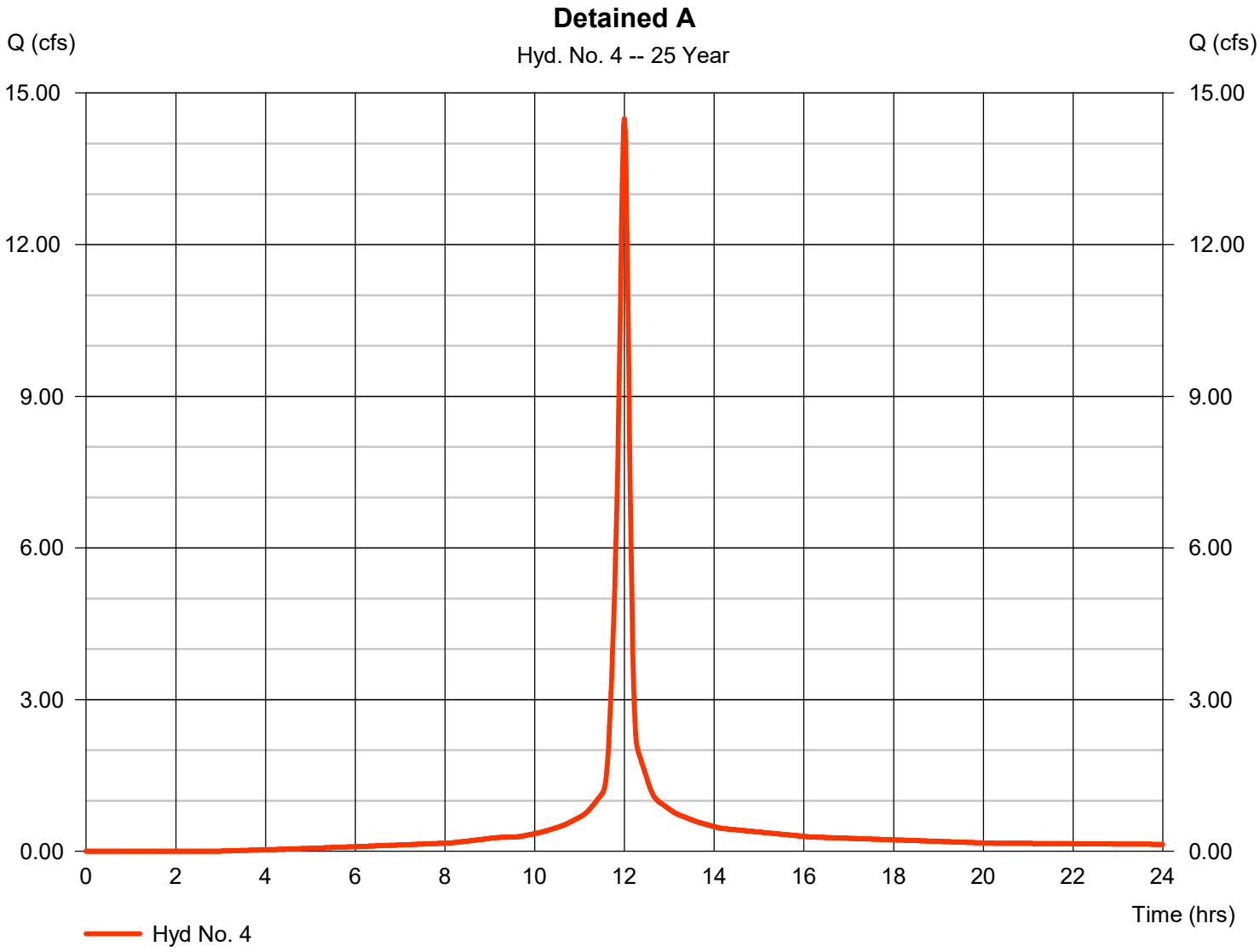
Hydrograph Report

Hyd. No. 4

Detained A

Hydrograph type	=	SCS Runoff	Peak discharge	=	14.49 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.00 hrs
Time interval	=	1 min	Hyd. volume	=	37,879 cuft
Drainage area	=	1.720 ac	Curve number	=	90*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.40 min
Total precip.	=	7.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.970 x 98) + (0.750 x 79)] / 1.720



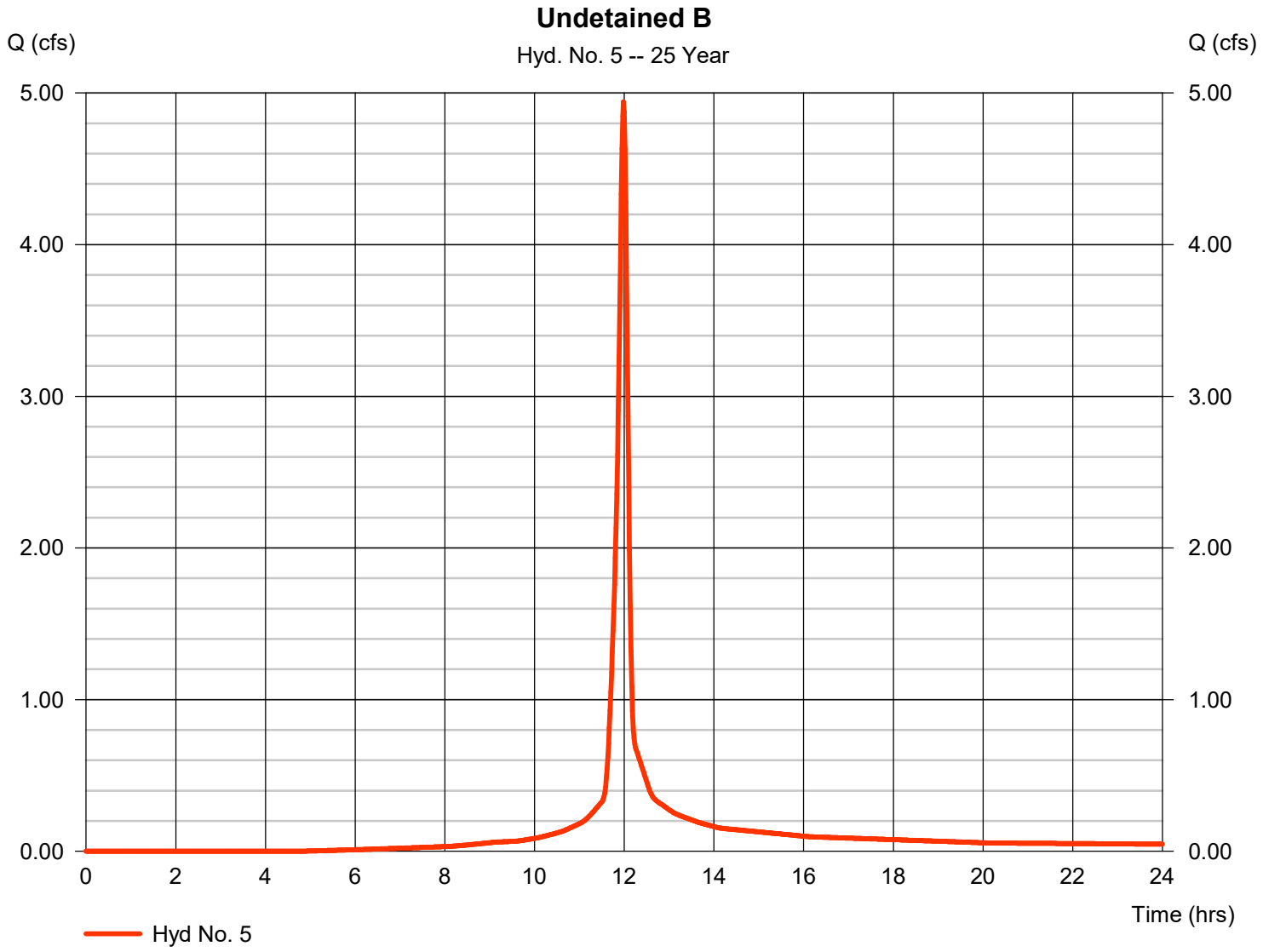
Hydrograph Report

Hyd. No. 5

Undetained B

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.941 cfs
Storm frequency	=	25 yrs	Time to peak	=	11.98 hrs
Time interval	=	1 min	Hyd. volume	=	11,613 cuft
Drainage area	=	0.620 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.00 min
Total precip.	=	7.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.130 x 98) + (0.490 x 79)] / 0.620



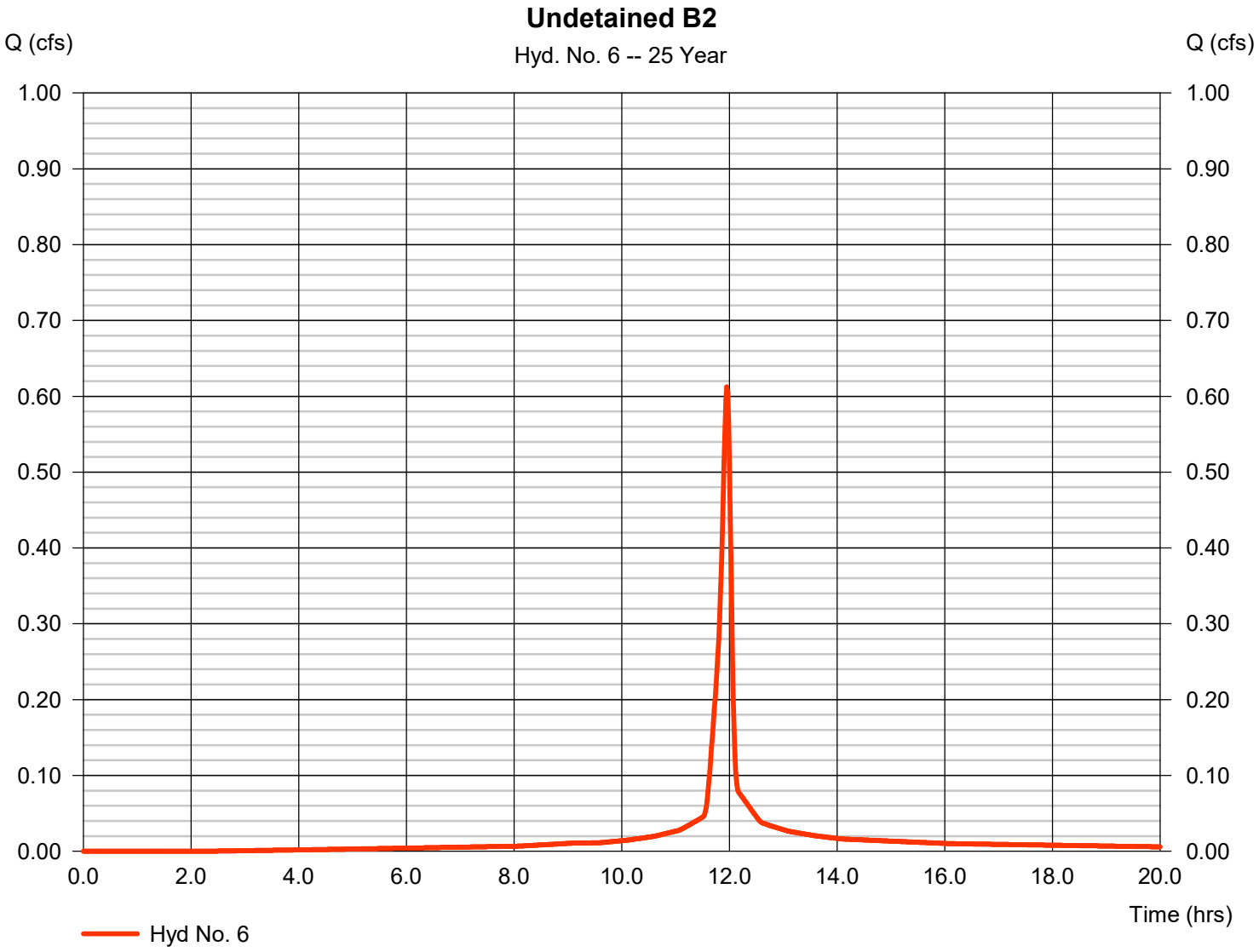
Hydrograph Report

Hyd. No. 6

Undetained B2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.613 cfs
Storm frequency	=	25 yrs	Time to peak	=	11.95 hrs
Time interval	=	1 min	Hyd. volume	=	1,391 cuft
Drainage area	=	0.060 ac	Curve number	=	92*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.020 x 79) + (0.040 x 98)] / 0.060



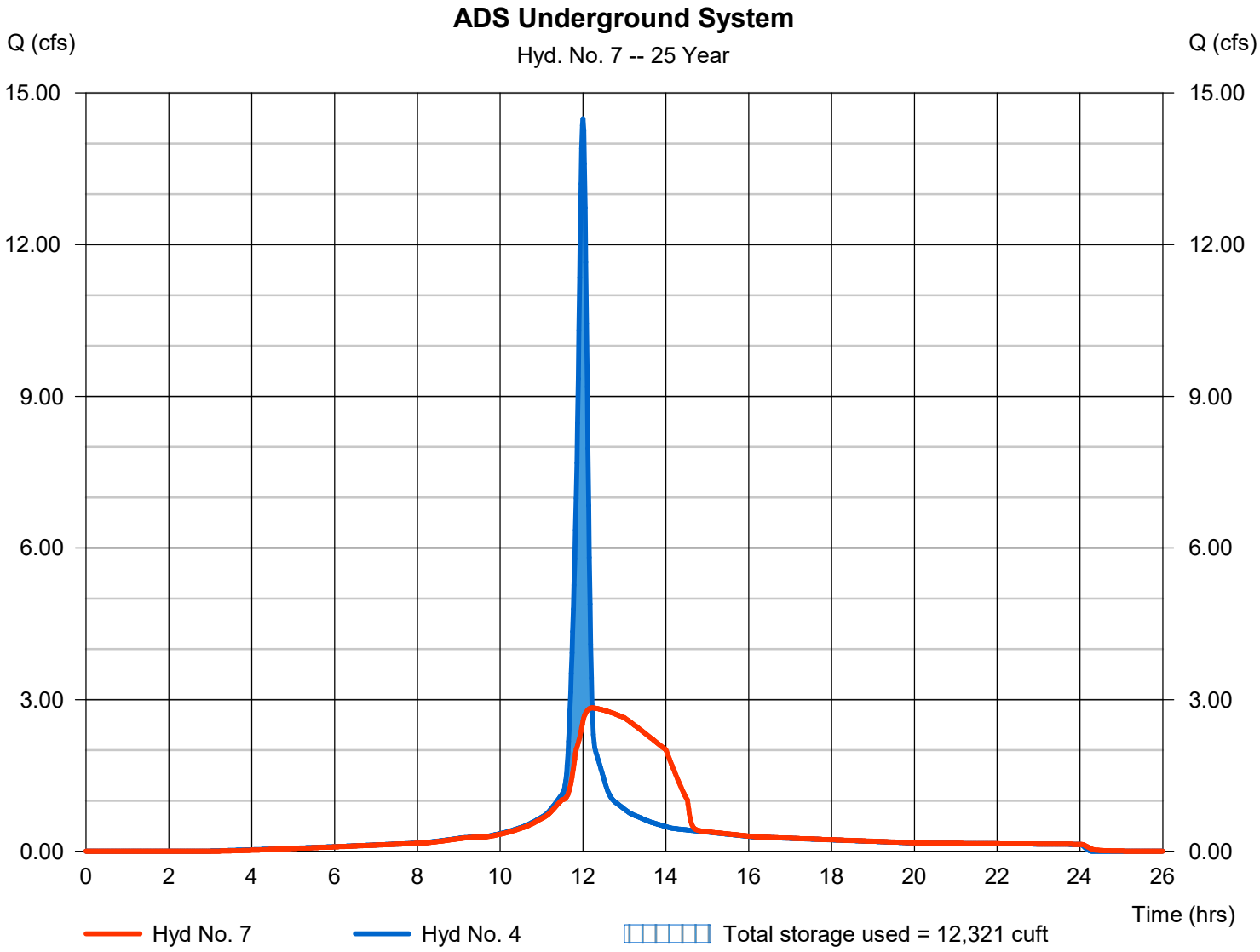
Hydrograph Report

Hyd. No. 7

ADS Underground System

Hydrograph type	=	Reservoir	Peak discharge	=	2.836 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.22 hrs
Time interval	=	1 min	Hyd. volume	=	37,878 cuft
Inflow hyd. No.	=	4 - Detained A	Max. Elevation	=	1231.35 ft
Reservoir name	=	<New Pond>	Max. Storage	=	12,321 cuft

Storage Indication method used.

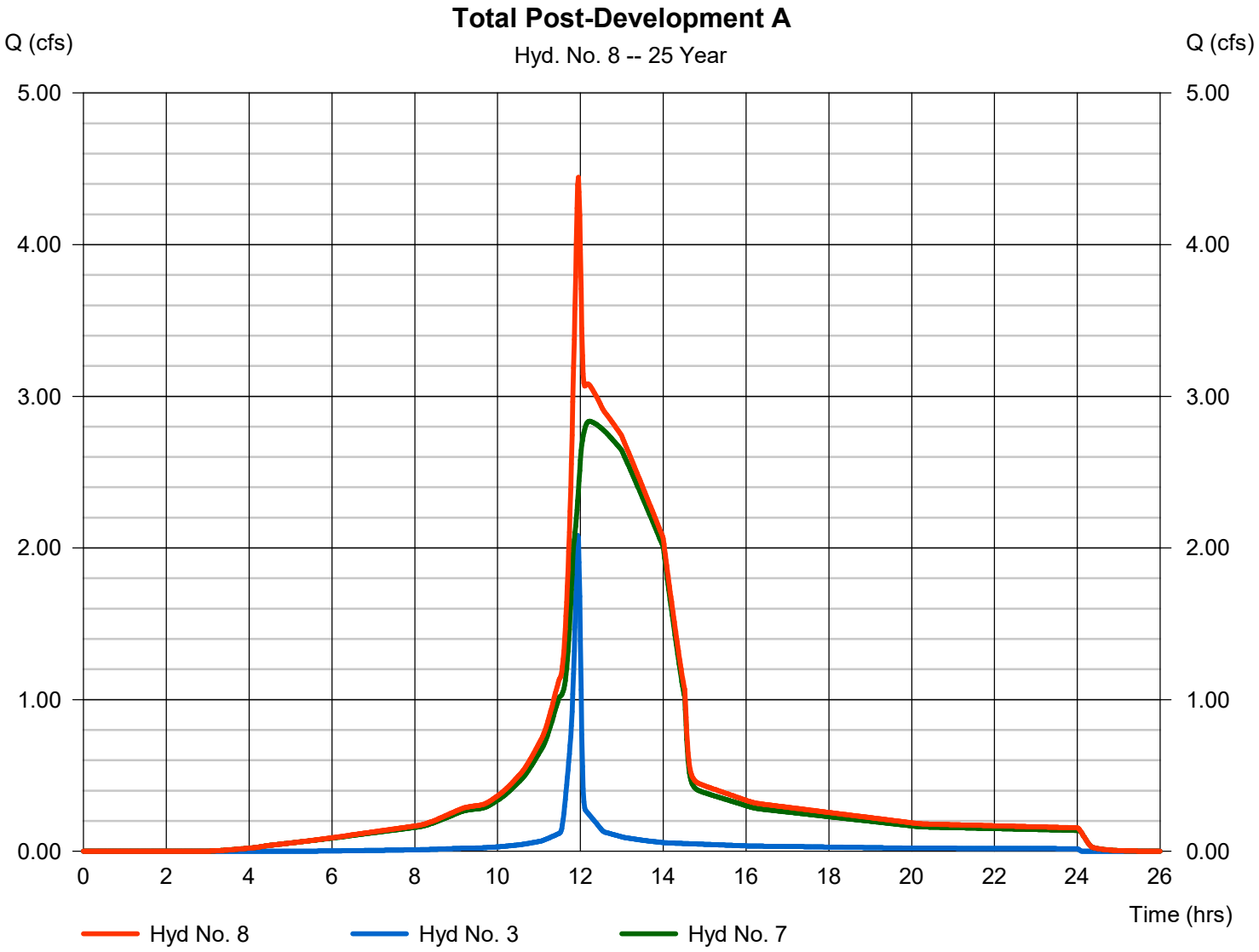


Hydrograph Report

Hyd. No. 8

Total Post-Development A

Hydrograph type	= Combine	Peak discharge	= 4.444 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.95 hrs
Time interval	= 1 min	Hyd. volume	= 41,998 cuft
Inflow hyds.	= 3, 7	Contrib. drain. area	= 0.230 ac

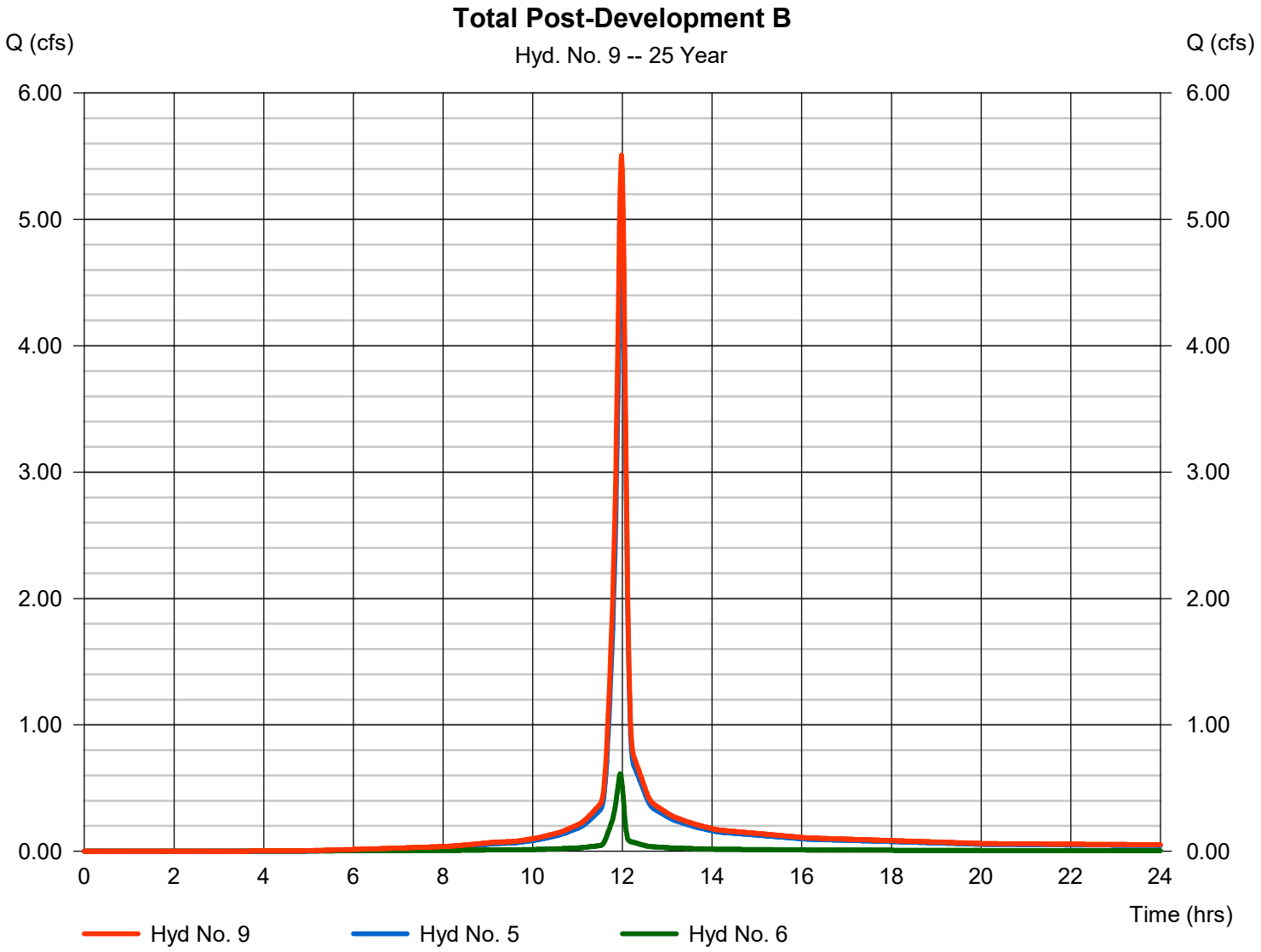


Hydrograph Report

Hyd. No. 9

Total Post-Development B

Hydrograph type	= Combine	Peak discharge	= 5.506 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.98 hrs
Time interval	= 1 min	Hyd. volume	= 13,004 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 0.680 ac



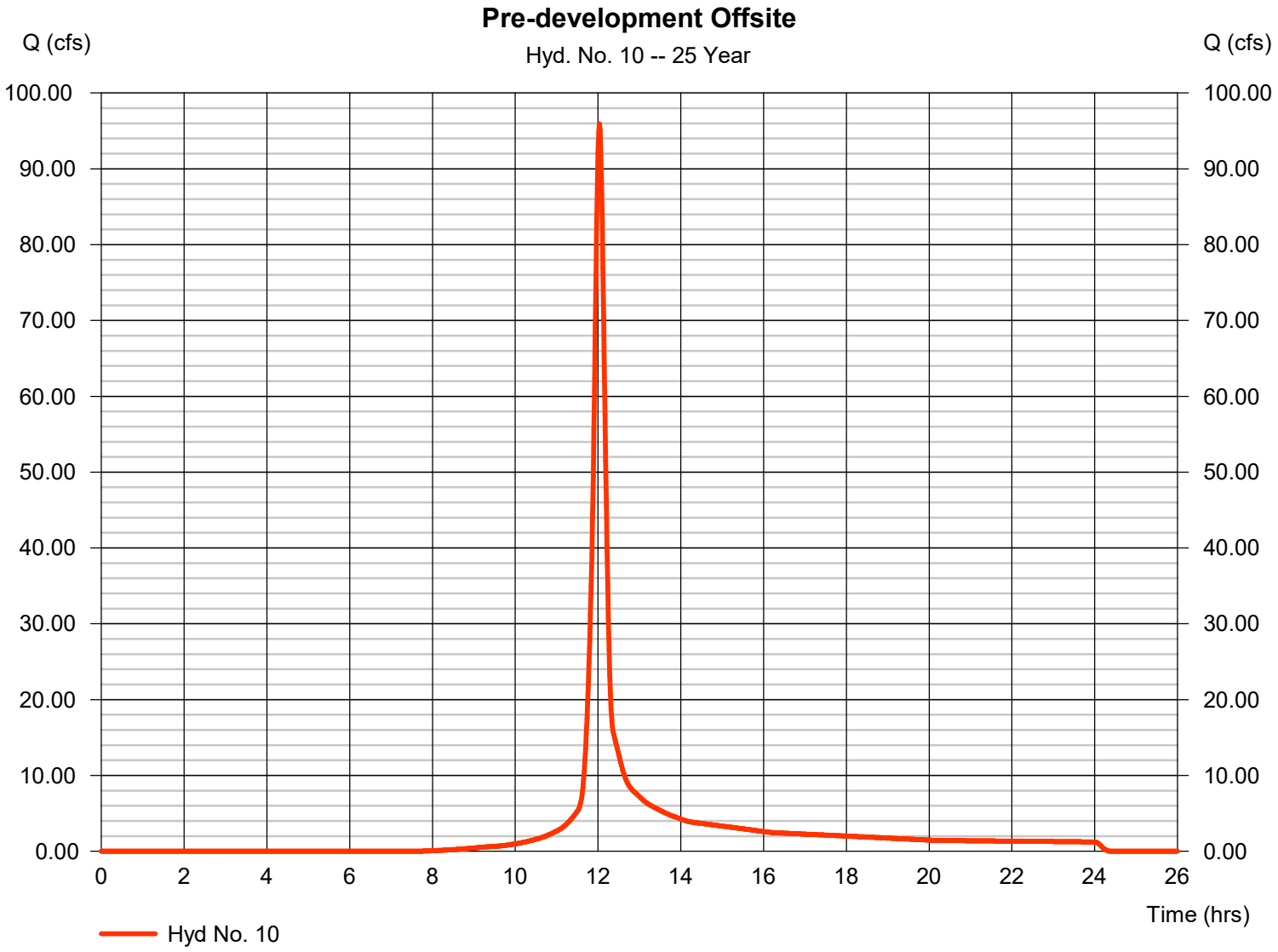
Hydrograph Report

Hyd. No. 10

Pre-development Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	95.91 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.03 hrs
Time interval	=	1 min	Hyd. volume	=	258,004 cuft
Drainage area	=	18.000 ac	Curve number	=	72*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.80 min
Total precip.	=	7.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.140 x 79) + (0.560 x 92) + (15.300 x 70)] / 18.000

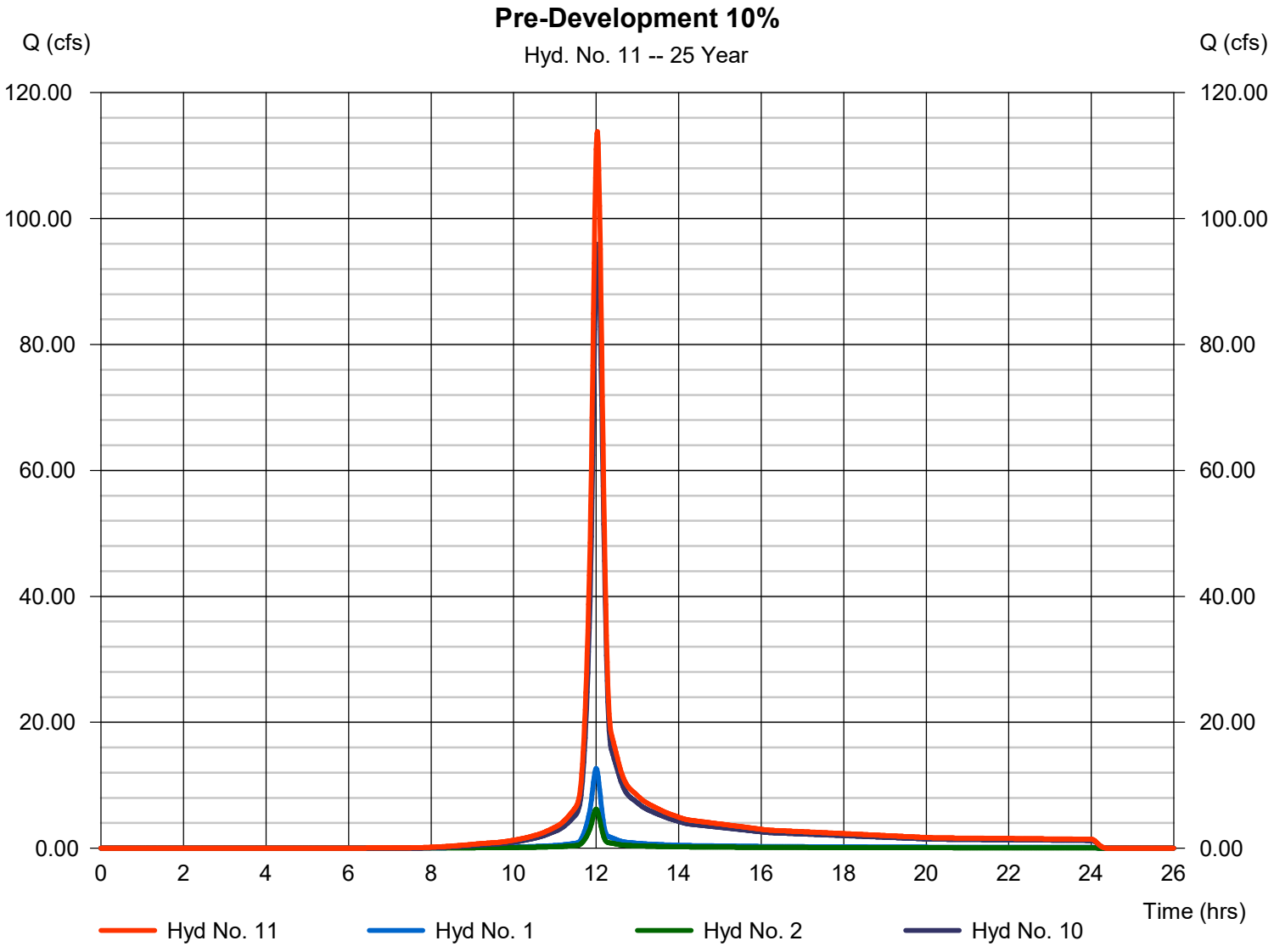


Hydrograph Report

Hyd. No. 11

Pre-Development 10%

Hydrograph type	= Combine	Peak discharge	= 113.81 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.03 hrs
Time interval	= 1 min	Hyd. volume	= 304,651 cuft
Inflow hyds.	= 1, 2, 10	Contrib. drain. area	= 20.620 ac

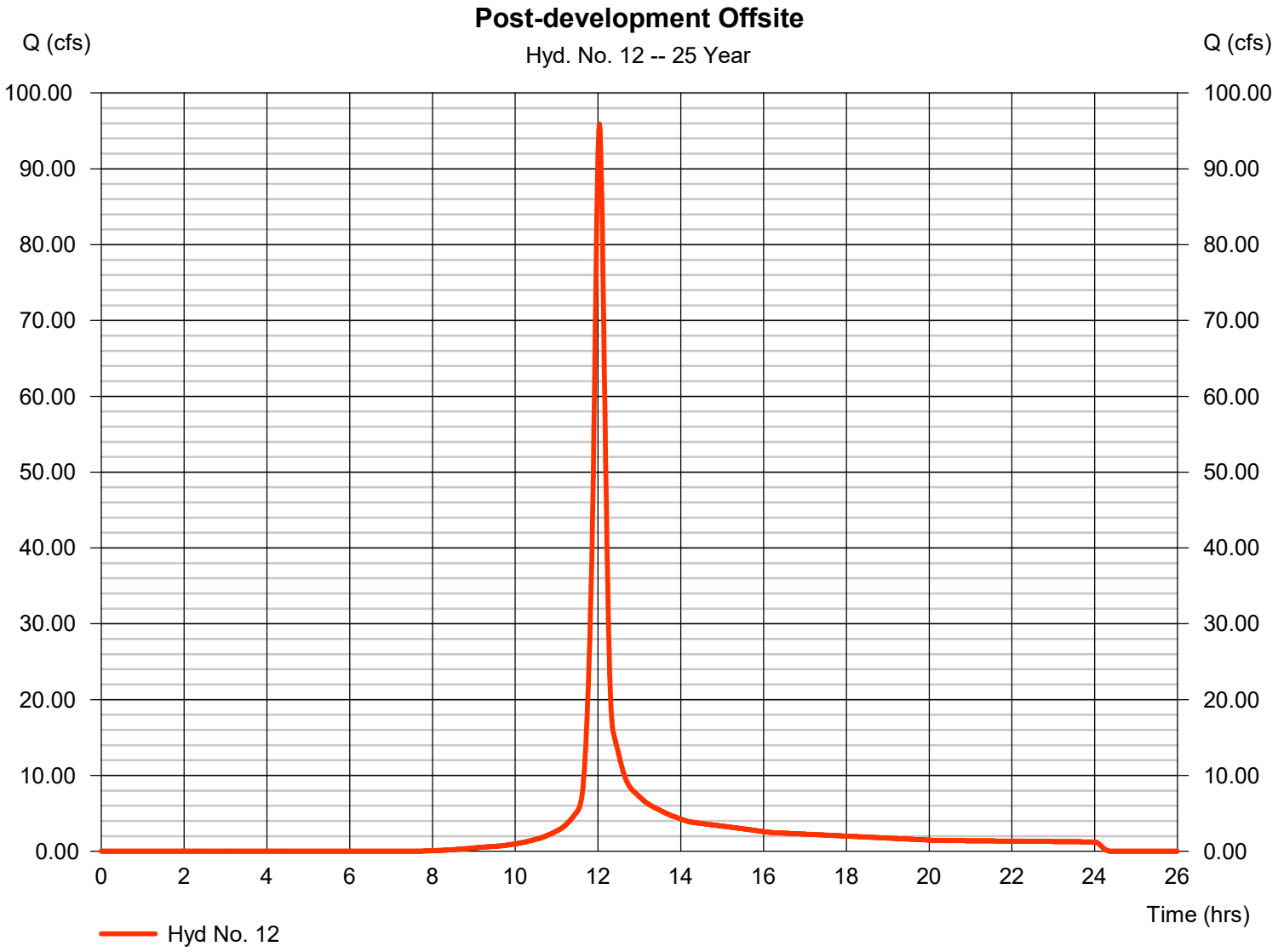


Hydrograph Report

Hyd. No. 12

Post-development Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	95.91 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.03 hrs
Time interval	=	1 min	Hyd. volume	=	258,004 cuft
Drainage area	=	18.000 ac	Curve number	=	72
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.80 min
Total precip.	=	7.14 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

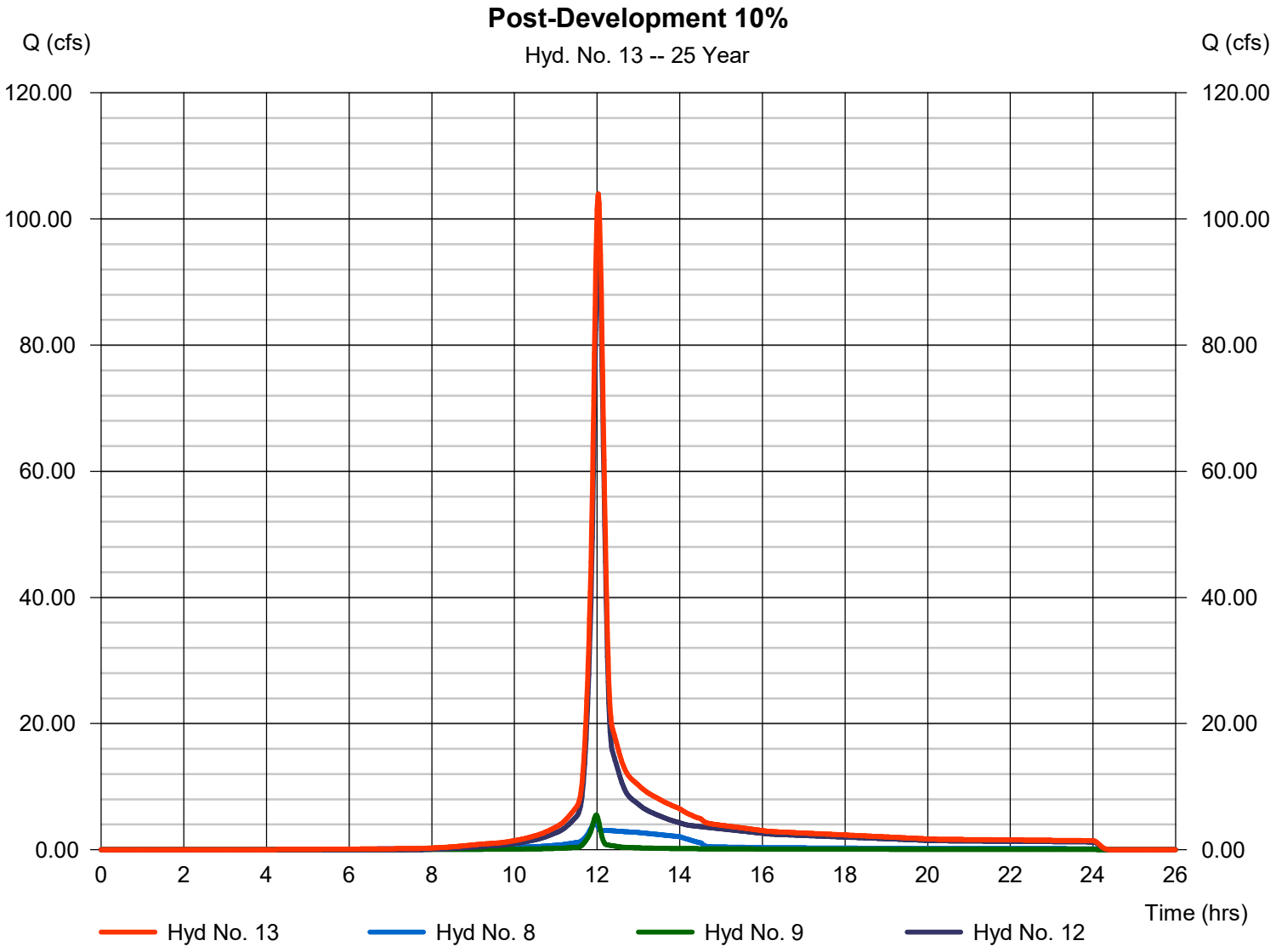


Hydrograph Report

Hyd. No. 13

Post-Development 10%

Hydrograph type	=	Combine	Peak discharge	=	104.00 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.03 hrs
Time interval	=	1 min	Hyd. volume	=	313,006 cuft
Inflow hyds.	=	8, 9, 12	Contrib. drain. area	=	18.000 ac



Hydrograph Summary Report

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

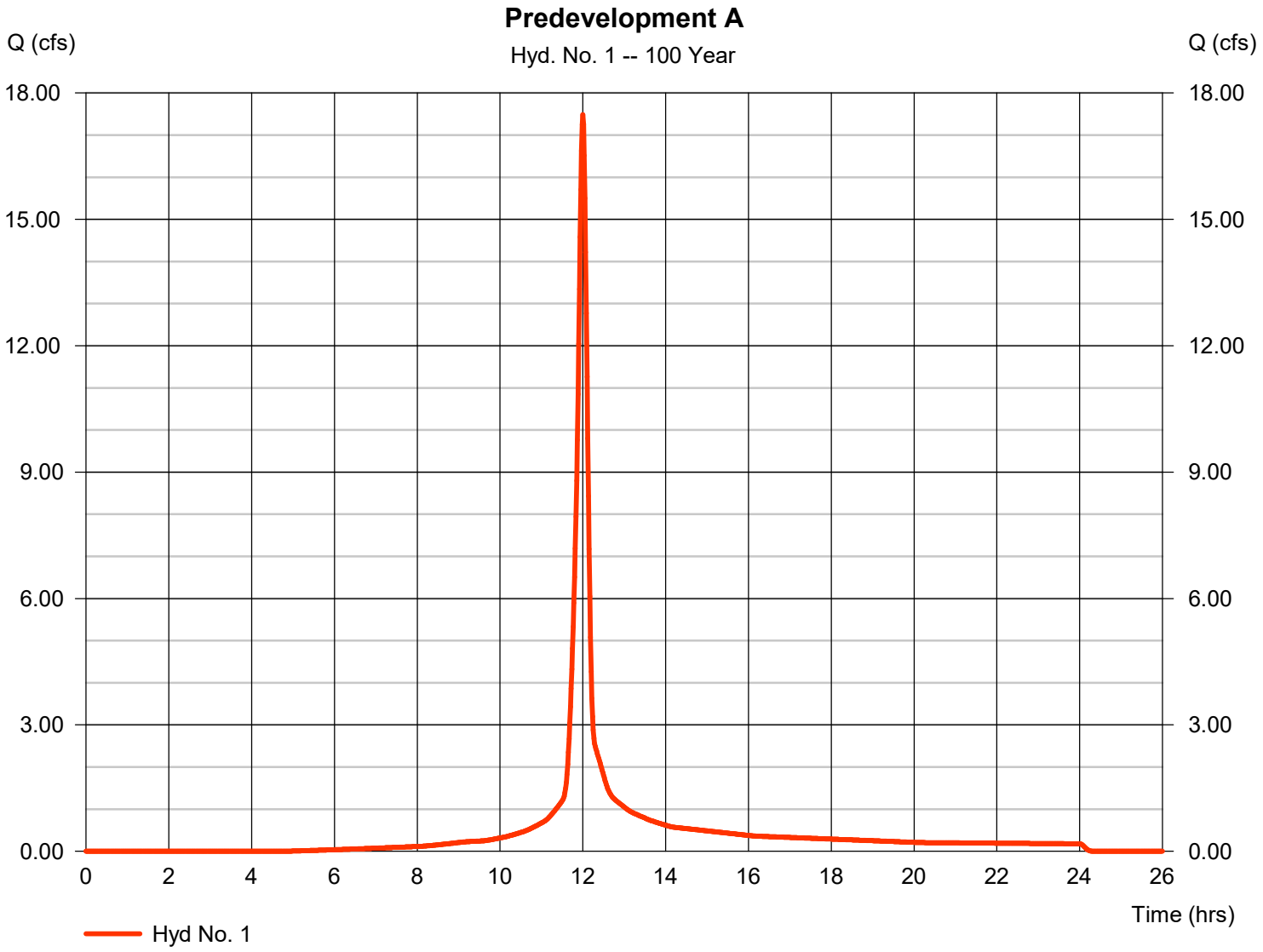
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	17.48	1	720	43,688	------	------	------	Predevelopment A
2	SCS Runoff	8.449	1	720	21,396	------	------	------	Predevelopment B
3	SCS Runoff	2.834	1	716	5,722	------	------	------	Undetained A
4	SCS Runoff	19.01	1	720	50,583	------	------	------	Detained A
5	SCS Runoff	6.674	1	719	15,980	------	------	------	Undetained B
6	SCS Runoff	0.797	1	717	1,842	------	------	------	Undetained B2
7	Reservoir	3.068	1	735	50,581	4	1231.81	17,500	ADS Underground System
8	Combine	5.420	1	717	56,303	3, 7	------	------	Total Post-Development A
9	Combine	7.409	1	719	17,822	5, 6,	------	------	Total Post-Development B
10	SCS Runoff	138.33	1	722	374,710	------	------	------	Pre-development Offsite
11	Combine	162.82	1	721	439,794	1, 2, 10	------	------	Pre-Development 10%
12	SCS Runoff	138.33	1	722	374,710	------	------	------	Post-development Offsite
13	Combine	148.45	1	722	448,835	8, 9, 12	------	------	Post-Development 10%

Hydrograph Report

Hyd. No. 1

Predevelopment A

Hydrograph type	=	SCS Runoff	Peak discharge	=	17.48 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.00 hrs
Time interval	=	1 min	Hyd. volume	=	43,688 cuft
Drainage area	=	1.790 ac	Curve number	=	79
Basin Slope	=	2.0 %	Hydraulic length	=	130 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.00 min
Total precip.	=	9.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



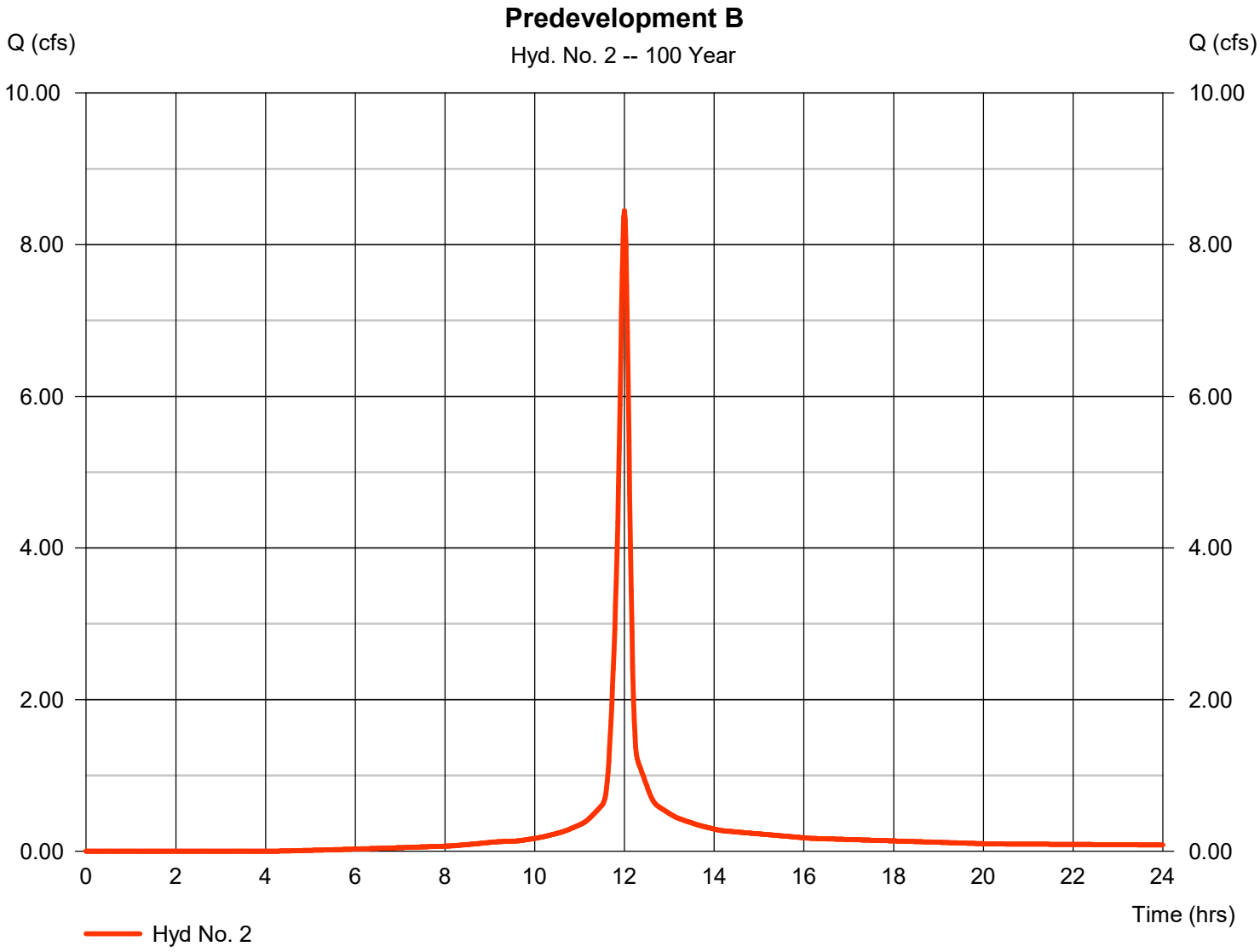
Hydrograph Report

Hyd. No. 2

Predevelopment B

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.449 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.00 hrs
Time interval	=	1 min	Hyd. volume	=	21,396 cuft
Drainage area	=	0.830 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.60 min
Total precip.	=	9.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.120 x 98) + (0.710 x 79)] / 0.830



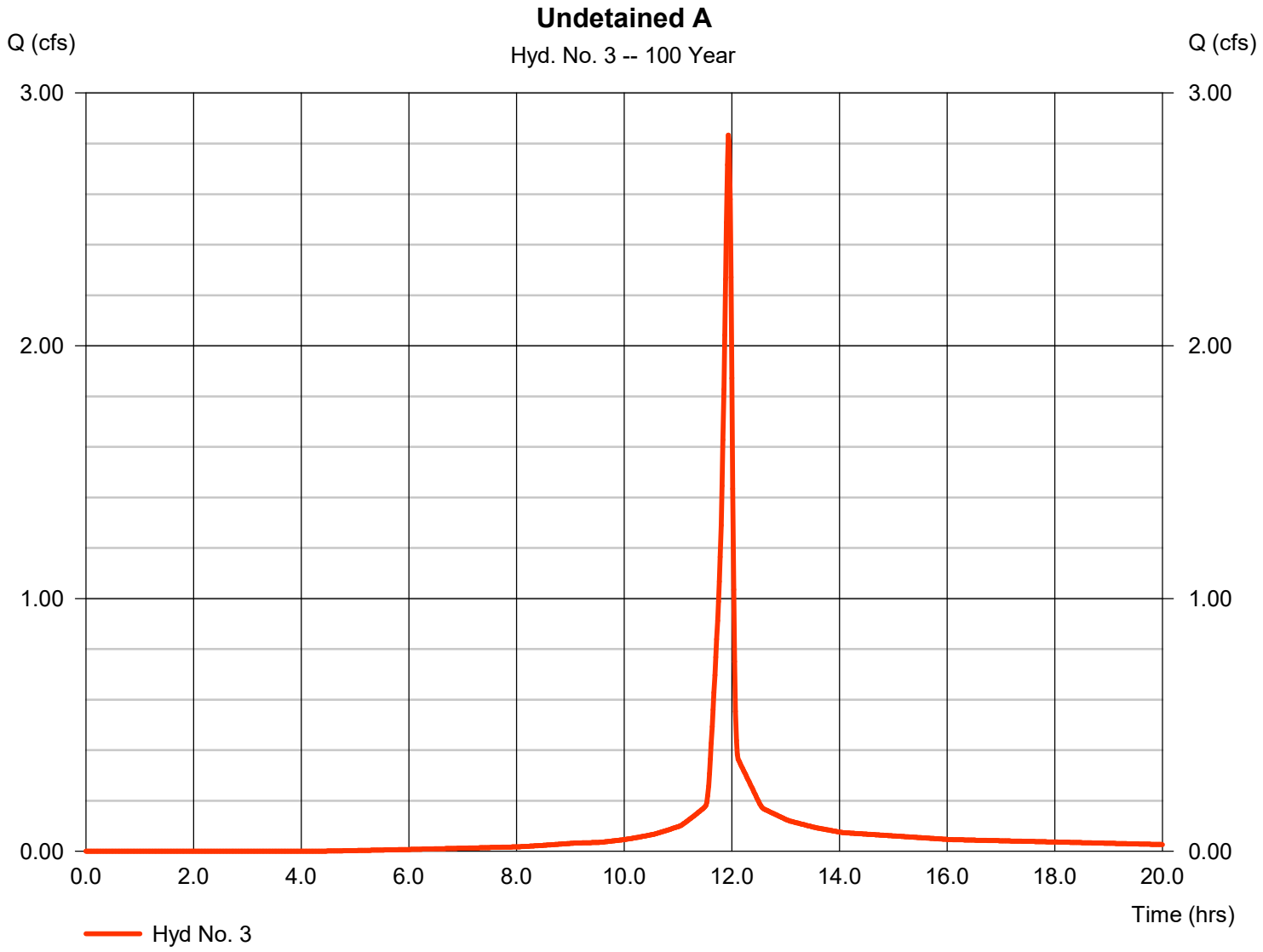
Hydrograph Report

Hyd. No. 3

Undetained A

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.834 cfs
Storm frequency	=	100 yrs	Time to peak	=	11.93 hrs
Time interval	=	1 min	Hyd. volume	=	5,722 cuft
Drainage area	=	0.230 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.40 min
Total precip.	=	9.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.200 x 79) + (0.030 x 98)] / 0.230



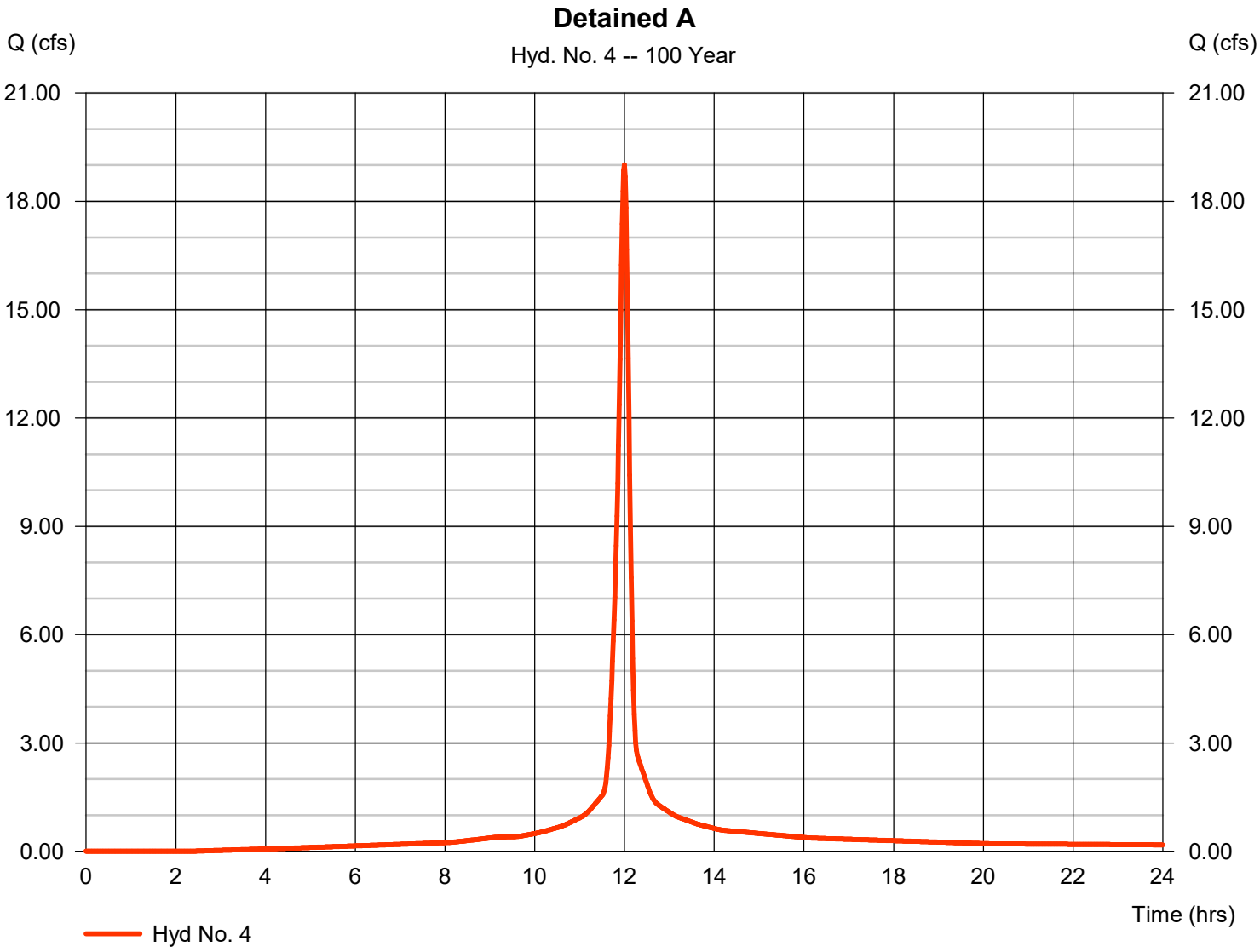
Hydrograph Report

Hyd. No. 4

Detained A

Hydrograph type	=	SCS Runoff	Peak discharge	=	19.01 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.00 hrs
Time interval	=	1 min	Hyd. volume	=	50,583 cuft
Drainage area	=	1.720 ac	Curve number	=	90*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.40 min
Total precip.	=	9.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.970 x 98) + (0.750 x 79)] / 1.720



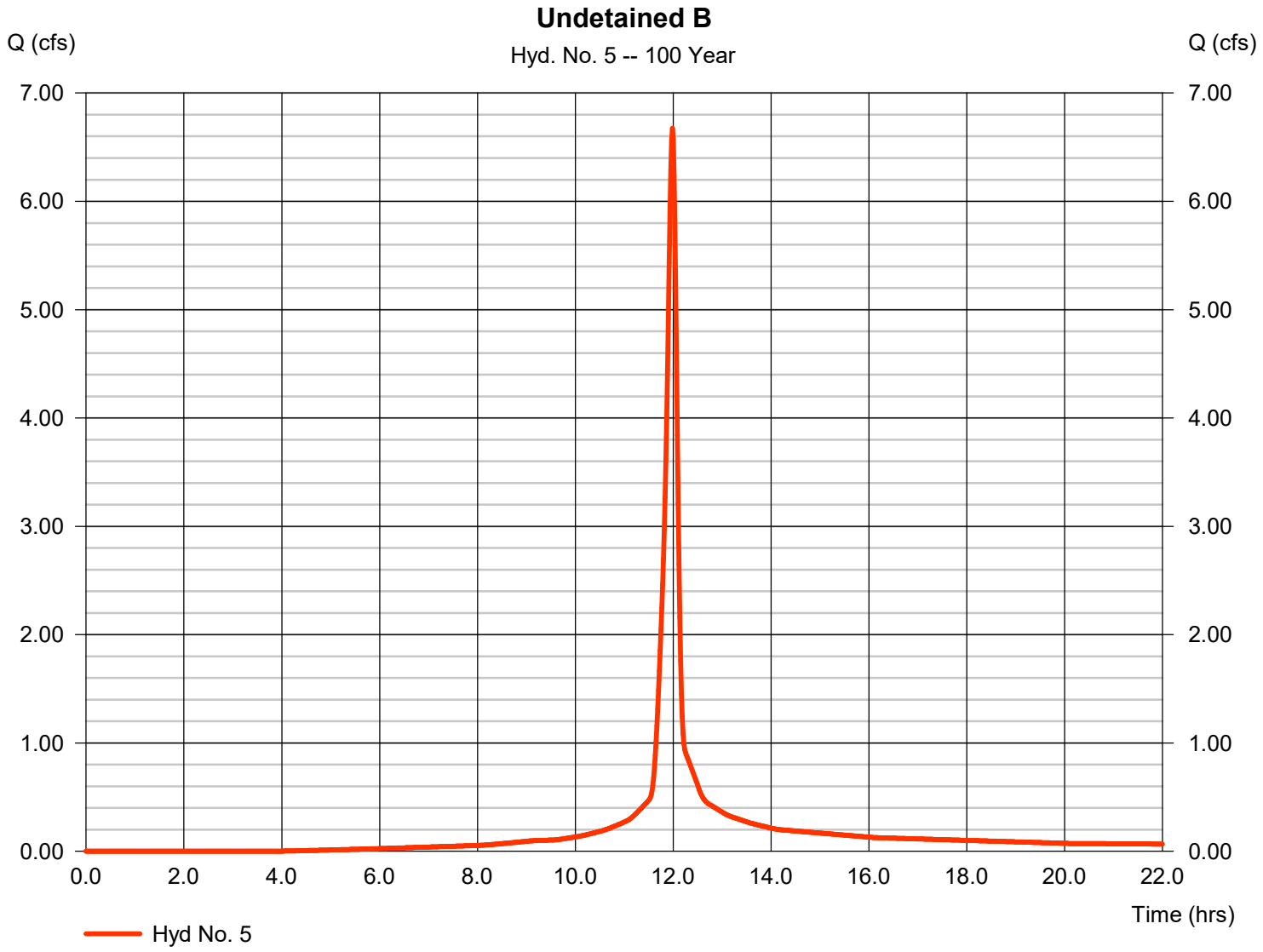
Hydrograph Report

Hyd. No. 5

Undetained B

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.674 cfs
Storm frequency	=	100 yrs	Time to peak	=	11.98 hrs
Time interval	=	1 min	Hyd. volume	=	15,980 cuft
Drainage area	=	0.620 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.00 min
Total precip.	=	9.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.130 x 98) + (0.490 x 79)] / 0.620



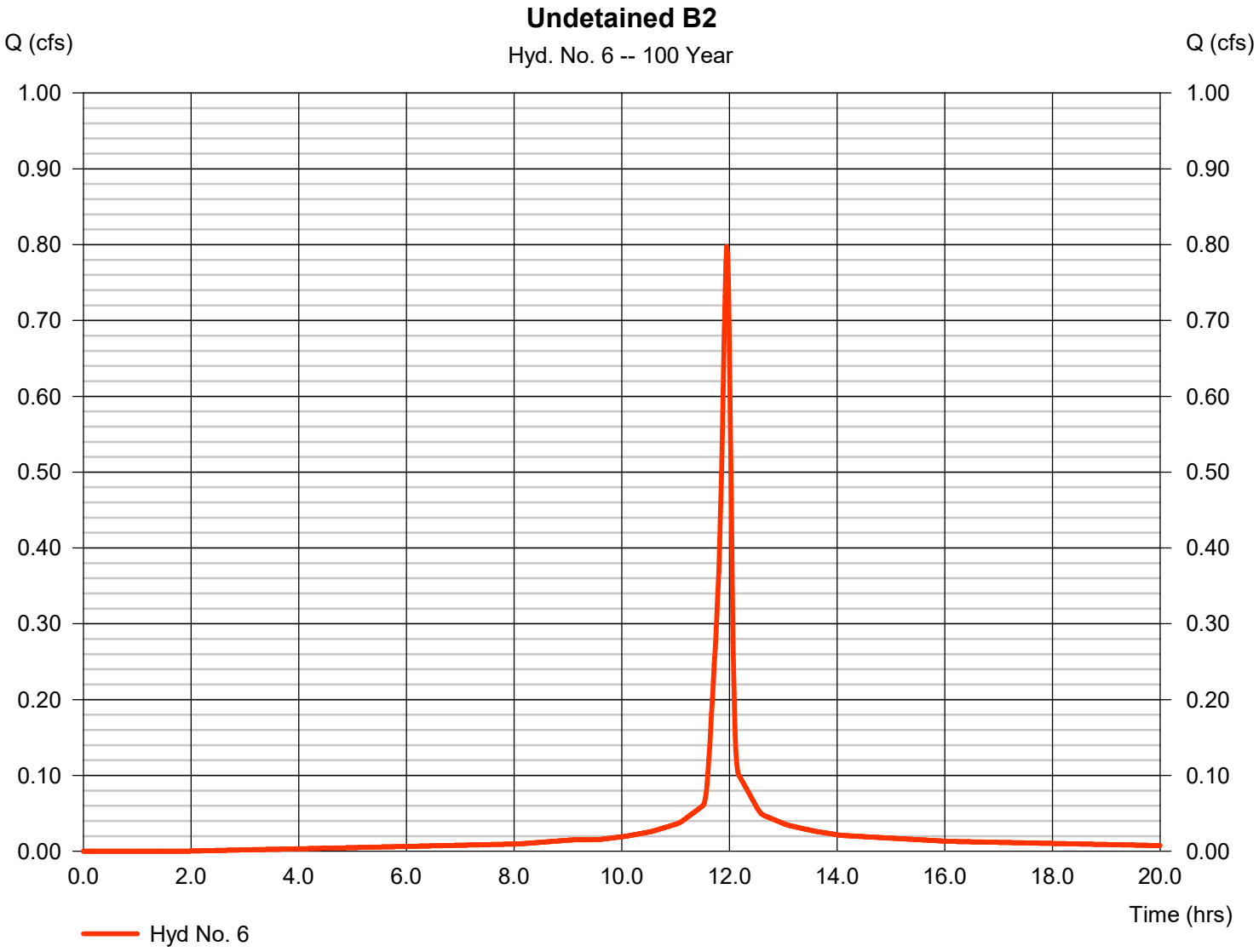
Hydrograph Report

Hyd. No. 6

Undetained B2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.797 cfs
Storm frequency	=	100 yrs	Time to peak	=	11.95 hrs
Time interval	=	1 min	Hyd. volume	=	1,842 cuft
Drainage area	=	0.060 ac	Curve number	=	92*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	9.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.020 x 79) + (0.040 x 98)] / 0.060



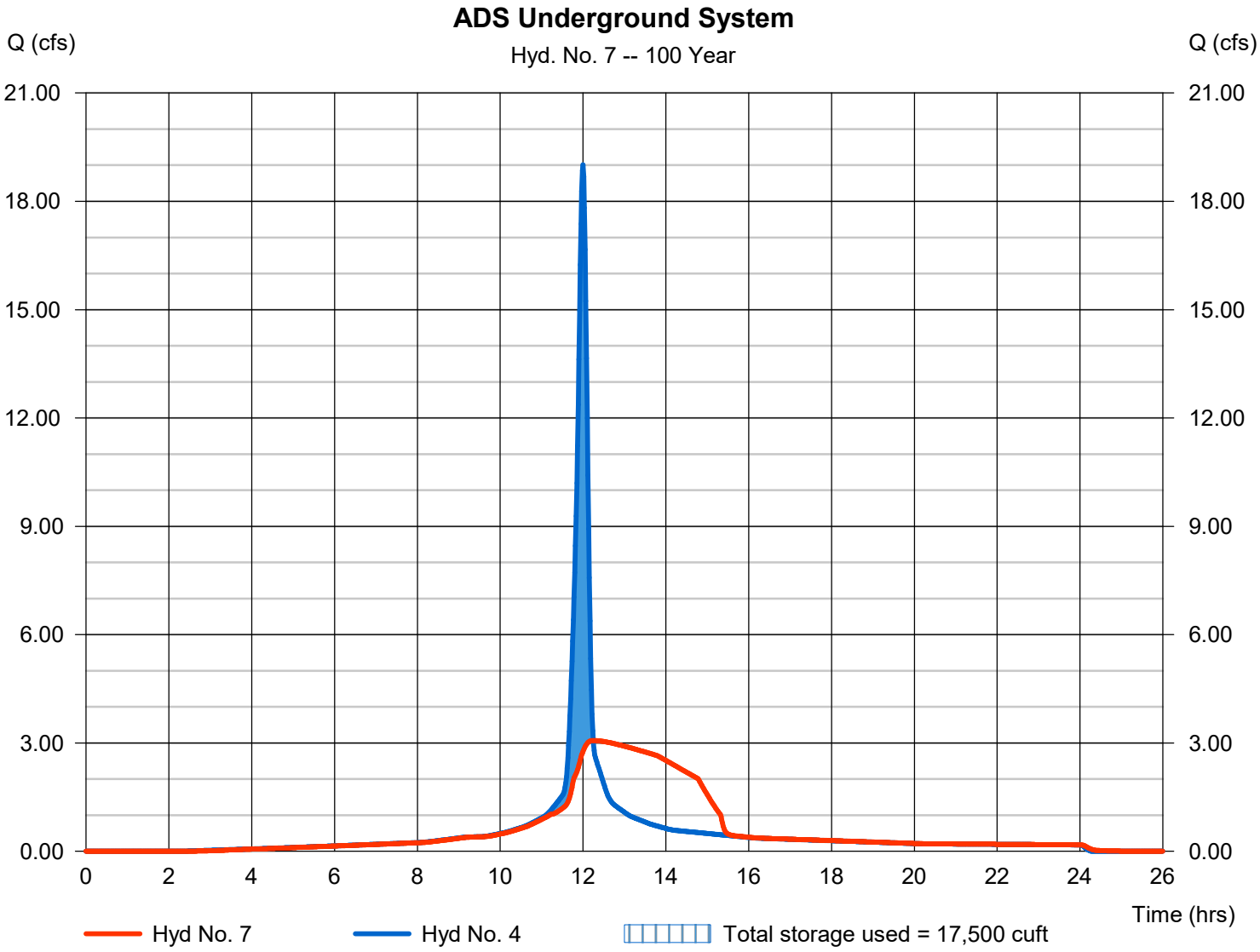
Hydrograph Report

Hyd. No. 7

ADS Underground System

Hydrograph type	=	Reservoir	Peak discharge	=	3.068 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.25 hrs
Time interval	=	1 min	Hyd. volume	=	50,581 cuft
Inflow hyd. No.	=	4 - Detained A	Max. Elevation	=	1231.81 ft
Reservoir name	=	<New Pond>	Max. Storage	=	17,500 cuft

Storage Indication method used.

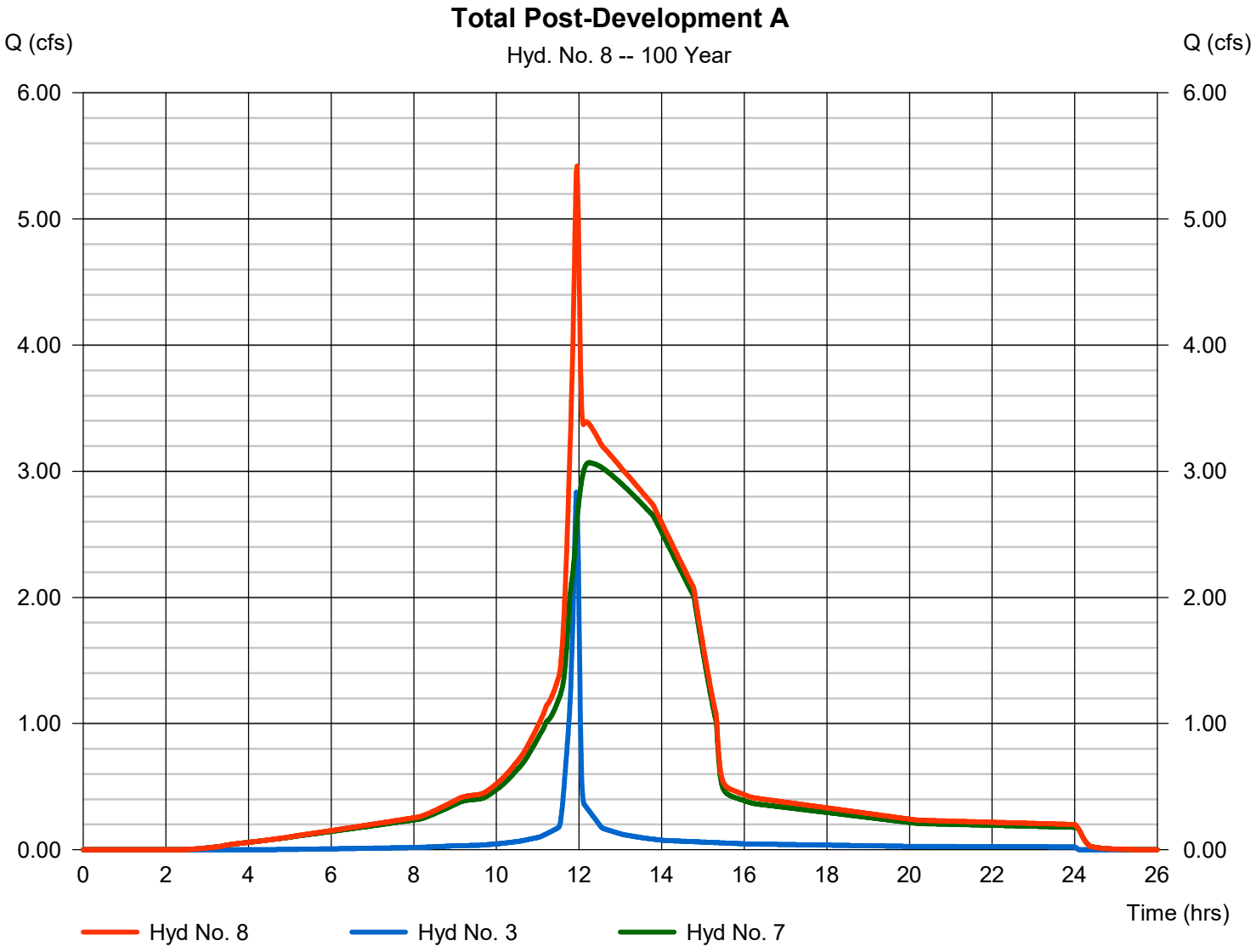


Hydrograph Report

Hyd. No. 8

Total Post-Development A

Hydrograph type	= Combine	Peak discharge	= 5.420 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.95 hrs
Time interval	= 1 min	Hyd. volume	= 56,303 cuft
Inflow hyds.	= 3, 7	Contrib. drain. area	= 0.230 ac

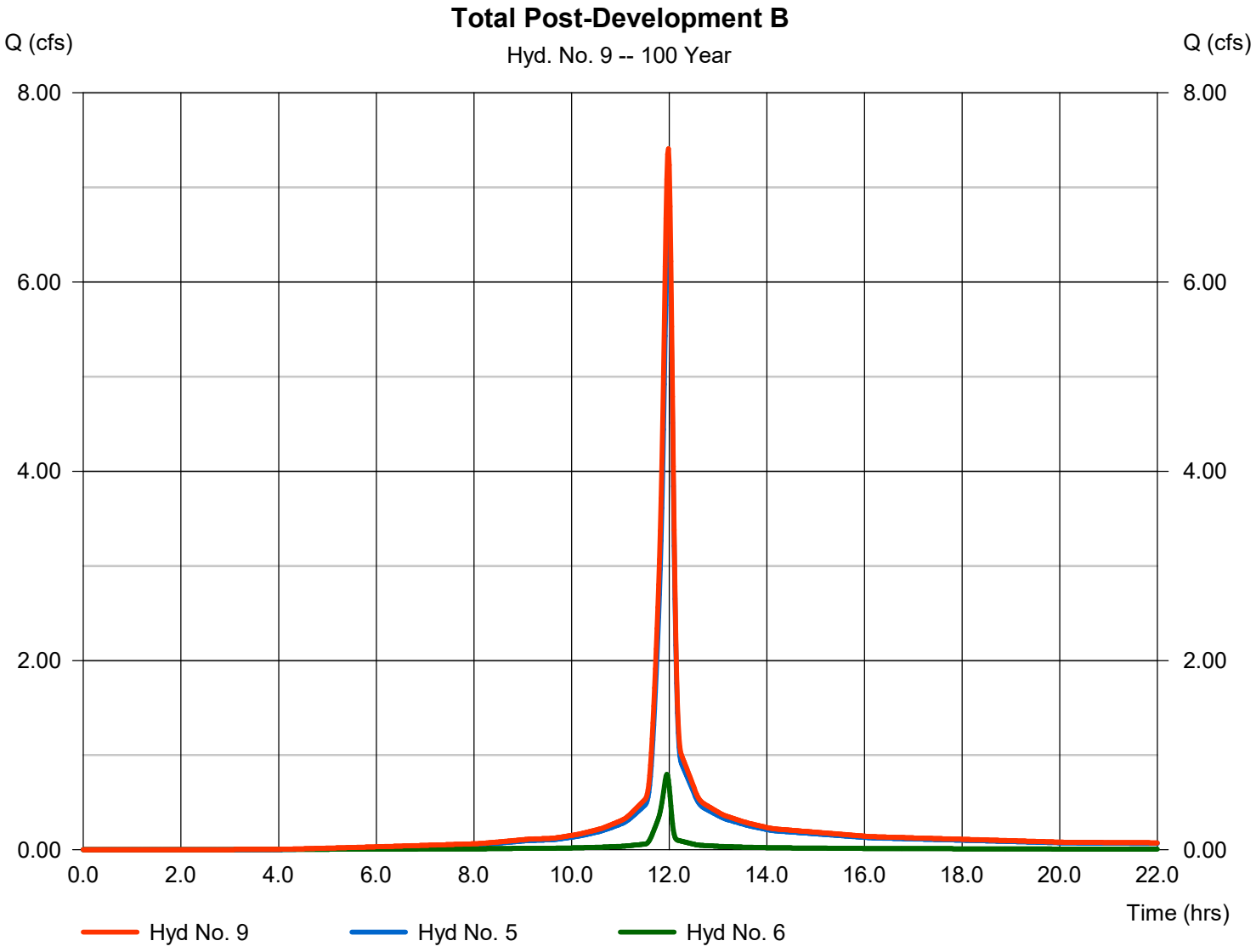


Hydrograph Report

Hyd. No. 9

Total Post-Development B

Hydrograph type	= Combine	Peak discharge	= 7.409 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.98 hrs
Time interval	= 1 min	Hyd. volume	= 17,822 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 0.680 ac



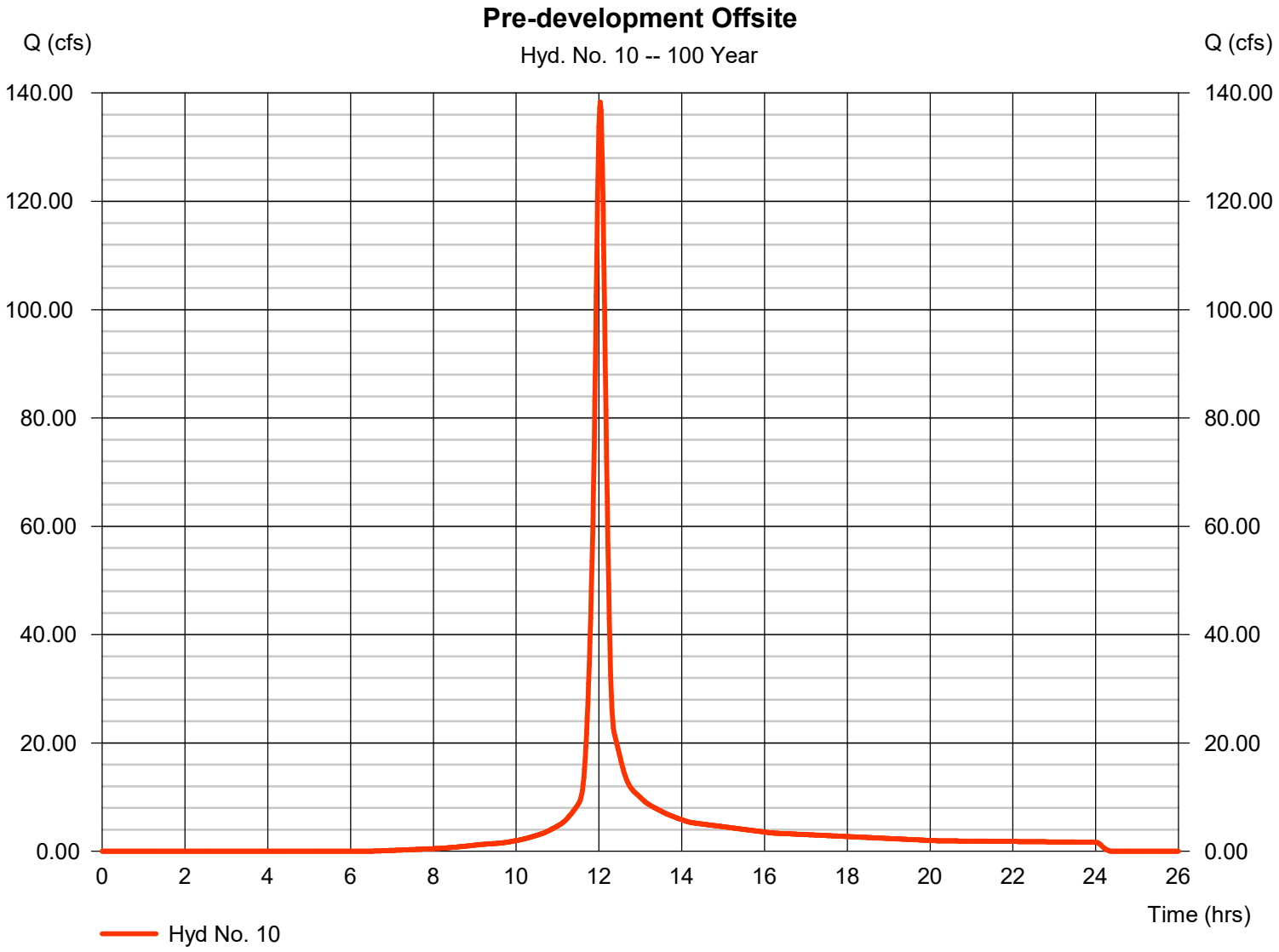
Hydrograph Report

Hyd. No. 10

Pre-development Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	138.33 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.03 hrs
Time interval	=	1 min	Hyd. volume	=	374,710 cuft
Drainage area	=	18.000 ac	Curve number	=	72*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.80 min
Total precip.	=	9.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.140 x 79) + (0.560 x 92) + (15.300 x 70)] / 18.000

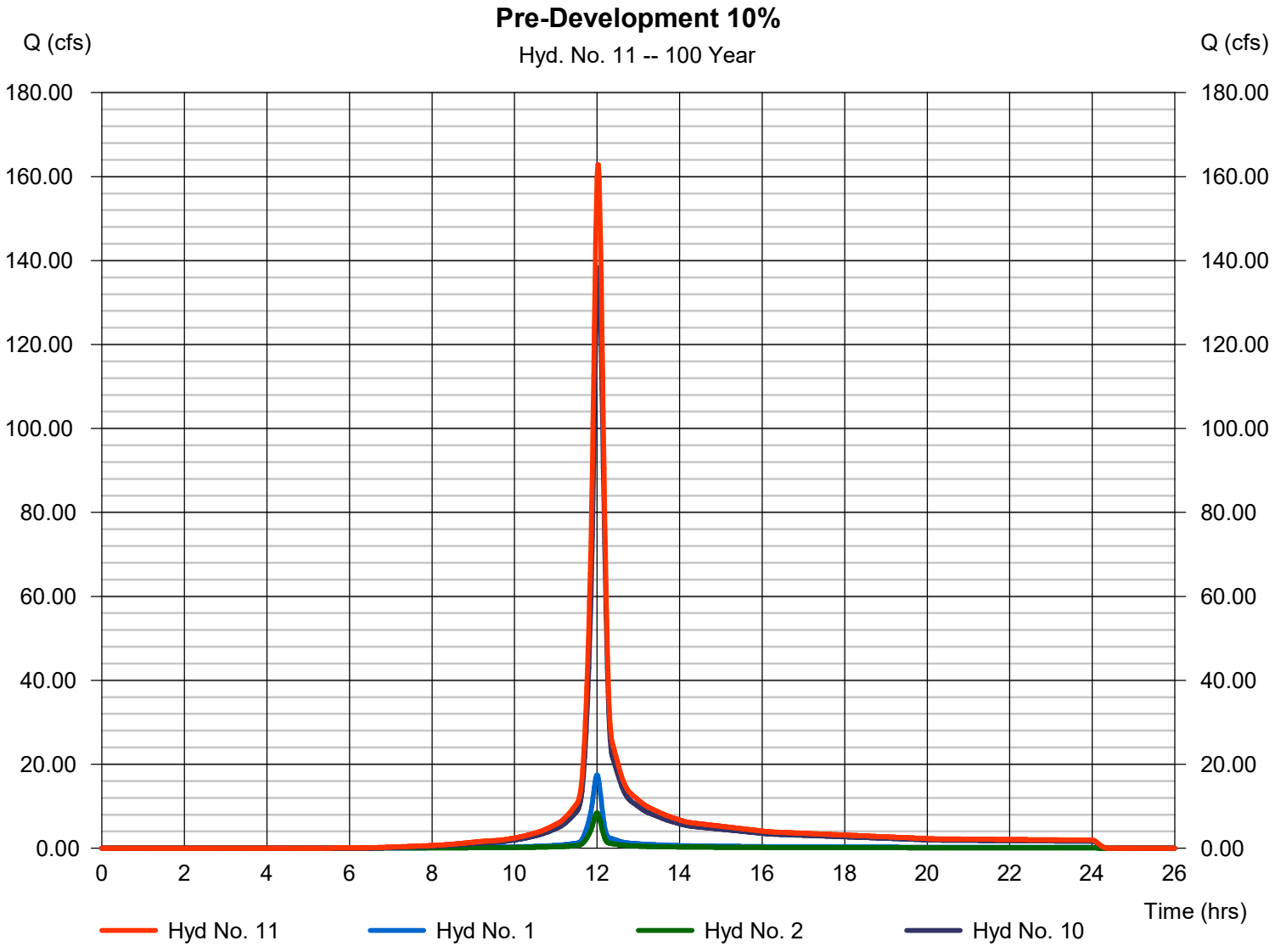


Hydrograph Report

Hyd. No. 11

Pre-Development 10%

Hydrograph type	= Combine	Peak discharge	= 162.82 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.02 hrs
Time interval	= 1 min	Hyd. volume	= 439,794 cuft
Inflow hyds.	= 1, 2, 10	Contrib. drain. area	= 20.620 ac

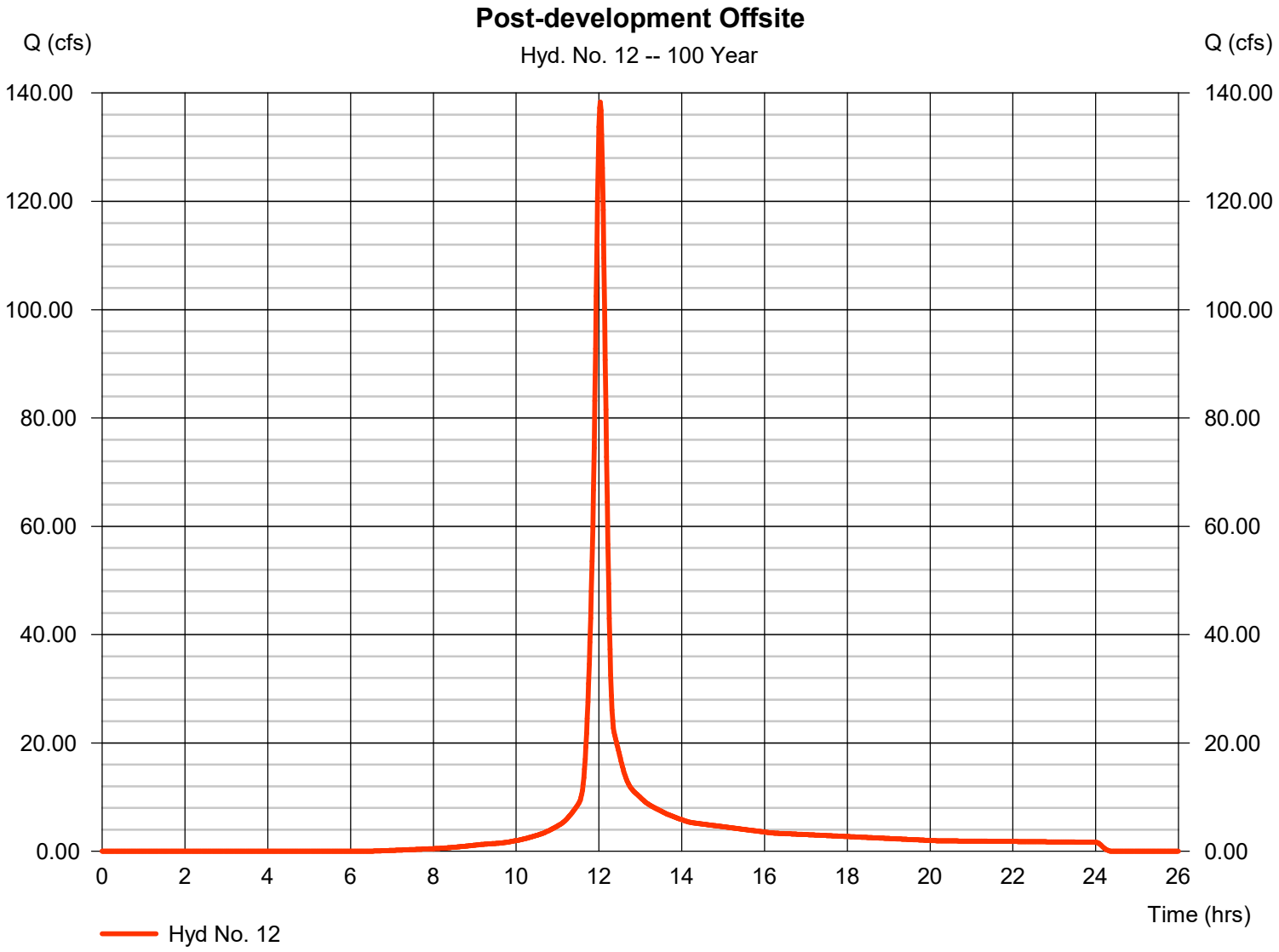


Hydrograph Report

Hyd. No. 12

Post-development Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	138.33 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.03 hrs
Time interval	=	1 min	Hyd. volume	=	374,710 cuft
Drainage area	=	18.000 ac	Curve number	=	72
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.80 min
Total precip.	=	9.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

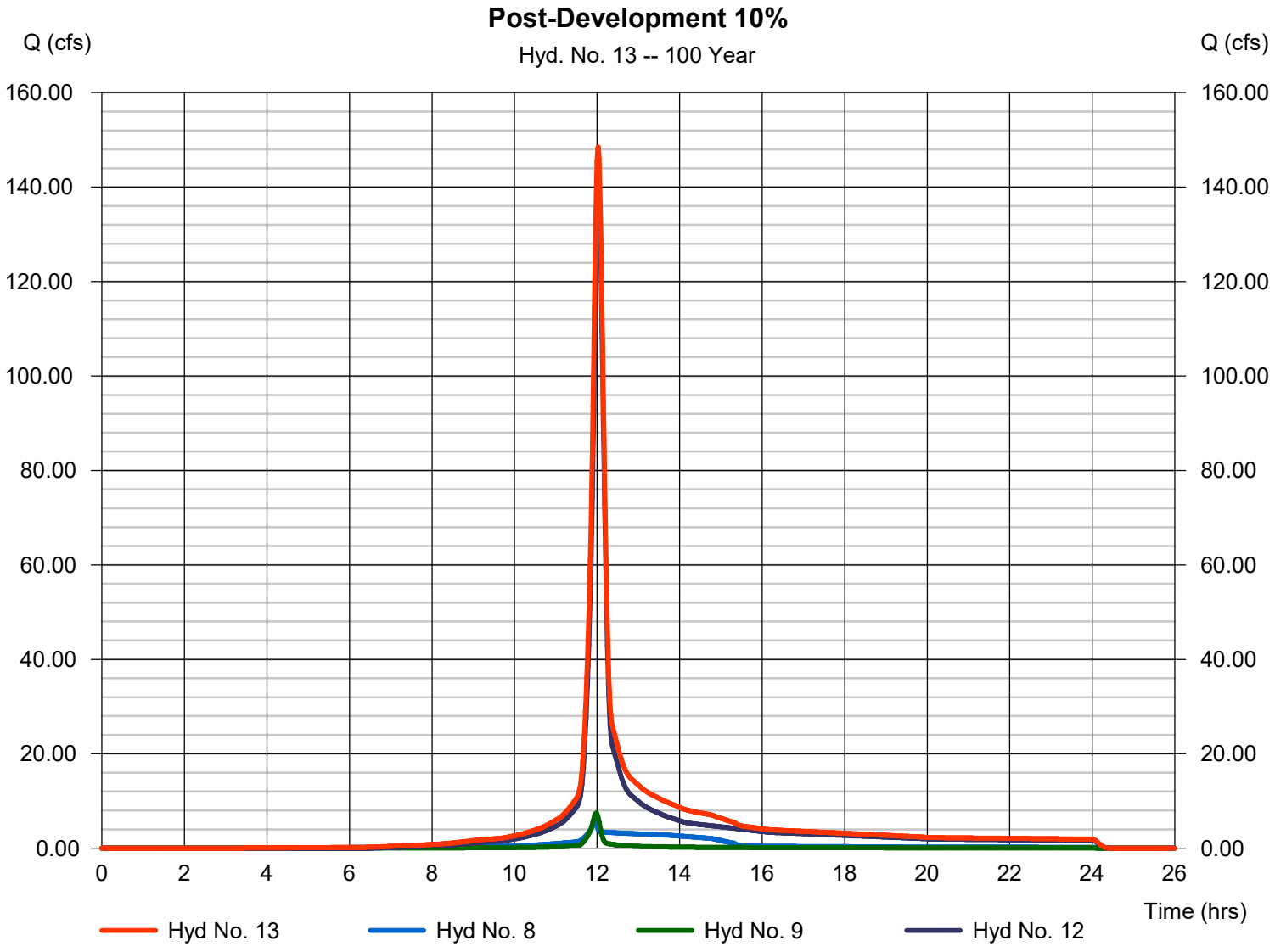


Hydrograph Report

Hyd. No. 13

Post-Development 10%

Hydrograph type	= Combine	Peak discharge	= 148.45 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.03 hrs
Time interval	= 1 min	Hyd. volume	= 448,835 cuft
Inflow hyds.	= 8, 9, 12	Contrib. drain. area	= 18.000 ac



Hydraflow Rainfall Report

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

File name: SampleFHA.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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.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	0.00	4.19	0.00	5.12	5.94	7.14	8.13	9.17
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

APPENDIX C

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER:	
ADS SALES REP:	
PROJECT NO:	

ADS Advanced Drainage Systems, Inc.

ADS SiteAssist™ FOR STORMTECH INSTALLATION INSTRUCTIONS VISIT OUR APP

SOURCES OF COMMUNITY INDEPENDENT LIVING

SC-740 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-740.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 550 LBS/IN/IN. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-740 SYSTEM

1. STORMTECH SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm).
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT

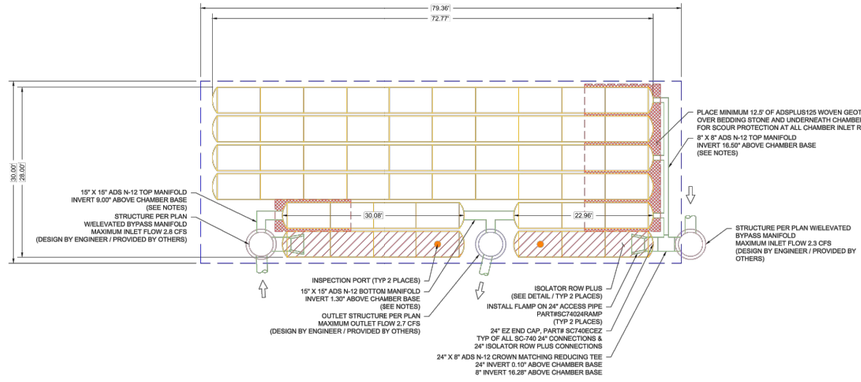
54	STORMTECH SC-740 CHAMBERS
16	STORMTECH SC-740 END CAPS
6	STONE ABOVE (in)
6	STONE BELOW (in)
40	% STONE VOID
4,922	**INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED)**
2381	SYSTEM AREA (ft²)
219	SYSTEM PERIMETER (ft)

PROPOSED ELEVATIONS

1239.00	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)
1232.50	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC)
1232.50	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)
1232.50	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT)
1232.50	MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT)
1231.50	TOP OF STONE
1231.00	TOP OF SC-740 CHAMBER
1229.88	8" TOP MANIFOLD INVERT
1229.25	15" TOP MANIFOLD INVERT
1228.61	15" BOTTOM MANIFOLD INVERT
1228.51	24" ISOLATOR ROW PLUS CONNECTION INVERT
1228.50	BOTTOM OF SC-740 CHAMBER
1228.00	BOTTOM OF STONE

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECHNICAL NOTE 6.32 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.



SOURCES OF COMMUNITY INDEPENDENT LIVING

DATE: 3-18-22 | DRAWN: BSW | PROJECT #: 8387266 | CHECKED: JEK

DATE	BY	DESCRIPTION
3-18-22	JEK	REVISED PER ISER STORAGE REQ.

StormTech® Chamber System
888-892-2694 | WWW.STORMTECH.COM

4640 TRUEMAN BLVD HILLIARD, OH 43026

0 1F 2F

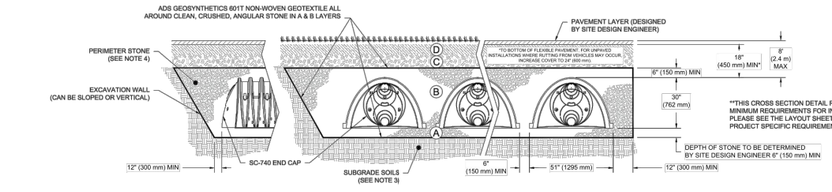
THIS DRAWING AND SPECIFICATIONS, DESIGNS, ARRANGEMENTS AND PLANS REPRESENTED THEREIN ARE AND SHALL REMAIN THE PROPERTY OF ADS AND SHALL NOT BE USED IN WHOLE OR IN PART FOR ANY WORK EXCEPT WITH THE WRITTEN PERMISSION OF ADS. VISUAL CONTACT WITH THESE PLANS SHALL CONSTITUTE PRIMA FACIE EVIDENCE OF ACCEPTANCE OF THESE RESTRICTIONS. IF THE SITE DESIGN ENGINEER OR OTHER PARTY IS NOT FAMILIAR WITH ADS PRODUCTS THEY SHOULD CONTACT ADS TO INSURE THAT THEIR PRODUCTS ARE USED IN THE MANNER FOR WHICH THEY ARE INTENDED. ADS ASSUMES NO RESPONSIBILITY FOR THE SITE DESIGN ENGINEER'S FAILURE TO INCORPORATE ADS'S MOST CURRENT RECOMMENDATIONS INTO THEIR DESIGN. ADS ASSUMES NO RESPONSIBILITY FOR IMPROPERLY INSTALLED PRODUCTS. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PROJECT IS DESIGNED AND CONSTRUCTED AS STIPULATED IN THE LATEST ADS AND STORMTECH MATERIALS AND INSTALLATION INSTRUCTIONS, AS WELL AS ALL APPLICABLE CODES, REGULATIONS, AND PROJECT REQUIREMENTS.

2 SHEET OF 5

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

SOURCES OF COMMUNITY INDEPENDENT LIVING

DATE: 3-18-22 | DRAWN: BSW | PROJECT #: 8387266 | CHECKED: JEK

DATE	BY	DESCRIPTION
3-18-22	JEK	REVISED PER ISER STORAGE REQ.

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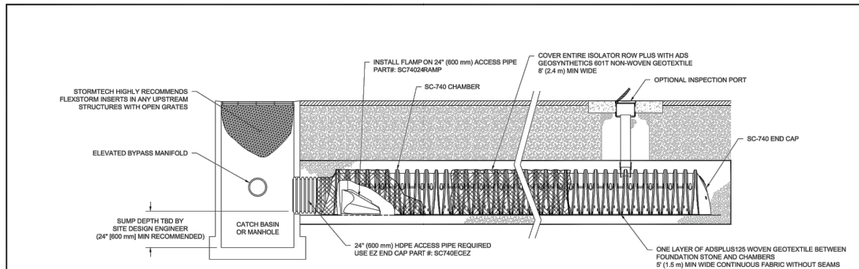
4640 TRUEMAN BLVD HILLIARD, OH 43026

3 SHEET OF 5



SC-740 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

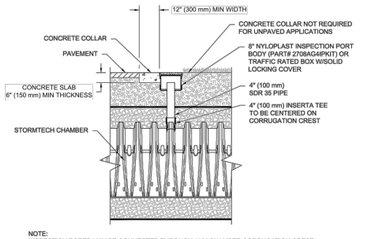
STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

4" PVC INSPECTION PORT DETAIL (SC SERIES CHAMBER)
NTS

4 SHEET OF 5

Revision	By	Date

WHOLEE

PRELIMINARY NOT FOR CONSTRUCTION

Drawn By:	ICF
Approved By:	ATD
Date:	5.04.2022
Project No.:	BBD-01
Vertical Scale:	–
Horizontal Scale:	
Plotting Scale:	1
Drawing Name:	–

SOURCES FOR COMMUNITY INDEPENDENT LIVING

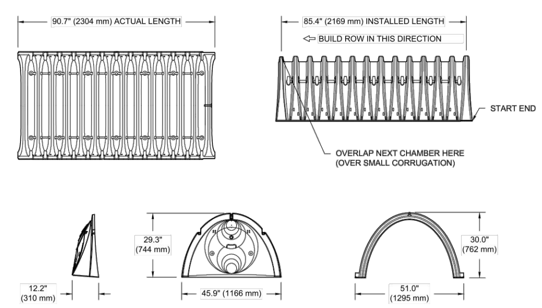
Little Rock, Pulaski County, Arkansas

UNDERGROUND DETENTION DETAILS 1

Issued for Review - 05.04.22

Sheet No.: 12 of 18

Drawing Name: M:\SDX\PROJ\BBD-01\DWG\BBD-01 BASE.dwg Last Modified: May 04, 2022 - 8:59am Plotted on: May 04, 2022 - 9:33am by ahS198



SC-740 TECHNICAL SPECIFICATION

NTS

NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET	(1.30 m³)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET	(2.12 m³)
WEIGHT	75.0 lbs.	(33.6 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS

PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPE06B / SC740EPE06BPC			---	0.5" (13 mm)
SC740EPE08T /SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	---
SC740EPE08B / SC740EPE08BPC			---	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	---
SC740EPE10B / SC740EPE10BPC			---	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	---
SC740EPE12B / SC740EPE12BPC			---	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	---
SC740EPE15B / SC740EPE15BPC			---	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	---
SC740EPE18B / SC740EPE18BPC			---	1.6" (41 mm)
SC740ECEZ*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)

ALL STUBS, EXCEPT FOR THE SC740ECEZ ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC740ECEZ THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

SOURCES OF COMMUNITY INDEPENDENT LIVING

DATE:	3-18-22	DRAWN:	BSW
PROJECT #:	S287285	CHECKED:	JEK

DATE	DRWN	CHKD	DESCRIPTION
4-29-22	BSW	JEK	REVISED PER NEW STORAGE REQ.

ADS 4640 TRUEMAN BLVD HILLIARD, OH 43026

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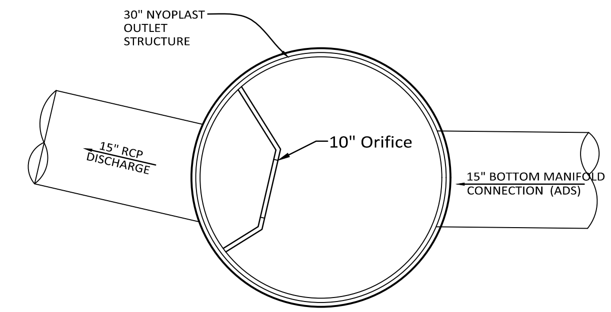
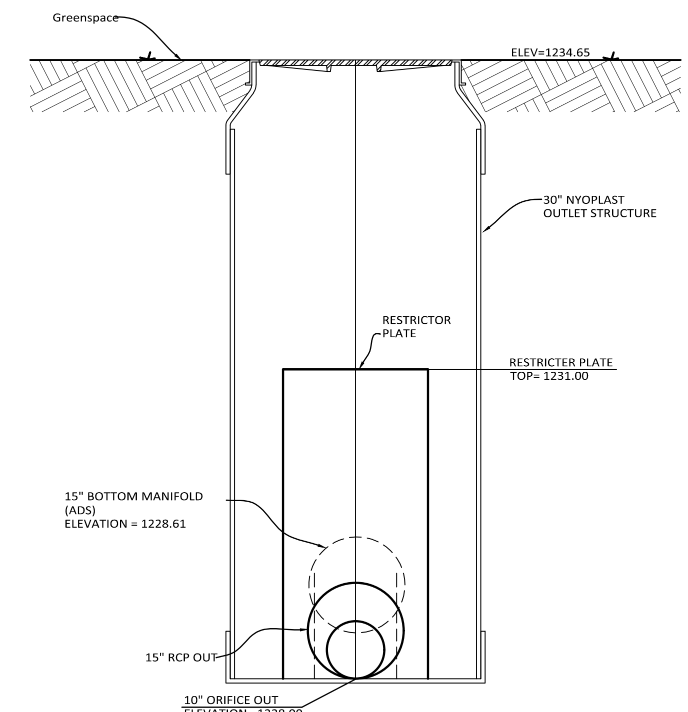
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

SHEET 5 OF 5



PLAN



1 DETENTION OUTLET STRUCTURE
(Not to Scale)

Revision	By	Date

WHOLEE

Drawn By:	ICF
Approved By:	ATD
Date:	5.04.2022
Project No.:	BBD-01

Vertical Scale:	–
Horizontal Scale:	
Plotting Scale:	1
Drawing Name:	–

SOURCES FOR COMMUNITY INDEPENDENT LIVING

Little Rock, Pulaski County, Arkansas

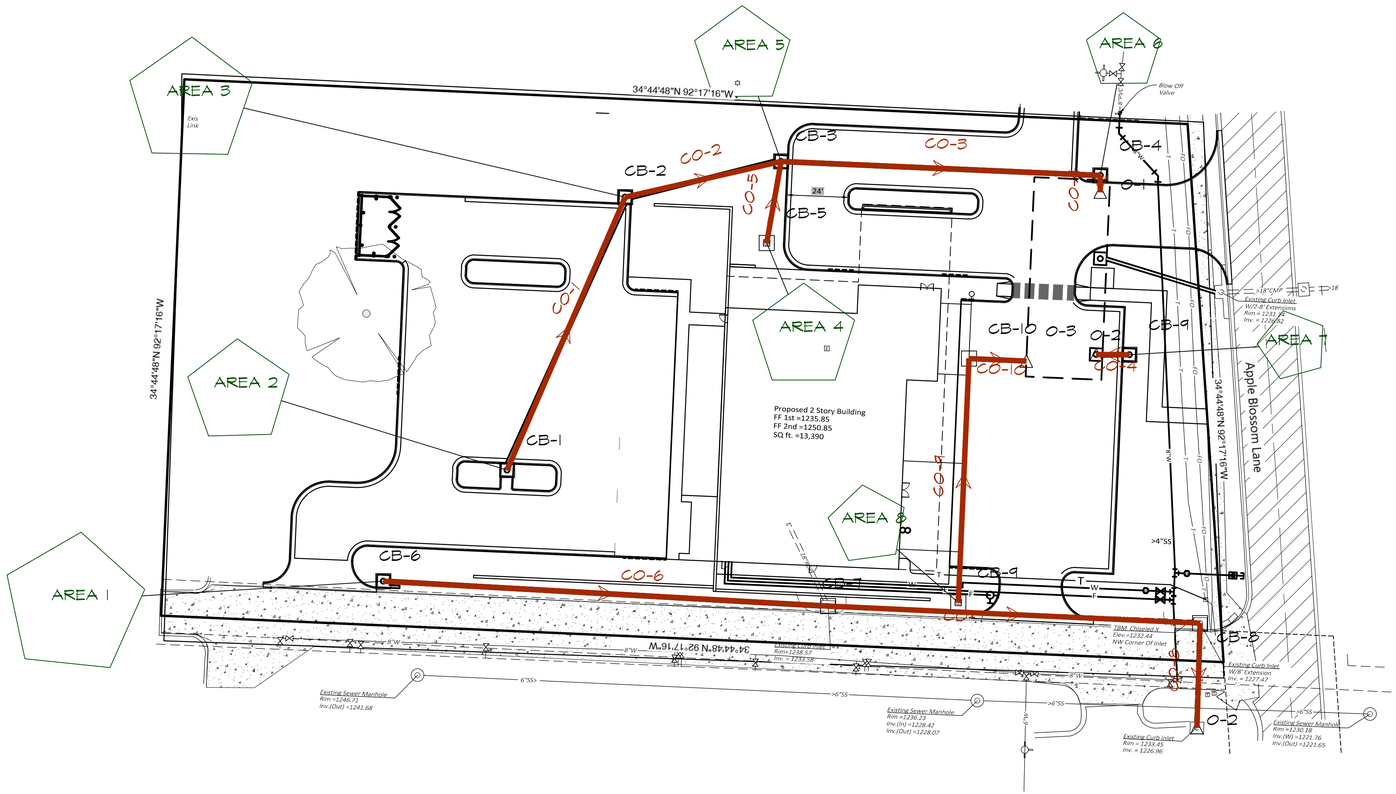
UNDERGROUND DETENTION DETAILS 2

Issued for Review - 05.04.22

Sheet No.: 13 of 18

Drawing Name: M:\SDSKPROJ\BBD-01\DRAFTING\BBD-01 BASE.dwg Last Modified: May 04, 2022 - 8:59am Plotted on: May 04, 2022 - 9:33am by ah5198

APPENDIX D



Revision	By	Date

WHOLEE

Drawn By:	ICF
Approved By:	AD
Date:	05-04-2022
Project No.:	BBD-01

Vertical Scale:	–
Horizontal Scale:	1"=30'
Plotting Scale:	1-1
Drawing Name:	DAM

SOURCES FOR COMMUNITY INDEPENDENT LIVING

Little Rock, Pulaski County, Arkansas

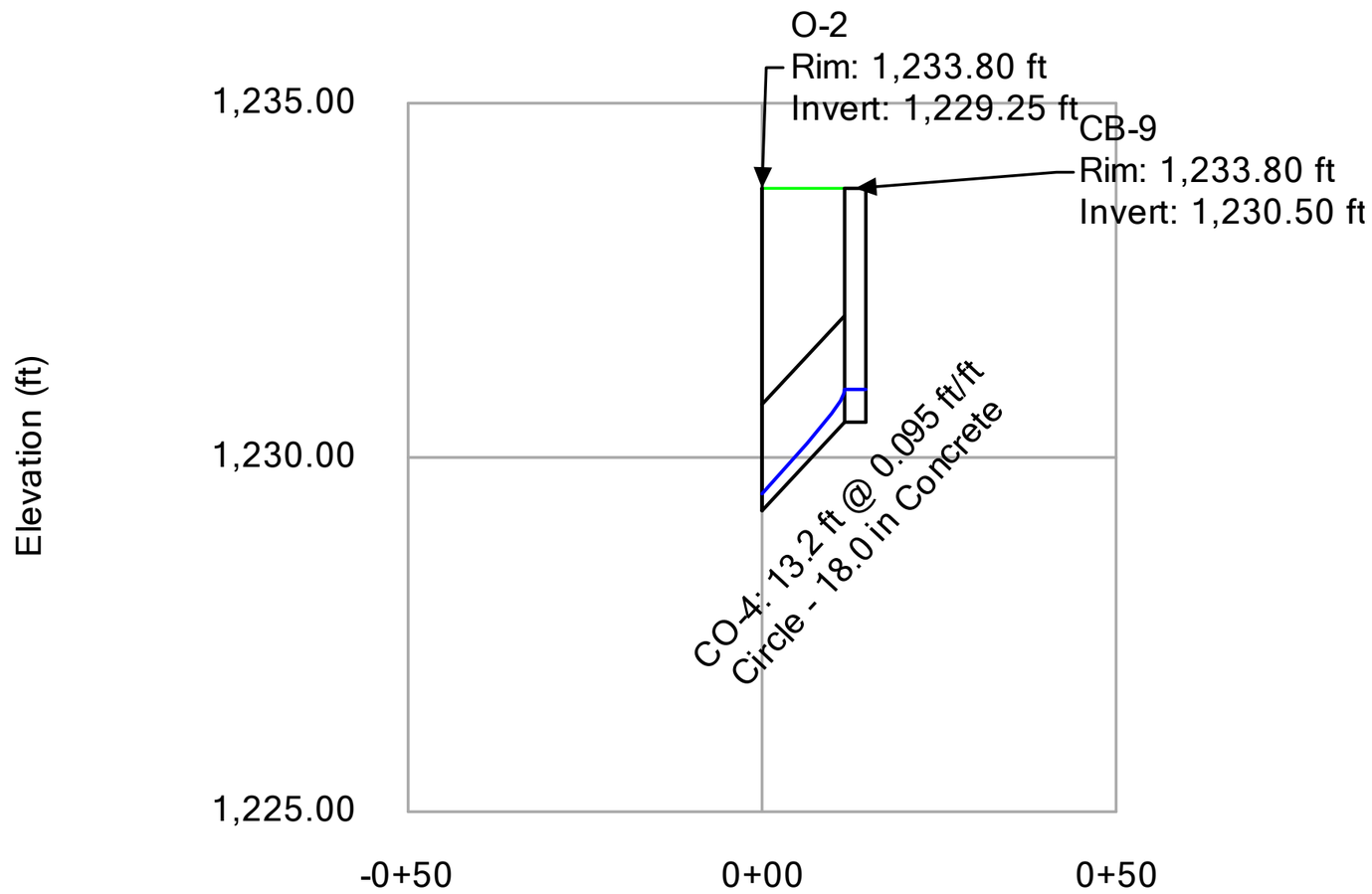
APPENDIX D: STORMCAD LAYOUT

Issued for Review - 05.04.22

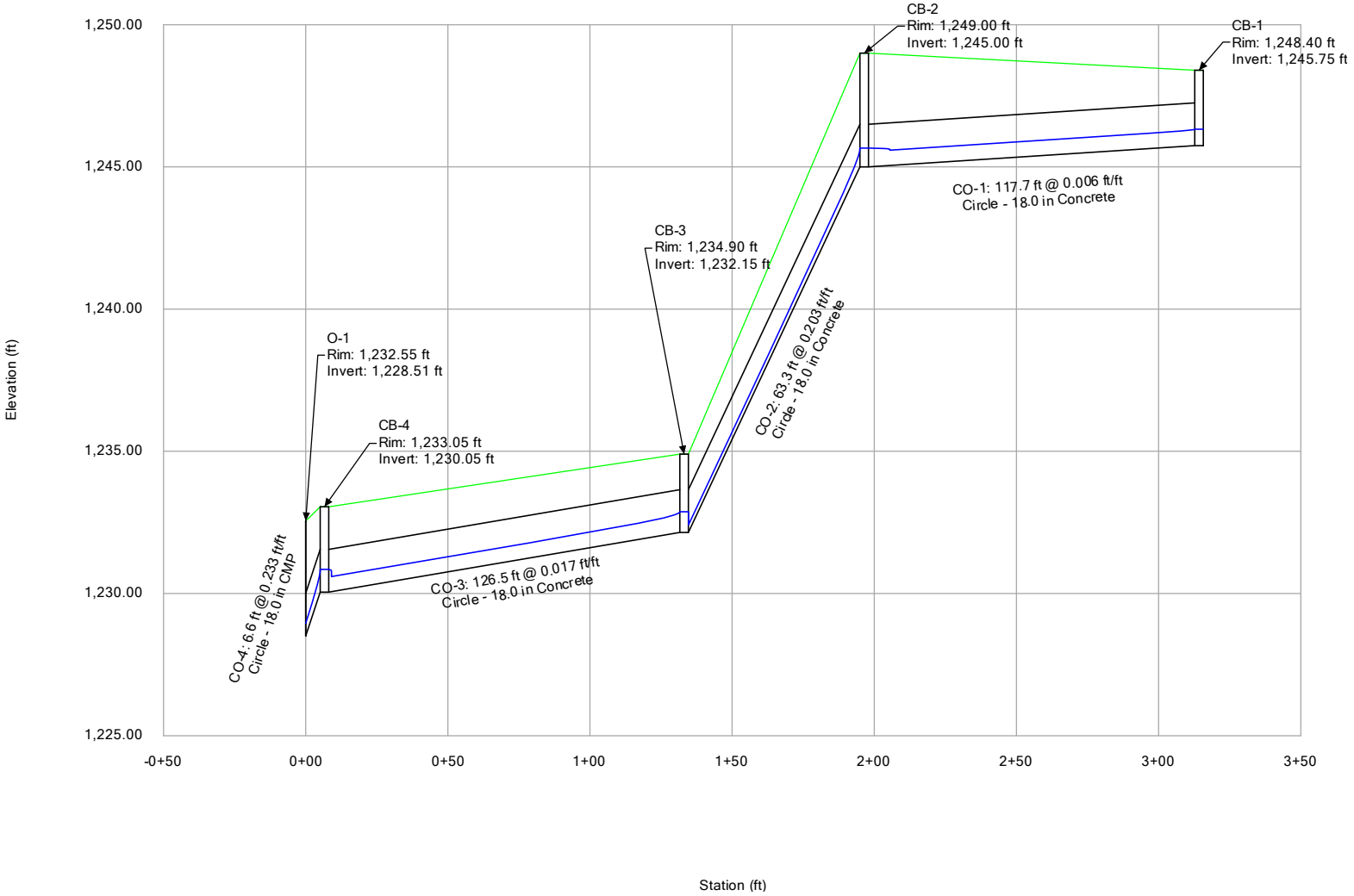
Sheet No.: 1 of 1

25-Year Storm Event

Profile Report
Engineering Profile - East Pipe To ADS System

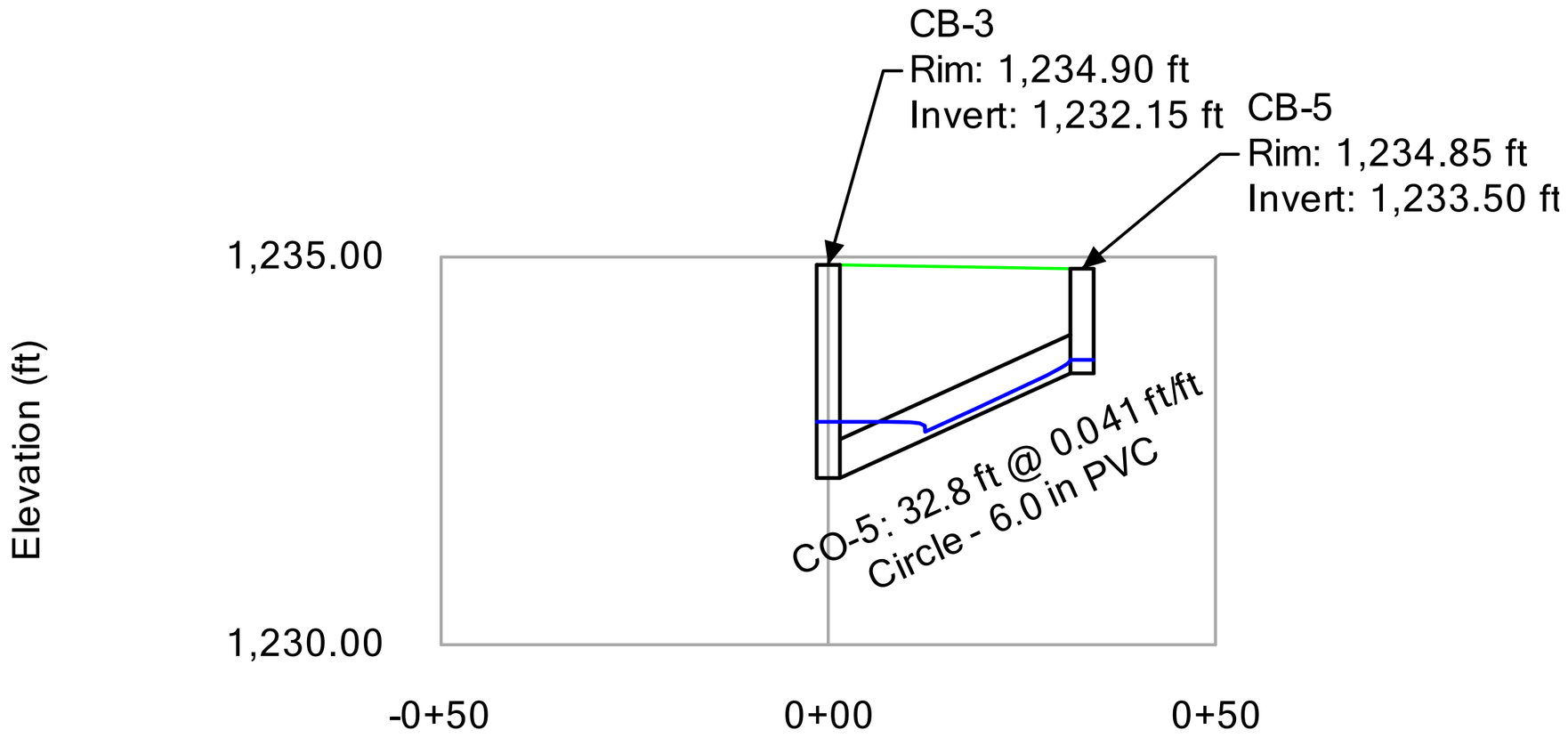


Profile Report
Engineering Profile - North System To ADS System

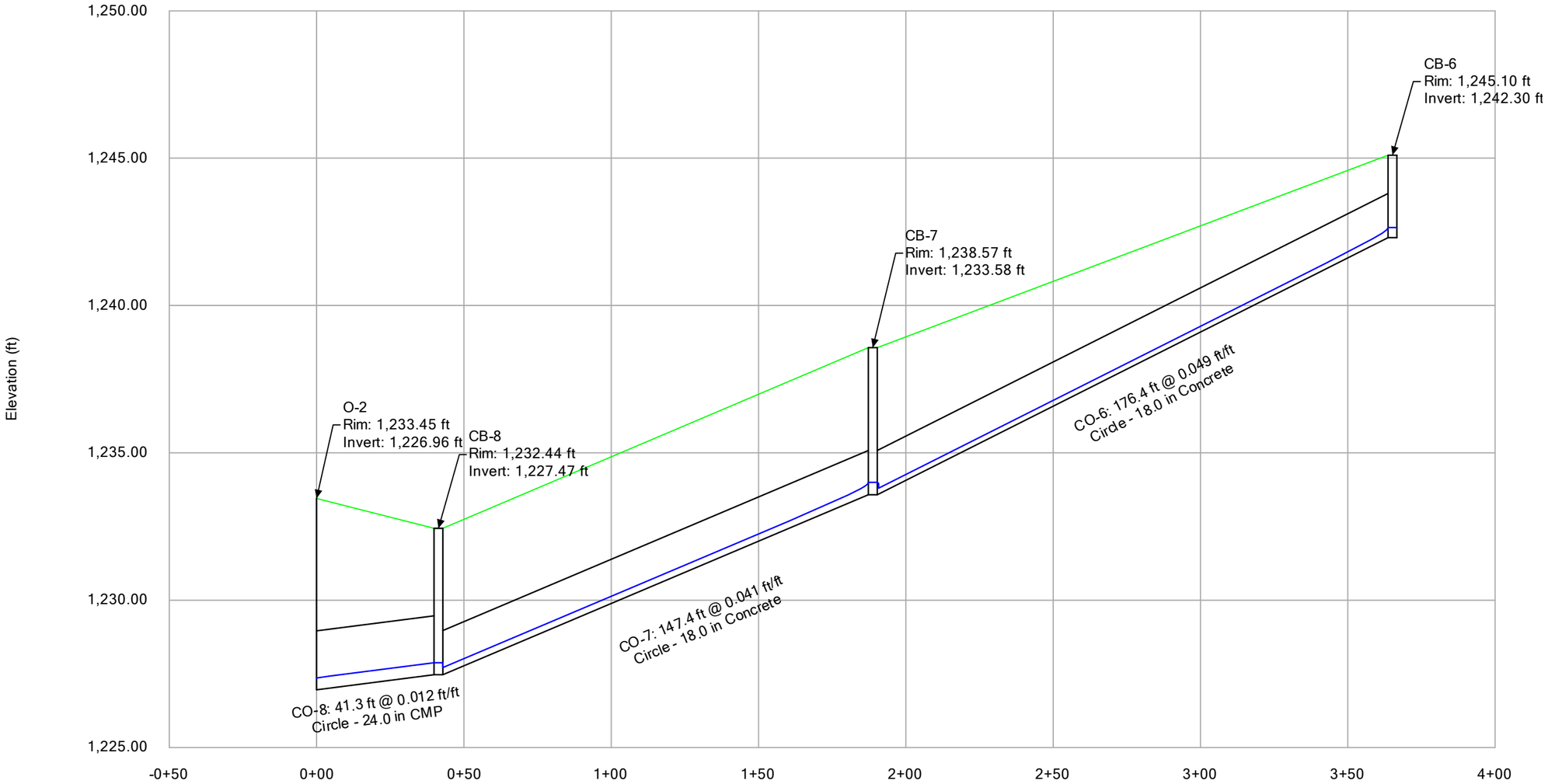


Bentley Systems, Inc. Haestad Methods Solution Center
76 Watertown Road, Suite 2D Thomaston, CT 06787 USA +1-203-755-1666

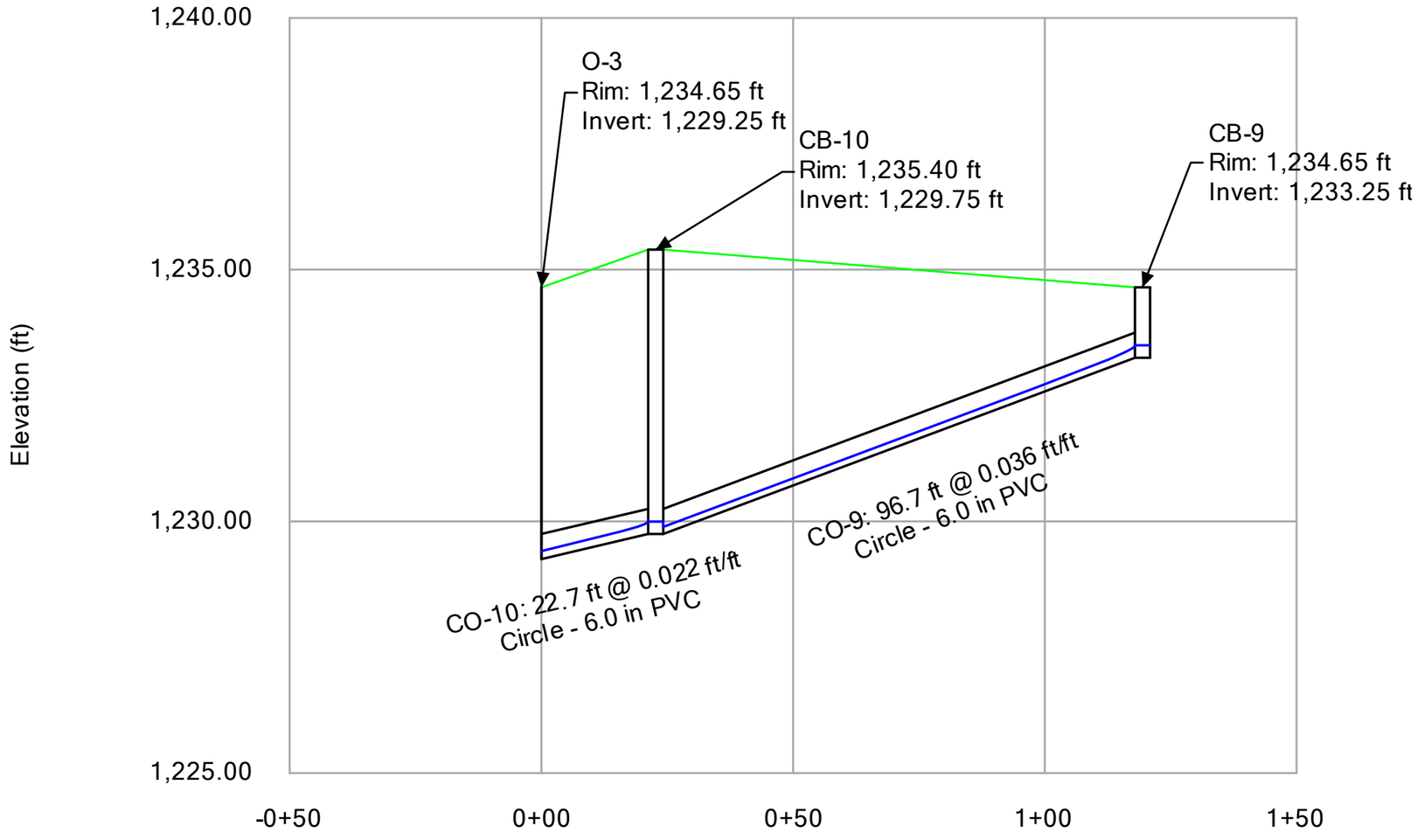
Profile Report
Engineering Profile - North Yard Drain



Profile Report
Engineering Profile - South System To Study Point B



Profile Report
Engineering Profile - South Yard Drain



Scenario: Base
Current Time Step: 0.000 h
FlexTable: Catch Basin Table

Label	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Curb Opening Length (ft)	Capture Efficiency (Calculated) (%)	Flow (Captured) (cfs)	Hydraulic Grade Line (In) (ft)	Spread / Top Width (ft)	Depth (Gutter) (in)	Road Cross Slope (ft/ft)
CB-1	1,248.40	1,245.75	8.0	100.0	2.30	1,246.32	15.9	6.9	0.013
CB-2	1,249.00	1,245.00	4.0	100.0	0.83	1,245.66	3.6	6.1	0.040
CB-3	1,234.90	1,232.15	4.0	100.0	0.60	1,232.87	1.7	5.8	0.068
CB-4	1,233.05	1,230.05	8.0	100.0	0.87	1,230.85	2.2	5.7	0.050
CB-5	1,234.85	1,233.50	-	100.0	0.12	1,233.67	0.0	(N/A)	0.020
CB-6	1,245.10	1,242.30	4.0	65.6	0.84	1,242.64	6.4	1.5	0.020
CB-7	1,238.57	1,233.58	4.0	94.0	0.50	1,234.00	4.9	1.2	0.020
CB-8	1,232.44	1,227.47	-	100.0	0.03	1,227.88	1.4	0.3	0.020
CB-9	1,233.80	1,230.50	4.0	100.0	1.52	1,230.96	6.1	7.0	0.035
CB-9	1,234.65	1,233.25	-	100.0	0.24	1,233.50	0.0	(N/A)	0.020
CB-10	1,235.40	1,229.75	-	100.0	0.00	1,230.00	0.0	0.0	0.020

Scenario: Base
Current Time Step: 0.000 h
FlexTable: Catchment Table

Label	Outflow Element	Area (User Defined) (acres)	Runoff Coefficient (Rational)	Time of Concentration (min)	Catchment Intensity (in/h)	Flow (Total Out) (cfs)
AREA 1	CB-6	0.510	0.398	-	6.297	1.29
AREA 2	CB-1	0.620	0.593	-	6.224	2.30
AREA 3	CB-2	0.300	0.463	-	5.943	0.83
AREA 4	CB-5	0.030	0.560	6.000	7.294	0.12
AREA 5	CB-3	0.160	0.495	5.000	7.560	0.60
AREA 6	CB-4	0.150	0.885	-	6.483	0.87
AREA 7	CB-9	0.210	0.950	5.000	7.560	1.52
AREA 8	CB-9	0.060	0.528	5.000	7.560	0.24

Scenario: Base
Current Time Step: 0.000 h
FlexTable: Conduit Table

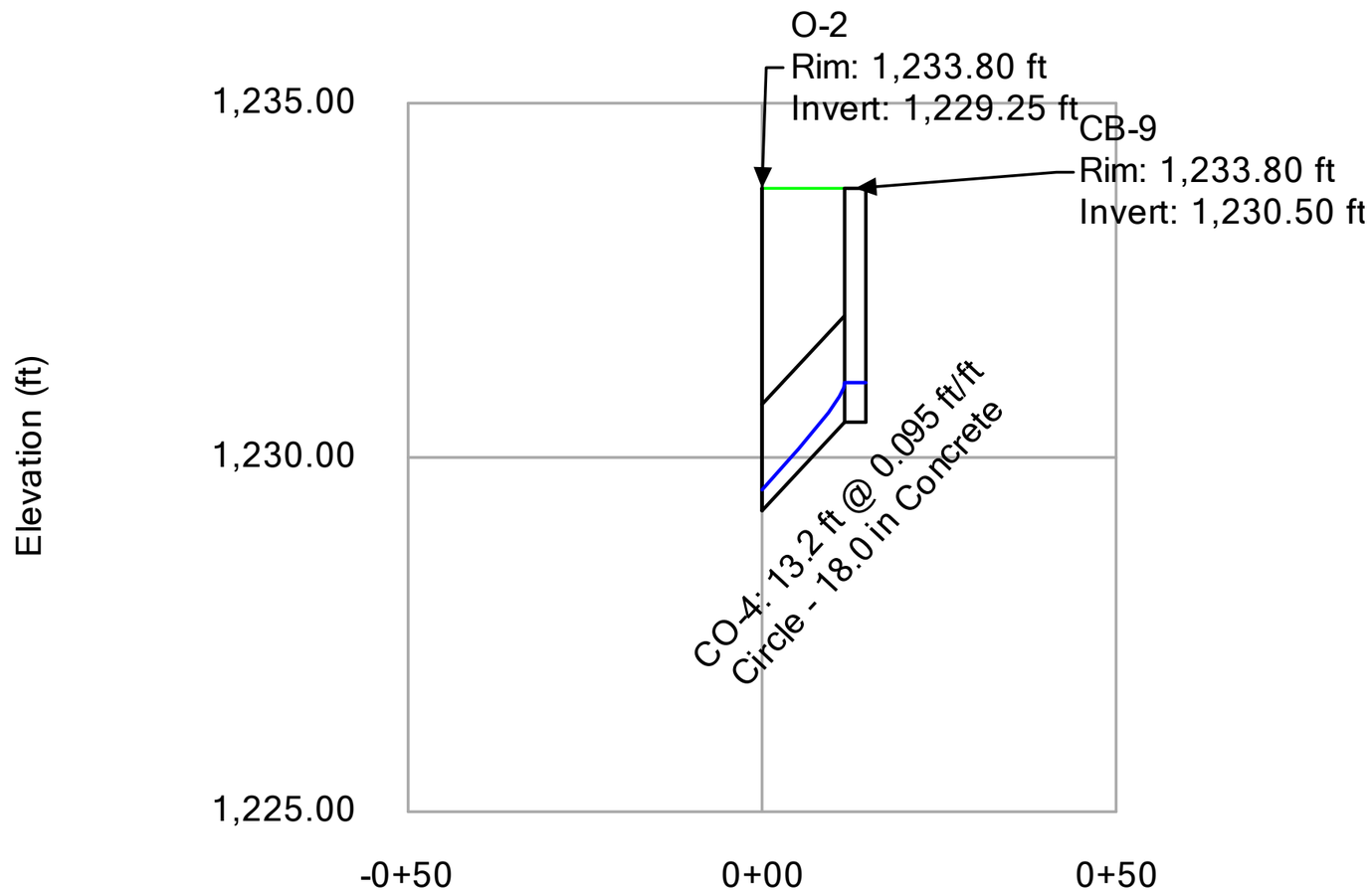
Label	Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Flow (cfs)	Size (Display)	Velocity (ft/s)	Depth (Out) (ft)
CO-1	CB-1	CB-2	1,245.75	1,245.00	117.7	0.006	18.0	2.30	18 inch	4.05	0.66
CO-2	CB-2	CB-3	1,245.00	1,232.15	63.3	0.203	18.0	3.03	18 inch	15.03	0.72
CO-3	CB-3	CB-4	1,232.15	1,230.05	126.5	0.017	18.0	3.60	18 inch	6.47	0.80
CO-4	CB-9	O-2	1,230.50	1,229.25	13.2	0.095	18.0	1.52	18 inch	9.37	0.24
CO-4	CB-4	O-1	1,230.05	1,228.51	6.6	0.233	18.0	4.32	18 inch	11.33	0.44
CO-5	CB-5	CB-3	1,233.50	1,232.15	32.8	0.041	6.0	0.12	6 inch	4.56	0.72
CO-6	CB-6	CB-7	1,242.30	1,233.58	176.4	0.049	18.0	0.84	18 inch	6.26	0.42
CO-7	CB-7	CB-8	1,233.58	1,227.47	147.4	0.041	18.0	1.24	18 inch	6.58	0.24
CO-8	CB-8	O-2	1,227.47	1,226.96	41.3	0.012	24.0	1.24	24 inch	2.70	0.38
CO-9	CB-9	CB-10	1,233.25	1,229.75	96.7	0.036	6.0	0.24	6 inch	5.30	0.14
CO-10	CB-10	O-3	1,229.75	1,229.25	22.7	0.022	6.0	0.24	6 inch	4.43	0.16

Scenario: Base
Current Time Step: 0.000 h
FlexTable: Outfall Table

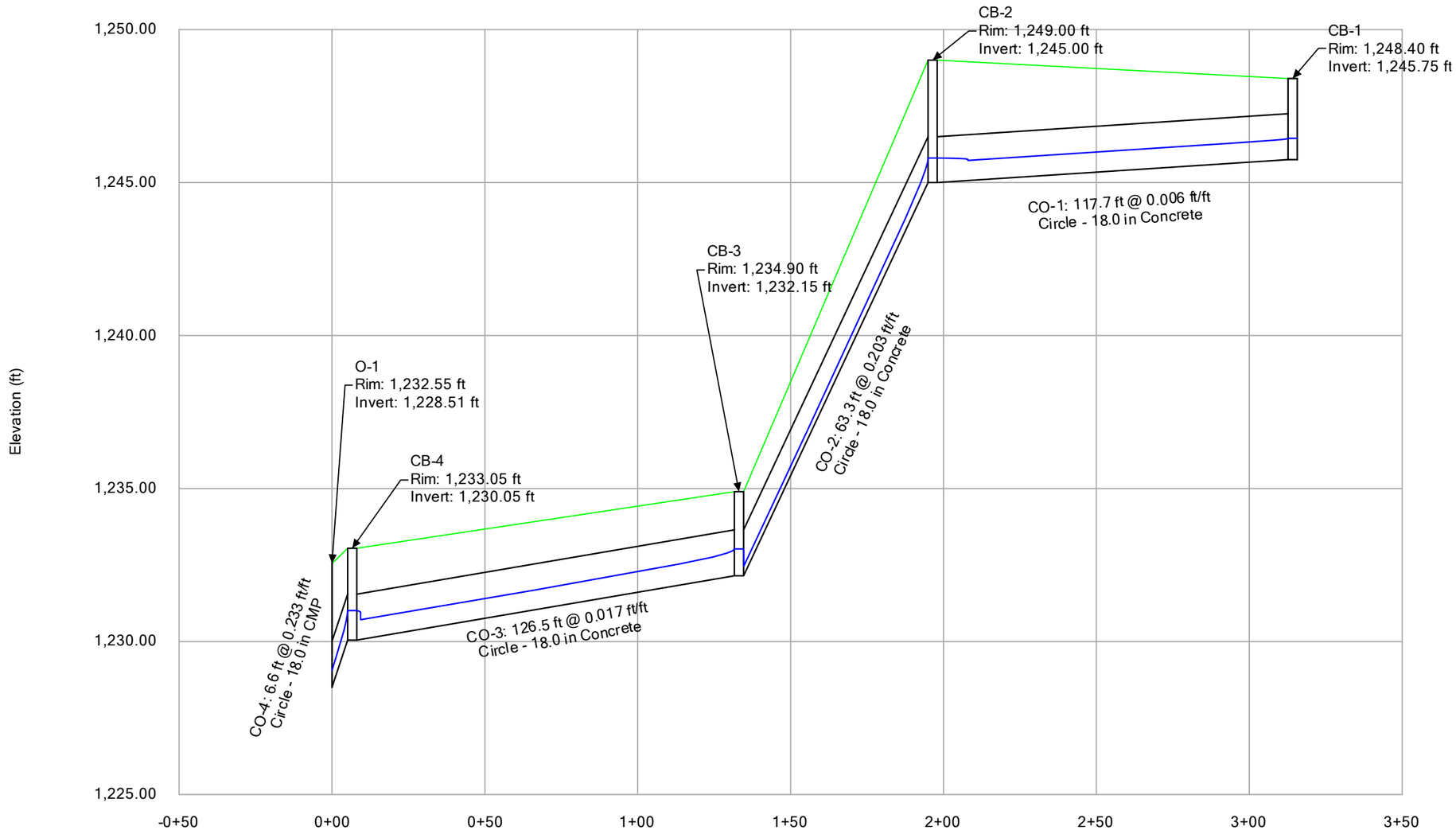
Label	Elevation (Ground) (ft)	Elevation (Invert) (ft)	Boundary Condition Type	Hydraulic Grade (ft)	Flow (Total Out) (cfs)	System Flow Time (min)	System Intensity (in/h)	System CA (acres)
O-1	1,232.55	1,228.51	Free Outfall	1,228.95	4.32	11.486	5.835	0.735
O-2	1,233.80	1,229.25	Free Outfall	1,229.49	1.52	5.023	7.554	0.199
O-2	1,233.45	1,226.96	Free Outfall	1,227.34	1.23	10.848	6.004	0.203
O-3	1,234.65	1,229.25	Free Outfall	1,229.41	0.24	5.390	7.456	0.032

100-Year Storm Event

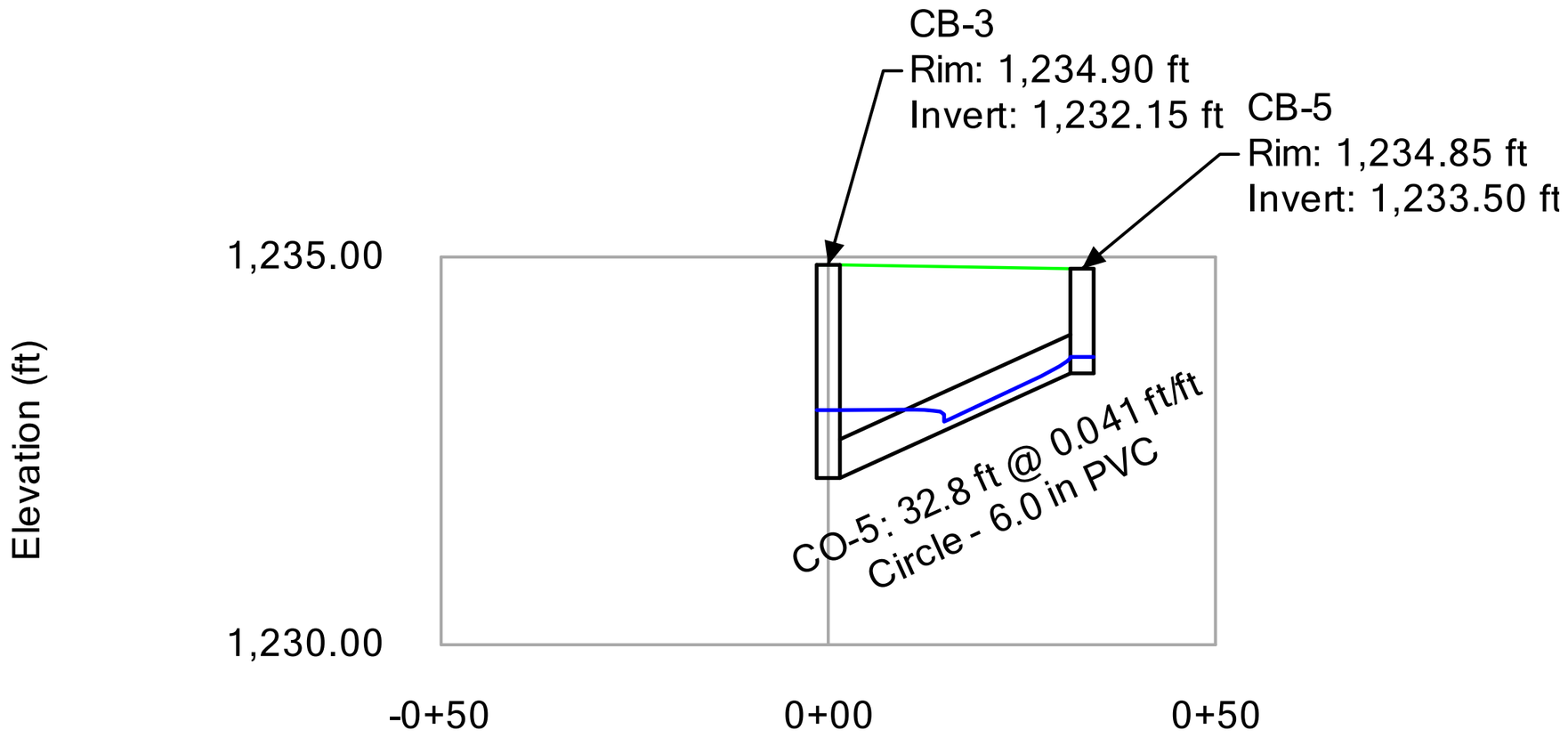
Profile Report
Engineering Profile - East Pipe To ADS System



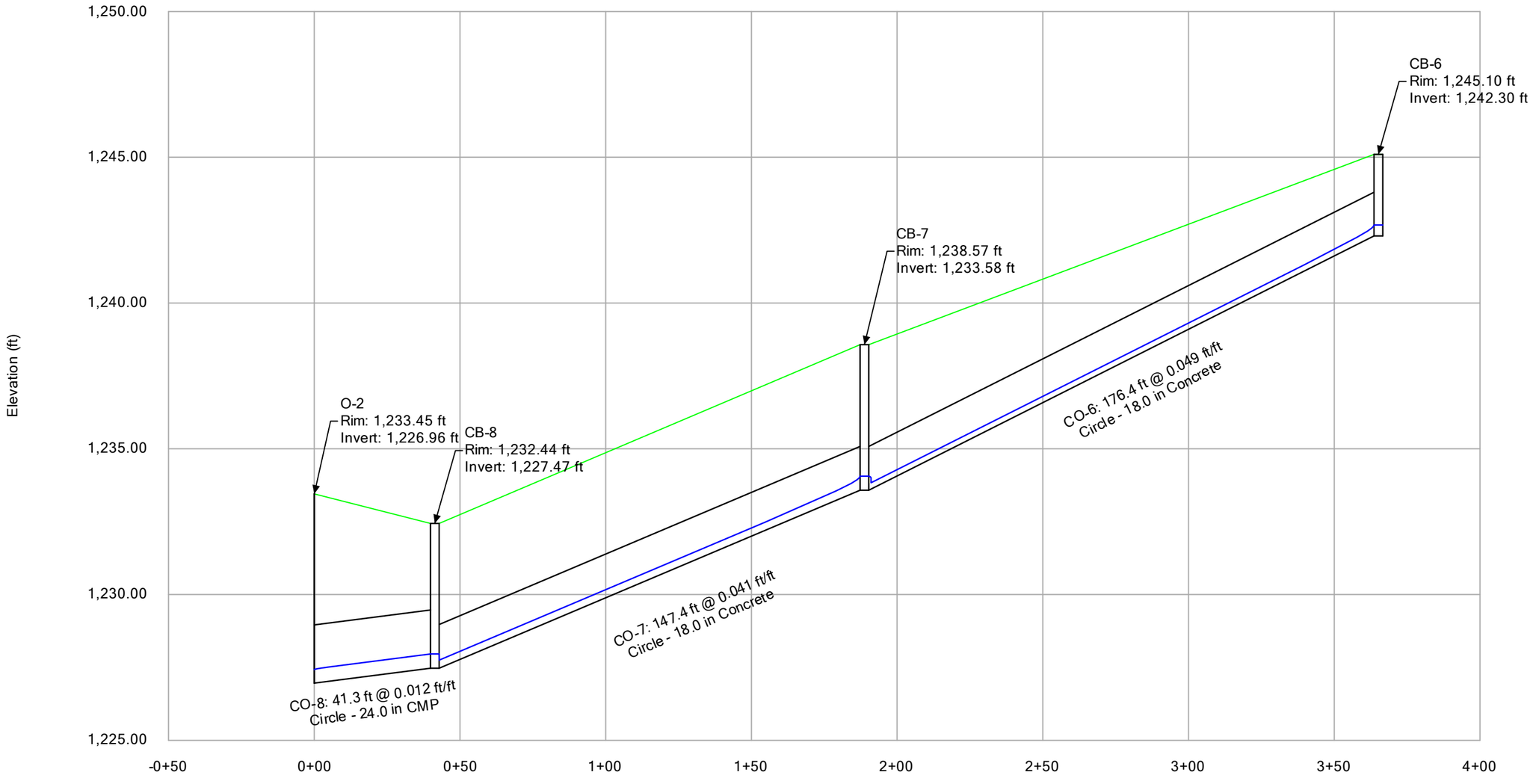
Profile Report
Engineering Profile - North System To ADS System



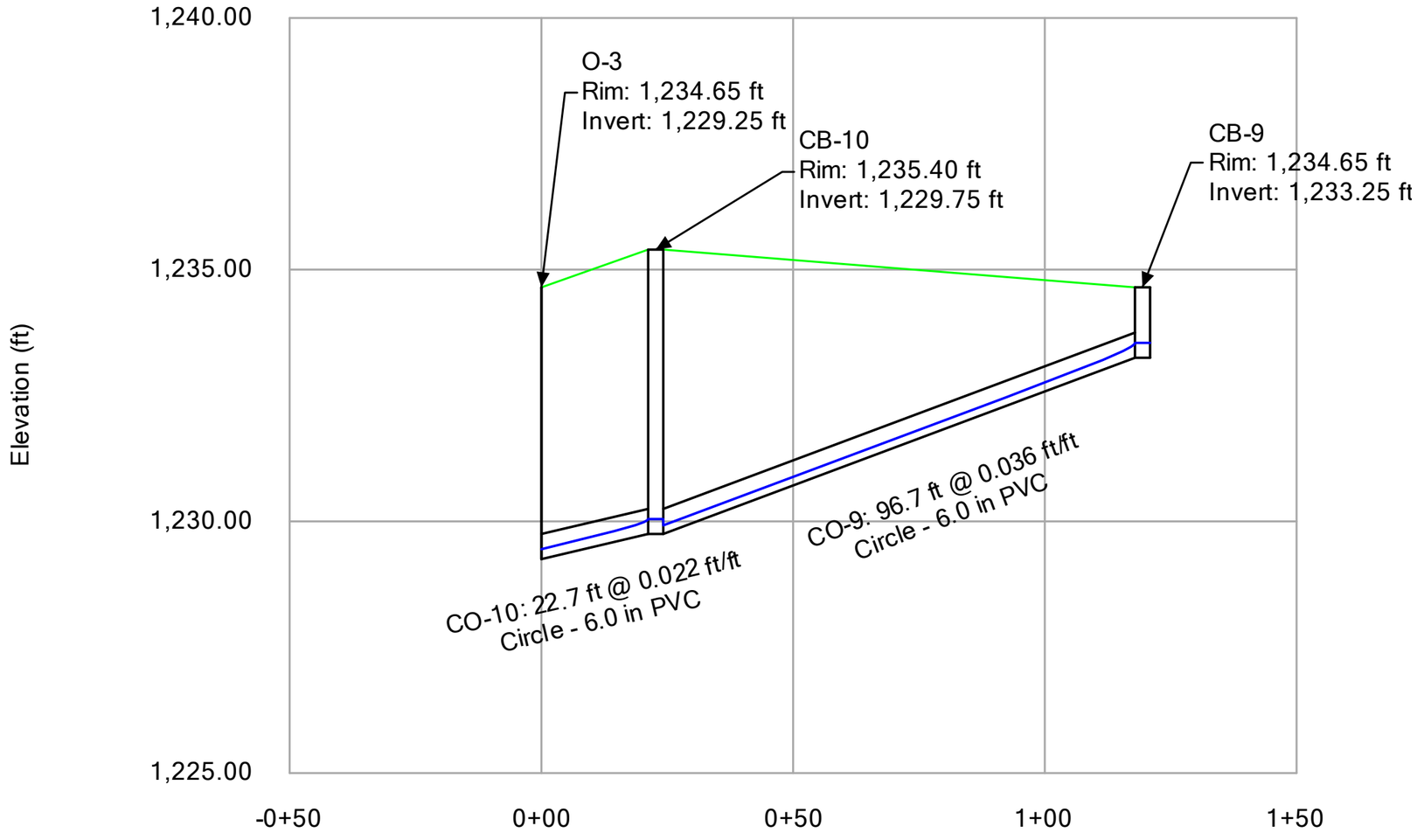
Profile Report
Engineering Profile - North Yard Drain



Profile Report
Engineering Profile - South System To Study Point B



Profile Report
Engineering Profile - South Yard Drain



Scenario: Base
Current Time Step: 0.000 h
FlexTable: Catch Basin Table

Label	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Curb Opening Length (ft)	Capture Efficiency (Calculated) (%)	Flow (Captured) (cfs)	Hydraulic Grade Line (In) (ft)	Spread / Top Width (ft)	Depth (Gutter) (in)	Road Cross Slope (ft/ft)
CB-1	1,248.40	1,245.75	8.0	100.0	3.31	1,246.44	20.2	7.6	0.013
CB-2	1,249.00	1,245.00	4.0	100.0	1.19	1,245.80	4.5	6.6	0.040
CB-3	1,234.90	1,232.15	4.0	100.0	0.86	1,233.03	2.2	6.2	0.068
CB-4	1,233.05	1,230.05	8.0	100.0	1.25	1,231.01	2.7	6.0	0.050
CB-5	1,234.85	1,233.50	-	100.0	0.18	1,233.71	0.0	(N/A)	0.020
CB-6	1,245.10	1,242.30	4.0	55.7	1.03	1,242.68	7.4	1.8	0.020
CB-7	1,238.57	1,233.58	4.0	77.0	0.75	1,234.06	6.1	1.5	0.020
CB-8	1,232.44	1,227.47	-	100.0	0.23	1,227.96	2.9	0.7	0.020
CB-9	1,233.80	1,230.50	4.0	100.0	2.18	1,231.06	7.8	7.7	0.035
CB-9	1,234.65	1,233.25	-	100.0	0.35	1,233.55	0.0	(N/A)	0.020
CB-10	1,235.40	1,229.75	-	100.0	0.00	1,230.05	0.0	0.0	0.020

Scenario: Base
Current Time Step: 0.000 h
FlexTable: Catchment Table

Label	Outflow Element	Area (User Defined) (acres)	Runoff Coefficient (Rational)	Time of Concentration (min)	Catchment Intensity (in/h)	Flow (Total Out) (cfs)
AREA 1	CB-6	0.510	0.398	-	9.044	1.85
AREA 2	CB-1	0.620	0.593	-	8.941	3.31
AREA 3	CB-2	0.300	0.463	-	8.544	1.19
AREA 4	CB-5	0.030	0.560	6.000	10.454	0.18
AREA 5	CB-3	0.160	0.495	5.000	10.830	0.86
AREA 6	CB-4	0.150	0.885	-	9.308	1.25
AREA 7	CB-9	0.210	0.950	5.000	10.830	2.18
AREA 8	CB-9	0.060	0.528	5.000	10.830	0.35

Scenario: Base
Current Time Step: 0.000 h
FlexTable: Conduit Table

Label	Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Flow (cfs)	Size (Display)	Velocity (ft/s)	Depth (Out) (ft)
CO-1	CB-1	CB-2	1,245.75	1,245.00	117.7	0.006	18.0	3.31	18 inch	4.46	0.80
CO-2	CB-2	CB-3	1,245.00	1,232.15	63.3	0.203	18.0	4.36	18 inch	16.71	0.88
CO-3	CB-3	CB-4	1,232.15	1,230.05	126.5	0.017	18.0	5.17	18 inch	7.15	0.96
CO-4	CB-9	O-2	1,230.50	1,229.25	13.2	0.095	18.0	2.18	18 inch	10.43	0.29
CO-4	CB-4	O-1	1,230.05	1,228.51	6.6	0.233	18.0	6.23	18 inch	12.56	0.55
CO-5	CB-5	CB-3	1,233.50	1,232.15	32.8	0.041	6.0	0.18	6 inch	5.08	0.88
CO-6	CB-6	CB-7	1,242.30	1,233.58	176.4	0.049	18.0	1.03	18 inch	6.63	0.48
CO-7	CB-7	CB-8	1,233.58	1,227.47	147.4	0.041	18.0	1.63	18 inch	7.15	0.49
CO-8	CB-8	O-2	1,227.47	1,226.96	41.3	0.012	24.0	1.79	24 inch	3.00	0.46
CO-9	CB-9	CB-10	1,233.25	1,229.75	96.7	0.036	6.0	0.35	6 inch	5.88	0.17
CO-10	CB-10	O-3	1,229.75	1,229.25	22.7	0.022	6.0	0.34	6 inch	4.89	0.20

Scenario: Base
Current Time Step: 0.000 h
FlexTable: Outfall Table

Label	Elevation (Ground) (ft)	Elevation (Invert) (ft)	Boundary Condition Type	Hydraulic Grade (ft)	Flow (Total Out) (cfs)	System Flow Time (min)	System Intensity (in/h)	System CA (acres)
O-1	1,232.55	1,228.51	Free Outfall	1,229.06	6.23	11.447	8.406	0.735
O-2	1,233.80	1,229.25	Free Outfall	1,229.54	2.18	5.021	10.822	0.199
O-2	1,233.45	1,226.96	Free Outfall	1,227.42	1.77	10.766	8.662	0.203
O-3	1,234.65	1,229.25	Free Outfall	1,229.45	0.34	5.352	10.698	0.032

APPENDIX E

Inspection and Maintenance Agreement
for

Sources for Community Independent Living

Apple Blossom Lane

Little Rock, Pulaski County, Arkansas

A. GENERAL

In accordance with the requirements stated by the Little Rock Stormwater Drainage Manual, this document outlines the aspects of long-term maintenance for the developed site.

Components
The drainage system on-site will be as shown in Appendix C and D. Maintenance of these on-site BMP's will be crucial to the longevity and safety of the developed site and the existing roadway.

B. INSPECTION

Structural Inspection
The drainage system shall be professionally inspected twice a year. The thorough inspections will take place in months of June and October to ensure the culverts have been checked before and after the rainy season (November-May).

Erosion
Along with structural inspection, the drainage system shall be inspected for signs of erosion before and after the rainy season.

Clearance of Debris
During the rainy season, inlets to the drainage system will be inspected once a month for debris such as branches, leaves, trash, and sediment to ensure the culverts function as designed.

Bioretention
The bioretention structure maintenance and inspection will adhere to the recommendations of WQ-04 (Bioretention) of Appendix C of the Little Rock Stormwater Drainage Manual.

C. DOCUMENTATION

A record shall be kept for all structural inspections and major maintenance activities. The report of inspections will be turned in to the City of Little Rock annually.

D. RESPONSIBILITY

The property owner will be responsible for the maintenance services.

E. CONCLUSION

As demonstrated above by the topics covered, the Inspections and Maintenance Agreement meets the requirements of the City of Little Rock.

I, Saul Kip, Licensed Contractor No. 12345 in the State of Arkansas, hereby certify that the long-term maintenance and inspection items contained in this agreement have been prepared in accordance with sound engineering practice and principles, and the requirements of the City of Little Rock. Further, I hereby acknowledge that the review of the long-term maintenance and inspection plan by the City of Little Rock or its representatives cannot and does not relieve me from any professional responsibility or liability.

Black Bear Builders, Inc.

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Saul Kip, G.C.

Site Developer