January 28, 2016

As-Built Drainage Report

Prepared for: City of Fayetteville

The Coves (Phase II)

Residential Subdivision

CTA JOB NO. 14101800

Experienced. Responsive. Accountable.

Prepared by:

Crafton Tull
architecture | engineering | surveying

901 N. 47th Street, Suite 200 | Rogers, AR 72756 | 479-636-4838 | **www.craftontull.com**

Final Drainage Report Checklist
The City of Fayetteville, Arkansas
Project name _____
Revision no. _____
Date _____

X
___ 1. PROJECT TITLE & DATE

X
___ 2. PROJECT LOCATION - Include street address and Vicinity Map.

X
___ 3. PROJECT DESCRIPTION - Brief description of the proposed project.

X
___ 4. PROJECT OWNER, ADDRESS, AND TELEPHONE NUMBER of the owner and developer, and proof of ownership for the property to be permitted.

X
___ 5. SITE AREA TOPOGRAPHIC MAP - To the nearest 0.1 acre, showing the location and elevation of benchmarks, including at least one benchmark for each control structure.

X
___ 6. AERIAL PHOTOGRAPH, if available, of the project vicinity, covering the project area and the total lands that contribute runoff.

X
___ 7. LAND USE MAP showing both current and proposed conditions for the drainage area that contributes runoff.

X
___ 8. SOILS AND VEGETATION MAP displaying the most recent U.S. Soil Conversation Service information and encompassing both the project area and the drainage area that contributes runoff.

X
___ 9. UPSTREAM AND DOWNSTREAM DRAINAGE - Brief description of the drainage path onto, through and away from the proposed site shown on a 1" = 200' minimum scale, 2' contour topographic map. All areas upstream which contribute runoff shall be shown. The downstream area(s) will be shown as necessary to document the receiving conveyance system.

X
___ 10. AREA DRAINAGE PROBLEMS - Description of any known onsite or downstream drainage/flooding problems.

X
___ 11. SITE DRAINAGE - Description of site drainage for proposed project - include an exhibit depicting different drainage areas and flow patterns (existing and proposed)

X
___ 12. WRITTEN SUMMARY OF THE PROPOSED IMPROVEMENTS including a summary of the off-site ares, onsite areas, condition of the downstream receiving areas, existing problems, increase in flows, proposed improvements, detention or lack of detention and final conclusions.

X
___ 13. SUMMARY OF RUNOFF - A table with minimum 2-, 10-, 25-, 50-, and 100-year storm flow comparisons for existing and proposed conditions and detention volumes required if applicable. Describe methods used for determining stormwater runoff flows. The summary must include (a) the flows entering the site, (b) the pre-development flows on the site, (c) the post-development flows generated on the site, and (d) the total flows leaving the site.

X
___ 14. DESIGN STORM DESIGNATED BY Q 2-, 10-, 25-, 50-, and/or 100-year and design flow rate for each culvert, inlet design, open channel, or other drainage structures. Design storm designations shall be summarized by tables.

X
___ 15. OPEN CHANNEL FLOW DESIGN - Include computations for normal depth and velocity (Use Figure 9.2 or equal).

X
___ 16. PAVEMENT DRAINAGE DESIGN - Include width of spread for design flow (Use Figures 6.2 through 6.6, and Figure 7.12 or equal).

X
___ 17. CULVERT DESIGN - Include all computations and check for inlet/outlet control (Use Table 4.3 or equal).

X
___ 18. STORM SEWER INLET DESIGN - Include all computations (Use Figure 7.12 or equal).

X
___ 19. STORM SEWER DESIGN - Include all computations (Use Figure 8.1 and 8.2 or equal).

X
___ 20. 100-YR WATER SURFACE ELEVATION (WSE) COMPUTATION. The water surface elevation (WSE) resulting from the 100-yr storm for all overland flow, including flow in the streets, parking lots, swales and between lots shall be calculated and shown on the construction drawings and the final plat. Minimum floor elevation shall be shown a minimum of 2 ft. above the 100-year flood elevation on each lot when located in a designated floodplain and in areas where flooding is known to occur. Minimum floor elevations for other areas shall be a minimum of 1 foot above the calculated 100-yr WSE of open channels, swales or overland flow.

X
____ 21. STORMWATER DETENTION DESIGN - Include the following computations and backup/support data:

SUMMARY OF RUNOFF - A table with minimum 2-, 10-, 25-, 50-, and 100-year storm flow comparisons for existing and proposed conditions and detention volumes required if applicable. Describe methods used for determining stormwater runoff flows. The summary must include (a) the flows entering the site, (b) the pre-development flows on the site, (c) the post-development flows generated on the site, and (d) the total flows leaving the site.

If detention is not proposed by the design engineer, or not requested by the City Engineer, then the design engineer shall submit hydrographs at key locations as determined by the design engineer and the City Engineer to document the effect of the combined runoff.

X
____ 22. RECOMMENDATIONS/SUMMARY - Detailed description of any drainage improvements to be made to the site - Also, the following backup/support data:

____ a. Runoff coefficient/RCN computations (existing and proposed conditions)

____ b. Complete runoff computations for the 2-, 10-, 25-, 50-, and 100-year storms (existing and proposed conditions)

____ c. Detention required based on runoff computations

____ 1. Detention basin size requirement computations (using an approved method)

____ 2. Release structure design computations (include release rate computations including flow and velocity for the 2-, 10-, 25-, 50-, and 100-year storms)

____ 3. Stage-Storage and Stage-Discharge curves for the detention facility

____ 4. A summary hydrograph of the effect of the detention facility

X
____ 23. EROSION AND SEDIMENT CONTROL PLAN identifying the type, location, and schedule for implementing erosion and sediment control measures, including appropriate

provisions for maintenance and disposition of temporary measures.

X 24. FEDERAL AND STATE REQUIREMENTS WERE APPLICABLE:

a) Wetlands determination _____
b) 404 permit requirement _____
c) "Notice of Intent" (ADPCE, NPDES) _____
d) ASWC permit/review for "dams" _____
X e) Other _____

____ 25. COORDINATION OF DESIGN AND MAINTENANCE responsibilities with Washington County for all development in the "Growth Area".

X
____ 26. OPERATION AND MAINTENANCE PLAN, prepared by a professional engineer, describing the activities and schedule required to operate and maintain the permitted facilities, including erosion control and drainage, until accepted by the City.

X
____ 27. ARKANSAS REGISTERED ENGINEER SEAL - Name, address, and telephone number on letter certifying erosion control and drainage improvements are constructed to the City of Fayetteville Standards, Criteria and Ordinances.

X
____ 28. ACKNOWLEDGEMENT THAT THE AS-BUILT DRAWINGS AND CERTIFICATION that the erosion control and drainage system have been constructed to the City of Fayetteville Standards, Criteria and Ordinances are due prior to final acceptance by the City.

__X__ 29. ADD THE FOLLOWING PARAGRAPH TO THE DRAINAGE LETTER:

"I, _____, Registered Professional Engineer No. _____ 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 the requirements of the City of Fayetteville. Further, I hereby acknowledge that the review of the drainage studies, reports, calculations, designs, and specifications by the City of Fayetteville or its representatives cannot and does not relieve me from any professional responsibility or liability."

_____
Signed & Sealed by Professional Engineer

____ 30. OTHER

Index

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DRAINAGE LETTER

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PROJECT TITLE:

Coves Phase II
Residential Subdivision

PROJECT OWNER AND DEVELOPER:

Rausch Coleman Development Group
342 N. Plainview Ave, Suite 200
Fayetteville, AR 72756

PROJECT LOCATION:

The project is located north of Alberta St., east of Christy Ln. and west of S. Holland Dr. in Fayetteville, AR.

PROJECT DESCRIPTION:

The project consisted of the constructing a 45 lot residential subdivision, complete with supporting traffic, storm, and utility infrastructure. The first phase of the project was constructed immediately to the east and incorporates a curvilinear layout design. Originally, the property was part of a PZD; however, the property was recently rezoned RSF-8 by the City of Fayetteville (04/15/14), which was later approved by the City of Farmington (05/12/14).

This project represented the revitalization of a subdivision that began construction in 2010. Under the title "The Coves at Walnut Crossing, Phase 3," several aspects of the construction plans were installed onsite, including the sub grade for Gentle Valley Drive and an 8" water main. Because of this, the updated design closing follows alignments and drainage patterns used in the 2010 plan set.

SITE DRAINAGE – EXISTING:

The site surface drains to one of four locations, approximately to each corner of the property. The site is mostly comprised of grassed field with minimal trees around the parameter. Through the center of the property, running north/south is the sub grade and gravel associated with the construction of Gentle Valley Drive. The site also contains poor hydraulic soils, with >90% in Soil Group D.

SITE DRAINAGE – PROPOSED:

After construction of the project, parts of the subdivision continue to surface drain to the areas same four areas as before. However, and large portion of runoff will be collecting in a storm sewer network and piped to a regional detention pond located south of the site, in the City of Farmington. Flow rates surface leaving the site via surface drainage were lower when compared to rates pre-construction, Table 1.

Table 1. Surface flow rates pre- and post development.

Study Point	*2YR* (cfs)		*5YR* (cfs)		*10YR* (cfs)		*25YR* (cfs)		*50YR* (cfs)		*100YR* (cfs)	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
A	4.5	4.3	7.4	5.8	9.3	6.7	12.0	7.9	14.5	9.0	16.5	9.8
B	3.9	2.8	5.9	3.8	7.1	4.3	8.9	5.1	10.4	5.8	11.7	6.3
C	4.5	4.2	6.9	5.6	8.3	6.5	10.3	7.7	12.2	8.7	13.6	9.5
D	8.9	1.2	13.5	1.5	16.3	1.8	20.2	2.1	23.8	2.4	26.6	2.6

Post developed flow rates were evaluated using the SCS method for all Study Points A, B, C, and D.

Originally, the subdivision was designed to drain to the north and to the south with no permanent detention proposed. To bring the subdivision into compliance with the City of Fayetteville Drainage manual, a large portion of the site will be piped to the South, were it will drain to a large regional detention pond located in the City of Farmington. The pond was sized with the Coves in mind, in addition to several other developments located in Farmington. Water surface elevations and flowrates related to the pond can be found in Table 2.

Table 2. Regional detention pond flow summary

Return Frequency	Pre (cfs)	Post (cfs)	Difference (cfs)	WSE (cfs)
2	60.8	57.5	-3.30	1213.6
5	97.1	94.8	-2.30	1214.1
10	120.0	113.1	-6.90	1214.3
25	151.2	139.1	-12.10	1214.6
50	182.9	165.8	-17.10	1214.8
100	207.0	185.4	-21.60	1215.0
	Top of Pond			1216.00

Between the Coves Phase II and the detention pond, water will be discharged into an opened, grassed channel. Calculations for this channel are provided in the Appendix.

FLOOD ZONE INFORMATION

The site is NOT in a flood zone according to FIRM Panel 05143C0210F.

CONCLUSION:

As described in this report, and documented by the supporting calculations, the Coves Phase II shall have no detrimental impact on existing drainage patterns in the area. A detention system will be provided to control and release post developed flow rates to a level equal to or below that of existing conditions for the 2, 10, 25, 50 and 100 year. In addition, the project meets the minimum standard set for the the City of Fayetteville ordinance requirements for the 2, 10, 25, 50, and 100-year storm events for storm sewer and detention drainage.

CERTIFICATION:

I, Zak Johnston, Registered Professional Engineer No. 16439 in the State of Arkansas, hereby certify that the drainage studies, and specifications contained in this report have been prepared in accordance with the regulations of the City of Fayetteville, Arkansas. Further, I hereby acknowledge that the review of the drainage studies, reports, calculations, designs, and specifications by the City of Fayetteville or its representatives cannot and does not relieve me from any professional responsibility or liability.

_____

Signed and Sealed by Professional Engineer

Sincerely,
Crafton, Tull & Associates, Inc.

Ryan Z. Johnston

Zak Johnston, P.E.
Vice President

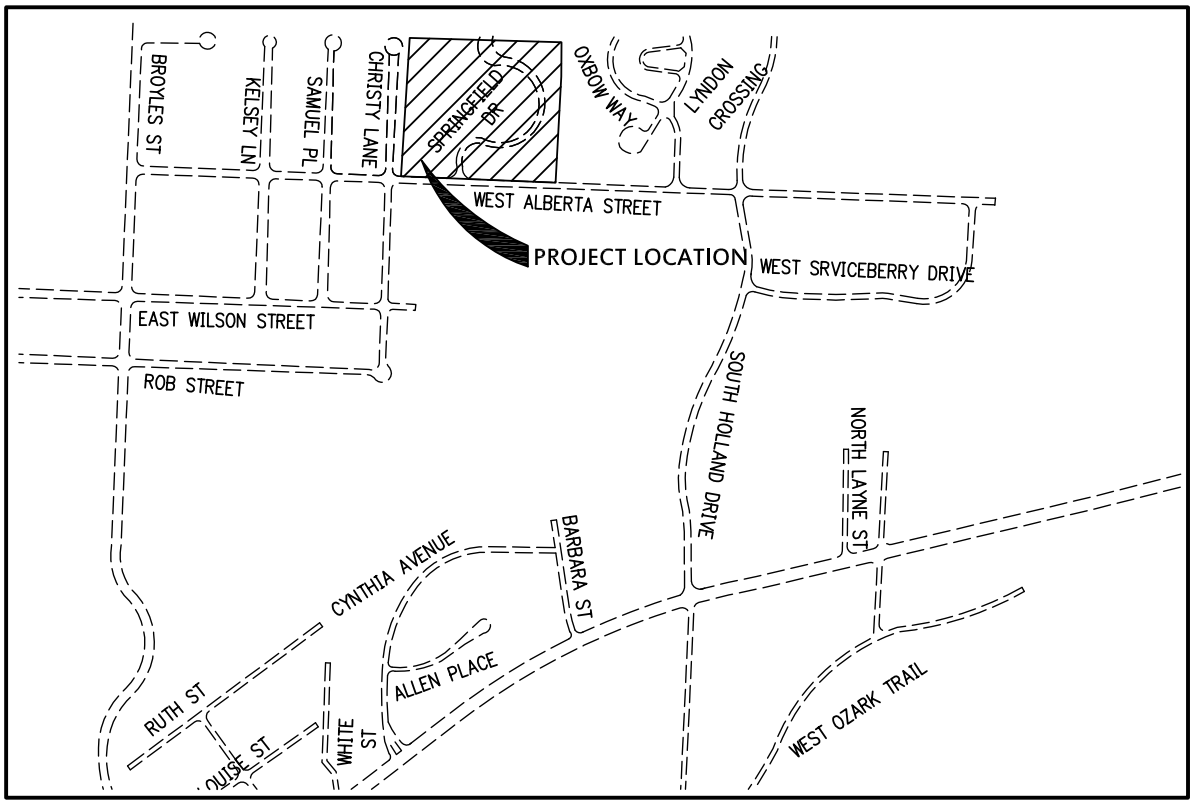
Crafton Tull
architecture | engineering | surveying

VICINITY MAP

Crafton Tull
architecture | engineering | surveying

COVES PHASE II

FAYETTEVILLE, ARKANSAS



VICINITY MAP
NTS

AERIAL MAP

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PREPARED FOR:

COVES PHASE II

FAYETTEVILLE, AR

DELTA	DESCRIPTION	DATE

170 Commerce Road, Building 201
Conway, Arkansas 72032
Crafton Tull
surveying
501.328.3316 t 501.328.3325 f
www.craftontull.com

AERIAL VIEW

PROJECT NO:	14101800
ISSUE DATE:	06/18/2014
CONTACT:	D. ELLIS
CHECKED BY:	
SHEET NO.:	

FEMA FIRM PANEL

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94°15'00.00"
36°03'45.00"
650000 FT
655000 FT
JOINS PANEL 0205
635000 FT
630000 FT
Goose Creek
W SELLERS ROAD
S 54TH AVENUE
W WOOLSEY FARM RD.
S BROYLES AVE.
CITY OF FAYETTEVILLE
050216
ZONE A
ZONE X
15
14
13
22
23
24
26
R. 31 W.
R. 30 W.
W DINSMO
S DINSMORE TRAIL
W LILAC DRIVE
S CAMELLIA LANE
S OLEANDER LANE
S PEPPER TREE LANE
W SWEETGUM LANE
W PECAN STREET
BROYLES STREET
E LARK LANE
E ALBERTA STREET
E CANARY DRIVE
KELSEY LANE
SAMUEL PLACE
CHRISTY LANE
W ALBERTA STREET
S HOLLAND DRIVE
W SERVICEBERRY DRIVE
E WILSON STREET
E ROB STREET
ROB STREET
N HUNTER STREET
N JAMES STREET
E SAXONY STREET
E SPOKANE STREET
E MARVEL STR.
N SABLE STREET
CITY OF FARMINGTON
050215
North Fork Farmington
Farmington Branch
Spring Mountain Creek
N HOLLAND DRIVE
CYNTHIA AVENUE
E ALLEN PLACE STREET
ERUTH STREET
N MAIN
N GREEN
W OZARK TRAIL
S SMOKEHOUSE TRAIL
S HOOT OWL LANE
S HANSHEW ROAD
W WHITE STREET
N LOCUST STREET
W MAIN STREET
W VINE STR.
S CHURCH STR.
LOCUST STR.
E OLD FARMINGTON ROAD
E RALSTON
E NEAL STREET
E PRVT. STR.
E GLEN STREET
E CEDAR STREET
E TERRY STREET
W OLD DEPOT ROAD
W NORTHAVEN STREET
W BRIARMEADOW STREET
S HOLLAND DRIVE
W FING

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET

PANEL 0215F

FIRM
FLOOD INSURANCE RATE MAP
WASHINGTON COUNTY, ARKANSAS
AND INCORPORATED AREAS

PANEL 215 OF 575
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
WASHINGTON COUNTY	050212	0215	F
FARMINGTON, CITY OF	050215	0215	F
FAYETTEVILLE, CITY OF	050216	0215	F
GREENLAND, CITY OF	050217	0215	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
05143C0215F

MAP REVISED
MAY 16, 2008

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

CITY OF FAYETTEVILLE ZONING MAP

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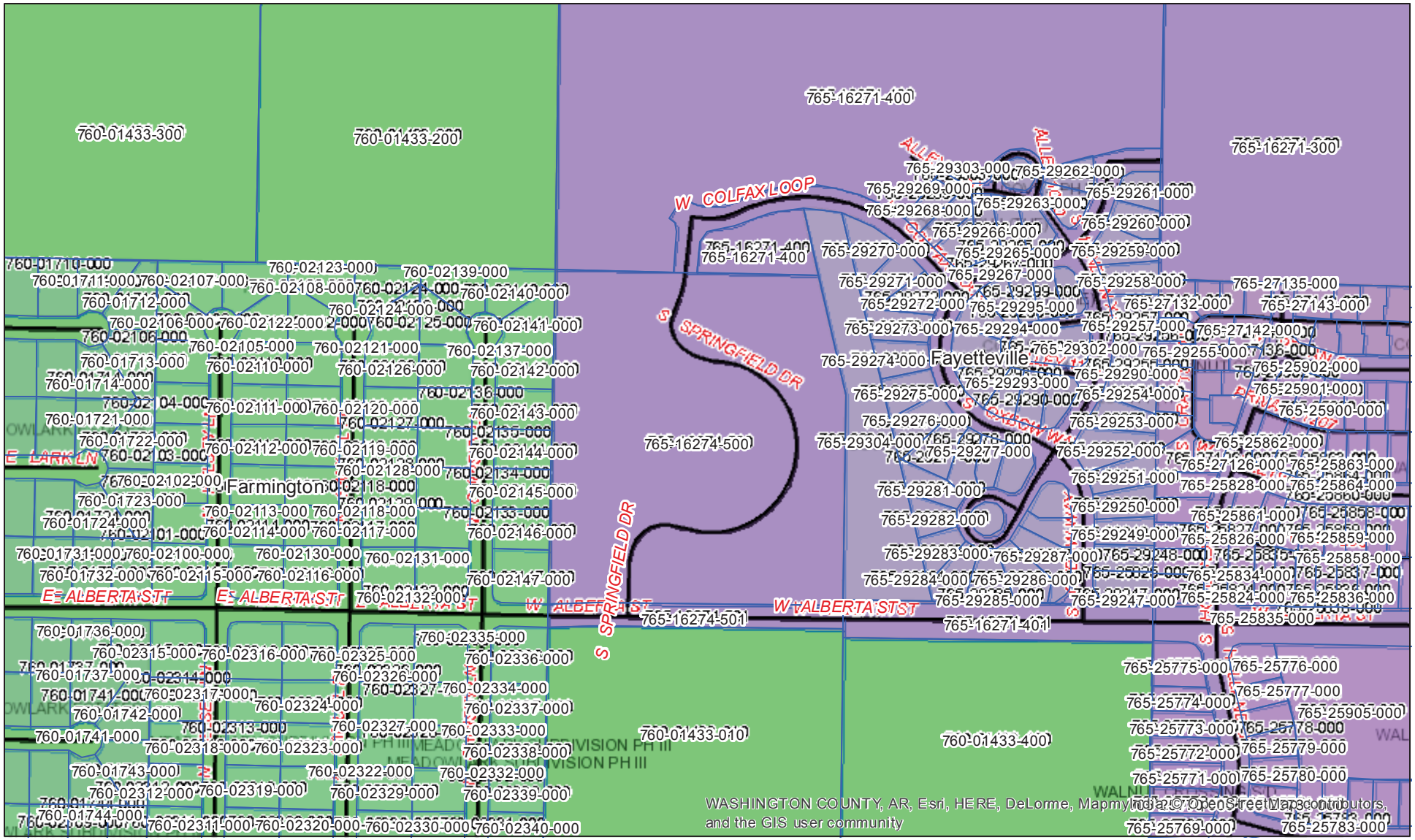
Washington County Public Map System



Print Date: 6/17/2014

1:4,504

County Disclaimer: These maps were created by Washington County using data created or acquired by its Assessor's office, Dept. of Emergency Management, and Road Department and in accordance with Arkansas Code 15-21-502 (2) (B), which states "The digital cadastre manages and provides access to cadastral information. Digital cadastre does not represent legal property boundary descriptions, nor is it suitable for boundary determination of the individual parcels included in the cadastre." and Arkansas Code 15-21-502 (6) which indicates that "Digital cadastre' means the storage and manipulation of computerized representations of parcel maps and linked databases." These maps have been developed from the best available sources. No guarantee of accuracy is granted, nor is any responsibility for reliance thereon assumed. In no event shall said Washington County be liable for direct, indirect, incidental, consequential or special damages of any kind, including, but not limited to, loss of anticipated profits or benefits arising out of use of or reliance on the maps. The parcel lines shown are considered a graphical representation of the actual boundaries. Washington County is in no way responsible for or liable for any misrepresentation or re-use of these maps. Distribution of these maps are intended for informational purposes and should not be considered authoritative for engineering, legal and other site-specific uses.

SOIL SURVEY

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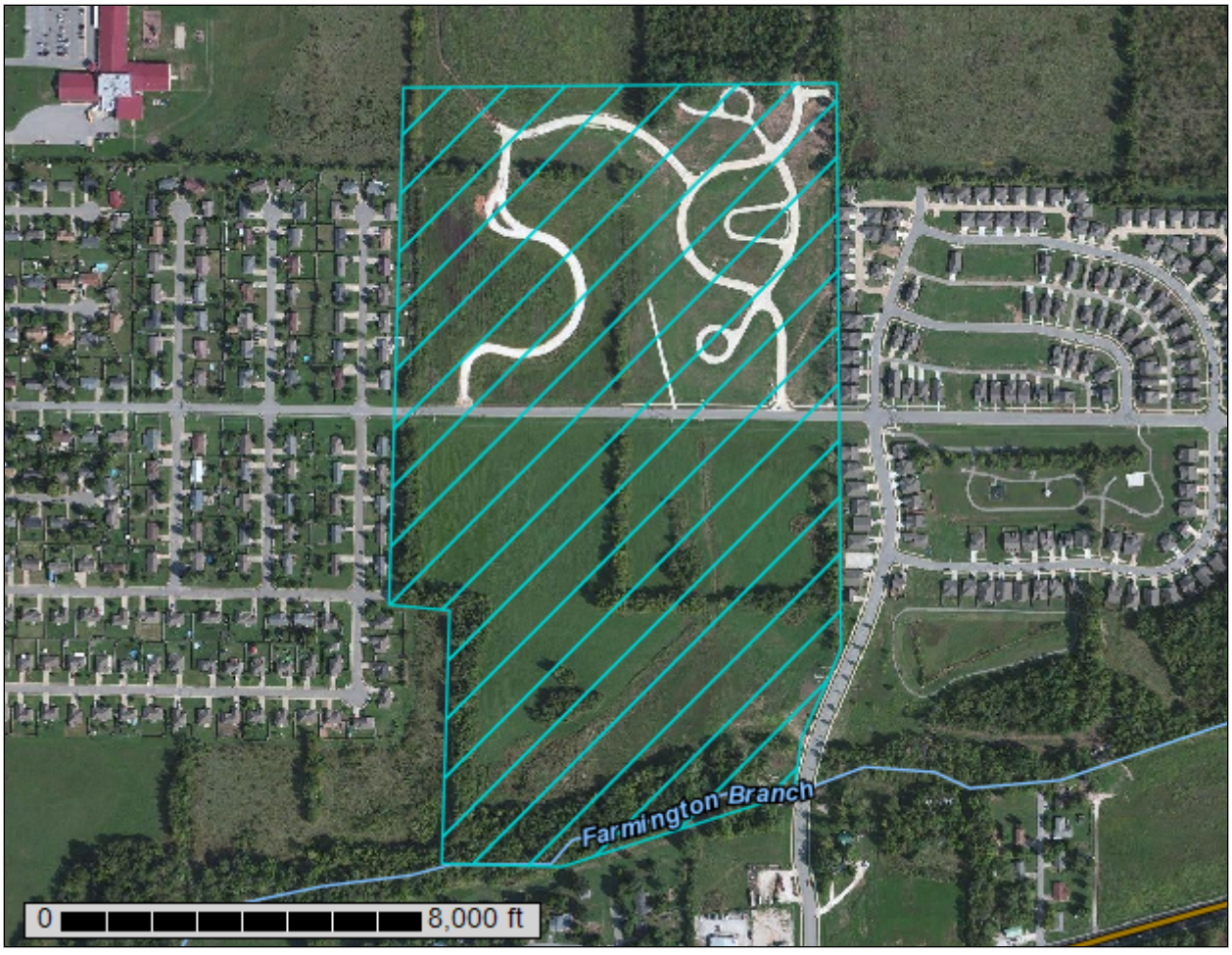
United States Department of Agriculture

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 Washington County, Arkansas



March 11, 2014

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 (http://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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

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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 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: http://websoilsurvey.nrcs.usda.gov
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: Washington County, Arkansas
Survey Area Data: Version 10, Dec 20, 2013

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

Date(s) aerial images were photographed: Sep 19, 2010—Oct 30, 2010

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

Washington County, Arkansas (AR143)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
JaB	Jay silt loam, 1 to 3 percent slopes	0.1	0.1%
LkC2	Linker loam, 3 to 8 percent slopes, eroded	12.9	18.4%
Sn	Sloan silt loam	5.6	8.1%
SsA	Summit silty clay, 0 to 1 percent slopes	10.9	15.7%
Ta	Taloka complex, mounded	2.5	3.5%
ToA	Taloka silt loam, 0 to 1 percent slopes	37.8	54.2%
Totals for Area of Interest		**69.8**	**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.

Washington County, Arkansas

JaB—Jay silt loam, 1 to 3 percent slopes

Map Unit Setting

Elevation: 1,200 to 1,500 feet
Mean annual precipitation: 38 to 53 inches
Mean annual air temperature: 47 to 69 degrees F
Frost-free period: 200 to 245 days

Map Unit Composition

Jay and similar soils: 95 percent
Minor components: 5 percent

Description of Jay

Setting

Landform: Hills
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Silty pedisediment

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: 25 to 33 inches to fragipan
Drainage class: Moderately well drained
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: About 16 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.8 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: LOAMY PRAIRIE (R117XY003AR)

Typical profile

0 to 9 inches: Silt loam
9 to 16 inches: Silt loam
16 to 29 inches: Silty clay loam
29 to 72 inches: Silty clay loam

Minor Components

Aqualfs

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Convex

LkC2—Linker loam, 3 to 8 percent slopes, eroded

Map Unit Setting

Elevation: 500 to 2,800 feet
Mean annual precipitation: 38 to 53 inches
Mean annual air temperature: 47 to 69 degrees F
Frost-free period: 200 to 245 days

Map Unit Composition

Linker and similar soils: 100 percent

Description of Linker

Setting

Landform: Hills, hills
Landform position (three-dimensional): Head slope, crest
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone and siltstone

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
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 capacity: Low (about 4.3 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 3e
Hydrologic Soil Group: B

Typical profile

0 to 5 inches: Loam
5 to 26 inches: Loam
26 to 34 inches: Fine sandy loam
34 to 37 inches: Unweathered bedrock

Sn—Sloan silt loam

Map Unit Setting

Elevation: 920 to 970 feet

Mean annual precipitation: 38 to 53 inches
Mean annual air temperature: 47 to 69 degrees F
Frost-free period: 200 to 245 days

Map Unit Composition
Sloan and similar soils: 90 percent
Minor components: 10 percent

Description of Sloan

Setting
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water capacity: High (about 11.0 inches)

Interpretive groups
Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 3w
Hydrologic Soil Group: B/D

Typical profile
0 to 17 inches: Silt loam
17 to 61 inches: Silt loam

Minor Components

Aquents
Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Convex

Razort
Percent of map unit: 5 percent

SsA—Summit silty clay, 0 to 1 percent slopes

Map Unit Setting
Elevation: 1,000 to 2,000 feet
Mean annual precipitation: 38 to 53 inches
Mean annual air temperature: 47 to 69 degrees F

Frost-free period: 200 to 245 days

Map Unit Composition

Summit and similar soils: 90 percent
Minor components: 10 percent

Description of Summit

Setting

Landform: Stream terraces, depressions
Down-slope shape: Concave
Across-slope shape: Linear, convex
Parent material: Clayey pedisediment

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
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 capacity: Moderate (about 8.9 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 2w
Hydrologic Soil Group: C

Typical profile

0 to 12 inches: Silty clay
12 to 36 inches: Clay
36 to 72 inches: Clay

Minor Components

Aquepts

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Convex

Ta—Taloka complex, mounded

Map Unit Setting

Elevation: 500 to 1,200 feet
Mean annual precipitation: 38 to 53 inches
Mean annual air temperature: 47 to 69 degrees F
Frost-free period: 200 to 245 days

Map Unit Composition

Taloka and similar soils: 90 percent
Minor components: 10 percent

Description of Taloka

Setting

Landform: Hills
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Silty pedisediment over clayey pedisediment

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 20 to 26 inches to abrupt textural change
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.6 inches)

Interpretive groups

Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season
Land capability (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: LOAMY PRAIRIE (R117XY003AR)

Typical profile

0 to 12 inches: Silt loam
12 to 23 inches: Silt loam
23 to 60 inches: Silty clay

Minor Components

Aqualfs

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Convex

ToA—Taloka silt loam, 0 to 1 percent slopes

Map Unit Setting

Elevation: 500 to 1,200 feet
Mean annual precipitation: 38 to 53 inches
Mean annual air temperature: 47 to 69 degrees F

Frost-free period: 200 to 245 days

Map Unit Composition

Taloka and similar soils: 90 percent
Minor components: 10 percent

Description of Taloka

Setting

Landform: Hills
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Silty pedisediment over clayey pedisediment

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 20 to 26 inches to abrupt textural change
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.6 inches)

Interpretive groups

Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season
Land capability (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: LOAMY PRAIRIE (R117XY003AR)

Typical profile

0 to 12 inches: Silt loam
12 to 23 inches: Silt loam
23 to 60 inches: Silty clay

Minor Components

Aqualfs

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Convex

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

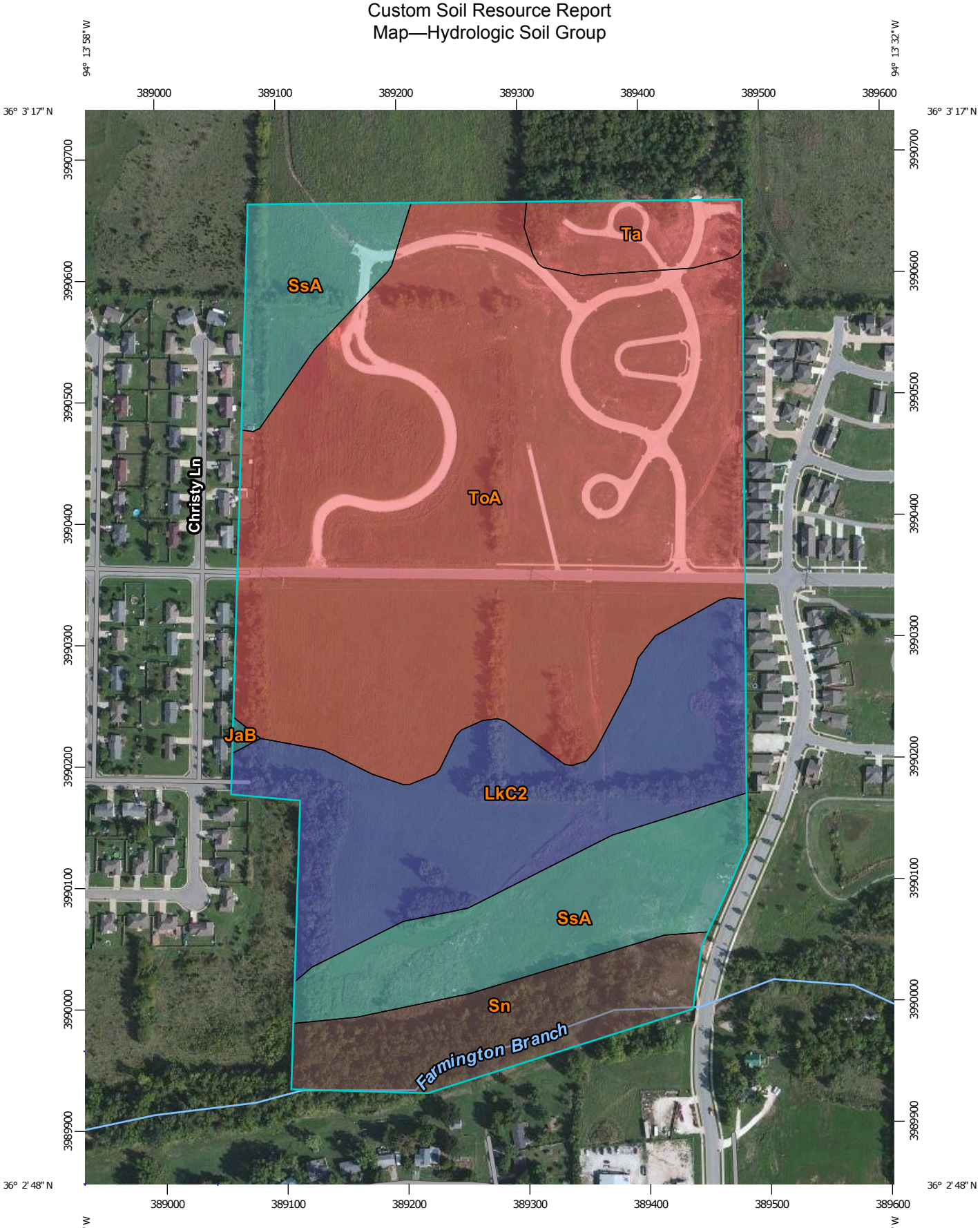
Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.



Map Scale: 1:4,320 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

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 Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
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: Washington County, Arkansas
Survey Area Data: Version 10, Dec 20, 2013

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

Date(s) aerial images were photographed: Sep 19, 2010—Oct 30, 2010

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.

Table—Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Washington County, Arkansas (AR143)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
JaB	Jay silt loam, 1 to 3 percent slopes	C	0.1	0.1%
LkC2	Linker loam, 3 to 8 percent slopes, eroded	B	12.9	18.4%
Sn	Sloan silt loam	B/D	5.6	8.1%
SsA	Summit silty clay, 0 to 1 percent slopes	C	10.9	15.7%
Ta	Taloka complex, mounded	D	2.5	3.5%
ToA	Taloka silt loam, 0 to 1 percent slopes	D	37.8	54.2%
Totals for Area of Interest			**69.8**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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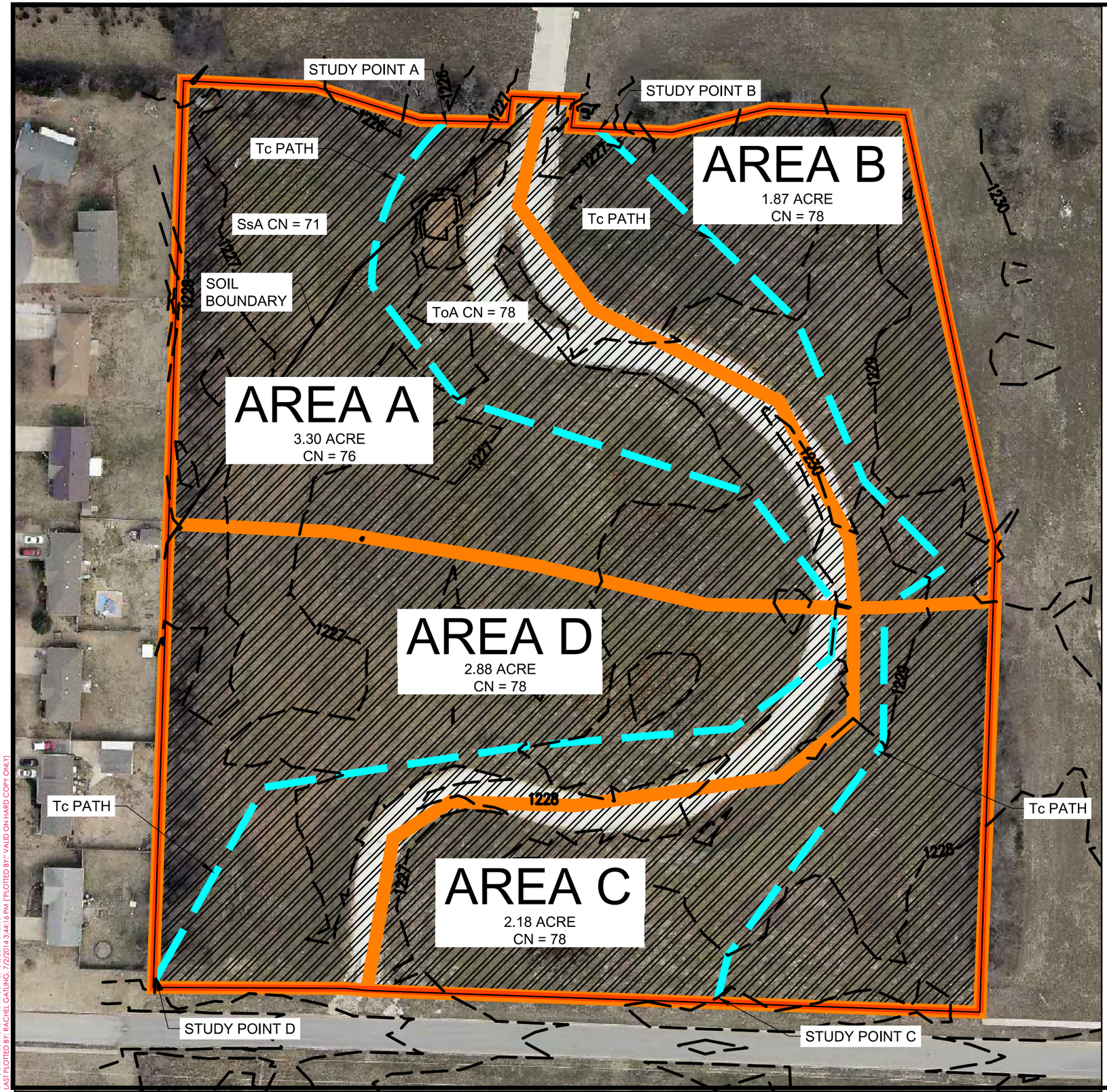
DRAINAGE DESIGN

Crafton Tull
architecture | engineering | surveying

PRE-DEVELOPED DRAINAGE MAP

Crafton Tull
architecture | engineering | surveying



GRASS AREA
SsA CN = 71
ToA CN = 78
A = 9.43 acre

PREPARED FOR:

GRAPHIC SCALE IN FEET

80' 0 80'

COVES PHASE II

FAYETTEVILLE, AR

DELTA	DESCRIPTION	DATE

170 Commerce Road, Building 201
Conway, Arkansas 72032
Crafton Tull
surveying
501.328.3316 t 501.328.3325 f
www.craftontull.com

PRE-DEVELOPED

PROJECT NO:	14101800
ISSUE DATE:	06/18/2014
CONTACT:	D. ELLIS
CHECKED BY:	
SHEET NO.:	

POST DEVELOPED DRAINAGE MAP

Crafton Tull
architecture | engineering | surveying

GRAPHIC SCALE IN FEET
100' 0 100'

INLET AREA

BYPASS AREA

FLOW LINES

INLET

GREEN AREAS: C = 0.61

IMPERVIOUS AREAS: C = 0.95

*SEE OVERALL DRAINAGE MAP FOR OFFSITE AREAS

CERTIFICATE OF AUTHORIZATION
CRAFTON, TULL, & ASSOCIATES, INC.
No. 109
ARKANSAS ENGINEER

PREPARED FOR:

THE COVES PHASE III

FAYETTEVILLE, AR

DELTA	DESCRIPTION	DATE

901 N. 47th St., Suite 200
Rogers, Arkansas 72756
Crafton Tull
architecture | engineering | surveying
479.636.4838 t 479.631.6224 f
www.craftontull.com

PRELIMINARY PLANS

THIS DOCUMENT IS PRELIMINARY IN NATURE AND IS NOT A FINAL, SIGNED AND SEALED DOCUMENT

NOT FOR CONSTRUCTION ··· REVIEW SET ··· NOT FOR CONSTRUCTION ··· REVIEW SET ···

PROJECT NO:	14101800
ISSUE DATE:	MM/DD/YYYY
CONTACT:	D. ELLIS
CHECKED BY:	
SHEET NO.:	D-101

2013 CRAFTON TULL CELEBRATING 50 YEARS

DRAWING: G:\14101800_COVESPHIII\CIV\DRAINAGE\MAPS_PHOTOS\INLET MAP 2.DWG
LAYOUT: LAYOUT1 | LAST SAVED: ZJS101 8/19/2014 2:08:19 PM
LAST PLOTTED BY: ZAK JOHNSTON 8/19/2014 5:43:12 PM (*PLOTTED BY:** VALID ON HARD COPY ONLY)

Hydraflow Table of Contents

072814.gpw

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4 Tuesday, 07 / 29 / 2014

SURFACE RUNOFF REPORT

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

Legend

Hyd.	Origin	Description
1	SCS Runoff	Pre A
2	SCS Runoff	Pre B
3	SCS Runoff	Pre C
4	SCS Runoff	Pre D
5	SCS Runoff	Post B
6	SCS Runoff	Post C
7	SCS Runoff	Post D
8	SCS Runoff	Post A

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	2.784	4.539	-------	7.452	9.278	11.98	14.48	16.45	Pre A
2	SCS Runoff	------	2.622	3.890	-------	5.902	7.109	8.856	10.44	11.68	Pre B
3	SCS Runoff	------	3.056	4.534	-------	6.880	8.287	10.32	12.17	13.61	Pre C
4	SCS Runoff	------	6.152	8.984	-------	13.54	16.26	20.20	23.77	26.55	Pre D
5	SCS Runoff	------	2.163	2.802	-------	3.752	4.303	5.085	5.786	6.329	Post B
6	SCS Runoff	------	3.248	4.211	-------	5.645	6.475	7.656	8.713	9.532	Post C
7	SCS Runoff	------	0.892	1.156	-------	1.548	1.775	2.098	2.387	2.611	Post D
8	SCS Runoff	------	3.349	4.343	-------	5.821	6.678	7.895	8.985	9.830	Post A

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

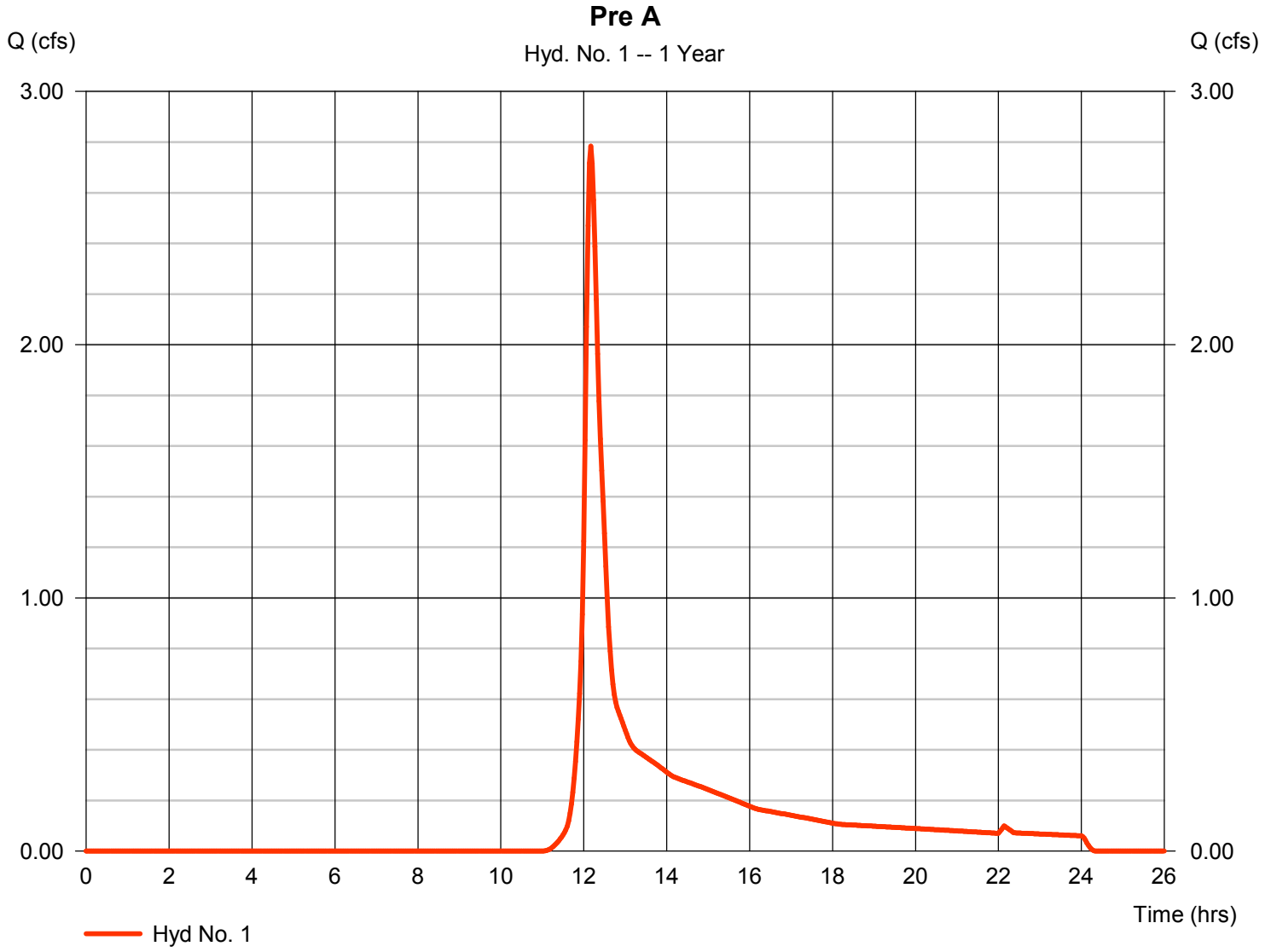
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.784	2	730	11,598	------	------	------	Pre A
2	SCS Runoff	2.622	2	726	9,144	------	------	------	Pre B
3	SCS Runoff	3.056	2	726	10,660	------	------	------	Pre C
4	SCS Runoff	6.152	2	720	14,083	------	------	------	Pre D
5	SCS Runoff	2.163	2	724	6,659	------	------	------	Post B
6	SCS Runoff	3.248	2	726	11,364	------	------	------	Post C
7	SCS Runoff	0.892	2	724	2,747	------	------	------	Post D
8	SCS Runoff	3.349	2	726	11,719	------	------	------	Post A

Hydrograph Report

Hyd. No. 1

Pre A

Hydrograph type	= SCS Runoff	Peak discharge	= 2.784 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 11,598 cuft
Drainage area	= 3.300 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 10.90 min
Total precip.	= 3.30 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 1

Pre A

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 4.10		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 7.24**	**+**	**0.00**	**+**	**0.00**	**=**	**7.24**
Shallow Concentrated Flow							
Flow length (ft)	= 500.00		0.00		0.00		
Watercourse slope (%)	= 2.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.28		0.00		0.00		
Travel Time (min)	**= 3.65**	**+**	**0.00**	**+**	**0.00**	**=**	**3.65**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

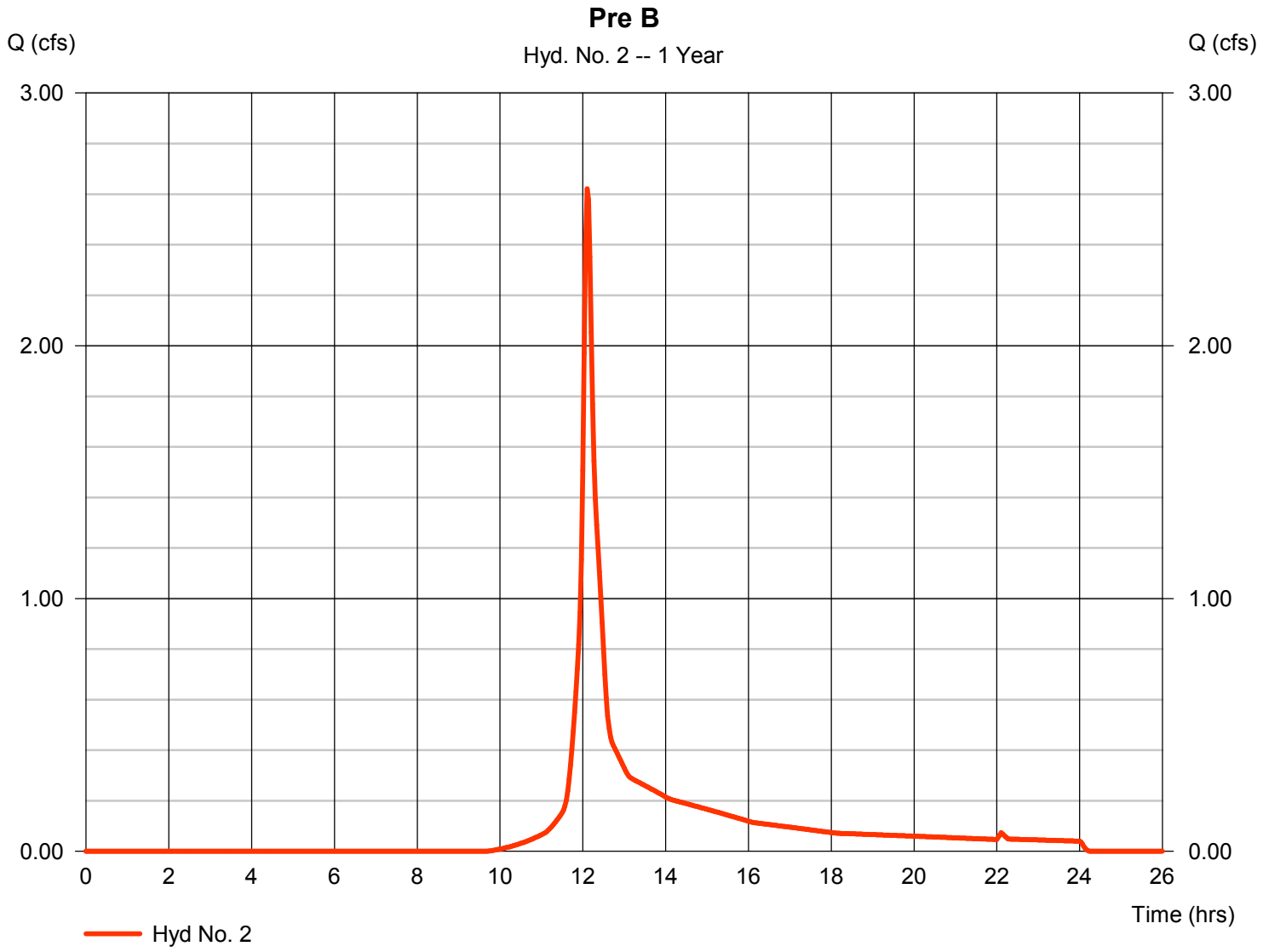
Total Travel Time, Tc ..... 10.90 min

Hydrograph Report

Hyd. No. 2

Pre B

Hydrograph type	= SCS Runoff	Peak discharge	= 2.622 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 9,144 cuft
Drainage area	= 1.870 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.40 min
Total precip.	= 3.30 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 2

Pre B

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 4.10		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 7.24**	**+**	**0.00**	**+**	**0.00**	**=**	**7.24**
Shallow Concentrated Flow							
Flow length (ft)	= 300.00		0.00		0.00		
Watercourse slope (%)	= 2.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.28		0.00		0.00		
Travel Time (min)	**= 2.19**	**+**	**0.00**	**+**	**0.00**	**=**	**2.19**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

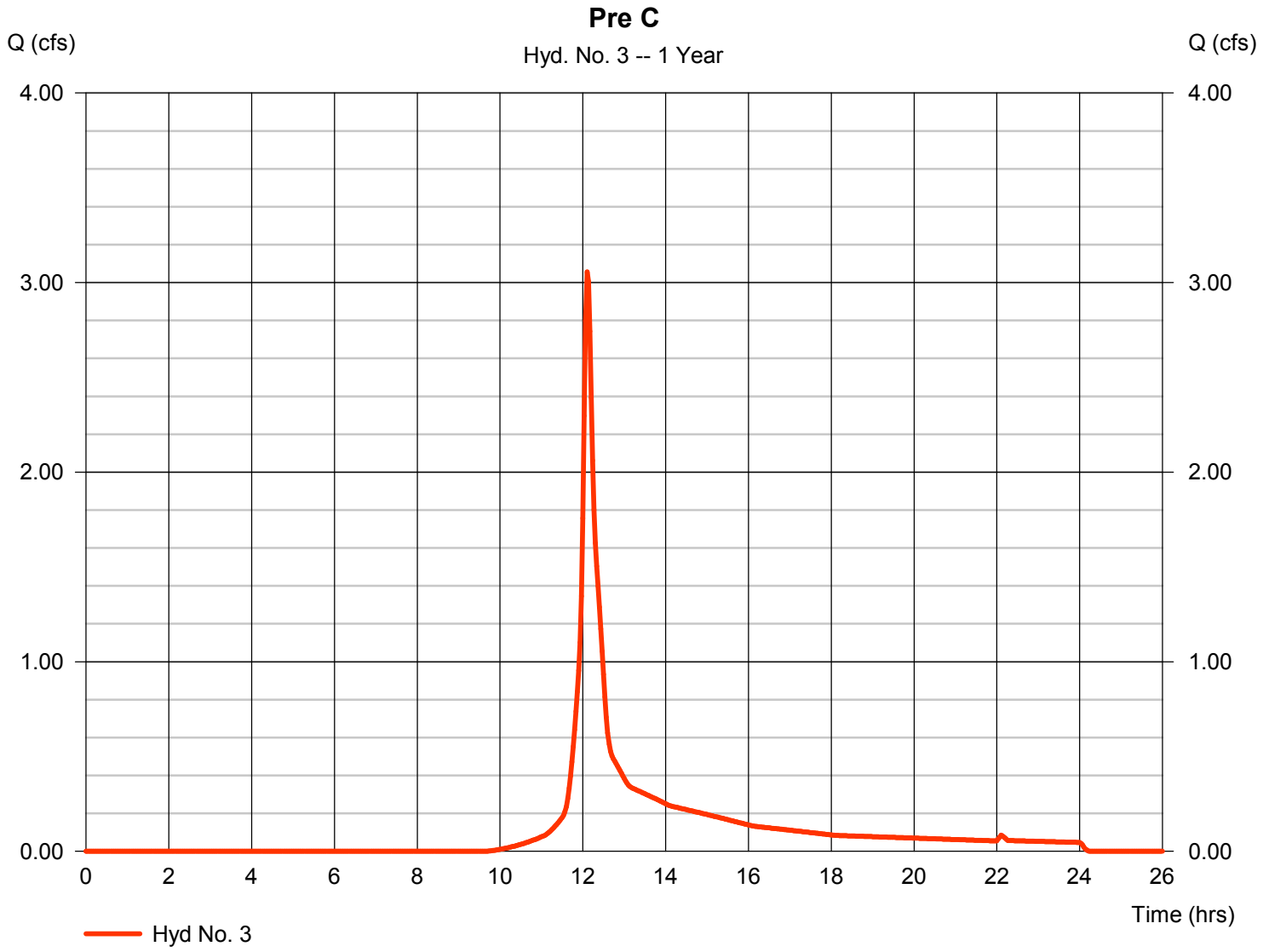
Total Travel Time, Tc ..... 9.40 min

Hydrograph Report

Hyd. No. 3

Pre C

Hydrograph type	= SCS Runoff	Peak discharge	= 3.056 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 10,660 cuft
Drainage area	= 2.180 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.70 min
Total precip.	= 3.30 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 3

Pre C

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 4.10		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 7.24**	**+**	**0.00**	**+**	**0.00**	**=**	**7.24**
Shallow Concentrated Flow							
Flow length (ft)	= 200.00		0.00		0.00		
Watercourse slope (%)	= 2.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.28		0.00		0.00		
Travel Time (min)	**= 1.46**	**+**	**0.00**	**+**	**0.00**	**=**	**1.46**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

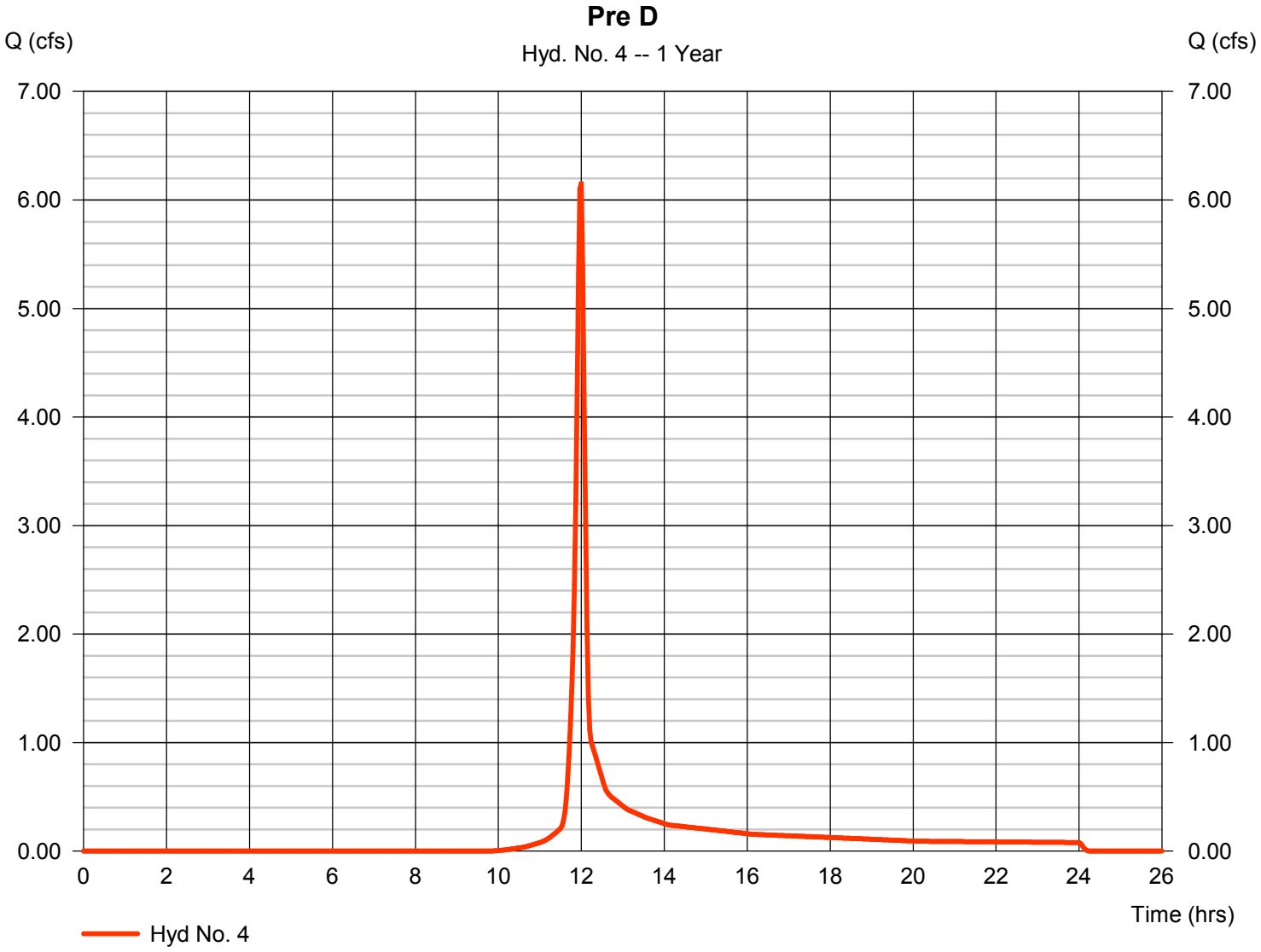
Total Travel Time, Tc ..... 8.70 min

Hydrograph Report

Hyd. No. 4

Pre D

Hydrograph type	= SCS Runoff	Peak discharge	= 6.152 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 14,083 cuft
Drainage area	= 2.880 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.80 min
Total precip.	= 3.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 4

Pre D

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 4.10		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 7.24**	**+**	**0.00**	**+**	**0.00**	**=**	**7.24**
Shallow Concentrated Flow							
Flow length (ft)	= 350.00		0.00		0.00		
Watercourse slope (%)	= 2.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.28		0.00		0.00		
Travel Time (min)	**= 2.56**	**+**	**0.00**	**+**	**0.00**	**=**	**2.56**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

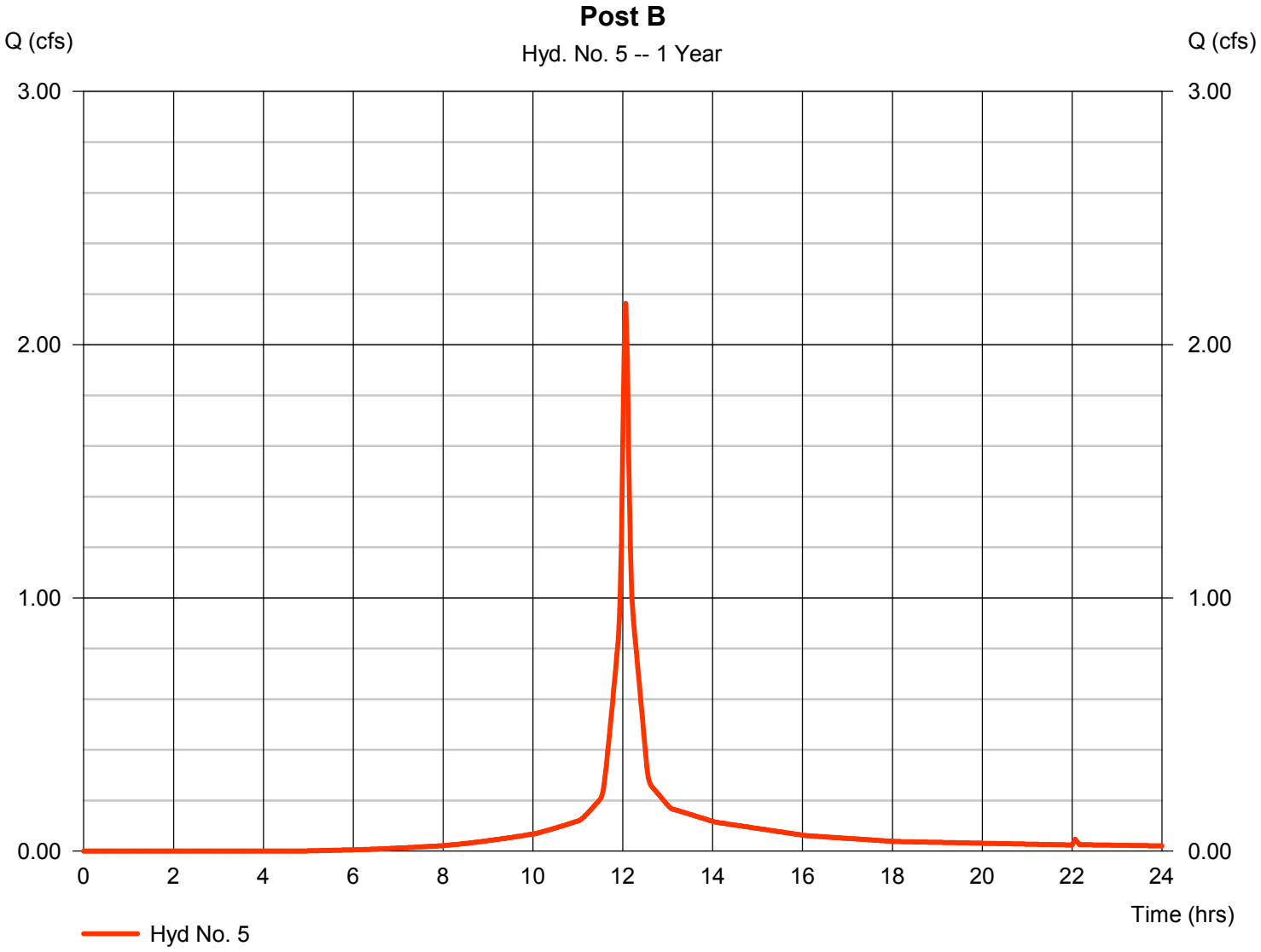
Total Travel Time, Tc ..... 9.80 min

Hydrograph Report

Hyd. No. 5

Post B

Hydrograph type	= SCS Runoff	Peak discharge	= 2.163 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 6,659 cuft
Drainage area	= 0.800 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.30 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

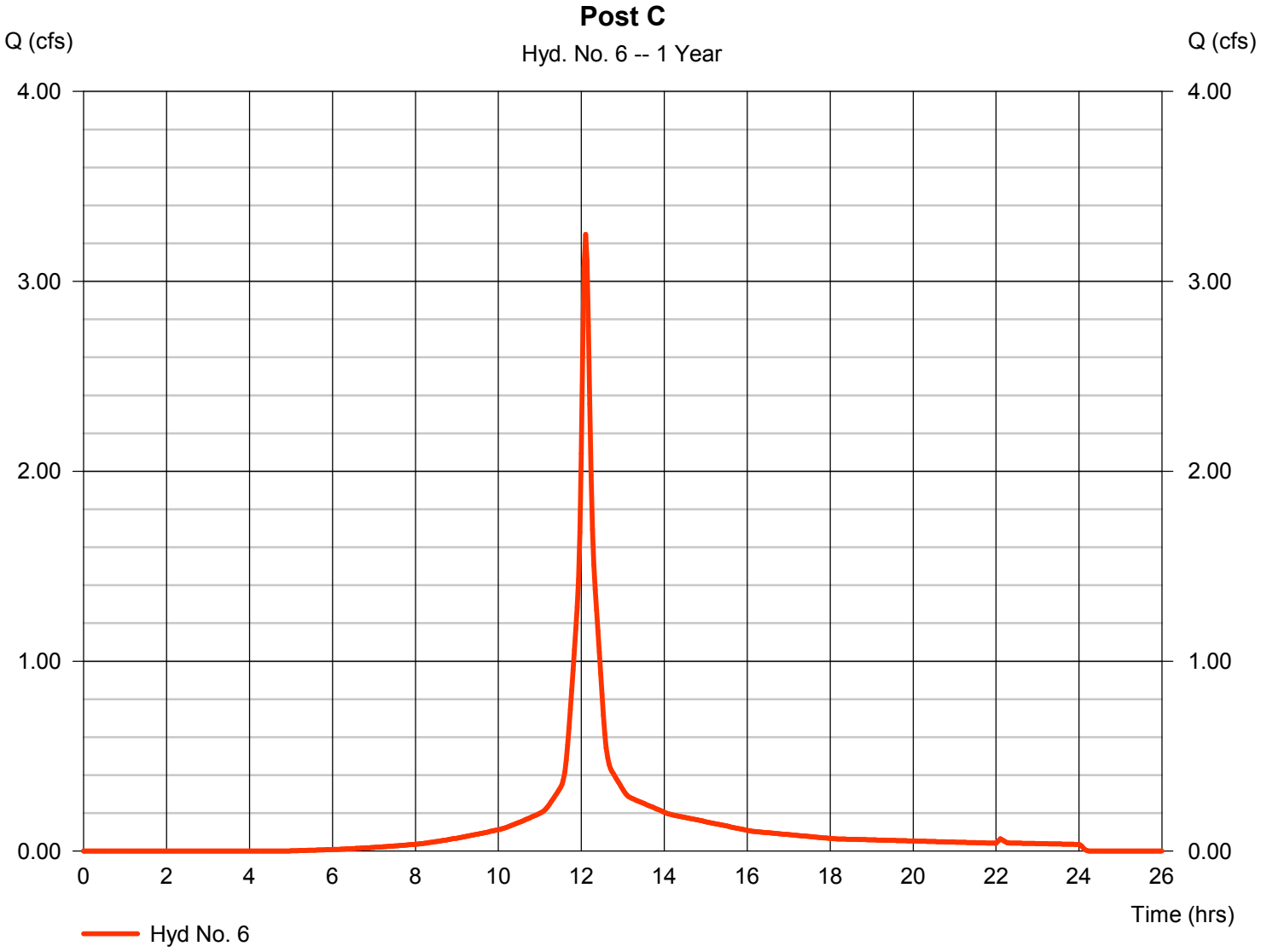


Hydrograph Report

Hyd. No. 6

Post C

Hydrograph type	= SCS Runoff	Peak discharge	= 3.248 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 11,364 cuft
Drainage area	= 1.280 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 3.30 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

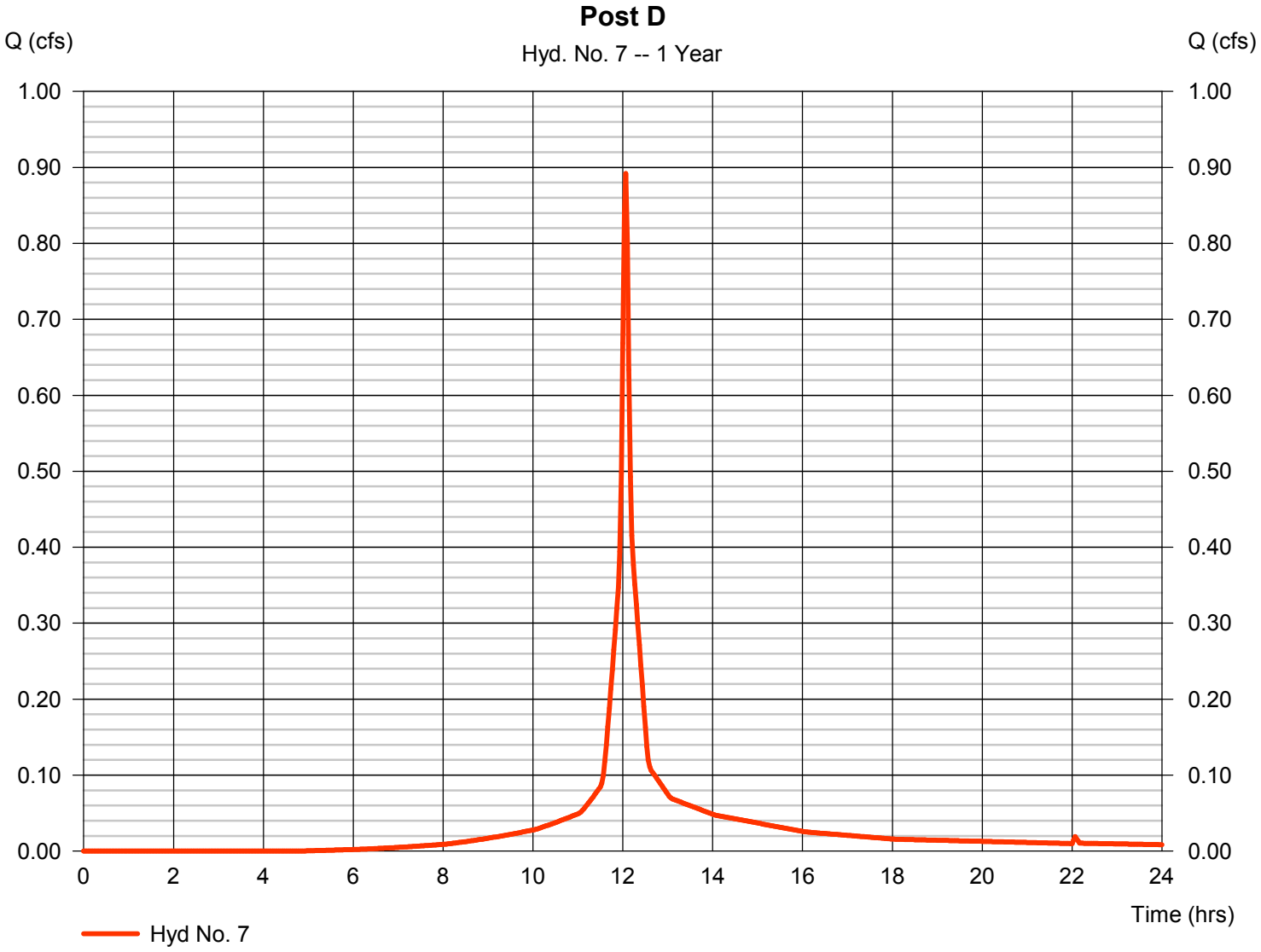


Hydrograph Report

Hyd. No. 7

Post D

Hydrograph type	= SCS Runoff	Peak discharge	= 0.892 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 2,747 cuft
Drainage area	= 0.330 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.30 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

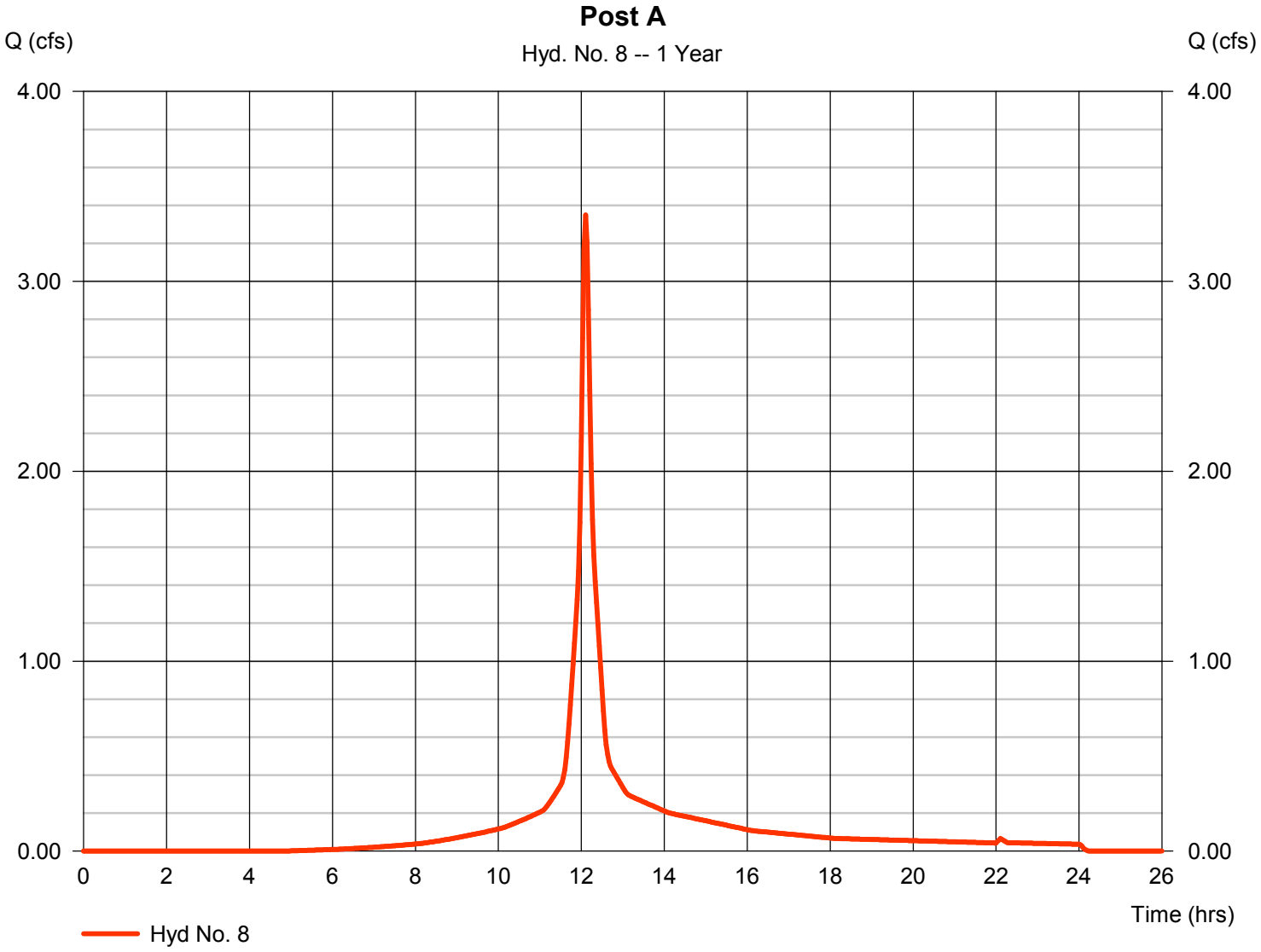


Hydrograph Report

Hyd. No. 8

Post A

Hydrograph type	= SCS Runoff	Peak discharge	= 3.349 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 11,719 cuft
Drainage area	= 1.320 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 3.30 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

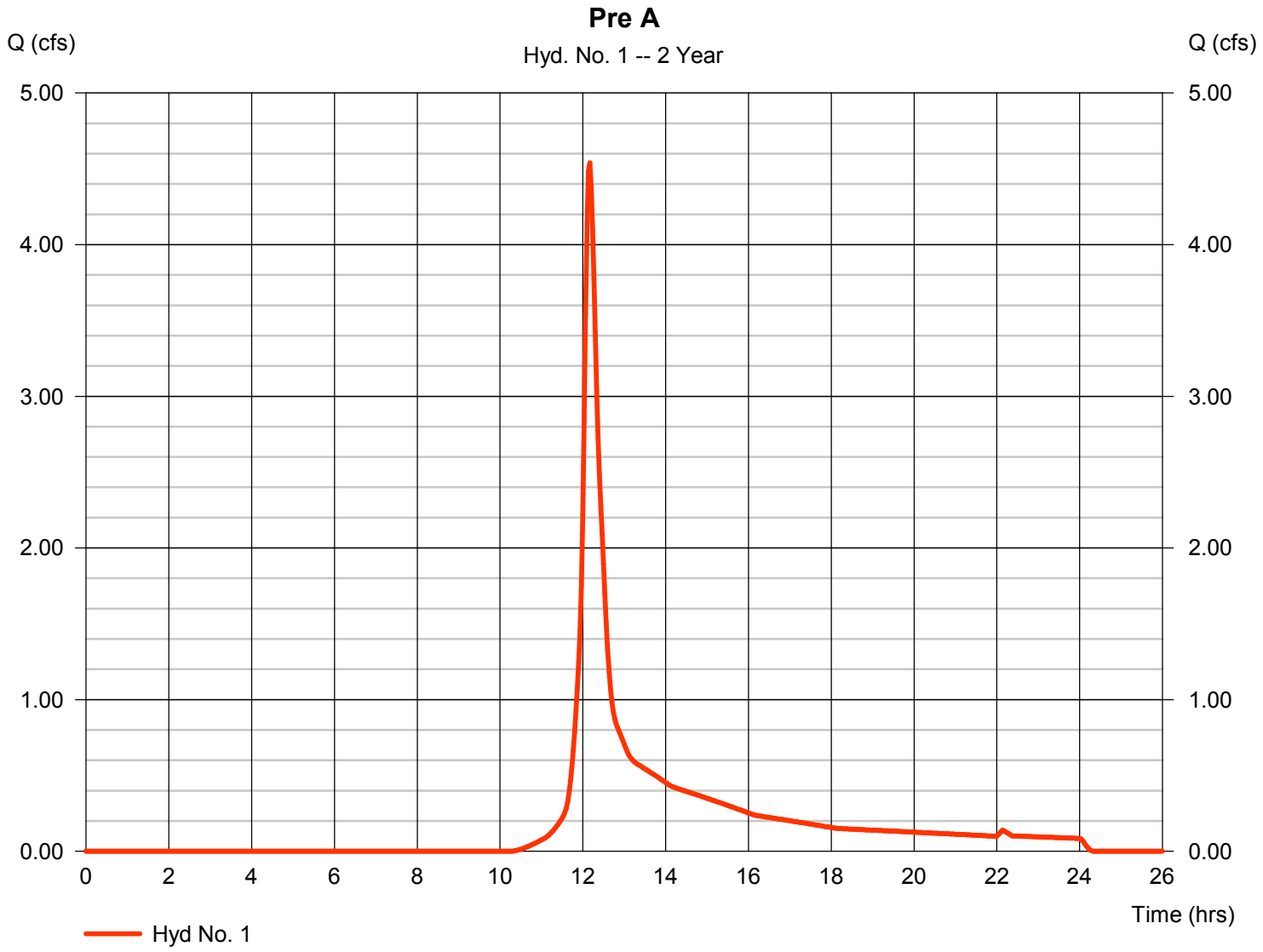
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	4.539	2	730	18,073	------	------	------	Pre A
2	SCS Runoff	3.890	2	726	13,352	------	------	------	Pre B
3	SCS Runoff	4.534	2	726	15,565	------	------	------	Pre C
4	SCS Runoff	8.984	2	718	20,563	------	------	------	Pre D
5	SCS Runoff	2.802	2	724	8,751	------	------	------	Post B
6	SCS Runoff	4.211	2	726	14,934	------	------	------	Post C
7	SCS Runoff	1.156	2	724	3,610	------	------	------	Post D
8	SCS Runoff	4.343	2	726	15,401	------	------	------	Post A

Hydrograph Report

Hyd. No. 1

Pre A

Hydrograph type	= SCS Runoff	Peak discharge	= 4.539 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 18,073 cuft
Drainage area	= 3.300 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 10.90 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

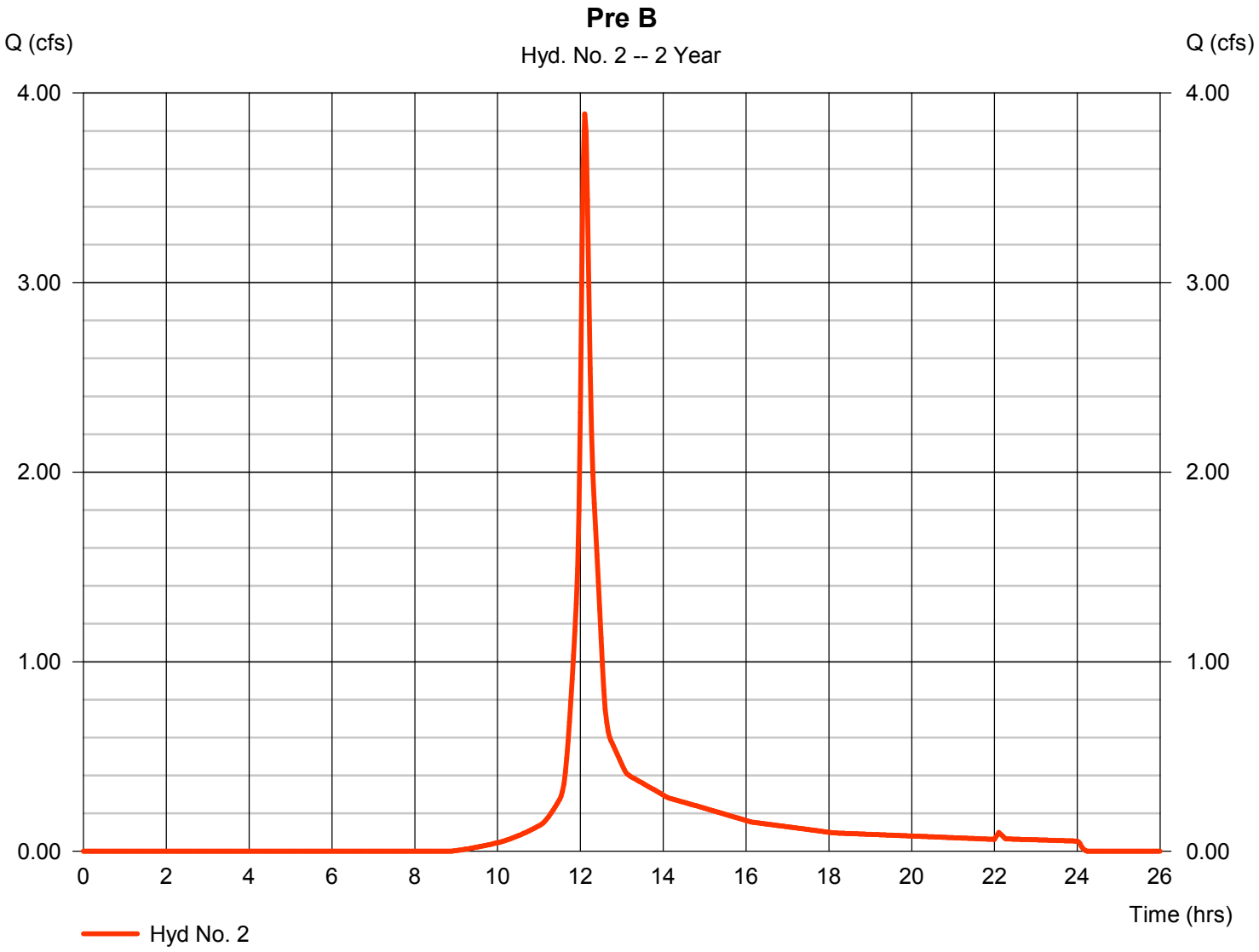


Hydrograph Report

Hyd. No. 2

Pre B

Hydrograph type	= SCS Runoff	Peak discharge	= 3.890 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 13,352 cuft
Drainage area	= 1.870 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.40 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

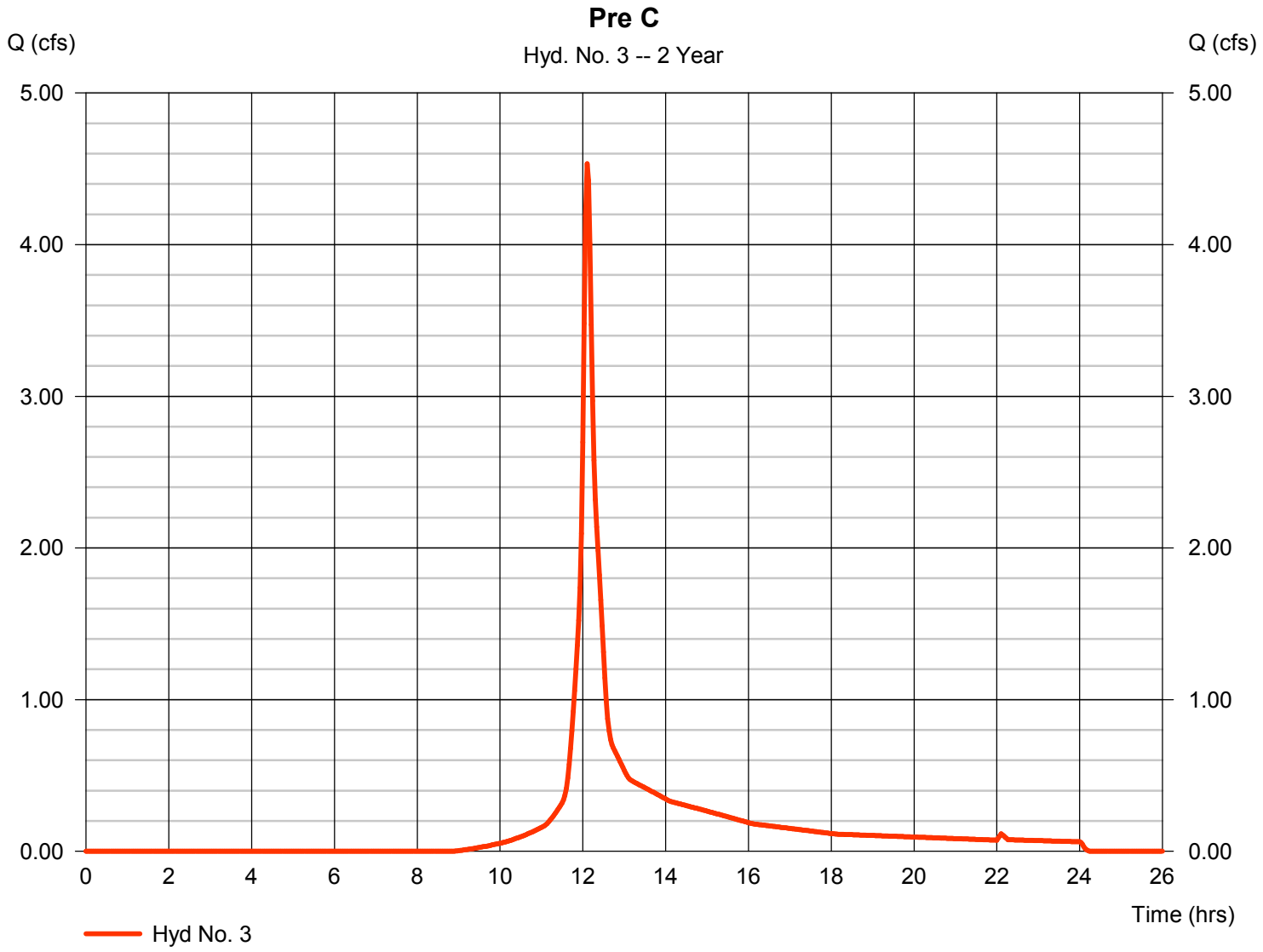


Hydrograph Report

Hyd. No. 3

Pre C

Hydrograph type	= SCS Runoff	Peak discharge	= 4.534 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 15,565 cuft
Drainage area	= 2.180 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.70 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

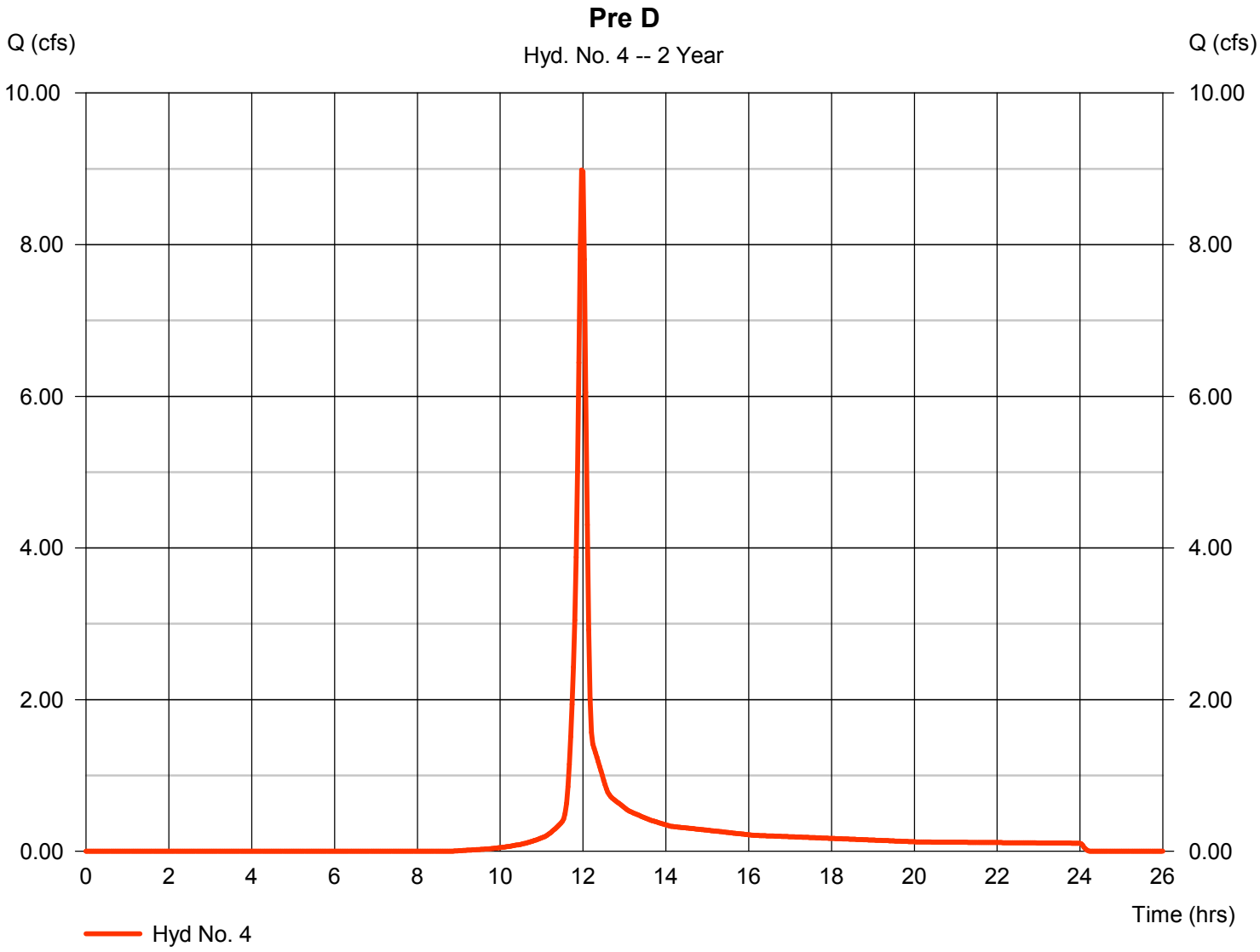


Hydrograph Report

Hyd. No. 4

Pre D

Hydrograph type	= SCS Runoff	Peak discharge	= 8.984 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 20,563 cuft
Drainage area	= 2.880 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.80 min
Total precip.	= 4.10 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

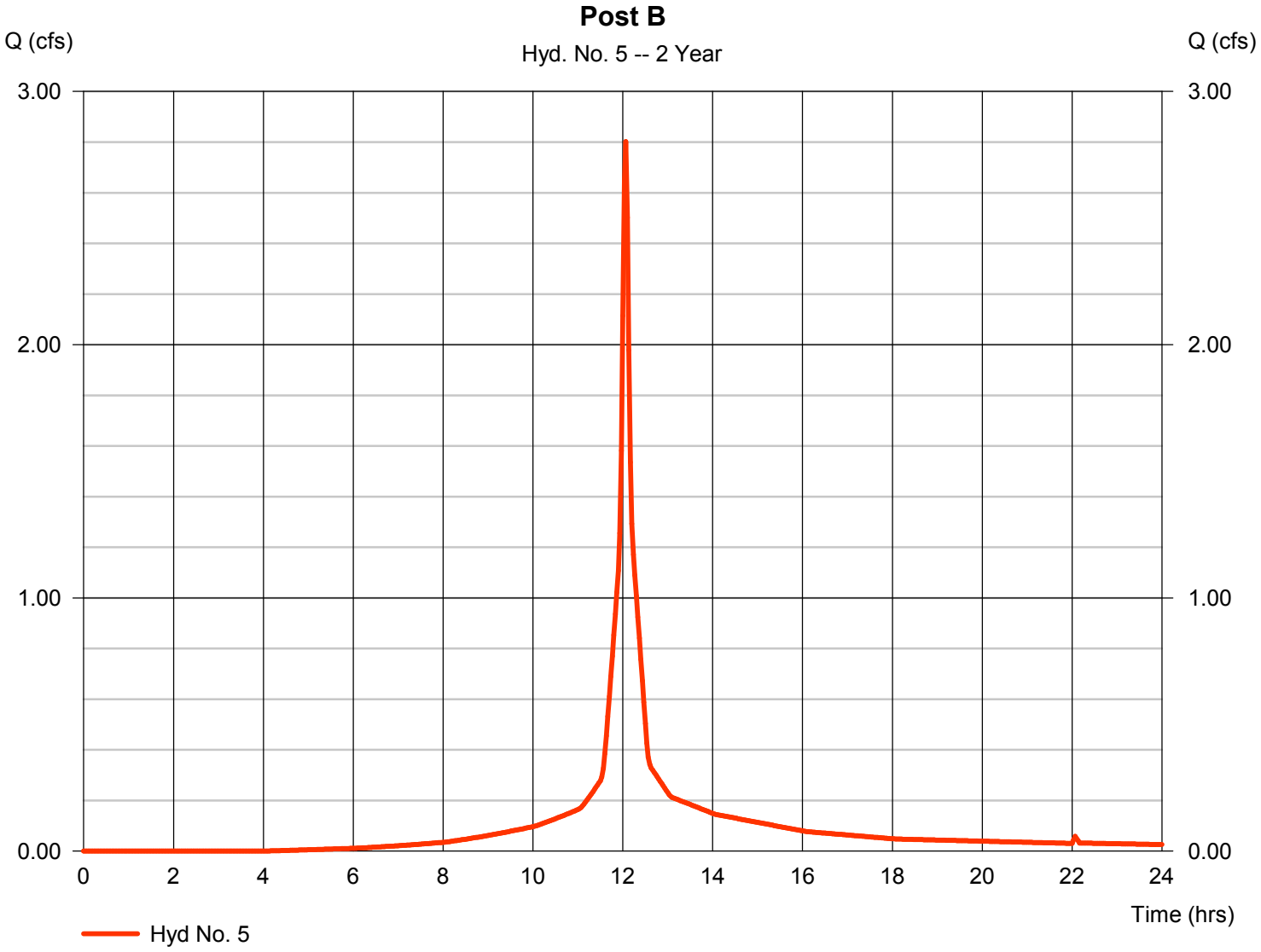


Hydrograph Report

Hyd. No. 5

Post B

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.802 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	8,751 cuft
Drainage area	=	0.800 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	4.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

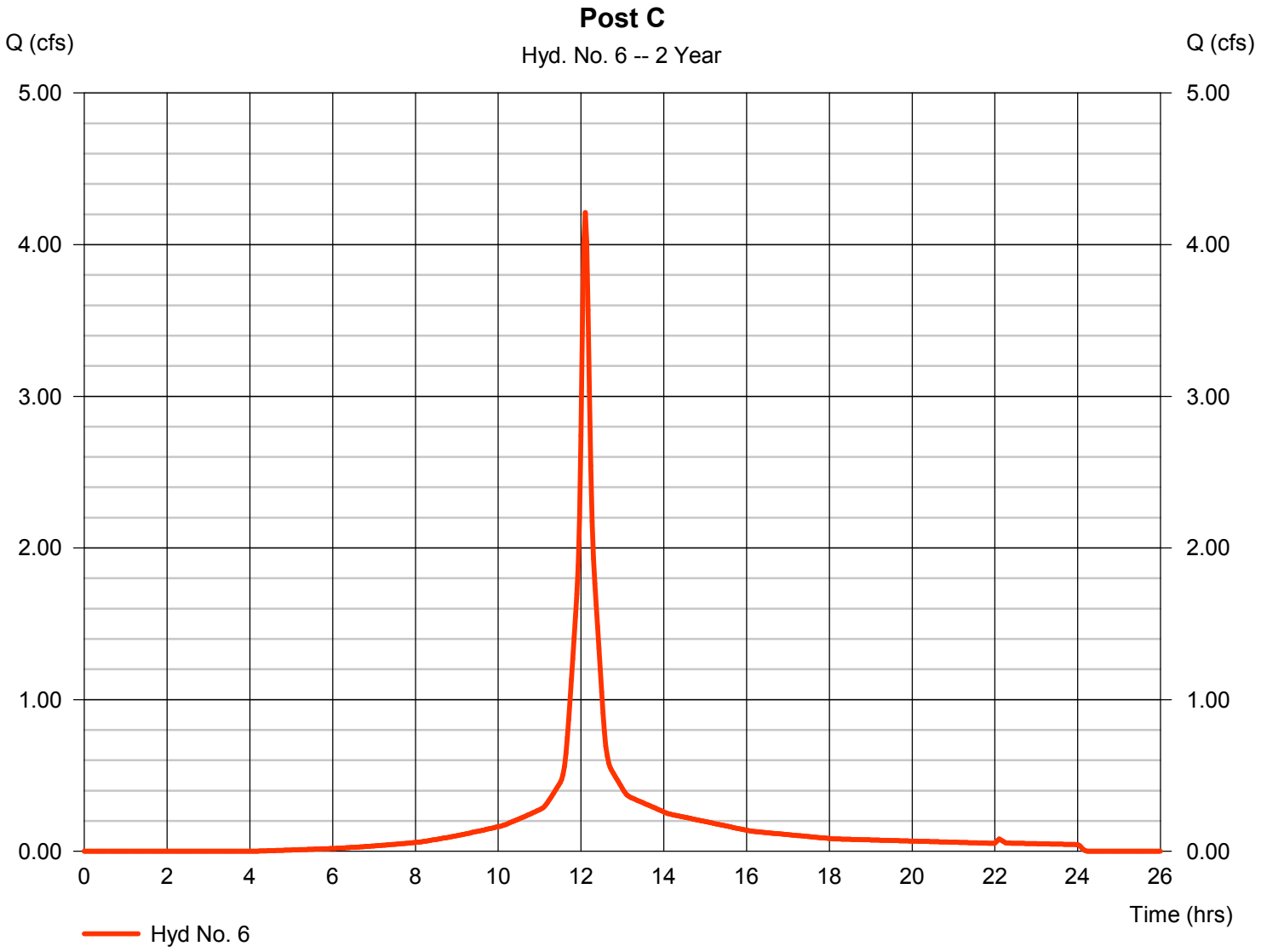


Hydrograph Report

Hyd. No. 6

Post C

Hydrograph type	= SCS Runoff	Peak discharge	= 4.211 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 14,934 cuft
Drainage area	= 1.280 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

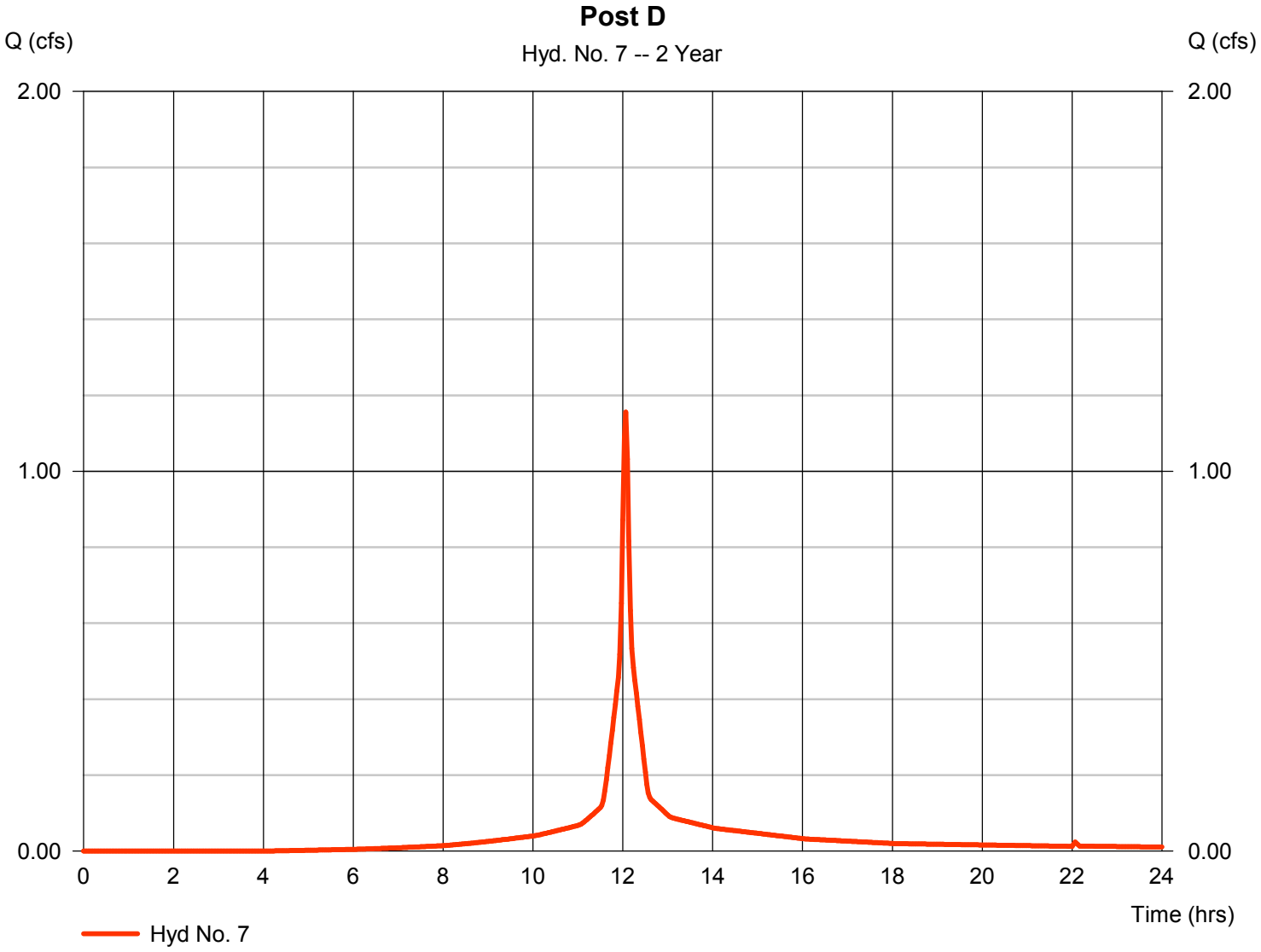


Hydrograph Report

Hyd. No. 7

Post D

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.156 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	3,610 cuft
Drainage area	=	0.330 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	4.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

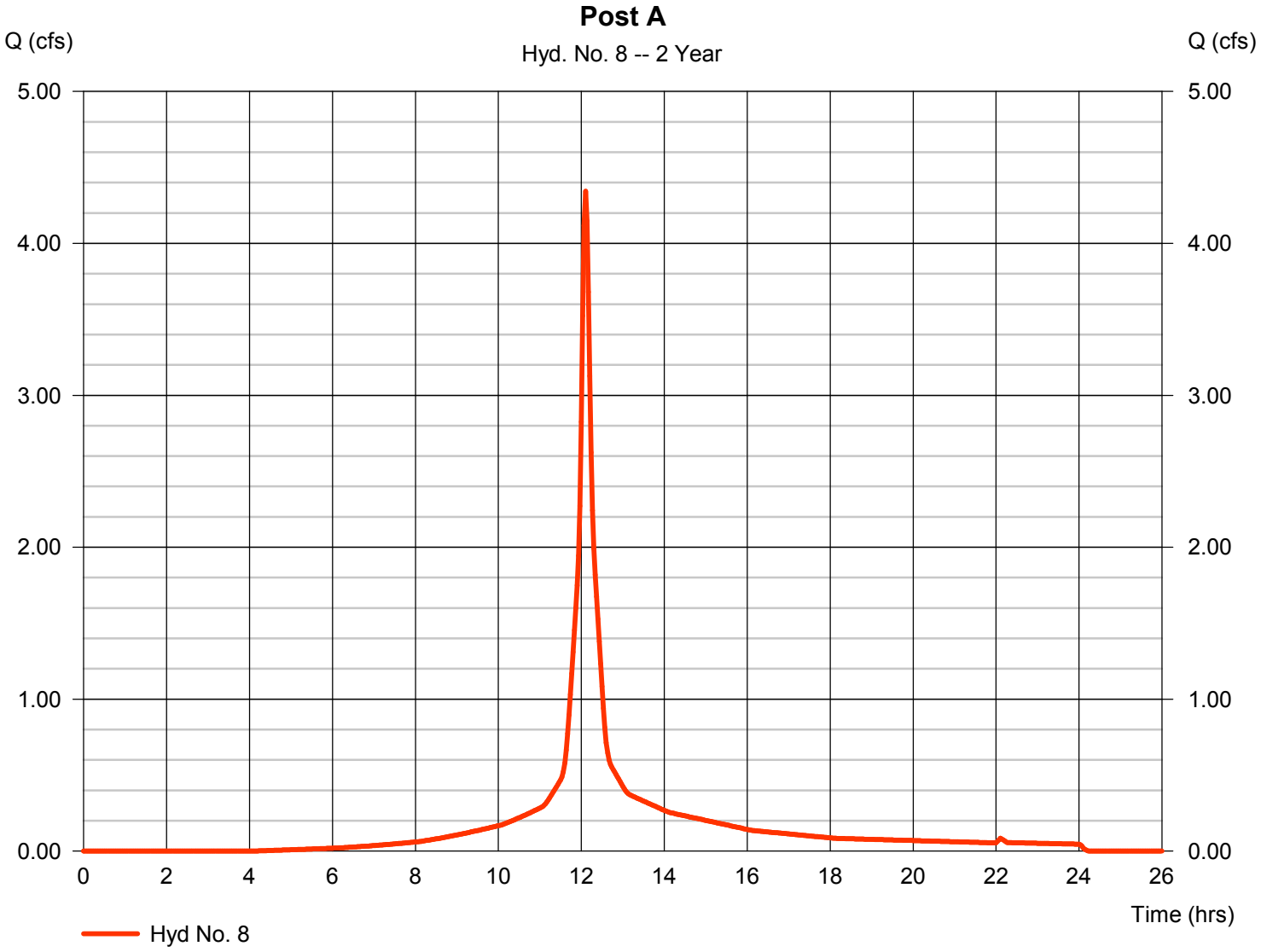


Hydrograph Report

Hyd. No. 8

Post A

Hydrograph type	= SCS Runoff	Peak discharge	= 4.343 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 15,401 cuft
Drainage area	= 1.320 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

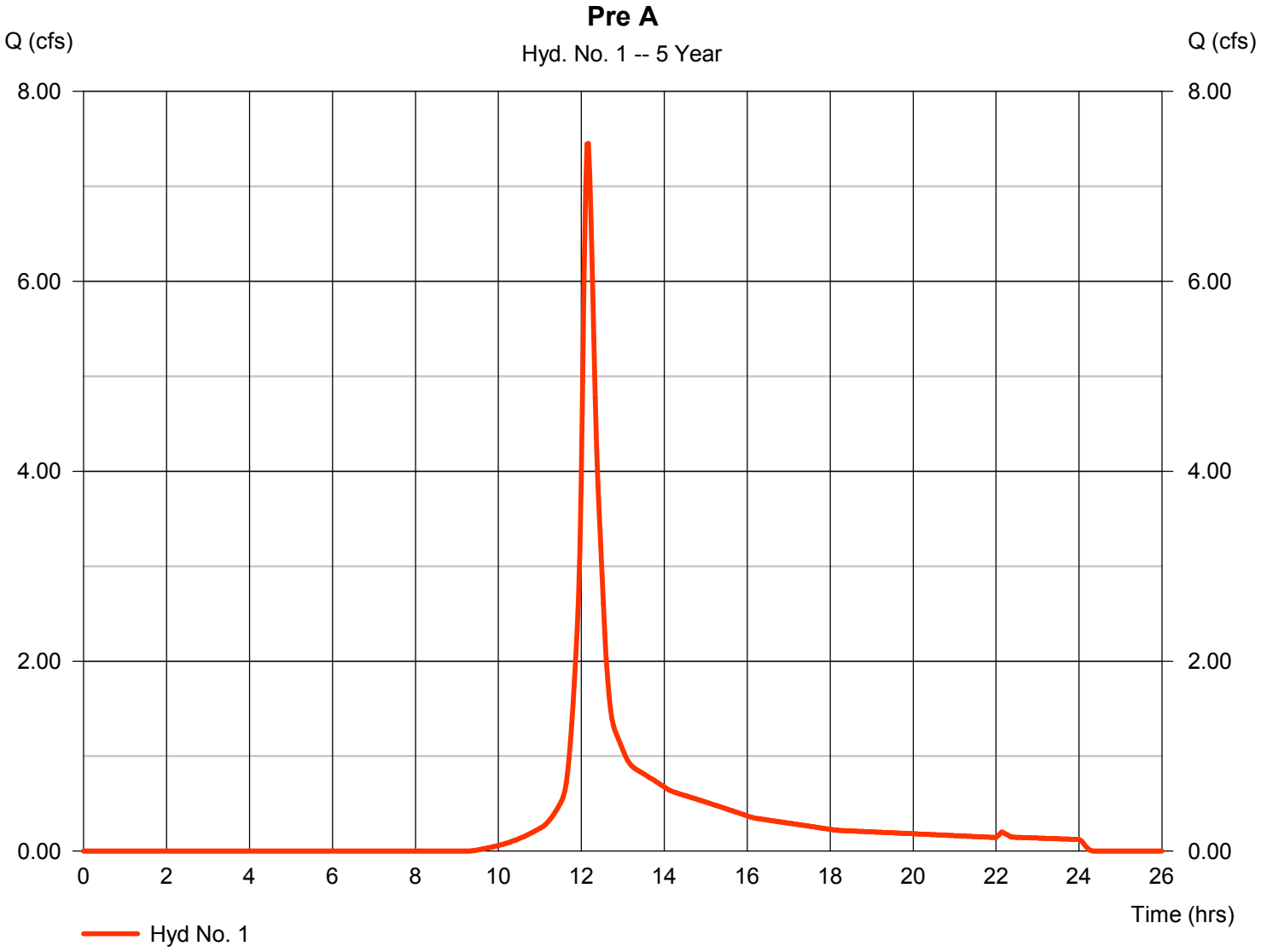
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	7.452	2	730	28,979	------	------	------	Pre A
2	SCS Runoff	5.902	2	726	20,148	------	------	------	Pre B
3	SCS Runoff	6.880	2	726	23,488	------	------	------	Pre C
4	SCS Runoff	13.54	2	718	31,030	------	------	------	Pre D
5	SCS Runoff	3.752	2	724	11,932	------	------	------	Post B
6	SCS Runoff	5.645	2	726	20,363	------	------	------	Post C
7	SCS Runoff	1.548	2	724	4,922	------	------	------	Post D
8	SCS Runoff	5.821	2	726	21,000	------	------	------	Post A

Hydrograph Report

Hyd. No. 1

Pre A

Hydrograph type	= SCS Runoff	Peak discharge	= 7.452 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 28,979 cuft
Drainage area	= 3.300 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 10.90 min
Total precip.	= 5.30 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

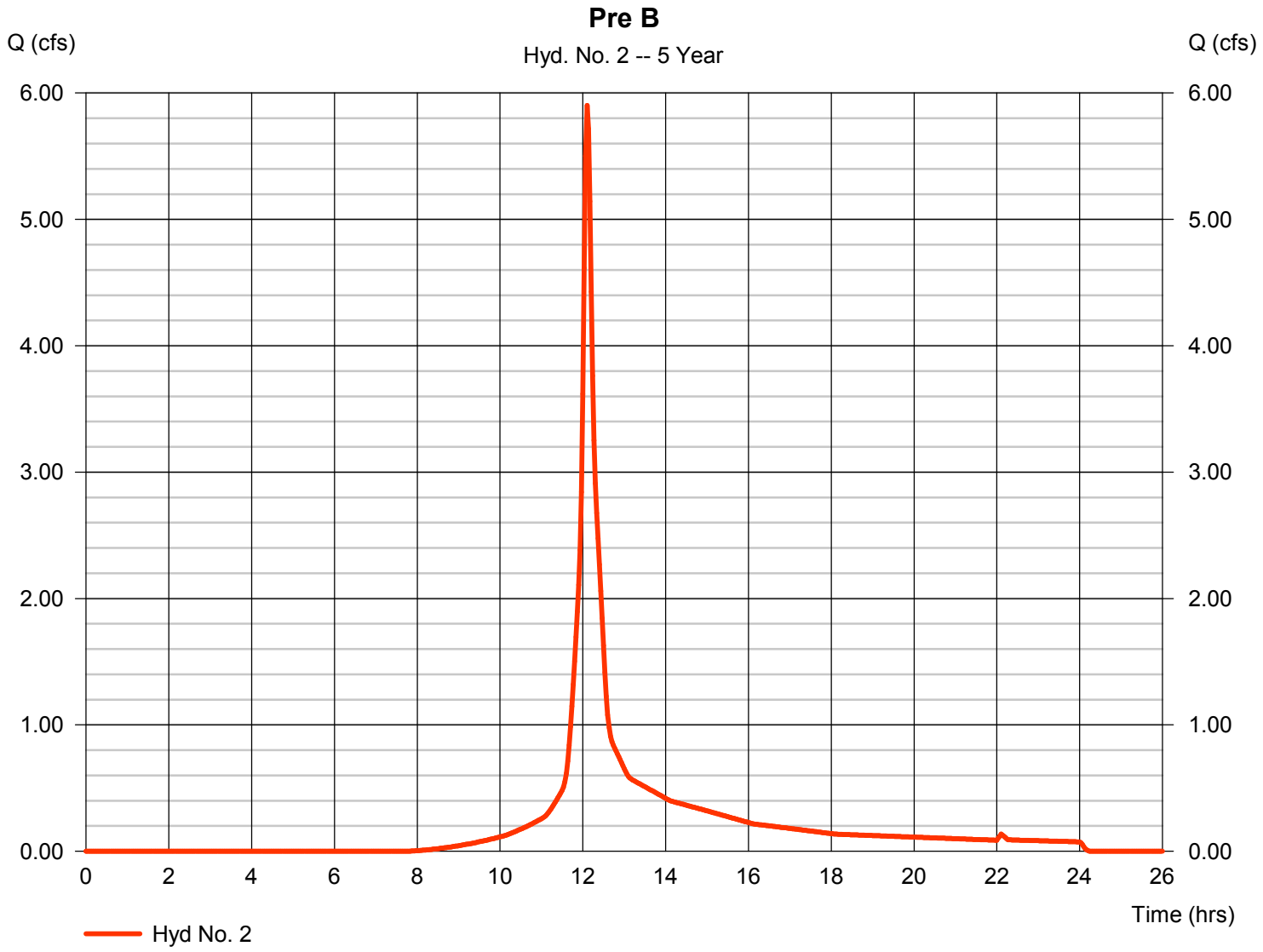


Hydrograph Report

Hyd. No. 2

Pre B

Hydrograph type	= SCS Runoff	Peak discharge	= 5.902 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 20,148 cuft
Drainage area	= 1.870 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.40 min
Total precip.	= 5.30 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

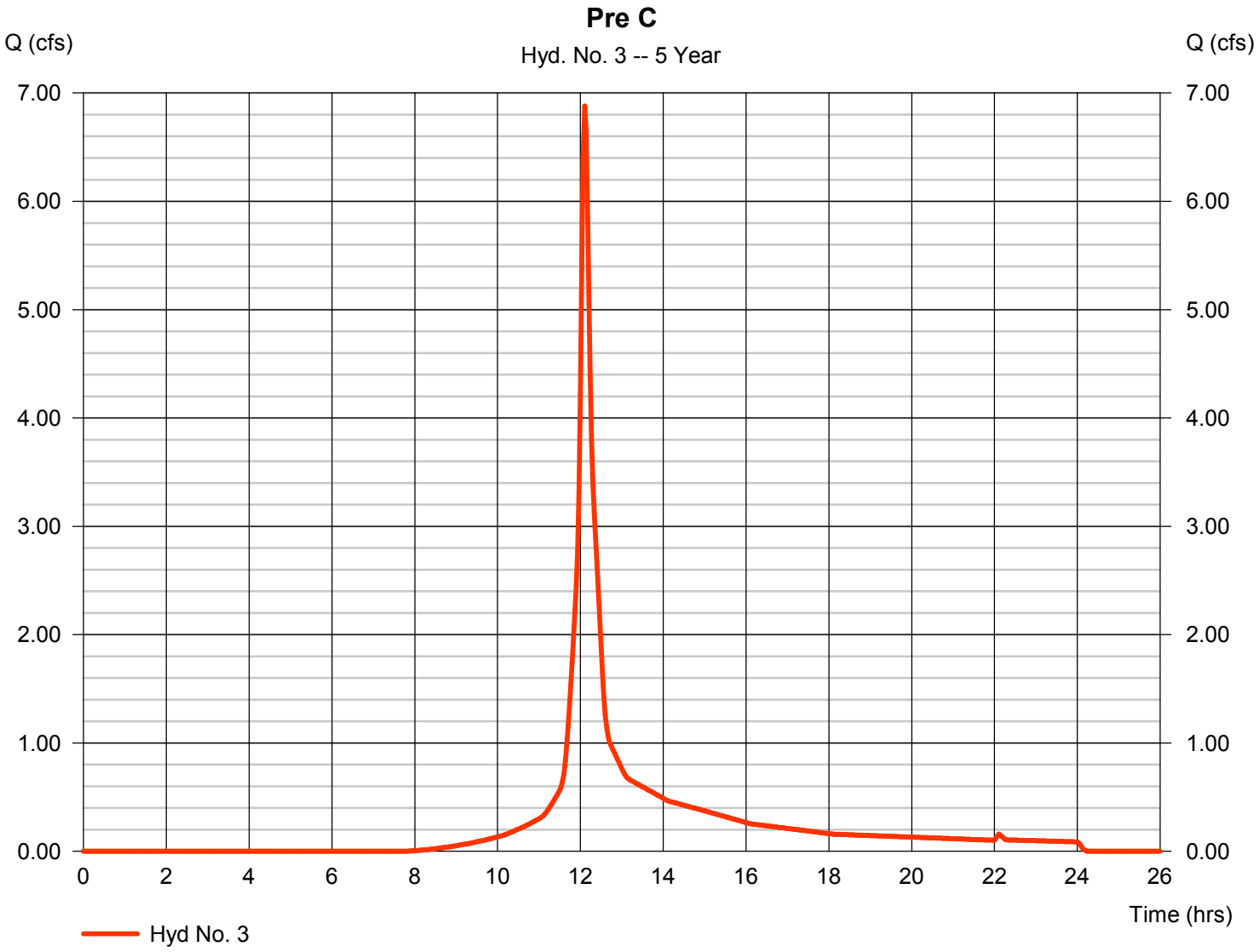


Hydrograph Report

Hyd. No. 3

Pre C

Hydrograph type	= SCS Runoff	Peak discharge	= 6.880 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 23,488 cuft
Drainage area	= 2.180 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.70 min
Total precip.	= 5.30 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

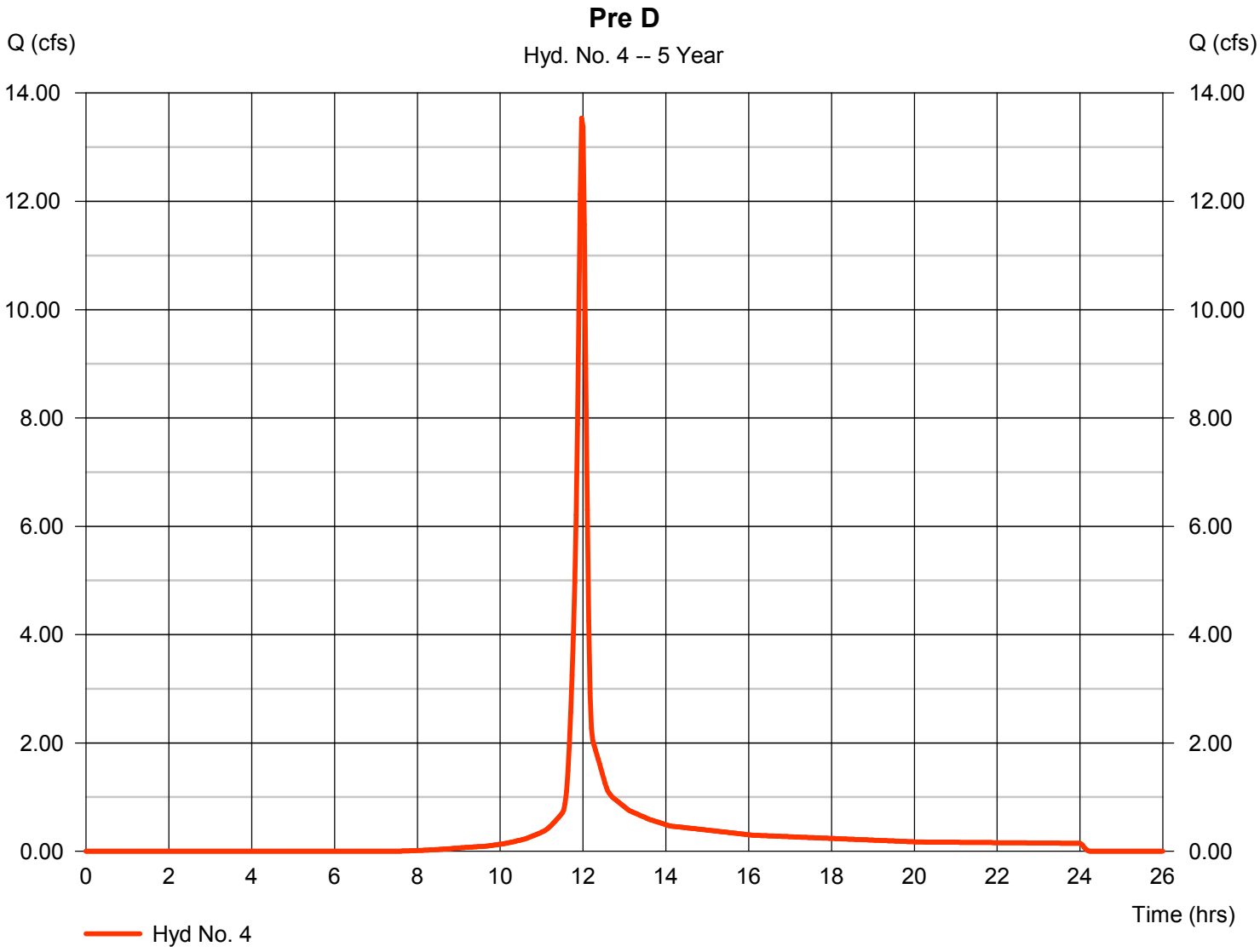


Hydrograph Report

Hyd. No. 4

Pre D

Hydrograph type	= SCS Runoff	Peak discharge	= 13.54 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 31,030 cuft
Drainage area	= 2.880 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.80 min
Total precip.	= 5.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

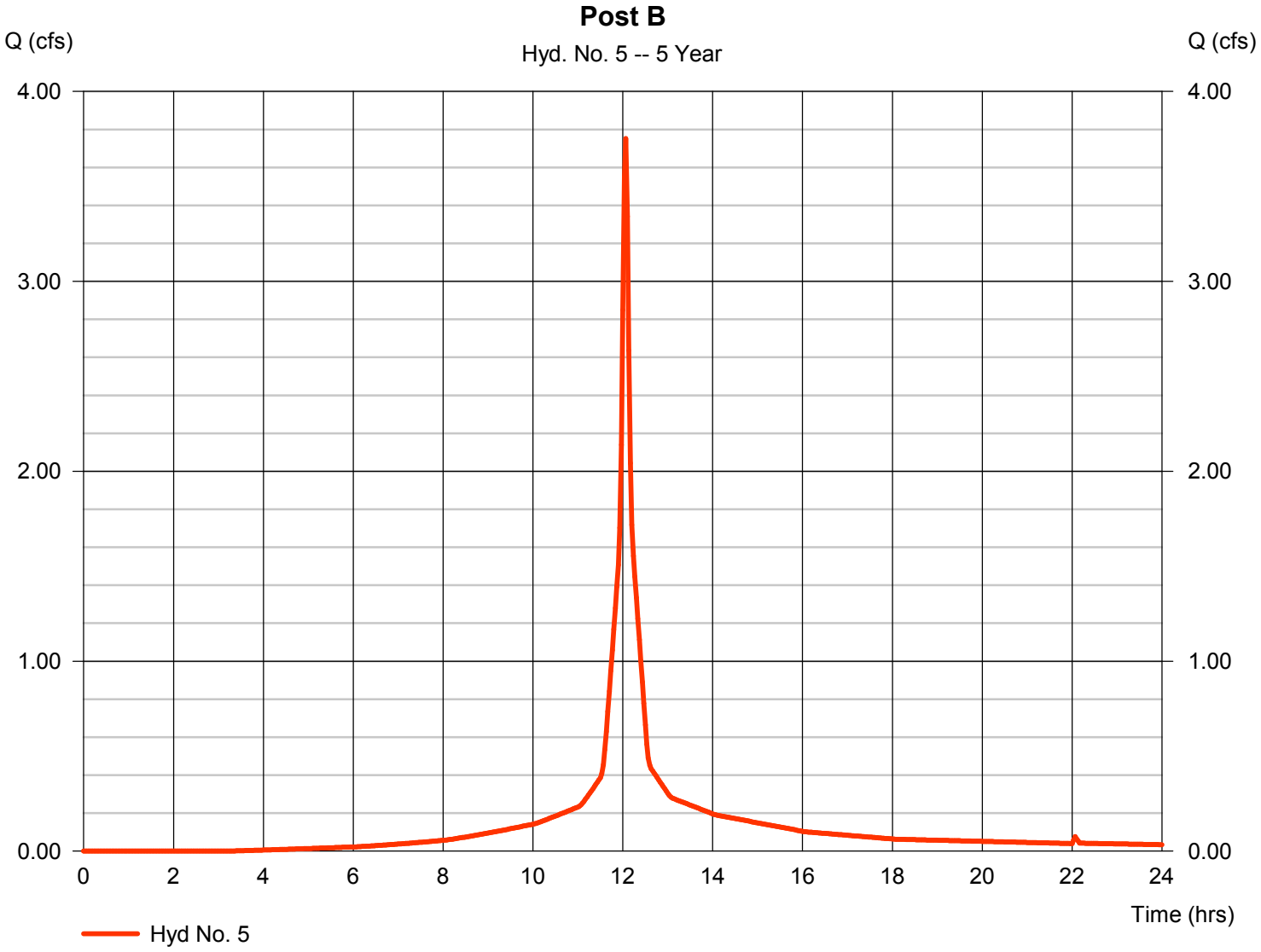


Hydrograph Report

Hyd. No. 5

Post B

Hydrograph type	= SCS Runoff	Peak discharge	= 3.752 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 11,932 cuft
Drainage area	= 0.800 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.30 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

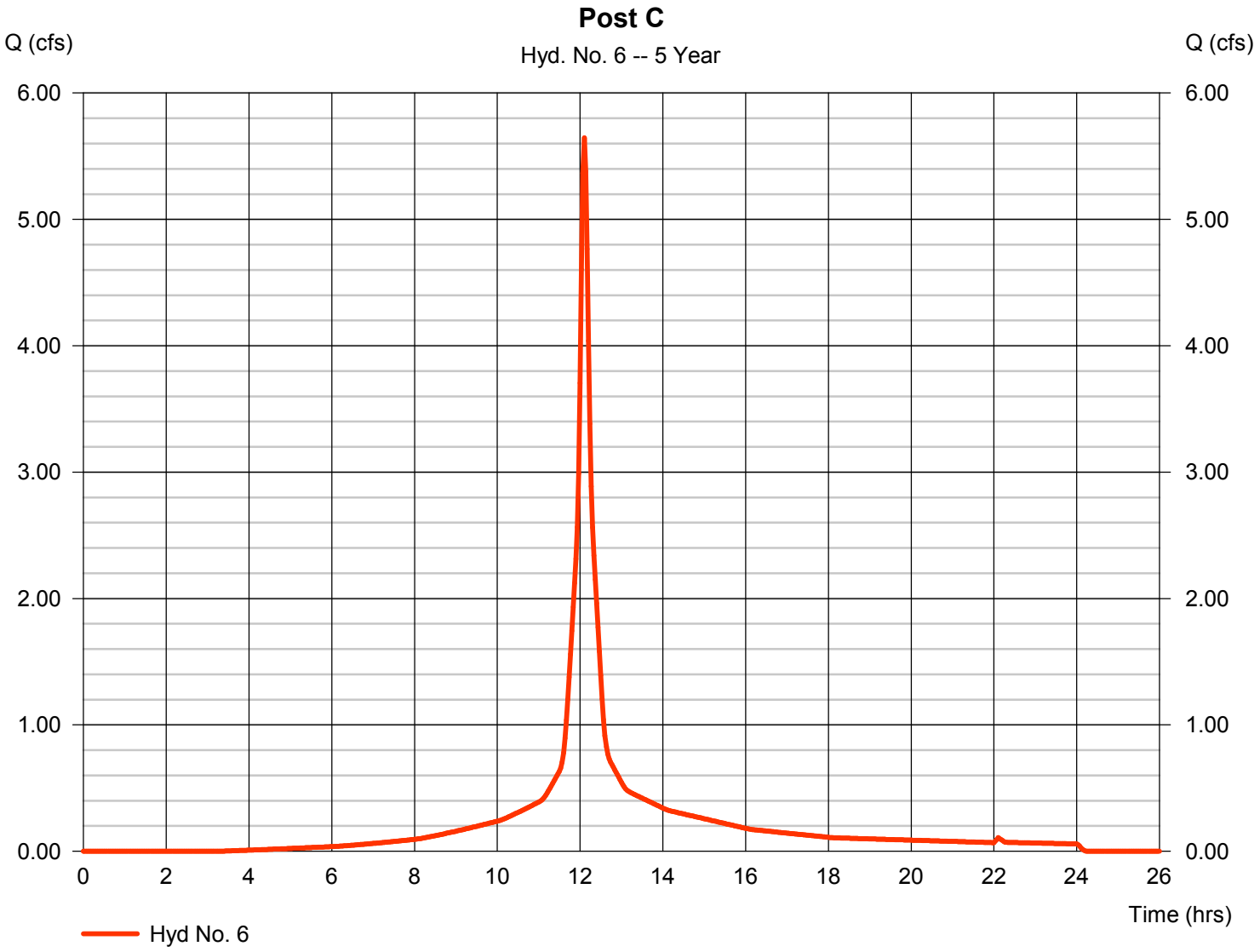


Hydrograph Report

Hyd. No. 6

Post C

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.645 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	20,363 cuft
Drainage area	=	1.280 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.00 min
Total precip.	=	5.30 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

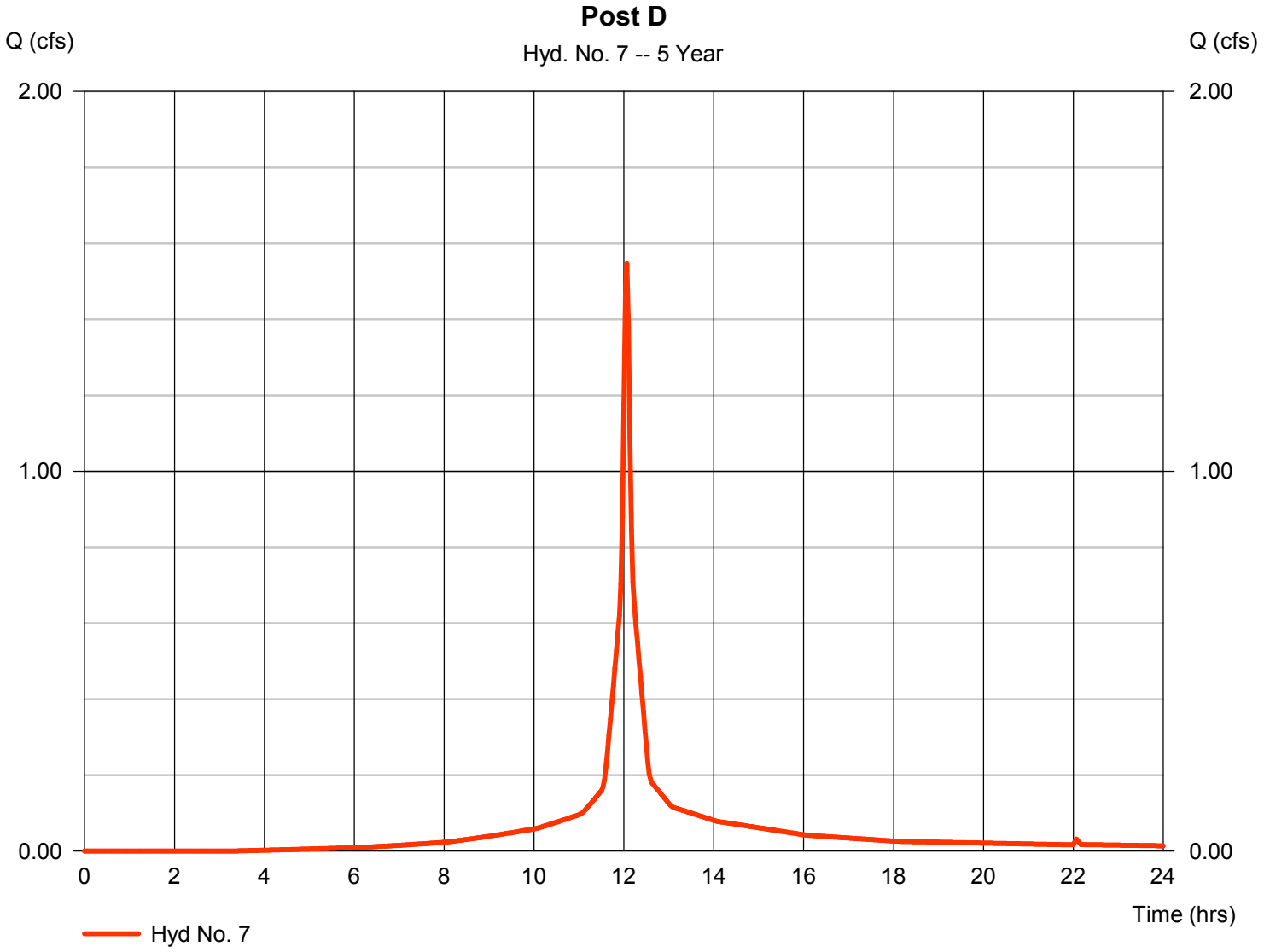


Hydrograph Report

Hyd. No. 7

Post D

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.548 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	4,922 cuft
Drainage area	=	0.330 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.30 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

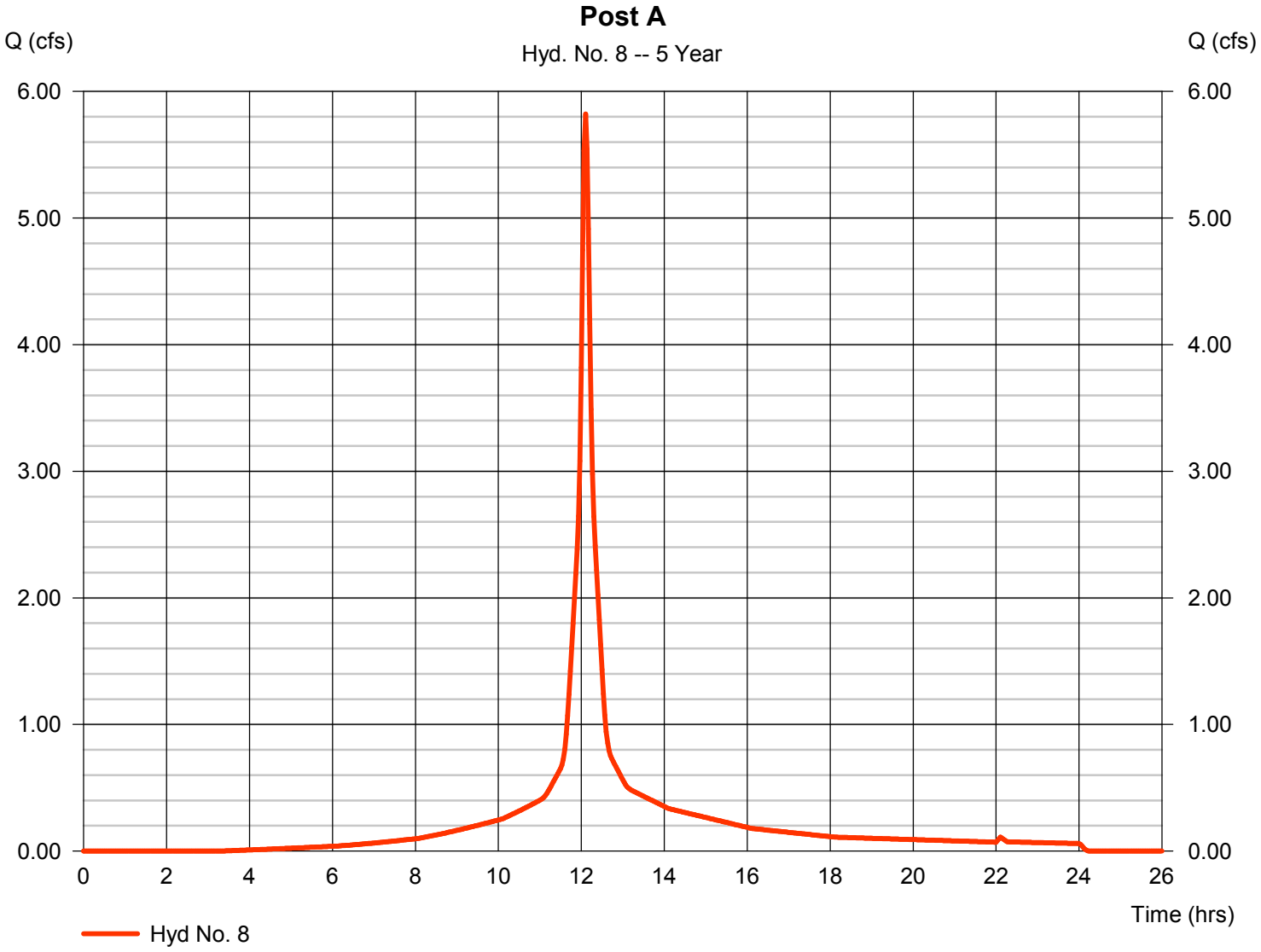


Hydrograph Report

Hyd. No. 8

Post A

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.821 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	21,000 cuft
Drainage area	=	1.320 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.00 min
Total precip.	=	5.30 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

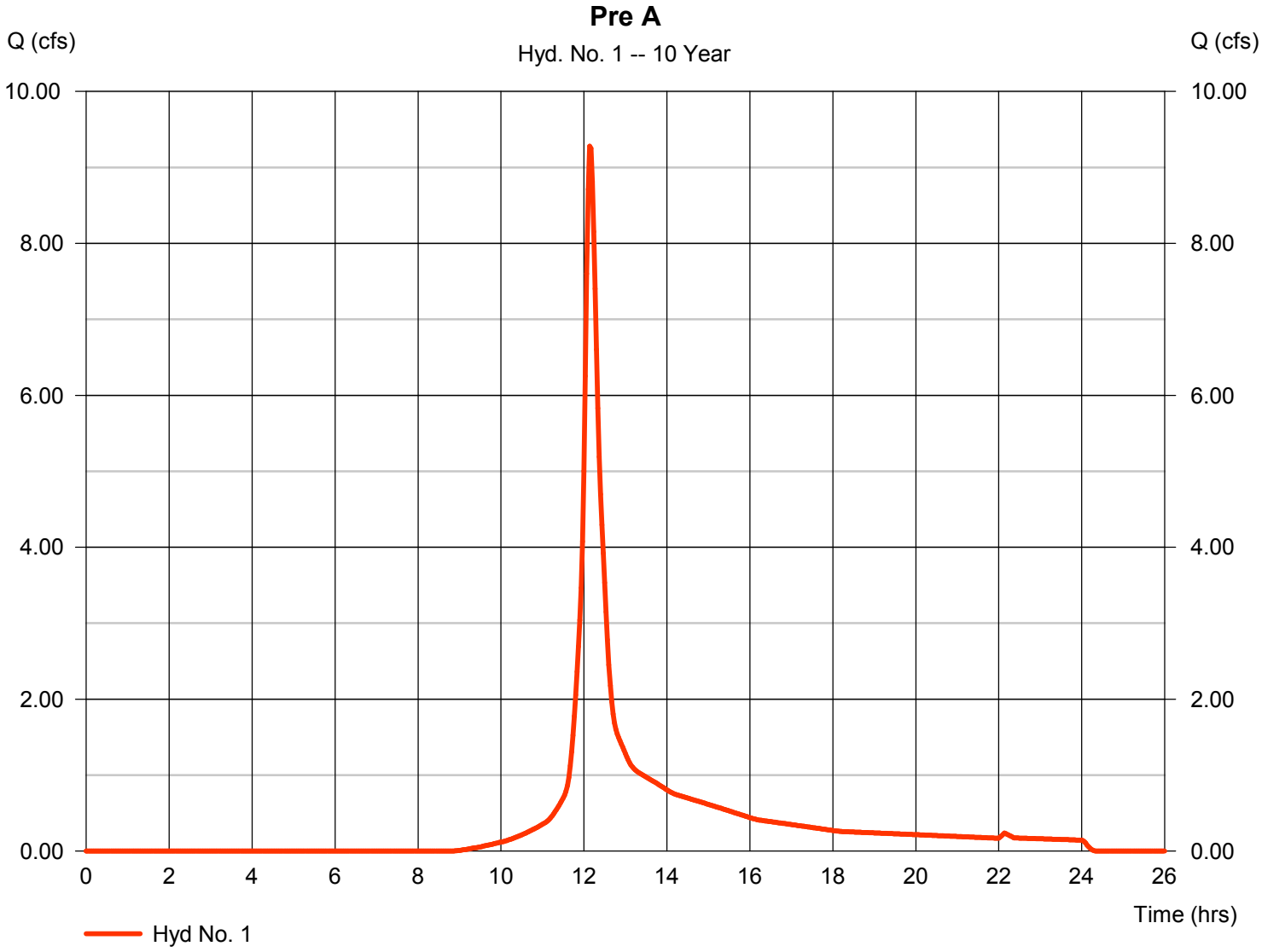
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	9.278	2	728	35,809	------	------	------	Pre A
2	SCS Runoff	7.109	2	726	24,294	------	------	------	Pre B
3	SCS Runoff	8.287	2	726	28,321	------	------	------	Pre C
4	SCS Runoff	16.26	2	718	37,415	------	------	------	Pre D
5	SCS Runoff	4.303	2	724	13,802	------	------	------	Post B
6	SCS Runoff	6.475	2	726	23,555	------	------	------	Post C
7	SCS Runoff	1.775	2	724	5,693	------	------	------	Post D
8	SCS Runoff	6.678	2	726	24,291	------	------	------	Post A

Hydrograph Report

Hyd. No. 1

Pre A

Hydrograph type	= SCS Runoff	Peak discharge	= 9.278 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 35,809 cuft
Drainage area	= 3.300 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 10.90 min
Total precip.	= 6.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

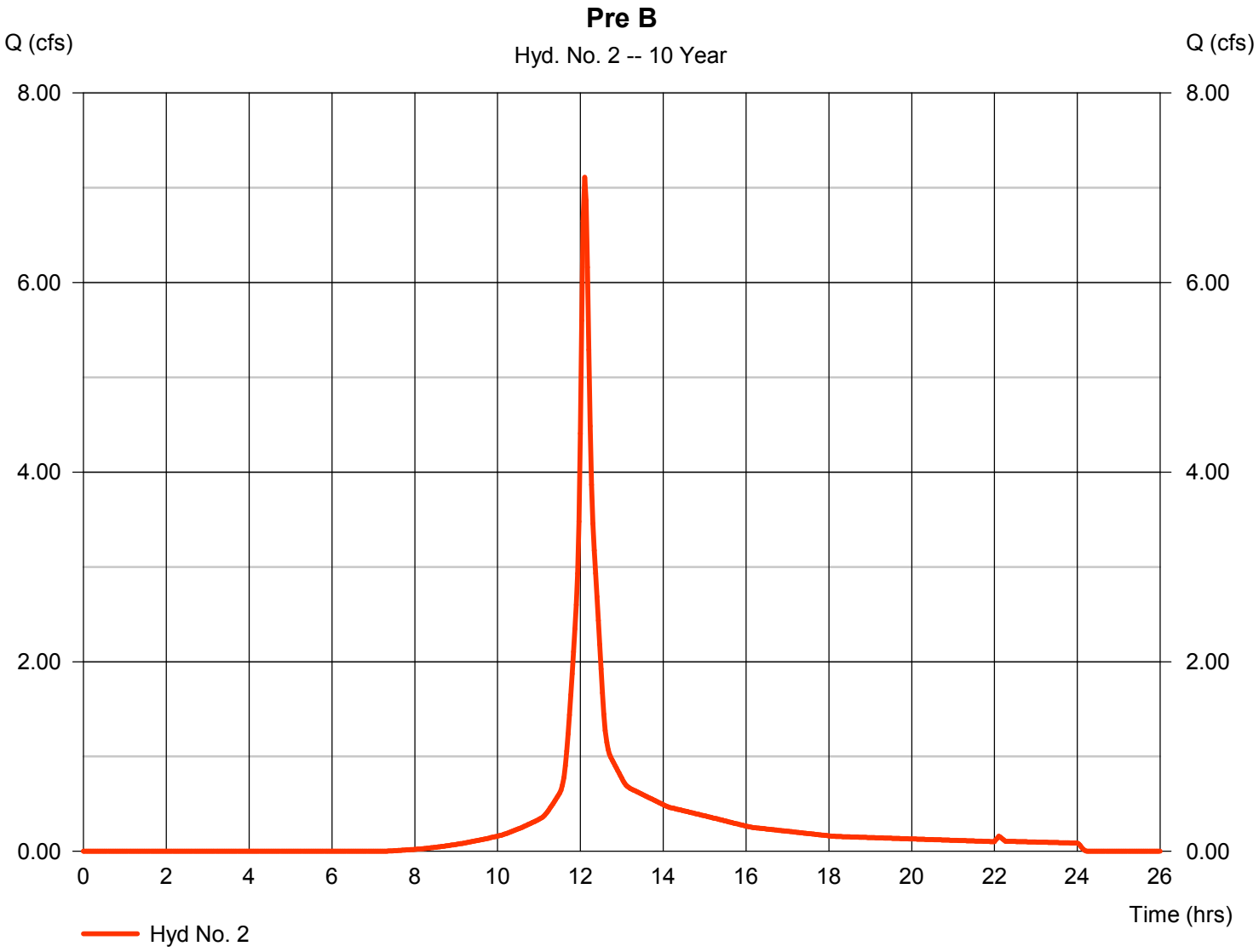


Hydrograph Report

Hyd. No. 2

Pre B

Hydrograph type	= SCS Runoff	Peak discharge	= 7.109 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 24,294 cuft
Drainage area	= 1.870 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.40 min
Total precip.	= 6.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

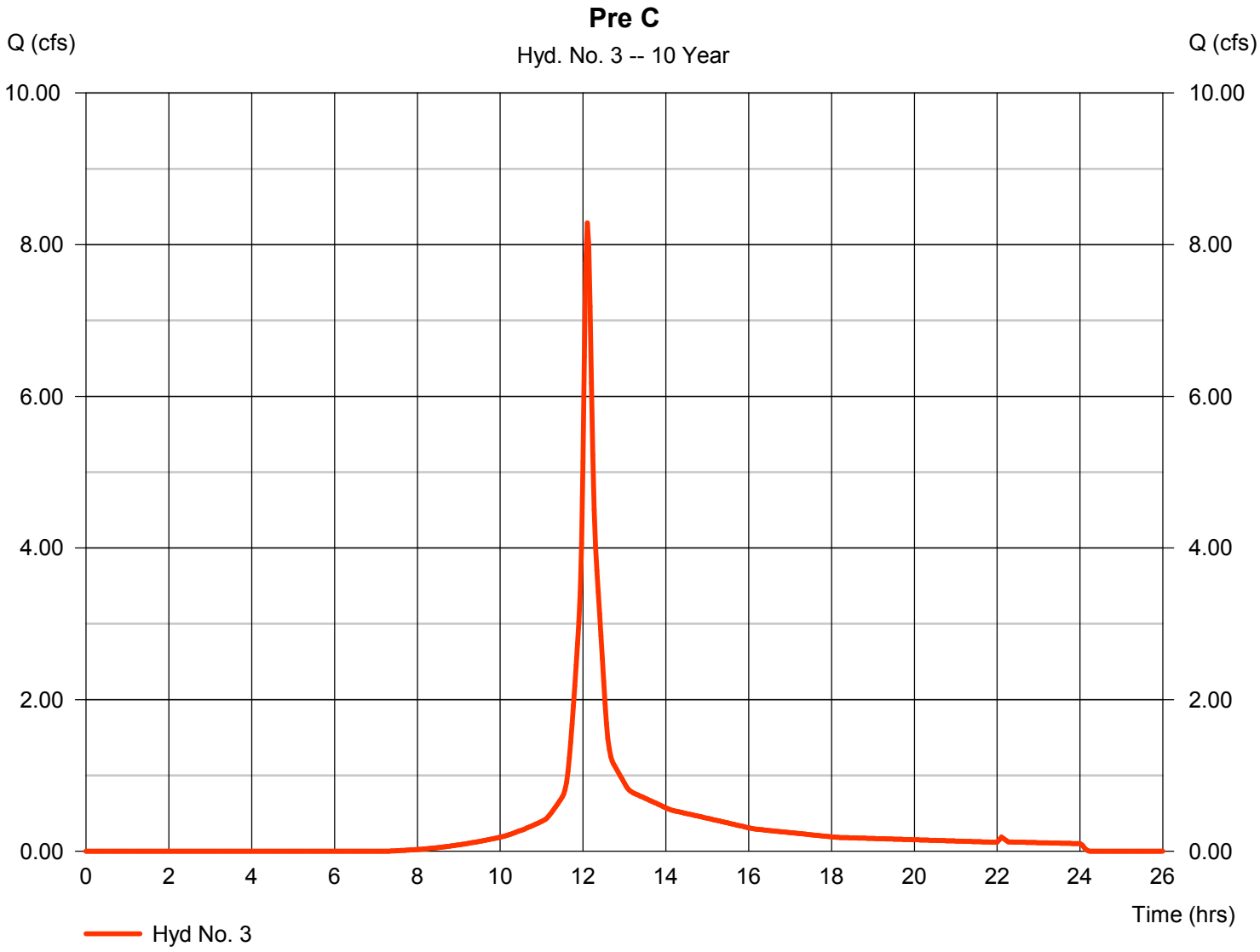


Hydrograph Report

Hyd. No. 3

Pre C

Hydrograph type	= SCS Runoff	Peak discharge	= 8.287 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 28,321 cuft
Drainage area	= 2.180 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.70 min
Total precip.	= 6.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

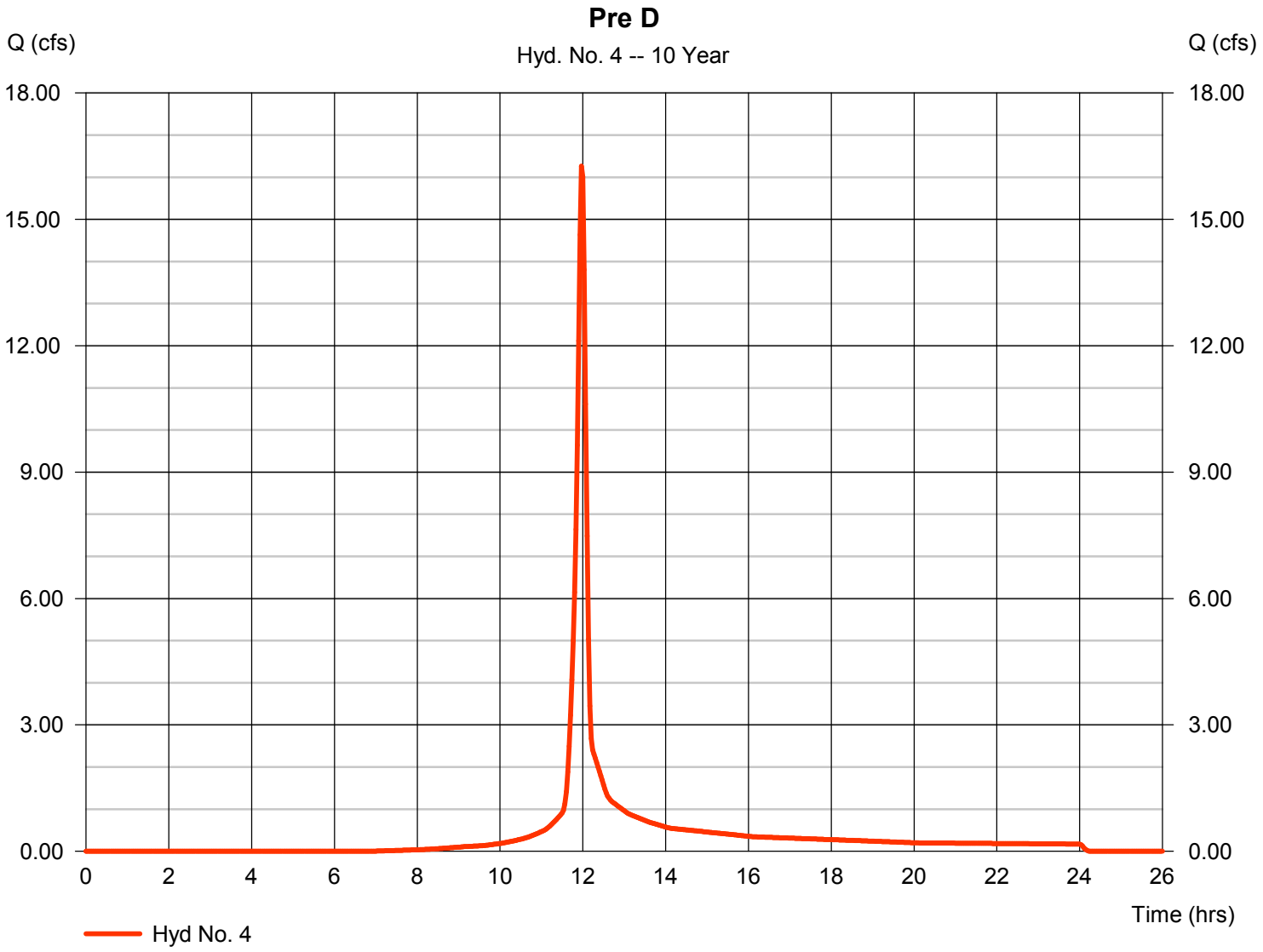


Hydrograph Report

Hyd. No. 4

Pre D

Hydrograph type	= SCS Runoff	Peak discharge	= 16.26 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 37,415 cuft
Drainage area	= 2.880 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.80 min
Total precip.	= 6.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

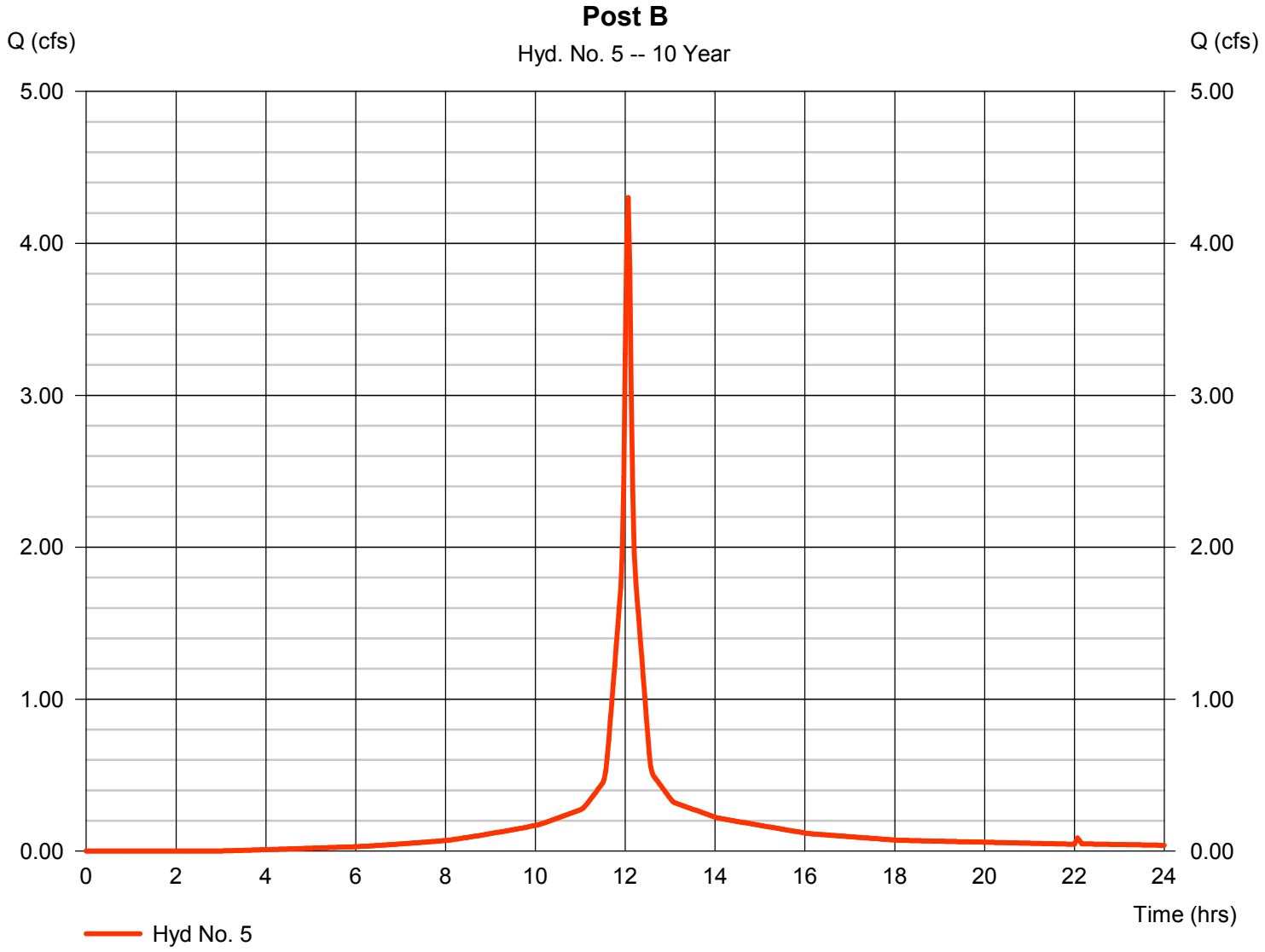


Hydrograph Report

Hyd. No. 5

Post B

Hydrograph type	= SCS Runoff	Peak discharge	= 4.303 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 13,802 cuft
Drainage area	= 0.800 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

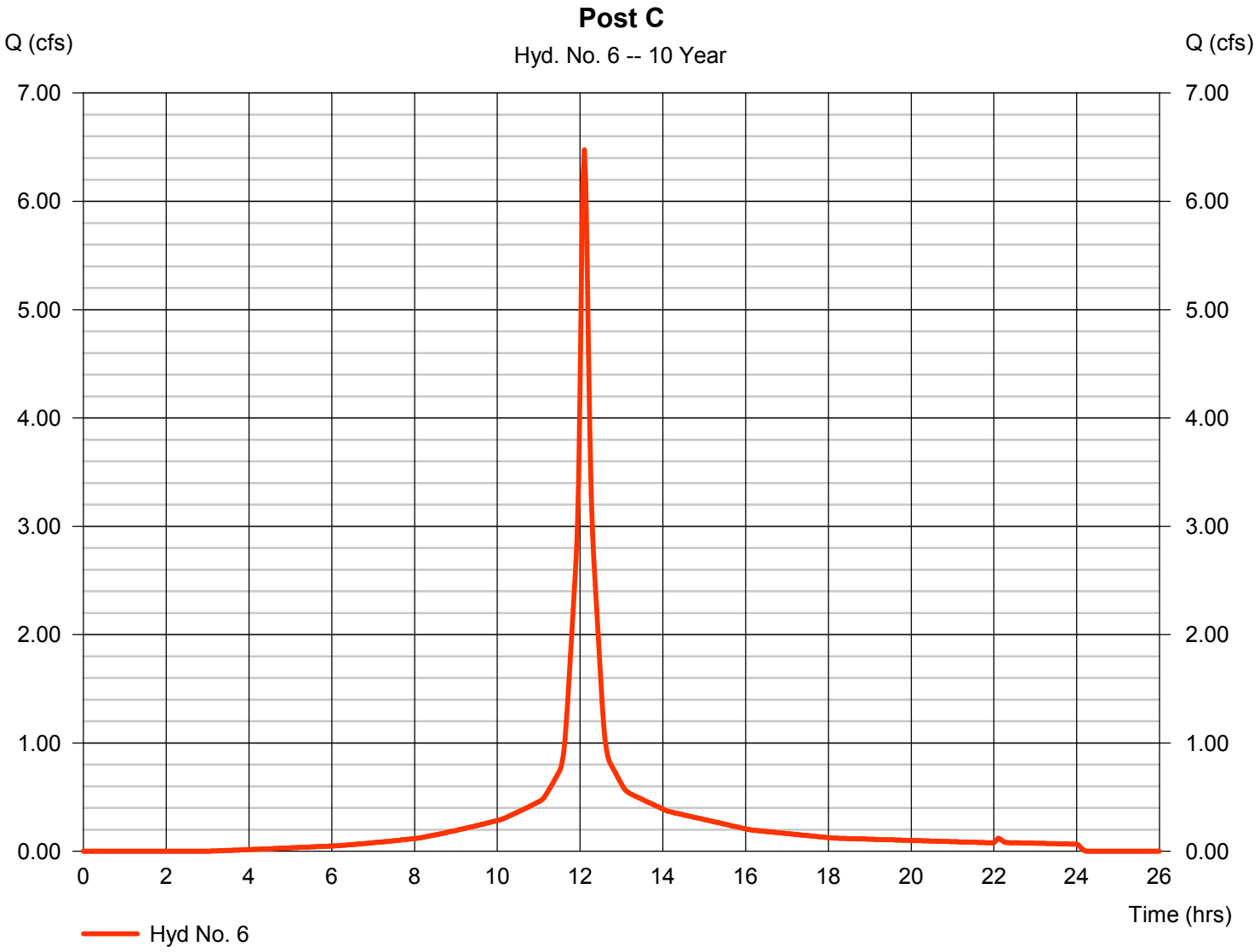


Hydrograph Report

Hyd. No. 6

Post C

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.475 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	23,555 cuft
Drainage area	=	1.280 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.00 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

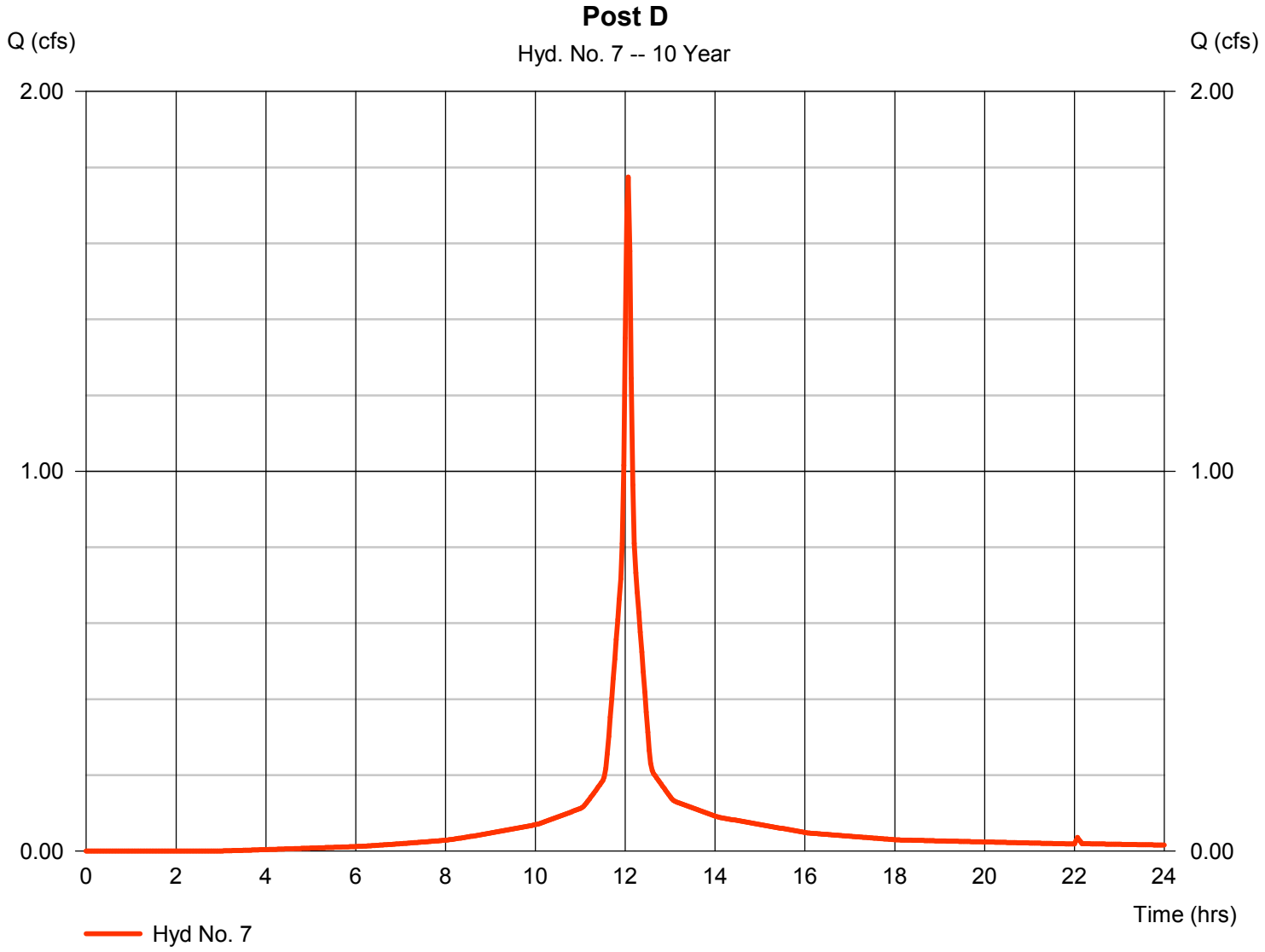


Hydrograph Report

Hyd. No. 7

Post D

Hydrograph type	= SCS Runoff	Peak discharge	= 1.775 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 5,693 cuft
Drainage area	= 0.330 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

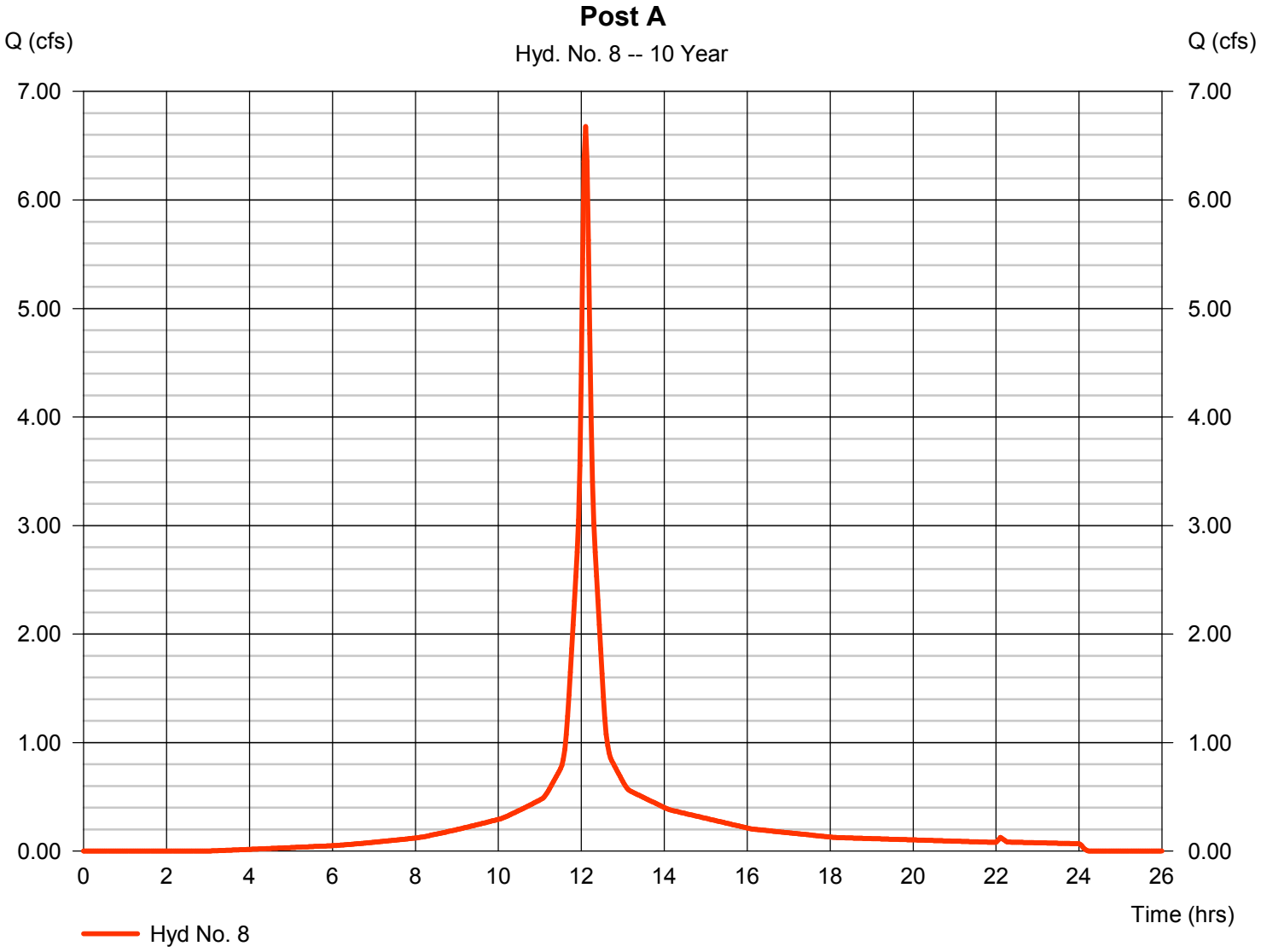


Hydrograph Report

Hyd. No. 8

Post A

Hydrograph type	= SCS Runoff	Peak discharge	= 6.678 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 24,291 cuft
Drainage area	= 1.320 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 6.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

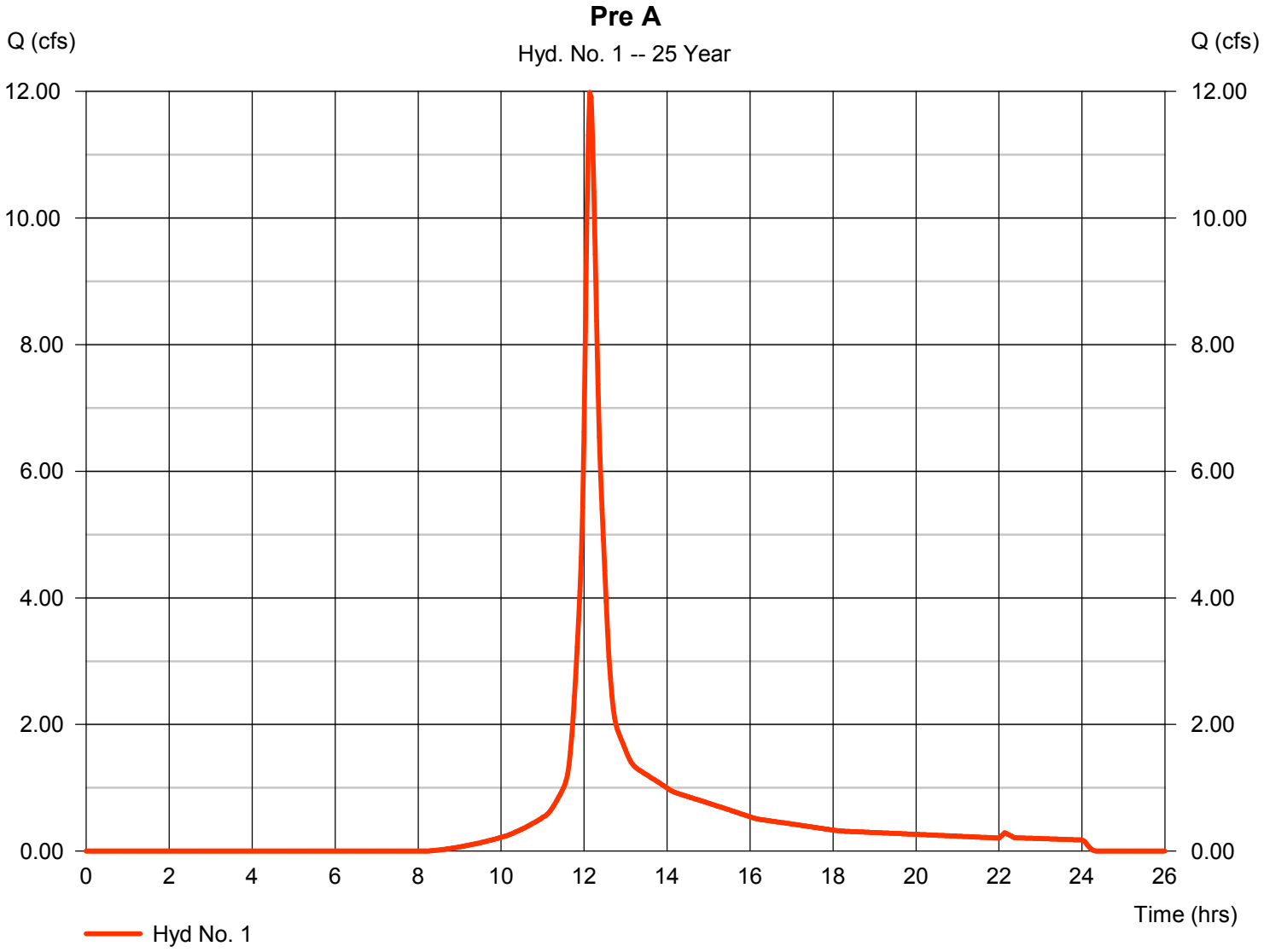
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	11.98	2	728	45,997	------	------	------	Pre A
2	SCS Runoff	8.856	2	726	30,376	------	------	------	Pre B
3	SCS Runoff	10.32	2	726	35,411	------	------	------	Pre C
4	SCS Runoff	20.20	2	718	46,782	------	------	------	Pre D
5	SCS Runoff	5.085	2	724	16,484	------	------	------	Post B
6	SCS Runoff	7.656	2	726	28,133	------	------	------	Post C
7	SCS Runoff	2.098	2	724	6,800	------	------	------	Post D
8	SCS Runoff	7.895	2	726	29,012	------	------	------	Post A

Hydrograph Report

Hyd. No. 1

Pre A

Hydrograph type	= SCS Runoff	Peak discharge	= 11.98 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 45,997 cuft
Drainage area	= 3.300 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 10.90 min
Total precip.	= 7.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

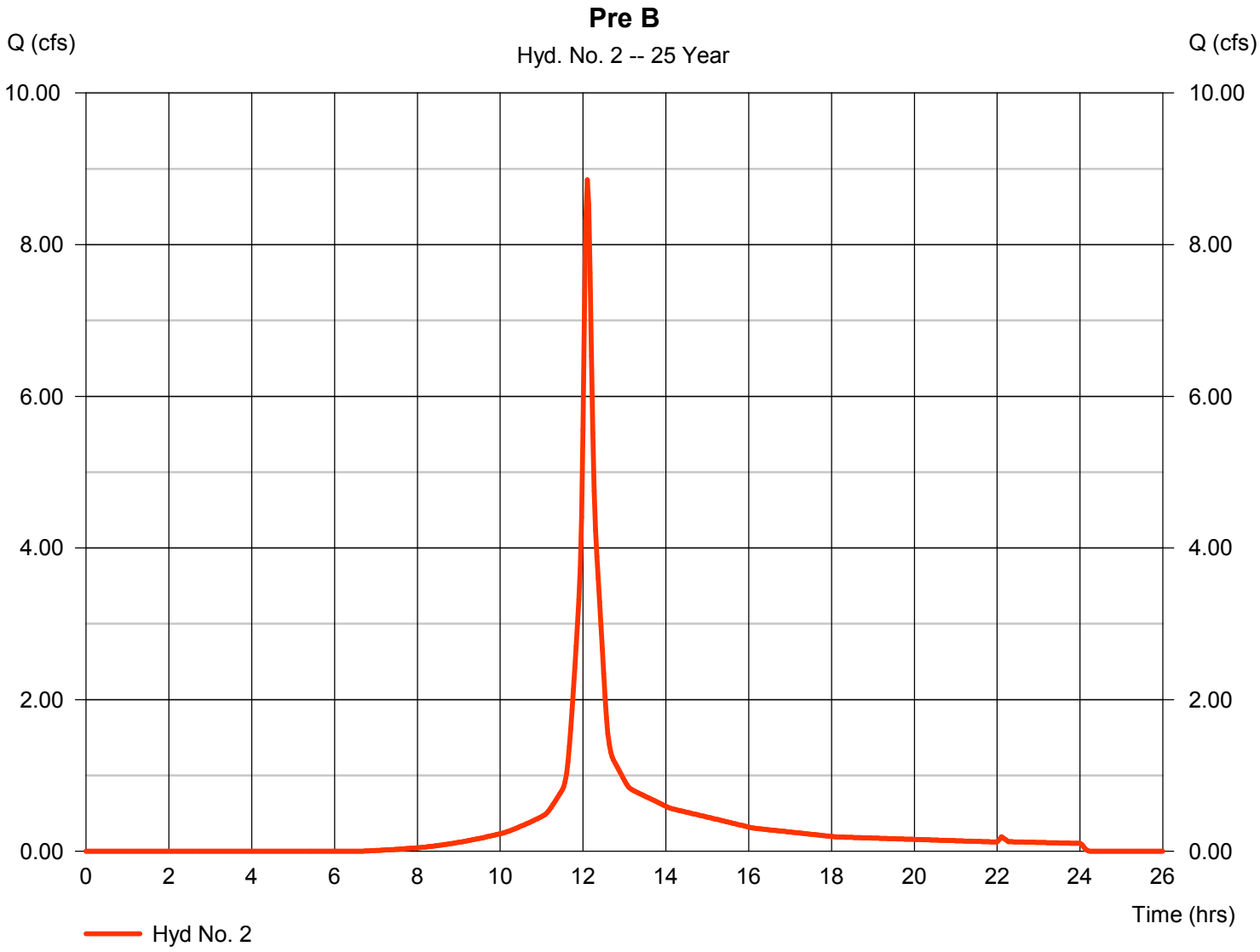


Hydrograph Report

Hyd. No. 2

Pre B

Hydrograph type	= SCS Runoff	Peak discharge	= 8.856 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 30,376 cuft
Drainage area	= 1.870 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.40 min
Total precip.	= 7.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

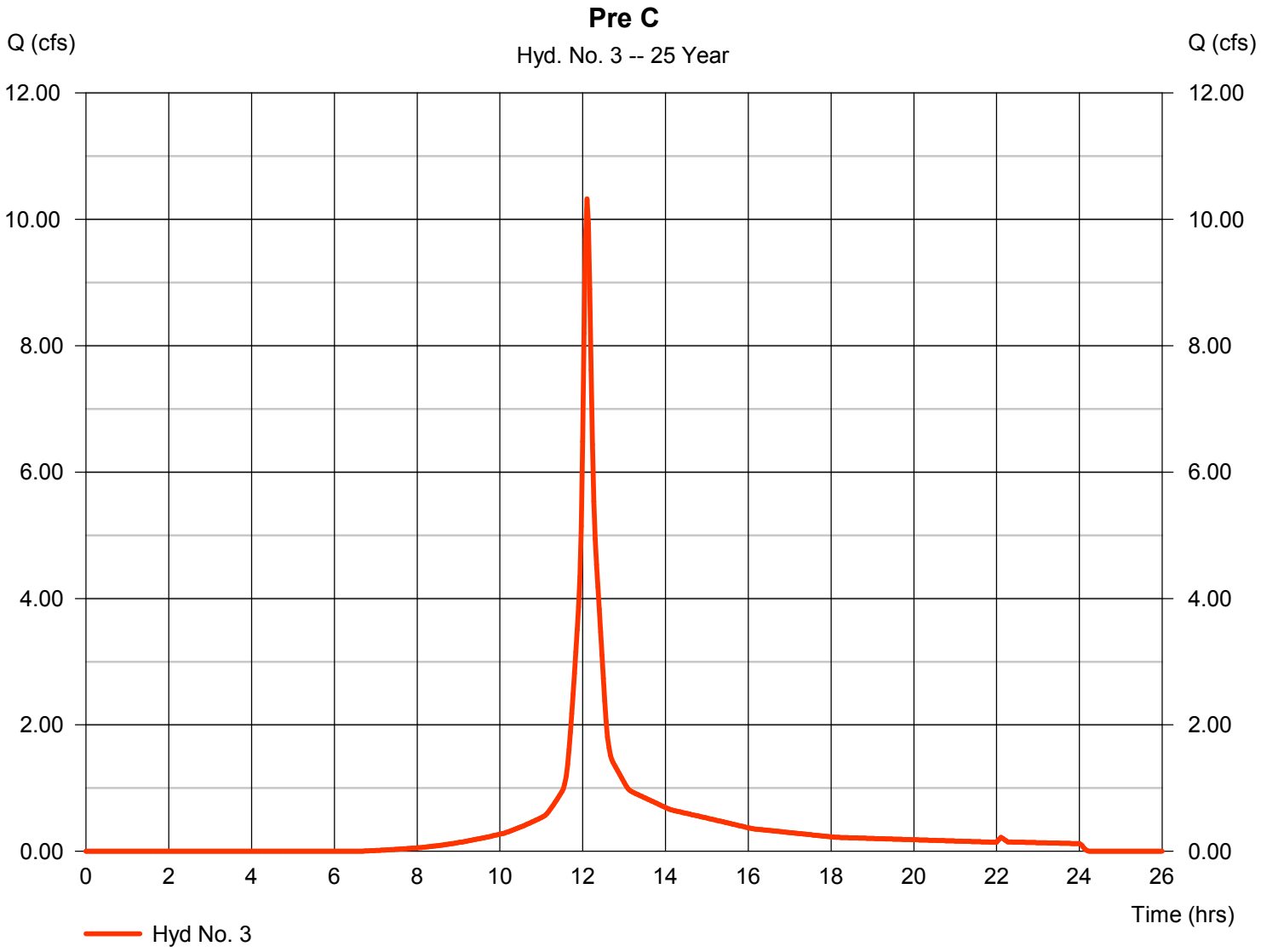


Hydrograph Report

Hyd. No. 3

Pre C

Hydrograph type	= SCS Runoff	Peak discharge	= 10.32 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 35,411 cuft
Drainage area	= 2.180 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.70 min
Total precip.	= 7.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

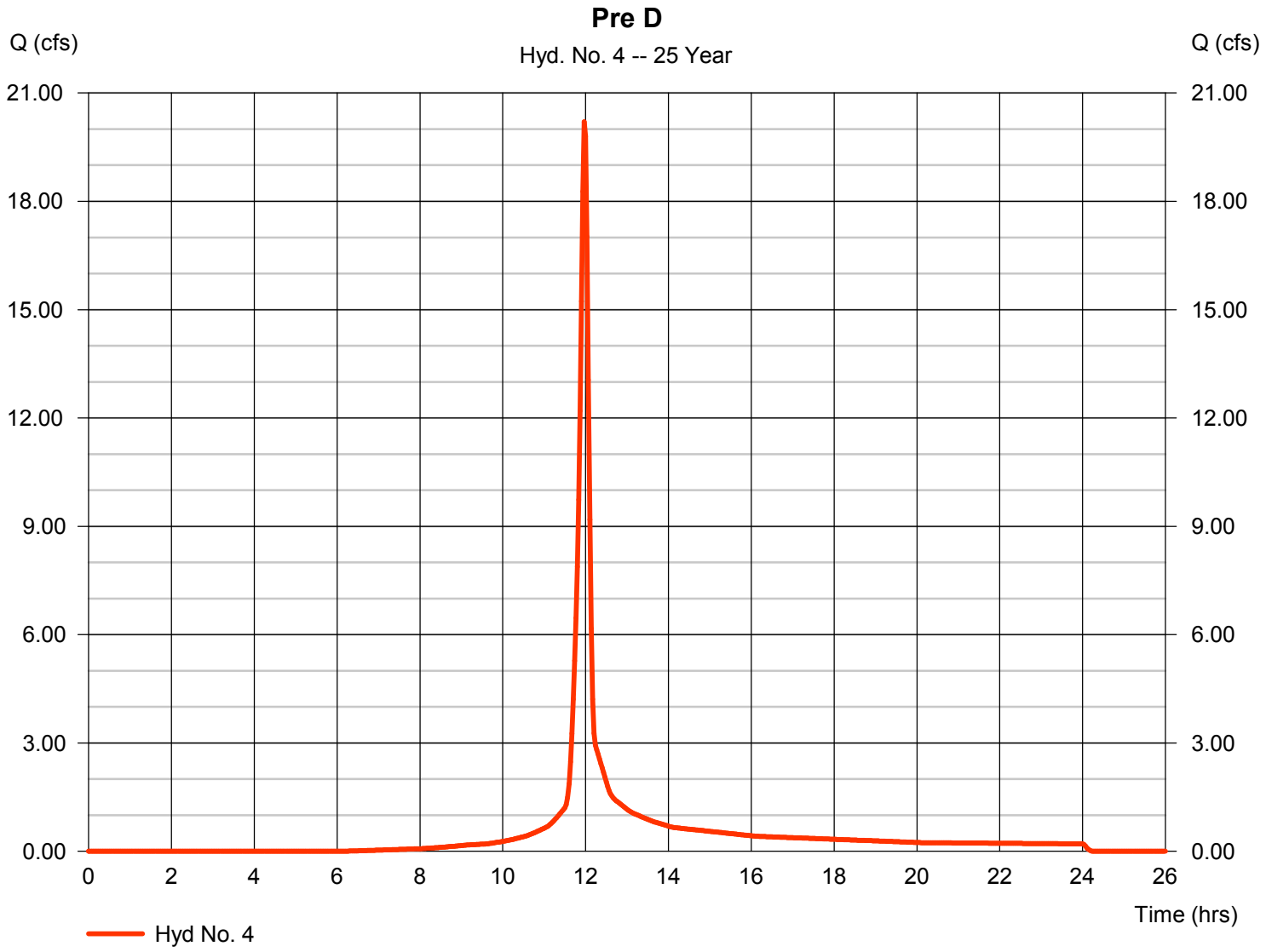


Hydrograph Report

Hyd. No. 4

Pre D

Hydrograph type	= SCS Runoff	Peak discharge	= 20.20 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 46,782 cuft
Drainage area	= 2.880 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.80 min
Total precip.	= 7.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

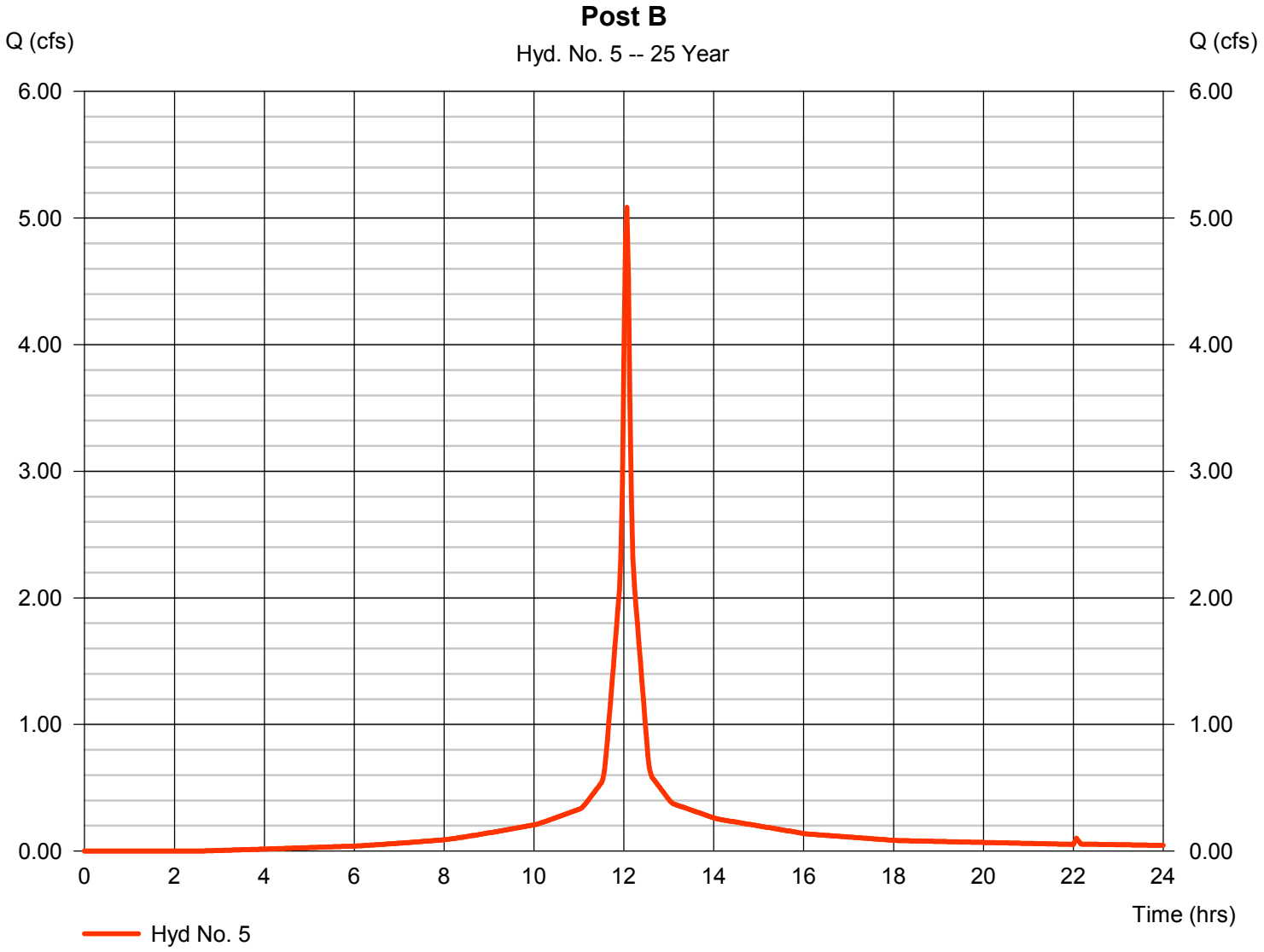


Hydrograph Report

Hyd. No. 5

Post B

Hydrograph type	= SCS Runoff	Peak discharge	= 5.085 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 16,484 cuft
Drainage area	= 0.800 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

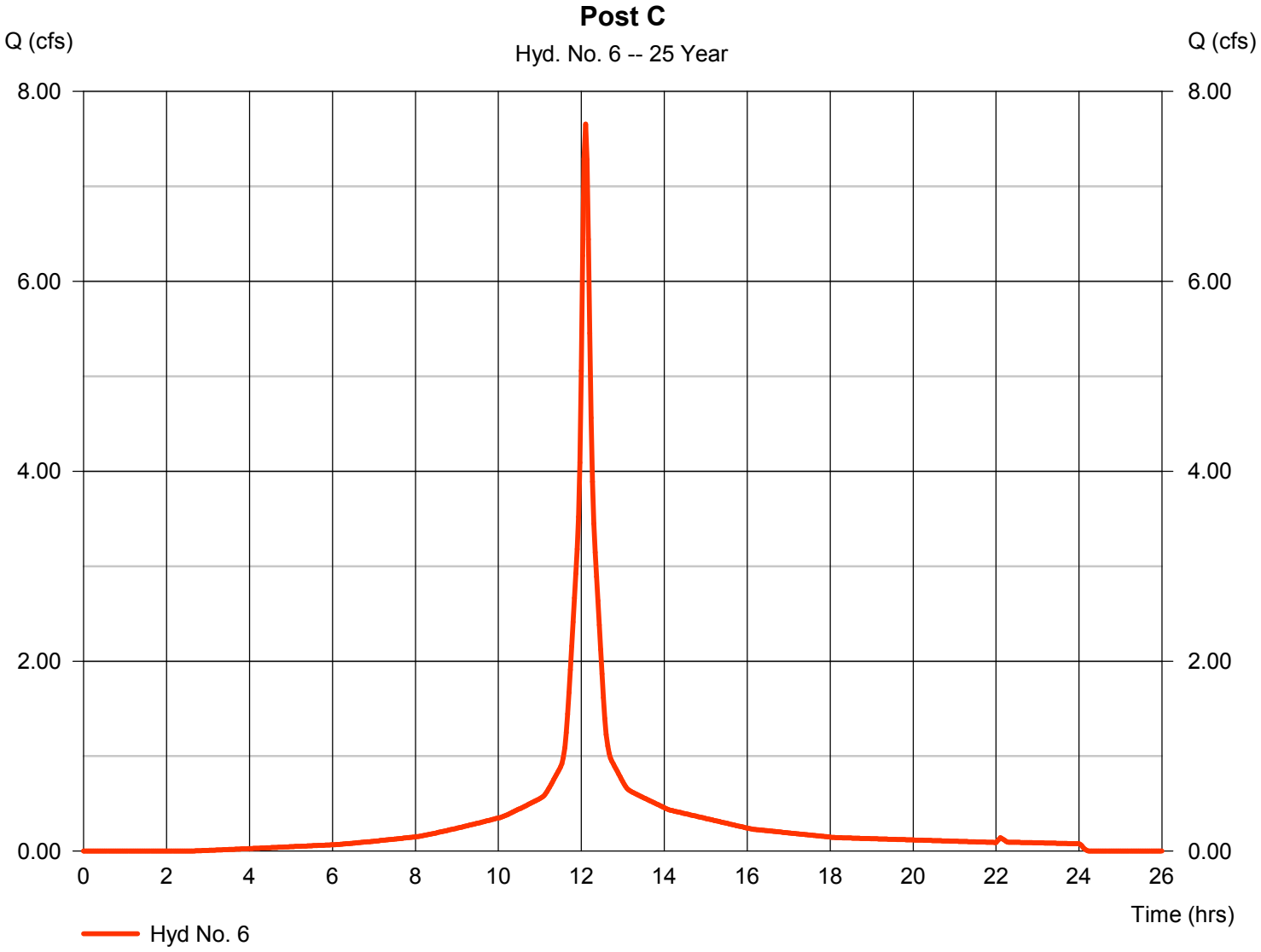


Hydrograph Report

Hyd. No. 6

Post C

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.656 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	28,133 cuft
Drainage area	=	1.280 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.00 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

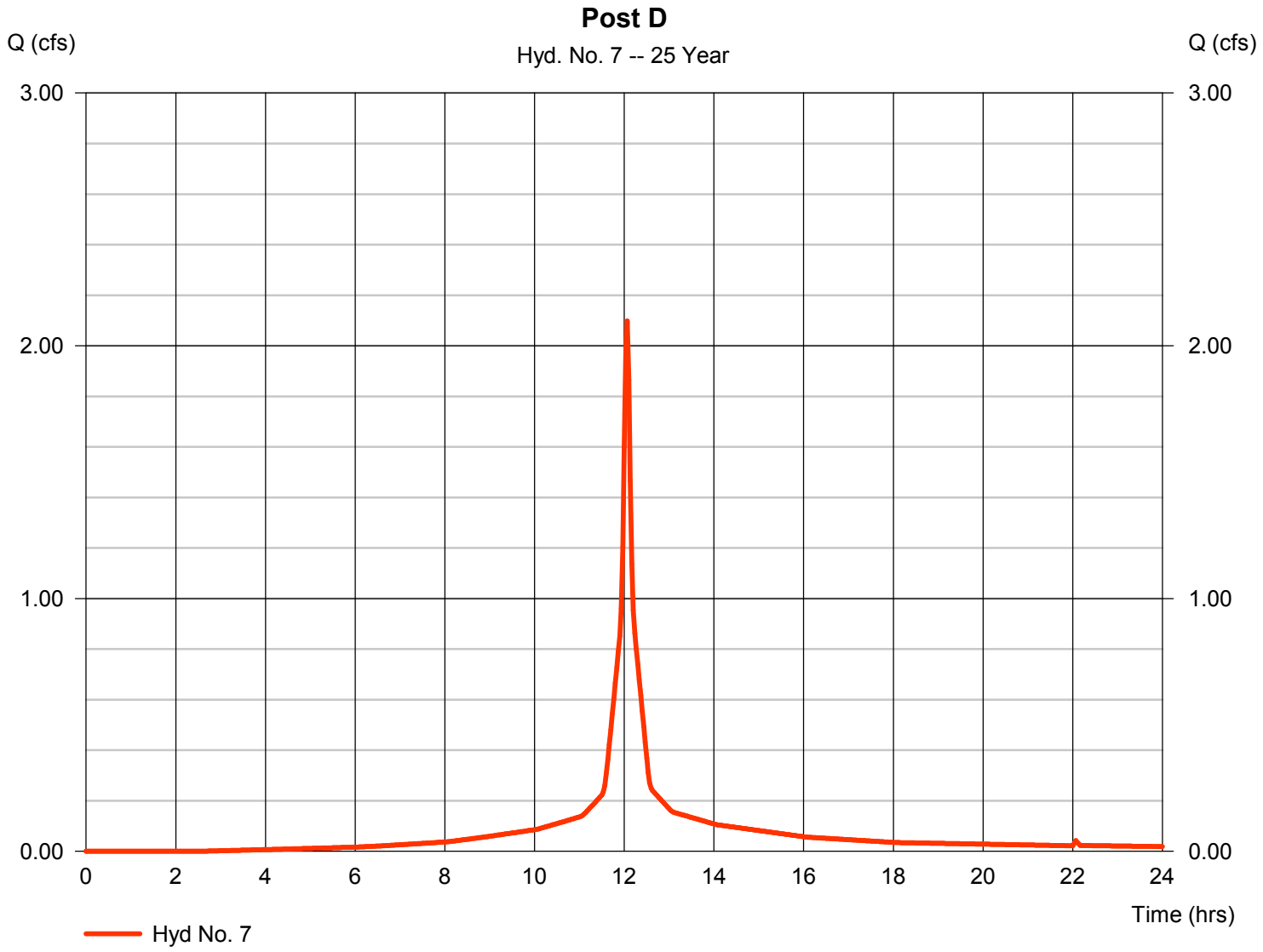


Hydrograph Report

Hyd. No. 7

Post D

Hydrograph type	= SCS Runoff	Peak discharge	= 2.098 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 6,800 cuft
Drainage area	= 0.330 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

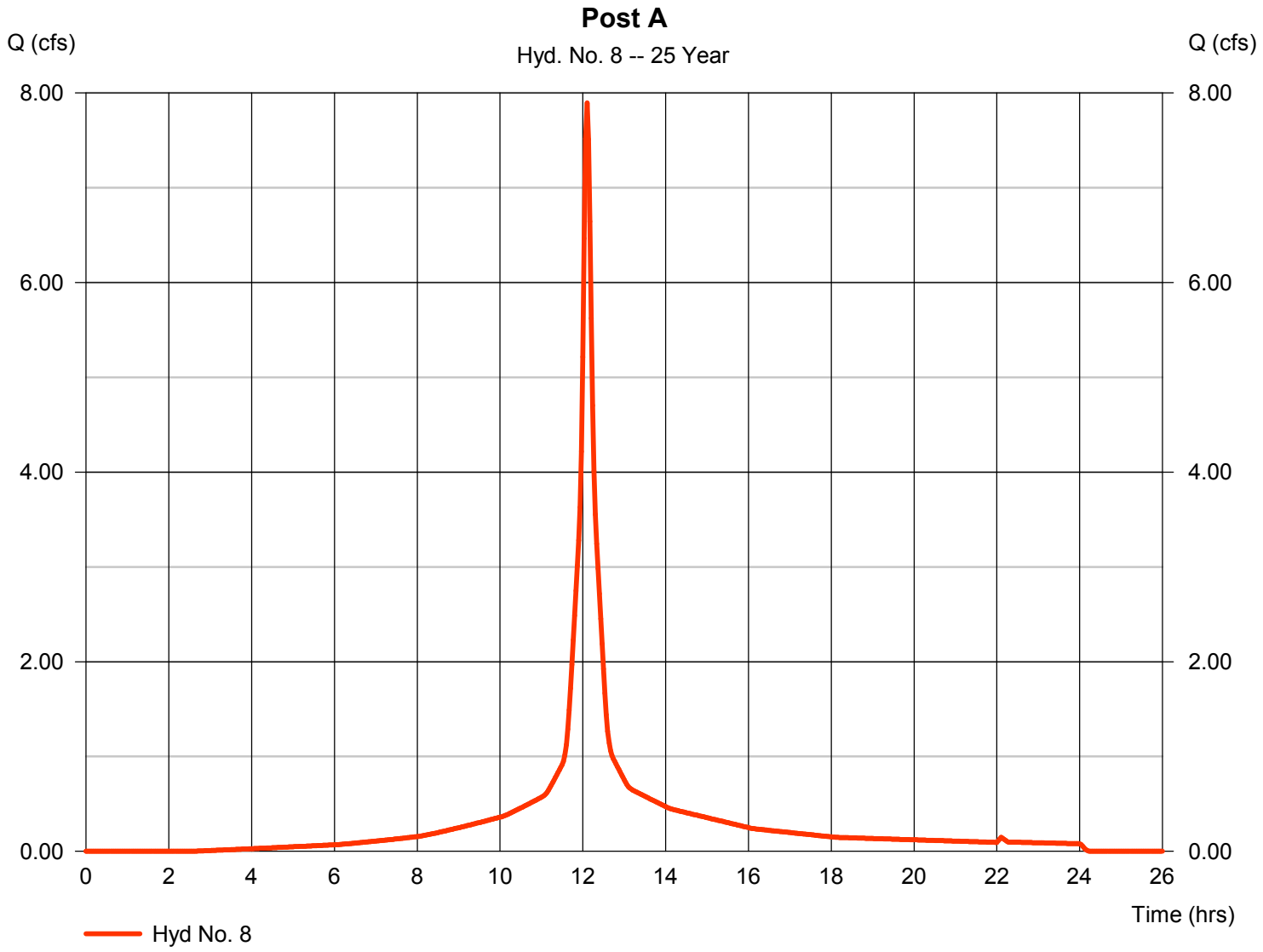


Hydrograph Report

Hyd. No. 8

Post A

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.895 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	29,012 cuft
Drainage area	=	1.320 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.00 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

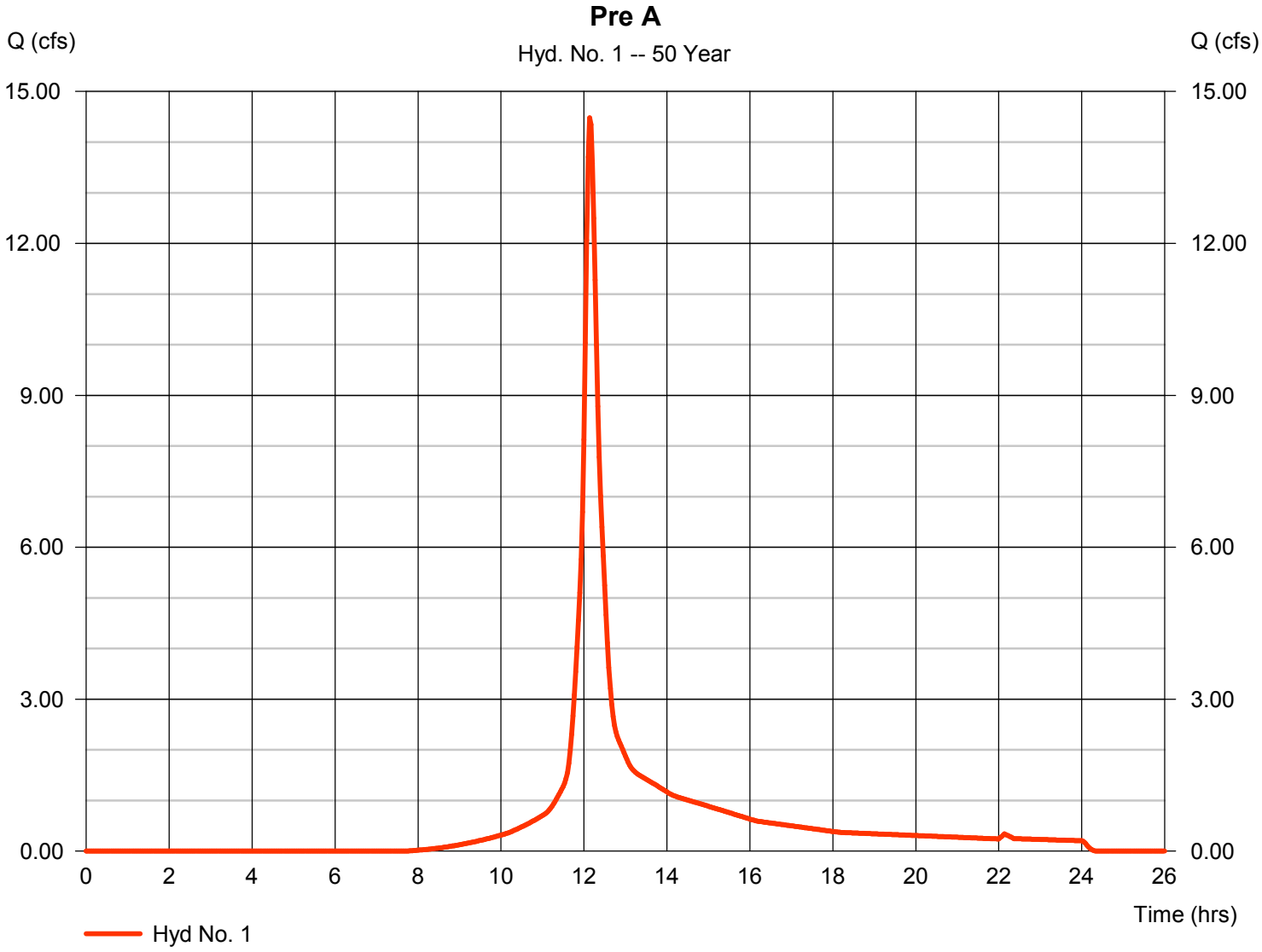
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	14.48	2	728	55,497	------	------	------	Pre A
2	SCS Runoff	10.44	2	726	35,968	------	------	------	Pre B
3	SCS Runoff	12.17	2	726	41,930	------	------	------	Pre C
4	SCS Runoff	23.77	2	718	55,394	------	------	------	Pre D
5	SCS Runoff	5.786	2	724	18,906	------	------	------	Post B
6	SCS Runoff	8.713	2	726	32,267	------	------	------	Post C
7	SCS Runoff	2.387	2	724	7,799	------	------	------	Post D
8	SCS Runoff	8.985	2	726	33,275	------	------	------	Post A

Hydrograph Report

Hyd. No. 1

Pre A

Hydrograph type	=	SCS Runoff	Peak discharge	=	14.48 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.13 hrs
Time interval	=	2 min	Hyd. volume	=	55,497 cuft
Drainage area	=	3.300 ac	Curve number	=	71
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.90 min
Total precip.	=	7.90 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

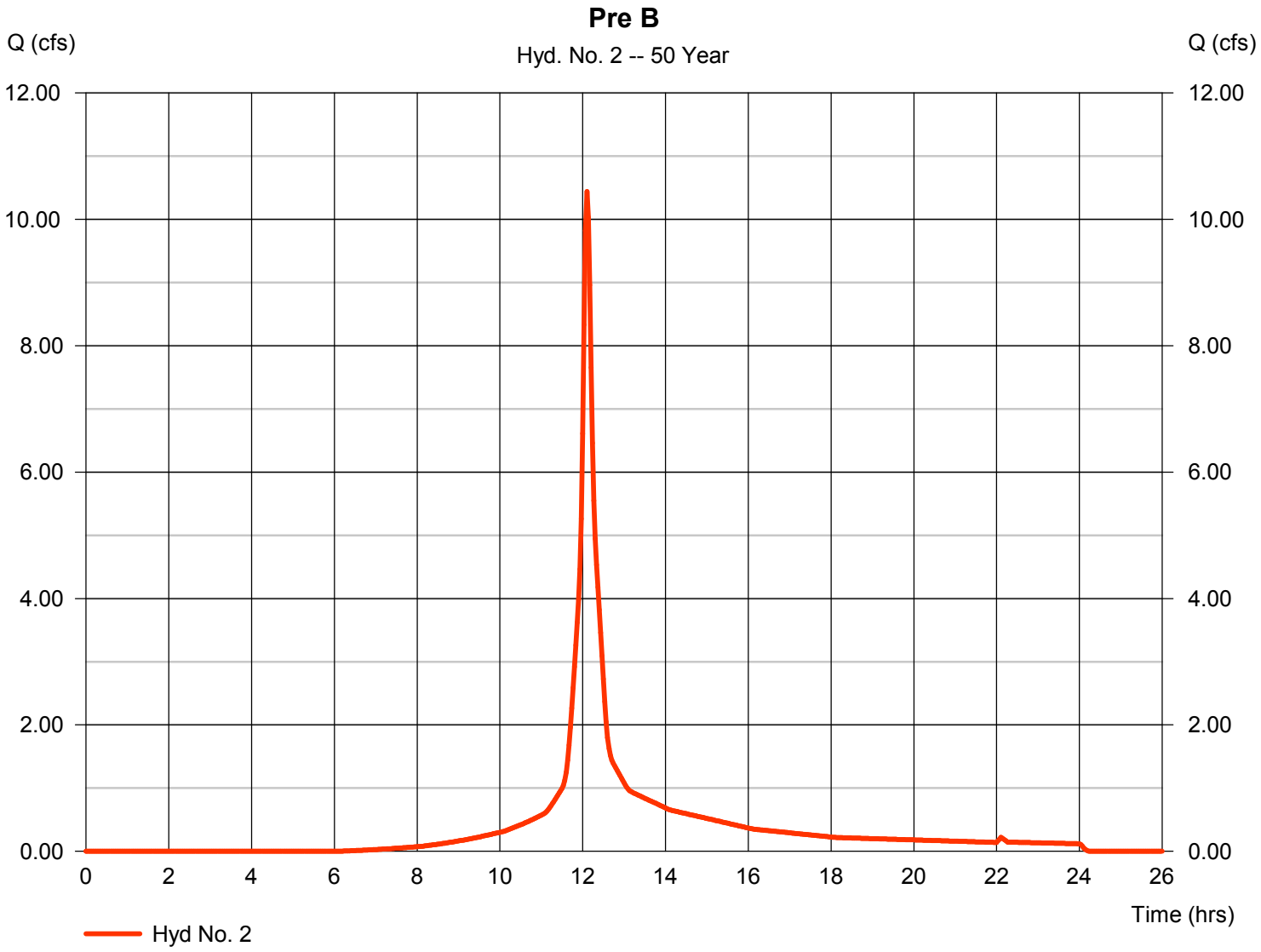


Hydrograph Report

Hyd. No. 2

Pre B

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.44 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	35,968 cuft
Drainage area	=	1.870 ac	Curve number	=	78
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.40 min
Total precip.	=	7.90 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

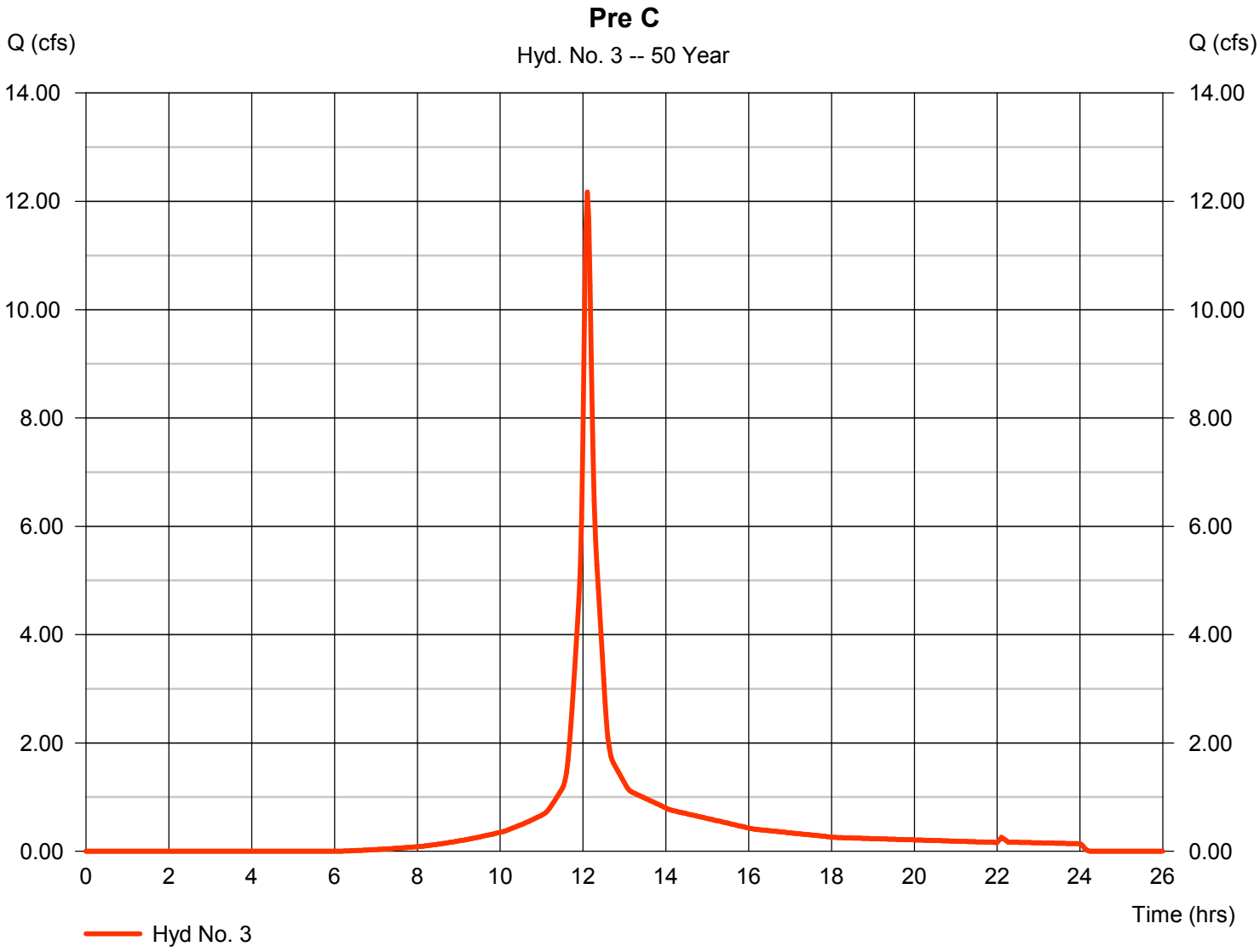


Hydrograph Report

Hyd. No. 3

Pre C

Hydrograph type	= SCS Runoff	Peak discharge	= 12.17 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 41,930 cuft
Drainage area	= 2.180 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.70 min
Total precip.	= 7.90 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

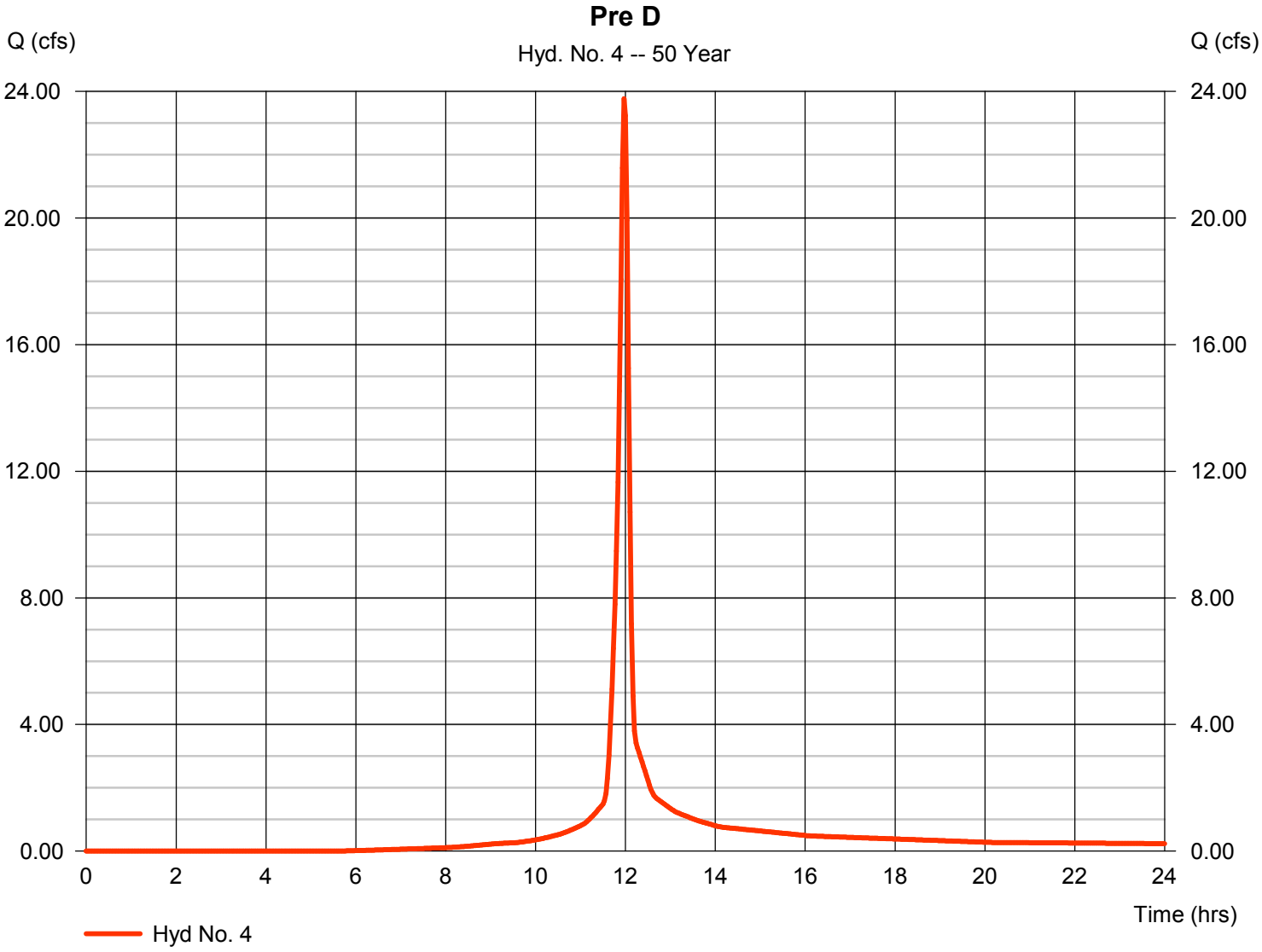


Hydrograph Report

Hyd. No. 4

Pre D

Hydrograph type	= SCS Runoff	Peak discharge	= 23.77 cfs
Storm frequency	= 50 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 55,394 cuft
Drainage area	= 2.880 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.80 min
Total precip.	= 7.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

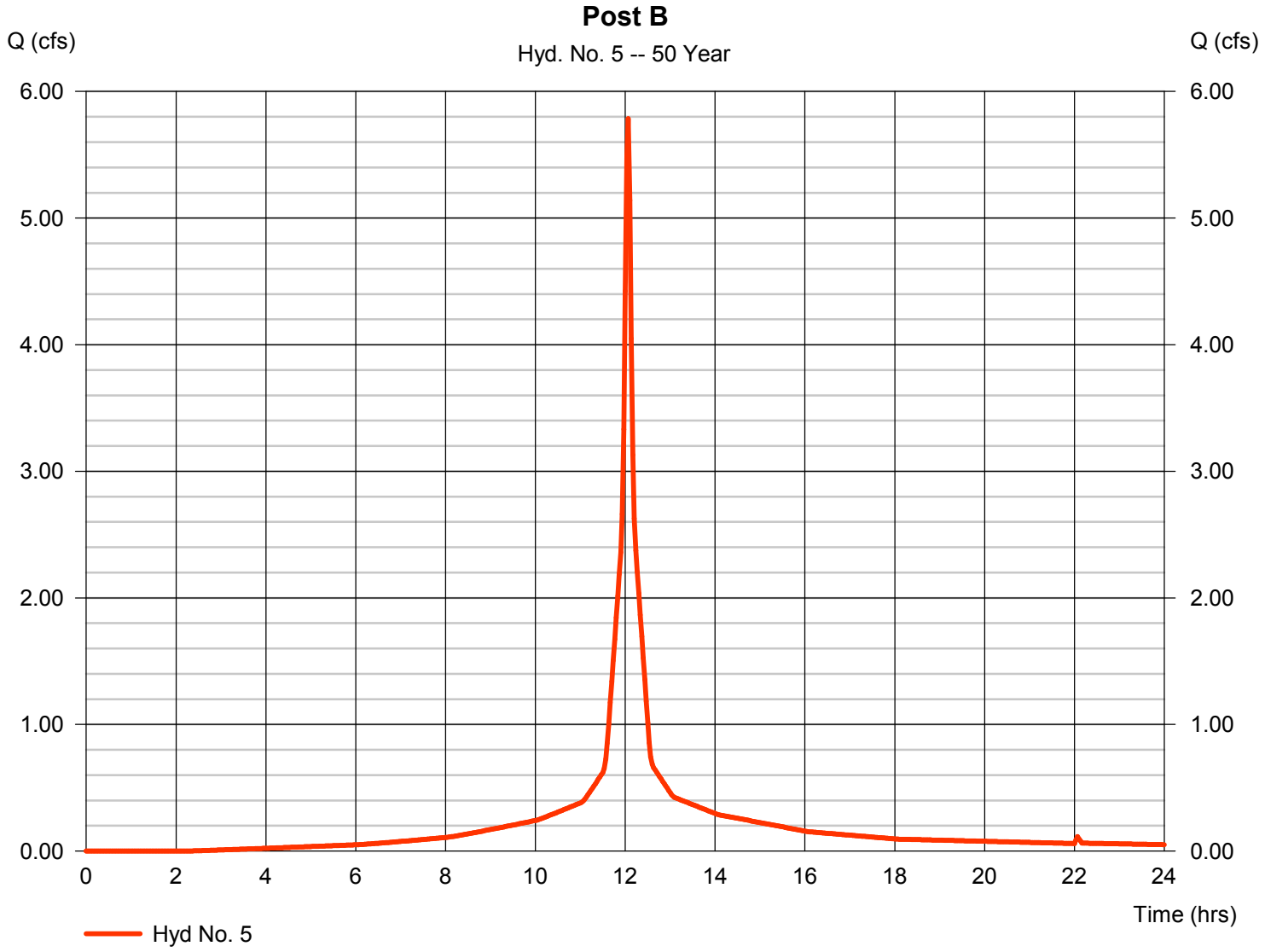


Hydrograph Report

Hyd. No. 5

Post B

Hydrograph type	= SCS Runoff	Peak discharge	= 5.786 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 18,906 cuft
Drainage area	= 0.800 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.90 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

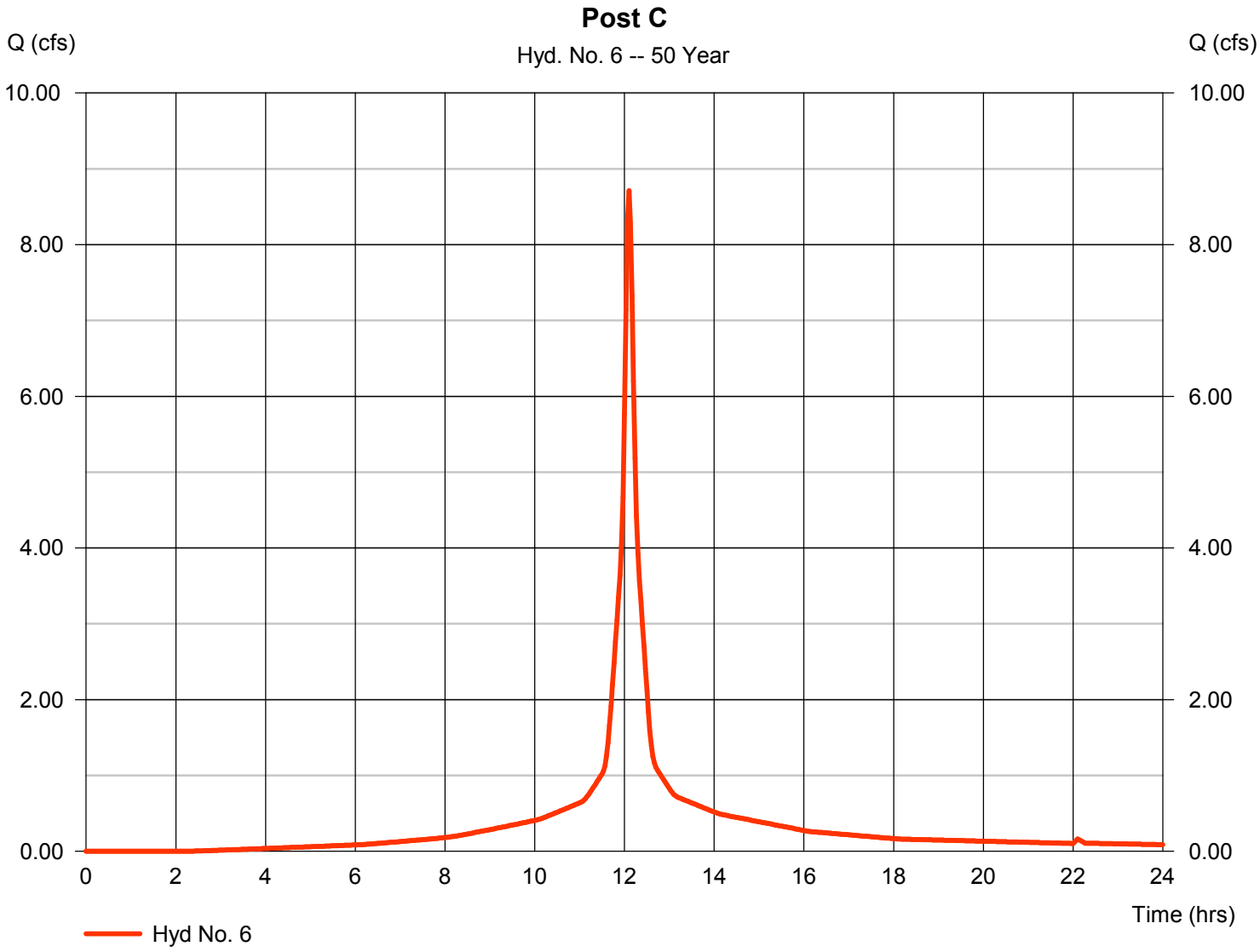


Hydrograph Report

Hyd. No. 6

Post C

Hydrograph type	= SCS Runoff	Peak discharge	= 8.713 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 32,267 cuft
Drainage area	= 1.280 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 7.90 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

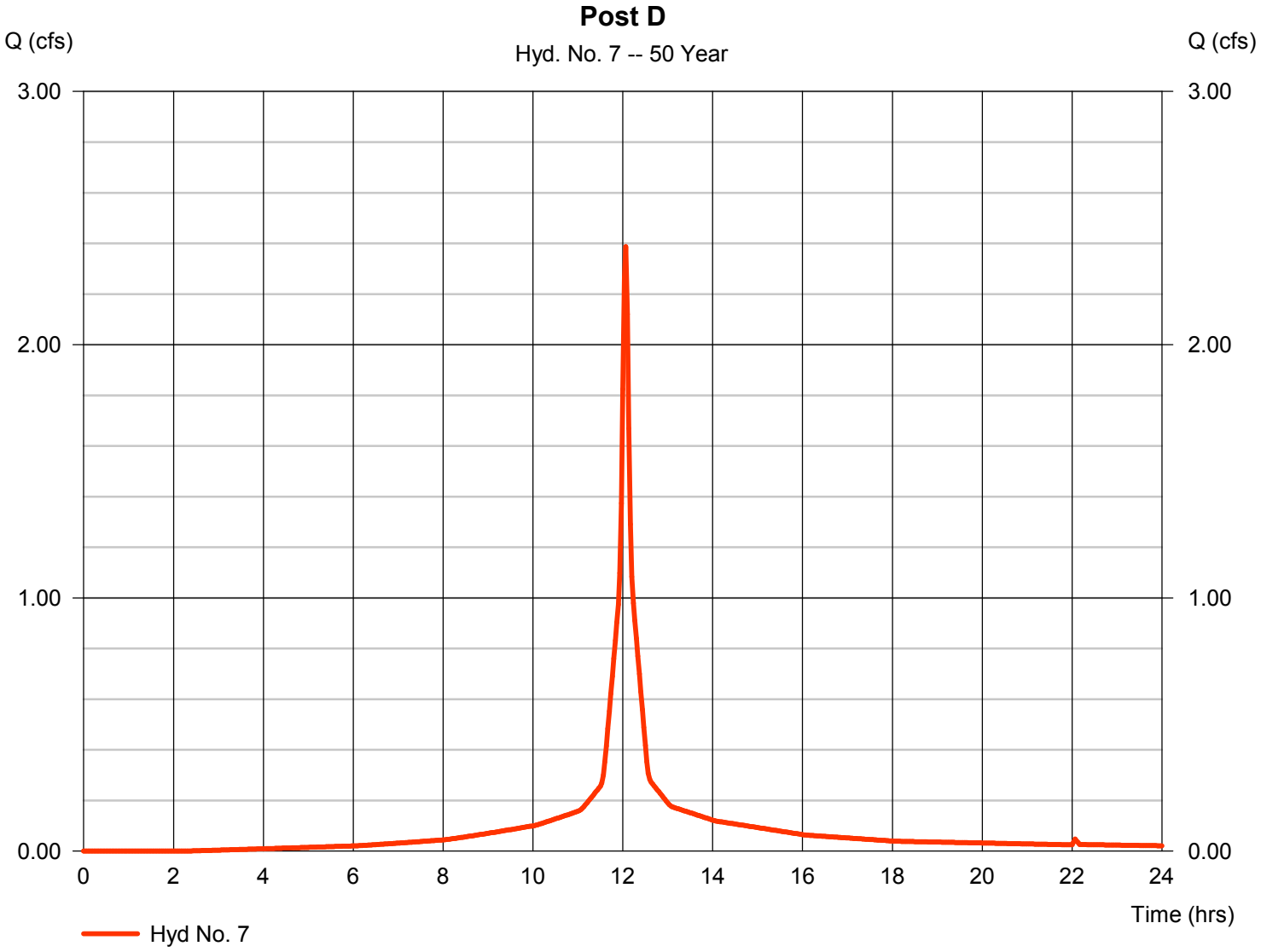


Hydrograph Report

Hyd. No. 7

Post D

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.387 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	7,799 cuft
Drainage area	=	0.330 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.90 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

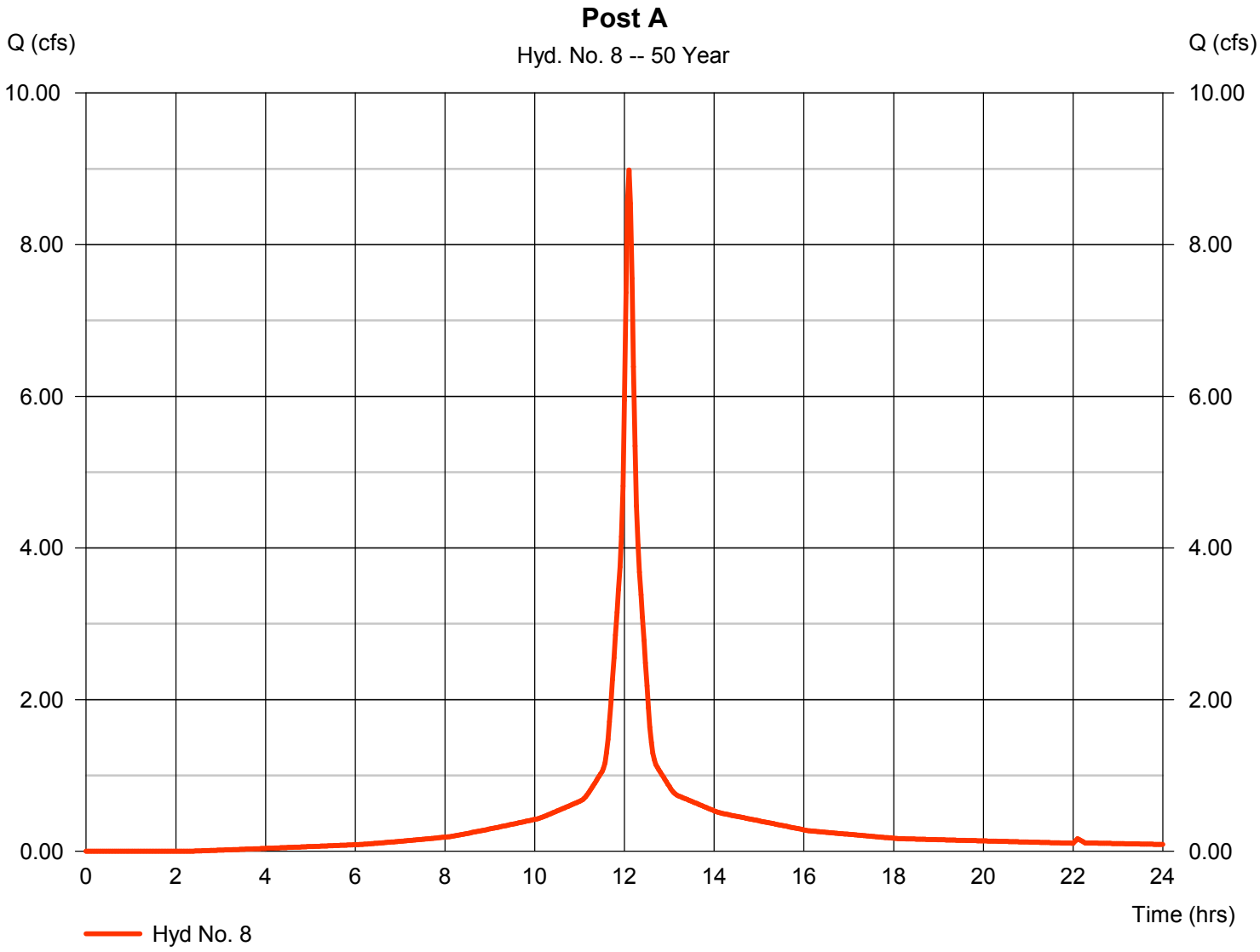


Hydrograph Report

Hyd. No. 8

Post A

Hydrograph type	= SCS Runoff	Peak discharge	= 8.985 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 33,275 cuft
Drainage area	= 1.320 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 7.90 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

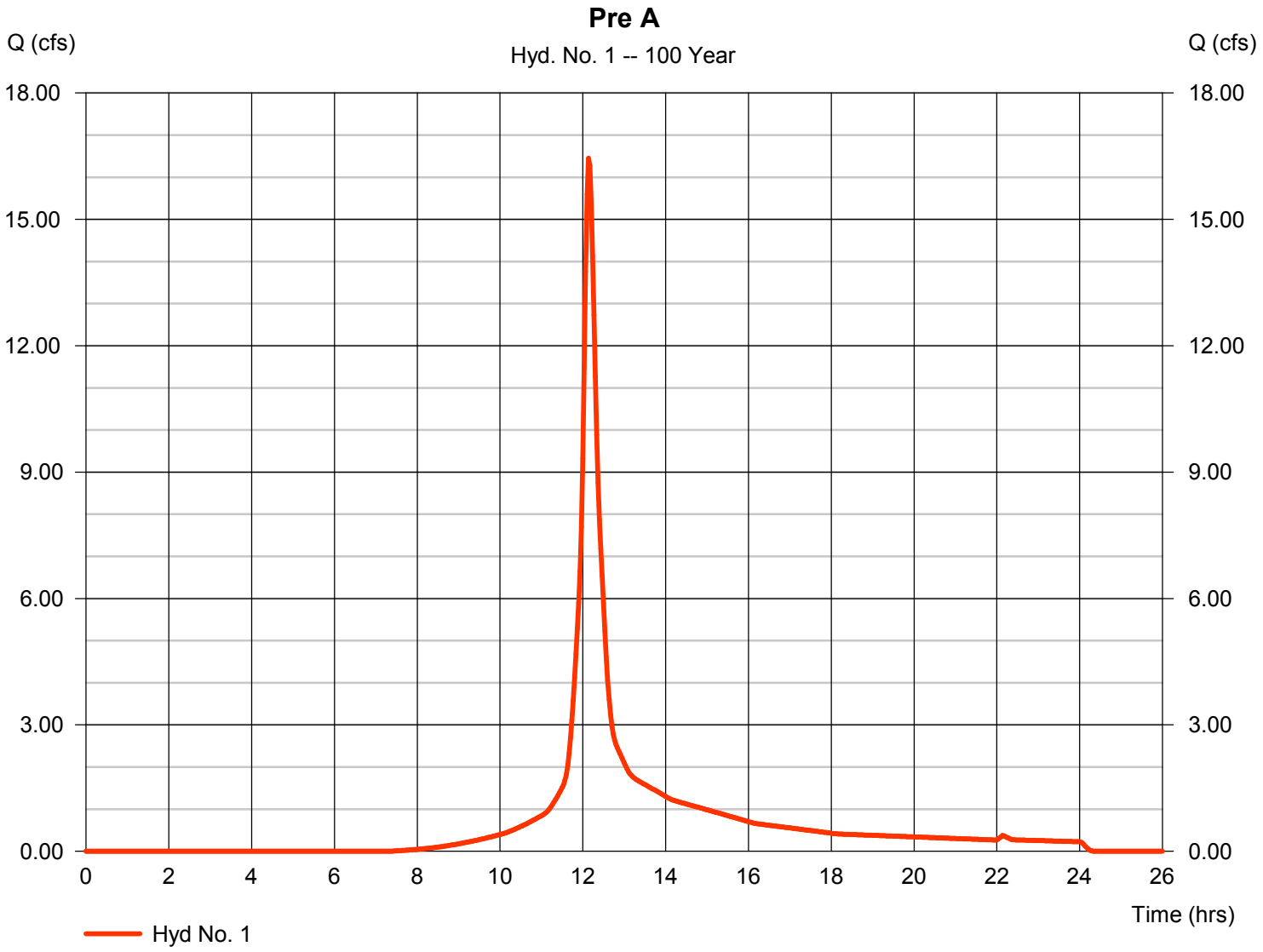
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	16.45	2	728	63,056	------	------	------	Pre A
2	SCS Runoff	11.68	2	726	40,377	------	------	------	Pre B
3	SCS Runoff	13.61	2	726	47,070	------	------	------	Pre C
4	SCS Runoff	26.55	2	718	62,184	------	------	------	Pre D
5	SCS Runoff	6.329	2	724	20,794	------	------	------	Post B
6	SCS Runoff	9.532	2	726	35,489	------	------	------	Post C
7	SCS Runoff	2.611	2	724	8,578	------	------	------	Post D
8	SCS Runoff	9.830	2	726	36,598	------	------	------	Post A

Hydrograph Report

Hyd. No. 1

Pre A

Hydrograph type	= SCS Runoff	Peak discharge	= 16.45 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 63,056 cuft
Drainage area	= 3.300 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 10.90 min
Total precip.	= 8.60 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

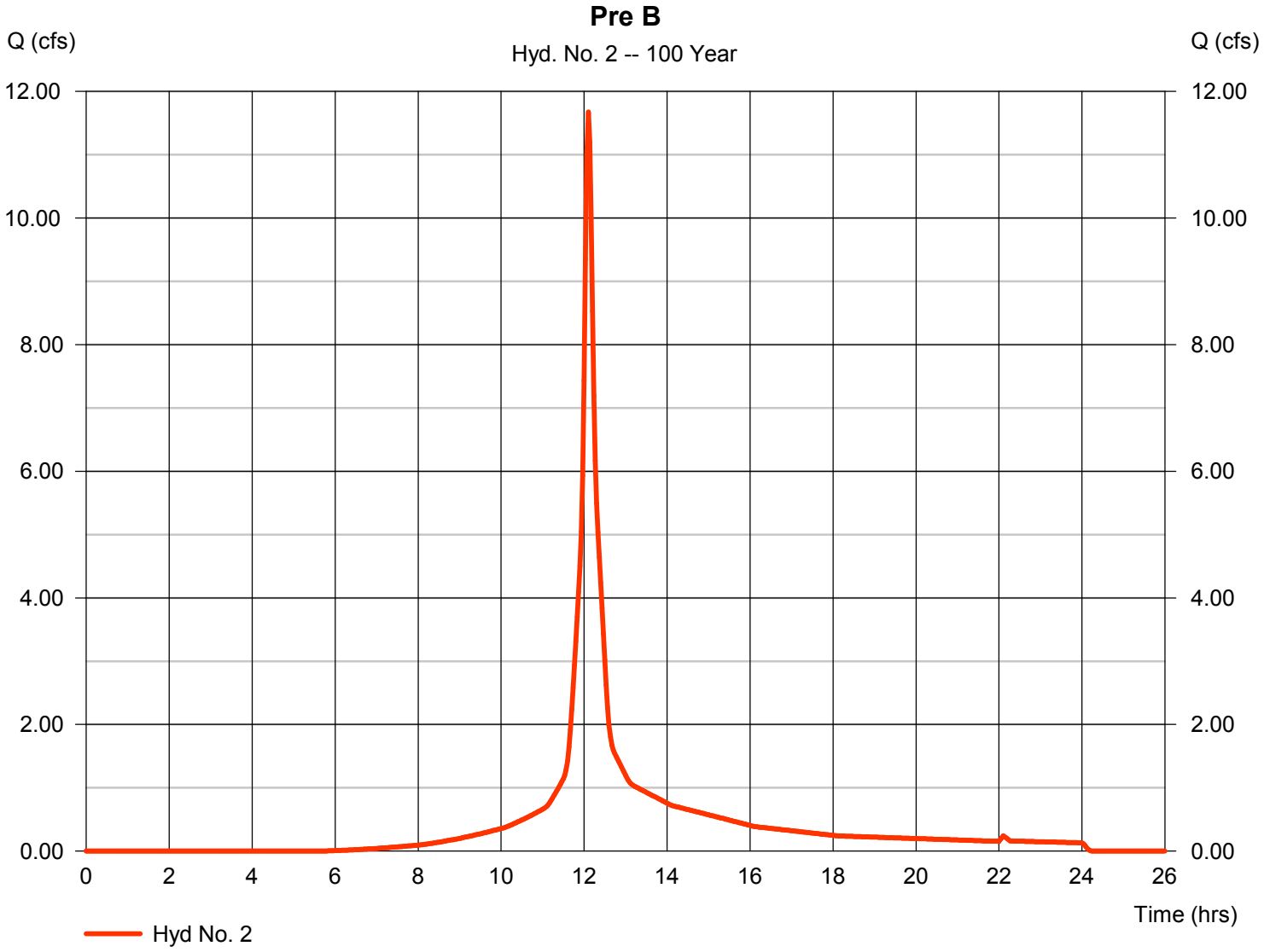


Hydrograph Report

Hyd. No. 2

Pre B

Hydrograph type	= SCS Runoff	Peak discharge	= 11.68 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 40,377 cuft
Drainage area	= 1.870 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.40 min
Total precip.	= 8.60 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

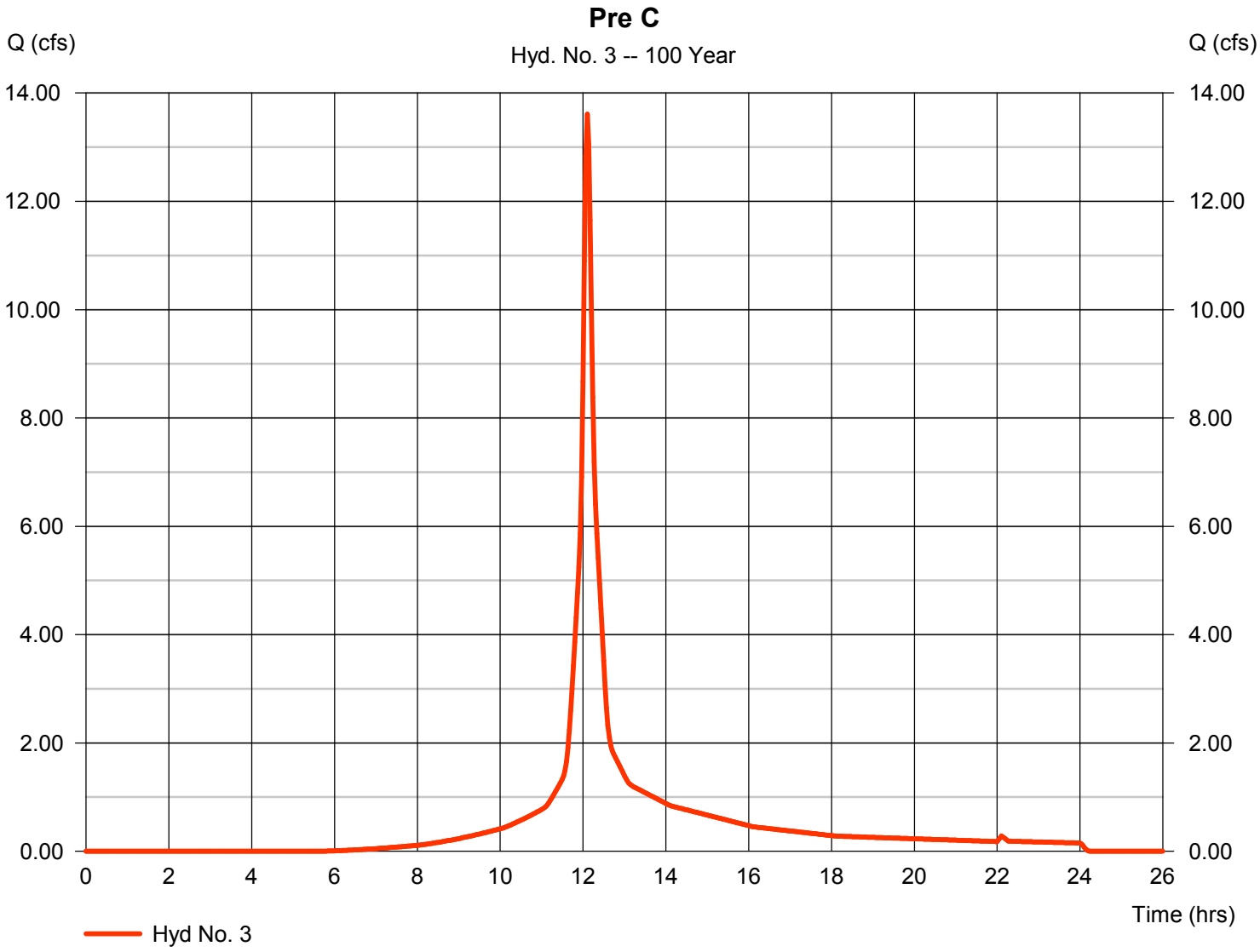


Hydrograph Report

Hyd. No. 3

Pre C

Hydrograph type	= SCS Runoff	Peak discharge	= 13.61 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 47,070 cuft
Drainage area	= 2.180 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.70 min
Total precip.	= 8.60 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

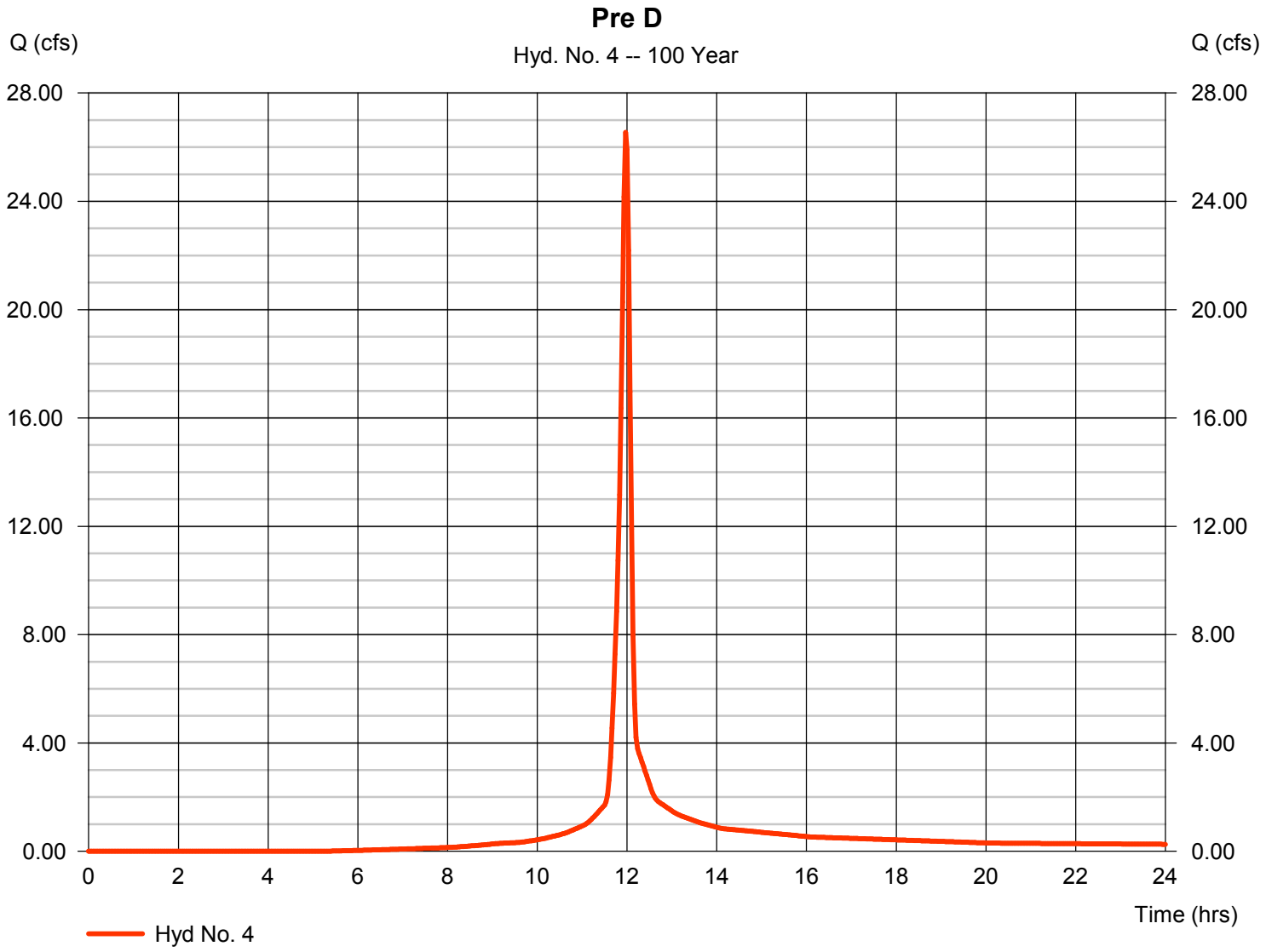


Hydrograph Report

Hyd. No. 4

Pre D

Hydrograph type	= SCS Runoff	Peak discharge	= 26.55 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 62,184 cuft
Drainage area	= 2.880 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.80 min
Total precip.	= 8.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

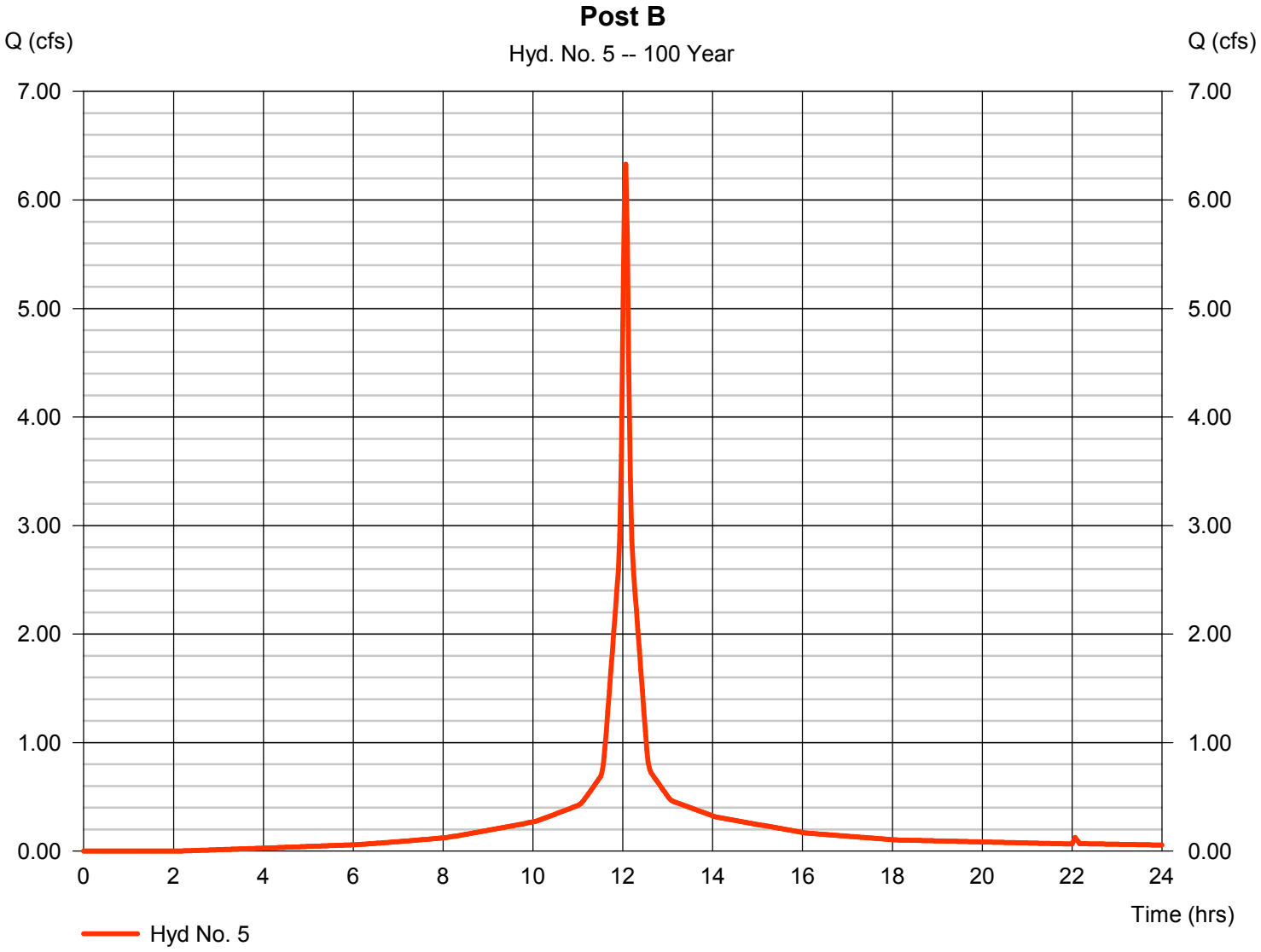


Hydrograph Report

Hyd. No. 5

Post B

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.329 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	20,794 cuft
Drainage area	=	0.800 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	8.60 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

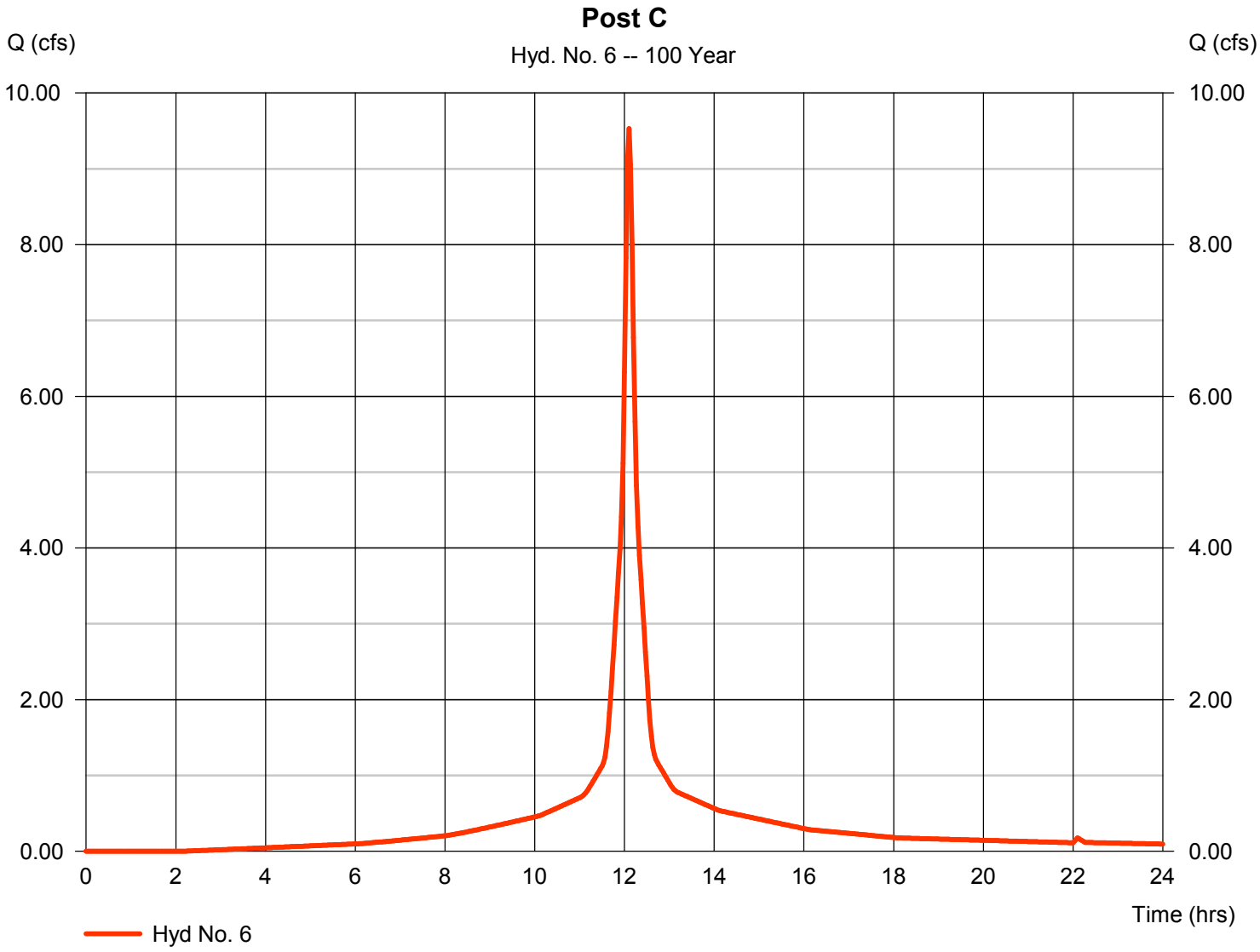


Hydrograph Report

Hyd. No. 6

Post C

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.532 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	35,489 cuft
Drainage area	=	1.280 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.00 min
Total precip.	=	8.60 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

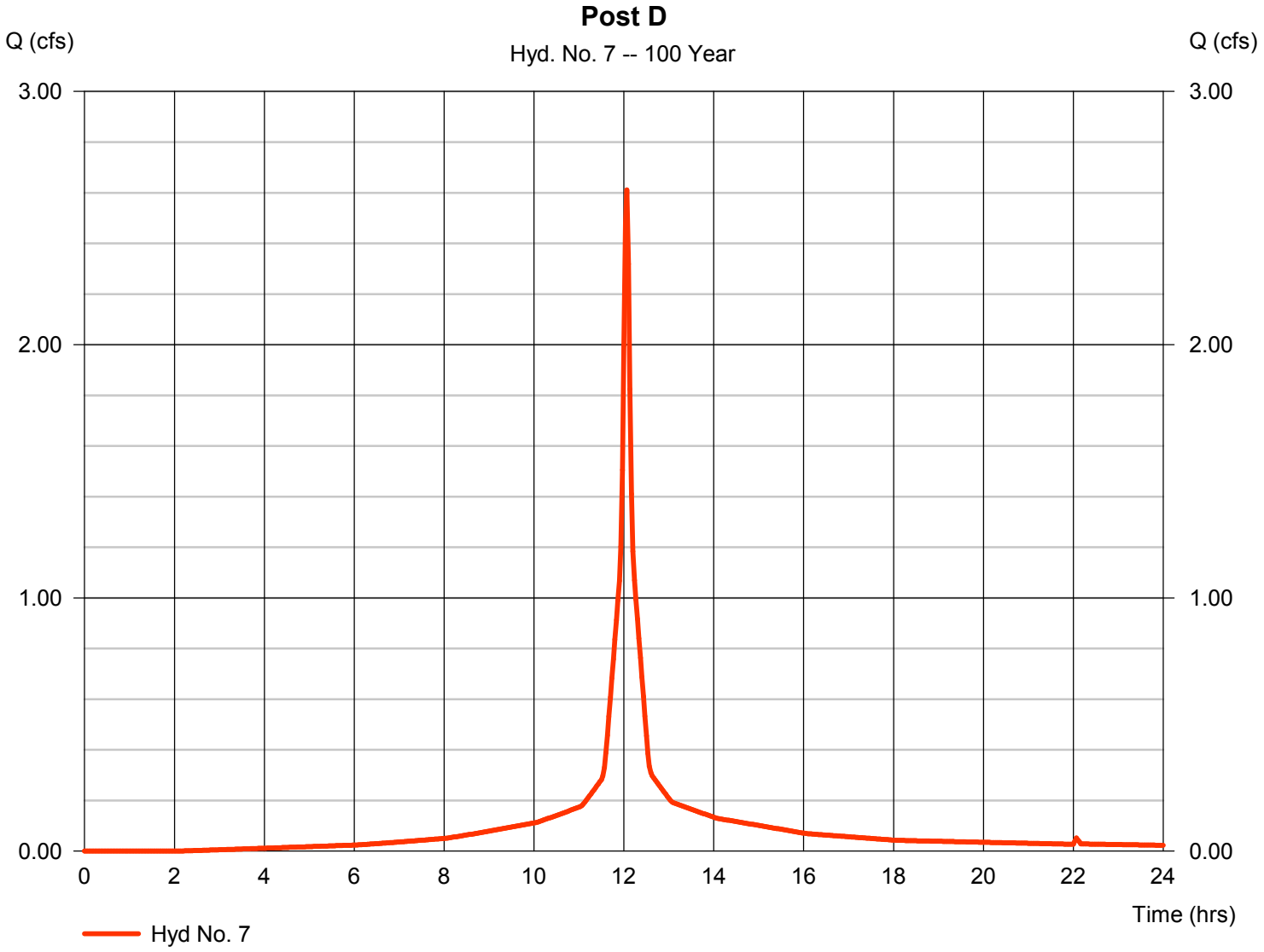


Hydrograph Report

Hyd. No. 7

Post D

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.611 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	8,578 cuft
Drainage area	=	0.330 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	8.60 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

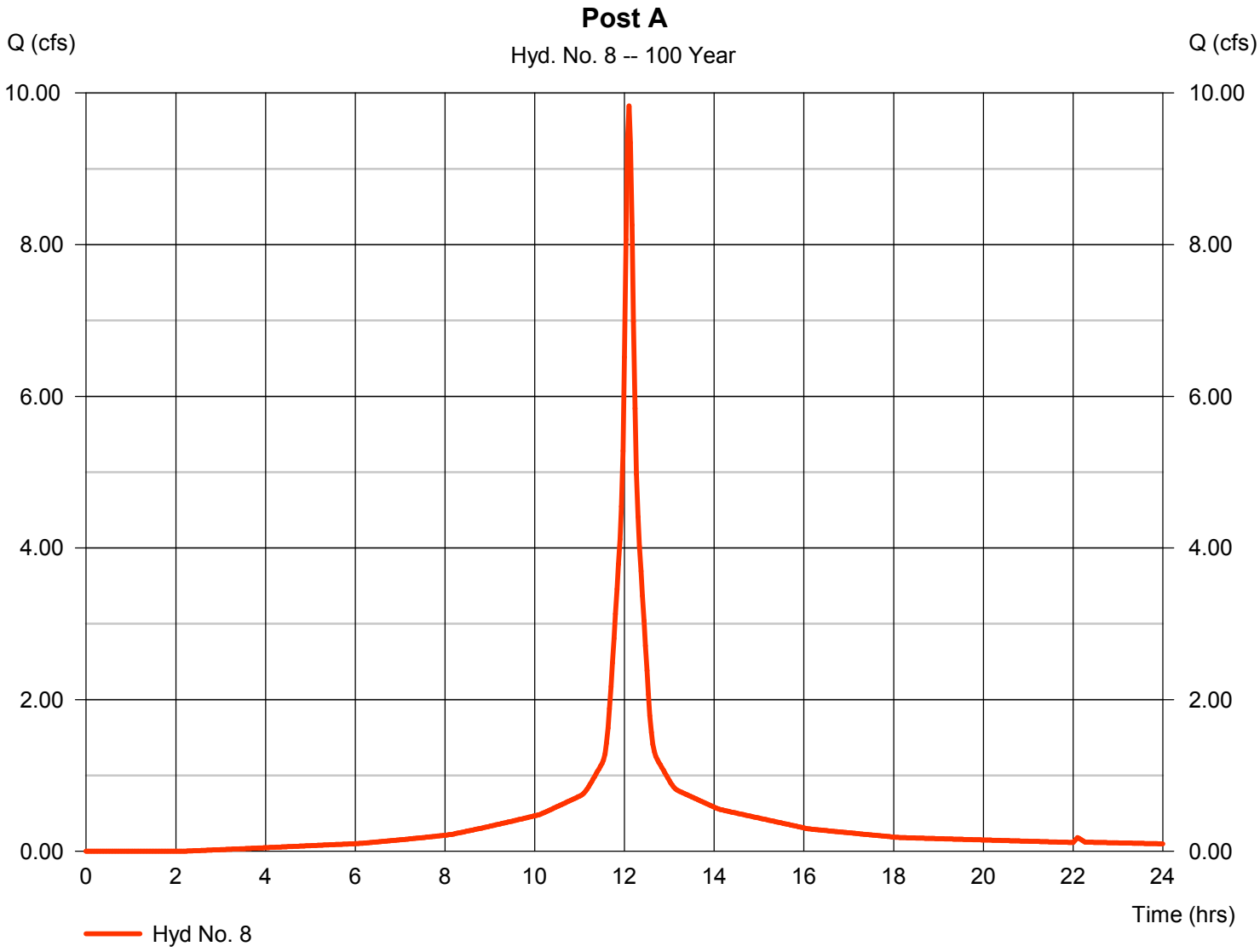


Hydrograph Report

Hyd. No. 8

Post A

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.830 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	36,598 cuft
Drainage area	=	1.320 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	7.00 min
Total precip.	=	8.60 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	63.3915	13.3000	0.8386	--------
3	0.0000	0.0000	0.0000	--------
5	64.9066	13.0000	0.7920	--------
10	79.4587	14.3000	0.8048	--------
25	104.1785	15.8000	0.8275	--------
50	102.8257	15.1000	0.7991	--------
100	95.5744	13.9000	0.7608	--------

File name: Rogers.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	5.54	4.52	3.84	3.35	2.98	2.69	2.45	2.26	2.10	1.96	1.84	1.73
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	6.58	5.42	4.64	4.07	3.64	3.30	3.02	2.80	2.60	2.44	2.30	2.17
10	7.34	6.10	5.24	4.62	4.14	3.76	3.45	3.19	2.97	2.79	2.62	2.48
25	8.45	7.07	6.11	5.39	4.84	4.40	4.04	3.74	3.48	3.26	3.07	2.90
50	9.35	7.83	6.77	5.99	5.38	4.90	4.51	4.18	3.90	3.65	3.44	3.26
100	10.21	8.54	7.39	6.55	5.90	5.38	4.96	4.60	4.30	4.04	3.82	3.62

Tc = time in minutes. Values may exceed 60.

Precip. file name: H:\Storm Data\Fort Smith.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	3.30	4.10	0.00	5.30	6.00	7.00	7.90	8.60
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

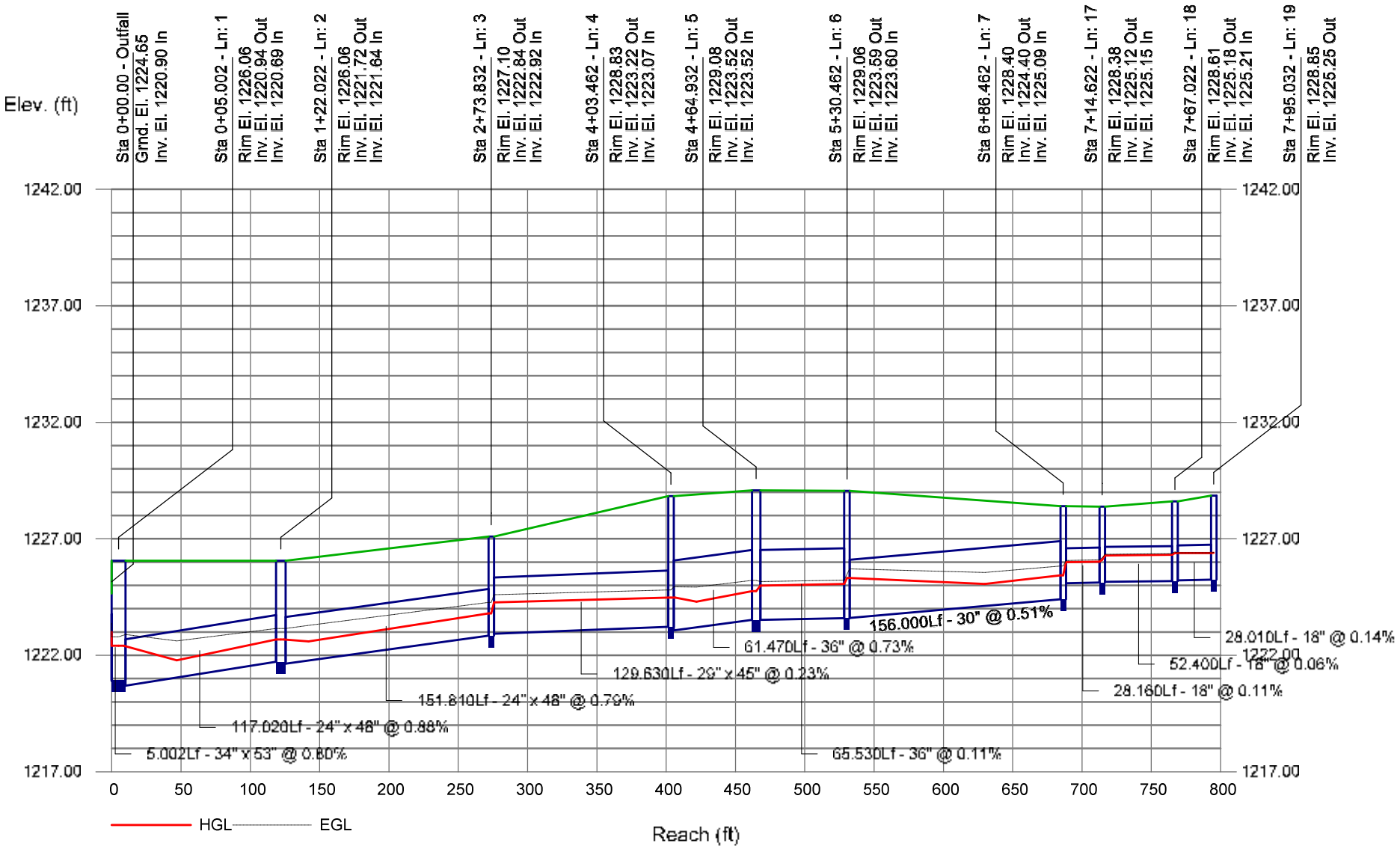
INLET DESIGN STORM SEWER ANALYSIS (10-YR)

Crafton Tull
architecture | engineering | surveying

Storm Sewer Profile

Proj. file: AS BUILT 012716.stm

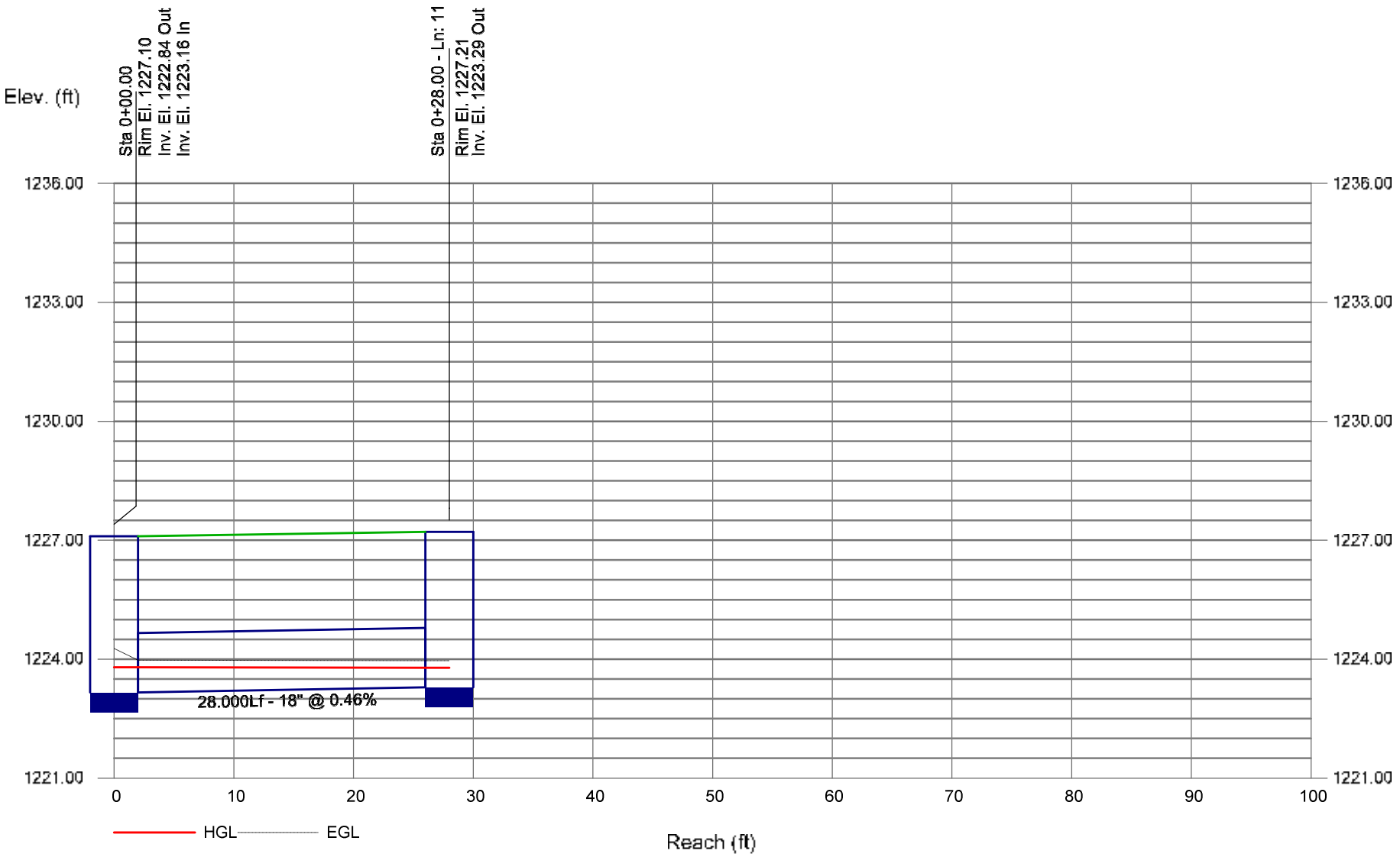
LINE 1 - 10 YR



Storm Sewer Profile

Proj. file: AS BUILT 012716.stm

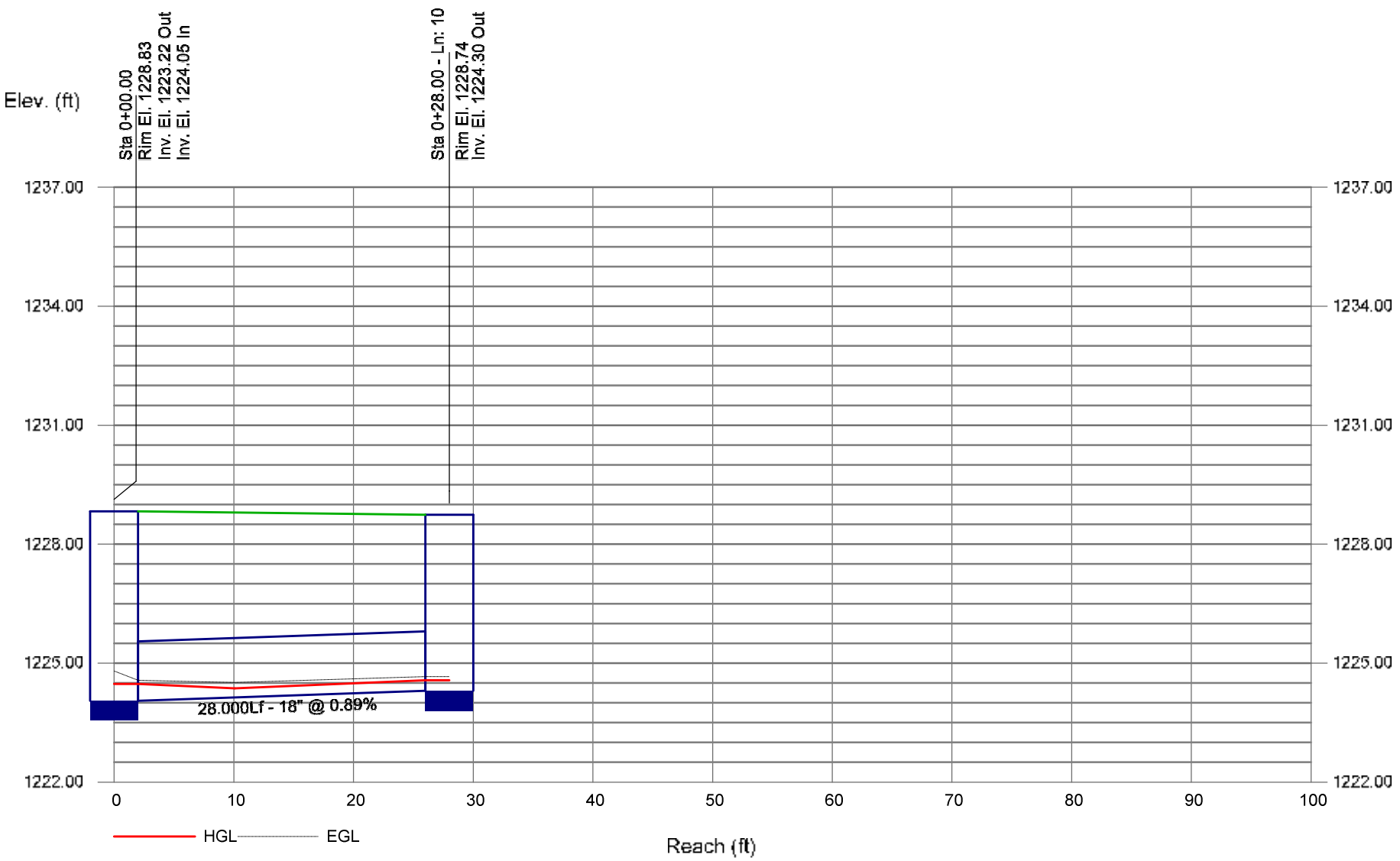
LINE 2 - 10 YR



Storm Sewer Profile

Proj. file: AS BUILT 012716.stm

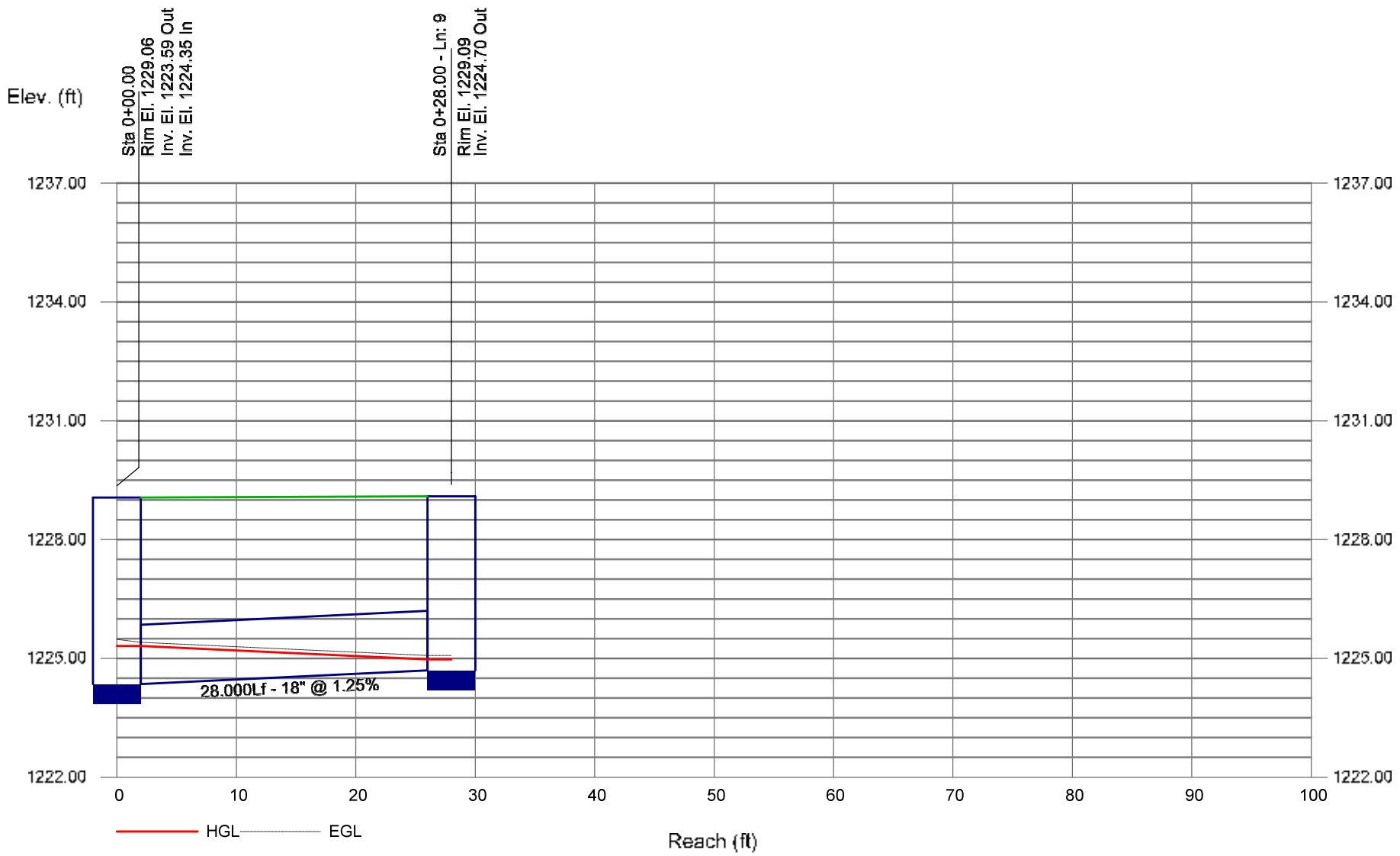
LINE 3 - 10 YR



Storm Sewer Profile

Proj. file: AS BUILT 012716.stm

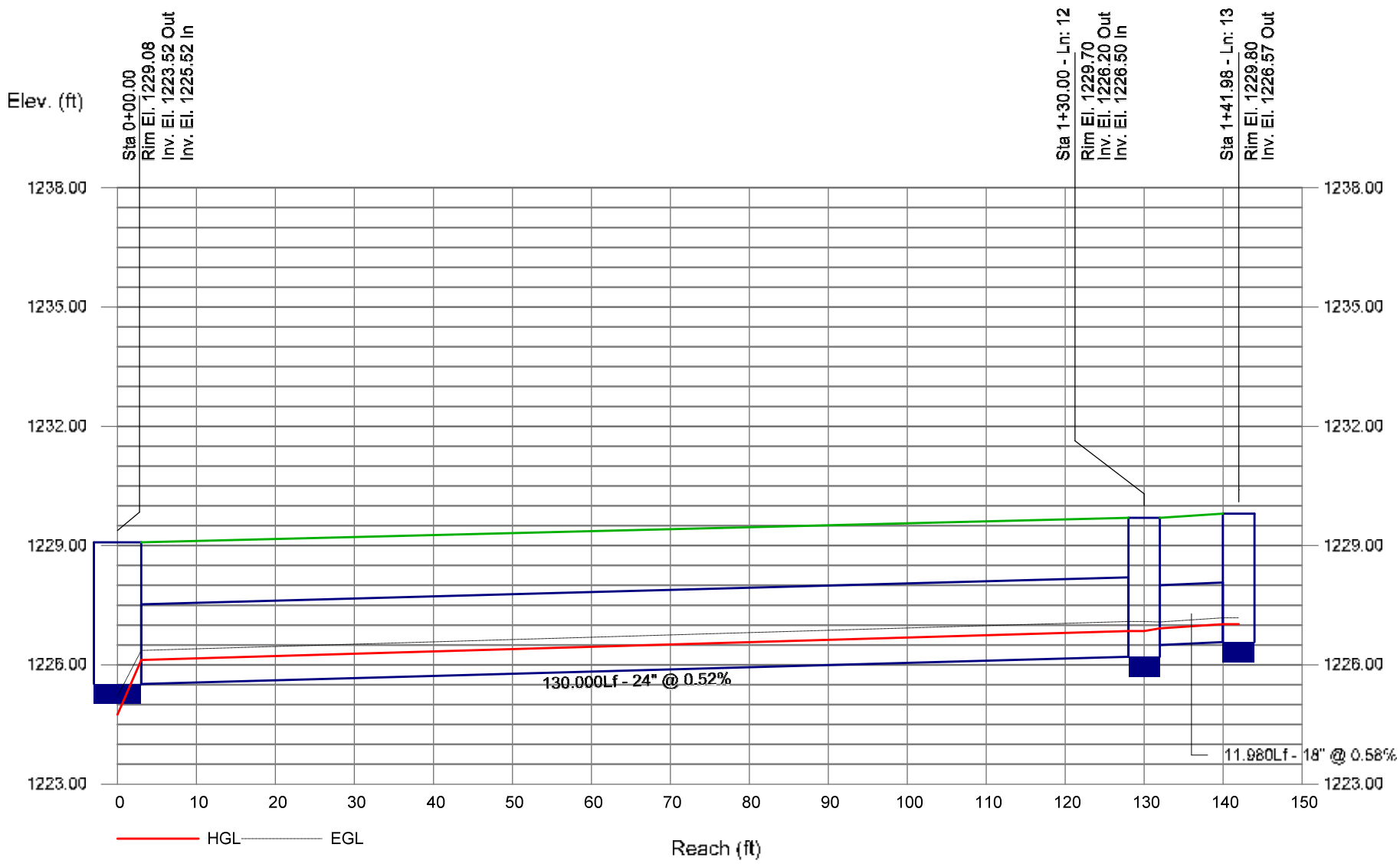
LINE 4 - 10 YR



Storm Sewer Profile

Proj. file: AS BUILT 012716.stm

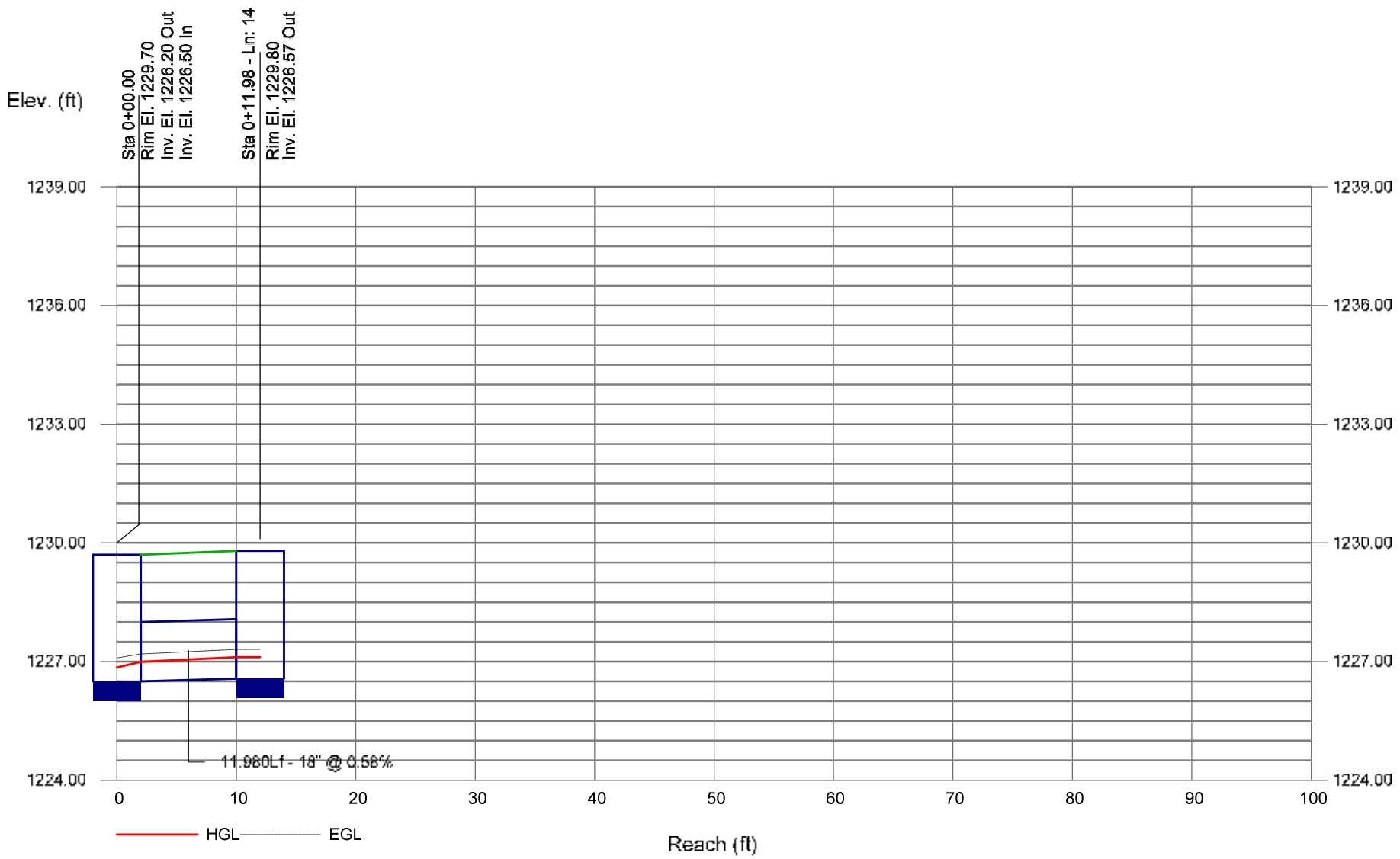
LINE 5 - 10 YR



Storm Sewer Profile

Proj. file: AS BUILT 012716.stm

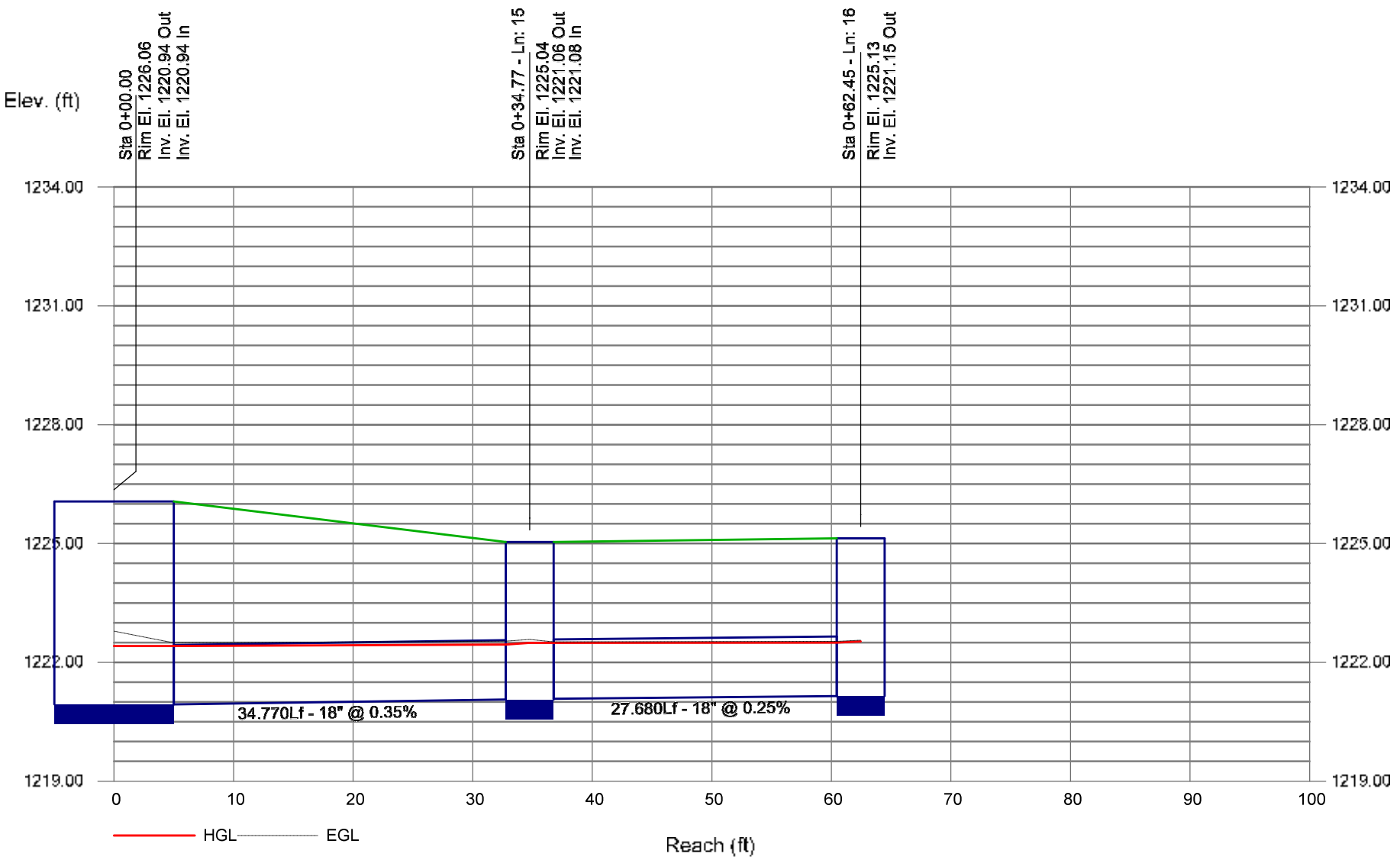
LINE 5B - 10 YR



Storm Sewer Profile

Proj. file: AS BUILT 012716.stm

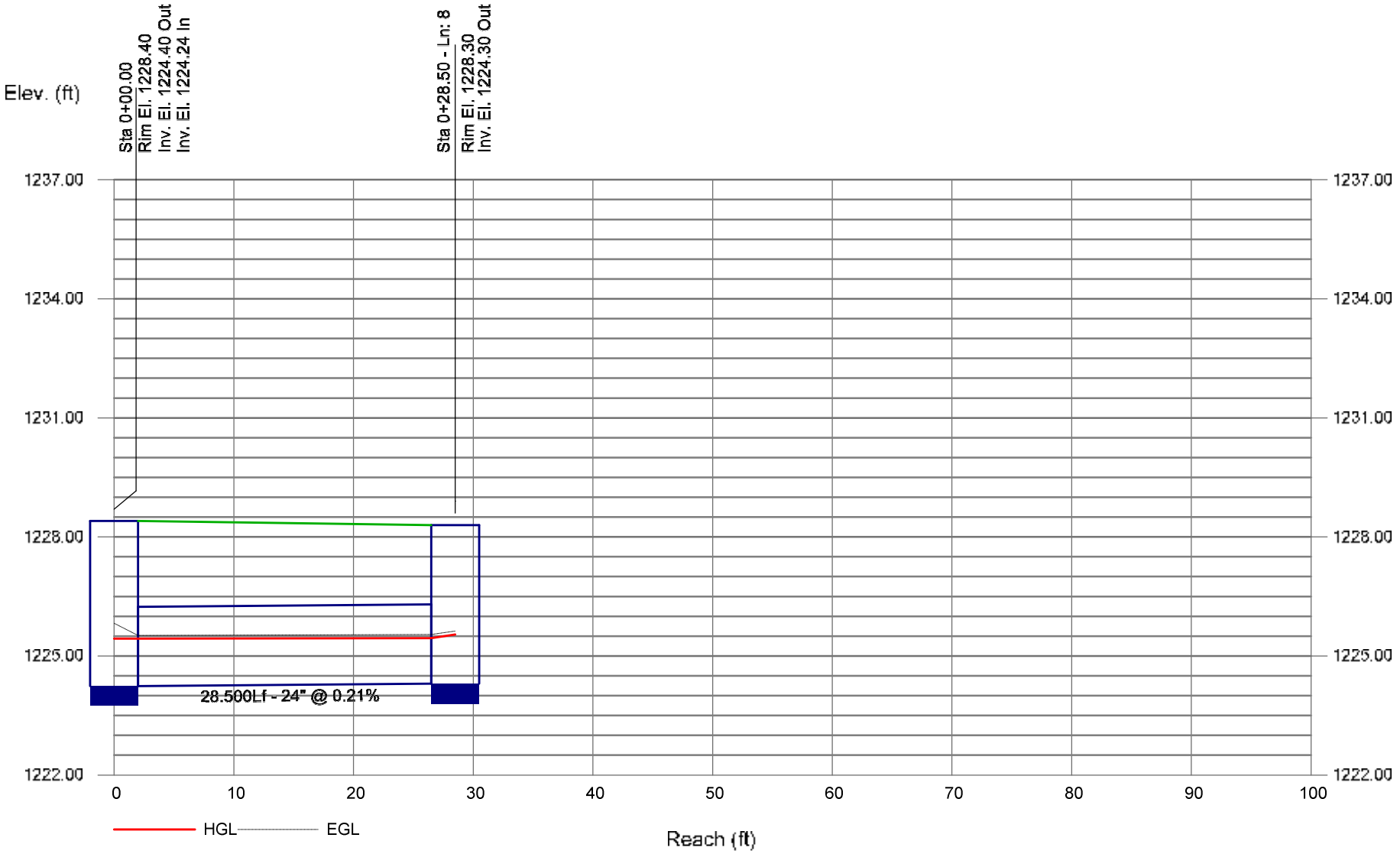
LINE 6 - 10 YR



Storm Sewer Profile

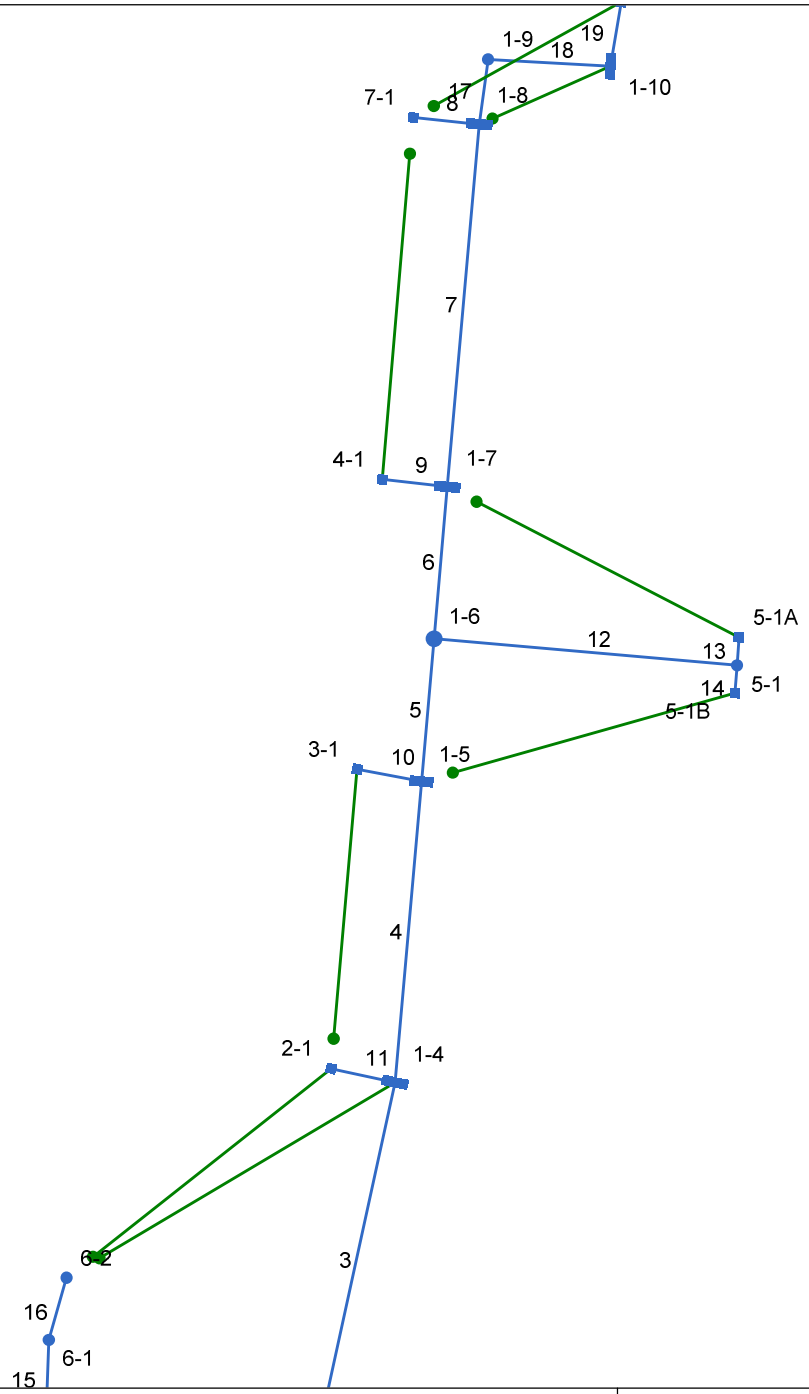
Proj. file: AS BUILT 012716.stm

LINE 7 - 10 YR



Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan

10 YEAR



Project File: AS BUILT 012716.stm	Number of lines: 19	Date: 1/27/2016

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	5.002	-68.726	MH	0.00	0.00	0.00	0.0	1220.90	0.80	1220.94	34X53	Ell	0.012	0.95	1226.06	1-2
2	1	117.020	70.293	MH	0.00	0.00	0.00	0.0	1220.69	0.88	1221.72	24X48	Box	0.012	0.99	1226.06	1-3
3	2	151.810	-79.314	Curb	0.00	0.89	0.60	17.0	1221.64	0.79	1222.84	24X48	Box	0.012	1.50	1227.10	1-4
4	3	129.630	-7.244	Curb	0.00	0.12	0.80	5.0	1222.92	0.23	1223.22	29X45	Ell	0.012	1.49	1228.83	1-5
5	4	61.470	0.000	MH	0.00	0.00	0.00	0.0	1223.07	0.73	1223.52	36	Cir	0.012	1.00	1229.08	1-6
6	5	65.530	0.000	Curb	0.00	0.37	0.60	11.8	1223.52	0.11	1223.59	36	Cir	0.012	1.50	1229.06	1-7
7	6	156.000	0.000	Curb	0.00	0.44	0.60	15.4	1223.60	0.51	1224.40	30	Cir	0.012	1.50	1228.40	1-8
8	7	28.500	-88.965	Curb	0.00	0.60	0.80	12.9	1224.24	0.21	1224.30	24	Cir	0.012	1.00	1228.30	7-1
9	6	28.000	-88.556	Curb	0.00	0.10	0.80	5.0	1224.35	1.25	1224.70	18	Cir	0.012	1.00	1229.09	4-1
10	4	28.000	-84.038	Curb	0.00	0.09	0.80	5.0	1224.05	0.89	1224.30	18	Cir	0.012	1.00	1228.74	3-1
11	3	28.000	-90.000	Curb	0.00	0.28	0.80	5.0	1223.16	0.46	1223.29	18	Cir	0.012	1.00	1227.21	2-1
12	5	130.000	90.000	MH	0.00	0.00	0.00	0.0	1225.52	0.52	1226.20	24	Cir	0.012	1.00	1229.70	5-1
13	12	11.980	-91.174	Curb	0.00	0.74	0.60	14.0	1226.50	0.58	1226.57	18	Cir	0.012	1.00	1229.80	5-1A
14	12	11.980	89.483	Curb	0.00	0.62	0.60	10.9	1226.50	0.58	1226.57	18	Cir	0.012	1.00	1229.80	5-1B
15	1	34.770	-19.125	Curb	0.00	0.28	0.80	5.0	1220.94	0.35	1221.06	18	Cir	0.012	0.50	1225.04	6-1
16	15	27.680	13.665	Curb	0.00	0.80	0.60	15.2	1221.08	0.25	1221.15	18	Cir	0.012	1.00	1225.13	6-2
17	7	28.160	2.671	MH	0.00	0.00	0.00	0.0	1225.09	0.11	1225.12	18	Cir	0.012	1.00	1228.38	1-9
18	17	52.400	85.572	Curb	0.00	0.90	0.60	16.3	1225.15	0.06	1225.18	18	Cir	0.012	1.49	1228.61	1-10
19	18	28.010	-83.760	Curb	0.00	0.90	0.80	17.7	1225.21	0.14	1225.25	18	Cir	0.012	1.00	1228.85	1-11

Project File: AS BUILT 012716.stm | Number of lines: 19 | Date: 1/27/2016

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1	1-2	Manhole	1226.06	Rect	10.00	5.00	34x53	Ellip	1220.94	24x48 18	Box Cir	1220.69 1220.94
2	1-3	Manhole	1226.06	Rect	7.00	7.00	24x48	Box	1221.72	24x48	Box	1221.64
3	1-4	Curb-Horiz	1227.10	Rect	4.00	11.00	24x48	Box	1222.84	29x45 18	Ellip Cir	1222.92 1223.16
4	1-5	Curb-Horiz	1228.83	Rect	4.00	10.00	29x45	Ellip	1223.22	36 18	Cir Cir	1223.07 1224.05
5	1-6	Manhole	1229.08	Cir	6.00	6.00	36	Cir	1223.52	36 24	Cir Cir	1223.52 1225.52
6	1-7	Curb-Horiz	1229.06	Rect	4.00	11.00	36	Cir	1223.59	30 18	Cir Cir	1223.60 1224.35
7	1-8	Curb-Horiz	1228.40	Rect	4.00	11.00	30	Cir	1224.40	24 18	Cir Cir	1224.24 1225.09
8	7-1	Curb-Horiz	1228.30	Rect	4.00	4.00	24	Cir	1224.30			
9	4-1	Curb-Horiz	1229.09	Rect	4.00	4.00	18	Cir	1224.70			
10	3-1	Curb-Horiz	1228.74	Rect	4.00	4.00	18	Cir	1224.30			
11	2-1	Curb-Horiz	1227.21	Rect	4.00	4.00	18	Cir	1223.29			
12	5-1	Manhole	1229.70	Cir	4.00	4.00	24	Cir	1226.20	18 18	Cir Cir	1226.50 1226.50
13	5-1A	Curb-Horiz	1229.80	Rect	4.00	4.00	18	Cir	1226.57			
14	5-1B	Curb-Horiz	1229.80	Rect	4.00	4.00	18	Cir	1226.57			
15	6-1	Curb-Horiz	1225.04	Cir	4.00	4.00	18	Cir	1221.06	18	Cir	1221.08
16	6-2	Curb-Horiz	1225.13	Cir	4.00	4.00	18	Cir	1221.15			
17	1-9	Manhole	1228.38	Cir	4.00	4.00	18	Cir	1225.12	18	Cir	1225.15
18	1-10	Curb-Horiz	1228.61	Rect	4.00	11.00	18	Cir	1225.18	18	Cir	1225.21
19	1-11	Curb-Horiz	1228.85	Rect	4.00	4.00	18	Cir	1225.25			

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	1-2	25.20	34x53	Ell	5.002	1220.90	1220.94	0.798	1223.01	1222.41	0.36	1222.41	End	Manhole
2	1-3	21.18	24x48	Box	117.020	1220.69	1221.72	0.880	1222.41	1222.68	n/a	1222.68 j	1	Manhole
3	1-4	21.18	24x48	Box	151.810	1221.64	1222.84	0.790	1222.68	1223.80	n/a	1223.80 j	2	Curb-Horiz
4	1-5	16.99	29x45	Ell	129.630	1222.92	1223.22	0.231	1224.27	1224.48	0.49	1224.48	3	Curb-Horiz
5	1-6	14.87	36	Cir	61.470	1223.07	1223.52	0.732	1224.48	1224.75	n/a	1224.75 j	4	Manhole
6	1-7	11.38	36	Cir	65.530	1223.52	1223.59	0.107	1224.99	1225.06	0.26	1225.31	5	Curb-Horiz
7	1-8	9.64	30	Cir	156.000	1223.60	1224.40	0.513	1225.31	1225.44	n/a	1225.44 j	6	Curb-Horiz
8	7-1	4.49	24	Cir	28.500	1224.24	1224.30	0.211	1225.44	1225.45	0.09	1225.54	7	Curb-Horiz
9	4-1	0.56	18	Cir	28.000	1224.35	1224.70	1.250	1225.31	1224.98	0.10	1224.98	6	Curb-Horiz
10	3-1	0.51	18	Cir	28.000	1224.05	1224.30	0.893	1224.48	1224.57	n/a	1224.57 j	4	Curb-Horiz
11	2-1	1.72	18	Cir	28.000	1223.16	1223.29	0.464	1223.80	1223.78	n/a	1223.78	3	Curb-Horiz
12	5-1	3.49	24	Cir	130.000	1225.52	1226.20	0.523	1226.12	1226.85	0.24	1226.85	5	Manhole
13	5-1A	1.45	18	Cir	11.980	1226.50	1226.57	0.584	1226.92	1227.02	0.16	1227.02	12	Curb-Horiz
14	5-1B	2.04	18	Cir	11.980	1226.50	1226.57	0.584	1226.99	1227.11	0.20	1227.11	12	Curb-Horiz
15	6-1	4.03	18	Cir	34.770	1220.94	1221.06	0.345	1222.41	1222.45	0.04	1222.49	1	Curb-Horiz
16	6-2	2.34	18	Cir	27.680	1221.08	1221.15	0.253	1222.49	1222.50	0.03	1222.53	15	Curb-Horiz
17	1-9	2.51	18	Cir	28.160	1225.09	1225.12	0.107	1225.99	1226.02	0.08	1226.10	7	Manhole
18	1-10	2.51	18	Cir	52.400	1225.15	1225.18	0.057	1226.28	1226.31	0.07	1226.39	17	Curb-Horiz
19	1-11	1.33	18	Cir	28.010	1225.21	1225.25	0.143	1226.39	1226.39	0.01	1226.40	18	Curb-Horiz

Project File: AS BUILT 012716.stm | Number of lines: 19 | Run Date: 1/27/2016

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	1-2	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
2	1-3	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
3	1-4	2.46	0.00	2.46	0.00	Curb	2.0	18.00	0.00	0.00	0.00	0.020	2.00	0.020	0.020	0.015	0.17	8.71	0.33	0.01	4.0	16
4	1-5	0.72	0.89	1.61	0.00	Curb	2.0	18.00	0.00	0.00	0.00	0.015	2.00	0.020	0.020	0.013	0.15	7.46	0.33	0.01	4.0	3
5	1-6	0.00	0.82	0.00	0.82	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.020	0.020	0.013	0.00	0.00	0.00	0.00	0.0	4
6	1-7	1.21	0.79	1.18	0.82	Curb	2.0	4.00	0.00	0.00	0.00	0.015	2.00	0.020	0.020	0.013	0.16	8.06	0.45	5.81	4.0	5
7	1-8	1.28	1.37	2.64	0.00	Curb	2.0	11.60	0.00	0.00	0.00	Sag	2.00	0.020	0.020	0.013	0.26	1.38	0.59	1.38	4.0	Off
8	7-1	2.52	1.97	4.49	0.00	Curb	2.0	11.60	0.00	0.00	0.00	Sag	2.00	0.020	0.020	0.013	0.27	1.45	0.60	1.45	4.0	Off
9	4-1	0.60	0.00	0.56	0.05	Curb	2.0	4.00	0.00	0.00	0.00	0.015	2.00	0.020	0.020	0.013	0.10	5.16	0.37	2.01	4.0	8
10	3-1	0.54	0.00	0.51	0.03	Curb	2.0	4.00	0.00	0.00	0.00	0.015	2.00	0.020	0.020	0.013	0.10	4.96	0.37	1.71	4.0	11
11	2-1	1.69	0.03	1.72	0.00	Curb	2.0	11.00	0.00	0.00	0.00	0.015	2.00	0.020	0.020	0.013	0.15	7.61	0.33	0.01	4.0	16
12	5-1	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	Off
13	5-1A	2.24	0.00	1.45	0.79	Curb	2.0	4.00	0.00	0.00	0.00	0.015	2.00	0.050	0.020	0.013	0.22	7.81	0.49	4.76	4.0	6
14	5-1B	2.10	0.00	2.04	0.06	Curb	2.0	7.50	0.00	0.00	0.00	0.015	2.00	0.050	0.020	0.013	0.21	7.56	0.40	1.26	4.0	4
15	6-1	1.69	0.00	1.69	0.00	Curb	4.0	14.50	0.00	0.00	0.00	0.015	1.50	0.050	0.020	0.013	0.19	7.21	0.17	0.00	2.0	Off
16	6-2	2.34	0.00	2.34	0.00	Curb	4.0	18.00	0.00	0.00	0.00	0.015	1.50	0.050	0.020	0.013	0.21	8.21	0.17	0.00	2.0	Off
17	1-9	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	7
18	1-10	2.54	0.00	1.17	1.37	Curb	4.0	4.00	0.00	0.00	0.00	0.020	2.00	0.050	0.020	0.013	0.21	7.71	0.34	5.81	2.0	7
19	1-11	3.26	0.00	1.33	1.93	Curb	4.0	4.00	0.00	0.00	0.00	0.020	2.00	0.050	0.020	0.013	0.23	8.61	0.36	6.86	2.0	8

Project File: AS BUILT 012716.stm | Number of lines: 19 | Run Date: 1/27/2016

NOTES: Inlet N-Values = 0.016; Intensity = 30.75 / (Inlet time + 4.80) ^ 0.62; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 1/27/2016
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 10 yrs
														Elev of Invert							Proj: AS BUILT 012716.stm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
1	End	MH	0.012	5.002	0.00	0.00	0.00	17.70	0.00	4.53	4.75	0.00	1226.06	1222.41	1223.01	-0.60	34	-11.93	6.08	25.20	1-2
					0.00	0.00	0.00					25.20		1223.77	1223.73		53	0.80	10.03	98.55	
					0.00	0.00	0.00							1220.94	1220.90	0.04	Elip				
2	1	MH	0.012	117.020	0.00	0.00	0.00	17.70	0.00	4.53	4.05	0.00	1226.06	1222.68	1222.41	0.26	24	0.22	4.31	21.18	1-3
					0.00	0.00	0.00					21.18		1223.72	1222.69		48	0.88	8.87	70.92	
					0.00	0.00	0.00							1221.72	1220.69	1.03	Box				
3	2	Curb	0.012	151.810	0.00	0.00	0.00	17.70	0.00	4.53	4.05	0.00	1227.10	1223.80	1222.68	1.12	24	0.74	5.33	21.18	1-4
					0.00	0.00	0.00					21.18		1224.84	1223.64		48	0.79	8.40	67.21	
					0.00	0.00	0.00							1222.84	1221.64	1.20	Box				
4	3	Curb	0.012	129.630	0.00	0.00	0.00	17.70	0.00	4.53	3.29	0.00	1228.83	1224.48	1224.27	0.20	29	0.16	4.59	16.99	1-5
					0.00	0.00	0.00					16.99		1225.64	1225.34		45	0.23	4.85	34.52	
					0.00	0.00	0.00							1223.22	1222.92	0.30	Elip				
5	4	MH	0.012	61.470	0.00	0.00	0.00	17.70	0.00	4.53	3.12	0.00	1229.08	1224.75	1224.48	0.27	36	0.44	5.01	14.87	1-6
					0.00	0.00	0.00					14.87		1226.52	1226.07		36	0.73	8.75	61.82	
					0.00	0.00	0.00							1223.52	1223.07	0.45	Cir				
6	5	Curb	0.012	65.530	0.00	0.00	0.00	17.70	0.00	4.53	2.31	0.00	1229.06	1225.06	1224.99	0.07	36	0.10	3.31	11.38	1-7
					0.00	0.00	0.00					11.38		1226.59	1226.52		36	0.11	3.34	23.61	
					0.00	0.00	0.00							1223.59	1223.52	0.07	Cir				
7	6	Curb	0.012	156.000	0.00	0.00	0.00	17.70	0.00	4.53	2.00	0.00	1228.40	1225.44	1225.31	0.12	30	0.08	3.85	9.64	1-8
					0.00	0.00	0.00					9.64		1226.90	1226.10		30	0.51	6.48	31.82	
					0.00	0.00	0.00							1224.40	1223.60	0.80	Cir				
8	7	Curb	0.012	28.500	0.00	0.00	0.00	12.90	0.00	5.25	0.48	0.00	1228.30	1225.45	1225.44	0.02	24	0.05	2.35	4.49	7-1
					0.00	0.00	0.00					4.49		1226.30	1226.24		24	0.21	3.58	11.25	
					0.00	0.00	0.00							1224.30	1224.24	0.06	Cir				
9	6	Curb	0.012	28.000	0.00	0.00	0.00	5.00	0.00	7.55	0.08	0.00	1229.09	1224.98	1225.31	-0.34	18	-1.20	1.48	0.56	4-1
					0.00	0.00	0.00					0.56		1226.20	1225.85		18	1.25	7.20	12.72	
					0.00	0.00	0.00							1224.70	1224.35	0.35	Cir				
10	4	Curb	0.012	28.000	0.00	0.00	0.00	5.00	0.00	7.55	0.07	0.00	1228.74	1224.57	1224.48	0.09	18	0.32	1.84	0.51	3-1
					0.00	0.00	0.00					0.51		1225.80	1225.55		18	0.89	6.08	10.75	
					0.00	0.00	0.00							1224.30	1224.05	0.25	Cir				

NOTES: Intensity = 30.75 / (Inlet time + 4.80) ^ 0.62 (in/hr) ; Time of flow in section is based on full flow. ; Total flows limited to inlet captured flows

Project File: AS BUILT 012716.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 1/27/2016
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 10 yrs
														Elev of Invert							Proj: AS BUILT 012716.stm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
11	3	Curb	0.012	28.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.00	7.55	0.22	0.00 1.72	1227.21	1223.78 1224.79 1223.29	1223.80 1224.66 1223.16	-0.01 0.13	18 18 Cir	-0.04 0.46	2.91 4.39	1.72 7.75	2-1
12	5	MH	0.012	130.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	14.00	0.00	5.05	0.82	0.00 3.49	1229.70	1226.85 1228.20 1226.20	1226.12 1227.52 1225.52	0.73 0.68	24 24 Cir	0.56 0.52	4.15 5.64	3.49 17.72	5-1
13	12	Curb	0.012	11.980	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	14.00	0.00	5.05	0.44	0.00 1.45	1229.80	1227.02 1228.07 1226.57	1226.92 1228.00 1226.50	0.11 0.07	18 18 Cir	0.89 0.58	3.44 4.92	1.45 8.69	5-1A
14	12	Curb	0.012	11.980	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.90	0.00	5.65	0.37	0.00 2.04	1229.80	1227.11 1228.07 1226.57	1226.99 1228.00 1226.50	0.11 0.07	18 18 Cir	0.95 0.58	3.79 4.92	2.04 8.69	5-1B
15	1	Curb	0.012	34.770	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	15.20	0.00	4.87	0.70	0.00 4.03	1225.04	1222.45 1222.56 1221.06	1222.41 1222.44 1220.94	0.03 0.12	18 18 Cir	0.10 0.35	2.32 3.78	4.03 6.69	6-1
16	15	Curb	0.012	27.680	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	15.20	0.00	4.87	0.48	0.00 2.34	1225.13	1222.50 1222.65 1221.15	1222.49 1222.58 1221.08	0.01 0.07	18 18 Cir	0.03 0.25	1.38 3.24	2.34 5.72	6-2
17	7	MH	0.012	28.160	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	17.70	0.00	4.53	1.26	0.00 2.51	1228.38	1226.02 1226.62 1225.12	1225.99 1226.59 1225.09	0.03 0.03	18 18 Cir	0.10 0.11	2.26 2.10	2.51 3.71	1-9
18	17	Curb	0.012	52.400	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	17.70	0.00	4.53	1.26	0.00 2.51	1228.61	1226.31 1226.68 1225.18	1226.28 1226.65 1225.15	0.03 0.03	18 18 Cir	0.06 0.06	1.75 1.54	2.51 2.72	1-10
19	18	Curb	0.012	28.010	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	17.70	0.00	4.53	0.72	0.00 1.33	1228.85	1226.39 1226.75 1225.25	1226.39 1226.71 1225.21	0.00 0.04	18 18 Cir	0.01 0.14	0.91 2.43	1.33 4.30	1-11

NOTES: Intensity = 30.75 / (Inlet time + 4.80) ^ 0.62 (in/hr) ; Time of flow in section is based on full flow. ; Total flows limited to inlet captured flows

Project File: AS BUILT 012716.stm

MyReport

Line No.	Area Dn (sqft)	Area Up (sqft)	Byp Ln No	Coeff C1 (C)	Coeff C2 (C)	Coeff C3 (C)	Capac Full (cfs)	Crit Depth (ft)	Cross Sl, Sw (ft/ft)	Cross Sl, Sx (ft/ft)	Curb Len (ft)	Defl Ang (Deg)	Depth Dn (ft)	Depth Up (ft)	DnStm Ln No	Drng Area (ac)	Easting X (ft)	EGL Dn (ft)	EGL Up (ft)	Energy Loss (ft)
1	3.49	5.11	n/a	0.20	0.50	0.90	98.55	1.47	....	....	....	-68.726	2.11	1.47**	Outfall	0.00	652781.22	1223.39	1222.79	0.000
2	6.89	3.82	n/a	0.20	0.50	0.90	70.92	0.96	....	....	....	70.293	1.72	0.96**	1	0.00	652898.20	1222.89	1223.15	0.000
3	4.14	3.82	16	0.20	0.50	0.90	67.21	0.96	0.020	0.020	18.00	-79.314	1.04	0.96**	2	0.89	652930.42	1223.15	1224.27	0.000
4	3.70	3.70	3	0.20	0.50	0.90	34.52	1.26	0.020	0.020	18.00	-7.244	1.35	1.26**	3	0.12	652941.74	1224.60	1224.80	0.000
5	2.72	2.72	4	0.20	0.50	0.90	61.82	1.23	....	....	....	0.000	1.41	1.23**	4	0.00	652947.10	1224.94	1225.21	0.000
6	3.44	3.44	5	0.20	0.50	0.90	23.61	1.07	0.020	0.020	4.00	0.000	1.47	1.47	5	0.37	652952.83	1225.16	1225.23	0.070
7	1.92	1.92	Sag	0.20	0.50	0.90	31.82	1.04	0.020	0.020	11.60	0.000	1.71	1.04**	6	0.44	652966.45	1225.70	1225.83	0.000
8	1.96	1.87	Sag	0.20	0.50	0.90	11.25	0.74	0.020	0.020	11.60	-88.965	1.20	1.15	7	0.60	652938.11	1225.52	1225.54	0.023
9	0.22	0.22	8	0.20	0.50	0.90	12.72	0.28	0.020	0.020	4.00	-88.556	0.96	0.28**	6	0.10	652925.00	1225.41	1225.07	0.000
10	0.21	0.21	11	0.20	0.50	0.90	10.75	0.27	0.020	0.020	4.00	-84.038	0.43	0.27**	4	0.09	652914.25	1224.57	1224.66	0.000
11	0.51	0.51	16	0.20	0.50	0.90	7.75	0.49	0.020	0.020	11.00	-90.000	0.64	0.49**	3	0.28	652903.06	1223.98	1223.96	0.000
12	0.80	0.89	n/a	0.20	0.50	0.90	17.72	0.65	....	....	....	90.000	0.60	0.65**	5	0.00	653076.61	1226.36	1227.09	0.000
13	0.40	0.45	6	0.20	0.50	0.90	8.69	0.45	0.050	0.020	4.00	-91.174	0.42	0.45**	12	0.74	653077.41	1227.08	1227.19	0.000
14	0.51	0.57	4	0.20	0.50	0.90	8.69	0.54	0.050	0.020	7.50	89.483	0.49	0.54**	12	0.62	653075.67	1227.19	1227.31	0.000
15	1.76	1.71	Offsite	0.20	0.50	0.90	6.69	0.77	0.050	0.020	14.50	-19.125	1.47	1.39	1	0.28	652782.53	1222.50	1222.53	0.038
16	1.72	1.67	Offsite	0.20	0.50	0.90	5.72	0.58	0.050	0.020	18.00	13.665	1.41	1.35	15	0.80	652790.07	1222.52	1222.53	0.010
17	1.11	1.11	7	0.20	0.50	0.90	3.71	0.60	....	....	....	2.671	0.90	0.90	7	0.00	652970.21	1226.07	1226.10	0.030
18	1.43	1.43	7	0.20	0.50	0.90	2.72	0.60	0.050	0.020	4.00	85.572	1.13	1.13	17	0.90	653022.53	1226.33	1226.36	0.030
19	1.49	1.44	8	0.20	0.50	0.90	4.30	0.43	0.050	0.020	4.00	-83.760	1.18	1.14	18	0.90	653027.15	1226.40	1226.40	0.004

Project File: AS BUILT 012716.stm | Number of lines: 19 | Date: 1/27/2016

NOTES: ** Critical depth ; System flows limited to inlet captured flows.

MyReport

Flow Rate (cfs)	Sf Ave (ft/ft)	Sf Dn (ft/ft)	Grate Area (sqft)	Grate Len (ft)	Grate Width (ft)	Gnd/Rim El Dn (ft)	Gnd/Rim El Up (ft)	Gutter Depth (ft)	Gutter Slope (ft/ft)	Gutter Spread (ft)	Gutter Width (ft)	HGL Dn (ft)	HGL Up (ft)	HGL Jnct (ft)	HGL Jmp Dn (ft)	HGL Jmp Up (ft)	Incr CxA	Incr Q (cfs)	Inlet Depth (ft)	Inlet Eff (%)
25.20	0.000	0.000	....	....	....	1224.65	1226.06	....	....	....	....	1223.01	1222.41	1222.41	....	....	0.00	0.00	....	....
21.18	0.000	0.000	....	....	....	1226.06	1226.06	....	....	....	....	1222.41	1222.68 j	1222.68	1222.35	1221.78	0.00	0.00	....	....
21.18	0.000	0.000	....	....	....	1226.06	1227.10	0.17	0.020	8.71	2.00	1222.68	1223.80 j	1223.80	1222.72	1222.60	0.53	2.46	0.33	100
16.99	0.000	0.000	....	....	....	1227.10	1228.83	0.15	0.015	7.46	2.00	1224.27	1224.48	1224.48	....	....	0.10	0.72	0.33	100
14.87	0.000	0.000	....	....	....	1228.83	1229.08	....	....	....	....	1224.48	1224.75 j	1224.75	1224.40	1224.30	0.00	0.00	....	....
11.38	0.107	0.107	....	....	....	1229.08	1229.06	0.16	0.015	8.06	2.00	1224.99	1225.06	1225.31	....	....	0.22	1.21	0.45	59
9.64	0.000	0.000	....	....	....	1229.06	1228.40	0.26	Sag	1.38	2.00	1225.31	1225.44 j	1225.44	1225.27	1225.08	0.26	1.28	0.59	100
4.49	0.080	0.075	....	....	....	1228.40	1228.30	0.27	Sag	1.45	2.00	1225.44	1225.45	1225.54	....	....	0.48	2.52	0.60	100
0.56	0.000	0.000	....	....	....	1229.06	1229.09	0.10	0.015	5.16	2.00	1225.31	1224.98	1224.98	....	....	0.08	0.60	0.37	92
0.51	0.000	0.000	....	....	....	1228.83	1228.74	0.10	0.015	4.96	2.00	1224.48	1224.57 j	1224.57	1224.46	1224.37	0.07	0.54	0.37	95
1.72	0.000	0.000	....	....	....	1227.10	1227.21	0.15	0.015	7.61	2.00	1223.80	1223.78	1223.78	....	....	0.22	1.69	0.33	100
3.49	0.000	0.000	....	....	....	1229.08	1229.70	....	....	....	....	1226.12	1226.85	1226.85	....	....	0.00	0.00	....	....
1.45	0.000	0.000	....	....	....	1229.70	1229.80	0.22	0.015	7.81	2.00	1226.92	1227.02	1227.02	....	....	0.44	2.24	0.49	65
2.04	0.000	0.000	....	....	....	1229.70	1229.80	0.21	0.015	7.56	2.00	1226.99	1227.11	1227.11	....	....	0.37	2.10	0.40	97
4.03	0.111	0.113	....	....	....	1226.06	1225.04	0.19	0.015	7.21	1.50	1222.41	1222.45	1222.49	....	....	0.22	1.69	0.17	100
2.34	0.037	0.036	....	....	....	1225.04	1225.13	0.21	0.015	8.21	1.50	1222.49	1222.50	1222.53	....	....	0.48	2.34	0.17	100
2.51	0.107	0.107	....	....	....	1228.40	1228.38	....	....	....	....	1225.99	1226.02	1226.10	....	....	0.00	0.00	....	....
2.51	0.057	0.057	....	....	....	1228.38	1228.61	0.21	0.020	7.71	2.00	1226.28	1226.31	1226.39	....	....	0.54	2.54	0.34	46
1.33	0.016	0.015	....	....	....	1228.61	1228.85	0.23	0.020	8.61	2.00	1226.39	1226.39	1226.40	....	....	0.72	3.26	0.36	41

Project File: AS BUILT 012716.stm | Number of lines: 19 | Date: 1/27/2016

NOTES: ^^ Critical depth ; System flows limited to inlet captured flows.

MyReport

Inlet ID	Inlet Loc	Inlet Spread (ft)	Inlet Time (min)	i Sys (in/hr)	i Inlet (in/hr)	Invert Dn (ft)	Invert Up (ft)	Jump Loc (ft)	Jump Len (ft)	Vel Hd Jmp Dn (ft)	Vel Hd Jmp Up (ft)	J-Loss Coeff	Junct Type	Known Q (cfs)	Cost RCP	Cost CMP	Cost PVC	Line ID	
1-2	Sag	....	0.0	4.53	0.00	1220.90	1220.94	....	....	0.00	0.00	0.95 z	MH	0.00	120	108	102	1-2	
1-3	Sag	....	0.0	4.53	0.00	1220.69	1221.72	35.11	6.78	0.24	0.84	0.99 z	MH	0.00	5,268	4,741	4,478	1-3	
1-4	On Grade	0.01	17.0	4.53	4.61	1221.64	1222.84	15.18	4.78	0.48	0.68	1.50 z	Curb	0.00	6,786	6,107	5,768	1-4	
1-5	On Grade	0.01	5.0	4.53	7.55	1222.92	1223.22	....	....	0.00	0.00	1.49 z	Curb	0.00	120	108	102	1-5	
1-6	Sag	....	0.0	4.53	0.00	1223.07	1223.52	12.29	6.18	0.46	0.62	1.00 z	MH	0.00	3,292	2,963	2,798	1-6	
1-7	On Grade	5.81	11.8	4.53	5.46	1223.52	1223.59	....	....	0.00	0.00	1.50	Curb	0.00	3,526	3,173	2,997	1-7	
1-8	Sag	1.38	15.4	4.53	4.84	1223.60	1224.40	93.60	5.92	0.28	0.50	1.50 z	Curb	0.00	7,584	6,826	6,446	1-8	
7-1	Sag	1.45	12.9	5.25	5.25	1224.24	1224.30	....	....	0.00	0.00	1.00	Curb	0.00	1,350	1,215	1,148	7-1	
4-1	On Grade	2.01	5.0	7.55	7.55	1224.35	1224.70	....	....	0.00	0.00	1.00 z	Curb	0.00	1,240	1,116	1,054	4-1	
3-1	On Grade	1.71	5.0	7.55	7.55	1224.05	1224.30	8.40	1.69	0.05	0.15	1.00 z	Curb	0.00	1,240	1,116	1,054	3-1	
2-1	On Grade	0.01	5.0	7.55	7.55	1223.16	1223.29	....	....	0.00	0.00	1.00 z	Curb	0.00	996	896	847	2-1	
5-1	Sag	....	0.0	5.05	0.00	1225.52	1226.20	....	....	0.00	0.00	1.00 z	MH	0.00	4,780	4,302	4,063	5-1	
5-1A	On Grade	4.76	14.0	5.05	5.05	1226.50	1226.57	....	....	0.00	0.00	1.00 z	Curb	0.00	468	421	398	5-1A	
5-1B	On Grade	1.26	10.9	5.65	5.65	1226.50	1226.57	....	....	0.00	0.00	1.00 z	Curb	0.00	468	421	398	5-1B	
6-1	On Grade	0.00	5.0	4.87	7.55	1220.94	1221.06	....	....	0.00	0.00	0.50	Curb	0.00	1,476	1,328	1,255	6-1	
6-2	On Grade	0.00	15.2	4.87	4.87	1221.08	1221.15	....	....	0.00	0.00	1.00	Curb	0.00	980	882	833	6-2	
1-9	Sag	....	0.0	4.53	0.00	1225.09	1225.12	....	....	0.00	0.00	1.00	MH	0.00	996	896	847	1-9	
1-10	On Grade	5.81	16.3	4.53	4.71	1225.15	1225.18	....	....	0.00	0.00	1.49	Curb	0.00	1,764	1,588	1,499	1-10	
1-11	On Grade	6.86	17.7	4.53	4.53	1225.21	1225.25	....	....	0.00	0.00	1.00	Curb	0.00	996	896	847	1-11	

Project File: AS BUILT 012716.stm | Number of lines: 19 | Date: 1/27/2016

NOTES: Intensity = 30.75 / (Inlet time + 4.80) ^ 0.82 – Return period = 10 Yrs. ; ^^ Critical depth ; System flows limited to inlet captured flows.

MyReport

Line Length (ft)	Line Size (in)	Line Slope (%)	Line Type	Local Depr (in)	n-val Gutter	n-val Pipe	Minor Loss (ft)	Northing Y (ft)	Pipe Travel (min)	Q Byp (cfs)	Q Capt (cfs)	Q Carry (cfs)	Line Rise (in)	Runoff Coeff (C)	Line Span (in)	Area A1 (ac)	Area A2 (ac)	Area A3 (ac)	Tc (min)	Throat Ht (in)	Total Area (ac)	Total CxA
5.002	34 x 53	0.80	Ell	....	....	0.012	0.36	632794.53	0.00	....	....	....	34	0.00	53	0.00	0.00	0.00	17.7	....	7.13	4.75
117.020	24 x 48	0.88	Box	....	....	0.012	n/a	632791.33	0.00	....	....	....	24	0.00	48	0.00	0.00	0.00	17.7	....	6.05	4.05
151.810	24 x 48	0.79	Box	4.0	0.015	0.012	n/a	632939.68	0.00	0.00	2.46	0.00	24	0.60	48	0.00	0.00	0.00	17.7	2.0	6.05	4.05
129.630	29 x 45	0.23	Ell	4.0	0.013	0.012	0.49	633068.82	0.00	0.00	1.61	0.89	29	0.80	45	0.00	0.00	0.00	17.7	2.0	4.88	3.29
61.470	36	0.73	Cir	....	....	0.012	n/a	633130.05	0.00	....	....	....	36	0.00	36	0.00	0.00	0.00	17.7	....	4.67	3.12
65.530	36	0.11	Cir	4.0	0.013	0.012	0.26	633195.33	0.00	0.82	1.18	0.79	36	0.60	36	0.00	0.00	0.00	17.7	2.0	3.31	2.31
155.000	30	0.51	Cir	4.0	....	0.012	n/a	633350.73	0.00	0.00	2.64	1.37	30	0.60	30	0.00	0.00	0.00	17.7	2.0	2.84	2.00
28.500	24	0.21	Cir	4.0	....	0.012	0.09	633353.74	0.00	0.00	4.49	1.97	24	0.80	24	0.00	0.00	0.00	12.9	2.0	0.60	0.48
28.000	18	1.25	Cir	4.0	0.013	0.012	0.10	633198.48	0.00	0.05	0.56	0.00	18	0.80	18	0.00	0.00	0.00	5.0	2.0	0.10	0.08
28.000	18	0.89	Cir	4.0	0.013	0.012	n/a	633074.14	0.00	0.03	0.51	0.00	18	0.80	18	0.00	0.00	0.00	5.0	2.0	0.09	0.07
28.000	18	0.46	Cir	4.0	0.013	0.012	n/a	632945.62	0.00	0.00	1.72	0.03	18	0.80	18	0.00	0.00	0.00	5.0	2.0	0.28	0.22
130.000	24	0.52	Cir	....	....	0.012	0.24	633118.70	0.00	....	....	....	24	0.00	24	0.00	0.00	0.00	14.0	....	1.36	0.82
11.980	18	0.58	Cir	4.0	0.013	0.012	0.16	633130.65	0.00	0.79	1.45	0.00	18	0.60	18	0.00	0.00	0.00	14.0	2.0	0.74	0.44
11.980	18	0.58	Cir	4.0	0.013	0.012	0.20	633106.76	0.00	0.06	2.04	0.00	18	0.60	18	0.00	0.00	0.00	10.9	2.0	0.62	0.37
34.770	18	0.35	Cir	2.0	0.013	0.012	0.04	632829.27	0.00	0.00	1.69	0.00	18	0.80	18	0.00	0.00	0.00	15.2	4.0	1.08	0.70
27.680	18	0.25	Cir	2.0	0.013	0.012	0.03	632855.91	0.00	0.00	2.34	0.00	18	0.60	18	0.00	0.00	0.00	15.2	4.0	0.80	0.48
28.160	18	0.11	Cir	....	....	0.012	0.08	633378.64	0.00	....	....	....	18	0.00	18	0.00	0.00	0.00	17.7	....	1.80	1.26
52.400	18	0.06	Cir	2.0	0.013	0.012	0.07	633375.67	0.00	1.37	1.17	0.00	18	0.60	18	0.00	0.00	0.00	17.7	4.0	1.80	1.26
28.010	18	0.14	Cir	2.0	0.013	0.012	0.01	633403.30	0.00	1.93	1.33	0.00	18	0.80	18	0.00	0.00	0.00	17.7	4.0	0.90	0.72

Project File: AS BUILT 012716.stm | Number of lines: 19 | Date: 1/27/2016

NOTES: ^^ Critical depth ; System flows limited to inlet captured flows.

MyReport

Total Runoff (cfs)	Vel Ave (ft/s)	Vel Dn (ft/s)	Vel Hd Dn (ft)	Vel Hd Up (ft)	Vel Up (ft/s)	Cover Dn (ft)	Cover Up (ft)	Storage (cft)
21.50	6.08	7.22	0.38	0.38	4.93	0.92	2.29	21.51
18.32	4.31	3.07	0.48	0.48	5.54	3.37	2.34	626.90
18.32	5.33	5.11	0.48	0.48	5.54	2.42	2.26	604.31
14.89	4.59	4.59	0.33	0.33	4.59	1.76	3.19	479.79
14.13	5.01	4.57	0.46	0.46	5.46	2.76	2.56	183.67
10.44	3.31	3.31	0.17	0.17	3.31	2.56	2.47	225.31
9.07	3.85	2.69	0.39	0.39	5.02	2.96	1.50	430.64
2.52	2.35	2.29	0.08	0.09	2.40	2.16	2.00	54.58
0.60	1.48	0.46	0.10	0.10	2.49	3.21	2.89	19.50
0.54	1.84	1.24	0.09	0.09	2.44	3.28	2.94	8.67
1.69	2.91	2.42	0.18	0.18	3.40	2.44	2.42	17.02
4.12	4.15	4.38	0.24	0.24	3.92	1.56	1.50	109.66
2.24	3.44	3.65	0.16	0.16	3.24	1.70	1.73	5.07
2.10	3.79	4.01	0.20	0.20	3.57	1.70	1.73	6.45
3.43	2.32	2.29	0.08	0.09	2.36	3.62	2.48	60.35
2.34	1.38	1.35	0.03	0.03	1.40	2.46	2.48	47.04
5.70	2.26	2.26	0.08	0.08	2.26	1.81	1.76	31.25
5.70	1.75	1.75	0.05	0.05	1.75	1.73	1.93	75.12
3.26	0.91	0.90	0.01	0.01	0.93	1.90	2.10	40.93

Project File: AS BUILT 012716.stm | Number of lines: 19 | Date: 1/27/2016

NOTES: ^^ Critical depth ; System flows limited to inlet captured flows.

Storm Sewer Inlet Time Tabulation

Line No.	Line ID	Tc Method	Sheet Flow					Shallow Concentrated Flow					Channel Flow							Total Travel Time (min)
			n-Value	flow Length (ft)	2-yr 24h P (in)	Land Slope (%)	Travel Time (min)	flow Length (ft)	Water Slope (%)	Surf Descr	Ave Vel (ft/s)	Travel Time (min)	X-sec Area (sqft)	Wetted Perim (ft)	Chan Slope (%)	n-Value	Vel	flow Length (ft)	Travel Time (min)	
1	1-2	User																		0.00
2	1-3	User																		0.00
3	1-4	TR55	0.240	75.00	3.39	1.00	14.53	290.00	1.50	UnPaved	1.98	2.45								17.00
4	1-5	User																		5.00
5	1-6	User																		0.00
6	1-7	TR55	0.150	91.00	3.39	2.00	8.83	450.00	1.50	Paved	2.49	3.01								11.80
7	1-8	TR55	0.240	75.00	3.39	1.00	14.53	135.00	1.50	Paved	2.49	0.90								15.40
8	7-1	TR55	0.240	58.00	3.39	1.00	11.83	155.00	1.50	Paved	2.49	1.04								12.90
9	4-1	User																		5.00
10	3-1	User																		5.00
11	2-1	User																		5.00
12	5-1	User																		0.00
13	5-1A	TR55	0.240	55.00	3.39	1.00	11.34	55.00 305.00	1.50 1.30	UnPaved Paved	1.98 2.32	0.46 2.19								14.00
14	5-1B	TR55	0.240	56.00	5.46	1.00	9.07	275.00	1.50	Paved	2.49	1.84								10.90
15	6-1	User																		5.00
16	6-2	TR55	0.240	65.00	3.39	1.00	12.96	23.00 310.00	2.00 1.50	UnPaved Paved	2.28 2.49	0.17 2.08								15.20
17	1-9	User																		0.00
18	1-10	TR55	0.240	75.00	3.39	1.00	14.53	30.00 216.00	1.50 1.30	UnPaved Paved	1.98 2.32	0.25 1.55								16.30
19	1-11	TR55	0.240	75.00	3.39	1.00	14.53	475.00	1.50	Paved	2.49	3.18								17.70

Project File: AS BUILT 012716.stm | Min. Tc used for intensity calculations = 5 min | Number of lines: 19 | Date: 1/27/2016

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	34 53 e	25.20	1220.90	1223.01	2.11	3.49	7.22	0.38	1223.39	0.000	5.002	1220.94	1222.41	1.47**	5.11	4.93	0.38	1222.79	0.000	0.000	n/a	0.95	0.36
2	24 48 B	21.18	1220.69	1222.41	1.72	6.89	3.07	0.48	1222.89	0.000	117.020	1221.72	1222.68 j	0.96**	3.82	5.54	0.48	1223.15	0.000	0.000	n/a	0.99	n/a
3	24 48 B	21.18	1221.64	1222.68	1.04	4.14	5.11	0.48	1223.15	0.000	151.810	1222.84	1223.80 j	0.96**	3.82	5.54	0.48	1224.27	0.000	0.000	n/a	1.50	n/a
4	29 45 e	16.99	1222.92	1224.27	1.35	3.70	4.59	0.33	1224.60	0.000	129.630	1223.22	1224.48	1.26**	3.70	4.59	0.33	1224.80	0.000	0.000	n/a	1.49	0.49
5	36	14.87	1223.07	1224.48	1.41	2.72	4.57	0.46	1224.94	0.000	61.470	1223.52	1224.75 j	1.23**	2.72	5.46	0.46	1225.21	0.000	0.000	n/a	1.00	n/a
6	36	11.38	1223.52	1224.99	1.47*	3.44	3.31	0.17	1225.16	0.107	65.530	1223.59	1225.06	1.47	3.44	3.31	0.17	1225.23	0.107	0.107	0.070	1.50	0.26
7	30	9.64	1223.60	1225.31	1.71	1.92	2.69	0.39	1225.70	0.000	155.000	1224.40	1225.44 j	1.04**	1.92	5.02	0.39	1225.83	0.000	0.000	n/a	1.50	n/a
8	24	4.49	1224.24	1225.44	1.20	1.96	2.29	0.08	1225.52	0.075	28.500	1224.30	1225.45	1.15	1.87	2.40	0.09	1225.54	0.085	0.080	0.023	1.00	0.09
9	18	0.56	1224.35	1225.31	0.96	0.22	0.46	0.10	1225.41	0.000	28.000	1224.70	1224.98	0.28**	0.22	2.49	0.10	1225.07	0.000	0.000	n/a	1.00	0.10
10	18	0.51	1224.05	1224.48	0.43	0.21	1.24	0.09	1224.57	0.000	28.000	1224.30	1224.57 j	0.27**	0.21	2.44	0.09	1224.66	0.000	0.000	n/a	1.00	0.09
11	18	1.72	1223.16	1223.80	0.64	0.51	2.42	0.18	1223.98	0.000	28.000	1223.29	1223.78	0.49**	0.51	3.40	0.18	1223.96	0.000	0.000	n/a	1.00	n/a
12	24	3.49	1225.52	1226.12	0.60*	0.80	4.38	0.24	1226.36	0.000	130.000	1226.20	1226.85	0.65**	0.89	3.92	0.24	1227.09	0.000	0.000	n/a	1.00	0.24
13	18	1.45	1226.50	1226.92	0.42*	0.40	3.65	0.16	1227.08	0.000	11.980	1226.57	1227.02	0.45**	0.45	3.24	0.16	1227.19	0.000	0.000	n/a	1.00	0.16
14	18	2.04	1226.50	1226.99	0.49*	0.51	4.01	0.20	1227.19	0.000	11.980	1226.57	1227.11	0.54**	0.57	3.57	0.20	1227.31	0.000	0.000	n/a	1.00	0.20
15	18	4.03	1220.94	1222.41	1.47	1.76	2.29	0.08	1222.50	0.113	34.770	1221.06	1222.45	1.39	1.71	2.36	0.09	1222.53	0.109	0.111	0.038	0.50	0.04
16	18	2.34	1221.08	1222.49	1.41	1.72	1.35	0.03	1222.52	0.036	27.680	1221.15	1222.50	1.35	1.67	1.40	0.03	1222.53	0.037	0.037	0.010	1.00	0.03
17	18	2.51	1225.09	1225.99	0.90*	1.11	2.26	0.08	1226.07	0.107	28.160	1225.12	1226.02	0.90	1.11	2.26	0.08	1226.10	0.107	0.107	0.030	1.00	0.08
18	18	2.51	1225.15	1226.28	1.13*	1.43	1.75	0.05	1226.33	0.057	52.400	1225.18	1226.31	1.13	1.43	1.75	0.05	1226.36	0.057	0.057	0.030	1.49	0.07
19	18	1.33	1225.21	1226.39	1.18	1.49	0.90	0.01	1226.40	0.015	28.010	1225.25	1226.39	1.14	1.44	0.93	0.01	1226.40	0.016	0.016	0.004	1.00	0.01

Project File: AS BUILT 012716.stm | Number of lines: 19 | Run Date: 1/27/2016

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

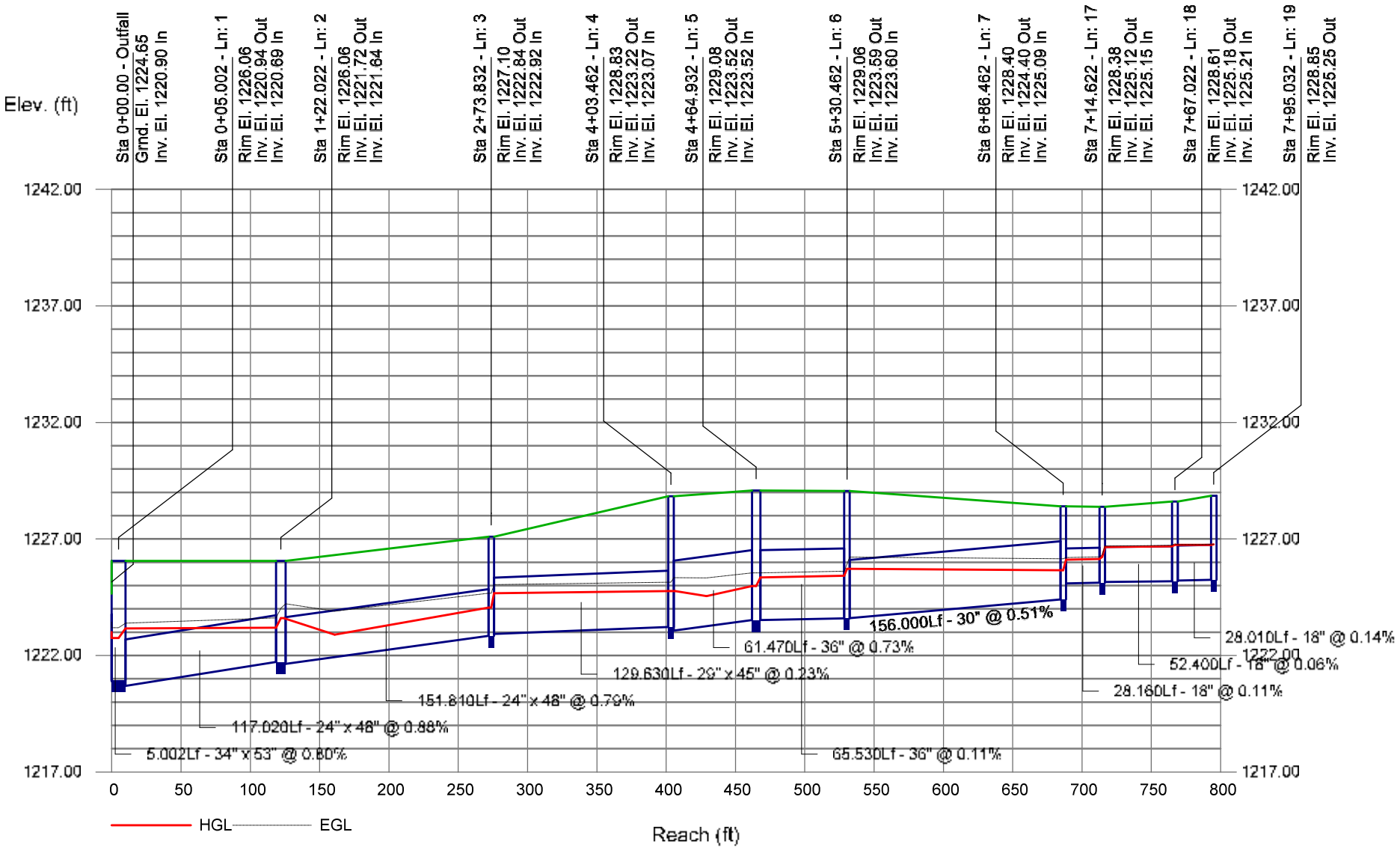
INLET DESIGN STORM SEWER ANALYSIS (100-YR)

Crafton Tull
architecture | engineering | surveying

Storm Sewer Profile

Proj. file: AS BUILT 012716.stm

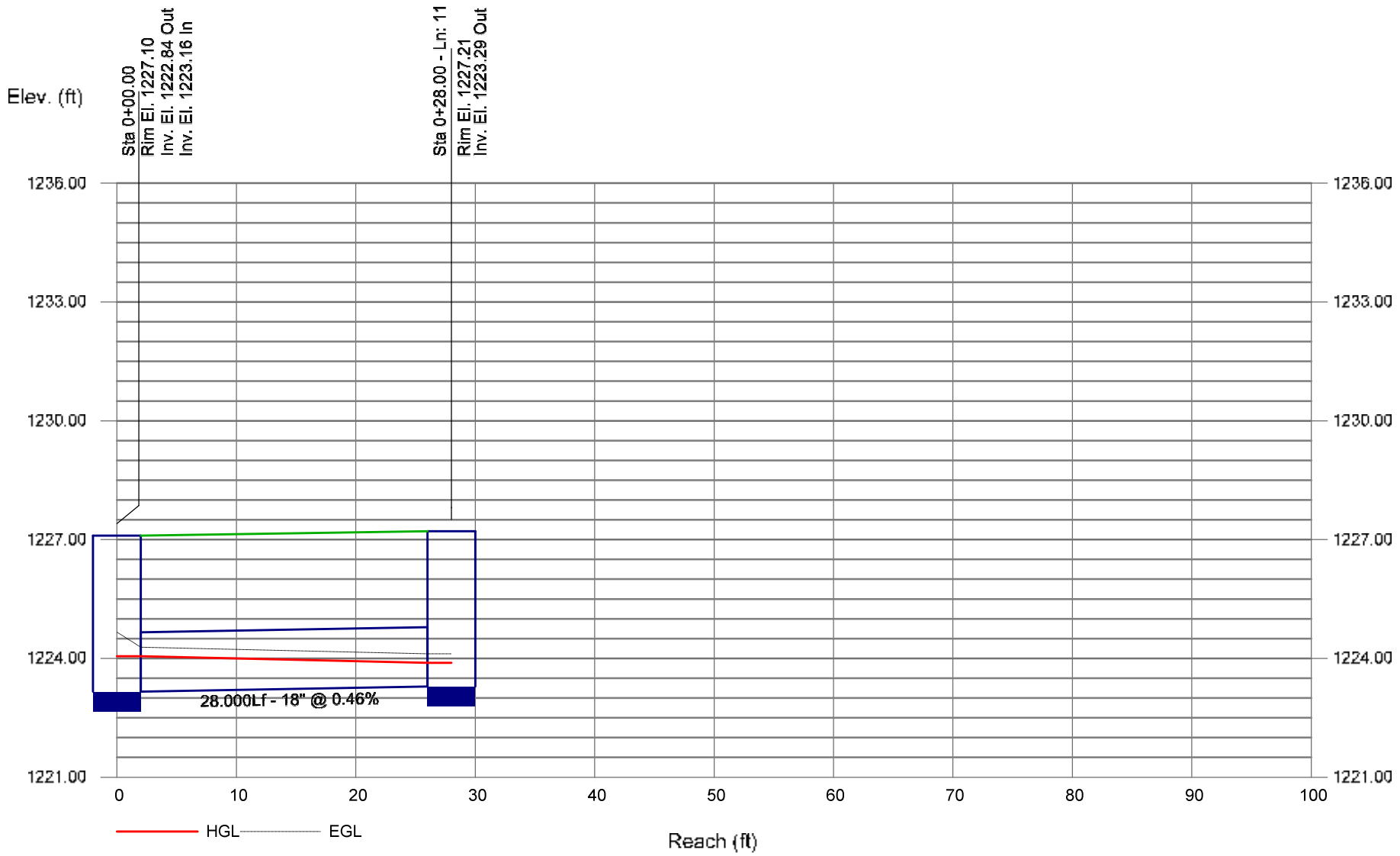
LINE 1 - 100 YR



Storm Sewer Profile

Proj. file: AS BUILT 012716.stm

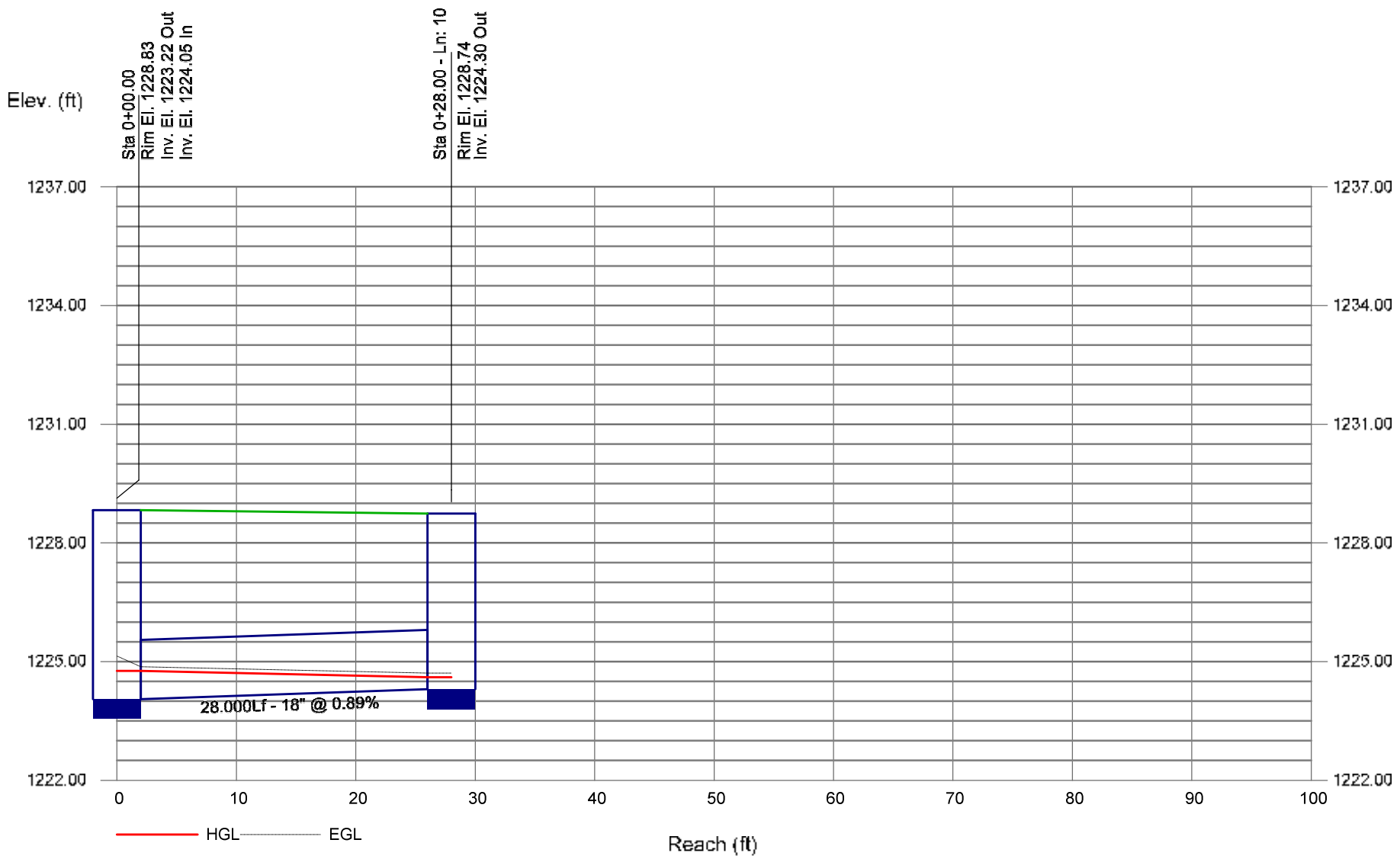
LINE 2 - 100 YR



Storm Sewer Profile

Proj. file: AS BUILT 012716.stm

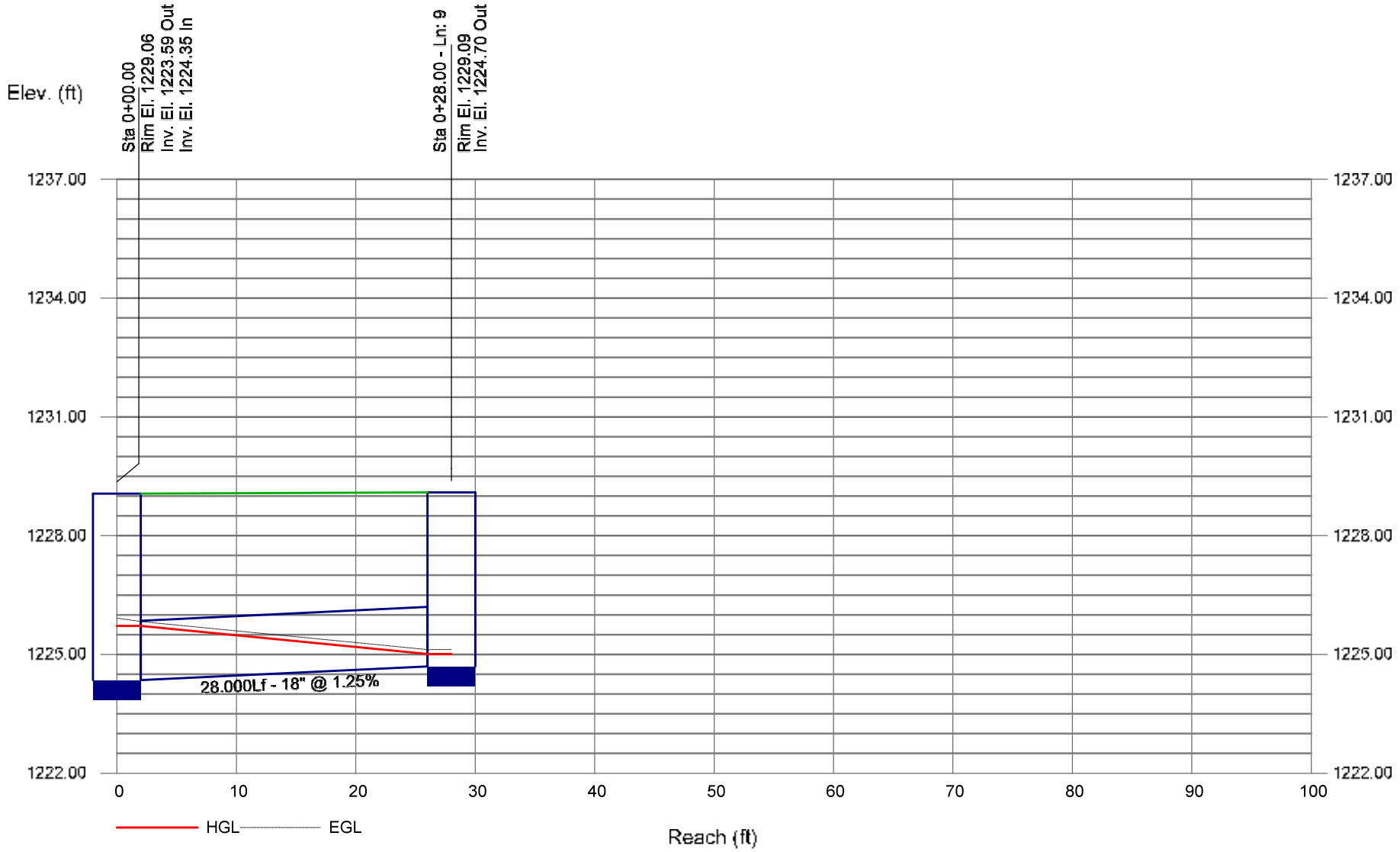
LINE 3 - 100 YR



Storm Sewer Profile

Proj. file: AS BUILT 012716.stm

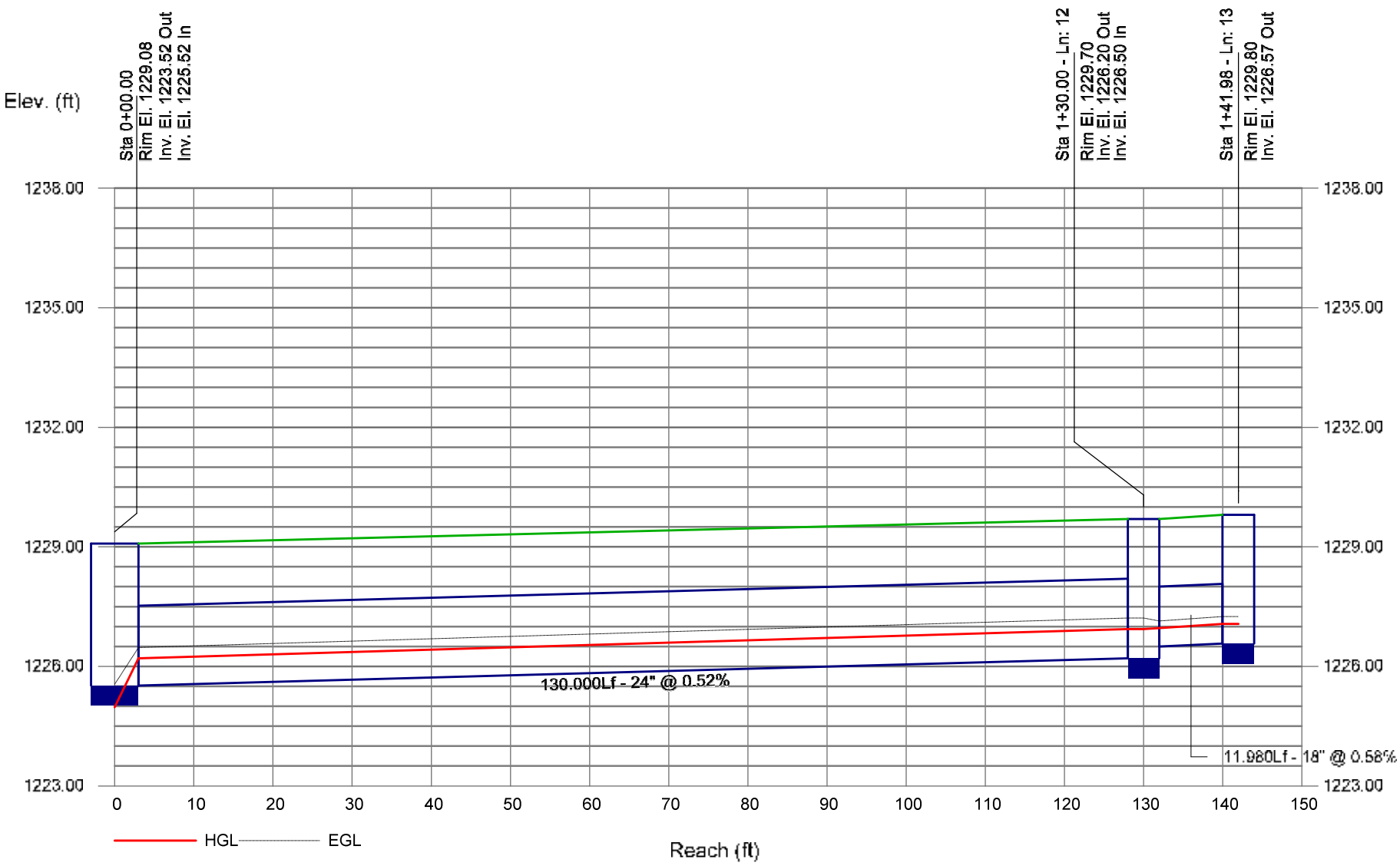
LINE 4 - 100 YR



Storm Sewer Profile

Proj. file: AS BUILT 012716.stm

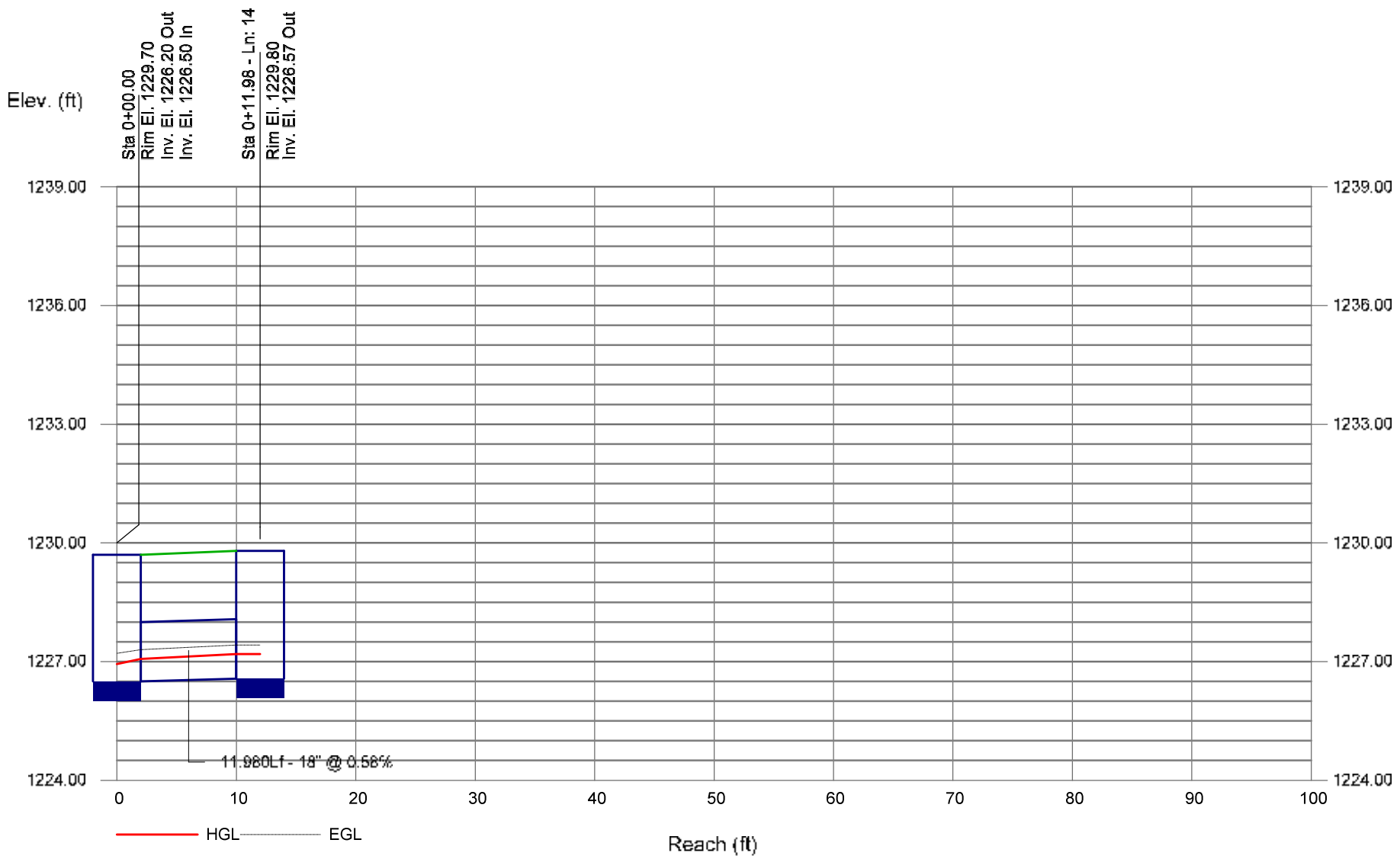
LINE 5 - 100 YR



Storm Sewer Profile

Proj. file: AS BUILT 012716.stm

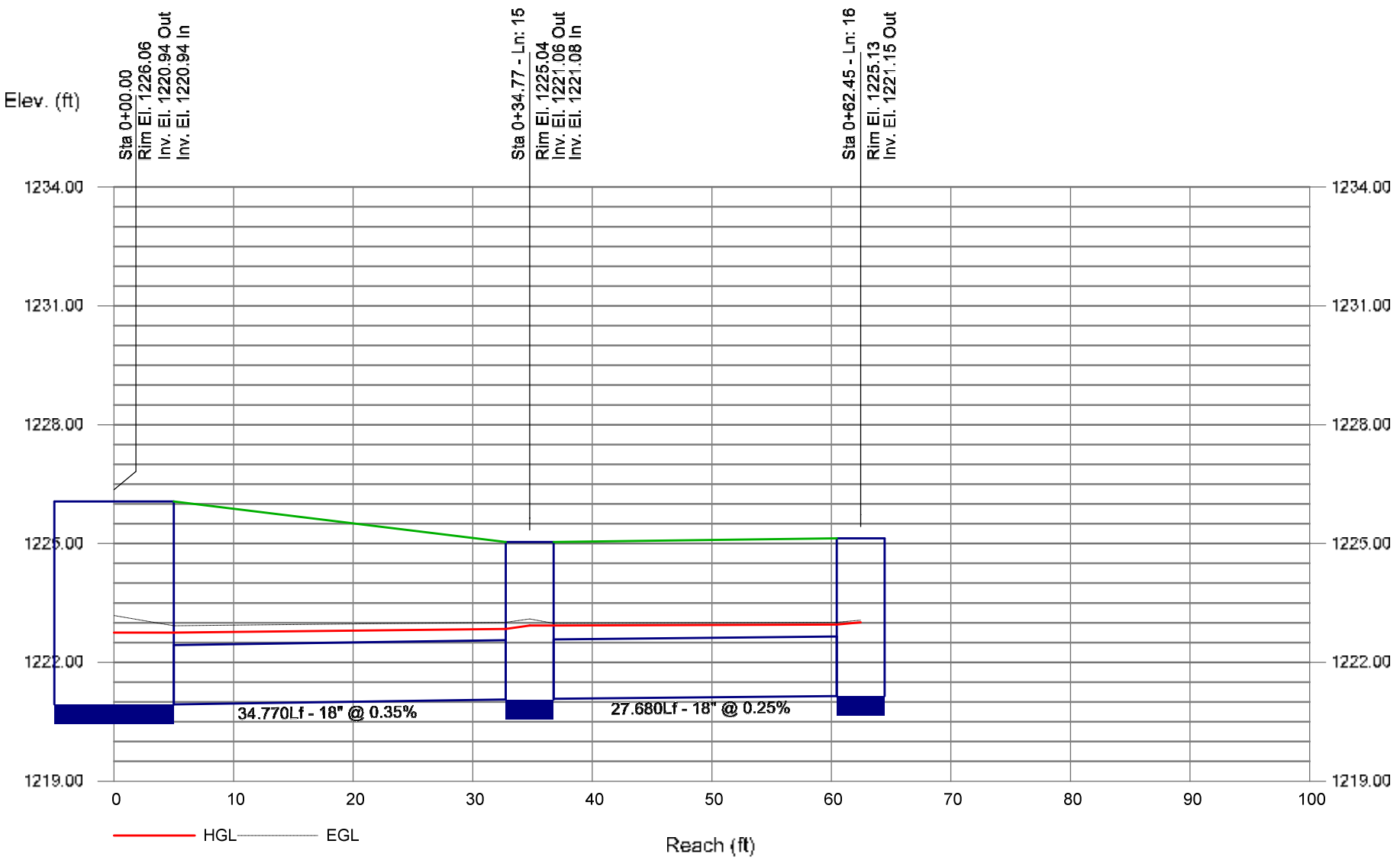
LINE 5B - 100 YR



Storm Sewer Profile

Proj. file: AS BUILT 012716.stm

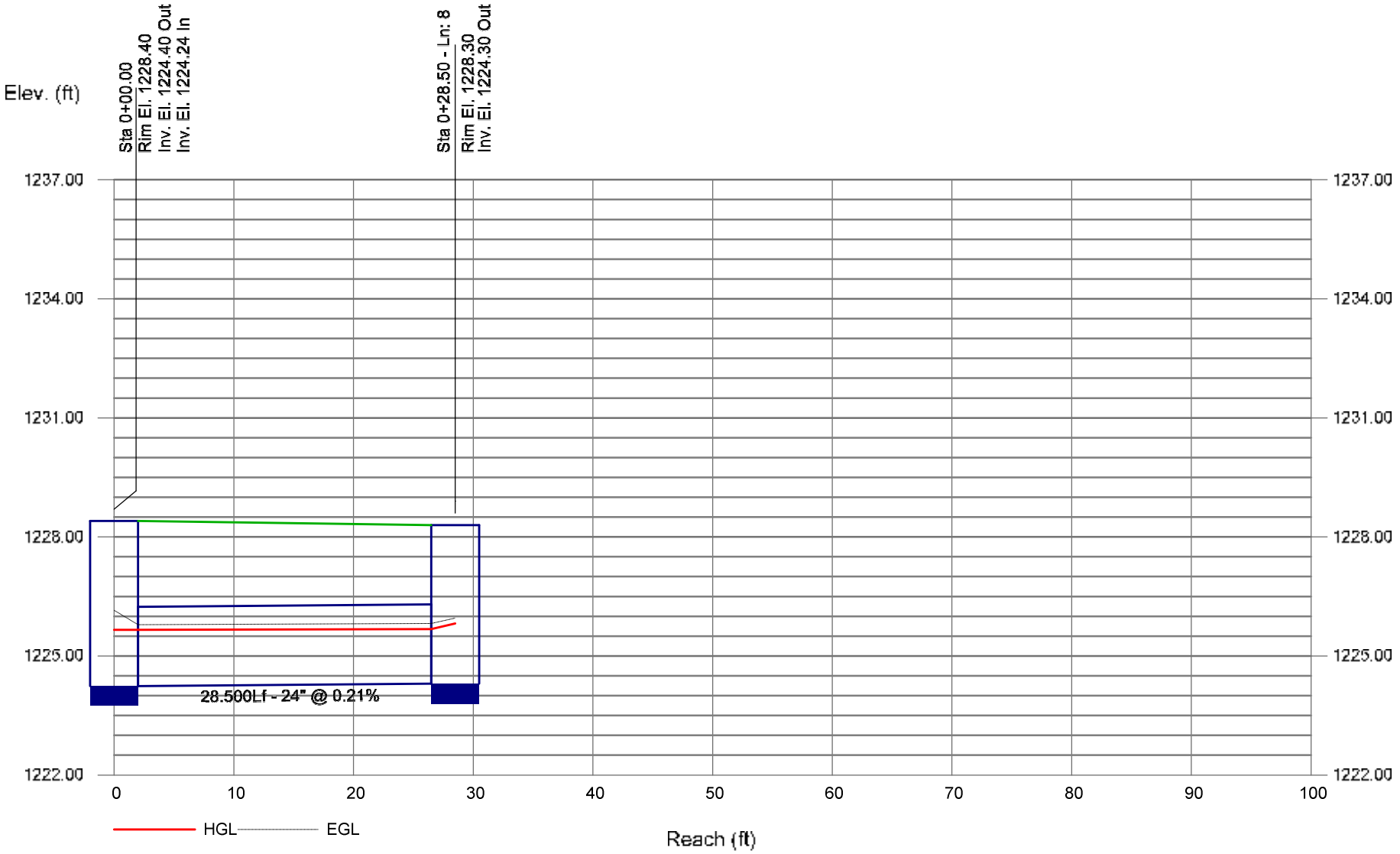
LINE 6 - 100 YR



Storm Sewer Profile

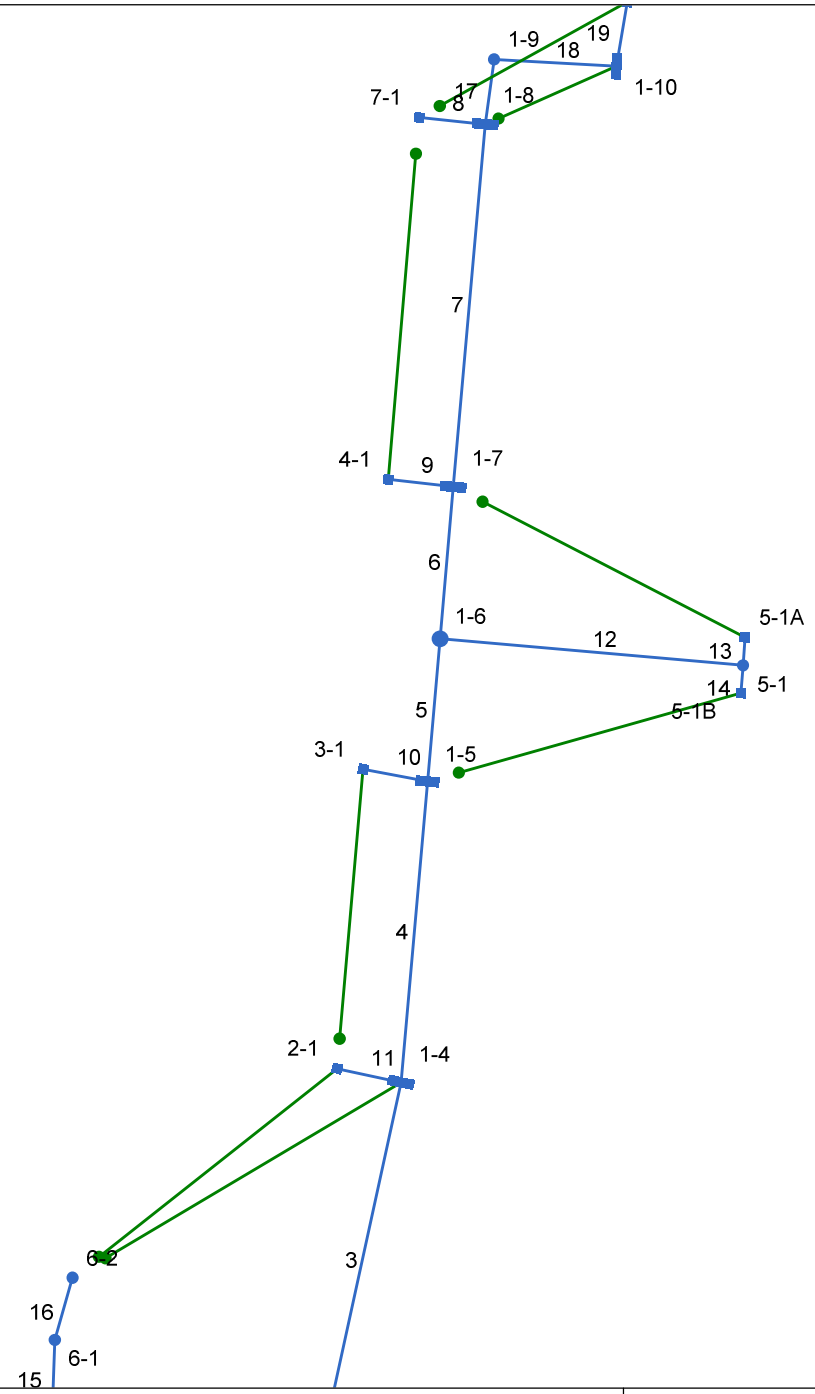
Proj. file: AS BUILT 012716.stm

LINE 7 - 100 YR



Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan

100 YR



Project File: AS BUILT 012716.stm	Number of lines: 19	Date: 1/27/2016

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	5.002	-68.726	MH	0.00	0.00	0.00	0.0	1220.90	0.80	1220.94	34X53	Ell	0.012	0.95	1226.06	1-2
2	1	117.020	70.293	MH	0.00	0.00	0.00	0.0	1220.69	0.88	1221.72	24X48	Box	0.012	0.99	1226.06	1-3
3	2	151.810	-79.314	Curb	0.00	0.89	0.60	17.0	1221.64	0.79	1222.84	24X48	Box	0.012	1.50	1227.10	1-4
4	3	129.630	-7.244	Curb	0.00	0.12	0.80	5.0	1222.92	0.23	1223.22	29X45	Ell	0.012	1.49	1228.83	1-5
5	4	61.470	0.000	MH	0.00	0.00	0.00	0.0	1223.07	0.73	1223.52	36	Cir	0.012	1.00	1229.08	1-6
6	5	65.530	0.000	Curb	0.00	0.37	0.60	11.8	1223.52	0.11	1223.59	36	Cir	0.012	1.50	1229.06	1-7
7	6	156.000	0.000	Curb	0.00	0.44	0.60	15.4	1223.60	0.51	1224.40	30	Cir	0.012	1.50	1228.40	1-8
8	7	28.500	-88.965	Curb	0.00	0.60	0.80	12.9	1224.24	0.21	1224.30	24	Cir	0.012	1.00	1228.30	7-1
9	6	28.000	-88.556	Curb	0.00	0.10	0.80	5.0	1224.35	1.25	1224.70	18	Cir	0.012	1.00	1229.09	4-1
10	4	28.000	-84.038	Curb	0.00	0.09	0.80	5.0	1224.05	0.89	1224.30	18	Cir	0.012	1.00	1228.74	3-1
11	3	28.000	-90.000	Curb	0.00	0.28	0.80	5.0	1223.16	0.46	1223.29	18	Cir	0.012	1.00	1227.21	2-1
12	5	130.000	90.000	MH	0.00	0.00	0.00	0.0	1225.52	0.52	1226.20	24	Cir	0.012	1.00	1229.70	5-1
13	12	11.980	-91.174	Curb	0.00	0.74	0.60	14.0	1226.50	0.58	1226.57	18	Cir	0.012	1.00	1229.80	5-1A
14	12	11.980	89.483	Curb	0.00	0.62	0.60	10.9	1226.50	0.58	1226.57	18	Cir	0.012	1.00	1229.80	5-1B
15	1	34.770	-19.125	Curb	0.00	0.28	0.80	5.0	1220.94	0.35	1221.06	18	Cir	0.012	0.50	1225.04	6-1
16	15	27.680	13.665	Curb	0.00	0.80	0.60	15.2	1221.08	0.25	1221.15	18	Cir	0.012	1.00	1225.13	6-2
17	7	28.160	2.671	MH	0.00	0.00	0.00	0.0	1225.09	0.11	1225.12	18	Cir	0.012	1.00	1228.38	1-9
18	17	52.400	85.572	Curb	0.00	0.90	0.60	16.3	1225.15	0.06	1225.18	18	Cir	0.012	1.49	1228.61	1-10
19	18	28.010	-83.760	Curb	0.00	0.90	0.80	17.7	1225.21	0.14	1225.25	18	Cir	0.012	1.00	1228.85	1-11

Project File: AS BUILT 012716.stm | Number of lines: 19 | Date: 1/27/2016

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1	1-2	Manhole	1226.06	Rect	10.00	5.00	34x53	Ellip	1220.94	24x48 18	Box Cir	1220.69 1220.94
2	1-3	Manhole	1226.06	Rect	7.00	7.00	24x48	Box	1221.72	24x48	Box	1221.64
3	1-4	Curb-Horiz	1227.10	Rect	4.00	11.00	24x48	Box	1222.84	29x45 18	Ellip Cir	1222.92 1223.16
4	1-5	Curb-Horiz	1228.83	Rect	4.00	10.00	29x45	Ellip	1223.22	36 18	Cir Cir	1223.07 1224.05
5	1-6	Manhole	1229.08	Cir	6.00	6.00	36	Cir	1223.52	36 24	Cir Cir	1223.52 1225.52
6	1-7	Curb-Horiz	1229.06	Rect	4.00	11.00	36	Cir	1223.59	30 18	Cir Cir	1223.60 1224.35
7	1-8	Curb-Horiz	1228.40	Rect	4.00	11.00	30	Cir	1224.40	24 18	Cir Cir	1224.24 1225.09
8	7-1	Curb-Horiz	1228.30	Rect	4.00	4.00	24	Cir	1224.30			
9	4-1	Curb-Horiz	1229.09	Rect	4.00	4.00	18	Cir	1224.70			
10	3-1	Curb-Horiz	1228.74	Rect	4.00	4.00	18	Cir	1224.30			
11	2-1	Curb-Horiz	1227.21	Rect	4.00	4.00	18	Cir	1223.29			
12	5-1	Manhole	1229.70	Cir	4.00	4.00	24	Cir	1226.20	18 18	Cir Cir	1226.50 1226.50
13	5-1A	Curb-Horiz	1229.80	Rect	4.00	4.00	18	Cir	1226.57			
14	5-1B	Curb-Horiz	1229.80	Rect	4.00	4.00	18	Cir	1226.57			
15	6-1	Curb-Horiz	1225.04	Cir	4.00	4.00	18	Cir	1221.06	18	Cir	1221.08
16	6-2	Curb-Horiz	1225.13	Cir	4.00	4.00	18	Cir	1221.15			
17	1-9	Manhole	1228.38	Cir	4.00	4.00	18	Cir	1225.12	18	Cir	1225.15
18	1-10	Curb-Horiz	1228.61	Rect	4.00	11.00	18	Cir	1225.18	18	Cir	1225.21
19	1-11	Curb-Horiz	1228.85	Rect	4.00	4.00	18	Cir	1225.25			

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	1-2	36.29	34x53	Ell	5.002	1220.90	1220.94	0.798	1223.01	1222.75	0.41	1222.75	End	Manhole
2	1-3	30.48	24x48	Box	117.020	1220.69	1221.72	0.880	1223.16	1223.20	0.41	1223.61	1	Manhole
3	1-4	30.48	24x48	Box	151.810	1221.64	1222.84	0.790	1223.61	1224.06	n/a	1224.06 j	2	Curb-Horiz
4	1-5	24.41	29x45	Ell	129.630	1222.92	1223.22	0.231	1224.67	1224.77	n/a	1224.77	3	Curb-Horiz
5	1-6	20.63	36	Cir	61.470	1223.07	1223.52	0.732	1224.77	1224.98	n/a	1224.98 j	4	Manhole
6	1-7	16.22	36	Cir	65.530	1223.52	1223.59	0.107	1225.35	1225.42	0.30	1225.72	5	Curb-Horiz
7	1-8	13.99	30	Cir	156.000	1223.60	1224.40	0.513	1225.72	1225.66	n/a	1225.66	6	Curb-Horiz
8	7-1	6.89	24	Cir	28.500	1224.24	1224.30	0.211	1225.66	1225.68	0.14	1225.82	7	Curb-Horiz
9	4-1	0.72	18	Cir	28.000	1224.35	1224.70	1.250	1225.72	1225.01	0.11	1225.01	6	Curb-Horiz
10	3-1	0.67	18	Cir	28.000	1224.05	1224.30	0.893	1224.77	1224.60	n/a	1224.60	4	Curb-Horiz
11	2-1	2.52	18	Cir	28.000	1223.16	1223.29	0.464	1224.06	1223.89	0.23	1223.89	3	Curb-Horiz
12	5-1	4.42	24	Cir	130.000	1225.52	1226.20	0.523	1226.20	1226.94	n/a	1226.94	5	Manhole
13	5-1A	1.76	18	Cir	11.980	1226.50	1226.57	0.584	1226.96	1227.07	0.18	1227.07	12	Curb-Horiz
14	5-1B	2.66	18	Cir	11.980	1226.50	1226.57	0.584	1227.07	1227.19	n/a	1227.19	12	Curb-Horiz
15	6-1	5.81	18	Cir	34.770	1220.94	1221.06	0.345	1222.75^	1222.84^	0.08	1222.93	1	Curb-Horiz
16	6-2	3.38	18	Cir	27.680	1221.08	1221.15	0.253	1222.93^	1222.95^	0.06	1223.01	15	Curb-Horiz
17	1-9	3.00	18	Cir	28.160	1225.09	1225.12	0.107	1226.11	1226.14	0.08	1226.23	7	Manhole
18	1-10	3.00	18	Cir	52.400	1225.15	1225.18	0.057	1226.65	1226.68	0.07	1226.75	17	Curb-Horiz
19	1-11	1.59	18	Cir	28.010	1225.21	1225.25	0.143	1226.75	1226.75	0.01	1226.76	18	Curb-Horiz

Project File: AS BUILT 012716.stm | Number of lines: 19 | Run Date: 1/27/2016

NOTES: Return period = 100 Yrs. ; ^Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	1-2	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
2	1-3	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
3	1-4	3.56	0.00	3.56	0.00	Curb	2.0	18.00	0.00	0.00	0.00	0.020	2.00	0.020	0.020	0.015	0.20	10.01	0.33	0.01	4.0	16
4	1-5	1.04	2.07	3.11	0.00	Curb	2.0	18.00	0.00	0.00	0.00	0.015	2.00	0.020	0.020	0.013	0.19	9.51	0.33	0.01	4.0	3
5	1-6	0.00	1.70	0.00	1.70	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.020	0.020	0.013	0.00	0.00	0.00	0.00	0.0	4
6	1-7	1.74	1.47	1.51	1.70	Curb	2.0	4.00	0.00	0.00	0.00	0.015	2.00	0.020	0.020	0.013	0.19	9.61	0.49	7.61	4.0	5
7	1-8	1.84	2.26	4.10	0.00	Curb	2.0	11.60	0.00	0.00	0.00	Sag	2.00	0.020	0.020	0.013	0.27	1.43	0.60	1.43	4.0	Off
8	7-1	3.63	3.27	6.89	0.00	Curb	2.0	11.60	0.00	0.00	0.00	Sag	2.00	0.020	0.020	0.013	0.34	1.81	0.67	1.81	4.0	Off
9	4-1	0.87	0.00	0.72	0.15	Curb	2.0	4.00	0.00	0.00	0.00	0.015	2.00	0.020	0.020	0.013	0.12	5.91	0.39	3.05	4.0	8
10	3-1	0.78	0.00	0.67	0.11	Curb	2.0	4.00	0.00	0.00	0.00	0.015	2.00	0.020	0.020	0.013	0.11	5.66	0.39	2.75	4.0	11
11	2-1	2.42	0.11	2.52	0.02	Curb	2.0	11.00	0.00	0.00	0.00	0.015	2.00	0.020	0.020	0.013	0.18	8.81	0.36	1.36	4.0	16
12	5-1	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	Off
13	5-1A	3.23	0.00	1.76	1.47	Curb	2.0	4.00	0.00	0.00	0.00	0.015	2.00	0.050	0.020	0.013	0.24	9.11	0.52	6.46	4.0	6
14	5-1B	3.02	0.00	2.66	0.37	Curb	2.0	7.50	0.00	0.00	0.00	0.015	2.00	0.050	0.020	0.013	0.24	8.86	0.45	3.01	4.0	4
15	6-1	2.42	0.00	2.42	0.00	Curb	4.0	14.50	0.00	0.00	0.00	0.015	1.50	0.050	0.020	0.013	0.21	8.31	0.17	0.00	2.0	Off
16	6-2	3.37	0.02	3.38	0.00	Curb	4.0	18.00	0.00	0.00	0.00	0.015	1.50	0.050	0.020	0.013	0.24	9.51	0.17	0.00	2.0	Off
17	1-9	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	7
18	1-10	3.67	0.00	1.41	2.26	Curb	4.0	4.00	0.00	0.00	0.00	0.020	2.00	0.050	0.020	0.013	0.24	9.06	0.37	7.36	2.0	7
19	1-11	4.70	0.00	1.59	3.12	Curb	4.0	4.00	0.00	0.00	0.00	0.020	2.00	0.050	0.020	0.013	0.26	10.01	0.40	8.46	2.0	8

Project File: AS BUILT 012716.stm | Number of lines: 19 | Run Date: 1/27/2016

NOTES: Inlet N-Values = 0.016; Intensity = 42.46 / (Inlet time + 4.70) ^ 0.60; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 1/27/2016
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 100 yrs
														Elev of Invert							Proj: AS BUILT 012716.stm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
1	End	MH	0.012	5.002	0.00	0.00	0.00	17.70	0.00	6.53	4.75	0.00	1226.06	1222.75	1223.01	-0.26	34	-5.13	7.09	36.29	1-2
					0.00	0.00	0.00					36.29		1223.77	1223.73		53	0.80	10.03	98.55	
					0.00	0.00	0.00							1220.94	1220.90	0.04	Elip				
2	1	MH	0.012	117.020	0.00	0.00	0.00	17.70	0.00	6.53	4.05	0.00	1226.06	1223.20	1223.16	0.03	24	0.03	4.49	30.48	1-3
					0.00	0.00	0.00					30.48		1223.72	1222.69		48	0.88	8.87	70.92	
					0.00	0.00	0.00							1221.72	1220.69	1.03	Box				
3	2	Curb	0.012	151.810	0.00	0.00	0.00	17.70	0.00	6.53	4.05	0.00	1227.10	1224.06	1223.61	0.45	24	0.30	5.07	30.48	1-4
					0.00	0.00	0.00					30.48		1224.84	1223.64		48	0.79	8.40	67.21	
					0.00	0.00	0.00							1222.84	1221.64	1.20	Box				
4	3	Curb	0.012	129.630	0.00	0.00	0.00	17.70	0.00	6.53	3.29	0.00	1228.83	1224.77	1224.67	0.10	29	0.08	4.90	24.41	1-5
					0.00	0.00	0.00					24.41		1225.64	1225.34		45	0.23	4.85	34.52	
					0.00	0.00	0.00							1223.22	1222.92	0.30	Elip				
5	4	MH	0.012	61.470	0.00	0.00	0.00	17.70	0.00	6.53	3.12	0.00	1229.08	1224.98	1224.77	0.21	36	0.34	5.53	20.63	1-6
					0.00	0.00	0.00					20.63		1226.52	1226.07		36	0.73	8.75	61.82	
					0.00	0.00	0.00							1223.52	1223.07	0.45	Cir				
6	5	Curb	0.012	65.530	0.00	0.00	0.00	17.70	0.00	6.53	2.31	0.00	1229.06	1225.42	1225.35	0.07	36	0.11	3.60	16.22	1-7
					0.00	0.00	0.00					16.22		1226.59	1226.52		36	0.11	3.34	23.61	
					0.00	0.00	0.00							1223.59	1223.52	0.07	Cir				
7	6	Curb	0.012	156.000	0.00	0.00	0.00	17.70	0.00	6.53	2.00	0.00	1228.40	1225.66	1225.72	-0.06	30	-0.04	4.40	13.99	1-8
					0.00	0.00	0.00					13.99		1226.90	1226.10		30	0.51	6.48	31.82	
					0.00	0.00	0.00							1224.40	1223.60	0.80	Cir				
8	7	Curb	0.012	28.500	0.00	0.00	0.00	12.90	0.00	7.55	0.48	0.00	1228.30	1225.68	1225.66	0.02	24	0.08	2.94	6.89	7-1
					0.00	0.00	0.00					6.89		1226.30	1226.24		24	0.21	3.58	11.25	
					0.00	0.00	0.00							1224.30	1224.24	0.06	Cir				
9	6	Curb	0.012	28.000	0.00	0.00	0.00	5.00	0.00	10.81	0.08	0.00	1229.09	1225.01	1225.72	-0.71	18	-2.52	1.54	0.72	4-1
					0.00	0.00	0.00					0.72		1226.20	1225.85		18	1.25	7.20	12.72	
					0.00	0.00	0.00							1224.70	1224.35	0.35	Cir				
10	4	Curb	0.012	28.000	0.00	0.00	0.00	5.00	0.00	10.81	0.07	0.00	1228.74	1224.60	1224.77	-0.16	18	-0.59	1.71	0.67	3-1
					0.00	0.00	0.00					0.67		1225.80	1225.55		18	0.89	6.08	10.75	
					0.00	0.00	0.00							1224.30	1224.05	0.25	Cir				

NOTES: Intensity = 42.40 / (Inlet time + 4.70) ^ 0.60 (in/hr) ; Time of flow in section is based on full flow. ; Total flows limited to inlet captured flows

Project File: AS BUILT 012716.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 1/27/2016
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 100 yrs
														Elev of Invert							Proj: AS BUILT 012716.stm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
11	3	Curb	0.012	28.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.00	10.81	0.22	0.00 2.52	1227.21	1223.89 1224.79 1223.29	1224.06 1224.66 1223.16	-0.17 0.13	18 18 Cir	-0.60 0.46	3.05 4.39	2.52 7.75	2-1
12	5	MH	0.012	130.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	14.00	0.00	7.28	0.82	0.00 4.42	1229.70	1226.94 1228.20 1226.20	1226.20 1227.52 1225.52	0.74 0.68	24 24 Cir	0.57 0.52	4.44 5.64	4.42 17.72	5-1
13	12	Curb	0.012	11.980	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	14.00	0.00	7.28	0.44	0.00 1.76	1229.80	1227.07 1228.07 1226.57	1226.96 1228.00 1226.50	0.11 0.07	18 18 Cir	0.92 0.58	3.64 4.92	1.76 8.69	5-1A
14	12	Curb	0.012	11.980	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.90	0.00	8.12	0.37	0.00 2.66	1229.80	1227.19 1228.07 1226.57	1227.07 1228.00 1226.50	0.12 0.07	18 18 Cir	0.99 0.58	4.09 4.92	2.66 8.69	5-1B
15	1	Curb	0.012	34.770	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	15.20	0.00	7.02	0.70	0.00 5.81	1225.04	1222.84 1222.56 1221.06	1222.75 1222.44 1220.94	0.09 0.12	18 18 Cir	0.26 0.35	3.29 3.78	5.81 6.69	6-1
16	15	Curb	0.012	27.680	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	15.20	0.00	7.02	0.48	0.00 3.38	1225.13	1222.95 1222.65 1221.15	1222.93 1222.58 1221.08	0.02 0.07	18 18 Cir	0.09 0.25	1.92 3.24	3.38 5.72	6-2
17	7	MH	0.012	28.160	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	17.70	0.00	6.53	1.26	0.00 3.00	1228.38	1226.14 1226.62 1225.12	1226.11 1226.59 1225.09	0.03 0.03	18 18 Cir	0.11 0.11	2.34 2.10	3.00 3.71	1-9
18	17	Curb	0.012	52.400	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	17.70	0.00	6.53	1.26	0.00 3.00	1228.61	1226.68 1226.68 1225.18	1226.65 1226.65 1225.15	0.03 0.03	18 18 Cir	0.06 0.06	1.70 1.54	3.00 2.72	1-10
19	18	Curb	0.012	28.010	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	17.70	0.00	6.53	0.72	0.00 1.59	1228.85	1226.75 1226.75 1225.25	1226.75 1226.71 1225.21	0.00 0.04	18 18 Cir	0.01 0.14	0.90 2.43	1.59 4.30	1-11

NOTES: Intensity = 42.40 / (Inlet time + 4.70) ^ 0.60 (in/hr) ; Time of flow in section is based on full flow. ; Total flows limited to inlet captured flows

Project File: AS BUILT 012716.stm

MyReport

Line No.	Area Dn (sqft)	Area Up (sqft)	Byp Ln No	Coeff C1 (C)	Coeff C2 (C)	Coeff C3 (C)	Capac Full (cfs)	Crit Depth (ft)	Cross Sl, Sw (ft/ft)	Cross Sl, Sx (ft/ft)	Curb Len (ft)	Defl Ang (Deg)	Depth Dn (ft)	Depth Up (ft)	DnStm Ln No	Drng Area (ac)	Easting X (ft)	EGL Dn (ft)	EGL Up (ft)	Energy Loss (ft)
1	4.08	6.88	n/a	0.20	0.50	0.90	98.55	1.81	....	....	....	-68.726	2.11	1.81**	Outfall	0.00	652781.22	1223.44	1223.19	0.000
2	8.00	5.90	n/a	0.20	0.50	0.90	70.92	1.22	....	....	....	70.293	2.00	1.48	1	0.00	652898.20	1223.39	1223.61	0.222
3	7.86	4.87	16	0.20	0.50	0.90	67.21	1.22	0.020	0.020	18.00	-79.314	1.97	1.22**	2	0.89	652930.42	1224.22	1224.67	0.000
4	4.98	4.98	3	0.20	0.50	0.90	34.52	1.55	0.020	0.020	18.00	-7.244	1.75	1.55**	3	0.12	652941.74	1225.04	1225.14	0.000
5	3.41	3.41	4	0.20	0.50	0.90	61.82	1.46	....	....	....	0.000	1.70	1.46**	4	0.00	652947.10	1225.34	1225.55	0.000
6	4.51	4.51	5	0.20	0.50	0.90	23.61	1.29	0.020	0.020	4.00	0.000	1.83	1.83	5	0.37	652952.83	1225.55	1225.62	0.070
7	2.47	2.47	Sag	0.20	0.50	0.90	31.82	1.26	0.020	0.020	11.60	0.000	2.12	1.26**	6	0.44	652966.45	1226.22	1226.16	0.000
8	2.38	2.31	Sag	0.20	0.50	0.90	11.25	0.93	0.020	0.020	11.60	-88.965	1.42	1.38	7	0.60	652938.11	1225.79	1225.82	0.032
9	0.27	0.27	8	0.20	0.50	0.90	12.72	0.31	0.020	0.020	4.00	-88.556	1.37	0.31**	6	0.10	652925.00	1225.83	1225.13	0.000
10	0.25	0.25	11	0.20	0.50	0.90	10.75	0.30	0.020	0.020	4.00	-84.038	0.72	0.30**	4	0.09	652914.25	1224.87	1224.71	0.000
11	0.66	0.66	16	0.20	0.50	0.90	7.75	0.60	0.020	0.020	11.00	-90.000	0.90	0.60**	3	0.28	652903.06	1224.28	1224.12	0.000
12	0.94	1.05	n/a	0.20	0.50	0.90	17.72	0.74	....	....	....	90.000	0.68	0.74**	5	0.00	653076.61	1226.48	1227.21	0.000
13	0.46	0.51	6	0.20	0.50	0.90	8.69	0.50	0.050	0.020	4.00	-91.174	0.46	0.50**	12	0.74	653077.41	1227.14	1227.25	0.000
14	0.62	0.69	4	0.20	0.50	0.90	8.69	0.62	0.050	0.020	7.50	89.483	0.57	0.62**	12	0.62	653075.67	1227.30	1227.42	0.000
15	1.77	1.77	Offsite	0.20	0.50	0.90	6.69	0.93	0.050	0.020	14.50	-19.125	1.50	1.50	1	0.28	652782.53	1222.92	1223.01	0.091
16	1.77	1.77	Offsite	0.20	0.50	0.90	5.72	0.70	0.050	0.020	18.00	13.665	1.50	1.50	15	0.80	652790.07	1222.99	1223.01	0.025
17	1.28	1.28	7	0.20	0.50	0.90	3.71	0.66	....	....	....	2.671	1.02	1.02	7	0.00	652970.21	1226.20	1226.23	0.030
18	1.77	1.77	7	0.20	0.50	0.90	2.72	0.66	0.050	0.020	4.00	85.572	1.50	1.50	17	0.90	653022.53	1226.70	1226.73	0.036
19	1.77	1.77	8	0.20	0.50	0.90	4.30	0.47	0.050	0.020	4.00	-83.760	1.50	1.50	18	0.90	653027.15	1226.76	1226.76	0.005

Project File: AS BUILT 012716.stm | Number of lines: 19 | Date: 1/27/2016

NOTES: ** Critical depth ; System flows limited to inlet captured flows.

MyReport

Flow Rate (cfs)	Sf Ave (ft/ft)	Sf Dn (ft/ft)	Grate Area (sqft)	Grate Len (ft)	Grate Width (ft)	Gnd/Rim El Dn (ft)	Gnd/Rim El Up (ft)	Gutter Depth (ft)	Gutter Slope (ft/ft)	Gutter Spread (ft)	Gutter Width (ft)	HGL Dn (ft)	HGL Up (ft)	HGL Jnct (ft)	HGL Jmp Dn (ft)	HGL Jmp Up (ft)	Incr CxA	Incr Q (cfs)	Inlet Depth (ft)	Inlet Eff (%)
36.29	0.000	0.000	....	....	....	1224.65	1226.06	....	....	....	....	1223.01	1222.75	1222.75	....	....	0.00	0.00	....	....
30.48	0.190	0.163	....	....	....	1226.06	1226.06	....	....	....	....	1223.16	1223.20	1223.61	....	....	0.00	0.00	....	....
30.48	0.000	0.000	....	....	....	1226.06	1227.10	0.20	0.020	10.01	2.00	1223.61	1224.06 j	1224.06	1223.56	1222.90	0.53	3.56	0.33	100
24.41	0.000	0.000	....	....	....	1227.10	1228.83	0.19	0.015	9.51	2.00	1224.67	1224.77	1224.77	....	....	0.10	1.04	0.33	100
20.63	0.000	0.000	....	....	....	1228.83	1229.08	....	....	....	....	1224.77	1224.98 j	1224.98	1224.67	1224.55	0.00	0.00	....	....
16.22	0.106	0.107	....	....	....	1229.08	1229.06	0.19	0.015	9.61	2.00	1225.35	1225.42	1225.72	....	....	0.22	1.74	0.49	47
13.99	0.000	0.000	....	....	....	1229.06	1228.40	0.27	Sag	1.43	2.00	1225.72	1225.66	1225.66	....	....	0.26	1.84	0.60	100
6.89	0.113	0.109	....	....	....	1228.40	1228.30	0.34	Sag	1.81	2.00	1225.66	1225.68	1225.82	....	....	0.48	3.63	0.67	100
0.72	0.000	0.000	....	....	....	1229.06	1229.09	0.12	0.015	5.91	2.00	1225.72	1225.01	1225.01	....	....	0.08	0.87	0.39	83
0.67	0.000	0.000	....	....	....	1228.83	1228.74	0.11	0.015	5.66	2.00	1224.77	1224.60	1224.60	....	....	0.07	0.78	0.39	86
2.52	0.000	0.000	....	....	....	1227.10	1227.21	0.18	0.015	8.81	2.00	1224.06	1223.89	1223.89	....	....	0.22	2.42	0.36	99
4.42	0.000	0.000	....	....	....	1229.08	1229.70	....	....	....	....	1226.20	1226.94	1226.94	....	....	0.00	0.00	....	....
1.76	0.000	0.000	....	....	....	1229.70	1229.80	0.24	0.015	9.11	2.00	1226.96	1227.07	1227.07	....	....	0.44	3.23	0.52	54
2.66	0.000	0.000	....	....	....	1229.70	1229.80	0.24	0.015	8.86	2.00	1227.07	1227.19	1227.19	....	....	0.37	3.02	0.45	88
5.81	0.261	0.261	....	....	....	1226.06	1225.04	0.21	0.015	8.31	1.50	1222.75	1222.84	1222.93	....	....	0.22	2.42	0.17	100
3.38	0.089	0.089	....	....	....	1225.04	1225.13	0.24	0.015	9.51	1.50	1222.93	1222.95	1223.01	....	....	0.48	3.37	0.17	100
3.00	0.106	0.107	....	....	....	1228.40	1228.38	....	....	....	....	1226.11	1226.14	1226.23	....	....	0.00	0.00	....	....
3.00	0.069	0.070	....	....	....	1228.38	1228.61	0.24	0.020	9.06	2.00	1226.65	1226.68	1226.75	....	....	0.54	3.67	0.37	39
1.59	0.019	0.019	....	....	....	1228.61	1228.85	0.26	0.020	10.01	2.00	1226.75	1226.75	1226.76	....	....	0.72	4.70	0.40	34

Project File: AS BUILT 012716.stm | Number of lines: 19 | Date: 1/27/2016

NOTES: ^^ Critical depth ; System flows limited to inlet captured flows.

MyReport

Inlet ID	Inlet Loc	Inlet Spread (ft)	Inlet Time (min)	i Sys (in/hr)	i Inlet (in/hr)	Invert Dn (ft)	Invert Up (ft)	Jump Loc (ft)	Jump Len (ft)	Vel Hd Jmp Dn (ft)	Vel Hd Jmp Up (ft)	J-Loss Coeff	Junct Type	Known Q (cfs)	Cost RCP	Cost CMP	Cost PVC	Line ID	
1-2	Sag	....	0.0	6.53	0.00	1220.90	1220.94	....	....	0.00	0.00	0.95 z	MH	0.00	120	108	102	1-2	
1-3	Sag	....	0.0	6.53	0.00	1220.69	1221.72	....	....	0.00	0.00	0.99	MH	0.00	5,268	4,741	4,478	1-3	
1-4	On Grade	0.01	17.0	6.53	6.66	1221.64	1222.84	30.36	8.39	0.32	1.00	1.50 z	Curb	0.00	6,786	6,107	5,768	1-4	
1-5	On Grade	0.01	5.0	6.53	10.81	1222.92	1223.22	....	....	0.00	0.00	1.49 z	Curb	0.00	120	108	102	1-5	
1-6	Sag	....	0.0	6.53	0.00	1223.07	1223.52	18.44	7.33	0.56	0.78	1.00 z	MH	0.00	3,292	2,963	2,798	1-6	
1-7	On Grade	7.61	11.8	6.53	7.85	1223.52	1223.59	....	....	0.00	0.00	1.50	Curb	0.00	3,526	3,173	2,997	1-7	
1-8	Sag	1.43	15.4	6.53	6.97	1223.60	1224.40	....	....	0.00	0.00	1.50 z	Curb	0.00	7,584	6,826	6,446	1-8	
7-1	Sag	1.81	12.9	7.55	7.55	1224.24	1224.30	....	....	0.00	0.00	1.00	Curb	0.00	1,350	1,215	1,148	7-1	
4-1	On Grade	3.05	5.0	10.81	10.81	1224.35	1224.70	....	....	0.00	0.00	1.00 z	Curb	0.00	1,240	1,116	1,054	4-1	
3-1	On Grade	2.75	5.0	10.81	10.81	1224.05	1224.30	....	....	0.00	0.00	1.00 z	Curb	0.00	1,240	1,116	1,054	3-1	
2-1	On Grade	1.36	5.0	10.81	10.81	1223.16	1223.29	....	....	0.00	0.00	1.00 z	Curb	0.00	996	896	847	2-1	
5-1	Sag	....	0.0	7.28	0.00	1225.52	1226.20	....	....	0.00	0.00	1.00 z	MH	0.00	4,780	4,302	4,063	5-1	
5-1A	On Grade	6.46	14.0	7.28	7.28	1226.50	1226.57	....	....	0.00	0.00	1.00 z	Curb	0.00	468	421	398	5-1A	
5-1B	On Grade	3.01	10.9	8.12	8.12	1226.50	1226.57	....	....	0.00	0.00	1.00 z	Curb	0.00	468	421	398	5-1B	
6-1	On Grade	0.00	5.0	7.02	10.81	1220.94	1221.06	....	....	0.00	0.00	0.50	Curb	0.00	1,476	1,328	1,255	6-1	
6-2	On Grade	0.00	15.2	7.02	7.02	1221.08	1221.15	....	....	0.00	0.00	1.00	Curb	0.00	980	882	833	6-2	
1-9	Sag	....	0.0	6.53	0.00	1225.09	1225.12	....	....	0.00	0.00	1.00	MH	0.00	996	896	847	1-9	
1-10	On Grade	7.36	16.3	6.53	6.79	1225.15	1225.18	....	....	0.00	0.00	1.49	Curb	0.00	1,764	1,588	1,499	1-10	
1-11	On Grade	8.46	17.7	6.53	6.53	1225.21	1225.25	....	....	0.00	0.00	1.00	Curb	0.00	996	896	847	1-11	

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NOTES: Intensity = 42.40 / (Inlet time + 4.70) ^ 0.60 – Return period = 100 Yrs. ; ^^ Critical depth ; System flows limited to inlet captured flows.

MyReport

Line Length (ft)	Line Size (in)	Line Slope (%)	Line Type	Local Depr (in)	n-val Gutter	n-val Pipe	Minor Loss (ft)	Northing Y (ft)	Pipe Travel (min)	Q Byp (cfs)	Q Capt (cfs)	Q Carry (cfs)	Line Rise (in)	Runoff Coeff (C)	Line Span (in)	Area A1 (ac)	Area A2 (ac)	Area A3 (ac)	Tc (min)	Throat Ht (in)	Total Area (ac)	Total CxA
5.002	34 x 53	0.80	Ell	....	....	0.012	0.41	632794.53	0.00	....	....	....	34	0.00	53	0.00	0.00	0.00	17.7	....	7.13	4.75
117.020	24 x 48	0.88	Box	....	....	0.012	0.41	632791.33	0.00	....	....	....	24	0.00	48	0.00	0.00	0.00	17.7	....	6.05	4.05
151.810	24 x 48	0.79	Box	4.0	0.015	0.012	n/a	632939.68	0.00	0.00	3.56	0.00	24	0.60	48	0.00	0.00	0.00	17.7	2.0	6.05	4.05
129.630	29 x 45	0.23	Ell	4.0	0.013	0.012	n/a	633068.82	0.00	0.00	3.11	2.07	29	0.80	45	0.00	0.00	0.00	17.7	2.0	4.88	3.29
61.470	36	0.73	Cir	....	....	0.012	n/a	633130.05	0.00	....	....	....	36	0.00	36	0.00	0.00	0.00	17.7	....	4.67	3.12
65.530	36	0.11	Cir	4.0	0.013	0.012	0.30	633195.33	0.00	1.70	1.51	1.47	36	0.60	36	0.00	0.00	0.00	17.7	2.0	3.31	2.31
155.000	30	0.51	Cir	4.0	....	0.012	n/a	633350.73	0.00	0.00	4.10	2.26	30	0.60	30	0.00	0.00	0.00	17.7	2.0	2.84	2.00
28.500	24	0.21	Cir	4.0	....	0.012	0.14	633353.74	0.00	0.00	6.89	3.27	24	0.80	24	0.00	0.00	0.00	12.9	2.0	0.60	0.48
28.000	18	1.25	Cir	4.0	0.013	0.012	0.11	633198.48	0.00	0.15	0.72	0.00	18	0.80	18	0.00	0.00	0.00	5.0	2.0	0.10	0.08
28.000	18	0.89	Cir	4.0	0.013	0.012	n/a	633074.14	0.00	0.11	0.67	0.00	18	0.80	18	0.00	0.00	0.00	5.0	2.0	0.09	0.07
28.000	18	0.46	Cir	4.0	0.013	0.012	0.23	632945.62	0.00	0.02	2.52	0.11	18	0.80	18	0.00	0.00	0.00	5.0	2.0	0.28	0.22
130.000	24	0.52	Cir	....	....	0.012	n/a	633118.70	0.00	....	....	....	24	0.00	24	0.00	0.00	0.00	14.0	....	1.36	0.82
11.980	18	0.58	Cir	4.0	0.013	0.012	0.18	633130.65	0.00	1.47	1.76	0.00	18	0.60	18	0.00	0.00	0.00	14.0	2.0	0.74	0.44
11.980	18	0.58	Cir	4.0	0.013	0.012	n/a	633106.76	0.00	0.37	2.66	0.00	18	0.60	18	0.00	0.00	0.00	10.9	2.0	0.62	0.37
34.770	18	0.35	Cir	2.0	0.013	0.012	0.08	632829.27	0.00	0.00	2.42	0.00	18	0.80	18	0.00	0.00	0.00	15.2	4.0	1.08	0.70
27.680	18	0.25	Cir	2.0	0.013	0.012	0.06	632855.91	0.00	0.00	3.38	0.02	18	0.60	18	0.00	0.00	0.00	15.2	4.0	0.80	0.48
28.160	18	0.11	Cir	....	....	0.012	0.08	633378.64	0.00	....	....	....	18	0.00	18	0.00	0.00	0.00	17.7	....	1.80	1.26
52.400	18	0.06	Cir	2.0	0.013	0.012	0.07	633375.67	0.00	2.26	1.41	0.00	18	0.60	18	0.00	0.00	0.00	17.7	4.0	1.80	1.26
28.010	18	0.14	Cir	2.0	0.013	0.012	0.01	633403.30	0.00	3.12	1.59	0.00	18	0.80	18	0.00	0.00	0.00	17.7	4.0	0.90	0.72

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NOTES: ^^ Critical depth ; System flows limited to inlet captured flows.

MyReport

Total Runoff (cfs)	Vel Ave (ft/s)	Vel Dn (ft/s)	Vel Hd Dn (ft)	Vel Hd Up (ft)	Vel Up (ft/s)	Cover Dn (ft)	Cover Up (ft)	Storage (cft)
31.05	7.09	8.90	0.43	0.43	5.27	0.92	2.29	27.41
26.45	4.49	3.81	0.23	0.41	5.17	3.37	2.34	813.34
26.45	5.07	3.88	0.61	0.61	6.26	2.42	2.26	966.49
21.49	4.90	4.90	0.37	0.37	4.90	1.76	3.19	645.86
20.40	5.53	5.01	0.57	0.57	6.06	2.76	2.56	231.45
15.07	3.60	3.60	0.20	0.20	3.59	2.56	2.47	295.57
13.09	4.40	3.15	0.50	0.50	5.65	2.96	1.50	546.68
3.63	2.94	2.89	0.13	0.14	2.98	2.16	2.00	66.89
0.87	1.54	0.42	0.11	0.11	2.66	3.21	2.89	28.22
0.78	1.71	0.80	0.11	0.11	2.61	3.28	2.94	14.95
2.42	3.05	2.28	0.23	0.23	3.81	2.44	2.42	24.69
5.94	4.44	4.68	0.27	0.27	4.20	1.56	1.50	129.72
3.23	3.64	3.85	0.18	0.18	3.42	1.70	1.73	5.82
3.02	4.09	4.32	0.23	0.23	3.87	1.70	1.73	7.79
4.94	3.29	3.29	0.17	0.17	3.29	3.62	2.48	61.43
3.37	1.92	1.92	0.06	0.06	1.92	2.46	2.48	48.90
8.23	2.34	2.34	0.09	0.08	2.34	1.81	1.76	36.13
8.23	1.70	1.70	0.04	0.04	1.70	1.73	1.93	92.58
4.70	0.90	0.90	0.01	0.01	0.90	1.90	2.10	49.49

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NOTES: ^^ Critical depth ; System flows limited to inlet captured flows.

Storm Sewer Inlet Time Tabulation

Line No.	Line ID	Tc Method	Sheet Flow					Shallow Concentrated Flow					Channel Flow							Total Travel Time (min)
			n-Value	flow Length (ft)	2-yr 24h P (in)	Land Slope (%)	Travel Time (min)	flow Length (ft)	Water Slope (%)	Surf Descr	Ave Vel (ft/s)	Travel Time (min)	X-sec Area (sqft)	Wetted Perim (ft)	Chan Slope (%)	n-Value	Vel	flow Length (ft)	Travel Time (min)	
1	1-2	User																		0.00
2	1-3	User																		0.00
3	1-4	TR55	0.240	75.00	3.39	1.00	14.53	290.00	1.50	UnPaved	1.98	2.45								17.00
4	1-5	User																		5.00
5	1-6	User																		0.00
6	1-7	TR55	0.150	91.00	3.39	2.00	8.83	450.00	1.50	Paved	2.49	3.01								11.80
7	1-8	TR55	0.240	75.00	3.39	1.00	14.53	135.00	1.50	Paved	2.49	0.90								15.40
8	7-1	TR55	0.240	58.00	3.39	1.00	11.83	155.00	1.50	Paved	2.49	1.04								12.90
9	4-1	User																		5.00
10	3-1	User																		5.00
11	2-1	User																		5.00
12	5-1	User																		0.00
13	5-1A	TR55	0.240	55.00	3.39	1.00	11.34	55.00 305.00	1.50 1.30	UnPaved Paved	1.98 2.32	0.46 2.19								14.00
14	5-1B	TR55	0.240	56.00	5.46	1.00	9.07	275.00	1.50	Paved	2.49	1.84								10.90
15	6-1	User																		5.00
16	6-2	TR55	0.240	65.00	3.39	1.00	12.96	23.00 310.00	2.00 1.50	UnPaved Paved	2.28 2.49	0.17 2.08								15.20
17	1-9	User																		0.00
18	1-10	TR55	0.240	75.00	3.39	1.00	14.53	30.00 216.00	1.50 1.30	UnPaved Paved	1.98 2.32	0.25 1.55								16.30
19	1-11	TR55	0.240	75.00	3.39	1.00	14.53	475.00	1.50	Paved	2.49	3.18								17.70

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Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	34 53 e	36.29	1220.90	1223.01	2.11	4.08	8.90	0.43	1223.44	0.000	5.002	1220.94	1222.75	1.81**	6.88	5.27	0.43	1223.19	0.000	0.000	n/a	0.95	0.41
2	24 48 B	30.48	1220.69	1223.16	2.00	8.00	3.81	0.23	1223.39	0.163	117.020	1221.72	1223.20	1.48	5.90	5.17	0.41	1223.61	0.216	0.190	0.222	0.99	0.41
3	24 48 B	30.48	1221.64	1223.61	1.97	7.86	3.88	0.61	1224.22	0.000	151.810	1222.84	1224.06 j	1.22**	4.87	6.26	0.61	1224.67	0.000	0.000	n/a	1.50	n/a
4	29 45 e	24.41	1222.92	1224.67	1.75	4.98	4.90	0.37	1225.04	0.000	129.630	1223.22	1224.77	1.55**	4.98	4.90	0.37	1225.14	0.000	0.000	n/a	1.49	n/a
5	36	20.63	1223.07	1224.77	1.70	3.41	5.01	0.57	1225.34	0.000	61.470	1223.52	1224.98 j	1.46**	3.41	6.06	0.57	1225.55	0.000	0.000	n/a	1.00	n/a
6	36	16.22	1223.52	1225.35	1.83*	4.51	3.60	0.20	1225.55	0.107	65.530	1223.59	1225.42	1.83	4.51	3.59	0.20	1225.62	0.106	0.106	0.070	1.50	0.30
7	30	13.99	1223.60	1225.72	2.12	2.47	3.15	0.50	1226.22	0.000	155.000	1224.40	1225.66	1.26**	2.47	5.65	0.50	1226.16	0.000	0.000	n/a	1.50	n/a
8	24	6.89	1224.24	1225.66	1.42	2.38	2.89	0.13	1225.79	0.109	28.500	1224.30	1225.68	1.38	2.31	2.98	0.14	1225.82	0.117	0.113	0.032	1.00	0.14
9	18	0.72	1224.35	1225.72	1.37	0.27	0.42	0.11	1225.83	0.000	28.000	1224.70	1225.01	0.31**	0.27	2.66	0.11	1225.13	0.000	0.000	n/a	1.00	0.11
10	18	0.67	1224.05	1224.77	0.72	0.25	0.80	0.11	1224.87	0.000	28.000	1224.30	1224.60	0.30**	0.25	2.61	0.11	1224.71	0.000	0.000	n/a	1.00	n/a
11	18	2.52	1223.16	1224.06	0.90	0.66	2.28	0.23	1224.28	0.000	28.000	1223.29	1223.89	0.60**	0.66	3.81	0.23	1224.12	0.000	0.000	n/a	1.00	0.23
12	24	4.42	1225.52	1226.20	0.68*	0.94	4.68	0.27	1226.48	0.000	130.000	1226.20	1226.94	0.74**	1.05	4.20	0.27	1227.21	0.000	0.000	n/a	1.00	n/a
13	18	1.76	1226.50	1226.96	0.46*	0.46	3.85	0.18	1227.14	0.000	11.980	1226.57	1227.07	0.50**	0.51	3.42	0.18	1227.25	0.000	0.000	n/a	1.00	0.18
14	18	2.66	1226.50	1227.07	0.57*	0.62	4.32	0.23	1227.30	0.000	11.980	1226.57	1227.19	0.62**	0.69	3.87	0.23	1227.42	0.000	0.000	n/a	1.00	n/a
15	18	5.81	1220.94	1222.75	1.50	1.77	3.29	0.17	1222.92	0.261	34.770	1221.06	1222.84	1.50	1.77	3.29	0.17	1223.01	0.261	0.261	0.091	0.50	0.08
16	18	3.38	1221.08	1222.93	1.50	1.77	1.92	0.06	1222.99	0.089	27.680	1221.15	1222.95	1.50	1.77	1.92	0.06	1223.01	0.089	0.089	0.025	1.00	0.06
17	18	3.00	1225.09	1226.11	1.02*	1.28	2.34	0.09	1226.20	0.107	28.160	1225.12	1226.14	1.02	1.28	2.34	0.08	1226.23	0.106	0.106	0.030	1.00	0.08
18	18	3.00	1225.15	1226.65	1.50*	1.77	1.70	0.04	1226.70	0.070	52.400	1225.18	1226.68	1.50	1.77	1.70	0.04	1226.73	0.069	0.069	0.036	1.49	0.07
19	18	1.59	1225.21	1226.75	1.50	1.77	0.90	0.01	1226.76	0.019	28.010	1225.25	1226.75	1.50	1.77	0.90	0.01	1226.76	0.019	0.019	0.005	1.00	0.01

Project File: AS BUILT 012716.stm | Number of lines: 19 | Run Date: 1/27/2016

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

DETENTION SUMMARY

Crafton Tull
architecture | engineering | surveying

PREPARED FOR:

HOLLAND CROSSING
SUBDIVISION

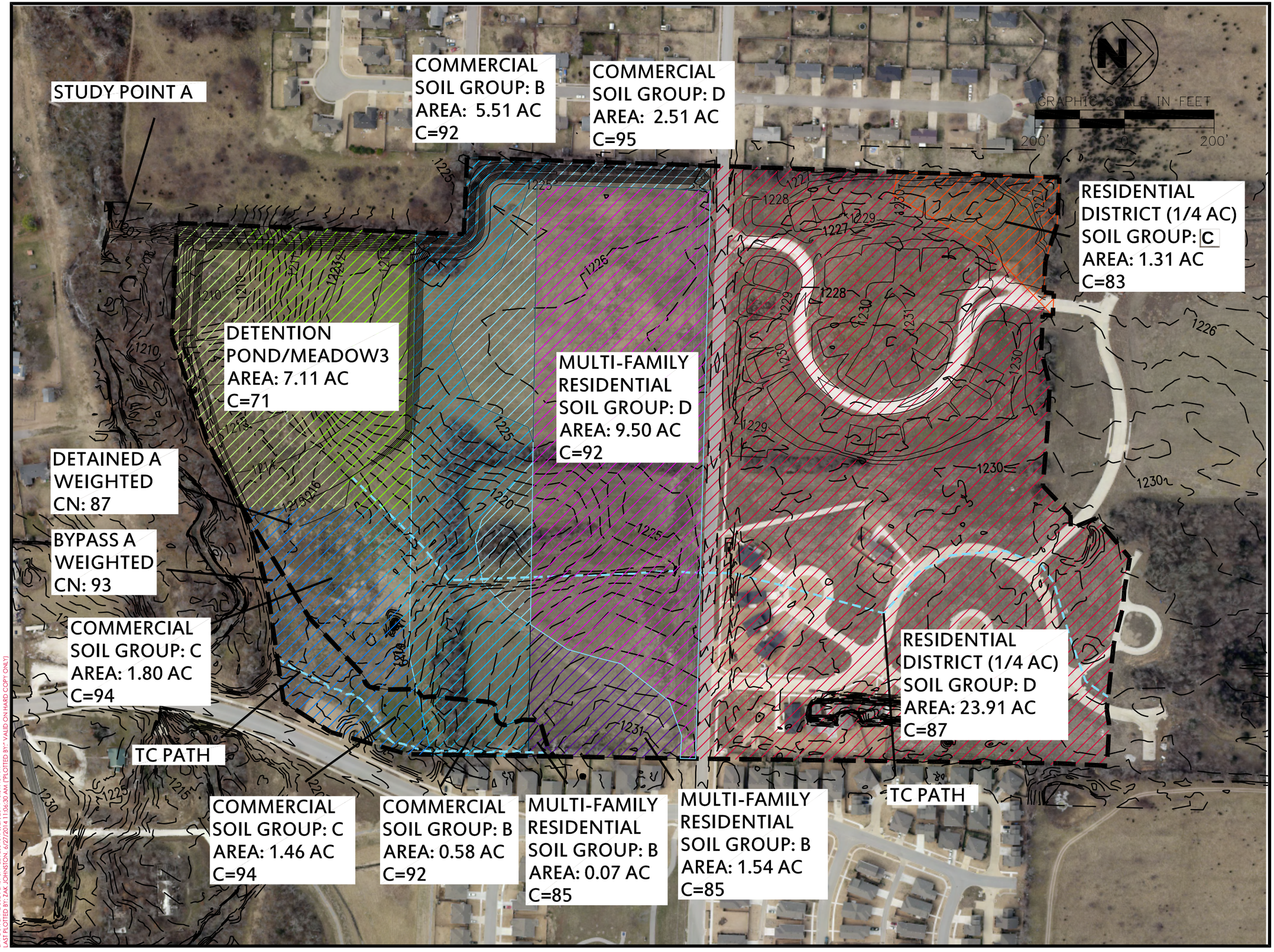
PRE DEVELOPED LAND USE
MAP

DELTA	DESCRIPTION	DATE

170 Commerce Road, Building 201
Conway, Arkansas 72032
Crafton Tull
surveying
501.328.3316 t 501.328.3325 f
www.craftontull.com

PROJECT NO:	13111100
ISSUE DATE:	
CONTACT:	D. ELLIS
CHECKED BY:	
SHEET NO.:	

DRAWING: G:\13111100_HOLLANDCROV_CIV_DRAINAGE_DEVELOPED_DRAINAGE_MAP_2_12_2014_ANE.DWG
LAYOUT: LAND_USEPRE LAST SAVED: ZJS101 4/27/2014 10:51:46 AM
LAST PLOTTED BY: ZAK JOHNSTON 6/27/2014 10:52:17 AM (PLOTTED BY "" VALID ONLY HARD COPY ONLY)



PREPARED FOR:

HOLLAND CROSSING
SUBDIVISION

DEVELOPED LAND USE MAP

DELTA	DESCRIPTION	DATE

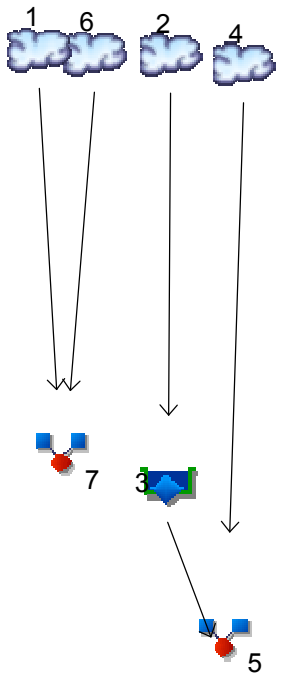
170 Commerce Road, Building 201
Conway, Arkansas 72032
Crafton Tull
surveying
501.328.3316 t 501.328.3325 f
www.craftontull.com

PROJECT NO:	13111100
ISSUE DATE:	
CONTACT:	D. ELLIS
CHECKED BY:	
SHEET NO.:	

DRAWING: G:\13111100_HOLLANDCROV\CIV\DRAINAGE\DEVLOPED_DRAINAGE_MAP_2_12_2014_LANE.DWG
LAYOUT: LANDUSE LAST SAVED: 6/30/2014 10:51:40 AM
LAST PLOTTED BY: ZAK JOHNSTON 6/27/2014 11:06:30 AM (PLOTTED BY: VALID ON HARD COPY ONLY)

Hydraflow Table of Contents

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	PREDEVELOPMENT
2	SCS Runoff	POSTDEVELOPMENT
3	Reservoir	pond
4	SCS Runoff	POST BYPASS
5	Combine	POST OUTFALL
6	SCS Runoff	PRE BYPASS
7	Combine	PRE OUTFALL

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)							Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	58.87	-------	93.77	115.72	145.68	176.16	199.23	PREDEVELOPMENT
2	SCS Runoff	------	-------	111.17	-------	156.86	184.36	220.96	257.45	284.72	POSTDEVELOPMENT
3	Reservoir	2	-------	57.52	-------	94.75	113.08	139.06	165.79	185.40	pond
4	SCS Runoff	------	-------	5.801	-------	7.738	8.893	10.42	11.95	13.09	POST BYPASS
5	Combine	3, 4	-------	57.52	-------	94.75	113.08	139.06	165.79	185.40	POST OUTFALL
6	SCS Runoff	------	-------	2.051	-------	3.602	4.610	6.013	7.486	8.619	PRE BYPASS
7	Combine	1, 6	-------	60.81	-------	97.10	119.95	151.15	182.91	206.96	PRE OUTFALL

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

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	58.87	2	736	284,634	------	------	------	PREDEVELOPMENT
2	SCS Runoff	111.17	1	735	510,514	------	------	------	POSTDEVELOPMENT
3	Reservoir	57.52	1	753	510,513	2	1213.55	145,781	pond
4	SCS Runoff	5.801	2	730	24,627	------	------	------	POST BYPASS
5	Combine	57.52	2	1506	1,045,654	3, 4	------	------	POST OUTFALL
6	SCS Runoff	2.051	2	732	9,003	------	------	------	PRE BYPASS
7	Combine	60.81	2	736	293,638	1, 6	------	------	PRE OUTFALL

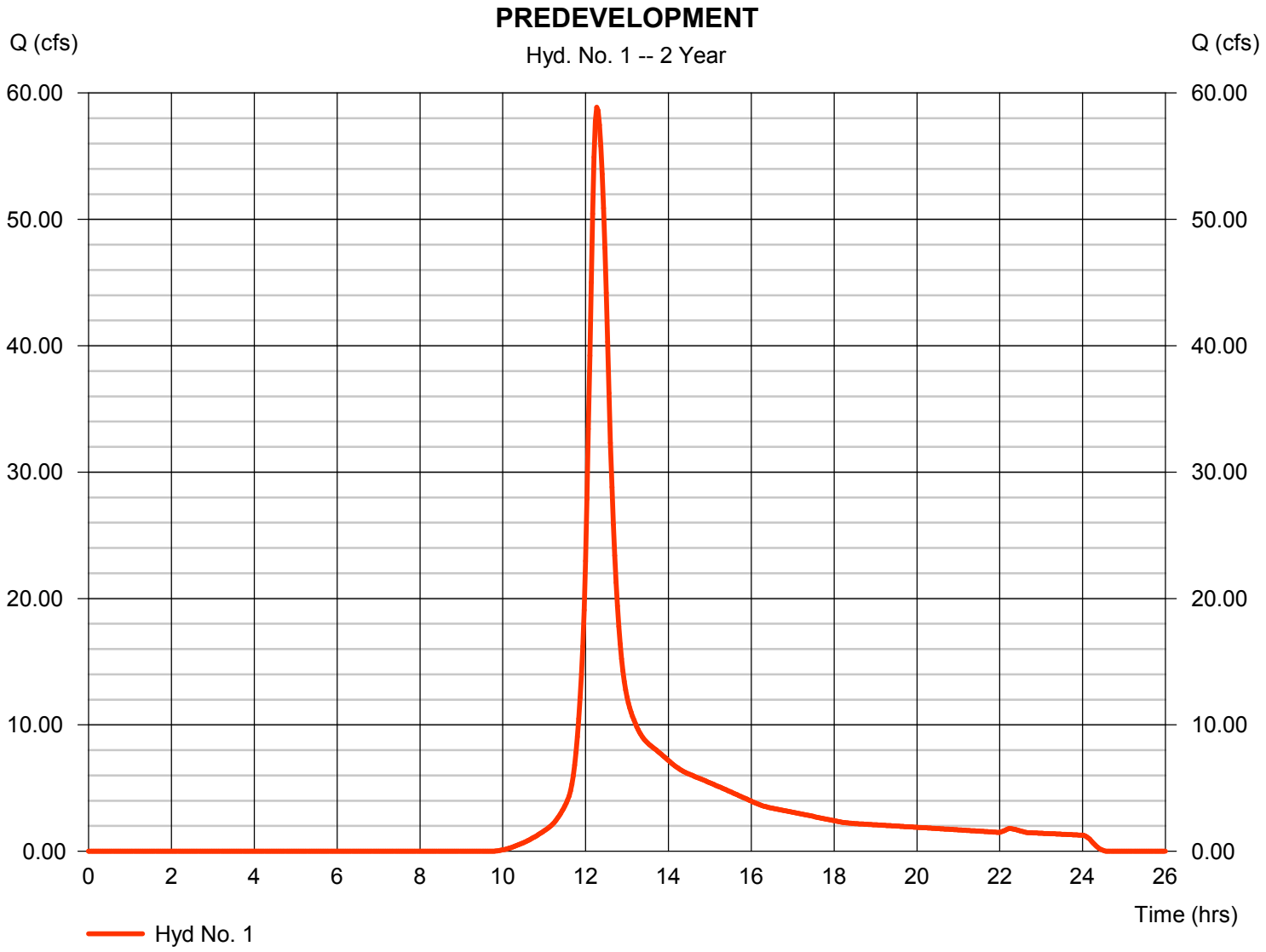
Hydrograph Report

Hyd. No. 1

PREDEVELOPMENT

Hydrograph type	= SCS Runoff	Peak discharge	= 58.87 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.27 hrs
Time interval	= 2 min	Hyd. volume	= 284,634 cuft
Drainage area	= 46.540 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.20 min
Total precip.	= 4.08 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(10.740 x 58) + (5.130 x 71) + (30.670 x 80)] / 46.540



TR55 Tc Worksheet

Hyd. No. 1

PREDEVELOPMENT

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.170		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 4.08		0.00		0.00		
Land slope (%)	= 1.00		0.00		0.00		
Travel Time (min)	**= 12.66**	**+**	**0.00**	**+**	**0.00**	**=**	**12.66**
Shallow Concentrated Flow							
Flow length (ft)	= 500.00		250.00		0.00		
Watercourse slope (%)	= 2.00		1.00		0.00		
Surface description	= Unpaved		Unpaved		Unpaved		
Average velocity (ft/s)	=2.28		1.61		0.00		
Travel Time (min)	**= 3.65**	**+**	**2.58**	**+**	**0.00**	**=**	**6.23**
Channel Flow							
X sectional flow area (sqft)	= 401.28		28.78		0.00		
Wetted perimeter (ft)	= 200.00		37.02		0.00		
Channel slope (%)	= 2.00		3.00		0.00		
Manning's n-value	= 0.030		0.030		0.015		
Velocity (ft/s)	=11.20						
			7.27				
					0.00		
Flow length (ft)	({0})600.0		1500.0		0.0		
Travel Time (min)	**= 0.89**	**+**	**3.44**	**+**	**0.00**	**=**	**4.33**

Total Travel Time, Tc ..... 23.20 min

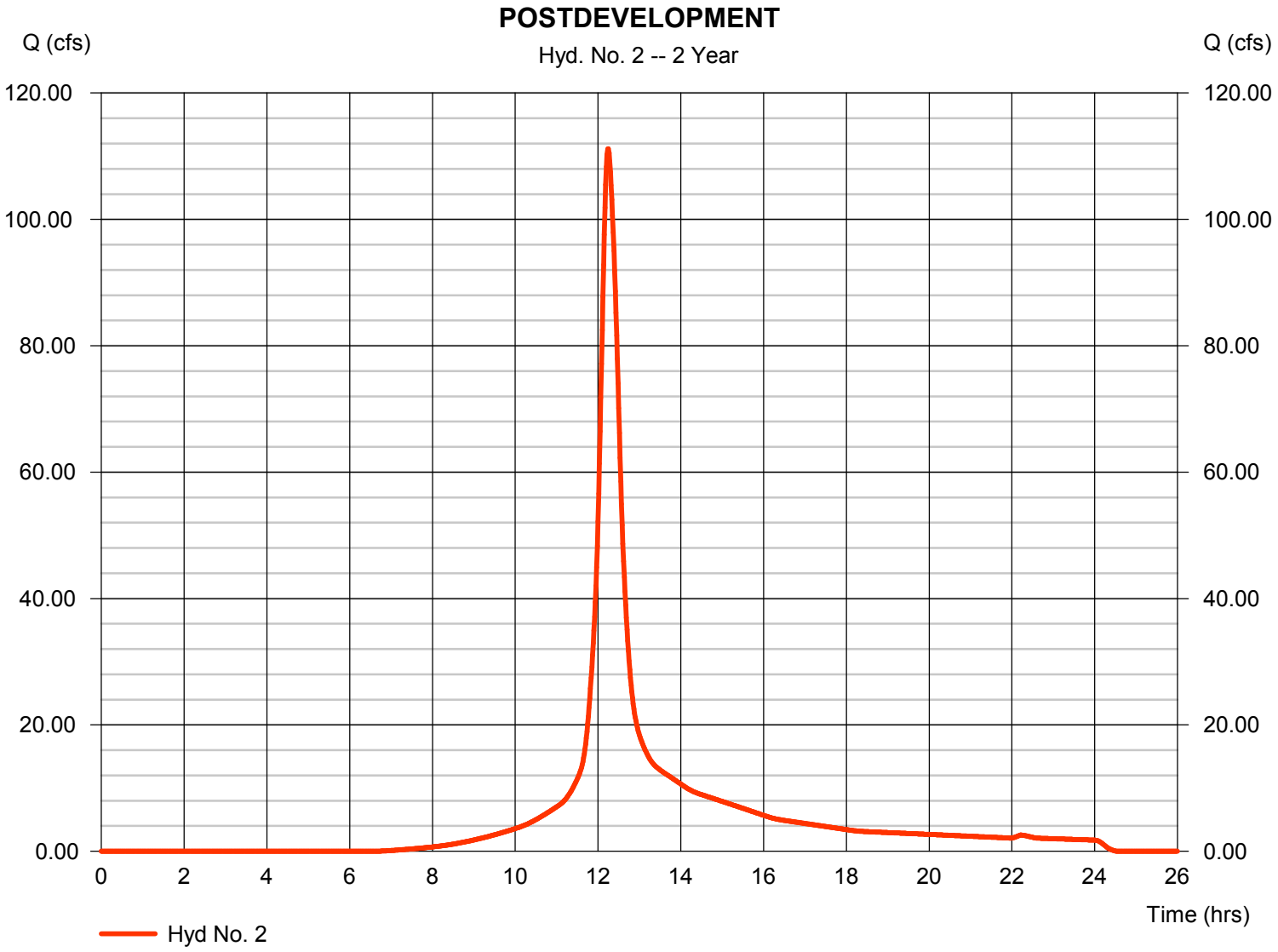
Hydrograph Report

Hyd. No. 2

POSTDEVELOPMENT

Hydrograph type	= SCS Runoff	Peak discharge	= 111.17 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.25 hrs
Time interval	= 1 min	Hyd. volume	= 510,514 cuft
Drainage area	= 53.190 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.10 min
Total precip.	= 4.08 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(11.040 x 91) + (25.220 x 86) + (7.110 x 71) + (5.510 x 92) + (2.510 x 95) + (1.800 x 94)] / 53.190



TR55 Tc Worksheet

Hyd. No. 2

POSTDEVELOPMENT

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.170		0.011		0.011		
Flow length (ft)	= 115.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 4.08		0.00		0.00		
Land slope (%)	= 1.00		0.00		0.00		
Travel Time (min)	**= 14.15**	**+**	**0.00**	**+**	**0.00**	**=**	**14.15**
Shallow Concentrated Flow							
Flow length (ft)	= 500.00		0.00		0.00		
Watercourse slope (%)	= 0.50		0.00		0.00		
Surface description	= Paved		Paved		Unpaved		
Average velocity (ft/s)	=1.44		0.00		0.00		
Travel Time (min)	**= 5.80**	**+**	**0.00**	**+**	**0.00**	**=**	**5.80**
Channel Flow							
X sectional flow area (sqft)	= 12.57		216.00		0.00		
Wetted perimeter (ft)	= 12.57		108.07		0.00		
Channel slope (%)	= 1.00		1.00		0.00		
Manning's n-value	= 0.015		0.017		0.015		
Velocity (ft/s)	=9.93						
			13.94				
					0.00		
Flow length (ft)	({0})500.0		225.0		0.0		
Travel Time (min)	**= 0.84**	**+**	**0.27**	**+**	**0.00**	**=**	**1.11**

Total Travel Time, Tc ..... 21.10 min

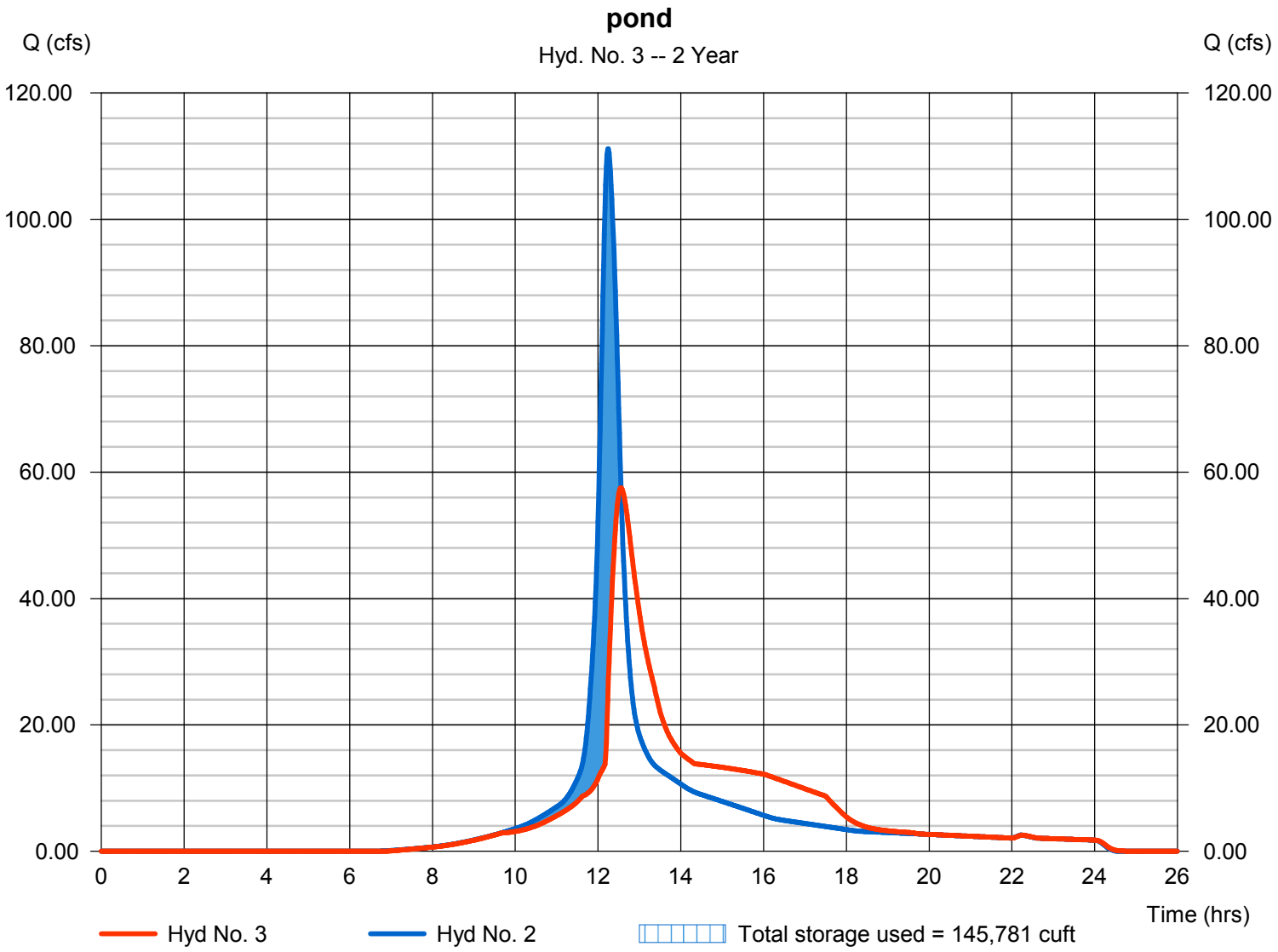
Hydrograph Report

Hyd. No. 3

pond

Hydrograph type	= Reservoir	Peak discharge	= 57.52 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.55 hrs
Time interval	= 1 min	Hyd. volume	= 510,513 cuft
Inflow hyd. No.	= 2 - POSTDEVELOPMENT	Max. Elevation	= 1213.55 ft
Reservoir name	= REGIONAL POND	Max. Storage	= 145,781 cuft

Storage Indication method used.



Pond No. 1 - REGIONAL POND

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 1209.20 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1209.20	400	0	0
0.80	1210.00	600	400	400
1.80	1211.00	18,400	9,500	9,900
2.80	1212.00	43,400	30,900	40,800
3.80	1213.00	69,800	56,600	97,400
4.80	1214.00	105,000	87,400	184,800
5.80	1215.00	167,000	136,000	320,800
6.80	1216.00	232,000	199,500	520,300

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	Inactive	Inactive	Inactive
Span (in)	= 18.00	0.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 1209.20	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	1.00	0.00	n/a
N-Value	= .010	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 2.40	14.00	Inactive	0.00
Crest El. (ft)	= 1212.60	1212.60	1209.20	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Rect	Broad	Rect	---
Multi-Stage	= No	No	No	No

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

TW Elev. (ft) = 0.00

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	1209.20	0.00	---	---	---	0.00	0.00	0.00	---	---	---	0.000
0.08	40	1209.28	0.04 ic	---	---	---	0.00	0.00	0.00	---	---	---	0.035
0.16	80	1209.36	0.14 ic	---	---	---	0.00	0.00	0.00	---	---	---	0.138
0.24	120	1209.44	0.30 ic	---	---	---	0.00	0.00	0.00	---	---	---	0.304
0.32	160	1209.52	0.53 ic	---	---	---	0.00	0.00	0.00	---	---	---	0.533
0.40	200	1209.60	0.81 ic	---	---	---	0.00	0.00	0.00	---	---	---	0.815
0.48	240	1209.68	1.15 ic	---	---	---	0.00	0.00	0.00	---	---	---	1.151
0.56	280	1209.76	1.53 ic	---	---	---	0.00	0.00	0.00	---	---	---	1.533
0.64	320	1209.84	1.96 ic	---	---	---	0.00	0.00	0.00	---	---	---	1.957
0.72	360	1209.92	2.42 ic	---	---	---	0.00	0.00	0.00	---	---	---	2.424
0.80	400	1210.00	2.92 ic	---	---	---	0.00	0.00	0.00	---	---	---	2.922
0.90	1,350	1210.10	3.58 ic	---	---	---	0.00	0.00	0.00	---	---	---	3.580
1.00	2,300	1210.20	4.26 ic	---	---	---	0.00	0.00	0.00	---	---	---	4.265
1.10	3,250	1210.30	4.96 ic	---	---	---	0.00	0.00	0.00	---	---	---	4.964
1.20	4,200	1210.40	5.65 ic	---	---	---	0.00	0.00	0.00	---	---	---	5.654
1.30	5,150	1210.50	6.32 ic	---	---	---	0.00	0.00	0.00	---	---	---	6.316
1.40	6,100	1210.60	6.92 ic	---	---	---	0.00	0.00	0.00	---	---	---	6.916
1.50	7,050	1210.70	7.37 ic	---	---	---	0.00	0.00	0.00	---	---	---	7.369
1.60	8,000	1210.80	7.84 ic	---	---	---	0.00	0.00	0.00	---	---	---	7.843
1.70	8,950	1210.90	8.29 ic	---	---	---	0.00	0.00	0.00	---	---	---	8.292
1.80	9,900	1211.00	8.72 ic	---	---	---	0.00	0.00	0.00	---	---	---	8.718
1.90	12,990	1211.10	9.12 ic	---	---	---	0.00	0.00	0.00	---	---	---	9.124
2.00	16,080	1211.20	9.51 ic	---	---	---	0.00	0.00	0.00	---	---	---	9.512
2.10	19,170	1211.30	9.88 ic	---	---	---	0.00	0.00	0.00	---	---	---	9.885
2.20	22,260	1211.40	10.24 ic	---	---	---	0.00	0.00	0.00	---	---	---	10.24
2.30	25,350	1211.50	10.59 ic	---	---	---	0.00	0.00	0.00	---	---	---	10.59
2.40	28,440	1211.60	10.93 ic	---	---	---	0.00	0.00	0.00	---	---	---	10.93
2.50	31,530	1211.70	11.25 ic	---	---	---	0.00	0.00	0.00	---	---	---	11.25
2.60	34,620	1211.80	11.57 ic	---	---	---	0.00	0.00	0.00	---	---	---	11.57
2.70	37,710	1211.90	11.88 ic	---	---	---	0.00	0.00	0.00	---	---	---	11.88
2.80	40,800	1212.00	12.18 ic	---	---	---	0.00	0.00	0.00	---	---	---	12.18
2.90	46,460	1212.10	12.47 ic	---	---	---	0.00	0.00	0.00	---	---	---	12.47
3.00	52,120	1212.20	12.76 ic	---	---	---	0.00	0.00	0.00	---	---	---	12.76
3.10	57,780	1212.30	13.04 ic	---	---	---	0.00	0.00	0.00	---	---	---	13.04
3.20	63,440	1212.40	13.32 ic	---	---	---	0.00	0.00	0.00	---	---	---	13.32

Continues on next page...

REGIONAL POND

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.30	69,100	1212.50	13.59 ic	---	---	---	0.00	0.00	0.00	---	---	---	13.59
3.40	74,760	1212.60	13.85 ic	---	---	---	0.00	0.00	0.00	---	---	---	13.85
3.50	80,420	1212.70	14.11 ic	---	---	---	0.25	1.15	0.00	---	---	---	15.51
3.60	86,080	1212.80	14.36 ic	---	---	---	0.71	3.25	0.00	---	---	---	18.33
3.70	91,740	1212.90	14.61 ic	---	---	---	1.31	5.98	0.00	---	---	---	21.90
3.80	97,400	1213.00	14.86 ic	---	---	---	2.02	9.21	0.00	---	---	---	26.09
3.90	106,140	1213.10	15.10 ic	---	---	---	2.83	12.87	0.00	---	---	---	30.79
4.00	114,880	1213.20	15.34 ic	---	---	---	3.71	16.92	0.00	---	---	---	35.97
4.10	123,620	1213.30	15.57 ic	---	---	---	4.68	21.32	0.00	---	---	---	41.57
4.20	132,360	1213.40	15.80 ic	---	---	---	5.72	26.04	0.00	---	---	---	47.56
4.30	141,100	1213.50	16.03 ic	---	---	---	6.82	31.07	0.00	---	---	---	53.93
4.40	149,840	1213.60	16.25 ic	---	---	---	7.99	36.39	0.00	---	---	---	60.64
4.50	158,580	1213.70	16.47 ic	---	---	---	9.22	41.99	0.00	---	---	---	67.68
4.60	167,320	1213.80	16.69 ic	---	---	---	10.50	47.84	0.00	---	---	---	75.04
4.70	176,060	1213.90	16.91 ic	---	---	---	11.84	53.94	0.00	---	---	---	82.69
4.80	184,800	1214.00	17.12 ic	---	---	---	13.24	60.30	0.00	---	---	---	90.66
4.90	198,400	1214.10	17.33 ic	---	---	---	14.68	66.87	0.00	---	---	---	98.88
5.00	212,000	1214.20	17.54 ic	---	---	---	16.17	73.67	0.00	---	---	---	107.38
5.10	225,600	1214.30	17.74 ic	---	---	---	17.71	80.68	0.00	---	---	---	116.14
5.20	239,200	1214.40	17.95 ic	---	---	---	19.30	87.90	0.00	---	---	---	125.14
5.30	252,800	1214.50	18.15 ic	---	---	---	20.93	95.32	0.00	---	---	---	134.40
5.40	266,400	1214.60	18.35 ic	---	---	---	22.60	102.95	0.00	---	---	---	143.89
5.50	280,000	1214.70	18.54 ic	---	---	---	24.32	110.76	0.00	---	---	---	153.62
5.60	293,600	1214.80	18.74 ic	---	---	---	26.08	118.76	0.00	---	---	---	163.58
5.70	307,200	1214.90	18.93 ic	---	---	---	27.87	126.95	0.00	---	---	---	173.75
5.80	320,800	1215.00	19.12 ic	---	---	---	29.72	135.34	0.00	---	---	---	184.17
5.90	340,750	1215.10	19.31 ic	---	---	---	31.59	143.88	0.00	---	---	---	194.78
6.00	360,700	1215.20	19.49 ic	---	---	---	33.50	152.60	0.00	---	---	---	205.60
6.10	380,650	1215.30	19.68 ic	---	---	---	35.46	161.49	0.00	---	---	---	216.62
6.20	400,600	1215.40	19.86 ic	---	---	---	37.44	170.54	0.00	---	---	---	227.84
6.30	420,550	1215.50	20.04 ic	---	---	---	39.47	179.75	0.00	---	---	---	239.26
6.40	440,500	1215.60	20.22 ic	---	---	---	41.53	189.13	0.00	---	---	---	250.88
6.50	460,450	1215.70	20.40 ic	---	---	---	43.62	198.66	0.00	---	---	---	262.68
6.60	480,400	1215.80	20.58 ic	---	---	---	45.75	208.35	0.00	---	---	---	274.67
6.70	500,350	1215.90	20.75 ic	---	---	---	47.91	218.19	0.00	---	---	---	286.85
6.80	520,300	1216.00	20.93 ic	---	---	---	50.10	228.20	0.00	---	---	---	299.24

...End

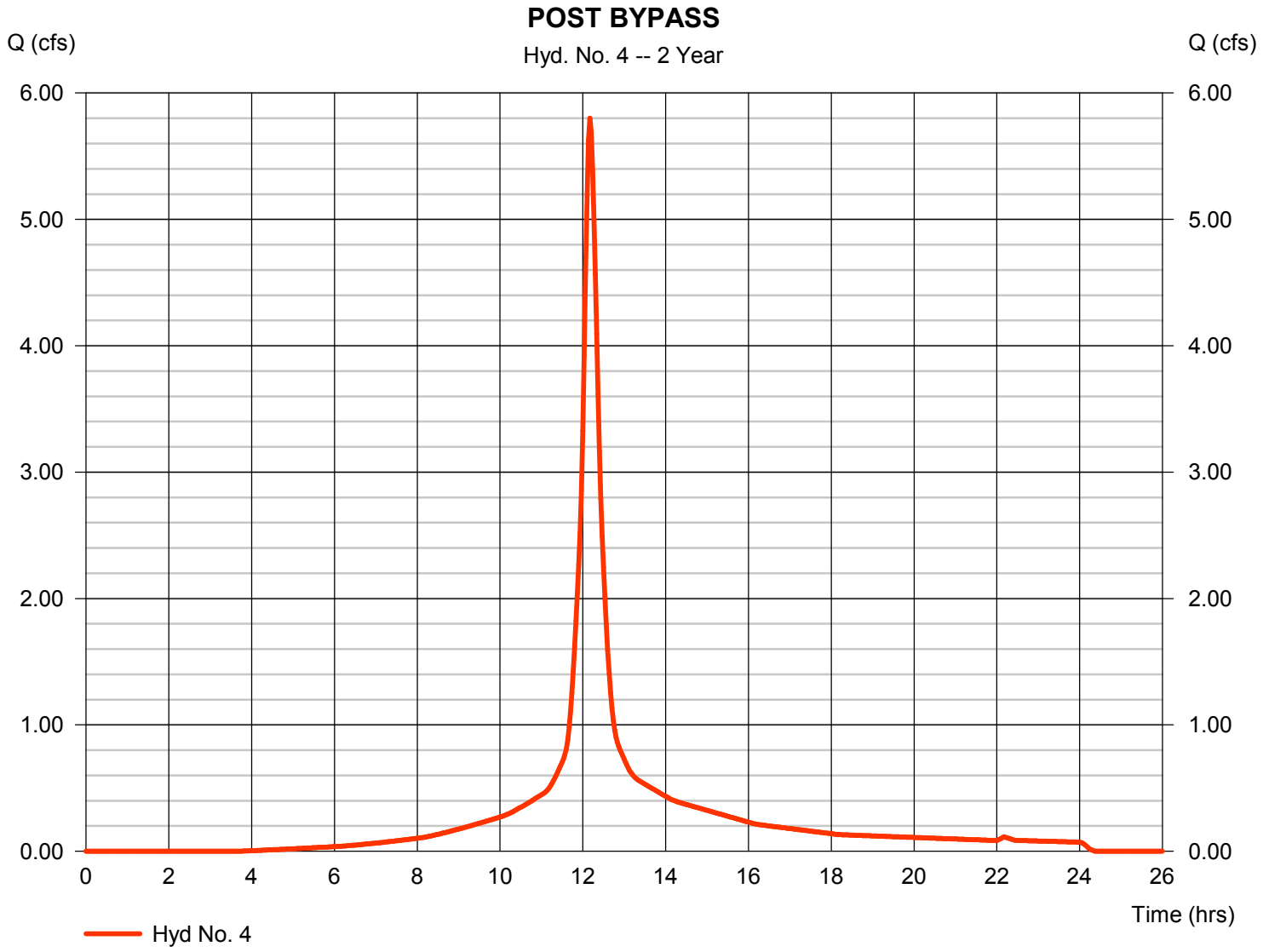
Hydrograph Report

Hyd. No. 4

POST BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 5.801 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 24,627 cuft
Drainage area	= 2.110 ac	Curve number	= 93*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.58 min
Total precip.	= 4.08 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 85) + (0.580 x 92) + (1.460 x 94)] / 2.110



TR55 Tc Worksheet

Hyd. No. 4

POST BYPASS

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)	= 4.08		0.00		0.00		
Land slope (%)	= 1.00		0.00		0.00		
Travel Time (min)	**= 11.45**	**+**	**0.00**	**+**	**0.00**	**=**	**11.45**
Shallow Concentrated Flow							
Flow length (ft)	= 400.00		0.00		0.00		
Watercourse slope (%)	= 1.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.61		0.00		0.00		
Travel Time (min)	**= 4.13**	**+**	**0.00**	**+**	**0.00**	**=**	**4.13**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

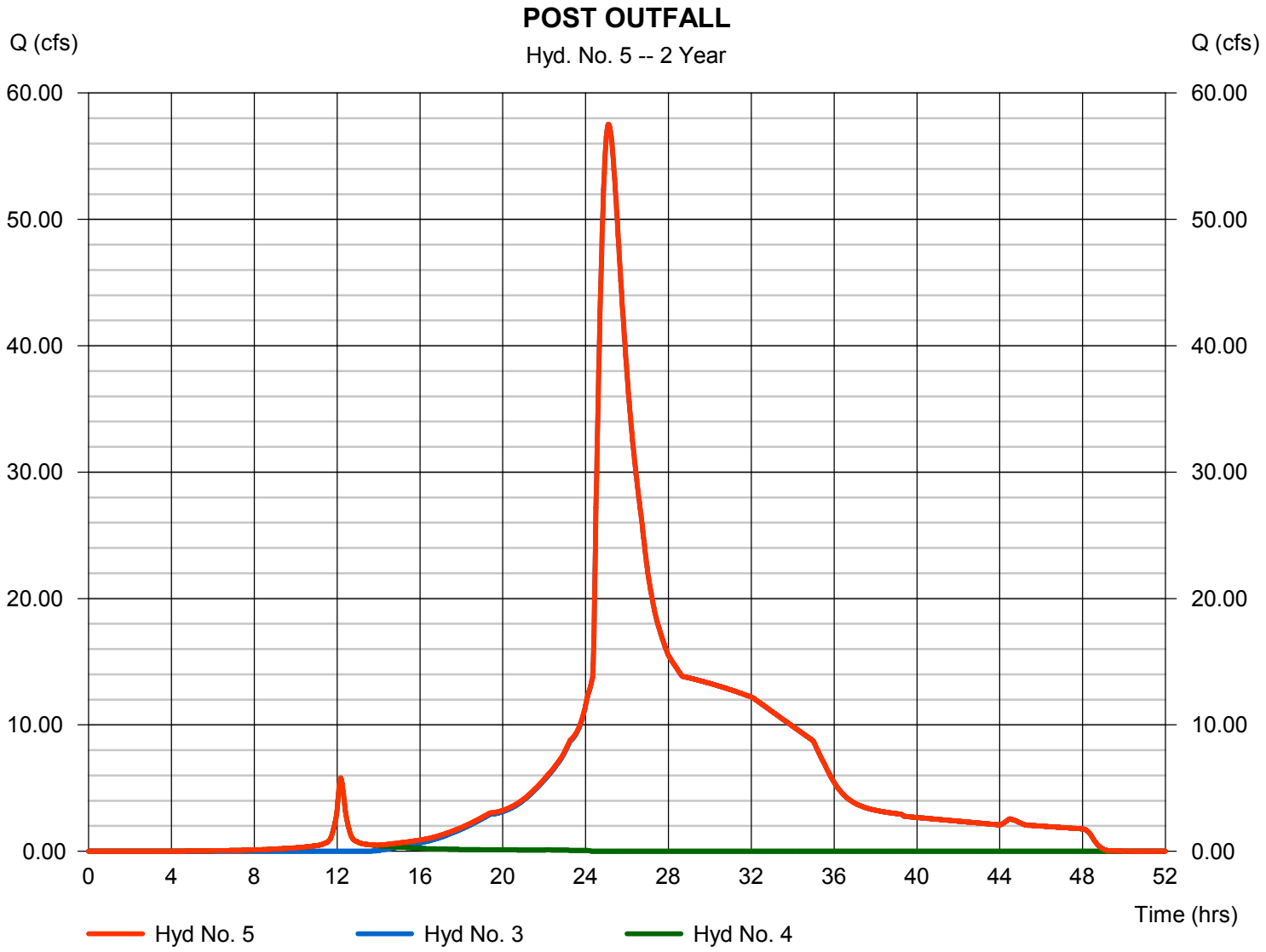
Total Travel Time, Tc ..... 15.58 min

Hydrograph Report

Hyd. No. 5

POST OUTFALL

Hydrograph type	= Combine	Peak discharge	= 57.52 cfs
Storm frequency	= 2 yrs	Time to peak	= 25.10 hrs
Time interval	= 2 min	Hyd. volume	= 1,045,654 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 2.110 ac



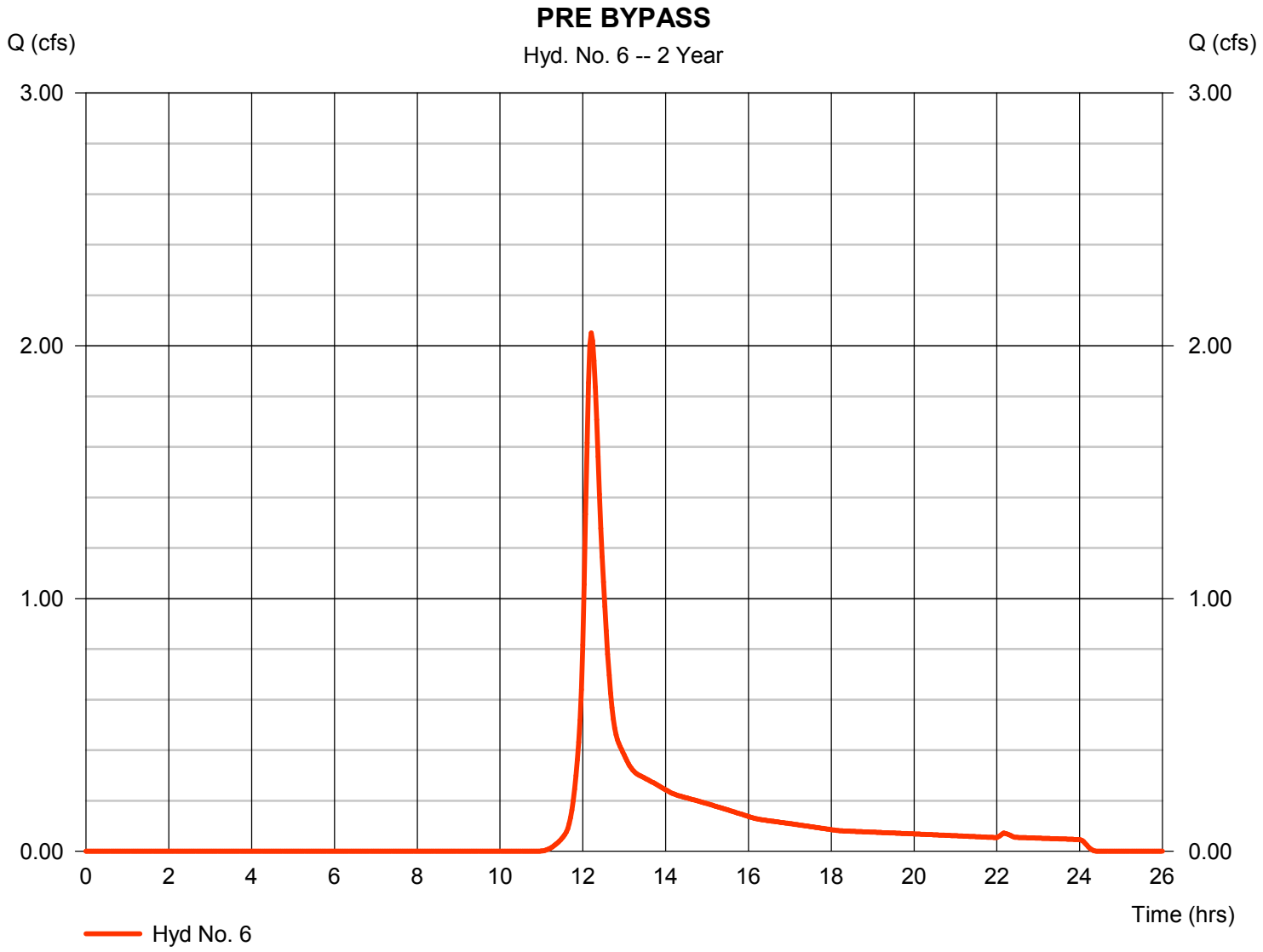
Hydrograph Report

Hyd. No. 6

PRE BYPASS

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.051 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.20 hrs
Time interval	=	2 min	Hyd. volume	=	9,003 cuft
Drainage area	=	2.130 ac	Curve number	=	67*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.50 min
Total precip.	=	4.08 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.470 x 71) + (0.660 x 58)] / 2.130



TR55 Tc Worksheet

Hyd. No. 6

PRE BYPASS

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 4.08		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 12.64**	**+**	**0.00**	**+**	**0.00**	**=**	**12.64**
Shallow Concentrated Flow							
Flow length (ft)	= 400.00		0.00		0.00		
Watercourse slope (%)	= 2.10		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.34		0.00		0.00		
Travel Time (min)	**= 2.85**	**+**	**0.00**	**+**	**0.00**	**=**	**2.85**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

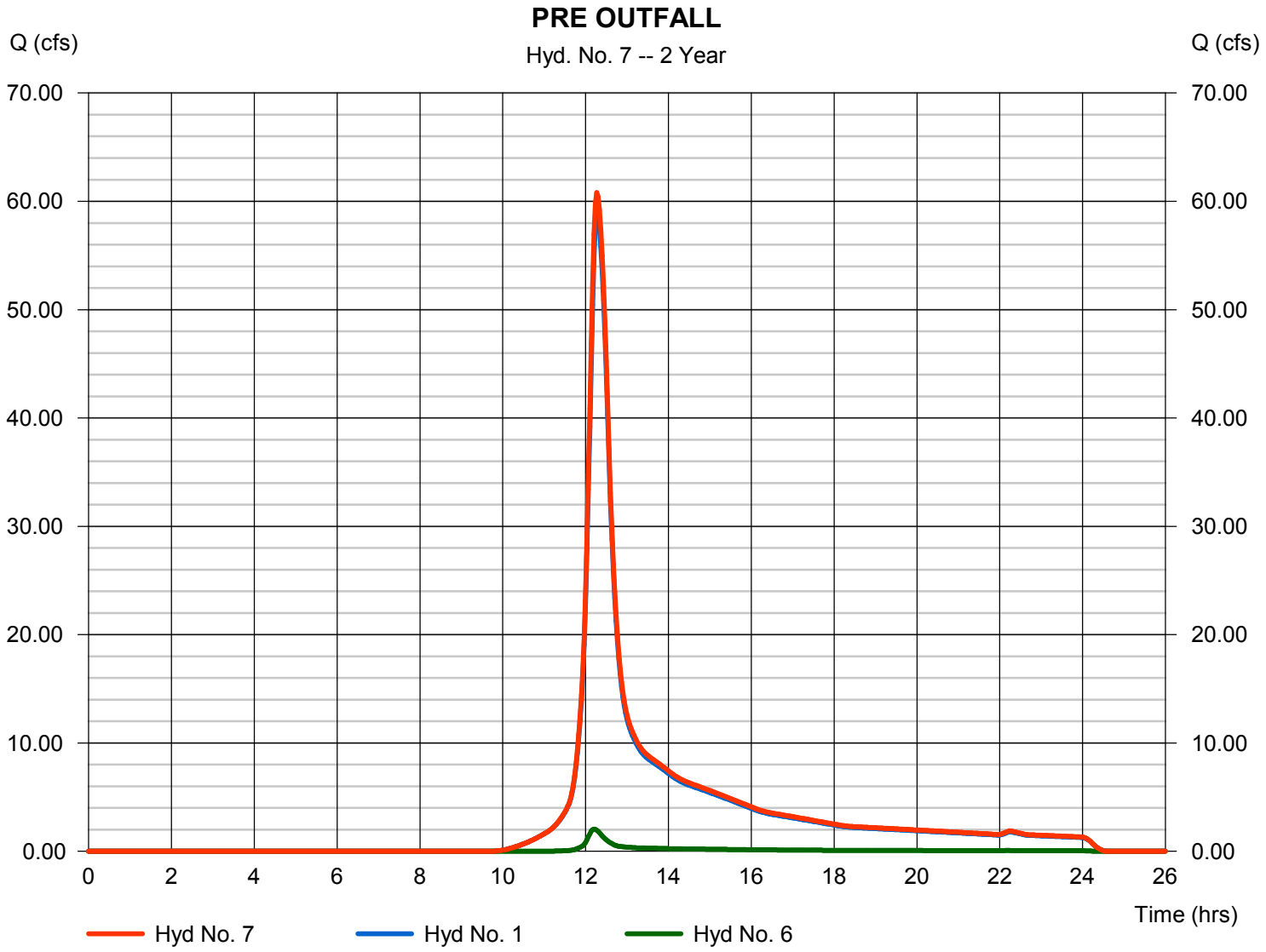
Total Travel Time, Tc ..... 15.50 min

Hydrograph Report

Hyd. No. 7

PRE OUTFALL

Hydrograph type	= Combine	Peak discharge	= 60.81 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.27 hrs
Time interval	= 2 min	Hyd. volume	= 293,638 cuft
Inflow hyds.	= 1, 6	Contrib. drain. area	= 48.670 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

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	93.77	2	736	445,293	------	------	------	PREDEVELOPMENT
2	SCS Runoff	156.86	1	734	726,940	------	------	------	POSTDEVELOPMENT
3	Reservoir	94.75	1	750	726,939	2	1214.05	191,565	pond
4	SCS Runoff	7.738	2	730	33,404	------	------	------	POST BYPASS
5	Combine	94.75	2	1500	1,487,282	3, 4	------	------	POST OUTFALL
6	SCS Runoff	3.602	2	732	15,082	------	------	------	PRE BYPASS
7	Combine	97.10	2	736	460,375	1, 6	------	------	PRE OUTFALL

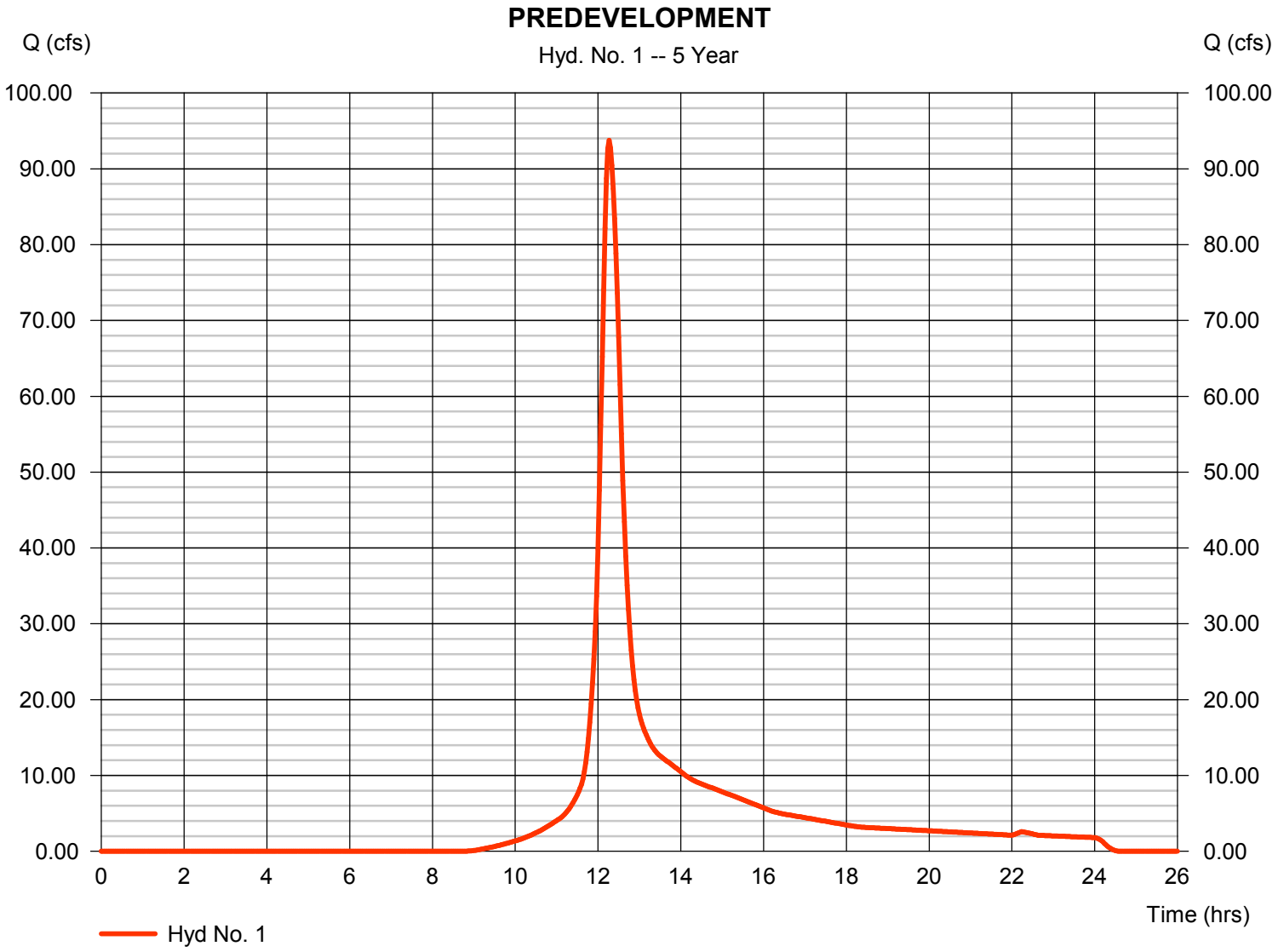
Hydrograph Report

Hyd. No. 1

PREDEVELOPMENT

Hydrograph type	= SCS Runoff	Peak discharge	= 93.77 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.27 hrs
Time interval	= 2 min	Hyd. volume	= 445,293 cuft
Drainage area	= 46.540 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.20 min
Total precip.	= 5.28 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(10.740 x 58) + (5.130 x 71) + (30.670 x 80)] / 46.540



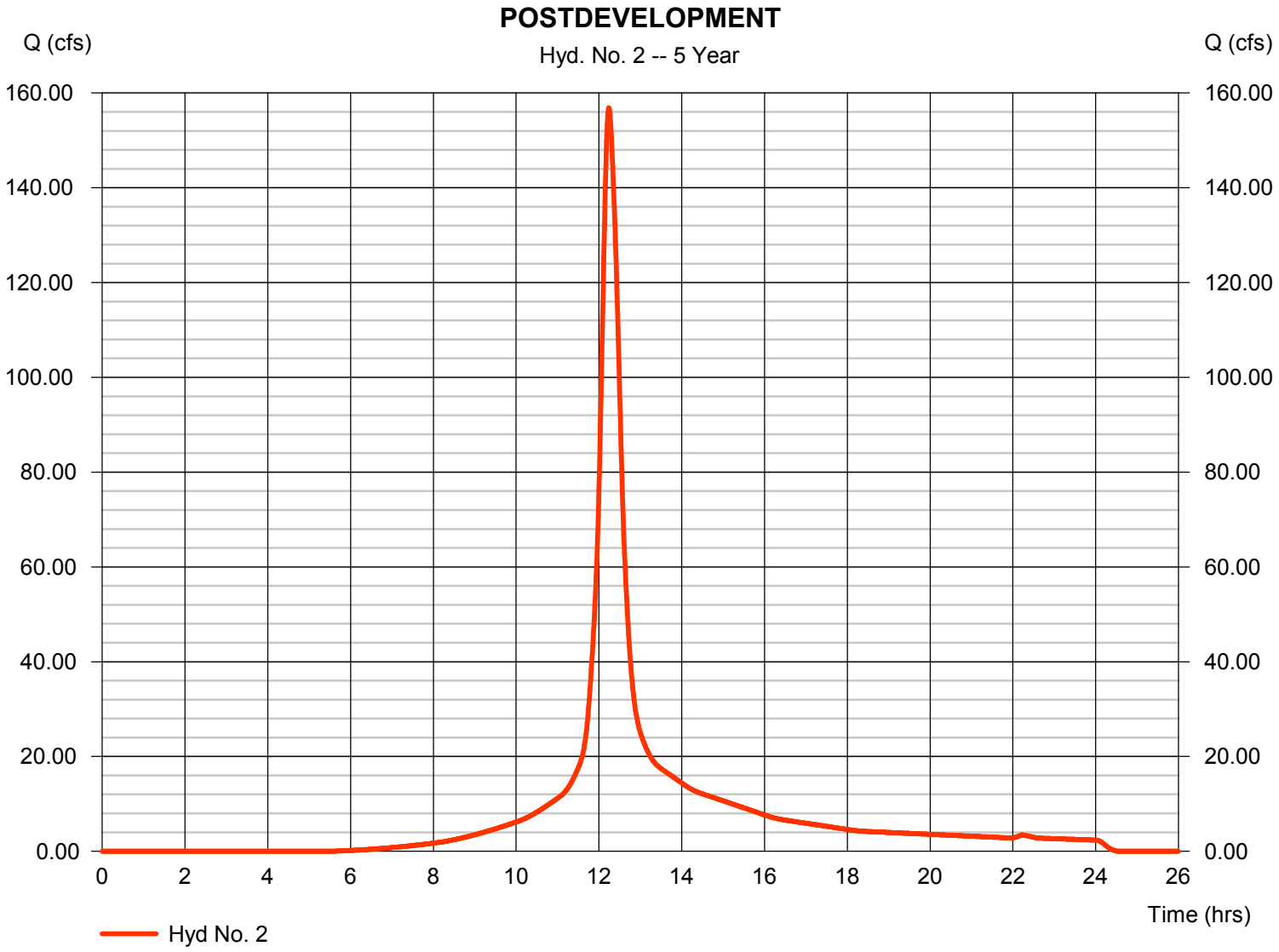
Hydrograph Report

Hyd. No. 2

POSTDEVELOPMENT

Hydrograph type	= SCS Runoff	Peak discharge	= 156.86 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.23 hrs
Time interval	= 1 min	Hyd. volume	= 726,940 cuft
Drainage area	= 53.190 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.10 min
Total precip.	= 5.28 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(11.040 x 91) + (25.220 x 86) + (7.110 x 71) + (5.510 x 92) + (2.510 x 95) + (1.800 x 94)] / 53.190



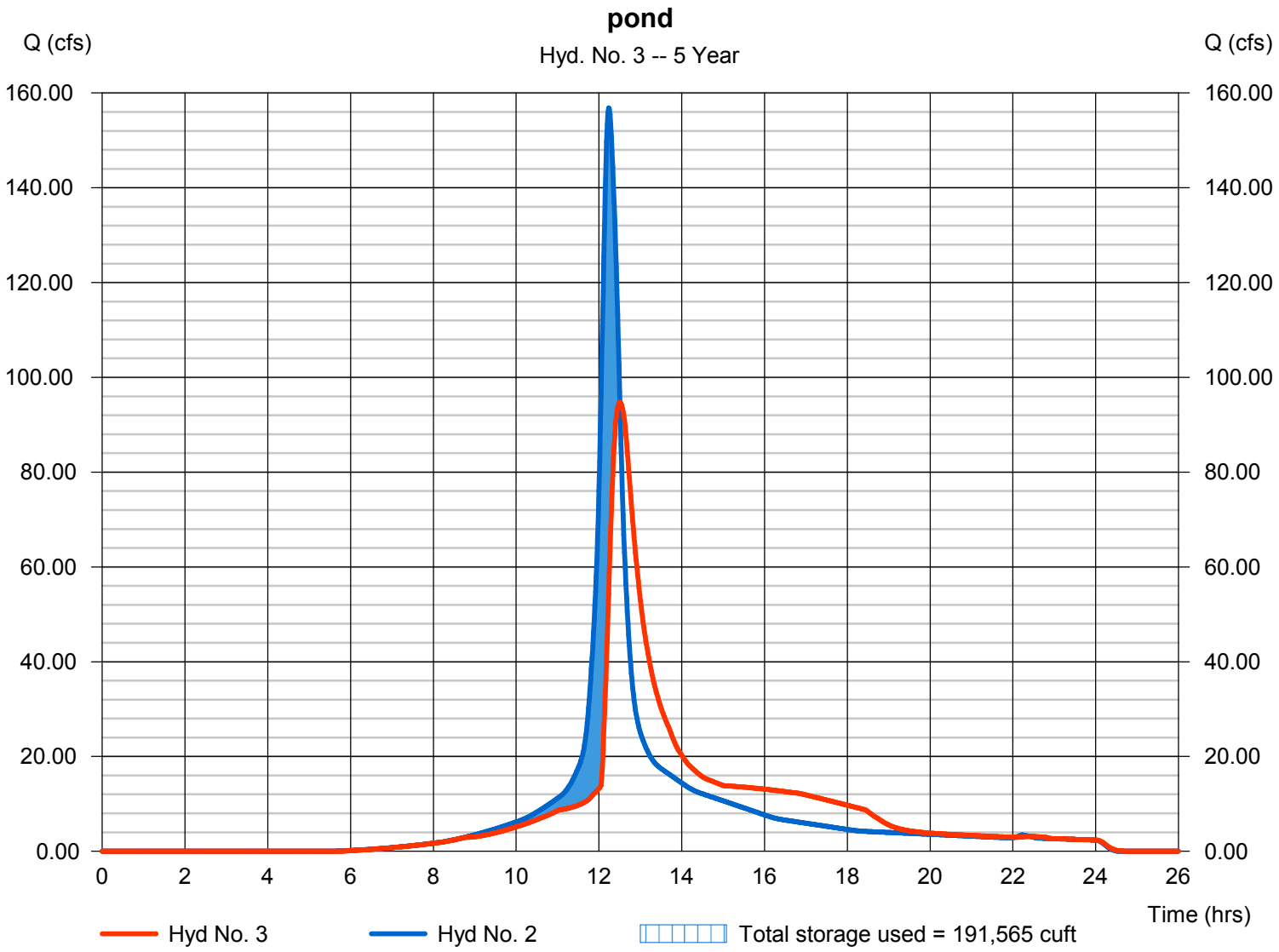
Hydrograph Report

Hyd. No. 3

pond

Hydrograph type	= Reservoir	Peak discharge	= 94.75 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.50 hrs
Time interval	= 1 min	Hyd. volume	= 726,939 cuft
Inflow hyd. No.	= 2 - POSTDEVELOPMENT	Max. Elevation	= 1214.05 ft
Reservoir name	= REGIONAL POND	Max. Storage	= 191,565 cuft

Storage Indication method used.



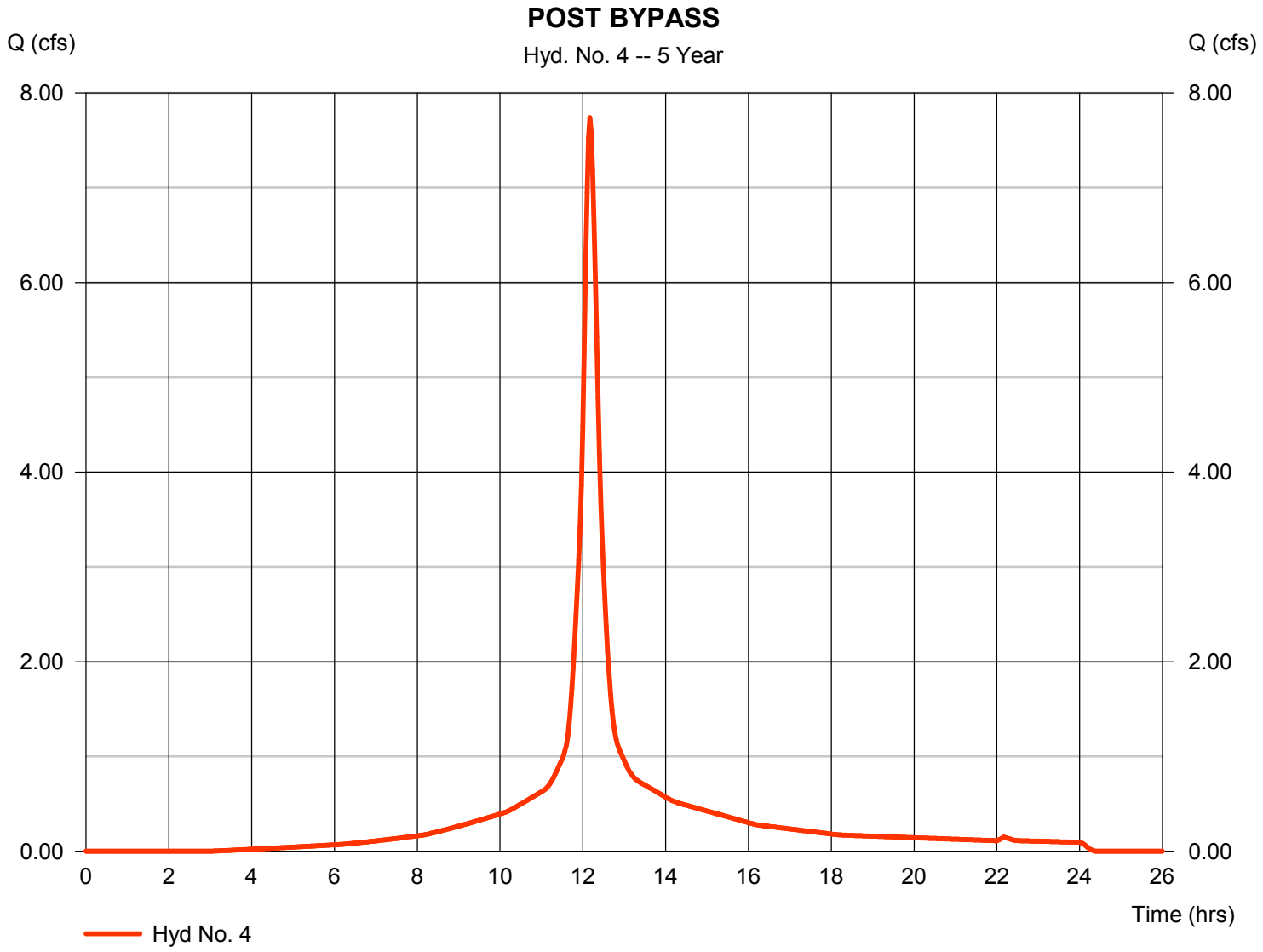
Hydrograph Report

Hyd. No. 4

POST BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 7.738 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 33,404 cuft
Drainage area	= 2.110 ac	Curve number	= 93*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.58 min
Total precip.	= 5.28 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 85) + (0.580 x 92) + (1.460 x 94)] / 2.110

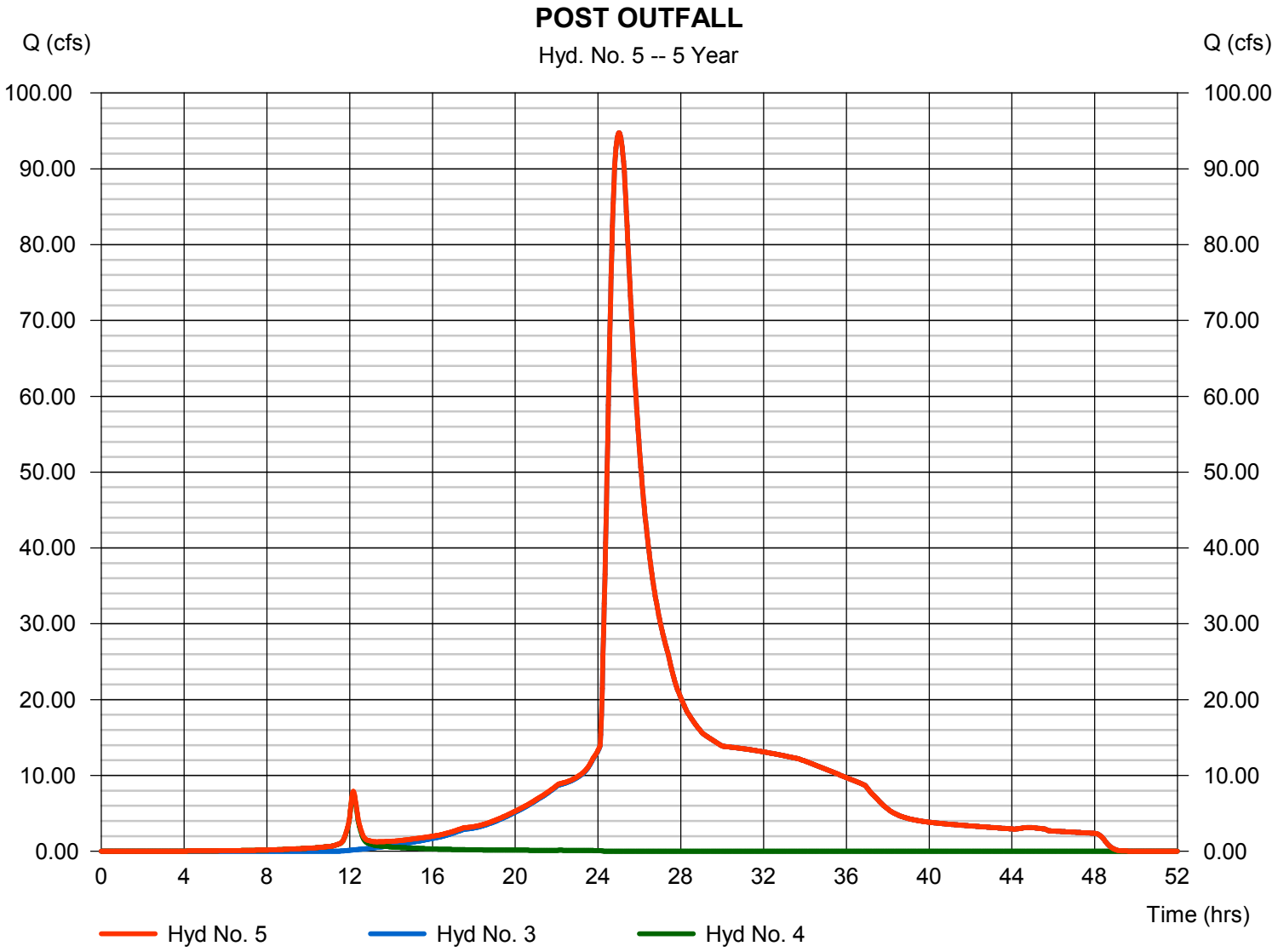


Hydrograph Report

Hyd. No. 5

POST OUTFALL

Hydrograph type	=	Combine	Peak discharge	=	94.75 cfs
Storm frequency	=	5 yrs	Time to peak	=	25.00 hrs
Time interval	=	2 min	Hyd. volume	=	1,487,282 cuft
Inflow hyds.	=	3, 4	Contrib. drain. area	=	2.110 ac



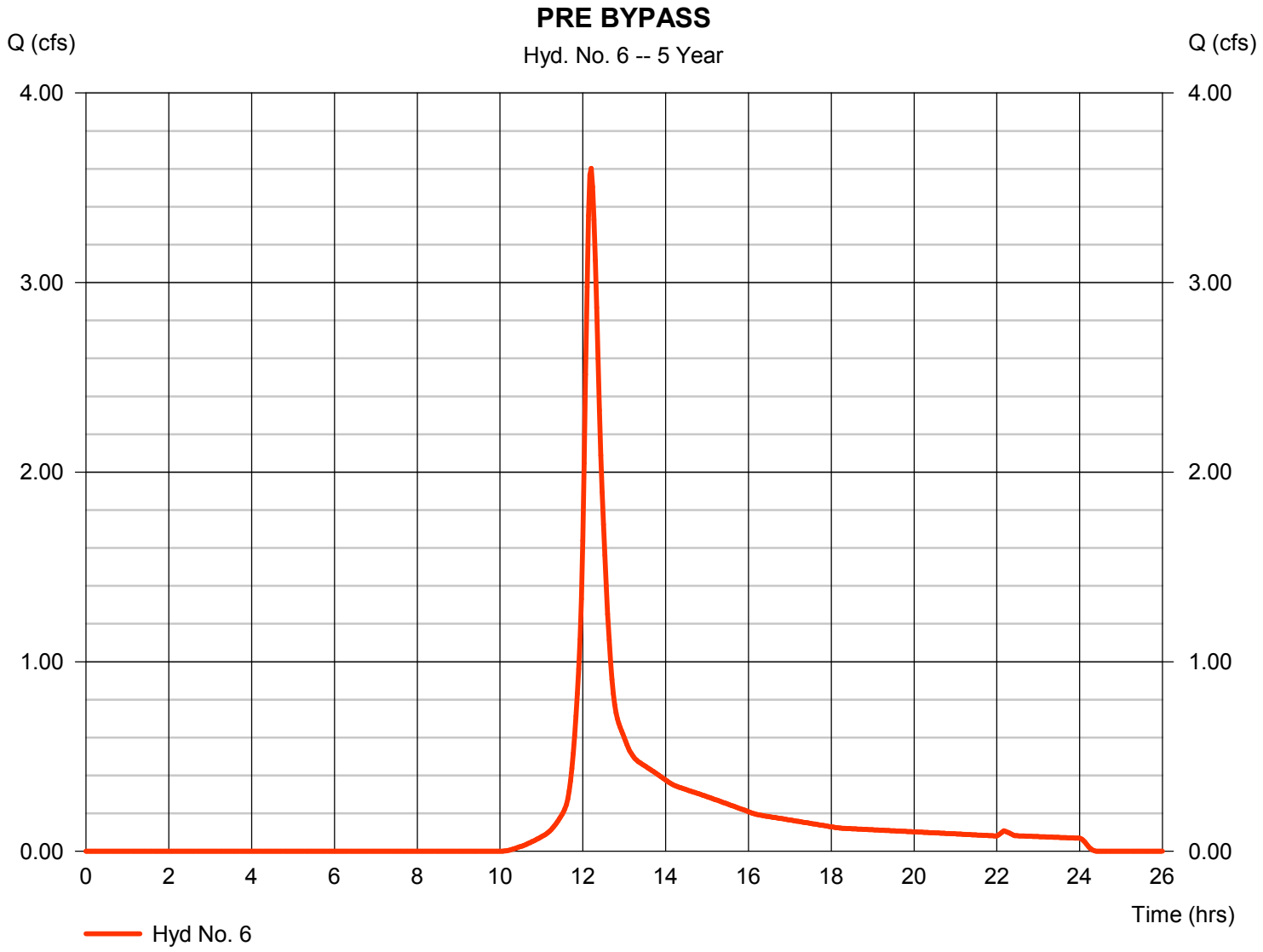
Hydrograph Report

Hyd. No. 6

PRE BYPASS

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.602 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.20 hrs
Time interval	=	2 min	Hyd. volume	=	15,082 cuft
Drainage area	=	2.130 ac	Curve number	=	67*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.50 min
Total precip.	=	5.28 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.470 x 71) + (0.660 x 58)] / 2.130

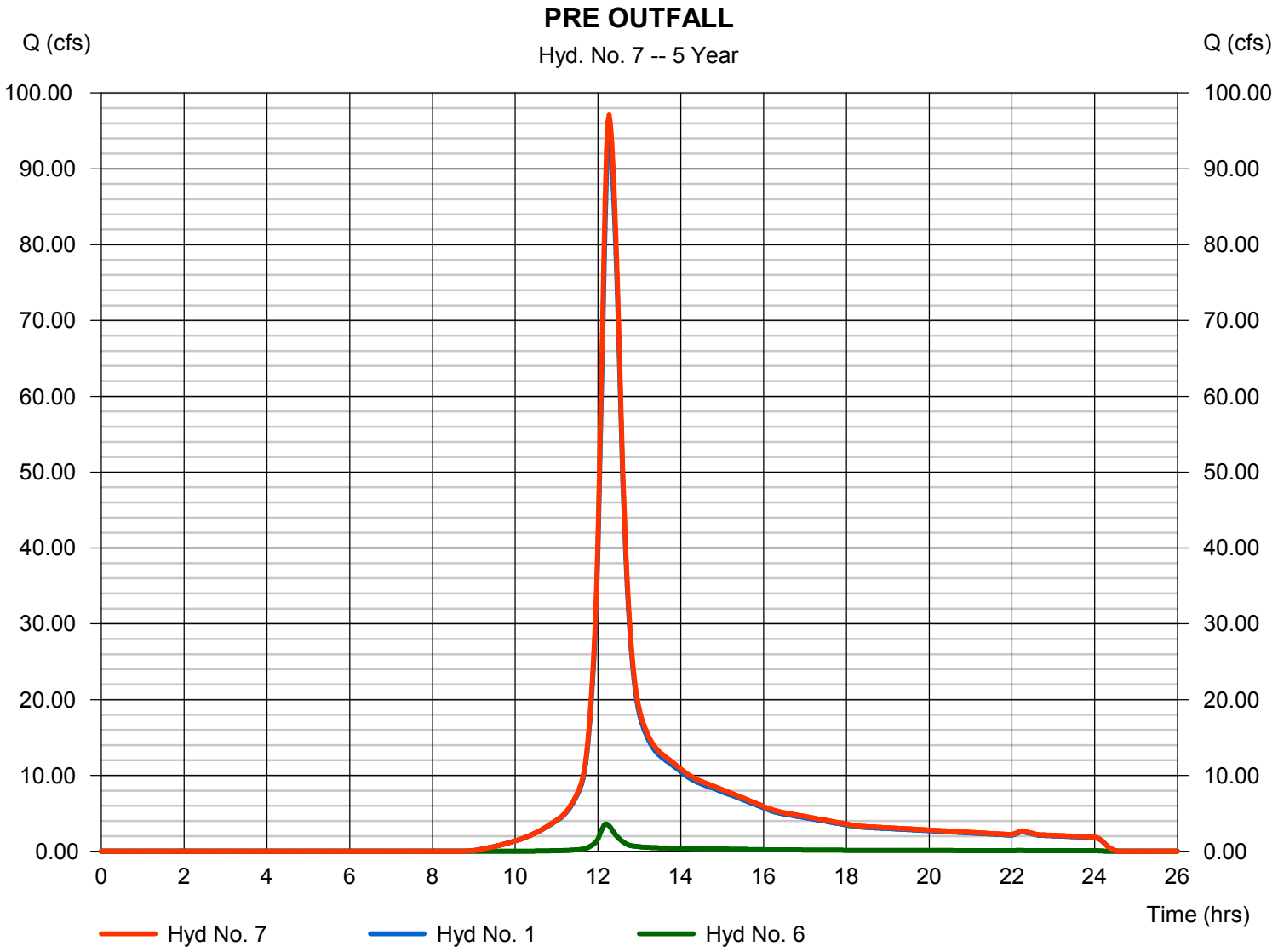


Hydrograph Report

Hyd. No. 7

PRE OUTFALL

Hydrograph type	= Combine	Peak discharge	= 97.10 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.27 hrs
Time interval	= 2 min	Hyd. volume	= 460,375 cuft
Inflow hyds.	= 1, 6	Contrib. drain. area	= 48.670 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

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	115.72	2	736	547,662	------	------	------	PREDEVELOPMENT
2	SCS Runoff	184.36	1	734	859,556	------	------	------	POSTDEVELOPMENT
3	Reservoir	113.08	1	750	859,554	2	1214.27	220,847	pond
4	SCS Runoff	8.893	2	730	38,703	------	------	------	POST BYPASS
5	Combine	113.08	2	1500	1,757,812	3, 4	------	------	POST OUTFALL
6	SCS Runoff	4.610	2	732	19,073	------	------	------	PRE BYPASS
7	Combine	119.95	2	736	566,735	1, 6	------	------	PRE OUTFALL

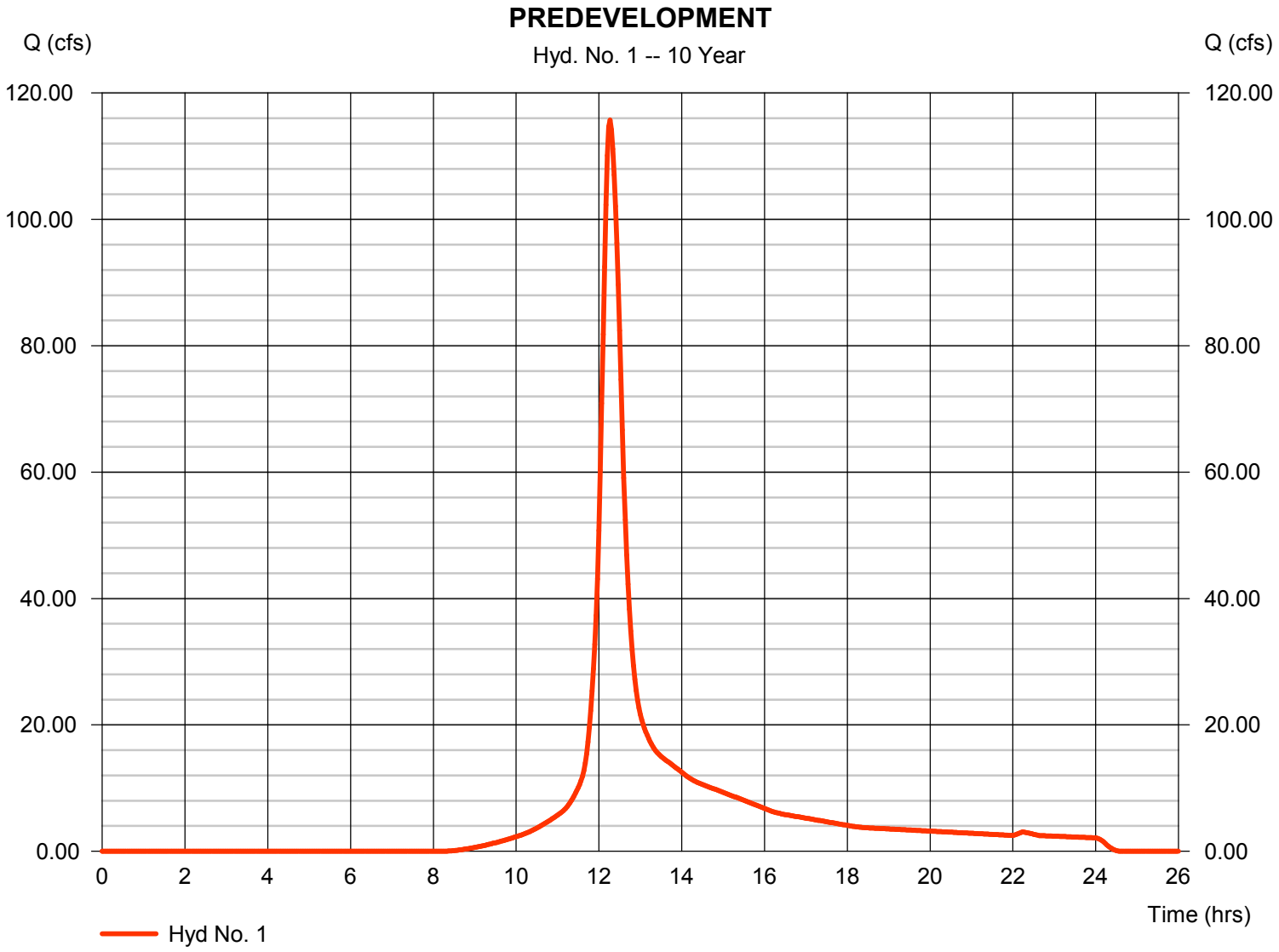
Hydrograph Report

Hyd. No. 1

PREDEVELOPMENT

Hydrograph type	= SCS Runoff	Peak discharge	= 115.72 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.27 hrs
Time interval	= 2 min	Hyd. volume	= 547,662 cuft
Drainage area	= 46.540 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.20 min
Total precip.	= 6.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(10.740 x 58) + (5.130 x 71) + (30.670 x 80)] / 46.540



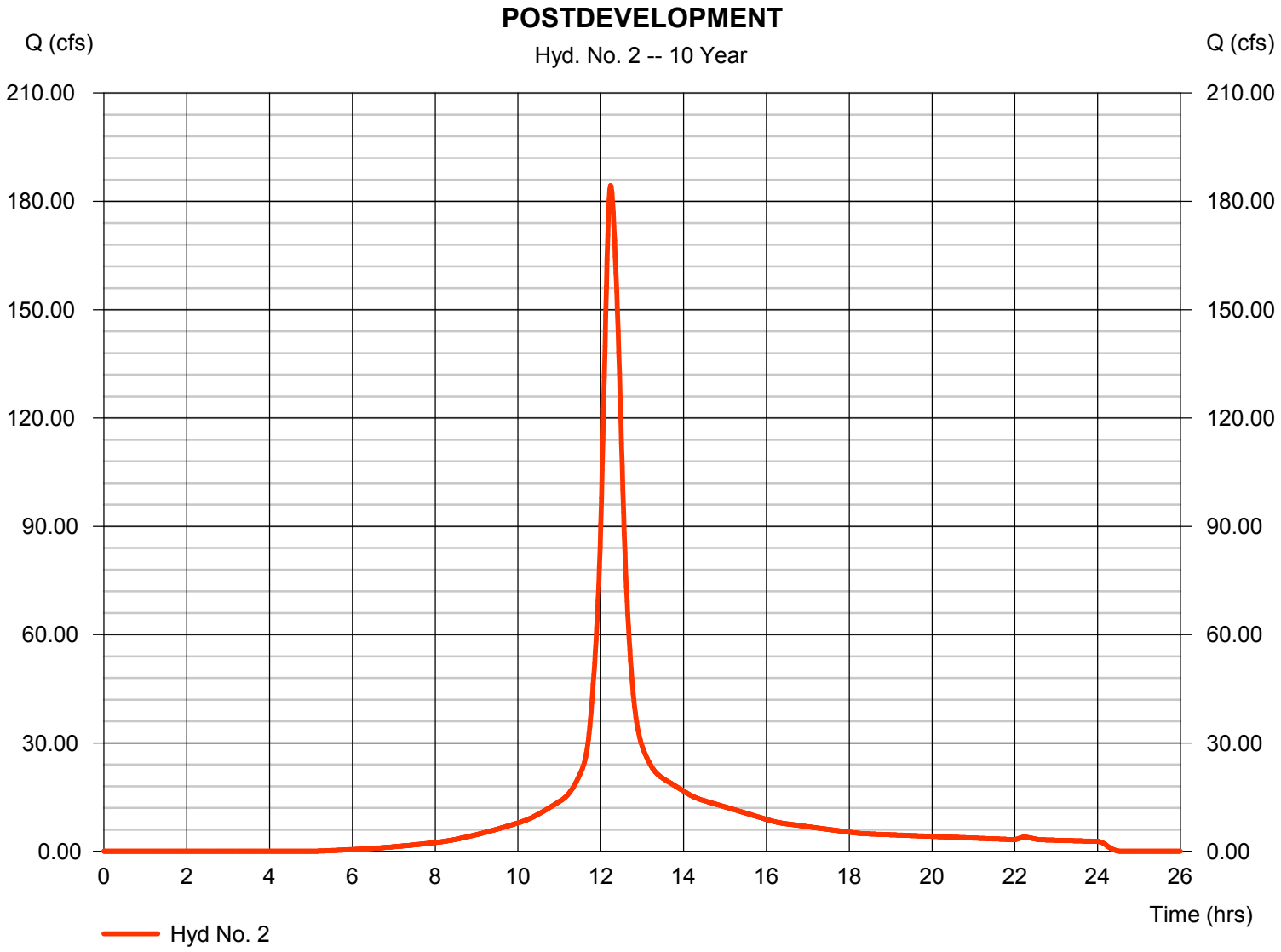
Hydrograph Report

Hyd. No. 2

POSTDEVELOPMENT

Hydrograph type	= SCS Runoff	Peak discharge	= 184.36 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.23 hrs
Time interval	= 1 min	Hyd. volume	= 859,556 cuft
Drainage area	= 53.190 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.10 min
Total precip.	= 6.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(11.040 x 91) + (25.220 x 86) + (7.110 x 71) + (5.510 x 92) + (2.510 x 95) + (1.800 x 94)] / 53.190



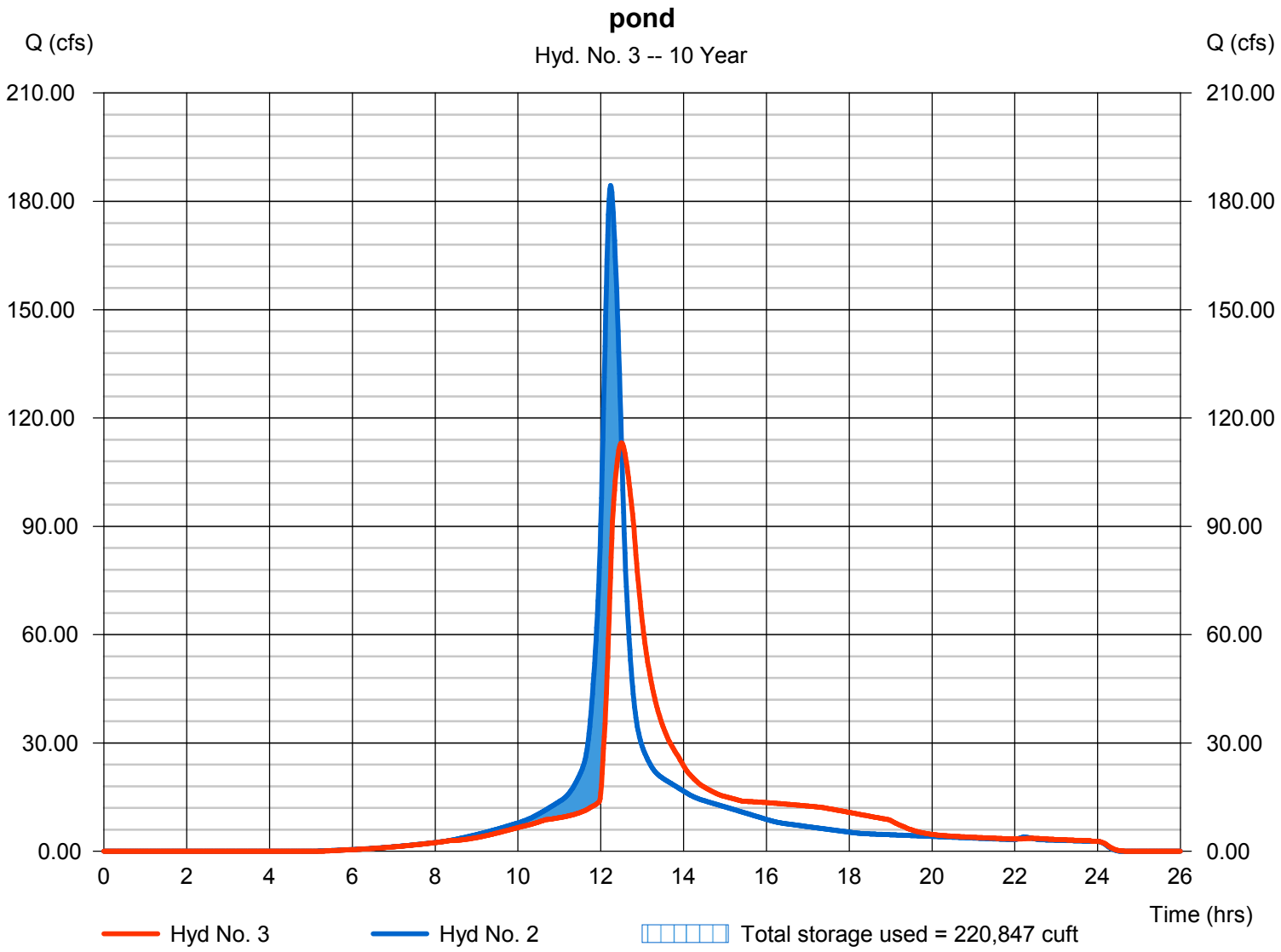
Hydrograph Report

Hyd. No. 3

pond

Hydrograph type	=	Reservoir	Peak discharge	=	113.08 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.50 hrs
Time interval	=	1 min	Hyd. volume	=	859,554 cuft
Inflow hyd. No.	=	2 - POSTDEVELOPMENT	Max. Elevation	=	1214.27 ft
Reservoir name	=	REGIONAL POND	Max. Storage	=	220,847 cuft

Storage Indication method used.



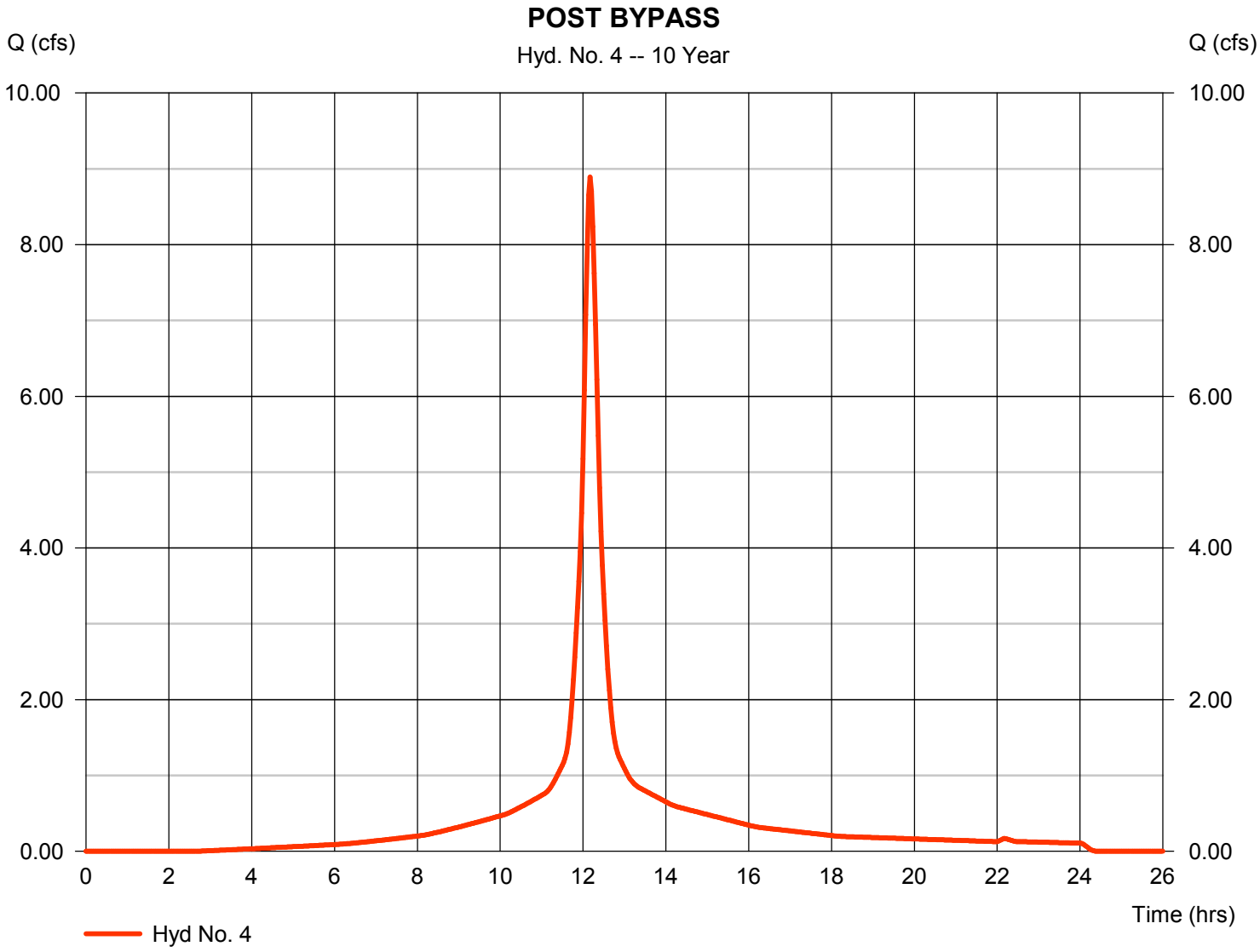
Hydrograph Report

Hyd. No. 4

POST BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 8.893 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 38,703 cuft
Drainage area	= 2.110 ac	Curve number	= 93*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.58 min
Total precip.	= 6.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 85) + (0.580 x 92) + (1.460 x 94)] / 2.110

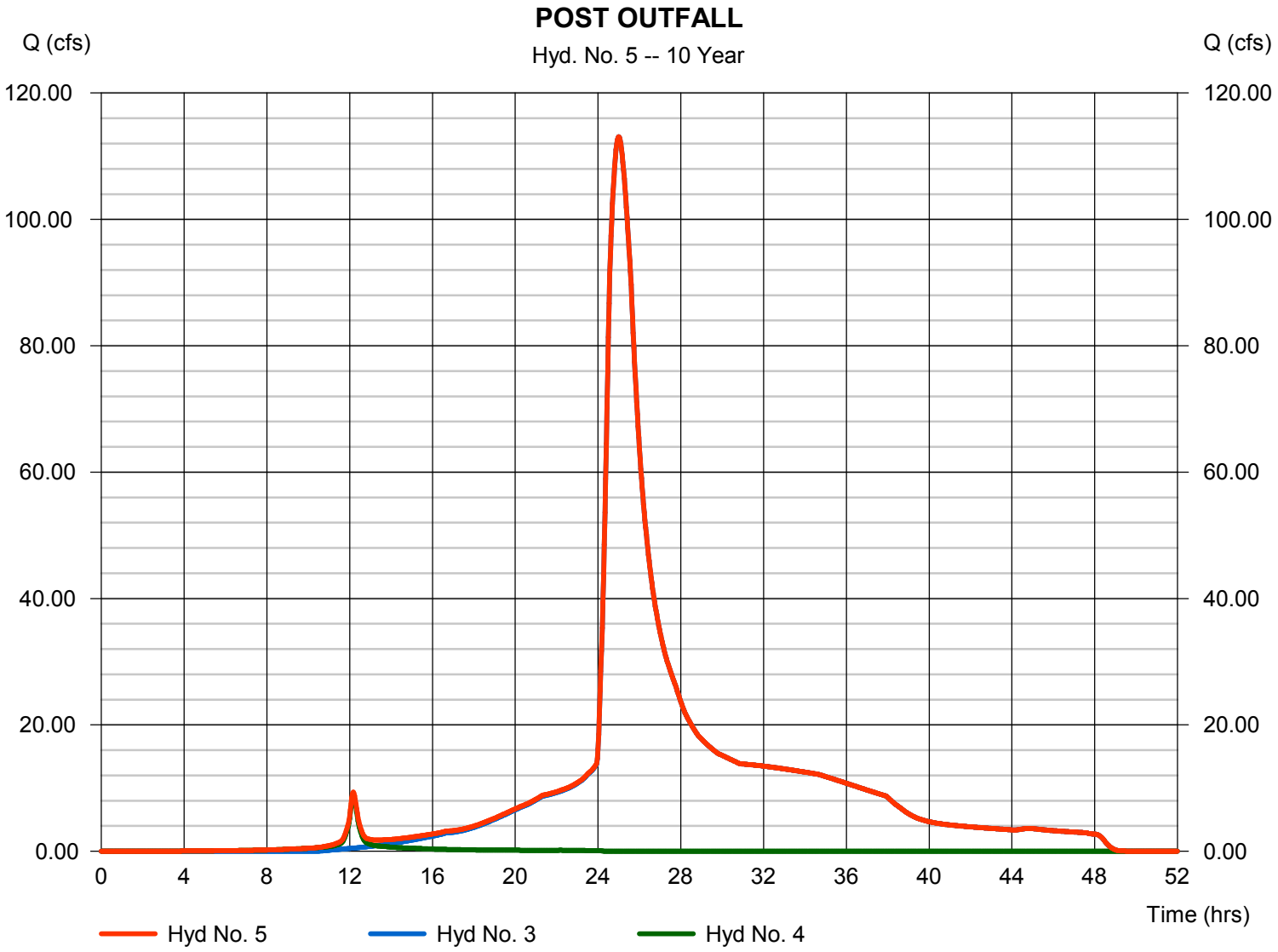


Hydrograph Report

Hyd. No. 5

POST OUTFALL

Hydrograph type	= Combine	Peak discharge	= 113.08 cfs
Storm frequency	= 10 yrs	Time to peak	= 25.00 hrs
Time interval	= 2 min	Hyd. volume	= 1,757,812 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 2.110 ac



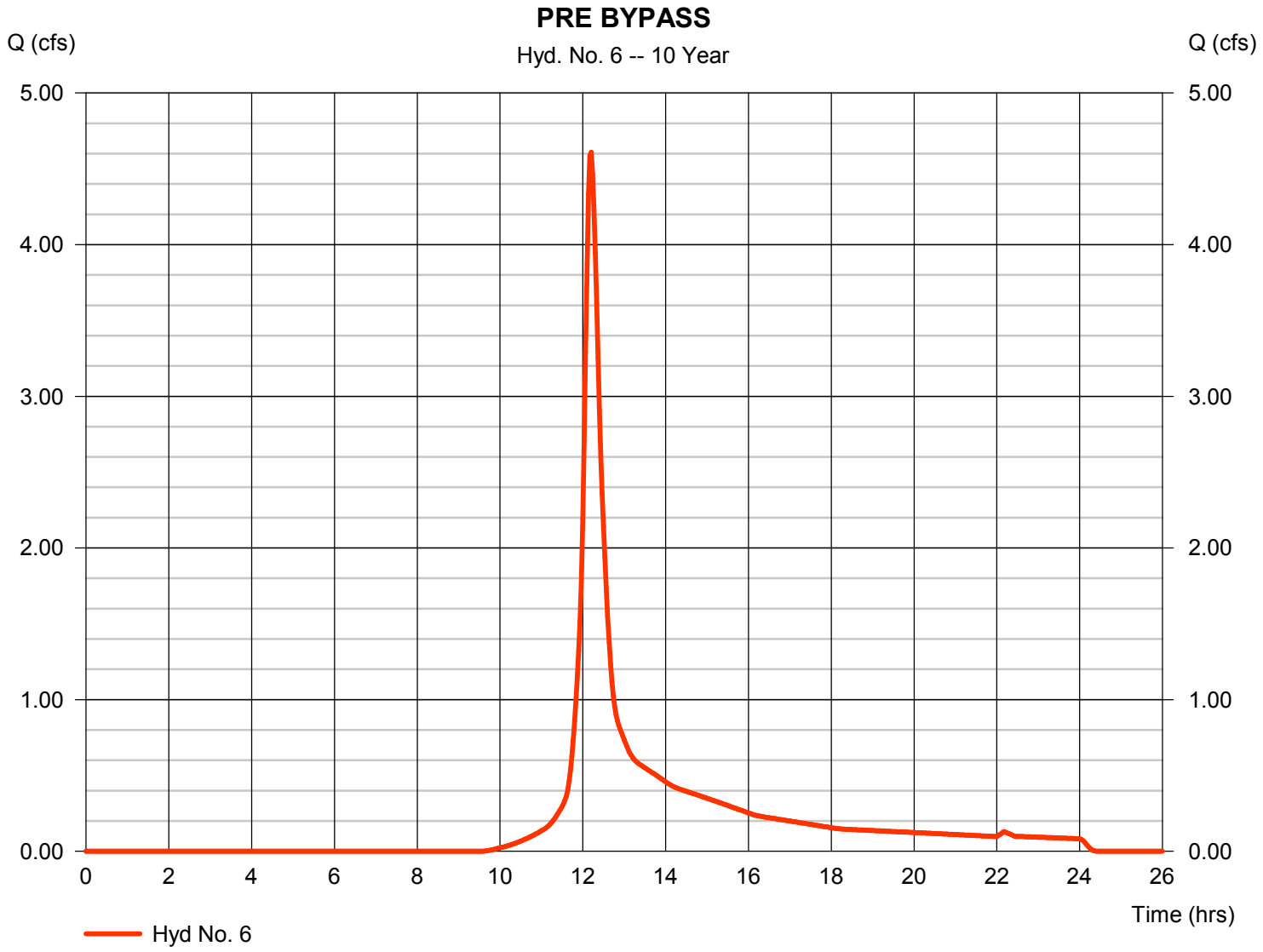
Hydrograph Report

Hyd. No. 6

PRE BYPASS

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.610 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.20 hrs
Time interval	=	2 min	Hyd. volume	=	19,073 cuft
Drainage area	=	2.130 ac	Curve number	=	67*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.50 min
Total precip.	=	6.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.470 x 71) + (0.660 x 58)] / 2.130

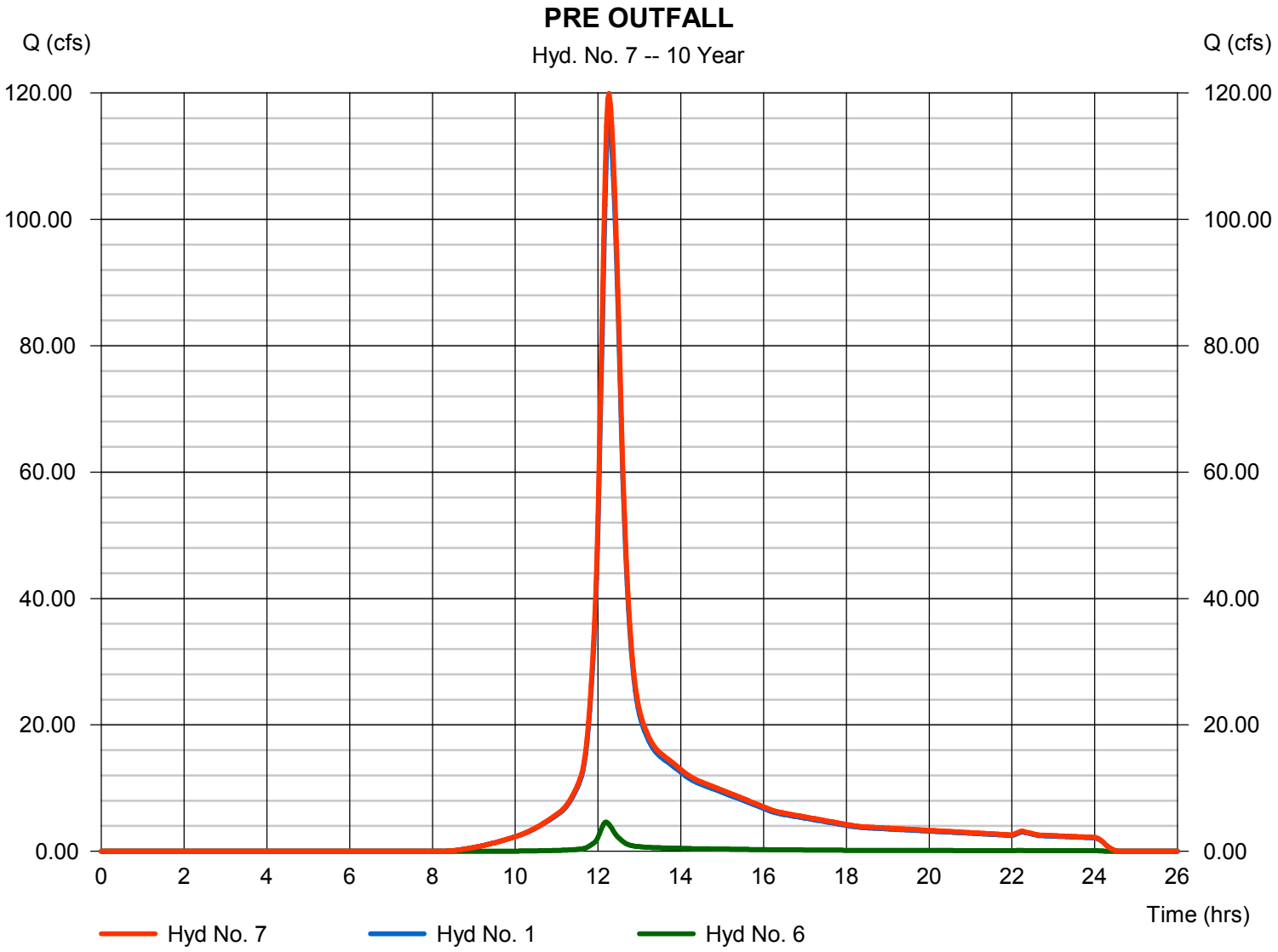


Hydrograph Report

Hyd. No. 7

PRE OUTFALL

Hydrograph type	=	Combine	Peak discharge	=	119.95 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.27 hrs
Time interval	=	2 min	Hyd. volume	=	566,735 cuft
Inflow hyds.	=	1, 6	Contrib. drain. area	=	48.670 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

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	145.68	2	736	689,069	------	------	------	PREDEVELOPMENT
2	SCS Runoff	220.96	1	734	1,038,475	------	------	------	POSTDEVELOPMENT
3	Reservoir	139.06	1	749	1,038,475	2	1214.55	259,469	pond
4	SCS Runoff	10.42	2	730	45,790	------	------	------	POST BYPASS
5	Combine	139.06	2	1498	2,122,741	3, 4	------	------	POST OUTFALL
6	SCS Runoff	6.013	2	732	24,690	------	------	------	PRE BYPASS
7	Combine	151.15	2	736	713,758	1, 6	------	------	PRE OUTFALL

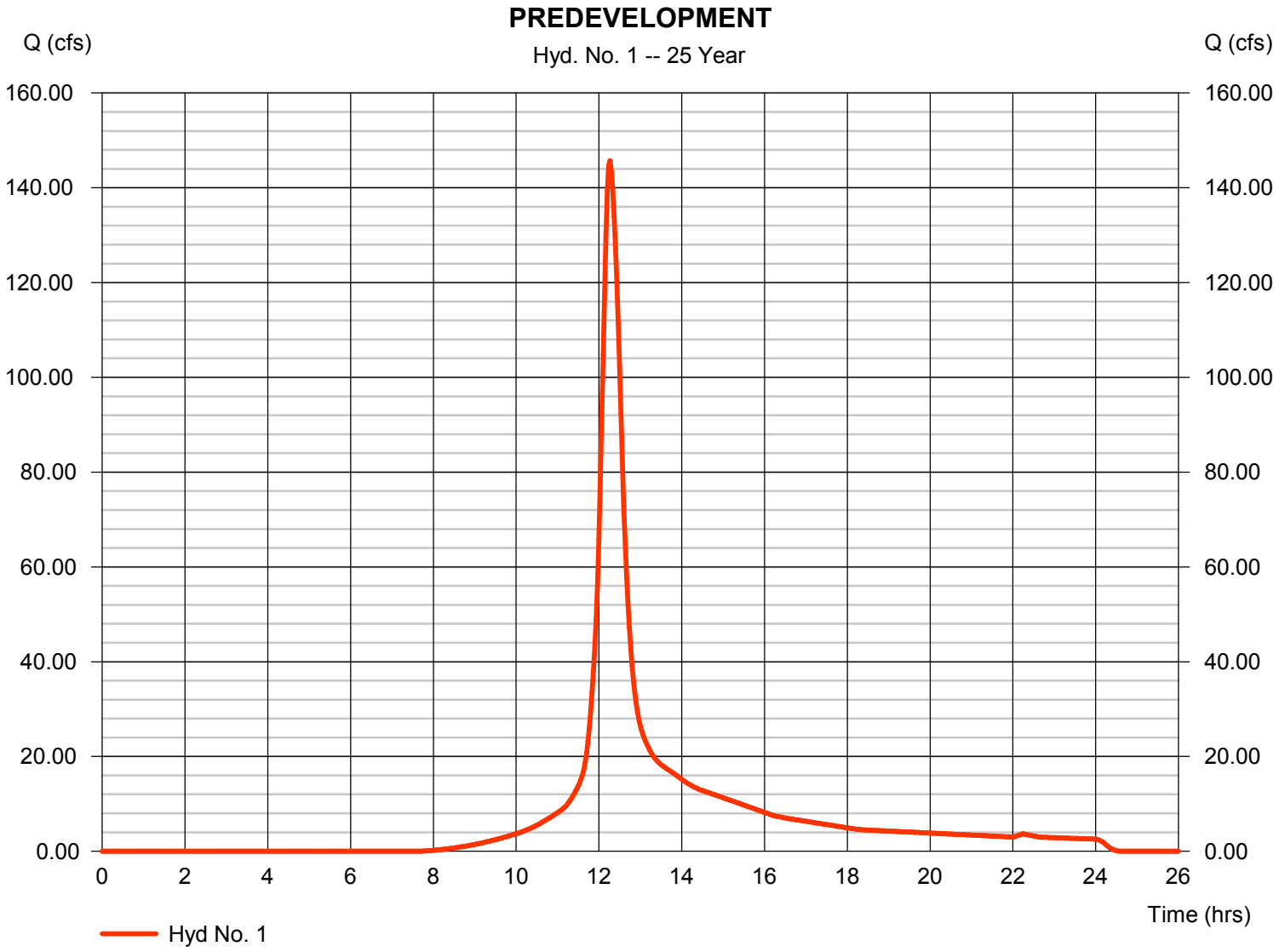
Hydrograph Report

Hyd. No. 1

PREDEVELOPMENT

Hydrograph type	= SCS Runoff	Peak discharge	= 145.68 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.27 hrs
Time interval	= 2 min	Hyd. volume	= 689,069 cuft
Drainage area	= 46.540 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.20 min
Total precip.	= 6.96 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(10.740 x 58) + (5.130 x 71) + (30.670 x 80)] / 46.540



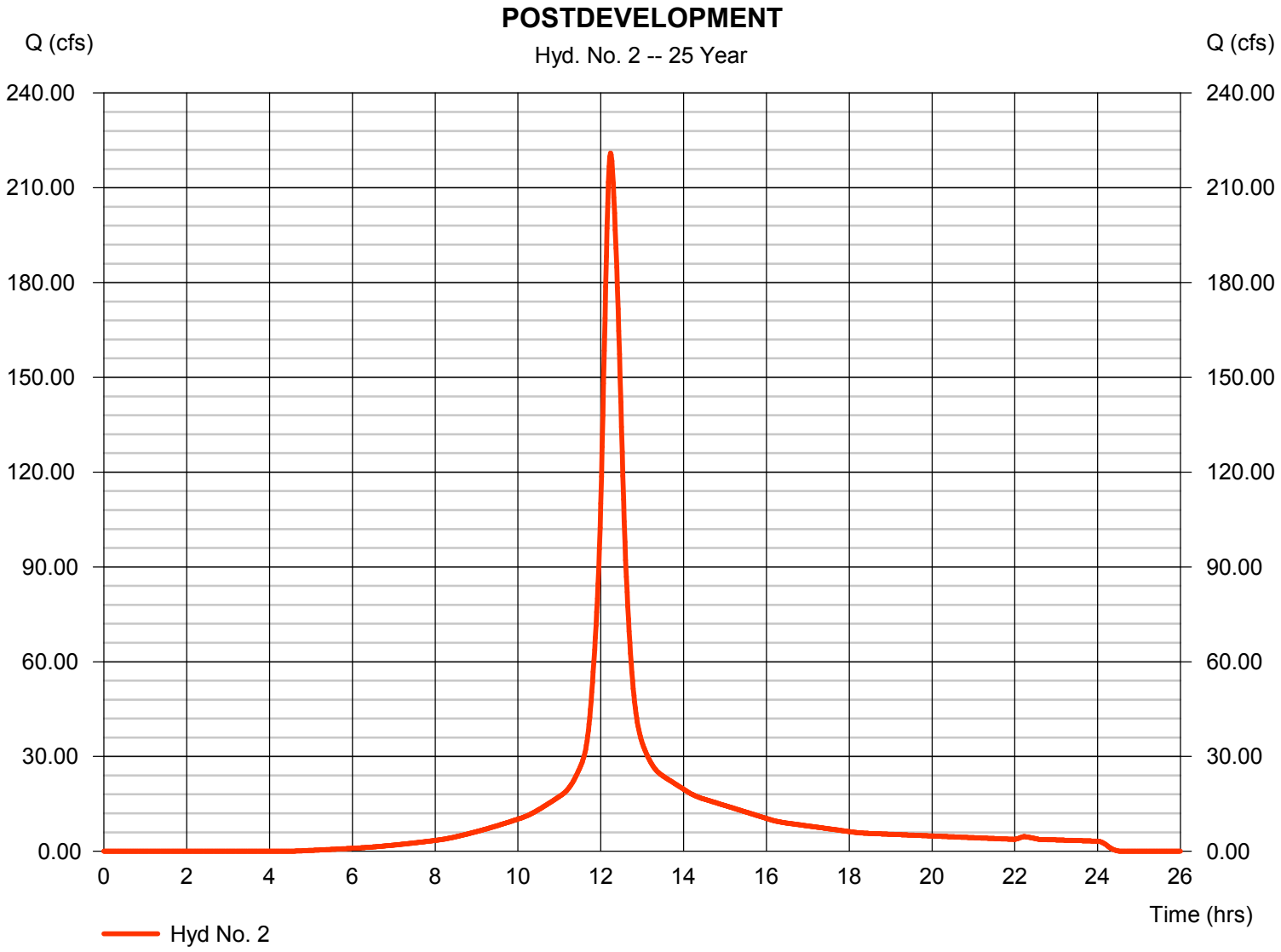
Hydrograph Report

Hyd. No. 2

POSTDEVELOPMENT

Hydrograph type	= SCS Runoff	Peak discharge	= 220.96 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.23 hrs
Time interval	= 1 min	Hyd. volume	= 1,038,475 cuft
Drainage area	= 53.190 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.10 min
Total precip.	= 6.96 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(11.040 x 91) + (25.220 x 86) + (7.110 x 71) + (5.510 x 92) + (2.510 x 95) + (1.800 x 94)] / 53.190



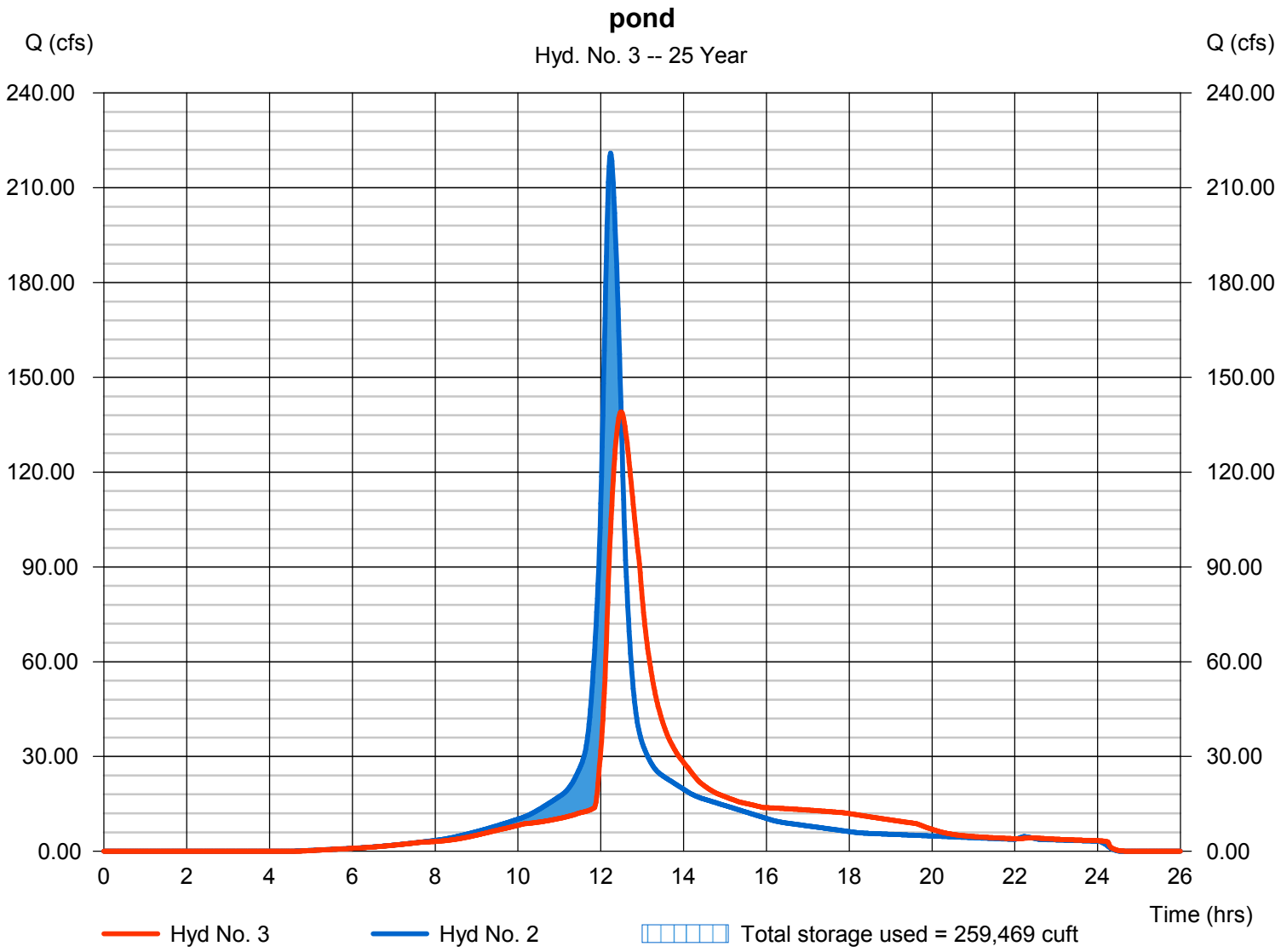
Hydrograph Report

Hyd. No. 3

pond

Hydrograph type	=	Reservoir	Peak discharge	=	139.06 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.48 hrs
Time interval	=	1 min	Hyd. volume	=	1,038,475 cuft
Inflow hyd. No.	=	2 - POSTDEVELOPMENT	Max. Elevation	=	1214.55 ft
Reservoir name	=	REGIONAL POND	Max. Storage	=	259,469 cuft

Storage Indication method used.



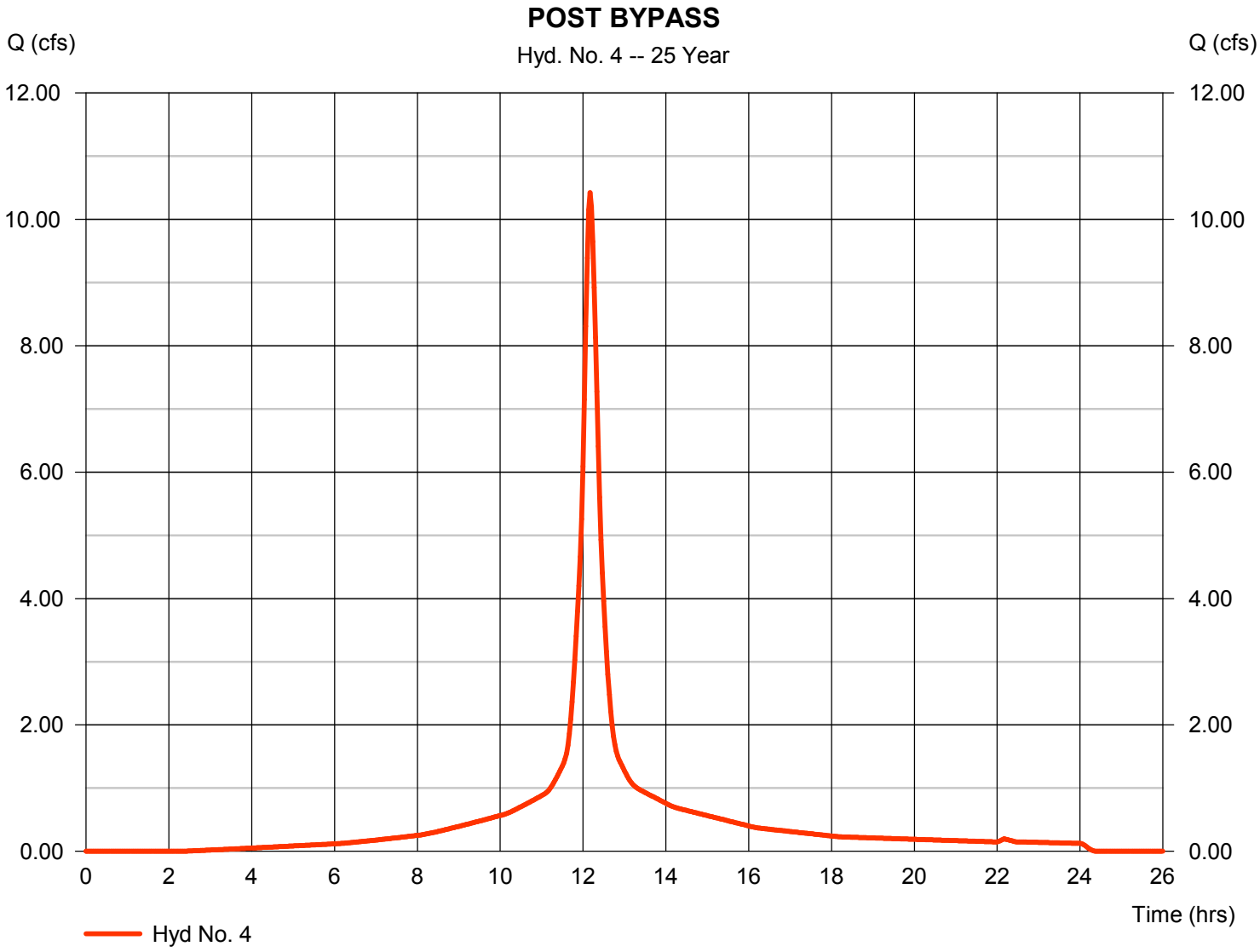
Hydrograph Report

Hyd. No. 4

POST BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 10.42 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 45,790 cuft
Drainage area	= 2.110 ac	Curve number	= 93*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.58 min
Total precip.	= 6.96 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 85) + (0.580 x 92) + (1.460 x 94)] / 2.110

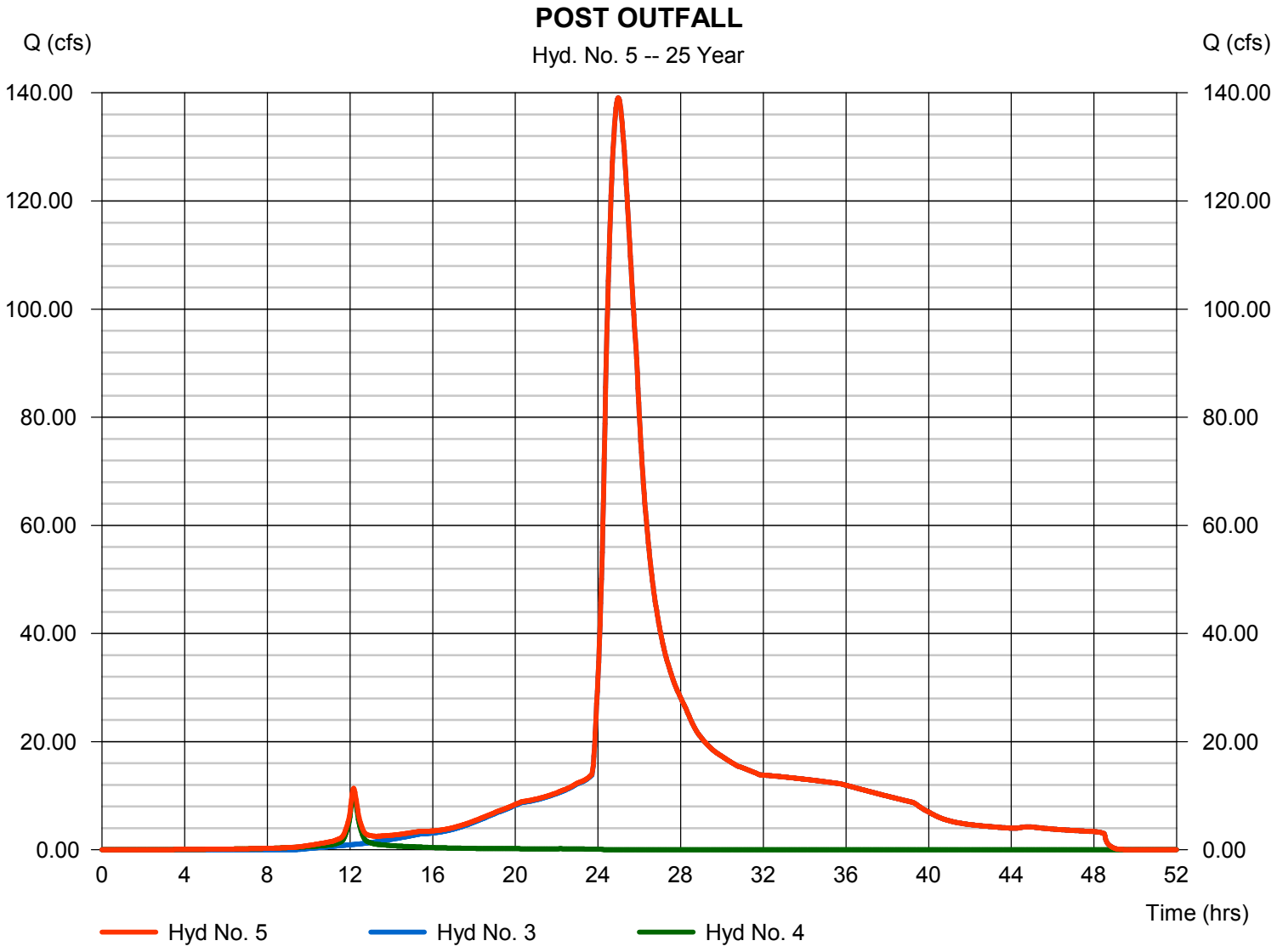


Hydrograph Report

Hyd. No. 5

POST OUTFALL

Hydrograph type	=	Combine	Peak discharge	=	139.06 cfs
Storm frequency	=	25 yrs	Time to peak	=	24.97 hrs
Time interval	=	2 min	Hyd. volume	=	2,122,741 cuft
Inflow hyds.	=	3, 4	Contrib. drain. area	=	2.110 ac



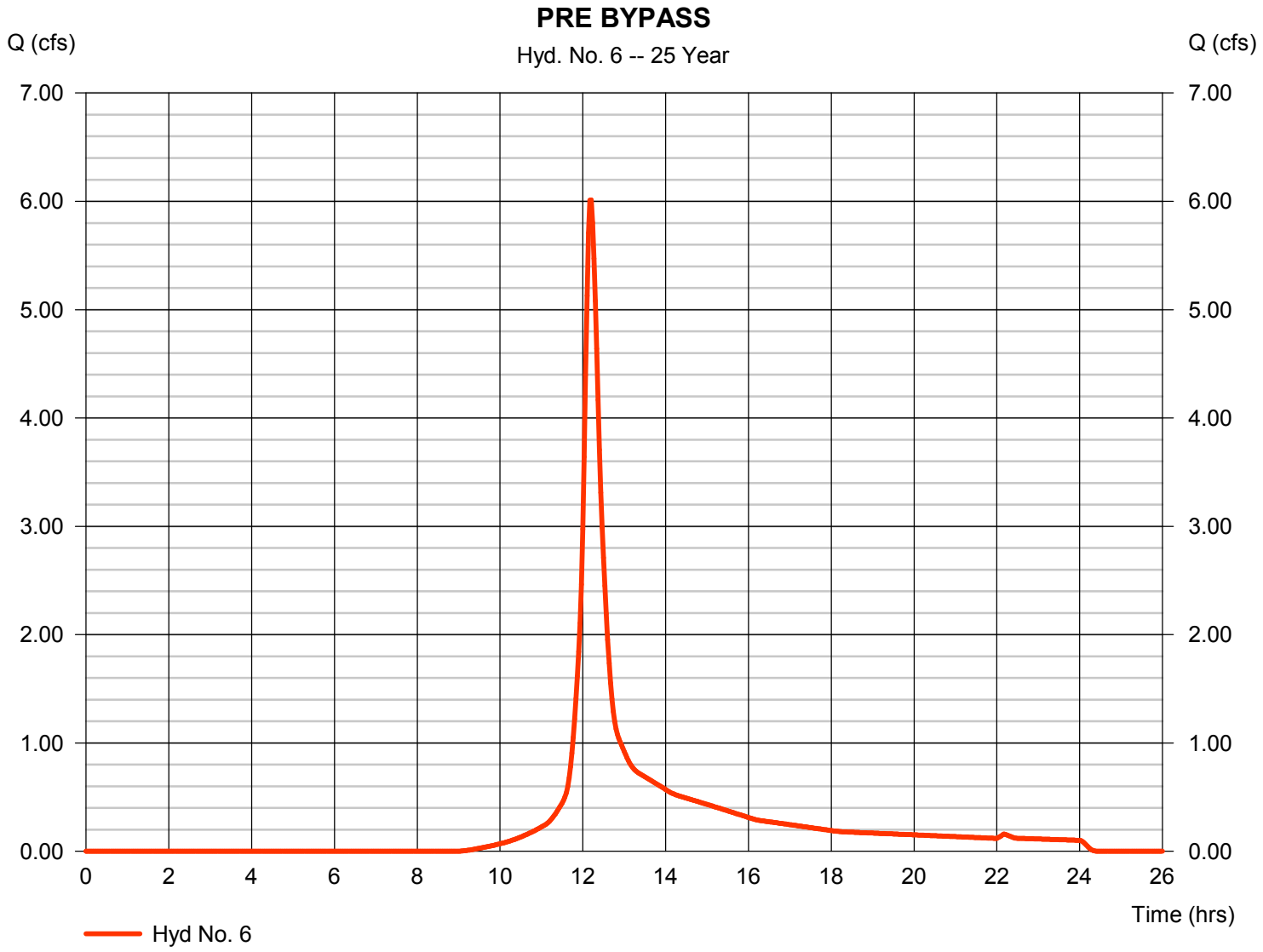
Hydrograph Report

Hyd. No. 6

PRE BYPASS

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.013 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.20 hrs
Time interval	=	2 min	Hyd. volume	=	24,690 cuft
Drainage area	=	2.130 ac	Curve number	=	67*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.50 min
Total precip.	=	6.96 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.470 x 71) + (0.660 x 58)] / 2.130

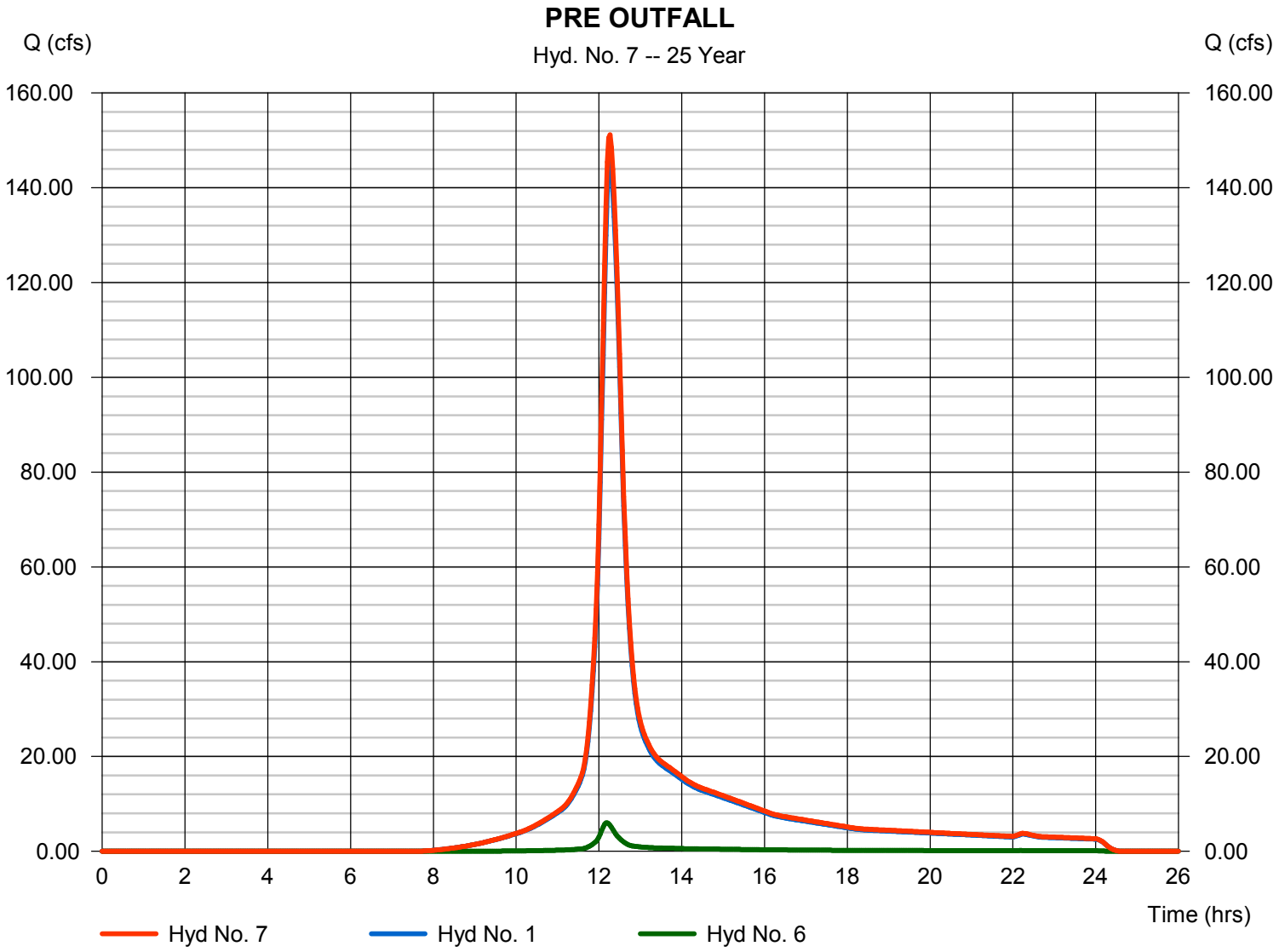


Hydrograph Report

Hyd. No. 7

PRE OUTFALL

Hydrograph type	= Combine	Peak discharge	= 151.15 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.27 hrs
Time interval	= 2 min	Hyd. volume	= 713,758 cuft
Inflow hyds.	= 1, 6	Contrib. drain. area	= 48.670 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

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	176.16	2	736	834,711	------	------	------	PREDEVELOPMENT
2	SCS Runoff	257.45	1	734	1,219,105	------	------	------	POSTDEVELOPMENT
3	Reservoir	165.79	1	749	1,219,106	2	1214.82	296,563	pond
4	SCS Runoff	11.95	2	730	52,896	------	------	------	POST BYPASS
5	Combine	165.79	2	1498	2,491,108	3, 4	------	------	POST OUTFALL
6	SCS Runoff	7.486	2	730	30,569	------	------	------	PRE BYPASS
7	Combine	182.91	2	736	865,280	1, 6	------	------	PRE OUTFALL

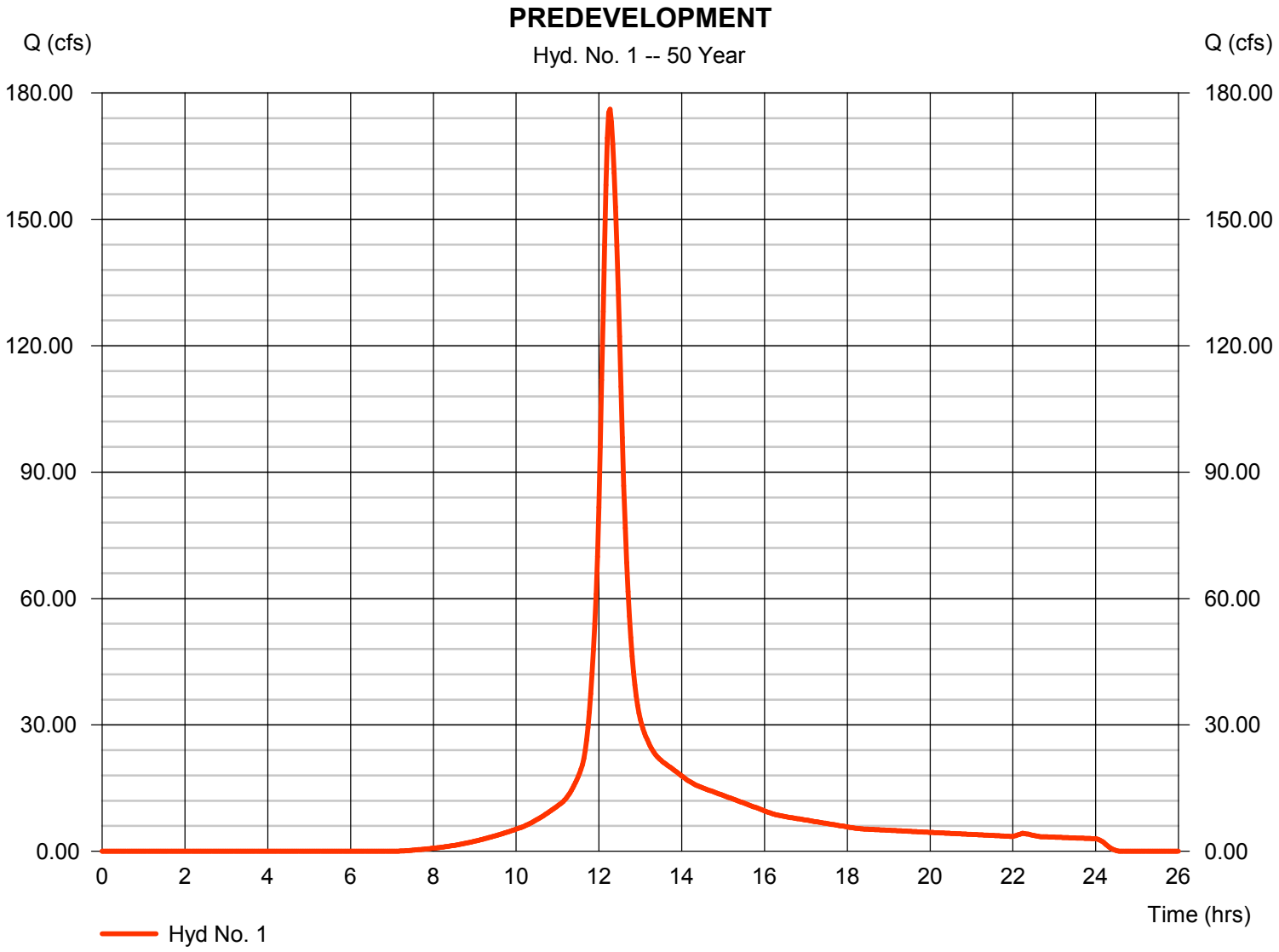
Hydrograph Report

Hyd. No. 1

PREDEVELOPMENT

Hydrograph type	=	SCS Runoff	Peak discharge	=	176.16 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.27 hrs
Time interval	=	2 min	Hyd. volume	=	834,711 cuft
Drainage area	=	46.540 ac	Curve number	=	74*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	23.20 min
Total precip.	=	7.92 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(10.740 x 58) + (5.130 x 71) + (30.670 x 80)] / 46.540



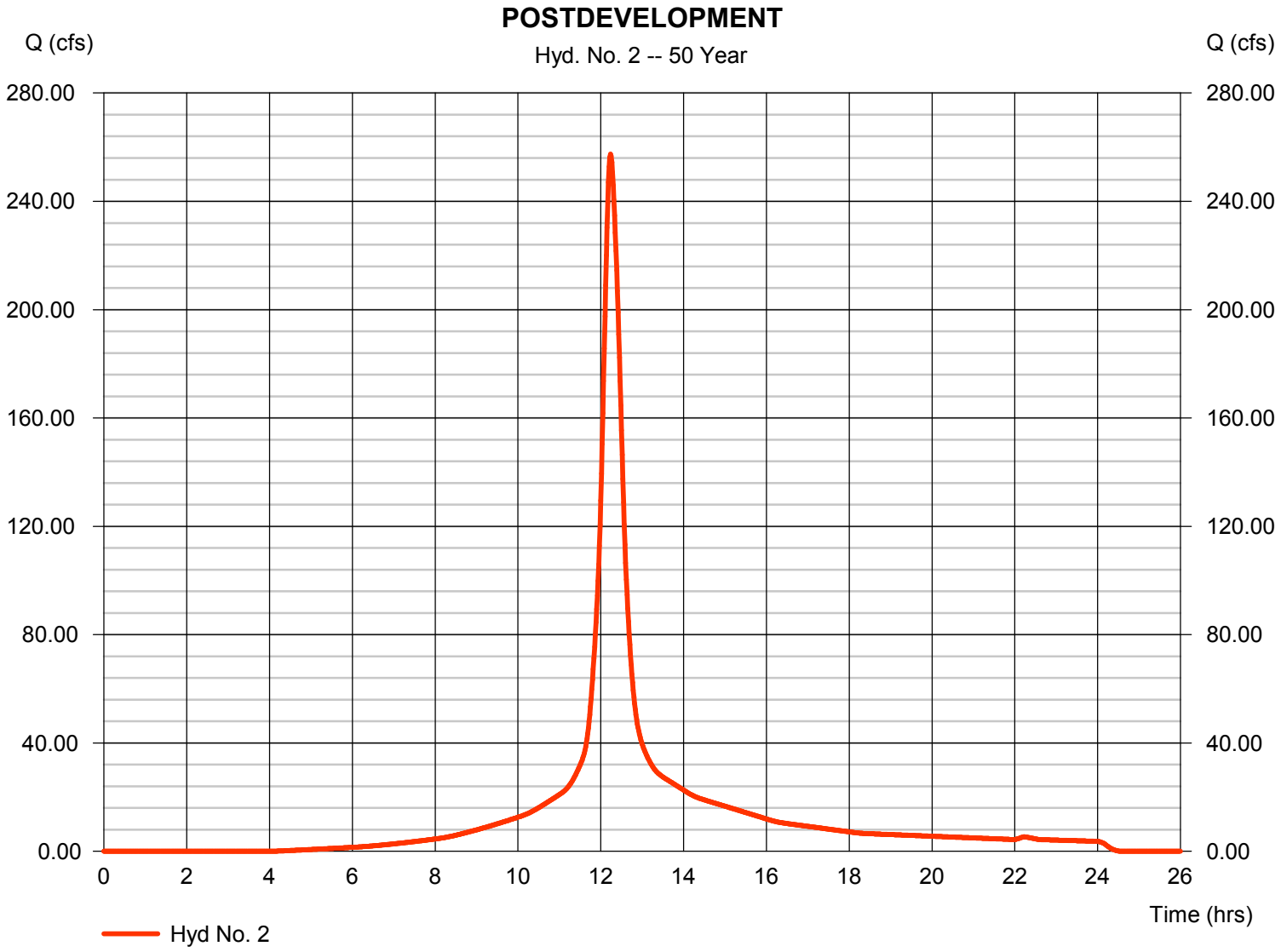
Hydrograph Report

Hyd. No. 2

POSTDEVELOPMENT

Hydrograph type	= SCS Runoff	Peak discharge	= 257.45 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.23 hrs
Time interval	= 1 min	Hyd. volume	= 1,219,105 cuft
Drainage area	= 53.190 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.10 min
Total precip.	= 7.92 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(11.040 x 91) + (25.220 x 86) + (7.110 x 71) + (5.510 x 92) + (2.510 x 95) + (1.800 x 94)] / 53.190



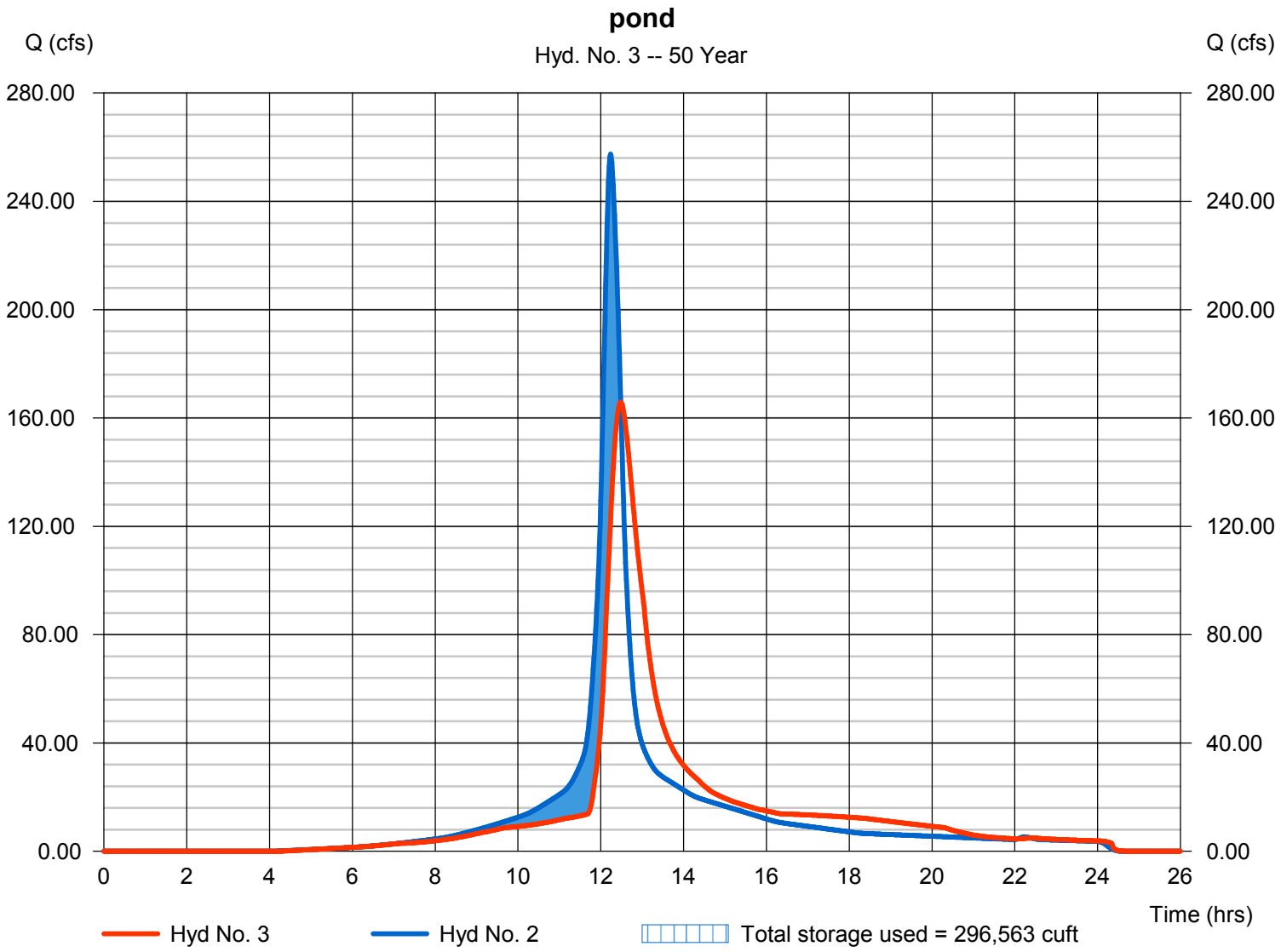
Hydrograph Report

Hyd. No. 3

pond

Hydrograph type	=	Reservoir	Peak discharge	=	165.79 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.48 hrs
Time interval	=	1 min	Hyd. volume	=	1,219,106 cuft
Inflow hyd. No.	=	2 - POSTDEVELOPMENT	Max. Elevation	=	1214.82 ft
Reservoir name	=	REGIONAL POND	Max. Storage	=	296,563 cuft

Storage Indication method used.



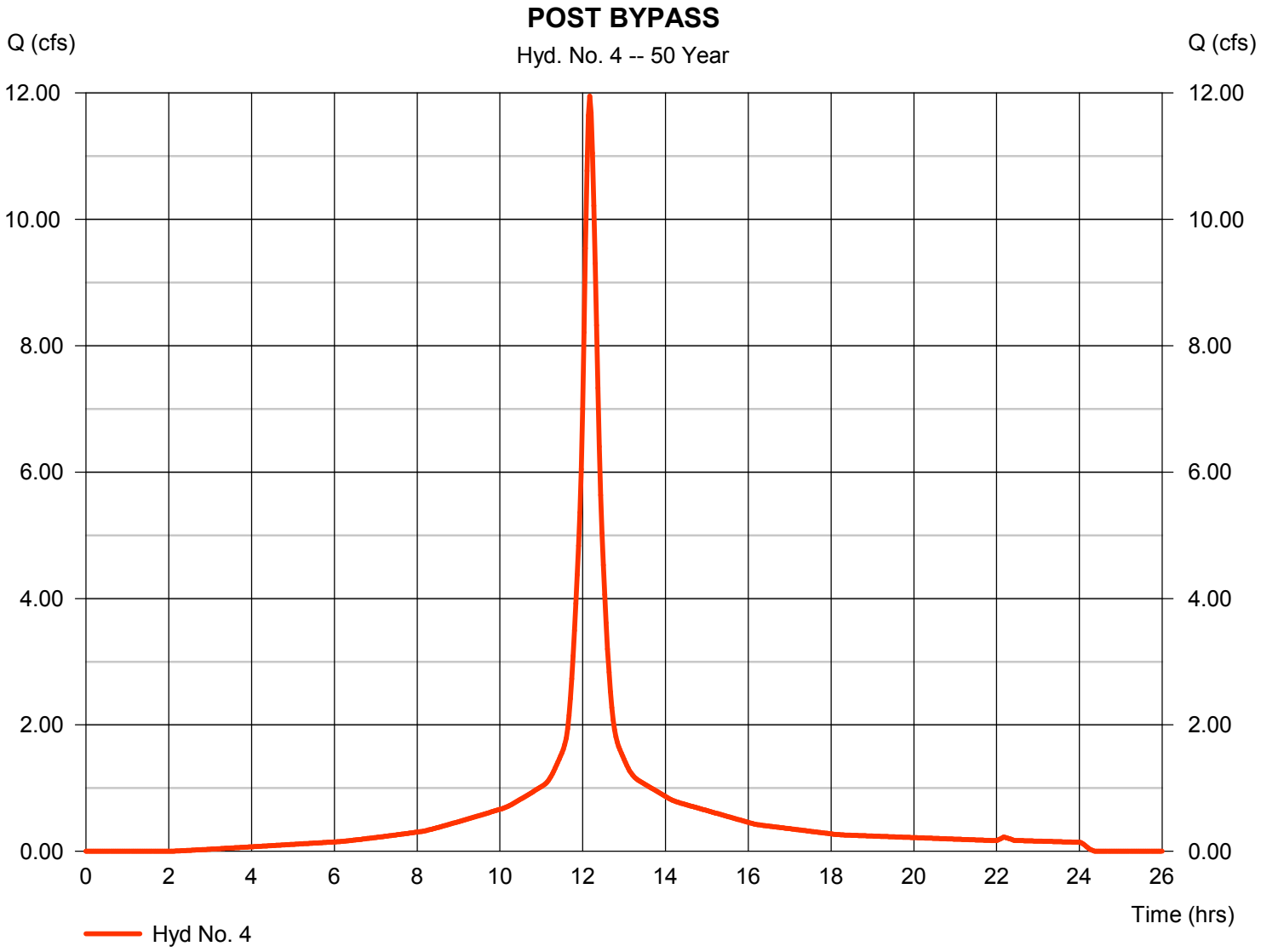
Hydrograph Report

Hyd. No. 4

POST BYPASS

Hydrograph type	=	SCS Runoff	Peak discharge	=	11.95 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.17 hrs
Time interval	=	2 min	Hyd. volume	=	52,896 cuft
Drainage area	=	2.110 ac	Curve number	=	93*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.58 min
Total precip.	=	7.92 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.070 x 85) + (0.580 x 92) + (1.460 x 94)] / 2.110

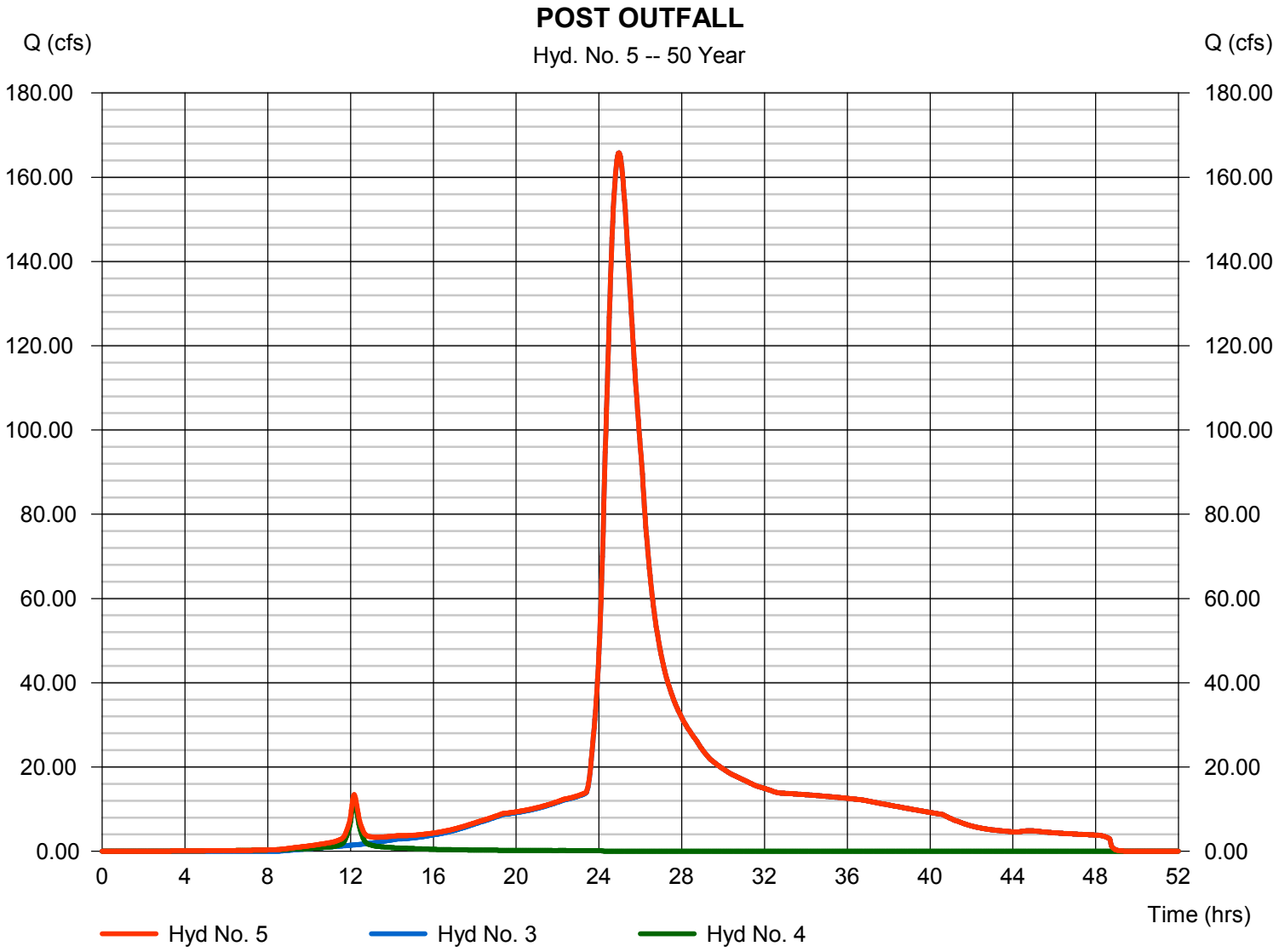


Hydrograph Report

Hyd. No. 5

POST OUTFALL

Hydrograph type	=	Combine	Peak discharge	=	165.79 cfs
Storm frequency	=	50 yrs	Time to peak	=	24.97 hrs
Time interval	=	2 min	Hyd. volume	=	2,491,108 cuft
Inflow hyds.	=	3, 4	Contrib. drain. area	=	2.110 ac



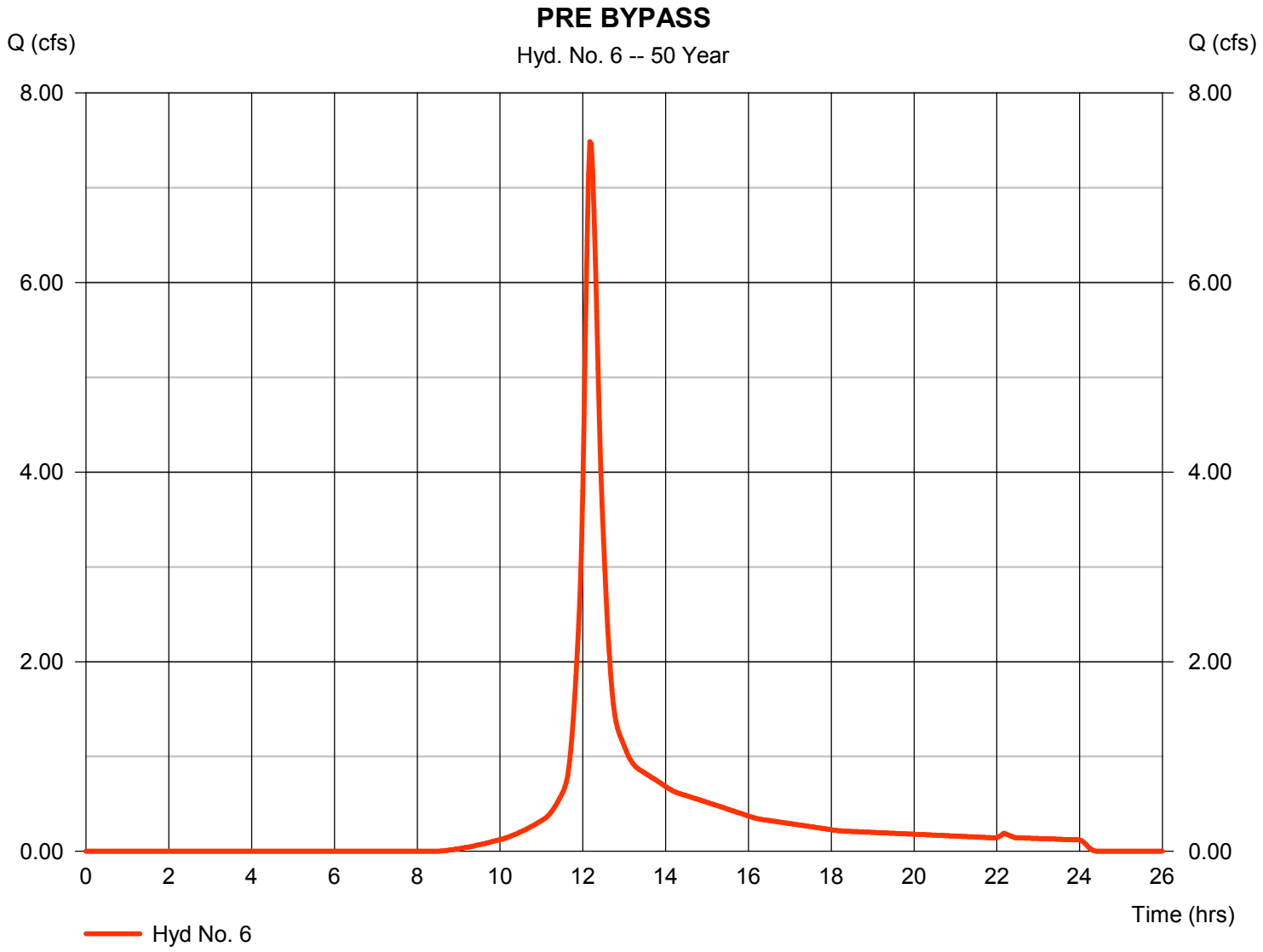
Hydrograph Report

Hyd. No. 6

PRE BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 7.486 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 30,569 cuft
Drainage area	= 2.130 ac	Curve number	= 67*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.50 min
Total precip.	= 7.92 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.470 x 71) + (0.660 x 58)] / 2.130

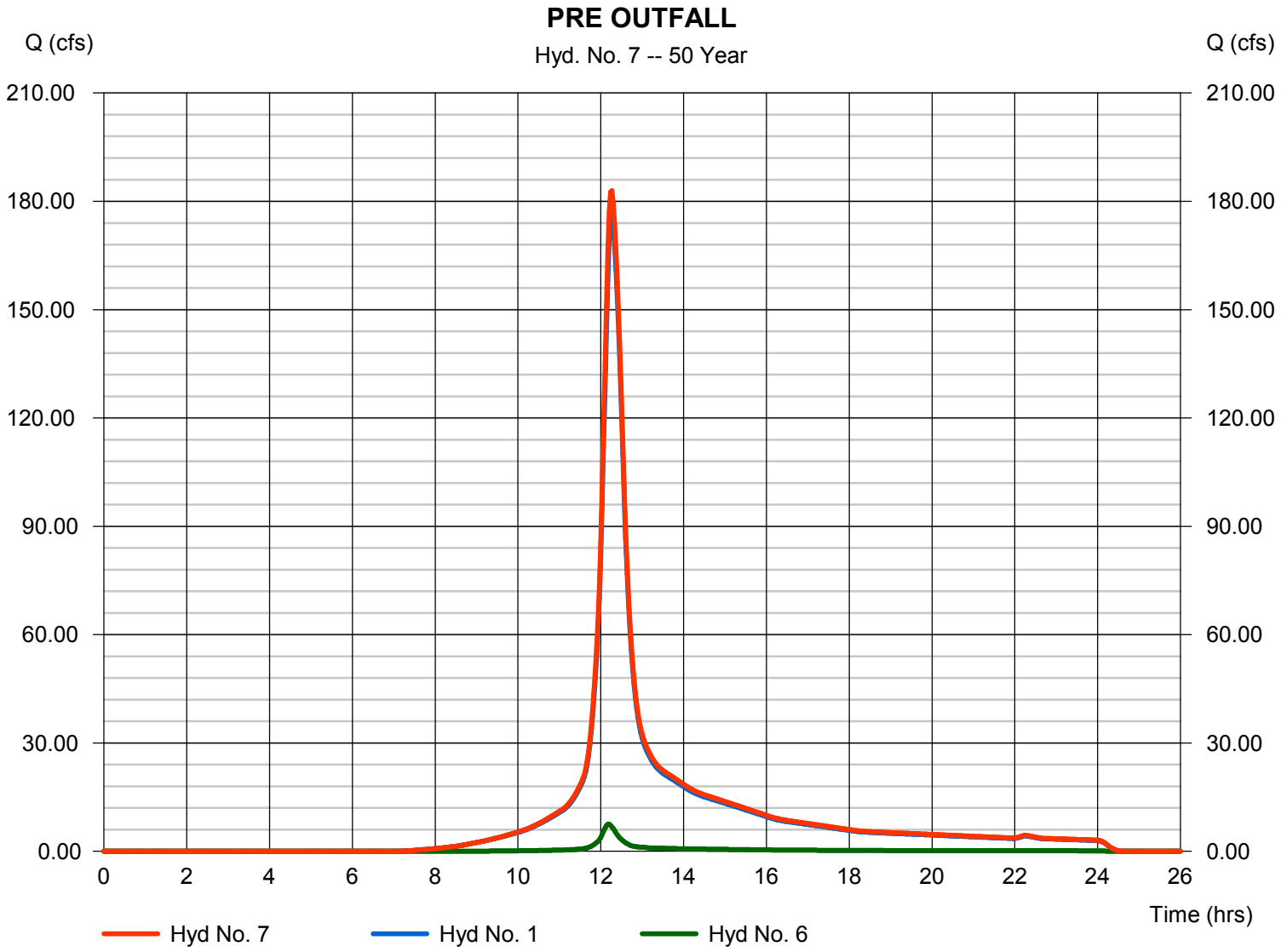


Hydrograph Report

Hyd. No. 7

PRE OUTFALL

Hydrograph type	= Combine	Peak discharge	= 182.91 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.27 hrs
Time interval	= 2 min	Hyd. volume	= 865,280 cuft
Inflow hyds.	= 1, 6	Contrib. drain. area	= 48.670 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

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	199.23	2	736	946,082	------	------	------	PREDEVELOPMENT
2	SCS Runoff	284.72	1	734	1,355,403	------	------	------	POSTDEVELOPMENT
3	Reservoir	185.40	1	749	1,355,403	2	1215.01	323,107	pond
4	SCS Runoff	13.09	2	730	58,235	------	------	------	POST BYPASS
5	Combine	185.40	2	1498	2,769,041	3, 4	------	------	POST OUTFALL
6	SCS Runoff	8.619	2	730	35,114	------	------	------	PRE BYPASS
7	Combine	206.96	2	736	981,197	1, 6	------	------	PRE OUTFALL

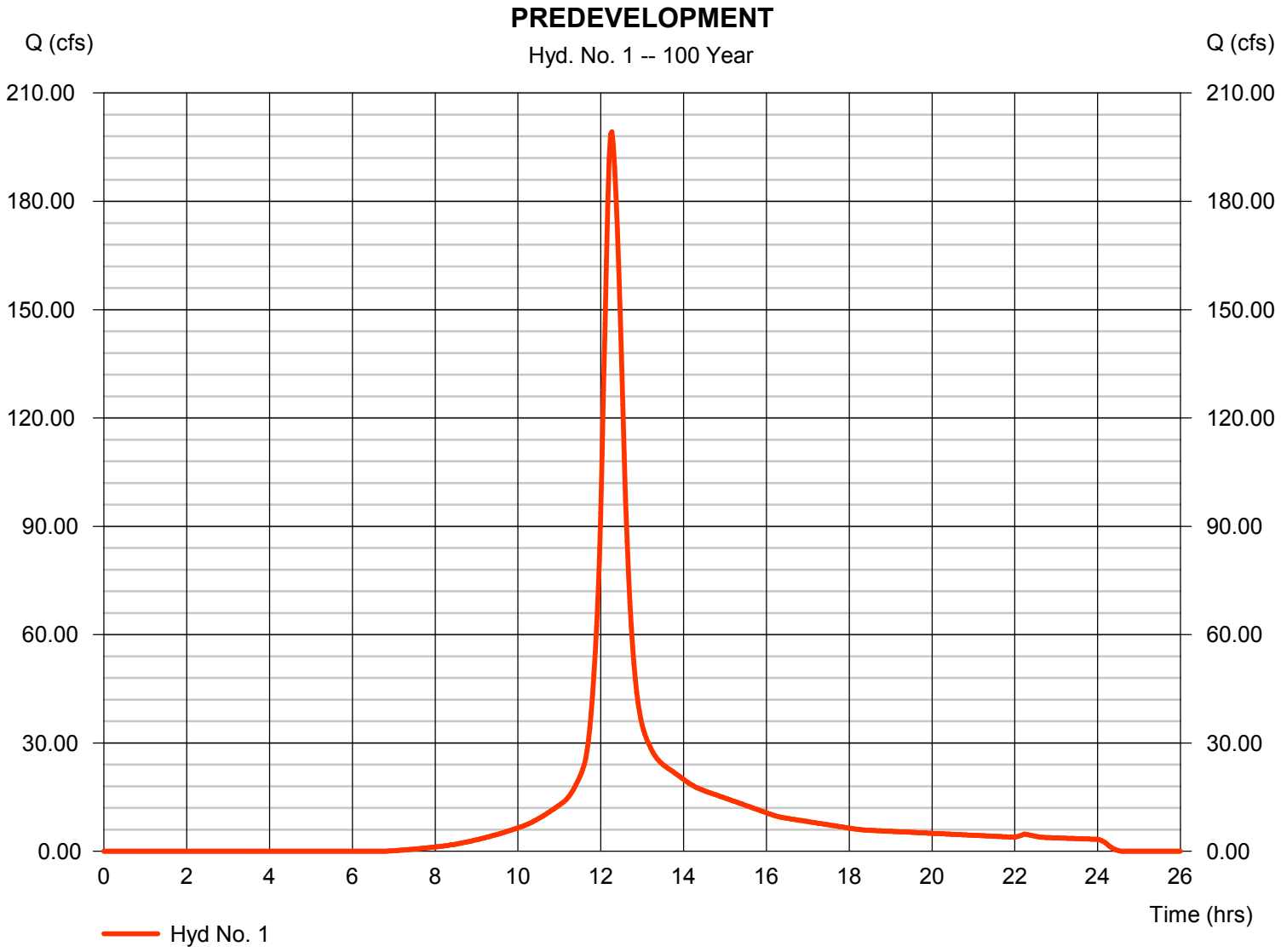
Hydrograph Report

Hyd. No. 1

PREDEVELOPMENT

Hydrograph type	= SCS Runoff	Peak discharge	= 199.23 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.27 hrs
Time interval	= 2 min	Hyd. volume	= 946,082 cuft
Drainage area	= 46.540 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.20 min
Total precip.	= 8.64 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(10.740 x 58) + (5.130 x 71) + (30.670 x 80)] / 46.540



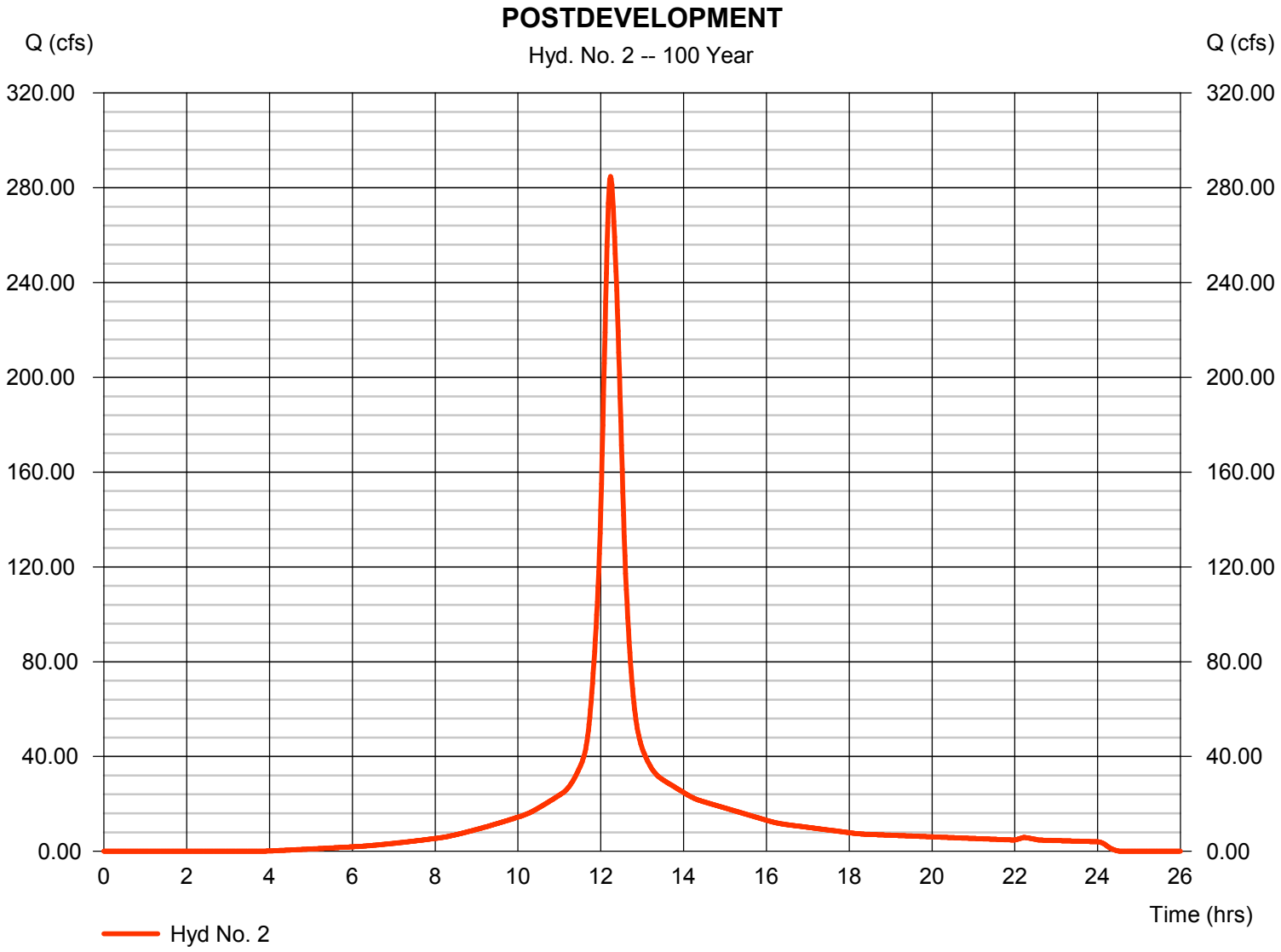
Hydrograph Report

Hyd. No. 2

POSTDEVELOPMENT

Hydrograph type	= SCS Runoff	Peak discharge	= 284.72 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.23 hrs
Time interval	= 1 min	Hyd. volume	= 1,355,403 cuft
Drainage area	= 53.190 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.10 min
Total precip.	= 8.64 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(11.040 x 91) + (25.220 x 86) + (7.110 x 71) + (5.510 x 92) + (2.510 x 95) + (1.800 x 94)] / 53.190



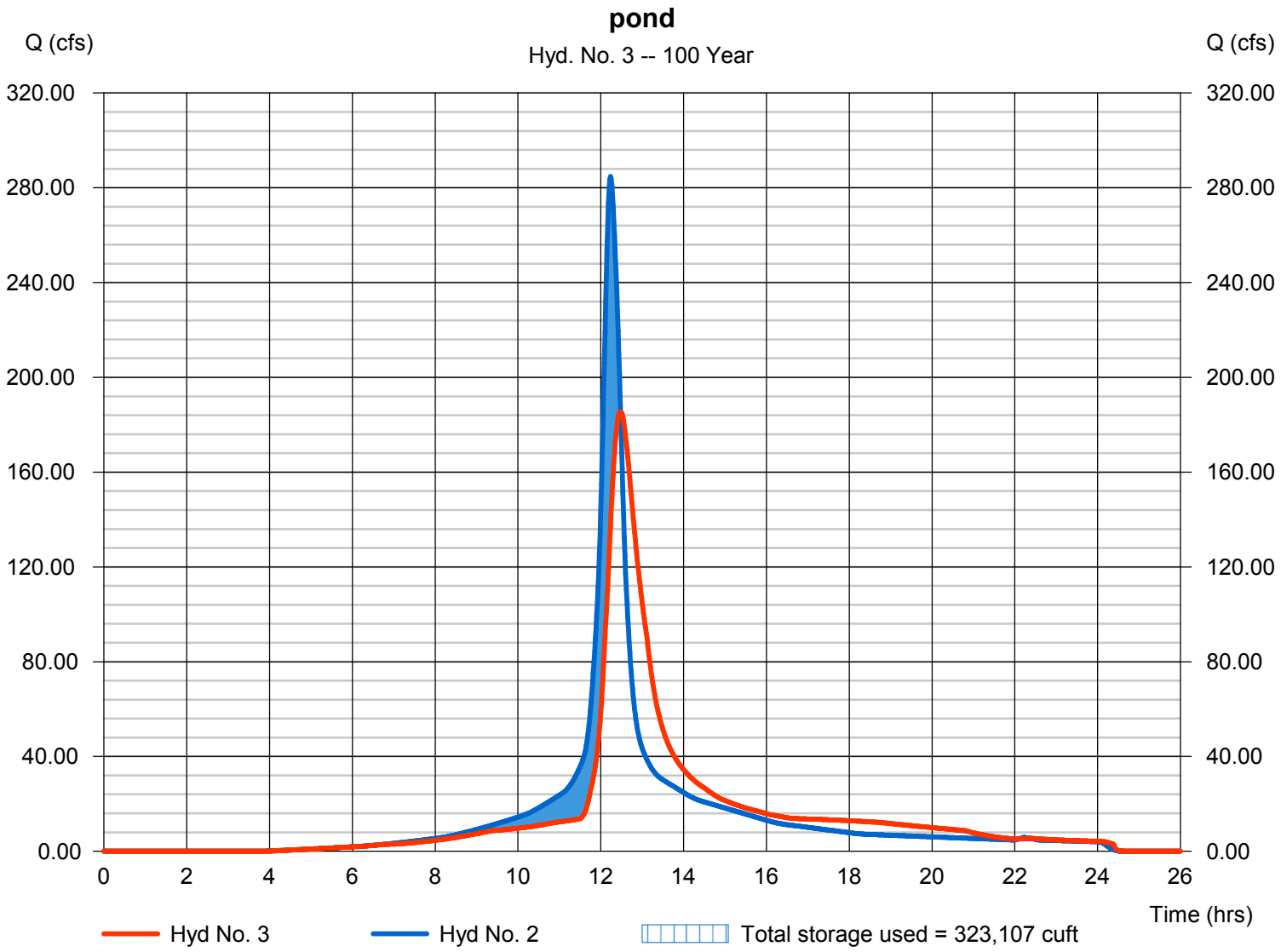
Hydrograph Report

Hyd. No. 3

pond

Hydrograph type	=	Reservoir	Peak discharge	=	185.40 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.48 hrs
Time interval	=	1 min	Hyd. volume	=	1,355,403 cuft
Inflow hyd. No.	=	2 - POSTDEVELOPMENT	Max. Elevation	=	1215.01 ft
Reservoir name	=	REGIONAL POND	Max. Storage	=	323,107 cuft

Storage Indication method used.



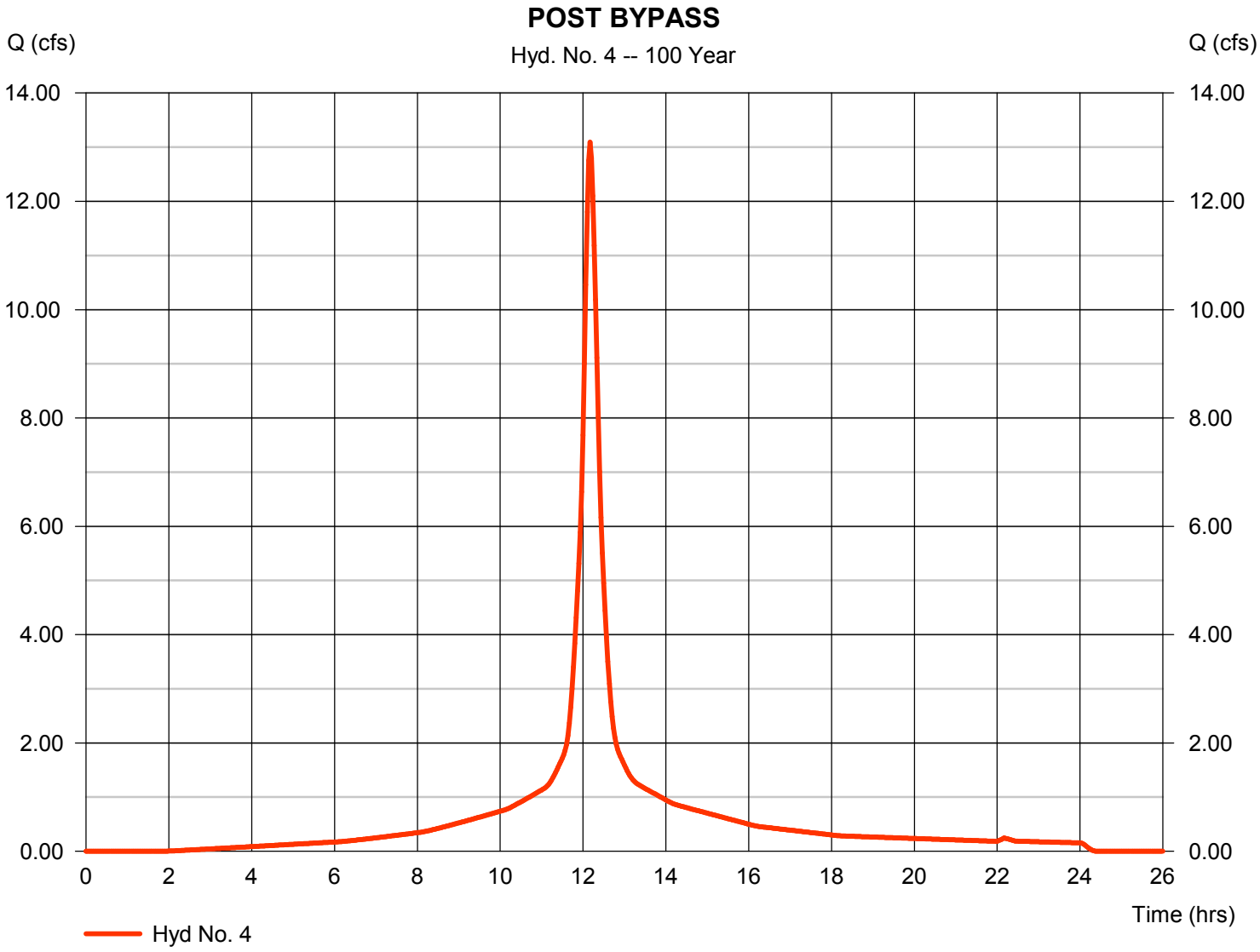
Hydrograph Report

Hyd. No. 4

POST BYPASS

Hydrograph type	=	SCS Runoff	Peak discharge	=	13.09 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.17 hrs
Time interval	=	2 min	Hyd. volume	=	58,235 cuft
Drainage area	=	2.110 ac	Curve number	=	93*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.58 min
Total precip.	=	8.64 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.070 x 85) + (0.580 x 92) + (1.460 x 94)] / 2.110

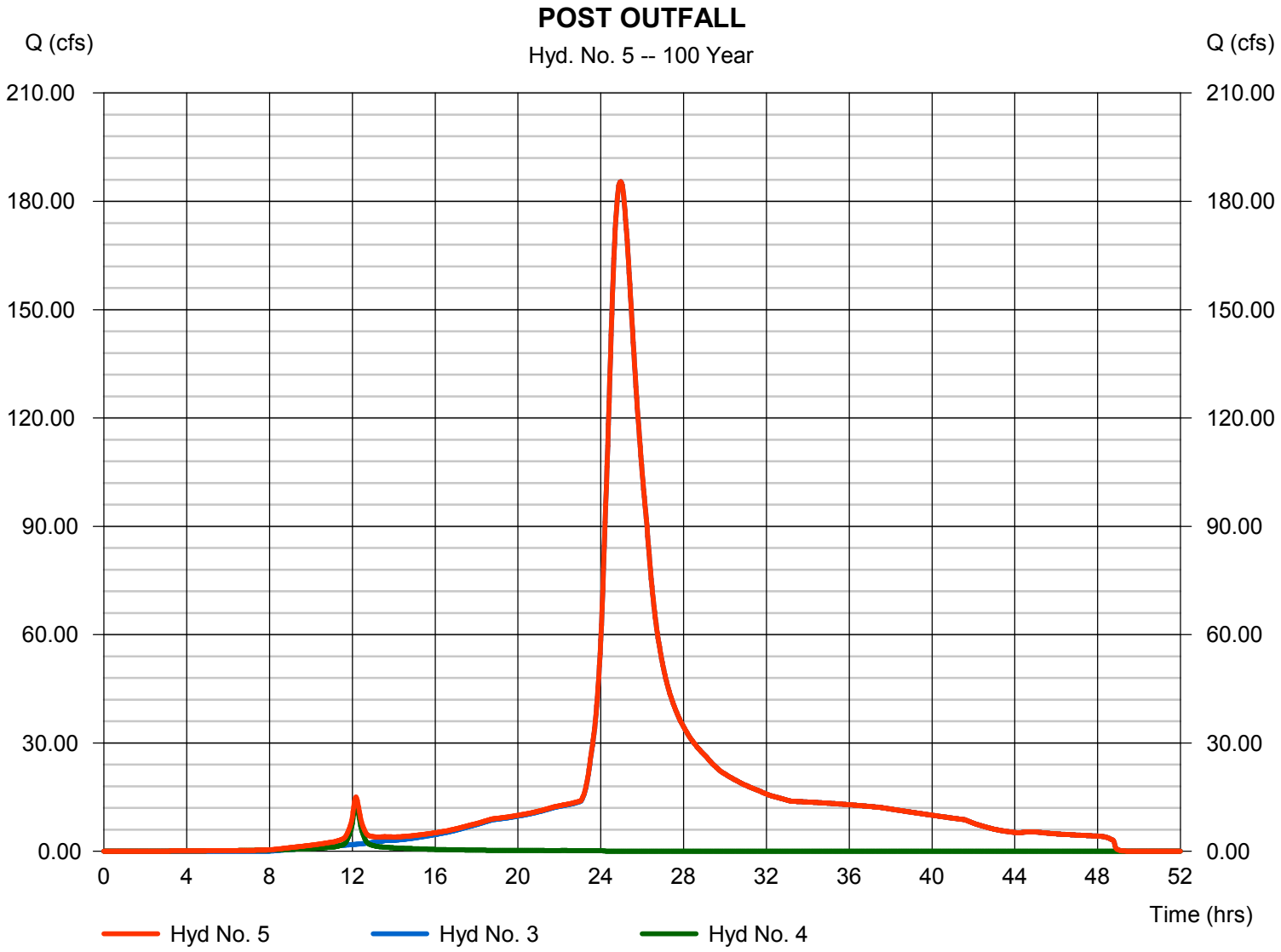


Hydrograph Report

Hyd. No. 5

POST OUTFALL

Hydrograph type	=	Combine	Peak discharge	=	185.40 cfs
Storm frequency	=	100 yrs	Time to peak	=	24.97 hrs
Time interval	=	2 min	Hyd. volume	=	2,769,041 cuft
Inflow hyds.	=	3, 4	Contrib. drain. area	=	2.110 ac



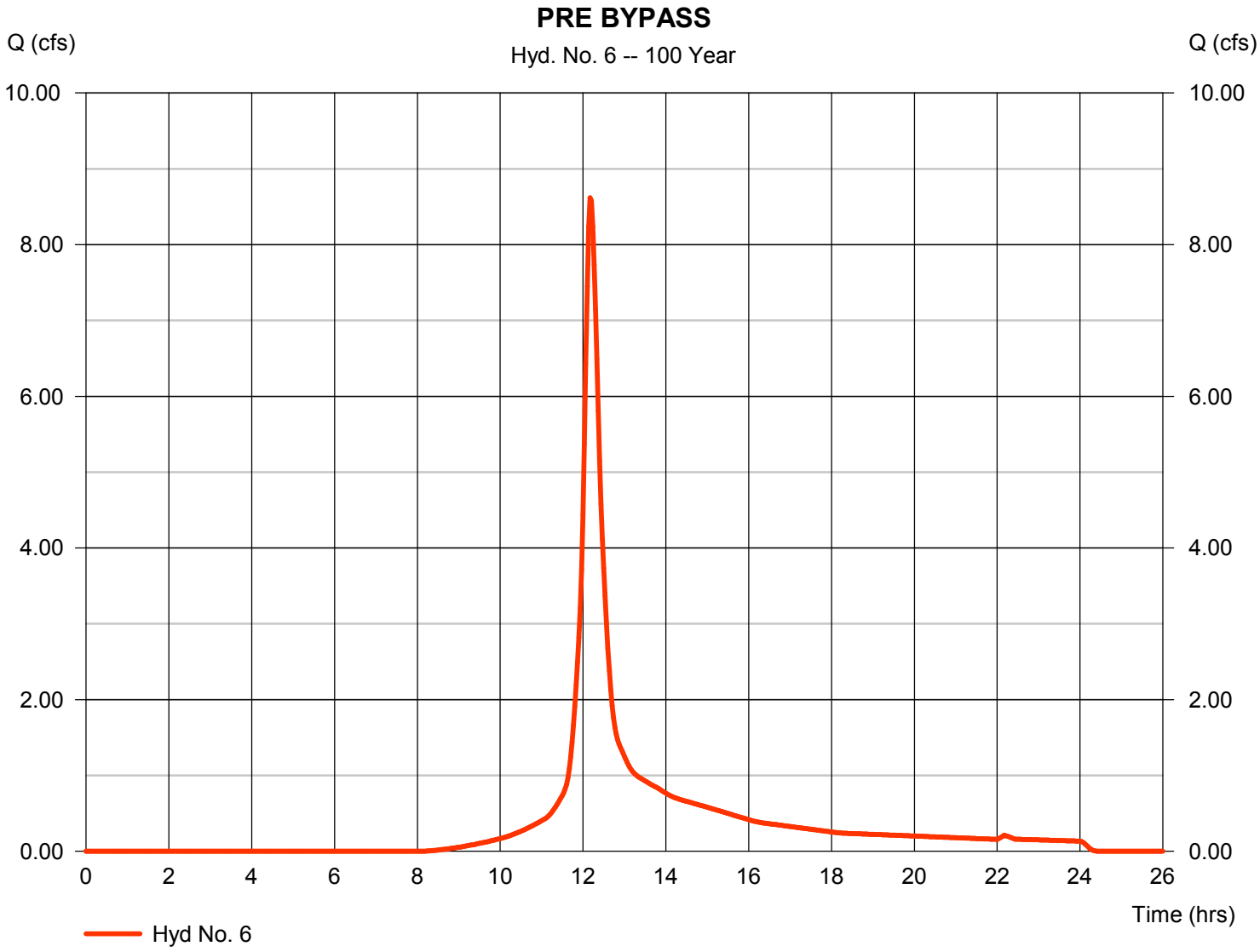
Hydrograph Report

Hyd. No. 6

PRE BYPASS

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.619 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.17 hrs
Time interval	=	2 min	Hyd. volume	=	35,114 cuft
Drainage area	=	2.130 ac	Curve number	=	67*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.50 min
Total precip.	=	8.64 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.470 x 71) + (0.660 x 58)] / 2.130

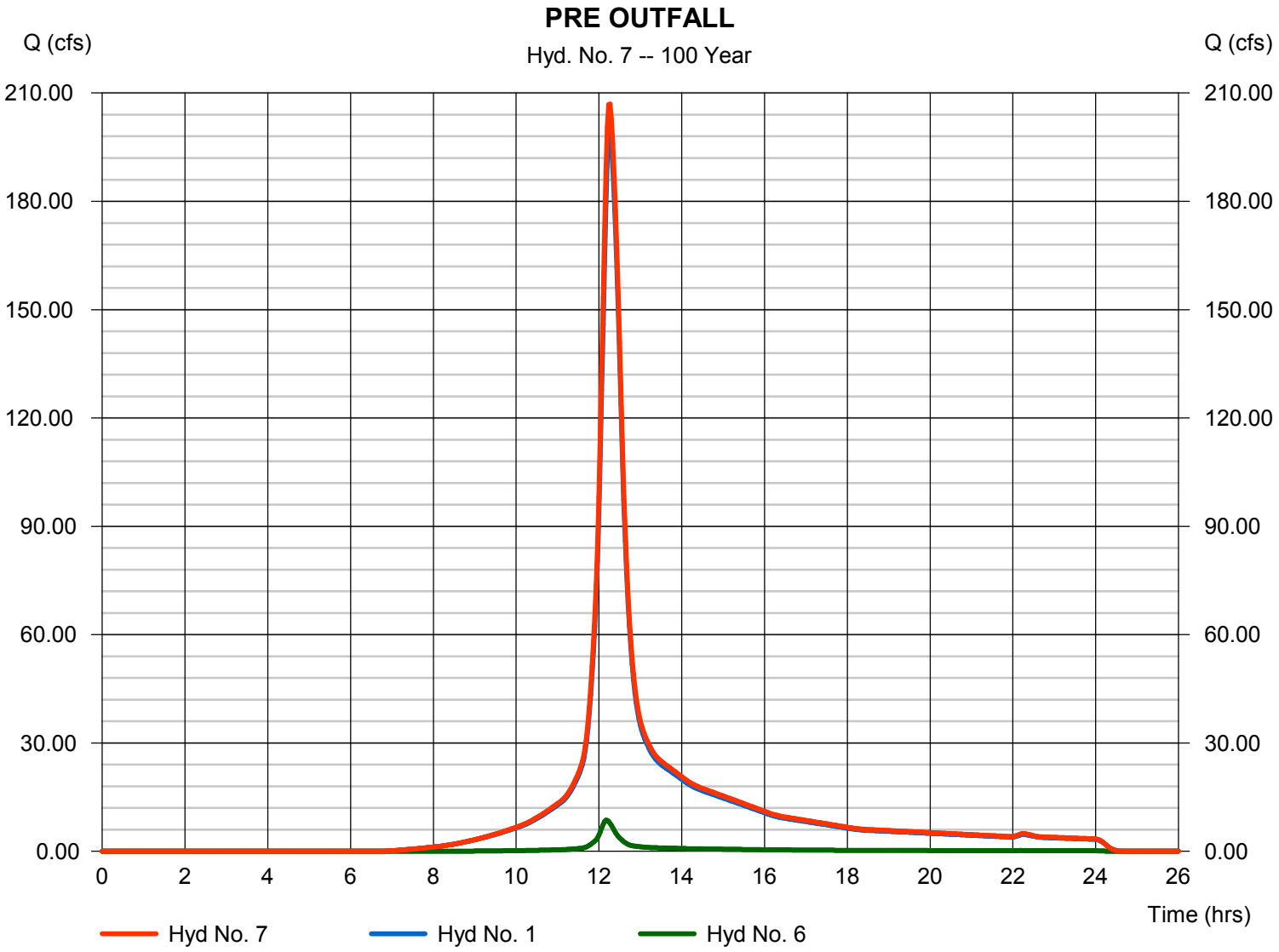


Hydrograph Report

Hyd. No. 7

PRE OUTFALL

Hydrograph type	= Combine	Peak discharge	= 206.96 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.27 hrs
Time interval	= 2 min	Hyd. volume	= 981,197 cuft
Inflow hyds.	= 1, 6	Contrib. drain. area	= 48.670 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	63.3915	13.3000	0.8386	--------
3	0.0000	0.0000	0.0000	--------
5	64.9066	13.0000	0.7920	--------
10	79.4587	14.3000	0.8048	--------
25	104.1785	15.8000	0.8275	--------
50	102.8257	15.1000	0.7991	--------
100	115.4065	13.6000	0.7532	--------

File name: Fayetteville IDF with 100yr multiplier.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	5.54	4.52	3.84	3.35	2.98	2.69	2.45	2.26	2.10	1.96	1.84	1.73
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	6.58	5.42	4.64	4.07	3.64	3.30	3.02	2.80	2.60	2.44	2.30	2.17
10	7.34	6.10	5.24	4.62	4.14	3.76	3.45	3.19	2.97	2.79	2.62	2.48
25	8.45	7.07	6.11	5.39	4.84	4.40	4.04	3.74	3.48	3.26	3.07	2.90
50	9.35	7.83	6.77	5.99	5.38	4.90	4.51	4.18	3.90	3.65	3.44	3.26
100	12.77	10.67	9.23	8.18	7.37	6.72	6.19	5.75	5.38	5.06	4.78	4.53

Tc = time in minutes. Values may exceed 60.

Precip. file name: C:\Users\je5001\Desktop\C3D Practice\CTA Rogers PCP.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	3.30	4.08	0.00	5.28	6.00	6.96	7.92	8.64
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

HOLLAND CROSSING OPEN CHANNEL FLOW CROSS SECTION

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Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Tuesday, Jul 29 2014

100 YEAR - GRASS CHANNEL

Trapezoidal

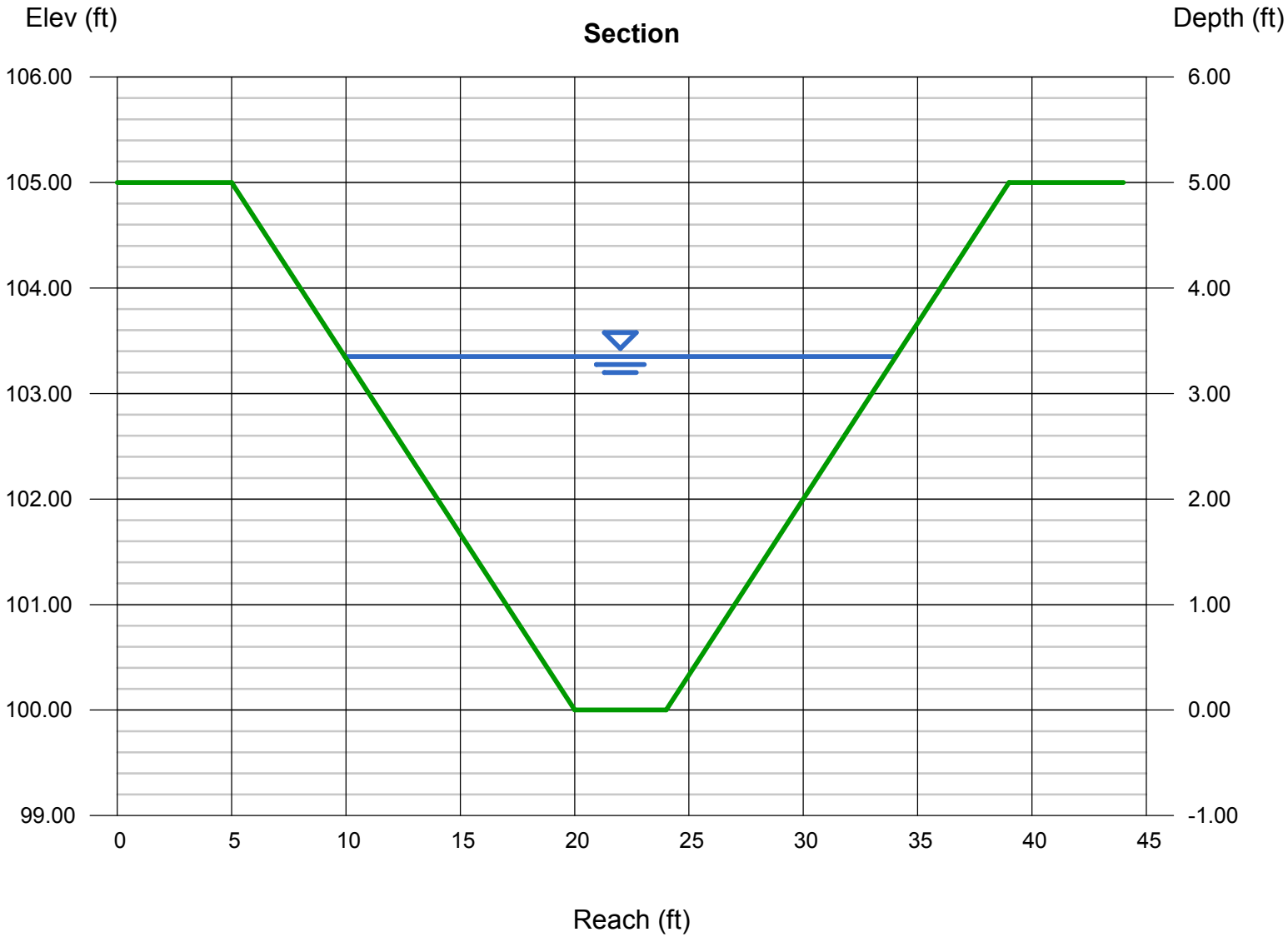
Bottom Width (ft)	= 4.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 5.00
Invert Elev (ft)	= 100.00
Slope (%)	= 0.25
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cfs)	= 151.00

Highlighted

Depth (ft)	= 3.35
Q (cfs)	= 151.00
Area (sqft)	= 47.07
Velocity (ft/s)	= 3.21
Wetted Perim (ft)	= 25.19
Crit Depth, Yc (ft)	= 2.18
Top Width (ft)	= 24.10
EGL (ft)	= 3.51



Hydraflow Table of Contents

Open Channel Flow Report

Tuesday, 03 / 11 / 2014

Watershed Model Schematic

Legend

Hyd.	Origin	Description
1	Rational	Drainage Channel

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Rational	------	-------	65.52	-------	-------	86.81	100.02	110.58	151.01	Drainage Channel

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

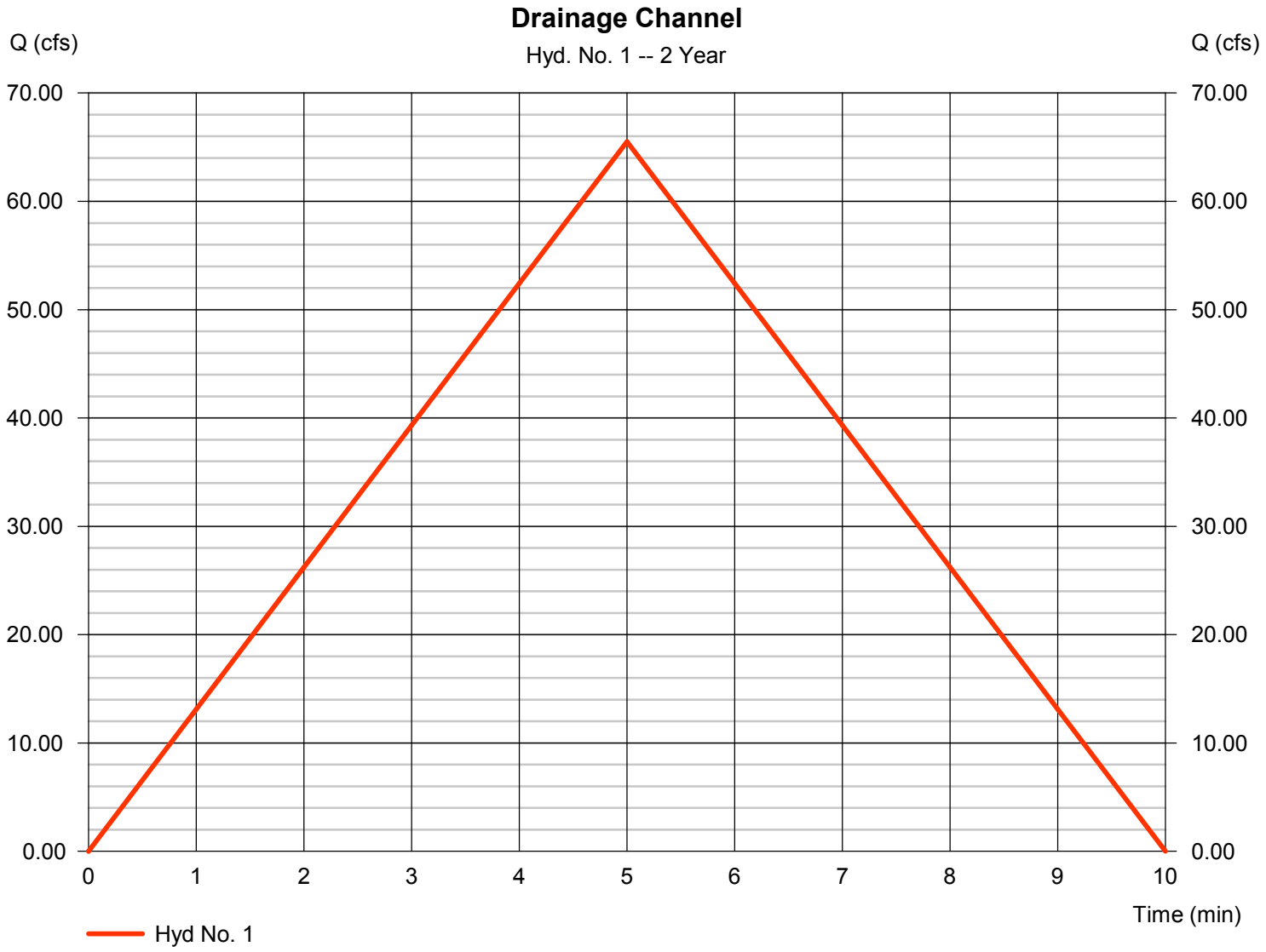
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	65.52	1	5	19,657	------	------	------	Drainage Channel

Hydrograph Report

Hyd. No. 1

Drainage Channel

Hydrograph type	=	Rational	Peak discharge	=	65.52 cfs
Storm frequency	=	2 yrs	Time to peak	=	5 min
Time interval	=	1 min	Hyd. volume	=	19,657 cuft
Drainage area	=	18.200 ac	Runoff coeff.	=	0.65
Intensity	=	5.539 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Fayetteville IDF with 100yr multiplied	Asc/Rec limb fact	=	1/1



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

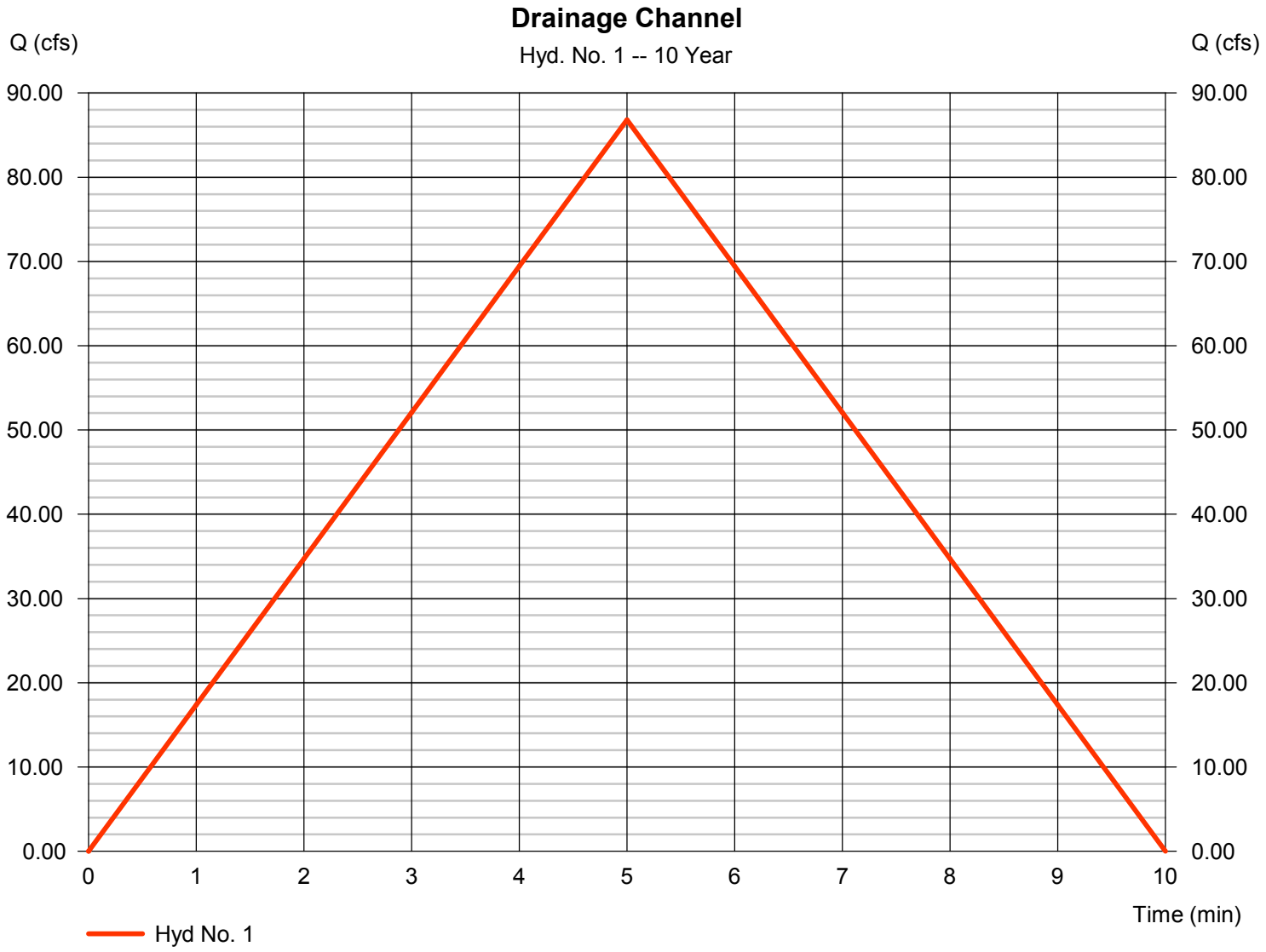
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	86.81	1	5	26,043	------	------	------	Drainage Channel

Hydrograph Report

Hyd. No. 1

Drainage Channel

Hydrograph type	=	Rational	Peak discharge	=	86.81 cfs
Storm frequency	=	10 yrs	Time to peak	=	5 min
Time interval	=	1 min	Hyd. volume	=	26,043 cuft
Drainage area	=	18.200 ac	Runoff coeff.	=	0.65
Intensity	=	7.338 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Fayetteville IDF with 100yr multiplied	Asc/Rec limb fact	=	1/1



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

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	Rational	100.02	1	5	30,007	------	------	------	Drainage Channel

Hydrograph Report

Hyd. No. 1

Drainage Channel

Hydrograph type	= Rational	Peak discharge	= 100.02 cfs
Storm frequency	= 25 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 30,007 cuft
Drainage area	= 18.200 ac	Runoff coeff.	= 0.65
Intensity	= 8.455 in/hr	Tc by User	= 5.00 min
IDF Curve	= Fayetteville IDF with 100yr multiplied	Asc/Rec limb fact	= 1/1

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

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	Rational	110.58	1	5	33,173	------	------	------	Drainage Channel

Hydrograph Report

Hyd. No. 1

Drainage Channel

Hydrograph type	=	Rational	Peak discharge	=	110.58 cfs
Storm frequency	=	50 yrs	Time to peak	=	5 min
Time interval	=	1 min	Hyd. volume	=	33,173 cuft
Drainage area	=	18.200 ac	Runoff coeff.	=	0.65
Intensity	=	9.347 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Fayetteville IDF with 100yr multiplied	Asc/Rec limb fact	=	1/1

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

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	Rational	151.01	1	5	45,304	------	------	------	Drainage Channel

Hydrograph Report

Hyd. No. 1

Drainage Channel

Hydrograph type	=	Rational	Peak discharge	=	151.01 cfs
Storm frequency	=	100 yrs	Time to peak	=	5 min
Time interval	=	1 min	Hyd. volume	=	45,304 cuft
Drainage area	=	18.200 ac	Runoff coeff.	=	0.65
Intensity	=	12.765 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Fayetteville IDF with 100yr multiplied	Asc/Rec limb fact	=	1/1

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