Appendix G

Hydrology

HYDROLOGY CALCULATIONS

FOR

TPM 37859 - RETAIL
CITY OF RIVERSIDE
CALIFORNIA

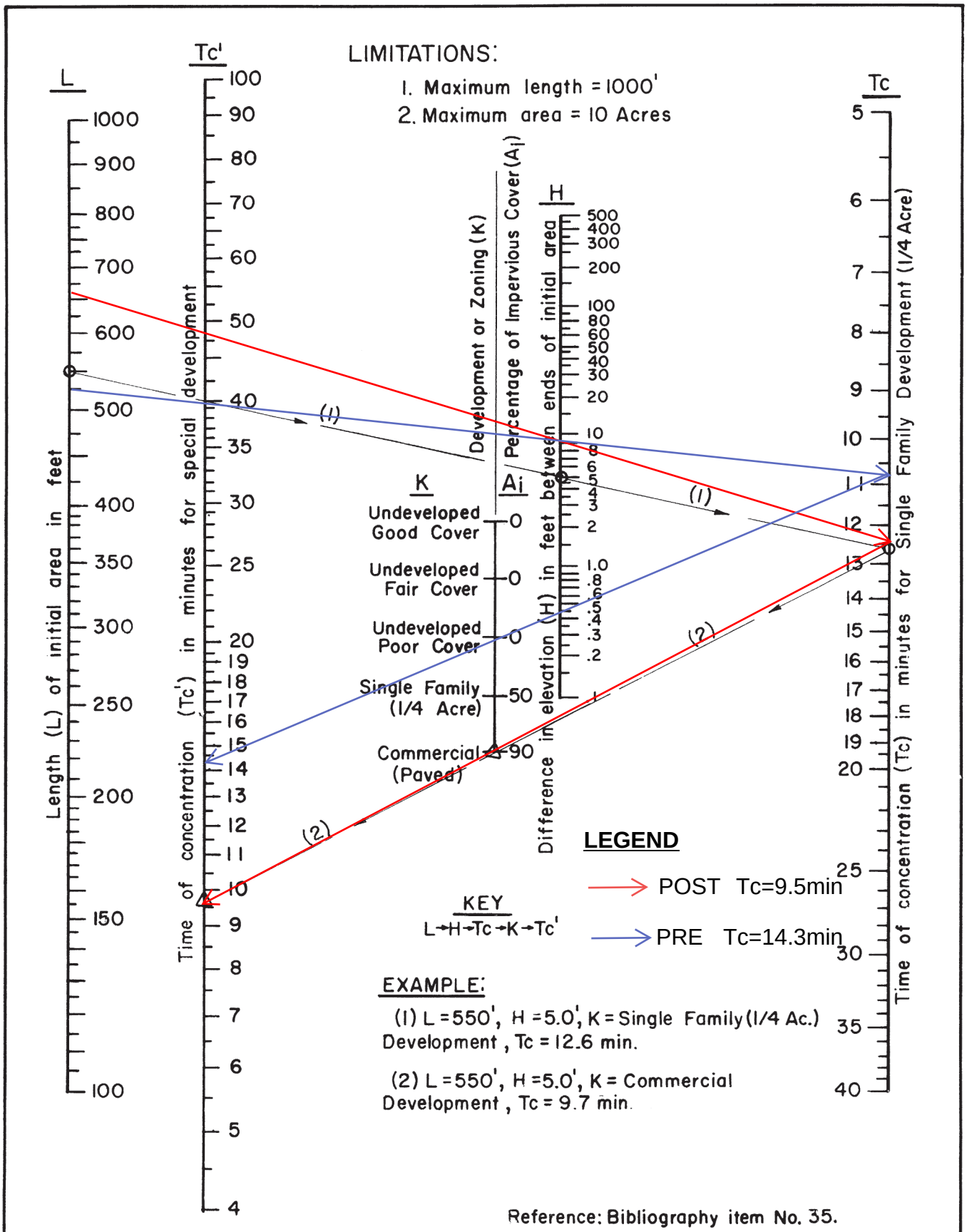
OWNER:

Steven Walker Communities
7111 Indiana Ave Ste. 300
Riverside, CA 92504
951-784-0840

PREPARED BY:

B&W Consulting Engineers, Inc

7223 Magnolia Ave
Riverside, CA 92504
951-907-5077

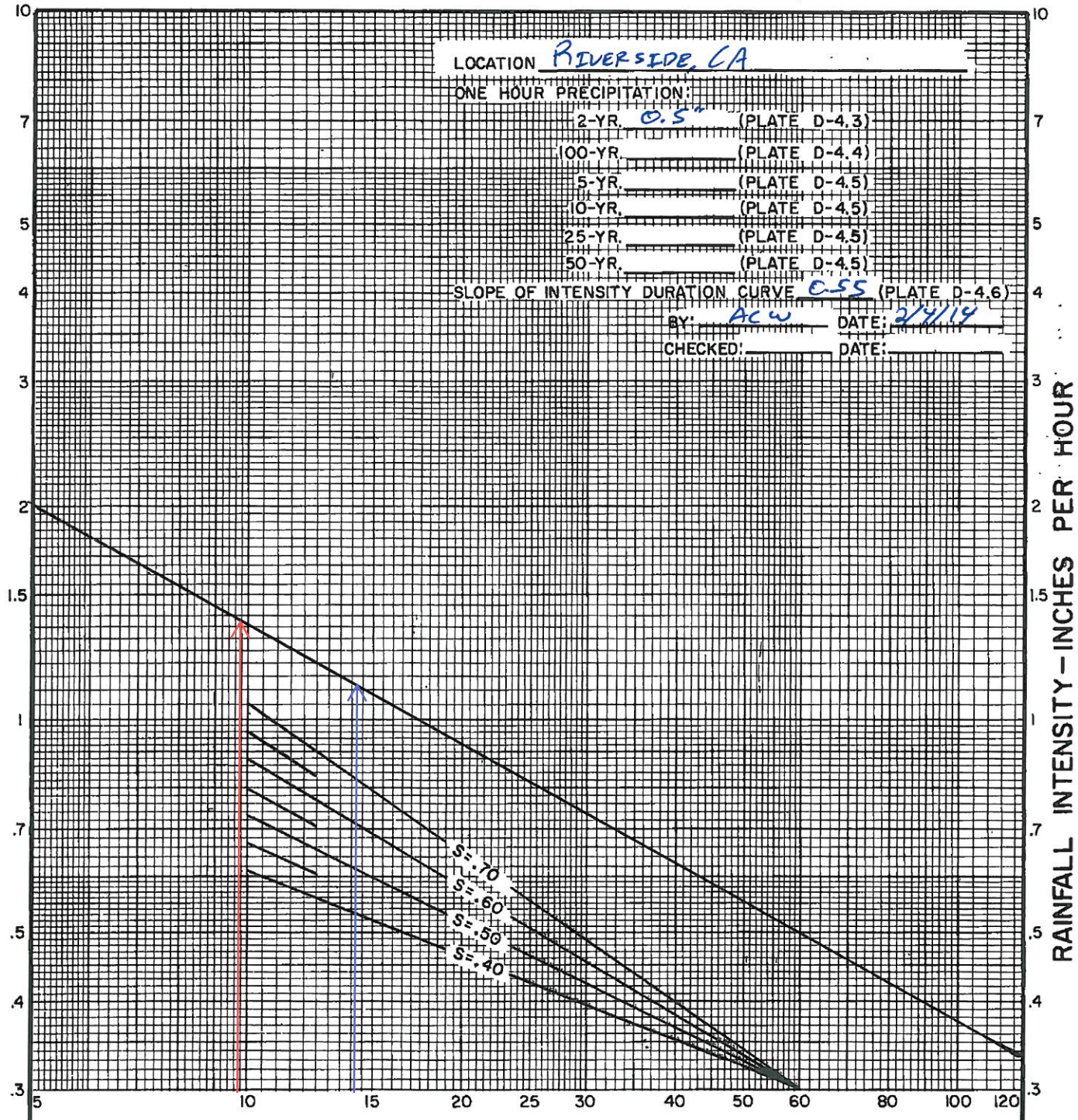


Reference: Bibliography item No. 35.

RCFC & WCD
HYDROLOGY MANUAL

TIME OF CONCENTRATION FOR INITIAL SUBAREA

PLATE D-3



RCFC & WCD

HYDROLOGY MANUAL

INTENSITY – DURATION CURVES CALCULATION SHEET

PLATE D-4.7

RCFC & WCD HYDROLOGY MANUAL

RATIONAL METHOD CALCULATION FORM

Sheet No. ___ of ___ Sheets

PROJECT HIGHGROVE

Calculated by ACW DATE 9/10/18

FREQUENCY 2 YR

Checked by _____ DATE _____

DRAINAGE AREA	Soil & Development	A Acres	I In/hr.	C	ΔQ CFS	ΣQ CFS	SLOPE	SECTION	v FPS	L FT.	T MIN.	ΣT	REMARKS
PRE-ALL	POOR-UND	2.05	1.10	0.48	1.1								
POST-ALL	SFR-1/4 AC	2.05	1.35	0.69	1.9								

PLATE D-2

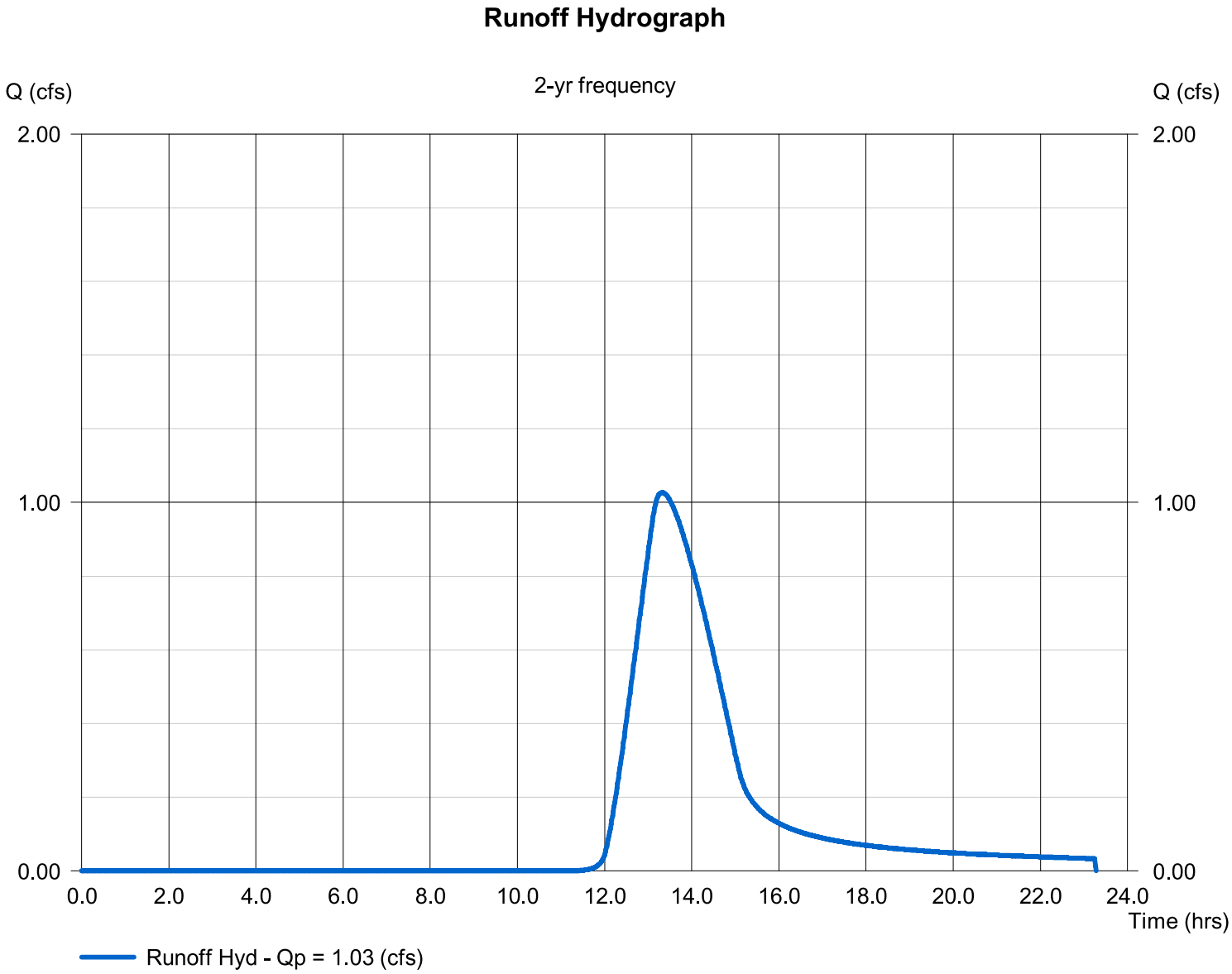
Hydrology Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Tuesday, Jul 23 2019

24 Hour Storm - PRE Condition

Hydrograph type	= SCS	Peak discharge (cfs)	= 1.027
Storm frequency (yrs)	= 2	Time interval (min)	= 1
Drainage area (ac)	= 2.050	Curve number (CN)	= 80
Basin Slope (%)	= n/a	Hydraulic length (ft)	= n/a
Tc method	= User	Time of conc. (min)	= 120
Total precip. (in)	= 3.04	Storm Distribution	= Synthetic
Storm duration (hrs)	= 24.00	Shape factor	= 484

Hydrograph Volume = 9,323 (cuft); 0.214 (acft)



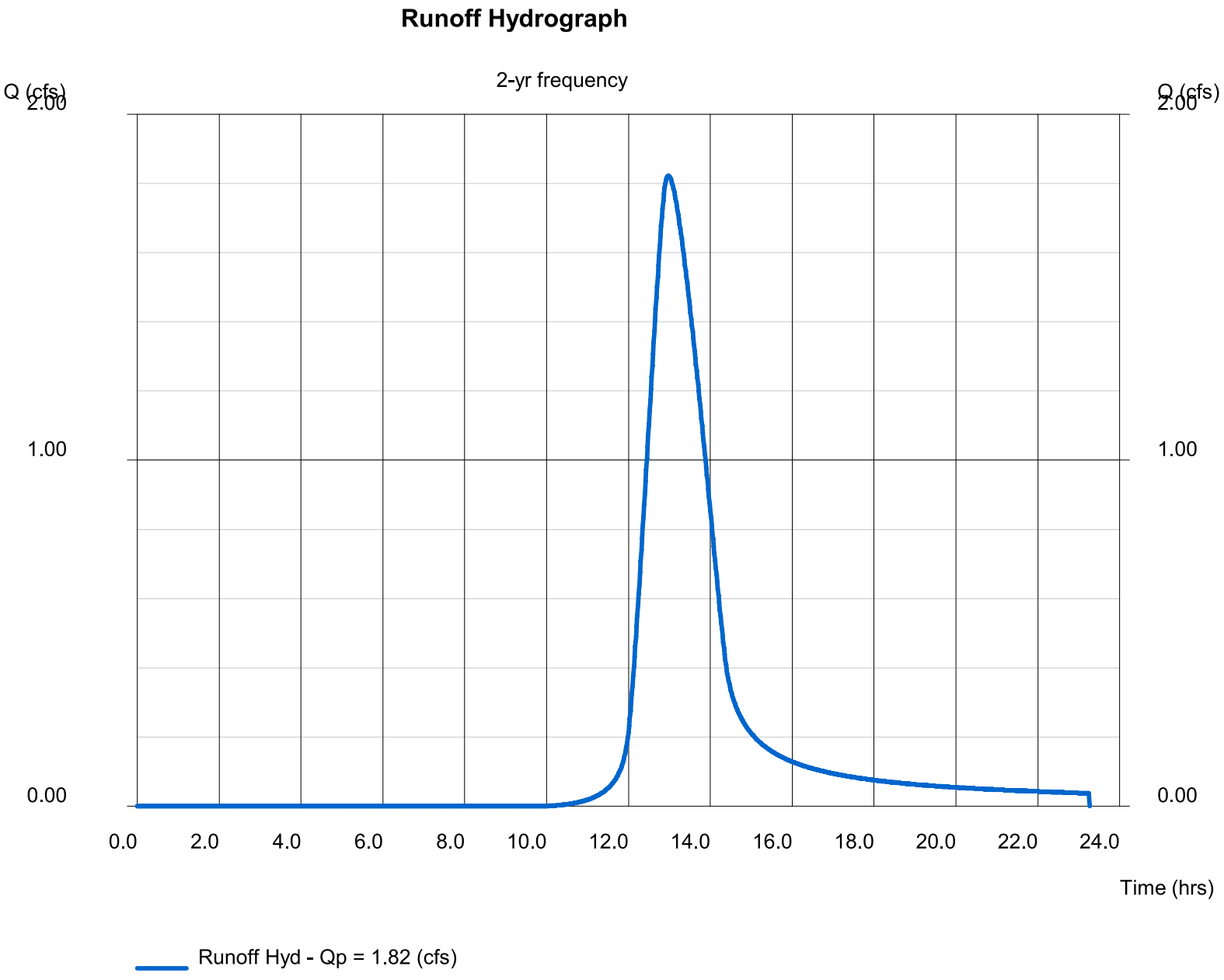
Hydrology Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Tuesday, Jul 23 2019

24 Hour Storm - Post Condition

Hydrograph type	= SCS	Peak discharge (cfs)	= 1.821
Storm frequency (yrs)	= 2	Time interval (min)	= 1
Drainage area (ac)	= 2.050	Curve number (CN)	= 87
Basin Slope (%)	= n/a	Hydraulic length (ft)	= n/a
Tc method	= User	Time of conc. (min)	= 90
Total precip. (in)	= 3.04	Storm Distribution	= Synthetic
Storm duration (hrs)	= 24.00	Shape factor	= 484

Hydrograph Volume = 13,032 (cuft); 0.299 (acft)



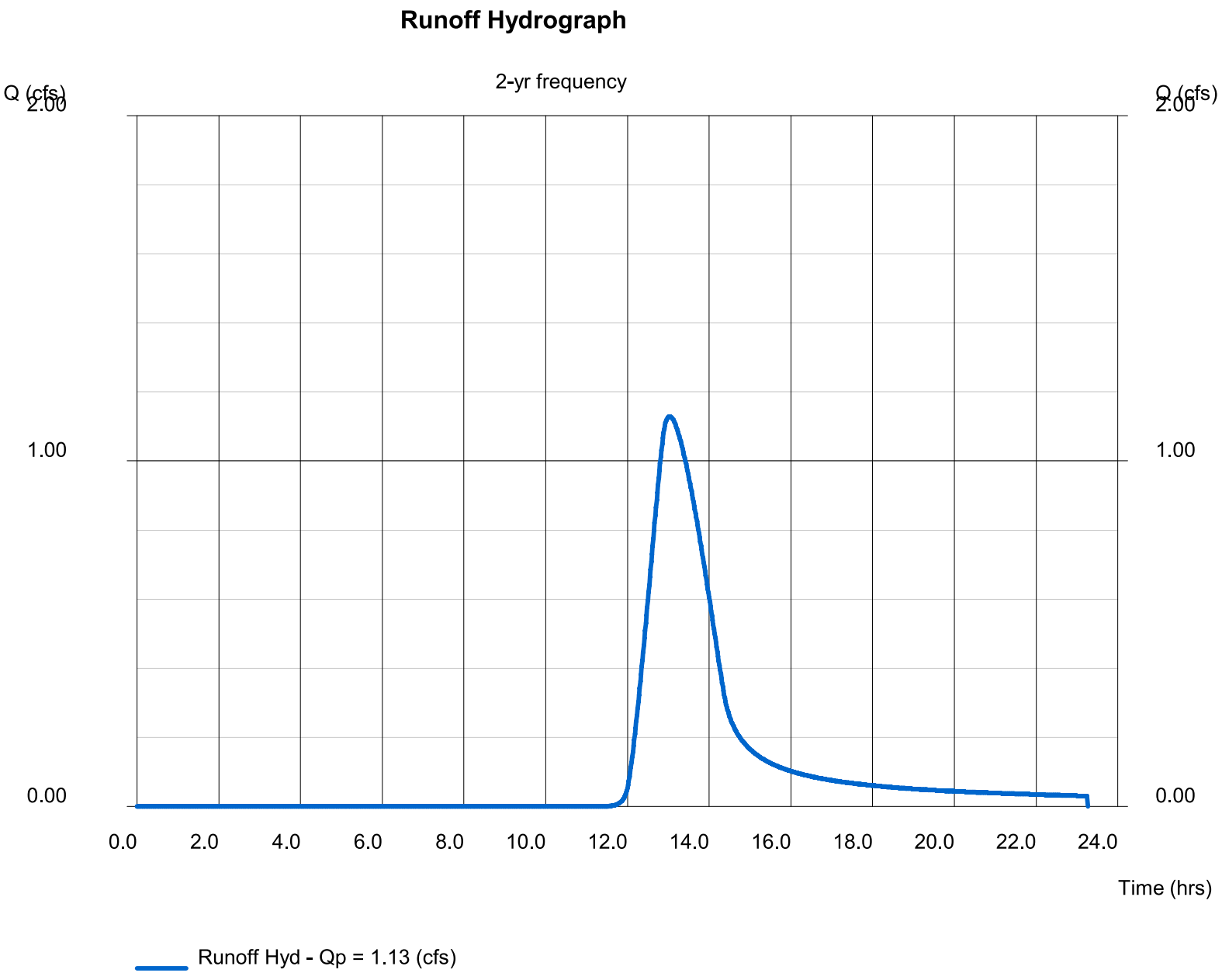
Hydrology Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Nov 9 2020

MITIGATED POST CONDITION

Hydrograph type	= SCS	Peak discharge (cfs)	= 1.129
Storm frequency (yrs)	= 2	Time interval (min)	= 1
Drainage area (ac)	= 2.050	Curve number (CN)	= 78
Basin Slope (%)	= n/a	Hydraulic length (ft)	= n/a
Tc method	= User	Time of conc. (min)	= 90
Total precip. (in)	= 3.04	Storm Distribution	= Synthetic
Storm duration (hrs)	= 24.00	Shape factor	= 484

Hydrograph Volume = 8,474 (cuft); 0.195 (acft)



HYDROLOGY AND HYDRAULICS STUDY

FOR

HIGHGROVE PLANNED RESIDENTIAL DEVELOPMENT
N-E CORNER MT. VERNON AND CENTER
COUTY OF RIVERSIDE
CALIFORNIA

OWNER:

Steven Walker Communities
7111 Indiana Ave Ste. 300
Riverside, CA 92504
951-784-0840

PREPARED BY:

3585 Main Street #205
Riverside, CA 92501
951-907-5077

September 2020

TABLE OF CONTENTS

INTRODUCTION

This project is a proposed 6.44 Acre commercial site with a planned to build 52 homes and a recreation center with associated streets and parking. The site is located on the northwest corner of the intersection of Mt Vernon Avenue and Center Street in the County of Riverside.

METHODOLOGY

The hydrology calculations were performed using the Riverside County Hydrology Manual Rational Method procedures. Calculations for the volume and mitigating basins were performed using the Hydraflow Express Extension for Autodesk AutoCAD Civil 3D program. This hydrograph program is based on the TR-55 calculation procedure. The TR-55 calculations were used to calculate the 24 hour storm flow and volume. Mitigation of post development flow was shown by adjusting the post development hydrograph down by the volume of the WQMP basin. Included in this report are the existing and proposed condition 2-year, storm hydrology calculations showing the peak flows and 24 hour volumes to the storm drain system.

EXISTING CONDITIONS

The existing site is currently undeveloped. Under existing condition, flow that originates onsite flow across the project area northwest from Center Street towards Mt Vernon Ave. There is no storm drain onsite and no storm drain on Mt Vernon Ave, so the water sheet flows out to the street. No offsite water enters the site.

CONCLUSION

Hydrology Results

Exist. Q2(cfs) Rational	Exist. Q2(cfs) TR55-24hr	Exist. Vol2(CF) TR55-24hr	Proposed Q2 (cfs) Rational	Proposed Q2 (cfs) TR55-24hr	Proposed Vol2(CF) TR55-24hr	Water Quality Vol (CF)	Proposed Q2 (cfs) TR55-24hr - **Mitigated**
4.2	2.44	29,060	6.0	3.02	35,263	8030	2.30

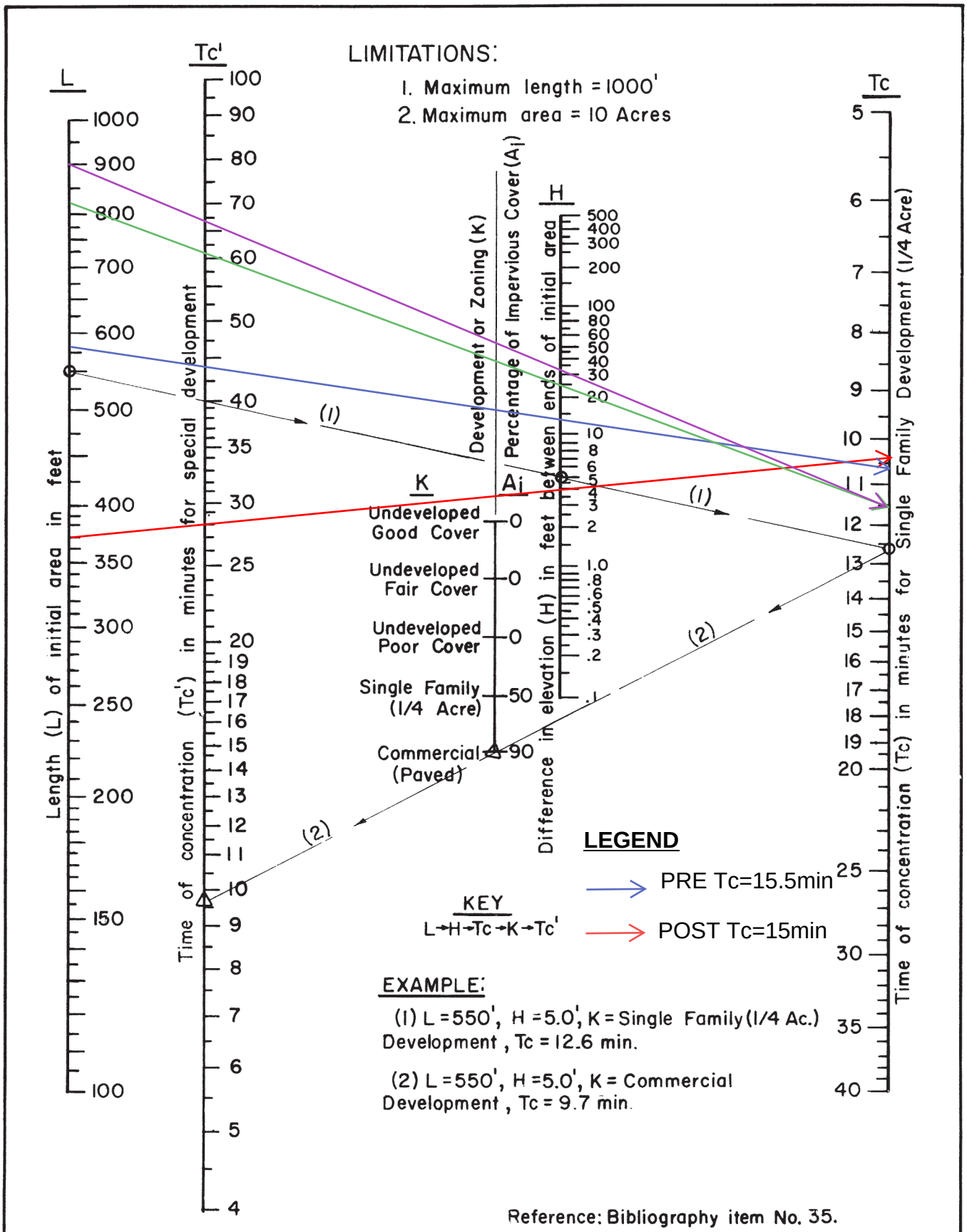
The project proposes constructing two (2) separate bio-retention areas in two drainage management areas. The combination of the two drainage management area requires a water quality volume of 8,030 cubic feet. The volume of the combined BMPs was shown to mitigate the peak 24 hour flow from 3.02 cfs to 2.30 cfs, which is less than the 2.44 cfs of th existing condition.

II. EXISTING HYDROLOGY CALCULATIONS

- 2/10/100-Year Storm Hydrology Calculations
- Hydrology Map

PROPOSED HYDROLOGY CALCULATIONS

- 2/10/100-Year Storm Hydrology Calculations
- Hydrology Map



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RCFC & WCD

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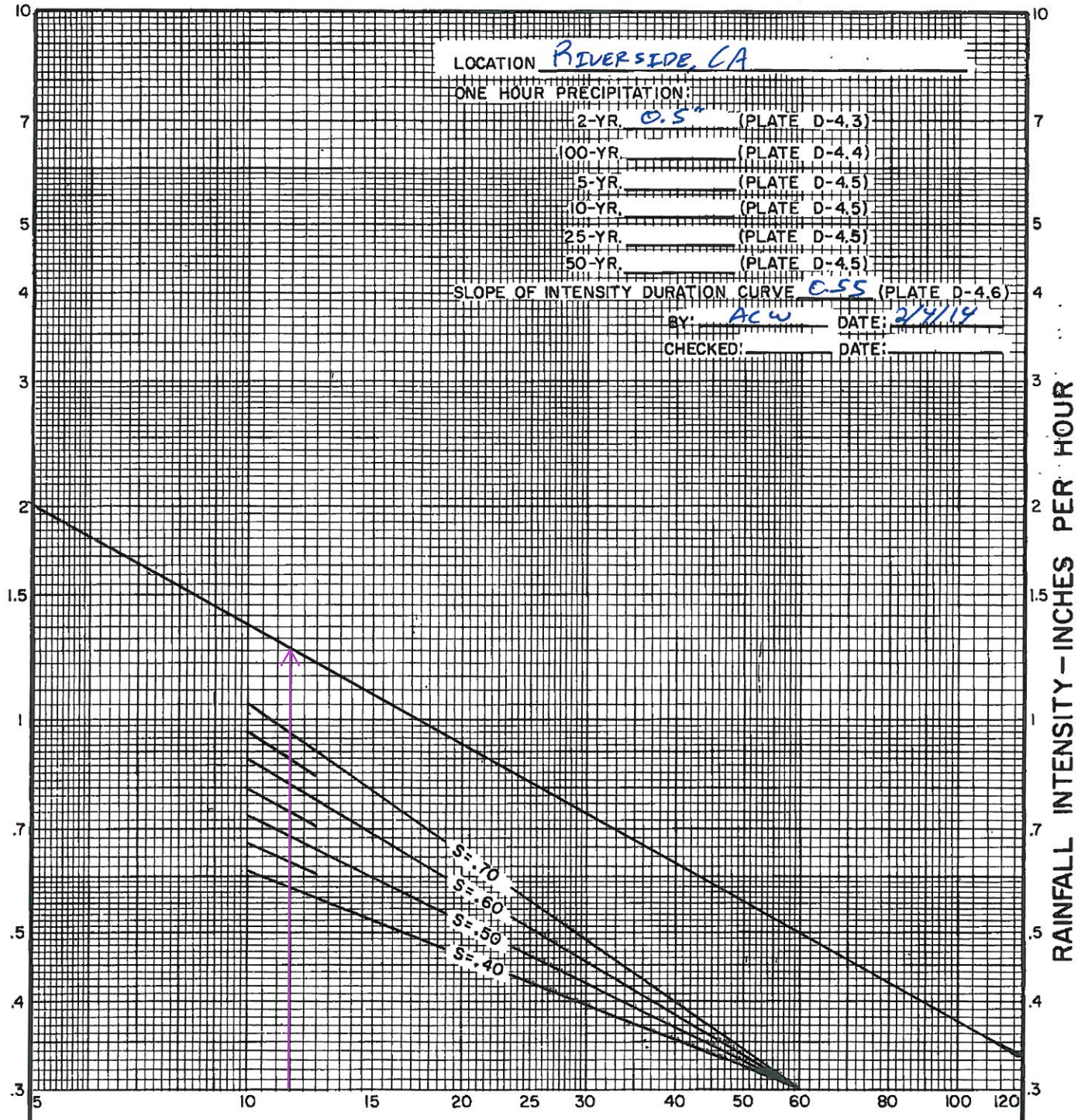
TIME OF CONCENTRATION FOR INITIAL SUBAREA

PLATE D-3



RCFC & WCD

HYDROLOGY MANUAL

INTENSITY – DURATION CURVES CALCULATION SHEET

PLATE D-4.7

RCFC & WCD HYDROLOGY MANUAL

RATIONAL METHOD CALCULATION FORM

Sheet No. ___ of ___ Sheets

PROJECT 2625 DURAHART

ACW 9/10/18

Calculated by _____ DATE

Checked by _____ DATE

FREQUENCY 2 YR

DRAINAGE AREA	Soil & Development	A Acres	I In/hr.	C	ΔQ CFS	ΣQ CFS	SLOPE	SECTION	v FPS	L FT.	T MIN.	ΣT	REMARKS
PRE-ALL	POOR-UND	6.44	1.35	0.48	4.2								
POST-ALL	SFR-1/4 AC	6.44	1.35	0.69	6.0								

PLATE D-2

Hydrology Report

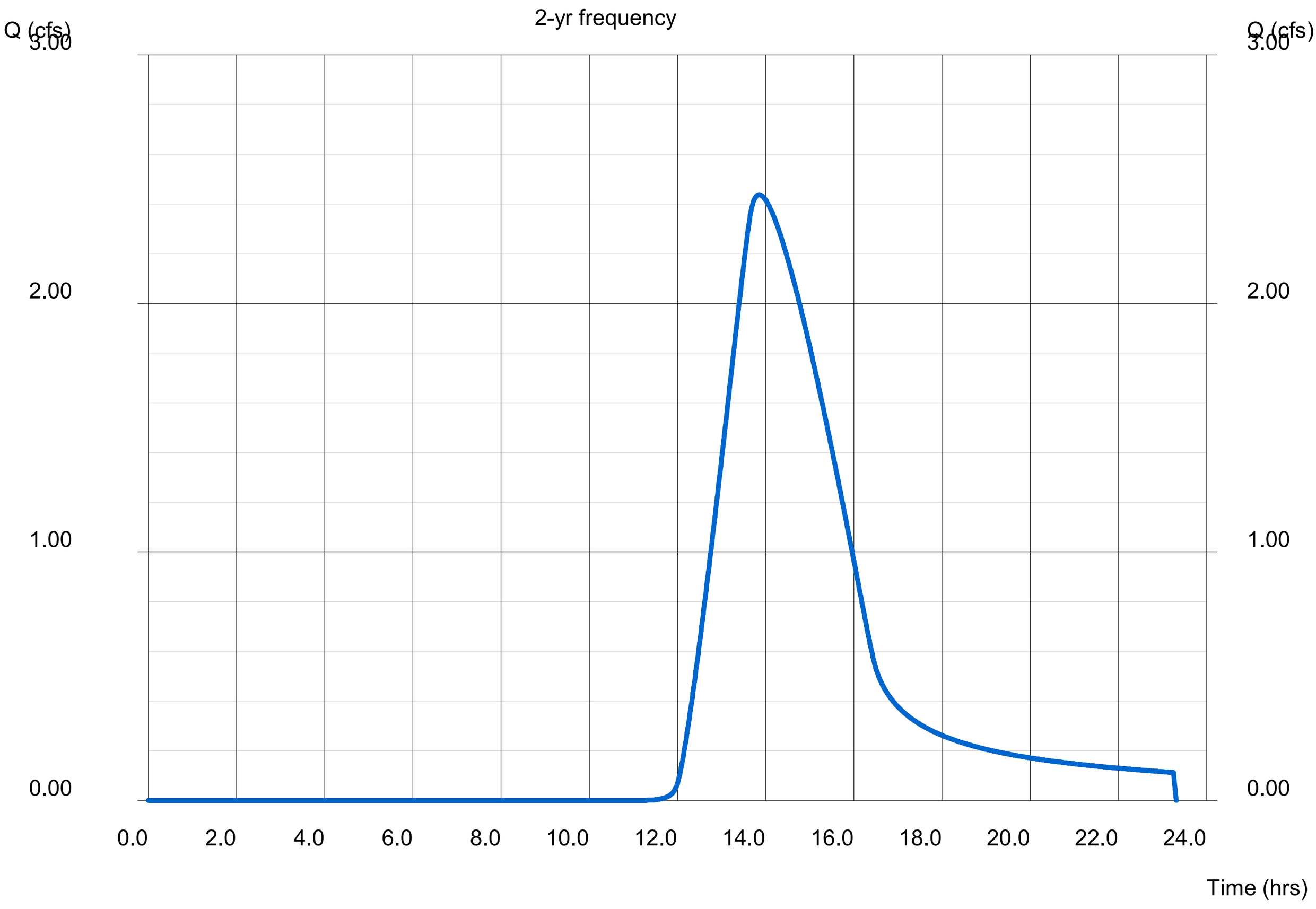
Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Wednesday, Apr 24 2019

24 Hour Storm - PRE Condition

Hydrograph type	= SCS	Peak discharge (cfs)	= 2.437
Storm frequency (yrs)	= 2	Time interval (min)	= 1
Drainage area (ac)	= 6.440	Curve number (CN)	= 80
Basin Slope (%)	= n/a	Hydraulic length (ft)	= n/a
Tc method	= User	Time of conc. (min)	= 170
Total precip. (in)	= 3.04	Storm Distribution	= Synthetic
Storm duration (hrs)	= 24.00	Shape factor	= 484

Hydrograph Volume = 29,060 (cuft); 0.667 (acft)

Runoff Hydrograph



Hydrology Report

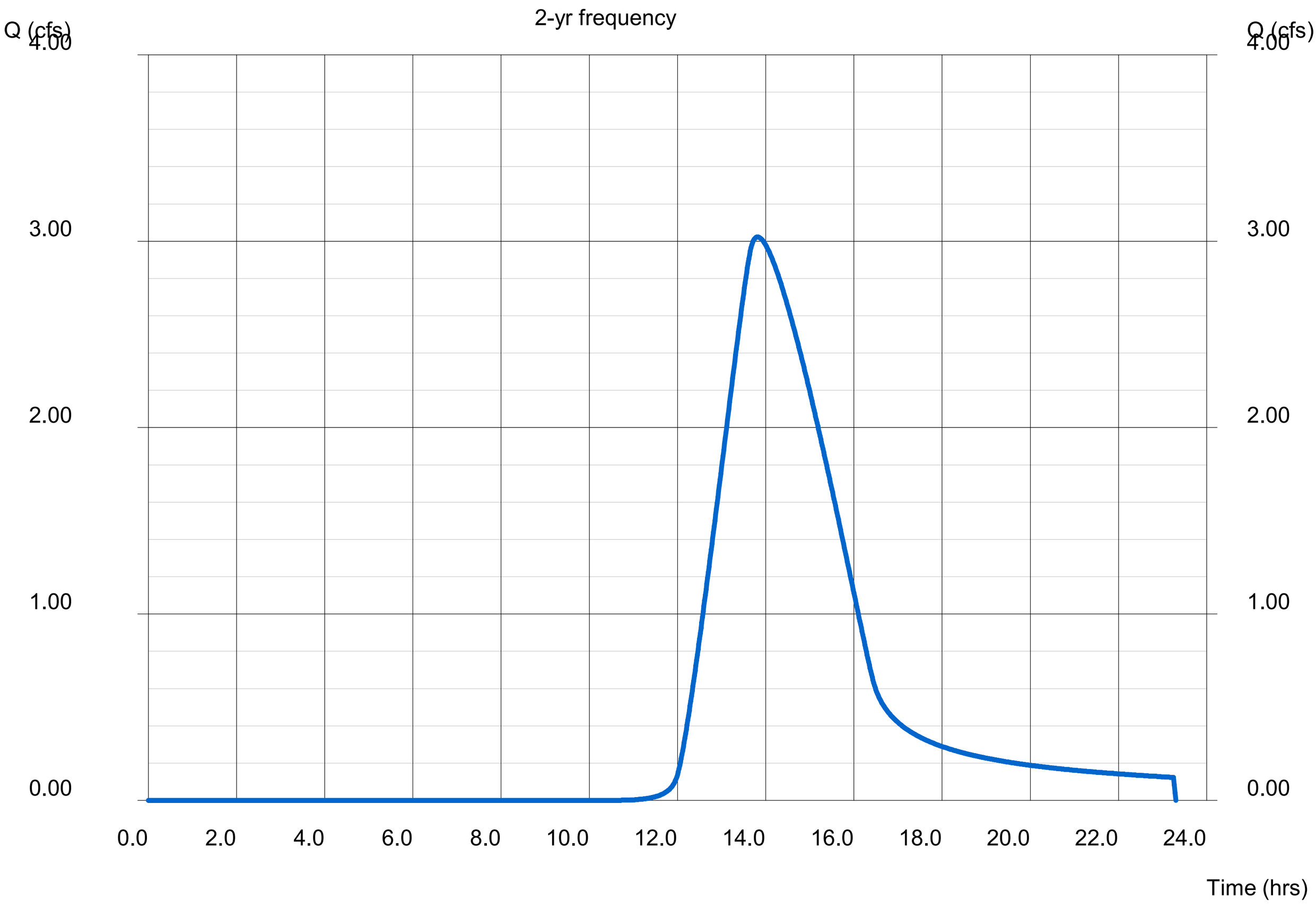
Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Wednesday, Apr 24 2019

24 Hour Storm - Post Condition

Hydrograph type	= SCS	Peak discharge (cfs)	= 3.023
Storm frequency (yrs)	= 2	Time interval (min)	= 1
Drainage area (ac)	= 6.440	Curve number (CN)	= 84
Basin Slope (%)	= n/a	Hydraulic length (ft)	= n/a
Tc method	= User	Time of conc. (min)	= 170
Total precip. (in)	= 3.04	Storm Distribution	= Synthetic
Storm duration (hrs)	= 24.00	Shape factor	= 484

Hydrograph Volume = 35,263 (cuft); 0.810 (acft)

Runoff Hydrograph



Hydrology Report

MITIGATED POST CONDITION

Hydrograph type	= SCS	Peak discharge (cfs)	= 2.302
Storm frequency (yrs)	= 2	Time interval (min)	= 1
Drainage area (ac)	= 6.440	Curve number (CN)	= 79
Basin Slope (%)	= n/a	Hydraulic length (ft)	= n/a
Tc method	= User	Time of conc. (min)	= 170
Total precip. (in)	= 3.04	Storm Distribution	= Synthetic
Storm duration (hrs)	= 24.00	Shape factor	= 484

Hydrograph Volume = 27,627 (cuft); 0.634 (acft)

Runoff Hydrograph