

Drainage Report

For

Jamey South Parking Lot

Bryant, Saline County, Arkansas



August 14, 2025

Prepared by:

RICHARDSON ENGINEERING, PLLC

**325 W. South St.
Benton, AR 72015
501-315-7225**

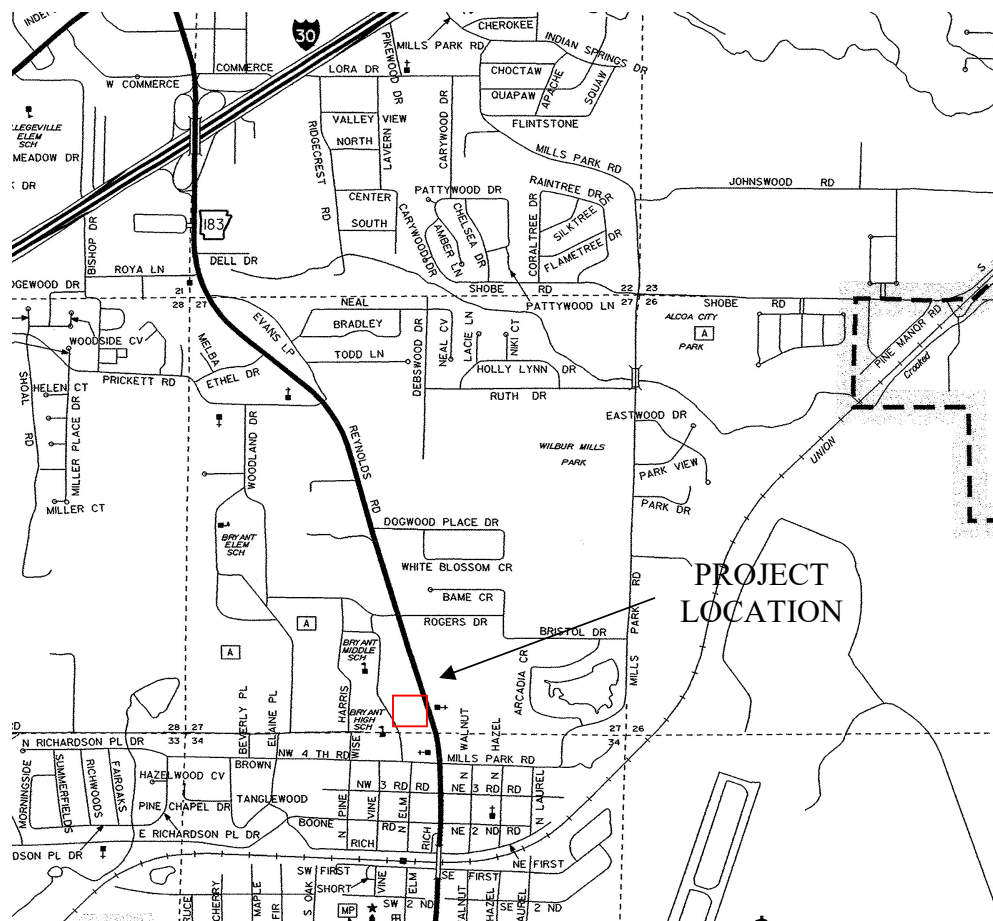
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Jamey South
515 N Reynolds Road
Bryant, AR 72022

Project Location and Description

The project is located on West side of N Reynolds Road, part of the Southwest Quarter of the Southeast Quarter, Section 27, Township 1-S, Range 14-W, Saline County, Arkansas.



Vicinity Map – N.T.S

This project is a proposed Commercial Development for a parking lot, located in the City of Bryant, Saline County.

Site Drainage

Pre-Development

The pre-developed runoff for the site flows to the west. The pre-development runoff condition consists of a mix of a small commercial development as well as a portion of undeveloped wooded property.

Post-Development

The site drainage starts on the East side of the project and flows to the West. The drainage is sheet flows across the proposed driving surface. The storm water is discharged off the parking lot to the west and sheet flows across a grass buffer/filter area. The post-development runoff conditions changed from developed/undeveloped to commercial development.

Runoff Summary

Basin Design Point

Development Drainage Study Area = 0.56 Ac

Existing Condition runoff Coefficient: $C = 0.61$

Proposed runoff Coefficient: $C = 0.75$

Tc Undeveloped = 9 Minutes (TR55 Method)

Tc Developed = 8 Minutes (TR55 Method)

Detention Basin Required Volume: 586 CF

Design Storm	Pre-Development Flow Rate (cfs)	Post-Development Flow Rate (cfs)
2-yr	1.61	2.09
10-yr	2.15	2.79
25-yr	2.47	3.21
50-yr	2.71	3.51
100-yr	2.94	3.81

Recommendations/Summary

The proposed drainage improvements include a grass buffer/filter area on the West side of the project. The proposed development slightly increases the peak flow leaving the site, but it is not considered to be significant.

Appendices

Runoff Coefficient Calculations

Site Drainage Map

Pond and Post Development Hydrographs (Hydrology Studio)

Runoff Coefficient Calculations



RICHARDSON ENGINEERING

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(1/1)

PROJECT 025-007 DRAINAGE CALCULATIONS

DATE 08/13/2025

EXISTING C:

DEVELOPED: 0.16 C = 0.95

UNDEVELOPED: 0.40 C = 0.47

(AVG 2-7%
FOREST/WOODS)

$$C = \frac{(0.16)(0.95) + (0.40)(0.47)}{0.56} = 0.61$$

POST-DEV:

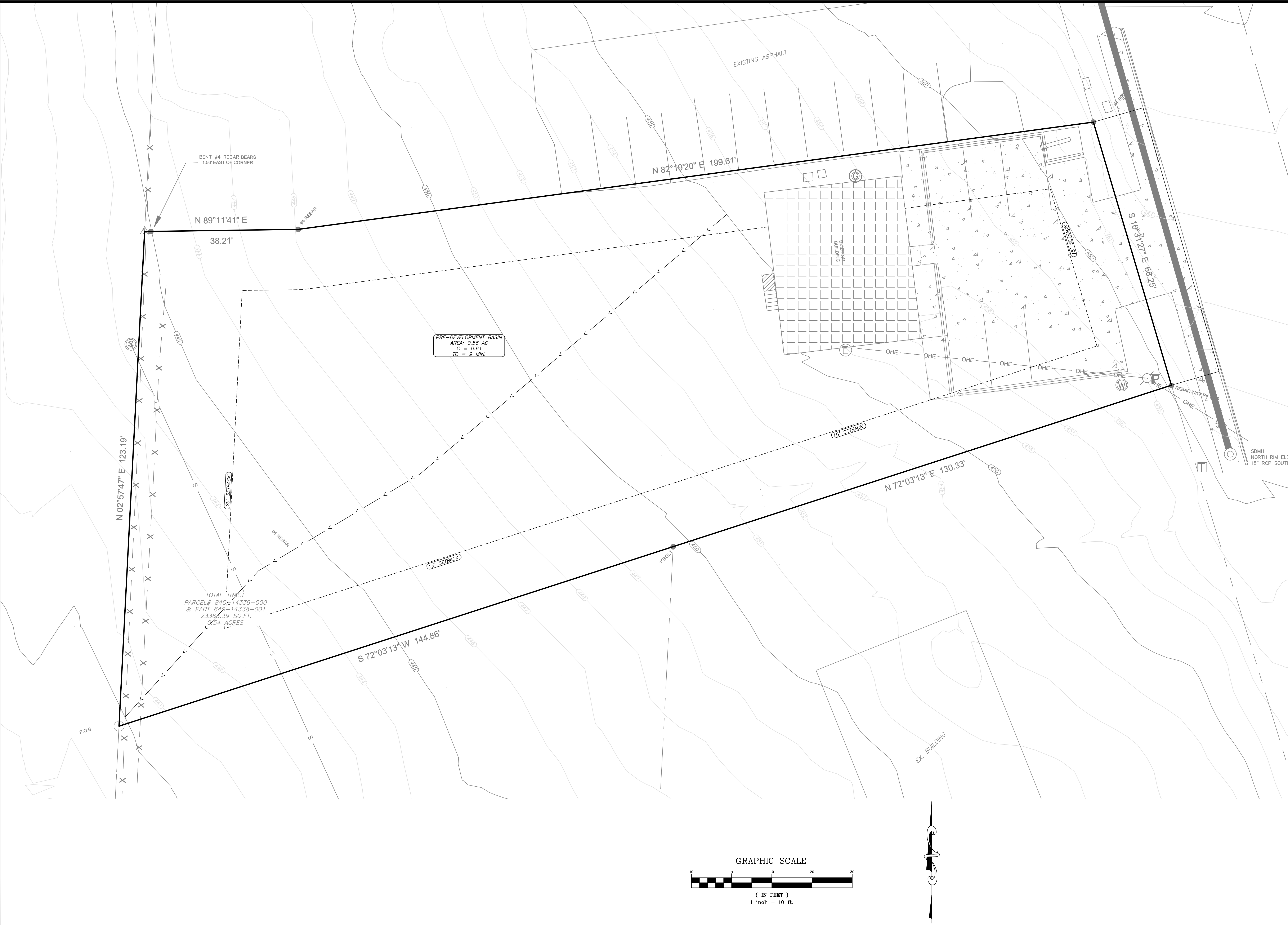
DEVELOPED: 0.33 C = 0.95

UNDEVELOPED: 0.23 C = 0.45

(AVG 2-7%
LAWNS & SANDY SOIL)

$$C = \frac{(0.33)(0.95) + (0.23)(0.45)}{0.56} = 0.75$$

Site Drainage Basin Maps



PROJECT #: 025-007

Scale: 1" = 10'

Sheet: 1 of 2

Revisions

No.	Date	Revisions

Prepared For:
JAMEY SOUTH

515 N. REYNOLDS ROAD
BRYANT, AR 72022

PRE-DEVELOPMENT DRAINAGE BASIN
STATE FARM – JAMEY SOUTH
PROPOSED PARKING LOT
515 N. REYNOLDS ROAD
BRYANT, ARKANSAS

RE**RICHARDSON**
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PROJECT #: 025-007
Scale: 1" = 10'
Date: 8/14/2025

Revisions
No.
Date

2 of 2

Prepared For:
JAMEY SOUTH
515 N. REYNOLDS ROAD
BRYANT, AR 72022

POST-DEVELOPMENT DRAINAGE BASIN
STATE FARM – JAMEY SOUTH
PROPOSED PARKING LOT
515 N. REYNOLDS ROAD
BRYANT, ARKANSAS

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Arkansas
Professional Engineer

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Pre and Post Development Hydrographs (Hydrology Studio)

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Hydrology Studio v 3.0.0.27

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Basin Model

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Pre-Dev Basin



Post-Dev Basin



Hydrograph by Return Period

Project Name: Jamey South Parking Lot

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08-14-2025

[illegible]

Hydrograph 2-yr Summary

Project Name: Jamey South Parking Lot

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Hydrograph Report

Project Name: Jamey South Parking Lot

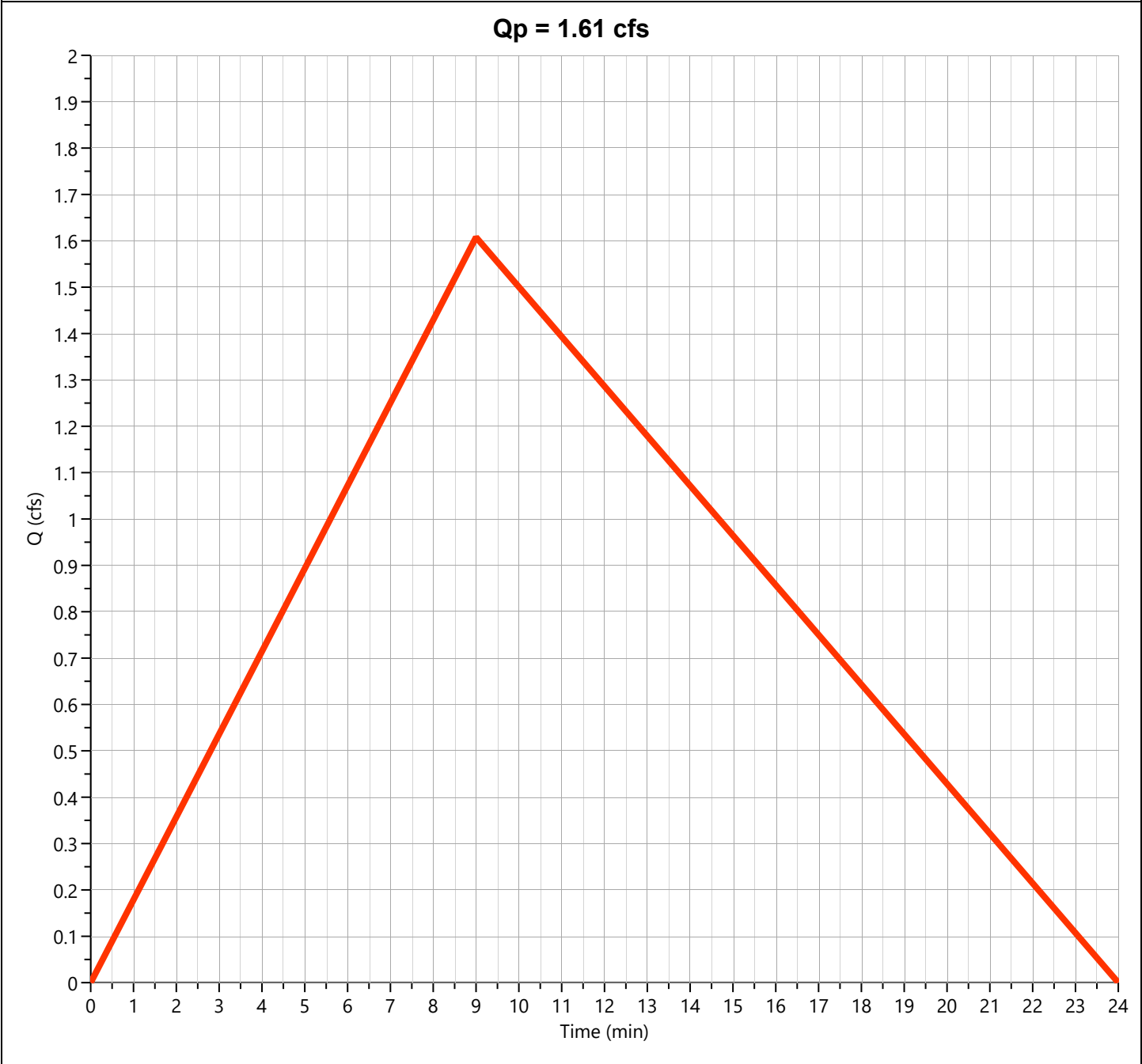
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08-14-2025

Pre-Dev Basin

Hyd. No. 1

Hydrograph Type	= Rational	Peak Flow	= 1.608 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.15 hrs
Time Interval	= 1 min	Runoff Volume	= 1,159 cuft
Drainage Area	= 0.56 ac	Runoff Coeff.	= 0.61
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 9.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 4.71 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Tc by TR55 Worksheet

Project Name: Jamey South Parking Lot

Hydrology Studio v 3.0.0.27

08-14-2025

Pre-Dev Basin Rational

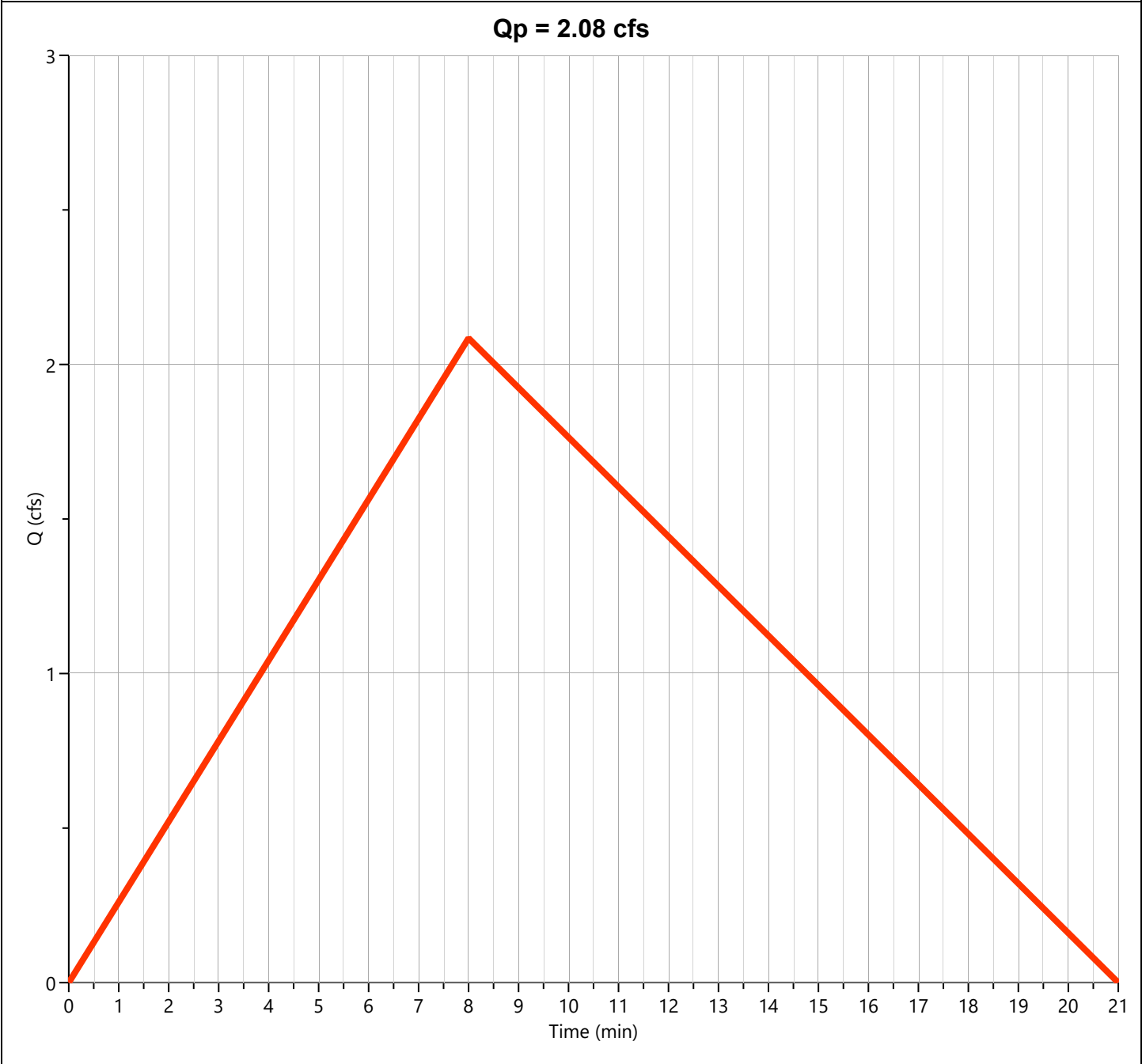
Hyd. No. 1

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.300	0.013	0.013	
Flow Length (ft)	100			
2-yr, 24-hr Precip. (in)	4.36	2.28	2.28	
Land Slope (%)	7.7			
Travel Time (min)	8.52	0.00	0.00	8.52
Shallow Concentrated Flow				
Flow Length (ft)	95			
Watercourse Slope (%)	7.60	0.00	0.00	
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	4.45			
Travel Time (min)	0.36	0.00	0.00	0.36
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.013	0.013	0.013	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				9 min

Post-Dev Basin

Hyd. No. 2

Hydrograph Type	= Rational	Peak Flow	= 2.085 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.13 hrs
Time Interval	= 1 min	Runoff Volume	= 1,336 cuft
Drainage Area	= 0.56 ac	Runoff Coeff.	= 0.75
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 4.96 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Tc by TR55 Worksheet

Project Name: Jamey South Parking Lot

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Post-Dev Basin Rational

Hyd. No. 2

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.410	0.013	0.013	
Flow Length (ft)	72			
2-yr, 24-hr Precip. (in)	4.36	2.28	2.28	
Land Slope (%)	8.8			
Travel Time (min)	7.98	0.00	0.00	7.98
Shallow Concentrated Flow				
Flow Length (ft)				
Watercourse Slope (%)	0.00	0.00	0.00	
Surface Description	Paved	Paved	Paved	
Average Velocity (ft/s)				
Travel Time (min)	0.00	0.00	0.00	0.00
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.013	0.013	0.013	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				8 min

Hydrograph 10-yr Summary

Project Name: Jamey South Parking Lot

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08-14-2025

[illegible]

Hydrograph Report

Project Name: Jamey South Parking Lot

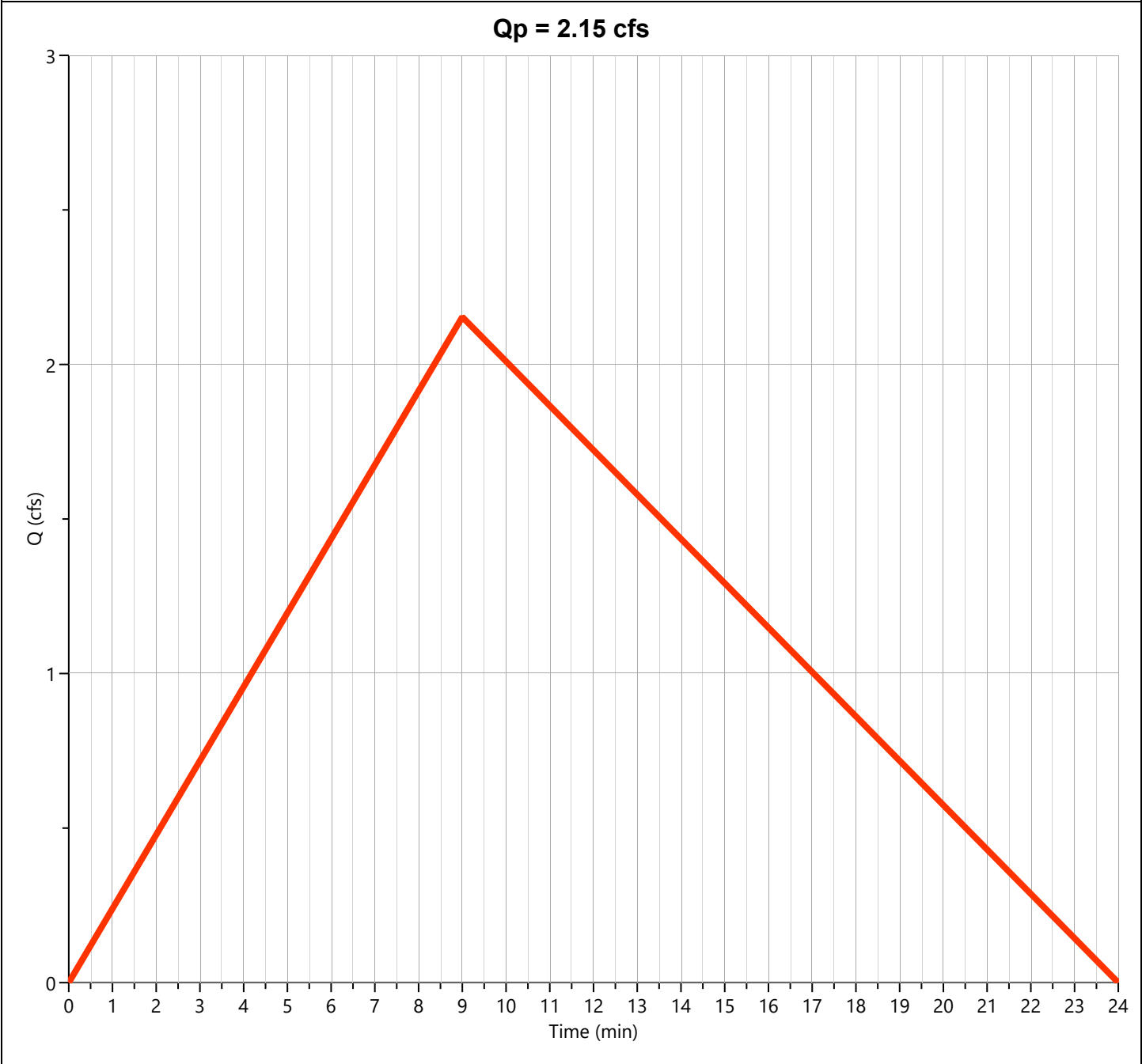
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08-14-2025

Pre-Dev Basin

Hyd. No. 1

Hydrograph Type	= Rational	Peak Flow	= 2.154 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.15 hrs
Time Interval	= 1 min	Runoff Volume	= 1,552 cuft
Drainage Area	= 0.56 ac	Runoff Coeff.	= 0.61
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 9.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.30 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67

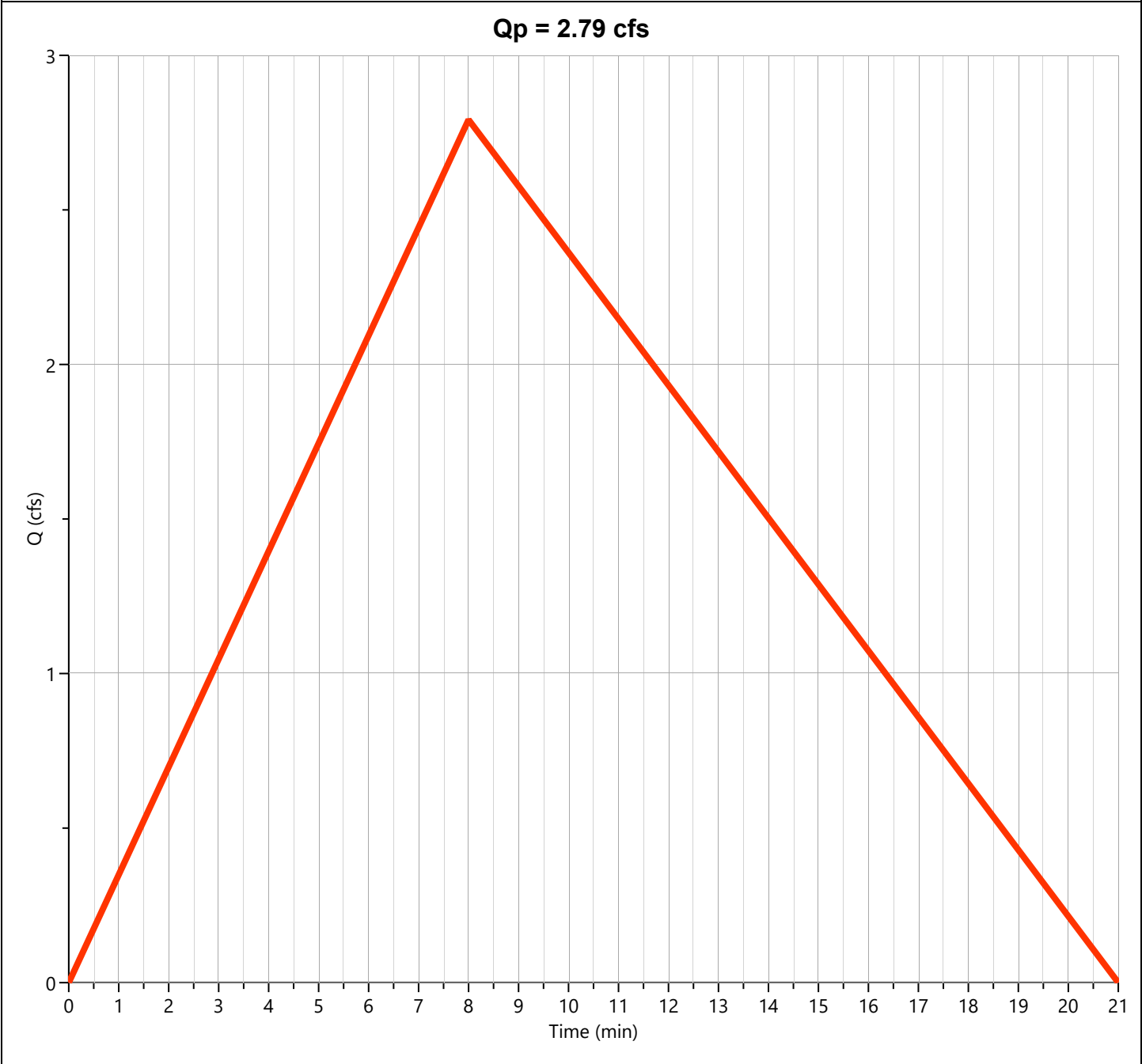


Hydrograph Report

Post-Dev Basin

Hyd. No. 2

Hydrograph Type	= Rational	Peak Flow	= 2.792 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.13 hrs
Time Interval	= 1 min	Runoff Volume	= 1,789 cuft
Drainage Area	= 0.56 ac	Runoff Coeff.	= 0.75
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.65 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Hydrograph 25-yr Summary

Project Name: Jamey South Parking Lot

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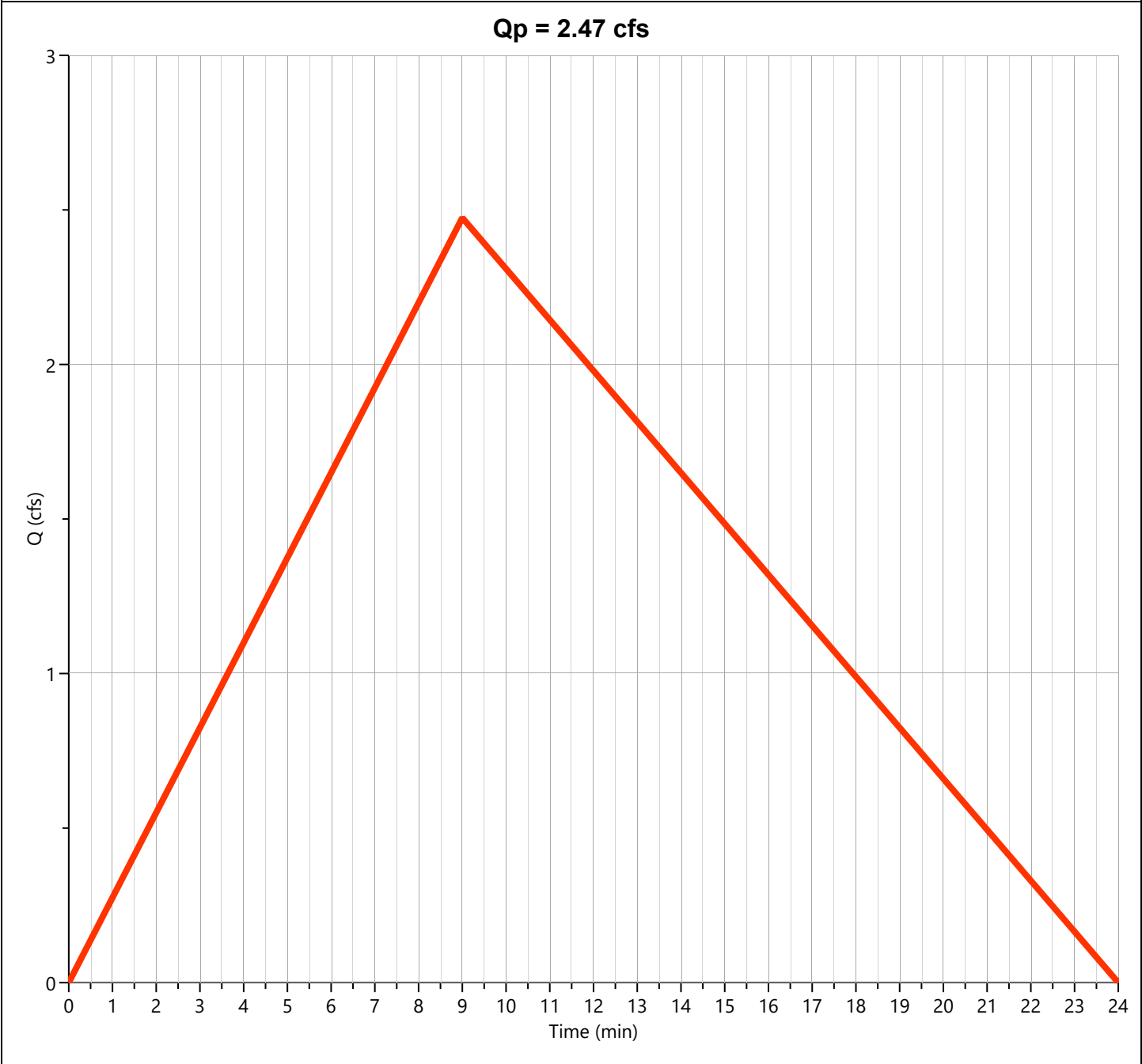
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Hydrograph Report

Pre-Dev Basin

Hyd. No. 1

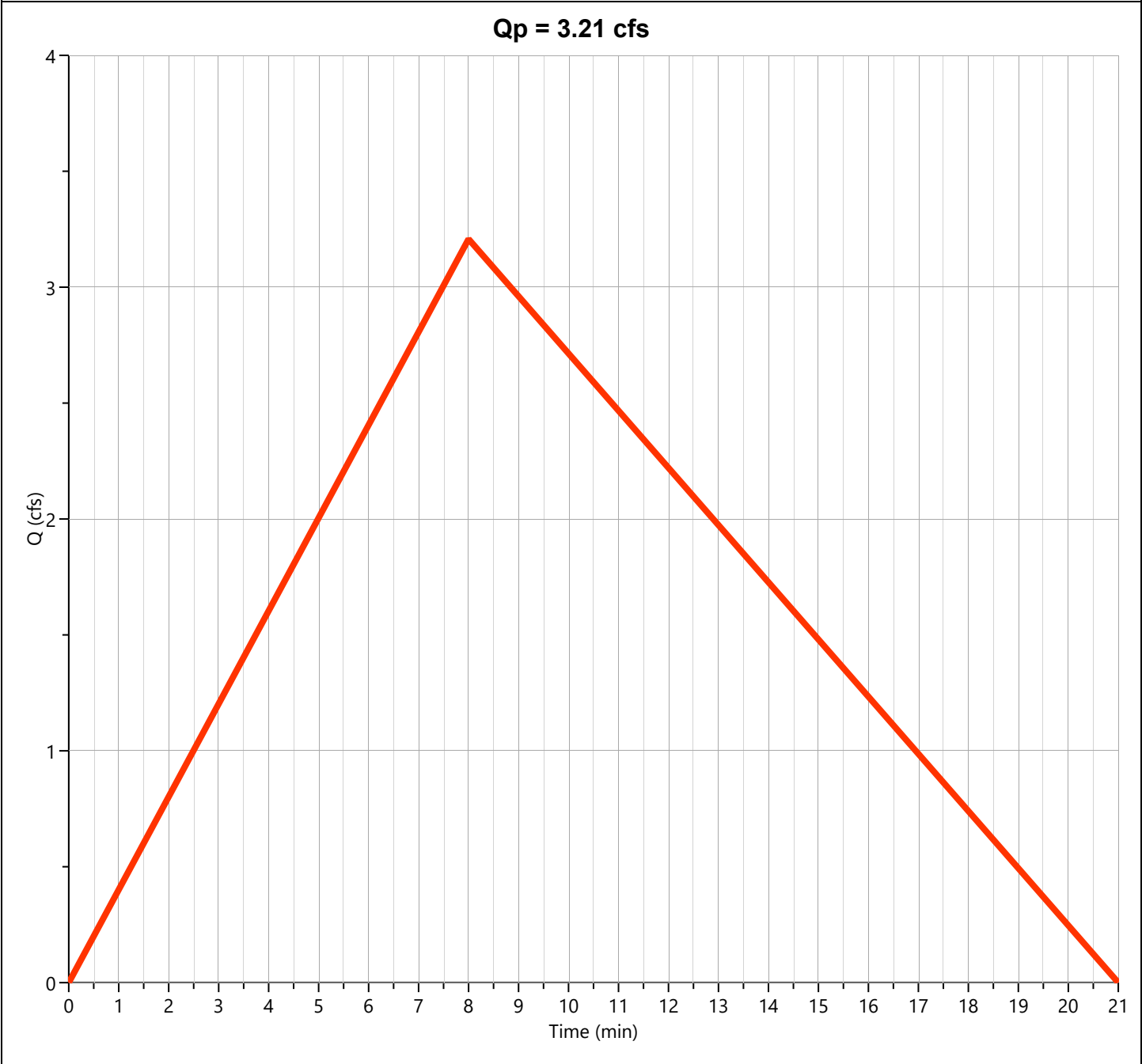
Hydrograph Type	= Rational	Peak Flow	= 2.474 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.15 hrs
Time Interval	= 1 min	Runoff Volume	= 1,784 cuft
Drainage Area	= 0.56 ac	Runoff Coeff.	= 0.61
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 9.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 7.24 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin

Hyd. No. 2

Hydrograph Type	= Rational	Peak Flow	= 3.207 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.13 hrs
Time Interval	= 1 min	Runoff Volume	= 2,055 cuft
Drainage Area	= 0.56 ac	Runoff Coeff.	= 0.75
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 7.64 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Hydrograph 50-yr Summary

Project Name: Jamey South Parking Lot

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08-14-2025

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Hydrograph Report

Project Name: Jamey South Parking Lot

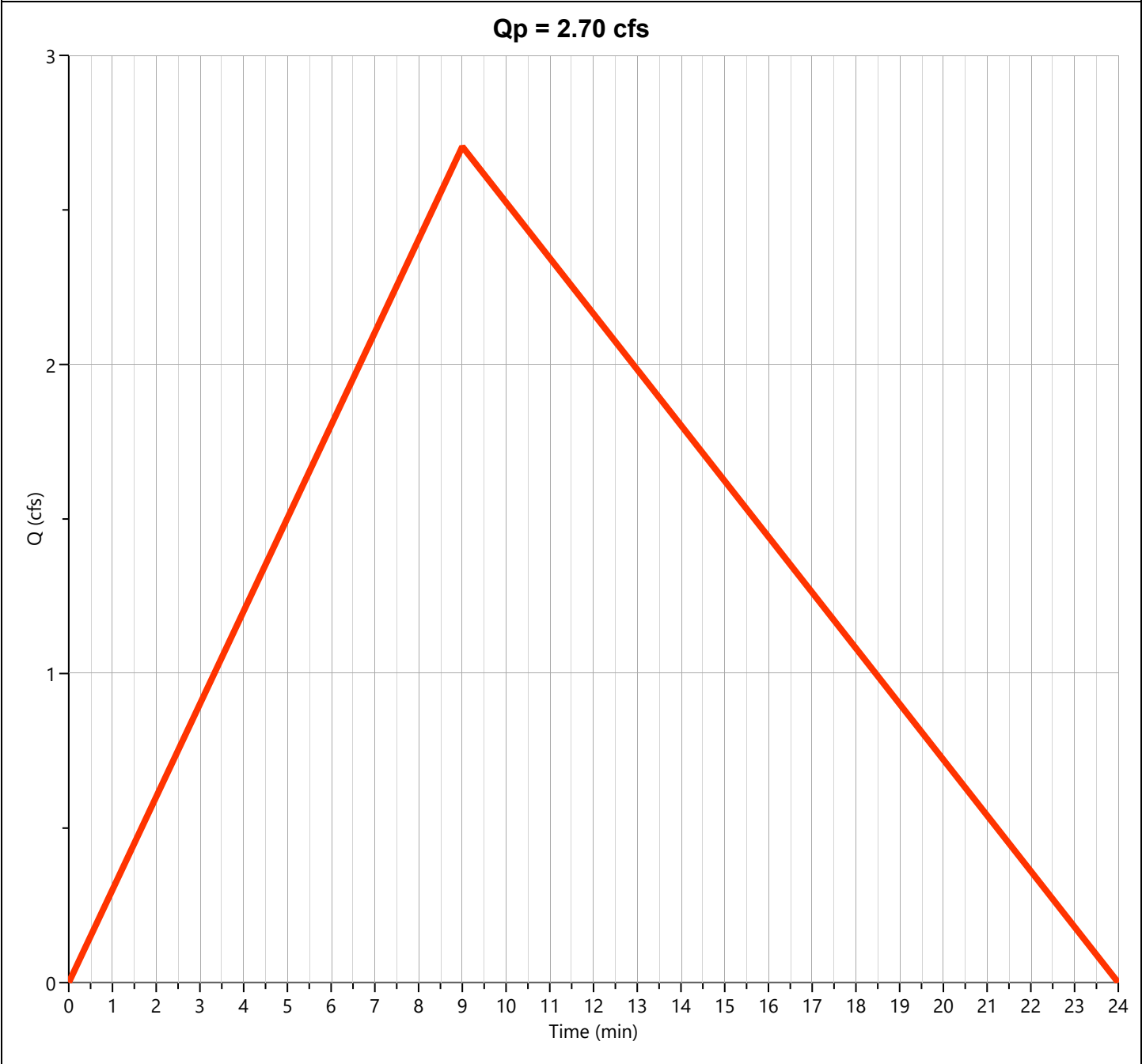
Hydrology Studio v 3.0.0.27

08-14-2025

Pre-Dev Basin

Hyd. No. 1

Hydrograph Type	= Rational	Peak Flow	= 2.705 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.15 hrs
Time Interval	= 1 min	Runoff Volume	= 1,950 cuft
Drainage Area	= 0.56 ac	Runoff Coeff.	= 0.61
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 9.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 7.92 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67

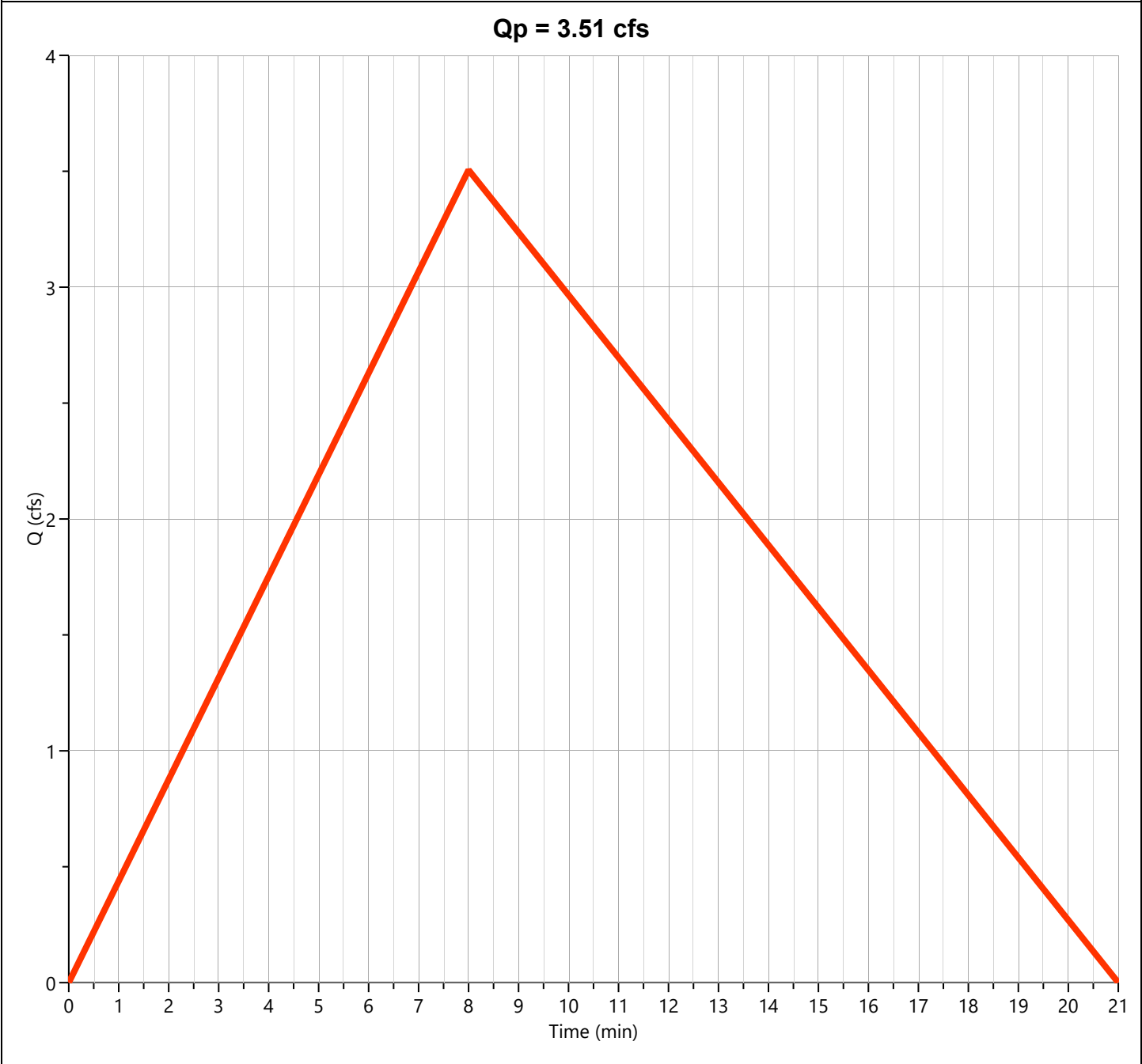


Hydrograph Report

Post-Dev Basin

Hyd. No. 2

Hydrograph Type	= Rational	Peak Flow	= 3.506 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.13 hrs
Time Interval	= 1 min	Runoff Volume	= 2,246 cuft
Drainage Area	= 0.56 ac	Runoff Coeff.	= 0.75
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 8.35 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Hydrograph 100-yr Summary

Project Name: Jamey South Parking Lot

Hydrology Studio v 3.0.0.27

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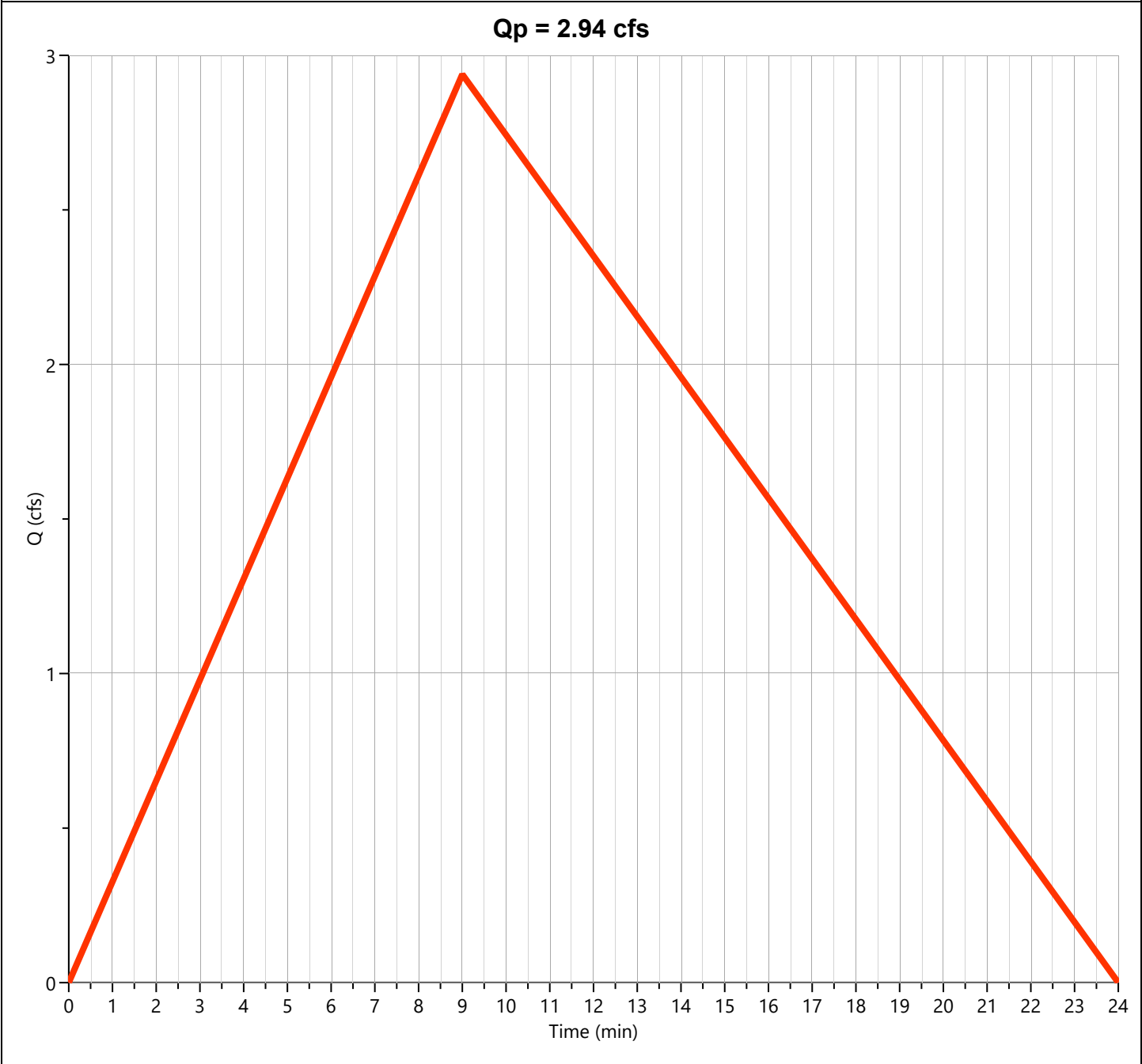
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Hydrograph Report

Pre-Dev Basin

Hyd. No. 1

Hydrograph Type	= Rational	Peak Flow	= 2.938 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.15 hrs
Time Interval	= 1 min	Runoff Volume	= 2,118 cuft
Drainage Area	= 0.56 ac	Runoff Coeff.	= 0.61
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 9.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 8.60 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Hydrograph Report

Project Name: Jamey South Parking Lot

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08-14-2025

Post-Dev Basin

Hyd. No. 2

Hydrograph Type	= Rational	Peak Flow	= 3.809 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.13 hrs
Time Interval	= 1 min	Runoff Volume	= 2,441 cuft
Drainage Area	= 0.56 ac	Runoff Coeff.	= 0.75
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 9.07 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67

