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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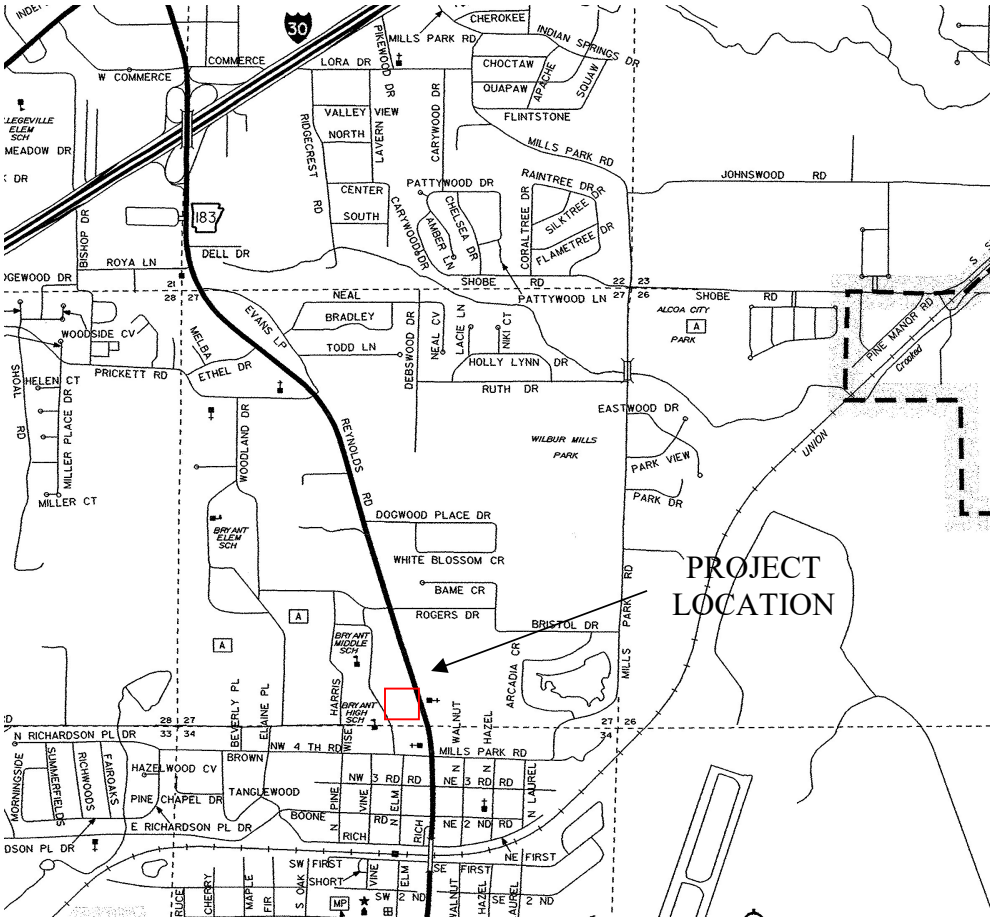
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Project Owner Information

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 Quater 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
Planning ▪ Engineering ▪ Development Consulting

325 West South Street
Benton, AR 72015
(501) 315-7225

(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)

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

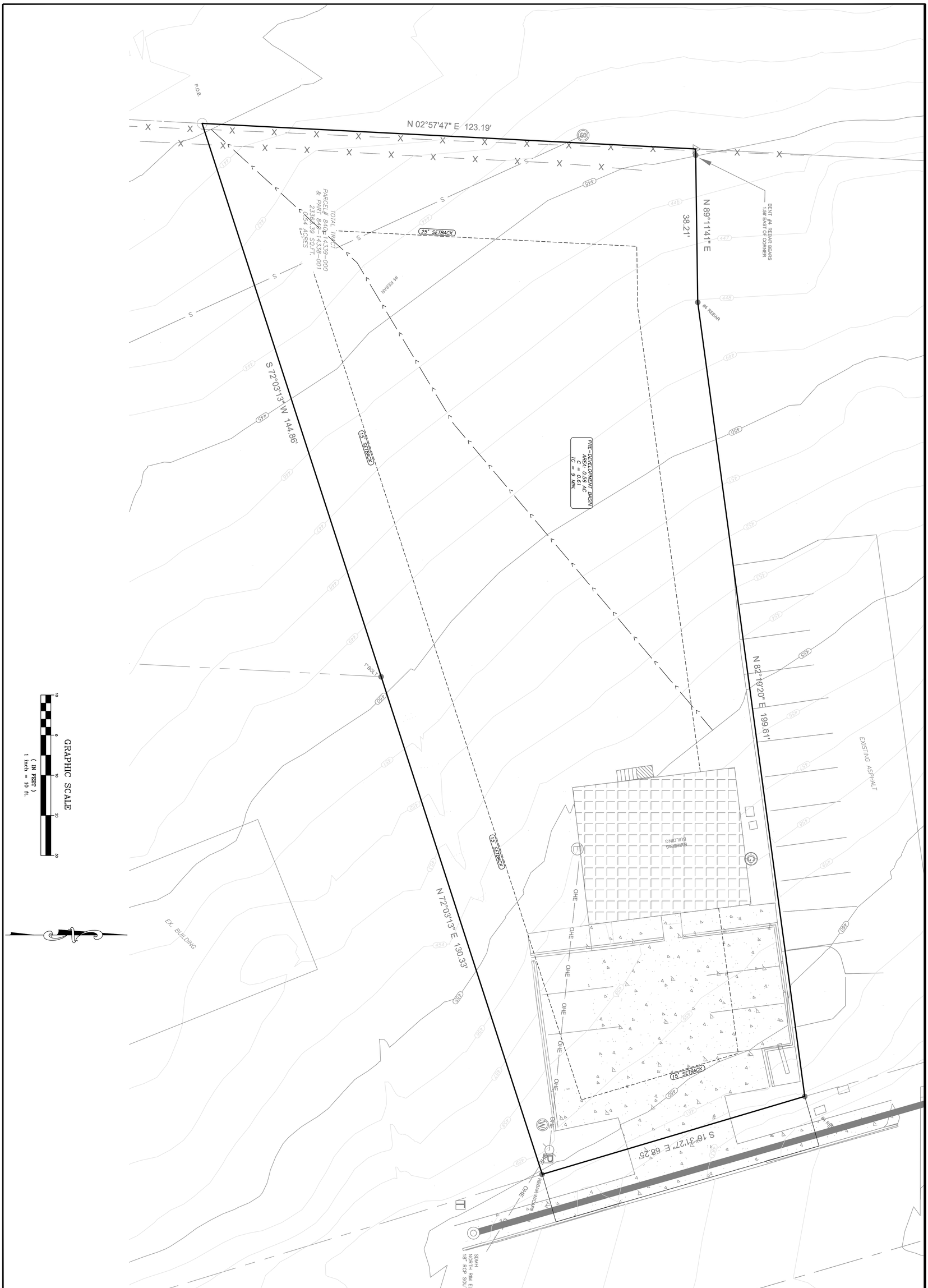
POST-DEV:

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	No.	Revisions	Date	Prepared For: JAMEY SOUTH	PRE-DEVELOPMENT DRAINAGE BASIN STATE FARM – JAMEY SOUTH PROPOSED PARKING LOT 515 N. REYNOLDS ROAD BRYANT, ARKANSAS	CERTIFICATE OF AUTHORIZATION Richardson Engineering, PLLC No. 2519 ARKANSAS	RICHARDSON ENGINEERING Planning • Engineering • Development Consulting 325 W. SOUTH STREET, BENTON, AR 72015 (501)315-7225
Scale: 1" = 10'				515 N. REYNOLDS ROAD			
Date: 8/14/2025				BRYANT, AR 72022			
Sheet: 1 of 2							



PROJECT #: 025-007	No. / Revisions / Date	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
Scale: 1" = 10' Date: 8/14/2025			
Sheet: 2 of 2			

CERTIFICATE OF AUTHORIZATION
Richardson Engineering, PLLC
No. 2519
ARKANSAS

RICHARDSON ENGINEERING
Planning • Engineering • Development Consulting
325 W. SOUTH STREET, BENTON, AR 72015 (501)315-7225

Pre and Post Development Hydrographs (Hydrology Studio)

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Basin Model

Hydrology Studio v 3.0.0.27

Project Name: Jamey South Parking Lot

08-14-2025



Hydrograph by Return Period

Project Name: Jamey South Parking Lot

08-14-2025

Hydrology Studio v 3.0.0.27

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Outflow (cfs)							
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
1	Rational	Pre-Dev Basin		1.608			2.154	2.474	2.705	2.938
2	Rational	Post-Dev Basin		2.085			2.792	3.207	3.506	3.809

Hydrograph 2-yr Summary

Project Name: Jamey South Parking Lot

Hydrology Studio v 3.0.0.27

08-14-2025

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	Rational	Pre-Dev Basin	1.608	0.15	1,159	----		
2	Rational	Post-Dev Basin	2.085	0.13	1,336	----		

Hydrograph Report

Project Name: Jamey South Parking Lot

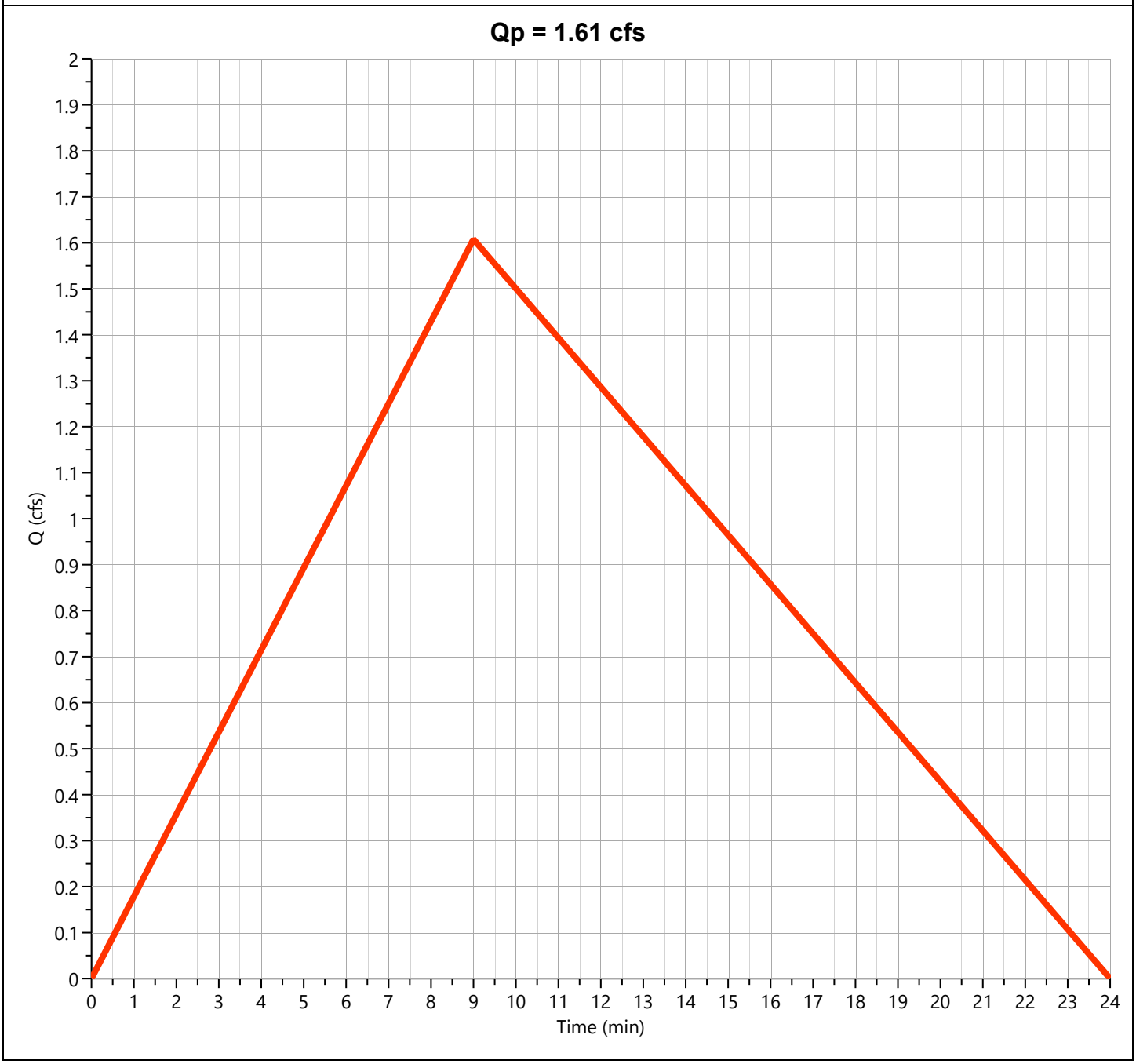
Hydrology Studio v 3.0.0.27

08-14-2025

Pre-Dev Basin

Hyd. No. 1

Hydrograph Type	= Rational	Peak Flow	= 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			
	A	B	C	Tc (min)
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**

Hydrograph Report

Project Name: Jamey South Parking Lot

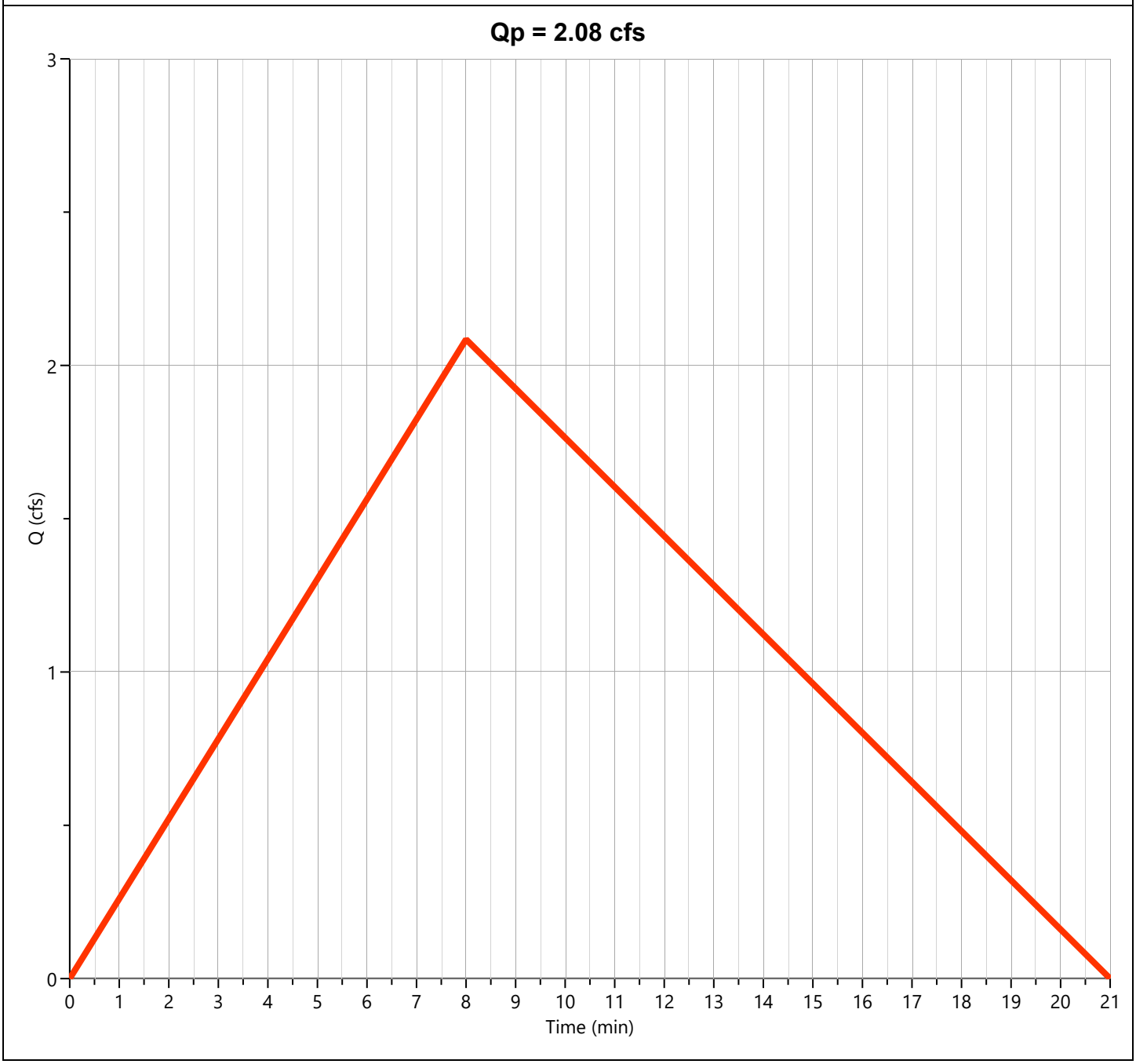
Hydrology Studio v 3.0.0.27

08-14-2025

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

Hydrology Studio v 3.0.0.27

08-14-2025

Post-Dev Basin
Rational

Hyd. No. 2

Description	Segments			
	A	B	C	Tc (min)
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

08-14-2025

Hydrology Studio v 3.0.0.27

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	Rational	Pre-Dev Basin	2.154	0.15	1,552	----		
2	Rational	Post-Dev Basin	2.792	0.13	1,789	----		

Hydrograph Report

Project Name: Jamey South Parking Lot

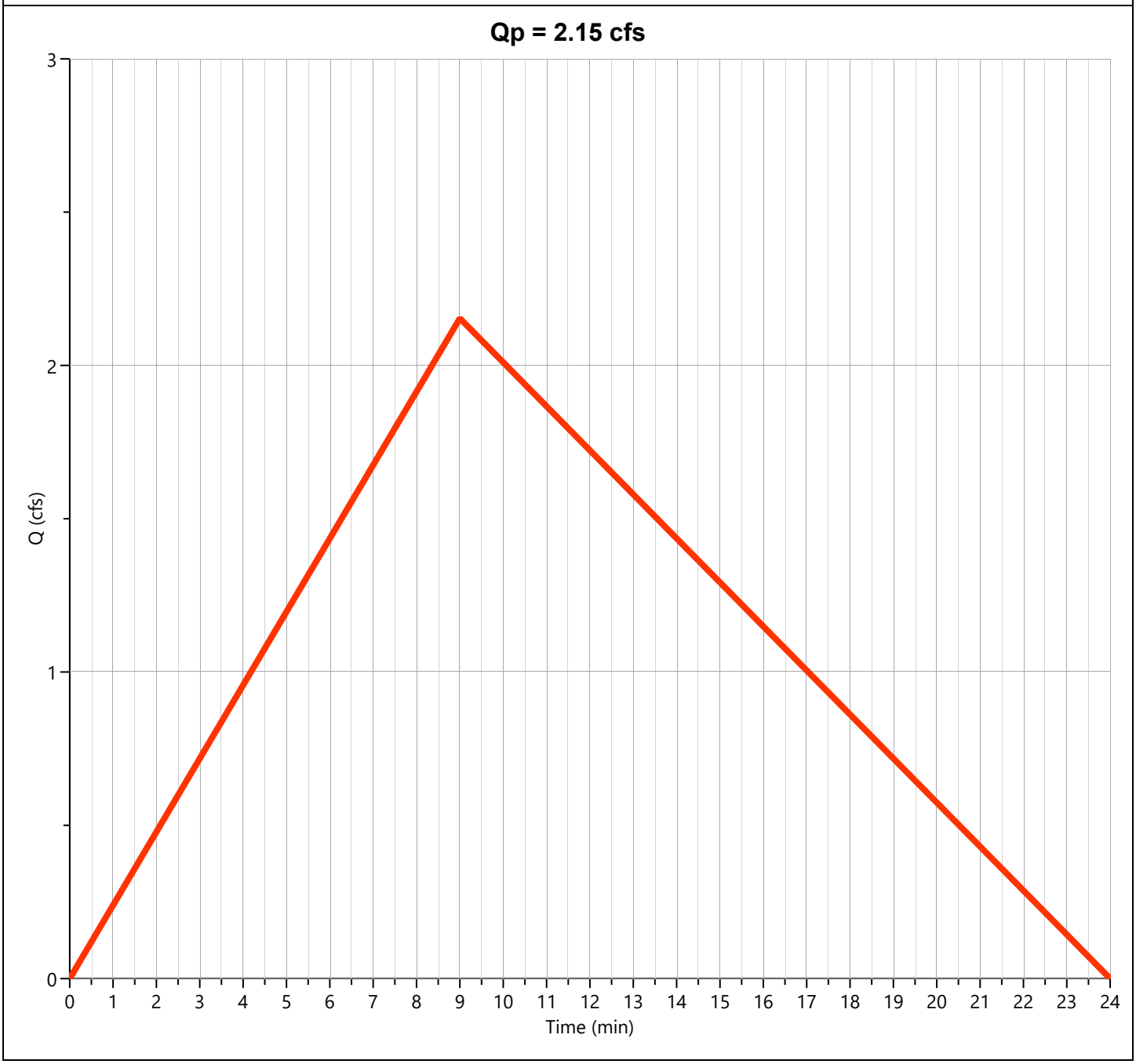
Hydrology Studio v 3.0.0.27

08-14-2025

Pre-Dev Basin

Hyd. No. 1

Hydrograph Type	= Rational	Peak Flow	= 2.154 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

Project Name: Jamey South Parking Lot

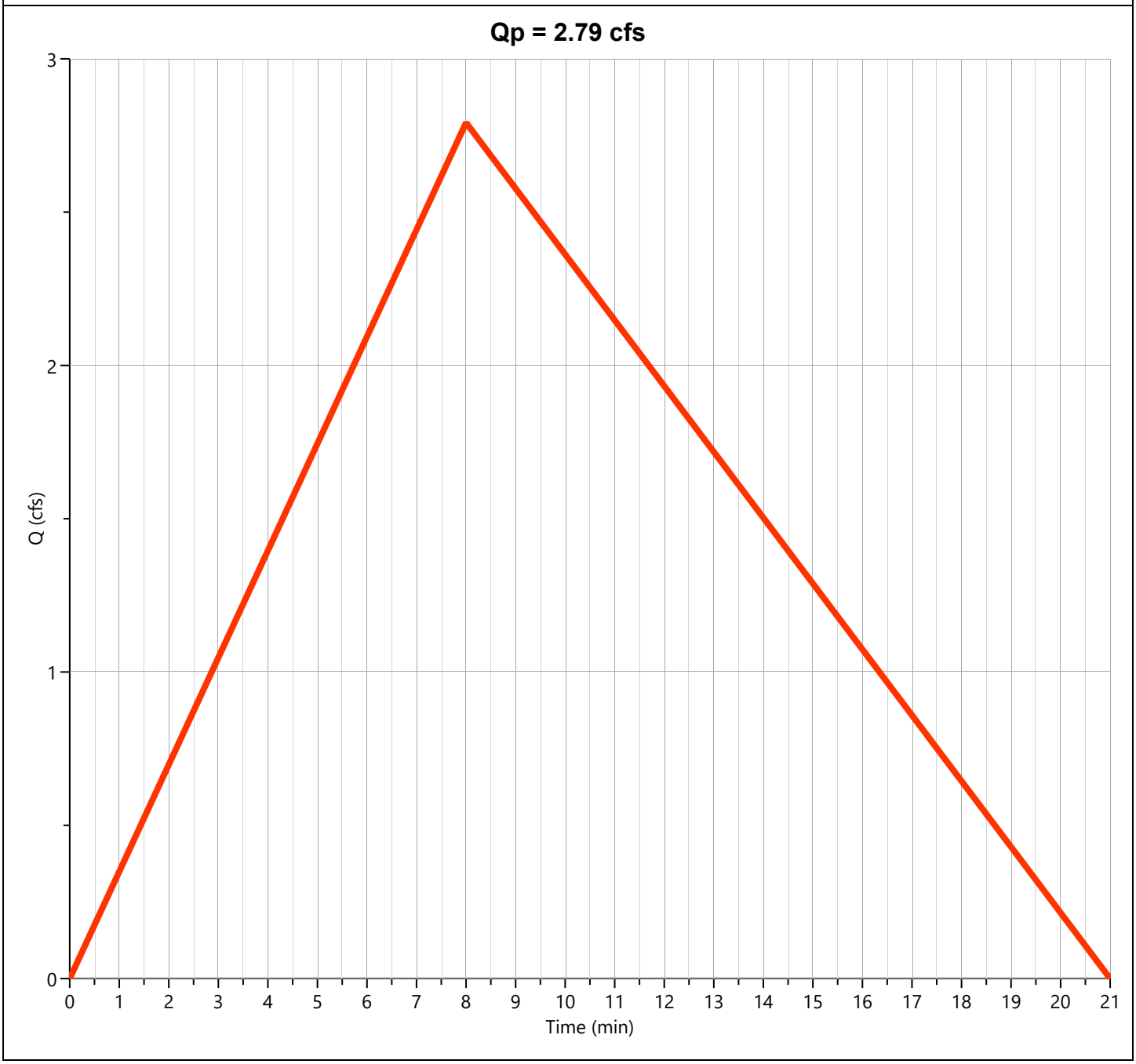
Hydrology Studio v 3.0.0.27

08-14-2025

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

08-14-2025

Hydrology Studio v 3.0.0.27

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	Rational	Pre-Dev Basin	2.474	0.15	1,784	----		
2	Rational	Post-Dev Basin	3.207	0.13	2,055	----		

Hydrograph Report

Project Name: Jamey South Parking Lot

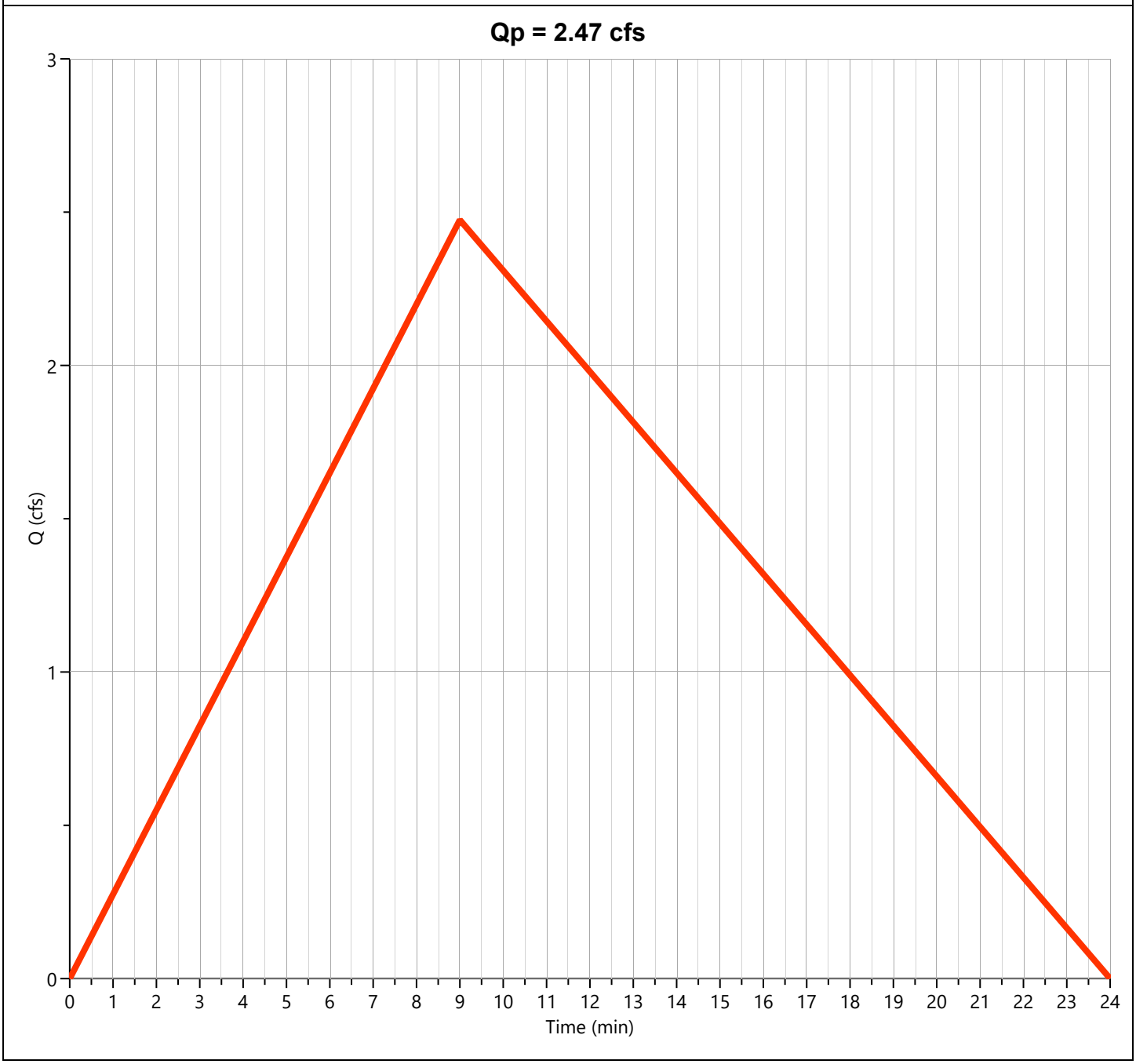
Hydrology Studio v 3.0.0.27

08-14-2025

Pre-Dev Basin

Hyd. No. 1

Hydrograph Type	= Rational	Peak Flow	= 2.474 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



Hydrograph Report

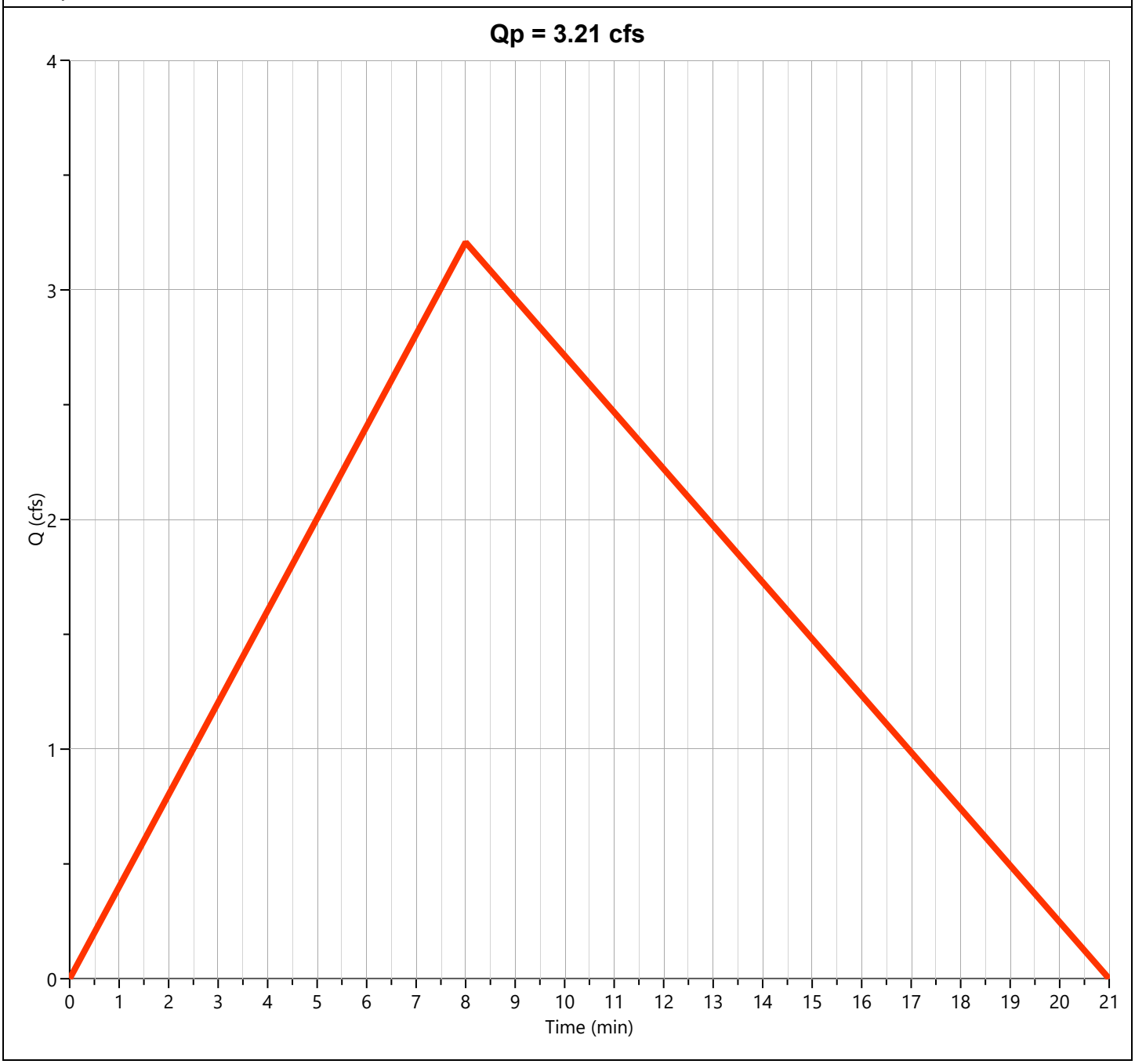
Hydrology Studio v 3.0.0.27

08-14-2025

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

08-14-2025

Hydrology Studio v 3.0.0.27

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	Rational	Pre-Dev Basin	2.705	0.15	1,950	----		
2	Rational	Post-Dev Basin	3.506	0.13	2,246	----		

Hydrograph Report

Project Name: Jamey South Parking Lot

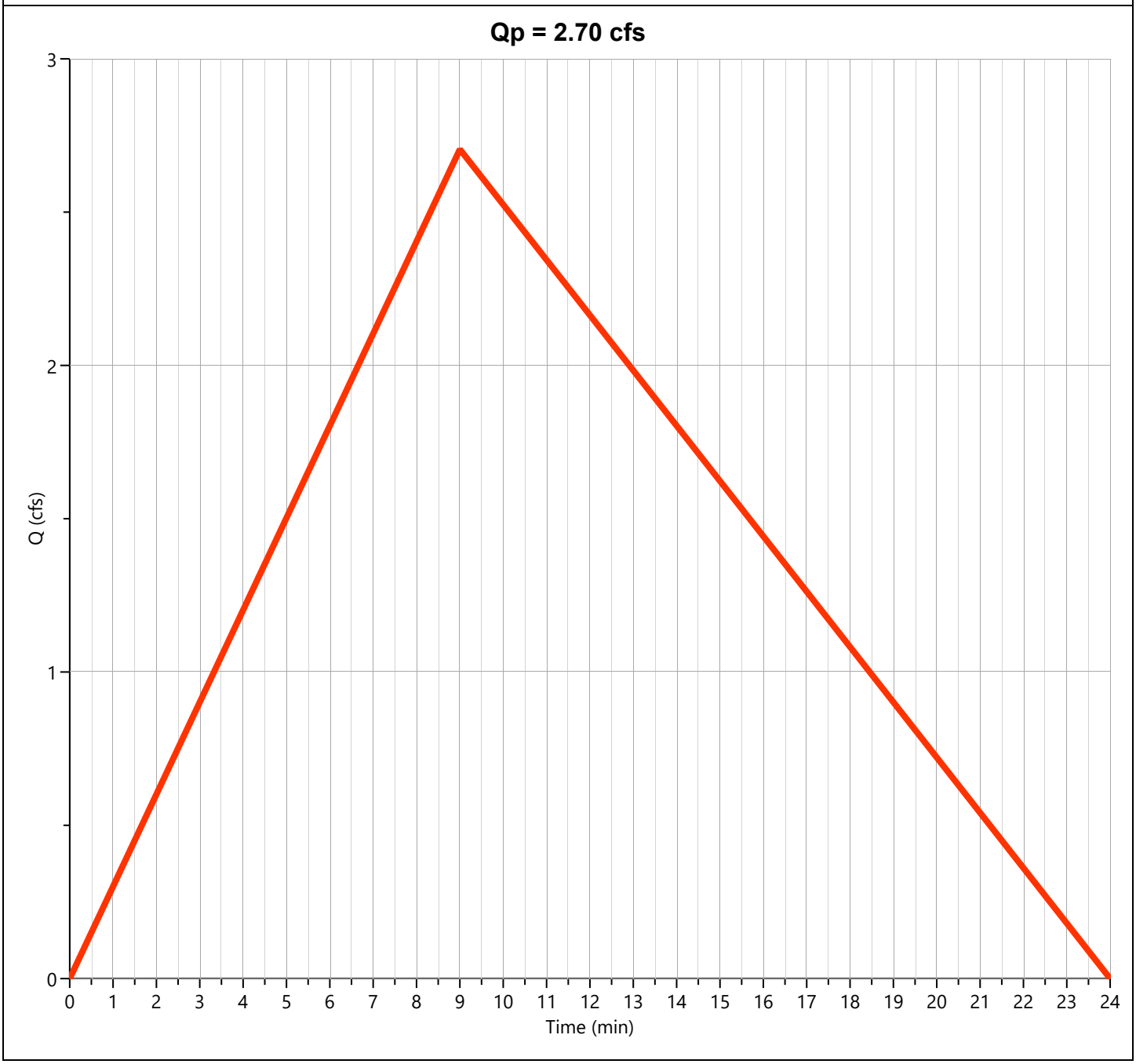
Hydrology Studio v 3.0.0.27

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

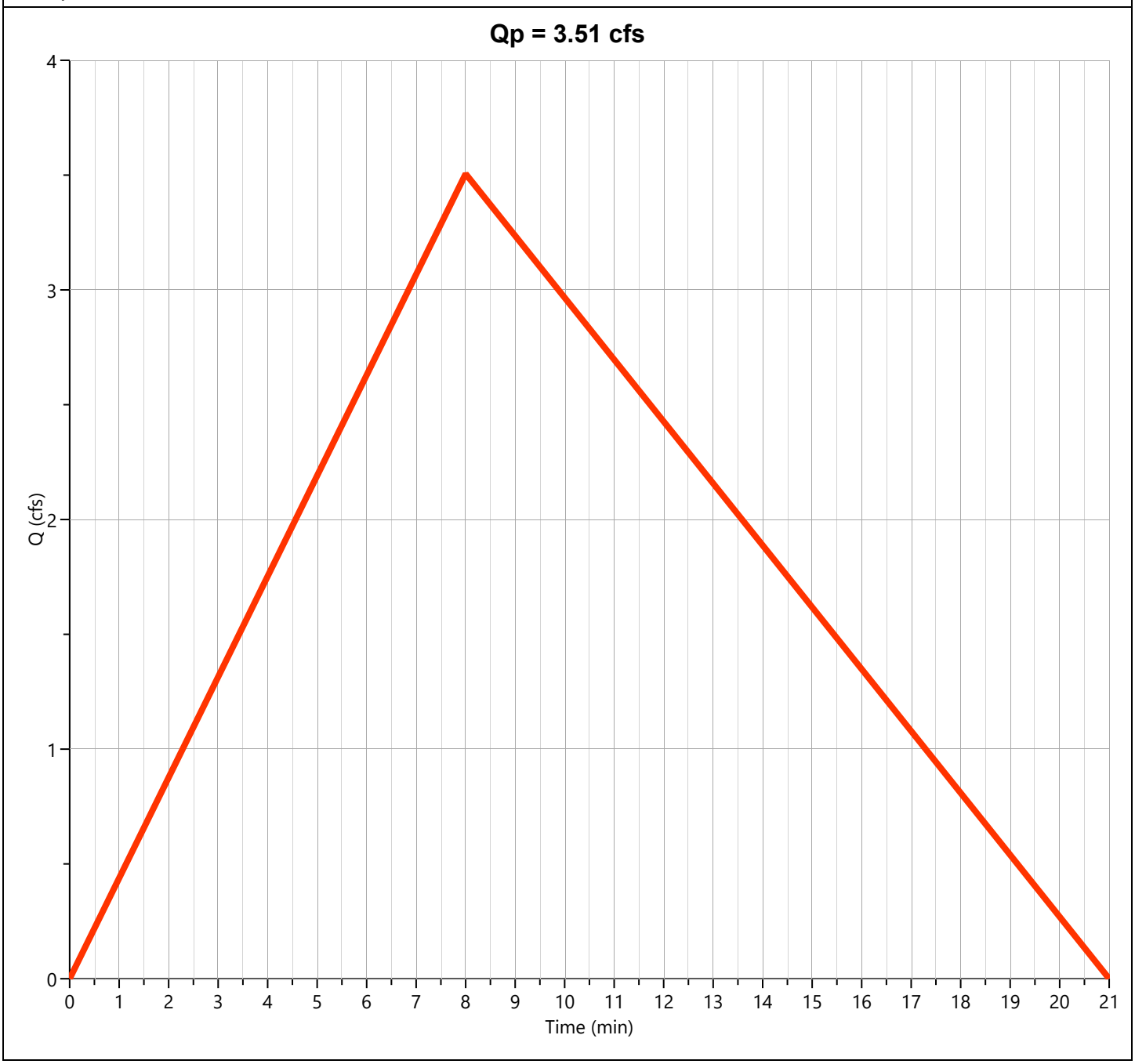
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08-14-2025

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

08-14-2025

Hydrology Studio v 3.0.0.27

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	Rational	Pre-Dev Basin	2.938	0.15	2,118	----		
2	Rational	Post-Dev Basin	3.809	0.13	2,441	----		

Hydrograph Report

Project Name: Jamey South Parking Lot

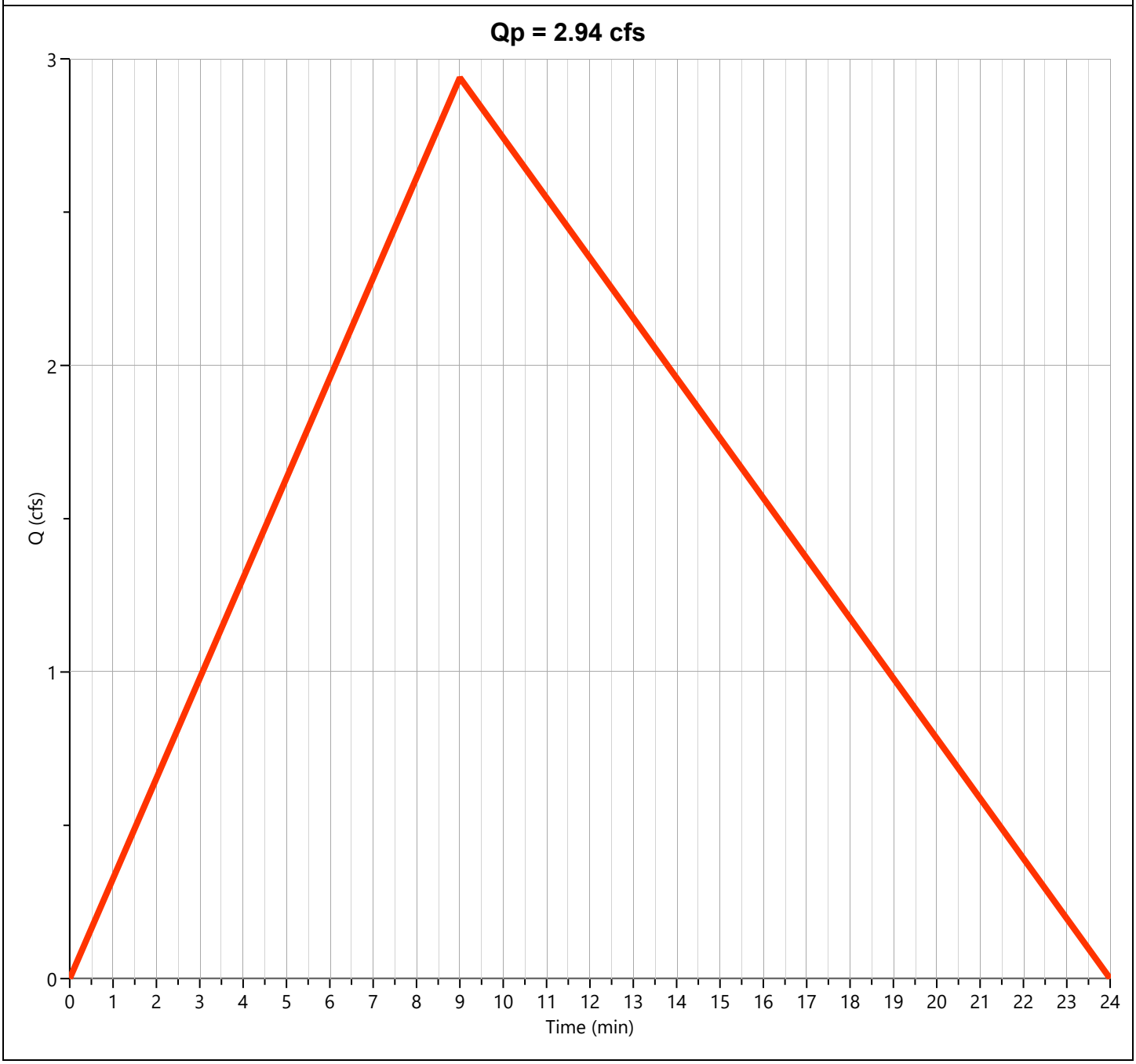
Hydrology Studio v 3.0.0.27

08-14-2025

Pre-Dev Basin

Hyd. No. 1

Hydrograph Type	= Rational	Peak Flow	= 2.938 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

Hydrology Studio v 3.0.0.27

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

