Drainage Report

For

Hilltop Manor Subdivision

Bryant, Saline County, Arkansas



March 4, 2025

Prepared by:

RICHARDSON ENGINEERING, PLLC

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

TABLE OF CONTENTS

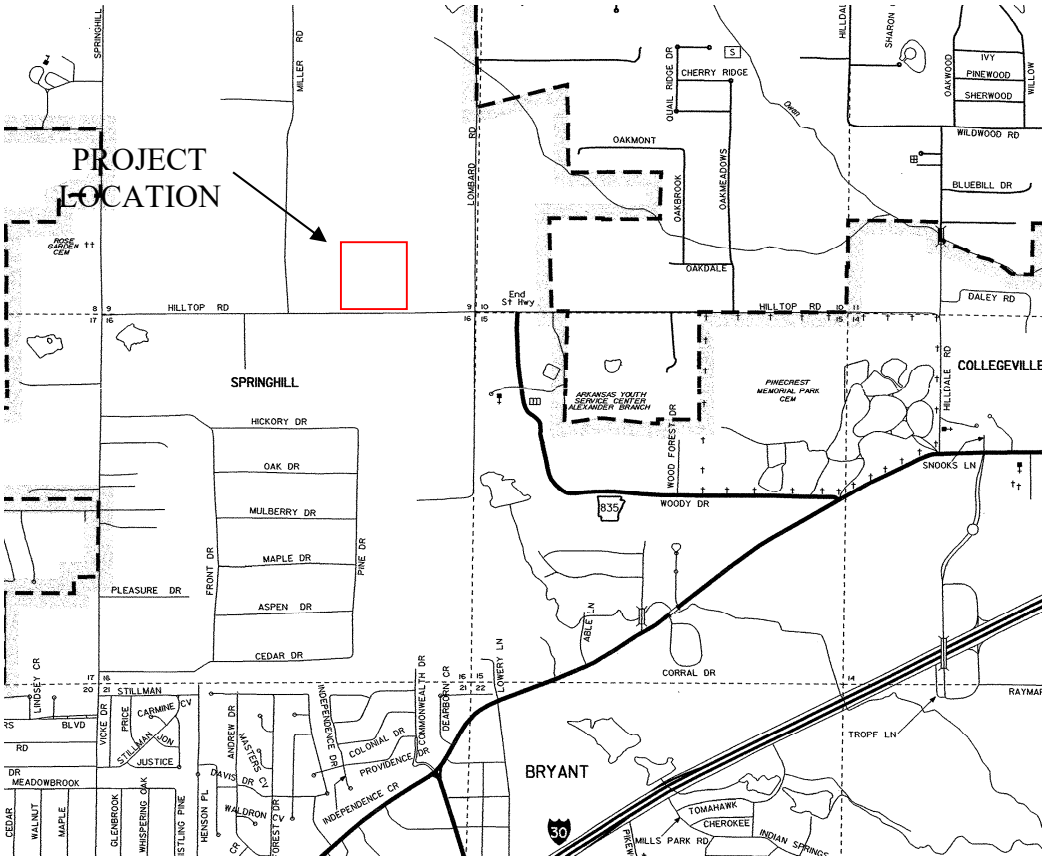
Title	Page Number
Project Owner Information	3
Project Location and Description	3
Site Drainage	4
Pre-Development	4
Post-Development	4
Runoff Summary's	5
Pre-Development Drainage Basin Information	5
Overall Site Post- Development Drainage Basin Information	6
Basin A	7
Basin B	7
Basin C	8
Basin D	8
Basin E	9
Basin F	10
Recommendations/Summary	10
Appendices:	11
Runoff Coefficient Calculation	12
Time of Concentration Calculation	13
NRCS Soil Report	14
NOAA Atlas 14 Data	15
Site Drainage Basin Maps	16
Overflow Wier Blockage Calculation	17
SSA Design Layout	18
Storm System Design (SSA)	19
2 Year Design Storm	20
10 Year Design Storm	21
25 Year Design Storm	22
50 Year Design Storm	23
100 Year Design Storm	24
Detention Pond Storage Estimate	25
Culvert Blockage Simulation	26
Pre and Post Development Hydrographs (Hydrology Studio)	27

Project Owner Information

Eminent Construction
1100 Hillfarm Road
Bryant, AR 72022

Project Location and Description

The project is located on North side of the Hilltop, part of the Southwest Quater of the Southeast Quarter, Section 9, Township 1-S, Range 14-W, Saline County, Arkansas.



Vicinity Map – N.T.S

This project is a proposed Residential Subdivision, consisting of 78 lots, located in the City of Bryant, Saline County.

Site Drainage

Pre-Development

The pre-developed runoff for the site flows to the East and West. The on-site drainage basins have been broken down into six separate basins that discharge water off-site. Drainage Basins A, B, and C discharge water to the West, Basin D, E and F discharge water to the East. The pre-development drainage basin delineation can be found in the appendix of this report.

The pre-development on-site runoff condition is undeveloped/woods.

Post-Development

The site drainage starts on the Western side of the project and flows to the East and West. The drainage is sheet flows across the lots and roads and is intercepted by the proposed storm sewer system and is discharged into a proposed detention basin on the Eastern side of the proposed development.

The City of Bryant Drainage Manual utilized different C values for each storm event. The C value for the 100-year design storm was utilized for all storm events for the drainage analysis for this site.

The minimum required volume of the detention basin was found by comparing the pre-development rational method hydrograph for the area that the detention pond is being discharged, to the post-development modified rational method hydrograph for the area that the detention basin is receiving using the Hydrology Studio program. The minimum required volume was found to be 42,611 CF for the 100-year storm event. In order to meet the City of Bryants Stormwater Manual detention requirements, the detention pond has to be sized with at least a 25% factory of safety; therefore, the minimum size of the detention pond is 53,264 CF.

Post-Development Basin A, B, and C consist of the lots on the Western border and off-site areas. Post-development Basins A, B, and C all discharge to the West of the proposed development. Post Development Basin D consists of the back half of the lots on the north line as well as off-site areas. Basin D discharges to Phase 2 of the Lombard Heights subdivision. The proposed detention basin will utilize a culvert/weir discharge structure. Post-Development Basin “E-1” is the drainage basin that discharges water into the proposed detention basin. Post-development drainage basin “E-1” consists of the majority of the storm drain system for the proposed development as well as the detention pond area. Post-Development Basin E-2 consists of the remaining storm drain system that does not get discharged into the proposed detention pond as well as off-site areas. Basin E-1 and E-2 discharge to the East. Post-Development Basin F consists of the back half of lots on the South line and off-site areas. Basin F discharges to the East. Basins A, B, C, D, E-2, and F are not routed through the detention basin, so they were calculated by themselves. A delineation for the drainage basins that were used in Hydrology Studio (for

the overall site drainage basins), as well as a delineation of the basins that were used in Storm and Sanitary Analysis (on-site storm inlets) can be seen in the appendix of this report.

The post-development on-site runoff conditions changed from undeveloped/woods to single family residential development.

Runoff Summary's

Overall Project Site Area: 29.16 Acres

Pre- Development Drainage Basin Information

Overall Pre-Development Drainage Basin Study Area: 71.08 Acres

Drainage Basins	Drainage Area (Ac)	C Value	Time of Concentration (min)
Basin A	3.20	0.62	11
Basin B	14.74	0.52	15
Basin C	6.84	0.55	11
Basin D	2.95	0.50	8
Basin E-1	11.20	0.50	12
Basin E-2	18.96	0.52	13
Basin F	13.19	0.53	17

Design Storm	Basin A (cfs)	Basin B (cfs)	Basin C (cfs)	Basin D (cfs)
2-yr	8.53	28.63	16.17	7.32
10-yr	11.43	38.41	21.67	9.80
25-yr	13.13	44.15	24.90	11.26
50-yr	14.36	48.29	27.23	12.31
100-yr	15.60	52.42	29.57	13.38

Design Storm	Basin E-1 (cfs)	Basin E-2 (cfs)	Basin F (cfs)
2-yr	23.14	39.29	24.68
10-yr	31.02	52.69	33.12
25-yr	35.65	60.55	38.07
50-yr	38.98	66.22	41.64
100-yr	42.33	71.90	45.20

Overall Site Post- Development Drainage Basin Information

Overall Post-Development Drainage Study Area: 71.08 Acres

Drainage Basins	Drainage Area (Ac)	C Value	Time of Concentration (min)
Basin A	3.53	0.66	14
Basin B	12.45	0.56	18
Basin C	6.75	0.57	11
Basin D	2.59	0.56	8
Basin E-1	16.23	0.66	17
Basin E-2	17.53	0.56	13
Basin F	12.00	0.56	16

Design Storm	Basin A (cfs)	Basin B (cfs)	Basin C (cfs)	Basin D (cfs)
2-yr	8.98	23.98	16.54	7.20
10-yr	12.04	32.19	22.16	9.64
25-yr	13.84	37.00	25.47	11.08
50-yr	15.14	40.48	27.85	12.11
100-yr	16.43	43.93	30.24	13.15

Design Storm	Basin E-1 (cfs)	Basin E-2 (cfs)	Basin F (cfs)
2-yr	37.81	39.12	24.38
10-yr	50.74	52.46	32.71
25-yr	58.33	60.29	37.60
50-yr	63.81	65.94	41.13
100-yr	69.26	71.59	44.65

Basin A

Pre-Development Drainage Study Area = 3.20
Post-Development Drainage Study Area = 3.53
Existing Condition runoff Coefficient: C = 0.62
Proposed runoff Coefficient: C = 0.66
Tc Undeveloped = 11 Minutes (TR55 Method)
Tc Developed = 14 Minutes (TR55 Method)

Design Storm	Pre-Development Flow Rate (cfs)	Post-Development Flow Rate (cfs)	Difference (cfs)
2-yr	8.53	8.98	+0.45
10-yr	11.43	12.04	+0.61
25-yr	13.13	13.84	+0.71
50-yr	14.36	15.14	+0.78
100-yr	15.60	16.43	+0.83

Basin B

Pre-Development Drainage Study Area = 14.7
Post-Development Drainage Study Area = 12.45
Existing Condition runoff Coefficient: C = 0.52
Proposed runoff Coefficient: C = 0.56
Tc Undeveloped = 15 Minutes (TR55 Method)
Tc Developed = 18 Minutes (TR55 Method)

Design Storm	Pre-Development Flow Rate (cfs)	Post-Development Flow Rate (cfs)	Difference (cfs)
2-yr	28.63	23.98	-4.65
10-yr	38.41	32.19	-6.22
25-yr	44.15	37.00	-7.15
50-yr	48.29	40.48	-7.81
100-yr	52.42	43.93	-8.49

Basin C

Pre-Development Drainage Study Area = 6.84
Post-Development Drainage Study Area = 6.75
Existing Condition runoff Coefficient: C = 0.55
Proposed runoff Coefficient: C = 0.57
Tc Undeveloped = 11 Minutes (TR55 Method)
Tc Developed = 11 Minutes (TR55 Method)

Design Storm	Pre-Development Flow Rate (cfs)	Post-Development Flow Rate (cfs)	Difference (cfs)
2-yr	16.17	16.54	+0.37
10-yr	21.67	22.16	+0.49
25-yr	24.90	25.47	+0.57
50-yr	27.23	27.85	+0.62
100-yr	29.57	30.24	+0.67

Basin D

Pre-Development Drainage Study Area = 2.95
Post-Development Drainage Study Area = 2.59
Existing Condition runoff Coefficient: C = 0.50
Proposed runoff Coefficient: C = 0.56
Tc Undeveloped = 8 Minutes (TR55 Method)
Tc Developed = 8 Minutes (TR55 Method)

Design Storm	Pre-Development Flow Rate (cfs)	Post-Development Flow Rate (cfs)	Difference (cfs)
2-yr	7.32	7.20	-0.12
10-yr	9.80	9.64	-0.16
25-yr	11.26	11.08	-0.18
50-yr	12.31	12.11	-0.20
100-yr	13.38	13.15	-0.23

Basin E

Pre-Development Drainage Study Area = 30.16
Post-Development Drainage Study Area = 33.76
Existing Condition runoff Coefficient: C = 0.50/0.52
Proposed runoff Coefficient: C = 0.66/0.56
Tc Undeveloped = 12/13 Minutes (TR55 Method)
Tc Developed = 17/13 Minutes (TR55 Method)
Detention Basin Required Volume: 42,611 CF
Detention Basin Volume: 177,357 CF
Maximum Storage: 92,311 CF
Discharge Structure: Culvert/Weir

Design Storm	Pre-Development Flow Rate (cfs)	Post-Development Flow Rate (cfs)	Post-Development w/ Detention Flow Rate (cfs)	Maximum Water Elevation in Pond (ft)
2-yr	61.27	69.48	39.66	477.15
10-yr	82.16	93.21	53.39	477.88
25-yr	94.42	107.1	61.49	478.31
50-yr	103.3	117.2	67.36	478.63
100-yr	112.1	127.2	73.24	478.93

Should the culvert get 100 percent blocked and the water can only be discharged from the pond over the top of the overflow weir structure, the maximum water elevation in the pond reaches 479.92. The water elevations for the other design storms can be seen in the appendix.

Basin F

Pre-Development Drainage Study Area = 13.19
Post-Development Drainage Study Area = 12.00
Existing Condition runoff Coefficient: C = 0.53
Proposed runoff Coefficient: C = 0.56
Tc Undeveloped = 17 Minutes (TR55 Method)
Tc Developed = 16 Minutes (TR55 Method)

Design Storm	Pre-Development Flow Rate (cfs)	Post-Development Flow Rate (cfs)	Difference (cfs)
2-yr	24.68	24.38	-0.30
10-yr	33.12	32.71	-0.41
25-yr	38.07	37.60	-0.47
50-yr	41.64	41.13	-0.51
100-yr	45.20	44.65	-0.55

Recommendations/Summary

The proposed drainage improvements include a storm sewer system and a detention basin on the Eastern side of the project. The proposed detention basin releases the post development runoff at a lower rate than the pre-development condition.

Appendices

Runoff Coefficient Calculations
Time of Concentration Calculation
NRCS Soil Report
NOAA Atlas 14 Data
Site Drainage Basin Map
Overflow Wier Blockage Calculation
SSA Design Layout
Storm System Design (SSA)
Detention Pond Storage Estimate
Culvert Blockage Simulation
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

(1/7)

PROJECT 024-034 DRAINAGE ANALYSIS DATE 03/03/2026

PRE-DEV BASIN "A" AREA: 3.20 AC

IMPERVIOUS: 0.20 AC C = 0.95

RESIDENTIAL: 2.09 AC C = 0.65
(1/2 OR LARGER)

UNDEVELOPED: 0.39 AC C = 0.50 (CLAY SOIL AVG 2-7%)

DITCHES: 0.52 AC C = 0.49 (FAIR CONDITION AVG 2-7%)

$$C = \frac{(0.20)(0.95) + (2.09)(0.65) + (0.39)(0.50) + (052)(0.49)}{3.20}$$

$$= 0.62$$

PRE-DEV BASIN "B" AREA: 14.74 AC

IMPERVIOUS: 0.19 AC C = 0.95

RESIDENTIAL: 0.29 AC C = 0.65
(1/2 OR LARGER)

UNDEVELOPED: 14.26 AC C = 0.50

$$C = \frac{(0.19)(0.95) + (0.29)(0.65) + (14.26)(0.50)}{14.74} = 0.51$$

RICHARDSON ENGINEERING
Planning ▪ Engineering ▪ Development Consulting

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

(2/7)

PROJECT 024-034 DRAINAGE ANALYSIS DATE 03/03/2026

PRE-DEV BASIN "C" AREA: 6.84 AC

IMPERVIOUS: 0.10 AC C = 0.95

RESIDENTIAL (1/2 or >) : 1.66 AC C = 0.65

COMMERCIAL: 0.23 AC (WET) C = 0.80

UNDEVELOPED: 4.85 AC C = 0.50

$$C = \frac{(0.10)(0.95) + (1.66)(0.65) + (0.23)(0.80) + (4.85)(0.50)}{6.84}$$

$$= 0.55$$

PRE-DEV BASIN "D" AREA: 2.95 AC

UNDEVELOPED: 2.95 AC C = 0.50

PRE-DEV BASIN "E-1" AREA: 11.20 AC

UNDEVELOPED: 11.20 AC C = 0.50

RICHARDSON ENGINEERING
Planning ▪ Engineering ▪ Development Consulting

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

(3/7)

PROJECT 024-034 DRAINAGE ANALYSIS DATE 03/03/2026

PRE-DEV BASIN "E-2" AREA: 18.96 AC

SINGLE FAMILY RES.	1.20 AC	C = 0.70
RESIDENTIAL (½ ac >)	1.0 AC	C = 0.65
UNDEVELOPED:	16.76 AC	C = 0.50

$$C = \frac{(1.20)(0.70) + (1.0)(0.65) + (16.76)(0.50)}{18.96} = 0.52$$ "

PRE-DEV BASIN "F" AREA: 13.19 AC

IMPERVIOUS:	0.35 AC	C = 0.95
RESIDENTIAL (½ ac >)	1.62 AC	C = 0.65
UNDEVELOPED:	11.22 AC	C = 0.50

$$C = \frac{(0.35)(0.95) + (1.62)(0.65) + (11.22)(0.50)}{13.19} = 0.53$$ "

RICHARDSON ENGINEERING
Planning ▪ Engineering ▪ Development Consulting

325 West South Street
Benton, AR 72015
(501) 315-7225
(4/7)

PROJECT 024-034 DRAINAGE ANALYSIS DATE 03/03/2026

POST-DEV BASIN "A" AREA: 3.53 AC

IMPERVIOUS: 0.28 AC C = 0.95

RESIDENTIAL: 2.09 AC C = 0.65
(1/4 OR >)

SINGLE FAMILY: 0.68 AC C = 0.70

DITCHES: 0.48 AC C = 0.49

$$C = \frac{(0.28)(0.95) + (2.09)(0.65) + (0.68)(0.70) + (0.48)(0.49)}{3.53}$$

$= 0.66$

POST-DEV BASIN "B" AREA: 12.45 AC

IMPERVIOUS: 0.19 AC C = 0.95

RESIDENTIAL: 0.29 AC C = 0.65
(1/2 OR LARGER)

SINGLE FAMILY: 3.33 AC C = 0.70

UNDEVELOPED: 8.64 AC C = 0.50

$$C = \frac{(0.19)(0.95) + (0.29)(0.65) + (3.33)(0.70) + (8.64)(0.50)}{12.45}$$

$= 0.56$

RICHARDSON ENGINEERING
Planning ▪ Engineering ▪ Development Consulting

325 West South Street
Benton, AR 72015
(501) 315-7225
(5/7)

PROJECT 024-034 DRAINAGE ANALYSIS DATE 03/03/2020

POST - DEV BASIN "C" AREA: 6.75 AC

IMPERVIOUS: 0.10 AC C = 0.95

RESIDENTIAL: 1.66 AC C = 0.65
(½ OF 7)

SINGLE FAMILY: 0.44 AC C = 0.70

COMMERCIAL: 0.23 AC C = 0.80
(LOT)

UNDEVELOPED: 4.32 AC C = 0.50

$$C = \frac{(0.10)(0.95) + (1.66)(0.65) + (0.44)(0.70) + (0.23)(0.80) + (4.32)(0.50)}{6.75}$$

$$= 0.57$$

POST - DEV BASIN "D" AREA: 2.59 AC

SINGLE FAMILY: 0.73 AC C = 0.70

UNDEVELOPED: 1.86 AC C = 0.50

$$C = \frac{(0.73)(0.70) + (1.86)(0.50)}{2.59} = 0.56$$

RICHARDSON ENGINEERING
Planning ▪ Engineering ▪ Development Consulting

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

(6/7)

PROJECT 024-034 DRAINAGE ANALYSIS DATE 03/03/2026

POST-DEV BASIN "E-1" AREA: 16.23 ac

SINGLE FAMILY : 13.30 C = 0.70

UNDEVELOPED : 2.93 ac C = 0.50

$$C = \frac{(13.30)(0.70) + (2.93)(0.50)}{16.23} = 0.66$$

POST-DEV BASIN "E-2" AREA: 17.53 ac

SINGLE FAMILY : 4.52 ac C = 0.70

RESIDENTIAL : (1/2 ac lots) 1.0 ac C = 0.65

UNDEVELOPED: 11.69 ac C = 0.50

GRAVEL : 0.32 ac C = 0.65

$$C = \frac{(4.52)(0.70) + (1.0)(0.65) + (11.69)(0.50) + (0.32)(0.65)}{17.53}$$

$$= 0.56$$

RICHARDSON ENGINEERING
Planning ▪ Engineering ▪ Development Consulting

325 West South Street
Benton, AR 72015
(501) 315-7225
(7/7)

PROJECT 024-034 DRAINAGE ANALYSIS DATE 03/03/2026

POST-DEV BASIN "F" AREA: 12.0 AC

IMPERVIOUS: 0.47 AC C = 0.95

SINGLE FAMILY: 1.60 AC C = 0.70

RESIDENTIAL (½ ac or larger): 1.62 AC C = 0.65

UNDEVELOPED: 8.31 AC C = 0.50

$$C = \frac{(0.47)(0.95) + (1.60)(0.70) + (1.62)(0.65) + (8.31)(0.50)}{12.0}$$

$$= 0.56$$

Runoff Coefficients

Land Use Types	Frequency 10	25	100
Business			
Central Business District	0.9	0.93	0.95
Commercial Area	.85 (.70-.95)*	0.9	0.95
Neighborhood Area	.70 (.50-.75)	0.75	0.8
Residential			
Single Family	.50 (.30-.60)	0.6	0.7
Multi-Unit (Detached)	.60 (.40-.65)	0.65	0.75
Multi-Unit (Attached)	.70 (.60-.75)	0.75	0.8
½ Acre Lots or Larger	.40 (.25-.50)	0.45	0.65
Apartments	.70 (.50-.80)	0.75	0.8
Industrial			
Light Areas	.80 (.50-.85)	0.82	0.85
Heavy Areas	.85 (.60-.90)	0.87	0.9
Miscellaneous			
Parks and Cemeteries	.30 (.10-.40)	0.4	0.6
Playgrounds	.35 (.20-.40)	0.5	0.7
Schools and Churches	.60 (.50-.75)	0.65	0.75
Railroad Yards	.50 (.30-.60)	0.6	0.7
Offsite Flow Analysis (When Land Use Not Defined)	.55 (.45-.65)	0.67	0.7

*NOTE: The range of runoff coefficients is based on soil type. The low value is for sandy soils, while the high value is for clay soils. The given runoff coefficient outside the parenthesis is to be used for design, unless the Engineer of Record receives approval from the City Engineer for another value located within the given coefficient range.

Source: City of Little Rock Stormwater Management & Drainage Design Manual

TABLE 400-1 Runoff Coefficients for Surface Types

Character of Surface	Return Period					
	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Developed						
Asphaltic	0.73	0.77	0.81	0.86	0.90	0.95
Concrete/Roof	0.75	0.80	0.83	0.88	0.92	0.97
Grass Areas (Lawns, Parks, etc.)						
Poor Condition (grass cover less than 50 percent of the area)						
Flat, 0-2%	0.32	0.34	0.37	0.40	0.44	0.47
Average, 2-7%	0.37	0.40	0.43	0.46	0.49	0.53
Steep, Over 7%	0.40	0.43	0.45	0.49	0.52	0.55
Fair Condition (grass cover on 50 to 75 percent of the area)						
Flat, 0-2%	0.25	0.28	0.30	0.34	0.37	0.41
Average, 2-7%	0.33	0.36	0.38	0.42	0.45	0.49
Steep, Over 7%	0.37	0.40	0.42	0.46	0.49	0.53
Good Condition (grass cover larger than 75 percent of the area)						
Flat, 0-2%	0.21	0.23	0.25	0.29	0.32	0.36
Average, 2-7%	0.29	0.32	0.35	0.39	0.42	0.46
Steep, Over 7%	0.34	0.37	0.40	0.44	0.47	0.51
Undeveloped						
Cultivated Land						
Flat, 0-2%	0.31	0.34	0.36	0.40	0.43	0.47
Average, 2-7%	0.35	0.38	0.41	0.44	0.48	0.51
Steep, Over 7%	0.39	0.42	0.44	0.48	0.51	0.54
Pasture/Range						
Flat, 0-2%	0.25	0.28	0.30	0.34	0.37	0.41
Average, 2-7%	0.33	0.36	0.38	0.42	0.45	0.49
Steep, Over 7%	0.37	0.40	0.42	0.46	0.49	0.53
Forest/Woodlands						
Flat, 0-2%	0.22	0.25	0.28	0.31	0.35	0.39
Average, 2-7%	0.31	0.34	0.36	0.40	0.43	0.47
Steep, Over 7%	0.35	0.39	0.41	0.45	0.48	0.52

Source: Rossmiller, R.L. "The Raional Formula Revisited."
County of Austin Drainage Criteria Manual

TABLE 400-2

Runoff Coefficients for Rational Method Composite Analysis

Land Use Types	Frequency 10	25	100
Undeveloped Areas			
Historic Flow Analysis, Greenbelts			
Agricultural, Natural Vegetation			
Clay Soil			
Flat, 2%	0.3	0.33	0.37
Average, 2-7%	0.4	0.44	0.5
Steep, 7%	0.5	0.55	0.62
Sandy Soil			
Flat, 2%	0.12	0.13	0.15
Average, 2-7%	0.2	0.22	0.25
Steep, 7%	0.3	0.33	0.37
Streets			
Paved	0.9	0.92	0.95
Gravel	0.35	0.5	0.65
Miscellaneous			
Drives and Walks	0.9	0.91	0.92
Roofs	0.9	0.92	0.95
Lawns			
Clay Soil			
Flat, 2%	0.18	0.2	0.25
Average, 2-7%	0.22	0.28	0.35
Steep, 7%	0.35	0.45	0.6
Sandy Soil			
Flat, 2%	0.1	0.25	0.4
Average, 2-7%	0.15	0.3	0.45
Steep, 7%	0.2	0.35	0.5

Source: City of Little Rock Stormwater Management & Drainage Design Manual

The design engineer shall use the preceding values as a rule of thumb. Areas not conforming to the preceding descriptions will be evaluated by calculating a composite runoff coefficient. Areas will be evaluated based upon the ultimate development for the area under consideration.

Time of Concentration

RICHARDSON ENGINEERING
Planning ▪ Engineering ▪ Development Consulting

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

(1/1)

PROJECT 024-034 T_c CALCULATIONS DATE 03/04/2026

POST-DEV BASIN "E-1"

SUB CB-28 T_c = 15.08 MIN

PIPE-22 => $\frac{L}{(V)(60)} = \frac{58}{(8.73)(60)}$ = 0.11 MIN

PIPE-21 => $\frac{237}{(4.4)(60)}$ = 0.89 MIN

PIPE-11 => $\frac{70}{(7.8)(60)}$ = 0.15 MIN

PIPE 10 => $\frac{256}{(7.38)(60)}$ = 0.58 MIN

PIPE 9 => $\frac{33}{(9.67)(60)}$ = 0.057 MIN

T_c = 17.43 MIN

PIPE 8 => $\frac{130}{(22.75)(60)}$ = 0.095 MIN

FES → POND

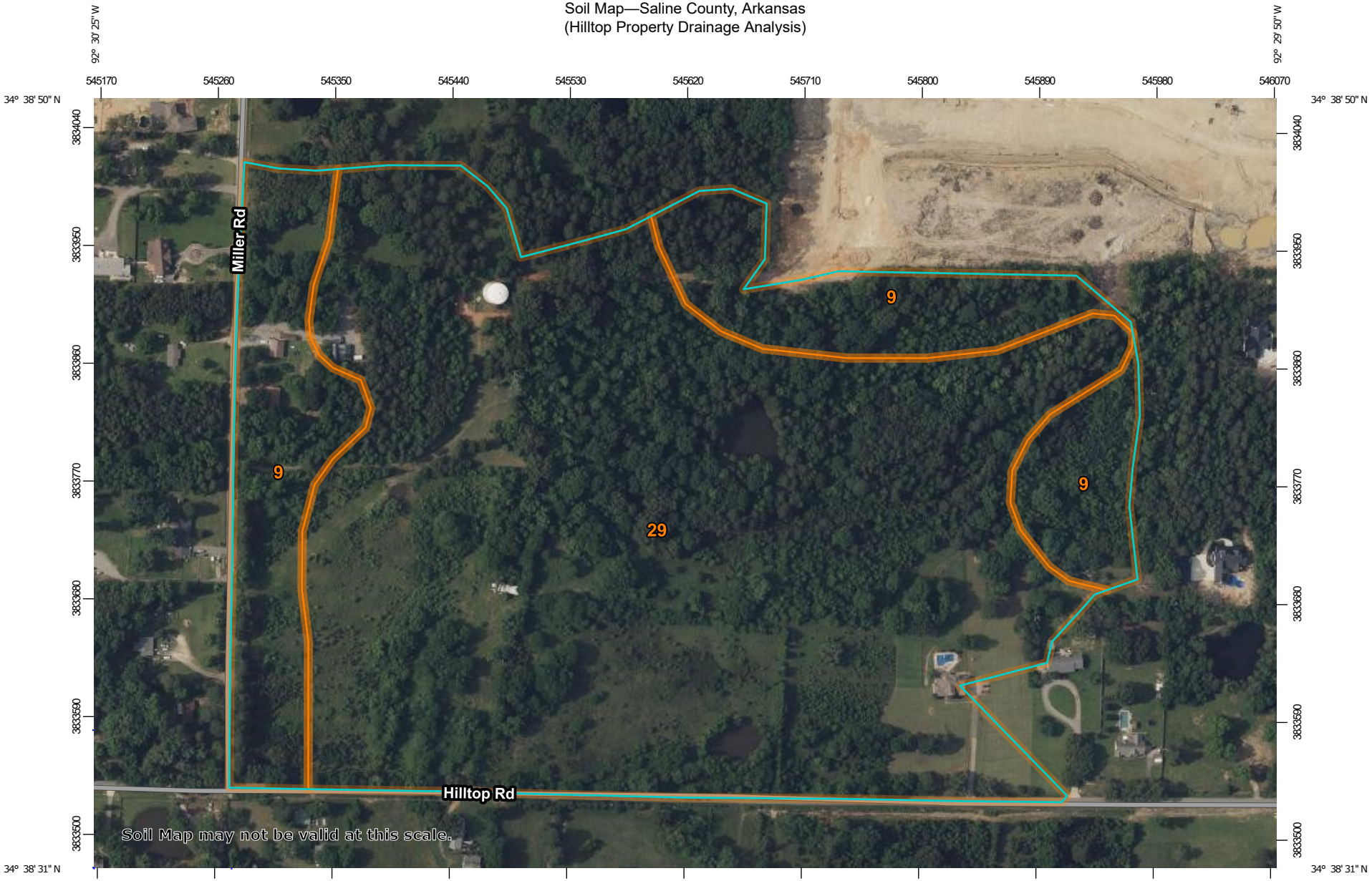
∴ L = 153 FT $S = \frac{492 - 475}{153} = 0.1111$ => 11.11%

$V = 16.1345\,(S)^{0.5} = 16.1345\,(0.1111)^{0.5} = 5.38$ FT/S

$T = 153 \div (5.38 \times 60) = 0.47$ MIN

NRCS Soil Report

Soil Map—Saline County, Arkansas
(Hilltop Property Drainage Analysis)



Map Scale: 1:4,150 if printed on A landscape (11" x 8.5") sheet.

N

0 50 100 200 300 Meters

0 200 400 800 1200 Feet

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Saline County, Arkansas
Survey Area Data: Version 22, Sep 10, 2025

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

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

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
9	Carnasaw-Townley association, undulating	16.2	22.7%
29	Tiak silt loam, 3 to 8 percent slopes	54.9	77.3%
Totals for Area of Interest		**71.1**	**100.0%**

Saline County, Arkansas

9—Carnasaw-Townley association, undulating

Map Unit Setting

National map unit symbol: m073
Landscape: Hills
Elevation: 500 to 1,800 feet
Mean annual precipitation: 44 to 61 inches
Mean annual air temperature: 49 to 74 degrees F
Frost-free period: 185 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Carnasaw and similar soils: 50 percent
Townley and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carnasaw

Setting

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

Typical profile

A - 0 to 3 inches: gravelly silt loam
Bt1 - 3 to 6 inches: silty clay loam
Bt2 - 6 to 40 inches: clay
Cr - 40 to 72 inches: bedrock

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C

Ecological site: F119XY006AR - Clayey Upland
Hydric soil rating: No

Description of Townley

Setting

Landscape: Hills
Landform: Hills
Landform position (three-dimensional): Nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy residuum weathered from sandstone and shale over clayey residuum weathered from sandstone and shale

Typical profile

A - 0 to 6 inches: silt loam
Bt1 - 6 to 23 inches: silty clay
Bt2 - 23 to 25 inches: silty clay
Cr - 25 to 29 inches: bedrock

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

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

Minor Components

Pirum

Percent of map unit: 15 percent
Landscape: Hills
Ecological site: F119XY007AR - Loamy Upland
Hydric soil rating: No

Data Source Information

Soil Survey Area: Saline County, Arkansas
Survey Area Data: Version 22, Sep 10, 2025

Saline County, Arkansas

29—Tiak silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: m06q
Landscape: Coastal plains
Elevation: 70 to 570 feet
Mean annual precipitation: 44 to 61 inches
Mean annual air temperature: 49 to 74 degrees F
Frost-free period: 185 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Tiak and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tiak

Setting

Landscape: Coastal plains
Landform: Interfluves
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy and clayey marine deposits

Typical profile

A - 0 to 7 inches: silt loam
E - 7 to 9 inches: loam
Bt1 - 9 to 32 inches: clay
Bt2 - 32 to 72 inches: clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F133BY002TX - Seasonally Wet Upland

Hydric soil rating: No

Data Source Information

Soil Survey Area: Saline County, Arkansas
Survey Area Data: Version 22, Sep 10, 2025

NOAA Atlas 14 Data

NOAA Atlas 14, Volume 9, Version 2
Location name: Bryant, Arkansas, USA*
Latitude: 34.6452°, Longitude: -92.5032°
Elevation: 527 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.452** (0.366-0.553)	**0.512** (0.414-0.627)	**0.607** (0.490-0.746)	**0.684** (0.549-0.844)	**0.786** (0.608-0.994)	**0.861** (0.652-1.11)	**0.934** (0.684-1.23)	**1.01** (0.707-1.36)	**1.10** (0.741-1.53)	**1.16** (0.768-1.66)
10-min	**0.661** (0.536-0.810)	**0.749** (0.607-0.918)	**0.889** (0.717-1.09)	**1.00** (0.803-1.24)	**1.15** (0.890-1.46)	**1.26** (0.955-1.62)	**1.37** (1.00-1.80)	**1.47** (1.04-2.00)	**1.60** (1.09-2.24)	**1.70** (1.12-2.42)
15-min	**0.806** (0.654-0.988)	**0.914** (0.740-1.12)	**1.08** (0.875-1.33)	**1.22** (0.980-1.51)	**1.40** (1.08-1.77)	**1.54** (1.16-1.98)	**1.67** (1.22-2.20)	**1.80** (1.26-2.44)	**1.96** (1.32-2.73)	**2.07** (1.37-2.96)
30-min	**1.20** (0.972-1.47)	**1.36** (1.10-1.67)	**1.62** (1.31-2.00)	**1.83** (1.47-2.26)	**2.11** (1.63-2.66)	**2.31** (1.75-2.96)	**2.50** (1.83-3.30)	**2.69** (1.89-3.65)	**2.93** (1.98-4.09)	**3.10** (2.05-4.42)
60-min	**1.60** (1.30-1.96)	**1.82** (1.47-2.23)	**2.16** (1.74-2.65)	**2.44** (1.95-3.00)	**2.81** (2.17-3.56)	**3.09** (2.34-3.97)	**3.36** (2.46-4.44)	**3.63** (2.56-4.93)	**3.98** (2.70-5.57)	**4.24** (2.80-6.05)
2-hr	**2.01** (1.64-2.44)	**2.27** (1.85-2.76)	**2.69** (2.19-3.28)	**3.04** (2.46-3.72)	**3.51** (2.74-4.42)	**3.87** (2.95-4.95)	**4.22** (3.12-5.54)	**4.58** (3.24-6.18)	**5.04** (3.44-7.00)	**5.38** (3.58-7.62)
3-hr	**2.26** (1.86-2.74)	**2.55** (2.09-3.09)	**3.03** (2.48-3.68)	**3.43** (2.79-4.19)	**3.99** (3.13-5.01)	**4.42** (3.39-5.64)	**4.85** (3.60-6.35)	**5.29** (3.77-7.13)	**5.88** (4.03-8.15)	**6.33** (4.22-8.93)
6-hr	**2.71** (2.24-3.26)	**3.08** (2.55-3.70)	**3.70** (3.05-4.46)	**4.24** (3.47-5.13)	**5.00** (3.97-6.27)	**5.61** (4.35-7.14)	**6.23** (4.67-8.14)	**6.89** (4.95-9.24)	**7.78** (5.37-10.7)	**8.47** (5.69-11.9)
12-hr	**3.20** (2.67-3.81)	**3.68** (3.07-4.40)	**4.52** (3.75-5.40)	**5.25** (4.33-6.30)	**6.30** (5.05-7.87)	**7.15** (5.59-9.06)	**8.04** (6.07-10.5)	**8.98** (6.50-12.0)	**10.3** (7.16-14.1)	**11.3** (7.65-15.8)
24-hr	**3.75** (3.15-4.44)	**4.35** (3.66-5.15)	**5.39** (4.51-6.40)	**6.30** (5.25-7.52)	**7.64** (6.18-9.50)	**8.74** (6.89-11.0)	**9.89** (7.53-12.8)	**11.1** (8.11-14.8)	**12.8** (8.99-17.5)	**14.2** (9.65-19.6)
2-day	**4.40** (3.73-5.16)	**5.07** (4.30-5.96)	**6.24** (5.27-7.35)	**7.28** (6.11-8.62)	**8.81** (7.18-10.9)	**10.1** (8.00-12.6)	**11.4** (8.73-14.6)	**12.8** (9.40-16.9)	**14.7** (10.4-20.0)	**16.3** (11.2-22.4)
3-day	**4.81** (4.10-5.62)	**5.54** (4.71-6.47)	**6.78** (5.75-7.95)	**7.87** (6.64-9.27)	**9.46** (7.75-11.6)	**10.8** (8.59-13.4)	**12.1** (9.33-15.5)	**13.6** (10.0-17.8)	**15.6** (11.0-21.0)	**17.2** (11.8-23.5)
4-day	**5.14** (4.39-5.98)	**5.90** (5.04-6.87)	**7.20** (6.12-8.41)	**8.33** (7.04-9.78)	**9.97** (8.18-12.2)	**11.3** (9.03-14.0)	**12.7** (9.78-16.1)	**14.1** (10.4-18.5)	**16.1** (11.5-21.7)	**17.7** (12.2-24.2)
7-day	**5.96** (5.13-6.89)	**6.79** (5.84-7.86)	**8.20** (7.02-9.52)	**9.41** (8.01-11.0)	**11.1** (9.18-13.5)	**12.5** (10.1-15.4)	**13.9** (10.8-17.6)	**15.4** (11.5-20.0)	**17.5** (12.5-23.4)	**19.1** (13.2-25.9)
10-day	**6.74** (5.82-7.76)	**7.61** (6.57-8.77)	**9.07** (7.80-10.5)	**10.3** (8.82-12.0)	**12.1** (9.99-14.5)	**13.5** (10.9-16.5)	**14.9** (11.6-18.7)	**16.4** (12.2-21.2)	**18.4** (13.2-24.5)	**20.0** (13.9-27.0)
20-day	**9.13** (7.96-10.4)	**10.1** (8.78-11.5)	**11.6** (10.1-13.4)	**12.9** (11.2-14.9)	**14.8** (12.3-17.5)	**16.2** (13.1-19.5)	**17.6** (13.8-21.8)	**19.0** (14.3-24.3)	**20.9** (15.1-27.6)	**22.4** (15.7-30.1)
30-day	**11.1** (9.71-12.6)	**12.2** (10.7-13.9)	**14.0** (12.2-15.9)	**15.4** (13.4-17.7)	**17.4** (14.6-20.6)	**18.9** (15.5-22.7)	**20.4** (16.1-25.2)	**21.9** (16.5-27.9)	**23.9** (17.3-31.3)	**25.4** (17.8-33.9)
45-day	**13.4** (11.8-15.2)	**14.9** (13.1-16.8)	**17.1** (15.0-19.5)	**18.9** (16.5-21.6)	**21.4** (17.9-25.1)	**23.2** (19.0-27.7)	**25.0** (19.7-30.6)	**26.7** (20.2-33.7)	**28.9** (20.9-37.7)	**30.5** (21.5-40.6)
60-day	**15.3** (13.6-17.3)	**17.1** (15.1-19.3)	**20.0** (17.5-22.6)	**22.2** (19.4-25.3)	**25.2** (21.2-29.4)	**27.4** (22.5-32.5)	**29.5** (23.3-36.0)	**31.5** (23.9-39.7)	**34.1** (24.8-44.2)	**35.9** (25.4-47.7)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

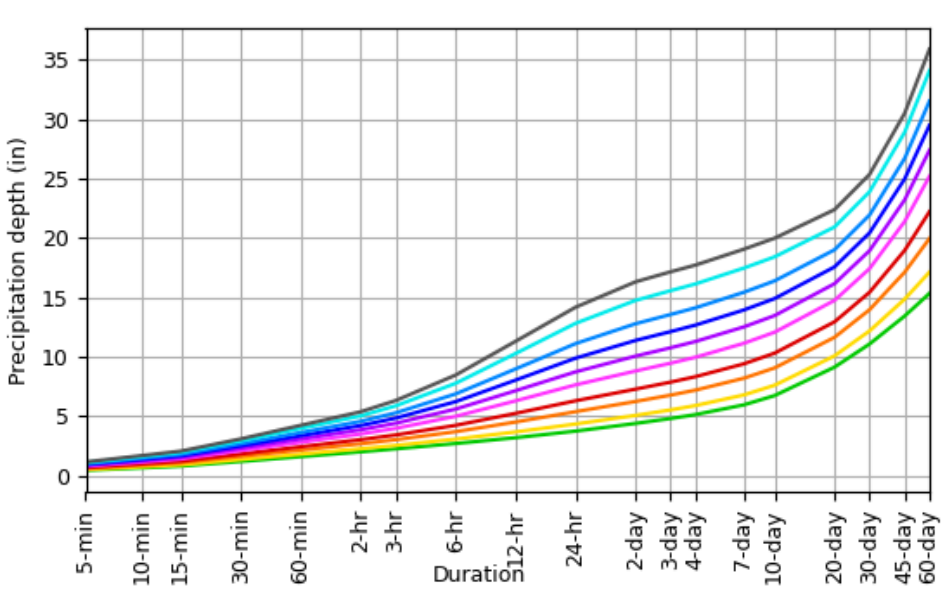
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

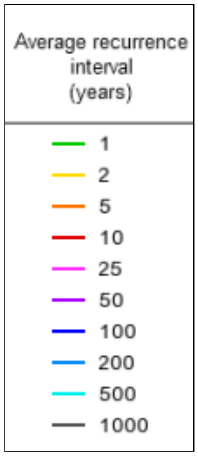
Please refer to NOAA Atlas 14 document for more information.

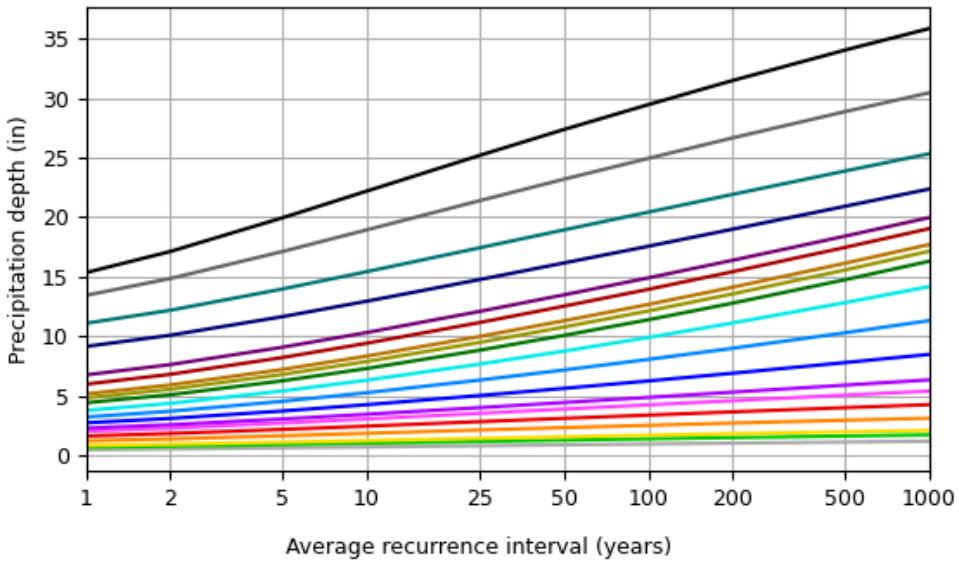
Back to Top

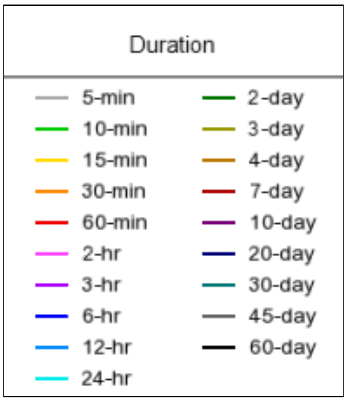
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 34.6452°, Longitude: -92.5032°









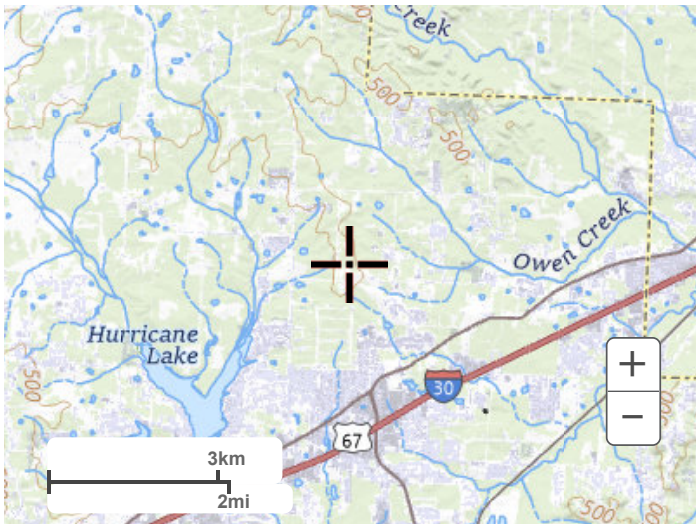
NOAA Atlas 14, Volume 9, Version 2

Created (GMT): Tue Mar 3 15:12:54 2026

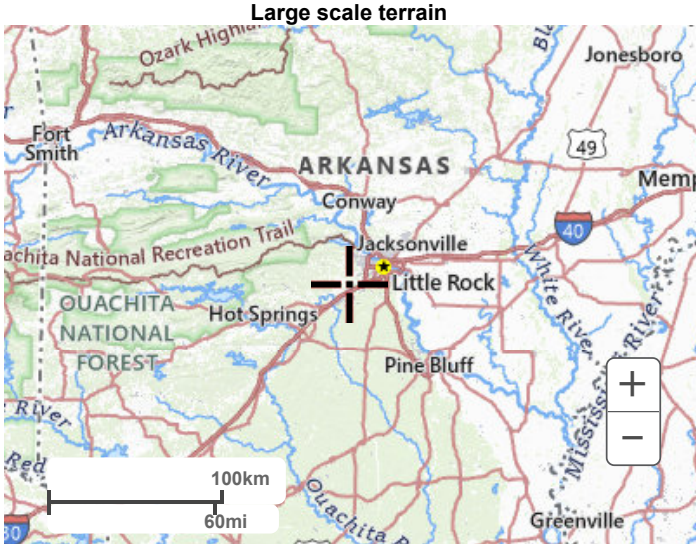
Back to Top

Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

NOAA Atlas 14, Volume 9, Version 2
Location name: Bryant, Arkansas, USA*
Latitude: 34.6452°, Longitude: -92.5032°
Elevation: 527 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**5.42** (4.39-6.64)	**6.14** (4.97-7.52)	**7.28** (5.88-8.95)	**8.21** (6.59-10.1)	**9.43** (7.30-11.9)	**10.3** (7.82-13.3)	**11.2** (8.21-14.8)	**12.1** (8.48-16.4)	**13.2** (8.89-18.4)	**13.9** (9.22-19.9)
10-min	**3.97** (3.22-4.86)	**4.49** (3.64-5.51)	**5.33** (4.30-6.55)	**6.01** (4.82-7.42)	**6.90** (5.34-8.73)	**7.57** (5.73-9.73)	**8.21** (6.01-10.8)	**8.84** (6.21-12.0)	**9.63** (6.52-13.4)	**10.2** (6.74-14.6)
15-min	**3.22** (2.62-3.95)	**3.66** (2.96-4.48)	**4.34** (3.50-5.33)	**4.88** (3.92-6.03)	**5.61** (4.34-7.10)	**6.15** (4.66-7.91)	**6.67** (4.88-8.80)	**7.18** (5.05-9.74)	**7.83** (5.30-10.9)	**8.30** (5.48-11.8)
30-min	**2.40** (1.94-2.94)	**2.73** (2.21-3.34)	**3.25** (2.62-3.99)	**3.66** (2.94-4.52)	**4.21** (3.25-5.32)	**4.62** (3.49-5.93)	**5.01** (3.66-6.59)	**5.38** (3.78-7.30)	**5.86** (3.96-8.17)	**6.20** (4.10-8.84)
60-min	**1.60** (1.30-1.96)	**1.82** (1.47-2.23)	**2.16** (1.74-2.65)	**2.44** (1.95-3.00)	**2.81** (2.17-3.56)	**3.09** (2.34-3.97)	**3.36** (2.46-4.44)	**3.63** (2.56-4.93)	**3.98** (2.70-5.57)	**4.24** (2.80-6.05)
2-hr	**1.00** (0.820-1.22)	**1.13** (0.926-1.38)	**1.35** (1.09-1.64)	**1.52** (1.23-1.86)	**1.75** (1.37-2.21)	**1.93** (1.48-2.47)	**2.11** (1.56-2.77)	**2.29** (1.62-3.09)	**2.52** (1.72-3.50)	**2.69** (1.79-3.81)
3-hr	**0.752** (0.618-0.910)	**0.849** (0.696-1.03)	**1.01** (0.824-1.22)	**1.14** (0.928-1.39)	**1.33** (1.04-1.67)	**1.47** (1.13-1.88)	**1.62** (1.20-2.12)	**1.76** (1.26-2.37)	**1.96** (1.34-2.72)	**2.11** (1.41-2.97)
6-hr	**0.452** (0.374-0.543)	**0.514** (0.425-0.618)	**0.618** (0.509-0.745)	**0.708** (0.579-0.857)	**0.835** (0.663-1.05)	**0.936** (0.726-1.19)	**1.04** (0.779-1.36)	**1.15** (0.825-1.54)	**1.30** (0.896-1.79)	**1.41** (0.950-1.98)
12-hr	**0.265** (0.221-0.316)	**0.305** (0.254-0.364)	**0.375** (0.311-0.448)	**0.435** (0.359-0.523)	**0.522** (0.419-0.653)	**0.593** (0.464-0.752)	**0.667** (0.504-0.867)	**0.745** (0.539-0.996)	**0.853** (0.594-1.17)	**0.938** (0.635-1.31)
24-hr	**0.156** (0.131-0.184)	**0.181** (0.152-0.214)	**0.224** (0.187-0.266)	**0.262** (0.218-0.313)	**0.318** (0.257-0.395)	**0.364** (0.287-0.458)	**0.412** (0.313-0.532)	**0.463** (0.337-0.615)	**0.534** (0.374-0.730)	**0.590** (0.402-0.817)
2-day	**0.091** (0.077-0.107)	**0.105** (0.089-0.124)	**0.130** (0.109-0.153)	**0.151** (0.127-0.179)	**0.183** (0.149-0.226)	**0.209** (0.166-0.262)	**0.237** (0.181-0.304)	**0.266** (0.195-0.351)	**0.307** (0.216-0.417)	**0.339** (0.232-0.466)
3-day	**0.066** (0.056-0.078)	**0.076** (0.065-0.089)	**0.094** (0.079-0.110)	**0.109** (0.092-0.128)	**0.131** (0.107-0.161)	**0.149** (0.119-0.185)	**0.168** (0.129-0.214)	**0.188** (0.138-0.247)	**0.216** (0.153-0.292)	**0.238** (0.163-0.326)
4-day	**0.053** (0.045-0.062)	**0.061** (0.052-0.071)	**0.074** (0.063-0.087)	**0.086** (0.073-0.101)	**0.103** (0.085-0.126)	**0.117** (0.094-0.145)	**0.131** (0.101-0.167)	**0.147** (0.108-0.192)	**0.168** (0.119-0.226)	**0.184** (0.127-0.251)
7-day	**0.035** (0.030-0.041)	**0.040** (0.034-0.046)	**0.048** (0.041-0.056)	**0.056** (0.047-0.065)	**0.066** (0.054-0.080)	**0.074** (0.059-0.091)	**0.082** (0.064-0.104)	**0.091** (0.068-0.119)	**0.103** (0.074-0.139)	**0.113** (0.078-0.153)
10-day	**0.028** (0.024-0.032)	**0.031** (0.027-0.036)	**0.037** (0.032-0.043)	**0.042** (0.036-0.049)	**0.050** (0.041-0.060)	**0.056** (0.045-0.068)	**0.062** (0.048-0.077)	**0.068** (0.050-0.088)	**0.076** (0.054-0.102)	**0.083** (0.057-0.112)
20-day	**0.019** (0.016-0.021)	**0.021** (0.018-0.024)	**0.024** (0.021-0.027)	**0.026** (0.023-0.031)	**0.030** (0.025-0.036)	**0.033** (0.027-0.040)	**0.036** (0.028-0.045)	**0.039** (0.029-0.050)	**0.043** (0.031-0.057)	**0.046** (0.032-0.062)
30-day	**0.015** (0.013-0.017)	**0.016** (0.014-0.019)	**0.019** (0.016-0.022)	**0.021** (0.018-0.024)	**0.024** (0.020-0.028)	**0.026** (0.021-0.031)	**0.028** (0.022-0.034)	**0.030** (0.022-0.038)	**0.033** (0.023-0.043)	**0.035** (0.024-0.047)
45-day	**0.012** (0.010-0.014)	**0.013** (0.012-0.015)	**0.015** (0.013-0.018)	**0.017** (0.015-0.020)	**0.019** (0.016-0.023)	**0.021** (0.017-0.025)	**0.023** (0.018-0.028)	**0.024** (0.018-0.031)	**0.026** (0.019-0.034)	**0.028** (0.019-0.037)
60-day	**0.010** (0.009-0.012)	**0.011** (0.010-0.013)	**0.013** (0.012-0.015)	**0.015** (0.013-0.017)	**0.017** (0.014-0.020)	**0.019** (0.015-0.022)	**0.020** (0.016-0.024)	**0.021** (0.016-0.027)	**0.023** (0.017-0.030)	**0.024** (0.017-0.033)

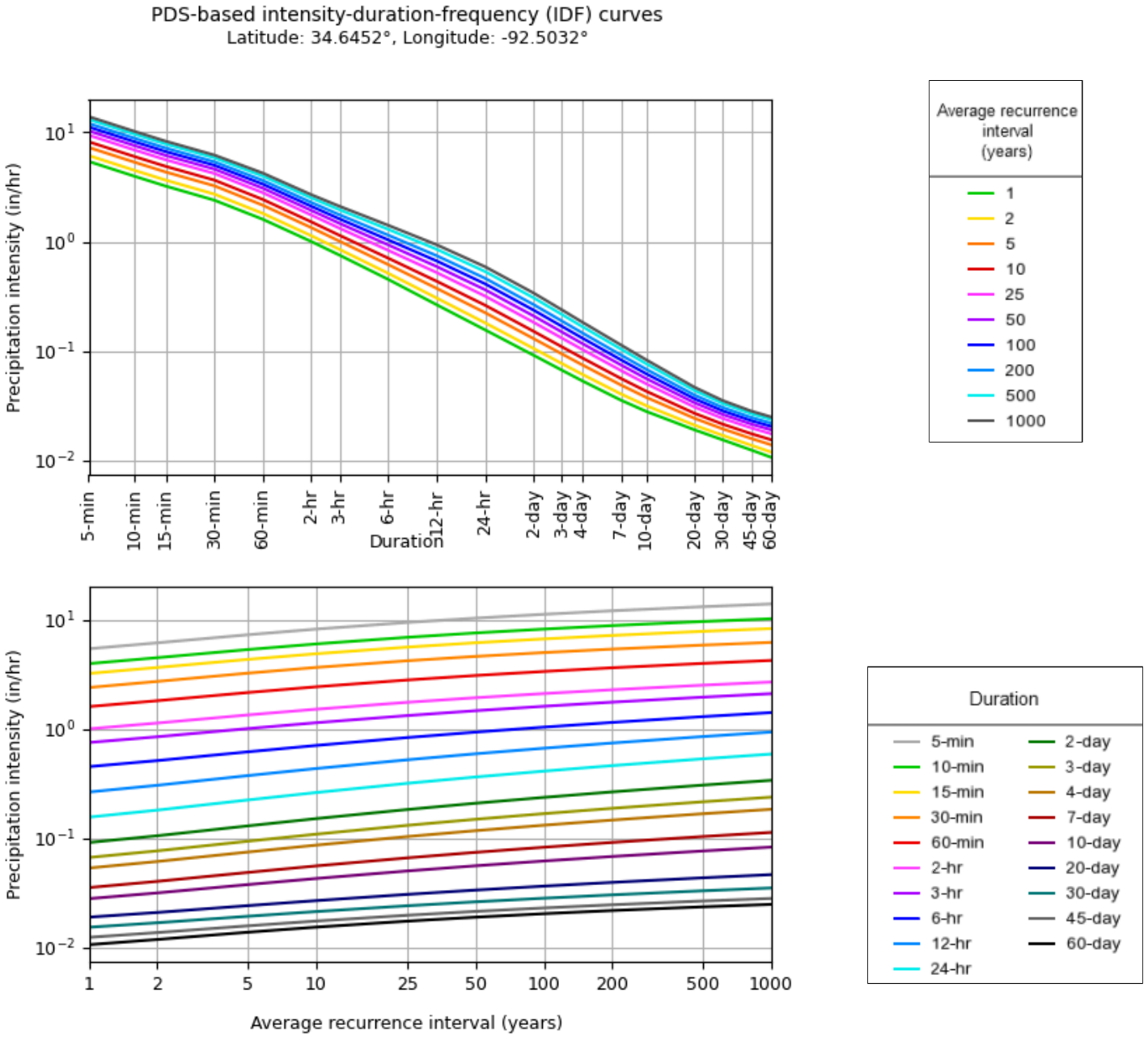
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



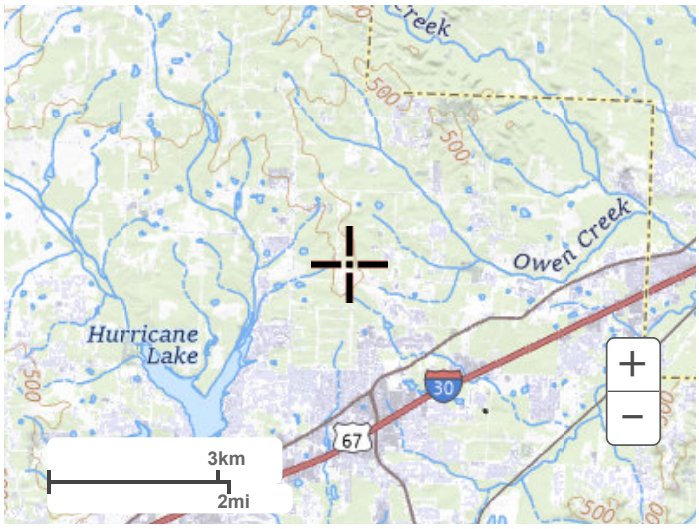
NOAA Atlas 14, Volume 9, Version 2

Created (GMT): Tue Mar 3 15:14:13 2026

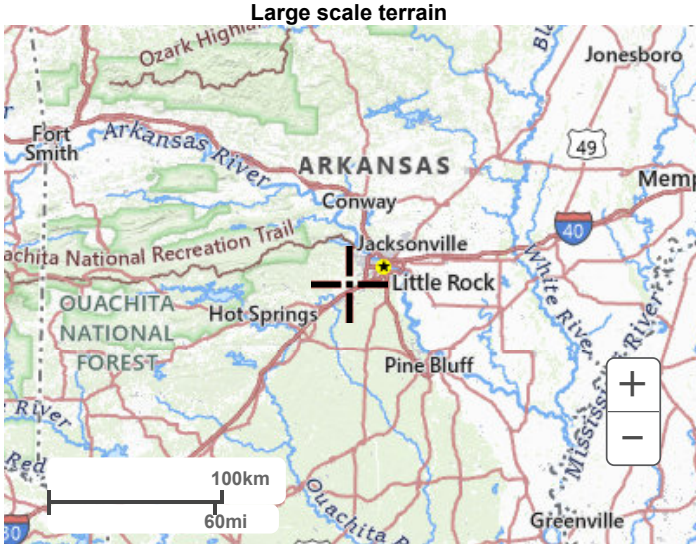
Back to Top

Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

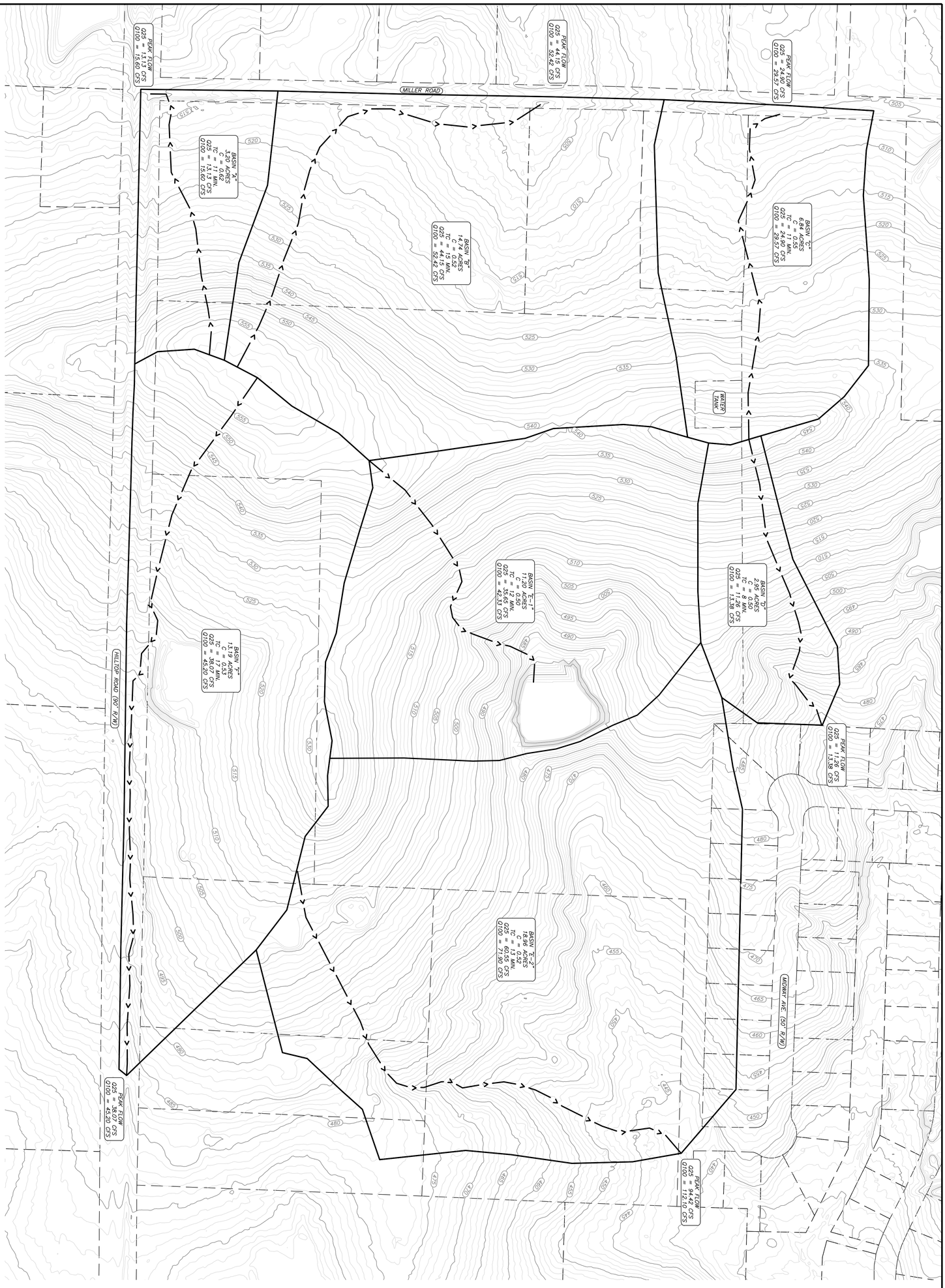


Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Site Drainage Basin Maps



GRAPHIC SCALE

(IN FEET)

1 inch = 100 ft.

PROJECT NO.: 024-034		
Scale: 1" = 100'	Date: 03/04/2026	
Sheet: 1 of 3		

No.	Revisions	Date

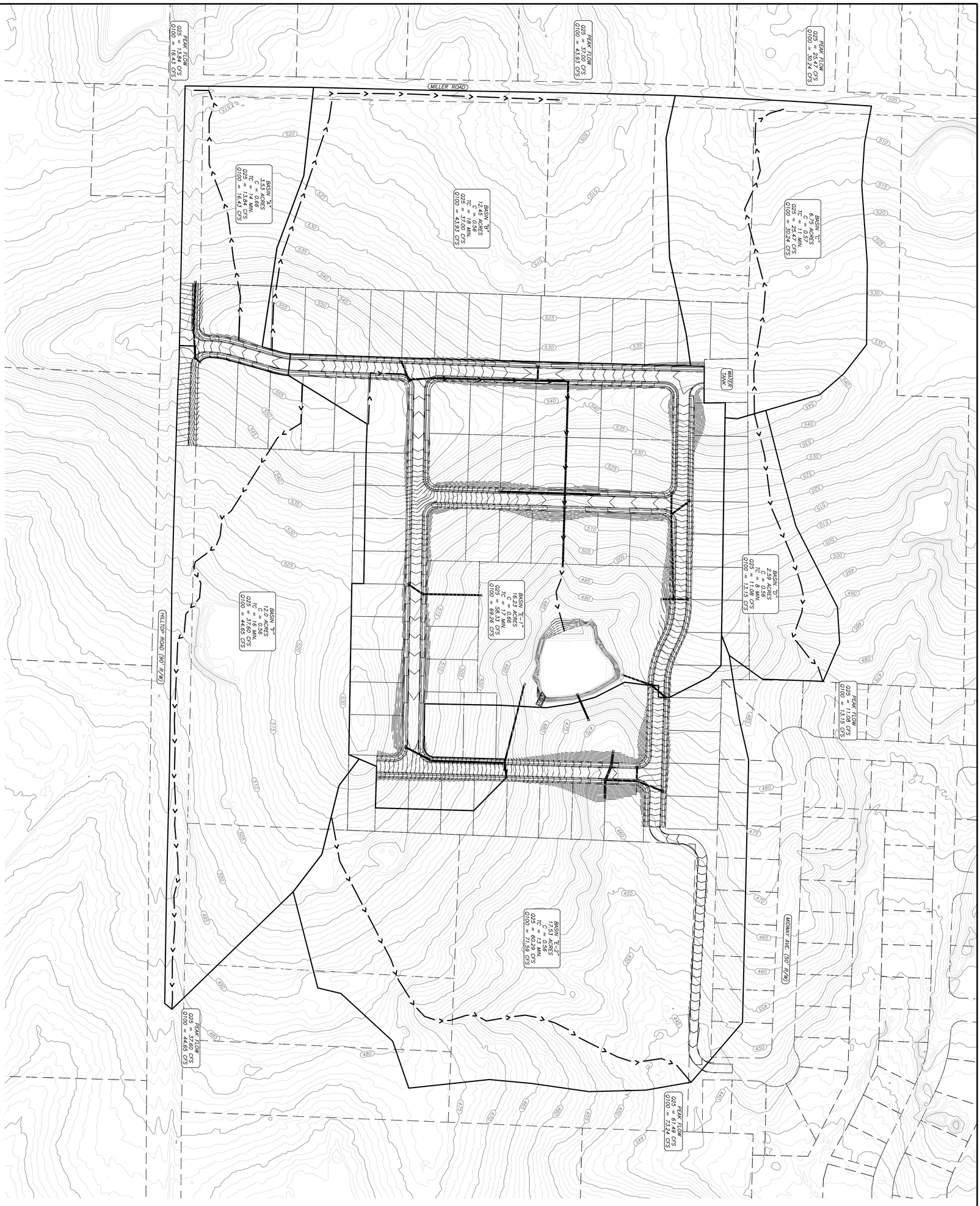
Prepared For:

EMINENT CONSTRUCTIONS

PRE-DEVELOPMENT DRAINAGE BASIN MAP
HILLTOP PROPERTY - R2
75' LOTS
HILLTOP 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



GRAPHIC SCALE

(IN FEET)

1 inch = 100 ft.

PROJECT NO.: 024-034

Scale: 1" = 100'

Date: 03/04/2026

Sheet: 2 of 3

No.	Revisions	Date

Prepared For: EMINENT CONSTRUCTIONS

POST-DEVELOPMENT DRAINAGE BASIN MAP

HILLTOP PROPERTY – R2

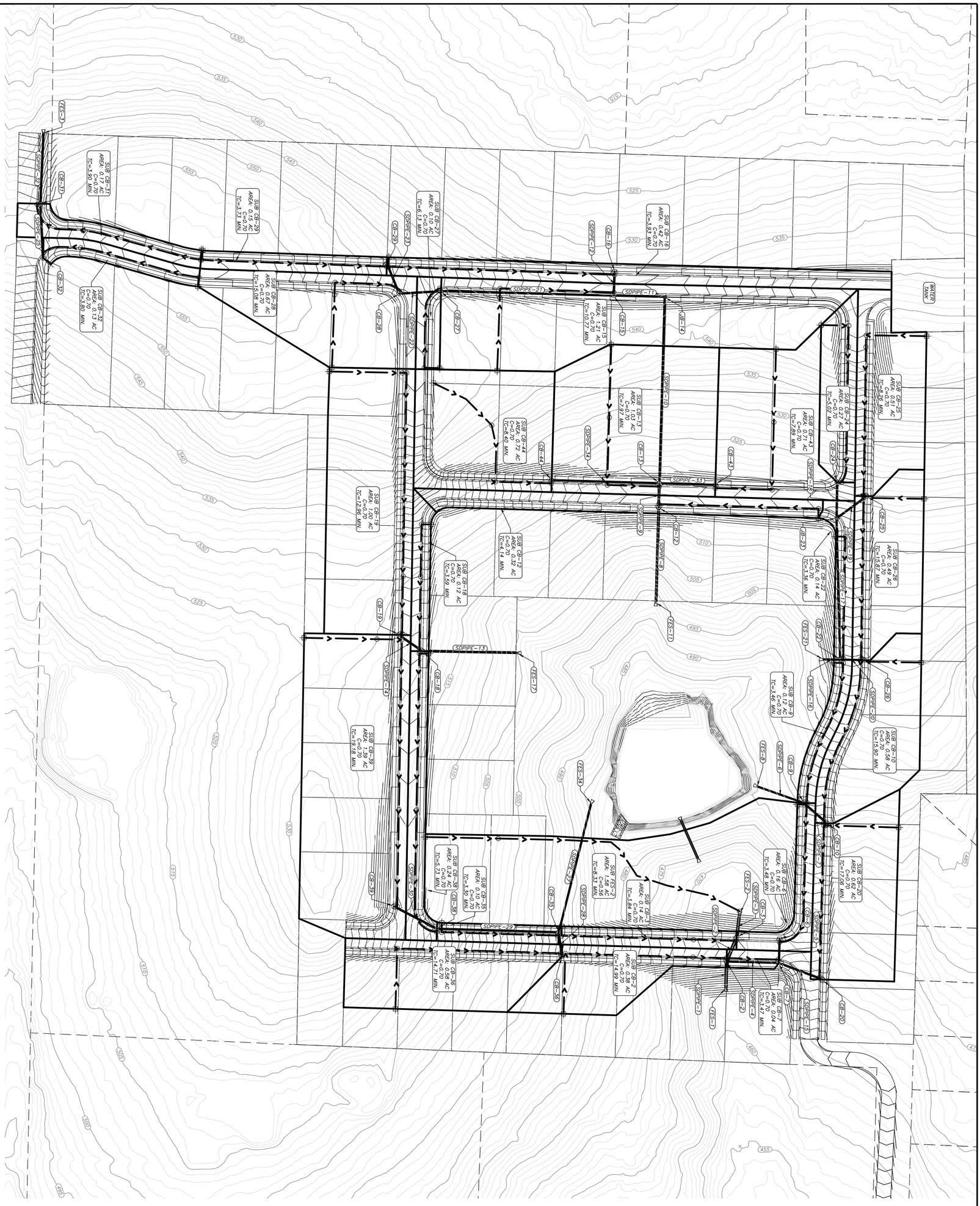
75' LOTS

HILLTOP 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



GRAPHIC SCALE

(IN FEET)

1 inch = 60 ft.

PROJECT NO.: 024-034			
Scale: 1" = 60'	Date: 03/04/2026		
Sheet: 3 of 3			

No.	Revisions	Date

Prepared For:

EMINENT CONSTRUCTIONS

POST-DEVELOPMENT DRAINAGE BASIN MAP
HILLTOP PROPERTY – R2
75' LOTS
HILLTOP 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

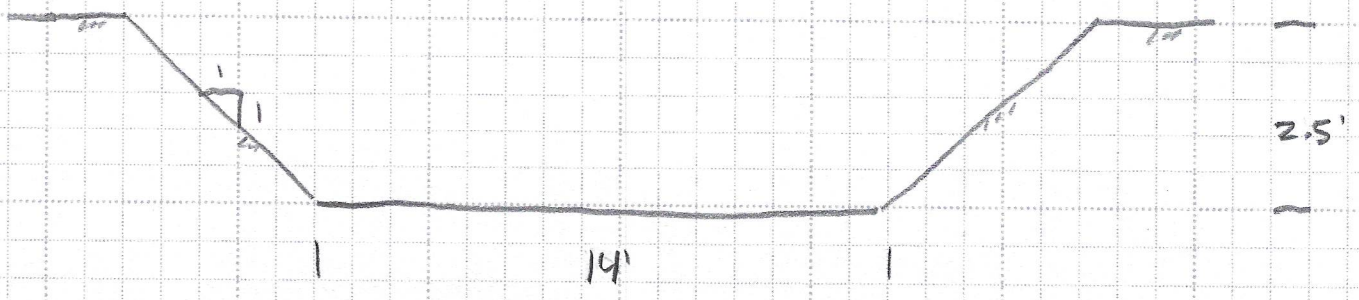
Overflow Wier Blockage Calculation

RICHARDSON ENGINEERING
Planning ▪ Engineering ▪ Development Consulting

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

(1/1)

PROJECT 024-034 OVER FLOW WEIR CALCULATION DATE 03/04/2026



$Q = C\,L\,H^{3/2}$

$C = 2.8$

$L = 14'$

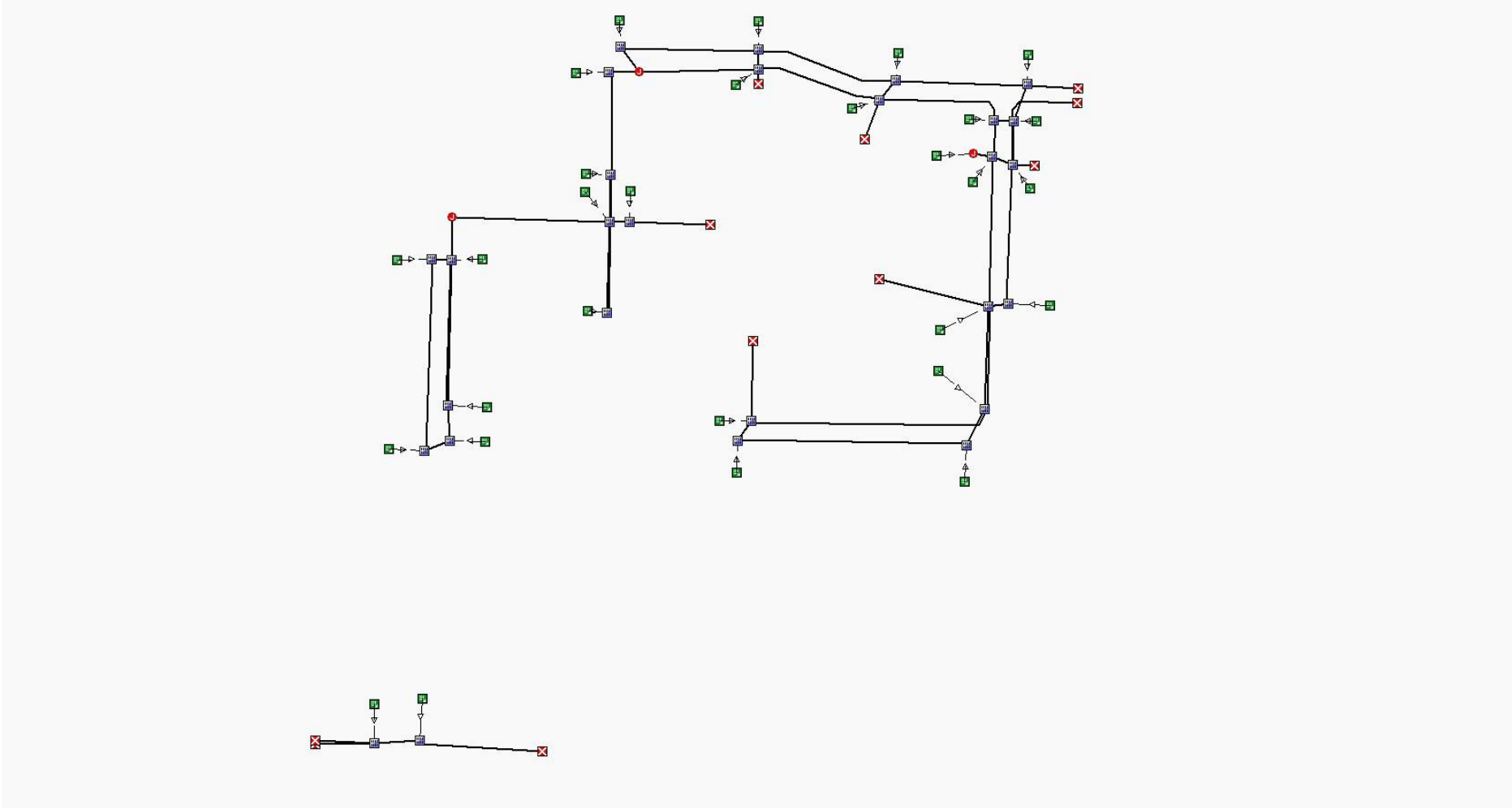
$H = 2.5'$

$Q = (2.8)(14)(2.5)^{3/2} = 154.95$ CFS

∴ ASSUMING THAT 50% OF THE WEIR IS BLOCKED

$Q = \frac{154.95}{2} = 77.48$ CFS > Q_{100} INTO POND = 69.92 CFS ✓

SSA Design Layout



Storm System Design (SSA)

2 Year Design Storm

Project Description

File Name	Hilltop Drainage Analysis 3-4-26.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	00:00:00	0:00:00
End Analysis On	00:00:00	0:00:00
Start Reporting On	00:00:00	0:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	29
Nodes	42
Junctions	3
Outfalls	11
Flow Diversions	0
Inlets	28
Storage Nodes	0
Links	52
Channels	21
Pipes	31
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	2 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	Sub-CB-10	0.58	0.7000	0.94	0.66	0.38	1.45	0 00:15:54
2	Sub-CB-12	0.32	0.7000	0.51	0.36	0.11	1.37	0 00:05:00
3	Sub-CB-13	1.03	0.7000	0.66	0.46	0.47	3.56	0 00:07:58
4	Sub-CB-15	1.21	0.7000	0.77	0.54	0.65	3.63	0 00:10:46
5	Sub-CB-16	0.42	0.7000	0.51	0.36	0.15	1.80	0 00:05:00
6	Sub-CB-18	0.12	0.7000	0.51	0.36	0.04	0.53	0 00:05:00
7	Sub-CB-19	1.00	0.7000	0.85	0.60	0.59	2.74	0 00:12:57
8	Sub-CB-2	0.38	0.7000	0.92	0.64	0.24	0.97	0 00:14:59
9	Sub-CB-20	0.62	0.7000	0.98	0.69	0.42	1.50	0 00:17:03
10	Sub-CB-22	0.14	0.7000	0.51	0.36	0.05	0.60	0 00:05:00
11	Sub-CB-24	0.27	0.7000	0.51	0.36	0.10	1.16	0 00:05:01
12	Sub-CB-25	0.51	0.7000	0.67	0.47	0.24	1.73	0 00:08:15
13	Sub-CB-26	0.49	0.7000	0.94	0.66	0.32	1.23	0 00:15:52
14	Sub-CB-27	0.10	0.7000	0.58	0.40	0.04	0.38	0 00:06:07
15	Sub-CB-28	0.67	0.7000	0.91	0.64	0.43	1.71	0 00:15:04
16	Sub-CB-29	0.15	0.7000	0.51	0.36	0.05	0.63	0 00:05:00
17	Sub-CB-3	0.14	0.7000	0.51	0.36	0.05	0.61	0 00:05:00
18	Sub-CB-31	0.17	0.7000	0.51	0.36	0.06	0.75	0 00:05:00
19	Sub-CB-32	0.13	0.7000	0.51	0.36	0.05	0.56	0 00:05:00
20	Sub-CB-35	0.10	0.7000	0.51	0.36	0.04	0.43	0 00:05:00
21	Sub-CB-36	0.58	0.7000	0.90	0.63	0.37	1.51	0 00:14:42
22	Sub-CB-38	0.24	0.7000	0.55	0.38	0.09	0.98	0 00:05:43
23	Sub-CB-39	1.39	0.7000	1.05	0.74	1.02	3.20	0 00:19:10
24	Sub-CB-43	0.71	0.7000	0.65	0.45	0.32	2.47	0 00:07:53
25	Sub-CB-44	0.72	0.7000	0.67	0.47	0.34	2.43	0 00:08:24
26	Sub-CB-6	0.16	0.7000	0.51	0.36	0.06	0.71	0 00:05:00
27	Sub-CB-7	0.04	0.7000	0.51	0.36	0.01	0.18	0 00:05:00
28	Sub-CB-9	0.12	0.7000	0.51	0.36	0.04	0.51	0 00:05:00
29	Sub-FES-2	1.58	0.5600	0.67	0.38	0.60	4.29	0 00:08:19

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft^2)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	(
1	FES-2	Junction	466.60	469.78	466.60	469.78	0.00	14.36	468.04	0.00	1.74	
2	JB-14	Junction	529.50	535.50	529.50	535.50	0.00	5.29	529.93	0.00	5.57	
3	JB-23	Junction	515.30	519.20	515.30	519.20	10.00	2.02	515.59	0.00	3.61	
4	OFFSITE-1	Outfall	540.30					0.03	540.33			
5	OFFSITE-2	Outfall	532.10					0.00	532.11			
6	OFFSITE-25	Outfall	464.82					0.00	464.82			
7	OFFSITE-26	Outfall	464.82					0.18	464.90			
8	Out-FES-1	Outfall	463.00					16.29	463.57			
9	Out-FES-11	Outfall	492.00					11.70	492.47			
10	Out-FES-17	Outfall	505.00					2.27	505.26			
11	Out-FES-21	Outfall	499.00					3.04	499.30			
12	Out-FES-3	Outfall	538.50					1.24	538.71			
13	Out-FES-34	Outfall	484.31					4.00	484.84			
14	Out-FES-8	Outfall	482.52					1.37	482.87			

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Fl Dep Total De Ra
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)	
1	SDPIPE-1	Pipe	CB-2	Out-FES-1	35.55	465.94	463.00	8.2700	36.000	0.0120	16.29	207.79	0.08	13.27	0.69	0
2	SDPIPE-10	Pipe	JB-14	CB-13	256.10	529.50	512.58	6.6100	18.000	0.0120	5.29	29.25	0.18	5.99	0.87	0
3	SDPIPE-11	Pipe	CB-15	JB-14	70.07	530.20	529.50	1.0000	18.000	0.0120	5.29	11.38	0.47	7.05	0.66	0
4	SDPIPE-12	Pipe	CB-16	CB-15	33.00	530.53	530.20	1.0000	18.000	0.0130	0.69	10.49	0.07	1.84	0.73	0
5	SDPIPE-13	Pipe	CB-18	Out-FES-17	130.50	517.50	505.00	9.5800	18.000	0.0120	2.27	35.22	0.06	10.80	0.26	0
6	SDPIPE-14	Pipe	FES-19	CB-18	39.55	517.99	517.50	1.2500	18.000	0.0130	2.28	11.74	0.19	5.82	0.41	0
7	SDPIPE-15	Pipe	CB-20	CB-7	64.04	468.11	467.47	1.0000	18.000	0.0130	1.45	10.50	0.14	3.74	0.41	0
8	SDPIPE-16	Pipe	CB-22	Out-FES-21	23.51	501.10	499.00	8.9300	18.000	0.0120	3.04	34.01	0.09	9.80	0.35	0
9	SDPIPE-17	Pipe	JB-23	CB-22	194.21	515.30	504.78	5.4200	18.000	0.0120	2.00	26.49	0.08	8.62	0.28	0
10	SDPIPE-18	Pipe	CB-24	JB-23	49.41	517.77	515.30	5.0000	18.000	0.0130	1.05	23.49	0.04	5.37	0.25	0
11	SDPIPE-19	Pipe	CB-25	JB-23	51.31	515.81	515.30	1.0000	18.000	0.0130	1.38	10.50	0.13	4.50	0.35	0
12	SDPIPE-2	Pipe	CB-3	CB-2	35.82	466.30	465.94	1.0000	36.000	0.0130	14.53	66.70	0.22	6.16	1.10	0
13	SDPIPE-20	Pipe	CB-26	CB-22	33.00	501.43	501.10	1.0000	18.000	0.0120	1.13	11.38	0.10	4.37	0.37	0
14	SDPIPE-21	Pipe	CB-27	CB-15	237.30	538.50	530.20	3.5000	18.000	0.0120	1.69	21.28	0.08	3.63	0.57	0
15	SDPIPE-22	Pipe	CB-28	CB-27	57.68	542.20	538.50	6.4100	18.000	0.0130	1.70	26.60	0.06	7.50	0.28	0
16	SDPIPE-23	Pipe	CB-29	CB-28	44.75	542.65	542.20	1.0000	18.000	0.0130	0.62	10.50	0.06	3.27	0.25	0
17	SDPIPE-25	Pipe	CB-32	CB-31	74.63	546.00	544.50	2.0100	18.000	0.0130	0.55	14.89	0.04	3.57	0.21	0
18	SDPIPE-27	Pipe	CB-35	Out-FES-34	182.53	487.50	484.31	1.7500	18.000	0.0120	4.00	15.03	0.27	6.84	0.55	0
19	SDPIPE-28	Pipe	CB-36	CB-35	33.55	487.84	487.50	1.0000	18.000	0.0130	1.27	10.50	0.12	3.12	0.46	0
20	SDPIPE-29	Pipe	CB-38	CB-35	167.22	505.00	487.50	10.4700	18.000	0.0120	3.08	36.81	0.08	7.34	0.43	0
21	SDPIPE-3	Pipe	FES-2	CB-3	30.36	466.60	466.30	1.0000	36.000	0.0120	14.44	71.83	0.20	7.37	1.32	0
22	SDPIPE-30	Pipe	CB-39	CB-38	66.71	510.34	505.00	8.0000	18.000	0.0130	3.08	29.71	0.10	10.67	0.33	0
23	SDPIPE-32	Pipe	CB-31	Out-FES-3	96.89	544.50	538.50	6.1900	18.000	0.0120	1.24	28.32	0.04	7.77	0.22	0
24	SDPIPE-33	Pipe	CB-43	CB-13	76.95	514.12	512.58	2.0000	18.000	0.0150	2.46	12.88	0.19	3.47	0.87	0
25	SDPIPE-34	Pipe	Inlet-CB-44	CB-13	148.00	516.28	512.58	2.5000	18.000	0.0150	2.16	14.39	0.15	3.23	0.86	0
26	SDPIPE-4	Pipe	CB-7	CB-2	71.93	467.47	466.75	1.0000	18.000	0.0120	1.44	11.38	0.13	4.10	0.38	0
27	SDPIPE-5	Pipe	CB-6	CB-7	33.00	467.80	467.47	1.0000	18.000	0.0130	0.42	10.50	0.04	1.92	0.28	0
28	SDPIPE-6	Pipe	CB-9	Out-FES-8	67.57	483.19	482.52	1.0000	18.000	0.0120	1.37	11.37	0.12	4.02	0.37	0

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Fl Dep Total De Ra
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)	
46	L-SDPIPE-29	Channel	CB-38	CB-35	172.07	510.35	492.85	10.1700	3.960	0.0150	0.02	8.06	0.00	1.78	0.02	0
47	L-SDPIPE-32	Channel	CB-31	OFFSITE-1	98.14	549.76	540.30	9.6400	6.000	0.0150	0.03	29.25	0.00	2.05	0.02	0
48	L-SDPIPE-33	Channel	CB-43	CB-13	78.40	517.57	516.63	1.2000	3.960	0.0320	0.00	2.77	0.00	0.00	0.17	0
49	L-SDPIPE-34	Channel	Inlet-CB-44	CB-13	149.79	521.28	516.63	3.1000	3.960	0.0320	0.22	4.46	0.05	0.22	0.22	0
50	L-SDPIPE-4	Channel	CB-7	OFFSITE-25	129.78	474.50	464.82	7.4600	3.960	0.0320	0.00	6.91	0.00	0.00	0.00	0
51	L-SDPIPE-6	Channel	CB-9	CB-6	214.12	489.41	474.50	6.9600	3.960	0.0150	0.00	6.67	0.00	0.00	0.09	0
52	L-SDPIPE-7	Channel	CB-10	CB-20	216.57	487.38	471.31	7.4200	3.960	0.0150	0.16	6.89	0.02	1.23	0.08	0

Inlet Summary

SN	Element ID	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft²)	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Allowable Spread (ft)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)
1	CB-10	On Grade	1	483.62	487.38	483.62	N/A	1.54	1.34	0.19	87.40	8.50	4.89	487.50
2	CB-12	On Sag	1	512.25	516.63	512.25	10.00	1.36	N/A	N/A	N/A	8.50	4.37	516.91
3	CB-13	On Sag	1	512.58	516.63	512.58	10.00	3.72	N/A	N/A	N/A	8.50	8.53	517.01
4	CB-15	On Sag	1	530.20	533.98	530.20	10.00	3.63	N/A	N/A	N/A	8.50	8.38	534.36
5	CB-16	On Sag	1	530.53	533.98	530.53	10.00	1.79	N/A	N/A	N/A	8.50	5.24	534.28
6	CB-18	On Grade	1	517.50	521.56	517.50	N/A	0.53	0.53	0.00	100.00	8.50	4.05	521.66
7	CB-2	On Grade	1	465.94	475.75	465.94	N/A	1.20	1.20	0.00	100.00	8.50	6.67	475.91
8	CB-20	On Grade	1	468.11	471.31	468.11	N/A	1.63	1.40	0.23	85.80	8.50	4.99	471.43
9	CB-22	On Grade	1	501.10	504.78	501.10	N/A	0.60	0.60	0.00	100.00	8.50	3.45	504.87
10	CB-24	On Grade	1	517.77	523.17	517.77	N/A	1.16	1.06	0.10	91.65	8.50	4.15	523.27
11	CB-25	On Grade	1	515.81	522.01	515.81	N/A	1.73	1.39	0.34	80.28	8.50	4.80	522.13
12	CB-26	On Grade	1	501.43	504.78	501.43	N/A	1.23	1.15	0.08	93.36	8.50	4.48	504.89
13	CB-27	On Grade	1	538.50	543.76	538.50	N/A	0.38	0.38	0.00	100.00	8.50	3.07	543.83
14	CB-28	On Sag	1	542.20	546.43	542.20	10.00	1.71	N/A	N/A	N/A	8.50	5.07	546.73
15	CB-29	On Grade	1	542.65	547.71	542.65	N/A	0.63	0.63	0.00	100.00	8.50	3.71	547.80
16	CB-3	On Grade	1	466.30	475.38	466.30	N/A	0.60	0.60	0.00	100.00	8.50	5.18	475.51
17	CB-31	On Grade	1	544.50	549.76	544.50	N/A	0.74	0.74	0.01	99.03	8.50	4.36	549.85
18	CB-32	On Grade	1	546.00	550.25	546.00	N/A	0.56	0.56	0.00	100.00	8.50	3.32	550.33
19	CB-35	On Grade	1	487.50	492.85	487.50	N/A	0.43	0.43	0.00	100.00	8.50	2.89	492.92
20	CB-36	On Grade	1	487.84	492.30	487.84	N/A	1.51	1.27	0.24	84.23	8.50	4.56	492.41
21	CB-38	On Grade	1	505.00	510.35	505.00	N/A	0.97	0.93	0.04	95.57	8.50	3.88	510.44
22	CB-39	On Sag	1	510.34	515.20	510.34	10.00	3.23	N/A	N/A	N/A	8.50	7.77	515.56
23	CB-43	On Grade	1	514.12	517.57	514.12	N/A	2.46	2.46	0.00	100.00	8.50	7.44	517.76
24	CB-6	On Sag	1	467.80	474.50	467.80	10.00	0.71	N/A	N/A	N/A	8.50	2.83	474.74
25	CB-7	On Grade	1	467.47	474.50	467.47	N/A	0.18	0.18	0.00	100.00	8.50	3.27	474.58
26	CB-9	On Grade	1	483.19	489.41	483.19	N/A	0.51	0.51	0.00	100.00	8.50	3.25	489.49
27	FES-19	On Grade	1	517.99	522.14	517.99	N/A	2.74	2.28	0.46	83.25	8.50	7.45	522.32
28	Inlet-CB-44	On Grade	1	516.28	521.28	516.28	N/A	2.43	2.18	0.24	89.92	8.50	5.34	521.41

Subbasin Hydrology

Subbasin : Sub-CB-10

Input Data

Area (ac) 0.58
Weighted Runoff Coefficient 0.7

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	82.99996647	0	0
Slope (%) :	1.25	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.09	0	0
Computed Flow Time (min) :	15.21	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	229.3185963	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.69	0	0

Total TOC (min) 15.90

Subbasin : Sub-CB-12

Input Data

Area (ac) 0.32
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	219.5273657	0	0
Slope (%) :	1.99	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	2.87	0	0
Computed Flow Time (min) :	1.28	0	0

Total TOC (min) 4.14

Subbasin : Sub-CB-13

Input Data

Area (ac) 1.03
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	11.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	7.27	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	93	71.4	0
Slope (%) :	11.5	1.99	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	5.47	2.87	0
Computed Flow Time (min) :	0.28	0.41	0

Total TOC (min) 7.97

Subbasin : Sub-CB-15

Input Data

Area (ac) 1.21
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.16	0	0
Computed Flow Time (min) :	10.14	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	12.98144373	156.302	0
Slope (%) :	2	5.74	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	4.87	0
Computed Flow Time (min) :	0.09	0.53	0

Total TOC (min) 10.77

Subbasin : Sub-CB-16

Input Data

Area (ac) 0.42
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13.01720552	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	310.5319881	0	0
Slope (%) :	5.74	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	4.87	0	0
Computed Flow Time (min) :	1.06	0	0

Total TOC (min) 3.93

Subbasin : Sub-CB-18

Input Data

Area (ac) 0.12
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13.10752092	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.88	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	71.43477489	102.308	0
Slope (%) :	11.86	2.45	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	7	3.18	0
Computed Flow Time (min) :	0.17	0.54	0

Total TOC (min) 3.59

Subbasin : Sub-CB-19

Input Data

Area (ac) 1
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100.0031436	0	0
Slope (%) :	3.4	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.14	0	0
Computed Flow Time (min) :	11.83	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	6.07922878	278.905	79.9642
Slope (%) :	2	11.86	2.45
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	7	3.18
Computed Flow Time (min) :	0.04	0.66	0.42

Total TOC (min) 12.96

Subbasin : Sub-CB-2

Input Data

Area (ac) 0.38
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	83	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	14.14	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	175.3484305	45.5292	0
Slope (%) :	10.46	0.85	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	6.57	1.87	0
Computed Flow Time (min) :	0.44	0.4	0

Total TOC (min) 14.99

Subbasin : Sub-CB-20

Input Data

Area (ac) 0.62
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	99.99258294	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.41	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	3.00743724	208.662	0
Slope (%) :	2	7.49	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	5.56	0
Computed Flow Time (min) :	0.02	0.63	0

Total TOC (min) 17.06

Subbasin : Sub-CB-22

Input Data

Area (ac) 0.14
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	12.99981258	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	167.0428132	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.5	0	0

Total TOC (min) 3.36

Subbasin : Sub-CB-24

Input Data

Area (ac) 0.27
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	37.99958613	0	0
Slope (%) :	6.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.15	0	0
Computed Flow Time (min) :	4.21	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	28.98355088	187.485	0
Slope (%) :	0.51	10.41	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	1.45	6.56	0
Computed Flow Time (min) :	0.33	0.48	0

Total TOC (min) 5.02

Subbasin : Sub-CB-25

Input Data

Area (ac) 0.51
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	82.99999586	0	0
Slope (%) :	7.25	0	0
2 yr, 24 hr Rainfall (in) :	4.32	0	0
Velocity (ft/sec) :	0.18	0	0
Computed Flow Time (min) :	7.56	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	16.12667612	203.961	0
Slope (%) :	0.51	10.41	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	1.45	6.56	0
Computed Flow Time (min) :	0.19	0.52	0

Total TOC (min) 8.26

Subbasin : Sub-CB-26

Input Data

Area (ac) 0.49
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	82.99998121	0	0
Slope (%) :	1.25	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.09	0	0
Computed Flow Time (min) :	15.21	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	221.0918618	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.66	0	0

Total TOC (min) 15.87

Subbasin : Sub-CB-27

Input Data

Area (ac) 0.1
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	21.13547973	0	0
Slope (%) :	1	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.06	0	0
Computed Flow Time (min) :	5.57	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	117.1502173	0	0
Slope (%) :	2.92	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.47	0	0
Computed Flow Time (min) :	0.56	0	0

Total TOC (min) 6.13

Subbasin : Sub-CB-28

Input Data

Area (ac) 0.67
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.11	0	0
Computed Flow Time (min) :	14.63	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	17.02372996	94.0918	0
Slope (%) :	2	5.74	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	4.87	0
Computed Flow Time (min) :	0.12	0.32	0

Total TOC (min) 15.08

Subbasin : Sub-CB-29

Input Data

Area (ac) 0.15
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	253.6223323	0	0
Slope (%) :	5.74	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	4.87	0	0
Computed Flow Time (min) :	0.87	0	0

Total TOC (min) 3.73

Subbasin : Sub-CB-3

Input Data

Area (ac) 0.14
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	181.26423	58.4106	0
Slope (%) :	10.46	0.85	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	6.57	1.87	0
Computed Flow Time (min) :	0.46	0.52	0

Total TOC (min) 3.84

Subbasin : Sub-CB-31

Input Data

Area (ac) 0.17
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	166.3763112	83.6548	0
Slope (%) :	3.19	6.34	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.63	5.12	0
Computed Flow Time (min) :	0.76	0.27	0

Total TOC (min) 3.90

Subbasin : Sub-CB-32

Input Data

Area (ac) 0.13
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	167.2624187	52.7043	0
Slope (%) :	3.19	6.34	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.63	5.12	0
Computed Flow Time (min) :	0.77	0.17	0

Total TOC (min) 3.80

Subbasin : Sub-CB-35

Input Data

Area (ac) 0.1
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	159.59	0	0
Slope (%) :	10.46	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	6.57	0	0
Computed Flow Time (min) :	0.4	0	0

Total TOC (min) 3.27

Subbasin : Sub-CB-36

Input Data

Area (ac) 0.58
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	83	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	14.14	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	224.201193	0	0
Slope (%) :	10.46	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	6.57	0	0
Computed Flow Time (min) :	0.57	0	0

Total TOC (min) 14.71

Subbasin : Sub-CB-38

Input Data

Area (ac) 0.24
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13.00000002	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	214.8866153	184.112	0
Slope (%) :	2.45	0.75	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.18	1.76	0
Computed Flow Time (min) :	1.13	1.74	0

Total TOC (min) 5.73

Subbasin : Sub-CB-39

Input Data

Area (ac) 1.39
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	99.98923348	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.41	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	34.45719772	233.523	132.701
Slope (%) :	1.5	2.45	0.75
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	1.98	3.18	1.76
Computed Flow Time (min) :	0.29	1.22	1.26

Total TOC (min) 19.18

Subbasin : Sub-CB-43

Input Data

Area (ac) 0.71
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	12	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	7.15	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	93	77.84	0
Slope (%) :	10.75	1.99	0
Surface Type :	Unpaved	Paved	Unpaved
Velocity (ft/sec) :	5.29	2.87	0
Computed Flow Time (min) :	0.29	0.45	0

Total TOC (min) 7.89

Subbasin : Sub-CB-44

Input Data

Area (ac) 0.72
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	9	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	8.02	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	78.42	77.02	0
Slope (%) :	16.7	11.38	0
Surface Type :	Unpaved	Paved	Unpaved
Velocity (ft/sec) :	6.59	6.86	0
Computed Flow Time (min) :	0.2	0.19	0

Total TOC (min) 8.40

Subbasin : Sub-CB-6

Input Data

Area (ac) 0.16
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	207.9606416	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.62	0	0

Total TOC (min) 3.48

Subbasin : Sub-CB-7

Input Data

Area (ac) 0.04
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	12.99999999	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	68.39700153	0	0
Slope (%) :	0.85	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	1.87	0	0
Computed Flow Time (min) :	0.61	0	0

Total TOC (min) 3.47

Subbasin : Sub-CB-9

Input Data

Area (ac) 0.12
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	12.99999519	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	199.7947467	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.6	0	0

Total TOC (min) 3.46

Subbasin : Sub-FES-2

Input Data

Area (ac) 1.58
Weighted Runoff Coefficient 0.56

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	12	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	7.15	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	363.3701089	0	0
Slope (%) :	10	0	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	5.1	0	0
Computed Flow Time (min) :	1.19	0	0

Total TOC (min) 8.33

Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft^2)	Minimum Pipe Cover (in)
1	FES-2	466.60	469.78	3.18	466.60	0.00	469.78	0.00	0.00	0.00
2	JB-14	529.50	535.50	6.00	529.50	0.00	535.50	0.00	0.00	0.00
3	JB-23	515.30	519.20	3.90	515.30	0.00	519.20	0.00	10.00	0.00

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Tim F Floo Occurre (days hh:r
1	FES-2	14.36	14.36	468.04	1.44	0.00	1.74	467.71	1.11	0 00:00	0 0(
2	JB-14	5.29	0.00	529.93	0.43	0.00	5.57	529.51	0.01	0 00:12	0 0(
3	JB-23	2.02	0.00	515.59	0.29	0.00	3.61	515.30	0.00	0 00:06	0 0(

Channel Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness
1	L-SDPIPE-1	73.15	475.75	9.81	474.50	7.03	1.25	1.7100	User-Defined	0.330	14.000	0.0150
2	L-SDPIPE-13	403.61	521.56	4.06	510.35	5.35	11.21	2.7800	User-Defined	0.330	14.000	0.0150
3	L-SDPIPE-14	373.89	522.14	4.14	515.20	4.86	6.94	1.8600	User-Defined	0.330	14.000	0.0150
4	L-SDPIPE-15	83.27	471.31	3.20	464.82	0.00	6.49	7.7900	User-Defined	0.330	14.000	0.0150
5	L-SDPIPE-16	206.62	504.78	3.68	489.41	6.22	15.37	7.4400	User-Defined	0.330	14.000	0.0150
6	L-SDPIPE-18	171.93	523.17	5.40	517.57	3.45	5.60	3.2600	User-Defined	0.330	14.000	0.0150
7	L-SDPIPE-19	227.29	522.01	6.20	504.78	3.35	17.23	7.5800	User-Defined	0.330	14.000	0.0150
8	L-SDPIPE-2	62.02	475.38	9.08	474.50	6.70	0.88	1.4200	User-Defined	0.330	14.000	0.0150
9	L-SDPIPE-20	233.87	504.78	3.35	487.38	3.76	17.40	7.4400	User-Defined	0.330	14.000	0.0150
10	L-SDPIPE-21	239.45	543.76	5.26	533.98	3.78	9.78	4.0800	User-Defined	0.330	14.000	0.0150
11	L-SDPIPE-23	314.52	547.71	5.07	533.98	3.45	13.74	4.3700	User-Defined	0.500	26.000	0.0150
12	L-SDPIPE-25	202.83	550.25	4.25	532.10	0.00	18.15	8.9500	User-Defined	0.500	26.000	0.0150
13	L-SDPIPE-27	245.69	492.85	5.35	475.38	9.08	17.47	7.1100	User-Defined	0.330	14.000	0.0150
14	L-SDPIPE-28	228.18	492.30	4.46	475.75	9.81	16.55	7.2500	User-Defined	0.330	14.000	0.0150
15	L-SDPIPE-29	172.07	510.35	5.35	492.85	5.35	17.49	10.1700	User-Defined	0.330	14.000	0.0150
16	L-SDPIPE-32	98.14	549.76	5.26	540.30	0.00	9.46	9.6400	User-Defined	0.500	26.000	0.0150
17	L-SDPIPE-33	78.40	517.57	3.45	516.63	4.05	0.94	1.2000	User-Defined	0.330	14.000	0.0320
18	L-SDPIPE-34	149.79	521.28	5.00	516.63	4.05	4.65	3.1000	User-Defined	0.330	14.000	0.0320
19	L-SDPIPE-4	129.78	474.50	7.03	464.82	0.00	9.68	7.4600	User-Defined	0.330	14.000	0.0320
20	L-SDPIPE-6	214.12	489.41	6.22	474.50	6.70	14.91	6.9600	User-Defined	0.330	14.000	0.0150
21	L-SDPIPE-7	216.57	487.38	3.76	471.31	3.20	16.07	7.4200	User-Defined	0.330	14.000	0.0150

Channel Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	I N
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)	
1	L-SDPIPE-1	0.00	0 00:00	3.30	0.00	0.00		0.00	0.00	0.00	
2	L-SDPIPE-13	0.00	0 00:00	4.21	0.00	0.00		0.02	0.06	0.00	
3	L-SDPIPE-14	0.46	0 00:13	3.45	0.13	0.37	16.84	0.24	0.73	0.00	
4	L-SDPIPE-15	0.18	0 00:17	7.06	0.03	1.66	0.84	0.08	0.24	0.00	
5	L-SDPIPE-16	0.00	0 00:05	6.90	0.00	0.00		0.00	0.01	0.00	
6	L-SDPIPE-18	0.11	0 00:05	4.56	0.02	6.54	0.44	0.07	0.21	0.00	
7	L-SDPIPE-19	0.34	0 00:08	6.96	0.05	2.95	1.28	0.07	0.22	0.00	
8	L-SDPIPE-2	0.00	0 00:00	3.02	0.00	0.00		0.09	0.27	0.00	
9	L-SDPIPE-20	0.09	0 00:16	6.90	0.01	0.82	4.75	0.07	0.21	0.00	
10	L-SDPIPE-21	0.00	0 00:00	5.11	0.00	0.00		0.17	0.50	0.00	
11	L-SDPIPE-23	0.00	0 00:06	19.69	0.00	0.01	524.20	0.15	0.31	0.00	
12	L-SDPIPE-25	0.00	0 00:05	28.17	0.00	0.00		0.01	0.02	0.00	
13	L-SDPIPE-27	0.00	0 00:00	6.74	0.00	0.00		0.00	0.00	0.00	
14	L-SDPIPE-28	0.24	0 00:14	6.81	0.03	2.96	1.28	0.06	0.18	0.00	
15	L-SDPIPE-29	0.02	0 00:07	8.06	0.00	1.78	1.61	0.02	0.06	0.00	
16	L-SDPIPE-32	0.03	0 00:05	29.25	0.00	2.05	0.80	0.02	0.05	0.00	
17	L-SDPIPE-33	0.00	0 00:00	2.77	0.00	0.00		0.17	0.50	0.00	
18	L-SDPIPE-34	0.22	0 00:08	4.46	0.05	0.22	11.35	0.22	0.66	0.00	
19	L-SDPIPE-4	0.00	0 00:00	6.91	0.00	0.00		0.00	0.00	0.00	
20	L-SDPIPE-6	0.00	0 00:00	6.67	0.00	0.00		0.09	0.27	0.00	
21	L-SDPIPE-7	0.16	0 00:16	6.89	0.02	1.23	2.93	0.08	0.23	0.00	

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness
1	SDPIPE-1	35.55	465.94	0.00	463.00	0.00	2.94	8.2700	CIRCULAR	36.000	36.000	0.0120
2	SDPIPE-10	256.10	529.50	0.00	512.58	0.00	16.92	6.6100	CIRCULAR	18.000	18.000	0.0120
3	SDPIPE-11	70.07	530.20	0.00	529.50	0.00	0.70	1.0000	CIRCULAR	18.000	18.000	0.0120
4	SDPIPE-12	33.00	530.53	0.00	530.20	0.00	0.33	1.0000	CIRCULAR	18.000	18.000	0.0130
5	SDPIPE-13	130.50	517.50	0.00	505.00	0.00	12.50	9.5800	CIRCULAR	18.000	18.000	0.0120
6	SDPIPE-14	39.55	517.99	0.00	517.50	0.00	0.49	1.2500	CIRCULAR	18.000	18.000	0.0130
7	SDPIPE-15	64.04	468.11	0.00	467.47	0.00	0.64	1.0000	CIRCULAR	18.000	18.000	0.0130
8	SDPIPE-16	23.51	501.10	0.00	499.00	0.00	2.10	8.9300	CIRCULAR	18.000	18.000	0.0120
9	SDPIPE-17	194.21	515.30	0.00	504.78	3.68	10.52	5.4200	CIRCULAR	18.000	18.000	0.0120
10	SDPIPE-18	49.41	517.77	0.00	515.30	0.00	2.47	5.0000	CIRCULAR	18.000	18.000	0.0130
11	SDPIPE-19	51.31	515.81	0.00	515.30	0.00	0.51	1.0000	CIRCULAR	18.000	18.000	0.0130
12	SDPIPE-2	35.82	466.30	0.00	465.94	0.00	0.36	1.0000	CIRCULAR	36.000	36.000	0.0130
13	SDPIPE-20	33.00	501.43	0.00	501.10	0.00	0.33	1.0000	CIRCULAR	18.000	18.000	0.0120
14	SDPIPE-21	237.30	538.50	0.00	530.20	0.00	8.30	3.5000	CIRCULAR	18.000	18.000	0.0120
15	SDPIPE-22	57.68	542.20	0.00	538.50	0.00	3.70	6.4100	CIRCULAR	18.000	18.000	0.0130
16	SDPIPE-23	44.75	542.65	0.00	542.20	0.00	0.45	1.0000	CIRCULAR	18.000	18.000	0.0130
17	SDPIPE-25	74.63	546.00	0.00	544.50	0.00	1.50	2.0100	CIRCULAR	18.000	18.000	0.0130
18	SDPIPE-27	182.53	487.50	0.00	484.31	0.00	3.19	1.7500	CIRCULAR	18.000	18.000	0.0120
19	SDPIPE-28	33.55	487.84	0.00	487.50	0.00	0.34	1.0000	CIRCULAR	18.000	18.000	0.0130
20	SDPIPE-29	167.22	505.00	0.00	487.50	0.00	17.50	10.4700	CIRCULAR	18.000	18.000	0.0120
21	SDPIPE-3	30.36	466.60	0.00	466.30	0.00	0.30	1.0000	CIRCULAR	36.000	36.000	0.0120
22	SDPIPE-30	66.71	510.34	0.00	505.00	0.00	5.34	8.0000	CIRCULAR	18.000	18.000	0.0130
23	SDPIPE-32	96.89	544.50	0.00	538.50	0.00	6.00	6.1900	CIRCULAR	18.000	18.000	0.0120
24	SDPIPE-33	76.95	514.12	0.00	512.58	0.00	1.54	2.0000	CIRCULAR	18.000	18.000	0.0150
25	SDPIPE-34	148.00	516.28	0.00	512.58	0.00	3.70	2.5000	CIRCULAR	18.000	18.000	0.0150
26	SDPIPE-4	71.93	467.47	0.00	466.75	0.81	0.72	1.0000	CIRCULAR	18.000	18.000	0.0120
27	SDPIPE-5	33.00	467.80	0.00	467.47	0.00	0.33	1.0000	CIRCULAR	18.000	18.000	0.0130
28	SDPIPE-6	67.57	483.19	0.00	482.52	0.00	0.67	1.0000	CIRCULAR	18.000	18.000	0.0120
29	SDPIPE-7	42.68	483.62	0.00	483.19	0.00	0.43	1.0000	CIRCULAR	18.000	18.000	0.0130
30	SDPIPE-8	130.51	512.25	0.00	492.00	0.00	20.25	15.5200	CIRCULAR	24.000	24.000	0.0120
31	SDPIPE-9	33.00	512.58	0.00	512.25	0.00	0.33	1.0000	CIRCULAR	24.000	24.000	0.0130

Pipe Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Fro Nur
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)	
1	SDPIPE-1	16.29	0 00:08	207.79	0.08	13.27	0.04	0.69	0.23	0.00	
2	SDPIPE-10	5.29	0 00:12	29.25	0.18	5.99	0.71	0.87	0.58	0.00	
3	SDPIPE-11	5.29	0 00:12	11.38	0.47	7.05	0.17	0.66	0.44	0.00	
4	SDPIPE-12	0.69	0 00:07	10.49	0.07	1.84	0.30	0.73	0.49	0.00	
5	SDPIPE-13	2.27	0 00:13	35.22	0.06	10.80	0.20	0.26	0.18	0.00	
6	SDPIPE-14	2.28	0 00:13	11.74	0.19	5.82	0.11	0.41	0.27	0.00	
7	SDPIPE-15	1.45	0 00:17	10.50	0.14	3.74	0.29	0.41	0.27	0.00	
8	SDPIPE-16	3.04	0 00:06	34.01	0.09	9.80	0.04	0.35	0.23	0.00	
9	SDPIPE-17	2.00	0 00:06	26.49	0.08	8.62	0.38	0.28	0.19	0.00	
10	SDPIPE-18	1.05	0 00:05	23.49	0.04	5.37	0.15	0.25	0.17	0.00	
11	SDPIPE-19	1.38	0 00:08	10.50	0.13	4.50	0.19	0.35	0.23	0.00	
12	SDPIPE-2	14.53	0 00:08	66.70	0.22	6.16	0.10	1.10	0.37	0.00	
13	SDPIPE-20	1.13	0 00:16	11.38	0.10	4.37	0.13	0.37	0.25	0.00	
14	SDPIPE-21	1.69	0 00:15	21.28	0.08	3.63	1.09	0.57	0.38	0.00	
15	SDPIPE-22	1.70	0 00:15	26.60	0.06	7.50	0.13	0.28	0.19	0.00	
16	SDPIPE-23	0.62	0 00:05	10.50	0.06	3.27	0.23	0.25	0.16	0.00	
17	SDPIPE-25	0.55	0 00:05	14.89	0.04	3.57	0.35	0.21	0.14	0.00	
18	SDPIPE-27	4.00	0 00:20	15.03	0.27	6.84	0.44	0.55	0.37	0.00	
19	SDPIPE-28	1.27	0 00:14	10.50	0.12	3.12	0.18	0.46	0.31	0.00	
20	SDPIPE-29	3.08	0 00:20	36.81	0.08	7.34	0.38	0.43	0.29	0.00	
21	SDPIPE-3	14.44	0 00:00	71.83	0.20	7.37	0.07	1.32	0.44	0.00	
22	SDPIPE-30	3.08	0 00:20	29.71	0.10	10.67	0.10	0.33	0.22	0.00	
23	SDPIPE-32	1.24	0 00:05	28.32	0.04	7.77	0.21	0.22	0.15	0.00	
24	SDPIPE-33	2.46	0 00:08	12.88	0.19	3.47	0.37	0.87	0.58	0.00	
25	SDPIPE-34	2.16	0 00:08	14.39	0.15	3.23	0.76	0.86	0.57	0.00	
26	SDPIPE-4	1.44	0 00:17	11.38	0.13	4.10	0.29	0.38	0.25	0.00	
27	SDPIPE-5	0.42	0 00:07	10.50	0.04	1.92	0.29	0.28	0.18	0.00	
28	SDPIPE-6	1.37	0 00:16	11.37	0.12	4.02	0.28	0.37	0.25	0.00	
29	SDPIPE-7	1.37	0 00:16	10.50	0.13	3.58	0.20	0.40	0.27	0.00	
30	SDPIPE-8	11.70	0 00:09	96.54	0.12	19.35	0.11	0.49	0.25	0.00	
31	SDPIPE-9	11.55	0 00:09	22.62	0.51	8.12	0.07	0.93	0.46	0.00	

Inlet Input

SN	Element ID	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Inlet Depth (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Ponded Area (ft^2)	Grate Clogging Factor (%)
1	CB-10	On Grade	1	483.62	487.38	3.76	483.62	0.00	N/A	0.00
2	CB-12	On Sag	1	512.25	516.63	4.38	512.25	0.00	10.00	0.00
3	CB-13	On Sag	1	512.58	516.63	4.05	512.58	0.00	10.00	0.00
4	CB-15	On Sag	1	530.20	533.98	3.78	530.20	0.00	10.00	0.00
5	CB-16	On Sag	1	530.53	533.98	3.45	530.53	0.00	10.00	0.00
6	CB-18	On Grade	1	517.50	521.56	4.06	517.50	0.00	N/A	0.00
7	CB-2	On Grade	1	465.94	475.75	9.81	465.94	0.00	N/A	0.00
8	CB-20	On Grade	1	468.11	471.31	3.20	468.11	0.00	N/A	0.00
9	CB-22	On Grade	1	501.10	504.78	3.68	501.10	0.00	N/A	0.00
10	CB-24	On Grade	1	517.77	523.17	5.40	517.77	0.00	N/A	0.00
11	CB-25	On Grade	1	515.81	522.01	6.20	515.81	0.00	N/A	0.00
12	CB-26	On Grade	1	501.43	504.78	3.35	501.43	0.00	N/A	0.00
13	CB-27	On Grade	1	538.50	543.76	5.26	538.50	0.00	N/A	0.00
14	CB-28	On Sag	1	542.20	546.43	4.23	542.20	0.00	10.00	0.00
15	CB-29	On Grade	1	542.65	547.71	5.07	542.65	0.00	N/A	0.00
16	CB-3	On Grade	1	466.30	475.38	9.08	466.30	0.00	N/A	0.00
17	CB-31	On Grade	1	544.50	549.76	5.26	544.50	0.00	N/A	0.00
18	CB-32	On Grade	1	546.00	550.25	4.25	546.00	0.00	N/A	0.00
19	CB-35	On Grade	1	487.50	492.85	5.35	487.50	0.00	N/A	0.00
20	CB-36	On Grade	1	487.84	492.30	4.46	487.84	0.00	N/A	0.00
21	CB-38	On Grade	1	505.00	510.35	5.35	505.00	0.00	N/A	0.00
22	CB-39	On Sag	1	510.34	515.20	4.86	510.34	0.00	10.00	0.00
23	CB-43	On Grade	1	514.12	517.57	3.45	514.12	0.00	N/A	0.00
24	CB-6	On Sag	1	467.80	474.50	6.70	467.80	0.00	10.00	0.00
25	CB-7	On Grade	1	467.47	474.50	7.03	467.47	0.00	N/A	0.00
26	CB-9	On Grade	1	483.19	489.41	6.22	483.19	0.00	N/A	0.00
27	FES-19	On Grade	1	517.99	522.14	4.14	517.99	0.00	N/A	0.00
28	Inlet-CB-44	On Grade	1	516.28	521.28	5.00	516.28	0.00	N/A	0.00

Roadway & Gutter Input

SN	Element ID	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (in)	Allowable Spread (ft)
1	CB-10	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
2	CB-12	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
3	CB-13	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
4	CB-15	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
5	CB-16	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
6	CB-18	0.0245	0.0258	0.0150	0.0200	1.00	0.1312	8.50
7	CB-2	0.0085	0.0258	0.0150	0.0200	1.00	0.1312	8.50
8	CB-20	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
9	CB-22	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
10	CB-24	0.1033	0.0258	0.0150	0.0200	1.00	0.1312	8.50
11	CB-25	0.1041	0.0258	0.0150	0.0200	1.00	0.1312	8.50
12	CB-26	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
13	CB-27	0.0574	0.0258	0.0150	0.0200	1.00	0.1312	8.50
14	CB-28	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
15	CB-29	0.0574	0.0258	0.0150	0.0200	1.00	0.1312	8.50
16	CB-3	0.0085	0.0258	0.0150	0.0200	1.00	0.1312	8.50
17	CB-31	0.0721	0.0200	0.0150	0.0200	1.50	0.1312	8.50
18	CB-32	0.0809	0.0258	0.0150	0.0200	1.00	0.1312	8.50
19	CB-35	0.1046	0.0258	0.0150	0.0200	1.00	0.1312	8.50
20	CB-36	0.1046	0.0258	0.0150	0.0200	1.00	0.1312	8.50
21	CB-38	0.1046	0.0258	0.0150	0.0200	1.00	0.1312	8.50
22	CB-39	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
23	CB-43	0.0199	0.0258	0.0150	0.0200	1.00	0.1312	8.50
24	CB-6	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
25	CB-7	0.0085	0.0258	0.0150	0.0200	1.00	0.1312	8.50
26	CB-9	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
27	FES-19	0.0245	0.0258	0.0150	0.0200	1.00	0.1312	8.50
28	Inlet-CB-44	0.1138	0.0258	0.0150	0.0200	1.00	0.1312	8.50

Inlet Results

SN	Element ID	Peak Flow (cfs)	Peak Lateral Inflow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	F \
1	CB-10	1.54	1.45	1.34	0.19	87.40	4.89	487.50	0.12	0 00:16	
2	CB-12	1.36	1.36	N/A	N/A	N/A	4.37	516.91	0.28	0 00:09	
3	CB-13	3.72	3.56	N/A	N/A	N/A	8.53	517.01	0.39	0 00:09	
4	CB-15	3.63	3.63	N/A	N/A	N/A	8.38	534.36	0.38	0 00:12	
5	CB-16	1.79	1.79	N/A	N/A	N/A	5.24	534.28	0.30	0 00:12	
6	CB-18	0.53	0.53	0.53	0.00	100.00	4.05	521.66	0.10	0 00:13	
7	CB-2	1.20	0.97	1.20	0.00	100.00	6.67	475.91	0.17	0 00:08	
8	CB-20	1.63	1.50	1.40	0.23	85.80	4.99	471.43	0.12	0 00:17	
9	CB-22	0.60	0.60	0.60	0.00	100.00	3.45	504.87	0.08	0 00:06	
10	CB-24	1.16	1.16	1.06	0.10	91.65	4.15	523.27	0.10	0 00:05	
11	CB-25	1.73	1.73	1.39	0.34	80.28	4.80	522.13	0.12	0 00:08	
12	CB-26	1.23	1.23	1.15	0.08	93.36	4.48	504.89	0.11	0 00:16	
13	CB-27	0.38	0.38	0.38	0.00	100.00	3.07	543.83	0.07	0 00:15	
14	CB-28	1.71	1.71	N/A	N/A	N/A	5.07	546.73	0.30	0 00:15	
15	CB-29	0.63	0.63	0.63	0.00	100.00	3.71	547.80	0.09	0 00:05	
16	CB-3	0.60	0.60	0.60	0.00	100.00	5.18	475.51	0.13	0 00:08	
17	CB-31	0.74	0.74	0.74	0.01	99.03	4.36	549.85	0.09	0 00:05	
18	CB-32	0.56	0.56	0.56	0.00	100.00	3.32	550.33	0.08	0 00:05	
19	CB-35	0.43	0.43	0.43	0.00	100.00	2.89	492.92	0.07	0 00:20	
20	CB-36	1.51	1.51	1.27	0.24	84.23	4.56	492.41	0.11	0 00:14	
21	CB-38	0.97	0.97	0.93	0.04	95.57	3.88	510.44	0.09	0 00:20	
22	CB-39	3.23	3.20	N/A	N/A	N/A	7.77	515.56	0.37	0 00:20	
23	CB-43	2.46	2.46	2.46	0.00	100.00	7.44	517.76	0.19	0 00:08	
24	CB-6	0.71	0.71	N/A	N/A	N/A	2.83	474.74	0.24	0 00:07	
25	CB-7	0.18	0.18	0.18	0.00	100.00	3.27	474.58	0.08	0 00:17	
26	CB-9	0.51	0.51	0.51	0.00	100.00	3.25	489.49	0.08	0 00:16	
27	FES-19	2.74	2.74	2.28	0.46	83.25	7.45	522.32	0.19	0 00:13	
28	Inlet-CB-44	2.43	2.43	2.18	0.24	89.92	5.34	521.41	0.13	0 00:08	

10 Year Design Storm

Project Description

File Name	Hilltop Drainage Analysis 3-4-26.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	00:00:00	0:00:00
End Analysis On	00:00:00	0:00:00
Start Reporting On	00:00:00	0:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	29
Nodes	42
Junctions	3
Outfalls	11
Flow Diversions	0
Inlets	28
Storage Nodes	0
Links	52
Channels	21
Pipes	31
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	10 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	Sub-CB-10	0.58	0.7000	1.26	0.88	0.51	1.94	0 00:15:54
2	Sub-CB-12	0.32	0.7000	0.69	0.48	0.15	1.82	0 00:05:00
3	Sub-CB-13	1.03	0.7000	0.88	0.62	0.63	4.76	0 00:07:58
4	Sub-CB-15	1.21	0.7000	1.03	0.72	0.88	4.85	0 00:10:46
5	Sub-CB-16	0.42	0.7000	0.69	0.48	0.20	2.40	0 00:05:00
6	Sub-CB-18	0.12	0.7000	0.69	0.48	0.06	0.71	0 00:05:00
7	Sub-CB-19	1.00	0.7000	1.14	0.80	0.79	3.67	0 00:12:57
8	Sub-CB-2	0.38	0.7000	1.23	0.86	0.33	1.30	0 00:14:59
9	Sub-CB-20	0.62	0.7000	1.32	0.92	0.57	2.01	0 00:17:03
10	Sub-CB-22	0.14	0.7000	0.69	0.48	0.07	0.80	0 00:05:00
11	Sub-CB-24	0.27	0.7000	0.68	0.48	0.13	1.55	0 00:05:01
12	Sub-CB-25	0.51	0.7000	0.90	0.63	0.32	2.31	0 00:08:15
13	Sub-CB-26	0.49	0.7000	1.26	0.88	0.43	1.64	0 00:15:52
14	Sub-CB-27	0.10	0.7000	0.77	0.54	0.05	0.50	0 00:06:07
15	Sub-CB-28	0.67	0.7000	1.22	0.86	0.57	2.29	0 00:15:04
16	Sub-CB-29	0.15	0.7000	0.69	0.48	0.07	0.84	0 00:05:00
17	Sub-CB-3	0.14	0.7000	0.69	0.48	0.07	0.81	0 00:05:00
18	Sub-CB-31	0.17	0.7000	0.69	0.48	0.08	1.00	0 00:05:00
19	Sub-CB-32	0.13	0.7000	0.69	0.48	0.06	0.74	0 00:05:00
20	Sub-CB-35	0.10	0.7000	0.69	0.48	0.05	0.58	0 00:05:00
21	Sub-CB-36	0.58	0.7000	1.21	0.85	0.49	2.02	0 00:14:42
22	Sub-CB-38	0.24	0.7000	0.73	0.51	0.12	1.30	0 00:05:43
23	Sub-CB-39	1.39	0.7000	1.41	0.99	1.37	4.29	0 00:19:10
24	Sub-CB-43	0.71	0.7000	0.87	0.61	0.43	3.30	0 00:07:53
25	Sub-CB-44	0.72	0.7000	0.89	0.63	0.45	3.25	0 00:08:24
26	Sub-CB-6	0.16	0.7000	0.69	0.48	0.08	0.95	0 00:05:00
27	Sub-CB-7	0.04	0.7000	0.69	0.48	0.02	0.23	0 00:05:00
28	Sub-CB-9	0.12	0.7000	0.69	0.48	0.06	0.68	0 00:05:00
29	Sub-FES-2	1.58	0.5600	0.90	0.50	0.80	5.74	0 00:08:19

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft^2)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	(
1	FES-2	Junction	466.60	469.78	466.60	469.78	0.00	18.15	468.23	0.00	1.55	
2	JB-14	Junction	529.50	535.50	529.50	535.50	0.00	7.08	530.00	0.00	5.50	
3	JB-23	Junction	515.30	519.20	515.30	519.20	10.00	2.48	515.62	0.00	3.58	
4	OFFSITE-1	Outfall	540.30					0.06	540.34			
5	OFFSITE-2	Outfall	532.10					0.01	532.12			
6	OFFSITE-25	Outfall	464.82					0.00	464.82			
7	OFFSITE-26	Outfall	464.82					0.41	464.93			
8	Out-FES-1	Outfall	463.00					20.77	463.64			
9	Out-FES-11	Outfall	492.00					16.42	492.56			
10	Out-FES-17	Outfall	505.00					2.73	505.28			
11	Out-FES-21	Outfall	499.00					4.02	499.35			
12	Out-FES-3	Outfall	538.50					1.63	538.74			
13	Out-FES-34	Outfall	484.31					5.47	484.94			
14	Out-FES-8	Outfall	482.52					1.79	482.92			

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Fl Dep Total De Ra
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)	
1	SDPIPE-1	Pipe	CB-2	Out-FES-1	35.55	465.94	463.00	8.2700	36.000	0.0120	20.77	207.79	0.10	13.80	0.80	0
2	SDPIPE-10	Pipe	JB-14	CB-13	256.10	529.50	512.58	6.6100	18.000	0.0120	7.07	29.25	0.24	6.63	1.00	0
3	SDPIPE-11	Pipe	CB-15	JB-14	70.07	530.20	529.50	1.0000	18.000	0.0120	7.08	11.38	0.62	7.49	0.79	0
4	SDPIPE-12	Pipe	CB-16	CB-15	33.00	530.53	530.20	1.0000	18.000	0.0130	0.81	10.49	0.08	1.89	0.92	0
5	SDPIPE-13	Pipe	CB-18	Out-FES-17	130.50	517.50	505.00	9.5800	18.000	0.0120	2.73	35.22	0.08	11.41	0.29	0
6	SDPIPE-14	Pipe	FES-19	CB-18	39.55	517.99	517.50	1.2500	18.000	0.0130	2.73	11.74	0.23	6.07	0.45	0
7	SDPIPE-15	Pipe	CB-20	CB-7	64.04	468.11	467.47	1.0000	18.000	0.0130	1.91	10.50	0.18	3.96	0.48	0
8	SDPIPE-16	Pipe	CB-22	Out-FES-21	23.51	501.10	499.00	8.9300	18.000	0.0120	4.02	34.01	0.12	10.32	0.41	0
9	SDPIPE-17	Pipe	JB-23	CB-22	194.21	515.30	504.78	5.4200	18.000	0.0120	2.46	26.49	0.09	9.13	0.31	0
10	SDPIPE-18	Pipe	CB-24	JB-23	49.41	517.77	515.30	5.0000	18.000	0.0130	1.29	23.49	0.05	5.64	0.28	0
11	SDPIPE-19	Pipe	CB-25	JB-23	51.31	515.81	515.30	1.0000	18.000	0.0130	1.65	10.50	0.16	4.72	0.38	0
12	SDPIPE-2	Pipe	CB-3	CB-2	35.82	466.30	465.94	1.0000	36.000	0.0130	18.39	66.70	0.28	6.53	1.26	0
13	SDPIPE-20	Pipe	CB-26	CB-22	33.00	501.43	501.10	1.0000	18.000	0.0120	1.51	11.38	0.13	4.60	0.46	0
14	SDPIPE-21	Pipe	CB-27	CB-15	237.30	538.50	530.20	3.5000	18.000	0.0120	2.26	21.28	0.11	4.01	0.69	0
15	SDPIPE-22	Pipe	CB-28	CB-27	57.68	542.20	538.50	6.4100	18.000	0.0130	2.28	26.60	0.09	8.09	0.32	0
16	SDPIPE-23	Pipe	CB-29	CB-28	44.75	542.65	542.20	1.0000	18.000	0.0130	0.83	10.50	0.08	3.51	0.29	0
17	SDPIPE-25	Pipe	CB-32	CB-31	74.63	546.00	544.50	2.0100	18.000	0.0130	0.72	14.89	0.05	3.84	0.24	0
18	SDPIPE-27	Pipe	CB-35	Out-FES-34	182.53	487.50	484.31	1.7500	18.000	0.0120	5.47	15.03	0.36	7.37	0.66	0
19	SDPIPE-28	Pipe	CB-36	CB-35	33.55	487.84	487.50	1.0000	18.000	0.0130	1.52	10.50	0.15	3.12	0.56	0
20	SDPIPE-29	Pipe	CB-38	CB-35	167.22	505.00	487.50	10.4700	18.000	0.0120	4.30	36.81	0.12	8.00	0.52	0
21	SDPIPE-3	Pipe	FES-2	CB-3	30.36	466.60	466.30	1.0000	36.000	0.0120	18.15	71.83	0.25	7.64	1.53	0
22	SDPIPE-30	Pipe	CB-39	CB-38	66.71	510.34	505.00	8.0000	18.000	0.0130	4.30	29.71	0.14	11.57	0.39	0
23	SDPIPE-32	Pipe	CB-31	Out-FES-3	96.89	544.50	538.50	6.1900	18.000	0.0120	1.63	28.32	0.06	8.35	0.25	0
24	SDPIPE-33	Pipe	CB-43	CB-13	76.95	514.12	512.58	2.0000	18.000	0.0150	3.24	12.88	0.25	3.72	1.01	0
25	SDPIPE-34	Pipe	Inlet-CB-44	CB-13	148.00	516.28	512.58	2.5000	18.000	0.0150	2.62	14.39	0.18	3.48	0.97	0
26	SDPIPE-4	Pipe	CB-7	CB-2	71.93	467.47	466.75	1.0000	18.000	0.0120	1.92	11.38	0.17	4.40	0.44	0
27	SDPIPE-5	Pipe	CB-6	CB-7	33.00	467.80	467.47	1.0000	18.000	0.0130	0.52	10.50	0.05	1.96	0.32	0
28	SDPIPE-6	Pipe	CB-9	Out-FES-8	67.57	483.19	482.52	1.0000	18.000	0.0120	1.79	11.37	0.16	4.31	0.43	0

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Fl Dep Total De Ra
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)	
46	L-SDPIPE-29	Channel	CB-38	CB-35	172.07	510.35	492.85	10.1700	3.960	0.0150	0.11	8.06	0.01	2.68	0.04	0
47	L-SDPIPE-32	Channel	CB-31	OFFSITE-1	98.14	549.76	540.30	9.6400	6.000	0.0150	0.06	29.25	0.00	2.14	0.04	0
48	L-SDPIPE-33	Channel	CB-43	CB-13	78.40	517.57	516.63	1.2000	3.960	0.0320	0.02	2.77	0.01	0.08	0.19	0
49	L-SDPIPE-34	Channel	Inlet-CB-44	CB-13	149.79	521.28	516.63	3.1000	3.960	0.0320	0.58	4.46	0.13	0.47	0.24	0
50	L-SDPIPE-4	Channel	CB-7	OFFSITE-25	129.78	474.50	464.82	7.4600	3.960	0.0320	0.00	6.91	0.00	0.00	0.00	0
51	L-SDPIPE-6	Channel	CB-9	CB-6	214.12	489.41	474.50	6.9600	3.960	0.0150	0.00	6.67	0.00	0.07	0.11	0
52	L-SDPIPE-7	Channel	CB-10	CB-20	216.57	487.38	471.31	7.4200	3.960	0.0150	0.37	6.89	0.05	1.51	0.11	0

Inlet Summary

SN	Element ID	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft²)	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Allowable Spread (ft)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)
1	CB-10	On Grade	1	483.62	487.38	483.62	N/A	2.18	1.68	0.50	77.21	8.50	5.56	487.52
2	CB-12	On Sag	1	512.25	516.63	512.25	10.00	1.82	N/A	N/A	N/A	8.50	5.29	516.93
3	CB-13	On Sag	1	512.58	516.63	512.58	10.00	5.27	N/A	N/A	N/A	8.50	10.76	517.07
4	CB-15	On Sag	1	530.20	533.98	530.20	10.00	4.85	N/A	N/A	N/A	8.50	10.18	534.41
5	CB-16	On Sag	1	530.53	533.98	530.53	10.00	2.39	N/A	N/A	N/A	8.50	6.35	534.31
6	CB-18	On Grade	1	517.50	521.56	517.50	N/A	0.70	0.70	0.00	100.00	8.50	4.49	521.67
7	CB-2	On Grade	1	465.94	475.75	465.94	N/A	1.78	1.78	0.00	100.00	8.50	7.69	475.94
8	CB-20	On Grade	1	468.11	471.31	468.11	N/A	2.32	1.75	0.57	75.33	8.50	5.68	471.45
9	CB-22	On Grade	1	501.10	504.78	501.10	N/A	0.80	0.80	0.00	99.97	8.50	3.85	504.88
10	CB-24	On Grade	1	517.77	523.17	517.77	N/A	1.54	1.29	0.25	83.68	8.50	4.62	523.28
11	CB-25	On Grade	1	515.81	522.01	515.81	N/A	2.31	1.66	0.65	71.68	8.50	5.33	522.14
12	CB-26	On Grade	1	501.43	504.78	501.43	N/A	1.65	1.41	0.24	85.52	8.50	5.00	504.91
13	CB-27	On Grade	1	538.50	543.76	538.50	N/A	0.50	0.50	0.00	100.00	8.50	3.41	543.84
14	CB-28	On Sag	1	542.20	546.43	542.20	10.00	2.28	N/A	N/A	N/A	8.50	6.16	546.76
15	CB-29	On Grade	1	542.65	547.71	542.65	N/A	0.84	0.84	0.00	100.00	8.50	4.12	547.81
16	CB-3	On Grade	1	466.30	475.38	466.30	N/A	0.81	0.81	0.00	100.00	8.50	5.73	475.52
17	CB-31	On Grade	1	544.50	549.76	544.50	N/A	0.99	0.93	0.06	93.74	8.50	4.88	549.86
18	CB-32	On Grade	1	546.00	550.25	546.00	N/A	0.74	0.74	0.00	100.00	8.50	3.68	550.33
19	CB-35	On Grade	1	487.50	492.85	487.50	N/A	0.60	0.60	0.00	100.00	8.50	3.25	492.93
20	CB-36	On Grade	1	487.84	492.30	487.84	N/A	2.02	1.53	0.49	75.65	8.50	5.06	492.42
21	CB-38	On Grade	1	505.00	510.35	505.00	N/A	1.30	1.15	0.15	88.46	8.50	4.31	510.45
22	CB-39	On Sag	1	510.34	515.20	510.34	10.00	4.44	N/A	N/A	N/A	8.50	9.60	515.61
23	CB-43	On Grade	1	514.12	517.57	514.12	N/A	3.29	3.23	0.06	98.14	8.50	8.27	517.78
24	CB-6	On Sag	1	467.80	474.50	467.80	10.00	0.95	N/A	N/A	N/A	8.50	3.43	474.75
25	CB-7	On Grade	1	467.47	474.50	467.47	N/A	0.23	0.23	0.00	100.00	8.50	3.63	474.59
26	CB-9	On Grade	1	483.19	489.41	483.19	N/A	0.68	0.68	0.00	100.00	8.50	3.61	489.50
27	FES-19	On Grade	1	517.99	522.14	517.99	N/A	3.67	2.74	0.93	74.60	8.50	8.28	522.35
28	Inlet-CB-44	On Grade	1	516.28	521.28	516.28	N/A	3.24	2.64	0.60	81.56	8.50	5.96	521.43

Subbasin Hydrology

Subbasin : Sub-CB-10

Input Data

Area (ac) 0.58
Weighted Runoff Coefficient 0.7

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	82.99996647	0	0
Slope (%) :	1.25	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.09	0	0
Computed Flow Time (min) :	15.21	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	229.3185963	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.69	0	0

Total TOC (min) 15.90

Subbasin : Sub-CB-12

Input Data

Area (ac) 0.32
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	219.5273657	0	0
Slope (%) :	1.99	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	2.87	0	0
Computed Flow Time (min) :	1.28	0	0

Total TOC (min) 4.14

Subbasin : Sub-CB-13

Input Data

Area (ac) 1.03
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	11.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	7.27	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	93	71.4	0
Slope (%) :	11.5	1.99	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	5.47	2.87	0
Computed Flow Time (min) :	0.28	0.41	0

Total TOC (min) 7.97

Subbasin : Sub-CB-15

Input Data

Area (ac) 1.21
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.16	0	0
Computed Flow Time (min) :	10.14	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	12.98144373	156.302	0
Slope (%) :	2	5.74	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	4.87	0
Computed Flow Time (min) :	0.09	0.53	0

Total TOC (min) 10.77

Subbasin : Sub-CB-16

Input Data

Area (ac) 0.42
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13.01720552	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	310.5319881	0	0
Slope (%) :	5.74	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	4.87	0	0
Computed Flow Time (min) :	1.06	0	0

Total TOC (min) 3.93

Subbasin : Sub-CB-18

Input Data

Area (ac) 0.12
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13.10752092	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.88	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	71.43477489	102.308	0
Slope (%) :	11.86	2.45	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	7	3.18	0
Computed Flow Time (min) :	0.17	0.54	0

Total TOC (min) 3.59

Subbasin : Sub-CB-19

Input Data

Area (ac) 1
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100.0031436	0	0
Slope (%) :	3.4	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.14	0	0
Computed Flow Time (min) :	11.83	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	6.07922878	278.905	79.9642
Slope (%) :	2	11.86	2.45
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	7	3.18
Computed Flow Time (min) :	0.04	0.66	0.42

Total TOC (min) 12.96

Subbasin : Sub-CB-2

Input Data

Area (ac) 0.38
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	83	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	14.14	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	175.3484305	45.5292	0
Slope (%) :	10.46	0.85	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	6.57	1.87	0
Computed Flow Time (min) :	0.44	0.4	0

Total TOC (min) 14.99

Subbasin : Sub-CB-20

Input Data

Area (ac) 0.62
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	99.99258294	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.41	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	3.00743724	208.662	0
Slope (%) :	2	7.49	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	5.56	0
Computed Flow Time (min) :	0.02	0.63	0

Total TOC (min) 17.06

Subbasin : Sub-CB-22

Input Data

Area (ac) 0.14
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	12.99981258	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	167.0428132	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.5	0	0

Total TOC (min) 3.36

Subbasin : Sub-CB-24

Input Data

Area (ac) 0.27
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	37.99958613	0	0
Slope (%) :	6.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.15	0	0
Computed Flow Time (min) :	4.21	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	28.98355088	187.485	0
Slope (%) :	0.51	10.41	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	1.45	6.56	0
Computed Flow Time (min) :	0.33	0.48	0

Total TOC (min) 5.02

Subbasin : Sub-CB-25

Input Data

Area (ac) 0.51
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	82.99999586	0	0
Slope (%) :	7.25	0	0
2 yr, 24 hr Rainfall (in) :	4.32	0	0
Velocity (ft/sec) :	0.18	0	0
Computed Flow Time (min) :	7.56	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	16.12667612	203.961	0
Slope (%) :	0.51	10.41	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	1.45	6.56	0
Computed Flow Time (min) :	0.19	0.52	0

Total TOC (min) 8.26

Subbasin : Sub-CB-26

Input Data

Area (ac) 0.49
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	82.99998121	0	0
Slope (%) :	1.25	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.09	0	0
Computed Flow Time (min) :	15.21	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	221.0918618	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.66	0	0

Total TOC (min) 15.87

Subbasin : Sub-CB-27

Input Data

Area (ac) 0.1
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	21.13547973	0	0
Slope (%) :	1	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.06	0	0
Computed Flow Time (min) :	5.57	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	117.1502173	0	0
Slope (%) :	2.92	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.47	0	0
Computed Flow Time (min) :	0.56	0	0

Total TOC (min) 6.13

Subbasin : Sub-CB-28

Input Data

Area (ac) 0.67
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.11	0	0
Computed Flow Time (min) :	14.63	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	17.02372996	94.0918	0
Slope (%) :	2	5.74	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	4.87	0
Computed Flow Time (min) :	0.12	0.32	0

Total TOC (min) 15.08

Subbasin : Sub-CB-29

Input Data

Area (ac) 0.15
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	253.6223323	0	0
Slope (%) :	5.74	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	4.87	0	0
Computed Flow Time (min) :	0.87	0	0

Total TOC (min) 3.73

Subbasin : Sub-CB-3

Input Data

Area (ac) 0.14
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	181.26423	58.4106	0
Slope (%) :	10.46	0.85	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	6.57	1.87	0
Computed Flow Time (min) :	0.46	0.52	0

Total TOC (min) 3.84

Subbasin : Sub-CB-31

Input Data

Area (ac) 0.17
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	166.3763112	83.6548	0
Slope (%) :	3.19	6.34	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.63	5.12	0
Computed Flow Time (min) :	0.76	0.27	0

Total TOC (min) 3.90

Subbasin : Sub-CB-32

Input Data

Area (ac) 0.13
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	167.2624187	52.7043	0
Slope (%) :	3.19	6.34	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.63	5.12	0
Computed Flow Time (min) :	0.77	0.17	0

Total TOC (min) 3.80

Subbasin : Sub-CB-35

Input Data

Area (ac) 0.1
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	159.59	0	0
Slope (%) :	10.46	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	6.57	0	0
Computed Flow Time (min) :	0.4	0	0

Total TOC (min) 3.27

Subbasin : Sub-CB-36

Input Data

Area (ac) 0.58
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	83	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	14.14	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	224.201193	0	0
Slope (%) :	10.46	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	6.57	0	0
Computed Flow Time (min) :	0.57	0	0

Total TOC (min) 14.71

Subbasin : Sub-CB-38

Input Data

Area (ac) 0.24
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13.00000002	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	214.8866153	184.112	0
Slope (%) :	2.45	0.75	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.18	1.76	0
Computed Flow Time (min) :	1.13	1.74	0

Total TOC (min) 5.73

Subbasin : Sub-CB-39

Input Data

Area (ac) 1.39
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	99.98923348	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.41	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	34.45719772	233.523	132.701
Slope (%) :	1.5	2.45	0.75
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	1.98	3.18	1.76
Computed Flow Time (min) :	0.29	1.22	1.26

Total TOC (min) 19.18

Subbasin : Sub-CB-43

Input Data

Area (ac) 0.71
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	12	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	7.15	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	93	77.84	0
Slope (%) :	10.75	1.99	0
Surface Type :	Unpaved	Paved	Unpaved
Velocity (ft/sec) :	5.29	2.87	0
Computed Flow Time (min) :	0.29	0.45	0

Total TOC (min) 7.89

Subbasin : Sub-CB-44

Input Data

Area (ac) 0.72
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	9	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	8.02	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	78.42	77.02	0
Slope (%) :	16.7	11.38	0
Surface Type :	Unpaved	Paved	Unpaved
Velocity (ft/sec) :	6.59	6.86	0
Computed Flow Time (min) :	0.2	0.19	0

Total TOC (min) 8.40

Subbasin : Sub-CB-6

Input Data

Area (ac) 0.16
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	207.9606416	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.62	0	0

Total TOC (min) 3.48

Subbasin : Sub-CB-7

Input Data

Area (ac) 0.04
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	12.99999999	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	68.39700153	0	0
Slope (%) :	0.85	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	1.87	0	0
Computed Flow Time (min) :	0.61	0	0

Total TOC (min) 3.47

Subbasin : Sub-CB-9

Input Data

Area (ac) 0.12
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	12.99999519	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	199.7947467	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.6	0	0

Total TOC (min) 3.46

Subbasin : Sub-FES-2

Input Data

Area (ac) 1.58
Weighted Runoff Coefficient 0.56

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	12	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	7.15	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	363.3701089	0	0
Slope (%) :	10	0	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	5.1	0	0
Computed Flow Time (min) :	1.19	0	0

Total TOC (min) 8.33

Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft^2)	Minimum Pipe Cover (in)
1	FES-2	466.60	469.78	3.18	466.60	0.00	469.78	0.00	0.00	0.00
2	JB-14	529.50	535.50	6.00	529.50	0.00	535.50	0.00	0.00	0.00
3	JB-23	515.30	519.20	3.90	515.30	0.00	519.20	0.00	10.00	0.00

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Tim F Floo Occurre (days hh:r
1	FES-2	18.15	18.15	468.23	1.63	0.00	1.55	467.87	1.27	0 00:08	0 0(
2	JB-14	7.08	0.00	530.00	0.50	0.00	5.50	529.51	0.01	0 00:12	0 0(
3	JB-23	2.48	0.00	515.62	0.32	0.00	3.58	515.30	0.00	0 00:05	0 0(

Channel Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness
1	L-SDPIPE-1	73.15	475.75	9.81	474.50	7.03	1.25	1.7100	User-Defined	0.330	14.000	0.0150
2	L-SDPIPE-13	403.61	521.56	4.06	510.35	5.35	11.21	2.7800	User-Defined	0.330	14.000	0.0150
3	L-SDPIPE-14	373.89	522.14	4.14	515.20	4.86	6.94	1.8600	User-Defined	0.330	14.000	0.0150
4	L-SDPIPE-15	83.27	471.31	3.20	464.82	0.00	6.49	7.7900	User-Defined	0.330	14.000	0.0150
5	L-SDPIPE-16	206.62	504.78	3.68	489.41	6.22	15.37	7.4400	User-Defined	0.330	14.000	0.0150
6	L-SDPIPE-18	171.93	523.17	5.40	517.57	3.45	5.60	3.2600	User-Defined	0.330	14.000	0.0150
7	L-SDPIPE-19	227.29	522.01	6.20	504.78	3.35	17.23	7.5800	User-Defined	0.330	14.000	0.0150
8	L-SDPIPE-2	62.02	475.38	9.08	474.50	6.70	0.88	1.4200	User-Defined	0.330	14.000	0.0150
9	L-SDPIPE-20	233.87	504.78	3.35	487.38	3.76	17.40	7.4400	User-Defined	0.330	14.000	0.0150
10	L-SDPIPE-21	239.45	543.76	5.26	533.98	3.78	9.78	4.0800	User-Defined	0.330	14.000	0.0150
11	L-SDPIPE-23	314.52	547.71	5.07	533.98	3.45	13.74	4.3700	User-Defined	0.500	26.000	0.0150
12	L-SDPIPE-25	202.83	550.25	4.25	532.10	0.00	18.15	8.9500	User-Defined	0.500	26.000	0.0150
13	L-SDPIPE-27	245.69	492.85	5.35	475.38	9.08	17.47	7.1100	User-Defined	0.330	14.000	0.0150
14	L-SDPIPE-28	228.18	492.30	4.46	475.75	9.81	16.55	7.2500	User-Defined	0.330	14.000	0.0150
15	L-SDPIPE-29	172.07	510.35	5.35	492.85	5.35	17.49	10.1700	User-Defined	0.330	14.000	0.0150
16	L-SDPIPE-32	98.14	549.76	5.26	540.30	0.00	9.46	9.6400	User-Defined	0.500	26.000	0.0150
17	L-SDPIPE-33	78.40	517.57	3.45	516.63	4.05	0.94	1.2000	User-Defined	0.330	14.000	0.0320
18	L-SDPIPE-34	149.79	521.28	5.00	516.63	4.05	4.65	3.1000	User-Defined	0.330	14.000	0.0320
19	L-SDPIPE-4	129.78	474.50	7.03	464.82	0.00	9.68	7.4600	User-Defined	0.330	14.000	0.0320
20	L-SDPIPE-6	214.12	489.41	6.22	474.50	6.70	14.91	6.9600	User-Defined	0.330	14.000	0.0150
21	L-SDPIPE-7	216.57	487.38	3.76	471.31	3.20	16.07	7.4200	User-Defined	0.330	14.000	0.0150

Channel Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	I N
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)	
1	L-SDPIPE-1	0.00	0 00:00	3.30	0.00	0.00		0.00	0.00	0.00	
2	L-SDPIPE-13	0.00	0 00:00	4.21	0.00	0.00		0.04	0.12	0.00	
3	L-SDPIPE-14	0.93	0 00:13	3.45	0.27	0.63	9.89	0.26	0.80	0.00	
4	L-SDPIPE-15	0.41	0 00:17	7.06	0.06	1.75	0.79	0.11	0.33	0.00	
5	L-SDPIPE-16	0.01	0 00:06	6.90	0.00	0.54	6.38	0.02	0.06	0.00	
6	L-SDPIPE-18	0.25	0 00:05	4.56	0.06	6.98	0.41	0.10	0.31	0.00	
7	L-SDPIPE-19	0.65	0 00:08	6.96	0.09	3.11	1.22	0.10	0.29	0.00	
8	L-SDPIPE-2	0.00	0 00:00	3.02	0.00	0.00		0.11	0.33	0.00	
9	L-SDPIPE-20	0.24	0 00:16	6.90	0.03	1.10	3.54	0.10	0.30	0.00	
10	L-SDPIPE-21	0.00	0 00:00	5.11	0.00	0.00		0.17	0.50	0.00	
11	L-SDPIPE-23	0.00	0 00:06	19.69	0.00	0.01	524.20	0.19	0.37	0.00	
12	L-SDPIPE-25	0.01	0 00:05	28.17	0.00	1.71	1.98	0.02	0.04	0.00	
13	L-SDPIPE-27	0.00	0 00:00	6.74	0.00	0.00		0.00	0.00	0.00	
14	L-SDPIPE-28	0.49	0 00:14	6.81	0.07	3.59	1.06	0.08	0.23	0.00	
15	L-SDPIPE-29	0.11	0 00:06	8.06	0.01	2.68	1.07	0.04	0.12	0.00	
16	L-SDPIPE-32	0.06	0 00:05	29.25	0.00	2.14	0.76	0.04	0.08	0.00	
17	L-SDPIPE-33	0.02	0 00:08	2.77	0.01	0.08	16.33	0.19	0.58	0.00	
18	L-SDPIPE-34	0.58	0 00:08	4.46	0.13	0.47	5.31	0.24	0.73	0.00	
19	L-SDPIPE-4	0.00	0 00:00	6.91	0.00	0.00		0.00	0.00	0.00	
20	L-SDPIPE-6	0.00	0 00:06	6.67	0.00	0.07	50.98	0.11	0.35	0.00	
21	L-SDPIPE-7	0.37	0 00:16	6.89	0.05	1.51	2.39	0.11	0.32	0.00	

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness
1	SDPIPE-1	35.55	465.94	0.00	463.00	0.00	2.94	8.2700	CIRCULAR	36.000	36.000	0.0120
2	SDPIPE-10	256.10	529.50	0.00	512.58	0.00	16.92	6.6100	CIRCULAR	18.000	18.000	0.0120
3	SDPIPE-11	70.07	530.20	0.00	529.50	0.00	0.70	1.0000	CIRCULAR	18.000	18.000	0.0120
4	SDPIPE-12	33.00	530.53	0.00	530.20	0.00	0.33	1.0000	CIRCULAR	18.000	18.000	0.0130
5	SDPIPE-13	130.50	517.50	0.00	505.00	0.00	12.50	9.5800	CIRCULAR	18.000	18.000	0.0120
6	SDPIPE-14	39.55	517.99	0.00	517.50	0.00	0.49	1.2500	CIRCULAR	18.000	18.000	0.0130
7	SDPIPE-15	64.04	468.11	0.00	467.47	0.00	0.64	1.0000	CIRCULAR	18.000	18.000	0.0130
8	SDPIPE-16	23.51	501.10	0.00	499.00	0.00	2.10	8.9300	CIRCULAR	18.000	18.000	0.0120
9	SDPIPE-17	194.21	515.30	0.00	504.78	3.68	10.52	5.4200	CIRCULAR	18.000	18.000	0.0120
10	SDPIPE-18	49.41	517.77	0.00	515.30	0.00	2.47	5.0000	CIRCULAR	18.000	18.000	0.0130
11	SDPIPE-19	51.31	515.81	0.00	515.30	0.00	0.51	1.0000	CIRCULAR	18.000	18.000	0.0130
12	SDPIPE-2	35.82	466.30	0.00	465.94	0.00	0.36	1.0000	CIRCULAR	36.000	36.000	0.0130
13	SDPIPE-20	33.00	501.43	0.00	501.10	0.00	0.33	1.0000	CIRCULAR	18.000	18.000	0.0120
14	SDPIPE-21	237.30	538.50	0.00	530.20	0.00	8.30	3.5000	CIRCULAR	18.000	18.000	0.0120
15	SDPIPE-22	57.68	542.20	0.00	538.50	0.00	3.70	6.4100	CIRCULAR	18.000	18.000	0.0130
16	SDPIPE-23	44.75	542.65	0.00	542.20	0.00	0.45	1.0000	CIRCULAR	18.000	18.000	0.0130
17	SDPIPE-25	74.63	546.00	0.00	544.50	0.00	1.50	2.0100	CIRCULAR	18.000	18.000	0.0130
18	SDPIPE-27	182.53	487.50	0.00	484.31	0.00	3.19	1.7500	CIRCULAR	18.000	18.000	0.0120
19	SDPIPE-28	33.55	487.84	0.00	487.50	0.00	0.34	1.0000	CIRCULAR	18.000	18.000	0.0130
20	SDPIPE-29	167.22	505.00	0.00	487.50	0.00	17.50	10.4700	CIRCULAR	18.000	18.000	0.0120
21	SDPIPE-3	30.36	466.60	0.00	466.30	0.00	0.30	1.0000	CIRCULAR	36.000	36.000	0.0120
22	SDPIPE-30	66.71	510.34	0.00	505.00	0.00	5.34	8.0000	CIRCULAR	18.000	18.000	0.0130
23	SDPIPE-32	96.89	544.50	0.00	538.50	0.00	6.00	6.1900	CIRCULAR	18.000	18.000	0.0120
24	SDPIPE-33	76.95	514.12	0.00	512.58	0.00	1.54	2.0000	CIRCULAR	18.000	18.000	0.0150
25	SDPIPE-34	148.00	516.28	0.00	512.58	0.00	3.70	2.5000	CIRCULAR	18.000	18.000	0.0150
26	SDPIPE-4	71.93	467.47	0.00	466.75	0.81	0.72	1.0000	CIRCULAR	18.000	18.000	0.0120
27	SDPIPE-5	33.00	467.80	0.00	467.47	0.00	0.33	1.0000	CIRCULAR	18.000	18.000	0.0130
28	SDPIPE-6	67.57	483.19	0.00	482.52	0.00	0.67	1.0000	CIRCULAR	18.000	18.000	0.0120
29	SDPIPE-7	42.68	483.62	0.00	483.19	0.00	0.43	1.0000	CIRCULAR	18.000	18.000	0.0130
30	SDPIPE-8	130.51	512.25	0.00	492.00	0.00	20.25	15.5200	CIRCULAR	24.000	24.000	0.0120
31	SDPIPE-9	33.00	512.58	0.00	512.25	0.00	0.33	1.0000	CIRCULAR	24.000	24.000	0.0130

Pipe Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Fro Nur
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)	
1	SDPIPE-1	20.77	0 00:08	207.79	0.10	13.80	0.04	0.80	0.27	0.00	
2	SDPIPE-10	7.07	0 00:12	29.25	0.24	6.63	0.64	1.00	0.67	0.00	
3	SDPIPE-11	7.08	0 00:12	11.38	0.62	7.49	0.16	0.79	0.53	0.00	
4	SDPIPE-12	0.81	0 00:09	10.49	0.08	1.89	0.29	0.92	0.61	0.00	
5	SDPIPE-13	2.73	0 00:13	35.22	0.08	11.41	0.19	0.29	0.19	0.00	
6	SDPIPE-14	2.73	0 00:13	11.74	0.23	6.07	0.11	0.45	0.30	0.00	
7	SDPIPE-15	1.91	0 00:17	10.50	0.18	3.96	0.27	0.48	0.32	0.00	
8	SDPIPE-16	4.02	0 00:07	34.01	0.12	10.32	0.04	0.41	0.27	0.00	
9	SDPIPE-17	2.46	0 00:06	26.49	0.09	9.13	0.35	0.31	0.21	0.00	
10	SDPIPE-18	1.29	0 00:05	23.49	0.05	5.64	0.15	0.28	0.19	0.00	
11	SDPIPE-19	1.65	0 00:08	10.50	0.16	4.72	0.18	0.38	0.25	0.00	
12	SDPIPE-2	18.39	0 00:08	66.70	0.28	6.53	0.09	1.26	0.42	0.00	
13	SDPIPE-20	1.51	0 00:08	11.38	0.13	4.60	0.12	0.46	0.31	0.00	
14	SDPIPE-21	2.26	0 00:15	21.28	0.11	4.01	0.99	0.69	0.46	0.00	
15	SDPIPE-22	2.28	0 00:15	26.60	0.09	8.09	0.12	0.32	0.22	0.00	
16	SDPIPE-23	0.83	0 00:05	10.50	0.08	3.51	0.21	0.29	0.19	0.00	
17	SDPIPE-25	0.72	0 00:05	14.89	0.05	3.84	0.32	0.24	0.16	0.00	
18	SDPIPE-27	5.47	0 00:19	15.03	0.36	7.37	0.41	0.66	0.44	0.00	
19	SDPIPE-28	1.52	0 00:14	10.50	0.15	3.12	0.18	0.56	0.37	0.00	
20	SDPIPE-29	4.30	0 00:20	36.81	0.12	8.00	0.35	0.52	0.34	0.00	
21	SDPIPE-3	18.15	0 00:08	71.83	0.25	7.64	0.07	1.53	0.51	0.00	
22	SDPIPE-30	4.30	0 00:19	29.71	0.14	11.57	0.10	0.39	0.26	0.00	
23	SDPIPE-32	1.63	0 00:05	28.32	0.06	8.35	0.19	0.25	0.17	0.00	
24	SDPIPE-33	3.24	0 00:08	12.88	0.25	3.72	0.34	1.01	0.67	0.00	
25	SDPIPE-34	2.62	0 00:08	14.39	0.18	3.48	0.71	0.97	0.64	0.00	
26	SDPIPE-4	1.92	0 00:16	11.38	0.17	4.40	0.27	0.44	0.30	0.00	
27	SDPIPE-5	0.52	0 00:07	10.50	0.05	1.96	0.28	0.32	0.21	0.00	
28	SDPIPE-6	1.79	0 00:16	11.37	0.16	4.31	0.26	0.43	0.29	0.00	
29	SDPIPE-7	1.80	0 00:16	10.50	0.17	3.78	0.19	0.47	0.31	0.00	
30	SDPIPE-8	16.42	0 00:09	96.54	0.17	21.05	0.10	0.59	0.30	0.00	
31	SDPIPE-9	16.06	0 00:09	22.62	0.71	8.68	0.06	1.14	0.57	0.00	

Inlet Input

SN	Element ID	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Inlet Depth (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Ponded Area (ft^2)	Grate Clogging Factor (%)
1	CB-10	On Grade	1	483.62	487.38	3.76	483.62	0.00	N/A	0.00
2	CB-12	On Sag	1	512.25	516.63	4.38	512.25	0.00	10.00	0.00
3	CB-13	On Sag	1	512.58	516.63	4.05	512.58	0.00	10.00	0.00
4	CB-15	On Sag	1	530.20	533.98	3.78	530.20	0.00	10.00	0.00
5	CB-16	On Sag	1	530.53	533.98	3.45	530.53	0.00	10.00	0.00
6	CB-18	On Grade	1	517.50	521.56	4.06	517.50	0.00	N/A	0.00
7	CB-2	On Grade	1	465.94	475.75	9.81	465.94	0.00	N/A	0.00
8	CB-20	On Grade	1	468.11	471.31	3.20	468.11	0.00	N/A	0.00
9	CB-22	On Grade	1	501.10	504.78	3.68	501.10	0.00	N/A	0.00
10	CB-24	On Grade	1	517.77	523.17	5.40	517.77	0.00	N/A	0.00
11	CB-25	On Grade	1	515.81	522.01	6.20	515.81	0.00	N/A	0.00
12	CB-26	On Grade	1	501.43	504.78	3.35	501.43	0.00	N/A	0.00
13	CB-27	On Grade	1	538.50	543.76	5.26	538.50	0.00	N/A	0.00
14	CB-28	On Sag	1	542.20	546.43	4.23	542.20	0.00	10.00	0.00
15	CB-29	On Grade	1	542.65	547.71	5.07	542.65	0.00	N/A	0.00
16	CB-3	On Grade	1	466.30	475.38	9.08	466.30	0.00	N/A	0.00
17	CB-31	On Grade	1	544.50	549.76	5.26	544.50	0.00	N/A	0.00
18	CB-32	On Grade	1	546.00	550.25	4.25	546.00	0.00	N/A	0.00
19	CB-35	On Grade	1	487.50	492.85	5.35	487.50	0.00	N/A	0.00
20	CB-36	On Grade	1	487.84	492.30	4.46	487.84	0.00	N/A	0.00
21	CB-38	On Grade	1	505.00	510.35	5.35	505.00	0.00	N/A	0.00
22	CB-39	On Sag	1	510.34	515.20	4.86	510.34	0.00	10.00	0.00
23	CB-43	On Grade	1	514.12	517.57	3.45	514.12	0.00	N/A	0.00
24	CB-6	On Sag	1	467.80	474.50	6.70	467.80	0.00	10.00	0.00
25	CB-7	On Grade	1	467.47	474.50	7.03	467.47	0.00	N/A	0.00
26	CB-9	On Grade	1	483.19	489.41	6.22	483.19	0.00	N/A	0.00
27	FES-19	On Grade	1	517.99	522.14	4.14	517.99	0.00	N/A	0.00
28	Inlet-CB-44	On Grade	1	516.28	521.28	5.00	516.28	0.00	N/A	0.00

Roadway & Gutter Input

SN	Element ID	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (in)	Allowable Spread (ft)
1	CB-10	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
2	CB-12	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
3	CB-13	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
4	CB-15	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
5	CB-16	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
6	CB-18	0.0245	0.0258	0.0150	0.0200	1.00	0.1312	8.50
7	CB-2	0.0085	0.0258	0.0150	0.0200	1.00	0.1312	8.50
8	CB-20	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
9	CB-22	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
10	CB-24	0.1033	0.0258	0.0150	0.0200	1.00	0.1312	8.50
11	CB-25	0.1041	0.0258	0.0150	0.0200	1.00	0.1312	8.50
12	CB-26	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
13	CB-27	0.0574	0.0258	0.0150	0.0200	1.00	0.1312	8.50
14	CB-28	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
15	CB-29	0.0574	0.0258	0.0150	0.0200	1.00	0.1312	8.50
16	CB-3	0.0085	0.0258	0.0150	0.0200	1.00	0.1312	8.50
17	CB-31	0.0721	0.0200	0.0150	0.0200	1.50	0.1312	8.50
18	CB-32	0.0809	0.0258	0.0150	0.0200	1.00	0.1312	8.50
19	CB-35	0.1046	0.0258	0.0150	0.0200	1.00	0.1312	8.50
20	CB-36	0.1046	0.0258	0.0150	0.0200	1.00	0.1312	8.50
21	CB-38	0.1046	0.0258	0.0150	0.0200	1.00	0.1312	8.50
22	CB-39	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
23	CB-43	0.0199	0.0258	0.0150	0.0200	1.00	0.1312	8.50
24	CB-6	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
25	CB-7	0.0085	0.0258	0.0150	0.0200	1.00	0.1312	8.50
26	CB-9	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
27	FES-19	0.0245	0.0258	0.0150	0.0200	1.00	0.1312	8.50
28	Inlet-CB-44	0.1138	0.0258	0.0150	0.0200	1.00	0.1312	8.50

Inlet Results

SN	Element ID	Peak Flow (cfs)	Peak Lateral Inflow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	F \
1	CB-10	2.18	1.94	1.68	0.50	77.21	5.56	487.52	0.14	0 00:16	
2	CB-12	1.82	1.82	N/A	N/A	N/A	5.29	516.93	0.30	0 00:09	
3	CB-13	5.27	4.75	N/A	N/A	N/A	10.76	517.07	0.44	0 00:09	
4	CB-15	4.85	4.85	N/A	N/A	N/A	10.18	534.41	0.43	0 00:12	
5	CB-16	2.39	2.39	N/A	N/A	N/A	6.35	534.31	0.33	0 00:12	
6	CB-18	0.70	0.70	0.70	0.00	100.00	4.49	521.67	0.11	0 00:13	
7	CB-2	1.78	1.30	1.78	0.00	100.00	7.69	475.94	0.19	0 00:08	
8	CB-20	2.32	2.01	1.75	0.57	75.33	5.68	471.45	0.14	0 00:17	
9	CB-22	0.80	0.80	0.80	0.00	99.97	3.85	504.88	0.09	0 00:07	
10	CB-24	1.54	1.54	1.29	0.25	83.68	4.62	523.28	0.11	0 00:05	
11	CB-25	2.31	2.31	1.66	0.65	71.68	5.33	522.14	0.13	0 00:08	
12	CB-26	1.65	1.64	1.41	0.24	85.52	5.00	504.91	0.12	0 00:08	
13	CB-27	0.50	0.50	0.50	0.00	100.00	3.41	543.84	0.08	0 00:15	
14	CB-28	2.28	2.28	N/A	N/A	N/A	6.16	546.76	0.33	0 00:15	
15	CB-29	0.84	0.84	0.84	0.00	100.00	4.12	547.81	0.10	0 00:05	
16	CB-3	0.81	0.81	0.81	0.00	100.00	5.73	475.52	0.14	0 00:08	
17	CB-31	0.99	0.99	0.93	0.06	93.74	4.88	549.86	0.10	0 00:05	
18	CB-32	0.74	0.74	0.74	0.00	100.00	3.68	550.33	0.09	0 00:05	
19	CB-35	0.60	0.57	0.60	0.00	100.00	3.25	492.93	0.08	0 00:19	
20	CB-36	2.02	2.02	1.53	0.49	75.65	5.06	492.42	0.12	0 00:14	
21	CB-38	1.30	1.30	1.15	0.15	88.46	4.31	510.45	0.11	0 00:19	
22	CB-39	4.44	4.29	N/A	N/A	N/A	9.60	515.61	0.41	0 00:19	
23	CB-43	3.29	3.29	3.23	0.06	98.14	8.27	517.78	0.21	0 00:08	
24	CB-6	0.95	0.95	N/A	N/A	N/A	3.43	474.75	0.26	0 00:07	
25	CB-7	0.23	0.23	0.23	0.00	100.00	3.63	474.59	0.09	0 00:16	
26	CB-9	0.68	0.68	0.68	0.00	100.00	3.61	489.50	0.09	0 00:16	
27	FES-19	3.67	3.67	2.74	0.93	74.60	8.28	522.35	0.21	0 00:13	
28	Inlet-CB-44	3.24	3.24	2.64	0.60	81.56	5.96	521.43	0.15	0 00:08	

25 Year Design Storm

Project Description

File Name	Hilltop Drainage Analysis 3-4-26.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	00:00:00	0:00:00
End Analysis On	00:00:00	0:00:00
Start Reporting On	00:00:00	0:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	29
Nodes	42
Junctions	3
Outfalls	11
Flow Diversions	0
Inlets	28
Storage Nodes	0
Links	52
Channels	21
Pipes	31
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	25 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	Sub-CB-10	0.58	0.7000	1.45	1.01	0.59	2.22	0 00:15:54
2	Sub-CB-12	0.32	0.7000	0.79	0.55	0.17	2.09	0 00:05:00
3	Sub-CB-13	1.03	0.7000	1.01	0.71	0.73	5.46	0 00:07:58
4	Sub-CB-15	1.21	0.7000	1.19	0.83	1.01	5.57	0 00:10:46
5	Sub-CB-16	0.42	0.7000	0.79	0.55	0.23	2.75	0 00:05:00
6	Sub-CB-18	0.12	0.7000	0.79	0.55	0.07	0.81	0 00:05:00
7	Sub-CB-19	1.00	0.7000	1.31	0.91	0.91	4.21	0 00:12:57
8	Sub-CB-2	0.38	0.7000	1.41	0.98	0.37	1.49	0 00:14:59
9	Sub-CB-20	0.62	0.7000	1.51	1.06	0.65	2.30	0 00:17:03
10	Sub-CB-22	0.14	0.7000	0.79	0.55	0.08	0.92	0 00:05:00
11	Sub-CB-24	0.27	0.7000	0.79	0.55	0.15	1.77	0 00:05:01
12	Sub-CB-25	0.51	0.7000	1.03	0.72	0.37	2.65	0 00:08:15
13	Sub-CB-26	0.49	0.7000	1.45	1.01	0.50	1.89	0 00:15:52
14	Sub-CB-27	0.10	0.7000	0.88	0.62	0.06	0.58	0 00:06:07
15	Sub-CB-28	0.67	0.7000	1.40	0.98	0.66	2.62	0 00:15:04
16	Sub-CB-29	0.15	0.7000	0.79	0.55	0.08	0.97	0 00:05:00
17	Sub-CB-3	0.14	0.7000	0.79	0.55	0.08	0.93	0 00:05:00
18	Sub-CB-31	0.17	0.7000	0.79	0.55	0.10	1.14	0 00:05:00
19	Sub-CB-32	0.13	0.7000	0.79	0.55	0.07	0.85	0 00:05:00
20	Sub-CB-35	0.10	0.7000	0.79	0.55	0.06	0.66	0 00:05:00
21	Sub-CB-36	0.58	0.7000	1.39	0.97	0.57	2.32	0 00:14:42
22	Sub-CB-38	0.24	0.7000	0.84	0.59	0.14	1.49	0 00:05:43
23	Sub-CB-39	1.39	0.7000	1.62	1.14	1.57	4.93	0 00:19:10
24	Sub-CB-43	0.71	0.7000	0.99	0.70	0.49	3.78	0 00:07:53
25	Sub-CB-44	0.72	0.7000	1.03	0.72	0.52	3.72	0 00:08:24
26	Sub-CB-6	0.16	0.7000	0.79	0.55	0.09	1.09	0 00:05:00
27	Sub-CB-7	0.04	0.7000	0.79	0.55	0.02	0.27	0 00:05:00
28	Sub-CB-9	0.12	0.7000	0.79	0.55	0.06	0.78	0 00:05:00
29	Sub-FES-2	1.58	0.5600	1.03	0.58	0.91	6.58	0 00:08:19

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft^2)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	(
1	FES-2	Junction	466.60	469.78	466.60	469.78	0.00	20.19	468.35	0.00	1.43	
2	JB-14	Junction	529.50	535.50	529.50	535.50	0.00	8.11	530.04	0.00	5.46	
3	JB-23	Junction	515.30	519.20	515.30	519.20	10.00	2.71	515.64	0.00	3.56	
4	OFFSITE-1	Outfall	540.30					0.12	540.36			
5	OFFSITE-2	Outfall	532.10					0.02	532.13			
6	OFFSITE-25	Outfall	464.82					0.00	464.82			
7	OFFSITE-26	Outfall	464.82					0.57	464.94			
8	Out-FES-1	Outfall	463.00					23.22	463.68			
9	Out-FES-11	Outfall	492.00					18.99	492.60			
10	Out-FES-17	Outfall	505.00					2.96	505.29			
11	Out-FES-21	Outfall	499.00					4.58	499.37			
12	Out-FES-3	Outfall	538.50					1.83	538.76			
13	Out-FES-34	Outfall	484.31					6.32	484.99			
14	Out-FES-8	Outfall	482.52					2.04	482.95			

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Fl Dep Total De Ra
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)	
1	SDPIPE-1	Pipe	CB-2	Out-FES-1	35.55	465.94	463.00	8.2700	36.000	0.0120	23.22	207.79	0.11	14.04	0.85	0
2	SDPIPE-10	Pipe	JB-14	CB-13	256.10	529.50	512.58	6.6100	18.000	0.0120	8.10	29.25	0.28	6.95	1.02	0
3	SDPIPE-11	Pipe	CB-15	JB-14	70.07	530.20	529.50	1.0000	18.000	0.0120	8.11	11.38	0.71	7.67	0.87	0
4	SDPIPE-12	Pipe	CB-16	CB-15	33.00	530.53	530.20	1.0000	18.000	0.0130	0.89	10.49	0.09	1.92	1.03	0
5	SDPIPE-13	Pipe	CB-18	Out-FES-17	130.50	517.50	505.00	9.5800	18.000	0.0120	2.96	35.22	0.08	11.66	0.30	0
6	SDPIPE-14	Pipe	FES-19	CB-18	39.55	517.99	517.50	1.2500	18.000	0.0130	2.96	11.74	0.25	6.18	0.47	0
7	SDPIPE-15	Pipe	CB-20	CB-7	64.04	468.11	467.47	1.0000	18.000	0.0130	2.19	10.50	0.21	4.05	0.52	0
8	SDPIPE-16	Pipe	CB-22	Out-FES-21	23.51	501.10	499.00	8.9300	18.000	0.0120	4.58	34.01	0.13	10.58	0.44	0
9	SDPIPE-17	Pipe	JB-23	CB-22	194.21	515.30	504.78	5.4200	18.000	0.0120	2.70	26.49	0.10	9.36	0.33	0
10	SDPIPE-18	Pipe	CB-24	JB-23	49.41	517.77	515.30	5.0000	18.000	0.0130	1.40	23.49	0.06	5.73	0.29	0
11	SDPIPE-19	Pipe	CB-25	JB-23	51.31	515.81	515.30	1.0000	18.000	0.0130	1.78	10.50	0.17	4.83	0.40	0
12	SDPIPE-2	Pipe	CB-3	CB-2	35.82	466.30	465.94	1.0000	36.000	0.0130	20.46	66.70	0.31	6.71	1.34	0
13	SDPIPE-20	Pipe	CB-26	CB-22	33.00	501.43	501.10	1.0000	18.000	0.0120	1.82	11.38	0.16	4.69	0.51	0
14	SDPIPE-21	Pipe	CB-27	CB-15	237.30	538.50	530.20	3.5000	18.000	0.0120	2.60	21.28	0.12	4.20	0.75	0
15	SDPIPE-22	Pipe	CB-28	CB-27	57.68	542.20	538.50	6.4100	18.000	0.0130	2.62	26.60	0.10	8.37	0.35	0
16	SDPIPE-23	Pipe	CB-29	CB-28	44.75	542.65	542.20	1.0000	18.000	0.0130	0.95	10.50	0.09	3.62	0.31	0
17	SDPIPE-25	Pipe	CB-32	CB-31	74.63	546.00	544.50	2.0100	18.000	0.0130	0.82	14.89	0.06	4.00	0.26	0
18	SDPIPE-27	Pipe	CB-35	Out-FES-34	182.53	487.50	484.31	1.7500	18.000	0.0120	6.32	15.03	0.42	7.62	0.71	0
19	SDPIPE-28	Pipe	CB-36	CB-35	33.55	487.84	487.50	1.0000	18.000	0.0130	1.65	10.50	0.16	3.02	0.61	0
20	SDPIPE-29	Pipe	CB-38	CB-35	167.22	505.00	487.50	10.4700	18.000	0.0120	5.03	36.81	0.14	8.33	0.56	0
21	SDPIPE-3	Pipe	FES-2	CB-3	30.36	466.60	466.30	1.0000	36.000	0.0120	20.18	71.83	0.28	7.74	1.64	0
22	SDPIPE-30	Pipe	CB-39	CB-38	66.71	510.34	505.00	8.0000	18.000	0.0130	5.04	29.71	0.17	12.00	0.43	0
23	SDPIPE-32	Pipe	CB-31	Out-FES-3	96.89	544.50	538.50	6.1900	18.000	0.0120	1.83	28.32	0.06	8.60	0.27	0
24	SDPIPE-33	Pipe	CB-43	CB-13	76.95	514.12	512.58	2.0000	18.000	0.0150	3.63	12.88	0.28	3.85	1.02	0
25	SDPIPE-34	Pipe	Inlet-CB-44	CB-13	148.00	516.28	512.58	2.5000	18.000	0.0150	2.86	14.39	0.20	3.60	0.98	0
26	SDPIPE-4	Pipe	CB-7	CB-2	71.93	467.47	466.75	1.0000	18.000	0.0120	2.24	11.38	0.20	4.57	0.48	0
27	SDPIPE-5	Pipe	CB-6	CB-7	33.00	467.80	467.47	1.0000	18.000	0.0130	0.57	10.50	0.05	1.97	0.35	0
28	SDPIPE-6	Pipe	CB-9	Out-FES-8	67.57	483.19	482.52	1.0000	18.000	0.0120	2.04	11.37	0.18	4.44	0.46	0

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Fl Dep Total De Ra
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)	
46	L-SDPIPE-29	Channel	CB-38	CB-35	172.07	510.35	492.85	10.1700	3.960	0.0150	0.18	8.06	0.02	2.83	0.05	0
47	L-SDPIPE-32	Channel	CB-31	OFFSITE-1	98.14	549.76	540.30	9.6400	6.000	0.0150	0.12	29.25	0.00	2.19	0.05	0
48	L-SDPIPE-33	Channel	CB-43	CB-13	78.40	517.57	516.63	1.2000	3.960	0.0320	0.14	2.77	0.05	0.14	0.22	0
49	L-SDPIPE-34	Channel	Inlet-CB-44	CB-13	149.79	521.28	516.63	3.1000	3.960	0.0320	0.82	4.46	0.18	0.61	0.25	0
50	L-SDPIPE-4	Channel	CB-7	OFFSITE-25	129.78	474.50	464.82	7.4600	3.960	0.0320	0.00	6.91	0.00	0.00	0.00	0
51	L-SDPIPE-6	Channel	CB-9	CB-6	214.12	489.41	474.50	6.9600	3.960	0.0150	0.00	6.67	0.00	0.17	0.13	0
52	L-SDPIPE-7	Channel	CB-10	CB-20	216.57	487.38	471.31	7.4200	3.960	0.0150	0.52	6.89	0.08	1.64	0.12	0

Inlet Summary

SN	Element ID	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft²)	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Allowable Spread (ft)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)
1	CB-10	On Grade	1	483.62	487.38	483.62	N/A	2.57	1.86	0.71	72.20	8.50	5.92	487.53
2	CB-12	On Sag	1	512.25	516.63	512.25	10.00	2.09	N/A	N/A	N/A	8.50	5.80	516.94
3	CB-13	On Sag	1	512.58	516.63	512.58	10.00	6.31	N/A	N/A	N/A	8.50	12.14	517.11
4	CB-15	On Sag	1	530.20	533.98	530.20	10.00	5.56	N/A	N/A	N/A	8.50	11.16	534.43
5	CB-16	On Sag	1	530.53	533.98	530.53	10.00	2.75	N/A	N/A	N/A	8.50	6.97	534.32
6	CB-18	On Grade	1	517.50	521.56	517.50	N/A	0.81	0.81	0.00	100.00	8.50	4.73	521.67
7	CB-2	On Grade	1	465.94	475.75	465.94	N/A	2.13	2.11	0.02	98.95	8.50	8.25	475.95
8	CB-20	On Grade	1	468.11	471.31	468.11	N/A	2.74	1.93	0.81	70.34	8.50	6.04	471.46
9	CB-22	On Grade	1	501.10	504.78	501.10	N/A	0.92	0.91	0.01	98.86	8.50	4.03	504.88
10	CB-24	On Grade	1	517.77	523.17	517.77	N/A	1.77	1.41	0.36	79.58	8.50	4.87	523.29
11	CB-25	On Grade	1	515.81	522.01	515.81	N/A	2.65	1.79	0.86	67.59	8.50	5.62	522.15
12	CB-26	On Grade	1	501.43	504.78	501.43	N/A	1.89	1.54	0.35	81.46	8.50	5.27	504.91
13	CB-27	On Grade	1	538.50	543.76	538.50	N/A	0.58	0.58	0.00	100.00	8.50	3.58	543.84
14	CB-28	On Sag	1	542.20	546.43	542.20	10.00	2.62	N/A	N/A	N/A	8.50	6.75	546.77
15	CB-29	On Grade	1	542.65	547.71	542.65	N/A	0.97	0.96	0.00	99.49	8.50	4.32	547.82
16	CB-3	On Grade	1	466.30	475.38	466.30	N/A	0.93	0.93	0.00	100.00	8.50	6.05	475.53
17	CB-31	On Grade	1	544.50	549.76	544.50	N/A	1.14	1.03	0.11	90.36	8.50	5.13	549.86
18	CB-32	On Grade	1	546.00	550.25	546.00	N/A	0.85	0.85	0.01	99.38	8.50	3.87	550.34
19	CB-35	On Grade	1	487.50	492.85	487.50	N/A	0.72	0.72	0.00	99.84	8.50	3.48	492.94
20	CB-36	On Grade	1	487.84	492.30	487.84	N/A	2.32	1.66	0.66	71.53	8.50	5.33	492.43
21	CB-38	On Grade	1	505.00	510.35	505.00	N/A	1.49	1.26	0.23	84.54	8.50	4.54	510.46
22	CB-39	On Sag	1	510.34	515.20	510.34	10.00	5.18	N/A	N/A	N/A	8.50	10.64	515.64
23	CB-43	On Grade	1	514.12	517.57	514.12	N/A	3.78	3.61	0.17	95.51	8.50	8.74	517.79
24	CB-6	On Sag	1	467.80	474.50	467.80	10.00	1.09	N/A	N/A	N/A	8.50	3.76	474.76
25	CB-7	On Grade	1	467.47	474.50	467.47	N/A	0.27	0.27	0.00	100.00	8.50	3.82	474.59
26	CB-9	On Grade	1	483.19	489.41	483.19	N/A	0.78	0.78	0.00	100.00	8.50	3.80	489.50
27	FES-19	On Grade	1	517.99	522.14	517.99	N/A	4.21	2.96	1.24	70.42	8.50	8.75	522.36
28	Inlet-CB-44	On Grade	1	516.28	521.28	516.28	N/A	3.72	2.88	0.84	77.39	8.50	6.29	521.44

Subbasin Hydrology

Subbasin : Sub-CB-10

Input Data

Area (ac) 0.58
Weighted Runoff Coefficient 0.7

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	82.99996647	0	0
Slope (%) :	1.25	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.09	0	0
Computed Flow Time (min) :	15.21	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	229.3185963	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.69	0	0

Total TOC (min) 15.90

Subbasin : Sub-CB-12

Input Data

Area (ac) 0.32
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	219.5273657	0	0
Slope (%) :	1.99	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	2.87	0	0
Computed Flow Time (min) :	1.28	0	0

Total TOC (min) 4.14

Subbasin : Sub-CB-13

Input Data

Area (ac) 1.03
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	11.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	7.27	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	93	71.4	0
Slope (%) :	11.5	1.99	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	5.47	2.87	0
Computed Flow Time (min) :	0.28	0.41	0

Total TOC (min) 7.97

Subbasin : Sub-CB-15

Input Data

Area (ac) 1.21
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.16	0	0
Computed Flow Time (min) :	10.14	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	12.98144373	156.302	0
Slope (%) :	2	5.74	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	4.87	0
Computed Flow Time (min) :	0.09	0.53	0

Total TOC (min) 10.77

Subbasin : Sub-CB-16

Input Data

Area (ac) 0.42
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13.01720552	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	310.5319881	0	0
Slope (%) :	5.74	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	4.87	0	0
Computed Flow Time (min) :	1.06	0	0

Total TOC (min) 3.93

Subbasin : Sub-CB-18

Input Data

Area (ac) 0.12
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13.10752092	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.88	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	71.43477489	102.308	0
Slope (%) :	11.86	2.45	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	7	3.18	0
Computed Flow Time (min) :	0.17	0.54	0

Total TOC (min) 3.59

Subbasin : Sub-CB-19

Input Data

Area (ac) 1
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100.0031436	0	0
Slope (%) :	3.4	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.14	0	0
Computed Flow Time (min) :	11.83	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	6.07922878	278.905	79.9642
Slope (%) :	2	11.86	2.45
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	7	3.18
Computed Flow Time (min) :	0.04	0.66	0.42

Total TOC (min) 12.96

Subbasin : Sub-CB-2

Input Data

Area (ac) 0.38
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	83	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	14.14	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	175.3484305	45.5292	0
Slope (%) :	10.46	0.85	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	6.57	1.87	0
Computed Flow Time (min) :	0.44	0.4	0

Total TOC (min) 14.99

Subbasin : Sub-CB-20

Input Data

Area (ac) 0.62
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	99.99258294	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.41	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	3.00743724	208.662	0
Slope (%) :	2	7.49	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	5.56	0
Computed Flow Time (min) :	0.02	0.63	0

Total TOC (min) 17.06

Subbasin : Sub-CB-22

Input Data

Area (ac) 0.14
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	12.99981258	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	167.0428132	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.5	0	0

Total TOC (min) 3.36

Subbasin : Sub-CB-24

Input Data

Area (ac) 0.27
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	37.99958613	0	0
Slope (%) :	6.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.15	0	0
Computed Flow Time (min) :	4.21	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	28.98355088	187.485	0
Slope (%) :	0.51	10.41	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	1.45	6.56	0
Computed Flow Time (min) :	0.33	0.48	0

Total TOC (min) 5.02

Subbasin : Sub-CB-25

Input Data

Area (ac) 0.51
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	82.99999586	0	0
Slope (%) :	7.25	0	0
2 yr, 24 hr Rainfall (in) :	4.32	0	0
Velocity (ft/sec) :	0.18	0	0
Computed Flow Time (min) :	7.56	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	16.12667612	203.961	0
Slope (%) :	0.51	10.41	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	1.45	6.56	0
Computed Flow Time (min) :	0.19	0.52	0

Total TOC (min) 8.26

Subbasin : Sub-CB-26

Input Data

Area (ac) 0.49
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	82.99998121	0	0
Slope (%) :	1.25	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.09	0	0
Computed Flow Time (min) :	15.21	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	221.0918618	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.66	0	0

Total TOC (min) 15.87

Subbasin : Sub-CB-27

Input Data

Area (ac) 0.1
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	21.13547973	0	0
Slope (%) :	1	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.06	0	0
Computed Flow Time (min) :	5.57	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	117.1502173	0	0
Slope (%) :	2.92	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.47	0	0
Computed Flow Time (min) :	0.56	0	0

Total TOC (min) 6.13

Subbasin : Sub-CB-28

Input Data

Area (ac) 0.67
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.11	0	0
Computed Flow Time (min) :	14.63	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	17.02372996	94.0918	0
Slope (%) :	2	5.74	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	4.87	0
Computed Flow Time (min) :	0.12	0.32	0

Total TOC (min) 15.08

Subbasin : Sub-CB-29

Input Data

Area (ac) 0.15
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	253.6223323	0	0
Slope (%) :	5.74	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	4.87	0	0
Computed Flow Time (min) :	0.87	0	0

Total TOC (min) 3.73

Subbasin : Sub-CB-3

Input Data

Area (ac) 0.14
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	181.26423	58.4106	0
Slope (%) :	10.46	0.85	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	6.57	1.87	0
Computed Flow Time (min) :	0.46	0.52	0

Total TOC (min) 3.84

Subbasin : Sub-CB-31

Input Data

Area (ac) 0.17
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	166.3763112	83.6548	0
Slope (%) :	3.19	6.34	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.63	5.12	0
Computed Flow Time (min) :	0.76	0.27	0

Total TOC (min) 3.90

Subbasin : Sub-CB-32

Input Data

Area (ac) 0.13
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	167.2624187	52.7043	0
Slope (%) :	3.19	6.34	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.63	5.12	0
Computed Flow Time (min) :	0.77	0.17	0

Total TOC (min) 3.80

Subbasin : Sub-CB-35

Input Data

Area (ac) 0.1
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	159.59	0	0
Slope (%) :	10.46	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	6.57	0	0
Computed Flow Time (min) :	0.4	0	0

Total TOC (min) 3.27

Subbasin : Sub-CB-36

Input Data

Area (ac) 0.58
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	83	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	14.14	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	224.201193	0	0
Slope (%) :	10.46	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	6.57	0	0
Computed Flow Time (min) :	0.57	0	0

Total TOC (min) 14.71

Subbasin : Sub-CB-38

Input Data

Area (ac) 0.24
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13.00000002	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	214.8866153	184.112	0
Slope (%) :	2.45	0.75	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.18	1.76	0
Computed Flow Time (min) :	1.13	1.74	0

Total TOC (min) 5.73

Subbasin : Sub-CB-39

Input Data

Area (ac) 1.39
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	99.98923348	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.41	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	34.45719772	233.523	132.701
Slope (%) :	1.5	2.45	0.75
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	1.98	3.18	1.76
Computed Flow Time (min) :	0.29	1.22	1.26

Total TOC (min) 19.18

Subbasin : Sub-CB-43

Input Data

Area (ac) 0.71
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	12	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	7.15	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	93	77.84	0
Slope (%) :	10.75	1.99	0
Surface Type :	Unpaved	Paved	Unpaved
Velocity (ft/sec) :	5.29	2.87	0
Computed Flow Time (min) :	0.29	0.45	0

Total TOC (min) 7.89

Subbasin : Sub-CB-44

Input Data

Area (ac) 0.72
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	9	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	8.02	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	78.42	77.02	0
Slope (%) :	16.7	11.38	0
Surface Type :	Unpaved	Paved	Unpaved
Velocity (ft/sec) :	6.59	6.86	0
Computed Flow Time (min) :	0.2	0.19	0

Total TOC (min) 8.40

Subbasin : Sub-CB-6

Input Data

Area (ac) 0.16
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	207.9606416	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.62	0	0

Total TOC (min) 3.48

Subbasin : Sub-CB-7

Input Data

Area (ac) 0.04
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	12.99999999	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	68.39700153	0	0
Slope (%) :	0.85	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	1.87	0	0
Computed Flow Time (min) :	0.61	0	0

Total TOC (min) 3.47

Subbasin : Sub-CB-9

Input Data

Area (ac) 0.12
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	12.99999519	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	199.7947467	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.6	0	0

Total TOC (min) 3.46

Subbasin : Sub-FES-2

Input Data

Area (ac) 1.58
Weighted Runoff Coefficient 0.56

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	12	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	7.15	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	363.3701089	0	0
Slope (%) :	10	0	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	5.1	0	0
Computed Flow Time (min) :	1.19	0	0

Total TOC (min) 8.33

Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft^2)	Minimum Pipe Cover (in)
1	FES-2	466.60	469.78	3.18	466.60	0.00	469.78	0.00	0.00	0.00
2	JB-14	529.50	535.50	6.00	529.50	0.00	535.50	0.00	0.00	0.00
3	JB-23	515.30	519.20	3.90	515.30	0.00	519.20	0.00	10.00	0.00

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Tim F Floo Occurre (days hh:r
1	FES-2	20.19	20.19	468.35	1.75	0.00	1.43	467.94	1.34	0 00:08	0 0(
2	JB-14	8.11	0.00	530.04	0.54	0.00	5.46	529.51	0.01	0 00:12	0 0(
3	JB-23	2.71	0.00	515.64	0.34	0.00	3.56	515.30	0.00	0 00:06	0 0(

Channel Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness
1	L-SDPIPE-1	73.15	475.75	9.81	474.50	7.03	1.25	1.7100	User-Defined	0.330	14.000	0.0150
2	L-SDPIPE-13	403.61	521.56	4.06	510.35	5.35	11.21	2.7800	User-Defined	0.330	14.000	0.0150
3	L-SDPIPE-14	373.89	522.14	4.14	515.20	4.86	6.94	1.8600	User-Defined	0.330	14.000	0.0150
4	L-SDPIPE-15	83.27	471.31	3.20	464.82	0.00	6.49	7.7900	User-Defined	0.330	14.000	0.0150
5	L-SDPIPE-16	206.62	504.78	3.68	489.41	6.22	15.37	7.4400	User-Defined	0.330	14.000	0.0150
6	L-SDPIPE-18	171.93	523.17	5.40	517.57	3.45	5.60	3.2600	User-Defined	0.330	14.000	0.0150
7	L-SDPIPE-19	227.29	522.01	6.20	504.78	3.35	17.23	7.5800	User-Defined	0.330	14.000	0.0150
8	L-SDPIPE-2	62.02	475.38	9.08	474.50	6.70	0.88	1.4200	User-Defined	0.330	14.000	0.0150
9	L-SDPIPE-20	233.87	504.78	3.35	487.38	3.76	17.40	7.4400	User-Defined	0.330	14.000	0.0150
10	L-SDPIPE-21	239.45	543.76	5.26	533.98	3.78	9.78	4.0800	User-Defined	0.330	14.000	0.0150
11	L-SDPIPE-23	314.52	547.71	5.07	533.98	3.45	13.74	4.3700	User-Defined	0.500	26.000	0.0150
12	L-SDPIPE-25	202.83	550.25	4.25	532.10	0.00	18.15	8.9500	User-Defined	0.500	26.000	0.0150
13	L-SDPIPE-27	245.69	492.85	5.35	475.38	9.08	17.47	7.1100	User-Defined	0.330	14.000	0.0150
14	L-SDPIPE-28	228.18	492.30	4.46	475.75	9.81	16.55	7.2500	User-Defined	0.330	14.000	0.0150
15	L-SDPIPE-29	172.07	510.35	5.35	492.85	5.35	17.49	10.1700	User-Defined	0.330	14.000	0.0150
16	L-SDPIPE-32	98.14	549.76	5.26	540.30	0.00	9.46	9.6400	User-Defined	0.500	26.000	0.0150
17	L-SDPIPE-33	78.40	517.57	3.45	516.63	4.05	0.94	1.2000	User-Defined	0.330	14.000	0.0320
18	L-SDPIPE-34	149.79	521.28	5.00	516.63	4.05	4.65	3.1000	User-Defined	0.330	14.000	0.0320
19	L-SDPIPE-4	129.78	474.50	7.03	464.82	0.00	9.68	7.4600	User-Defined	0.330	14.000	0.0320
20	L-SDPIPE-6	214.12	489.41	6.22	474.50	6.70	14.91	6.9600	User-Defined	0.330	14.000	0.0150
21	L-SDPIPE-7	216.57	487.38	3.76	471.31	3.20	16.07	7.4200	User-Defined	0.330	14.000	0.0150

Channel Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	I N
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)	
1	L-SDPIPE-1	0.00	0 00:00	3.30	0.00	0.00		0.00	0.00	0.00	
2	L-SDPIPE-13	0.00	0 00:00	4.21	0.00	0.00		0.05	0.15	0.00	
3	L-SDPIPE-14	1.24	0 00:13	3.45	0.36	0.77	8.09	0.28	0.84	0.00	
4	L-SDPIPE-15	0.57	0 00:17	7.06	0.08	1.79	0.78	0.12	0.38	0.00	
5	L-SDPIPE-16	0.01	0 00:05	6.90	0.00	0.65	5.30	0.03	0.09	0.00	
6	L-SDPIPE-18	0.37	0 00:05	4.56	0.08	7.93	0.36	0.12	0.36	0.00	
7	L-SDPIPE-19	0.86	0 00:08	6.96	0.12	3.22	1.18	0.11	0.33	0.00	
8	L-SDPIPE-2	0.00	0 00:00	3.02	0.00	0.00		0.12	0.37	0.00	
9	L-SDPIPE-20	0.35	0 00:16	6.90	0.05	1.22	3.19	0.11	0.34	0.00	
10	L-SDPIPE-21	0.00	0 00:07	5.11	0.00	0.00		0.17	0.50	0.00	
11	L-SDPIPE-23	0.00	0 00:06	19.69	0.00	0.01	524.20	0.20	0.41	0.00	
12	L-SDPIPE-25	0.02	0 00:05	28.17	0.00	1.78	1.90	0.03	0.05	0.00	
13	L-SDPIPE-27	0.00	0 00:05	6.74	0.00	0.00		0.00	0.01	0.00	
14	L-SDPIPE-28	0.66	0 00:14	6.81	0.10	3.88	0.98	0.09	0.26	0.00	
15	L-SDPIPE-29	0.18	0 00:06	8.06	0.02	2.83	1.01	0.05	0.16	0.00	
16	L-SDPIPE-32	0.12	0 00:05	29.25	0.00	2.19	0.75	0.05	0.11	0.00	
17	L-SDPIPE-33	0.14	0 00:08	2.77	0.05	0.14	9.33	0.22	0.66	0.00	
18	L-SDPIPE-34	0.82	0 00:08	4.46	0.18	0.61	4.09	0.25	0.76	0.00	
19	L-SDPIPE-4	0.00	0 00:00	6.91	0.00	0.00		0.00	0.00	0.00	
20	L-SDPIPE-6	0.00	0 00:06	6.67	0.00	0.17	20.99	0.13	0.39	0.00	
21	L-SDPIPE-7	0.52	0 00:16	6.89	0.08	1.64	2.20	0.12	0.36	0.00	

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness
1	SDPIPE-1	35.55	465.94	0.00	463.00	0.00	2.94	8.2700	CIRCULAR	36.000	36.000	0.0120
2	SDPIPE-10	256.10	529.50	0.00	512.58	0.00	16.92	6.6100	CIRCULAR	18.000	18.000	0.0120
3	SDPIPE-11	70.07	530.20	0.00	529.50	0.00	0.70	1.0000	CIRCULAR	18.000	18.000	0.0120
4	SDPIPE-12	33.00	530.53	0.00	530.20	0.00	0.33	1.0000	CIRCULAR	18.000	18.000	0.0130
5	SDPIPE-13	130.50	517.50	0.00	505.00	0.00	12.50	9.5800	CIRCULAR	18.000	18.000	0.0120
6	SDPIPE-14	39.55	517.99	0.00	517.50	0.00	0.49	1.2500	CIRCULAR	18.000	18.000	0.0130
7	SDPIPE-15	64.04	468.11	0.00	467.47	0.00	0.64	1.0000	CIRCULAR	18.000	18.000	0.0130
8	SDPIPE-16	23.51	501.10	0.00	499.00	0.00	2.10	8.9300	CIRCULAR	18.000	18.000	0.0120
9	SDPIPE-17	194.21	515.30	0.00	504.78	3.68	10.52	5.4200	CIRCULAR	18.000	18.000	0.0120
10	SDPIPE-18	49.41	517.77	0.00	515.30	0.00	2.47	5.0000	CIRCULAR	18.000	18.000	0.0130
11	SDPIPE-19	51.31	515.81	0.00	515.30	0.00	0.51	1.0000	CIRCULAR	18.000	18.000	0.0130
12	SDPIPE-2	35.82	466.30	0.00	465.94	0.00	0.36	1.0000	CIRCULAR	36.000	36.000	0.0130
13	SDPIPE-20	33.00	501.43	0.00	501.10	0.00	0.33	1.0000	CIRCULAR	18.000	18.000	0.0120
14	SDPIPE-21	237.30	538.50	0.00	530.20	0.00	8.30	3.5000	CIRCULAR	18.000	18.000	0.0120
15	SDPIPE-22	57.68	542.20	0.00	538.50	0.00	3.70	6.4100	CIRCULAR	18.000	18.000	0.0130
16	SDPIPE-23	44.75	542.65	0.00	542.20	0.00	0.45	1.0000	CIRCULAR	18.000	18.000	0.0130
17	SDPIPE-25	74.63	546.00	0.00	544.50	0.00	1.50	2.0100	CIRCULAR	18.000	18.000	0.0130
18	SDPIPE-27	182.53	487.50	0.00	484.31	0.00	3.19	1.7500	CIRCULAR	18.000	18.000	0.0120
19	SDPIPE-28	33.55	487.84	0.00	487.50	0.00	0.34	1.0000	CIRCULAR	18.000	18.000	0.0130
20	SDPIPE-29	167.22	505.00	0.00	487.50	0.00	17.50	10.4700	CIRCULAR	18.000	18.000	0.0120
21	SDPIPE-3	30.36	466.60	0.00	466.30	0.00	0.30	1.0000	CIRCULAR	36.000	36.000	0.0120
22	SDPIPE-30	66.71	510.34	0.00	505.00	0.00	5.34	8.0000	CIRCULAR	18.000	18.000	0.0130
23	SDPIPE-32	96.89	544.50	0.00	538.50	0.00	6.00	6.1900	CIRCULAR	18.000	18.000	0.0120
24	SDPIPE-33	76.95	514.12	0.00	512.58	0.00	1.54	2.0000	CIRCULAR	18.000	18.000	0.0150
25	SDPIPE-34	148.00	516.28	0.00	512.58	0.00	3.70	2.5000	CIRCULAR	18.000	18.000	0.0150
26	SDPIPE-4	71.93	467.47	0.00	466.75	0.81	0.72	1.0000	CIRCULAR	18.000	18.000	0.0120
27	SDPIPE-5	33.00	467.80	0.00	467.47	0.00	0.33	1.0000	CIRCULAR	18.000	18.000	0.0130
28	SDPIPE-6	67.57	483.19	0.00	482.52	0.00	0.67	1.0000	CIRCULAR	18.000	18.000	0.0120
29	SDPIPE-7	42.68	483.62	0.00	483.19	0.00	0.43	1.0000	CIRCULAR	18.000	18.000	0.0130
30	SDPIPE-8	130.51	512.25	0.00	492.00	0.00	20.25	15.5200	CIRCULAR	24.000	24.000	0.0120
31	SDPIPE-9	33.00	512.58	0.00	512.25	0.00	0.33	1.0000	CIRCULAR	24.000	24.000	0.0130

Pipe Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Fro Nur
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)	
1	SDPIPE-1	23.22	0 00:08	207.79	0.11	14.04	0.04	0.85	0.28	0.00	
2	SDPIPE-10	8.10	0 00:12	29.25	0.28	6.95	0.61	1.02	0.68	0.00	
3	SDPIPE-11	8.11	0 00:12	11.38	0.71	7.67	0.15	0.87	0.58	0.00	
4	SDPIPE-12	0.89	0 00:08	10.49	0.09	1.92	0.29	1.03	0.69	0.00	
5	SDPIPE-13	2.96	0 00:13	35.22	0.08	11.66	0.19	0.30	0.20	0.00	
6	SDPIPE-14	2.96	0 00:13	11.74	0.25	6.18	0.11	0.47	0.32	0.00	
7	SDPIPE-15	2.19	0 00:16	10.50	0.21	4.05	0.26	0.52	0.35	0.00	
8	SDPIPE-16	4.58	0 00:07	34.01	0.13	10.58	0.04	0.44	0.29	0.00	
9	SDPIPE-17	2.70	0 00:06	26.49	0.10	9.36	0.35	0.33	0.22	0.00	
10	SDPIPE-18	1.40	0 00:05	23.49	0.06	5.73	0.14	0.29	0.20	0.00	
11	SDPIPE-19	1.78	0 00:08	10.50	0.17	4.83	0.18	0.40	0.27	0.00	
12	SDPIPE-2	20.46	0 00:08	66.70	0.31	6.71	0.09	1.34	0.45	0.00	
13	SDPIPE-20	1.82	0 00:08	11.38	0.16	4.69	0.12	0.51	0.34	0.00	
14	SDPIPE-21	2.60	0 00:15	21.28	0.12	4.20	0.94	0.75	0.50	0.00	
15	SDPIPE-22	2.62	0 00:15	26.60	0.10	8.37	0.11	0.35	0.23	0.00	
16	SDPIPE-23	0.95	0 00:05	10.50	0.09	3.62	0.21	0.31	0.21	0.00	
17	SDPIPE-25	0.82	0 00:05	14.89	0.06	4.00	0.31	0.26	0.17	0.00	
18	SDPIPE-27	6.32	0 00:19	15.03	0.42	7.62	0.40	0.71	0.48	0.00	
19	SDPIPE-28	1.65	0 00:14	10.50	0.16	3.02	0.19	0.61	0.41	0.00	
20	SDPIPE-29	5.03	0 00:19	36.81	0.14	8.33	0.33	0.56	0.37	0.00	
21	SDPIPE-3	20.18	0 00:08	71.83	0.28	7.74	0.07	1.64	0.55	0.00	
22	SDPIPE-30	5.04	0 00:19	29.71	0.17	12.00	0.09	0.43	0.29	0.00	
23	SDPIPE-32	1.83	0 00:05	28.32	0.06	8.60	0.19	0.27	0.18	0.00	
24	SDPIPE-33	3.63	0 00:08	12.88	0.28	3.85	0.33	1.02	0.68	0.00	
25	SDPIPE-34	2.86	0 00:08	14.39	0.20	3.60	0.69	0.98	0.65	0.00	
26	SDPIPE-4	2.24	0 00:16	11.38	0.20	4.57	0.26	0.48	0.32	0.00	
27	SDPIPE-5	0.57	0 00:07	10.50	0.05	1.97	0.28	0.35	0.23	0.00	
28	SDPIPE-6	2.04	0 00:16	11.37	0.18	4.44	0.25	0.46	0.31	0.00	
29	SDPIPE-7	2.05	0 00:16	10.50	0.19	3.88	0.18	0.51	0.34	0.00	
30	SDPIPE-8	18.99	0 00:09	96.54	0.20	21.80	0.10	0.64	0.32	0.00	
31	SDPIPE-9	18.56	0 00:09	22.62	0.82	8.86	0.06	1.27	0.63	0.00	

Inlet Input

SN	Element ID	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Inlet Depth (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Ponded Area (ft^2)	Grate Clogging Factor (%)
1	CB-10	On Grade	1	483.62	487.38	3.76	483.62	0.00	N/A	0.00
2	CB-12	On Sag	1	512.25	516.63	4.38	512.25	0.00	10.00	0.00
3	CB-13	On Sag	1	512.58	516.63	4.05	512.58	0.00	10.00	0.00
4	CB-15	On Sag	1	530.20	533.98	3.78	530.20	0.00	10.00	0.00
5	CB-16	On Sag	1	530.53	533.98	3.45	530.53	0.00	10.00	0.00
6	CB-18	On Grade	1	517.50	521.56	4.06	517.50	0.00	N/A	0.00
7	CB-2	On Grade	1	465.94	475.75	9.81	465.94	0.00	N/A	0.00
8	CB-20	On Grade	1	468.11	471.31	3.20	468.11	0.00	N/A	0.00
9	CB-22	On Grade	1	501.10	504.78	3.68	501.10	0.00	N/A	0.00
10	CB-24	On Grade	1	517.77	523.17	5.40	517.77	0.00	N/A	0.00
11	CB-25	On Grade	1	515.81	522.01	6.20	515.81	0.00	N/A	0.00
12	CB-26	On Grade	1	501.43	504.78	3.35	501.43	0.00	N/A	0.00
13	CB-27	On Grade	1	538.50	543.76	5.26	538.50	0.00	N/A	0.00
14	CB-28	On Sag	1	542.20	546.43	4.23	542.20	0.00	10.00	0.00
15	CB-29	On Grade	1	542.65	547.71	5.07	542.65	0.00	N/A	0.00
16	CB-3	On Grade	1	466.30	475.38	9.08	466.30	0.00	N/A	0.00
17	CB-31	On Grade	1	544.50	549.76	5.26	544.50	0.00	N/A	0.00
18	CB-32	On Grade	1	546.00	550.25	4.25	546.00	0.00	N/A	0.00
19	CB-35	On Grade	1	487.50	492.85	5.35	487.50	0.00	N/A	0.00
20	CB-36	On Grade	1	487.84	492.30	4.46	487.84	0.00	N/A	0.00
21	CB-38	On Grade	1	505.00	510.35	5.35	505.00	0.00	N/A	0.00
22	CB-39	On Sag	1	510.34	515.20	4.86	510.34	0.00	10.00	0.00
23	CB-43	On Grade	1	514.12	517.57	3.45	514.12	0.00	N/A	0.00
24	CB-6	On Sag	1	467.80	474.50	6.70	467.80	0.00	10.00	0.00
25	CB-7	On Grade	1	467.47	474.50	7.03	467.47	0.00	N/A	0.00
26	CB-9	On Grade	1	483.19	489.41	6.22	483.19	0.00	N/A	0.00
27	FES-19	On Grade	1	517.99	522.14	4.14	517.99	0.00	N/A	0.00
28	Inlet-CB-44	On Grade	1	516.28	521.28	5.00	516.28	0.00	N/A	0.00

Roadway & Gutter Input

SN	Element ID	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (in)	Allowable Spread (ft)
1	CB-10	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
2	CB-12	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
3	CB-13	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
4	CB-15	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
5	CB-16	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
6	CB-18	0.0245	0.0258	0.0150	0.0200	1.00	0.1312	8.50
7	CB-2	0.0085	0.0258	0.0150	0.0200	1.00	0.1312	8.50
8	CB-20	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
9	CB-22	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
10	CB-24	0.1033	0.0258	0.0150	0.0200	1.00	0.1312	8.50
11	CB-25	0.1041	0.0258	0.0150	0.0200	1.00	0.1312	8.50
12	CB-26	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
13	CB-27	0.0574	0.0258	0.0150	0.0200	1.00	0.1312	8.50
14	CB-28	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
15	CB-29	0.0574	0.0258	0.0150	0.0200	1.00	0.1312	8.50
16	CB-3	0.0085	0.0258	0.0150	0.0200	1.00	0.1312	8.50
17	CB-31	0.0721	0.0200	0.0150	0.0200	1.50	0.1312	8.50
18	CB-32	0.0809	0.0258	0.0150	0.0200	1.00	0.1312	8.50
19	CB-35	0.1046	0.0258	0.0150	0.0200	1.00	0.1312	8.50
20	CB-36	0.1046	0.0258	0.0150	0.0200	1.00	0.1312	8.50
21	CB-38	0.1046	0.0258	0.0150	0.0200	1.00	0.1312	8.50
22	CB-39	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
23	CB-43	0.0199	0.0258	0.0150	0.0200	1.00	0.1312	8.50
24	CB-6	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
25	CB-7	0.0085	0.0258	0.0150	0.0200	1.00	0.1312	8.50
26	CB-9	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
27	FES-19	0.0245	0.0258	0.0150	0.0200	1.00	0.1312	8.50
28	Inlet-CB-44	0.1138	0.0258	0.0150	0.0200	1.00	0.1312	8.50

Inlet Results

SN	Element ID	Peak Flow (cfs)	Peak Lateral Inflow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	F \
1	CB-10	2.57	2.22	1.86	0.71	72.20	5.92	487.53	0.15	0 00:16	
2	CB-12	2.09	2.09	N/A	N/A	N/A	5.80	516.94	0.32	0 00:09	
3	CB-13	6.31	5.46	N/A	N/A	N/A	12.14	517.11	0.48	0 00:09	
4	CB-15	5.56	5.56	N/A	N/A	N/A	11.16	534.43	0.45	0 00:12	
5	CB-16	2.75	2.75	N/A	N/A	N/A	6.97	534.32	0.35	0 00:12	
6	CB-18	0.81	0.81	0.81	0.00	100.00	4.73	521.67	0.12	0 00:13	
7	CB-2	2.13	1.49	2.11	0.02	98.95	8.25	475.95	0.21	0 00:08	
8	CB-20	2.74	2.30	1.93	0.81	70.34	6.04	471.46	0.15	0 00:16	
9	CB-22	0.92	0.92	0.91	0.01	98.86	4.03	504.88	0.10	0 00:07	
10	CB-24	1.77	1.77	1.41	0.36	79.58	4.87	523.29	0.12	0 00:05	
11	CB-25	2.65	2.65	1.79	0.86	67.59	5.62	522.15	0.14	0 00:08	
12	CB-26	1.89	1.88	1.54	0.35	81.46	5.27	504.91	0.13	0 00:08	
13	CB-27	0.58	0.58	0.58	0.00	100.00	3.58	543.84	0.09	0 00:15	
14	CB-28	2.62	2.62	N/A	N/A	N/A	6.75	546.77	0.34	0 00:15	
15	CB-29	0.97	0.97	0.96	0.00	99.49	4.32	547.82	0.11	0 00:05	
16	CB-3	0.93	0.93	0.93	0.00	100.00	6.05	475.53	0.15	0 00:08	
17	CB-31	1.14	1.14	1.03	0.11	90.36	5.13	549.86	0.10	0 00:05	
18	CB-32	0.85	0.85	0.85	0.01	99.38	3.87	550.34	0.09	0 00:05	
19	CB-35	0.72	0.66	0.72	0.00	99.84	3.48	492.94	0.08	0 00:19	
20	CB-36	2.32	2.32	1.66	0.66	71.53	5.33	492.43	0.13	0 00:14	
21	CB-38	1.49	1.49	1.26	0.23	84.54	4.54	510.46	0.11	0 00:19	
22	CB-39	5.18	4.92	N/A	N/A	N/A	10.64	515.64	0.44	0 00:19	
23	CB-43	3.78	3.78	3.61	0.17	95.51	8.74	517.79	0.22	0 00:08	
24	CB-6	1.09	1.09	N/A	N/A	N/A	3.76	474.76	0.26	0 00:07	
25	CB-7	0.27	0.27	0.27	0.00	100.00	3.82	474.59	0.09	0 00:16	
26	CB-9	0.78	0.78	0.78	0.00	100.00	3.80	489.50	0.09	0 00:16	
27	FES-19	4.21	4.21	2.96	1.24	70.42	8.75	522.36	0.22	0 00:13	
28	Inlet-CB-44	3.72	3.72	2.88	0.84	77.39	6.29	521.44	0.16	0 00:08	

50 Year Design Storm

Project Description

File Name	Hilltop Drainage Analysis 3-4-26.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	00:00:00	0:00:00
End Analysis On	00:00:00	0:00:00
Start Reporting On	00:00:00	0:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	29
Nodes	42
Junctions	3
Outfalls	11
Flow Diversions	0
Inlets	28
Storage Nodes	0
Links	52
Channels	21
Pipes	31
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	50 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	Sub-CB-10	0.58	0.7000	1.59	1.11	0.64	2.44	0 00:15:54
2	Sub-CB-12	0.32	0.7000	0.87	0.61	0.19	2.31	0 00:05:00
3	Sub-CB-13	1.03	0.7000	1.11	0.78	0.80	6.00	0 00:07:58
4	Sub-CB-15	1.21	0.7000	1.30	0.91	1.10	6.11	0 00:10:46
5	Sub-CB-16	0.42	0.7000	0.87	0.61	0.25	3.03	0 00:05:00
6	Sub-CB-18	0.12	0.7000	0.87	0.61	0.07	0.89	0 00:05:00
7	Sub-CB-19	1.00	0.7000	1.43	1.00	1.00	4.62	0 00:12:57
8	Sub-CB-2	0.38	0.7000	1.54	1.08	0.41	1.64	0 00:14:59
9	Sub-CB-20	0.62	0.7000	1.66	1.16	0.71	2.52	0 00:17:03
10	Sub-CB-22	0.14	0.7000	0.87	0.61	0.08	1.02	0 00:05:00
11	Sub-CB-24	0.27	0.7000	0.87	0.61	0.16	1.95	0 00:05:01
12	Sub-CB-25	0.51	0.7000	1.14	0.80	0.41	2.92	0 00:08:15
13	Sub-CB-26	0.49	0.7000	1.59	1.11	0.55	2.07	0 00:15:52
14	Sub-CB-27	0.10	0.7000	0.97	0.68	0.07	0.64	0 00:06:07
15	Sub-CB-28	0.67	0.7000	1.54	1.08	0.72	2.87	0 00:15:04
16	Sub-CB-29	0.15	0.7000	0.87	0.61	0.09	1.07	0 00:05:00
17	Sub-CB-3	0.14	0.7000	0.87	0.61	0.09	1.02	0 00:05:00
18	Sub-CB-31	0.17	0.7000	0.87	0.61	0.10	1.26	0 00:05:00
19	Sub-CB-32	0.13	0.7000	0.87	0.61	0.08	0.94	0 00:05:00
20	Sub-CB-35	0.10	0.7000	0.87	0.61	0.06	0.73	0 00:05:00
21	Sub-CB-36	0.58	0.7000	1.52	1.06	0.62	2.54	0 00:14:42
22	Sub-CB-38	0.24	0.7000	0.92	0.64	0.16	1.65	0 00:05:43
23	Sub-CB-39	1.39	0.7000	1.78	1.24	1.72	5.40	0 00:19:10
24	Sub-CB-43	0.71	0.7000	1.09	0.77	0.54	4.16	0 00:07:53
25	Sub-CB-44	0.72	0.7000	1.13	0.79	0.57	4.09	0 00:08:24
26	Sub-CB-6	0.16	0.7000	0.87	0.61	0.10	1.20	0 00:05:00
27	Sub-CB-7	0.04	0.7000	0.87	0.61	0.02	0.30	0 00:05:00
28	Sub-CB-9	0.12	0.7000	0.87	0.61	0.07	0.86	0 00:05:00
29	Sub-FES-2	1.58	0.5600	1.13	0.63	1.00	7.24	0 00:08:19

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft^2)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	(
1	FES-2	Junction	466.60	469.78	466.60	469.78	0.00	21.66	468.43	0.00	1.35	
2	JB-14	Junction	529.50	535.50	529.50	535.50	0.00	8.88	530.07	0.00	5.43	
3	JB-23	Junction	515.30	519.20	515.30	519.20	10.00	2.88	515.65	0.00	3.55	
4	OFFSITE-1	Outfall	540.30					0.16	540.37			
5	OFFSITE-2	Outfall	532.10					0.03	532.13			
6	OFFSITE-25	Outfall	464.82					0.00	464.82			
7	OFFSITE-26	Outfall	464.82					0.69	464.95			
8	Out-FES-1	Outfall	463.00					25.01	463.71			
9	Out-FES-11	Outfall	492.00					20.77	492.63			
10	Out-FES-17	Outfall	505.00					3.12	505.30			
11	Out-FES-21	Outfall	499.00					5.00	499.39			
12	Out-FES-3	Outfall	538.50					1.97	538.77			
13	Out-FES-34	Outfall	484.31					6.96	485.03			
14	Out-FES-8	Outfall	482.52					2.23	482.97			

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Fl Dep Total De Ra
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)	
1	SDPIPE-1	Pipe	CB-2	Out-FES-1	35.55	465.94	463.00	8.2700	36.000	0.0120	25.01	207.79	0.12	14.18	0.89	0
2	SDPIPE-10	Pipe	JB-14	CB-13	256.10	529.50	512.58	6.6100	18.000	0.0120	8.88	29.25	0.30	7.18	1.03	0
3	SDPIPE-11	Pipe	CB-15	JB-14	70.07	530.20	529.50	1.0000	18.000	0.0120	8.88	11.38	0.78	7.77	0.93	0
4	SDPIPE-12	Pipe	CB-16	CB-15	33.00	530.53	530.20	1.0000	18.000	0.0130	0.95	10.49	0.09	1.94	1.12	0
5	SDPIPE-13	Pipe	CB-18	Out-FES-17	130.50	517.50	505.00	9.5800	18.000	0.0120	3.12	35.22	0.09	11.83	0.31	0
6	SDPIPE-14	Pipe	FES-19	CB-18	39.55	517.99	517.50	1.2500	18.000	0.0130	3.12	11.74	0.27	6.25	0.49	0
7	SDPIPE-15	Pipe	CB-20	CB-7	64.04	468.11	467.47	1.0000	18.000	0.0130	2.40	10.50	0.23	4.11	0.55	0
8	SDPIPE-16	Pipe	CB-22	Out-FES-21	23.51	501.10	499.00	8.9300	18.000	0.0120	5.00	34.01	0.15	10.74	0.46	0
9	SDPIPE-17	Pipe	JB-23	CB-22	194.21	515.30	504.78	5.4200	18.000	0.0120	2.87	26.49	0.11	9.51	0.34	0
10	SDPIPE-18	Pipe	CB-24	JB-23	49.41	517.77	515.30	5.0000	18.000	0.0130	1.49	23.49	0.06	5.82	0.30	0
11	SDPIPE-19	Pipe	CB-25	JB-23	51.31	515.81	515.30	1.0000	18.000	0.0130	1.88	10.50	0.18	4.89	0.41	0
12	SDPIPE-2	Pipe	CB-3	CB-2	35.82	466.30	465.94	1.0000	36.000	0.0130	21.96	66.70	0.33	6.83	1.39	0
13	SDPIPE-20	Pipe	CB-26	CB-22	33.00	501.43	501.10	1.0000	18.000	0.0120	2.05	11.38	0.18	4.75	0.54	0
14	SDPIPE-21	Pipe	CB-27	CB-15	237.30	538.50	530.20	3.5000	18.000	0.0120	2.85	21.28	0.13	4.31	0.81	0
15	SDPIPE-22	Pipe	CB-28	CB-27	57.68	542.20	538.50	6.4100	18.000	0.0130	2.87	26.60	0.11	8.56	0.37	0
16	SDPIPE-23	Pipe	CB-29	CB-28	44.75	542.65	542.20	1.0000	18.000	0.0130	1.03	10.50	0.10	3.69	0.32	0
17	SDPIPE-25	Pipe	CB-32	CB-31	74.63	546.00	544.50	2.0100	18.000	0.0130	0.90	14.89	0.06	4.12	0.27	0
18	SDPIPE-27	Pipe	CB-35	Out-FES-34	182.53	487.50	484.31	1.7500	18.000	0.0120	6.96	15.03	0.46	7.79	0.76	0
19	SDPIPE-28	Pipe	CB-36	CB-35	33.55	487.84	487.50	1.0000	18.000	0.0130	1.74	10.50	0.17	2.93	0.65	0
20	SDPIPE-29	Pipe	CB-38	CB-35	167.22	505.00	487.50	10.4700	18.000	0.0120	5.60	36.81	0.15	8.55	0.60	0
21	SDPIPE-3	Pipe	FES-2	CB-3	30.36	466.60	466.30	1.0000	36.000	0.0120	21.65	71.83	0.30	7.83	1.72	0
22	SDPIPE-30	Pipe	CB-39	CB-38	66.71	510.34	505.00	8.0000	18.000	0.0130	5.60	29.71	0.19	12.30	0.46	0
23	SDPIPE-32	Pipe	CB-31	Out-FES-3	96.89	544.50	538.50	6.1900	18.000	0.0120	1.97	28.32	0.07	8.81	0.28	0
24	SDPIPE-33	Pipe	CB-43	CB-13	76.95	514.12	512.58	2.0000	18.000	0.0150	3.91	12.88	0.30	3.95	1.08	0
25	SDPIPE-34	Pipe	Inlet-CB-44	CB-13	148.00	516.28	512.58	2.5000	18.000	0.0150	3.03	14.39	0.21	3.68	0.98	0
26	SDPIPE-4	Pipe	CB-7	CB-2	71.93	467.47	466.75	1.0000	18.000	0.0120	2.48	11.38	0.22	4.68	0.51	0
27	SDPIPE-5	Pipe	CB-6	CB-7	33.00	467.80	467.47	1.0000	18.000	0.0130	0.61	10.50	0.06	1.98	0.38	0
28	SDPIPE-6	Pipe	CB-9	Out-FES-8	67.57	483.19	482.52	1.0000	18.000	0.0120	2.23	11.37	0.20	4.55	0.48	0

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Fl Dep Total De Ra
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)	
46	L-SDPIPE-29	Channel	CB-38	CB-35	172.07	510.35	492.85	10.1700	3.960	0.0150	0.26	8.06	0.03	3.10	0.06	0
47	L-SDPIPE-32	Channel	CB-31	OFFSITE-1	98.14	549.76	540.30	9.6400	6.000	0.0150	0.16	29.25	0.01	2.22	0.06	0
48	L-SDPIPE-33	Channel	CB-43	CB-13	78.40	517.57	516.63	1.2000	3.960	0.0320	0.25	2.77	0.09	0.22	0.23	0
49	L-SDPIPE-34	Channel	Inlet-CB-44	CB-13	149.79	521.28	516.63	3.1000	3.960	0.0320	1.02	4.46	0.23	0.72	0.26	0
50	L-SDPIPE-4	Channel	CB-7	OFFSITE-25	129.78	474.50	464.82	7.4600	3.960	0.0320	0.00	6.91	0.00	0.00	0.00	0
51	L-SDPIPE-6	Channel	CB-9	CB-6	214.12	489.41	474.50	6.9600	3.960	0.0150	0.00	6.67	0.00	0.20	0.14	0
52	L-SDPIPE-7	Channel	CB-10	CB-20	216.57	487.38	471.31	7.4200	3.960	0.0150	0.64	6.89	0.09	1.71	0.13	0

Inlet Summary

SN	Element ID	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft²)	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Allowable Spread (ft)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)
1	CB-10	On Grade	1	483.62	487.38	483.62	N/A	2.87	1.98	0.89	69.05	8.50	6.13	487.53
2	CB-12	On Sag	1	512.25	516.63	512.25	10.00	2.30	N/A	N/A	N/A	8.50	6.19	516.95
3	CB-13	On Sag	1	512.58	516.63	512.58	10.00	7.16	N/A	N/A	N/A	8.50	13.20	517.13
4	CB-15	On Sag	1	530.20	533.98	530.20	10.00	6.11	N/A	N/A	N/A	8.50	11.87	534.45
5	CB-16	On Sag	1	530.53	533.98	530.53	10.00	3.03	N/A	N/A	N/A	8.50	7.44	534.33
6	CB-18	On Grade	1	517.50	521.56	517.50	N/A	0.89	0.89	0.00	100.00	8.50	4.92	521.68
7	CB-2	On Grade	1	465.94	475.75	465.94	N/A	2.40	2.33	0.07	97.03	8.50	8.66	475.96
8	CB-20	On Grade	1	468.11	471.31	468.11	N/A	3.07	2.06	1.01	66.97	8.50	6.33	471.47
9	CB-22	On Grade	1	501.10	504.78	501.10	N/A	1.02	0.99	0.03	97.34	8.50	4.19	504.88
10	CB-24	On Grade	1	517.77	523.17	517.77	N/A	1.95	1.50	0.45	76.81	8.50	5.02	523.29
11	CB-25	On Grade	1	515.81	522.01	515.81	N/A	2.91	1.89	1.02	64.86	8.50	5.82	522.15
12	CB-26	On Grade	1	501.43	504.78	501.43	N/A	2.12	1.65	0.47	77.94	8.50	5.52	504.92
13	CB-27	On Grade	1	538.50	543.76	538.50	N/A	0.64	0.64	0.00	100.00	8.50	3.72	543.85
14	CB-28	On Sag	1	542.20	546.43	542.20	10.00	2.87	N/A	N/A	N/A	8.50	7.18	546.78
15	CB-29	On Grade	1	542.65	547.71	542.65	N/A	1.06	1.05	0.02	98.31	8.50	4.47	547.82
16	CB-3	On Grade	1	466.30	475.38	466.30	N/A	1.02	1.02	0.00	100.00	8.50	6.30	475.54
17	CB-31	On Grade	1	544.50	549.76	544.50	N/A	1.26	1.10	0.15	87.73	8.50	5.33	549.87
18	CB-32	On Grade	1	546.00	550.25	546.00	N/A	0.94	0.92	0.02	98.15	8.50	4.01	550.34
19	CB-35	On Grade	1	487.50	492.85	487.50	N/A	0.86	0.84	0.02	97.83	8.50	3.72	492.95
20	CB-36	On Grade	1	487.84	492.30	487.84	N/A	2.54	1.75	0.79	68.73	8.50	5.54	492.43
21	CB-38	On Grade	1	505.00	510.35	505.00	N/A	1.64	1.34	0.30	81.76	8.50	4.70	510.46
22	CB-39	On Sag	1	510.34	515.20	510.34	10.00	5.73	N/A	N/A	N/A	8.50	11.38	515.66
23	CB-43	On Grade	1	514.12	517.57	514.12	N/A	4.15	3.88	0.27	93.41	8.50	9.02	517.80
24	CB-6	On Sag	1	467.80	474.50	467.80	10.00	1.20	N/A	N/A	N/A	8.50	4.01	474.77
25	CB-7	On Grade	1	467.47	474.50	467.47	N/A	0.30	0.30	0.00	100.00	8.50	3.97	474.60
26	CB-9	On Grade	1	483.19	489.41	483.19	N/A	0.87	0.86	0.00	99.48	8.50	3.96	489.51
27	FES-19	On Grade	1	517.99	522.14	517.99	N/A	4.61	3.13	1.49	67.78	8.50	9.02	522.36
28	Inlet-CB-44	On Grade	1	516.28	521.28	516.28	N/A	4.09	3.05	1.04	74.65	8.50	6.49	521.44

Subbasin Hydrology

Subbasin : Sub-CB-10

Input Data

Area (ac) 0.58
Weighted Runoff Coefficient 0.7

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	82.99996647	0	0
Slope (%) :	1.25	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.09	0	0
Computed Flow Time (min) :	15.21	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	229.3185963	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.69	0	0

Total TOC (min) 15.90

Subbasin : Sub-CB-12

Input Data

Area (ac) 0.32
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	219.5273657	0	0
Slope (%) :	1.99	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	2.87	0	0
Computed Flow Time (min) :	1.28	0	0

Total TOC (min) 4.14

Subbasin : Sub-CB-13

Input Data

Area (ac) 1.03
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	11.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	7.27	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	93	71.4	0
Slope (%) :	11.5	1.99	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	5.47	2.87	0
Computed Flow Time (min) :	0.28	0.41	0

Total TOC (min) 7.97

Subbasin : Sub-CB-15

Input Data

Area (ac) 1.21
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.16	0	0
Computed Flow Time (min) :	10.14	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	12.98144373	156.302	0
Slope (%) :	2	5.74	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	4.87	0
Computed Flow Time (min) :	0.09	0.53	0

Total TOC (min) 10.77

Subbasin : Sub-CB-16

Input Data

Area (ac) 0.42
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13.01720552	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	310.5319881	0	0
Slope (%) :	5.74	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	4.87	0	0
Computed Flow Time (min) :	1.06	0	0

Total TOC (min) 3.93

Subbasin : Sub-CB-18

Input Data

Area (ac) 0.12
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13.10752092	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.88	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	71.43477489	102.308	0
Slope (%) :	11.86	2.45	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	7	3.18	0
Computed Flow Time (min) :	0.17	0.54	0

Total TOC (min) 3.59

Subbasin : Sub-CB-19

Input Data

Area (ac) 1
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100.0031436	0	0
Slope (%) :	3.4	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.14	0	0
Computed Flow Time (min) :	11.83	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	6.07922878	278.905	79.9642
Slope (%) :	2	11.86	2.45
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	7	3.18
Computed Flow Time (min) :	0.04	0.66	0.42

Total TOC (min) 12.96

Subbasin : Sub-CB-2

Input Data

Area (ac) 0.38
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	83	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	14.14	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	175.3484305	45.5292	0
Slope (%) :	10.46	0.85	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	6.57	1.87	0
Computed Flow Time (min) :	0.44	0.4	0

Total TOC (min) 14.99

Subbasin : Sub-CB-20

Input Data

Area (ac) 0.62
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	99.99258294	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.41	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	3.00743724	208.662	0
Slope (%) :	2	7.49	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	5.56	0
Computed Flow Time (min) :	0.02	0.63	0

Total TOC (min) 17.06

Subbasin : Sub-CB-22

Input Data

Area (ac) 0.14
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	12.99981258	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	167.0428132	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.5	0	0

Total TOC (min) 3.36

Subbasin : Sub-CB-24

Input Data

Area (ac) 0.27
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	37.99958613	0	0
Slope (%) :	6.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.15	0	0
Computed Flow Time (min) :	4.21	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	28.98355088	187.485	0
Slope (%) :	0.51	10.41	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	1.45	6.56	0
Computed Flow Time (min) :	0.33	0.48	0

Total TOC (min) 5.02

Subbasin : Sub-CB-25

Input Data

Area (ac) 0.51
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	82.99999586	0	0
Slope (%) :	7.25	0	0
2 yr, 24 hr Rainfall (in) :	4.32	0	0
Velocity (ft/sec) :	0.18	0	0
Computed Flow Time (min) :	7.56	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	16.12667612	203.961	0
Slope (%) :	0.51	10.41	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	1.45	6.56	0
Computed Flow Time (min) :	0.19	0.52	0

Total TOC (min) 8.26

Subbasin : Sub-CB-26

Input Data

Area (ac) 0.49
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	82.99998121	0	0
Slope (%) :	1.25	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.09	0	0
Computed Flow Time (min) :	15.21	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	221.0918618	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.66	0	0

Total TOC (min) 15.87

Subbasin : Sub-CB-27

Input Data

Area (ac) 0.1
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	21.13547973	0	0
Slope (%) :	1	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.06	0	0
Computed Flow Time (min) :	5.57	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	117.1502173	0	0
Slope (%) :	2.92	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.47	0	0
Computed Flow Time (min) :	0.56	0	0

Total TOC (min) 6.13

Subbasin : Sub-CB-28

Input Data

Area (ac) 0.67
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.11	0	0
Computed Flow Time (min) :	14.63	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	17.02372996	94.0918	0
Slope (%) :	2	5.74	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	4.87	0
Computed Flow Time (min) :	0.12	0.32	0

Total TOC (min) 15.08

Subbasin : Sub-CB-29

Input Data

Area (ac) 0.15
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	253.6223323	0	0
Slope (%) :	5.74	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	4.87	0	0
Computed Flow Time (min) :	0.87	0	0

Total TOC (min) 3.73

Subbasin : Sub-CB-3

Input Data

Area (ac) 0.14
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	181.26423	58.4106	0
Slope (%) :	10.46	0.85	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	6.57	1.87	0
Computed Flow Time (min) :	0.46	0.52	0

Total TOC (min) 3.84

Subbasin : Sub-CB-31

Input Data

Area (ac) 0.17
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	166.3763112	83.6548	0
Slope (%) :	3.19	6.34	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.63	5.12	0
Computed Flow Time (min) :	0.76	0.27	0

Total TOC (min) 3.90

Subbasin : Sub-CB-32

Input Data

Area (ac) 0.13
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	167.2624187	52.7043	0
Slope (%) :	3.19	6.34	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.63	5.12	0
Computed Flow Time (min) :	0.77	0.17	0

Total TOC (min) 3.80

Subbasin : Sub-CB-35

Input Data

Area (ac) 0.1
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	159.59	0	0
Slope (%) :	10.46	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	6.57	0	0
Computed Flow Time (min) :	0.4	0	0

Total TOC (min) 3.27

Subbasin : Sub-CB-36

Input Data

Area (ac) 0.58
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	83	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	14.14	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	224.201193	0	0
Slope (%) :	10.46	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	6.57	0	0
Computed Flow Time (min) :	0.57	0	0

Total TOC (min) 14.71

Subbasin : Sub-CB-38

Input Data

Area (ac) 0.24
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13.00000002	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	214.8866153	184.112	0
Slope (%) :	2.45	0.75	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.18	1.76	0
Computed Flow Time (min) :	1.13	1.74	0

Total TOC (min) 5.73

Subbasin : Sub-CB-39

Input Data

Area (ac) 1.39
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	99.98923348	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.41	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	34.45719772	233.523	132.701
Slope (%) :	1.5	2.45	0.75
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	1.98	3.18	1.76
Computed Flow Time (min) :	0.29	1.22	1.26

Total TOC (min) 19.18

Subbasin : Sub-CB-43

Input Data

Area (ac) 0.71
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	12	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	7.15	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	93	77.84	0
Slope (%) :	10.75	1.99	0
Surface Type :	Unpaved	Paved	Unpaved
Velocity (ft/sec) :	5.29	2.87	0
Computed Flow Time (min) :	0.29	0.45	0

Total TOC (min) 7.89

Subbasin : Sub-CB-44

Input Data

Area (ac) 0.72
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	9	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	8.02	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	78.42	77.02	0
Slope (%) :	16.7	11.38	0
Surface Type :	Unpaved	Paved	Unpaved
Velocity (ft/sec) :	6.59	6.86	0
Computed Flow Time (min) :	0.2	0.19	0

Total TOC (min) 8.40

Subbasin : Sub-CB-6

Input Data

Area (ac) 0.16
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	207.9606416	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.62	0	0

Total TOC (min) 3.48

Subbasin : Sub-CB-7

Input Data

Area (ac) 0.04
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	12.99999999	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	68.39700153	0	0
Slope (%) :	0.85	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	1.87	0	0
Computed Flow Time (min) :	0.61	0	0

Total TOC (min) 3.47

Subbasin : Sub-CB-9

Input Data

Area (ac) 0.12
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	12.99999519	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	199.7947467	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.6	0	0

Total TOC (min) 3.46

Subbasin : Sub-FES-2

Input Data

Area (ac) 1.58
Weighted Runoff Coefficient 0.56

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	12	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	7.15	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	363.3701089	0	0
Slope (%) :	10	0	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	5.1	0	0
Computed Flow Time (min) :	1.19	0	0

Total TOC (min) 8.33

Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft^2)	Minimum Pipe Cover (in)
1	FES-2	466.60	469.78	3.18	466.60	0.00	469.78	0.00	0.00	0.00
2	JB-14	529.50	535.50	6.00	529.50	0.00	535.50	0.00	0.00	0.00
3	JB-23	515.30	519.20	3.90	515.30	0.00	519.20	0.00	10.00	0.00

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Tim F Floo Occurre (days hh:r
1	FES-2	21.66	21.66	468.43	1.83	0.00	1.35	468.00	1.40	0 00:08	0 0(
2	JB-14	8.88	0.00	530.07	0.57	0.00	5.43	529.51	0.01	0 00:12	0 0(
3	JB-23	2.88	0.00	515.65	0.35	0.00	3.55	515.30	0.00	0 00:06	0 0(

Channel Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness
1	L-SDPIPE-1	73.15	475.75	9.81	474.50	7.03	1.25	1.7100	User-Defined	0.330	14.000	0.0150
2	L-SDPIPE-13	403.61	521.56	4.06	510.35	5.35	11.21	2.7800	User-Defined	0.330	14.000	0.0150
3	L-SDPIPE-14	373.89	522.14	4.14	515.20	4.86	6.94	1.8600	User-Defined	0.330	14.000	0.0150
4	L-SDPIPE-15	83.27	471.31	3.20	464.82	0.00	6.49	7.7900	User-Defined	0.330	14.000	0.0150
5	L-SDPIPE-16	206.62	504.78	3.68	489.41	6.22	15.37	7.4400	User-Defined	0.330	14.000	0.0150
6	L-SDPIPE-18	171.93	523.17	5.40	517.57	3.45	5.60	3.2600	User-Defined	0.330	14.000	0.0150
7	L-SDPIPE-19	227.29	522.01	6.20	504.78	3.35	17.23	7.5800	User-Defined	0.330	14.000	0.0150
8	L-SDPIPE-2	62.02	475.38	9.08	474.50	6.70	0.88	1.4200	User-Defined	0.330	14.000	0.0150
9	L-SDPIPE-20	233.87	504.78	3.35	487.38	3.76	17.40	7.4400	User-Defined	0.330	14.000	0.0150
10	L-SDPIPE-21	239.45	543.76	5.26	533.98	3.78	9.78	4.0800	User-Defined	0.330	14.000	0.0150
11	L-SDPIPE-23	314.52	547.71	5.07	533.98	3.45	13.74	4.3700	User-Defined	0.500	26.000	0.0150
12	L-SDPIPE-25	202.83	550.25	4.25	532.10	0.00	18.15	8.9500	User-Defined	0.500	26.000	0.0150
13	L-SDPIPE-27	245.69	492.85	5.35	475.38	9.08	17.47	7.1100	User-Defined	0.330	14.000	0.0150
14	L-SDPIPE-28	228.18	492.30	4.46	475.75	9.81	16.55	7.2500	User-Defined	0.330	14.000	0.0150
15	L-SDPIPE-29	172.07	510.35	5.35	492.85	5.35	17.49	10.1700	User-Defined	0.330	14.000	0.0150
16	L-SDPIPE-32	98.14	549.76	5.26	540.30	0.00	9.46	9.6400	User-Defined	0.500	26.000	0.0150
17	L-SDPIPE-33	78.40	517.57	3.45	516.63	4.05	0.94	1.2000	User-Defined	0.330	14.000	0.0320
18	L-SDPIPE-34	149.79	521.28	5.00	516.63	4.05	4.65	3.1000	User-Defined	0.330	14.000	0.0320
19	L-SDPIPE-4	129.78	474.50	7.03	464.82	0.00	9.68	7.4600	User-Defined	0.330	14.000	0.0320
20	L-SDPIPE-6	214.12	489.41	6.22	474.50	6.70	14.91	6.9600	User-Defined	0.330	14.000	0.0150
21	L-SDPIPE-7	216.57	487.38	3.76	471.31	3.20	16.07	7.4200	User-Defined	0.330	14.000	0.0150

Channel Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	I N
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)	
1	L-SDPIPE-1	0.00	0 00:00	3.30	0.00	0.00		0.00	0.00	0.00	
2	L-SDPIPE-13	0.00	0 00:00	4.21	0.00	0.00		0.06	0.17	0.00	
3	L-SDPIPE-14	1.49	0 00:13	3.45	0.43	0.87	7.16	0.28	0.86	0.00	
4	L-SDPIPE-15	0.69	0 00:17	7.06	0.10	1.82	0.76	0.13	0.41	0.00	
5	L-SDPIPE-16	0.02	0 00:05	6.90	0.00	0.70	4.92	0.03	0.10	0.00	
6	L-SDPIPE-18	0.46	0 00:05	4.56	0.10	7.80	0.37	0.13	0.39	0.00	
7	L-SDPIPE-19	1.03	0 00:08	6.96	0.15	3.25	1.17	0.12	0.37	0.00	
8	L-SDPIPE-2	0.00	0 00:00	3.02	0.00	0.00		0.13	0.39	0.00	
9	L-SDPIPE-20	0.44	0 00:16	6.90	0.06	1.31	2.98	0.12	0.37	0.00	
10	L-SDPIPE-21	0.00	0 00:07	5.11	0.00	0.00		0.17	0.50	0.00	
11	L-SDPIPE-23	0.01	0 00:05	19.69	0.00	0.01	524.20	0.22	0.43	0.00	
12	L-SDPIPE-25	0.03	0 00:05	28.17	0.00	1.83	1.85	0.03	0.06	0.00	
13	L-SDPIPE-27	0.00	0 00:06	6.74	0.00	0.00		0.00	0.01	0.00	
14	L-SDPIPE-28	0.79	0 00:14	6.81	0.12	4.05	0.94	0.14	0.42	0.00	
15	L-SDPIPE-29	0.26	0 00:06	8.06	0.03	3.10	0.93	0.06	0.18	0.00	
16	L-SDPIPE-32	0.16	0 00:05	29.25	0.01	2.22	0.74	0.06	0.12	0.00	
17	L-SDPIPE-33	0.25	0 00:08	2.77	0.09	0.22	5.94	0.23	0.70	0.00	
18	L-SDPIPE-34	1.02	0 00:08	4.46	0.23	0.72	3.47	0.26	0.78	0.00	
19	L-SDPIPE-4	0.00	0 00:00	6.91	0.00	0.00		0.00	0.00	0.00	
20	L-SDPIPE-6	0.00	0 00:06	6.67	0.00	0.20	17.84	0.14	0.42	0.00	
21	L-SDPIPE-7	0.64	0 00:16	6.89	0.09	1.71	2.11	0.13	0.39	0.00	

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness
1	SDPIPE-1	35.55	465.94	0.00	463.00	0.00	2.94	8.2700	CIRCULAR	36.000	36.000	0.0120
2	SDPIPE-10	256.10	529.50	0.00	512.58	0.00	16.92	6.6100	CIRCULAR	18.000	18.000	0.0120
3	SDPIPE-11	70.07	530.20	0.00	529.50	0.00	0.70	1.0000	CIRCULAR	18.000	18.000	0.0120
4	SDPIPE-12	33.00	530.53	0.00	530.20	0.00	0.33	1.0000	CIRCULAR	18.000	18.000	0.0130
5	SDPIPE-13	130.50	517.50	0.00	505.00	0.00	12.50	9.5800	CIRCULAR	18.000	18.000	0.0120
6	SDPIPE-14	39.55	517.99	0.00	517.50	0.00	0.49	1.2500	CIRCULAR	18.000	18.000	0.0130
7	SDPIPE-15	64.04	468.11	0.00	467.47	0.00	0.64	1.0000	CIRCULAR	18.000	18.000	0.0130
8	SDPIPE-16	23.51	501.10	0.00	499.00	0.00	2.10	8.9300	CIRCULAR	18.000	18.000	0.0120
9	SDPIPE-17	194.21	515.30	0.00	504.78	3.68	10.52	5.4200	CIRCULAR	18.000	18.000	0.0120
10	SDPIPE-18	49.41	517.77	0.00	515.30	0.00	2.47	5.0000	CIRCULAR	18.000	18.000	0.0130
11	SDPIPE-19	51.31	515.81	0.00	515.30	0.00	0.51	1.0000	CIRCULAR	18.000	18.000	0.0130
12	SDPIPE-2	35.82	466.30	0.00	465.94	0.00	0.36	1.0000	CIRCULAR	36.000	36.000	0.0130
13	SDPIPE-20	33.00	501.43	0.00	501.10	0.00	0.33	1.0000	CIRCULAR	18.000	18.000	0.0120
14	SDPIPE-21	237.30	538.50	0.00	530.20	0.00	8.30	3.5000	CIRCULAR	18.000	18.000	0.0120
15	SDPIPE-22	57.68	542.20	0.00	538.50	0.00	3.70	6.4100	CIRCULAR	18.000	18.000	0.0130
16	SDPIPE-23	44.75	542.65	0.00	542.20	0.00	0.45	1.0000	CIRCULAR	18.000	18.000	0.0130
17	SDPIPE-25	74.63	546.00	0.00	544.50	0.00	1.50	2.0100	CIRCULAR	18.000	18.000	0.0130
18	SDPIPE-27	182.53	487.50	0.00	484.31	0.00	3.19	1.7500	CIRCULAR	18.000	18.000	0.0120
19	SDPIPE-28	33.55	487.84	0.00	487.50	0.00	0.34	1.0000	CIRCULAR	18.000	18.000	0.0130
20	SDPIPE-29	167.22	505.00	0.00	487.50	0.00	17.50	10.4700	CIRCULAR	18.000	18.000	0.0120
21	SDPIPE-3	30.36	466.60	0.00	466.30	0.00	0.30	1.0000	CIRCULAR	36.000	36.000	0.0120
22	SDPIPE-30	66.71	510.34	0.00	505.00	0.00	5.34	8.0000	CIRCULAR	18.000	18.000	0.0130
23	SDPIPE-32	96.89	544.50	0.00	538.50	0.00	6.00	6.1900	CIRCULAR	18.000	18.000	0.0120
24	SDPIPE-33	76.95	514.12	0.00	512.58	0.00	1.54	2.0000	CIRCULAR	18.000	18.000	0.0150
25	SDPIPE-34	148.00	516.28	0.00	512.58	0.00	3.70	2.5000	CIRCULAR	18.000	18.000	0.0150
26	SDPIPE-4	71.93	467.47	0.00	466.75	0.81	0.72	1.0000	CIRCULAR	18.000	18.000	0.0120
27	SDPIPE-5	33.00	467.80	0.00	467.47	0.00	0.33	1.0000	CIRCULAR	18.000	18.000	0.0130
28	SDPIPE-6	67.57	483.19	0.00	482.52	0.00	0.67	1.0000	CIRCULAR	18.000	18.000	0.0120
29	SDPIPE-7	42.68	483.62	0.00	483.19	0.00	0.43	1.0000	CIRCULAR	18.000	18.000	0.0130
30	SDPIPE-8	130.51	512.25	0.00	492.00	0.00	20.25	15.5200	CIRCULAR	24.000	24.000	0.0120
31	SDPIPE-9	33.00	512.58	0.00	512.25	0.00	0.33	1.0000	CIRCULAR	24.000	24.000	0.0130

Pipe Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Fro Nur
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)	
1	SDPIPE-1	25.01	0 00:08	207.79	0.12	14.18	0.04	0.89	0.30	0.00	
2	SDPIPE-10	8.88	0 00:12	29.25	0.30	7.18	0.59	1.03	0.69	0.00	
3	SDPIPE-11	8.88	0 00:12	11.38	0.78	7.77	0.15	0.93	0.62	0.00	
4	SDPIPE-12	0.95	0 00:08	10.49	0.09	1.94	0.28	1.12	0.75	0.00	
5	SDPIPE-13	3.12	0 00:13	35.22	0.09	11.83	0.18	0.31	0.21	0.00	
6	SDPIPE-14	3.12	0 00:13	11.74	0.27	6.25	0.11	0.49	0.33	0.00	
7	SDPIPE-15	2.40	0 00:16	10.50	0.23	4.11	0.26	0.55	0.37	0.00	
8	SDPIPE-16	5.00	0 00:07	34.01	0.15	10.74	0.04	0.46	0.31	0.00	
9	SDPIPE-17	2.87	0 00:06	26.49	0.11	9.51	0.34	0.34	0.23	0.00	
10	SDPIPE-18	1.49	0 00:05	23.49	0.06	5.82	0.14	0.30	0.20	0.00	
11	SDPIPE-19	1.88	0 00:08	10.50	0.18	4.89	0.17	0.41	0.27	0.00	
12	SDPIPE-2	21.96	0 00:08	66.70	0.33	6.83	0.09	1.39	0.46	0.00	
13	SDPIPE-20	2.05	0 00:08	11.38	0.18	4.75	0.12	0.54	0.36	0.00	
14	SDPIPE-21	2.85	0 00:15	21.28	0.13	4.31	0.92	0.81	0.54	0.00	
15	SDPIPE-22	2.87	0 00:15	26.60	0.11	8.56	0.11	0.37	0.24	0.00	
16	SDPIPE-23	1.03	0 00:05	10.50	0.10	3.69	0.20	0.32	0.22	0.00	
17	SDPIPE-25	0.90	0 00:05	14.89	0.06	4.12	0.30	0.27	0.18	0.00	
18	SDPIPE-27	6.96	0 00:19	15.03	0.46	7.79	0.39	0.76	0.50	0.00	
19	SDPIPE-28	1.74	0 00:14	10.50	0.17	2.93	0.19	0.65	0.43	0.00	
20	SDPIPE-29	5.60	0 00:19	36.81	0.15	8.55	0.33	0.60	0.40	0.00	
21	SDPIPE-3	21.65	0 00:08	71.83	0.30	7.83	0.06	1.72	0.57	0.00	
22	SDPIPE-30	5.60	0 00:19	29.71	0.19	12.30	0.09	0.46	0.30	0.00	
23	SDPIPE-32	1.97	0 00:05	28.32	0.07	8.81	0.18	0.28	0.18	0.00	
24	SDPIPE-33	3.91	0 00:08	12.88	0.30	3.95	0.32	1.08	0.72	0.00	
25	SDPIPE-34	3.03	0 00:08	14.39	0.21	3.68	0.67	0.98	0.66	0.00	
26	SDPIPE-4	2.48	0 00:16	11.38	0.22	4.68	0.26	0.51	0.34	0.00	
27	SDPIPE-5	0.61	0 00:07	10.50	0.06	1.98	0.28	0.38	0.25	0.00	
28	SDPIPE-6	2.23	0 00:16	11.37	0.20	4.55	0.25	0.48	0.32	0.00	
29	SDPIPE-7	2.23	0 00:16	10.50	0.21	3.95	0.18	0.53	0.36	0.00	
30	SDPIPE-8	20.77	0 00:09	96.54	0.22	22.26	0.10	0.68	0.34	0.00	
31	SDPIPE-9	20.31	0 00:09	22.62	0.90	8.94	0.06	1.36	0.68	0.00	

Inlet Input

SN	Element ID	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Inlet Depth (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Ponded Area (ft^2)	Grate Clogging Factor (%)
1	CB-10	On Grade	1	483.62	487.38	3.76	483.62	0.00	N/A	0.00
2	CB-12	On Sag	1	512.25	516.63	4.38	512.25	0.00	10.00	0.00
3	CB-13	On Sag	1	512.58	516.63	4.05	512.58	0.00	10.00	0.00
4	CB-15	On Sag	1	530.20	533.98	3.78	530.20	0.00	10.00	0.00
5	CB-16	On Sag	1	530.53	533.98	3.45	530.53	0.00	10.00	0.00
6	CB-18	On Grade	1	517.50	521.56	4.06	517.50	0.00	N/A	0.00
7	CB-2	On Grade	1	465.94	475.75	9.81	465.94	0.00	N/A	0.00
8	CB-20	On Grade	1	468.11	471.31	3.20	468.11	0.00	N/A	0.00
9	CB-22	On Grade	1	501.10	504.78	3.68	501.10	0.00	N/A	0.00
10	CB-24	On Grade	1	517.77	523.17	5.40	517.77	0.00	N/A	0.00
11	CB-25	On Grade	1	515.81	522.01	6.20	515.81	0.00	N/A	0.00
12	CB-26	On Grade	1	501.43	504.78	3.35	501.43	0.00	N/A	0.00
13	CB-27	On Grade	1	538.50	543.76	5.26	538.50	0.00	N/A	0.00
14	CB-28	On Sag	1	542.20	546.43	4.23	542.20	0.00	10.00	0.00
15	CB-29	On Grade	1	542.65	547.71	5.07	542.65	0.00	N/A	0.00
16	CB-3	On Grade	1	466.30	475.38	9.08	466.30	0.00	N/A	0.00
17	CB-31	On Grade	1	544.50	549.76	5.26	544.50	0.00	N/A	0.00
18	CB-32	On Grade	1	546.00	550.25	4.25	546.00	0.00	N/A	0.00
19	CB-35	On Grade	1	487.50	492.85	5.35	487.50	0.00	N/A	0.00
20	CB-36	On Grade	1	487.84	492.30	4.46	487.84	0.00	N/A	0.00
21	CB-38	On Grade	1	505.00	510.35	5.35	505.00	0.00	N/A	0.00
22	CB-39	On Sag	1	510.34	515.20	4.86	510.34	0.00	10.00	0.00
23	CB-43	On Grade	1	514.12	517.57	3.45	514.12	0.00	N/A	0.00
24	CB-6	On Sag	1	467.80	474.50	6.70	467.80	0.00	10.00	0.00
25	CB-7	On Grade	1	467.47	474.50	7.03	467.47	0.00	N/A	0.00
26	CB-9	On Grade	1	483.19	489.41	6.22	483.19	0.00	N/A	0.00
27	FES-19	On Grade	1	517.99	522.14	4.14	517.99	0.00	N/A	0.00
28	Inlet-CB-44	On Grade	1	516.28	521.28	5.00	516.28	0.00	N/A	0.00

Roadway & Gutter Input

SN	Element ID	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (in)	Allowable Spread (ft)
1	CB-10	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
2	CB-12	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
3	CB-13	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
4	CB-15	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
5	CB-16	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
6	CB-18	0.0245	0.0258	0.0150	0.0200	1.00	0.1312	8.50
7	CB-2	0.0085	0.0258	0.0150	0.0200	1.00	0.1312	8.50
8	CB-20	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
9	CB-22	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
10	CB-24	0.1033	0.0258	0.0150	0.0200	1.00	0.1312	8.50
11	CB-25	0.1041	0.0258	0.0150	0.0200	1.00	0.1312	8.50
12	CB-26	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
13	CB-27	0.0574	0.0258	0.0150	0.0200	1.00	0.1312	8.50
14	CB-28	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
15	CB-29	0.0574	0.0258	0.0150	0.0200	1.00	0.1312	8.50
16	CB-3	0.0085	0.0258	0.0150	0.0200	1.00	0.1312	8.50
17	CB-31	0.0721	0.0200	0.0150	0.0200	1.50	0.1312	8.50
18	CB-32	0.0809	0.0258	0.0150	0.0200	1.00	0.1312	8.50
19	CB-35	0.1046	0.0258	0.0150	0.0200	1.00	0.1312	8.50
20	CB-36	0.1046	0.0258	0.0150	0.0200	1.00	0.1312	8.50
21	CB-38	0.1046	0.0258	0.0150	0.0200	1.00	0.1312	8.50
22	CB-39	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
23	CB-43	0.0199	0.0258	0.0150	0.0200	1.00	0.1312	8.50
24	CB-6	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
25	CB-7	0.0085	0.0258	0.0150	0.0200	1.00	0.1312	8.50
26	CB-9	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
27	FES-19	0.0245	0.0258	0.0150	0.0200	1.00	0.1312	8.50
28	Inlet-CB-44	0.1138	0.0258	0.0150	0.0200	1.00	0.1312	8.50

Inlet Results

SN	Element ID	Peak Flow (cfs)	Peak Lateral Inflow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	F \
1	CB-10	2.87	2.43	1.98	0.89	69.05	6.13	487.53	0.15	0 00:16	
2	CB-12	2.30	2.30	N/A	N/A	N/A	6.19	516.95	0.33	0 00:09	
3	CB-13	7.16	6.00	N/A	N/A	N/A	13.20	517.13	0.51	0 00:09	
4	CB-15	6.11	6.11	N/A	N/A	N/A	11.87	534.45	0.47	0 00:12	
5	CB-16	3.03	3.03	N/A	N/A	N/A	7.44	534.33	0.36	0 00:12	
6	CB-18	0.89	0.89	0.89	0.00	100.00	4.92	521.68	0.12	0 00:13	
7	CB-2	2.40	1.64	2.33	0.07	97.03	8.66	475.96	0.22	0 00:08	
8	CB-20	3.07	2.52	2.06	1.01	66.97	6.33	471.47	0.16	0 00:16	
9	CB-22	1.02	1.02	0.99	0.03	97.34	4.19	504.88	0.10	0 00:07	
10	CB-24	1.95	1.95	1.50	0.45	76.81	5.02	523.29	0.12	0 00:05	
11	CB-25	2.91	2.91	1.89	1.02	64.86	5.82	522.15	0.14	0 00:08	
12	CB-26	2.12	2.07	1.65	0.47	77.94	5.52	504.92	0.14	0 00:08	
13	CB-27	0.64	0.64	0.64	0.00	100.00	3.72	543.85	0.09	0 00:15	
14	CB-28	2.87	2.87	N/A	N/A	N/A	7.18	546.78	0.35	0 00:15	
15	CB-29	1.06	1.06	1.05	0.02	98.31	4.47	547.82	0.11	0 00:05	
16	CB-3	1.02	1.02	1.02	0.00	100.00	6.30	475.54	0.16	0 00:08	
17	CB-31	1.26	1.26	1.10	0.15	87.73	5.33	549.87	0.11	0 00:05	
18	CB-32	0.94	0.94	0.92	0.02	98.15	4.01	550.34	0.10	0 00:05	
19	CB-35	0.86	0.73	0.84	0.02	97.83	3.72	492.95	0.09	0 00:19	
20	CB-36	2.54	2.54	1.75	0.79	68.73	5.54	492.43	0.14	0 00:14	
21	CB-38	1.64	1.64	1.34	0.30	81.76	4.70	510.46	0.12	0 00:19	
22	CB-39	5.73	5.39	N/A	N/A	N/A	11.38	515.66	0.46	0 00:19	
23	CB-43	4.15	4.15	3.88	0.27	93.41	9.02	517.80	0.23	0 00:09	
24	CB-6	1.20	1.20	N/A	N/A	N/A	4.01	474.77	0.27	0 00:07	
25	CB-7	0.30	0.30	0.30	0.00	100.00	3.97	474.60	0.10	0 00:16	
26	CB-9	0.87	0.86	0.86	0.00	99.48	3.96	489.51	0.10	0 00:16	
27	FES-19	4.61	4.61	3.13	1.49	67.78	9.02	522.36	0.23	0 00:13	
28	Inlet-CB-44	4.09	4.09	3.05	1.04	74.65	6.49	521.44	0.16	0 00:08	

100 Year Design Storm

Project Description

File Name	Hilltop Drainage Analysis 3-4-26.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	00:00:00	0:00:00
End Analysis On	00:00:00	0:00:00
Start Reporting On	00:00:00	0:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	29
Nodes	42
Junctions	3
Outfalls	11
Flow Diversions	0
Inlets	28
Storage Nodes	0
Links	52
Channels	21
Pipes	31
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	100 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	Sub-CB-10	0.58	0.7000	1.72	1.21	0.70	2.65	0 00:15:54
2	Sub-CB-12	0.32	0.7000	0.93	0.65	0.21	2.48	0 00:05:00
3	Sub-CB-13	1.03	0.7000	1.20	0.84	0.87	6.49	0 00:07:58
4	Sub-CB-15	1.21	0.7000	1.41	0.99	1.20	6.62	0 00:10:46
5	Sub-CB-16	0.42	0.7000	0.93	0.65	0.27	3.27	0 00:05:00
6	Sub-CB-18	0.12	0.7000	0.93	0.65	0.08	0.96	0 00:05:00
7	Sub-CB-19	1.00	0.7000	1.55	1.09	1.09	5.01	0 00:12:57
8	Sub-CB-2	0.38	0.7000	1.67	1.17	0.44	1.78	0 00:14:59
9	Sub-CB-20	0.62	0.7000	1.80	1.26	0.78	2.74	0 00:17:03
10	Sub-CB-22	0.14	0.7000	0.93	0.65	0.09	1.10	0 00:05:00
11	Sub-CB-24	0.27	0.7000	0.93	0.65	0.18	2.11	0 00:05:01
12	Sub-CB-25	0.51	0.7000	1.23	0.86	0.44	3.15	0 00:08:15
13	Sub-CB-26	0.49	0.7000	1.72	1.21	0.59	2.25	0 00:15:52
14	Sub-CB-27	0.10	0.7000	1.05	0.73	0.07	0.69	0 00:06:07
15	Sub-CB-28	0.67	0.7000	1.67	1.17	0.78	3.12	0 00:15:04
16	Sub-CB-29	0.15	0.7000	0.93	0.65	0.10	1.15	0 00:05:00
17	Sub-CB-3	0.14	0.7000	0.93	0.65	0.09	1.10	0 00:05:00
18	Sub-CB-31	0.17	0.7000	0.93	0.65	0.11	1.36	0 00:05:00
19	Sub-CB-32	0.13	0.7000	0.93	0.65	0.08	1.01	0 00:05:00
20	Sub-CB-35	0.10	0.7000	0.93	0.65	0.07	0.78	0 00:05:00
21	Sub-CB-36	0.58	0.7000	1.65	1.16	0.67	2.76	0 00:14:42
22	Sub-CB-38	0.24	0.7000	0.99	0.70	0.17	1.77	0 00:05:43
23	Sub-CB-39	1.39	0.7000	1.93	1.35	1.87	5.86	0 00:19:10
24	Sub-CB-43	0.71	0.7000	1.18	0.83	0.59	4.49	0 00:07:53
25	Sub-CB-44	0.72	0.7000	1.22	0.85	0.61	4.43	0 00:08:24
26	Sub-CB-6	0.16	0.7000	0.93	0.65	0.11	1.29	0 00:05:00
27	Sub-CB-7	0.04	0.7000	0.93	0.65	0.03	0.32	0 00:05:00
28	Sub-CB-9	0.12	0.7000	0.93	0.65	0.08	0.92	0 00:05:00
29	Sub-FES-2	1.58	0.5600	1.22	0.69	1.09	7.82	0 00:08:19

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft^2)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	(
1	FES-2	Junction	466.60	469.78	466.60	469.78	0.00	23.00	468.51	0.00	1.27	
2	JB-14	Junction	529.50	535.50	529.50	535.50	0.00	9.58	530.09	0.00	5.41	
3	JB-23	Junction	515.30	519.20	515.30	519.20	10.00	3.03	515.66	0.00	3.54	
4	OFFSITE-1	Outfall	540.30					0.20	540.37			
5	OFFSITE-2	Outfall	532.10					0.03	532.13			
6	OFFSITE-25	Outfall	464.82					0.00	464.82			
7	OFFSITE-26	Outfall	464.82					0.82	464.96			
8	Out-FES-1	Outfall	463.00					26.65	463.73			
9	Out-FES-11	Outfall	492.00					22.98	492.66			
10	Out-FES-17	Outfall	505.00					3.27	505.31			
11	Out-FES-21	Outfall	499.00					5.37	499.40			
12	Out-FES-3	Outfall	538.50					2.10	538.78			
13	Out-FES-34	Outfall	484.31					7.59	485.07			
14	Out-FES-8	Outfall	482.52					2.41	482.98			

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Fl Dep Total De Ra
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)	
1	SDPIPE-1	Pipe	CB-2	Out-FES-1	35.55	465.94	463.00	8.2700	36.000	0.0120	26.65	207.79	0.13	14.34	0.93	0
2	SDPIPE-10	Pipe	JB-14	CB-13	256.10	529.50	512.58	6.6100	18.000	0.0120	9.58	29.25	0.33	7.38	1.05	0
3	SDPIPE-11	Pipe	CB-15	JB-14	70.07	530.20	529.50	1.0000	18.000	0.0120	9.58	11.38	0.84	7.80	0.99	0
4	SDPIPE-12	Pipe	CB-16	CB-15	33.00	530.53	530.20	1.0000	18.000	0.0130	1.17	10.49	0.11	1.95	1.22	0
5	SDPIPE-13	Pipe	CB-18	Out-FES-17	130.50	517.50	505.00	9.5800	18.000	0.0120	3.27	35.22	0.09	11.98	0.32	0
6	SDPIPE-14	Pipe	FES-19	CB-18	39.55	517.99	517.50	1.2500	18.000	0.0130	3.27	11.74	0.28	6.32	0.50	0
7	SDPIPE-15	Pipe	CB-20	CB-7	64.04	468.11	467.47	1.0000	18.000	0.0130	2.60	10.50	0.25	4.15	0.58	0
8	SDPIPE-16	Pipe	CB-22	Out-FES-21	23.51	501.10	499.00	8.9300	18.000	0.0120	5.37	34.01	0.16	10.87	0.48	0
9	SDPIPE-17	Pipe	JB-23	CB-22	194.21	515.30	504.78	5.4200	18.000	0.0120	3.01	26.49	0.11	9.63	0.35	0
10	SDPIPE-18	Pipe	CB-24	JB-23	49.41	517.77	515.30	5.0000	18.000	0.0130	1.56	23.49	0.07	5.88	0.31	0
11	SDPIPE-19	Pipe	CB-25	JB-23	51.31	515.81	515.30	1.0000	18.000	0.0130	1.97	10.50	0.19	4.95	0.42	0
12	SDPIPE-2	Pipe	CB-3	CB-2	35.82	466.30	465.94	1.0000	36.000	0.0130	23.32	66.70	0.35	6.93	1.44	0
13	SDPIPE-20	Pipe	CB-26	CB-22	33.00	501.43	501.10	1.0000	18.000	0.0120	2.22	11.38	0.19	4.80	0.56	0
14	SDPIPE-21	Pipe	CB-27	CB-15	237.30	538.50	530.20	3.5000	18.000	0.0120	3.09	21.28	0.15	4.40	0.86	0
15	SDPIPE-22	Pipe	CB-28	CB-27	57.68	542.20	538.50	6.4100	18.000	0.0130	3.11	26.60	0.12	8.73	0.38	0
16	SDPIPE-23	Pipe	CB-29	CB-28	44.75	542.65	542.20	1.0000	18.000	0.0130	1.10	10.50	0.10	3.71	0.34	0
17	SDPIPE-25	Pipe	CB-32	CB-31	74.63	546.00	544.50	2.0100	18.000	0.0130	0.97	14.89	0.07	4.20	0.28	0
18	SDPIPE-27	Pipe	CB-35	Out-FES-34	182.53	487.50	484.31	1.7500	18.000	0.0120	7.59	15.03	0.50	7.93	0.80	0
19	SDPIPE-28	Pipe	CB-36	CB-35	33.55	487.84	487.50	1.0000	18.000	0.0130	1.82	10.50	0.17	2.86	0.69	0
20	SDPIPE-29	Pipe	CB-38	CB-35	167.22	505.00	487.50	10.4700	18.000	0.0120	6.15	36.81	0.17	8.74	0.63	0
21	SDPIPE-3	Pipe	FES-2	CB-3	30.36	466.60	466.30	1.0000	36.000	0.0120	22.99	71.83	0.32	7.93	1.78	0
22	SDPIPE-30	Pipe	CB-39	CB-38	66.71	510.34	505.00	8.0000	18.000	0.0130	6.15	29.71	0.21	12.56	0.48	0
23	SDPIPE-32	Pipe	CB-31	Out-FES-3	96.89	544.50	538.50	6.1900	18.000	0.0120	2.10	28.32	0.07	8.96	0.29	0
24	SDPIPE-33	Pipe	CB-43	CB-13	76.95	514.12	512.58	2.0000	18.000	0.0150	4.04	12.88	0.31	4.02	1.26	0
25	SDPIPE-34	Pipe	Inlet-CB-44	CB-13	148.00	516.28	512.58	2.5000	18.000	0.0150	3.17	14.39	0.22	3.75	0.99	0
26	SDPIPE-4	Pipe	CB-7	CB-2	71.93	467.47	466.75	1.0000	18.000	0.0120	2.71	11.38	0.24	4.78	0.54	0
27	SDPIPE-5	Pipe	CB-6	CB-7	33.00	467.80	467.47	1.0000	18.000	0.0130	0.65	10.50	0.06	1.98	0.41	0
28	SDPIPE-6	Pipe	CB-9	Out-FES-8	67.57	483.19	482.52	1.0000	18.000	0.0120	2.41	11.37	0.21	4.63	0.50	0

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Fl Dep Total De Ra
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)	
46	L-SDPIPE-29	Channel	CB-38	CB-35	172.07	510.35	492.85	10.1700	3.960	0.0150	0.33	8.06	0.04	3.26	0.07	0
47	L-SDPIPE-32	Channel	CB-31	OFFSITE-1	98.14	549.76	540.30	9.6400	6.000	0.0150	0.20	29.25	0.01	2.24	0.07	0
48	L-SDPIPE-33	Channel	CB-43	CB-13	78.40	517.57	516.63	1.2000	3.960	0.0320	0.36	2.77	0.13	0.30	0.24	0
49	L-SDPIPE-34	Channel	Inlet-CB-44	CB-13	149.79	521.28	516.63	3.1000	3.960	0.0320	1.20	4.46	0.27	0.81	0.26	0
50	L-SDPIPE-4	Channel	CB-7	OFFSITE-25	129.78	474.50	464.82	7.4600	3.960	0.0320	0.00	6.91	0.00	0.00	0.00	0
51	L-SDPIPE-6	Channel	CB-9	CB-6	214.12	489.41	474.50	6.9600	3.960	0.0150	0.01	6.67	0.00	0.22	0.15	0
52	L-SDPIPE-7	Channel	CB-10	CB-20	216.57	487.38	471.31	7.4200	3.960	0.0150	0.76	6.89	0.11	1.79	0.14	0

Inlet Summary

SN	Element ID	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft²)	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Allowable Spread (ft)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)
1	CB-10	On Grade	1	483.62	487.38	483.62	N/A	3.18	2.10	1.08	66.02	8.50	6.39	487.54
2	CB-12	On Sag	1	512.25	516.63	512.25	10.00	2.48	N/A	N/A	N/A	8.50	6.50	516.96
3	CB-13	On Sag	1	512.58	516.63	512.58	10.00	7.94	N/A	N/A	N/A	8.50	14.14	517.16
4	CB-15	On Sag	1	530.20	533.98	530.20	10.00	6.62	N/A	N/A	N/A	8.50	12.52	534.47
5	CB-16	On Sag	1	530.53	533.98	530.53	10.00	3.28	N/A	N/A	N/A	8.50	7.84	534.34
6	CB-18	On Grade	1	517.50	521.56	517.50	N/A	0.96	0.96	0.00	100.00	8.50	5.03	521.68
7	CB-2	On Grade	1	465.94	475.75	465.94	N/A	2.77	2.61	0.16	94.08	8.50	9.08	475.97
8	CB-20	On Grade	1	468.11	471.31	468.11	N/A	3.39	2.18	1.21	64.21	8.50	6.53	471.47
9	CB-22	On Grade	1	501.10	504.78	501.10	N/A	1.09	1.05	0.04	95.92	8.50	4.31	504.89
10	CB-24	On Grade	1	517.77	523.17	517.77	N/A	2.10	1.57	0.54	74.48	8.50	5.18	523.30
11	CB-25	On Grade	1	515.81	522.01	515.81	N/A	3.15	1.97	1.18	62.63	8.50	5.99	522.16
12	CB-26	On Grade	1	501.43	504.78	501.43	N/A	2.37	1.77	0.60	74.78	8.50	5.71	504.92
13	CB-27	On Grade	1	538.50	543.76	538.50	N/A	0.69	0.69	0.00	100.00	8.50	3.80	543.85
14	CB-28	On Sag	1	542.20	546.43	542.20	10.00	3.12	N/A	N/A	N/A	8.50	7.58	546.79
15	CB-29	On Grade	1	542.65	547.71	542.65	N/A	1.15	1.11	0.03	97.01	8.50	4.61	547.83
16	CB-3	On Grade	1	466.30	475.38	466.30	N/A	1.10	1.10	0.00	100.00	8.50	6.45	475.54
17	CB-31	On Grade	1	544.50	549.76	544.50	N/A	1.35	1.16	0.19	85.78	8.50	5.44	549.87
18	CB-32	On Grade	1	546.00	550.25	546.00	N/A	1.01	0.98	0.03	96.82	8.50	4.14	550.35
19	CB-35	On Grade	1	487.50	492.85	487.50	N/A	0.98	0.94	0.05	95.34	8.50	3.91	492.95
20	CB-36	On Grade	1	487.84	492.30	487.84	N/A	2.76	1.83	0.93	66.42	8.50	5.69	492.44
21	CB-38	On Grade	1	505.00	510.35	505.00	N/A	1.77	1.41	0.36	79.52	8.50	4.83	510.47
22	CB-39	On Sag	1	510.34	515.20	510.34	10.00	6.29	N/A	N/A	N/A	8.50	12.10	515.68
23	CB-43	On Grade	1	514.12	517.57	514.12	N/A	4.49	4.11	0.38	91.44	8.50	9.30	517.80
24	CB-6	On Sag	1	467.80	474.50	467.80	10.00	1.29	N/A	N/A	N/A	8.50	4.22	474.77
25	CB-7	On Grade	1	467.47	474.50	467.47	N/A	0.32	0.32	0.00	100.00	8.50	4.08	474.60
26	CB-9	On Grade	1	483.19	489.41	483.19	N/A	0.95	0.93	0.01	98.45	8.50	4.08	489.51
27	FES-19	On Grade	1	517.99	522.14	517.99	N/A	5.01	3.27	1.73	65.39	8.50	9.31	522.37
28	Inlet-CB-44	On Grade	1	516.28	521.28	516.28	N/A	4.42	3.20	1.23	72.29	8.50	6.68	521.45

Subbasin Hydrology

Subbasin : Sub-CB-10

Input Data

Area (ac) 0.58
Weighted Runoff Coefficient 0.7

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	82.99996647	0	0
Slope (%) :	1.25	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.09	0	0
Computed Flow Time (min) :	15.21	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	229.3185963	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.69	0	0

Total TOC (min) 15.90

Subbasin : Sub-CB-12

Input Data

Area (ac) 0.32
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	219.5273657	0	0
Slope (%) :	1.99	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	2.87	0	0
Computed Flow Time (min) :	1.28	0	0

Total TOC (min) 4.14

Subbasin : Sub-CB-13

Input Data

Area (ac) 1.03
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	11.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	7.27	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	93	71.4	0
Slope (%) :	11.5	1.99	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	5.47	2.87	0
Computed Flow Time (min) :	0.28	0.41	0

Total TOC (min) 7.97

Subbasin : Sub-CB-15

Input Data

Area (ac) 1.21
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.16	0	0
Computed Flow Time (min) :	10.14	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	12.98144373	156.302	0
Slope (%) :	2	5.74	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	4.87	0
Computed Flow Time (min) :	0.09	0.53	0

Total TOC (min) 10.77

Subbasin : Sub-CB-16

Input Data

Area (ac) 0.42
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13.01720552	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	310.5319881	0	0
Slope (%) :	5.74	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	4.87	0	0
Computed Flow Time (min) :	1.06	0	0

Total TOC (min) 3.93

Subbasin : Sub-CB-18

Input Data

Area (ac) 0.12
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13.10752092	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.88	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	71.43477489	102.308	0
Slope (%) :	11.86	2.45	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	7	3.18	0
Computed Flow Time (min) :	0.17	0.54	0

Total TOC (min) 3.59

Subbasin : Sub-CB-19

Input Data

Area (ac) 1
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100.0031436	0	0
Slope (%) :	3.4	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.14	0	0
Computed Flow Time (min) :	11.83	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	6.07922878	278.905	79.9642
Slope (%) :	2	11.86	2.45
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	7	3.18
Computed Flow Time (min) :	0.04	0.66	0.42

Total TOC (min) 12.96

Subbasin : Sub-CB-2

Input Data

Area (ac) 0.38
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	83	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	14.14	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	175.3484305	45.5292	0
Slope (%) :	10.46	0.85	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	6.57	1.87	0
Computed Flow Time (min) :	0.44	0.4	0

Total TOC (min) 14.99

Subbasin : Sub-CB-20

Input Data

Area (ac) 0.62
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	99.99258294	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.41	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	3.00743724	208.662	0
Slope (%) :	2	7.49	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	5.56	0
Computed Flow Time (min) :	0.02	0.63	0

Total TOC (min) 17.06

Subbasin : Sub-CB-22

Input Data

Area (ac) 0.14
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	12.99981258	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	167.0428132	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.5	0	0

Total TOC (min) 3.36

Subbasin : Sub-CB-24

Input Data

Area (ac) 0.27
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	37.99958613	0	0
Slope (%) :	6.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.15	0	0
Computed Flow Time (min) :	4.21	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	28.98355088	187.485	0
Slope (%) :	0.51	10.41	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	1.45	6.56	0
Computed Flow Time (min) :	0.33	0.48	0

Total TOC (min) 5.02

Subbasin : Sub-CB-25

Input Data

Area (ac) 0.51
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	82.99999586	0	0
Slope (%) :	7.25	0	0
2 yr, 24 hr Rainfall (in) :	4.32	0	0
Velocity (ft/sec) :	0.18	0	0
Computed Flow Time (min) :	7.56	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	16.12667612	203.961	0
Slope (%) :	0.51	10.41	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	1.45	6.56	0
Computed Flow Time (min) :	0.19	0.52	0

Total TOC (min) 8.26

Subbasin : Sub-CB-26

Input Data

Area (ac) 0.49
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	82.99998121	0	0
Slope (%) :	1.25	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.09	0	0
Computed Flow Time (min) :	15.21	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	221.0918618	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.66	0	0

Total TOC (min) 15.87

Subbasin : Sub-CB-27

Input Data

Area (ac) 0.1
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	21.13547973	0	0
Slope (%) :	1	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.06	0	0
Computed Flow Time (min) :	5.57	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	117.1502173	0	0
Slope (%) :	2.92	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.47	0	0
Computed Flow Time (min) :	0.56	0	0

Total TOC (min) 6.13

Subbasin : Sub-CB-28

Input Data

Area (ac) 0.67
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.11	0	0
Computed Flow Time (min) :	14.63	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	17.02372996	94.0918	0
Slope (%) :	2	5.74	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	2.28	4.87	0
Computed Flow Time (min) :	0.12	0.32	0

Total TOC (min) 15.08

Subbasin : Sub-CB-29

Input Data

Area (ac) 0.15
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	253.6223323	0	0
Slope (%) :	5.74	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	4.87	0	0
Computed Flow Time (min) :	0.87	0	0

Total TOC (min) 3.73

Subbasin : Sub-CB-3

Input Data

Area (ac) 0.14
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	181.26423	58.4106	0
Slope (%) :	10.46	0.85	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	6.57	1.87	0
Computed Flow Time (min) :	0.46	0.52	0

Total TOC (min) 3.84

Subbasin : Sub-CB-31

Input Data

Area (ac) 0.17
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	166.3763112	83.6548	0
Slope (%) :	3.19	6.34	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.63	5.12	0
Computed Flow Time (min) :	0.76	0.27	0

Total TOC (min) 3.90

Subbasin : Sub-CB-32

Input Data

Area (ac) 0.13
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	167.2624187	52.7043	0
Slope (%) :	3.19	6.34	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.63	5.12	0
Computed Flow Time (min) :	0.77	0.17	0

Total TOC (min) 3.80

Subbasin : Sub-CB-35

Input Data

Area (ac) 0.1
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	159.59	0	0
Slope (%) :	10.46	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	6.57	0	0
Computed Flow Time (min) :	0.4	0	0

Total TOC (min) 3.27

Subbasin : Sub-CB-36

Input Data

Area (ac) 0.58
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	83	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	14.14	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	224.201193	0	0
Slope (%) :	10.46	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	6.57	0	0
Computed Flow Time (min) :	0.57	0	0

Total TOC (min) 14.71

Subbasin : Sub-CB-38

Input Data

Area (ac) 0.24
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13.00000002	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	214.8866153	184.112	0
Slope (%) :	2.45	0.75	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	3.18	1.76	0
Computed Flow Time (min) :	1.13	1.74	0

Total TOC (min) 5.73

Subbasin : Sub-CB-39

Input Data

Area (ac) 1.39
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	99.98923348	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.1	0	0
Computed Flow Time (min) :	16.41	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	34.45719772	233.523	132.701
Slope (%) :	1.5	2.45	0.75
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	1.98	3.18	1.76
Computed Flow Time (min) :	0.29	1.22	1.26

Total TOC (min) 19.18

Subbasin : Sub-CB-43

Input Data

Area (ac) 0.71
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	12	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	7.15	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	93	77.84	0
Slope (%) :	10.75	1.99	0
Surface Type :	Unpaved	Paved	Unpaved
Velocity (ft/sec) :	5.29	2.87	0
Computed Flow Time (min) :	0.29	0.45	0

Total TOC (min) 7.89

Subbasin : Sub-CB-44

Input Data

Area (ac) 0.72
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	9	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.21	0	0
Computed Flow Time (min) :	8.02	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	78.42	77.02	0
Slope (%) :	16.7	11.38	0
Surface Type :	Unpaved	Paved	Unpaved
Velocity (ft/sec) :	6.59	6.86	0
Computed Flow Time (min) :	0.2	0.19	0

Total TOC (min) 8.40

Subbasin : Sub-CB-6

Input Data

Area (ac) 0.16
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	13	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	207.9606416	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.62	0	0

Total TOC (min) 3.48

Subbasin : Sub-CB-7

Input Data

Area (ac) 0.04
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	12.99999999	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	68.39700153	0	0
Slope (%) :	0.85	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	1.87	0	0
Computed Flow Time (min) :	0.61	0	0

Total TOC (min) 3.47

Subbasin : Sub-CB-9

Input Data

Area (ac) 0.12
Weighted Runoff Coefficient 0.7

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	12.99999519	0	0
Slope (%) :	2	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	2.86	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	199.7947467	0	0
Slope (%) :	7.49	0	0
Surface Type :	Paved	Paved	Paved
Velocity (ft/sec) :	5.56	0	0
Computed Flow Time (min) :	0.6	0	0

Total TOC (min) 3.46

Subbasin : Sub-FES-2

Input Data

Area (ac) 1.58
Weighted Runoff Coefficient 0.56

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.3	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	12	0	0
2 yr, 24 hr Rainfall (in) :	4.35	0	0
Velocity (ft/sec) :	0.23	0	0
Computed Flow Time (min) :	7.15	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	363.3701089	0	0
Slope (%) :	10	0	0
Surface Type :	Unpaved	Paved	Paved
Velocity (ft/sec) :	5.1	0	0
Computed Flow Time (min) :	1.19	0	0

Total TOC (min) 8.33

Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft^2)	Minimum Pipe Cover (in)
1	FES-2	466.60	469.78	3.18	466.60	0.00	469.78	0.00	0.00	0.00
2	JB-14	529.50	535.50	6.00	529.50	0.00	535.50	0.00	0.00	0.00
3	JB-23	515.30	519.20	3.90	515.30	0.00	519.20	0.00	10.00	0.00

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Tim F Floo Occurre (days hh:r
1	FES-2	23.00	23.00	468.51	1.91	0.00	1.27	468.04	1.44	0 00:08	0 0(
2	JB-14	9.58	0.00	530.09	0.59	0.00	5.41	529.51	0.01	0 00:12	0 0(
3	JB-23	3.03	0.00	515.66	0.36	0.00	3.54	515.30	0.00	0 00:05	0 0(

Channel Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness
1	L-SDPIPE-1	73.15	475.75	9.81	474.50	7.03	1.25	1.7100	User-Defined	0.330	14.000	0.0150
2	L-SDPIPE-13	403.61	521.56	4.06	510.35	5.35	11.21	2.7800	User-Defined	0.330	14.000	0.0150
3	L-SDPIPE-14	373.89	522.14	4.14	515.20	4.86	6.94	1.8600	User-Defined	0.330	14.000	0.0150
4	L-SDPIPE-15	83.27	471.31	3.20	464.82	0.00	6.49	7.7900	User-Defined	0.330	14.000	0.0150
5	L-SDPIPE-16	206.62	504.78	3.68	489.41	6.22	15.37	7.4400	User-Defined	0.330	14.000	0.0150
6	L-SDPIPE-18	171.93	523.17	5.40	517.57	3.45	5.60	3.2600	User-Defined	0.330	14.000	0.0150
7	L-SDPIPE-19	227.29	522.01	6.20	504.78	3.35	17.23	7.5800	User-Defined	0.330	14.000	0.0150
8	L-SDPIPE-2	62.02	475.38	9.08	474.50	6.70	0.88	1.4200	User-Defined	0.330	14.000	0.0150
9	L-SDPIPE-20	233.87	504.78	3.35	487.38	3.76	17.40	7.4400	User-Defined	0.330	14.000	0.0150
10	L-SDPIPE-21	239.45	543.76	5.26	533.98	3.78	9.78	4.0800	User-Defined	0.330	14.000	0.0150
11	L-SDPIPE-23	314.52	547.71	5.07	533.98	3.45	13.74	4.3700	User-Defined	0.500	26.000	0.0150
12	L-SDPIPE-25	202.83	550.25	4.25	532.10	0.00	18.15	8.9500	User-Defined	0.500	26.000	0.0150
13	L-SDPIPE-27	245.69	492.85	5.35	475.38	9.08	17.47	7.1100	User-Defined	0.330	14.000	0.0150
14	L-SDPIPE-28	228.18	492.30	4.46	475.75	9.81	16.55	7.2500	User-Defined	0.330	14.000	0.0150
15	L-SDPIPE-29	172.07	510.35	5.35	492.85	5.35	17.49	10.1700	User-Defined	0.330	14.000	0.0150
16	L-SDPIPE-32	98.14	549.76	5.26	540.30	0.00	9.46	9.6400	User-Defined	0.500	26.000	0.0150
17	L-SDPIPE-33	78.40	517.57	3.45	516.63	4.05	0.94	1.2000	User-Defined	0.330	14.000	0.0320
18	L-SDPIPE-34	149.79	521.28	5.00	516.63	4.05	4.65	3.1000	User-Defined	0.330	14.000	0.0320
19	L-SDPIPE-4	129.78	474.50	7.03	464.82	0.00	9.68	7.4600	User-Defined	0.330	14.000	0.0320
20	L-SDPIPE-6	214.12	489.41	6.22	474.50	6.70	14.91	6.9600	User-Defined	0.330	14.000	0.0150
21	L-SDPIPE-7	216.57	487.38	3.76	471.31	3.20	16.07	7.4200	User-Defined	0.330	14.000	0.0150

Channel Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	I N
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)	
1	L-SDPIPE-1	0.00	0 00:17	3.30	0.00	0.00		0.00	0.01	0.00	
2	L-SDPIPE-13	0.00	0 00:00	4.21	0.00	0.00		0.06	0.18	0.00	
3	L-SDPIPE-14	1.73	0 00:13	3.45	0.50	0.97	6.42	0.29	0.88	0.00	
4	L-SDPIPE-15	0.82	0 00:17	7.06	0.12	1.85	0.75	0.14	0.44	0.00	
5	L-SDPIPE-16	0.03	0 00:05	6.90	0.00	0.81	4.25	0.04	0.13	0.00	
6	L-SDPIPE-18	0.54	0 00:05	4.56	0.12	8.20	0.35	0.14	0.42	0.00	
7	L-SDPIPE-19	1.18	0 00:08	6.96	0.17	3.25	1.17	0.13	0.40	0.00	
8	L-SDPIPE-2	0.00	0 00:00	3.02	0.00	0.00		0.14	0.42	0.00	
9	L-SDPIPE-20	0.53	0 00:16	6.90	0.08	1.39	2.80	0.13	0.40	0.00	
10	L-SDPIPE-21	0.00	0 00:08	5.11	0.00	0.00		0.17	0.50	0.00	
11	L-SDPIPE-23	0.03	0 00:05	19.69	0.00	0.03	174.73	0.23	0.45	0.00	
12	L-SDPIPE-25	0.03	0 00:05	28.17	0.00	1.87	1.81	0.03	0.06	0.00	
13	L-SDPIPE-27	0.00	0 00:06	6.74	0.00	0.00		0.01	0.02	0.00	
14	L-SDPIPE-28	1.02	0 00:14	6.81	0.15	4.11	0.93	0.15	0.46	0.00	
15	L-SDPIPE-29	0.33	0 00:06	8.06	0.04	3.26	0.88	0.07	0.20	0.00	
16	L-SDPIPE-32	0.20	0 00:05	29.25	0.01	2.24	0.73	0.07	0.14	0.00	
17	L-SDPIPE-33	0.36	0 00:08	2.77	0.13	0.30	4.36	0.24	0.73	0.00	
18	L-SDPIPE-34	1.20	0 00:08	4.46	0.27	0.81	3.08	0.26	0.80	0.00	
19	L-SDPIPE-4	0.00	0 00:00	6.91	0.00	0.00		0.00	0.00	0.00	
20	L-SDPIPE-6	0.01	0 00:06	6.67	0.00	0.22	16.22	0.15	0.45	0.00	
21	L-SDPIPE-7	0.76	0 00:16	6.89	0.11	1.79	2.02	0.14	0.42	0.00	

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness
1	SDPIPE-1	35.55	465.94	0.00	463.00	0.00	2.94	8.2700	CIRCULAR	36.000	36.000	0.0120
2	SDPIPE-10	256.10	529.50	0.00	512.58	0.00	16.92	6.6100	CIRCULAR	18.000	18.000	0.0120
3	SDPIPE-11	70.07	530.20	0.00	529.50	0.00	0.70	1.0000	CIRCULAR	18.000	18.000	0.0120
4	SDPIPE-12	33.00	530.53	0.00	530.20	0.00	0.33	1.0000	CIRCULAR	18.000	18.000	0.0130
5	SDPIPE-13	130.50	517.50	0.00	505.00	0.00	12.50	9.5800	CIRCULAR	18.000	18.000	0.0120
6	SDPIPE-14	39.55	517.99	0.00	517.50	0.00	0.49	1.2500	CIRCULAR	18.000	18.000	0.0130
7	SDPIPE-15	64.04	468.11	0.00	467.47	0.00	0.64	1.0000	CIRCULAR	18.000	18.000	0.0130
8	SDPIPE-16	23.51	501.10	0.00	499.00	0.00	2.10	8.9300	CIRCULAR	18.000	18.000	0.0120
9	SDPIPE-17	194.21	515.30	0.00	504.78	3.68	10.52	5.4200	CIRCULAR	18.000	18.000	0.0120
10	SDPIPE-18	49.41	517.77	0.00	515.30	0.00	2.47	5.0000	CIRCULAR	18.000	18.000	0.0130
11	SDPIPE-19	51.31	515.81	0.00	515.30	0.00	0.51	1.0000	CIRCULAR	18.000	18.000	0.0130
12	SDPIPE-2	35.82	466.30	0.00	465.94	0.00	0.36	1.0000	CIRCULAR	36.000	36.000	0.0130
13	SDPIPE-20	33.00	501.43	0.00	501.10	0.00	0.33	1.0000	CIRCULAR	18.000	18.000	0.0120
14	SDPIPE-21	237.30	538.50	0.00	530.20	0.00	8.30	3.5000	CIRCULAR	18.000	18.000	0.0120
15	SDPIPE-22	57.68	542.20	0.00	538.50	0.00	3.70	6.4100	CIRCULAR	18.000	18.000	0.0130
16	SDPIPE-23	44.75	542.65	0.00	542.20	0.00	0.45	1.0000	CIRCULAR	18.000	18.000	0.0130
17	SDPIPE-25	74.63	546.00	0.00	544.50	0.00	1.50	2.0100	CIRCULAR	18.000	18.000	0.0130
18	SDPIPE-27	182.53	487.50	0.00	484.31	0.00	3.19	1.7500	CIRCULAR	18.000	18.000	0.0120
19	SDPIPE-28	33.55	487.84	0.00	487.50	0.00	0.34	1.0000	CIRCULAR	18.000	18.000	0.0130
20	SDPIPE-29	167.22	505.00	0.00	487.50	0.00	17.50	10.4700	CIRCULAR	18.000	18.000	0.0120
21	SDPIPE-3	30.36	466.60	0.00	466.30	0.00	0.30	1.0000	CIRCULAR	36.000	36.000	0.0120
22	SDPIPE-30	66.71	510.34	0.00	505.00	0.00	5.34	8.0000	CIRCULAR	18.000	18.000	0.0130
23	SDPIPE-32	96.89	544.50	0.00	538.50	0.00	6.00	6.1900	CIRCULAR	18.000	18.000	0.0120
24	SDPIPE-33	76.95	514.12	0.00	512.58	0.00	1.54	2.0000	CIRCULAR	18.000	18.000	0.0150
25	SDPIPE-34	148.00	516.28	0.00	512.58	0.00	3.70	2.5000	CIRCULAR	18.000	18.000	0.0150
26	SDPIPE-4	71.93	467.47	0.00	466.75	0.81	0.72	1.0000	CIRCULAR	18.000	18.000	0.0120
27	SDPIPE-5	33.00	467.80	0.00	467.47	0.00	0.33	1.0000	CIRCULAR	18.000	18.000	0.0130
28	SDPIPE-6	67.57	483.19	0.00	482.52	0.00	0.67	1.0000	CIRCULAR	18.000	18.000	0.0120
29	SDPIPE-7	42.68	483.62	0.00	483.19	0.00	0.43	1.0000	CIRCULAR	18.000	18.000	0.0130
30	SDPIPE-8	130.51	512.25	0.00	492.00	0.00	20.25	15.5200	CIRCULAR	24.000	24.000	0.0120
31	SDPIPE-9	33.00	512.58	0.00	512.25	0.00	0.33	1.0000	CIRCULAR	24.000	24.000	0.0130

Pipe Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Fro Nur
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)	
1	SDPIPE-1	26.65	0 00:08	207.79	0.13	14.34	0.04	0.93	0.31	0.00	
2	SDPIPE-10	9.58	0 00:12	29.25	0.33	7.38	0.58	1.05	0.70	0.00	
3	SDPIPE-11	9.58	0 00:12	11.38	0.84	7.80	0.15	0.99	0.66	0.00	
4	SDPIPE-12	1.17	0 00:08	10.49	0.11	1.95	0.28	1.22	0.81	0.00	
5	SDPIPE-13	3.27	0 00:13	35.22	0.09	11.98	0.18	0.32	0.21	0.00	
6	SDPIPE-14	3.27	0 00:13	11.74	0.28	6.32	0.10	0.50	0.33	0.00	
7	SDPIPE-15	2.60	0 00:16	10.50	0.25	4.15	0.26	0.58	0.39	0.00	
8	SDPIPE-16	5.37	0 00:07	34.01	0.16	10.87	0.04	0.48	0.32	0.00	
9	SDPIPE-17	3.01	0 00:05	26.49	0.11	9.63	0.34	0.35	0.23	0.00	
10	SDPIPE-18	1.56	0 00:05	23.49	0.07	5.88	0.14	0.31	0.21	0.00	
11	SDPIPE-19	1.97	0 00:08	10.50	0.19	4.95	0.17	0.42	0.28	0.00	
12	SDPIPE-2	23.32	0 00:08	66.70	0.35	6.93	0.09	1.44	0.48	0.00	
13	SDPIPE-20	2.22	0 00:08	11.38	0.19	4.80	0.11	0.56	0.38	0.00	
14	SDPIPE-21	3.09	0 00:15	21.28	0.15	4.40	0.90	0.86	0.58	0.00	
15	SDPIPE-22	3.11	0 00:15	26.60	0.12	8.73	0.11	0.38	0.26	0.00	
16	SDPIPE-23	1.10	0 00:05	10.50	0.10	3.71	0.20	0.34	0.22	0.00	
17	SDPIPE-25	0.97	0 00:05	14.89	0.07	4.20	0.30	0.28	0.19	0.00	
18	SDPIPE-27	7.59	0 00:19	15.03	0.50	7.93	0.38	0.80	0.53	0.00	
19	SDPIPE-28	1.82	0 00:14	10.50	0.17	2.86	0.20	0.69	0.46	0.00	
20	SDPIPE-29	6.15	0 00:19	36.81	0.17	8.74	0.32	0.63	0.42	0.00	
21	SDPIPE-3	22.99	0 00:08	71.83	0.32	7.93	0.06	1.78	0.59	0.00	
22	SDPIPE-30	6.15	0 00:19	29.71	0.21	12.56	0.09	0.48	0.32	0.00	
23	SDPIPE-32	2.10	0 00:05	28.32	0.07	8.96	0.18	0.29	0.19	0.00	
24	SDPIPE-33	4.04	0 00:07	12.88	0.31	4.02	0.32	1.26	0.84	0.00	
25	SDPIPE-34	3.17	0 00:08	14.39	0.22	3.75	0.66	0.99	0.66	0.00	
26	SDPIPE-4	2.71	0 00:16	11.38	0.24	4.78	0.25	0.54	0.36	0.00	
27	SDPIPE-5	0.65	0 00:07	10.50	0.06	1.98	0.28	0.41	0.27	0.00	
28	SDPIPE-6	2.41	0 00:16	11.37	0.21	4.63	0.24	0.50	0.34	0.00	
29	SDPIPE-7	2.41	0 00:16	10.50	0.23	4.01	0.18	0.56	0.37	0.00	
30	SDPIPE-8	22.98	0 00:09	96.54	0.24	22.75	0.10	0.72	0.36	0.00	
31	SDPIPE-9	22.41	0 00:09	22.62	0.99	9.67	0.06	1.38	0.69	0.00	

Inlet Input

SN	Element ID	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Inlet Depth (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Ponded Area (ft^2)	Grate Clogging Factor (%)
1	CB-10	On Grade	1	483.62	487.38	3.76	483.62	0.00	N/A	0.00
2	CB-12	On Sag	1	512.25	516.63	4.38	512.25	0.00	10.00	0.00
3	CB-13	On Sag	1	512.58	516.63	4.05	512.58	0.00	10.00	0.00
4	CB-15	On Sag	1	530.20	533.98	3.78	530.20	0.00	10.00	0.00
5	CB-16	On Sag	1	530.53	533.98	3.45	530.53	0.00	10.00	0.00
6	CB-18	On Grade	1	517.50	521.56	4.06	517.50	0.00	N/A	0.00
7	CB-2	On Grade	1	465.94	475.75	9.81	465.94	0.00	N/A	0.00
8	CB-20	On Grade	1	468.11	471.31	3.20	468.11	0.00	N/A	0.00
9	CB-22	On Grade	1	501.10	504.78	3.68	501.10	0.00	N/A	0.00
10	CB-24	On Grade	1	517.77	523.17	5.40	517.77	0.00	N/A	0.00
11	CB-25	On Grade	1	515.81	522.01	6.20	515.81	0.00	N/A	0.00
12	CB-26	On Grade	1	501.43	504.78	3.35	501.43	0.00	N/A	0.00
13	CB-27	On Grade	1	538.50	543.76	5.26	538.50	0.00	N/A	0.00
14	CB-28	On Sag	1	542.20	546.43	4.23	542.20	0.00	10.00	0.00
15	CB-29	On Grade	1	542.65	547.71	5.07	542.65	0.00	N/A	0.00
16	CB-3	On Grade	1	466.30	475.38	9.08	466.30	0.00	N/A	0.00
17	CB-31	On Grade	1	544.50	549.76	5.26	544.50	0.00	N/A	0.00
18	CB-32	On Grade	1	546.00	550.25	4.25	546.00	0.00	N/A	0.00
19	CB-35	On Grade	1	487.50	492.85	5.35	487.50	0.00	N/A	0.00
20	CB-36	On Grade	1	487.84	492.30	4.46	487.84	0.00	N/A	0.00
21	CB-38	On Grade	1	505.00	510.35	5.35	505.00	0.00	N/A	0.00
22	CB-39	On Sag	1	510.34	515.20	4.86	510.34	0.00	10.00	0.00
23	CB-43	On Grade	1	514.12	517.57	3.45	514.12	0.00	N/A	0.00
24	CB-6	On Sag	1	467.80	474.50	6.70	467.80	0.00	10.00	0.00
25	CB-7	On Grade	1	467.47	474.50	7.03	467.47	0.00	N/A	0.00
26	CB-9	On Grade	1	483.19	489.41	6.22	483.19	0.00	N/A	0.00
27	FES-19	On Grade	1	517.99	522.14	4.14	517.99	0.00	N/A	0.00
28	Inlet-CB-44	On Grade	1	516.28	521.28	5.00	516.28	0.00	N/A	0.00

Roadway & Gutter Input

SN	Element ID	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (in)	Allowable Spread (ft)
1	CB-10	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
2	CB-12	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
3	CB-13	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
4	CB-15	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
5	CB-16	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
6	CB-18	0.0245	0.0258	0.0150	0.0200	1.00	0.1312	8.50
7	CB-2	0.0085	0.0258	0.0150	0.0200	1.00	0.1312	8.50
8	CB-20	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
9	CB-22	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
10	CB-24	0.1033	0.0258	0.0150	0.0200	1.00	0.1312	8.50
11	CB-25	0.1041	0.0258	0.0150	0.0200	1.00	0.1312	8.50
12	CB-26	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
13	CB-27	0.0574	0.0258	0.0150	0.0200	1.00	0.1312	8.50
14	CB-28	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
15	CB-29	0.0574	0.0258	0.0150	0.0200	1.00	0.1312	8.50
16	CB-3	0.0085	0.0258	0.0150	0.0200	1.00	0.1312	8.50
17	CB-31	0.0721	0.0200	0.0150	0.0200	1.50	0.1312	8.50
18	CB-32	0.0809	0.0258	0.0150	0.0200	1.00	0.1312	8.50
19	CB-35	0.1046	0.0258	0.0150	0.0200	1.00	0.1312	8.50
20	CB-36	0.1046	0.0258	0.0150	0.0200	1.00	0.1312	8.50
21	CB-38	0.1046	0.0258	0.0150	0.0200	1.00	0.1312	8.50
22	CB-39	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
23	CB-43	0.0199	0.0258	0.0150	0.0200	1.00	0.1312	8.50
24	CB-6	N/A	0.0258	0.0150	0.0200	1.00	0.1312	8.50
25	CB-7	0.0085	0.0258	0.0150	0.0200	1.00	0.1312	8.50
26	CB-9	0.0749	0.0258	0.0150	0.0200	1.00	0.1312	8.50
27	FES-19	0.0245	0.0258	0.0150	0.0200	1.00	0.1312	8.50
28	Inlet-CB-44	0.1138	0.0258	0.0150	0.0200	1.00	0.1312	8.50

Inlet Results

SN	Element ID	Peak Flow (cfs)	Peak Lateral Inflow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	F \
1	CB-10	3.18	2.64	2.10	1.08	66.02	6.39	487.54	0.16	0 00:16	
2	CB-12	2.48	2.48	N/A	N/A	N/A	6.50	516.96	0.33	0 00:09	
3	CB-13	7.94	6.48	N/A	N/A	N/A	14.14	517.16	0.53	0 00:09	
4	CB-15	6.62	6.62	N/A	N/A	N/A	12.52	534.47	0.49	0 00:12	
5	CB-16	3.28	3.26	N/A	N/A	N/A	7.84	534.34	0.37	0 00:12	
6	CB-18	0.96	0.96	0.96	0.00	100.00	5.03	521.68	0.12	0 00:13	
7	CB-2	2.77	1.78	2.61	0.16	94.08	9.08	475.97	0.23	0 00:08	
8	CB-20	3.39	2.74	2.18	1.21	64.21	6.53	471.47	0.16	0 00:16	
9	CB-22	1.09	1.09	1.05	0.04	95.92	4.31	504.89	0.11	0 00:07	
10	CB-24	2.10	2.10	1.57	0.54	74.48	5.18	523.30	0.13	0 00:05	
11	CB-25	3.15	3.15	1.97	1.18	62.63	5.99	522.16	0.15	0 00:08	
12	CB-26	2.37	2.24	1.77	0.60	74.78	5.71	504.92	0.14	0 00:08	
13	CB-27	0.69	0.69	0.69	0.00	100.00	3.80	543.85	0.09	0 00:15	
14	CB-28	3.12	3.12	N/A	N/A	N/A	7.58	546.79	0.36	0 00:15	
15	CB-29	1.15	1.15	1.11	0.03	97.01	4.61	547.83	0.11	0 00:05	
16	CB-3	1.10	1.10	1.10	0.00	100.00	6.45	475.54	0.16	0 00:08	
17	CB-31	1.35	1.35	1.16	0.19	85.78	5.44	549.87	0.11	0 00:05	
18	CB-32	1.01	1.01	0.98	0.03	96.82	4.14	550.35	0.10	0 00:05	
19	CB-35	0.98	0.78	0.94	0.05	95.34	3.91	492.95	0.09	0 00:19	
20	CB-36	2.76	2.76	1.83	0.93	66.42	5.69	492.44	0.14	0 00:14	
21	CB-38	1.77	1.77	1.41	0.36	79.52	4.83	510.47	0.12	0 00:19	
22	CB-39	6.29	5.86	N/A	N/A	N/A	12.10	515.68	0.48	0 00:19	
23	CB-43	4.49	4.49	4.11	0.38	91.44	9.30	517.80	0.23	0 00:09	
24	CB-6	1.29	1.29	N/A	N/A	N/A	4.22	474.77	0.28	0 00:07	
25	CB-7	0.32	0.32	0.32	0.00	100.00	4.08	474.60	0.10	0 00:16	
26	CB-9	0.95	0.92	0.93	0.01	98.45	4.08	489.51	0.10	0 00:16	
27	FES-19	5.01	5.01	3.27	1.73	65.39	9.31	522.37	0.23	0 00:13	
28	Inlet-CB-44	4.42	4.42	3.20	1.23	72.29	6.68	521.45	0.17	0 00:08	

Detention Pond Storage Estimate

Pond No. 1 : Hilltop Detention Pond

Pond Designer

Report | Help

Estimate Storage* > Create Pond > Add Outlet Structures

1-Yr | 2-Yr | 3-Yr | 5-Yr | 10-Yr | 25-Yr | 50-Yr | 100-Yr

Post-dev Hyd = 13 - Mod Rational - Post-Dev Basin "E

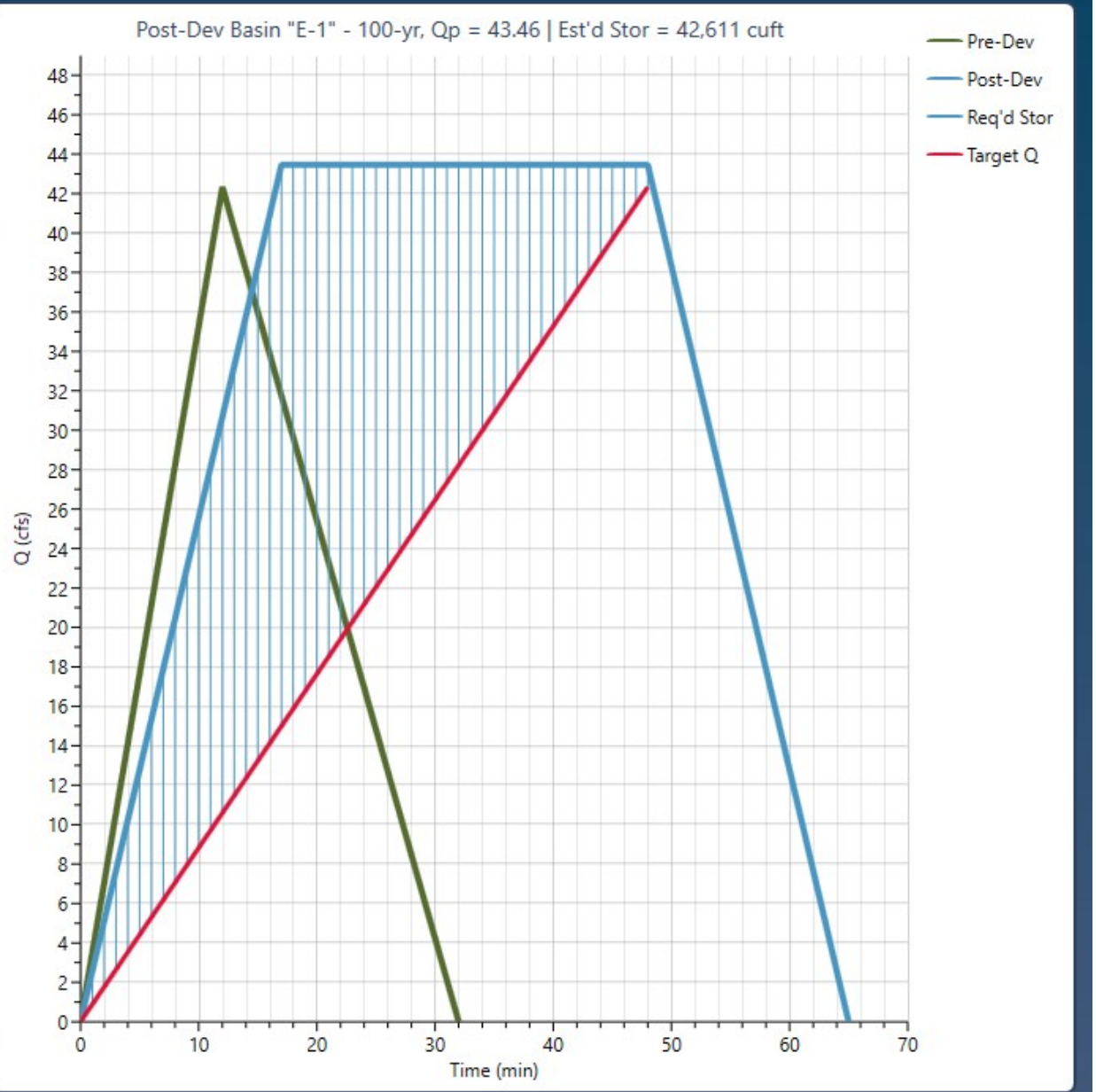
Pre-dev Hyd = 5 - Rational - Pre-Dev Basin "E-1"

Freq (Yr)	Vol Pre (cuft)	Vol Post (cuft)	Qp Post (cfs)	Q Targ (cfs)	Req Stor (cuft)
1					
2	22,242	68,090	23.64	23.14	22,967
3					
5					
10	29,819	91,663	31.83	31.02	31,174
25	34,268	105,431	36.61	35.65	35,913
50	37,472	115,494	40.10	38.98	39,483
100	40,692	125,154	43.46	42.33	42,611

Clear | Estimate Storage

	Extended Detention Storage (optional)	
Zone	Description	Volume (cuft)
1	WQv	
2	CPv	
3	Custom	
4	Custom	

Clear | Apply



*Estimate Storage Step is Optional

Always skip this step

Create Pond >

Culvert Blockage Simulation

Pond No. 1 : Hilltop Detention Pond

Pond Designer

Report | Help

Estimate Storage > Create Pond > **Add Outlet Structures**

Table | Structure | Plan / Profile | Stage vs. Q | Stage vs. Drain Time | Trial Route | Help | Flow Pat

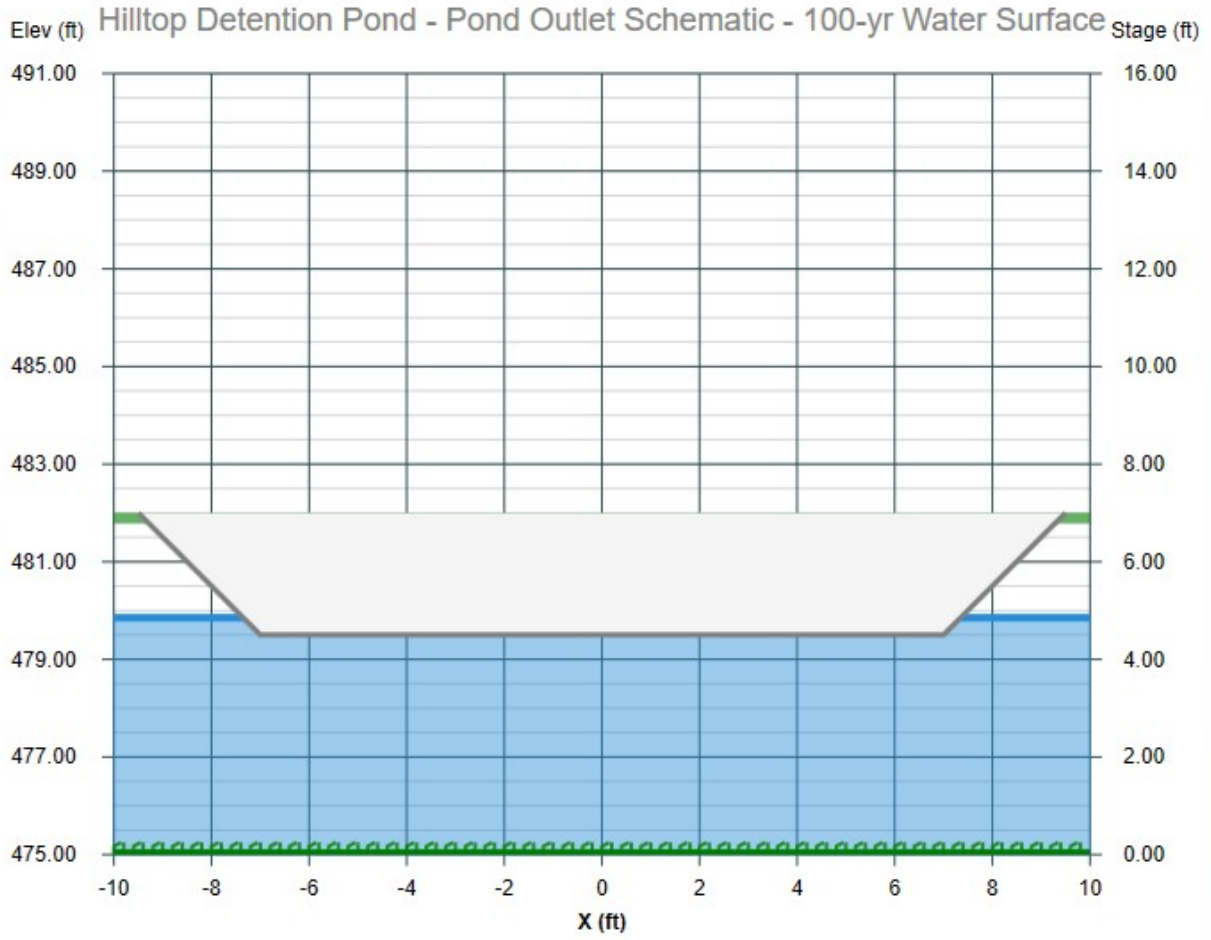
Culvert	Riser	Orifice	Weir
Exfiltration	User	Perf Riser	Tailwater

Primary Culvert	Input
Outlet Structure =	Culvert
Shape =	Circular
Diameter (in) =	18
No. Barrels =	1
Invert Elev. (ft) =	475.00
Orifice Coeff. (Co) =	0.6
Length (ft) =	57.00
Barrel Slope (%) =	1.17
N-Value (n) =	0.013
Restrictor (optional)	None
Active =	☐

Auto | Add/Update

Freq (Yr)	Q Targ (cfs)	Q Act (cfs)	Max Ele (ft)	Max Stor (cuft)
2	23.14	0.00	477.97	68,090
10	31.02	0.00	478.91	91,663
25	35.65	0.00	479.43	105,431
50	38.98	5.42	479.74	113,429
100	42.33	12.95	479.92	118,321

Auto Route | Trial Route



Numerical Output

X = 9.22 ft Y = 482.09 ft

< Create Pond | Finish

Pre and Post Development Hydrographs (Hydrology Studio)

Table of Contents

Basin Model Schematic 1

Hydrograph by Return Period 2

2 - Year

Hydrograph Summary 3

Hydrograph Reports

Hydrograph No. 1, Rational, Pre-Dev Basin "A" 4

Tc by TR55 Worksheet 5

Hydrograph No. 2, Rational, Pre-Dev Basin "B" 6

Tc by TR55 Worksheet 7

Hydrograph No. 3, Rational, Pre-Dev Basin "C" 8

Tc by TR55 Worksheet 9

Hydrograph No. 4, Rational, Pre-Dev Basin "D" 10

Tc by TR55 Worksheet 11

Hydrograph No. 5, Rational, Pre-Dev Basin "E-1" 12

Tc by TR55 Worksheet 13

Hydrograph No. 6, Rational, Pre-Dev Basin "E-2" 14

Tc by TR55 Worksheet 15

Hydrograph No. 7, Junction, Total Pre Basin "E" 16

Hydrograph No. 8, Rational, Pre-Dev Basin "F" 17

Tc by TR55 Worksheet 18

Hydrograph No. 9, Rational, Post-Dev Basin A 19

Tc by TR55 Worksheet 20

Hydrograph No. 10, Rational, Post-Dev Basin B 21

Tc by TR55 Worksheet 22

Hydrograph No. 11, Rational, Post-Dev Basin "C" 23

Tc by TR55 Worksheet 24

Hydrograph No. 12, Rational, Post-Dev Basin "D" 25

Tc by TR55 Worksheet 26

Hydrograph No. 13, Mod Rational, Post-Dev Basin "E-1" 27

Hydrograph No. 14, Pond Route, Detention Basin 28

Detention Pond Reports - Hilltop Detention Pond 29

Hydrograph No. 15, Rational, Post-Dev Basin "E-2" 33

Tc by TR55 Worksheet 34

Hydrograph No. 16, Junction, Total Post-Dev "E" 35

Hydrograph No. 17, Rational, Post-Dev Basin "F" 36

Tc by TR55 Worksheet 37

Contents continued...

10 - Year

Hydrograph Summary **38**

Hydrograph Reports

Hydrograph No. 1, Rational, Pre-Dev Basin "A" 39

Hydrograph No. 2, Rational, Pre-Dev Basin "B" 40

Hydrograph No. 3, Rational, Pre-Dev Basin "C" 41

Hydrograph No. 4, Rational, Pre-Dev Basin "D" 42

Hydrograph No. 5, Rational, Pre-Dev Basin "E-1" 43

Hydrograph No. 6, Rational, Pre-Dev Basin "E-2" 44

Hydrograph No. 7, Junction, Total Pre Basin "E" 45

Hydrograph No. 8, Rational, Pre-Dev Basin "F" 46

Hydrograph No. 9, Rational, Post-Dev Basin A 47

Hydrograph No. 10, Rational, Post-Dev Basin B 48

Hydrograph No. 11, Rational, Post-Dev Basin "C" 49

Hydrograph No. 12, Rational, Post-Dev Basin "D" 50

Hydrograph No. 13, Mod Rational, Post-Dev Basin "E-1" 51

Hydrograph No. 14, Pond Route, Detention Basin 52

Hydrograph No. 15, Rational, Post-Dev Basin "E-2" 53

Hydrograph No. 16, Junction, Total Post-Dev "E" 54

Hydrograph No. 17, Rational, Post-Dev Basin "F" 55

25 - Year

Hydrograph Summary **56**

Hydrograph Reports

Hydrograph No. 1, Rational, Pre-Dev Basin "A" 57

Hydrograph No. 2, Rational, Pre-Dev Basin "B" 58

Hydrograph No. 3, Rational, Pre-Dev Basin "C" 59

Hydrograph No. 4, Rational, Pre-Dev Basin "D" 60

Hydrograph No. 5, Rational, Pre-Dev Basin "E-1" 61

Hydrograph No. 6, Rational, Pre-Dev Basin "E-2" 62

Hydrograph No. 7, Junction, Total Pre Basin "E" 63

Hydrograph No. 8, Rational, Pre-Dev Basin "F" 64

Hydrograph No. 9, Rational, Post-Dev Basin A 65

Hydrograph No. 10, Rational, Post-Dev Basin B 66

Hydrograph No. 11, Rational, Post-Dev Basin "C" 67

Hydrograph No. 12, Rational, Post-Dev Basin "D" 68

Hydrograph No. 13, Mod Rational, Post-Dev Basin "E-1" 69

Contents continued...

Hydrograph No. 14, Pond Route, Detention Basin 70
Hydrograph No. 15, Rational, Post-Dev Basin "E-2" 71
Hydrograph No. 16, Junction, Total Post-Dev "E" 72
Hydrograph No. 17, Rational, Post-Dev Basin "F" 73

50 - Year

Hydrograph Summary **74**

Hydrograph Reports

Hydrograph No. 1, Rational, Pre-Dev Basin "A" 75
Hydrograph No. 2, Rational, Pre-Dev Basin "B" 76
Hydrograph No. 3, Rational, Pre-Dev Basin "C" 77
Hydrograph No. 4, Rational, Pre-Dev Basin "D" 78
Hydrograph No. 5, Rational, Pre-Dev Basin "E-1" 79
Hydrograph No. 6, Rational, Pre-Dev Basin "E-2" 80
Hydrograph No. 7, Junction, Total Pre Basin "E" 81
Hydrograph No. 8, Rational, Pre-Dev Basin "F" 82
Hydrograph No. 9, Rational, Post-Dev Basin A 83
Hydrograph No. 10, Rational, Post-Dev Basin B 84
Hydrograph No. 11, Rational, Post-Dev Basin "C" 85
Hydrograph No. 12, Rational, Post-Dev Basin "D" 86
Hydrograph No. 13, Mod Rational, Post-Dev Basin "E-1" 87
Hydrograph No. 14, Pond Route, Detention Basin 88
Hydrograph No. 15, Rational, Post-Dev Basin "E-2" 89
Hydrograph No. 16, Junction, Total Post-Dev "E" 90
Hydrograph No. 17, Rational, Post-Dev Basin "F" 91

100 - Year

Hydrograph Summary **92**

Hydrograph Reports

Hydrograph No. 1, Rational, Pre-Dev Basin "A" 93
Hydrograph No. 2, Rational, Pre-Dev Basin "B" 94
Hydrograph No. 3, Rational, Pre-Dev Basin "C" 95
Hydrograph No. 4, Rational, Pre-Dev Basin "D" 96
Hydrograph No. 5, Rational, Pre-Dev Basin "E-1" 97
Hydrograph No. 6, Rational, Pre-Dev Basin "E-2" 98
Hydrograph No. 7, Junction, Total Pre Basin "E" 99
Hydrograph No. 8, Rational, Pre-Dev Basin "F" 100
Hydrograph No. 9, Rational, Post-Dev Basin A 101

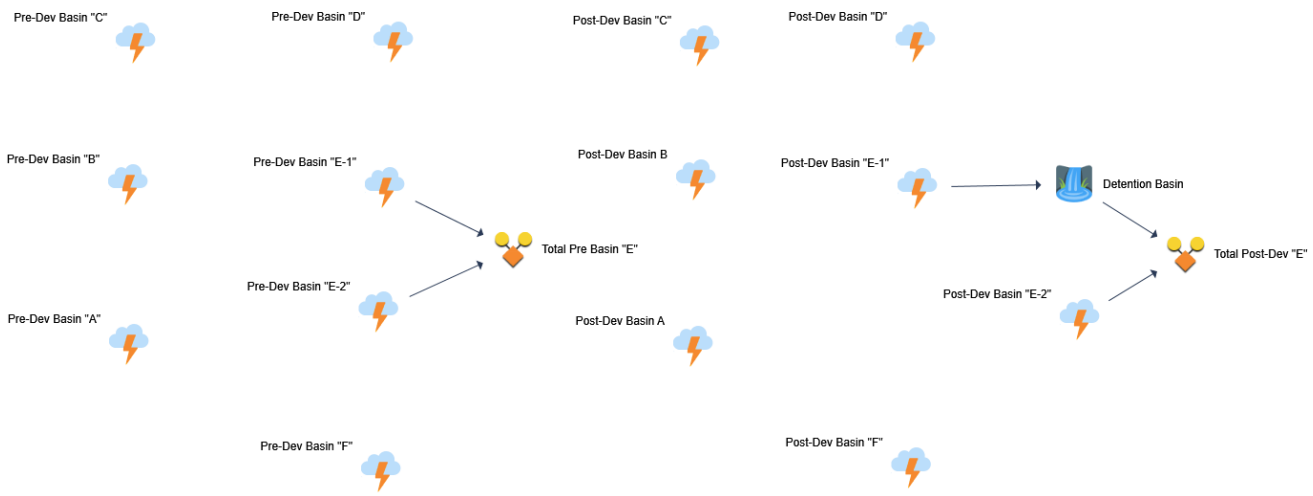
Contents continued...

Hydrograph No. 10, Rational, Post-Dev Basin B 102
Hydrograph No. 11, Rational, Post-Dev Basin "C" 103
Hydrograph No. 12, Rational, Post-Dev Basin "D" 104
Hydrograph No. 13, Mod Rational, Post-Dev Basin "E-1" 105
Hydrograph No. 14, Pond Route, Detention Basin 106
Hydrograph No. 15, Rational, Post-Dev Basin "E-2" 107
Hydrograph No. 16, Junction, Total Post-Dev "E" 108
Hydrograph No. 17, Rational, Post-Dev Basin "F" 109

Basin Model

Hydrology Studio v 3.0.0.39

Project Name: Hilltop Subdivision
File: Detention Calculation 3-4-26.hys
03-04-2026



Hydrograph by Return Period

Hydrology Studio v 3.0.0.39

Project Name: Hilltop Subdivision
File: Detention Calculation 3-4-26.hys
03-04-2026

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 "A"		8.527			11.43	13.13	14.36	15.60
2	Rational	Pre-Dev Basin "B"		28.63			38.41	44.15	48.29	52.42
3	Rational	Pre-Dev Basin "C"		16.17			21.67	24.90	27.23	29.57
4	Rational	Pre-Dev Basin "D"		7.322			9.804	11.26	12.31	13.38
5	Rational	Pre-Dev Basin "E-1"		23.14			31.02	35.65	38.98	42.33
6	Rational	Pre-Dev Basin "E-2"		39.29			52.69	60.55	66.22	71.90
7	Junction	Total Pre Basin "E"		61.27			82.16	94.42	103.3	112.1
8	Rational	Pre-Dev Basin "F"		24.68			33.12	38.07	41.64	45.20
9	Rational	Post-Dev Basin A		8.979			12.04	13.84	15.14	16.43
10	Rational	Post-Dev Basin B		23.98			32.19	37.00	40.48	43.93
11	Rational	Post-Dev Basin "C"		16.54			22.16	25.47	27.85	30.24
12	Rational	Post-Dev Basin "D"		7.200			9.641	11.08	12.11	13.15
13	Mod Rational	Post-Dev Basin "E-1"		23.64			31.83	36.61	40.10	43.46
14	Pond Route	Detention Basin		10.07			12.42	13.61	14.43	15.18
15	Rational	Post-Dev Basin "E-2"		39.12			52.46	60.29	65.94	71.59
16	Junction	Total Post-Dev "E"		39.66			53.39	61.49	67.36	73.24
17	Rational	Post-Dev Basin "F"		24.38			32.71	37.60	41.13	44.65

Hydrograph 2-yr Summary

Hydrology Studio v 3.0.0.39

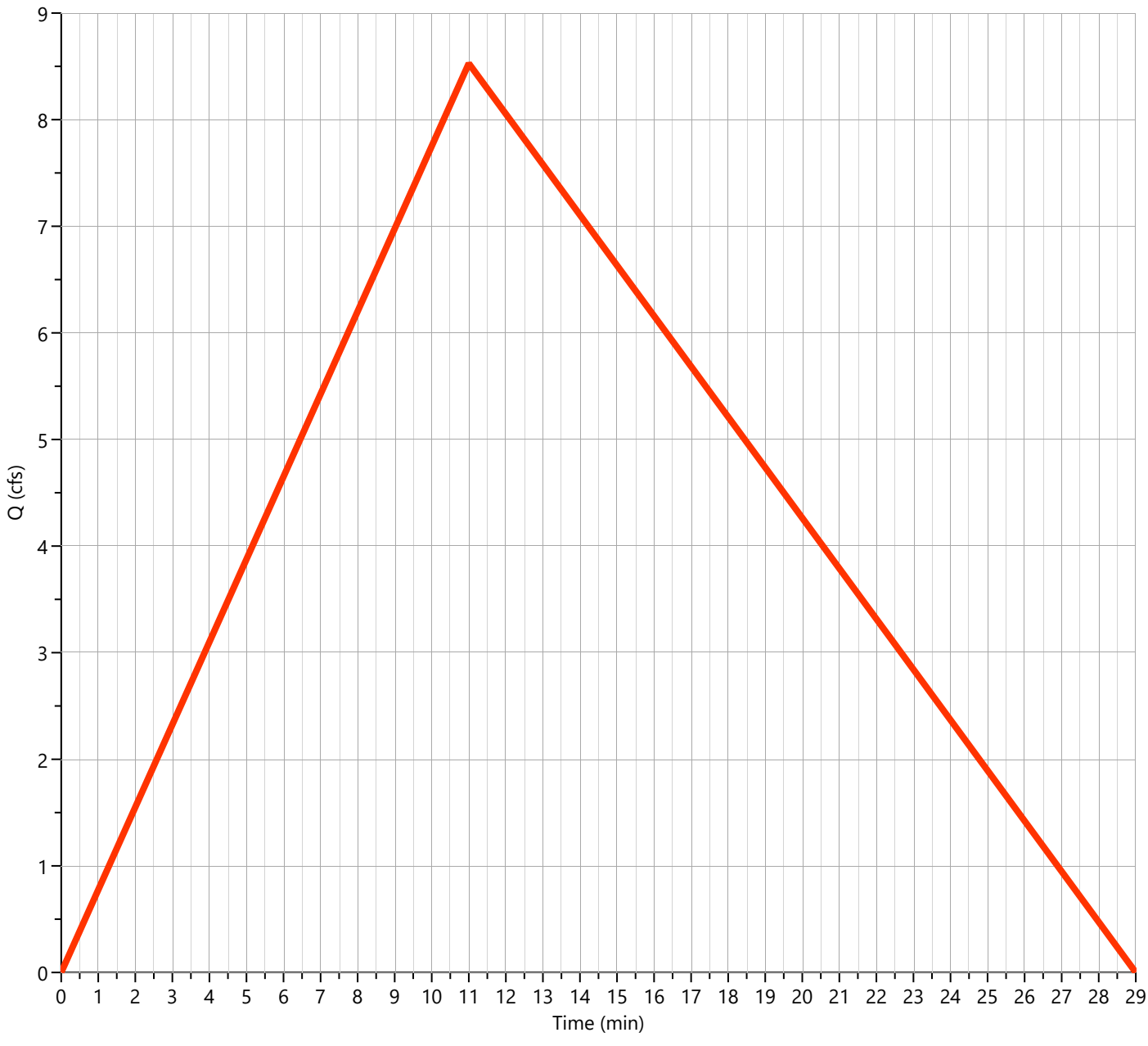
Project Name: Hilltop Subdivision
File: Detention Calculation 3-4-26.hys
03-04-2026

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 "A"	8.527	0.18	7,513	----		
2	Rational	Pre-Dev Basin "B"	28.63	0.25	34,400	----		
3	Rational	Pre-Dev Basin "C"	16.17	0.18	14,247	----		
4	Rational	Pre-Dev Basin "D"	7.322	0.13	4,692	----		
5	Rational	Pre-Dev Basin "E-1"	23.14	0.20	22,242	----		
6	Rational	Pre-Dev Basin "E-2"	39.29	0.22	40,914	----		
7	Junction	Total Pre Basin "E"	61.27	0.22	62,291	5, 6		
8	Rational	Pre-Dev Basin "F"	24.68	0.28	33,601	----		
9	Rational	Post-Dev Basin A	8.979	0.23	10,069	----		
10	Rational	Post-Dev Basin B	23.98	0.30	34,576	----		
11	Rational	Post-Dev Basin "C"	16.54	0.18	14,570	----		
12	Rational	Post-Dev Basin "D"	7.200	0.13	4,614	----		
13	Mod Rational	Post-Dev Basin "E-1"	23.64	0.28	68,090	----		
14	Pond Route	Detention Basin	10.07	0.97	68,005	13	477.15	48,434
15	Rational	Post-Dev Basin "E-2"	39.12	0.22	40,738	----		
16	Junction	Total Post-Dev "E"	39.66	0.22	107,909	14, 15		
17	Rational	Post-Dev Basin "F"	24.38	0.27	31,245	----		

Pre-Dev Basin "A"

Hyd. No. 1

Hydrograph Type	= Rational	Peak Flow	= 8.527 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.18 hrs
Time Interval	= 1 min	Runoff Volume	= 7,513 cuft
Drainage Area	= 3.2 ac	Runoff Coeff.	= 0.62
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 11.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 4.30 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "A"
Rational

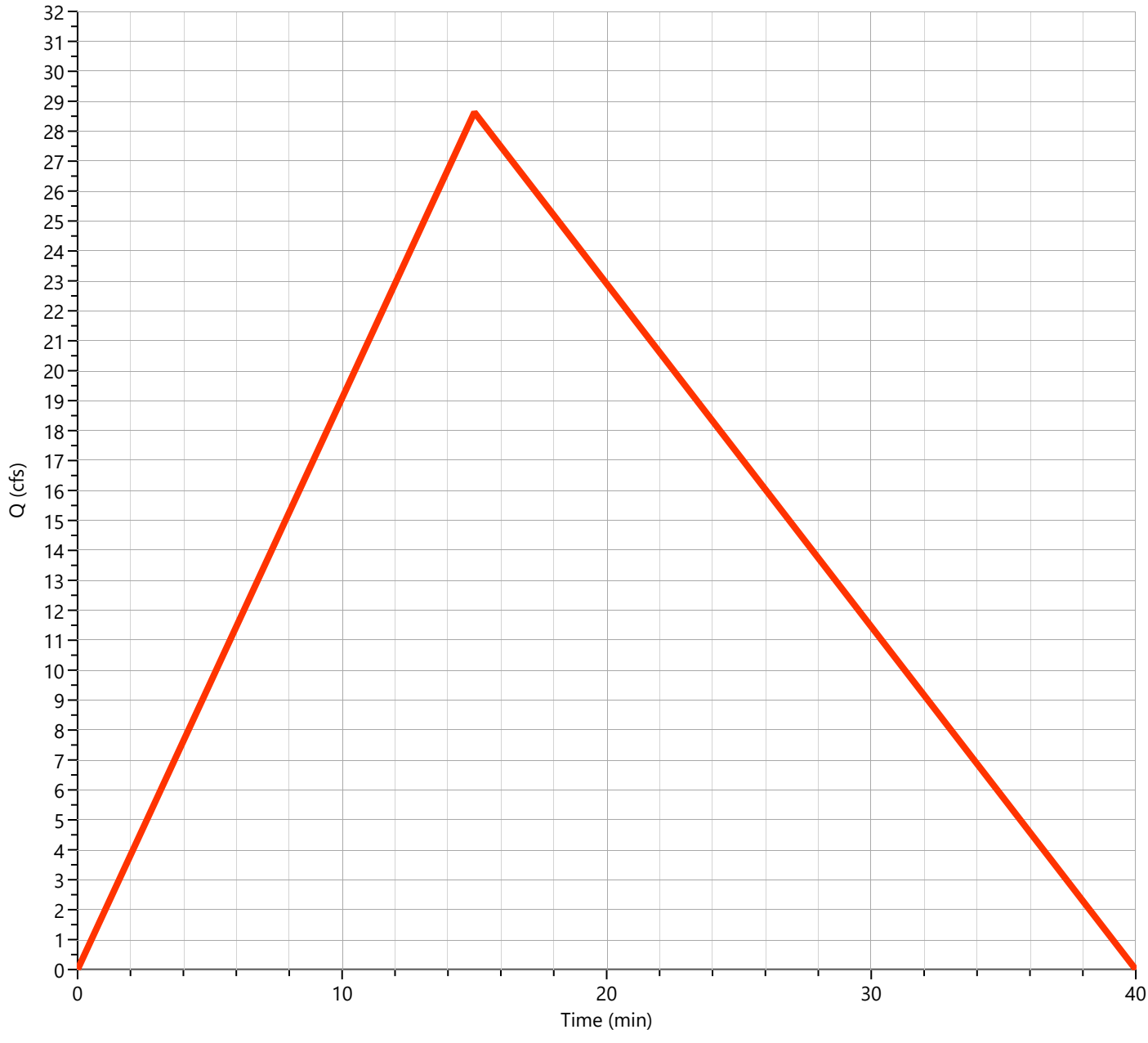
Hyd. No. 1

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)	4.35	2.28	2.28	
Land Slope (%)	6			
Travel Time (min)	**9.43**	**0.00**	**0.00**	**9.43**
Shallow Concentrated Flow				
Flow Length (ft)	509			
Watercourse Slope (%)	8.35	0.00	0.00	
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	4.66			
Travel Time (min)	**1.82**	**0.00**	**0.00**	**1.82**
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				**11 min**

Pre-Dev Basin "B"

Hyd. No. 2

Hydrograph Type	= Rational	Peak Flow	= 28.63 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.25 hrs
Time Interval	= 1 min	Runoff Volume	= 34,400 cuft
Drainage Area	= 14.74 ac	Runoff Coeff.	= 0.52
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 15.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 3.74 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "B"
Rational

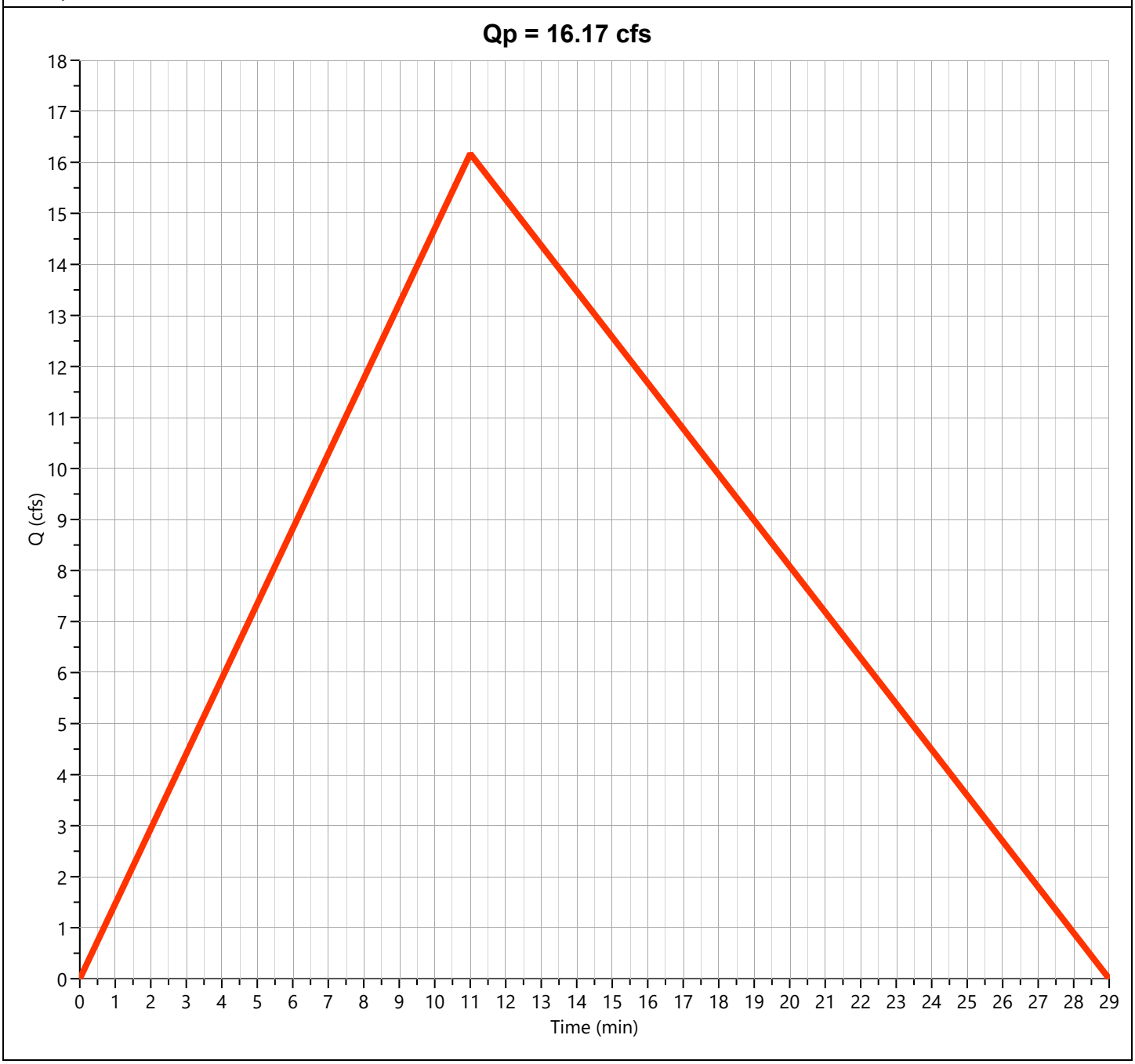
Hyd. No. 2

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)	4.35	2.28	2.28	
Land Slope (%)	4			
Travel Time (min)	**11.09**	**0.00**	**0.00**	**11.09**
Shallow Concentrated Flow				
Flow Length (ft)	926			
Watercourse Slope (%)	5.90	0.00	0.00	
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	3.92			
Travel Time (min)	**3.94**	**0.00**	**0.00**	**3.94**
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				**15 min**

Pre-Dev Basin "C"

Hyd. No. 3

Hydrograph Type	= Rational	Peak Flow	= 16.17 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.18 hrs
Time Interval	= 1 min	Runoff Volume	= 14,247 cuft
Drainage Area	= 6.84 ac	Runoff Coeff.	= 0.55
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 11.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 4.30 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "C"
Rational

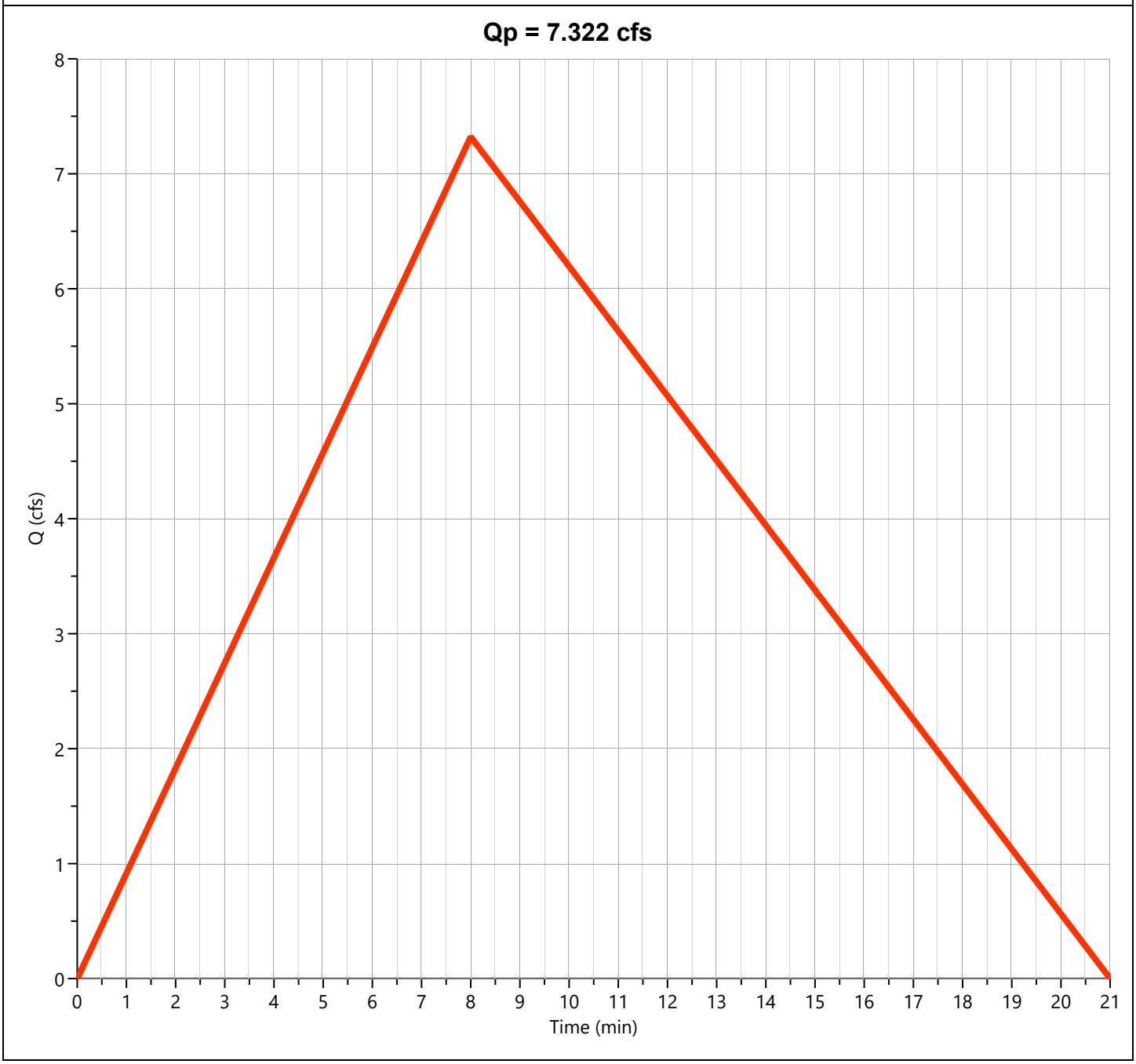
Hyd. No. 3

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)	4.35	2.28	2.28	
Land Slope (%)	8			
Travel Time (min)	**8.40**	**0.00**	**0.00**	**8.40**
Shallow Concentrated Flow				
Flow Length (ft)	654	71		
Watercourse Slope (%)	5.68	6.20	0.00	
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	3.85	5.06		
Travel Time (min)	**2.83**	**0.23**	**0.00**	**3.07**
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				**11 min**

Pre-Dev Basin "D"

Hyd. No. 4

Hydrograph Type	= Rational	Peak Flow	= 7.322 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.13 hrs
Time Interval	= 1 min	Runoff Volume	= 4,692 cuft
Drainage Area	= 2.95 ac	Runoff Coeff.	= 0.50
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

Hydrology Studio v 3.0.0.39

03-04-2026

Pre-Dev Basin "D"
Rational

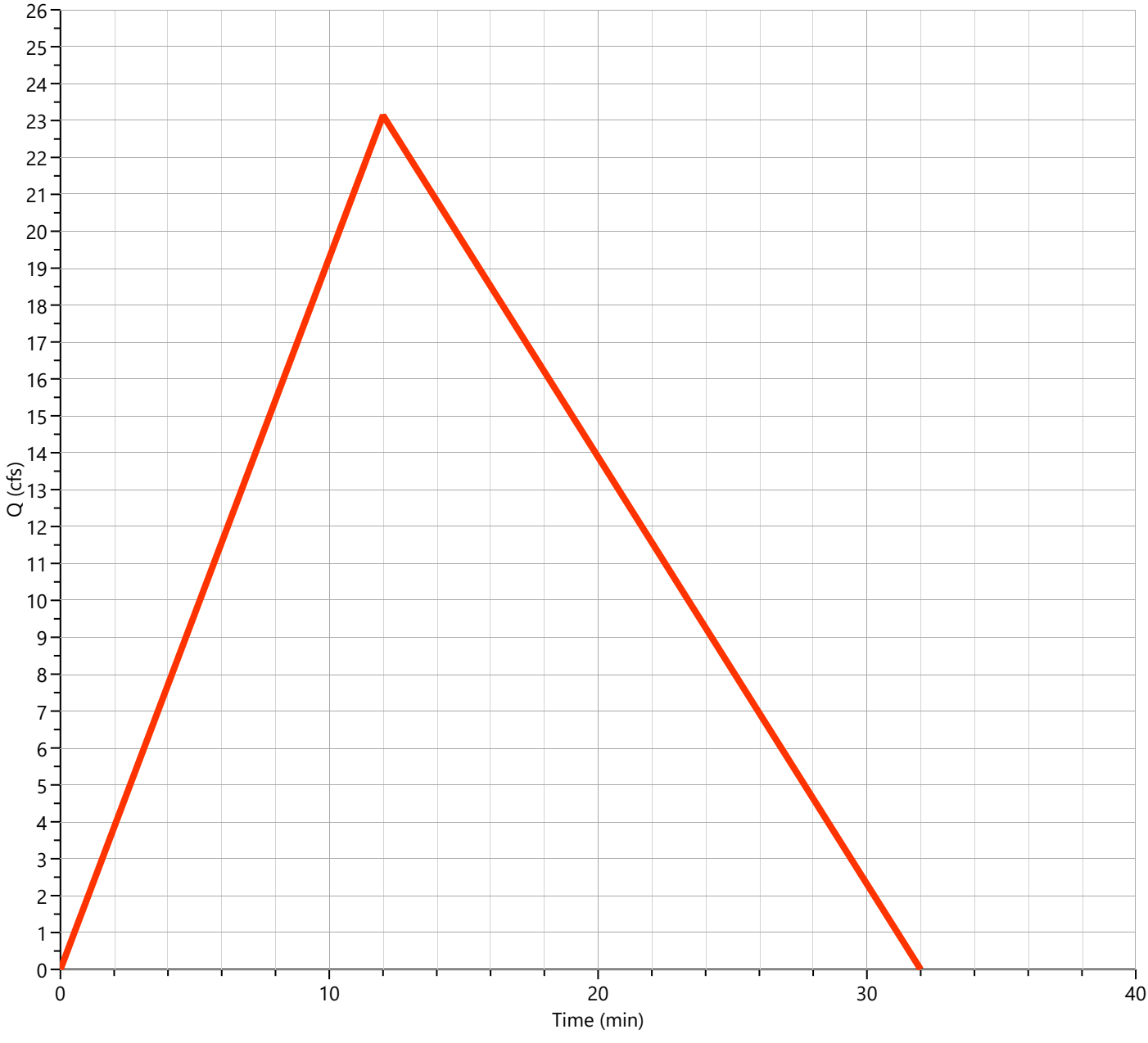
Hyd. No. 4

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)	4.35	2.28	2.28	
Land Slope (%)	14			
Travel Time (min)	**6.72**	**0.00**	**0.00**	**6.72**
Shallow Concentrated Flow				
Flow Length (ft)	554			
Watercourse Slope (%)	11.00	0.00	0.00	
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	5.35			
Travel Time (min)	**1.73**	**0.00**	**0.00**	**1.73**
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**

Pre-Dev Basin "E-1"

Hyd. No. 5

Hydrograph Type	= Rational	Peak Flow	= 23.14 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.20 hrs
Time Interval	= 1 min	Runoff Volume	= 22,242 cuft
Drainage Area	= 11.2 ac	Runoff Coeff.	= 0.50
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 12.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 4.13 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "E-1"
Rational

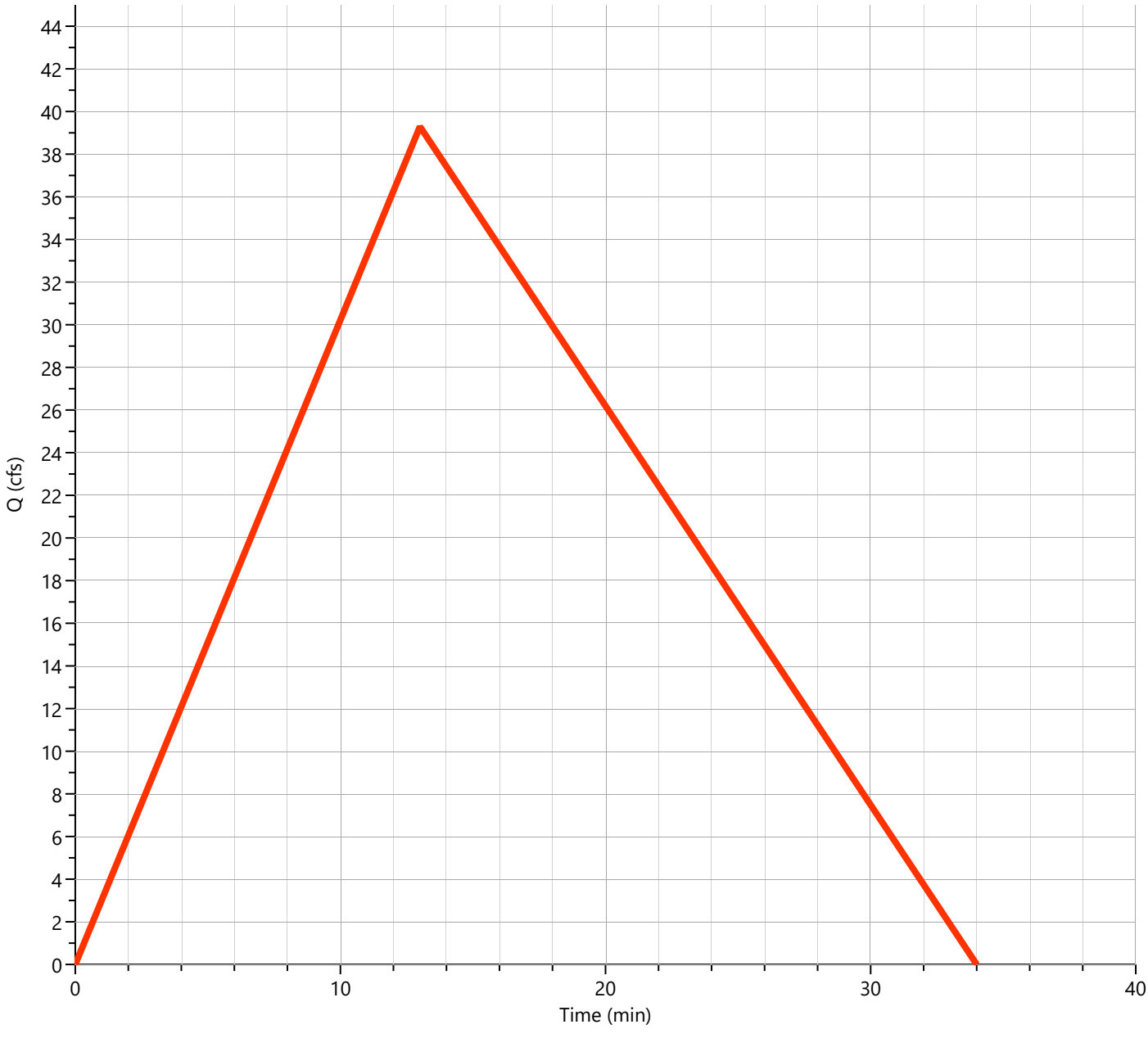
Hyd. No. 5

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)	4.35	2.28	2.28	
Land Slope (%)	5			
Travel Time (min)	**10.14**	**0.00**	**0.00**	**10.14**
Shallow Concentrated Flow				
Flow Length (ft)	565			
Watercourse Slope (%)	13.00	0.00	0.00	
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	5.82			
Travel Time (min)	**1.62**	**0.00**	**0.00**	**1.62**
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				**12 min**

Pre-Dev Basin "E-2"

Hyd. No. 6

Hydrograph Type	= Rational	Peak Flow	= 39.29 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Runoff Volume	= 40,914 cuft
Drainage Area	= 18.96 ac	Runoff Coeff.	= 0.52
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 3.99 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "E-2"
Rational

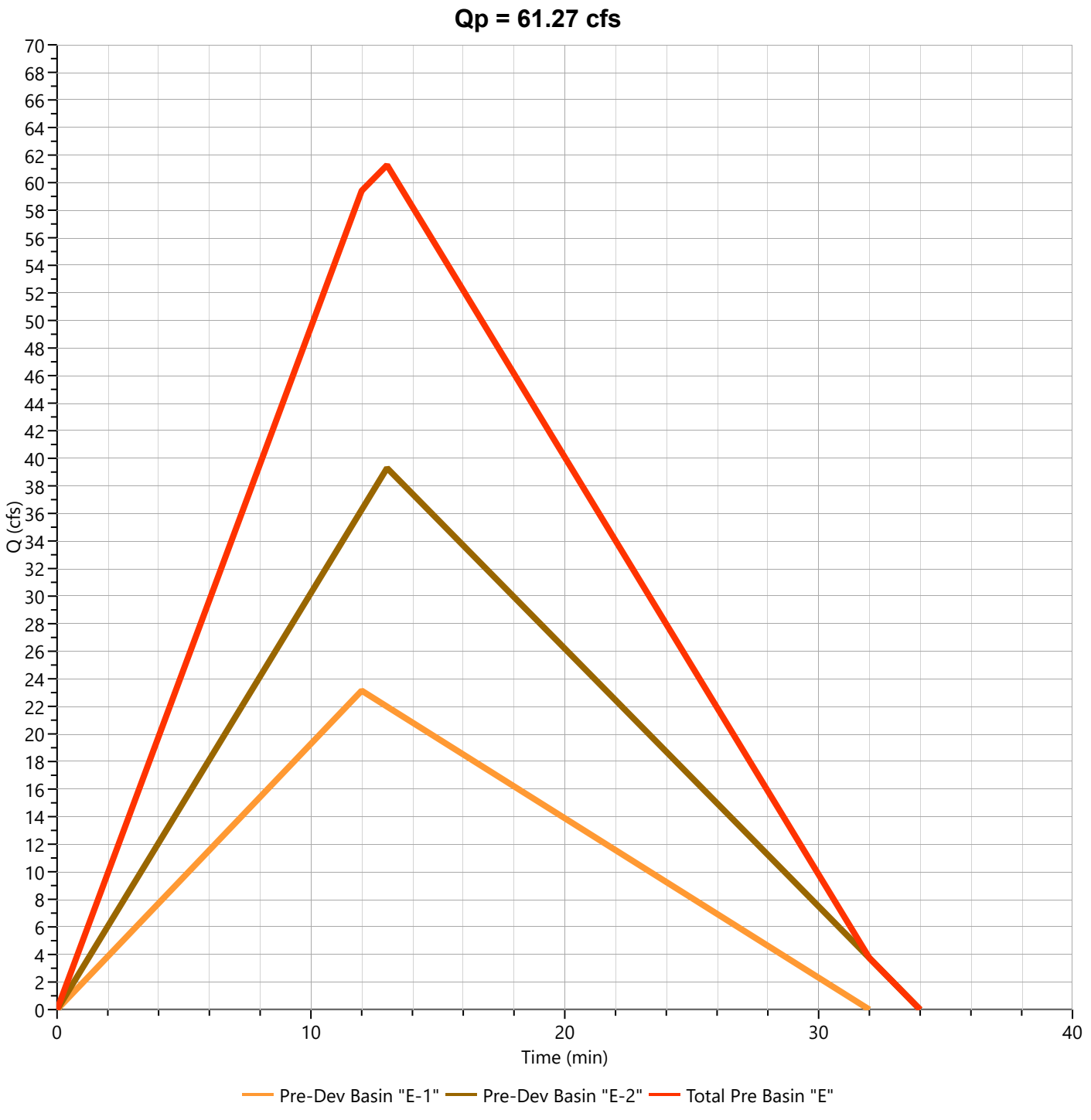
Hyd. No. 6

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)	4.35	2.28	2.28	
Land Slope (%)	7.25			
Travel Time (min)	**8.74**	**0.00**	**0.00**	**8.74**
Shallow Concentrated Flow				
Flow Length (ft)	1070			
Watercourse Slope (%)	6.23	0.00	0.00	
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	4.03			
Travel Time (min)	**4.43**	**0.00**	**0.00**	**4.43**
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				**13 min**

Total Pre Basin "E"

Hyd. No. 7

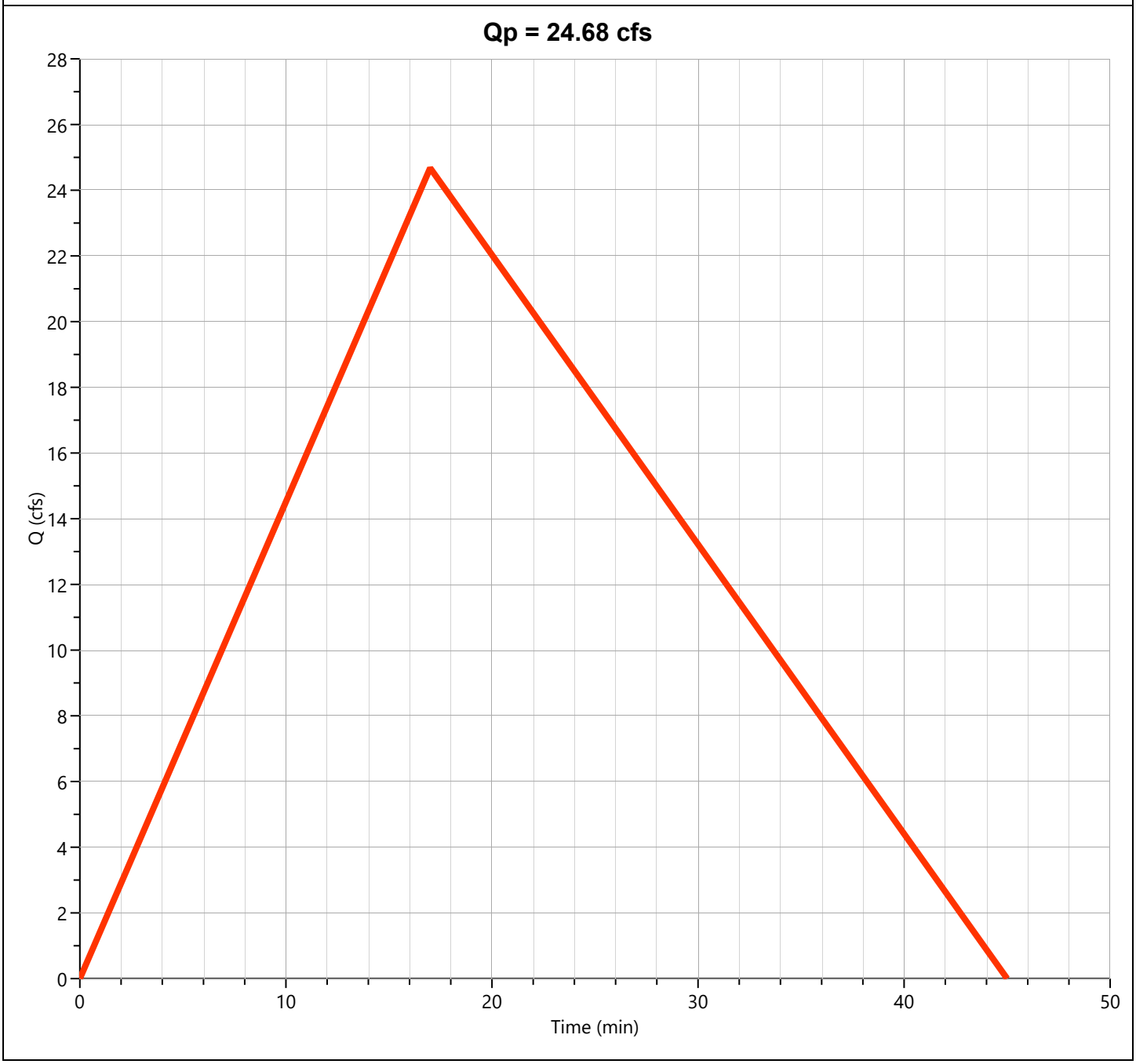
Hydrograph Type	= Junction	Peak Flow	= 61.27 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Hydrograph Volume	= 62,291 cuft
Inflow Hydrographs	= 5, 6	Total Contrib. Area	= 30.16 ac



Pre-Dev Basin "F"

Hyd. No. 8

Hydrograph Type	= Rational	Peak Flow	= 24.68 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.28 hrs
Time Interval	= 1 min	Runoff Volume	= 33,601 cuft
Drainage Area	= 13.19 ac	Runoff Coeff.	= 0.53
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 17.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 3.53 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "F"
Rational

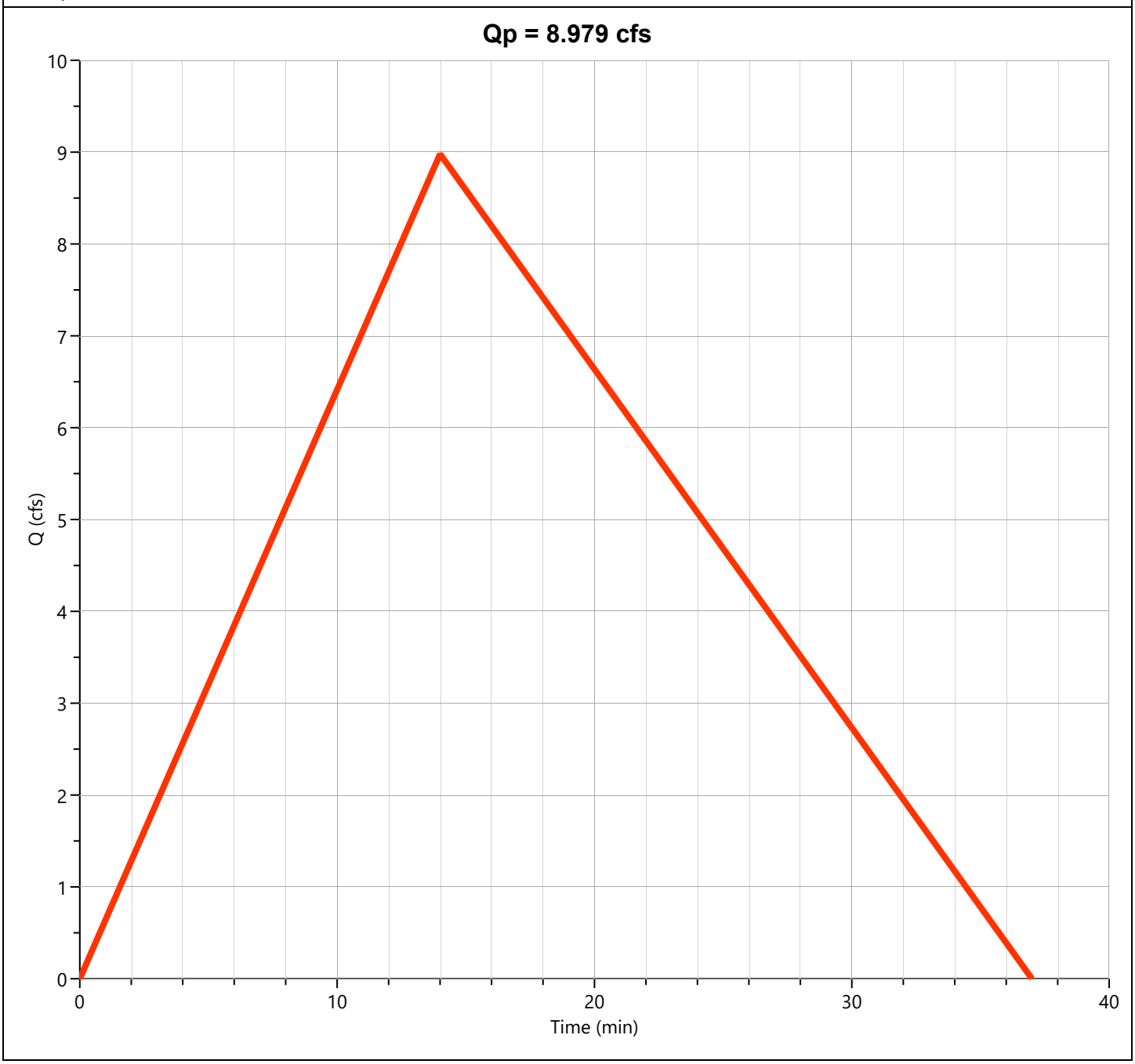
Hyd. No. 8

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)	4.35	2.28	2.28	
Land Slope (%)	5			
Travel Time (min)	**10.14**	**0.00**	**0.00**	**10.14**
Shallow Concentrated Flow				
Flow Length (ft)	1477			
Watercourse Slope (%)	4.90	0.00	0.00	
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	3.57			
Travel Time (min)	**6.89**	**0.00**	**0.00**	**6.89**
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				**17 min**

Post-Dev Basin A

Hyd. No. 9

Hydrograph Type	= Rational	Peak Flow	= 8.979 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.23 hrs
Time Interval	= 1 min	Runoff Volume	= 10,069 cuft
Drainage Area	= 3.53 ac	Runoff Coeff.	= 0.66
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 14.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 3.85 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin A
Rational

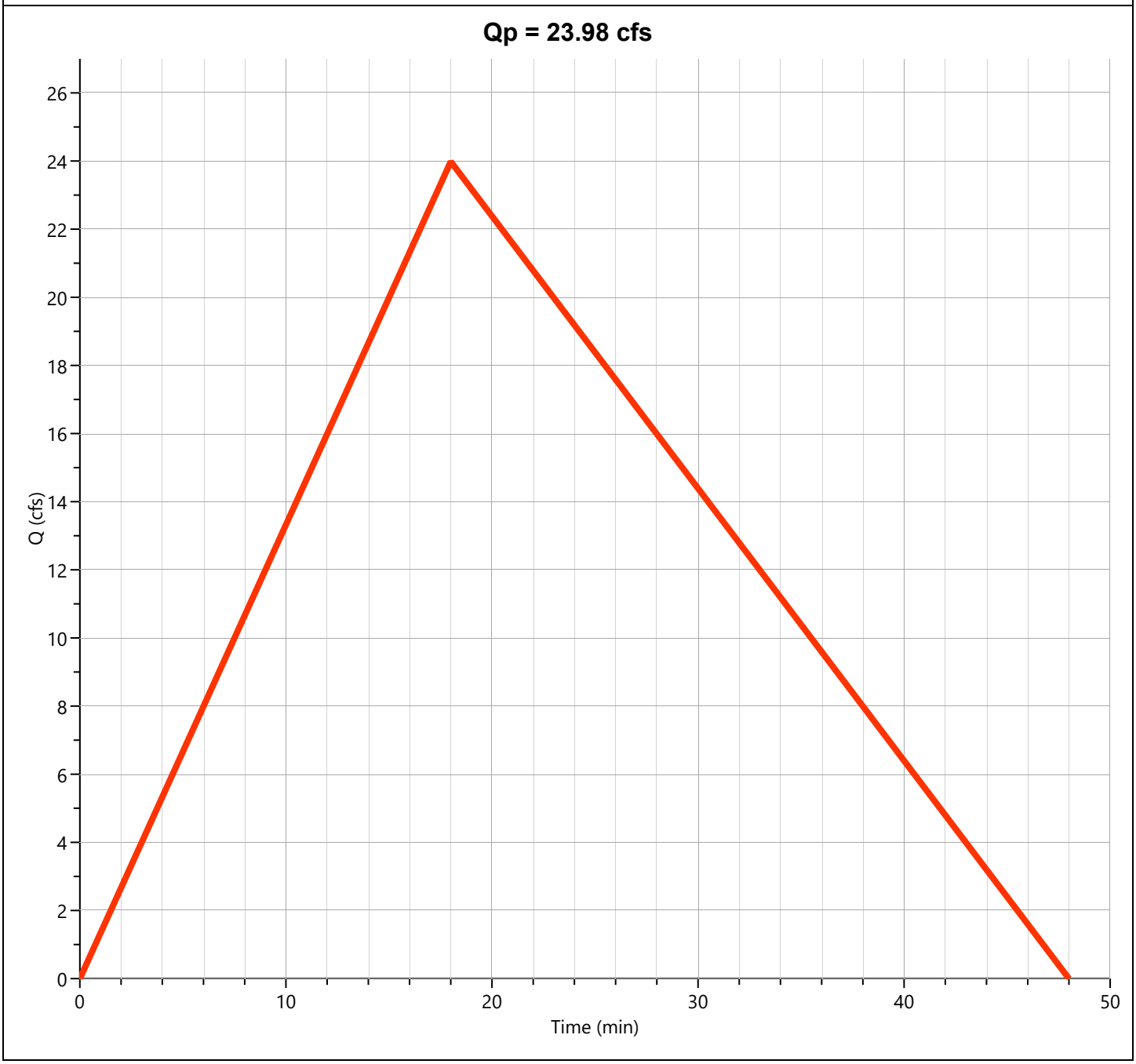
Hyd. No. 9

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)	4.35	2.28	2.28	
Land Slope (%)	3			
Travel Time (min)	**12.44**	**0.00**	**0.00**	**12.44**
Shallow Concentrated Flow				
Flow Length (ft)	519			
Watercourse Slope (%)	8.38	0.00	0.00	
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	4.67			
Travel Time (min)	**1.85**	**0.00**	**0.00**	**1.85**
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				**14 min**

Post-Dev Basin B

Hyd. No. 10

Hydrograph Type	= Rational	Peak Flow	= 23.98 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.30 hrs
Time Interval	= 1 min	Runoff Volume	= 34,576 cuft
Drainage Area	= 12.45 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 18.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 3.44 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin B
Rational

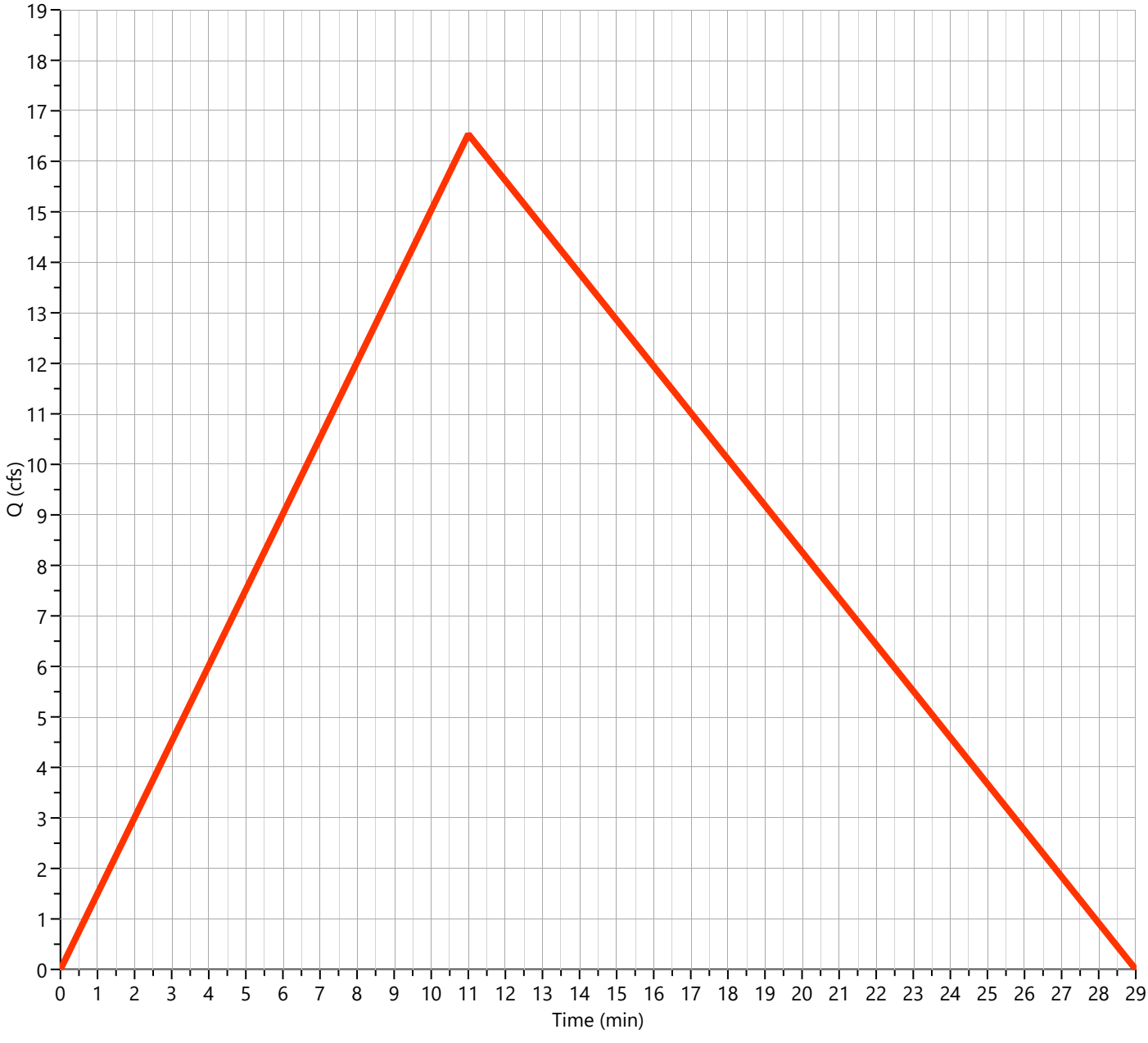
Hyd. No. 10

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)	4.35	2.28	2.28	
Land Slope (%)	2.5			
Travel Time (min)	**13.38**	**0.00**	**0.00**	**13.38**
Shallow Concentrated Flow				
Flow Length (ft)	1025			
Watercourse Slope (%)	5.49	0.00	0.00	
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	3.78			
Travel Time (min)	**4.52**	**0.00**	**0.00**	**4.52**
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				**18 min**

Post-Dev Basin "C"

Hyd. No. 11

Hydrograph Type	= Rational	Peak Flow	= 16.54 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.18 hrs
Time Interval	= 1 min	Runoff Volume	= 14,570 cuft
Drainage Area	= 6.75 ac	Runoff Coeff.	= 0.57
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 11.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 4.30 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin "C"
Rational

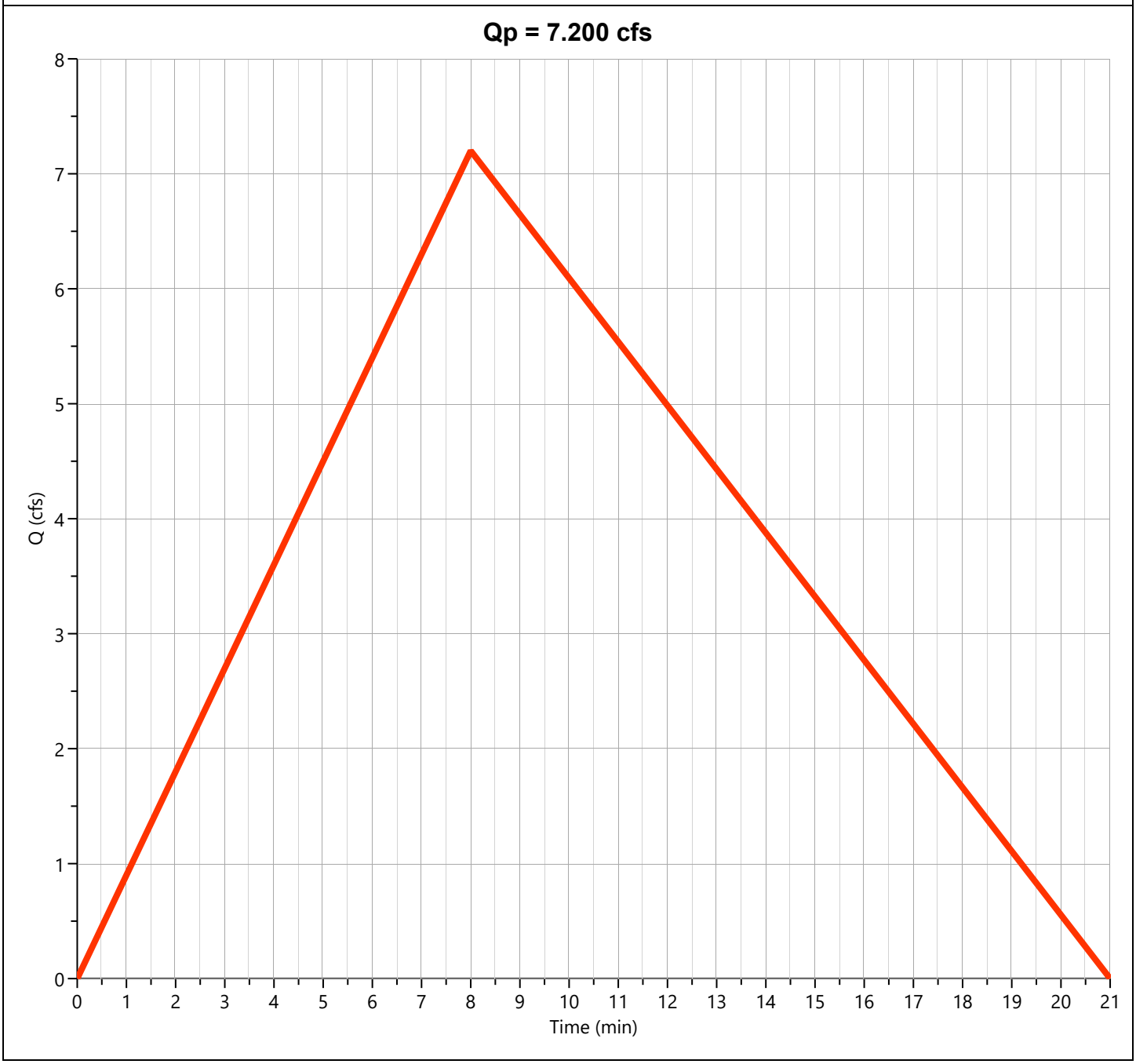
Hyd. No. 11

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)	4.35	2.28	2.28	
Land Slope (%)	8			
Travel Time (min)	**8.40**	**0.00**	**0.00**	**8.40**
Shallow Concentrated Flow				
Flow Length (ft)	654			
Watercourse Slope (%)	5.68	0.00	0.00	
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	3.85			
Travel Time (min)	**2.83**	**0.00**	**0.00**	**2.83**
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				**11 min**

Post-Dev Basin "D"

Hyd. No. 12

Hydrograph Type	= Rational	Peak Flow	= 7.200 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.13 hrs
Time Interval	= 1 min	Runoff Volume	= 4,614 cuft
Drainage Area	= 2.59 ac	Runoff Coeff.	= 0.56
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



Post-Dev Basin "D"
Rational

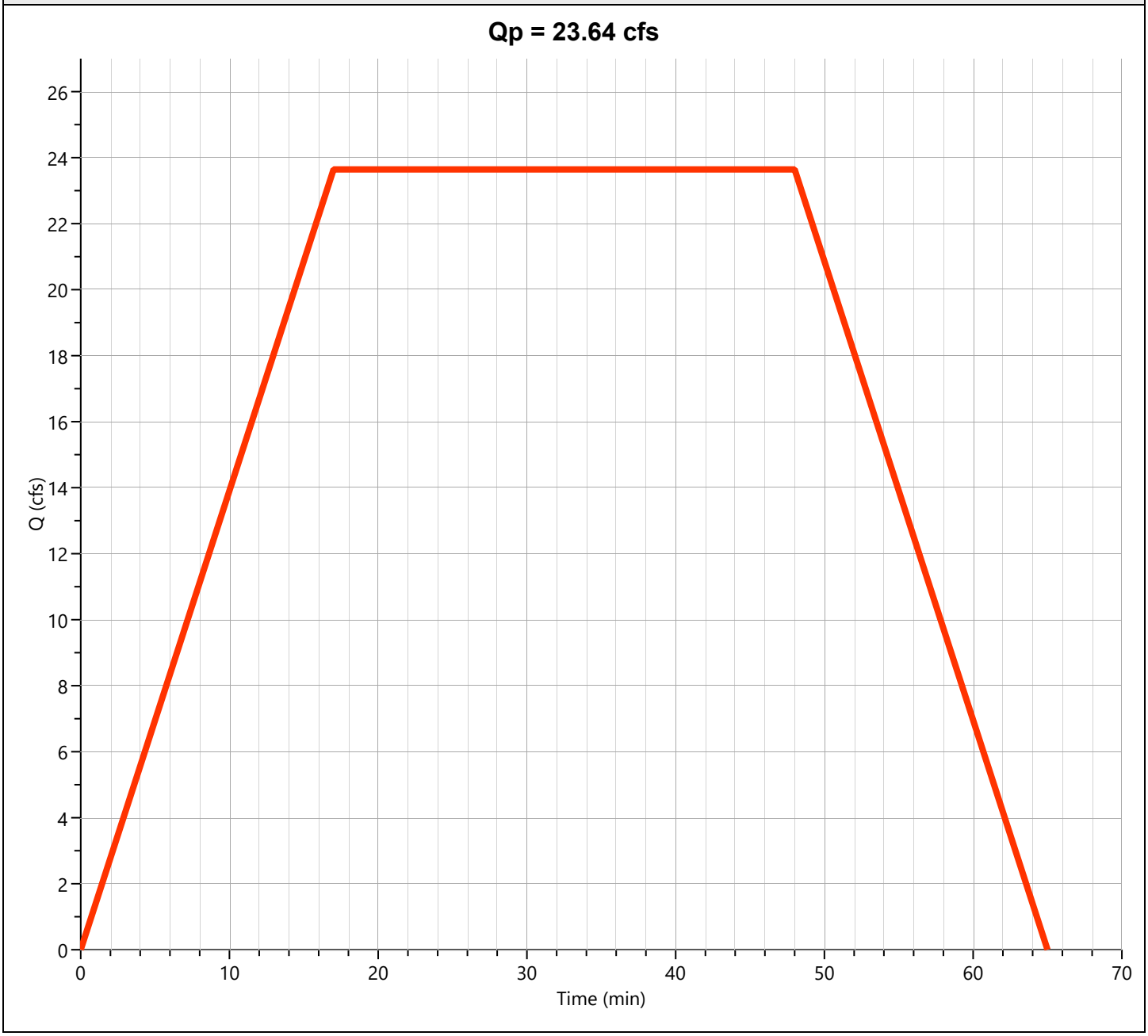
Hyd. No. 12

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)	4.35	2.28	2.28	
Land Slope (%)	14			
Travel Time (min)	**6.72**	**0.00**	**0.00**	**6.72**
Shallow Concentrated Flow				
Flow Length (ft)	554			
Watercourse Slope (%)	11.00	0.00	0.00	
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	5.35			
Travel Time (min)	**1.73**	**0.00**	**0.00**	**1.73**
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**

Post-Dev Basin "E-1"

Hyd. No. 13

Hydrograph Type	= Mod Rational	Peak Flow	= 23.64 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.28 hrs
Time Interval	= 1 min	Runoff Volume	= 68,090 cuft
Drainage Area	= 16.23 ac	Runoff Coeff.	= 0.66
Tc Method	= User	Time of Conc. (Tc)	= 17.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 2.21 in/hr
Freq. Corr. Factor	= 1.00	Storm Duration	= 2.82 x Tc
Target Q	= 0.000 cfs	Required Storage	= 0.000 cuft



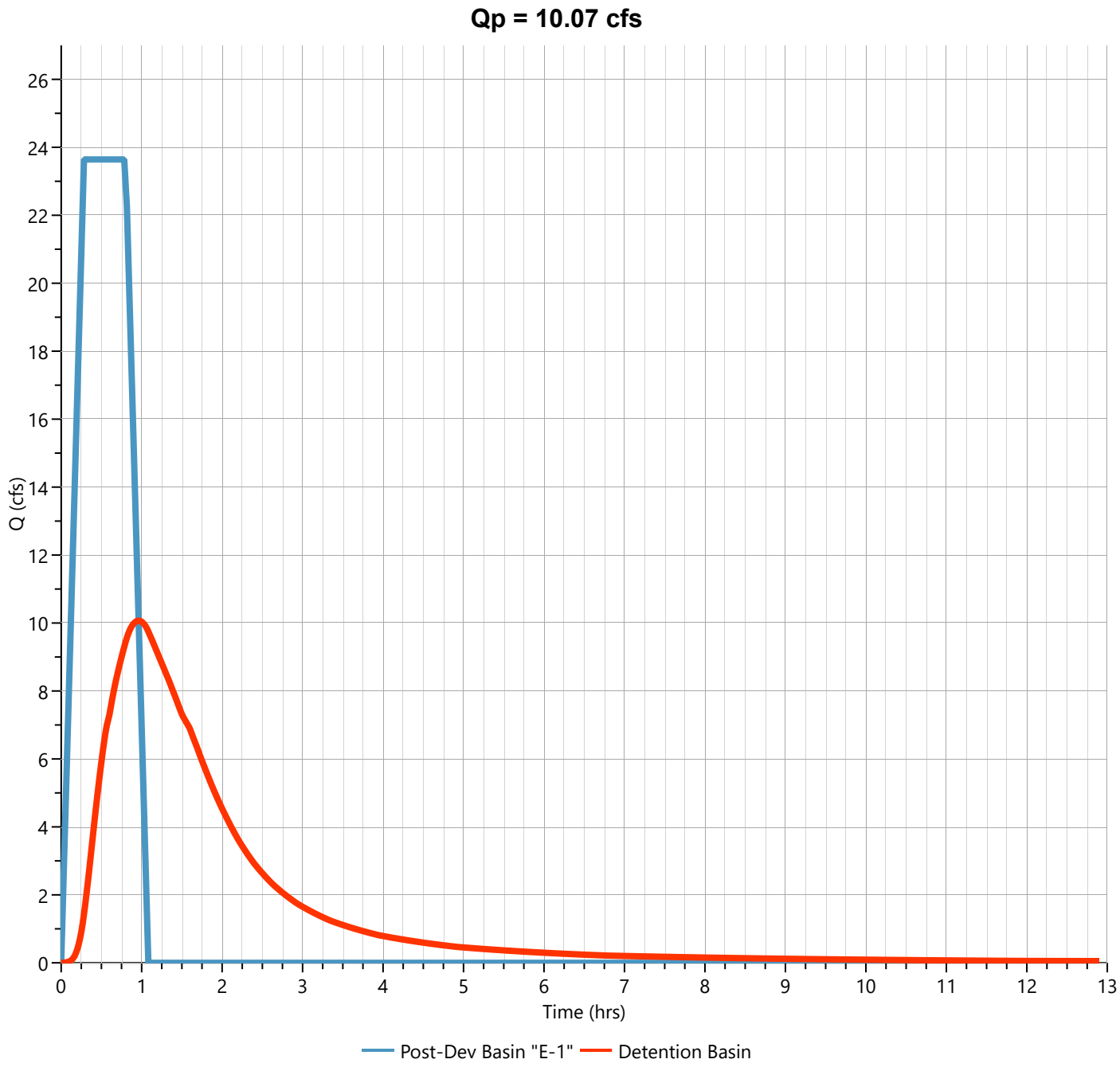
Detention Basin

Hyd. No. 14

Hydrograph Type	= Pond Route	Peak Flow	= 10.07 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.97 hrs
Time Interval	= 1 min	Hydrograph Volume	= 68,005 cuft
Inflow Hydrograph	= 13 - Post-Dev Basin "E-1"	Max. Elevation	= 477.15 ft
Pond Name	= Hilltop Detention Pond	Max. Storage	= 48,434 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 1.35 hrs



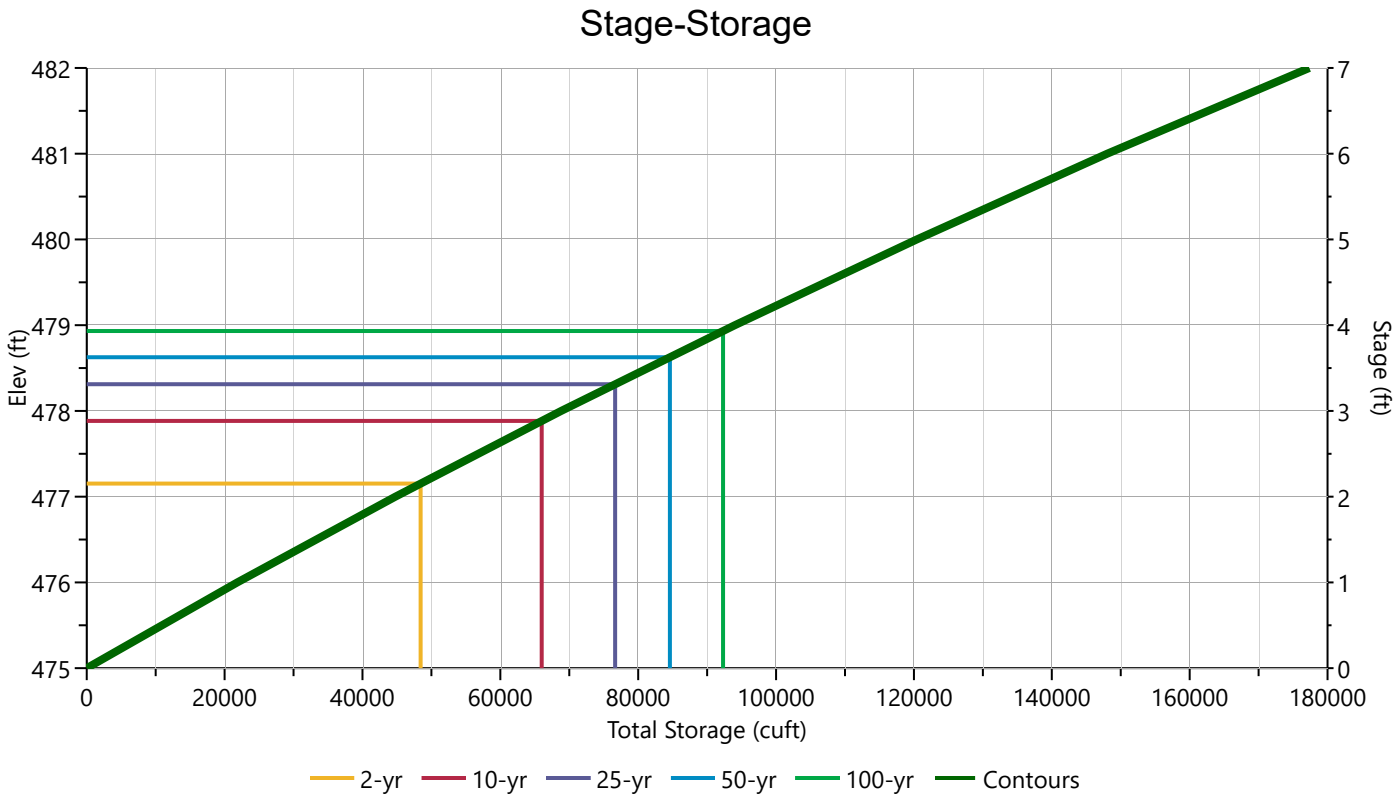
Hilltop Detention Pond

Stage-Storage

User Defined Contours	
Description	**Input**
Bottom Elevation, ft	475.00
Voids (%)	100.00
Volume Calc	Ave End Area

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour Area (sqft)	Incr. Storage (cuft)	Total Storage (cuft)
0.00	475.00	21,307	0.000	0.000
1.00	476.00	22,378	21,843	21,843
2.00	477.00	23,482	22,930	44,773
3.00	478.00	24,620	24,051	68,824
4.00	479.00	25,790	25,205	94,029
5.00	480.00	26,995	26,393	120,421
6.00	481.00	28,232	27,614	148,035
7.00	482.00	30,413	29,323	177,357



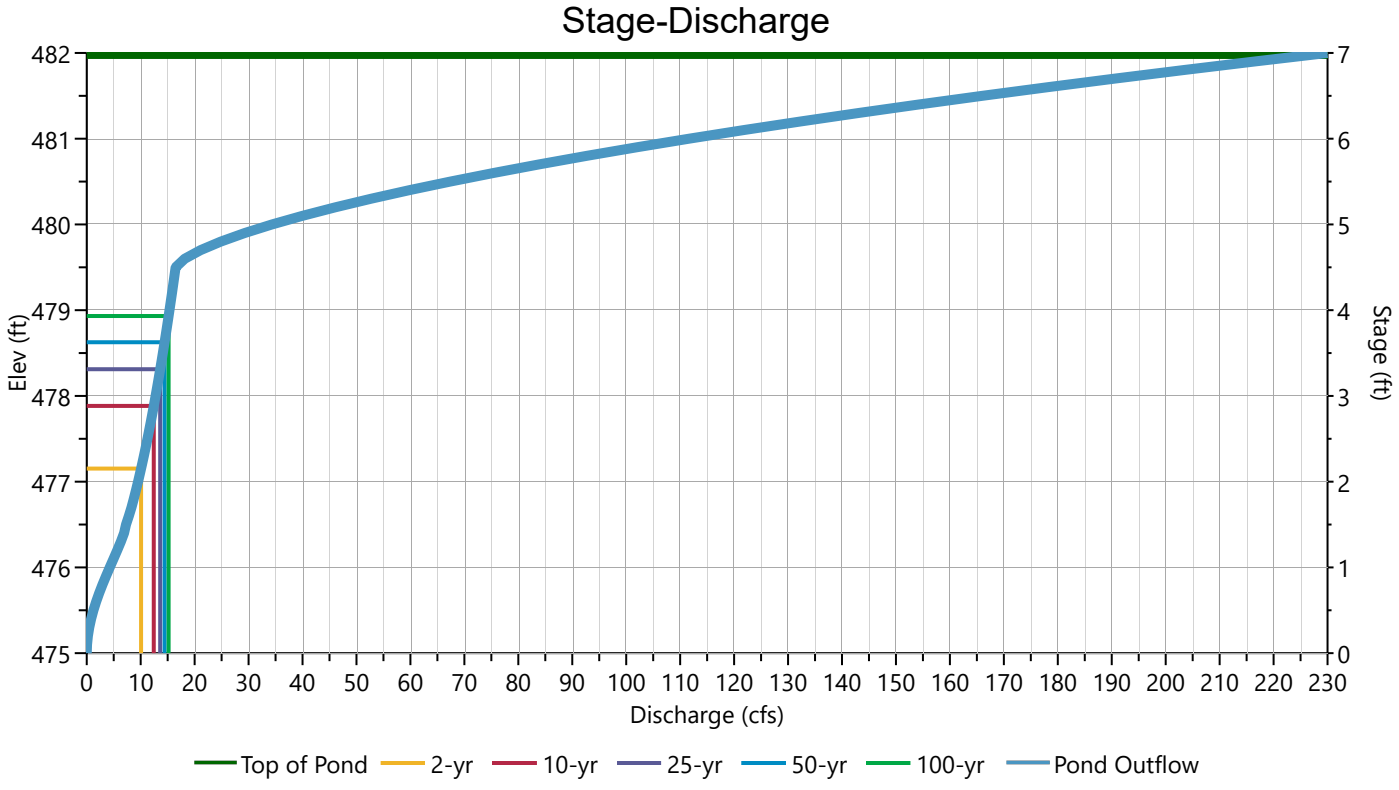
Hilltop Detention Pond

Stage-Discharge

Culvert / Orifices	Cir Culvert	Orifice			Perforated Riser	
		1	2	3		
Rise, in	18				Hole Diameter, in	
Span, in	18				No. holes	
No. Barrels	1				Invert Elevation, ft	
Invert Elevation, ft	475.00				Height, ft	
Orifice Coefficient, Co	0.60				Orifice Coefficient, Co	
Length, ft	57					
Barrel Slope, %	1.17					
N-Value, n	0.013					

Weirs	Riser	Weir			Ancillary	
		1 (i)	2	3		
Shape / Type		Broad Crested			Exfiltration, in/hr	
Crest Elevation, ft		479.5				
Crest Length, ft		14				
Angle, deg		45 (1:1)				
Weir Coefficient, Cw		3.3				

m = Flows through Culvert, i = Independent



Hilltop Detention Pond

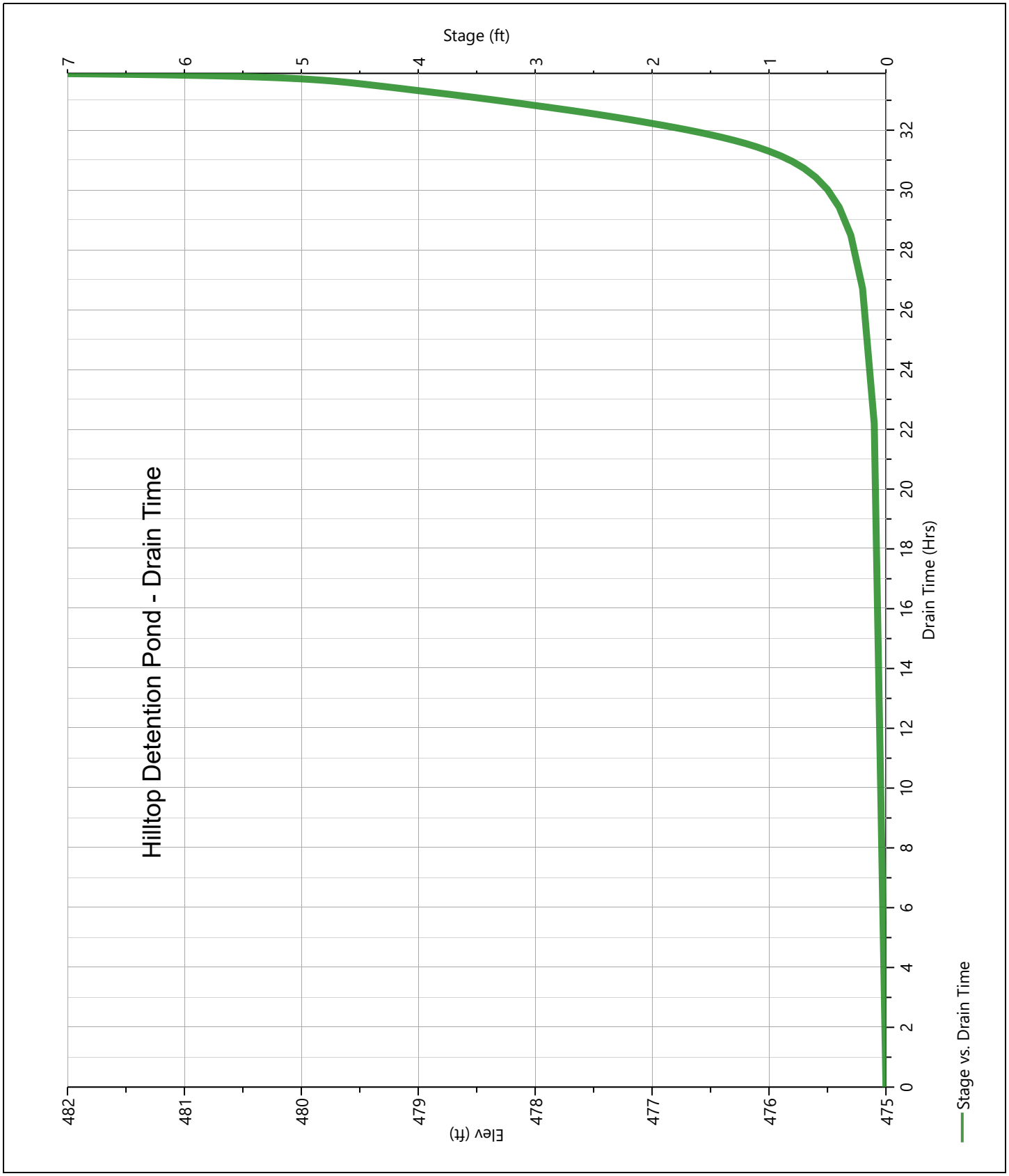
Stage-Storage-Discharge Summary

Stage (ft)	Elev. (ft)	Storage (cuft)	Culvert (cfs)	Orifices, cfs			Riser (cfs)	Weirs, cfs			Pf Riser (cfs)	Exfil (cfs)	User (cfs)	Total (cfs)
				1	2	3		1	2	3				
0.00	475.00	0.000	0.000					0.000						0.000
1.00	476.00	21,843	4.265 ic					0.000						4.265
2.00	477.00	44,773	9.512 ic					0.000						9.512
3.00	478.00	68,824	12.76 ic					0.000						12.76
4.00	479.00	94,029	15.34 ic					0.000						15.34
5.00	480.00	120,421	17.54 ic					16.80						34.34
6.00	481.00	148,035	19.49 ic					92.15						111.6
7.00	482.00	177,357	21.27 ic					208.7						230.0

Suffix key: ic = inlet control, oc = outlet control, s = submerged weir

Hilltop Detention Pond

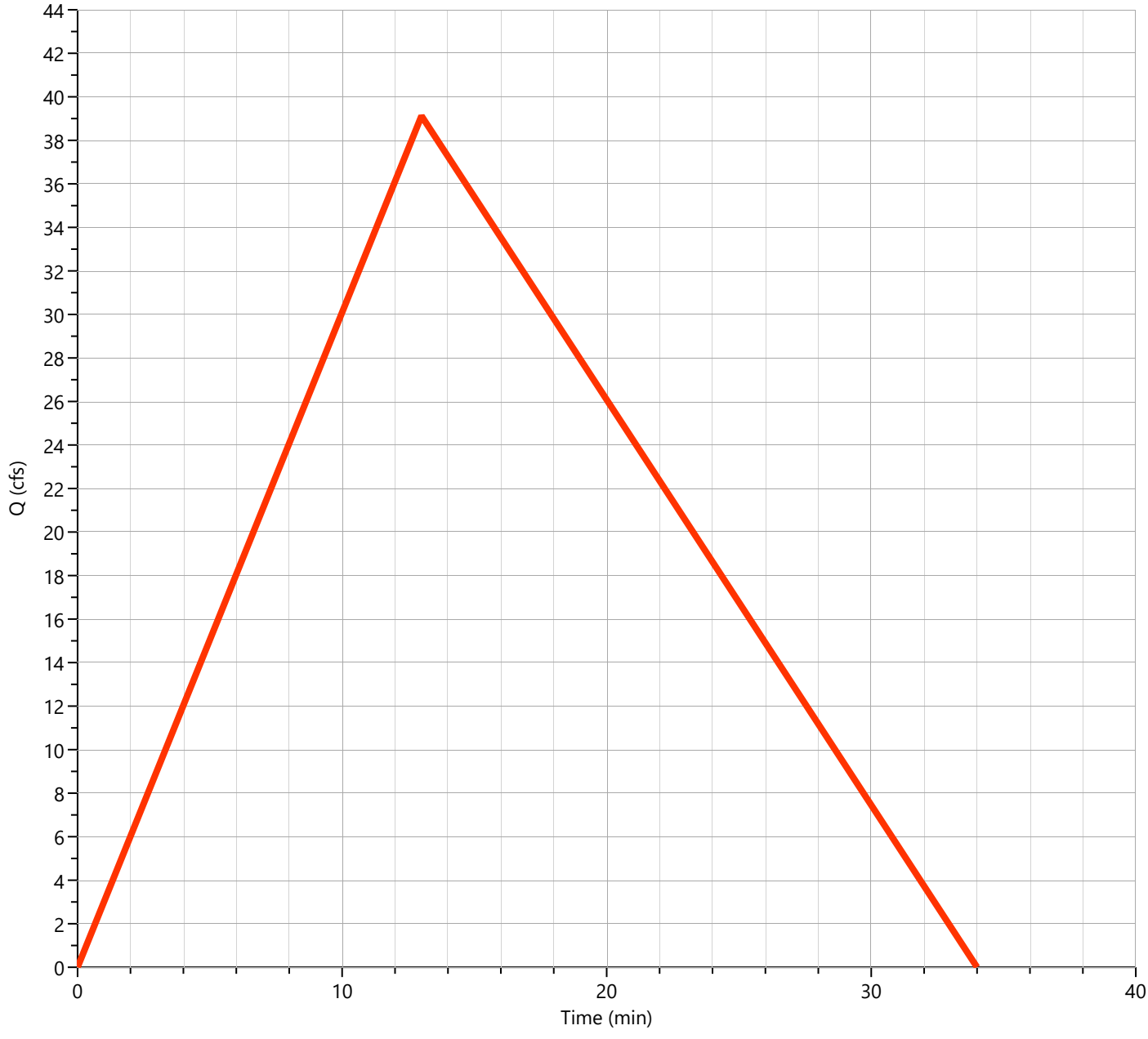
Pond Drawdown



Post-Dev Basin "E-2"

Hyd. No. 15

Hydrograph Type	= Rational	Peak Flow	= 39.12 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Runoff Volume	= 40,738 cuft
Drainage Area	= 17.53 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 3.99 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin "E-2"
Rational

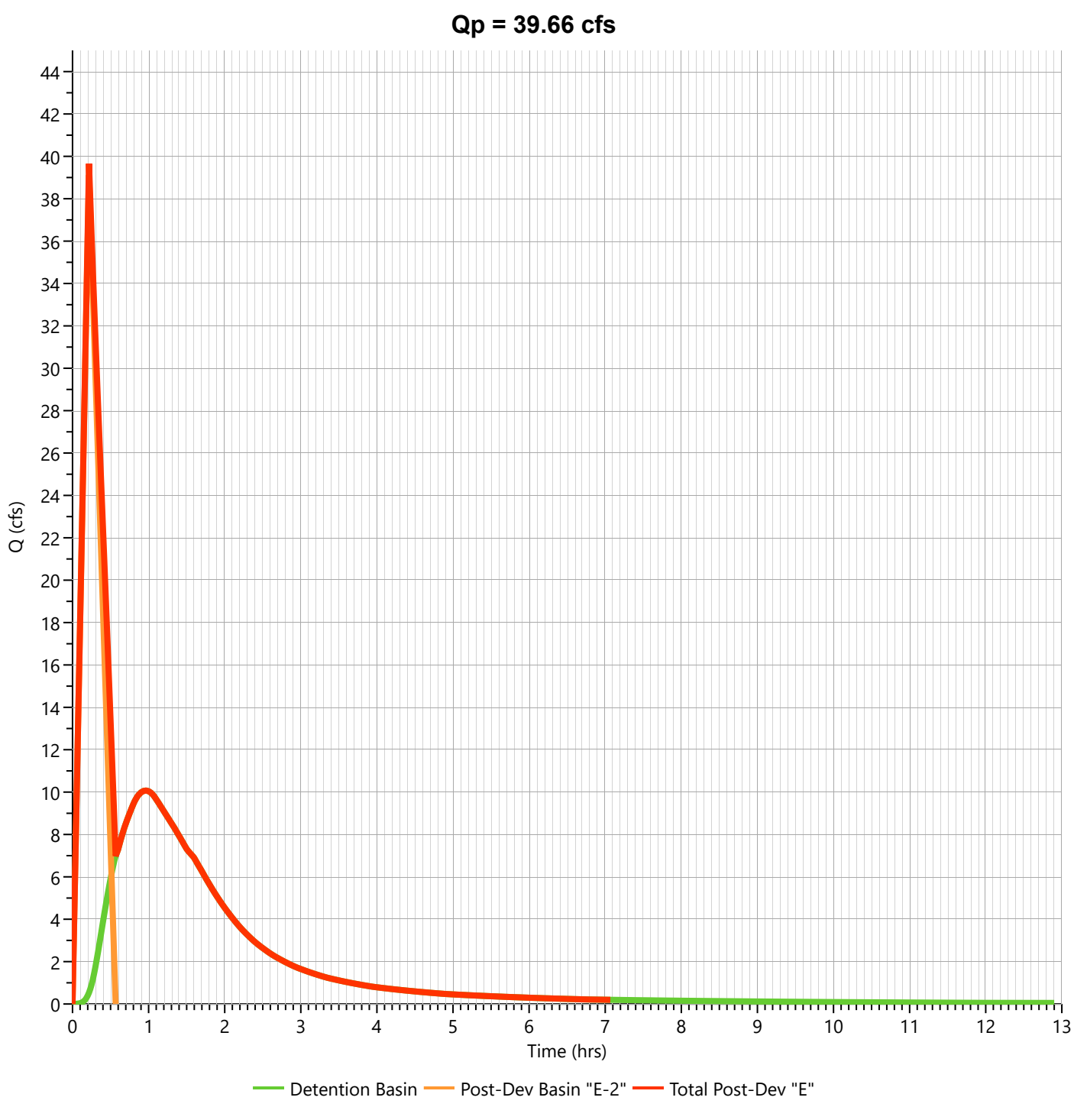
Hyd. No. 15

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)	4.35	2.28	2.28	
Land Slope (%)	7.25			
Travel Time (min)	**8.74**	**0.00**	**0.00**	**8.74**
Shallow Concentrated Flow				
Flow Length (ft)	1070			
Watercourse Slope (%)	6.23	0.00	0.00	
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	4.03			
Travel Time (min)	**4.43**	**0.00**	**0.00**	**4.43**
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				**13 min**

Total Post-Dev "E"

Hyd. No. 16

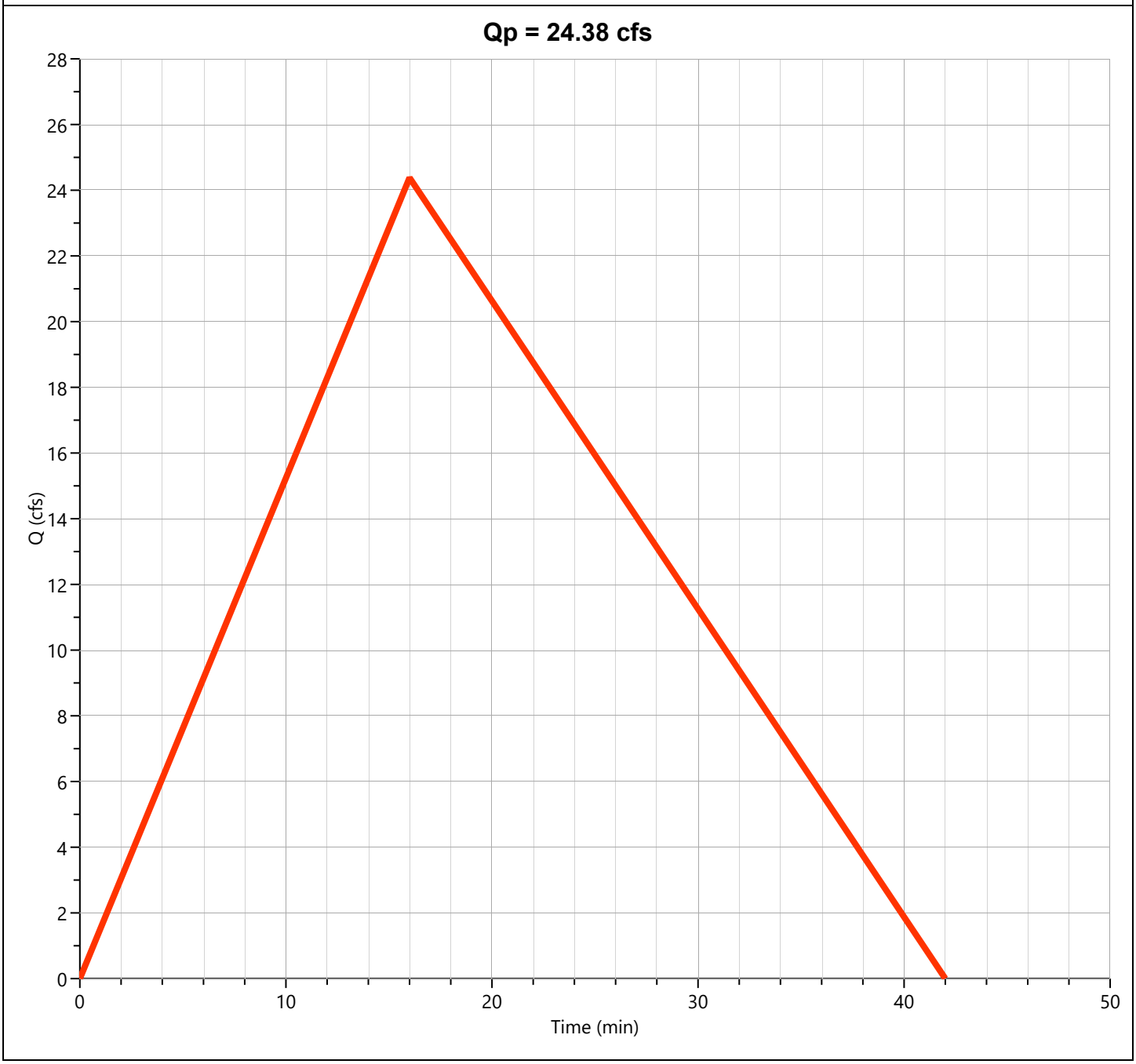
Hydrograph Type	= Junction	Peak Flow	= 39.66 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Hydrograph Volume	= 107,909 cuft
Inflow Hydrographs	= 15	Total Contrib. Area	= 17.53 ac



Post-Dev Basin "F"

Hyd. No. 17

Hydrograph Type	= Rational	Peak Flow	= 24.38 cfs
Storm Frequency	= 2-yr	Time to Peak	= 0.27 hrs
Time Interval	= 1 min	Runoff Volume	= 31,245 cuft
Drainage Area	= 12.0 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 16.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 3.63 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin "F"
Rational

Hyd. No. 17

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)	4.35	2.28	2.28	
Land Slope (%)	6			
Travel Time (min)	**9.43**	**0.00**	**0.00**	**9.43**
Shallow Concentrated Flow				
Flow Length (ft)	1449			
Watercourse Slope (%)	4.90	0.00	0.00	
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	3.57			
Travel Time (min)	**6.76**	**0.00**	**0.00**	**6.76**
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				**16 min**

Hydrograph 10-yr Summary

Hydrology Studio v 3.0.0.39

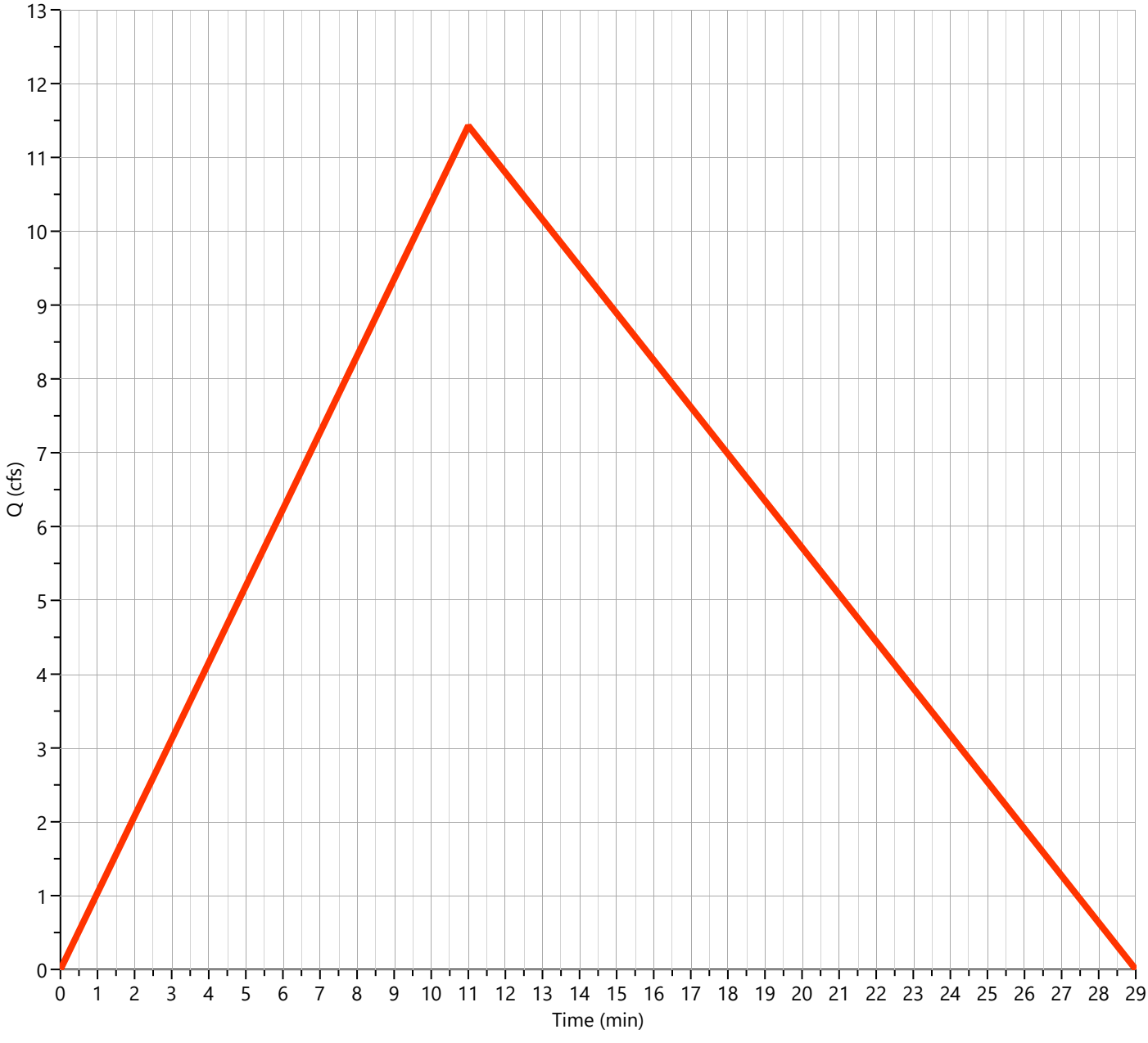
Project Name: Hilltop Subdivision
File: Detention Calculation 3-4-26.hys
03-04-2026

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 "A"	11.43	0.18	10,070	----		
2	Rational	Pre-Dev Basin "B"	38.41	0.25	46,149	----		
3	Rational	Pre-Dev Basin "C"	21.67	0.18	19,095	----		
4	Rational	Pre-Dev Basin "D"	9.804	0.13	6,283	----		
5	Rational	Pre-Dev Basin "E-1"	31.02	0.20	29,819	----		
6	Rational	Pre-Dev Basin "E-2"	52.69	0.22	54,864	----		
7	Junction	Total Pre Basin "E"	82.16	0.22	83,523	5, 6		
8	Rational	Pre-Dev Basin "F"	33.12	0.28	45,094	----		
9	Rational	Post-Dev Basin A	12.04	0.23	13,505	----		
10	Rational	Post-Dev Basin B	32.19	0.30	46,411	----		
11	Rational	Post-Dev Basin "C"	22.16	0.18	19,529	----		
12	Rational	Post-Dev Basin "D"	9.641	0.13	6,178	----		
13	Mod Rational	Post-Dev Basin "E-1"	31.83	0.28	91,663	----		
14	Pond Route	Detention Basin	12.42	0.97	91,575	13	477.88	66,000
15	Rational	Post-Dev Basin "E-2"	52.46	0.22	54,628	----		
16	Junction	Total Post-Dev "E"	53.39	0.22	145,085	14, 15		
17	Rational	Post-Dev Basin "F"	32.71	0.27	41,924	----		

Pre-Dev Basin "A"

Hyd. No. 1

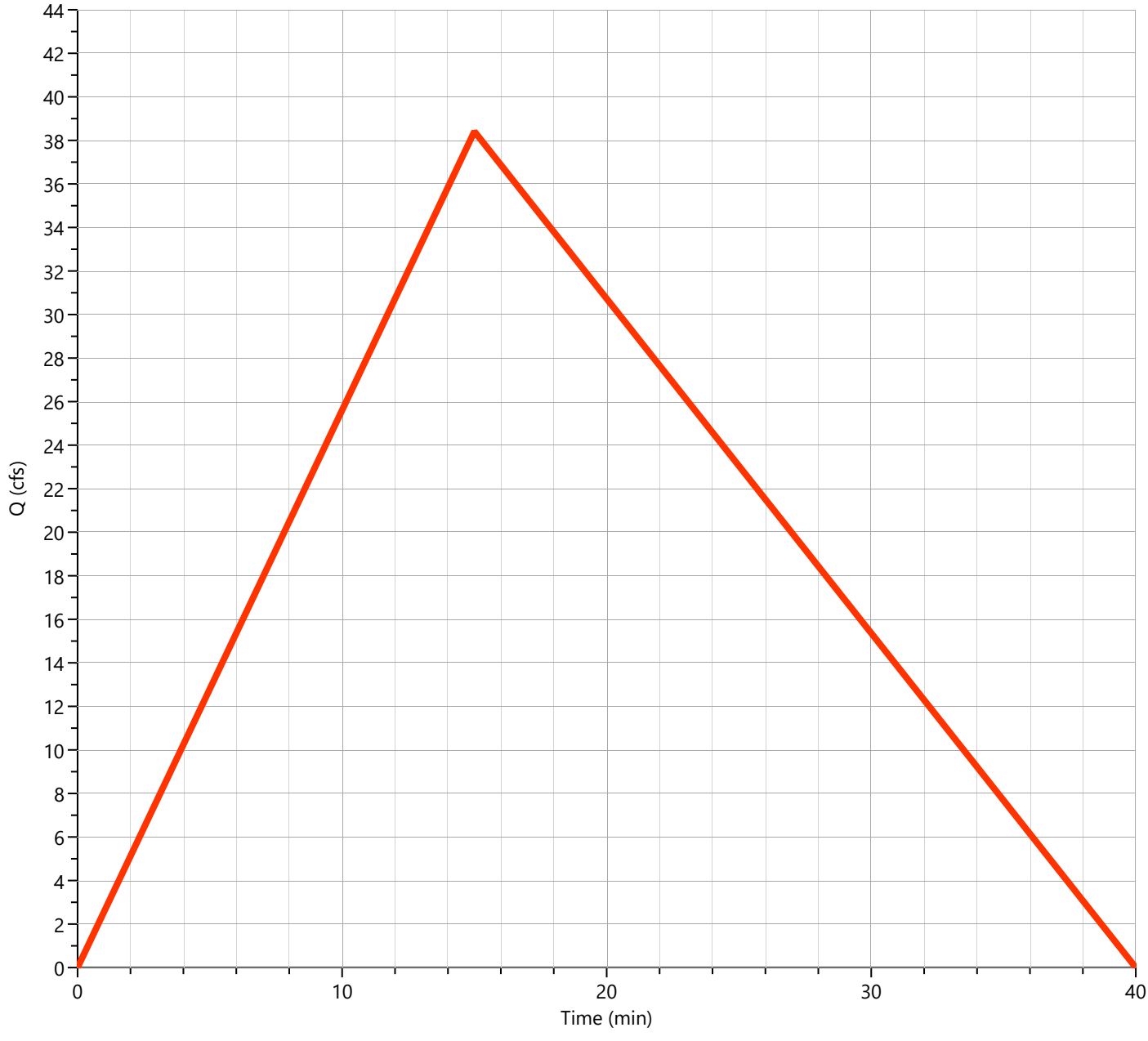
Hydrograph Type	= Rational	Peak Flow	= 11.43 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.18 hrs
Time Interval	= 1 min	Runoff Volume	= 10,070 cuft
Drainage Area	= 3.2 ac	Runoff Coeff.	= 0.62
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 11.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 5.76 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "B"

Hyd. No. 2

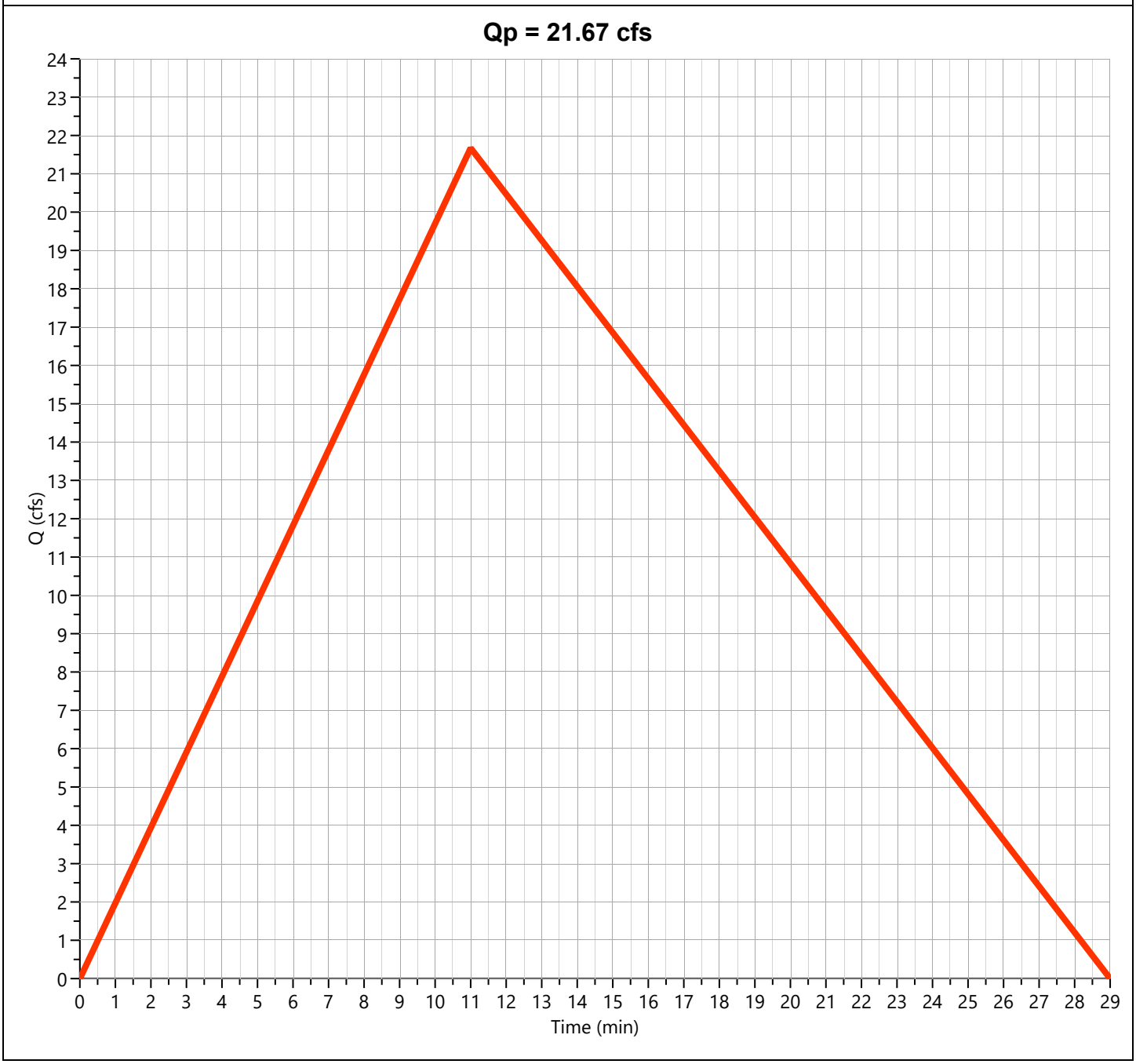
Hydrograph Type	= Rational	Peak Flow	= 38.41 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.25 hrs
Time Interval	= 1 min	Runoff Volume	= 46,149 cuft
Drainage Area	= 14.74 ac	Runoff Coeff.	= 0.52
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 15.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 5.01 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "C"

Hyd. No. 3

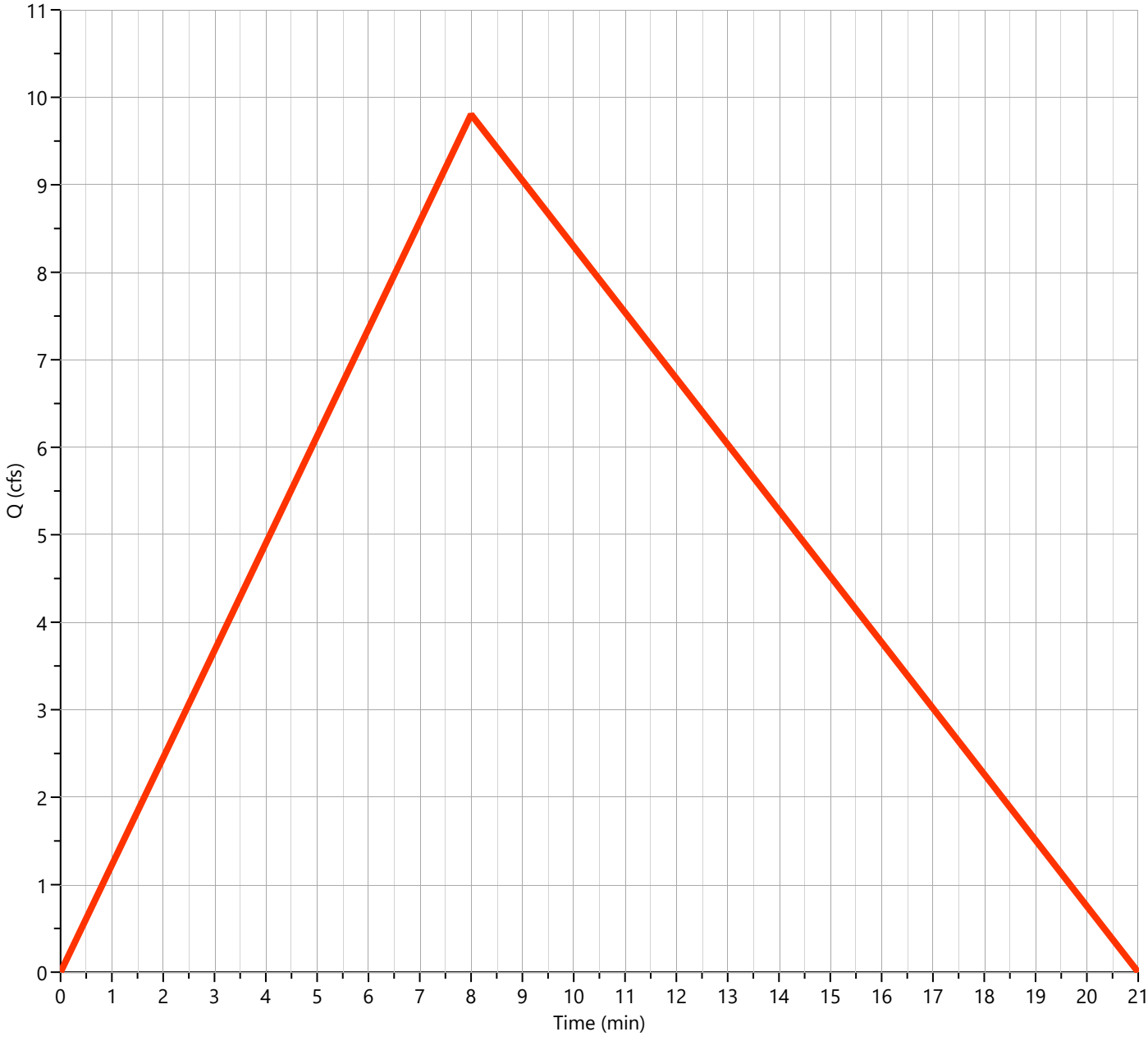
Hydrograph Type	= Rational	Peak Flow	= 21.67 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.18 hrs
Time Interval	= 1 min	Runoff Volume	= 19,095 cuft
Drainage Area	= 6.84 ac	Runoff Coeff.	= 0.55
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 11.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 5.76 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "D"

Hyd. No. 4

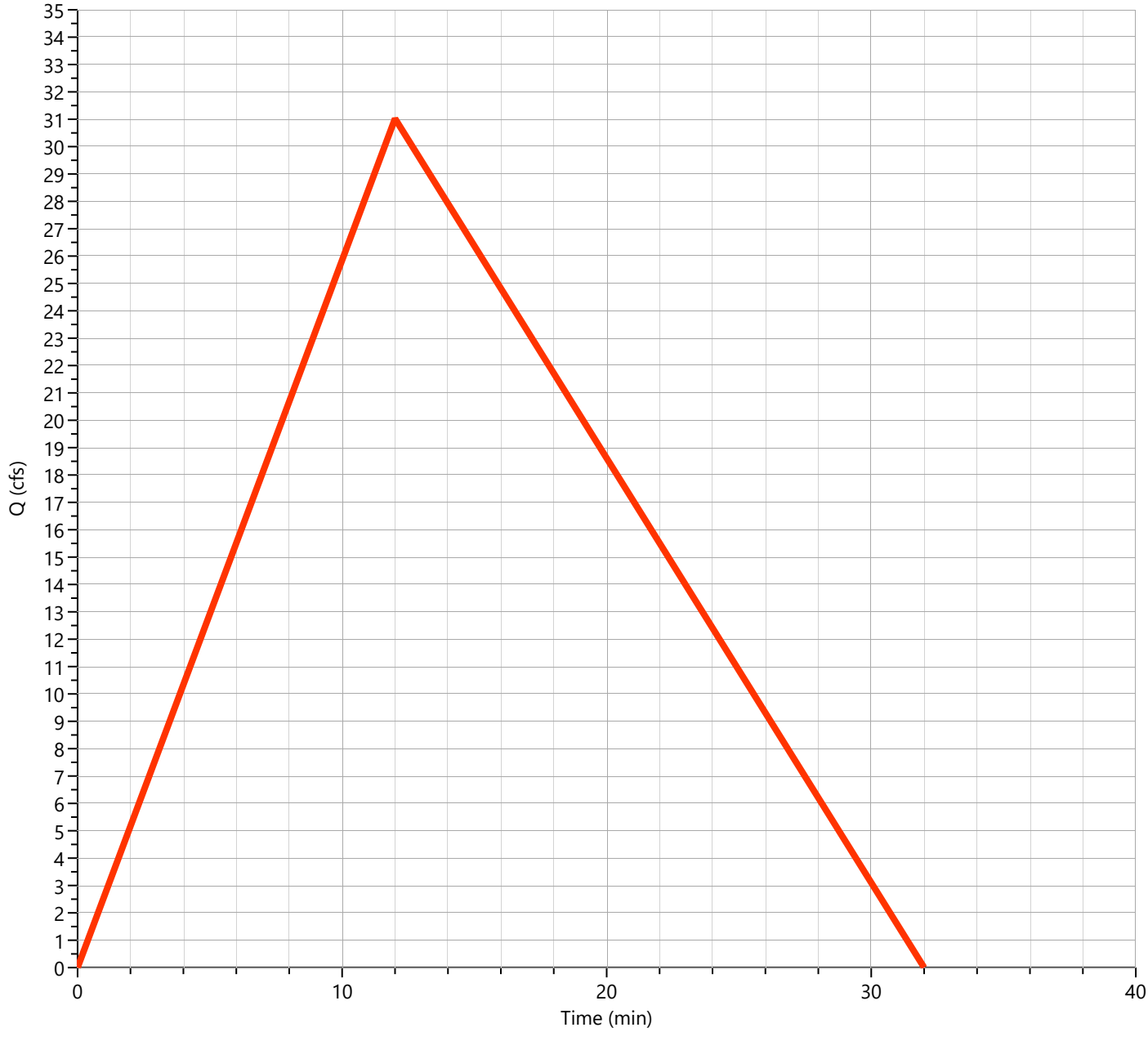
Hydrograph Type	= Rational	Peak Flow	= 9.804 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.13 hrs
Time Interval	= 1 min	Runoff Volume	= 6,283 cuft
Drainage Area	= 2.95 ac	Runoff Coeff.	= 0.50
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.65 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "E-1"

Hyd. No. 5

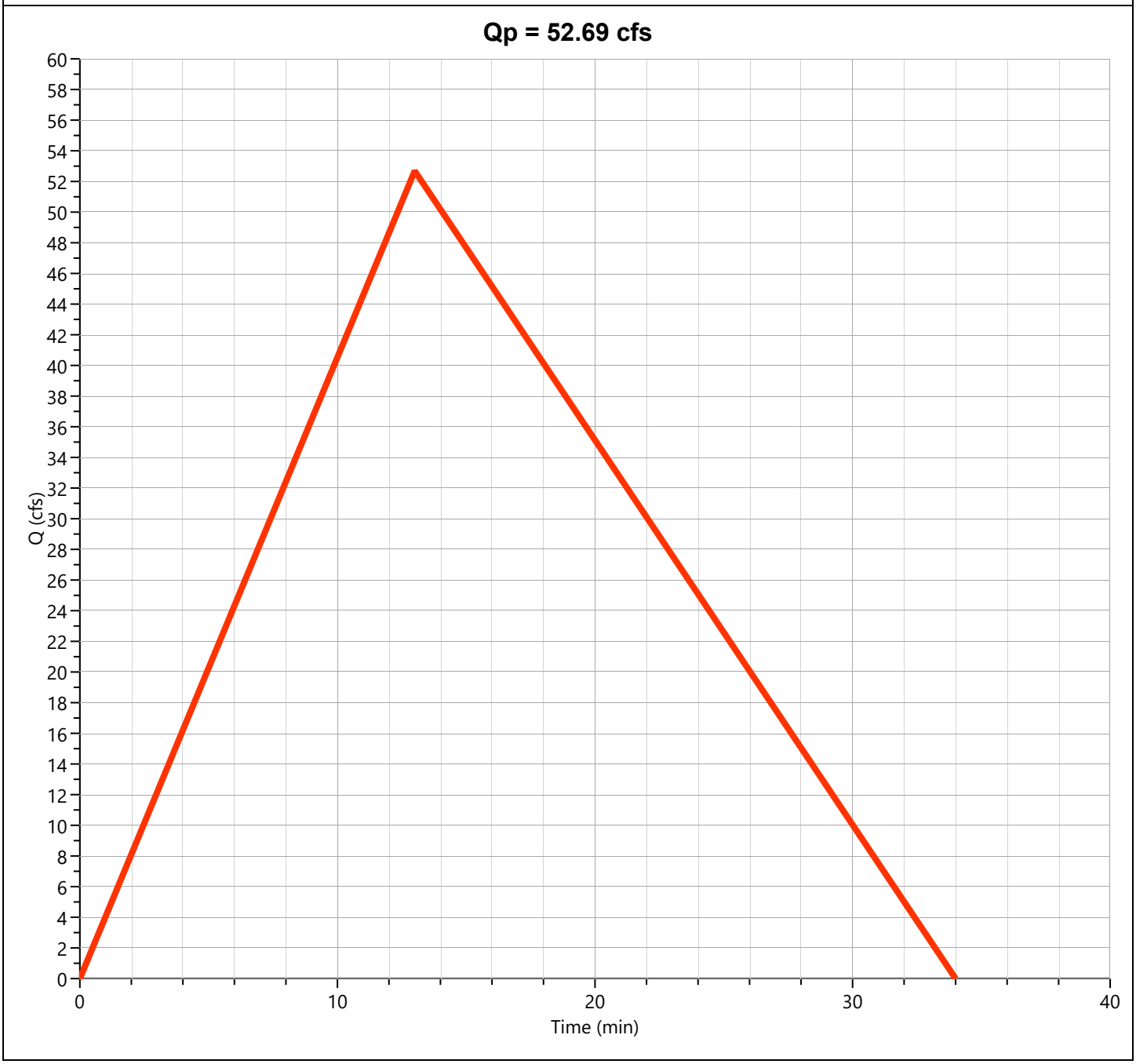
Hydrograph Type	= Rational	Peak Flow	= 31.02 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.20 hrs
Time Interval	= 1 min	Runoff Volume	= 29,819 cuft
Drainage Area	= 11.2 ac	Runoff Coeff.	= 0.50
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 12.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 5.54 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "E-2"

Hyd. No. 6

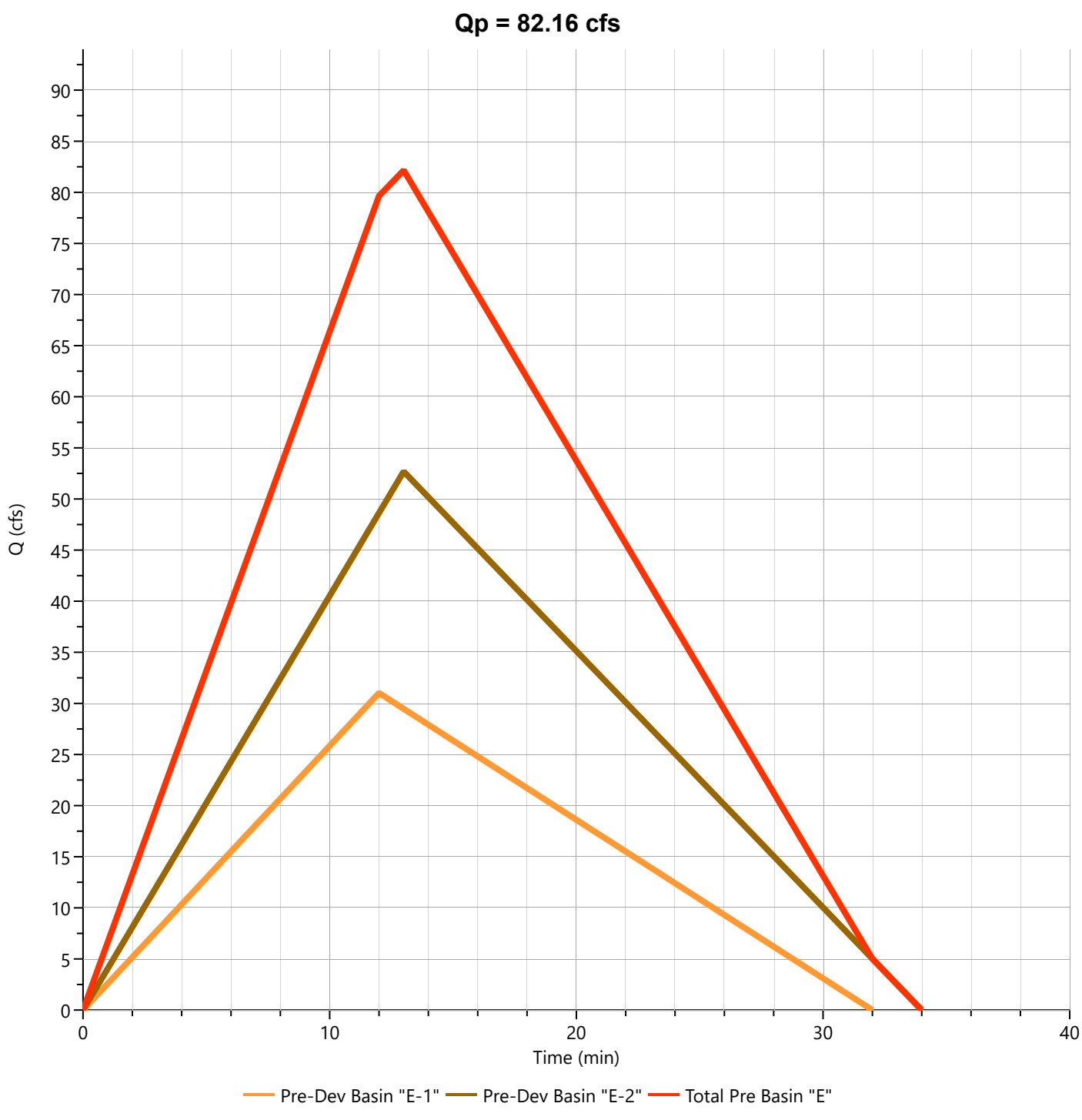
Hydrograph Type	= Rational	Peak Flow	= 52.69 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Runoff Volume	= 54,864 cuft
Drainage Area	= 18.96 ac	Runoff Coeff.	= 0.52
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 5.34 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Total Pre Basin "E"

Hyd. No. 7

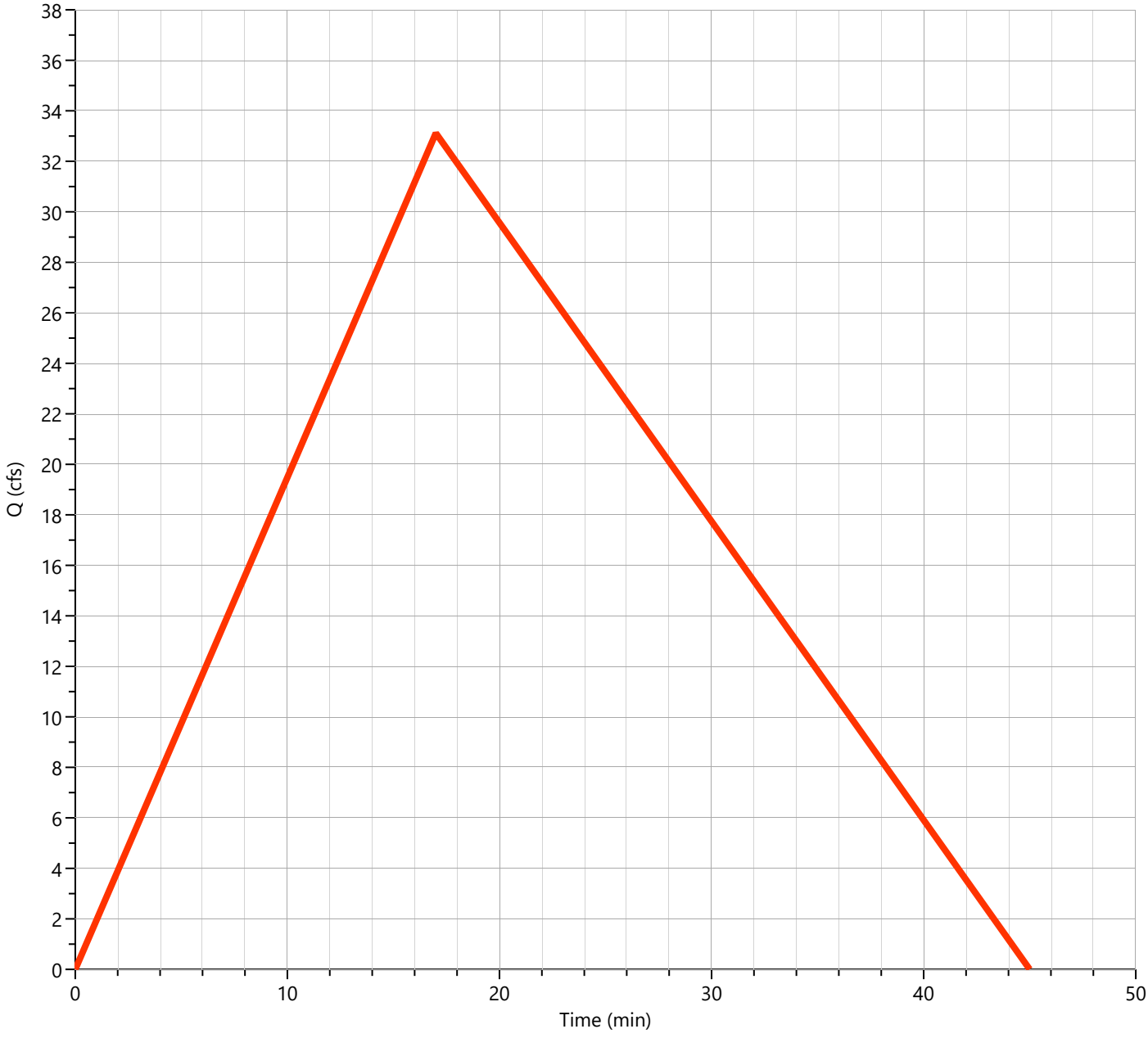
Hydrograph Type	= Junction	Peak Flow	= 82.16 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Hydrograph Volume	= 83,523 cuft
Inflow Hydrographs	= 5, 6	Total Contrib. Area	= 30.16 ac



Pre-Dev Basin "F"

Hyd. No. 8

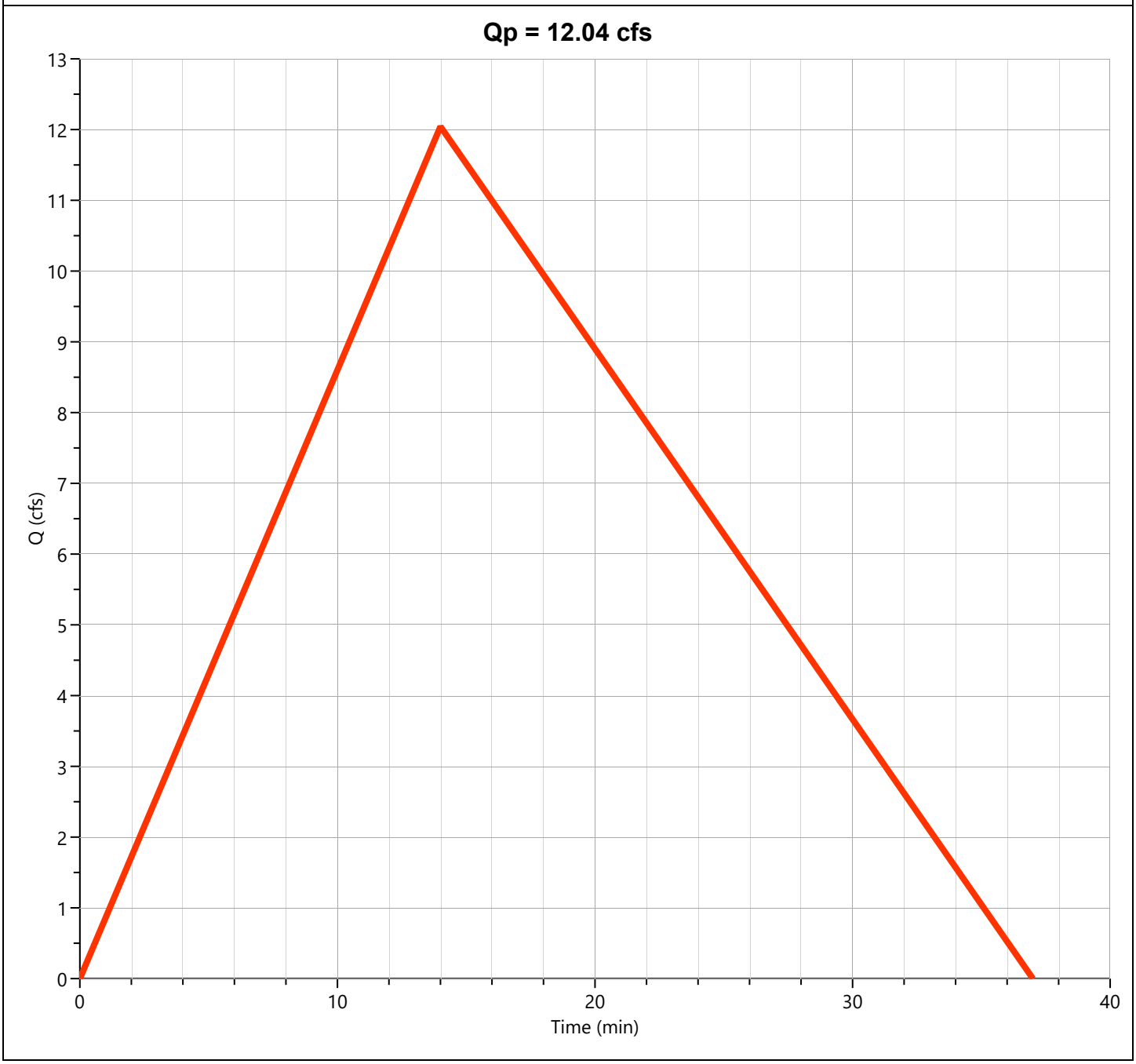
Hydrograph Type	= Rational	Peak Flow	= 33.12 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.28 hrs
Time Interval	= 1 min	Runoff Volume	= 45,094 cuft
Drainage Area	= 13.19 ac	Runoff Coeff.	= 0.53
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 17.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 4.74 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin A

Hyd. No. 9

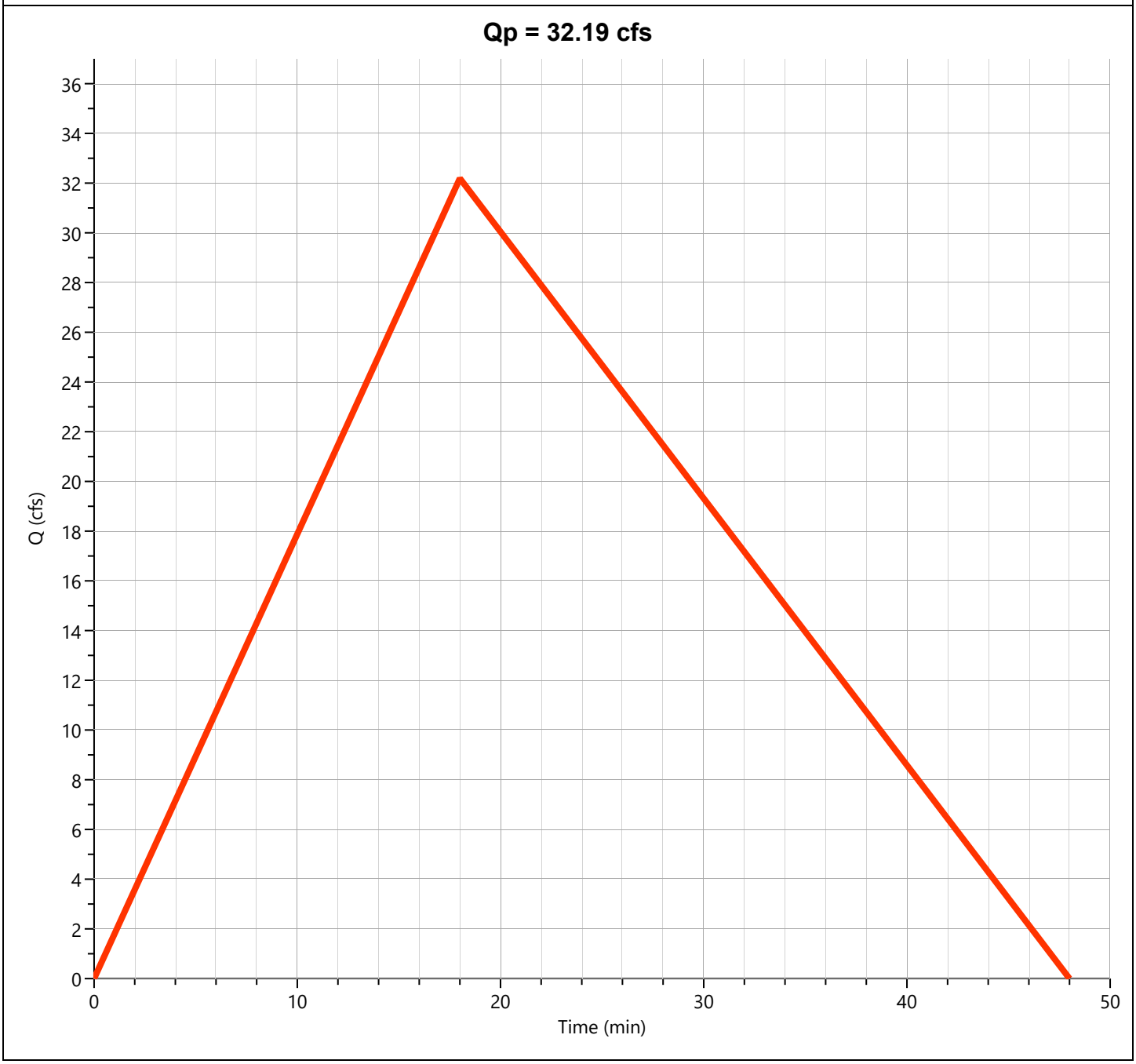
Hydrograph Type	= Rational	Peak Flow	= 12.04 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.23 hrs
Time Interval	= 1 min	Runoff Volume	= 13,505 cuft
Drainage Area	= 3.53 ac	Runoff Coeff.	= 0.66
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 14.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 5.17 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin B

Hyd. No. 10

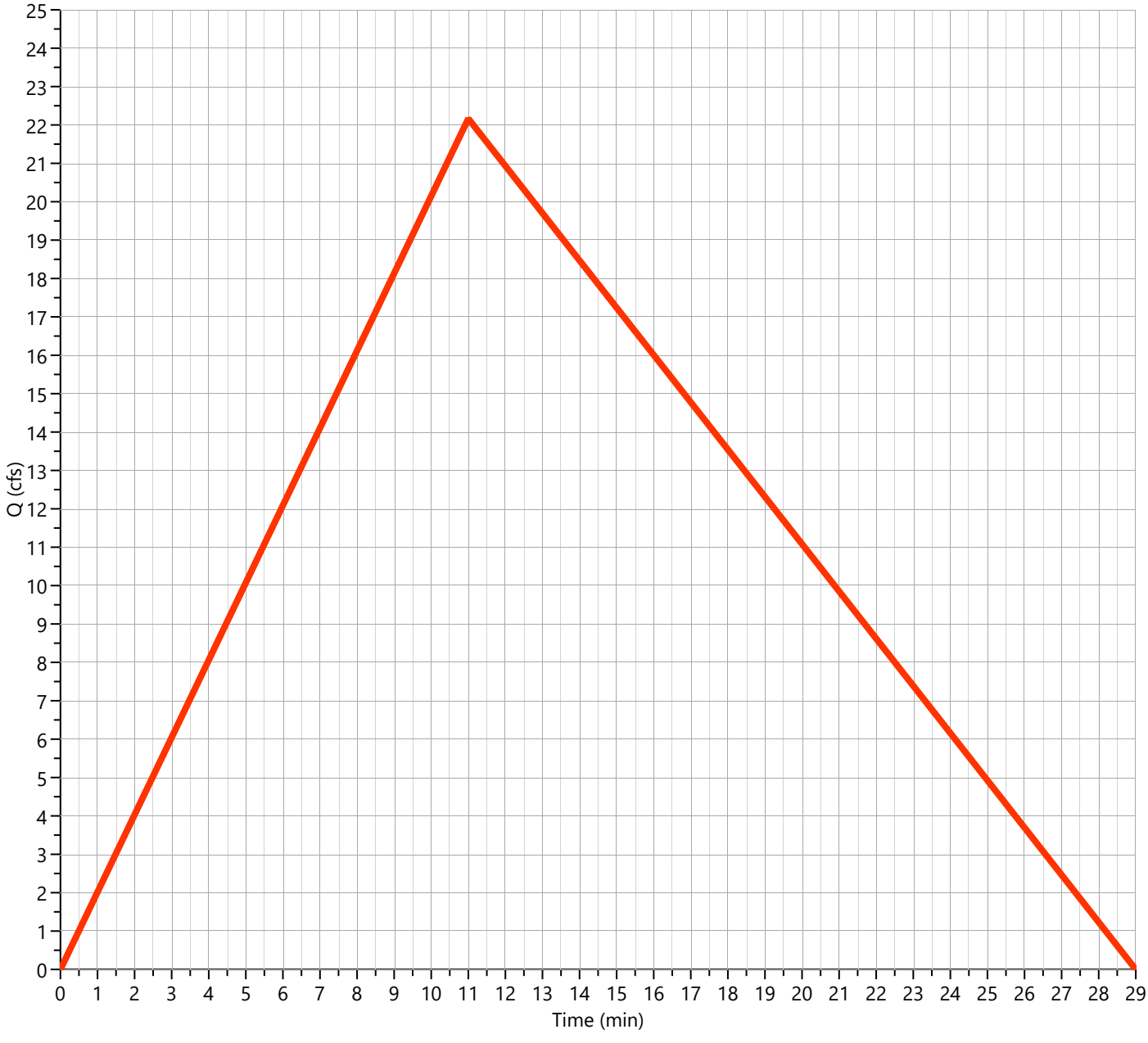
Hydrograph Type	= Rational	Peak Flow	= 32.19 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.30 hrs
Time Interval	= 1 min	Runoff Volume	= 46,411 cuft
Drainage Area	= 12.45 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 18.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 4.62 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin "C"

Hyd. No. 11

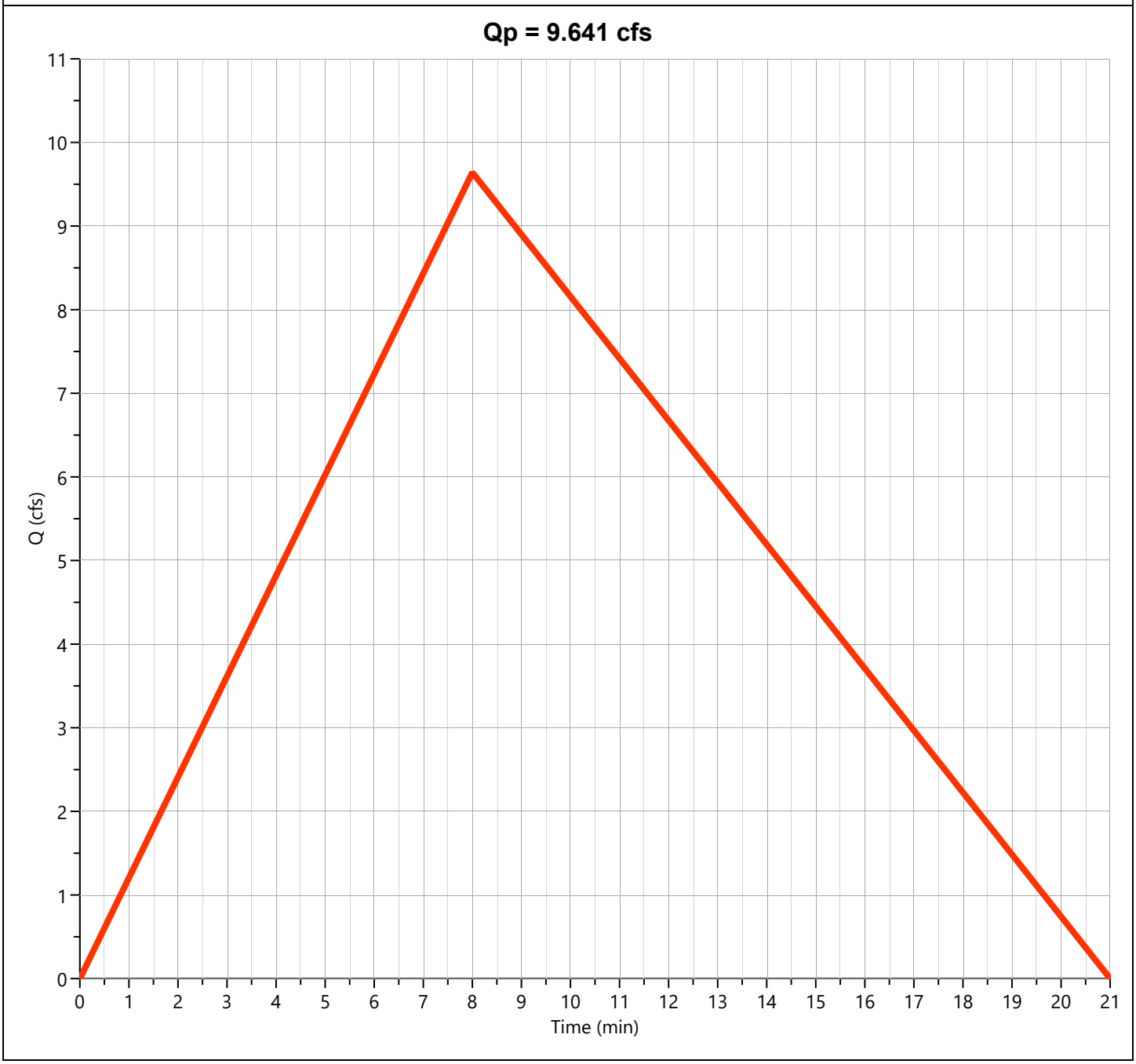
Hydrograph Type	= Rational	Peak Flow	= 22.16 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.18 hrs
Time Interval	= 1 min	Runoff Volume	= 19,529 cuft
Drainage Area	= 6.75 ac	Runoff Coeff.	= 0.57
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 11.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 5.76 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin "D"

Hyd. No. 12

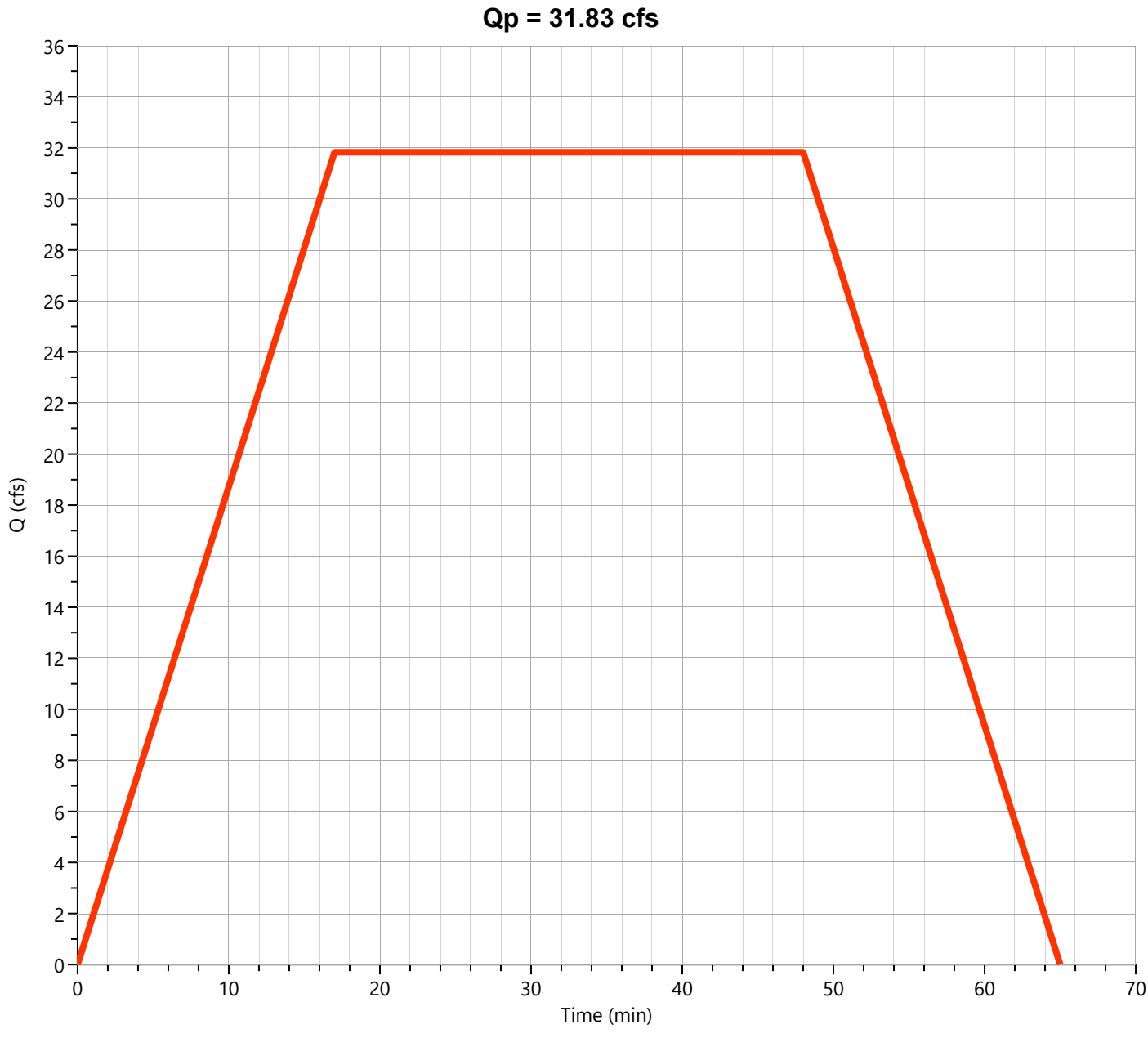
Hydrograph Type	= Rational	Peak Flow	= 9.641 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.13 hrs
Time Interval	= 1 min	Runoff Volume	= 6,178 cuft
Drainage Area	= 2.59 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.65 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin "E-1"

Hyd. No. 13

Hydrograph Type	= Mod Rational	Peak Flow	= 31.83 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.28 hrs
Time Interval	= 1 min	Runoff Volume	= 91,663 cuft
Drainage Area	= 16.23 ac	Runoff Coeff.	= 0.66
Tc Method	= User	Time of Conc. (Tc)	= 17.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 2.97 in/hr
Freq. Corr. Factor	= 1.00	Storm Duration	= 2.82 x Tc
Target Q	= 0.000 cfs	Required Storage	= 0.000 cuft



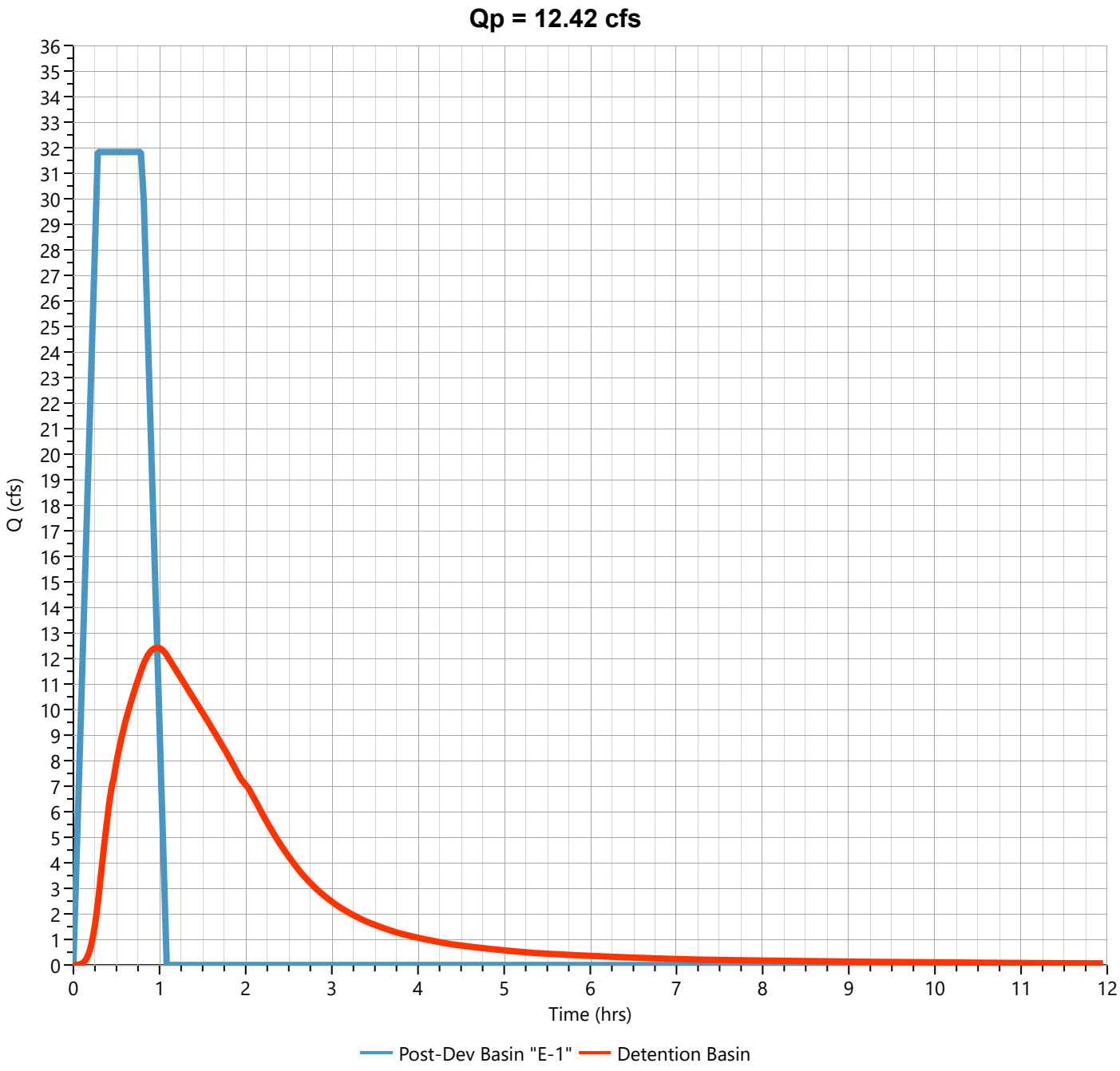
Detention Basin

Hyd. No. 14

Hydrograph Type	= Pond Route	Peak Flow	= 12.42 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.97 hrs
Time Interval	= 1 min	Hydrograph Volume	= 91,575 cuft
Inflow Hydrograph	= 13 - Post-Dev Basin "E-1"	Max. Elevation	= 477.88 ft
Pond Name	= Hilltop Detention Pond	Max. Storage	= 66,000 cuft

Pond Routing by Storage Indication Method

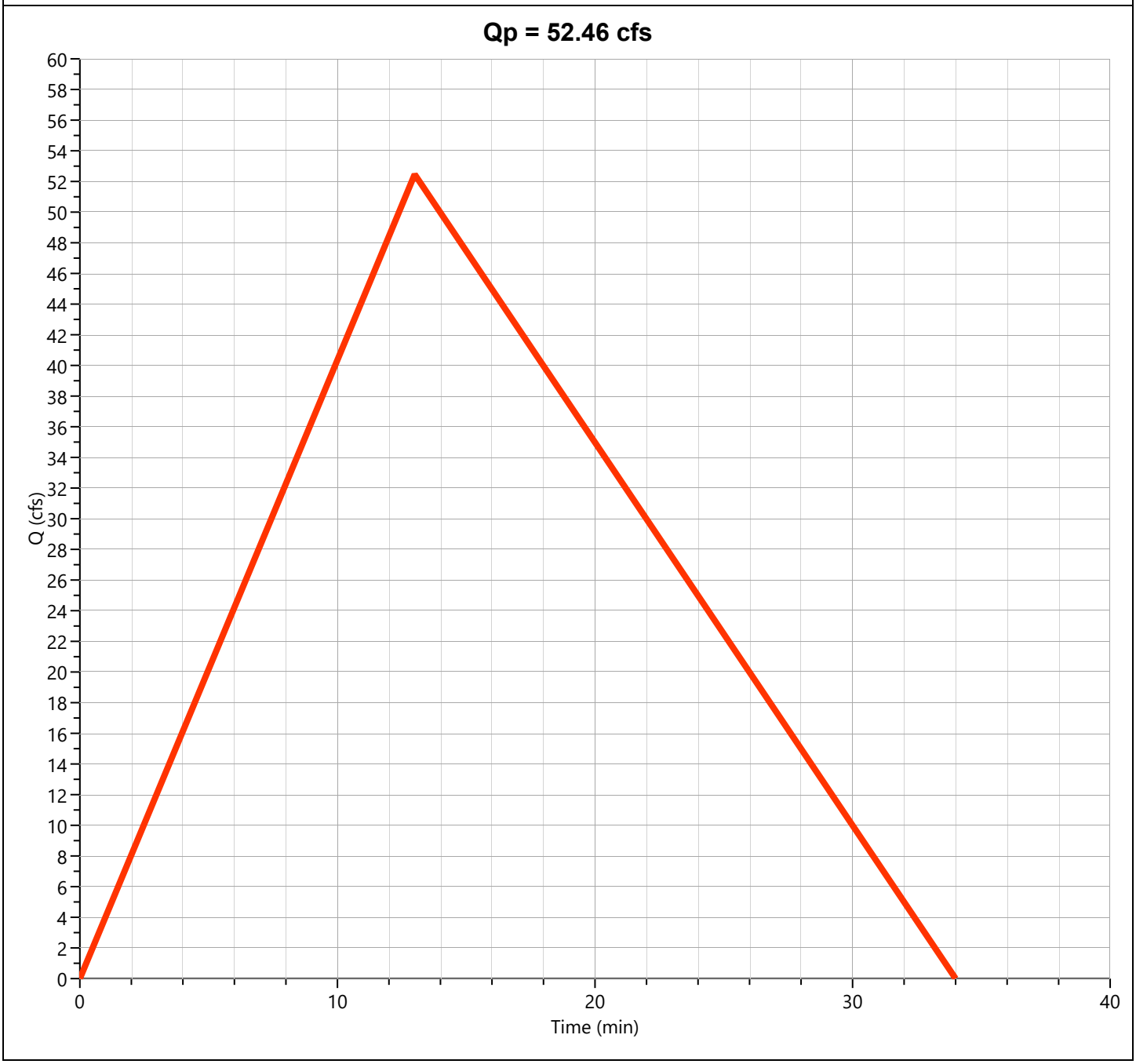
Center of mass detention time = 1.34 hrs



Post-Dev Basin "E-2"

Hyd. No. 15

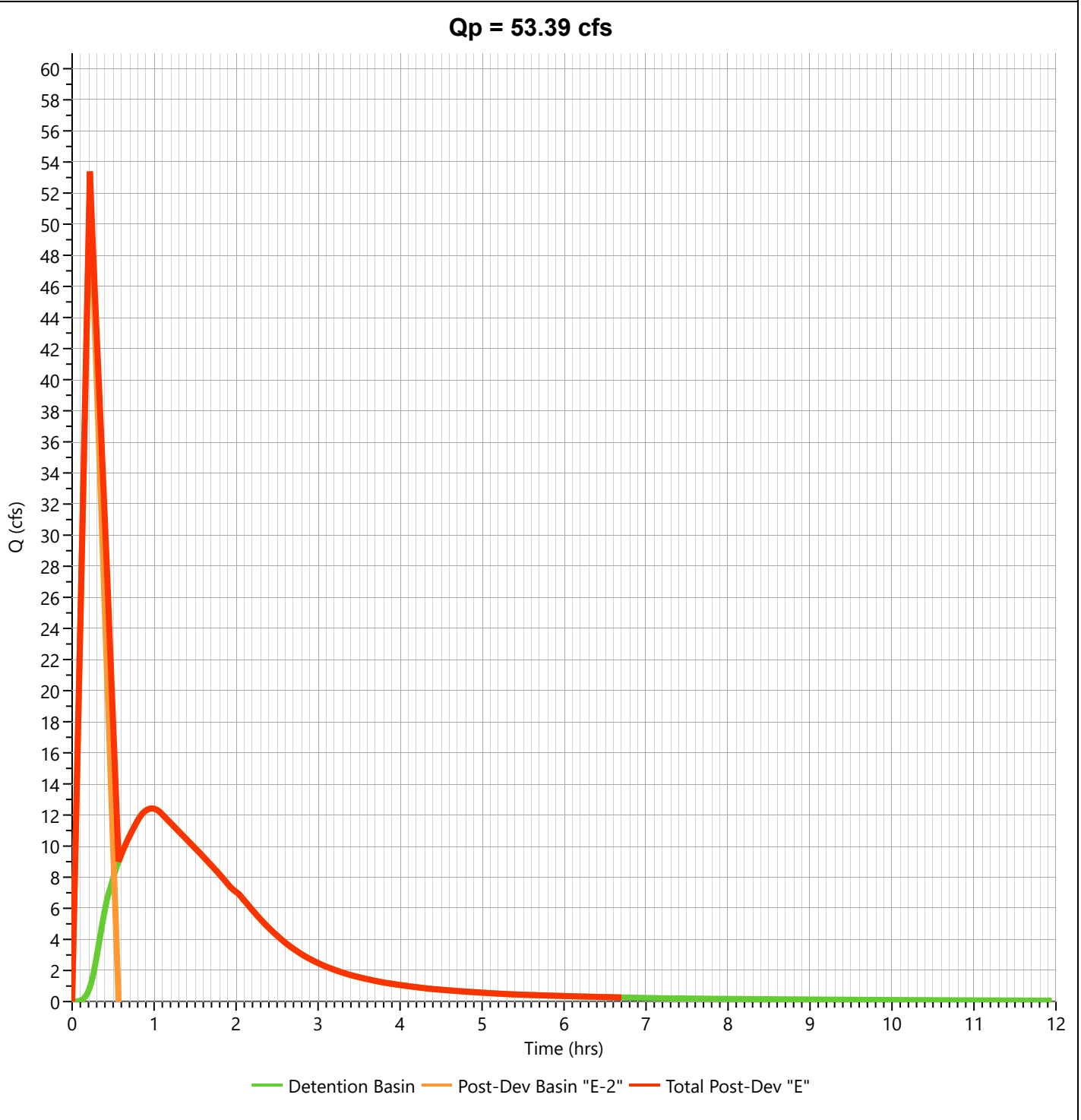
Hydrograph Type	= Rational	Peak Flow	= 52.46 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Runoff Volume	= 54,628 cuft
Drainage Area	= 17.53 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 5.34 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Total Post-Dev "E"

Hyd. No. 16

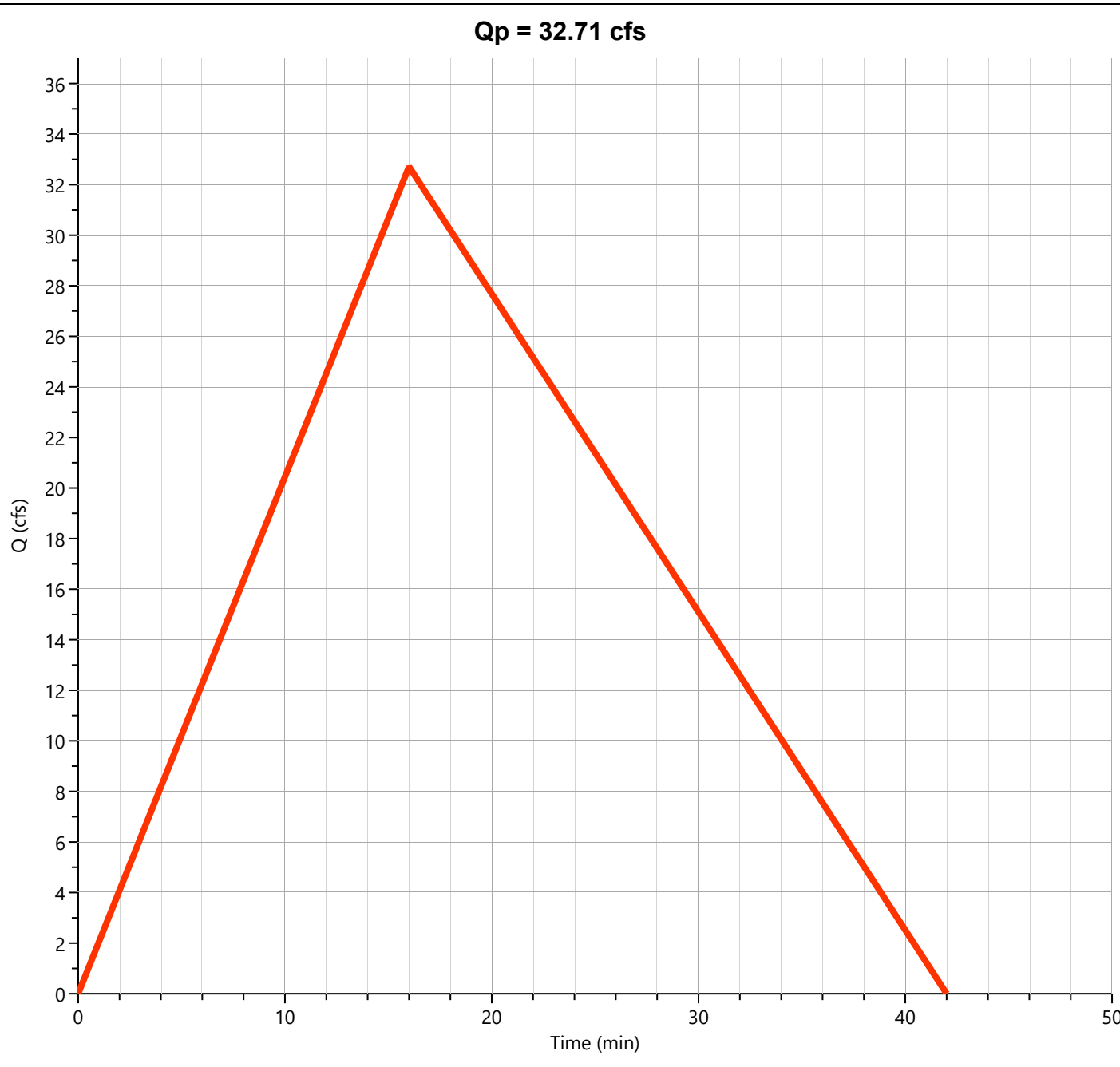
Hydrograph Type	= Junction	Peak Flow	= 53.39 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Hydrograph Volume	= 145,085 cuft
Inflow Hydrographs	= 15	Total Contrib. Area	= 17.53 ac



Post-Dev Basin "F"

Hyd. No. 17

Hydrograph Type	= Rational	Peak Flow	= 32.71 cfs
Storm Frequency	= 10-yr	Time to Peak	= 0.27 hrs
Time Interval	= 1 min	Runoff Volume	= 41,924 cuft
Drainage Area	= 12.0 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 16.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 4.87 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Hydrograph 25-yr Summary

Hydrology Studio v 3.0.0.39

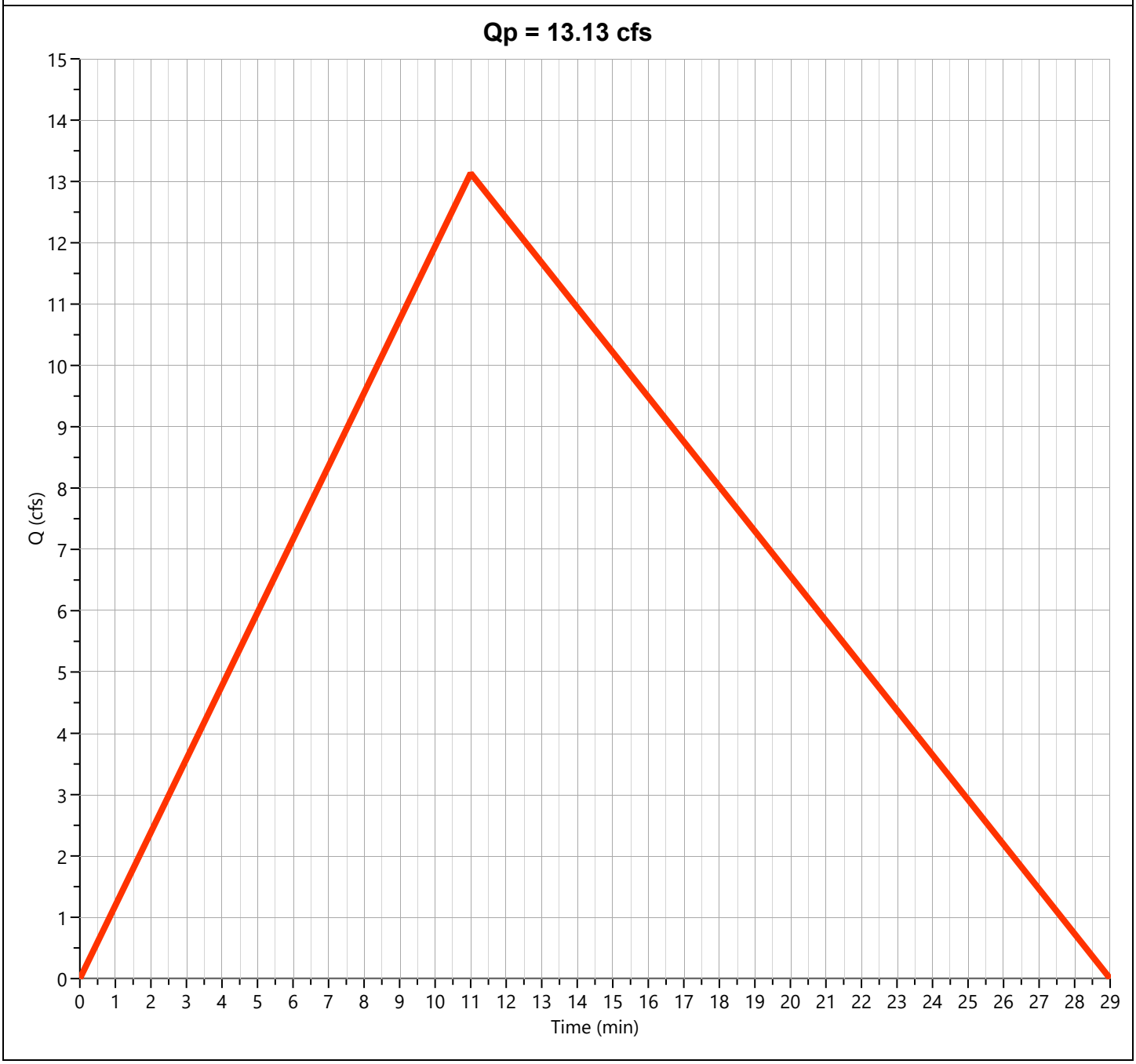
Project Name: Hilltop Subdivision
File: Detention Calculation 3-4-26.hys
03-04-2026

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 "A"	13.13	0.18	11,572	----		
2	Rational	Pre-Dev Basin "B"	44.15	0.25	53,043	----		
3	Rational	Pre-Dev Basin "C"	24.90	0.18	21,943	----		
4	Rational	Pre-Dev Basin "D"	11.26	0.13	7,218	----		
5	Rational	Pre-Dev Basin "E-1"	35.65	0.20	34,268	----		
6	Rational	Pre-Dev Basin "E-2"	60.55	0.22	63,053	----		
7	Junction	Total Pre Basin "E"	94.42	0.22	95,989	5, 6		
8	Rational	Pre-Dev Basin "F"	38.07	0.28	51,833	----		
9	Rational	Post-Dev Basin A	13.84	0.23	15,521	----		
10	Rational	Post-Dev Basin B	37.00	0.30	53,350	----		
11	Rational	Post-Dev Basin "C"	25.47	0.18	22,441	----		
12	Rational	Post-Dev Basin "D"	11.08	0.13	7,098	----		
13	Mod Rational	Post-Dev Basin "E-1"	36.61	0.28	105,431	----		
14	Pond Route	Detention Basin	13.61	0.98	105,341	13	478.31	76,654
15	Rational	Post-Dev Basin "E-2"	60.29	0.22	62,782	----		
16	Junction	Total Post-Dev "E"	61.49	0.22	166,838	14, 15		
17	Rational	Post-Dev Basin "F"	37.60	0.27	48,189	----		

Pre-Dev Basin "A"

Hyd. No. 1

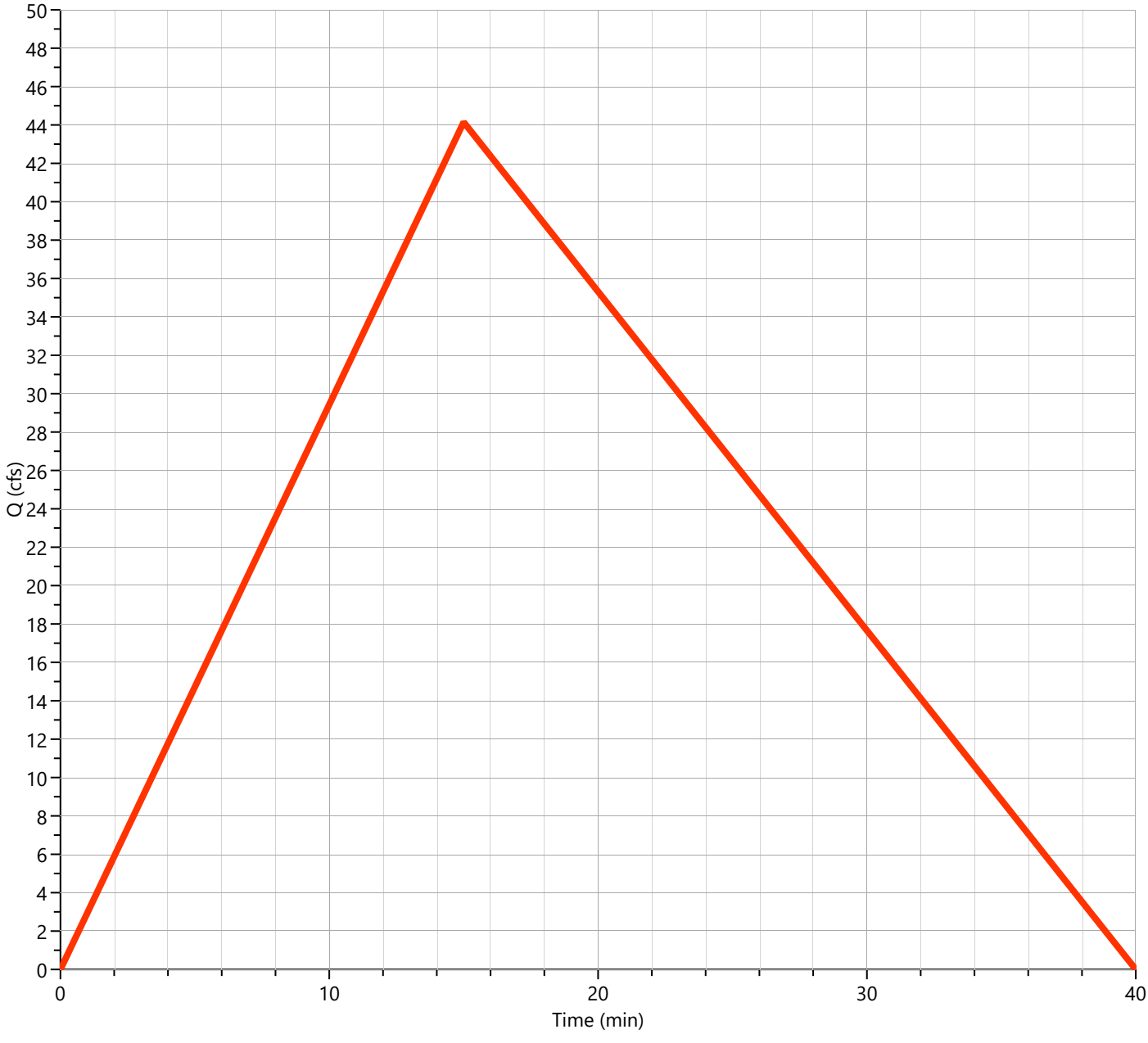
Hydrograph Type	= Rational	Peak Flow	= 13.13 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.18 hrs
Time Interval	= 1 min	Runoff Volume	= 11,572 cuft
Drainage Area	= 3.2 ac	Runoff Coeff.	= 0.62
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 11.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.62 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "B"

Hyd. No. 2

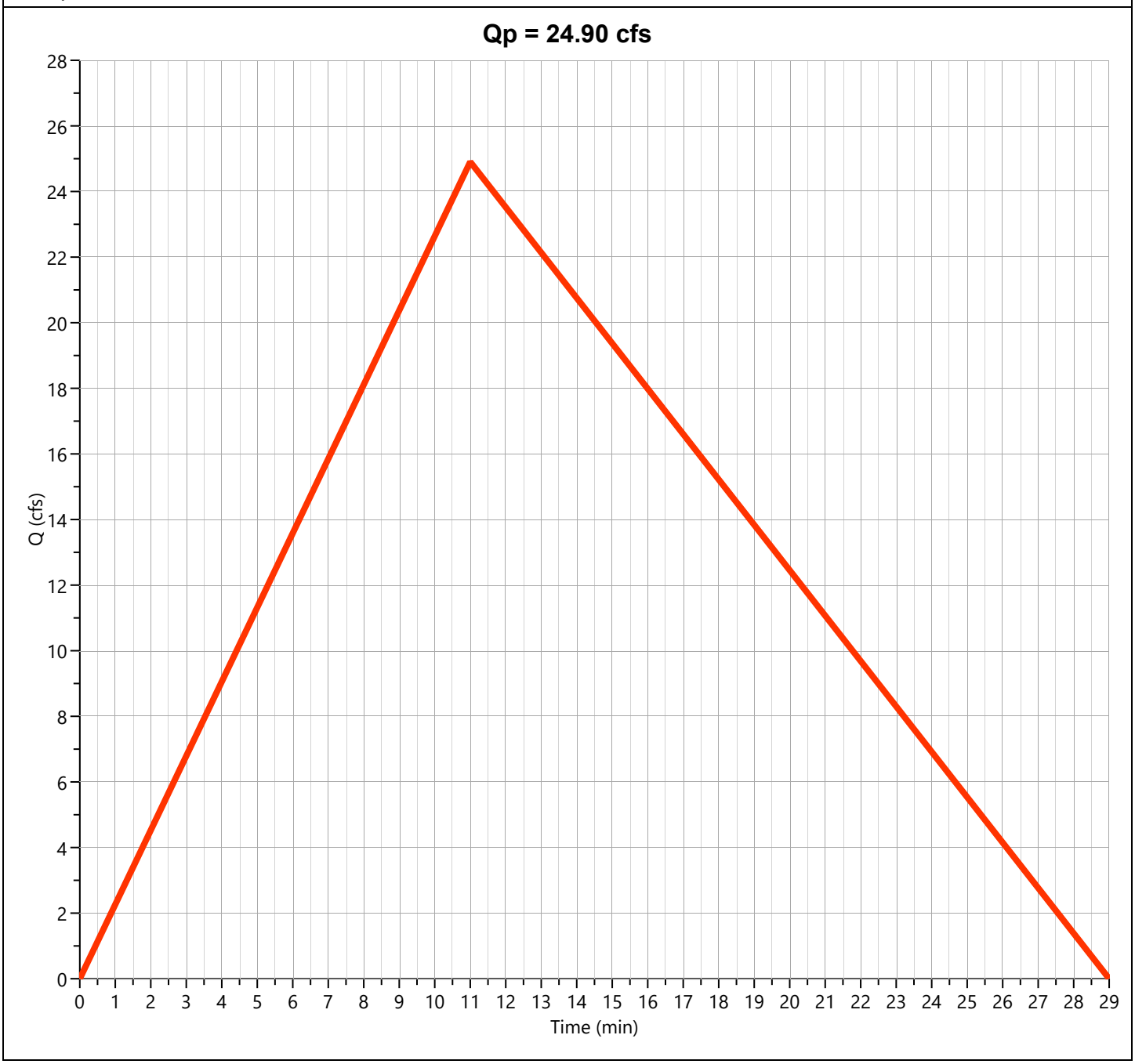
Hydrograph Type	= Rational	Peak Flow	= 44.15 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.25 hrs
Time Interval	= 1 min	Runoff Volume	= 53,043 cuft
Drainage Area	= 14.74 ac	Runoff Coeff.	= 0.52
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 15.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 5.76 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "C"

Hyd. No. 3

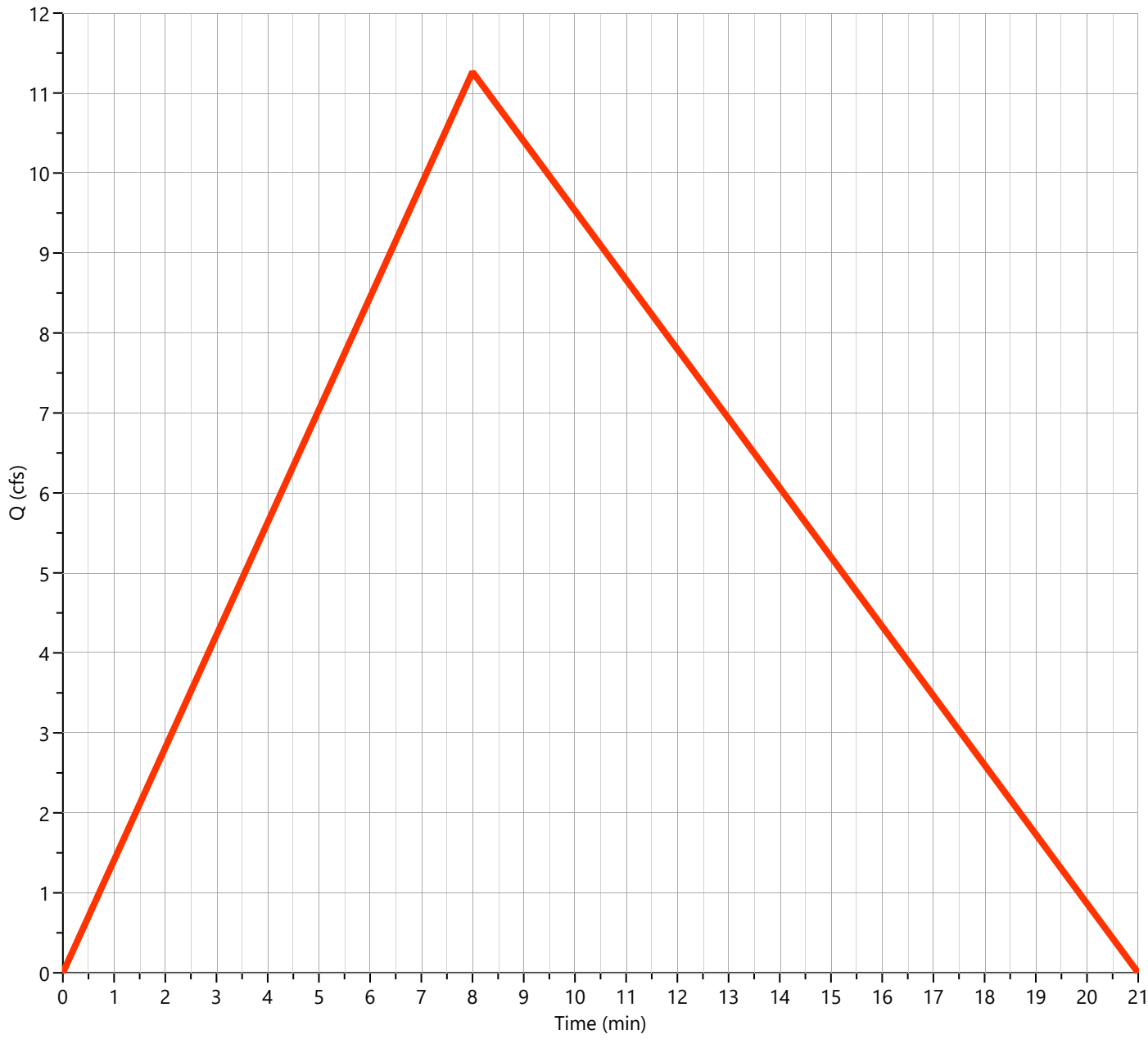
Hydrograph Type	= Rational	Peak Flow	= 24.90 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.18 hrs
Time Interval	= 1 min	Runoff Volume	= 21,943 cuft
Drainage Area	= 6.84 ac	Runoff Coeff.	= 0.55
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 11.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.62 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "D"

Hyd. No. 4

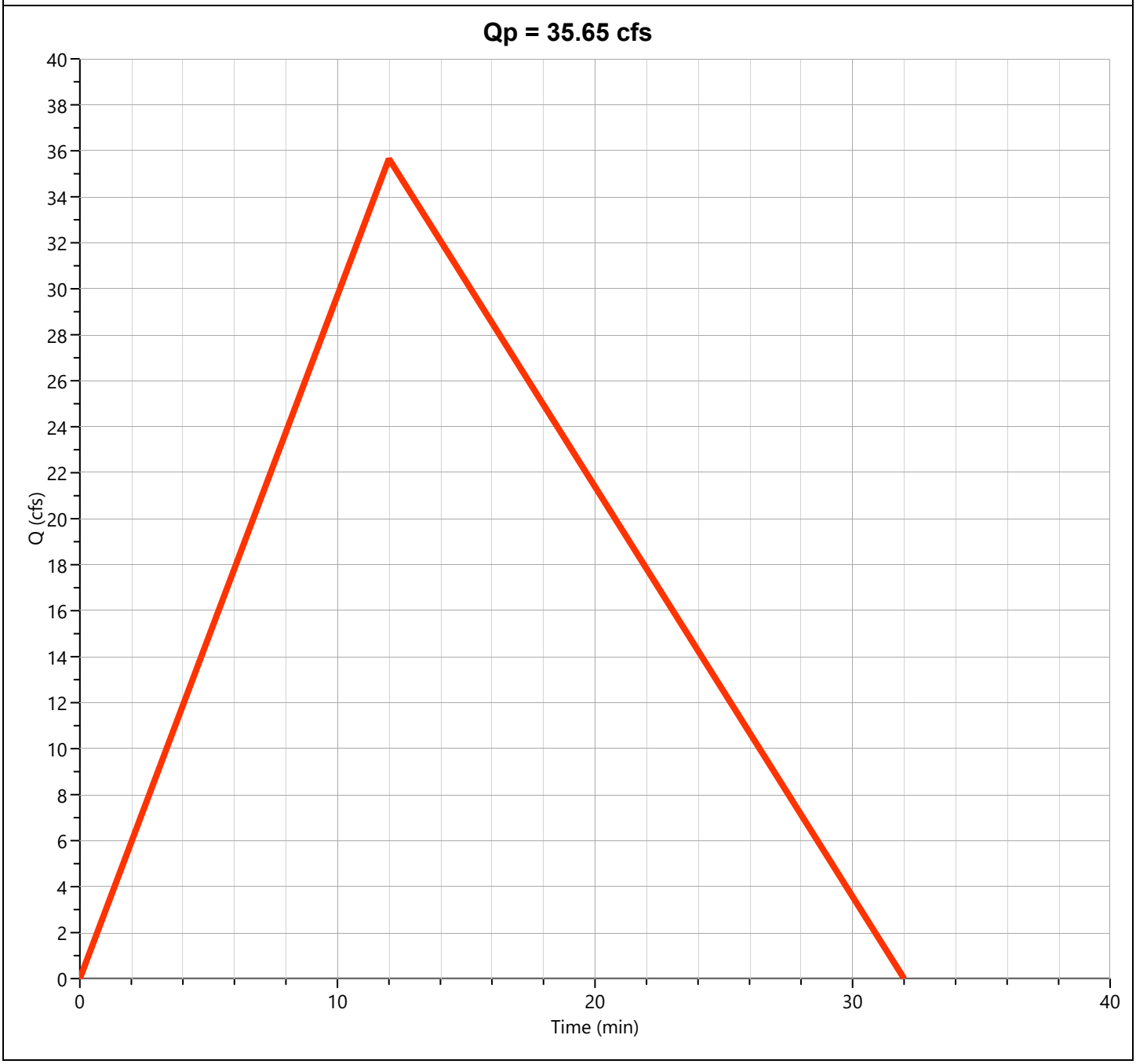
Hydrograph Type	= Rational	Peak Flow	= 11.26 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.13 hrs
Time Interval	= 1 min	Runoff Volume	= 7,218 cuft
Drainage Area	= 2.95 ac	Runoff Coeff.	= 0.50
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 7.64 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "E-1"

Hyd. No. 5

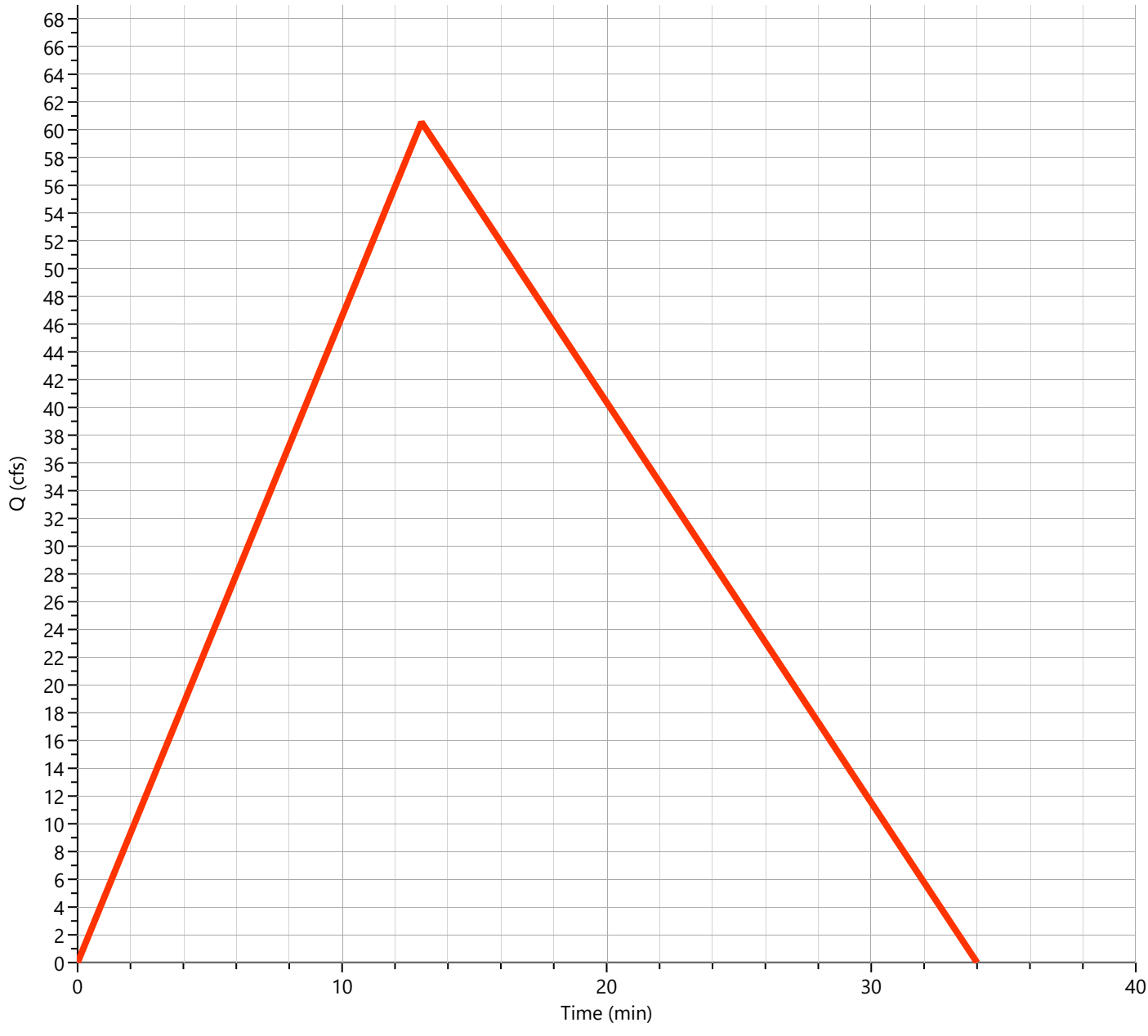
Hydrograph Type	= Rational	Peak Flow	= 35.65 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.20 hrs
Time Interval	= 1 min	Runoff Volume	= 34,268 cuft
Drainage Area	= 11.2 ac	Runoff Coeff.	= 0.50
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 12.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.37 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "E-2"

Hyd. No. 6

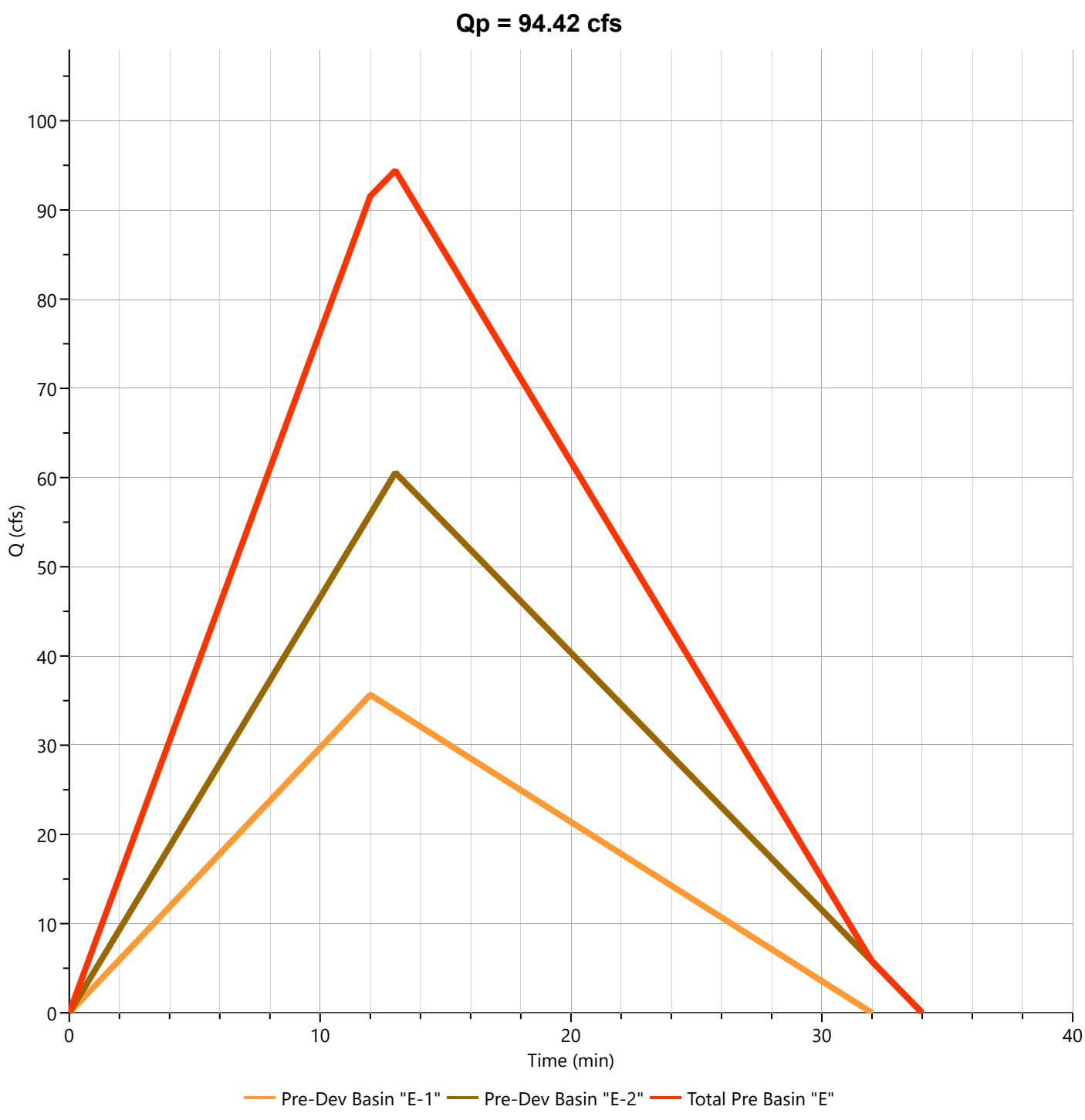
Hydrograph Type	= Rational	Peak Flow	= 60.55 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Runoff Volume	= 63,053 cuft
Drainage Area	= 18.96 ac	Runoff Coeff.	= 0.52
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.14 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Total Pre Basin "E"

Hyd. No. 7

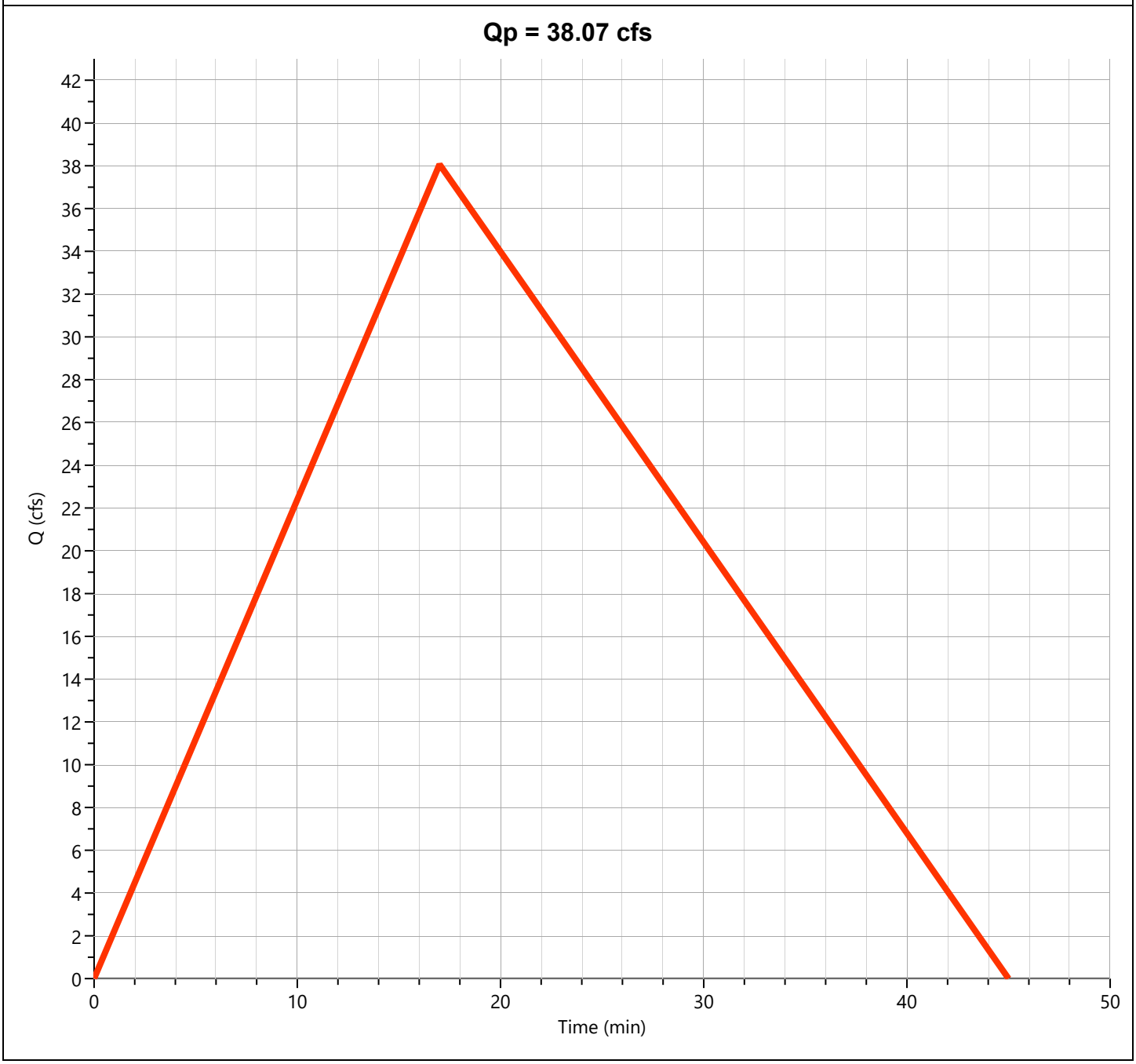
Hydrograph Type	= Junction	Peak Flow	= 94.42 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Hydrograph Volume	= 95,989 cuft
Inflow Hydrographs	= 5, 6	Total Contrib. Area	= 30.16 ac



Pre-Dev Basin "F"

Hyd. No. 8

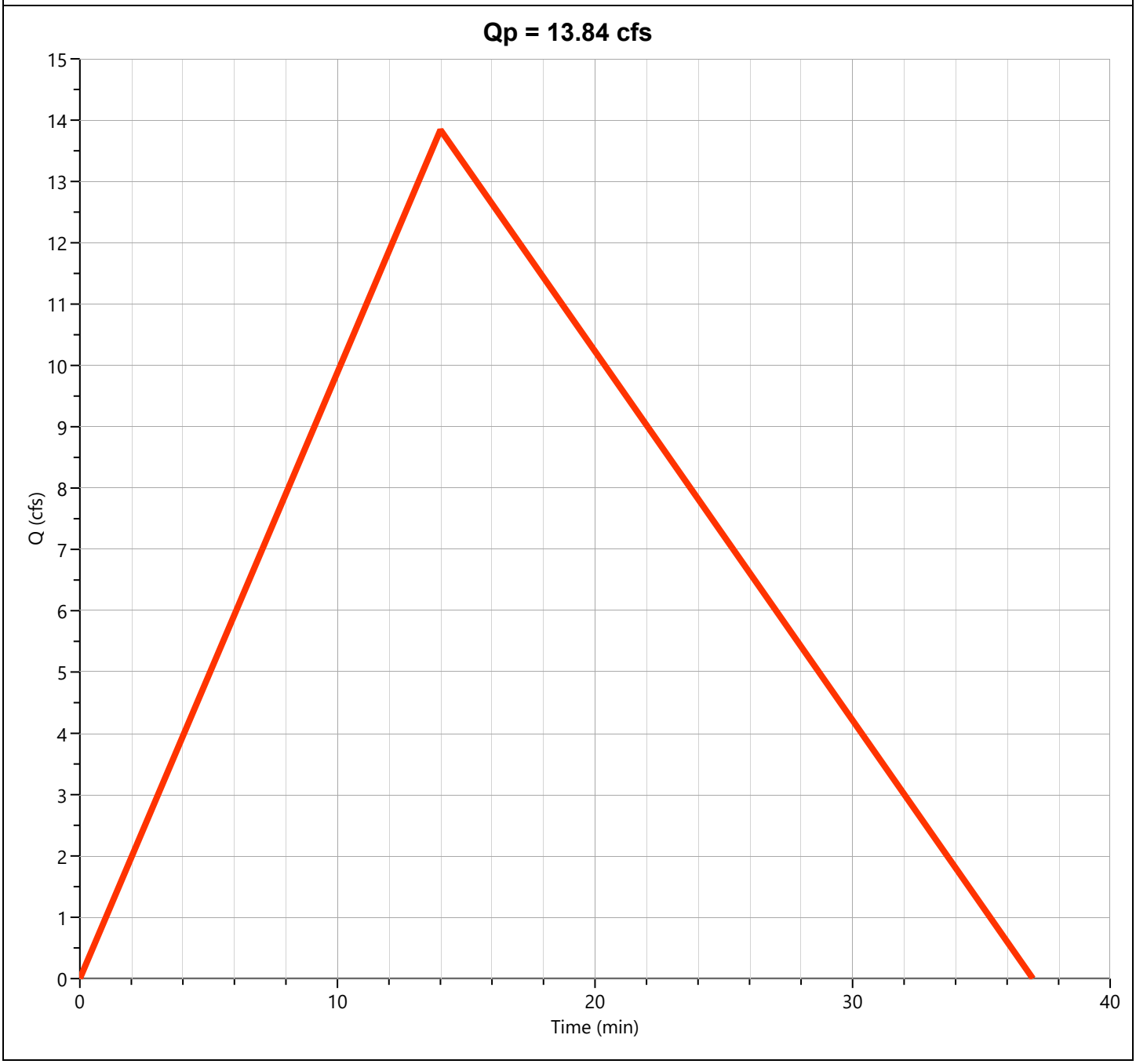
Hydrograph Type	= Rational	Peak Flow	= 38.07 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.28 hrs
Time Interval	= 1 min	Runoff Volume	= 51,833 cuft
Drainage Area	= 13.19 ac	Runoff Coeff.	= 0.53
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 17.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 5.45 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin A

Hyd. No. 9

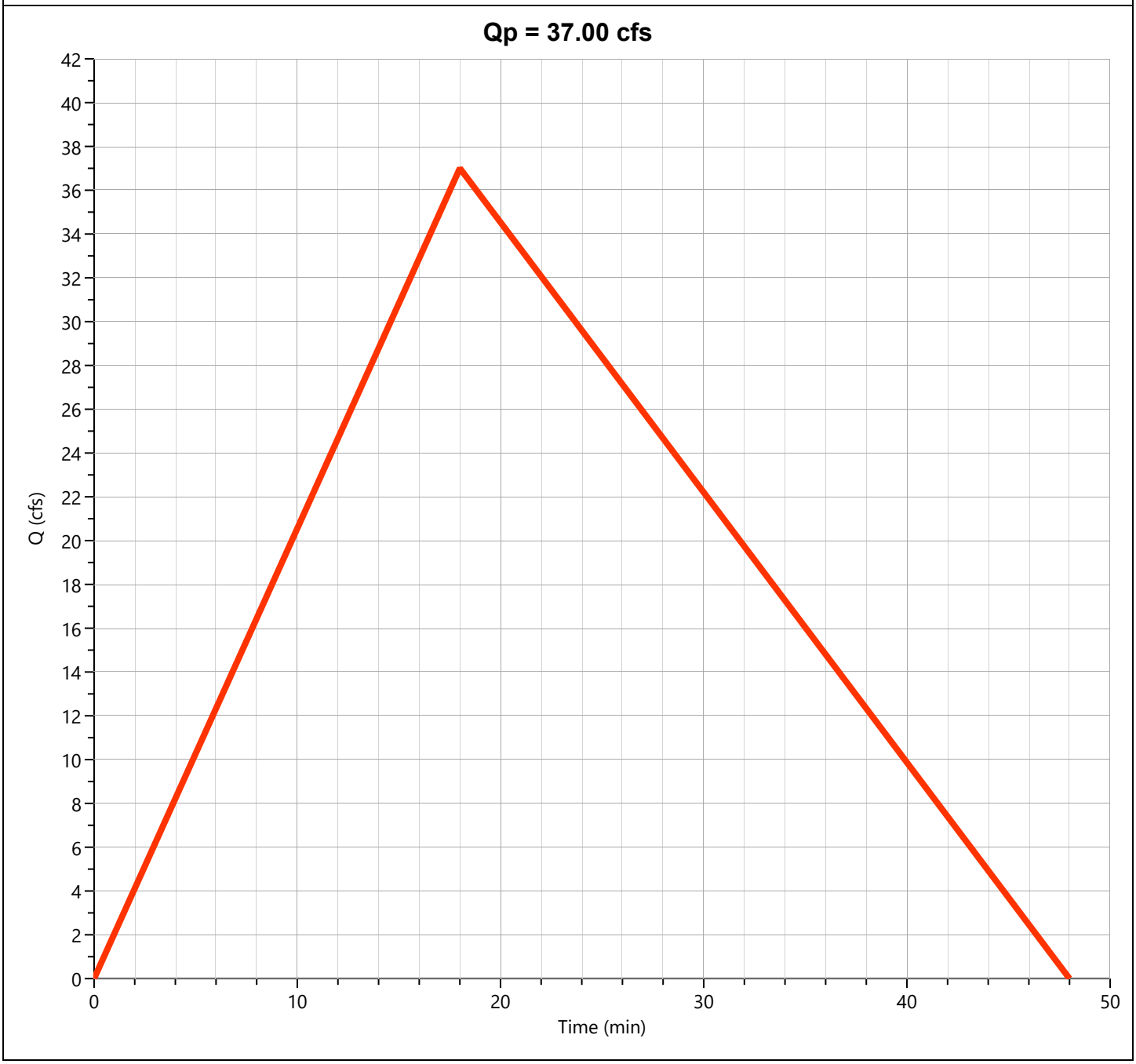
Hydrograph Type	= Rational	Peak Flow	= 13.84 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.23 hrs
Time Interval	= 1 min	Runoff Volume	= 15,521 cuft
Drainage Area	= 3.53 ac	Runoff Coeff.	= 0.66
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 14.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 5.94 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin B

Hyd. No. 10

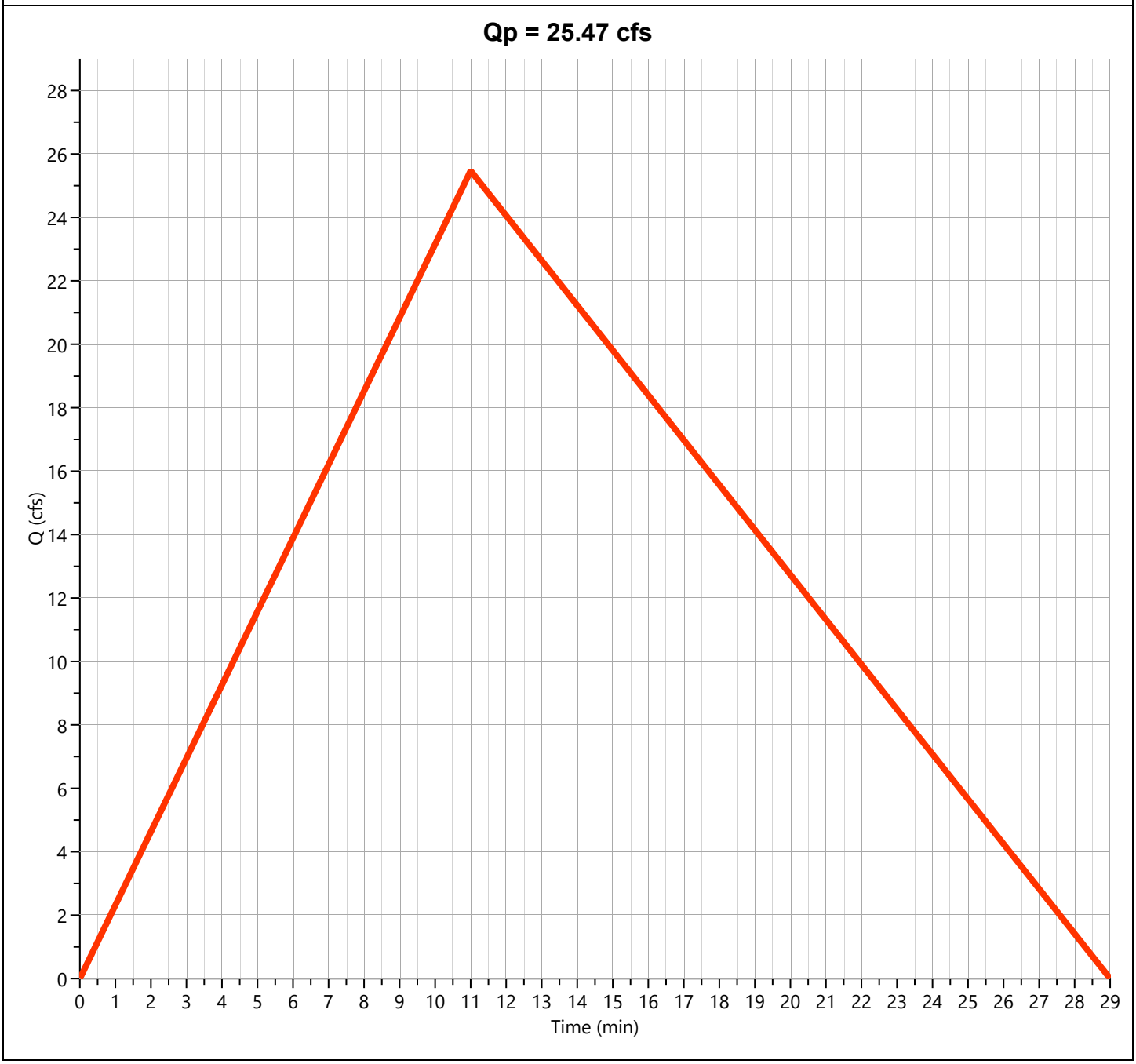
Hydrograph Type	= Rational	Peak Flow	= 37.00 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.30 hrs
Time Interval	= 1 min	Runoff Volume	= 53,350 cuft
Drainage Area	= 12.45 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 18.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 5.31 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin "C"

Hyd. No. 11

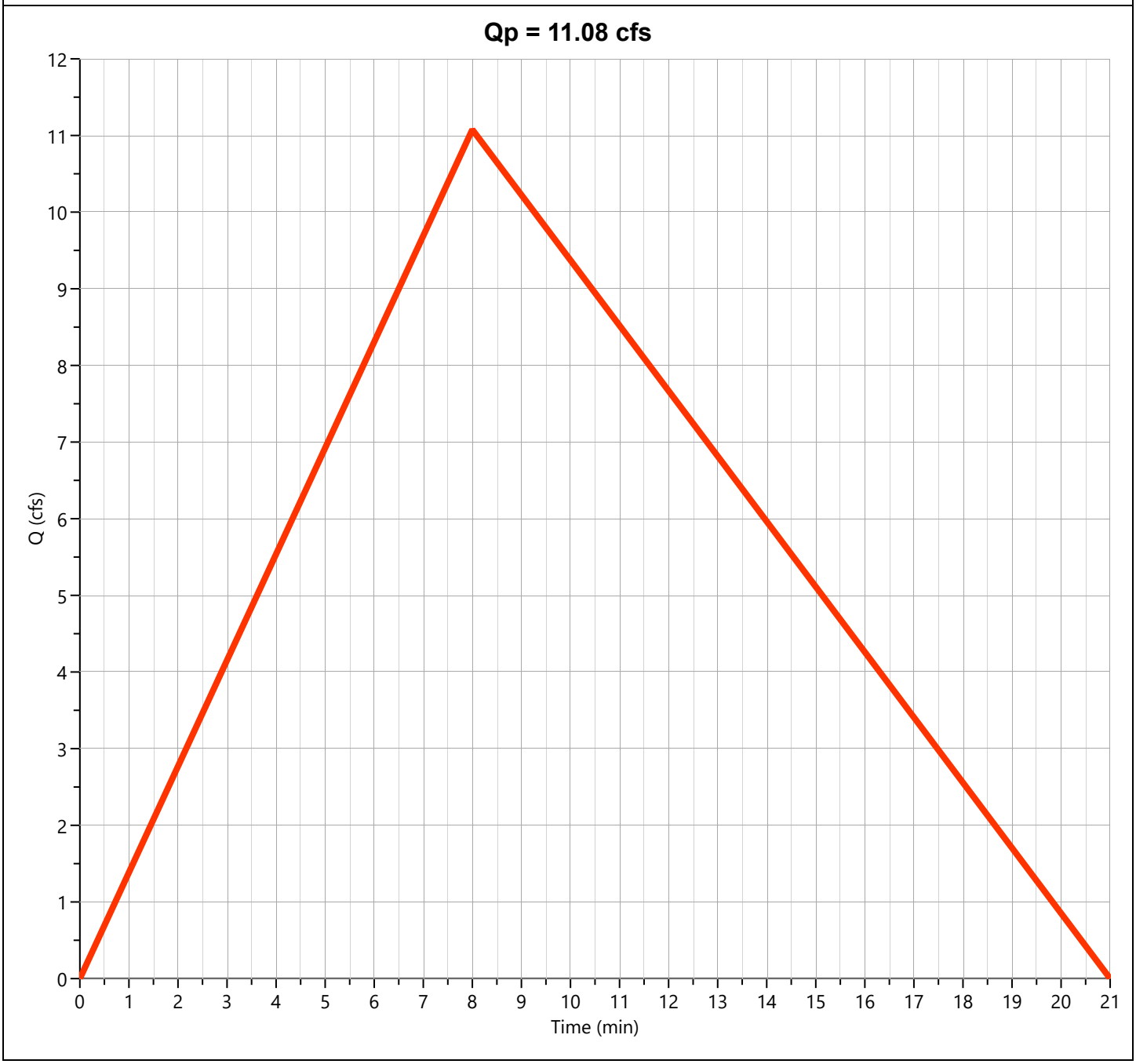
Hydrograph Type	= Rational	Peak Flow	= 25.47 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.18 hrs
Time Interval	= 1 min	Runoff Volume	= 22,441 cuft
Drainage Area	= 6.75 ac	Runoff Coeff.	= 0.57
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 11.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.62 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin "D"

Hyd. No. 12

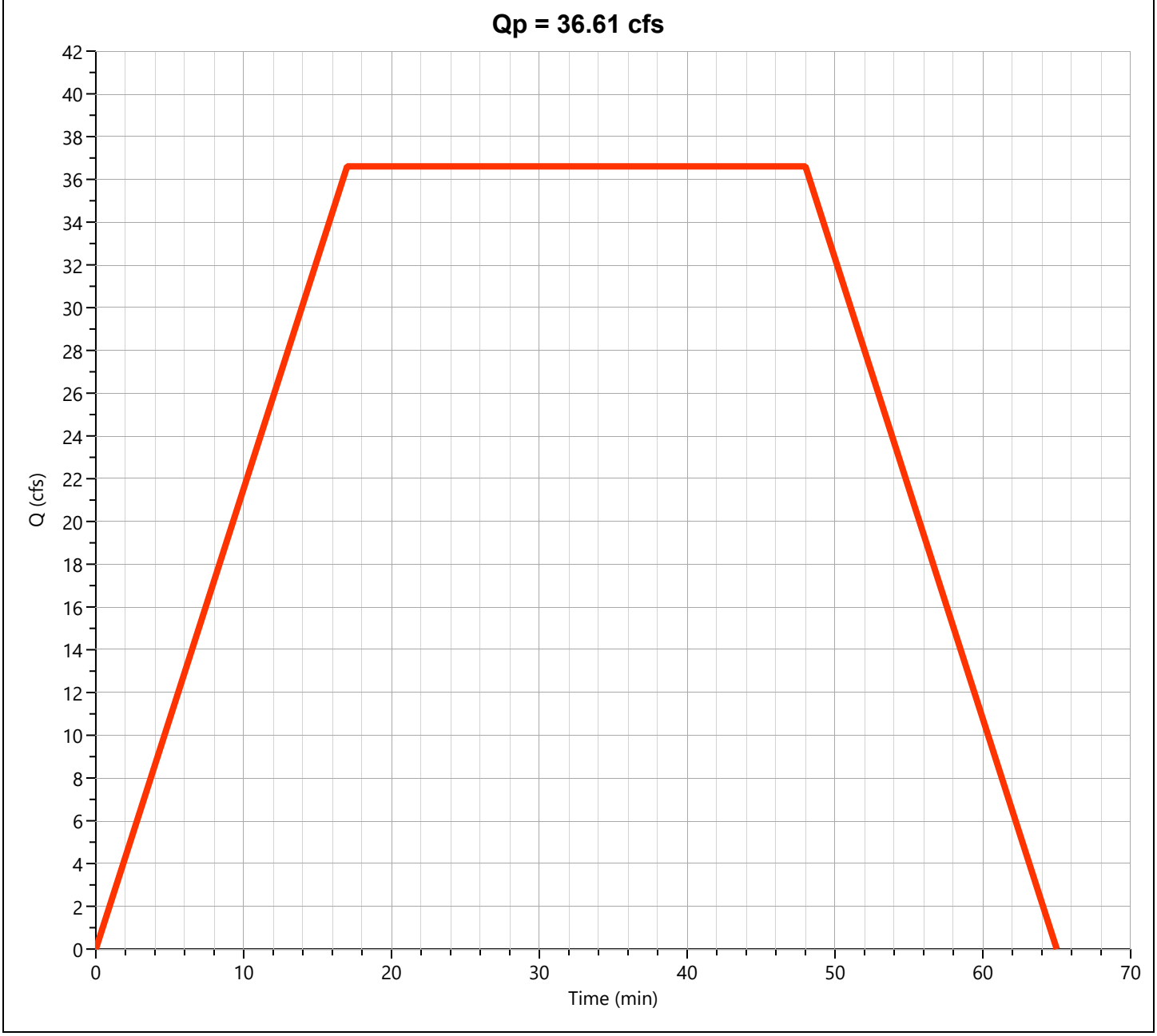
Hydrograph Type	= Rational	Peak Flow	= 11.08 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.13 hrs
Time Interval	= 1 min	Runoff Volume	= 7,098 cuft
Drainage Area	= 2.59 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 7.64 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin "E-1"

Hyd. No. 13

Hydrograph Type	= Mod Rational	Peak Flow	= 36.61 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.28 hrs
Time Interval	= 1 min	Runoff Volume	= 105,431 cuft
Drainage Area	= 16.23 ac	Runoff Coeff.	= 0.66
Tc Method	= User	Time of Conc. (Tc)	= 17.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 3.42 in/hr
Freq. Corr. Factor	= 1.00	Storm Duration	= 2.82 x Tc
Target Q	= 0.000 cfs	Required Storage	= 0.000 cuft



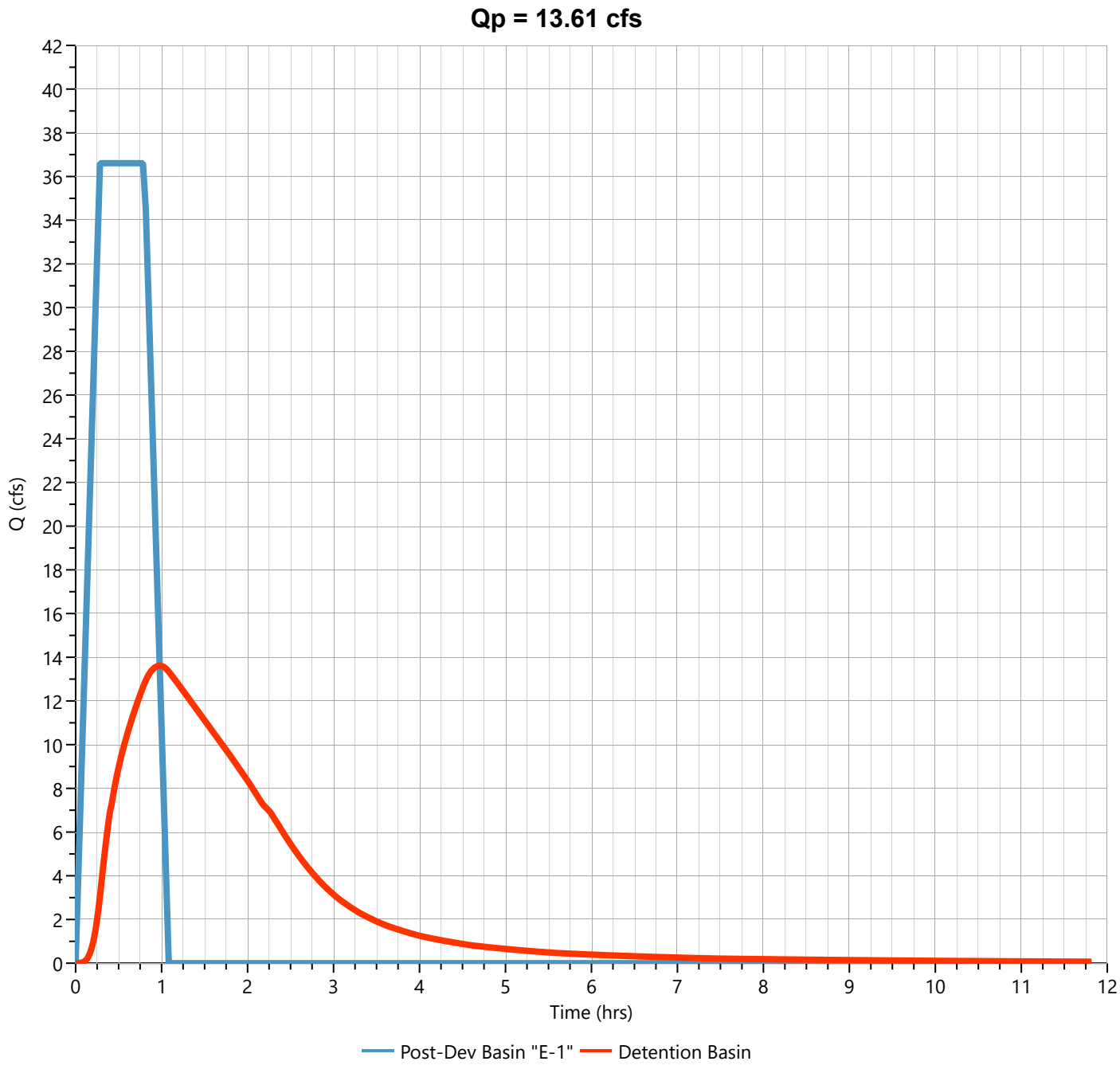
Detention Basin

Hyd. No. 14

Hydrograph Type	= Pond Route	Peak Flow	= 13.61 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.98 hrs
Time Interval	= 1 min	Hydrograph Volume	= 105,341 cuft
Inflow Hydrograph	= 13 - Post-Dev Basin "E-1"	Max. Elevation	= 478.31 ft
Pond Name	= Hilltop Detention Pond	Max. Storage	= 76,654 cuft

Pond Routing by Storage Indication Method

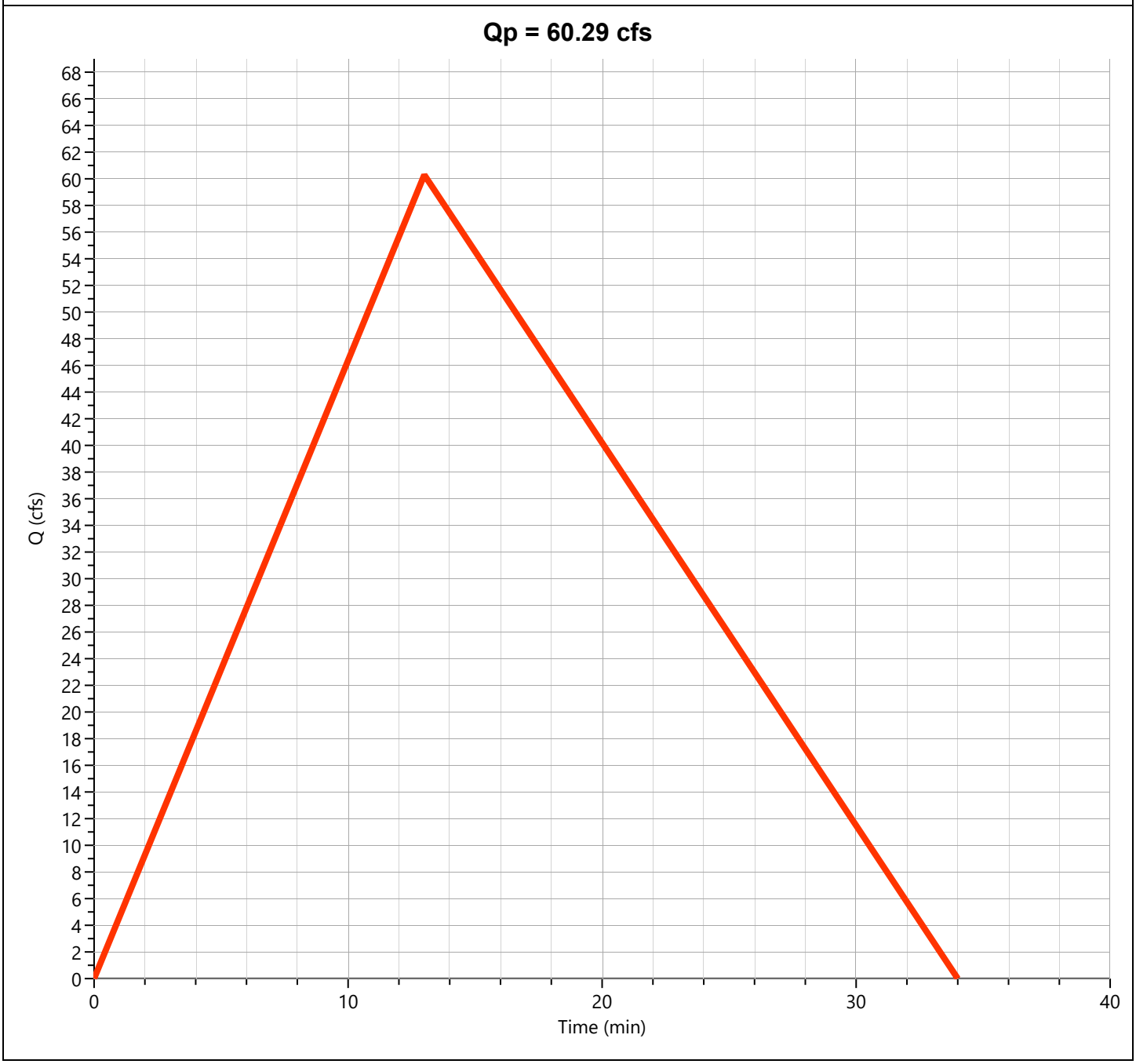
Center of mass detention time = 1.35 hrs



Post-Dev Basin "E-2"

Hyd. No. 15

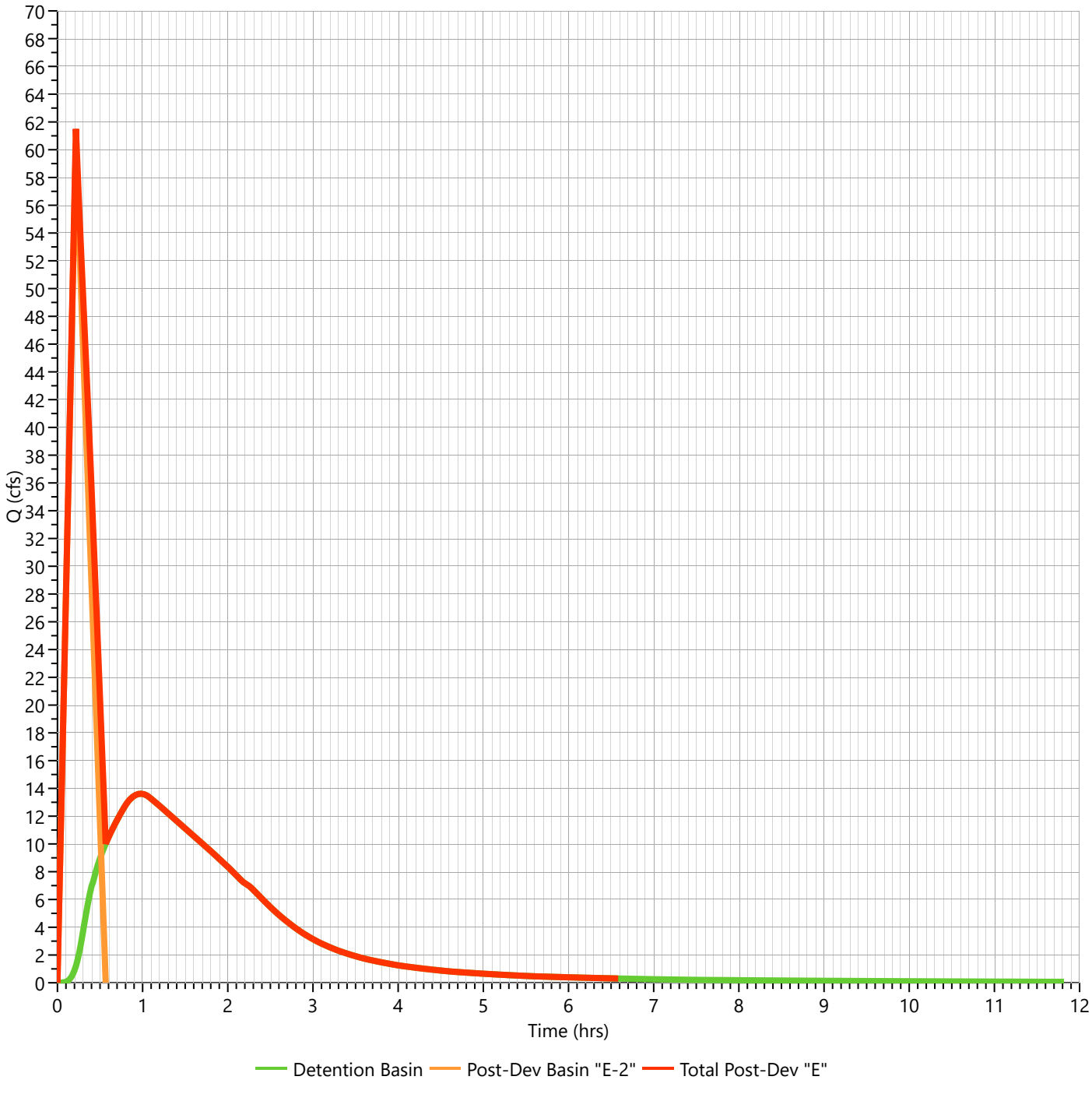
Hydrograph Type	= Rational	Peak Flow	= 60.29 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Runoff Volume	= 62,782 cuft
Drainage Area	= 17.53 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.14 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Total Post-Dev "E"

Hyd. No. 16

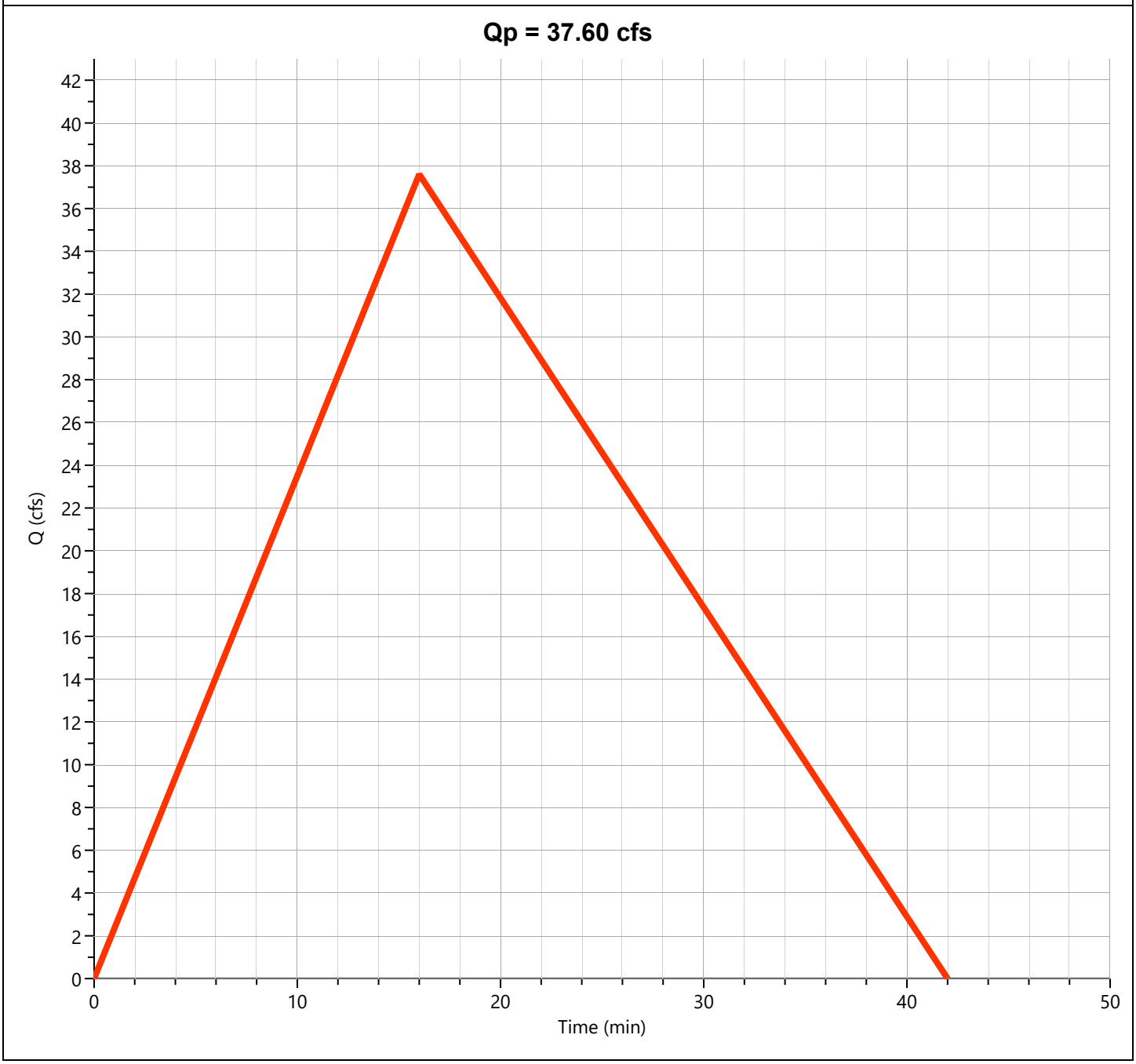
Hydrograph Type	= Junction	Peak Flow	= 61.49 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Hydrograph Volume	= 166,838 cuft
Inflow Hydrographs	= 15	Total Contrib. Area	= 17.53 ac



Post-Dev Basin "F"

Hyd. No. 17

Hydrograph Type	= Rational	Peak Flow	= 37.60 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.27 hrs
Time Interval	= 1 min	Runoff Volume	= 48,189 cuft
Drainage Area	= 12.0 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 16.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 5.60 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Hydrograph 50-yr Summary

Hydrology Studio v 3.0.0.39

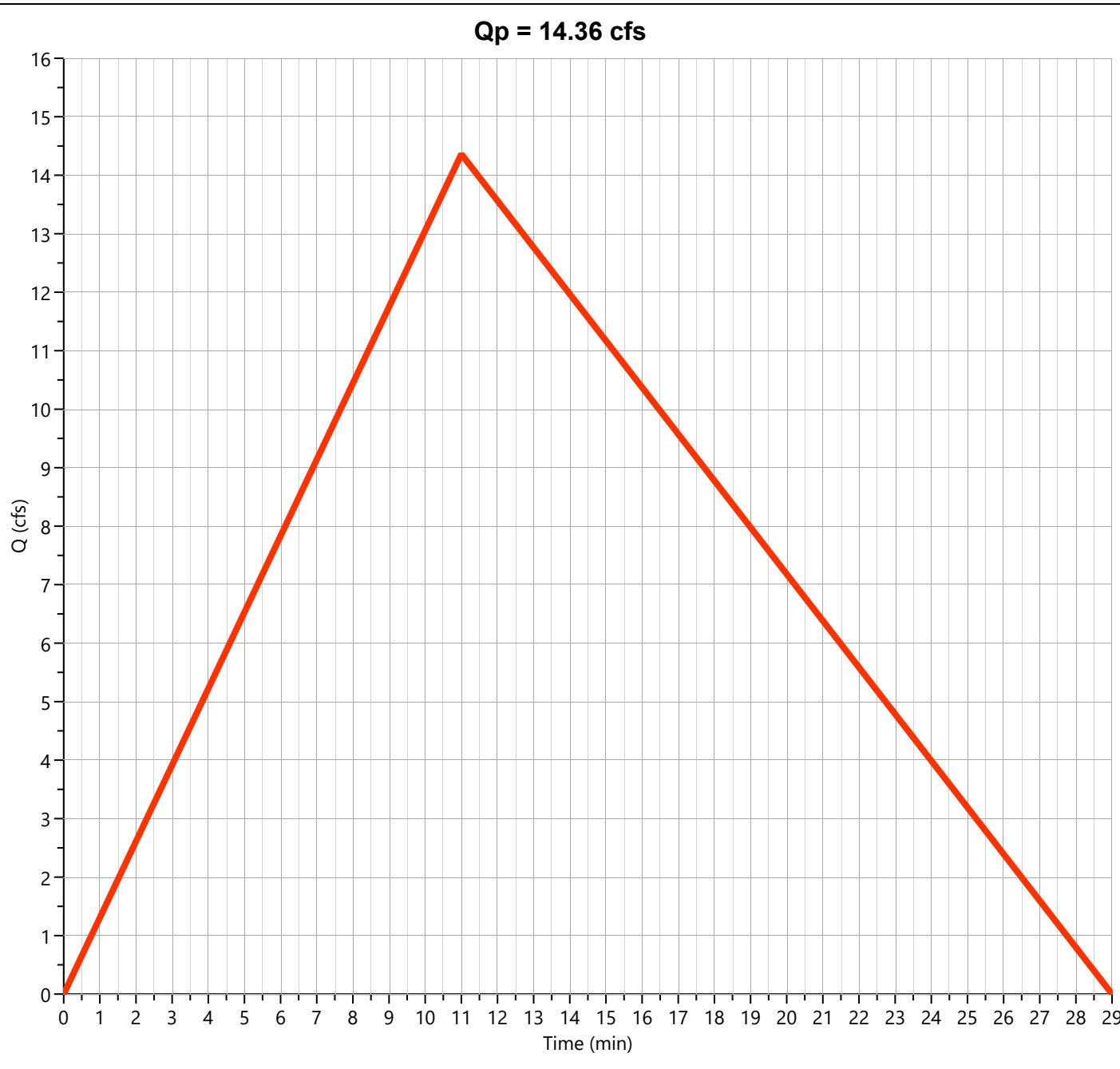
Project Name: Hilltop Subdivision
File: Detention Calculation 3-4-26.hys
03-04-2026

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 "A"	14.36	0.18	12,653	----		
2	Rational	Pre-Dev Basin "B"	48.29	0.25	58,019	----		
3	Rational	Pre-Dev Basin "C"	27.23	0.18	23,992	----		
4	Rational	Pre-Dev Basin "D"	12.31	0.13	7,889	----		
5	Rational	Pre-Dev Basin "E-1"	38.98	0.20	37,472	----		
6	Rational	Pre-Dev Basin "E-2"	66.22	0.22	68,955	----		
7	Junction	Total Pre Basin "E"	103.3	0.22	104,970	5, 6		
8	Rational	Pre-Dev Basin "F"	41.64	0.28	56,705	----		
9	Rational	Post-Dev Basin A	15.14	0.23	16,976	----		
10	Rational	Post-Dev Basin B	40.48	0.30	58,368	----		
11	Rational	Post-Dev Basin "C"	27.85	0.18	24,537	----		
12	Rational	Post-Dev Basin "D"	12.11	0.13	7,757	----		
13	Mod Rational	Post-Dev Basin "E-1"	40.10	0.28	115,494	----		
14	Pond Route	Detention Basin	14.43	0.98	115,403	13	478.63	84,597
15	Rational	Post-Dev Basin "E-2"	65.94	0.22	68,659	----		
16	Junction	Total Post-Dev "E"	67.36	0.22	182,657	14, 15		
17	Rational	Post-Dev Basin "F"	41.13	0.27	52,714	----		

Pre-Dev Basin "A"

Hyd. No. 1

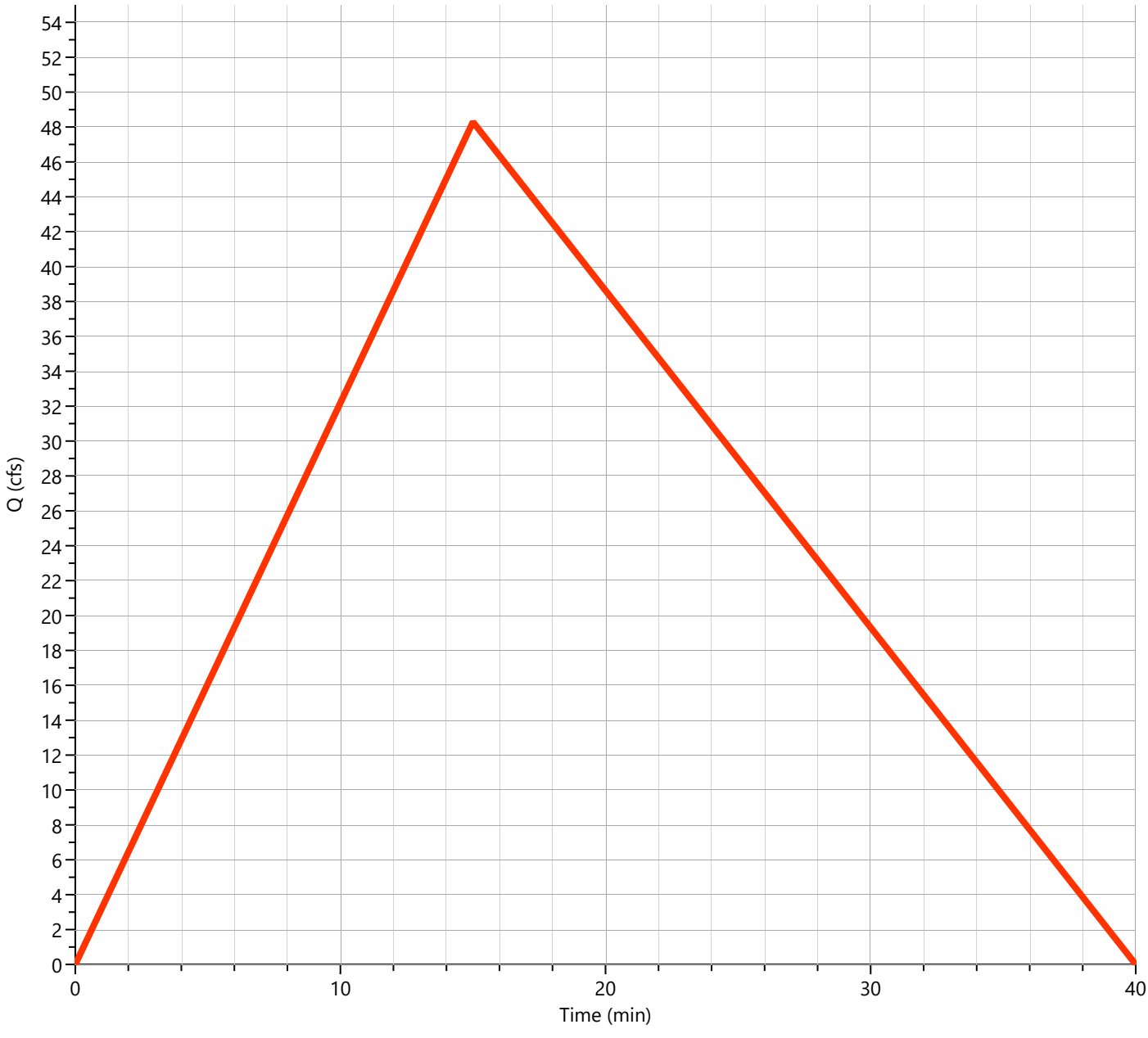
Hydrograph Type	= Rational	Peak Flow	= 14.36 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.18 hrs
Time Interval	= 1 min	Runoff Volume	= 12,653 cuft
Drainage Area	= 3.2 ac	Runoff Coeff.	= 0.62
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 11.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 7.24 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "B"

Hyd. No. 2

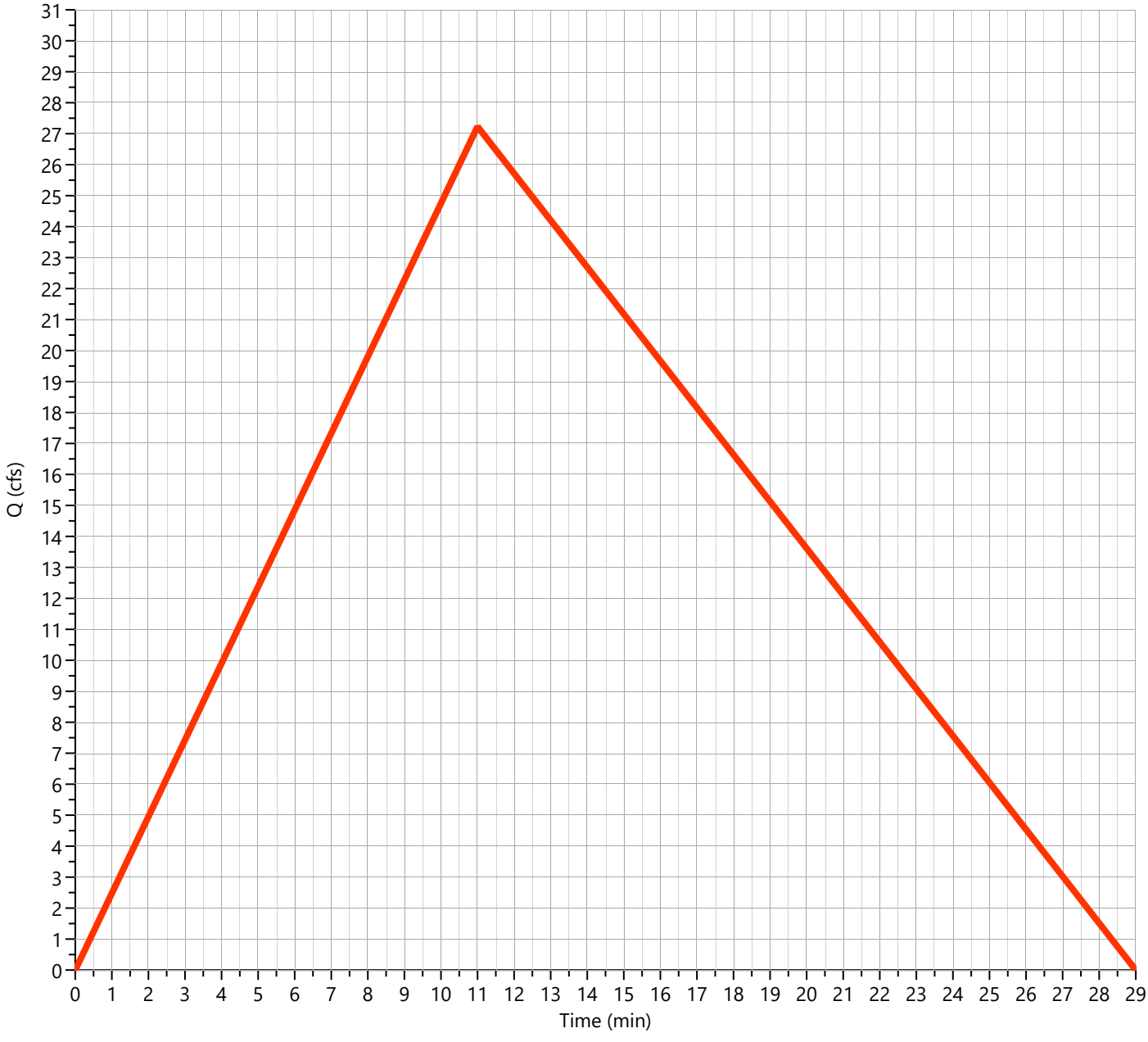
Hydrograph Type	= Rational	Peak Flow	= 48.29 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.25 hrs
Time Interval	= 1 min	Runoff Volume	= 58,019 cuft
Drainage Area	= 14.74 ac	Runoff Coeff.	= 0.52
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 15.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.30 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "C"

Hyd. No. 3

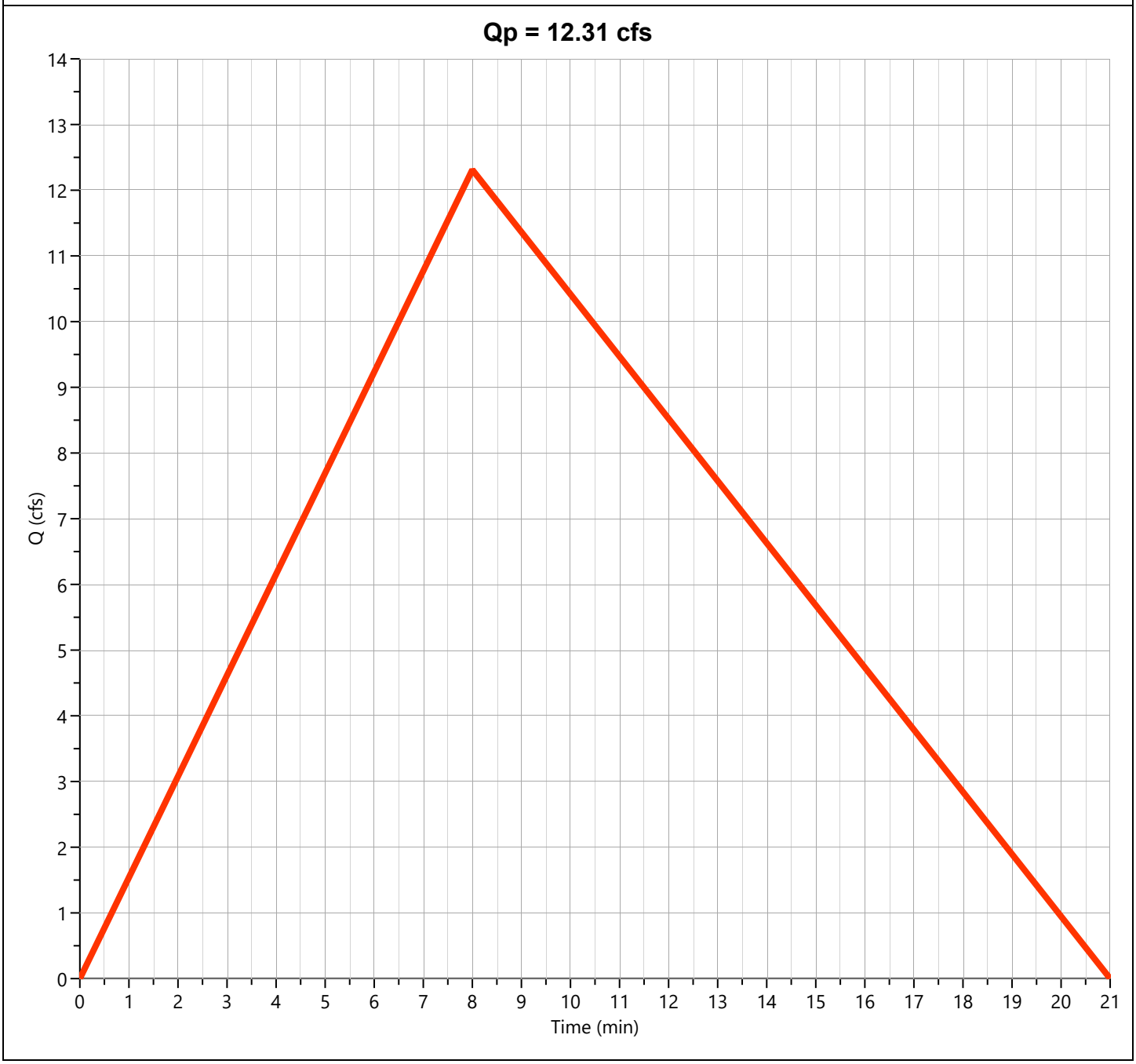
Hydrograph Type	= Rational	Peak Flow	= 27.23 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.18 hrs
Time Interval	= 1 min	Runoff Volume	= 23,992 cuft
Drainage Area	= 6.84 ac	Runoff Coeff.	= 0.55
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 11.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 7.24 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "D"

Hyd. No. 4

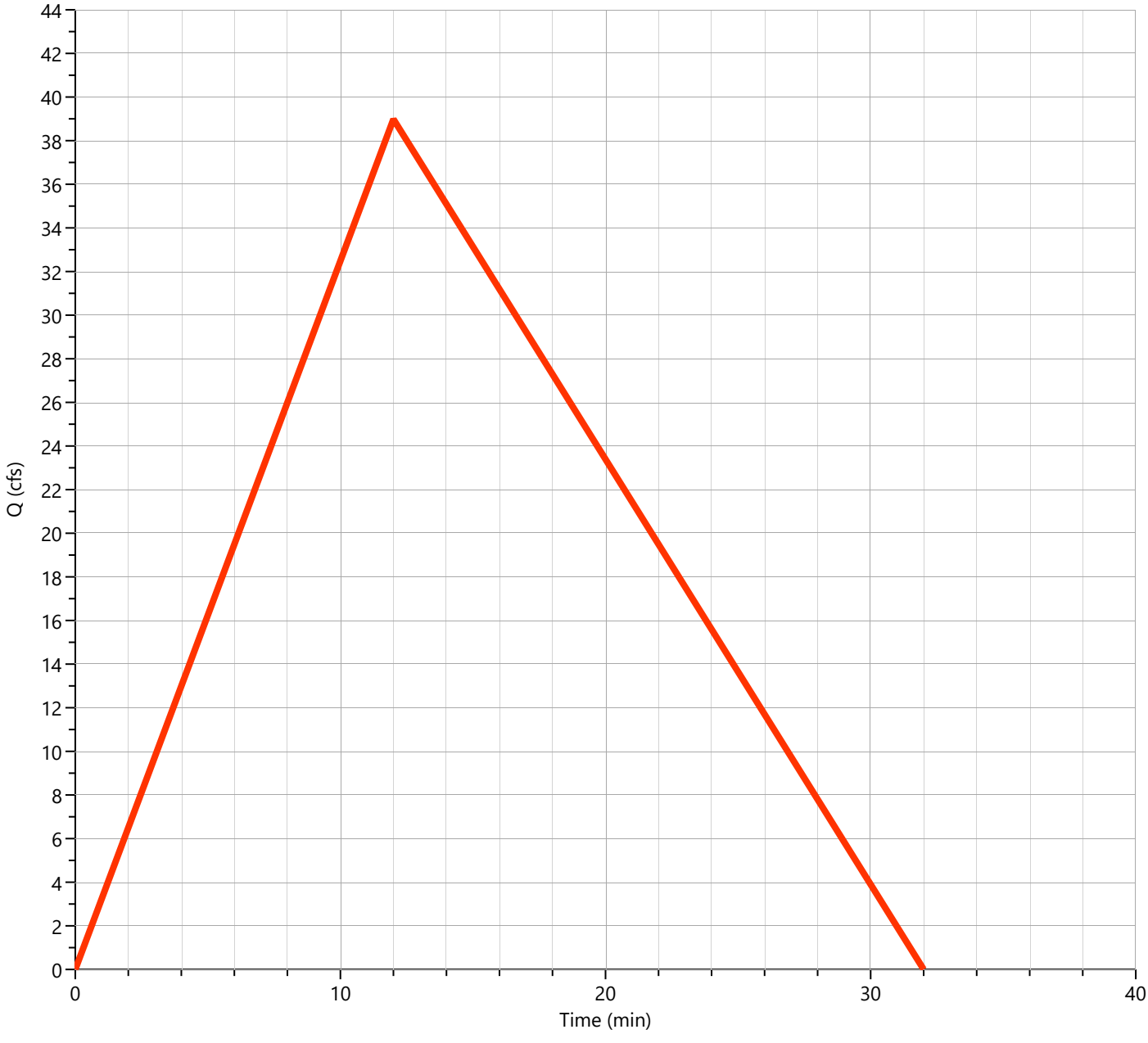
Hydrograph Type	= Rational	Peak Flow	= 12.31 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.13 hrs
Time Interval	= 1 min	Runoff Volume	= 7,889 cuft
Drainage Area	= 2.95 ac	Runoff Coeff.	= 0.50
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 8.35 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "E-1"

Hyd. No. 5

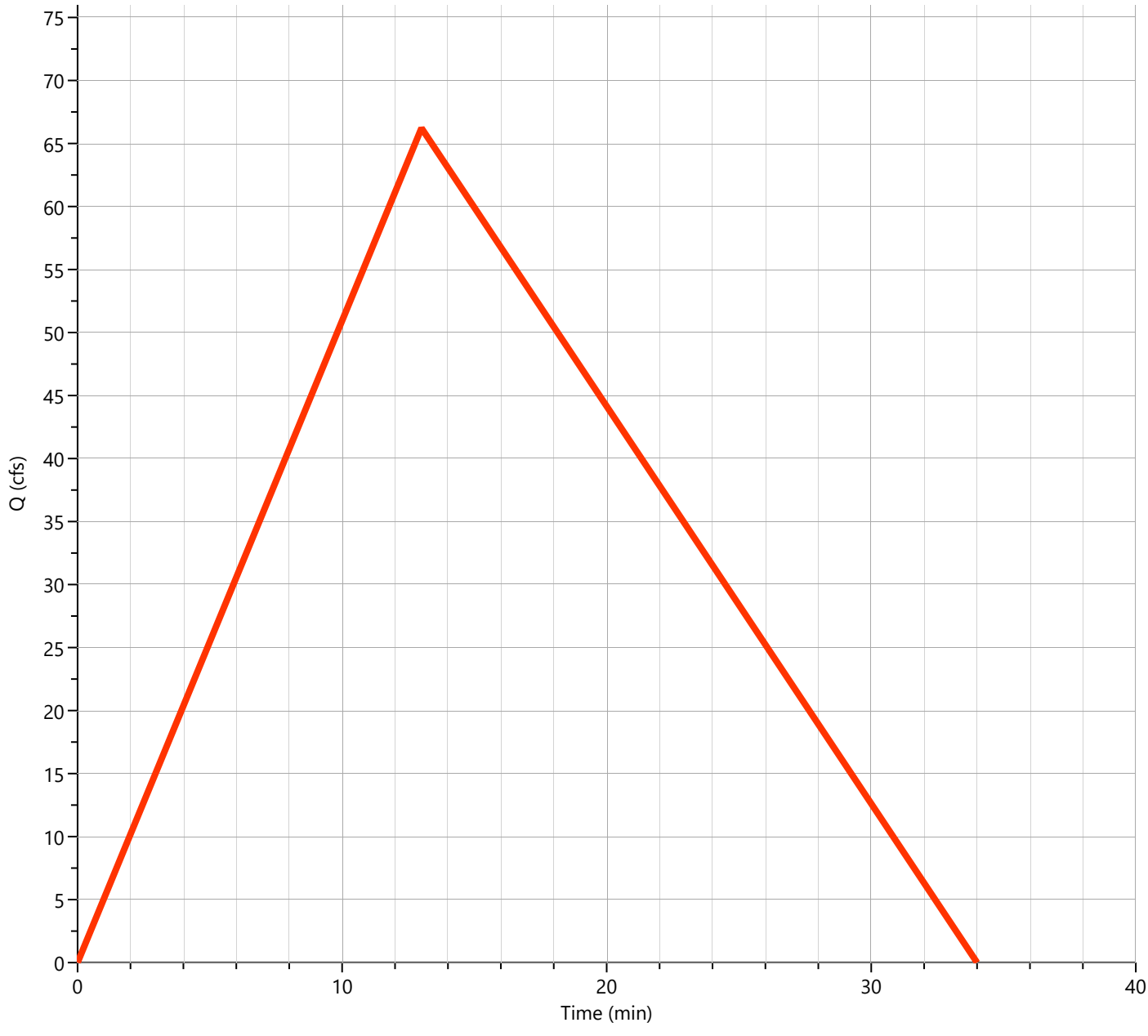
Hydrograph Type	= Rational	Peak Flow	= 38.98 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.20 hrs
Time Interval	= 1 min	Runoff Volume	= 37,472 cuft
Drainage Area	= 11.2 ac	Runoff Coeff.	= 0.50
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 12.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.96 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "E-2"

Hyd. No. 6

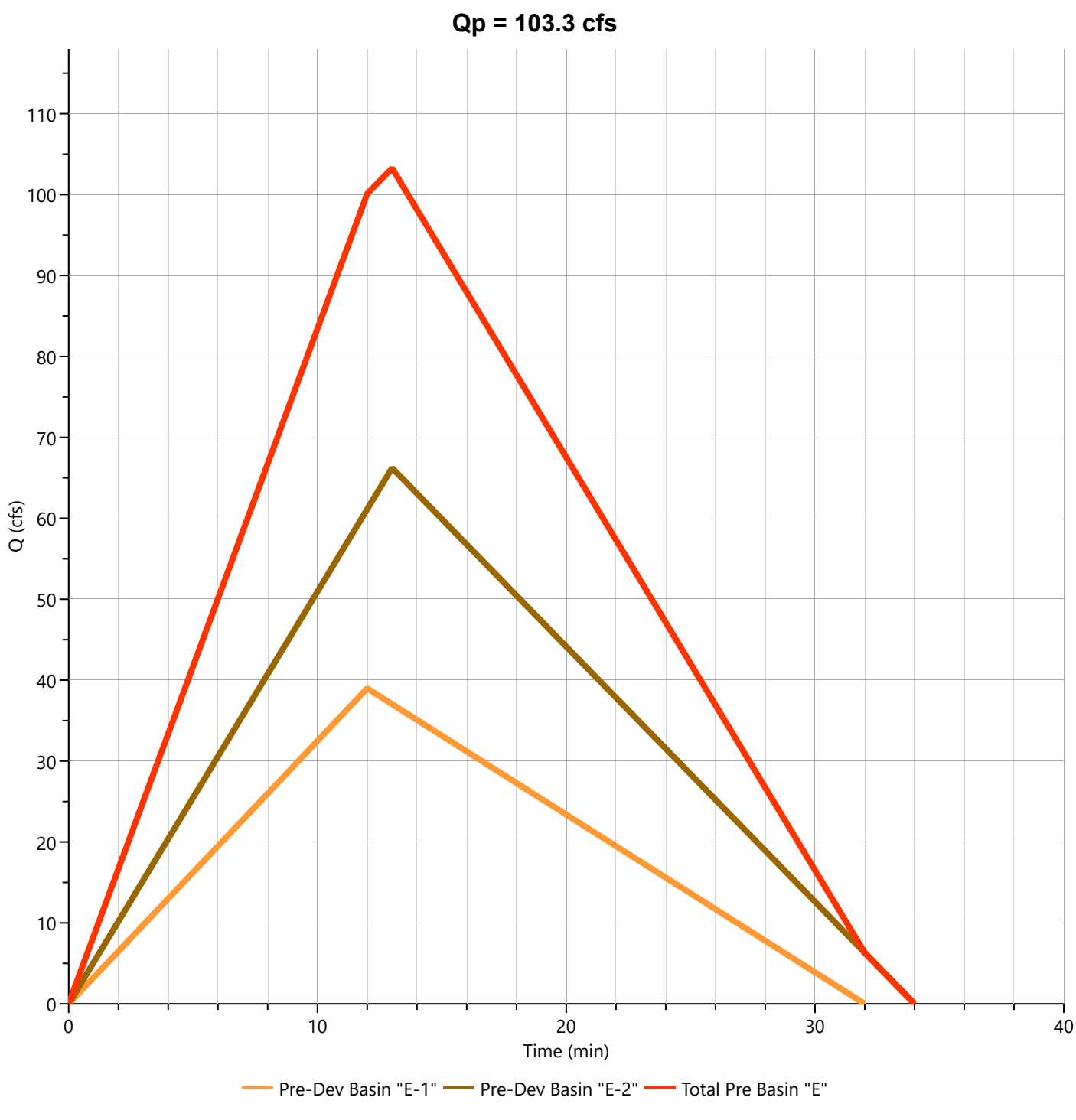
Hydrograph Type	= Rational	Peak Flow	= 66.22 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Runoff Volume	= 68,955 cuft
Drainage Area	= 18.96 ac	Runoff Coeff.	= 0.52
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.72 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Total Pre Basin "E"

Hyd. No. 7

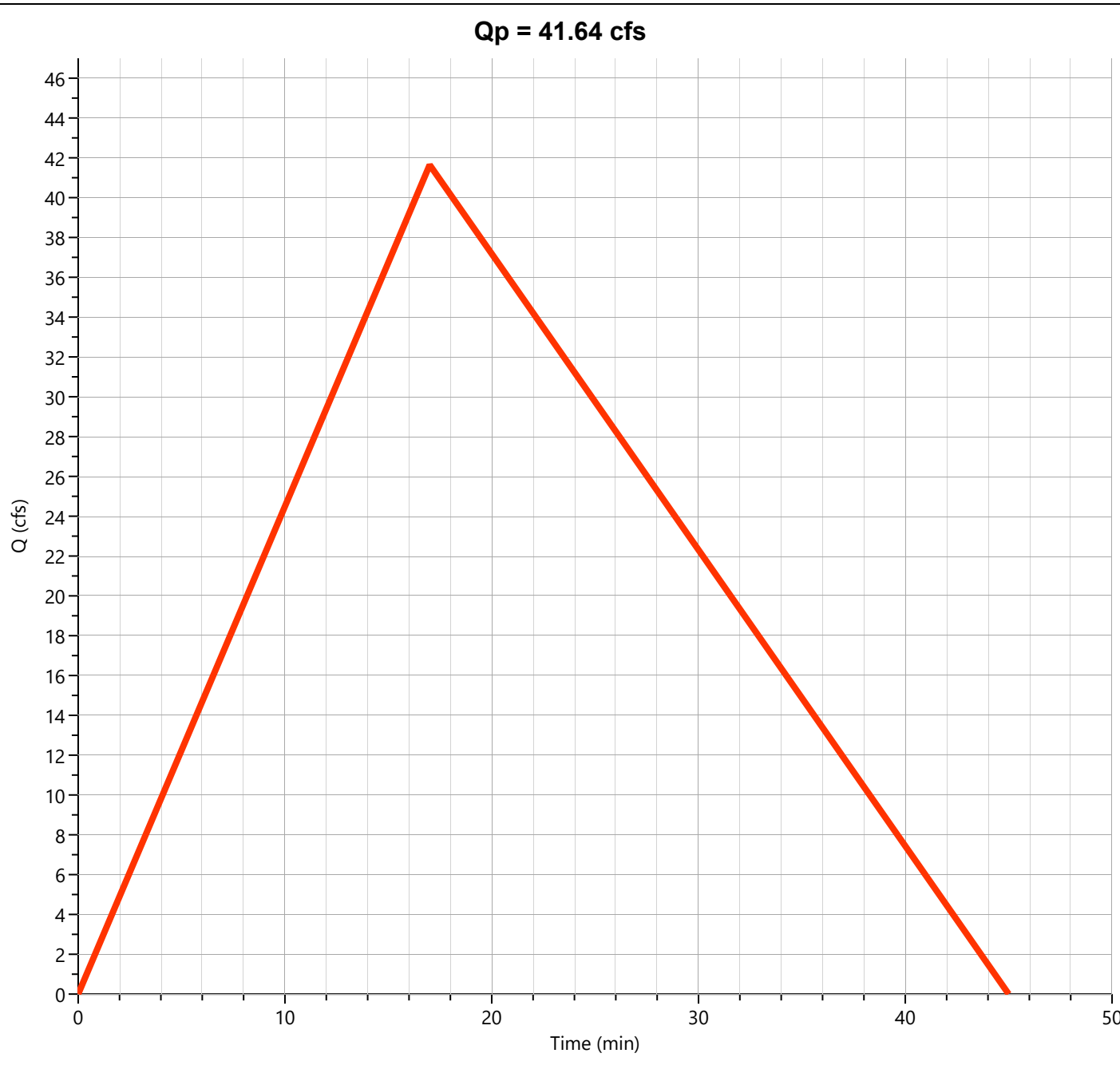
Hydrograph Type	= Junction	Peak Flow	= 103.3 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Hydrograph Volume	= 104,970 cuft
Inflow Hydrographs	= 5, 6	Total Contrib. Area	= 30.16 ac



Pre-Dev Basin "F"

Hyd. No. 8

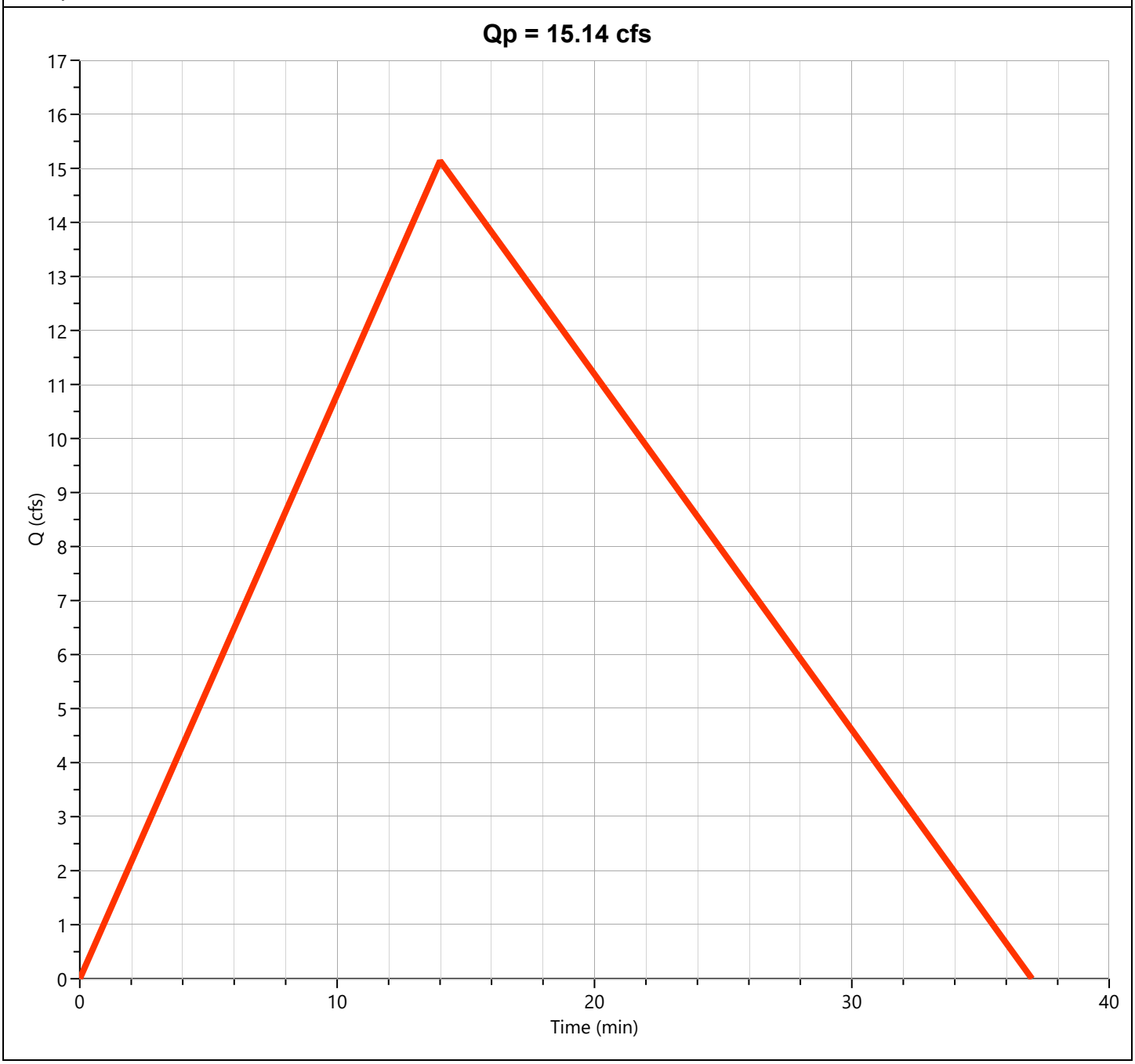
Hydrograph Type	= Rational	Peak Flow	= 41.64 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.28 hrs
Time Interval	= 1 min	Runoff Volume	= 56,705 cuft
Drainage Area	= 13.19 ac	Runoff Coeff.	= 0.53
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 17.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 5.96 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin A

Hyd. No. 9

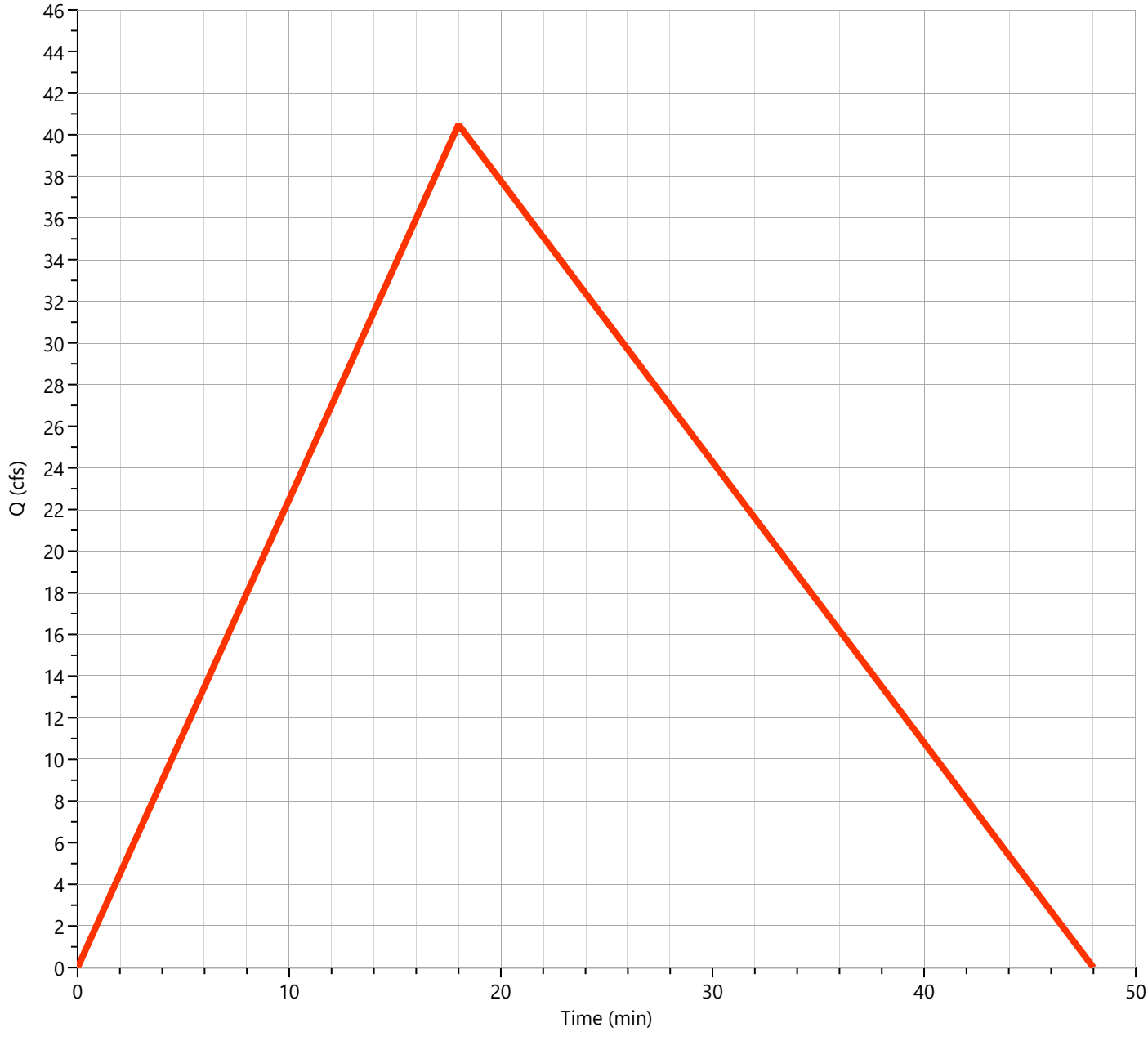
Hydrograph Type	= Rational	Peak Flow	= 15.14 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.23 hrs
Time Interval	= 1 min	Runoff Volume	= 16,976 cuft
Drainage Area	= 3.53 ac	Runoff Coeff.	= 0.66
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 14.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.50 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin B

Hyd. No. 10

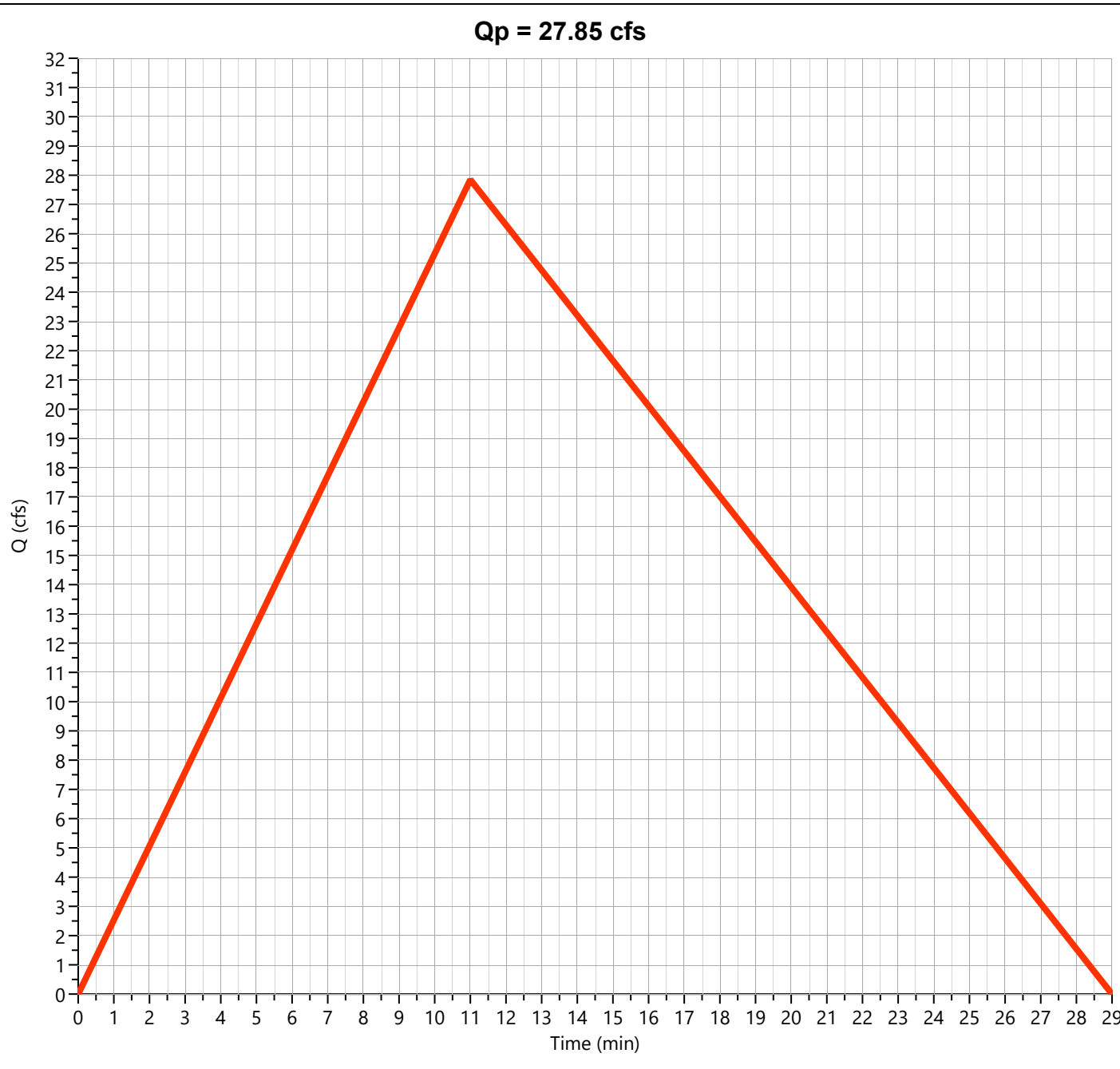
Hydrograph Type	= Rational	Peak Flow	= 40.48 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.30 hrs
Time Interval	= 1 min	Runoff Volume	= 58,368 cuft
Drainage Area	= 12.45 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 18.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 5.81 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin "C"

Hyd. No. 11

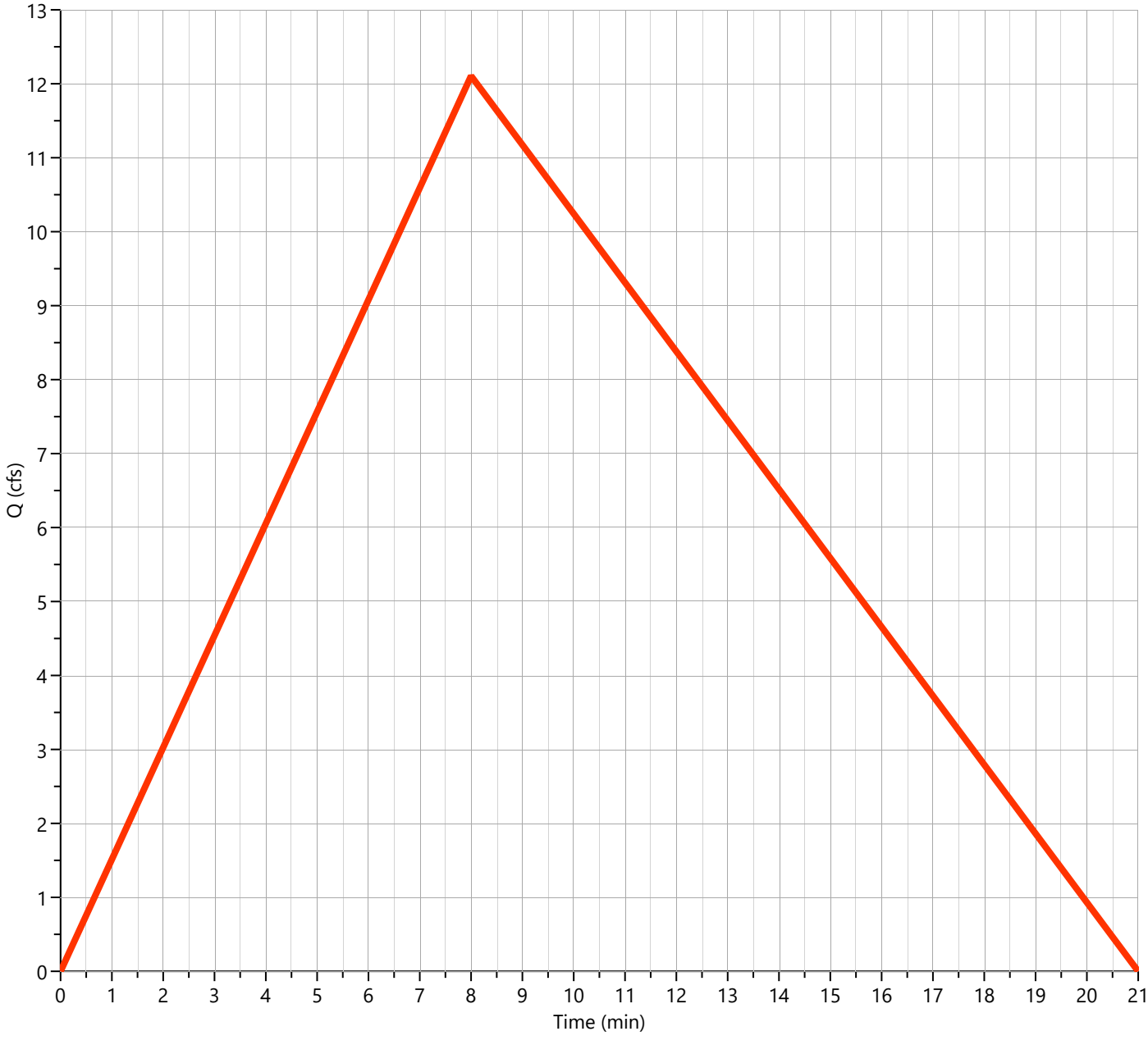
Hydrograph Type	= Rational	Peak Flow	= 27.85 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.18 hrs
Time Interval	= 1 min	Runoff Volume	= 24,537 cuft
Drainage Area	= 6.75 ac	Runoff Coeff.	= 0.57
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 11.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 7.24 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin "D"

Hyd. No. 12

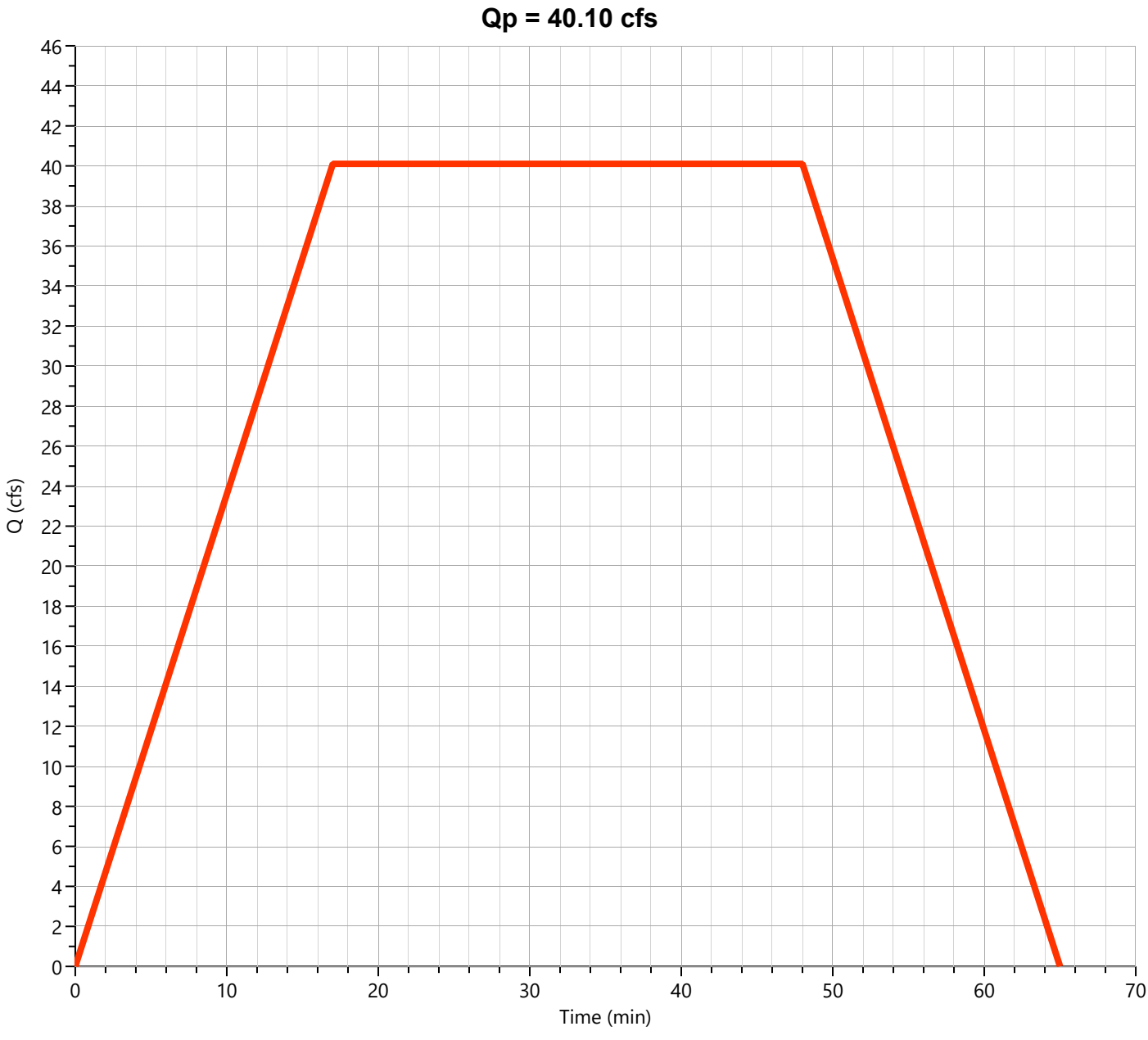
Hydrograph Type	= Rational	Peak Flow	= 12.11 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.13 hrs
Time Interval	= 1 min	Runoff Volume	= 7,757 cuft
Drainage Area	= 2.59 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 8.35 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin "E-1"

Hyd. No. 13

Hydrograph Type	= Mod Rational	Peak Flow	= 40.10 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.28 hrs
Time Interval	= 1 min	Runoff Volume	= 115,494 cuft
Drainage Area	= 16.23 ac	Runoff Coeff.	= 0.66
Tc Method	= User	Time of Conc. (Tc)	= 17.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 3.74 in/hr
Freq. Corr. Factor	= 1.00	Storm Duration	= 2.82 x Tc
Target Q	= 0.000 cfs	Required Storage	= 0.000 cuft



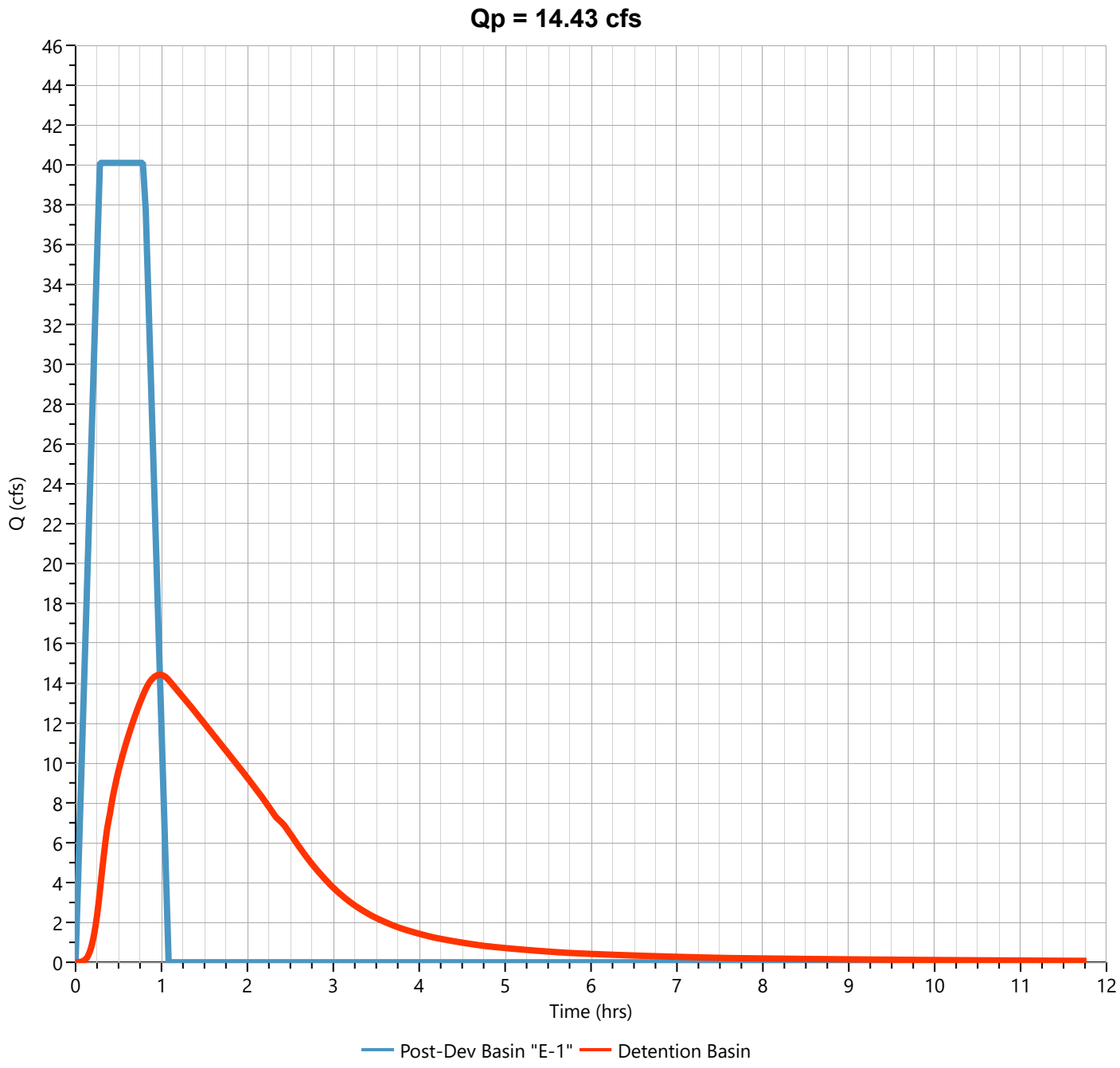
Detention Basin

Hyd. No. 14

Hydrograph Type	= Pond Route	Peak Flow	= 14.43 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.98 hrs
Time Interval	= 1 min	Hydrograph Volume	= 115,403 cuft
Inflow Hydrograph	= 13 - Post-Dev Basin "E-1"	Max. Elevation	= 478.63 ft
Pond Name	= Hilltop Detention Pond	Max. Storage	= 84,597 cuft

Pond Routing by Storage Indication Method

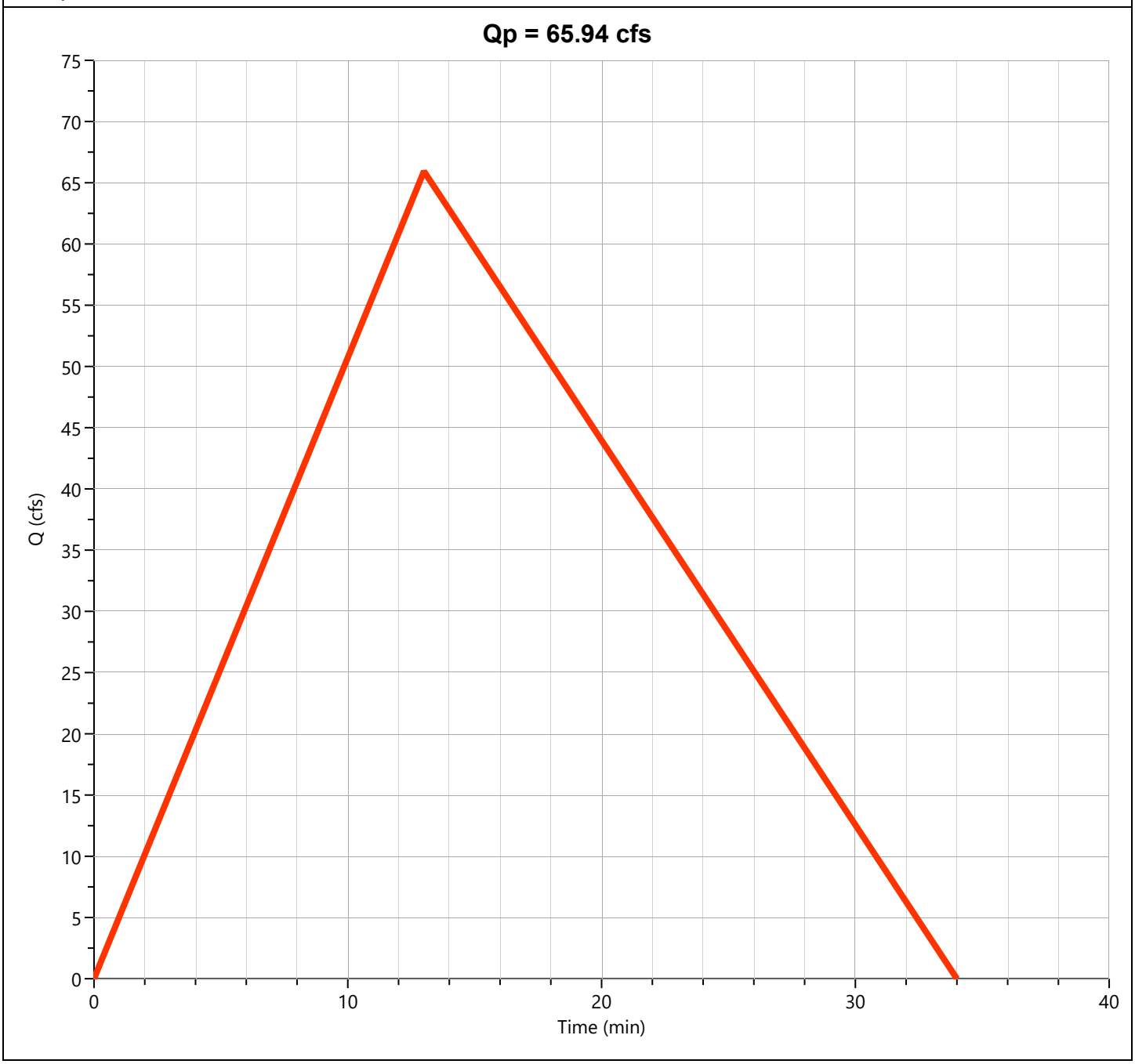
Center of mass detention time = 1.37 hrs



Post-Dev Basin "E-2"

Hyd. No. 15

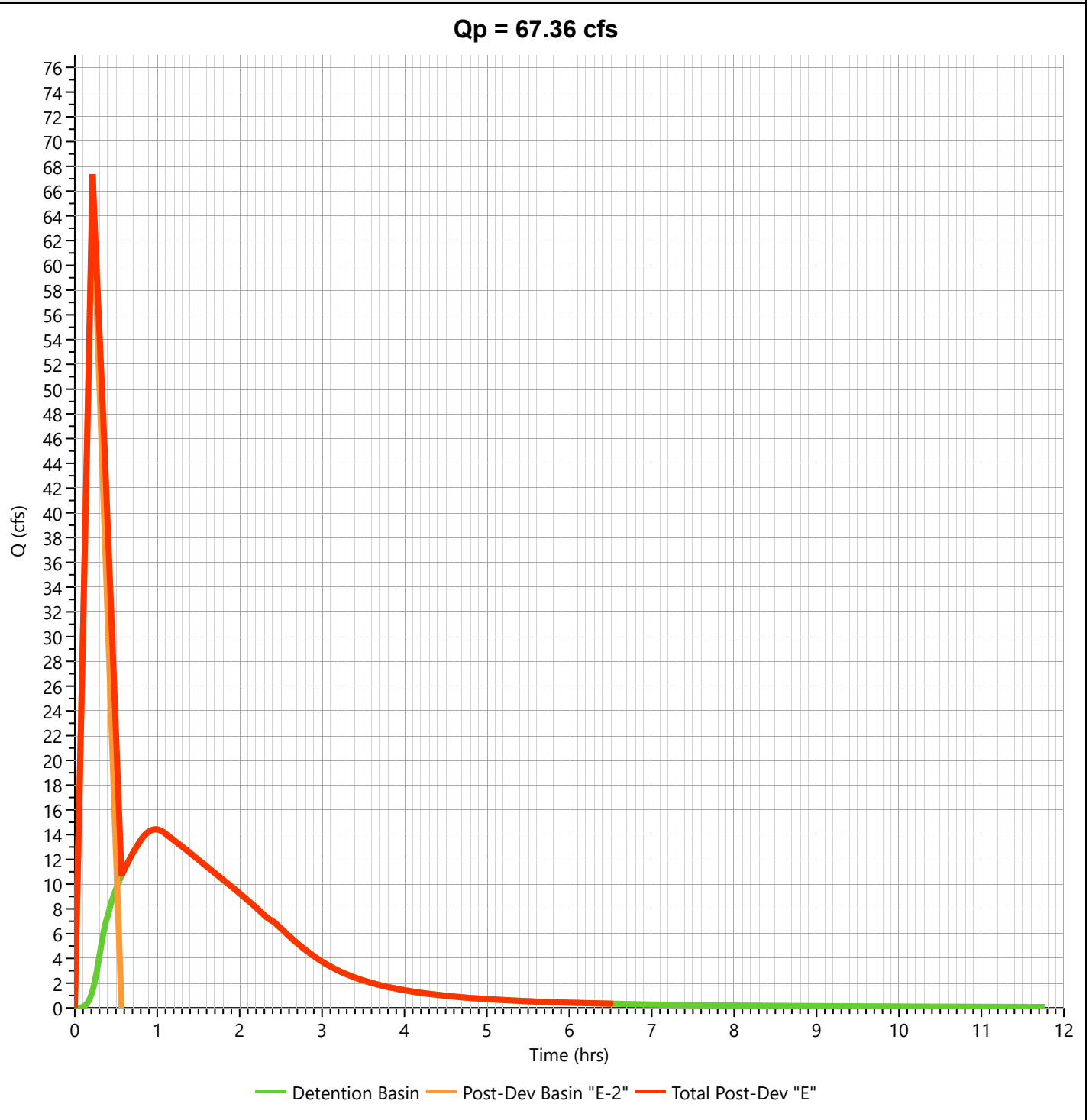
Hydrograph Type	= Rational	Peak Flow	= 65.94 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Runoff Volume	= 68,659 cuft
Drainage Area	= 17.53 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.72 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Total Post-Dev "E"

Hyd. No. 16

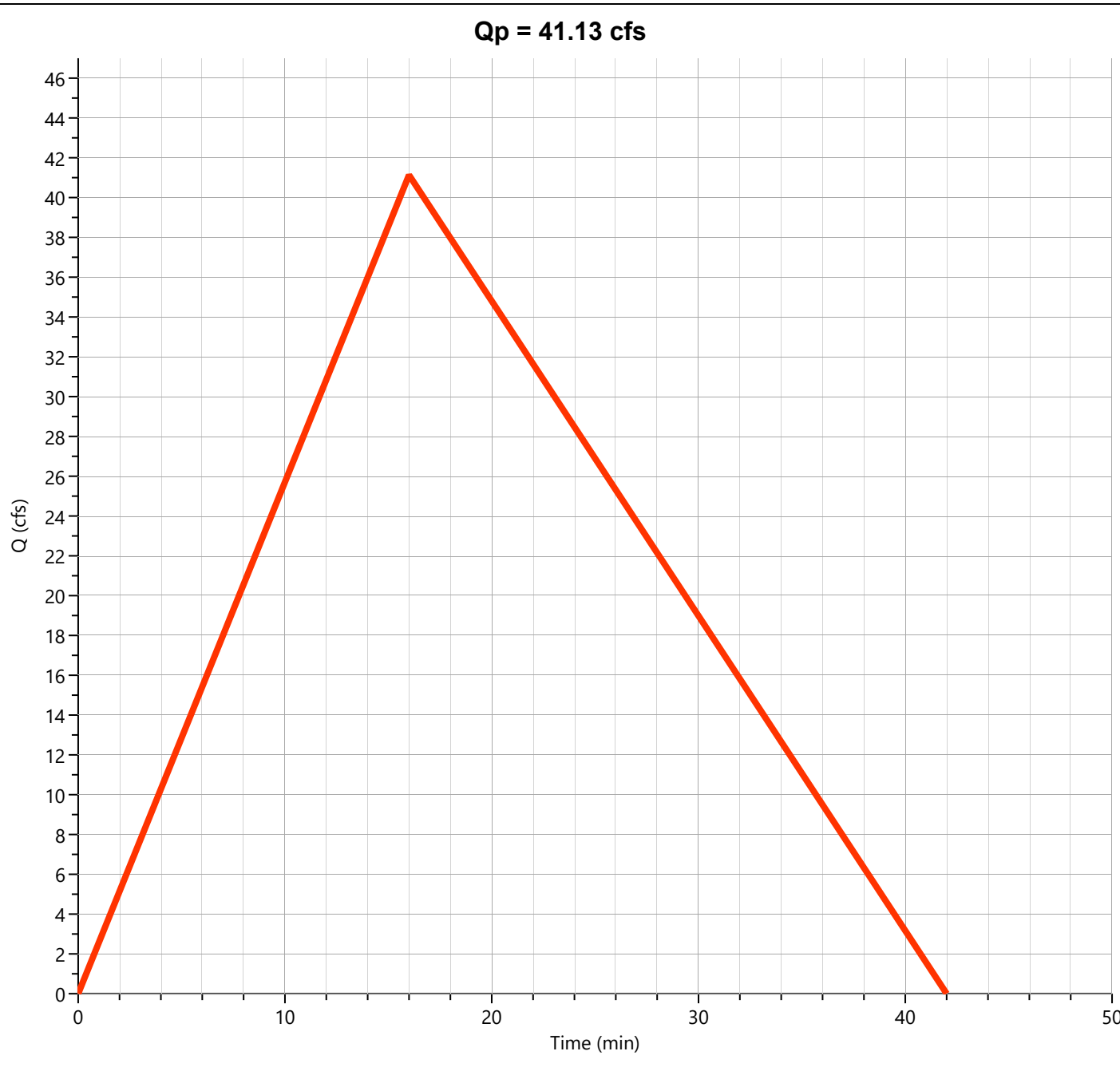
Hydrograph Type	= Junction	Peak Flow	= 67.36 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Hydrograph Volume	= 182,657 cuft
Inflow Hydrographs	= 15	Total Contrib. Area	= 17.53 ac



Post-Dev Basin "F"

Hyd. No. 17

Hydrograph Type	= Rational	Peak Flow	= 41.13 cfs
Storm Frequency	= 50-yr	Time to Peak	= 0.27 hrs
Time Interval	= 1 min	Runoff Volume	= 52,714 cuft
Drainage Area	= 12.0 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 16.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.12 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Hydrograph 100-yr Summary

Hydrology Studio v 3.0.0.39

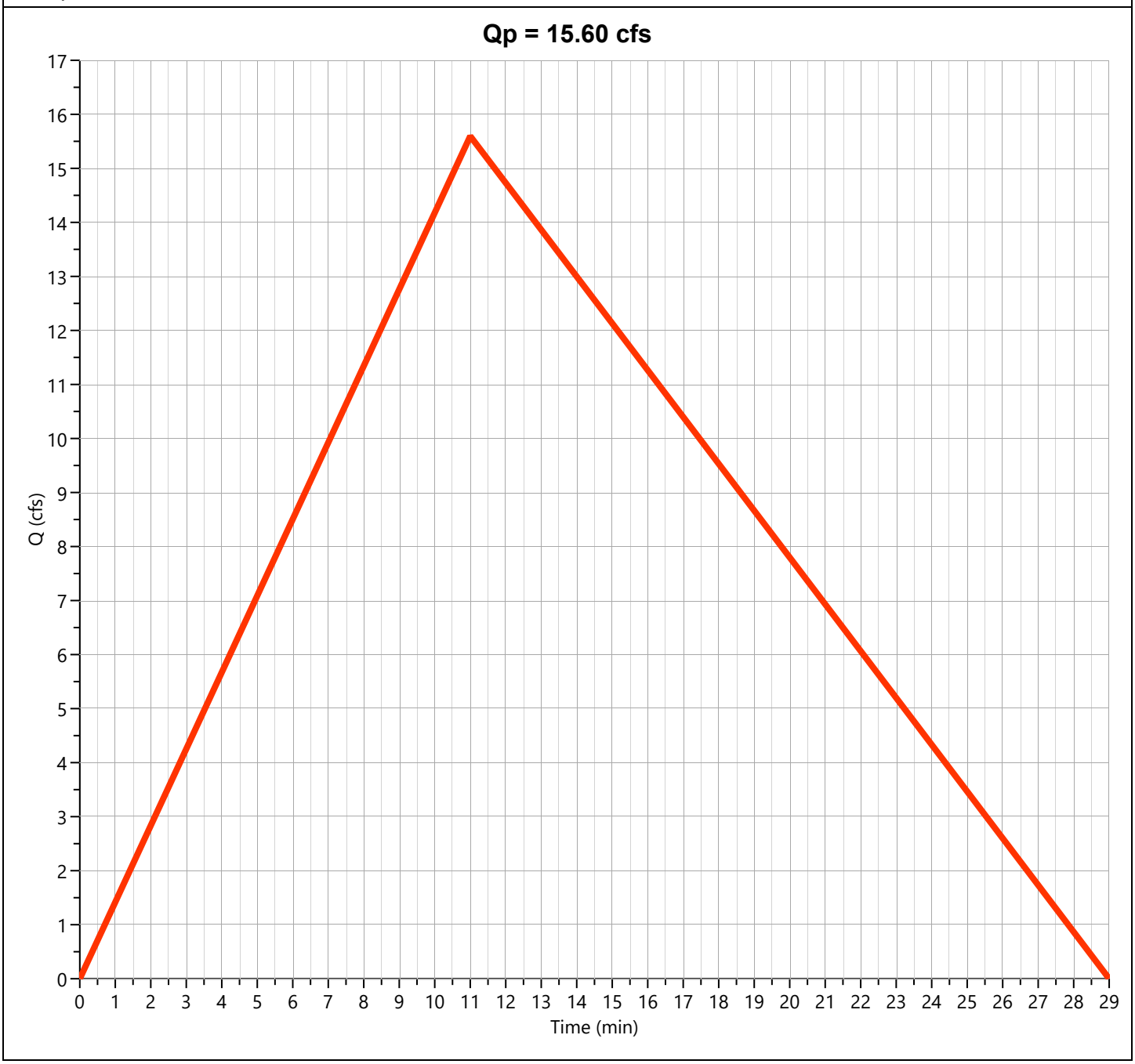
Project Name: Hilltop Subdivision
File: Detention Calculation 3-4-26.hys
03-04-2026

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 "A"	15.60	0.18	13,742	----		
2	Rational	Pre-Dev Basin "B"	52.42	0.25	62,983	----		
3	Rational	Pre-Dev Basin "C"	29.57	0.18	26,057	----		
4	Rational	Pre-Dev Basin "D"	13.38	0.13	8,572	----		
5	Rational	Pre-Dev Basin "E-1"	42.33	0.20	40,692	----		
6	Rational	Pre-Dev Basin "E-2"	71.90	0.22	74,872	----		
7	Junction	Total Pre Basin "E"	112.1	0.22	113,981	5, 6		
8	Rational	Pre-Dev Basin "F"	45.20	0.28	61,545	----		
9	Rational	Post-Dev Basin A	16.43	0.23	18,430	----		
10	Rational	Post-Dev Basin B	43.93	0.30	63,344	----		
11	Rational	Post-Dev Basin "C"	30.24	0.18	26,649	----		
12	Rational	Post-Dev Basin "D"	13.15	0.13	8,429	----		
13	Mod Rational	Post-Dev Basin "E-1"	43.46	0.28	125,154	----		
14	Pond Route	Detention Basin	15.18	0.98	125,061	13	478.93	92,311
15	Rational	Post-Dev Basin "E-2"	71.59	0.22	74,550	----		
16	Junction	Total Post-Dev "E"	73.24	0.22	198,086	14, 15		
17	Rational	Post-Dev Basin "F"	44.65	0.27	57,218	----		

Pre-Dev Basin "A"

Hyd. No. 1

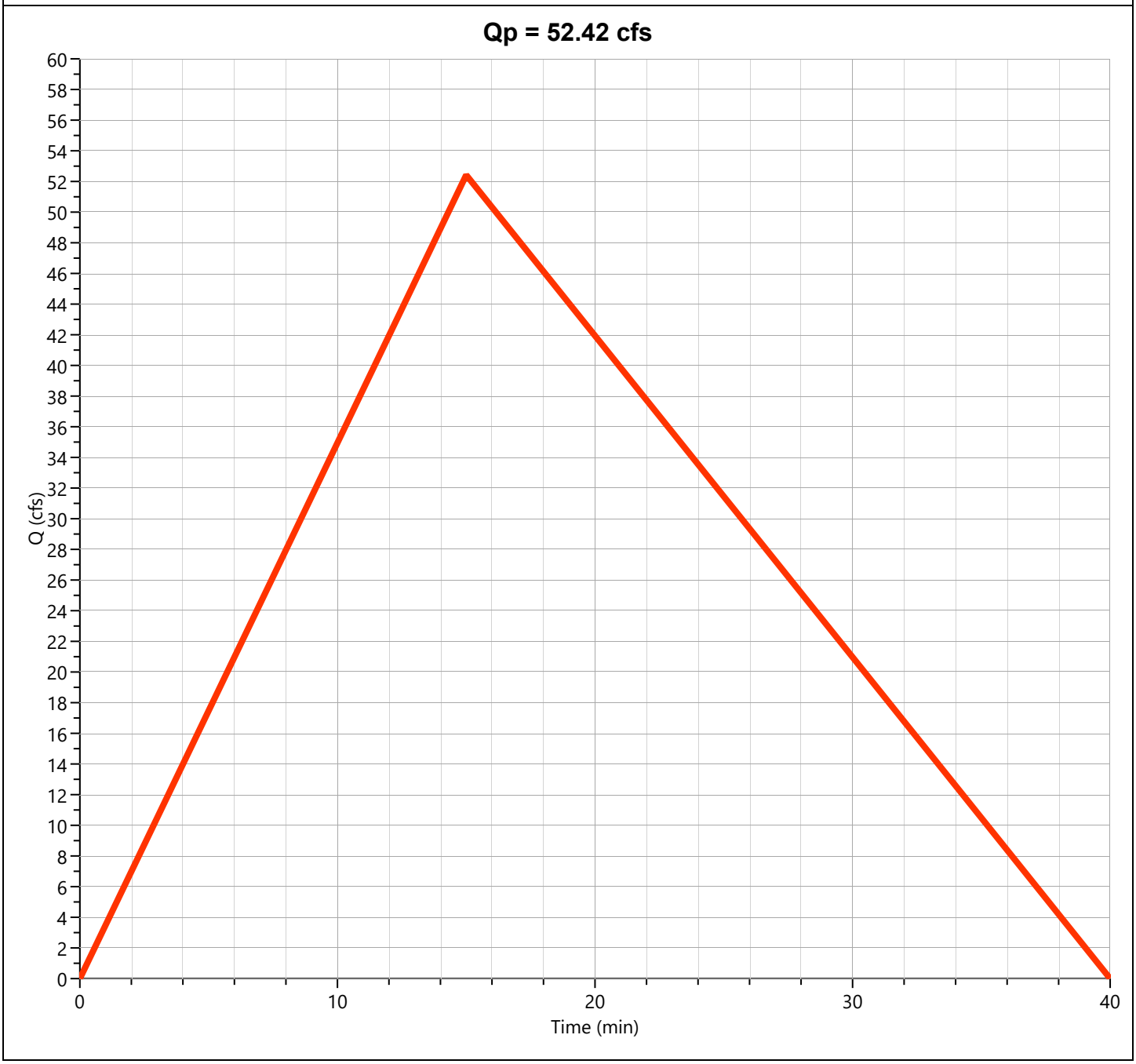
Hydrograph Type	= Rational	Peak Flow	= 15.60 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.18 hrs
Time Interval	= 1 min	Runoff Volume	= 13,742 cuft
Drainage Area	= 3.2 ac	Runoff Coeff.	= 0.62
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 11.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 7.86 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "B"

Hyd. No. 2

Hydrograph Type	= Rational	Peak Flow	= 52.42 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.25 hrs
Time Interval	= 1 min	Runoff Volume	= 62,983 cuft
Drainage Area	= 14.74 ac	Runoff Coeff.	= 0.52
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 15.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.84 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "C"

Hyd. No. 3

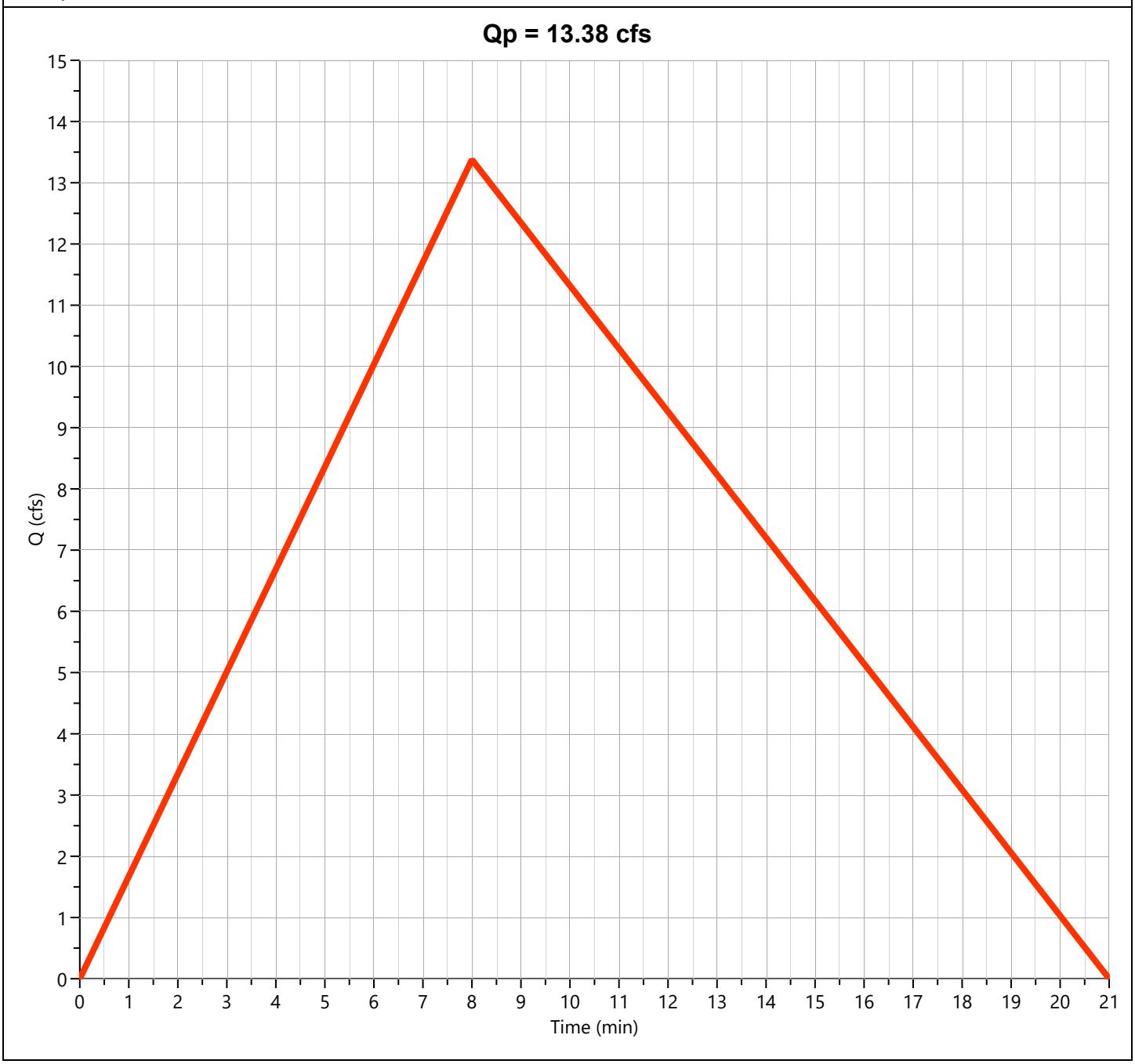
Hydrograph Type	= Rational	Peak Flow	= 29.57 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.18 hrs
Time Interval	= 1 min	Runoff Volume	= 26,057 cuft
Drainage Area	= 6.84 ac	Runoff Coeff.	= 0.55
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 11.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 7.86 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "D"

Hyd. No. 4

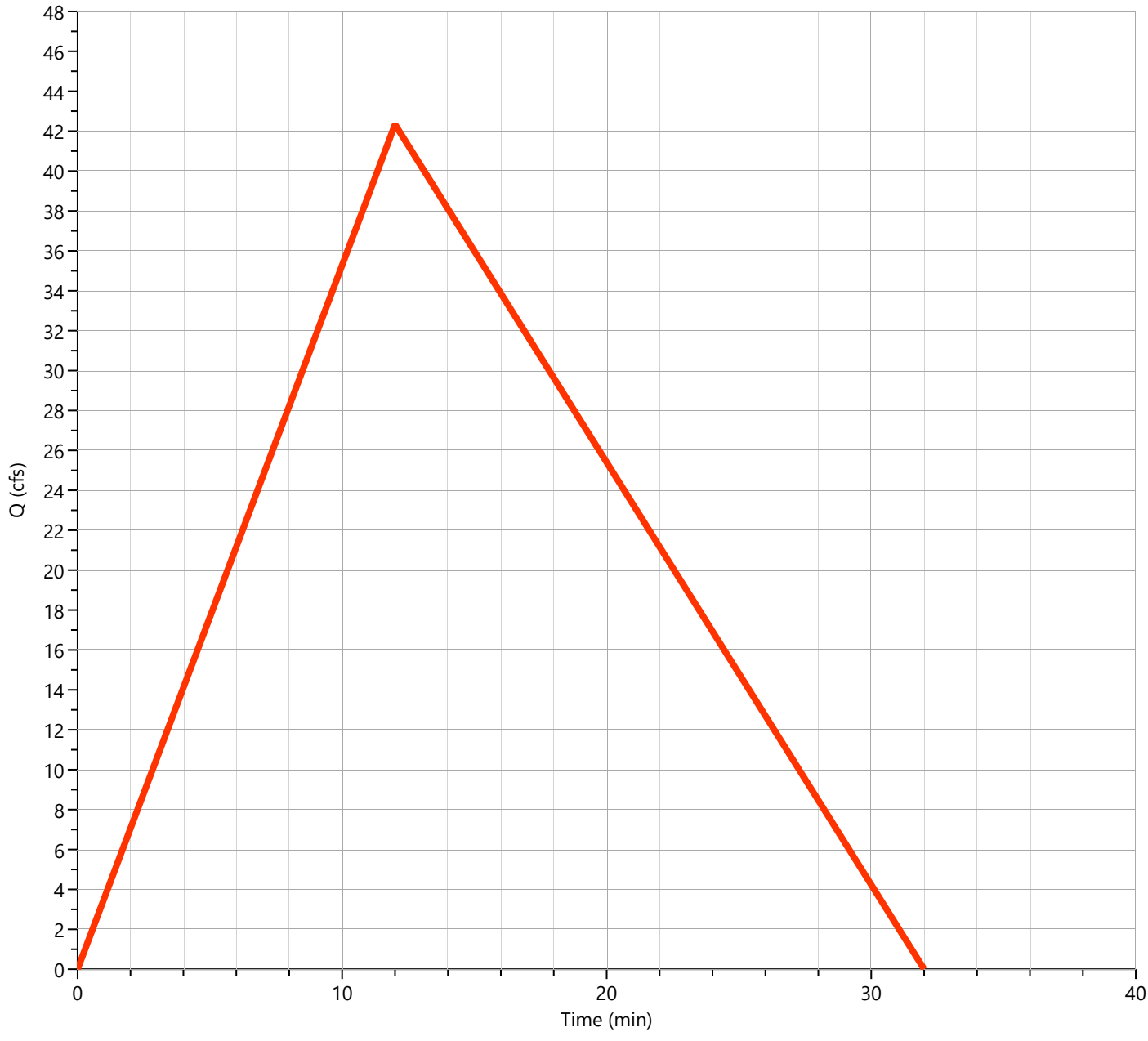
Hydrograph Type	= Rational	Peak Flow	= 13.38 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.13 hrs
Time Interval	= 1 min	Runoff Volume	= 8,572 cuft
Drainage Area	= 2.95 ac	Runoff Coeff.	= 0.50
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 9.07 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "E-1"

Hyd. No. 5

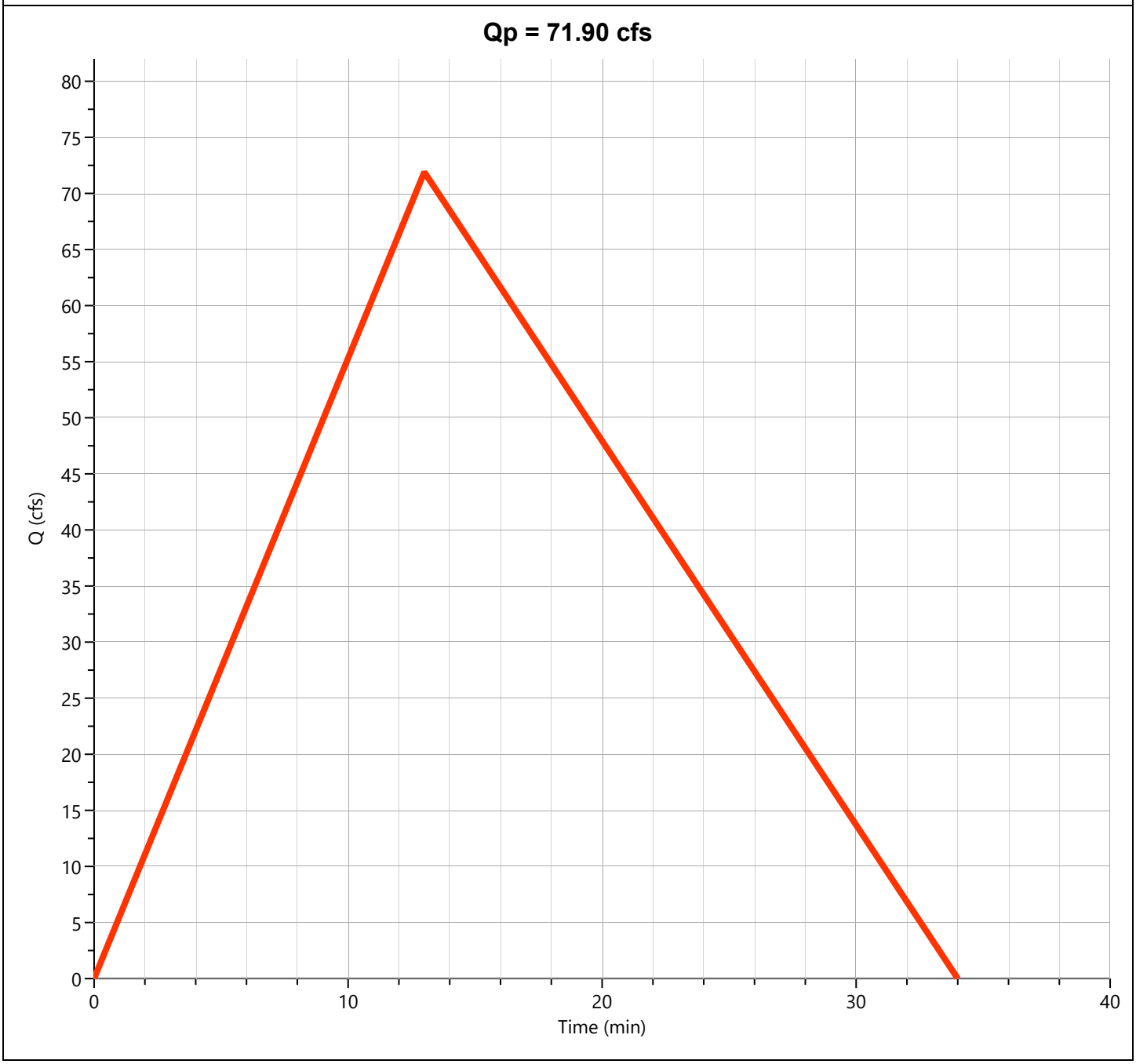
Hydrograph Type	= Rational	Peak Flow	= 42.33 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.20 hrs
Time Interval	= 1 min	Runoff Volume	= 40,692 cuft
Drainage Area	= 11.2 ac	Runoff Coeff.	= 0.50
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 12.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 7.56 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Pre-Dev Basin "E-2"

Hyd. No. 6

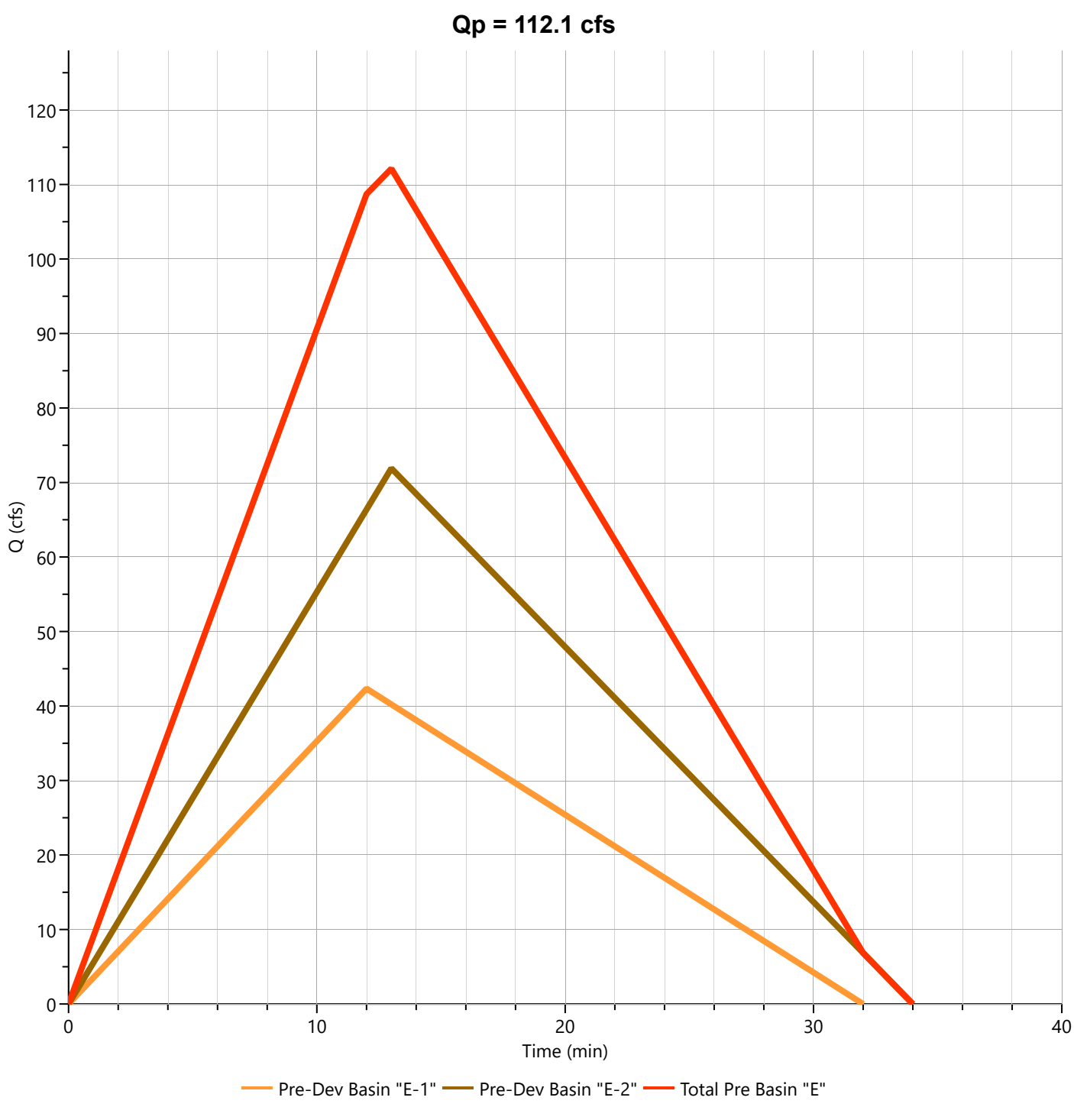
Hydrograph Type	= Rational	Peak Flow	= 71.90 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Runoff Volume	= 74,872 cuft
Drainage Area	= 18.96 ac	Runoff Coeff.	= 0.52
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 7.29 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Total Pre Basin "E"

Hyd. No. 7

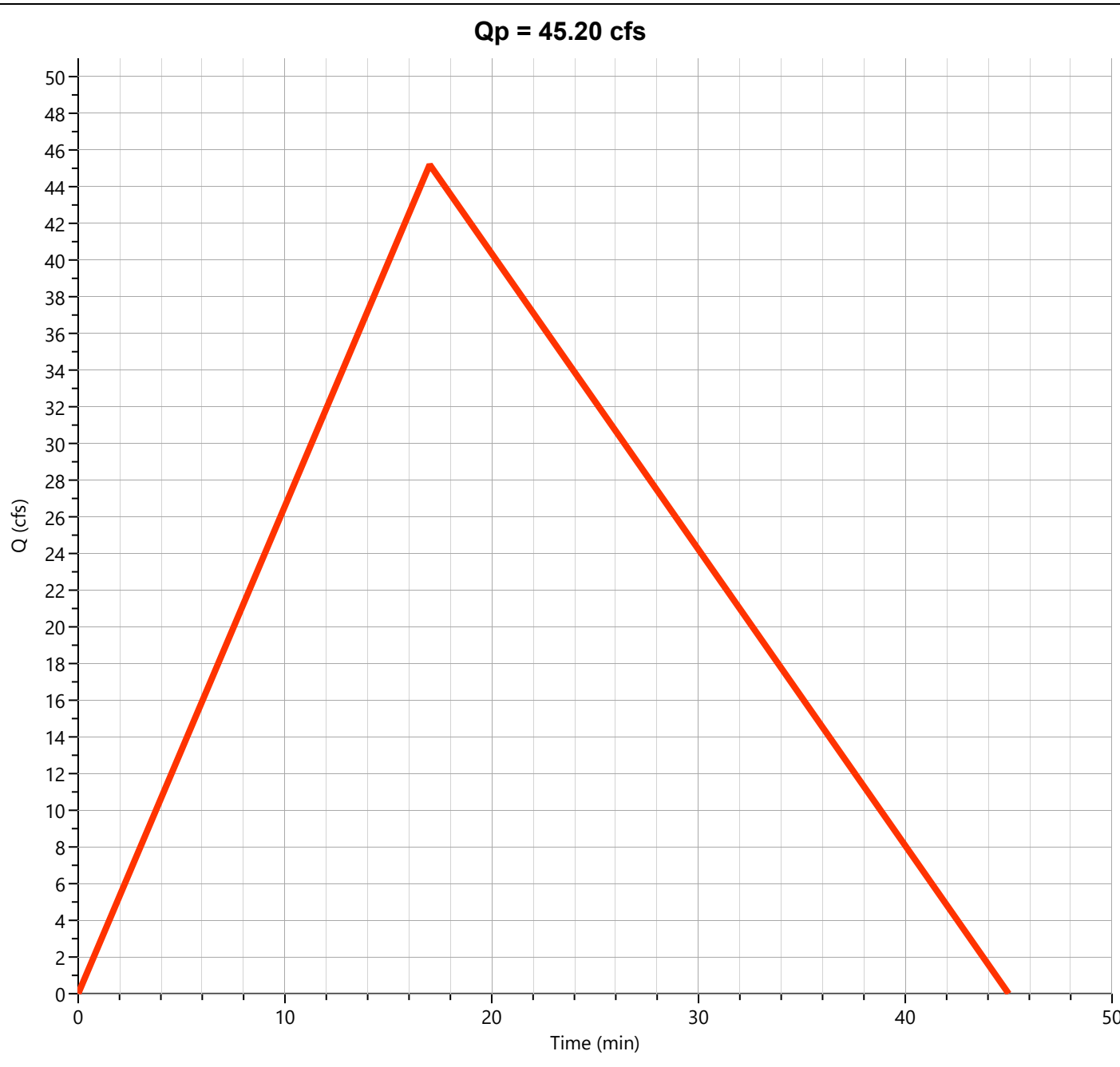
Hydrograph Type	= Junction	Peak Flow	= 112.1 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Hydrograph Volume	= 113,981 cuft
Inflow Hydrographs	= 5, 6	Total Contrib. Area	= 30.16 ac



Pre-Dev Basin "F"

Hyd. No. 8

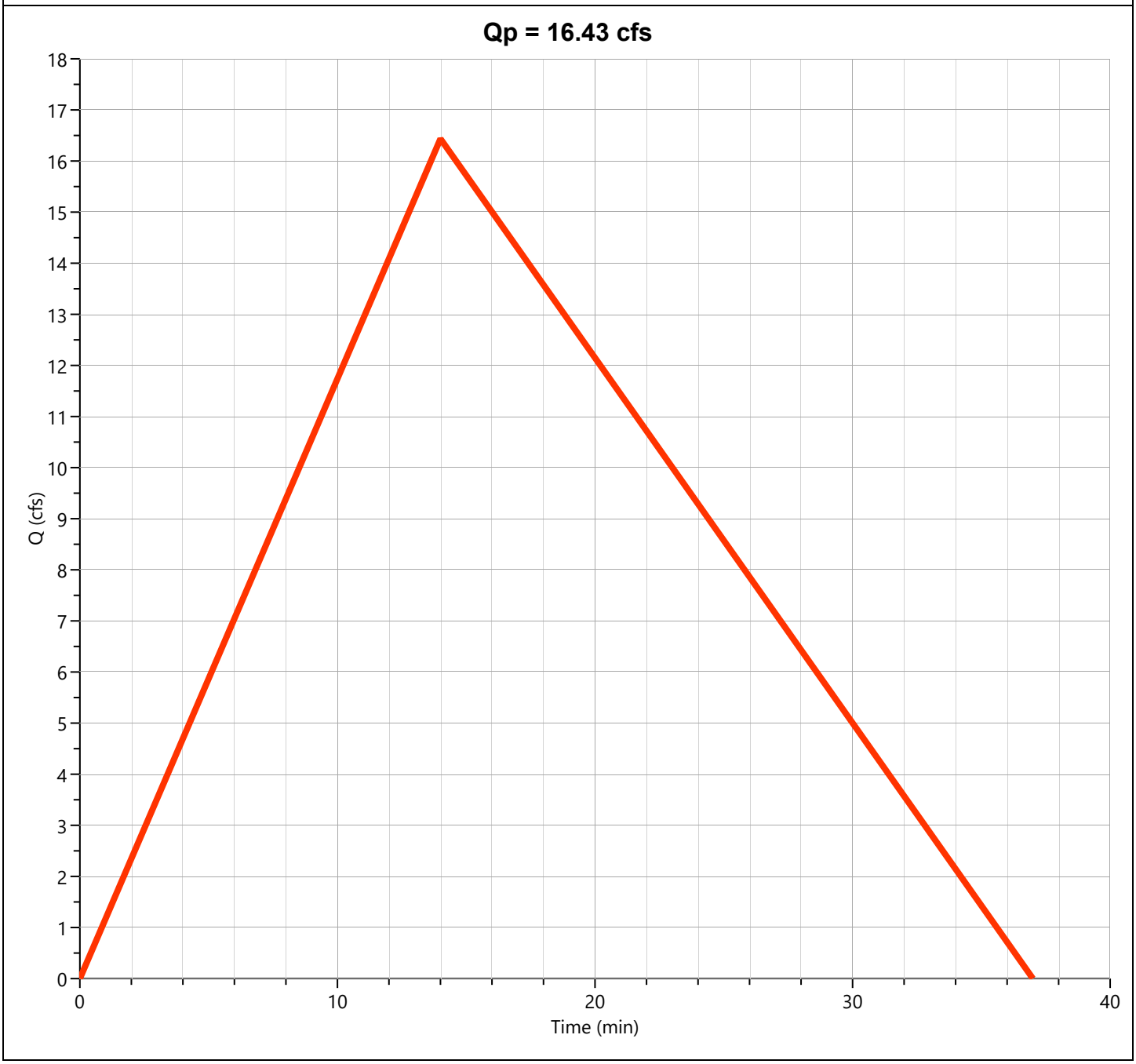
Hydrograph Type	= Rational	Peak Flow	= 45.20 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.28 hrs
Time Interval	= 1 min	Runoff Volume	= 61,545 cuft
Drainage Area	= 13.19 ac	Runoff Coeff.	= 0.53
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 17.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.47 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin A

Hyd. No. 9

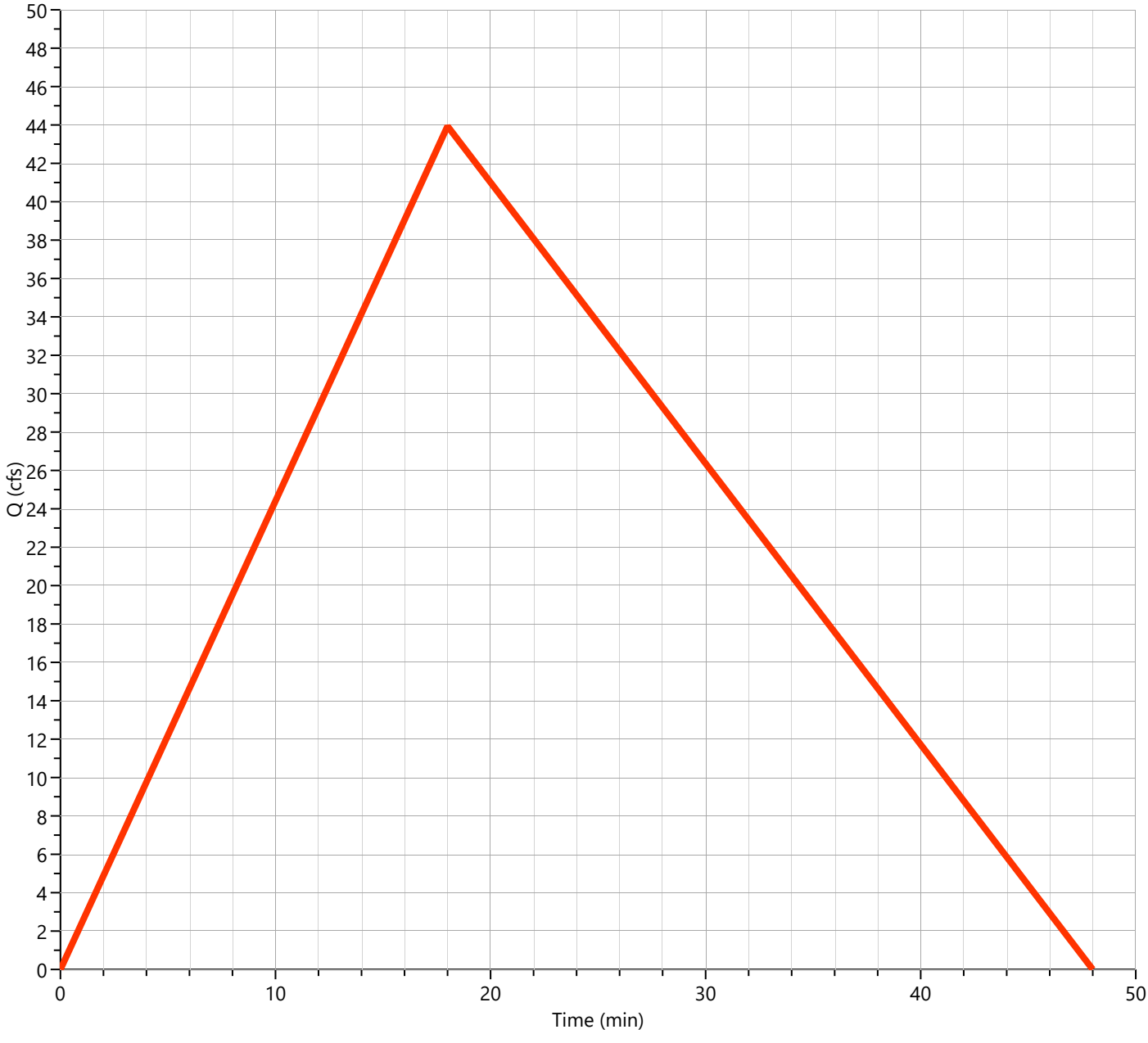
Hydrograph Type	= Rational	Peak Flow	= 16.43 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.23 hrs
Time Interval	= 1 min	Runoff Volume	= 18,430 cuft
Drainage Area	= 3.53 ac	Runoff Coeff.	= 0.66
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 14.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 7.05 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin B

Hyd. No. 10

Hydrograph Type	= Rational	Peak Flow	= 43.93 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.30 hrs
Time Interval	= 1 min	Runoff Volume	= 63,344 cuft
Drainage Area	= 12.45 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 18.0 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



Post-Dev Basin "C"

Hyd. No. 11

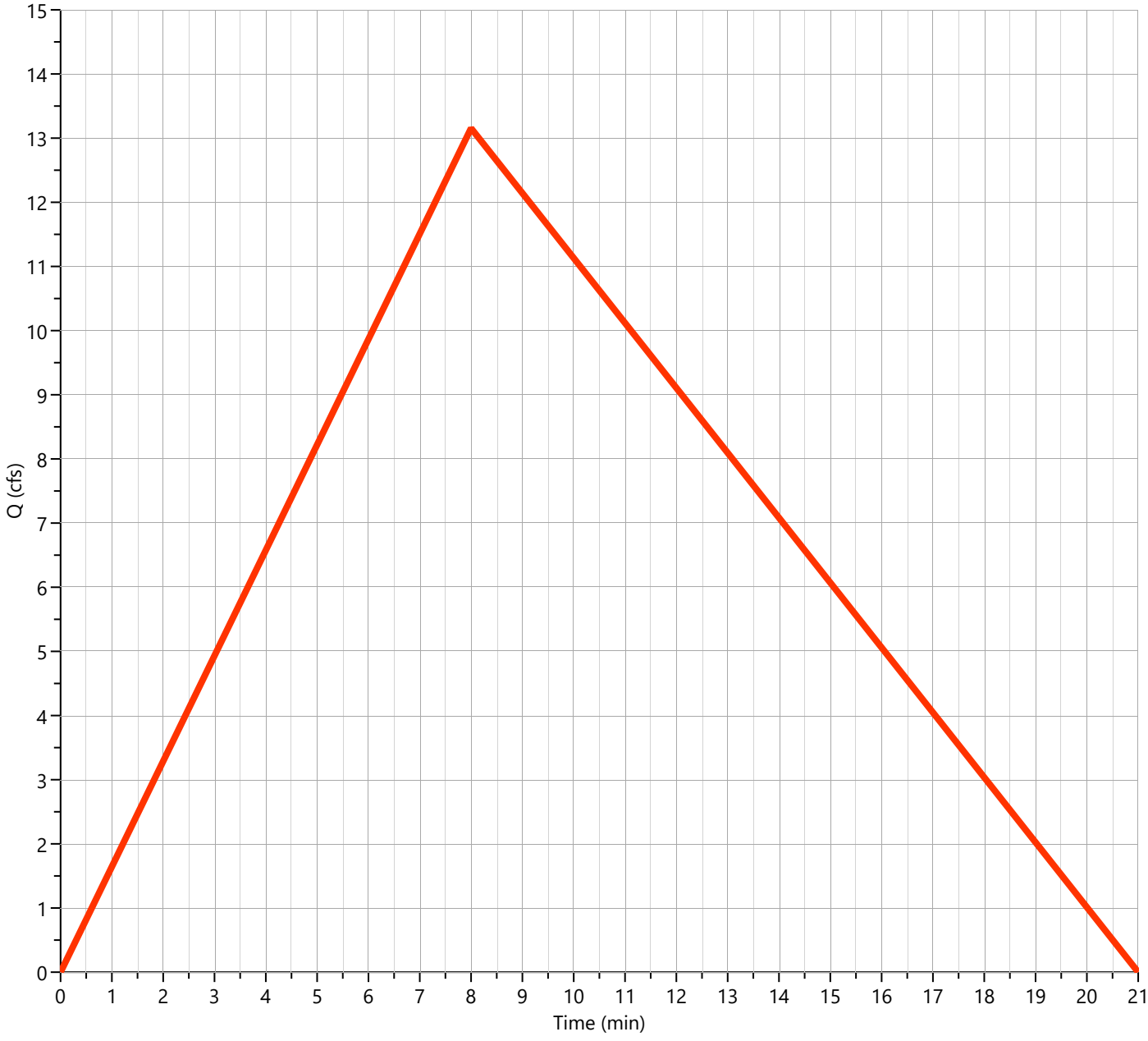
Hydrograph Type	= Rational	Peak Flow	= 30.24 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.18 hrs
Time Interval	= 1 min	Runoff Volume	= 26,649 cuft
Drainage Area	= 6.75 ac	Runoff Coeff.	= 0.57
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 11.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 7.86 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin "D"

Hyd. No. 12

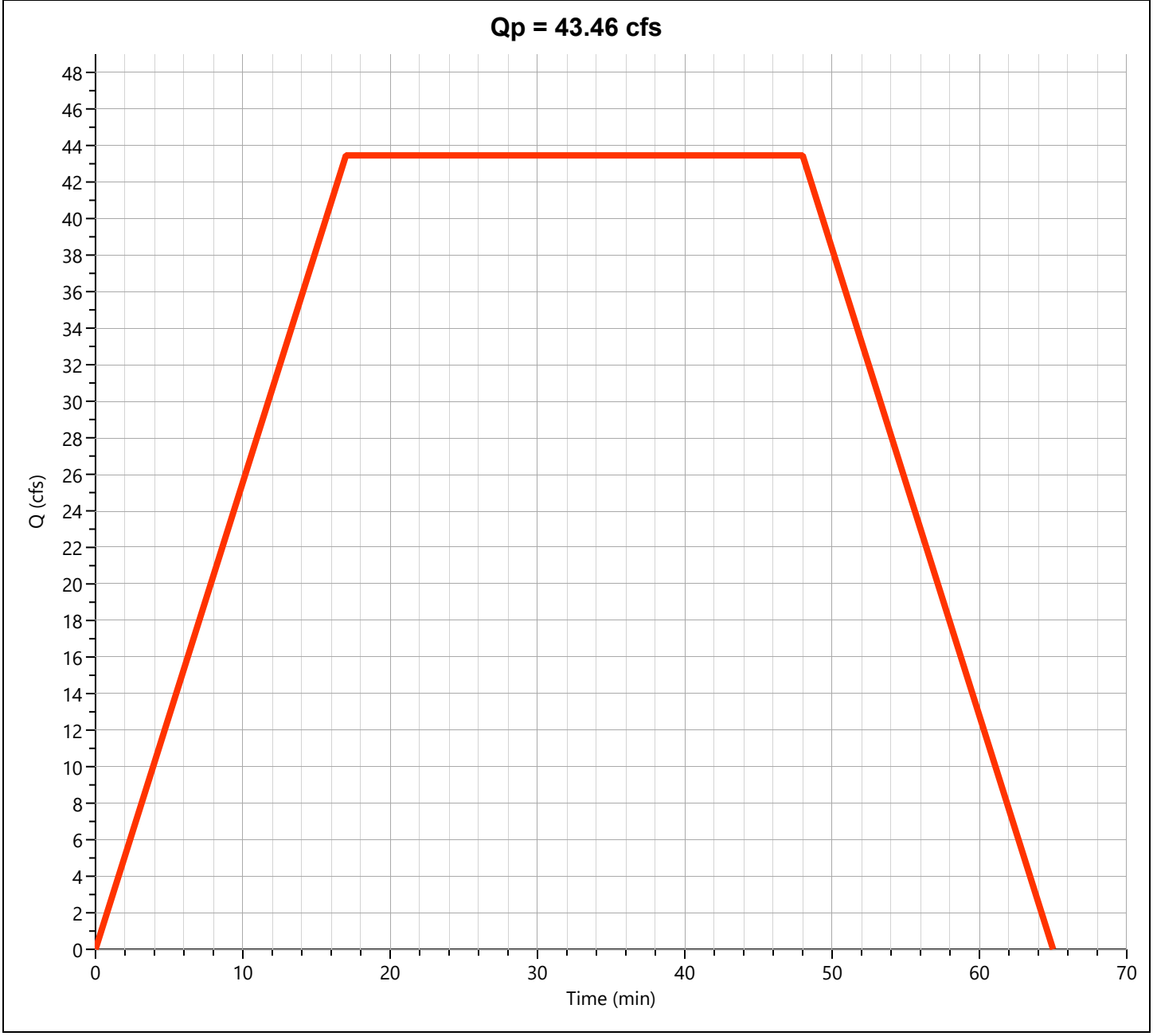
Hydrograph Type	= Rational	Peak Flow	= 13.15 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.13 hrs
Time Interval	= 1 min	Runoff Volume	= 8,429 cuft
Drainage Area	= 2.59 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 8.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 9.07 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Post-Dev Basin "E-1"

Hyd. No. 13

Hydrograph Type	= Mod Rational	Peak Flow	= 43.46 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.28 hrs
Time Interval	= 1 min	Runoff Volume	= 125,154 cuft
Drainage Area	= 16.23 ac	Runoff Coeff.	= 0.66
Tc Method	= User	Time of Conc. (Tc)	= 17.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 4.06 in/hr
Freq. Corr. Factor	= 1.00	Storm Duration	= 2.82 x Tc
Target Q	= 0.000 cfs	Required Storage	= 0.000 cuft



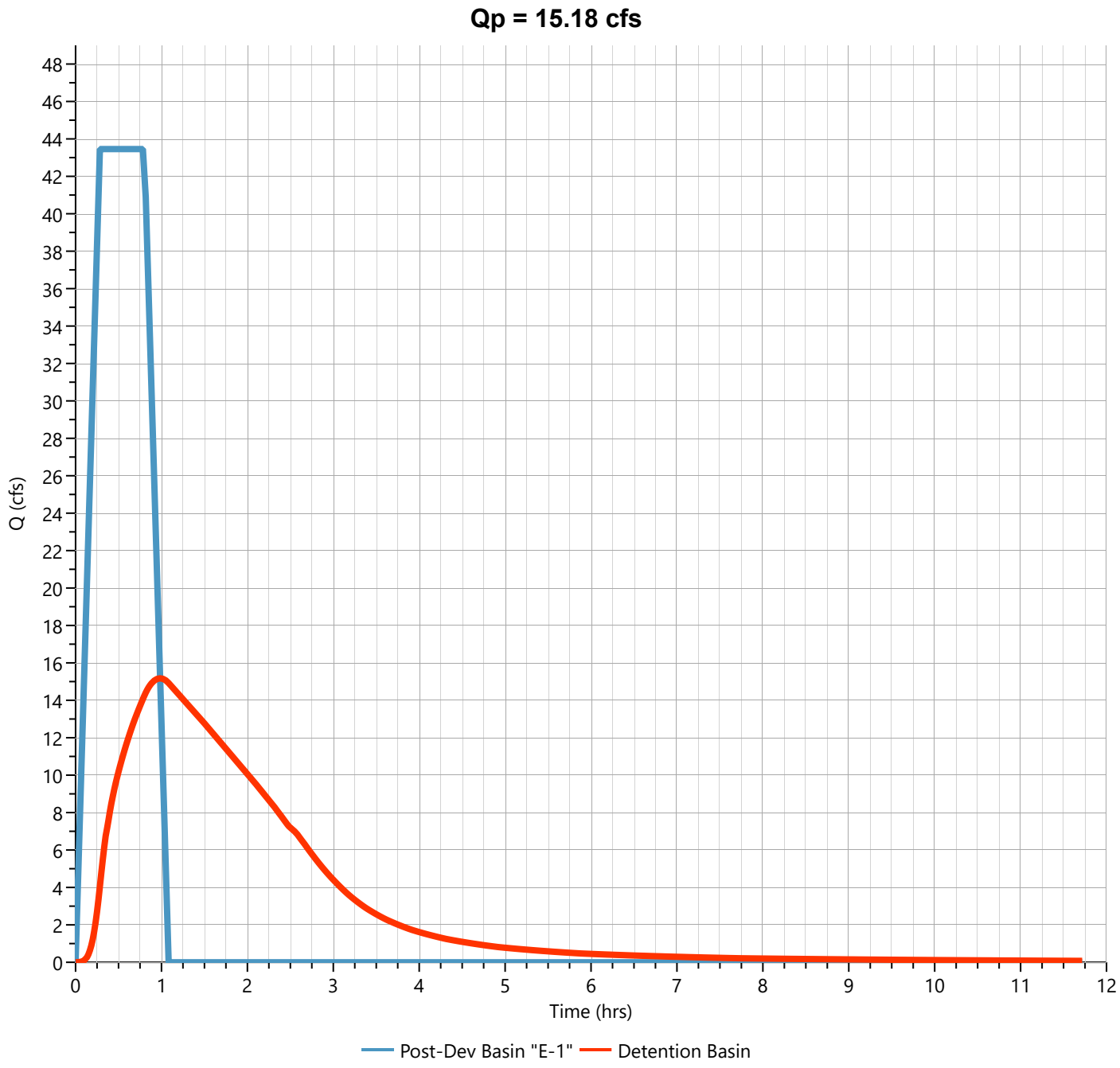
Detention Basin

Hyd. No. 14

Hydrograph Type	= Pond Route	Peak Flow	= 15.18 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.98 hrs
Time Interval	= 1 min	Hydrograph Volume	= 125,061 cuft
Inflow Hydrograph	= 13 - Post-Dev Basin "E-1"	Max. Elevation	= 478.93 ft
Pond Name	= Hilltop Detention Pond	Max. Storage	= 92,311 cuft

Pond Routing by Storage Indication Method

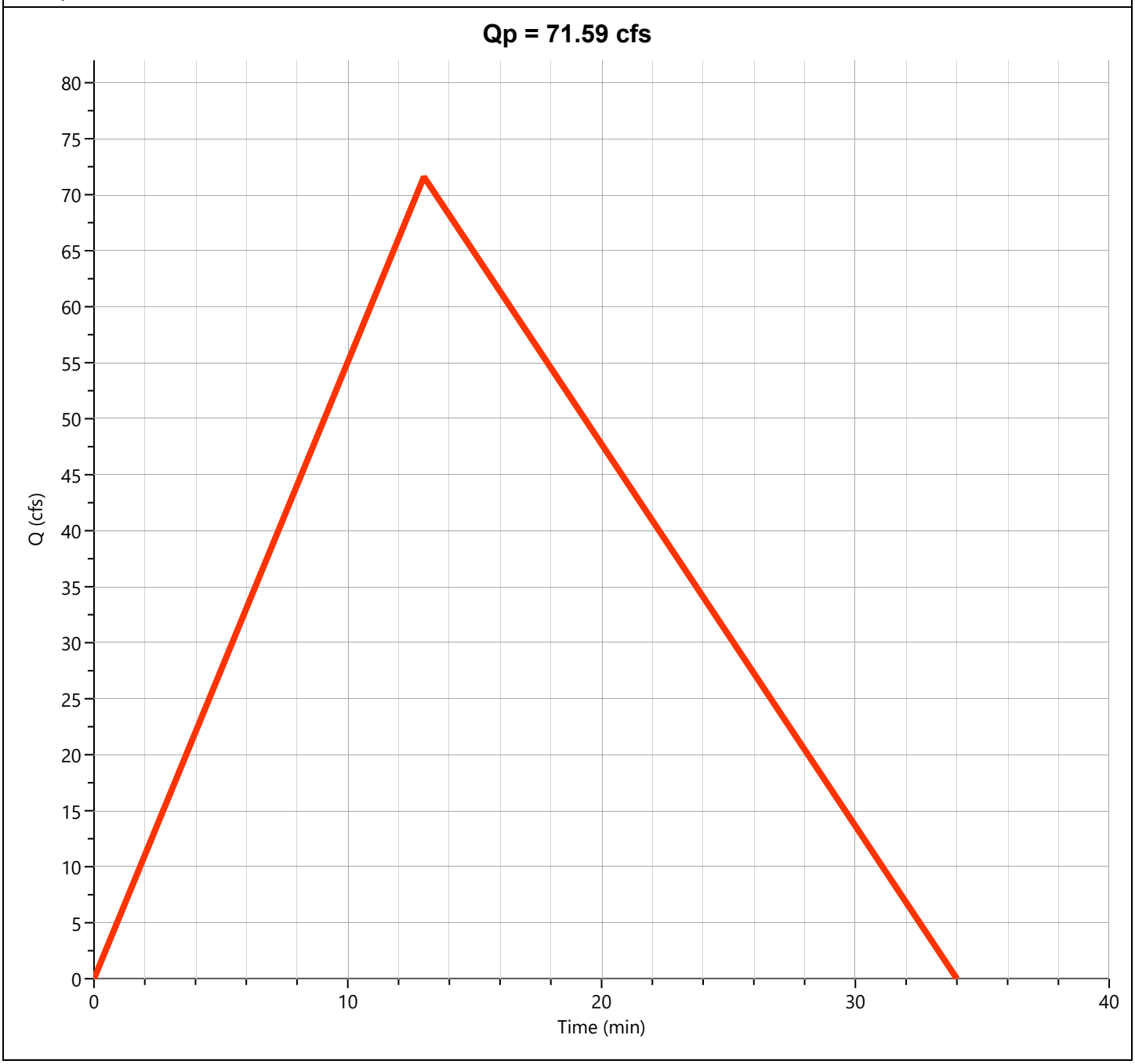
Center of mass detention time = 1.39 hrs



Post-Dev Basin "E-2"

Hyd. No. 15

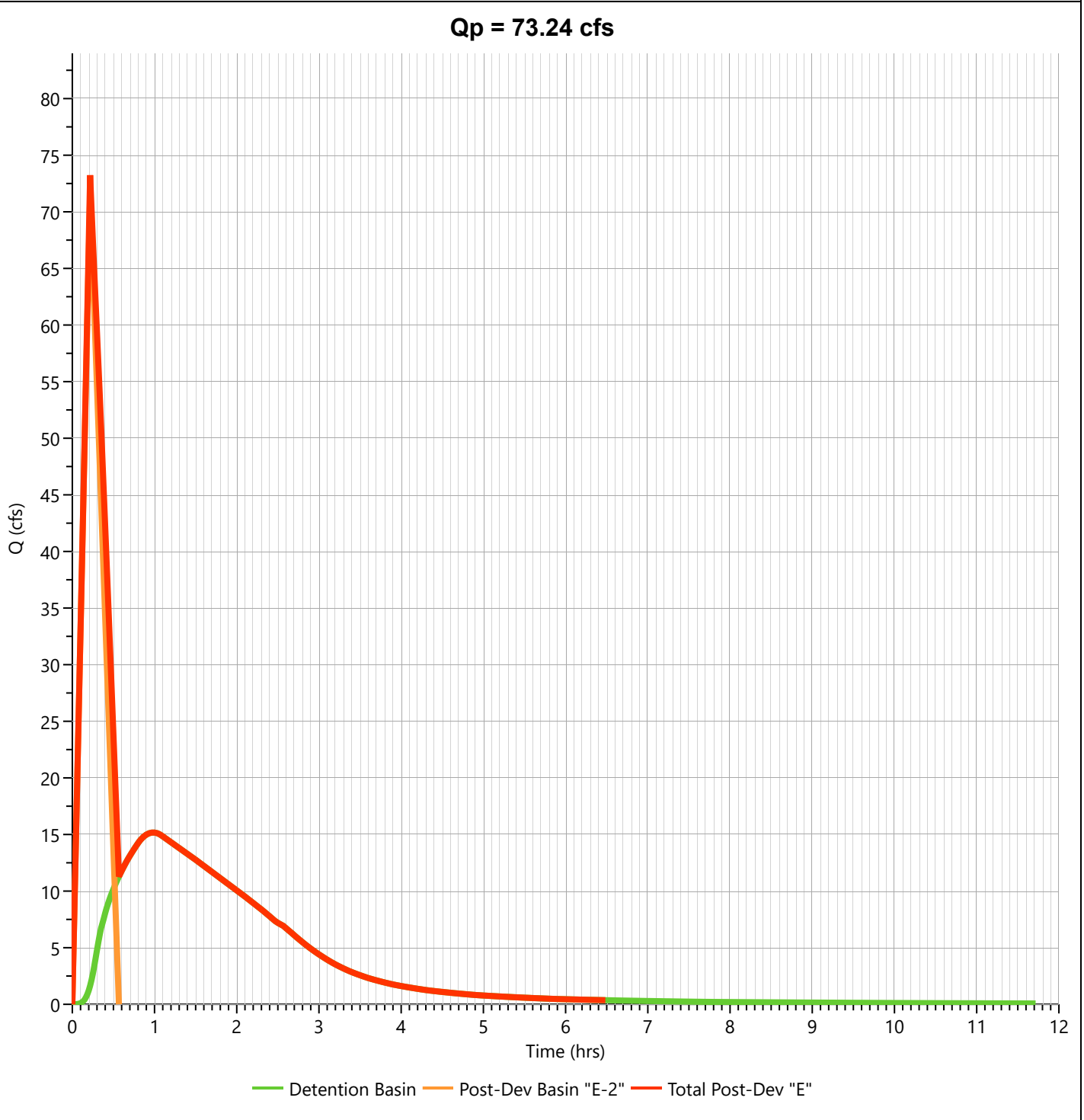
Hydrograph Type	= Rational	Peak Flow	= 71.59 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Runoff Volume	= 74,550 cuft
Drainage Area	= 17.53 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 7.29 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67



Total Post-Dev "E"

Hyd. No. 16

Hydrograph Type	= Junction	Peak Flow	= 73.24 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.22 hrs
Time Interval	= 1 min	Hydrograph Volume	= 198,086 cuft
Inflow Hydrographs	= 15	Total Contrib. Area	= 17.53 ac



Post-Dev Basin "F"

Hyd. No. 17

Hydrograph Type	= Rational	Peak Flow	= 44.65 cfs
Storm Frequency	= 100-yr	Time to Peak	= 0.27 hrs
Time Interval	= 1 min	Runoff Volume	= 57,218 cuft
Drainage Area	= 12.0 ac	Runoff Coeff.	= 0.56
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 16.0 min
IDF Curve	= City of Bryant IDF Curve.idf	Intensity	= 6.64 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1.67

