

Hydrological Calculations Summary

1.83 acres
Stoltz Enterprises
Rip Stoltz
Section 37, T-8-S, R-14-E
St Tammany Parish, LA

The rational method was used to determine existing and proposed peak flows.

1.0 Summary of Hydrograph Flows (See attached hydrograph report) 25 Year Storm

1.0 Existing Conditions:

Area 1 = 1.83 acres
Tc= 18 min
C = 0.53
Total Pre-Existing Flow = 6.85 cfs



2.0 Developed Conditions:

Area 1 = 1.83 acres
Tc= 18 min
C = 0.56
Total Pre-Existing Flow = 7.23 cfs

2.0 Conclusion

There is an increase of less than 1 cfs runoff, therefore no reduction requirements should be applied.

3.0 Appendices

Hydrograph Reports

Pre Existing Flow

Post Construction Flow

Table of Contents

25 - Year

Hydrograph Summary	1
Hydrograph Reports	
Hydrograph No. 1, Rational, Pre Area	2
Tc by TR55 Worksheet	4
Hydrograph No. 2, Rational, Post Area	5
Tc by TR55 Worksheet	7
Design Storm Report - IDF Based - Synthetic, 6-hr	8
IDF Report	9
Precipitation Report	10

Hydrograph 25-yr Summary

Project Name: Stoltz

Hydrology Studio v 3.0.0.33

09-10-2024

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Critical Volume (cuft)	Total Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	Rational	Pre Area	6.851	7,399	7,399	---		
2	Rational	Post Area	7.231	7,810	7,810	---		

Hydrograph Report

Project Name: Stoltz

Hydrology Studio v 3.0.0.33

09-10-2024

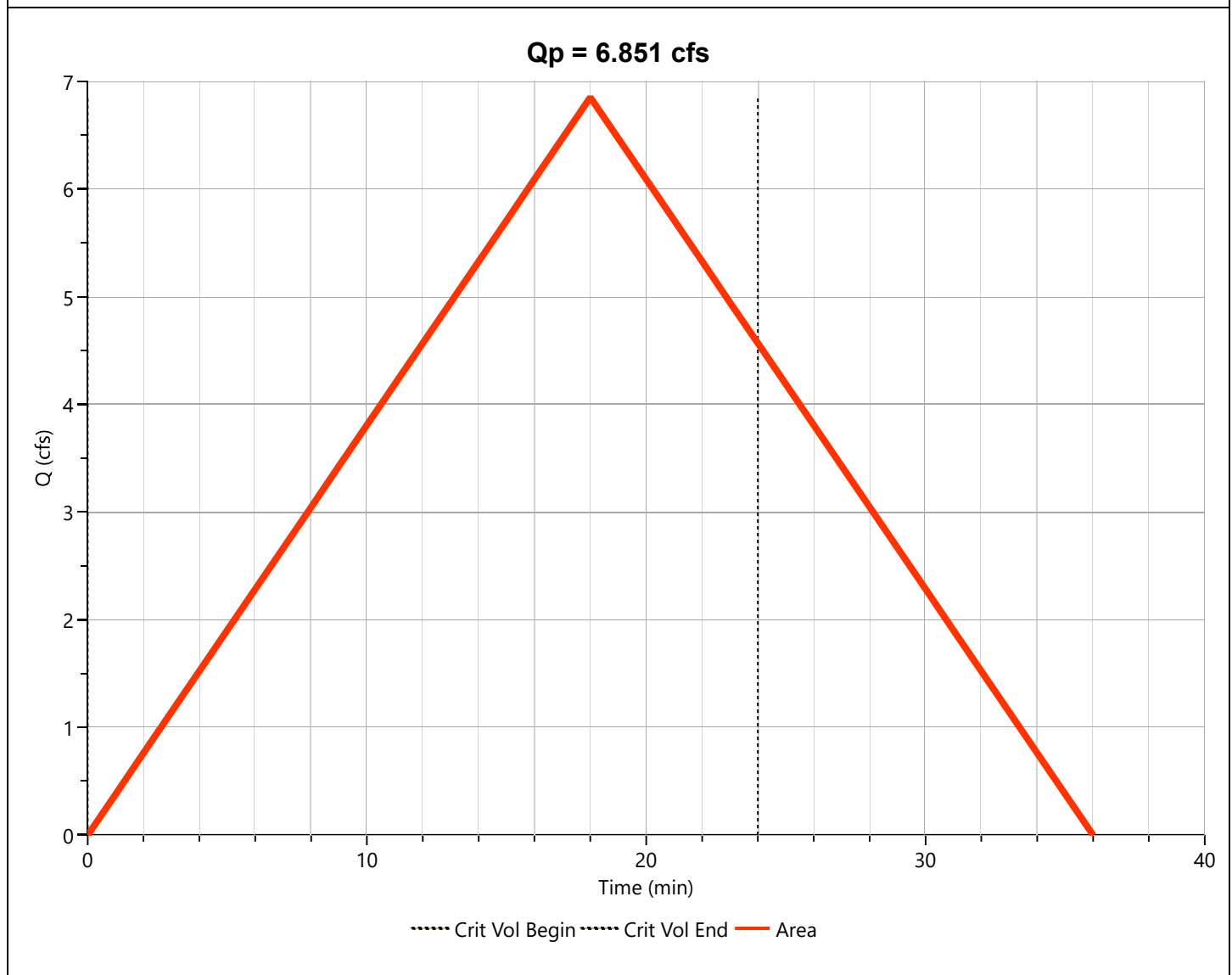
Pre Area

Hyd. No. 1

Hydrograph Type	= Rational	Peak Flow	= 6.851 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.30 hrs
Critical Volume	= 7,399 cuft	Runoff Volume	= 7,399 cuft
Drainage Area	= 1.83 ac	Runoff Coeff.	= 0.53*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 17.53 min
IDF Curve	= SampleIDF-Louisiana.idf	Intensity	= 7.06 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1

* Composite C Worksheet

AREA (ac)	C	DESCRIPTION
0.184	0.90	BUILDING
0.25	0.90	CONCRETE
0.1	0.70	GRAVEL
1.296	0.40	GRASS
1.83	0.53	



Hydrograph Discharge Table

Area

Time (min)	Outflow (cfs)	Time (min)	Outflow (cfs)	Time (min)	Outflow (cfs)	Time (min)	Outflow (cfs)	Time (min)	Outflow (cfs)
1	0.381	...end	...end						
2	0.761								
3	1.142								
4	1.522								
5	1.903								
6	2.284								
7	2.664								
8	3.045								
9	3.426								
10	3.806								
11	4.187								
12	4.567								
13	4.948								
14	5.329								
15	5.709								
16	6.090								
17	6.471								
18	6.851								
19	6.471								
20	6.090								
21	5.709								
22	5.329								
23	4.948								
24	4.567								
25	4.187								
26	3.806								
27	3.426								
28	3.045								
29	2.664								
30	2.284								
31	1.903								
32	1.522								
33	1.142								
34	0.761								
35	0.381								
36	0.000								

Tc by TR55 Worksheet

Project Name: Stoltz

Hydrology Studio v 3.0.0.33

09-10-2024

Area Rational

Hyd. No. 1

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.150	0.013	0.013	
Flow Length (ft)	100			
2-yr, 24-hr Precip. (in)	4.48	2.28	2.28	
Land Slope (%)	.5			
Travel Time (min)	14.42	0.00	0.00	14.42
Shallow Concentrated Flow				
Flow Length (ft)	92			
Watercourse Slope (%)	0.50	0.00	0.00	
Surface Description	Prairie	Paved	Paved	
Average Velocity (ft/s)	.49			
Travel Time (min)	3.11	0.00	0.00	3.11
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				17.53 min

Hydrograph Report

Project Name: Stoltz

Hydrology Studio v 3.0.0.33

09-10-2024

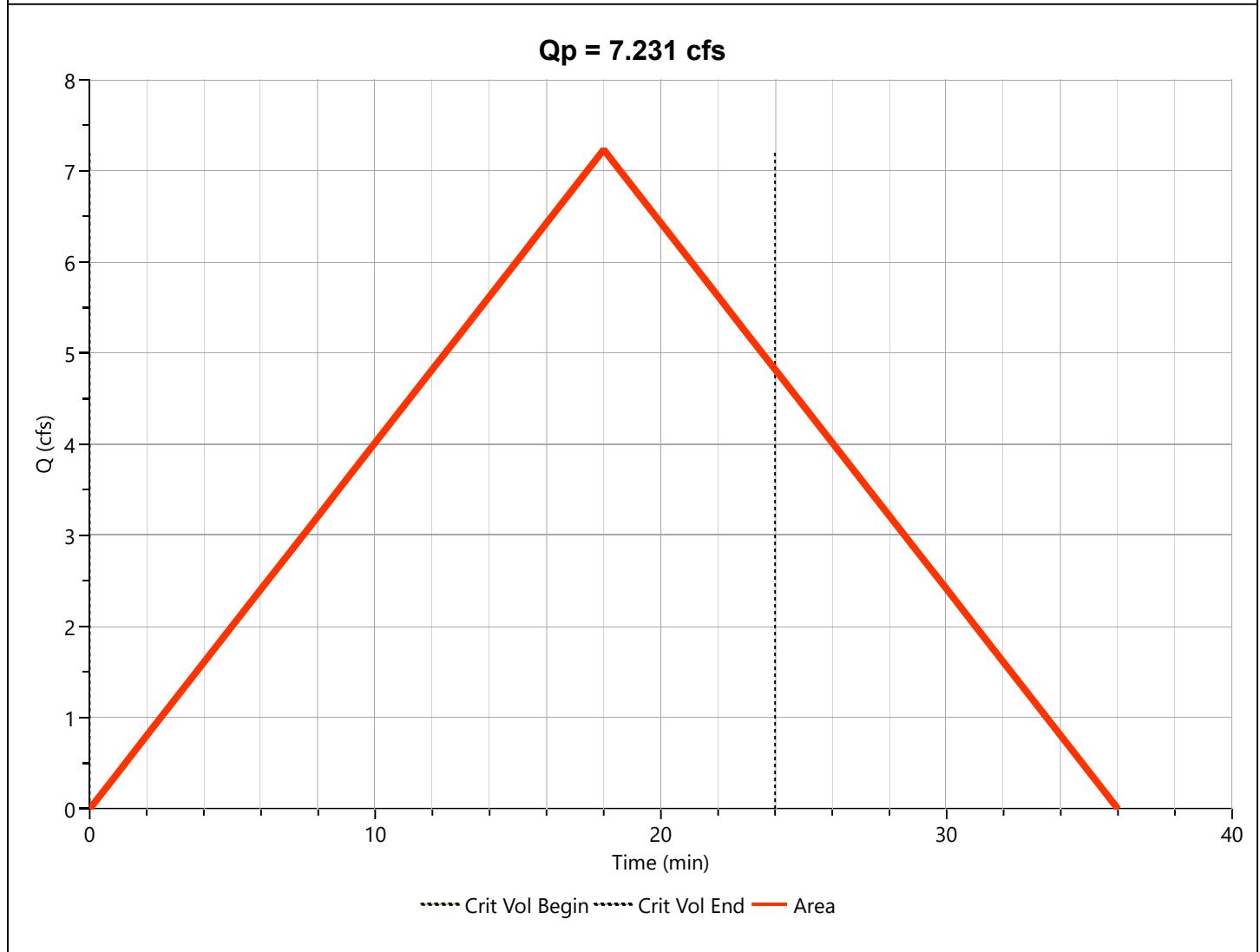
Post Area

Hyd. No. 2

Hydrograph Type	= Rational	Peak Flow	= 7.231 cfs
Storm Frequency	= 25-yr	Time to Peak	= 0.30 hrs
Critical Volume	= 7,810 cuft	Runoff Volume	= 7,810 cuft
Drainage Area	= 1.828 ac	Runoff Coeff.	= 0.56*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 18.0 min
IDF Curve	= SampleIDF-Louisiana.idf	Intensity	= 7.06 in/hr
Freq. Corr. Factor	= 1.00	Asc/Rec Limb Factors	= 1/1

* Composite C Worksheet

AREA (ac)	C	DESCRIPTION
0.184	0.90	BUILDING
0.25	0.90	CONCRETE
0.026	0.70	GRAVEL
1.232	0.40	GRASS
0.076	0.90	NEW BUILDING
0.06	0.90	new concrete
1.828	0.56	



Hydrograph Discharge Table

Area

Time (min)	Outflow (cfs)	Time (min)	Outflow (cfs)	Time (min)	Outflow (cfs)	Time (min)	Outflow (cfs)	Time (min)	Outflow (cfs)
1	0.402	...end	...end						
2	0.803								
3	1.205								
4	1.607								
5	2.009								
6	2.410								
7	2.812								
8	3.214								
9	3.616								
10	4.017								
11	4.419								
12	4.821								
13	5.222								
14	5.624								
15	6.026								
16	6.428								
17	6.829								
18	7.231								
19	6.829								
20	6.428								
21	6.026								
22	5.624								
23	5.222								
24	4.821								
25	4.419								
26	4.017								
27	3.616								
28	3.214								
29	2.812								
30	2.410								
31	2.009								
32	1.607								
33	1.205								
34	0.803								
35	0.402								
36	0.000								

Tc by TR55 Worksheet

Project Name: Stoltz

Hydrology Studio v 3.0.0.33

09-10-2024

Area Rational

Hyd. No. 2

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description				
Manning's n	0.150	0.013	0.013	
Flow Length (ft)	100			
2-yr, 24-hr Precip. (in)	4.48	2.28	2.28	
Land Slope (%)	.5			
Travel Time (min)	14.42	0.00	0.00	14.42
Shallow Concentrated Flow				
Flow Length (ft)	92			
Watercourse Slope (%)	0.50	0.00	0.00	
Surface Description	Prairie	Paved	Paved	
Average Velocity (ft/s)	.49			
Travel Time (min)	3.11	0.00	0.00	3.11
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

Design Storm Report

Custom Storm filename:

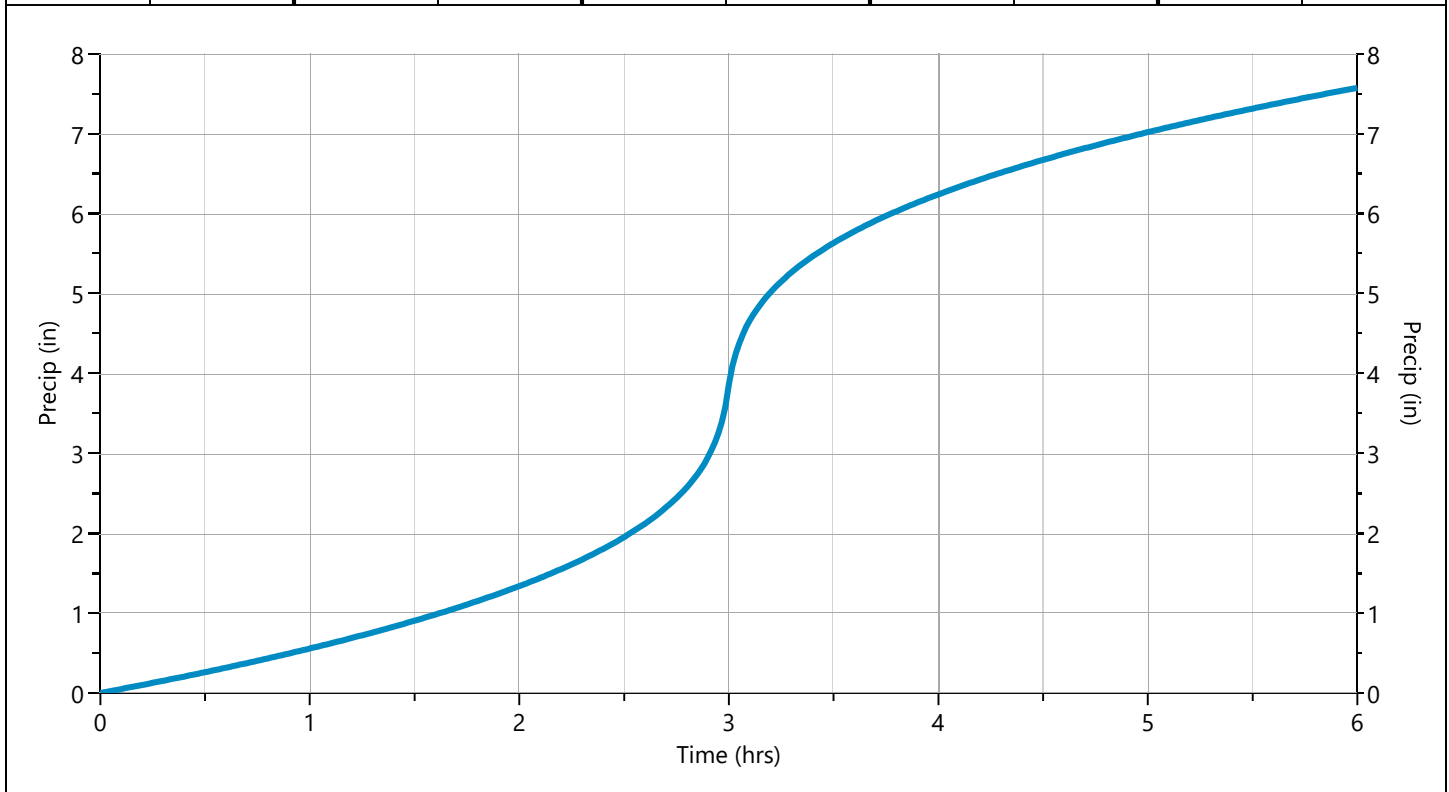
Hydrology Studio v 3.0.0.33

09-10-2024

Storm Distribution: IDF Based - Synthetic, 6-hr

Storm Duration	Total Rainfall Volume (in)								
	1-yr	2-yr	3-yr	5-yr	10-yr	✓ 25-yr	50-yr	100-yr	
6 hrs	3.64	4.08	0	4.98	6.04	7.57	9.09	10.81	

Incremental Rainfall Distribution, 25-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
2.50	0.025906	2.68	0.035144	2.87	0.062990	3.05	0.128181	3.23	0.044267
2.52	0.026495	2.70	0.036447	2.88	0.068828	3.07	0.106345	3.25	0.042178
2.53	0.027119	2.72	0.037879	2.90	0.076138	3.08	0.091404	3.27	0.040318
2.55	0.027782	2.73	0.039462	2.92	0.085573	3.10	0.080535	3.28	0.038650
2.57	0.028488	2.75	0.041221	2.93	0.098234	3.12	0.072266	3.30	0.037146
2.58	0.029243	2.77	0.043191	2.95	0.116135	3.13	0.065755	3.32	0.035781
2.60	0.030050	2.78	0.045413	2.97	0.143358	3.15	0.060488	3.33	0.034536
2.62	0.030917	2.80	0.047941	2.98	0.189532	3.17	0.056135	3.35	0.033395
2.63	0.031850	2.82	0.050847	3.00	0.283393	3.18	0.052471	3.37	0.032345
2.65	0.032859	2.83	0.054227	3.02	0.226946	3.20	0.049342	3.38	0.031375
2.67	0.033953	2.85	0.058213	3.03	0.163042	3.22	0.046635	3.40	0.030475



IDF Report

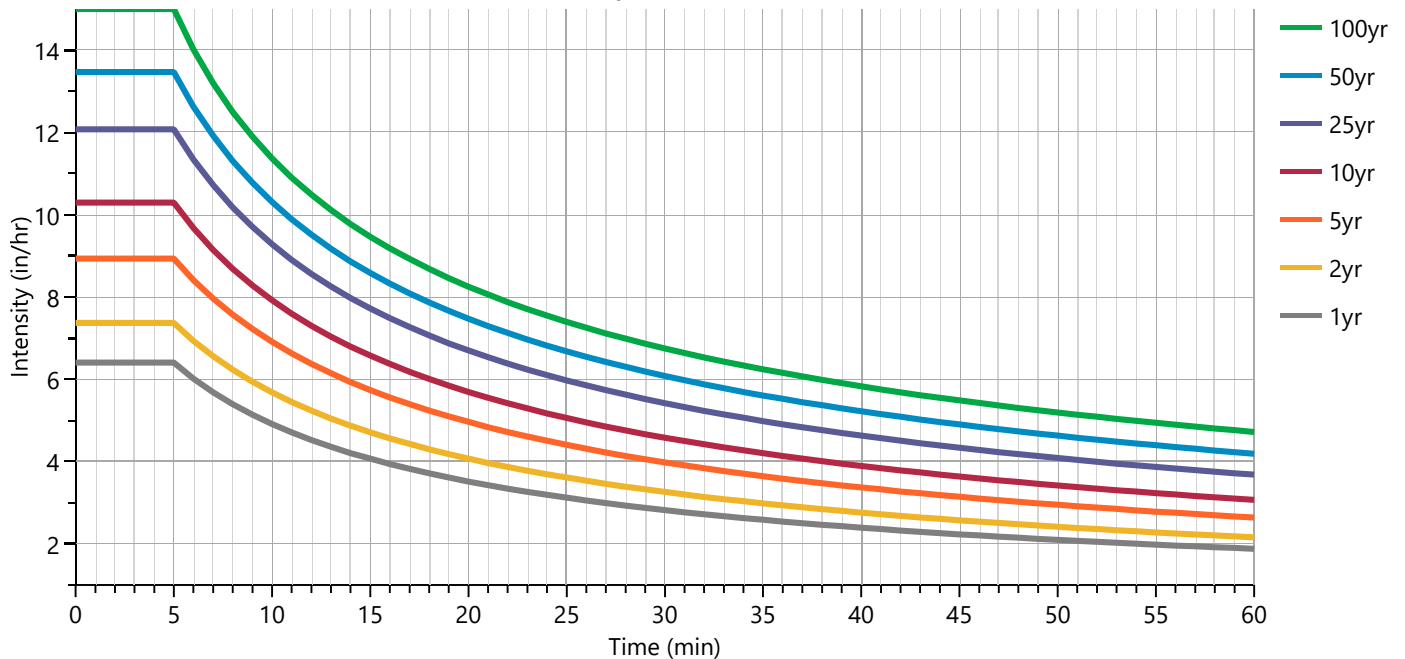
Equation Coefficients	Intensity = B / (Tc + D)^E (in/hr)								
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
B	28.9467	36.1415	0.0000	44.4487	45.5656	48.1686	47.2579	45.6023	
D	5.0000	5.6000	0.0000	5.8000	5.0000	4.4000	3.6000	2.6000	
E	0.6550	0.6734	0.0000	0.6744	0.6462	0.6175	0.5835	0.5483	

Minimum Tc = 5 minutes

Tc (min)	Intensity Values (in/hr)								
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
Cf	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
5	6.41	7.37	0	8.93	10.29	12.08	13.47	15.00	
10	4.91	5.68	0	6.91	7.92	9.28	10.31	11.37	
15	4.07	4.71	0	5.74	6.58	7.72	8.59	9.46	
20	3.52	4.07	0	4.96	5.69	6.70	7.47	8.25	
25	3.12	3.61	0	4.40	5.06	5.97	6.68	7.40	
30	2.82	3.26	0	3.98	4.58	5.42	6.08	6.75	
35	2.58	2.98	0	3.64	4.20	4.98	5.61	6.24	
40	2.39	2.76	0	3.37	3.89	4.63	5.22	5.83	
45	2.23	2.57	0	3.14	3.64	4.33	4.90	5.48	
50	2.10	2.41	0	2.95	3.42	4.08	4.63	5.19	
55	1.98	2.28	0	2.78	3.23	3.87	4.40	4.94	
60	1.88	2.16	0	2.64	3.07	3.68	4.19	4.72	

Cf = Correction Factor applied to Rational Method runoff coefficient.

Sample IDF Curves



Precipitation Report

	Active	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Active						✓	✓		✓
SCS Storms	> SCS Dimensionless Storms								
SCS 6hr		1.20	1.50	0	1.86	2.18	2.64	3.01	3.41
Type I, 24-hr		0	0	0	0	0	0	0	0
Type IA, 24-hr		0	0	0	0	0	0	0	0
Type II, 24-hr		1.82	2.28	0	2.85	3.31	3.94	4.43	4.94
Type II FL, 24-hr		0	0	0	0	0	0	0	0
Type III, 24-hr		0	0	0	0	0	0	0	0
Synthetic Storms	> IDF-Based Synthetic Storms								
1-hr		1.88	2.16	0	2.64	3.07	3.68	4.19	4.72
2-hr		2.45	2.79	0	3.41	4.02	4.90	5.69	6.53
3-hr		2.84	3.22	0	3.93	4.69	5.77	6.77	7.87
6-hr	✓	3.64	4.08	0	4.98	6.04	7.57	9.09	10.81
12-hr		4.65	5.14	0	6.28	7.75	9.91	12.17	14.81
24-hr		5.92	6.46	0	7.89	9.93	12.94	16.26	20.28
Huff Distribution	> 1st Quartile (0 to 6 hrs)								
1-hr		0.76	0.98	0	1.33	1.61	2.01	2.34	2.69
2-hr		0.89	1.14	0	1.50	1.80	2.24	2.60	2.99
3-hr		0.98	1.24	0	1.59	1.90	2.33	2.68	3.07
6-hr		1.20	1.50	0	1.86	2.18	2.64	3.01	3.41
Huff Distribution	> 2nd Quartile (>6 to 12 hrs)								
8-hr		0	0	0	0	0	0	0	0
12-hr		0	0	0	0	0	0	0	0
Huff Distribution	> 3rd Quartile (>12 to 24 hrs)								
18-hr		0	0	0	0	0	0	0	0
24-hr		0	0	0	0	0	0	0	0
Custom Storms	> Custom Storm Distributions								
My Custom Storm 1		0	0	0	0	0	0	0	0
My Custom Storm 2		0	0	0	0	0	0	0	0
My Custom Storm 3		0	0	0	0	0	0	0	0
My Custom Storm 4		0	0	0	0	0	0	0	0
My Custom Storm 5		0	0	0	0	0	0	0	0
My Custom Storm 6		0	0	0	0	0	0	0	0
My Custom Storm 7		0	0	0	0	0	0	0	0
My Custom Storm 8		0	0	0	0	0	0	0	0
My Custom Storm 9		0	0	0	0	0	0	0	0
My Custom Storm 10		0	0	0	0	0	0	0	0

Precipitation Report Cont'd

Precipitation filename: SamplePrecip.pcp

Rainfall totals in Inches

09-10-2024

	Active	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Active						✓	✓		✓
Huff Indiana	> Indianapolis								
30-min		0.99	1.19	0	1.44	1.63	1.89	2.08	2.28
1-hr		1.21	1.46	0	1.81	2.08	2.45	2.75	3.06
2-hr		1.46	1.77	0	2.22	2.57	3.05	3.44	3.85
3-hr		1.57	1.90	0	2.38	2.76	3.30	3.75	4.21
6-hr		1.92	2.31	0	2.88	3.36	4.01	4.56	5.13
12-hr		0	0	0	0	0	0	0	0
24-hr		0	0	0	0	0	0	0	0
Huff Indiana	> Evansville								
30-min		0.99	1.19	0	1.44	1.63	1.89	2.08	2.28
1-hr		1.21	1.46	0	1.81	2.08	2.45	2.75	3.06
2-hr		1.46	1.77	0	2.22	2.57	3.05	3.44	3.85
3-hr		1.57	1.90	0	2.38	2.76	3.30	3.75	4.21
6-hr		1.92	2.31	0	2.88	3.36	4.01	4.56	5.13
12-hr		0	0	0	0	0	0	0	0
24-hr		0	0	0	0	0	0	0	0
Huff Indiana	> Fort Wayne								
30-min		0.99	1.19	0	1.44	1.63	1.89	2.08	2.28
1-hr		1.21	1.46	0	1.81	2.08	2.45	2.75	3.06
2-hr		1.46	1.77	0	2.22	2.57	3.05	3.44	3.85
3-hr		1.57	1.90	0	2.38	2.76	3.30	3.75	4.21
6-hr		1.92	2.31	0	2.88	3.36	4.01	4.56	5.13
12-hr		0	0	0	0	0	0	0	0
24-hr		0	0	0	0	0	0	0	0
Huff Indiana	> South Bend								
30-min		0.99	1.19	0	1.44	1.63	1.89	2.08	2.28
1-hr		1.21	1.46	0	1.81	2.08	2.45	2.75	3.06
2-hr		1.46	1.77	0	2.22	2.57	3.05	3.44	3.85
3-hr		1.57	1.90	0	2.38	2.76	3.30	3.75	4.21
6-hr		1.92	2.31	0	2.88	3.36	4.01	4.56	5.13
12-hr		0	0	0	0	0	0	0	0
24-hr		0	0	0	0	0	0	0	0

Precipitation Report Cont'd

Precipitation filename: SamplePrecip.pcp

Rainfall totals in Inches

09-10-2024

	Active	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Active						✓	✓		✓
NRCS Storms	> NRCS Dimensionless Storms								
NRCS MSE3, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
NRCS MSE4, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
NRCS MSE3, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
NRCS MSE4, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
NRCS MSE5, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
NRCS MSE6, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
NOAA-A, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
NOAA-B, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
NOAA-C, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
NOAA-D, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
NRCC-A, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
NRCC-B, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
NRCC-C, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
NRCC-D, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
CA-1, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
CA-2, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
CA-3, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
CA-4, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
CA-5, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
CA-6, 24-hr		4.82	5.74	0	7.35	8.76	10.80	12.50	14.30
FDOT Storms	> Florida DOT Storms								
FDOT, 1-hr		0	0	0	0	0	0	0	0
FDOT, 2-hr		0	0	0	0	0	0	0	0
FDOT, 4-hr		0	0	0	0	0	0	0	0
FDOT, 8-hr		0	0	0	0	0	0	0	0
FDOT, 24-hr		0	0	0	0	0	0	0	0
FDOT, 72-hr		0	0	0	0	0	0	0	0
SFWMD, 72-hr		0	0	0	0	0	0	0	0
Austin Storms	> Austin Frequency Storms								
Austin Zone 1, 24-hr		0	0	0	0	0	0	0	0
Austin Zone 2, 24-hr		0	0	0	0	0	0	0	0