

**2020 IDF Curves, Intensity Summary, Parameters, and Design Storms**

Table A.1 2020 IDF Curves – Intensity (mm/hr)

Time		Return Frequency						
Minutes	Hours	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	200-yr
5		67.84	91.53	109.85	135.00	155.14	178.49	204.34
6		63.13	85.94	103.63	127.77	146.95	169.28	194.46
7		59.12	81.08	98.15	121.36	139.70	161.11	185.63
8		55.67	76.81	93.30	115.64	133.22	153.81	177.68
9		52.65	73.03	88.96	110.50	127.40	147.23	170.47
10		49.99	69.66	85.06	105.86	122.13	141.26	163.92
11		47.63	66.62	81.53	101.63	117.34	135.84	157.92
12		45.51	63.88	78.32	97.77	112.96	130.87	152.40
13		43.60	61.38	75.38	94.23	108.94	126.31	147.32
14		41.87	59.10	72.68	90.97	105.23	122.10	142.61
15	0.25	40.29	57.01	70.20	87.96	101.80	118.20	138.24
16		38.84	55.08	67.90	85.16	98.63	114.58	134.17
17		37.52	53.29	65.76	82.56	95.67	111.21	130.37
18		36.29	51.63	63.78	80.13	92.90	108.06	126.80
19		35.15	50.09	61.92	77.86	90.32	105.11	123.46
20		34.09	48.65	60.18	75.74	87.89	102.34	120.32
21		33.11	47.31	58.56	73.73	85.61	99.73	117.35
22		32.19	46.04	57.02	71.85	83.46	97.27	114.55
23		31.33	44.85	55.58	70.07	81.44	94.95	111.90
24		30.52	43.74	54.22	68.39	79.52	92.76	109.39
25		29.75	42.68	52.93	66.80	77.70	90.68	107.00
26		29.03	41.68	51.71	65.29	75.98	88.70	104.74
27		28.35	40.73	50.55	63.86	74.34	86.83	102.58
28		27.71	39.83	49.45	62.49	72.78	85.04	100.52
29		27.10	38.98	48.41	61.19	71.30	83.33	98.56
30	0.5	26.52	38.17	47.41	59.95	69.88	81.70	96.68
31		25.97	37.39	46.46	58.77	68.53	80.15	94.89
32		25.44	36.65	45.55	57.64	67.23	78.66	93.17
33		24.94	35.95	44.68	56.55	65.99	77.24	91.52
34		24.46	35.27	43.85	55.52	64.80	75.87	89.93
35		24.00	34.63	43.05	54.52	63.66	74.56	88.41
36		23.57	34.01	42.29	53.56	62.57	73.30	86.95
37		23.15	33.41	41.55	52.65	61.52	72.09	85.54
38		22.74	32.84	40.84	51.76	60.50	70.92	84.19
39		22.36	32.29	40.16	50.91	59.53	69.80	82.88
40		21.99	31.76	39.51	50.09	58.59	68.71	81.62
41		21.63	31.26	38.88	49.30	57.68	67.67	80.41
42		21.29	30.77	38.27	48.54	56.81	66.66	79.23
43		20.95	30.29	37.69	47.81	55.96	65.69	78.09

Time		Return Frequency						
Minutes	Hours	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	200-yr
44		20.63	29.84	37.12	47.10	55.15	64.74	77.00
45	0.75	20.33	29.40	36.57	46.41	54.36	63.83	75.93
46		20.03	28.97	36.04	45.74	53.60	62.95	74.90
47		19.74	28.56	35.53	45.10	52.86	62.10	73.90
48		19.46	28.16	35.04	44.48	52.14	61.27	72.94
49		19.19	27.77	34.56	43.87	51.45	60.47	72.00
50		18.93	27.40	34.09	43.29	50.77	59.69	71.09
51		18.68	27.04	33.64	42.72	50.12	58.94	70.20
52		18.44	26.69	33.20	42.17	49.49	58.20	69.34
53		18.20	26.35	32.78	41.64	48.87	57.49	68.51
54		17.97	26.02	32.36	41.12	48.27	56.80	67.70
55		17.75	25.69	31.96	40.61	47.69	56.12	66.91
56		17.53	25.38	31.57	40.12	47.12	55.47	66.14
57		17.32	25.08	31.19	39.64	46.57	54.83	65.39
58		17.11	24.78	30.83	39.17	46.04	54.21	64.66
59		16.91	24.49	30.47	38.72	45.52	53.61	63.95
60	1.0	16.72	24.21	30.12	38.28	45.01	53.02	63.25
61		16.53	23.94	29.78	37.85	44.51	52.44	62.58
62		16.35	23.68	29.44	37.43	44.03	51.88	61.92
63		16.17	23.42	29.12	37.02	43.56	51.34	61.28
64		15.99	23.16	28.80	36.62	43.10	50.80	60.65
65		15.82	22.92	28.50	36.24	42.65	50.28	60.03
66		15.66	22.68	28.20	35.86	42.21	49.77	59.44
67		15.49	22.44	27.90	35.48	41.78	49.28	58.85
68		15.33	22.21	27.62	35.12	41.36	48.79	58.28
69		15.18	21.99	27.34	34.77	40.96	48.32	57.72
70		15.03	21.77	27.06	34.42	40.56	47.85	57.17
71		14.88	21.56	26.80	34.08	40.17	47.40	56.64
72		14.74	21.35	26.54	33.75	39.78	46.96	56.11
73		14.60	21.15	26.28	33.43	39.41	46.52	55.60
74		14.46	20.95	26.03	33.11	39.04	46.10	55.10
75	1.25	14.32	20.75	25.79	32.80	38.69	45.68	54.61
76		14.19	20.56	25.55	32.50	38.34	45.28	54.13
77		14.06	20.37	25.31	32.20	37.99	44.88	53.66
78		13.94	20.19	25.08	31.91	37.66	44.49	53.19
79		13.81	20.01	24.86	31.63	37.33	44.10	52.74
80		13.69	19.83	24.64	31.35	37.00	43.73	52.30
81		13.57	19.66	24.42	31.08	36.69	43.36	51.86
82		13.46	19.49	24.21	30.81	36.38	43.00	51.44
83		13.34	19.33	24.00	30.55	36.07	42.64	51.02
84		13.23	19.16	23.80	30.29	35.78	42.30	50.61

Time		Return Frequency						
Minutes	Hours	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	200-yr
85		13.12	19.01	23.60	30.03	35.48	41.96	50.20
86		13.02	18.85	23.40	29.79	35.19	41.62	49.81
87		12.91	18.70	23.21	29.54	34.91	41.29	49.42
88		12.81	18.55	23.02	29.30	34.64	40.97	49.04
89		12.71	18.40	22.84	29.07	34.36	40.65	48.66
90	1.5	12.61	18.25	22.66	28.84	34.10	40.34	48.29
120	2	10.28	14.86	18.40	23.44	27.82	33.03	39.60
180	3	7.68	11.07	13.65	17.38	20.76	24.75	29.73
240	4	6.23	8.96	11.00	14.00	16.80	20.09	24.17
300	5	5.30	7.59	9.30	11.83	14.24	17.07	20.54
360	6	4.64	6.63	8.09	10.29	12.43	14.93	17.97
420	7	4.14	5.91	7.20	9.15	11.07	13.33	16.05
480	8	3.75	5.35	6.50	8.26	10.02	12.07	14.54
540	9	3.44	4.89	5.94	7.54	9.17	11.06	13.33
600	10	3.18	4.52	5.48	6.96	8.47	10.23	12.33
660	11	2.97	4.21	5.09	6.46	7.88	9.53	11.48
720	12	2.78	3.94	4.76	6.04	7.38	8.93	10.76
780	13	2.62	3.71	4.48	5.68	6.94	8.41	10.14
840	14	2.48	3.51	4.23	5.36	6.56	7.96	9.60
900	15	2.36	3.33	4.01	5.09	6.23	7.56	9.11
960	16	2.25	3.17	3.82	4.84	5.93	7.20	8.69
1020	17	2.15	3.03	3.64	4.62	5.67	6.89	8.30
1080	18	2.06	2.90	3.48	4.42	5.42	6.60	7.95
1140	19	1.98	2.79	3.34	4.23	5.21	6.34	7.64
1200	20	1.91	2.68	3.21	4.07	5.01	6.10	7.35
1260	21	1.84	2.58	3.09	3.92	4.82	5.88	7.09
1320	22	1.78	2.50	2.98	3.78	4.66	5.68	6.85
1380	23	1.72	2.41	2.88	3.65	4.50	5.49	6.62
1440	24	1.67	2.34	2.79	3.53	4.36	5.32	6.41

**Table A.2 2020 IDF – Intensity Summary Table (mm/hr)**

Time		Return Frequency						
Minutes	Hours	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	200-yr
5	0.083	67.84	91.53	109.85	135.00	155.14	178.49	204.34
10	0.167	49.99	69.66	85.06	105.86	122.13	141.26	163.92
15	0.250	40.29	57.01	70.20	87.96	101.80	118.20	138.24
20	0.333	34.09	48.65	60.18	75.74	87.89	102.34	120.32
25	0.417	29.75	42.68	52.93	66.80	77.70	90.68	107.00
30	0.500	26.52	38.17	47.41	59.95	69.88	81.70	96.68
35	0.583	24.00	34.63	43.05	54.52	63.66	74.56	88.41
40	0.667	21.99	31.76	39.51	50.09	58.59	68.71	81.62
45	0.750	20.33	29.40	36.57	46.41	54.36	63.83	75.93
50	0.833	18.93	27.40	34.09	43.29	50.77	59.69	71.09
55	0.917	17.75	25.69	31.96	40.61	47.69	56.12	66.91
60	1	16.72	24.21	30.12	38.28	45.01	53.02	63.25
120	2	10.28	14.86	18.40	23.44	27.82	33.03	39.60
180	3	7.68	11.07	13.65	17.38	20.76	24.75	29.73
240	4	6.23	8.96	11.00	14.00	16.80	20.09	24.17
360	6	4.64	6.63	8.09	10.29	12.43	14.93	17.97
720	12	2.78	3.94	4.76	6.04	7.38	8.93	10.76
1440	24	1.67	2.34	2.79	3.53	4.36	5.32	6.41

<b>Rate=<math>a*(t+c)^b</math></b>	<b>2020 IDF Return Frequency</b>						
Parameters	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	200-yr
'a' (t in min)	370.26	587.05	798.40	1044.56	1145.99	1290.08	1554.16
'b'	-0.74	-0.76	-0.78	-0.78	-0.77	-0.75	-0.75
'c' (min)	4.83	6.56	7.83	8.70	8.63	8.76	9.73

Table A.3 2020 Design Storms

2020 Chicago Distribution - 4 hour Design Storms (mm/hr)

Time (min)	Return Frequency						
	2-yr	5-hr	10-yr	25-yr	50-yr	100-yr	200-yr
0	0	0	0	0	0	0	0
5	1.74	2.40	2.80	3.54	4.51	5.61	6.83
10	1.83	2.53	2.96	3.75	4.77	5.93	7.22
15	1.94	2.68	3.15	3.99	5.06	6.29	7.66
20	2.06	2.86	3.36	4.27	5.40	6.71	8.17
25	2.20	3.07	3.62	4.59	5.80	7.20	8.77
30	2.37	3.31	3.91	4.98	6.28	7.77	9.48
35	2.56	3.60	4.28	5.44	6.85	8.47	10.33
40	2.80	3.95	4.72	6.02	7.55	9.31	11.37
45	3.10	4.40	5.28	6.75	8.43	10.38	12.68
50	3.49	4.98	6.01	7.70	9.58	11.77	14.39
55	4.01	5.77	7.01	9.01	11.15	13.65	16.71
60	4.75	6.90	8.46	10.90	13.41	16.35	20.03
65	5.90	8.67	10.75	13.89	16.95	20.57	25.22
70	7.94	11.85	14.90	19.32	23.32	28.09	34.43
75	12.75	19.33	24.62	31.95	37.96	45.21	55.12
80	48.81	67.94	82.93	103.19	119.09	137.78	159.90
85	48.81	67.94	82.93	103.19	119.09	137.78	159.90
90	23.24	35.13	44.74	57.49	67.24	79.03	94.93
95	14.67	22.31	28.48	36.93	43.70	51.90	63.14
100	10.82	16.35	20.76	26.97	32.21	38.53	47.11
105	8.64	12.95	16.33	21.19	25.50	30.66	37.57
110	7.24	10.76	13.47	17.45	21.14	25.52	31.29
115	6.26	9.23	11.48	14.85	18.08	21.90	26.86
120	5.53	8.10	10.02	12.94	15.82	19.23	23.57
125	4.97	7.24	8.90	11.48	14.09	17.17	21.04
130	4.53	6.55	8.02	10.32	12.72	15.53	19.02
135	4.16	6.00	7.31	9.39	11.61	14.20	17.38
140	3.86	5.54	6.72	8.62	10.69	13.10	16.03
145	3.60	5.15	6.22	7.98	9.91	12.17	14.88
150	3.38	4.82	5.80	7.43	9.25	11.37	13.90
155	3.19	4.53	5.44	6.96	8.68	10.68	13.05
160	3.02	4.28	5.12	6.54	8.18	10.08	12.31
165	2.87	4.05	4.84	6.18	7.74	9.55	11.66
170	2.74	3.86	4.60	5.86	7.35	9.08	11.08
175	2.62	3.68	4.37	5.57	7.00	8.66	10.56
180	2.51	3.52	4.18	5.32	6.69	8.28	10.09
185	2.41	3.37	4.00	5.08	6.41	7.93	9.67

190	2.32	3.24	3.83	4.87	6.15	7.62	9.28
195	2.24	3.12	3.68	4.68	5.91	7.33	8.93
200	2.16	3.01	3.55	4.50	5.70	7.07	8.61
205	2.09	2.91	3.42	4.34	5.50	6.82	8.31
210	2.03	2.81	3.31	4.19	5.31	6.60	8.04
215	1.97	2.73	3.20	4.05	5.14	6.39	7.78
220	1.91	2.64	3.10	3.92	4.98	6.20	7.54
225	1.86	2.57	3.00	3.80	4.83	6.02	7.32
230	1.81	2.50	2.92	3.69	4.70	5.85	7.11
235	1.76	2.43	2.83	3.59	4.57	5.69	6.92
240	1.72	2.37	2.76	3.49	4.44	5.54	6.74

**2020 Huff Distribution – 24 hour Design Storms (mm/hr)**

Time		Return Frequency						
Minutes	Hours	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	200-yr
0	0	0	0	0	0	0	0	0
15		0.30	0.42	0.50	0.63	0.78	0.95	1.15
30		0.60	0.84	1.00	1.27	1.56	1.91	2.30
45		0.90	1.26	1.50	1.90	2.34	2.86	3.45
60	1	1.20	1.67	2.00	2.53	3.12	3.81	4.60
75		1.59	2.23	2.66	3.37	4.16	5.08	6.12
90		2.39	3.34	3.99	5.05	6.23	7.60	9.17
105		3.18	4.45	5.32	6.73	8.30	10.13	12.22
120	2	3.97	5.56	6.64	8.41	10.37	12.66	15.26
135		4.76	6.67	7.97	10.08	12.44	15.18	18.31
150		5.30	7.42	8.86	11.21	13.84	16.88	20.36
165		5.44	7.62	9.10	11.52	14.22	17.35	20.92
180	3	5.59	7.83	9.35	11.83	14.60	17.82	21.49
195		5.73	8.03	9.59	12.14	14.98	18.28	22.05
210		5.88	8.24	9.84	12.45	15.37	18.75	22.61
225		5.79	8.11	9.68	12.26	15.13	18.45	22.25
240	4	5.54	7.76	9.26	11.73	14.47	17.66	21.29
255		5.29	7.41	8.85	11.20	13.82	16.86	20.33
270		5.04	7.06	8.43	10.67	13.16	16.06	19.37
285		4.79	6.71	8.01	10.14	12.51	15.26	18.41
300	5	4.54	6.36	7.60	9.62	11.87	14.48	17.47
315		4.30	6.02	7.19	9.10	11.24	13.71	16.53
330		4.06	5.68	6.79	8.59	10.60	12.93	15.60
345		3.81	5.34	6.38	8.07	9.96	12.16	14.66
360	6	3.57	5.00	5.97	7.56	9.33	11.38	13.72
375		3.35	4.69	5.60	7.09	8.75	10.67	12.87
390		3.13	4.38	5.23	6.62	8.17	9.96	12.01

Time		Return Frequency						
Minutes	Hours	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	200-yr
405		2.90	4.07	4.86	6.15	7.58	9.25	11.16
420	7	2.68	3.75	4.48	5.67	7.00	8.54	10.30
435		2.47	3.46	4.13	5.23	6.46	7.88	9.50
450		2.32	3.25	3.88	4.91	6.06	7.39	8.91
465		2.17	3.03	3.62	4.59	5.66	6.90	8.33
480	8	2.01	2.82	3.37	4.26	5.26	6.42	7.74
495		1.86	2.61	3.11	3.94	4.86	5.93	7.15
510		1.74	2.44	2.92	3.69	4.56	5.56	6.70
525		1.68	2.35	2.81	3.56	4.39	5.36	6.46
540	9	1.62	2.27	2.71	3.43	4.23	5.16	6.22
555		1.56	2.18	2.60	3.29	4.06	4.96	5.98
570		1.49	2.09	2.50	3.16	3.90	4.76	5.74
585		1.43	2.00	2.39	3.03	3.74	4.56	5.50
600	10	1.37	1.92	2.29	2.90	3.57	4.36	5.26
615		1.31	1.83	2.18	2.76	3.41	4.16	5.02
630		1.24	1.74	2.08	2.63	3.25	3.96	4.78
645		1.18	1.65	1.97	2.50	3.08	3.76	4.54
660	11	1.12	1.57	1.88	2.38	2.94	3.58	4.32
675		1.07	1.50	1.79	2.26	2.79	3.40	4.10
690		1.01	1.42	1.69	2.14	2.64	3.23	3.89
705		0.96	1.34	1.60	2.02	2.50	3.05	3.68
720	12	0.90	1.26	1.51	1.91	2.35	2.87	3.46
735		0.87	1.22	1.46	1.85	2.28	2.78	3.36
750		0.85	1.18	1.41	1.79	2.21	2.69	3.25
765		0.82	1.14	1.37	1.73	2.14	2.61	3.14
780	13	0.79	1.11	1.32	1.67	2.06	2.52	3.04
795		0.76	1.07	1.27	1.61	1.99	2.42	2.92
810		0.73	1.02	1.21	1.54	1.90	2.31	2.79
825		0.69	0.97	1.16	1.46	1.81	2.20	2.66
840	14	0.66	0.92	1.10	1.39	1.71	2.09	2.52
855		0.62	0.87	1.04	1.32	1.62	1.98	2.39
870		0.60	0.84	1.00	1.27	1.56	1.91	2.30
885		0.59	0.83	0.99	1.25	1.54	1.88	2.27
900	15	0.58	0.82	0.98	1.24	1.53	1.86	2.24
915		0.58	0.81	0.97	1.22	1.51	1.84	2.22
930		0.57	0.80	0.95	1.21	1.49	1.82	2.19
945		0.56	0.79	0.94	1.19	1.47	1.79	2.16
960	16	0.56	0.78	0.93	1.18	1.45	1.77	2.14
975		0.55	0.77	0.92	1.16	1.43	1.75	2.11
990		0.54	0.76	0.91	1.15	1.42	1.73	2.08
1005		0.54	0.75	0.90	1.13	1.40	1.71	2.06



Time		Return Frequency						
Minutes	Hours	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	200-yr
1020	17	0.53	0.74	0.88	1.12	1.38	1.68	2.03
1035		0.52	0.73	0.87	1.10	1.36	1.66	2.00
1050		0.51	0.72	0.86	1.09	1.34	1.64	1.98
1065		0.51	0.71	0.85	1.07	1.33	1.62	1.95
1080	18	0.50	0.70	0.84	1.06	1.31	1.60	1.92
1095		0.49	0.69	0.83	1.04	1.29	1.57	1.90
1110		0.49	0.68	0.81	1.03	1.27	1.55	1.87
1125		0.48	0.67	0.80	1.02	1.25	1.53	1.84
1140	19	0.47	0.66	0.79	1.00	1.24	1.51	1.82
1155		0.46	0.65	0.78	0.98	1.21	1.48	1.79
1170		0.45	0.63	0.75	0.95	1.18	1.44	1.73
1185		0.44	0.61	0.73	0.92	1.14	1.39	1.68
1200	20	0.42	0.59	0.71	0.89	1.10	1.35	1.62
1215		0.41	0.57	0.68	0.87	1.07	1.30	1.57
1230		0.39	0.55	0.66	0.84	1.03	1.26	1.52
1245		0.38	0.53	0.64	0.81	1.00	1.21	1.46
1260	21	0.37	0.51	0.61	0.78	0.96	1.17	1.41
1275		0.35	0.49	0.59	0.75	0.92	1.13	1.36
1290		0.34	0.48	0.57	0.72	0.89	1.08	1.30
1305		0.33	0.46	0.54	0.69	0.85	1.04	1.25
1320	22	0.31	0.44	0.52	0.66	0.81	0.99	1.20
1335		0.30	0.42	0.50	0.63	0.78	0.95	1.14
1350		0.28	0.40	0.47	0.60	0.74	0.90	1.09
1365		0.27	0.38	0.45	0.57	0.70	0.86	1.04
1380	23	0.26	0.36	0.43	0.54	0.67	0.82	0.98
1395		0.24	0.34	0.40	0.51	0.63	0.77	0.93
1410		0.23	0.32	0.38	0.48	0.60	0.73	0.88
1425		0.21	0.30	0.36	0.45	0.56	0.68	0.82
1440	24	0.20	0.28	0.33	0.42	0.52	0.64	0.77