

**APPENDIX H**

**CITY OF PICKERING IDF  
RELATIONSHIPS AND DESIGN STORMS**



### 6.2.4 Rainfall Intensity-Duration-Frequency (IDF)

The City of Pickering's IDF data (refer to Table 12) shall be used to determine the appropriate rainfall intensity for use with the Rational Method. The equations are also provided. IDF data has been revised from the previous City of Pickering standards.

The equation of IDF curves is expressed as:

$$I = \frac{A}{(t_c + B)^C}$$

where I = intensity of rainfall in mm/hour  
t<sub>c</sub> = time of concentration in minutes for the cumulative drainage area to the point of interest

**Table 12 - Pickering IDF Parameters**

Parameter	Return Period					
	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
A	715.076	1082.901	1313.979	1581.718	1828.009	2096.425
B	5.262	6.007	6.026	6.007	6.193	6.485
C	0.815	0.837	0.845	0.848	0.856	0.863

#### City of Pickering Rainfall Intensity

##### Rainfall Intensity (mm/hr)

Return Period	Duration (min)								
	5	10	15	30	60	120	360	720	1440
2 Year	109.2	76.1	61.7	39.1	23.8	14.0	5.7	3.4	1.9
5 Year	151.9	101.6	85.0	54.6	32.6	18.7	7.6	4.4	2.5
10 Year	180.1	118.5	100.5	64.9	38.5	21.8	8.9	5.1	2.8
25 Year	215.8	139.8	120.1	77.9	45.9	25.7	10.4	6.0	3.3
50 Year	242.3	155.7	134.6	87.5	51.4	28.7	11.6	6.6	3.6
100 Year	268.5	171.4	148.9	97.0	56.8	31.6	12.8	7.2	3.9

#### City of Pickering Rainfall Depth

##### Rainfall Depth (mm)

Return Period	Duration (min)								
	5	10	15	30	60	120	360	720	1440
2 Year	9.1	12.7	15.4	19.5	23.8	27.9	34.5	41.1	45.9
5 Year	12.7	16.9	21.3	27.3	32.6	37.4	45.8	53.2	59.0
10 Year	15.0	19.7	25.1	32.4	38.5	43.6	53.2	61.3	67.6
25 Year	18.0	23.3	30.0	38.9	45.9	51.5	62.7	71.4	78.5
50 Year	20.2	25.9	33.6	43.7	51.4	57.3	69.7	79.0	86.7
100 Year	22.4	28.6	37.2	48.5	56.8	63.1	76.6	86.5	94.7

### City of Pickering AES Storm Hyetographs 2-yr Return Period

IDF Data: Toronto, Bloor St.  
AES Distribution: Toronto

1-Hour AES Storm		12-Hour AES Storm	
Time (hr)	Precip. (mm/hr)	Time (hr)	Precip. (mm/hr)
0	0.00	0	0.00
5	2.86	15	0.41
10	8.57	30	0.41
15	22.85	45	0.41
20	42.84	60	0.41
25	79.97	75	0.41
30	42.84	90	0.41
35	34.27	105	0.41
40	22.85	120	0.41
45	14.28	135	2.47
50	8.57	150	2.47
55	2.86	165	2.47
60	2.86	180	2.47
<b>Depth (mm)</b>	<b>23.8</b>	195	6.99
		210	6.99
		225	6.99
		240	6.99
		255	18.91
		270	18.91
		285	18.91
		300	18.91
		315	5.34
		330	5.34
		345	5.34
		360	5.34
		375	2.88
		390	2.88
		405	2.88
		420	2.88
		435	1.64
		450	1.64
		465	1.64
		480	1.64
		495	0.82
		510	0.82
		525	0.82
		540	0.82
		555	0.41
		570	0.41
		585	0.41
		600	0.41
		615	0.41
		630	0.41
		645	0.41
		660	0.41
		675	0.41
		690	0.41
		705	0.41
		720	0.41
		<b>Depth (mm)</b>	<b>41.1</b>

### City of Pickering AES Storm Hyetographs 5-yr Return Period

IDF Data: Toronto, Bloor St.  
AES Distribution: Toronto

1-Hour AES Storm		12-Hour AES Storm	
Time (hr)	Precip. (mm/hr)	Time (hr)	Precip. (mm/hr)
0	0.00	0	0.00
5	3.91	15	0.53
10	11.74	30	0.53
15	31.30	45	0.53
20	58.68	60	0.53
25	109.54	75	0.53
30	58.68	90	0.53
35	46.94	105	0.53
40	31.30	120	0.53
45	19.56	135	3.19
50	11.74	150	3.19
55	3.91	165	3.19
60	3.91	180	3.19
<b>Depth (mm)</b>	<b>32.6</b>	195	9.04
		210	9.04
		225	9.04
		240	9.04
		255	24.47
		270	24.47
		285	24.47
		300	24.47
		315	6.92
		330	6.92
		345	6.92
		360	6.92
		375	3.72
		390	3.72
		405	3.72
		420	3.72
		435	2.13
		450	2.13
		465	2.13
		480	2.13
		495	1.06
		510	1.06
		525	1.06
		540	1.06
		555	0.53
		570	0.53
		585	0.53
		600	0.53
		615	0.53
		630	0.53
		645	0.53
		660	0.53
		675	0.53
		690	0.53
		705	0.53
		720	0.53
		<b>Depth (mm)</b>	<b>53.2</b>

### City of Pickering AES Storm Hyetographs 10-yr Return Period

IDF Data: Toronto, Bloor St.  
AES Distribution: Toronto

1-Hour AES Storm		12-Hour AES Storm	
Time (hr)	Precip. (mm/hr)	Time (hr)	Precip. (mm/hr)
0	0.00	0	0.00
5	4.62	15	0.61
10	13.86	30	0.61
15	36.96	45	0.61
20	69.30	60	0.61
25	129.36	75	0.61
30	69.30	90	0.61
35	55.44	105	0.61
40	36.96	120	0.61
45	23.10	135	3.68
50	13.86	150	3.68
55	4.62	165	3.68
60	4.62	180	3.68
<b>Depth (mm)</b>	<b>38.5</b>	195	10.42
		210	10.42
		225	10.42
		240	10.42
		255	28.20
		270	28.20
		285	28.20
		300	28.20
		315	7.97
		330	7.97
		345	7.97
		360	7.97
		375	4.29
		390	4.29
		405	4.29
		420	4.29
		435	2.45
		450	2.45
		465	2.45
		480	2.45
		495	1.23
		510	1.23
		525	1.23
		540	1.23
		555	0.61
		570	0.61
		585	0.61
		600	0.61
		615	0.61
		630	0.61
		645	0.61
		660	0.61
		675	0.61
		690	0.61
		705	0.61
		720	0.61
		<b>Depth (mm)</b>	<b>61.3</b>

### City of Pickering AES Storm Hyetographs 25-yr Return Period

IDF Data: Toronto, Bloor St.  
AES Distribution: Toronto

1-Hour AES Storm		12-Hour AES Storm	
Time (hr)	Precip. (mm/hr)	Time (hr)	Precip. (mm/hr)
0	0.00	0	0.00
5	5.51	15	0.71
10	16.52	30	0.71
15	44.06	45	0.71
20	82.62	60	0.71
25	154.22	75	0.71
30	82.62	90	0.71
35	66.10	105	0.71
40	44.06	120	0.71
45	27.54	135	4.28
50	16.52	150	4.28
55	5.51	165	4.28
60	5.51	180	4.28
<b>Depth (mm)</b>	<b>45.9</b>	195	12.14
		210	12.14
		225	12.14
		240	12.14
		255	32.84
		270	32.84
		285	32.84
		300	32.84
		315	9.28
		330	9.28
		345	9.28
		360	9.28
		375	5.00
		390	5.00
		405	5.00
		420	5.00
		435	2.86
		450	2.86
		465	2.86
		480	2.86
		495	1.43
		510	1.43
		525	1.43
		540	1.43
		555	0.71
		570	0.71
		585	0.71
		600	0.71
		615	0.71
		630	0.71
		645	0.71
		660	0.71
		675	0.71
		690	0.71
		705	0.71
		720	0.71
		<b>Depth (mm)</b>	<b>71.4</b>

### City of Pickering AES Storm Hyetographs 50-yr Return Period

IDF Data: Toronto, Bloor St.  
AES Distribution: Toronto

1-Hour AES Storm		12-Hour AES Storm	
Time (hr)	Precip. (mm/hr)	Time (hr)	Precip. (mm/hr)
0	0.00	0	0.00
5	6.17	15	0.79
10	18.50	30	0.79
15	49.34	45	0.79
20	92.52	60	0.79
25	172.70	75	0.79
30	92.52	90	0.79
35	74.02	105	0.79
40	49.34	120	0.79
45	30.84	135	4.74
50	18.50	150	4.74
55	6.17	165	4.74
60	6.17	180	4.74
<b>Depth (mm)</b>	<b>51.4</b>	195	13.43
		210	13.43
		225	13.43
		240	13.43
		255	36.34
		270	36.34
		285	36.34
		300	36.34
		315	10.27
		330	10.27
		345	10.27
		360	10.27
		375	5.53
		390	5.53
		405	5.53
		420	5.53
		435	3.16
		450	3.16
		465	3.16
		480	3.16
		495	1.58
		510	1.58
		525	1.58
		540	1.58
		555	0.79
		570	0.79
		585	0.79
		600	0.79
		615	0.79
		630	0.79
		645	0.79
		660	0.79
		675	0.79
		690	0.79
		705	0.79
		720	0.79
		<b>Depth (mm)</b>	<b>79.0</b>

### City of Pickering AES Storm Hyetographs 100-yr Return Period

IDF Data: Toronto, Bloor St.  
AES Distribution: Toronto

1-Hour AES Storm		12-Hour AES Storm	
Time (hr)	Precip. (mm/hr)	Time (hr)	Precip. (mm/hr)
0	0.00	0	0.00
5	6.82	15	0.86
10	20.45	30	0.86
15	54.53	45	0.86
20	102.24	60	0.86
25	190.85	75	0.86
30	102.24	90	0.86
35	81.79	105	0.86
40	54.53	120	0.86
45	34.08	135	5.19
50	20.45	150	5.19
55	6.82	165	5.19
60	6.82	180	5.19
<b>Depth (mm)</b>	<b>56.8</b>	195	14.71
		210	14.71
		225	14.71
		240	14.71
		255	39.79
		270	39.79
		285	39.79
		300	39.79
		315	11.24
		330	11.24
		345	11.24
		360	11.24
		375	6.06
		390	6.06
		405	6.06
		420	6.06
		435	3.46
		450	3.46
		465	3.46
		480	3.46
		495	1.73
		510	1.73
		525	1.73
		540	1.73
		555	0.86
		570	0.86
		585	0.86
		600	0.86
		615	0.86
		630	0.86
		645	0.86
		660	0.86
		675	0.86
		690	0.86
		705	0.86
		720	0.86
		<b>Depth (mm)</b>	<b>86.5</b>