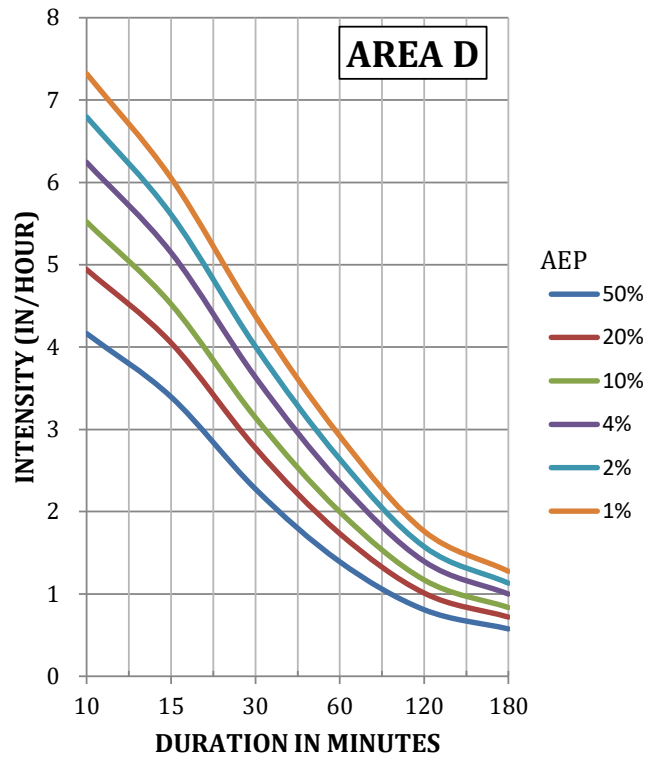
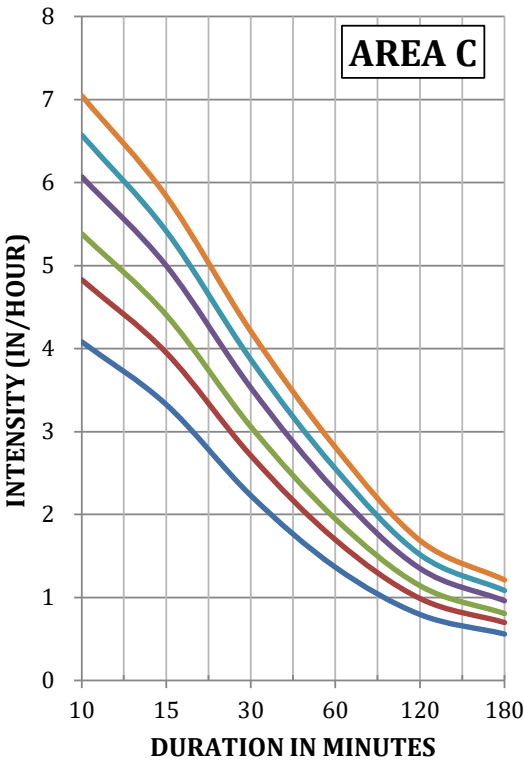
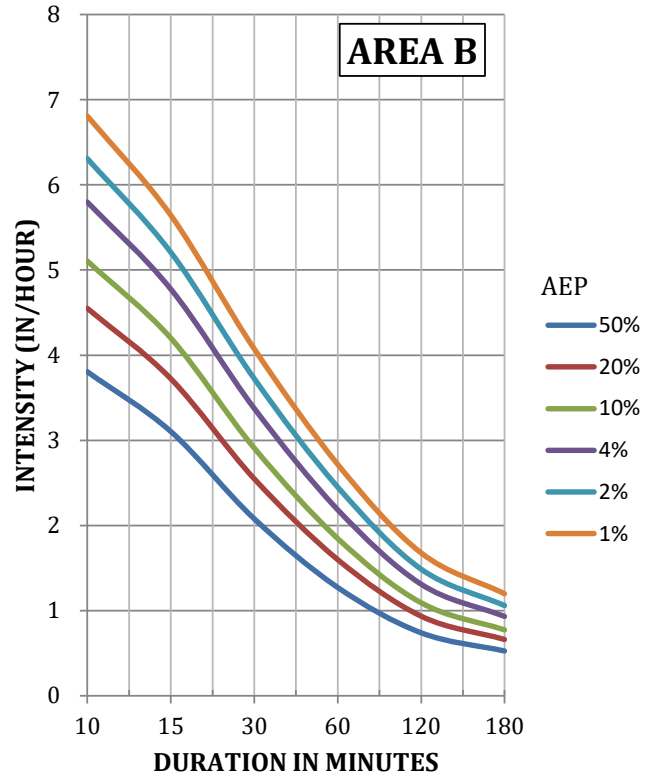
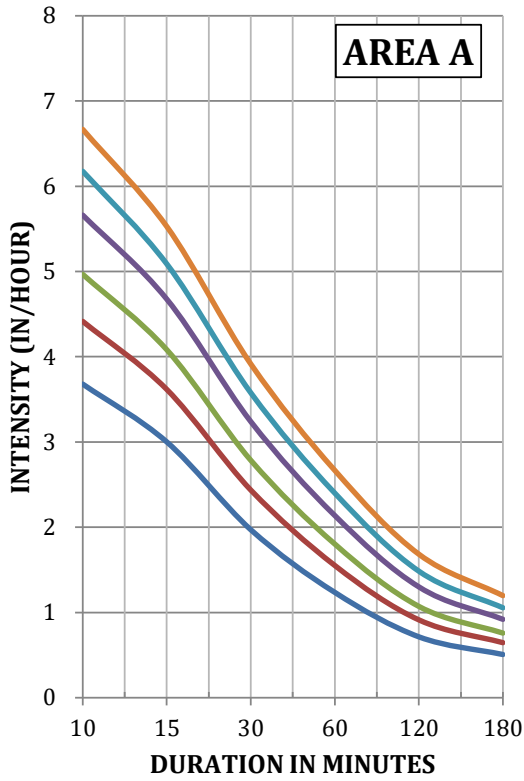


Rainfall Intensity-Frequency-Duration Curves

1101-2

REFERENCE SECTION

1101.2.3

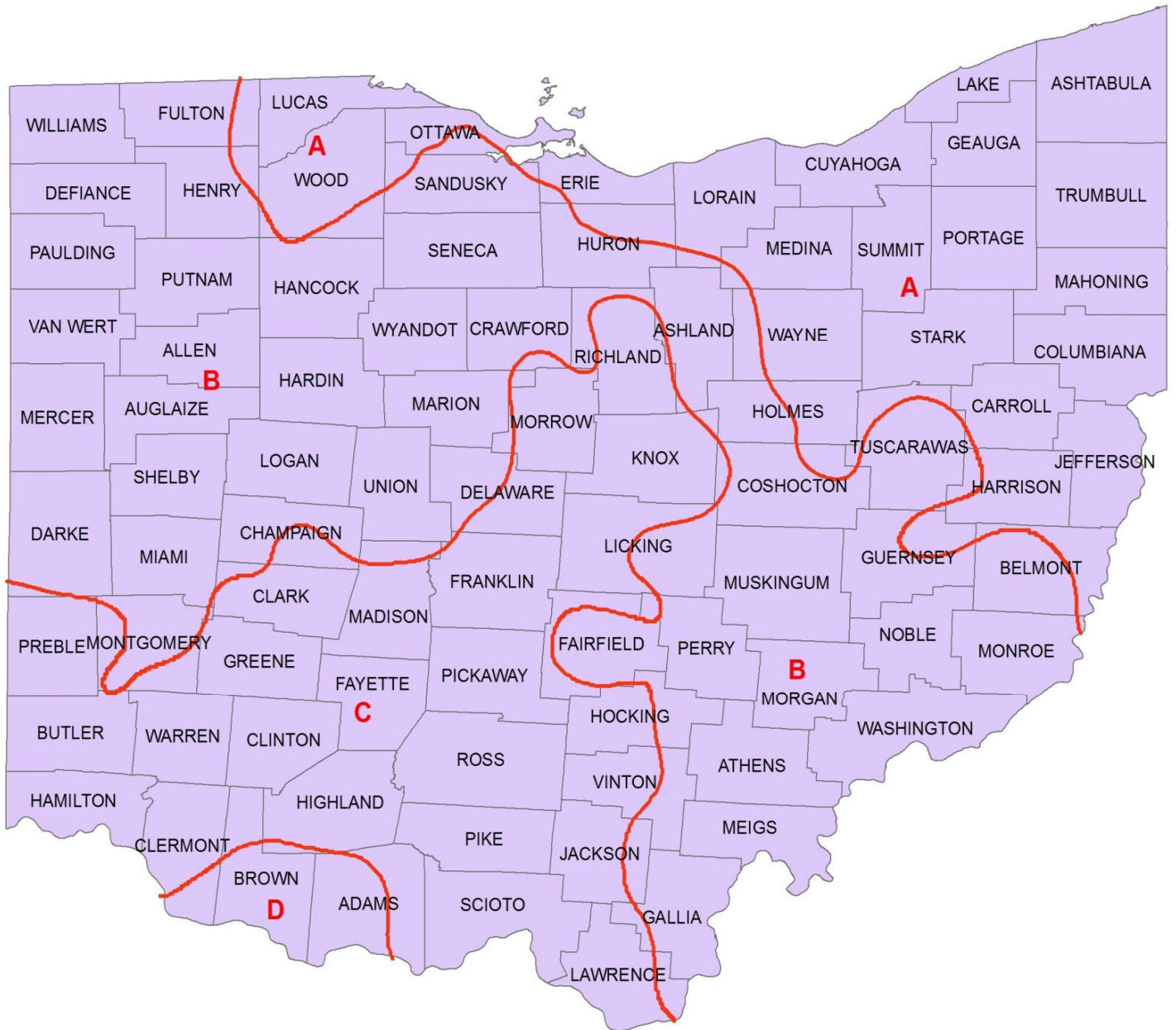


Rainfall Intensity-Frequency-Duration Curves

1101-2

REFERENCE SECTION

1101.2.3



Rainfall Intensity Zone Map

Rainfall Intensity-Frequency-Duration Curves

1101-2

REFERENCE SECTION

1101.2.3

The Rainfall Intensity-Duration-Frequency (IDF) curves are based upon precipitation data obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14. The precipitation data was collected between 4/1863 to 12/2000.

Rainfall depth varies across the State with more rainfall depth present in the Southwest portion of the state and gradually decreasing towards the Northeast. IDF curves were developed for 4 regions across the State to simplify hydraulic design. The regions were determined by normalizing contours created from NOAA precipitation GIS data from the 10% AEP, 60 minute duration.

Federal Highway Administration Hydraulic Engineering Circular No. 12 Appendix A offers a methodology for converting IDF data points to an equation of the general form:

$$i = a/(t+b)^c$$

Where: i = rainfall intensity (inches/hour)
 t = time of concentration (minutes)
 a = constant
 b = constant
 c = constant

The IDF Curves can be expressed using the above general equation utilizing the constants shown below.

Intensity Zone	AEP %	Constant a	Constant b	Constant c
A	50	46.184	9.000	0.859
	20	56.985	10.250	0.851
	10	64.167	11.000	0.842
	4	66.528	11.000	0.811
	2	65.702	10.750	0.782
	1	64.489	10.500	0.754
B	50	47.987	9.000	0.859
	20	60.684	10.500	0.858
	10	73.126	12.000	0.863
	4	75.841	12.000	0.833
	2	65.621	10.000	0.781
	1	85.047	13.250	0.806
C	50	56.299	10.000	0.876
	20	67.933	11.000	0.869
	10	84.550	13.000	0.882
	4	95.736	14.000	0.871
	2	96.783	14.000	0.850
	1	80.436	11.500	0.794
D	50	57.448	10.000	0.876
	20	67.933	11.000	0.869
	10	79.192	12.000	0.864
	4	87.886	12.750	0.849
	2	95.169	13.500	0.839
	1	91.982	13.000	0.810