CE 365K Hydraulic Engineering Design **Spring 2016**

Assignment 2
Orifices, Weirs and Design Rainfall

The solution to this homework should be posted in pdf format to the Canvas web site for this class under Assignment 2 by Thursday Feb 4.

1. Solve problem 1.15 on p.37 of Haested using Flowmaster. Use a hand calculation to verify the flow through the weir when the height of the water above the weir crest is 0.7m

2. Solve problem 1.16 on p.38 of Haested using Flowmaster. Use a hand calculation to verify the flow through the orifice and through the rectangular weir when the depth in the pond is 2.60m.

3. Solve problem 1.17 on p.38 of Haested using Flowmaster. Use a hand calculation to verify the flow through the orifice when the water in the pond has an elevation of 4.60m.

4. Use the standard formula for Austin Intensity-Duration-Frequency curves defined as Equation (2-8) of the Austin Drainage Criteria Manual to define the intensity duration frequency curve for Austin for a 10 year return interval storm with a duration of 3 hours using 10 minute time intervals. Determine the corresponding design rainfall hyetograph using the alternating block method.

5. Use the data from Section 2 of the Austin Drainage Criteria Manual to develop a 24-hour SCS design hyetograph for a 100 year return period. Use the spreadsheet at: http://www.caee.utexas.edu/prof/maidment/CE365KSpr16/Rainfall/SCS24HourHyetograph.xlsx to obtain the standard hyetograph shape in 5 min intervals for this problem. Plot the rainfall intensity hyetograph and the cumulative rainfall hyetograph.

6. Use the data in Section 2 of the Austin Drainage Criteria manual to plot a bar chart showing 100 year, 500 year and Probable Maximum Precipitation for Austin for 1, 2, 3, 6, 12, 24 hour durations. All rainfall depths are in inches.