CE 413 Homework II

Fall 2018 Due October 1 B.A. DeVantier

Problem 1

Text problem 7.5 *Domestic wastewater from an area of 350 acres is to be carried by a circular pipe at a velocity not less than 2.5 ft/s. Mannilng's n = 0.013. The population density is 16 persons per acre. Find the maximum hourly and minimum hourly flows. Determine the pipe size required to handle these flows and the required slope.* You may assume that the average generation rate of sewage is 115 gallons per person per day which includes infiltration, and that the minimum flow is one third of the average and the maximum is three times the average. Use the maximum velocity to set pipe diameter, since slope is unspecified and calculated based on the pipe diameter at maximum flow.

Problem 2

Recalculate the in-class rework of Text Example 7.1 using the log-log straight line fitting approach for handout Fig. 3-4 as well as for Fig. 3-5 (already done in class example).

Problem 3

Recalculate **Step 6** of Text Example 7.3 using Figures 3-1, 3-4, and 3-5 in the class handout. Give the MGD/acre value and the maximum to average total flow ratio (they were 0.0138 MGD/acre and 3 to 1).

Problem 4 (worth three times other problems)

Verify Text Tables 7.3 and 7.4 using the spreadsheet supplied on the course website using a logical if statement for minimum slope determination rather than the table interpolation used in the Text. Print out your spreadsheet table results and note any discrepancies with the Text Table 7.4. Send a copy of the final spreadsheet as an e-mail attachment to bruce.devantier@siu.edu .