

Municipal Engineering  
Assignment #4  
Due Monday 9 June 2008

Use the EPANET model to analyze and design a water system network for a small town with a residential area of 140 hectares with a housing density of 8 houses per hectare and an average of 4 persons per household.

Determine the total population, the average daily flow, the maximum daily flow and the flow requirements for fire fighting. Use the total flow for design.

Select a looped network of pipes and junctions to service this town. For each pipe select the diameter, length and type of pipe (or roughness coefficient). For each node or junction select the elevation and the demand. You need to provide a demand pattern based on the expected daily flow fluctuations but you can use the same pattern for all nodes. You can use a time step of between one and four hours.

The velocity of flow should be between 0.75 m/s and 2.3 m/s and the pressure should be maintained between 20 psi and 80 psi.

You should provide two overhead storage tanks for the system and for each tank give the minimum elevation, the maximum elevation, the initial water level and the tank diameter. A minimum water level should always be maintained in the tanks for fire-fighting purposes. You should use one or two pumps and for each provide the head discharge curve.

Use the H – W equation and units of gpm (the default values for the model).

The National Board of Fire Underwriters equation can be used to calculate fire fighting flows for communities of less than 200,000 people where Q = demand in gpm and P is population in thousands. This flow must be available for up to 10 hours.

$$Q = \sqrt{P}(1 - .01\sqrt{P})$$

A hard copy of your network plan should be submitted in class and a soft copy of the file should be emailed to the Teaching Assistant and his email addresses are given below. You are responsible for verifying with the Teaching Assistant that he has received your file and you need to make sure you send it early so it will be received in time.

[asapo@engr.mun.ca](mailto:asapo@engr.mun.ca)

or

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