CE 3372 – Water Systems Design
Exercise Set 8

Exercise

1. Figure 1 is a map of a proposed subdivision. Each lot will house an executive home.
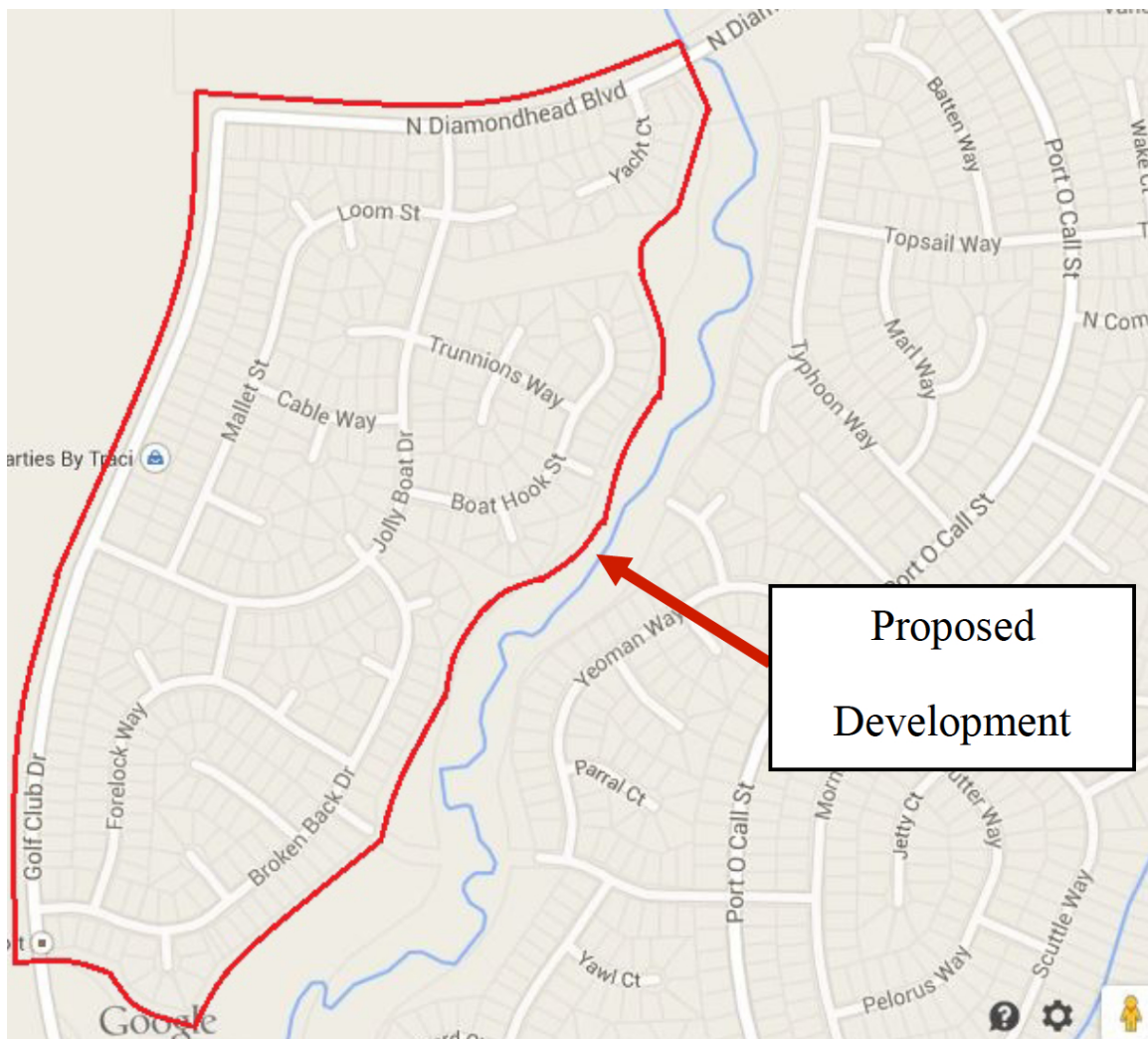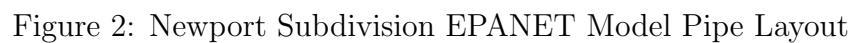

Figure 1: Newport Subdivision Proposed Development

Figure 2: Newport Subdivision EPANET Model Pipe Layout

Figure 2 is a skeletonized layout for an EPANET model of the water distribution system. Each node serves several lots.

a) List the different types of hydraulic elements in the EPANET model (e.g. pipes, nodes, ...).

b) Describe how to estimate demand for the water distribution system.

c) Estimate the water demand for the water distribution system.

2. Figure 3 is a five-pipe network with a water supply source (a reservoir, not shown) connected at Node 1, and demands at Nodes 1-5. Table 1 is a list of the relevant pipe and node data.
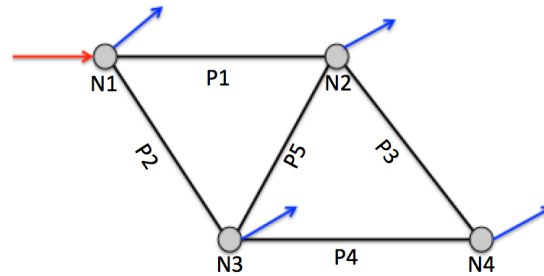

Figure 3: Layout of Simple Network

Table 1: Node and Pipe Data

Pipe ID	Diameter (inches)	Length (feet)	Material
P1	8	800	PVC
P2	8	700	PVC
P3	8	700	PVC
P4	8	800	PVC
P5	6	600	PVC

Node ID	Demand (CFS)	Elevation (feet)
N1	2.0	0.0
N2	4.0	0.0
N3	3.0	0.0
N4	1.0	0.0

Build an EPANET model, using the Darcy-Weisbach head loss model of the network. From your model:

a) Make a screen capture of the EPANET program showing your network map, with the Node ID and Node Pressures displayed on the map, and with the Pipe ID and Pipe Flow Rates on the map.

b) Make a table that lists each node name, node elevation, and the resultant pressure in U.S. Customary units.

c) Make a table that lists each pipe name, length, diameter, computed friction factor, and the resultant flow rate in U.S. Customary units.

d) Identify the node with the lowest pressure in your solution.

Submit the above items as content in a technical memorandum that includes a description of how the model was built and a discussion and interpretation of the results.

Attach the EPANET output report to the memorandum.