



Activity 2.3.8 Residential Water Supply

Introduction

Most people take it for granted that when they turn on a faucet, water is available. In fact a lot of planning has been completed to ensure that homes and business have adequate water. Engineers use codes and calculations to ensure that source and pressure are adequate. Historically civilizations in Rome and China were able to establish large urban areas and advance culture in large part because of their ability to transport large amounts of fresh water to citizens to meet their needs.

Equipment

-  Calculator
-  pencil
-  Hazen Williams Constants & Equivalent Length of (Generic) Fittings handout

Procedure

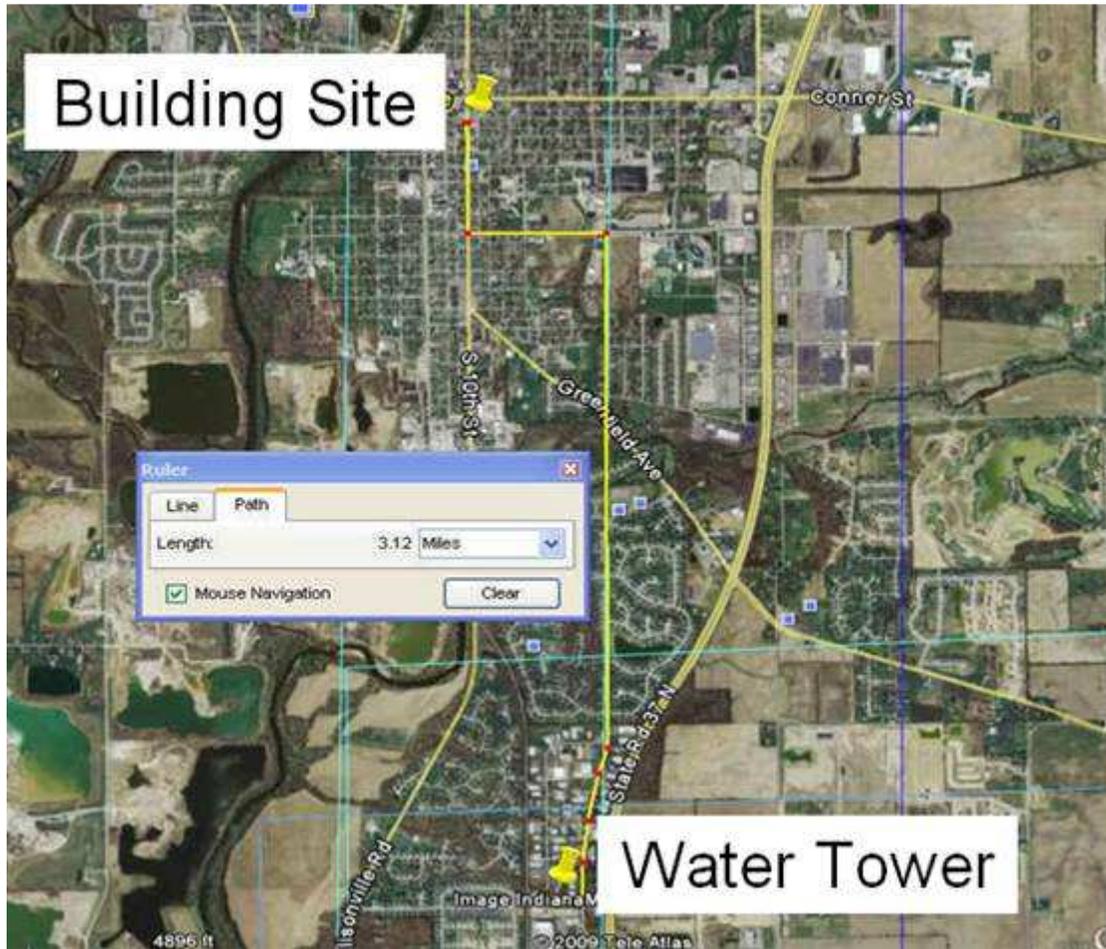
Complete water supply calculations for each of the following.

1. Complete the following calculations for your affordable home in your engineering notebook or journal.

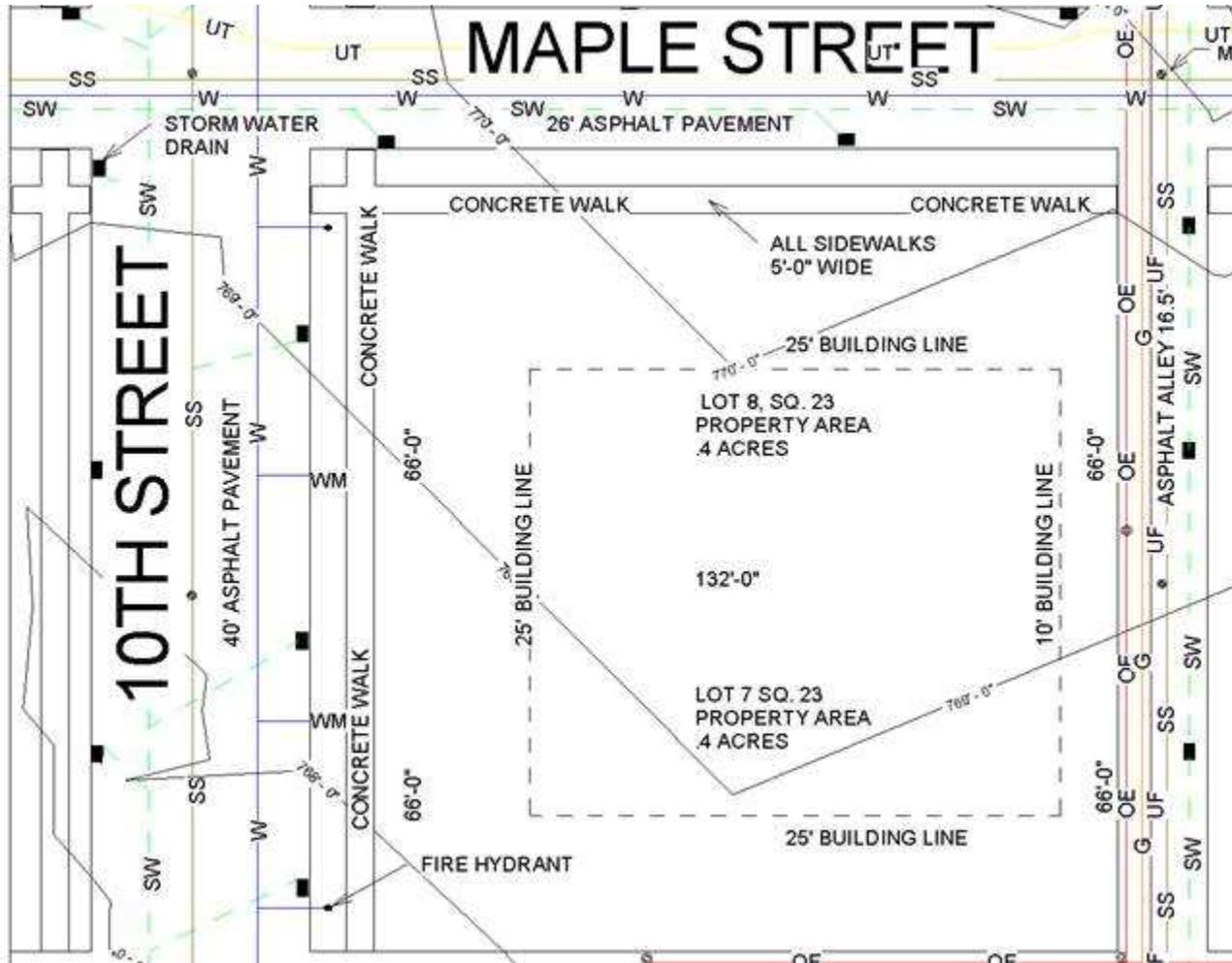
Water Supply Line Facts

-  The water line is 15 years old and is located 6 feet below 10th Street.
-  The elevation at the lowest point of the tower's water cavity is 872.81 ft.
-  The pipe's diameter is 8 in.
-  The pipe's length is 3.12 miles.
-  The pipe is cast iron.
-  The pipe has seven 90 degree flanged elbows and one 45 degree flanged elbow.
-  The pipe's flow rate is 100 gpm.

Satellite Image



Site Plan



- Calculate the static head at the point of discharge under 10th street excluding head loss.
 - Calculate the head loss, including the losses for pipe fittings.
 - Calculate the dynamic head at the point of discharge under 10th Street.
 - Calculate the actual pressure in front of the house.
 - Is the actual pressure sufficient for residential use? Should a pressure reducing valve be installed?
- A facility that receives water at an elevation of 350 ft at the water meter is 4.1 miles from the water tower. The water level in the tower is 527 ft. The water flow rate is 110 gpm. Assume an 8 in. ductile or cast iron pipe with flanged fittings. The supply line includes the following fittings:
 - 2-90 degree elbows
 - 2 gate valves

