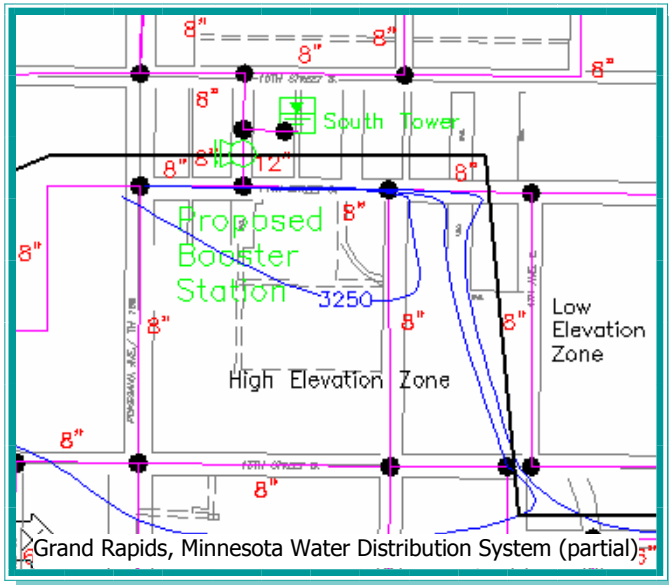


Distribution System Modeling Improves Water Network

Water distribution system modeling has become a key tool in evaluating existing water networks and planning for future development. Modeling can show the weak links in a distribution system. It can also help plan for the best location for a new tower or pump station and the optimum sizing of new watermain.



PCE uses WaterCAD, which takes into account citywide demands; site specific demands; water storage facilities; watermain length, diameter, ages; friction factors; network interconnections; high service pumps; well pumps; and node elevations to model the water system. WaterCAD calculates the pressure at each junction node, the flow and direction through each pipe, and head loss in each pipe. The model interfaces with ARCVIEW GIS data and can model water quality to optimize the flushing program.

The key part to water system modeling is the use of field data to calibrate the computer model. Field data is gathered by flowing a city fire hydrant and measuring the flow rate, monitoring a nearby hydrant for static and residual pressures, and recording production and storage levels at the time of the test. PCE has calibrated even very large network models to within ten percent, a very respectable figure.

The numerous water distribution system modeling projects that PCE has completed include planning multiple pressure zones for the cities of Brooklyn Center, Brooklyn Park, Buffalo, Grand Rapids, and Red Wing, Minnesota. PCE eliminated problematic high water residence times in Brooklyn Center's water network. Other projects have improved fire flow capacities and overall water network performance by using extended period simulations to solve poor re-reservoir inter-connectivity. PCE's staff has more than 39 years of modeling experience to help improve water distribution system networks.

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