

City of Clawson Water Distribution System Evaluation Program Clawson, Michigan

The water distribution system of the City of Clawson is approximately 40-70 years old. It consists of approximately 257,702 lineal feet of cast iron pipe ranging in size from 6 -16" inches in diameter. The City began experiencing low pressure, rusty water, water main breaks, and reduced ability of fire fighting in various parts of the system.

Spalding DeDecker Associates, Inc. (SDA) studied and evaluated the Water Distribution System and recommended a cost-effective long-range Sustainable Action Plan (SAP). The study was completed in four phases:

1. Physical Evaluation
2. Hydraulic Modeling Investigation
3. Development of the SAP
4. Cost Analysis of Different Improvement Projects Recommended

The **Water Supply System Model** was developed using CYBERNET Hydraulic Model 3.0 and AutoCAD R14 software. The system was evaluated for peak-hour, average, peak-instantaneous, and multiple fire flows. On the basis of the results of the physical and modeling evaluation, a long-range plan for repair, replacement, rehabilitation, and maintenance was developed for the City. SDA's conclusions, recommendations, and determination of probable improvement costs were prepared in the context of a 10-year program as stipulated by the City. A package of prioritized improvements was recommended.

The **Physical Evaluation** was conducted by performing hydrant flow tests for co-efficiency and fire flow tests. The test data was used to develop Hazen-William coefficients, which were used in performing the hydraulic analysis of the water distribution system for the baseline conditions and recommended improvements.

The **Recommended Rehabilitation and Replacement Program** included pipe cleaning, hydrant flushing, valve exercising, pipe and hydrant replacement, and a facility maintenance program. The recommended improvements were prioritized within the context of a 10-year program with probable improvement costs. The system improvement program benefited the City's fire fighting ability, improved the overall quality of water supplied to the City's customers, and helped to sustain the life of the facilities.

SPECIAL FEATURES

A Geographical Information System (GIS) based hydraulic model of the City's entire existing water supply system was developed using CYBERNET software based upon the principles of EPANET software that models water distribution piping systems, and generates results consistent with EPANET.

OWNER / CLIENT

City of Clawson

PROJECT START - END

July 1999- January 2000

SDA PROJECT NO.

CN99-001