

FACTORS AFFECTING THE DETERIORATION OF WATER MAIN

Mohamed I. Amer, Ahmed H . Ibrahim, Mohamed S. Yamany

Abstract

The civil infrastructure including buildings, highways, bridges, and water/sewer systems, is crucial for economic and prosperity. As water mains deteriorate structurally and functionally, their breakage rates increase, net hydraulic capacity decreases, and the water quality in the distribution system may decline. So there are two things that affect the condition of water mains themselves, and the other influences negatively general health of things especially human beings. To confront these threats, it is necessary to rate the conditions of existing water mains by whether direct inspection or using one of the developed condition rating models. That's to make a decision on replacement, maintenance, or no action. Nevertheless typical water distribution systems comprise not only pipes but also more than thousands of underground buried pipes, direct inspections for all of them are often extremely expensive. Therefore, for more efficiency and less cost, it is supposed using one of the condition rating models. This paper is presented to identify the factors affecting the condition of water mains which will be considered for categorizing the conditions of water mains. The aim of this research is to identify the factors affecting the deterioration of water mains and to rank them according to their importance indexes. In this research, three categories of factors: environmental and operational factors are supposed. A designed convenient questionnaire is sent to several organizations: various attitudes; construction companies, consultant offices, management companies, and owners to evaluate the diverse factors. Eventually, a robust analysis for all available and trusted data shows that there are eight factors are the most effective factors on water mains deterioration. These factors are: pipe type, age, diameter, soil type, backfill soil type, operational pressure, and breakage rate.