Diagnosis and renewal decision making of water mains using 3D scanning data

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ABSTRACT

The aging water infrastructure is one of the emerging issues for sustainable water supply. The renewal priority has been a concern for the operators of waterworks and decided by risk and residual life. The thickness of corrosion is measured using a pit depth gauge which is hard to read every detail of pipe surface roughness. 3D scanner, however, scans the three-dimensional surface of a pipe with high accuracy. The 3D analysis could be also used to analyze corrosion area, maximum corrosion depth, and tensile strength simulation. Using 3D scanning results, a modified method for residual life prediction was developed combining 3D scanning data analysis with conventional direct and indirect methods. In this study, a method was developed to perform numerical simulation for a tensile test from 3D scanning data. Although the simulation method was not verified with physical examination, tensile strength simulation showed a potentiality to supplement physical test after the accumulation of kinetic parameters.

Keywords: Aged pipe; Residual life; Pipe corrosion; Renewal decision making; 3D scanning

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