

Stormwater Pipeline Infrastructure Management

ABSTRACT:

Asset management of stormwater systems requires an accurate structural condition coding and assessment of pipes that is essential to overall management and capital improvement planning. The fundamental step to prediction of asset condition starts with data collection, initial condition coding, and failure analysis based on established parameters and methods. While data collection methods are well established for stormwater pipes, methods of initial coding and parameters to determine failure have not been well established. The purpose of this research is to assist water utilities by reporting on what other public agencies use for condition rating for their storm sewer pipes, complete with primary condition defect coding approaches. This report presents the review of literature and review of current practice in storm water pipe management and related pipe defect coding, rating, and prioritization schemes. In the review of practice, seven U.S. utilities were contacted and provided current practice methods and future intentions and three Australian stormwater asset management plans were reviewed. For each plan, a review of the condition rating model, objective, and scoring scale were analyzed. As a result, it was identified that current practice lacks overall structure and utilities with a plan initiated, most methodologies have been adopted from sanitary sewer methods, such as the use of NASSCO's PACP.

Condition Rating Reference Sheet - Stormwater Pipes


<p>1 Excellent</p> <p>NO DEFECTS DETECTED No evidence of damage. The structure appears perfect.</p>		
<p>2 Good</p> <p>REHABILITATION CAN BE SCHEDULED LONG TERM Construction deficiencies in accordance with significant influence to hygiene, hydraulic or other functions of pipe. For example some joints, heavy finished cracks, minor deformation of plastic pipe, minor root intrusion etc.</p>		
<p>3 Average</p> <p>REHABILITATION IS NECESSARY MEDIUM TERM WITHIN 3 to 6 YEARS Construction deficiencies generating static, hydraulic and hygiene. For example open joints, unsealed cracks, cracks, minor drainage obstructions such as calcareous build up, protruding material, minor damage to pipe wall, individual root penetrations, corroded pipe walls etc.</p>		
<p>4 Poor</p> <p>REHABILITATION PROCEDURE IS URGENT AND HAS TO BE COMPLETED WITHIN 1 to 2 YEARS NECESSITY FOR EMERGENCY OPERATIONS HAS TO BE EXAMINED Construction damage with insufficient static safety, hydraulic or hygiene. For example substantial pipe bursts, pipe deformations, visually noticeable unsealed cracks, cracks to pipe wall, severe protruding materials severe root penetrations, severe corrosion of pipe wall etc.</p>		
<p>5 Very Poor</p> <p>REHABILITATION URGENT AND MUST BE COMPLETED AS SOON AS POSSIBLE TO PREVENT FURTHER DAMAGE. REPAIRS TO BE COMPLETED AS SOON AS POSSIBLE EMERGENCY 12000 Pipe is severely or not structurally safe. The structure is severely damaged. Severe pipe or pipe bursts, unsealed cracks, cracks to pipe wall, severe protruding materials, severe root penetrations, severe corrosion of pipe wall etc.</p>		

Figure 1: Framework for Uniform Rating of Stormwater Pipeline Performance

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