Quality Function Deployment Application in Sewer Pipeline Assessment

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Abstract : Infrastructure assets are essential in urban cities; their purpose is to facilitate the public needs. As a result, their conditions and states shall always be monitored to avoid any sudden malfunction. Sewer systems, one of the assets, are an essential part of the underground infrastructure as they transfer sewer medium to designated areas. However, their conditions are subject to deterioration due to ageing. Therefore, it is of great significance to assess the conditions of pipelines to avoid sudden collapses. Current practices of sewer pipeline assessment rely on industrial protocols that consider distinct defects and grades to conclude the limited average or peak score of the assessed assets. This research aims to enhance the evaluation by integrating the Quality Function Deployment (QFD) and the Decision-Making Trial and Evaluation Laboratory (DEMATEL) methods in assessing the condition of sewer pipelines. The methodology shall study the cause and effect relationship of the systems’ defects to deduce the relative influence weights of each defect. Subsequently, the overall grade is calculated by aggregating the WHAT’s and HOW’s of the House of Quality (HOQ) using the computed relative weights. Thus, this study shall enhance the evaluation of the assets to conclude informative rehabilitation and maintenance plans for decision makers.

Keywords : condition assessment, DEMATEL, QFD, sewer pipelines
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