

Service Life Prediction of Tunnel Structures Subjected to Water Seepage

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Abstract : Water seepage is one of the most common causes of damage in tunnel structures, which can cause direct and indirect e.g. reinforcement corrosion and calcium leaching damages. Estimation of water seepage or inflow is one of the main challenges in probabilistic assessment of tunnels. The methodology proposed in this study is an attempt for mathematically modeling the water seepage in tunnel structures and further predicting its service life. Using the time-dependent reliability, water seepage is formulated as a failure mode, which can be used for prediction of service life. Application of the formulated seepage failure mode to a case study tunnel is presented.

Keywords : water seepage, tunnels, time-dependent reliability, service life

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