

Thesis title:

A reliability-based approach for predicting degradation of building assets

Abstract:

Managing ageing building assets, within available budgets, is a major challenge faced in the present, mainly due to the lack of a proper asset rehabilitation system. The most common, current approach adopted, is a reactive process wherein the assets are repaired or replaced when they degrade beyond the functional thresholds. However, this poses many risks to the asset managers as well as the community being served by these assets. Buildings can be complicated and challenging to manage as an asset group, due to the complexity of the process, caused by the non-uniform nature of the assets and a large number of components involved. Predictive modelling for degradation of building components, is important for estimating future costs and optimised management of building portfolios. This research proposes two approaches for predicting degradation of building assets. In the first, both deficiency- and deterioration-based condition ratings of building components from seven local councils in Sri Lanka will be analysed to develop reliability-based Markov models. In the second, the nominal replacement times and costs of individual building components, assigned by City of Melbourne estimators, will be used to determine the deterioration rates at component group level.