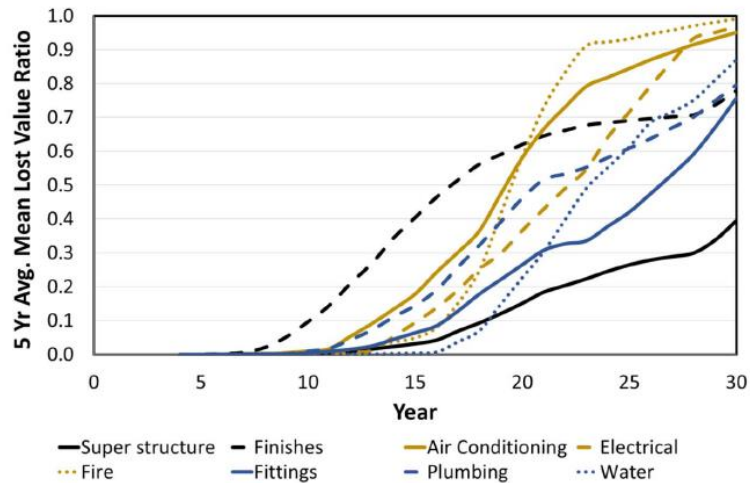
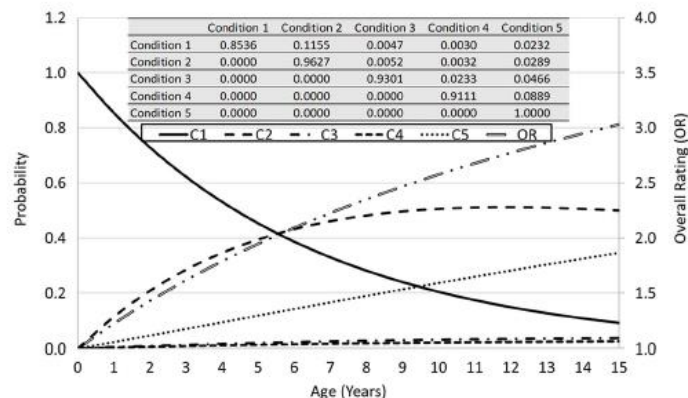


## Performance of aging buildings

Key Researcher (s): Prof. Munidasa Ranaweera, Prof. Priyan Dias, Dr. Nihal Somaratna Dr. Gobithas Tharmarajah



Variation of Lost Value Ratio with time for various component groups in the City of Melbourne's asset base



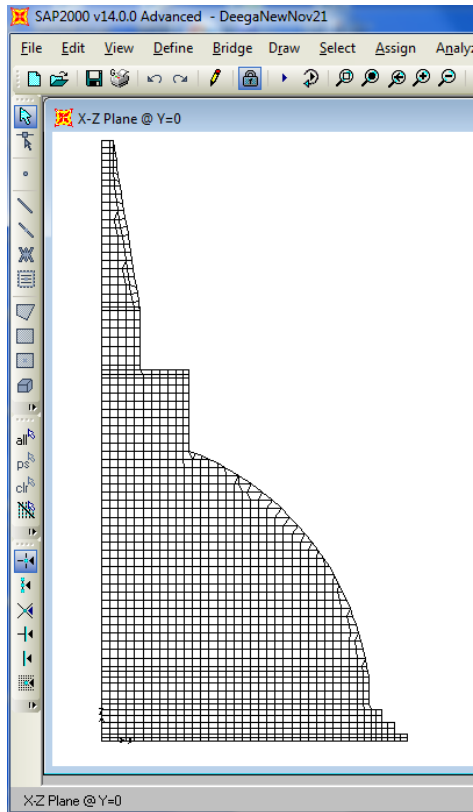
Markov degradation model (transition matrix) and outputs for ceiling fans in Sri Lankan Local Authorities

- Proper models for the degradation of building elements are essential for well planned maintenance, especially for Local Authorities that have a significant asset base. Markov modelling has been found to be the best way to approach degradation, because of its ability to accommodate the stochasticity of degradation. This work is being carried out in collaboration with RMIT University in Melbourne. Research outputs to date include models for the City of Melbourne assets using a component group approach; and for Local Authorities in Sri Lanka, focusing on 12 diverse elements.

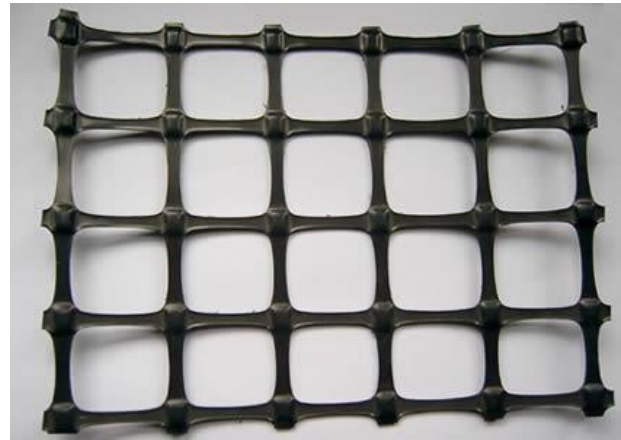


Locations of the conducted bridge inspections and observations during a bridge inspection

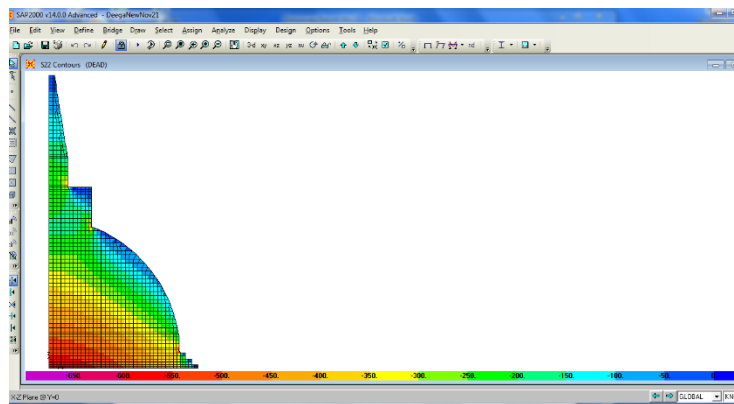
- Bridges are a salient feature of ground transportation. It is important to observe the structural condition of the bridge structures continuously to ensure the serviceability of the structure and to ensure appropriate rectification is carried out in a timely manner. Here at SLIIT, with the support of Road Development Authority (RDA), we are working on a research project to develop a stochastic based service life prediction model that can be employed to track the rapidly deteriorating bridge structures. The project explores use of Markov Chain method and Delphi study to evaluate the condition of bridge structures. A similar health monitoring method is evaluated for high rise residential building as well.
- In Sri Lanka there are some critically important concrete components associated with major structures such as dams which have developed cracking as they age. For devising repair strategies for these structures, it essential to understand the causes of such cracks. This research attempts to do so in the cases of some affected structures.



Axisymmetric Finite Element Model



Geogrid for reinforced mortar layer



Vertical Stresses (full model)

- Sri Lanka has a rich history with tall structures such as stupas, and many need rehabilitation/restoration with some structural modifications. Those models are being analyzed using finite element methods to propose suitable construction techniques to enhance the stress behavior. In one such works it was found that the use of a reinforced mortar layer with geo-grid would resist high tensile stress region.