ABSTRACT

In recent times, many researchers have realized the importance of maintainability of buildings in achieving cost savings and building performance. Construction 21 highlighted the prevalence of buildings in Singapore with low performance and high repair and replacement requirements throughout the service life. One of the reasons is the lack of consideration of the maintainability issue during the planning and design stages.

In separate surveys done by the Building and Construction Authority of Singapore (BCA) and the National University of Singapore (NUS) on private residential buildings and high-rise buildings respectively, it was found that most defects in local buildings occurred in the wet areas.

This study aims to highlight maintainability problems in non-residential buildings in Singapore by identifying the common defects in high-rise non-residential buildings, understanding the underlying causes of defects, the effects of the building parameters on the occurrences of the defects and providing recommendations to address such defects.
This study has identified the major defects in non-residential buildings to be water leakages, staining, spalling of concrete and paint defects. This study has found that design, construction, material/environment and maintenance factors are the fundamental building parameters for improving the maintainability of wet areas right from the design phase. Prediction models and correlation studies are developed in this study to determine the effects of the building parameters on the occurrences and seriousness of the major defects in the wet areas of non-residential buildings. In the study, case studies on the defects are also presented to illustrate the significance of evaluated factors such as poor workmanship, insufficient design detailing at penetrations and interfaces, ad-hoc maintenance practices and material performance.