

SERVICEABILITY OPTIMIZATION OF HIRISE BUILDINGS USING NSGA-II AND RESIZING TECHNIQUE

Abstract— Vibration induced by wind can be a factor in causing the discomfort for building users. Although this serviceability problems are not significantly related to a building's structural safety, wind-caused vibration is a detail that architects should consider, as it is related to the quality of residential performance. Such vibration can be reduced by adjusting the vibration acceleration in the top floor. Therefore, we aimed to implement the multi-objective optimal design method by minimizing building weights and reducing the vibration acceleration. NSGA-II was used as the optimal design technique, although NSGA-II has the shortcoming that the time required for structural analysis increases as the design variable and computational quantities increase. To overcome such problems, a resizing technique was used in the algorithm.

Keyword : Wind vibration, Serviceability, NSGA-II, Resizing Technique, Optimization