The optimum location of outrigger in reducing the along-wind and across-wind responses

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Abstrak

Outrigger is one of the many tall building structural systems that are used to reduce the building responses to wind. However, it is not known where the outrigger should be placed so that the responses of the tall building due to wind can be minimized. Thus, 64-story reinforced concrete buildings with the ratio of height to the breadth of 6:1 are studied in order to determine the optimum location to construct the outriggers to minimize the along-wind and across-wind responses. Buildings with different location of outriggers are analysed by a structural analysis software in order to determine the natural frequencies and eigenvectors in the along-wind and across-wind direction. The along-wind responses are determined by employing the procedures from the ASCE 7-02 while the across-wind responses of the buildings are calculated based on the procedures and wind tunnel data available in a data base of aerodynamic load. The database is comprised of high-frequency base balance measurements on a host of isolated tall buildings models. Results from the analysis shows that the optimum location to construct the outriggers is between one third to two third of the height of the building