

## Performance-Based Seismic-Wind Design of Coupled Structures with Various Connection Details

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### ABSTRACT

As urban densification and high-rise development accelerate, the structural connection of two buildings is becoming increasingly common. Such connections are primarily facilitated through skybridge or damper, with skybridge offering versatility beyond its structural function by serving as emergency evacuation routes. Previous studies have extensively investigated buildings connected by skybridge or damper. **Xu et al. (1999)** analyzed the seismic response of buildings connected by damper, examining the systemic changes resulting from connectivity. Similarly, **Song et al. (2016)** explored the aerodynamic characteristics of twin buildings connected by skybridge, analyzing the advantages of such connections. However, these studies often have limitations, such as the fixed location of skybridge or lack of simultaneous consideration of seismic and wind effects due to connectivity. Therefore, this study conducted wind tunnel experiments and finite element analyses on two high-rise buildings with square planar shapes, varying the skybridge installation location and length as parameters to analyze the results. Additionally, skybridge can be connected either as strong coupling through rigid connection detail to the buildings or as weak coupling through isolation pad or damper. This study also parameterized the connection details to analyze the resulting changes in structural response.

### REFERENCES

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- Song, J., Tse, K.T., Tamura, Y., and Kareem A. (2016), "Aerodynamics of closely spaced buildings: With application to linked buildings", *J. Wind. Eng. Ind. Aerodyn.*, **149**, 1-16.

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