

## **Screening Criteria for Structures and Sites Sensitive to Seismic Interaction Effects**

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Structure-Soil-Structure Interaction (SSSI) is the effect of a neighboring structure on the dynamic response of a given structure on a common soil site. Consideration of SSSI effects is typically required for important to safety structures. Previous publications have shown that SSSI effects are more pronounced on lightweight structures in close proximity to a much heavier structures, specifically on soft soil sites with low frequency ground motion characteristics. However, additional studies on adjacent deeply embedded heavy structures have shown that the SSSI effect is more sensitive to the site characteristics and proximity of the structures as opposed to the discrepancies in seismic mass.

In this presentation, the sensitivity of SSSI effects on the seismic response and subsequent design of a given structure is assessed with multiple variable parameters.

The dominant frequency characteristics of the neighboring structure are varied to assess the effect of resonance. In order to assess the effect of site characteristics, two site conditions are considered. A soft soil case is paired with a motion characteristic of the Western United States, rich in low frequency content. A rock case is paired with a motion characteristic of the Central and Eastern United States, rich in high frequency content. Additionally, the distance of the structures is varied from 10' separation to 1000' separation.

The acceleration response spectra and zero-period accelerations throughout the structure for each test case are compared. Along with the previous publications demonstrating significant SSSI effects in certain conditions, conclusions are drawn from the resulting seismic responses. Screening criteria are proposed to help the engineer determine in what conditions SSSI effects are most pronounced. This allows for a quick assessment at the conceptual phase of the project. The screening criteria can be used as a metric to communicate conceptual change proposals with project management.