

**Effect of Varying Seismic Wave-Fields on SSI Responses of
Embedded and Deeply Embedded Structures**

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The soil structure interaction analysis of embedded and deeply embedded structures has two key components, the development of the dynamic soil impedance supporting the structure and the application of seismic loads to the soil-structure system. This presentation will discuss the effects of varying seismic wave-fields on the SSI responses in both frequency and time domain analyses. A companion presentation by Greg Mertz will discuss the issues related to the development of dynamic soil impedance.

The presentation will begin with a review of the SSI responses of deeply embedded foundations computed using the generally assumed vertically propagating, horizontally polarized SV-wave and P-wave fields in the frequency domain. These SSI responses will be compared to responses caused by wave-fields composed of Rayleigh waves as well as combined SV-wave and P-wave fields created using inclined seismic waves. The application of non-vertically propagating waves and Rayleigh waves to deeply embedded foundations will be developed in the frequency domain and a time domain application will be demonstrated. Comparison of computed Rayleigh-wave field responses to measured responses in the time domain will also be presented as a partial verification of the analysis methodology.