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# CONSIDERATION OF SITE EFFECT IN NEAR FIELD STRONG GROUND MOTION

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Abstract

Accelerograms recorded near active faults have some important characteristics that make them different from those recorded in far-fault regions. High-frequency components in acceleration records and long-period velocity pulses are among notable specifications of such ground motions. Moreover recent investigations about site effect indicate seismic hazards during many disastrous earthquakes are observed to be aggravating at the sites with the soft soil deposits due to amplification of ground motion. The characteristics of strong ground motion, the site category, depth of the soil column, type of rock strata, and the dynamic soil properties at a particular site significantly influence the free field motion during an earthquake. In this paper, free field surface motion is evaluated via seismic site response analysis that involves the propagation of earthquake ground motions from the bedrock through the overlying soil layers to the ground surface. These analyses are carried out for three well-know multiple near-fault seismic ground motions at two different site classes. The free field surface motion is quantified in terms of amplification ratio and spectral acceleration. Seismic site coefficients at different time periods are also evaluated for each site category due to near-fault ground motions from the acceleration response spectra of free field surface motion at each site and the corresponding acceleration response spectra at a reference rock outcrop site.

**Keywords: Near Fault, Amplification Ratio, Spectral Acceleration.**

## 1. INTRODUCTION

Ground motion close to a causative fault can differ significantly from the typical ground motion that have been observed at greater distances from the fault. The peculiar characteristics of near-fault ground motion depend on the relative position of the site with respect to the orientation and propagation of the fault rupture (namely forward-directivity effect). The most distinguished feature is the presence of one or more high-amplitude, long-duration (2–5 s) pulses generally observed in the velocity– time and displacement–time histories usually occurring at the beginning of the record and oriented in the fault normal direction [1].The presence of severe long-duration pulses gives rise to considerable velocity and displacement demand, and may therefore be considered a key factor in causing damage to structures. Although the forward-directivity effect has been thought to be limited to earthquake magnitude greater than 6.5, it has been ascertained that it may play a significant role in seismic events of smaller magnitude for which near-fault pulses may occur at shorter periods of about 0.5–1 s [2]. In this regard, Bray and Rodriguez-Marek [3] and Rodriguez-Marek and Bray [4], based on available moderate-magnitude near-fault ground motion recordings, have also investigated the effects of soil conditions showing the occurrence of pulse-like velocity waveforms of longer periods at soil sites than at rock sites. This difference diminishes as magnitude increases and disappears for larger magnitudes. The evaluation of near-fault ground motion for earthquakes of small-to-medium magnitude.
In present paper two deep assumed deposit with about 30 meters dept and various velocity have excited as the three near field and far field records that normalized to 0.37g by EERA (Equivalent-linear Earthquake Response Analysis)program and the effect of near field an far field on loose and dense deposit have considerate with mean acceleration response spectra.