

## SITE-SPECIFIC SPECTRA CONSIDERATIONS FOR HIGH-RISE BUILDINGS

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### ABSTRACT

Optimization of design criteria for structures against earthquake is one of the main concerns of seismic codes all over the world. Hence, in most of the world's seismic codes, there are some requirements and suggestions in order to utilize site-specific design spectra for high-rise buildings that site effects are needed to be investigated in specific points.

By study of site effects in specific points, ground level seismic parameters such as peak ground acceleration and the normalized design spectra are estimated during the earthquakes in the scope of the project. In order to estimate the value of peak ground acceleration for each point of sediment, firstly, appropriate accelerograms are selected for seismic bedrock based on results of site Seismicity studies. Secondly, geotechnical earthquake model of basement layers of the site is provided in accordance with results of geological, geotechnical and geophysical engineering studies. Then seismic bedrock accelerograms are applied to geotechnical earthquake profile of the site. Finally, the results are analyzed and the peak acceleration at the desired level is estimated. Generally, the normalized design spectra are extracted based on statistical analysis of acceleration response spectra which is resulted from sediment dynamic analysis.

In this research, considerations associated with aforementioned process in extracting the site-specific spectra for high-rise buildings are investigated and according to a case study necessary recommendations are presented.

### 1. INTRODUCTION

Optimization of design criteria for structures against earthquake is one of the main concerns of seismic codes all over the world. Hence, in most of the world's seismic codes, there are some requirements in order to utilize site-specific design spectra for high-rise buildings that site effects are needed to be investigated in specific points. The aim of the site effects study at a specific point is to estimate the ground level seismic parameters seismic parameters during the desired earthquakes. Generally, Two important characteristics of ground level seismic parameters include the following:

1. Peak ground acceleration
2. Normalized design spectra

In order to estimate the value of peak ground acceleration for each point of sediment, firstly, appropriate accelerograms are selected for seismic bedrock based on results of site Seismicity studies. Secondly, geotechnical earthquake model of basement layers of the site is provided in accordance with results of geological, geotechnical and geophysical engineering studies. Then seismic bedrock accelerograms