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Evaluation of reliability under dynamic conditions of airport runways: a case study of İzmir/Gaziemir Air Military base

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ABSTRACT

The most important parameter which is horizontal earthquake force for earthquake resistant building design. Shear-Strain changes why occur earthquake force at soil must be associate with soil-structure common behaviour. Because of that reason; static load of structure, structure height and soil-engineering bedrock models should be interpreted together and investigate shear-strain changes which depends on earthquake force. Study area at Air Technical Schools Command in Gaziemir-Izmir is 1st degree earthquake hazard zone and situated on the old Quaternary alluvial unit. To investigate the earthquake-site-structure relations at existing structures (residential areas and runway) microtremor, microgravity and Multi-Channel Analysis of Surface Waves (MASW) studies were carried out. In this context, microtremor data at 35 points, MASW data at 4 profiles and microgravity data at 60 points were collected. Maximum amplitude and frequency values which are read from the Quasi Transfer Spectrum obtained by using microtremor measurements and S wave velocities obtained by using MASW measurements are evaluated together to reach the site thickness. By examining the 2D engineering bedrock and depth model obtained by using the microgravity method data the soil layers which can change the amplitude and frequency of the earthquake waves were investigated. Initial results for the study area indicate that a thick layer of soil is located at the study area. This situation is also supported by predominant periods which are greater than 1 second. In addition, being greater than 25 of the vulnerability index values which is calculated for the study area, indicates high lateral deformation values during a potential earthquake.

Key words: QTS; microgravity; MASW; engineering bedrock.

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