

Seismic Site Effect Study of the Diego Martin Valley

Description: The Diego Martin Valley is densely populated, 2,790 per km², and is one of the largest residential districts in Trinidad and Tobago. For a given earthquake, seismic intensity reports from the Diego Martin Valley are generally anomalously high. Even when compared with other areas in the north-western peninsula (western Northern Range), as well as other densely populated areas the intensity reports often show that the Diego Martin Valley experiences higher intensities. This research aims to identify the geophysical reasons for these observations.

The main hypothesis is that the Diego Martin Valley Geology and the Geometry of its Geomorphology, amplify ground motion. This is due to high impedance contrast between, thick unconsolidated and often saturated sediments (the valley alluvium and reclaimed coastal mangrove), and the underlying Rock Strata (Chancellor Schists/Limestone, Maracas Schists and Maraval Limestone), as well as a possible focusing effects of the geometry of the interface between the sediments and the rock strata of the valley which may also play a part in amplifying ground motion. The project aims to produce a model of the Diego Martin Valley illustrating the fundamental frequency/period of the soil, shear wave velocities, and thicknesses of the sediments from the surface to the underlying rock formations based on HVSR (Horizontal to Vertical Spectral Ratio) recordings and MAM (Microtremor Array Measurements).

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