Student project

Key Topics:

- earthquake [1]
- risk analysis [2]

Quantifying the seismic and site amplification characteristics of Adelaide's regolith [3]
This research is quantifying the amplification characteristics of Adelaide's regolith (loose material covering rock) in relation to earthquake loading. These characteristics will enable engineers to more accurately predict the behaviour of a range of structures subjected to earthquake loads of varying magnitude. The project will also enable regulators to more accurately evaluate earthquake risk.

Research team

Student researcher

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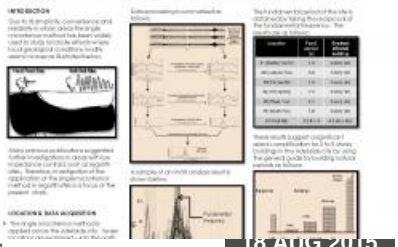
Full description

The main aim of this research is to quantify the site amplification characteristics of Adelaide's regolith with respect to earthquake loading. These characteristics will enable engineers more accurately to predict the behaviour of a range of structures subjected to earthquake loads of varying magnitude. In addition, the outputs of this research will enable regulators to evaluate earthquake risk more accurately.

Adelaide has a high seismic risk. In the past half of the last century the city had more medium-sized earthquakes than any other city in Australia (McCue,1990). A paleoseismological study concluded that fault scarps within 100 km of the Adelaide's CBD present the greatest threat of an earthquake magnitude of M7+ with the Para Fault presenting the highest threat. Moreover, site amplification in Adelaide significantly increases earthquake vibrations encountered at the ground surface. The ground acceleration recording in the Adelaide's regolith is very much stronger than that on rock just outside the city (DMITRE, 2013). Therefore, quantifying the soil response due to seismic ground motion and its relationship to structural behaviour is paramount in for robust and effective design of infrastructure.

At present, Australian national scale earthquake hazard predictions do not include the effect of localised regolith site response on ground shaking, and as such, incorporate inaccurate estimates in some areas. Local geotechnical conditions at the site modify the seismic ground motions (Idriss & Seed, 1968) by significantly altering the amplitude, frequency and duration of the seismic waves. This local effect influences the occurrence and degree of damage to structures (Idriss, 1990) and was observed in the 1989 Newcastle earthquake (Chandler et al.,1991), and in many earthquakes around the world. Thus, how the degree to which Adelaide's soil cover modifies strong seismic events is a critical question that needs to be answered

Posters



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18 AUG 2015

Application of the Single Microtremor Method to the Adelaide's Regolith

[6]

EARTHQUAKE [1], RISK ANALYSIS [2]

The single microtremor method has been applied to Adelaide's regolith which exhibits low impedance contrast...

Linked Projects

Cost-effective mitigation strategy for building related earthquake risk [7]

BUILT ENVIRONMENT [8]

Prof Michael Griffith
University of Adelaide [5]

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