

# **IDENTIFICATION OF ZONES PRONE TO SEISMIC SITE EFFECTS IN THE GRAND-DUCHY OF LUXEMBOURG**

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Numerous large earthquakes in the world indicated that unconsolidated sediments from ancient lakes, rivers and glacial episodes often amplify ground shaking conducting in important spatial variation of damages in urban areas as most of them are built on such a recent deposits. For this reason, site amplification is the first cause of earthquake damage, more important than the size of the earthquake itself.

A study has been initiated in order to identify zones in the Grand-Duchy of Luxembourg prone to seismic waves amplification in case of important earthquake. It uses in a first stage ambient noise records to estimate the resonance frequency  $f_0$  of the unconsolidated deposits. Four different types of site response are recognized and two of them, corresponding to clay and marl of Lias-Dogger ages as well as recent alluvial deposits, could be the place of amplification for a range of frequencies affecting all types of buildings and infrastructures. In the future, the seismic response of those sites needs to be further analysed in order to reduce at an acceptable level the seismic risk in the country.