

# City of Ottawa sits atop soil, geologic features that amplify seismic waves

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Engineers and city planners study surface geology in order to construct buildings that can respond safely to earthquakes. Soft soil amplifies seismic waves, resulting in stronger ground motion than for sites built over bedrock. This study examines the local site response for the city of Ottawa, and the results indicate seismic waves may amplify ground motion greater than expected or referenced in the National Building Code of Canada.

Current knowledge of the earthquake activity in Ottawa area is based on less than 200 years of reported felt events and approximately 100 years of instrumental recordings. While the area has experienced moderate shaking from earthquakes in the range of M 5.2 – 6.2 during this time, historical accounts suggests certain parts of the city have experienced higher levels of ground motion than others during the larger earthquakes. There is also evidence of devastating prehistoric earthquakes, causing widespread landslides, sediment deformation and liquefaction.

The area's geological structure complicates site response analyses. Roughly 20 percent of the Ottawa area is built on bedrock, while the remaining area contains unconsolidated surface deposits.

In this study, the authors reconfirmed the unusually large seismic amplification values for weak motion, prompting an extensive site response analysis as part of seismic microzonation studies for the entire city.

**More information:** "Seismic Site Response Analysis for Ottawa, Canada: A Comprehensive Study Using Measurements and Numerical Simulations," published by the *Bulletin of the Seismological Society of America*, Vol. 102 – 5.

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