



Alternative Energy Sources in Seismic Methods

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When the suitability of a settlement area is investigated, soil-amplification, liquefaction and fault-related hazards should be defined, and the associated risks should be clarified. For this reason, soil engineering parameters and subsurface geological structure of a new settlement area should be investigated. Especially, faults covered with quaternary alluvium; thicknesses, shear-wave velocities and geometry of subsurface sediments could lead to a soil amplification during an earthquake. Likewise, changes in shear-wave velocities along the basin are also very important. Geophysical methods can be used to determine the local soil properties. In this study, use of alternative seismic energy sources when implementing seismic reflection, seismic refraction and MASW methods in the residential areas of Eskisehir/Turkey, were discussed. Our home developed seismic energy source, EAPSG (Electrically-Fired-PS-Gun), capable to shoot 2x24 magnum shotgun cartridges at once to generate P and S waves; and our home developed WD-500 (500 kg Weight Drop) seismic energy source, mounted on a truck, were developed under a scientific research project of Anadolu University. We were able to reach up to penetration depths of 1200 m for EAPSG, and 800 m for WD-500 in our seismic reflection surveys. WD-500 seismic energy source was also used to perform MASW surveys, using 24-channel, 10 m apart, 4.5 Hz vertical geophone configuration. We were able to reach 100 m of penetration depth in MASW surveys.