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Geophysical Characterizations of Unconsolidated Sediments for Geotechnical Studies at Bhadrapur Municipality Area of South-east Nepal

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Geophysical characterizations of unconsolidated sediments can be correlated with the invasive geotechnical investigations considered as a scientific basis for land use planning and development. In this study, Centerless Circular Array (CCA) having 2 Hz frequency (short period with a circumscribed radius of 2 m) seismometers were used to estimate the subsurface velocity profile, whereas Vertical Electrical Sounding (VES) used to estimate the resistivity of individual layers. Standard Penetration Test (SPT) were used to conduct the field survey for estimating N values. Soil samples were taken for laboratory testing to understand the soil type, water saturation, texture etc. Preliminary result showed that the sediments in Bhadrapur Municipality area which has shear wave (V_s) velocity ranges from 100 to 500 m/s, whereas the resistivity ranges from 20 to 400 ohm-m. Corrected N value for the gravelly sand ranges from 7 to 25 blows whereas for silty sand it ranges from 4 to 10 blows. The shear wave velocity, resistivity and the N value map were prepared. Shear wave velocity and its correlation with N value would be helpful in seismic micro-zonation of the areas where ground motion is considered as an important parameter.

Promotional text

Our department has engaged in using various surface geophysical techniques such as seismic, geoelectric, GPR, geo-magnetics to solve the problems underneath the ground. Those techniques have greater relevance in on-site inspection of the Nuclear Test sites.

Primary author: Mr BHANDARI, Rajendra Prasad (Department of Mines and Geology (DMG), Kathmandu, Nepal)

Co-authors: Mr SHRESTHA, Suresh (Department of Mines and Geology (DMG), Kathmandu, Nepal); Mr KANDEL, Thakur (Geoscience Division, Kathmandu, Nepal); Mr BHATTARAI, Mukunda (National Earthquake Monitoring and Research Center, Kathmandu, Nepal); Mr KAYASTHA, Sulav (Department of Mines and Geology (DMG), Kathmandu, Nepal); Mr B. K., Navin (National Earthquake Monitoring and Research Center, Kathmandu, Nepal)

Presenter: Mr BHANDARI, Rajendra Prasad (Department of Mines and Geology (DMG), Kathmandu, Nepal)

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