Poisson’s ratio of surface soils and shallow sediments determined from seismic compressional and shear wave velocities

Akaninyene Okon Akankpo¹ and Ubong Effiong Essien²
¹University of Uyo, Nigeria
²Akwa Ibom State Polytechnic, Nigeria

This paper presents the results of the seismic compressional, P- and shear, S-wave measurements carried out on unconsolidated top-soil at the different locations in the Akwa Ibom, Nigeria to determine Poisson’s ratio. Seismic refraction data was used to determine the Poisson’s ratio as an aid to the engineering foundation. A 12-channel seismograph with signal stacking ability was used together with the high frequency (100 Hz) geophones on the top-soil. The geophone intervals were set to the 5 m at all locations. In all locations, Vp/Vs ratio ranged from 1.0289 to 1.4185 for the top layer. Vp/Vs ratio in the second layer ranged from the 1.0512 to 1.5834. The Poisson’s ratio for the first layer ranged from the −8.0324 to 0.2060. For the second layer, the Poisson’s ratio ranged from the −0.7567 to 0.1683. The values of Vp/Vs ratio less than 2 in the first layer and in some locations in second layer resulted in negative Poisson’s ratio. The negative and low values of Poisson’s ratio are the symptomatic of occurrence of ripable anisotropic materials in the locations where they occur, which suggests that the indicated average depth should be removed and refilled with the geomaterials that may be resilient to carry engineering loads.

Biography
Akaninyene Okon Akankpo holds PhD degree in Geophysics from Michael Okpara University of Agriculture, Umudike, Nigeria. He is currently lecturing at the Department of Physics, University of Uyo, Nigeria. He has published more than 30 articles in reputable journals both locally and internationally. He is a Member of some professional bodies including Nigerian Institute of Physics (NIP) and Physics Writers Creation Series (PWCS).

akaninyeneakankpo@uniuyo.edu.ng
akankpo@yahoo.com

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