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[Image PDF (1493K)] [References]

Estimating the shear velocity profile of Quaternary silts using microtremor array (SPAC) measurements

James Roberts[1)] and Michael Asten[2)]

1) School of Geoscience, Monash University
2) FlagStaff Geo Consultants Pty Ltd.

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ABSTRACT We have used the microtremor method, with arrays of up to 96 m diameter, to carry out non-invasive estimation of shear-wave velocity profiles to a depth of 30 to 50 m in unconsolidated Quaternary Yarra Delta sediments. Two silt units (Coode Island Silt, and Fishermans Bend Silt) dominate our interpretation; the method yields shear velocities for these units with precision of 5%, and differentiates between the former, softer unit (V_s = 130 m/sec) and the latter, firmer unit (V_s = 235 m/sec). Below these silts, the method resolves a firm unit correlating with known gravels (V_s 500 to 650 m/sec).

Using surface traverses with the single-station H/V spectral ratio method, we show that the variation in thickness of the softer silt can be mapped rapidly but only qualitatively. The complexity of the geological section requires that array methods be used when quantitative shear-wave velocity profiles are desired.

Key words: microtremor method, Rayleigh waves, sediment thickness, shear velocities, Yarra Delta, SPAC, spectral ratio

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