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An Automated Bender Element System Used for S-Wave Velocity Tomography during Model Pile Installation

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Abstract : A high-speed and time-lapse S-wave velocity measurement system has been built up for S-wave tomography in sand. This system is based on bender elements and applied to model pile tests in a tailor-made pressurized chamber to monitor the shear wave velocity distribution during pile installation in sand. Tactile pressure sensors are used parallel together with bender elements to monitor the stress changes during the tests. Strain gages are used to monitor the shaft resistance and toe resistance of pile. Since the shear wave velocity (Vs) is determined by the shear modulus of sand and the shaft resistance of pile is also influenced by the shear modulus of sand around the pile, the purposes of this study are to time-lapse monitor the S-wave velocity distribution change at a certain horizontal section during pile installation and to correlate the S-wave velocity distribution and shaft resistance of pile in sand.

Keywords : bender element, pile, shaft resistance, shear wave velocity, tomography
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