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Experimental Simulation of Soil Boundary Condition for Dynamic Studies

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Abstract : This paper studies the free-field response by adopting a flexible membrane container as soil boundary for experimental shaking table tests. The influence of the soil container boundary on the soil behaviour and the dynamic soil properties under seismic effect were examined. A flexible container with 1/50 scale factor was adopted in the experimental tests, including construction, instrumentation, and determination of the results of dynamic tests on a shaking table. Horizontal face displacements and accelerations were analysed to determine the influence of the container boundary on the performance of the soil. The outputs results show that the flexible boundary container allows more displacement and larger accelerations. The soil in a rigid wall container cannot deform as similar as the soil in the real field does. Therefore, the response of flexible container tested is believed to be more reliable for soil boundary than that in the rigid container.

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