

# Multi-Shaker Modal Testing and Modal Identification of Hollow-Core Floor System

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## Abstract

The approach used to estimate dynamic properties of civil engineering structures normally comprise numerical modelling and much less frequently—experimental modal analysis. Hence, the work presented in this paper focuses on the later approach. The multi-input multi-output (MIMO) modal test for civil engineering structures is not commonly used and is rarely presented in the literature due to its cost and practical difficulties. This paper aims to show the advantages of adapting this exercise in the identification of the modal properties of a full-scale floor system. The floor is located on the first level of a building undergoing major refurbishment. The results presented in this paper are for a test conducted on the bare floor where no modifications were done to the as-built structural layout. A forced vibration test was undertaken with three electrodynamic shakers and 14 accelerometers. To excite the floor, the shakers were driven by statistically uncorrelated random excitation signals with frequency spans of 0–50 Hz. The testing demonstrated that the floor has closely spaced modes of vibration. The procedure for identifying the estimated modal properties from this experimental modal analysis exercise will be discussed.