

# **Vibration Analysis Of A High-rise Building Under Construction - Study of A Full-scale Application**

SHOHREH ALAEDINI<sup>1</sup>

<sup>1</sup> Western sydney university

The focus of this paper is the structural evaluation of the central core wall of a 48-story office building and podium in Australia. This building is being renovated where the northern part of the existing building is being demolished and reconstruction is being undertaken. The new building will be a hybrid building, with the original sections built in the 1970s and followed by staged demolition and reconstruction. A structural health monitoring (SHM) network was installed during the demolition and reconstruction of the building, which records the vibrations produced during construction. This consisted of accelerometers, anemometers, vibrating wire strain gauges, tilt sensors, and surveying tools.

Monitoring such characteristics as the natural frequencies of the building, corresponding mode shapes, damping ratios, and displacements have been carried out during demolition and reconstruction in assessing the safety and serviceability of the structure. The analysis of the field measurement data has been done using a state-of-the-art modal identification technique in the time domain and the accuracy of different techniques is presented in this paper.