

STRUCTURAL ASSESSMENT OF HISTORICAL MONUMENTS: THE JOURNEY FROM QUALITATIVE TO QUANTITATIVE ASSESSMENT

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The structural assessment of historical monuments is a challenge to engineers because current construction techniques use different systems and materials. Engineers are not trained to design massive structures that use structural elements made of stone and/or brick. The assessment requires a multidisciplinary team in order to understand the original construction, look for evidence and records for modifications throughout the life span of the structure and document deterioration due to environmental conditions. This requires knowledge of the monument history, use, geometrical dimensions of structural elements, defects and/or inclinations. Thus, feedback from the historian, architect, surveyor, materials and geotechnical engineer is required. Finite element modelling is typically used to predict the behavior of the different structural elements. Sometimes simple two dimensional models are sufficient to present the performance of the structure and other times three dimensional models are necessary. Model verification is an integral part of the analysis and is usually done by field measurements. For some structures, it is useful to perform free vibration measurements to determine the natural frequencies and use the measured values to tune the finite element model parameters. The mechanical properties of the construction materials as well as the soil under the foundation are key parameters that define the overall behavior of the structure.



Biography

Sherif A Mourad is currently serving as a Professor at the Structural Engineering Department, Faculty of Engineering, Cairo University. He obtained his Bsc in Civil Engineering and MSc in Structural Engineering from Cairo University in 1984 and 1987 respectively. He has completed his PhD in Modal Analysis and Buckling Effects on Steel Structures under Dynamic Loading in 1990 from the University of California, Irvine, USA. He was the Dean of the Faculty of Engineering, Cairo University from 2012-2016, and Vice Dean for Graduate Studies and Research from 2009-2012. He has published more than 120 technical papers in local and international journals as well as local and international conference proceedings. He has supervised 68 MSc thesis as well as 22 PhD dissertations that were awarded at Cairo University, in addition to supervision at other schools and universities.

His research interests are Earthquake Engineering, Seismic Performance of Steel Structures, Structural Assessment and Retrofit of Historical Buildings, Progressive Collapse Behavior and Prevention, Structural Health Monitoring

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