Foreword

When I was invited to write this forward for the comprehensive book *Seismic Assessment and Rehabilitation of Historical Structures* Edited by Professors Asteris and Plevris, I did not hesitate to gladly accept, feeling the importance of the topic. I began by thinking of how to best introduce such an important multi-disciplinary topic not only to researchers, professionals, or practitioners but also to the rest of mankind. If nowadays we speak about the importance of the notion of “Global Citizens,” or more specifically “Global Engineers,” it is of utmost importance to also speak of the “Global Structures.” Historical structures and monuments are indeed global ones.

The title and content of the book are important, timely, and complete. The effort put forward by the authors of this book has made a major contribution to literature. This is obvious from the quality of the presented work with technical and practical depth, yet covering a broad range of relevant topics organized in 28 Chapters in addition to this forward and the introduction. This voluminous breadth of information spans the expertise of 85 authors from 13 countries located in three continents.

The best way to introduce this important book is to be viewed as a contribution to an essential topic regarding our current world and its potential future. To accurately represent this, I had to look back at my experiences. So I started reminiscing about my own involvements to share with the reader a few relevant thoughts to convey my sense of significance of such topic. Growing up and being educated in the old part of Cairo, Egypt, historical structures and monuments were a common part of my life. Studying Structural Engineering followed by higher education with emphasis on response of structures in the context of Earthquake Engineering led one to embrace a multifaceted views affected by exposure to mechanics, materials, analysis theories and applications, design approaches of structures, including their social, esthetical, and even ethical impacts. Most of these fundamental elements of Structural Engineering are included in the different parts within the body of this book.

It is always very disappointing to read or conduct a reconnaissance work that involves earthquake damaged sites involving historical or monumental structures. This includes, but not limited to, the lighthouse of Alexandria (or Pharos of Alexandria), Egypt, damaged and collapsed by earthquakes between 956 and 1323, the Arg-é Bam, Iran, destroyed in an earthquake in 2003, the Basilica di Santa Maria di Collemaggio, L’Aquila, Italy, severely damaged during an earthquake in 2009. These examples are a reminder that many countries with historical and monumental structures are vulnerable to earthquake damages. Therefore, a future devastating earthquake can be expected to cause damage, which is beyond repair and restoration rendering essential parts of the human history to be sadly lost.

Fortunately, many years of earthquake engineering research worldwide provided us with outstanding accumulation of knowledge related to research activities in field measurements, experimental techniques, computational modeling, constitutive relationships, repair and restoration techniques, health monitoring
Foreword

methods, socio-economic aspects, probabilistic approaches, …etc. This book disseminates several key research activities and results as they relate to several of the above topics. One of the unique aspect of the book is its emphasis on the implementation of modern techniques for the structural seismic assessment and rehabilitation of historic structures and monuments in addition to providing the relevant theoretical foundation. I encourage the acquisition of this excellent book by readers interested in all or a subset of the addressed topics, namely Seismic vulnerability and retrofitting, Numerical modelling, Case studies, Emerging technologies and materials, Non-destructive testing, Codes and provisions, Ancient materials, Historical earthquakes, Structural identification and health monitoring, Lifecycle assessment, Probabilistic approaches, Experimental techniques including laser scanning, and Near-field seismic effects.

Khalid M. Mosalam
University of California, USA

Khalid M. Mosalam obtained his BS and MS from Cairo University, Egypt, where he also taught for 3 years. In 1996, he earned his PhD from Cornell University in Structural Engineering and subsequently spent one year as a lecturer in the same university. In 1997, he joined the Department of Civil and Environmental Engineering, University of California, Berkeley where he is currently a professor. Mosalam teaches structural engineering, finite element methods, and behavior and design of reinforced and prestressed concrete structures. He conducts research on the performance and health monitoring of structural systems of reinforced concrete, masonry, and wood subjected to extreme loads. He is also active in the areas of assessment and rehabilitation of essential facilities such as bridges and electrical substations. His research approach covers large-scale computations (deterministic and probabilistic) and physical testing including hybrid simulations. Mosalam was a visiting professor at Kyoto University, Japan, Middle East Technical University, Turkey, and Nanyang Technological University, Singapore. He is the recipient of the 2006 ASCE Walter L. Huber Civil Engineering Research Prize with citation: “For advanced computational research integrated with large experiments to solve practical structural engineering problems.” He is also the recipient of the award of public service from the chancellor of the University of California, Berkeley in 2013. Recently, Mosalam became active in the area of building energy efficiency and sustainability.