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EDITOR-IN-CHIEF'S WORD

Dear readers,

already traditionally, our Academy's Bulletin Engineering Power features achievements of its members, renowned scientists, in their field of expertise.

Guest-Editor of this issue is Zoran Veršić, PhD, Associate of the Academy in the Department of Architecture and Urban Planning. Therefore I believe You will read presented professional papers with great interest, since they are intriguing from the technical as well as the artistic perspective.

Editor-in-Chief

Vladimir Andročec, President of the Croatian Academy of Engineering

EDITOR'S WORD

Dear readers,

Architecture has always been a special field of human creativity where engineering expertise meets artistic inspiration as well as sociological, historical and other conditions of modern life.

To this end, it is my great pleasure to present this edition of Academy's Bulletin Engineering Power dedicated to Architecture, and its Guest-Editor, Zoran Veršić, Associate of the Academy of the Department of Architecture and Urban Planning.

Editor

Zdravko Terze, Vice-President of the Croatian Academy of Engineering

FOREWORD

The University of Zagreb, Faculty of Architecture is the oldest and in terms of its diverse activities the leading institution of higher education in the field of architecture, urban planning and design in the Republic of Croatia. The present Faculty of Architecture is based on the academic formation of architects that has followed the tradition of engineering education since 1919. In addition, the artistic aspect of architectural education has also been built into the academic programmes of the Faculty. The Faculty comprises four departments (Department of Architectural Design, Department of Urban and Physical Planning and Landscape Architecture, Department of Architectural Technology and Building Science, Department of History and Theory of Architecture). These organisational units are in charge of scientific and artistic activities and education. Each department has a corresponding institute (Institute of Architecture, Institute of Urban Planning, Physical Planning and Landscape, Institute of Building Construction and Building Physics, Institute of Architectural Heritage) established for the purposes of research projects and activities related to the architectural profession. Conducted independently or in collaboration with investors and contractors, these activities entail the application of knowledge grounded in the most recent theoretical and empirical research in architecture and urban planning. A very significant aspect of the Faculty's work is interdisciplinarity, being a specific quality of the Department of Architectural Technology and Building Science whose staff, in addition to architects, includes civil and mechanical engineering experts, facilitating thereby a comprehensive approach to teaching, research and professional work.

This issue comprises papers written by members of the Department of Architectural Technology and Building Science and the Department of History and Theory of Architecture, and their corresponding institutes (the Institute of Building Construction and Building Physics and the Institute of Architectural Heritage). The papers cover a wide range of topics that include energy efficiency in building construction, reconstruction of existing buildings, energy renovation and structural strengthening. During their lifetime buildings decay due to atmospheric conditions and their use, the latter of which is closely related to constantly changing social, cultural and economic circumstances. After several decades of continuous us, buildings occasionally require a thorough refurbishment when their structural elements are repaired and partially replaced, which helps them adapt to contemporary needs and demands as well as to comply with valid technical regulations.

In the last several years, energy efficiency improvement has been one of the major enticements for building reconstruction and refurbishment. It resulted from the European Union's directives obliging the member states to carry out plans for the reduction of greenhouse gas emissions, the improvement of energy efficiency and of the ratio of renewable resources in new and already existing building stocks. In terms of technical possibilities for implementing diverse measures of energy efficiency improvement and the use of renewably energy resources, Nearly-Zero Energy Building (nZEB) has been chosen as a cost-effective model for building refurbishment. However, it is important to mention a feature related to the model that is specific to the Republic of Croatia, namely that energy performance of buildings depend on the climatic conditions of the region in which they are located. Reconstruction and energy renovation of buildings necessarily require analyses, and most frequently, there is a need to improve their mechanical resistance and stability. Buildings that are included in the Register of Cultural Property of the Republic of Croatia or form part of protected cultural and historic ensembles, require a more elaborate reconstruction approach because of different measures that limit the improvement of their qualities in order to safeguard their original and authentic characteristics.

Guest-Editor

Zoran Veršić, University of Zagreb, Faculty of Architecture