# EDITORIAL

## Herbert A. Mang[1], Gintaris Kaklauskas[2]

*Guest Editors*

[1]*Institute for Mechanics of Materials and Structures, Vienna University of Technology,
Karlsplatz 13/202, 1040 Vienna, Austria*
[2]*Dept of Bridges and Special Structures, Vilnius Gediminas Technical University,
Saulėtekio al. 11, LT-10223 Vilnius, Lithuania*
E-mail: [1]*Herbert.Mang@tuwien.ac.at;* [2]*Gintaris.Kaklauskas@st.vgtu.lt*

This Special Issue of the Journal of Civil Engineering and Management (JCEM) contains expanded versions of selected papers presented at the 9-th International Conference on Modern Building Materials, Structures and Techniques, in Vilnius, May 16–18, 2007. The first conference was held in 1991, just a year after the independence of Lithuania was restored. A continuously increasing number of participants reflected the growing prestige of the conferences. At the last conference, with a participation of 458 researchers from 25 countries, 193 oral presentations (including key-note lectures) were given and 58 posters were shown. The conference series provides an excellent international forum for discussion and debate, highlighting advances in theoretical, numerical and experimental research, aimed at solving challenging problems of Civil Engineering.

The conferences have been organised jointly by the Civil Engineering Faculty of Vilnius Gediminas Technical University (VGTU) and the Lithuanian Academy of Sciences. The International Association for Bridge and Structural Engineering as well as the Board of the Association of European Civil Engineering Faculties are the official sponsors of the Conference. A special tribute should be paid to the Dean of the Civil Engineering Faculty of VGTU, who has successfully organised all the Conferences held so far.

The authors of selected papers were invited to submit extended versions to this Special Issue. The submitted papers underwent a rigorous international peer review procedure. The sole criterion for publication was quality. This Special Issue is devoted to research problems in the field of structural engineering and mechanics.

The paper at the beginning of this Issue (Mazzolani *et al.*) is aimed at improving seismic response of RC structures equipped with dissipative bracing systems such as eccentric braces and buckling restrained braces. Results of experimental tests carried out on two similar two-storey one-bay RC structures equipped with the above bracing systems were reported.

The second paper, authored by A. Kuranovas *et al.*, presents results from an investigation on the load-bearing capacity of concrete-filled steel columns. Experimental data from 1303 columns of various sections tested under different loading conditions were compared with analytical results obtained using the EC4 code.

The paper by H. Mang *et al.* investigates hilltop buckling in sensitivity analysis of the initial postbuckling behaviour of elastic structures. It is shown that hilltop buckling is imperfection sensitive. The results from the numerical investigation corroborate the theoretical findings. Two classes of sensitivity analyses are identified by means of the so-called consistently linearized eigenproblem.

B. Faggiano *et al.* deals with an innovative connection system for composite timber-steel-concrete floors. In this paper, results from push-out monotonic tests on several rectangular shaped configurations of the connection system are presented. The mechanical behaviour is described by means of a load-slip relationship.

The fifth paper, authored by P. Aliawdin and S. Kasabutski, deals with limit and shakedown analysis of RC bar sections under quasistatic low-cyclic loading. Plasticity conditions for the materials were formulated either in the stress or the strain space. Simple solutions for both direct and inverse problems of nonlinear optimization were obtained.

Y. Zhuk and I. Senchenkov presented an approximate formulation to a dynamic coupled thermomechanical problem for physically non-linear, inelastic, thin-walled elements. Simplifications are the consequence of using the geometrically linear theory and the Kirchhoff–Love hypotheses. The model is used to describe vibrations and dissipative heating of inhomogeneous physically non-linear bodies under harmonic loading.

R. Lewandowski and J. Grzymisławska were investigating a possibility of reducing the vibrations of frame building structures using multiple tuned mass dampers. Structures exposed to strong winds were considered. Based on the results of the analysis, recommendations regarding the effectiveness of multiple tuned mass dampers were made.

In the eighth paper, A. Grigorenko and S. Yaremchenko investigated the static and dynamic behaviour of anisotropic inhomogeneous shallow shells. The authors have proposed an efficient approach for solving problems of stress-strain and free vibrations. The initial system of partial differential equations is reduced to one-dimensional problems using an approximation of the solution in terms of basic splines in one coordinate direction.

In the last paper, E. R. Vaidogas and V. Juocevičius discussed the application of fragility functions to the assessment of potential damage of structures resulting from accidental actions. The assessment represents an estimation of the probability of a foreseeable damage event. A potential field of application of this approach is risk studies of hazardous industrial facilities.

We wish to thank the authors of the papers for their efforts concerning preparation and revision of the manuscripts. The critical comments of the reviewers are highly appreciated. This Special Issue would not have been possible without the enthusiastic support of Prof. E. K. Zavadskas in his capacity as the Editor-in-Chief of the Journal. Let us also express our gratitude to Assoc. Prof. D. Bacinskas, Managing Editor of JCEM, who was involved in administrating the review process. We hope that this Issue will provide the readers with new insights into problems of structural engineering and structural mechanics.