

Table of Contents

Preface

Chapter 1: Advances in Concrete

Evaluation of the Effect of Impregnation Coatings on Concrete Protection L. Sedlacek, J. Fladr and I. Broukalova	3
Usability of the Combination of Fly Ash from Different Species M. Merunka, P. Sperling, M. Tazky and R. Hela	11
3D Printed Cement Composites Testing D. Jancarikova, I. Khongova, P. Bibora and H. Szklorzova	17
Comparison of Concrete Mixtures and Alkaline Activated Material with Regard to Selected Properties for Structural Design J. Jerabek	25
Replacement of Fine Aggregates in Fine-Grained Concrete by Waste Material from Cetris Boards Production K. Matyskova, V. Bilek, L. Prochazka, R. Hedlova and M. Hornakova	31
Selected Mechanical Properties of Concrete with Regard to the Type of Steel Fibers R. Gandel	39
High Performance and Ultra-High Performance Fibre Reinforced Concrete with Stabilized Homogeneity L. Musil, J. Vesecky, J. Kubat and J. Vodicka	45
Rheological Properties and Segregation of Fresh UHPC with Fibers Affected by Initial Temperature of Concrete Mix T. Bittner, K. Hurtig and D. Jiroutova	53

Chapter 2: Concrete Structures and Structural Elements in Modern Construction

Implementation of Large-Format 3D Façade Components Using Glass Fibre Reinforced Concrete: ČSOB Hradec Králové, C&A Zürich, Illuster Uster K. Janousova	63
Analysis of Position Effect of Vertical Load-Bearing Elements for Reinforcement of Steel Reinforced Concrete Floor Structures M. Tipka, T. Macecek and J. Vaskova	73
Optimization of Reinforced Concrete Structures in Terms of Environmental Impacts, Durability and Cost A. Horakova, A. Kohoutkova and I. Broukalova	83
Theory of the Second Order for Braced and Bracing Columns E. Fillo and V. Benko	101
Limits for the Punching Shear Capacity of the Flat Slabs Reinforced with Transverse Reinforcement N. Gregusova and J. Halvonik	107
Temperature Measurement in Massive Concrete Structures V. Nemcic, J.L. Vitek and J. Lukes	115
Investigations on Blast Performance of Steel-Concrete Composite Structures V. Sulc, M. Foglar, R. Hajek, J. Kolisko, A. Citek and K. Hurtig	121
Dependence of a Steel-concrete-Steel Sandwich Structure Behavior under Pure In-Plane Shear Loading on the Reinforcement Ratio R. Kubat and P. Bily	133
Experimental Study of Cast in Anchors Embedded in UHPFRC J. Prchal and L. Vrablik	141
Load-Bearing Capacity of Bended FRP Reinforcement with Various Anchorage Lengths J. Lagin, F. Girgle, V. Kostiha and P. Stepanek	155

Aspects Affecting the Quality of Masonry Buildings and Innovations in Masonry K. Richteroval, P. Heinrich, J. Hars and P. Bily	163
Production of Steel-Concrete Composite UHPFRC Elements for Experimental Tests of the Blast Resistance A. Citek, M. Krystov, K. Hurtig, V. Sulc, M. Foglar and D. Citek	175
The Impact of Hydration Heat on the Formation of Cracks in Massive Concrete Structures S. Potuckoval, M. Holy and J. Kolisko	183

Chapter 3: Innovative Approaches in Bridge Engineering

Static Analysis of a Fully Composite Modular Footbridge D. Vasatko, P. Zlamalova, F. Girgle, V. Kostiha and P. Stepanek	193
Effect of External Prestressing on the Stability of a Flat Arch M. Velesik, J. Strasky, R. Necas, J. Kolacek and M. Pozar	203
Important Aspects Influencing the Dynamic Parameters of Slender Pedestrian Bridges Formed by Stress Ribbon Structure J. Kolacek, R. Necas and M. Velesik	213
Possibilities of Indirect Techniques for Prestressing Analysis of Existing Structures and Bridges M. Moravcik and J. Kralovanec	225
Experimental Analysis of Joints in Slender Footbridges from Precast Segments M. Velesik, J. Strasky, R. Necas and L. Sopik	233
Condition Evaluation of Inspected Bridges Built of Prestressed Standardized Precast Girders KA-73 after 40 Years of Use M. Krystov, A. Citek, S. Rehacek and D. Citek	241
Conceptual Design and Sustainable Development J.L. Vitek	247