

Table of Contents

Preface, Partner Universities and Committees

Chapter 1: Materials and Technologies in Civil and Building Engineering

Development of Green Engineered Cementitious Composites M. Jašek, J. Brozovsky, L. Mynarzova and J. Hurta	3
Applications of Titanium Sheets in Modern Building Construction J. Adamus	9
Galvanised Sheets as Building Material J. Adamus, M. Gierzyńska-Dolna, W. Gorecki and P. Lacki	15
Spectral Emissivity of Roof Membranes and Vapor Barriers M. Čekon and R. Ingeli	21
Comparison of Experimental and Computational Characteristics of Light Perimeter Walls of Wooden Buildings M. Šuštiaková, P. Ďurica, R. Ponechal and M. Cangár	25
Exploration Results of Applying Limestone Powder in Crushed-Stone-Sand Mixtures for Road Pavement Layers H. Gyulzadyan, G. Voskanyan and V. Ter-Simonyan	31
Degradation of the Building Structures due to Carbonation of Concrete J. Pasek and L. Vejvara	37
The Present and the Future of Polystyrene Foam in Construction J. Pasek and F. Vörös	43
Impacts of Floods on Wooden Structures and Elements in the Buildings J. Pasek and J. Frankl	49
Nanostructured Metallic Coatings for Protection of Materials against Mould Attack I. Pobol, I. Gontcharova and J. Rajczyk	55
Technological Processes in Natural Stone Processing with Recommendations of Processing Tools Evaluation J. Rajczyk and M. Kosiń	60
Improved Technology of Reinforcement Works and Technical Substantiation of Reinforcement Bar Oscillation Cutting S.A. Evtyukov	66
Numerical Analysis of Wooden Beams Reinforced with Aramid Ropes Exposed to Fire M. Rajczyk and D. Jończyk	71
Compare of Evaluation Methodology of Activity of Metakaolin Y.F. Hou, S.R. Zhao and B.C. Xu	76
Study on Effect of Performance of Recycled Aggregate Concrete with Secondary Manufacturing Shell Mixing Approach J.B. Mu and Y.Q. Cui	80
Research on the Effectiveness of Water Drainage from Concrete Road Surfaces Depending on the Texture Parameters M. Rajczyk and Z. Respondek	86
Numerical Analysis of the 2-Dimensional Diffusion Models of Chloride Ions Based on the FDM with Alternating Direction Implicit Schemes F. Hou, Y. Bai and J. Dong	92
Metallurgical By-Products in Earthworks, Hazards of their Utilization F. Kresta	98

Chapter 2: Structural Mechanics and Analysis, Applied Mechanics, Constructions and Civil Engineering Applications

Reliability of Masonry Structures According to the Contemporary Computational Procedures	
L. Vejvara and J. Pasek	113
Studies on the Mechanical Performance of Long Span Continuous Rigid Frame Bridge under the Influences of Different Curvature Radius	
J.X. Feng, J. Dong and T. Liang	119
Impact Analysis of Tower Number on Automotive Live Load Effect in Suspension Bridge	
Z.G. Qi, J. Dong and B.Q. Yao	124
Study on Cable Forces in Cable-Stayed Bridges Based on Forward Simulation Method	
C. Tian, J. Dong and T. Liang	130
Studies on the Dynamic Performance of the Continuous Rigid Frame Bridge Impacted by the Damage at Some Key Positions of the Side Piers	
B.Q. Yao, J. Dong and Z.G. Qi	137
Definition of Critical Loading on Three-Layered Plate with Cuts by Transition from Static Problem to Stability Problem	
G. Kipiani	143
Numerical Analysis of Aluminium Cellular Beams with Cells of Different Diameters	
A. Derlatka and P. Kasza	151
Numerical Analysis of Aluminum Cellular Beams with Cells of Different Arrangement	
A. Derlatka and P. Kasza	158
Comparative Analysis of the Distribution of Effective Stress in Mooney and Zahorski Materials Using ADINA Software	
M. Major and I. Major	165
Modeling of Wave Propagation in the ADINA Software for Simple Elastic Structures	
I. Major and M. Major	171
Load Bearing Capacity Tests of Mechanical Joining on Timber-Concrete Beam	
P. Agel and A. Lokaj	177
Numerical Modelling of Historical Masonry Structures	
J. Brozovsky, M. Jašek, L. Mynarzova and M. Maluchová	182
Propagation of the Surface of a Strong Discontinuity in the Hyperelastic Materials	
M. Major, I. Major and J. Rózycka	188
The Characterization of Porosity and Frost Resistance of Concrete with Fly Ashes Modified	
J. Halbiniak and B. Langier	193
Reinforced Round Timber Bolted Joints under Cyclic Loading	
A. Lokaj and K. Klajmonová	199
Comparison of Measured Displacement of the Plate in Interaction with the Subsoil and the Results of 3D Numerical Model	
J. Labudková and R. Čajka	204
Post-Cracking Steel Fiber Reinforced Concrete Slabs with Subsoil Interaction	
D. Pieszka, K. Kubečka and I. Kološ	210
Dynamic Experimental Analysis of a Steel Bridge	
R. Fojtík, T. Novotný, I. Skotnicova, M. Stolárik, N. Zdražilová and M. Pinka	215
Measurement Processes and Destructive Testing of Fiber Concrete Foundation Slab Pattern	
P. Mynarčík	221
Experimental Testing the Interaction of Fiber-Concrete Foundation Slab and Subsoil and Compare the Results with Numerical Models	
V. Buchta	227
Dowel Type Joints in Agglomerated Wood	
K. Vavrusova, A. Lokaj and P. Valíček	233
The Split's Spread in the Section of Dangerous Structure	
G.V. Ter-Petrosyan	238
Investigations of RC Shear Wall-Frame Structures with Various Openings in Walls under Earthquake Loading	
T. Dadayan and E. Roudi	242
Finite Element Analyses of Aghjots Monastery Taking into Account Seismic Action	
L. Karapetyan	248

Contact Interaction between an Infinite or Finite Stringer and Elastic Semi-Infinite Plate with a Finite Vertical Crack Coming out to the Stringer by One End S. Mkhitarian	253
Finite Element Analysis of the Seismic Behaviors on Web-Bolted Connected of Replaceable Shear Links for Eccentrically Braced Steel Frame C.Y. Zhao and K. Gong	258
Investigation on Optimization of Cable Tension for Extradosed Cable-Stayed Bridge under the Rational Completion Stage J. Dong, T. Liang and J.X. Feng	264
Analysis on Mechanical Characteristics of Important Components in Overlong Frame Structure under Overall Cooling Temperature C.Y. Zhao, G.X. Yu and B.Y. Zhu	270
Reinforcement of Prefabricate Concrete Beams with Basalt-Epoxy Bars M. Rajczyk and B. Stachecki	275
A Torsion Problem of a Prismatic Rod Composed of Two Orthotropic Materials V. Yedoyan	280
Longitudinal Shear of a Compound Elastic Half-Space Weakened by Cracks K.L. Aghayan, E.K. Grigoryan and V.G. Zakaryan	286
Analytical Method of Determining Folded Depressed Shells' Free Oscillation Frequency L.N. Kondratyeva, Y.L. Routman, A.M. Maslennikov and O.V. Golykh	291
Experiences with Building a Floating Barge M. Głowacki, M. Halbiniak, P. Rajczyk and P. Sroka	297
The Failure Mechanism and Finite Element Analysis of Recycled Concrete Two-Way Slabs with Stud-Shear Reinforcement J. Luo, Y. Zong and C.X. Du	303
Experimental Research on Strength of GFRP Bars in Shield Engineering J. Liu, H. Zhou, H.J. Yuan and J.F. Li	308
Empirical Cellular Automata Model to Predict Failure Patterns of Laterally Loaded Masonry Wall Panel D. Pan, C.Z. Qi and J. Luo	314
Shrinkage of Industrial Concrete Floors L. Zizka, L. Vackova and L. Spas	317
Influence of Electrical Power Lines on Acoustic Properties of Partition Constructions J. Winkler, D. Kubečková, N. Zdražilová and P. Oravec	323
Determining the Size of Anchor Plates on the Basis of Laboratory Measurements M. Stara, M. Smirakova and V. Buchta	329
Sliding Joints from Traditional Asphalt Belts M. Smirakova, M. Stara and P. Mynářčik	335
Methods to Assess Load Capacity of the Old Wooden Building Components K. Dubała and J. Seledjak	341
Design and Evaluation of a Subterranean Work Lining from Layers of Shotcrete and Steel Arch K. Vojtasik, E. Hrubesova, M. Mohyla and L. Duris	347
Round Timber Bolted Joints Reinforcement Methods K. Klajmonová and A. Lokaj	351
Study of Under Pressure Viscous Fluid Pulsating Flow in Cylindrical Pipe of Circular Cross-Section A.A. Sarukhanyan and A.V. Martirosyan	356
Research of Nonstationary Laminar Flow of Decelerating Viscous Fluid in Circular Cylindrical Communications H.V. Tokmajyan and T.A. Sarukhanyan	361
On One Class of Boundary Value Problems of the Steady-State Filtration Theory in Porous Grounds S. Mkhitarian and H.V. Tokmajyan	367
On Steady-State Filtration of Fluid in Strip-Like and Wedge-Shaped Porous Ground Bases S. Mkhitarian, H.V. Tokmajyan, S.A. Avetisyan and M.S. Grigoryan	373
Static Ensuring of Sacral Building of Mining Areas J. Solař	379

The Rationalization of Parameters of the Suction Intake Device for Packed Bulk Construction Materials	
S.A. Evtyukov, A.A. Schimanova, J. Rajczyk and M. Rajczyk	385

Chapter 3: Geotechnologies and Geology, Tunneling and Subways, Seismology

Investigations of the Ground Settlements of a Subway Station Constructed by the Method of Burning Shallow and Dig Invisible of Tunnel Construction	
D.H. Liu, J. Dong and W.J. Song	393
Investigations of Influence of the Variation of Underground Water Levels to the Structural Performance of the Existed Subway Station	
W.J. Song, J. Dong and D.H. Liu	399
Structure Detection and Evaluation of the Highway Tunnel	
C.J. Zhu, F. Liu and J. Dong	405
The Reasearch of the Level of Tunnel Surrounding Rock and the Stability Based on Fractal Theory	
J.T. He and J. Dong	411
The Effect of Structure Bury Depth on Dynamic Response of Underground Tunnel under Longitudinal Shearing Seismic Action	
Y.Q. Xu, C.Z. Qi and G.X. Chen	415
Back Analysis Methods in Geotechnical Engineering	
E. Hrubesova and M. Mohyla	423
Analysis of Load of the Tunnel Definitive Lining due to Vibrations of Various Sources	
M. Stolárik, M. Pinka and J. Maršálek	429
Temperature Monitoring on the Final Tunnel Lining	
L. Duris, J. Aldorf and J. Géryk	435
Seismic Load Analysis around the Temporary Bridge Construction before and after Vibration Mats Installation	
M. Pinka, M. Stolárik, R. Fojtík and T. Novotný	441
Ground Improvement by a Nonparallel Layout of Soil Nails	
K. Vojtasik, M. Chodacki and T. Hochsmann	447
Underground Barrier Protection against the Spread of Vibration - A Model Study	
T. Petřík, E. Hrubesova, M. Pinka and A. Hastíková	451
Shaking Table Test Study on Seismic Responses of Base-Isolated Buildings under Near-Fault Ground Motions	
M. Han, Y.L. Duan and H. Sun	457
Seismic Response of Underground Structure under Vertical Seismic Excitation	
C.Z. Qi, X. Liu, G.H. Li, D. Pan and J. Luo	463
Basics of Metals Theory of Extraction by Means of Chemical Water Solutions Filtration through Underground Ores	
V. Sargsyan and E. Saratikyan	472
Prediction of the Erosive Processes in the Corridor of Baku-Tbilisi-Ceyhan Oil Pipeline and Development of Methods to Design the New Engineering Environmental Protection Measures	
G. Gavardashvili	478
Analysis of Quasi-Geoid Model Created for Territory of the Republic of Armenia	
V. Margaryan	484

Chapter 4: Environmental Engineering, Green, Energy and Thermal Engineering in Building

Economic Aspects of Implementing Energy Performance Labelling of Buildings and Flats in the Czech Republic	
J. Pasek, J. Mlcak and K. Paskova	491
Microgeneration Based on Renewable Energy in Sustainable Building	
L. Kurzak	495

Exploitation of Heat from Thermal Active Coal Tips F. Kresta	501
The Utilization of Ground Source Heat Pumps (GSHP) for Research Purpose in the Campus of VSB - Technical University of Ostrava P. Bujok, M. Klempa, M. Porzer, A. Kunz, P. Pospíšil, P. Vojčinák and M. Sekerášová	507
The Analysis of the Influence of Boundary Conditions on the Energy Performance of Houses K. Kubenková, B. Hrubá, M. Kraus and D. Kubečková	513
Comparison between Energy Performance of Building and Investments to the Renewable Energy Sources M. Kovac and K. Knizova	518
Influence of Plants on the CO₂ Concentration in the Passive House V. Šípková, Z. Galda, J. Labudek and D. Hibler	524
Comparative Analysis of Energy Certification in Poland and Slovakia J. Jura, M. Šušťáková, P. Ďurica and M. Ulewicz	529
Using Probabilistic Calculation for the Assessment of the Risk of Water Vapor Condensation on Structures D. Donová, N. Zdražilová and V. Šípková	534
Diagnostics and Optimization of Airtightness in Experimental Wooden Structures B. Hrubá, P. Oravec and J. Labudek	540
Comparison Thermal Conductivity and Cost of Materials Specified for Thermal Insulation of the Building's Facade V. Šípková, S. Korbelova and J. Labudek	545
Comparison of Experimental and Computational Characteristics of Selected Window M. Janíková, P. Ďurica and R. Ponechal	550
Dynamic Simulation of the Energy Performance of the Timber-Frame Passive House I. Skotnicova, Z. Galda, P. Tymova and L. Lausova	556
Architectural Elements with Respect to the Energy Performance of Buildings R. Ingeli, K. Minarovičová and M. Čekon	561
Diagnostics of Building Claddings and Design of Technical Solutions with Regards to Energy Performance Z. Peřina, M. Haliřová, M. Wolfová, R. Fabian, H. Ševčíková and E. Rykalová	566
New Trends in the Separation of Significant Greenhouse Gases from Flue Gas Streams R. Witasek and P. Pánek	573
Influence of Transparent Partitions on Selected Energy Indicators of the Building Located in Central Europe A. Ujma and A. Lis	579
Changes in the External Environment and of Interior Microclimate as a Consequence of Energetic Modernization of Building A. Lis and A. Ujma	585
Built-In Moisture Process in Structure with Damaged Waterproofing after the Application of Thermal Insulation Boards A. Břenek, V. Václavík, T. Dvorský, J. Daxner and V. Dirner	591
Windows Energy Labelling in Slovakia I. Chmúrny	597
Geocological Stability Disorder as a Result of Civil Construction of Yerevan S.M. Shahinyan	601
GIS for Assesment of Management of Urban Environmental Situation S. Shahinyan and T. Aleksanyan	605
Context of the Growth of Microorganism on the External Composite Systems of Claddings of Panel Buildings D. Kubečková, J. Kukutschová, V. Kučeriková and H. Doležalová	610
The Biotic Attack on Frontage V. Kučeriková, D. Kubečková, H. Doležalová and J. Kukutschová	615
Environmental Aspects and Impacts Assessment in Deployment of Construction Equipment K. Prokopčáková	621
Technological and Constructive Proposals on Sand Trap and Removal from Industrial and Domestic Waste Water V.L. Shamyan	626

Risk Assessment of Biocorrosion Recurrence of ETICS N. Antošová and K. Minarovičová	631
Comparison of the Brownfield Regeneration and Greenfield Development on the Mathematical Model Basis J. Peterová, S. Endel and F. Kuda	637
Forecasting of Microclimate in the Course of Buildings Design and Reconstruction T. Datsuk, V. Pukhkal and U. Ivlev	643

Chapter 5: Architectural Culture and Design, Urban and Transport Planning and Problems

Regularities of Creating in the XVIII - Mid XX Centuries a Regular Agglomeration of St. Petersburg - Leningrad and Problems of its Preservation as a World Heritage Object S.V. Sementsov	651
Thinking on the Design Practice of Modern Commercial Complex - Taking Hohhot Jinyu New Field Project as an Example N.W. Wu	655
Capacity of Intersection with and without Connection Lane on the Left of Running Lane V. Krivda and I. Mahdalova	663
The Influence of the Architectural and Landscape Planning on the Development of the Public Space in European Cities M. Tubielewicz-Michalczuk	669
The Influence of Roundabouts on Drivers' Speed and Behaviour R. Ziolkowski	674
Factors Affecting the Attractiveness of the Area for Individual Housing O. Vašíček, M. Budina, T. Nehudek and J. Česelský	680
Influence of Alternative Education on the Architecture of Conventional Schools M. Nedvěd and V. Zámečnicková	686
Mass Prefabricated-Panel Housing Construction in Private Ownership in the Czech Republic E. Špačková	692
Modernization of a Historical Object in the Contest of Contemporary Requirements of Urban Space in the City of Czestochowa N. Sołkiewicz-Kos	698
The Problem of Preservation of National Traditions in Modern Armenian Architecture M.A. Gasparyan and Y.A. Safaryan	702
Some Issues of Reconstruction of Public Centers and Conservation of Historical Cultural Heritage in Yerevan Z. Mamian	707
Open-Air Museums: Scenario Planning for the Future K. Stepanyan	711
Measure of the Town and Metropolis M. Peřinková	716
The Importance of Tourism in Preserving of Architectonic Zones L.M. Pinto, P. Carvalho and L. País	722
Housing Policy of the City of Vienna as an Example for the Czech Republic A. Koželouhová	726
Contrast Harmony New Implementations In Interior Design Architecture in the Republic of Armenia S.M. Shahinyan and A.S. Shahinyan	732
Geometric Analysis of the Truss above the Nave and Presbytery of the Roman-Catholic Church in Village Bela Dulice P. Krušinský and E. Capková	736
Reliability Analysis of Relevant Radom Variables in Pedestrian Evacuation Study in Underground Transportation Hub D.F. Zhao, X.L. Zhang and Y. Su	741

Chapter 6: Municipal Engineering, Water Systems and Resources, Management and Economics, Forensic Sciences

The Rule of Law when Renting State and Municipal Property V.M. Chibinev	749
Risk Analysis - An Alternative Method in Forensic Sciences K. Kubečka, P. Vlček, D. Kubečková and D. Pieszka	751
Determination of Sediment Accumulation Volume and its Deposition in the Khachen Reservoir P. Baljyan, S. Sedrakyan and A. Manukyan	756
Goodwill and Special Influences Affecting the Value of Real Estate V. Kulil	760
Preparation of Sub-Criteria for Mathematical Modeling of Multi-Criteria Decision Making E. Berankova, F. Kuda and S. Endel	765
The Methodology Suggestion of Capitalization Rates in the Real Estate Z. Stefanovová and P. Procházka	769
Sustainability of the Construction Sector in Poland in Comparison to other Economic Sectors A. Mesjasz-Lech	776
Managing the Local Economy on the Example of the Construction Sector Companies J. Nowakowska-Grunt and A. Wiśniewska-Salek	783
Modeling of Innovation Processes in the Management of SME's Enterprises Activities J. Nowakowska-Grunt	789
The Assessment of Construction Project Management Maturity Level in the Silesian Region in Poland D. Jelonek, J. Nowakowska-Grunt and L. Ziora	796
Peculiarities of Mountainous Area's Water Supply Systems L. Dashtoyan	803
Design Problems of Fish Passes at Water Level Fluctuation at Upstream of Intake Structure A. Samvelyan, G. Gabayan and S. Nurişnyan	807
New Material Solutions for Road Surface Construction Made of WMA J. Rajczyk	811
The Problems of Preserving Zones of Monuments in Urban Structure and Natural Environment in Republic of Armenia L. Khachikyan	817
Experimental Design of Surface Modification of Expanded Obsidian and Determination of Water Sorption Capacity G.S. Hovsepyan, M.A. Kalantaryan and T.V. Yedoyan	823
Urban Spatial Justice in Australian Low-Carbon City: Perth as a Case Study X. Wu	827
Priority Determination Criteria and Strategic Trends of Funding in the Sphere of Water Economy Investments M. Mkrtumyan, G. Grigoryan, R. Harutyunyan and G. Madatyan	834
The Technical Data Analysis of Khachen Reservoir's Hydrosystem A. Sarukhanyan and A. Manukyan	839
Drinking and Waste Water Price Specificity Formation Process in the Republic of Armenia A. Simonyan	844
Construction Cluster: Trends and Prospects G.F. Tokunova	849
Development of Construction Cost Assessment Methods during Preparation for Tender E.B. Smirnov and S.A. Ershova	854
Choosing a Diversification Strategy for the Production Process in a Construction Company P. Rodionov, J. Frková and V. Sojková	859
Bim Management: The Use of GDL Language for Effective Work in BIM J. Fridrich and K. Kubečka	865

Peculiarities of Discharge and Purification of Sewage in the Sevan Basin L. Levonyan, G. Hovsepyan, G. Madatyan and R. Harutyunyan	870
Peculiarities of Urban Strategy Formation of the Republic of Armenia A.A. Aloyan and A.Y. Safaryan	875
Application of Risk Analysis for Building Evaluation M. Bilanič, K. Kubečka and P. Vlček	879
Multi-Criteria Optimization and its Application to Earthwork Processes L. Paulovičová	883
Design of Mechanized Concrete Processes L. Prokopčák	888

Chapter 7: Education Engineering

Educational Process at the Faculty of Civil Engineering, VŠB – Technical University of Ostrava, in the Context of Evolution of the Bologna Process L. Jurčíková and I. Kološ	895
The Problems of an Internal System Formation in Quality Assurance for the Professional Tertiary Education of the Architects and Constructors A. Markosyan, S. Tokmajyan and G. Ivanyan	900
Development Prospects of the Organizational and Legal Status of Education System in the Republic of Armenia N. Hakobyan and A. Ghazarosyan	904