

Advanced Construction Technologies

Part 1

Edited by
Husain Abbas and TAN Kiang Hwee



TRANS TECH PUBLICATIONS

Advanced Construction Technologies

PART 1

Selected, peer reviewed papers from the
2014 4th International Conference on
Structures and Building Materials
(ICSBM 2014),
March 15-16, 2014, Guangzhou, China

Edited by

Husain Abbas and TAN Kiang Hwee



Copyright © 2014 Trans Tech Publications Ltd, Switzerland

All rights reserved. No part of the contents of this publication may be reproduced or transmitted in any form or by any means without the written permission of the publisher.

Trans Tech Publications Ltd
Kreuzstrasse 10
CH-8635 Dürnten-Zürich
Switzerland
<http://www.ttp.net>

Volumes 919-921 of
Advanced Materials Research *3-part-set*
ISSN print 1022-6680
ISSN cd 1022-6680
ISSN web 1662-8985

Full text available online at <http://www.scientific.net>

Distributed worldwide by

Trans Tech Publications Ltd
Kreuzstrasse 10
CH-8635 Dürnten-Zürich
Switzerland

Fax: +41 (44) 922 10 33
e-mail: sales@ttp.net

and in the Americas by

Trans Tech Publications Inc.
PO Box 699, May Street
Enfield, NH 03748
USA

Phone: +1 (603) 632-7377
Fax: +1 (603) 632-5611
e-mail: sales-usa@ttp.net

printed in Germany

Preface

The International Conference on Structures and Building Materials (ICSBM) is the premier forum for the presentation of new advances and research results in the fields of civil engineering and materials. This conference series bring together international scientific community, academics and practitioners, researchers and students and provide an opportunity to discuss and share recent advances in both research and practice about all aspects of building materials and diagnostics of civil engineering, building, structures and geotechnics. After the very successful previous issues ICSBM'2011 (Guangzhou, China), ICSBM'2012 (Hangzhou, China) and ICSBM'2013 (Guiyang, China), the ICSBM'2014: 4th International Conference on Structures and Building Materials was held successfully in Guangzhou, China, from March 15 to 16, 2014.

This book is a collection of accepted papers. All these accepted papers were subjected to strict peer-reviewing by 2-4 expert referees. The book is divided into 24 chapters, including Structural Engineering, Monitoring and Control of Structures, Structural Rehabilitation, Retrofitting and Strengthening, Reliability and Durability of Structures, Disaster Prevention and Mitigation, Bridge Engineering, Geotechnical and Geological Engineering, Tunnel, Subway and Underground Facilities, Seismic Engineering, Roads, Railway Engineering and Traffic Engineering, Hydrology, Coastal and Hydraulic Engineering, Computational Mechanics and Mathematical Modeling, Construction Technology, Project Management and Engineering Management, Architectural Design and Its Theory, Urban Planning and Design, Landscape Planning and Design, Architectural Environment, Eco-Building and Green Building, Building Energy Saving Technology, Construction Materials Research, Materials Science, Data and Signal Processing, Environmental Engineering and Wastewater Treatment, etc. This book will not only provide the readers a broad overview of the latest advances but also provide the researchers a valuable summary and reference in this field.

We would like to express our sincere appreciations to all the authors for their contributions to this volume. We are indebted to all the referees for their constructive comments on the papers. Thanks are also given to Trans Tech Publications for producing this volume.

The Committee of ICSBM 2014

2014 4th International Conference on
Structures and Building Materials
(ICSBM 2014)

Conference Organization

Chairmen

Prof. Husain Abbas, Chair Professor, King Saud University

Prof. TAN Kiang Hwee, National University of Singapore

Prof. Genda Chen, Missouri University of Science and Technology, USA

Technical and Organizing Committee

Prof. Xiuli Du, Beijing University of Technology, China

Prof. Yong Huang, Guizhou University, China

Prof. Jianjun Zheng, Zhejiang University of Technology

Prof. Chaohe Chen, Hainan University, China

Prof. Weiliang Jin, Zhejiang University, China

Prof. Jianguo Nie, Tsing Hua University, China

Prof. Bo Wu, South China University of Technology, China

Prof. Shilang Xu, Zhejiang University, China

Prof. Yiqiang Xiang, Zhejiang University, China

Prof. Jianjun Zheng, Zhejiang University of Technology

Prof. Boyang Ding, Zhejiang University of Technology

Prof. Minyun Hu, Zhejiang University of Technology

Prof. Zhiyong Dong, Zhejiang University of Technology

Prof. Xinjun Zhang, Zhejiang University of Technology

Prof. Fuying Liu, Zhejiang University of Technology

Academician Prof. Wei Sun, Southeast University, China

Prof. Ailin Zhang, Beijing University of Technology, China

Prof. Weiming Yan, Beijing University of Technology, China

Prof. Bin Xu, Hunan University, China

Prof. Feng Fan, Harbin Institute of Technology, China

Prof. Lijuan Li, Guangdong University of Technology

Prof. Yiqiang Xiang, Zhejiang University, China

Prof. Peiyu Yan, Tsinghua University, China

Prof. Feng Liu, Guangdong University of Technology

Prof. Jun Deng, Guangdong University of Technology

Prof. Jianxun Ma, Xi'an Jiaotong University, China

Prof. Jichao Zhang, Guangzhou University, China

Prof. Linhai Han, Tsinghua University, China

Prof. Wenguang Liu, Shanghai University, China

Prof. Yanpeng Zhu, Lanzhou University of Technology, China

Prof. Yun Zhou, Guangzhou University, China

Prof. Zhengliang Li, Chongqing University, China

Prof. Zhihua Chen, Tianjin University, China

Prof. Guangfan Li, Hainan University, China

Prof. Jiping Hao, Xi'AN Univ. of Architecture and Tech., China

Prof. Jihong Ye, Southeast University, China

Prof. Zixiong Guo, Hua Qiao University, China

Prof. Xuejun Zhou, Shandong Jianzhu University, China

Prof. Ayman Mosallam, Univ of California Irvine, USA

Prof. Aftab Mufti, University of Manitoba, Canada

Prof. Antoine E. Naaman, University of Michigan, USA

Prof. A. Kaveh, Iran University of Science & Technology, Iran

Prof. Aftab Mufti, University of Manitoba, Canada

Prof. B. H. V. Topping, Heriot-Watt University, Edinburgh, UK

Prof. David Hui, University of New Orleans, USA

Prof. Faris Albermani, University of Queensland, Australia

Prof. Hamid Ronagh, The University of Queensland, Australia

Prof. Han-Bin Ge, Meiju University, Japan

Prof. I. E. Harik, University of Kentucky, USA

Prof. J-G. Teng, Hong Kong Polytechnic University, Hong Kong

Prof. J. H. Bungey, University of Liverpool, Liverpool, UK

Prof. Jian-Fei Chen, the University of Edinburgh, UK

Prof. Kang Seok Lee, Chonnam National University, South Korea

Prof. K. J. Bathe, Massachusetts Institute of Technology, USA

Prof. Lawrence C. Bank, University of Wisconsin-Madison, USA

Prof. Luciano Feo, University of Salerno, Italy

Prof. M. N. Soutsos, University of Liverpool, Liverpool, UK

Prof. Mark G Stewart, The University of Newcastle, Australia

Prof. Marcus M.K. Lee, the University of Southampton, UK

Prof. R. Sri Ravindra rajah, University of Technology, Australia

Prof. Ramiro Sofronie, University of Bucharest, Romania

Prof. Steve.G.Millard, University of Liverpool, UK

Dr.Tianjian Ji, The University of Manchester, UK

Prof. Tamon UEDA, Hokkaido University, Japan

Prof. Tan Kiang Hwee, National University of Singapore

Prof. Tim Ibell, University of Bath, UK

Prof. Zong Woo Geem, iGlobal University, USA

Prof. Zhi-Shen Wu, Ibaraki University, Japan

Table of Contents

Preface	v
Conference Organization	vi

PART 1

Chapter 1: Structural Engineering

A Nonlinear Model for Beam-Column Joint Based on OpenSees Y.Z. Ju, Y. Mu and D.H. Wang	3
A Study on the Effect of a Dyke Reinforced by Geotextile-Encased Sand Columns F. Ouyang, J.W. Bi, J.W. Han and W.M. Liao	7
Analysis of a Transmission Tower Structure with Dynamic Elastic-Plastic Time History Method Z.G. Xu, K. Qin and C.G. Deng.....	10
Analysis of Composite Beam with Different Web Openings W.Y. Liao, D.H. Zhou and L.Q. Li	15
Analysis of Reconstruction and Reinforcement Design for a Thermal Power Plant Boiler Frame J.L. Wu, P.Z. Cao and C. Liu	19
Axial Strains in FRP-Confined Normal- and High-Strength Concrete: An Examination of Strain Measurement Methods T. Vincent and T. Ozbakkaloglu	23
Comparison of Stress-Strain Relationships of FRP and Actively Confined High-Strength Concrete: Experimental Observations J.C. Lim and T. Ozbakkaloglu	29
Construction Control of a Continuous Beam Arch Composite Bridge C.Y. Zhou, J.R. Yang, W.M. Zhu and J. Shi.....	35
Construction Technique of Cast <i>In Situ</i> RC Grillage Shear Wall Building Formed with Thermal Insulation Hollow Blocks W.J. Zhang, Q. Zhang and P.R. Fu	39
Damage Identification Based on Power Spectral Density Sensitivity Analysis of Structural Responses W.H. Chen, C.Y. Ding, B.Q. He, Z.R. Lv and J.K. Liu.....	45
Damage Location Identification of Truss Structure Based on Strain Modal Method B.D. Ding, M. Tang and Y.N. Shang	51
Design Analysis of Steel Frame for Denitrification through Existing Structure C. Liu and P.Z. Cao.....	58
Design and Numerical Simulation on Concrete Two-Way Slab Strengthened with Partially Bonded Steel Plate J.H. Hu and X.C. Li	64
Discussion on the Rationality Simplified Calculation Method of Reinforced Concrete Two-Way Slab S.Z. Liu	68
Displacement Control Technology on High-Rise Steel Structure about Main Power House of Thermal Power Plant H.Q. Liu, W.B. Li and K. Ma	72

Dynamic Analysis of Tapered Plates Based on Higher Order Beam Theory S.M. Ibrahim, Y.A. Al-Salloum and H. Abbas	79
Effect of Loading Pattern on Performance of FRP-HSC-Steel Double Skin Tubular Columns B.A. Louk Fanggi and T. Ozbakkaloglu	83
Evaluation of Snow Load Using a Wind Tunnel on the Arched House S.Y. Paek, J.Y. You, K.P. You and Y.M. Kim	88
Evaluation of the Fire Resistance of H-Section Made of High Strength Structural Steels with a Difference of Length I.K. Kwon.....	95
Experiment Design of the Scale Model of the RC Frame Structure under Internal Blast Loading X.W. Zhu, B. Jia, T. Liu and J.L. Tao.....	99
Experimental Study of Reinforcement Effect of Injured Frame Joints under Different Axial Compression Ratio M.X. Fang, Z.Y. Yang, Z.F. Chang, S.H. Liu and G. Wang.....	106
Experimental Study of Strengthening of Reinforced Concrete Beams with Externally Bonded GFRP Sheets H.Y. Hu, Y.C. Zhang and Z.M. Huang	115
Experimental Study on Early-Age Crack of RC Using TSTM N.N. Shi and D.H. Huang	119
Experimental Study on Glued Bamboo Beam L.F. Zhang, H.T. Li, J.W. Su, X.Y. Chen, W. Liu, M.H. Xu, J. Dai, F. Wu, Z. Song, B. Li, Z.Q. Zhou and J. Chen	123
Experimental Study on the Flexural Behavior of Stone Slabs with near Surface Mounted Steel Bar E.X. Dong, Z.F. Chen and M. Xu	128
Failure Analysis of Reinforced Concrete Beams Subjected to Explosion and Post-Explosion Fire J.K. Zhao, P. Yan, B. Gu and J. Gu	133
Finite Element Software for Optimization of Triangular Light Roof Truss Structure of Gymnasium T. Li and H. Wang	139
Geometric Nonlinear Shallow Shells for Variable Thickness Investigation L.U. Stupishin and A.G. Kolesnikov	144
Interfacial Slip Calculation of RC Beams Strengthened with FRP Plate under Mid-Span Concentrated Loads A.X. Liu and J. Yang	148
Isolation Performance Analysis of Concrete-Filled Steel Tubular Composite Structure Based on the Lead Rubber Bearing S.W. Duan, X. Tan and W. Huang	152
Lifting Point Optimization of Large Steel Truss on the Principle of Minimum Potential Energy X.C. Fan, H. Chen, Y. Liu and W.C. Lv	158
Non Shrinkage Self-Compacting Steel Box Concrete Application in a Landscape Tower S.J. Li, X.Y. Xu, W.J. Lu and Y.G. Fu	164
Nonlinear Buckling Analysis of Long-Span Suspended Latticed Intersected Cylindrical Shell M.L. Zhu and Y. Sun	169
Nonlinear Finite Element Method Ultimate Strength Analysis of Open Box Girders V.T. Vu and W.G. Wu	177
Nonlinear Numerical Study of Cold-Formed Lipped Channel Beam-Columns M. Chen, Z.B. Feng, Z. Zhou, Y.L. Wang and Q. Zhang	183
On Expected Performance of a Frame-Structure Made by All GFRP Pultruded Profiles A. Dal Cin	188

Parametric Sensitivity Analysis of Long-Span Arch-Truss String Structure Z.X. Bai, X.M. Hou, S. Tian and J.Z. Wu.....	193
Performance Based Optimized Design of Steel Structure L.L. Zhang, X.G. Song and J.J. Zhang.....	199
Prediction Method of the Load Resisting Mechanisms in the Corroded RC Beams W. Dong, H. Oshita and T. Tsutsumi.....	203
Research on Compressible Flow around Cylinder and Truncated Cone with LES Method M. Zhao, J. Mao and G.W. Yang.....	210
Snow Wind Tunnel Experiment for Snowdrift Prediction of Domed Stadium S.Y. Paek, B.H. Nam, J.Y. You, K.P. You and Y.M. Kim.....	216
Stress and Stability Analysis of a Cooling Tower by ANSYS M.L. Cao and X.J. Qiu.....	222
Study on Collapse Numerical Simulation Method of Frame Structures Based on Explicit Dynamics K. Hu.....	226
Study on Dynamic Characteristics of a New Space Latticed Shell String Structure Y.L. Yao, G.Y. Ma and S.L. Dong.....	239
Study on New Reinforcing Method of Composite Beam with Web Openings under Negative Moment W.Y. Liao, D.H. Zhou and C.X. Han.....	243
Test Scheme and Result Analysis of New-Type Frame Structure with Column End of Steel-Concrete Composite Joint G.H. Lu and Z. Wang.....	247
The Dynamic Characteristic and Response's Discussion of External Prestressing Curved Beam M.Y. Huang.....	254
The Effect of Splicing Area Parameters on Mechanical Behavior of Beam-Column Connection with Cantilever Beam Splicing J.R. Pan, Z.T. Yang, L.Q. Zheng and R.B. Gao.....	258
The Numerical Simulation Experiment of Exploded in the Flat Box Sealed Structure Z. Wen, B. Jia, T. Liu and J.L. Tao.....	262
The Optimization Calculation and Analysis of Trough Solar Collector Bracket System G. Li, L.Y. Zhou and Z.D. Ai.....	267
Thermal Effect Test of Outer Compressive Ring of the Roof of Bao'an Stadium H. Deng, X.L. Sun, Y. Cao and X.L. Zhang.....	271
Transverse Free Vibration of Timoshenko Beams Resting on Viscoelastic Foundations L. Peng and Y. Wang.....	275
RPC Pole Composite Cross Arm Design and Wind-Induced Dynamic Analysis Y.Z. Ju, N. Tong and Q. Wu.....	280
Exterior-Template Design for Concrete Engineering in an Arched Structure D.Q. He and W.H. Wu.....	284
The Strain Change Rules of Full-Scale High Strength Concrete Frame Columns with High Axial Compression Ratios G.J. Zhang, Y.B. Jia and X.L. Lu.....	288
Upheaval Buckling Analysis of Buried Offshore Pipelines under High Temperature and High Pressure P. Liu, S.Y. Wu and L. Kang.....	292
A Case Study on the Use of Aluminum Forms in Nuclear Power Plant Construction G.H. Kim, H.M. Song and Y.S. Shin.....	296

Chapter 2: Monitoring and Control of Structures

A DE-Based Algorithm for Structural Damage Detection Y.M. Fu and L. Yu	303
Construction Monitoring of Prestressed Concrete Continuous Beam Bridge C.Q. Li, W.J. Ge, D.F. Cao and B.Y. Wang	308
Experimental Measurement of Two-Dimensional Circular Boundary Temperature Field by Acoustic Method L.W. Zhang, M.J. Wang and W. Cao	313
Knowledge of the Construction Technique of the Multiple Leaf Masonry Façades of Palazzo Ducale in Venice with ND and MD Tests G. Boscato, A. Dal Cin, G. Riva, S. Russo and F. Sciarretta	318
Modal Parameter Identification of Concrete Filled Steel Tube Arch Bridge Based on Stochastic Subspace Method L.X. Wang and S.K. Di	325
Moving Force Identification Based on Firefly Algorithm C.D. Pan and L. Yu	329
Static Monitoring and Non-Destructive Test of a Historic Damaged Palace G. Boscato and A. Dal Cin	334
Structural Damage Detection by Fusion of GA and PSO L. Yu and Y.M. Fu	338
Structural Diagnosis of a Historic Tower Hit by Earthquake A. Dal Cin	344
Test of Thick Rubber Bearings on its Compressive Properties H.W. Chen, P. Pan, J.C. Liu, Y. Sakurai, M. Nakamura and N. Murota	348
The Vibration Modal Displacement Component Method of Identifying the Crack Damage from Simple Supported Beam Z.H. Fang and X.Y. Liu	355
Development of On-Site Fast Detector Used for Waterproof Membrane Joint Peeling Strength J.L. Xu, Y. Zheng, T.X. Wang, P. Du and Z.H. Liu	359
Analysis of Displacement Influence Line Characteristics of Simply Supported Beam with Local Damage K. Sun and Y.Q. Zhang	364
Detection and Monitoring Technologies of Bridge Cable Force and Disease Y. Zheng	369
Edge Detection Technology and its Application in the Model Test of Vehicle Bridge Coupled Vibration J. Wu and X.R. Yuan	373
Critical Application Technology of PIV in Dynamic Centrifugal Test and Design Method of Instrumentation Y.Z. Wang and X.M. Yuan	378
Detection of Unfavorable Karst Cavities in the Carbonaceous Bedrock Area at the Kaihua Segment of Hangzhou-Xinanjiang-Jingdezhen Expressway M. Xu, Z.H. Chen, B. Zeng, W.L. Ye and K.F. Chen	382
Ubiquitous Sensor Network for Construction Site Monitoring J.M. Shin, S.Y. Kim, G.H. Kim, M.G. Jung and D.W. Shin	388
Research on the Environmental Effects of GB-SAR for Dam Monitoring C. Xing, J.J. Huang and X.Q. Han	392

Chapter 3: Structural Rehabilitation, Retrofitting and Strengthening

A New Reinforcement Measure Suited for Space Truss with No-Fire Operation Z.Y. Mei, C.Q. Liu, X. Mi and P. Wu.....	401
Experimental Investigation on Axial Compressive Behavior of Masonry Column Strengthened by SGFRP Z. Zhang and Q. Gu	406
Experimental Investigation on Shear-Reinforced Masonry Sample with FRP Bars G. Boscato	411
Experimental Study on the Bonding Behavior of GFRP-to-Brick Interface J. Zhao, W.B. Sun, Q.Q. Zhu and H.B. Yong	416
Model's Calibration for Masonry Reinforced with FRP Mesh-Bars A. Dal Cin	421
Reinforcement Planning Decision of Old Bridge Based on TOPSIS-AHP Method X.F. Liang and Y. Xu.....	426
Review of the Study on the FRP Strengthened Masonry Walls J. Zhao, W.B. Sun, H.B. Yong and Q.Q. Zhu	430
Simulation on Strengthening of a Cement Fresh Material Silo Y.S. Chen, L. Liu and X.L. Lei.....	434
The Concrete Protective Effect of Silane Impregnated Materials with Different Molecular Chain Structure H.S. Wang, W. Wang, R. Wang, W.B. Wang, L. Li and Q. Tian.....	439
Safety Evaluation of Reinforced Concrete Girder Bridge after Strengthened with Pasting Technology Z.M. Zhao, K.D. Liu, J.Y. Chai, L.L. Lei, Q. Wang, X.S. Qi and R.X. Liu	443

Chapter 4: Reliability and Durability of Structures

Application of Fuzzy Pattern Recognition in Spalling Risk Evaluation of Concrete Structures at High Temperature R.T. Li.....	451
Application of the Failure Assessment Method for Cracked Pipeline Y.Q. Bai, L.H. Lv, T. Wang and X.F. Zhang.....	455
Experimental Study on Influence of Bending Load on Chloride Ion Concentration of Concrete in Marine Environment H.Y. Jin, H.X. Zhuang, R.T. Liu, J.L. Shi and J.Z. Zhang.....	460
National Road 209 Line Shibi Mountain Bridge Concrete Anti-Carbonation Performance Analysis H. Liang, X.D. Liang and W.L. Du.....	465
Safety Assessment of Large-Scale Crude Oil Tank after Fire Process W.H. Wang, H.X. Li, Z.S. Xu and D. Liang.....	469
The Effect of Section Optimization on the Double Nonlinear Global Stability of Latticed Shell S.Y. Chen, X.Z. Liu, H.L. Wang and X.Y. Lu.....	473
The Influence of Main Components of Building under Residual Deformation in Subsidence Area J.B. Yu	477

Chapter 5: Disaster Prevention and Mitigation

Explosion Experimental Study Based on the Small Tailings Pond Model S.R. Lv, Q.N. Wei and K. Yang.....	485
Fire Resistance of Reinforced Concrete Column Exposed to Fire with Cooling Phase J.K. Zhao, P. Yan, D.P. Li and Y. Liu	491
Modeling of Mechanical Damage in Traditional Brickwork Walls after Fire Exposure F. Sciarretta	495
Research on HSE Risk Assessment and Control in Oil-Gas Drilling Operations F. Li and G. Zhang	500
Study on Fire Risk Assessment on Irradiation Room under Stuck Radioactive Sources X.L. Yao.....	507
Study on Fire Risk Assessment on Round Irradiation Room of Stacking under Stuck Radioactive Sources X.L. Yao.....	512
Wind Tunnel Test of Symmetrical Twin-Tower Tall Building Model J.G. Zhang and H.M. Zhuang.....	518
Work at Height in Safety Work Plan Management I. Tureková, V. Tomková and T. Bagalová.....	523

Chapter 6: Bridge Engineering

A Revised the B3 Creep Prediction Model Based on Short-Time Tests S.X. Hu, Q. Huang and S.F. Lin	529
An Analysis on the Deformation of an Arch Bridge under the Action of Live Load by Using ANSYS L.L. Duan, Y.M. Zhao and X.W. Wang.....	533
Dynamic Model Scheme Optimization Based on Fuzzy Decision Theory of Self-Anchored Cable-Stayed Suspension Bridge M. Feng	538
Effect of Wheel Pressure on Vibration of Straddle Monorail Transit Vehicle-Bridge System G. Liu, B. Jang, Z.H. Zhou and Q.Y. Zeng.....	542
Estimation Method for Prestress Loss of Externally Prestressed Composite Girder Bridges Y.M. Zhao, H.X. Li and X.W. Wang.....	547
Finite Element Simulation of Large Segment Hoisting Construction for Hong Kong-Zhuhai-Macao Bridge H.X. Li, L.L. Duan, X.W. Wang and B. Zhu	551
Hybrid Vibration Control of Self-Anchored Cable-Stayed Suspension Bridge M. Feng	556
Influence of Tensioning Stress to Web Cracking of Rigid Frame Bridge in Cantilever Construction D.J. Yin, X.J. He, D.Q. You and B.K. Liu.....	560
Investigation on Nonlinear Vibration of the Cable in Cable-Stayed Bridge in 3D Space T. Wang.....	564
Key Technologies Research in Incremental Launching Demolition Construction of Beijiang Bridge W.X. Lin, D.L. Xu, C. Yang, B.Y. Jia, Z.Z. He and D.Y. Chen.....	570

Optimal Design of Suspension Bridge Based on Minimization of Life Cycle Cost M.S. Bang	577
Research on Mechanical Behavior of Box Girder with Corrugated Steel Webs of Cable Stayed Bridge L. Lv and B. Liang.....	583
Research on the Wave Load Effect Based on Time History Analysis of Donghai Island Bridge W.G. Yuan and M.Y. Liu.....	587
Risk Prevention Measures for Three-Tower and Four-Span Suspension Bridge under Vehicle Fire M.Y. Liu, W. Tian, Y. Wang, W. Jing and X. Chen.....	590
Structure Calculation of the Carrier and Determination of Pre-Camber of Main Girder of Cable Stayed Bridge H.Y. Xu, D.Y. Cui and C. He	598
Study on Nonlinear Structural Behaviors of Steel and Concrete Composite Slab S. Xu and T.Y. Xiang.....	602
The Key Technologies Research in Demolition Construction of Liuxi River Bridge H.Q. Wen, Z.L. Zhang, W.J. Luo, B.Y. Jia, Z.Z. He and D.Y. Chen	607
The Local Stress Analysis of Slide Beam Taking into Account the Roughness of Girder Undersurface Y.B. Wang, Z.Y. Li and R.D. Zhao	615
Bridge Pavla Wonky in Pardubice. Diagnostics of Corrosion Condition of External Cables and Use of Special Materials for Proposal of Treatment J. Kolisko, P. Huňka and S. Řeháček.....	619

Chapter 7: Geotechnical and Geological Engineering

A Constitutive Model with Effect of Temperature for Frozen Soil X.T. Xu, C.X. Fan and T.Y. Zhang.....	627
A Statistical Damage Constitutive Model for Brittle Rocks Based on the Lade-Duncan Failure Criterion Z.Y. Tian, W. Wang, X.H. Li and W.Y. Xu	632
Analysis and Study on Slope Stability of High Fill Subgrade Q. Zhang	637
Analysis of One-Dimensional Thermal Consolidation for Saturated Soil Considering Different Permeabilities C.X. Guo and R.Q. Wu	641
Analysis on the Influence of the Primary Consolidation Settlement of the e-p Curves and the Soil Bulk Density of the Soft Soil Foundation W.S. Wang and J.Q. Yu	645
Analysis the Influence of Non-Prestressed Reinforcement for Horizontal Bearing Capacity of PHC Pipe Pile P.S. Xi and X.K. Sun	649
Characteristics of Xinjiang Bad Foundation Soil J.H. Zhang.....	654
Discussion on Application of Empirical Formulas for Ultimate Bearing Capacity H.W. Jin and H.W. Song.....	660
Effects of Ice Content on Mechanical Behavior of Frozen Loess under Uniaxial Compression X.T. Xu, C.X. Fan and J.H. Yuan	666
Experimental Study and Numerical Simulation on the Large-Sized Models of Micro Anti-Slide Piles X.S. Tang, Y.R. Zheng and J.P. Xin	670

Experimental Study of Meijiang Artificial Island Fill X.C. Su, X.Y. Wang and Z. Liu.....	678
Ground Response of Seasonal Frozen Site under Moderate Intensity Earthquake Z.S. Chen, X.M. Yuan and S.J. Meng.....	682
Influence Factor on Dilatancy of Coarse-Grained Soil Based on Large-Scale Triaxial Test F.Y. Chu.....	687
Influence of Existing State of Pore Aqueous Solution on the Swelling Pressure of Expansive Soils Z.Q. Huang.....	693
Numerical Analysis of the Excavation of Deep Pit Based on Mohr-Coulomb Failure Model H.J. Sun and Y.Q. Li.....	697
Numerical Simulation of Unloading Zone Division for Excavated Rock Slope X.X. Wang and C.J. Deng.....	701
Numerical Tests on Laterally Loaded Drilled Shafts Socketed in Rock S.J. Yuan, K.Y. Zhang, Z.J. Liu and J.C. Li	706
On Atypical Affection on Environment due to Dewatering of Foundation Pit in Developed River System Area D. Li, N.F. Li, B. Tang and J.W. Gong.....	710
Predicts Based on Multi Modality Support Vector of the Settlement of Composite Foundation L.H. Zhang, H.B. Liu and F.P. An	716
Research of Stratigraphic Classification Based on Difficult Degree of Construction Y.Q. Duan and Y.Q. Li	723
Research on Application of Suction Bucket Foundation for Transmission Tower in River Network Area L. Qin, J.X. Zhu and S.W. Zhao	727
Research on Improved AHP Evaluation in Supporting the Right to Determine the Weight of Deep Foundation H.Y. Jiang and G.G. Yu.....	731
Stability Analysis of Surrounding Rock with Two Groups Parallel Joints Using DDARF Method H.P. Ma, L.G. Wang and X.W. Li	735
Stress-Strain State of Weightless Inhomogeneous Array with Cylindrical Hole V.I. Andreev.....	740

PART 2

Chapter 7: Geotechnical and Geological Engineering

Study of Reasonable Length of Coal Seam Mining under Different Fault Dips Y.J. Zhang and T. Xu.....	747
Study of Reinforcement Scheme for Tunnel Heaving due to Excavation of Sunken Plaza over Subway Tunnels H. Lin, J. Yang, J.T. Chen and Q.Q. Luo.....	751
Study on Coal Seam Mining Face Floor Failure under Imbalance High Water Pressure C.J. Song, C. Fan and L. Song	758
Study on Effect of Excavation Depth on Internal Force of Retaining Structure of Arc Row Piles with Arc Ring Beam on the Pile Top Z.W. Zhang, R.G. Deng and Z.S. Chen	762

Study on Expansion Properties Experimental of the Different Stratification Slates in Chongqing Y.J. Zhang and C. Fan.....	769
Study on the Interfacial Shear Stress Distribution Characteristics of Geotechnical Prestressed Anchorage Structure S.F. Zhang, L. Zhang, L. Li and X.G. Song.....	773
Testing and Numerical Simulation Research on Shear Band of Soil S.W. Hou, J.H. Qu and X.L. Du.....	777
The Application of Stepwise-Discriminant-Analysis Oriented FCM Method in Debris Flow Classification Y.L. Shangguan, Q. Wang, J.P. Chen, L.X. He and J.Y. Yan	783
The Comparison of the Loess Mechanical Properties under Plane Strain and Conventional Triaxial Experiments L. Ma.....	791
The Experiment on Soil Water Characteristic Curve Considering the Effect of Urea Concentration G.Q. Dai, D.F. Tian, Y. Ruan, L. Tian and Y.L. Wang	795
The Preliminary Study on the Impact of the Velocity <i>Situ</i> Test Standard Deviation to the Response Spectra in Deep-Soft Sites Z.S. Chen, X.M. Yuan and S.J. Meng.....	800
The Strength Calculation Method of Foundation Treated with Sand Well Y.C. Zhang, H.Y. Hu and Z.M. Huang.....	805
The Study of Jinnan Loess Collapsible and Depth K.F. Yuan and J.B. Zhao.....	809
Study on the Prevention Measures and Causes of Cracks in Arch Crests of Galleries in High Concrete Dams P.P. Chen and G.X. Zhang.....	813
Analysis of the Influence of Water Content on Shanxi Loess CBR and Rebound Module X.R. Wu and L.L. Zhu	820
Study on Group Piles Effects of Offshore Engineering under Lateral Load S.J. Di, M.Y. Wang and W.B. Du.....	824
Model Tests on Additional Stress Transmission between Different Granular Materials in Foundation Soils C.D. Wang, S.H. Zhou and H. Su	828
Experimental Research of Matrix Suction of the Unsaturated Red Clay W.F. Zhao, L. Li and Y.H. Xiao	835

Chapter 8: Tunnel, Subway and Underground Facilities

A Scale Model Test on Hydraulic Resistance of Tunnel Elements during Floating Transportation Z.Q. Ying, L.W. Su and M.H. Lin	841
Effect Analysis on Tunnel Serviceability State by the above Expressway Extension in Loess Area K.G. Sun, C. Kong, W.G. Qiu, K. Liu, W.P. Xu and L. Gong	846
Ground Treatment and its Application in Shallow Subway Tunnel Crossing Urban River by Shield Tunneling Method X.J. Zhou.....	853
Key Technology for the Structure Design of Mining Metro Station in Rock Strata J. Wang	857
Mechanism Analysis of Hydraulic Cutting Outburst Prevention Measure Applied to Mining Area of Heilongjiang Province X.M. Liu, M.H. Liu, Y. Kang and J. Zhou.....	860

Research of Train Wind Characteristics in High-Speed Railway Tunnel	
R.Z. Fei, L.M. Peng, W.C. Yang and W.G. Yan	865
Research on Influence of Span on Surrounding Rock Quality of Tunnels	
X.J. Geng, X.W. Du and Q. Yan	869
Stress Management in Rock Drivage Team Based on Fault Tree Analysis Method	
R.L. Shan, S.H. Dong, B.L. Huang, F. Huang, S.J. Wu and Q.A. Wu	873
Study of the Safety Evaluation of Urban Subway Operation Based on Extenics	
S.M. Bai, H.S. Sun and Y.C. Zhao	878
Study on Model of Back-Filled Grouting of Shield Tunnel	
D.Y. Wang, D. Li and J.X. Yuan	883
Study on Structural Design and Driving Process of Subway Station Passageway Crossing Urban Trunk Road by Tunneling Method	
X.J. Zhou	887
Study on the Model Test of Tunnel Lining Deformation Characteristic under the Frost Heaving Force	
Y. Hu, Z.Y. Li and M.F. Qu	891
The Analysis of Stratum Settlement for a Large Diameter Slurry Shield Obliquely Under-Passing Embankment of the Yangtze River	
Z.Y. Jiang and J. Yu	895
The Operation Safety Evaluation of Xi'an Subway	
Y.F. He and C.X. Ji	902
Safety Assessment of Secondary Lining on the Basis of Load Structure Method and Strength Reduction Method	
K. Liu, G. Wang and C. Kong	907

Chapter 9: Seismic Engineering

Analysis of the Potential of Seismic Stability for the Southern Region of Tangshan Based on ArcGIS	
C.C. Li and X.M. Yuan	915
Dynamic Response Analysis of Soil Slope under Strong Earthquake	
S. Huang, H.Y. Yan, D.G. Cai and B. Song	921
Experimental and Numerical Study of Enhancing the Seismic Behavior of Rammed Earth Buildings	
K. Liu, Y.A. Wang and M. Wang	925
Finite Element Analysis on Low Cycle Fatigue Properties of HRBF RC Pile Tip	
Q. Fu, S.T. Liang and X.J. Zhu	932
Research on the Reparability of Structures Based on Post-Earthquake Residual Deformation	
J.B. Hao, G. Wu and Z.S. Wu	938
Seismic Performance Evaluation of Residential Structures in Egypt	
Y.E. Ibrahim, O. Shallan, A. Elshihy and M. Selim	945
Seismic Performance of T-Shaped CFT Column to Steel Frame Beam Connection – Experimental Study	
Y.T. Li, C.X. Xu and G.F. Du	951
Shaking Table Test of Underground Pipeline under Three Dimension Seismic Excitation – Numerical Simulation	
X. Fu, J.W. Bi, Z.J. Wang and C.W. Yang	960
Study on Corrugated Steel Web Bridge Seismic Isolation Technology in High Intensity Seismic Region	
H.X. Li and Y.M. Zhao	965