

International Structural Engineering and Construction Conference (ISEC-9)

**Resilient Structures and
Sustainable Construction**

**Valencia, Spain
24-29 July 2017**

Volume 1 of 2

Editors:

**Eugenio Pellicer
José M. Adam
Victor Yepes**

**Amarjit Singh
Siamak Yazdani**

ISBN: 978-1-5108-9996-4

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2017) by The International Structural Engineering and Construction Society (ISEC)
All rights reserved.

Printed with permission by Curran Associates, Inc. (2020)

For permission requests, please contact The International Structural Engineering and Construction Society (ISEC) at the address below.

ISEC PRESS
PO Box 1334
Fargo, North Dakota 58107
USA

isec.sec@gmail.com

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

VOLUME 1

KEYNOTE PAPERS

EVOLUTION AND APPLICATION OF COST AND SCHEDULE RISK MANAGEMENT ON COMPLEX PROJECTS	1
<i>Keith Molenaar</i>	
FAILURE LITERACY IN STRUCTURAL ENGINEERING	8
<i>Norbert Delatte</i>	

CONCRETE STRUCTURES

BRITTLE/DUCTILE ASSESSMENT OF HYBRID REINFORCED CONCRETE BEAMS CONTAINING STEEL REBAR AND FIBERS	14
<i>Alessandro P. Fantilli, Andrea Gorino, Bernardino Chiaia</i>	
MEASURING CRACK WIDTH IN RC AND R/FRC TIES THROUGH LASER SCANNER	20
<i>Nicola Critelli, Alessandro Cesetti, Alessandro P. Fantilli, Francesco Tondolo</i>	
NUMERICAL ANALYSIS OF CONCRETE BEAM REINFORCED WITH GLASS FIBER REINFORCED POLYMER BARS	26
<i>Osama A. Mohamed, Rania Khattab</i>	
REINFORCED CONCRETE CRACK MODEL BASED ON STIFFNESS ANALYSIS OF TENSION MEMBERS	32
<i>Angus Murray, Raymond Ian Gilbert, Arnaud Castel</i>	
SERVICEABILITY OF LOW CREEP FLY ASH GEOPOLYMER CONCRETE BEAMS	38
<i>Arnaud Castel, Stephen Foster, Raymond Ian Gilbert</i>	
ULTIMATE STRENGTH OF CONCRETE FILLED SQUARE STEEL TUBULAR BEAM-COLUMNS	44
<i>Masayuki Haraguchi, Masae Kido, Keigo Tsuda</i>	
FRCM SHEAR STRENGTHENING FOR CONCRETE BEAMS	50
<i>Adel Younis, Usama Ebead, Kshitij C. Shrestha</i>	
UTILIZATION OF STEEL FIBERS IN DIAGONALLY REINFORCED CONCRETE COUPLING BEAMS AS ADDITIONAL TRANSVERSE REINFORCEMENTS	56
<i>Hyun-Do Yun, Seok-Joon Jang, Sun-Woo Kim, Wan-Shin Park</i>	
DUCTILITY ENHANCEMENT OF RC BEAMS STRENGTHENED WITH STRAIN HARDENING CEMENTITIOUS COMPOSITES	62
<i>Abd El-Hakim Khalil, Emad Etman, Ahmed Atta, Mohamed Essam</i>	
STRENGTHENING OF RC BEAMS SUBJECTED TO CYCLIC LOAD USING ULTRA HIGH-PERFORMANCE STRAIN HARDENING CEMENTITIOUS COMPOSITES	68
<i>Abd El-Hakim Khalil, Emad Etman, Ahmed Atta, Mohamed Essam</i>	

COMPOSITE STRUCTURES

ASSESSING THE BEHAVIOR OF COLUMN-SPLICE CONNECTIONS BETWEEN CFSTS IN AXIAL TENSION	74
<i>Avik Saha, Swapan Saha, Brian Uy, Dongxu Li</i>	
EXPERIMENTAL STUDY ON STRUCTURAL BEHAVIOR OF FIRE PROTECTED DOUBLE CFT COLUMN SUBJECTED TO FIRE LOAD	80
<i>Kyung Soo Chung, Jae Sung Lee, Jong Eun Song, Woo Chul Kim, Heung Youl Kim, Jong Moon Choi</i>	
EFFECT OF STRAIN-STRESS RELATIONSHIP OF STEEL TUBE ON THE INITIAL STIFFNESS OF SQUARE CFT COLUMNS	86
<i>Ryo Handa, Masae Kido, Mao Liu, Keigo Tsuda</i>	
BEHAVIOR OF EXPANSIVE CONCRETE-FILLED STEEL TUBULAR COLUMNS UNDER AXIAL LOADINGS	92
<i>Aman Mwafy, Amr El-Dieb, Abdulaziz Lazkani</i>	

EXPERIMENTAL STUDY OF RESTRAINED STEEL-CONCRETE COMPOSITE BEAMS UNDER CYCLIC LOADS.....	98
<i>Sarawut Yodmune, Torkul Kanchanalai</i>	
EXPERIMENTAL STUDY ON SHEAR PERFORMANCE OF COMPOSITE CONNECTOR FOR PRECAST CONCRETE SANDWICH PANELS	104
<i>Ximei Zhai, Wenjian Ying, Wang Xueming</i>	
EXPERIMENTS AND FEM MODELS ON SEMI-COMPOSITE BEHAVIOR OF SRC STRUCTURES	110
<i>Takayuki Matsuta, Mikio Kitajima, Koji Maegawa</i>	
COMPARISON OF COOLING AND HEATING REQUIREMENTS BETWEEN BRICK VENEER AND FIBRO CEMENT WALLING SYSTEM.....	116
<i>Swapan Saha, Dharma Hagare, Jiaqi Zhou, Md Kamrul Hassan</i>	

STEEL STRUCTURES

VULNERABILITY REDUCTION OF STEEL MOMENT RESISTING FRAMES BY MEANS OF REDUCED BEAM SECTION.....	122
<i>Rosario Montuori</i>	
INTERACTION STRENGTH FOR CHS-TOLONGITUDINAL PLATE JOINTS UNDER AXIAL LOAD AND IN-PLANE BENDING MOMENT.....	128
<i>Hee-Du Lee, Swoo-Heon Lee, Da-Som Chu, Hye-Min Shin, Kyung-Jae Shin, Hong-Jin Kim, Woo-Bum Kim</i>	
EXPERIMENTAL STUDY OF BEAMS WITH EMBOSSED WEB	133
<i>Kyung-Jae Shin, Han-Min Park, Wha-Jung Kim, Il-Soo Chae, Hyung-Seok Kim</i>	
MOMENT AMPLIFICATION FACTOR OF BEAM-COLUMNS WITH INITIAL DEFLECTION.....	139
<i>Haruna Utsunomiya, Masayuki Haraguchi, Masae Kido, Keigo Tsuda</i>	
EXPERIMENTAL STUDY ON H-SHAPED STEEL BEAM WITH CONTINUOUS BRACING SUBJECTED TO END MOMENT.....	145
<i>Masae Kido, Mao Liu, Kazuaki Hoki, Yoichi Onomiya, Keigo Tsuda</i>	
STABILITY EVALUATION OF STEEL BRACED FRAMES UNDER INELASTIC CYCLIC LOADING.....	151
<i>Iraj H. P. Mamaghani</i>	
BEHAVIORS OF SLIP-CRITICAL BOLTS IN COMBINATION WITH FILLET WELDS.....	157
<i>Heui-Yung Chang, Ching-Yu Yeh, Chia-Yu Chen</i>	
AUTOMATION OF A STEEL WALL FRAMING ASSEMBLY.....	163
<i>Edgar Tamayo, Michael Bardwell, Ahmed Qureshi, Mohamed Al-Hussein</i>	
HEAVYLIFTING OPERATIONS FOR THE ASSEMBLY OF THE ARCH OF BRIDGE REPLACEMENT	169
<i>Juan J. Marti, Alvaro Saenz, Javier Martínez, Jose L. Salamanca, Salvador Salamanca</i>	
SEISMIC PERFORMANCE OF SIX-STORY FABRICATED STEEL FRAMES UNDER PSEUDO-DYNAMIC TESTING.....	175
<i>Cao Zhenggang, Wan Zongshuai, Liu Han, Du Peng, Fan Feng</i>	

BRIDGE STRUCTURES

ESTIMATION OF VEHICULAR COLLISION FORCE FOR BRIDGE COLUMNS USING COMPUTATIONAL MODELS.....	181
<i>Nadim Wehbe, Abdullah Boudaqa</i>	
SHRINKAGE AND CREEP EFFECT ANALYSES OF DOUBLE COMPOSITE CONTINUOUS BOX-GIRDER BRIDGE CONSTRUCTED BY PRE-JACKING METHOD.....	187
<i>Shujin Duan, Bin Wang, Yuanyuan Wang, Runming Niu</i>	
EVALUATIONS OF FLEXURAL CAPACITY IMPROVEMENT METHOD FOR RC PIERS AND CISS FOUNDATION CONNECTIONS IN BRIDGES.....	193
<i>Jung-Kyun Kim, Hak-Eun Lee</i>	
INFLUENCE OF MEMBER CONNECTION MODELING FOR REDUNDANCY ANALYSIS OF TRUSS BRIDGES	198
<i>Keiji Tajima, Naoyuki Oka, Kazuaki Uchiyama, Toshihiko Aso</i>	
STUDY OF CRITERIA USED TO OBTAIN A SUSTAINABLE BRIDGE	204
<i>Vicent Penadés, Víctor Yepes, Tatiana García-Segura, José-Vicente Martí</i>	

FATIGUE BEHAVIOR AT THE UPPER END OF VERTICAL STIFFENERS CONNECTED WITH SWAY BRACINGS	210
<i>Chihiro Sakamoto, Masahiro Sakano, Hideyuki Konishi, Masahiro Koyama</i>	
LOCAL CORROSION ENVIRONMENT AROUND CROSS SECTION OF A PLATE GIRDER BRIDGE	216
<i>Kazuto Maruyama, Seiya Kamasaki, Keiji Tajima, Toshihiko Aso</i>	
ESTIMATION OF AIRBORNE SALT LEVEL FOR BRIDGE CONSTRUCTION	222
<i>Makoto Ohya, Masamich Takebe, Nozomu Hirose, Shota Ajiki, Toshihiko Aso</i>	
DIAGNOSIS OF BRIDGE BEARINGS BASED ON FIELD MEASUREMENTS	228
<i>Naho Shibasaki, Mariko Ikeda, Masahiro Sakano</i>	

BUILDING STRUCTURES AND INFRASTRUCTURE

STRUCTURAL DESIGN AND ANALYSIS OF HIGH-RISE BUILDING USING ULTRA-LIGHTWEIGHT FLOOR SYSTEM	234
<i>Rashad Hajjaj, Abdulaziz Alhimeidi, Mohamed Sabbagh, Abdallah Alatallah, Danish Ahmed, Andi Asiz, Tahar Ayadat, Alaa Salman, Omar K. M. Ouda</i>	
EFFECT OF HEIGHT AND ORIENTATION OF INTERFERING BUILDINGS ON WIND LOADS ON TALL BUILDINGS	240
<i>Bharat Chauhan, Ashok Ahuja</i>	
INCREASING ROBUSTNESS OF REINFORCED CONCRETE STRUCTURES UNDER COLUMN LOSS SCENARIO	246
<i>Said Elkholy, Bilal El-Ariss</i>	
IMPACT OF PREDICTING BRITTLE FAILURE MODES ON SELECTION OF LIMIT STATES OF VERTICALLY-IRREGULAR TALL BUILDINGS	252
<i>Aman Mwafy, Sayed Khalifa, Bilal El-Ariss</i>	
MEASUREMENT AND COMPARISON OF SNOW DENSITY ON GROUND AND ROOF	258
<i>Zhang Qingwen, Ren Zhicheng, Wang Shiyu</i>	
STRUCTURAL AND TECHNOLOGICAL INVESTIGATIONS OF BUILDING ENVELOPE	264
<i>Ruta Miniotaite</i>	
THE STUDY OF DEGRADATION CONDITION OF HIGH-RISE BUILDING EXTERIOR WALL	270
<i>Chu-Tsen Liao, Kuang-Jou Chen, Jen-Chun Hsiao, Po-Jui Wu, You-Zhen Fu</i>	
SUSTAINABLE ULTRA-HIGH-PERFORMANCE GLASS CONCRETE FOR INFRASTRUCTURES	276
<i>Arezki Tagnit-Hamou, Nancy A. Soliman</i>	
WIND PRESSURE DISTRIBUTION ON NORTH-LIGHT INDUSTRIAL BUILDING ROOF	282
<i>Astha Verma, Ashok Kumar Ahuja</i>	

STRUCTURAL ANALYSIS

WIND PRESSURE DISTRIBUTION ON CIRCULAR CANOPY ROOFS	288
<i>Neelam Rani, Ashok Kumar Ahuja</i>	
A METHOD FOR STATIC ANALYSIS OF CABLE-STAYED STRUCTURES SUBJECTED TO IN-PLANE LOADS	294
<i>Nguyen Tuong Lai, Phung Ba Thang</i>	
ANALYSIS OF SPACE FRAMES WITH GENERALIZED SEMI-RIGID CONNECTIONS	300
<i>Shujin Duan, Zhiyue Li, Meixiang Liu, Xiaofeng Xie</i>	
RELATIONSHIP BETWEEN BATTENED BUILT-UP COLUMNS AND FRAMES ABOUT BUCKLING - BUCKLING STRENGTH BY BLEICH	306
<i>Gang Cui, Masae Kido, Keigo Tsuda, Hideyuki Nakano</i>	
ON THE USE OF EXPERIMENTAL TESTING IN RC BUILDING STRUCTURES UNDER CONSTRUCTION	312
<i>Manuel Buitrago, Jose M. Adam, Pedro A. Calderón, Juan J. Moragues</i>	
WIND LOAD PREDICTION OF LARGE-SPAN DRY COAL SHEDS BASED ON GRNN AND ITS APPLICATION	318
<i>Ying Sun, Lin Yang, Yue Wu</i>	
FINITE ELEMENT ANALYSIS OF CONTROLLED LOW-STRENGTH MATERIAL PAVEMENT BASES: STATIC ANALYSIS	324
<i>Li-Jeng Huang, Her-Yung Wang, Wen-Ling Huang, Ming-Chao Lin</i>	

STRUCTURES UNDER SEISMIC LOADING

INFLUENCE OF TIE BEAMS ON THE SEISMIC PERFORMANCE OF TWO-COLUMNED HIGH PIERS	330
<i>Yong Li, Yafeng Li, Shujin Duan</i>	
EFFECT OF SEISMIC STRENGTHENING OF WOODEN BUILDING AS DETERMINED WITH MICRO-TREMOR MEASUREMENTS	336
<i>Mitsuhiro Miyamoto, Yoshiaki Tominaga</i>	
THE EFFECT OF EARTHQUAKE ACCELERATION RECORDS AND THEIR EQUIVALENT DYNAMIC LOADS ON EARTH-DAM RESPONSES	342
<i>Sara Mamani, Siamak Yazdani</i>	

DYNAMIC BEHAVIOR OF STRUCTURES

DYNAMIC ANALYSIS OF FIBER-REINFORCED POLYMER COMPOSITE ELECTRIC POLES	348
<i>Sara Mohamadi, Girum Urgessa</i>	
VIBRATIONAL PROPERTIES OF EARLY SHOWA PERIOD BILLBOARD ARCHITECTURE FOR RENOVATING DENSELY BUILT-UP WOODEN HOUSE AREAS	354
<i>Noriko Takiyama, Kohei Hara, Ryo Sanuki, Masumi Matsumoto, Tomoyuki Gondo, Shigeru Aoki</i>	
SEISMIC BEHAVIOR OF POST-TENSIONED ROCKING COLUMNS WITH RE-PLACEABLE ENERGY DISSIPATERS	360
<i>H. H. Hung, C. W. Huang, C. R. Jiang</i>	
FINITE ELEMENT ANALYSIS OF CONTROLLED LOW STRENGTH MATERIAL PAVEMENT BASES: FREE VIBRATION ANALYSIS	366
<i>Li-Jeng Huang, Her-Yung Wang, Wen-Ling Huang, Ming-Chao Lin</i>	
DAMAGE MODES AND FAILURE MECHANISM OF 160,000 m³ LNG OUTER CONCRETE TANK UNDER IMPACT LOADING	372
<i>Ximei Zhai, Xinyu Zhao, Xinrui Li</i>	

DAMAGE DETECTION AND STRUCTURE RETROFIT

CRITICAL COMPARISON BETWEEN TWO STRENGTHENING TECHNIQUES OF REINFORCED CONCRETE COLUMNS	378
<i>Rosario Montuori</i>	
NUMERICAL PARAMETRIC STUDIES FOR THERMOGRAPHIC INSPECTION IN CONCRETE	384
<i>Rilya Rumbayan, Glenn Washer</i>	
A RETROFIT METHOD FOR OLD PRECAST PANEL BUILDING	390
<i>Haruyuki Yamamoto, Ankhtuya Altangerel, He Huang</i>	
APPLICABILITY OF WIDE-RANGE ULTRASONIC TESTING TO NON-DESTRUCTIVE INSPECTION OF GROUT CONDITION IN PRESTRESSED CONCRETE BRIDGES	396
<i>Kuniharu Fukushima, Kimihiko Amaya, Takanori Kinoshita, Isamu Yoshitake</i>	
A PERSPECTIVE ON SEAWATER/FRP REINFORCEMENT IN CONCRETE STRUCTURES	402
<i>Adel Younis, Usama Ebead, Antonio Nanni</i>	
EFFECT OF SURFACE ROUGHENING ON CONCRETE/TRM BOND	408
<i>Kshitij C. Shrestha, Usama Ebead, Adel Younis</i>	
REHABILITATION OF BOX GIRDER BRIDGE	414
<i>Kawan Alani, Abdullah Ahmed</i>	
EVALUATIONS OF REMAINING STRENGTH ESTIMATION METHOD BY USING PLATE GIRDER MODELS WITH CORROSION UNDER SLEEPERS	420
<i>Naoyuki Asao, Katashi Fujii</i>	

NUMERICAL ANALYSIS AND COMPUTATION

DAMAGE MODELING AND ASSESSMENT FOR BRITTLE MATERIALS	426
<i>Siamak Yazdani, Amin Salehi, Ashkan Saboori, Babak Jahani, Svenn Borgersen</i>	
A RATIONAL METHOD FOR COMPUTATION OF CABLE STRUCTURES	432
<i>Phung Ba Thang, Nguyen Tuong Lai</i>	

ANALYZING REINFORCED CONCRETE BEAMS BY USING THE UPF FEATURES OF ANSYS	438
<i>Paula Manica Lazzari, Américo Campos Filho, Bruna Manica Lazzari, Alexandre Rodrigues Pacheco</i>	
DEFORMATION AND ULTIMATE STRENGTH OF R/C ARCH UNDER ASYMMETRIC LOAD	444
<i>Takashi Hara</i>	
USING THE ELEMENT-EMBEDDED REBAR MODEL IN ANSYS TO ANALYZE REINFORCED CONCRETE BEAMS	450
<i>Bruna Manica Lazzari, Américo Campos Filho, Paula Manica Lazzari, Alexandre Rodrigues Pacheco</i>	
A COMPUTATIONAL FRAMEWORK FOR HOLISTIC LIFE-CYCLE DESIGN OF BUILDINGS	456
<i>Terje Haukaas, Stevan Gavrilovic</i>	
NUMERICAL INVESTIGATION OF THE BEARING CAPACITY OF TRANSVERSELY PRESTRESSED CONCRETE DECK SLABS	462
<i>Sana Amir, Cor Van Der Veen, Ane De Boer, Joost C. Walraven</i>	

STRUCTURAL ANALYSIS, OPTIMIZATION, AND DESIGN

DESIGN OF STRUCTURAL PARTS BY USING MODERN SIMULATION PROCEDURES	468
<i>Boštjan Harl, Jožef Predan, Marko Kegl, Dejan Dinevsk</i>	
SLIP COEFFICIENT OF BOLTED SLIP-CRITICAL CONNECTIONS	474
<i>Cheng-Chih Chen, Tsung-Cheng Hsieh</i>	
ANALYSIS OF TIMBER COLUMN-GROUND SILL JOINTS REINFORCED WITH IMPROVED ARAMID FIBER SHEETS	479
<i>Akari Yamaguchi, Xinyan Chen, Noriko Takiyama</i>	
STRUCTURAL CHARACTERISTICS OF TRADITIONAL THATCHED HOUSES IN OLD POST TOWNS	485
<i>Noriko Takiyama, Ryohei Tamaki, Xinyan Chen, Akari Yamaguchi, Mitsuhiro Miyamoto</i>	
THE STATIC BEHAVIORS AND NUMERICAL PREDICTION ON DISPLACEMENT OF AN EXISTING ARCH DAM	491
<i>Nishiuchi Tatsuo</i>	
SPIRAL PARABOLIC DOME: HISTORICAL STUDIES OF IRANIAN ARCHITECTURE	497
<i>Afshin Turk, Mohammad Shabani, Shabnam Ghanavatzadeh</i>	

DURABILITY AND CORROSION

THE STUDY ON THE PROPERTIES OF Ca CONCRETE UNDER NATURAL ENVIRONMENT	503
<i>Atsushi Shimabukuro</i>	
BEHAVIOR OF CORRODED RC BEAMS WITHOUT STIRRUPS REPAIRED WITH CFRP SHEETS	509
<i>Abdullah Al-Saidy, Sherif El-Gamal, Khlaifa Al-Jabri, Bilal Waris</i>	
EFFECTS OF RESIDUAL RUST ON STRENGTH RECOVERY OF CORRODED STEEL PLATE REPAIRED WITH PATCH PLATE	515
<i>Hiroshi Ogami, Katashi Fujii, Ryuichi Yokota, Makoto Kawano, Hisakazu Horii</i>	
EFFECT OF FLY ASH CONTENT IN MBC BONDER FOR SUSTAINABLE CFRP RETROFIT	521
<i>Reece Sainsbury, Vasudeva Upadhyaya Raghavendra, T. G. Suntharavadeivel, Kai Duan</i>	
EVALUATION OF APPLIED REMEDIATION WORKS ON HISTORICAL MASONRY WALL EXPOSED TO LONG-TERM DETERIORATION	527
<i>Jan Fort, Zbyšek Pavlík, Lukáš Balík, Robert Cerný</i>	

RECYCLED CONCRETE AND SUPPLEMENTARY CEMENTING MATERIALS

CERAMIC WASTE POWDER: AN ALTERNATIVE INGREDIENT FOR GREEN CONCRETE	533
<i>Sama Aly, Dima Kannan, Amr El-Dieb, Mahmoud Reda Taha, Samir Abu-Eishah</i>	
STUDY OF REPLACEMENT OF SAND BY EXPANDED POLYSTYRENE IN STRUCTURAL LIGHTWEIGHT CONCRETE	539
<i>Mateus Titon Tostes, Daniel Hastenpflug</i>	
MICROSTRUCTURE, TEXTURE, AND MECHANICAL PROPERTIES OF GEOPOLYMERS PREPARED USING INDUSTRIAL WASTE	545
<i>Monika Čáchová, Jaroslava Kotátková, Pavla Rovnaníková, Magdaléna Doleželová, Nikol Alblová, Petr Svora, Eva Vejmelková, Václav Kocí, Robert Cerný</i>	

MECHANICAL PROPERTIES OF COCONUT FIBER-REINFORCED CONCRETE	551
<i>Gino Ng, Girum Urgessa, Yared Shifferaw, Harianto Hardjasaputra</i>	

FIBER REINFORCED CEMENTITIOUS COMPOSITES

EFFECT OF RECYCLED MATERIALS ON THE TENSILE BEHAVIOR OF STEEL FIBER-REINFORCED CEMENT COMPOSITE	557
<i>Sun-Woo Kim, Wan-Shin Park, Young-Il Jang, Yi-Hyun Nam, Sun-Woong Kim, Jong-Won Lee, Hyun-Do Yun</i>	
THE REINFORCED CONCRETE BEAM DEFLECTION AND CRACKING BEHAVIOR WITH ADDITIONAL FIBER STEEL	562
<i>Faisal Ananda, Agoes Soehardjono, Achfas Zacoeb, Gunawan Saroji</i>	
PUNCH TEST FOR THE ASSESSMENT OF FRACTURE ENERGY ON CONCRETE MIXED TO NATURAL PLANT FIBERS	567
<i>Laura Anania, Giuseppe D'Agata</i>	
TENSILE CHARACTERIZATION OF TEXTILE REINFORCED MORTAR	573
<i>Adel Younis, Usama Ebead, Kshitij Shrestha</i>	

MECHANICAL PROPERTIES OF CONCRETE MATERIALS

EVALUATION OF CRYSTALLINE WATERPROOFING ADMIXTURE ON PORTLAND CEMENT CONCRETE	579
<i>Rodolfo De Sá Petrucci, Daniel Hastenpflug</i>	
THERMAL RESISTANCE OF ALKALI ACTIVATED SLAG CONCRETE	584
<i>Kiacher Behfarnia, Mohammad Shahbaz</i>	
COMPARATIVE INVESTIGATION OF STRENGTH PROPERTIES OF CONCRETE MIXED WITH VARIOUS POWDER AS ALTERNATIVE CEMENTITIOUS MATERIALS	590
<i>Isamu Yoshitake, Keisuke Miyamoto, Jun Mizushima, Kurumi Yamamoto, Koichiro Yamato</i>	
EFFECT OF CURING TEMPERATURE ON THE PROPERTIES OF 100% CLAY-BASED GEOPOLYMER CONCRETE	596
<i>Muhammad Mukhlesur Rahman, David W. Law, Indubhushan Patnaikuni</i>	
MULTI-FUNCTIONAL CEMENTITIOUS COMPOSITES WITH SENSING AND HEALING CAPABILITIES	602
<i>Hocine Siad, Mohamed Lachemi, Mustafa Sahmaran, Anwar Hossain</i>	
STUDY ON DETECTION METHOD OF DEFECTS IN COVERED CONCRETE USING ELECTRICAL RESISTIVITY MEASUREMENT	608
<i>Keiyu Kawaai, Isao Ujike, Hiroshi Okuno</i>	
EXPERIMENTAL STUDY ON CONCRETE PERMEABILITY AFFECTED BY ENVIRONMENTAL VIBRATION	614
<i>Xue-Feng Ma, Jian-Qing Bu</i>	
STUDY ON FAILURE MODE OF HUSK MORTAR ENERGY-SAVING WALLBOARDS	620
<i>Yu Zhang, Qingwen Zhang, Jian Zhao, Guangchun Zhou</i>	
A STUDY OF HEMPCRETE PROPERTIES USING NATURAL HYDRAULIC LIME - MIX DESIGN, MECHANICAL PROPERTIES, AND MICROSTRUCTURE	625
<i>Samo Lubej, Sebastian Toplak, Marjan Lep, Andrej Ivanic</i>	
EFFECTS OF CLAY ON PROPERTIES OF CONCRETE	631
<i>Ayub Elahi, Atizaz Ali</i>	

TESTING AND APPLICATION OF NEW CONSTRUCTION MATERIALS FOR INFRASTRUCTURE

EVALUATION OF THE HIRSCH MODEL FOR DYNAMIC MODULUS ESTIMATION OF ASPHALT MIXTURES	637
<i>Hassan Malekzhehtab, Hamid Nikraz</i>	
BOND AND FLEXURAL BEHAVIOR OF SELF-CONSOLIDATING CONCRETE BEAMS REINFORCED WITH GFRP BARS	643
<i>Slamah Krem, Khaled Soudki</i>	
EXPERIMENTAL STUDY OF ULTRA-HIGH PERFORMANCE FIBER REINFORCED CONCRETE DOSAGES WITH ULTRA FAST SETTING TIME	649
<i>Ester Gimenez-Carbo, Raquel Torres, Pedro Serna</i>	

CHARACTERISTICS OF FRESH MIXTURE OF A NOVEL CEMENT-LESS WASTEPAPER-BASED LIGHTWEIGHT BLOCK AND ITS MOLDING PROCESSES	655
<i>Oriyomi M. Okeyinka, David A. Oloke, Jamal M. Khatib</i>	

VOLUME 2

APPLICATION OF INNOVATIVE MATERIALS IN PRECAST CONCRETE STRUCTURES.....	661
<i>Klaus Holschemacher</i>	
SELF-HEALING CONCRETE USING FLY ASH.....	667
<i>Yoshitaka Ishikawa</i>	
THEORETICAL APPROACH TO DETERMINATION OF ACOUSTIC PROPERTIES OF BUILDING MATERIALS.....	673
<i>Lukáš Fiala, Robert Cerný</i>	
YIELD STRESS BASED ON NATURAL STRAIN THEORY UNDER CYCLIC TENSILE-COMPRESSIVE LOADING AFTER LARGE UNIAXIAL TENSION	679
<i>Yasuyuki Kato</i>	
SPALL REPAIR USING A 3D PRINTER AND EPOXY RESIN ADHESIVE	685
<i>Jaehum Yeon, Julian Kang</i>	

ENERGY AND CLIMATE CONTROL IN CONSTRUCTION

HEALTH OF GREEN BUILDING OCCUPANTS: BOTH INDOOR AND NEIGHBORHOOD ENVIRONMENTS MATTER.....	691
<i>Isabelle Y. S. Cha, Anita M. M. Liu, Felix T. H. Tom</i>	
ROBUST IFC FILES TO IMPROVE INFORMATION EXCHANGE: AN APPLICATION FOR THERMAL ENERGY SIMULATION.....	697
<i>Qian Chen, Yunus Emre Harmanci, Yaowen Ou, Borja Garcia De Soto</i>	
A FINITE ELEMENT ANALYSIS APPROACH TO IMPROVE INTEROPERABILITY FOR THERMAL ENERGY SIMULATIONS	703
<i>Yaowen Ou, Yunus Emre Harmanci, Qian Chen, Borja Garcia De Soto, Vasileios Nertimanis, Eleni Chatzi</i>	
COMPUTATIONAL APPROACH FOR ESTIMATING HYGRIC PROPERTIES OF HETEROGENEOUS MATERIALS IN LONG-TERM ASSESSMENT OF MOISTURE-INDUCED DAMAGE.....	709
<i>Václav Kocí, Jirí Madera, Robert Cerný</i>	
DEALING WITH WEATHER-RELATED CLAIMS IN CONSTRUCTION CONTRACTS: A NEW APPROACH	715
<i>Pablo Ballesteros-Pérez, Shabnam Kabiri, Stefan T. Smith, Will Hughes</i>	

ASSET AND TRANSPORTATION MANAGEMENT

PROPERTY ASSET MANAGEMENT: STATE OF THE ART AND PROPOSALS OF ACTION.....	721
<i>Desiree Sandoica Paris, Manuel Soler Severino</i>	
THE IMPORTANCE OF ISO 55000 IN SMALL AND MEDIUM SIZED ENTERPRISES.....	727
<i>Desiree Paris, Manuel Severino</i>	
PROPERTY ASSET MANAGEMENT: LEGAL FRAMEWORK	733
<i>Desiree Paris, Manuel Severino</i>	
THE IMPORTANCE OF PROPERTY ASSET MANAGEMENT IN THE SPANISH PUBLIC SECTOR.....	738
<i>Desiree Sandoica Paris, Manuel Soler Severino</i>	
AN ASSET MANAGEMENT FRAMEWORK FOR RAMP METERING SYSTEMS AND ADAPTIVE TRAFFIC CONTROL SYSTEMS	744
<i>Song He, Ossama Salem, Baris Salman</i>	
AFFORDABLE HOUSING POLICY IMPLEMENTATION MUNICIPALITIES: A CASE STUDY	750
<i>Neetu Sharma, Vishal Sharma</i>	
ANALYZING DATABASES IN THE TAIWAN BRIDGE MANAGEMENT SYSTEM USING BIG DATA APPROACHES	755
<i>Yu-Han Chuang, Nie-Jia Yau</i>	

INNOVATION SCENARIOS FOR THE TECHNOLOGICAL DESIGN OF THE OPERATING SUITE: DESIGN CRITERIA AND METHODS	761
<i>Michele Di Sivo, Valentina De Paolis</i>	
CORPORATE FINAL NODAL DESTINATION CHOICES IN THE EXODUS FROM JOHANNESBURG CENTRAL BUSINESS DISTRICT	767
<i>Nihatisi Khatleli</i>	
CHARACTERISTICS OF FUNDAMENTAL DIAGRAMS DUE TO SHOCKWAVE BY NON-LANE BASED HETEROGENEOUS TRAFFIC	773
<i>Abu Jar Md. Minhuz Uddin Ahmed, Md. Tarek Hasan, Md. Rakibul Ala, Md. Shamsul Hoque</i>	
THE IMPORTANCE OF LOCAL FACTORS FOR INVENTORY ANALYSIS	779
<i>Saniye Karaman Öztas, Leyla Tanaçan</i>	
AN OVERVIEW OF THE LOCATION OF AIRPORTS USING GEOGRAPHIC INFORMATION SYSTEM.....	785
<i>Mehrdad Honarmand, Mohammad Beiranvand, Sina Bashash, Ali Ghaderi</i>	

GEOTECHNICAL AND WATER ENGINEERING SOLUTIONS

STUDY ON MECHANISM OF ROCK FALL AT TUNNEL CUTTING FACE AFTER BLASTING	791
<i>Fumi Sato, Naotaka Kikkawa, Nobutaka Hiraoka, Kazuya Itoh, Naoaki Suemasa</i>	
COASTAL PROTECTION OF GOTVAND RESERVOIR DAM: ELECTRICAL CONDUCTIVITY PERFECTION OF SALTY DOMES	797
<i>Afshin Turk, Bahram Mombeni, Hamidreza Khodabakhshi, Dariush Bahmaei, Mehdi Behdarvandi Askar, Shabnam Ghanavatizadeh</i>	
ANALYSIS OF EMPIRICAL COMPRESSION INDEX EQUATIONS USING THE WATER CONTENT	803
<i>Amir W. Al-Khafaji, Krishnanand Y. Maillacheruvu, Melissa Hoerber</i>	
ANALYSIS OF EMPIRICAL COMPRESSION INDEX EQUATIONS USING THE VOID RATIO.....	809
<i>Amir Al-Khafaji, Krishnanand Maillacheruvu, Robert Jacobs</i>	
INNOVATIVE IMPLICIT FINITE DIFFERENCE SOLUTION TO TIME RATE OF SETTLEMENT IN CLAY	815
<i>Amir W. Al-Khafaji</i>	
INNOVATIVE EXPLICIT FINITE DIFFERENCE SOLUTION TO TIME RATE OF SETTLEMENT IN CLAY	821
<i>Amir W. Al-Khafaji</i>	
FULL-SCALE MODEL TEST FOR PREDICTING COLLAPSE USING INVERSE OF VELOCITY OF SLOPE SURFACE DURING EXCAVATION	827
<i>Nobutaka Hiraoka, Naotaka Kikkawa, Katsuo Sasahara, Kazuya Itoh</i>	
BIOLOGIC STEP STIFFNESS SIMULATION OF TANGENCY JOINTS ON SHEET PILE LOAD TRANSFER INTO WATERWAY BED	833
<i>Afshin Turk, Pakavach Samani, Shabnam Ghanavatizadeh</i>	
EXPERIMENTAL STUDY OF STILLING BASIN MODELS.....	839
<i>Hari Lal Tiwari, Kamal Singh</i>	
SUITABILITY OF RED MUD IN SUBGRADE USING RBI GRADE 81	845
<i>Kamal Singh, Hari Lal Tiwari</i>	

ENGINEERING AND CONSTRUCTION EDUCATION

STAND-ALONE EDUCATIONAL CENTER	851
<i>Rashid Al Shali, Ghulam Qadir, Asalah El Naffar, Batoul Hittini, Aisha Obaid, Hind Rida</i>	
DEVELOPMENT OF PORTABLE VIBRATION EXPERIMENT DEVICE TO SUPPORT INTUITIVE UNDERSTANDING	857
<i>Osamu Tsujihara, Yuichi Nakatani, Terumasa Okamoto, Takeshi Yamamura</i>	
SUSTAINABLE ASSESSMENT OF RETAINING WALLS THROUGH AN ACTIVE LEARNING METHOD CONSIDERING MULTIPLE STAKEHOLDERS	863
<i>Leonardo Sierra-Varela, Victor Yepes, Eugenio Pellicer</i>	
FROM PROTEGE TO CUSTOMER: INCREASING STUDENT INFLUENCE IN CIVIL AND STRUCTURAL ENGINEERING EDUCATION	869
<i>Ulrike Quapp, Klaus Holschemacher</i>	

A LINEAR PROGRAMMING APPLICATION AND SOLUTION FOR MINIMIZING CLASS SCHEDULING CONFLICTS	875
<i>Melissa Humphrey, Amarjit Singh</i>	
IDENTIFYING BAD PRACTICES: A WAY TO INTRODUCE ETHICS IN THE CLASSROOM	881
<i>Ester Gimenez-Carbo, Hugo Coll, Ma Jose Pelufo, Guillermo Noguera, Pedro Serna</i>	
PROFESSIONAL EDUCATION FOR DESIGN MANAGEMENT IN THE CONTEXT OF INDUSTRIAL PROJECTS	886
<i>Tássia Farssura Lima Da Silva, Aline Valverde Arrotéia, Silvio Burrattino Melhado</i>	
SIMILARITY ASSESSMENT OF COUNTRIES TO FACILITATE LEARNING FROM INTERNATIONAL CONSTRUCTION PROJECTS	892
<i>Beste Ozyurt, Gozde Bilgin, Irem Dikmen, M. Talat Birgonul</i>	
CONSTRUCTION MANAGEMENT STUDENTS' PERCEPTIONS ON WORK-LIFE BALANCE	898
<i>Duygu Akalp, Mehmet Ozbek, Pinar Omur-Ozbek</i>	
DISASTER IMAGINATION GAME ENHANCED BY MOBILE MAPPING SYSTEM AND ITS APPLICATION	904
<i>Osamu Tsujihara, Kyohei Yamaguchi, Hideyuki Ito, Tomoyuki Sato, Terumasa Okamoto</i>	
LEADERSHIP AND COLLABORATION IN PROJECT MANAGEMENT EDUCATION: A CASE STUDY	910
<i>Silvia Mazzetto</i>	
TRANSFORMING INTO A KNOWLEDGE-BASED SOCIETY: EXAMINING THE ROLES OF HIGHER EDUCATION INSTITUTIONS	916
<i>John Aliu, Clinton Aigbavboa</i>	

PROCUREMENT METHOD AND DISPUTE MANAGEMENT

THE IMPACT OF OBSOLESCENCE IN HEALTH PUBLIC PRIVATE PARTNERSHIP PROJECTS	922
<i>Nthatsi Khatleli</i>	
PREDICTING PERFORMANCE IN DESIGN-BID-BUILD PROJECTS	928
<i>Bryan W. Franz, Keith R. Molenaar, M. Amalia Sanz, Eugenio Pellicer</i>	
AN EXPLORATION OF TEAM INTEGRATION IN DESIGN-BID-BUILD PROJECTS	934
<i>M. Amalia Sanz, Bryan Franz, Keith Molenaar, Behzad Esmaeili, Eugenio Pellicer</i>	
USE OF PPP IN DIFFERENT COUNTRIES AND REGIONS	940
<i>Asli Pelin Gurgun, Gul Polat, Hasan Gokberk Bayhan</i>	
FACTORS AFFECTING THE SELECTION OF CONTRACTORS IN GREEN BUILDING PROJECTS	946
<i>Asli Pelin Gurgun, Mehmet Egemen Ozbek</i>	
A VALIDATION OF A RE-EQUILIBRIUM DECISION SUPPORT SYSTEM FOR PPP CONTRACTS	952
<i>Amira Shalaby, Amr Hassanein, Atter Hammoura</i>	
PROJECT CONDITIONS JUSTIFYING TIME-AT-LARGE CLAIMS	958
<i>Mohamed-Asem Abdul-Malak, Abed Elkhalek Jaber</i>	
MULTI-OBJECTIVE OPTIMIZATION FOR CONFLICT RESOLUTION IN CONSTRUCTION PROJECTS	964
<i>Changjun Lee, Seung Heon Han, Woosik Jang, Wooyong Jung</i>	
PROGRAM-FOR RESULTS: AN ANALYSIS OF PROCUREMENT STRATEGIES	969
<i>Kareem Zahran, A. Samer Ezeldin</i>	
RISK ALLOCATION MECHANISM FOR BUILDING PROJECTS BASED ON THE RIBA PLAN OF WORK	975
<i>Chipozya Tembo, Nthatsi Khatleli</i>	
USE OF THE ALTERNATIVE TECHNICAL CONCEPTS IN TRANSPORTATION PROJECTS	981
<i>Ali Touran, Firooz Panah</i>	
A PRELIMINARY STUDY OF ALTERNATIVE TECHNICAL CONCEPTS IN HIGHWAY PROJECT DELIVERY METHODS	987
<i>R. Edward Minchin Jr., Parth Choksi, Linda Konrath, Sid Scott, Yuanxin Zhang</i>	
CHALLENGES OF DESIGN-BUILD METHOD IMPLEMENTATION IN PUBLIC WORKS PROJECT DELIVERY	993
<i>Puti Farida Marzuki, Rizal Zainuddin Tamin</i>	
OPTIMIZING GREEN-BUILDING PROJECT DELIVERY: COMPARATIVE ANALYSIS OF DESIGN-BID-BUILD AND DESIGN-BUILD DELIVERY METHODS USING CASE STUDIES	999
<i>Alessandro Orsi, Eugenio Pellicer, Ignacio Guillen Guillamon</i>	

FRAMEWORK OF A DECISION SUPPORT SYSTEM FOR APPLYING PROGRAM-FOR-RESULTS FUNDING MECHANISM	1005
<i>Kareem Zahran, A. Samer Ezeldin</i>	

SUSTAINABLE CONSTRUCTION PROCESS

FINANCIAL AND ECONOMICAL RISKS IMPACTING COST OF LEED CERTIFIED PROJECTS	1011
<i>Asli Pelin Gurgun, Gul Polat, Hasan Gokberk Bayhan, Atilla Damci</i>	
WORKING WITH AVAILABLE RESOURCES TO DEVELOP LOCAL KNOWLEDGE TO SUSTAIN DEVELOPMENT DURING CRISES	1016
<i>Enrique Villacis, Maria Lorena Rodriguez, Cynthia Ayarza</i>	
COMPARISON OF BUILDINGS IN ANCIENT TIMES WITH MODERN GREEN BUILDING PRACTICES	1022
<i>Elizabeth Sayer, M. G. Matt Syal, George Berghorn</i>	
STRATEGIC ASSESSMENT AND PLANNING FOR SUSTAINABLE DEVELOPMENT	1028
<i>Amir Al-Khafaji, Seshadri Guha, Laith Al-Khafaji</i>	
ACHIEVING REGIONAL SUSTAINABILITY	1034
<i>Amir W. Al-Khafaji, Seshadri Guha, Laith Al-Khafaji</i>	
ENVIRONMENTAL IMPACT SHARES OF A REINFORCED CONCRETE EARTH-RETAINING WALL WITH BUTTRESSES	1040
<i>Francisca Molina-Moreno, Jose V. Martí, Víctor Yepes, Andreas Ciroth</i>	
FEASIBILITY, VALUE ENGINEERING, AND ROCK FILL DAMS CONSTRUCTION: A CASE STUDY	1046
<i>Hamed Ahmadi Moghadam, Sahar Ahmadi, Mir Ahmad Neshaei</i>	
RESILIENT COMMUNITIES FOR SAFE CITIES	1052
<i>Daniela Ladiana, Michele Di Sivo</i>	
SUSTAINABLE NITROGEN REMOVAL USING APPROPRIATE TECHNOLOGIES	1058
<i>Krishnanand Maillacheruvu, Derek Hartmann</i>	
PRESERVING TRADITIONAL CONSTRUCTION TECHNIQUES AND MATERIALS AS AN ANSWER TO FUTURE ENERGY-FUEL CRISIS	1064
<i>Enrique Villacis, Maria Lorena Rodriguez, Cynthia Ayarza</i>	
OPTIMAL BUDGET ALLOCATION MODEL FOR REHABILITATION OF SEWER SYSTEM CONSIDERING SOCIAL AND ENVIRONMENTAL CHANGES	1070
<i>Yeonsoo Kim, Woosik Jang, Seung Heon Han</i>	
A REVIEW OF CORPORATE SOCIAL RESPONSIBILITY PRACTICES IN DEVELOPING COUNTRIES	1074
<i>Ali Alotaibi, Francis Edum-Fotwe, Andrew Price</i>	
ASSESSMENT OF ADDITIVE AND CONVENTIONAL MANUFACTURING: CASE STUDIES FROM THE AEC INDUSTRY	1080
<i>Nataša Mrazovic, Danijel Mocibob, Michael Lepech, Martin Fischer</i>	
ENVIRONMENTAL IMPACTS OF BUILDINGS ACROSS THEIR LIFE CYCLE STAGES	1086
<i>Lusca Ngwepe, Clinton Aigbavboa, Wellington Thwala</i>	

INNOVATION IN INFRASTRUCTURE DESIGN

ROAD SAFETY AUDIT: A CASE STUDY	1092
<i>Cumhur Aydin, Nura Balla</i>	
INTERFERENCES BY THE APPLICATION FOR THE CHARGES BY USE OF RAIL INFRASTRUCTURE IN EUROPEAN INTEROPERABILITY	1097
<i>Juan Torres</i>	
VEHICLE CONTROL OF VEHICLES SEPARATING FROM VEHICLE PLATOON	1102
<i>Eisuke Kita, Ryoma Sato, Miichiro Yamada, Tatsuhiko Tamaki</i>	
PROJECT MANAGEMENT METHODS FOR PUBLIC INFRASTRUCTURE PROJECTS	1108
<i>Fernanda Borges, Silvio Melhado</i>	

BUILDING INFORMATION MODELING

BUSINESS PROCESS THROUGH THE BUILDING LIFECYCLE USING BIM	1114
<i>Manfred Helmus, Matthias Kaufhold, Agnes Kelm, Nahid Khorrami, Anica Meins-Becker</i>	
BIM - PROCESSES - HEALTH & SAFETY	1120
<i>Christoph Bodtländer, Manfred Helmus, Agnes Kelm, Anica Meins-Becker</i>	
BIM EXECUTION PROCESS OF CONSTRUCTION COMPANIES FOR BUILDING PROJECTS	1126
<i>Bilge Gercek, Onur Behzat Tokdemir, Mustafa Emre Ilal, Husnu Murat Gunaydin</i>	
EXPLORING BARRIERS IN IMPLEMENTING BUILDING INFORMATION MODELING: A PRELIMINARY STUDY	1132
<i>Ghanim A. Bekr</i>	
OPTIMIZING MULTI-WALL PANEL CONFIGURATION FOR PANELIZED CONSTRUCTION USING BIM	1138
<i>Hexu Liu, Benjamin Holmwood, Christoph Sydora, Gurjeet Singh, Mohamed Al-Hussein</i>	
PREVALENCE AND VALUE OF BUILDING INFORMATION MODELING USES IN CONSTRUCTION	1144
<i>Robert M. Leicht, Miaomiao Niu, John I. Messner</i>	
CURRICULUM RENEWAL IN ARCHITECTURE, ENGINEERING, AND CONSTRUCTION EDUCATION: VISUALIZING BUILDING INFORMATION MODELING VIA AUGMENTED REALITY	1150
<i>Mehrdad Arashpour, Guillermo Aranda-Mena</i>	
STANDARD INFORMATION FOR CONSTRUCTION EQUIPMENT IN A RELATIONAL DATABASE	1156
<i>Marco L. Trani, Manuele Cassano, Davide Todaro</i>	
COLLABORATIVE CONTRACT WITH BUILDING INFORMATION MODELLING: COMPARISON BETWEEN USA AND EUROPEAN APPROACH	1162
<i>Giuseppe Martino Di Giuda, Valentina Villa, Paolo Ettore Giana</i>	

MODERN CONSTRUCTION SAFETY TECHNIQUES

HEAVYLIFTING OPERATIONS FOR THE ASSEMBLY OF A 150 M LONG SIMPLY SUPPORTED BRIDGE DECK	1168
<i>Juan J. Marti, Javier Martinez, Jose L. Salamanca, Salvador Salamanca, Alvaro Delicado, Alvaro Saenz, Fernando Espinosa De Los Monteros</i>	
THE PERFORMANCE OF CONSTRUCTION HEALTH AND SAFETY AGENTS	1174
<i>John Smallwood, Claire Deacon</i>	
INFLUENCE OF BASEBOARD HEIGHT ON WIND FORCE OF SCAFFOLDS AT BUILDING EDGE	1180
<i>Hiroki Takahashi, Katsutoshi Ohdo, Kazuo Ohgaki</i>	
DESIGN FOR SAFETY KNOWLEDGE-BASED BIM-INTEGRATED RISK REGISTER SYSTEM	1186
<i>Md. Aslam Hossain, Ernest L. S. Abbott, David K. H. Chua</i>	
USING EYE MOVEMENTS TO IDENTIFY HAZARDS MISSED BY AT-RISK WORKERS	1192
<i>Sogand Hasanzadeh, Behzad Esmaeili, Michel D. Dodd, Eugenio Pellicer</i>	

COST CONTROL AND PROJECT MANAGEMENT SYSTEMS

PROBABILISTIC CALCULATION OF TOTAL LABOR CONSUMPTION RATE OF REINFORCED CONCRETE WORKS - WITH AND WITHOUT CORRELATIONS	1198
<i>Markus Kummer, Christian Hofstadler</i>	
CALCULATION OF "NORMAL" CONSTRUCTION TIME FOR BUILDING CONSTRUCTION PROJECTS WHILST CONSIDERING UNCERTAINTIES	1204
<i>Christian Hofstadler</i>	
CALCULATION OF THE LABOR CONSUMPTION RATE FOR SHUTTERING WORKS WHILST CONSIDERING UNCERTAINTIES	1210
<i>Christian Hofstadler, Markus Kummer</i>	
SPATIAL REGRESSION ANALYSIS FOR MODELING THE SPATIAL VARIATION IN HIGHWAY CONSTRUCTION COSTS	1216
<i>Minsoo Baek, Baabak Ashuri</i>	

GENETIC ALGORITHM OPTIMIZATION OF MULTIPLE RESOURCES FOR MULTI-PROJECTS	1222
<i>Sarah Fotouh, A. Samer Ezeldin</i>	
ECONOMIC SCORING FORMULAE IN MULTI-ATTRIBUTE CONSTRUCTION AUCTIONS	1228
<i>Pablo Ballesteros-Perez, Eugenio Pellicer, Ma Carmen Gonzalez-Cruz</i>	
DESIRED VERSUS REALIZED BENEFITS OF ALTERNATIVE CONTRACTING METHODS ON EXTREME VALUE HIGHWAY PROJECTS	1234
<i>Douglas Alleman, Arthur Antoine, Dean Papajohn, Keith Molenaar</i>	
AN INVESTIGATION OF PERSON-TASKTECHNOLOGY INTERACTION AND ICT ADOPTION IN CONSTRUCTION	1240
<i>Yuanyuan Hua, Anita M. M. Liu</i>	
FACTORS INFLUENCING PRODUCTIVITY IN CONSTRUCTION	1246
<i>Khedher Yahya Almathami, Bambang Trigunaryah, Vaughan Coffey</i>	
IMPROVING PRODUCTIVITY, WORKFLOW MANAGEMENT, AND RESOURCE UTILIZATION IN PRECAST CONSTRUCTION	1252
<i>Mehrdad Arashpour, Eric Too, Tiendung Le</i>	
APPLICABILITY OF CULTURE PROFILE ON CONSTRUCTION ORGANIZATION	1258
<i>Debby Willar, Chris Hombokau, Estrellita Waney</i>	
INFLUENCES ON INNER CITY CONSTRUCTION SITES: A COMPARISON OF THEORY AND PRACTICE	1264
<i>Bernhard Bauer, Ulrike Haider, Jörg Koppelhuber, Detlef Heck</i>	
USING STATISTICAL MODELS BASED ON HISTORICAL PROJECT DATA TO ESTIMATE DURATIONS FOR TRANSPORTATION PROJECTS	1270
<i>Guillermo Nevett, Douglas Alleman, Paul Goodrum</i>	
KNOWLEDGE-BASED PORTFOLIO MANAGEMENT: A TAXONOMY FOR LESSONS LEARNED	1276
<i>Gorkem Eken, Gozde Bilgin, Irem Dikmen, M. Talat Birgonul</i>	
PUBLIC NON-CONSULTATION RELATED DELAYS IN DELIVERY OF MEGA PROJECTS	1282
<i>Nthatsi Khatleli</i>	
FORECASTING CONCEPTUAL COSTS OF BRIDGE PROJECTS USING NON-PARAMETRIC REGRESSION ANALYSIS	1288
<i>Yuanxin Zhang, R. Edward Minchin Jr.</i>	
CALCULATION OF THE LABOR CONSUMPTION RATE FOR SHUTTERING WORKS WHILST CONSIDERING UNCERTAINTIES	1294
<i>Markus Kummer</i>	

SOIL PROPERTIES AND FOUNDATION ENGINEERING

TECHNICAL-ECONOMIC RESEARCH FOR PASSIVE BUILDINGS FOUNDATION	1300
<i>Ruta Miniotaite</i>	
EXCEL BASED SETTLEMENT OF BEAMS ON ELASTIC FOUNDATIONS WITH FREE-ENDS AND ARBITRARY LOADING	1306
<i>Amir W. Al-Khafaji, Robert Jacobs</i>	
AN ESTIMATING METHOD FOR LATERAL BEHAVIOR OF PILED-RAFT FOUNDATION	1312
<i>Haruyuki Yamamoto, He Huang</i>	
ESTIMATION OF DYNAMIC RESPONSES ON CONTOURS OF SEVERAL ROUND CUTS AT THIN PLATE VIBRATIONS	1318
<i>Aleksey Kolesnikov, Vladimir Popov</i>	
NON-CRACKING TECHNIQUES FOR GROUTING	1324
<i>Miroslav Todorov</i>	
Author Index	