# TABLE OF CONTENTS

## EDUCATIONAL ISSUES IN AE – I

**BIM Collaboration in Student Architectural Technologist Learning**
Malachy Mathews .......................................................... 1

**Integration in the Classroom: Structural Planning and Design**
Marci S. Uihlein ............................................................. 13

**Entrepreneurial Characteristics of Architecture and Building Students in Nigeria: A Case of Covenant University**
Patience Tunji-Olayeni .................................................. 23

**Assessing the Impact of Using Photographic Images to Influence Building Retrofit Design Education**
Steven K. Ayer, John I. Messner, Chimay J. Anumba .......... 33

**Results of a Pilot Multidisciplinary BIM-Enhanced integrated Project Delivery Capstone Engineering Design Course in Architectural Engineering**
M. Kevin Parfitt, Robert J. Holland, Ryan L. Solnosky ...... 43

## CONSTRUCTION ENGINEERING AND MANAGEMENT – I

**Causes of Construction Delays for Engineering Projects: An Egyptian Perspective**
A. Samer Ezeldin, Mohamed Abdel-Ghany .......................... 53

**The Application of Lean Construction Tools in United Kingdom Construction Organisations: Findings From a Qualitative Inquiry**
Abubakar M. Bashir, Sabashini Suresh, David A. Oloke, David G. Proverbs, Rod Gameson ......................................................... 63

**Relationships Among Contracting Parties and Their Effects On Outcomes of Public Construction Projects in China**
Yongjian Ke, Florence Y. Y. Ling, Shouqing Wang, Patrick X. W. Zou, Mohan M. Kumaraswamy, Yan Ning ................................................................. 73

**Value Management in Building Construction Industry of Northern Cyprus: Addressing a Theory and Practice Gap**
A. Afsharghotli, Alireza Rezaei ........................................ 83

**An Analysis of Causes of Disputes in the Construction Industry Using Analytical Hierarchy Process (AHP)**
Pinar Irlayici Cakmak, Emre Cakmak ................................ 93

## BUILDING RETROFITS

**Improving Campus Chilled Water Systems with Intelligent Control Valves: A Field Study**
Gregor P. Henze, Walter Henry, Marc Thuillard .................. 102

**Methods for Assessing Longitudinal Variations of Energy Production by PV Systems**
Seyed Mohsen Shahandashti, Kia Mostaan, Baabak Ashuri .......... 112

**An Approach for Capturing Requirements of Collaborative Design Teams to Facilitate Evaluation of Energy Efficient Retrofit Design Options**
Jennifer Frazier, Burcu Akinc, Semih Ergun ......................................................... 122

**The Need for Change and Dependency Management in Energy Efficient Retrofit Projects**
Abdou Karim Jallow, Fangxiao Liu, Chimay J. Anumba, John Messner .......... 132

## HIGH PERFORMANCE BUILDING SYSTEMS

**Finish Materials of Hospital Operating Rooms of the USA and Egypt: Selection and Actual Performance-in-Use**
Ahmed H. Sherif .......................................................... 144

**Mortar Joint Maintenance – From Abomination to Preservation**
Erik Valentino, Brian Chilton .......................................... 154

**Pre-Occupancy Evaluation of High-Rise Building Forms**
Seyed Saleh Kalantari Hematabadi ........................................ 164
Analysis of Balance Between Modeling Accuracy and Computational Speed for a Hybrid Ray-Tracing and Radiosity Method Used in Lighting Simulation

Ying-Chieh Chan, Athanasios Tzempelikos

564

INNOVATIONS IN BUILDINGS

Diagrids, the New Stability System: Combining Architecture with Engineering

Terri Meyer Boake

574

Evidence-Based Assessment of Geometrical Staircase Configurations for Older Adults

Mona Affi, Belinda Parke, Mohamed Al-Hussein

584

Sustainable Innovations in Building Design: The Courtyard and Veranda Concepts in Nigeria

Adetokunbo O. Ilesanmi, Misan Egbe

594

Microclimate Analyses for the Design of Building-Integrated Wind Turbines

Nicholas M. Rekstad, Jelena Srebric, Ute Poerschke

604

SUSTAINABILITY OF BUILDINGS AND CITIES

Urban Electricity Systems: A UK Case Study

Sara Louise Walker

614

Fire Safety Design and Construction Considerations for Sustainable Residential Structures

Thomas M. Korman

624

Sustainability Through Collaboration-Based Corporate Social Responsibility

Unite Simon Ekwo

633

INNOVATIVE BUILDING MATERIALS

Low Carbon Construction Materials and Techniques for Sustainable Housing Development in Nigeria

Y. M. D. Adelefeji, A. A. Taiwo, O. A. Olotuah, G. Fadairo, D. A. Ayeni

643

Recycled Asphalt Pavement As Course Aggregate Replacement in High Strength Concrete Mixes

Tara Capson, Andrew D. Sorensen

652

Effect of Spent Catalyst as a Fine Aggregate on the Properties of Concrete

Khalifa Al-Jabri, Zehran Al-Kamyani, Ramzi Taha, Mahad Baawain, Khalid Al-Shamsi, Abdullah Al-Saidy

662

FACILITIES MANAGEMENT

Challenges and Opportunities Involving Facilities Management in Data Handover: London 2012 Case Study

Carmel Lindkvist, Jennifer Whyte

670

Developing Standards to Assess the Quality of BIM Criteria for Facilities Management

Colleen Kasprzak, Ashwin Ramesh, Craig Dubler

680

A Case Study Implementation of the BIM Planning Procedures for Facility Owners

Sreelatha Chandur, Ralph Kreider, John I. Messner

691

A Methodological Approach to Identify Key Performance Indicators and Measures in Maintenance Services in Infection Control

Stanley Njuangang, Champika Liyanage, Akintola Akintoye

702

STRUCTURAL SYSTEMS

Use of Mechanical Couplers in Concrete Columns

Donald J. Phillippi, Gilbert A. Hegemier

715

Racking Performance Analysis of Four-Sided Structural Sealant Glazing Curtain Wall Systems through Video Capture Technique

Nicholas C. Simmons, Ali M. Memari

725

Finite Element Modeling to Predict Racking Test Results and Performance of Four-Sided Structural Sealant Glazing Curtain Wall Systems

Nicholas C. Simmons, Ali M. Memari

735
SUSTAINABILITY

Sustainable Development of Urban Heritage at Fort Kochi, Kerala, India ......................................................... 924
A. K. Kasthurba

Integrating Space-Syntax and Discrete-Event Simulation for E-Mobility Analysis .................................................. 934
Eiman Y. Elbanhawy, Ruth Dalton, Khaleed Nassar

Building Sustainability into the UAE: ESTIDAMA ................................................................................................. 946
Yasemin Nielsen

A Methodology to Quantify Visual Quality into Smart Communities: An Optimization Approach ....................... 956
E. Y. Elbanhawy, O. Hosny, K. Nassar

STRUCTURAL PERFORMANCE

Architecturally Exposed Structural Steel: Clear Communications for a Better Project ............................................. 968
Terri Meyer Boake

Masonry Wall Flashing – Critical to Performance, but Often Overlooked ........................................................... 978
Scott Siegfried, Erik Valentino

Advancing the Structural Use of Earth-based Bricks: Assessing the Reliability of Existing Testing Procedures .......................................................................................................................... 988
E. A. Obonyo, P. Donkor, M. Baskaran, F. Amegogue

Development of Kinematic Equations for Racking Performance Evaluation of Four-Sided Structural Sealant Glazing Curtain Wall Systems ........................................................................ 997
Nicholas C. Simmons, Ali M. Memari

DESIGN AND CONSTRUCTION

A Framework for Construction Labor Productivity Improvement in Egypt .............................................................. 1007
Ahmed H. El-Batreek, Ahmed S. Ezeldin, Mohamed M. G. Elbarkouky

Design Philosophy of the Traditional Kuwaiti House ............................................................................................... 1018
Mohammad Alhazim, John Littlewood, Keireine Canavan, Paul Carey

Author Index