



# **MODULAR AND OFFSITE CONSTRUCTION SUMMIT**

At the

2018 **WORLD OF  
MODULAR**  
ANNUAL CONVENTION & TRADESHOW

Hollywood, Florida

March 22 - March 25, 2018

## Proceedings of the 2018 Modular and Offsite Construction Summit

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It is with great pleasure that we welcome you to the 2018 Modular and Off-site Construction [MOC] Summit being held as part of the Modular Building Institute's 2018 World of Modular at the Diplomat Beach Resort in Hollywood, Florida on March 22-25, 2018. Since the inaugural event in 2012, the MOC Summit has become a globally distinguished event creating an active platform for idea exchange and communication for leaders and practitioners in modular construction. The 2018 MOC Summit at World of Modular brings together academics, engineers, and industry stakeholders, and offers presentations encompassing leading-edge research, showcasing best practices in the area of modular and offsite construction.

Compared to traditional construction methods, the industrialized construction process reduces cost and construction time, generates higher quality products, and creates healthier and safer environments for workers and occupants. The 2018 MOC Summit brings together researchers and industry stakeholders to showcase the benefits and address the challenges of industrializing building construction through a series of interactive presentations and information sessions, and is bolstered by the industry-leading World of Modular event.

Papers have been submitted to this year's conference on a diverse range of topics including:

- Offsite Construction Methods
- Productivity Studies
- Building Information Modelling (BIM)
- Architectural Design for Modular Construction
- Automation and Robotics in Construction
- Sustainable Building and Management Practices
- Product R&D
- Teaching Offsite and Modular Construction
- History of Industrialized Construction
- Offsite Project Delivery
- Best Practice Case Studies

We are grateful to all who have committed significant time and expertise to make the 2018 MOC Summit a success, from planning and preparation, to submissions and presentations. This conference would not have been possible without your efforts.

Best regards,

Dr. Mohamed Al-Hussein  
Conference Chair  
2018 MOC Summit

2018 **WORLD OF**  
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## FRIDAY, MARCH 23

### Session 1

- MODULAR INDUSTRY CHARACTERISTICS AND BARRIERS TO ITS INCREASED MARKET SHARE  
Tarek Salama, Osama Moselhi, and Mohamed Al-Hussein 8–15
- A BIM-BASED SUPPLY CHAIN INTEGRATION FOR PREFABRICATION AND MODULARIZATION  
Iloabuchi Alex Ocheoha and Osama Moselhi 16–24

### Session 2

- INVESTIGATING THE EFFECTS OF REDUCED TECHNOLOGICAL CONSTRAINTS ON CYCLE TIME THROUGH SIMULATION MODELLING FOR AUTOMATED STEEL WALL FRAMING  
Nabeel Malik, Rafiq Ahmad, and Mohamed Al-Hussein 25–32
- IOT-BASED INVENTORY CONTROL SYSTEM FRAMEWORK FOR PANELIZED CONSTRUCTION  
Meng Wang, Yongsheng Ma, Mohammed Sadiq Altaf, and Mohamed Al-Hussein 33–40

### Session 3

- THE MERITS OF VARYING FORMS OF MASS TIMBER PRODUCTS FOR OFFSITE AND MODULAR CONSTRUCTION  
Robert Hairstans, Ryan Smith, and Peter Wilson 41–48
- PREDICTIVE MODEL FOR SIDING PRACTICE IN PANELIZED CONSTRUCTION  
Beda Barkokebas, Chelsea Ritter, Xinming Li, and Mohamed Al-Hussein 49–56
- MASS CUSTOMISABLE ROOFING SOLUTIONS FOR THE NEW BUILD AND RETROFIT MARKETS IN THE UK  
Wojciech Plowas, Robert Hairstans, and Jonathan Fellingham 57–64

## SATURDAY, MARCH 24

### Session 4

- INTERIOR GLAZING SYSTEMS: MARKET ANALYSIS  
Ryan Smith and Joshua Workman 65–76
- TRAINING FOR MANUFACTURED CONSTRUCTION: BENEFITS AND CHALLENGES FOR WORKFORCE DEVELOPMENT AT MANUFACTURED HOUSING INDUSTRY  
Charles Kibert, Mohamad Ahmadzade Razkenari, Andriel Fenner, and Hamed Hakim 77–84

### Session 5

- TOWARDS NET ZERO ENERGY MODULAR HOUSING: A CASE STUDY  
Caroline Hachem-Vermette, Chinyere Dara, and Rhys Kane 85–92
- EVALUATION OF EXISTING LAYOUT IMPROVEMENT AND CREATION ALGORITHMS FOR USE IN THE OFFSITE CONSTRUCTION INDUSTRY  
Chelsea Ritter, Beda Barkokebas, and Mohamed Al-Hussein 93–100

*Session 6*

OUTCOMES OF THE STATE-OF-THE-ART SYMPOSIUM: STATUS, CHALLENGES AND FUTURE DIRECTIONS OF OFFSITE CONSTRUCTION

Andriel Fenner, Mohamad Ahmadzade Razkenari, Hamed Hakim, Alireza Shojaei,  
and Charles Kibert

101–108

ADDRESSING THE IMPACT OF INDUSTRIALIZED COMPONENTS ON THE REDUCTION OF TEMPORARY HEATING COST IN COLD-CLIMATE REGIONS

Beda Barkokebas, Regina Celi Dias Ferreira, Lana Secchi, Mustafa Gül,  
and Mohamed Al-Hussein

109–116

*Session 7*

CONSTRUCTION CAPACITY AND NEW HOUSING DEMAND CAUSED BY TORNADOS

Augusto Alves and David Ardit

117–124

A NEW GRADUATE COURSE ON MODULAR CONSTRUCTION: UNIVERSITY OF NEVADA, LAS VEGAS

Jin Ouk Choi

125–132