

ICCREM 2017



ASCE

Edited by Yaowu Wang
Yongshi Pang
Geoffrey Q. P. Shen



**CONSTRUCTION
INSTITUTE**

This is a preview. [Click here to purchase the full publication.](#)

ICCREM 2017

*PREFABRICATED BUILDINGS, INDUSTRIALIZED
CONSTRUCTION, AND PUBLIC-PRIVATE PARTNERSHIPS*

PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON
CONSTRUCTION AND REAL ESTATE MANAGEMENT 2017

November 10–12, 2017
Guangzhou, China

SPONSORED BY

Modernization of Management Committee
of the China Construction Industry Association

The Construction Institute
of the American Society of Civil Engineers

EDITORS

Yaowu Wang
Yongshi Pang
Geoffrey Q. P. Shen
Yimin Zhu, Ph.D.



Published by the American Society of Civil Engineers

This is a preview. [Click here to purchase the full publication.](#)

Published by American Society of Civil Engineers
1801 Alexander Bell Drive
Reston, Virginia, 20191-4382
www.asce.org/publications | ascelibrary.org

Any statements expressed in these materials are those of the individual authors and do not necessarily represent the views of ASCE, which takes no responsibility for any statement made herein. No reference made in this publication to any specific method, product, process, or service constitutes or implies an endorsement, recommendation, or warranty thereof by ASCE. The materials are for general information only and do not represent a standard of ASCE, nor are they intended as a reference in purchase specifications, contracts, regulations, statutes, or any other legal document. ASCE makes no representation or warranty of any kind, whether express or implied, concerning the accuracy, completeness, suitability, or utility of any information, apparatus, product, or process discussed in this publication, and assumes no liability therefor. The information contained in these materials should not be used without first securing competent advice with respect to its suitability for any general or specific application. Anyone utilizing such information assumes all liability arising from such use, including but not limited to infringement of any patent or patents.

ASCE and American Society of Civil Engineers—Registered in U.S. Patent and Trademark Office.

Photocopies and permissions. Permission to photocopy or reproduce material from ASCE publications can be requested by sending an e-mail to permissions@asce.org or by locating a title in ASCE's Civil Engineering Database (<http://cedb.asce.org>) or ASCE Library (<http://ascelibrary.org>) and using the “Permissions” link.

Errata: Errata, if any, can be found at <https://doi.org/10.1061/9780784481059>

Copyright © 2017 by the American Society of Civil Engineers.
All Rights Reserved.
ISBN 978-0-7844-8105-9 (PDF)
Manufactured in the United States of America.

Preface

We would like to welcome you to the 2017 International Conference on Construction and Real Estate Management (ICCREM 2017). Harbin Institute of Technology, Guangzhou University, Hong Kong Polytechnic University, Louisiana State University, University of Alberta, Luleå University of Technology, Heriot-Watt University, Marquette University, Karlsruhe Institute of Technology. The Conference is a continuation of the ICCREM series which have been held annually since 2003.

The theme for this conference is “Prefabricated Construction and Construction Industrialization”. It especially highlights the importance of construction industrialization and prefabricated technology for construction engineering and management. The conference proceedings include 174 peer-review papers covered eleven important subjects. And all papers went through a two-step peer review process. The proceedings of the congress are divided into four parts:

- Prefabricated Buildings, Industrialized Construction and PPP
- Industry Regulation and Sustainable Development
- Real Estate and Urbanization
- Project Management and Construction Technology

On behalf of the Construction Institute, the American Society of Civil Engineers and the 2017 ICCREM Organizing Committee, we welcome you and wish you leave with a wonderful experience and memory at ICCREM 2017.

Professor Yaowu Wang

Harbin Institute of Technology
P. R. of China

Professor Yongshi Pang

Guangzhou University
P. R. of China

Acknowledgments

Organized by

Harbin Institute of Technology, P.R. China
Guangzhou University, P.R. China
Hong Kong Polytechnic University, P.R. China
Louisiana State University, USA
University of Alberta, Canada
Luleå University of Technology, Sweden
Heriot-Watt University, UK
Marquette University, USA
Karlsruhe Institute of Technology, Germany

Executive Editors

Xianfei Yin
Xianwei Meng
Zhuyue Li
Chong Feng
Wei Gao
Yuru Gao
Tingting Chen
Jia Ding
Xiangkun Qi
Yue Cao
Zixin Han
Tongyao Feng
Hongmeng Kang

Conference website: <http://www.iccrem.com/>

Email: iccrem@vip.163.com

Conference Committee

Committee Chairs

Prof. Yaowu Wang, Harbin Institute of Technology, P.R. China
Prof. Geoffrey Q.P. Shen, Hong Kong Polytechnic University, P.R. China

Conference Executive Chair

Prof. Jiyang Fu, Guangzhou University, P.R. China

Conference Co-Chairs

Prof. Yongshi Pang, Guangzhou University, P.R. China
Director Katerina Lachinova, Construction Institute of ASCE.(ASCE members), USA
Prof. Yimin Zhu, Louisiana State University, USA
Prof. Mohamed Al-Hussein, University of Alberta, Canada
Prof. Thomas Olofsson, Luleå University of Technology, Sweden
Prof. Ming Sun, Heriot Watt University, UK
Prof. Yong Bai, Marquette University, USA
Prof. Kunibert Lennerts, Karlsruhe Institute of Technology, German

Organizing Committee and Secretariat

General Secretariat

Prof. Xiaolong Xue, Harbin Institute of Technology, P.R. China

Deputy General Secretariat

Prof. Xuetong Wang, Guangzhou University, P.R. China

Committee Members

Asso. Prof. Chengshuang Sun, Harbin Institute of Technology, P.R. China

Asso. Prof Qingpeng Man, Harbin Institute of Technology, P.R. China

Mr. Zhenmin Yuan, Harbin Institute of Technology, P.R. China

Mr. Shiwei Chen, Harbin Institute of Technology, P.R. China

Contents

Research on Collaborative Management of Prefabricated Construction: Integration of Design and Construction	1
Xuetong Wang, Yuan Huang, Weirui Xue, and Chen Lu	
Research on BIM-Based Assembly Sequence Planning of Prefabricated Buildings	10
Yaowu Wang and Zhenmin Yuan	
The Environmental Performance of Prefabricated Building and Construction: A Critical Review	18
Kailun Feng, Yaowu Wang, and Weizhuo Lu	
Research on the Influencing Factors of the Remaining Control Configuration of PPP Project: Based on DEA Model Analysis	43
Lizhong She and Tao Li	
The Risk Assessment of Traditional Village Conservation Project Based on the PPP Mode	52
Chao Wang, Jun Fang, and Chunhong Wu	
Pricing for the Basic Educational PPP Project: Two Stages Game Theoretical Analysis	62
Hui Bai and Bing Li	
The Applied Exploration of Big Data Technology in Prefabricated Construction Project Management	71
Zixin Han and Yaowu Wang	
Major Barriers to Different Kinds of Prefabricated Public Housing in China: The Developers' Perspective	79
Chen Cheng, Kaicheng Shen, Xiaodong Li, and Zhihui Zhang	
Job Stress and Job Satisfaction of Workers in Traditional Cast-in-Situ Projects and Industrialized Projects	89
Xiaodong Li, Yifan Geng, Ziyang Song, Qianli Ma, and Xiangdong Tian	
A Life-Cycle Analysis for Both Energy and Cost of Precast Concrete Building Components: A Process-Based Model.....	97
Yaowu Wang, Shiwei Chen, and Jiabin Zhang	

Situation, Problems, and Countermeasures of Urban Utility Tunnel Based on Public–Private Partnership	109
Xuetong Wang, Tao Wang, Chen Lu, and Weirui Xue	
The Risk Evaluation of Beautiful Village Construction Project Based on PPP Mode.....	119
Chunhong Wu, Jun Fang, and Chao Wang	
Research on Information Flow of Prefabricated Building Supply Chain Based on BIM.....	131
Jing Bian and Qinghua He	
A Review on Current Research about Construction Industrialization	139
Wenbo Huangfu and Xiaolong Xue	
Study on Factors Affecting Construction Schedule of Prefabricated Buildings Based on PCA	147
Junwu Wang and Wenshuang Li	
Evaluating Demand Guarantee for PPP Projects by Real-Option Pricing.....	155
Xiaoling Chu, Shouqing Wang, and Ke Feng	
SD-Based Research on Industrialized Construction Supply Chain.....	163
Hongbing Li and Qin Mao	
Analysis on the Main Relationship in Industrial Chain of Industrialized Building.....	173
Wang Liang and Shoujian Zhang	
Research on Existing Problems of Fabricated Building in China.....	180
Wei Huang, Yan Lei, and Shoujian Zhang	
Research on Factors Influencing Collaborative Innovation of Stakeholders in Construction Industrialization.....	189
Yingbo Ji, Fuyi Yao, and Fadong Zhu	
Evaluation of Industrialized Construction Capability of Construction Enterprises Based on AHP-Entropy Method.....	199
Yudan Dou and Xiaolong Xue	
Analysis of Non-Value-Adding Activities in Prefabricated Building Construction Project: Case Study	207
Yan Liu, Xin Zhang, and Fadong Zhu	

Research on Hoisting Sequence Optimization for Prefabricated Components Based on Genetic Algorithm	217
Gaoyu Yue, Kailang Huang, and Jingjing Yang	
Steel Structure Construction Industrialization in China: Literature Review and Future Direction.....	224
Jingyu Yu, Longyu Zhang, Jingfeng Wang, and Xuebei Pan	
Research on Developer's Willingness to Use Precast Concrete System Based on Structural Equation Modeling	234
Tingting Chen, Chengshuang Sun, and Lijuan Luo	
A Comparative Study on the Transformation Trend of Chinese Urban Trail Transit PPP Models	247
Yunshi Niu and Yuan Zhang	
The Research Status and Prospects of Public-Private Partnership in China	256
Lizhong She and Jia Li	
Research on the Standard System Framework of Industrialized Buildings Based on System Analysis Methodology	262
Kangning Liu and Shoujian Zhang	
Multivariate Analysis of PPP Project Risk Based on System Dynamics	276
Liangping Xu, Xianwei Meng, and Yue Cao	
Risk Identification of Shield Tunnel Construction Based on Failure Knowledge	289
Ming Xue and Hong Zhou	
Research on Risk Management of PPP Financing Project in China	299
Yunshan Su	
Research on the Performance Evaluation of the Contract Governance in the PPP Mode Based on AHP	309
Lizhong She and Sha Tang	
China's Underground Comprehensive Utility Tunnel Project of PPP Mode Risk Identification	318
Xianhua Zhou, Hongting Pan, and Yunfei Shen	
Critical Risk Identification for PPP Waste-to-Energy Incineration Projects in China: A Multiple Case Study	328
Chenjunyan Sun, Caiyun Cui, and Yong Liu	

Study on the Decision Making of Concession Period for PPP Highway Based on Subsidies of Government	337
Junwu Wang, Qianjin Wang, and Jingtao Feng	
Critical Success Factors of Applying PPP to Construction of New Campuses for Public Colleges in China	346
Jiali You and Weiyu Wu	
Construction of Rural Fire Risk Assessment System Based on Analytic Hierarchy Process: A Case Study of Tuyang Village in Shenzhen	353
Hongmeng Kang, Fengyong Zhai, and Wei Gao	
Negotiation Transaction Cost of PPP Based on the Cumulative Prospect-Evolutionary Game Model.....	360
Fangfang Liu, Yousong Wang, Hui Yan, Hongyang Li, and Yan Zhang	
Study on the Risk Evaluation Model of Utility Tunnel Project under a PPP Mode	371
Weiming Wang and Jun Fang	
Comparative Study on BOO Project Risk Evaluation Based on Ownership Perspective.....	382
Yiping Zhang and Jun Fang	
The Division of Roles in Operation Models for PPP Elderly Housing Projects	396
Lin Yang, Yi Zhou, and Liang Tan	