



ICCREM 2015



Environment and the Sustainable Building

Edited by
Yaowu Wang, Ph.D.
Thomas Olofsson, Ph.D.
Geoffrey Qiping Shen, Ph.D.
Yong Bai, Ph.D.



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ICCREM 2015

ENVIRONMENT AND THE SUSTAINABLE BUILDING

PROCEEDINGS OF THE 2015 INTERNATIONAL CONFERENCE
ON CONSTRUCTION AND REAL ESTATE MANAGEMENT

August 11-12, 2015
Luleå, Sweden

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, Ph.D.
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Published by the American Society of Civil Engineers

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

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Errata: Errata, if any, can be found at <http://dx.doi.org/10.1061/9780784479377>

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ISBN 978-0-7844-7937-7 (PDF)
Manufactured in the United States of America.

Preface

We would like to welcome you to the 2015 International Conference on Construction and Real Estate Management (ICCREM 2015). The Conference is jointly organized by the Harbin Institute of Technology, Luleå University of Technology, North Dakota State University, Hong Kong Polytechnic University, China Construction Fourth Engineering Division Corp, Ltd, Queensland University of Technology, Louisiana State University, Heriot-Watt University, University of Alberta, National Central University and Karlsruhe Institute of Technology. The Construction Institute (CI) of the American Society of Civil Engineers (ASCE) and the Modernization of Management Committee (MMC) of the China Construction Industry Association (CCIA) are co-sponsors of the ICCREM 2015. The 2015 Conference is a continuation of the ICCREM series which have been held annually since 2003.

The ICCREM 2015 aims to create an international platform for researchers, educators, and practitioners from colleges and universities, research institutes, government agencies, consulting firms, construction companies, financial institutions and other related organizations to exchange ideas, share knowledge, build networks, and explore future potentials in construction and real estate industries. The conference proceedings include 132 peer-review papers covered nine important subjects. These subjects are: Global Construction Management; Information Technology Application in Construction; Sustainable Construction and Innovation; Land Use and Urban Management; Project Management; Risk Management; Real Estate Investment, Finance and Management; Construction Enterprise Management; and Facility Management, Infrastructure Construction and Management. We believe that the ICCREM 2015 will be invaluable to construction professionals in advancing their career.

It was a pleasure and an honour to organize and host ICCREM 2015 and we want to emphasize that the success of the conference would have not been possible without the contributions of members of the Organizing Committee, the Scientific Committees, and the Conference Secretariat. We also want to express our gratitude to all authors and reviewers for their contributions. In closing, we hope that you enjoy the conference and catch up with old friends and colleagues and make new ones.

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Contents

Global Construction Management

Towards a Knowledge-Based Engineering Methodology for Construction.....	1
Marcus Sandberg	
Maintenance Management: A Case Study of the Obstetrics and Gynecology Building in Al-Shifa Hospital in the Gaza Strip	9
Farida Elshorafa and Adnan Enshassi	
Embedding Corporate Social Responsibility into the Construction Process: A Preliminary Study	18
Weiyan Jiang and Johnny K. W. Wong	
A Safety Model for Construction Site Layout Planning Using an ACO Algorithm.....	28
Xin Ning and Wenhan Liu	
Instruments of Strategy Management Accounting and Their Application in Inter-Organizational Cost Management	33
Xu Chen	
Research on the Index System of Comprehensive Benefits of the Reconstruction of Old Factory Buildings, Old Villages, and Old Towns.....	42
Jingkuang Liu, Jiangfeng Li, and Jian Zhu	
Research on the Current Situation and Development Countermeasures of Engineering Construction Supervision.....	51
Yi Wu and Chenhao Zeng	
Workflow Analysis for the Lean Construction Process of a Construction Earthmoving Project	58
Feifei Cheng	
Analyzing Factors Affecting Time, Cost, and Quality between Diverse Public Construction Agencies	67
Jesper Kranker Larsen, Thomas Ditlev Brunoe, and Søren Munch Lindhard	
Representation and Reasoning for Common Quality Faults of Construction Based on Ontology	78
Xin Liu, Shaohua Jiang, and Zhongfu Li	