

## Preface

The ICCASCE is an annual International Conference on Civil, Architectural, Structural and Constructional Engineering. The ICCASCE 2016 took place on July 15-17, 2016 in Busan, South Korea. Organized by the Dong-A University, ICCASCE 2016 continues to highlight the relationship between the fundamental and applied research, respectively the technological transfer in the fields of Civil, Architectural, Structural and Constructional Engineering. The aim of ICCASCE 2016 were the presentation of the latest research and results of scientists related to Civil, Architectural, Structural and Constructional Engineering topics. This conference provided opportunities for the delegates to exchange new ideas face-to-face, to establish business or research relations as well as to find global partners for future collaborations. We hope that the conference results will lead to significant contributions to the knowledge in these up-to-date scientific fields.

The book is a collection of accepted papers including preliminary review process conducted by conference editors and committee members before their publication by Trans Tech Publication. The committee of ICCASCE 2016 expresses their sincere thanks to all authors for their high-quality research papers and careful presentations. All reviewers are also thanked for their careful comments and advices.

Thanks are finally given to Trans Tech Publication as well for producing this volume.

The Organizing Committee of ICCASCE 2016

Committee Chair

Prof. Dongkeon Kim

Department of Architectural Engineering at Dong-A University

In the Republic of Korea

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### **Research Institute of Construction Technology and Planning (Department of Architectural Engineering) in Dong-A University**

Recently, various efforts to prevent and prepare are vitally needed for prevention of Disasters and calamities. So we understand the necessity for technology of disaster and we built up the Research Institute of Construction Technology and Planning was built in 1965 in Dong-A University in order to contribute the development of construction industry.

Accordingly, Research Institute of Construction Technology and Planning in Dong-A University has progressed of research on the construction technology and planning through the various seminars, conference and lectures. These research could be conducted cooperation with Dong-A University in various fields structure, soil, hydraulic, environment.

Research Institute of Construction Technology and Planning will try to be a leader in the construction of industry through the various research activities, technical exchanges and global conference.