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Developing Indicators of Green Operation and Maintenance of Green Supply Chain Management in Construction Industry

Wibowo, Mochamad Agung[a] ; Handayani, Naniek Utami[b]; Farida, Nur[b]
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[a] Department of Civil Engineering, Diponegoro University, Semarang, 50275, Indonesia
[b] Department of Industrial Engineering, Diponegoro University, Semarang, 50275, Indonesia

Abstract

Operation and maintenance (O&M) is the last phase of Project Life Cycle (PLC) that focused on releasing the final deliverables to the customer and followed by the use of facilities and the maintenance of the whole building. This phase is the longest phase because it covers the entire lifetime of the building. The building that is operated and maintained using the green principles will contribute to sustainability by

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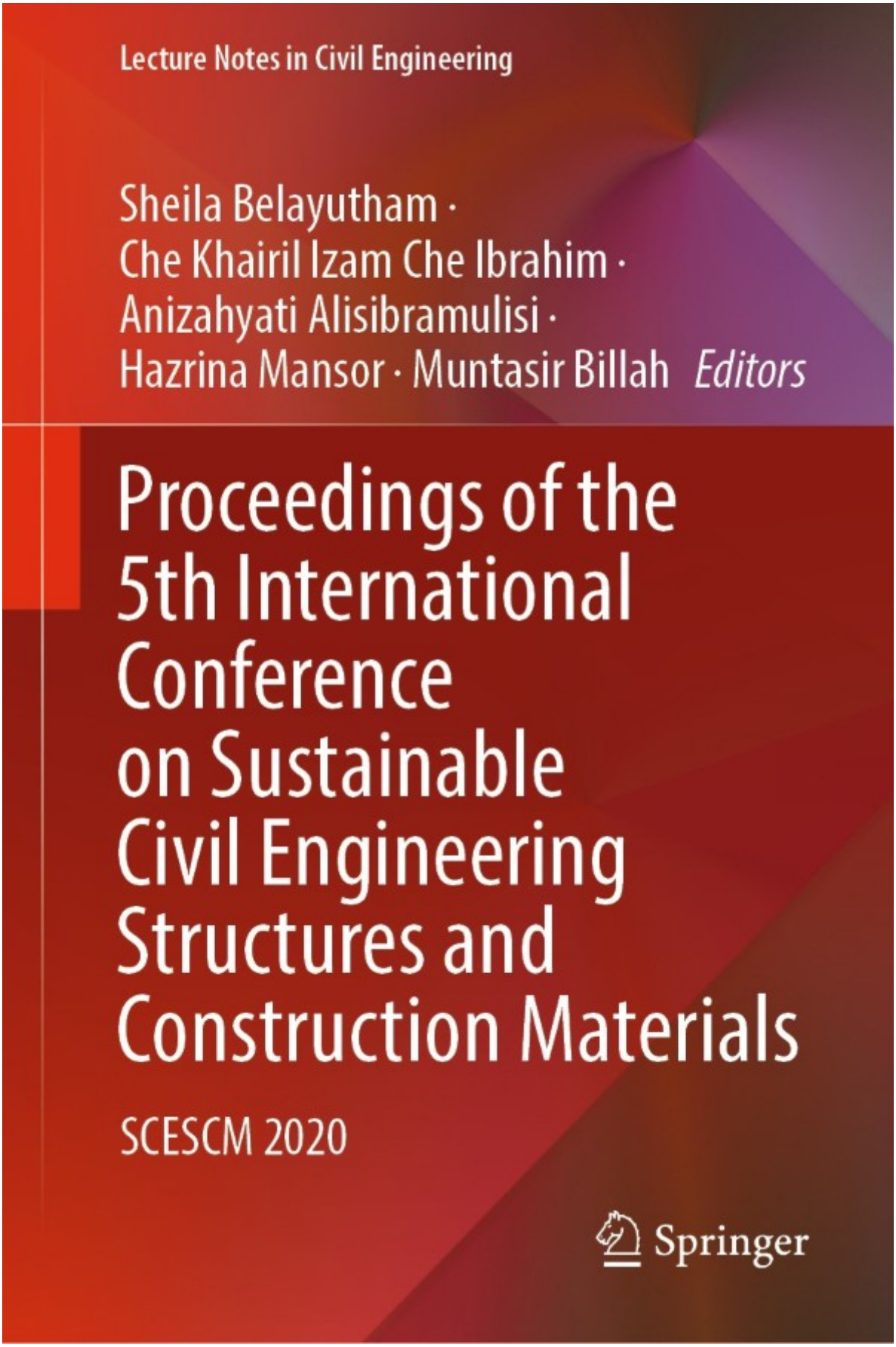

Lecture Notes in Civil Engineering

Volume 215

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SCESCM 2020

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Editors
Sheila Belayutham
School of Civil Engineering, College of Engineering
Universiti Teknologi MARA
Shah Alam, Selangor, Malaysia

Che Khairil Izam Che Ibrahim
School of Civil Engineering, College of Engineering
Universiti Teknologi MARA
Shah Alam, Selangor, Malaysia

Anizahyati Alisibramulisi
School of Civil Engineering, College of Engineering
Universiti Teknologi MARA
Shah Alam, Selangor, Malaysia

Hazrina Mansor
School of Civil Engineering, College of Engineering
Universiti Teknologi MARA
Shah Alam, Selangor, Malaysia

Muntasir Billah
Department of Civil Engineering
Lakehead University
Thunder Bay, ON, Canada

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Preface

In current times, the civil engineering field has developed in many ways, especially on the technologies and materials, in riding along the waves of Industry 4.0. Alongside the current developments and state-of-the-art affairs, the construction industry has also been very engaging in regard to sustainability, as construction academics and practitioners all around the world strive to embedded sustainability in all aspects of construction, in order to sustain the balance in the environment for the next generation. The concept of high efficiency and effectiveness of human resources and the use of materials with low or minimal impact to the environment should be implemented in the design, construction and maintenance phase of civil engineering structures/buildings. Thus, the series of International Conference on Sustainable Civil Engineering Structures and Construction Materials has been conceived to spread the latest information, scientific findings and achievements of civil engineers around the world in regard to the applications of sustainability in all aspects of civil engineering and infrastructure facilities. This series of conference was initiated by the Civil and Environmental Engineering Department of Gadjah Mada University, in cooperation with Hokkaido University, Japan, and Karlsruhe Institute of Technology, Germany, with the organization of the inaugural first Sustainable Civil Engineering Structures and Construction Materials (SCESCM) International Conference in 2012 in Yogyakarta, Indonesia, with the theme "Enhancing the Role of Civil Engineering for Sustainable Environment". This scholarly platform of network building and information sharing has since been routinely organized every two years (biennial) to support the agenda of sustainability in civil engineering and construction. The biennial conference is now at its fifth series (SCESCM 2020), which was virtually held from Malaysia, in December 2020. The main organizer for the fifth series is Universiti Teknologi MARA, in collaboration with Gadjah Mada University, Indonesia, Hokkaido Universiti, Japan, and Karlsruhe Institute of Technology, Germany. The theme for the fifth SCESCM was "Transforming the World, Foster the Sustainable Development Goals (SDGs)", aimed to explore and demonstrate the range of issues, novel findings, as well as developments in the area of civil and infrastructure, conforming to the SDGs. The inclusion of SCESCM 2020 in the Lecture Notes in Civil Engineering (LNCE) highlights the latest developments in civil engineering

with research that spans across different fields in civil engineering, from structures, materials, geotechnic, environment, water resource, construction management to smart cities and built environment. The blend of various fields in civil engineering that were grounded to the theme of sustainability within the context of SDGs makes this book a comprehensive referral point for civil engineering academics, as well as practitioners in general. All the papers included in this book have been carefully reviewed and selected with approximately 75% rate of acceptance.

This book represents the blood, sweat and tears of many, and we would like to sincerely thank the SCESCM 2020 organizing committee and scientific committee for their relentless effort, commitment and invaluable contribution. Our appreciation also goes to the dedicated reviewers, authors and participants for their active role in contributing to the wealth of knowledge and advocation on sustainability in civil engineering.

Our sincere gratitude also goes to Mr. Ramesh Kumaran and Dr. Ramesh Nath Premnath, Publishing Editors at Springer for their immense assistance and support in materializing the book.

Finally, we hope that the readers would find the book beneficial for their current tasks, as well as the source of inspiration in expanding the plethora of knowledge in future works.

Shah Alam, Malaysia — Sheila Belayutham
Shah Alam, Malaysia — Che Khairil Izam Che Ibrahim
Shah Alam, Malaysia — Anizahyati Alisibramulisi
Shah Alam, Malaysia — Hazrina Mansor
Thunder Bay, Canada — Muntasir Billah

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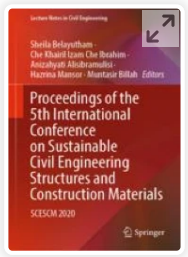

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SCESCM 2020: **Proceedings of the 5th International Conference on Sustainable Civil Engineering Structures and Construction Materials**
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Developing Indicators of Green Operation and Maint Supply Chain Manag Construction Industr

Mochamad Agung Wibowo ✉,
& Nur Farida

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Naniek Utami Handayani

Department of Industrial Engineering, Diponegoro University, Semarang, Indonesia, 50275

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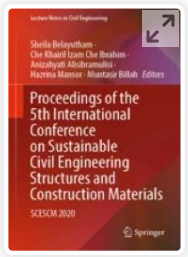
Abstract

Operation and maintenance (O&M) is the last phase of Project Life Cycle (PLC) that focused on releasing the final deliverables to the customer and followed by the use of facilities and the maintenance of the whole building. This phase is the longest phase because it covers the entire lifetime of the building. The building that is operated and maintained using the green principles



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Development of Numerical Model for Highly-Flowable Strain Hardening Fiber Reinforced Concrete (HF-SHFRC) Columns Subjected to Lateral Displacement Reversals and High Axial Loading Level

Wisena Perceka, Wen-Cheng Liao & Li-Wei Tseng

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Li-Wei Tseng

National Taiwan University, Taipei, 10617, Taiwan

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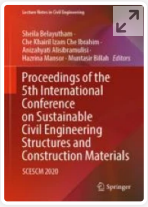
Abstract

Highly-flowable strain hardening fi
concrete (HF-SHFRC) is one of the
concrete material technologies. This material has good workability in the fresh state and exhibits strain-hardening and multiple cracking characteristics of high-performance fibre-reinforced cementitious composites (HPFRCC) in the hardened



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Effect of Partial Replacement of Cement with Volcanic Ash on Mechanical Behaviour of Mortar

Md. Shahjalal, Jesika Rahman, Afia Farzana Haque, Lutful Habib, Khadiza Binte Jalal & Mohd Mezanur Rahman

Conference paper | First Online: 07 April 2022

Part of the Lecture Notes in Civil Engineering book series (LNCE,volume 215)

Abstract

Portland Composite Cement (PCC) has so far been the most used binding material worldwide. However, it is also one of the significant sources of carbon dioxide emitters leading to global warming. It is, therefore, of utmost importance nowadays in developing nations that a sustainable cementitious material is developed. Volcanic ash (VA) is the debris found after volcanic eruptions. VA shows pozzolanic properties upon reacting with calcium hydroxide, which is given off during cement hydration. This paper represents the effect of VA on the physical and mechanical properties of mortar. VA is used to replace PCC by 5, 10, 15 and 20% by weight. The results of the mechanical properties are represented in terms of compressive strength, whereas the physical properties are illustrated through its specific gravity, fineness, setting time and consistency. This study shows that the compressive strength of the hardened mortar increases as the replacement is increased up to 15% by weight and then decreases as the replacement with VA is greater. Lastly, this study suggests the potential of VA as a

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Numerical Modelling of Concrete-Filled Steel Tube Columns Under Eccentric Loading

Joarder Md. Sarwar Mujib, Avijit Pal, Ibriju Ibrahim & Tanvir Mustafy

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(LNCE,volume 215)

Tanvir Mustafy

Military Institute of Science and Technology, Dhaka, Bangladesh

University of Alberta, Edmonton, Canada

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Abstract

Concrete-filled steel tubular (CFST) columns have been widely adopted in structural engineering. It is used most often for tall building structures and bridge piers construction processes to enhance and modify the structural behaviors. CFST columns are a form of composite construction that comprises of concrete-filled into a steel tube. The purpose of using a steel tubular structure is to provide necessary confinement to the concrete core of the

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Study on Partial Replacement of Cement with Limonite in Mechanical Strength of Mortar

Md. Shahjalal, Jesika Rahman, Afia Farzana Haque, Lutful Habib, Khadiza Binte Jalal & Mohd Mezanur Rahman

Conference paper | First Online: 07 April 2022

Md. Shahjalal

Military Institute of Science and Technology, Dhaka, Bangladesh

Contact Md. Shahjalal

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living spaces but also managing waste disposal and greenhouse emissions. The supplementary cementitious materials (SCM) therefore play a vital role in providing an economical solution towards a greener environment, especially in the developing countries. The pozzolanic properties of limonite are