Abdullah Al Mamun Hiroshi Takebayashi Ahmed Tareq Noaman *Editors*

Proceedings of the 2nd International Conference on Civil Engineering for Sustainability and Disaster Resilience

ICCESDiRe 2024, August 13–14, Selangor, Malaysia



Lecture Notes in Civil Engineering

Volume 668

Series Editors

China

Marco di Prisco, Politecnico di Milano, Milano, Italy

Sheng-Hong Chen, School of Water Resources and Hydropower Engineering, Wuhan University, Wuhan, China

Ioannis Vayas, Institute of Steel Structures, National Technical University of Athens, Athens, Greece

Sanjay Kumar Shukla, School of Engineering, Edith Cowan University, Joondalup, Australia

Anuj Sharma, Iowa State University, Ames, USA

Nagesh Kumar, Department of Civil Engineering, Indian Institute of Science Bangalore, Bengaluru, India

Chien Ming Wang, School of Civil Engineering, The University of Queensland, Brisbane, Australia

Zhen-Dong Cui, China University of Mining and Technology, Xuzhou, China Xinzheng Lu, Department of Civil Engineering, Tsinghua University, Beijing,

Lecture Notes in Civil Engineering (LNCE) publishes the latest developments in Civil Engineering—quickly, informally and in top quality. Though original research reported in proceedings and post-proceedings represents the core of LNCE, edited volumes of exceptionally high quality and interest may also be considered for publication. Volumes published in LNCE embrace all aspects and subfields of, as well as new challenges in, Civil Engineering. Topics in the series include:

- Construction and Structural Mechanics
- Building Materials
- Concrete, Steel and Timber Structures
- Geotechnical Engineering
- Earthquake Engineering
- Coastal Engineering
- Ocean and Offshore Engineering; Ships and Floating Structures
- Hydraulics, Hydrology and Water Resources Engineering
- Environmental Engineering and Sustainability
- Structural Health and Monitoring
- Surveying and Geographical Information Systems
- Indoor Environments
- Transportation and Traffic
- Risk Analysis
- Safety and Security

To submit a proposal or request further information, please contact the appropriate Springer Editor:

- Pierpaolo Riva at pierpaolo.riva@springer.com (Europe and Americas);
- Swati Meherishi at swati.meherishi@springer.com (Asia—except China, Australia, and New Zealand);
- Wayne Hu at wayne.hu@springer.com (China).

All books in the series now indexed by Scopus and EI Compendex database!

Abdullah Al Mamun · Hiroshi Takebayashi · Ahmed Tareq Noaman Editors

Proceedings of the 2nd International Conference on Civil Engineering for Sustainability and Disaster Resilience

ICCESDiRe 2024, August 13–14, Selangor, Malaysia



Editors
Abdullah Al Mamun
Department of Civil Engineering
International Islamic University Malaysia
Kuala Lumpur, Malaysia

Ahmed Tareq Noaman Department of Civil Engineering University of Anbar Ramadi, Iraq Hiroshi Takebayashi Disaster Prevention Research Institute Kyoto University Kyoto, Japan

ISSN 2366-2557 ISSN 2366-2565 (electronic) Lecture Notes in Civil Engineering ISBN 978-981-96-7813-6 ISBN 978-981-96-7814-3 (eBook) https://doi.org/10.1007/978-981-96-7814-3

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2025

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Singapore Pte Ltd. The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

If disposing of this product, please recycle the paper.

About This Book

This book contains the selected papers presented in the 2nd International Conference on Civil Engineering for Sustainability and Disaster Resilience 2024 (ICCESDiRe'24), held at the Kulliyyah (Faculty) of Engineering, International Islamic University Malaysia (IIUM), Gombak, Malaysia, on 13–14 August 2024. The papers include contributions from researchers, scientists, academia, authorities, and practitioners covering topics from the civil engineering fields of structure and construction, traffic and pavements, geo-environment, and water resources related to sustainability and disaster resilience. The papers are produced based on contemporary research works, which were in line with the theme of the conference. This international conference was organised by IIUM in collaboration with Dr. Nik Associates, the Malaysian Institute of Road Safety Research (MIROS) and the University Technology Brunei (UTB).

Contents

Survey Md Motiar Rahman, Nor Aqilah Haji Juffle, and Rajul Adli Asli	1
Causes and Effects of Variation Orders Associated with the Performance of Construction Projects Nur Hadirah Amzafi, Afizah Ayob, Mustaqqim Abdul Rahim, and Nur Rahmawati Syamsiyah	19
Sustainable Lightweight Block from Construction Waste in Malaysia Nor Azian Aziz and Zamri Hashim	31
Comparison of Molasses and Sika Plastiment VZ as Set-Retarders in High-Strength Self-Compacting Concrete Nanindya Sofie Aliyyinaya and Mochamad Teguh	45
Impacts of Crumb Rubber Surface Treatments on the Strength of Rubberised Mortar Alia Nazifa Aminuddin, Wan Firdaus Wan Hassan, Siti Asmahani Saad, Nadiah Md. Husain, and Siti Noratikah Che Deraman	59
Influence of Hot Water Curing on the Mechanical Properties of Ultra-High-Performance Concrete (UHPC) Incorporating Alumina Powder Hani Zulaikha Hisham, Wan Firdaus Wan Hassan, Nur Khairiyah Basri, and Ahmad Bukhari Ramli	75
Effect of Seawater on Mechanical and Microstructure Properties of Polypropylene Fibre Reinforced Concrete (PPFRC) Ammar Izuddin Mohd Asri, Siti Asmahani Saad, Wan Nur Firdaus Wan Hassan, Nadiah Md. Husain, Siti Noratikah Che Deraman, and Chin Siew Choo	91

viii Contents

Durability of Stone Mastic Asphalt Mixture with the Amalgamation of Bamboo Fibres as a Binder Modifier Noor Syahirah Khiyon, Nadiah Md. Husain, Siti Noratikah Che Deraman, Nur Khairiyah Basri, Wan Nur Firdaus Wan Hassan, and Siti Asmahani Saad	103
Performance Evaluation of Asphalt Mixture Incorporating Polyethylene Terephthalate Nabil Irfan Nasir, Wan Nur Aifa Wan Azahar, Norhidayu Kasim, Nur Khairiyah Basri, Ahmad Bukhari Ramli, and Nur Atikah Kamaruzaman	119
Influence of Reclaimed Asphaltic Pavement (RAP) on Cold Mix Asphalt Performance Nurul Billahizzati Rusli, Nur Khairiyah Basri, Wan Nur Aifa Wan Azahar, Nadiah Md. Husain, Wan Firdaus Wan Hassan, Ahmad Bukhari Ramli, Siti Noratikah Deraman, and Tahara Ramadzan Md. Kassim	135
Contact Angle Modification in Optimising Adhesion Performance of Bitumen Binder in Stone Mastic Asphalt Mixture Nur Alisa Izati Azri, Nadiah Md. Husian, Siti Noratikah Che Deraman, Wan Nur Firdaus Wan Hassan, Nur Khairiyah Basri, and Tahara Ramadzan Md. Kassim	149
Evaluation of the Raised Pedestrian Crossing (RPC) for Roads with Different Speeds Rizati Hamidun, Nora Sheda Mohd. Zulkiffli, Azzuhana Roslan, Syed Tajul Malik, Rohayu Sarani, W. H. Alvin Poi, and Mohd. Shafie Nemmang	165
Effect of Traffic Calming Measures on Passenger Cars in Kuala Lumpur Syed Tajul Malik Syed Tajul Arif, Ho Jen Sim, Rizati Hamidun, Mohd Shafie Nemmang, and Nora Sheda Mohd Zulkiffli	187
Correlation of Macroeconomic Variables and Traffic Safety in Malaysia Jen Sim Ho, Syed Tajul Malik, Rizati Hamidun, Azzuhana Roslan, and Piotr Gorzelanczyk	197
Identification of Flow Patterns in T-Shaped Open Channel Bifurcations Izihan Ibrahim and Saerahany Legori Ibrahim	209
Nature-Based Solutions (NbS) for Sustainable Riverbank Protection Using Coconut Coir and Vetiver Grass Siti Nurain Che Mohd Azmi, Saerahany Legori Ibrahim, Naqib Azfar Azmi, Izihan Ibrahim, and Dani Irwan Masbah	227

Contents ix

Sustainable Coastal Development: Addressing Dredging	
and Reclamation Challenges in Malaysia	239
Rosniza Ramli, Nik Mohd Kamel Nik Hassan,	
and Nik Abdullah Mu'az Nik Mohd Kamel	

About the Editors

Dr. Abdullah Al Mamun is affiliated as a professor in the Department of Civil Engineering at the International Islamic University Malaysia (IIUM). He obtained a B.Sc. in Civil Engineering from Bangladesh University of Engineering and Technology (BUET) in 1993, and completed his Ph.D. in environmental engineering in 2005 from the University Putra Malaysia (UPM). He has 19 years of engineering teaching experience at an International University and 32 years of professional experience in Civil Engineering (water and environment sector). Dr. Abdullah is a chartered and professional engineer and a member of various professional bodies. He is active in conducting research (25 grants), presenting conference papers (106 papers) and publishing research findings in indexed and peer reviewed journal papers (91 papers), writing and editing books and chapters. He is an associate editor of the IIUM Engineering Journal (Scopus and WOS Indexed). Every year, he reviews manuscripts for top-level journals and conferences in his field of expertise. Dr. Abdullah is also keen to develop environmentally friendly products and processes (27 awards, 3 patents granted, and 1 pending) and is often involved in part-time engineering consultancy (36 various projects). His academic, industrial, and research work are mainly focused on hydrology, water pollution control, water and wastewater treatment, urban stormwater management, flood mitigation, and integrated river basin management.

Dr. Hiroshi Takebayashi is affiliated as an associate professor in the Disaster Prevention Research Institute (DPRI) at Kyoto University. He obtained his B.Eng. degree from Ritsumeikan University in 1995 and completed his Ph.D. in 2000 from the same University. He has 24 years of engineering teaching experience at Japanese Public Universities and 30 years of research experience in Civil Engineering (water and environment sector). Dr. Takebayashi is a chairperson and a member of various professional bodies (e.g. Visiting Professor at Advanced Disaster Prevention Engineering Center, Nagoya Institute of Technology, Advisory Board Member at UNESCO International Sediment Initiative, Chairperson of iRIC Research Institute). He has completed 60 research grants, published 122 journal papers, written/edited 9 books, delivered 105 invited lectures, and presented research works in newspapers and TV

xii About the Editors

shows. Dr. Takebayashi is also keen to develop products for river management and disaster prevention (e.g. iRIC, Doshaburu). iRIC is a free software to simulate river flow and channel deformation. His academic research works are mainly focused on river engineering, fluvial morphology, flood and sediment disaster mitigation, and integrated river basin management.

Dr. Ahmed Tareq Noaman is an assistant professor of Construction Technology in the College of Engineering, University of Anbar, Iraq. He obtained his B.Sc. in Civil Engineering in 2002 and M.Sc. in Structural Engineering in 2005 from the University of Anbar. He received his Ph.D. from Universiti Sains Malaysia (USM) in 2017. He was appointed as the head of the Civil Engineering department at the University of Anbar from 2021 until 2024. His academic experience is dedicated to teaching under and higher graduate students at the same university. His teaching experience includes advanced engineering mathematics, scientific research methodology, concrete technology, strength of materials, calculus, and steel structures. He published many papers in local and international journals. As a presenter or keynote speaker, he presented numerous papers at international conferences in Iraq and overseas countries. He received awards for publication in top journals (two awards). He was an editor of the Iraqi Journal of Civil Engineering (2018–2021). Dr. Noaman reviewed more than a hundred papers in Publons until 2024. His current research interest is in sustainable constructions and green concrete, impact, and toughness. Currently, he is focusing on the utilisation of agro-waste to produce green building materials.