



HANOI UNIVERSITY OF CIVIL ENGINEERING

JOURNAL OF
SCIENCE AND TECHNOLOGY IN
CIVIL
ENGINEERING

p-ISSN 1859-2996
e-ISSN 2734-9268

(ACI Indexed Journal - www.stce.nuce.edu.vn)

Vol.16 No.1

1 - 2022



AIMS AND SCOPE

Journal of Science and Technology in Civil Engineering (STCE Journal) is a specialized scientific journal in the field of construction, which has annually been published with three issues in English under p-ISSN 1859-2996 and e-ISSN 2734-9268. The Journal has been established in 2007. The STCE Journal provides a forum for announcing and introducing new researches and application results in the field of construction which have not been previously published or under review elsewhere. The scope of the journal includes the following areas: building and industrial engineering; bridge and road engineering; coastal, offshore and hydraulic engineering; materials; mechanical engineering; environmental engineering; project management and computer science. The STCE Journal has been recognized as a prestigious national journal by National Science and Technology Development (NAFOSTED) - Ministry of Science and Technology since August 2019 and then accepted in the ASEAN Citation Index (ACI) system since April 30, 2020. All manuscripts submitted to the Journal are subjected to a double-blind peer review process by at least two qualified researchers or leading experts in Vietnam and abroad. The process of manuscript submission, peer-review and publication is conducted via the online system at <http://stce.nuce.edu.vn/index.php/en>.

EDITOR-IN-CHIEF

Pham Duy Hoa

Hanoi University of Civil Engineering, Vietnam

DEPUTY EDITOR-IN-CHIEF

Nguyen Hoang Giang

Hanoi University of Civil Engineering, Vietnam

Dinh Van Thuat

Hanoi University of Civil Engineering, Vietnam

GUEST EDITORS

Le Anh Tuan

University of Technology, VNU HCMC, Vietnam

EDITORIAL BOARD MEMBERS

Pham Hoang Anh

Hanoi University of Civil Engineering, Vietnam

Shingo Asamoto

Saitama University, Japan

Nguyen Viet Anh

Hanoi University of Civil Engineering, Vietnam

Ayman Nassif

University of Portsmouth, UK

Nguyen Van Chinh

University of Science and Technology, UDN, Vietnam

Tran Anh Binh

Hanoi University of Civil Engineering, Vietnam

Cosmin G. Chiorean

Technical University of Cluj-Napoca, Romania

Ngo Huu Cuong

University of Technology, VNU HCMC, Vietnam

Nguyen Tien Dung

Hanoi University of Civil Engineering, Vietnam

Ho Duc Duy

University of Technology, VNU HCMC, Vietnam

Pham Xuan Dat

Hanoi University of Civil Engineering, Vietnam

Pham Anh Duc

University of Science and Technology, UDN, Vietnam

Luong Van Hai

University of Technology, VNU HCMC, Vietnam

Nguyen Thi Nguyet Hang

Hanoi University of Civil Engineering, Vietnam

Hidenari Yasui

The University of Kitakyushu, Japan

Nghiem Manh Hien

Marshall University, USA

Nguyen Trung Hieu

Hanoi University of Civil Engineering, Vietnam

Pham Thai Hoan

Hanoi University of Civil Engineering, Vietnam

Pham Cao Hung

University of Sydney, Australia

Nguyen Xuan Hung

HCMC University of Technology (HUTECH), Vietnam

Truong Viet Hung

ThuyLoi University, Vietnam

Dang Thi Thanh Huyen

Hanoi University of Civil Engineering, Vietnam

Tran Quang Hung

University of Science and Technology, UDN, Vietnam

J.N Reddy

Texas A&M University, USA

Ikuro Kasuga

The University of Tokyo, Japan

Ken Kawamoto

Saitama University, Japan

Keun-Hyeok Yang

Kyonggi University, South Korea

Pham Nguyen Linh Khanh

International University, VNU HCMC, Vietnam

Thai Duc Kien

Sejong University, Korea

Bui Ngoc Kien

The University of Tokyo, Japan

Nguyen Trung Kien

Hanoi University of Civil Engineering, Vietnam

Nguyen Trung Kien

HCMC University of Technology and Education, Vietnam

Dinh Kien

Consens Inc. Quebec, Canada

Nguyen Chau Lan

University of Transport and Communications, Vietnam

Tran Van Lien

Hanoi University of Civil Engineering, Vietnam

Nguyen Duy Liem

HCMC University of Technology and Education, Vietnam

Nguyen Minh Long

Ho Chi Minh City University of Technology, Vietnam

Nguyen Duc Luong

Hanoi University of Civil Engineering, Vietnam

Mahen Mahendran

Queensland University of Technology, Australia

Tran Van Mien

University of Technology, VNU HCMC, Vietnam

Wang Chien Ming

The University of Queensland, Australia

Tang Anh Minh

Ecole des Ponts ParisTech, France

Phan Quang Minh

Hanoi University of Civil Engineering, Vietnam

Ngo Van Minh

University of Transport and Communications, Vietnam

Tran Thi Viet Nga

Hanoi University of Civil Engineering, Vietnam

Vu Minh Ngoc

Duy Tan University, Vietnam

Tran Cao Thanh Ngoc

International University, VNU HCMC, Vietnam

Dao Dinh Nhan

University of Architecture Ho Chi Minh City, Vietnam

Nguyen Viet Phuong

Hanoi University of Civil Engineering, Vietnam

Priyan Mendis

University of Melbourne, Australia

Le Thien Phu

Université d'Évry Val d'Essonne, Paris, France

Tran Ngoc Quang

Hanoi University of Civil Engineering, Vietnam

Nguyen The Quan

Hanoi University of Civil Engineering, Vietnam

Thai Son

University of Technology, VNU HCMC, Vietnam

Thai Huu Tai

University of Melbourne, Australia

Nguyen Viet Thanh

University of Transport and Communications, Vietnam

Chau Dinh Thanh

HCMC University of Technology and Education, Vietnam

Bui Tien Thanh

University of Transport and Communications, Vietnam

Le Trung Thanh

Institute for Building Materials, MOC, Vietnam

Dao Nguyen Thang

University of Alabama, USA

Do Tien Thinh

Institute for Building Science & Tech., MOC, Vietnam

Pham Minh Thong

Curtin University, Australia

Vo Phuong Thuc

La Trobe University, Australia

Bui Quoc Tinh

Tokyo Institute of Technology, Japan

Nguyen Xuan Tinh

Tohoku University, Japan

Bui Phuong Trinh

Ho Chi Minh City University of Technology, Vietnam

Nguyen Thanh Trung

University of Transport and Communications, Vietnam

Tran Minh Tu

Hanoi University of Civil Engineering, Vietnam

Pham Anh Tuan

Institute for Building Science & Tech., MOC, Vietnam

Tuan Ngo

University of Melbourne, Australia

Nguyen Manh Tuan

University of Technology, VNU HCMC, Vietnam

Nguyen Van Tuan

National University of Civil Engineering, Vietnam

Khuc Dang Tung

Hanoi University of Civil Engineering, Vietnam

Pham Thanh Tung

Hanoi University of Civil Engineering, Vietnam

Nguyen Ngoc Vinh

Vietnam-Japan University, Vietnam

Cao Van Vui

University of Technology, VNU HCMC, Vietnam

JOURNAL OFFICE

Dinh Van Thuat, Nguyen Thi Nguyet Hang, Nguyen Huong Thao, Le Phuong Chi

Table of Contents

1. Effect of prestressing force on flexural behavior of unbonded prestressed concrete beams strengthened by CFRP sheets <i>Dang Dang Tung, Chu Van Tu, Huynh Thi Kim Phung, Nguyen Minh Long</i>	1
2. Experimental investigation of the secondary creep of fiber reinforced concrete at high stress: Macroscopic measurement and digital image correlation <i>Pham Duc Tho, Tran Manh Tien, Dang Trung Thanh, Vu Minh Ngan, Vu Minh Ngoc, Luca Sorelli</i>	19
3. Study on dislocation cell structure, dislocation density-fatigue property relationship of a structural steel <i>Nguyen Ngoc Vinh</i>	29
4. Study on the mechanism of urban planning information exchange to enhance the community participation in urban detailed planning in Vietnam – towards sustainable development <i>Ta Quynh Hoa</i>	42
5. Development and evaluation of short-term strength and durability characteristics of an eco-friendly sulfate-activated binder <i>Nguyen Thi Cao, Thi Hai Yen Nguyen, Hoang-Tung Luu, Trong-Phuoc Huynh</i>	57
6. Buckling analysis of functionally graded sandwich plates resting on Pasternak foundation using a novel refined quasi-3D third-order shear deformation theory <i>Vu Tan Van, Nguyen Van Hieu</i>	68
7. Daily personal exposure to black carbon in different microenvironments in Hanoi, Vietnam <i>Tran Ngoc Quang, Nguyen Thi Hue, Mac Van Dat, Nguyen Van Duy</i>	80
8. Numerical scheme for transient seepage analysis under unsaturated conditions <i>Pham Nguyen Linh Khanh, Nguyen Hoai Nghia</i>	89
9. A proposed method for selecting and scaling recorded seismic accelerations according to TCVN-9386:2012 <i>Xuan Dai Nguyen, Van Tu Nguyen</i>	100
10. Effect of paste content on long-term strength and durability performance of green mortars <i>Si-Huy Ngo, Trong-Phuoc Huynh</i>	113
11. Influence of artificial lightweight aggregate on property modification of unfired brick with celow energy super-sulfated cement <i>Hoang-Anh Nguyen, Vu-An Tran</i>	126
12. Effect of pre-tensioned rope tensions on a ladder structure of turntable ladders <i>Van Tinh Nguyen</i>	138