## **Civil Engineering**



Winter 2021

## Editor-in-Chief: Mohsen Ghaemian

This Journal is published under the auspices of Sharif University of technology, Office of the Vice-Chancellor-in-Charge of Research.

The Journal is published quarterly in Farsi language, aims at establishing a relationship between scientists active in different branches of science and technology and, in particular, at providing a forum for exchange of knowledge between scientists and technologists related to scientific problems prevailing in contemporary society. The journal also strives to present practical and theoretical7 analyses of these issues and facilitates the circulation of modern scientific findings by scientists and researchers for practical application. In addition, "Sharif" publishes original papers focusing on issues of specific concern to universities, including research, technological advancements, and topics related to matters of higher education.

P.O.BOX 11155-8639 AZADI AVENUE, TEHRAN, I.R. IRAN Phone: (98-21) 66005419 - 66164093 Fax: (98-21) 66012983 Web: http://journal.sharif.ir/ http:// www. globalsciencejournals.com E-mail: pajouhesh@sharif.edu

## CONTENTS

- 3 EVALUATION OF INTERACTION BETWEEN MECHANICAL PARAMETERS OF UNBOUND GRANULAR MATERIALS IN BASE LAYER OF ASPHALT PAVEMENT M.R. Ahadi, S.F. Mirhashemi and M. Sadeghnejad
- 15 ESTIMATION OF SCOUR AROUND THE TWIN BRIDGE PIERS USING THE OPTIMIZED ANFIS-FIREFLY MODEL S. Amiri, F. Yosefvand and S. Shabanlou
- 25 INVESTIGATING THE EFFECT OF ADDING PET SCUM ON THE MECHANICAL PROPERTIES AND DURABILITY OF CONCRETE BLOCK PAVEMENT A. Ahmadnia, A.M. Ramezanianpour and M. Dolatshahi Piroz
- 35 EXPERIMENTAL STUDY ON PULLOUT BEHAVIOR OF EMBEDDED GEOGRID IN UNIFORM SANDY SOIL UNDER STATIC, CYCLIC, AND POST-CYCLIC LOADS A. Mahigir, A.R. Ardakani and M. Hassanlou Rad
- 47 DAMAGE REDUCTION DUE TO AIRCRAFT CRASH TO CONCRETE PROTECTIVE STRUCTURES A.H. Boluri Kashani and H. Ostad Hossein
- 63 INTEGRATION OF BIM AND REAL-TIME SENSOR DATA TO ENHANCE FACILITY MANAGEMENT S.M. Motaghi Pour, H. Taghaddos and E. Eshtehardian
- 73 CLOSED-FORM SOLUTIONS FOR THE ELASTIC FIELDS DUE TO THE MOTION OF A SCREW DISLOCATION AT A CONSTANT VELOCITY ALONG A LINEAR PATH WITH AN ARBITRARY DIRECTION M.R. Delfani
- 81 INVESTIGATING THE EFFECTS OF USING PYROGENIC NANOSILICA IN HIGH-PERFORMANCE CONCRETE ON CONCRETE RESISTIVITY AGAINST REBAR CORROSION M.H. Mobini and A.R. Khaloo
- 91 EXPERIMENTAL EVALUATION OF THE EFFECT OF MOISTURE CONTENT AND SHEAR DIRECTION ON THE INTERFACE BEHAVIOR OF SAND AND FIBER REINFORCEMENT POLYMER V. Toufigh, V. Toufigh and H. Ghaseminezhad
- 101 NUMERICAL AND EXPERIMENTAL MODELING OF FLOW OVER DROP WITH UPSTREAM CIRCULAR CHANNEL M. Fereshtehpour and M.R. Chamani

**RESEARCH NOTES**:

- 111 EVALUATION OF NEAR MISS SHIP COLLISION WITH CONSIDERATION OF NON-CONVENTIONAL VESSELS IN NORTHEAST OF QESHM ISLAND R. Edraki, R. Panahi, H. Akbari, S. Khorsandi and M. Daneshjou
- 121 ASSESSMENT OF STEEL STRUCTURES WITH A DUAL SYSTEM OF MOMENT FRAME WITH CONCENTRICALLY BRACE INFLUENCING REPEATED EARTHQUAKES N. Jahan, A.M. Heydari Tafreshi and M. Gerami
- 133 PUNCHING SHEAR BEHAVIOR OF FLAT SLABS STRENGTHEND WITH ECC CONCRETE B. Hashemi Salanghouch and M.R. Esfahani
- 143 COMPARISON IN THE EROSION RATE OF STABILIZED SILTY SAND SOILS WITH CEMENT AND NANOCLAY Sh.S. Babaei, S.M.A. Zomorodian and J. Mohamadzadeh-Habili

APPENDIX

## 162 ABSTRACTS OF PAPERS IN ENGLISH