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Proceedings of the Indian Geotechnical Conference 2019

IGC-2019 Volume I



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Preface

The Indian Geotechnical Society, Surat Chapter, and Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat, India, organized the Indian Geotechnical Conference (IGC) in Surat during 19–21 December 2019. The main theme of the conference was "GeoINDUS: Geotechnics for INfrastructure Development and UrbaniSation". The sub-themes of the conference included:

- 1. Characterization of Geomaterials and Physical Modelling
- 2. Foundations and Deep Excavations
- 3. Soil Stabilization and Ground Improvement
- 4. Geoenvironmental Engineering and Waste Material Utilization
- 5. Soil Dynamics and Earthquake Geotechnical Engineering
- 6. Earth Retaining Structures, Dams and Embankments
- 7. Slope Stability and Landslides
- 8. Transportation Geotechnics
- 9. Geosynthetics Applications
- 10. Computational, Analytical and Numerical Modelling
- 11. Rock Engineering, Tunnelling and Underground Constructions
- 12. Forensic Geotechnical Engineering and Case Studies
- 13. Others Topics: Behaviour of Unsaturated Soils, Offshore and Marine Geotechnics, Remote Sensing and GIS, Field Investigations, Instrumentation and Monitoring, Retrofitting of Geotechnical Structures, Reliability in Geotechnical Engineering, Geotechnical Education, Codes and Standards and other relevant topics.

The proceedings of this conference consists of selected papers presented at the conference. The proceedings is divided into six volumes, including a special volume with all keynote/invited presentations.

vi Preface

We sincerely thank all the authors who have contributed their papers to the conference proceedings. We also thank all the reviewers who have been instrumental in giving their valuable inputs for improving the quality of the final papers. We greatly appreciate and thank the student volunteers, especially Vemula Anand Reddy, Mohit Mistry, Rahul Pai, Manali Patel, Rohan Deshmukh, Hrishikesh Shahane, Anand M. Hulagabali, Jiji Krishnan and Bhavita Dave, for their unwavering support that was instrumental in preparation of this proceedings. Finally, thanks to the Springer team for their support and full cooperation for publishing six volumes of this IGC-2019 proceedings.

Surat, India Surat, India Chicago, USA Joondalup, Australia Editors Satyajit Patel C. H. Solanki Krishna R. Reddy Sanjay Kumar Shukla

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of executive committee of IGS for the terms (2015–2022). His research interests include subsoil characteristics, predictions in geotechnical engineering, soil dynamics, ground improvement and geoenvironmental engineering. He has given 50 expert talks throughout India and abroad. He is a life member of Indian Geotechnical Society, Indian Society for Technical Education (ISTE), and Institution of Engineers (India).



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About the Editors xv

include geosynthetics and fibres for sustainable developments, ground improvement techniques, utilization of wastes in construction, earth pressure and slope stability, environmental, mining and pavement geotechnics, and soil-structure interaction. He is an author/editor of 15 books, including 7 textbooks, and more than 260 research papers, including 160 refereed journal papers. He has been honoured with several awards, including IGS Award 2018 by the International Geosynthetics Society, USA, in recognition of outstanding contribution to the development and use of geosynthetics. He is a fellow of Engineers Australia, Institution of Engineers (India), and Indian Geotechnical Society, and a member of American Society of Civil Engineers, International Geosynthetics Society, and several other professional bodies.