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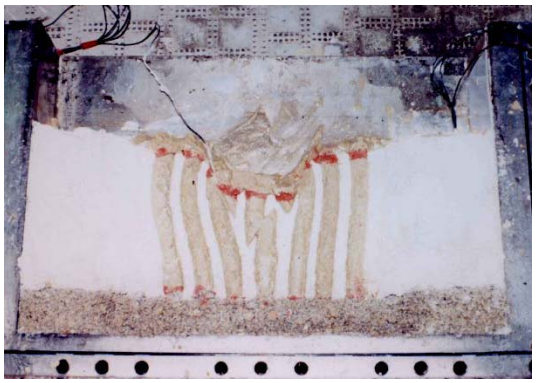
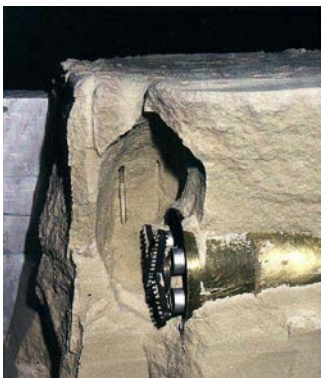
Editors: B.V.S. Viswanadham Hanh Quang Le Ooi Teik Aun



Failure mode of compacted sand piles
(After Kitazume et al., 2014)



Unsupported cavity (After König et al., 2014)

View of a soil confined coal ash embankment
(After Viswanadham & Mathur, 2014)

Run-out modelling of Byneset landslide
(After Thakur & Nigussie, 2014)

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September-2014 Issue : Centrifuge Modelling of Geotechnical Infrastructures

Edited By Prof. B.V.S. Viswanadham, Prof. Christophe Gaudin & Prof. Tom Schanz

Prof. B.V.S. Viswanadham

Prof. Viswanadham obtained his PhD (Dr.-Ing.) from the Ruhr-University of Bochum, Germany in November 1996. He obtained his Bachelor degree in Civil Engineering from the Andhra University, Visakhapatnam, India in 1987 and thereafter did his Master of Technology in Civil Engineering with Geotechnical Engineering as a specialization from the Indian Institute of Technology Madras (IIT Madras), Chennai, India in 1989. Before joining the Indian Institute of Technology Bombay (IIT Bombay) in December 1998, he worked as a Senior Project Officer, Department of Ocean Engineering, IIT Madras and as a Scientist, Geotechnical Engineering Division, Central Road Research Institute, New Delhi for about eleven years. Currently, Prof. Viswanadham is working as a Professor in the department of Civil Engineering with geotechnical engineering as a specialization. The research interest of Prof. Viswanadham is on: (1) Centrifuge model studies on the behaviour of geotechnical structures; (2) Environmental Geotechnics with a special reference to landfill waste containment systems; (3) Ground improvement using Geosynthetics and studies on the behaviour of geosynthetic reinforced soil structures; (4) Natural hazard mitigation – landslides and slope protection; (5) Bulk utilization of waste materials especially coal ash. He has published 120+ technical papers in peer-reviewed international journals/International conferences/National conferences.

Prof. Viswanadham is a Co-ordinator of the National Geotechnical Centrifuge Facility available at IIT Bombay. He has focused in disseminating knowledge on centrifuge modelling to Students/Professionals through courses (for both undergraduate and post-graduate levels) and continuing education programme courses at IIT Bombay with an aim to establish centrifuge modelling technique as an essential tool for studying problems in geotechnical and Geoenvironmental Engineering. Prof. Viswanadham is the Member of the Technical Committee for Physical Modelling on Geotechnics (TC104) of the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE), and the Chair of the Ist Asian regional workshop on the Centrifuge Modelling for Geotechnical Infrastructure to be held in IIT Bombay in November 14-16, 2012.

Prof. Christophe Gaudin

Prof. Gaudin graduated with a Doctorate in Engineering Science from the Ecole Centrale de Nantes in November 2002. He subsequently joined the Centre for Offshore Foundation Systems (COFS) in July 2003 and was appointed as Manager of the UWA centrifuge facilities. He was promoted Research Professorial Fellow in 2009 and hold since the position of Deputy Director of COFS. His research interests cover offshore anchoring systems and shallow foundations, pipeline-soil interaction and similitude principles associated with centrifuge modelling, for which he has authored 90+ referred publications.

As manager of the UWA centrifuge facilities and a team of 8 technicians, Prof Gaudin has focused on establishing centrifuge modelling techniques as an essential tool to assist the offshore industry in developing and designing foundation solutions. He has built a strong relationship with the offshore industry, raising over $3.5M of research funding and producing 50+ consulting reports.

Since 2010, Prof. Gaudin is the Chair of the Technical Committee for Physical Modelling on Geotechnics (TC104) of the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE), and the Chair of the 8th International Conference on Physical Modelling in Geotechnics to be held in Perth in 2014. His goals as TC Chair for the current term are notably to increase awareness of centrifuge modelling techniques and capabilities in the geotechnical engineering community, both in academia and industry, and to support the emergence of new centrifuge centres around the world.

Prof. Tom Schanz

Prof. Tom Schanz received his PhD at ETH Zurich on the mechanical behavior of granular mixture. This period followed a PostDoc stay at Kagoshima University (Japan). Thereafter he received his habilitation at University Stuttgart (Germany). After ten years as Professor at Bauhaus-University Weimar (Germany) he is nowadays head of the Laboratory of Foundation Engineering, Soil- and Rock Mechanics at Ruhr-University Bochum, Germany. The laboratory is running currently two geotechnical centrifuges since about 30 years. Research projects involving these equipments cover all subjects from environmental engineering, natural hazard assessment and nowadays problems involving unsaturated soil mechanics. Beside the centrifuge center the laboratory is running an excellent equipped soil dynamics and clay lab. Tom's research papers cover a wide range of theoretical, experimental and numerical subjects, as unsaturated soil mechanics, physico-chemical clay behavior, constitutive models, earthquake engineering and application of numerical methods to geomechanical problems. Tom is member of international committees as Unsaturated soils and European Numerical methods, he is chairman of the German committee for Numerical Methods in Geotechnics.

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FORWARD

By Prof Viswanadham, and Dr.Ooi Teik Aun & Dr. Hanh Quang Le

A growing number of papers were received from time to time by authors who have an active interest in the journal. It is the only journal and SE Asia and we need to cater well for all authors.

As such, this Issue of the Journal is in two parts. The First Part is edited by Prof. Viswanadham and his team on Centrifugal Model Tests. The second part is edited by the in-house editors of the Journal.

Part 1: Centrifuge-based Physical Modeling

It is a pleasure for us to be Guest Editors for this Special Issue on Centrifuge-based Physical Modeling. There are seven excellent papers:

Centrifuge Modelling of Improved Ground; Simulation of Soil Movement in Geotechnical Centrifuge Testing – Deep Excavations, Tunnelling, Deposit; Run-out of sensitive clay debris: significance of the flow behaviour of sensitive clays; Verification of the Generalized Scaling Law for Flat Layered Sand Deposit; Performance of Rail Embankments Constructed with Coal Ash as a Structural Fill Material: Centrifuge study; Centrifuge Model Tests on the Use of Geocomposite as an Internal Drain in Levees; Field scale tests for determination of pullout capacity of suction pile anchors under varying loading conditions.

The authors of these papers are M. Kitazume, Y. Morikawa and S. Nishimura; D. König, O. Detert andT.Schanz; V. Thakur and D. Nigussie; T. Tobita, S. Escoffier, J. L. Chazelas and S. Iai; B.V.S. Viswanadham and V.K. Mathur; Vijaya Ravichandran, R. Ramesh, S. Muthukrishna Babu, G.A.Ramadass, M.V.Ramanamoorthy and M.A. Atmanand

With an aim of disseminating knowledge and expertise about the centrifuge based physical modelling techniques, the Technical committee TC 104 on Physical Modelling in Geotechnics of the *International Society of Soil Mechanics and Geotechnical Engineering* (ISSMGE) is organizing regional workshops first in Europe and Asia. The first Asian workshop on Physical Modelling in Geotechnics (Asiafuge2012) was held in Mumbai, India in November 14-16, 2012 and was organised in association with Indian Institute of Technology Bombay, Mumbai, India, and the Indian Geotechnical Society Delhi with an emphasis on the application of centrifuge-based physical modelling for infrastructure development. Selected themes included *soft ground problems, foundations, deep excavations, slopes and embankments, earthquakes, climate change, ground improvement techniques, tunnels, offshore foundation systems, environmental geotechnics, geosynthetics and novel construction techniques in infrastructure geotechnics*. The above papers were selected by a scientific committee consisting of delegates, who attended Asiafuge 2012.

B.V.S. Viswanadham (Lead Guest Editor)
C. Gaudin
T. Shanz

Part 2: Contributed Papers

In this part there are 7 contributed papers on mobile information system for risk management in urban underground construction; Design methods in Segmental Tunnel Linings; Challenges in constructing urban tunnels; Bulk compression of dredges soils; Energy piles; Bored piles in residual soils and Centrifugal shaking table tests on reinforced earth embankments.

The authors of the papers are: Hanh Quang Le and Bin-Chen Benson Hsiung; N.A. Do, D. Dias, P.P. Oreste, I. Djeran-Maigre; R. Katzenbach and S. Leppla; Hiroshi Shinsha and Takahiro Kumagai; A.M. Tang, J.M. Pereira, G. Hassen, N. Yavari; Mutiasani Dianmarti Kusuma and Eng-Choon Leong; W.Y. Hung , J.H. Hwang, C.J. Lee.

The editorial team of the contributed papers are most grateful to the authors and the reviewers for their excellent job. Most papers in Part 2 were presented in Geotech Hanoi 2013, but were modified significantly and had been subjected to extensive review.

Ooi Teik Aun (Lead Editor Part 2)
Hanh Quang Le
Noppodol Phienwej

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ACKNOWLEDGEMENT

A growing number of contributed papers are now received for the journal. As such this Issue is in two parts; Part 1 is on Centrifuge based Physical Modelling with Prof. B.V.S. Viswanadham as lead editor. There are six papers contributed in this part. Part 2 of the Issue is on contributed papers as edited by In-house Editors Dr. Ooi Teik Aun and Dr. Hanh Quang Le. The future Issues of the Journal will also have papers edited by Guest Editors on theme Issues and contributed papers on a wide range of topics which are of great interest to our Geotechnical Community in SE Asia and elsewhere.

The topics and the authors are adequately described in the Foreword. The reviewers are not named here. But most papers had more than two reviewers. Special thanks are extended to the Editors, authors and reviewers for their excellent work.

K. Y. Yong
N . Phienwej
T. A. Ooi
A. S. Balasubramaniam

GEOTECHNICAL ENGINEERING

SEPTEMBER 2014: SPECIAL ISSUE ON CENTRIFUGE MODELLING OF GEOTECHNICAL INFRASTRUCTURE

Editors: B.V.S. Viswanadham, Christophe Gaudin & Tom Schanz

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