IRAN CHAPTER

Technical Webinar

Interactions between Geosynthetic-Reinforced Fill Walls and Laterally-Loaded Piles

Prof. Jie Han, University of Kansas, USA.

21 DECEMBER 2020

08.00~10:00 PM IR (04:30~06:30 PM GMT)

Sponsors:

Registration:

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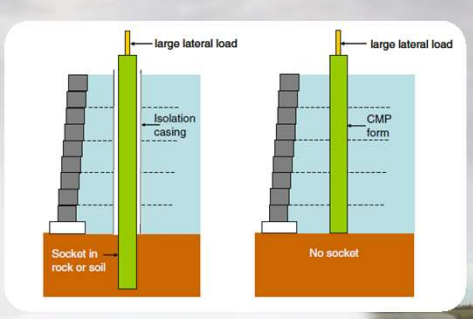
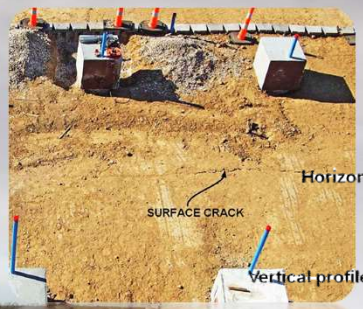
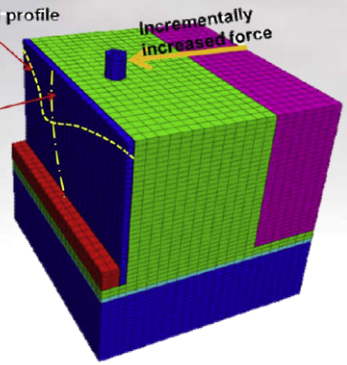
"Interactions between Geosynthetic-Reinforced Fill Walls and Laterally Loaded Piles"

Abstract:

Piles have been increasingly installed in geosynthetic-reinforced fill (GRF) walls to support superstructures, such as sound barrier walls near highways or bridge foundations within abutments. The traditional design is to isolate the piles from the GRF mass, which requires rock sockets and large-diameter piles, and thus very costly. An alternative design was proposed and verified through a 50-m long and 6-m high full-scale GRF test wall in Kansas, USA. In this field study, the piles were installed at four offset distances from the wall facing, seated on the bedrock, and supported by the GRF mass. The field single and group pile lateral load testing demonstrated that the piles could carry significant loads when they were located at the distances of two or more times the pile diameter. A group effect was observed from the group pile test as compared with the single pile test when the piles were closely spaced. The segmental block facing was tolerable to the differential movement induced by the piles and very effective in hiding the local deformations even at the wall facing deflections more than 100 mm. Additional physical model tests were conducted in the laboratory to investigate the effects of wall height, facing connection type, and cyclic loading. This presentation will discuss the construction, instrumentation, field and laboratory testing, and numerical analyses of laterally-loaded piles in GRF walls, evaluate the interactions between laterally-loaded piles and GRF walls, and offer design guidance.







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Biography of Speaker:

Professor Jie Han, Ph.D., PE, F. ASCE

Glenn L. Parker Professor of Geotechnical Engineering, the University of Kansas, USA.

Dr. Jie Han is the Glenn L. Parker Professor of Geotechnical Engineering in the Civil, Environmental, and Architectural Engineering Department at the University of Kansas. He received his BS and MS degree in geotechnical engineering from Tongji University, China and his Ph.D. degree in Civil Engineering from the Georgia Institute of Technology in the USA. Prof. Han is the sole author of the book entitled "Principles and Practice of Ground Improvement" and has published more than 400 peer reviewed journal and conference papers. Prof. Han is a board governor of the ASCE Geo-Institute, the chair of the ASCE Geo-Institute Soil Improvement Committee, the chair of the TRB Transportation Earthworks Committee, and the council member of the International Geosynthetics Society. He serves as an associate editor for the ASCE Journal of Geotechnical & Geoenvironmental Engineering and the ASCE Journal of Materials in Civil Engineering, and a handling editor for Transportation Research Record. Prof. Han has been invited to give more than 200 keynote/invited lectures and short courses around the world, including the State of the Practice Lecture at the 21st Annual George F. Sowears Symposium in Atlanta, Georgia in 2018 and the 18th UK IGS Lecture in London in 2018. He has received numerous awards from the profession including but not limited to the 2011 Shamsher Prakash Prize for Excellence in Practice of Geotechnical Engineering, the 2014 the International Geosynthetics Society Award, the 2017 ASCE Martin S. Kapp Foundation Engineering Award, and the 2018 ASCE Kansas City Section Engineer of Year Award.