



Webinar on

Geothermal Piles – Recent Developments and New Opportunities for the Indian Geotechnical Community

Date: 29th January (Saturday) 2022 at 11 AM

Speaker



Dr. Prasenjit Basu

Associate Professor, Civil Engineering Department, IIT Bombay

Meeting link:

<https://kaksha.webex.com/kaksha/j.php?MTID=m152045a15426a2d5acead2364d80ed7c>

Meeting number: 2512 410 7473

Password: ArdtsWS2f63

Corresponding address: Advance and dynamic soil testing laboratory, 4th floor VM Convention Centre, Civil Engineering Annex, Indian Institute of Technology Bombay, Mumbai 400 076. Tel.: 022 2575 4305. Email: igsmumbai@gmail.com

ABSTRACT: Geothermal piles serve the dual purpose of supporting structural load and harvesting energy from the ground underneath. Energy harvested through geothermal piles (also referred to as heat exchanger piles or energy piles) are often used as an auxiliary measure to meet the space heating and cooling energy demand of residential and commercial buildings. Design and implementation of pile-anchored energy harvesting technology is largely influenced by successful operations of geothermal boreholes, which have been in use over the last several decades. Accordingly, heavy reliance on experience and empirical rules has partially deterred the rate of adoption of this technology in routine foundation engineering practice. While the use of the dual-purpose piles is increasingly being popular in different parts of the world (e.g., Europe, USA, and Eastern Asia), this sustainable foundation alternative is yet to be explored and adopted in the Indian geotechnical engineering practice. Significant research and development in this area over the past decade has paved the way for scientific understanding of critical aspects of geothermal pile design. This presentation will provide a basic overview of geothermal piles and describe some recent advancements in predictive thermal performance assessment of these piles. Field, operational, and design parameters that play crucial roles in thermal performance assessment of these piles will be discussed. Moreover, in the light of contemporary research, this talk will briefly discuss physics governing pile-soil heat exchange under different subsurface conditions. It is anticipated that a synchronized effort involving both academia and industry can facilitate identification of future directions towards exploration of this sustainable energy harvesting alternative in the Indian context and adoption of this innovative foundation technology in Indian geotechnical engineering practice.

About the speaker

Dr. Prasenjit Basu is an Associate Professor in the Geotechnical Engineering specialization of the Civil Engineering Department at IIT Bombay. Before joining IIT Bombay, he served as an Assistant Professor at the Pennsylvania State University, USA, from 2010 to 2015. Basu earned his doctoral degree from Purdue University, USA. His recent research areas include energy geotechnics with a specific focus on near-surface geothermal energy harvesting, engineering of foundations, and classical geomechanics. He is an international member of the TRB committee AKG70: *Foundations of Bridges and other Structures* and a nominated member of the ISSMGE technical committee TC308 *Energy Geotechnics*. He is also member of professional bodies including American Society of Civil Engineers (ASCE) and Indian Geotechnical Society (IGS). Basu is the recipient of the Telford Premium Paper Award (2011) by Institution of Civil Engineers (ICE) U.K. and the Harry West Teaching Award (2013) by Civil Engineering Department at the Pennsylvania State University, USA.

Prof. Dasaka S Murty
(Chairman, IGS Mumbai Chapter)