National Institute of Technology Rourkela

Registration Seminar

Seminar Title	: Numerical Analysis of Foundations on Unsaturated Soil for Various Flow Conditions
Speaker	: Ipsita Mukherjee (Rollno : 522ce1001)
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Venue	: Department Seminar Room (CE)
Date and Time	: 16 Jul 2024 (4:30 PM)
Abstract	: The global advancement of a nation is highly dependent on its provision of infrastructures to the mankind, to name a few, roads, railways, dams, schools, hospitals, bridges etc. Therefore, the ultimate load carrying capacity of foundations on unsaturated soil is of paramount importance in geotechnical engineering as it allows engineers to optimize foundation designs to meet specific project requirements. Foundations built on unsaturated soil are susceptible to various factors such as changes in moisture content, soil suction, and loading conditions due to environmental factors such as rainfall, temperature variations, and vegetation. The field of unsaturated soil mechanics examines the interactions among water, air, and soil particles within soil pores, affecting properties like permeability, volume change, and shear strength. Thus, understanding the ultimate load carrying capacity of foundations built on such soil, enables engineers to assess and mitigate potential risks associated with these factors, reducing the likelihood of foundation failure. This study aims to evaluate the ultimate load carrying capacity of various foundation structures on unsaturated soil for different flow conditions using lower bound theorem of finite element limit analysis in combination with Second Order Cone Programming (SOCP). The results have been compared with the previous literatures and show good agreement. In future the parametric studies will be conducted to investigate the effects of different parameters, such as height of the wall, unit weight, backfill surface and wall inclination, water table location, soil&ndashwall interface friction and presence of tension cracks.