Dr. Gyan Vikash, Assistant Professor, Department of Civil Engineering receives the DST Grant under Fast Track Young Scientist Scheme

Dr. Gyan Vikash, Assistant Professor, Department of Civil Engineering, School of Engineering, has received the DST grant for his project on "*Experimental Investigation of Diffusion Process during CRS Consolidation under Monotonic Loading and Cycle of Unloading-Reloading*".

Consolidation characteristics of fine grained soils play important role in finding the settlement of foundations and simulation of other structures for their stress-deformation response. The samples collected through geotechnical investigations are generally used in the laboratory to find the compressibility and permeability of clay by performing Incremental Loading (IL) consolidation test. It takes somewhere around 7-12 days to perform one test. A complete project may have around 50 to 100 such samples to characterize, which makes it a formidable task sometimes to perform IL consolidation test considering the time line of the project and the amount of effort required.

On the other hand, the Constant Rate of Strain (CRS) consolidation test on fine grained soils can be performed in 4-5 hours. The testing method is simple enough for any laboratory to adopt. However, the existing theories for interpreting the CRS consolidation test data provide unreasonable results for a significant duration at early stage of the test. In addition to this, these methods also lack in interpretation of the test data of unloading and reloading stages. Because of these issues, CRS consolidation test is not being widely used in research and practice despite its advantages. It is therefore imperative to resolve these issues to obtain reasonable interpretation for monotonic loading as well as unloading-reloading stages of CRS consolidation.

Talking about his research, Dr. Gyan said, “The need to resolve the issues associated with CRS consolidation inspired me to investigate experimentally as well as analytically the mechanism of consolidation at constant rate of strain. The objective of the present research is to understand the reason behind these issues, which will eventually, facilitates development of a new method of interpretation to obtain reasonable results for both monotonic as well as unloading-reloading stages.”