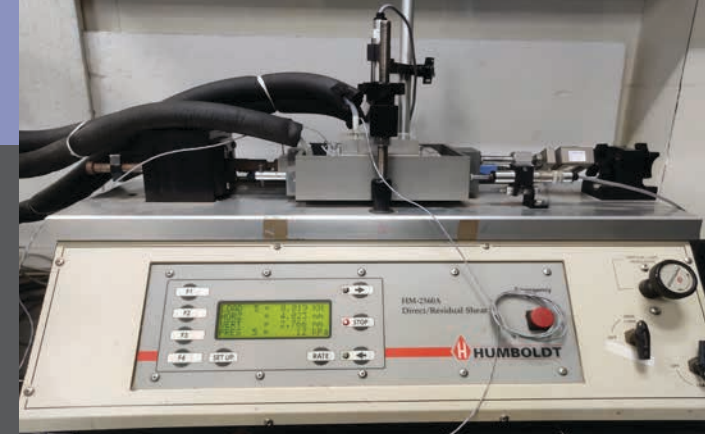


DetFroSS: Frozen Soil Shear Strength Estimator



Problem Statement: India showcases a wide range of soil types at varying altitudes and temperatures. Knowledge of these environmental circumstances is necessary for an ecologist and an engineer to know how, why, and what kind of materials should be utilised to construct hefty buildings on soil in different temperature zones. Understanding aspects like the soil's shear strength, density, saturation and dryness/moisture are essential in designing the foundation for structures in cold regions of India. DetFroSS is a setup designed to determine the shear strength of the frozen soil corresponding to different temperatures (ranging between 0°C - 25°C).

Uniqueness of the Solution: The proposed invention of developing Frozen Soil Shear Strength Estimator enables the determination of shear strength of frozen soil mass quickly and economically compared to the ones existing in previous literature. Also, volumetric deformation, a crucial aspect of soil, is essential to

analyse as the deformation could be due to mechanical loading or environmental changes. However, if not analysed, it might impact the foundation during construction. Therefore, the estimator determines the volumetric deformation undergone by the soil sample in its fully or partially saturated states, compacted to a target dry-density and subjected to different confining pressures.

Current Status of Technology: The team of researchers have set up the strength estimator. It is ready to use to determine the soil characteristics economically and rapidly in regions with a soil temperature of up to 25°C, such as in areas like the Northeast part of India.

Societal Impact: This test setup to determine the shear strength of frozen soil in the cold regions in India will be helpful in the execution of infrastructure development, mainly in the Northeast states in India.

Patent(s): Filed

Relevant Industries: Infrastructure, Laboratory Material Testing Equipment Manufacturers.

Faculty: Prof. D. N. Singh, Civil Engineering.