# Geotechnical Enginneing Laboratory

Geotechnical Engineering Laboratory is well-equipped with the majority of the automatic and digitalized equipment used to determine soil index and engineering properties. All of the facilities are used for undergraduate teaching and research in the field of geotechnical engineering. Furthermore, this lab is used for various consultancy works for government and private agencies related to pavement design, building design, and water tank foundation design in order to contribute to the country's social and industrial development. The experiments in this laboratory allow students to gain fundamental and detailed knowledge about soil properties and behavior, which are the building blocks of any foundation system

| S.No | Name of the Equipment | Description | Image |
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| 1 | CALIFORNIA BEARING RATIO EQUIPMENT (CBR) | The California Bearing Ratio or CBR test is performed in construction materials laboratories to evaluate the strength of soil sub grades and base course materials. Those who design and engineer highways, airport runways and taxiways, parking lots, and other pavements rely on CBR test values when selecting pavement and base thicknesses. |  |
| 2 | CONSOLIDATION TEST EQUIPMENT | Consolidation Test is used to determine the rate and magnitude of settlement in soils. The settlement values obtained by this test are due to primary consolidation only which is 90% of the total consolidation. The results of consolidation test are very much helpful in the design of foundations. |  |

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| 3 | DIRECT SHEAR EQUIPMENT | Shearing strength of the soil is the magnitude of maximum shearing resistance offered by the soil when subjected to shear stress. The friction and interlocking of soil particles cause shearing resistance in soil. |  |
| 4 | HOT AIR OVEN | Electrical devices work on the principle of dry and hot air convection (that is circulation of heated air), conduction, and radiation. The hot air convection process is of two types. a. Gravity convection process: Heated air expands and possesses less density than cooled air which rises up and displaces the cooler air (the cooler air descends). |  |

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| 5 | PERMIABLITY EQUIPMENT | The rate of flow of water, under laminar flow conditions, through a unit cross sectional are of soil mass, under unit hydraulic gradient, is defined as coefficient of permeability. Permeability of the soil governs the magnitude of excess pore water pressure built-up in the embankment or cuttings, during consolidation process or when the embankment is ponded by water |  |
| 6 | PROCTOR TEST EQUIPMENT | It is process through which soil particles are pressed close to each other by mechanical methods. Air remaining between the soil particles is removed by this process. By compaction, we can improve soil properties. |  |

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| 7 | TRI AXIAL SHEAR EQUIPMENT | Tri axial (shear) tests are an excellent way of measuring the mechanical properties of soil, rock and granular materials, with results used to solve a wide range of geotechnical engineering problems. |  |
| 8 | VANE SHEAR TEST EQUIPMENT | The laboratory vane shear test for the measurement of shear strength of cohesive soils, is useful for soils of low shear strength for which triaxial or unconfined tests cannot be performed. The test gives the undrained strength of the soil. |  |

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| 9 | UNIVERSAL SAMPLE EXTRACTOR | Extractor Frame is used for taking out soil samples compacted or undisturbed from 100mm dia and 150mm Dia cylinders such as core cutters, proctor moulds, CBR moulds etc |  |