# CORE CUTTER METHOD
# (IS 2720-PART-29-1975) Reaffirmed-2005

**THEORY:**

The in-situ density is defined as the bulk density of soil measured at its actual depth. By conducting this test, it is possible to determine the field density of the soil. The moisture content is likely to vary from time and hence the field density also. So it is required to report the test result in terms of dry density.

**NEED & SCOPE:**

This method covers the determination of the **in-situ density** of compacted soils by using core cutter. The in situ density of natural soil is needed for the determination of bearing capacity of soils, for the purpose of stability analysis of slopes, for the determination of pressures on underlying strata for the calculation of settlement and the design of underground structures. It is a quality control test, where compaction is required, in the cases like embankment and pavement construction.

**APPARATUS REQUIRED:**

1. Rammer
2. Dolly
3. Cutter
4. Balance 15kg. capacity
5. Sensitive Balance
6. Moisture tins

**PROCEDURE:**

1. In the spot adjacent to that where the field density by sand replacement or balloon method has been determined, drive the core cutter using the dolly over the core cutter.
2. Stop ramming when the dolly is just around the surface.
3. Dig out the cutter containing the soil out of the ground and trim off any solid extruding from its ends, so that the cutter contains a volume of soil equal to its internal volume which is determined from the dimensions of the cutter.
4. Determine the weight of the contained soil is found and its moisture content.

**OBSERVATIONS & RECORDINGS:**

**Dry density:**

| | | |
|---|---|---|
| Wt. of Core-Cutter ($W_1$) | = | gms. |
| Wt. of Core-Cutter + Wet Soil ($W_2$) | = | gms. |
| Wt. of Wet Soil ($W_s = W_2 - W_1$) | = | gms. |
| Volume of Core-cutter $V_c$ | = | c.c. |
| Bulk Density of Soil ($\gamma_s = W_s/V_c$) | = | g/c.c. |
| Dry Density of Soil $\gamma_d = \frac{\gamma_s}{1+w}$ | = | g/c.c. |

**Moisture Content:**

| | | |
|---|---|---|
| Wt. of Container + Wet Soil (W) | = | gms. |
| Wt. of Container ($W_c$) | = | gms. |
| Wt. of Container + dry Soil ($W_d$) | = | gms. |
| Wt. of Moisture ($W - W_d$) | = | gms. |
| Wt. of dry Soil ($W_d - W_c$) | = | gms. |

Moisture content w % $= \frac{W - W_d}{W_d - W_c} \times 100 =$