

PENETRATION TEST

Penetration Tests have been found very useful and economical, for sub-soil exploration. The correlation of these tests with various other standard tests and soil parameters like cohesion and angle of friction have made these tests much more useful in evaluation of soil strength in-situ.

The tests have gained importance particularly in soils where undisturbed sampling is not possible either due to its high moisture content or non-cohesive nature. IS : 4968 specifies three different methods for sub-surface sounding of soils.

Part 1. Dynamic method using 50 mm cone without bentonite slurry.

Part II Dynamic method using 62.5 mm cone with bentonite slurry.

Part III. Static cone penetration test.

DYNAMIC TEST

The standard penetration test using a split spoon sampler is covered separately in IS : 2131.

●● HS34.60

Dynamic Cone Penetration Test Apparatus

(50 mm cone without bentonite slurry)

The apparatus helps for determining relative resistance of soil strata at different depths to penetration of 50 mm dia, 60° cone under standard driving energy per stroke. The resistance offered 'Ncd' to penetration of cone in terms of number of blows of 65 kg hammer falling freely through a height of 75 cm per 30 cm penetration is correlated with bearing capacity of cohesionless soils and also with the load carrying capacity of piles. Bore hole is not required for this test.

The equipment comprises of the following :-

- i) Drive weight 65 kg.
- ii) Drive pipe assembly for 75 cm fall.

- iii) Tripod stand 5 mm high.
- iv) 50 mm dia cone 60° vertex angle without threads.
- v) Adopter for cone without threads.
- vi) A-rods one meter long 5 Nos.
- vii) A-rod guide 1 No.

●● HS34.65

Dynamic Cone Penetration Test Apparatus (62.5 mm cone without bentonite slurry)

In this test a modified version of the 60° cone is used wherein arrangements for circulating bentonite slurry is additionally provided. As in the earlier case the cone here also is directly driven into the ground and the bentonite slurry reduces the skin friction of the driving rods.

The resistance of the cone per 30 cm of penetration in this case is designated as NCbr.

The equipment comprises of the following :-

- i) Drive weight 65 kg.
- ii) Drive pipe assembly for 75 cm fall of hammer.
- iii) Tripod stand 5000 mm high.
- iv) 62.5 mm dia cone 60° angle
- v) A-rods one meter long each 5 Nos.
- vi) A-rod guide 1 No.
- vii) Hand Operated Slurry pump with hose pipe - 1 No.
- viii) Water swivel - 1 No.