6. DETERMINATION OF FREE SWELL INDEX OF SOILS

STANDARD

- IS: 2720 (Part 40) 1977.

DEFINITION

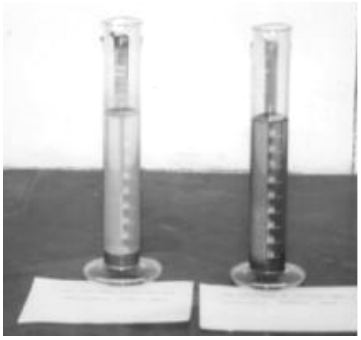
- Free Swell Index is the increase in volume of a soil, without any external constraints, on submergence in water.

APPARATUS

- 425 micron IS sieve.
- Graduated glass cylinders 100 ml capacity 2Nos (IS: 878 -1956).
- Glass rod for stirring.
- Balance of capacity 500grams and sensitivity 0.01 gram.

PROCEDURE

- Take two representative oven dried soil samples each of 10 grams passing through 425 micron sieve.
- Pour each soil sample in to each of the two glass graduated cylinders of 100ml capacity.
- Fill one cylinder with kerosene and the other with the distilled water up to the100ml mark.
- Remove the entrapped air in the cylinder by gentle shaking and stirring with a glass rod.



Sample kept for free swell index

- Allow the samples to settle in both the cylinders.

- Sufficient time, not less than 24 hours shall be allowed for soil sample to attain equilibrium state of volume without any further change in the volume of the soils.
- Record the final volume of the soils in each of the cylinders.

CALCULATIONS

$$\text{Free Swell Index, (\%)} = \frac{V_d - V_k}{V_k} \times 100$$

V_d = Volume of the soil specimen read from the graduated cylinder containing distilled water.

V_k = Volume of the soil specimen read from the graduated cylinder containing kerosene.

REPORT

- Read the level of the soil in the kerosene graduated cylinder as the original volume of the soil samples, kerosene being non polar liquid does not cause swelling of the soil.
- Read the level of the soil in the distilled water cylinders as free swell level.
- Record the individual and the mean results to the nearest second decimal.

PRECAUTION

- In the case of highly expansive soils such as Sodium Betonites. the sample size may be 5 grams or alternatively a cylinder of 250ml capacity for 10 grams of sample may be used.

FORM D46

Punjab State Road Sector Project
PWD B&R Branch, Govt. of Punjab
Punjab Roads & Bridges Development Board

DETERMINATION OF FREE SWELL INDEX OF SOILS
(IS 2720 Part 40)

Description of Material : _____ Date of Sampling : _____

Location : _____ Sampled by : _____

Tested by : _____ Date of Testing : _____

Determination No.	Measuring Cylinder No.		Reading After 24 hours		Free Swell Index, %
	Kerosene	Distilled Water	Kerosene	Distilled Water	

Remarks : _____

Approved/Not Approved:

_____	_____	_____
Contractor's Representative	Materials Engineer Consultant	Resident Engineer Consultant