AMEV08 SOIL MECHANICS AND FOUNDATION ENGINEERING

UNIT-1 SOIL PROPERTIES AND COMPACTION OF SOIL

- 1.1 Nature of Soil- Problems with soil- phase relation- particle size distribution
- 1.2 Atterberg limits- classification for engineering purposes
- 1.3 BIS Classification system- Soil compaction-factors affecting compaction
- 1.4 Laboratory and field compaction methods and monitoring- Clay Minerology.

UNIT-2 SOIL MOISTURE- PERMEABILITY, STRESSES IN SOILS

- 2.1 Soil water- Various forms- Capillary rise- Suction
- 2.2 Effective stress concepts in soil- Total, neutral and effective stress distribution in soil
- 2.3 Permeability- Darcy's Law- Permeability measurement in the laboratory- quick sand condition- Stress distribution in soil media
- 2.4 Boussinesq"s formula- stress due to line load,
- 2.5 Circular and rectangular loaded area approximate methods
- 2.6 Use of influence charts Westerguard equation for point load.

UNIT-3 SHEAR STRENGTH AND SLOPE STABILITY

- 3.1 Shear strength of cohesive and cohesion less soil- Mohr,
- 3.2 Coulomb failure theory- Measurement of shear strength- direct shear,
- 3.3 Triaxial compression, UCC and Vane shear tests- Types of shear tests based on drainage and their applicability- Drained and undrained behaviour of clay and sand.
- 3.4 Slope failure mechanisms- Modes- Infinite slopes- Finite slopes- Total and effective stress analysis
- 3.5 Stability analysis for purely cohesive and C Φ soils- Method of slices- Modified Bishop's method- Friction circle method stability number.

UNIT-4 SOIL EXPLORATION

- 4.1 Scope and objectives- Methods of exploration
- 4.2 Averaging and boring- Wash boring and rotary drilling- Depth of boring- Spacing of bore hole
- 4.3 Sampling- Representative and undisturbed sampling- sampling techniques- Split spoon sampler, Thin tube sampler, Stationary piston sampler
- 4.4 Bore log report- Penetration tests (SPT and SCPT)- Data interpretation (Strength parameters and Liquefaction potential).

UNIT-5 FOUNDATION- BEARING CAPACITY AND SETTLEMENT

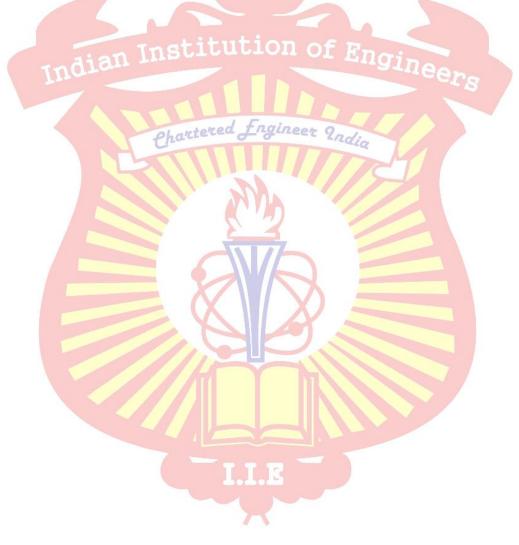
- 5.1 Introduction- Location and depth of foundation- Selection of foundation based on soil condition
- 5.2 Codal provisions- bearing capacity of shallow foundation on homogeneous deposits
- 5.3 Terzaghi"s formula and BIS formula- factors affecting bearing capacity- problems

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- 5.4 Bearing Capacity from insitu tests (SPT, SCPT and plate load)- Allowable bearing pressure,
- 5.5 Settlement- Components of settlement- Determination of settlement of foundations on granular and clay deposits- Allowable settlements
- 5.6 Codal provision- Methods of minimising settlement, differential settlement.

References Books

- 1. Coduto, D.P, Geotechnical Engineering Principles and Practices, Prentice Hall of India Private Limited, New Delhi, 2002.
- 2. McCarthy D.F, Essentials of Soil Mechanics and Foundations Basic Geotechniques, Sixth Edition, Prentice-Hall, New Jersey, 2002.



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