

AMSV15 GEOTECHNICAL ENGINEERING

UNIT-1 ORIGIN AND CLASSIFICATION

- 1.1 Preview of Geotechnical field problems in Civil Engineering,
- 1.2 Soil formation, transport and deposit, Soil composition,
- 1.3 Basic definitions, Weight volume relationships, Clay minerals, Soil structure,
- 1.4 Index properties, sensitivity and thixotropic, Particle size analysis,
- 1.5 Unified and Indian standard soil classification system.

UNIT-2 SOIL HYDRAULICS

- 2.1 Stress conditions in soil- total, effective and neutral stresses and relationships.
- 2.2 Permeability - Darcy's Law, hydraulic conductivity, equivalent hydraulic conductivity in stratified soil.
- 2.3 Seepage, flow nets, seepage calculation from a flow net, flow nets in anisotropic soils, seepage through earth dam, capillarity, critical hydraulic gradient and quick sand condition, uplift pressure, piping;

UNIT-3 SOIL COMPACTION

- 3.1 Water content- dry unit weight relationships.
- 3.2 Factors controlling compaction.
- 3.3 Field compaction equipment; field compaction control; Proctor needle method.
- 3.4 Consolidation: Primary and secondary consolidation,
- 3.5 Terzaghi's one dimensional theory of consolidation, Consolidation test, Normal and Over Consolidated soils, Over Consolidation Ratio,
- 3.6 Determination of coefficient of consolidation, Contact pressure.

UNIT-4 SHEAR STRENGTH

- 4.1 Mohr-Coulomb failure criterion, shear strength parameters and determination;
- 4.2 Direct and tri-axial shear test; unconfined compression test; pore pressure, Skempton's pore pressure coefficients.
- 4.3 Earth pressure: Classical theories, Coulomb and Rankin's approaches for frictional and $c\phi$ soils, inclined backfill, Graphical methods of earth pressure determination,
- 4.4 Stability of slopes, Culman method & Method of slices, Stability number & chart.

UNIT-5 SUB SURFACE STRUCTURE

- 5.1 Bearing capacity of shallow foundations, SPT, Plate load test; Effect of water table.
- 5.2 Deep foundations: Types of piles, Static and dynamic formulae, Pile group, Settlement of Pile Group, Negative skin friction.

References Books

- 1 V.N.S. Murthy- Soil Mechanics and Foundation Engineering (Fifth Edition)
- 2 K.R. Arora- Soil Mechanics and Foundation Engineering