

AMC- 12 : FOUNDATION ENGINEERING

1 INTRODUCTION

Soil as a three phase system, water content, density and unit weights, specific gravity, voids ratio, porosity and degree of saturation, density index

2 CLASSIFICATION OF SOILS

General, compaction, standard proctor test, equivalent for standard proctor test. [is : 2720 a (part vii) : 1965 : light compaction], water-density relationship, modified proctor test, modified proctor test curve, jodhpur mini-compactor test, typical comparison of the standard proctor test and jodhpur mini-compactor test, jodhpur mini-compactor, field compaction methods, field compaction control, proctor needle, calibration curve, factors affecting compaction, effect of compactive effort on compaction, obtained by the jodhpur mini-compactor, shear strength

3 STRESS DISTRIBUTION

Introduction, concentrated force: boussinesq equations, concentrated load: boussinesq, analysis, pressure distribution diagrams, variation of σ_z with r at constant depth, vertical stress distribution on a horizontal plane (influence diagram for σ_z at a), σ_z distribution on vertical lane, vertical pressure under a uniformly, uniformly distributed load over circular area, vertical pressure due to a line load, vertical pressure under strip load, vertical. Pressure under centre of strip load, vertical pressure under a uniformly loaded rectangular area, rectangular loaded area, influence factor for rectangular area (after steinbrenner), equivalent point load method, newmark's influence chart, radii of concentric circles for influence chart, contact pressure,

4 SURFACE TENSION CAPILLARITY & EFFECTIVE STRESS

Modes of occurrence of water in soil, adsorbed water, adsorbed water and pore water (lambe, 1953), capillary water, surface tension and formation of meniscus, capillary rise, values of unit weight, dynamic viscosity and surface tension for water, capillary heights of soil, stress conditions in soil : effective and neutral pressures, capillary siphoning,

5 PERMEABILITY

Introduction, darcy's law, discharge velocity and seepage velocity, validity of darcy's law, factors affecting permeability, constant head permeability test, falling head , permeability test, permeability of stratified soil deposits,

6 SEEPAGE ANALYSIS

Head gradient and potential, seepage pressure, upward flow : quick condition
Sand condition, two dimensional flow: laplace equation, seepage through anisotropic soil, phreatic line of an earth dam , one dimensional consolidation, consolidation of laterally confined soil, semi log plot of pressure voids ratio relationship, consolidation of undisturbed specimen, terzaghi's theory of one dimensional consolidation, calculation of voids ratio and coefficient of volume change, calculation of voids ratio by height of solids method, calculation of voids ratio by change in voids ratio method, determination of coefficient of consolidation, shear strength, theoretical considerations : mohr's stress circle, mohr-coulomb failure theory, the effective stress principle, measurement of shear strength, direct shear test, triaxial compression test, vane shear test , shear strength of cohesive soils

7 EARTH PRESSURE

Introduction , plastic equilibrium in soils : active and pasive states, active and passive states of plastic equilibrium, active earth pressure: rankine's thry, backfill with uniform surcharge, active earth pressure of cohesive soils, passive earth pressure : rankine's theory, coulomb's wedge theory

8 DESIGN OF GRAVITY RELATING WALL

Design of gravity relating wall

9 STABILITY OF SLOPES

Introduction, stability analysis of infinite slopes, stability analysis of finite slopes, the swedish slip circle method, stability of slopes of earth dam

10 SUBSOIL EXPLORATION

Introduction, site reconnaissance, site exploration, methods of site exploration, soil samples and samplers, disturbed sampling, undisturbed sampling, penetration and sounding tests, geophysical methods

11 SHALLOW FOUNDATION:

Types of foundations, spread footing, safe bearing pressure, settlement of footings, combined footing and strap footing, mat or raft footing, i.s. Code of practice for design of raft foundations, modulus of subgrade reaction K_s

12 WELL FOUNDATION

Introduction: caissons, shapes of wells and component parts, depth of well foundation and bearing capacity, forces acting on a well foundation, analysis of well foundation,
Heavy wells

