

AMC- 19: ADVANCED FOUNDATION ENGINEERING

1. MAT FOUNDATIONS:

Introduction, combined footings, common types of mat foundations, differential settlement of mats, field settlement observations for mat foundations, compensated foundation, structural design of iv/at foundations.

2. SHEET PILES WALLS:

Introduction, construction methods, cantilever sheet pile walls, special cases for cantilever walls penetrating a sandy soil, cantilever sheet piling penetrating clay, special cases for cantilever walls penetrating clay, anchored sheet pile walls, free earth support method for penetration of sandy soil, moment reduction for anchored sheet pile walls, computational pressure diagram method for penetration into sandy soil, free earth support method for penetration of clay, holding capacity of anchor plates in sand, ultimate resistance of tiebacks, field observations for anchored sheet pile walls.

3. BRACED CUTS:

Introduction, pressure envelope for braced-cut design, pressure envelope for cuts in layered soil, design of various components of a braced cut, bottom heave of a cut in clay, stability of the bottom of a cut in sand, lateral yielding of sheet piles and ground settlement.

4. PILE FOUNDATION:

Introduction, types of piles and their structural characteristics, estimating pile length, installation of piles, load transfer mechanism, equations for estimating pile capacity, meyerhof's method for estimating q_p , vesic's method for estimating q_p , janbu's method for estimating q_p , coyle and castello's method for estimating q_p in sand, other correlations for calculating q_p with spt and cpt results, frictional resistance (q_s) in sand, frictional (skin) resistance in clay, general comments and allowable pile capacity, point bearing capacity of piles resting on rock, pile load tests, comparison of theory with field load test results, elastic settlement of piles, laterally loaded piles, pile-driving formulas, stress on piles during driving, pile capacity for vibration-driven piles, negative skin friction, group efficiency, ultimate capacity of group piles in saturated clay, piles in rock, elastic settlement of group piles, consolidation settlement of group piles,

5. DRILLED SHAFT FOUNDATIONS:

Introduction, types of drilled shafts, construction procedures, other design considerations, load transfer mechanism, estimation of load-bearing capacity, drilled shafts in sand: load-bearing capacity, settlement of drilled shafts at working load, lateral load-carrying capacity, drilled shafts extending into rock.

6. FOUNDATIONS ON DIFFICULT SOILS:

Introduction, definition -and types of collapsible soil, physical parameters for identification, procedure for calculating collapse settlement, foundation design in soils not susceptible to wetting, foundation design in soils susceptible to wetting, case histories of stabilization of collapsible soil, general nature of expansive soils, laboratory measurement of swell, classification of expansive soil on the basis" of index tests, foundation considerations for expansive soils, construction on expansive soils, general nature of sanitary landfills, settlement of sanitary landfills.

7. SOIL IMPROVEMENT AND GROUND MODIFICATION:

Introduction, general principles of compaction, correction for compaction of soils with oversized particles, field compaction, compaction control for clay hydraulic barriers, vibroflotation, precompression, sand drains, an example of a sand drain application, prefabricated vertical drains, cement stabilization, fly-ash stabilization, stone columns, sand compaction piles, dynamic compaction