Civil Engg Department

Lesson Planning

Name of the Teacher- Ramcharan Singla Subject- SFE Sem Vth

Periods per week 4(T)

Week 1

1. Introduction: 1.1 Importance of soil studies in Civil Engineering, Geological origin of soils with special reference to soil profiles in India
2. Residual and transported soil, alluvial deposits, lake deposits, local soil  
   found in J&K, dunes and loess, glacial deposits.
3. Black cotton soils, conditions in which above deposits are formed and their engineering characteristics, Names of organizations dealing with soil engineering work in India, soil map of India
4. Constituents of soil and representation by a phase diagram  
   Definitions of void ratio, porosity, water content, degree of saturation.

**Week 2**

1. Specific gravity, unit weight, bulk density/bulk unit weight, dry unit  
   weight, saturated unit weight and submerged unit weight of soil grains and  
   correlation between them, Simple numerical problems with the help of phase diagrams.
2. Classification and Identification of Soils. Particle size, shape and their effect on engineering properties of soil.
3. particle size classification of soils, Gradation and its influence on engineering properties, Relative density and its use in describing cohesionless soils.
4. Behaviour of cohesive soils with change in water content, Atterberg’s limit  
   - definitions, use and practical significance.

**Week-3**

1. Field identification tests for soils.
2. Soil classification system as per BIS 1498; basis, symbols, major divisions  
   and sub divisions, groups, plasticity chart; procedure for classification of a  
   given soil.
3. Concept of permeability and its importance  
   Darcy's law, coefficient of permeability, seepage velocity and factors  
   affecting permeability
4. Comparison of permeability of different soils as per BIS, Measurement of permeability in the laboratory.

**Week 4**

13. Stresses in subsoil, Definition and meaning of total stress, effective stress and neutral stress.

14 Principle of effective stress, Importance of effective stress in engineering problems.  
15. Meaning, conditions/situations of occurrence with emphasis on practical, significance of:a) Consolidation and settlementb) Creepc) Plastic flow d) Heaving  
e) Lateral movement f) Freeze and thaw of soil  
16. Definition and practical significance of compression index, coefficient of  
consolidation, degree of consolidation.

**Week 5**

17. Revision & Assignment

18. Revision & Assignment

19. Revision & Assignment

20 Revision & Assignment

**Week 6**

21. Meaning of total settlement, uniform settlement and differential settlement;  
rate of settlement and their effects

22. Settlement due to construction operations and lowering of water table, Tolerable settlement for different structures as per BIS.

23.Concept and Significance of shear strength.  
24.Factors contributing to shear strength of cohesive and cohesion less soils,  
Coulomb's law.

**Week 7**  
25. Examples of shear failure in soils  
26.Definition and necessity of compaction, Laboratory compaction test (standard and modified proctor test as per BIS)  
27. definition and importance of optimum water content, maximum dry  
density; moisture dry density relationship for typical soils with different  
compactive efforts  
28. Compaction control; Density control, measurement of field density by core  
cutter method.

**Week 8**

29. sand replacement method, moisture control, Proctor's needle and its use,

30. thickness control, jobs of an embankment supervisor inrelation to compaction  
  
31. Revision & Assignment

32. Revision & Assignment

**Week-9**

33. Revision & Assignment

34. Revision & Assignment

35. Purpose and necessity of soil exploration

36. Reconnaissance, methods of soil exploration, Trial pits, borings (auger,  
wash, rotary, percussion to be briefly dealt)

**Week 10**

37. Sampling; undisturbed, disturbed and representative samples

38. selection of type of sample; thin wall and piston samples

39. area ratio, recovery ratio of samples and their significance, number and quantity of samples,

40. resetting, sealing and preservation of samples. Presentation of soil investigation results  
  
**Week 11**

41. Revision & Assignment

42. Revision & Assignment

43. Concept of bearing capacity  
44. Definition and significance of ultimate bearing capacity, net safe bearing  
capacity **and allowable bearing pressure.**

**Week 12**

45. Guidelines of BIS (IS 6403) for estimation of bearing capacity of soil.

46. Factors affecting bearing capacity.  
47. Concept of vertical stress distribution in soils due to foundation loads,  
pressure bulb.

48. Applications of SPT,

**Week 13**

49. unconfined compression test and direct shear test in estimation of bearing capacity.  
50. Plate load test (no procedure details) and its limitations

51. Improvement of bearing capacity by sand drain method, compaction, use  
of geo-synthetics.

52. Revision & Assignment

**Week 14**

53. Revision & Assignment

54. Concept of shallow and deep foundation

55. types of shallow foundations: isolated,  
combined, strip, mat, and their suitability.

56. Factors affecting the depth of shallowfoundations, deep foundations,

**Week 15**

57. type of piles and their suitability;

58. pile classification on the basis of material, pile group and pile cap.

59. Revision & Assignment

60. Revision & Assignment

Civil Engg Department

Lesson Planning

Name of the Teacher- Ramcharan Singla Subject- SFE Sem Vth

Periods per week 4(P)

**Week 1**

1. **To determine the moisture content of a given sample of soil**

**Week 2 & 3**

Auger Boring and Standard Penetration Test  
a) Identifying the equipment and accessories  
b) Conducting boring and SPT at a given location  
c) Collecting soil samples and their identification  
d) Preparation of boring log and SPT graphs  
e) Interpretation of test results

**Week 4**Extraction of Disturbed and Undistrubed Samples  
a) Extracting a block sample  
b) Extracting a tube sample  
c) Extracting a disturbed samples for mechanical analysis.  
d) Field identification of samples

**Week 5 & 6**Field Density Measurement (Sand Replacement and Core Cutter Method)  
a) Calibration of sand  
b) Conducting field density test at a given location  
c) Determination of water content  
d) Computation and interpretation of results

**Week 7 & 8**

Liquid Limit and Plastic Limit Determination:  
a) Identifying various grooving tools  
b) Preparation of sample  
c) Conducting the test  
d) Observing soil behaviour during tests  
e) Computation, plotting and interpretation of results

**Week 9 & 10**

Mechanical Analysis  
a) Preparation of sample  
b) Conducting sieve analysis  
c) Computation of results  
d) Plotting the grain size distribution curve  
e) Interpretation of the curve.

**Week 11 & 12**Laboratory Compaction Tests (Standard Proctor Test)  
a) Preparation of sample  
b) Conducting the test  
c) Observing soil behaviour during test  
d) Computation of results and plotting  
e) Determination of optimum moisture content and maximum dry density

**Week 13**8. Demonstration of Unconfined Compression Test  
a) Specimen preparation  
b) Conducting the test  
c) Plotting the graph  
d) Interpretation of results and finding/bearing capacity

**Week 14**Demonstration of: a) Direct Shear and Vane Shear Test on sandy soil samples

**Week 15**

Permeability test apparatus

Civil Engg Department

Lesson Planning

Name of the Teacher- Ramcharan Singla Subject- Building Construction Sem IIIrd Periods per week 4(T)

**Week 1**

1. Introduction:

2. Definition of a building, classification of buildings based on occupancy

3. Different parts of a building

4. Concept of foundation and its purpose

Week 2

5. Types of foundation-shallow and deep, Shallow foundation - constructional details of: Spread foundations for walls, min. depth criteria, thumb rules for depth and width of foundation and thickness of concrete block, stepped foundation for masonry pillars and concrete columns

6. Introduction to deep foundation and

7. their types

1. Layout/setting out for surface excavation, cutting and filling

Week 3

1. Excavation of foundation, trenches, shoring,
2. timbering and de- watering
3. Revision & Assignment
4. Revision & Assignment

Week 4

1. Purpose of walls
2. Classification of walls - load bearing, non-load bearing,
3. dwarf wall, retaining, breast walls and partition walls
4. Classification of walls as per materials of construction: brick, stone, reinforced brick

Week 5

1. reinforced concrete, precast, hollow and solid concrete block and composite masonry walls
2. Partition walls: Constructional details, suitability and uses of brick and wooden partition walls
3. Scaffolding, construction details and suitability of mason’s brick layers
4. tubular scaffolding, shoring, underpinning

Week 6

1. Brick Masonry: Definition of terms like header, stretcher, queen closer, king closer, frog and quoin, course, bond,
2. facing, backing, hearting, jambs, reveals, soffit, plinth, pillars and pilasters
3. Bond – meaning and necessity; English, flemish bond and other types of bonds
4. Construction of brick walls –methods of laying bricks in walls, precautions observed in the construction of walls,

Week 7

1. methods of bonding new brick work with old (toothing, raking, back and block bonding),
2. Expansion and contraction joints.
3. Mortars: types, selection of mortar and its preparation
4. Revision & Assignment

Week 8

1. Revision & Assignment
2. natural bed, bedding planes, string course, corbel, cornice, block in course grouting, moulding, templates, corner stone, bond stone, throating, through stone, parapet, coping, pilasters and buttress
3. Types of stone masonry: rubble masonry - random and coursed;
4. Ashlar masonry, principles to be observed in construction of stone masonry walls

Week 9

1. Meaning and use of arches and lintels:
2. abutment, pier, arch ring, intrados, soffit, extrados, voussoirs, springer, springing line, crown, key stone, skew back, span, rise, depth of an arch, haunch, spandril, jambs, bearing, thickness of lintel, effective span
3. Types of Arches - Semi circular, segmental, elliptical and parabolic, flat, inverted and relieving
4. Stone arches and their construction, Brick arches and their construction

Week 10

1. Purpose of lintel, Materials used for lintels, Cast-in-situ and pre-cast lintels, Lintel along with sun-shade or chhajja
2. Glossary of terms with neat sketche
3. Classification based on materials i.e. wood, metal and plastic and their suitability for different situations.
4. Different type of doors- panel door, flush door, glazed door, rolling shutter, steel door, sliding door, plastic and aluminium doors

Week 11

1. Window – Panel window, glazed windows (fixed and openable) ventilators, sky light window, Louveres shutters, plastic and aluminium windows
2. Door and window frames – materials and sections, fixtures and fasteners, hold fasts
3. Revision & Assignment
4. Revision & Assignment

Week 12

45 .Dampness and its ill effects on bricks, plaster, wooden fixtures, metal fixtures and reinforcement, damage to aesthetic appearance, damage to heat insulating materials, damage to stored articles and health

46. Sources of dampness - moisture penetrating the building from outside e.g. rainwater, surface water, ground moisture. Moisture entrapped during construction i.e. moisture in concrete, masonry construction and plastering work etc. Moisture which originates in the building itself i.e. water in kitchen and bathrooms etc.

47. Damp proofing materials and their specifications: rich concrete and mortar, bitumen, bitumen mastic, polymer coating, use of chemicals

48 Damp proofing of basement, Ground floors, plinth and walls, water storage tank, kitchen, W.C., roof.

Week 13

49. Glossary of terms-floor finish, topping, under layer, base course, rubble filling and their purpose

50.Types of floor finishes - concrete flooring, ceramic tile flooring, stone (marble and kota) flooring. Wooden flooring

51.Special emphasis on level/slope/reverse slope in bathrooms, toilets, kitchen, balcony and staircase

52.Types of roofs, concept of flat, pitched and arched roofs

Week 14

53 Glossary of terms for pitched roofs - batten, eaves, facia board, gable, hip, lap, purlin, rafter, rag bolt, valley, ridge, rain water gutter, anchoring bolts

54. False ceilings using gypsum, plaster boards, cellotex, fibre boards

55. Glossary of terms: Staircase, winders, landing, stringer, newel, baluster, riser, tread, width of staircase, hand-rail, nosing .Classification of staircase on the basis of material – RCC, timber, steel, Aluminium

1. Planning and layout of staircase: Relations between rise and tread, determination of width of stair, landing, Various types of layout - straight flight, dog legged, open well, quarter turn, half turn (newel and geometrical stairs), bifurcated stair, spiral stair

Week 15

1. Plastering - classification according to use and finishes like plain plaster, grit finish, rough cast, pebble dashed, concrete and stone cladding etc., dubbing, proportion of mortars used for different plasters, techniques of plastering and curing Pointing - different types of pointing and their methods
2. Painting - preparation of surface, primer coat and application of paints on wooden, steel and plastered wall surfaces. Application of white washing, colour washing and distempering, polishing, application of cement and plastic paints.

59. Selection of appropriate paints/finishes for interior and exterior surfacesImportance of preparation of surfaces such as hacking, grooving etc before application of surface finishes

60. Anti Termite Treatment to Foundation, Masonary, RCC, Floors, Junction of walls and Floors. Treatment to wooden joinery, Treatment to existing building

Civil Engg Department

Lesson Planning

Name of the Teacher- Ramcharan Singla Subject- Building Construction Sem IIIrd Periods per week 4(P)

**Week 1**

Demonstration of tools and plants used in building construction

**Week 2 & 3**

To prepare Layout of a building: two rooms building with front verandah

**Week 4, 5 & 6**

To construct brick bonds (English bond only) in one, one and half and two brick thick: (a) Walls for L, T and cross junction (b) Columns

**Week 7**

Demonstration of Timbering of excavated trenching

**Week 8**

Laying damp proof courses

**Week 9**

Construction of masonry walls

**Week 10**

Laying of tile flooring on an already prepared lime concrete base

**Week 11**

Plastering and pointing exercise

**Week 12**

Constructing RCC work

**Week 13 & 14**

Pre-construction and post construction termite treatment of building and woodwork

**Week 15**

Interlocking tiles