



## STRUCTURAL ENGG. LAB

### List of Experiments:

1. Fineness of cement by sieving
2. Water content for standard consistency of cement.
3. Initial and final setting times of cement
4. Fineness of cement by air permeability method.
5. Soundness of Cement by Le-Chatelier's Apparatus.
6. Soundness of cement by Autoclave test method.
7. Compressive strength of cement.
8. Tensile strength of cement
9. Moisture content and bulking of fine aggregate.
10. Gradation & Fineness modulus of coarse and fine aggregates.
11. Water absorption, compressive strength of Bricks.
12. Workability of cement concrete by (a) Slump test, and compaction factor test.
13. Concrete mix design for a given concrete strength and slump by I.S. Code method.
14. Flexural strength of concrete.
15. Tensile and bend test of M.S and HYSD bar.
16. Clark Maxwell's Reciprocal theorem using a beam analysis of redundant joint
17. a) Deflections of a truss b) Maxwell's Reciprocal theorem.
18. Elastic displacements of curved members
19. Elastic properties of beams
20. Three hinged arch
21. Two hinged arch
22. Behavior of struts and columns.
23. Experimental and Analytical study of 3 bar pin jointed truss.
24. Experimental and Analytical study of deformations in bar-beam combination.
25. Experimental and Analytical study of deflections in unsymmetrical bending.
26. Verification of Muller-Breslau principle-Arch / continuous beam / frame models.
27. Verification of Muller-Breslau principle-Begg's deformeter.

28. To find carry over factor for the beam with far end fixed.
29. Compressive, Flexural and tensile strength of Mortar.
30. Initial drying shrinkage, moisture movement, and coefficient of expansion of concrete.
31. Stress strain curve of concrete.
32. Behaviour of under reinforced and over reinforced R.C. beams in flexure.
33. Behaviour of R.C. beams, with and without shear reinforcement in shear.
34. Bond strength between steel bar and concrete (a) in a beam specimen and (b) by pull-out test.
35. Behaviour of pre-stressed concrete beams in flexure.
36. Ultimate strength and deflection of R.C.C. slab.
37. High strength concrete using admixtures.
38. Non destructive testing of concrete.



## TRANSPORTATION ENGG. LAB

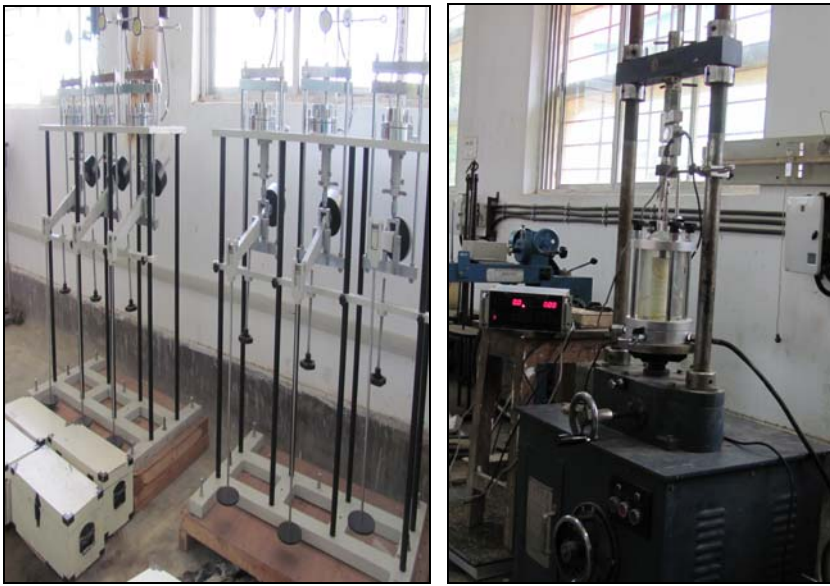
### List of Experiments:

1. Determination of Water absorption of road aggregates
2. Determination of Specific gravity of aggregates
3. Determination of Impact Test of aggregates
4. Los Angel's abrasion test
5. Devel's abrasion test
6. Test for Crushing Strength of Aggregates
7. Determination of Flakiness and Elongation Indices of aggregates, Angularity number
8. Determination of Penetration of bitumen
9. Determination of Viscosity of bitumen (Saybolt)
10. Determination of Specific Gravity of bitumen
11. Determination of Ductility of bitumen
12. Determination of Softening point of bitumen
13. Determination of Water content of bitumen
14. Determination of Bitumen content by Centrifuge Extractor
15. Field test of Bricks
16. Determination of CBR value (Field)
17. Determination of CBR value (Lab)
18. Determination of water absorption of Brick
19. Determination of Crushing value of Brick
20. Determination of Loss on Heating of bitumen.
21. Bituminous Mix Design (Marshal Method)
22. Determination of stripping value of Road Aggregate,
23. Determination of Soundness Test of Aggregate
24. Roughness Evaluation of Pavement surface using MERLIN
25. Roughness Evaluation of Pavement surface using Bump integrator
26. Banklemen beam Test of Pavement
27. Soil-Cement Mix Design,
28. Test on Cutback, Emulsion and Tar
29. Spot speed studies
30. Traffic Volume studies
31. Axle Load Survey
32. Traffic density, Capacity studies.
33. Accident Studies.



### **SOLID MECHANICS LAB**

- 1) Introduction to testing equipments
- 2) Uniaxial tension test ( Mild Steel, Timber)
- 3) Uniaxial compression test (Timber along and across, concrete, bricks etc.)
- 4) Torsion test (Mild Steel, aluminum)
- 5) Bending stress distribution in beams using demec gauges extensometer
- 6) Analysis of truss model with spring members.
- 7) Compression test on brick masonry specimen
- 8) Hardness test
- 9) Creep test
- 10) Impact test
- 11) Strength of Etched and Un-etched glasses
- 12) Spring test
- 13) To study the microstructure of various metals.



## GEOTECHNICAL ENGINEERING LAB

### List of Experiments:

1. Grain Size analysis of Soil by Sieve.
2. Specific Gravity of Soil.
3. Grain size analysis of Soil by Hydrometer.
4. Field Density of Soil.(Two Methods)
5. Atterberg Limits of Soil ( Two methods)
6. Permeability test of Soil.
7. Consolidation Test of Soil.
8. Determination of moisture content by rapid moisture metre.
9. Standard Proctor test of Soil.
10. Direct Shear Test.
11. Triaxial Test for Different Drainage Condition
12. Standard Penetration test of Soil
13. Static Cone Penetration Test.
14. Dynamic Cone Penetration test
15. Plate load test



## SURVEY FIELD WORKS

### **Survey Field Works based on :**

1. Chain Surveying.
2. Compass Surveying.
3. Levelling.
4. Plane Table Surveying.
5. Triangulation Survey including adjusted coordinates.
6. Trilateration Survey.
7. Plane Table Survey including Two and Three point Problems
8. Layout of Curves.
9. Layout of Building and Culvert.
10. Topographic Mapping ( i.e. Plotting of the details of well contours area).
11. Volume Calculation.
12. Locate a point using hand GPS.
13. Profiling by total station.

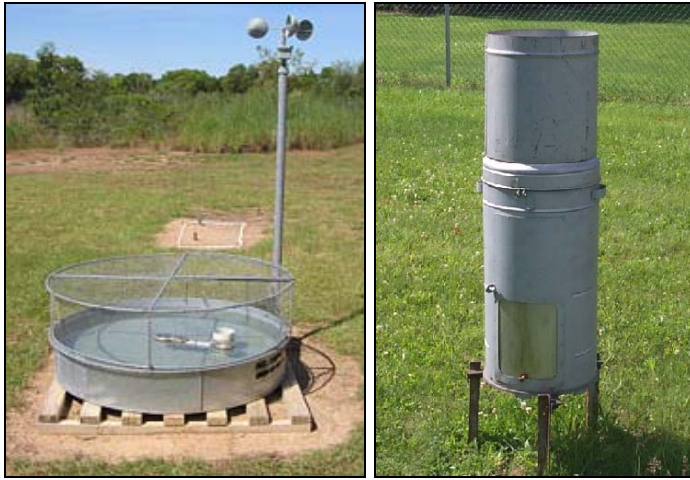




### **ENVIRONMENTAL ENGG. LAB**

#### List of Experiments:

1. Collection and analysis of sound samples.
2. Classification of Solid wastes.
3. Air volume sampling.
4. Determination of turbidity, colour and conductivity.
5. Determination of pH, alkalinity and acidity.
6. Determination of hardness and chlorides.
7. Determination of residual chlorine and chlorine demand.
8. Determination of Dissolved Oxygen.
9. Determination of Most Probable Number (MPN) of Coliforms.
10. Determination of B.O.D of sewage
11. Determination of C.O.D of domestic and industrial sewage.
12. Determination of kjeldal nitrogen
13. Determination of volatile, mixed, filterable and dissolved solids.
14. Determination of optimum dose of coagulants.
15. Determination iron and two heavy metals.
16. Determination of SO<sub>2</sub> in the ambient air.
17. Measurement of particulate matter in air.
18. Determination of Sound intensity by sound level meter.



## **WATER RESOURCES ENGG LAB**

### **List of Experiments:**

1. Rainfall Measurement
2. Measurement of rate of evaporation
3. Measurement of rate of infiltration of water in soil.
4. Measurement of velocity of flow in river or stream
5. Delineation of catchment boundary and drainage network to determine the hydrological parameters.
6. Computer Aided (CAD) design in water resources engineering.





### **ENGINEERING GEOLOGY-LAB**

1. Megascopic identification of minerals and rocks.
2. Microscopic identification of some selected minerals and rocks.
3. Interpretation of Geological Maps-
  - a) Drawing the geological sections of geological maps.
  - b) Inter-relation of Geological maps and sections with respect to sub surface structure.
4. Problems of Locating Sites of projects like Dams, Tunnels, Highways.



## HYDRAULICS LAB

### List of Experiments:

1. To verify the momentum equation experimentally.
2. To verify the Bernoulli's Equation experimentally
3. To determine the co-efficient of friction in pipe
4. To determine the coefficient of discharge of venturimeter.
5. To determine the coefficient of discharge of an orifice meter.
6. To determine the coefficient of discharge of Triangular Notch.
7. To determine the Manning's coefficient of roughness 'n' for the bed of a given flume.
8. To study the velocity distribution in an open channel and to determine the energy and momentum correction factors.
9. To study the flow characteristics over a hump placed in an open channel.
10. To study the flow through a horizontal contraction in a rectangular channel.
11. To study the characteristics of free hydraulic jump, using tilting flume.



## **HYDRO-INFORMATICS ENGINEERING LABORATORY**

### **LIST OF EXPERIMENTS**

#### **WATER QUALITY, HYDROLOGY AND HYDRAULICS INSTRUMENT LABORATORY**

1. Determination of Physical Parameters of Water Quality - Turbidity, Temperature, Color, Electrical Conductivity, Total Dissolved Solid, Total Suspended Solid
2. Determination of Chemical Parameters of Water Quality-pH, Hardness, Chlorine, DO, BOD, COD.
3. Determination of Biological Parameters of Water Quality- Bacteria- Testing for coliforms.
4. Rainfall Measurement- Rainfall Data collection by Natural Syphon Recording type Raingauge.
5. Meteorological Parameter determination- Weather Station Instrument.
6. Determination of  $\phi$  index- Double Ring type Infiltrometer, Single Ring Infiltrometer.
7. Determination of rate of evaporation.
8. Velocity measurement- Micro ADV (Lab measurement).
9. Velocity & Discharge measurement - River Surveyor M9.
10. Depth measurement- Echo-Sounder, River Surveyor M9.
11. Particle size distribution analysis-Sieve Analysis.

#### **APPLICATION SOFTWARE LABORATORY**

1. Delineation of watershed boundary using Google Earth Pro. and G.I.S. Tool.
2. Derivation of the information using image processing software.
3. Simulation of the hydrological response of watershed using the HEC-HMS software Hydrological modeling- HEC -HMS Software.
4. Developing Simulation model based on real life problem using Alyuda NeuroIntelligence (ANN) and Group Method of Data Handling (PNN).
5. Developing the autoregressive model that is representation of a type of random process, as such, it is used to describe certain time-varying process in nature, economics etc.
5. Conversion of the data into outstanding color, surface, weir frame, vector, image, shaded relief and post maps using Surfer 3D mapping software.
6. Analysis of Hydraulic and pipe flow system using CADRE Flow software.