

Minutes of the meeting held on 22.05.2018 with the Principals, Heads of Civil Engineering Section and soil mechanics lab in-charges in the conference hall O/o Commissioner of Technical Education, Vijayawada.

The following have attended the meeting to finalise the guidelines, rates for the testing of samples and Certificate to be issued.

1. The Special Commissioner of Technical Education, AP., Vijayawada
2. Regional Joint Directors of TE, Tirupathi and Kakinada
3. Officers of the O/o Commissioner of Technical Education, Vijayawada
4. Principals of Government Polytechnics
5. Heads of Civil Engineering Section.
6. Lab-in charges of Soil Mechanics lab.

The staff-members of the Polytechnics have been formed into four groups and entrusted the following tasks.

Group I : to finalise the Rates to be charged for each test

Group II: to prepare the Guidelines for undertaking Internal Revenue Generation

Group III: to prepare the modalities for the utilisation of Institute share of IRG

Group IV: to finalise the format of Certificate to be issued for the tests

On completion of the tasks the groups have made a presentation to other groups and after thorough discussions they have finalised the guidelines rates and certificate to be issued. The guidelines, rates for the tests, certificate has been finalised and are enclosed to these minutes as an annexure.

Sd/- G.S.Panda Das
SPECIAL COMMISSIONER

Encl: as above

To

The Principals of all Government Polytechnics in the state

Copy to

The Regional Joint Directors of TE, Tirupathi and Kakinada for information

GUIDE LINES FOR IRG AT INSTITUTION LEVEL

Testing and Consultancy Services:

1. Testing and Consultancy services from all laboratories of all branches shall be brought under a single head of account under the name "IRG-<Name of the Polytechnic>" for Ex: IRG-GPT, TIRUPATHI
The Revenue thus generated shall be remitted to the said account of institution, on the same day by DD/Online/Swiping machine.
2. A receipt book (with pages numbering and book numbering) shall be maintained.
3. A cash book shall also be maintained.
4. Requisition letters from the clients addressed to the Principal shall be obtained.
5. The following register shall be maintained

Sl. No.	Name of the Client	Tests required	Amount (DD/Online/ Swiping machine)	Receipt No.	Date of Request	Report issue Date	Signature of the Staff	Signature of Head of section	Signature of principal
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6. A statement reflecting the revenue generated during a month and the amount transferred to the O/o Commissioner of Technical Education shall be sent to The O/o Commissioner of Technical Education every month before 10th of the subsequent month.
7. Every lab shall maintain latest editions of relevant I.S. Codes (Hard copies)
8. An office copy of the test reports issued shall be kept in the laboratories for a period of three years.
9. The specimen calculations shall also be preserved for a period of three years for future reference.
10. Any field tests, if required, shall be conducted in the presence of the laboratory/testing in-charge at the expense of the client. The necessary log of visit to the site shall be maintained. The absence shall be treated as on duty
11. The principals are requested to instruct the clients that the sample collection and transportation of the sample to the polytechnic duly following the standard procedure is the responsibility of the client. The tests will be conducted on the samples brought to the laboratory by the client and result will be based on them

The funds generated by taking up of Testing, Institutional Consultancy & Individual Consultancy services will be Utilised / Distributed as suggested below.

I. TESTING IN THE LABORATORY

1. To the Office of Commissioner of Technical Education 50 %

These funds shall be utilised for the developmental activities of those institutions where generation of IRG is not possible.

2. To the Institution 50 %

a. Staff Involved (40 % of the 50% of institutional share)

- i. Faculty 16%+4%(Lab in charge) 20 %
- ii. Head Of Section 07 %
- iii. Principal 04 %
- iv. Supporting Staff/ Helper 06 %
- v. Office staff 03 %

b. Institution (60 % of the 50% of institutional share)

The funds can be utilised for the following activities

- i. Calibration / Repairs / Maintenance of Lab Equipment
- ii. Stationary / Consumables
- iii. Net Connectivity / Smart Classes
- iv. Development of Institution – Priority has to be given for the Department which has generated IRG.
- v. Wages for guest faculty as per Govt. Memo/Orders
- vi. For students welfare

II. INSTITUTIONAL CONSULTANCY

- 1. The Department(s) / Branch (es) doing consultancy 60 %
- 2. To the Office of Commissioner of Technical Education 20 %
- 3. To the Institution 20 %

III. INDIVIDUAL (STAFF ON ROLLS) CONSULTANY

- 1. The Individual staff doing consultancy 70 %
- 2. To the Office of Commissioner of Technical Education 15 %
- 3. To the Institution 15 %

Note: The Technical Education Department / Institution where the faculty is working will not hold any type of responsibility in the Consultancy works

LABORATORY SOIL TESTING:

- Use of different Tests
- Relevant Codes of Practice and
- Significance of the Results for Design and Quality Control in the Field of Soil Mechanics

REAS OF FIELD APPLICATIONS:

- Design (Strength and Settlement Analysis) and Construction of Foundations in Buildings, Bridges, Retaining Walls etc.,
- Quality Control in Highways, Railways, Earthen Dams, Slope Protection, Filter Beds, etc.

Sl. No.,	Details of the Test	Test Method/ Reference Codes of Practice (Please check for any latest Revisions)	Significance and Theory	Test Charges in Rupees
1.	WATER CONTENT	(IS: 2720 (Part 2) – 1973) (IS: 2720 (Part 18) – 1964) (IS: 2720 (Part 19) – 1964)	In almost all soil tests, natural moisture content of the soil is to be determined. The knowledge of the natural moisture content is essential in all studies of soil mechanics. To sight a few, natural moisture content is used in determining the bearing capacity and settlement. The natural moisture content will give an idea of the state of soil in the field.	250
2.	SPECIFIC GRAVITY	IS: 2720 (Part 3/ Sec 1 & 2) -1980	Specific gravity is the ratio of the weight in air of a given volume of a material at a standard temperature to the weight in air of an equal volume of distilled water at the same stated temperature.	300
3.	BULK DENSITY	IS: 2720 -1980	Bulk density of soil is the mass of aggregates required to fill the container of a unit volume after soil is batched based on volume. It depends on the packing of soil i.e. Either loosely packed or well dense compacted soil. In case, if the specific gravity of material is known, then it depends on the shape and size of particles. It is because, if all the particles are of same size then, packing can be done up to a very limited extent. If the addition of smaller particles is possible within the voids of larger particles then these smaller particles enhance the bulk density of the packed material. Shape of the particles also influence very widely, because closeness of particles depends on the shape of soil particles.	300
4.	GRAIN SIZE ANALYSIS BY SIEVING	IS: 2720 (Part 4) - 1985	The grain size analysis is widely used in classification of soils. The data obtained from grain size distribution curves is used in the design of filters for earth dams and to determine suitability of soil for road construction, air field etc. Information obtained from grain size analysis can be used to predict soil water movement although permeability tests are more generally used.	750
5.	FREE SWELL	IS: 2720 (Part	Used for Soil classification The clay and specially the black cotton soils have a tendency to swell in small	400

	INDEX	40) -1977	or more proportion when submerged in water. Free swell or differential free swell also termed as free swell index, is the increase in volume of soil without any external constraint when subjected to submergence in water.	
6.	SWELLING PRESSURE OF SOIL	IS: 2720 (Part 41) – 1977	The one-dimensional consoli-dometer is widely used for the measurement of swelling characteristics of expansive soils. The swelling pressure (in the consolidometer test) has been defined as the pressure which prevents the specimen from swelling or the pressure which is required to return a swelled specimen back to its original state (void ratio, height) prior to swelling.	3000
7.	ATTERBERG LIMIT (LL & PL) & Plasticity Index	IS: 2720 (Part 5) -1985	The Atterberg limits are a basic measure of the critical water contents of a fine-grained soil, such as its shrinkage limit, plastic limit, and liquid limit. As a dry, clayey soil takes on increasing amounts of water, it undergoes dramatic and distinct changes in behaviour and consistency. Depending on the water content of the soil, it may appear in four states: solid, semi-solid, plastic and liquid. In each state, the consistency and behaviour of a soil is different and consequently so, are its engineering properties. Estimated compression index is useful for settlement analysis.	1200
8.	SHRINKAGE FACTORS	IS: 2720 (Part 6) – 1972	The soil shrinkage is defined as the specific volume change of soil relative to its water content and is mainly due to swelling properties of the clay.	1500
9.	CLASSIFICATION OF SOIL based on Grain size & Atterberg's limits mandatory	IS: 2720 (Part 4) -1985, IS: 2720 (Part 5) - 1985 IS: 1498- 1970	To enable the identification and classification of soil strata	250
10.	STANDARD PROCTOR'S COMPACTION TEST / MDD & OMC of soil	IS: 2720 (Part 7) – 1980	Basis of comparison for field compaction to produce a strong, settlement free and firm sub grade (soil layer supporting the foundation of a road pavement.) Soil compaction is defined as the method of mechanically increasing the density of soil. In construction, this is a significant part of the building process. If performed improperly, settlement of the soil could occur and result in unnecessary maintenance costs or structural failures. Almost all types of building sites and construction projects utilize mechanical compaction techniques. OMC & MDD are essential parameters for the design, construction & quality control of earth works, in highways, dams etc.,	1250
11.	MODIFIED PROCTOR'S COMPACTION TEST OR HEAVY COMPACTION TEST / MDD &	IS: 2720 (Part 8)- 1983	For Projects where heavy compaction is essential, like Airfields, Highways, Earthen Dams.	1500

	OMC of soil			
12.	FIELD DENSITY OF SOIL- By Sand Replacement Method	IS: 2720 (Part 28) -1974	The field density Indicates the state of compaction of the soil at a location and the method is suitable for locations/situations where a core cannot be cut/taken	1200
13.	FIELD DENSITY OF SOIL- By core cutter Method	IS: 2720 (Part 29) -1975	Indicates soil compaction and suitable where a cake of soil can be cut for density measurement	1000
14.	UNCONFINED COMPRESSIVE STRENGTH TEST OF SOIL	IS: 2720 (Part 10) - 1973	The unconfined compressive strength (UCS) is the maximum axial compressive stress that a right-cylindrical sample of material can withstand under unconfined conditions (the confining stress is zero). It is also known as the uniaxial compressive strength of a material because the application of compressive stress is only along one (longitudinal) or axis i.e., the axis of the specimen.	3000
15.	TRIAXIAL SHEAR TEST	IS: 2720 (Part 11 & Part 12) - 1986	In a triaxial shear test, stress is applied to a sample of the material being tested in a way which results in stresses along one axis being different from the stresses in perpendicular directions. This is typically achieved by placing the specimen between two parallel platens which apply stress in one direction, and applying fluid pressure to the specimen to apply stress in the perpendicular directions. The triaxial test is carried out in a cell on a cylindrical soil specimen having a length to diameter ratio of 2. The usual sizes are 76 mm x 38 mm and 100 mm x 50 mm. Three principal stresses are applied to the soil specimen, out of which two are through radially applied water pressure inside the confining cell and are equal. The third principal stress is applied by a loading ram through the top of the cell and is different to the other two principal stresses. The soil specimen is placed inside a rubber sheath which is sealed to a top cap and bottom pedestal by rubber O-rings. For tests with pore pressure measurement, porous discs with filter papers (soil side) are placed at both ends of the of the specimen in order to speed up the consolidation process. Pore pressure generated inside the specimen during testing can be measured by means of pressure transducers/special apparatus (pore pressure apparatus).	5000
16.	DIRECT SHEAR TEST	IS: 2720 (Part 13) - 1986	The concept of direct shear is simple and mostly recommended for granular soils, sometimes on soils containing some cohesive soil content. The cohesive soils have issues regarding controlling the strain rates to drained or undrained loading. In granular soils, loading can always assumed to be drained. A schematic diagram of shear box shows that soil sample is placed in a square box which is split into upper and lower halves. Lower section is fixed and upper section is pushed or pulled horizontally	2000

			relative to other section; thus forcing the soil sample to shear/fail along the horizontal plane separating two halves. Under a specific Normal force, the Shear force is increased from zero until the sample is fully sheared. The test is repeated for different values of normal stress (1, 2 & 3 kgf/cm ² using the counterweights earmarked) The relationship of Normal stress and Shear stress at failure gives the failure envelope of the soil and provides the shear strength parameters (cohesion-'c' and internal friction angle-' Φ ').	
17.	LABORATORY CALIFORNIA BEARING RATIO TEST a) Soaked b) Unsoaked	IS 2720 - Part 16 : 198	The California Bearing Ratio test is a penetration test meant for the evaluation of sub-grade strength of roads and pavements. The results obtained by these tests are used with the empirical curves to determine the thickness of pavement and its component layers. This is the most widely used method for the design of flexible pavements in countries like India where there is no data on comprehensive long range road tests (AASHTO, NHRP).	5500 3500
18.	PERMEABILITY OF SOIL	IS: 2720 (Part 17) - 1986	The soil permeability is a measure indicating the capacity of the soil or rock to allow fluids to pass through it. The permeability coefficient can be determined in the laboratory using falling head permeability test (for coarse grained soils like sands & gravels) and constant head permeability test (for fine grained soils like clays & silts). Permeability of a soil is a measure of seepage/percolation, which is the ease with which the water flows through the voids in soil in The knowledge of this property is much useful in solving problems involving yield of wells in water bearing strata, design of sand filters, seepage calculations through earthen dams, stability of earthen dams and embankments of canal banks affected by seepage, settlement etc.	3500
19.	CONSOLIDATION TEST	IS: 2720 (Part 15) - 1986	This test is useful for settlement calculations in foundation design. It is performed to determine the magnitude and rate of volume reduction that a laterally confined soil specimen undergoes when subjected to compression in the form of different vertical pressures. From the measured data, the consolidation curve (pressure-void ratio relationship) can be plotted. This data is useful in determining the compression index, the recompression index and the pre-consolidation pressure (or maximum past pressure) of the soil. In addition, the data obtained can also be used to determine the coefficient of consolidation and the coefficient of secondary compression of the soil.	8000
20.	LABORATORY VANE SHEAR TEST	IS:2720 (Part 30)-1980	Used for the measurement of shear strength of cohesive soils of low values of shear strength (<0.5N/cm ²)	1500

RATES FOR TESTS IN CIVIL ENGINEERING LABORATORIES

S.No.	Name of the Test	Proposed rates
1	TESTS ON CEMENT	
	Specific Gravity	Rs.300/-
	Fineness of Cement	Rs.300/-
	Normal Consistency	Rs.300/-
	Initial Setting Time	Rs.300/-
	Final Setting Time	Rs.300/-
	Compressive Strength-3 days	Rs.450/-
	Compressive Strength-7 days	Rs.450/-
	Compressive Strength-28 days	Rs.450/-
	Soundness test	Rs.400/-
	All cement tests	Rs.1500/-
2	TESTS ON FINE AGGREGATE	
	Water Absorption of Sand	Rs.300/-
	Fineness Modulus (Sieve Analysis)	Rs.350/-
	Silt content & clay content	Rs.400/-
	Specific Gravity	Rs.300/-
	% of Voids	Rs.300/-
	Bulking of sand	Rs.300/-
	Bulk Density	Rs.300/-
	Sieve Analysis	Rs.400/-
	Uniformity coefficient of sand	Rs.300/-
3	TESTS ON COARSE AGGREGATE	
	Sieve Analysis	Rs.400/-
	Specific Gravity	Rs.300/-
	% of Voids	Rs.300/-
	Water Absorption of CA	Rs.300/-
	Flakiness Index	Rs.250/-
	Elongation Index	Rs.400/-
	Impact Value	Rs.400/-
	Crushing Value	Rs.400/-
	Abrasion Value	Rs.500/-
	Silt CONTENT	Rs.300/-
	Bulk Density	Rs.300/-
4	TESTS ON BRICKS	
	Water Absorption	Rs.300/-
	Compressive Strength of Bricks (3 Nos.)	Rs.450/-
	Compressive Strength of Fly Ash Bricks	Rs.600/-
	Compressive Strength of size 29x19x15cm bricks	Rs.600/-
	DIMENSIONAL ANALYSIS	Rs.250/-
	Efflorescence of Bricks (% of Solids Deposition)	Rs.300/-
5	TESTS ON CONCRETE	
	Compressive Strength of CC Cubes of size 150x150x150mm	Rs.450/-
	Compressive Strength of CM Cubes	Rs.450/-
	Slump Test	Rs.600/-
	Compaction Test	Rs.600/-
	Compressive Strength of Cubes of size 300x300x300mm	Rs.450/-

6	DESIGN MIX REPORT (Including all material properties)	Rs.8000/-
7	TESTS ON METALS	
	Tension Test including Weight Coefficient, Ultimate Stress, Proof Stress & Percentage elongation	
	up to 12mm	Rs.800/-
	More than 12mm	Rs.1000/-
	Brinnell Hardness Test	Rs.500/-
	Rockwell Hardness Test	Rs.500/-
	Impact Test	Rs.500/-
	Torsion Test	Rs.500/-
	Cold Bend test	Rs.300/-
	Re bend test	Rs.300/-
8	TESTS ON WATER	
	Temporary hardness	Rs.300/-
	Permanent hardness	Rs.300/-
	Chlorides	Rs.400/-
	Sulphates	Rs.400/-
	Nitrates	Rs.400/-
	pH	Rs.200/-
	Turbidity	Rs.300/-
	Conductivity	Rs.200/-
	Acidity	Rs.200/-
	Alkalinity	Rs.200/-
	TDS	Rs.500/-
	Volatile Organic solids	Rs.500/-
	Inorganic solids	Rs.500/-
	Water Testing of all parameters-Physical & Chemical	Rs.1500/-
9	TESTS ON BITUMEN	
	Flash point & Fire point	Rs.1000/-
	Bitumen Adhesion test	Rs.700/-
	Penetration test	Rs.700/-
	Specific Gravity	Rs.700/-
	Ductility test	Rs.700/-
	Viscosity test	Rs.700/-
	Float test	Rs.700/-
	Softening point test	Rs.700/-
	Loss on heating test	Rs.700/-
	Water content test	Rs.700/-
10	TESTS ON FLOOR & WALL TILES	
	Modulus of rupture	Rs.1500/-
	Water absorption	Rs.1000/-
	Physical test (size and thickness)	Rs.500/-
	Scratch resistance	Rs.1500/-
	Chemical resistance	Rs.1500/-



GOVERNMENT OF ANDHRA PRADESH DEPARTMENT OF TECHNICAL EDUCATION



NAME OF THE POLYTECHNIC : _____
NAME OF THE TEST : _____
NAME OF THE CLIENT : _____
NAME OF THE WORK : _____

CLIENT REF NO. : _____
POLY. REFERENCE NO : _____

DATE OF SAMPLE RECEIVED : _____
DATE OF TESTING : _____
DATE OF ISSUE : _____

CERTIFICATE

This is to certify that the following test has been conducted on the test samples supplied by the client.

TEST RESULTS

TEST REFERENCE CODE: _____

Note: Test results are related to the samples tested only

Test Conducted by:

HEAD OF SECTION

PRINCIPAL

Note:

1. Results of all the tests have to be given in the certificate only.
2. Any data, graphs, notes to be provided to the client can be given as an attachment to this certificate.

Sd/- G.S.Panda Das
Special Commissioner