



# **INSTITUTE OF INFRASTRUCTURE, TECHNOLOGY, RESEARCH AND MANAGEMENT**

An Autonomous University established by Government of Gujarat



## ***Department of Civil Engineering***

*Laboratory facilities available for  
External Institutions/Organizations*



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**About:**

The Government of India is emphasizing on up gradation of infrastructure by focusing on schemes such as development of Smart Cities, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), National Highways Development Project (NHDP), and Setu Bharatam. With a view to contribute in such initiatives of the Government, by developing technical qualified human resource and state-of-the-art infrastructural facilities, the Department of Civil Engineering at IITRAM started along with the inception of the Institute in the year 2013. Presently, the Department offers three academic programmes leading to B.Tech. in Civil Engineering, M.Tech. in Civil Engineering (with specializations in Urban Infrastructure) Geotechnical and Engineering and Ph.D. in all major Civil Engineering sub-specializations.

Since, Civil Engineering is the professional engineering discipline that constitutes the backbone of the infrastructural and economic development of the society, the Department is well equipped with state-of-the-art facilities to fulfill requirements of both academics, industries and cutting edge research. The well qualified and experienced faculty members in the Department also aspire to share their expertise for consultancy services and involve in the R&D activities in the field of Soil Mechanics, Roads and Building, Traffic Engineering, Water Resources, Structural Engineering, Environmental Engineering and allied areas.

**Laboratories:**

- Hydraulics Laboratory
- Surveying & Geoinformatics Laboratory
- Soil Mechanics Laboratory
- Transportation Engineering Laboratory
- Smart & Sustainable Materials Laboratory
- Advanced Instrumentation Laboratory
- Environmental Engineering Laboratory
- Construction Materials Laboratory



# HYDRAULICS LABORATORY



## Recirculating flume with dimensions of 10m (length) x 1m (width) x 0.8m (depth)

### Key capabilities:

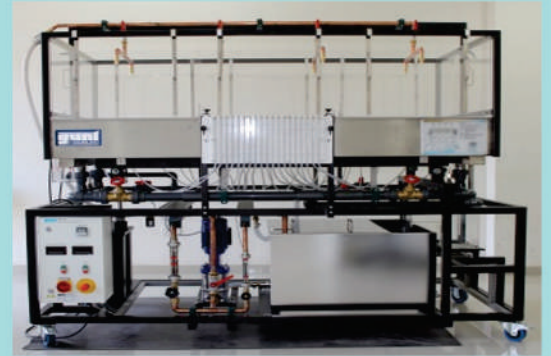
1. Hydrodynamic Experiments - Turbulent flow studies, Vortex and wave generation etc.
2. Sediment Transport Studies - Sediment supply and recirculation, Sediment scouring around hydraulics structures, Morphodynamics modelling etc.
3. Environmental Hydraulics - Pollutant transport studies etc.
4. Model Testing and Validation - Scaled physical models, Hydraulic structure efficiency etc.

## Advanced Hydrological Simulator

### Key capabilities:

1. Hydrological Process Simulation - Precipitation-runoff modelling, Infiltration and percolation estimation etc.
2. Surface and Groundwater Interaction - Surface water flow modelling, Groundwater flow, Aquifer and well dynamics etc.
3. Sediment Transport and Erosion Modeling - Sediment transport dynamics, Soil erosion processes etc.
4. Urban Hydrology - Stormwater management studies, Small scale flood risk management studies

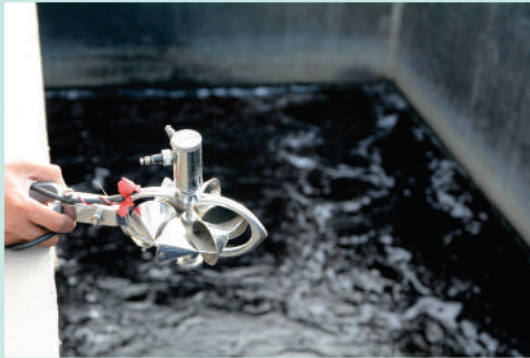
Make / model – GUNT, Germany



## Pigmy/ Cup type Water Current Meter

### Key capabilities:

1. Measurement of wide range of velocities of flowing water
2. Range for Pigmy type water current meter-0-2.5 m/s
3. Range for Cup type water current meter-0-3.5 m/s



## Charges

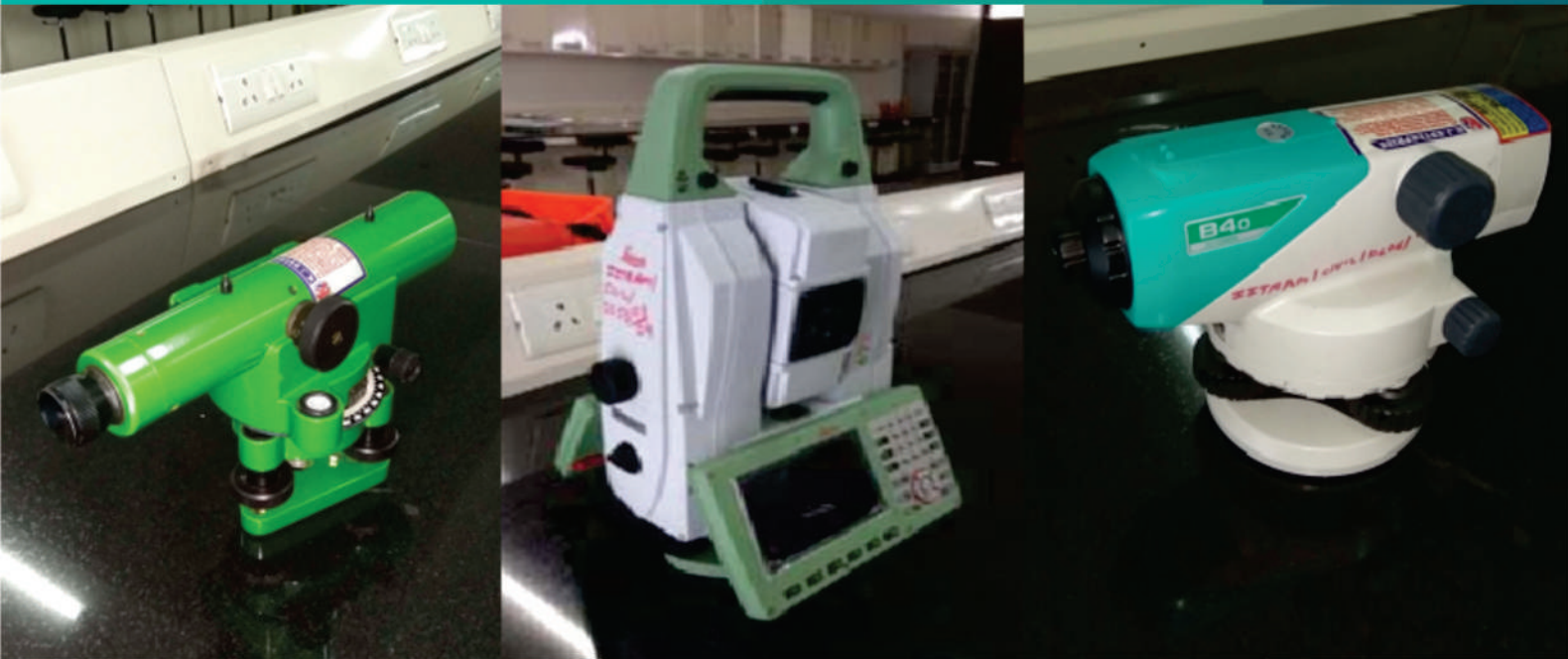
Sr. No.	Name of equipment / facility	Charges for Academic institutions & Government organizations (INR)	Charges for Industry (INR)	Remarks if any
1	Advanced Hydrological Simulator	5000	10,000*	*per day charges
2	Pigmy/ Cup type Water Current Meter	3000*	6000*	*per day charges
3	Recirculating Flume with ADV	15000*	25000*	*per day charges **consumable charges extra



(All charges mentioned above are excluding GST)



# SURVEYING AND GEOINFORMATICS LABORATORY



## Automatic Level



Sokkia B40 Automatic Level

### Key capabilities

- Reliable and precise instrument widely used for measuring elevation, slope angle, and horizontal distance in surveying.
- **Make / model - Sokkia B40 Automatic Level**

## Total Station



Leica MS60 Total Station



Prism

### Key capabilities:

- Good accuracy and advanced performance, making it ideal for most of the surveying tasks.
- **Make / model – Leica MS60**

### Charges

Sr. No.	Name of equipment / facility	Charges for Academic institutions & Government organizations (INR)	Charges for Industry (INR)	Remarks if any
1	Automatic Level	2000	3000	*Per day charges
2	Total Station	25000	35000	*Per day charges

(All charges mentioned above are excluding GST)

## SOIL MECHANICS LAB

### Universal Automatic Soil Compactor



Sr. No.	Key capabilities	Charges for Academic institutions & Government organizations (INR)	Charges for Industry (INR)	Remark (if any)
1	It is designed to compact specimens automatically and uniformly for standard and modified proctor tests.	1500	3000	For Light Compaction Test, Rates are per test set
		1750	3500	For Heavy Compaction Test, Rates are per test set

### California Bearing Ratio Test



Sr. No.	Key capabilities	Charges for Academic institutions & Government organizations (INR)	Charges for Industry (INR)	Remark (if any)
1	This test setup helps to measure the strength of soil and other paved materials by determining the pressure required to penetrate a soil sample with a plunger	2560	3200	Unsoaked – Light compaction, Rates are per test set
		3200	4000	Soaked – Light compaction, Rates are per test set
		3200	4000	Unsoaked – Heavy Compaction, Rates are per test set
		4000	5000	Soaked – Heavy Compaction, Rates are per test set

### Unconfined Compression Shear Test



Sr. No.	Key capabilities	Charges for Academic institutions & Government organizations (INR)	Charges for Industry (INR)	Remark (if any)
1	The test measures the unconfined compressive strength (UCS) of a soil/cemented soil specimen. The maximum loading capacity is 10 kN.	800	1000	Set of three tests

(All charges mentioned above are excluding GST)



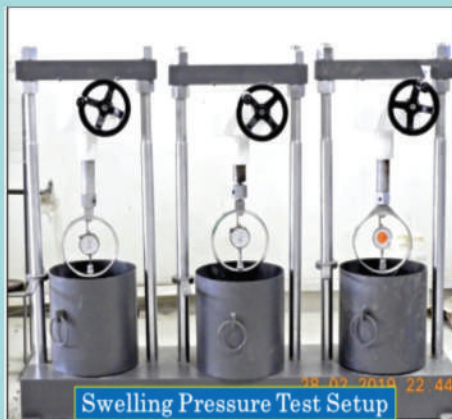
## SOIL MECHANICS LAB

### Direct Shear Apparatus (60 mm × 60 mm) - Motorised



Sr. No.	Key capabilities	Charges for Academic institutions & Government organizations (INR)	Charges for Industry (INR)	Remark (if any)
1	The test measures geotechnical properties of soil/cemented soils	1600	2000	Rates are per test set

### Swelling Pressure Apparatus



Sr. No.	Key capabilities	Charges for Academic institutions & Government organizations (INR)	Charges for Industry (INR)	Remark (if any)
1	To determine the swelling pressure developed by soil specimens moulded to desired densities at known moisture content	2400	3000	Rates per test Sample

### Autotriax Test Apparatus

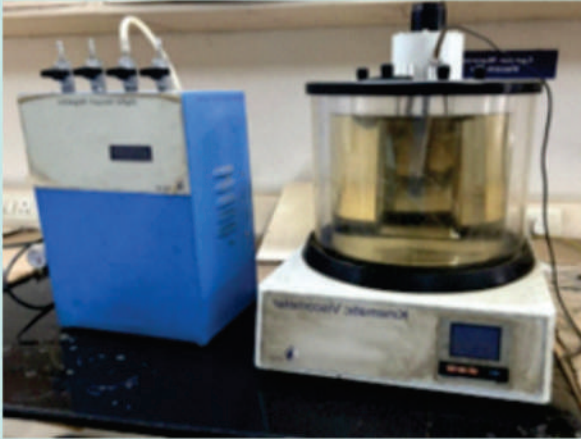


Sr. No.	Key capabilities	Charges for Academic institutions & Government organizations (INR)	Charges for Industry (INR)	Remark (if any)
1	The AUTOTRIAX test apparatus can perform variety of triaxial tests (UU / CU / CD and measure permeability) on up to 100 mm samples.	5760	7200	UU Triaxial tests on 3 Specimen of 38 mm × 76 mm
		6800	8500	UU Triaxial tests on 3 Specimen of 50 mm × 100 mm
		14400	18000	CU Triaxial tests on 3 Specimen of 38 mm × 76 mm
		16800	21000	CU Triaxial tests on 3 Specimen of 50 mm × 100 mm

(All charges mentioned above are excluding GST)

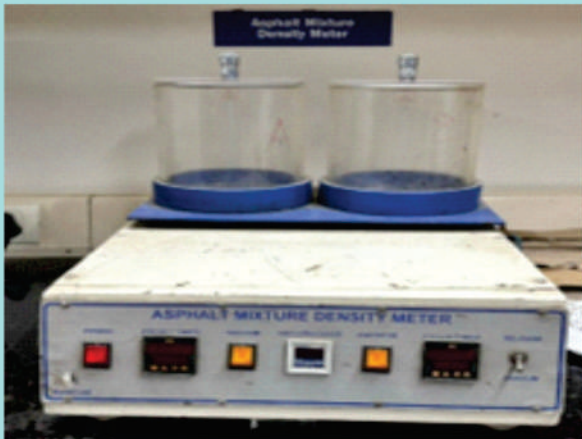
## TRANSPORTATION ENGINEERING LAB

### Cannon-Manning Viscometer-Make: AIMIL (XMT/F9000)



<b>Key capabilities</b>	Measures the viscosity of highly viscous materials
<b>Charges for Academic institutions &amp; Government organizations (INR)</b>	2460
<b>Charges for Industry (INR)</b>	3080
<b>Remark (if any)</b>	Per sample

### Asphalt Density Meter Make: AIMIL (AIM 582)



<b>Key capabilities</b>	Used for determination of theoretical density of asphalt mixer by vacuum method
<b>Charges for Academic institutions &amp; Government organizations (INR)</b>	3000
<b>Charges for Industry (INR)</b>	5000
<b>Remark (if any)</b>	Per sample

### Rolling Thin-Film Oven (RTFO) Make: Controls (81-PV1612/230V/50Hz/1ph)



<b>Key capabilities</b>	To measure the short-term effect of heat and air on pavement performance
<b>Charges for Academic institutions &amp; Government organizations (INR)</b>	12000
<b>Charges for Industry (INR)</b>	15000
<b>Remark (if any)</b>	Set of 5 samples

(All charges mentioned above are excluding GST)



## TRANSPORTATION ENGINEERING LAB

**Pressure Aging Vessel (PAV) Make: Prentex-PAV 9500/EN 14769. 230 V, 50-60 Hz, 1 ph)**



<b>Key capabilities</b>	To simulate the long-term aging of asphalt binder after 5 to 10 years.
<b>Charges for Academic institutions &amp; Government organizations (INR)</b>	18400
<b>Charges for Industry (INR)</b>	23000
<b>Remark (if any)</b>	Set of 8 samples

**Dynamic Shear Rheometer Make: Malvern/Kinexus DSR+/20-44404)**



<b>Key capabilities</b>	To characterize the viscous and elastic behaviour of binder material
<b>Charges for Academic institutions &amp; Government organizations (INR)</b>	6000
<b>Charges for Industry (INR)</b>	8000
<b>Remark (if any)</b>	Per sample & Per test

**Marshal Mix Make: HEICO: (MB64.505)**



<b>Key capabilities</b>	Bituminous Mix design
<b>Charges for Academic institutions &amp; Government organizations (INR)</b>	52800
<b>Charges for Industry (INR)</b>	66000
<b>Remark (if any)</b>	Per design

(All charges mentioned above are excluding GST)



# SMART AND SUSTAINABLE MATERIALS LABORATORY

## 200 kN capacity Loading Frame With Tank (1m x 1m x 1m) and Hydraulic Assembly



### Key capabilities

1. Performing plate load tests on soil and other geomaterials
2. Performing plate load tests on geosynthetics reinforced or stabilized soil/geomaterials

## Large Direct Shear Apparatus



### Key capabilities

1. Performing direct shear test for soils and other geo materials
2. Performing direct shear test for aggregates
3. Performing interface shear tests for soil/geomaterial with geo synthetics
4. Sample size 300 mm x 300 mm x 300mm

**Make: AIMIL**

## 5 Ton Capacity Loading Frame (Tank size: 40 cm diameter, 30 cm height)



### Key capabilities

1. Performing plate load tests on soil and other geomaterials
2. Performing plate load tests on geosynthetics reinforced or stabilized soil/geomaterials

## PH /EC/TDS Multi Meter



### Key capabilities

1. Measuring pH, Electrical conductivity and Total dissolved solids for supernatant extracted from soil/geomaterial, leachate, etc.

**Note:** Supernatant/liquid for measurement shall be free of solid particles

### Charges (\*GST extra as applicable)

Sr. No.	Name of equipment / facility	Charges for Academic institutions & Government organizations (INR)	Charges for Industry (INR)	Remarks if any
1.	200 kN capacity Loading Frame with Tank and Hydraulic Assembly	4000/- per day	8000/- per day	Labour charges are excluded
2.	5 Ton Capacity Loading Frame	2000/- per day	4000/- per day	Labour charges are excluded
3.	Large Direct shear Apparatus	4800/- (for set of 3 tests)	6000/- (for set of 3 tests)	-
4.	PH /EC/TDS Multi Meter	Minimum charges 500/- per day (For more than 10 samples Rs. 50/sample)	Minimum charges 1000/- per day (For more than 10 samples, Rs. 100/sample)	The supernatant/ liquid shall be free of solid particles

(All charges mentioned above are excluding GST)

## CONSTRUCTION MATERIALS LAB

### Compression Testing Machine (3000 kN) and Flexure Frame (300 kN)



#### Key capabilities

1. Stress strain curve determination of cementitious materials.
2. Accessories for determination of elastic modulus and poissons ratio
3. Three point and Four flexure testing assembly
4. Provisions for determination of bond strength of cementitious composites

**Make/Model** – M/s Controls, Italy, MCC8 multi test

### Universal Testing Machine (600 kN)



#### Key Capabilities

1. Stress strain curve: Reinforcement steel, Hot/cold rolled steel steel bars, angles, flats, plates etc
2. On sample deformation measurement for accurate strain prediction
3. Suitable for determination of stress strain curves in tension, compression and flexure

**Make/Model:** Heico, India

### Creep Testing Machine (1000 kN)



#### Key Capabilities

1. Capable to measuring short term and long-term creep performance of cementitious systems
2. Ability to hold load with an accuracy of  $\pm 2\%$  upto a period of 6 months
3. Continuous data measurement for accurate prediction on the rate of creep

**Make/Model:** Chirayu Controls and M/s. Controls Italy

### Compression Testing Machine (3000 kN)



#### Key Capabilities

1. Auto pace-controlled compression testing machine for testing compressive strength of construction materials
2. Measures compressive strength under load control
3. Provisions of auto load control, peak load protection, autostop,

**Make/ Model:** M/s Controls, Italy, Auto Pilot

(All charges mentioned above are excluding GST)



# CONSTRUCTION MATERIALS LAB

## Permeability Apparatus



### Key Capabilities

1. Simultaneous measurements of upto 6 specimens
2. Permeability measurements against water upto 8 bar pressure

**Make/Model:** M/s. Controls., Italy

## Rapid Chloride Penetration Test (RCPT)



### Key Capabilities

1. Measure chloride penetration of concrete specimens at constant voltage
2. Measure chloride migration of concrete specimens at variable voltage (RCMT)
3. Provisions for preconditioning of specimens as per relevant IS/ASTM/EN codes

**Make/Model:** Vedantrik Technologies | **Make/Model:** M/s. Controls Italy

## Charges

Sr. No.	Name of equipment / facility	*Charges for academic institutions excluding GST (INR)	*Charges for industry excluding GST (INR)
1	3000 kN capacity Strain Controlled Compression Testing Machine	3000-6000/set (Depending on the test)	5000-12000/set (Depending on the test)
2	300 kN capacity Strain Controlled Flexure Testing Machine	2000/- per set	3500/- per set
3	600 kN capacity Universal Testing Machine	2000/- per set	5500/- per set
4.	1000 kN capacity Creep Testing Machine	3000-50,000/set (Price depending on the test duration)	10000-2,00,000/set (Price depending on the test duration)
5	3000 kN capacity Compression Testing Machine (Load Control)	462/set (concrete) 1276-2068/set (bricks)	583/set (concrete) 1595-2585/set (bricks)
6	6 Cell Permeability Apparatus	4444 - 10340/- per set	5555 - 12925/- per set
7	Rapid Chloride Penetration Test Setup	2000/- set	7500/-set
8	Rapid Chloride Migration Test Setup	2000/- set	7500/-set

Note: Charges for Government organizations are same as that for academic institutions

(All charges mentioned above are excluding GST)