# Proposal
# for
# Extension of Autonomous Status

# List of Lab Equipment's
## Department of Civil Engineering

## Amritsar Group of Colleges, Amritsar

(Autonomous College since 2014)

(NAAC Grade "A" in 3rd Cycle)

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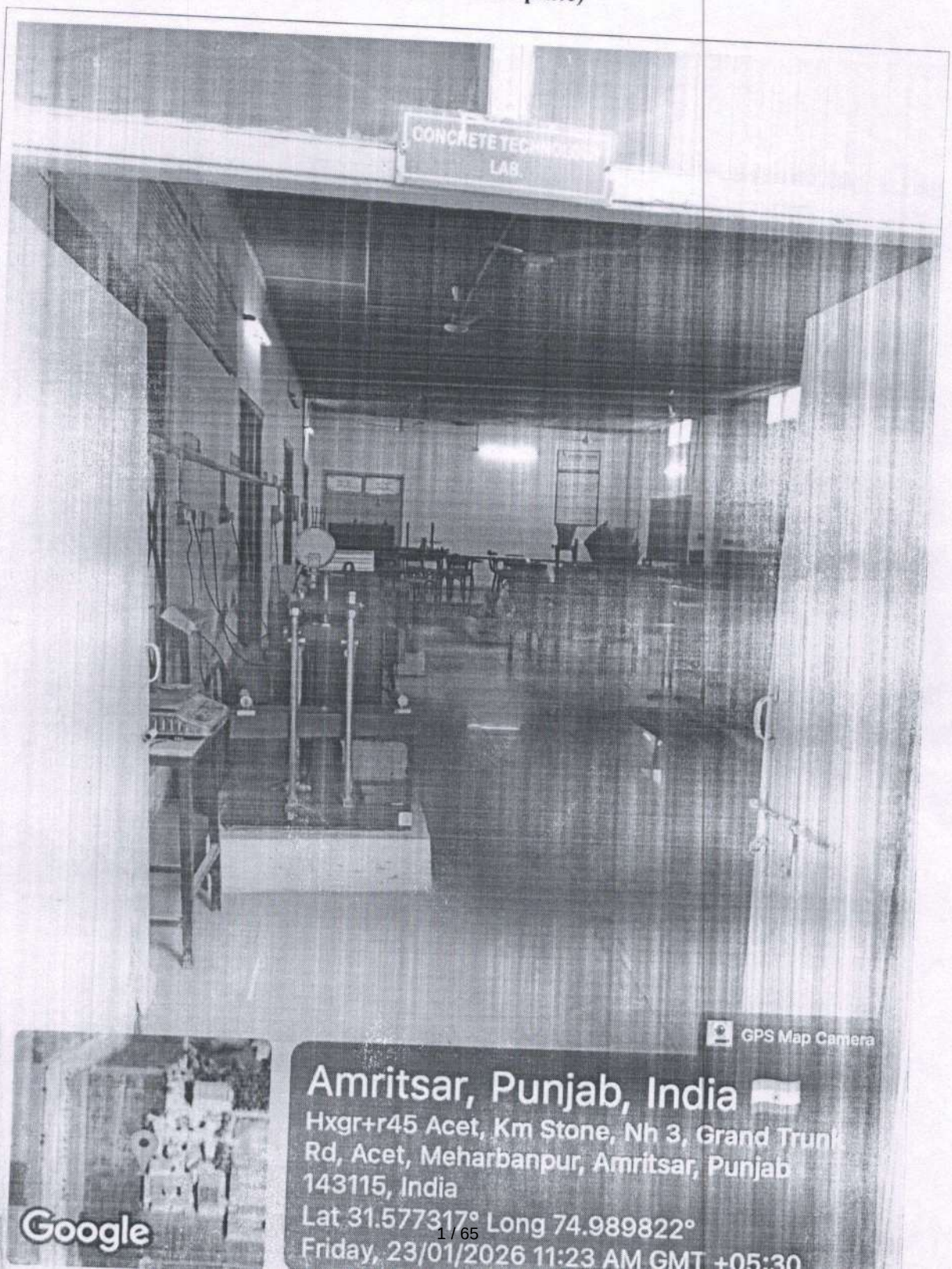
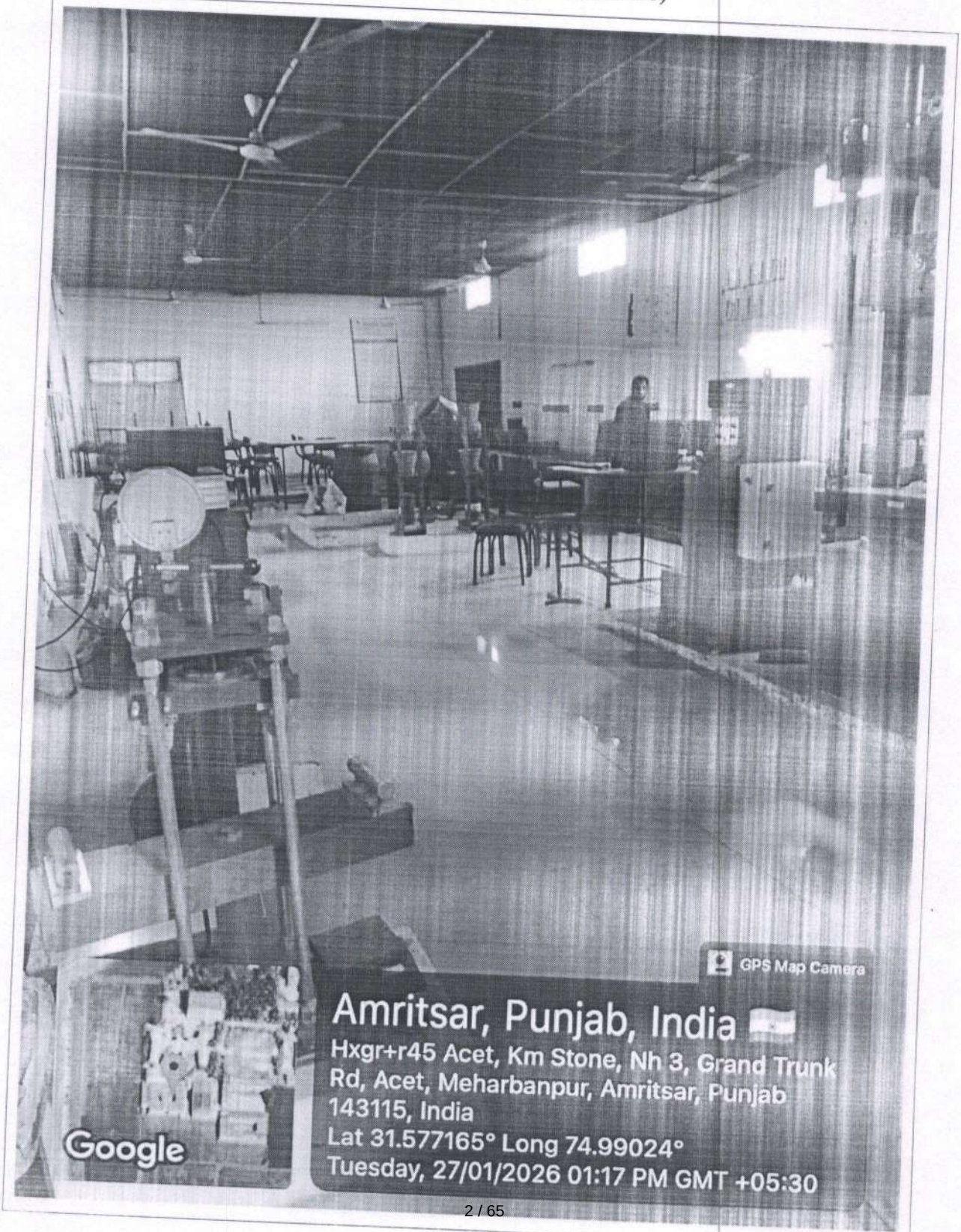
Name of the Laboratory: Concrete Technology Lab

**Picture of the Lab (Outside – showing the name plate)**



**Picture of the Lab (Inside – showing a wider view of the lab)**



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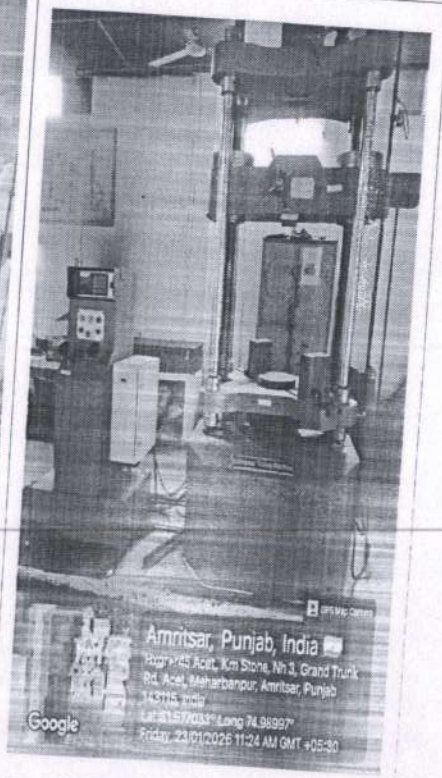
**Details of the Laboratory Equipment's**

| S. N. | Name of Equipment | Description / Specification of the Equipment | Quantity | Normal Picture | Geotagged Picture |
|---|---|---|---|---|---|
| 1. | Universal Testing Machine | HEICO Universal Testing Machine - Max Capacity 2000 kN is a heavy-duty servo-hydraulic or electro-hydraulic testing system with a maximum force capacity of 2000 kN (~200 tonnes) designed for performing a wide range of mechanical tests, including tensile (pull), compression (push), bending/flexure, shear, and sometimes peel tests on metals, concrete, composites and structural components. It features a rigid multi-column load frame with precision load cells and displacement measurement, high-resolution digital control, and often computer software for real-time data acquisition, graphing, analysis, and reporting compliant with international standards like ASTM, ISO, and DIN. Typical specifications include force accuracy within ±1 %, test speed from very slow up to ~60–100 mm/min (software controlled), crosshead travel/stroke of ~200–300 mm, and large tensile/compression test spaces (clearance up to ~800–1100 mm). The machine is suitable for quality control, R&D, and material qualification in | 1 |  |  |

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| | | sectors such as aerospace, automotive, civil engineering, and manufacturing. | | | |
| 2. | Compression Testing Machine | HEICO Compression Testing Machine is a robust hydraulic system designed to measure the compressive strength of construction materials such as concrete, cement cubes, bricks, and similar specimens in laboratories and quality control environments. The machines are built with a sturdy welded steel load frame with upper and lower hardened platens and conform to Indian standards like IS 516 and optionally BS 1881/DIN for reliable testing accuracy. They are available in portable hand-operated models and motorised hydraulic models with capacities ranging from small laboratory units up to high-capacity industrial systems. Advanced versions include digital readouts with microprocessor control, data storage, and PC connectivity for logging test results, and automatic pacing systems to maintain consistent load application up to specimen failure. Typical features include a hydraulic pump, safety overload protection, accurate pressure gauges or digital displays, and options for programmable load rate and data acquisition. | 2 |  |  |

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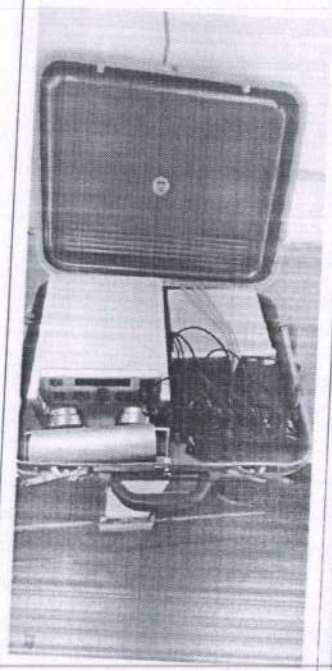
| 3. | Ultra Sonic pulse Velocity | A HEICO Ultrasonic Pulse Velocity (UPV) Tester is a non-destructive concrete quality evaluation instrument used to assess homogeneity, internal defects (voids/cracks), and approximate material integrity by sending ultrasonic pulses through concrete and measuring the time taken for the pulse to travel between transmitter and receiver probes; this velocity helps indicate concrete quality without harming the specimen. UPV testers typically include a microprocessor-based portable electronic unit with digital display, rechargeable battery, pair of ultrasonic transducers (commonly around 24-150 kHz), coupling agent and calibration rod, and offer RS232/USB connectivity for data logging and analysis, operating over a wide transit time measurement range with high resolution (e.g., 0.1 µs) in accordance with standards such as ASTM C597 and IS codes for Ultrasonic Pulse Velocity testing. | 1 |  |  |

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| 4. | Rebound hammer | A HEICO Rebound Hammer is a hand-held non-destructive concrete testing instrument (also known as a Schmidt hammer) used to assess the surface hardness and estimate the compressive strength of in-place concrete by measuring the rebound of a spring-loaded mass after it impacts the concrete surface; the higher the rebound number, the harder and generally stronger the concrete. It operates on a spring-controlled impact mechanism, typically has an impact energy around 2.207 J, a measurement range roughly from 10 MPa to 70 MPa, a graduated scale for rebound numbers, and is rugged, portable, and calibrated to standards like IS 13311 (Part 2), ASTM C805 and BS 1881 for quick field evaluations without damaging the structure. | 1 |    |

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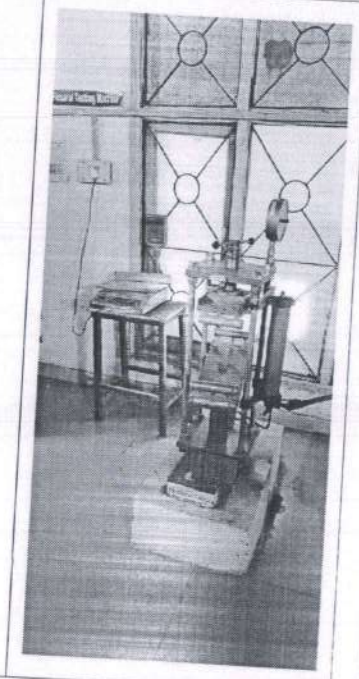
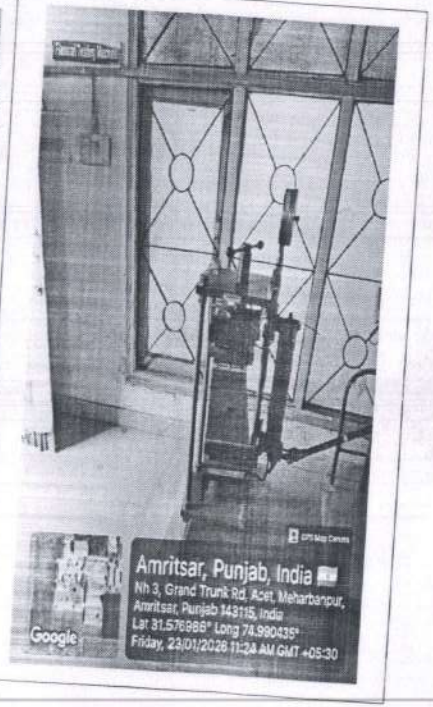
| 5. | Flexural Testing Machine | A HEICO Flexural Testing Machine is a robust laboratory device designed to measure the flexural (bending) strength of concrete beams by applying a controlled load until the specimen fails; it conforms to standards such as IS 9399/IS 516 and can test beam specimens with typical square cross-sections (e.g., 100 mm and 150 mm) using a four-pillar steel frame and hydraulic system with adjustable rollers and load indication (analog gauge or electronic readout with peak-hold and computer interface) for accurate breaking load measurement. | 1 |    |

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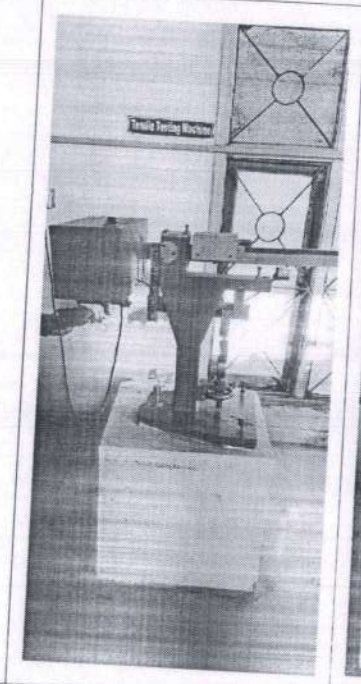
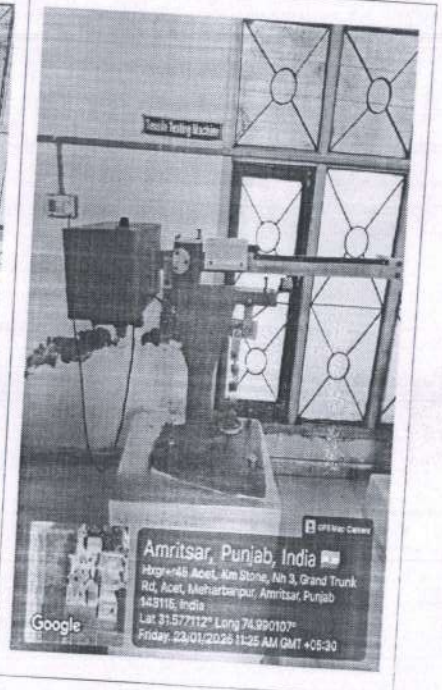
| 6. | Tensile Testing Machine | A HEICO Tensile Testing Machine (a form of Universal Testing Machine by Hydraulic & Engineering Instruments – HEICO) is a material testing instrument used to measure tensile (pulling) strength, along with other mechanical properties like compression, flexure, shear, and hardness, of various materials such as metals, plastics and composites under controlled conditions. It typically has a rigid hydraulic or electronic load frame with adjustable grips, applies a uniaxial load to a specimen until failure, and displays load and displacement digitally or via a control panel, often with computer connectivity for real-time data acquisition and graphing. HEICO UTMs are built to meet national and international standards (e.g., IS/ASTM), offer high accuracy in load/displacement measurement, and are suitable for quality control, R&D, and educational labs. | 1 |     |

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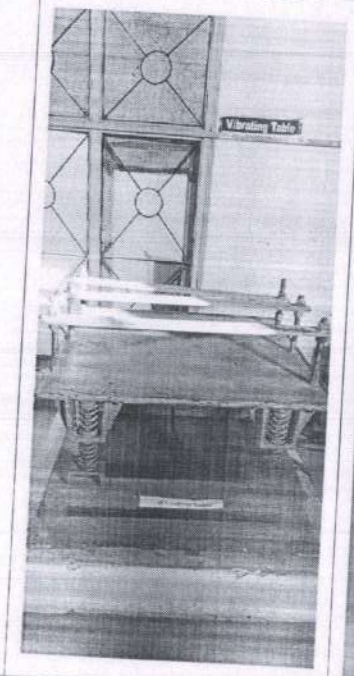
| 7. | Vibrating table | A HEICO Vibrating Table is a heavy-duty laboratory instrument used to compact fresh concrete specimens (cubes, cylinders, etc.) by controlled vibration to remove entrapped air and ensure uniform density and reliable strength test results; it features a sturdy steel-plate top with edge stops to hold moulds, a motor-driven vibrator mounted beneath, and rubber-mounted support for consistent vibration, with typical load capacity around 140–150 kg and designed to operate on industrial three-phase power (e.g., 440 V, 50 Hz) in compliance with concrete testing standards such as IS 2514/IS 10086. | 2 |     |

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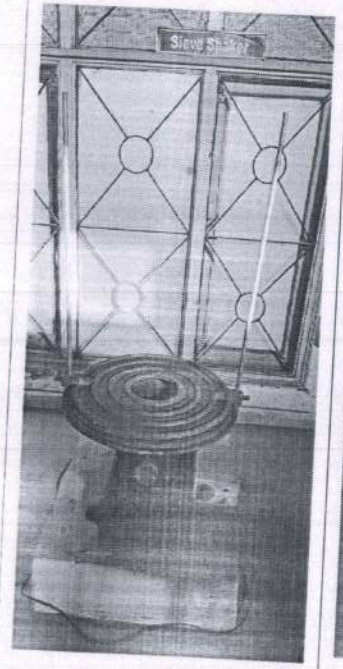
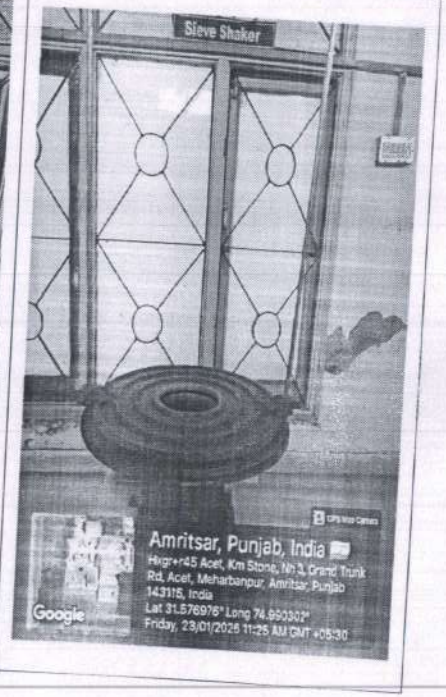
| 8. | Sieve Shaker | A HEICO Sieve Shaker is a laboratory instrument used for particle size analysis and separation by automatically vibrating a stack of test sieves so that finer particles pass through while coarser ones remain above, ensuring accurate and repeatable grading of soil, aggregates, powders, and other materials; HEICO models include hand-operated, motorised, and advanced electromagnetic types with controlled vibration motion and timing options. Typical specifications (model dependent) include capacity for up to about 7–8 sieves of 150 mm or 200 mm diameter, adjustable digital timers (e.g., 1–999 min), electromagnetic or gyratory/vibratory motion, an adjustable clamping plate to secure sieves, and operation on standard 220–230 V, 50 Hz single-phase supply, delivering consistent, efficient sieving compared with manual methods. | 1 |    |

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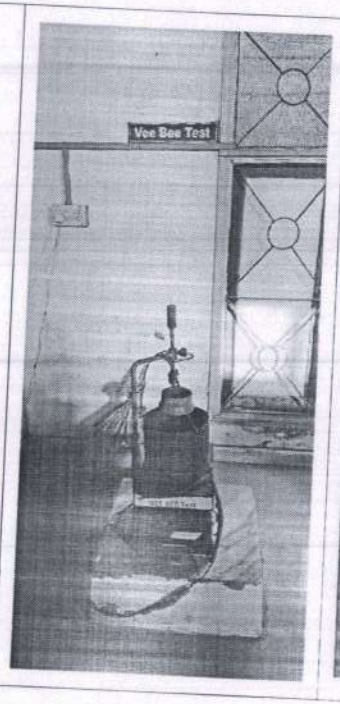
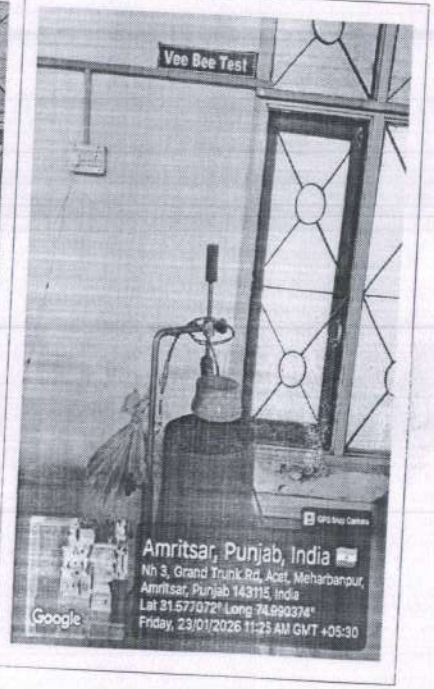
| 9. | Vee Bee Time Consistometer | A Vee Bee Consistometer (also sold in variants like Vee Bee Consistometer, Vee Bee Consistometer - Black & White and others) is a concrete testing instrument used in labs to assess the workability and consistency of fresh concrete, especially stiff mixes that aren't easily measured by the traditional slump test. It comprises a vibrating table with elastic supports, a cylindrical container, a slump cone, a graduated rod with a disc, and controls; after filling the cone with concrete and removing it, vibration is applied and the time in seconds required for the concrete to change from its initial conical shape to a uniform cylindrical shape (Vee Bee time) is recorded, which indicates how easily the mix can compact and flow under vibration according to standards like IS 1199/BS EN 12350. | 1 |   |

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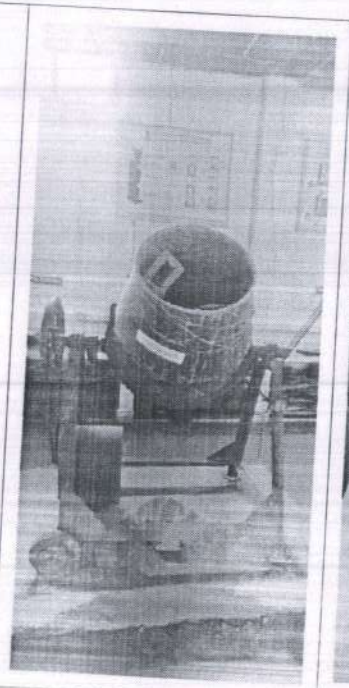
| 10. | Concrete Mixer | A concrete mixer is a construction machine designed to homogeneously combine cement, sand/aggregate, and water to form concrete by constantly rotating a drum with internal blades or using powered mixing shafts, which ensures a uniform, workable mix for foundations, slabs, and other structural elements; these mixers can be portable or stationary, powered by electric motors or diesel engines, and are sized by drum capacity (e.g., ~200–300 L for small portable units up to several cubic meters for industrial models) with typical rotation speeds around 18-32 rpm, standard power ratings (single-phase or three-phase electric, or 5–6 HP and above for engine types), and adaptable designs such as tilting or reversing drums for easy discharge and efficient mixing. | 1 |    |

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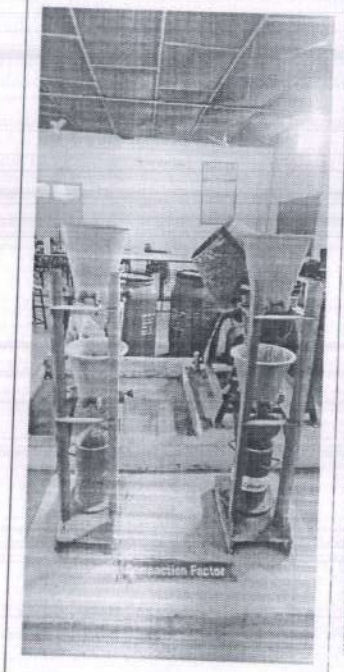
| 11. | Compaction Factor | A Compaction Factor Apparatus is a laboratory device used to measure the workability and consistency of fresh concrete, especially for mixes too stiff for the slump test, by determining the degree of compaction achieved under standard conditions. The apparatus typically consists of two conical hoppers (upper and lower), a cylindrical mould, and a base plate; concrete is allowed to fall through the hoppers under gravity, and the ratio of the weight of partially compacted concrete to fully compacted concrete is measured to calculate the compaction factor. Typical specifications include cylindrical mould diameter ~150 mm, height ~300 mm, upper hopper capacity ~4–5 kg, and lower hopper capacity ~3–4 kg, made of mild steel with smooth finish, designed to operate in accordance with standards like IS 1199/BS EN 12350. | 1 |  |  |

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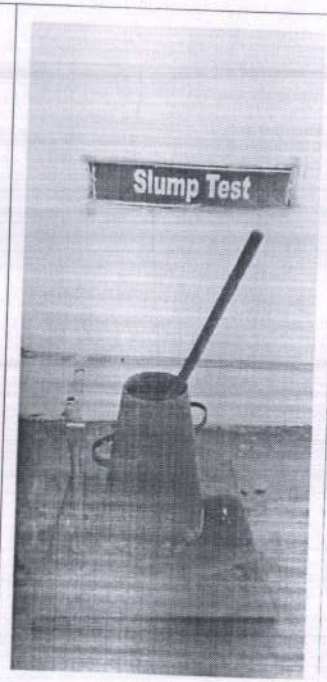
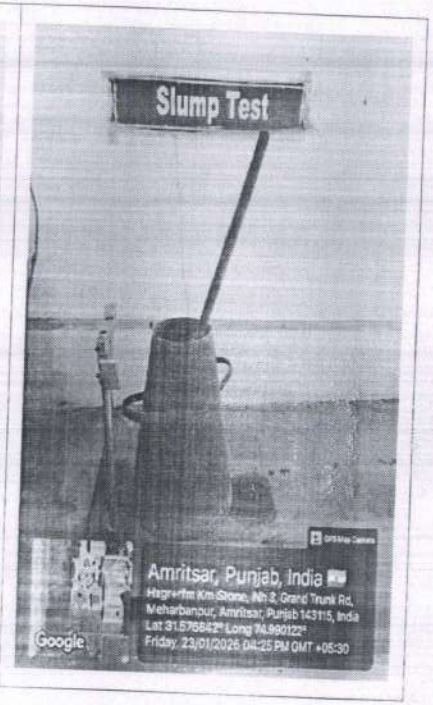
| 12. | Slump Cone | A HEICO Slump Cone is a simple concrete testing tool used to determine the workability and consistency of freshly mixed concrete by measuring how much the concrete "slumps" (settles) under its own weight after the standard mould is lifted—an important quality control test for concrete before placement.(HEICO) The apparatus typically consists of a frustum-shaped steel cone with internal dimensions of about 100 mm top diameter, 200 mm bottom diameter, and 300 mm height, a base plate, and a 16 mm × 600 mm tamping rod; the concrete is filled and compacted in layers inside the cone, the cone is then lifted vertically, and the vertical difference between the original cone height and the highest point of the slumped concrete gives the slump value used to gauge workability. | 07 |   |

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| 13. | Vicat Apparatus | A HEICO Vicat Apparatus is a classic cement testing tool used in civil engineering labs to determine the standard (normal) consistency of cement paste and the initial and final setting times of cement and similar materials by measuring how far a weighted needle or plunger penetrates the paste under controlled conditions. It consists of a rigid vertical frame with a movable rod, interchangeable needles (for initial and final setting), a 10 mm diameter plunger for consistency, and a Vicat mould (frustum of a cone approx. 60 mm top × 70 mm bottom × 40 mm height) with a glass base plate, all arranged so the penetration depth can be read on a graduated scale as specified in standards like IS 5513/ASTM C187. | 08 |    |

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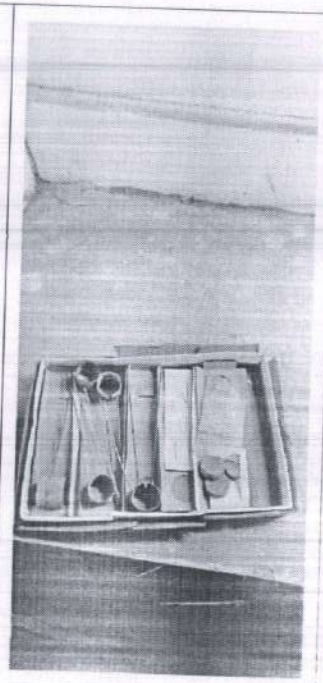
| 14. | Le-chatlier Appratus | A Heico Le-Chatelier Apparatus is a cement soundness testing tool used in material testing labs to check the volumetric stability of cement by measuring the expansion of a cement paste specimen when subjected to boiling water; excessive expansion indicates unsound cement that may cause cracks or structural problems in concrete. It typically consists of a split brass mould (standard internal diameter ~30 mm and height ~30 mm) with two long indicator arms that magnify small changes in size, along with glass plates and sometimes a water bath for immersion, so that the difference in pointer positions before and after boiling gives the expansion value which should remain within prescribed limits (e.g., ≤ 10 mm for ordinary Portland cement) according to standards like IS 5514/IS 4031. | 06 |    |

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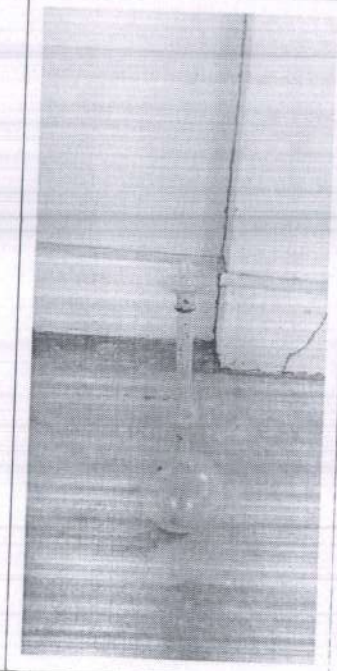
| 15. | Le-chatlier flask | A Heico Le-Chatelier Flask Apparatus is a precision laboratory glass instrument used in cement testing to determine the specific gravity (relative density) of hydraulic cement and similar fine materials, which is important for quality control and mix design. It is made of high-grade borosilicate glass with a bulbous body of about 250 ml capacity and a long, narrow graduated neck (marked typically from 0 to 1 ml and 18 to 24 ml in 0.1 ml divisions) with a ground glass stopper, allowing a known volume of liquid (like kerosene or naphtha) and cement to be combined and the displaced volume measured to calculate specific gravity in accordance with standards such as IS 4031 (Part 11) and ASTM C188. | 5 |    |

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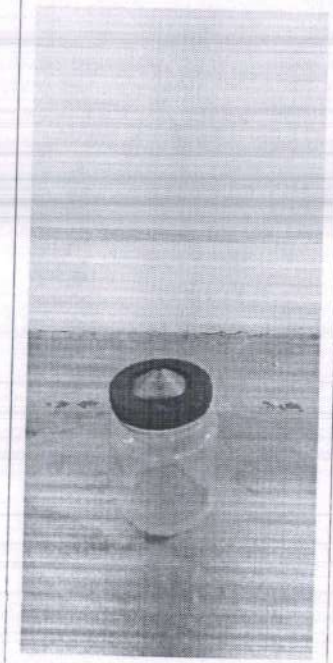
| 16. | Pycnometer | A Pycnometer is a laboratory device used to determine the density or specific gravity of liquids, fine powders, or small solid particles with high accuracy. It consists of a precision-made glass or metal flask with a close-fitting stopper that has a small capillary hole, allowing trapped air to escape and ensuring reproducible volume measurements. Typical pycnometers have a volume range from 25 ml to 100 ml, are made of borosilicate glass for chemical resistance, and come with graduations or calibration marks for precise weighing. The sample is added to the pycnometer, filled with liquid to the mark, and weighed; the density is calculated from the mass difference and known flask volume, in accordance with standards such as ASTM D854 and IS 2720 (Part 3). | 10 |  |  |

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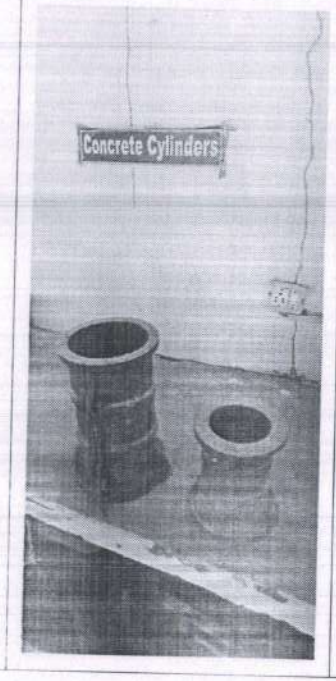
| 17. | Concrete Cylinders Mould | A HEICO Concrete Cylinder Apparatus refers to the standard cylindrical moulds used for casting concrete specimens (cylinders) in quality-control and materials testing labs so that their compressive strength and other mechanical properties can be evaluated after curing; these moulds are made to precise internal dimensions with tight tolerances, split easily for specimen removal, and include a flat machined base plate to create uniform, leak-free specimens in accordance with standards like IS 516/IS 10086. | 4 |  |  |

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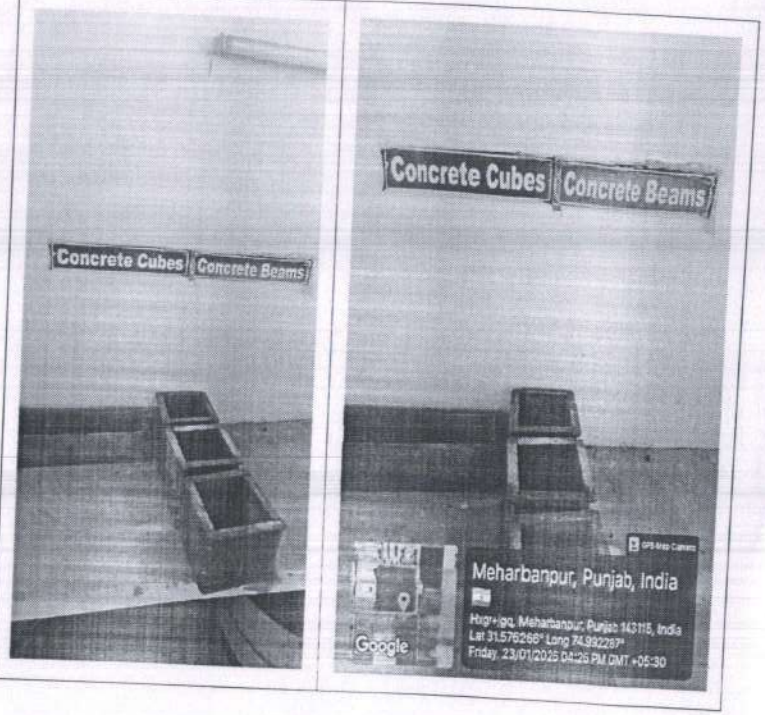
| 18. | Concrete Beam and Cube Moulds | A HEICO concrete beam and cube moulds set is a precision-made metal formwork used in construction and materials testing laboratories to cast standardized concrete specimens for strength evaluation — cube moulds for compressive strength tests and beam moulds for flexural (bending) strength tests of concrete according to standard methods like IS 516 and IS 10086. The moulds are machined with accurate internal dimensions and flat faces (tight tolerances on size and flatness) to ensure uniform specimen shape and size, made from durable cast iron or mild steel, and supplied complete with base plates for stable casting and easy demoulding. | Cube Moulds ($15cm^3$-10), ($10cm^3$-06), ($7.06cm^3$-06) Beams-02 |   |



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Head of the Department

| AMRITSAR GROUP OF COLLEGES<br>NAAC Grade "A" 3rd Cycle \| Autonomous College<br>under Autonomous Category (Since 2014) Conferred by UGC | Details of Laboratory Equipment | Civil Engineering |
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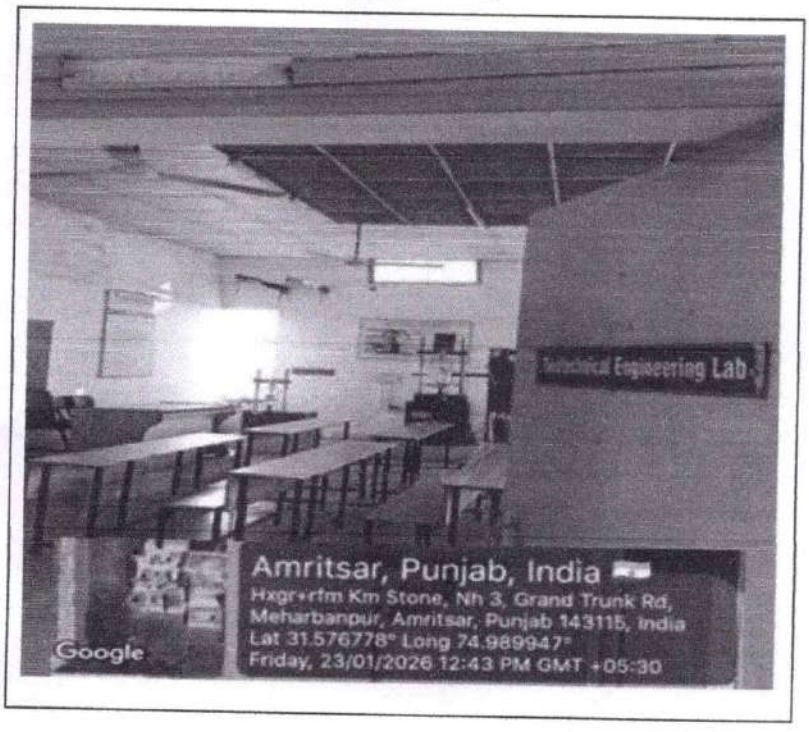
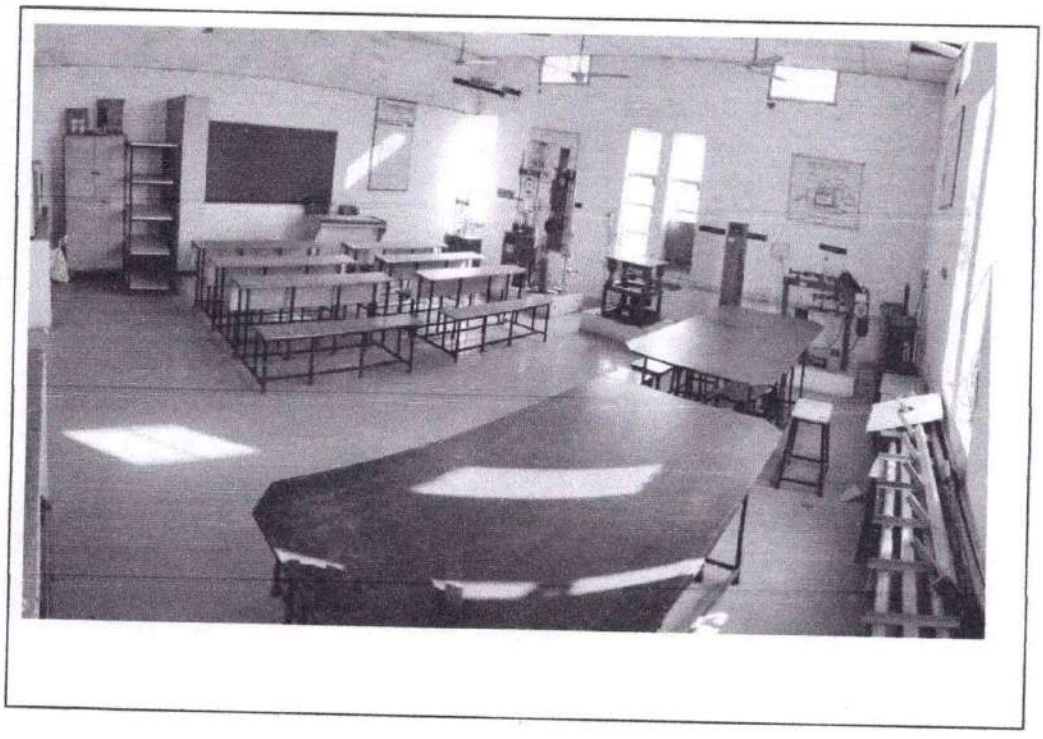
Name of the Laboratory: **Geotechnical Engineering Lab**



| AMRITSAR GROUP OF COLLEGES<br>NAAC Grade "A" 3rd Cycle \| Autonomous College | Details of Laboratory Equipment | Civil Engineering |
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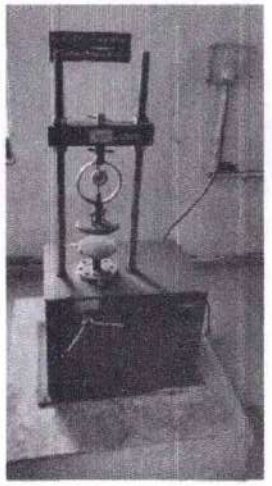
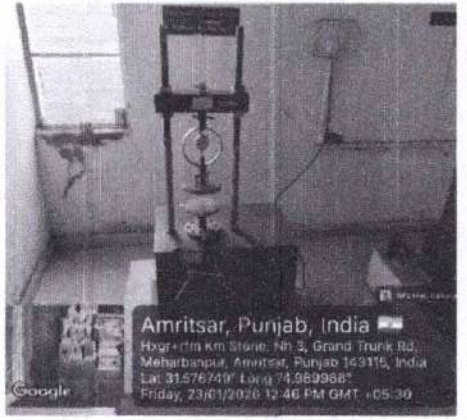
**Details of the Laboratory Equipment's**

| S. N. | Name of Equipment | Description / Specification of the Equipment | Quantity | Normal Picture | Geotagged Picture |
|---|---|---|---|---|---|
| 1 | Unconfined Compression Testing Machine | **Description**<br>A motorized strain-controlled compression testing machine used to determine the **Unconfined Compressive Strength (UCS)** of cohesive soils. The equipment applies axial load on cylindrical soil specimens at a constant strain rate and measures load and deformation accurately as per **IS 2720 (Part 10)**. Suitable for routine testing, research, and quality control in geotechnical laboratories.<br>**Specifications**<br>• **Make:** HEICO<br>• **Type:** Motorized UCS Testing Machine<br>• **Load Capacity:** 2 kN / 5 kN proving ring<br>• **Strain Rate:** ~1.25 mm/min (constant strain)<br>• **Load Measurement:** Proving ring with dial gauge<br>• **Deformation Measurement:** High-precision dial gauge | 1 |  |  |

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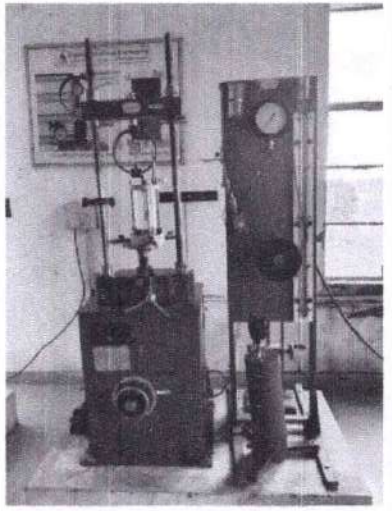
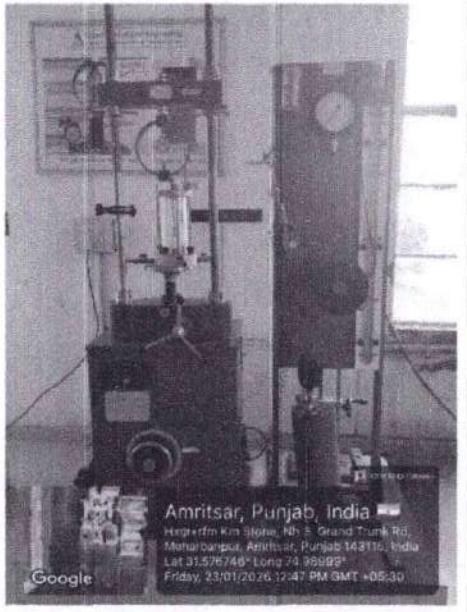
| | | • **Platens:** Upper spherical seat & lower fixed platen<br>• **Specimen Size Compatibility:** 38 mm × 76 mm, 50 mm, 75 mm diameter specimens<br>• **Power Supply:** 230 V AC, Single Phase | | | |
| 2 | Triaxial Shear testing Machine | **Description**<br>A motorized triaxial shear testing system used to determine the shear strength parameters (c & φ) of soil under drained and undrained conditions. The equipment applies axial load through a strain-controlled loading frame while maintaining cell pressure using a pressure system. Suitable for UU, CU, and CD tests as per IS 2720 (Part 11 & 12).<br>**Specifications**<br>• **Make:** HEICO<br>• **Type:** Motorized Triaxial Shear Testing Machine<br>• **Loading Frame Capacity:** 5 kN / 10 kN<br>• **Strain Application:** Constant strain rate, ~1.25 mm/min | 1 |  |  |

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| | | • **Cell Pressure Range:** 0 – 10 kg/cm² (with burette / pressure regulator)<br>• **Load Measurement:** Proving ring or load cell with dial gauge<br>• **Deformation Measurement:** High-precision dial gauge<br>• **Triaxial Cell:** Compatible with 38 mm, 50 mm, 75 mm soil specimens<br>• **Accessories:**<br>o Pressure chamber with gauge<br>o Volume change burette<br>o Loading platen & porous stones<br>• **Power Supply:** 230 V AC, Single Phase | | | |

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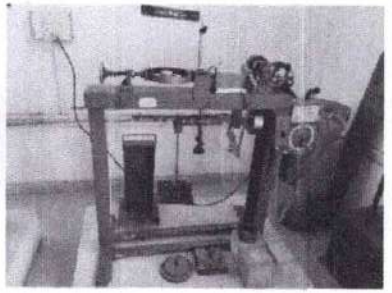
| 3 | Direct Shear Test Machine | **Description**<br>A motorized geotechnical testing apparatus used to determine the **shear strength parameters (cohesion and angle of internal friction)** of soil by applying horizontal shear stress on a specimen confined in a shear box. The machine operates at a constant strain rate and conforms to **IS 2720 (Part 13)**.<br>**Specifications**<br>• **Type:** Motorized Direct Shear Testing Machine<br>• **Make:** HEICO / Equivalent<br>• **Shear Box Size:** 60 mm × 60 mm (standard)<br>• **Strain Rate:** 0.5–1.25 mm/min (selectable)<br>• **Normal Load Capacity:** Up to 5 kN<br>• **Shear Load Measurement:** Proving ring / load cell with dial gauge<br>• **Horizontal Displacement Measurement:** Dial gauge with fine least count<br>• **Vertical Displacement Measurement:** Dial gauge for | 1 |  |  |

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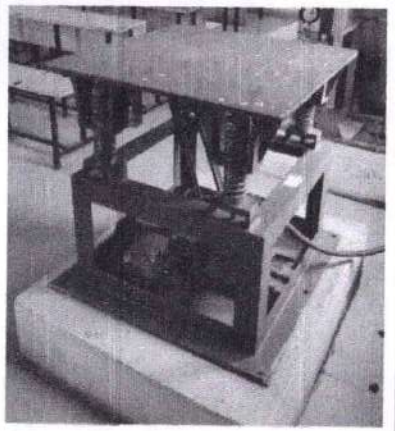
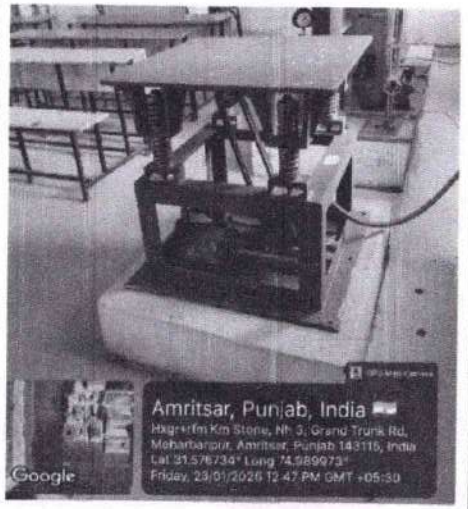
| | | settlement<br>• **Motor:** Geared induction motor for uniform strain<br>• **Accessories:** Weights, hanger, loading yoke, shear box, grid plates, porous stones<br>• **Power Supply:** 230 V AC, Single Phase | | | |
| 4 | A heavy-duty vibrating table | **Description**<br>A heavy-duty vibrating table used to determine the **maximum and minimum densities** of cohesionless soils (sand) for calculating **Relative Density (RD)**. The table provides controlled vertical vibration to compact the soil in a mold as per **IS 2720 (Part 14)**. Suitable for geotechnical lab testing and academic demonstration.<br>Specifications<br>Type: Motorized Vibrating Table<br>Make: HEICO / Equivalent<br>Table Size: Approx. 50 cm × 50 cm<br>Vibration System: Vertical vibration with adjustable frequency | 1 |  |  |

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| | | Motor: Geared electric motor with eccentric cam<br>Load Capacity: Suitable for 1 L / 2 L density molds<br>Controls:<br>On/Off switch<br>Vibration intensity control (if provided)<br>Springs: Heavy compression springs for controlled oscillation<br>Purpose: Determination of Maximum Density of Sand (Relative Density Test)<br>Power Supply: 230 V AC, Single Phase | | | |

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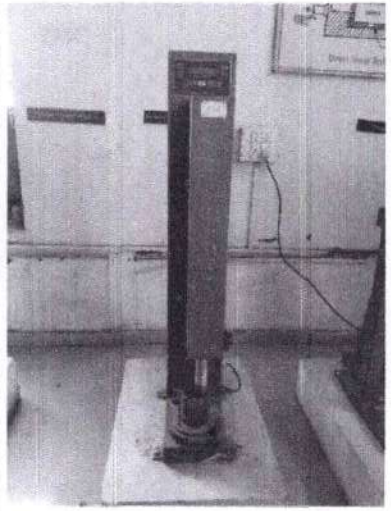
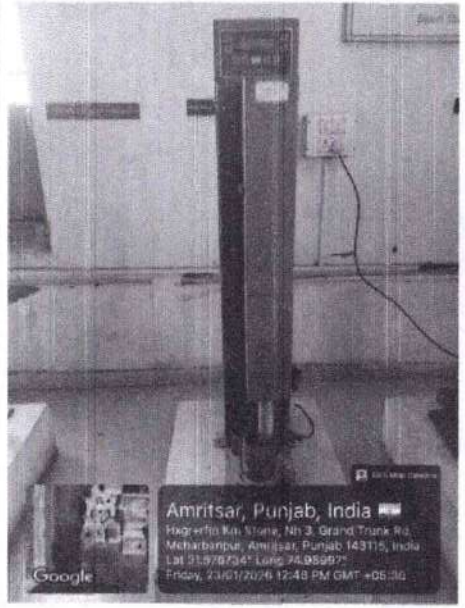
| 5 | Automatic Compacting Machine | Description<br>A motorized automatic compaction machine used for uniform and repeatable compaction of soil samples in laboratory conditions. The equipment provides controlled hammer blows at a fixed height and frequency, ensuring consistent compaction for soil preparation, density studies, and geotechnical laboratory experiments. It eliminates manual effort and ensures better accuracy and repeatability.<br>**Specifications**<br>• **Type:** Automatic Soil Compactor<br>• **Make:** HEICO / Equivalent<br>• **Purpose:** Routine laboratory soil compaction (not intended for Modified Proctor)<br>• **Hammer:** Motor-operated automatic drop hammer<br>• **Drop Height:** Fixed, as per preset settings<br>• **Compaction Frequency:** Automatic with programmable blow count<br>• **Mold Compatibility:** Standard laboratory compaction molds | 1 |  |  |

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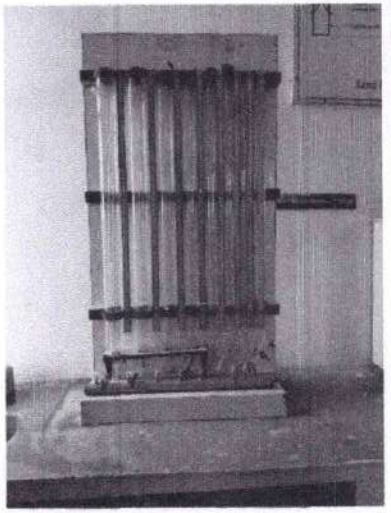
| | | • **Control Panel:** Digital/automatic control for start, stop, and number of blows<br>• **Safety:** Enclosed compaction chamber with auto-stop<br>• **Power Supply:** 230 V AC, Single Phase | | | |
| 6 | Constant Head Permeability Apparatus | A laboratory apparatus used to determine the permeability (coefficient of hydraulic conductivity) of coarse-grained soils under constant head conditions as per IS 2720 (Part 17). The system provides a steady flow of water through a soil sample and measures discharge and head loss using vertical standpipes/manometers.<br>**Specifications**<br>• Type: Constant Head Permeability Apparatus<br>• Make: HEICO / Equivalent<br>• Standpipes: Multiple transparent manometer tubes for head measurement<br>• Sample Holder: Transparent/metal permeameter mould<br>• Flow System: Constant head | 1 |  |  |

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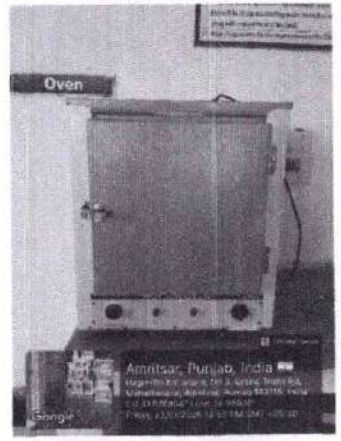
| | | water supply with inlet and outlet valves<br>• Measurement: Head difference via manometer + discharged volume<br>• Use: Permeability testing of sands and coarse soils<br>• Mounting: Wall-mounted frame with stable base<br>• Standards: IS 2720 (Part 17) compliant | | | |
| 7 | **Thermostatically controlled Oven** | A thermostatically controlled drying oven used for drying soil samples, determining moisture content, and general laboratory heating applications. The oven provides uniform hot air circulation for accurate and reliable drying of materials.<br>Specifications<br>• Type: Laboratory Hot Air Oven<br>• Make: Generic / Standard Laboratory Supplier<br>• Temperature Range: Ambient to 250°C (typical)<br>• Temperature Control: Thermostat or digital temperature controller | 1 |  |  |

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| | | • Chamber Type: Double-walled, insulated chamber<br>• Shelves: Removable stainless-steel shelves (2–3 depending on model)<br>• Air Circulation: Natural or forced convection (depending on model)<br>• Door: Insulated door with handle and gasket<br>• Use: Drying soil samples, moisture content determination as per IS 2720<br>• Power Supply: 230 V AC, Single Phase | | | |
| 8 | **Atterberg Limits Apparatus** | A standard set of equipment used to determine the **Atterberg Limits** (Liquid Limit and Plastic Limit) of fine-grained soils as per **IS 2720 (Part 5)**. The apparatus helps classify the soil based on its consistency characteristics and plasticity. Suitable for geotechnical labs and academic use.<br>**Specifications**<br>• **Components Included:**<br>o **Casagrande Liquid Limit Device** (brass cup, cam & drop | 2 |  |  |

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| | | mechanism)<br>○ **Grooving Tools** (ASTM or Casagrande type)<br>○ **Glass Plate** for rolling threads<br>○ **Plastic Limit Roller / Steel Rod**<br>○ **Moisture Containers**<br>• **Drop Height:** 10 mm (fixed)<br>• **Blow Counter:** Mechanical / manual<br>• **Cup Material:** Brass<br>• **Base:** Hard rubber base block<br>• **Use:** Determination of Liquid Limit (LL), Plastic Limit (PL), and Plasticity Index (PI)<br>• **Standard:** IS 2720 (Part 5) | | | |

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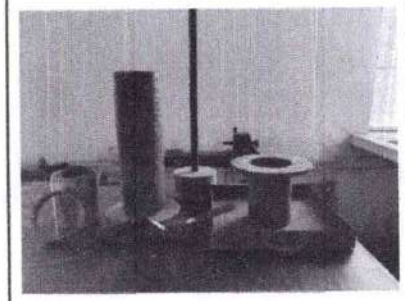
| 9 | **In situ Density Determination Apparatus** | Core Cutter Apparatus<br>**Description**<br>A field equipment set used to determine the **in-situ bulk density and dry density** of cohesive soils by driving a steel core cutter into the ground as per **IS 2720 (Part 29)**. Suitable for soft to medium cohesive soils.<br>**Specifications**<br>• **Cutter Material:** Mild steel<br>• **Core Cutter Dimensions:** 100 mm internal diameter × 130 mm height (standard)<br>• **Accessories:**<br>o Steel dolly<br>o Rammer (hammer)<br>o Metal tray<br>• **Purpose:** In-situ density and moisture content of cohesive soils<br>• **Standard:** IS 2720 (Part 29)<br>**Sand Replacement Apparatus**<br>Description<br>A field density testing apparatus used for determining the in-situ density of cohesionless soils (sands, gravels) | 1 |  |  |

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| | | using the sand replacement method as per IS 2720 (Part 28). Involves pouring standard sand into a calibrated hole.<br>Specifications<br>• Sand Pouring Cylinder: Metal cylinder with conical valve<br>• Metal Tray: With central hole for calibration and excavation<br>• Calibration Container: For determining bulk density of standard sand<br>• Accessories: Scraper tool, pouring cone, standard sand<br>• Purpose: Field density test for granular soils<br>• Standard: IS 2720 (Part 28) | | | |

Note: This proforma must include all types of laboratory equipment, including computer systems, licensed software, projectors, smart screens, and other ICT-enabled teaching–learning resources.

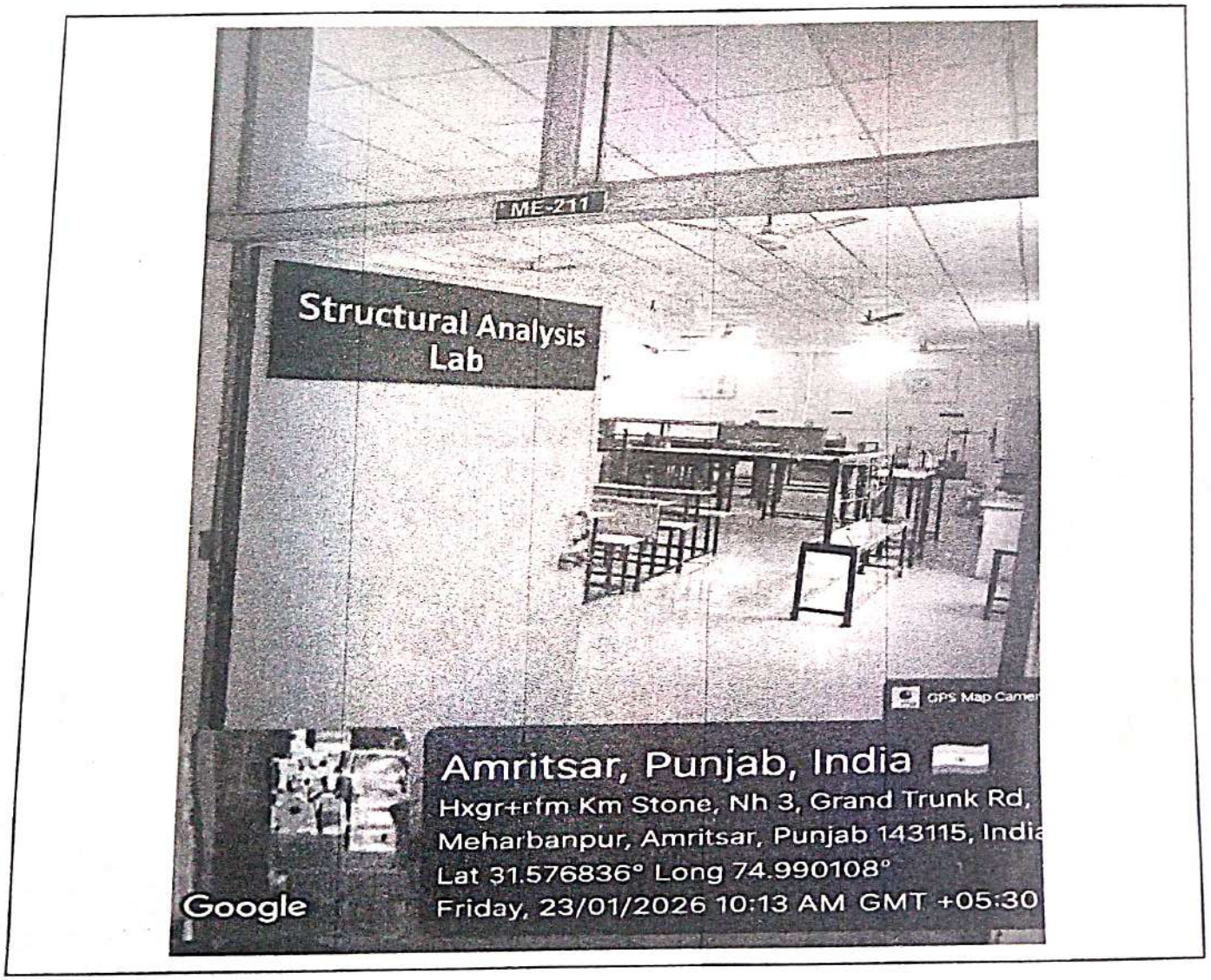
Er. Vijay Kumar

Lab In charge

Head of the Department

| AMRITSAR GROUP OF COLLEGES<br>NAAC Grade "A" 3rd Cycle \| Autonomous College | **Details of Laboratory Equipment** | **Civil Engineering Department** |
|---|---|---|

Name of Laboratory: **Structural Analysis Laboratory**



**Details of the Laboratory Equipment's**

| S. N. | Name of Equipment | Description / Specification of the Equipment | Quantity | Normal Picture | Geo tagged Picture |
|---|---|---|---|---|---|
| 1 | Two Hinged Arch Apparatus | A laboratory demonstration apparatus used to study the structural behavior of a **two hinged arch**. The model consists of an arch rib with hinges provided at both supports, mounted on a rigid steel frame. It is used to analyze thrust, reactions, bending moment distribution, and deformation characteristics of two hinged arches under applied loads in Structural Analysis laboratory. | 1 |  |   |

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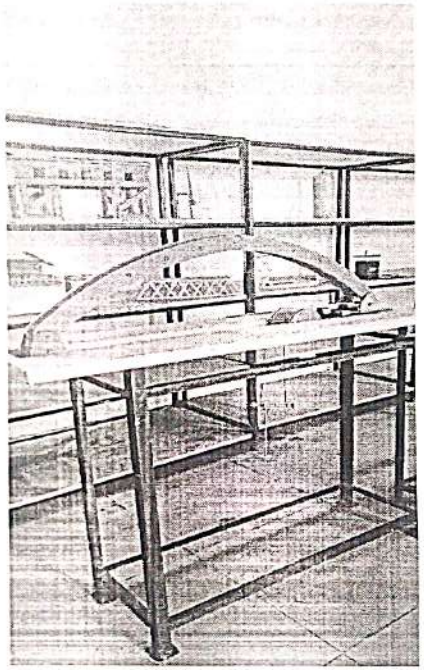
| 2 | Three Hinged Arch Apparatus | A laboratory experimental apparatus used to study the structural behavior of a **three hinged arch**. The model consists of an arch rib provided with hinges at both supports and an additional hinge at the crown. It is mounted on a rigid steel frame and is used to analyze reactions, horizontal thrust, bending moments, and internal forces under different loading conditions in Structural Analysis laboratory. | 1 |  |   |

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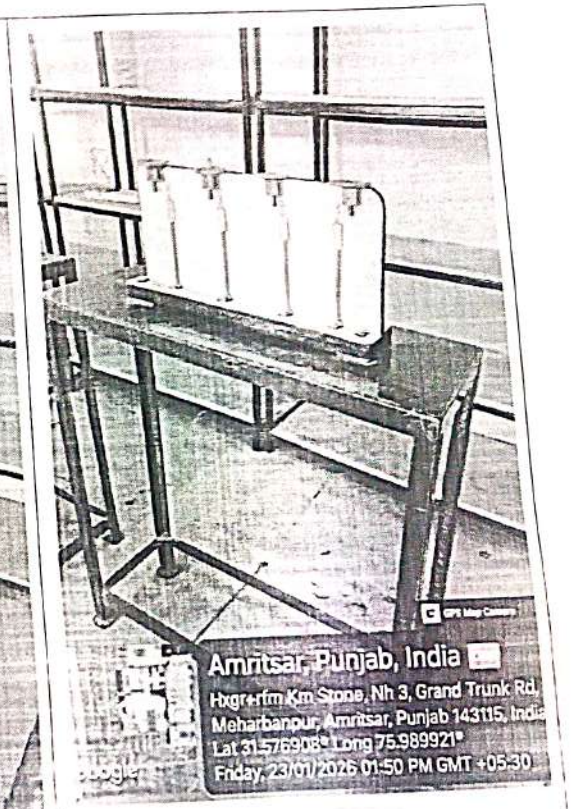
| 3 | Column and Strut Apparatus | A laboratory experimental apparatus used to study the behavior of **columns and struts under axial compressive load**. The setup consists of multiple slender column specimens mounted on a rigid frame with adjustable end conditions. It is used to study **buckling behavior, effective length, critical load, and failure modes** of columns in Strength of Materials / Structural Engineering laboratory. | 1 |  |  |

| AMRITSAR GROUP OF COLLEGES<br>NAAC Grade "A" 3rd Cycle \| Autonomous College | Details of<br>Laboratory Equipment | Civil<br>Engineering<br>Department |
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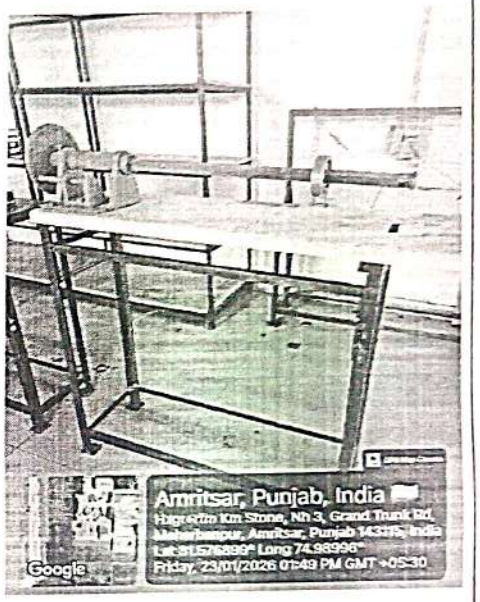
| 4 | Unsymmetrical Bending Apparatus | A laboratory experimental apparatus used to study **unsymmetrical bending of beams.** The setup consists of a beam mounted on rigid supports with provision for applying loads at eccentric locations. It is used to determine bending stresses, neutral axis position, and stress distribution when bending occurs about unsymmetrical axes, as studied in Strength of Materials / Structural Engineering laboratory. | 1 |  |  |

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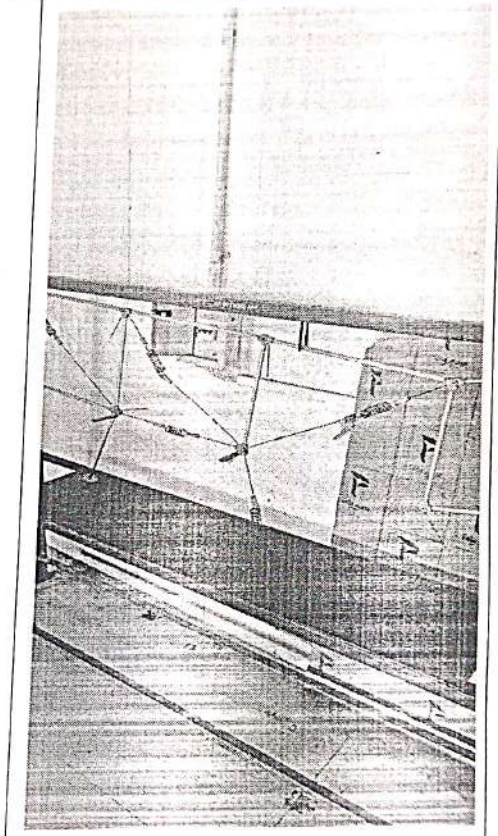
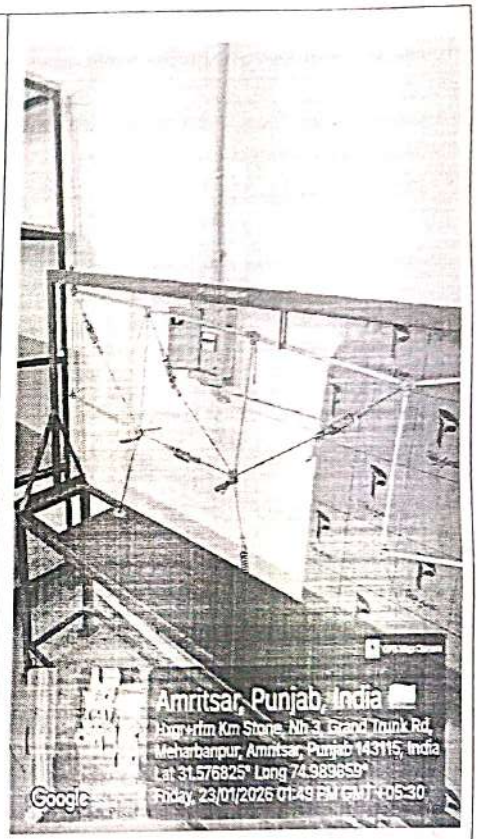
| 5 | Deflection of Truss Apparatus | A laboratory experimental apparatus used to study the **deflection behavior of truss members under applied loads.** The setup consists of a pin-jointed truss model with dial gauges/spring balances provided at selected joints to measure deflection. It is used to verify theoretical deflection values and study load distribution in truss members in Structural Analysis / Engineering Mechanics laboratory. | 1 |  |  |

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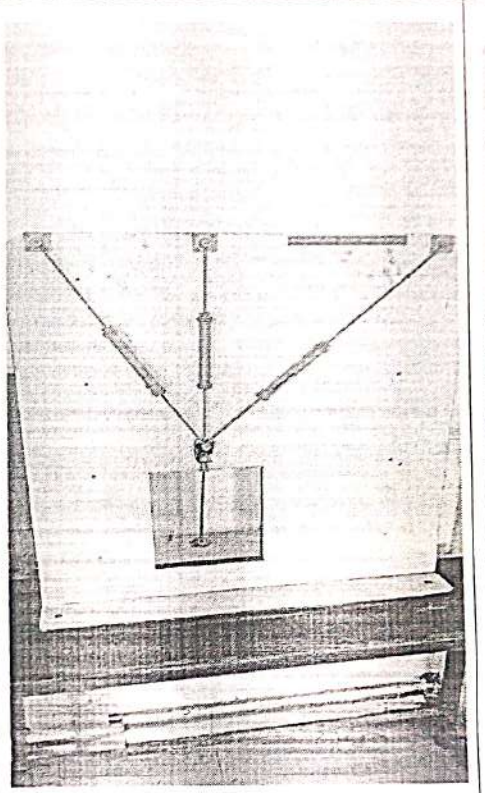
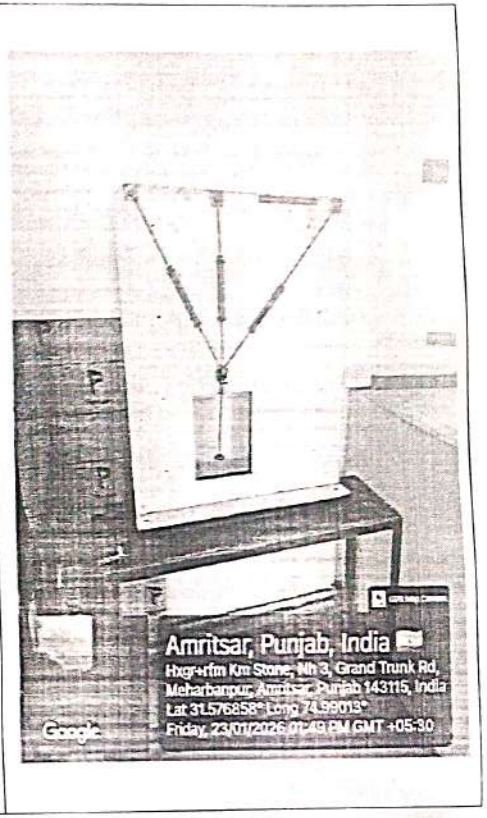
| 6 | Redundant Joint Apparatus | A laboratory experimental apparatus used to study the behavior of a **statically indeterminate (redundant) joint** in a truss system. The setup consists of multiple pin-jointed members connected to a common joint with spring balances/adjustable members to measure internal forces. It is used to analyze load sharing, force redistribution, and redundancy effects in truss structures in Structural Analysis laboratory. | 1 |  |   |

| AMRITSAR GROUP OF COLLEGES<br>NAAC Grade "A" 3rd Cycle \| Autonomous College | Details of Laboratory Equipment | Civil Engineering Department |
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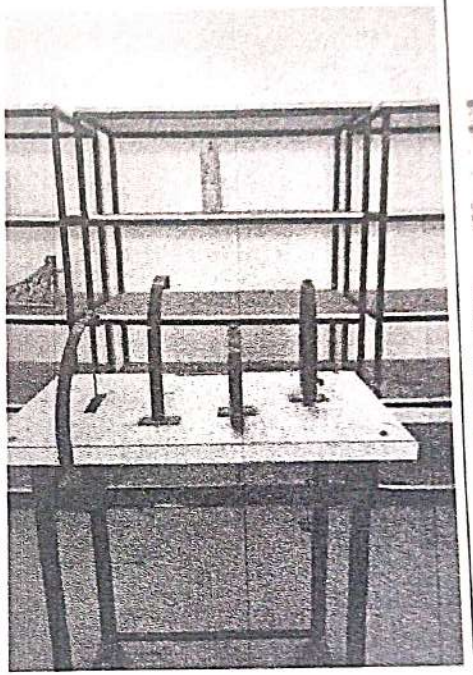
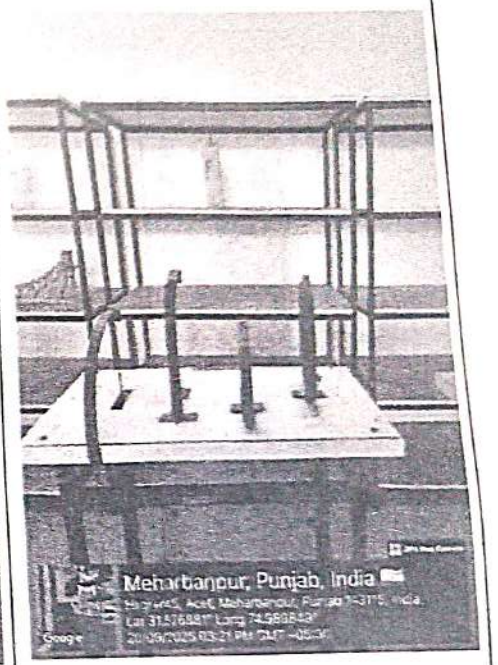
| 87 | Curved Member Apparatus | A laboratory experimental apparatus used to study the **stress distribution in curved members** such as rings, hooks, and curved beams subjected to loads. The setup consists of curved specimens mounted on a rigid frame with provision for load application. It is used to analyze circumferential stress, radial stress, and bending effects in curved members in Strength of Materials / Structural Engineering laboratory. | 1 |  |  |

| AMRITSAR GROUP OF COLLEGES<br>NAAC Grade "A" 3rd Cycle \| Autonomous College | Details of Laboratory Equipment | Civil Engineering Department |
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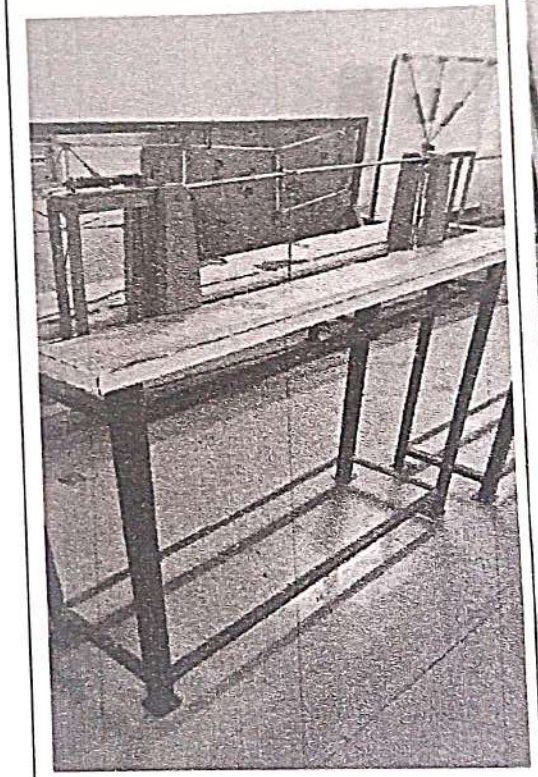
| 18 | Clarkes Maxwell Reciprocal Theorm Apparatus | A laboratory experimental apparatus used to verify Maxwell's Reciprocal Theorem in structural analysis. The setup consists of a beam/truss arrangement with provision for applying loads at different points and measuring corresponding deflections using dial gauges/indicators. It is used to demonstrate that the deflection at point A due to a load at point B is equal to the deflection at point B due to the same load applied at point A, within elastic limits. | 1 |  |  |

Er. Kaiser Saleem

Lab In charge

Head of Department

| AMRITSAR GROUP OF COLLEGES<br>NAAC Grade "A" 3rd Cycle \| Autonomous College<br>under Autonomous Category (Since 2014) Conferred by UGC | Details of Laboratory Equipment | Department Civil Engineering |
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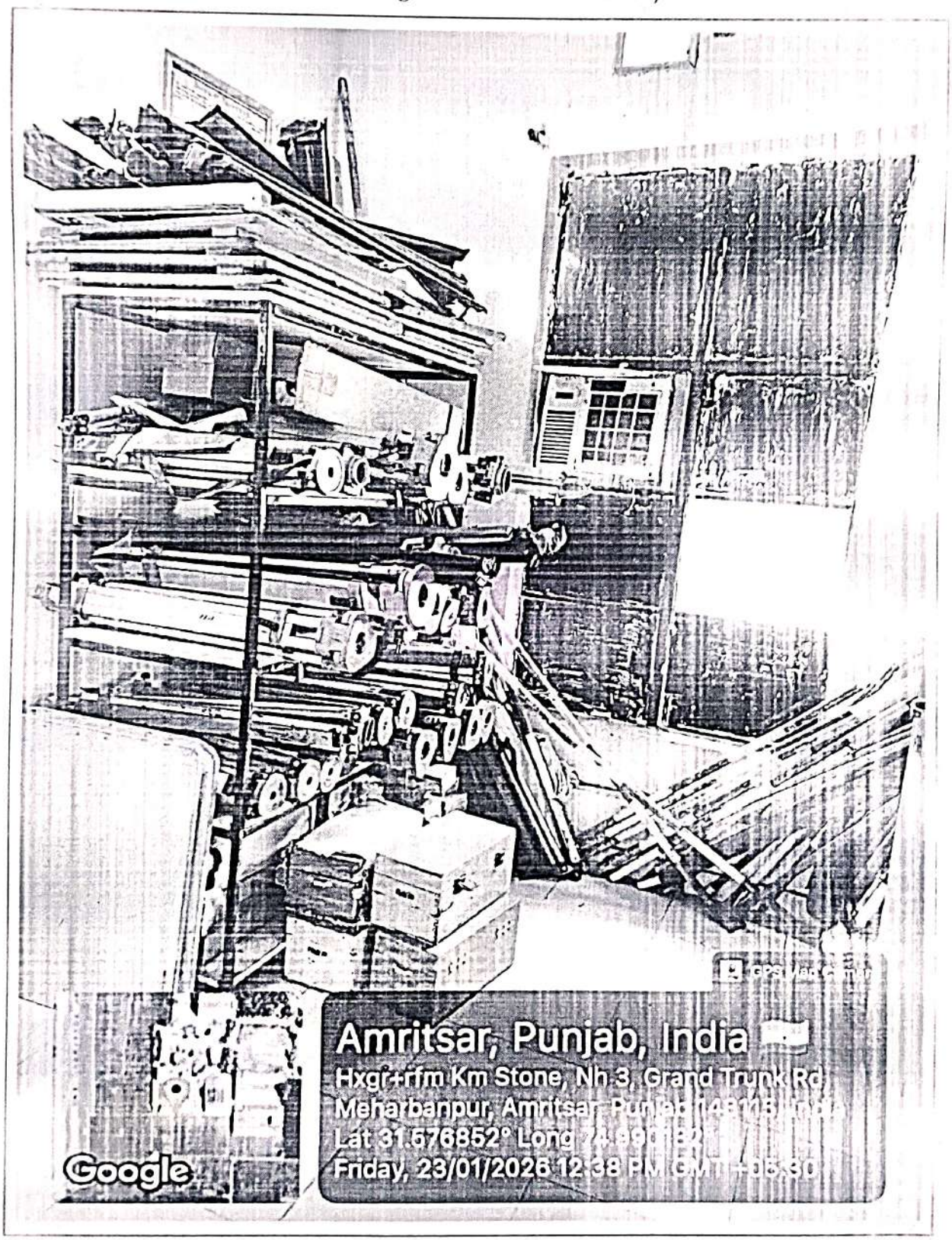
Name of the Laboratory: Survey Lab

**Picture of the Lab (Outside – showing the name plate)**

Picture of the Lab (Inside – showing a wider view of the lab)



| AMRITSAR GROUP OF COLLEGES NAAC Grade "A" 3rd Cycle \| Autonomous College | Details of Laboratory Equipment | Department Civil Engineering |
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**Details of the Laboratory Equipment's**

| S. N. | Name of Equipment | Description / Specification of the Equipment | Quantity | Normal Picture | Geotagged Picture |
|---|---|---|---|---|---|
| 1 | Vernier Theodolite | To measure horizontal and vertical angles accurately in surveying, alignment, and layout work. | 10 |  |   |

| AMRITSAR GROUP OF COLLEGES NAAC Grade "A" 3rd Cycle \| Autonomous College | Details of Laboratory Equipment | Department Civil Engineering |
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| 2 | Total Station | modern electronic surveying instrument used to measure horizontal angles, vertical angles, and distances with high accuracy | 01 |  |  |

| AMRITSAR GROUP OF COLLEGES NAAC Grade A 3rd Cycle \| Autonomous College | Details of Laboratory Equipment | Department Civil Engineering |
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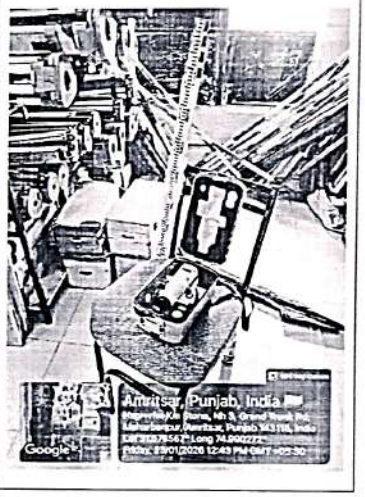
| 3 | Auto Level with levelling staff | To determine relative elevations (levels) of points on the ground with high accuracy. | 10 |  |  |

| AMRITSAR GROUP OF COLLEGES NAAC Grade 'A' 3 Cycle \| Autonomous College | Details of Laboratory Equipment | Department Civil Engineering |
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| 4 | Digital Theodolite | A modern precision surveying instrument used to measure horizontal and vertical angles electronically with high accuracy | 03 |  |   |

| AMRITSAR GROUP OF COLLEGES NAAC Grade "A" 3rd Cycle \| Autonomous College | Details of Laboratory Equipment | Department Civil Engineering |
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| 5 | Prismatic Compass | To measure the bearing of survey lines with respect to the magnetic meridian. | 06 |  |  |

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| 6 | Plane Table with Accessories | It is used for direct field plotting, where observations and plotting are done simultaneously. | 12 |  |  |

| AMRITSAR GROUP OF COLLEGES NAAC Grade A++ Cycle 4 Autonomous College | Details of Laboratory Equipment | Department Civil Engineering |
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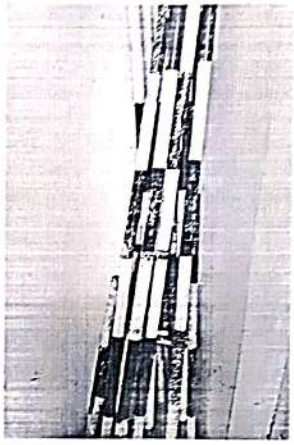
| 7 | Ranging Rods | Ranging rods are simple surveying accessories used to mark survey stations and align straight survey lines on the ground. | 25 |  |   |

| AMRITSAR GROUP OF COLLEGES NAAC Grade "A" 3rd Cycle \| Autonomous College | Details of Laboratory Equipment | Department Civil Engineering |
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| 8 | GPS | A modern electronic surveying system used to determine the precise position of points on the Earth's surface | 01 |   |   |

| AMRITSAR GROUP OF COLLEGES NAAC Grade "A" Cycle | Details of Laboratory Equipment | Department Civil Engineering |
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| 9 | Laser distance meter | A modern electronic measuring instrument used to measure distance accurately and quickly using a laser beam. | 02 |  |   |

| AMRITSAR GROUP OF COLLEGES NAAC Grade A+ Cycle \| Autonomous College | Details of Laboratory Equipment | Department Civil Engineering |
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| 10 | Electronic digital caliper | A precision measuring instrument used to measure external dimensions, internal dimensions and depths of objects with high accuracy. | 01 |   |   |

Note: This proforma must include all types of laboratory equipment, including computer systems, licensed software, projectors, smart screens, and other ICT-enabled teaching–learning resources.

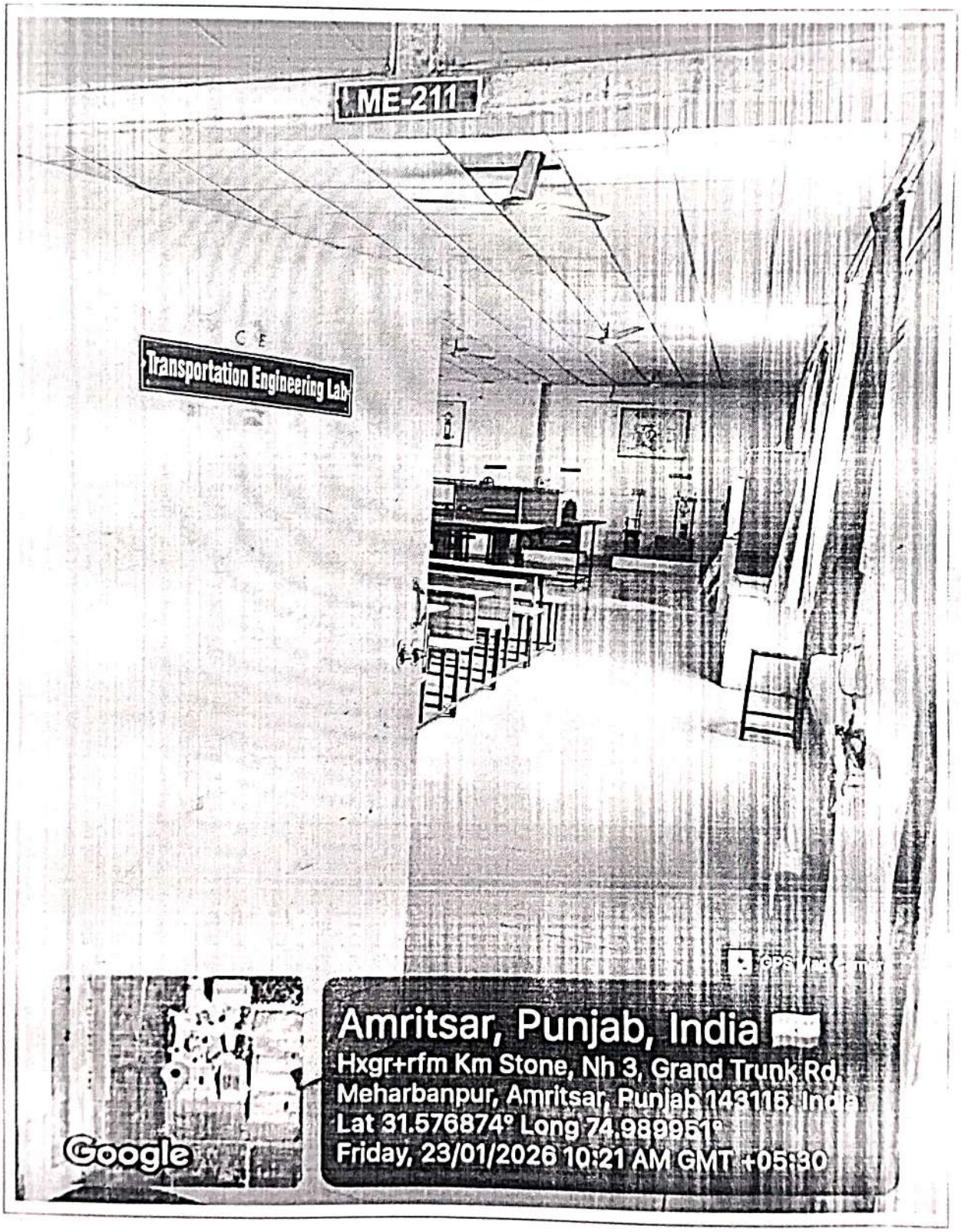
Lab In Charge

Head of the Department

| AMRITSAR GROUP OF COLLEGES<br>NAAC Grade "A" 3rd Cycle \| Autonomous College<br>under Autonomous Category \| (Since 2014) Conferred by UGC | Details of Laboratory Equipment | Department Civil Engineering |
|---|---|---|

Name of the Laboratory: Transportation Engineering Lab

**Picture of the Lab (Outside – showing the name plate)**



Picture of the Lab (Inside – showing a wider view of the lab)

| AMRITSAR GROUP OF COLLEGES NAAC Grade "A" 3rd Cycle \| Autonomous College | Details of Laboratory Equipment | Department Civil Engineering |
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**Details of the Laboratory Equipment's**

| S. N. | Name of Equipment | Description / Specification of the Equipment | Quantity | Normal Picture | Geotagged Picture |
|---|---|---|---|---|---|
| 1 | Impact Test Apparatus | To determine the impact strength or toughness of a material | 01 |  |  |
| 2 | Bitumen Extractor Test Apparatus | To determine the bitumen content present in a bituminous mix by separating bitumen from the aggregate using a suitable solvent. | 02 |  |  |

| AMRITSAR GROUP OF COLLEGES NAAC Grade "A" Cycle \| Autonomous College | Details of Laboratory Equipment | Department Civil Engineering |
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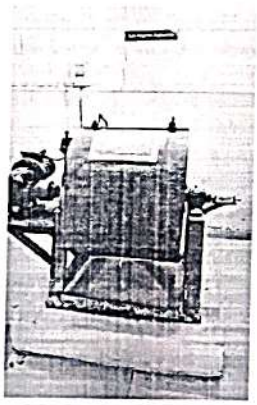
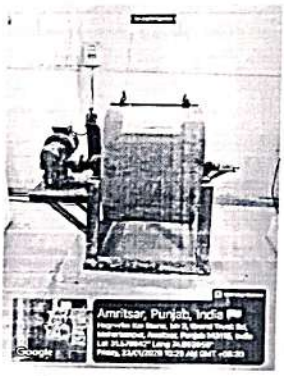
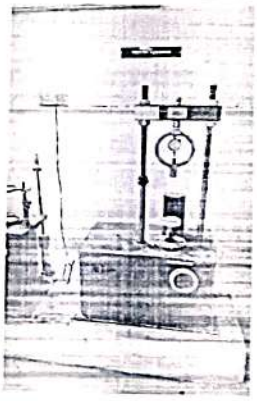
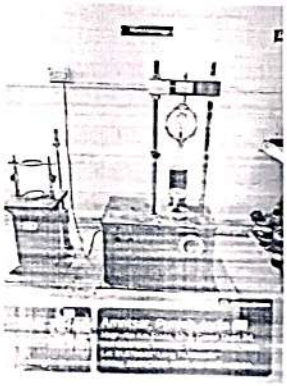
| 3 | Los Angeles test apparatus | To determine the abrasion resistance and toughness of aggregates | 01 |  |  |
| 4 | Marshal Apparatus | To determine the stability and flow value of bituminous paving mixtures as per the Marshall mix design method. | 01 |  |  |

| AMRITSAR GROUP OF COLLEGES<br>NAAC Grade 'A' 3rd Cycle \| Autonomous College | Details of Laboratory Equipment | Department Civil Engineering |
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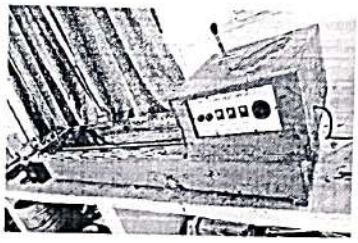
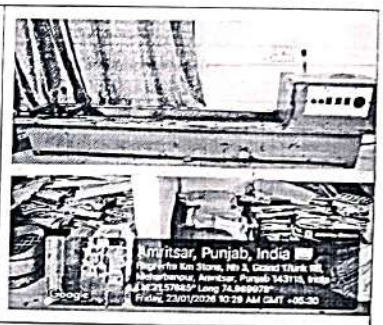
| 5 | Ductility Apparatus | To determine the ductility of bitumen | 01 |  |  |
| 6 | Hot Air oven | equipment used to dry, heat, and condition materials such as aggregates and bitumen | 01 |  |  |

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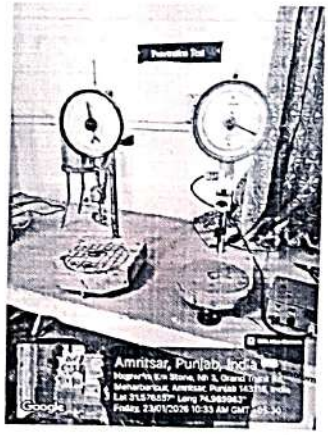
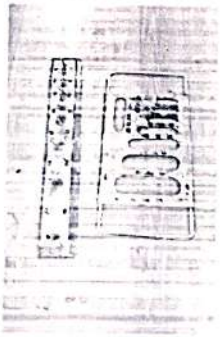
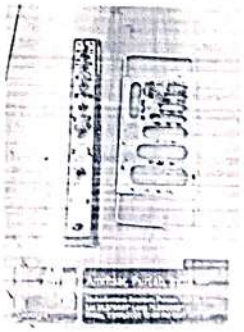
| 7 | Penetration Test Apparatus | To determine the consistency or hardness of bitumen | 02 |  |  |
| 8 | Shape test ( flakiness and elongation index) | To determine the shape characteristics of coarse aggregates, specifically the flakiness index and elongation index | 01 |  |  |

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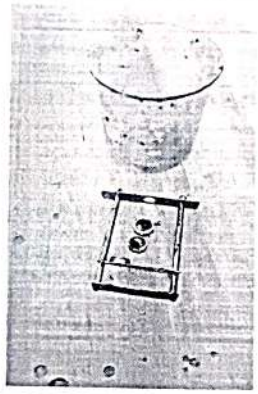
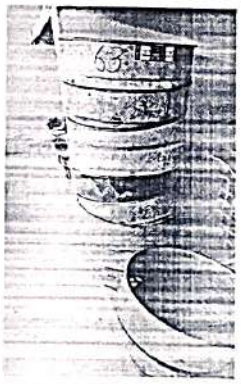
| 9 | Ring and ball Apparatus | To determine the softening point of bitumen | 02 |  |   |
| 10 | Sieve test | To determine the particle size distribution (gradation) of aggregates | 01 |  |  |

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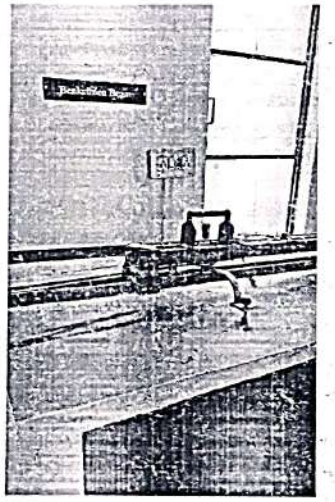
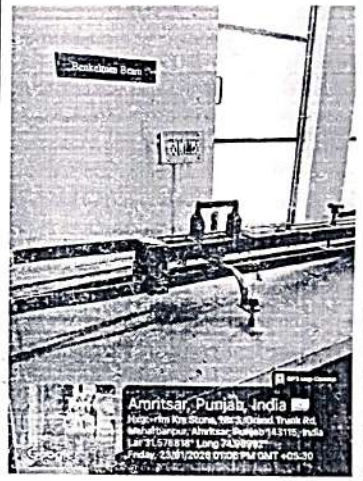
| 11 | Benkelmen Beam test apparatus | To measure the deflection of flexible pavements under a moving wheel load | 01 |  |   |

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| 12 | Water bath | Equipment used to maintain test samples at a constant and uniform temperature | 01 |   |   |

Note: This proforma must include all types of laboratory equipment, including computer systems, licensed software, projectors, smart screens, and other ICT-enabled teaching–learning resources.

Lab In Charge

Head of the Department