

## Research Facilities

# Materials Testing Laboratory



**Materials Testing Laboratory Overlooking El-Jamaa Street**

### Materials Testing Laboratory Testing Facilities & Consulting Services

**Acting Director: Dr. Hatem Hasan Aly Ibrahim**

**Starting November 1, 2020**

The Materials Testing Laboratory is one of the first labs established in the Faculty of Engineering, Cairo University. It was founded in 1927 and occupied, at that time, the current location of the Bio-Medical Engineering and Systems Department. The lab was later developed and expanded and occupied a separate building with a vast hall incorporating various testing machines with different load capacities (ranging from 50 kg up to 400,000 kg). The laboratory carries out different tests on building materials such as bricks, stones, timber, aggregates, cement, concrete in both fresh and hardened stages, reinforcement steel, gypsum, tiles, ceramics, electric cables and wires, electric insulators ... etc. The lab incorporates, as well, a workshop for the preparation of standard test specimens and wooden forms. Special rooms for concrete casting, curing, and carrying out some standard tests are also available in the basement of the building.

The academic staff of the laboratory comprises a group of highly qualified professors, associate professors and assistant professors with diversified and integrated scientific and technical expertise in the fields of properties, strength, and technology of construction materials; as well as composite materials and quality control and assurance. The academic staff is assisted by a number of teaching assistants and demonstrators as well as a crew of experienced technicians and workers. They all cooperate for serving the fields of quality control/quality assurance (QC/QA) of construction industry.

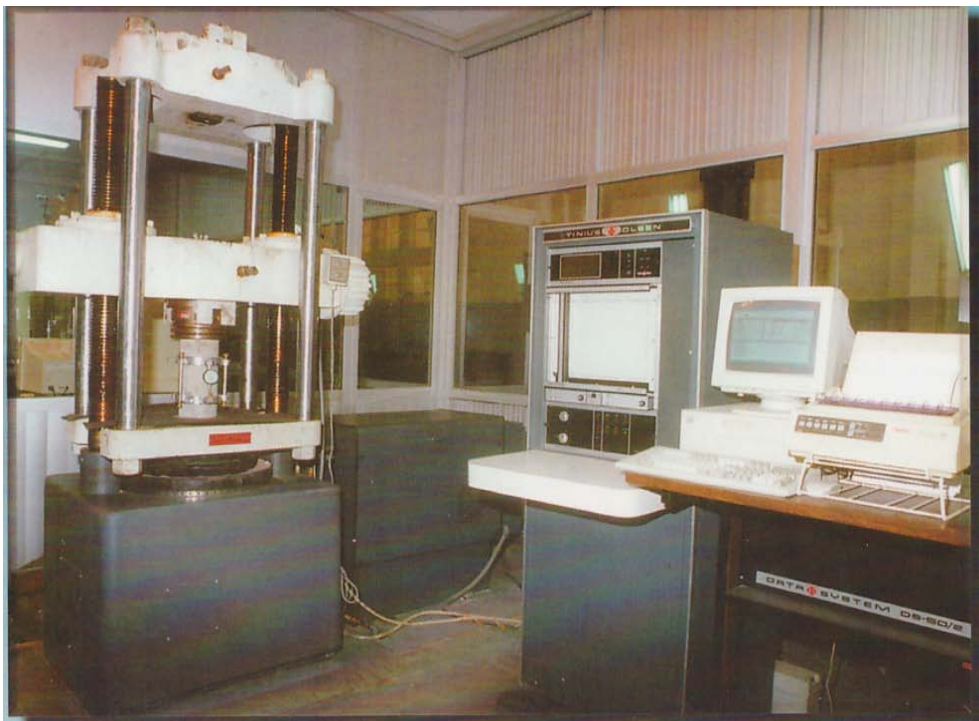
The Materials Testing laboratory plays a pioneering role in the QC/QA of Egyptian construction industry using its up-to-date facilities which include:

- Equipment for standard testing of concrete aggregates
- Equipment for standard testing of different types of cement
- Regularly calibrated universal, compression and other testing machines with various load capacities ranging from 50 kg up to 400,000 kg that test different building materials under various loading cases (tension, compression, bending, shear, torsion, impact, fatigue, abrasion, creep and hardness)

- Equipment for standard testing of concrete in both fresh and hardened stages
- Equipment for non-destructive testing of different elements of existing structures, such as Pundit ultrasonic device, calibrated Schmidt hammer, Windsor probe, Profometer for measuring concrete cover and diameter of steel bars, half cell apparatus for detecting steel corrosion, in addition to thermal insulation and coating thickness measuring devices
- Devices for measuring deformations of loaded specimens, including those working by laser and acoustic emission
- Core drill machine for extracting cores from concrete and masonry elements and structures
- Integrated computer lab serving the analysis of test data, current research work, and preparation of technical reports and engineering drawings.



**Testing Machines Hall**



**Computerized 200 Ton Olsen Universal Testing Machine**



**Computerized 50 Ton Shimadzu Universal Testing Machine**

The Materials Testing Lab currently serves different educational and scientific activities including:

**1- Serving the Educational Needs of Undergraduate Students of the Faculty of Engineering:**

By conducting standard tests on different building materials to determine their conformity with standard specifications and their suitability for construction applications. The students study also in the lab the strength of different building materials and their behavior under various loading conditions.

**2- Serving Research Work:**

By providing all its laboratory facilities and testing equipment to serve different research activities carried out by faculty members and postgraduate students in the Structural Engineering Department, as well as faculty members and students of other departments and other university faculties.

**3- Providing Laboratory Services and Consultations for Construction Projects:**

The Materials Testing Lab also plays a leading role in serving as a consultant and testing lab for different governmental and private organizations as well as individuals in the following fields:

**A- Laboratory Tests:**

- Standard testing of different building materials
- Concrete mix design
- Field sampling of building materials and/or fresh concrete for laboratory testing
- Preparation and testing of concrete cores extracted from different existing structures
- Calibration of instruments and testing machines belonging to different organizations and other testing labs

**B- Field Tests:**

- Non-destructive testing for quality assurance
- Quality control of concrete mixes by conducting field tests on consistency and workability
- Extraction of cores from existing structures



**Computerized 400 Ton Technotest Compression Testing Machine**



**10000 Kg Lloyd Universal Testing Machine**



**40 Ton Loading Frame for Testing Non-Standard Models**



**Various Non-Destructive Testing Equipment**



**Non-Traditional Tests on Non-Standard Specimens**

### **C- Evaluation of Existing Structures:**

- Technical inspection of materials and components of existing structures
- Investigation, measurement and classification of different cracks with interpretation of causes and recommendations of remedial measures
- Execution of non-destructive tests and measurements for the evaluation of degree of safety of different structural and non-structural elements in existing structures
- Rendering consultation services for repair of structures made of different building materials and subjected to deterioration and/or local failure

### **D- Technical Inspection of Construction Works:**

Technical inspection of construction works in all of their aspects: material storage, batching, preparation of forms, concrete casting, fixing of connections, reinforcement arrangement, material and concrete sampling and testing.



**Technical Inspection of Construction Works**

### **E- Preparation of Technical Reports:**

- Preparation of quality control and standard lab test reports
- Preparation of technical reports for structure examination and inspection, and evaluation of materials status
- Preparation of reports for statistical analysis of lab and field data, using computer software
- Preparation of periodical technical reports and follow-up reports on technical inspection of construction works
- Preparation of consulting technical reports on construction problems, obstacles and/or risks

### **F- Training and Educational Seminars**

Seminars for upgrading the skills and efficiency of:

- Construction engineers supervising work sites
- Technicians in work sites
- Skilled laborers for different activities in the construction field

### **Address**

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