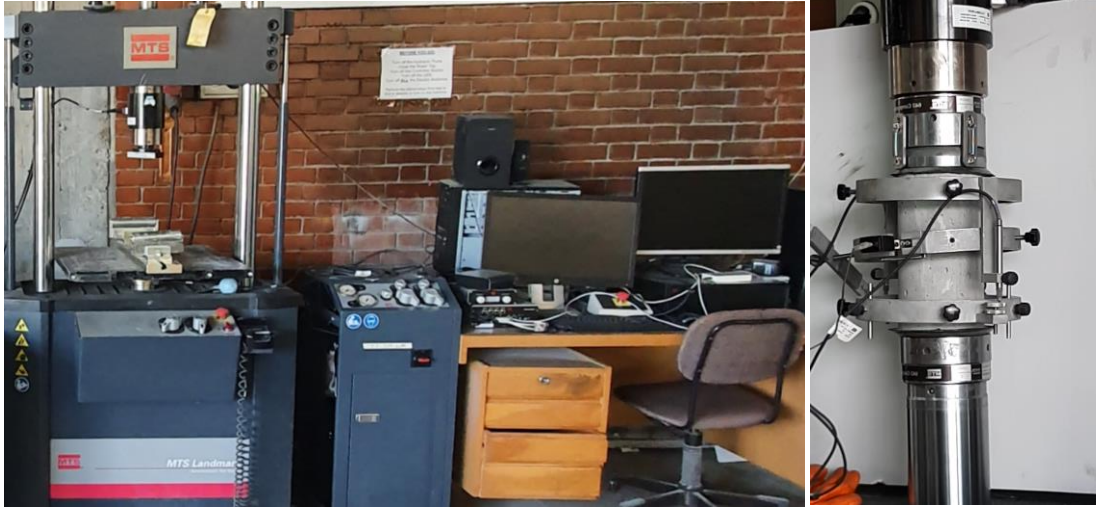


## Materials of Construction Laboratory Testing Equipment



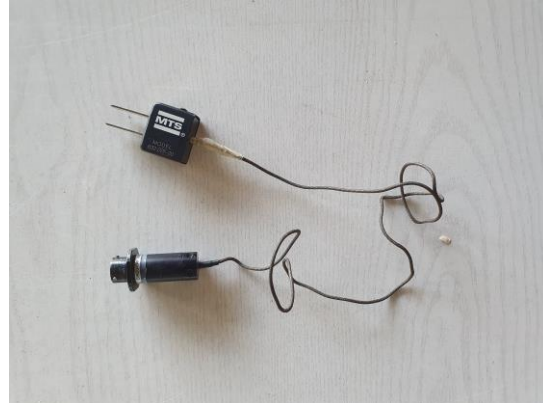
### Universal Testing Machine (MTS Landmark 250)

This servohydraulic test system is used to determine the elastic properties of concrete. The compressive load as well as the longitudinal and lateral displacements that would occur on the concrete specimens are determined which are needed to calculate the Modulus of Elasticity and Poisson's Ratio of concrete.



### Linear Variable Differential Transformer

Using this gauge, it is possible to determine the longitudinal displacement of the concrete material during the test. It is used in determining the Modulus of Elasticity of concrete.



### Crack Opening Displacement Gauge

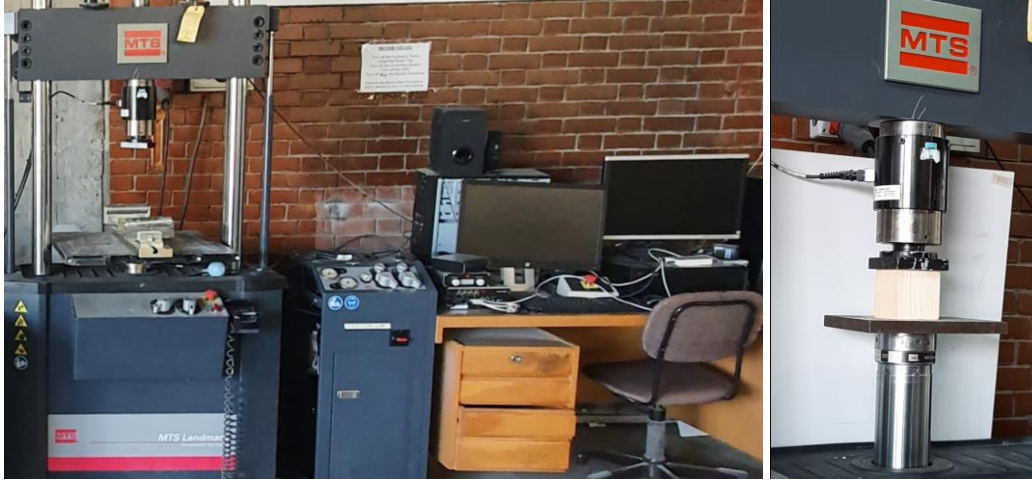
This gauge measures the deformations using the movements of its clamps. It is used in determining the Poisson's Ratio of concrete.



### **Compressometer**

The compressometer is attached to a cylindrical concrete specimen to measure the longitudinal and lateral displacements taken from the specimen which are then used to determine the Modulus of Elasticity and Poisson's Ratio of concrete.

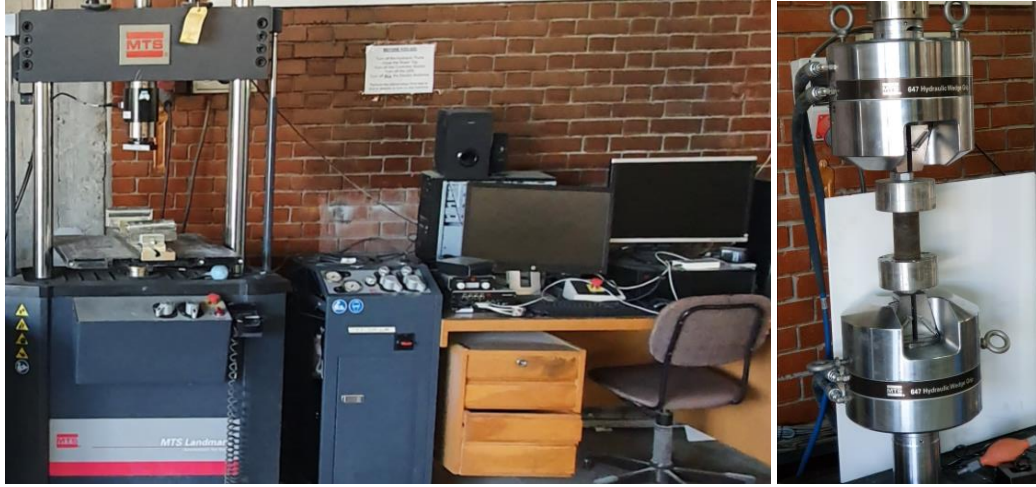
## Materials of Construction Laboratory Testing Equipment



### Universal Testing Machine (MTS Landmark 250)

This servohydraulic test system is used to determine the elastic properties of wood in two different directions. The same load is applied to wood specimen for both directions, separately. To determine the elastic moduli in two directions, the longitudinal deformations are measured by the machine.

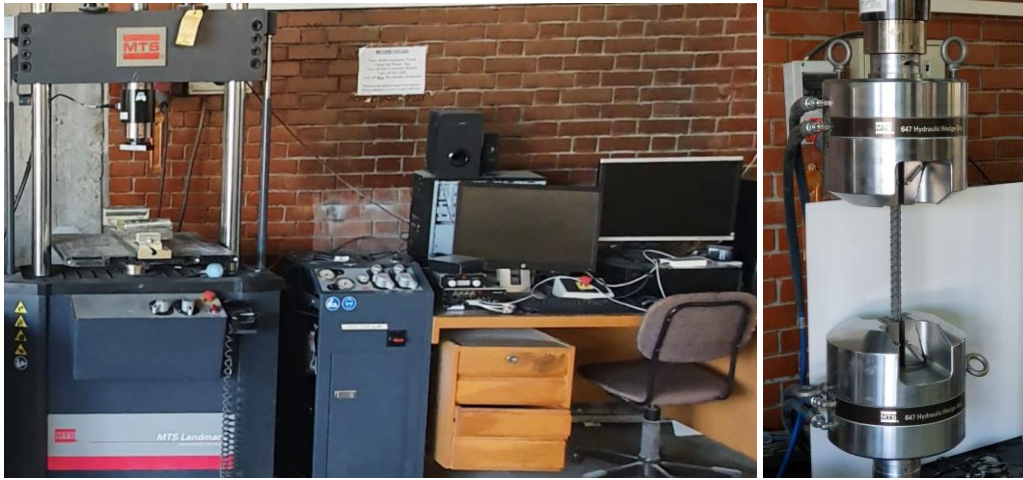
## Materials of Construction Laboratory Testing Equipment



### Universal Testing Machine (MTS Landmark 250)

The cyclic loading is applied to a rubber specimen, which is a viscoelastic material. The load – displacement graph is drawn by the machine and the energy dissipation is calculated.

## Materials of Construction Laboratory Testing Equipment



### Universal Testing Machine (MTS Landmark 250)

This servohydraulic test system is used for direct tensile loading and strain hardening tests to steel specimens. The material parameters depending on tests are determined and compared with each other.



### Materials of Construction Laboratory Testing Equipment



**Le Chatelier Flask**

Measures density of materials of construction by employing the principle that the volume of displaced liquid (in general kerosene) is exactly equal to the volume of immersed material



**Water Bath**

The machine offers a constant temperature of water. This apparatus is used for determination of density.



**Blaine Air-Permeability Apparatus**

Determines fineness of materials of construction by considering the principle that the air can move easier through the inter particle space in coarser materials than finer materials.



**Mixer (manual and automatic programmable)**

These apparatuses are used for mixing pastes and mortars. The machine provides a homogeneous paste for normal consistency test, setting time test and mortar for compressive strength, flexural strength tests.



**Vicat Apparatus**

The apparatus is used for determination of normal consistency and setting time of paste.



**Flow Table**

This apparatus is used for determination of flow of mortar. The flow demonstrates consistency of freshly mixed mortar.



**Mold (40 x 40 x 160 mm prismatic specimens)**

The 40 x 40 x 160 mm prismatic mold is used for determination of compressive strength/flexural strength of mortar or paste.



**Mold (50 mm cube specimens)**

The 50 mm cube mold whose dimension is compatible with ASTM standard is used for determination of compressive strength of mortar or paste.



**Universal Testing Machine**

This hydraulic compression testing machine is used to determine the flexural strength (right frame) and the compressive strength (left frame) of cement mortar.

### Materials of Construction Laboratory Testing Equipment



**Sample Splitter**

Samples the aggregate for laboratory tests. Sample splitter is used to take a small "representative sample" from a larger parent sample. It divides the aggregate sample into two. The dividing process is continued until the sample size is sufficiently reduced.



**Balance (in different capacities)**

Measures the weight of the aggregates.



**Oven**

Dries the aggregates to constant mass at a certain temperature. The first step applied is drying the aggregates in the oven at  $110 \pm 5^\circ\text{C}$  to constant mass when determining many properties of aggregates such as bulk density, density, specific gravity, absorption capacity, particle size distribution.



**Measure and Tamping Rod**

These apparatuses are used to determine the bulk density ("unit weight") of compacted or loose aggregate and to calculate the voids between particles in fine, coarse, or mixed aggregates.





**Mechanical Sieve Shaker for Fine Aggregates**

The particle size distribution is an index which shows particle size of particles and their relatively proportions. This apparatus is used for particle size distribution of fine aggregates. It is equipped with a vibrator to shake the sieves.



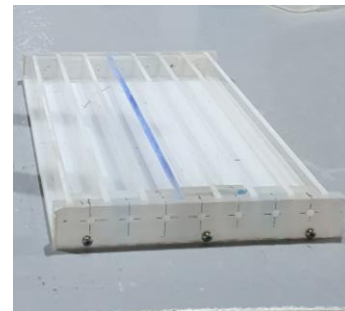
**Mechanical Sieve Shaker for Coarse Aggregates**

The particle size distribution is an index which shows particle size of particles and their relatively proportions. This apparatus is used for particle size distribution of coarse aggregates. It is equipped with a vibrator to shake the sieves.



**Mixer (manual and automatic programmable)**

These apparatuses are used to prepare mortar sample for alkali-aggregate reactivity test.



**Mold (25 x 25 x 285-mm prisms)**

The molds are used for test sample used in determining the length change of cement mortars. They are necessary for alkali-aggregate reactivity test.



**Curing Cabinet**

This cabinet is used when testing potential alkali reactivity of aggregates. Samples are stored in the containers filled with 1N NaOH solution at a temperature of  $80.0^{\circ}\text{C} \pm 2.0^{\circ}\text{C}$ .



**Length Change Measurement Apparatus**

This apparatus is used to measure length change of mortar prism samples because of alkali-aggregate reaction.



**Specific Gravity Frame with Electronic Balance, Basket and Container**

The apparatus is used for determination of density (not including the volume of spaces between particles), specific gravity, and absorption of coarse aggregate.



A pycnometer is used for determination of specific gravity and absorption of fine aggregate. The aggregate sample is introduced to the pycnometer.



### **Mold and Tamper**

The apparatus is used for surface moisture test of fine aggregates.



### **Los Angeles Testing Machine**

The apparatus measures abrasion resistance of aggregates. Abrasion resistance is essentially important for applications such as airport, highway and industrial floors.



### Materials of Construction Laboratory Testing Equipment



**Rotary Drum Concrete Mixer**

This equipment is used to mix the ingredients of concrete. It has a capacity of 150 liters.



**Slump Cone**

The slump cone is used to determine the consistency of the fresh concrete.



**Concrete Air Meter**

This equipment is used to determine the unit weight and air content of freshly-mixed concrete.



**Capping Apparatus**

The capping apparatus is used to determine the compressive strength of concrete when cylindrical specimens are used.





### **Compression Testing Machine (ELE-3000)**

This hydraulic compression testing machine is used to determine the compressive strength of concrete. It has a capacity of 3000 kN.



### **Splitting Tensile Strength Test Fixture**

This fixture is used in determining the splitting tensile strength of concrete.



### **Cylindrical Cubic and Prismatic Molds**

These molds are used for concrete casting. These specimens obtained from these can be used for compressive, split tensile and flexural tensile strength tests.