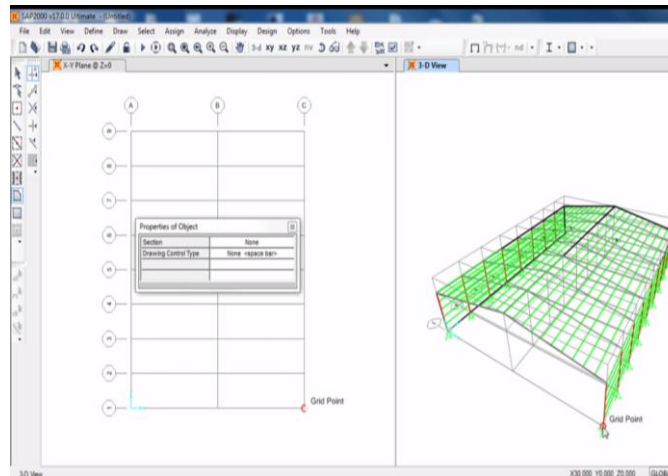


Computer and Software Application in Civil Engineering

Civil engineering students use AutoCAD 2D & 3D (for drafting/drawing), REVIT (For detailing), SAP2000, STAAD PRO and E TABS (for design), Autodesk Civil 3D, PRIMAVERA (For management), 3d max, V ray for modelling, EPANET (designing of water tanks and distribution systems), MX roads, and other software.

Laboratories of the Civil Engineering Department

- 1- Concrete laboratory
- 2- Construction building material testing laboratory
- 3- Environmental engineering laboratory
- 4- Fluids Laboratory
- 5- Geotechnical engineering laboratory
- 6- Hydraulics laboratory
- 7- Pavement laboratory
- 8- Surveying laboratory



Welcome to Civil Engineering Laboratories



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Our laboratories technologists

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1- Concrete Laboratory



The concrete laboratory is equipped with the necessary equipment and test facilities to carry out a wide range of tests on a variety of structures. Starting from fracture toughness and flexural modulus tests on small-sized concrete beams, a variety of other tests have been carried out in the laboratory. Fatigue tests on 0.9 m diameter tubular T-joints applying a dynamic load of 1.3 MN and seismic on 2.0m x 2.0 m x 0.20 m thick concrete slabs, frictional holding strength tests, static and dynamic tests have been carried out on variety of structural elements.

2- Construction Building Material Testing Laboratory

The major experimental facilities available in this laboratory consist of:

- A high strength test 24m x 12m x 1m thick;
- A cold room with an up to 275 kN dynamic load frame;
- A dynamic test bed cum shaker with a capacity 1.0 kN and frequency up to 2000 Hz;
- One 2.7 MN actuator with a 70 gpm hydraulic power supply and control panel;
- Two 1.3 MN loading frames and control panels with dynamic testing capabilities;
- One universal test machine (1.35 MN);
- One 2.7 MN compression test machine (Soil Test Inc.);
- Five hydraulic actuators having fatigue-rated load cells (10 kN to 1.3 MN).



3- Environmental Engineering Laboratory

A state-of-the-art analytical equipment are available such as:

For Water analysis

- Total organic (TOC) analyzer;
- Ultraviolet (UV) spectroscopy system;
- Portable gas chromatograph (GC) with flame ionization detector (FID) and electron capture detector (ECD);
- Equipment for biochemical oxygen demand (BOD, solid, turbidity, alkalinity and nitrogen determination);
- Portable kits for water quality analysis

For noise and indoor air quality analysis

- Noise measurements
- Indoor air quality measurements
- Sample preparation including extraction and digestion facilities.

For air quality analysis

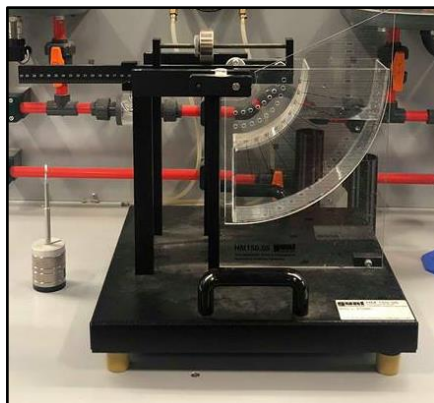
- Monitors and samplers to monitor sulfur dioxide in the ambient air;
- High volume samplers for total suspended particulate matter (TSP);
- Dichotomous inhalable particulate matters;
- Portable meteorological station with data logging facilities.



4- Fluids and Hydraulics Laboratory

The fluids laboratory has specialized equipment such as:

- Large Flume for Flow in Open Channels
- Tow tank facility(170 ft x 14 ft x 8 ft);
- An open-channel flume tank;
- A deep tank for pressure testing
- An erosion table and a multi-phase flow loop
- **Center of Pressure and Resultant Force (Photo).**
- Viscosity and Buoyancy.
- Impact of A Jet.
- Pressure Head Loss



5- Geotechnical Engineering Laboratory

The Soil Lab has equipment such as:

- Motorized direct shear devices (2)
- Triaxial loader and cells
- Mechanical sieve shakers (2)
- Multi-bay consolidation apparatus (2)
- Table top consolidation apparatus
- Combination permeameters (constant/falling head)
- Manual unconfined compression tester (2)
- Liquid limit devices, Plastic limit kits
- Shrinkage limit kits
- Hydrometers
- Compaction molds and test hammers
- Hand vane shear tester
- Mechanical vane shear tester (2)
- Fixed type consolidometer
- Volume sure apparatus
- Malt mixers (4)
- Mixer w/ 4L Bowl



6- Asphalt and Pavement Laboratory

The equipment for Asphalt Materials Testing include:

- Marshall mixture design and testing system
- Asphalt mixture preparation equipment
- ITS testing system (capable to SCB test)
- Convection oven
- Asphalt mixture volumetric and quality control testing system
- Rotational viscometer
- Universal testing system
- Environmental chamber/materials conditioning room
- Asphalt pavement fracture study system by image processing
- Surface Free Energy Device
- Dynamic Shear Rheometer
- Atomic Force Microscope
- Scanning Electron Microscope
- TLC-FID



7- Surveying Laboratory

The laboratory contains:

- Digital Theodolite with Tripod case
- Plane Table with Tripod case
- Digital Leveling Instrument with Tripod case
- Automatic Leveling Instrument with Tripod Case
- Spirit Level
- Plumbing Fork
- Engineering Chain, Measuring Tape
- Prismatic Compass With Stand
- Trough Compass
- Arrow, Plum Bob,
- Hand GPS
- Alidade
- Optical Square
- Aluminum Ranging Pole, 3 meter long
- Hammer
- Survey Bag
- Spray Paint
- Umbrella
- Digital Camera
- High Definition Handy Cam
- First Aid Box
- Leveling Staff



8- Soil-Pipe Interaction Testing



Our laboratories support our graduate students' wide spectrum civil engineering research in the areas of:

Structural engineering, ice, wind, hydro and energy, pollution control, watershed management, petroleum waste management, soil and groundwater remediation and climate change, limit states of municipal and energy pipelines, pipeline corrosion/deterioration, self-consolidating concrete, high performance concretes, waste products and mineral admixtures in concrete, durability of concrete structures, corrosion of concrete, bond, shear, cracking and deflection of large structural members, geotechnical engineering, landslides, onshore and offshore oil and gas pipelines, pile foundations, fatigue performance of deep water risers, arctic seabed hazards on subsea structures, offshore foundations and geotechnique, arctic subsea renewable energies, water filtration technology, biogas and bioenergy, biohydrogen, advanced composite materials as reinforcement for concrete structures, physical hydrology, remote sensing and GIS, offshore oil spill response, marine oily wastewater treatment, offshore reservoir souring analysis, biological interactions affecting pollutant transport, solid waste composting and northern environmental studies, pavement materials, asphalt cement and polymer, and more.