

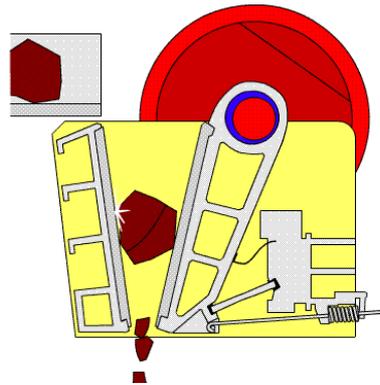
Concrete laboratory

The concrete laboratory of the University of Pretoria is equipped to conduct specialized materials testing. The laboratory is not only equipped for teaching concrete technology at under- and postgraduate level, but the main focus in the laboratory is to conduct both applied and basic materials research. The concrete laboratory is staffed with a Concrete Technologist and three Technical Assistants working with a Post-doctoral Researcher as well as PhD and Masters degree students. Current research projects include investigations into:

- The minimization of materials used by optimizing concrete mix compositions for specific uses. Research on high strength concrete, lightweight and foamed concrete mixtures and the determination of actual concrete properties forms part of these investigations;
- The use of waste materials in cement and concrete. The effect of waste materials such as recycled building waste, ash and slag on cement and concrete properties is investigated.
- Fibre reinforced concrete. The contribution of fibres towards the post-cracked strength of concrete investigated through laboratory tests, large scale experiments (full scale testing) and non-linear finite element modelling.
- Concrete pavements. Steel fibres can be used to reduce the required thickness of concrete pavements and current research focuses on the use of Ultra-Thin Continuous Reinforced Concrete Pavements (UTCRC).
- Alkali activated ash and slag cements and concrete.

The laboratory is well equipped with standard concrete testing equipment as well as equipment that can be used to conduct non-standard testing for research purposes. The equipment includes the following:

- a jaw crusher that can be used to produce aggregate from sources such as building rubble, redundant concrete products, or reject pre-cast concrete elements.



- ten different cement and concrete mixers, which include shear mixers, drum mixers and pan mixers.

Our equipment is used to cast elements such as:

- Mortar bars for cement quality control;
- Foamed concrete with densities as low as 300 kg/m³;
- Concrete in laboratory and site conditions;
- High strength fibre reinforced concrete.



Field unit for casting foamed concrete

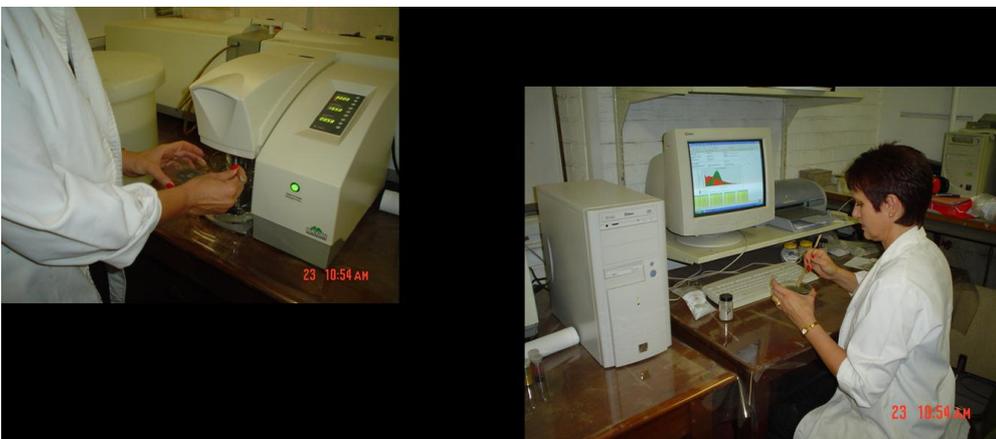


Casting of foamed concrete for heat of hydration experiments



Self levelling mortars

□ Material properties can be optimized by improved particle size distributions



Malverne Laser Scanner to determine particle size distributions