

# Test Facilities in the Sir John Laing Building

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A major purpose-built facility located 300m from the Engineering and Computing building

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# Wet Concrete Testing

- Concrete mixing area with 3 pan mixers (10 – 50 litres)
- Concrete and grout rheometers
- Slump, Vebe, Flow table, J-ring, L-box, V-Funnel (Self-Compacting Concrete tests)
- Temperature probes and associated data acquisition unit (hydration temperature of concrete)
- Range of ovens and curing tanks





# Mechanical test machines

- 50 kN and 100 kN computer controlled tension-compression machines.
- Torsion machine



# Hydraulic Test machines

- 5000kN capacity Amsler machine
- Three Denison machines with capacities of 500kN – 3000kN
- Full computer control of all machines and data acquisition (load and displacement including strain gauges etc.)





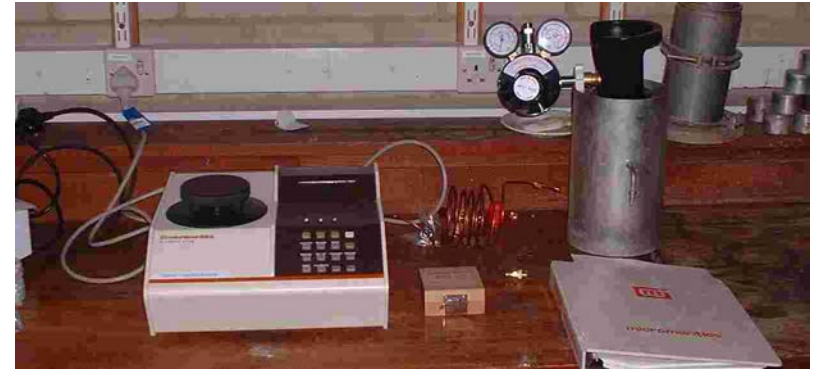
# Strong Floor

8m × 6m strongfloor with a range of hydraulic actuators with full computer control.



# Durability Testing 1

- Freeze- Thaw
- Expansion (sulphate/ASR)
- Helium pyconometer (porosity measurement)

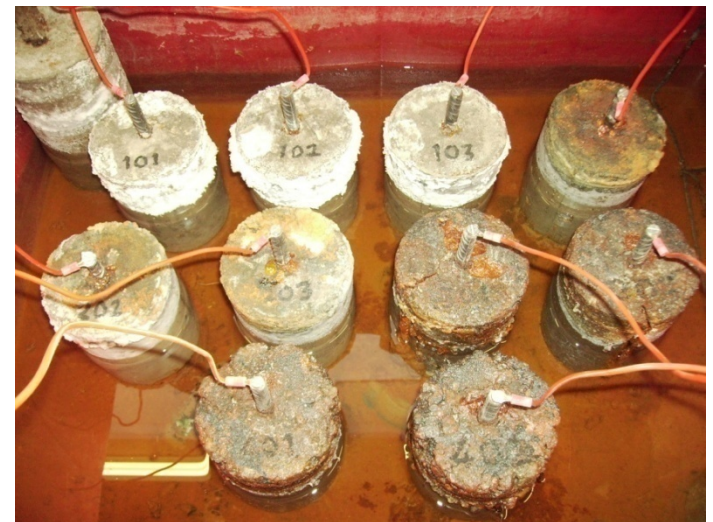
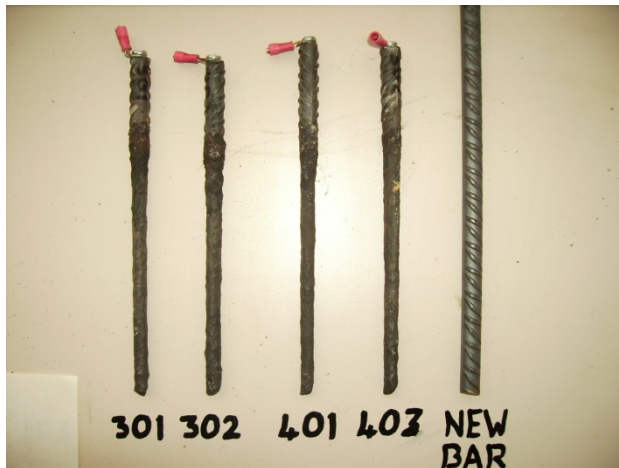




# Durability Testing 2

## Tests for Reinforcement Corrosion

- Accelerated corrosion testing apparatus
- Computer controlled potentiostat
- Resistivity measurements



# Durability Testing 3

- High pressure through flow permeability cells.
- Diffusion cells
- Pore fluid expression cell

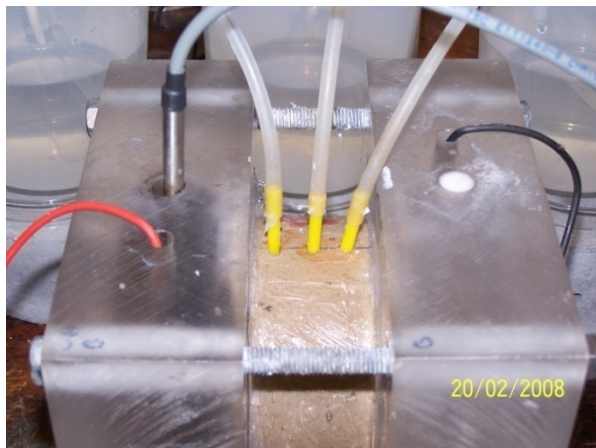
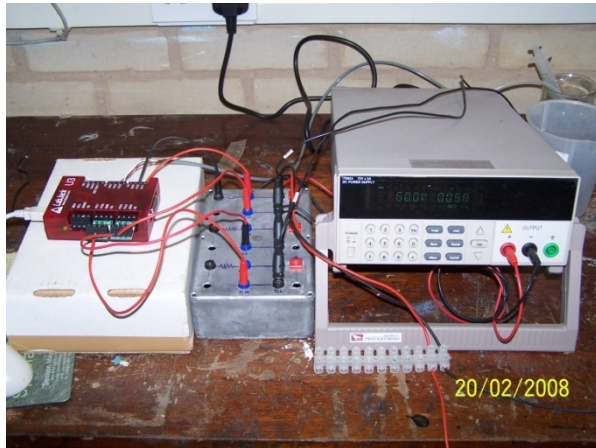




# Durability Testing 4

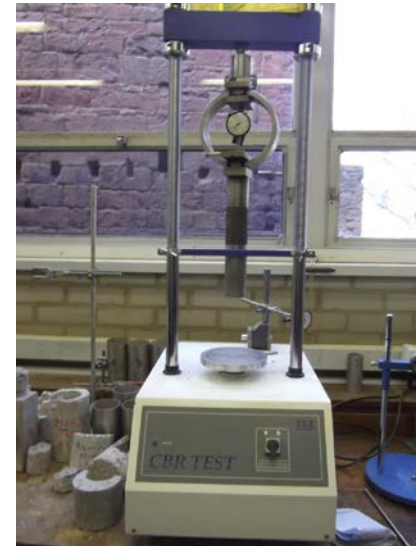
## Chloride Migration Tests

Rapid Chloride Migration  
test to ASTM C1202



# Geotechnics / Pavements

- Triaxial cells (UU and CU)
- Direct shear box apparatus (including large 300mm × 300mm)
- Standard compaction apparatus
- 1-dimensional compression oedometer (consolidation test)
- California Bearing Ratio apparatus
- Soil classification equipment (moisture content, plastic and liquid limit)
- Dry sieve analysis apparatus (63 $\mu$ m – 20mm sieves)
- Soil permeability (constant head and falling head)
- Marshall test apparatus on asphalt mixes





# Bitumen testing

Marshall apparatus

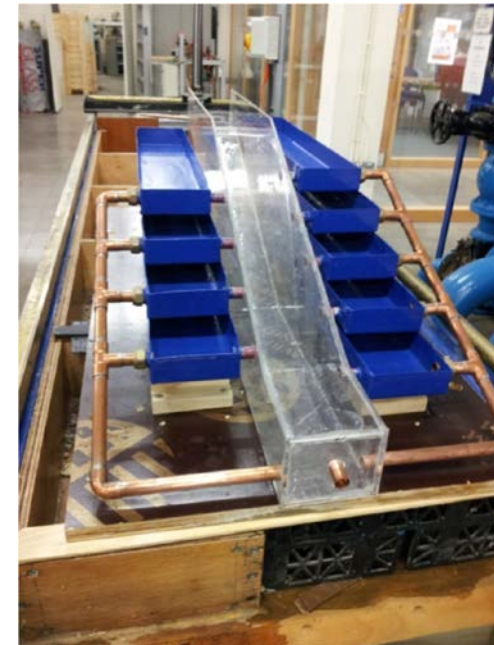
Fume cupboard

Automatic compactor



# Hydraulics

- Flume: rectangular, 15 m long, 0.3 m wide, flow up to 70 l/s with flow measurement, gradient adjustable, wave generation equipment
- 0.3 m diameter pipe, 14 m long, with openings for depth measurement etc, attached to flume above (gradient adjustable) roughened to represent a concrete surface
- Flume: rectangular, 5 m long, 0.3 m wide, flow up to 30 l/s with flow measurement
- Flume: rectangular, 5 m long, 0.1 m wide, flows up to 10 l/s with flow measurement





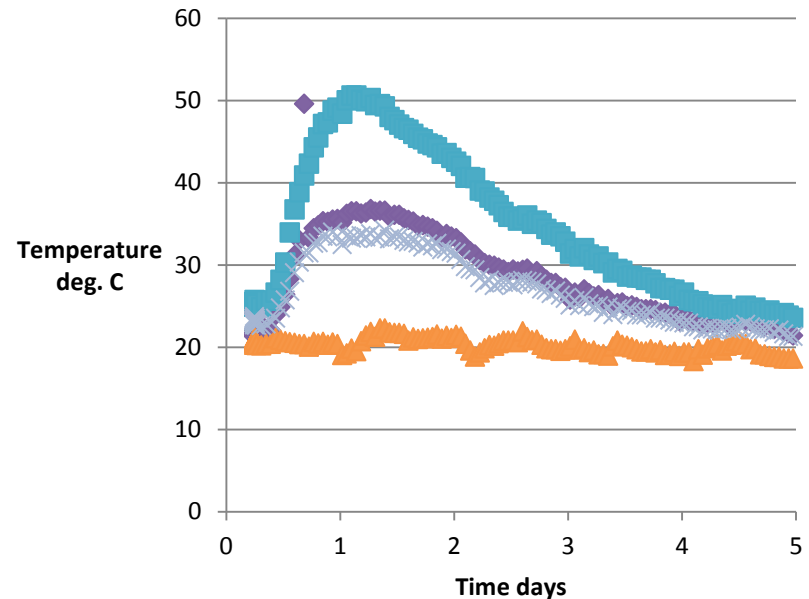
# Building Services

- Thermal conductivity test rig
- Refrigerant cycle rig
- Cooling tower rig
- Pipe to pipe heat exchanger rig
- Pressure and Density rig
- Airflow Developments Vane Anemometer
- Artificial sky (for daylighting measurements)
- FLIR infrared camera
- Hagner luminance/illuminance meter
- Bruel & Kjaer digital sound level meter with filter set
- Masons screen hygrometer



# Computer Modelling

- Thermal Modelling
- Transport (permeability, diffusion, electro-migration) modelling for durability and waster containment.
- Software development for customer requirements.





# Site Trials



# Thank You

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[www.claisse.info](http://www.claisse.info)

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700 papers for free download from our major conferences

“Sustainable Construction Materials and Technologies”

Coventry 2007, Ancona Italy 2010

and Kyoto Japan 2013.