Technical Services

Laboratory Testing and Mobile Data Collection Services

Road Science
Leading Transport Technology | A Downer Company

Laboratory services >

Testing and Services

Road Science laboratories provide expert construction materials testing, classification, quality assurance, material design, data collection technology, pavement investigation and advice.

Road Science has four permanent IANZ accredited laboratories in Auckland, Mount Maunganui, Wellington and Christchurch, as well as the ability to establish mobile laboratories for specific projects.

In the field you can expect skilled and knowledgeable technicians utilising modern equipment and methods to advise and help you meet your specifications and deliverables.

The experienced laboratory team work to current New Zealand and International test methods to help customers meet Waka Kotahi NZ Transport Agency, local authority and project specifications.

Each Road Science laboratory is led by a team who have extensive experience in the construction materials testing industry. Each laboratory works collaboratively with the other Road Science teams to share resources and knowledge.

Compliance to Standards

All our laboratories are IANZ accredited to NZS/ISO/ IEC 17025 covering mechanical test sections on:

4.01	Aggregates
4.02	Bituminous Materials
4.04	Concrete
4.08	Soils
4.15	Seconded Sampling
4.20	Pavements
4.99	Site Testing

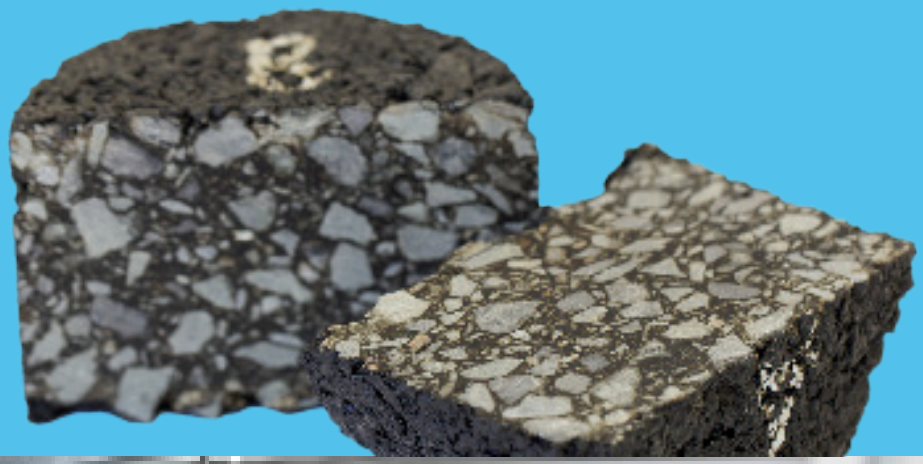
LABORATORY SERVICES

Advice and support >

When you choose the Road Science Technical Services team you are guaranteed a reliable service with fast turnaround times. The Technical Services team provide more than just test results and data - they can provide technical assistance to help you understand the quality of your materials and pavements for your projects or assist with tenders.

The Road Science laboratories work in collaboration with a team of experts including Dr Greg Arnold - Principal Pavement Engineer and Darcy Rogers - Technical Development Manager. Greg's team can can analyse laboratory test results and interpret them as inputs to pavement design modelling - for predicting performance with comparisons with other standard products.

FIND OUT MORE



Technology Driven Data >

Hawkeye

Road Science has three high speed data surveying vehicles - the first generation Hawkeye 1000, and two of the new generation Hawkeye 1000's.

These vehicles are operated by Road Science's highly skilled technicians who survey roads right throughout New Zealand.

The Hawkeye survey vehicles use the latest in digital laser technology to accurately and continuously record road and pavement information, such as roughness and texture. This data is then related back to GPS or distance based instruments.

New to the Hawkeye 1000 is a GipsiTrac geometry module. The road geometry is recorded, in particular horizontal and vertical curvature, camber and superelevation. Geometric road designers can now have access to geometric and stress data in order to back up high-value treatment selections.

Hawkeye also has a profiler (a class 1 instrument, which is the most accurate type).

The laser attached to the profiler is able to measure texture in accordance with AG:AM/T013 and roughness in accordance with AG:AM/T001.

Compliance to international standards:

- ASTM E950: Longitudinal profile
- AASHTO PP37: Pavement roughness
- ASTM E1845: Pavement macrotexture
- ISO 13473: Mean Profile Depth (MPD)

The Hawkeye processing toolkit software ensures that the survey database can be reviewed, edited and processed quickly and efficiently. The data from each module can be compared against other results and exported to pavement and asset management systems. The Hawkeye data viewer is an office-based programme that enables detailed assessment of sites to be completed by providing zoom and measurement tools for reviewing processed surveys.

Falling Weight Deflectometer

The FWD is a trailer mounted system that imparts a dynamic impulse to a pavement through an applied load or "falling weight" and then measures the resulting seismic response using geophones to measure the change in the pavement's velocity or "deflection."

The data generated from a FWD is one of the cornerstones of pavement design around the world.

It is used extensively to evaluate the performance, durability and expected life of pavements.

It is mandatory on all Waka Kotahi NZ Transport Agency and Auckland Transport reseal and rehabilitation sites.

The pavement response is analysed with Dynatest's Evaluation of Layer Moduli and Overlay Design (ELMOD) to determine the elastic moduli and stresses of each modelled layer. ELMOD reports the weakest layer of failure, residual life and then provides optimum rehabilitation alternatives saving time and resource for our clients

Our FWD testing conforms to Austroads ASTM AG:AM/T006.

Benefits of the Falling Weight Deflectometer:

- Automated and rapid structural pavement testing applicable to pavements all over the world.
- Determines individual layer modulus.
- Determines the layer of failure, rather than simply determining the bearing capacity.
- QA/QC of newly built pavements.
- Compares a range of rehabilitation options, including plane off and recycling rather than just applying overlays.
- The use of the FWD provides accurate, reproducible and repeatable structural data.
- Automated and real-time monitoring of the load cell, geophones, and data variations ensures high quality of collected data.
- Uses mechanistic-empirical analysis applicable to most of pavement structure.

Mobile Mapper

The Lieca Pegasus II Ultimate mobile mapping platform combines a laser scanning sensor, multiple cameras and an Inertial Measurement Unit (IMU) to deliver its survey datasets. In the P2U's case the point cloud dataset is captured by a laser scanner collecting 1M points across 200 line scans per second to sub-millimetre accuracy.

The photogrammetric survey data is stitched together from six cameras taking photos every 3m – 5m.

There are two additional external cameras used for pavement analysis - crack, roughness and rut detection. Cameras can rotate 360° so they can also analyse structures.

Benefits of the Mobile Mapper:

- Market-leading survey technology - this equipment is a quantum leap in innovation.
- A step change in safety - surveying with the Mobile Mapper is undertaken without putting people in live traffic lanes.
- Faster and more accurate results – it allows self-delivery of results quicker than traditional survey techniques.

Mobile laboratories

Road Science currently has three re-locatable mobile laboratories with the ability to scale up as a project may require. All of Road Science's mobile facilities are equipped to provide IANZ accredited testing of soils, aggregates, concrete and asphalt for specific project work. The mobile laboratories can also act as a base for the field testing offered by Road Science. An example of where we have provided a mobile laboratory is our Kaikoura facility, which supports the North Canterbury Transport Infrastructure Recovery (NCTIR). NCTIR has been set- up by the government under the Hurunui/Kaikōura Earthquakes Recovery Act 2016 to repair and get the road and rail networks reopened.

We have also recently sent a laboratory to both Vanuatu and Samoa to support delivery of a number of roading contracts in the Pacific. Another great use of our mobile laboratories was for the successful delivery of the Gisborne's Eastland Port Upgrade, State Highways and Locals Roads Rehabilitation.

FIND OUT MORE

Meet the Team >

Steven Uffindell
Technical Services Manager

Steven leads the Road Science Technical Services department. This department includes the most advanced binder, asphalt, aggregates, soils and pavement investigation testing facilities and data collection technology services in New Zealand.

With 17 years' experience in road asset maintenance, construction and management Steven has an extensive technical and leadership experience. Steve joined Downer in 2012 as a Contract Manager for the surfacing division and has been managing contracts throughout the Waikato.

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