Monash University’s capabilities in construction materials, structural health monitoring and underground infrastructure are enabling the delivery of more resilient and sustainable structures and increased productivity of existing infrastructure.

Focus areas

- Railways, mining equipment, water pipes, bridges and port structures.
- Construction materials
- Structural health monitoring
- Corrosion
- Modular construction

Research capabilities

Our researchers are developing novel materials for construction including high performance concrete and steels, nano-materials for reinforcement and for corrosion control. We have exceptional facilities for materials characterisation and structural testing, including a wind tunnel, and leading expertise in analysis of fractures and fatigue.

Monash’s Maintenance Technology Institute uses high-tech monitoring and assessment techniques for large equipment that have led to enhanced productivity of mining assets. In the geo-infrastructure field the flagship project Critical Pipes is helping governments in Australia and overseas determine when and how to best replace ageing water pipes.

In design for structures our principal expertise is digital fabrication, design of housing at the precinct scale and engineering for resilience in extreme conditions.

We are also researching emerging technologies for building and managing structures such as 3D printing of concrete, modular construction, sensor networks for infrastructure monitoring, and robots and remotely piloted aircraft systems for asset inspection.
CASE STUDY

Protecting our water supply

A vibrant collaboration of researchers and water utilities from around the globe is helping water utilities manage critical water pipe assets effectively, via a research program called Advanced Condition Assessment and Pipe Failure Prediction.

Researchers at Monash University, University of Technology Sydney, and University of Newcastle worked together with two international partners and nine Australian water utilities, including Sydney Water from 2011 to 2016 to solve the problem of how to predict failures in ageing cast iron water pipes. The results produced by the research are assisting water utilities to get the best possible data, to ensure that pipelines are only replaced near the end of their life, which provides significant savings.

The project’s chief investigator, Professor Jayantha Kodikara, said “the project has produced excellent results, which is creating a paradigm shift in improving industry practice locally and around the world”.

Asset Infrastructure Research Coordinator at Sydney Water, Dammika Vitanage, said: “The research and the tools the project has produced have already contributed to a decrease of millions of dollars in annual expenditure on water main renewals for Sydney Water.”

www.criticalpipes.com

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Monash Infrastructure

Monash Infrastructure (MI) is a virtual institute that facilitates industry and government engagement with Monash University’s extensive capabilities in infrastructure research. MI coordinates interdisciplinary teams from engineering, information technologies, business, design and social sciences. Our researchers provide the expertise, resources and access to international knowledge networks to solve infrastructure problems, develop new technologies, build industry capacity and inform government policy and planning.