

# CENTRE FOR SUSTAINABLE INFRASTRUCTURE

## Overview

The Centre for Sustainable Infrastructure (CSI) provides a focus for multi-disciplinary research in the field of sustainable civil infrastructure.

Expert staff undertake research and specialist consulting to industry in three main program areas:

- Advanced structural and geotechnical systems
- Transportation systems
- Water resources modelling

Facilities include a modern geotechnical laboratory, structural testing and data acquisition equipment, and a fluids laboratory that has been used for the development of a number of innovative storm water systems to improve water quality.

## Research

CSI has three major research programs consisting of a series of projects involving industry partners, centre staff, research fellows and graduate students. The research is carried out using analytical and experimental techniques, which suit the project requirements, and emerging technologies are always considered.

The three research program areas are as follows:

**Advanced Structural and Geotechnical Systems** – Some of the current and emerging projects include:

- Proof testing and performance rating of building products
- Strength and drift capacity investigation of structural systems
- Structural health monitoring and retrofitting structural systems
- Development of long span integrated floor systems
- Applications of reclaimed and new materials in civil infrastructure
- Concrete technology applications
- Integrated pavement design using reclaimed materials
- Geotechnical laboratory testing, field instrumentation and *in situ* testing
- Ground improvement, soil stabilisation and geosynthetic applications

*Continued overleaf*

## Recent projects

CSI's most recent projects in our three research program areas are:

- **Advanced Structural and Geotechnical Systems** – The projects within this theme focus on physical testing of structural systems and the re-use of materials reclaimed from construction and demolition waste. Many of the projects have a sustainability theme through the use of new materials, the re-use of old materials and the extension of life of existing facilities
- **Transportation Systems** – The centre's transportation systems research strengths currently lie in asset management of low volume roads and the complex contact interface between wheel and rail. The centre has also started work on the emerging theme of transport access for the elderly
- **Water Resources Modelling** – CSI conducts internationally recognised coastal and oceanography research with a focus on wave and ocean modelling. CSI also conducts urban water research which focuses on improving water supply capacity through the harvesting of storm water and the re-use of wastewater. This research is particularly relevant to Australia in the context of climate change, drought and a growing population

**Transportation Systems** – Some of the current and emerging projects include:

- Knowledge management systems for transport asset management
- Modelling low volume road performance
- Development of new rail and wheel materials to improve performance
- Modelling wear and rolling contact fatigue at the wheel rail interface
- New thick rail coatings for reducing noise and extending asset life
- Improving railway access issues for an ageing population

**Water Resources Modelling** – Some of the current and emerging projects include:

- Deterioration modelling of water supply, stormwater and sewer systems
- Litter separation in urban water stormwater systems
- Sustainable water resource management
- Spectral modelling of wind generated waves
- Dynamics of surface ocean waves
- Wave breaking and dissipation
- Impact of climate change on coastal and port facilities

## Industry Involvement

Staff within CSI have a number of existing alliances and linkages with government, industry, and research centres and universities around the world. A number of CSI staff are involved in the technical and management committees of Standards Australia and Engineers Australia. One of the centre's core objectives is to further establish and broaden its links with industry to facilitate research opportunities and to ensure that research outcomes are focused on the needs of society.

The centre has undertaken many collaborative research projects and currently provides specialist consulting advice to a number of leading consulting firms and industries including, construction, infrastructure service providers, energy, mining, petrochemical, manufacturing and government organisations.

The centre's diverse range of industry partners include:

- Local councils and the City of Melbourne
- The Building Commission, the Australian Building Control Board and the Victorian Office of Housing
- CSIRO, the Bureau of Meteorology, Melbourne Water, City West Water and South East Water
- Terrock Consulting and the International Committee on Industrial Chimneys
- VicRoads, the Australian Road Research Board and Sustainability Victoria
- Alex Fraser Industries and Delta Demolition
- Woodside Energy, MetOcean Engineers, Coastal Engineering Solutions and Ocean Waves Pacific
- Network Rail and the UK Rail Safety and Standards Board

## Education

The centre provides education and training through an undergraduate civil engineering degree and postgraduate coursework programs in construction management and civil engineering. CSI provides a vibrant and supportive research environment for postgraduate research students. The centre has a number of students that undertake minor research projects within CSI; these projects contribute to the research output of CSI and provide pathways for PhD studies.

## Need to know more?

### Key contact

Professor John Wilson  
Director, Centre for Sustainable Infrastructure  
**Telephone:** +61 3 9214 4882  
**Email:** [jwilson@swin.edu.au](mailto:jwilson@swin.edu.au)

### Further information

Centre for Sustainable Infrastructure  
Faculty of Engineering and Industrial Sciences  
Swinburne University of Technology  
PO Box 218  
Hawthorn VIC 3122 Australia

**Telephone (general enquiries):**  
+61 3 9214 8455

**Website:** [www.swinburne.edu.au/feis/civil/csi](http://www.swinburne.edu.au/feis/civil/csi)