SHAPING URBAN FUTURES
BUILT ENVIRONMENT, CONSTRUCTION AND INFRASTRUCTURE
From the houses we live in to the shape of our cities and how we respond to the environmental challenges facing us, RMIT is tackling the big questions that will make a difference to our future.

— PROFESSOR MARGARET GARDNER AO
VICE-CHANCELLOR AND PRESIDENT
RMIT SNAPSHOT

RMIT University is a global university of technology and design with its heart in the city of Melbourne. Founded in 1887, RMIT is one of Australia's original educational institutions and is now the nation’s largest tertiary institution.

RMIT focuses on creating solutions that will transform the future for the benefit of people and their environments. The University has an international reputation for excellence in professional and practical education programs and high quality outcome-oriented research.

The University is proud of the strong industry links it has forged over its long history. Collaboration with industry is integral to RMIT’s leadership in applied research and education, and in the development of highly skilled, globally focused graduates.

RMIT offers an extensive range of programs, from vocational through to undergraduate and postgraduate. The work-relevant learning pathways RMIT offers between vocational and higher education provide students with flexible learning options that combine the best of both worlds.

As a result, RMIT graduates are valued by employers around the world for their leadership skills and work readiness.

RMIT has a student population of 72,000 at its three Melbourne campuses (central business district, Brunswick and Bundoora) and its RMIT Vietnam campuses (Ho Chi Minh City and Hanoi). The University has a staff population of more than 4,000, with 3,615 at its Melbourne campuses and 422 in Vietnam.

RMIT Vietnam is the country’s first and only fully foreign-owned university, delivering internationally recognised degrees from campuses in Hanoi and Ho Chi Minh City. Since it opened in 2001, RMIT Vietnam has grown rapidly and currently enrols more than 5,000 students in undergraduate programs.

RMIT also has significant partnerships in Hong Kong, China, Malaysia and Singapore, and a very strong educational presence in the Asia-Pacific region.

The University has a vibrant global alumni community of graduates that stretches across more than 100 countries.

BUILT ENVIRONMENT, CONSTRUCTION AND INFRASTRUCTURE SNAPSHOT

Teaching and Learning

For the Built Environment, Construction and Infrastructure sector, RMIT offers 52 Higher Education and 25 vocational programs delivered via 10 academic schools to more than 8,200 students.

Disciplines include:

» Architecture
» Civil, Environmental and Chemical Engineering
» Construction Management
» Environment, Planning and Sustainability
» Industrial Design
» Landscape Architecture
» Mechanical Engineering
» Project Management
» Property

2011 QS World University rankings, based on employer reputation, research quality and academic reputation, rated RMIT University in the top 150 universities worldwide for: Computer Science and Information Systems, Chemical Engineering, Civil and Structural Engineering, Electrical and Electronic Engineering and Mechanical, Aeronautical and Manufacturing Engineering. Civil Engineering rated in the top 100.

Research

In the 2011 Excellence in Research Australia assessment, RMIT’s focus on key research areas was rated as ‘above world standard’ in:

» Architecture
» Mechanical Engineering
» Urban and Regional Planning

Additionally RMIT research was assessed ‘at world standard’ in:

» Materials Engineering
» Civil Engineering
» Electrical and Electronic Engineering
» Applied Mathematics
» Building
» Design Practice and Management
» Physical Chemistry (inc: Structure)
» Condensed Matter Physics
The construction industry is constantly evolving, with innovation via new ways of thinking and working taking place across the sector all the time. RMIT expertise and capability exists in a number of key areas, from nano-technology to occupational health and safety of the workforce.

Improving the health of the construction industry

Almost 10 per cent of all injury and death claims in Australia are attributed to construction, creating a significant social and economic burden. RMIT researchers are working on an inaugural Future Fellowship “Differentiation not Disintegration: Integrating Strategies to Improve Occupational Health and Safety in the Construction Industry”. Findings so far show that the construction industry in Australia is hugely fragmented, from stakeholders and architects to builders and subcontractors. All these groups have very different work cultures and understandings of how a project and the industry operate. Through integrating strategies, the project seeks to reduce death and injury claims in the industry.

Additionally, RMIT is subcontracting with Virginia Tech in a five-year US National Institute for Occupation Safety and Health-funded project with a collaboration of international experts, examining strategies for embedding occupational health and safety into the construction supply chain. The project involves international benchmarking of both industry and research and working with trade union representatives, engineers and other stakeholders.

Constructing a work-life balance

A new book, ‘Managing Work-Life Balance in Construction’ by Professor Helen Lingard from RMIT University and Valerie Francis, presents research findings from the past eight years. It uses industry case studies to highlight important aspects of the management of work-life balance in the construction industry.

Building Information Modelling studio

RMIT has established the first Building Information Modelling (BIM) studio within an academic setting in Australia. Capable of applied research and project collaboration with external partners, the studio makes a significant contribution towards establishing an RMIT urban laboratory for training, innovation and collaboration through partnership projects.

The studio will produce world-standard graduates skilled in the use and application of BIM. It will also help industry provide better, more creative solutions in Australia, as well as connecting and engaging with global industrial communities and networks.

Improving building structures with a twist

Wind loading is a major factor to be carefully considered and resourced when designing buildings. Taller buildings being proposed around the world present both major challenges and opportunities in the pursuit of new techniques and materials used in their construction.

At the initiation of Felicetti Pty, Ltd and in conjunction with them, RMIT has established a cutting-edge, computer-automated design tool that will improve the competitiveness and productivity of the Australian building design industry.

The developed technology will significantly enhance the performance and safety of buildings, and substantially reduce construction materials and costs. Examples of twist towers include the Turning Torso in Sweden, the Infinity Tower in Dubai and the Shanghai Tower in China.
BUILDINGS AND MATERIALS TECHNOLOGIES

Creating new and advanced materials and composites will underpin growth in many industrial and economic activities in Australia and will be a component of future growth in industry.

**CAPABILITY**

**Dedicated research clusters**

Dedicated research clusters with extensive capability in building and materials technologies are currently working on:

- Optimising timber use in residential building to reduce environmental impact
- Minimising water pollution from leaching of alkali from freshly cast concrete in waterways
- High volume fly ash concrete
- Converting end-of-life shipping containers to liveable houses
- Strengthening reinforced concrete bridges using fibre-reinforced polymer composites
- Offsite manufacture and prefabrication

**CAPABILITY**

**Extending material use for urban/architectural projects**

A multidisciplinary team of architects, material scientists, textile designers and industry has been working to extend the use of existing and newly developed materials.

Utilising RMIT’s high-tech fabrication laboratories, a manufacturer of widely used veneers, laminate sheet and other board products has been working with RMIT experts to investigate the possibilities of reusing these materials.

Long-life afterglow phosphorescent materials developed for safety path systems have been adapted for passive urban lighting to reduce the energy needs. RMIT expertise is working with a local council to customise the technology.

**CAPABILITY**

**Life Cycle Assessment**

This is an internationally recognised method for small business and industry that evaluates the potential environmental impacts of products and services. The evaluation method is based on the whole life cycle of the product/service, with typical stages including extraction of raw materials, processing, manufacturing, packaging and distribution, use, and waste disposal including landfill, reuse and recycling.

**CAPABILITY**

**Advanced Manufacturing Precinct**

RMIT’s Advanced Manufacturing Precinct showcases up-to-date and relevant advanced manufacturing technologies and processes, and creates a facility where industry can exhibit and be involved in these new technologies. It meets whole-of-industry needs by incorporating teaching in engineering and advanced manufacturing technologies, applied design, R&D, production, marketing and management.

**New design tool and materials**

Researchers at RMIT have developed techniques for analysing and optimising the design of microstructures of materials and composites with functional properties. The research will lead to the creation of new and advanced materials and composites with the necessary desirable properties. An Australian initiative, this research has earned widespread international recognition and has had a significant affect on contemporary structural optimisation techniques.

Increasingly, material systems are facing a variety of performance demands. These include materials with desirable mechanical, thermal, electromagnetic, optical, chemical, and flow properties, as well as low weight. The RMIT research will also create an advanced design tool for material scientists and engineers that will enhance performance and lead to significant savings in energy consumption.
With cities worldwide growing exponentially and large high rise buildings meeting both corporate and residential needs, managing these buildings and facilities is a key growth area in the 21st century.

**Facilities Management Learning**

For a long time there has been a lack of skill development opportunities in the facilities management industry—an interdisciplinary field devoted to maintenance of the built environment. For people entering the industry, there is a need for greater recognition and a clear skill development framework.

To meet this need, RMIT offers two new nationally recognised academic qualifications in the facility management sector—Certificate IV in Property Services (Operations) and the Certificate IV traineeship. Developed in consultation with various industry leaders and governing bodies, the new training courses aim to meet the increasing challenges of managing the built environment.

**Smarter councils, better service delivery**

RMIT researchers are addressing the major issue of maintaining service delivery and managing risk of failure of infrastructure owned by local councils. Based on the understanding of behaviour of building infrastructure over a long period of time, a working business tool will be developed.

The tool will enable 79 local councils in Victoria to optimise their maintenance and capital expenditure with a realistic understanding of the implications of investment. The national benefit will be a significant improvement of service delivery to the community, through better design and management of council assets and a significant saving of maintenance costs.
Australia’s housing, urban and regional circumstances are in a state of upheaval and change for a number of reasons, including a long period of economic prosperity, major reforms in the Commonwealth and State government’s relationship, and changing demographics and social patterns, including age and size of household.

**Green belts and peri-urban areas**

RMIT’s Sustainability Urban Planning area has carried out extensive research of green belts and peri-urban areas that has contributed to government policy development. Modelling of scenarios for Melbourne’s peri-urban area highlights the continuing importance of Melbourne’s hinterland.

An RMIT expert, Professor Michael Buxton, has contributed extensively to government policy in the areas of urban and rural planning and maintains strong industry connections. Professor Buxton is a former chairperson of the Premier’s Green Wedge Working Party that advised the Victorian government on the introduction of a legislated urban growth boundary, and revised green wedge zones for Melbourne’s green belt. He is also a former member of the Melbourne 2030 Implementation Reference Group and has been a member of many government committees.

**VicUrban Grey and Brown Fields**

RMIT research is quantifying the economic and environmental benefits of providing affordable housing on sites in urban areas, rather than on greenfield sites at the urban periphery. Current data on brownfield and greyfield sites will be supplemented with research identifying appropriate locations for affordable housing, based on demand factors such as land prices, sustainable travel options, and employment location. The cost of releasing land within the case study locations will be assessed against the economic, social and environmental benefits identified.

**ARC Centre of Excellence for Environmental Decisions**

Biodiversity underpins Australia’s cultural and economic prosperity, but work to protect this natural inheritance are proving inadequate—Australia has the worst extinction record of any developed nation.

Often, environmental management has not been run in a way that allows us to learn from our decisions. This RMIT research project will generate the knowledge and tools needed to make the best use of available resources for conservation. It will provide new techniques for assessing what resources are required and innovative ways for learning from investment decisions.

**Sustainable Urban and Regional Futures**

Building on RMIT’s strengths in urban research, the new Sustainable Urban and Regional Futures program is dedicated to tackling the many challenges facing cities in an era of climate change. The growing environmental footprints of cities are driving the need for significant reconfiguration of the social and technical dimensions of the urban realm. Additionally, there is growing socio-spatial inequality and problems of social exclusion, increasing the likelihood of social conflict. The research focuses on six overlapping themes: cities in transition, social change, learning cities, urban metabolism, sustainable business practices, and urban built environments.
Public transport in a carbon constrained era

RMIT expertise is helping Australian and overseas cities to improve the role of public transport and the ability of residents and businesses to traverse their cities. An award-winning Geographic Information System tool has been developed to measure and visualise land use and transport integration, allowing planners and politicians to make informed decisions about public transport investment and urban growth priorities.

Tackling biodiversity in the urban fringe

Accelerating urbanisation in Australia is considered to be one of the greatest threats to biodiversity, with more than 50 per cent of threatened species in urban fringe areas. Up until now, conservation planners in the urban fringe have lacked the tools to tackle these complex issues.

An RMIT research project is addressing this important gap between conservation theory and real-life practice, providing tools for managers to develop optimal strategies given the real-world constraints. It will result in better theories and models for designing and evaluating conservation policy and plans to ensure good biodiversity outcomes. Results will be applicable to any complex conservation planning scenario.

Mekong Delta Project in Vietnam

Final-year RMIT environmental science, environmental engineering and social science students, have undertaken an undergraduate environmental research project on the Mekong Delta in Vietnam. The initiative running now for almost a decade involves students working in a small environmentally focused consultancy-style group, as part of a two-week intensive research program.

The group investigates specific environmental issues associated with urban development and the implications for flooding in Ho Chi Minh City. Outcomes include a detailed report with recommendations on how development projects in Ho Chi Minh City could be improved to reduce the effects of climate change on urban and peri-urban communities.
Resilient design, flexible dynamics and nurturing the bonds that create communities that can adapt and recover from the realities of climate change are essential elements for resilient cities.

**Climate Change Adaptation**

Researchers at RMIT’s Climate Change Adaptation Program (CCAP) are working on developing and testing an operational framework for climate adaptation. Ultimately, this will act as a decision-making roadmap to better inform adaptation policy and practice by Victorian state and local government. The framing will cover assessing risk and opportunities arising from a changing climate, through to adaptation. It will include case studies in Melbourne, Bendigo and Port Fairy, and is supported by the Department of Sustainability and the Environment and the Victorian Centre for Climate Change Adaptation Research. Research by CCAP aims to create a global framework for the infrastructural adaptation of cities in the Asia-Pacific region to climate change.

**UN Global Compact Cities Programme**

RMIT Global Cities Research Institute is the home of the United Nations Global Compact Cities Programme, which helps government, business and community leaders to address the effects of rapid urbanisation and associated problems. The program focuses on long-term and intractable urban issues – from slums to human rights and anticorruption, traffic safety and water, waste and sanitation management.

Under the program, 15 cities around the world are conducting major projects targeting priority issues, while another 40 cities have signed onto the Global Compact principles. Melbourne was among the first to sign up and other cities involved include Berlin, San Francisco and Jinan in China.

**Melbourne’s heatwave 2009**

Released in 2010, a report on the affect of the 2009 heatwave on Melbourne’s critical infrastructure was developed using expertise drawn from Climate Change Adaptation Program partners, which included a number of major Australian universities.

The affect on telecommunications, water and airports appeared to be relatively minor, for roads and sea ports the affect were moderate, but the impact on rail (trains) was greater. For rail, issues were either related to physical impacts such as tracks buckling in the heat, or the comfort of travellers being affected with the lack or failure of air conditioning. The report showed that Melbourne’s electricity sector stands out as being the most vulnerable to heat, with the transmission and distribution systems particularly affected.

**Low income urban populations**

Studies in Bangladesh and Vietnam are examining the vulnerability of a large segment of the urban population. The studies look at sustainability, security and climate change adaptability of housing of low-income urban populations.

In Bangladesh, the Local Partnerships for Urban Poverty Reduction Program’s crime and domestic violence prevention initiatives were assessed. A second study on safety for the urban poor in Dhaka, Bangladesh, examined the vulnerabilities of this population group in the context of climate change.

RMIT’s Climate Change Adaptation Program hosted a visiting researcher from the Vietnam Green Building Council which resulted in a co-authored report and peer-reviewed publication on sustainability of low-income urban housing in Vietnam. A study to diagnose living conditions and potential for adaptation to climate change of low-income urban housing in Hanoi and Ho Chi Minh City, Vietnam is ongoing.
Managing risk in environmental disasters

Climate change is fuelling not just temperatures but the risks of disaster, and the insurance industry is one sector taking the challenge seriously. According to Swiss Re, a leading global reinsurer, eight of the top 10 insured losses worldwide between 1970 and 2005 were weather related. Insurance companies and governments want to know what sorts of environmental disasters will occur, how frequently, and what can be done to prepare for these including ways to reduce the risk.

RMIT experts analysing Australia’s bushfires are part of a huge global team preparing a special report “Managing the Risks of Extreme Events and Disasters” for the Intergovernmental Panel for Climate Change, which includes 192 nation states. One of the key outcomes is to establish whether communities can become more adaptive and resilient in the face of environmental disasters. The report must be published within two years, which is a very short time frame for such a mammoth undertaking.

Circles of Sustainability

Given the immense challenges of the contemporary world, we need to find new ways to sustain our cities, communities and organisations. In the past decade, various bodies have developed highly sophisticated indicators for monitoring and measuring sustainability. However, these indicators often become detached from practical tasks or are skewed by unrecognised biases.

RMIT’s Circles of Sustainability project has developed a conceptual framework for choosing, evaluating, and applying indicators in common planning and reporting situations. In the next stage of the project, a leading-edge software system will be developed to provide the technological support to assist organisations manage their sustainability goals. The project will benefit cities, communities and organisations by guiding their decisions on clear and practical sustainability goals, lowering the cost of reporting compliance, and improving sustainability practices.

Engaging with climate change in Vietnam

A multi-disciplinary team of science, social science and design academics from RMIT’s Climate Change Adaption Program collaborated with the Vietnamese Academy of Social Sciences in a workshop to help Vietnamese cities adapt to the impacts of climate change in Hue, Vietnam.

The research focused on the climatic challenges facing secondary cities in Vietnam, which have received less attention than their larger counterparts.

World Vision and UN-Habitat were among the organisations representing the exploratory discussions, which also examined the opportunity for collaborative research to play a role in informing the development of adaptation strategies for the city of Hue and other cities in central Vietnam. A follow-up workshop for 2011 is being planned at Tra Vinh in the Mekong Delta.

Climate-proofing Australia’s seaports

A multi-disciplinary team, headed by the CCAP of the Global Cities Research Institute is collaborating with industry and government on a project to enhance the resilience of the nation’s ports. Sea ports are vital to Australia’s current and future prosperity. Activity at the Port of Melbourne is projected to quadruple by 2035 and plans that include adapting to climate change will put Australia at the front of international best practice.

During the life of the project, RMIT researchers from a range of disciplines will team up with CCAP and the University of Queensland to work with stakeholders that include Ports Australia, the National Transport Commission, the Maritime Union of Australia and Shipping Australia, as well as local authorities and councils. The project will foster opportunities for international engagement with other major ports such as London, Rotterdam and New York through the port cities network.
Growing cities in Australia and the Asia–Pacific region are increasing the consumption of natural resources and creating growing problems of pollution and waste disposal. Research in this area primarily addresses social and environmental sustainability in cities experiencing global economic forces, as well as on the affects of, and policy responses to, climate change at the systematic level of cities and their regions.

**Skilling up the Green Economy**

Green jobs and green industries help reduce the dependency on fossil fuels, reduce greenhouse gas emissions and protect natural eco-systems. Through the Teaching and Learning Capital Fund for Vocational Education and Training, the Australian government has provided RMIT with a leading-edge renewable energy training unit on the roof of an RMIT City campus building. The unit includes solar, wind and hydro technologies and data from the unit's panels is recorded and stored on site and transmitted into the RMIT class rooms below. The energy generated also helps to power the building.

Students in electrical programs—pre-apprenticeship, apprenticeship, diploma and advanced diploma—monitor conditions on the building's roof, giving them practical experience in operating solar energy systems. Training in solar grid installation, monitoring, and occupational health and safety, is also a benefit to students looking to widen their career options.
As the joint first Fairtrade University in Australia, RMIT is committed to reducing its carbon footprint and providing a safe and ‘green’ university for students and staff. The University aims to lead the way in environmentally sustainable best practice and is committed to a 25 per cent reduction in greenhouse gas emissions by 2020.

**Mortgage Default in Australia: nature, causes and social and economic impacts**

This Australian Housing and Urban Research Institute funded project focused on the incidence, causes and affects of the increase in mortgage arrears and defaults, apparent in Australia in recent years. The global financial crisis in the second half of 2008 gave the project added currency and urgency. The Federal and State governments are addressing many of the issues raised by this study. The project sought to establish the primary causes of mortgage default in Australia, its consequences, the possible policy interventions which could reduce the incidence of mortgage defaults and the broader risks to the Australian housing industry posed by the global mortgage climate.

**Sustainable Products Research**

Since 1988, RMIT’s Centre for Design’s Sustainable Products and Packaging Group has been involved in developing and delivering Design for Sustainability programs and seminars. The group continues to develop educational programs and industry-orientated seminars to integrate sustainability into existing industry practices.

**Green IT Observatory**

Government and industry are increasingly focused on sustainable, economical and environmental best practice. RMIT’s experts in business, IT and logistics have world-class capability in sustainable IT and information systems. Green IT is supported by the Australian Information Industry Association, Fujitsu Australia and Connection Research.

**VicHealth Research in Community Development and Residential Planning**

In a social model, housing is recognised as a key determinant of health and wellbeing. In the context of housing demand for housing, housing affordability and climate change, this research will shed light on how health and wellbeing can be optimised and sustained for communities in new housing developments.

Drawing on a unique partnership between Stockland, the Planning Institute of Australia, the Victorian Growth Areas Authority, and the City of Casey, master planning for the development Selanda Rise, a demonstration residential housing development in Melbourne’s south east growth corridor, has focused on three core objectives:

- an engaged community
- providing local employment
- diversity and affordability of housing

Key design features include open space, a sustainable living hub and opportunities for local employment, education and aged care. The research approach is informed by sociology, public health and housing studies and the outcomes will contribute to an evidence base for policy makers.

**Sustainable housing for Indigenous communities**

RMIT research into sustainable housing for Aboriginal and Torres Strait Islanders is taking an innovative holistic approach to complex issues. Led by Professor John Fien, with Dr Esther Charlesworth, the research is looking into culturally appropriate consultation; economic multipliers from housing; employment and the education and training needed; procurement, construction and property maintenance, via a tenant-managed system; and an overall integrated policy.

The three-year Australian Research Council grant funded project, “More than a Roof Overhead: Meeting the need for a Sustainable Housing System in Remote Indigenous Communities”, also involves research with RMIT’s Professor Ralph Home and Professor Ron Wakefield, and researchers from Charles Darwin University and the ANU, in conjunction with industry partners including Housing Departments from the NT and WA governments.
Powerful design can change the world, which is why RMIT’s Design Research Institute is working across many disciplines to foster a design community. This trans-disciplinary approach recognises that RMIT’s designers, who work in fields from aerospace to textiles and architecture to nanomaterials, are involved in design that is functional, beautiful, innovative, transformative and environmentally sensitive.

**Spatial Information Architecture Laboratory**

The Spatial Information Architecture Laboratory (SIAL) is a unique facility for innovation in transdisciplinary design research and education. It provides the opportunity to research strategies for viewing and managing information in a spatial perspective, instead of information technology constraining design decisions to two-dimensional abstractions. Its distinctiveness comes from working with a wide range of software and hardware, and a clear association with all areas of design in the University combined with social and cultural studies.

SIAL is involved in a diverse range of projects including a collaboration with UPC University Catalunya, Spain working on untangling the mysteries of Gaudi’s compositional strategies at the Sagrada Familia Church in Barcelona, Antoni Gaudi’s unfinished masterpiece.

**Procuring Innovative Architecture**

*Procuring Innovative Architecture*, a book by Professor Leon van Schaik and Geoffrey London, provides case studies that describe how clients’ promotion of innovative communities of practice have led to important collections of architectural works. The book provides an assessment of the effectiveness of their approaches and what to look for in constructing careers and portfolios with innovation as a goal.

**Architecture—helping communities in need**

RMIT research will help to meet the housing needs of vulnerable communities through sustainable design via a $600,000 project. The four-year research project will investigate the roles that architects can play in meeting the complex housing needs of vulnerable communities. It will look at four case studies of housing in Australia, USA, Sri Lanka and Vietnam in communities affected by social marginalisation, civil conflict, natural disaster and climate change.

The project will build on the international research links established by Dr Esther Charlesworth who heads up the research. In 2000, she founded Architects Without Frontiers (Australia), helping establish community infrastructure projects in remote Aboriginal communities in the Northern Territory, in post-tsunami Sri Lanka, and for socially marginalised communities in Vietnam and South Africa.

**Alternative futures for Chinese cities**

China is rapidly becoming an urban nation, with development that poses many challenges as well as opportunities. At the end of 2008, China’s population was 1.33 billion, with 723 million people living in rural areas and 607 million in urban areas (excluding Hong Kong, Macau and Taiwan). The United Nations has forecast that by 2015 the rural and urban populations in China will be about equal, and that by 2035 nearly 70 per cent of Chinese will live in urban areas.

A team of experts from RMIT’s Global Cities Research Institute has linked with prestigious Chinese organisations, including the Shanghai Academy of Social Sciences, to map alternative futures for Chinese cities including Shanghai and Chongqing. The focus is on a number of carefully chosen cities and their hinterlands in the Asia-Pacific region, and the project will have practical outcomes for communities and governments in China and the rest of Asia.

Another international RMIT team is putting together a plan for a new city development for 20,000 people in Ji County, Tianjin. The project aims to turn a small town into a world-class resort, using leading-edge concepts of environmentally sustainable development.
RMIT has retrofitted four buildings as part of the City of Melbourne’s 1200 Buildings Program aimed at reducing energy and water use and carbon emissions. The University is also constructing two new buildings and assessing 50 existing buildings for possible inclusion in the program.

The six key RMIT building projects are:

**Swanston Academic Building**
This 11-storey building will wrap around the historic Oxford Scholar pub and will include learning, retail and office space, and 10 light-filled portals with landscaped balconies. The design includes “green concrete” and recycled materials, a high-performance façade, rainwater collection and greywater filtration, and a recycling system, intelligent lighting, solar panels for hot water and a precinct plant to reduce energy.

**Info Corner/Green Brain**
On the corner of Swanston and La Trobe streets, this building has been retrofitted complete with a new fifth floor and rooftop canopy resembling a green brain. Features include water harvesting, an air delivery system, a thermal envelope and energy efficient lighting.

**Francis Ormond Building**
This retrofitted building has been awarded a 5-Star Green Star rating, only the second heritage-listed building to achieve this in Victoria. The design includes exposed thermal mass, rainwater harvesting for garden irrigation, toilet flushing and solar hot water generation, chilled beams used in a café, internal waste management, intelligent lighting controls and systems, underfloor air distribution, low-VOC (volatile organic compounds) paints, carpets and finishes, glazing to reduce solar gain and a shared boiler.

**Design Hub**
This collaborative research building at the former CUB site, due to be completed by late 2011, will have a second-skin of 16,000 sand-blasted glass discs that will rotate with the sun to help heat, power and cool the building.

**Emily McPherson Building**
The new home of the Graduate School of Business and Law has been retrofitted with a design that includes daylight sensors that turn lights off, energy-efficient plant and software to monitor room occupancy levels and the requirement to expend energy in either heating or cooling spaces. It includes using certified timbers, recyclable materials and materials with low-emissivity in office fit-outs, water-efficient fitting and fixtures in all bathrooms and kitchens, and installing high-performance double glazing.

**School of Media and Communication**
This retrofitted building on the City campus has won several Institute of Architecture awards and has rainwater collection tanks, exposed thermal mass of building structure to assist with temperature regulation, natural ventilation, energy-efficient lighting and recycled or Forest Stewardship Council certified timber furnishings, and flexible teaching and learning spaces.

**Campus development in Vietnam**
Students from RMIT Melbourne visited RMIT Vietnam to conduct a collaborative research project on environmental issues relevant to campus development. Reports prepared by the students, from Environmental Science, Social Science (Environment) and Environmental Engineering disciplines, have been provided to RMIT Vietnam management to assist in campus development.
RMIT EXPERTISE

Why RMIT?

» RMIT is ranked highly worldwide in the areas of engineering and technology.
» RMIT is an Australian market leader in architecture, creative arts, information technology and engineering-related technologies.
» RMIT uses multidisciplinary groups of academics, research staff and postgraduate students to develop comprehensive solutions and original innovations.
» RMIT has diverse industry engagement in Melbourne, Vietnam and globally.

Professional Association and Organisations

RMIT graduates can become members of the following organisations, depending on the degree program they graduated in:

» Australian Institute of Building
» Australian Institute of Mining and Metallurgy (Aus IMM) recognises RMIT environmental engineering graduates.
» Australian Institute of Quantity Surveyors
» Australian Property Institute
» Engineers Australia recognises graduates of Bachelor of Engineering (Environmental Engineering). They are also recognised as professional engineers in all member countries of the Washington Accord.
» Engineers Without Borders
» Environment Institute of Australia and New Zealand
» Institution of Engineers, Australia
» Planning Institute of Australia

International Accreditation

» Australian Institute of Mining and Metallurgy
» The Australian Mathematical Society
» Institution of Chemical Engineers (London)
» Mapping Sciences Institute of Australia
» Singapore Institute of Surveyors and Valuers
» Royal Institute of Chartered Surveyors
» State Surveyors Board
» Statistical Society of Australia and graduate membership to the Australian Society for Operations Research
» Surveying and Spatial Sciences Institute (Australia)

Research and Innovation

RMIT’s research collaborations with some of the world’s leading educational institutes enable knowledge to cross borders. Almost half of RMIT’s academics were born overseas and many bring with them collaborations with researchers from their home countries and beyond.

The University has strong research links with high level institutes and governments including:

» Politecnico di Milano to University of California, USA
» Indian Institute of Chemical Technology, Hyderabad, India
» Melbourne City/Tianjin sister city relationship which has been ongoing for 30 years, Tianjin, China
» Virginia Polytechnic Institute and State University, USA

Research Institutes:

» Design Research Institute—works across many disciplines to foster a design community.
» Global Cities Research Institute—focuses on research that aims to provide sustainable and secure cities in the Asia–Pacific region. The Institute’s work on climate change adaptation, globalisation, urbanisation, security and reconciliation looks at the ties that bind us, as well as the challenges different communities face.
» Platform Technologies Research Institute—brings together scientists and engineers to create innovative materials and smart systems.

Research Centres:

» AHURI (Australian Housing and Urban Research Institute) Research Centre—specialises in applied research in housing and urban planning policy with emphasis on the role of housing in the economic, social and environmental sustainability of cities and regions.
» Cooperative Research Centre for Polymers—RMIT expertise from the disciplines of applied chemistry, mathematics, physics, aerospace engineering together with a range of industries.
» Rheology and Materials Processing Centre—a multidisciplinary RMIT group, of academics, research staff and postgraduate students, conducts fundamental and applied research in polymers; fluids and multi-phase mixtures that include polymer melts and solutions; composites, including nano-composites; nano-pigments; mineral slurries; and foodstuffs.
» Centre for Design—specialises in innovative design methods and tools to support the sustainable design of products and services. This includes packaging and consumer products as well as sustainable buildings, suburbs and cities.
» Centre for Finance—specialises in empirical studies in the broad field of finance, such as corporate finance, asset pricing, capital markets and financial services, financial and monetary economics, financial market regulation, marketing aspects of finance, and economic and social aspects of financial market activity.

International Centres:

» Asia Business and Management Studies
» Australian APEC Centre
» European Union Centre—one of only three in Australia
» Spatial Informational Architecture Laboratory
» UN Habitat Asia–Pacific
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