2019 DSC PCPM PhD Projects: Information Sheet

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Information for applicants

**Project title:** HIV/AIDS management in South African construction firms

**Project Description:** (250 words) this project explores the nature, cost and effectiveness of interventions by management within construction organizations in relation to HIV/AIDS and the barriers to improving them. Private sector employer involvement in HIV/AIDS management for workers is increasingly necessary in South Africa due to the strain on government health funding and resources.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor - Professor P A Bowen (UCT)

2nd Supervisor: Professor K Cattell (UCT)

3rd Supervisor: Dr P J Edwards

**FOR Code:** 120201

**Project title:** Work-related stress among construction professionals in South Africa

**Project Description:** **(250 words)** this project explores the nature, extent, causal factors, effect and coping mechanisms for work-related stress among professionals in several disciplines in the construction industry in South Africa. The construction industry is renowned as a stressful environment at all levels, with strain effects that can impact severely on work-life balance in terms of family, social and community perspectives.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor - Professor P A Bowen (UCT)

2nd Supervisor: Professor K Cattell (UCT)

3rd Supervisor: Dr P J Edwards

4th Supervisor: Professor H Lingard

# **FOR Code:** 120201

**Project title:** Value Management (VM) in South Africa: industry comparisons

**Project Description: (250 words)** this project explores the nature and perceived effectiveness of VM practice in the construction, manufacturing and food and beverages industries in South Africa. Value management has a history of more than fifty years, but little is known about contemporary practice of this project management technique. Using web-based opinion surveys and case based interview techniques, the study aimed to provide key insights into the field.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor - Professor P A Bowen (UCT)

2nd Supervisor: Professor K Cattell (UCT)

3rd Supervisor: Dr P J Edwards

**FOR Code:** 120201

**Project title:** Corruption in the South African construction industry

**Project Description: (250 words)** this project explores the nature and extent of corruption in the South African construction industry. Corruption in South Africa has reached alarming levels, despite government attempts to eradicate it. Intended to be followed by case-based research, the project will initially use a web-based opinion survey.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor - Professor P A Bowen (UCT)

2nd Supervisor: Professor K Cattell (UCT)

3rd Supervisor: Dr P J Edwards

**FOR Code:** 120201

**Project title:** Prospective modifications in public–private partnership procurement

**Project Description: (250 words)** this project aims to capture current knowledge and explore possible changes in project development, delivery, operations and financial processes in public- private partnership (PPP) procurement. PPP is now a well-known and well-used method of procurement for public infrastructure assets and service delivery, at least in the project development and delivery phases. Some insights are emerging in the operational phases of PPP concessions. Literature review and case-based analysis will form the main research techniques.

## **Relevant literature (max 4):**

Steven McCann, Guillermo Aranda-Mena and Peter Edwards

“Public private partnership projects in the operating phase: Three Australian case studies” Journal of Strategic Contracting and Negotiation 2015, Vol. 1(4) 268–287

DOI: 10.1177/2055563616634110

Steven McCann, Guillermo Aranda-Mena and Peter Edwards

“Delivering Value-for-Money in the Operating Phase of PPPs”

Public Management Review 2014. Vol 15(2):91-110

DOI: 10.3233/978-1-58603-973-8-3

Steven McCann, Guillermo Aranda-Mena and Peter Edwards

“Managing Partnership Relations and Contractual Performance in the Operating Phase of PPPs” International Public Management Review. 2014. Vol. 15(2): 111-132

DOI: 10.3233/978-1-58603-973-8-3

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Associate Professor Guillermo Aranda-Mena

2nd Supervisor: Dr P J Edwards

3rd Supervisor: Professor P A Bowen (UCT)

**FOR Code:** 120201

**Project title:** Evidence-based recommendations for policy change to support public safety and community welfare. Funded by: Energy Pipelines CRC from (2017 to 2019)

**Project Description: (250 words)**

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Associate Professor Jan Hayes

2nd Supervisor: Dr Sarah Holdsworth

**FOR Code:** 120201

**Project title:** Work-ability: Exploring the interaction between bodily pain and mental health. Funded by: Chartered Institute of Building Jenkins Legacy Research Fund 2016 from (2017 to 2019)

**Project Description: (250 words)** the study aims to contribute to our understanding of work ability by exploring the association between musculoskeletal bodily pain and the impact this has on the mental health of construction workers. The objectives of the study are to:

1. Explore the association between musculoskeletal bodily pain and mental health.

 2. Identify how the bodily pain-mental health interaction impacts on work ability.

3. Extend the integrated approach to occupational health and safety and health promotion to better understand work ability.

4. Using a social ecological framework, identify strategies at an individual, environment and organizational level which promote work ability and health

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dist. Professor Helen ingard

2nd Supervisor: Dr Michelle Turner

**FOR Code:** 120201

**Project title:** The business case for social housing as infrastructure.

**Project Description: (250 words)** This project investigates the conceptual and practical basis for the use of business cases and cost benefit analysis for public infrastructure investment in Australia. A technical framework to apply a business case approach to investment in social housing as public infrastructure in Australia is developed.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Eric Too

2nd Supervisor: Associate Professor Peter SP Wong

**FOR Code:** 120201

**Project title:** Cost reduction and Deployment of Prefabricated Building Integrated Photovoltaics.

**Project Description: (250 words)** this research aims to formalize a deployment framework to empirically decompose cost trajectories and socio-technical context of distributed renewable energy system into a set of low- and high-level factors. This topic involves social system simulation and dynamic analysis.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Rebecca Yang

2nd Supervisor: Prof Ron Wakefield

**FOR Code:** 120201

**Project title:** Efficient construction: analysis of integrated supply chains for innovative off site housing manufacturing,

**Project Description: (250 words)** this project sheds considerable insights on offsite construction/ manufacturing practice, while contributing to theoretical discussions on a range of topics, including innovation, collaboration, supply chains, and large-scale industry change. Actor Network theory is applied to address the fragmentation of offsite manufacturing in Australia. Apart from theoretical and empirical contributions, this project laid the groundwork for guiding policy and practice in the Australian housing sector. A new collaborative model is built for the practitioners in the OSM industry. Other outcomes include the creation of innovative interactive training materials to be used in virtual simulations involving business collaboration scenarios for various practitioners.

Simulations will be run in a special training laboratory, the innovative Building Leadership Simulation Centre, which is the only one of its kind in the southern hemisphere and is owned the Master Builders Association Victoria.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Professor Kerry London (WSU)

2nd Supervisor: Associate Professor Peter SP Wong

3rd Supervisor: Associate Professor Malik Khalfan

4th Supervisor: Dr. Zelinna Pablo (WSU)

**FOR Code:** 120201

**Project title:** Organizational changes in integrating prefabrication into project management practice

**Project Description: (250 words)** while off-site construction presents opportunities for increased productivity, safety and decreased costs, little is understood as to why it has fail to be applied more extensively in projects. This project provides insight into fostering organisational change to increase the adoption of off-site construction. The study is conducted through an exploration of the relationship between organisational changes, organisational readiness. This project developed on two PCPM seed grants and it’s still continuing. Research output as at 2018 includes four ERA ranked journal and three conference publications.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Associate Professor Peter SP Wong

2nd Supervisor: Dr. Sarah Holdsworth

**FOR Code:** 120201

**Project title:** Carbon reduction in construction projects

**Project Description: (250 words)** carbon accounting allows for the assessment of carbon emissions associated with the construction stage of project development. However, in Australia such practice is not mandatory. This project investigates if carbon accounting can affect decisions in building design. Semi-structured interviews of project managers were conducted in Melbourne, Australia. The research presented real construction project data indicated that more embodied carbon may need to be consumed in the development of a more energy efficient building. Methods of carbon accounting in construction project are proposed. This project developed on a PCPM seed grant and it’s still continuing. Research output as at 2018 includes three ERA ranked and SCI journal publications.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Associate Professor Peter SP Wong

2nd Supervisor: Dr. Sarah Holdsworth

3rd Supervisor: Dr Mary Myla Andamon

**FOR Code:** 120201

**Project title:** The application of virtual reality in construction projects and education

**Project Description: (250 words)** this project investigates the use of virtual reality (VR) in construction education and management. Groundwork has been done on identifying the areas that virtual reality is being applied in construction management practice. This project collaborates with multiple contractor firms in Greater Melbourne region. Pilot testing is being done in developing VR apps for use in education. VR apps development is collaborating with the Chinese University of Hong Kong.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Associate Professor Peter SP Wong

2nd Supervisor: Dr. Rita Zhang

3rd Supervisor: Dr Mary Myla Andamon

4th Supervisor: Dr. Sarah Holdsworth

**FOR Code:** 120201

**Project title:** Adoption of virtual reality (VR) in construction practice

**Project Description: (250 words)** The project aims to adopt VR techniques in construction practice and industry-based professional training. The study is conducted by the scholars in RMIT University and the China University of Mining and Technology (CUMT). 4K Spherical Virtual Reality (4KSVR) images are captured in the construction sites of mainland China and Australia for developing a smartphone VR App for construction practice and construction technologies training.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Associate Professor Peter SP Wong

2nd Supervisor: Dr. Alireza Ahankoob

3rd Supervisor: Dr Behzad Abbasnejad

**FOR Code:** 120201

**Project title:** Building commissioning in the delivery of projects

**Project Description: (250 words)** The increasing focus on the performance of buildings has highlighted the importance of building (and operational) commissioning as a critical phase in the project lifecycle and project delivery. Building Commissioning (Cx) is the professional practice that ensures buildings are delivered according to the Owner's Project Requirements (OPR) (National Institute of Building Sciences, 2016). Buildings that are properly commissioned typically have fewer change orders, tend to be more energy efficient, and have lower operation and maintenance cost. The documentation of the commissioning process provides the foundation for correctly benchmarking the baseline energy consumption of the facility. In the building project lifecycle, running from the Design phase, through to construction phase and culminating with the operation phase, building commissioning is placed towards the end of the construction phase. This is typically viewed as part of the post-construction phase bridging the construction with the operational phases. Post-construction activities have been more in line with the preparation for building occupancy, project punch-out and certification of substantial completion. Whereas, building commissioning activities which mark the commencement of service delivery from a new project (among others, ensuring that all building systems operate effectively and efficiently, and that staff are familiar with operating the facility before client services commence) have largely been least defined and often relegated as within the purview of facility management. With complex new facilities, building commissioning can be a major activity in itself.

Investigate:

1. Building commissioning (operational commissioning) process in Australia

2. Integration of building commissioning (operational commissioning) in project delivery

- Drivers, challenges, imperatives

3. Commissioning of new and retrofit/refurbished projects

4. Incentives

- Green rating/certification

- Energy performance contracting

- Developer/client requirement (building commissioning and operational commissioning)

## **Relevant literature (max 4):**

1. ASHRAE. (2013). ASHRAE Standard 202-2013: Commissioning Process for Buildings and Systems (ANSI Approved; IES Co-sponsored) (pp. 50). Atlanta, GA: American Society of Heating Refrigerating and Air-conditioning Engineers (ASHRAE).
2. Building Commissioning Association. (2016). New Construction Building Commissioning Best Practices. Beaverton, OR: Building Commissioning Association.
3. Mills, E. (2010). Building Commissioning: A Golden Opportunity for Reducing Energy Costs and Greenhouse Gas Emissions (pp. 65). Berkeley, CA: Lawrence Berkeley National Laboratory (LBNL).
4. Tuohy, P. (2009). Simulation and BIM for building design, commissioning and operation: A comparison with the microelectronics industry. Paper presented at the 11th International IBPSA Conference 2015 (27-30 July 2009), Glasgow, Scotland. [Accessed: 26 August 2017].

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor: Dr Mary Myla Andamon

2nd Supervisor: Associate Professor Peter SP Wong

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# **FOR Code:** 120201

**Project title:** Application of IOTs within Australian Construction Industry

**Project Description: (250 words)** IoT, or The internet of Things, describes a series of interrelated devices with unique identifiers, which can interconnect, interact and exchange data. These devices operate autonomously - without a requirement for human intervention - and therefore project the appearance of being self-aware, and able to make decisions. The Australian Construction Industry may potentially realise significant cost savings and improved safety levels if it were to utilise and leverage some of the benefits which this technology offers. The focus of this project will be primarily to evaluate the existing body of research, with a view to bring together varying approaches and findings. These will in turn inform findings, which will aim to provide quantitative data to make a compelling case for the adoption of these technologies into the Australian Construction Industry. The report will include analyses of recent findings and data, to ensure applicability to the Australian context. This will be evaluated against any relevant data sets from international sources, to compare and contrast divergent trends to argue the case for, or against, the adoption of this relatively recent technology.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Associate Professor Malik Khalfan

2nd Supervisor: Associate Professor Tayyab Maqsood

**FOR Code:** 120201

**Project title:** Application of Blockchain within the Construction Procurement System

**Project Description: (250 words)** research has shown deficient performance; cost overrun; project delays; disputes and rework are typical challenges faced by the construction industry (Kim & Tuan 2016; Love & Li 2000). Furthermore, recent debate in the construction industry outlines transparency and accountability; reduced project information sharing platforms; and outdated technologies as prime factors hindering the project success (Nguyen & Chileshe 2015; Ofori 2012). Loss of precious lives due to some poor in some cases further fuelled debate on transparency and accountability issues related to construction procurement practices (Hawkins & McKittrick 2012).

Therefore, this study will explore the innovative blockchain technology and its application in the construction industry context. Blockchain technology is in its nascent stage and especially for the construction industry there is no specific development that is currently underway. The research intends to create a prototype of Blockchain technology for the construction industry and get buy-in from big industry player to form partnerships to develop a complete technology. By adopting smart contract application of this technology, the company can monitor chains of errors, disputes, and conflicts (Molenaar et al., 2000), overcome the challenge of team integration (Korpela et al., 2017) leading to enhance trust among parties, transparent financial clearance, improved transparency and accuracy of information, and cost reductions. This will immensely reduce the amount of litigation that happens in the construction industry.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Associate Professor Malik Khalfan

2nd Supervisor: Associate Professor Tayyab Maqsood

**FOR Code:** 120201

**Project title:** Dealing with the Big Data within Australian construction industry

## **Project Description: (250 words)** Relevant literature (max 4):Construction industry is usually one of the slowest to adopt new technology. The current revolutionary technology trends such as adoption of block chain, or big data, or even artificial intelligence (AI) and augmented reality (AR); would take some time to enter main stream construction projects. It is very common for researchers within construction management domain to carry out experiments and case studies to show case the use of such technology but the hardest thing is to make it part of the food chain within daily routine. This paper is not going to discuss the causes of the delay in adoption of new technology but the author is discussing the incremental changes which could be adopted within the context of big data that would pave the future adoption easier and natural. The paper briefly discusses what big data is all about and some research anecdotes confirming the suitability of its adoption. The other half of the paper presents, how incremental changes towards using the small and readily available data could help in the future to adopt and analyses the big data. The author concludes that taking small and incremental steps towards any technology adoption, in this case big data, could help develop the readiness towards adoption of that new technology trend. For this particular case, the adoption of big data resembles the knowledge management process within any company or on a project, except the amount of available data and information is huge and therefore, extraction of new knowledge from these massive records of data and information requires new analytical tools.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Associate Professor Malik Khalfan

2nd Supervisor: Associate Professor Tayyab Maqsood

**FOR Code:** 120201

**Project title:** BIM - sustainability, supply chain management and integration tool

**Project Description: (250 words)**

**Relevant literature (max 4):** Several definitions of Building Information Modeling (BIM) exist with many authors adding variations. Azhar (2012) defined BIM as a transformational approach to undertaking construction projects throughout the whole lifecycle of a facility. According to the National Building Information Model Standard (NBIMS, 2013), “Building Information Modeling (BIM) is a digital representation of physical and functional characteristics of a facility” further stating that BIM “is a shared knowledge resource for information about a facility forming a reliable basis for decisions during its life-cycle; defined as existing from earliest conception to demolition”. These two definitions will be adopted by the author for the purpose of this research.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Associate Professor Malik Khalfan

2nd Supervisor: Associate Professor Tayyab Maqsood

3rd Supervisor: Dr Farshid Rahmani

**FOR Code:** 120201

**Project title:** Using PPP within Public Infrastructure Development in Australia

**Project Description:** **(250 words)** This research will explore the fundamental issues in procurement of public private partnership (PPP) projects for various infrastructure projects in the public sector in Australia. The supervisors have conducted research by in the past employing archival and qualitative case study analysis. With the help of new case studies from public sector organisations in Australia, the research will discuss the procurement of PPP infrastructure projects. This research will identify the various factors affecting choice of procurement and the issues in its implementation in the public sector organisations involved with managing various infrastructure projects. This research will also highlight issues including the enablers and barriers of procuring PPP infrastructure projects in public sector of Australia.

## **Supervisory team (min 2, max 4 supervisors):**1st Supervisor – Associate Professor Malik Khalfan2nd Supervisor: Dr Pauline Teo3rd Supervisor: Dr Farshid Rahmani

**FOR Code:** 120201

**Project title:** Framework and business case for developing a market place and a trading platform for selling and buying Construction and Demolition waste across housing, building and infrastructure construction across Australia

**Project Description: (250 words)** Construction and demolition waste is an ever growing problem in Australia. Landfill sites across Australia are at capacity. The Australian Government has been discouraging dumping waste in landfills by increasing levies on waste going to landfill and encouraging reuse and recycling of construction and demolition waste. However, the definitions pertaining to classes of waste and the levies are not consistent across different states in Australia. There are different economic factors pertinent to a certain state that are at play which determines this levy in that state. The type of construction and demolition waste also depends on the nature of the industry. The project would focus on the waste generated by residential, commercial, rail and road infrastructure. With advances in technology, it is now possible to develop a platform that could encourage buying and selling of construction and demolition waste across different industries and across different states. This project seeks to develop a framework and a business case underpinning the development of this trading platform. Using JIT (Just in Time) principles, buyers and sellers would be able engage in on-line transactions and be able to buy or sell the construction and demolition waste at various locations in a timely manner.

**Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Associate Professor Tayyab Maqsood

2nd Supervisor: Professor Ron Wakefield

3rd Supervisor: Dr Malik Khalfan

**FOR Code:** 120201

**Project title:** Data and information technologies to support decision making in construction and the built environment

**Project Description: (250 words)**

**Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Maged Georgy

2nd Supervisor: Dr Frank Boukamp

**FOR Code:** 120201

**Project title:** Corporate Social Responsibility (CSR) in the Construction Industry

## **Project Description: (250 words)**

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Rita Zhang

2nd Supervisor: Dr Nader Naderpajouh

3rd Supervisor: Dr Eric Too

**FOR Code:** 120201

**Project title:** Leadership styles for successful delivery of complex projects

## **Project Description: (250 words):**

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Maged Georgy

2nd Supervisor: Dr Christina Scott-Young

**FOR Code:** 120201

**Project title:** Smart renewable energy design and distribution in high & low density urban regions

**Project Description: (250 words)** this research aims to develop an integrated cyber-physical platform for distributed renewable energy system design and development. This topic involves programing, system optimisation and knowledge relevant to machine learning and artificial intelligence.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Rebecca Yang

2nd Supervisor: Prof Ron Wakefield

**FOR Code:** 120201

**Project title:** Financial mechanism in the distributed renewable energy market

**Project Description: (250 words)** this research aims to develop a comprehensive financial mechanism and procurement model which can provide accurate prediction and optimisation of the long term investment benefit. This topic involves economic modelling and evaluation.

**Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Rebecca Yang

2nd Supervisor: Prof Ron Wakefield

**FOR Code:** 120201

**Project title:** Enabling offsite construction through computer-based modelling and tracking

**Project Description: (250 words)** currently, with the integration of advanced positioning and digital technologies and offsite construction, various issues including design speciality, stakeholder collaboration, traceability, real time data collection, quality control, precision in scheduling and construction, onsite movement, and safety problems can be addressed effectively as compared to conventional prefabrication practices. This research aims to develop an integrated modelling and tracking system to facilitate offsite construction.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Rebecca Yang

2nd Supervisor: Prof Ron Wakefield

**FOR Code:** 120201

**Project title:** Evaluation of sustainable housing developments in Australia

**Project Description: (250 words)** this project will evaluate Mullum Creek and Cape Paterson sustainable housing developments across multiple years using a multi-method approach. Both developments offer significantly improved sustainability outcomes in comparison to traditional housing in Australia and provide significant opportunities for understanding outcomes to help scale up sustainable housing in Australia. Analysis will focus on three key streams. Interested PhDs could focus on one or more of these streams. 1) The technical performance (energy, water, thermal comfort, IAQ etc) of the houses and comparing this to design intent. This stream will also include a cost-benefit analysis. 2) Occupant perspectives including pre and post move analysis to explore their expectations of the housing and how that plays out after several years in the dwellings. 3) Stakeholder analysis of those who have been involved in the development of these sites over their 10+ year journeys to understand the processes involved and what lessons other developments, communities and planning authorities can draw upon to help scale up the speed of such developments in the future.

**Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Trivess Moore

2nd Supervisor: Dr Nicola Willand

**FOR Code:** 120201

**Project title:** Career resilience: Bouncing back; career resilience of project managers in the dynamic built environment

## **Project Description: (250 words)**

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Nader Naderpajouh

2nd Supervisor: Dr Christina Scott Young

3rd Supervisor: Professor Arun Kumar

**FOR Code:** 120201

**Project title:** Supply chain resilience: Gauging the effectiveness of supply chain management frameworks in supply chain resilience of the construction industry

**Project Description: (250 words):**

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Nader Naderpajouh

2nd Supervisor: Dr Rita Zhang

3rd Supervisor: Associate Professor Jan Hayes

**FOR Code:** 120201

**Project title:** Infrastructure resilience: Resilience of the infrastructure systems within communities

**Project Description: (250 words):**

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Nader Naderpajouh

2nd Supervisor: Dr Rita Zhang

3rd Supervisor: Professor Ron Wakefield

**FOR Code:** 120201

**Project title:** Organisational resilience: Establishing best practices to digital innovation within organisations

## **Project Description: (250 words):**

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Nader Naderpajouh

2nd Supervisor: Dr Frank Boukamp

3rd Supervisor: Professor Ron Wakefield

# **FOR Code:** 120201

**Project title:** The role of PropTech and Blockchain in land registration and the recording of interests in property, mortgages and land use planning & development

**Project Description: (250 words)** blockchain and PropTech/FinTech products and services play a significant role in land conveyancing, registration, and the recording of real property and land use planning and development interests. There is great opportunity for international comparative research, which considers socio-legal tensions, and related ethical, governance and legal issues in this emerging and disruptive area of built environment enquiry. Blockchain technologies, together with PropTech products and services claim immutable recording of land ownership, and in interests in use & development of land, including cultural and heritage intangible interests. There are, however, transparency, governance and enforcement concerns with such recordings, and many cross jurisdictional inconsistencies. Some jurisdictions, such as Australia, have sophisticated methods for land registration (Torrens system). Other cities and nations may not offer such certainty, due to cost restraints or wars or climate change disasters which have interrupted record keeping. Blockchain technologies claim to offer high level protection for land owners and occupiers. As this area of enquiry crosses into ownership and licences (permission) to use and develop land, which is a highly scarce resource, there are tensions between stakeholder interests (owners/occupiers/homeowner interests etc) and regulation from municipalities and the state in the areas of property law, land use planning and development environmental and heritage law, consumer law etc. This area of inquiry is ripe for cross jurisdictional socio-legal research, noting the experiences of stakeholders in Australian and abroad, in both developed and developing countries. Australia’s robust Torrens system created in the mid 1800s can offer lessons to others, as well as continue to learn from cross jurisdictional experiences.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Rebecca Leshinsky

2nd Supervisor: - Dr Judith Callanan

**FOR Code:** 120201

**Project title:** Sustainable housing in India

**Project Description: (250 words)** developed by Oxford Brookes University, Development Alternatives Group, TERI and UN-HABITAT, this two year research project seeks to promote sustainability in terms of environmental performance, affordability and social inclusion as an integrated part of social housing in India. The project will develop a Decision Support Tool (DST) that will provide guidelines at the conceptual stage of housing projects to enable the adoption of sustainable building.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Professor Usha Iyer-Raniga

**FOR Code:** 120201

**Project title:** Use of low carbon cement and other low impact materials in the built environment

**Project Description: (250 words)** the objective of LCCI network is to identify and analyze potential solutions to mitigate CO2 emissions and increase resource efficiency over the life cycle of the cementitious materials, and promote those that are low-cost, technologically robust and environmentally sound.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Professor Usha Iyer-Raniga

**FOR Code:** 120201

**Project title:** Circularity in the built environment: use of material banks, use of low impact materials, multi-functional use of spaces, tapping resource efficiency

**Project Description: (250 words)** the use of material banks, use of low impact materials, multi-functional use of spaces, tapping resource efficiency potentials, net zero energy buildings and the like.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Professor Usha Iyer-Raniga

**FOR Code:** 120201

**Project title:** Sustainability assessment of smart towns and actions for improvement

**Project Description: (250 words)** sustainability assessment of smart towns and actions for improvement, including building and planning overlays; foster the paradigm shift towards an eco- efficient, socially inclusive and economically viable urban development such as in the Aburrá Valley (in Colombia) and its adjacent regions by implementing strategies relevant to the local needs, constraints and opportunities, while keeping view on global priorities.

## **Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Professor Usha Iyer-Raniga

**FOR Code:** 120201

**Project title:** Wellness in buildings and the built environment

**Project Description: (250 words)** Linking health, wellbeing and happiness to good planning and building design and operation

**Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Professor Usha Iyer-Raniga

**FOR Code:** 120201

**Project title:** Indoor air quality in Aged care centres

## **Project Description: (250 words)** Climate change has deteriorated the air quality of cities leading to increased temperature, level of carbon dioxide and other pollutants such as dust and allergens. Extreme weather events such as heat waves and thunderstorms are rising. Air pollution results in 3000 premature deaths each year in Australia, costing the nation up to $24.3 billion in health expenses annually. In addition 15% of the population is above 65 years which causes a huge burden to the healthcare system.The project aims to investigate the indoor air quality of aged care centers and its implication on the health and well-being of elderly population. The methodology involves design and development field measurements including selection and deployment of sensors, conducting surveys and focus group.

**Relevant literature (max 4):**

1. [Maio S](https://www.ncbi.nlm.nih.gov/pubmed/?term=Maio%20S%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=26535792), [Sarno G](https://www.ncbi.nlm.nih.gov/pubmed/?term=Sarno%20G%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=26535792), [Baldacci S](https://www.ncbi.nlm.nih.gov/pubmed/?term=Baldacci%20S%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=26535792), [Annesi-Maesano I](https://www.ncbi.nlm.nih.gov/pubmed/?term=Annesi-Maesano%20I%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=26535792), [Viegi G](https://www.ncbi.nlm.nih.gov/pubmed/?term=Viegi%20G%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=26535792), 2015, Air quality of nursing homes and its effect on the lung health of elderly residents, [Expert Rev Respir Med.](https://www.ncbi.nlm.nih.gov/pubmed/26535792) 2015;9(6):671-3. doi: 10.1586/17476348.2015.1105742

2. [Ana Mendes](https://www.ncbi.nlm.nih.gov/pubmed/?term=Mendes%20A%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=23514075), [Cristiana Pereira](https://www.ncbi.nlm.nih.gov/pubmed/?term=Pereira%20C%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=23514075), [Diana Mendes](https://www.ncbi.nlm.nih.gov/pubmed/?term=Mendes%20D%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=23514075),[Lívia Aguiar](https://www.ncbi.nlm.nih.gov/pubmed/?term=Aguiar%20L%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=23514075),[Paula Neves](https://www.ncbi.nlm.nih.gov/pubmed/?term=Neves%20P%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=23514075),[Susana Silva](https://www.ncbi.nlm.nih.gov/pubmed/?term=Silva%20S%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=23514075),[Stuart Batterman](https://www.ncbi.nlm.nih.gov/pubmed/?term=Batterman%20S%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=23514075), and [João Paulo Teixeira](https://www.ncbi.nlm.nih.gov/pubmed/?term=Teixeira%20JP%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=23514075), Indoor air quality and thermal comfort—results of a pilot study in elderly care centers in Portugal, J Toxicol Environ Health A. 2013; 76(0): 333–344,

doi: [10.1080/15287394.2013.757213](https://dx.doi.org/10.1080/15287394.2013.757213).

3.  [C. Coelho](https://onlinelibrary.wiley.com/action/doSearch?ContribAuthorStored=Coelho%2C%2BC) ,[M. Steers](https://onlinelibrary.wiley.com/action/doSearch?ContribAuthorStored=Steers%2C%2BM),[P. Lutzler](https://onlinelibrary.wiley.com/action/doSearch?ContribAuthorStored=Lutzler%2C%2BP), [L. Schriver‐Mazzuoli](https://onlinelibrary.wiley.com/action/doSearch?ContribAuthorStored=Schriver-Mazzuoli%2C%2BL),2005, Indoor air pollution in old people's homes related to some health problems: a survey study, [Indoor air](https://europepmc.org/search%3Bjsessionid%3D89E438B421B474D7673C24A7EAE5B982?query=JOURNAL%3A%22Indoor%2BAir%22&amp;page=1) 15(4):267-274.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor: Dr Jin Woo

2nd Supervisor: Associate Professor Priya Rajagopalan

3rd Supervisor: Dr Mary Myla Andamon

**FOR CODE:**120202

**Project title:** Indoor air quality in Schools and Early Childhood Centers

**Project Description: (250 words)** studies on the effects of poor indoor environments, particularly of thermal effects and indoor environmental quality on the performance of schoolwork by students are limited. As little research has been reported on these relationships for children in schools, much of the information have assumed that influences of indoor settings on adults have relevance to the influences of school environments on children However, research indicates that adult-based IAQ standards are not directly applicable to children in school buildings. This project aims to investigate the indoor air quality of primary schools and early learning centres and its implication on the health and well-being of young children. The key methods involve design and development field measurements including selection and deployment of sensors; conducting surveys and focus groups; investigating the relationship between these aspects of indoor environments and student performance.

**Relevant literature (max 4):**

1. Mendell, MJ & Heath, GA 2005, 'Do indoor pollutants and thermal conditions in schools influence student performance? A critical review of the literature', Indoor Air, vol. 15, no. 1, pp. 27-52.

2. Wargocki, P & Wyon, DP 2006, 'Effects of HVAC on Student Performance',

ASHRAE Journal, vol. 48, no. 10 (October), pp. 23-7.

### 3. Wargocki, P & Wyon, DP 2013, 'Providing better thermal and air quality conditions in school classrooms would be cost-effective', Building and Environment, vol. 59, no. 0, pp. 581-9.

4. de Dear, R, Kim, J, Candido, C, et al. 2015, 'Adaptive thermal comfort in Australian school classrooms', Building Research & Information, vol. 43, no. 3, pp. 383-98.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor: Dr Mary Myla Andamon

2nd Supervisor: Associate Professor Priya Rajagopalan

3rd Supervisor: Dr Jin Woo

**FOR Code:** 120202

**Project title:** Urban heat island mitigation measures

**Project Description: (250 words)** urban heat island (UHI) is the most documented phenomenon of climate change and is prevalent in many cities. Uncomfortable outdoor environments and extreme heat adversely affect public health, particularly that of the elderly who are more vulnerable to heat (Loughnan et al, 2010; Nicholls et al, 2008). Extreme heat events have killed many people in the past 200 years than any other climate hazard, and have caused major economic disruptions. Projected increases in heat-related mortality and associated morbidity will place pressure on emergency and health services. High urban temperature decreases the potential of passive cooling techniques and enhances the use of mechanical cooling. A number of mitigation strategies such as green spaces and cool materials are proved to be ameliorating the overheating effect and improving the health outcomes. This project aims to investigate the various techniques for mitigating urban heat island in Australian cities.

**Relevant literature (max 4):**

1. Santamouris, M. On the energy impact of urban heat island and global warming on buildings. Energy Build. 82, 100–113 (2014).

2. Santamouris, M., Cartalis, C., Synnefa, A. & Kolokotsa, D. On the impact of urban heat island and global warming on the power demand and electricity consumption of buildings—A review. Energy Build. 98, 119–124 (2015).

3. Jamei, E., Rajagopalan, P., Seyedmahmoudian, M. & Jamei, Y. Review on the impact of urban geometry and pedestrian level greening on outdoor thermal comfort. Renew. Sustain. Energy Rev. 54, 1002–1017 (2016).

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor: Associate Professor Priya Rajagopalan

2nd Supervisor: Dr Mary Myla Andamon

**FOR Code:** 120202

**Project title:** Energy saving potential of green infrastructure

**Project Description: (250 words)** the use of greenery in the built environment provides cooling through evapotranspiration and shading.The potential of shaded trees and other green infrastructure to mitigate urban heat islands and conserve heating and cooling energy has been well documented. This project aims to investigate the energy saving potential of different greening scenarios on residential and commercial buildings. Methodology can include field measurements, microclimate modelling and energy simulations.

**Relevant literature (max 4):**

1. Hashem Akbari, Dan M. Kurn, Sarah E. Bretz, James W. Hanford, Peak power and cooling energy savings of shade trees, Energy and Buildings, Volume 25, Issue 2, 1997, Pages 139-148

2. Shashua-Bar, L. and Hoffman, M. (2000) 'Vegetation as a climatic component in the design of an urban street: An empirical model for predicting the cooling effect of urban green areas with trees', Energy and Buildings, 31(3), pp.221- 235.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor: Associate Professor Priya Rajagopalan

2nd Supervisor: Dr Mary Myla Andamon

**FOR Code:** 120202

**Project title:** Economic, social and environmental impacts of artificial cooling in developing countries.

**Project Description: (250 words)** Higher ambient temperatures resulting from global and local climate change influences future needs of air conditioning. Poorly designed buildings present a significantly higher demand for cooling. Increased use of air conditioners to satisfy indoor comfort conditions increases the electricity consumption significantly impacting on the peak electricity demand forcing the utilities to build additional power plants. This project will investigate the economic, social and environmental impact of using air conditioners in developing countries; and assist public, industry and policy stakeholders in mitigating and adapting to climate change.

 **Relevant literature (max 4):**

1. Amol Phadke, Dr Nikit Abhyankar, Dr. Nihar Shah: Avoiding 100 New Power Plants by Increasing Efficiency of Room Air Conditioners in India: Opportunities and Challenges, Lawrence Berkeley National Laboratory, Berkeley, USA.

2. Santamouris, M (2015), Cooling the buildings – past, present and future, Energy and Buildings 128 (2016) 617–638.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor: A/Prof Priya Rajagopalan

2nd Supervisor: Dr Mary Myla Andamon

**FOR Code:** 120202

**Project title:** Managing occupational health risks in construction work

**Project Description: (250 words)** in Australia, Work Health and Safety (WHS) legislation requires duty holders to reduce risk ‘so far as is reasonably practicable’. Duty holders are expected to establish management processes to identify WHS hazards, assess risks presented by these hazards, decide how to control the risks and implement and monitor the selected control measures. Underpinning the selection of WHS risk controls is a hierarchy of control, which categorizes controls into three levels based on their effectiveness. Level one controls eliminate a hazard altogether. Level two controls act on the work environment to make it physically safer, while level three controls rely for their effectiveness on human behaviour, such as establishing rules/procedures and providing personal protective equipment. Safe Work Australia estimate that while, on average, over 250 workers in Australia die from an injury sustained at work each year, over 2,000 workers die from a work-related illness. Despite the seriousness of occupational health risks, little research has been undertaken investigating the factors that influence the selection and effectiveness of risk controls for occupational health hazards relevant to construction work. The proposed research will investigate what influences decision making in relation to the control of significant occupational health risks in the construction industry and how technological, socio-cultural and psychological barriers to the implementation of level one and two controls can be overcome.

**Relevant literature (max 4):**

1. Snashall, D, 2005, ‘Occupational health in the construction industry.’, Scandinavian Journal of Work, Environment & Health 31(2), pp. 5-10.
2. Meeker, J-D, Cooper, M-R, Lefkowitz, D & Susi, P 2009,’ Engineering Control Technologies to Reduce Occupational Silica Exposures in Masonry Cutting and Tuckpointing’, Public Health Reports, vol. 124, pp. 101-111.
3. Hnizdo, E, Berry, A, Hakobyan, A, Beeckman-Wagner, L-A & Catlett, L 2011, ‘Worksite Wellness Program for Respiratory Disease Prevention in Heavy-Construction Workers’, Journal of Occupational and Environmental Medicine, vol. 53(3), pp. 274-281.
4. Kolmet, M, Marino, R & Plummer, D 2006, ‘Anglo-Australian male blue collar workers discuss gender and health issues’ International Journal of Men’s Health, 5(1), pp. 81–91.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor: Dist. Professor Helen Lingard

2nd Supervisor: Dr James Harley

3rd Supervisor: Professor Ron Wakefield

**FOR Code:** 120201

**Project title:** Evaluating the effectiveness of apprenticeship schemes in construction

**Project Description: (250 words)** the unprecedented public sector spending on infrastructure construction projects (in Victoria and New South Wales) has increased the demand for skilled construction workers. Demographic trends, including the ageing population, as well as the construction industry’s reputation as being a ‘dirty, dangerous’ industry create challenges for the attraction, development and long term retention of skilled workers. The Victorian Government (with the Civil Contractors’ Federation) has established a Civil Construction Cadetship Program to attract workers from specific targeted groups, including people from vulnerable or disadvantaged sectors of our community, or those sectors such as car manufacturing or energy, that are going through enormous transition. For more information see:<http://www.earthmovers-magazine.com.au/index.php/constructing-australias-infrastructure-with_the-civil-contractors-federation>. RMIT has been engaged to evaluate this program. In particular, the research will answer the following questions:

· what are the expectations of participants recruited to the Civil Skills Cadetship program at time of recruitment , and how well are these expectations met through the program?

· how do participant characteristics measured at the recruitment stage e.g. language, literacy and numeracy, impact subsequent engagement with and impact of different types of training?

· how engaged are participants and what are their intentions with regard to participation in the program and long term employment in the civil construction industry?

· if people leave the program at any point in its duration, what are the reasons for doing so?

· what features of instructional design and training delivery method work best for different groups pf participant?

· what individual and environmental (i.e., workplace) characteristics support the transfer of training into practice?

· how can civil contractors create work environments that support and enable the transfer of training into practice?

· on completion of the program, what do participants believe are the strengths, benefits and/or areas for improvement inherent in the program?

**Relevant literature (max 4):**

Toner, P. (2008). Survival and decline of the apprenticeship system in the Australian and UK construction industries. British Journal of Industrial Relations, 46(3), 431-438.

Cohen-Scali, V. (2003). The influence of family, social, and work socialization on the construction of the professional identity of young adults. Journal of Career Development, 29(4), 237-249.

Coe, P. J. (2013). Apprenticeship programme requirements and apprenticeship completion rates in Canada. Journal of Vocational Education & Training, 65(4), 575-605.

Worthen, H., & Haynes, R. A. (2009). Outcomes of two construction trades pre-apprenticeship programs: A comparison. Journal of Community Practice, 17(1-2), 207-222.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor: Dist. Professor Helen Lingard

2nd Supervisor: Dr James Harley

**FOR Code:** 120201

**Project title:** Inefficiencies of rural Public Transportation Systems: Australian Study

**Project Description: (250 words)** currently, there are many mobility and rural transportation challenges, in particular accessibility, for the Australian rural communities. The aim of this research is to carefully study the inefficiencies of rural Public Transportation Systems, particularly in Australia. In doing so, Intelligent Transportation Systems (ITS) along with Autonomous vehicles will be reviewed in response to such incapability. Such technological advancements have long been deployed in urban areas, while not so for the rural regions. While there are efficiency issues in the public transportation systems, including superior performance and functionality, such apprehension are ever more prevalent in the rural areas. For Australia with its large and growing rural regions, such issues are more noteworthy. Accordingly, this research will investigate some of the most essential sustainable elements of Australian rural Public Transportation Systems. In addition, the utilization of ITS and Autonomous vehicles for the purpose of remedy to the inefficiencies of rural Public Transportation Systems will be carefully investigated.

**Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor: Dr Koorosh Gharehbaghi

2nd Supervisor: Professor Chris Eves

3rd Supervisor: Dr Maged Georgy

4th Supervisor: Dr Farshid Rahmani

**FOR Code:** 120201

**Project title:** Agile Project Management

**Project Description: (250 words)** Global economy and increased market competition compel organizations and prompt project managers to be flexible in a project system to adjust constantly to emerging challenges and opportunities (Fernandez & Fernandez, 2008). Managerial approaches projects are broadly divided into traditional and agile. It should be noted in this context that project management methodology consists of methods, techniques, procedures, rules, templates, and practices that are applied to manage a project (Špundak, 2014) and these management aspects and their application vary for based on project characteristics. Obviously, agile and traditional approaches differ in adopting them or modifying them based on the project at hand.

Specifically, traditional and Agile project management methodologies differ based on the extent to which the project goal and solution are clear (Wysocki, 2006). Using the goal and solution clarity as criteria, Wysocki identified five strategies to manage projects. Traditional projects use lineal project management lifecycle (linear and incremental strategies) as described in the Project Management Book of Knowledge (PMBOK Guide), whereas software development cycle (SDLC) differs significantly from the project management life cycle proposed in PMBOK. For this reason, Agile methodology (iterative, adaptive, and extreme strategies) sprung into prominence.

In traditional project management style adopting linear and incremental strategies, the project goal and solution are clear (Fernandez & Fernandez, 2008). In linear strategy, accommodating change and responding to customer needs are difficult as the project plan is finalized early as compared to incremental strategy. Agile strategies of iterative and adaptive are suitable when goal is clear, but solution is either partially clear or not clear at all. In the extreme agile strategy, both the goal and strategy remain unclear (Fernandez & Fernandez, 2008). However, agile methodology need not be limited to technology projects alone. Citing a research study (Owen et. al, 2006), Fernandez and Fernandez (2008) agrees the with the idea of employing agile methodology in pre-design and design phases of construction projects as well.

In the global economy that presents complex and uncertain environment for projects, agile method seems to work well (Fernandez & Fernandez, 2008). Specifically, software development, which often employs agile methodology, faces the challenge of meeting frequent changes to requirements to meet evolving demands of the market and increasing global competition. For this study, project management methodologies are broadly categorized into traditional (waterfall) and agile. From a team development perspective, team structure within traditional projects are different from the agile project management team. The study will enhance the understanding of agile project team development which not necessarily follow the conventional process of Forming, Storming, Norming, Performing, and Adjourning.

**Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor: Associate Professor Malik Khalfan

2nd Supervisor: Associate Professor Tayyab Maqsood

**FOR Code:** 120201

**Project title:** Sustainability education in the residential building industry

**Project Description: (250 words)** One of the identified challenges to delivering more sustainable housing is a lack of knowledge and skills amongst builders. There are different ways in which builders can gain knowledge about improving the delivery of sustainability in housing including attending green building courses (e.g. run by peak housing bodies or other accredited organisations). There is a lack of understanding about the impact of different education or knowledge development initiatives. For example there are key questions about how these initiatives change (or not) building practices and broader influence they have on the building industry and clients. This PhD will look at a range of initiatives aiming to upskill builders in Australia.

**Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Sarah Holdsworth

2nd Supervisor: Dr Trivess Moore

**FOR Code:** 120201

**Project title:** Project Managing Community Rehabilitation: The role of sporting clubs in post-disaster response and recovery

**Project Description: (250 words)** Sporting organisations and/or clubs have traditionally been seen as social contributing factor to the communities in which they are embedded. Sporting clubs in Australia are considered to be essential providers of opportunities for organised sport and physical activities, which create social cohesion, as well as a sense of community and identity for diverse range of social groups and population. Recent studies have started to recognize the important role that sporting clubs play in post-disaster situations (Matheson & Baade 2006; Klein & Huang 2007; Gschwend and Selvaraju, 2007; Kunz, 2009; Wicker et al., 2013). Wicker et al. (2013) investigated organizational resilience of community-based sporting clubs and highlighted the impact that disasters have on the operations of Australian sporting clubs. Studies such as those conducted by Gschwend and Selvaraju (2007) and Kunz (2009) assessed the effectiveness of sport-based interventions and activities to help restore the well-being of disaster victims. Kunz’s (2009) study focused on sport activities that took place after the 2003 Bam earthquake in Iran and demonstrated how these activities partly contributed to enhancing the well-being of traumatized children and youths. Inoue and Havard (2015) performed a content analysis of sport and disaster relief activities and developed a framework which identified sport activities implemented by high-profile sport organisations and athletes that could be applied during disaster relief and response. However, the findings were solely based on the analysis of news media that predominantly reported North American cases such as the 2013 Boston marathon Bombings. Most studies on sporting clubs and disasters have demonstrated the connection that exists between the two; however, none have yet to explore how project management skills demonstrated by sporting clubs can be used to promote effective disaster response and recovery.

The aim of this research is to investigate the role played by sporting clubs in the response and recovery efforts of major disasters including natural and man-made disasters. The investigation will be performed with the objective of developing a framework that will support and guide the inclusion of project management skills learned from sporting clubs in a post-disaster strategy development. With the development of the framework, this research will seek to answer the following questions:

RQ1. What project management skills sporting clubs have?

RQ2. How can these project management skills be applied to post-disaster recovery?

## **Relevant literature (max 4):**

Gschwend, A. and Selvaraju, U., 2007. Psycho-social sport programmes to overcome trauma in post-disaster interventions. An overview.

Kunz, V., 2009. Sport as a post-disaster psychosocial intervention in Bam, Iran. Sport in Society, 12(9), pp.1147-1157.

Wicker, P., Hallmann, K. and Breuer, C., 2013. Analyzing the impact of sport infrastructure on sport participation using geo-coded data: Evidence from multilevel models. Sport management review, 16(1), pp.54-67.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor - Dr Erica Mulowayi

2nd Supervisor: Dr Guinevere Gilbert

3rd Supervisor: Associate Professor Bambang Trigurnasyah

**FOR Code:** 120201

**Project title:** How steep is the sustainability learning curve for builders and developers?

**Project Description: (250 words)** Anytime improving minimum performance regulations of housing in Australia are discussed it is countered with a number of challenges including that builders and developers lack the required skills to deliver low-energy/carbon housing. However, with an increasing number of sustainable housing developments around Australia, and a number of State or Federal government programs to help deliver low energy/carbon housing, it is timely to explore this notion and find out how steep the learning curve is for builders and developers. We need to understand this if we are to help deliver a low carbon housing transition. For example is do they need to deliver 5, 10, 100 or more low energy/carbon houses for learnings to filter through their processes.

**Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Trivess Moore

2nd Supervisor: Dr Sarah Holdsworth

**FOR Code:** 120201

**Project title:** BIM-Centric Design Optimization on sustainable building facade

**Project Description: (250 words)** This research aims to optimize sustainable building facade through BIM. Accordingly, the specific research objectives are:

I. To identify the design considerations attached to building facade design and development

II. To model the alternative sustainable building facade designs through BIM

III. To optimize the designs under multiple scenarios

**Relevant literature (max 4):**

Ning, G., Junnan, L., Yansong, D., Zhifeng, Q., Qingshan, J., Weihua, G., & Geert, D. (2017). BIM-based PV system optimization and deployment. Energy and Buildings, 150, 13-22. doi:10.1016/j.enbuild.2017.05.082

Ning, G., Kan, H., Zhifeng, Q., Weihua, G., & Geert, D. (2018). e-BIM: a BIM-centric design and analysis software for Building Integrated Photovoltaics. Automation in Construction, 87, 127-137. doi:10.1016/j.autcon.2017.10.020

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor Rebecca Yang

2nd Supervisor: Chris Bellman

**FOR Code:**120202

**Project title:** Distributed Renewable Energy Technology in Smart Building and Urban Precincts

**Project Description: (250 words)** This research aims to enhance the adoption of distributed renewable energy in buildings and urban precincts smartly through technology improvement, building environment simulation, energy demand modelling, scenario-based economic assessment, optimisation, and socio-technical context analysis.

**Relevant literature (max 4):**

Wijeratne, W.P.U., Yang, R.J., Too, E. and Wakefield, R., 2019. Design and development of distributed solar PV systems: Do the current tools work?. Sustainable cities and society. vol. 45, pp. 553-578

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor Rebecca Yang

2nd Supervisor: Ron Wakefield

**FOR Code:** 120202

**Project title:** Stakeholder collaborations in construction supply chain, governance, contract or/ and digital technology application processes

**Project Description: (250 words)** This research aims to enhance stakeholder management and engagement practices in complex construction project environment, including procurement, supply chain, governance, contract, and digital technology application processes.

**Relevant literature (max 4):**

Yang, R.J. and Shen, G.Q.P. (2015) “Framework for Stakeholder Management in Construction Projects”. Journal of Management in Engineering, 31(4), 04014064-1-14.

Mok, K. Y., Shen, G. Q. and Yang, R. J. (2015) “Stakeholder management studies in mega construction projects: A review and future directions”, International Journal of Project Management, 33(2), 446-457.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor Rebecca Yang

2nd Supervisor: Ron Wakefield

**FOR Code:**120201

**Project title:** The examination of impact of debt and leverage on Australian and Asian Real Estate Investment Trust (REIT) markets

**Project Description: (250 words)** The real estate investment trusts (REITs) market in Asia is valued at over A$200 billion and now provides an attractive diversification option for Australian institutions seeking high returns and exposure to growing Asian markets. According to the Asia Pacific Real Estate Association (APREA 2016), 70% of global managers and 60% of investors are expected to increase their allocations to Asia Pacific REITs in the next decade. Asian REITs returns have averaged around 15% in the last fifteen years, putting them ahead of the more established Australian and United States counterparts (Smith 2016). In particular, Asian markets like the Japanese REITs have grown three times in size to A$147 billion since 2012 supported by Bank of Japan's negative interest rate policy. This can be compared to the Australian REITs (A-REITs) market capitalization of A$128 billion. Historically portfolios including both Australian and Asian REIT indices have provided higher returns with lower volatility than investing in A-REITs on its own (Smith 2016). This project has wider industry significance. Quantifying the Australian and Asian REIT sector’s performance patterns over different market conditions would broaden Australian fund managers’ understanding in financial asset pricing and implications of any future movements in interest rates in the Asian region. In addition, the proposed comparative analysis of Asian REITs and A-REITs markets would provide investors ability to understand the key structural and performance differences. This would be beneficial for Australian fund managers seeking diversification options in the significantly growing Asian real estate investment market.

**Relevant literature (max 4):**

Reddy, W. and Wong, W., 2018, 'Australian interest rate movements and A-REITs performance: an analysis by industry sector', in Pacific Rim Property Research Journal, Vol. 24(1), pp. 85-103

Wong W. and Reddy W., 2018, 'Evaluation of Australian REIT Performance and the Impact of Interest Rates and Leverage', in International Real Estate Review, Asian Real Estate Society, Vol. 21(1), pp. 41-70

Wong W., 2018, The equity and fixed income characteristics of Asian REITs: Evidence from Japan, Singapore and Hong Kong', in RELAND: International Journal of Real Estate & Land Planning, Vol. 1, pp. 155-177

Reddy, W. and Wong, W. 2017, 'Impact of Interest Rate Movements on A-REITs Performance Before, During And After The Global Financial Crises', in 23rd Pacific Rim Real Estate Society Annual Conference 2017, Pacific Rim Real Estate Society, Sydney, Australia, pp. 1-10

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Wejen Reddy

2nd Supervisor: - Dr Woon Weng Wong

**FOR Code:** 120201

**Project title:** Health and safety of young construction workers

**Project Description: (250 words)** The male-dominated, blue-collar construction industry is characterised by dangerous work environment, long work hours, high work stress, and low job security. Young construction workers in Australia experience much higher injury rate than other age groups, are about 2.4 times more likely to commit suicide than other youth. We seek to reduce that number by understanding the health and safety issues experienced by young construction workers, and engaging multiple stakeholders to collaboratively develop a “Support Net” specifying preventive and support strategies to protect young construction workers’ health and safety.

**Relevant literature (max 4):**

Breslin, F. C., Polzer, J., MacEachen, E., Morrongiello, B., & Shannon, H. (2007). Workplace injury or “part of the job”?: Towards a gendered understanding of injuries and complaints among young workers. Social Science & Medicine, 64(4), 782-793.

Chin, P., DeLuca, C., Poth, C., Chadwick, I., Hutchinson, N., & Munby, H. (2010). Enabling youth to advocate for workplace safety. Safety Science, 48(5), 570-579.

Holte, K. A., Kjestveit, K., & Lipscomb, H. J. (2015). Company size and differences in injury prevalence among apprentices in building and construction in Norway. Safety Science, 71, 205-212.

Nielsen, M. L. (2012). Adapting 'The Normal'-Examining Relations between Youth, Risk and Accidents at Work. Nordic journal of working life studies, 2(2), 71-85.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Rita Zhang

2nd Supervisor – Dr Helen Lingard

3rd Supervisor – Dr James Harley

**FOR Code:** 120201

**Project title:** Evaluating the effectiveness of virtual reality (VR), augmented reality (AR) and mixed reality (MR) in construction safety training

**Project Description: (250 words)** The construction industry is a hazardous industry and characterised by high number of workplace injuries and fatalities. Existing construction accident causation models have identified that risk factors such as a lack of trade knowledge and skills, inadequate understanding of risk controls, and low level of safety awareness may contribute to workplace accidents. This highlights the importance of training and upskilling in assuring that workers competently perform work tasks by adhering to health and safety requirements. The main and conventional way of developing safety knowledge and compliant skills is to attend classroom-based training on safety regulations and related codes of practice. However, such a training approach has long been questioned about its effectiveness due to low level of engagement and innovation and lack of opportunities to practice in a real site scenario. Emerging visualisation technologies such as virtual reality (VR), augmented reality (AR) and mixed-reality (MR) seem promising to overcome the limitations of traditional training approach. Existing research shows that researchers have made considerable efforts in developing a variety of VR and AR technologies or systems in enhancing safety training effectiveness. This research aims to evaluate the effectiveness of those technologies in construction safety training.

**Relevant literature (max 4):**

Burke, MJ, Sarpy, SA, Smith-Crowe, K, Chan-Serafin, S, Salvador, RO & Islam, G 2006, 'Relative effectiveness of worker safety and health training methods', American Journal of Public Health, vol. 96, no. 2, pp. 315-324.

Sacks, R, Perlman, A & Barak, R 2013, 'Construction safety training using immersive virtual reality', Construction Management and Economics, vol., pp. 1-13.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Rita Zhang

2nd Supervisor – Dr Lei Hou

**FOR Code:** 120201

**Project title:** Using Virtual Reality (VR) in enhancing design professionals’ construction health and safety knowledge and safe design capabilities

**Project Description: (250 words)** Work health and safety (WHS) risks on construction sites can be traced back to decisions made upstream from the construction stage. Research evidence shows that some risks that contribute to accidents and injuries can be reduced or eliminated through applying the principle of design for safety. However, design professionals may have little knowledge of construction processes and construction safety due to their formal education and limited site experience, making it very difficult for them to fully appreciate the safety implication of their decisions. This research aims to explore how virtual reality (VR) can be used to enhance design professionals’ construction health and safety knowledge and safe design capabilities

**Relevant literature (max 4):**

Sacks, R, Whyte, J, Swissa, D, Raviv, G, Zhou, W & Shapira, A 2015, 'Safety by design: dialogues between designers and builders using virtual reality', Construction Management and Economics, vol. 33, no. 1, pp. 55-72.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Dr Rita Zhang

2nd Supervisor – Dr Payam Pirzadeh

**FOR Code:** 120201

**Project title:** Compulsory acquisition, valuation and compensation in rural mining communities: An assessment of the procedures for expropriation

**Project Description: (250 words)**

**Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Prof Chris Eves

2nd Supervisor – Dr Dulani Halvitigala

3rd Supervisor – Dr Hyemi Hwang

**FOR Code**: 120201

**Project title:** Development of a novel 3p (people, profit and property) model to optimise value of advanced technologies used in facilities management in commercial buildings

**Project Description: (250 words)** The aim of this research is to develop a novel 3P (people, profit and property) model to optimise value of advanced technologies used in facilities management in commercial buildings. Research objectives are:

1. To identify various advanced technologies used in FM in the commercial property sector.
2. To develop a conceptual model to optimise FM technology and matrix of determinants for each value addition contributor under 3P categories (People, Profit and Property).
3. To examine the relationship between different 3P determinants and various advanced technologies used in FM.
4. To propose and develop a novel 3P (People, Profit and Property) model to optimise added value of FM advanced technologies used in commercial buildings.

**Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Prof Chris Eves

2nd Supervisor – Dr Dulani Halvitigala

**FOR Code:** 120201

**Project title:** Value of public institutions' property and maintenance system assessment: A case study in Ghana.

**Project Description: (250 words)** The aim of this study is to assess the maintenance system situations of public institutions’ properties as well as the value of such properties in the Ghanaian public sector. The research objectives are:

1. To investigate whether or not public institutions in Ghana have defined maintenance systems for the institutions’ properties, the appropriateness of such systems if any, and how they are carried out.
2. To assess public property users’ attitudes towards the maintenance of public properties and its impacts on property lifespan, functionality and value.
3. To develop a comparable financial assessment of the cost of replacing abandoned properties due to lack of or improper maintenances against the cost of maintenance of such properties.
4. To identify ways by which maintenance culture can be boosted in public institutions on the part of both property managers and property users in Ghana.

**Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Prof Chris Eves

2nd Supervisor – Dr Dulani Halvitigala

**FOR Code:** 120201

**Project title:** Implications of digital technology and big data on the future of the valuation profession

**Project Description: (250 words)** The valuation profession is facing major challenges as more processes are digitised and automated, and the role of the valuer becomes more of data handling and information processing than of economic analysis. The aim of this research is to explore the implications of digital technology and big data on the future of the property valuation profession and how the profession could be changed in order to maintain and increase its relevance and currency.

**Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Prof Chris Eves

2nd Supervisor – Dr Dulani Halvitigala

**FOR Code:** 120201

**Project title:** New ways of working and their implications for office designs, property management and investment returns

**Project Description: (250 words)** The aim of this project is to examine key changes occurring within office occupier businesses and their implications on the design of workplaces, corporate real estate managers who manage them, and the investment returns of office property investors.

**Relevant literature (max 4):**

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Prof Chris Eves

2nd Supervisor – Dr Dulani Halvitigala

**FOR Code:** 120201

**Project title:** Investigating front end planning for government projects in Australia

**Project description:** **(250 words)** Governments are a major source of investment for infrastructure. The effectiveness of capital investment depends heavily on how projects are selected and developed for execution. This research explores the front end planning (early planning) phase of government projects in Australia to identify critical elements in the decision making process. It will develop a model to facilitate making decision. It can serve as the basis for subsequent benchmarking efforts to improve investment effectiveness in the government sector.

**Relevant literature (max 4):**

· Morris, PWG 2009, 'Implementing Strategy Through Project Management: The Importance of Managing the Project Front-end' in Making Essential Choices with Scant Information – Front-end Decision Making in Major Projects, eds Williams, T, Samset, K & Sunnevag, K, Palgrave Macmillan, Hampshire, UK, pp. 39-67.

· Gibson Jr., GE, Wang, Y-R, Cho, C-S & Pappas, MP 2006, ‘What Is Preproject Planning, Anyway?’, Journal of Management in Engineering, , vol. 22, no. 1, pp. 35-42.

· Williams, T & Samset, K 2010, ‘Issues in Front-End Decision Making on Projects’, Project Management Journal, vol. 41, no. 2, pp. 38-49.

· Flyvbjerg, B 2014, ‘What You Should Know About Megaprojects and Why: An Overview’, Project Management Journal, vol. 45, no. 2, pp. 6-19.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor: Dr. Tiendung Le
2nd Supervisor: A/Prof. Dr. Tayyab Maqsood
3rd Supervisor: Dr. Eric Too

**FOR Code:** 120201

**Project title:** Best practices in project delivery of international development projects

**Project description: (250 words)** International development projects is one of the main mechanisms for international financial institutions to assist developing countries in building human and physical infrastructures for development. In these projects, project delivery strategies play a vital role for success. This research explores current best practices in the delivery of these projects from the perspectives of multiple parties using case studies as the principal research strategy. It will develop a framework to assist in selecting and developing delivery strategies for international development projects.

**Relevant literature (max 4):**

· Golini, Ruggero and Landoni, Paolo (2013). International Development Projects: Peculiarities and Managerial Approaches. Project Management Institute, Inc., Pennsylvania, USA

· Khang, D. B., & Moe, T. L. (2008). Success criteria and factors for international development projects: A life-cycle-based framework. Project Management Journal, 39(1), 72-84.

· Landoni, P., & Corti, B. (2011). The management of international development projects: Moving toward a standard approach or differentiation? Project Management Journal, 42(3), 45-61.

· Muriithi, N., & Crawford, L. (2003). Approaches to project management in Africa: Implications for international development projects. International Journal of Project Management, 21(5), 309-319.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor: Dr. Tiendung Le
2nd Supervisor: A/Prof. Dr. Bambang Trigunarsyah
3rd Supervisor: Dr. Eric Too

**FOR Code:** 120201

**Project title:** Social and Affordable housing in Australia

**Project Description: (250 words)** Melbourne and Sydney are among the least affordable cities in the world when it comes to housing. A large majority of low income households in the private rental sector are experiencing housing stress –meaning they spend more than 30% of their income on housing. This is occurring at a time of historical under-investment in social and affordable housing. Housing price inflation has also contributed to declining home ownership rates, particularly among first home buyers. There is broad agreement that that low-income households require assistance, but no coherent, sustained policy strategy to address this need. Declining housing affordability is of intense public interest, but its causes and the preferred solutions are highly contested.

To increase access to, and quality of social and affordable housing, many obstacles are to be overcome. A few examples:

* Land values have been inflated by competition for centrally located sites and permissive planning schemes;
* Most public funding goes to existing home owners;
* Existing residents protest the development of housing in their neighbourhood;
* The taxation system encourages property speculation;
* And multi-residential construction costs are high.

We invite HDR proposals that investigate one or more of the following topics:

* Underlying causes of the lack of affordable housing (planning processes; financial, economic, policy and political issues);
* Underlying causes of inadequate housing supply for low to middle income households (financial, economic, policy and political issues);
* Effectiveness of measures to improve the quality and cost of housing (design, environmental sustainability, materials, construction processes;
* Innovative approaches to solving Australia’s affordable housing problem.

**Relevant literature (max 4):**

Freeman, L., & Schuetz, J. (2017). Producing affordable housing in rising markets: What works? Cityscape, 19(1), 217-236.

Hulse, K., Reynolds, M., Stone, W., & Yates, J. (2015). Supply shortages and affordability outcomes in the private rental sector: short and longer-term trends. AHURI Final Report. Melbourne: Australian Housing and Research Institute.

Moore, T., Strengers, Y., & Maller, C. (2016). Utilising mixed methods research to inform low-carbon social housing performance policy. Urban Policy and research, 34(3), 240-255.

Yates, J. (2016). Why does Australia have an affordable housing problem and what can be done about it? Australian Economic Review, 49(3), 328-339.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor – Associate Professor Karien Dekker

2nd Supervisor – Dr. Judith Callanan

3rd Supervisor –  Dr. Andrea Sharam

4th Supervisor – Dr. Tom Alves

**Project:** Investigating physical and psychological effects of long exposure to whole-body vibration

**Project Description: (250 words)** Long exposure to whole-body vibration (WBV) on off-road trucks drivers poses a risk to workers’ health, their life quality, their safety and the safety of others nearby. WBV-related illnesses including low-back pain (LBP) also represent an economical burden, specially to the mining and construction industry due to its inherent needs of occupational drivers. Understanding the mechanics and physiological processes involved in these illnesses can guide the development of technologies to absorb vibration, reducing worker’s risk and improving their comfort which, in turn, can have profound effects to workers health. This project aims: to develop new tools and methods using prototyping to measure and monitor WBV doses on off-road truck drivers; and to provide insights on the effects of WBV on their psychosocial health and well-being. This will shed light into physical and psychological impacts to the human body and the execution of work-related tasks. The contribution will be in the knowledge acquired to develop new technologies capable of better absorbing vibration and preventing WBV-related illnesses.

**Relevant literature (max 4):**

Wikström, Bengt-Olov, Anders Kjellberg, and Ulf Landström. "Health effects of long-term occupational exposure to whole-body vibration: a review." International journal of industrial ergonomics 14.4 (1994): 273-292.

Bortolini, Alexander, Letícia Fleck Fadel Miguel, and Tiago Becker. "Measurement and evaluation of whole‐body vibration exposure in drivers of cargo vehicle compositions." Human Factors and Ergonomics in Manufacturing & Service Industries.

M. BovenziC. T. J. Hulshof. “An updated review of epidemiologic studies on the relationship between exposure to whole-body vibration and low back pain (1986–1997)” International Archives of Occupational and Environmental Health September 1999, Volume 72, Issue 6, pp 351–365.

**Supervisory team:**

1st Supervisor: Susanne Tepe

2nd Supervisor: David Oswald

**FOR Code:** 120201

**Project title:** Intelligent Transportation Systems (ITS) and sustainability: enhancing urban rail network operations

**Project Description: (250 words)**Transport Systems are essential to the world economy. However, they use substantial energy resources and contribute to greenhouse gas emissions. Any algorithm which could contribute to the reduction of resource use and greenhouse gas would be of benefit to the environment. This study proposes to concentrate on urban rail networks. With new networks, an approach is needed to assist the measurement of its contribution to sustainability. Assessment of the sustainability of a network could be made by judging the quality of its compliance with the triple bottom line of social, environmental, and financial factors. Such processes have been put forward in the past, but few have been directed to urban rail networks. There is a requirement to determine the most important elements to consider in assessing compliance that will satisfy the demands of the users, operators and owners of the new facility. There is a challenge to identify the elements and their ranking for any project.

Once the important elements have been determined, the network needs to be operated in such a manner that supports continuous development to improve its sustainability. The use of digital technology including ITS, has the ability to support the improvement. One of the issues is the identification of which factors need attention and how new technologies could assist. The objective of the PhD project is to find an algorithm that will provide guidance in establishing the most significant elements that effect the network sustainability and the use of technology i.e. ITS, to monitor and improve performance. Accordingly, the main focus of the study will be on the sustainability of urban rail networks using ITS.

**Relevant literature (max 4):**Since there are a huge number of relevant literature available, a current/relevant list is yet to be finalized.

**Supervisory team (min 2, max 4 supervisors):**

1st Supervisor: Koorosh Gharehbaghi

2nd Supervisor: Kerry McManus

3rd Supervisor: Kath Robson