

# Centre for Comparative Construction Research

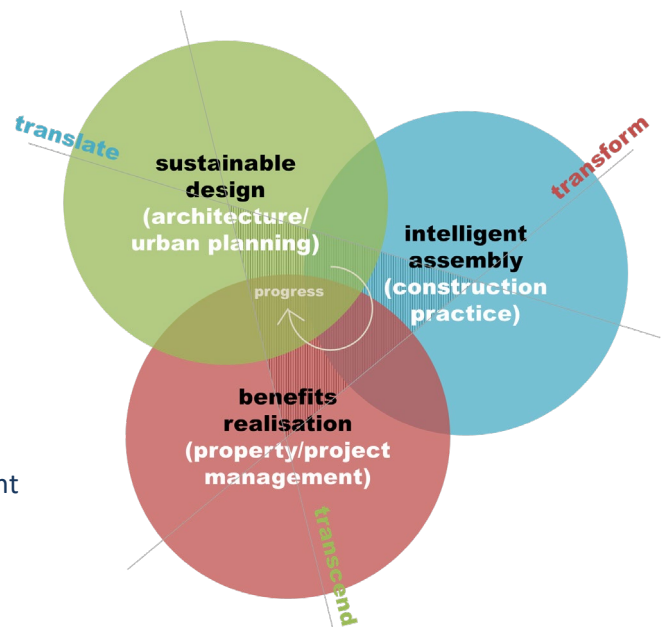
## Annual Report: 2021

### Research Mission and Vision

The Centre for Comparative Construction Research (CCCR) is focused on creating new insight into the performance of the built environment through an interdisciplinary evidence-based process of:

- > **translating** sustainable design into superior urban infrastructure,
- > **transforming** intelligent assembly into safer and more productive construction practices, and
- > **transcending** benefits realisation into successful financial, social, ethical and environmental outcomes.

Our vision is to be a respected and independent source of research concerning the contribution that the built environment makes to our collective prosperity. Our impact can be assessed in terms of collaborative industry links and funding support. Bond University is, unsurprisingly, a signatory to the United Nations Sustainable Development Goals (SDG1-17).



### Capabilities

Our Centre comprises three research incubators that explore the *Built Environment and Design* Field of Research (FoR) according to the above niche areas:

- > **TAED** – sustainable design (architectural/urban planning focus, led by Associate Professor Daniela Ottmann). Other members are Professor Adrian Carter, Associate Professor Marja Sarvimaki, Associate Professor Danny O’Hare, Associate Professor Bhisna Bajracharya and Assistant Professor Vanessa Menadue [6].
- > **OPiC** – intelligent assembly (construction practice focus, led by Associate Professor Jasper Mbachu). Other members are Professor Martin Skitmore, Professor Stephen Rowlinson, Associate Professor James Birt, Associate Professor Dane Miller, Assistant Professor Danielle Lester, Assistant Professor Nima Talebian, Dr Darmicka Rajendra, Dr Bode Ogunmakinde and Dr Rosemarie Rusch [10].
- > **PMI\_LAB** – benefits realisation (property/project management focus, led by Professor Craig Langston). Other members are Professor Alan Patching, Associate Professor Greg Skulmoski, Assistant Professor Alexander Lang, Assistant Professor Amir Ghanbaripour, Assistant Professor Matthew Moorhead and Dr Ashkan Memari [7].

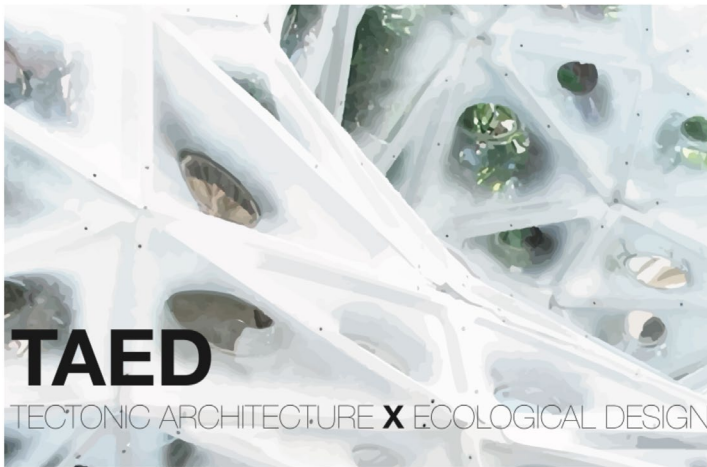
The strength of CCCR lies in its interdisciplinary collaboration combining, but not limited to, architecture, construction and urban planning expertise. Buildings and other urban infrastructure have become complicated and expensive assets that reflect a mix of financial, social, ethical and environmental characteristics. Our research is cognisant of expected trends in future practice – climate change, automation and globalisation. The nexus of our research interests is achieving progressive built environment infrastructure.

### Membership

CCCR has 22 researchers as at the end of 2021, including the appointment of Professor Martin Skitmore as one of four Bond University Professorial Fellows.

## Highlights for 2021

Our main highlights for 2021 are described in the context of the research incubators within CCCR that helped create them.



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### New Book Release

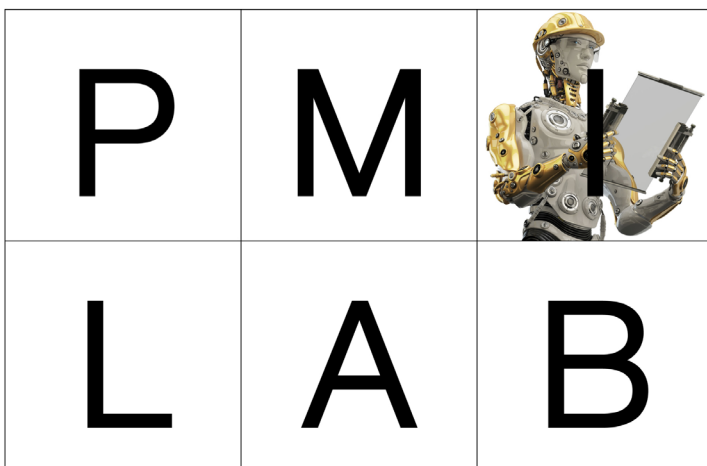
Professor Adrian Carter and Associate Professor Marja Sarvimaki published an international research book with Routledge called *Jørn Utzon and Transcultural Essentialism*. This book introduces and defines the burgeoning concepts of transculturalism and essentialism and how they relate to one another, as articulated with reference to the work of Jørn Utzon. It introduces critical contemporary perspectives of the design thinking and career of this renowned Danish architect, internationally recognised for his competition-winning, iconic design for the Sydney Opera House – an outstanding exemplar of transcultural essentialism in architecture. This book forms part of Routledge’s *Research in Architecture* series.



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### Dean’s Award Research Grant

Professor Craig Langston led a team of early career researchers, comprising Vanessa Menadue, Danielle Lester, Matthew Moorhead and Rosemarie Rusch, to win the *Dean’s Award Research Grant* in 2021 for the assessment of latent defects using LiDAR technology: a proof-of-concept case study of Bond’s Building 3 extension (\$25,000). The aim of this research was to test the extent of differences between as-planned and as-built design by comparing the design team’s final BIM model with a scan-to-BIM model created after handover. This work has led to three new PhD candidatures as well as ongoing collaboration with ADCO Constructions and Bond Facilities Management. The project leveraged 2020’s successful infrastructure funding bid for laser scanning equipment.



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### Vice Chancellor’s Quality Award

Professor Craig Langston, representing the Faculty of Society & Design, won the *Vice Chancellor’s Quality Award (Research Supervision)* in 2021. At the time of his nomination, Professor Langston had two recent HDR completions, one under examination, three continuing and five new PhD candidates commencing in Semester 213. He also supervises every project management postgraduate research project in SSUD74-200 (20 cp). Since taking on this role in 2015, Professor Langston had supervised 178 students (av. 8.5 per semester) with a success completion rate of 95%. Muath Abu Arqoub, Metanshu Pawan, Victor Ovwah, Ranka Novak Camozzi, Weiwei Zhang and Charles Crowley all followed this pathway as part of their current HDR journey.

## Publications

The following 2021 outputs published by CCCR researchers (shown as **bold** text) were downloaded from Bond's PURE database on 19/02/2022:

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A cartography of delay risks in the Australian construction industry: impact, correlations and timing, Derakhshanfar, H., Ochoa, J. J., Kirytopoulos, K., Mayer, W. & **Langston**, C. A., 16 Jul 2021, In: Engineering, Construction and Architectural Management. 28, 7, p. 1952-1978 27 p. [Q1]

BIM Adoption in the Cambodian Construction Industry: Key Drivers and Barriers, Durdyev, S., **Mbachu**, J. I. C., Turnell, D., Zhao, L. & Hosseini, M. R., 1 Apr 2021, In: ISPRS International Journal of Geo-Information. 10, 4, 15 p., 215. [Q1]

Comparison of Single and Multiuser Immersive Mobile Virtual Reality Usability in Construction Education, **Birt**, J. R. & Vasilevski, N., 28 Mar 2021, In: Educational Technology and Society. 24, 2, p. 93-106 14 p. [Q1]

Contributions of the circular economy to the UN sustainable development goals through sustainable construction, **Ogunmakinde**, O. E., Egbelakin, T. & Sher, W., Mar 2022, In: Resources, Conservation and Recycling. 178, 106023. [Q1]

DfMA: Towards an integrated strategy for a more productive and sustainable construction industry in Australia, **Langston**, C. A. & Zhang, W., 17 Aug 2021, In: Sustainability. 13, 16, 21 p., 9219. [Q1]

Dynamic quality monitoring system to assess the quality of asphalt concrete pavement, Ma, Z., Zhang, J., Philbin, S. P., Li, H., Yang, J., Feng, Y., Ballesteros-Pérez, P. & **Skitmore**, M., Dec 2021, In: Buildings. 11, 12, 577. [Q1]

Evaluation of transportation infrastructure: A case study of Gold Coast Light Rail Stage 1&2, **Langston**, C. A. & Crowley, C., 20 Dec 2021, In: Construction Economics and Building. 21, 4, p. 1-20 20 p. [Q2]

From hard bed to luxury home: impacts of reusing HM Prison Pentridge on property values, Shehata, W., Abu Arqoub, M., **Langston**, C. A., Elkheshien, R. & **Sarvimaki**, M., Jun 2021, In: Journal of Housing and the Built Environment. 36, 2, p. 627-643 17 p. [Q1]

From Hard Bed to Luxury Home: The Metamorphosis of HM Prison Pentridge, Shehata, W., **Sarvimaki**, M. & **Langston**, C. A., 2021, In: Time and Mind: the journal of archaeology, consciousness and culture. 14, 1, p. 135-167 33 p. [Q2]

Investigating causal relationships between project complexities and project cost: An empirical study from New Zealand, Zhao, L., **Mbachu**, J. I. C., Liu, Z. & Wang, B., 20 Aug 2021, In: Advances in Civil Engineering. 2021, 17 p., 6624647. [Q3]

Investigating the role of emissions trading policy to reduce emissions and improve the efficiency of industrial green innovation, Zhang, J., Sun, X., Li, H., Philbin, S. P., Ballesteros-Pérez, P., **Skitmore**, M. & Lin, H., 9 Oct 2021, (E-pub ahead of print) In: Journal of Management Science and Engineering. [unranked]

Making the Gold Coast a Smart City - An Analysis, Khanjanasthiti, I., Sundarraj Chandrasekar, K. & **Bajracharya**, B., 24 Sep 2021, In: Sustainability. 13, 19, 624. [Q1]

Managing Fast-Track Construction Project in Qatar: Challenges and Opportunities, Egbelakin, T., **Ogunmakinde**, O. E., Teshich, B. & Omotayo, T., 11 Dec 2021, In: Buildings. 11, 12, 640. [Q1]

Risk management processes used in determining project feasibility in the property development process early stages by Australia/New Zealand property developers, **Moorhead**, M., Armitage, L. & **Skitmore**, M., 14 Dec 2021, (E-pub ahead of print) In: Journal of Property Investment and Finance. [Q2]

The adaptive reuse potential of underused heritage gaols in Australia: a case study of Richmond Gaol, Tasmania, Shehata, W., **Langston**, C. A., **Sarvimaki**, S. & Novak Camozzi, R., 26 Mar 2021, (E-pub ahead of print) In: Journal of Cultural Heritage Management and Sustainable Development. [Q1]

Career Choice and Professional Preference of Architecture Students in Nigeria, Olanrewaju, O. S. & **Ogunmakinde, O. E.**, 28 Oct 2021, Proceedings of the 44th AUBEA Conference: Construction Education - Live the Future. Kamardeen, I., Mills, A., Mahmood, N., Thaheem, J., Karunasena, G., Sadick, A-M., Hasan, A., Holmes, J., Stenhouse, T., Uebergang, A. & Abel, L. (eds.). Geelong: Deakin University, p. 492-501 10 p.

Challenges of Green Building In Nigeria: Stakeholders' Perspectives, Oladoja, O. & **Ogunmakinde, O. E.**, 28 Oct 2021, Proceedings of the 44th AUBEA Conference: Construction Education - Live the Future. Kamardeen, I., Mills, A., Mahmood, N., Thaheem, J., Karunasena, G., Sadick, A-M., Hasan, A., Holmes, J., Stenhouse, T., Uebergang, A. & Abel, L. (eds.). Geelong: Deakin University, p. 481-491 10 p.

Circular cities careers: Sustainable careers enabling sustainable cities, **Ottmann, D.** & **Skulmoski, G. J.**, 2 Jul 2021, AMPS Proceedings Series 21. Rapid Cities – Responsive Architectures. Qamhaieh, A. (ed.). Dubai: Architecture Media Politics Society (AMPS), p. 90-101

A decision support system for front-end planning of infrastructure projects: a case study of the Gold Coast Light Rail Stages 1 & 2, Pawan, M., **Langston, C.** & **Skulmoski, G.** 10-11 Jun 2021, IPMA Research Conference, Online.

Jørn Utzon and Transcultural Essentialism, **Carter, A.** & **Sarvimaki, S.**, 2021, London: Routledge. 268 p.

Sustainable Project-oriented Careers: A Conceptual Model, **Skulmoski, G. J.**, **Langston, C. A.**, **Patching, A.** & **Ghanbaripour, A.**, 2021, Research on Project, Programme and Portfolio Management: Integrating Sustainability into Project Management. Cuevas, R., Bodea, C-N. & Torres-Lima, P. (eds.). Cham: Springer, p. 55-80 26 p. (Lecture Notes in Management and Industrial Engineering).

Sydney Opera House: The Poiesis of Tectonic Architecture in the Age of Digital Augmentation, **Carter, A.** & Botin, L., 2021, Postphenomenology and Architecture: Human Technology Relations in the Built Environment. Botin, L. & Berling Hyams, I. (eds.). Lanham: Lexington Books, p. 147-166 20 p. (Postphenomenology and the Philosophy of Technology).