

THE Fleetwood Challenge Cup

in association with



In 2021 the construction sector continues to face significant challenges in Australia and across the globe: housing shortages, demand in the social infrastructure space, lagging productivity, tight labour markets, ageing populations and reduced numbers of school leavers choosing to pursue construction sector careers. Added to these headwind forces are economic, environmental and social pressures exacerbated by the climate crisis and global impacts of the COVID-19 pandemic.

Offsite manufacturing and prefabrication the means of the modern methods of construction (MMC), is being leveraged to overcome these challenges, delivering resilience in the response to resource scarcity, sustainability and the climate emergency.

Fleetwood Building Solutions and prefabAUS are proud to continue to play an industry leadership role in championing the development of Architects, Engineers, Construction (AEC) and related professionals of tomorrow. The Challenge Cup fosters links between industry and academia, vital in preparing for, and investing in the future of the construction sector.

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ELIGIBILITY FOR ENTRY

Each year, select Universities are invited to participate in The Challenge Cup. Interested students from AEC design streams at participating institutions are asked to **form collaborative, cross-disciplinary teams** of between four to six students. Teams must nominate a team captain who will be responsible for submitting the team registration and final submission of their Project on behalf of the entire team. All official competition information will be sent directly to Team Captains with copies provided to University Coordinators.

THE DESIGN CHALLENGE

Through an inter-University representative steering committee, the competition will articulate a contemporary design challenge, with competition submission requirements to be assessed by an expert judging panel of cross-disciplinary AEC industry professionals.

PROJECT CONTEXT

Never before have the pressures of long-term performance and return on investment been so challenging to navigate for asset managers and building owners.

While scarcity continues to drive upward pressure on affordable housing, the same cannot be said for large scale commercial buildings who in the face of COVID-19 are undergoing mass vacancies never before experienced. Building owners are now seeking solutions through adaptive re-use and re-development to revive their asset performance for the long term.

The quality assurance of offsite manufactured solutions in controlled and safe factory environments is ideally placed to deliver this longer-term performance value proposition. The 2021 Cup seeks to explore this phenomenon. The project encompasses adaptive re-use and extension of a brown-field site with an

existing structure to be retained and incorporated into a mixed-use development comprising retail tenancy space, student accommodation and build-to-rent residential accommodation utilising offsite construction and prefabrication solutions.

Design solutions for a multi-level unit typology shall comprise a block plan providing four two-bedroom units and four one-bedroom units for the build-to-rent programme, and six one-bedroom student accommodation units. The programme also calls for a retail tenancy programme comprising a “click and collect” shopfront, a convenience store or small scale grocer / retail tenancy and a third larger tenancy to suit a commercial activity dependent upon the gathering of a medium sized group of 10 to 15 people, this may be for an office, café, boutique restaurant or other use.

With an emphasis on good design, the project will use construction as a point of reference, demonstrating a novel approach through design for manufacture, assembly and disassembly principles.

THE SITE

The project will be sited in an inner-city urban area with the following characteristics;

- ▶ A local brown-field urban site to be considerably retained intact with a single storey warehouse of significant architectural merit
- ▶ The site will be approximately 1000m² in total,
- ▶ There is only one access point to the site
- ▶ No on site car parking is required. The site has dispensation due to its urban location and proximity to public transport
- ▶ All the required services for electricity, gas, telecommunications, water, stormwater and sewer are located underground, outside the site's primary street frontage and boundary. Incoming service connections can be made at any single point along the primary street frontage and site boundary.

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OFFSITE PARAMETERS

- ▶ Manufacturing facility will be within 50km to 250km of the building destination site
- ▶ Maximum load height for transport and delivery is 3.9m

PROJECT BRIEF

Demonstrate how offsite manufacturing and prefabrication modern methods of construction can be harnessed to effect innovative and novel design solutions for the adaptive re-use and extensions to, the existing built environment within the Australian market.

Leveraging prefabrication and modular offsite construction technologies, develop an original project design that responds to this question through the exploration of Industry 4.0 and emerging strategies in the construction sector, embracing;

- ▶ Advanced design that delivers community and client value
- ▶ The potential of new technologies
- ▶ Design for Manufacture and Assembly (DfMA) and Disassembly processes and smart engagement with changing construction sites
- ▶ New construction systems and smart materials
- ▶ high building performance across the whole building lifecycle
- ▶ Advanced & efficient manufacture of building components, digitisation, robotics, LEAN manufacturing and operational efficiency
- ▶ Processes and professions in transdisciplinary design approaches
- ▶ Innovative business models and development and financing models e.g. circular economy
- ▶ Resilience and sustainability responses to the climate emergency

The project must be a low-rise accommodation typology of between two to four storey construction.

Emulating real world challenges, the **cross disciplinary project team** will need to demonstrate the design effectively integrates building science principles, construction sector best practice, and adherence to the principles of national building codes and regulations.

SUBMISSION DELIVERABLES

Explain the inspiration for your design and how it meets the challenges of the Project Brief. The submission must include sufficient information to fully explain your design. Submissions will be limited to the following requirements outlined below and are to be submitted as prescribed by the advertised deadline. Unless otherwise stated, all requirements must be submitted in PDF file format:

- 1)** A 200 word abstract summarising key points of the innovative design solution features for use on The Challenge Cup website.
- 2)** A detailed two page (500 word) Executive Summary detailing how the project's novel design response to meet the challenges of the project brief, suitable for general public explanation and publication.
- 3)** A 10-page Concept Design Validation report and supporting calculation appendices capped at 10-pages. The report must address key considerations of the Concept design and demonstrate validation of how these meet the project brief requirements, through the inclusion in the appendices of one the following quantitative project assessments:
 - ▶ engineering analysis and supporting calculations
 - ▶ construction programme and budget evaluations
 - ▶ building statutory and regulatory compliance
 - ▶ energy assessment and building performance calculations.
- 4)** A minimum of one to a maximum of three, A1 size posters (portrait orientation PDF), suitable for printing and public display summarising the submission and containing:
 - ▶ project drawings
 - ▶ details and connections
 - ▶ project programme.
- 5)** A summary PowerPoint presentation presenting the design solution, limited to 10 slides.

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6) A recorded video project presentation pitching the design solution, explaining how the solution meets the challenges of the brief, limited to 10 slides (as above) and a maximum of five minutes duration. The presentation needs to be anonymous without reference to the University, team members or names. (MP4)

7) Three high resolution images/artist impressions/renders of the final design solution - minimum 2MB each. (JPEG or PNG 300dpi recommended)

SUBMISSION PROTOCOLS

- ▶ Entries must comply with the APA 6th Guidelines for referencing and citations.
- ▶ Entries must comply in general accordance with Academic policy guidelines.
- ▶ Student Intellectual Property will be treated in general accordance with each University's existing policy guidelines.

JUDGING

Judging panel will consist of AEC industry experts from a cross-disciplinary background.

WHERE CAN I GET MORE INFORMATION?

Website: www.fleetwood.com.au/the-fleetwood-challenge-cup/

Email: challengecup@fleetwood.com.au

CASH PRIZES ON OFFER

First place	\$7,000
Second place	\$3,500
Third prize	\$2,500
Fleetwood industry award	\$2,000

Winning, second and third placed teams are scheduled to be announced at the prefabAUS 2021 Conference. In addition, the Fleetwood industry award will also be presented to a team who demonstrates best use of offsite manufacturing and cross-disciplinary integration of architectural, engineering and construction-related disciplines. Competition entries and highlights will be showcased on The Challenge Cup website after the close of the event.

Notes:

- *Maximum file upload for individual files will be 300MB**
- *All competition submission material must be clearly legible**
- *All submissions must have no distinguishing marks or attributes that will identify the teams in the blind judging process, including names or authors/ team members. Any entries found not to comply will be disqualified from the competition**

Key Dates:



• Team registrations open



• Team registrations closes



• Final submissions due 4pm AEST



• Finalists announced



- prefabAUS conference and winners announced
- **Proposed live event and announcement of competition winners (Final event date to be confirmed)**

Curtin University

THE UNIVERSITY OF MELBOURNE

MONASH University

QUT Queensland University of Technology

THE UNIVERSITY OF QUEENSLAND AUSTRALIA

THE UNIVERSITY OF WESTERN AUSTRALIA

WESTERN SYDNEY UNIVERSITY

UNIVERSITY OF TASMANIA

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

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