THE Fleetwood Challenge Cup

in association with prefabAUS

Building for the Future; NOW

The 2023 Challenge Cup competition theme: "Building for the Future; Now" looks to address the materials supply and embodied energy agenda driving the increasing need for agile architecture, continuously evolving and developing our buildings for future use.

Increasing resource scarcity, inflated construction costs and supply chain sovereignty are challenging the construction sector to adopt a mindset of long-term value creation over short-term market demands.

As we approach 2050 and the need for NetZero emissions, the energy embodied in construction materials and the need to do more with less, is becoming a major consideration for designers to extend the useful life of buildings by ensuring they can be reused and repurposed for decades to come.

The 2023 Challenge Cup leverages the unique value proposition of prefabrication and modular building by employing extraordinary design and technical innovation that cannot be matched by traditional construction methods.

The proposed solution requires an innovative design response for a multi-level unit typology comprising of a block plan accommodating the following minimum spatial programme requirements;

- 2 x three-bedroom and two bathroom units
- 2 x two-bedroom and two bathroom units
- 4 x two-bedroom and single bathroom units
- 4 x one-bedroom and single bathroom units
- Communal spaces with multiple functions that are defined by the submitting teams.

The building design must be readily modified, capable of being delivered in multiple configurations and offer maximum flexibility to accommodate more than one façade type over its life.

The submission will need to effectively demonstrate the consideration of the "agile" nature of the project by demonstrating:

- a multi-function communal space programme that serves both building occupants and the public,
- the quality of the initial residential spaces, and
- how the building could be adaptively reused in the future, showing consideration of life-cycle thinking, current supply chain issues and circular economy principles.

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Eligibility for entry

A number of key Universities are invited to participate in the 2023 Fleetwood Challenge Cup.

Interested students from Architectural, Engineering and Construction (AEC) streams at participating tertiary 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 Project submission on behalf of the entire team.

All official competition information will be sent directly to Team Captains with copies provided to staff acting as University Coordinators.

The design challenge

The competition poses a contemporary design challenge which is determined in consultation with University (staff) Coordinators forming an inter-University representative steering committee.

The final project design must be a low-rise accommodation typology of between 2 and 4 storey construction.

The site

The project site is located in a middle-ring suburban area with the following characteristics:

- A local development suburban site which is assumed to be cleared and available for re-development
- The site will approximately be 1000m^2 to 2400m^2 in total
- There may be more than one access point
- Due to its urban location and proximity to public transport, on-site parking is optional
- 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
- The maximum load height for transport and delivery is 3.9m (for the purpose of the competition)

Project brief

Leveraging prefabrication and modular offsite construction technologies, develop an original project design that responds to the challenge posed by exploring Industry 4.0 and emerging strategies in the construction sector, embracing:

- The potential of new technologies
- Advanced design that delivers community and client value
- 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 and 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 team design process should involve the following stages that are showcased in the submission:

- designing an innovative modular building system that allows different configuration and uses
- demonstrating how the system could be applied to different building uses or configurations.
- applying your system to the current functional brief and chosen location in detail, and
- outlining a future project re-use and reconfiguration.

Emulating real world practice, each team will need to demonstrate cross-disciplinary thinking to address the relationships between building science principles, construction sector best practice and adherence to the principles of national building codes and regulations.

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Submission deliverables

The entry submission must explain the inspiration for the design and how it meets the challenges of this 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 maximum 1000-word Executive Summary detailing how the project's novel design response will meet the challenges of the project brief. This text must be suitable for general public explanation and publication.

3. A Concept Design Validation report (capped at 10 A4 pages) and supporting calculation appendices.

   Five pages of the report should validate the concept design with equal consideration of each of the following five aspects below, providing supporting reference to the methodology, technical detail and calculations as appropriate.

   - architectural design
   - application of sustainability principles, with a focus on materials
   - structural engineering analysis
   - building services e.g., mechanical, electrical, and plumbing concepts
   - construction programme, budget and regulatory evaluations

A further five pages should dive in deeper detail into one of the aspects above, providing supporting information to explain the methodology, technical detail and calculations that validate the solution offered.

4. A summary PowerPoint presentation presenting the design solution, limited to 10 slides.

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

6. 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 architectural drawings
   - structural/modular system details and connections
   - diagrams/drawings indicating services and sustainability considerations

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

Judging

An expert judging panel of AEC industry professionals from a cross-disciplinary background will assess submissions and determine placings.

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 2023 Conference on Sunday 5th November 2023.

The Fleetwood Industry Award will also be presented at this event to the team who demonstrates the best use of offsite manufacturing and cross-disciplinary AEC integration.

A special recognition People's Choice Award (non-cash prize) will also be presented to a finalist team at the prefabAUS 2023 Conference.

Competition entries and highlights will be showcased on The Challenge Cup website after the close of the event.

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Submission protocols

- Digital submissions are to be made via a dedicated online portal by teams pre-registered ahead of the registration deadline
- 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

Notes:

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

Key dates

1 January
Competition commencement

1 February
Portal opens for submissions

1 June
University team registrations close

28 June
Competition submission Deadline 12 noon AEST

29 July
Finalist teams announced

22-23 August
Announcement of competition winners at the prefabAUS Conference, Melbourne

Grading matrix

- Collaboration and multidisciplinary approach **20%**
- Design response and presentation to brief **20%**
- Innovation in prefabrication - production, feasibility and technical buildability **20%**
- Environmental sustainability **15%**
- Structure **15%**
- Services **10%**