

the SAFE HARBOR

Adaptive shelters for climate resilience
Cyclone | Floods | Bush Fire

The design concept is rooted in the resilience, adaptability and community engagemnt. It aims to address the urgent need for safe and sustainable housing solution in extreme weather events while fostering a sense of belonging and support among displces individuals.

Deriving from vernacular practices

Wisdom from traditional construction style of native habitants of Northern territory of Australia was studied and incorporated in the design.



Elevated Floor



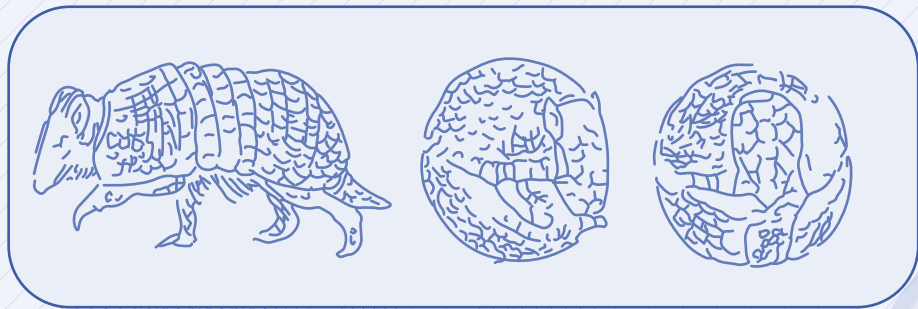
Temporary structures



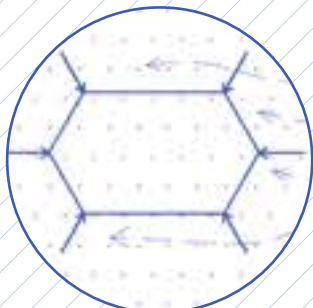
Interlocking Joinery

Biomimicry

Armadillos inspire biomimicry in protective gear, resilient systems, thermal management, and flexible materials through their shell, rolling ability, adaptability, and segmented armor.



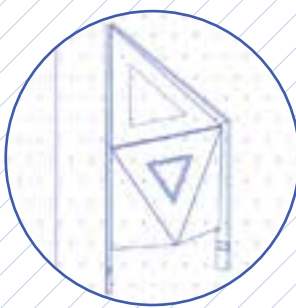
Understanding Forces of Nature



Clyclonic forces and aerodynamic form.



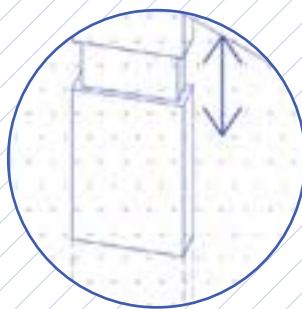
Steel Structure and Cross bracing for high wind speed.



Foldable prefabricated wall and roof (air-tight for fire).

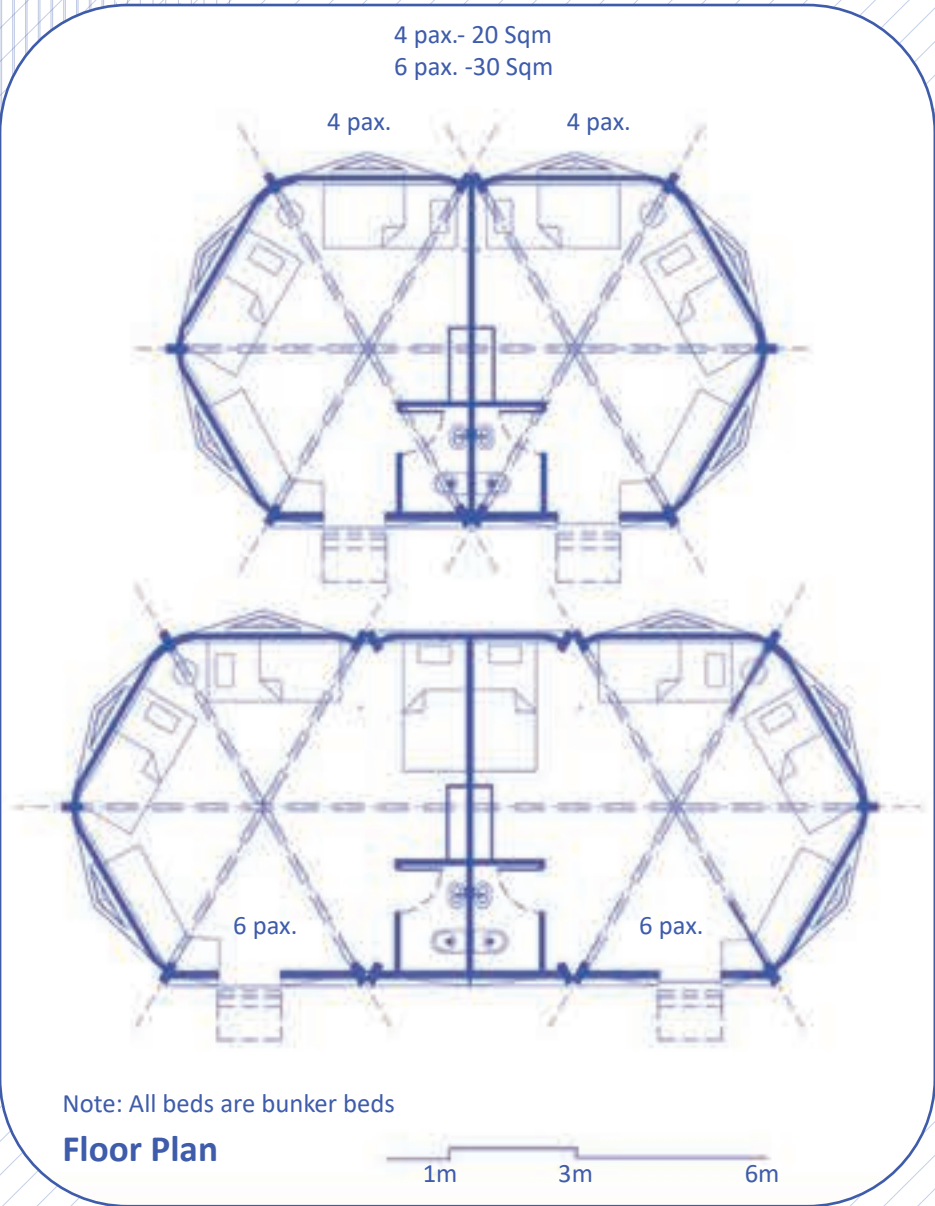
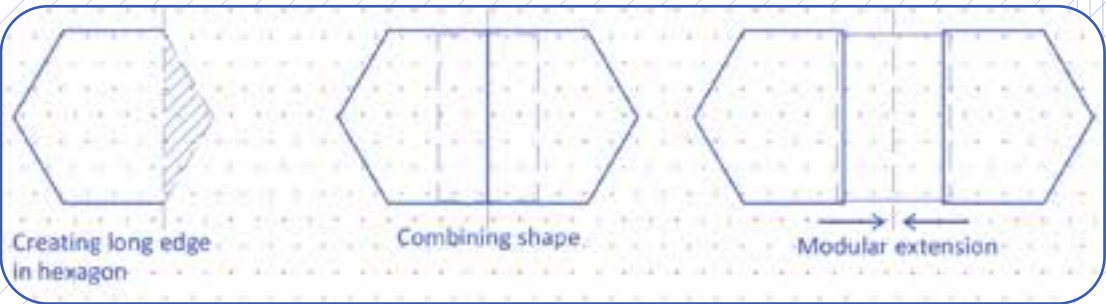


Adjustable floor level for flood (hydraulic).



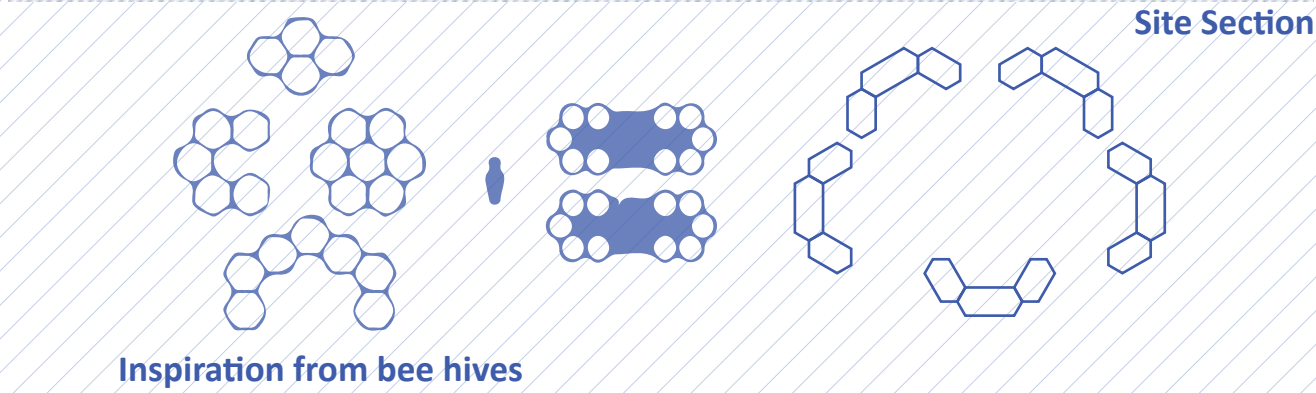
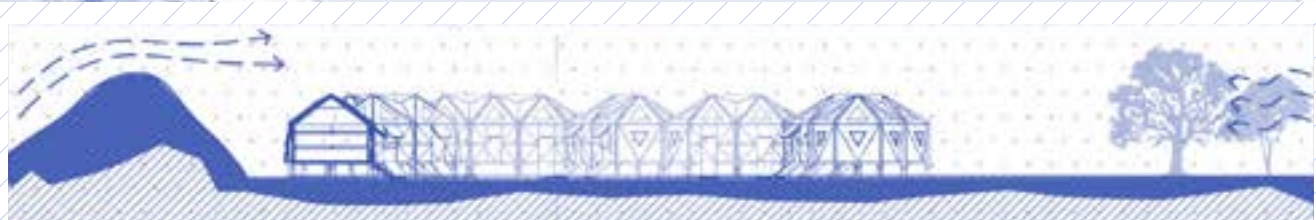
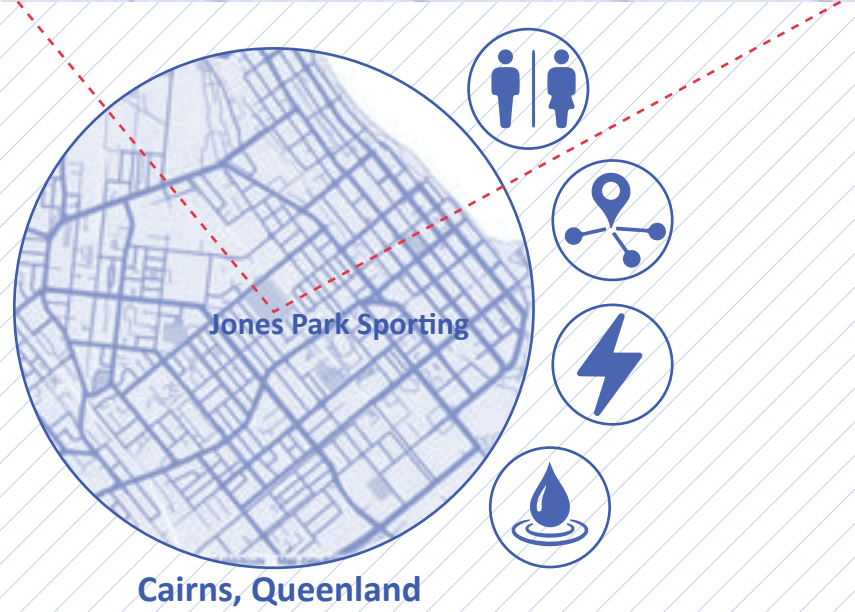
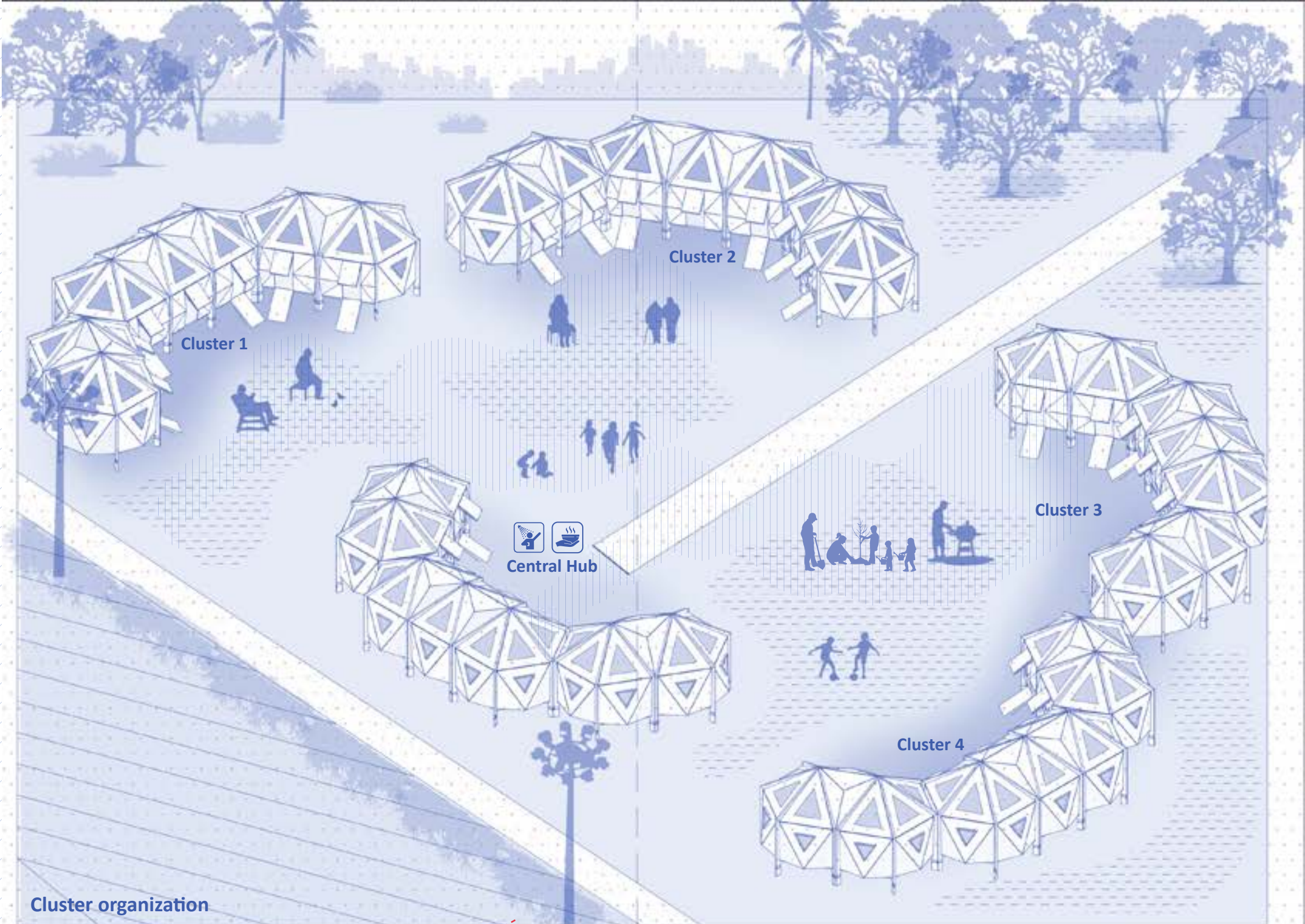
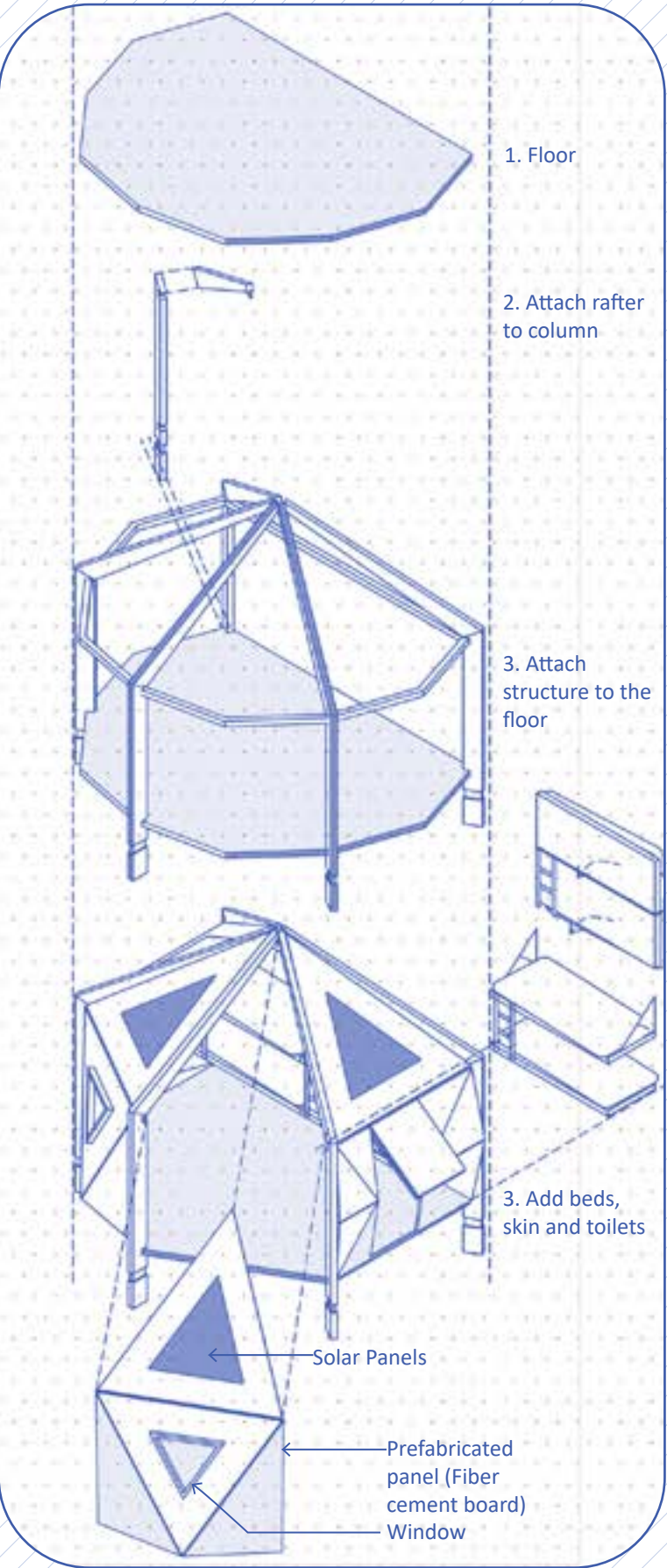
Understanding Modularity

Interlockable and scaleable modular pods.



the SAFE HARBOR

Kit of parts and Assembly



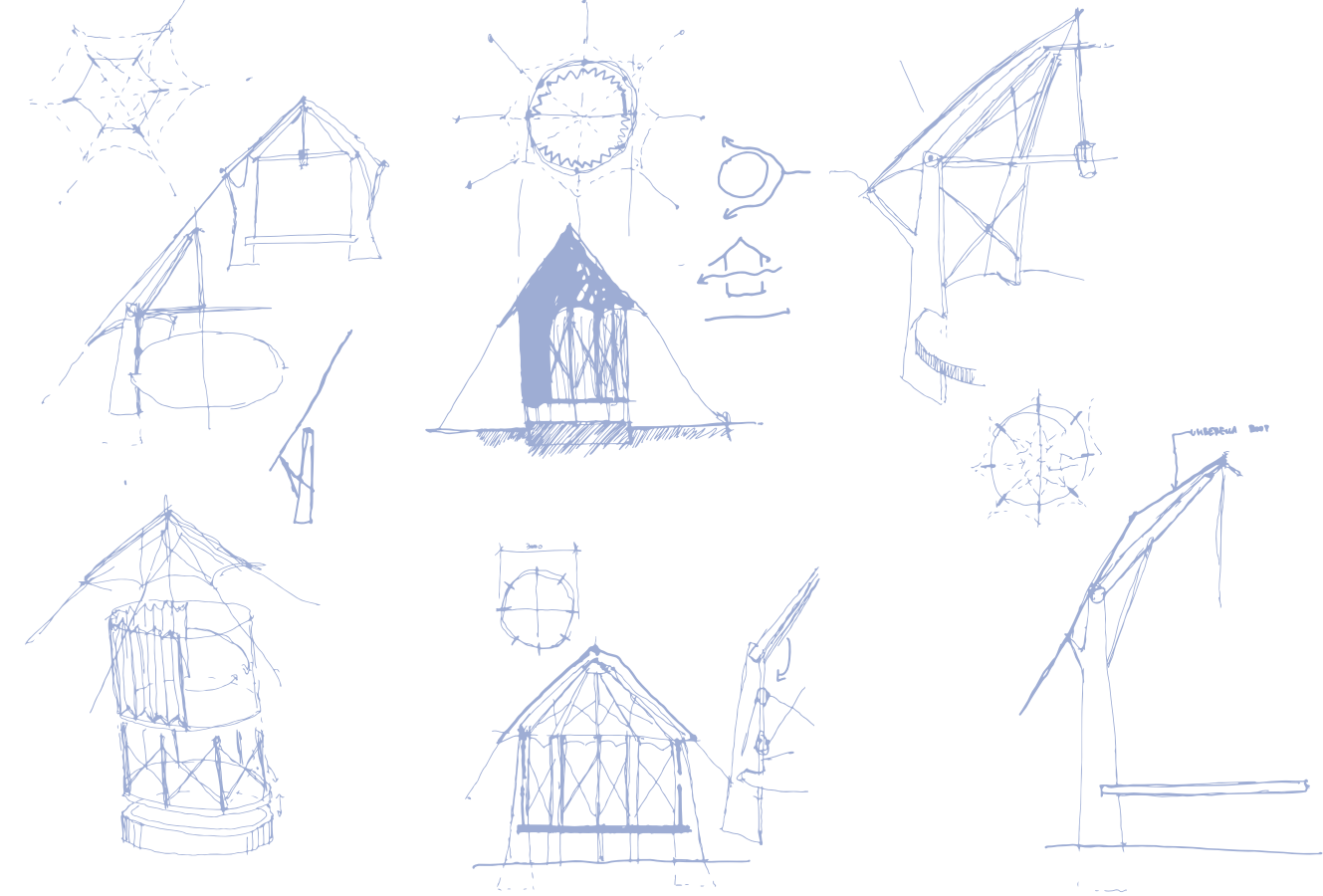
the SAFE HARBOR

PROJECT DESCRIPTION

Design Intent - The concept of our design is inspired from the traditional construction style of the native people of Australia to combat the destructive forces of cyclone, floods and bush fire. They utilized sustainable local materials and employed a technique called seasonal adaptation, modifying their homes according to the seasons. During the wet or rainy season, large communal houses were built for increased clan gatherings, while smaller shelters were used at other times. Elevated structures with increasing the floor height protected the shelters from floods and cyclones. The homes featured good cross ventilation, and they used wood, stone and mud for the walls which keeps the temperature of the houses cold in summers and warm in winters. There homes were designed to be flexible and mobile, allowing them to be easily dismantled and relocated in response to seasonal changes.

Our Proposal- Our design is Modular in nature which emphasizes on adaptability, flexibility and scalability enabling quick assembly and disassembly in response to changing community needs. The design is innovative and highlights the usage of prefabricated materials which are easily transportable and quickly assembled on the location. We have altered the pod’s shape from a hexagon into pentagon, allowing us to extend the floor space from the sides. The structure of the module gets its strength from the steel columns which are connected in an interlocking manner with the roof truss giving it more rigidity and support. The walls and roof are clad with fibre cement board which are non-combustible, durable and moisture resistant. We have provided extra steel bracing in walls by sandwiching the boards and adding a fire insulator foam in between. The floor of the pod fibre cement board from exterior and vinyl coated polyester panels in the interiors. We have incorporated sustainable features to the pods like solar panels and trolleys for rain water storage.

In regions susceptible to bushfires, cyclones and floods, these modular pods can help the displaced people to create their temporary homes. The site chosen for the temporary shelter is Jones Park Sporting Complex Cairns, Queensland. The pods are arranged on the site to form clusters, each consisting of five pods surrounding a central courtyard for sitting and interacting with each other. These clusters feature a central community area with storage lockers, bathing areas, a community kitchen and dining and a laundry space. The design foster community development while considering the emotional needs of displaced people. Our vision is to create a space where these individuals can rebuild their lives and find motivation to live.



REFERENCES

- Agency, A. G. N. E. M., n.d. Australian Institute for Disaster Resilience. [Online] Available at: <https://www.australianwarningsystem.com.au/>
- Anon., 1999. The Australian Journal Of Emergency management. [Online] Available at: <https://search.informit.org/doi/abs/10.3316/ielapa.391776260888078> [Accessed 6 8 2024].
- Anon., 2021. ABC News. [Online] Available at: <https://www.abc.net.au/news/2021-05-04/federal-government-natural-disaster-agency-bushfires-cyclone/100116332> [Accessed 6 August 2024].
- Anon., n.d. [Online].
- Anon., n.d. Arch Daily. [Online] Available at: <https://www.archdaily.com/904642/fiber-cement-facades-in-architecture-9-notable-examples>
- Area, B. A. M. H. I. A. B. P., 2018. Modscape. [Online] Available at: <https://modscape.com.au/need-know-building-modular-home-bushfire-prone-area/> [Accessed 6 08 2024].
- Authority), T. s. o. q. (. R., 2024. Queenslan Government. [Online] Available at: <https://www.getready.qld.gov.au/getting-ready/understand-your-risk/types-disasters/cyclone-and-storm-surge> [Accessed 2024].
- desk, A. n. & e., 2021. Archiytecture and Design. [Online] Available at: <https://www.architectureanddesign.com.au/features/list/bushfire-proof-house-design> [Accessed 6 8 2024].
- Ltd., N. M. a. B. P., n.d. Builders 9. [Online] Available at: <https://builders9.com/fiber-cement-board/> [Accessed 6 August 2024].
- Penberthy, N., 2016. Australian Geographic. [Online] Available at: <https://www.australiangeographic.com.au/topics/science-environment/2016/02/how-to-cyclone-proof-your-house/> [Accessed 6 8 2024].