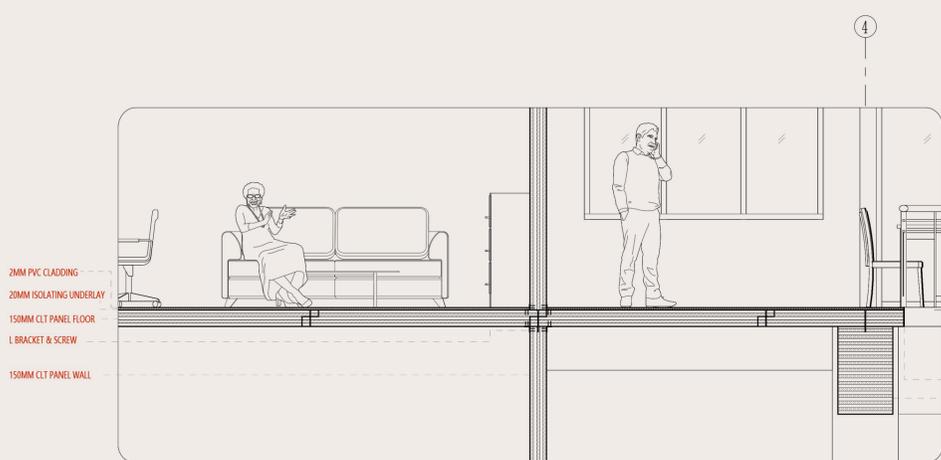


Bailey Gradine (Abstract)

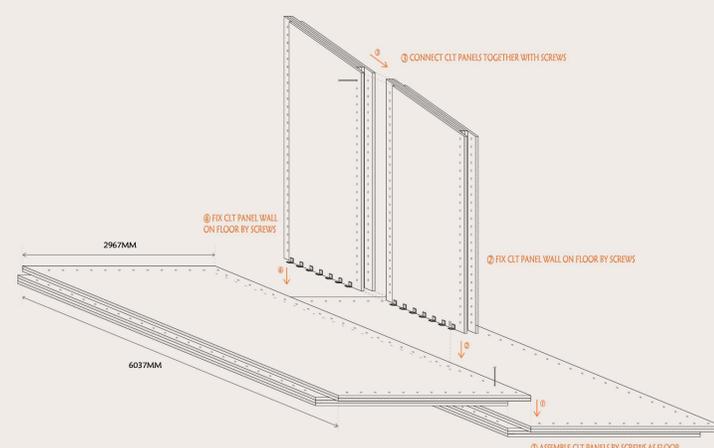
This design proposal of Bailey Gradine explores the potential of circular design for the adaptive reuse of a warehouse. This proposal aims to acquire profound knowledge from circular economy's principles, while instigate the applicable actions from the ReSOLVE framework to inform sustainable design strategies. Furthermore, this proposal will provide knowledge for the construction process. that is, the process of "design - prefabrication/assembly - transport - installation", designing and modelling the building components and then hand it over to the factory for processing. According to the transportation size requirements, components can be assembled in the factory into volume and hybrid forms and then bring to the site for further assembly. Finally, as a completed component, it will be hoisted to the designed position by a crane. This proposal begins with an overview of the broader concept behind the project. Thereafter, expand and connect the idea to the context of the proposal, such as social and cultural instances. Meanwhile, this proposal would examine certain prospects of the site that align to the axis of environment, transportation et cetera to provide additional parameters for the design decisions. The research part of this proposal would investigate several design disciplines that pertain to the intentions of circular economy, namely the adaptive reuse, modular treatments, prefabrication methodology, and environmental performance.



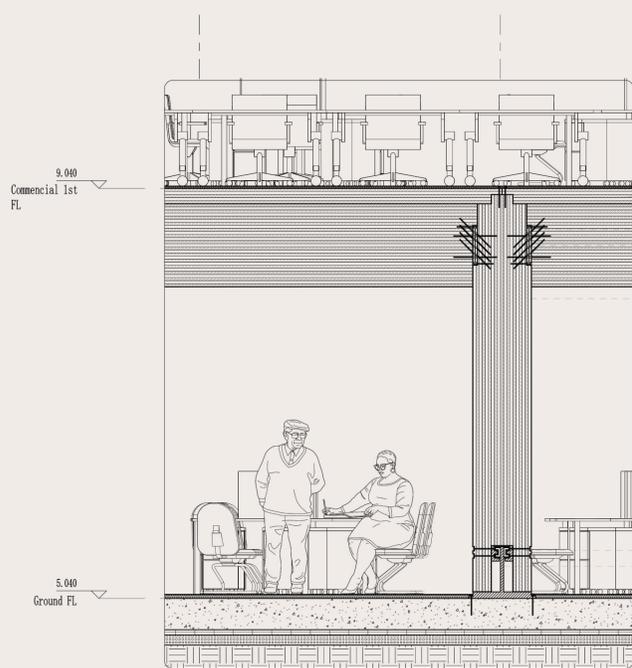
COMMERCIAL OFFICE PERSPECTIVE



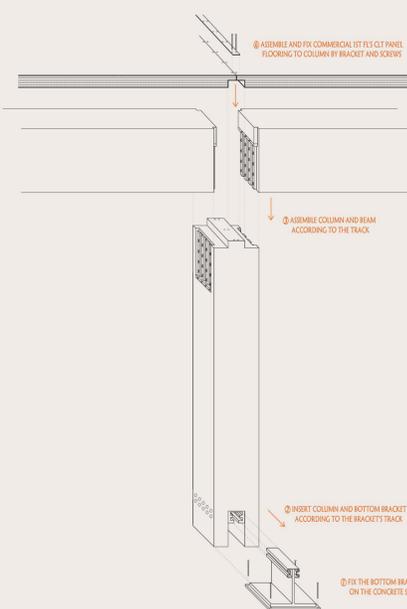
CLT WALL-TO-SLAB CONNECTION



ASSEMBLY PROCESS OF CLT WALLS AND SLABS



COLUMN-TO-SLAB & COLUMN-TO-BEAM CONNECTIONS



ASSEMBLY PROCESS OF CLT STRUCTURE

Prefabrication process

1. Design and make 3D models for each prefabricated components and connection. The design and modelling include the size of columns and beams, the division of slabs size, and the size of walls with holes in the window and door position.
2. Deliver a comprehensive 3D digital documentation to the off-site factory to produce and process the components.
3. Transport the building components to Bailey Gradine.
4. Due to the original warehouse's restrictions, these components will be assembly directly in the warehouse and then fixed to the specific location.

July 1st 12:00 Noon

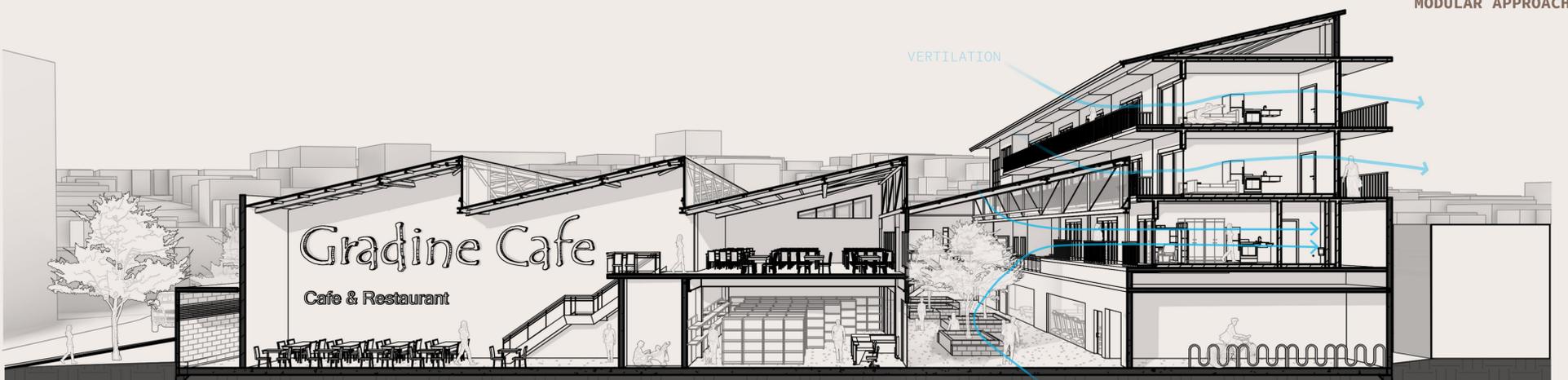
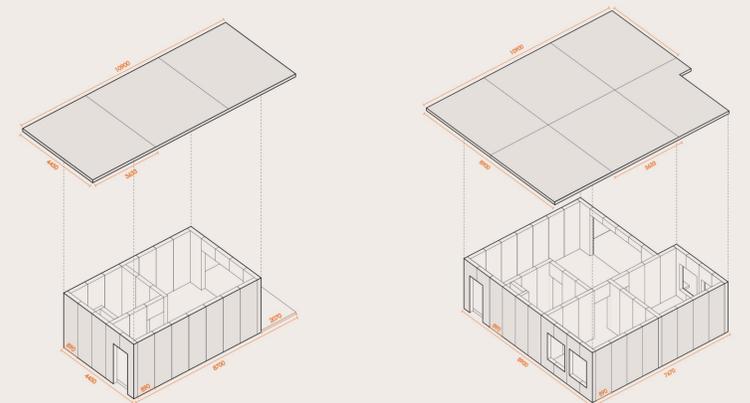
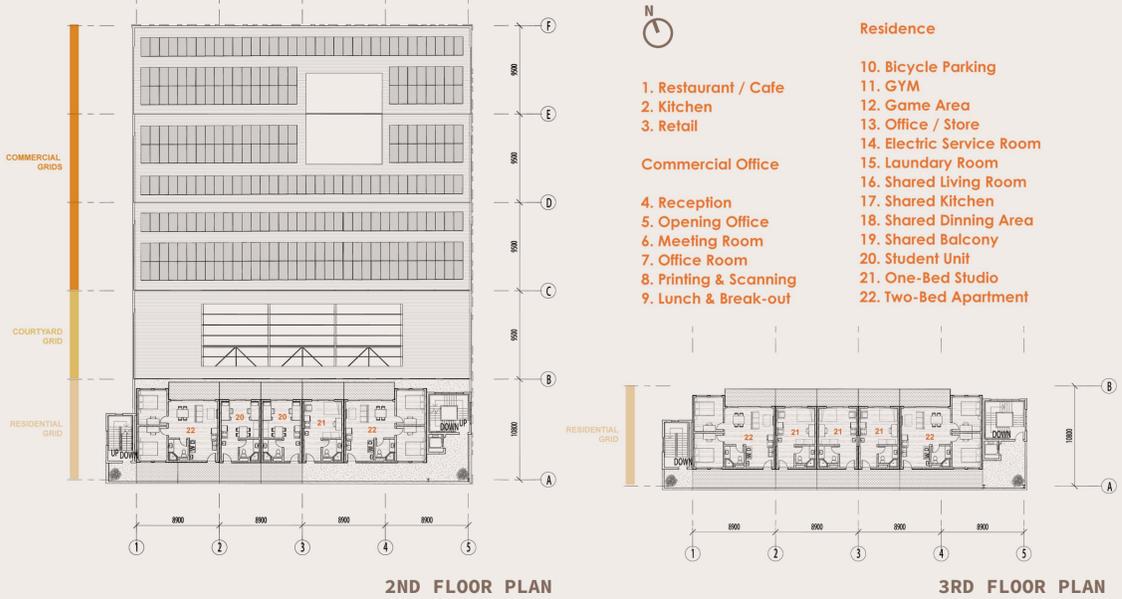
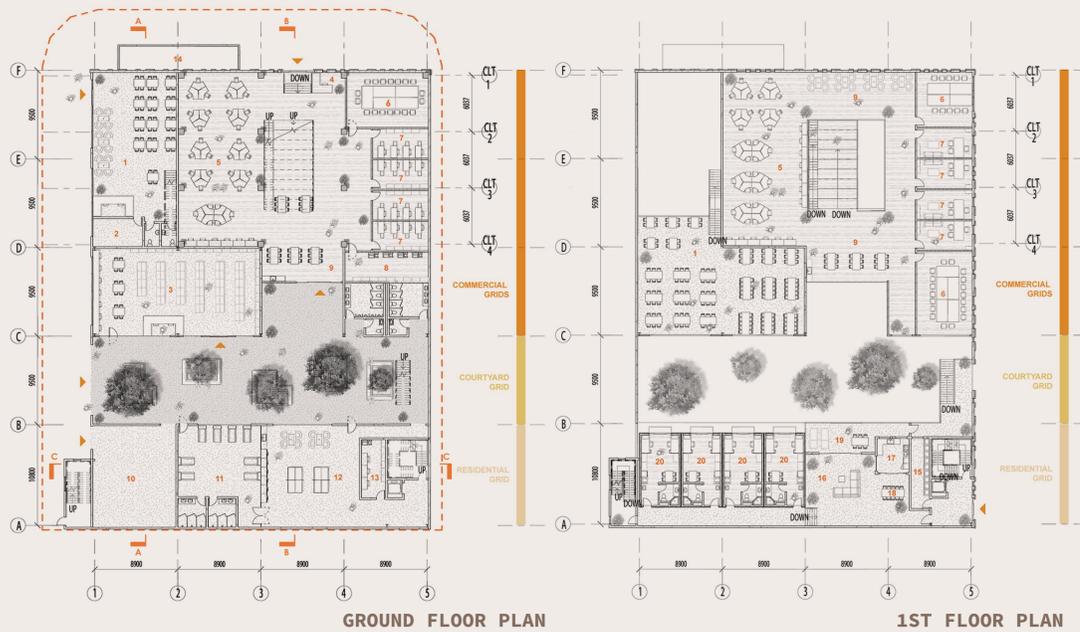
Feb 1st 12:00 Noon



PERSPECTIVE SECTION B-B (COMMERCIAL OFFICE & RESIDENTIAL PUBLIC AREA)



COURTYARD PERSPECTIVE



Bailey Gradine

Workshop renovation

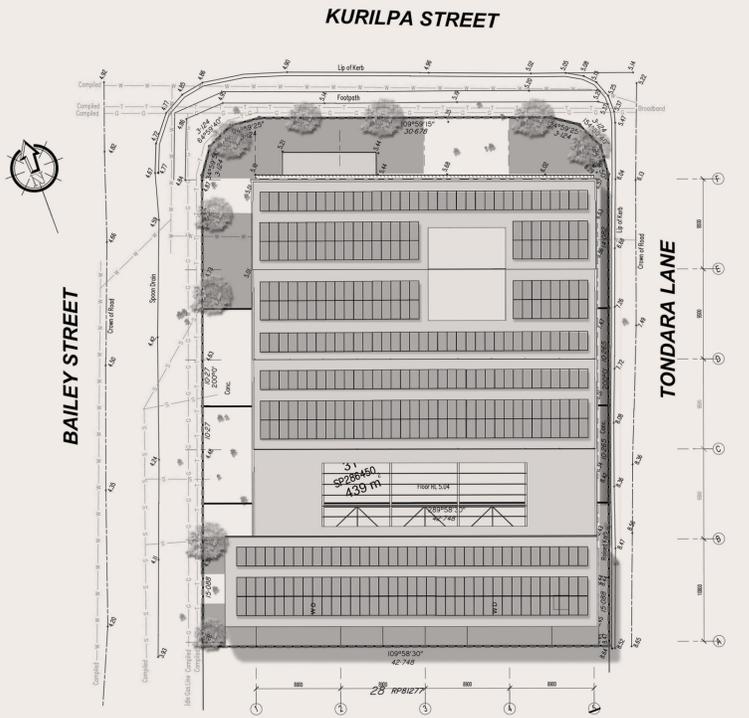
This design proposal of Bailey Gradine explores the potential of circular design for the adaptive reuse of a warehouse. This proposal aims to acquire profound knowledge from circular economy's principles, while instigate the applicable actions from the ReSOLVE framework to inform sustainable design strategies. Furthermore, this proposal will provide knowledge for the construction process, that is, the process of "design - prefabrication/assembly - transport - installation", designing and modelling the building components and then hand it over to the factory for processing. According to the transportation size requirements, components can be assembled in the factory into volume and hybrid forms and then bring to the site for further assembly. Finally, as a completed component, it will be hoisted to the designed position by a crane.



ORIGINAL WAREHOUSE



BIRD VIEW



ROOF PLAN

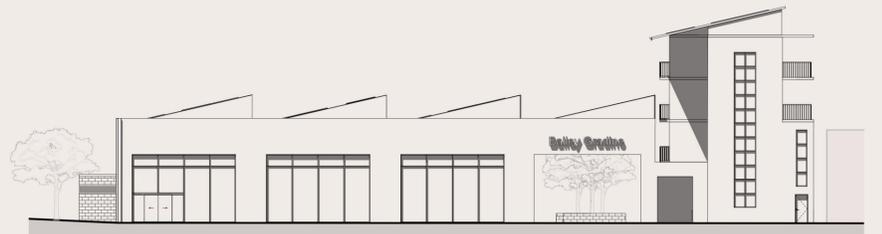
410W Sunpower P3 Commercial Solar Panels

Size: 2066x998x40mm
Max Power: 9.21A @ 44.5 V

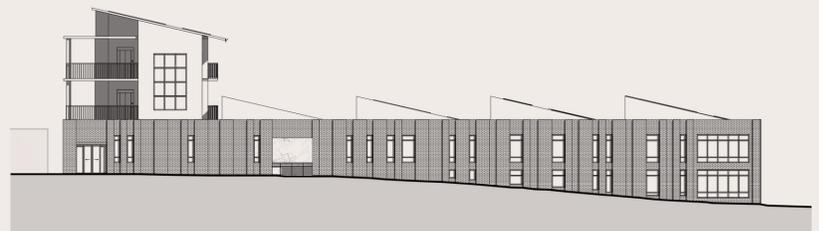
Count 386

Energy
410 Watts each

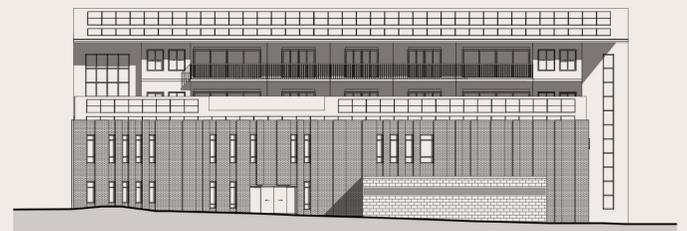
386 X 410
= 158,260Watts
= 158.3 Kilowatts of Power



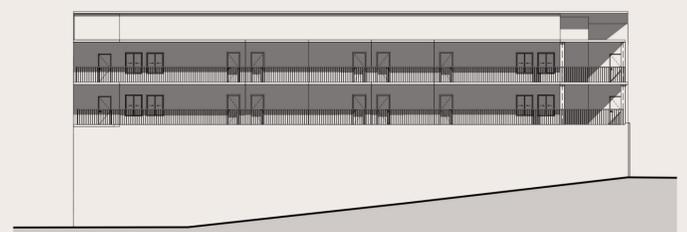
WEST FACADE



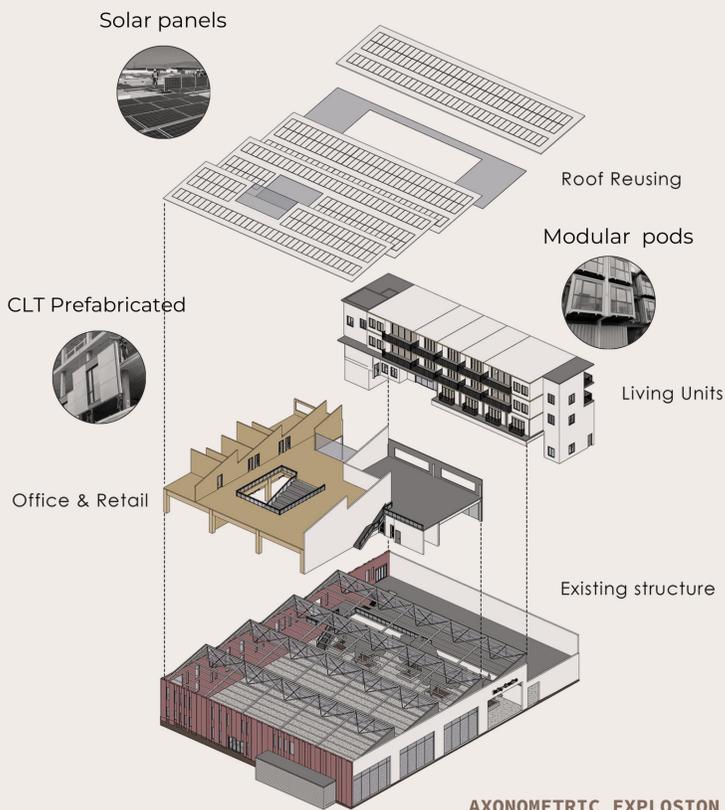
EAST FACADE



NORTH FACADE

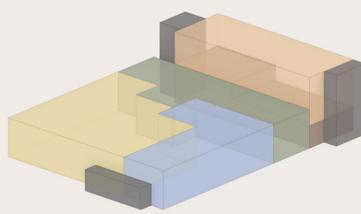


SOUTH FACADE

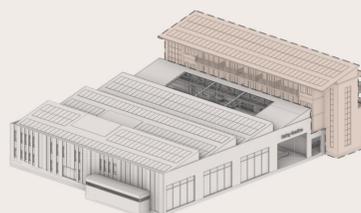


AXONOMETRIC EXPLOSION

- Residential Unit
- Residential Public Area
- Service & Fire Stairs
- Courtyard
- Commercial Office
- Cafe & Retail



- Existing Warehouse (for renovation)
- Residential Part (for extension)



Bailey Gradine (Executive Summary)

Bailey Gradine imagines an advanced integration of conventional and contemporary construction technologies. From acknowledging circular economy's principles, which allows us to assemble a sustainable model that inherits these values. And tries to create a comfortable and pleasant living environment for the local community and residents. We imagine a synthesis of green, recyclable materials and prefabricated methodology to enable material circulation for future demands, such as the Design for Manufacture and Assembly (DfMA) and Disassembly. This allowed us to use the building as a potential warehouse of materials, most of which could be disassembled quickly and used for the new building after the old building reached its useful life. In addition, prefabricated and modular construction methods can meet the urgent demand of people for multi-functional buildings and changing construction site in the post-epidemic era. We also focus on the theme of adaptive reuse, maximizing the use of the existing space to meet the project's brief through a detailed evaluation of the existing materials and construction. Our proposal echoes the executive framework of circular economy, vis-à-vis the concepts of regenerate, share, optimize, loop, virtualize and exchange, and augment it to inform our design strategies.

For the construction process, Bailey Gradine could be consisted by two pieces, renovation and extension. For the warehouse part of the original building, which is renovation part, we retained the existing truss structural system and successfully introduced commercial functions into the space. Due to the limitations of the entrance size and roof height of the existing building, we design to prefabricate the building components as a construction method, those components are manufactured in off-site factory and transport them to Bailey Gradine to assembly directly in the warehouse and then fixed to the specific location. For the residential part(extension), we follow a type of fixed module to decompose the building into "parts" that are easy to transport and install. It is the first to design and model the building components and then hand it over to the factory for processing. According to the transportation size requirements, components can be assembled in the factory into volume and hybrid forms and then bring to the site for further assembly. Finally, as a completed component, it will be hoisted to the designed position by a crane.

On the other hand, the strategy of the adaptive reuse further improves the performance of the building. Bailey Gradine responds well to the characteristics of the project, both in terms of structure and environment. The full utilization of the original structure greatly reduces the renovation cost and carbon emission under the condition of ensuring safety. Appropriate ventilation and lighting strategies also enhance the building's comfort. In addition, the large use of solar panels makes it easier for the building to achieve the aim of sustainable. From the perspective of geographical condition, the site remains in the subtropical monsoon climate zone of the southern hemisphere. It exhibits a relatively moderate temperature change, with four distinct seasons, and it has the same period of rain and heat. As a result, local developers often produce projects with adequate ventilation, insulation, and waterproofing. In terms of topography, due to its proximity to a river, it will be affected by the rising level of the

river during particular seasons, i.e., the heavy rain season. Therefore, the architectural scheme will also have corresponding coping strategies, such as choosing deep-rooted plants with strong permeability as landscape plants. In addition, there is an estimated height difference of three meters between the two adjacent traffic ways (Bailey St. & Tondara Ln.), and some natural gradients also facilitate the passive drainage efficiency of the building.

Overall, the scheme of Bailey Gradine is according with adaptive reuse, which are making full use of existing materials, responding to locational characteristics and creating sustainable and reproducible green building design. It is reasonable to believe that Bailey Gradine's solution can serve as an example for the development of green buildings in the post-epidemic era, and provide a low-carbon, comfortable and highly adaptable building model