

## **ABSTRACT**

The project explores the opportunity of activating the place “12 Stack Street, Fremantle” through social and communal interaction. The vision of our project focuses on creating a platform for people to interact. ‘Connectivity and Liveability’ are the two main aspects followed in the design. The design follows the concept of “Designing from inside out by bringing the outside in” (Duffy 2019). The existing warehouse has been transformed into public zoned spaces, like Boutique Restaurants, Click and collect shops, and Grocery stores. The liveability aspect can be seen by integrating open space within the built environment, attracting people to achieve social cohesion. The green courtyard spaces will create a communal area. Therefore the student accommodation is zoned on the ground floor of the accommodation block, which gets more access to the communal area. The built-to-rent two-bedroom apartments consist of a great balcony space facing the communal area. On the other hand, the private balcony spaces for the in-house residents are zoned towards the northern edges, which will provide them with ample sunlight and privacy in the accommodation block. The connectivity aspect can be seen in the communal level or the first-floor level. The first floor of the entire built space is connected with walkways. The roof level of the warehouse is transformed into a community farming area, which will provide the people with strong communal activity.

## **REFERENCES**

Duffy, Alan. 2019. "Australian design review."

<https://www.australiandesignreview.com/architecture/nature-new-school-design-evolving-concept/>.

## EXCECUTIVE SUMMARY

The project demonstrates a proposal for place activation strategy with the introduction of prefab construction. The existing site was inactive with a closed warehouse, therefore the core idea of this project is to create a mixed – use development which helps to activate the site. The mixed – use development comprises of Click and collect shop front, Boutique Restaurants, Cafes, Office Spaces and Accommodation units.

The modular construction technology paved an innovative approach to achieve circular economy by reduce, reuse and recycle principle. The modules are designed and stacked on top of each other, which creates space for the internal built environment. These modules are connected by walkways which creates a flexible pedestrian movement. The usage of solar panels for energy will be a strong point in the path of circular economy. The windows are designed with “shadow – voltaic” smart system with clip – on sun shading device, which helps to maintain internal thermal comfort.

The design approach toward the site was followed by two main aspects, one is ‘Connectivity’. The new additions in the site is well connected in terms of built environment and open spaces. The built space – open space relationship is created by addition and subtraction principles, which helps to bring the outside in. The three – fourth of the site is zoned for public access which makes the site active. There arises the second aspect of ‘Liveability’. Also the residents living here has a strong connection with the context because of the community engagement. These liveliness and connectivity can be seen in ground floor as well as first floor with the integration of walkways and balcony spaces.

The design development was followed by the concept of “**design for disassembly**” in the material selection and construction technology and therefore the modules are placed next to the existing building and provided accessible connections. Thus, the design strategy allows the modules to be easily dismantled and transported to the next spot. The walkway decks and balcony spaces are additionally attached to the modules using hinges. There will be a structural skeleton which supports the stacked modules externally.

The rooftop community farming area of existing warehouse consists of structural framing which will be a clear focal point for the visitors. The material used for the construction will be **Structural Insulated Panels (SIPs)** which is easily available and enables future adaptations. Additional framing support is also attached to the SIPs to create the external walkways and balcony spaces. The SIPs are energy efficient, cost – effective and has the ability to resist storm, fire and termites(Industries 2021). The material used for the cladding will be **LuxeWall**, which is a modern light weight residential cladding solution developed with a concealed fixing system. LuxeWall panel covers a width of 1200mm and consists of two thicknesses 50mm or 75mm(SteelSelect 2021).

The prefab modules will be of three types, Type A will be 6m\*5.4m, Type B 5.4m\*4m and Type C 3.2m\*8m. The modules are prefabricated and transported to our site using trucks of dimension, 14.6 \* 5.4\* 3.9. Therefore, the truck has to do 11 shifts of each prefab modules to the site, to build the whole structure. The assembly and disassembly of modules in the site

will not affect the existing building, as there is no direct layering of existing building with the modules.

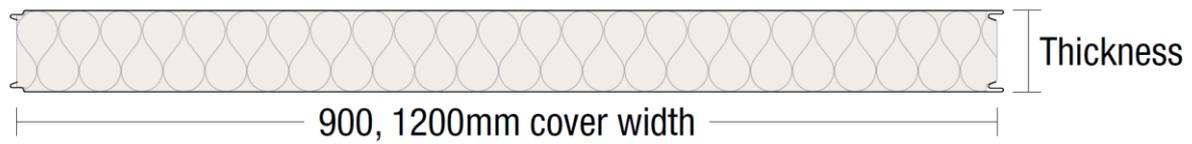


Figure 1: LuxeWall profile diagram(SteelSelect 2021)

## REFERENCES

- ✚ Duffy, Alan. 2019. "Australian design review." <https://www.australiandesignreview.com/architecture/nature-new-school-design-evolving-concept/>.
- ✚ Industries, SIPS. 2021. "sipform." <https://www.sipsindustries.com.au/faqs/56-1-what-are-sips>.
- ✚ SteelSelect. 2021. *Bondor LuxeWall*. <https://steelselect.com.au/products/bondor/bondor-luxewall-mw>.



## PLACE ACTIVATION THROUGH COMMUNAL INTERACTION

The design focuses on creating a 'Centre for Interaction'. The mixed-use development comprises of shops, restaurants, office spaces and accommodation units. The concept is based on "Connectivity" between spaces. The shared green corridors, high quality liveable spaces and communal spaces are designed in a way that, each built space is connected with an open space. Thus creating a pathway between the buildings within the site.

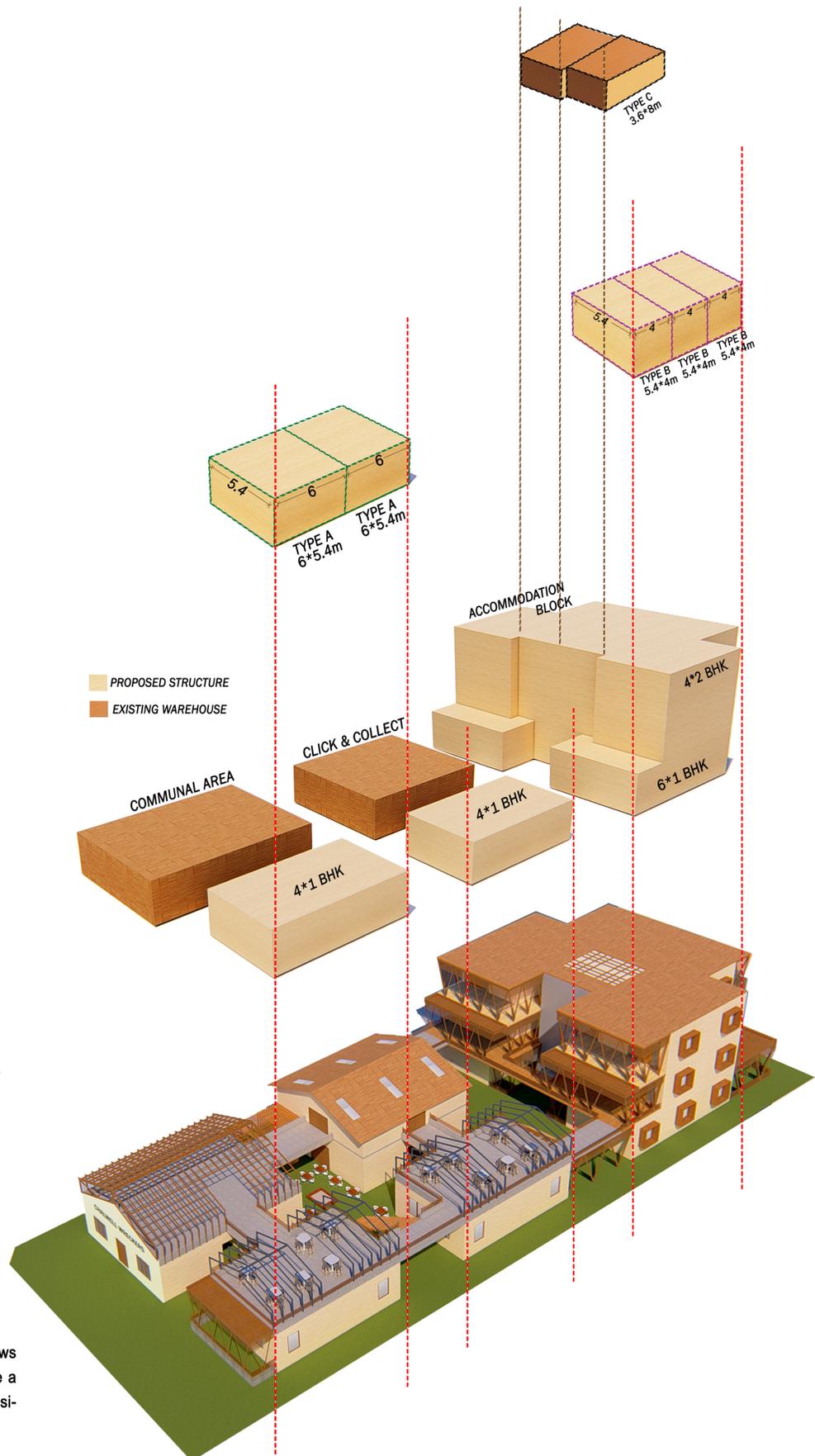


The site is located in **12 Stack Street, Fremantle**. A single storey corrugated galvanised iron warehouse situated on the north eastern corner of Stack and Wood Streets which has a gabled roof.

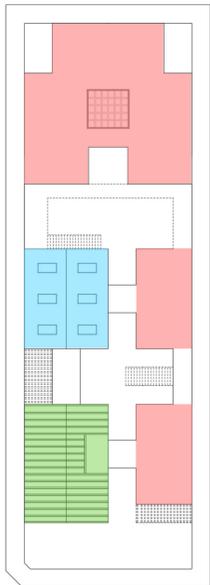
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## CONNECTIVITY AND LIVEABILITY

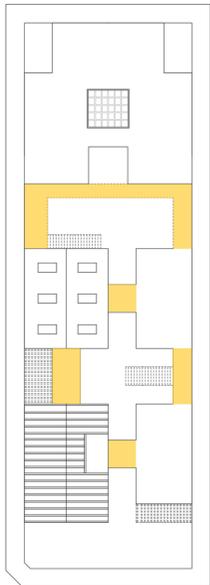
Integration of green space into the built environment, with respect to the subtraction of volumes. The design development follows the concept of "DESIGNING FROM INSIDE OUT BY BRINGING THE OUTSIDE IN". The green courtyard spaces will create a communal area, on the other hand balcony spaces provided at the northern edges will be a private space for the inhouse residents.



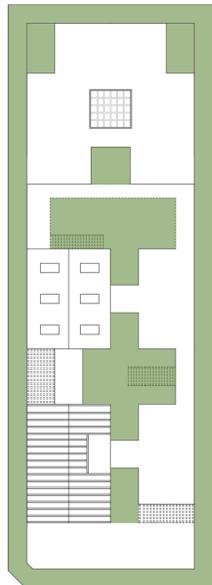
# SITE PARAMETERS



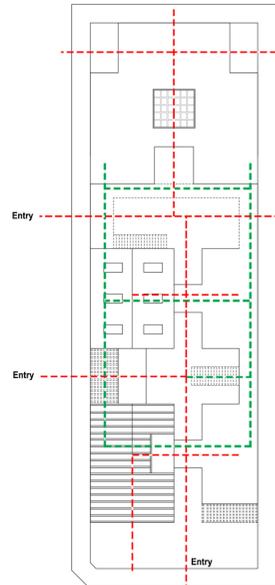
BUILDING ZONING



CONNECTION BRIDGES



OPEN GREEN SPACE



CIRCULATION PATTERN

■ Apartments  
■ Boutique Restaurant + Community Farming  
■ Grocery Store + Office Spaces

■ Pathways  
- - - Communal Floor circulation pattern  
- - - Ground Floor circulation pattern

Courtyard Space

# SCHEMATIC SECTION



## ACCOMMODATION BLOCK

The accommodation block consists of student accommodation units and two bedroom units. The student accommodation units are arranged in the ground floor with shared open kitchen, shared living spaces. The two bedroom units are designed on the upper levels with an interesting balcony space at the front facing the courtyard, as well as private balcony spaces for the master bedroom facing the northern direction.

ROOFTOP CAFE

THE CONNECTION BRIDGE

THE CONNECTION BRIDGE

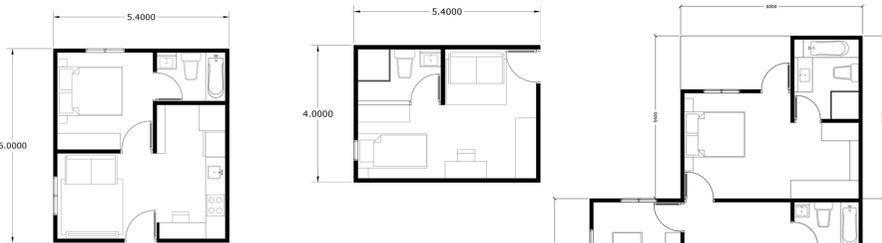
ROOFTOP CAFE

# MODULE FLOOR PLANS

TYPE A - 4\*1 BHK

TYPE B - 6\*1 BHK

TYPE B+C - 4\*2 BHK



4\*1 BHK APARTMENT

6\*1 BHK APARTMENT



4\*2 BHK APARTMENT

# ENGINEERING PROGRAM

## STRUCTURAL SYSTEM

The structural system for this scenario consists of 3 volumetric modules. With each of the module's beams and columns to built with **Glulam18**. The glulam can sustain longer span without support in between due to its properties.

## INTERFACES

The volumetric modules will be stacked on top of one another, and no additional materials will be required between modules. Mineral wool cavity barriers are used to separate the two chambers.

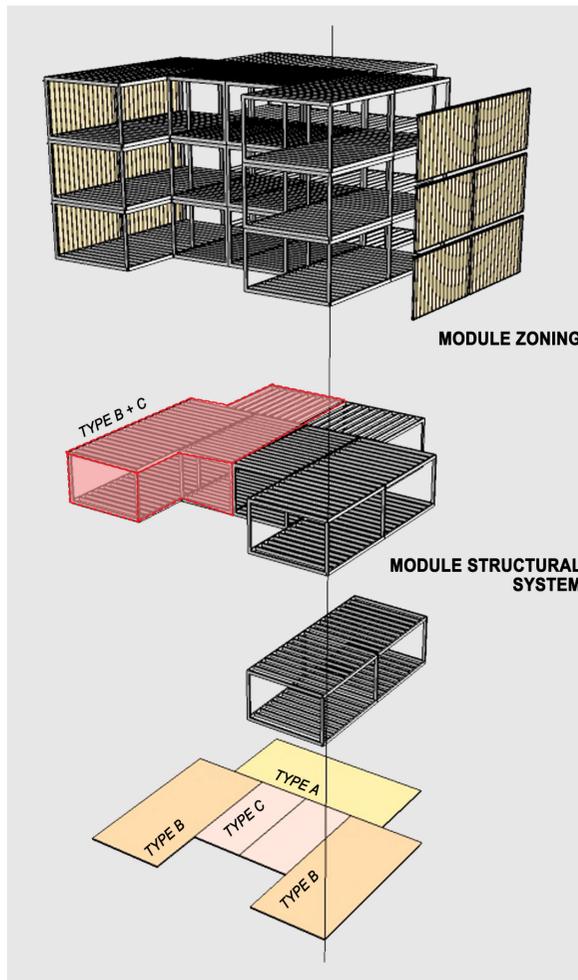
## CONSTRUCTION SEQUENCE

1. Purchase materials for construction from manufacturer
2. Cut and prepare materials to required members' sizing.
3. Build the structure frame for each module with connections claddings etc.
4. Mobilisation of the modules to the site.
5. Assembly of the modules at site as accordance to architectural drawings.

## MATERIAL CHOICE

**Glue - laminated timber (Glulam)** is chosen due to its higher strength than steel and timber at the same member size. It has high loading capacity and low self-weight, making an ideal material used for longer span where support is not required. The glulam GL18 is chosen to be used for the main frame of the module.

The material discussed for the walls, ceilings and floors is **SIPS Structural Insulated Panels**. As SIP is ideal for the situation where pre-manufactured building module is needed. Furthermore, manufacturing SIPs are much eco-friendly because the timber amount used is less when compared to other material.



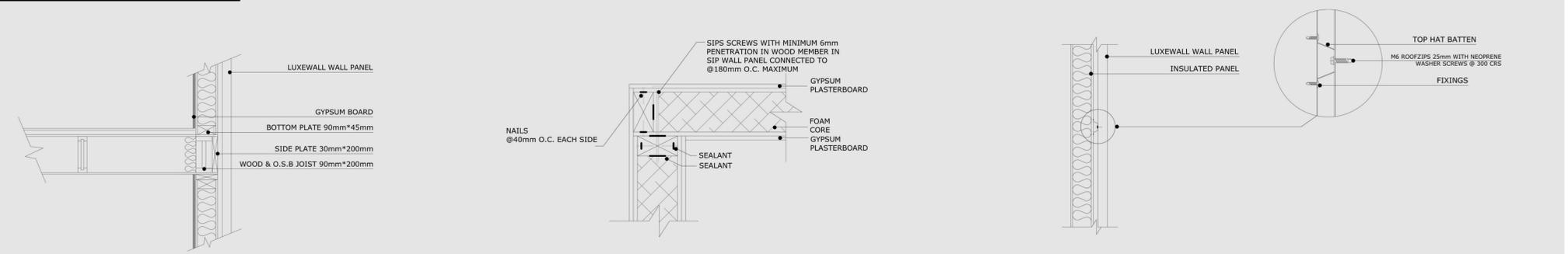
MODULE ZONING

MODULE STRUCTURAL SYSTEM

GLULAM TIMBER FRAME

SIPS PANEL WITH CLADDING

# DETAILS AND CONNECTIONS



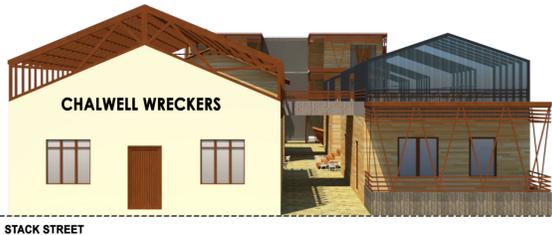
KEY DETAIL  
SCALE - 1:20

WALL-TO-WALL PANEL CONNECTIONS  
SCALE - 1:20

EXTERNAL WALL CONNECTION  
SCALE - 1:20

# VIEWS

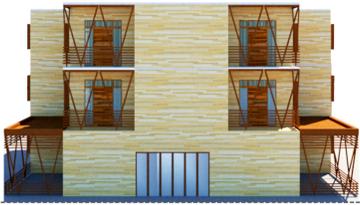
# ELEVATIONS



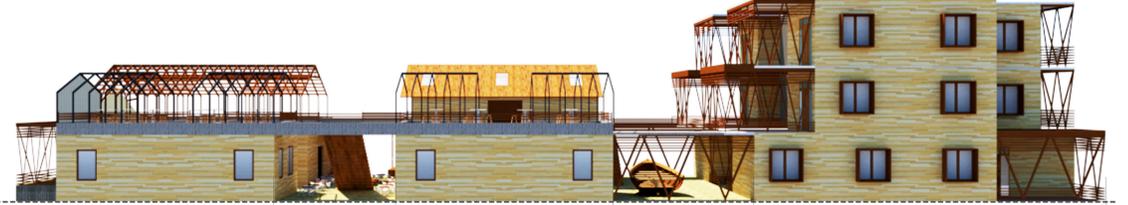
STACK STREET  
**SOUTH ELEVATION**



**WEST ELEVATION**

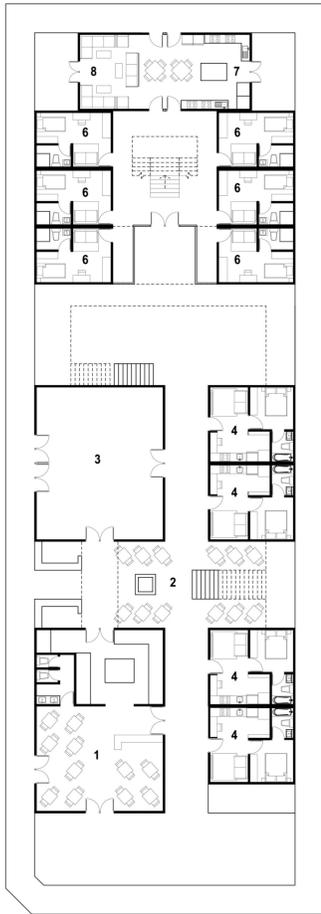


**NORTH ELEVATION**



**EAST ELEVATION**

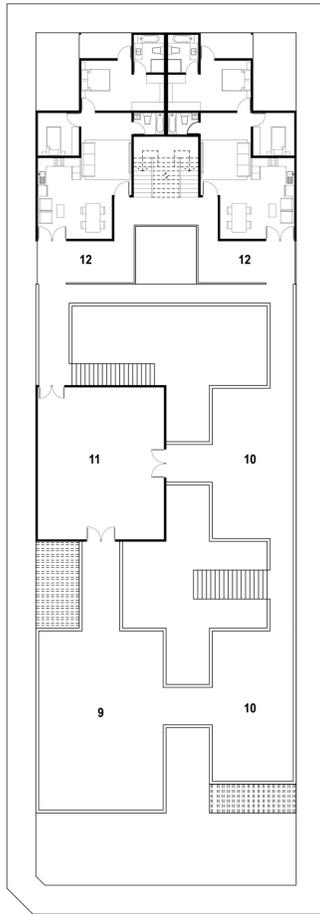
# PROJECT DRAWINGS



**GROUND FLOOR PLAN**

- 1. Boutique Restaurant
- 2. Open Food Court
- 3. Click and Collect Shopfront/Grocery Store
- 4. 4\*1 BHK
- 5. Interactive Area
- 6. Student Bedroom 6\*1
- 7. Open Kitchen
- 8. Open Living and Dining

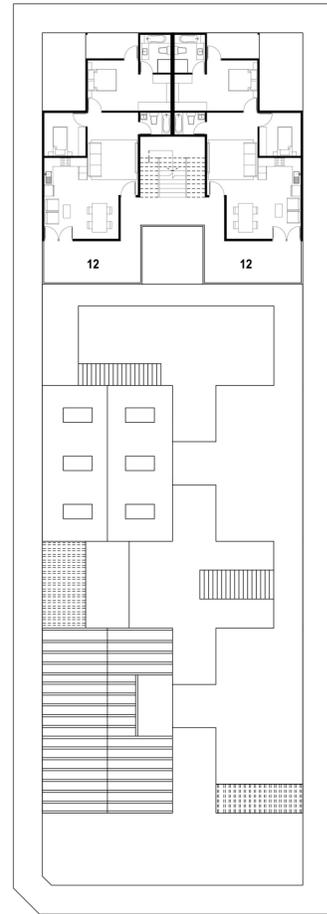
SCALE 1:200



**FIRST FLOOR PLAN**

- 9. Community Farming Space
- 10. Rooftop Food Court
- 11. Office Spaces
- 12. 4\*2 BHK

SCALE 1:200



**SECOND FLOOR PLAN**

- 12. 4\*2 BHK

SCALE 1:200

