2025

SOLO TECTURE

ARCHITECTURE PORTFOLIO

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ARCHITECTURE PORTFOLIO

SELECTED ACADEMIC AND COMPETITION WORKS

EDUCATION

University of Salford, Manchester, UK
MSc. in BIM and Digital Built Environment (Distinction), Sep 2024 - Sep 2025

Politecnico di Milano, Lecco, Italy
MSc. in Building and Architectural Engineering, GPA: 110L/110 (Cum laude), Sep 2017 - July 2020

Arba Minch University, Arba Minch, Ethiopia
BSc. in Architecture, GPA: 3.73/4.00 (Honours), Sep 2011 - Mar 2016

PROFESSIONAL EXPERIANCE

IMM Design Lab, Politecnico di Milano, Milan, Italy
Digital Built Environment Researcher, Jul 2021 - Present

Gogo Studio, London, UK
Architectural designer, Sep 2020 - May 2021

Fasil Giorghis consult, Addis Abeba, Ethiopia
Intern Architect, Mar 2014 - Aug 2014

SKILLS

ISO 19650 Series
COBie and IFC Data Management
BIM Execution Plans (BEP)
Lean Construction Principles
BIM Work-flows and Concepts
Revit (Architecture,MEP,Structure)
Rhino
BlenderBIM / Bonsai
Dynamo for Revit
BIM 360
Solibri
Navisworks Manage
Synchro 4D
CostX (Quantification)
Microsoft Office Suite & Adobe PS/AI/ID

MEMBERSHIPS & AWARDS

Student Member: Chartered Institute of Building (CIOB).
Gold Scholarship: Politecnico di Milano (Awarded for academic excellence and merit).
Erasmus Mobility Scholarship: Studied Architectural Technology at Robert Gorden University (Aberdeen) for half a year.
Polisocial Award 2020: Part of a funded research initiative at Politecnico di Milano focusing on social impact projects in the built environment.

LANGUAGES

English (Proficient), Italian (Beginner)

Solomon Tesfaye
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+4477 788 318 98

ACADEMIC WORKS

ROBERT GORDEN UNIVERSITY
POLITECNICO DI MILANO

WITHOUT SMART SLUM

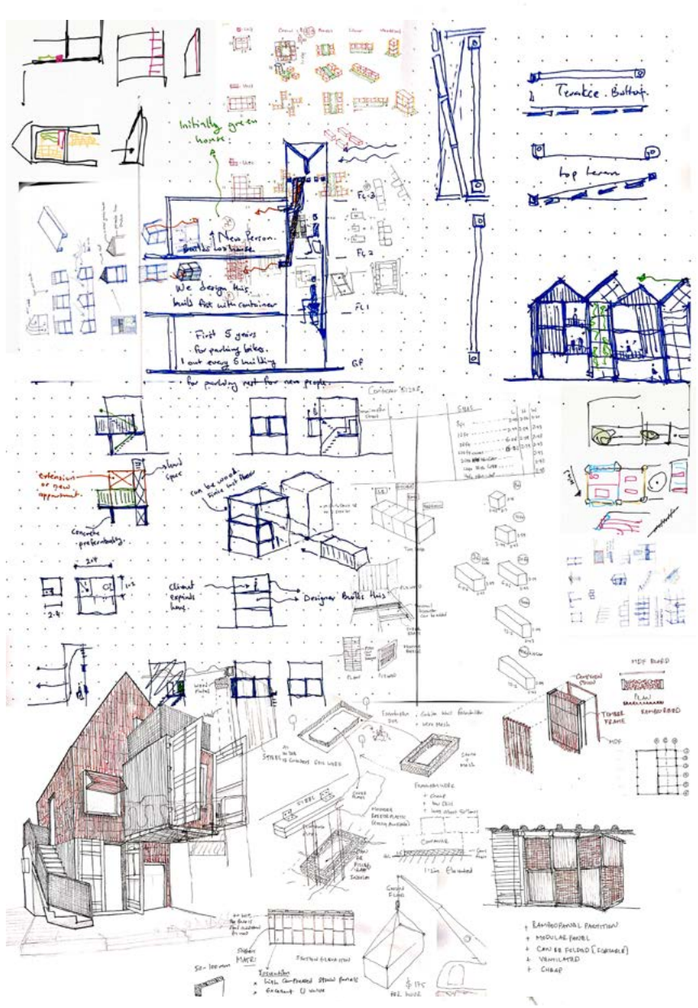
SMART without SLUM

QUELIMANE, MOZAMBIQUE

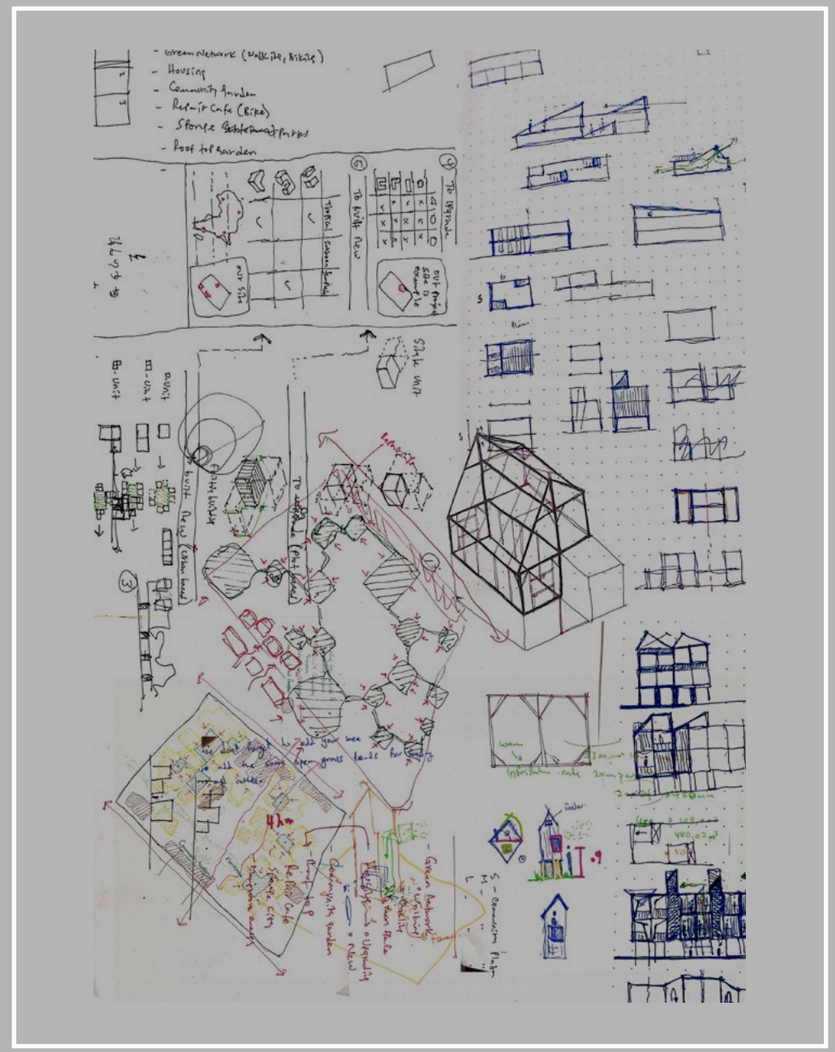
FINAL THESIS PROJECT 2020

Quelimane is a seaport in Mozambique. It is the administrative capital of the Zambezia Province and the province's largest city and stands 25 km (16 mi) from the mouth of the Rio dos Bons Sinais (or "River of the Good Signs").

The most common local language is Chuabo. Quelimane, along with much of Zambezia Province, is extremely prone to floods during Mozambique's rainy season. The most recent bout of severe flooding took place in January 2007.



The **abundant** of containers in Quelimane and the availability of natural materials such as bamboo, timber and straw makes the design to be rely on those materials. **Containers** in the port of Quelimane are easily available to the users interms of transportation and **affordability**.It is also possible to observe container shelters, shops and small businesses built out of container in Quelimane.



These would give the slum dwellers a sense of confidence and the know how on using traditional knowledge and materials to create a comfortable, durable and aesthetically pleasing architecture. It also applied basic principles such as **modularity in construction system**, use of local materials, expandability for future needs and low cost in the early design stage.

the City scale intervention

Towards Airport

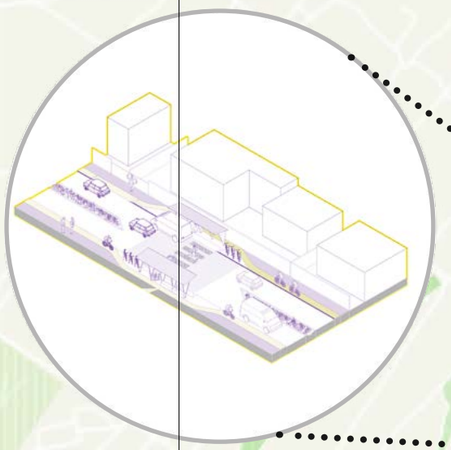
Towards Milato

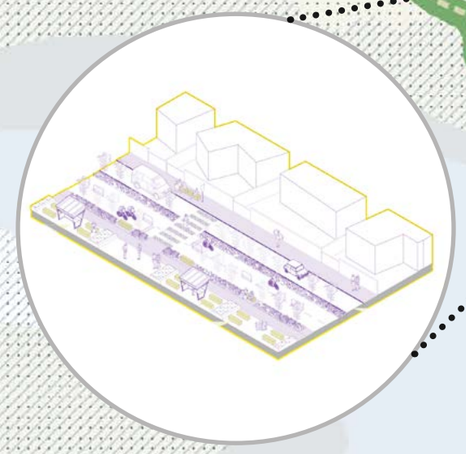
Towards Litave

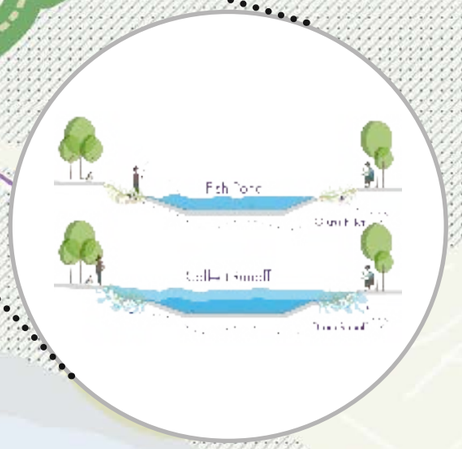
Greenbelt

City park

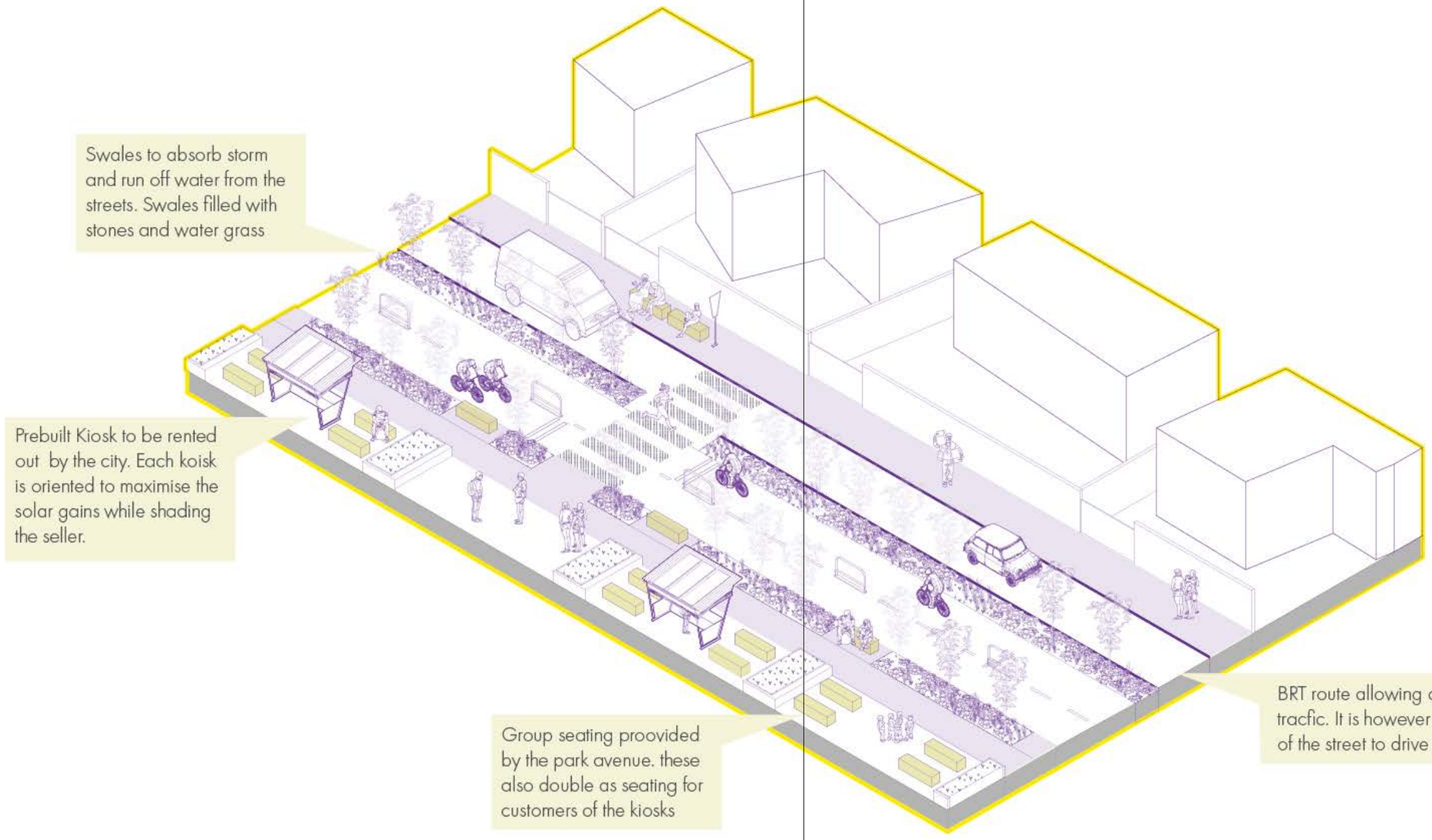
Chapa
Taxiroute







750 1500 2250 3000 m



SOFT MULTILAYER AGRITECTURE ROBUST TECHNOLOGY

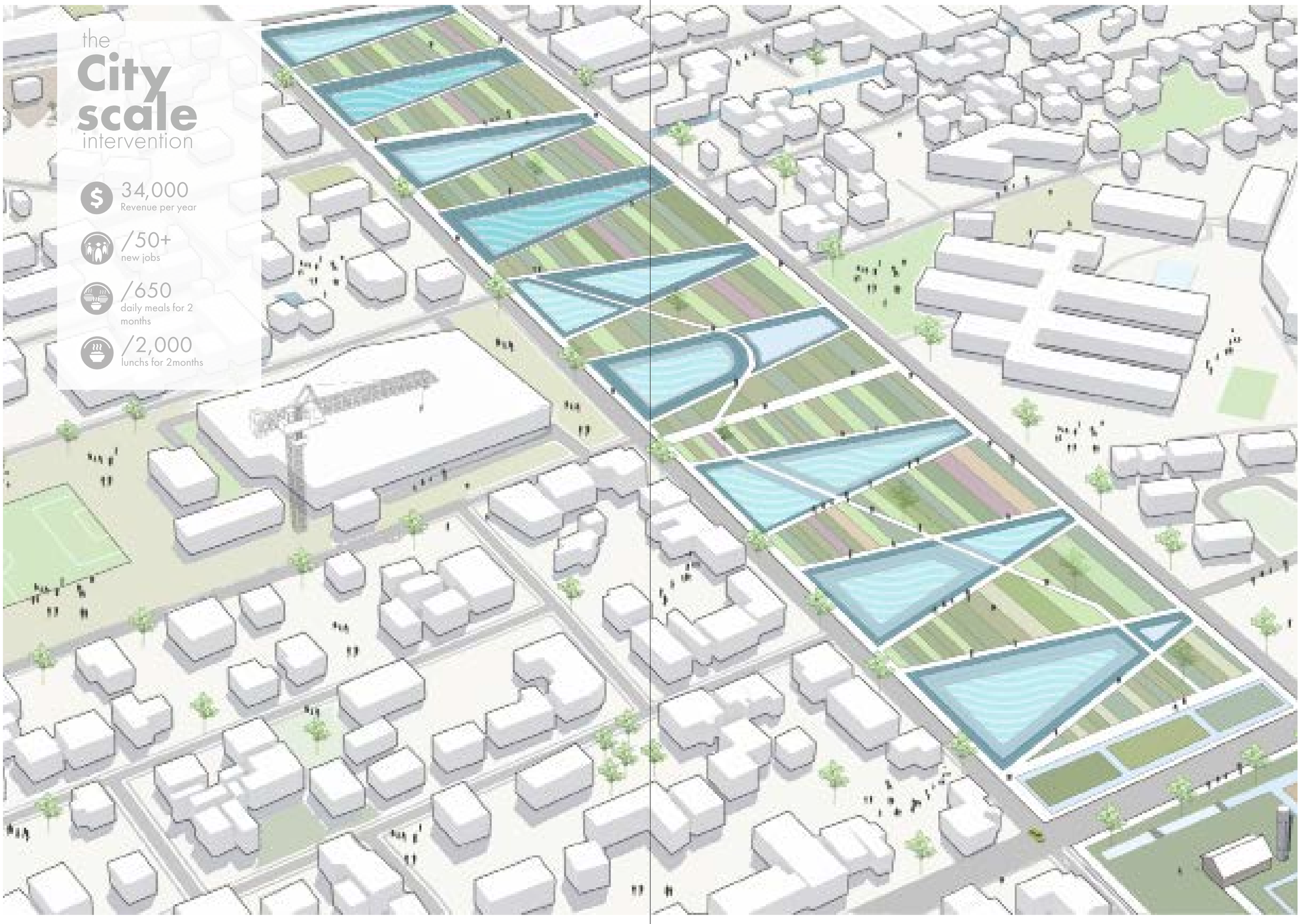
the City scale intervention

34,000
Revenue per year

/50+
new jobs

/650
daily meals for 2 months

/2,000
lunchs for 2months



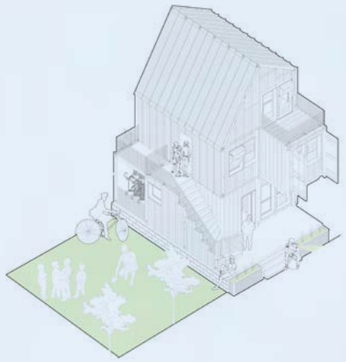
the Local scale intervention

Communal wells

Bike cafe

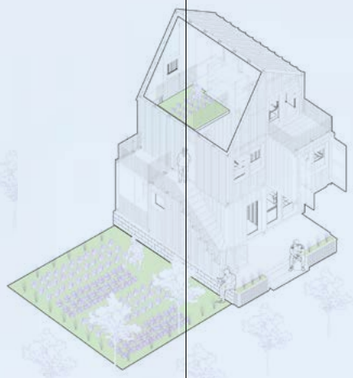
site

Bee Hives



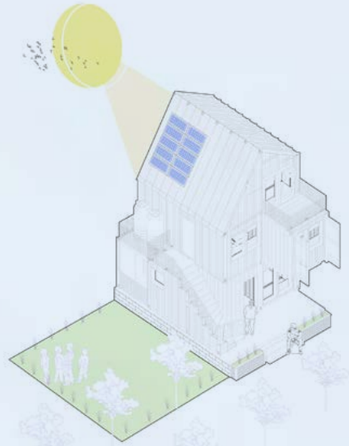
S The entrance has a small verndah space which makes the two families that are living on ground and upstairs to meet there in daily basis. The design also considers a bicycle parking space under the staircase which can accomodate three bikes at a time.

M The dwellers in the ground floor has the opportunity to expand their house horizontally and the families from upstairs can extend their home horizontally and verically. This concept allows to create the idea of Multilayer regarding functionality.

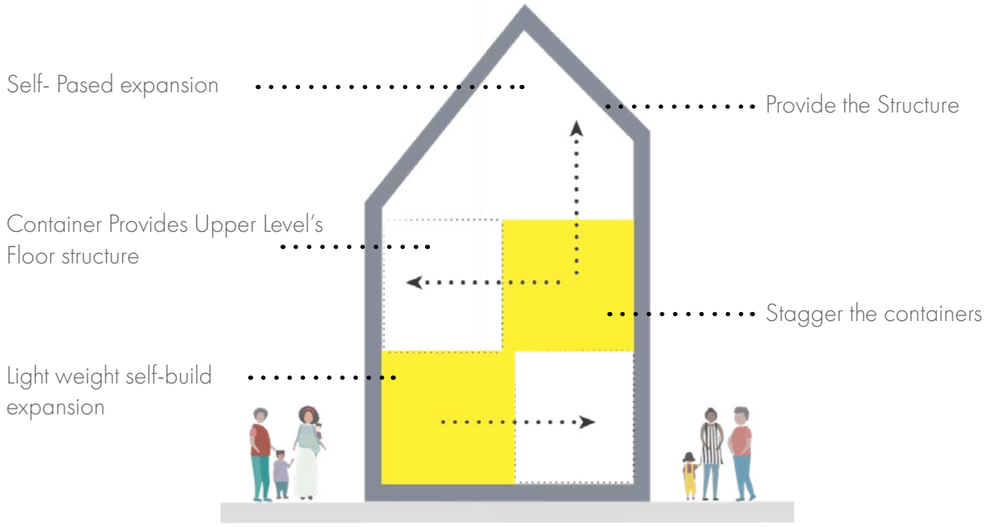


A The concept of Agritecture is to utilize the architecture not only for habitable spaces but also to produce food. By designing the building to produce food it is possible to make food part of urban life process by eliminating the physical barrier between food and us.

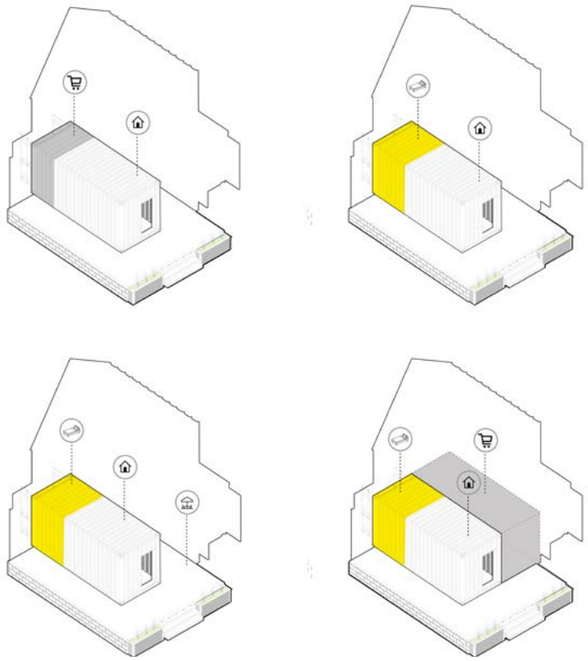
R The SMART houses are built on elevated foundation to protect themselves from flooding. it is also advantageous if the design allows scope for extending their size with minimal impact on both the original structure and surrounding buildings and spaces.

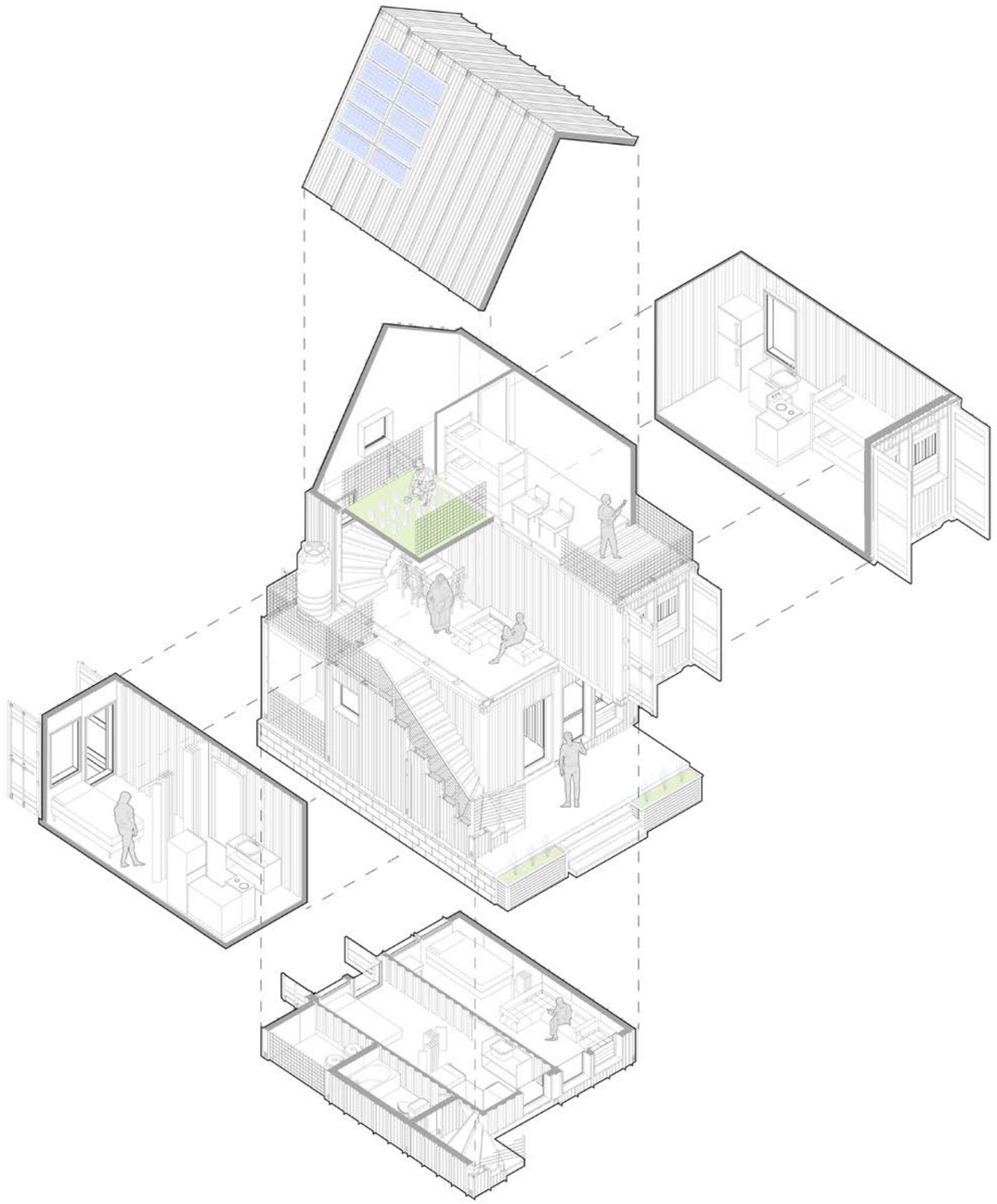


T The roof design was purposly slanted to be compatiable with the future integration of solar PV panels. Electricity produced by solar cells is also clean and silent. A biodigester converts fermentable organic matter into a combustible gas and organic manure.



The design strategy allows the occupants to **expand the spaces** based on their family size, economic status and functional requirnment. The dwellers in the ground floor has the opportunity to expand their house horizontally and the families from upstairs can extend their home **horizontally** and **verically**.





Phase one

The buildings in yellow color are identified as to be upgraded. Where as the purple buildings were demolished.

Phase Two

In this stage, the construction of 24 new foundations will begin. The SMART houses are groupedin different parts of the site so that the sense of community can be acheived.

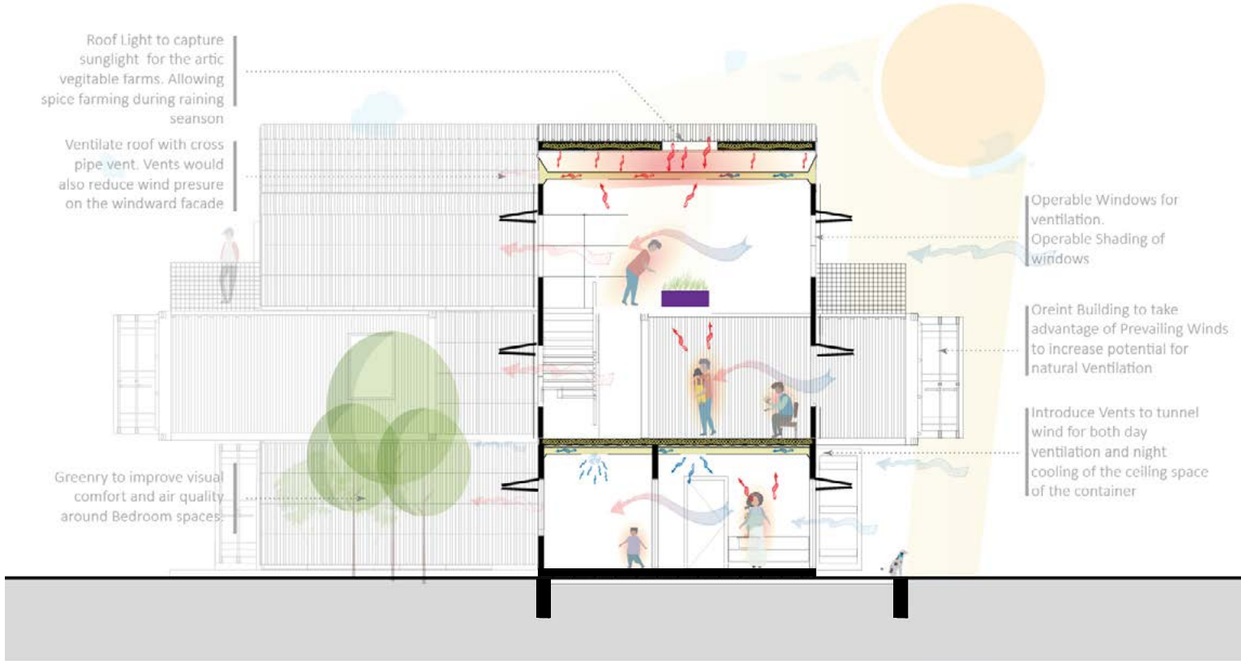
Phase 3&4

These can be considered as the final construction phases in which the owner of the new houses will bring the containers to place on the foundations that already built.

The selected study block was a brownfield area within Barrio 11. The city of Quelimane has been projected to grow by approximately 146,641 people in 2035. This is equivalent to about 64% increase in population. This growth can be assumed to come with its housing issues and inevitably slum growth. The urban block study addresses this issue using the prototype SMART house.

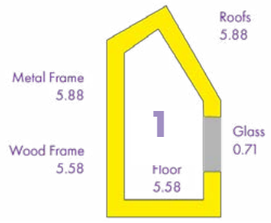
PASSIVE STRATEGY

OPAQUE/TRANSPARENT CASE

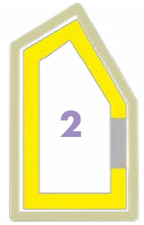


Opaque Strategies, The selection of materials for the layering of the structure is based on the architectural decision to work with localized sources. This constraints the designer to find thermally performing materials that can found locally. The decision is also guided by the building living challenge Materials Petal. **Compressed straw** (Straw is commonly found in local construction of Quelimane. In developed countries the return to straw for construction has seen the development of the European Straw Bale Gathering). Ventilation cavity (A ventilation cavity has been decided between the bamboo layer and the water proofing. This is meant to allow the ventilation of the facade).

Transparent Strategies, The transparent facade mainly consist of the windows. The widow dimension was fixed at a width of 900mm due to the modular approach used in the structure. For the selection of window to wall raio, research paper by Mamdooh ALwetaishi was consulted. In his research, he studied the effects of 5%,10%,20% and 30% window to wall ratios on buildings within a hot dry and hot humid climates. He suggested the use of 10% in the hot dry and 20% maximum in the hot humid. However the study was not natural ventilation based,as such study admitted to reduced air exchange due to the 20% window to wall ratio by calling it sufficient.



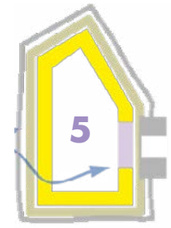
Base model



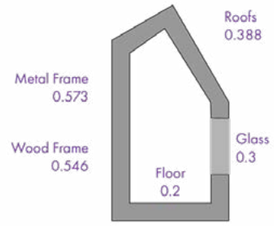
Selected 75 cm insulation

Opaque Strategies

2/3 Shading

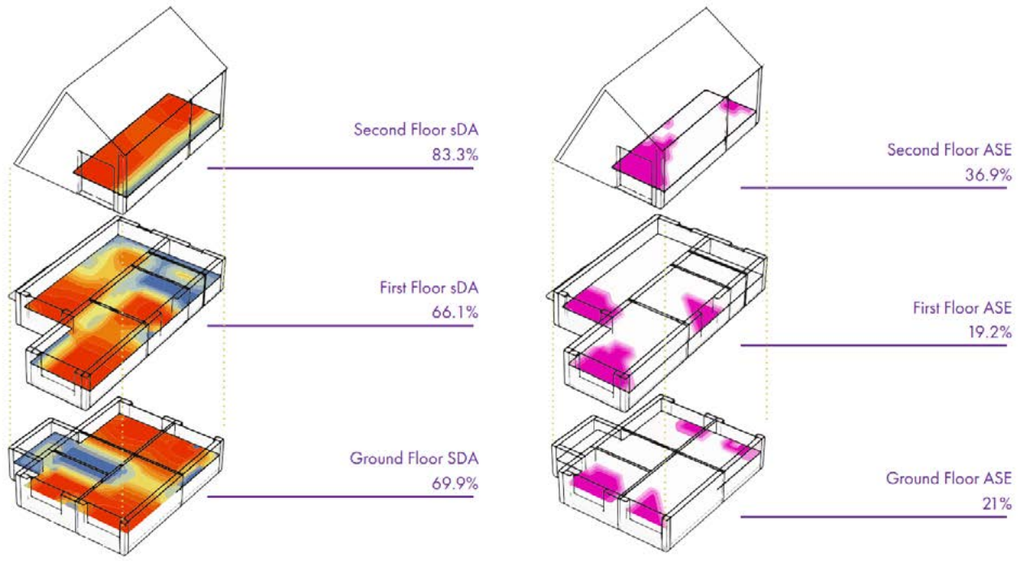


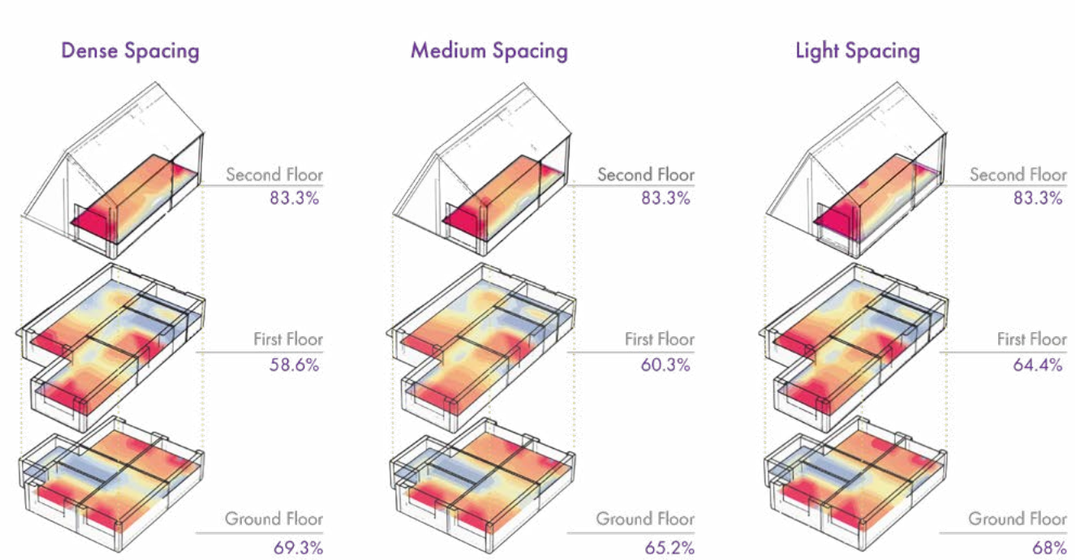
Day and Night Ventilation

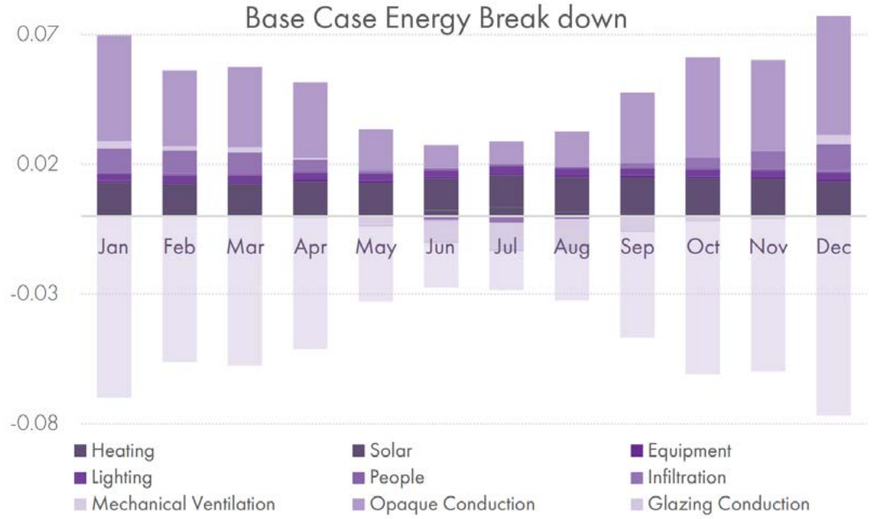


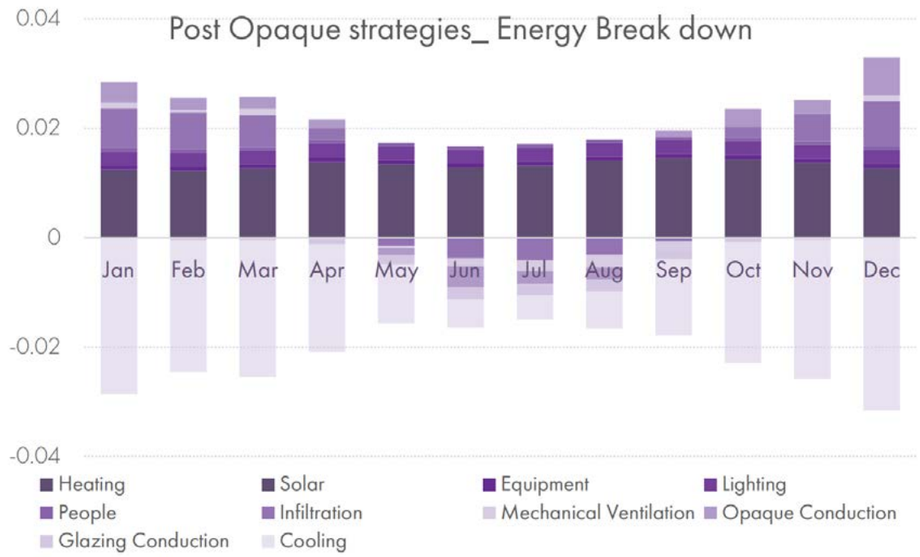
ASHRAE Metal Frame Base model -2010

This is the target









1 Finish layer: Aluminum based Ridge cover
| 0.5mm Thick |30 cm wide | λ = 50W/mk |

2 Substructure : Intermittent Spacer
| 40cm centers |

3 Substructure : Perforated metal Vent screen

4 substructure : Continuous Galvanized Z brackets

5

6 Primary Structure support: L bent reinforcement bar fixed between
(Locally Fabricated according to specification)
| Dia. = 16mm |

7 Insulation layer : Compressed straw with in the perpendicular
direction
75cm Thick | λ = 0.052 W/mK | Density = 90.0 kg/m^3
Substructure: Plywood support for Roofing
| 1.8cm Thick | 5cm wide |Density =600 kg/m3 |λ= 0.44 W/mK |

8 Finish: Plywood coated with penetrating oils waterproofing
| 1.8cm Thick | 100cm wide |Density =600 kg/m3 |λ= 0.44 W/mK |

9 Primary Substructure : Hardwood (Roof Module)
| 4.5cm Thick | 10cm wide |

10 Structure support: Reinforcement bar welded to Plate (Locally
Fabricated according to specification)
| Dia. = 16mm |

12 Structure support: Weld Plate (Locally Fabricated according to
specification)
| .2 cm Thick |

1 Substructure : Wood battens support
2cm x 2cm

2 Finish layer: Long Span Aluminium based standing sear
0.5mm Thick |5 cm wide | λ = 50W/mk |

3 Structure support: Reinforcement bar locks (Locally Fab
according to specification) |
Dia. = 16mm

4 Structure support: Equal Angled steel pre-nailed into m
frames
| .4cm Thick | 4cm X 4cm

5 Substructure : Wood battens support
2cm x 2cm

6 Substructure: Plywood
0.5cm Thick | 100cm wide |Density =600 kg/m3 |λ= 0.4

7 Sub - Finish Layer: Bamboo layer (sticks aranged / loca
/ Local Bamboo wattle)
| max of 5cm Thick

8 Substructure: Plywood
1.8cm Thick | 5cm wide |Density =600 kg/m3 |λ= 0.44 V

9 Substructure : Tite-Loc AR clip (Replace based on equ
form local Supplier)

10 Sub- Finish Support : Wood batten / bamboo strip
1.25cm Thick | 5cm wide |

11 Structure : Hardwood
4.5cm Thick | 14.5cm wide |

12 Structure : Welded Rebar on the container structure su
1.6cm Reinforcement bar

13 Container Structure : Top rail
|.4cm Thick | 6cm x 6cm|

14 Substructure : Hardwood
| 4.5cm Thick | 7.5cm wide |

15 Container Finish: Metal sheets

16 Container Finish : Inner layer of Container sheets

17 Substructure: Plywood
0.5cm Thick | 100cm wide |Density =600 kg/m3 |λ= 0.4

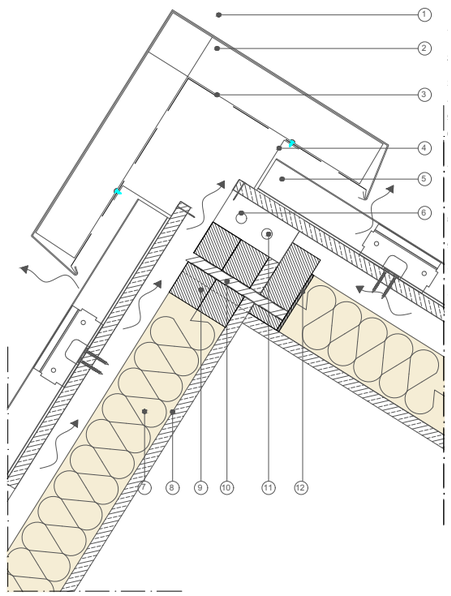
18 Insulation layer : Compressed straw with in the perpenc
direction
75cm Thick | λ = 0.052 W/mK | Density = 90.0 kg/m^3
Substructure: Plywood support for Roofing
1.8cm Thick | 5cm wide |Density =600 kg/m3 |λ= 0.44 V

19 Finish: Plywood coated with penetrating oils waterproo
1.8cm Thick | 100cm wide |Density =600 kg/m3 |λ= 0.44

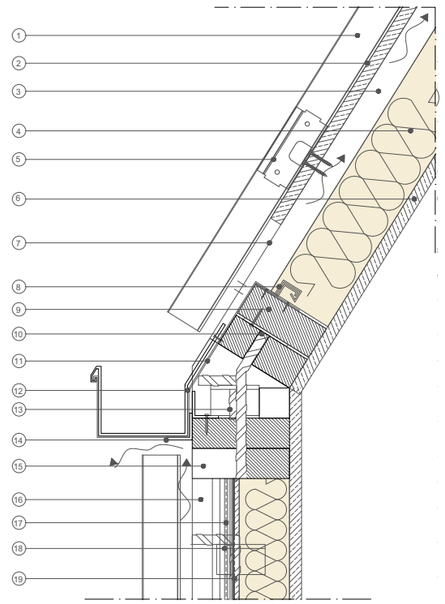
20 Structure : Hardwood
4.5cm Thick | 10cm wide |

21 Substructure : Wood battens support
2cm x 2cm

A



B



1 Finish layer: Long Span Aluminium based standing seam sheets
0.5mm Thick |5 cm wide | λ = 50W/mk |

2 Substructure: Plywood
0.5cm Thick | 25cm wide |Density =600 kg/m3 |λ= 0.44 W/mK

3 Ventilation layer: Fully ventilated roof cavity with moving fresh
air |4.0 cm thick moving air layer assumed as a homogenous
layer | 0.1 w/m.k on the interior side and 0.04 exterior side.

4 Insulation layer : Compressed straw with in the perpendicular
direction
75cm Thick | λ = 0.052 W/mK | Density = 90.0 kg/m^3
Substructure: Plywood support for Roofing
| 1.8cm Thick | 5cm wide |Density =600 kg/m3 |λ= 0.44 W/mK |

5 Substructure : Tite-Loc AR clip (Replace based on equivalent
form local Supplier)

6 Finish: Plywood coated with penetrating oils waterproofing
| 1.8cm Thick | 100cm wide |Density =600 kg/m3 |λ= 0.44 W/mK |

7 Primary Structure : Hardwood (Roof Module)
| 4.5cm Thick | 14.5cm wide |

8 Substructure Support : Roof Gutter Anchorage
| .2cm thick | 2cm x 2cm Anchor | 7.6 cm wide Plate

9 Primary Substructure : Hardwood (Roof Module)
| 4.5cm Thick | 12.5cm wide |

10 Structure support: Reinforcement bar welded to Plate (Locally
Fabricated according to specification)
| Dia. = 16mm |

11 Substructure support : Roof gutter Anchor strips
.2cm Thick | 5cm wide | 55cm long

12 Weatherproofing : Roof Gutter
.2 cm Thick | 10cm X 12.5cm |

13 Structure support: Equal Angled steel pre-nailed into roof
modular frames
| .4cm Thick | 4cm X 4cm

14 Substructure Support : Equal Angled steel pre-nailed into wall
modular frames
| .4cm Thick | 4cm X 4cm

15 Primary Substructure : Hardwood (Roof Module)
| 4.5cm Thick | 14.5cm wide |

16 Primary Structure : Hardwood (Wall Module)
| 4.5cm Thick | 14.5cm wide |

17 Sub - Finish Layer: Bamboo layer (sticks arranged / locally
arranged / Local Bamboo wattle)
| max of 5cm Thick

18 Structure support: Equal Angled steel pre-nailed into wall
modular frames (for lateral frame connections)
| .4cm Thick | 4cm X 4cm

19 Substructure: Plywood
0.5cm Thick | 100cm wide |Density =600 kg/m3 |λ= 0.44 W/mK |

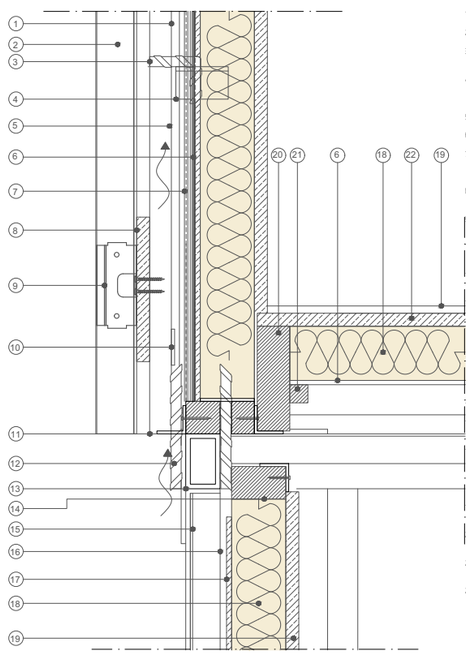
A

B

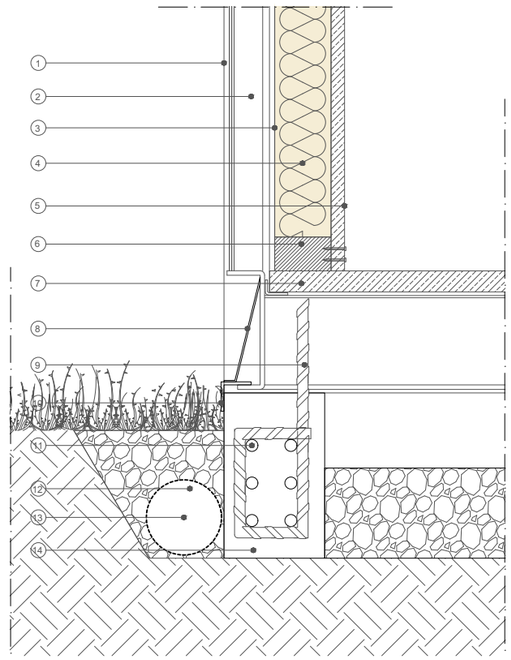
C

D

C



D



1 Container Finish: Metal sheets

2 Container Finish : Inner layer of Container sheets

3 Substructure: Plywood
0.5cm Thick | 100cm wide |Density =600 kg/m3 |λ= 0.44 W/mK |

4 Insulation layer : Compressed straw with in the perpendicular
direction
75cm Thick | λ = 0.052 W/mK | Density = 90.0 kg/m^3
Substructure: Plywood support for Roofing
1.8cm Thick | 5cm wide |Density =600 kg/m3 |λ= 0.44 W/mK |

5 Finish: Plywood coated with penetrating oils waterproofing
1.8cm Thick | 100cm wide |Density =600 kg/m3 |λ= 0.44 W/mK |

6 Structure : Hardwood
4.5cm Thick | 7.5cm wide |

7 Container Substructure : Plywood flooring
2.8cm Thick | 100cm wide |Density =600 kg/m3 |λ= 0.44 W/mK |

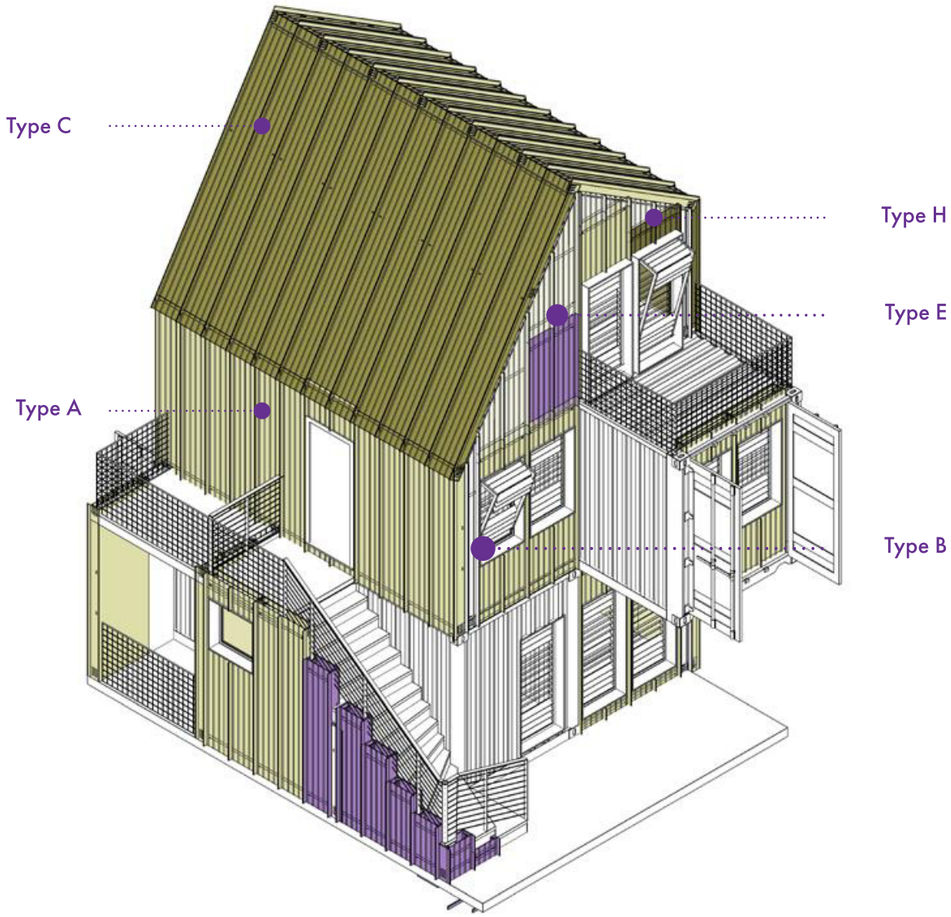
8 Weatherproofing Strip: L bent Metal sheet weld to angled steel
.2cm Thick | 13cm X 1.6 cm |

9 Structure Support : P bent Reinforcement Bar
Dia 1.6cm

10 Weatherproofing Strip : Angle steel
.4cm thick | 4cm X 4cm |

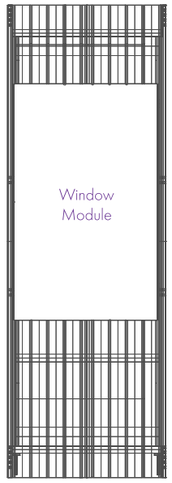
11 Weatherproofing Strip : Gravels for Splash dissipation and
foundation protection
| Dia range 2cm - 5cm |

12 Drain : Perforated PVC pipe
Dia 10cm

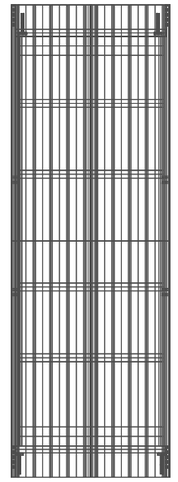


This blow up introduces the major sections of the building. The Facade modules that make up the structure have been quantified to give an express the modular nature of the construction. The Module types have be envisioned as one to be carried out off-site. The team thus came up with module types A-H. The variations in type A are meant to house Windows, Doors. The modules are also thought of to allow the pre-construction of the frames according to the type. Although modularity can most often restrict the use of variety , the team managed to achieve the a variety towards beauty in the roof form. This resulted in the module type C, E and H. Modules type G, F and B would be adjusted on-site.

Type A
Type A with a WIndow
Qty - 5pcs

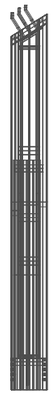


Type A
Type A without Window
Qty - 17 pcs

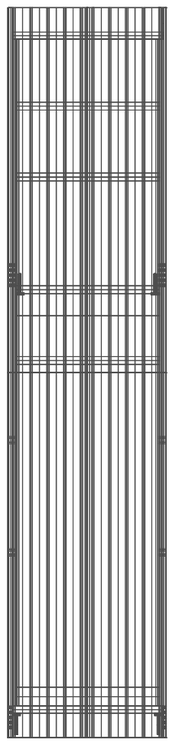


Type A
Type A with a Door
Qty - 5pcs

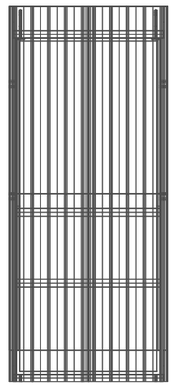
Type B
Type B _58 degree
Chamfered



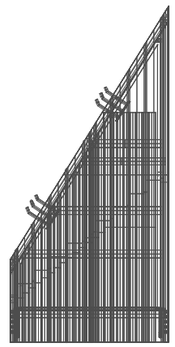
Type C
Roof _Height 4.6m
Qty - 6 pcs



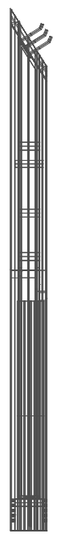
Type D
Wall / Floor _ Height 2.3m
Qty - 24 pcs



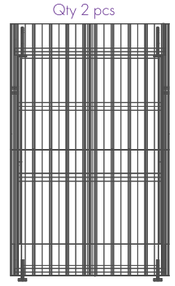
Type E
Offsite : Cross facade 58'
Qty - 4 pcs



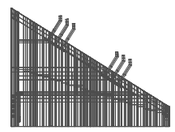
Type F
Onsite: Cornner Piece
Qty - 2 pcs



Type G
Onsite : Wall Height 2.3m
Qty 2 pcs



Type H
Offsite : Cross facade 32'
Qty 4 pcs



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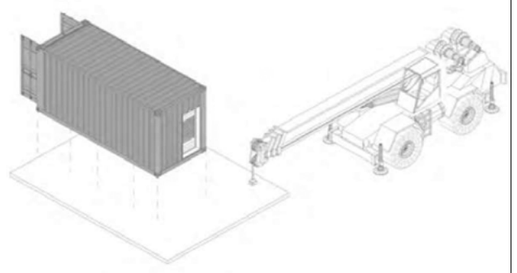

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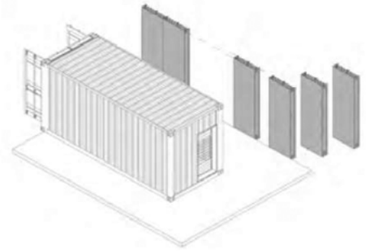

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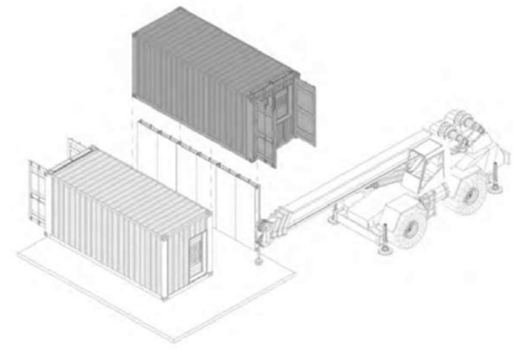

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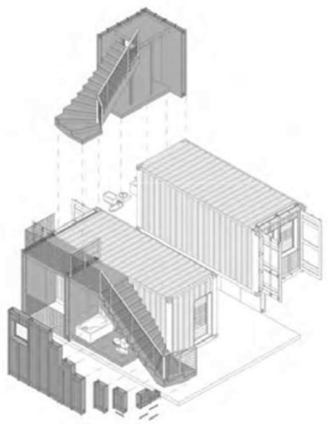

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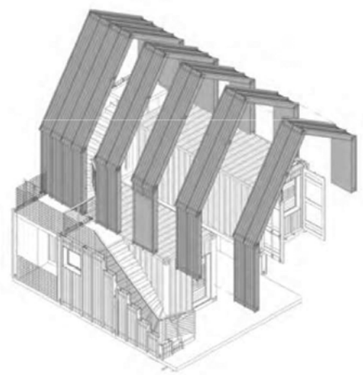

7

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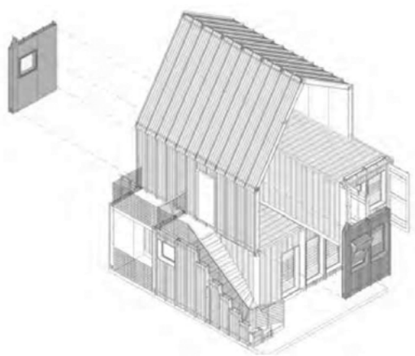
9



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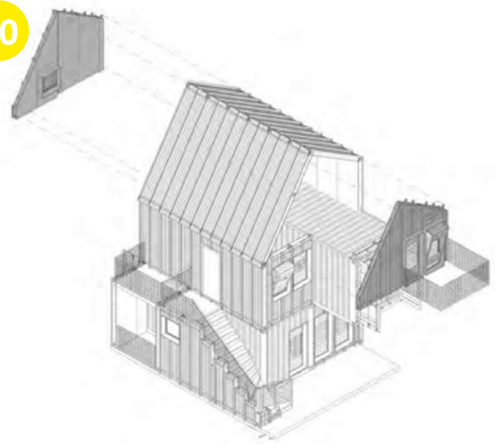


11

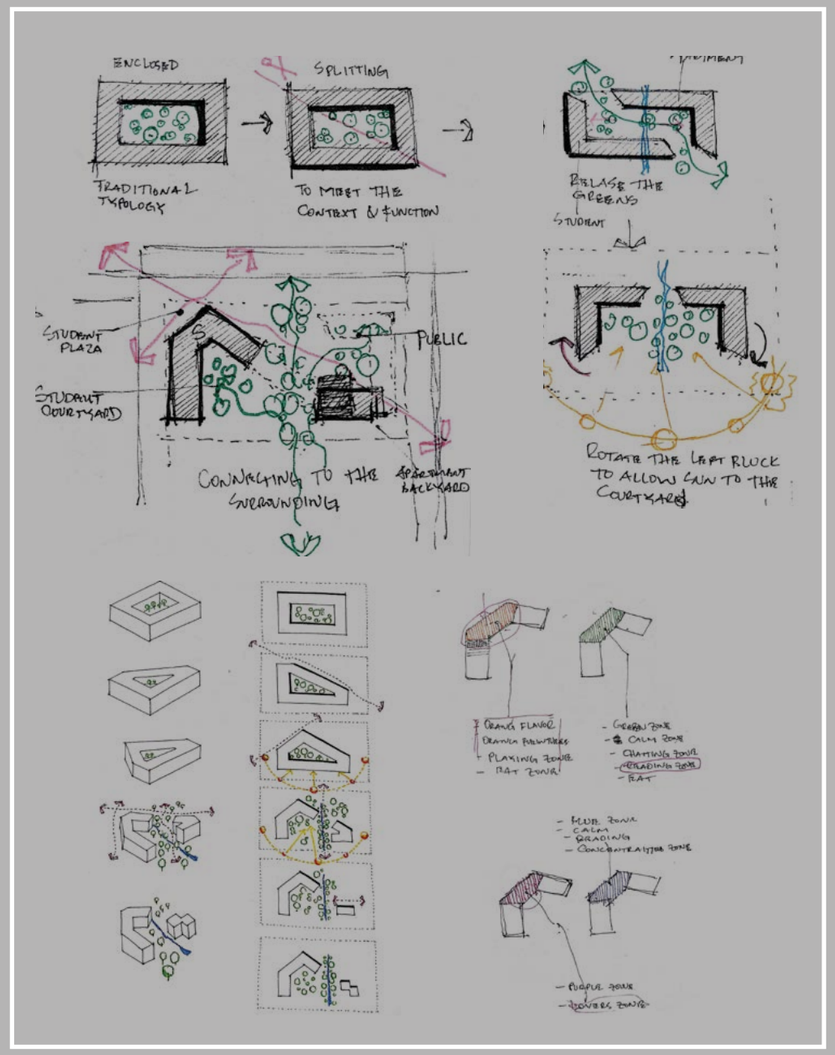
COLLABORATION WORK

SERIO HEIGHTS

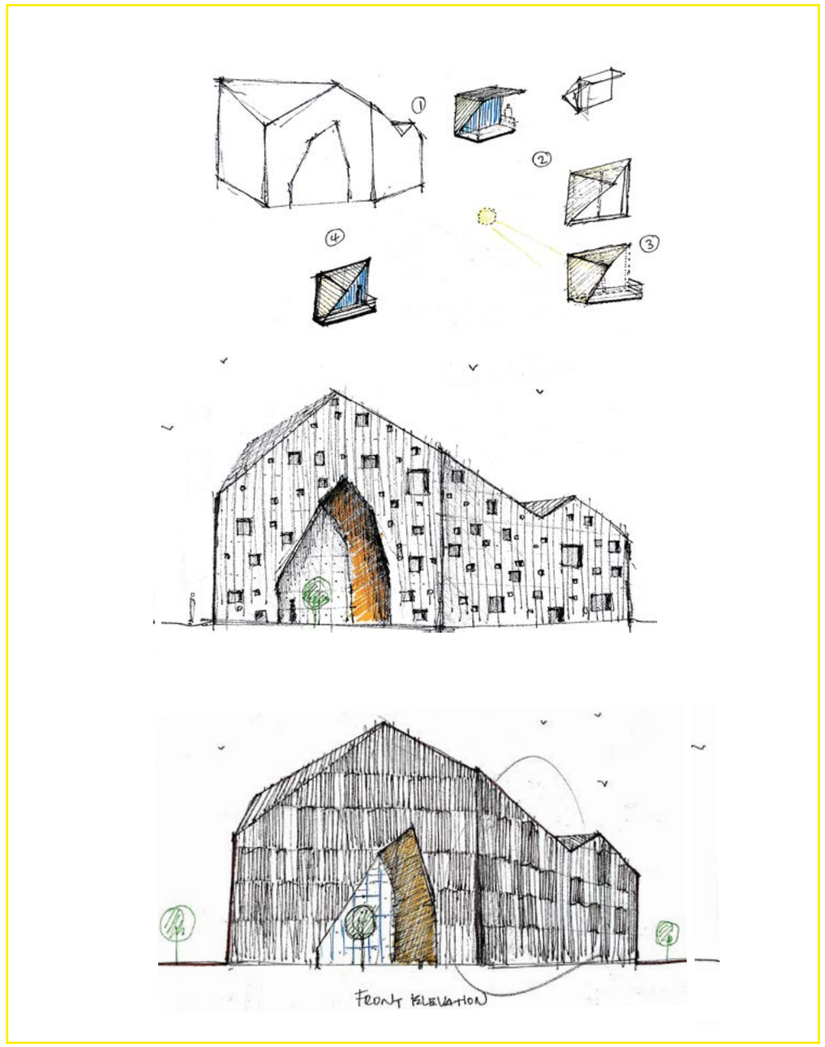
MILANO, ITALY

POLITECNICO DI MILANO 2019

Serio is included in the area selected for the European programme, Sharing Cities. This Horizon 2020 programme supports the redevelopment of the district as a smart low-energy neighborhood, adopting an innovative approach to address key environmental challenges, such as reducing the polluting emissions of buildings. Serio is also next to the Symbiosis development area. Currently under construction, it will host a business centre of excellence, including the headquarters of innovation companies, with new buildings boasting a high technological profile. The site is just 3 minutes' walk from the brand new Prada Foundation art complex which was opened in 2015 and has quickly become one of the city's most important cultural attractions.



The above original sketches of Serio Height shows how the building is evolved through a series of thinking process in which we redefined the traditional courtyard block into nZEB (nearly zero-energy building). By doing this the final energy consumption of the building (EUI) becomes 23 Kwh/m2year which catagorized under the active house standard. The energy design was part of the early design process which regards Comfort, Energy and Environment.

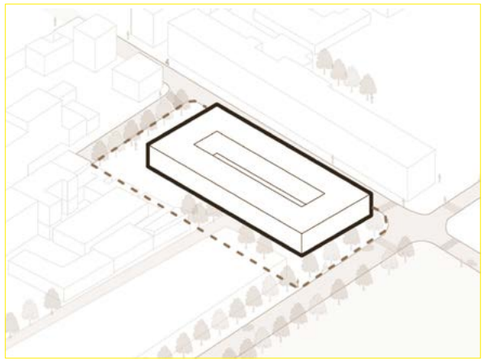


The Void entrance faced the direction to which the students predominatly entered the facility. It also gives the feeling of a living cave in the monolothic form with strongly defined inclined lines. Morover, the entrance gives an iconic character for the building. The sloping ends were design to be parallel at some points to the externl fabric. This however creates major concerns as to how to solve the detailing of these major joints and connections.

1

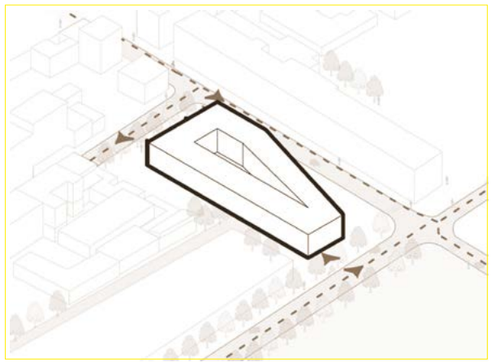
The Serio site has a cadastral area of approximately 5,468 sqm.

2



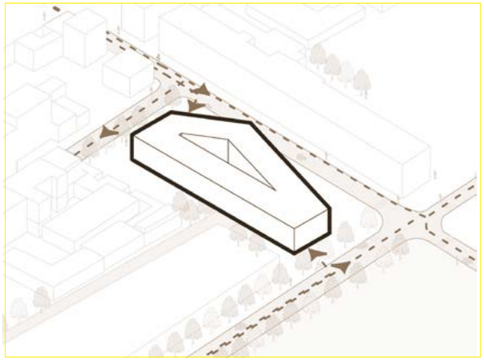
Traditional Milanese courtyard block, which have private inside and outside public spaces.

3



Chamfering the edge to create a public space and to connect the two streets in short path.

4

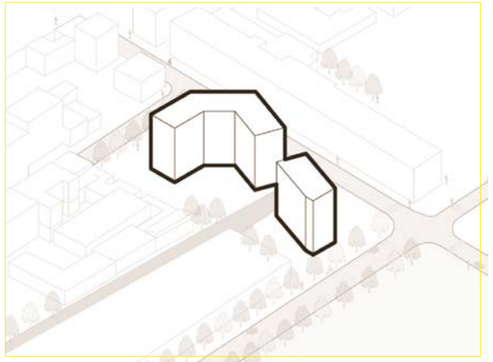


Chamfering the West corner of the block to create the student plaza and entrance.

5

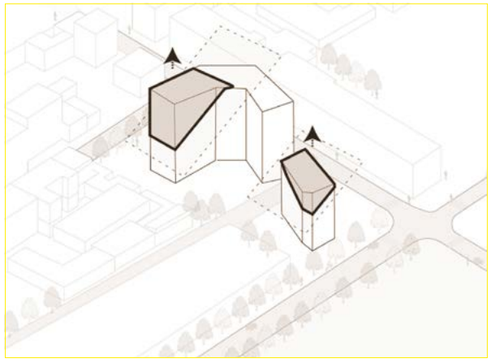
Cutting out the South part arm of the block to allow wind and sunlight to the courtyard.

6



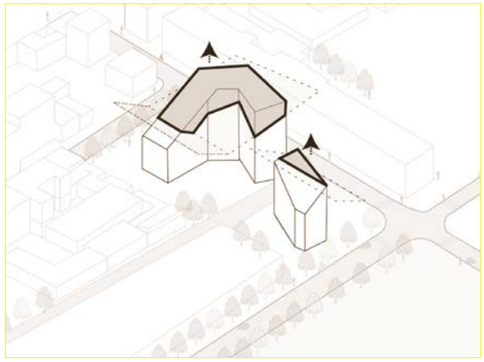
Splitting the block for both the existing water canal and to have two apartment blocks.

7



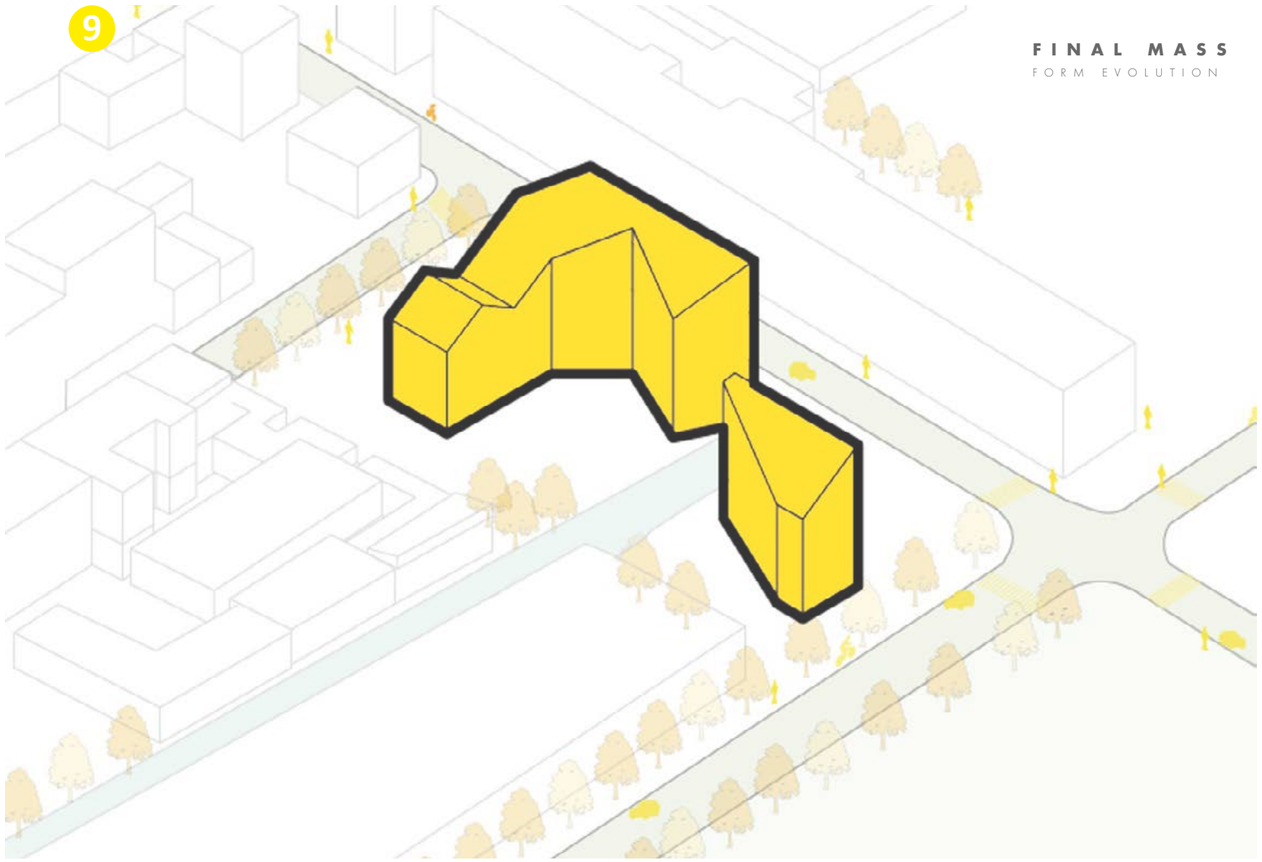
Cutting the block top at 330 to take advantage of the South sun using PVsolar panels.

8



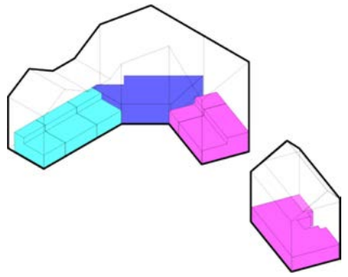
Cutting the North part of the block at 600 not to cast shadow on the immediate buildings.

9

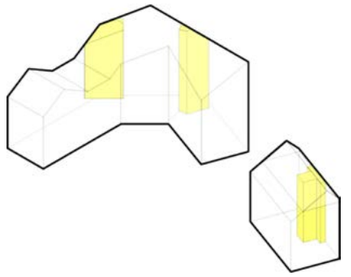


FINAL MASS
FORM EVOLUTION

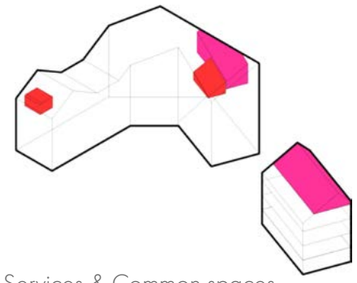
FUNCTIONAL LAYOUT
APARTMENT/STUDENT ACCOM.



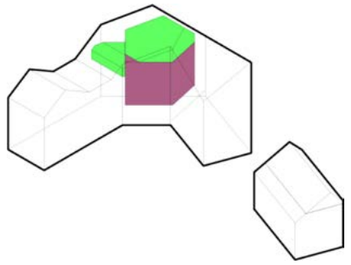
Transitional spaces



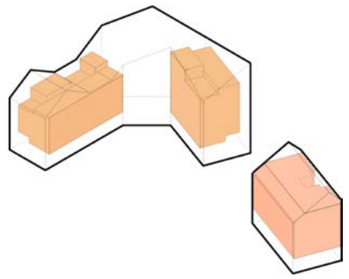
Vertical circulation



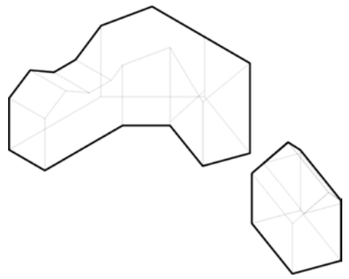
Services & Common spaces



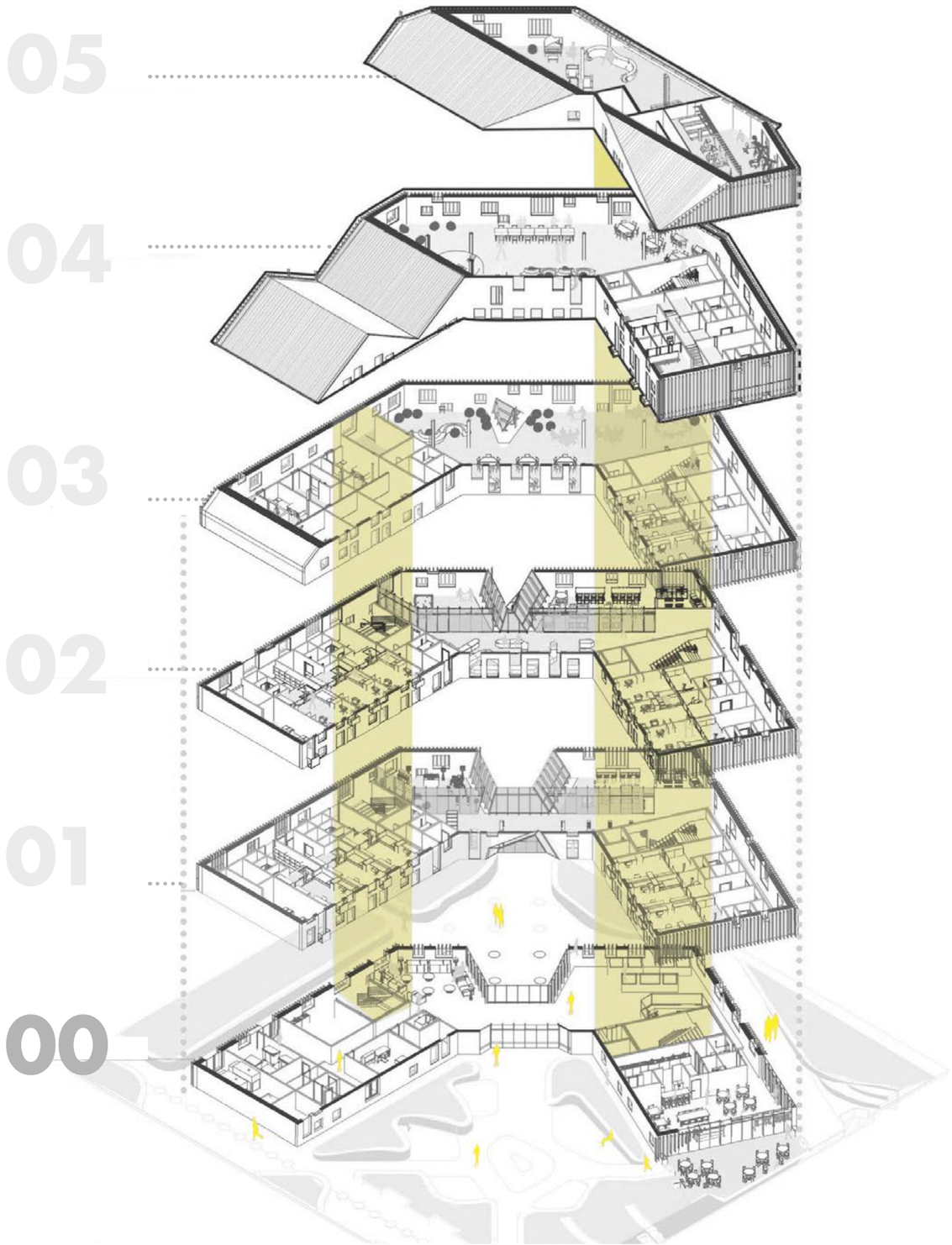
Kitchen and study areas



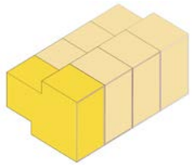
Apartments and Residences



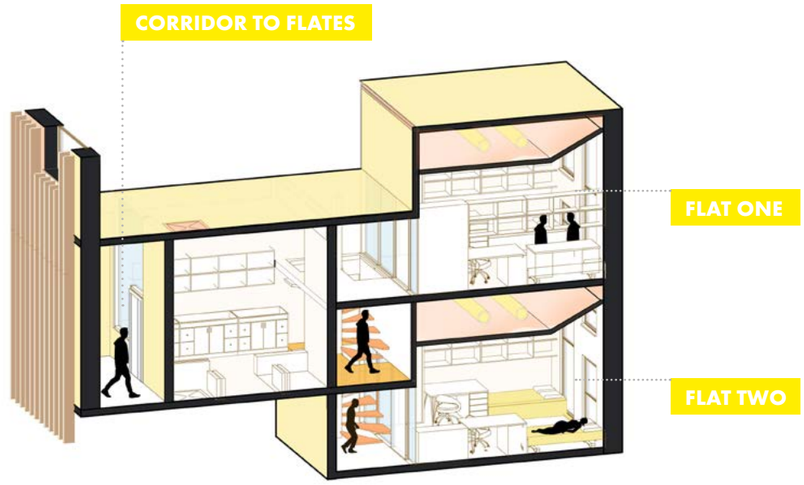
Final mass



Vertical arrangment



Horizontal arrangment



DUPLEX MODULE
ROOM/PLAN FLEXIBILITY

This is the typical arrangment of the room for studying and sleeping during the class season of the year.

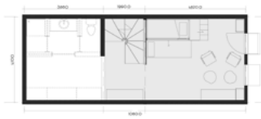
NORMAL MODE

In this arrangment of the room it is possible to rent the rooms out in summer when the students are leaving.

VACATION MODE

When student's guest arrive the can rearrange the furnitures into game mode to create a social interaction among them.

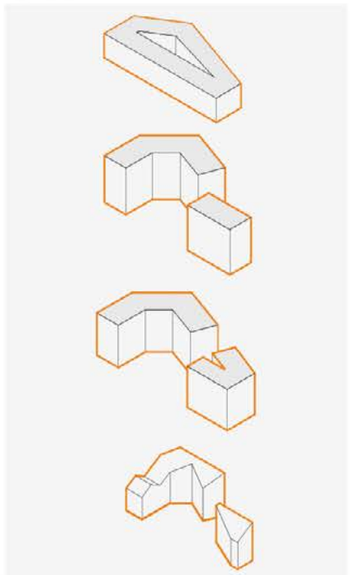
SOCIAL MODE



Each dorm unites has a kichenette which can be shared between the duplex units.

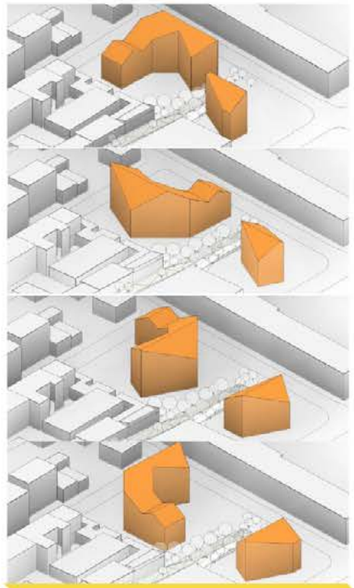
KITCHENETTE

1



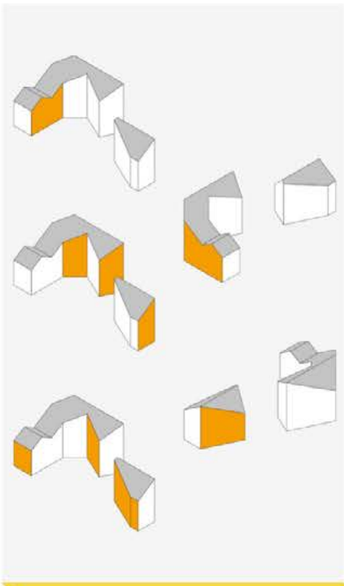
S/V FACTOR

2



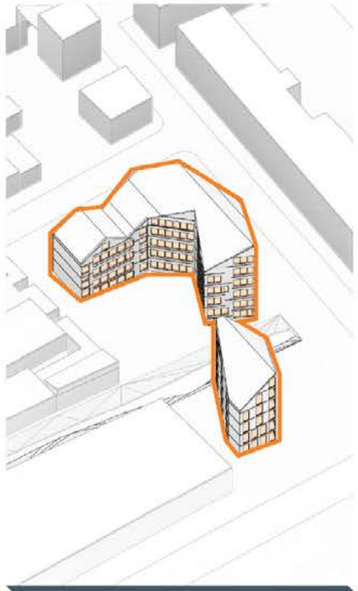
ROTATION

3



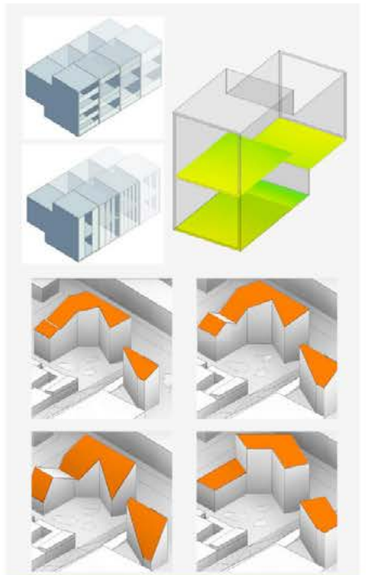
WINDOWS SIZING

4



WINDOWS OPTIMIZED MODEL

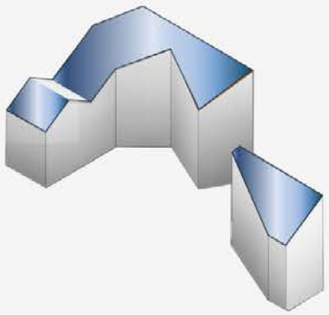
5



MODULE OPTIMAZATION

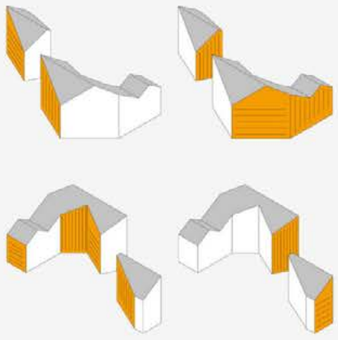
SOLAR PANEL SURFACE

6



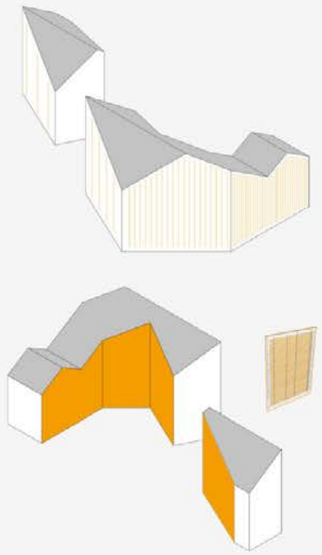
SLOPE OPTIMIZED MODEL

7



SHADING ANALYSIS

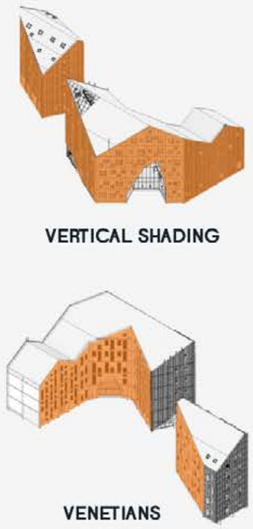
8



VERTICAL SHADING

VENETIANS

9

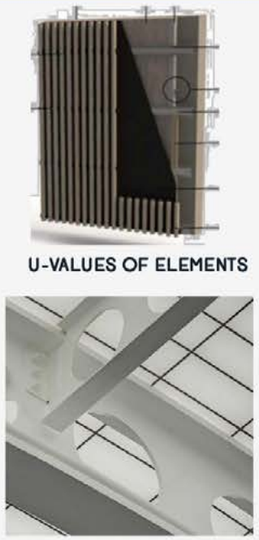


VERTICAL SHADING

VENETIANS

SHADING OPTIMIZED MODEL

10



U-VALUES OF ELEMENTS

U- VALUE OPTIMIZATION

1. The Serio site has a cadastral area of approximately 5,468 sqm. The Serio site has a cadastral area of approximately 5,468 sqm.
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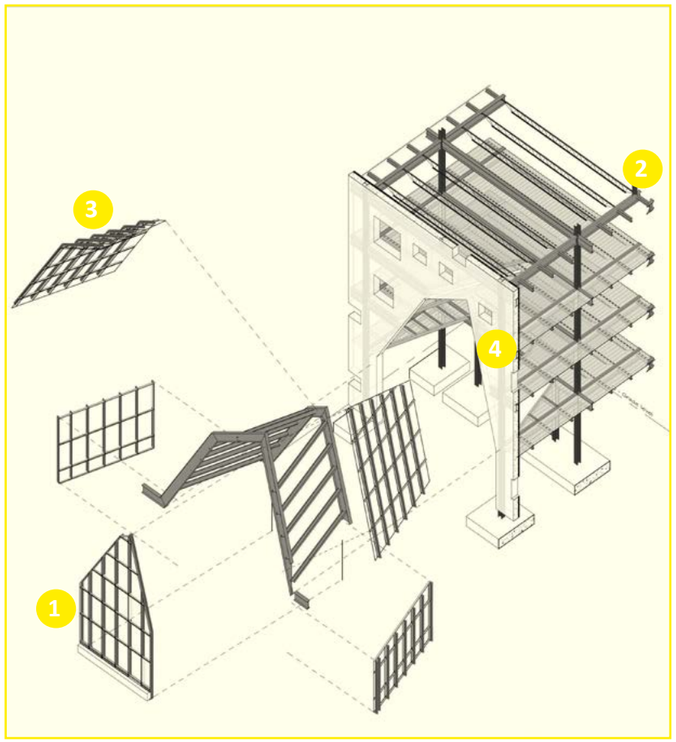
10. The Serio site has a cadastral area of approximately 5,468 sqm. The Serio site has a cadastral area of approximately 5,468 sqm.

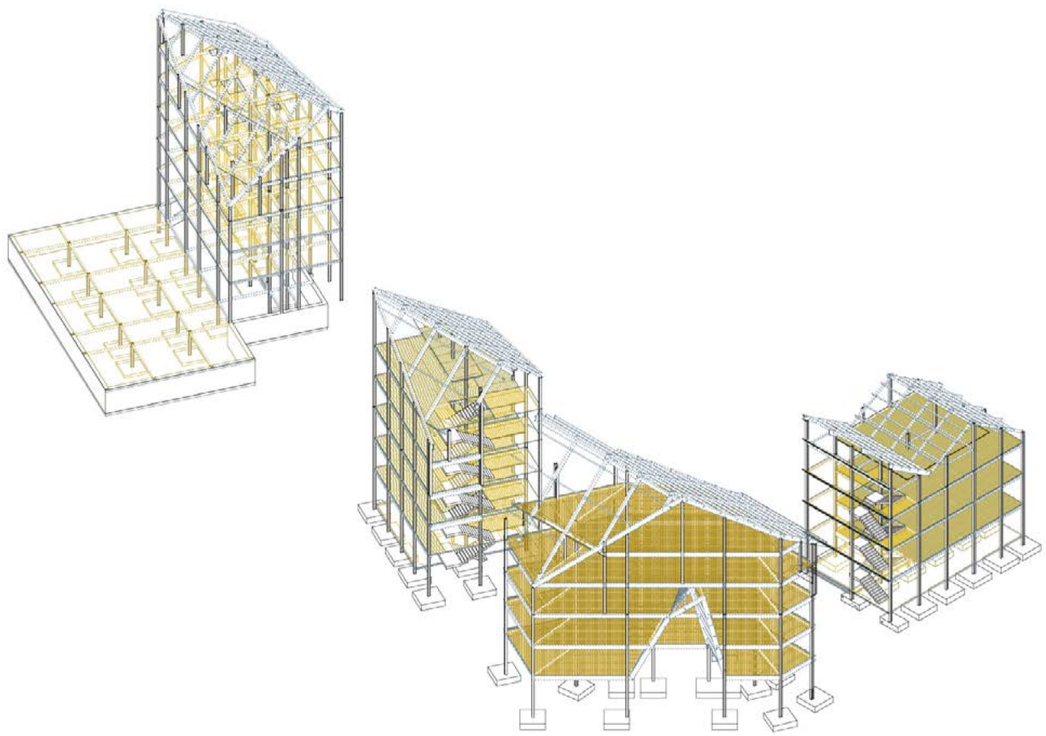
1 STICK FACADE GLAZING SYSTEM

2 I-STEEL SECTION BEAM



3 I-STEEL SECTION SECONDARY BEAM

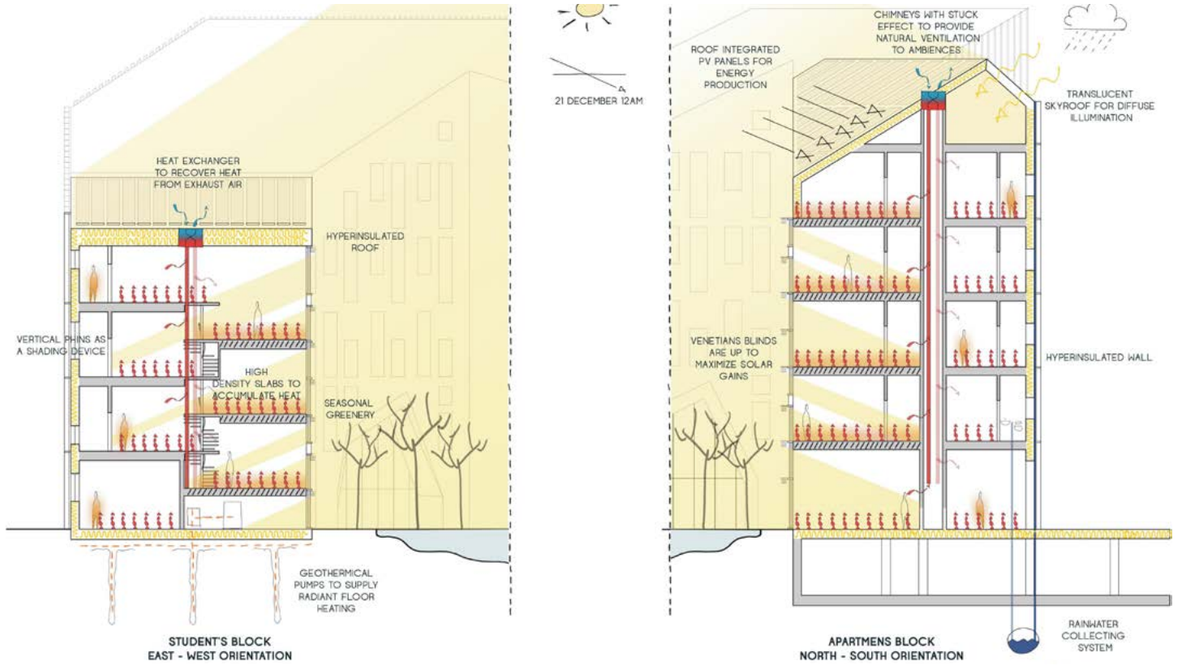
4 GLASS REINFORCED CONCRETE



ENTRANCE
STUDENT RESIDENCE

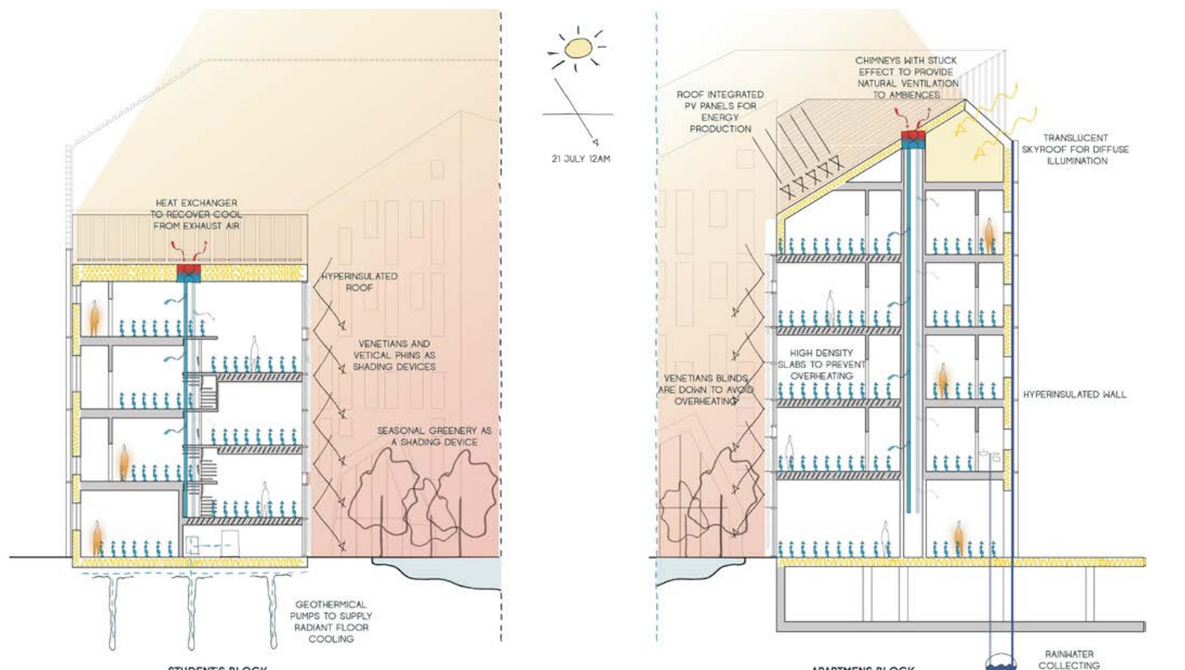
PASSIVE STRATEGY

WINTER AND SUMMER CASE



STUDENT'S BLOCK
EAST - WEST ORIENTATION

APARTMENS BLOCK
NORTH - SOUTH ORIENTATION



STUDENT'S BLOCK
EAST - WEST ORIENTATION

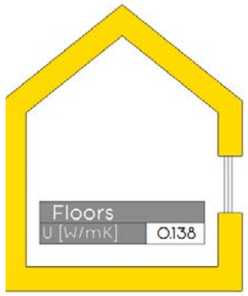
APARTMENS BLOCK
NORTH - SOUTH ORIENTATION

Winter season, While air-source heat pumps are very common, the project used **Geothermal heat pumps** to be more efficient for a radiant heating system. The difference between the two pumps is that instead of using outside air, a geothermal heat pump absorbs heat from the earth. Moreover, the project applied **waste heat recovery** system for potential energy saving in the existing system. Waste heat recovery is so important because by reducing the amount of fuel used to produce heat in a boiler installation, heating efficiency increases, resulting in lower fuel use. **Hyperinsulation envelope** is also the key energy design to reduce the heat loss in the season coupled with vertical fins as a shading device for comfortable indoor environment.

Summer season, the project used Geothermal heat pumps to be more efficient for a radiant cooling system. The difference between the two pumps is that instead of using outside air, a geothermal heat pump absorbs cool air from the earth. Hyperinsulation envelope is also the key energy design to reduce the heat gain in the season coupled with vertical fins as a shading device for comfortable indoor environment. venetian blinds are also integrated to the student dormiteries and family apartment to let the users control the shading devices. The project used **chimney effect** for the family apartment building resulting from air buoyancy. Buoyancy occurs due to a difference in indoor-to-outdoor air density resulting from temperature and moisture differences.

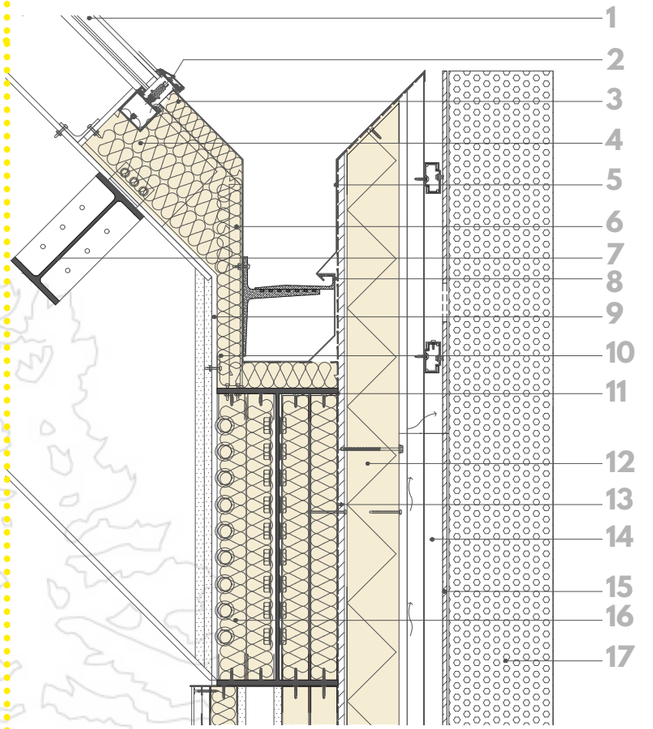
SECTION

STUDENT & APARTMENT



Roofs U [W/mK]	0.138
Walls U [W/mK]	0.157
Others U [W/mK]	0.5
Glazing U [W/mK]	1.0

PROJECT U-VALUES RESUME



1 Glazing layer:double pane glazing Thick 8mm.

2 Sub structure: Aluminium frame fixed with over the glazing ends with gussets.

3 Insulation and water proof layer: Aluminium finishes sandwich panel.

4 Support layer: Aluminium frame mullions connected to the secondary steel beams 150 x 50mm.

5 Splash layermetal flashing over the dump proof layer directed to the gutter thick 5mm.

6 Support layer: Steel 'L' Section to support the gutter and the wind resistant edge support.25x25mm thic 2mm.

7 Secondary Beam:I section 240x120mm.

8 Gutter: steel gutter inclined towards the drain thick 17x17mm.

9 Finishing layer double gypsum boards on PFC Aluminium frame thick 10mm.

10 Support : 50x50mm equal angle supporting the the Oriented strand boards to the main beams.

11 Air tightness layer for roof material is PP fleece with PP covering & its Sd-value: 18 (± 0.5) m Thick 0.2 mm.

12 Layer of insulation: mineral insulating panel based on calcium silicate hydrates, without fibers, incombustible for facades (hydrophobic in the mass) (type: Rofix - Minopor 045) - Thick 8 cm - rt 0.034 - ρ 15 kg / m³.

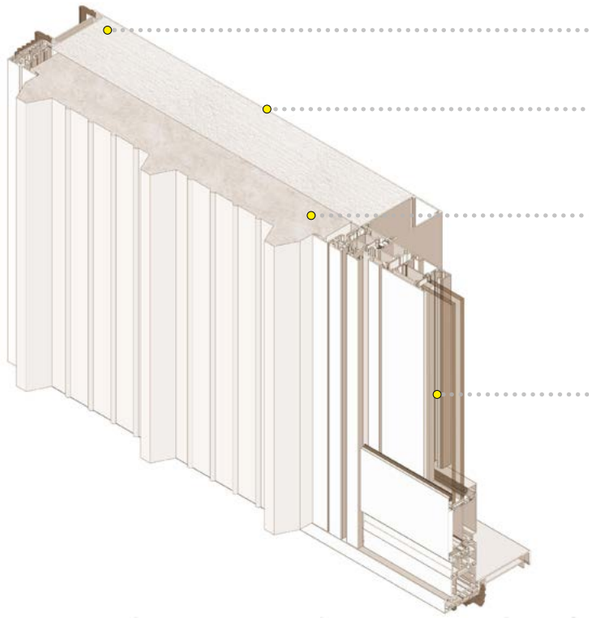
13 Supporting layer:Pre fabricated concrete panel with reinforcement mesh thick 1.25 cm.

14 Substructure layer: aluminumhorizontal and vertical metal frame, fixed to the supporting structure with stainless steel screws.

15 **Rainscreen cladding:** Reinforced fiber cement sheets thick - 1.2 cm Various dimensions.

16 Insulation layer: rock wool panel (type: Knauf - DP5) - Thick 3 cm - rt 0.04 W / mK - ρ 30 kg / m³.

17 Shading device layer: 'V' Shaped perforated aluminium profiles with bronze coating Ø holes thick 2mm.

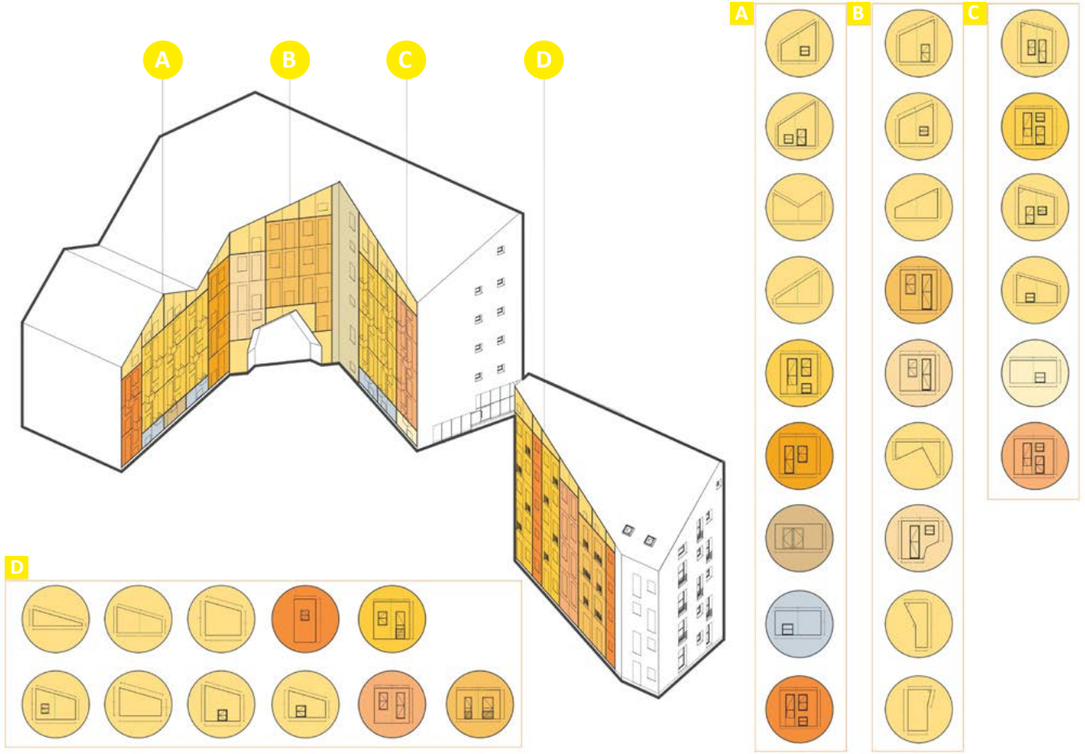


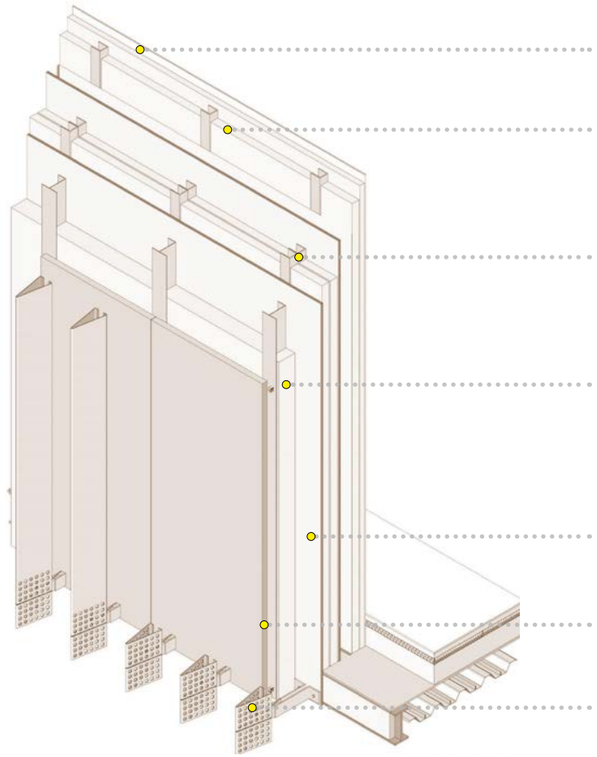
Insulation layer: EPS panels - : 0,030 W/mK : 20 kg/m^3 - Thickness 10 cm.

Finishing layer: doule gypsum boards with water-ba-sed paint finishing - Thic. 2x1,25 cm.

Insulation and weather barrier: rock wool sandwich panel with white aluminium coating - : 0,04 W/mk : 50 kg/m^3 - Thic. 12 cm

Unitised facade system:Schuco 65F transom Sch co USC 65 FSG in structural glazing look with horizontal or vertically arranged glazing beads.





Finishing layer:doule gypsum boards with water-ba-sed paint finishing Thickness 2x1.25 cm

Sound insulation layer: double mineral wool - thickness 60 mm density 18 kg / m

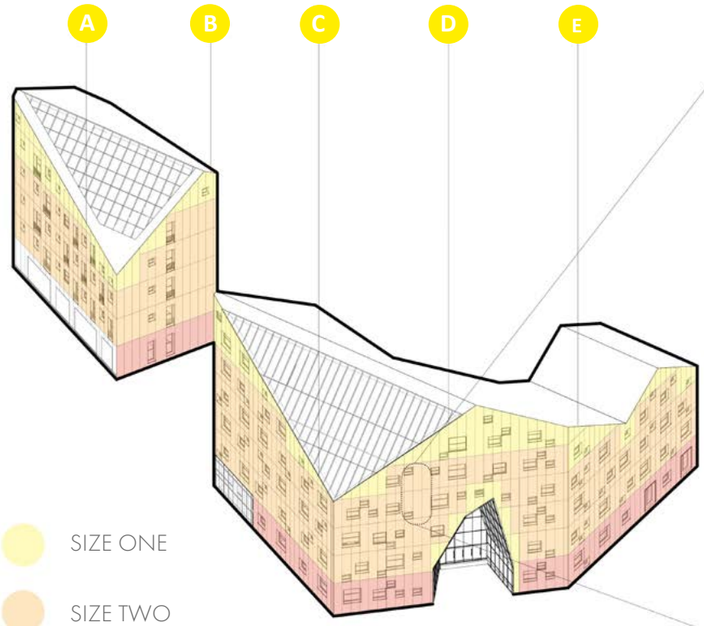
Sub structure, double side by side wraping C 75/50

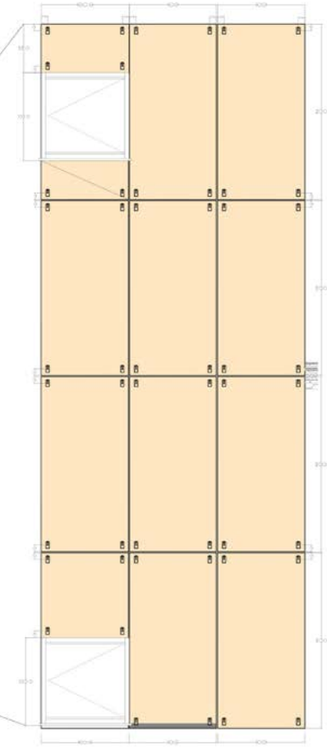
Layer of insulation: mineral insulating panel based on calcium silicate hydrates, without fibers, incombustible for facades(hydrophobic in the mass) (type: Rofix - Minopor 045) Thick 8 cm - 0.034 - 15 kg / m3

Supporting layer: Pre fabricated concrete panel with reinforcement mesh thick 1.25 cm.

Rainscreen cladding: Reinforced fiber cement sheets thick - 1.2cm Various dimensions.

Shading device layer: 'V' Shaped perforated aluminium profiles with bronze coating holes thick 2mm

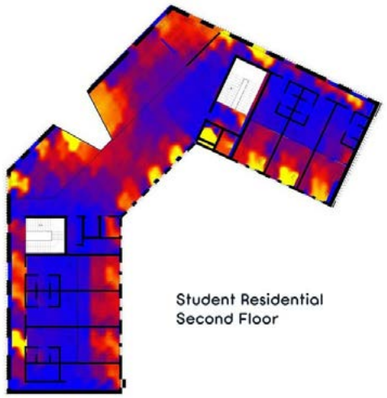




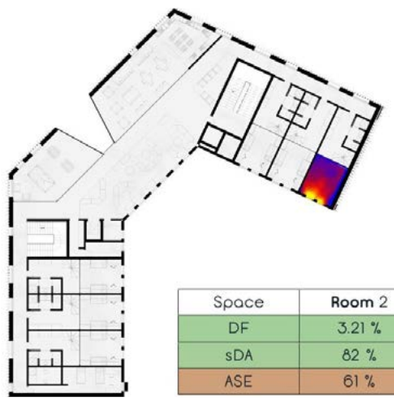
SIZE ONE

SIZE TWO

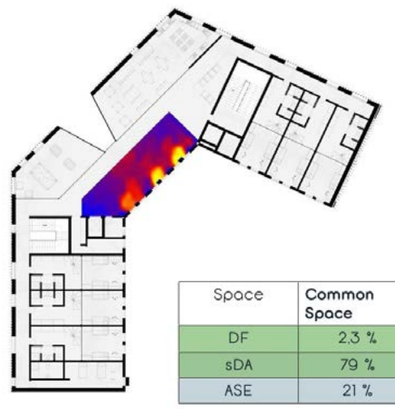
SIZE THREE



Space	Room 1
DF	3.07 %
sDA	53 %
ASE	31 %



Space	Room 2
DF	3.21 %
sDA	82 %
ASE	61 %



Space	Common Space
DF	2.3 %
sDA	79 %
ASE	21 %

Space	Kitchenette 1
DF	0.19 %
sDA	n.a.
ASE	n.a.

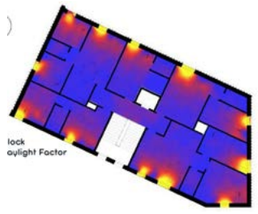
Percentage of floor area where Daylight Factor (DF) is measured at 0.85 meters above the floor plate.

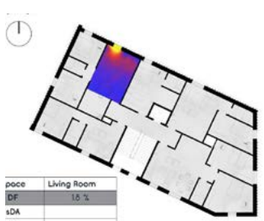
Considerations

Daylight analysis was conducted to assess visual comfort. The Daylight Factor (DF) exceeded the 2% minimum in key areas such as common rooms, which require precise lighting. Transitional spaces like kitchenettes fell below this threshold but are used briefly, so impact is minimal. Southern and southeastern zones met Spatial Daylight Autonomy (sDA) criteria, while east-facing rooms were only marginally acceptable. However, based on Annual Sun Exposure (ASE), southeast-facing rooms may experience glare.

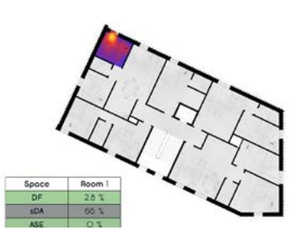
Solution

To address low Daylight Factor (DF) values in the central area, the layout was designed to place spaces like bathrooms and kitchenettes—where light control is less critical—so they can rely on artificial lighting. To improve light access, translucent glass was added between the main corridor and rooms, allowing light into the kitchenette without affecting DF. High Annual Sun Exposure (ASE) levels can be mitigated by installing a movable shading system on the southwest facade, enabling users to manage glare, as further detailed in the next section.



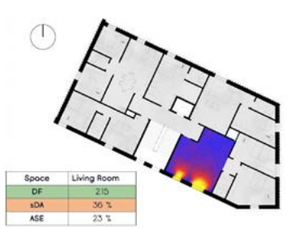


pace	Living Room
DF	1.8 %
sDA	
ASE	



Space	Room 1
DF	2.8 %
sDA	66 %
ASE	0 %

Space	Room 1
DF	2.1 %
sDA	23 %
ASE	6 %



Space	Living Room
DF	2.15
sDA	36 %
ASE	23 %

Space	Room 1
DF	1.07 %
sDA	65 %
ASE	27 %

Space	Room 1
DF	2.35 %
sDA	49 %
ASE	12 %

Percentage of floor area where Daylight Factor (DF) is measured at 0.85 meters above the floor plate.

Considerations

The residential building was included in all simulations, with a focus on south- and north-facing spaces. While most rooms met the Daylight Factor (DF) requirement, Spatial Daylight Autonomy (sDA) was notably impacted on the west side due to shading from the adjacent student housing, significantly reducing daylight availability.

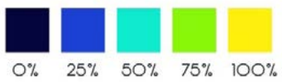
Solution

To simplify construction, window types were standardized, which led to insufficient daylight on the west elevation. A potential solution is to increase the window dimensions on that side.

Percentage of occupied hours where illuminance is at least 300 lux, measured at 0.85 meters above the floor plate.

Considerations

Climate-based annual simulations show that the minimum illuminance level of 300 lux at 0.85 m above the floor is met across all student dorm areas requiring this standard. The internal furniture layout in rooms and common spaces further supports optimal lighting conditions. While some dark spots may occur due to building geometry and plan depth, these can be easily corrected with minimal artificial lighting.



Percentage of occupied hours where illuminance is at least 300 lux, measured at 0.85 meters above the floor plate.

Considerations:

Illumination simulations for the residential block confirm that the west fa ade is the most affected due to window dimensions and surrounding context. However, lighting conditions in the rest of the building are generally acceptable.

GRAY'S TUNNEL

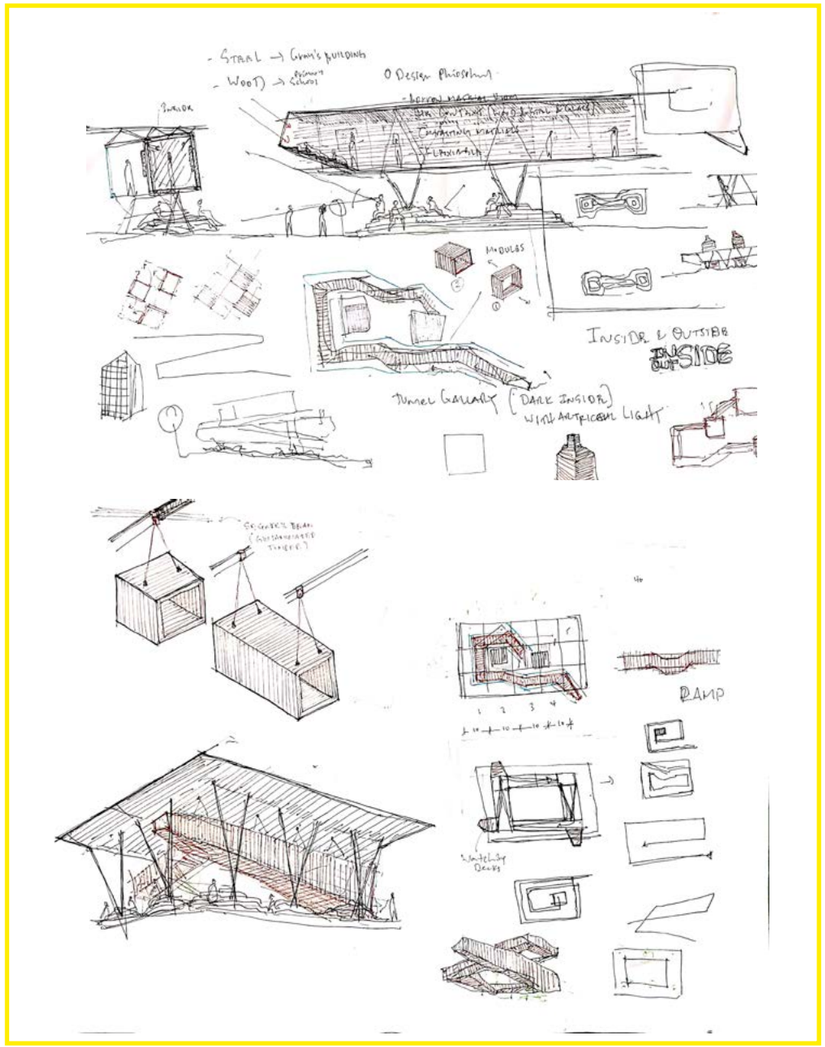
INDIVIDUAL WORK

GRAY'S TUNNEL

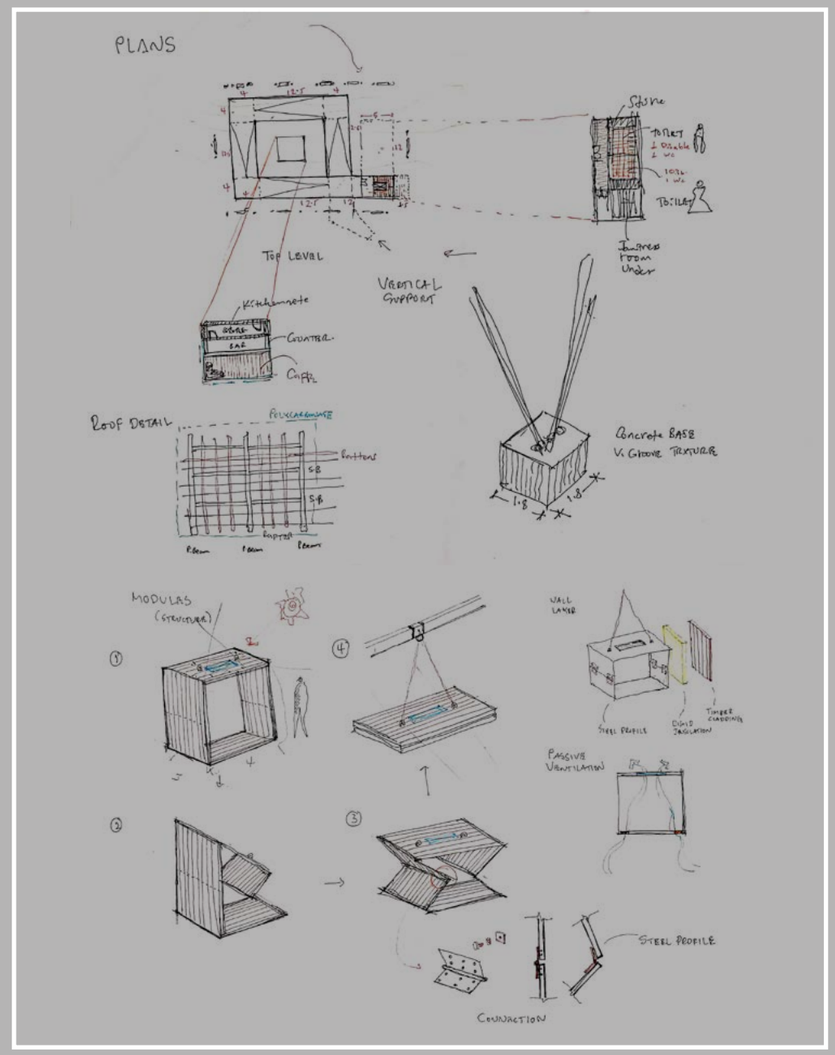
ABERDEEN, SCOTLAND

ROBERT GORDEN UNIVERSITY 2020

Design for deconstruction (DfD) is a concept that borrows from the fields of design for disassembly, reuse, remanufacturing and recycling in the consumer products industries. The client, Robert Gordon University ,with the focus being on Gray's School of Art. Whilst intake in art and design courses increases in the school, there is a growing demand for a contemporary exhibition space that can accommodate the end of year degree shows and exhibition evenings throughout summer months. The building life is limited to 15 to 20 years life span and your client would like to recycle / reuse the building for other purposes.

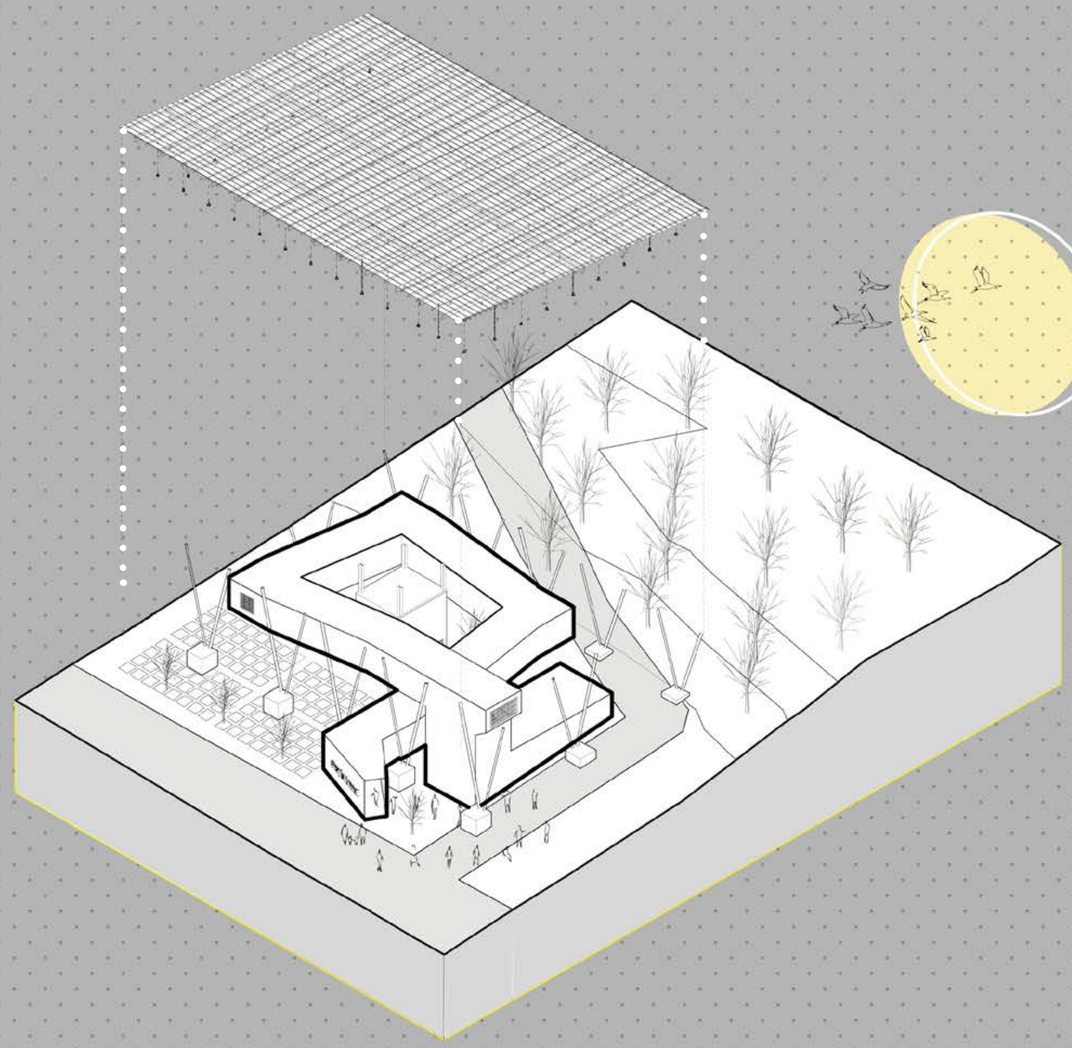


The above original sketches of Gray's Tunnel shows how the building is evolved through a series of thinking process in which the gallery building made suitable for flexiable space..Since the client defined about the life span of the building, it is designed as modolar and temporary structure to answer the needs. The modules are made of timber which are prefabricated and assembled on the site which makes the construction process fast and easy.

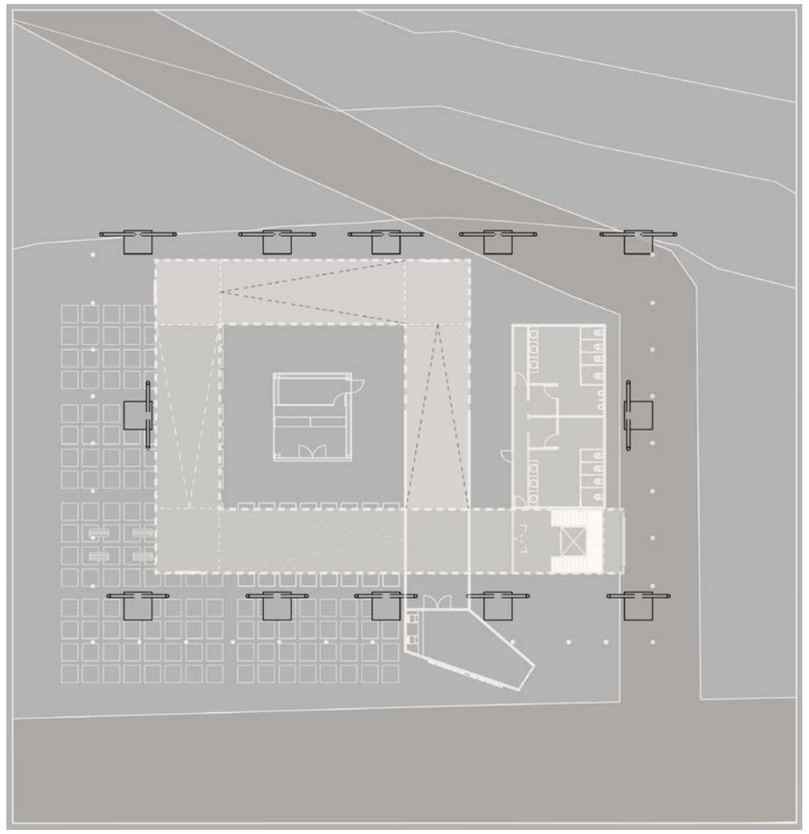


The concept begins with creating two contrasting spaces, one is a tunnel in which the paintings are displayed through artificial light. On the other hand, the wide space under the canopy is proposed to show sculptures and artefacts. Moreover, the space can be used as socializing and different outdoor activities served by the bar in the middle of the tunnel courtyard. The modules can be dismantled when necessary for maintenance or demolish and reused again.

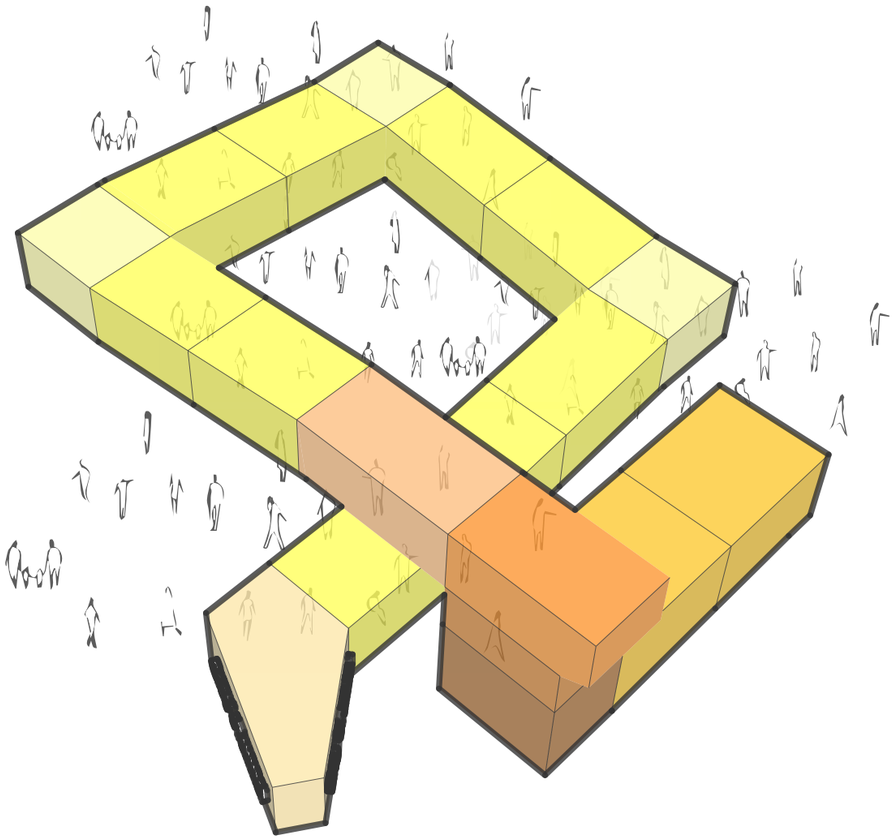
ISOMETRIC
GRAY'S TUNNEL

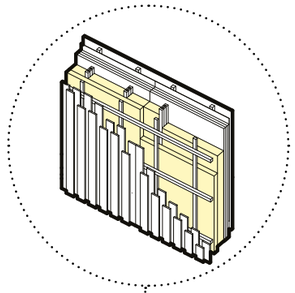


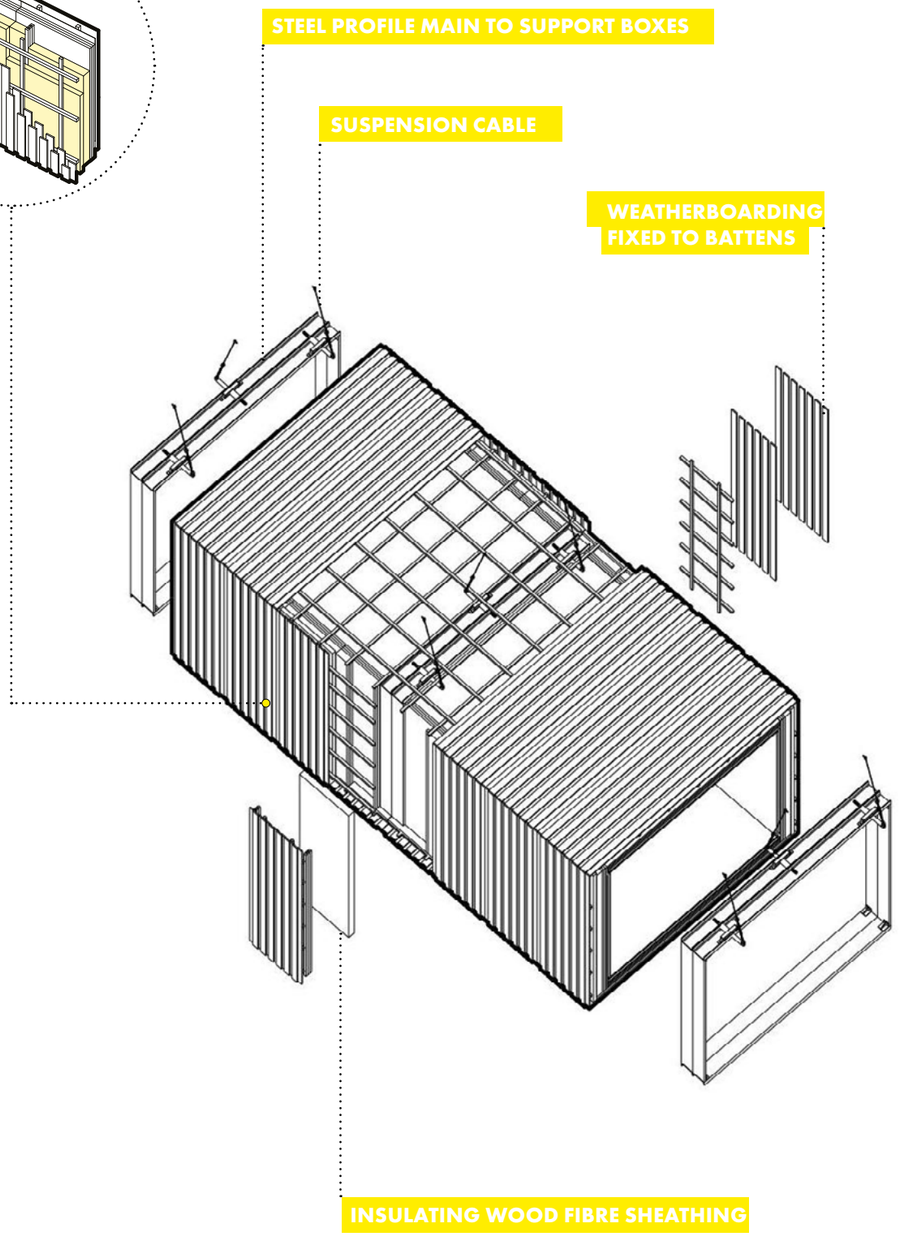
FLOORPLAN
GRAY'S TUNNEL

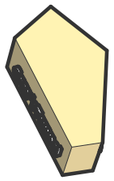


The plan is Square shaped made of timber wood modules and suspended from the roof with cables to form the ramp of gallery. In the middle is the bar to serve the visitors and at the end of the tunnel to meet the stairs and elevetor to go downstairs.

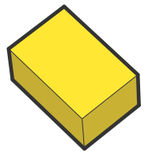




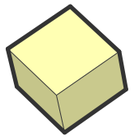




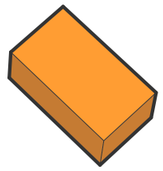
6m*4m*3.2m



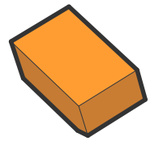
4m*4m*3.2m



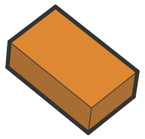
8m*4m*3.2m



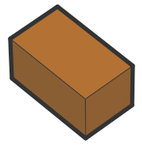
7m*4m*3.2m



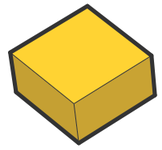
6m*4m*2.2m



6m*4m*3.2m

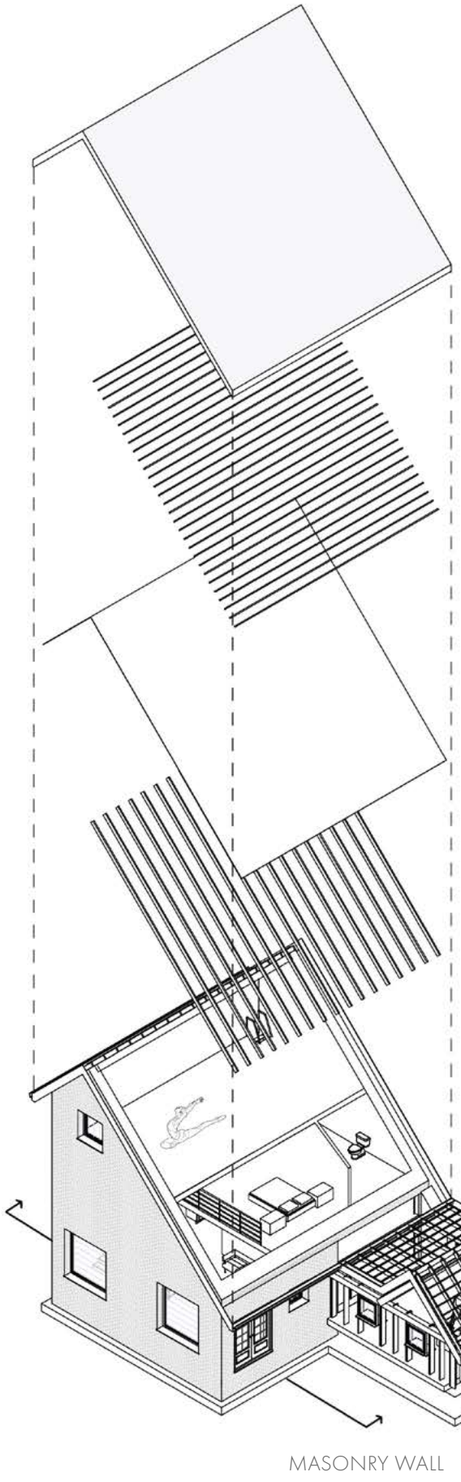


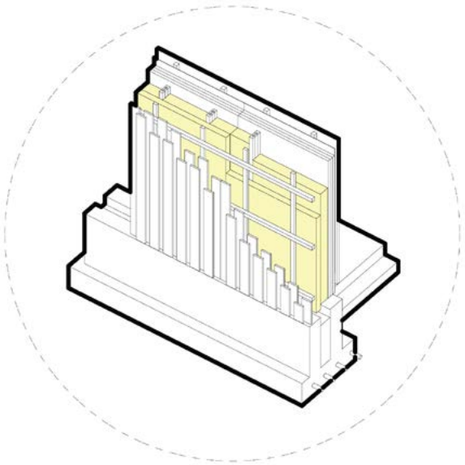
6m*6m*3.2m



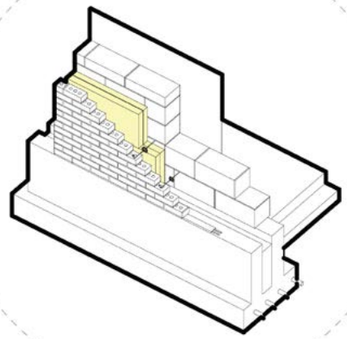
Take a break with this **DETAIL!**

ABERDEEN, SCOTLAND - BUILDING TECHNOLOGY





TIMBER WALL

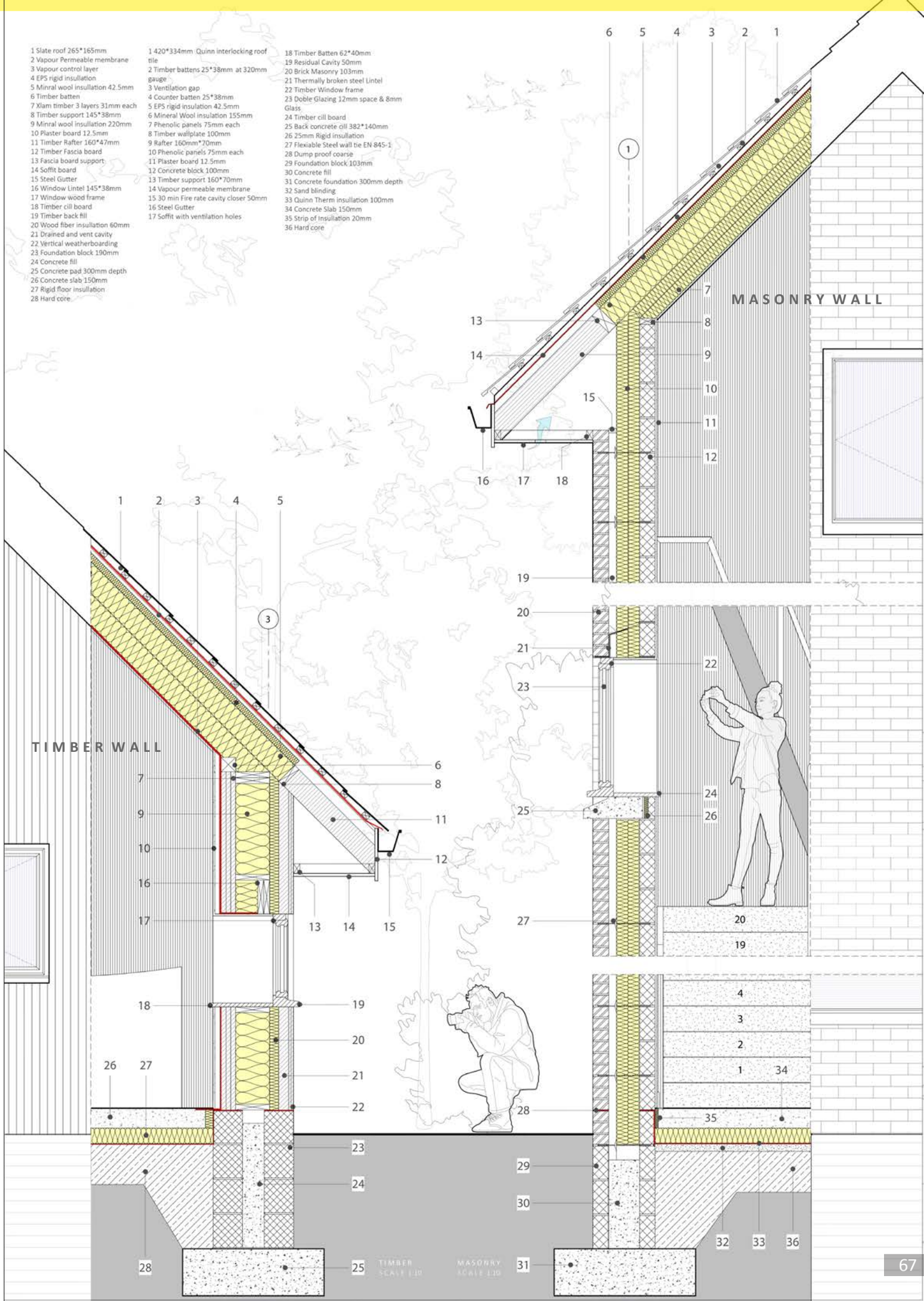


MASONRY WALL

1 Slate roof 265*165mm
2 Vapour Permeable membrane
3 Vapour control layer
4 EPS rigid insullation
5 Minral wool insullation 42.5mm
6 Timber batten
7 Xlam timber 3 layers 31mm each
8 Timber support 145*38mm
9 Minral wool insullation 220mm
10 Plaster board 12.5mm
11 Timber Rafter 160*47mm
12 Timber Fascia board
13 Fascia board support
14 Soffit board
15 Steel Gutter
16 Window Lintel 145*38mm
17 Window wood frame
18 Timber cill board
19 Timber back fill
20 Wood fiber insullation 60mm
21 Drained and vent cavity
22 Vertical weatherboarding
23 Foundation block 190mm
24 Concrete fill
25 Concrete pad 300mm depth
26 Concrete slab 150mm
27 Rigid floor insullation
28 Hard core

1 420*334mm Quinn interlocking roof tile
2 Timber battens 25*38mm at 320mm gauge
3 Ventilation gap
4 Counter batten 25*38mm
5 EPS rigid insulation 42.5mm
6 Mineral Wool insulation 155mm
7 Phenolic panels 75mm each
8 Timber wallplate 100mm
9 Rafter 160mm*70mm
10 Phenolic panels 75mm each
11 Plaster board 12.5mm
12 Concrete block 100mm
13 Timber support 160*70mm
14 Vapour permeable membrane
15 30 min Fire rate cavity closer 50mm
16 Steel Gutter
17 Soffit with ventilation holes

18 Timber Batten 62*40mm
19 Residual Cavity 50mm
20 Brick Masonry 103mm
21 Thermally broken steel Lintel
22 Timber Window frame
23 Doble Glazing 12mm space & 8mm Glass
24 Timber cill board
25 Back concrete cill 382*140mm
26 25mm Rigid insullation
27 Flexiable Steel wall tie EN-845-1
28 Dump proof coarse
29 Foundation block 103mm
30 Concrete fill
31 Concrete foundation 300mm depth
32 Sand blinding
33 Quinn Therm insullation 100mm
34 Concrete Slab 150mm
35 Strip of insullation 20mm
36 Hard core



COMPETITION WORKS

KAIRA LOORO ARCHITECTURE COMPETITION 2022
TILI WINE COMPETITION 2022
ARCHSHARING STUDENT COMPETITION 2017

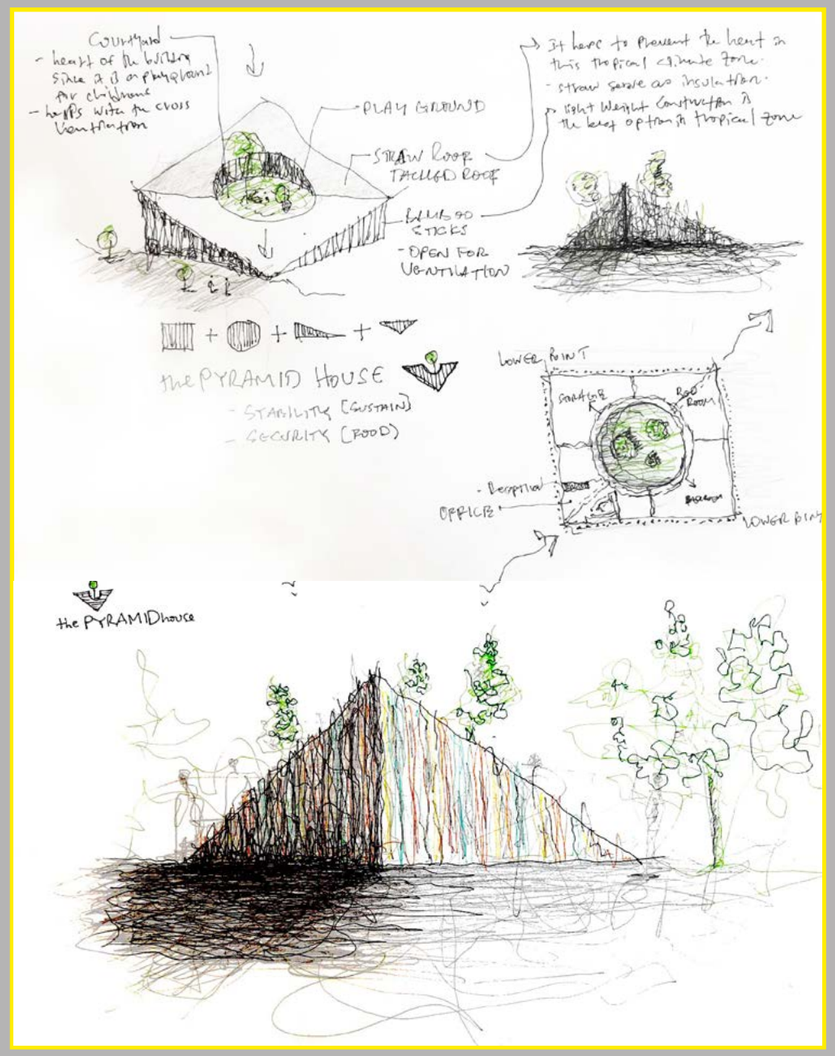
INDIVIDUAL WORK

THE HEALING PYRAMID

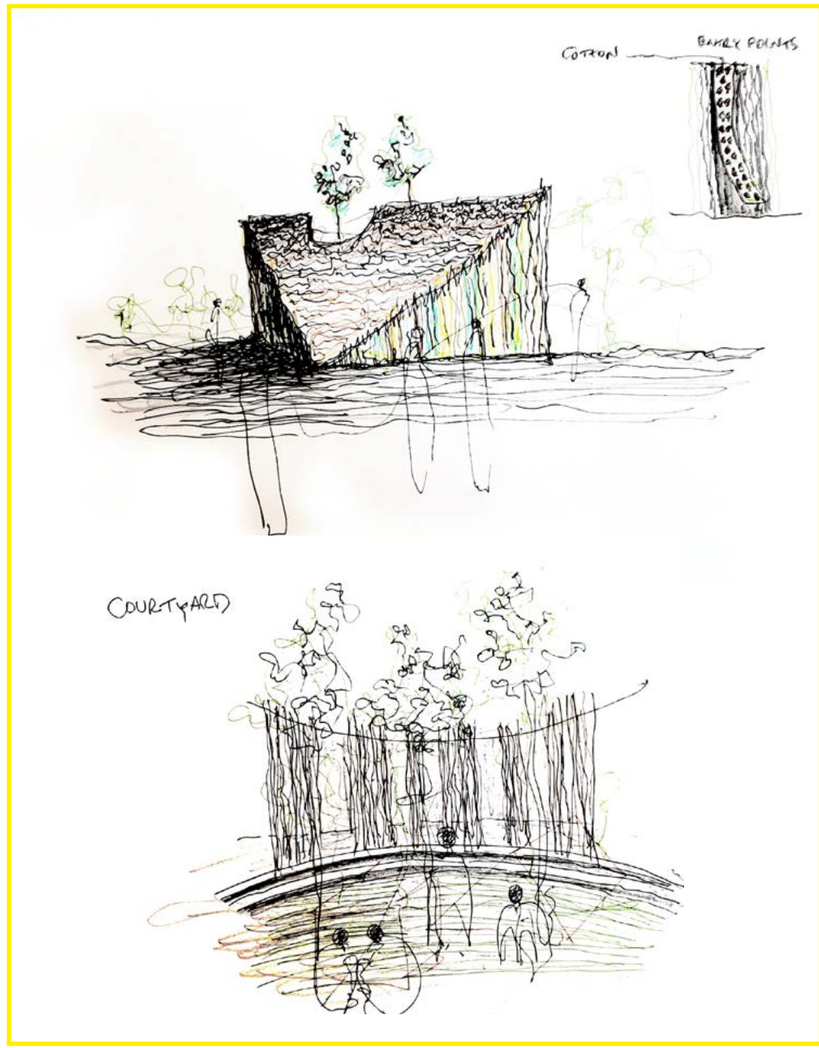
BAGHERE, SENEGAL

KAIRA LOORO ARCHITECTURE COMPETITION 2022

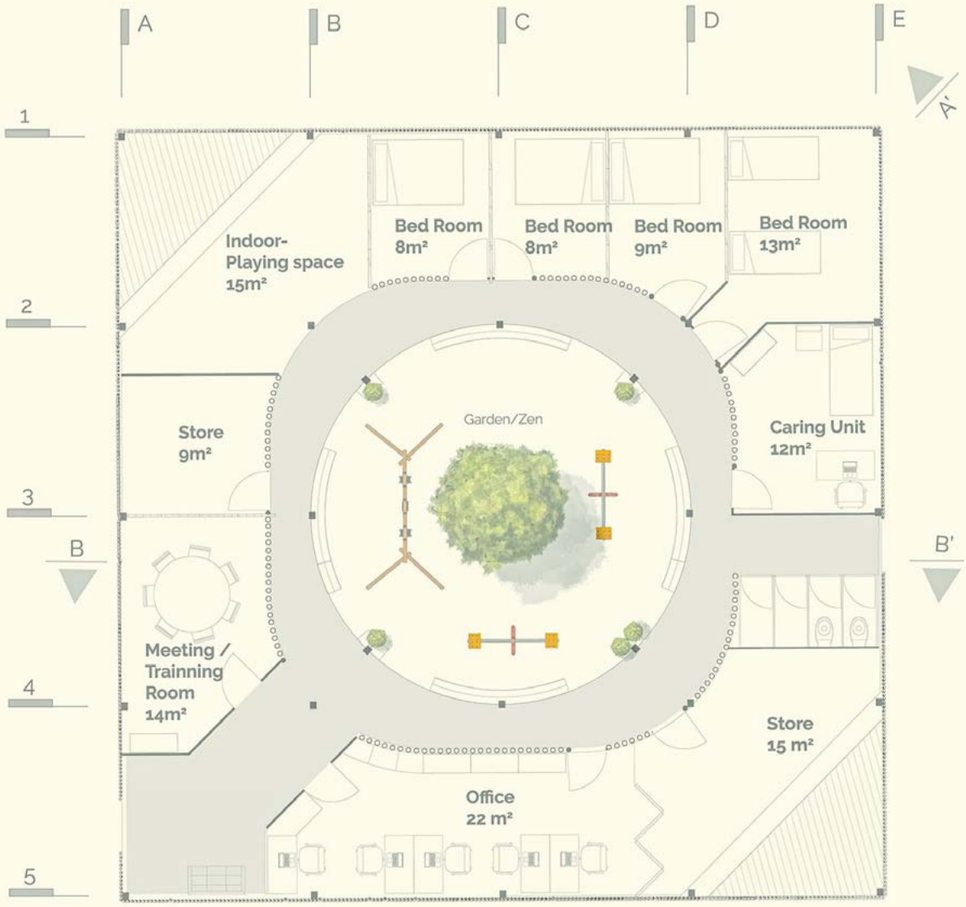
The project area is located in the south of Senegal: a western sub-Saharan African country bordered by the Atlantic Ocean, Mauritania, Mali, Gambia, and Guinea. The national population is almost 17 million people, mainly concentrated in the larger urban centres and in the capital. Dakar. The central region is Sedhiou, and it is here that the project will be introduced. This is one of the country's less developed regions, with an average rate of urbanisation of 10%, and an average poverty rate of around 92%. This region has a purely agricultural focus, and the rural villages have an average of 1500 inhabitants. The administrative centre of Sedhiou has approximately 22,000 inhabitants.



The design concept for the children's house is characterized by three key elements that cater to the specific needs and interests of young occupants while addressing the tropical climate of Senegal. Firstly, the intentional use of a pyramidal shape serves as a visually stimulating and recognizable form, purposefully designed to attract children who are naturally drawn to Platonic forms. Secondly, the central courtyard, identified as the heart of the design, not only

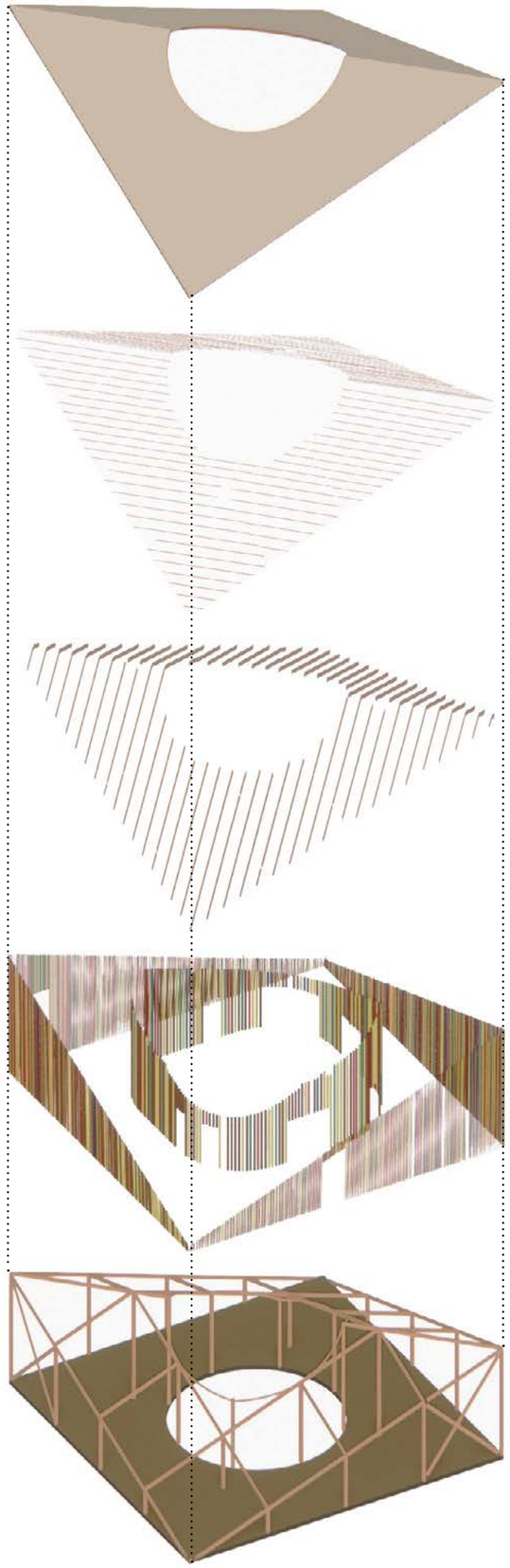


dren but also promotes cross ventilation, essential in Senegal's tropical climate. Lastly, the addition of a colored bamboo facade enhances the building's aesthetic appeal, creating a playful and welcoming atmosphere that aligns with the natural interest children have in vibrant colors. Collectively, these elements contribute to a holistic design that is both functional and engaging for the young occupants, incorporating architectural features that prioritize their well-being and enjoyment.



The Circular Garden found at the center is the heart of a Zen space created that integrates with traditional aesthetics and spatial artistic concept where the children will recognize the strong inclined colorful walls that surrounds them and protects them while they play inside in the green garden.

SECTION - AA



THATCHED ROOF

The thick layer of thatch acts as a barrier against direct sunlight, helping to reduce the amount of heat that enters the building as the location is in tropical zone.

ROSEWOOD BATTENS

Rosewood is widely avaliable in the project area. It is also a valuable and often protected hardwood, known for its beauty and durability.

IROKO (MILICIA EXCELSA)

Iroko is known for its natural resistance to decay, insects, and fungi. It is a hardwood with good strength properties whichmakes it capable of supporting the load of the roof battens & thatch effectively.

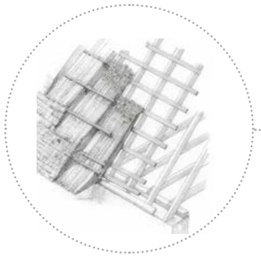
COLORED BAMBOO CLADDING

Bamboo is widely avaliable in the project area. It is known for its strength, versatility, and rapid growth, making it an eco-friendly and suitable for natural ventilation.

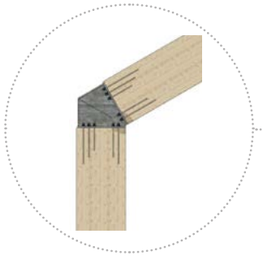
IROKO TIMBER STRUCTURE

Iroko is a durable hardwood that is commonly used in West Africa, including Senegal. It has good resistance to decay and insects, making it suitable for structural components.

3D DETAIL
HEALING PYRAMID

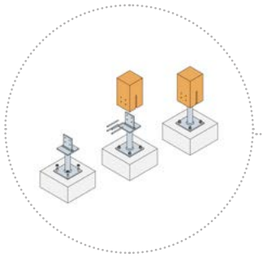


THATCHED ROOF DETAIL

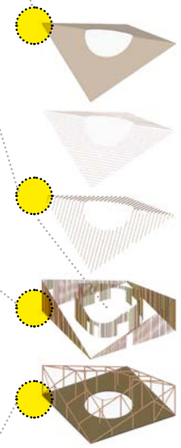


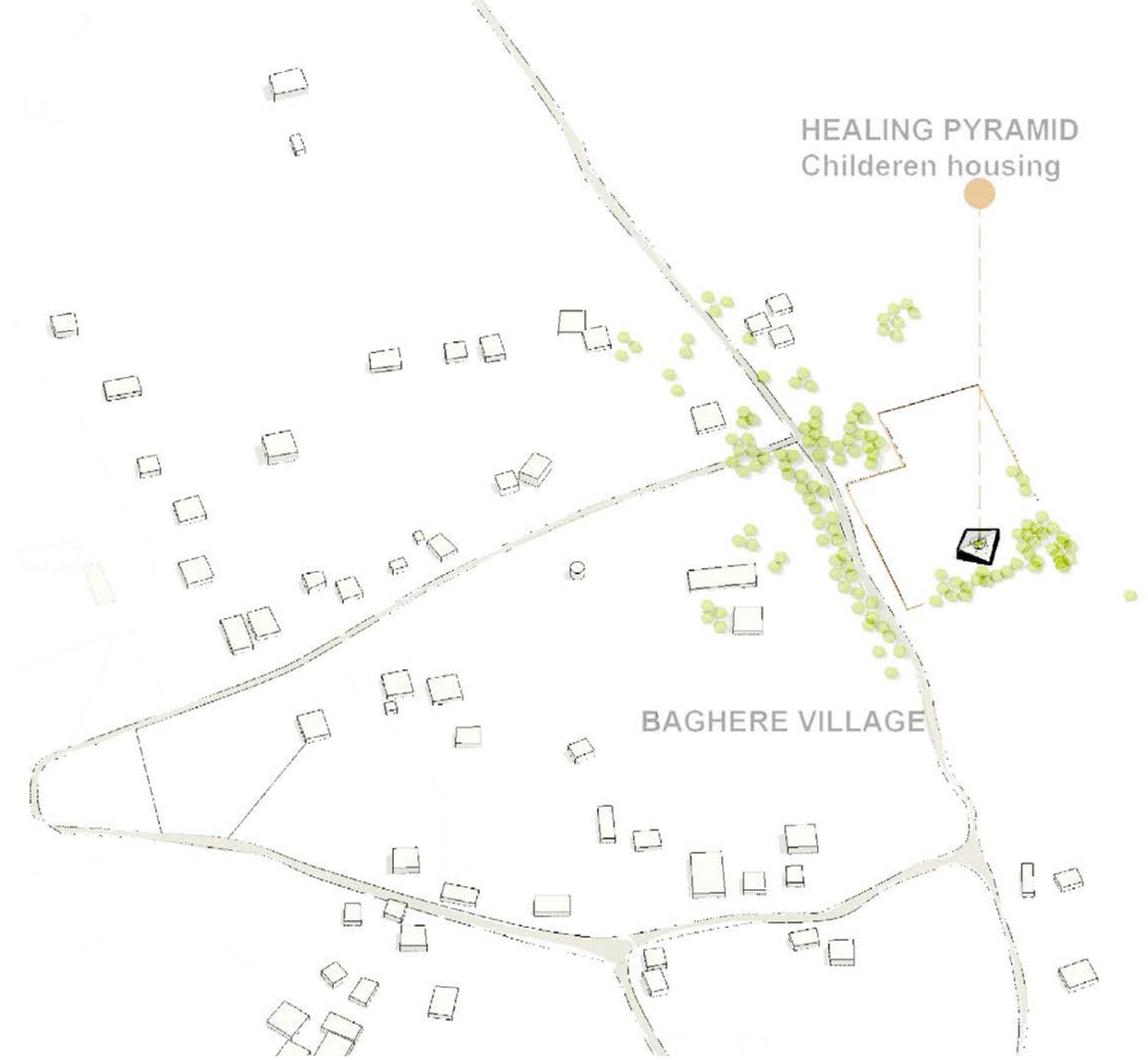
COLOMN-BEAM CONN.

WHOLE BAMBOO CULMS



FLOOR TO COLOMN CONN.





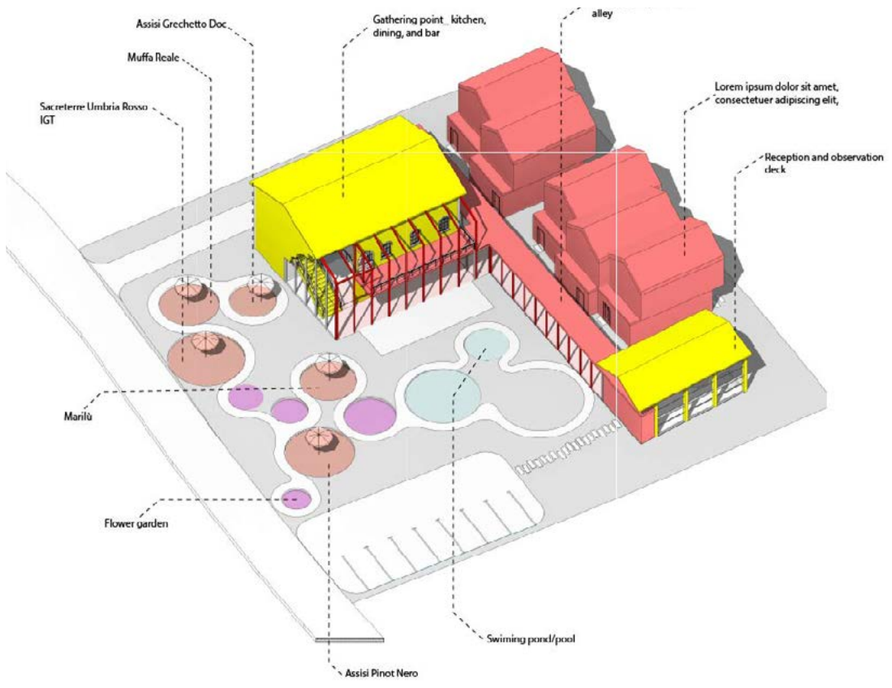
INDIVIDUAL WORK

TILI WINE GUEST HOUSE

ASSISI, ITALY

BUILDNER ARCHITECTURE COMPETITIONS 2022

The Tili Wine Italy Guest Homes Competition 2021 was an international architecture competition organized by Buildner (formerly Bee Breeders) in collaboration with Tili Vini Italy, a boutique organic winery located in the Umbrian hills near Assisi, Italy. The competition invited architects and designers to propose sustainable guest accommodations that harmonize with the winery's ethos and landscape.


Assisi Grechetto Doc
Muffa Reale
Sacreterre Umbria Rosso IGT
Gathering point_kitchen, dining, and bar
alley
Lorem ipsum dolor sit amet, consectetuer adipiscing elit,
Reception and observation deck
Marilù
Flower garden
Swiming pond/pool
Assisi Pinot Nero

ARCH SHARING
STUDENT COMPETITIONS

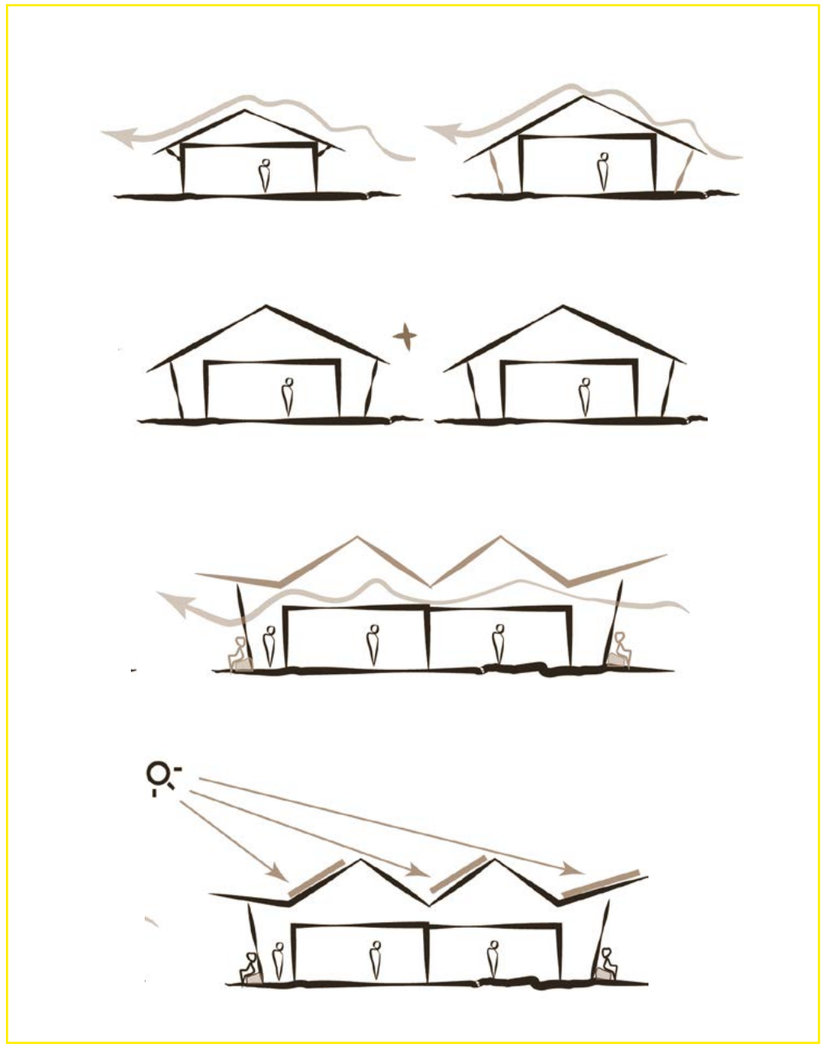
INDIVIDUAL WORK

COMMUNITY CENTER

PHARPING, NEPAL

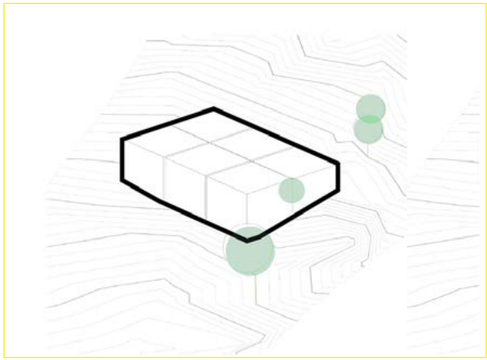
ARCHSHARING STUDENT COMPETITION 2017

In this context, ARCHsharing, in partnership with Rook'n Wood NGO, invites participants to imagine the construction of a community center in an area 20km away from Kathmandu. The goal is to propose a useful infrastructure which improves the daily life of the inhabitants. It shall be a community a building serving several of the village's unaddressed needs. The facility will provide a community room, an atelier, a kitchen, a media/cultural space and bathroom (shower and toilets). The site is located towards the end of a valley with a stunning views on the landscape. It is a typical site of the Nepalese topography: a plot of land with terraces, clinging onto the moutain slope, overlooking the valley.



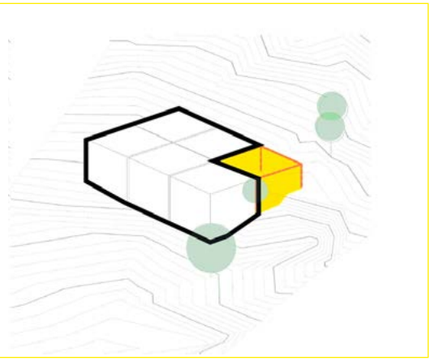
The **vernacular style** of constructing the Nepalis pagoda is a series of **square plans** which is very effective in **resisting earthquakes**. We have used 5x5 meter squares for spatial orientation. The use of slim and light weight materials to lower the resultant forces on the structure, thus reducing the damage. Seperating the masonry and the roof system so that they negate each others movements and neutralize the effect at the time of an earthquake.

1



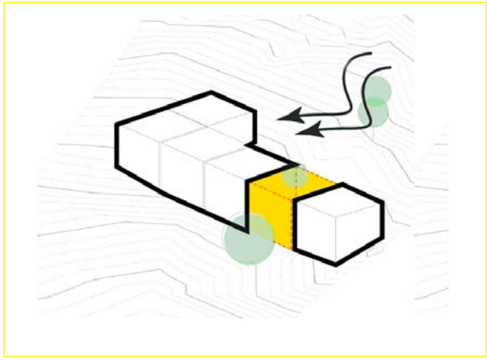
Each cube has 25 suqare meters of area, which accountsa total of 150 square meters.

2



Removing one of the cube to maintain the existing tree on the upper part of the site.

3

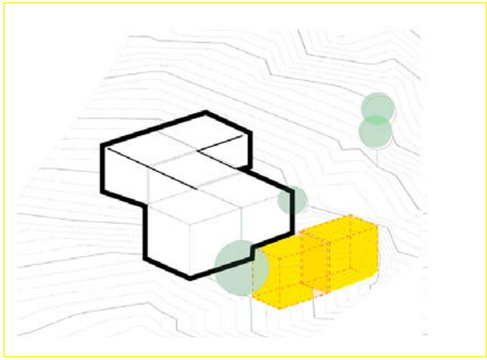


Extending the East part of the cubes in order to catch the North-Eastern wind flow.

4

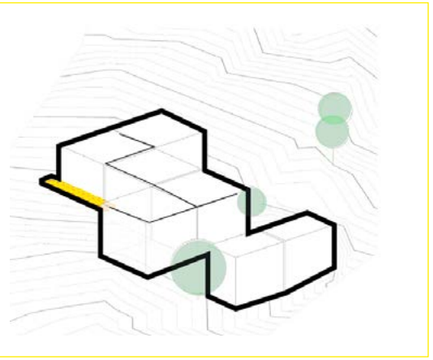
Position the kitchen in the South-East side based on Vastu (Traditional Buda design style)

5



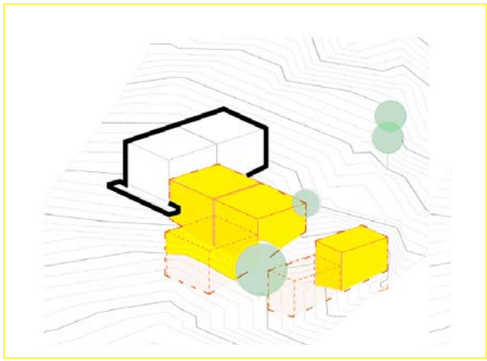
Split and separate the East side cubes to accomodate the toilet based on Vastu concept.

6



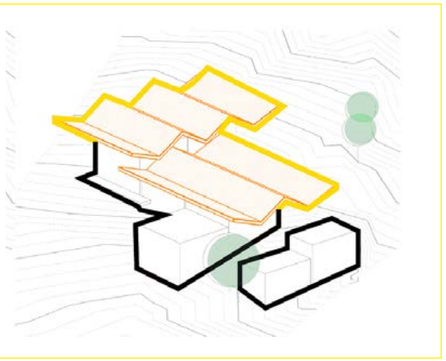
Position a viewing deck on the South part of the cubes to take advantage of the view.

7



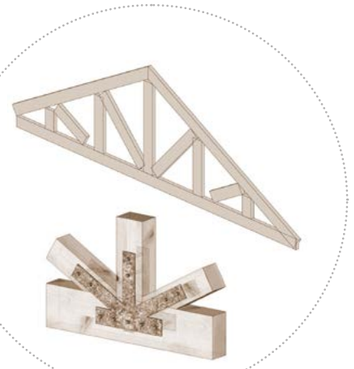
Adjusting the cubes according to the slope of the site while reducing the chance of infilling.

8



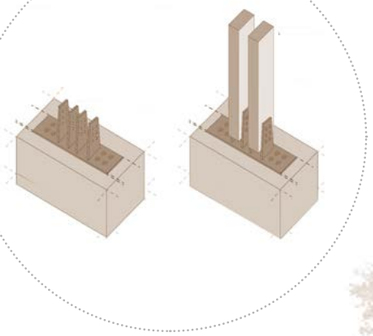
Ut pra nihiliquam, oImpernat iistis quisMagnimet re ne re, ipsantio eosPuda volupta

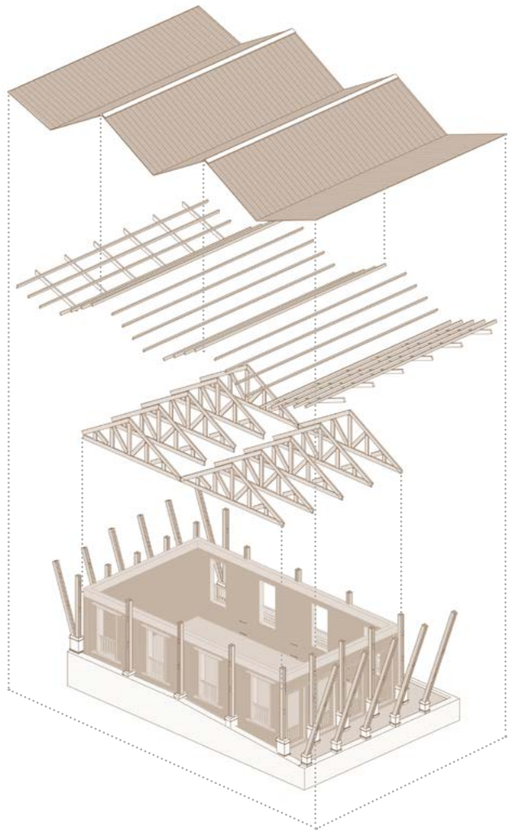
WOODEN TRUSS

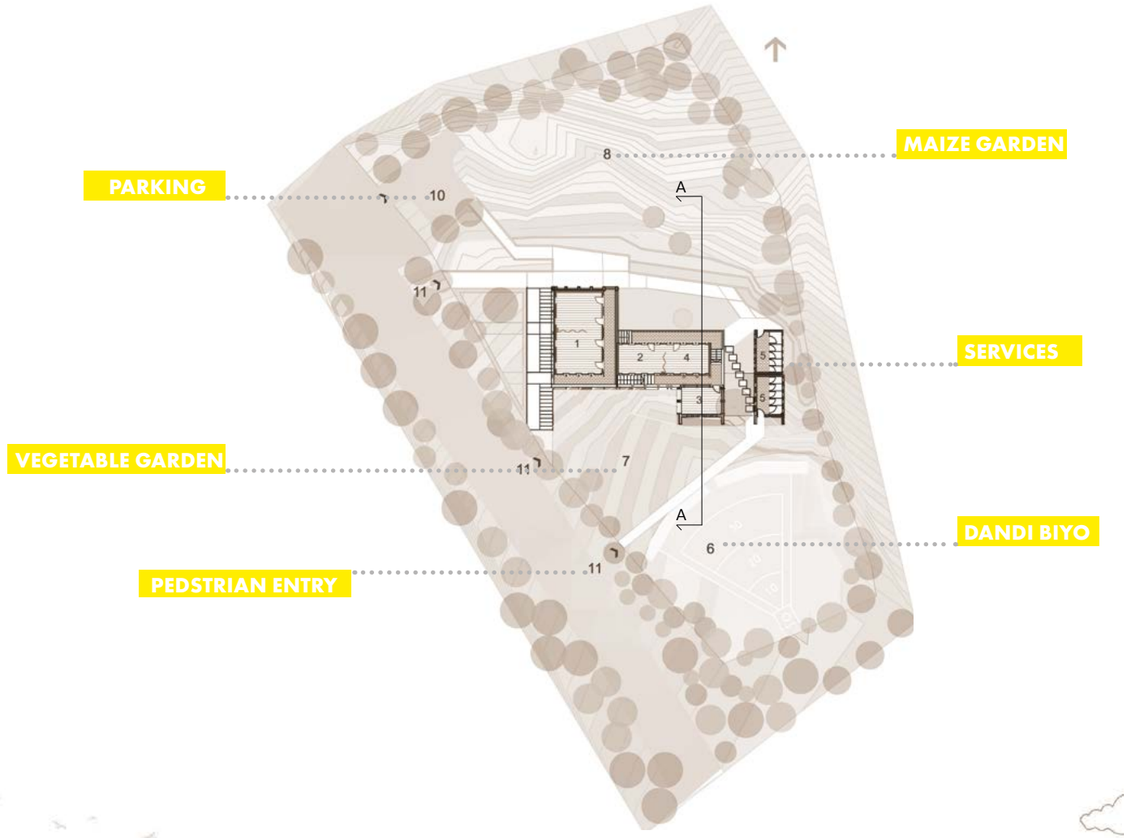


TIMBER COLOMN

25*40CM CONCRETE BASE







SECTION A-A

... NOT THE END

Architecture Portfolio 2025

SOLOMON TESFAYE