ARCHITECTURE PORTFOLIO

SELECTED WORKS

KANI AHUONBAR

CONTENT

CONTENT

EDEN STUDENT ACCOMMODATION

Location:
Tasmania, Australia

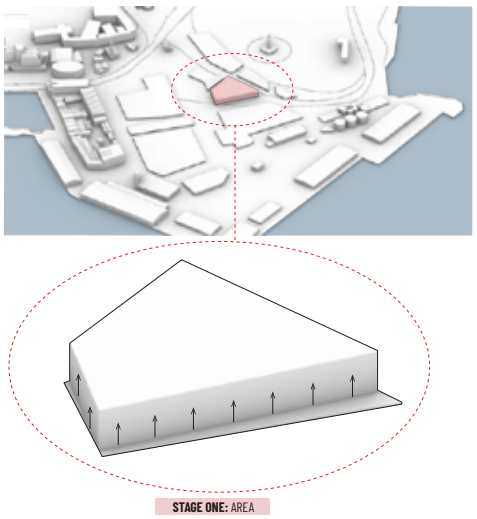
Year:
2021

Architectural Design Studio
Groundwork

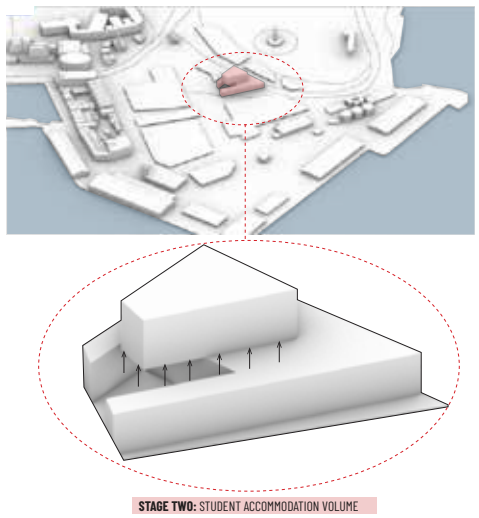
Eden Student Accommodation is a mixed-use accommodation building that has been designed in response to the shortage of housing for domestic and international students participating in a tertiary or technical institution. The buildings architectural design extends out into the community, therefore having the ability to capture the attention of visitors from different age groups and backgrounds.

The project responds to the studio brief through its incorporation of useful programs within Parcel 4 and it aim to create a strong connection between built forms and the surrounding context of Macquarie Point.

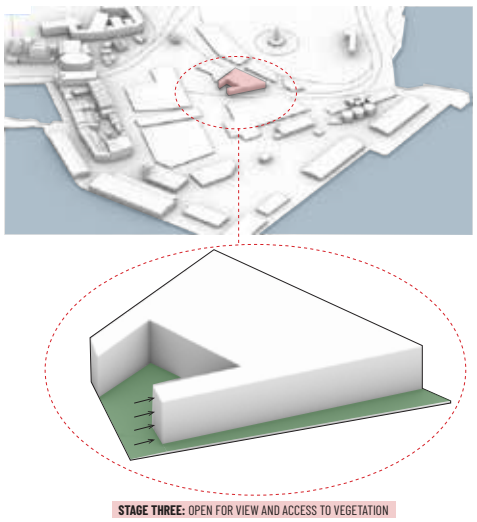
Ultimately, spaces have been organized, arranged and considered to ensure efficient circulation throughout the levels and a connection between public, private and semi-private spaces.



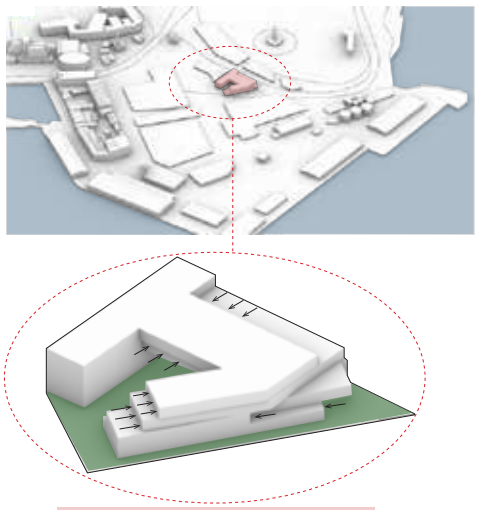
STAGE ONE: AREA



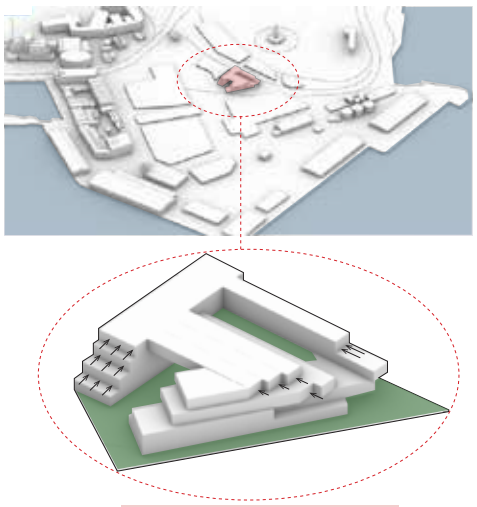
STAGE TWO: STUDENT ACCOMMODATION VOLUME



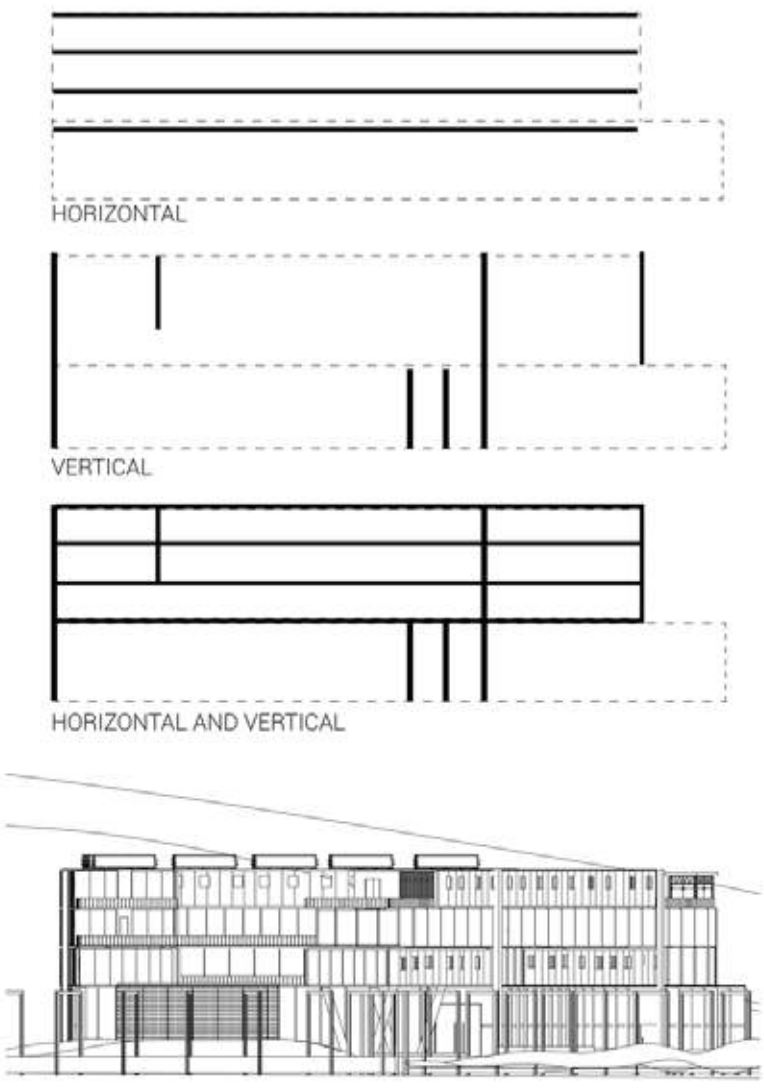
STAGE THREE: OPEN FOR VIEW AND ACCESS TO VEGETATION



STAGE FOUR: SEPERATE LEVELS FOR ORGANIZATION OF PROGRAMS



STAGE FIVE: PUSH BACK FOR SURROUNDING VIEW ACCESS

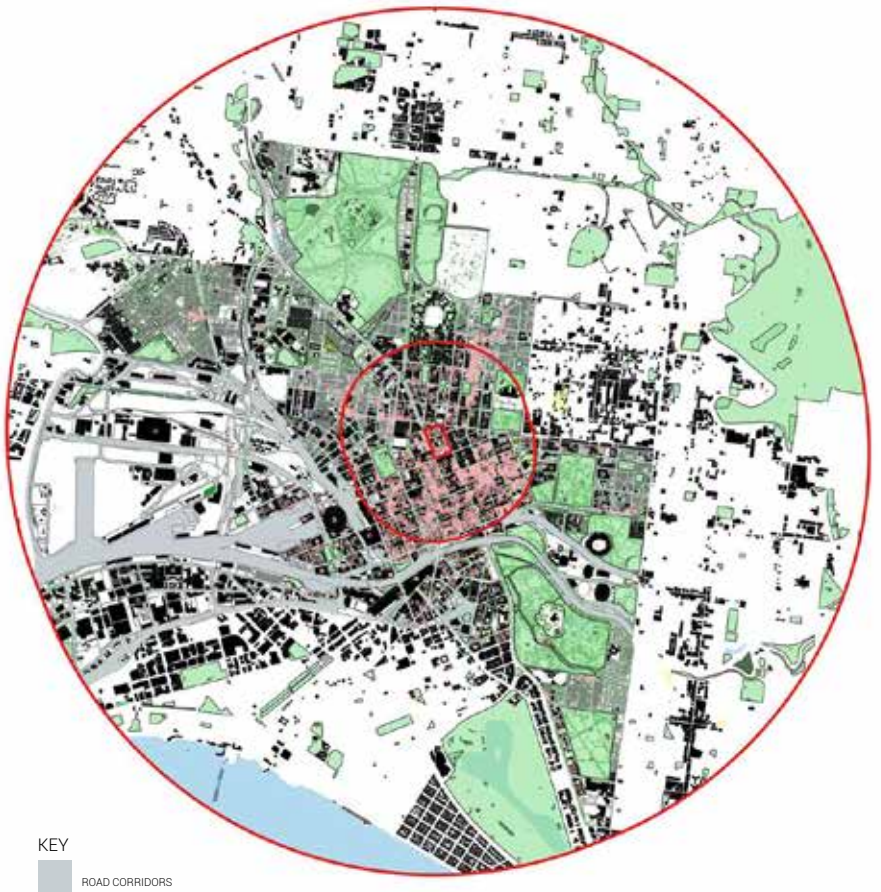


VERTICAL AND HORIZONTAL DESIGN DEVELOPMENT

KEY

- ROAD CORRIDORS
- PROPERTY BOUNDRY
- RESIDETIAL AND COMMERCIAL BUILDINGS
- TREE CANOPY ARRANGEMENT
- GREENERY/GRASS LAND/ PARK AREAS
- CAFE'S AND RESTAURANTS
- RMIT ACADEMIC BUILDING, MELBOURNE

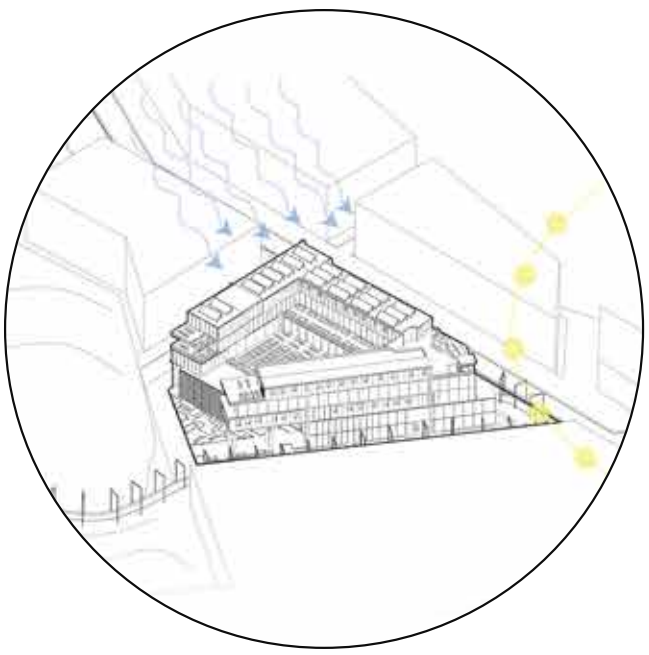
GIS DATA SET - 5KM RADIUS



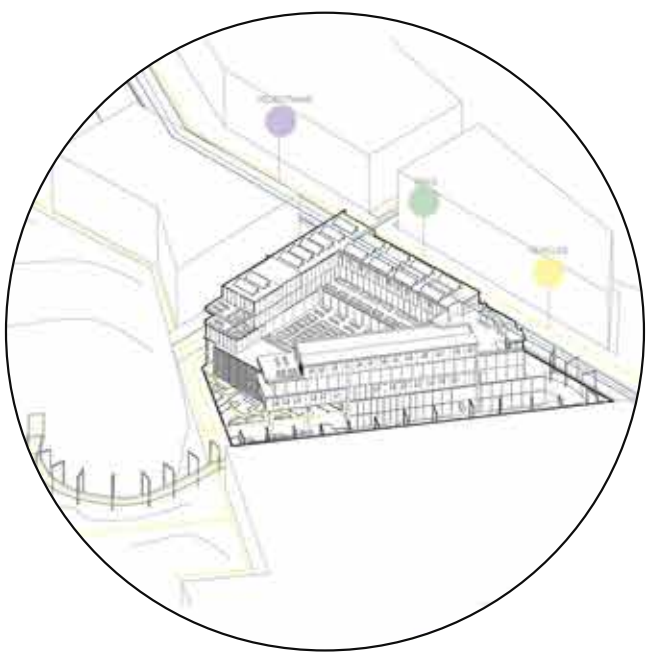
KEY

- ROAD CORRIDORS
- PROPERTY BOUNDRY
- RESIDETIAL AND COMMERCIAL BUILDINGS
- TREE CANOPY ARRANGEMENT
- GREENERY/GRASS LAND/ PARK AREAS
- WATER, BAY, BEACH, WETLAND
- CAFE'S AND RESTAURANTS
- RMIT ACADEMIC BUILDING, MELBOURNE

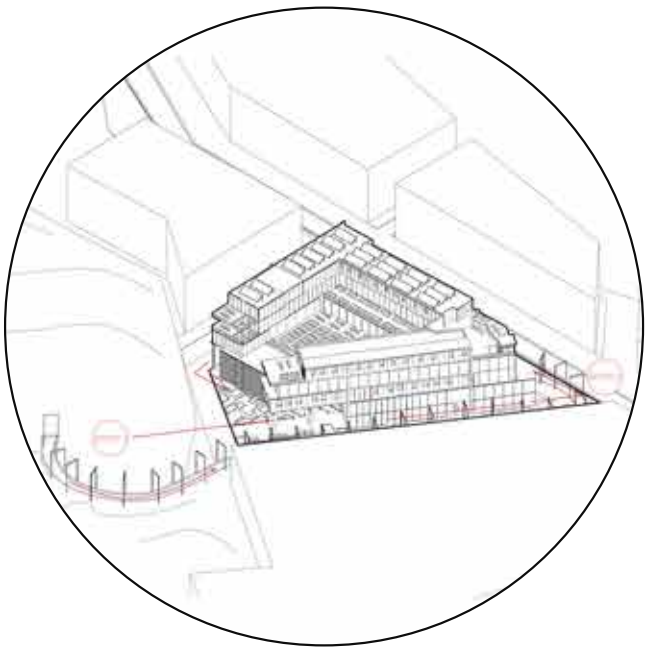
GIS DATA SET - 10KM RADIUS



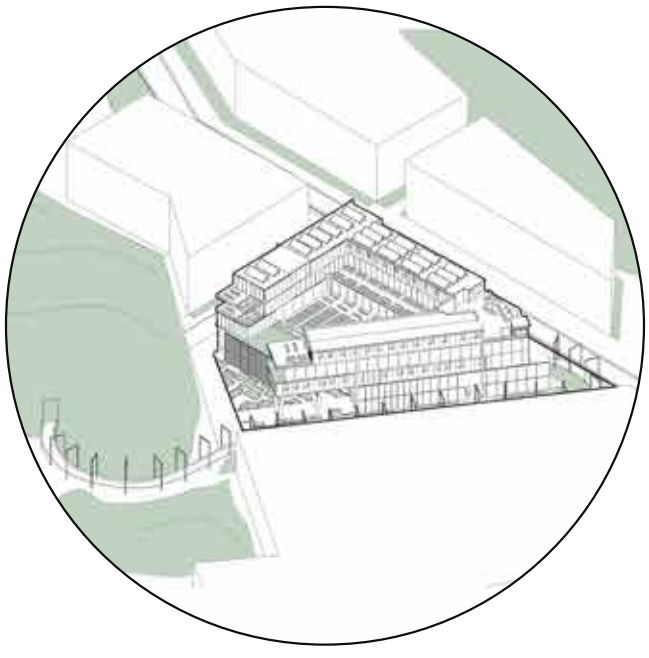
SUN AND WIND DIAGRAM



VEHICLE DIAGRAM

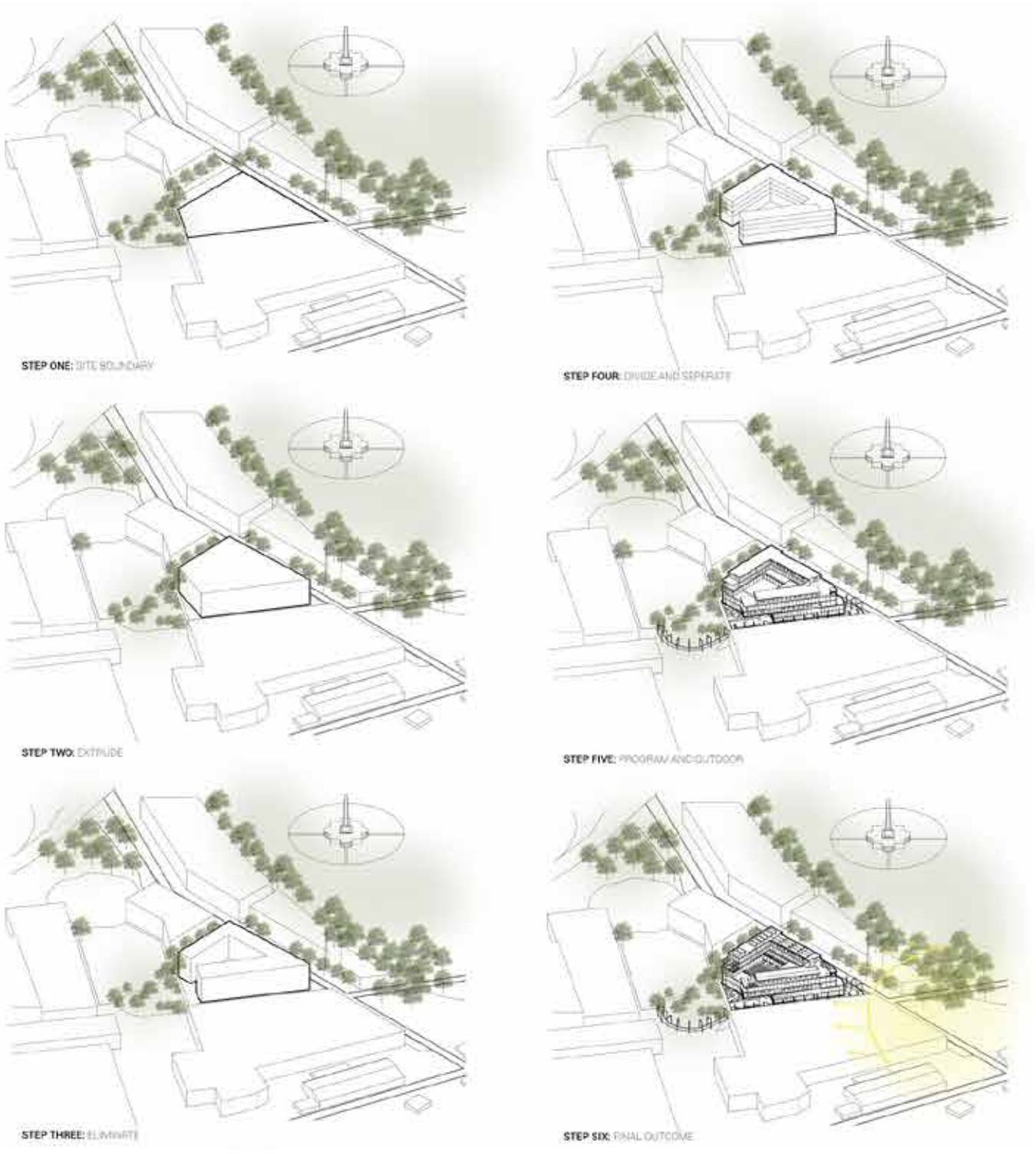


ENTRY DIAGRAM

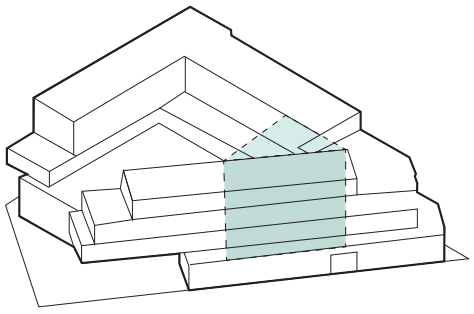


VEGETATION DIAGRAM

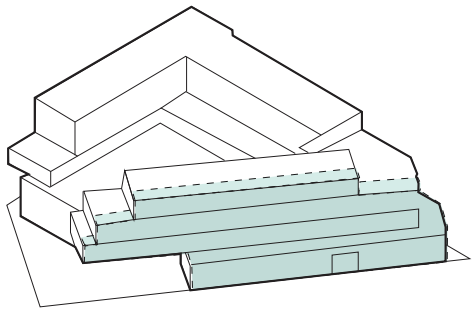
SITE PLAN 1:1000 CAPTURING CONNECTION TO SURROUNDING LANDSCAPE AND ADJACENT PARK



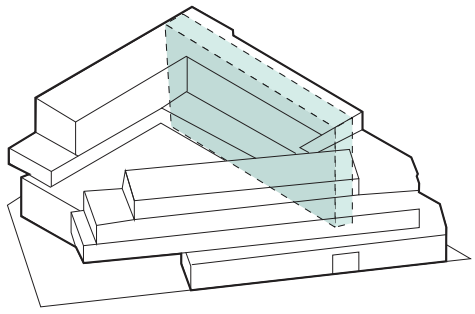
CONSTRUCTION SEQUENCE DRAWING



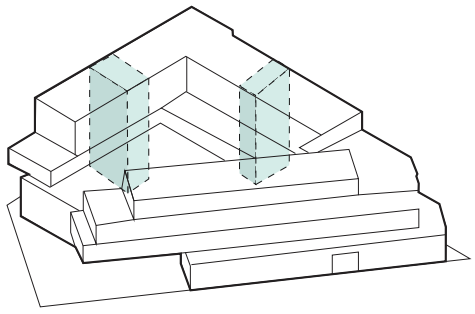
CENTRALIZED ATRIUM



SEMI-ENCLOSED ATRIUM



LINEAR ATRIUM



DOUBLE LINEAR ATRIUM

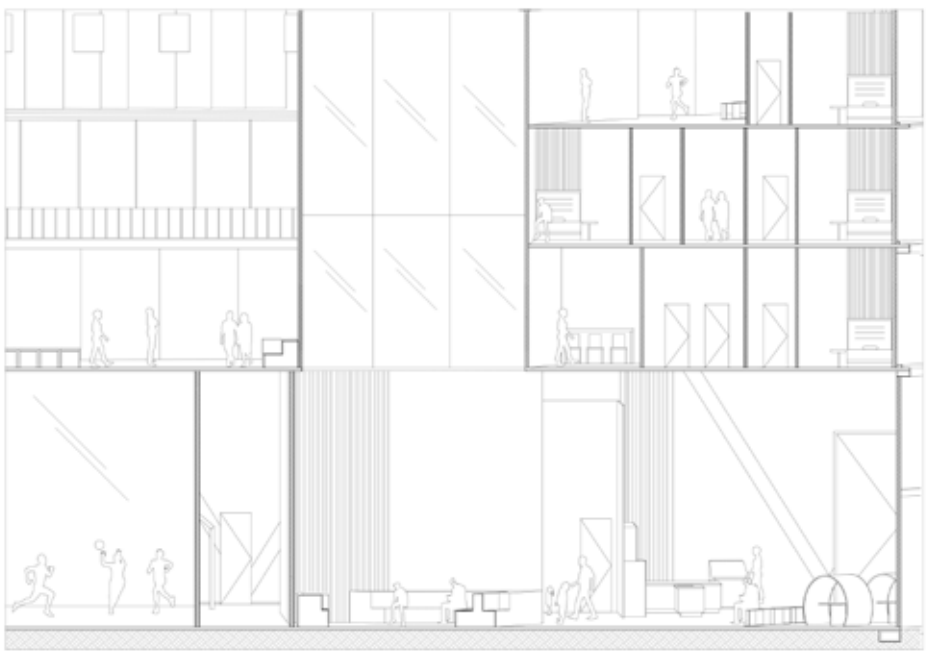
GROUNDFLOOR
1:200 AT A2

LEVEL THREE
1:200 AT A2

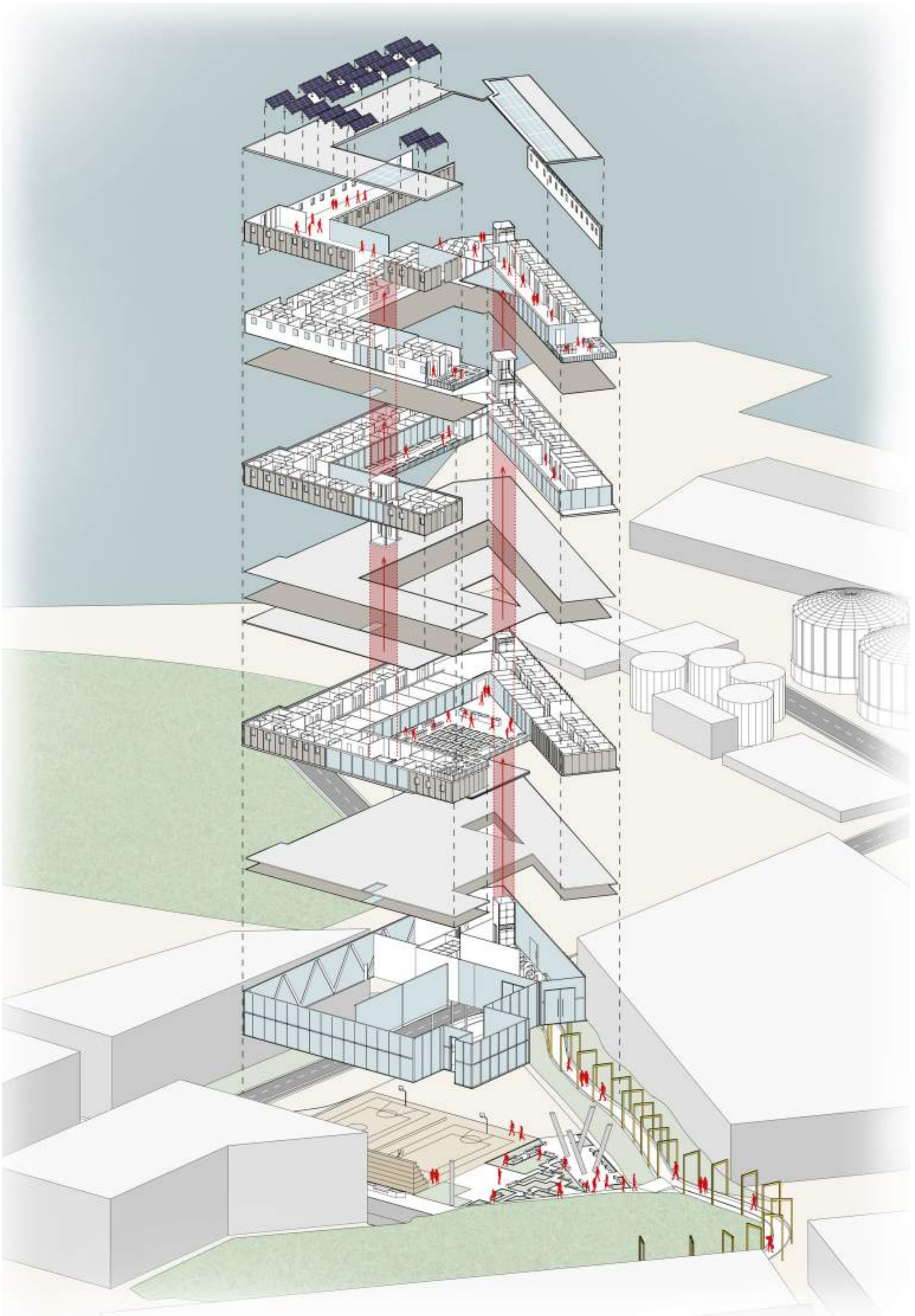
LEVEL ONE
1:200 AT A2

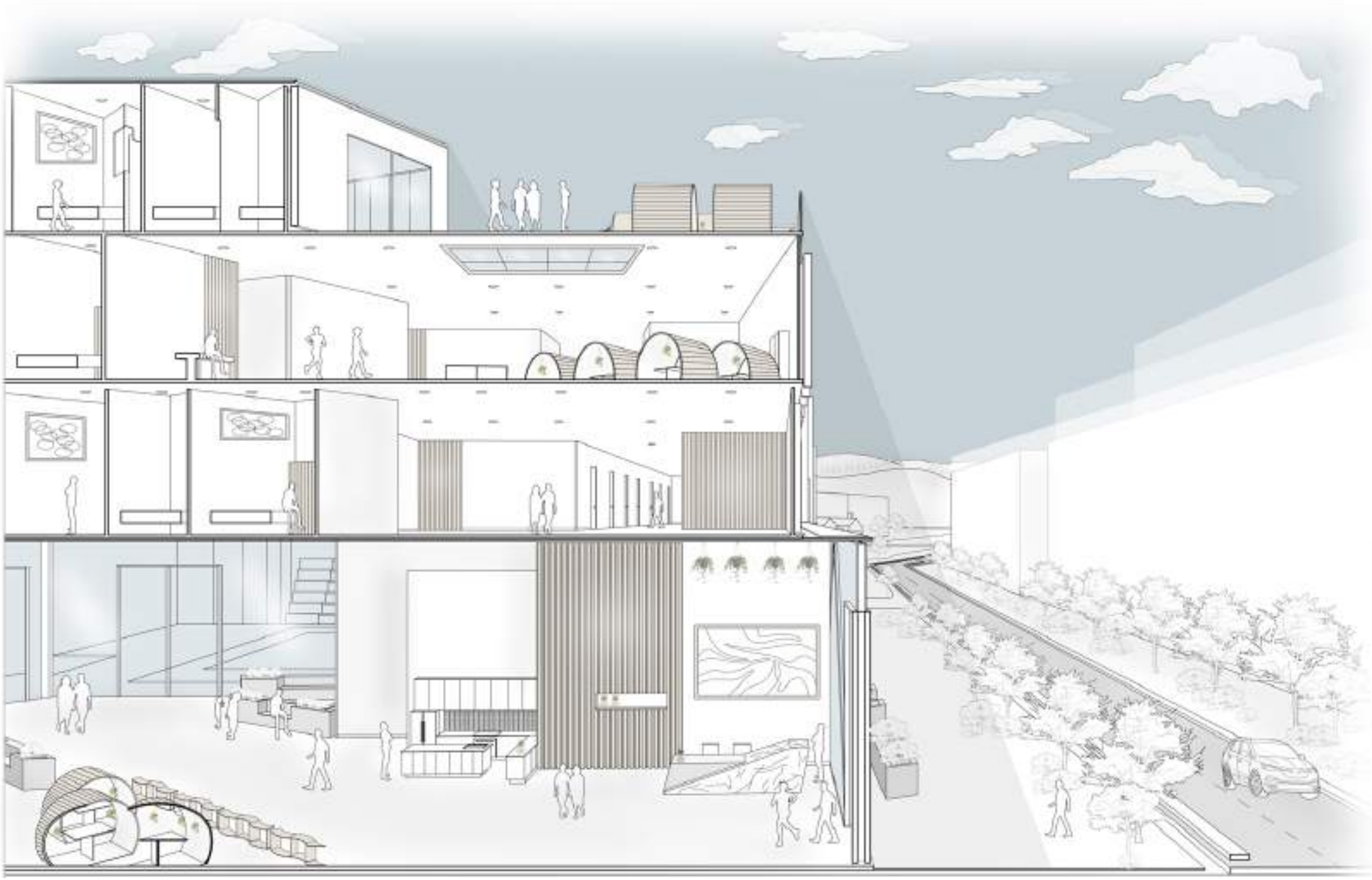
ROOF PLAN
1:200 AT A2

LEVEL TWO
1:200 AT A2



PERSPECTIVE SECTION
1:50 AT A2

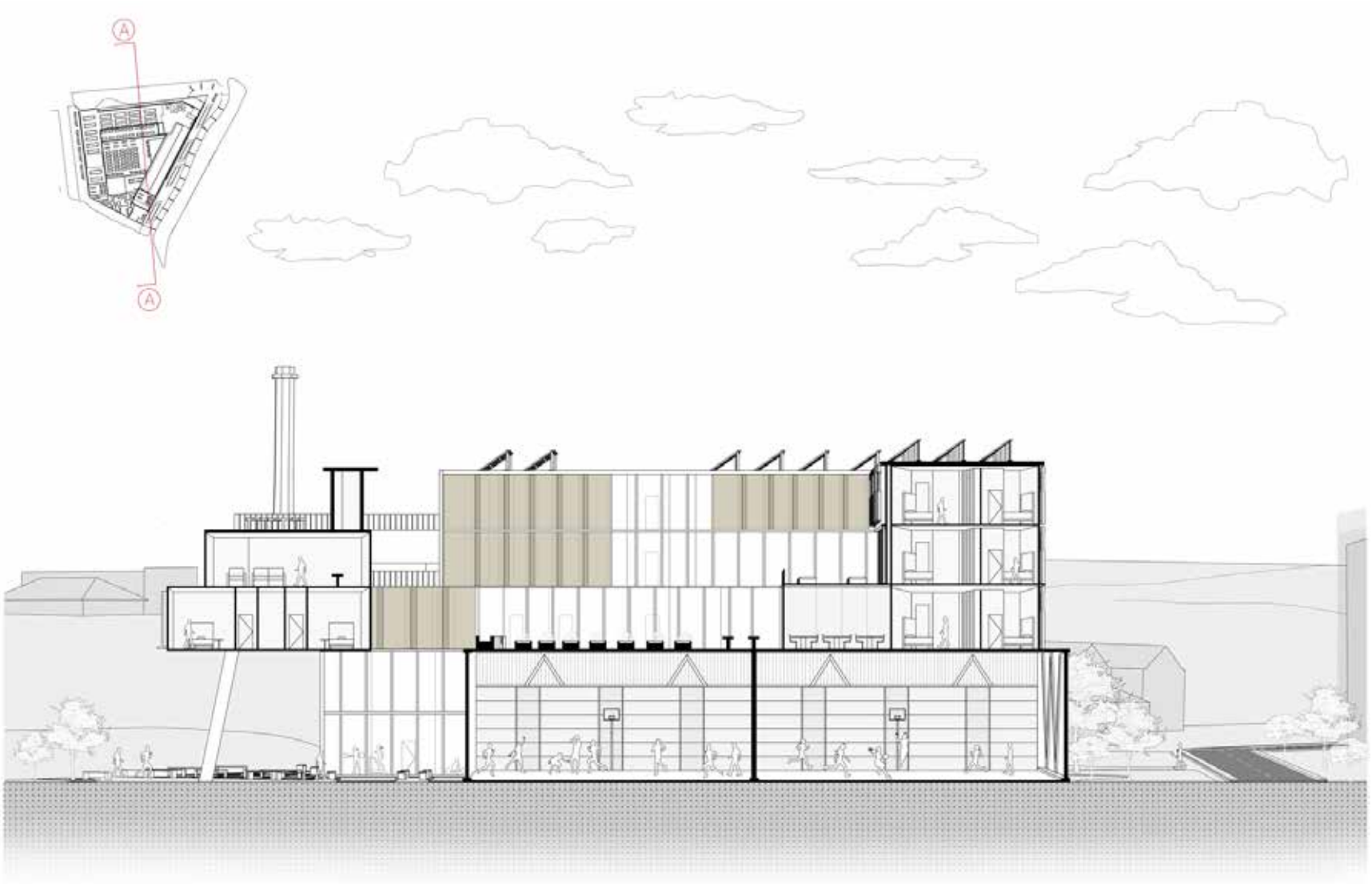




PERSPECTIVE SECTION
1:50 at A3

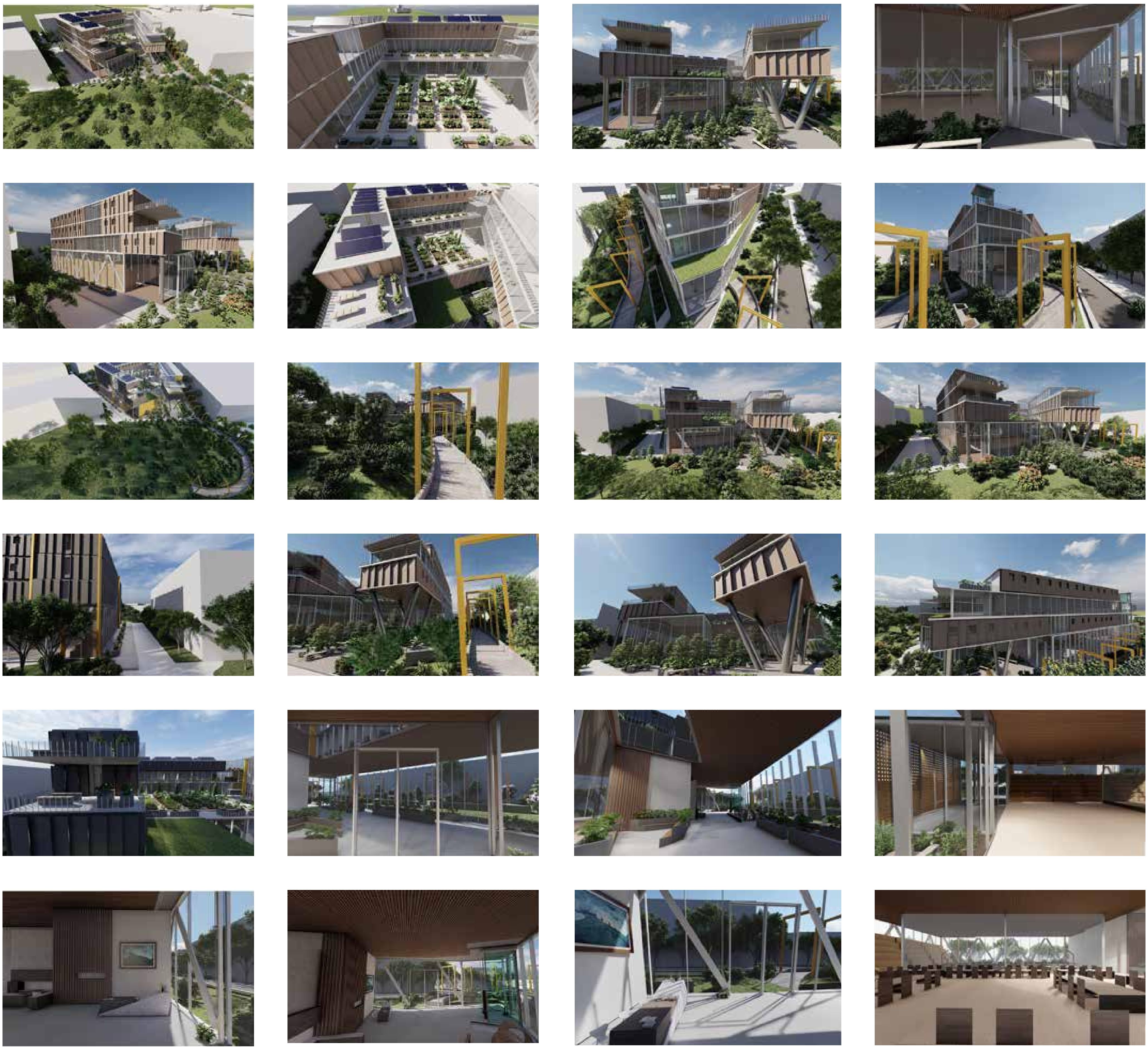
SECTION A-A DEVELOPMENT
1:200 at A3

SECTION B-B DEVELOPMENT
1:200 at A3



SECTION A-A
1:200 at A3

SECTION B-B
1:200 at A3



EXTERIOR AND INTERIOR VIEWS

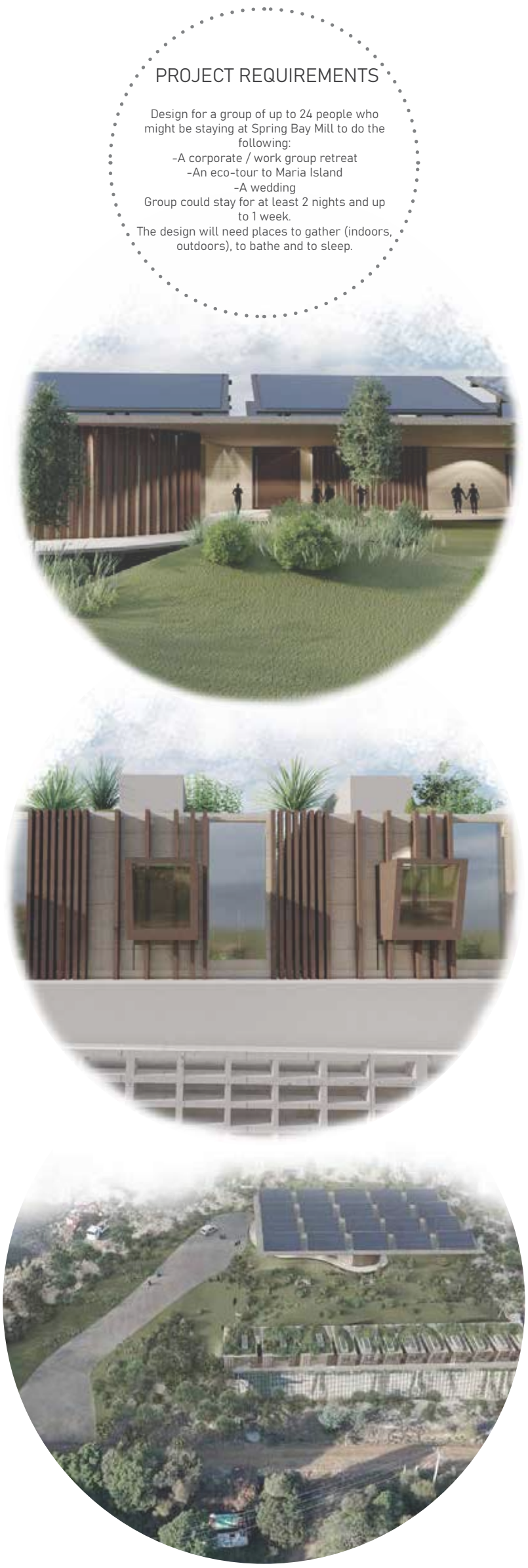
INTERIOR RENDERS REVEALING PROJECT DEVELOPMENT

MOUND POINT ACCOMMODATION

Location:
Spring Bay Mill Tasmania, Australia

Year:
2021

Architectural Design Studio
Regenerating



As a result of post-colonial land uses that have significantly impacted and damaged Spring Bay Mill, 'Mound Point Accommodation' aims to repair and regenerate the existing retaining wall site through the process of generating vegetation mounds, followed by the orchestration of different architectural elements, such as a place for resting, bathing and gathering surrounding the developed landscape. The central mound will be the main focal point upon entrance and exit from the retaining wall site, and will be able to expose the processes and methods that are being taken place in order to restore and enhance the damaged site.

The design is situated around a neglected retaining wall and features a large solar collecting roof that connects through to the central vegetation mounds and the adjacent accommodation huts. Each of the 12 huts has access to its own ensuite, with three of the huts including disability accessible bathing areas.

Structurally, the building of rammed earth, glass and a combination of Tasmanian timber is in essence a single long solar roof which seems to float above the twisted and curved gathering space beneath. The semi-enclosed outdoor gathering space that forms underneath invites individuals to engage with the expansive natural surroundings.

The concept of sustainability is prevalent throughout the Mound Point Accommodation project, whereby it implements renewable energy through the provision of a solar collecting roof, as well as the adoption of sustainable materials where possible, as a way to develop ideas and attitudes towards ethical and environmentally sustainable material use.

BLACKWOOD

Blackwood will be used for both exterior and interior elements within the project and some pieces of furniture. It has been selected due to its workability, durability and darker timber colour.

REDDISH-BROWN - POLISHED FINISH

Britton Timbers
Phone: (03) 64351108
Location:2 Elizabeth Street, Somerset TAS
Email:veneersales@brittontimbers.com
Website:https://brittontimbers.com.au/timbers/tasmanian-blackwood/

PLYWOOD

Plywood will be used to define the space for window installation. It has been selected as it is highly durable, light weight, environmentally friendly and is able to cover a larger area for the design.

CREAM - SMOOTH FINISH

UBEECO Packaging Solutions - Expert Packagers
Phone: 1800 147 977
Location: 28 Sarah Andrews Close Erskine Park NSW 2759
Email: sales@ubeeco.com.au
Website:https://www.ubeeco.com.au/contact/

RAMMED EARTH

Rammed Earth will be used for the flooring, the lining of the ceiling, the slab and some of the walls throughout the project. The reason that I have selected rammed earth is because it has high thermal mass qualities and allows for a comfortable internal temperature during both summer and winter. It is also strong and durable, long lasting with low maintenance required, fireproof, non-toxic for the environment and is highly versatile, which allows for different textured finishes.

LIGHT GREY - SMOOTH FINISH

Olnee Constructions – Rammed Earth Inspired by Nature
Phone: +03 9551 5749
Fax: 03 9551 5786
Location: Melbourne, Australia
Email: info@olnee.com.au
Website:https://olneerammedearth.com.au/contact-us/

SPOTTED GUM TIMBER

This material will be used for the main structural beams and frames of the accommodation building. This type of recycled timber has a pale to dark brown colour and is a type of hard wood that is dense, highly durable and highly tough, which is necessary for the structural elements of the design.

LIGHT BROWN - POLISHED FINISH

McKay Timber
Phone: (03) 62726941
Location: 22 Wrights Avenue Glenorchy, TAS
Email: mckaytimber@mckaytimber.com
Website:https://mckaytimber.com.au/spotted-gum/

RUSTED IRON SHEETS

This material found on site will be used for the door and window framing. This material is not only aesthetically appealing when incorporated into the interior and exterior of the design, but is also effective due to its durability, low maintenance, UV resistance, flexibility and lightweight.

REDDISH-BROWN - ROUGH FINISH

SPRING BAY MILL

PINEWOOD

This material will be used for the interior structure of gathering space building. Pinewood has a light cream colour and has been selected as it is durable and can be cut, stained and carved easily for the design of the project.

CREAM - ROUGH FINISH

Timber Wholesale
Phone: (03)62733815
Location: 20 Knoll St, Glenorchy TAS
Email: info@timberwholesale.com.au
Website:https://timberwholesaletas.com.au/contact-us/

TASMANIAN OAK

This timber will be used for the doors within the gathering and bathing design, as well as the internal framing and the joinery. Its reddish-brown colour is ideal for creating an aesthetically pleasing interior design where individuals feel a sense of warmth and wellbeing. Tasmanian Oak timber is known for its durability, strength and ability to be adapted in terms of finishes and sanding.

LIGHT BROWN - SMOOTH FINISH

McKay Timber
Phone: (03) 62726941
Location: 22 Wrights Avenue Glenorchy, TAS
Email: mckaytimber@mckaytimber.com
Website:https://mckaytimber.com.au/spotted-gum/

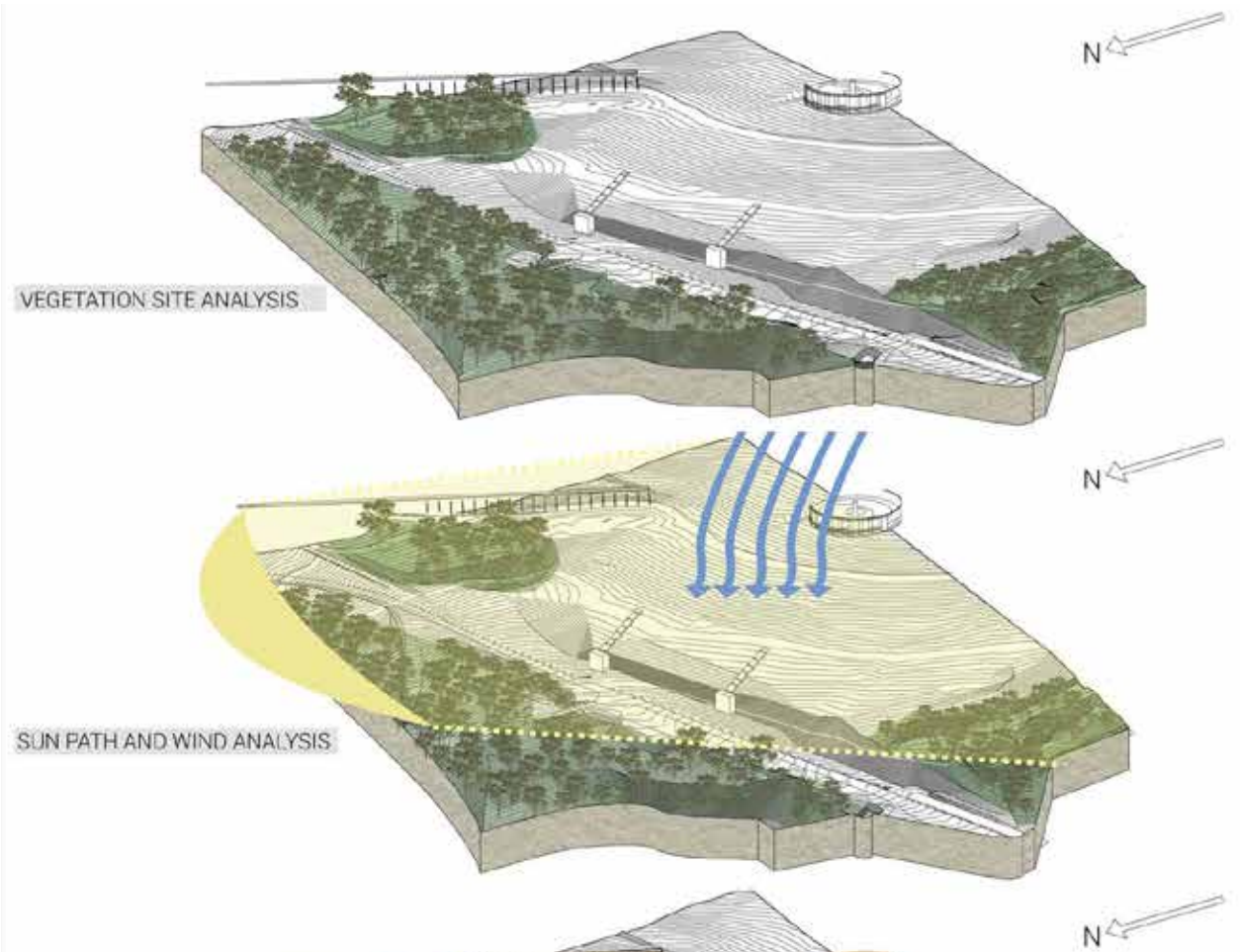
RADIATA PINE

This material will be used for the cladding for the outdoor gathering space, some of the walls of the interior gathering space and the separated boards on the façade. It has been selected as a result of its durability and its pale brown appearance, which results in a warm internal environment.

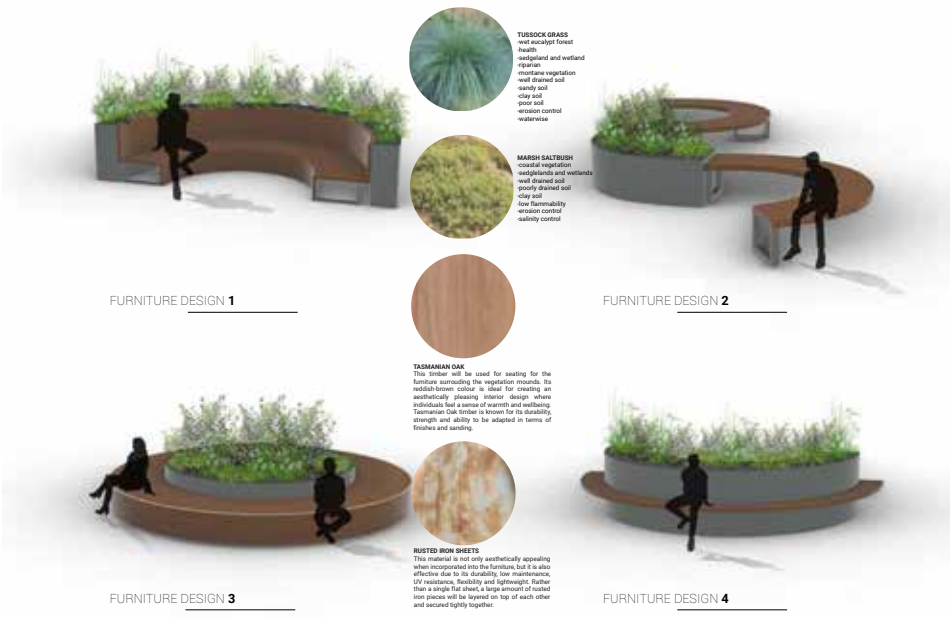
LIGHT CREAM - SMOOTH FINISH

Tasmanian Timber
Phone: 1300 041 766
Location: Tasmania
Email:contact@tasmaniantimber.com.au
Website:https://tasmaniantimber.com.au/contact/

MATERIAL PALETTE



EXISTING RETAINING WALL SITE CONDITION ANALYSIS



TUSSOCK GRASS
-wet eucalypt forest
-heath
-sedgeland and wetland
-riparian
-montane vegetation
-well drained soil
-sandy soil
-clay soil
-poor soil
-erosion control
-waterwise

MARSH SALTBUSH
-coastal vegetation
-sedgelands and wetlands
-well drained soil
-poorly drained soil
-clay soil
-low flammability
-erosion control
-salinity control

TASMANIAN OAK
This timber will be used for seating for the furniture surrouding the vegetation mounds. Its reddish-brown colour is ideal for creating an aesthetically pleasing interior design where individuals feel a sense of warmth and wellbeing. Tasmanian Oak timber is known for its durability, strength and ability to be adapted in terms of finishes and sanding.

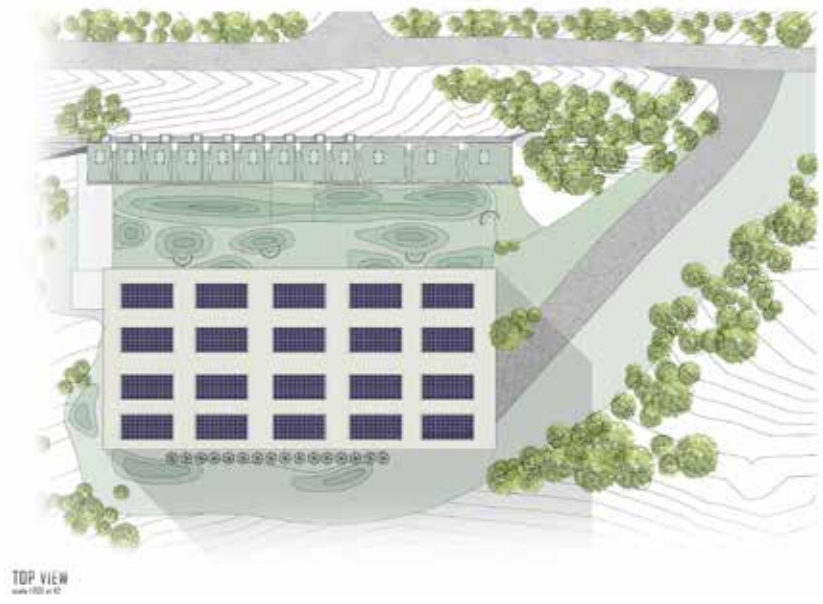
RUSTED IRON SHEETS
This material is not only aesthetically appealing when incorporated into the furniture, but it is also effective due to its durability, low maintenance, UV resistance, flexibility and lightweight. Rather than a single flat sheet, a large amount of rusted iron pieces will be layered on top of each other and secured tightly together.

FURNITURE DESIGN **1**

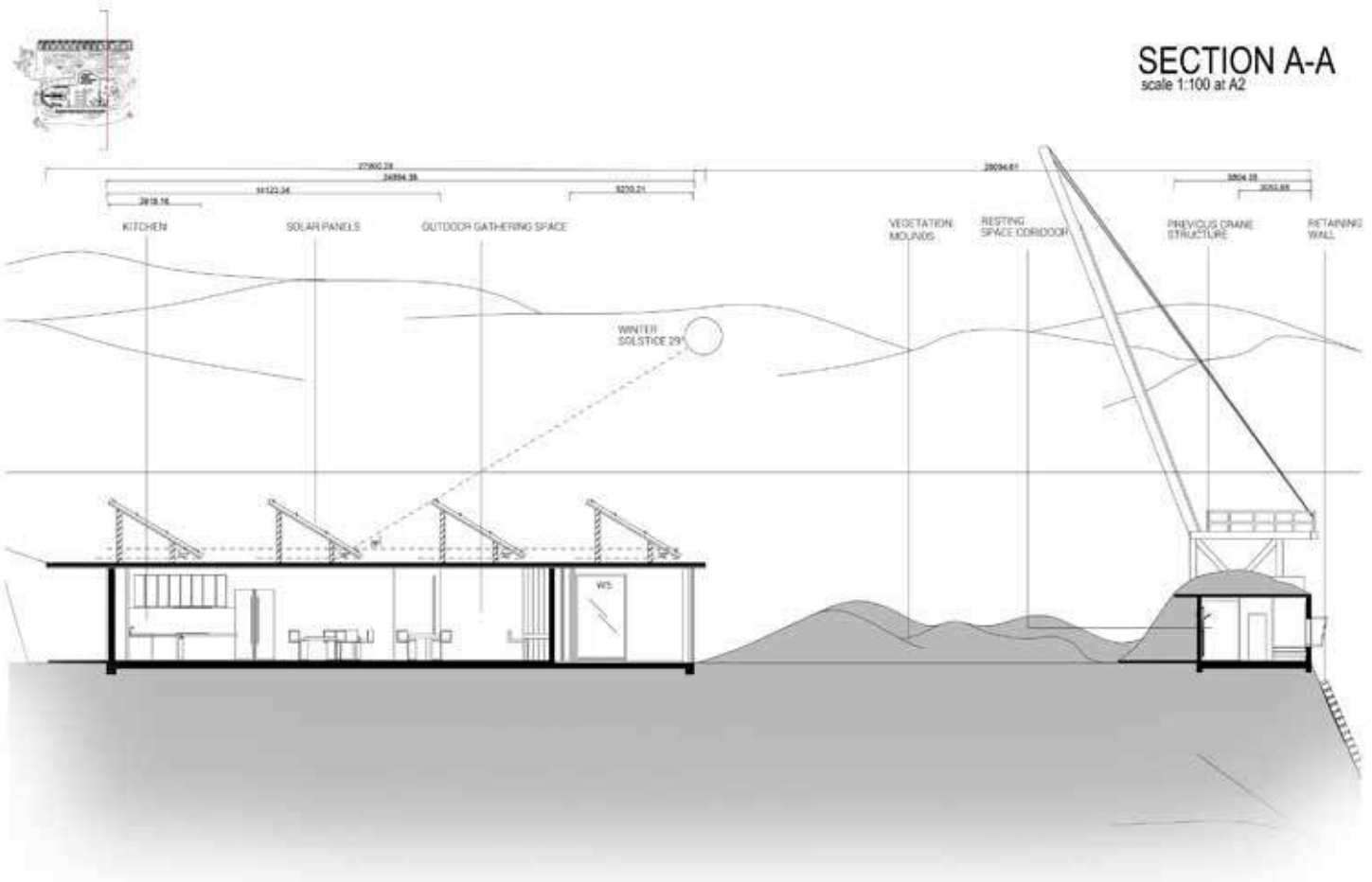
FURNITURE DESIGN **2**

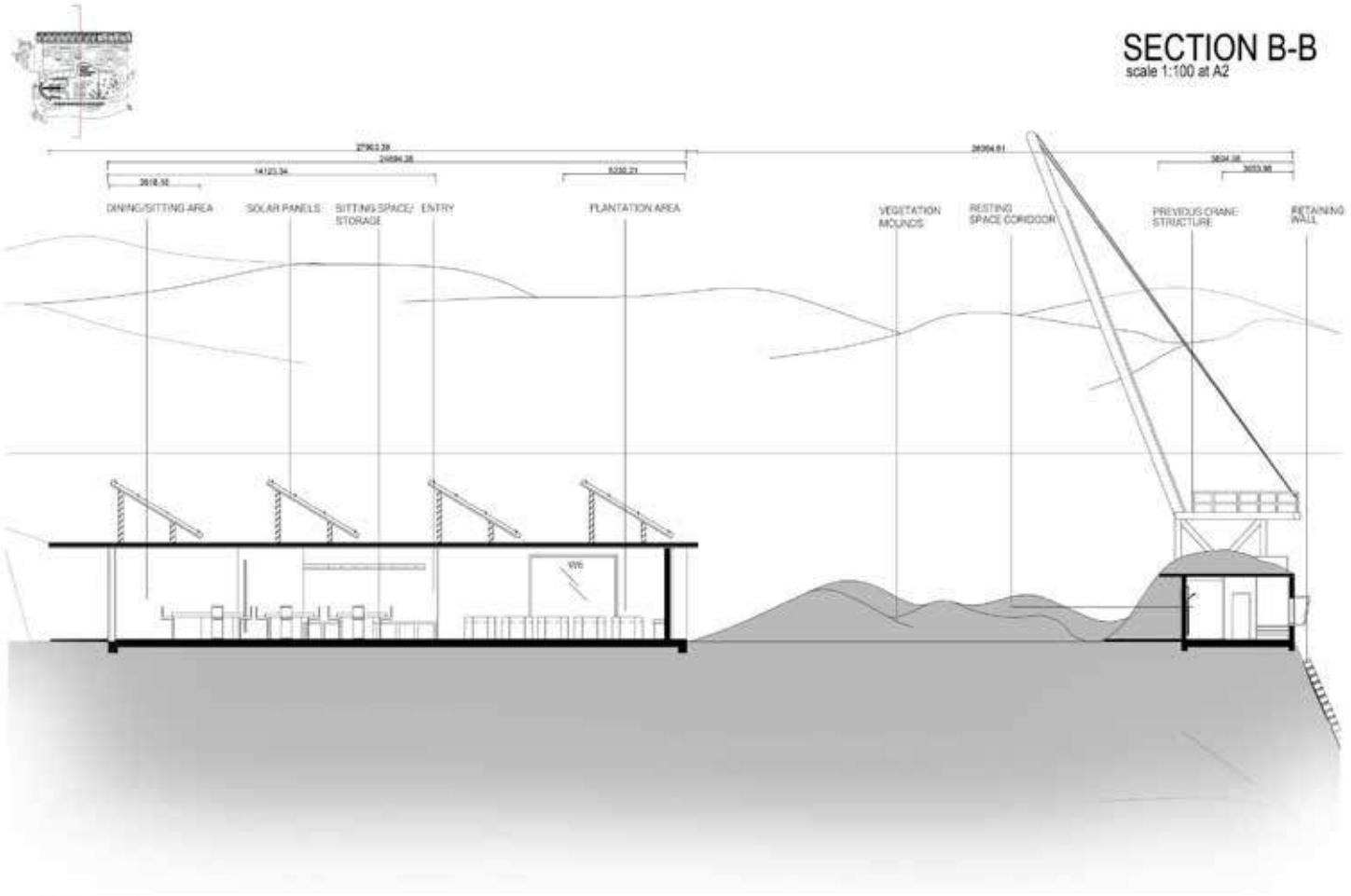
FURNITURE DESIGN **3**

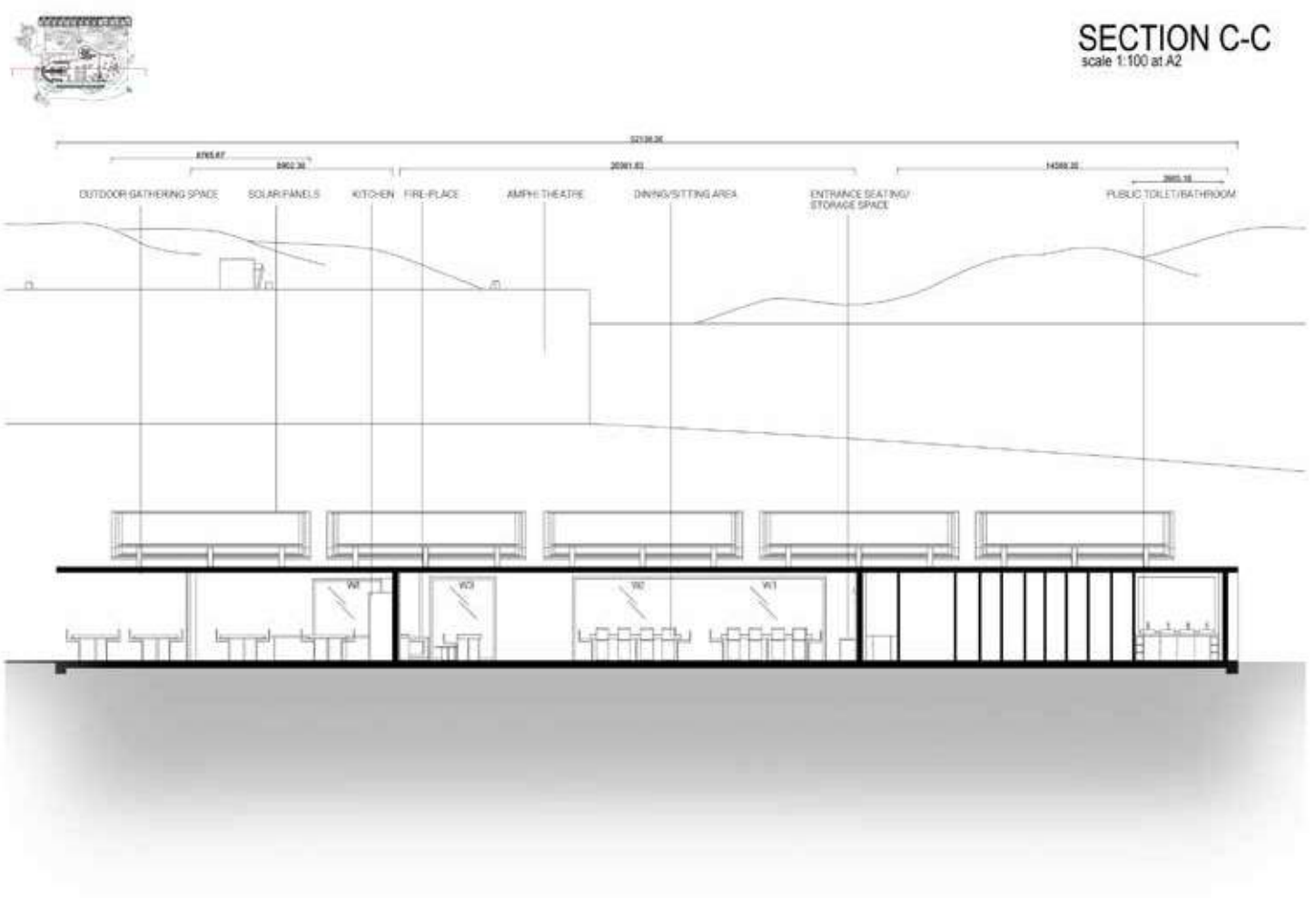
FURNITURE DESIGN **4**

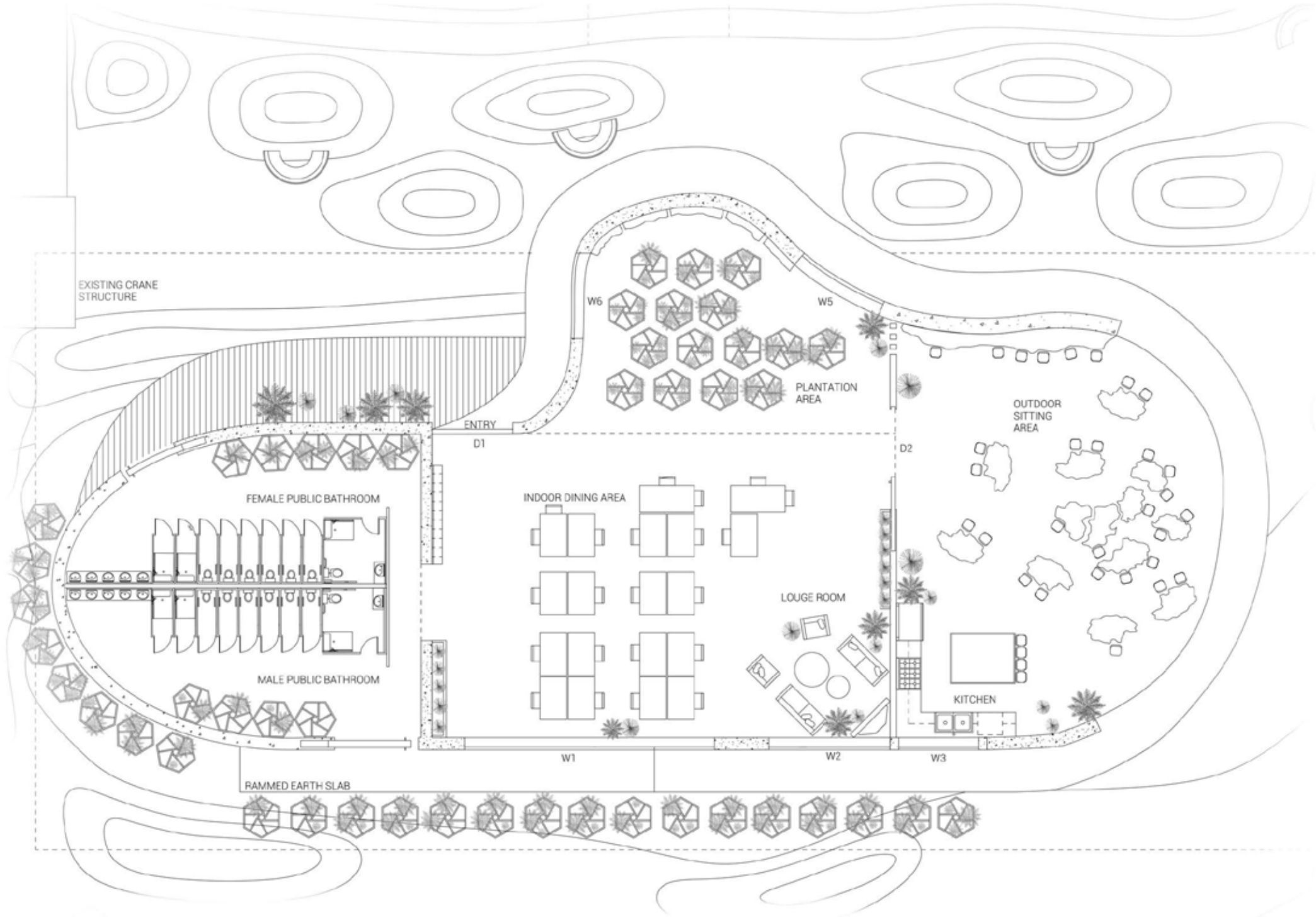


TOP VIEW


SECTION A-A
scale 1:100 at A2
KITCHEN
SOLAR PANELS
OUTDOOR GATHERING SPACE
VEGETATION MOUNDS
RESTING SPACE CORRIDOR
PREVIOUS CRANE STRUCTURE
RETAINING WALL
WINTER SOLSTICE 29°
WS

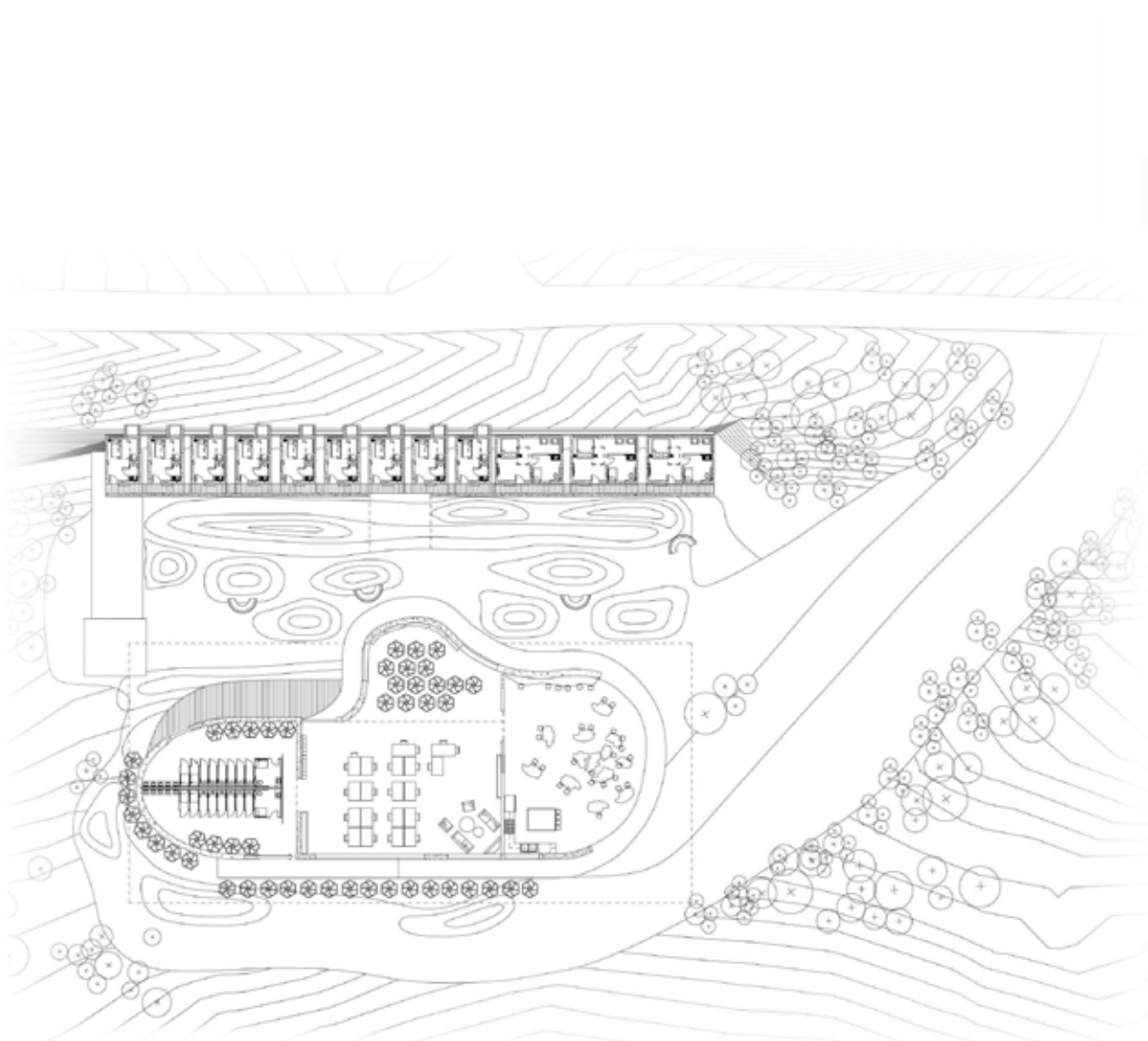

SECTION B-B
scale 1:100 at A2
DINING/SITTING AREA
SOLAR PANELS
SITTING SPACE/ STORAGE
ENTRY
PLANTATION AREA
VEGETATION MOUNDS
RESTING SPACE CORRIDOR
PREVIOUS CRANE STRUCTURE
RETAINING WALL
WS


SECTION C-C
scale 1:100 at A2
OUTDOOR GATHERING SPACE
SOLAR PANELS
KITCHEN
FIRE-PLACE
AMPHI THEATRE
DINING/SITTING AREA
ENTRANCE SEATING/ STORAGE SPACE
PUBLIC TOILET/BATHROOM
W4
W3
W2
W1



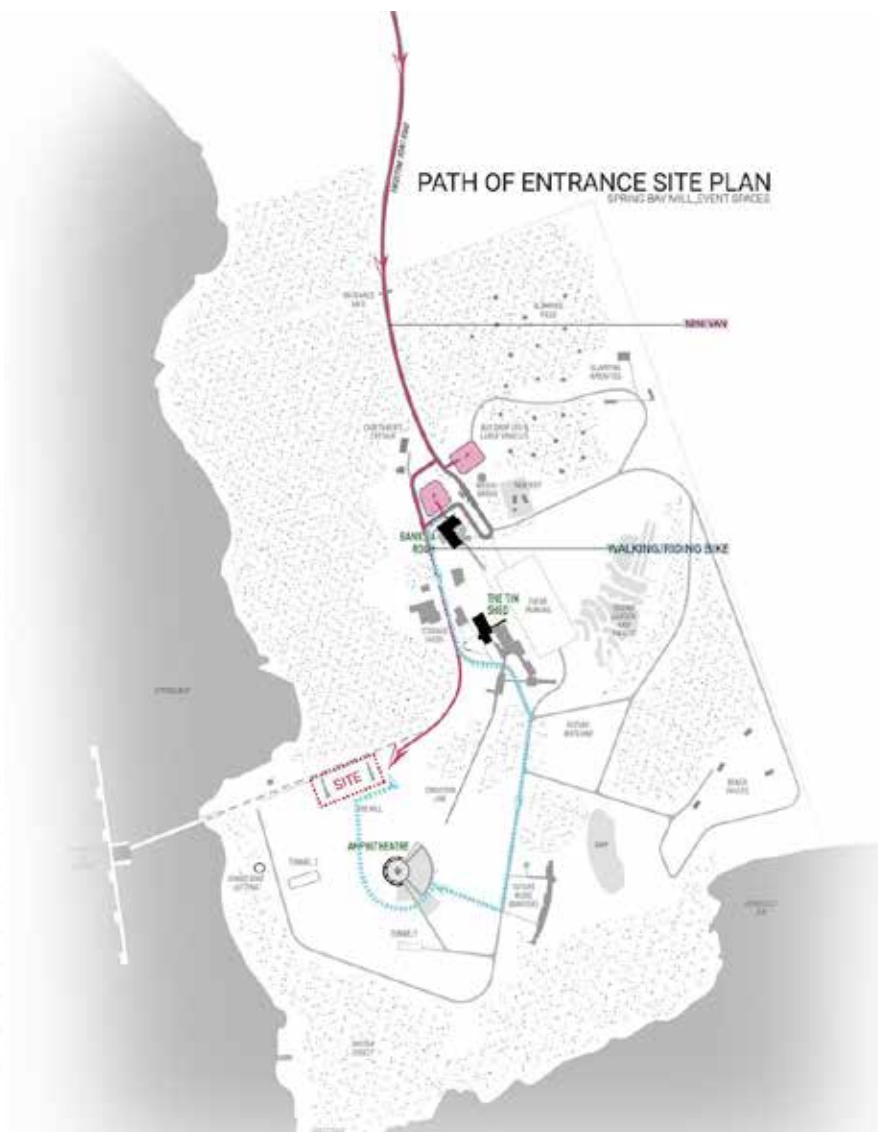
GATHERING SPACE FLOORPLAN

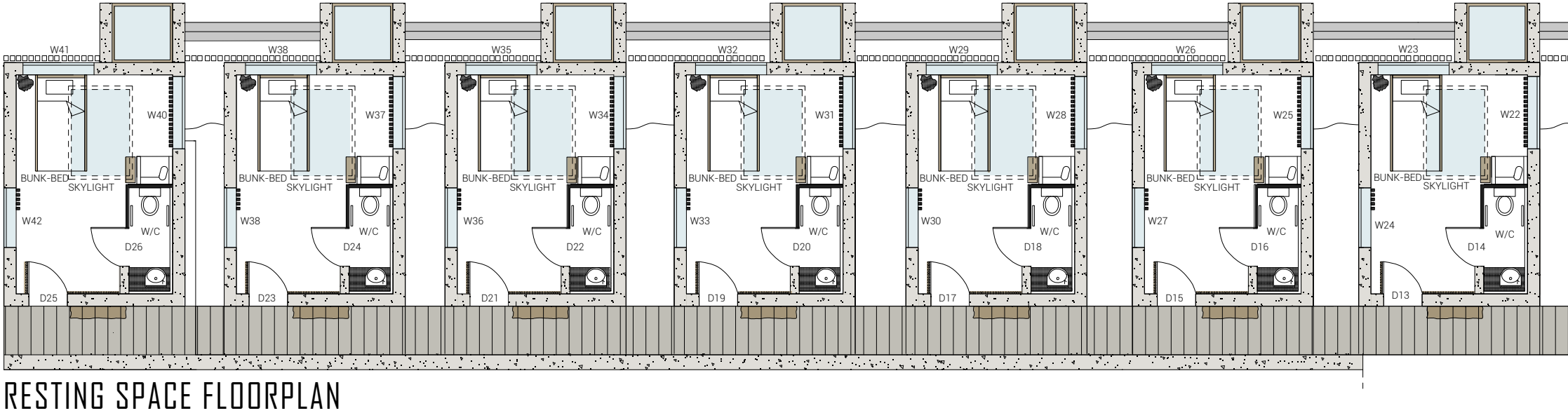
scale 1:100 at A2



ACCOMMODATION FLOORPLAN

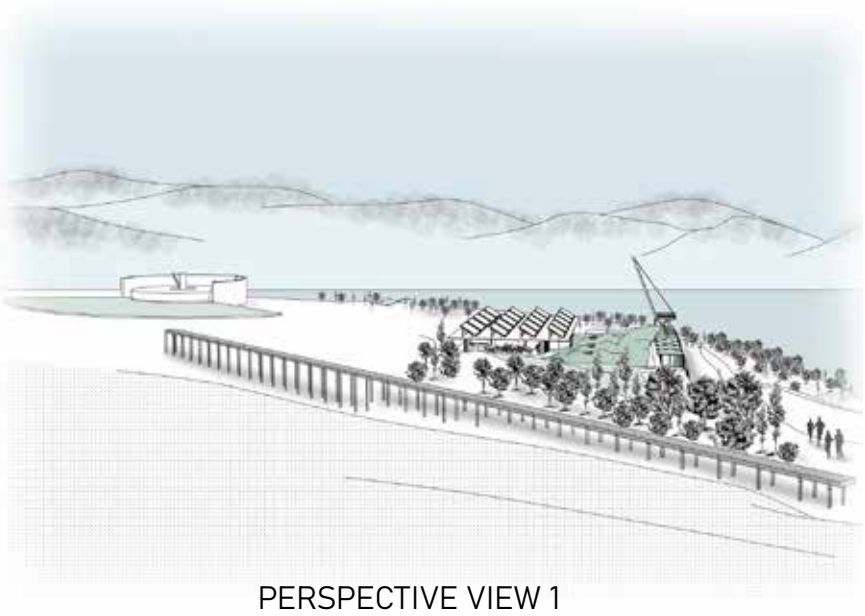
scale 1:200 at A2



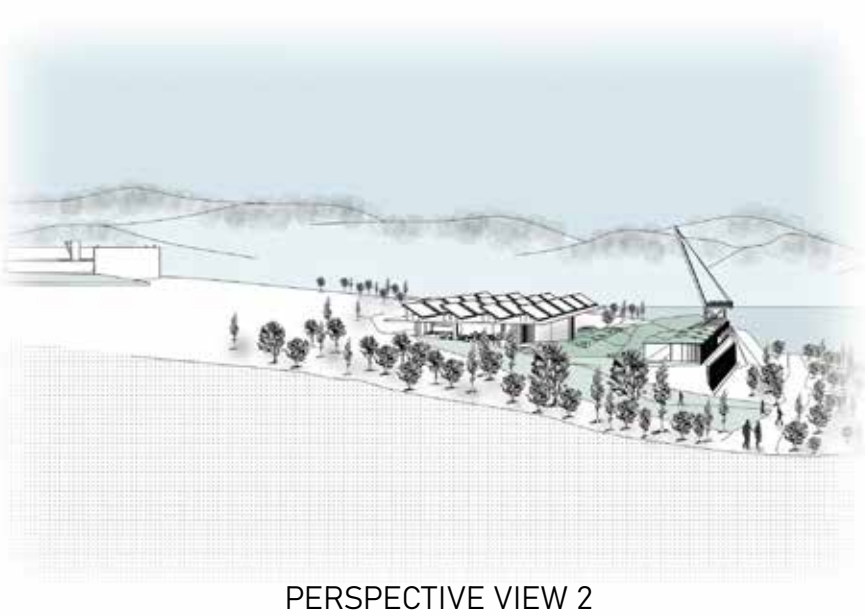


RESTING SPACE FLOORPLAN

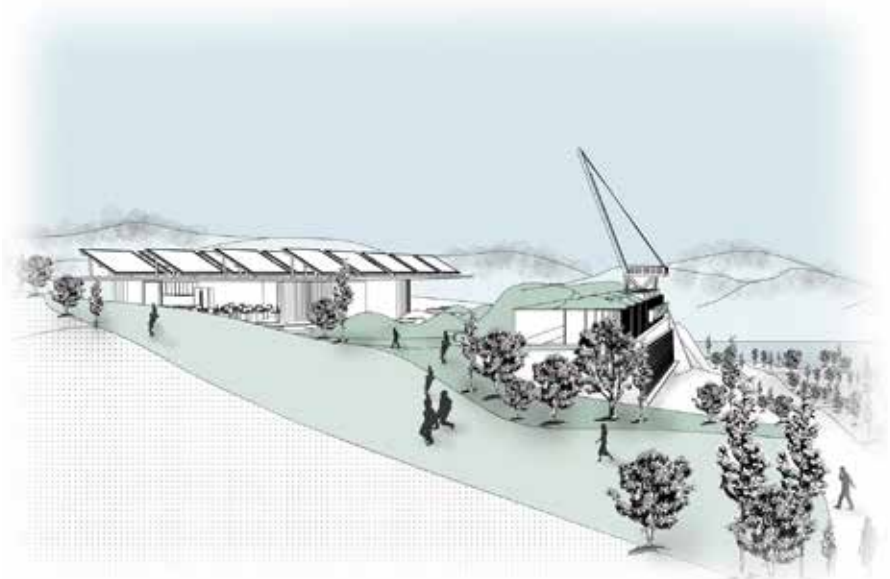
scale 1:50 at A0



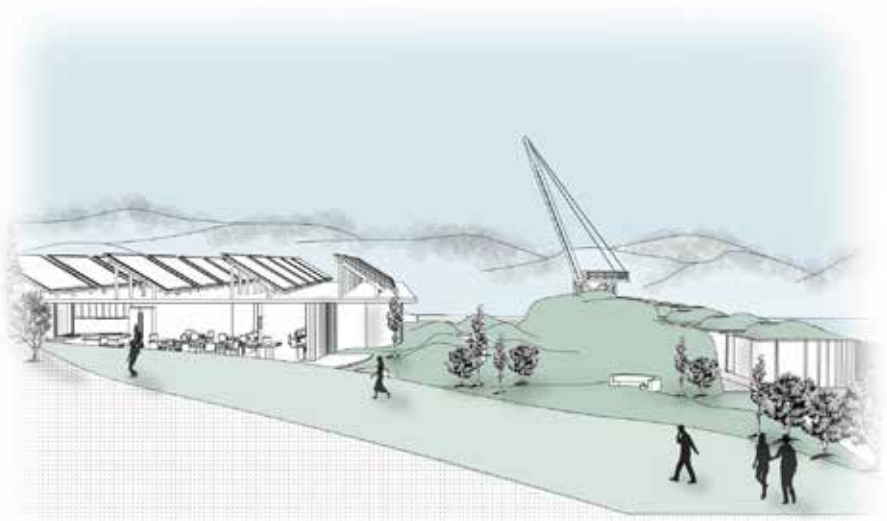
PERSPECTIVE VIEW 1



PERSPECTIVE VIEW 2

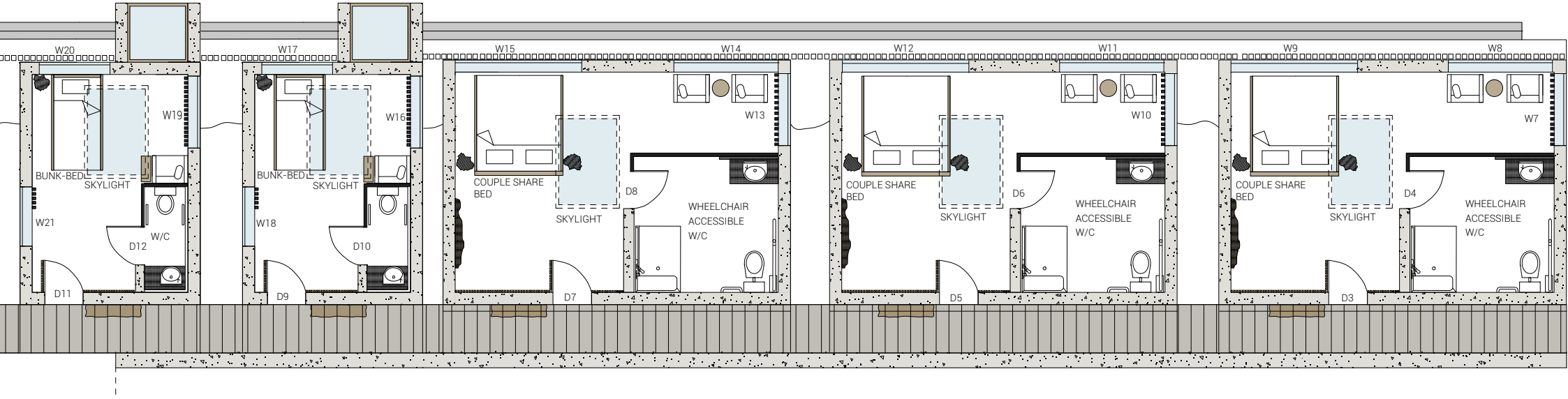


PERSPECTIVE VIEW 3



PERSPECTIVE VIEW 4

PERSPECTIVE VIEW 5



1 PREPARE SITE AND EXCAVATE. SEPERATE SOME OF THE SOIL FOR RAMMED EARTH WALL CONSTRUCTION. BLEND THE REMAINING CONTAMINATED SOIL WITH GOOD CLEAN SOIL, WHICH CAN BE USED FOR THE EXPANSION OF THE VEGETATION MOUNDS IN THE FUTURE.

2 REMOVE THE EXISTING CRANE STRUCTURE THAT IS LOCATED ON THE LEFT SIDE OF THE RETAINING WALL STRUCTURE.

3 THE LAWN SHOULD BE PLOTTED AND MARKED. A LAYER OF SOIL MUST BE REMOVED BEFORE THE BERM IS SET UP. REMOVE THE CLUTTER TO GENERATE A DEFINED SPACE FOR THE DESIGN OF THE VEGETATION MOUNDS. SAND, SOIL, ASPHALT AND RUBBLE SHOULD BE LAYERED TO CREATE THE MOUNDS.

4 PLANT THE SLOWER GROWING VEGETATION VARIETIES. THE DIFFERENT SHAPED MOUNDS SHOULD BE NATURALIZED BY GROWING TREES SUCH AS DROOPING SHEOAK, BLACK PEPPERMINT AND BLACKWOD TREES. PLANT SHRUBS SUCH AS SWEET WATTLE, MARSH SALTBUSH AND WHITE KUNZEA. FINALLY, PLANT ADDITIONAL SPREADING FLAX-LILY, WHITE FLAG-IRIS AND TUSSOCK GRASS.

5 CONSTRUCT THE FORM WORK FOR THE RAMMED EARTH SLABS. THEN MEASURE THE AREA TO BE DUG OUT AND EXCAVATE THE AREA. THE NEXT STEP INCLUDES PREPARING THE SLAB BEDDING AND PLACING THE REINFORCED MESH.

6 POUR THE RAMMED EARTH MIX INTO THE FORM WORK TO CREATE THE GROUND SLABS AND SMOOTH OUT THE SURFACE.

7 REMOVE THE FORMWORK AROUND THE RAMMED EARTH SLABS AND LEAVE FOR 24-48 HOURS TO PREPARE FOR THE NEXT STAGE OF THE CONSTRUCTION PROCESS.

8 CONSTRUCT FORM WORK FOR THE RAMMED EARTH WALLS. POUR IN THE RAMMED EARTH MIX INTO THE FORM WORK FOR THE CURVED GATHERING SPACE AND THE SEPERATED RESTING AREAS.

9 REMOVE THE FORMWORK, LEAVING THE DRIED RAMMED EARTH WALLS OF THE TWO DIFFERENT COMPONENTS OF THE DESIGN.

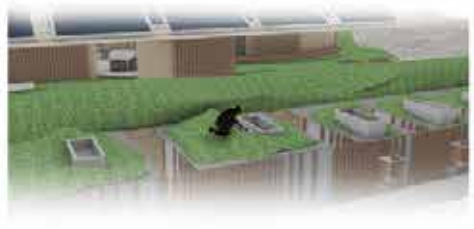
10 CONTINUE TO BUILD THE FORMWORK FOR THE SEPERATED RESTING AREAS AND THE REPETATIVE TIMBER EXTERIOR FOR THE GATHERING SPACE.

11 CONSTRUCT THE FORM WORK FOR THE RAMMED EARTH ROOF. ATTACH THE RUSTED IRON PIECES OF METAL REMAINS FROM THE SITE TO THE EXTERIOR OF THE RESTING SPACE AND CONTINUE TO LAYER THE MATERIAL OVER THE ENTRY DOORS.

12 ONCE THE RAMMED EARTH ROOF OF THE GATHERING SPACE IS DRIED, REMOVE THE WOODEN FORMWORK THAT WAS CONSTRUCTED EARLIER AND ADD THE SOLAR PANELS ON THE 30 DEGREE ANGLE.

13 NEXT CONTINUE TO SPREAD THE VEGETATION MOUNDS OVER THE SURFACE OF THE RESTING SPACES ONCE THE RAMMED EARTH ROOF SLAB IS DRIED AND REASY FOR THE NEXT STAGE.

14 CONSTRUCT THE METAL AND TIMBER OUTDOOR FURNITURE ON-SITE AND DISTRIBUTE ACCORDING TO THE TOP VIEW FOR ARRANGEMENT OF SEATING AREAS.



15 PLANT SHRUBS SUCH AS SWEET WATTLE, MARSH SALTBUSH AND WHITE KUNZEA. FINALLY, PLANT ADDITIONAL SPREADING FLAX-LILY, WHITE FLAG-IRIS AND TUSSOCK GRASS TO THE GREEN ROOF OF THE SEPERATED RESTING DESIGNS.

16 THE FINAL STAGES INCLUDE CONTINUING TO ADD FURNITURE WITHIN THE INTERIOR OF THE OUTDOOR GATHERING SPACE AND ADDING THE HEXAGONAL PLANTATION BOXES ALONG THE SIDE FOR ADDITIONAL PLANTATION SPACES.

CONSTRUCTION SEQUENCE







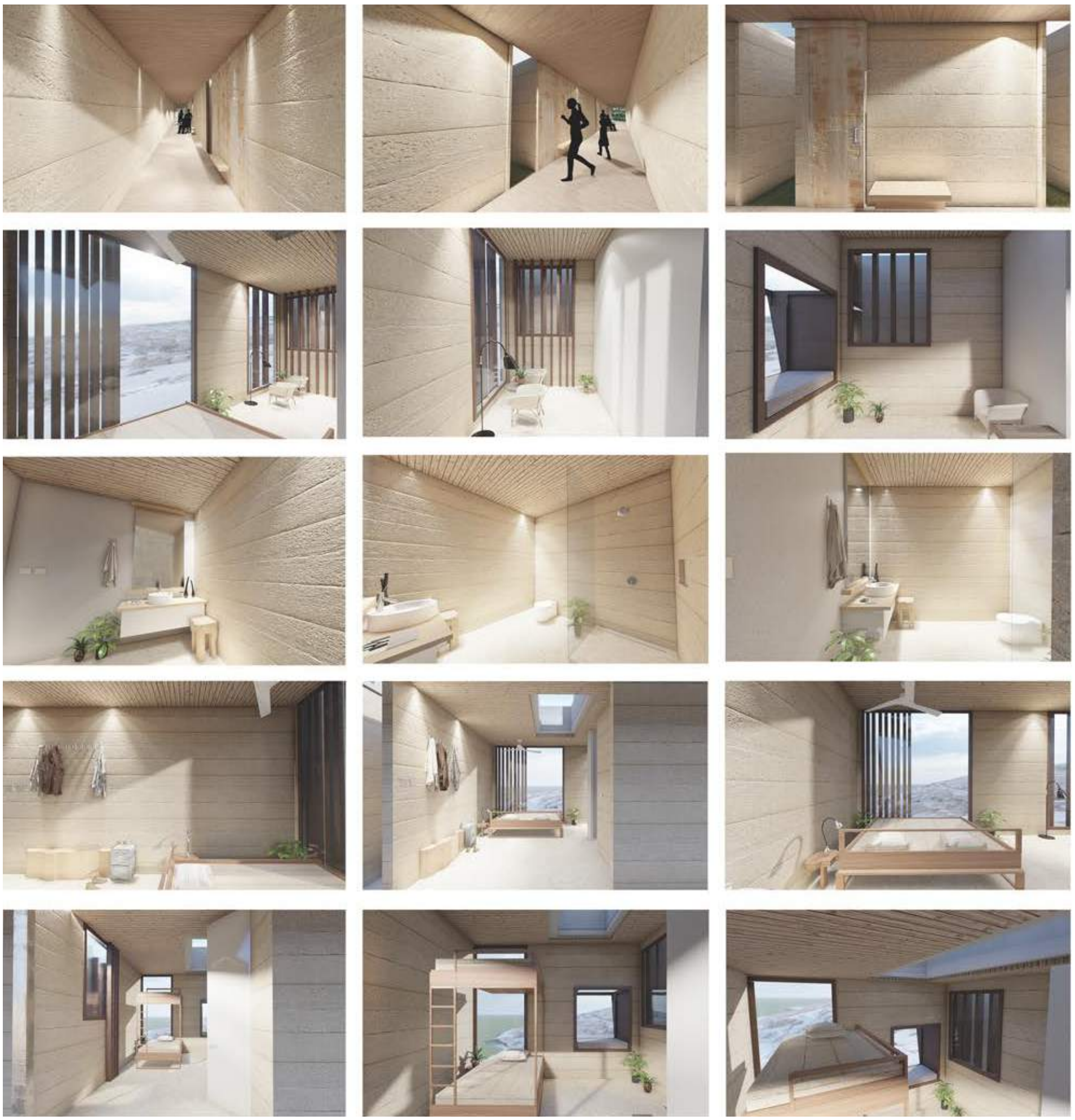








FINAL EXTERIOR PERSPECIVE VIEWS



FINAL INTERIOR PERSPECIVE VIEWS



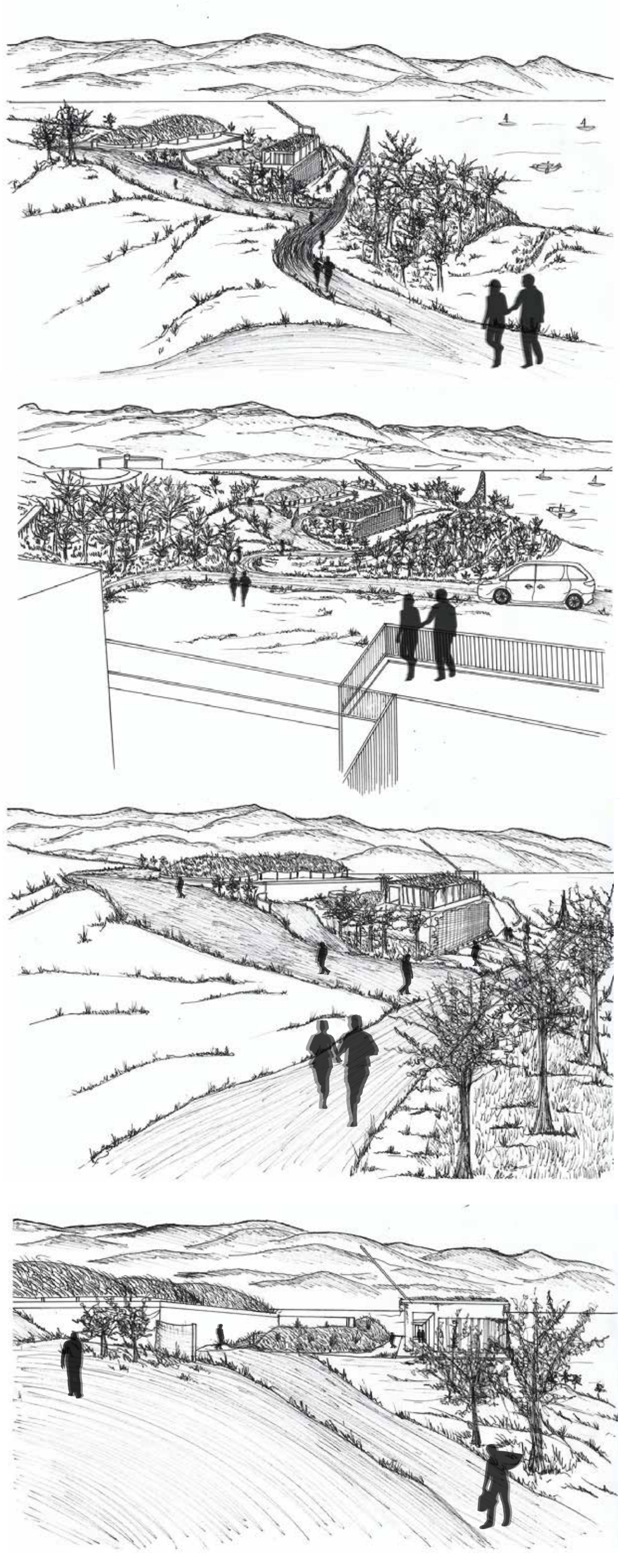









FINAL INTERIOR PERSPECIVE VIEWS



NIGHT RENDERS

RESTING

Location:
Spring Bay Mill Tasmania, Australia

Year:
2021

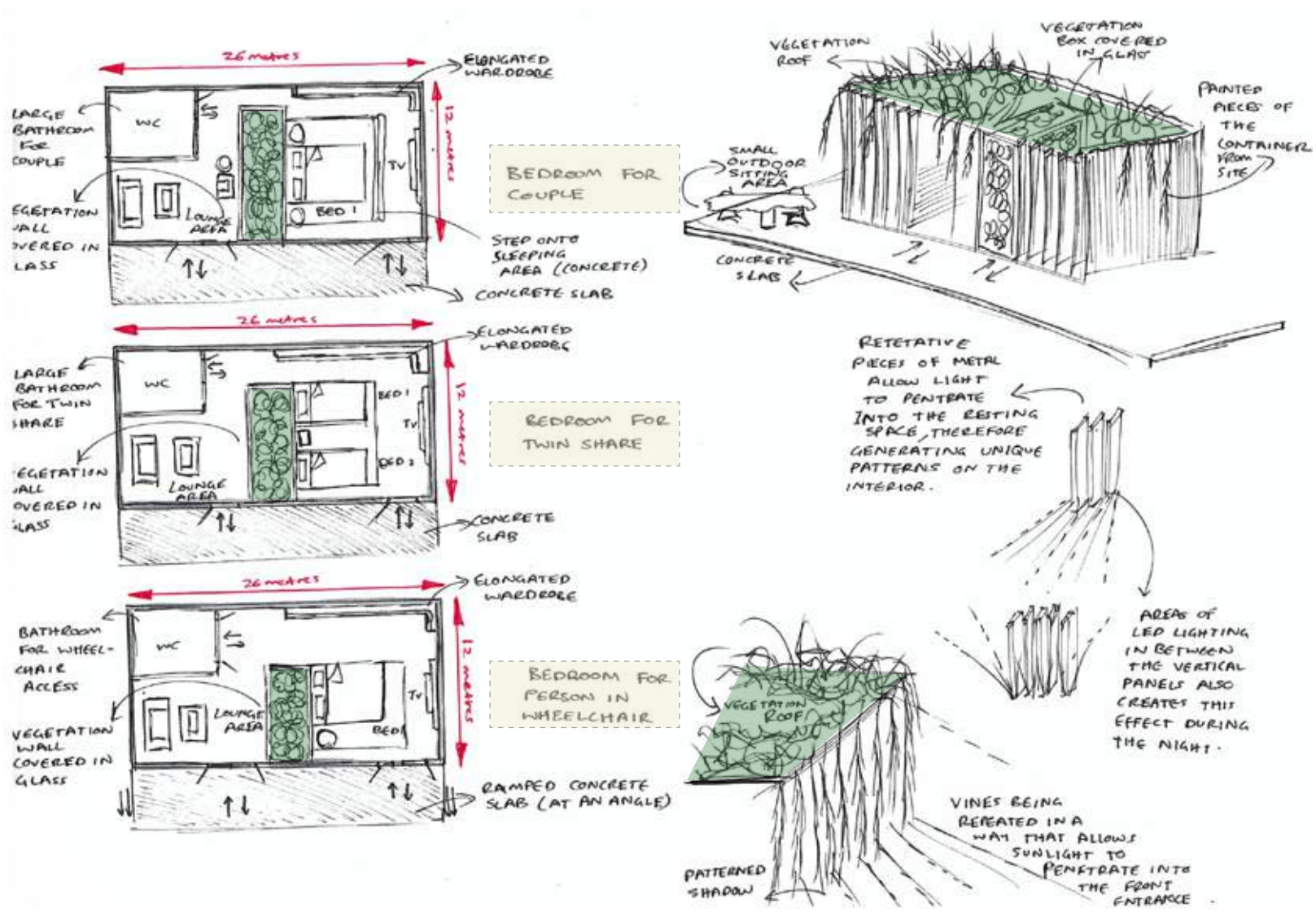
Architectural Design Studio
Regenerating

The resting space project offers a memorable experience for the end-user as result of the use of lighting that brings an emotional value to the architecture. Both daylighting and artificial lighting, achieved through the selection of various glass openings and vertical exterior panels is able to draw the attention of the end-user to the colours, textures, materials and forms of the resting space. In order to make particular materials the centre of attention, such as the timber backboards throughout the space, I decided that wall washing would be effective, where light would be directed towards different wall surfaces and in between the repeated vertical panels on the exterior.

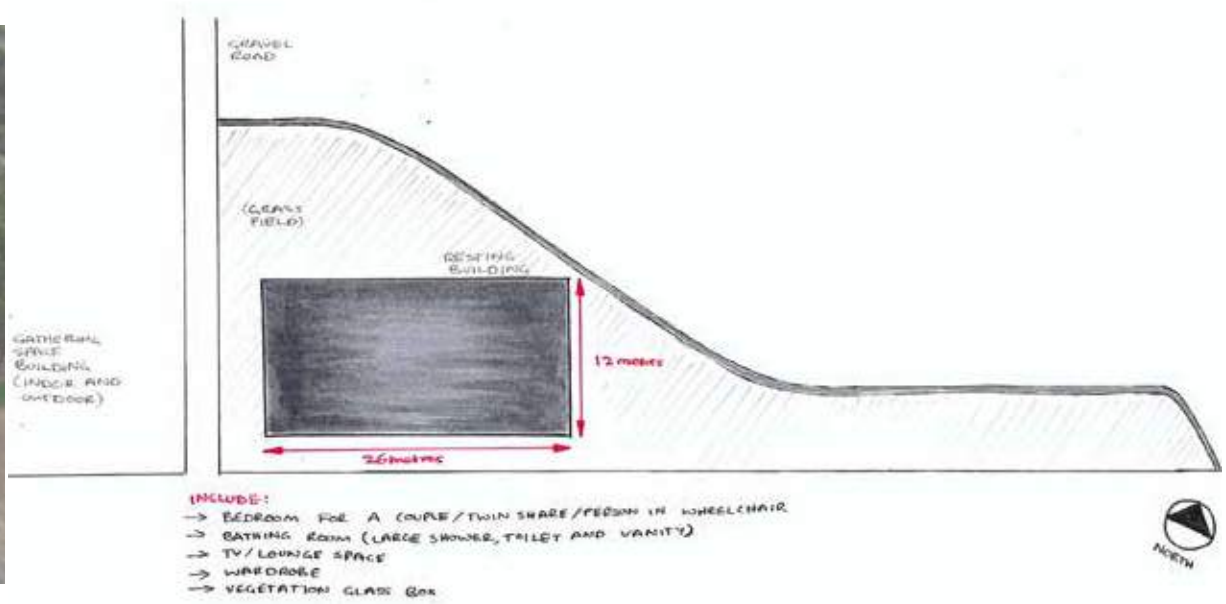
The design continues to offer a healing environment and enhance the feeling of well-being due to this connection with the natural environment.

As there were many corrugated metal designs on site with vertically repeated elements, I decided to link the resting space back to some of these previous projects. Therefore, pieces of the corrugated metal have been incorporated within the façade and separated at different distances to allow natural sunlight to penetrate into the space.

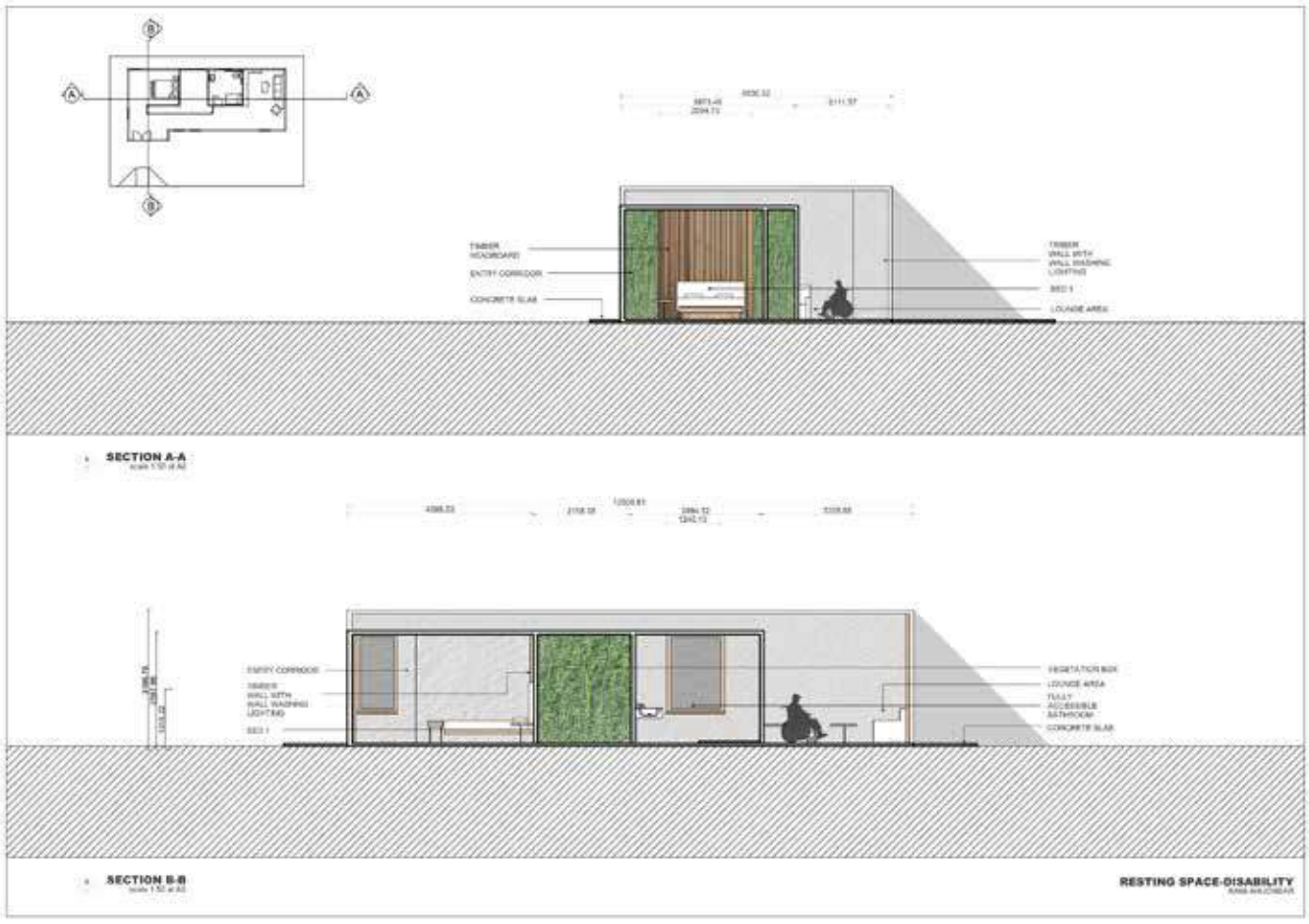
I have developed the organization of different rooms within the accommodation buildings so that there is more of a difference between the three. Checklists were useful in highlighting the way the resting spaces accommodated to the needs of the particular user groups (twin share, couple share and wheelchair access).



INITIAL SKETCHES



PLANNING AND SITE DEVELOPMENT



SECTIONAL DRAWINGS

FLOORPLAN ARRANGEMENTS

INTERIOR RENDERS

SUNLIGHT PENETRATING THROUGH EXTENDED RESTING WALL STRUCTURE DUE TO SELECTION OF GLASS

RUSTED IRON REMAINS FOR WINDOW FRAMING AND EXTENDED WALL STRUCTURE

TIMBER BACKBOARD

PIECES OF METAL SHIPPING CONTAINER INTEGRATED INTO THE EXTERIOR FACADE SYSTEM AND PAINTED WHITE

VEGETATION GROWING OVER THE SURFACE OF THE SHIPPING CONTAINER FACADE

NATURAL SUNLIGHT PENETRATING THROUGH SPACE FROM INTERIOR VEGETATION BOX IN ORDER TO GENERATE A TRANQUIL ENVIRONMENT

ELONGATED WARDROBE WALL

VERTICAL REPETITION OF PIECES OF PAINTED SHIPPING CONTAINERS ON THE FACADE OF THE DESIGN

LIGHTING AND VEGETATION

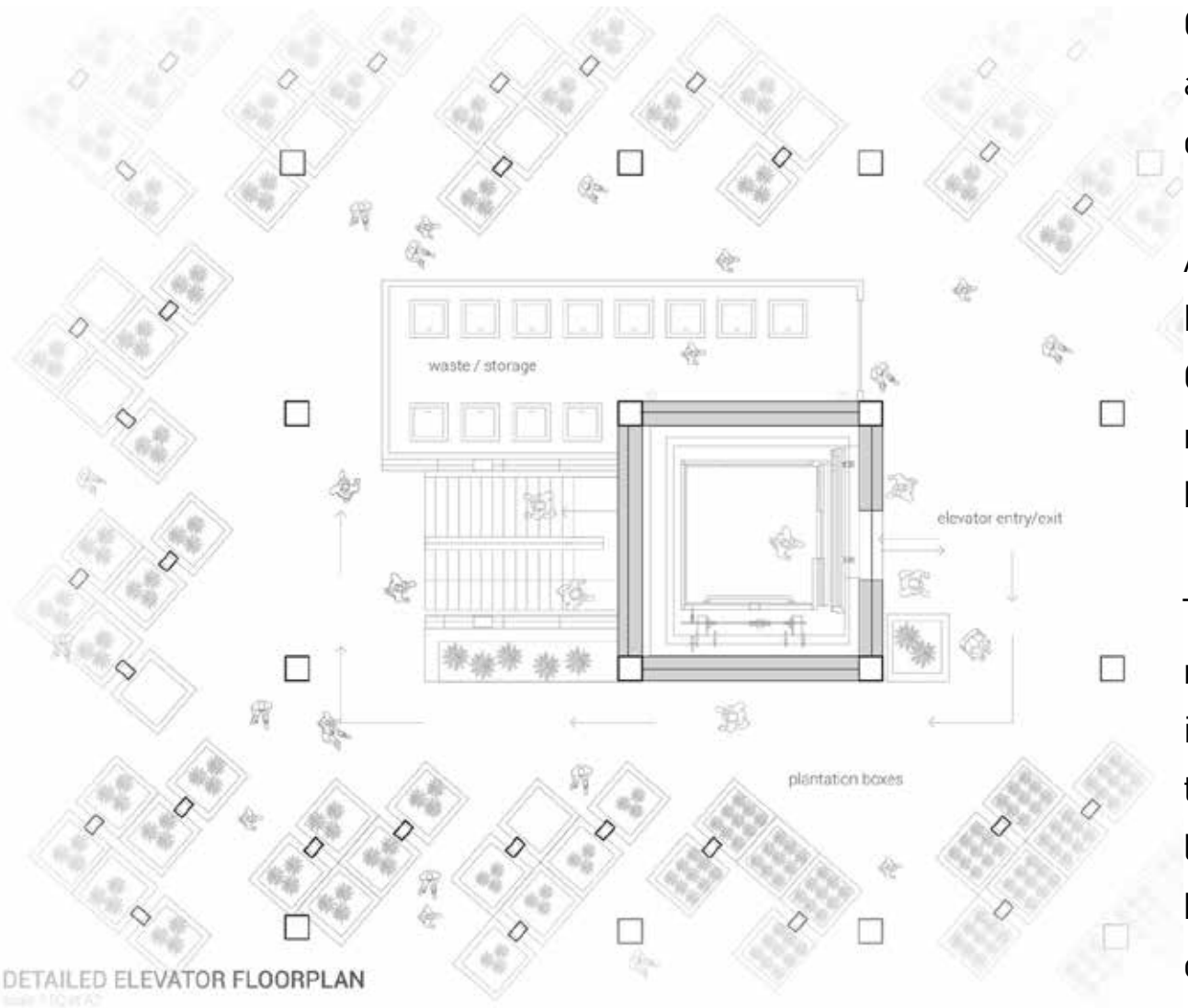
EXTERIOR RENDER

GREEN FARM

Location:
Melbourne, Australia

Year:
2020

Architectural Design Studio
XXX Park



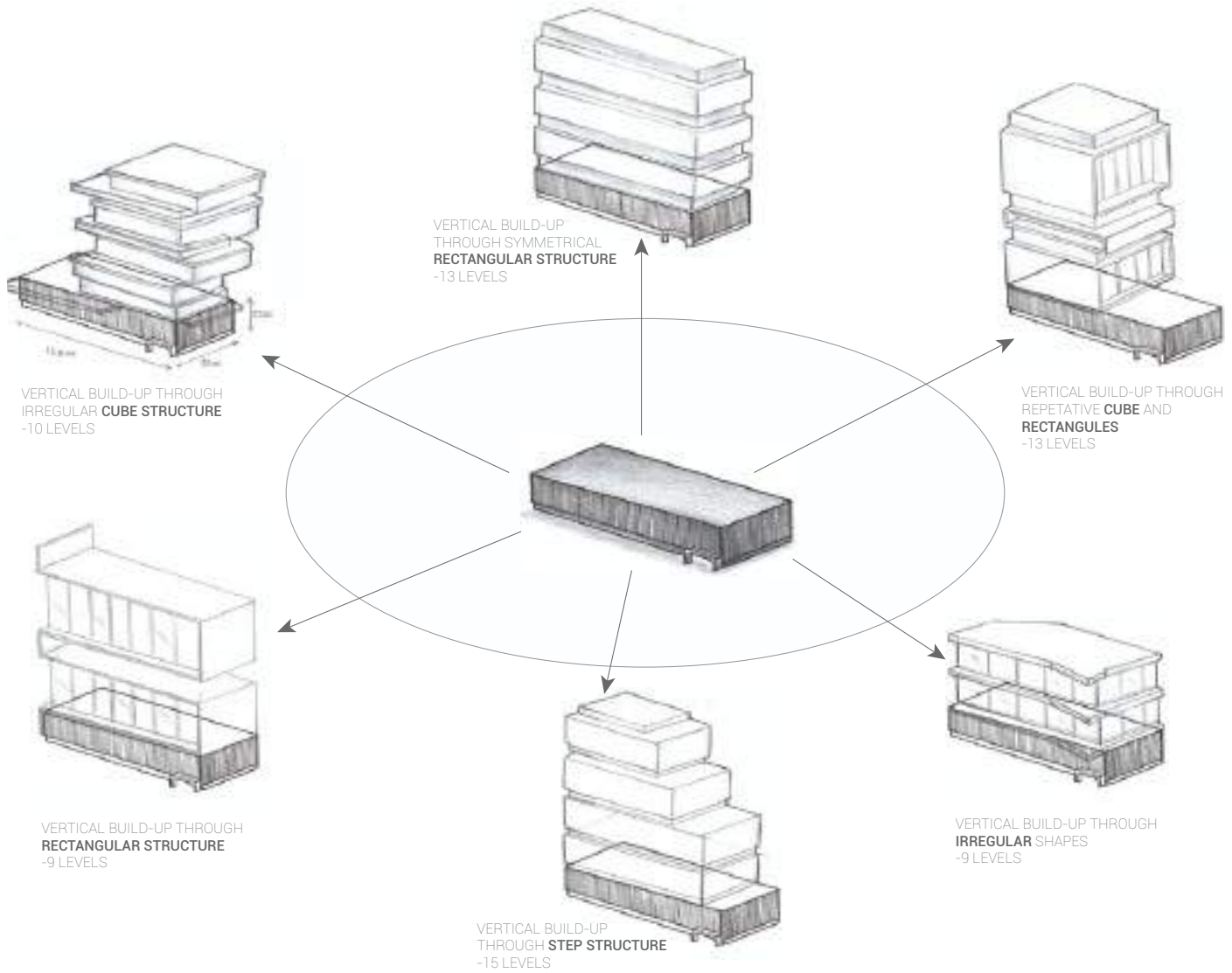
Green Farm is a project that focuses on the augmentation of institution within the urban context of Clayton Oakleigh.

As the spaces for greenery surrounding the Monash Children's Hospital is becoming limited, Green Farm aims to better utilise the previous multi-level car park structure by projecting the building vertically.

The function has been manipulated, where a new design for a pop-up urban farm has been introduced, allowing surrounding residents to harvest fresh produce within the separate levels of the new structure. Additional programs have been incorporated, including a community outdoor gathering space, a café and a lounge space.

The studio theme focuses on the way in which previous car parking structures can be better utilized, where a greater amount of parking spaces can be put to another use to benefit the wider community within the city of Melbourne.

Green Farm addresses this through the amalgamation of new levels to the already existing Hospital's multi-deck car park structure and the reintegration of the architecture with the surrounding environment.



VERTICAL BUILD-UP THROUGH IRREGULAR **CUBE STRUCTURE**
-10 LEVELS

VERTICAL BUILD-UP THROUGH SYMMETRICAL **RECTANGULAR STRUCTURE**
-13 LEVELS

VERTICAL BUILD-UP THROUGH REPETATIVE **CUBE** AND **RECTANGULES**
-13 LEVELS

VERTICAL BUILD-UP THROUGH **RECTANGULAR STRUCTURE**
-9 LEVELS

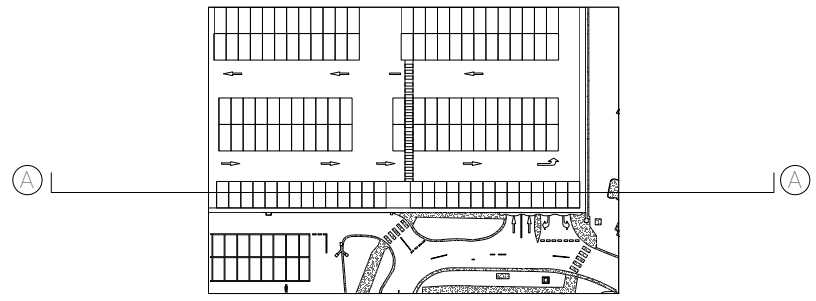
VERTICAL BUILD-UP THROUGH **STEP STRUCTURE**
-15 LEVELS

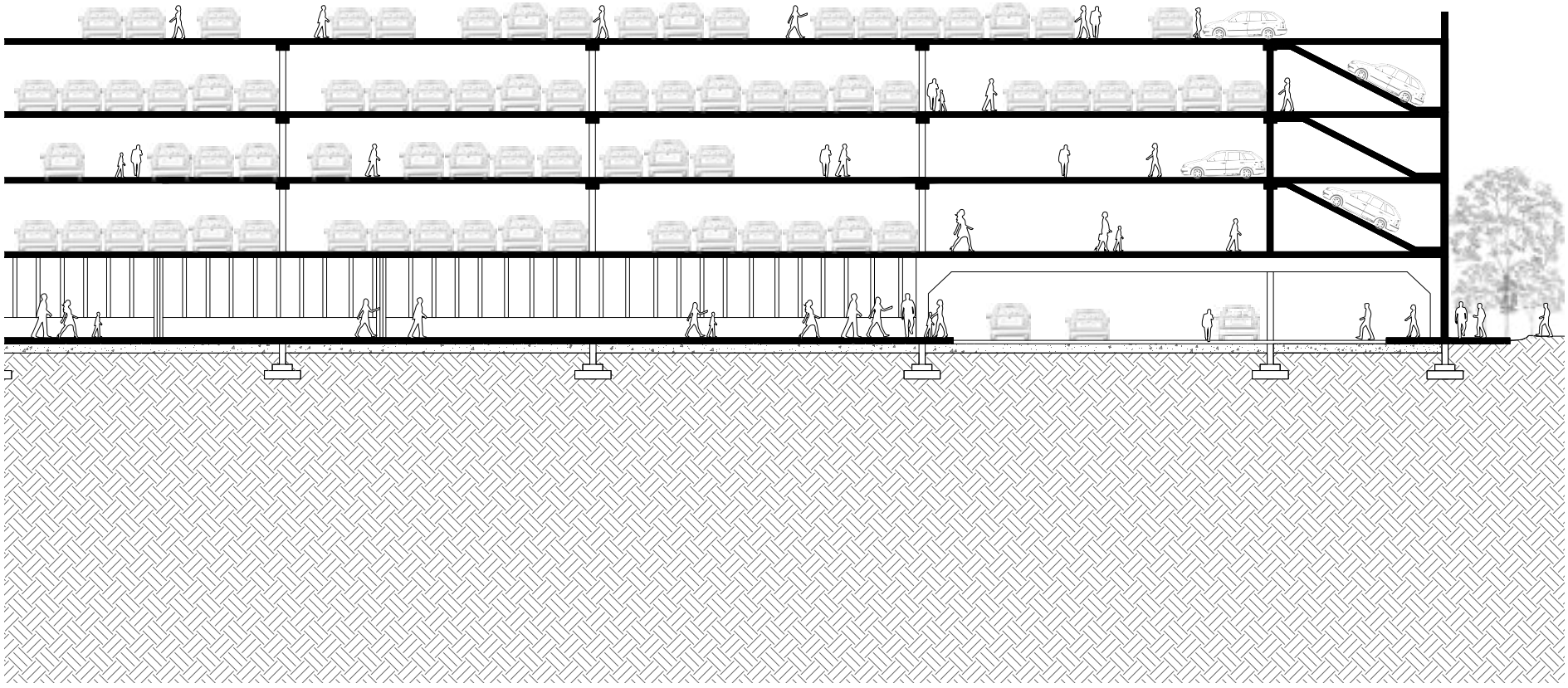
VERTICAL BUILD-UP THROUGH **IRREGULAR** SHAPES
-9 LEVELS

MULTI-DECK STRUCTURE MAP

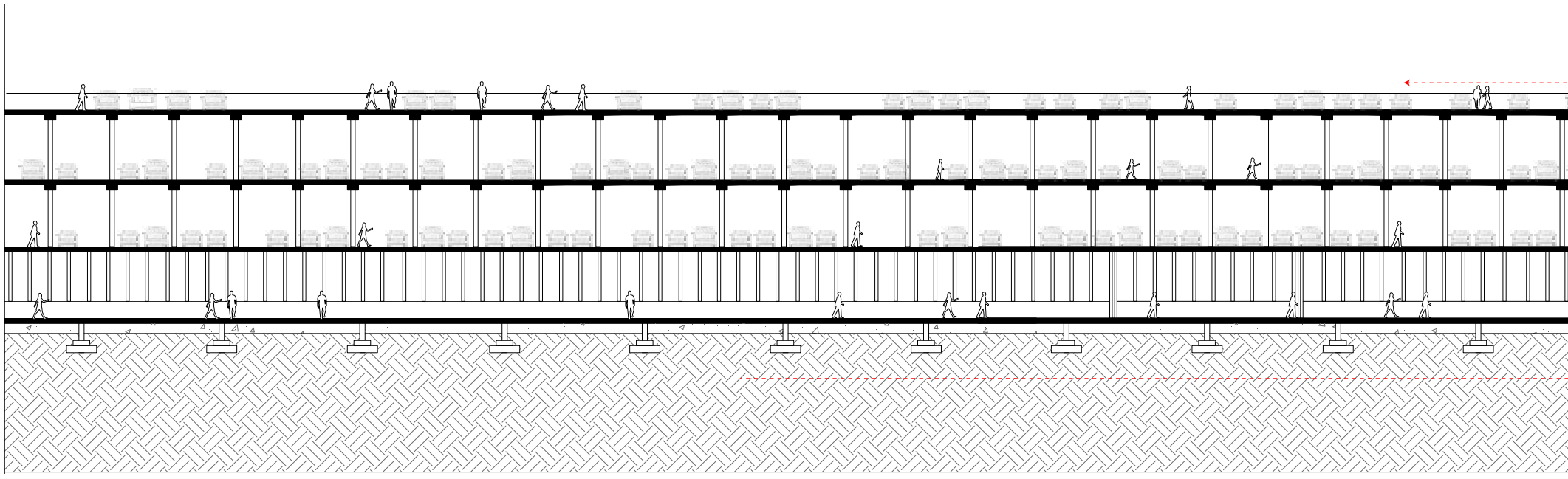
SITE PLAN MAP OVERVIEW

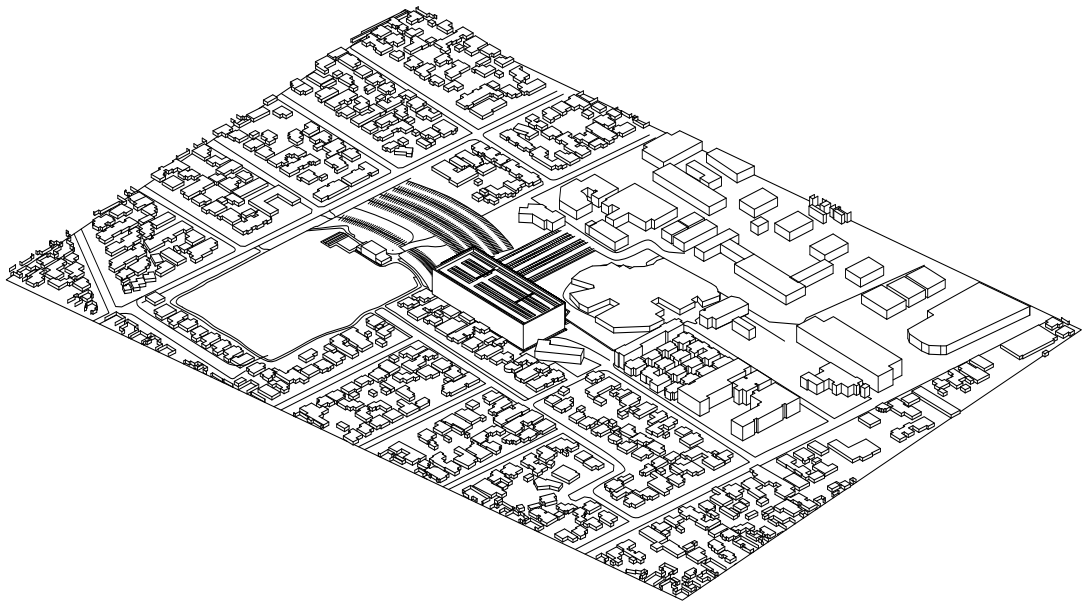
PLAN: MONASH CHILDREN'S HOSPITAL MULTI-DECK STRUCTURE
scale 1:100 at A1





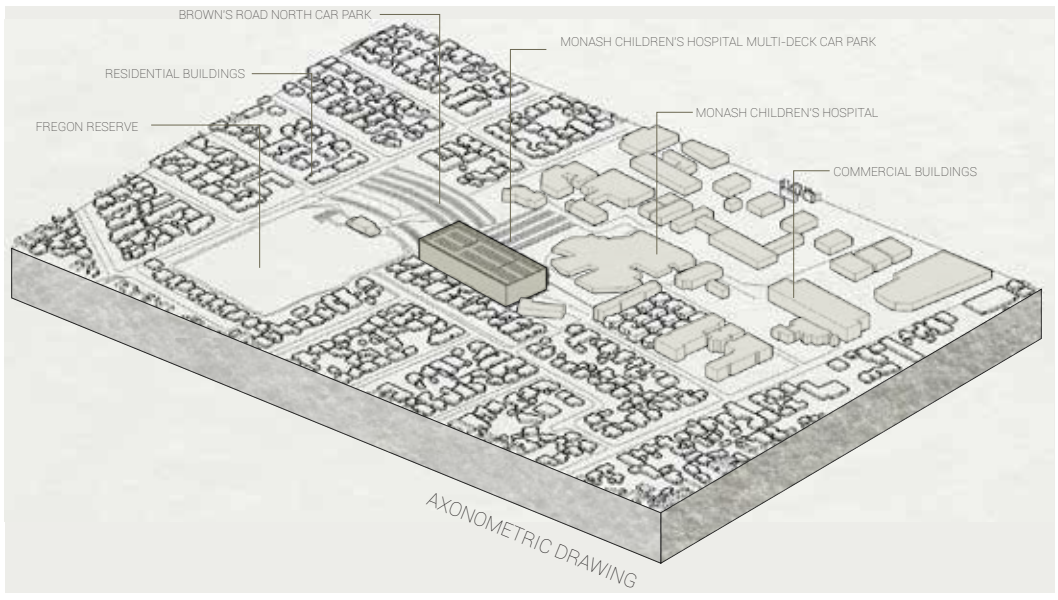
SECTION A-A : MONASH CHILDREN'S HOSPITAL MULTI-DECK STRUCTURE
scale 1:100 at A1



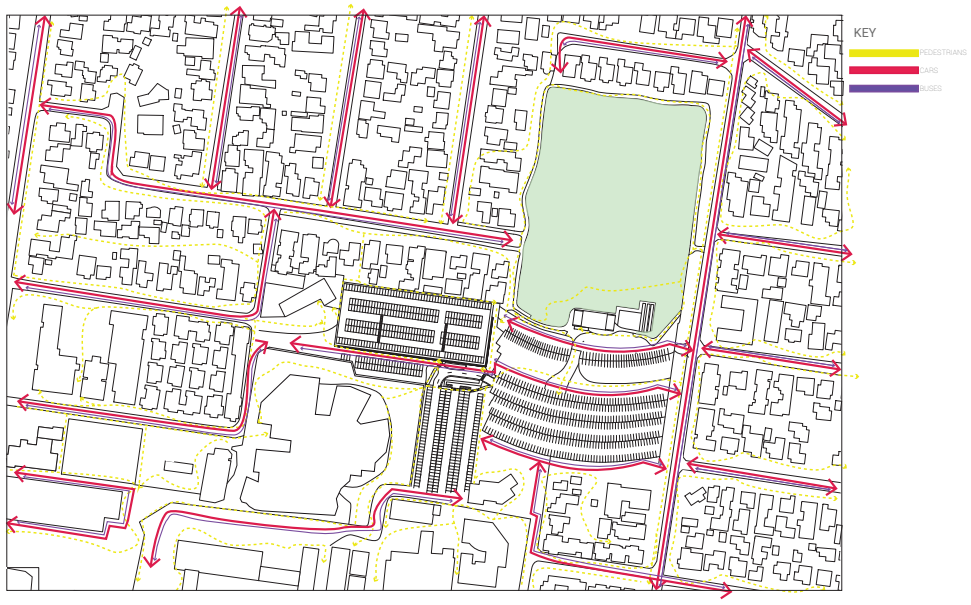


INITIAL SITE AXONOMETRIC DRAWING

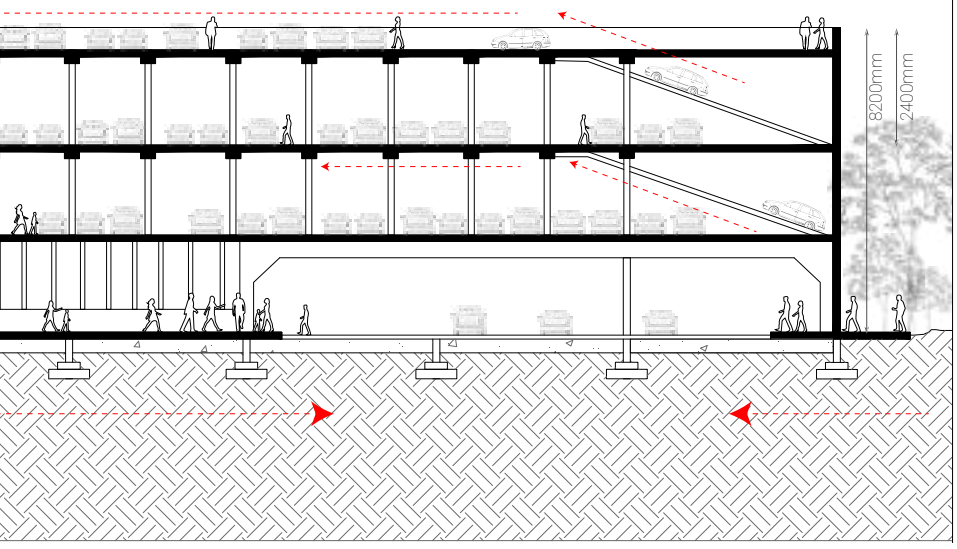
INITIAL FIGURE-GROUND MAP DRAWING - RESIDENTIAL AND COMMERCIAL BUILDINGS



UPDATED SITE AXONOMETRIC DRAWING

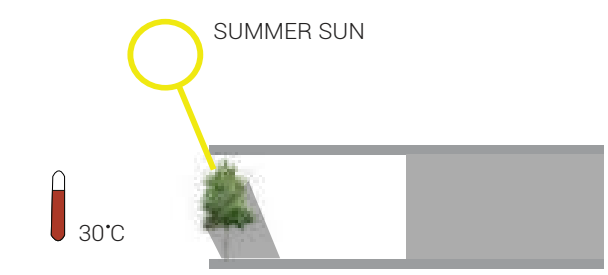


CIRCULATION DIAGRAM

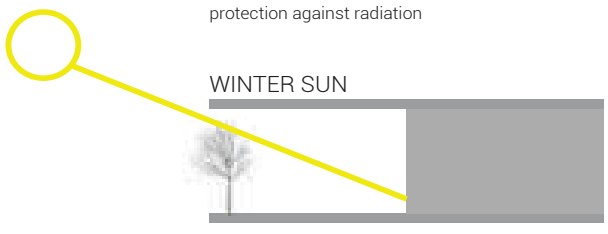


SECTIONAL DRAWING

SITE PLAN
scale 1:1000

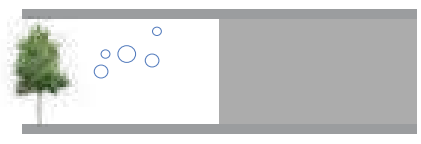


protection against radiation



deciduous trees allow sun light into the building

plants provide protection against wind

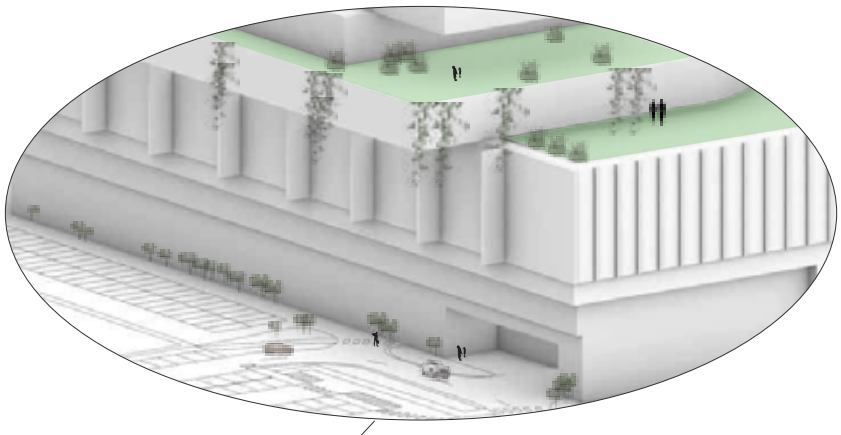


humidity is released

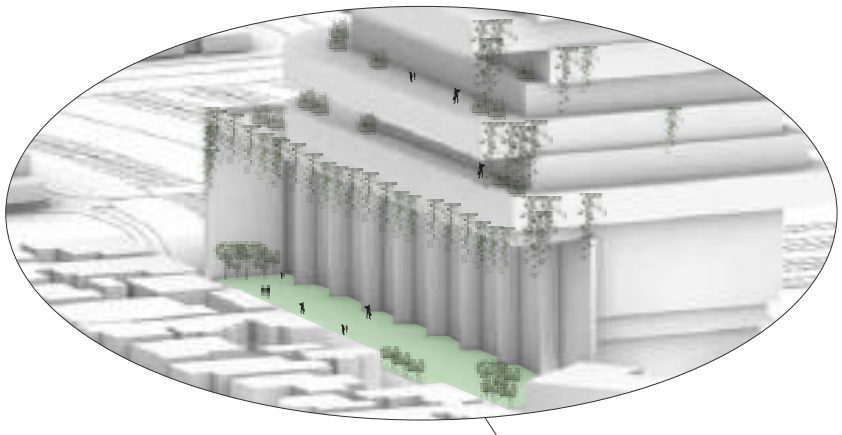
plants allow small dust particles to be captured

the production oxygen

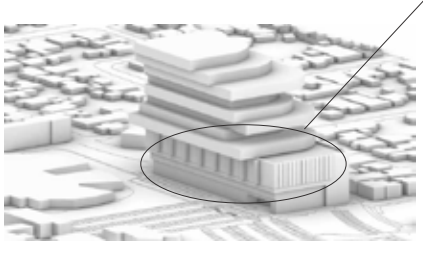
plants result in the reduction of acoustic pollution

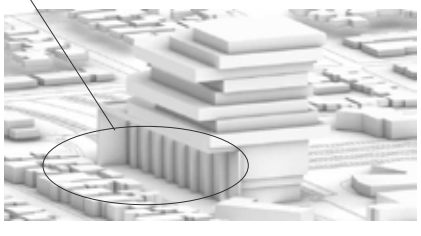


FRONT ENTRANCE

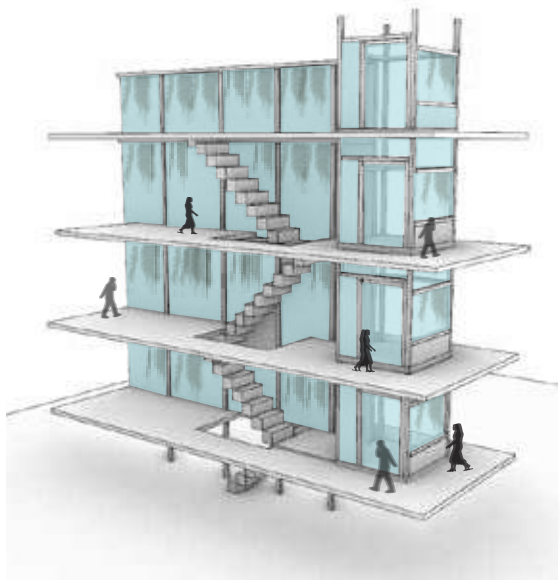


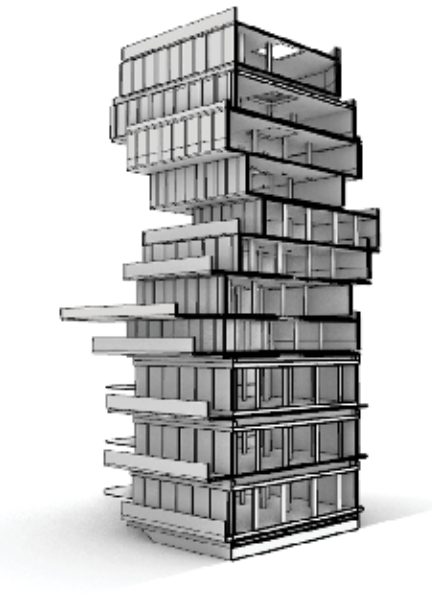
RESIDENTIAL ACCESS AT
BACK OF STRUCTURE



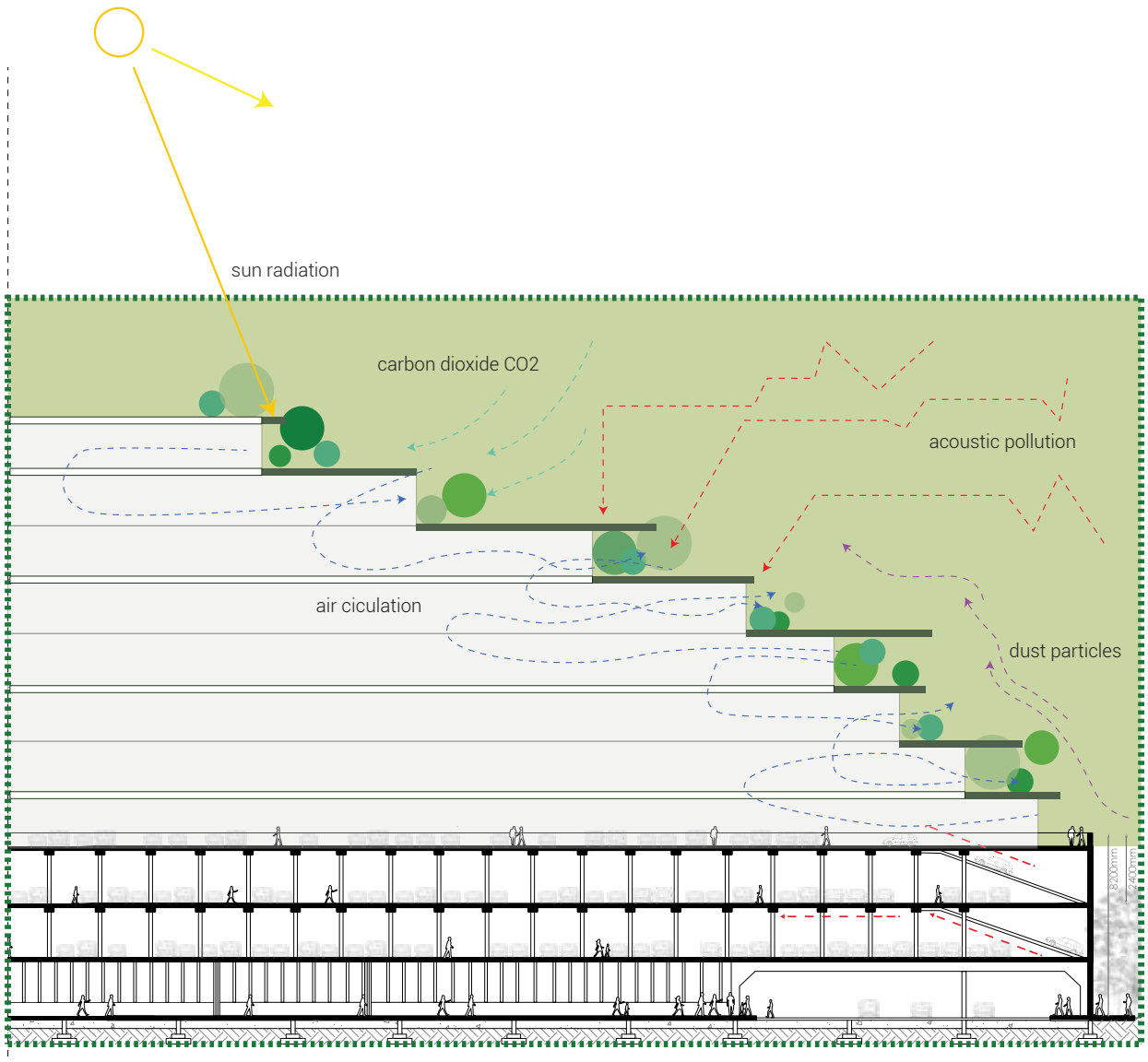


ACCESS POINTS

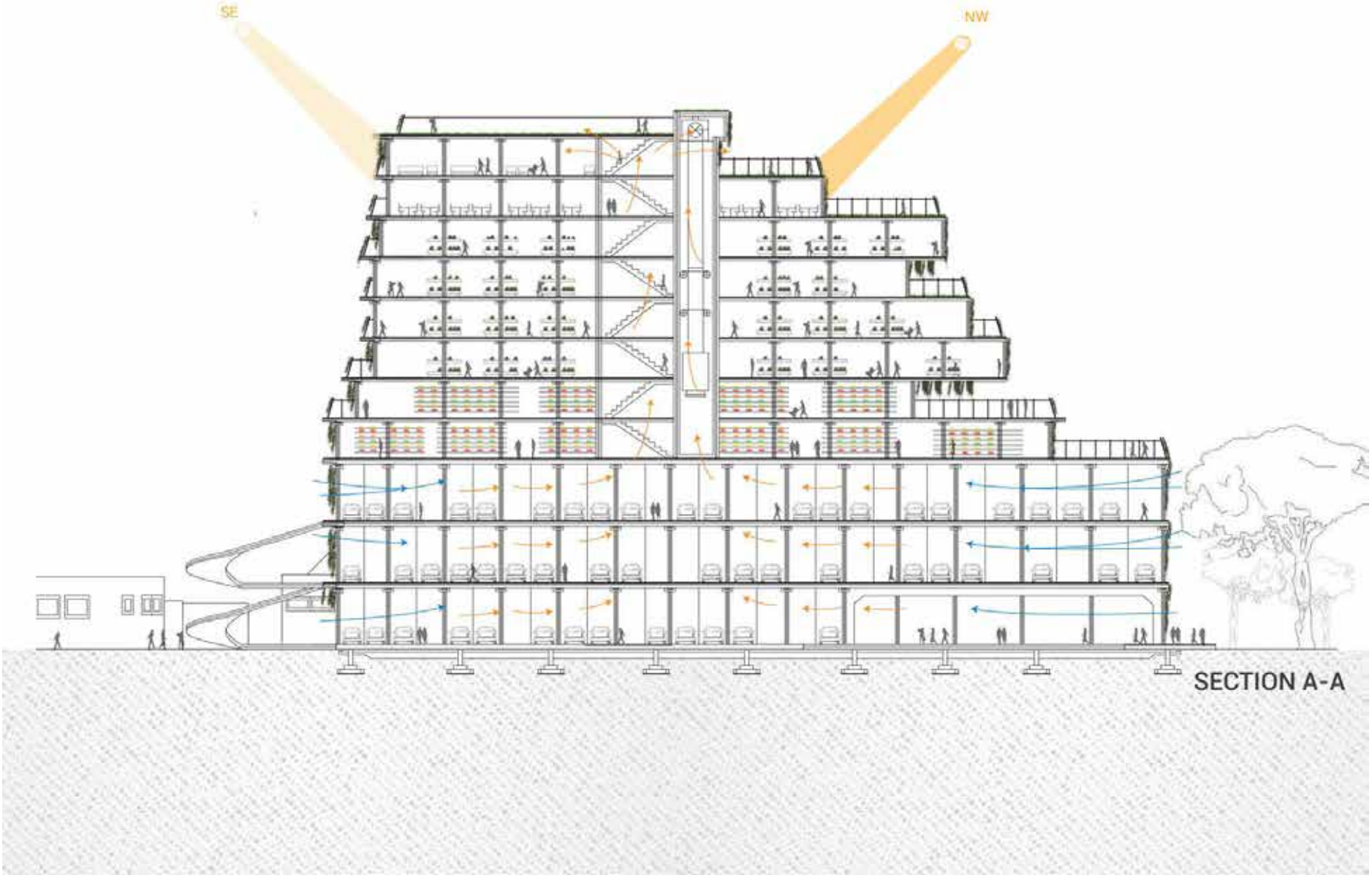


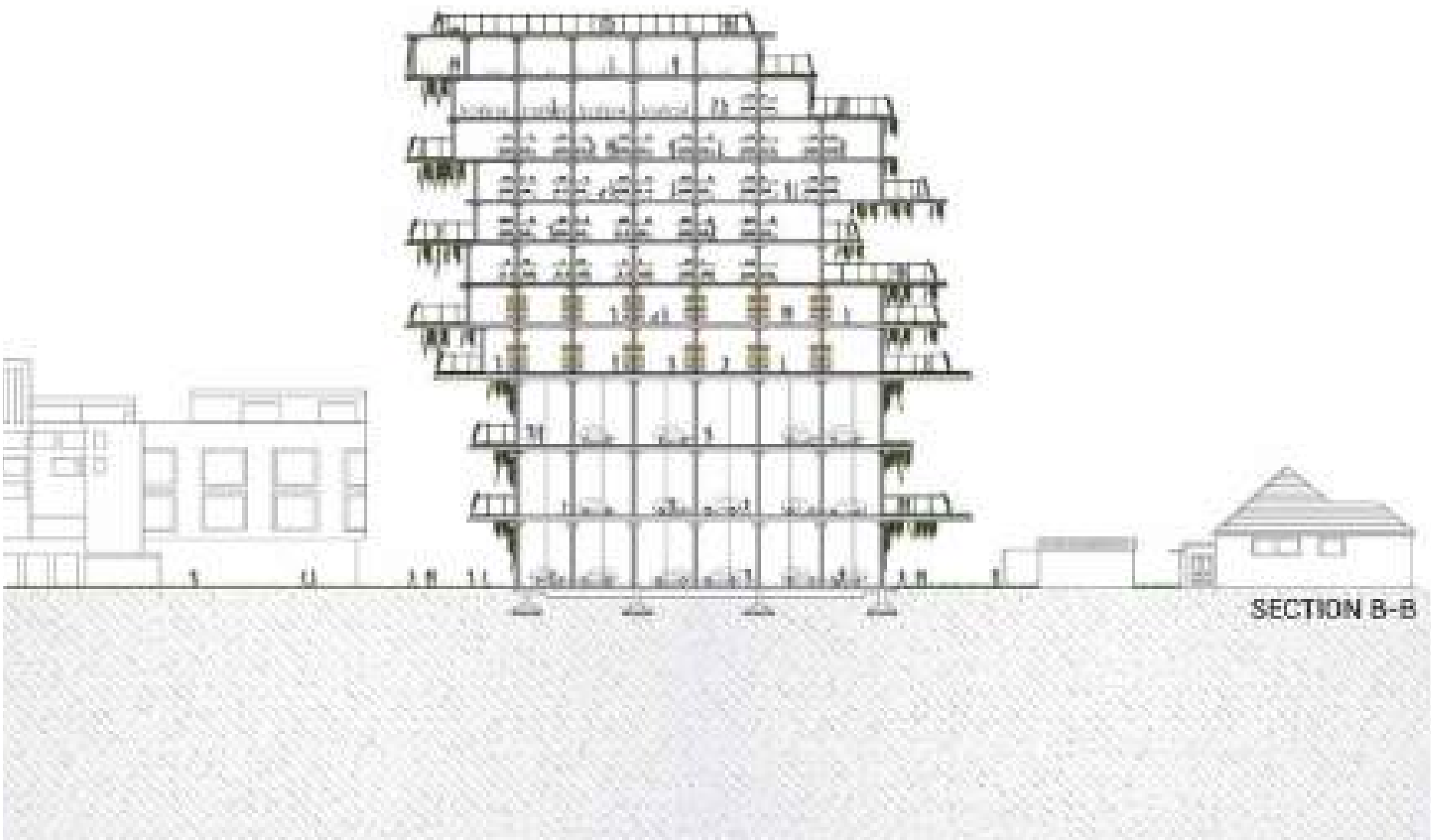


MODEL DEVELOPMENT

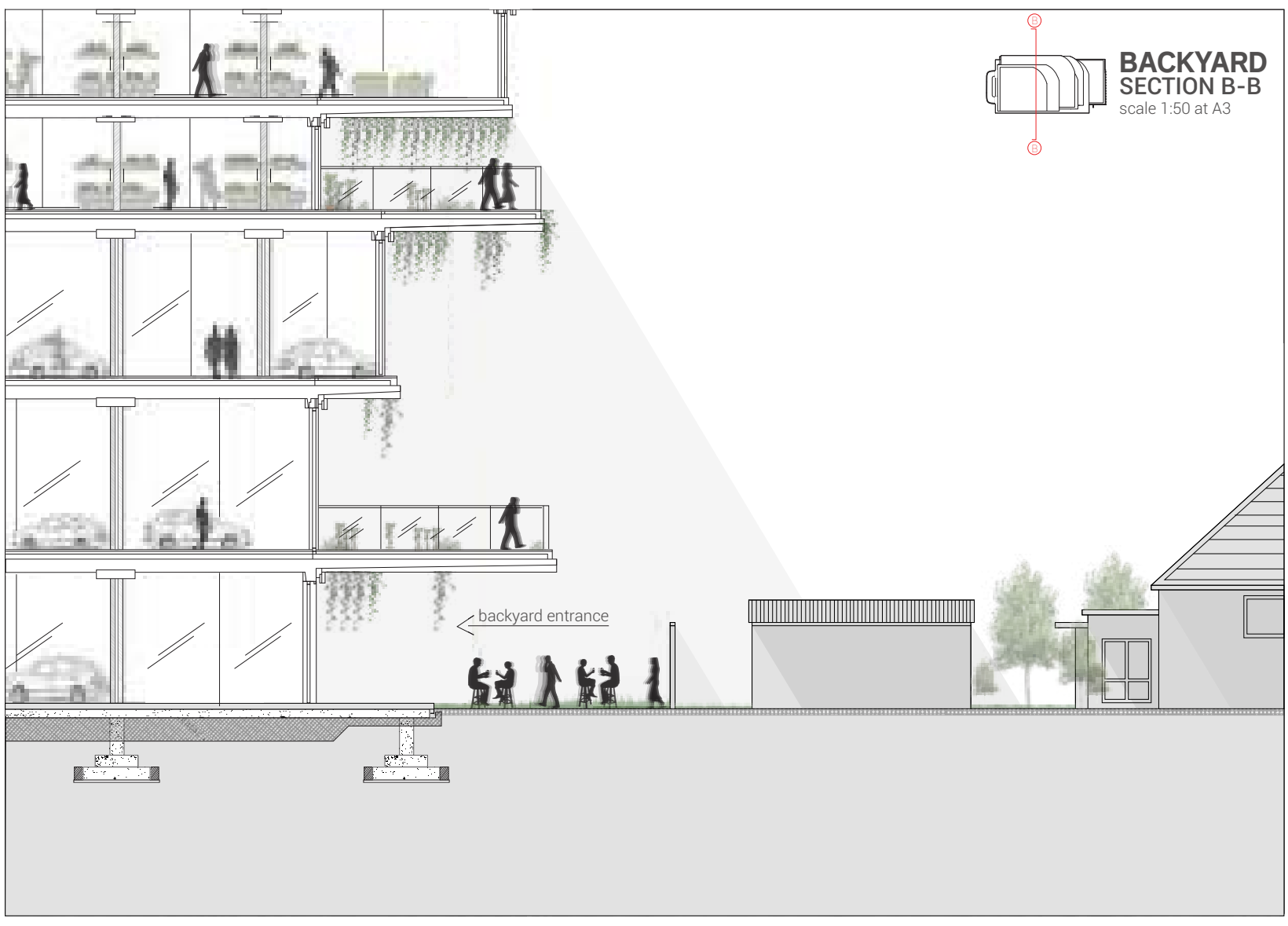


ADAPTED MULTI-LEVEL STRUCTURE SECTION
scale 1:100

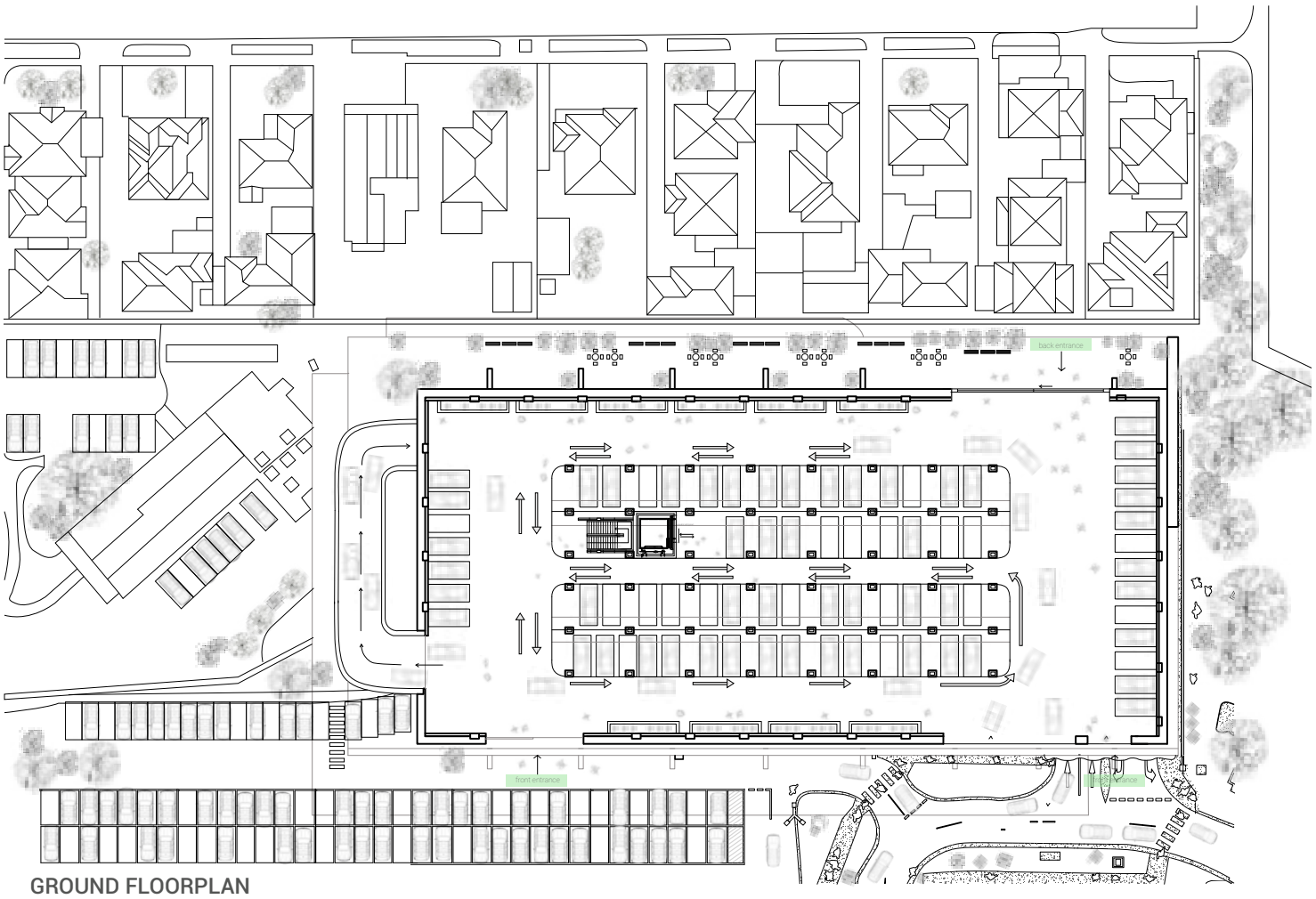




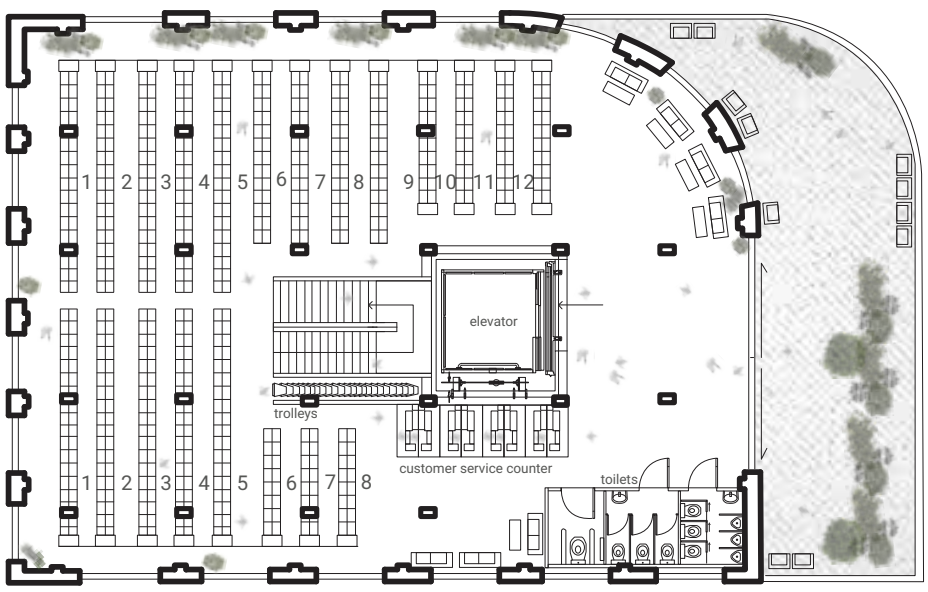
SECTIONAL DRAWINGS



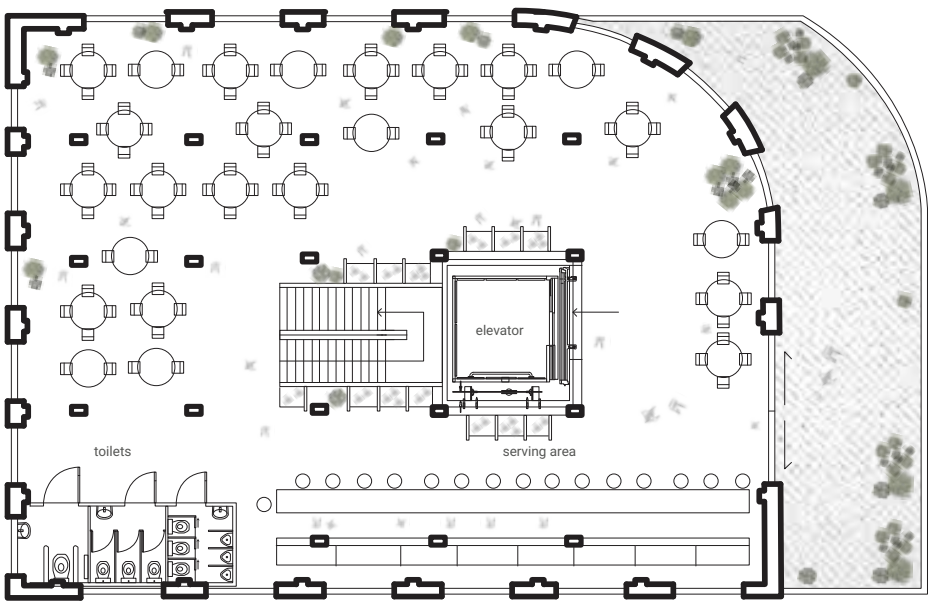
ENTRANCE AND BACKYARD SECTIONAL DRAWINGS



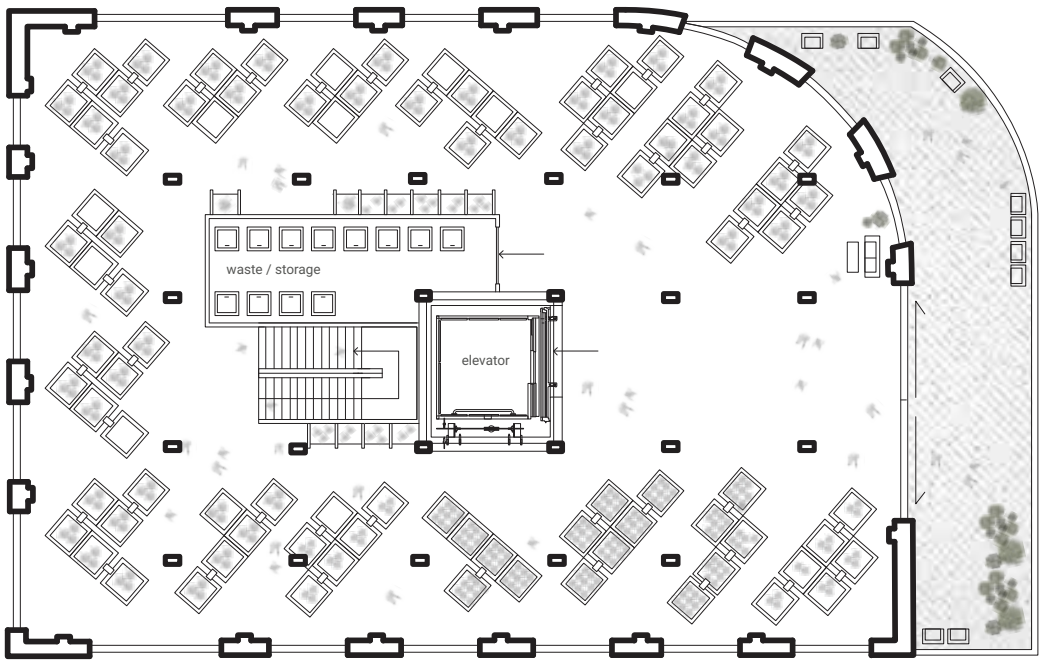
GROUND FLOORPLAN
scale 1:200 at A2



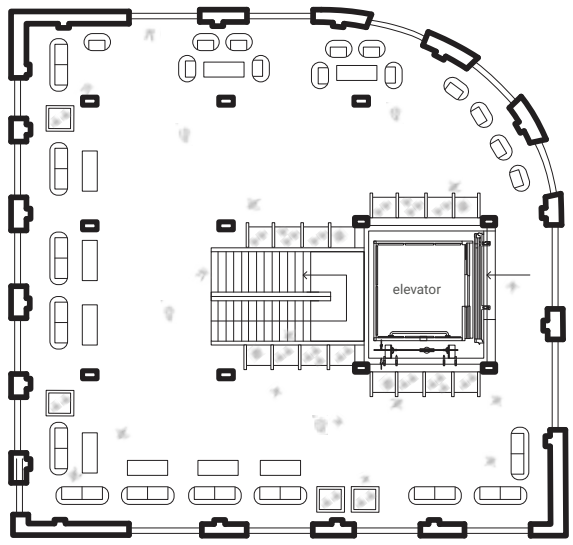
LEVEL 4 -5
grocery store



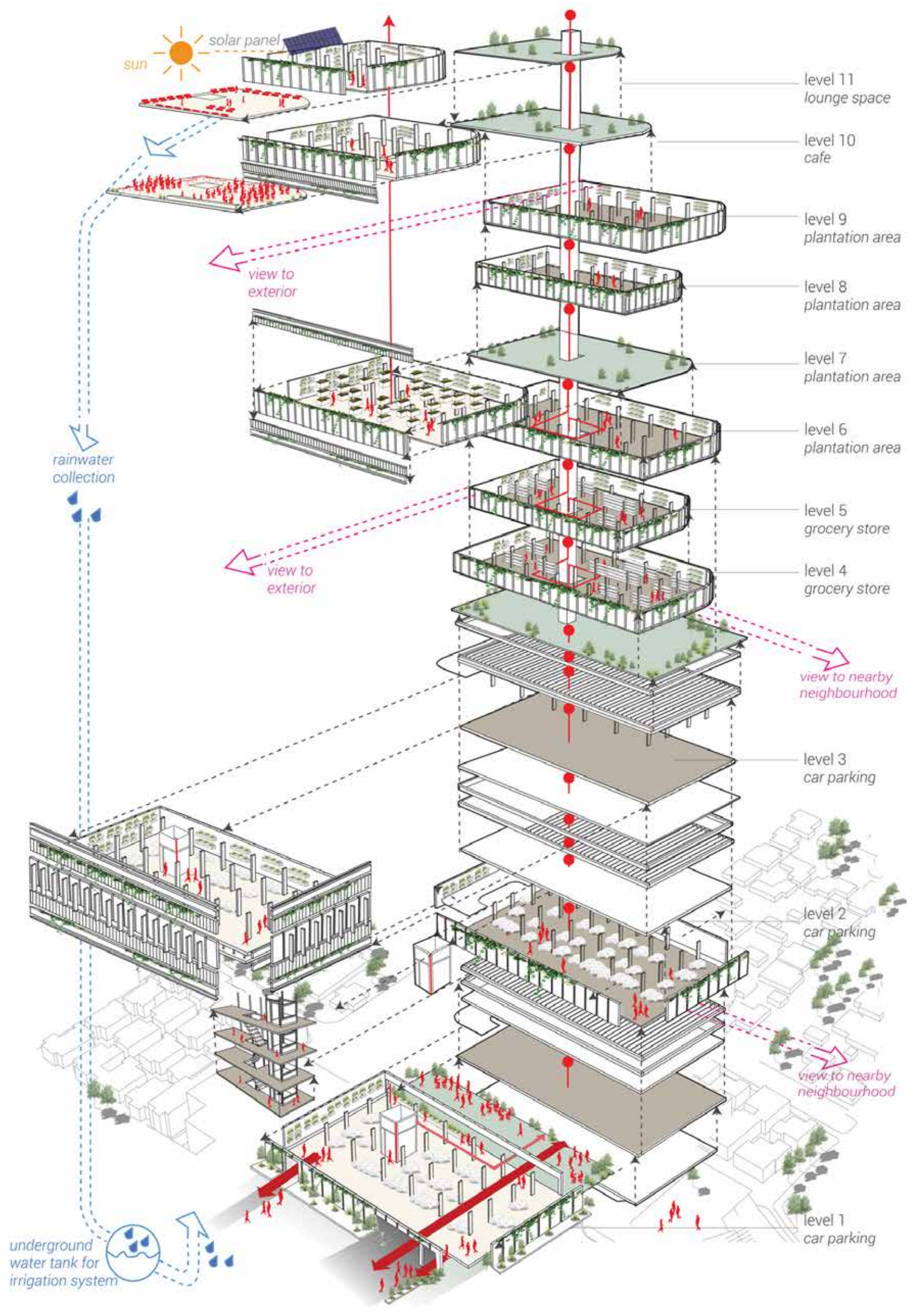
LEVEL 10
cafe



LEVEL 6-9
plantation

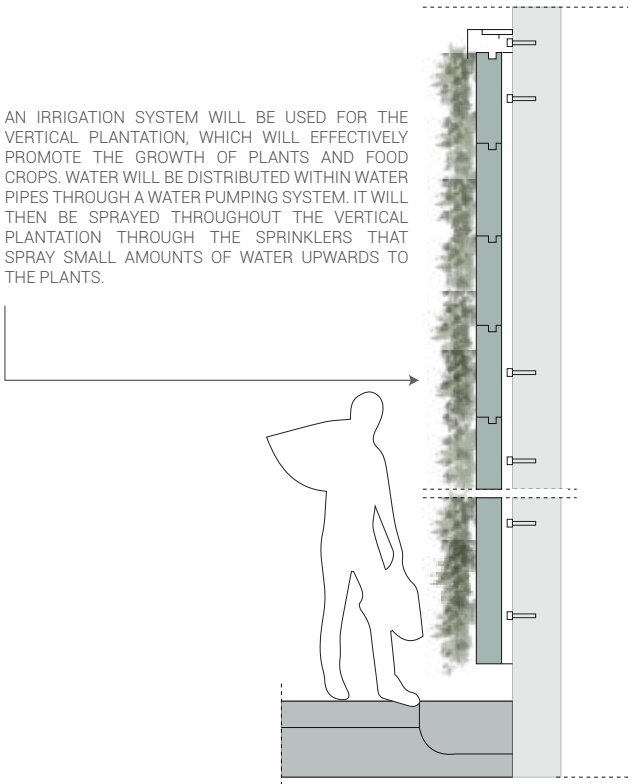


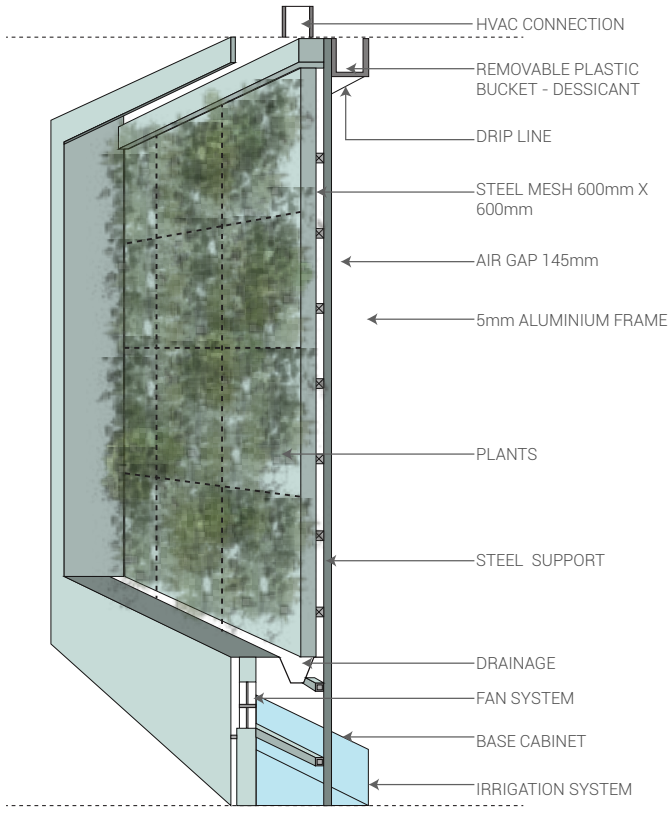
LEVEL 11
community lounge space



EXPLODED AXONOMETRIC DRAWING

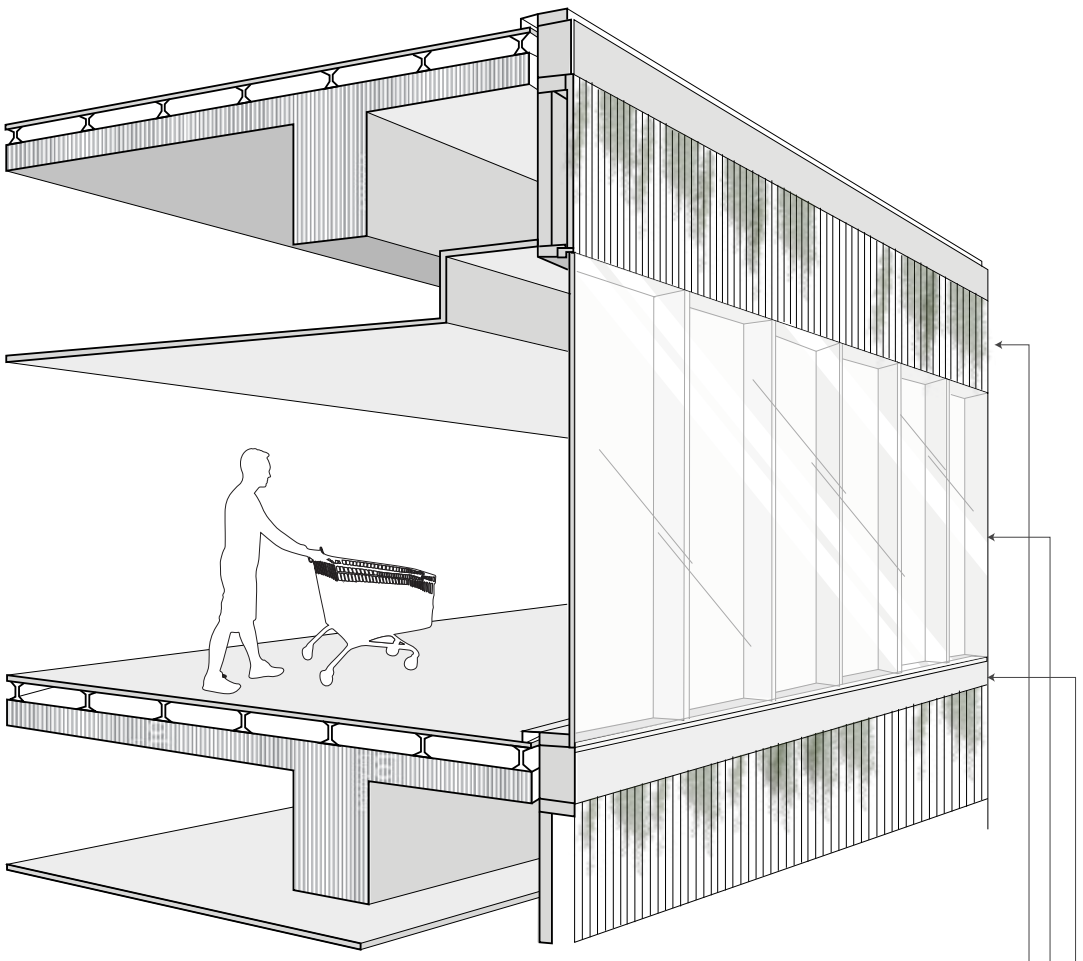
AN IRRIGATION SYSTEM WILL BE USED FOR THE VERTICAL PLANTATION, WHICH WILL EFFECTIVELY PROMOTE THE GROWTH OF PLANTS AND FOOD CROPS. WATER WILL BE DISTRIBUTED WITHIN WATER PIPES THROUGH A WATER PUMPING SYSTEM. IT WILL THEN BE SPRAYED THROUGHOUT THE VERTICAL PLANTATION THROUGH THE SPRINKLERS THAT SPRAY SMALL AMOUNTS OF WATER UPWARDS TO THE PLANTS.





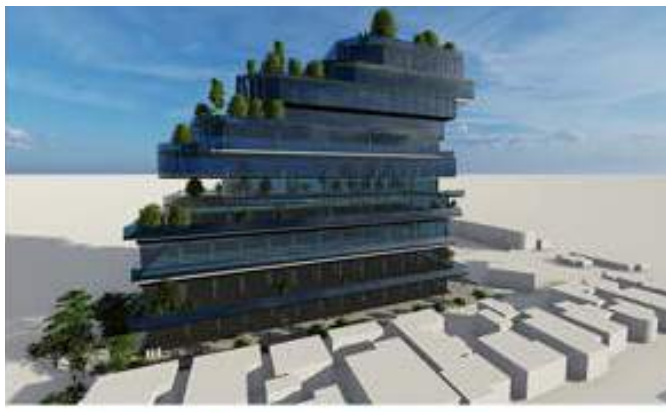
IRRIGATION SYSTEM FOR PLANTATION

SECTION AND THREE-DIMENSIONAL VIEW



ONE POINT PERSPECTIVE SECTION

STRUCTURAL ELEMENTS AND MATERIALITY







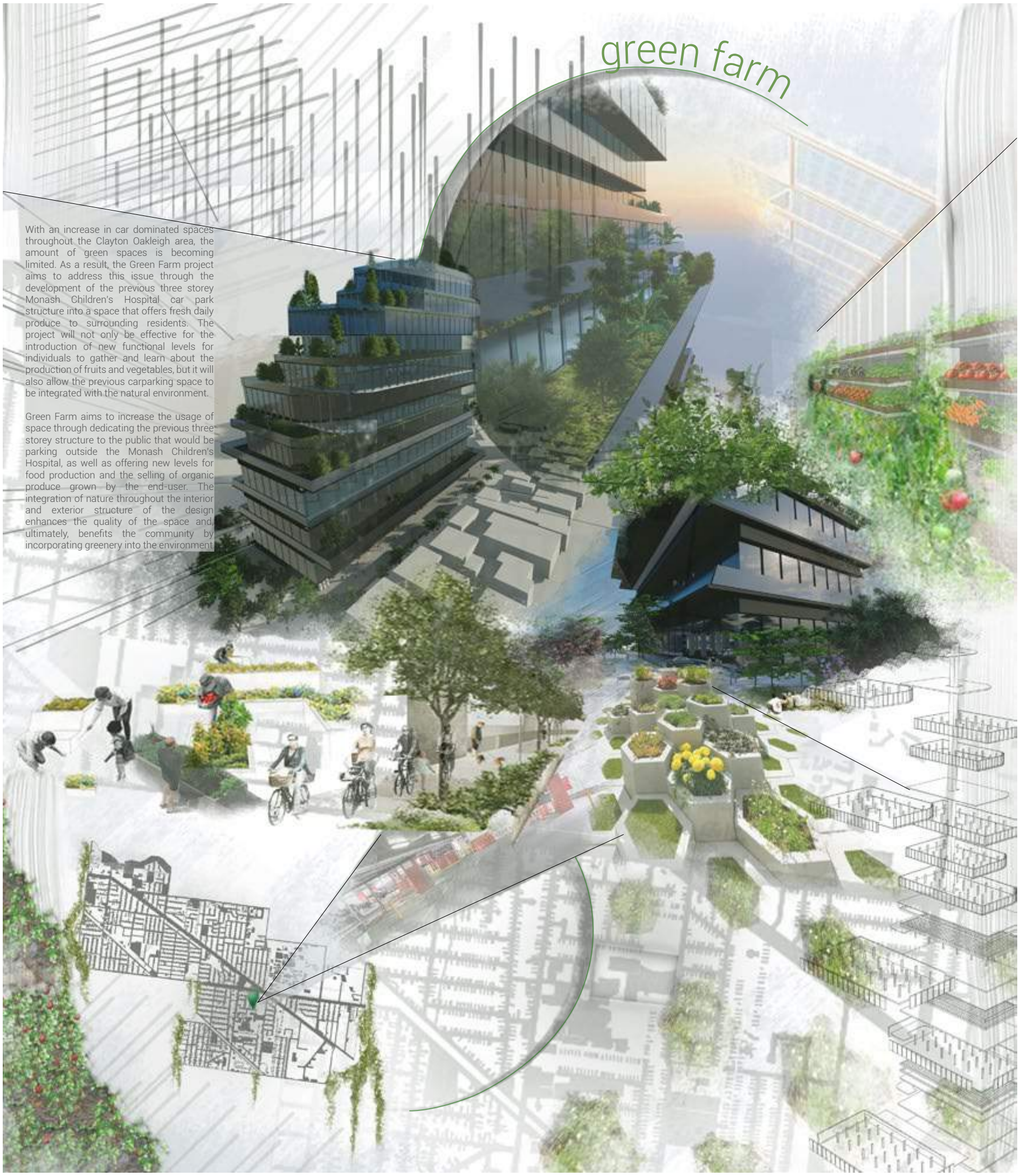


EXTERIOR RENDERS


INTERIOR RENDER
GROCERY STORE

INTERIOR RENDERS

INITIAL HYBRID PRESENTATION POSTER



HYBRID PRESENTATION POSTER

NORTHCOTE HIGH SCHOOL REDEVELOPMENT

Location:
Melbourne, Australia

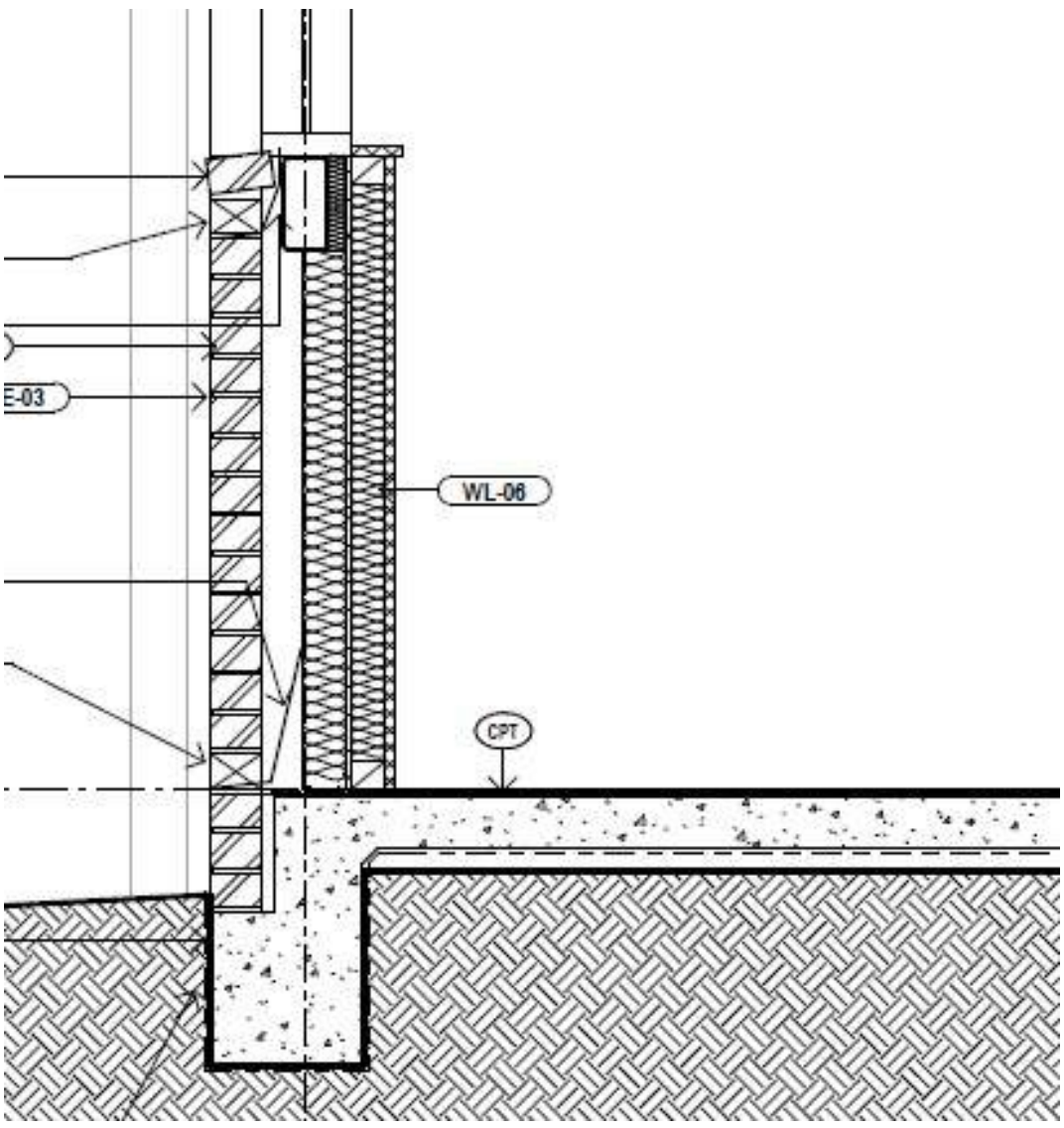
Year:
2020

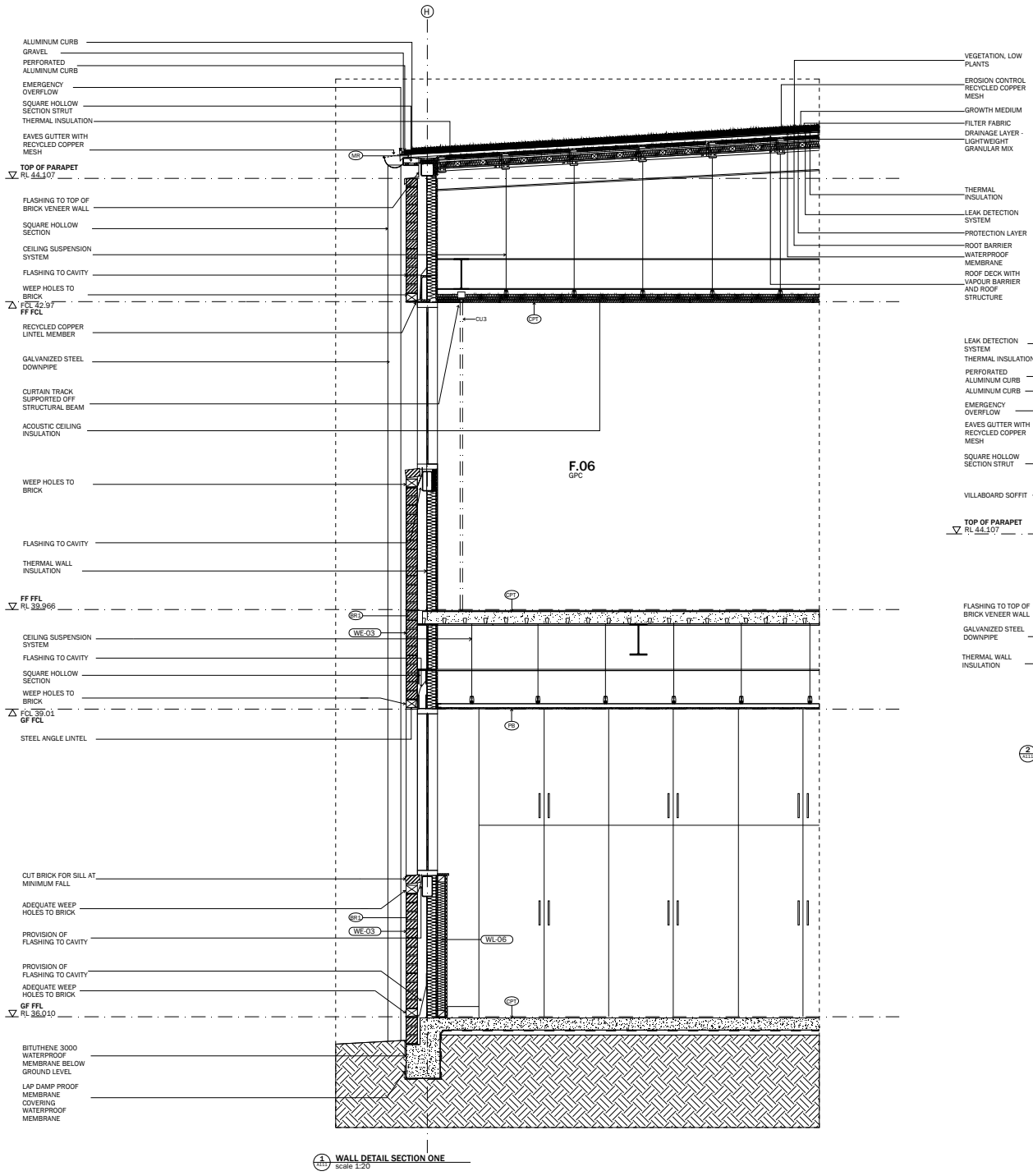
Architectural Performance
Integrated Design and Professional Study

The Northcote Performing Arts High School has been further developed through the suggestion of alternative materials and methods to increase its overall efficiency and performance. There will be a particular focus on the level of wall and roof insulation, as well as the manipulation of the previous roof structure. Not only will these changes enhance the overall comfort and quality of life of the end-user but will allow the campus complex to be one step closer to a net positive building with minimal effects on the natural environment. The first component of the campus complex that I focused on redesigning was the roof structure. I did this through the incorporation of a green roof, which I discovered was highly beneficial for the overall design in terms of its sustainability.

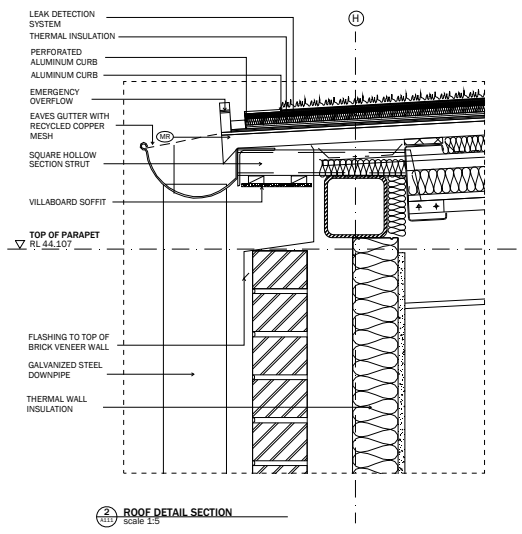
The provision of the green roof also enhanced the function of the design by acting as a rainwater buffer, where the vegetation growing on the surface would be able to absorb the rainwater. It also contributes to the purification of the air around the building, reducing the ambient temperature through the absorption of sunlight, reducing the temperature on the roof, acting as acoustic insulation through the absorption of surrounding sounds from the street, extending the overall life span and quality of the roof structure and finally, creating a layer on the surface of the roof that is more fire resistant compared to the previous metal roofing.

The roof insulation was also altered by replacing the existing insulation with Polyester Insulation Batts sourced from a local Melbourne company, Enviroflexx Shop. I thought that it was important to incorporate this type of breathable fibre insulation with an R value of R1.5 within the design due to its ability to significantly reduce energy costs for heating and cooling, as well as contributing to the comfort of the end-user.





1 WALL DETAIL SECTION ONE
scale 1:20



2 ROOF DETAIL SECTION
scale 1:5

ASSIGNMENT THREE_DETAILED SECTION

NORTHCOTE HIGH SCHOOL PERFORMING ARTS HUB

CLIENT

NORTHCOTE HIGH SCHOOL

19 - 25 ST GEOGRES RD
NORTHCOTE VIC 3070

__MATERIALS

ACP ACOUSTIC PANEL
BR1 RED BRICKWORK
BR2 HIT + MISS BRICKWORK
BR3 GLAZED BLACK BRICKWORK
BRP BRICK PAVERS
CPT CARPET TILE
CON CONCRETE
CT CEILING TILE
FC FIBRE CEMENT SHEET
GL GLAZING
GLM MIRROR
MR METAL ROOF
MSH METAL MESH
MSS STAINLESS STEEL
PB PLASTERBOARD
PLY PLYWOOD
SS STAINLESS STEEL
RU RUBBER MAT
TI TACTILE INDICATORS
TL TILE
VY VINYL

__ABBREVIATIONS

COL	COLUMN
CJ	CONTROL JOINT
CL	CENTRE LINE
DP	RAINWATER DOWNPIPE
EXSL	EXISTING SLAB LEVEL
FCL	FINISHED CEILING LEVEL
FEX	FIRE EXTINGUISHER
FFL	FINISHED FLOOR LEVEL
FHR	FIRE HOSE REEL
FHY	FIRE HYDRANT
FIP	FIRE INDICATOR PANEL
FW	FLOOR WASTE
PS	PRIVACY SCREEN
RL	RELATIVE LEVEL
SSL	STRUCTURAL SLAB LEVEL

DRAWING TITLE

-WALL SECTION DETAILS

-ROOF DETAIL SECTION

DRAWING NO.

A111

AUTHOR

KANI AHUONBAR

DATE

11/05/21

SCALE

1 :20 at A1
1 :5 at A1

SECTIONAL DRAWINGS

SECTIONAL AXONOMETRIC CLOSE-UP ONE

SECTIONAL AXONOMETRIC CLOSE-UP TWO

SECTIONAL AXONOMETRIC DRAWING

ASSIGNMENT THREE_SECTIONAL AXONOMETRIC DRAWING

NORTHCOTE HIGH
SCHOOL PERFORMING
ARTS HUB

CLIENT

NORTHCOTE HIGH SCHOOL

19 - 25 ST GEOGRES RD
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SSL	STRUCTURAL SLAB LEVEL

DRAWING TITLE

-SECTIONAL AXONOMETRIC DRAWING

-

DRAWING NO.

A111

AUTHOR

KANI AHUONBAR

DATE

12/05/21

SCALE

SECTIONAL AXONOMETRIC DRAWINGS

ALAMILLO BRIDGE RECREATION

Location:
Seville, Spain

Year:
2019

Architectural Performance
Technology and Environments

This project included researching and recreating the cable-stayed Alamillo Bridge.

Cable-stayed bridges are maintained by elastic supports and can deal with and absorb compression forces. The cables experience tension and pull on the towers while doing so. The deck of the bridge is under compression and tension forces. Cable stayed bridges are efficient in terms of materiality as they require fewer steel cables and can be erected in less time compared to other bridges.

The benefit of using a cable-stayed bridge for the Alamillo bridge is its long span and the fact that the cables have the ability to handle more pressure and weight. As the tower is leaning towards one side, using a cable-stayed bridge is an effective bridge type to use as they have the capability to displace the weight throughout the cable structures.

During the construction of the Alamillo bridge, the unsupported pylon design resulted in technical challenges. The first design approach was to generate a cantilever that was balanced. This was a difficult task as it required the deck and the pylon to be constructed at the same time in order to balance the weight of the pylon and deck. Engineers manipulated this approach after studying of the structure of the bridge and decided to construct the deck and pylon separately. A caisson pylon made from steel was an adaptation made by the engineers instead of using concrete for the pylon.

Overall, the Alamillo Bridge went through a range of adaptations, including both the structure and the asymmetrical design, thus displaying the influence that structural aspects of designs can have on their final appearance.

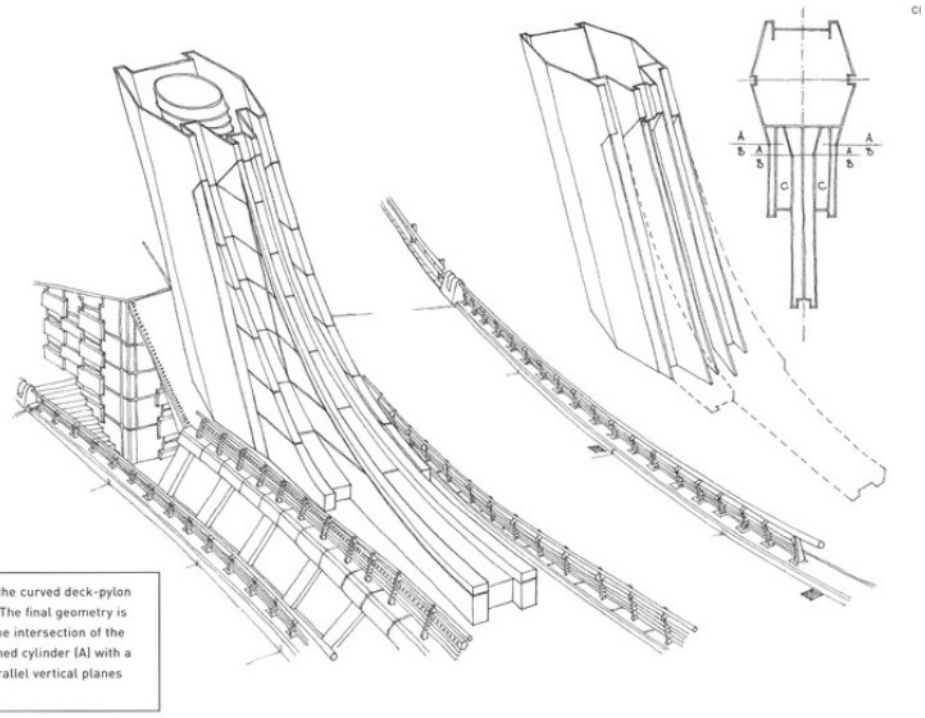
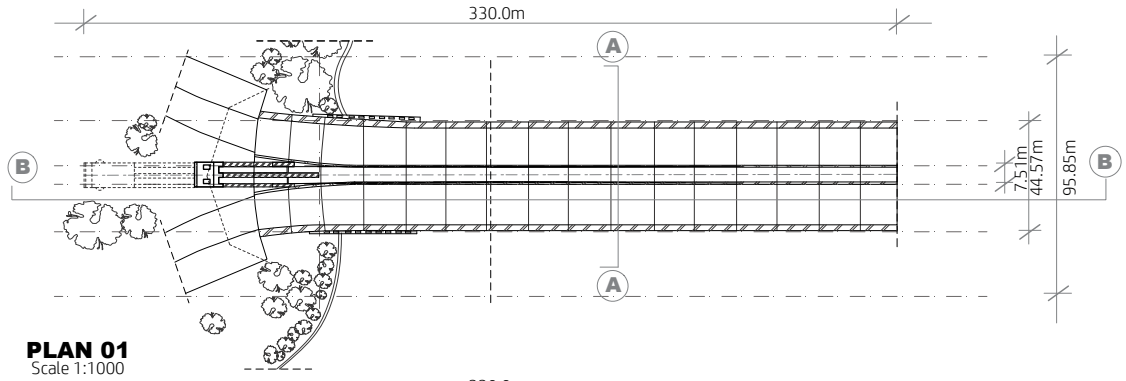
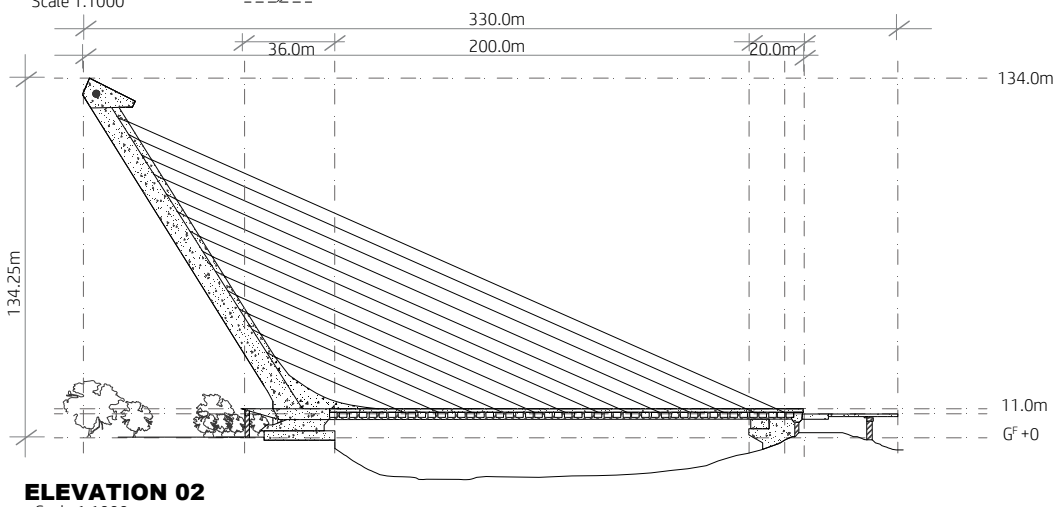


Fig. 6.32 Diagram of the curved deck-pylon connection. The final geometry is formed by the intersection of the pylon's inclined cylinder (A) with a series of parallel vertical planes (B and C).

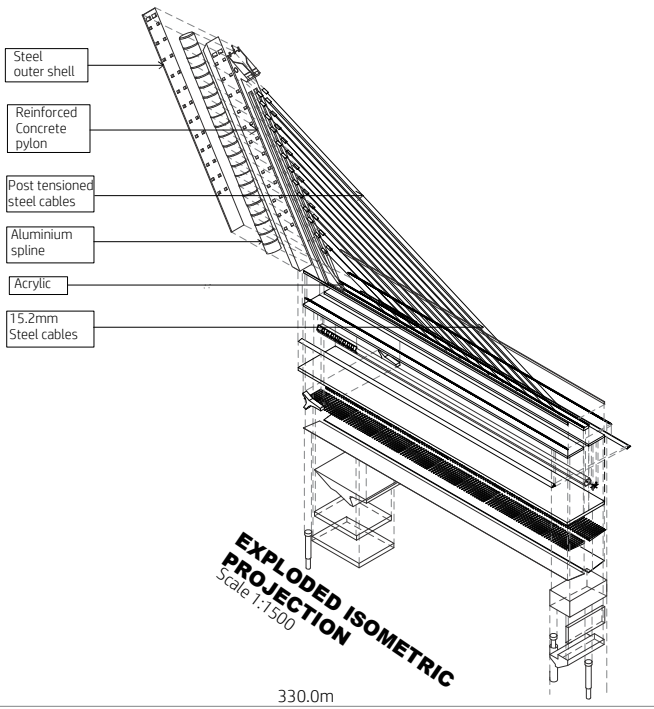


PLAN 01
Scale 1:1000

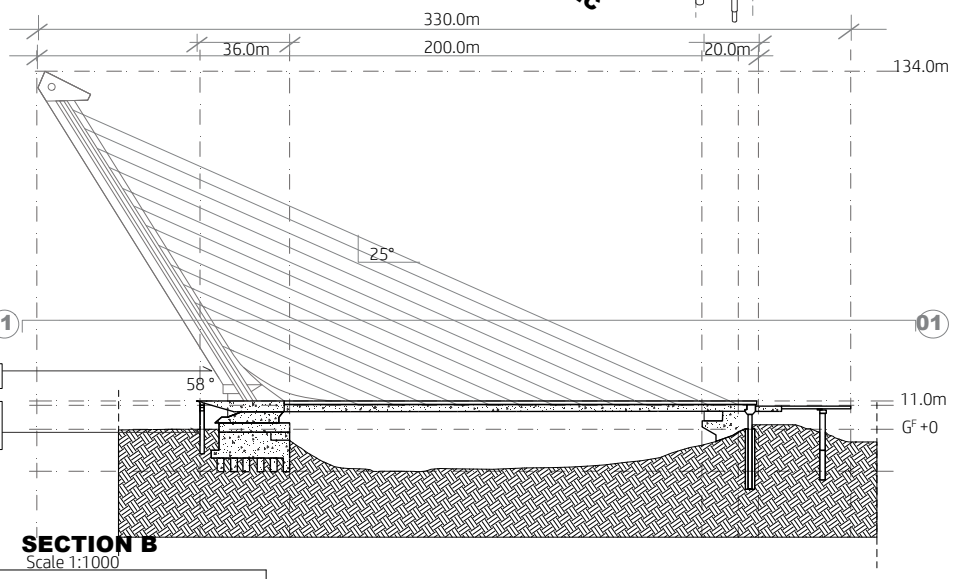


ELEVATION 02
Scale 1:1000

SECTION A
Scale 1:200



EXPLODED ISOMETRIC PROJECTION
Scale 1:1500

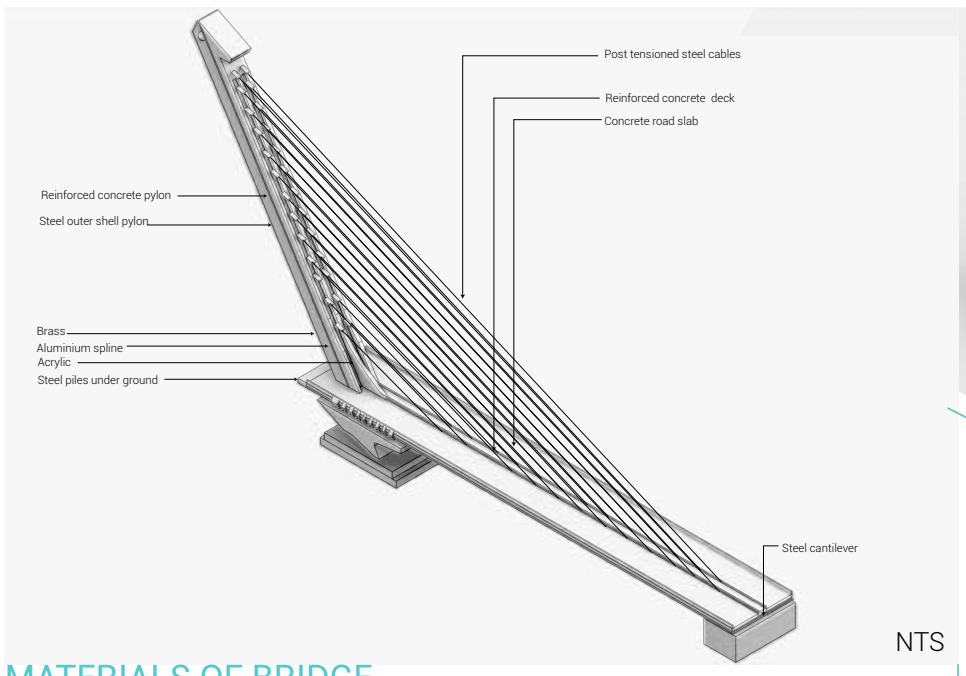


SECTION B
Scale 1:1000

ARC2101 ASSIGNMENT ONE Name: Kani Ahuonbar Email: kahu0001@student.monash.edu.au GENERAL NOTE- Verify all dimensions and report any discrepancies to the Architect prior to the commencement of work on site. Read only figured dimensions – DO NOT SCALE FROM DRAWINGS.	LEGEND AL Aluminium, Aluminium spline, Acrylic, Brass, Steel outer shell, Reinforced concrete, Steel piles, ST Steel, PC Polished concrete, ROD Steel rod, GV Gravel, CP Concrete panels, CONC Concrete	Alamillo Bridge, Seville, (Andalusia-Spain) Cable-stayed single pylon SCALE 1:1000 @ A1 1:200 @ A1 Cross Section A 1:15000 @ A1 Exploded Axonometric DATE 09/04/2020	PLAN Scale 1:1000 ELEVATION Scale 1:1000 CROSS SECTION (A) Scale 1:200 LONGITUDINAL SECTION (B) Scale 1:1000 EXPLODED AXONOMETRIC PROJECTION Scale 1:1500 N E S W Architect - Santiago Calatrava

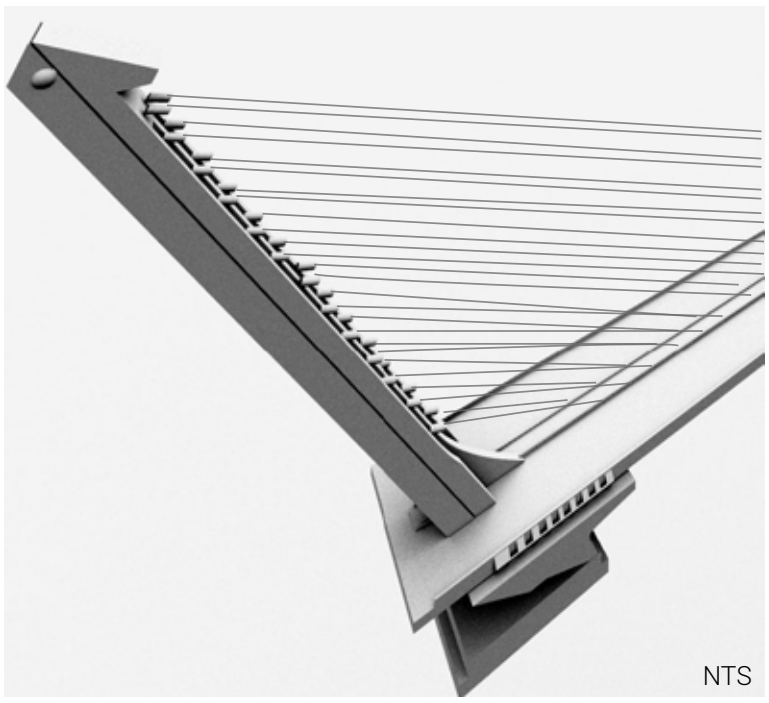
ALAMILLO BRIDGE, SEVILLE ARCHITECTURAL DRAWING

ALAMILLO BRIDGE
KANI AHUONBAR



NTS

MATERIALS OF BRIDGE



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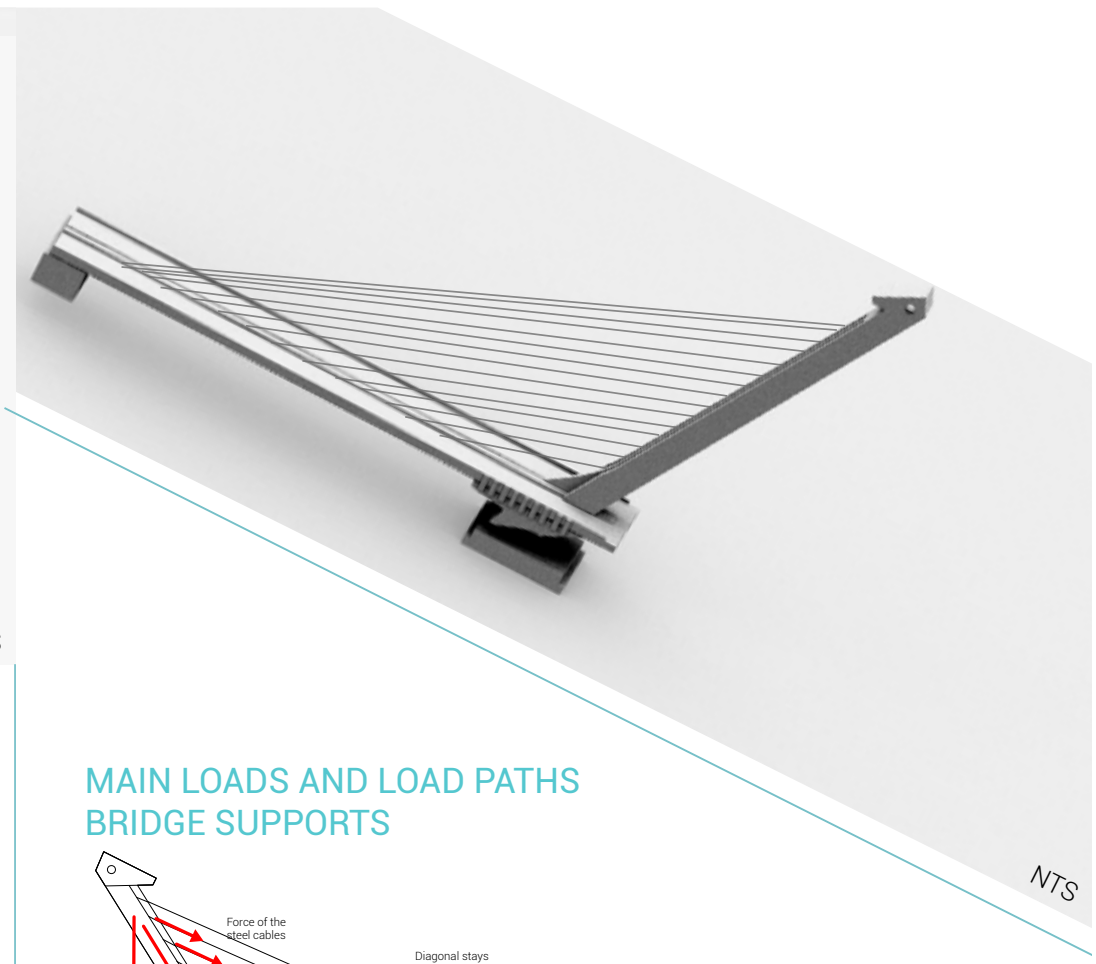
ALAMILLIO BRIDGE
DRAWING ANALYSIS



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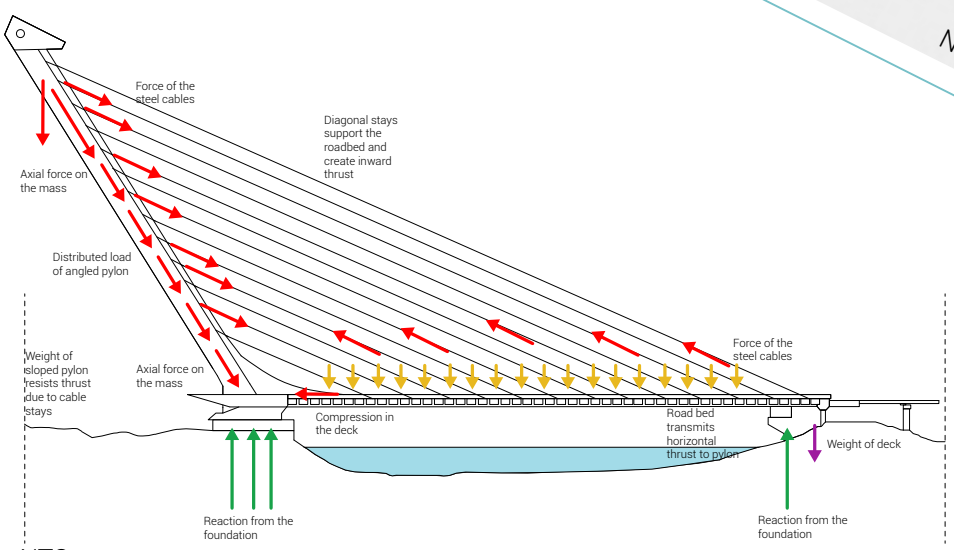
MAIN LOADS AND LOAD PATHS
BRIDGE SUPPORTS



NTS

KANI AHUONBAR