

HOUSE OF CELEBRATION

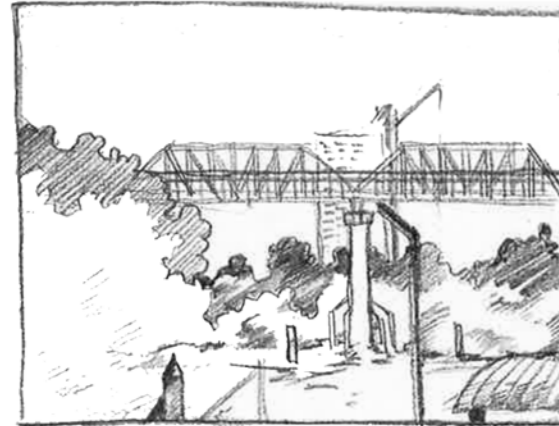
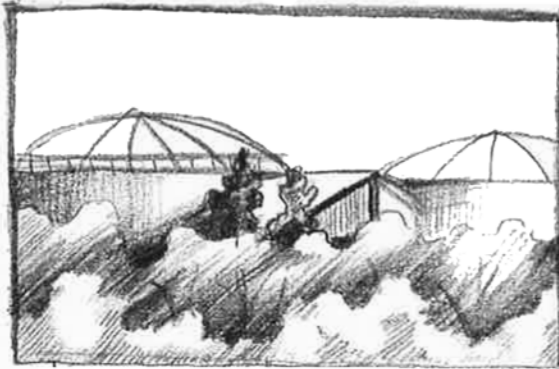
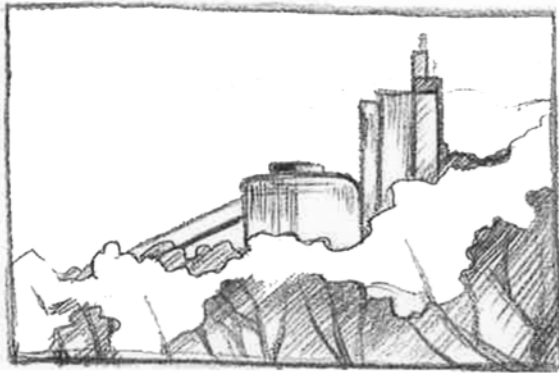
ERIC PRIMROSE RESERVE PARK)

BDES 2013 ARCHITECTURAL TECHNOLOGIES 2
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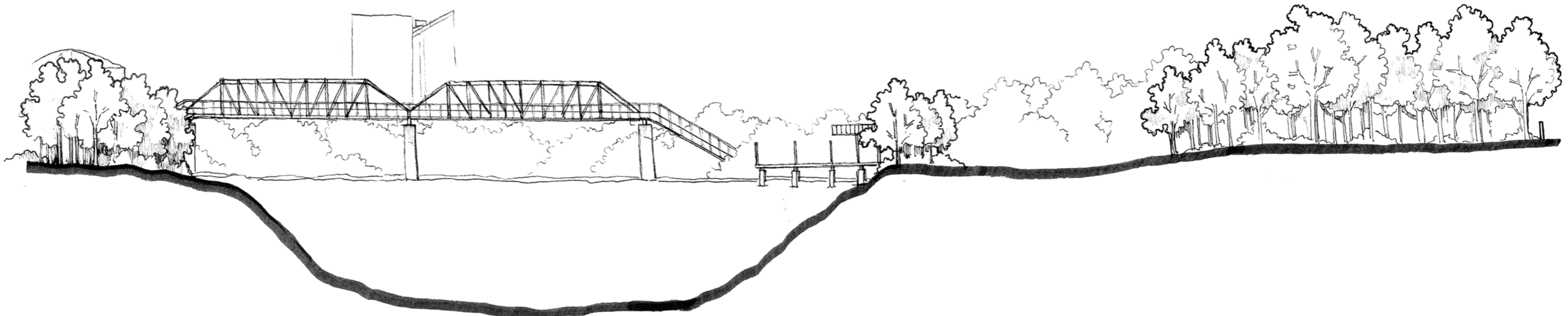
OVERVIEW

Eric primrose reserve park is a man-made park located along the side of Parramatta river of Rydalmere in Western Sydney. The park follows Paramatta River and John Street and is adjacent to a residential zone.

The site is largely grassy fields, with a children's playground on one end of the park and a footpath and bike path that goes through the entire site and ends up at the pier and public parking lot that connects to John Street.

An existing way station is located on the site, providing benches and tables for those who may want to rest and take in the view of Paramatta River. A barbecue grill is also available for those who may want to have a small gathering on the site.

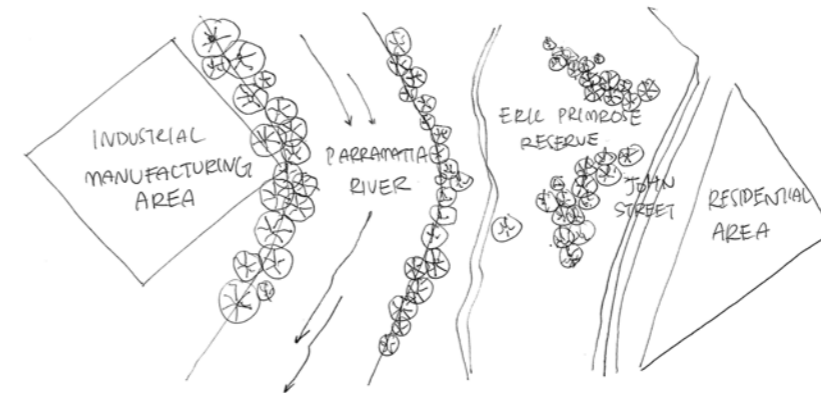
Industrial buildings and factories are located on the opposite bank, creating an unpleasant view from certain places on the site, especially the places where the mangrove trees no longer block the view of the opposite bank.



LOCATION WITHIN SYDNEY

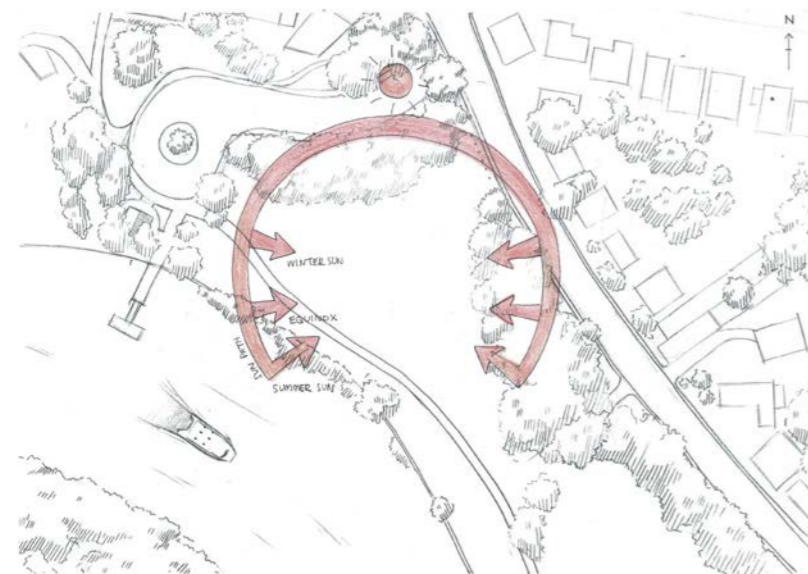


CONTEXT



The reserve is located between a residential zone and an industrial zone, and follows Paramatta River and John Street

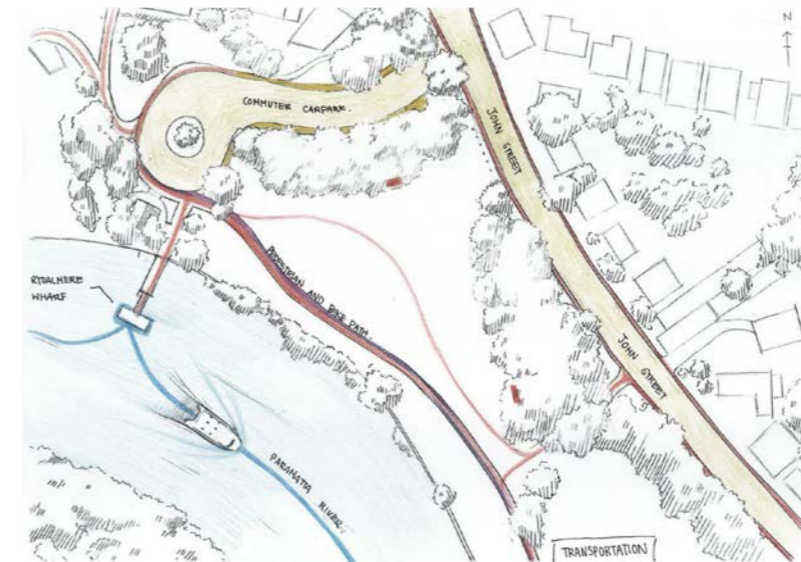
SUN PATH



The summer sun covers most of the site, making the area uncomfortable to remain in for long periods of time during the summer, though the trees in the north and in the east do provide shading for those who need it, though the area of it during the summer is very small due to the high angle of the sun.

The winter sun is mostly blocked off by the trees in the north east, casting a maximum of a 27 metre long shadow. a small patch of the field is still under the sun during the winter, making that area the optimal position for the building.

CIRCULATION AND APPROACH



The site is located in a convenient location, as it is next to a main road that has access to the parking lot right next to the site, providing access to those in automobiles. There are bus stops also located at around a 10 minute walk away, as well as a pier on site, providing access to those who travel by public transport.

There is also a footpath and bike path through the site, though it has been noted that some people do stray from the path and move through the field instead. The path is often used as many of the people in the residential area nearby take advantage of the path for exercise - both biking and jogging.

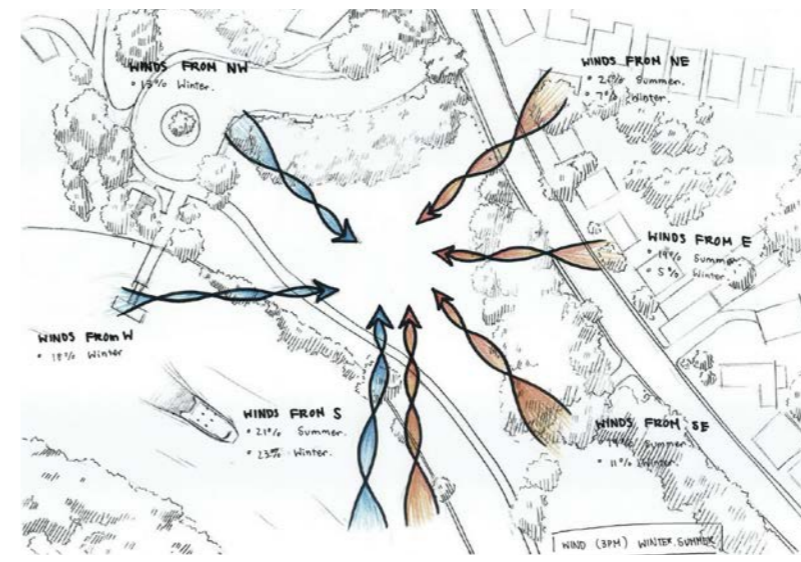
TREES



The tallest trees on the site form a large part of the north eastern part of the site, and are made up of Hill's Weeping figs. These trees can reach up to a height of 15 to 18 metres, and are deciduous, making them a problem during the winter as they will cast a very long shadow on the site during the afternoons in the winter, minimizing the amount of space available for the building to site on on the site to get thermal comfort during the winter.

The weeping bottlebrush on the eastern side of the site do not cause as much of a problem, as they

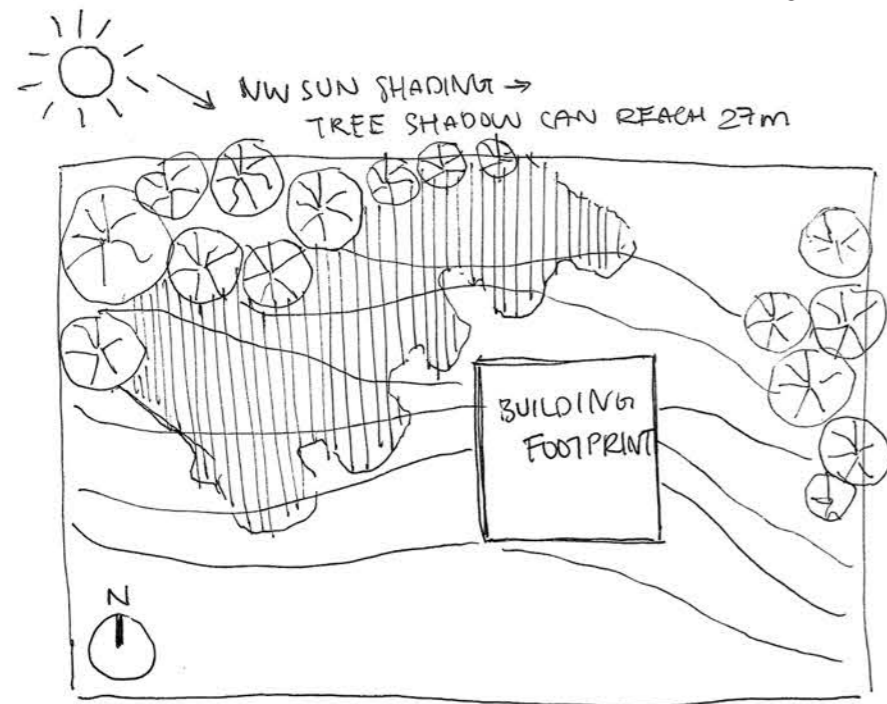
WIND



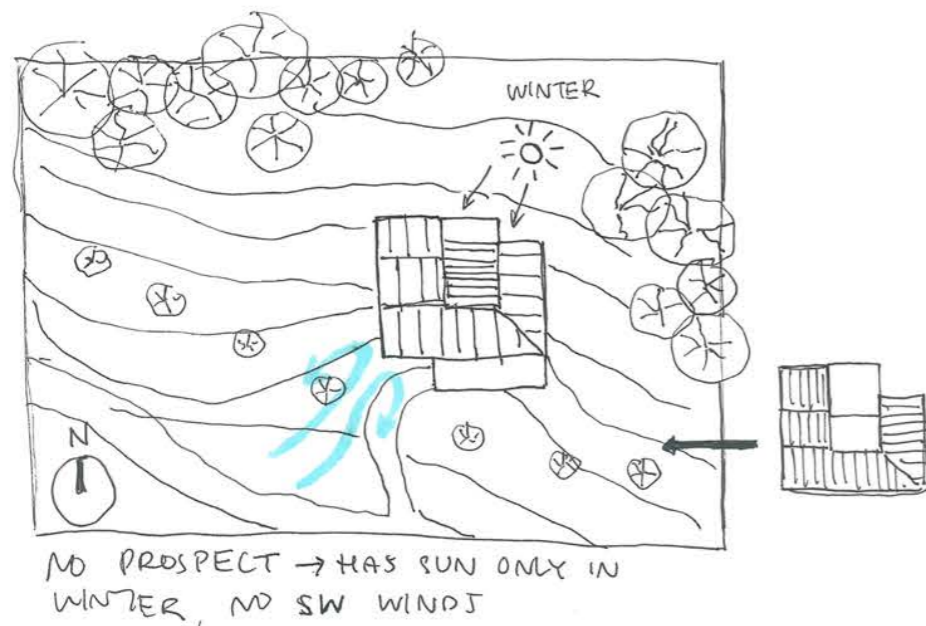
According to the Sydney wind rose, the wind predominantly comes from the South and the North East. The South Westerly wind brings hot breezes during the summer, which will cause discomfort so it will be wise to consider orientating the openings of the building away from the southwest.

On the other hand, cool northerly and north easterly winds are on site during the summer, though due to the trees the breezes are slightly weakened, so most of the cool winds come from the opening between the trees that opens up to the main road, it would be wise to orient

ORIENTATION

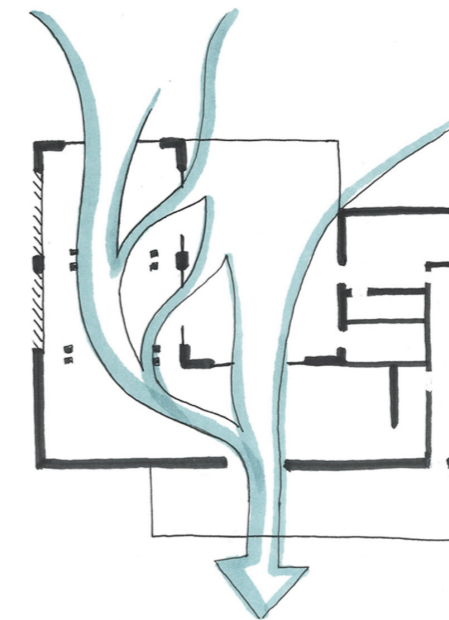
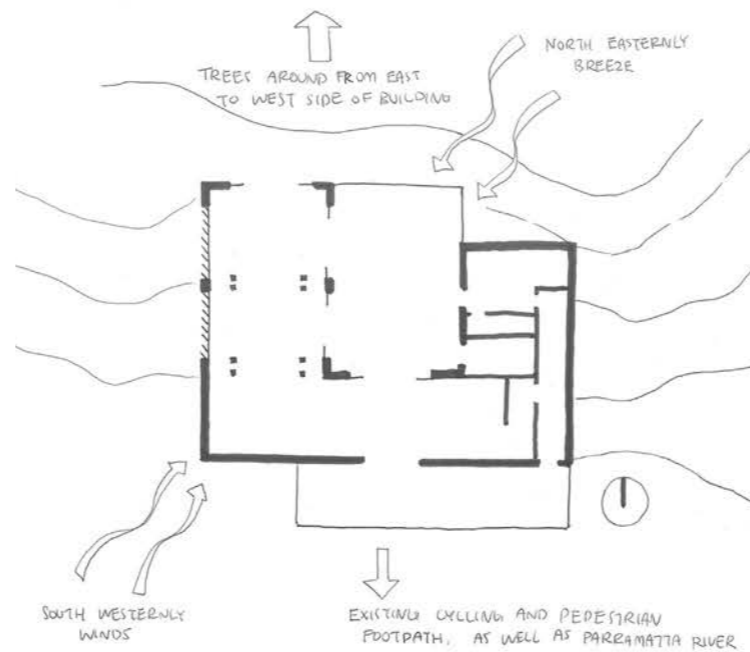


The building is placed in the middle of the field on the site, around 27 metres away from the trees in the north east, as this is the length of the shadow that the trees cast during the winter, thus ensuring that the building is not under the trees' shadows during the winter and there will be sunlight within the building.



The building itself is orientated such that the outdoor area is facing the north so that there is sufficient sunlight throughout the day during the winter. The toilets are placed in the southwest corner of the building to block the south westerly winds.

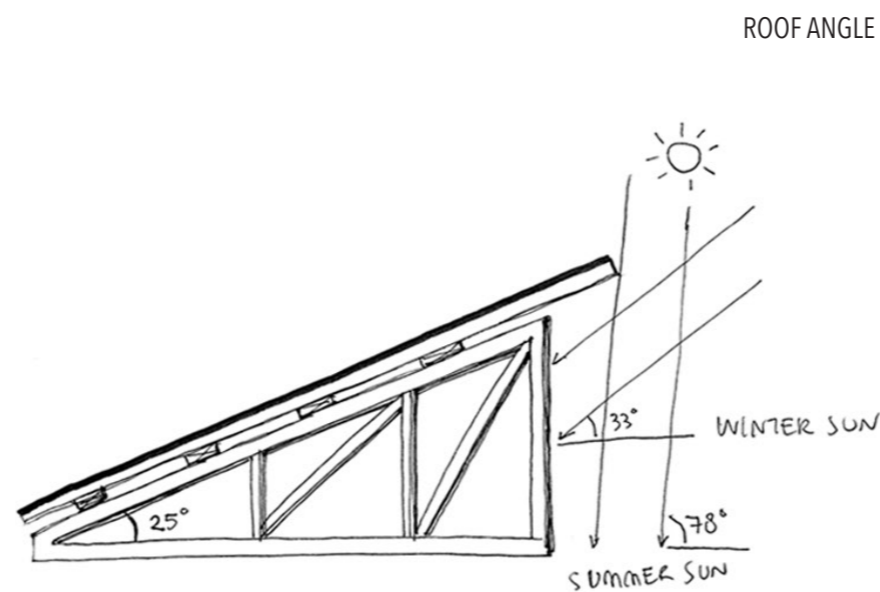
VENTILATION



The outdoor courtyard is positioned such that it is open to the cool north eastern winds during the summer, and operable windows allow for cross ventilation throughout the building.

The toilets within the building are placed such that they block the south westerly winds, and the storage room and staff access corridor are placed such that they block the south easterly winds.

SUNLIGHT AND SHADING

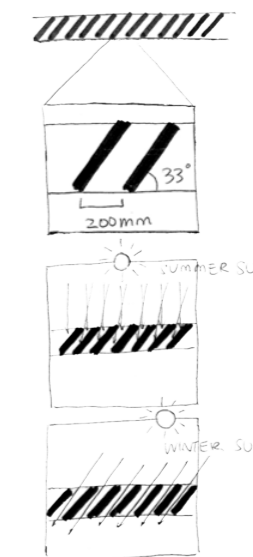


The angle of the roof was set so that sufficient sunlight is let into the building throughout the day during the winter to keep the interior of the building warm, but blocks out the summer sun throughout the day with the assistance of the overhang.

Panels are also fixed on the trusses on the western facades to keep out the western sun in all the seasons

ROOF ANGLE

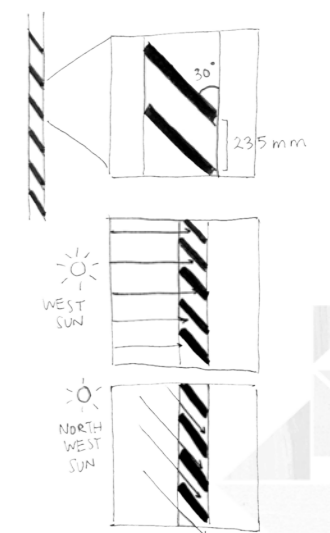
HORIZONTAL LOUVRES



The horizontal louvres cover the outdoor space, and are set up similarly to the roof so that they allow winter sun into the outdoor space and block out the summer sun throughout the day.

LOUVRES

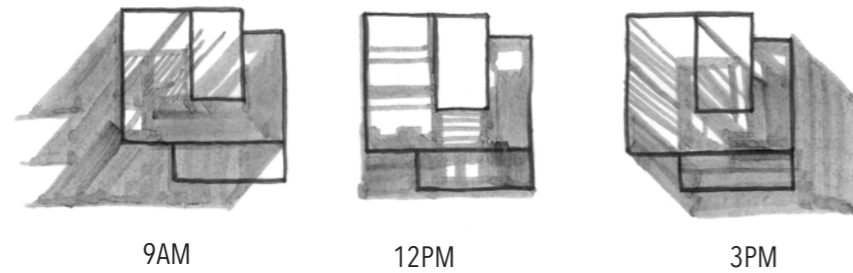
VERTICAL LOUVRES



The horizontal louvres cover the outdoor space, and are set up similarly to the roof so that they allow winter sun into the outdoor space and block out the summer sun throughout the day.

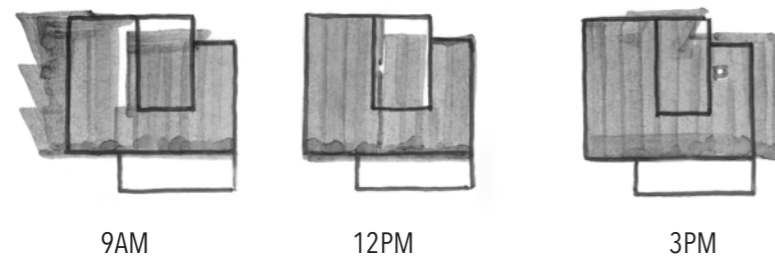
SUNLIGHT AND SHADING

JUNE 21ST



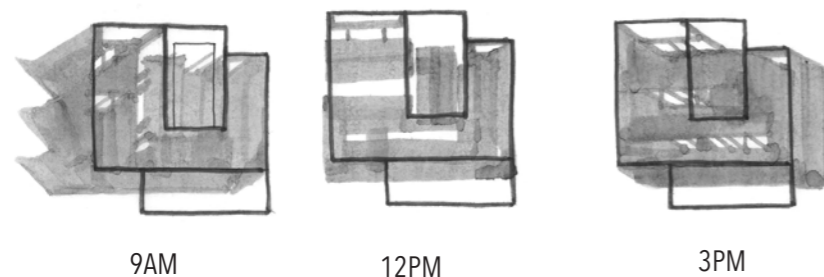
During the winter the interior of the building gets a lot of sun, especially throughout the afternoon, which is good as it will provide thermal comfort throughout the day. The louvres on the western facade also allow some of the North Western sun into the room even in the late afternoon to keep the interior warmer for longer.

DECEMBER 21ST



During the Summer the building is kept out of the sun due to the overhangs on the roof, the horizontal louvres above the outdoor area and the vertical louvres on part of the western facade. This helps keep the inhabitants out of the unpleasant sun and remain cool throughout the day.

MARCH 22ND / SEPTEMBER 21ST

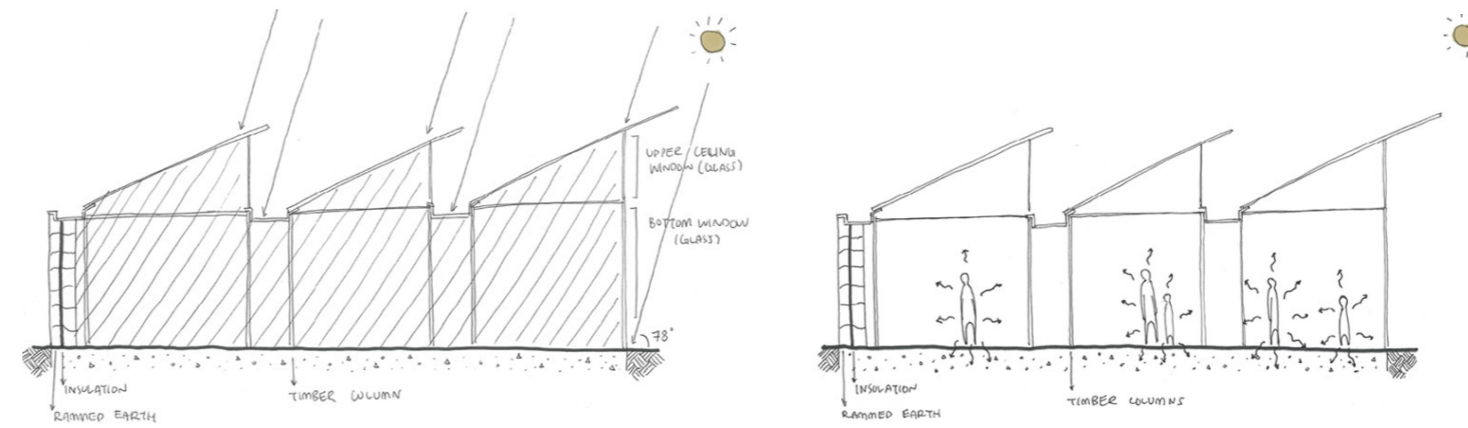


For the equinoxes, only some sunlight is let through, as there are still chances that the temperature is too warm for a lot of sunlight or too cold for minimal sunlight. Options for manipulating the openings on the building are still available if the inhabitants want to create a even more comfortable environment

The floor of the building is made out of concrete, and the walls are predominantly made out of rammed earth, both are materials with thermal mass and high thermal capacity.

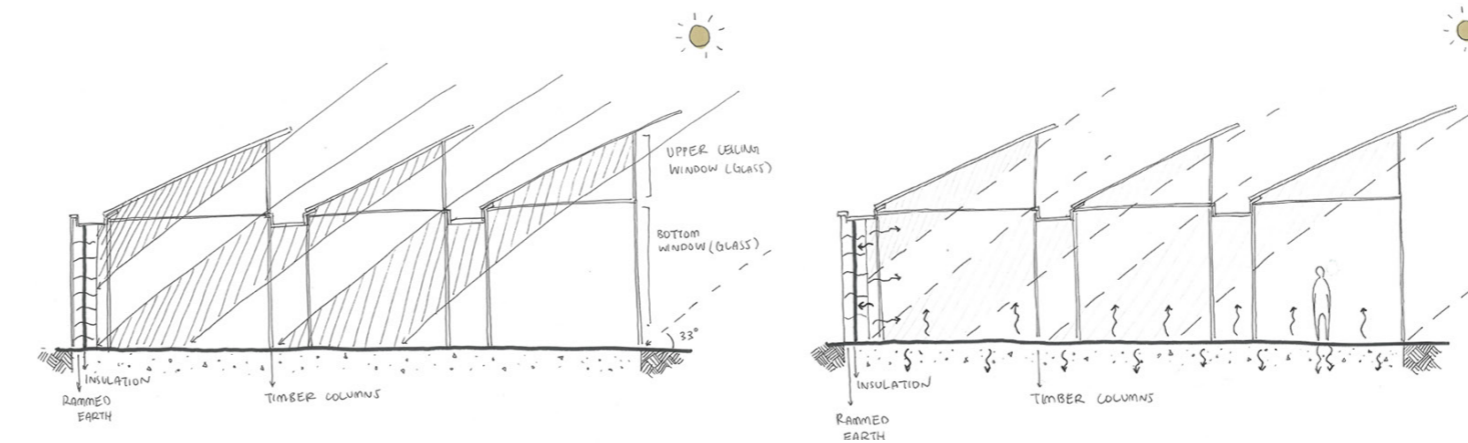
THERMAL MASS

SUMMER DAY



The walls and the concrete slab are kept out of the sun throughout the day, so the floor is kept cool for the people within the building. The people who inhabit the building also radiate heat into the floor, cooling them down and also slightly warming up the concrete floor,

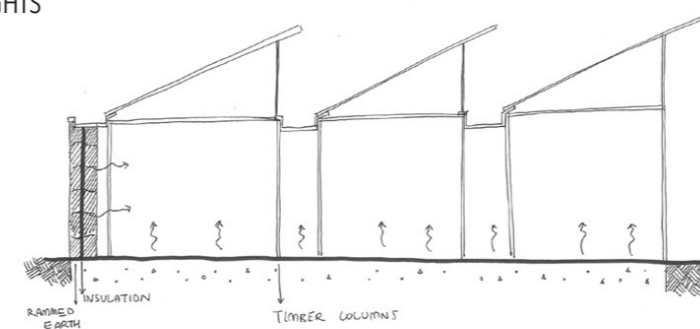
WINTER DAY



Due to the concrete slab being exposed to the sun throughout the day, the concrete slab is kept warm and comfortable for the people in the building, the materials also re-radiate the heat they have absorbed throughout the day, continuously warming up the building.

SUMMER NIGHTS

As the air temperature drops during the summer nights, the heat absorbed by the concrete from the inhabitants of the building throughout the day is re-radiated back into the air, keeping the interior of the building at a moderate temperature during the cooler summer nights



WINTER NIGHTS

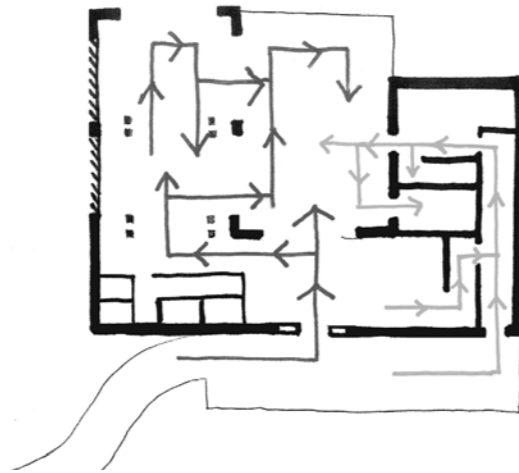
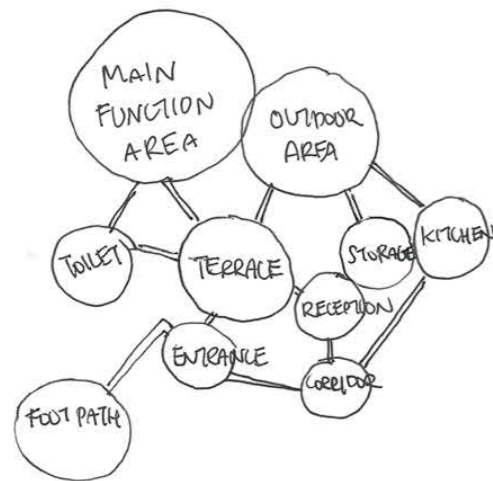
As the temperature drops even further during the winter nights, the heat absorbed from the sun and the inhabitants of the building throughout the day is re-radiated into the air by the concrete and

INSULATION

Insulation is added in the middle of the rammed earth as well as right underneath the custom orb roofing and above the trusses, preventing the warm air inside from escaping during the winter to keep the interior of the building warm, and preventing the cool air from escaping and the warm air from entering during the summer to keep the interior of the building cool during the summer.

CIRCULATION

HOW THE SPACE IS USED



The overall circulation of the building is tightly packed so that it is convenient and efficient when moving through the spaces. It is easy for the staff to move from the kitchen to the event spaces for catering as the spaces are adjacent to one another. The toilet is located in a location that is easily accessible by both the outdoor venue and the main function room. The outdoor space and the main function room are adjacent to one another so inhabitants can move between them and potentially expand the size of both spaces if they feel too small.

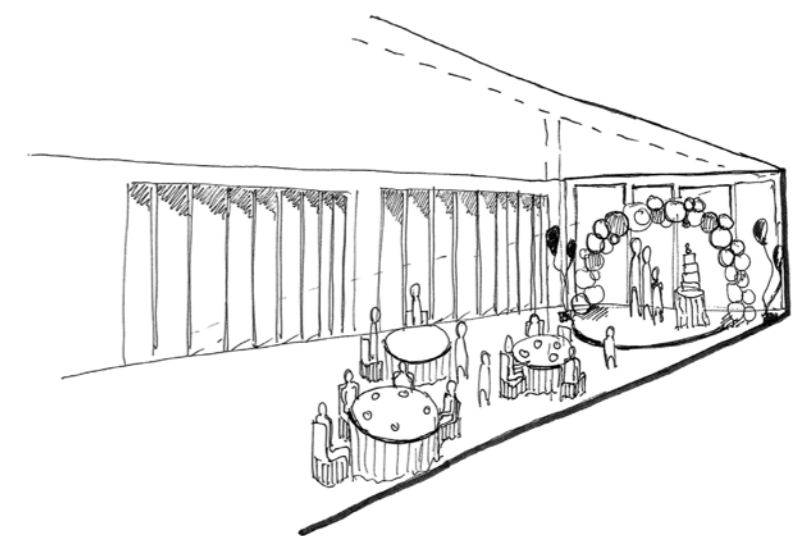
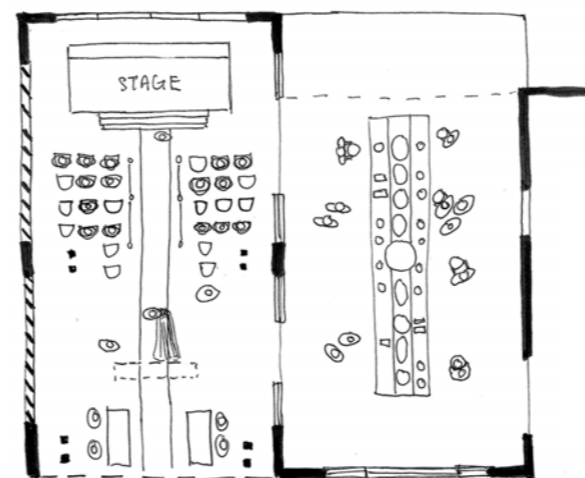
An alternative path has also been provided for deliveries and staff that is a lot more discreet and hidden than the main entrance so that people do not get mistaken.

The space can be used for weddings, banquets, graduations (as there is a school nearby), small performances and simple informal gatherings.

When no event is being held, the building is still open for bikers that are exercising on the bike path to park their bikes and take a rest and take in the view, as the bike parking zone is placed on the southern entry terrace, which faces the river view.

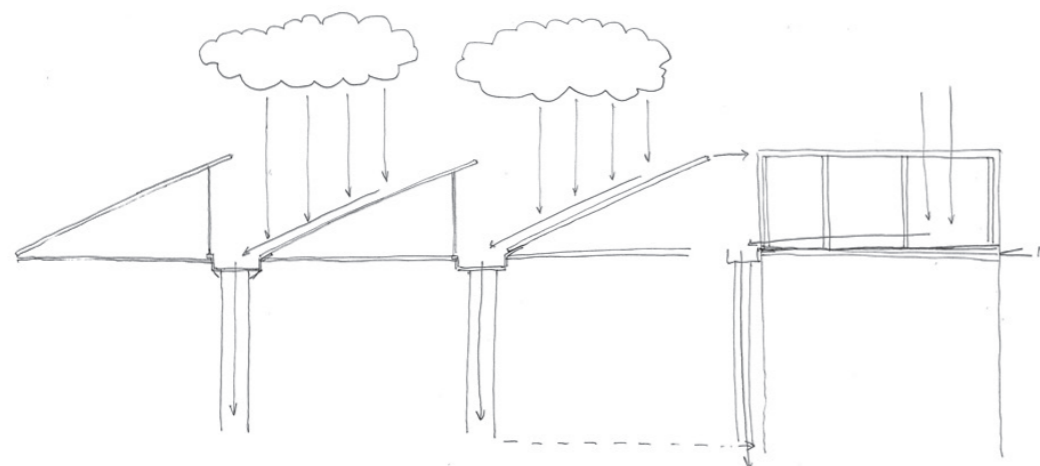
The many openings between the adjacent outdoor space and the main function room make it easy for the inhabitants to navigate between the two spaces, providing a lot of space for the event when the weather is optimal. Therefore events can be happening both inside and outside at the same time.

The storage room provides a space for the storage of various furniture when the space is not in use, this can include dining tables, folding chairs and a collapse-able stage.



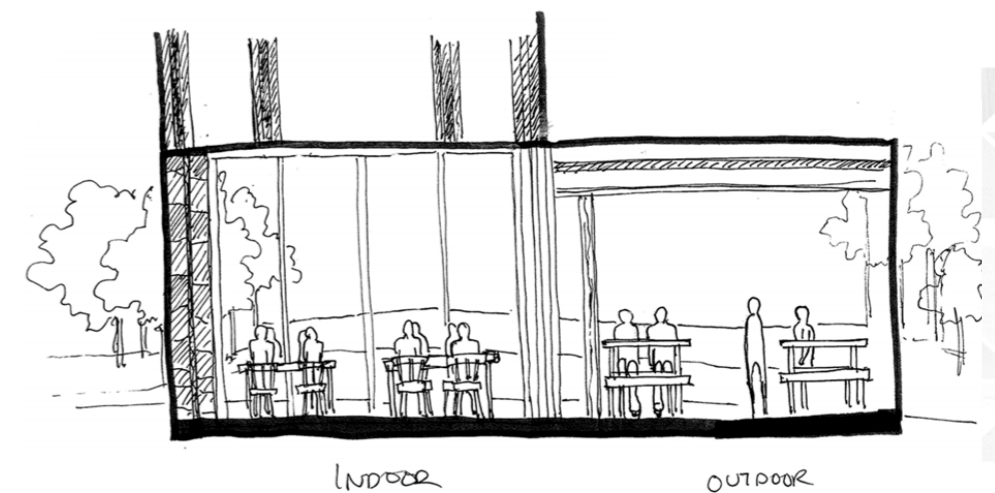
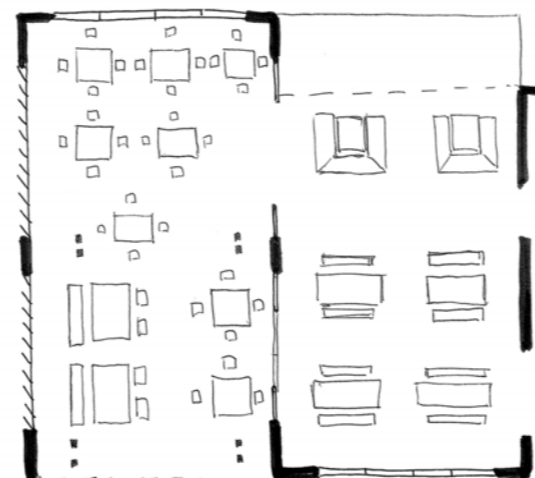
The space being used during a wedding

WATER STRATEGIES



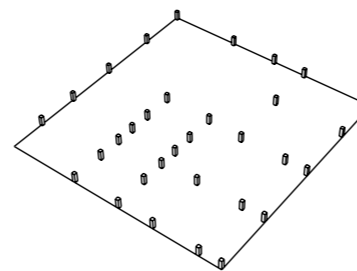
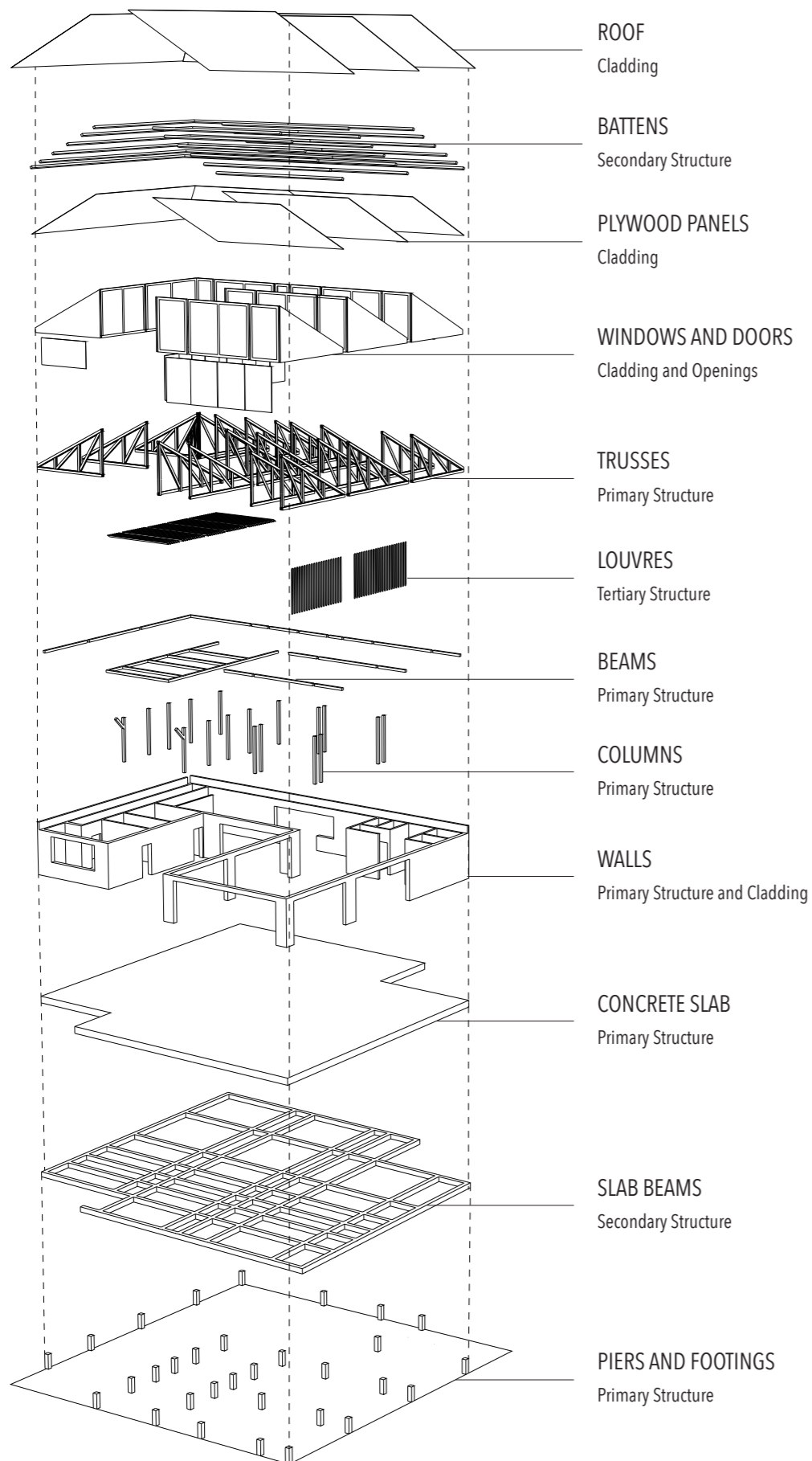
The skillion roofs provide a steep enough slope for the water to flow down them and into the gutter, which is slightly angled towards one end, making the water flow to the exterior of the building rather than into the outdoor space to ensure that the downpipes do not ruin the aesthetics of the building itself.

The downpipes then let the water flow back into the field

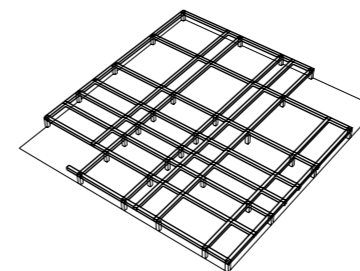


The space in use during a gathering dinner

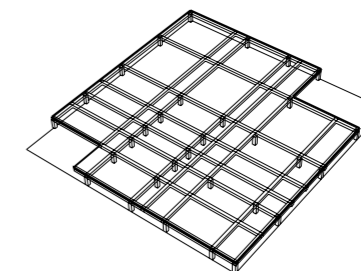
STRUCTURAL ANALYSIS



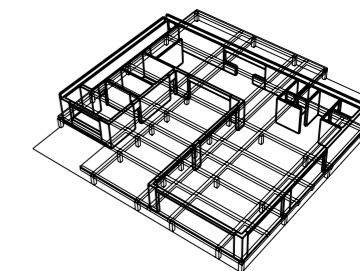
Dig and pour Piers and Footings



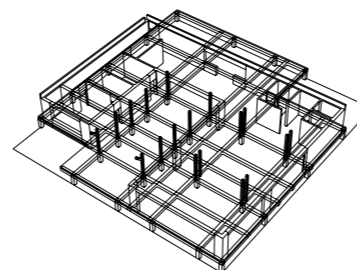
Pour Slab Beams and fix to piers



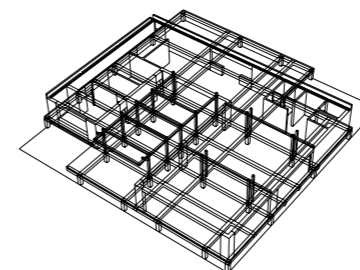
Transport Pre-casted Concrete Slab and fix to beams



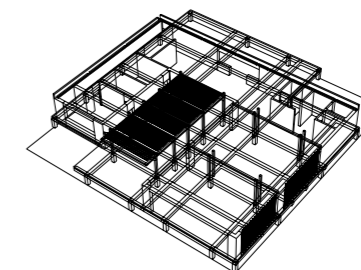
Cast Rammed Earth Walls with dug out soil and fix to concrete slab



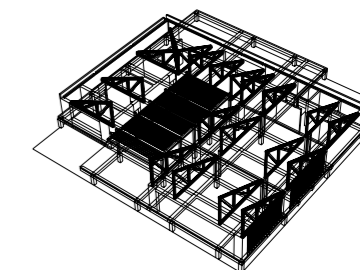
Fix Timber Posts to Concrete Slab



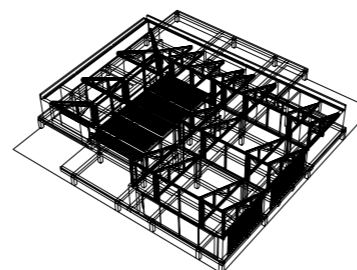
Fix Timber Beams to Timber Posts



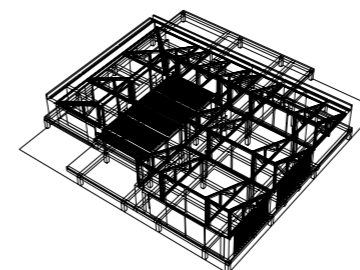
Fix Louvres to Timber Beams and Posts



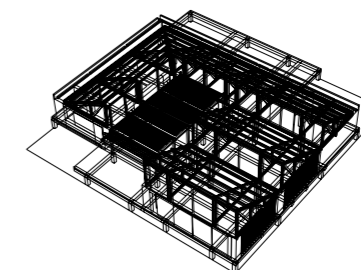
Construct trusses on site and fix to beams, columns and walls



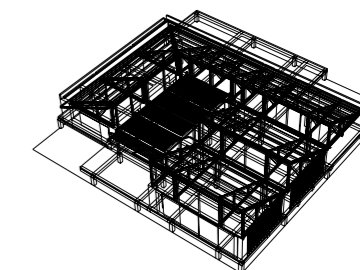
Fix Timber Panels, Windows and Doors to frames fixed to trusses



Fix Plywood Layer to trusses and fix insulation to Plywood



Fix Battens to trusses



Fix Roof to Battens

LOAD PATH ANALYSIS

The loads of the roof are transferred from the trusses to the main beams and columns as well as the walls of the building, which form the primary structure of the building.

This load is then transferred into the concrete slab then into the piers and footings underground.

Rammed earth is great at absorbing and releasing heat, but has weak thermal insulation, thus insulation has been added. The soil dug out to make room for the piers and footings can be used to make the rammed earth and more can be transported

A material with great thermal qualities (high thermal capacity) and a long life span that is commonly used in flooring and base construction. It can be precast and transported to the site or poured on site.

A hardwood that is particularly hard, strong and durable, with a range of applications due to its resistance to termites.

A lightweight and strong roofing material that is versatile and readily available in all the regions of Australia

MATERIALS

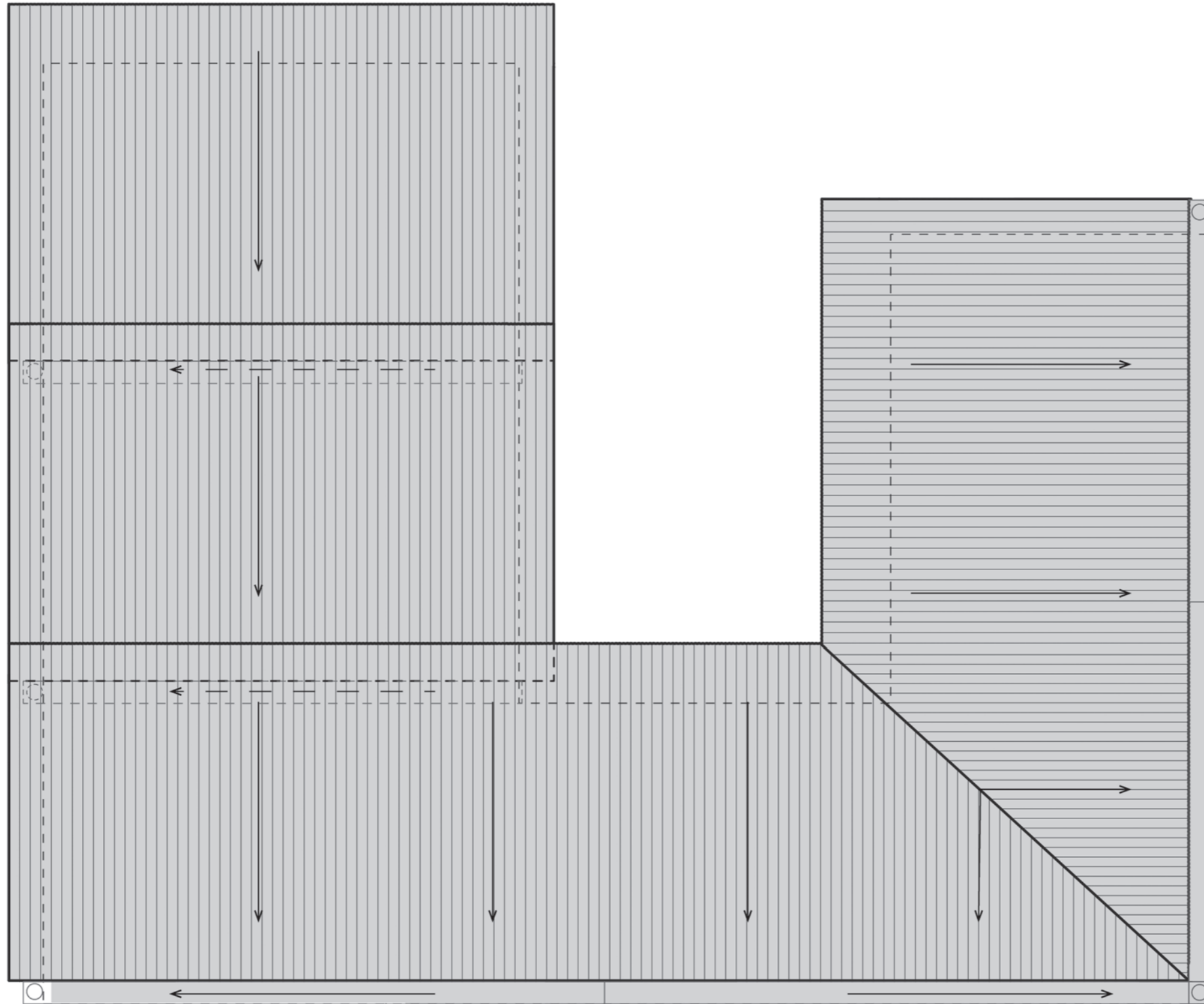
RAMMED EARTH - Interior and Exterior Walls

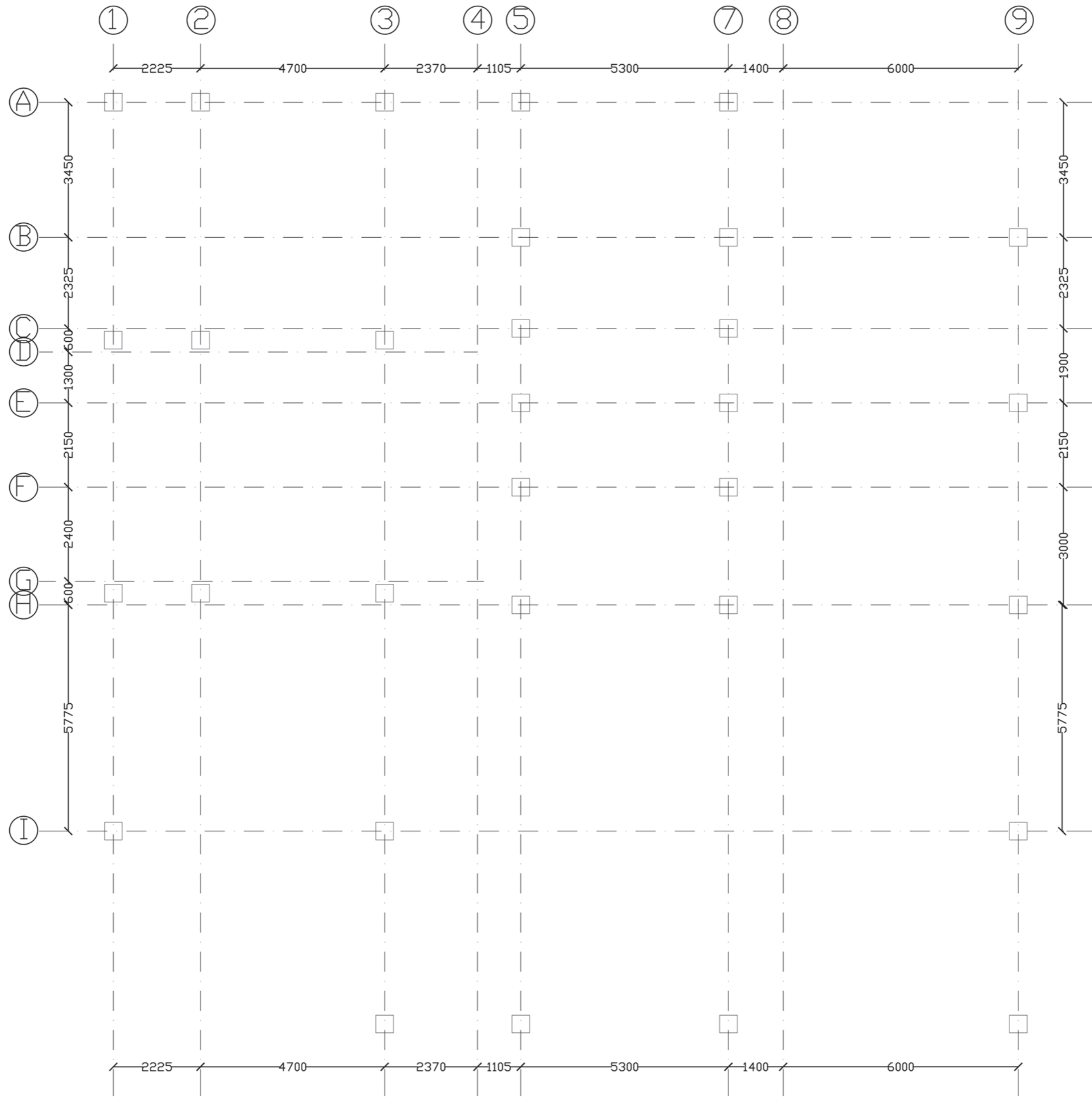
CONCRETE SLAB - Flooring

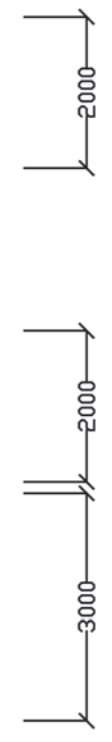
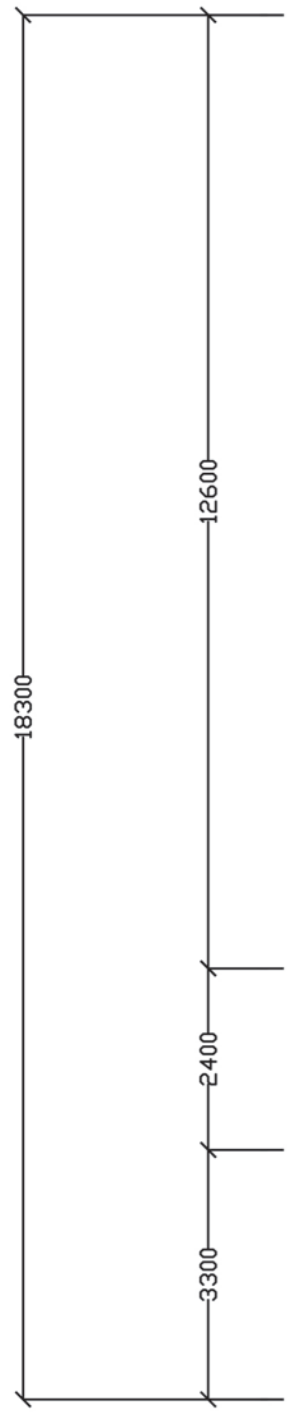
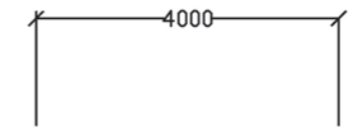
IRON BARK TIMBER - Beams, Posts and Trusses

CUSTOM ORB









MAIN FUNCTION ROOM
113.4m²

OUTDOOR AREA
94.5m²

KITCHEN
18.2m²

FOOD STORAGE
8m²

GENERAL STORAGE
12m²

TOILETS

RECEPTION

ENTRY COURTYARD



SECTION A

SECTION B

