



ALL CREATURES GREAT AND SMALL

M.ARCH 2020/21

MADAR MOGE

HARVESTING COMMUNITY OF FRANKINCENSE



THESIS STATEMENT

The community serves as a support system for both the population of trees and its harvesters by promoting the diffusion of the correct method of harvesting as well as providing appropriate spaces for the sustainable tapping and use of the *Boswellia Frereana* tree. This is a community of harvesters whose primary interest is to conserve and protect the Frankincense tree due to it being the primary livelihood of Somalilanders. Develop the community where there is a more direct interaction or knowledge by the consumers and the harvesters/workers. To continue to educate the rest of the community and impose the correct way of harvesting so there is a constant high quality resins being produced. Overall improving the lives of the harvesting community, local community and conserving the *Boswellia* trees for future uses.

MANIFESTO FOR DESIGN:

- 1. Synergetic Relationship:**
Establish a strong Synergetic Relationship between the existing Community
- 2. Environment Conservation:**
Conserve the current trade of Frankincense in a sustainable way and transform Cal Madow into a National Monument to gain respectable recognition and respect from the Nation and Worldwide.
- 4. Symbiotic Relationship:**
Create a Symbiotic Relationship between the users and the trees through Architectural Design
- 5. Forest Regrowth:**
Re-grow the forest that has been cleared due to overexploitation and the destruction of the Charcoal Production Industry.
- 6. Community & Collaboration:**
Design a community that represent as a beacon of Hope and a Prime example of Collaboration can nuild a strong learning environment and a Potential to Magnify Growth
- 7. Water Harvesting:**
Design a Water Catchment Facility for Drinking Water because many communities suffer both erosion due to loss of vegetation cover and lack access to drinking water.
- 8. Livelihood Methods:**
Propose Alternative Methods Of Livelihood To Reduce The Pressure On The Frankincense And allow time for it to grow.





ABOUT THE CAL MEDOW

The Cal Madow, which literally means “black mountains”, is a range of mountains in the north of Somaliland, a country that is primarily arid savannah to desert ecosystem. The Cal Madow is an uplifted limestone escarpment that rises up to 2,460 meters above sea level, stretching from eastern Somaliland to western Puntland. The mountains receive high levels of rainfall and ocean mists, and as a result are covered in thick forest that harbors high levels of biodiversity. The Cal Madow is unique—there is nowhere else on earth like it.

The Cal Madow and its surroundings are also home to *Boswellia carterii* and *Boswellia frereana*, two species of trees that produce frankincense resin. Communities here have been tapping these trees for thousands of years, and today they supply some of the best quality resin and essential oil on the market. The trade of frankincense resin is key to the ecology of the Cal Madow, and is an African cultural legacy.

However, the mountains today are under threat. Increasing international demand and a growing population has put pressure on frankincense harvesters to cut trees at unsustainable levels. Over-cutting, along with drought and an increasing number of pests is causing the trees in some areas to decline and die at alarming rates. In addition to the frankincense tree decline, the forests are cut for charcoal production and timber, and mining operations threaten to pollute the water supply. Furthermore, the forests are under increasing stress as climate change alters the patterns of rainfall and oceanic mists upon which the forests depend.

LANDSCAPE

The Cal Madow area consists of an arid coastal plain, transitioning into sub-coastal hills that while largely arid are covered in *Acacia*, *Commiphora*, and *Boswellia* species of varying densities. At intermediate elevations of the escarpment itself, the ecosystem is wetter and dominated by thick evergreen scrub with many different species of *Buxus*, *Pistacia*, *Cordia*, *Boswellia*, *Commiphora*, *Olea*, and *Dracaena*. At the highest elevations, along the top of the escarpment, the evergreen scrub transitions into old-growth *Juniperus procera* forest, some of the last in Somaliland, much of which is degraded but some of which is still intact. Here, the long history of organic matter has built up rich black soil, a rare sight in Somaliland and absolutely essential for healthy forest.

THE OVERALL BIODIVERSITY

A swath of thick forest surrounded by arid ecosystem, the Cal Madow forests are a hotspot of biodiversity. The area is officially recognized as an Important Biodiversity Area and is a regional center of endemism in the Horn of Africa. The biodiversity is not well known; many areas in the mountains are remote and not scientifically explored. However, over 1000 species of plants have been discovered here, with up to 200 found nowhere else. Three hundred species of birds, 4 endemic, and dozens of species of mammals, reptiles, and amphibians live in the forests—with many species likely yet to be discovered and described.

As the mountains are explored and documented more fully, there will undoubtedly be new species discovered and ever more stories to tell.

PROGRAMME //

1. Meeting Hall:

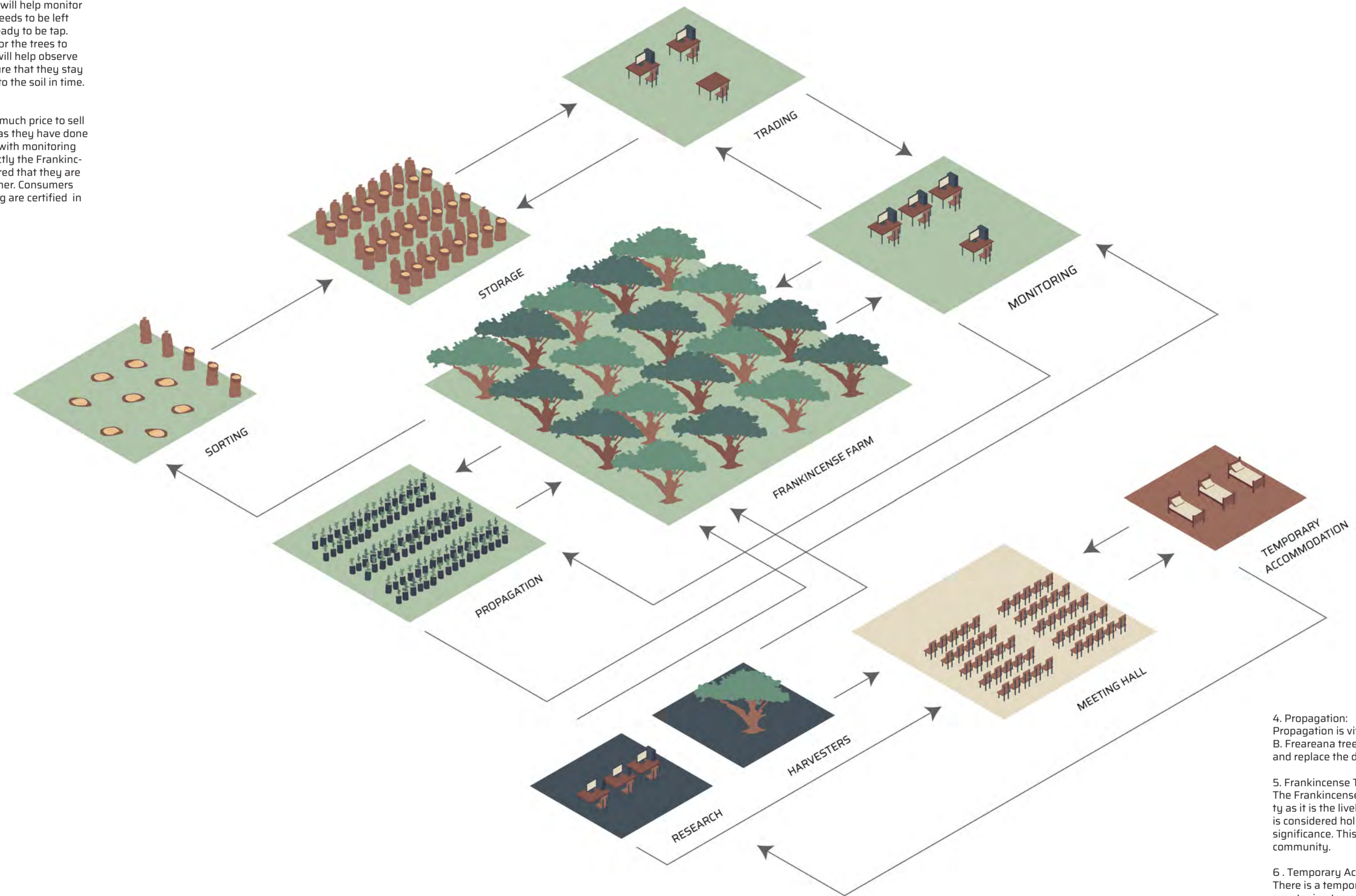
A meeting hall is important to discuss and resolve as a community any conflicts or issues that needs to be discussed. This includes what are the best practices of harvesting, main events in the community to create a strong unity between everyone.

2. Monitoring:

There will be a monitoring center that will help monitor the existing Frankincense trees that needs to be left alone to grow and the ones that are ready to be tap. Ensuring that there are enough time for the trees to heal before tapping. The monitoring will help observe the baby Frankincense trees and ensure that they stay healthy and be ready to be planted into the soil in time.

3. Trading:

Trading is important for learning how much price to sell the resins so they do not under sell it as they have done in the past. Trading needs to be close with monitoring as consumers like to know where exactly the Frankincense resins comes from and be ensured that they are being harvested in a sustainable manner. Consumers like to know that what they are buying are certified in the correct practice of harvesting.



4. Propagation:
Propagation is vital to grow more *Boswellia Carterii* and *B. Frereana* trees in the area to regenerate the trees and replace the dead ones.

5. Frankincense Tree Farm:
The Frankincense Tree farm is the core of the community as it is the livelihood of the community. Frankincense is considered holy through its great historic and cultural significance. This Frankincense should grow past the community.

6. Temporary Accommodation
There is a temporary accommodation for people who are staying temporary for research, charity or visitors that the community may host. This is so that the Madar Moge community can learn from the outside world by allowing them to stay in their village and learn from each other. Through the design, it aims to protect and develop the community.

PHASING //



PHASE 1 // MEETING HALL/PRAYER HALL

A place for the community to meet, discuss and resolve important issues regarding key events/issues. A place to share ideas, work together and come to a compromise on what is the best for the community. A place where the elders can declare how important it is to execute the proper way of harvesting to for everyone have a livelihood. This hall can then be turned into a Prayer Hall for the Muslim community to pray.



PHASE 2 // HARVESTING AND PROPAGATION TRAINING CENTRE

For the elders to teach the younger generations the correct method to tap the Frankincense trees and teach them how to look after them so that they produce quality resins all year round. This is to maintain the knowledge of Frankincense Trees that has been passed down for millenniums and the proper traditional method to harvest the trees for future generations.



PHASE 3// FRANKINCENSE RESEARCH & DEVELOPMENT

Frankincense oil has been linked to treatments for ovarian, breast, and skin cancers. Developing a Frankincense Research centre close to the Frankincense trees will enhance the existing knowledge and provide facilities for the community. This will be in partnership with the University of Hargeisa to research the potential of Frankincense, a university that offers students courses in environmental science and conservation.



PHASE 4 // HOMES AND PLANT TREES

To improve the existing homes of the community and provide temporary accommodation for tourists and visitors that are staying temporarily in the Cal Madow for research or leisure. This is typically designated for the students/researchers from the University of Hargeisa so that they can live in the site and work closely with the Frankincense Trees.



PHASE 5 // VEGETABLE FARMS AND LIVESTOCK FARMS

To encourage another alternative of food production and ways of trading instead of depending solely on Frankincense trees for their livelihood.



PHASE 6 // HEALTH CENTRE

To provide health care to the many small communities in Cal Madow that struggle to go the closest hospital to them which is in Erigavo. A closer health centre will be more efficient for people who need treatment and provide care to those who cannot travel to the city. The health centre works alongside the Research and Development.



PHASE 7 // PROPAGATION CENTRE

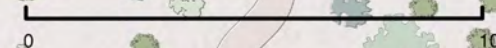
To plant more Frankincense trees in the area to replace the dead trees.



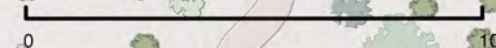
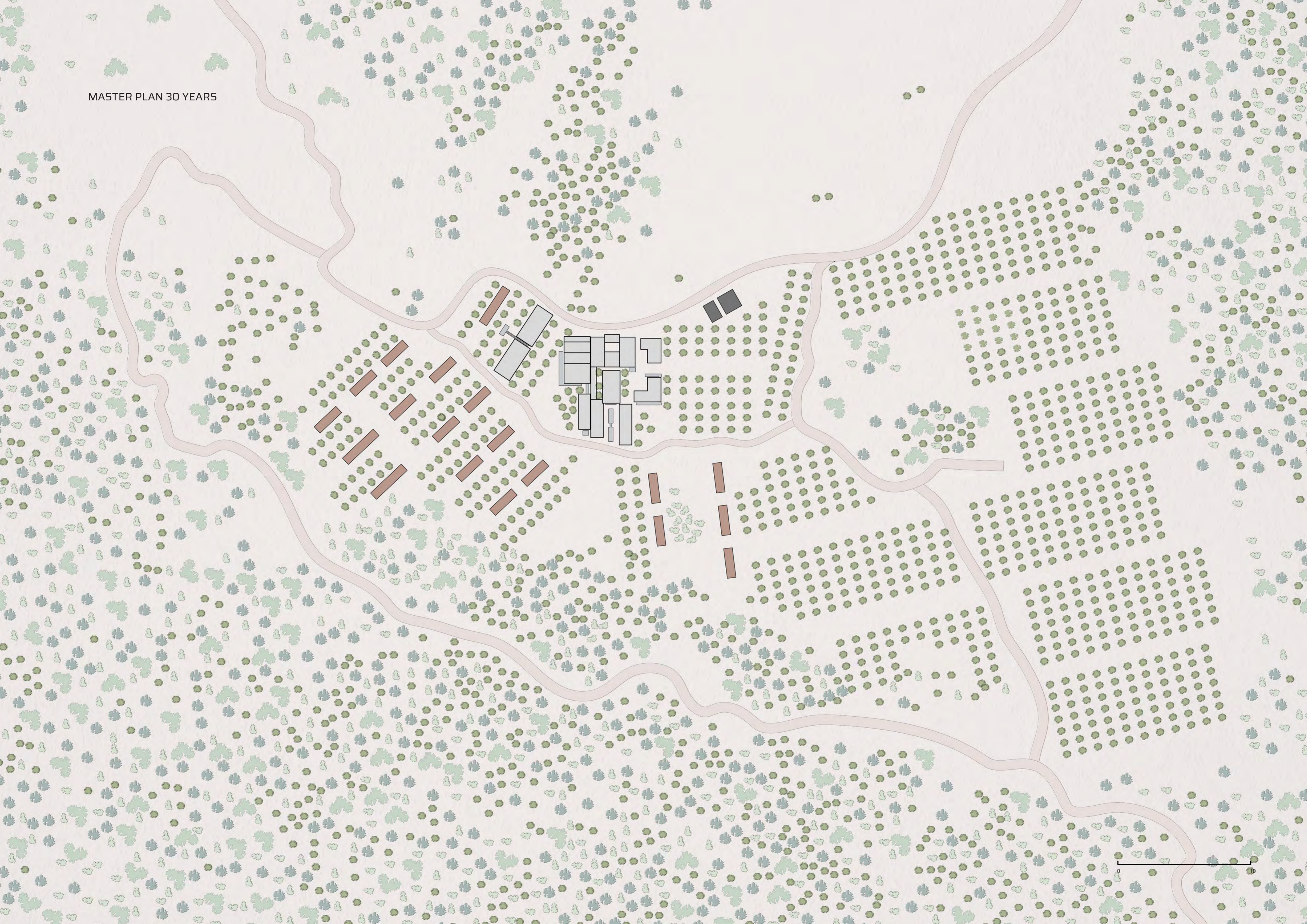
PHASE 8 // DISTILLERY

To create a stronger platform for the community in the selling of essential oils and aromatherapy industry by producing Frankincense essential oils locally instead.

MASTER PLAN

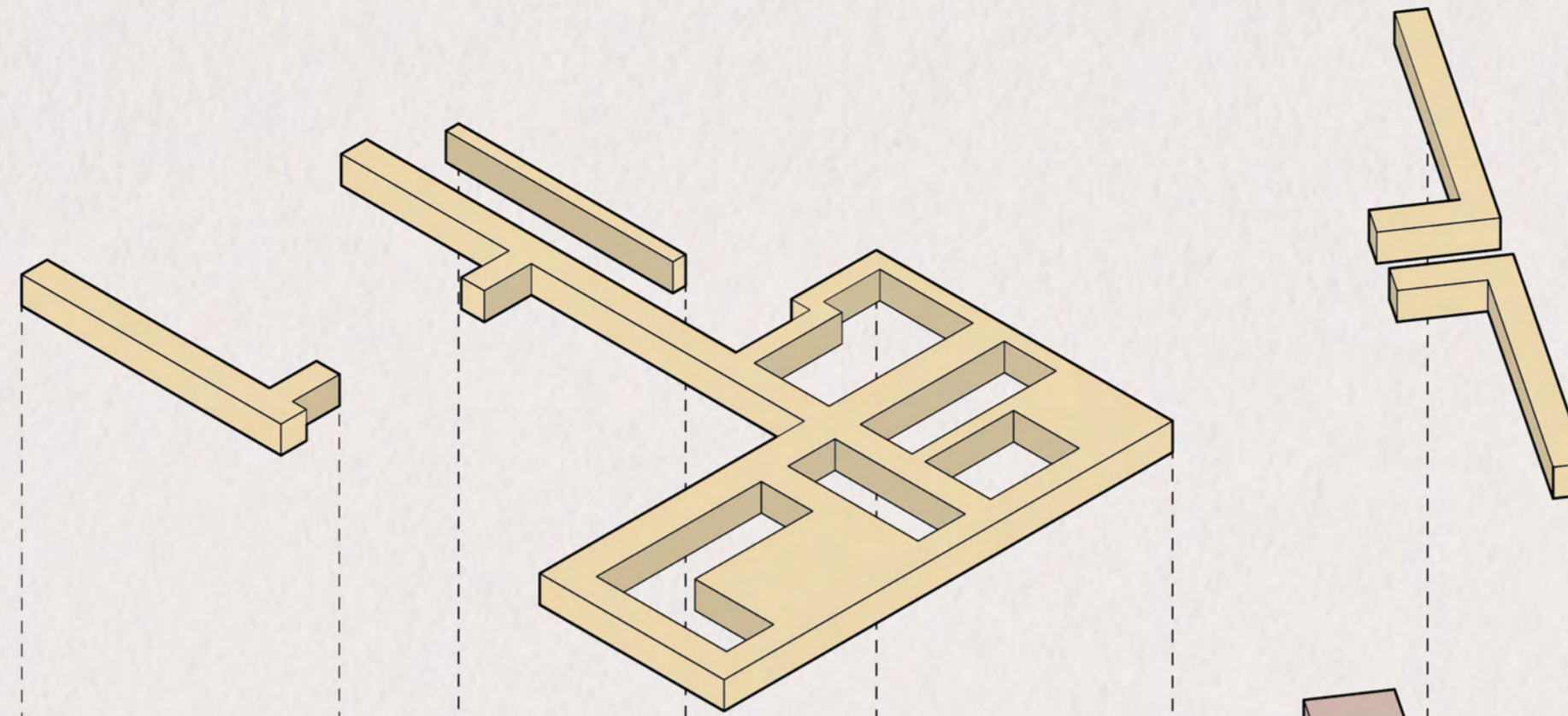


MASTER PLAN 30 YEARS

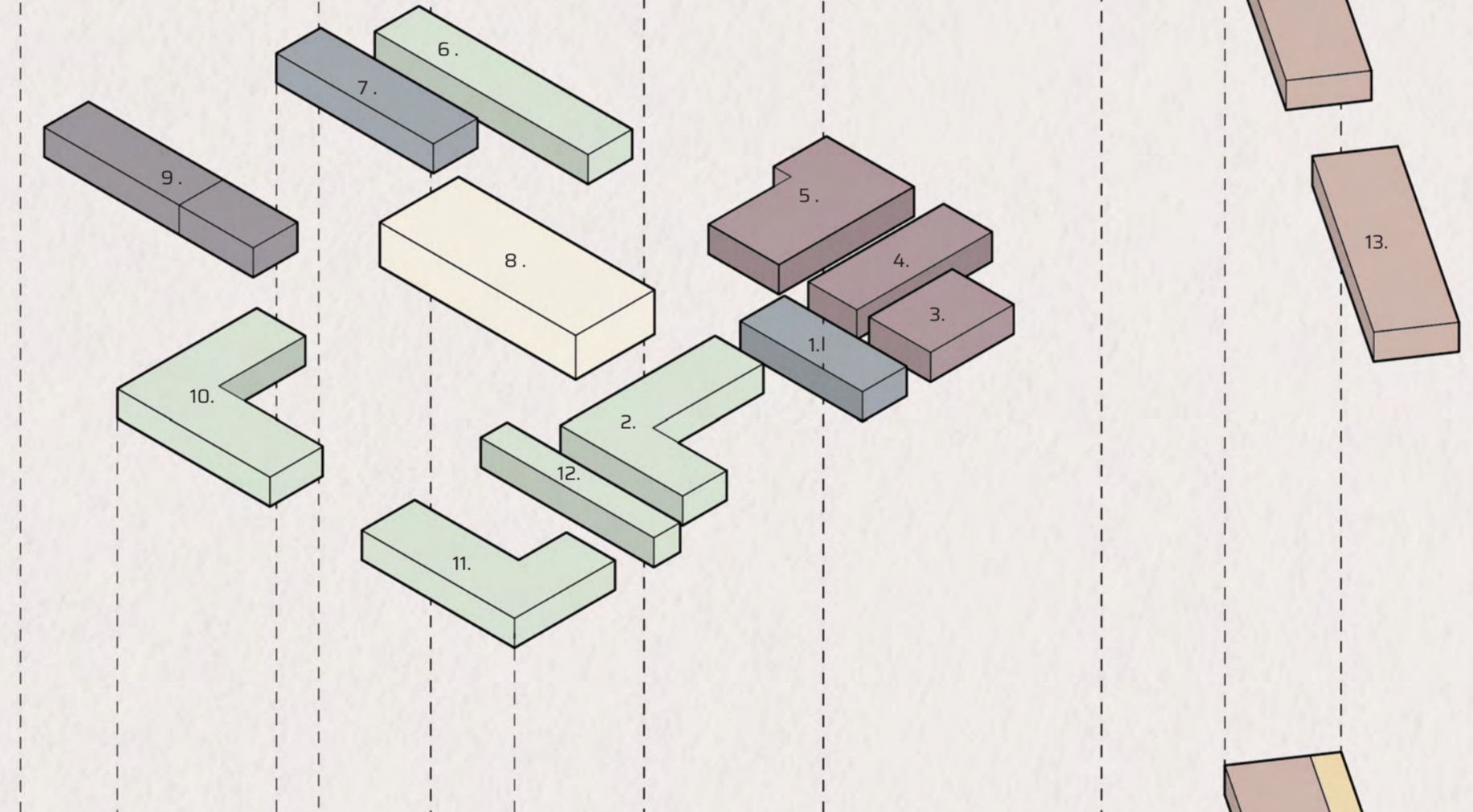


EXPLODED PROGRAMMATIC MASSING

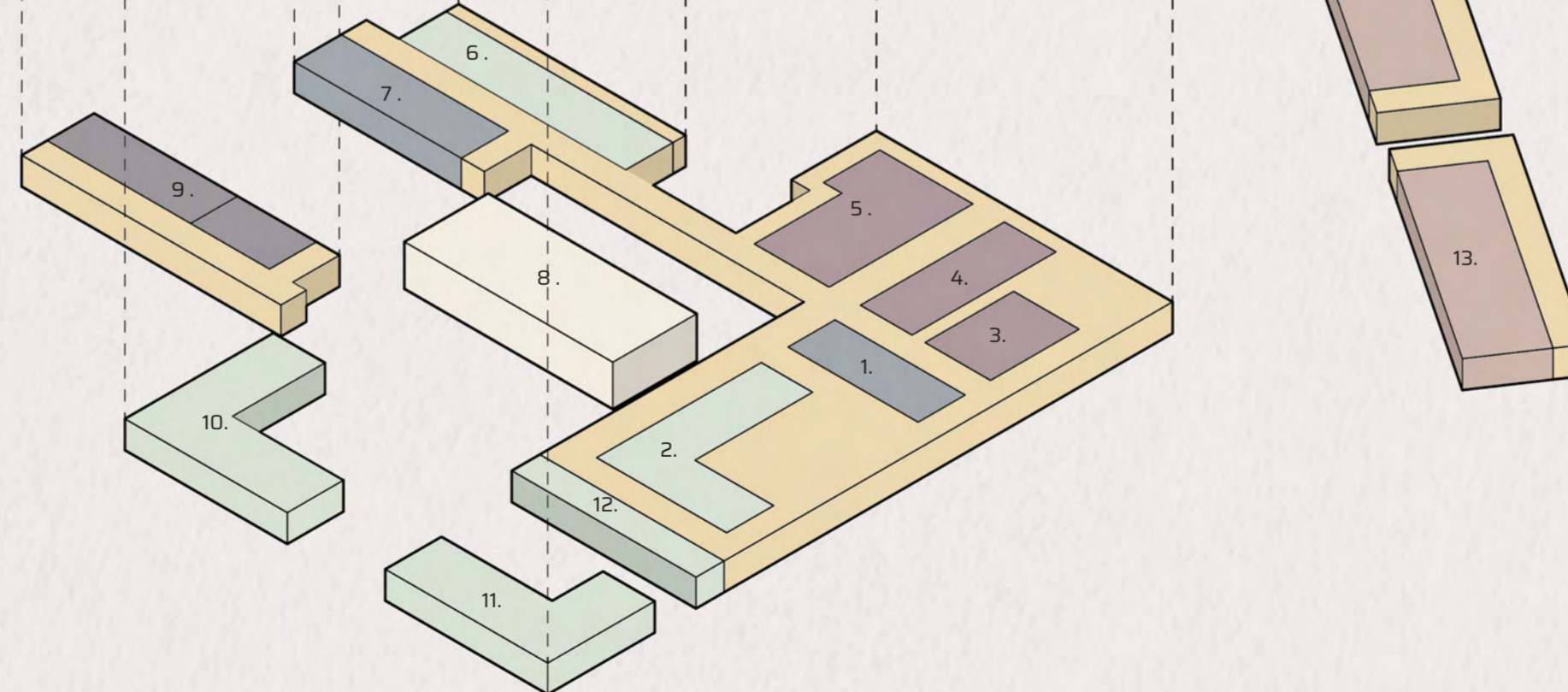
CIRCULATION



PROGRAMMES



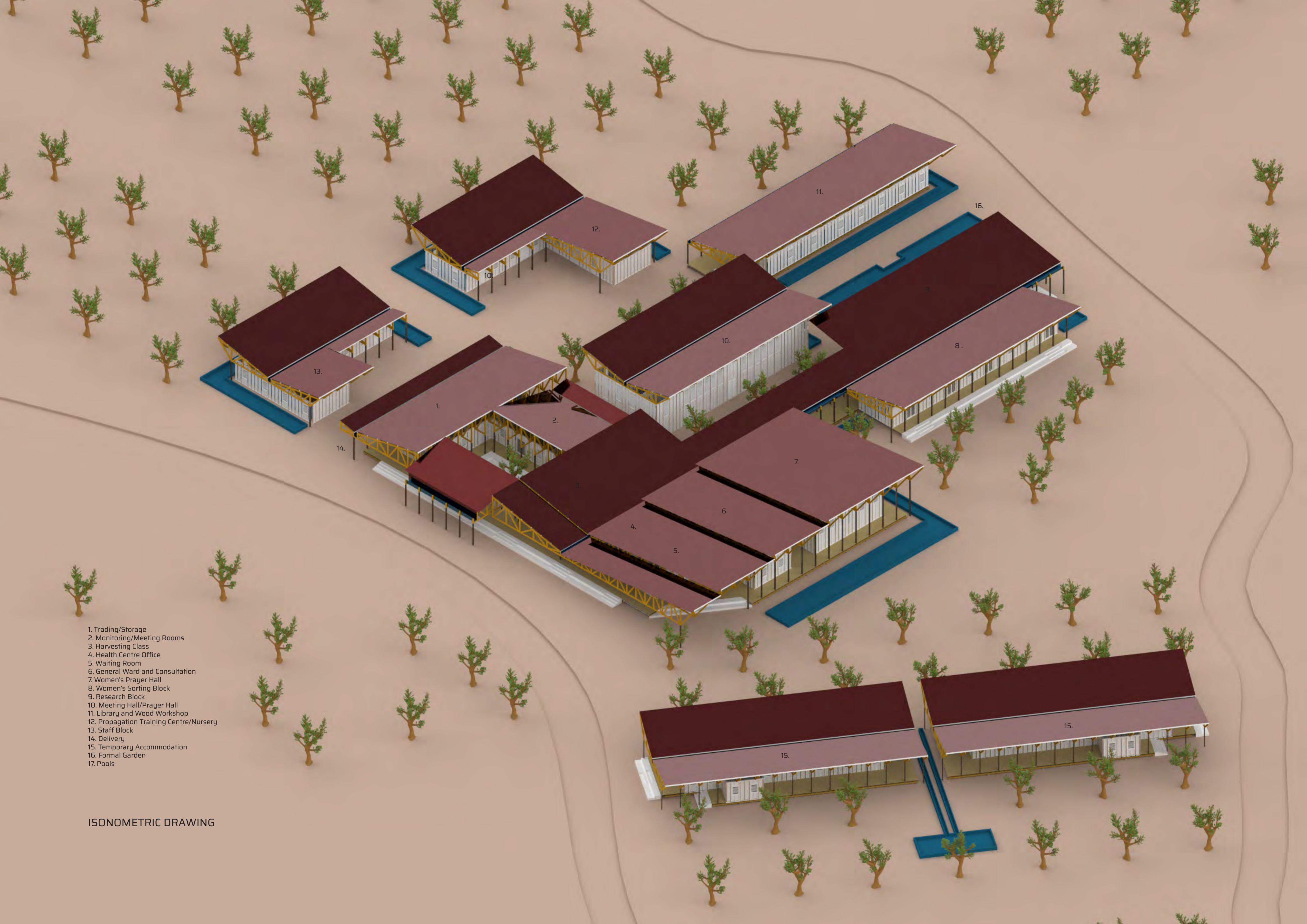
CIRCULATION AND PROGRAMMES



COLOUR KEY

- CIRCULATION
- HEALTH CENTRE
- RESEARCH
- FRANKINCENSE CENTRES
- MEETING HALL
- LIBRARY AND WOOD WORKSHOP

1. Harvesting Class
2. Monitoring/Trading/Storage/Meeting
3. Health Centre Office
4. Waiting Room
5. General Ward and Consultation
6. Women's Sorting Block
7. Research Block
8. Meeting Hall/Prayer Hall
9. Library and Wood Workshop
10. Propagation Training Centre/Nursery
11. Staff Block
12. Delivery
13. Temporary Accommodation



- 1. Trading/Storage
- 2. Monitoring/Meeting Rooms
- 3. Harvesting Class
- 4. Health Centre Office
- 5. Waiting Room
- 6. General Ward and Consultation
- 7. Women's Prayer Hall
- 8. Women's Sorting Block
- 9. Research Block
- 10. Meeting Hall/Prayer Hall
- 11. Library and Wood Workshop
- 12. Propagation Training Centre/Nursery
- 13. Staff Block
- 14. Delivery
- 15. Temporary Accommodation
- 16. Formal Garden
- 17. Pools

ISONOMETRIC DRAWING

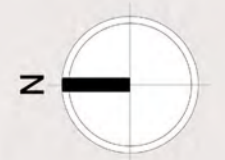
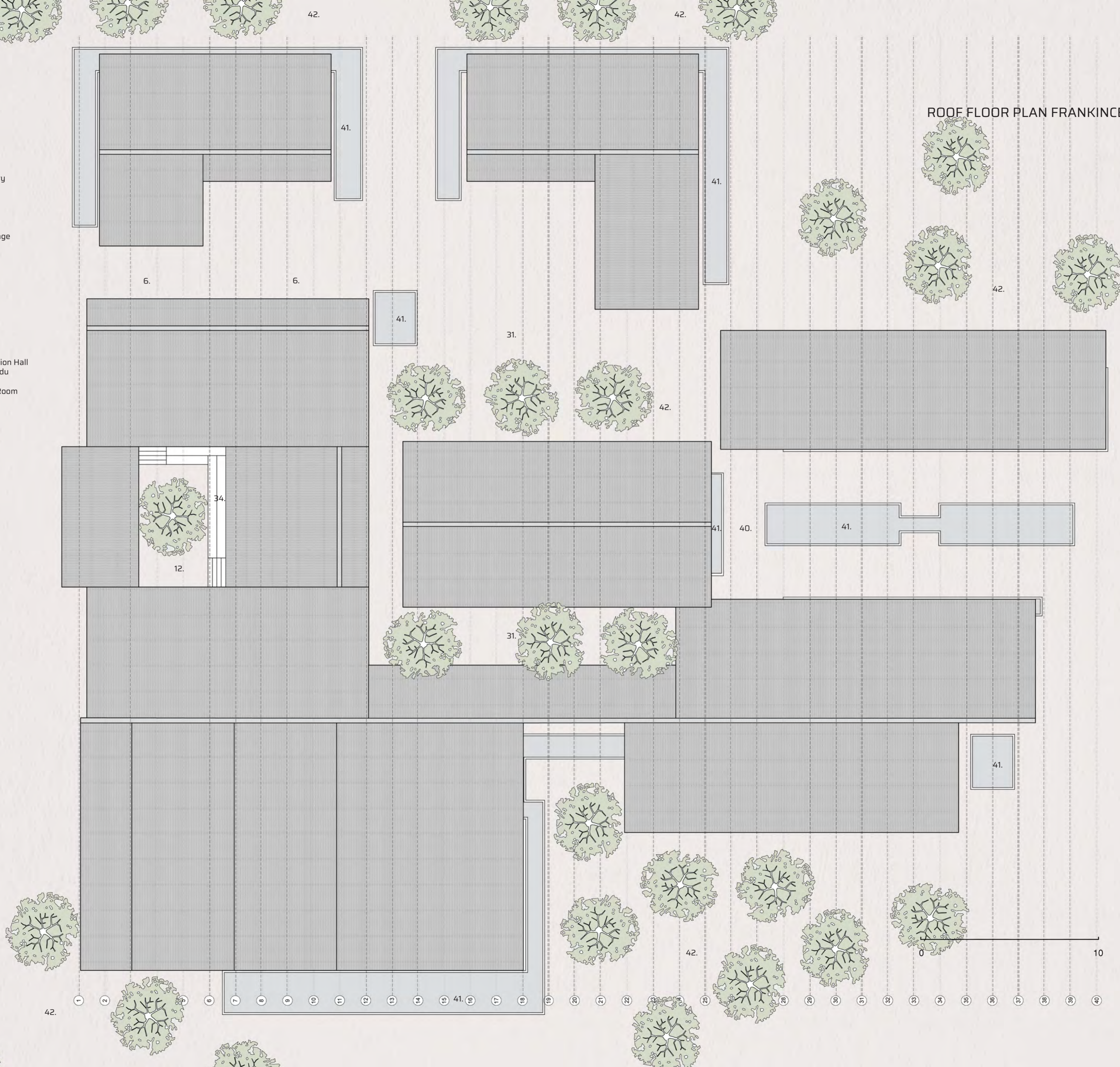
GROUND FLOOR PLAN FRANKINCENSE R.T.D.C

- 1. Staff Office
- 2. Break Room
- 3. Frankincense Plant Nursery
- 4. Propagation Training
- 5. Storage
- 6. Delivery Parking
- 7. Trading Reception
- 8. Meeting Roof for Trading
- 9. Frankincense Resins Storage
- 10. Monitoring Room
- 11. Meeting Room
- 12. Harvesting Training Area
- 13. Harvesting Class
- 14. Changing Room
- 15. Cleaning Storage
- 16. Staff Storage
- 17. Health Centre Staff Office
- 18. Health Centre Reception
- 19. Waiting Room/Space
- 20. Consultation Room
- 21. General Ward
- 22. Women's Prayer/Meditation Hall
- 23. Women's Absolution/Wudu
- 24. Women's Toilet
- 25. Solo Prayer/Meditation Room
- 26. Men's Absolution/Wudu
- 27. Men's Toilet
- 28. Boy's Absolution/Wudu
- 29. Boy's Toilet
- 30. Meeting Hall/Prayer Hall
- 31. Courtyard
- 32. Corridor
- 33. Women's Sorting Room
- 34. Outdoor Seating Space
- 35. Research Room
- 36. Research Laboratory
- 37. Library
- 38. Computer Room
- 39. Wood Workshop
- 40. Formal Garden
- 41. Pools
- 42. Frankincense Trees

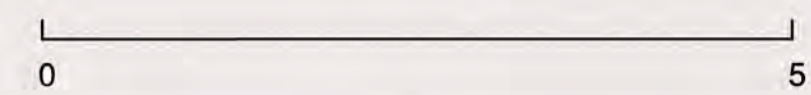


ROOF FLOOR PLAN FRANKINCENSE R.T.D.C.

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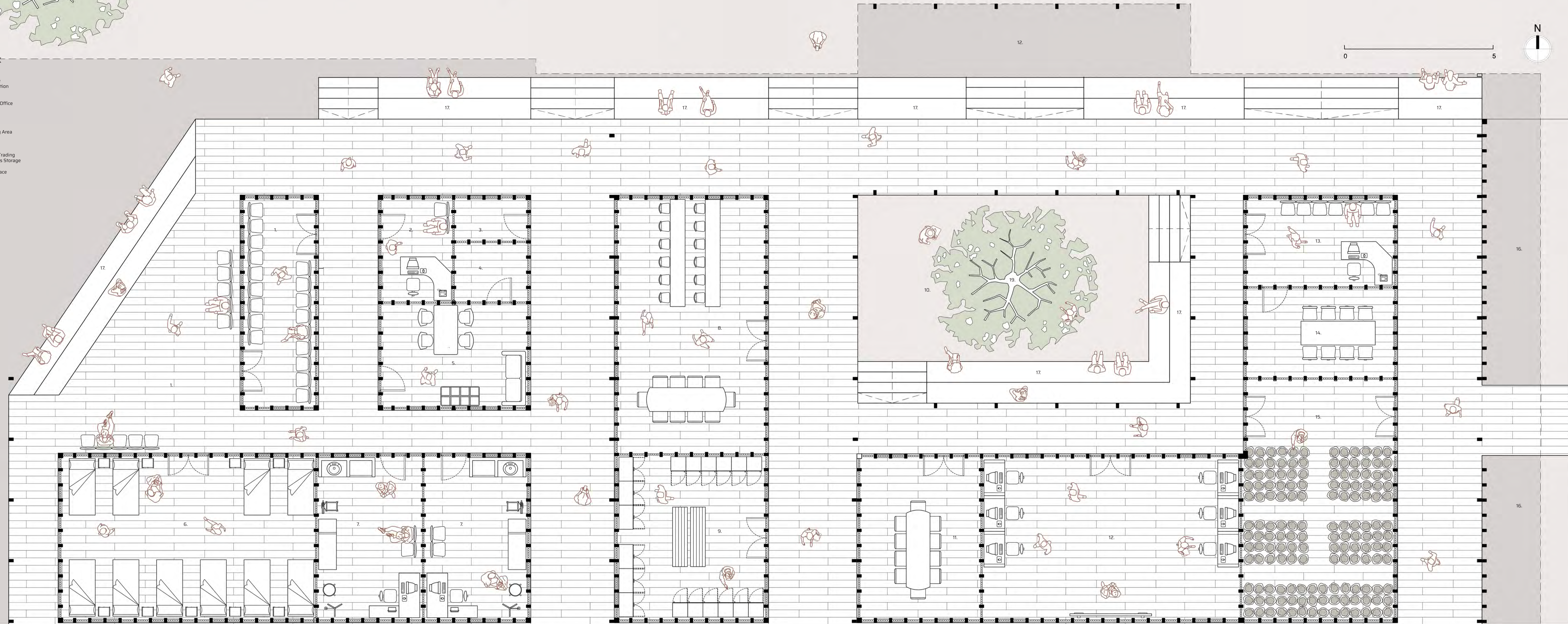


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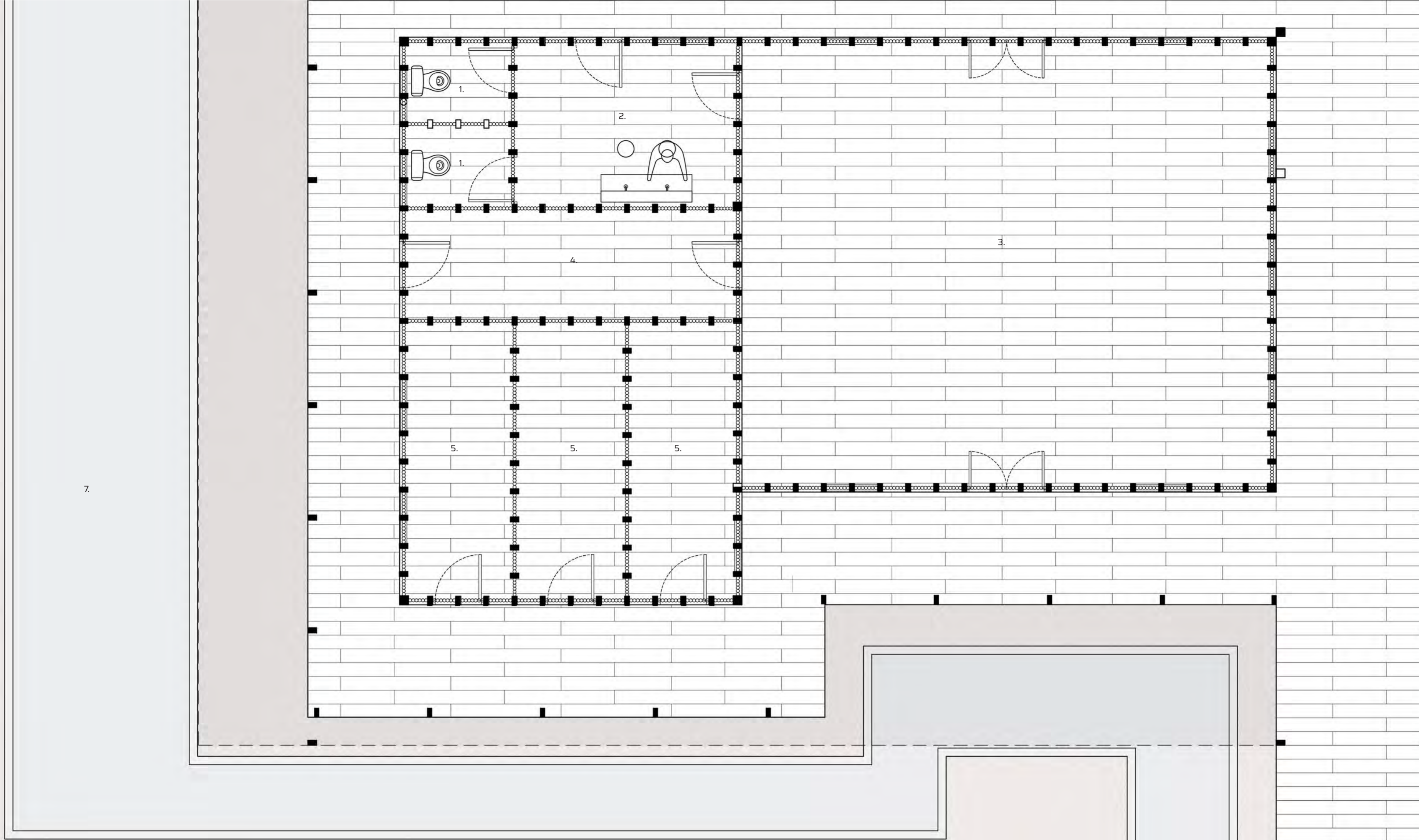
NORTH BLOCK

- 1. Waiting Room/Space
- 2. Health Centre Reception
- 3. Cleaning Storage
- 4. Staff Storage
- 5. Health Centre Staff Office
- 6. General Ward
- 7. Consultation Room
- 8. Harvesting Class
- 9. Changing Room
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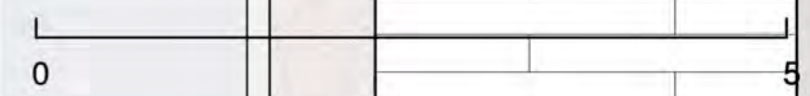
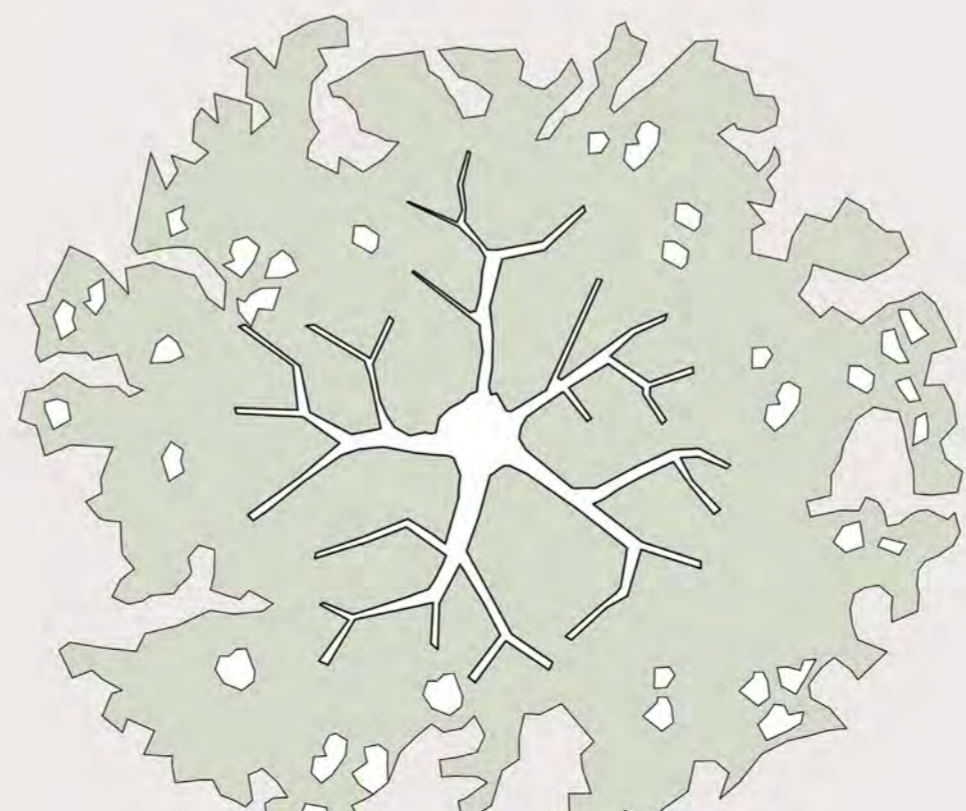
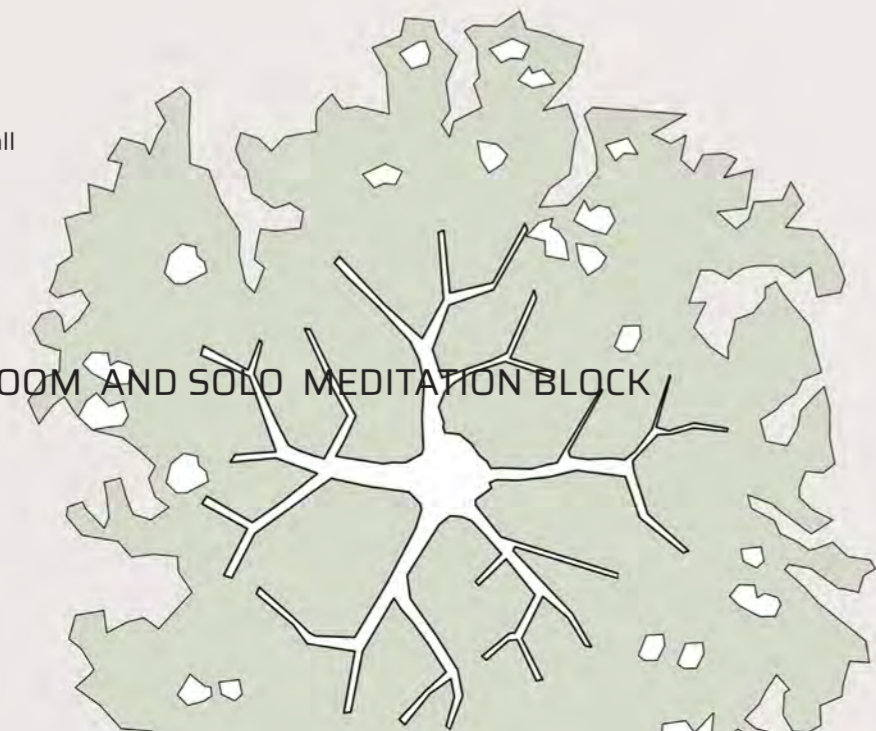
HARVESTING TRAINING AREA





- 1. Women's Toilet
- 2. Women's Absolution/Wudu
- 3. Women's Prayer/Meditation Hall
- 4. Storage
- 5. Solo Prayer/Meditation Room
- 6. Corridor
- 7. Pools
- 8. Frankincense Trees

WOMEN'S PRAYER ROOM AND SOLO MEDITATION BLOCK

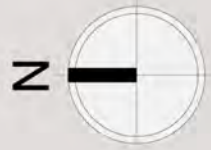
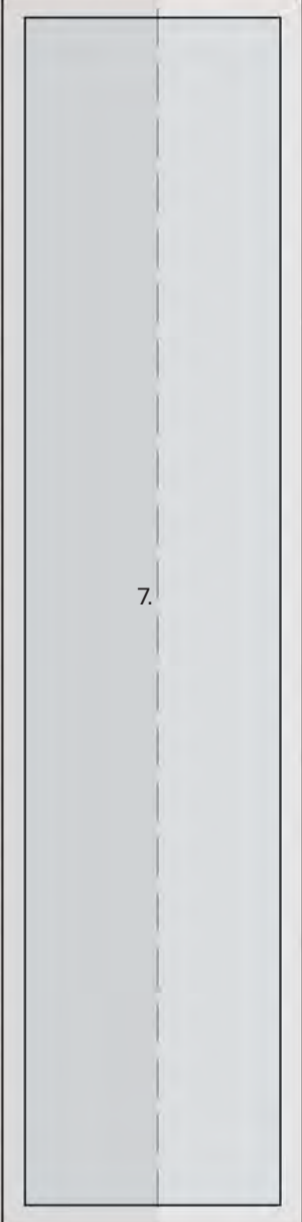
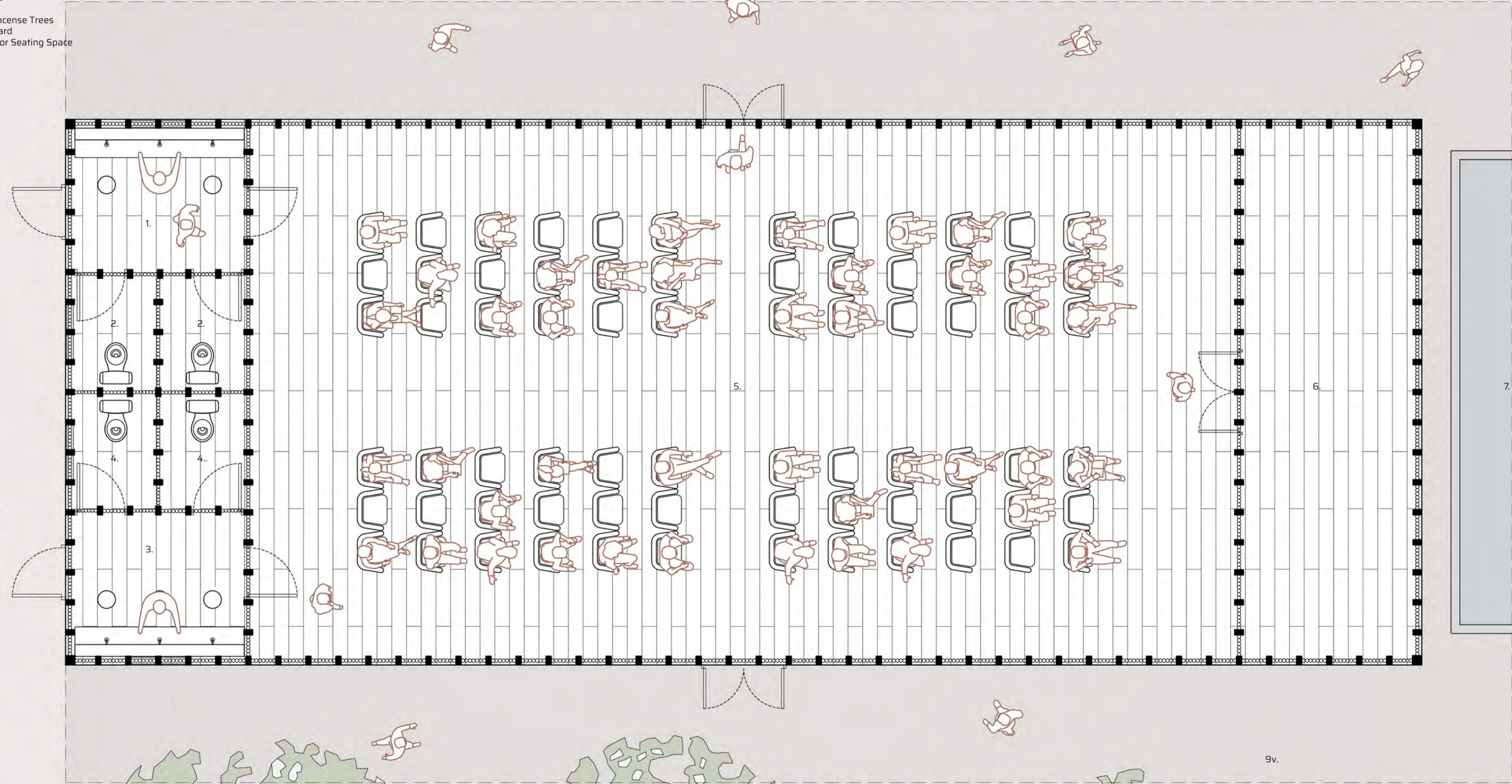


THRESHOLD SPACE



MEETING HALL/PRAYER

- 1. Men's Absolution/Wudu
- 2. Men's Toilet
- 3. Boy's Absolution/Wudu
- 4. Boy's Toilet
- 5. Meeting Hall/Prayer Hall
- 6. Storage
- 7. Pools
- 8. Frankincense Trees
- 9. Courtyard
- 10. Outdoor Seating Space

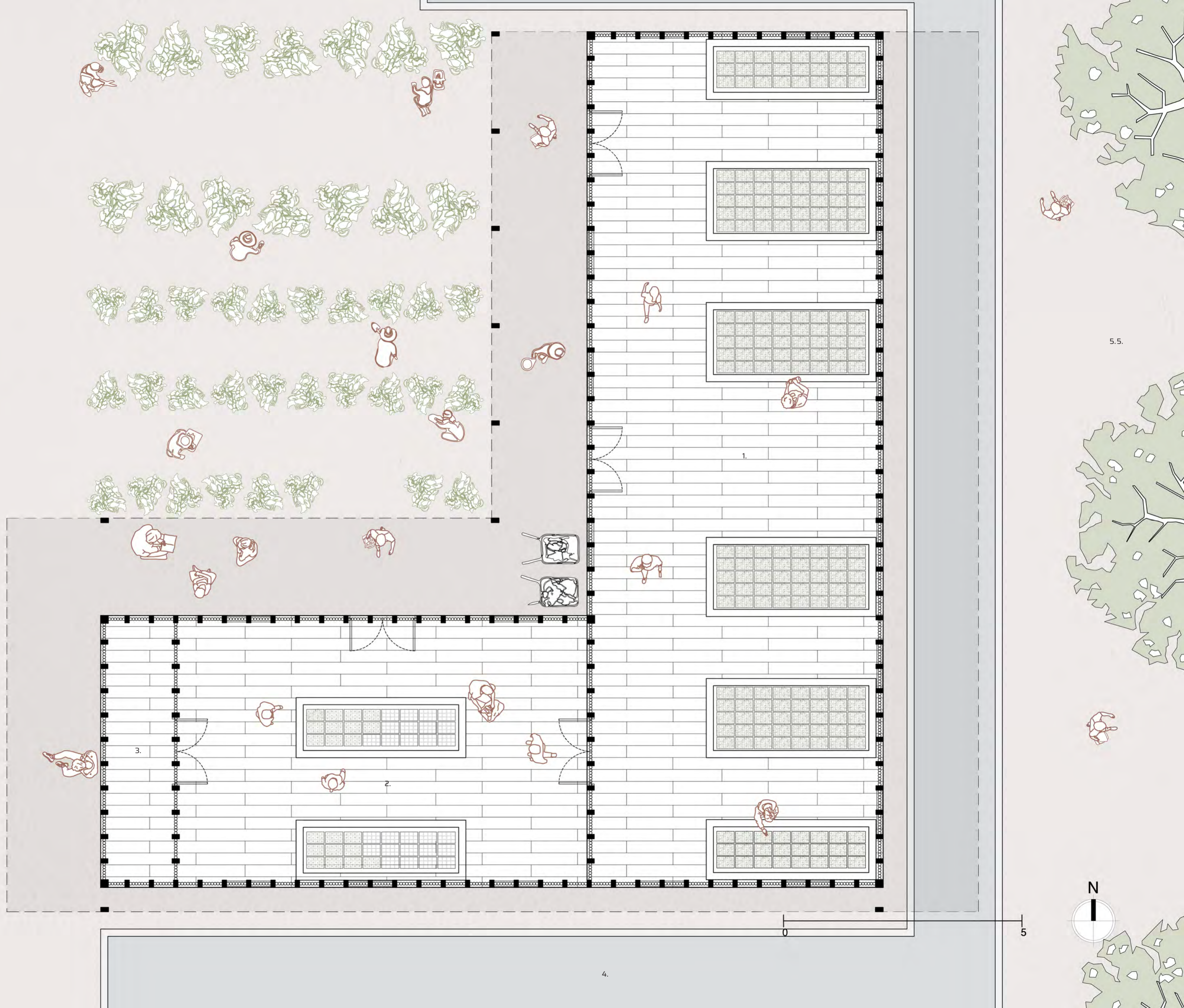


MEETING HALL/ PRAYER HALL



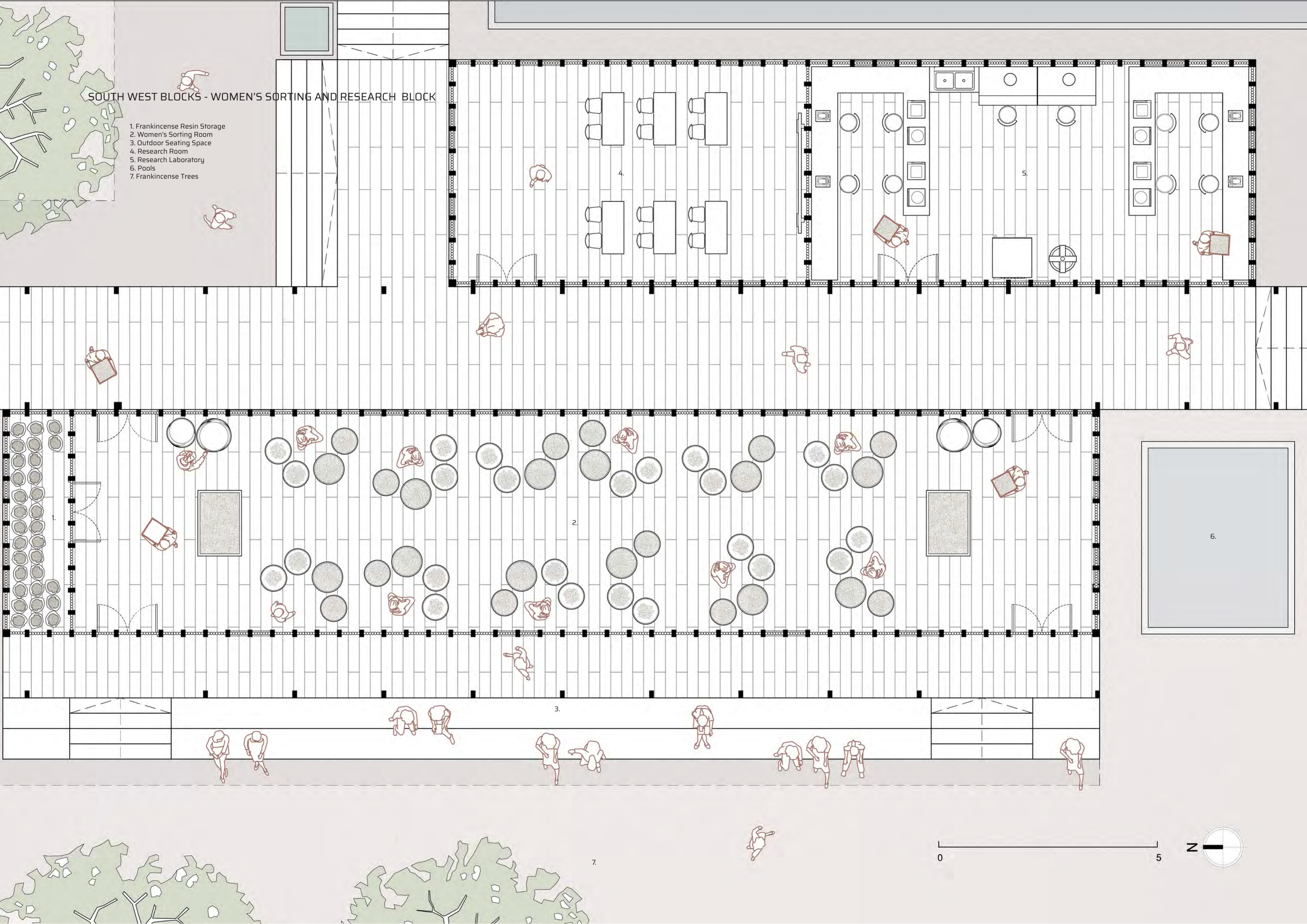
PROPAGATION CENTRE

- 1. Frankincense Plant Nursery
- 2. Propagation Training
- 3. Storage
- 4. Pools
- 5. Frankincense Trees
- 6. Courtyard



SOUTH WEST BLOCKS - WOMEN'S SORTING AND RESEARCH BLOCK

- 1. Frankincense Resin Storage
- 2. Women's Sorting Room
- 3. Outdoor Seating Space
- 4. Research Room
- 5. Research Laboratory
- 6. Pools
- 7. Frankincense Trees

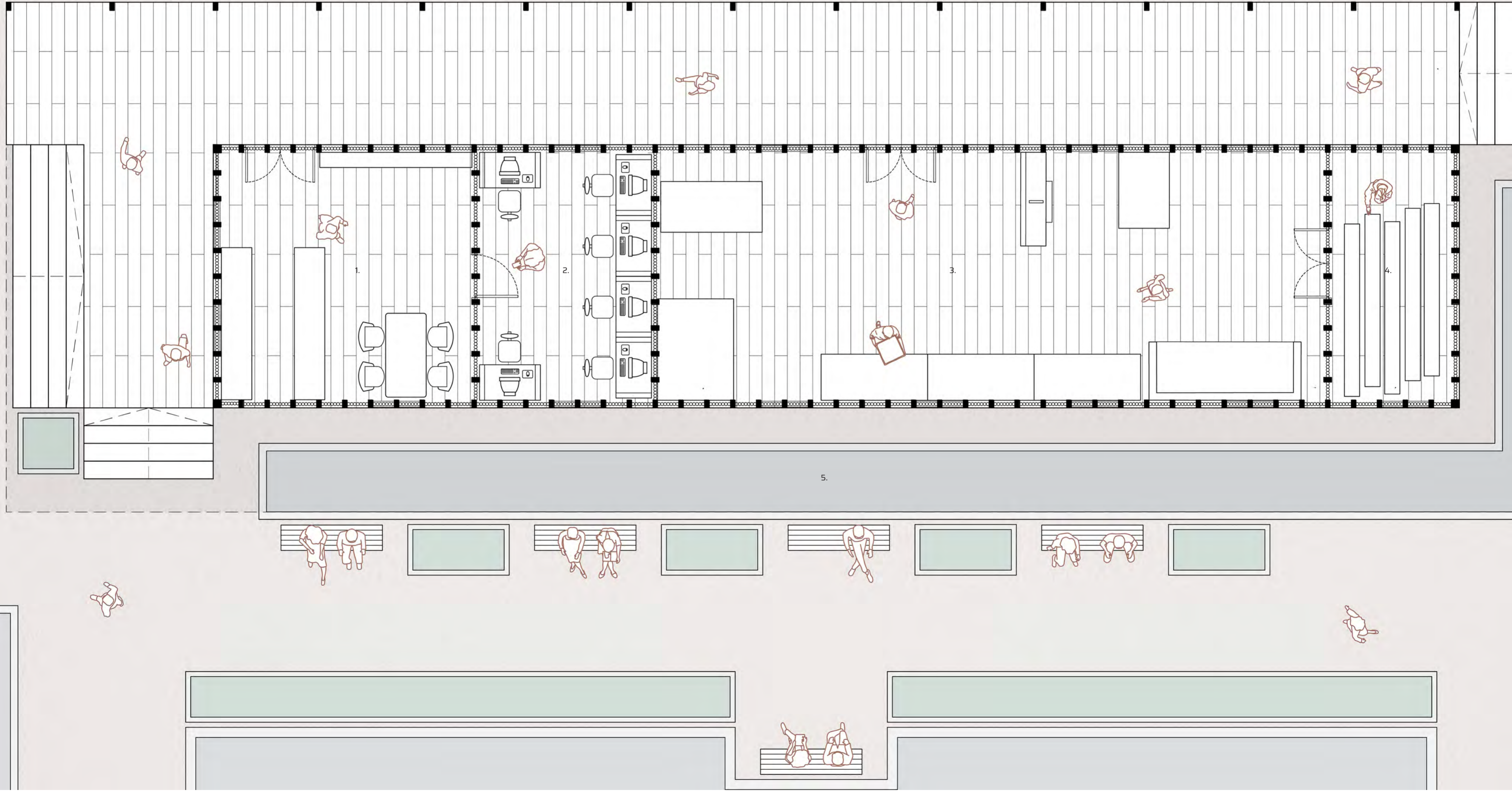
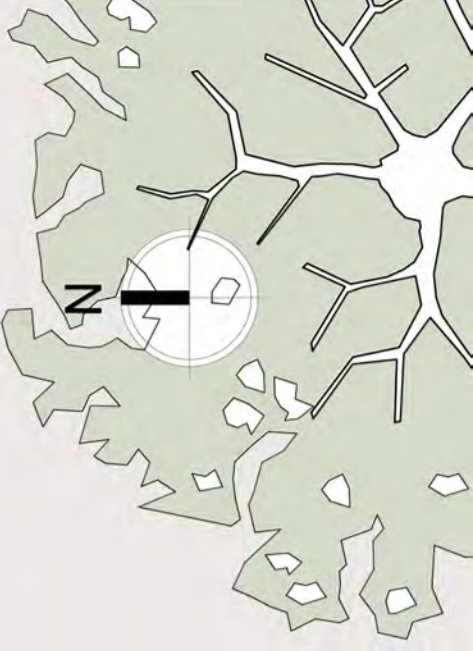
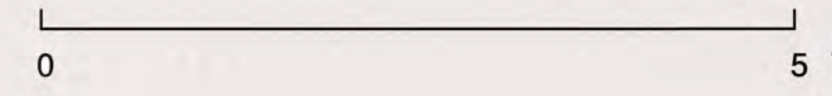
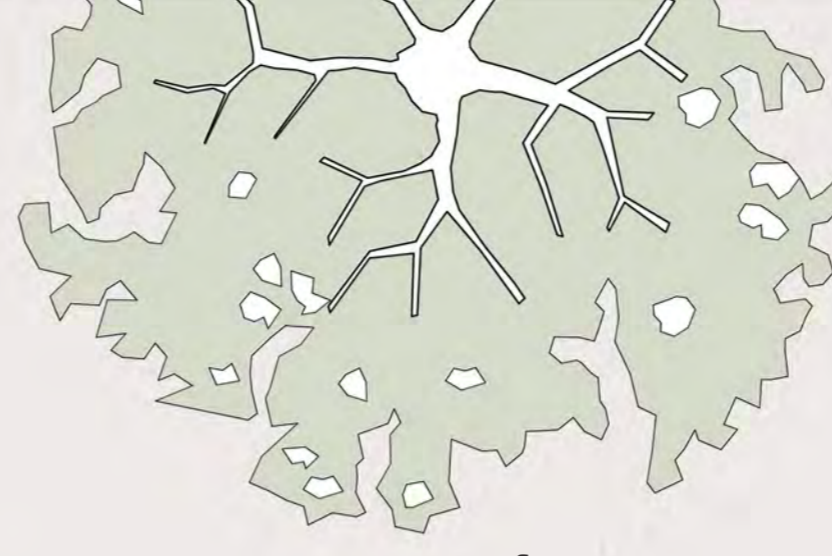


WOMEN'S SORTING BLOCK

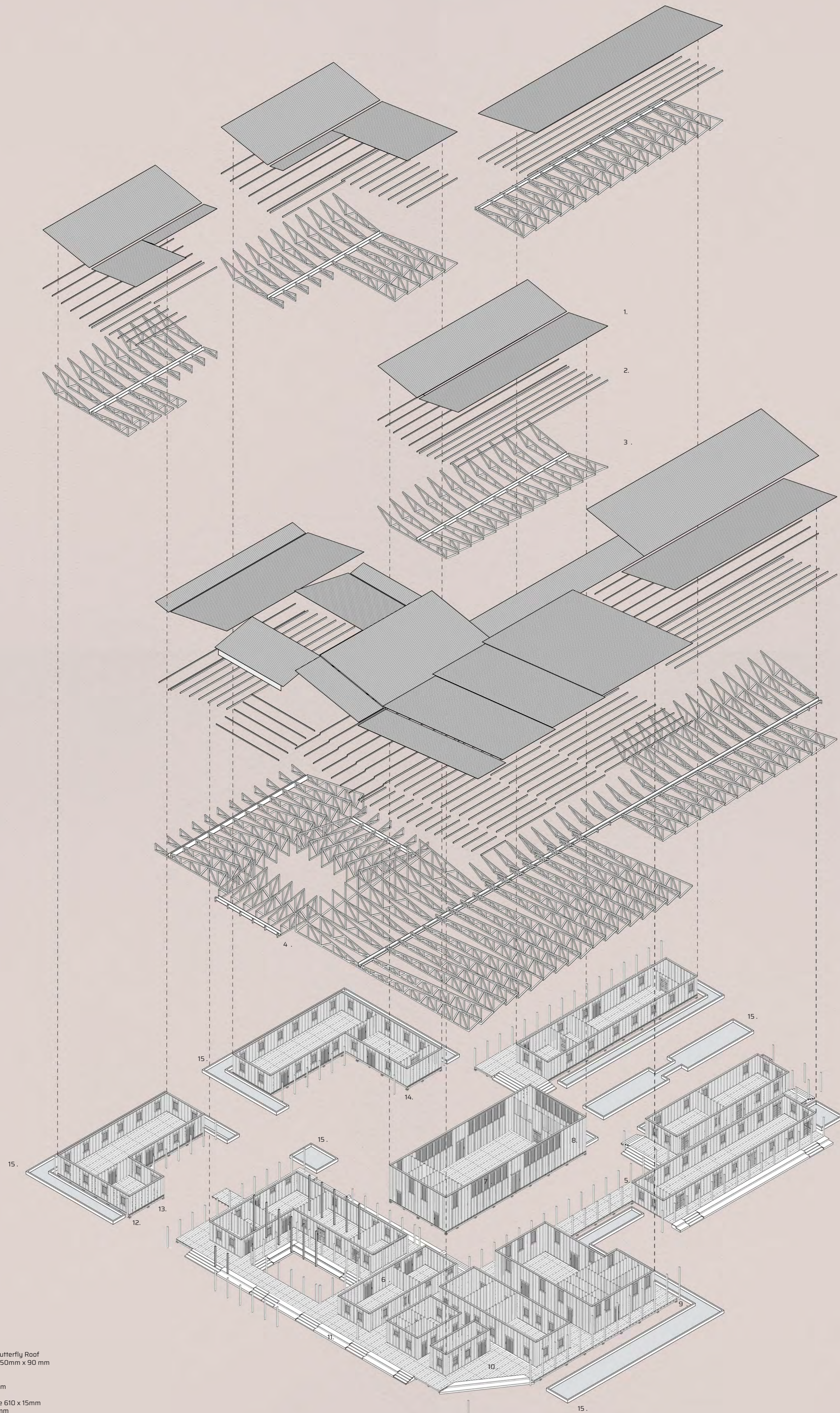


SOUTH EAST BLOCK - PUBLIC LIBRARY AND WOOD WORKSHOP

- 1. Library
- 2. Computer Room
- 3. Wood Workshop
- 4. Storage
- 5. Pools
- 6. Frankincense Trees

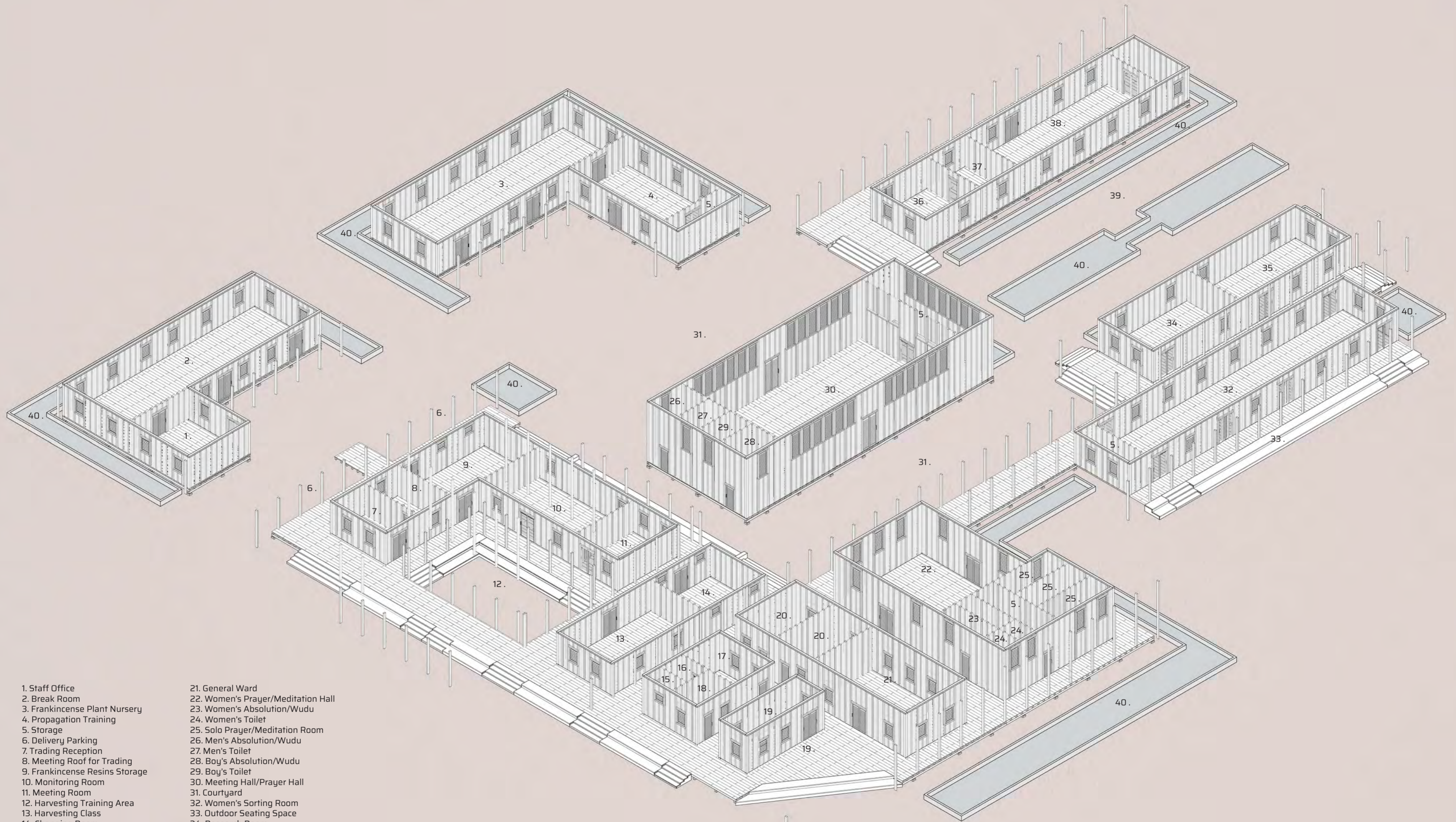


EXPLODED AXONOMETRIC - FRANKINCENSE RESEARCH, TRADE AND DEVELOPMENT CENTRE



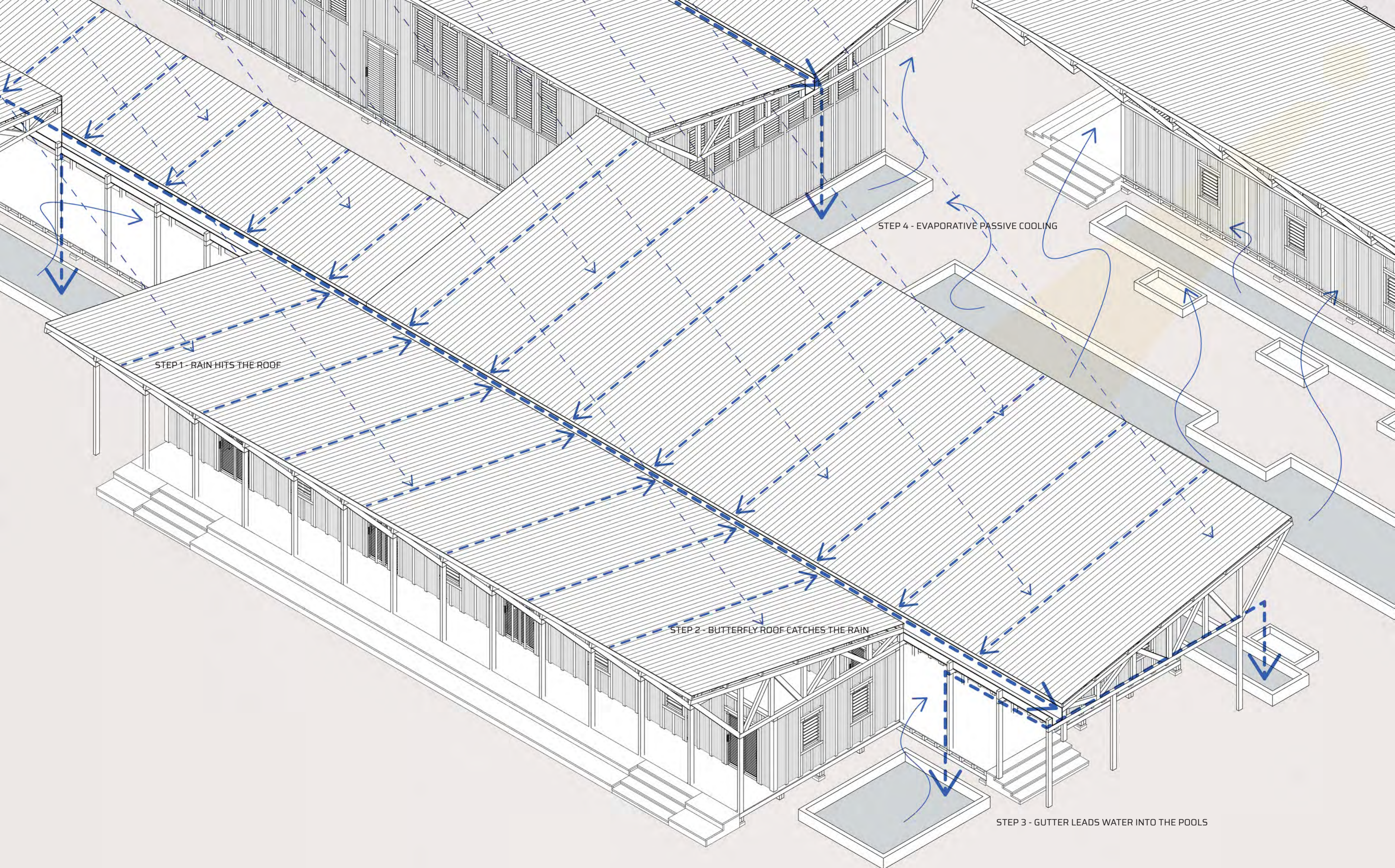
1. Corrugated Metal Sheet 0.5mm Butterfly Roof
2. Palm Wood (Dactylifera) Rafters 150mm x 90 mm
3. Palm Wood Trusses 150 x 50mm
4. Metal Sheet Gutters 0.5mm
5. Top Plates Palm Wood 150 x 50mm
6. Palm Wood Studs 150 x 50mm
7. Recycled Palm Wood Louvre Blade 610 x 15mm
8. Timber Screen Skin Diameter 60mm
9. Bottom Plates Palm Wood 150 x 50mm
10. Decking Acacia Nitroica 25mm
11. Palm Wood Slats 50mm Thickness
12. Joists 155mm x 90mm
13. Bearer 155mm x 180mm
14. Shlts - Local Masonry 250mm x 250mm
15. Rainwater Pools - Mudbrick 150mm Thick

AXONOMETRIC - FRANKINCENSE RESEARCH, TRADE AND DEVELOPMENT CENTRE



- 1. Staff Office
- 2. Break Room
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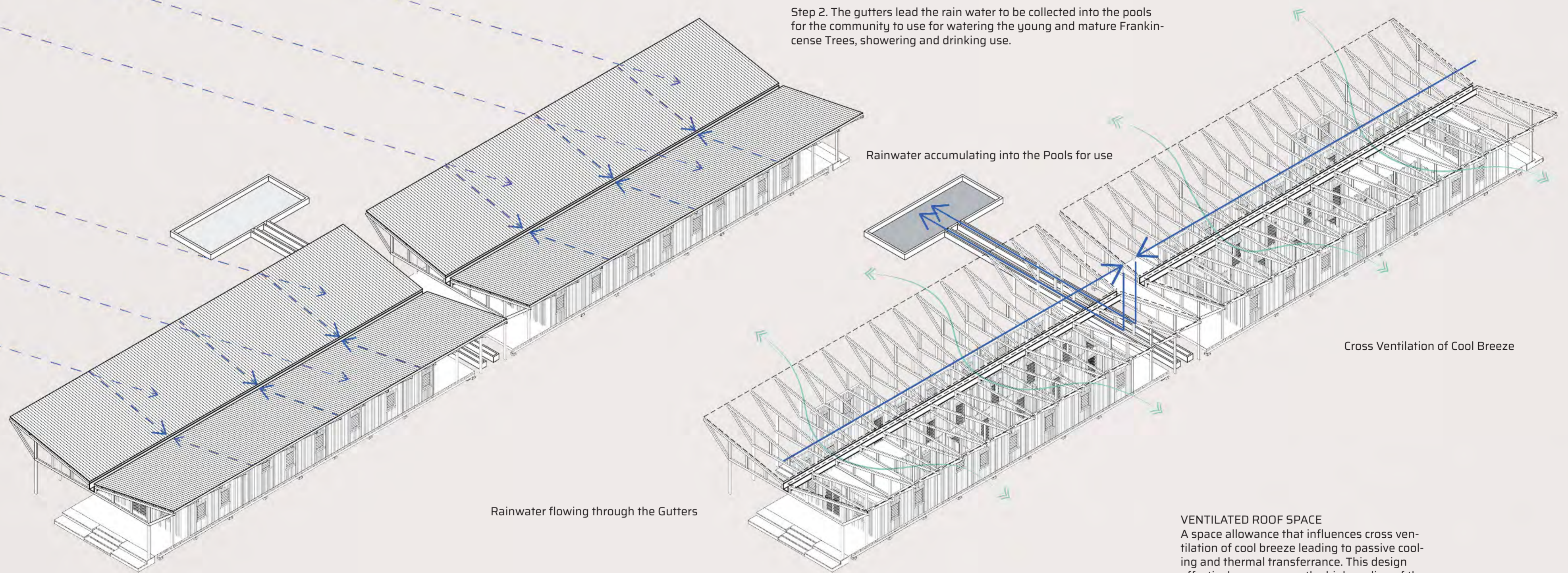


RAINWATER HARVESTING PROCESS - SOUTH WEST BLOCK

ROOF WATER HARVESTING BUTTERFLY ROOF STRUCTURE - TEMPORARY ACCOMMODATION

Step 1. It rains and the butterfly roof collects the water in the centre

Step 2. The gutters lead the rain water to be collected into the pools for the community to use for watering the young and mature Frankincense Trees, showering and drinking use.



Rainwater accumulating into the Pools for use

Rainwater flowing through the Gutters

Cross Ventilation of Cool Breeze

BUTTERFLY ROOF

A butterfly roof is designed to collect water in the centre line of a building. The water collected can then be used in a variety of ways such as: watering plants, showering, or even for drinking use after being purified.

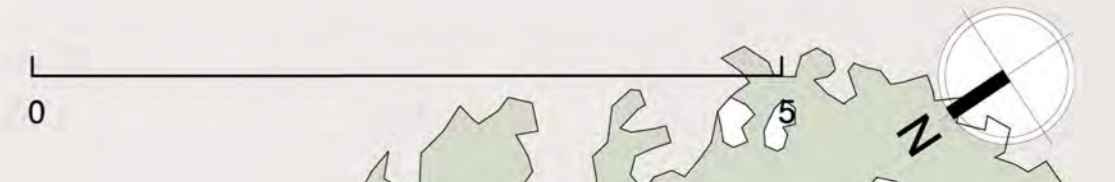
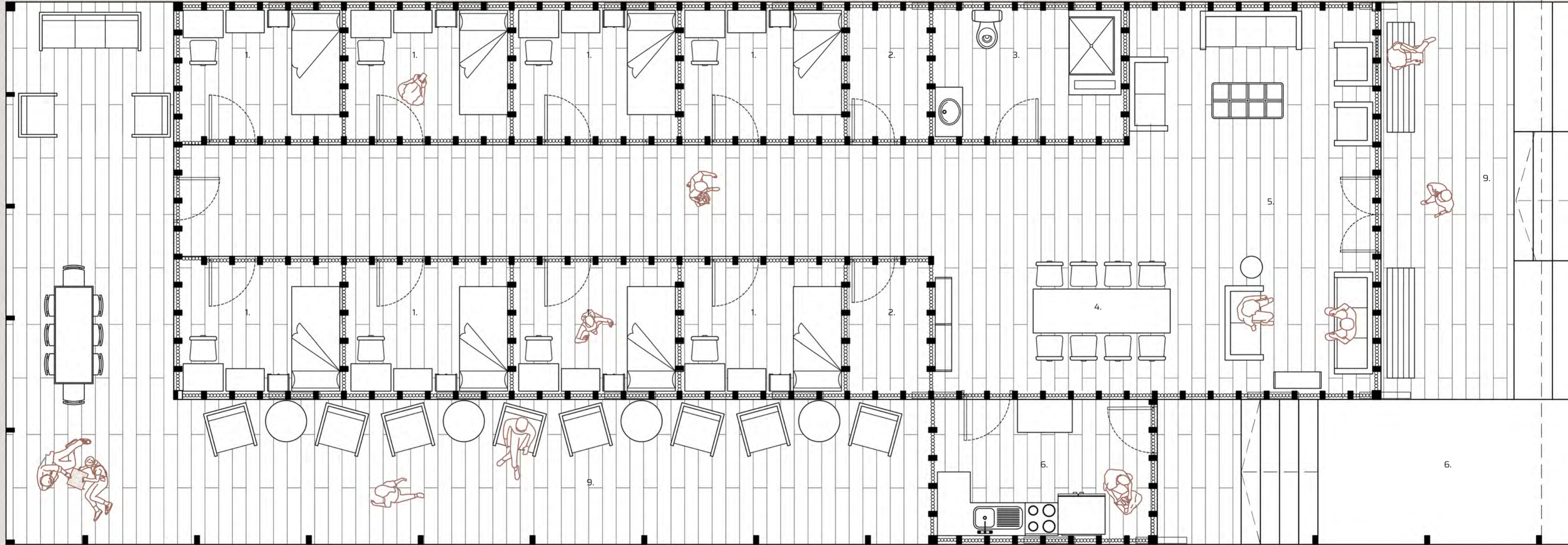
In addition to this due to their aerodynamic structure, butterfly roofs can resist wind damage from heavy storms and coastal winds. The design of the roof also means fewer repairs and maintenance, cutting down on costs in the long run.

VENTILATED ROOF SPACE

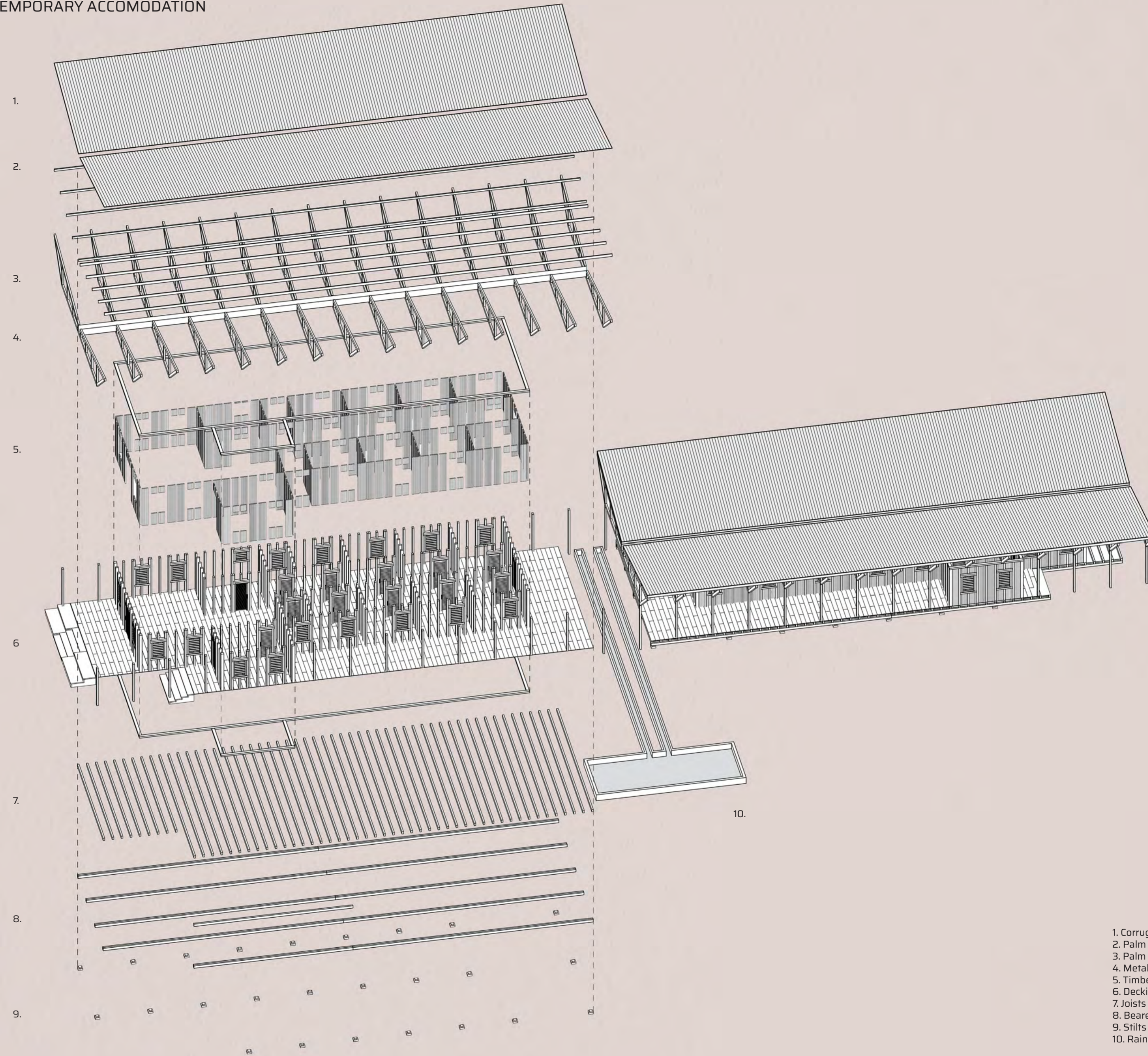
A space allowance that influences cross ventilation of cool breeze leading to passive cooling and thermal transference. This design effectively encourages the high cooling of the building and the users in the most economically and environmentally friendly method.

TEMPORARY ACCOMODATION

- 1. Bedroom
- 2. Storage
- 3. Toilet
- 4. Dining Table
- 5. Living Room
- 6. Kitchen/Outdoor Kitchen
- 7. Pools
- 8. Frankincense Trees
- 9. Terrace

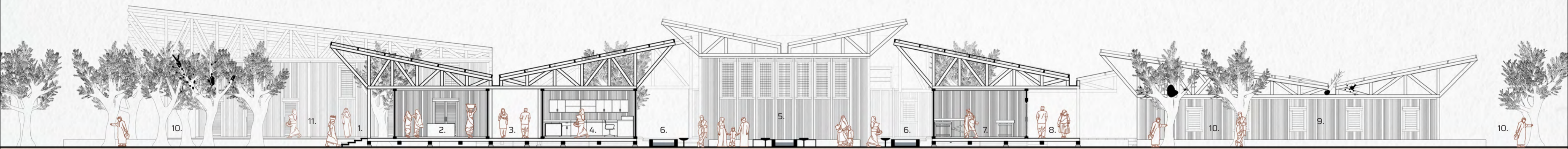


EXPLODED AXONOMETRIC OF TEMPORARY ACCOMODATION



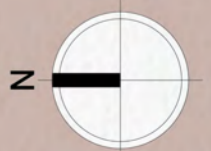
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- 7. Joists 155mm x 90mm
- 8. Bearer 155mm x 180mm
- 9. Stilts - Local Masonry 250mm x 250mm
- 10. Rain Water Ponds

LONGITUDINAL SECTION

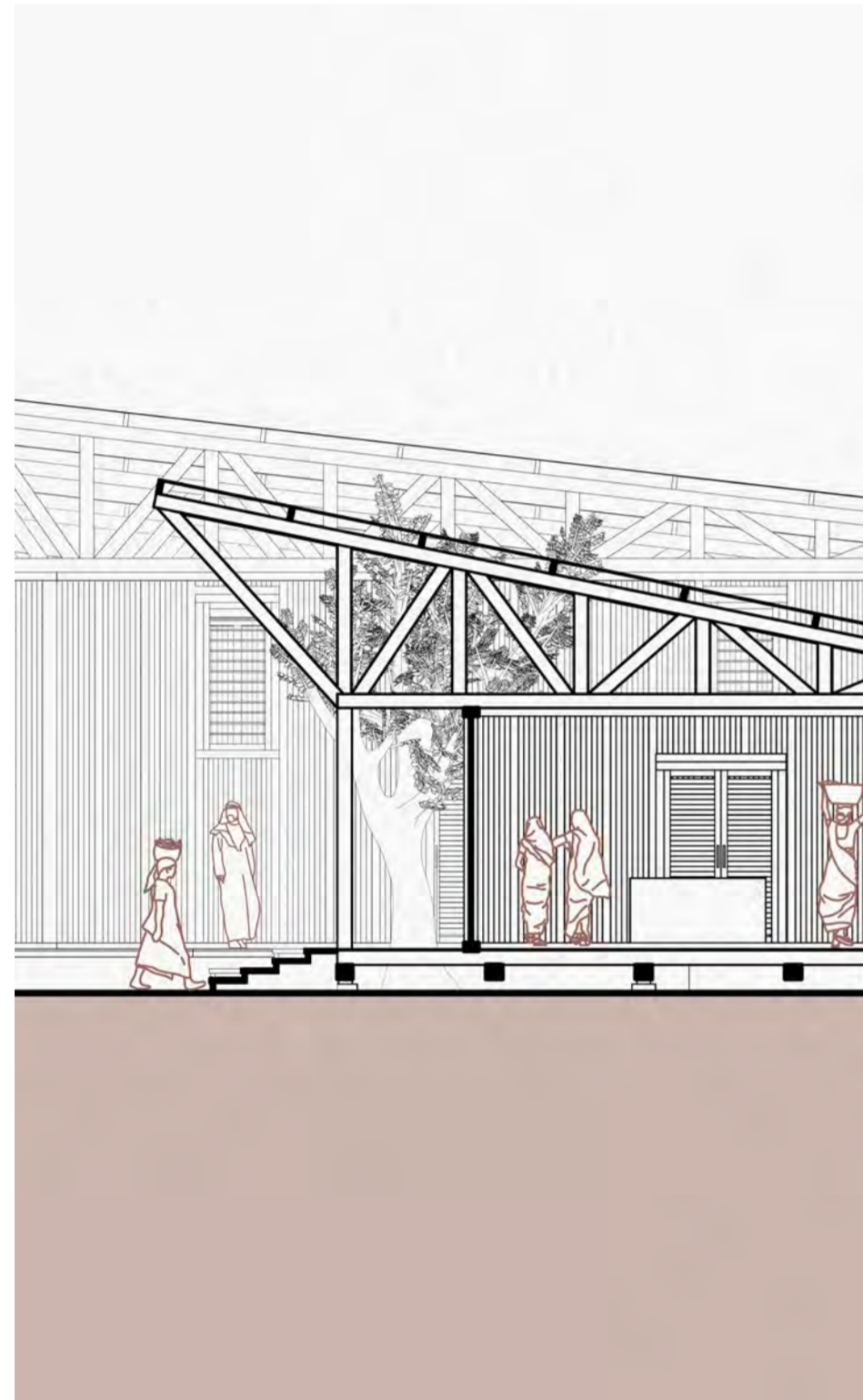


1. Seating Area for the Women Sorting the Resins
2. Women's Sorting Block
3. Main Long Corridor connecting to the North Blocks
4. Research Block
5. Formal Garden
6. Pools
7. Wood Workshop
8. Corridor
9. Propagation Centre
10. Frankincense Trees
11. Women's Prayer Hall

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LONGITUDINAL SECTION - KEY DESIGN COMPONENTS



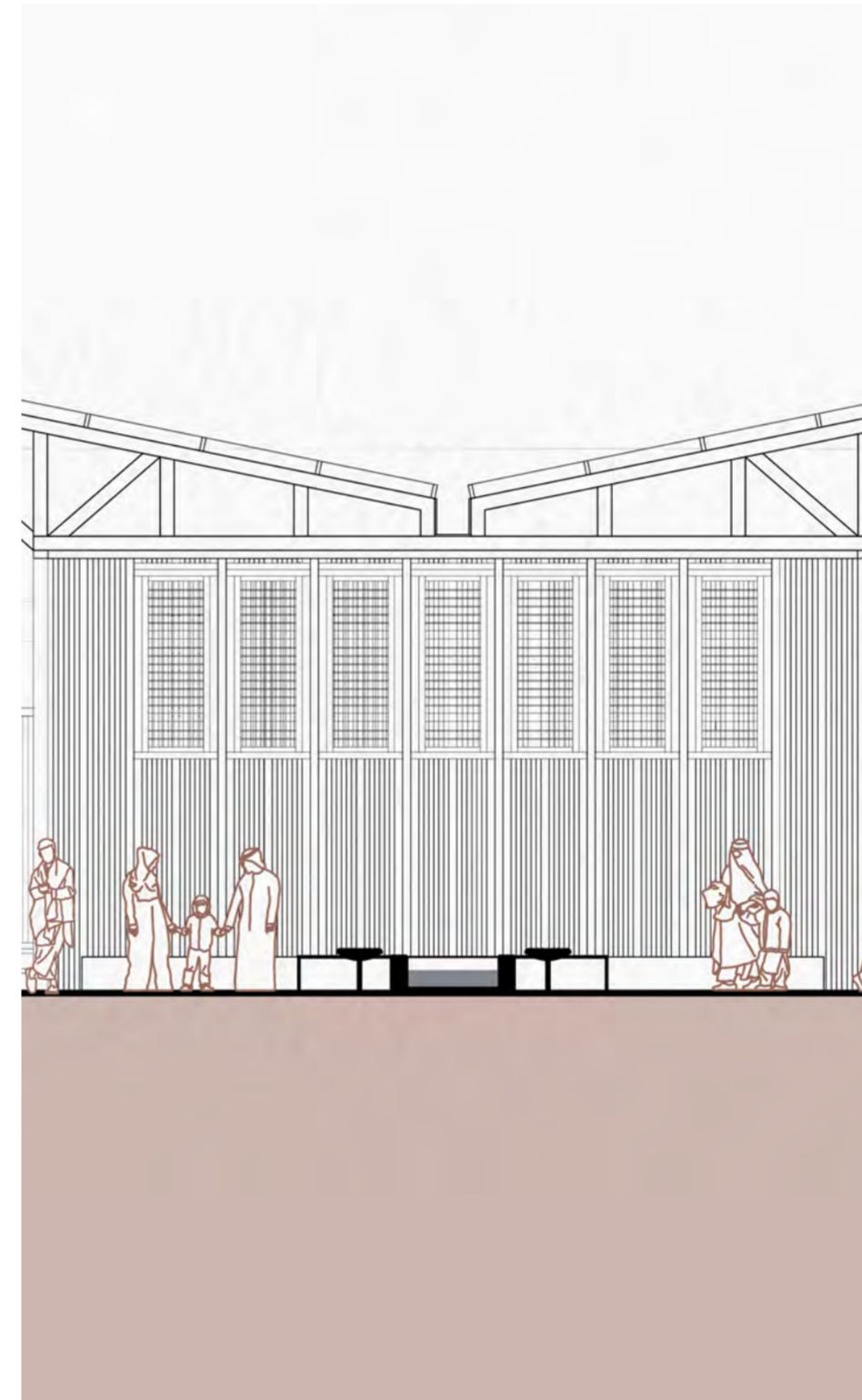
1. Circulation and Opportunities of Seating on the Outside

All hallways in the Frankincense R.D.T.C are located along the building's exterior so that users and staff can move throughout the building in open-air, allowing fresh air and beautiful views of the landscape which encourages people to be more comfortable, happier and healthier. This is also an architectural solution of creating a threshold for the community and nature to connect. In addition to this, along with the whole building, there are opportunities for seating outside so that people can relax and appreciate nature whilst getting fresh air. Seating outside also provides the opportunity for the community to sit to cool down from the hot climate from the North winds cooling the users whilst being protected from the sun with the overhanging roofs providing shade.



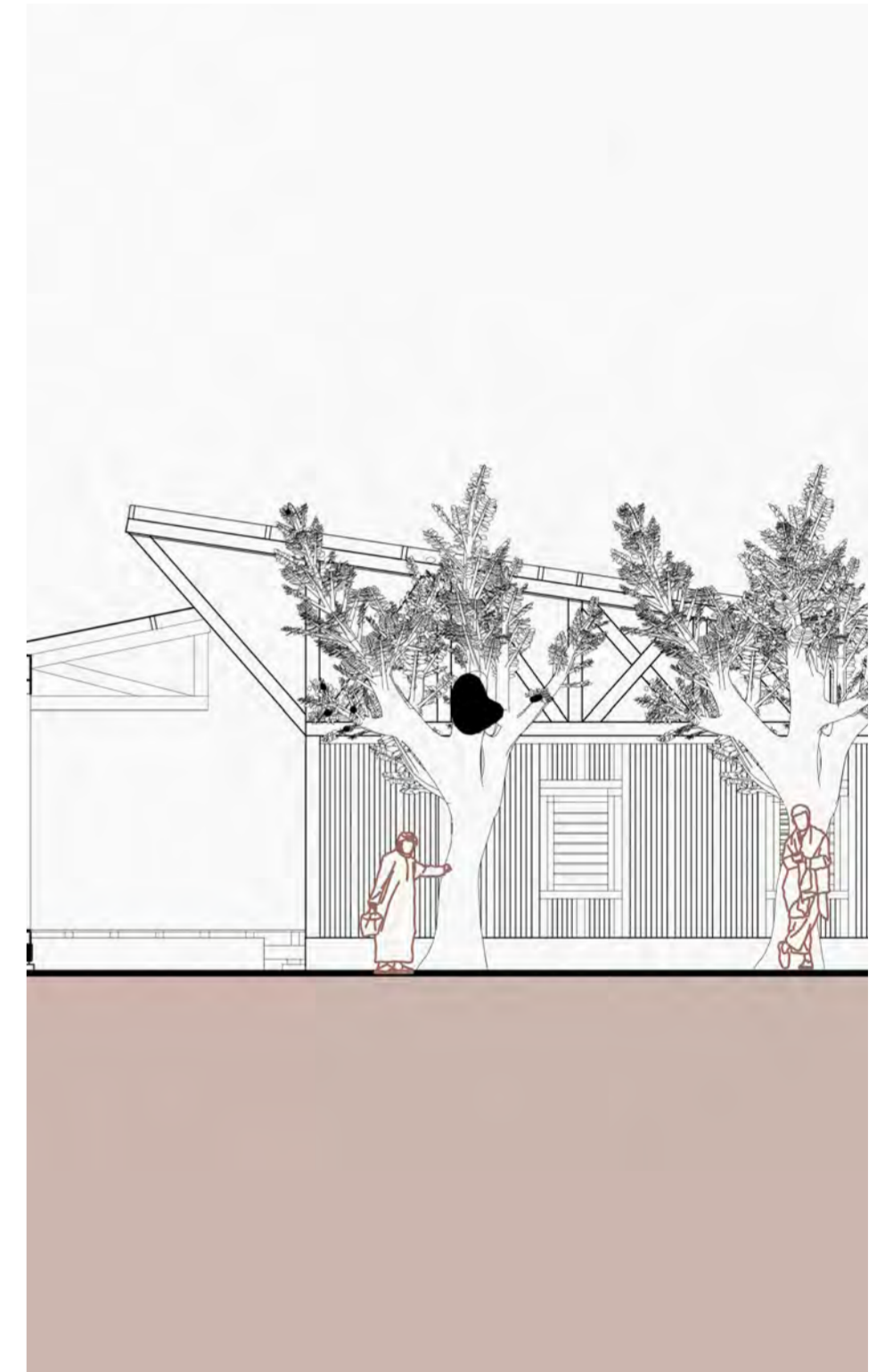
2. Butterfly Roofs

The overhanging butterfly roof acts as a rainwater catchment facility and provides shading for the users from the high sun all year round. The rainwater that is collected into the pools is for the community to use for watering the young and mature Frankincense Trees, showering and drinking use.



3. Formal Garden and Rainwater Pools

The community can enjoy and relax in the Formal Garden with local plants and collected rainwater to appreciate nature and give respect to the importance of the environment and the importance of having a symbiotic relationship with nature so that both can thrive. The community needs water and Frankincense to survive and for livelihood. The formal garden is designed in symmetry like traditional Islamic gardens.



4. Frankincense Trees in Vicinity of the Buildings for Harvesting

As Frankincense trees are the primary livelihood of the community, they have been carefully considered when designing. They are in the perimeter of the Frankincense R.D.T.C. to showcase the natural heritage of these trees being the world's oldest commercial commodities. With the Frankincense trees close by, the harvesters would not have to travel far to harvest the resins to then later trade.

NORTH WEST ELEVATION

