

Design Concept: Inside and Outside

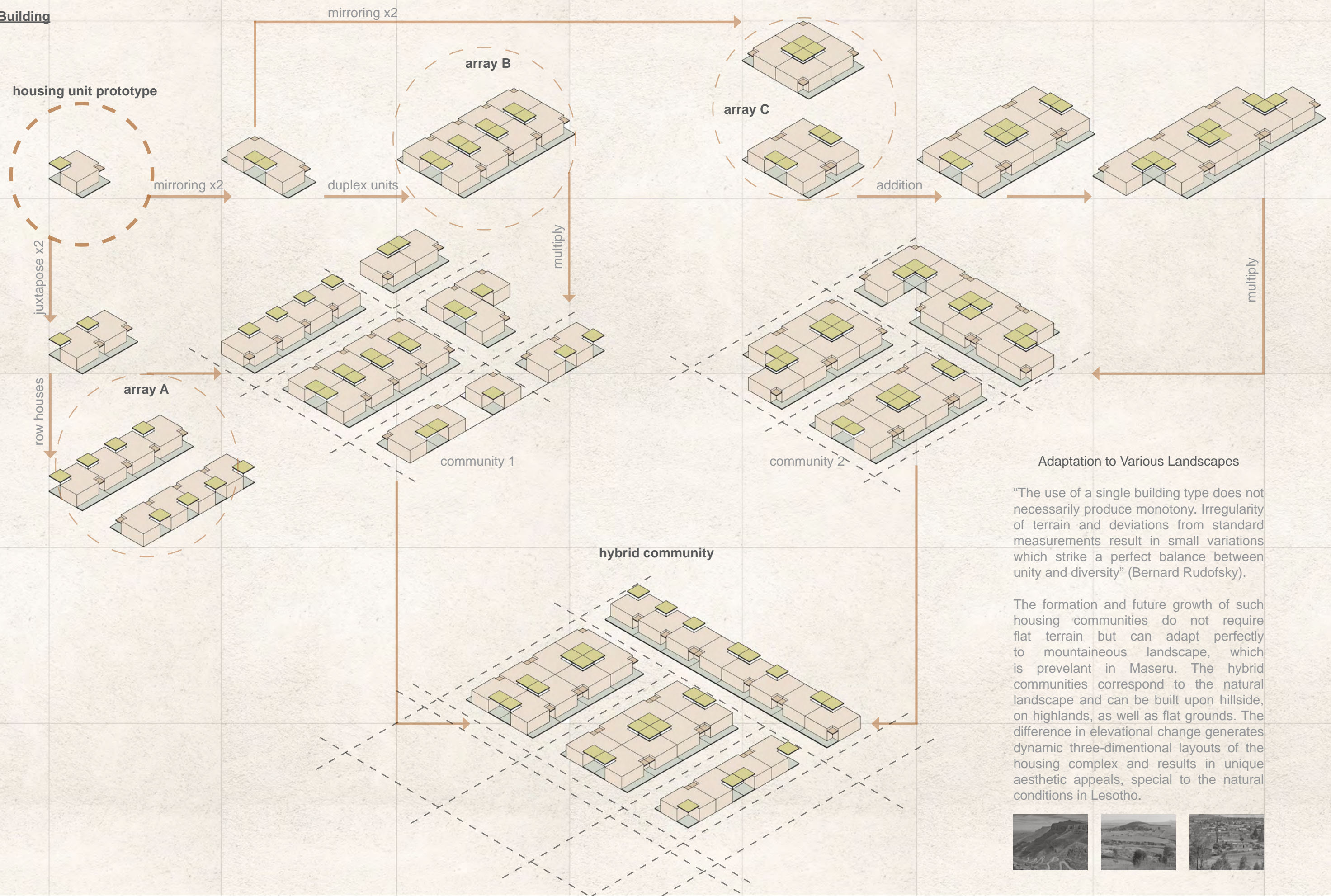
The “inside” and the “outside” exhibits an interactive relationship in this project in Maseru. A “house” is not only an enclosed shelter but a means of communication between each family and nature. Quality of life is enhanced by private green space that is personalized and enjoyed by each family unit: courtyard and front porch offer each family member a place to relax, recreate, and cultivate a garden. The green spaces could also be potential small-scale farms for the family and community to cultivate food for self-sustainability. These courtyards and front porches also form active public spaces that are flexible in function, creating a strong sense of community within residents.

Design Concept: Sustainable Local Materials

The choice of building materials is based on the availability of locally-sourced and affordable material elements: adobe bricks and thatched roof. With manufacturing techniques that are already mature and popular in the region, adobe brick is a low-cost and low environmental impact materials suitable for the climate and customs of the country. The thatched roof for courtyard canopy is customized by each family unit and the process of handcrafting is a good opportunities for the habitants, especially kids, to learn this traditional and beautiful crafting skill. Overall, building materials used in this project are hands-on, low-tech, yet is affordable for each family and sustainable both environmentally and culturally.



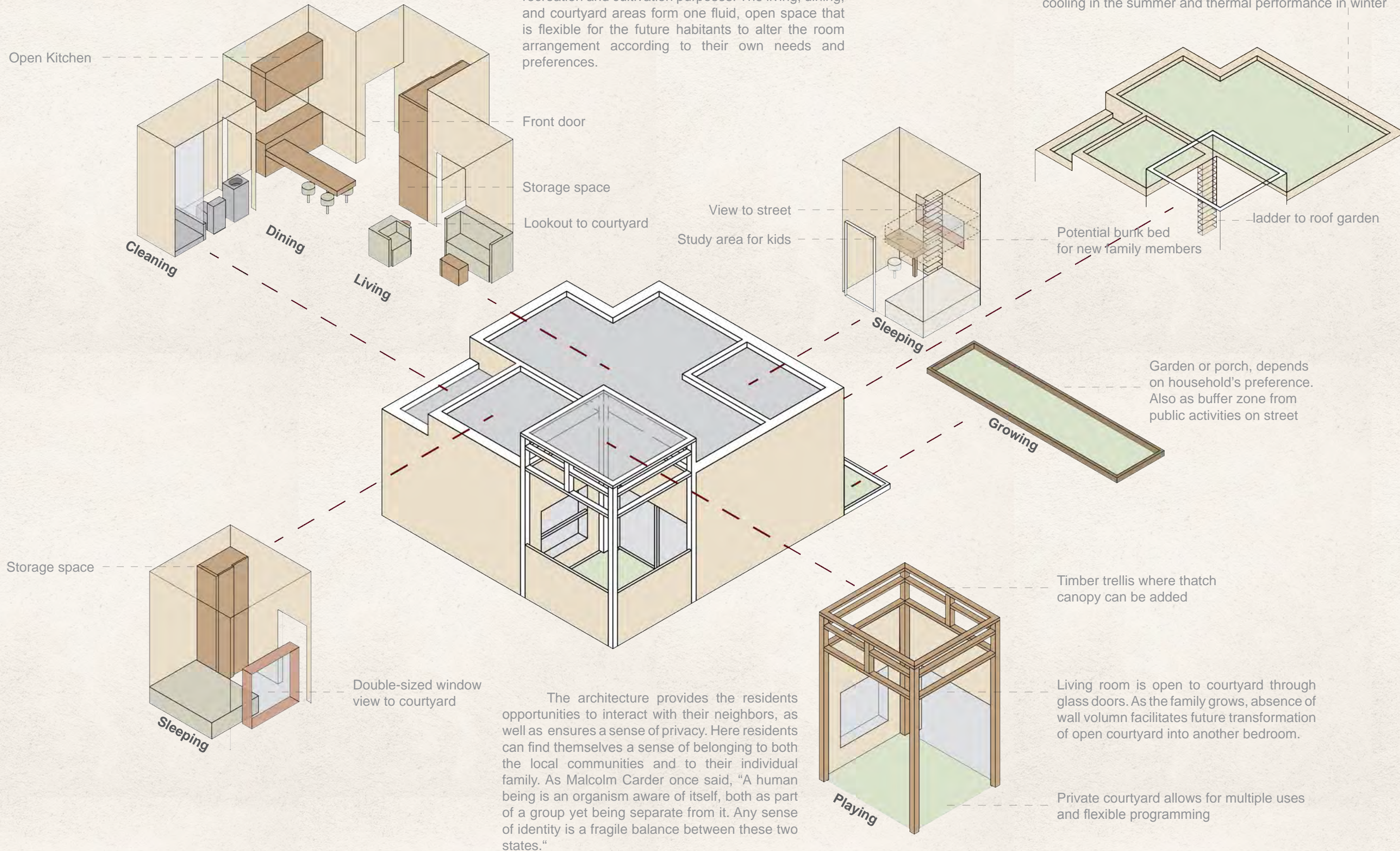
Community-Building

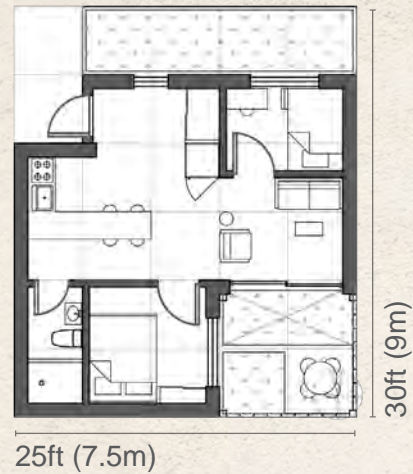
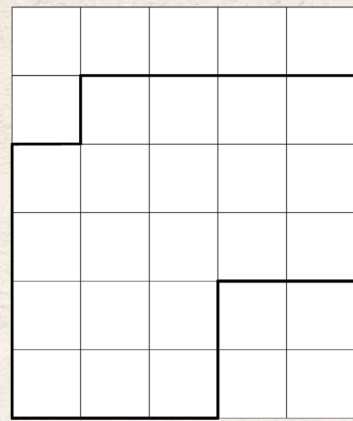
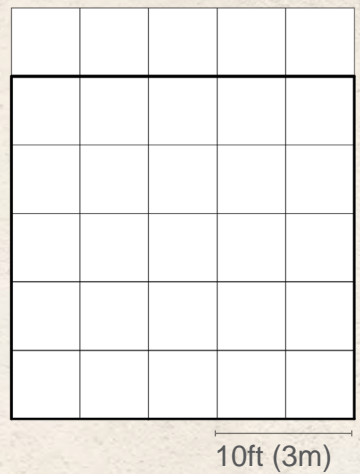
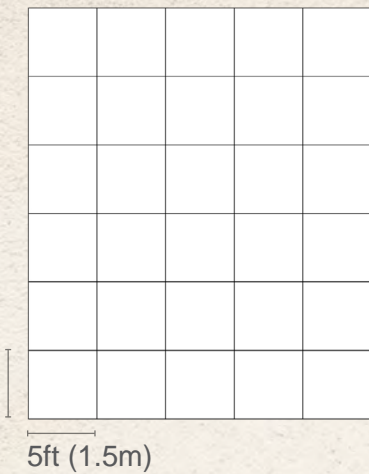


Family-Living

Each family unit consists of living, cooking, dining areas, two bedrooms for parents and children respectively, one bathroom, and outdoor areas for recreation and cultivation purposes. The living, dining, and courtyard areas form one fluid, open space that is flexible for the future habitants to alter the room arrangement according to their own needs and preferences.

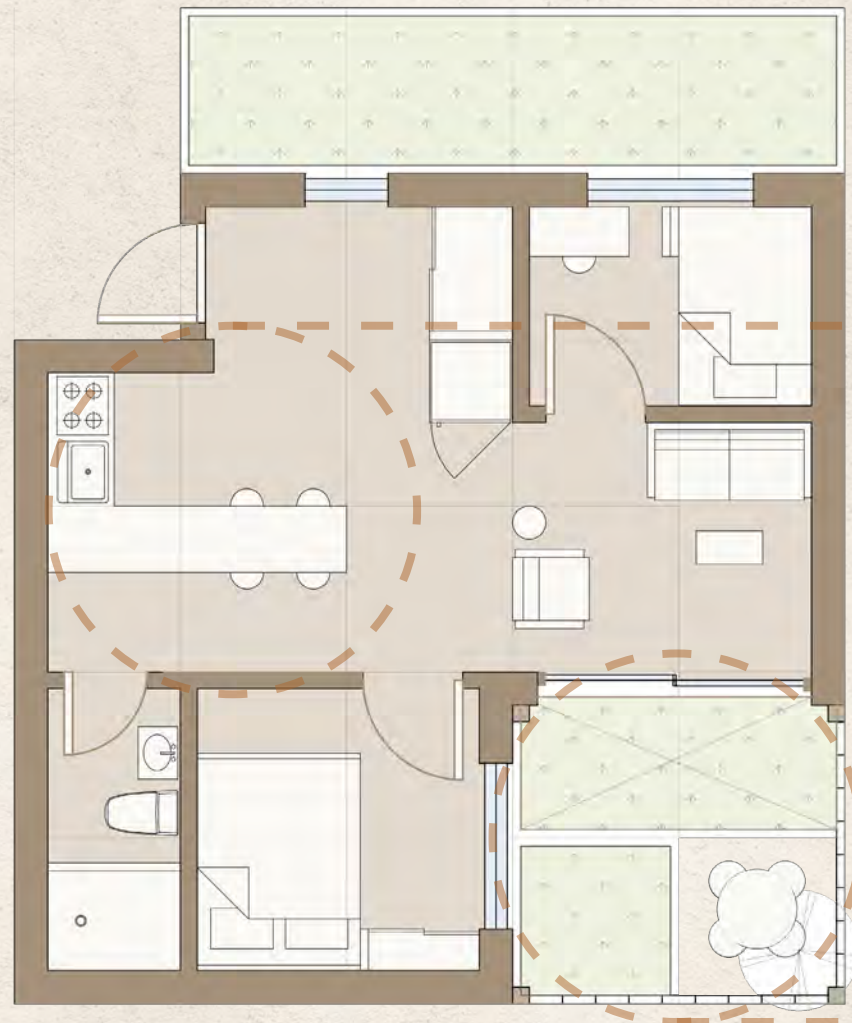
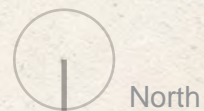
Roof is accessible for additional outdoor living space or self-sustaining farm. The green roof also helps with passive cooling in the summer and thermal performance in winter





Module and Grid

The plan is based on a lot size of 7.5mx9m(25' x 30'), which conveniently configures a 525sqft(48.7sqm) enclosed space and 225sqft(30sqm) open green space on both front and rear sides of the house. The lot size also successfully generate urban residential blocks as 4 units can take up a typical-sized lot in Maseru (30m in length). The interior organization is based on a 5'x5'(1.5mx1.5m) grid which makes design logics clearer and construction eaiser to control.



Interior view of living and dining areas.

Exterior view of private courtyard.

Flexible Orientation

As a modular unit within a bigger housing complex, the house itself does not have a specific orientation. Although a recommendable orientation is to have the living room and courtyard facing north, in order to receive most natural daylight and thermal gains in the winter.

Inside / Outside

Each unit has private courtyard and front porch/garden where the household can design and occupy creatively according to their interests. The green outdoor spaces form opportunities for residents to engage with their neighbors yet also buffer private domain from public activities.

Future Adaptation

When family grows bigger and needs more space, the open courtyard can be converted into another bedroom. The construction requires few efforts other than to add two more exterior walls and roof. The 3mx3m lot size is open for any future incremental improvement or addition to the already-built home.



Energy Efficiency and Sustainability

Locally-sourced natural materials
handcrafted with traditional techniques

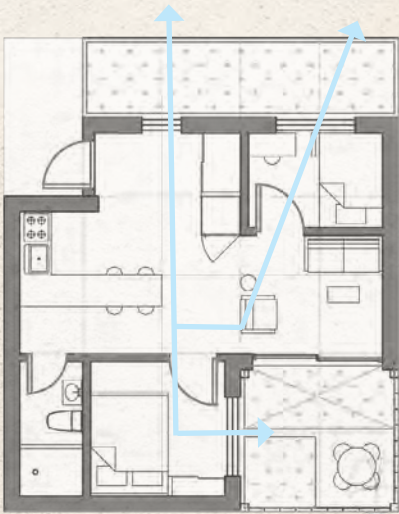
Height of windows is based on human
scale. The apertures frame the views
out while vivifying building elevations



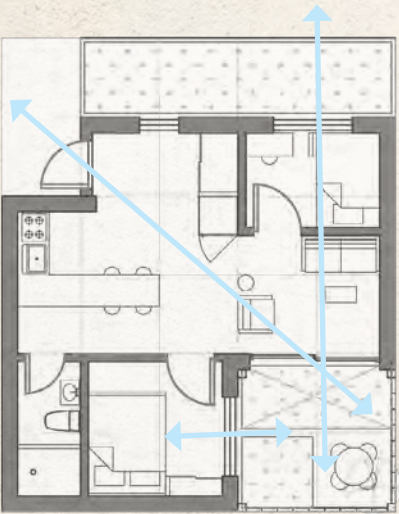
Summer Sun Diagram without Canopy



Summer Sun Diagram with Canopy

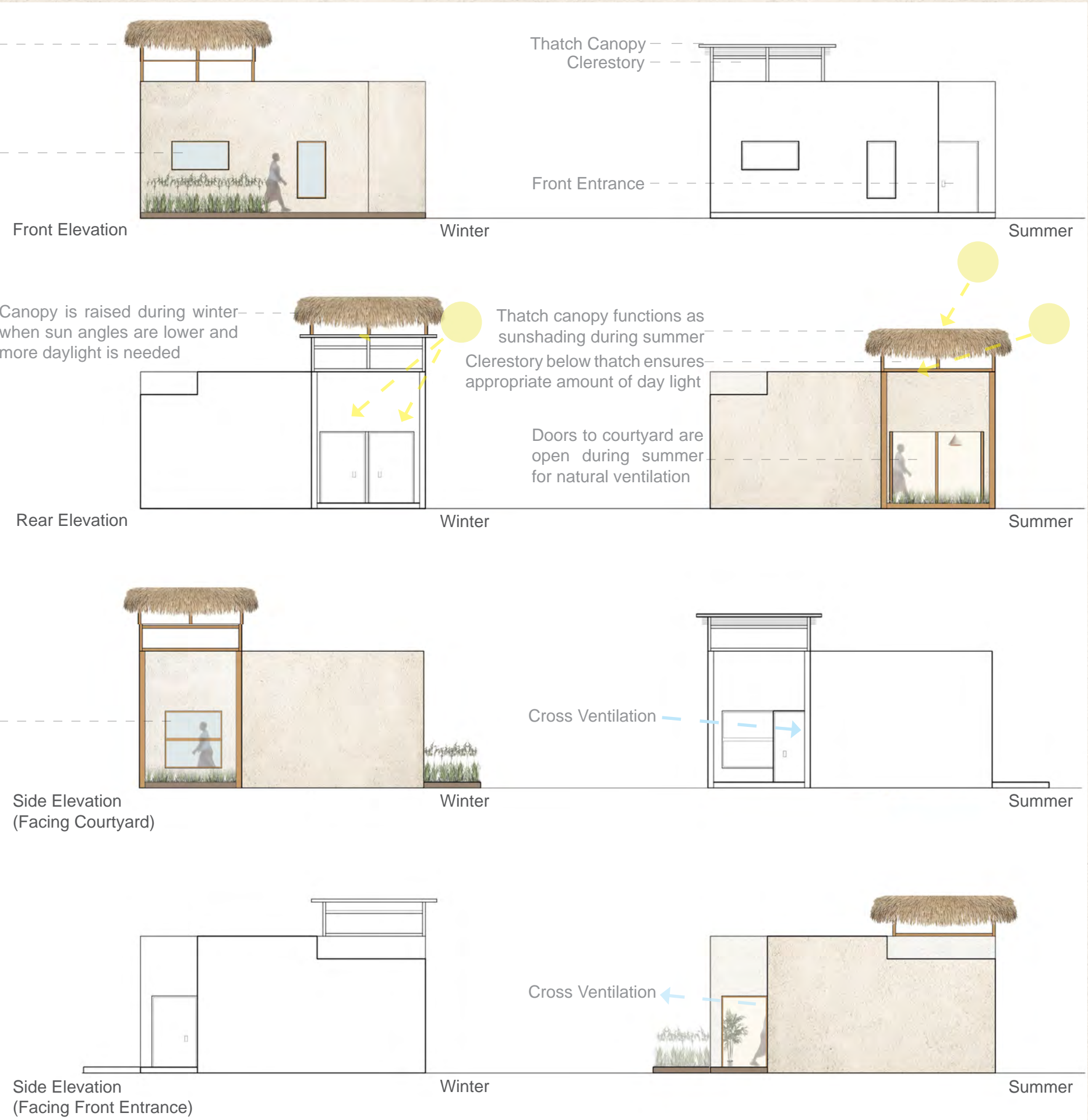


Winter Cross Ventilation Diagram



Summer Cross Ventilation Diagram

Two insulated glass units introduces
ample natural light into master bedroom,
while framing a view to the courtyard



Local Materials and Traditional Handcrafts

Abobe Bricks with Mud Plaster



Manufacturing

The ingredients for making adobe brick are all locally-sourced and the costs are extremely low. With skilled labor, adobe bricks are easy and fast to produce. As a building material, adobe brick is very popular in the region of Lesotho and has witnessed a long history throughout the world.



Drying

It takes about three days to dry adobe bricks, which is manageable for the construction schedule. The relatively dry climate in Maseru also helps to facilitate this process.



Construction

Adobe walls are easy to be put up and does not require highly skilled labor force. The future habitants can participate in the construction to save money on labor and enjoy this hand-on experience.



Texture

Adobe walls are very common in Maseru and the texture and color coordinates harmoniously with local aesthetics.



Finishing

To protect the interior and exterior adobe walls, future habitants can choose to apply finishes such as mud plaster (lower cost) and stucco (higher cost). These finishes prevent water damage and other weatering and deterioration. Apart from water protection, these finishes also create aesthetics appeal and each family can customerize the look of their house therein.



Environmentally Sustainable

These materials are locally available and therefore easy to attain and transport to site. As renewable resouce, thatch can be reused and has very low environmental impact; adobe bricks can also be recycled with no additional environmenta damage.

Culturally Sustainable

The process of manufacturing is a continuation of a building culture that is rooted in the region and has been prevelent for a long history. By adopting these traditional techniques, this handcrafting culture is respected and further developed.

Socially Sustainable

The maintainance of the architecture involves future participation of the habitants. For example, the finisheds for adobe walls need to be reapplied periodically and the thatched canopy needs to be adjusted between seasons. This participatory process creates a sense of stewardship among residents and the architecture becomes a habitat that is socially sustained by each individual.

Handcrafted Thatched Roof



The canopy for courtyard is made of locally-sourced thatch, very convenient to attain, replace, and reuse. The low cost of thatch is also very easy for the family to afford. These thatched roof can be either handcrafted with traditional techniques, or customerized and made innovatively by each family.



Project Statement

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Project Cost Estimate

Strip Foundation

Reinforced Concrete
LSL1695.00/m3 x 18 m3 = LSL30510.00

Wall

Adobe Bricks (manufactured locally)
LSL0.50/m3 x 112 m3 = LSL56.00

Floor

Adobe Bricks (manufactured locally)
LSL0.00/m2 x 45 m2 = LSL0.00

Roof Sheets

LSL140.00/m2 x 45 m2 = LSL6300.00

Courtyard Trellis

Sawn Pine Timber
LSL24.00/m x 36 m = LSL864.00

Courtyard Canopy

Thatch (sourced locally)
LSL0.00/m2 x 8.5sqm = LSL0.00

Window

1.5m x 0.75m (5'x2'6")
LSL720.00/unit x4 = LSL2880.00

Door

1m x 2m (3'x6'8")
LSL500.00/unit x4 = LSL2000.00
1.2m x 2m (4'x6'8")
LSL1500.00/unit x2 = LSL3000.00

Labor

including manufacturing adobe bricks,
construction of the entire structure of the house,
and installation of windows and doors
LSL140/day/person x 7 days x 3 people = LSL2940.00

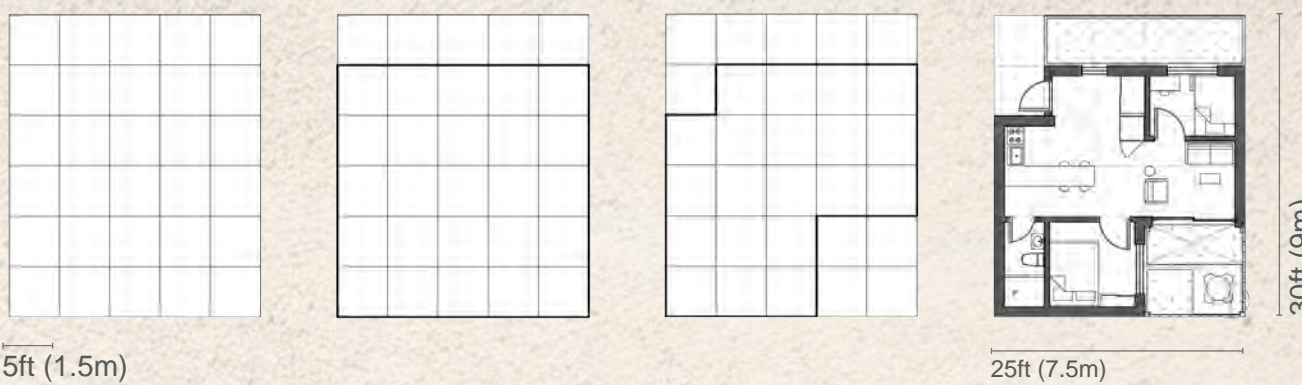
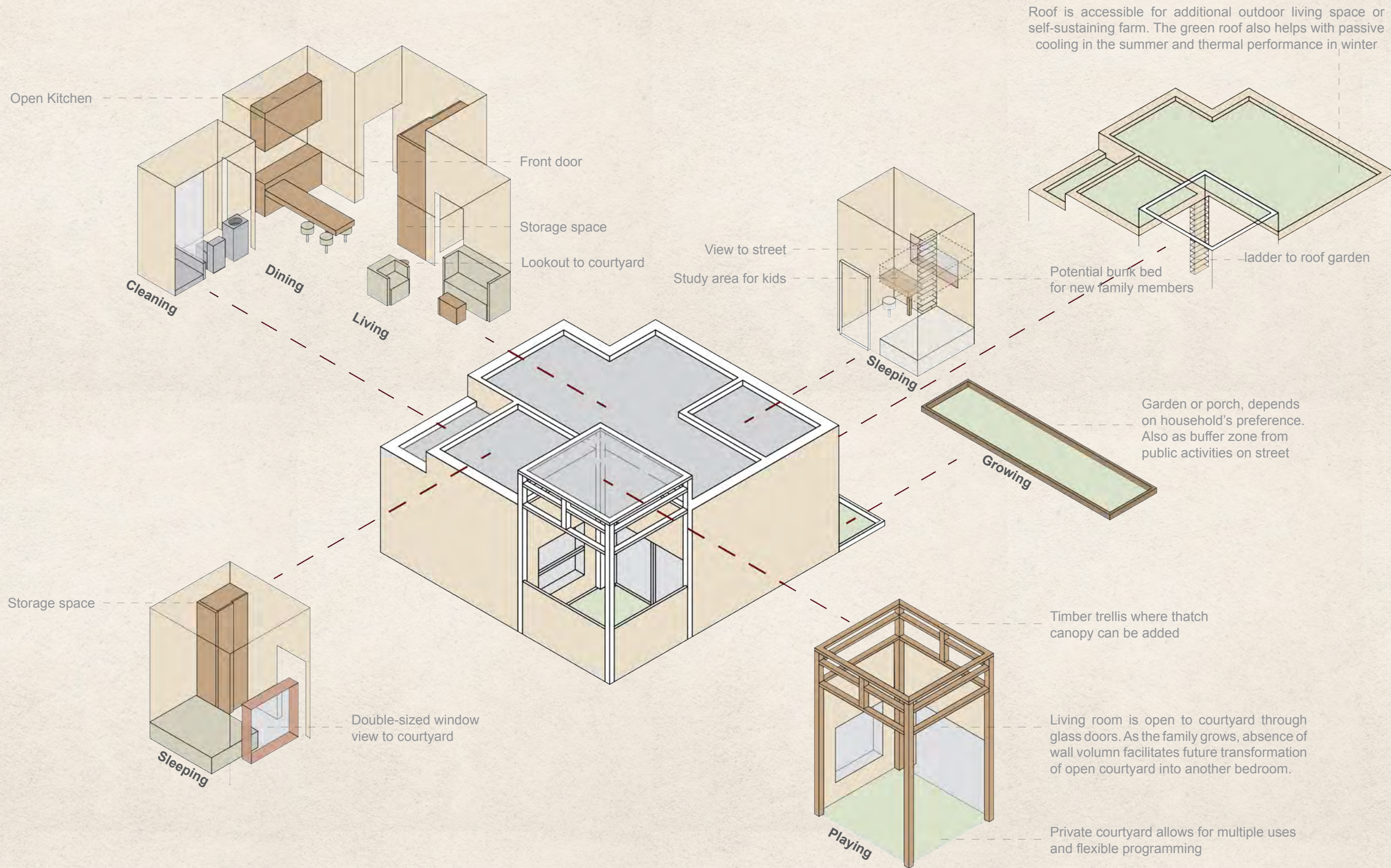
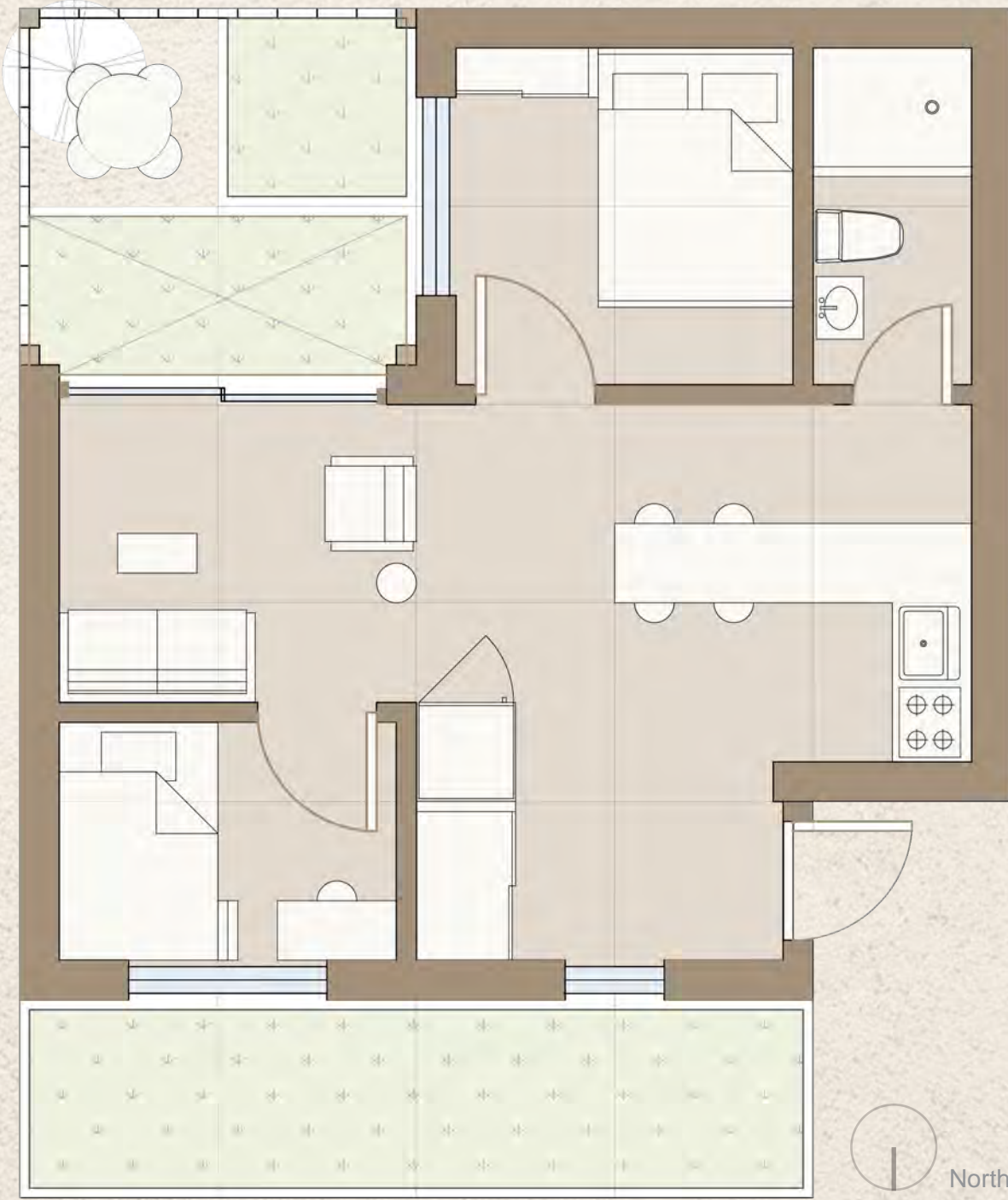
External landscaping is not taken into account in this budget, and will be self-implemented by the future habitants of the house.

Project Budget: LSL50,000

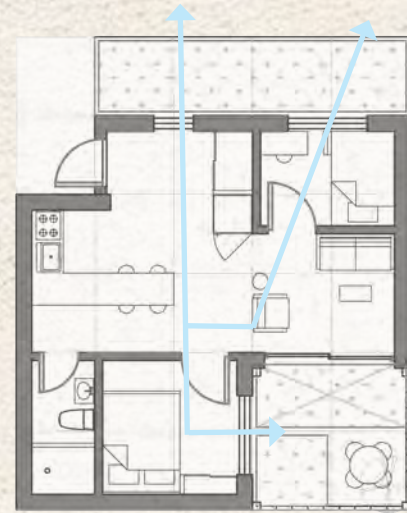
Construction Total: LSL48,550

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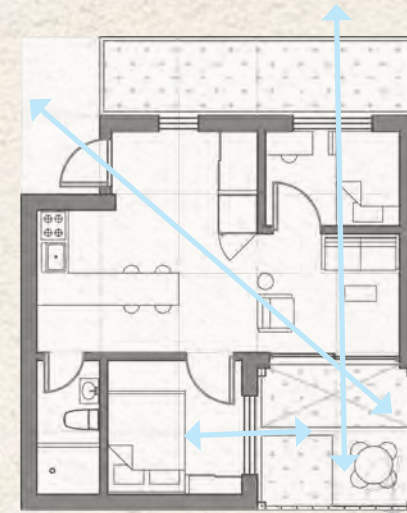
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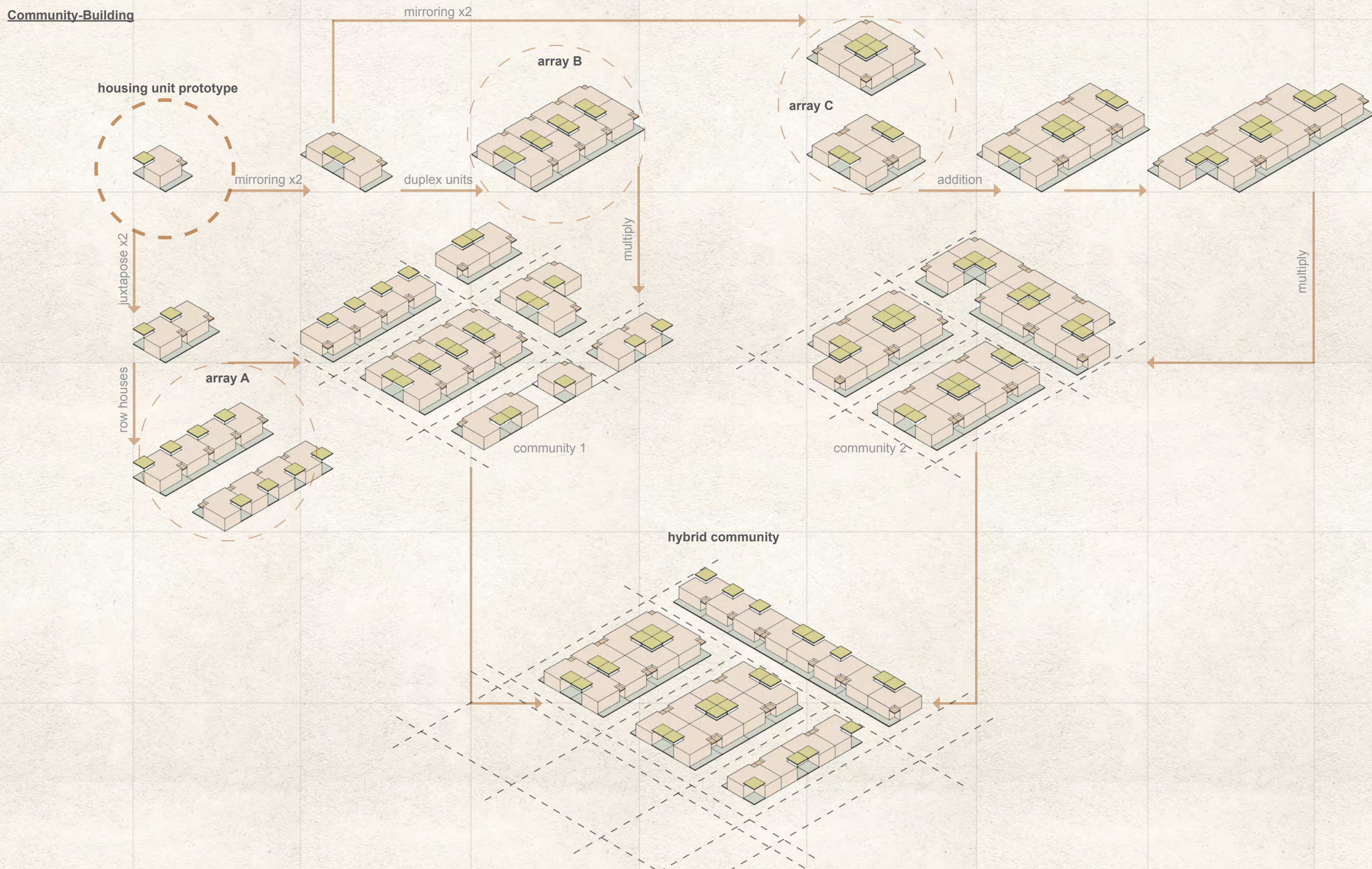
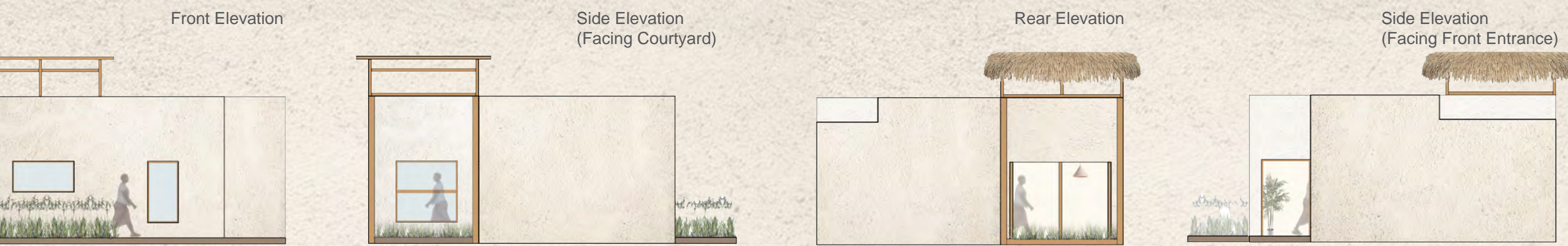
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Interior view of living and dining areas.



Exterior view of street.



Exterior view of private courtyard.

