



LESOTHO
AFFORDABLE
HOUSING

PROJECT DESCRIPTION

The project consists of a 20m² octagonal core that includes the kitchen and living areas, with seating that follows the east and west inner perimeters to allow more efficient sitting space for dining or living. At the center of this room, a wood burning stove is installed, which allows the heating of the house during cold winters, as well as serving for cooking. At the south end of the kitchen a ladder connects to a small platform 2.80m above the kitchen, that can be used for storage.

The bedrooms are oriented to the winter sun, and together they frame the entrance to the house, creating a funnel to catch stronger winds in summer, allowing the circulation of air through the house. Additionally, the straight walls of the octagonal core leave open the possibility to add more 'modules' to the house by adding two more walls and a roof, so up to four extra modules can be added, completing in a sense, the circle.

The foundation of the house is a concrete floor slab that has an excellent thermal mass, and the walls are 50cm thick adobe brick, to provide good insulation and thermal mass, as well as reducing the cost of materials. The roofs are made by thatch on a structural timber frame that again, will reduce costs, and respond to the culture of Lesotho. Since this is a project that should be able to be replicated anywhere in the city, its location is not very relevant to the design, mostly the orientation.

From the first sketch, I tried to establish the key elements that would shape most of the project, which included not using hallways, to maximize usable space; restricting the house to one story, to minimize building costs and complexity, and getting as much solar exposure as possible during the winter, mainly in the bedrooms.

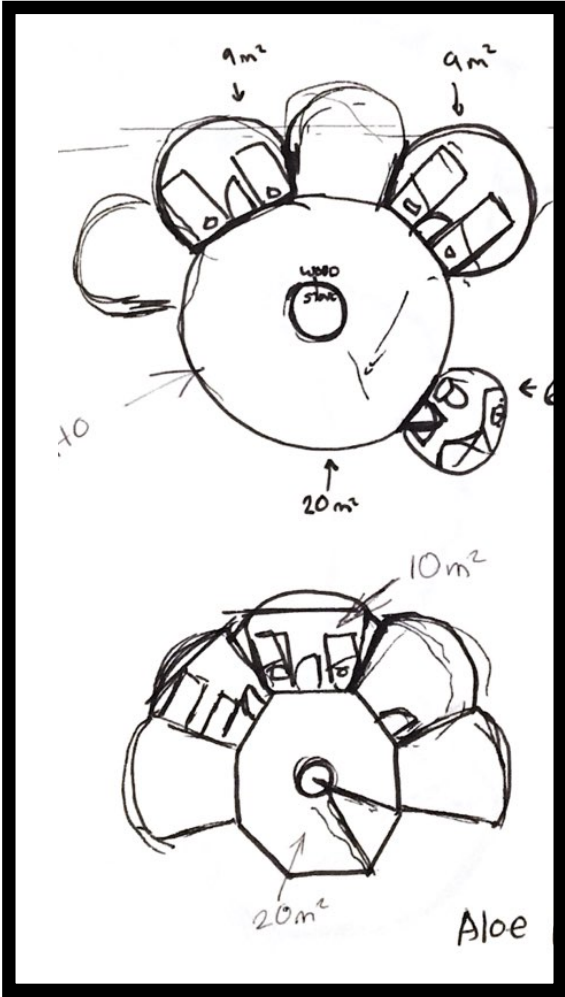
Early designs incorporate some of these elements, and another one which included the Basotho hut as a modern house for many people. However, the curvature proved challenging, and didn't allow for the incremental expansion of the house.

By combining the cultural relevance and layout of the Basotho hut, I turned its circular shape into an octagon, for more efficient use of the space, and the possibility of add-on modules for potential expansion. In the final design, the Basotho hut remains the core of the house with kitchen and dining areas, while bedrooms and a bathroom are attached to it. In a way, the Basotho hut becomes 'nested' in the heart of the house, as an anchor point to remain true to the established way of life in this beautiful country.

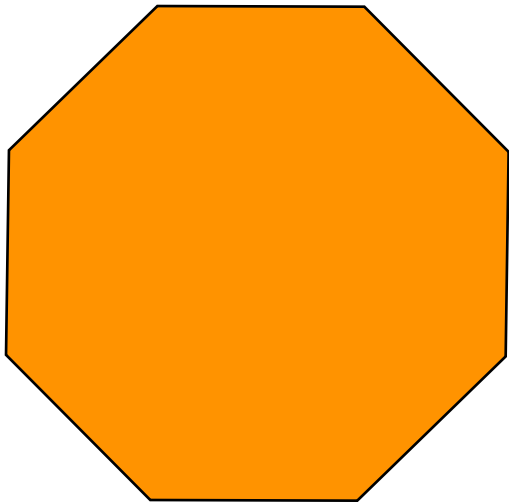
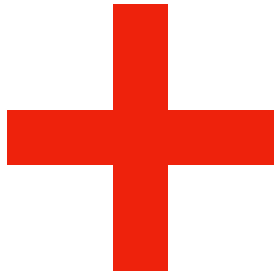
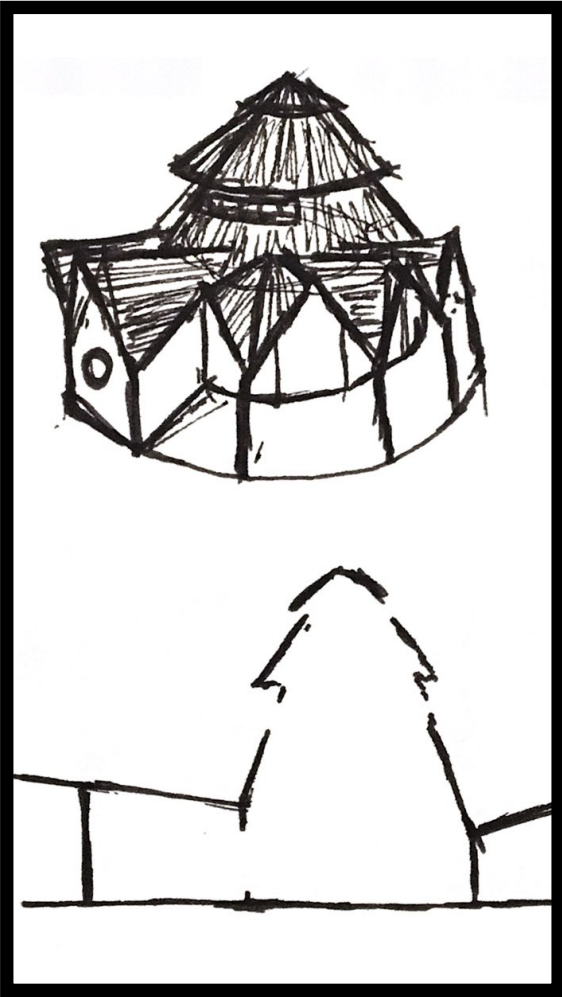
FIRST SKETCHES



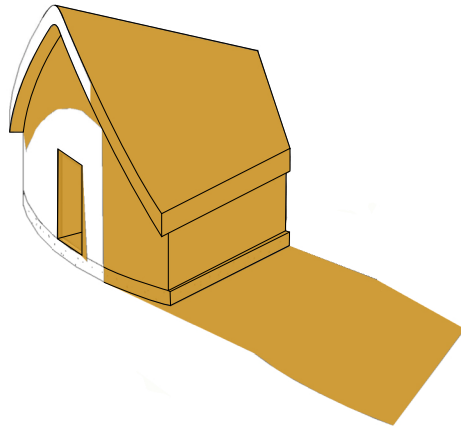
INTERMEDIATE SKETCHES



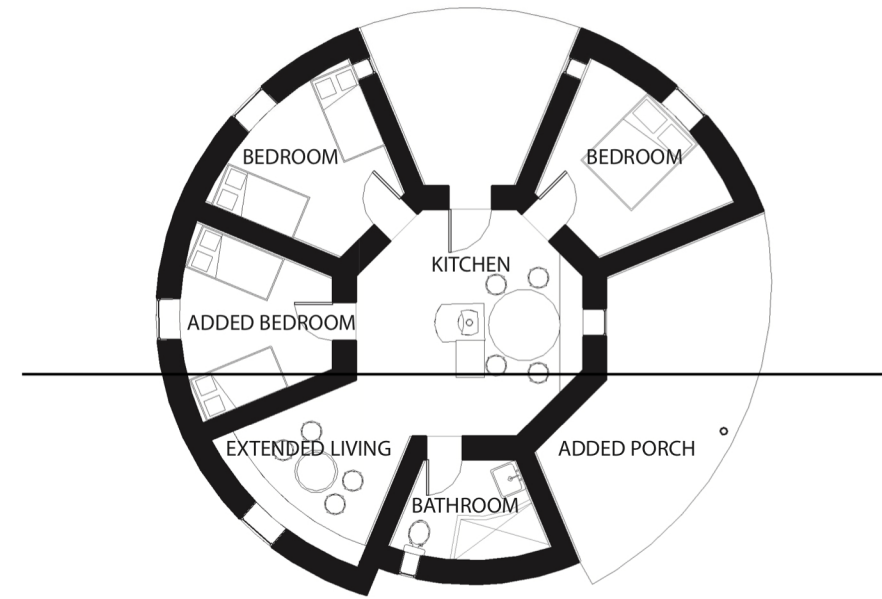
FIANL SKETCHES



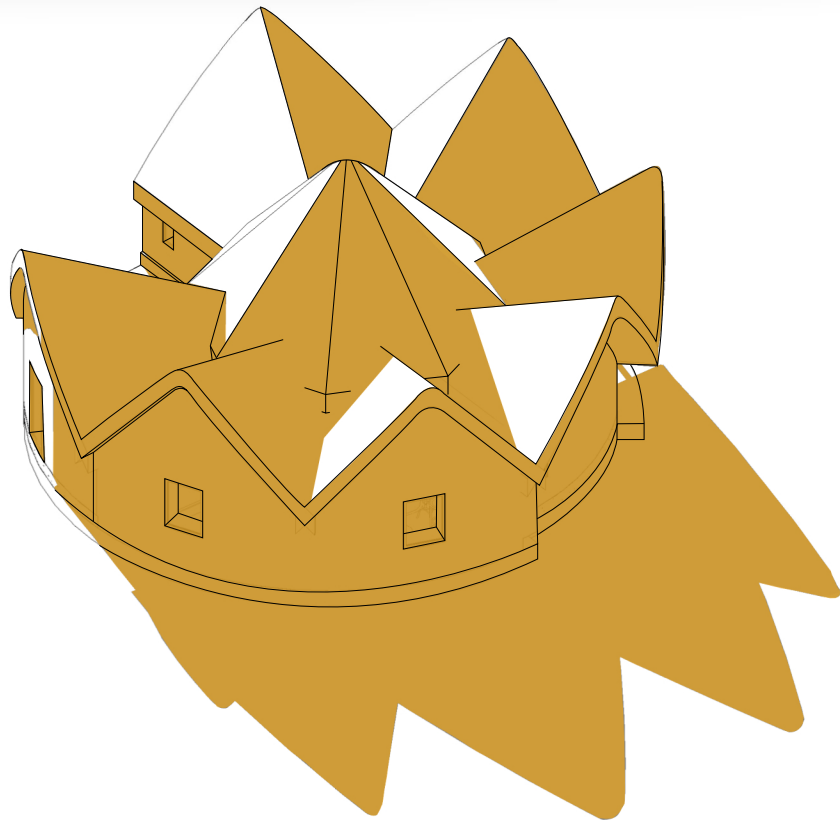
ADD-ON MODULES



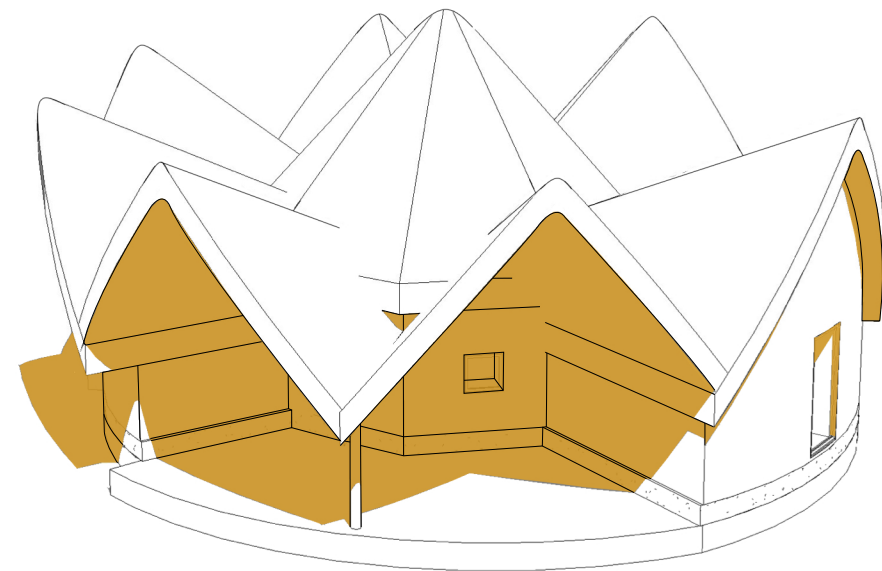
Each add on module has the same area, dimensions, and material requirements as the bedrooms. So if the family chooses to expand, they won't need any additional or extensive planning. Since walls are shared, the first module will require just two walls to be built, and the second, will require only one, simplifying each consecutive expansion.



Above the line, the add-on modules can be bedrooms, to still enjoy some benefits of winter solar exposure, and more dedicated shared spaces below, where thermal exposure is not crucial.

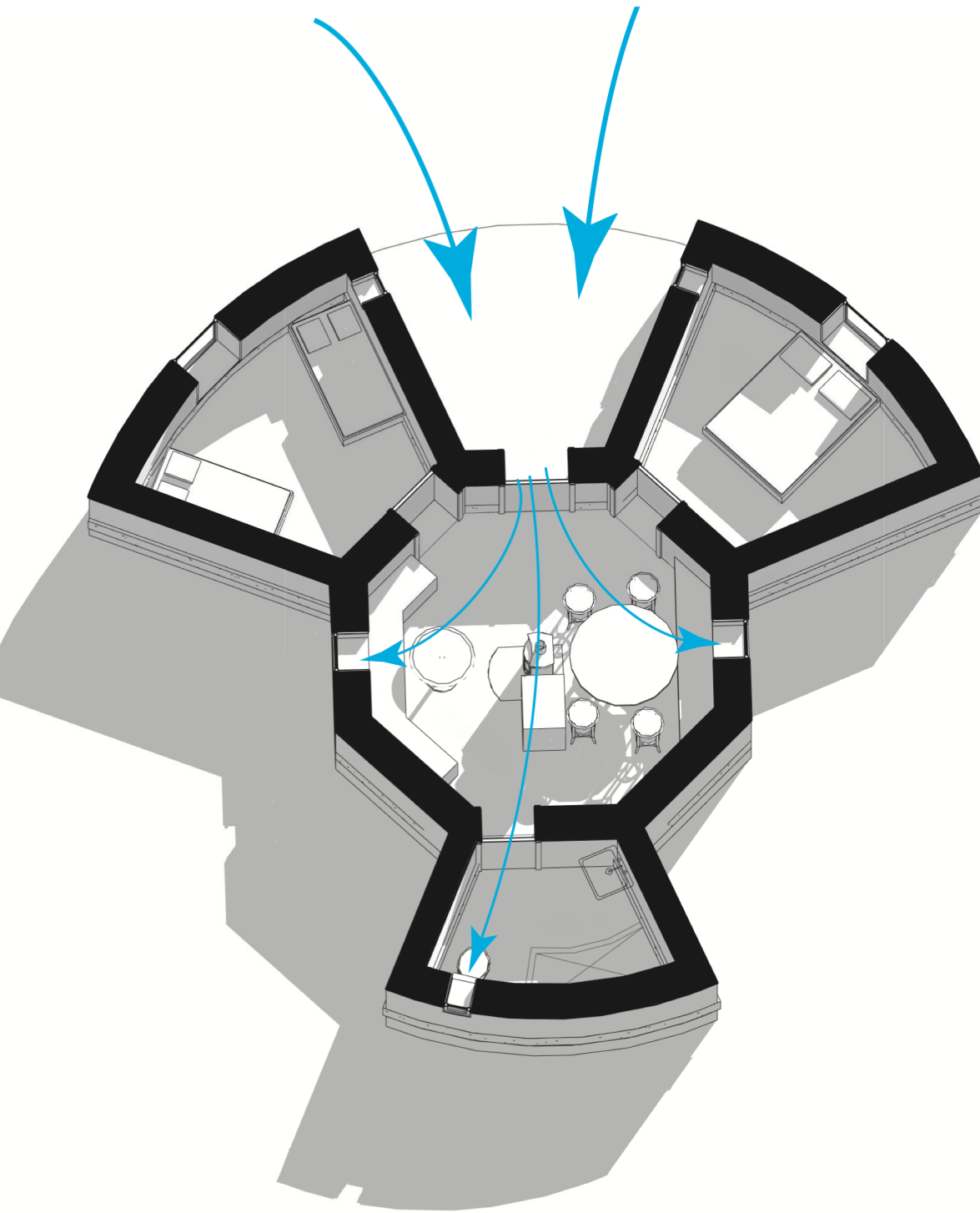


This octagonal system allows the central space to be 'completed' with many extra rooms...



or to simply add porches to enjoy de summer days, by just building the roof.

ORIENTATION AND BUILDING MATERIALS



The house is oriented North, facing the winter sun and summer winds, allowing the house to soak up sunlight during winter, and ventilate during summer.



Concrete is used for the foundations, and left brute to work as the floor of the entire house for its insulating properties and thermal mass, so that it collects heat during the day, and releases it at night. It also extends 30cm under the walls to work as a base for the adobe and prevent its erosion. Rebar and steel mesh are used to reinforce the concrete.



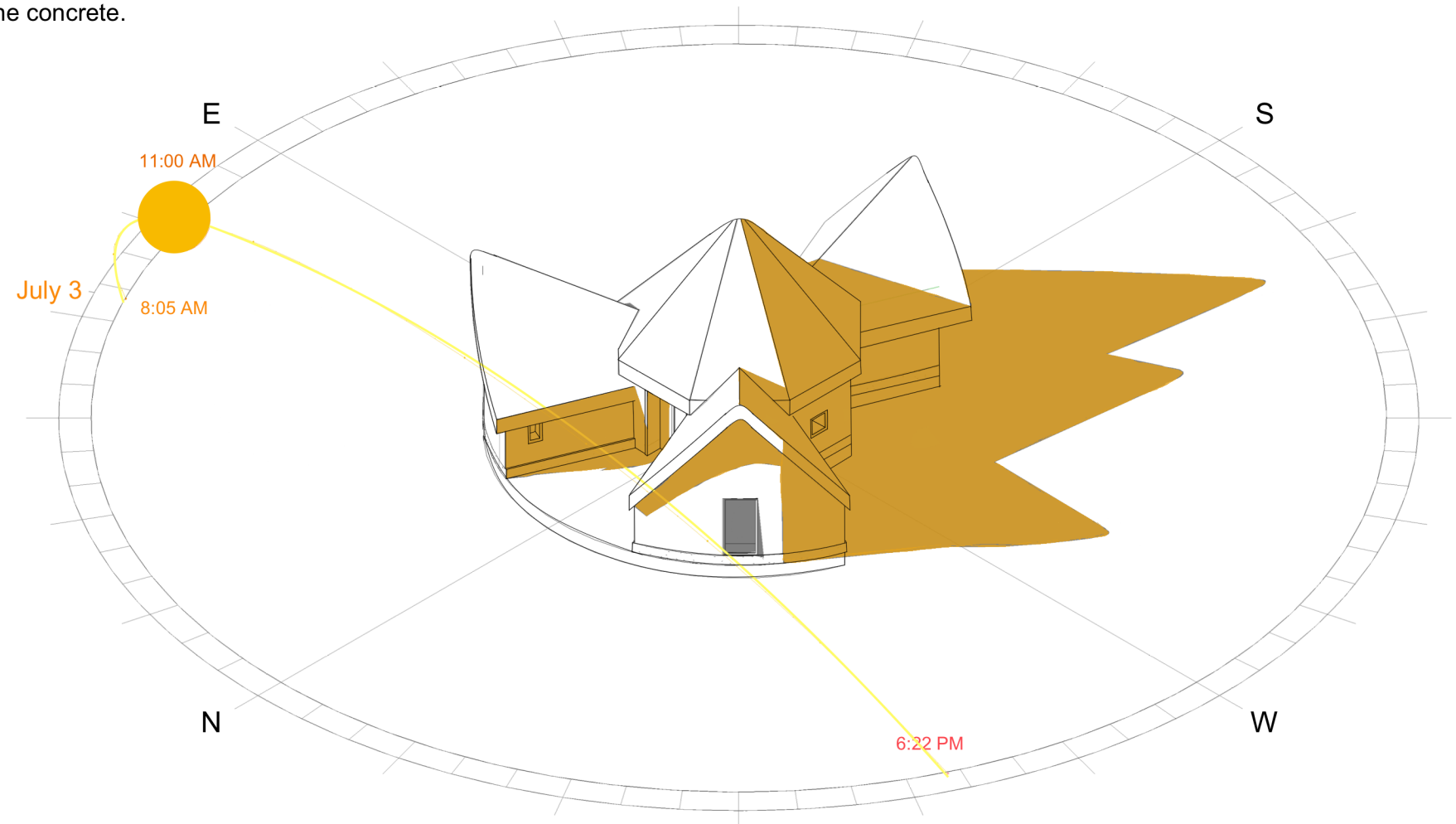
The walls are 50cm thick, made with adobe bricks (soil, sand, cement) in an effort to use **locally sourced materials** while reducing costs and achieving sufficient insulation. Additionally, the interior benches are made out of cob.



This effort is continued with the 30cm thick packed straw roof...



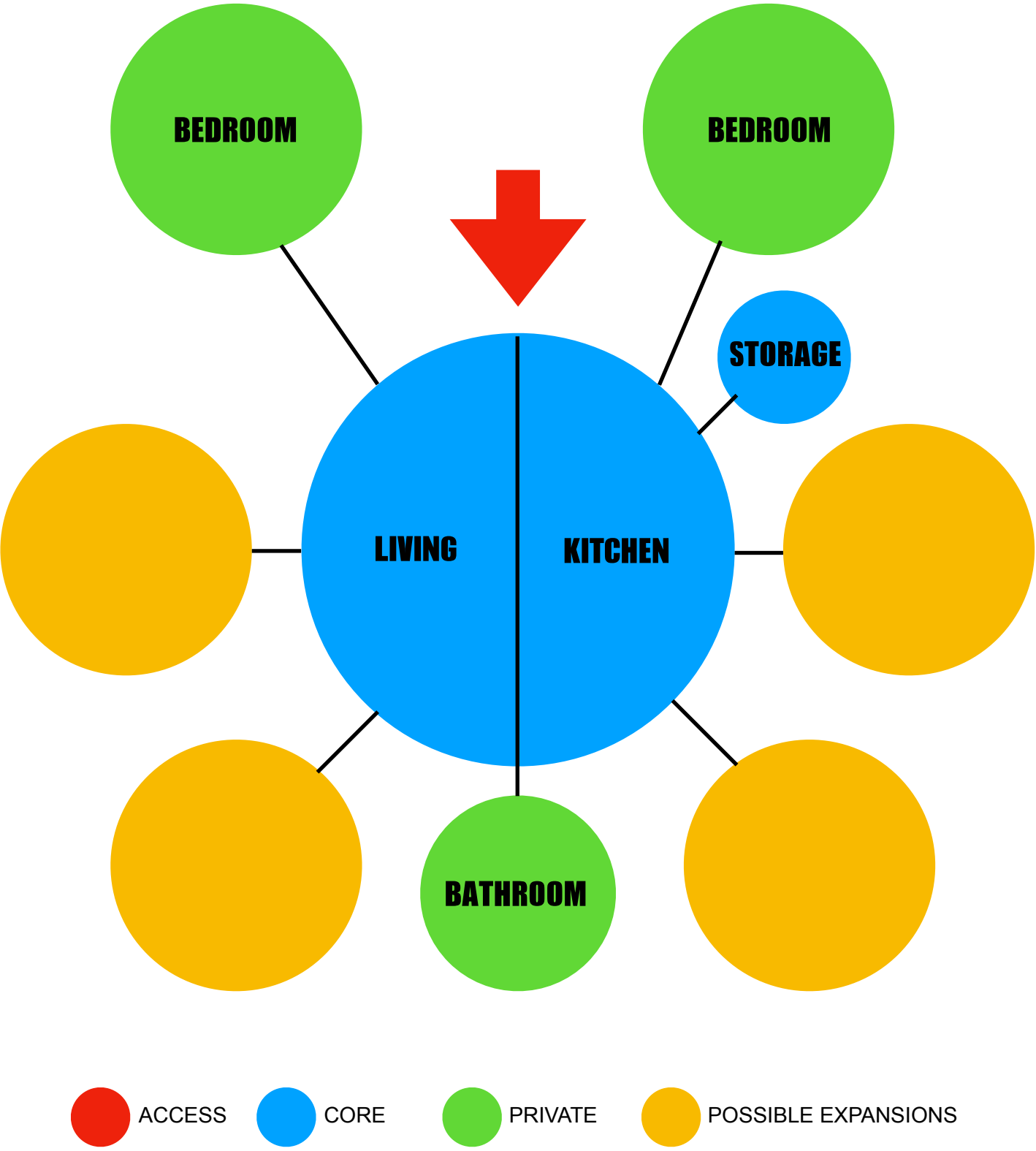
held up by a frame of structural timber, embedded into the walls with steel plates.



INSPIRATIONAL IMAGES



BUBBLE DIAGRAM



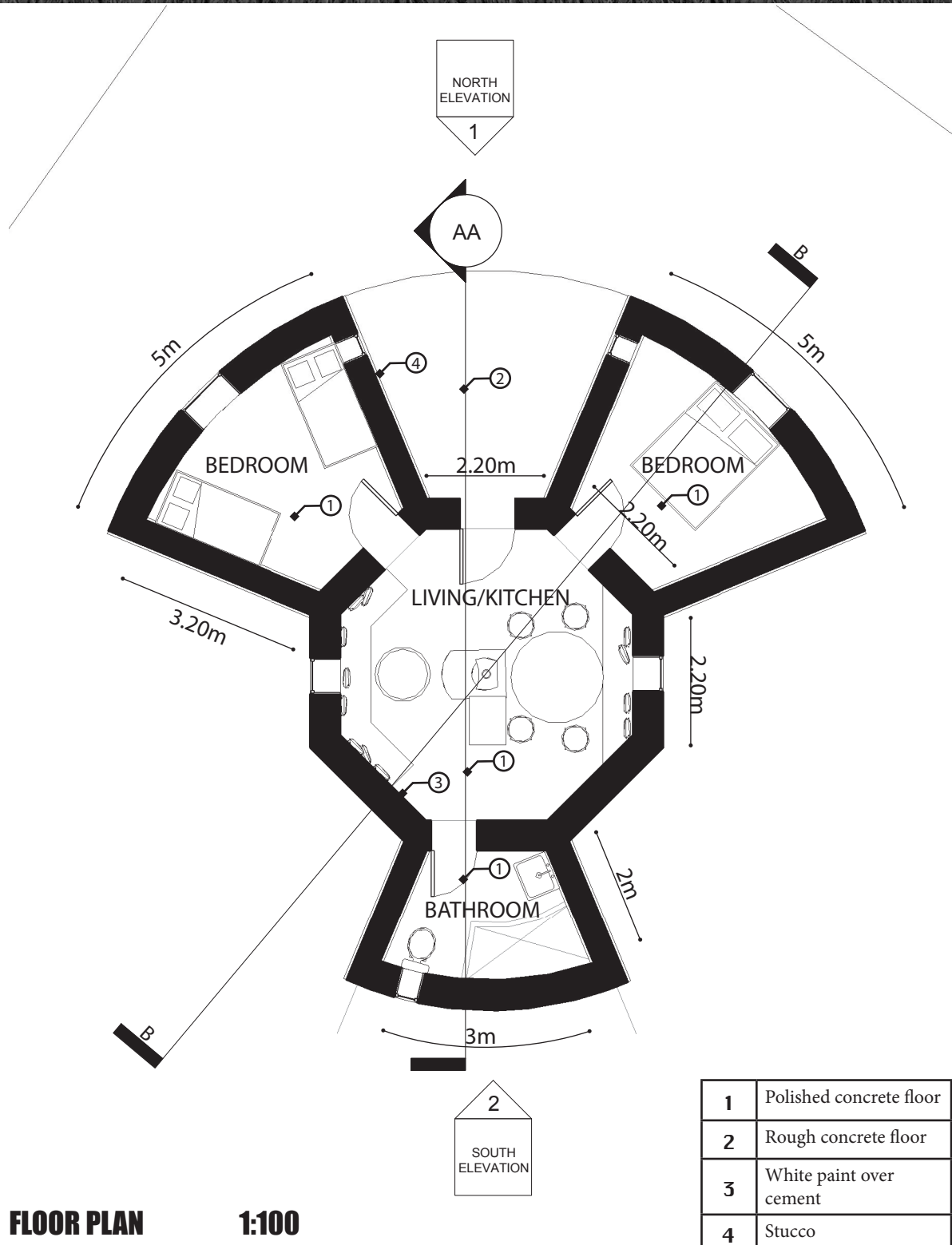
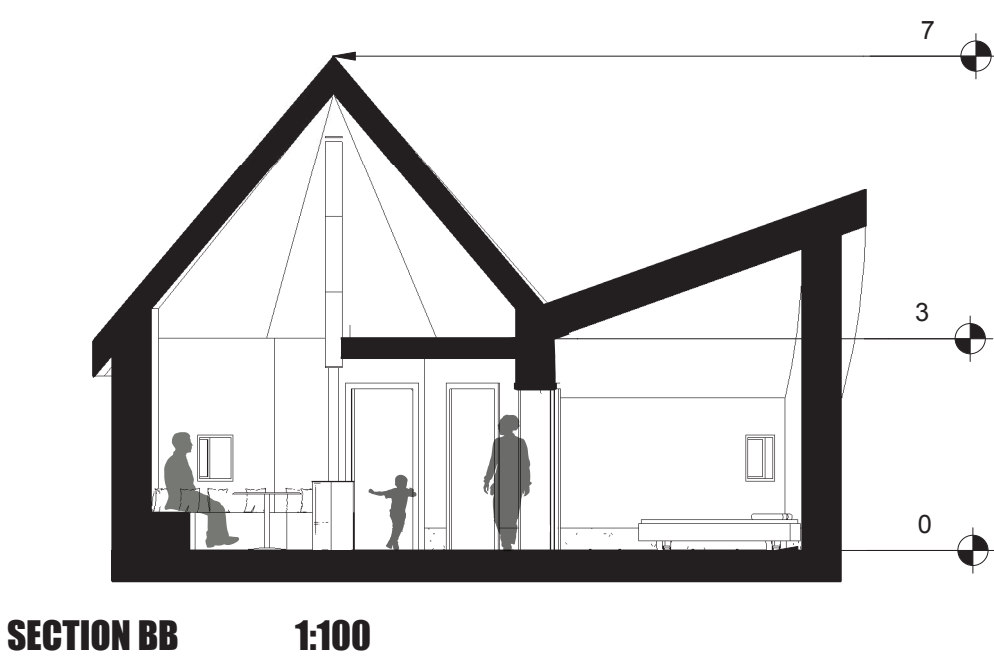
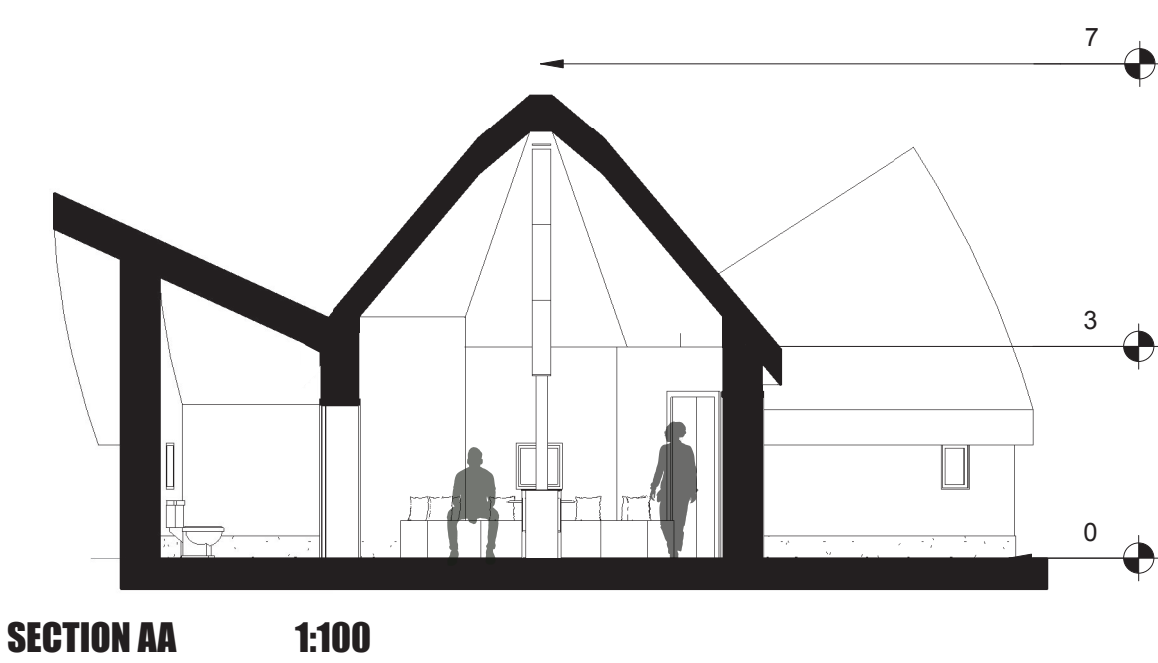
STATEMENT

Low cost housing around the world is often boxy and devoid of culture or personality, and always lacks the ability to really work for the needs of its inhabitants. This house has at its heart the true vernacular architecture of Lesotho, and this design allows for potential expansion as a full house by implementing a module based system around its core that'll let families to suit it to their needs with minimal effort.

PROJECT COST ESTIMATE

MATERIAL	COST (LSL)
Cement (floor)	12,472
Sand (floor)	8,728
Reinforced Mesh	1,695
Timber	2,099
Cement (walls)	3,897
Sand (walls)	5,222
Rebar	680
Kitchen installation	1,437
Water Tank	2,047
Plumbing	1,521
Doors and windows	2,000
TOTAL	41,798

AFFORDABLE HOUSING COMPETITION



1	Polished concrete floor
2	Rough concrete floor
3	White paint over cement
4	Stucco

