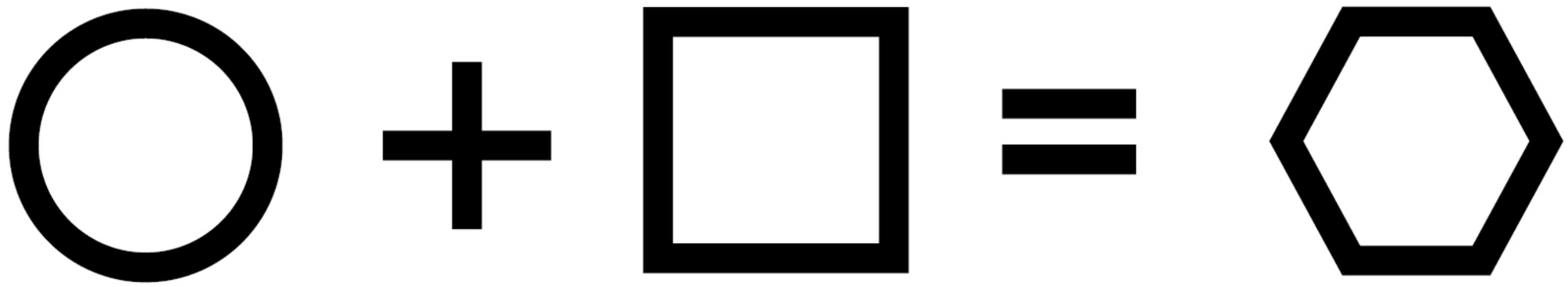
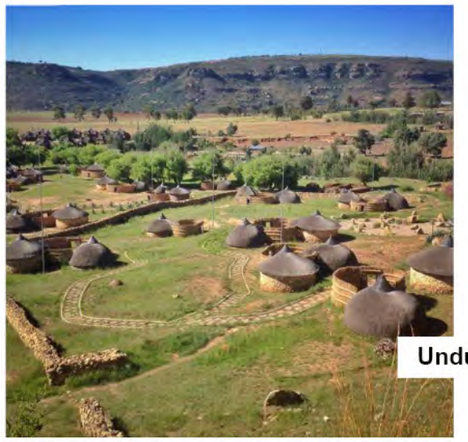
Rise in the City

Entry by
Sharon Nair

Block Number 68



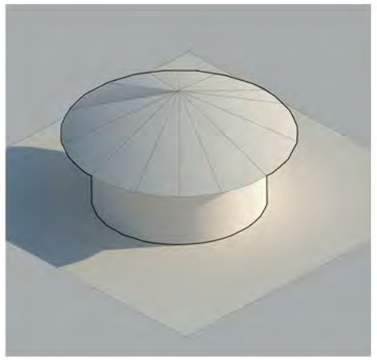
Local Inspirations

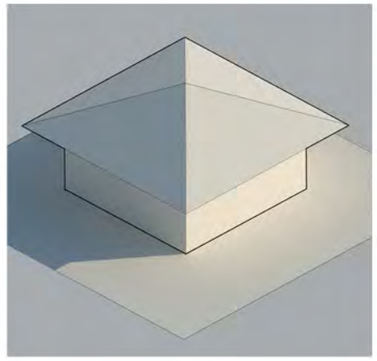


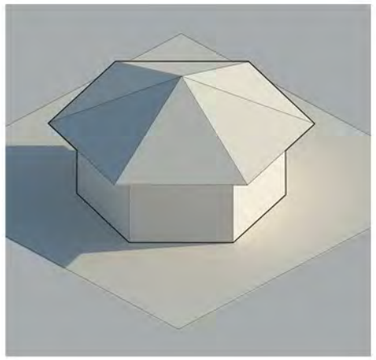
Varying Landscape in Lesotho

Materials

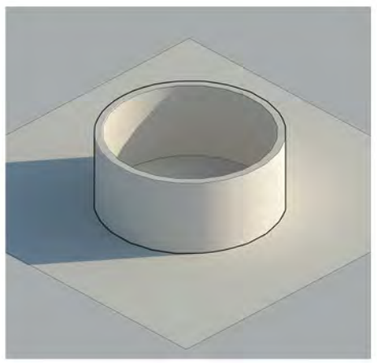
Dhajji Dewari Construction in J&K and Himachal Pradesh, India

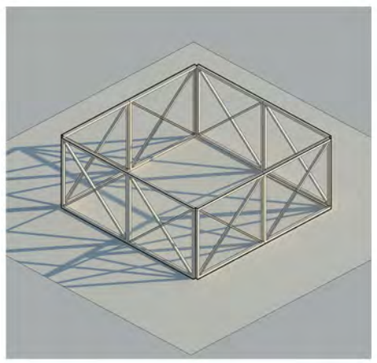


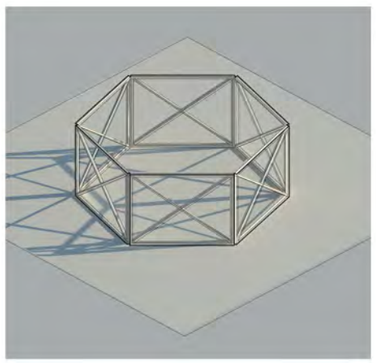




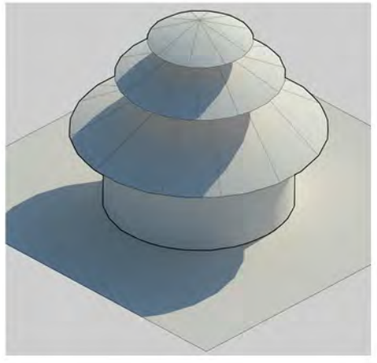
Evolution

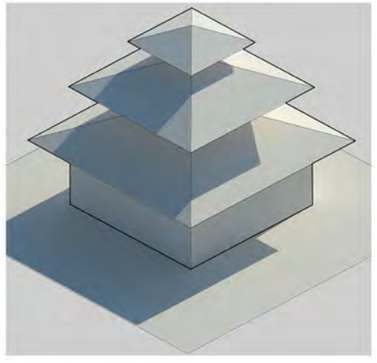


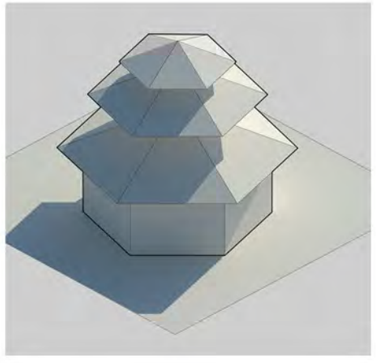




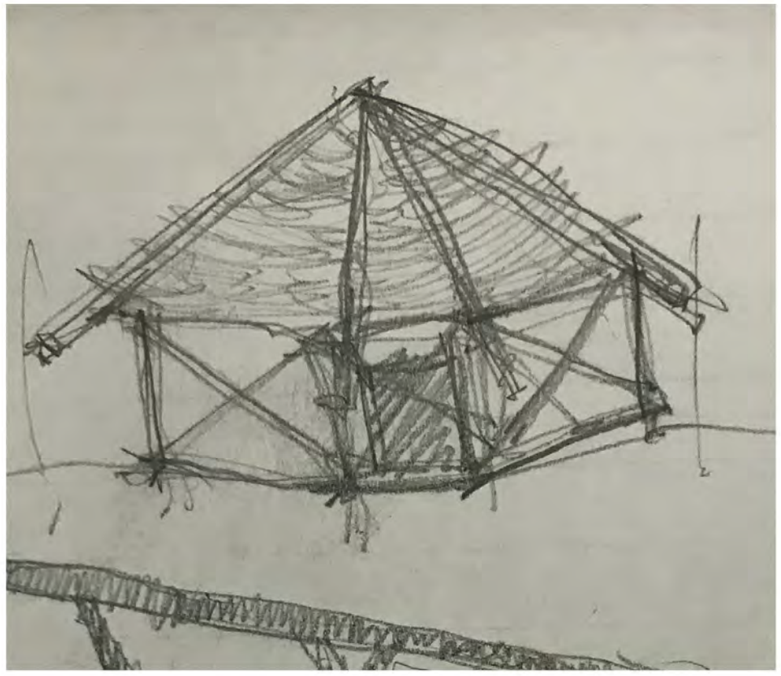
Wall Profile

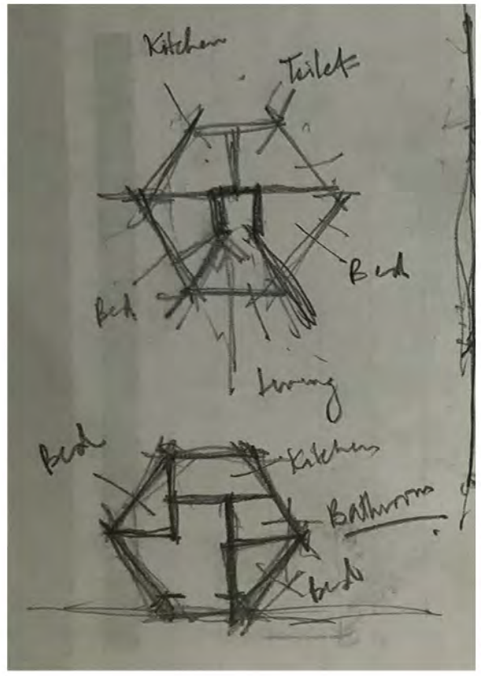




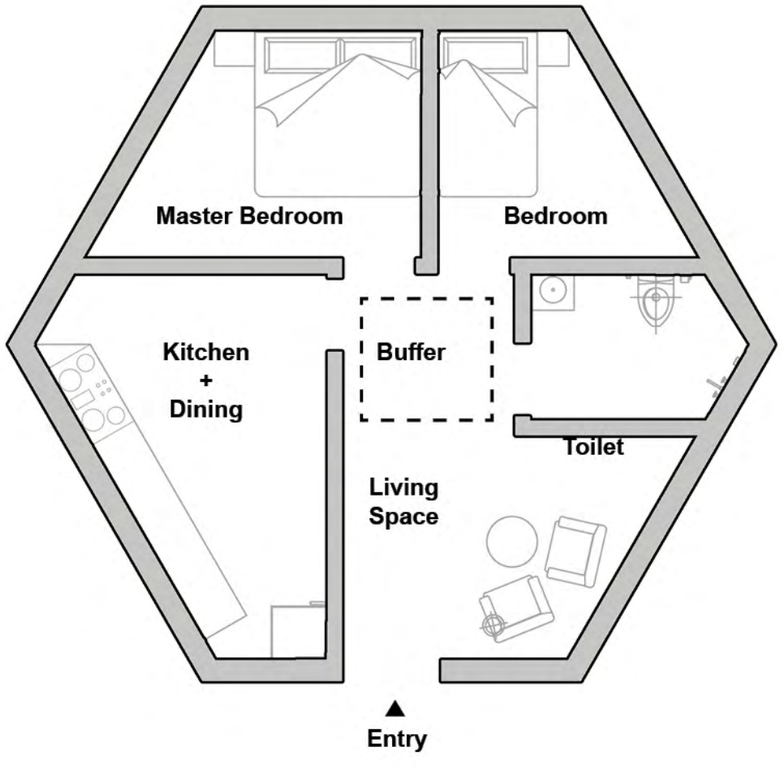


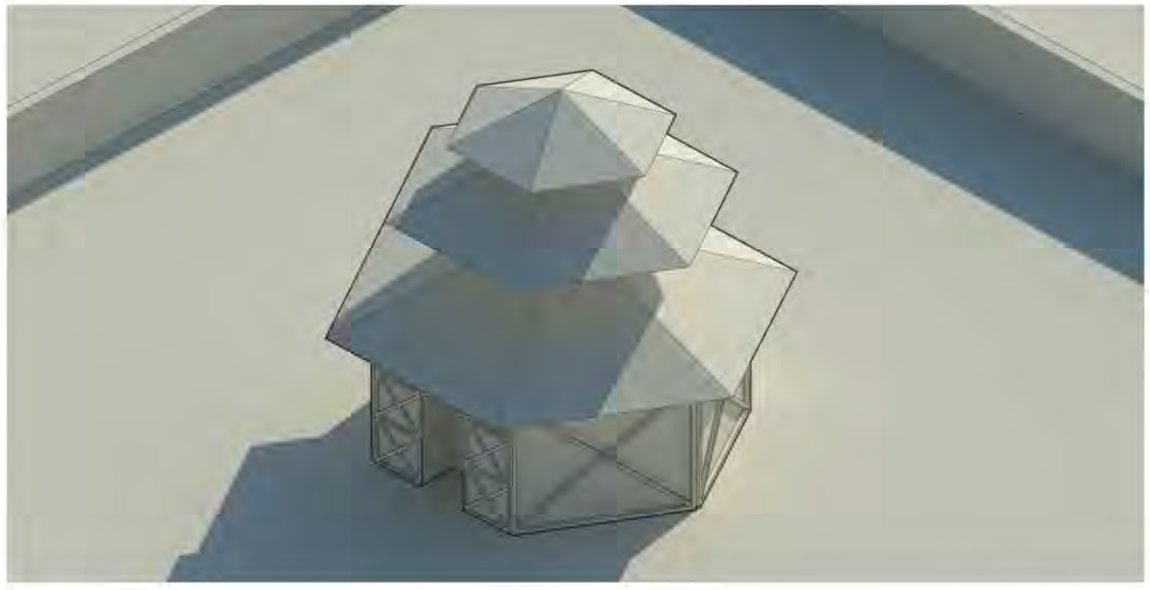
Roof Profile





Area Distribution





One of the major characteristics which is common to African Architecture is the Rondavels or the round shape the huts took. The reason being the round walls were able to dissipate the strong winds in the contours. This protected them from harsh weather. It was cheaper to construct round huts than rectangular ones, occupied less materials on walls and roofs than their corner counterparts and all the materials were available locally.

The second aspect of the concept are the Dhajji Dewari walls. Dhajji consists of a braced frame with stone infill and mud mortar, typically used in the mountain regions of South Asia. Typically found on shallow foundations on stone masonry. So in order to amalgamate Dhajji into African Housing, the rondavel took the shape of a hexagon.

The third and final aspect is the triple roofing. This is to protect the Lesotho households from snow as accumulated snow during winters can increase weight. So even if snow falls continuously it will flow down like water through layers of thatch roof. This way snow doesn't put much weight on the comparitively weaker thatch.

RITC
Block 68

Presentation 2
Sharon Nair

Location:

Lesotho, a high-altitude, landlocked kingdom encircled by South Africa, is crisscrossed by a network of rivers and mountain ranges including the 3,482m-high peak of Thabana Ntlenyana.

Latitude of Lesotho: **29.6100° S, 28.2336° E**
Latitude of Jammu and Kashmir: **34.083656°N, 74.797371°E**
(for comparison)

Block 68 converted as a site

Affordability for Housing:

Lesotho has a growing housing finance sector. Most households still finance their housing independently, with savings or non-mortgage credit.

The cheapest newly built house by a developer recorded by CAHF is US$ 24 500, which is for a 72 square metre unit. Cement prices are lower than the continental average, at US$ 5.50 for a 50-kilogram bag.

3.15%

Urbanisation Rate

40%

Lesotho's National population living below international poverty line earning USD1.25

28.1%

Unemployment Rate

Living Standards:

70% earn < **LSL1000 (about US$ 99)** = Do not meet banks' requirements for loan. Access to housing finance is through mortgage financing with about 400 loans a year provided to citizens earning more than US$900 a month. Salaries and wages determine the amount of loan.

Cost of living in Lesotho is **64.86%** > India. **Rent** in Lesotho is **73.31%** higher than in India. E.g. If inexpensive meal in India is **100 INR**, then Meal in Lesotho is **265 LSL**.

Climate:

High Temp: **28 °C**	Precipitation: **54.4 mm**	Wind: **9 km/h**
Low Temp: **-1 °C**	Humidity: **51%**	Pressure: **N/A**
Mean Temp: **16 °C**	Dew Point: **5 °C**	Visibility: **38 km**

Local contractors, architects, engineers, and the Government in Lesotho are very interested in learning how to build our structures - as cost of heating buildings, or cooling in summer, is a heavy drain on the economy. During winter months middle and upper income groups pay on the average 15 - 20% of their salary on heating their home.

The above picture (left) is a prototype developed by SARID, a non profit NGO, in collaboration with Climate CoLab, MIT, Massachusetts for Sisters of Charity of Ottawa - Lesotho. Most of the insulation is waste expanded polystyrene (EPS), recycled takeout boxes, that would have been burnt as trash. Solar PV's provide energy to Solar Water Heater and electricity to the building envelope.

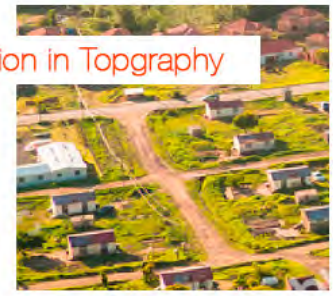
The picture above (right) from Lesotho show how most of the population lives in these unheated stone buildings that are not air tight, not energy efficient and are bitterly cold in winter. Close to 70% of the country's population lives in villages in these type or similar homes.

Conceptual Development:

My conceptual development mainly rotates around the **vernacular typologies of Lesotho**, the climate and materials and the link it can have with other typologies haviing similar latitudes.



Local Inspirations



Varying Landscape in Lesotho

Materials

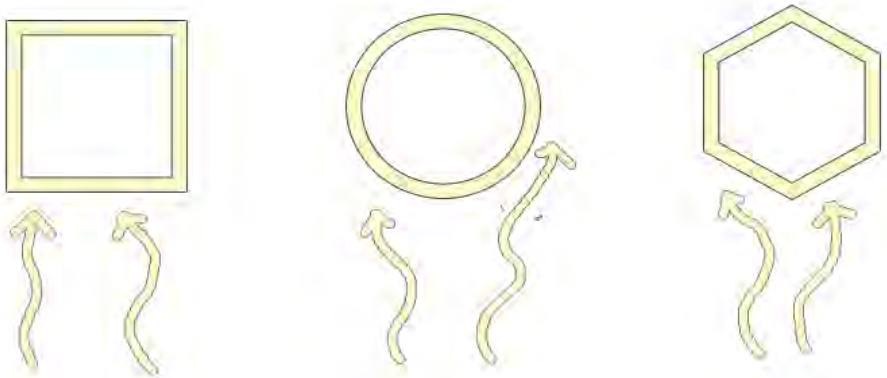
Advantages of a circular house over a rectangular house in African Culture:

Less Expensive:
In addition to being attractive and unique, a circular panelized house a circular house has about **20% less exterior wall area**, for same amount of interior floor space of a rectangular house. This reduces the material, labor and maintainence costs .

Wind and Seismic Resistant:
Cold winter winds flow smoothly around the house instead of leaking in and causing drafts, making it aerodynamic. Apart from that there are dozens of interconnected points which give the building a unique combination of flexibility and strength, making it seismic resistant.

Better Acoustics:
The shape also resists noise penetrating from the outside. Sound waves dissipate as they wrap around the building, shielding the interior from loud noise outside.

Intangible Culture:
Most indigenous societies culturally sat in circles, round fires or elders. Circular huts ensured that no one is hidden in corners even during communal drinking of traditional brews or storytelling sessions.



Character of Wind Draught in different shapes

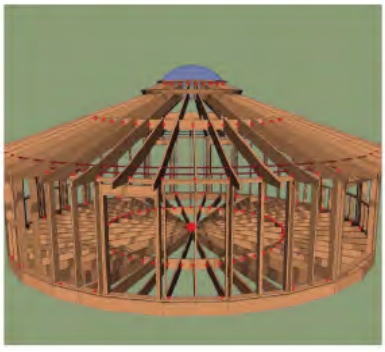
Contexual Images:

These are some images which picturizes the context of Maseru and Lesotho. Most of the traditional thatched-roof mud-brick houses, called rondavels, have been replaced with modern housing and office blocks which have a tint of traditional architecture.







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http://housingfinanceafrica.org/countries/lesotho/#

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Entry by Block Number 68/Sharon Nair

100 word description

An idea based upon the rondavels of Africa, mainly Lesotho, the design was evolved through the contextual approach of the traditional and vernacular housing typology of the country. The design eventually manifests from a perfect circle to an octagon so that it can accommodate the wooden bracings seamlessly, which is however inspired from the traditional architecture of the Northern colder regions of India. The circular derived design was chosen because winter winds flow smoothly around the house, better acoustics, better seismic resistance, 20% less wall area than a rectangular one, less material costs and intangible African culture of sitting in circles. (Genius!)

The Dhajji (bracing) technique doesn't only give an aesthetic appeal but also a functional aspect, that is seismic design, easy construction with less manpower and sustainable approach. The wooden struts supporting the thatch extend a bit more to get a lotus like figure, in which in between will be placed a source of light. Therefore Individually, it looks eccentric, but when having multiple units together, it looks like a **village of lights**.

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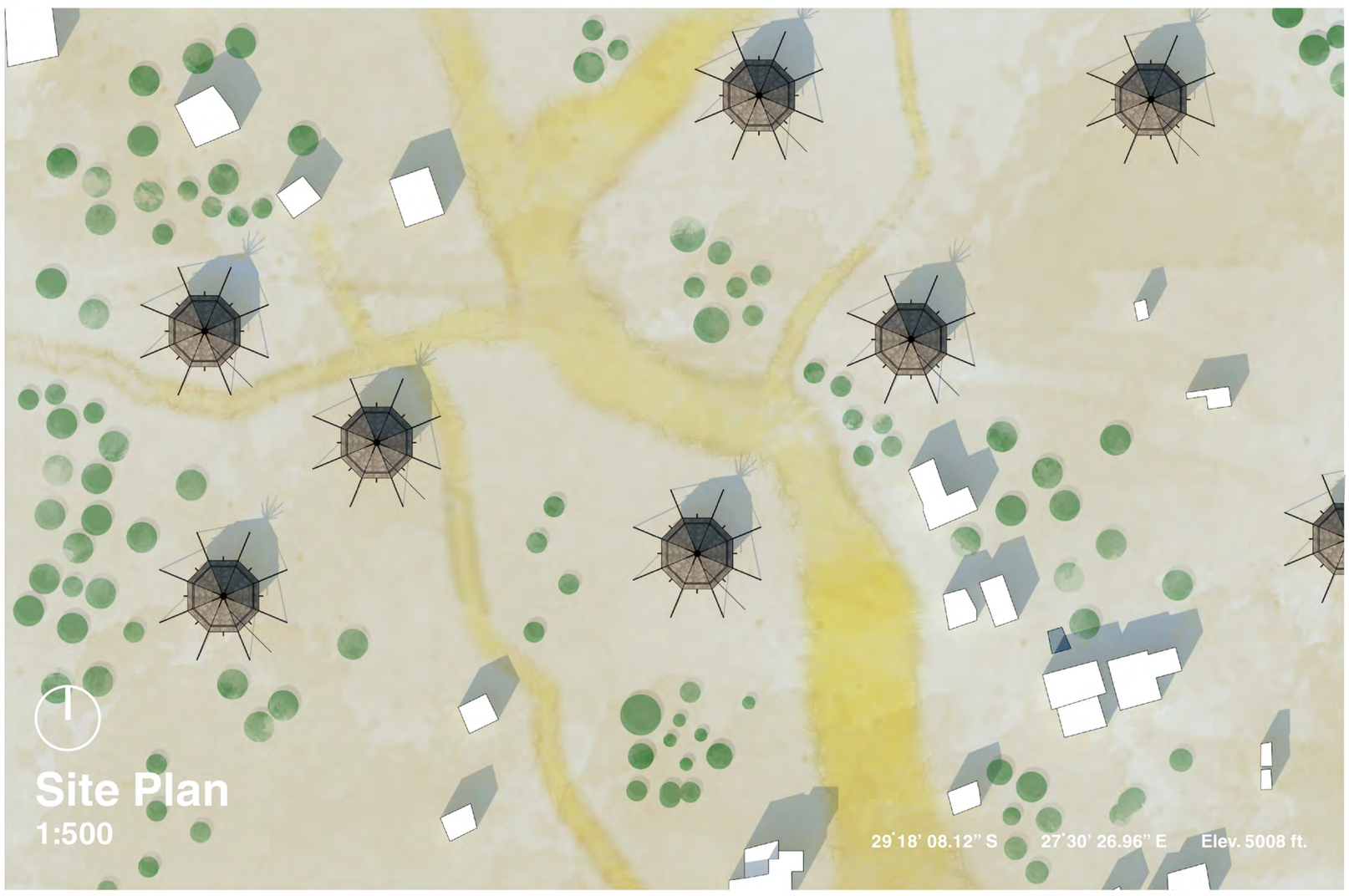
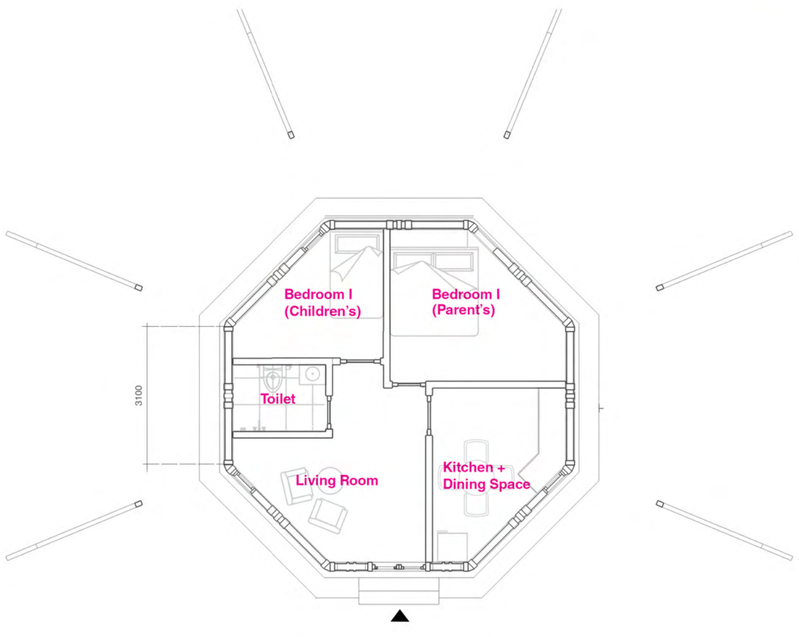
View



Site Plan
1:500

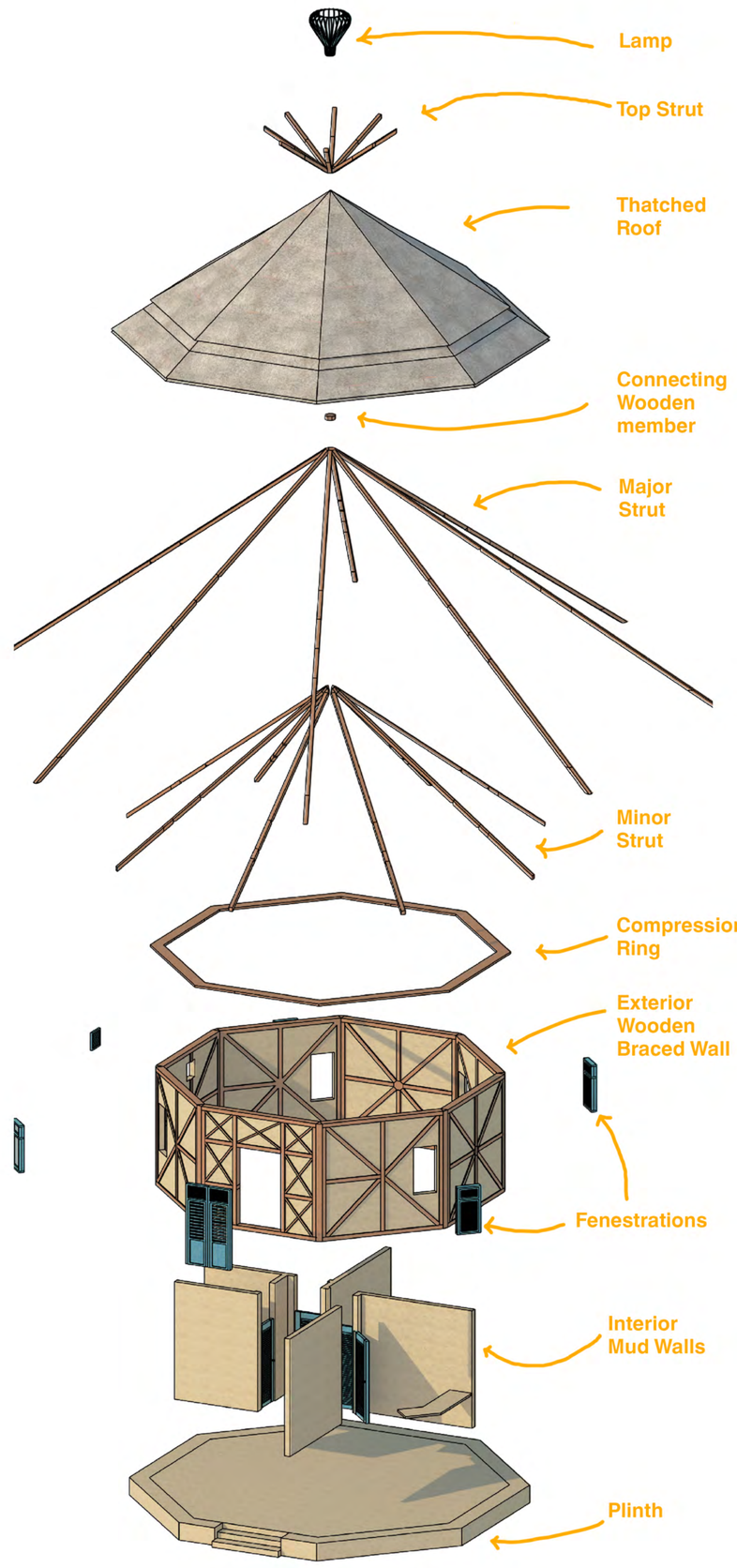


Floor Plan
1:100

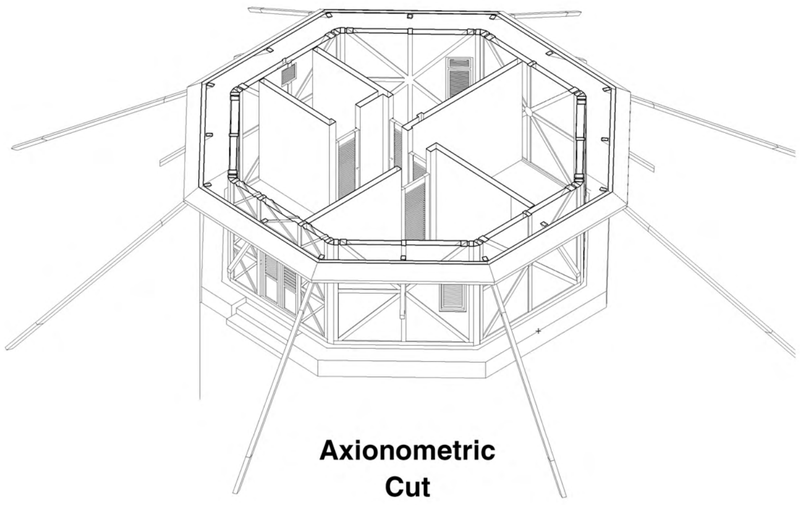
Elevation
1:100

Section A-A
1:100

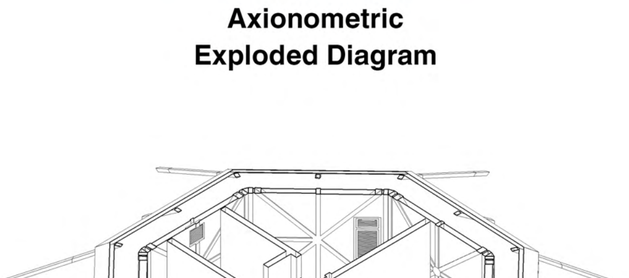
Section B-B
1:100



Axionometric
Exploded Diagram

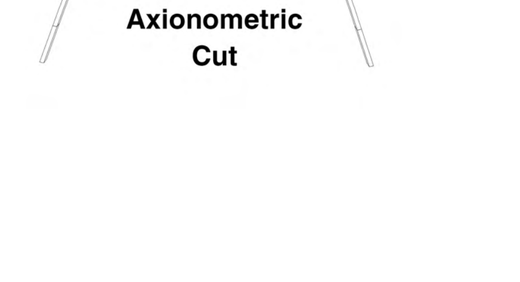


Axionometric
Cut



Detail A

Detail B



Detail B
(alternate version)

Detail C

Joinery
Details

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Project Cost Estimate

S.No.	Cost of material	Cost per length/sq.m	Area S.No. occupied	Total Area
1.	Sawn Pine Timber Rafters (Dhajji Wall)	M24/m	27.2 x 8 x 24 (Length per wall x Number of walls x Cost of timber rafter)	5222.5 LSL
2.	Sawn Pine Timber Rafters (Long)	M24/m	11.4 x 8 x 24 (Length per rafter x Number of rafters x Cost of timber rafter)	2188 LSL
3.	Sawn Pine Timber Rafters (Long)	M24/m	6.5 x 8 x 24 (Length per rafter x Number of rafters x Cost of timber rafter)	1248 LSL
4.	Thatched Roof	M300/sq.m	139.3 x 300 (Total area of thatched roof x Cost of thatched roof/sq.m)	41790 LSL
5	Mud	-	-	0 LSL
6.	Window (600 x 900)	M420	4 x 420 (Total number of windows x cost per window)	1680 LSL
7.	Door (1200 x 2100)	M900	5 x 900 (Total number of doors x cost per door)	4500 LSL

References:

1. https://www.doorsdirect.co.za/925mm-high-windows-small-pane-economy-window-range (for window)
2. https://www.avforums.co.za/index.php?topic=29934.0 (for thatched roof)
3. https://riseint.org/ritc2018/questions-answers/ (for sawn timber rafters)
4. https://www.doorsdirect.co.za/semi-exterior-doors (for doors)
5. https://unhabitat.org/wp-content/uploads/2016/02/Lesotho%20Urban%20Housing%20Profile_1.pdf (for stone aggregate)