

rise in the city 2018

Affordable Urban Housing Competition



CULTURAL

The architecture is inspired by the traditional ‘Basotho Hut’ Rondavel, popular in the high-lands and distinctive to the Lesotho landscape and cultural heritage. Although they serve to keep the residents warm in winter and cool in the summer, rondavels lack in comfort & privacy, particularly for larger families. Hence this type of construction is slowly disappearing to make way for modern buildings that provide a more progressive way of living.



SUSTAINABILITY

Lesotho has a massive recycling crisis and cannot cope with the amount of waste produced. A way of helping with the issue is to find creative uses for waste that will otherwise end up in landfills or burnt, producing toxic fumes and greenhouse gases. These proposed type of houses, made from plastic bottles that are 8” tall x 2.25” in diameter (16.9 oz.), filled with dug out soil or other construction site waste, laid out in rows like bricks and bound together with mud, provide low-cost homes that are sturdy, naturally well insulated, bullet-proof and resistant to earthquakes. Aluminum cans are also one of the highest causes of pollution. A roof made of recycled cans turns ‘this problem’ into a beautiful and functional solution. The shape of the shingles are also a great way to harvest rain water. See the DIY instructions included with the budget.

GEOGRAPHY

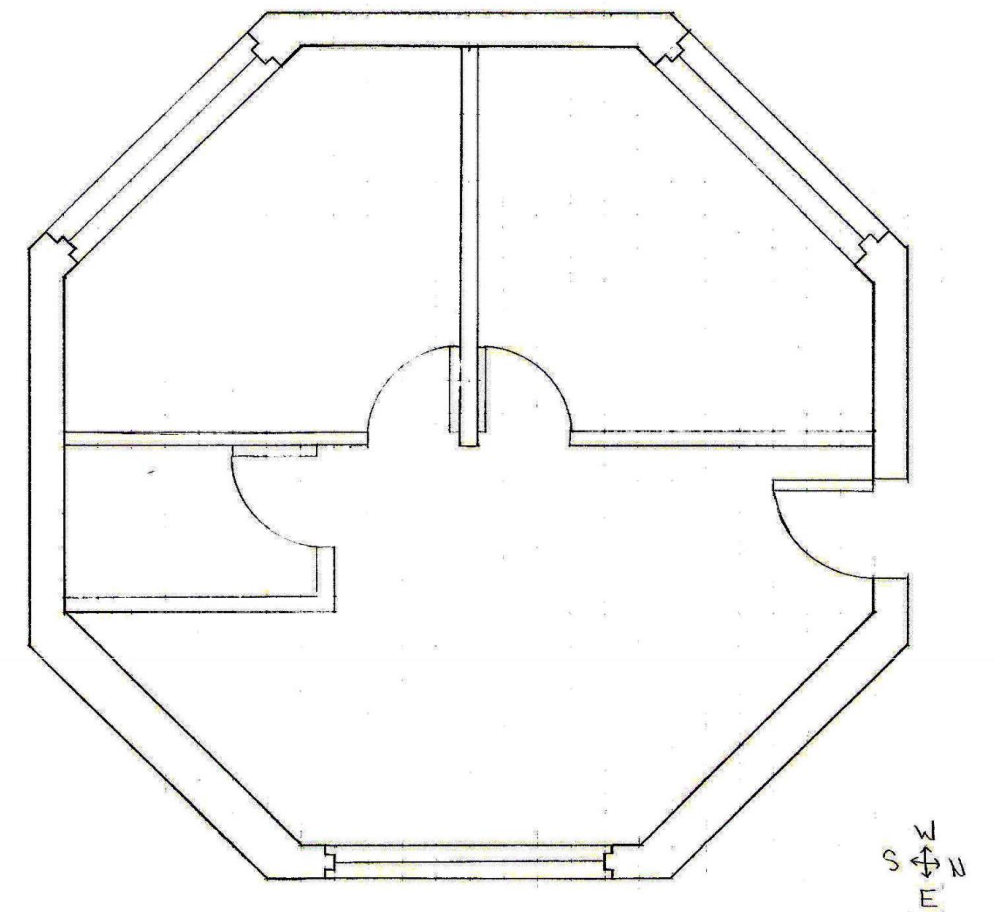
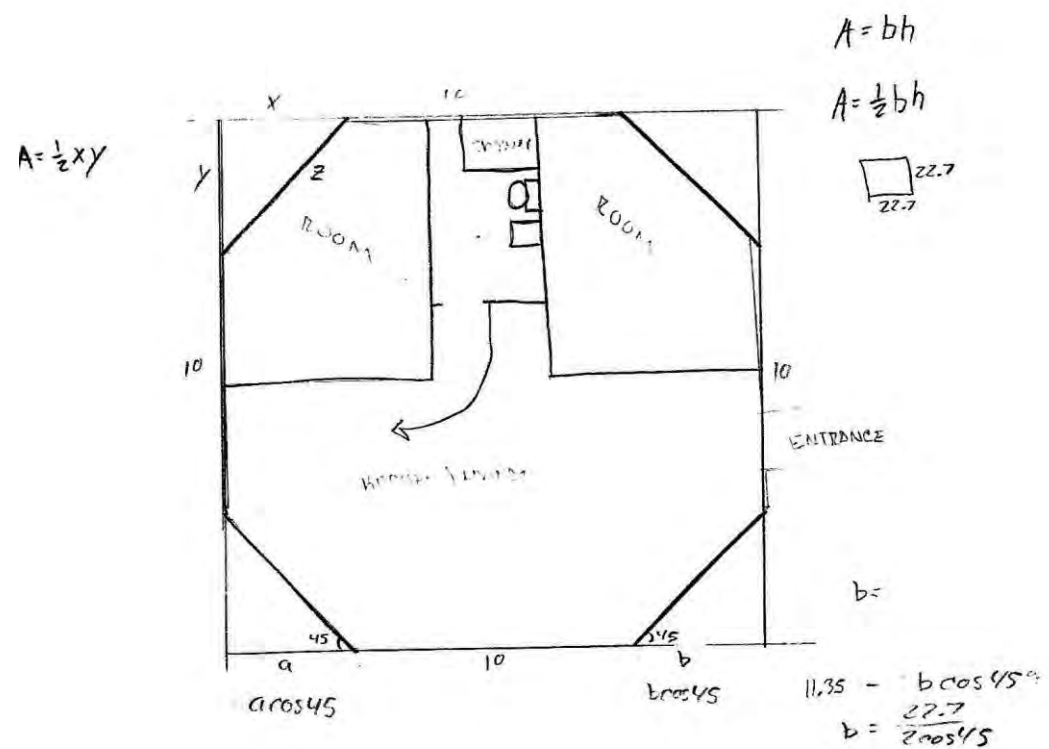
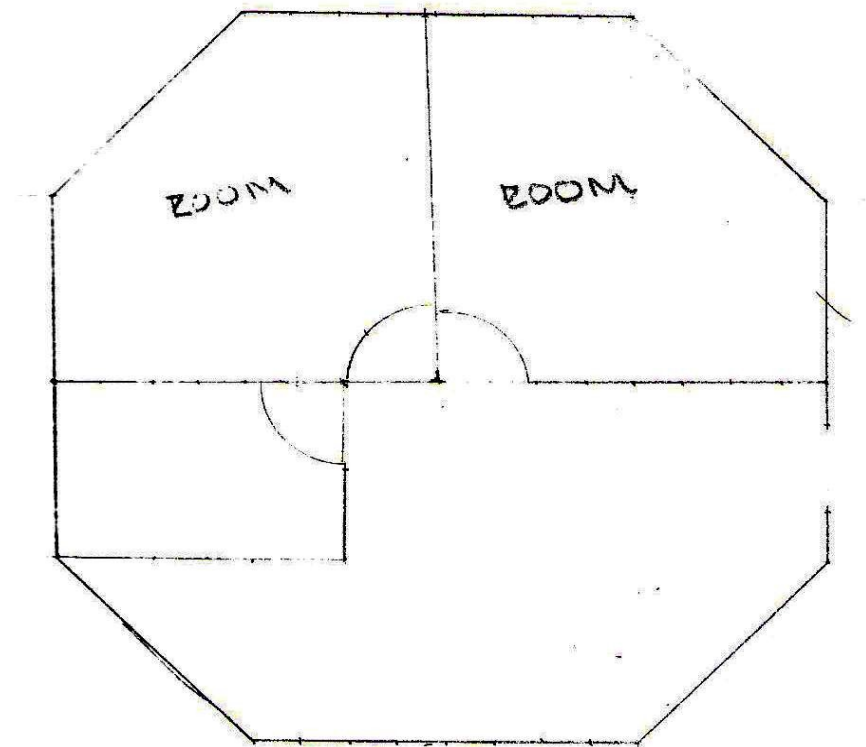
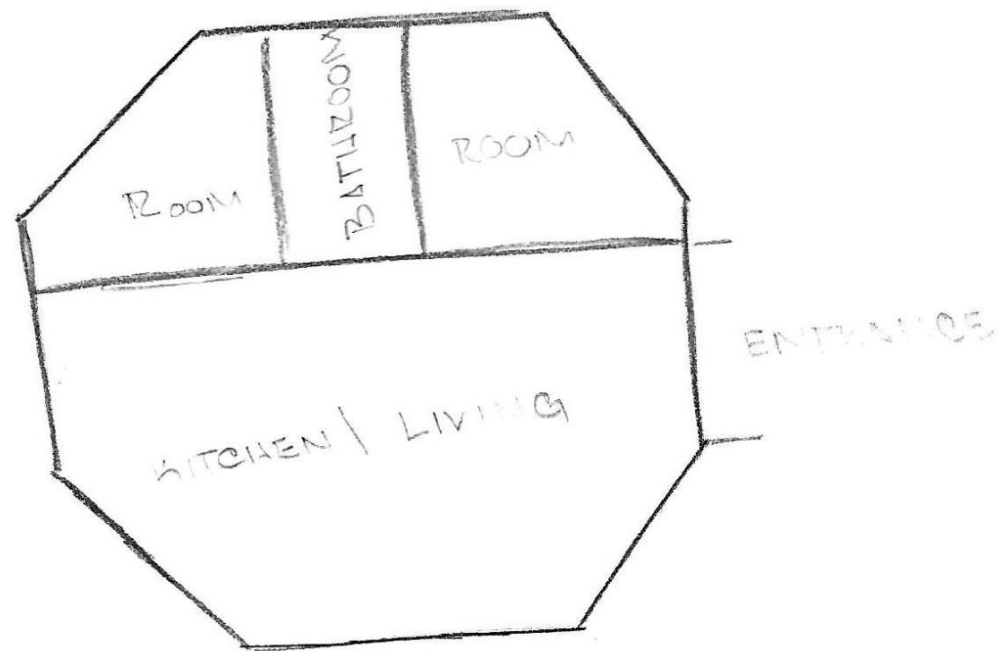
Due to the mountaineous landscape, Lesotho has a seemingly endless source of sandstone, hence the use of this stone can be quite inexpensive. In addition, the very compact soil, can be used to build bricks.

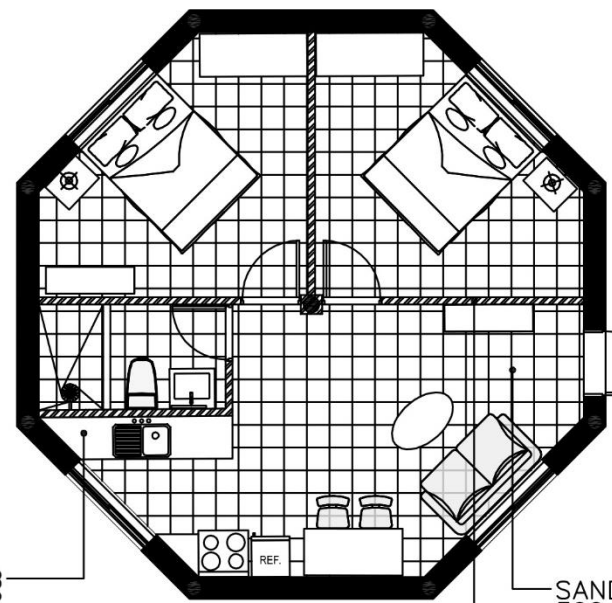
Because of the large sedimentary rock deposits available in most parts of the country, experts say that sandstone mining has the potential to continue for the next 100 years. This will not only provide a great local source of material for construction that could be affordable to the population, but creates employment and the potential to help the Lesotho industry development and the country’s own economy.



INTO THE FUTURE

Building with more sustainable means and harvesting more of the natural resources available is an important part of this proposal, although perhaps a bit costly to begin with. Due to its location and altitude, Lesotho can harvest a great deal of solar power, that could help a small dwelling unit provide enought electricity to run basic electronics. Solar energy can also be used to power a larger scale rainwater harvesting system that could help the months of severe drought.

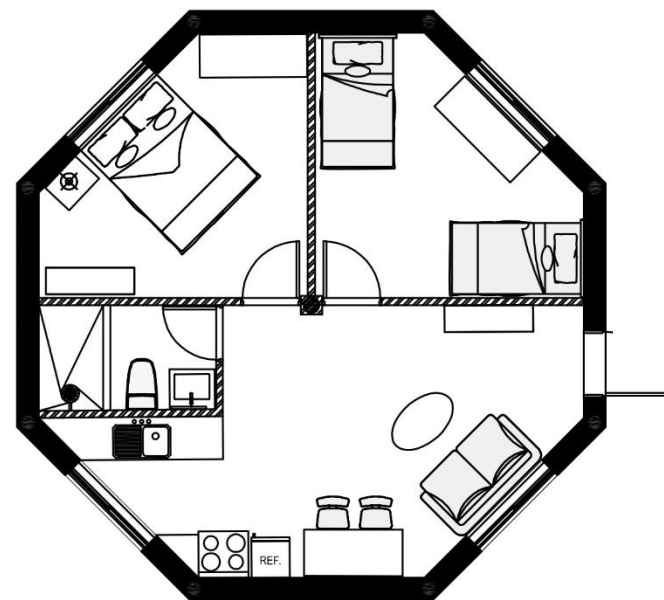




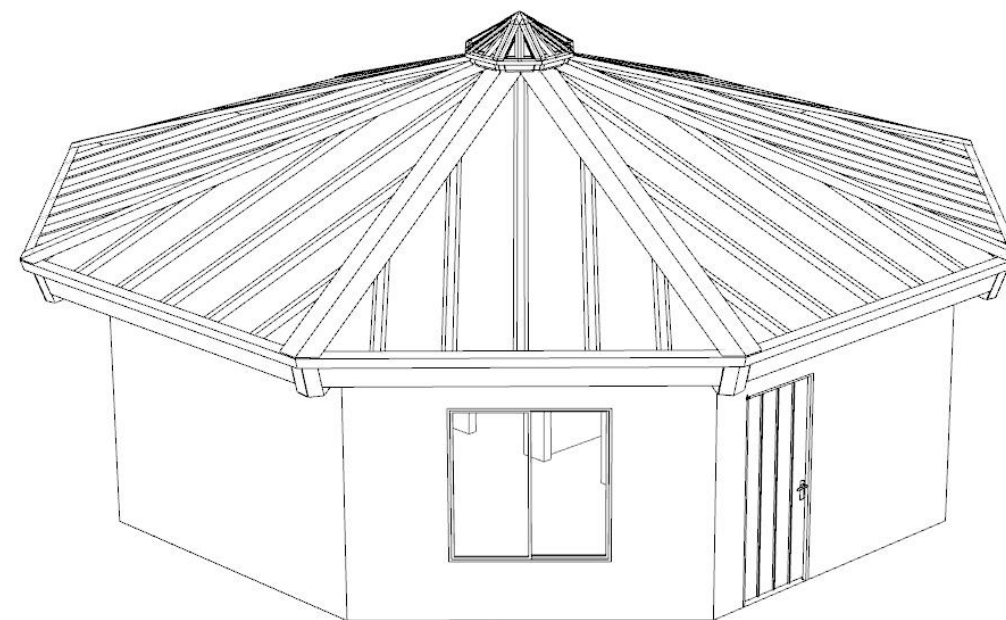
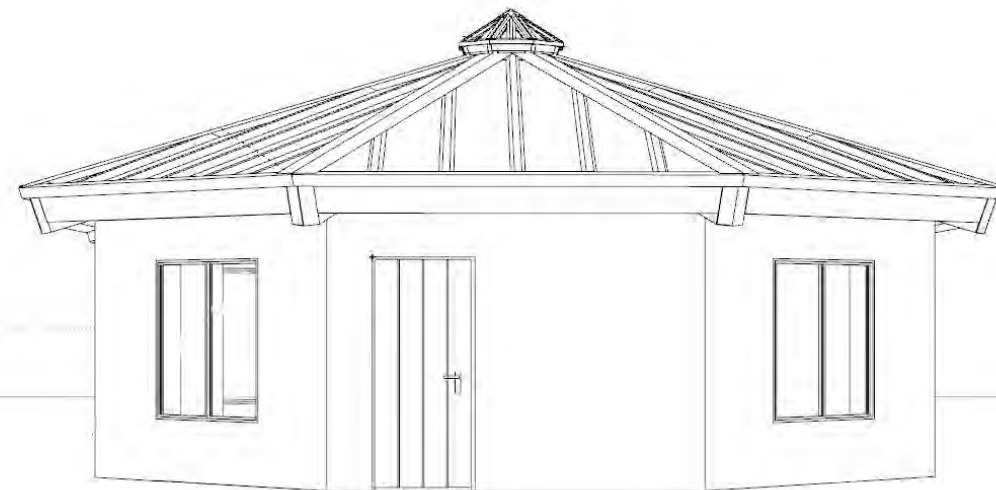
SANDSTONE SLAB
KITCHEN COUNTER

SANDSTONE FLOOR TILES
300 x 300mm

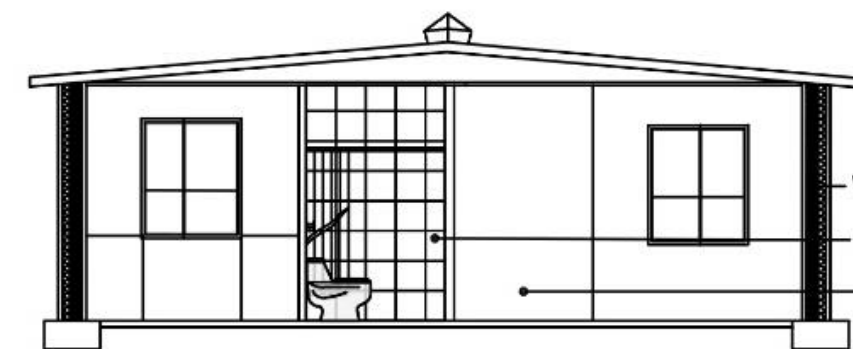
GYPSUM BOARD
DIVIC



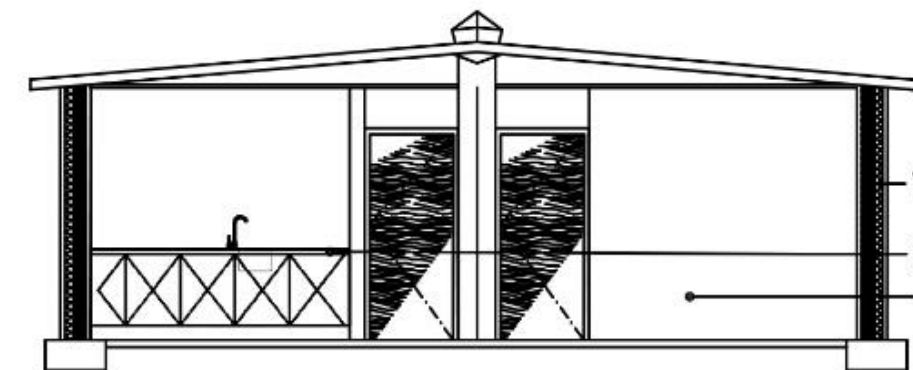
FLOOR PLANS



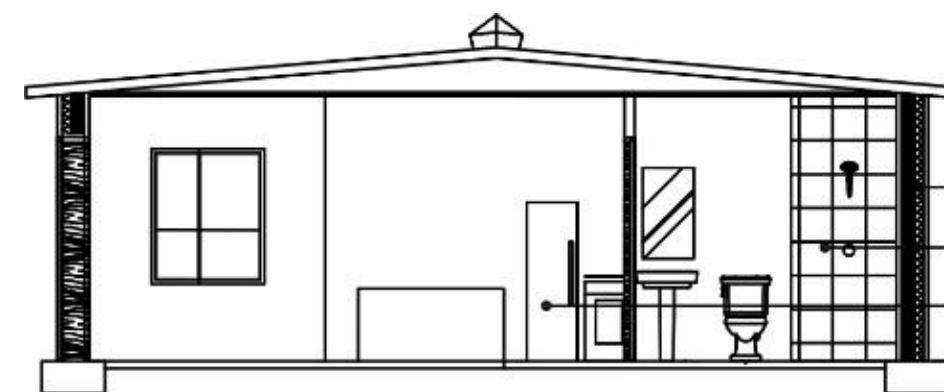
3D VIEWS



WATER BOTTLES
SANDSTONE TILE
PAINT

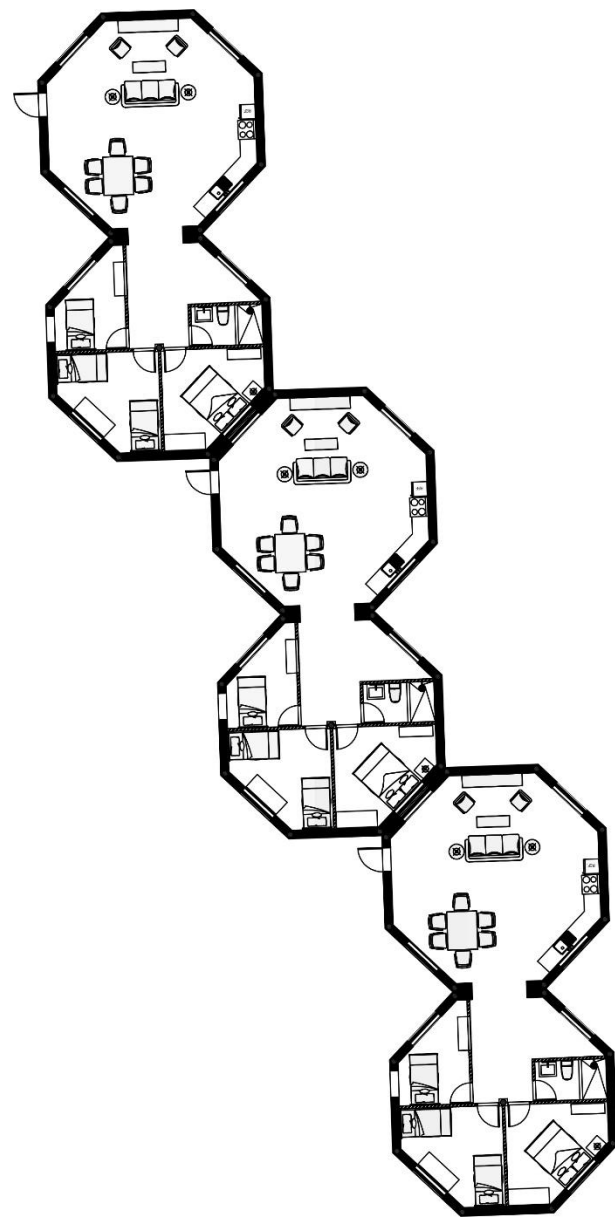


WATER BOTTLES
SANDSTONE TILE
PAINT

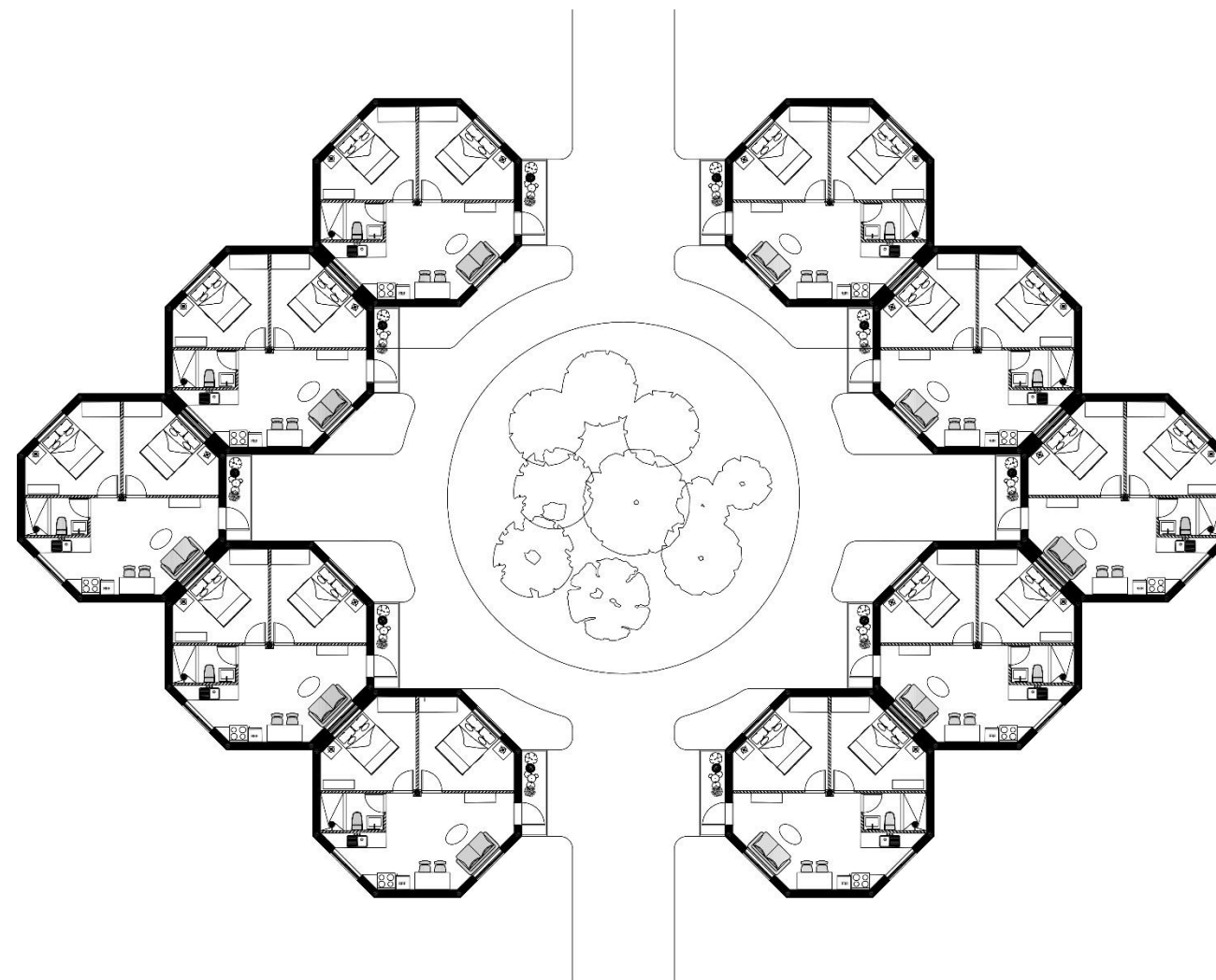


WATER BOTTLES
SANDSTONE TILE
PAINT

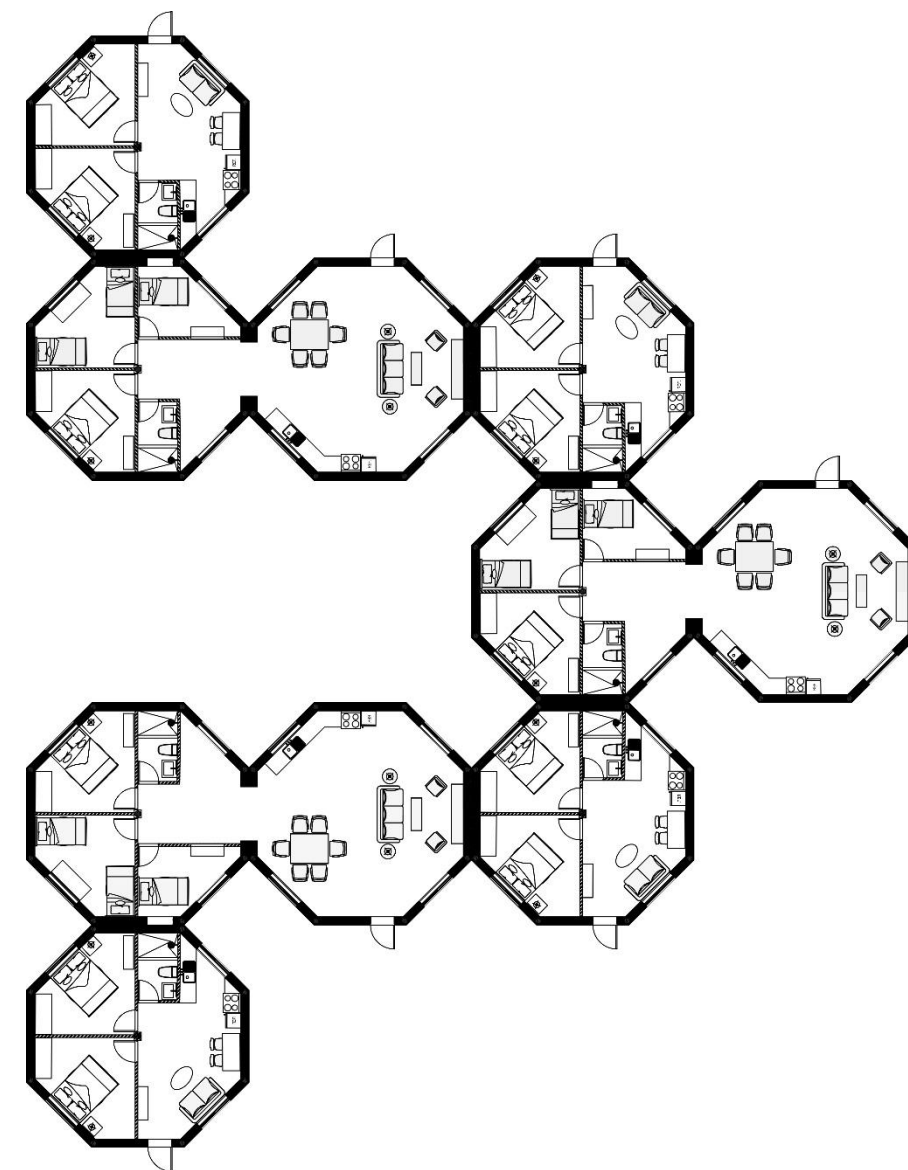
ELEVATIONS



DOUBLE MODULE UNITS



SINGLE MODULE UNITS



COMBINATION UNITS



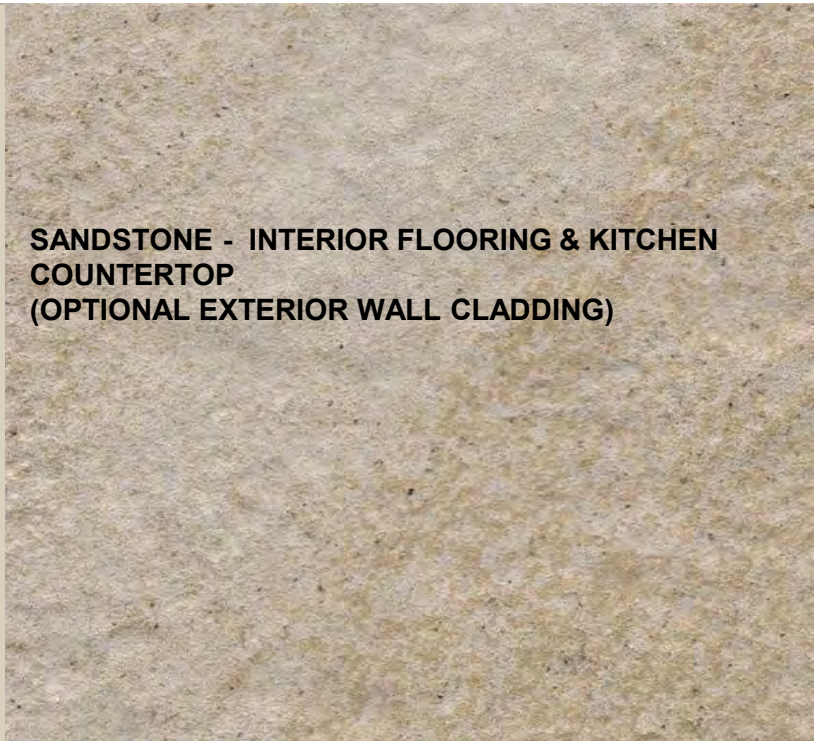
RECYCLED ALUMINUM CANS - ROOFING



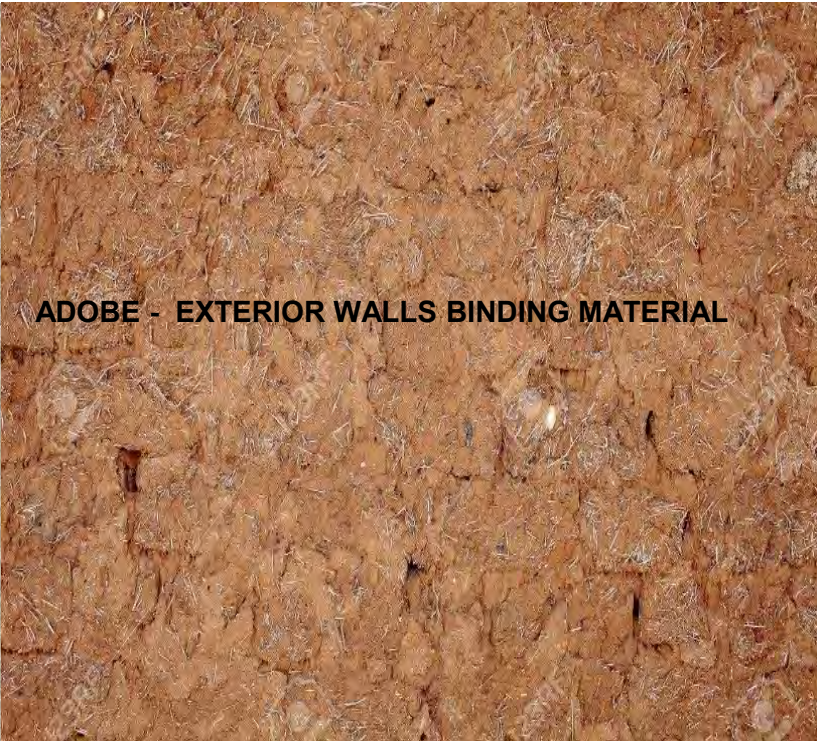
RECYCLED WATER BOTTLES – EXTERIOR WALLS



PAINT – INTERIOR & EXTERIOR WALLS



**SANDSTONE - INTERIOR FLOORING & KITCHEN COUNTERTOP
(OPTIONAL EXTERIOR WALL CLADDING)**



ADOBE - EXTERIOR WALLS BINDING MATERIAL



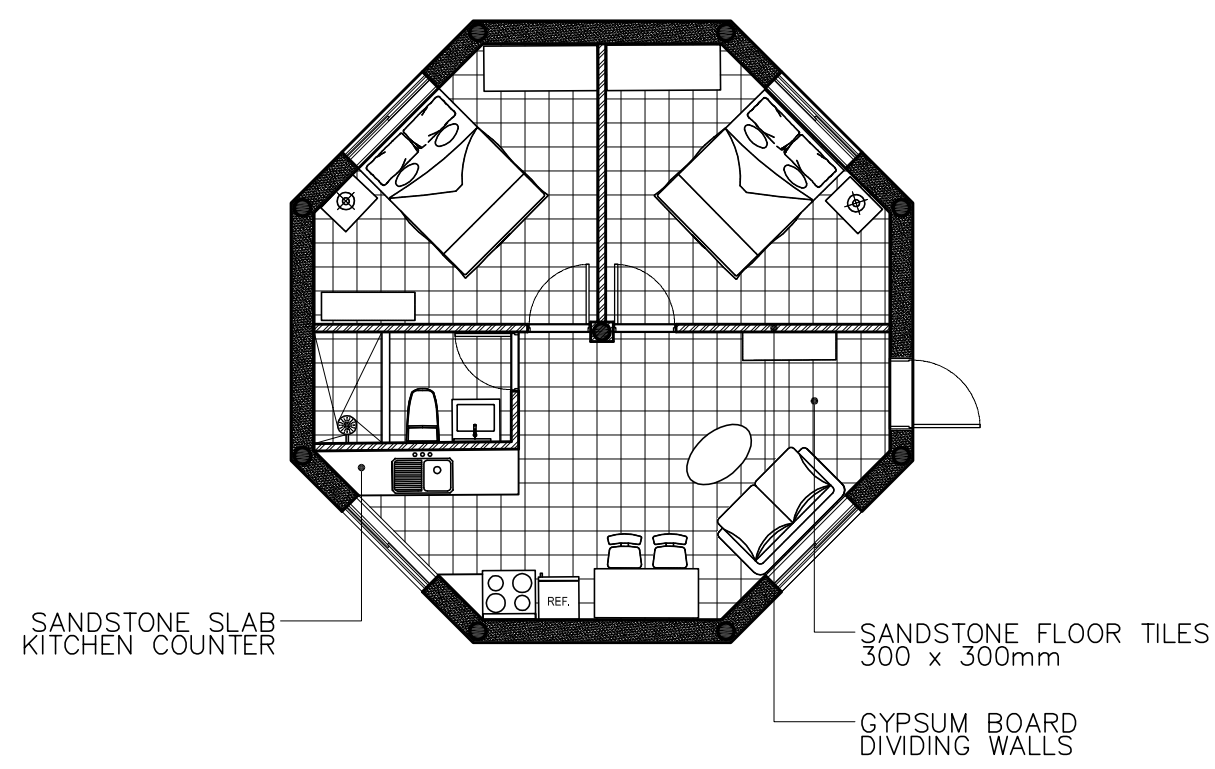
'BATH FITTER' ACRYLIC, STAIN & MILDEW-RESISTANT SHOWER SURROUND & PAN



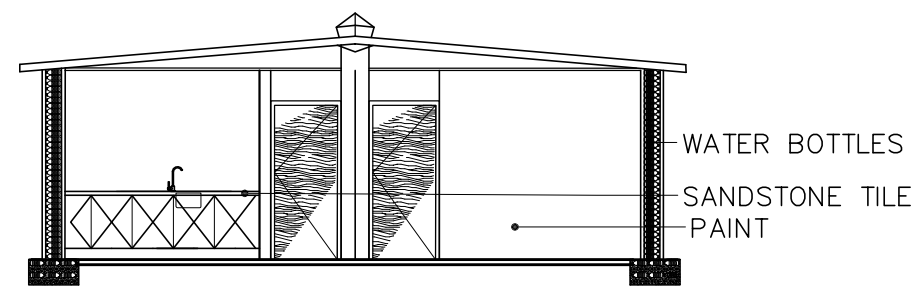
MATERIALS & FIXTURES BOARD

An aerial photograph of a city, likely Johannesburg, South Africa, showing a dense urban area with various buildings, including a large stadium in the foreground, and rolling hills in the background. The text "THANK YOU" is centered over the city.

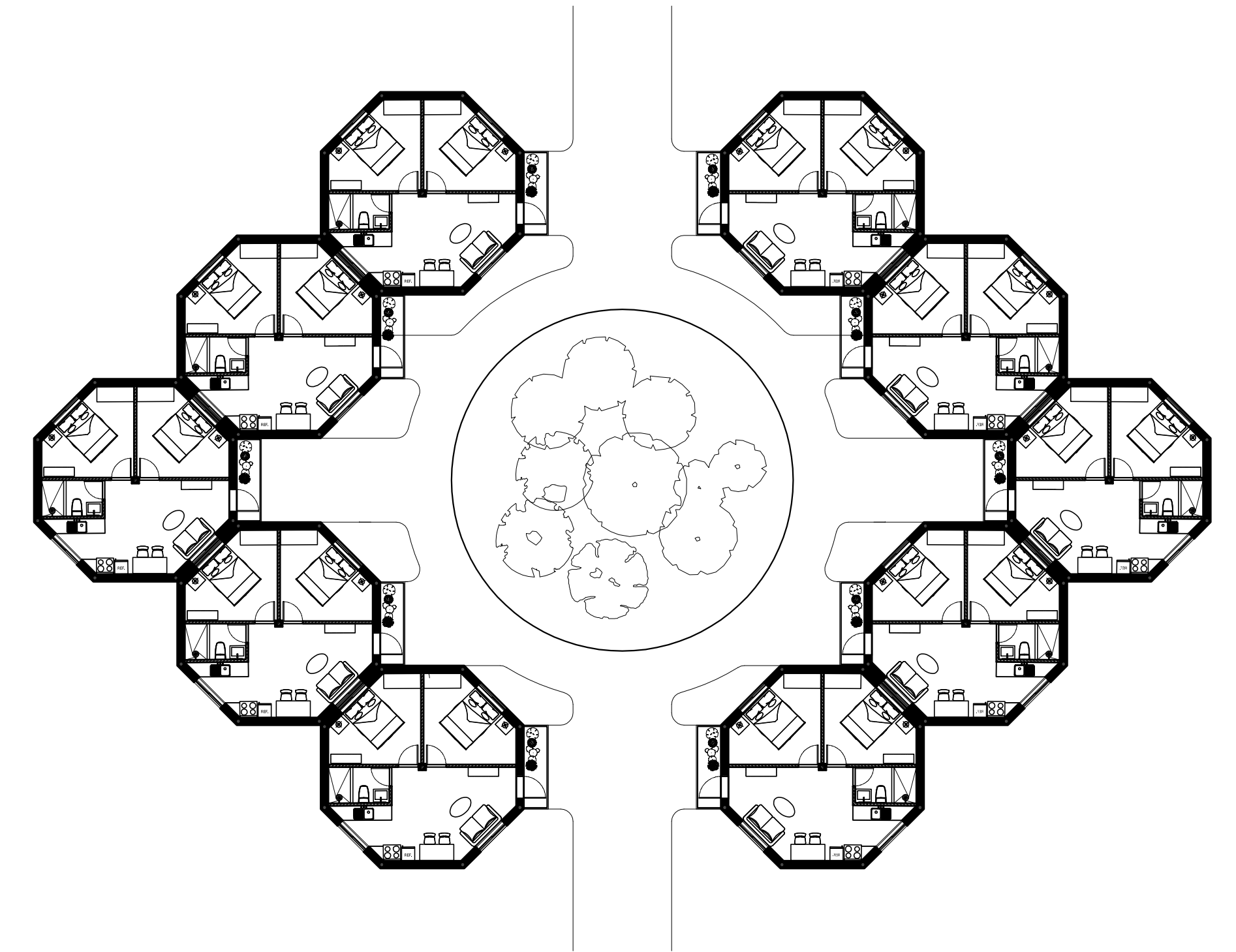
THANK YOU



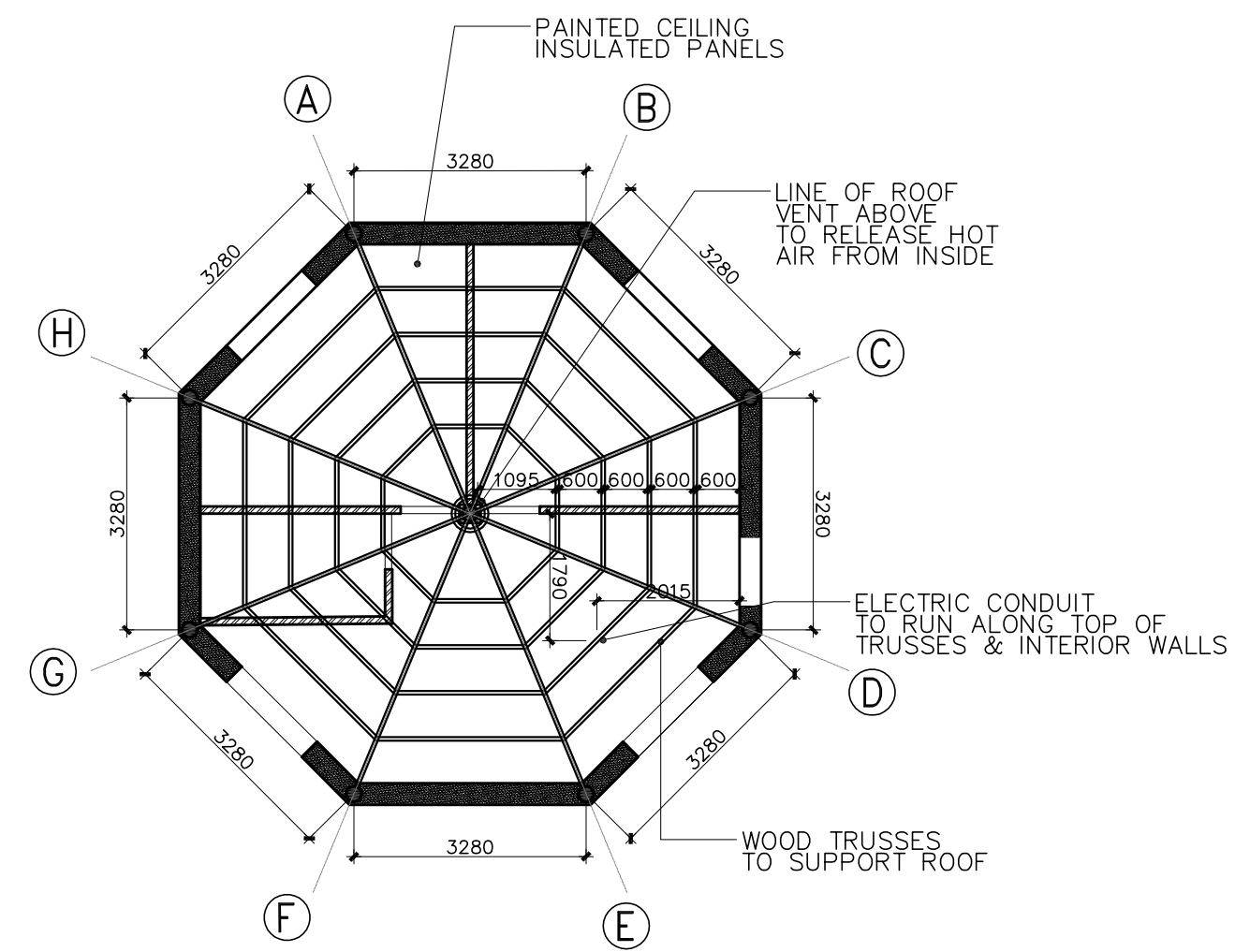
FF FURNITURE & FINISHES PLAN 1:100



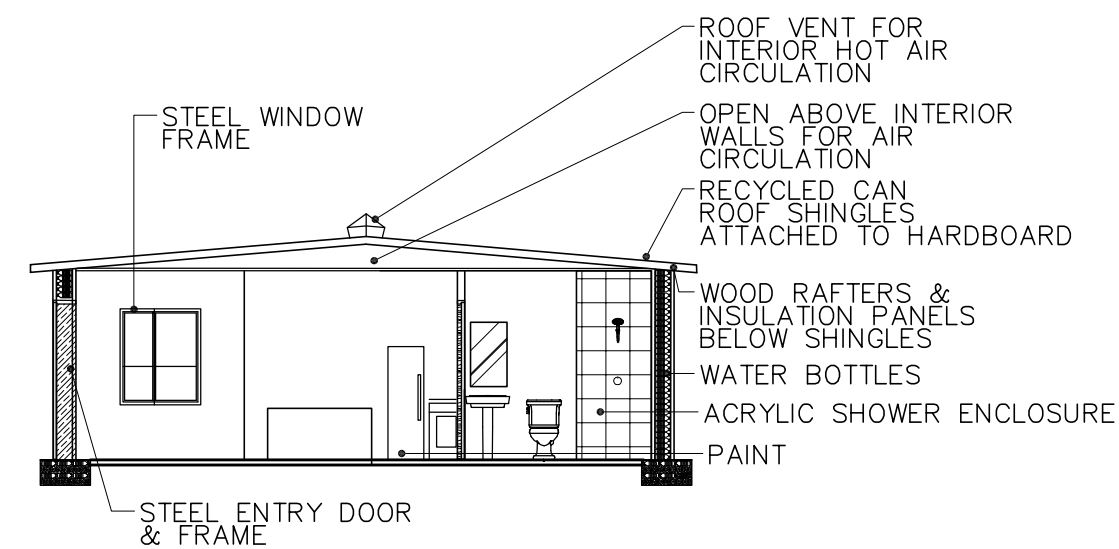
1 SECTION / ELEVATION 1:100



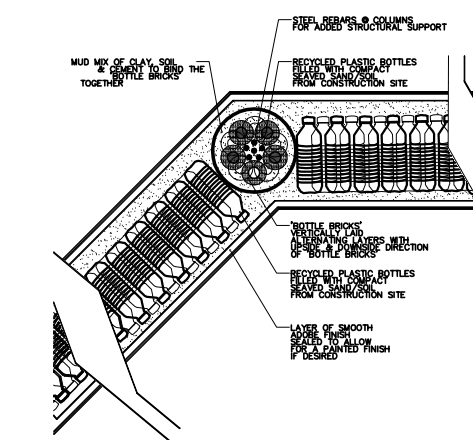
6 SITE PLAN - SUGGESTED HOUSING DEVELOPMENT 1:200



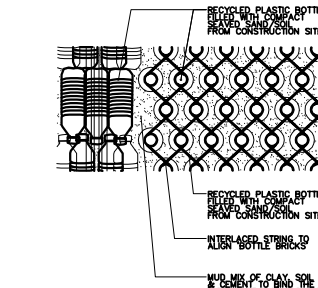
RC REFLECTED CEILING PLAN 1:100



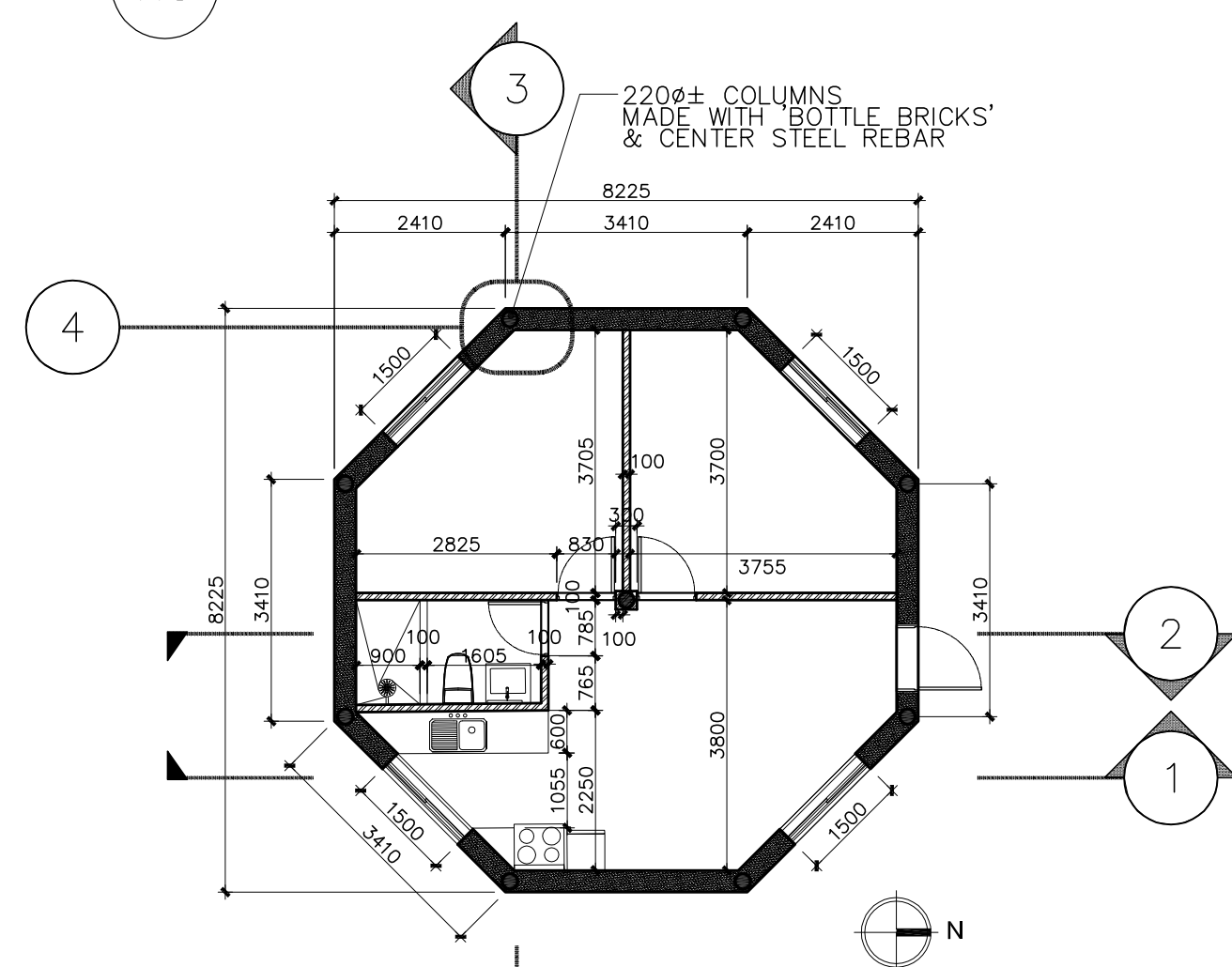
2 SECTION / ELEVATION 1:100



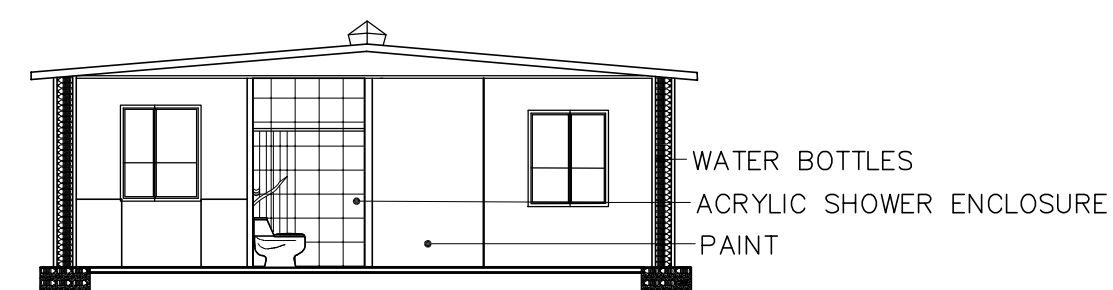
4 DETAIL - HORZ. 1:20



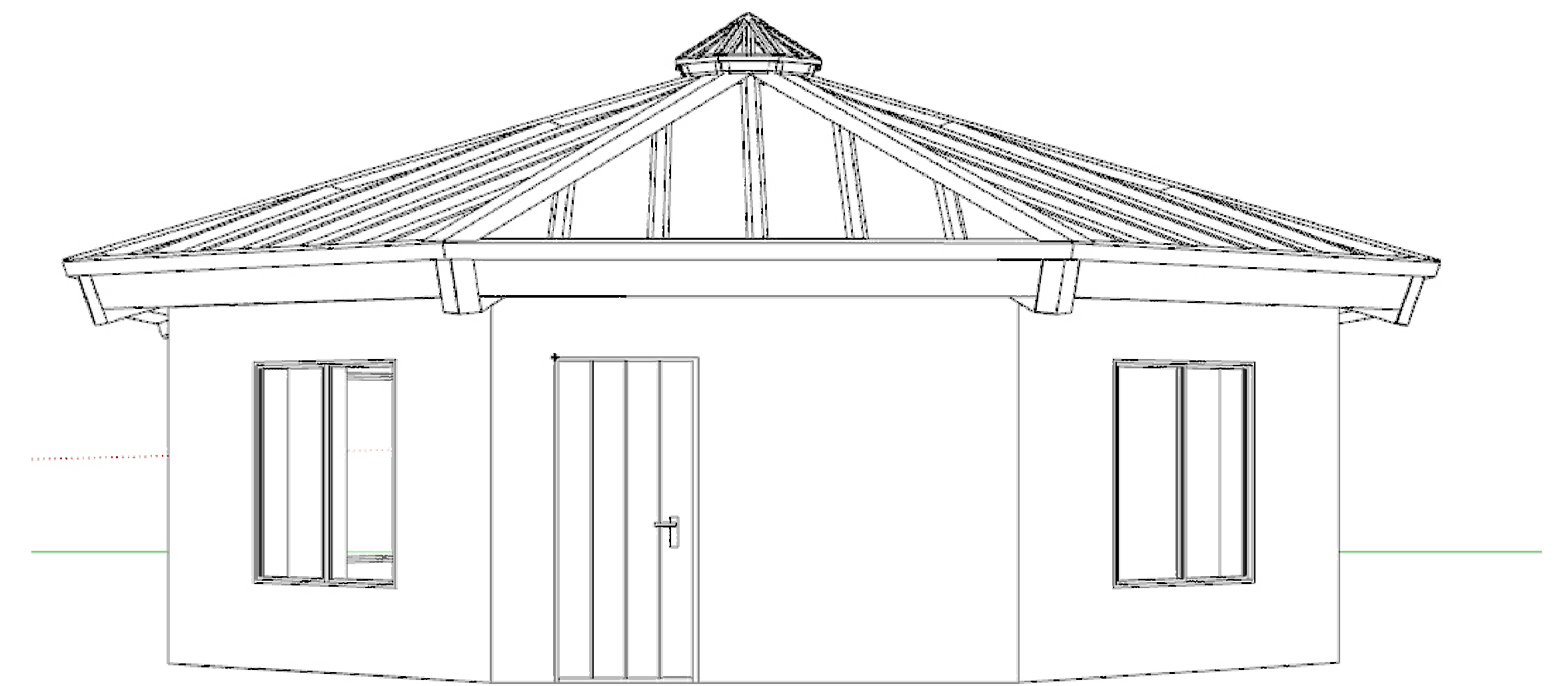
5 DETAIL - VERT. 1:20



AR ARCHITECTURAL INFORMATION PLAN 1:100



3 SECTION / ELEVATION 1:100



7 3D VIEW N.T.S.

rise in the city 2018

Affordable Urban Housing Competition

PROJECT COST ESTIMATE**5

CONSTRUCTION LINE ITEM	UNIT	APPROX. QUANTITY	APPROX COST (LSL)	APPROX. TOTAL COST (LSL)
Premix / Cement Bag	50Kg.	25	LSL 78.95	LSL 1,973.75
Wood Framing / Rafters	lm	360	LSL 24.00	LSL 8,640.00
Reinforced Steel Rebar (Columns)	lm	120	LSL 11.50	LSL 1,380.00
Hardboard (Roof & Floor Substrate)	m²	50	LSL 30.00	LSL 1,500.00
Gypsum Board (Interior Walls)	m²	50	LSL 33.50	LSL 1,675.00
Roofing IBR (Recycled Cans)**1	m²	50	LSL 0.00	LSL 0.00
Insulation Panels	m²	50	LSL 30.00	LSL 1,500.00
Sandstone Flooring	m²	50	LSL 200.00	LSL 10,000.00
Sandstone Decorative Exterior Cladding (Optional)	m²	-	LSL 0.00	LSL 0.00
Doors (Masonite) & Frame (Steel)	units	3	LSL 400.00	LSL 1,200.00
Entry Door & Frame (Steel) with Lockset	units	1	LSL 1,200.00	LSL 1,200.00
Windows	units	4	LSL 1,500.00	LSL 6,000.00
Paint (Interior)	20 litres	3	LSL 185.00	LSL 555.00
Paint (Exterior)	20 litres	4	LSL 745.00	LSL 2,980.00
Experienced Labor (8 hrs/day)	day	30	LSL 140.00	LSL 4,200.00
Donated Labor*2 (8 hrs/day)	day		LSL 0.00	LSL 0.00
TOTAL CONSTRUCTION ITEMS				LSL 42,803.75

PLUMBING FIXTURES*3	UNIT	QUANTITY	APPROX COST (LSL)	APPROX. TOTAL COST (LSL)
Toilet + Seat	set	1	LSL 1,185.00	LSL 1,185.00
Sink	unit	1	LSL 1,105.00	LSL 1,105.00
Mixer + Pop-up drain	set	1	LSL 600.00	LSL 600.00
Shower Mixer, Arm & Head	set	1	LSL 715.00	LSL 715.00
Shower Pan & Walls System (Donated by Bath Fitter)	unit	1	LSL 0.00	LSL 0.00
Kitchen Sink & Waste Strainer	unit	1	LSL 750.00	LSL 750.00
Kitchen Faucet	unit	1	LSL 1,090.00	LSL 1,090.00
TOTAL PLUMBING FIXTURES				LSL 5,445.00

TOTAL APPROXIMATE PROJECT COST **LSL 48,248.75**

WISHLIST OF ADDITIONAL ITEMS*4	UNIT	QUANTITY	APPROX COST (LSL)	APPROX. TOTAL COST (LSL)
Grey Water Sink & Toilet Unit (Roca)	unit	1	LSL 26,660.00	LSL 26,660.00
Off-Grid PV Solar Panel System & Backup Battery	unit	1	LSL 30,000.00	LSL 30,000.00
Rainwater Harvesting, Filter & Tank System (5,000 gallons)	unit	1	LSL 35,825.00	LSL 35,825.00

NOTES*:

1. See addendum for instructions on how to make this roofing material out of recycled cans.
2. The majority of this project is based on the hopeful use of the younger population and their ability to learn a particular skill, as they are trained by trade experts. Once they are properly trained, these houses could potentially be built by the own future residents, their families and friends. This could greatly help the entire community by way of helping each other. The average time to build this type of house is approximately 6 weeks and approximately 15,000 bottles are needed.
3. Except for the shower pan & wall system donated by Bath Fitter, all the plumbing items were sourced from www.plumbblink.co.za - South Africa.
4. These add-on items are quite costly initially, however they will provide long term savings and sustainability for the residents.
5. Approximate prices sourced mainly from 'Built It' and 'Cashbuild'.

rise in the city 2018

Affordable Urban Housing Competition

ADDENDUM

RECYCLED CAN ALUMINUM SHINGLES DIY

Aluminum cans are one of highest causes of pollution. This roof allows to turn what would be more of a problem into a beautiful and functional solution. The shape of the shingles are also a great way to harvest water when it rains. For this DIY project one would need:

- Aluminum beer/soda cans
- 2 one foot 5/16 inch metal square rods
- 2 1x6 hardwood board

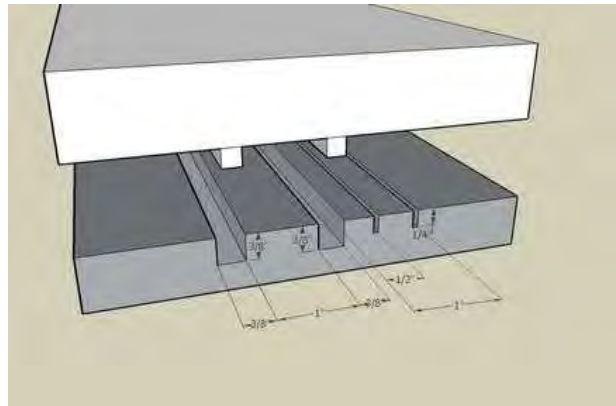
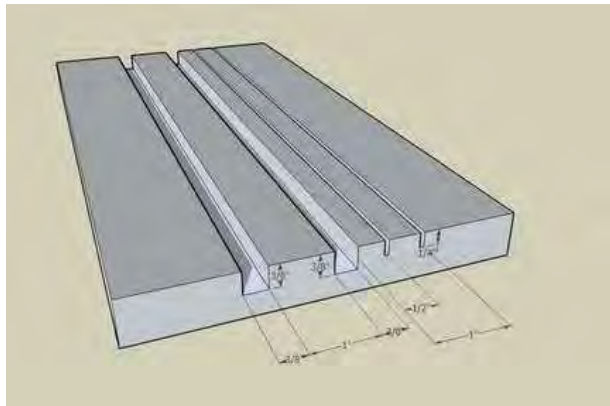
STEP 1: Prep the cans

1. Use scissors to cut top off at the seam where it bends
2. Cut down the center to the bottom and then cut off the bottom



STEP 2: Mark and cut

3. Mark the 1x6 hardwood boards to the measurements in the picture
4. Use a circular machine to cut the grooves



STEP 3: Attach square rods to wood

5. Drill holes in the end of the two 5/16 inch rods
6. Screw the rods onto the hardwood into the grooves



STEP 4: Clean and add hinge

7. Clean the cuts with chisel and hammer
8. Staple an aluminum can as a hinge to keep the wood lined up together



STEP 5: Insert pre-cut aluminum and press it

9. Insert the pre-cut aluminum cans and press them putting a lot of pressure to create the shingle.
10. The shingles made this way, can be layered to make them stronger.



STEP 6: Add foundation

11. Make a foundation of plywood

12. Start stapling the shingles on top of each other and add desired layers



STEP 7: Cap the top and edges of eaves

13. Fold an edge of some precut cans so they have a round exposed edge and staple

14. Overlap them across the ridge and edges where the eaves change direction/pitch.



For more information visit <https://youtu.be/twqdlTBAGKA>

rise in the city 2018

Affordable Urban Housing Competition

CONCEPT DESIGN STATEMENT

We all deserve a place to call home, a place where we can come to after a hard day of work or school, a place where we can reunite with our families and feel safe and comfortable, no matter what our income is. The design for this low-income housing project, is based on this idea, and with the idea of making our way of living more sustainable. The use of recycled waste, that will otherwise end in landfills, the use of materials with thermal mass, that will allow the use of less energy and fuel-based heating and cooling equipment, and harvesting natural resources, we can not only build a house, but also create a strong community that helps the environment and all who live in it.