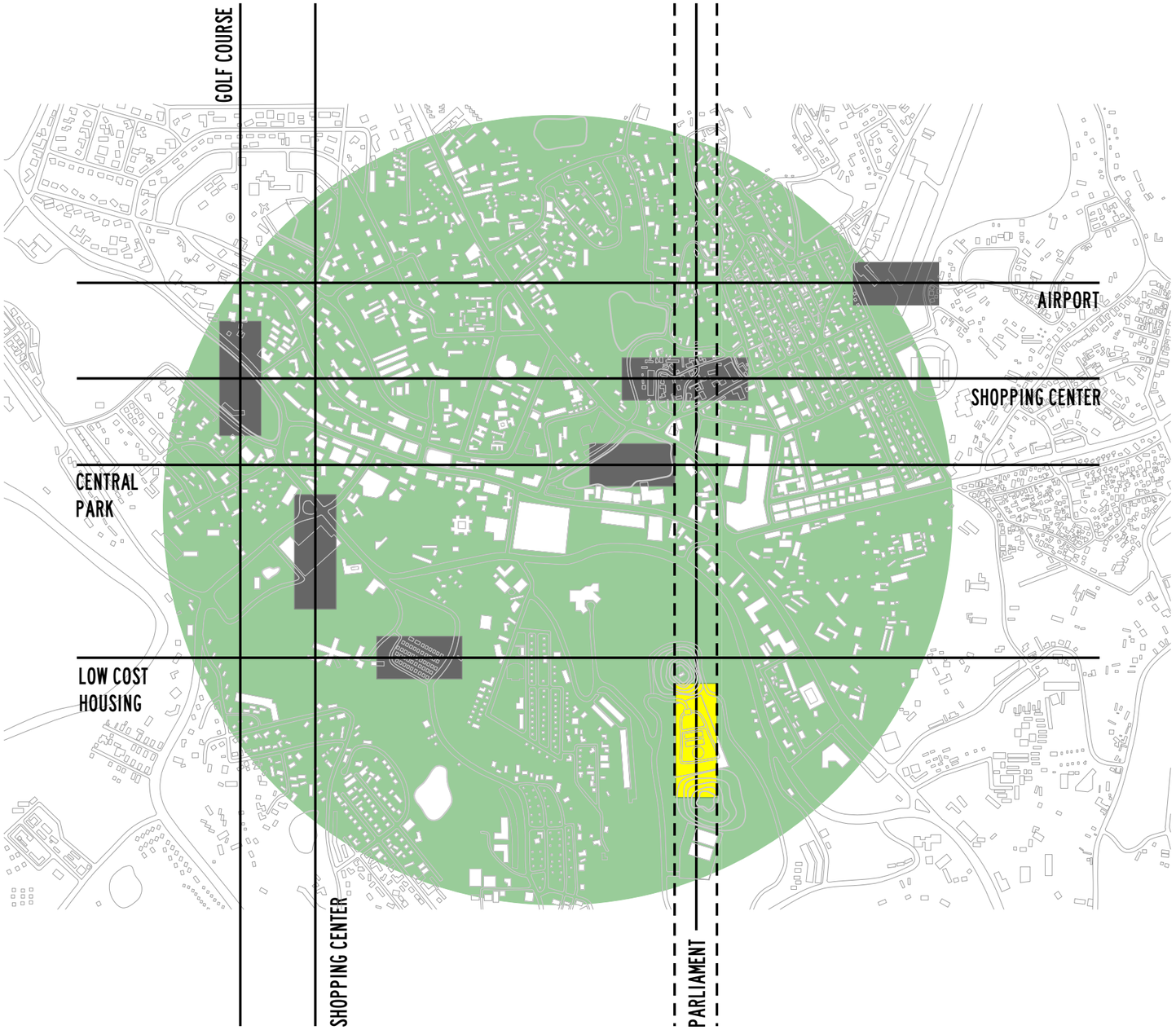
LINKED

AFFORDABLE HOUSING - MASERU, LESOTHO

The basic human right of access to safe and affordable housing has largely become a luxury for the lower-income inhabitants of a city. Throughout most of the world, affordable housing developments adopt a quick-build, low-cost approach that continuously falls short of delivering good, functional housing that leaves the occupants of the space with a feeling of dignity and pride.
It is becoming increasingly important that a system of housing be developed that not only delivers the basics but tackles broader community issues and sets up a more sustainable and resilient future for the city and its residents. This project deals with Maseru, Lesotho, a fast-growing urban capital city that needs to create innovative solutions to deal with its rapid development and urbanization. As a consequence, low-density urban sprawl with increasing numbers of informal settlements and a lack of basic service delivery to every inhabitant of the city has occurred.

The proposed Linked affordable housing is a building system that can be utilized by a multitude of demographics, a system that has no boundaries. It is a flexible wall module that can easily be used to expand a dwelling in any direction. The construction of Linked can be done with minimal skilled labour, reducing costs but also empowering and equipping locals with building knowledge and skills. The 7.5m² potential expansion space can accommodate either a single bedroom, bathroom, kitchen or living space and will roughly cost LSL 800.00 per m² and can easily be erected in under 5 working days. The LSL 50.000 budget can only be achieved through the power of the people and the use of local materials - by locals for locals. Each homeowner can be directly involved with the design and construction of their new home, an aspect which most low-cost developments lack.

A key economic factor in many African countries is trade. Low-income families are dependent on the trade of goods and services out of their homes in order to meet their financial needs. Additionally, with the rise of tourism and globalization, many of these low-income families are unable to reap any benefits from the boom of this industry. The design of the Linked affordable housing intends to create a footprint that allows for homeowners to develop a small liveable space that can be transformed into a small shop or accommodation space for tourists, allowing for families to benefit directly from tourism, trade and industry if needed. By creating this foundation, the possibility and opportunity for expansion becomes more accessible at a fraction of the cost (less than a third of the original building cost). Homeowners who wish to can then take full opportunity of the digital age we are in and possibly run an AirBnB from the small liveable space. If the home owner were to charge LSL 120.00 per night over 50 nights, the expansion cost will have been worked off. This will hopefully result in a well looked after urban space, inspiring the further city development and the installation of good infrastructure.



SITE ANALYSIS - MASERU

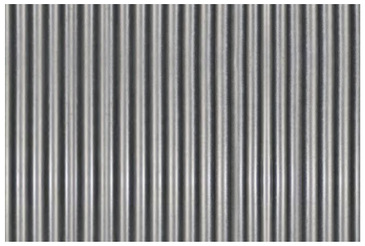
SCALE 1:250

TYPICAL CONSTRUCTION MATERIALS

THATCH

ROUGH CUT SAND STONE

WATTLE AND DUBE



CORRUGATED IRON

CONCRETE BLOCK WORK

LOCALLY FIRED ADOBE BRICKS

PROBLEMS FOUNDS

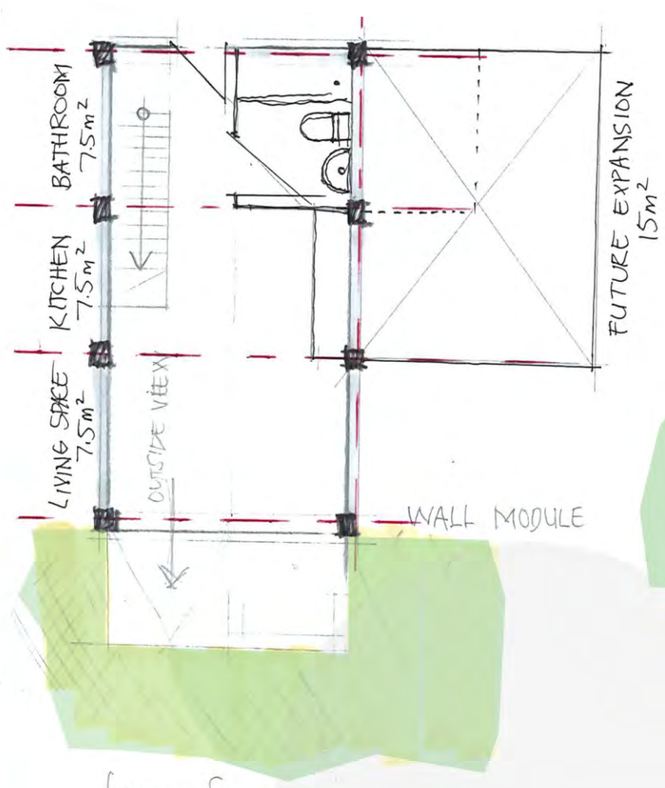
- Low density urban sprawl as a result of large erven with single dwellings
- Poor construction material quality
- No asset value to homes

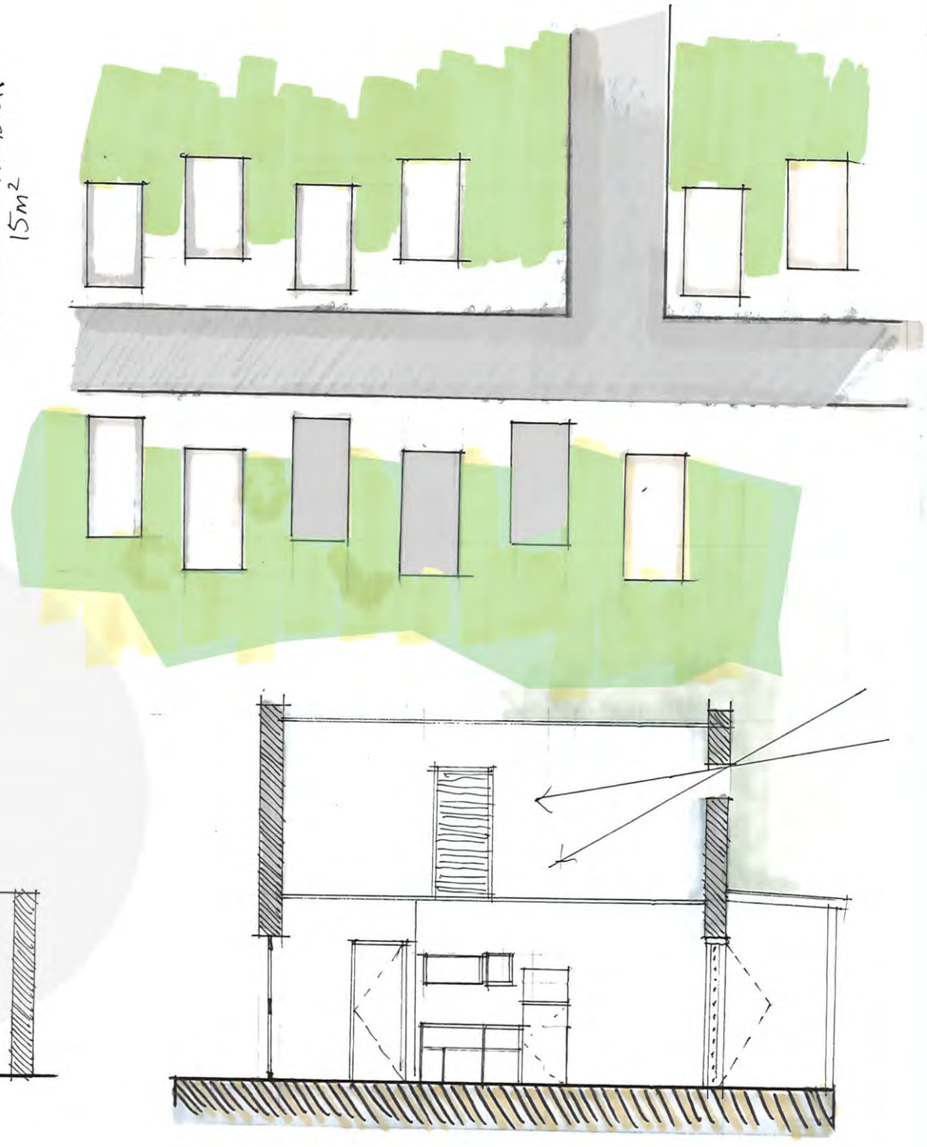
- Informal feeder roads
- Very little to no public edge

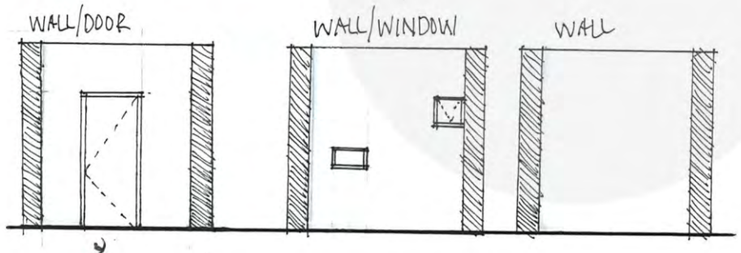
- Toilet disconnected from dwelling

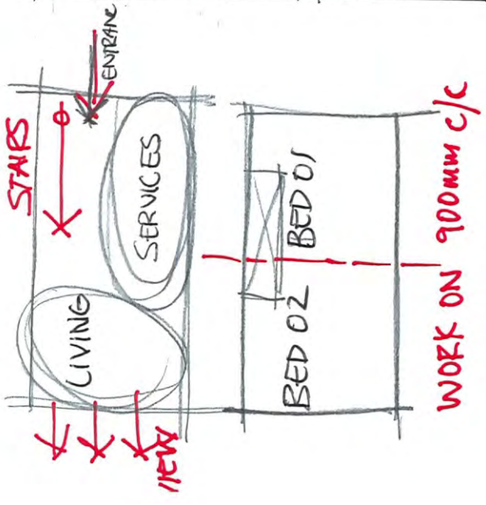
- Poor construction resulting in water issues
- Poor marriage of materials resulting in roofs needed to be anchored down with other material
- Constant maintenance required

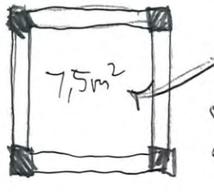
PROCESS WORK

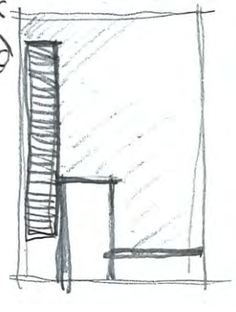


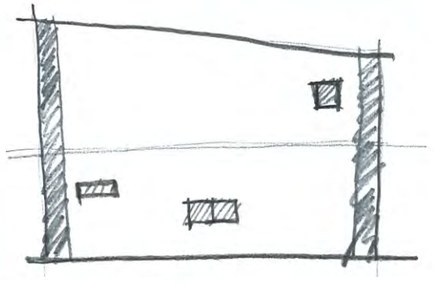


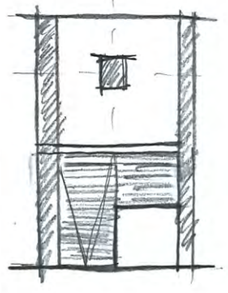


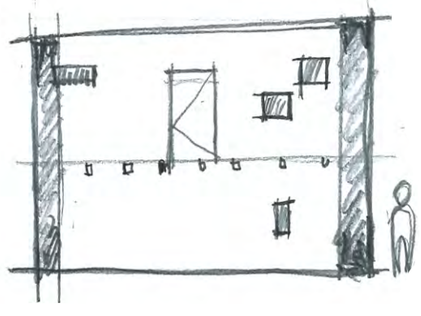




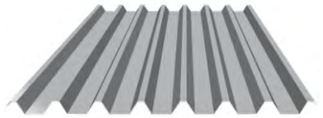








CONSTRUCTION MATERIALS



IBR ROOF SHEETS

CONSTRUCTION PINE

LOCALLY FIRED BRICKS

SAND BAGS

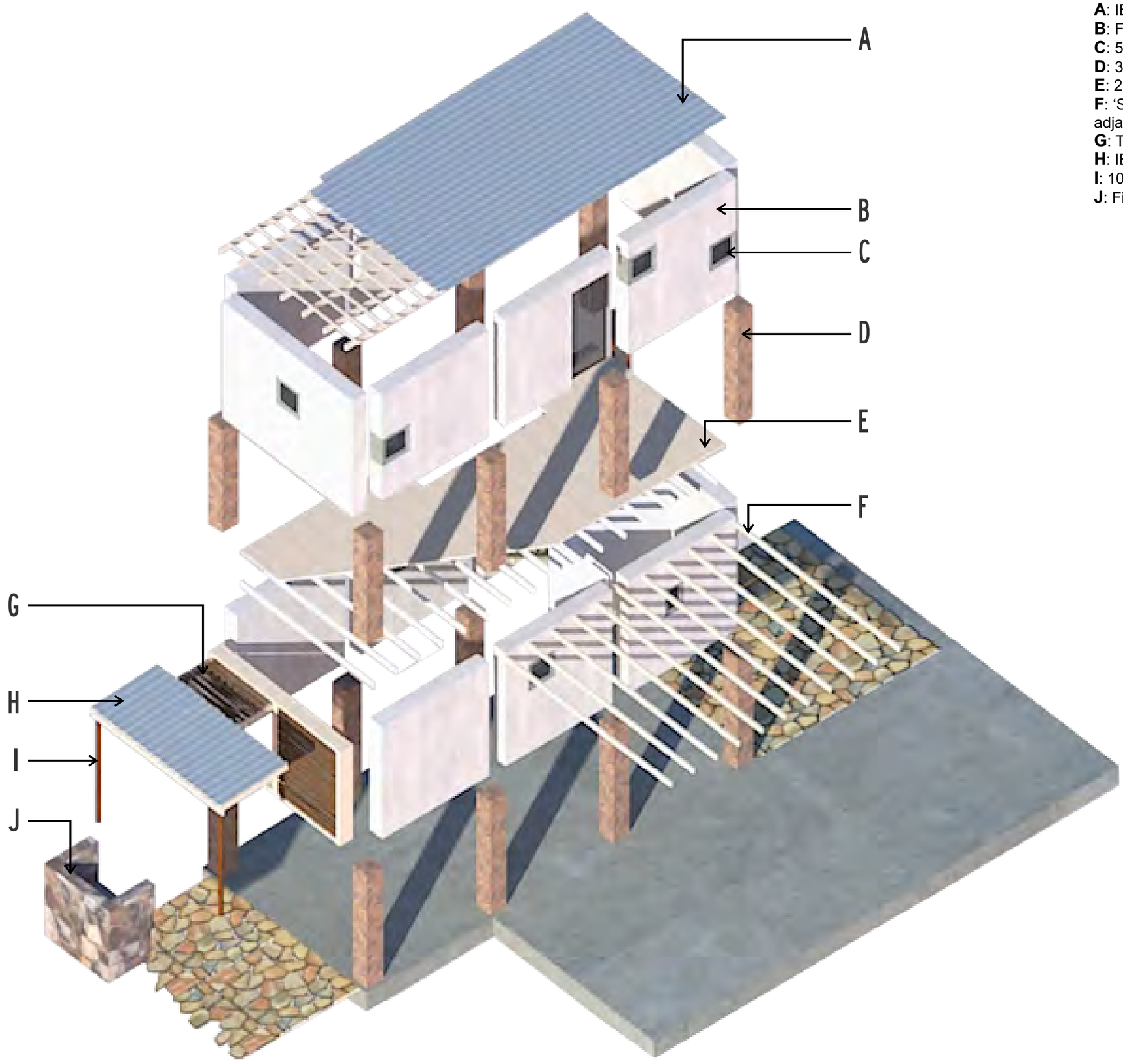
RECYCLED TEXTILE WASTE

SHUTTER PLY

LOCALLY SOURCED WATTLE

PRECAST CONCRETE WINDOW

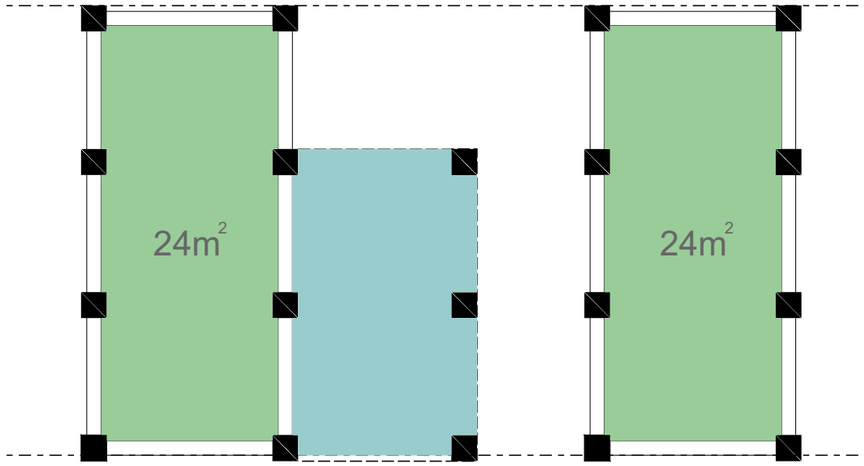
EXPLODED CONSTRUCTION



CONSTRUCTION

A: IBR roof sheeting fixed to ‘SA Pine’ rafters and branders
B: First storey sand bag wall in-fill with 25mm adobe render
C: 590x590mm precast concrete window
D: 350x350 column made from locally fired bricks
E: 29mm shutter ply on ‘SA Pine’ joist members
F: ‘SA Pine’ joist members fixed to exterior side of wall and adjacent building
G: Timber Louver
H: IBR roof sheeting fixed to ‘SA Pine’ rafters and branders
I: 100mm diameter gum pole
J: Fire place made from local rough sand stone

FLOOR PLAN CONFIGURATIONS



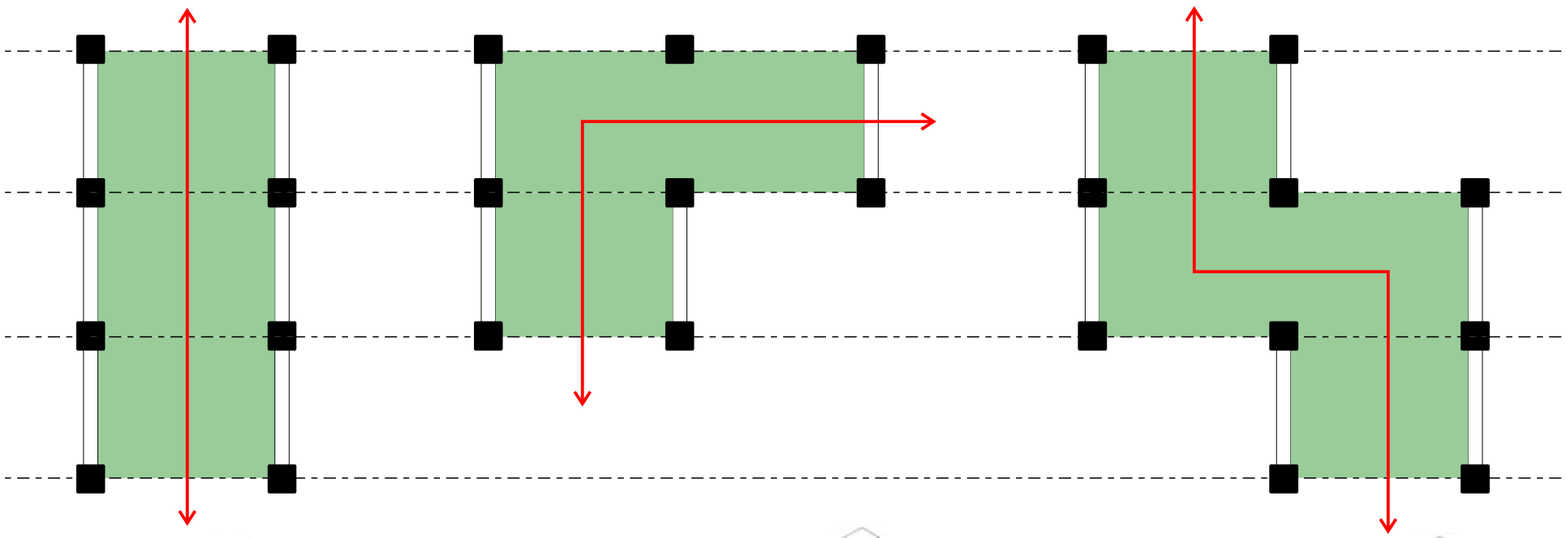
START UP HOME SIZE = 48m2

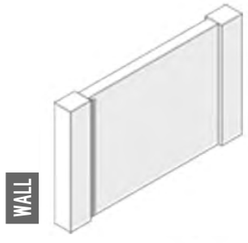
POTENTIAL RETAIL OR AIR BnB

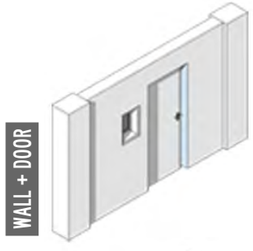
A home which cannot be arranged according to the home maker is not a home. A home must be flexible to allow for programmability and this can be achieved with modular design.

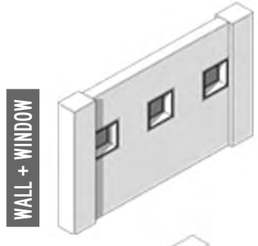
Each wall module is a set size which allows for different configurations. Each interior space can be fitted in to a wall module allowing for a flexible space according to the home maker.

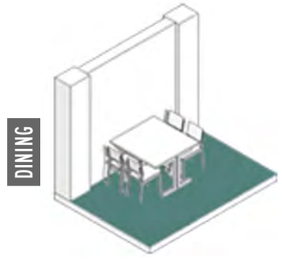
On an average plot size of 30x15m **FOUR** linked homes can be placed.

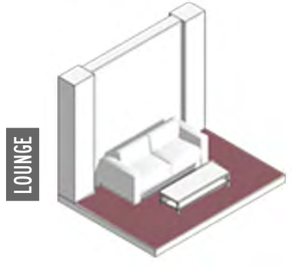


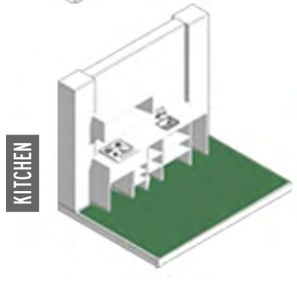




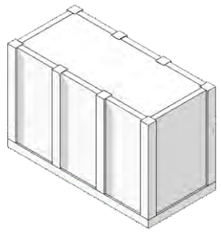




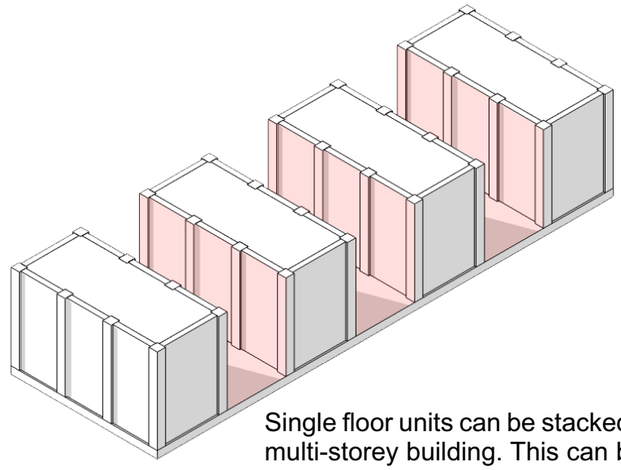




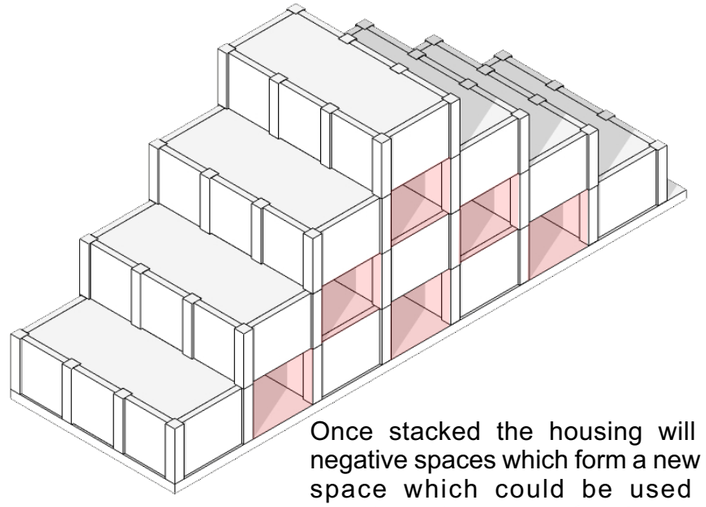
GOING UP



The single two storey unit can be placed along side each other with a space between. This space between can be used as space for incremental improvements over time or an outdoor covered space. It also allows for interconnection between spaces which is commonly found in rural area's.



Single floor units can be stacked to create a multi-storey building. This can be achieved due to the use of column construction which will act as the load-bearing element. From there, the negative spaces can be filled in to create an enclosed space.



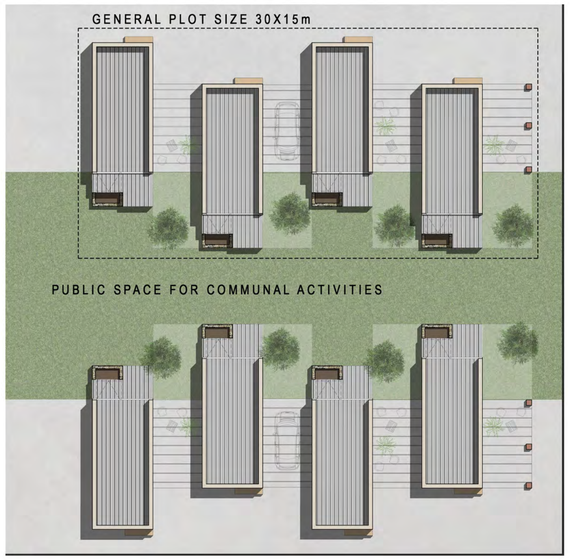
Once stacked the housing will create negative spaces which form a new interior space which could be used as an apartment, space for incremental improvement or a terrace for crops. This type of arrangement will decrease material quantities and increase vertical and horizontal space

100-word press release summary

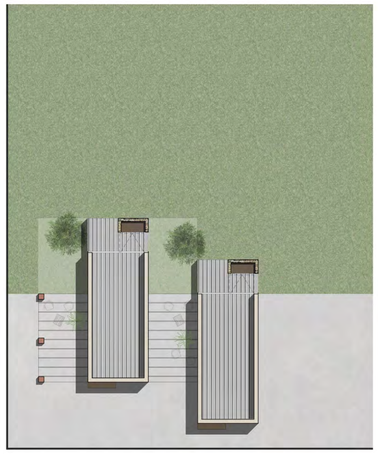
LINKED affordable housing is a building system which is designed to meet the nations living requirements at a low cost. Linked's modular system can be manipulated to create new spaces at ease with very little knowledge in construction. The system allows home owners to move away from a fixed design and allow creativity take over.

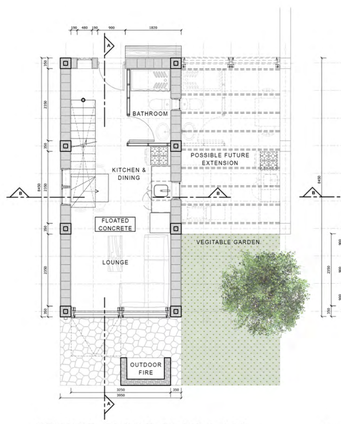
The proposed design creates a footprint that allows home owners to create a small livable space which can be used as a small shop or Air Bnb for tourists. Secondly this creates investable opportunity for the government to run a small shop from that space.

Material	Spec	Quantity	UoM	Selling Price		Total Selling
Roof						
Roof Sheeting	686x3600x0.47mm zinc AL IBR	12	Each / per meter	79	LSL	948
Roof Sheeting	IBR UV1 Polycarbonate Roof Sheeting	6	Each / per meter	97	LSL	582
Rafters	114x38x6000mm S5	6	Each	112.44	LSL	674.64
Purlins	38x38x6000mm	12	Each	25.62	LSL	307.44
Insulation	Recycled textile waste				LSL	FREE
				TOTAL	**LSL**	**3912.28**
Wetworks						
Bricks		3000	P/1000	1.3	LSL	3900
Cement	Cement Afrisam 42.5 50KG (all purpose cement)	19	Each	87.06	LSL	1654.14
Sand		11	per m3	144.75	LSL	1592.25
Stone	Crusher Mix	4	per m4	175.44	LSL	701.76
Sand Bags		2200	Each	5.5	LSL	12100
				TOTAL	**LSL**	**24505.55**
Doors and Windows						
External Door	Wooden Door Medium	2	Each	405	LSL	810
Internal Door	Hollow core timber door	1	Each	194.12	LSL	194.12
Precast concrete window with aluminum top hung frame		5	each	428	LSL	2140
Precast concrete window with fixed glazing		4	each	265	LSL	1060
				TOTAL	**LSL**	**6339.92**
Sanitary ware						
Toilet	plastic Cistern LL, P-Pan Rapido LL & plastic toilet seat	1	Each	515.85	LSL	515.85
Basin	Wall mounted ceramic basin	1	Each	289.95	LSL	289.95
Kitchen Sink	Franke stainles steel sink drop on	1	Each	385	LSL	385
Solar Geyser	The Sun Pays Low Pressure 90l Solar Geyser with Auxiliary	1	Each	2890	LSL	2890
				TOTAL	**LSL**	**5551.75**
Electrical						
Light Switch	1 Lever light switch	4	Each	17.15	LSL	68.6
Plug Point	4x4 16A Double	5	Each	22.12	LSL	110.6
DB Board	DB 12 Way Steel plush	1	Each	473.41	LSL	473.41
				TOTAL	**LSL**	**1120.21**
Interior fittings						
Staircase						
First Floor						
				TOTAL	**LSL**	**8909.04**
NOTE: only main materials are shown, but final costs reflect all material selections				**GRAND TOTAL**	**LSL**	**50338.75**

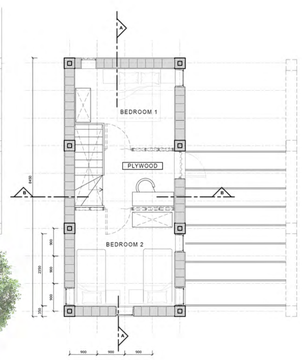


SITE PLAN 1:200





GROUND FLOOR PLAN 1:100



FIRST FLOOR PLAN 1:100

01 - FLOOR SLAB
1x sand bags layer laid on 150mm compact soil; sandbags compacted until level with secondary sand bag layer added with 50mm spacing between bags; 240mic DPM to be placed between sand bag layers; concrete to be poured over nags with 85mm thickness above sand bags; concrete floor slab to be floated.

02 - EXTERIOR WALLS R-Value 1.1
300x300x90mm sand bag walls to be finished with chicken wire and 25mm adobe plaster.

03 - WINDOWS
590x590x300mm 'Winblok' precast concrete window.

04 - FIRST FLOOR
144x38mm grade S5 'SA Pine' floor joists built in to brick work with 22mm plywood floor finish.

05 - ROOF SHEETING
3600x0,47mm galvanized IBR roof sheet fixed to 38x38mm 'SA Pine' branders; recycled textile waste to be used as insulation.

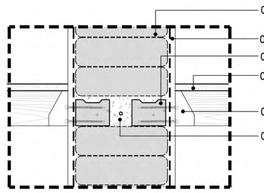
06 - OUTDOOR FIRE
1600x900mm outdoor fire constructed from locally sourced/repurposed limestone.

07 - TIMBER SCREEN
Timber screen constructed from pine members and locally sourced wattle.

08 - ROOF SHEETING
3600x0,47mm galvanized IBR roof sheet fixed to 38x38mm 'SA Pine' branders; recycled textile waste to be used as insulation.

09 - FIRST FLOOR
144x38mm grade S5 'SA Pine' floor joists built in to brick work with 22mm plywood floor finish. See A0.01.

10 - GUTTER
Domestic 124mm O.G gutter with 75x50mm domestic down pipe.



DETAIL A0.01
FLOOR JOIST CONNECTION
SCALE 1:20

01 - EXTERIOR WALLS R-Value 1.1
300x300x90mm polypropylene sand bag.

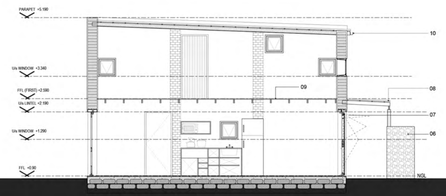
02 - EXTERIOR WALLS R-Value 1.1
300x300x90mm sand bag. Walls to be finished with 0,71mm
chicken wire and 25mm adobe plaster; chicken wire to be fixed to sand bags with wire fastening hook nail.

03 - CONCRETE LINTEL
146x75x6000mm reinforced concrete lintel placed on top of sand bag at 2350mm above FFL; concrete to be poured in cavity between lintels.

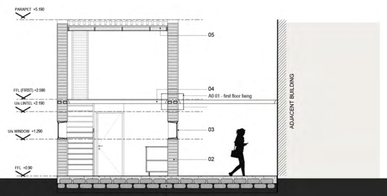
04 - FIRST FLOOR
144x38mm grade S5 'SA Pine' floor joists built in to brick work with 22mm plywood floor finish.

05 - TIMBER JOISTS
114x38mm 'SA Pine' joists fixed to wall with GMS 38x1,6mm hanger; GMS hanger fixed to precast concrete lintel with 8mm GMS roll bolts.

06 - OUTDOOR FIRE
Reinforced concrete infill with Y12 reinforcing bar laid centred.

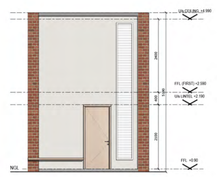


SECTION A-A 1:100



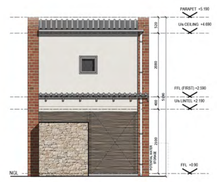
SECTION B-B 1:100

SIDE ELEVATION



FRONT ELEVATION

SIDE ELEVATION



REAR ELEVATION

ELEVATIONS 1:100