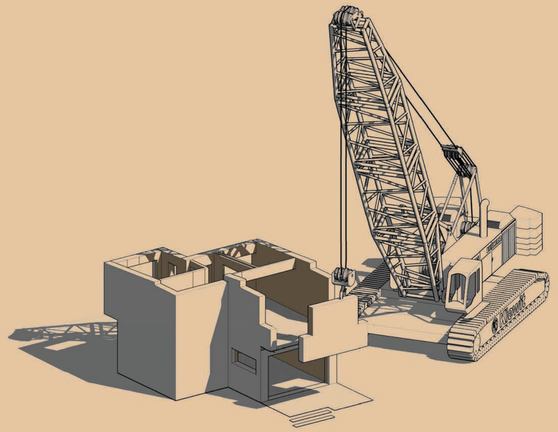
Fundokuhle Kubheka

RE-IMAGINING SOCIAL HOUSING
USING CLT CONSTRUCTION

BY FUNDOKUHLE KUBHEKA



RE-IMAGINING S0CIAL HOUSING
USING CLT PRODUCTION

The provision of housing has become an integral part in the world.
With increasing expenses within the South African landscape
the need for sustainable low cost housing has become a necessity
within disadvantaged communities.

The project symbolises the average South African household, the concept explores easy
mass assembly with soft thresholds linking communities.
Using CLT production makes affordable housing possible further ensuring
low skill requirement while being a warm family home.

Housing is no longer mono-functional it will resolve an array environmental problems.
The approach of a social housing fosters connection between addressing local issues
while satisfying the needs of the client

Site:

Langa Township, Cape Town,
Papu Street & Lerotholi Street

Langa is located in the outskirts
of Cape Town. The surrounding
site has a rich range of social
oppurunity with Guga S'thebe and
sport centres near. The urban context
consists of suburban houses along
with informal settlements.

Scenic views of Table Mountain, social
and the historical aspects play a crucuial
role in the community.

SITE CIRCULATION

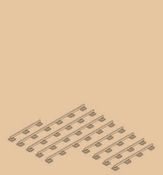
VEGETATION

CLIMATE

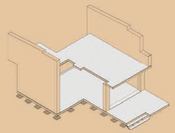
URBAN PROPOSAL EXTENT

MAP OF CAPE TOWN INDICATING LANGA

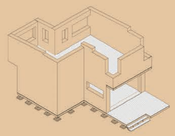
NOLLY DIAGRAN OF LANGA



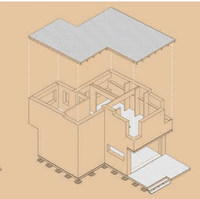
STEP 1: LAYING JACKPADS



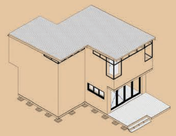
STEP 2: FLOORS & EXTERIOR WALLS



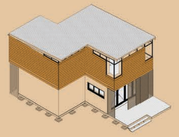
STEP 4: EXTERIOR WALLS



STEP 5: INTERIOR WALLS & ROOF



STEP 6: WINDOWS AND DOORS



STEP 7: CLADDING

Why Should John & Amy Build A Timber Home ?

John and Amy are passionate about sustainable design especially having impact on local communities. Working with local housing projects John and Amy have decided to partner with locals to building a housing prototype which will be replicated on the choosen site off Langa.

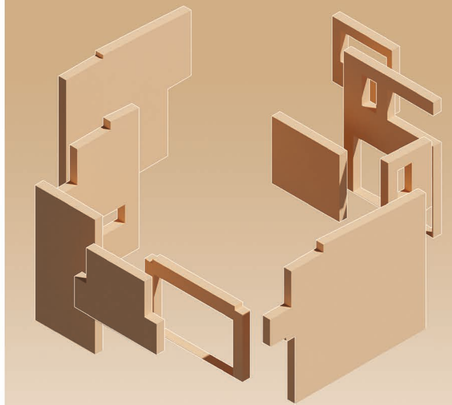
The philsophy of recycling extends to the entire construction of the project. Jackpad foundations are used manufactured from recycled plastic, Langa has a big drive with recycling, communities will thus be iinvolved whilst gaining knowledge about sustainable design.

Sustainable Design Principles:

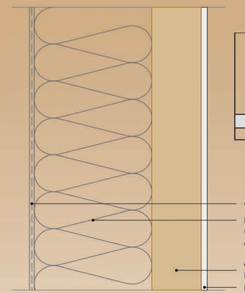
- Parts must be easy to dusassemble and can be reused to make new products
- Use of life cycle analysis tools to help design more sustainable products.
- Sustainably managed renewable resources

STRUCTURAL COMPOSITION

WALL SYSTEM
NOVATOP STRUCTURE



HORIZONTAL SECTION



W 100	dimensions [mm]							
	contact facade	wood fibreboard	NOVATOP-Solid	gypsum fibreboard	total thickness of the structure	fire resistance	airborne sound insulation	overall heat transfer coefficient
No.	A	B	C	D	Σ	REI/EI [min]	Rw [dB]	U [W/m²K]
12	8	200	124	10	342	REI 60	52	0,17

A – CONTACT FACADE

B – WOOD FIBREBOARD (λ = 0,043 W/mK; q = 190 kg/m³)
(STEICOprotect TYP L)
// MINERAL INSULATION (λ = 0,040 W/mK; q = 100 kg/m³)

C – SOLID WOOD WALL
NOVATOP SOLID

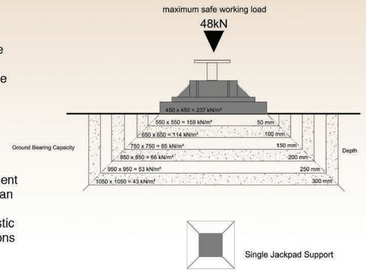
D – GYPSUM FIBREBOARD (FERMACELL)

FOUNDATION SYSTEM
JACKPAD FOUNDATION

The foundation system keeps with the project objective of a sustainable innovative take on social housing. The system is re-usable and portable for easy re-positioning.

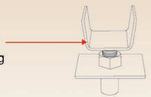
Structure is capable of overcoming excessive loads even multiple floor levels.

The sustainability ensures environment stays intact. Community members can be encouraged to participate in the construction phase by recycling plastic which used to produce the foundations



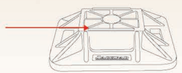
ADJUSTER

Consisting of two parts, the painted steel adjuster provides final adjustment of the systemm. The base plate is universal to all applications. The receiving plate incorporates a 42mm thread.



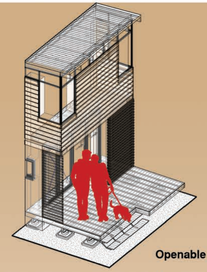
JACKPAD 400 SUPPORT BLOCK

The support block takes a vertical load and disperses it through its base. The jackpad support block is manufactured from recycled plastic and is 100% recyclable



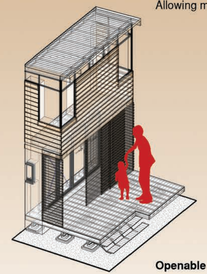
INCREMENTAL PACKERS

Also manufactured from recycled plastic, the incremental packer provides a simple solution tp overcome fall of ground. Fitted with interlocking lugs, the incremental packers are stable when in multiple use.



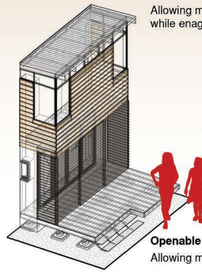
Openable Shutters (Threshold device)

Allowing maximum light penetration



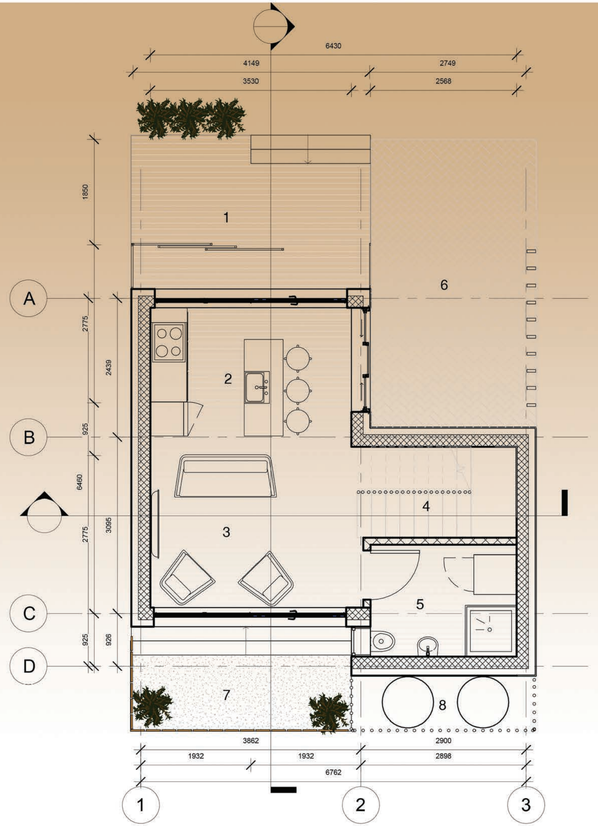
Openable Shutters (Threshold device)

Allowing medium light penetration
while enaging with the street edge



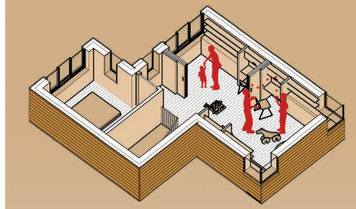
Openable Shutters (Threshold device)

Allowing minimum light penetration



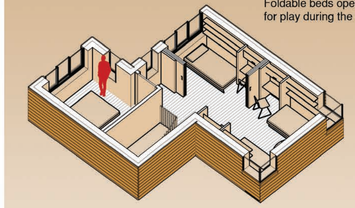
1. VERANDA
2. KITCHEN
3. LOUNGE
4. STAIRCASE
5. BATHROOM
6. FUTURE USE SPACE
7. PRIVATE GARDEN
8. WATER TANK STORAGE

GROUND FLOOR PLAN



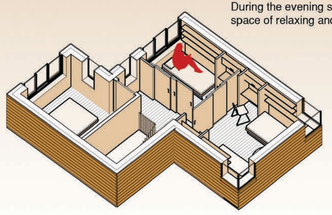
Spatial Duality (Multi-functional Space)

Foldable beds opens up space
for play during the day



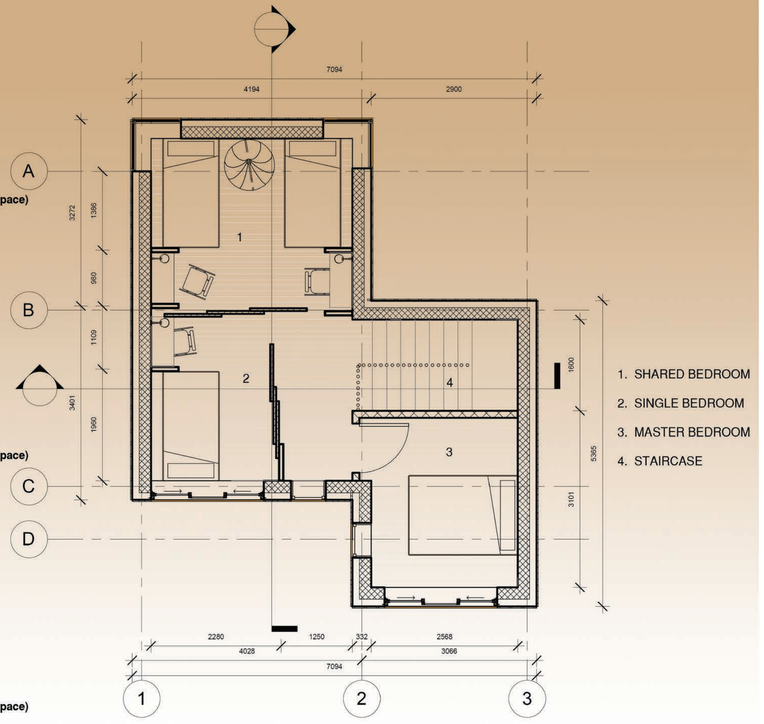
Spatial Duality (Multi-functional Space)

During the evening space becomes
space of relaxing and studying



Spatial Duality (Multi-functional Space)

Night time doors are closed giving
intimate space.



1. SHARED BEDROOM
2. SINGLE BEDROOM
3. MASTER BEDROOM
4. STAIRCASE

FIRST FLOOR PLAN

ARTIST'S IMPRESSION

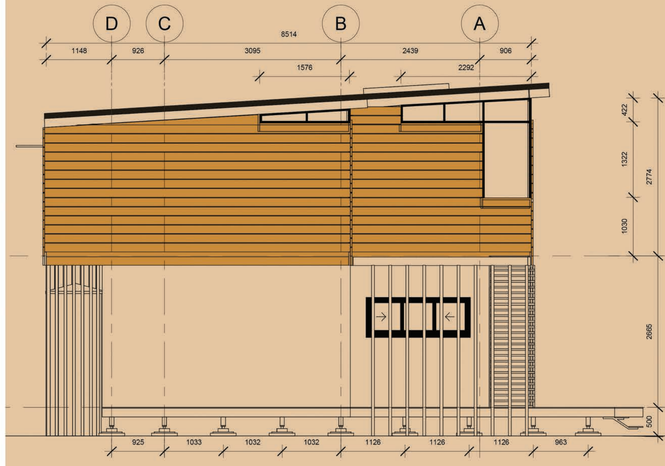
MORNING SET UP CREATING SPACE OF PLAY

VIEW OF CHILDREN'S BEDROOM

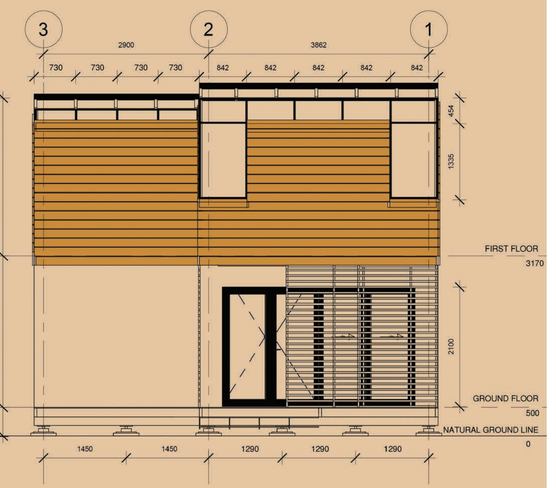
ARTIST'S IMPRESSION

NIGHT SET UP SLEEP TIME

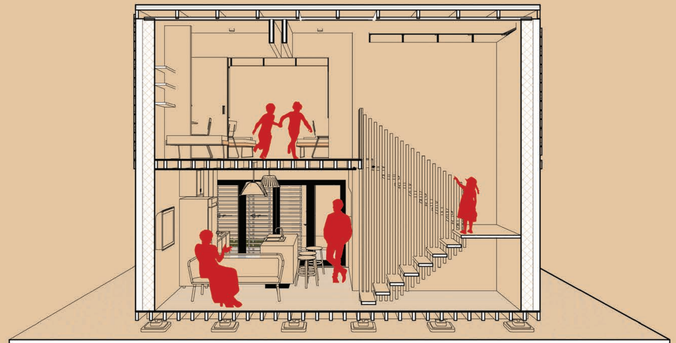
VIEW OF CHILDREN'S BEDROOM



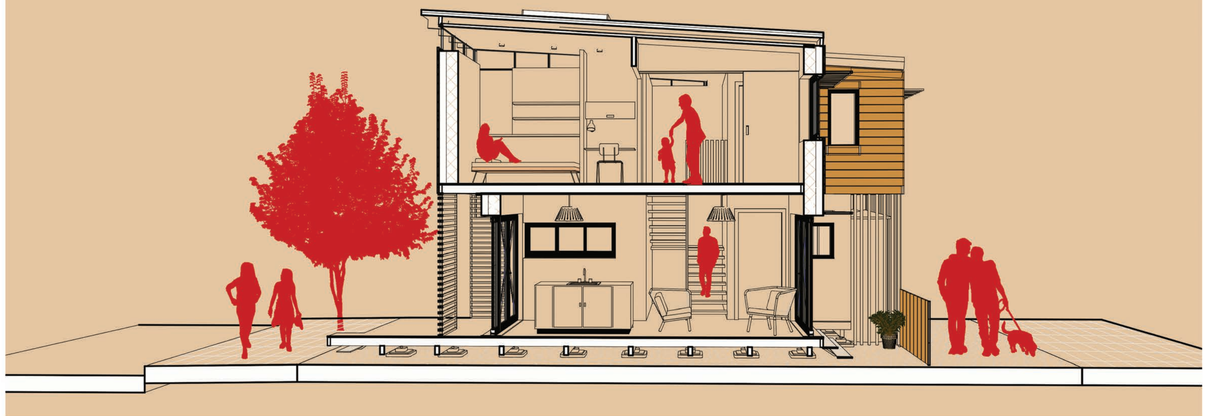
EAST ELEVATION



NORTH ELEVATION



SECTION A - A



ARTIST'S IMPRESSION

EVENING SET UP PREPARATION OF SLEEPING TIME

VIEW OF CHILDREN'S BEDROOM

Limited Internal walls

The lack of internal walls allows for the creation of an open plan and space that is not limited to singular function

Rafters

CLT Timber Rafters spaced at 750mm

Glulam Ceiling Beams

Glued beams with a tongue and groove profile. Due to the glue line which is invisible from the bottom side, the gluelam ceiling beams are form stable and the solid wood appearance is maintained.

Wall System

Constructed CLT Wall system consisting of Novatop Specs.
Contact Facade 8mm
Wood Fibreboard 200mm
Solid Wood Wall - Novatop Solid 124mm
Gypsum Fibreboard 10mm

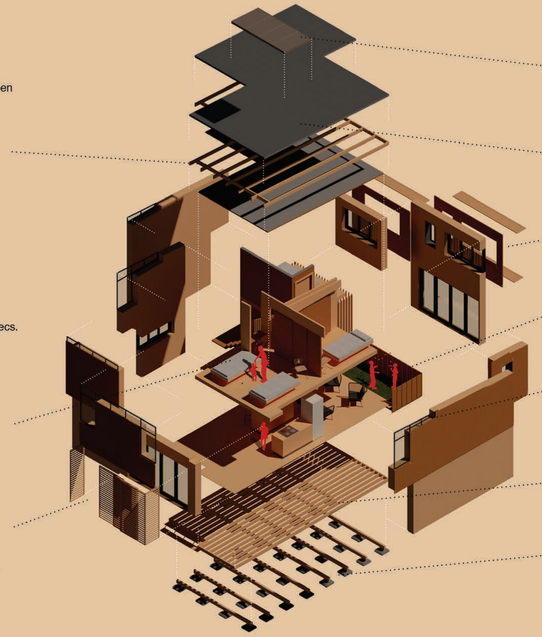
Total Thickness of structure 342mm

Spatial Duality (Multi-functional Space)

The sleeping area doubles up as a play area when not being utilised for sleep. Rollaway beds can be folded in and out of the walls

Openable CLT Shutters (Threshold device)

The openable horizontal shutters act as a threshold device but also a shading device to block direct sunlight entering the house.



Photovoltaic Cells

Typical 2.2 kW domestic system which will be utilised in the heating of water as an alternative for the more costly option of having a geyser.

Corrugated Roof Sheeting

Macsteel IBR Galvanized Roof Sheet (47mm x 4800mm)

Wall Cladding

Horizontal Weatherboarding fixed to battens

Outdoor Play Area

Intimate private space becomes a spill out area for the lounge extending the threshold of inside and outside

Stripped Windows

The stripped windows will be utilesed to let in ambient light into the house for passive heating and natural lighting purposes.

Floor System

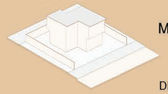
Acoustically Isolated CLT Flooring supported by timber battons spaced at 250mm intervals.

Jackpad Foundation system

Manufactured from recycled plastic, Jackpad is a reusable foundation system with the ability to support modular buildings of all manufacture in various single, double and treble storey configurations.

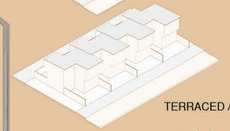
URBAN PROPOSAL

MODULAR POSSIBILITIES



DETACHED HOUSE

SEMI-DETACHED HOUSE

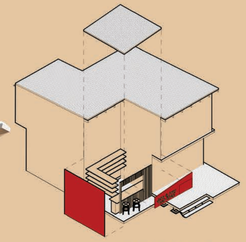


TERRACED / ROW HOUSING

Tuck Shops (Commonly known as Spaza Shops) are meeting points and are the spine of South African township economy. They highly visible and foster the vibrancy scenery of township culture. They are makeshift retail spaces inhabitants residence's.

A fully integrated house prototype addresses local issues, the design allows for future growth of the house allowing individuals to fully own the space they live.

The approach is to follow a adaptable form of Architecture , benefiting surrounding communities.



FUTURE GROWTH

Giving residents possibilties to own spaces and enriching communities