

# Rethinking Migration

Redesigning refugee camps

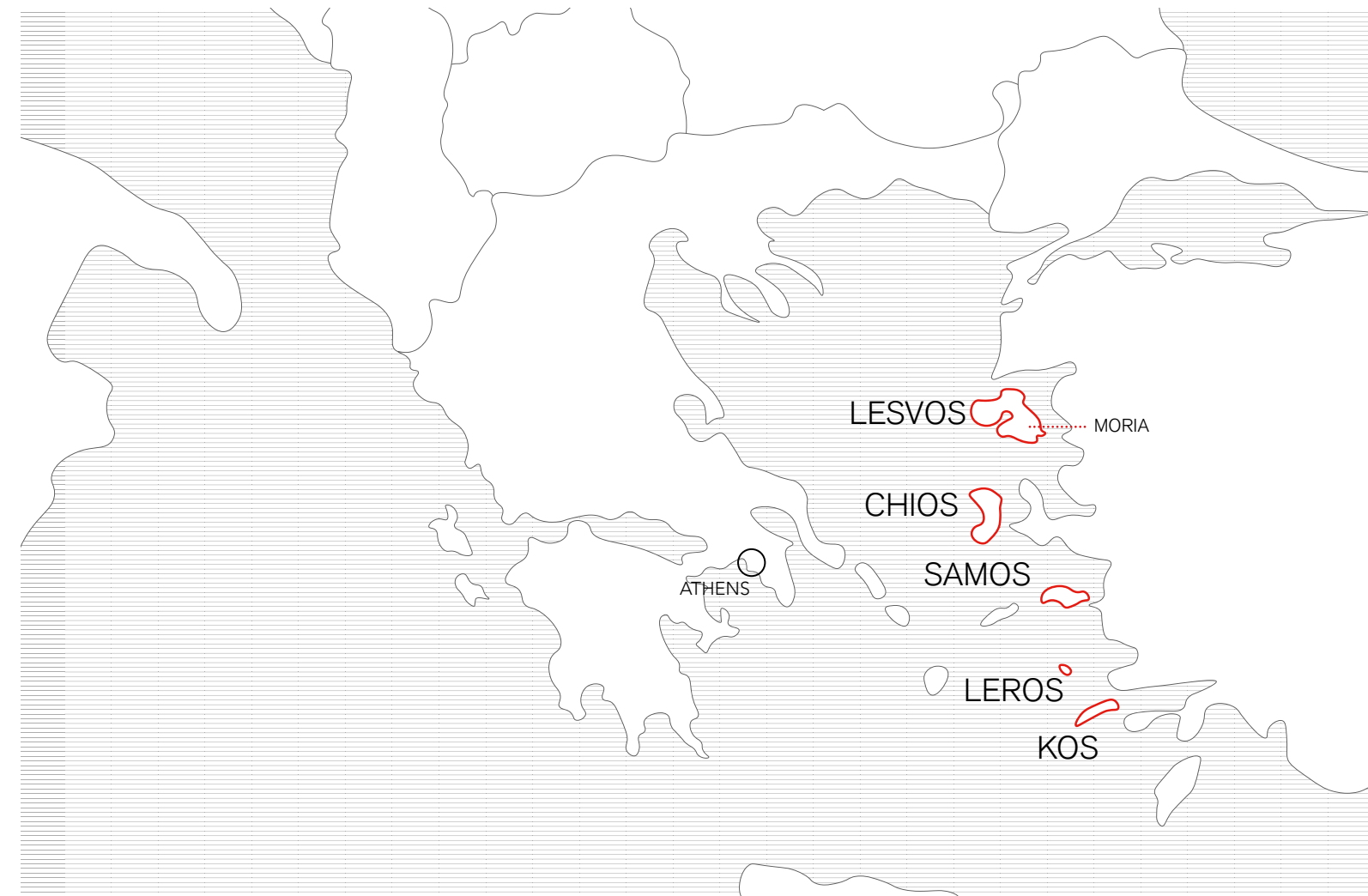
The case of Moria

Marcel van der Maas

*Studio aE*



8 september 2020  
RIC Moria



location of Moria on Lesvos Island, Greece.

## Background

Living conditions before 8th of September 2020



**Research**  
Existing Situation



## Research

Existing Situation



'informal' settlement - tents.

## Research

Existing Situation - different types of shelter

<https://www.theguardian.com/world/2020/apr/23/two-migrants-injured-after-shots-fired-into-refugee-camp-on-greek-island-of-lesbos>

Guy Smallman/Getty Images



trying to make a 'home'?

## Research

Existing Situation - different types of shelter

[https://morningstaronline.co.uk/sites/default/files/styles/article\\_full/public/camp\\_moria.jpg?itok=z-KGleUSn](https://morningstaronline.co.uk/sites/default/files/styles/article_full/public/camp_moria.jpg?itok=z-KGleUSn) Guy Smallman/Getty Images



ingenuity in shelter construction.

## Research

Existing Situation - different types of shelter

<https://www.humanstories.gr/wp-content/uploads/2020/02/campMoria.jpg>





baker in the camp.

## Research

Existing Situation - different types of shelter



make-shift shop selling baked bread.

## Research

Existing Situation - different types of shelter



baker in the camp.

## Research

Existing Situation - different types of shelter



more ingenuity. adding a door for privacy.

## Research

Existing Situation - different types of shelter



MOTG Tents.

## Research

Existing Situation - different types of shelter



overcrowding in initial camp area.

## Research

Existing Situation - different types of shelter

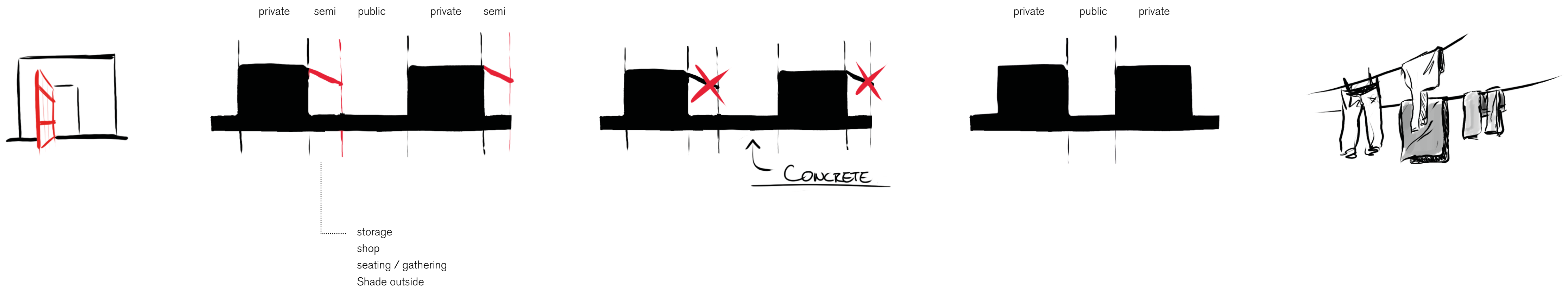


IKEA shelters, public / private?

## Research

Existing Situation - different types of shelter

[https://media.spokesman.com/photos/2016/04/03/Greece\\_Migrants.JPG.jpg](https://media.spokesman.com/photos/2016/04/03/Greece_Migrants.JPG.jpg)



the use of space and need for privacy.

## Research

Existing Situation - conclusions



**VICE** World News

# Violence Is Exploding in Europe's Most Notorious Migrant Camp

Residents of the Moria refugee camp on the Greek island of Lesbos are living in fear under lockdown and a spate of vicious knife attacks.

**TH** By [Tim Hume](#)

June 12, 2020, 3:47pm [Share](#) [Tweet](#) [Snap](#)



The attacks have prompted some residents to flee the camp altogether, while many who remain are terrified to leave their shelters at night, arming themselves in their beds.

"When you go to sleep, you just pray you wake up alive the next morning," said one 31-year-old asylum seeker, who was threatened outside his tent just weeks ago. "We're obliged to sleep with something to defend ourselves with."

The factors behind the attacks are complex, but people who live or work in the camp say the appalling conditions and severe overcrowding have created a perfect breeding ground for violence. A recent coronavirus lockdown imposed over Moria since March has only fuelled the problem, they say, stranding terrified asylum seekers with their tormentors, and ratcheting up the pressure cooker atmosphere in the camp.

violence.

## Background

Living conditions before 8th of September 2020



waiting.

## Background

Living conditions before 8th of September 2020

<https://time.com/5781936/lesbos-greece-refugee-camps-dangerous/> Ivan Romano / GettyImages

from an architect's perspective.

## Background

Positioning / statement

## **Background**

state of the art theory and practice on camp design

## **Research**

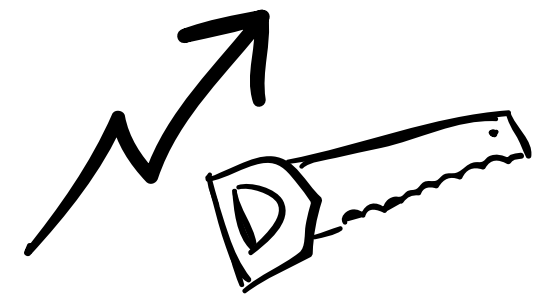
overall design question  
straw as a building material  
vision for the future  
character of Lesvos

## **Construction and design**

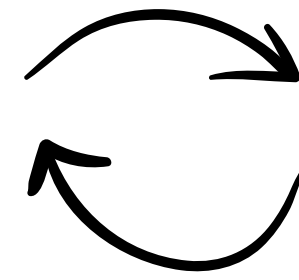
experience life in this place (from camp to city)



**co-creation**  
**(of a *home*)**



**(economically) active**  
**- having control**



**interdependence -**  
**getting rid of isolation**



**integration**

## Background

State of the art theory and practice on refugee camp design

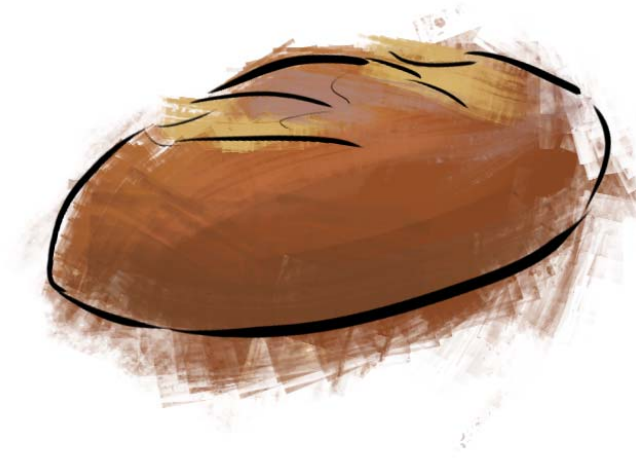
“How to redesign the layout and shelters of Reception and Identification Camp Moria, Lesvos, into a sustainable, affordable, co-created and climate appropriate design, fostering (economic) activity and interdependence with its surroundings?”



## Thematic Research

Straw as a building material

<https://www.pexels.com/nl-nl/foto/bruin-gras-1204998/>

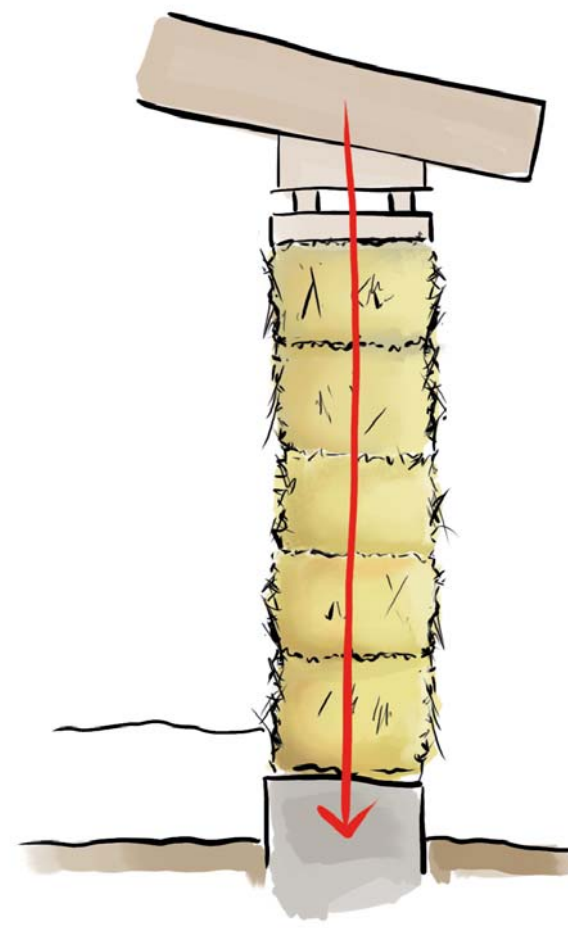


two-fold application of straw. food and building material.

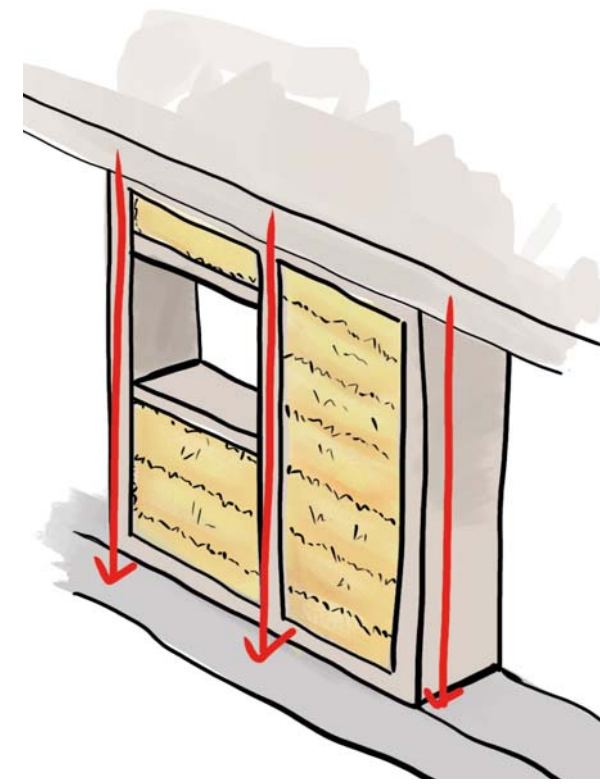
## Thematic Research

Straw as a building material

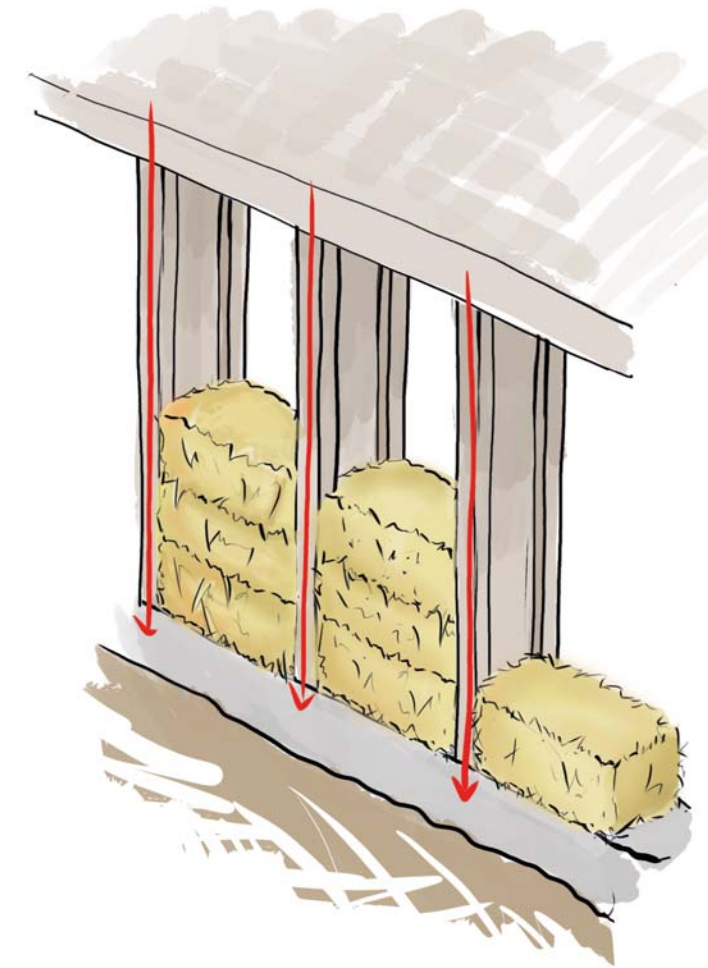




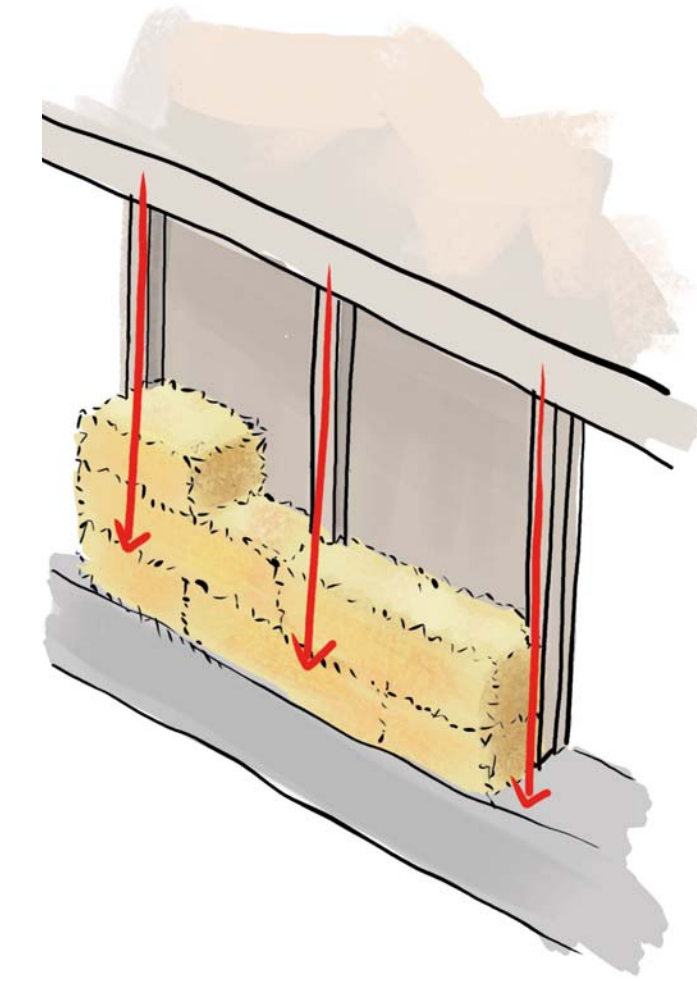
load-bearing



prefab



infill

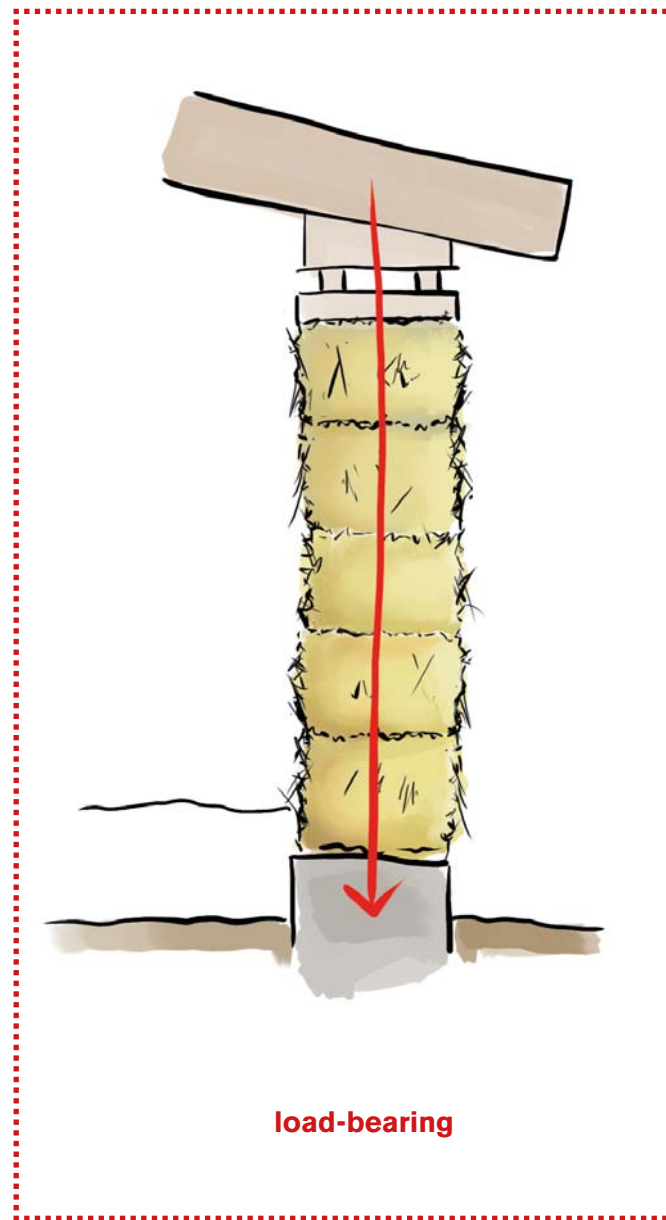


wrapping

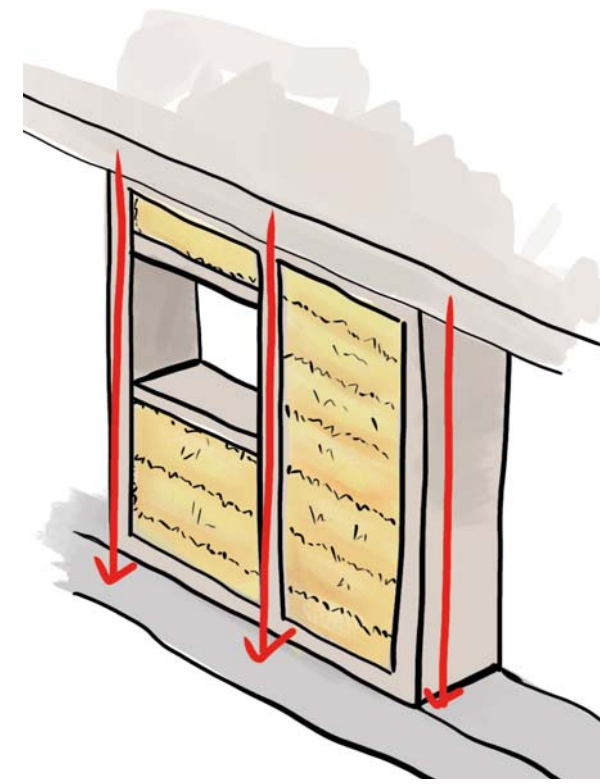
four main construction methods with straw.

## Thematic Research

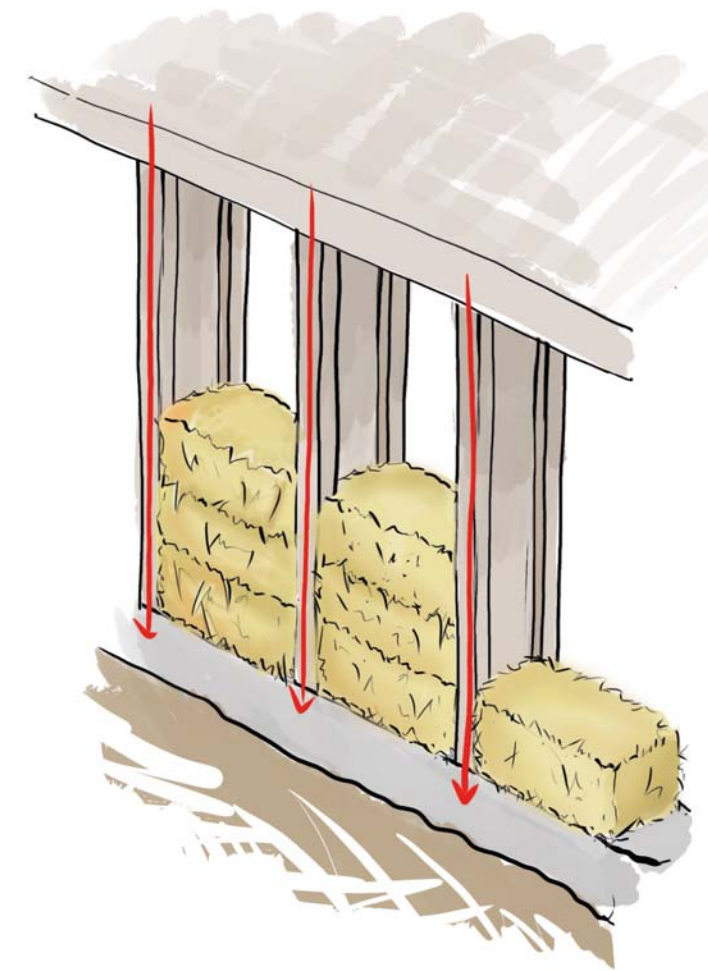
Straw as a building material



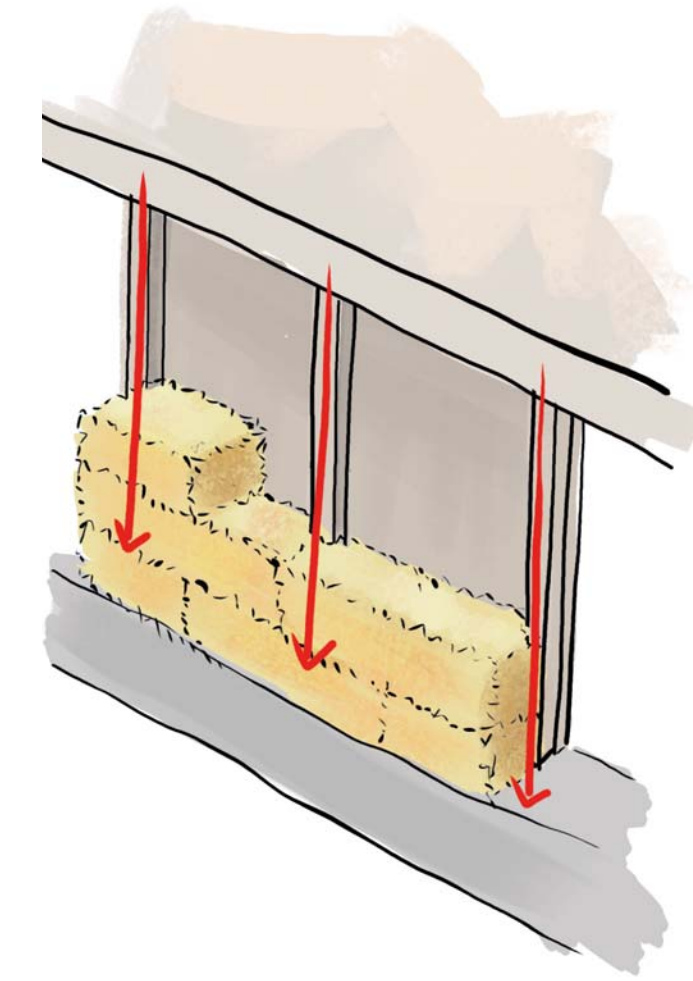
load-bearing



prefab



infill

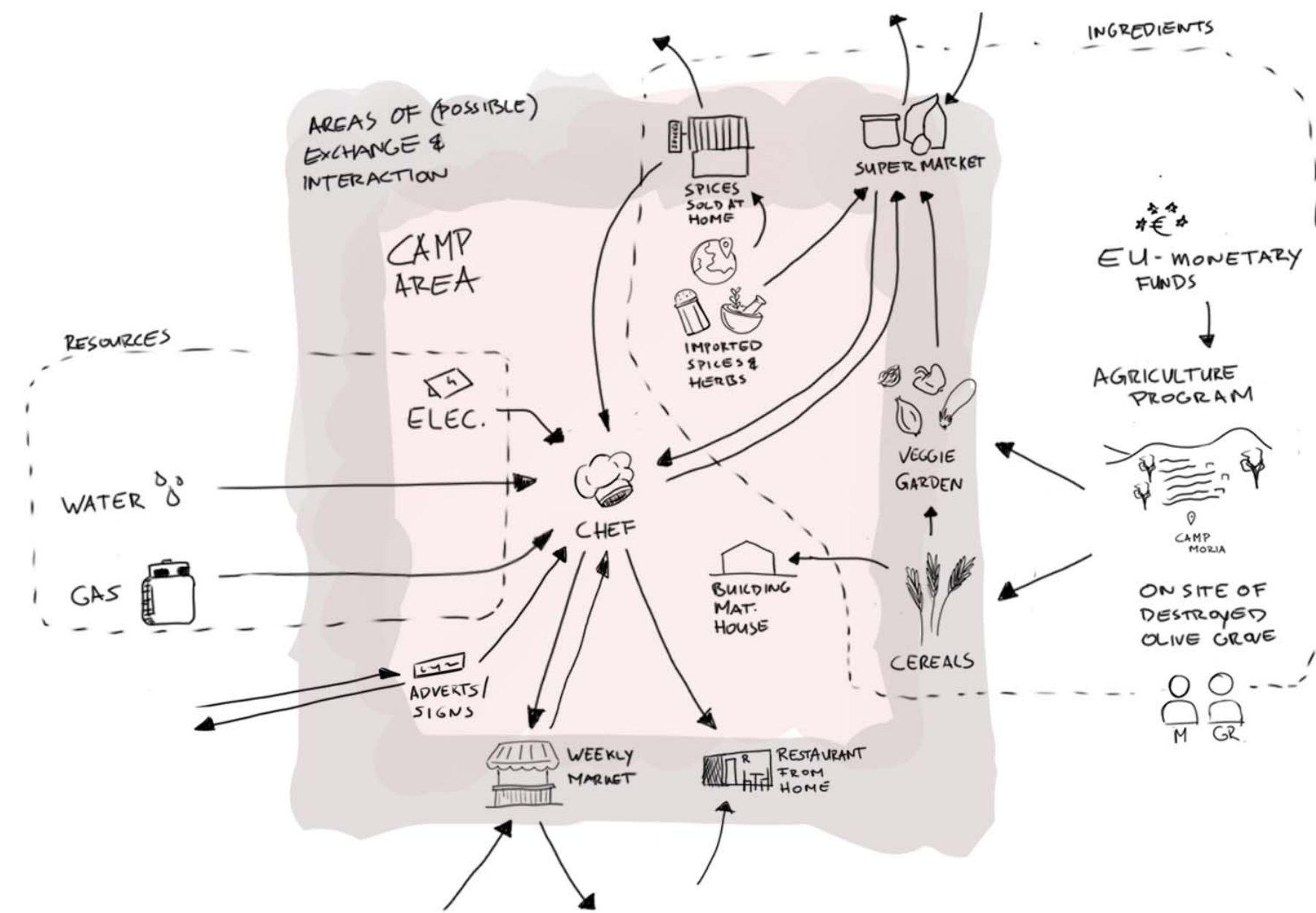


wrapping

load-bearing; low-tech, low tradeskill.

## Thematic Research

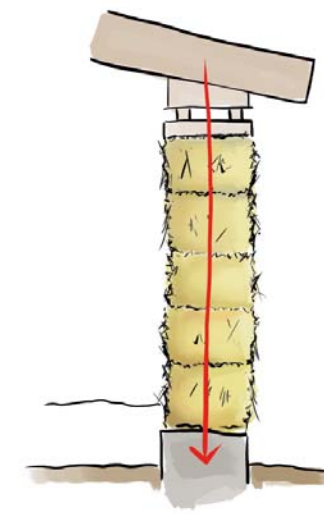
Straw as a building material



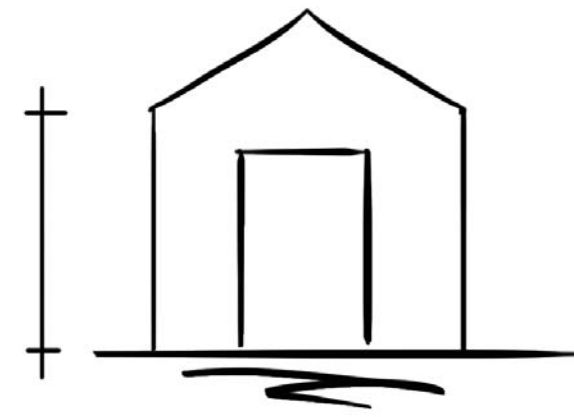
flow of goods and services.

## Thematic Research

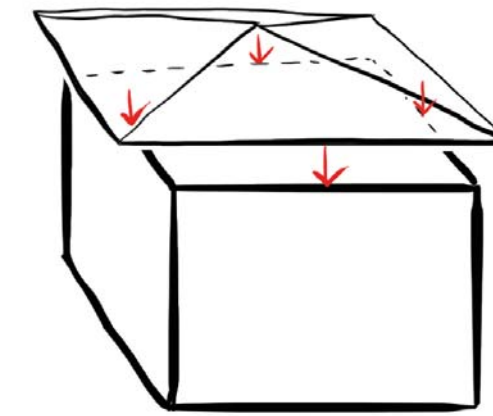
Straw as a building material



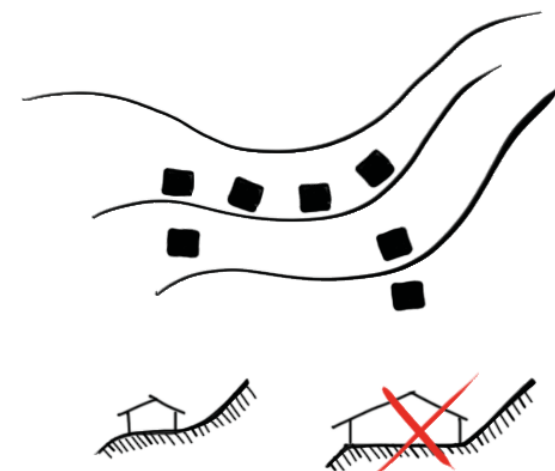
load bearing straw bale walls



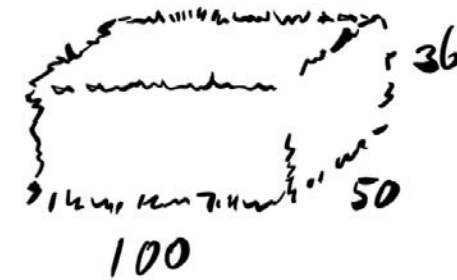
height - one storey  
smaller bales - can be carried by people



square type.  
equal distribution of roof loads on  
walls, easy construction methods



free standing houses to account for  
terrain changes, minimize terrain prep



size of straw bale



19,8 kg at 110 kg/m<sup>3</sup>

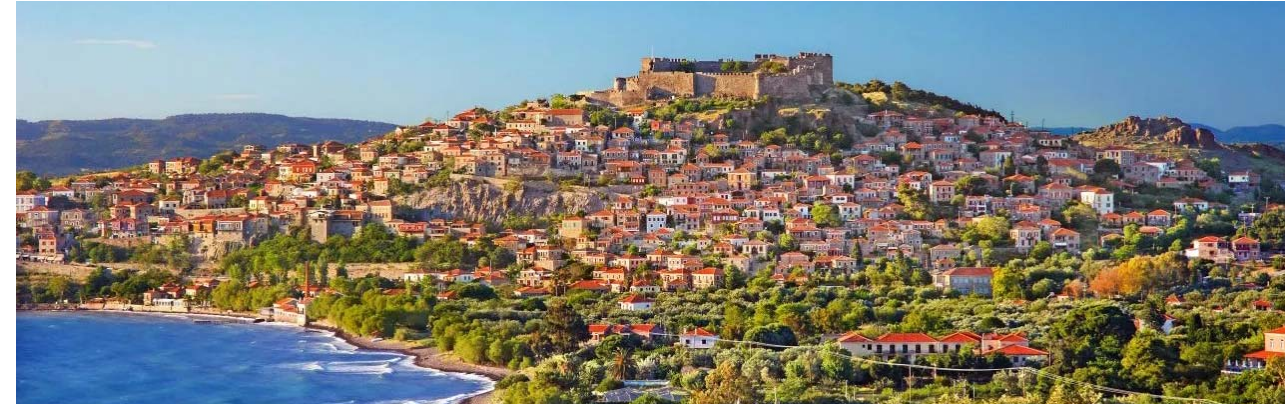


foundation of used car tires filled with  
concrete

construction parameters of the building system.

## Thematic Research

Straw as a building material



Research  
Character of Lesvos



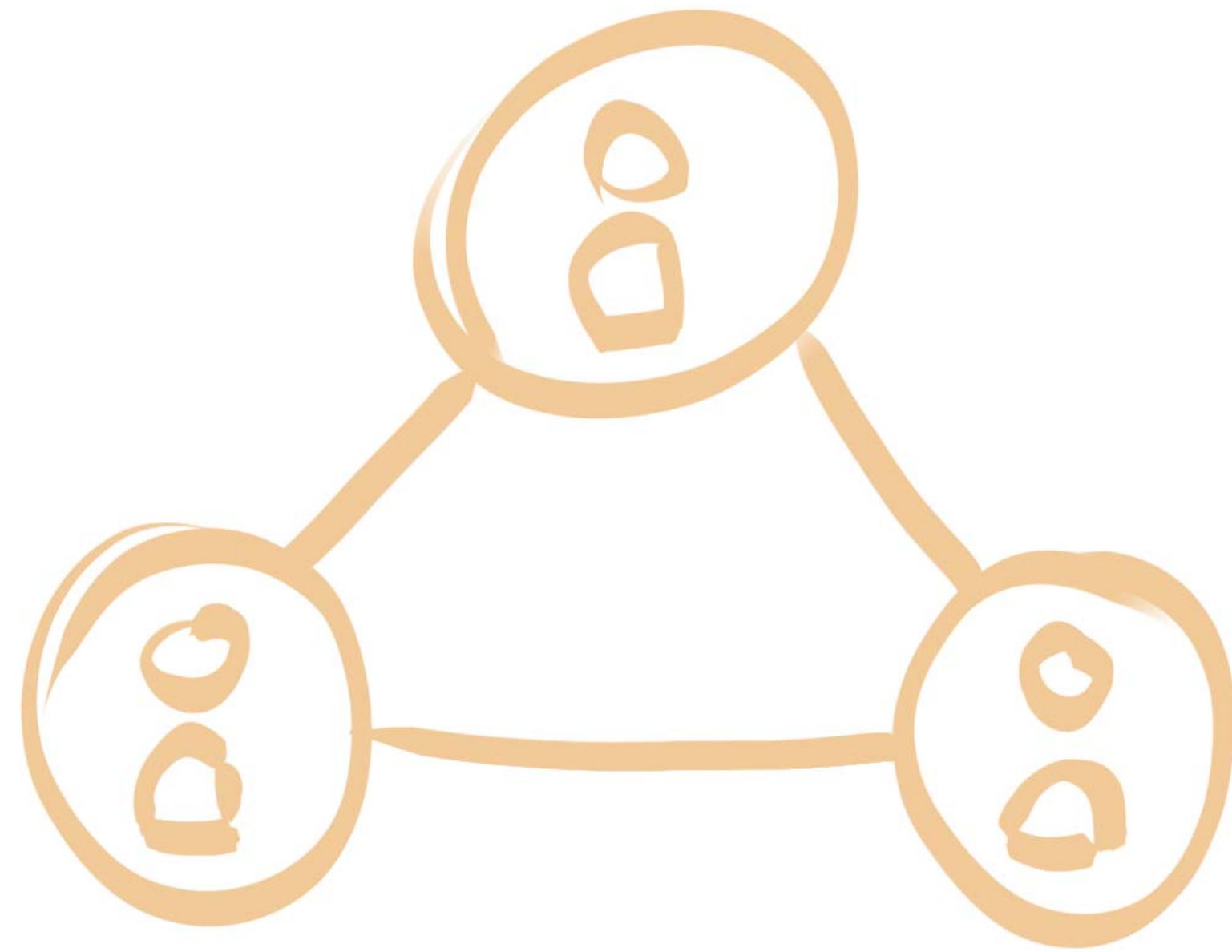
streets of Mytilene.

## Research

Character of Lesvos

# DESIGN

Urban Design

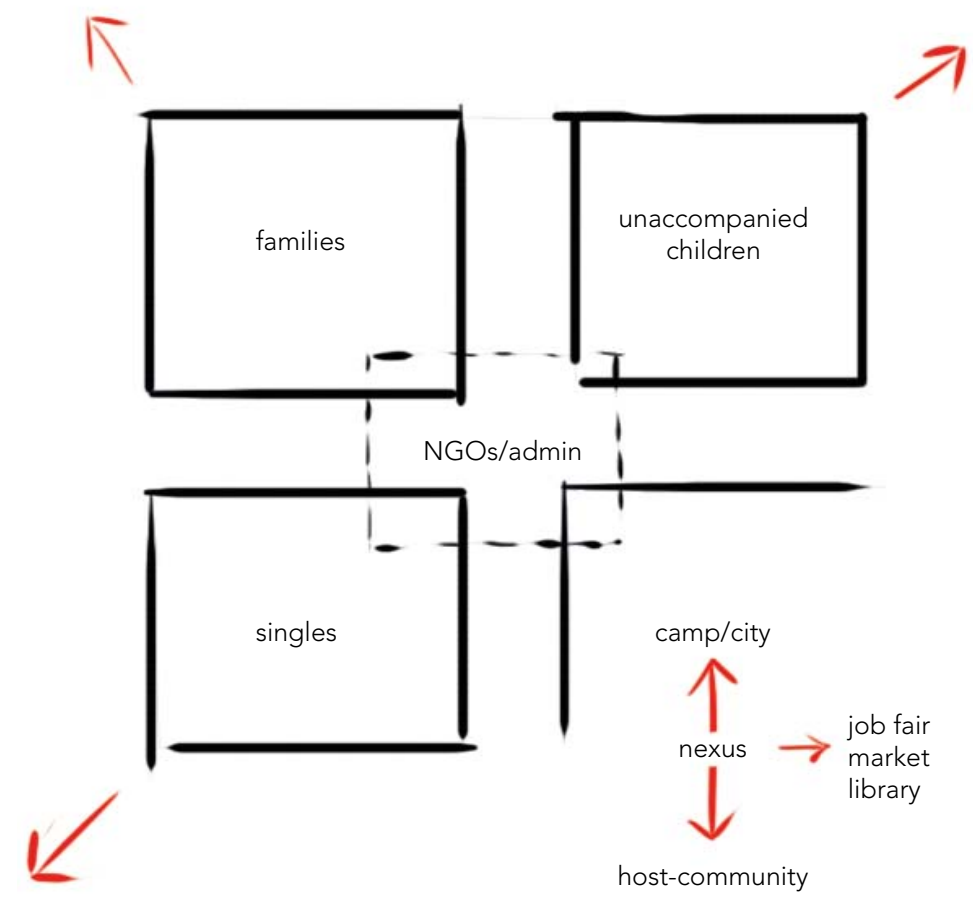


need for structure.

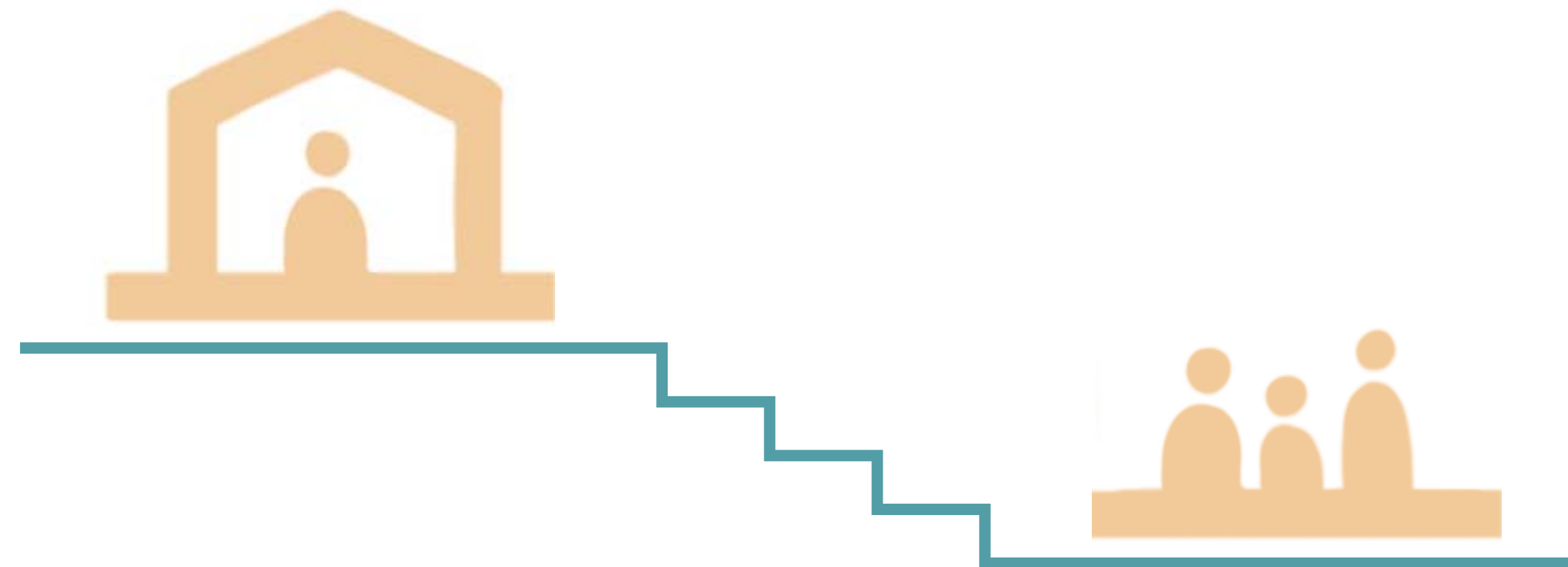
## Design

Organisational structure



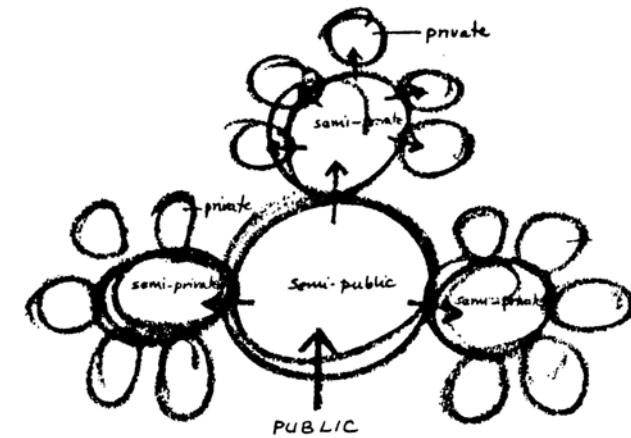


diagrammatic lay-out refugee city



safety.  
sense of belonging.  
community.

Diagram showing a hierarchically organized housing area with private, semiprivate, semipublic, and public spaces. The clear structure strengthens natural surveillance, helps the inhabitants know which people "belong," and improves the possibility for making group decisions concerning shared problems. (From Oscar Newman, *Defensible Space* [41].)



in the residential group are, it is true, publicly accessible, but have – because of close connection to a limited number of residences – a semipublic character. The communal spaces in the neighborhood are somewhat more public, while the city's town hall square is a totally public space.

The scale between public and private also can be considerably more differentiated than mentioned here. Or it can be considerably less defined, as in the case with the multistory residence or the single-family house in the undefined city structure. In many such cases, almost no middle ground or transition between private and very public territory exists.

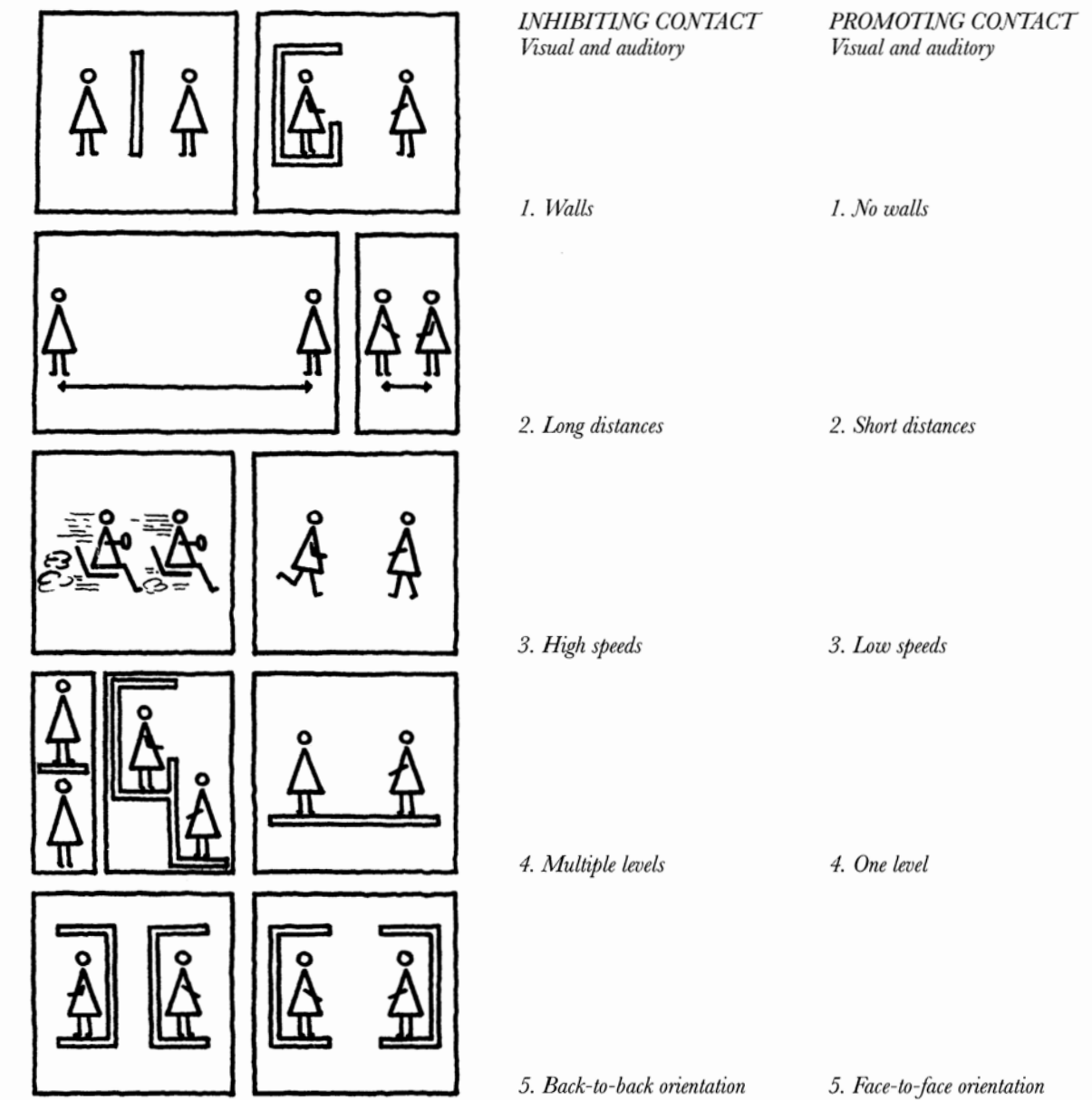
territories, security, and sense of belonging

The establishment of a social structure and corresponding physical structure with communal spaces at various levels permits movement from small groups and spaces toward larger ones and from the more private to the gradually more public spaces, giving a greater feeling of security and a stronger sense of belonging to the areas outside the private residence. The area that the individual perceives as belonging to the dwelling, the residential environment, can extend well beyond the actual dwelling. This in itself may result in greater use of public spaces – such as parents permitting young children to play outdoors at an earlier age than they otherwise might.

Establishing residential areas so that there is a graduation of outdoor spaces with semipublic, intimate, and familiar spaces nearest the residence also makes it possible to know the people in the area better, and the experience of outdoor spaces as belonging to the residential area results in a greater degree of surveillance and collective responsibility for this public space and its residences. The public spaces become part of the residential

### the senses and communication

Physical arrangement can promote or prevent visual and auditory contact in at least five different ways.



Gradual transition between private and public, and tools to encourage social interaction.  
Life between buildings, using public space. Jan Gehl.

## Design

Urban Design



## Design

Urban framework

Scale 1:600



building zone.

## Design

Urban framework

Scale 1:600



courtyards.

**Design**

Urban framework

Scale 1:600



cluster square.

## Design

Urban framework

Scale 1:600



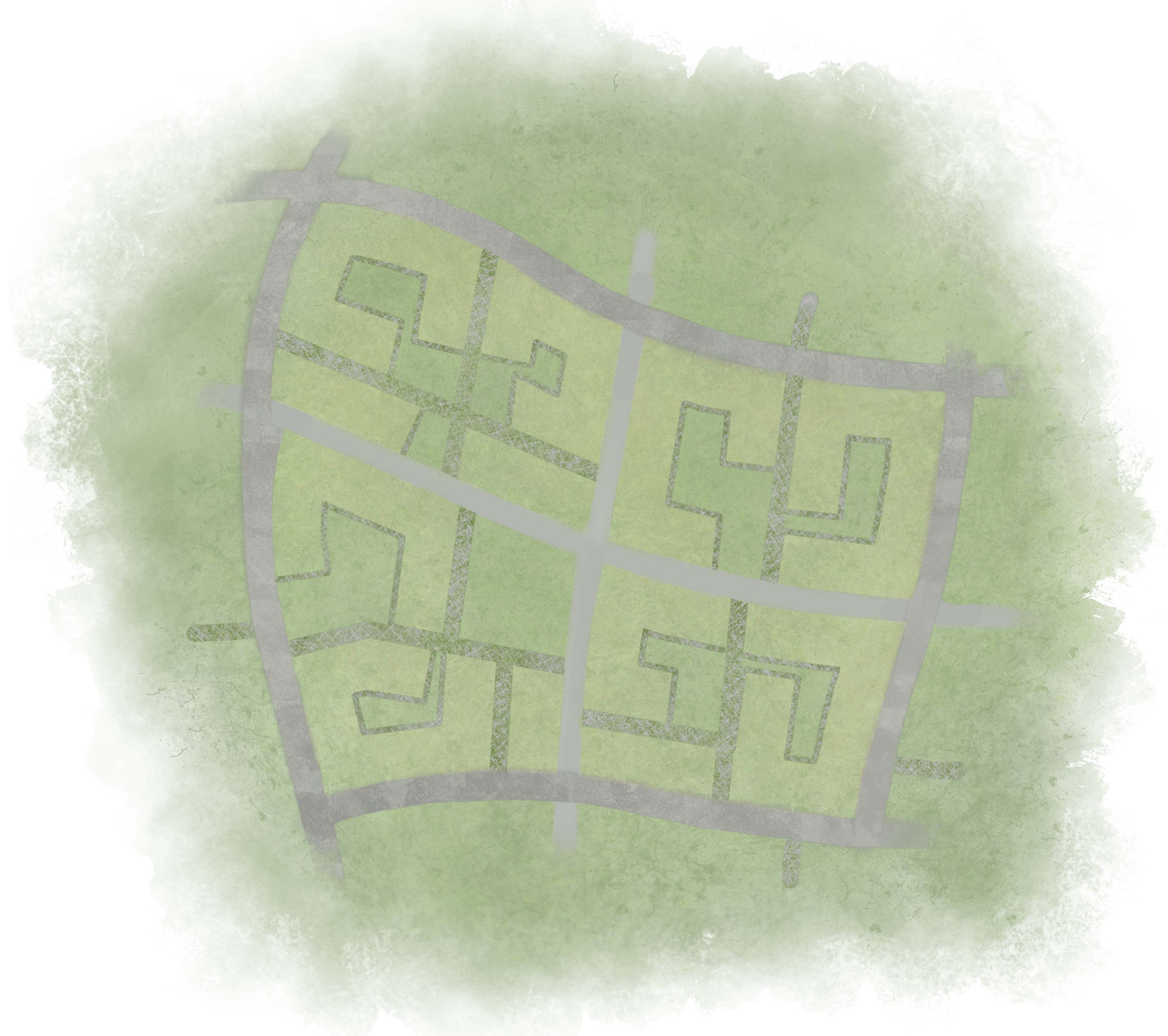
neighbourhood square.

## Design

Urban framework

Scale 1:600





## Design

Urban framework

Scale 1:600



urban neighbourhood design.  
1:600

## Design

Urban framework

Scale 1:600



urban neighbourhood design.  
1:600

## Design

Urban framework

Scale 1:600



urban neighbourhood design.  
1:600

## Design

Urban framework

Scale 1:600



urban neighbourhood design.  
1:600

## Design

Urban framework

Scale 1:600

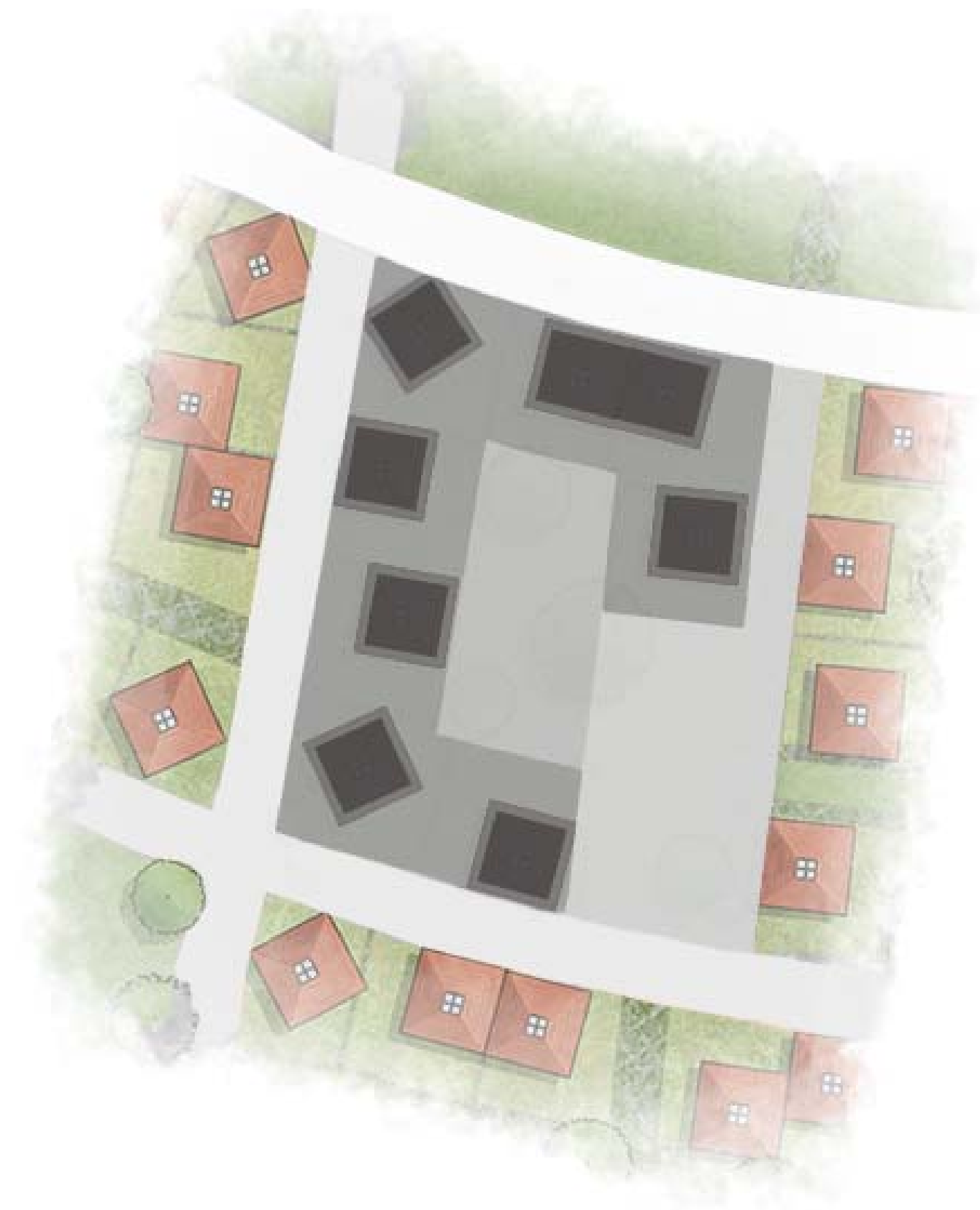


urban neighbourhood design.  
1:600

## Design

Urban framework

Scale 1:600



PUBLIC



PRIVATE

public to private scheme.

## Design

Urban framework



urban neighbourhood design.  
1:600

## Design

Urban framework

Scale 1:600



# DESIGN

Construction process



construction process.

## Construction and design

Instructions and construction of the dwelling



## Construction and design

Instructions and construction of the dwelling



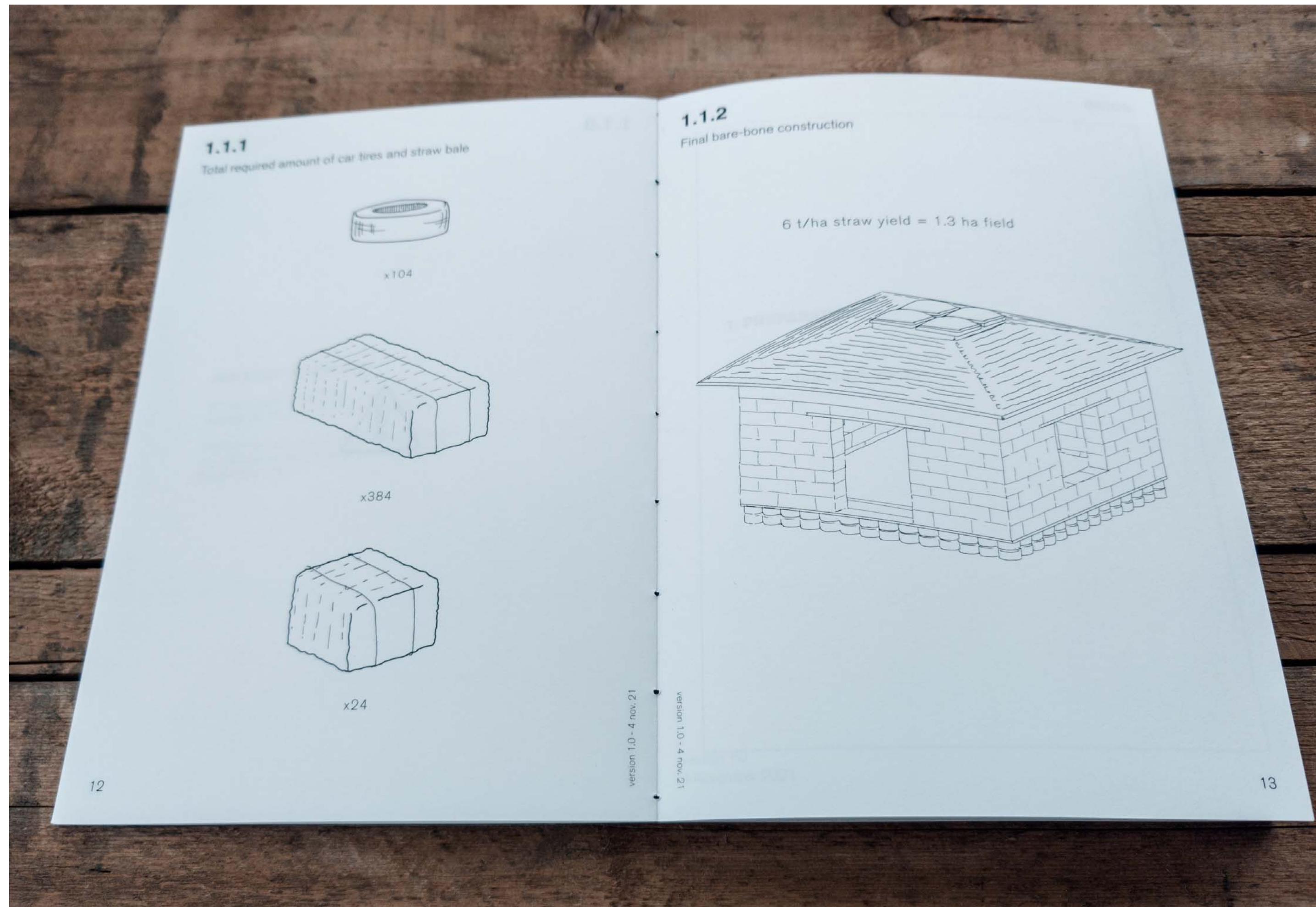
## Construction and design

Instructions and construction of the dwelling



## Construction and design

Instructions and construction of the dwelling



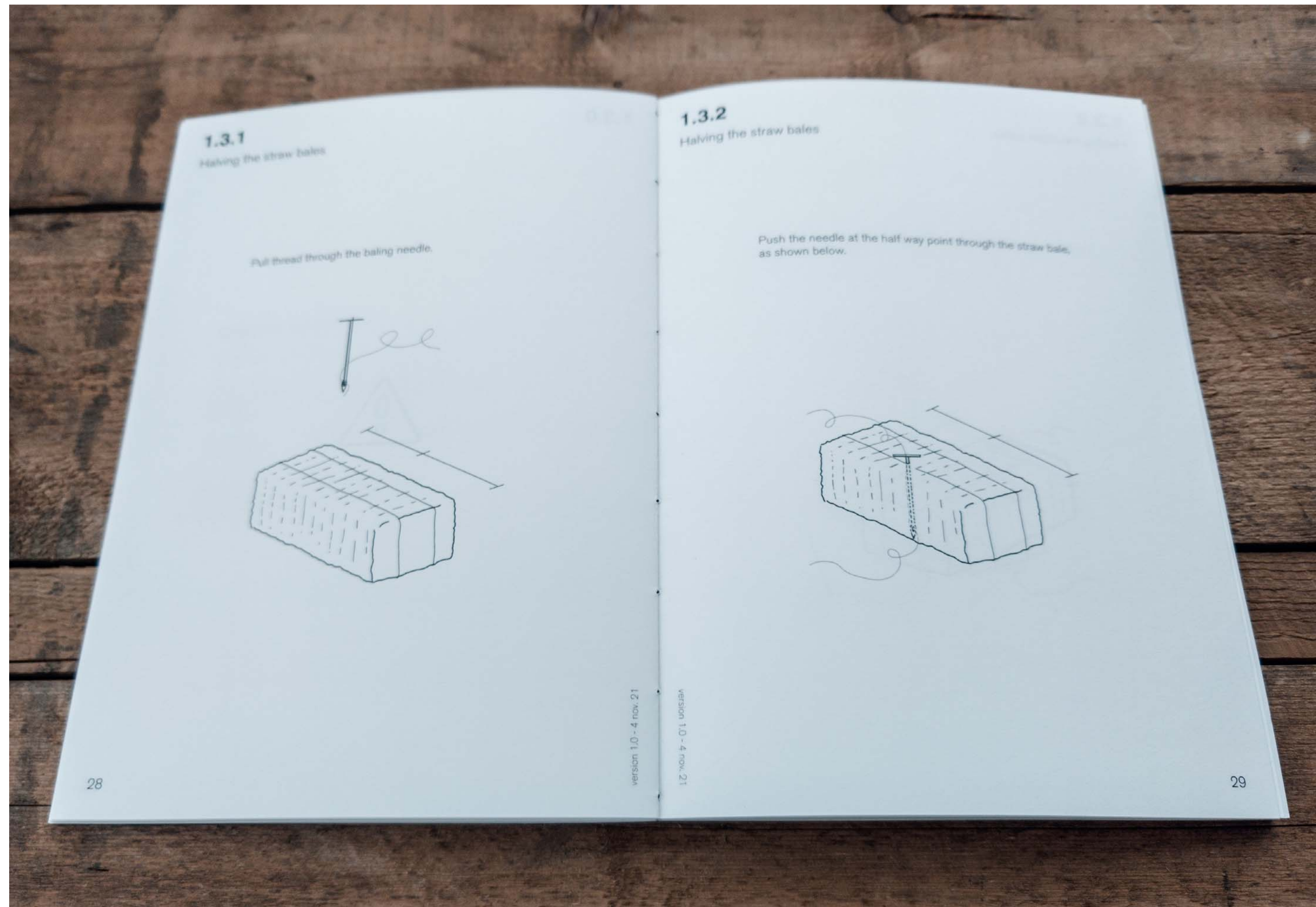
## Construction and design

Instructions and construction of the dwelling



## Construction and design

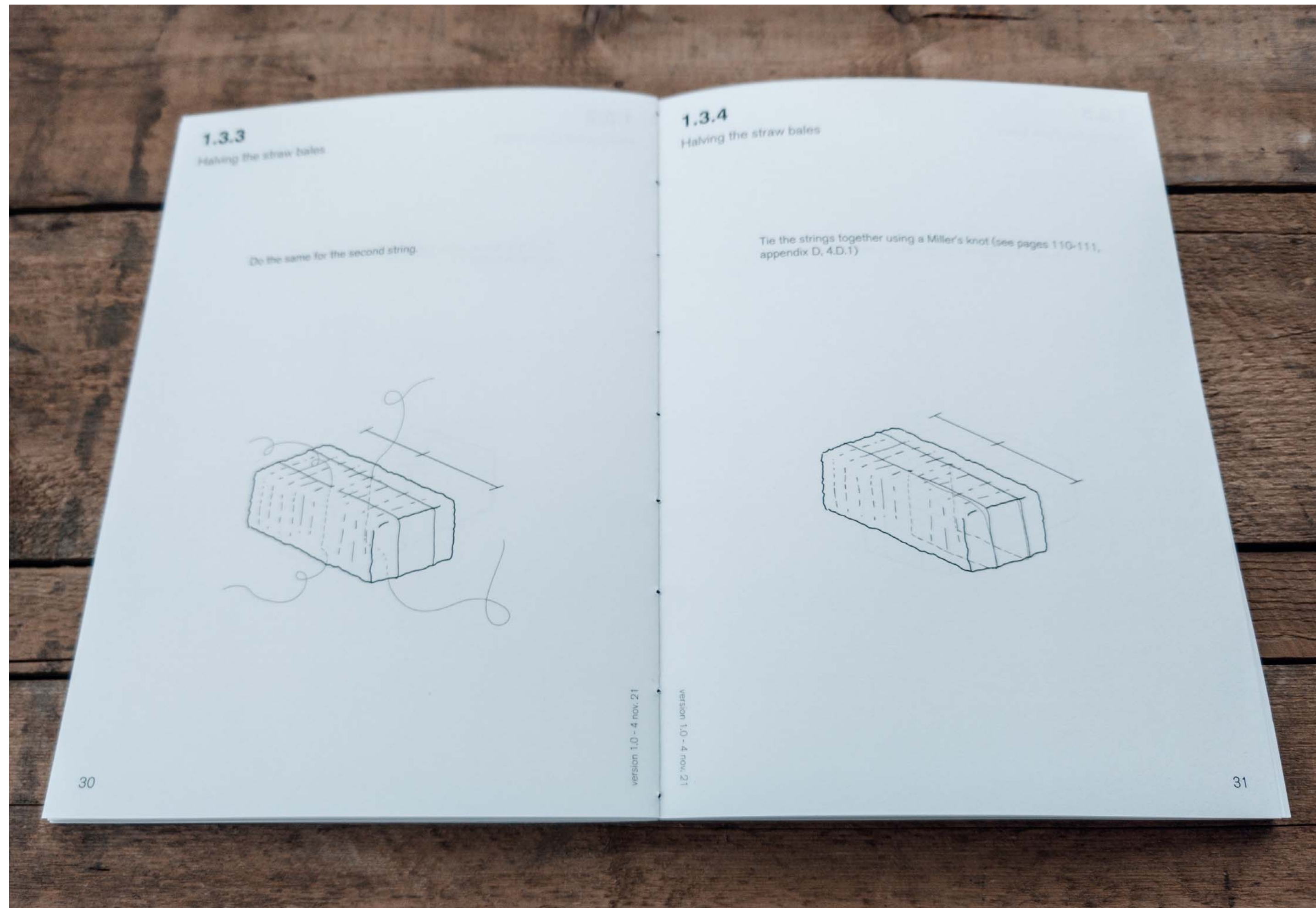
Instructions and construction of the dwelling



## Construction and design

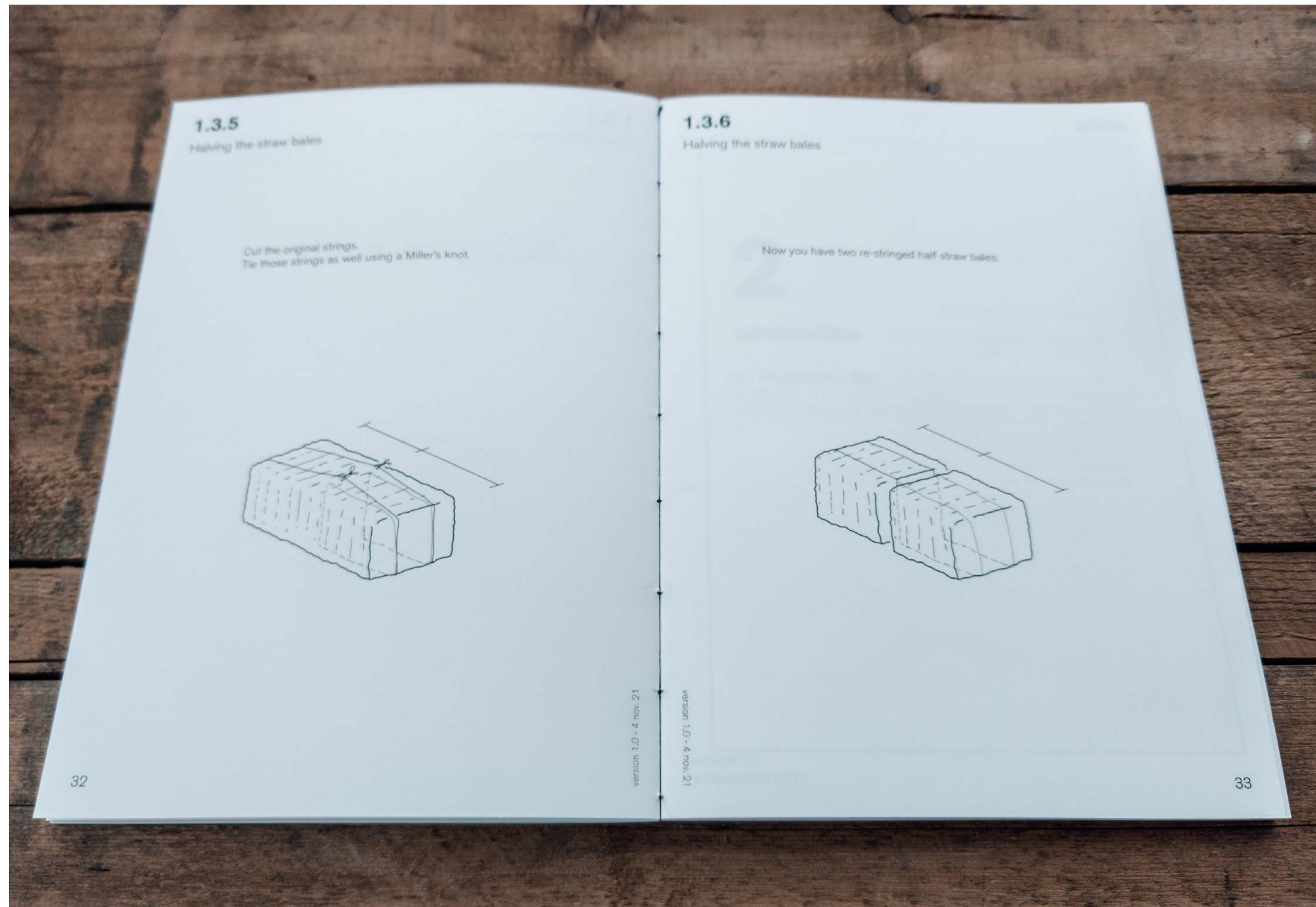
Instructions and construction of the dwelling





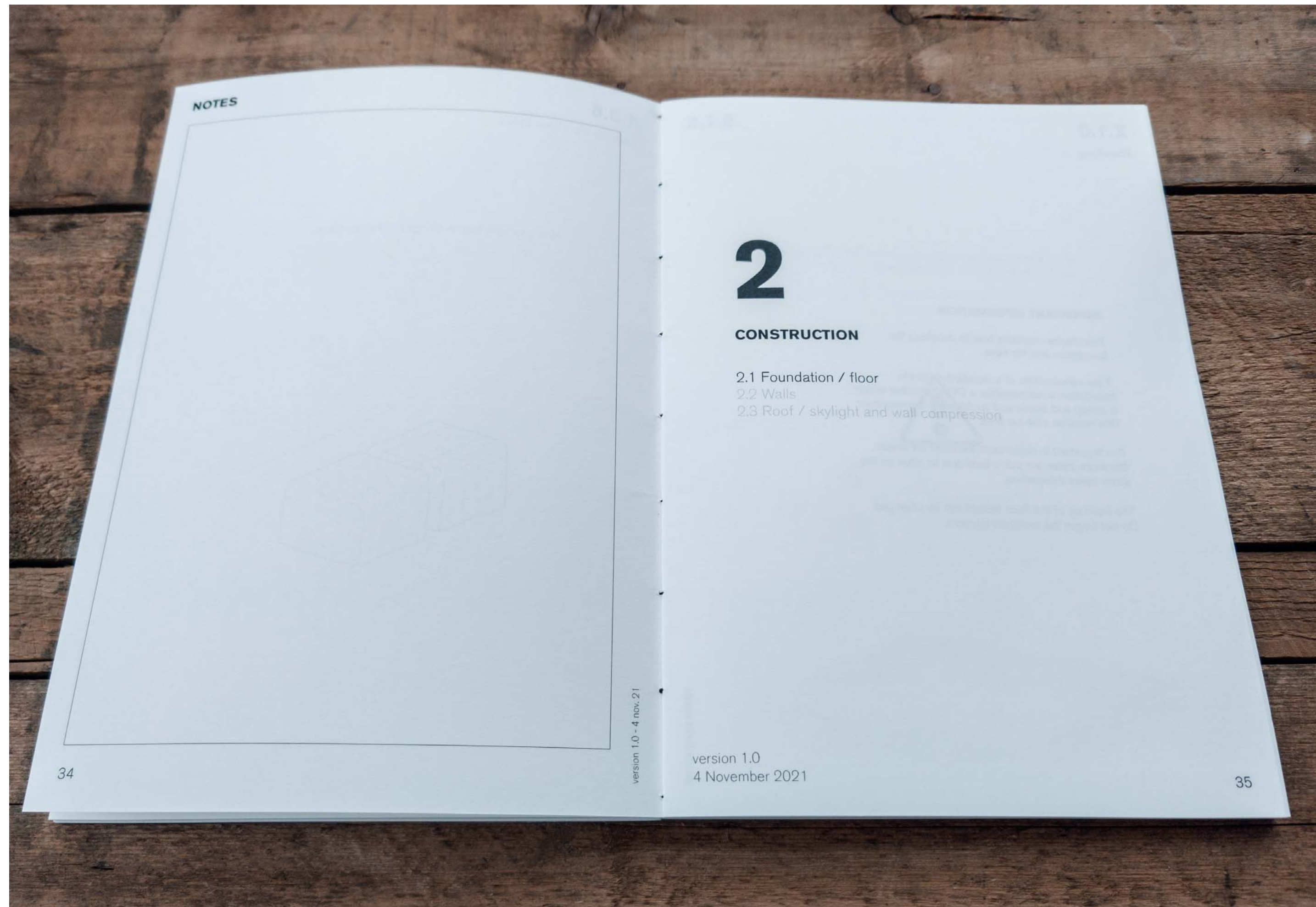
## Construction and design

Instructions and construction of the dwelling



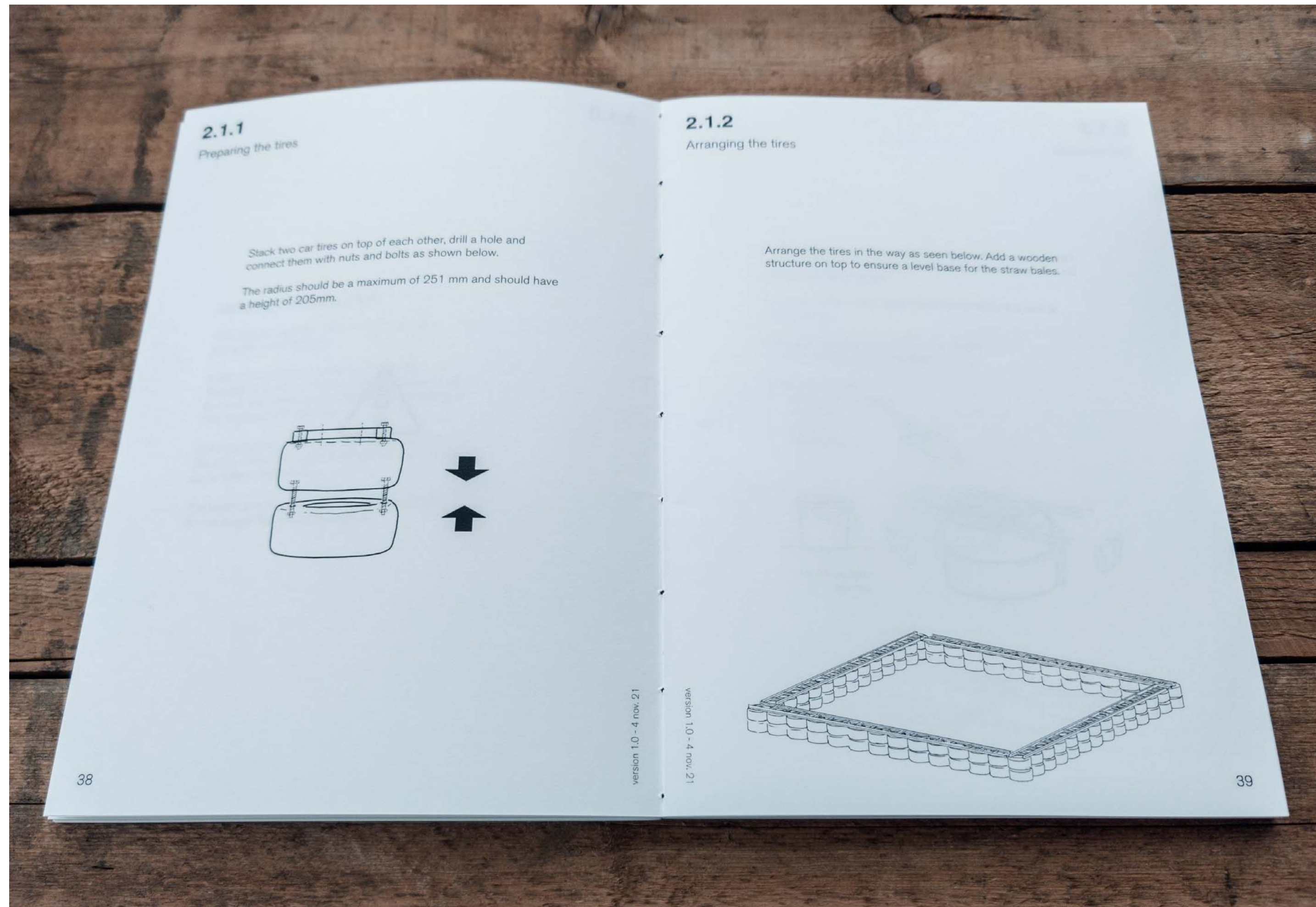
## Construction and design

Instructions and construction of the dwelling



## Construction and design

Instructions and construction of the dwelling



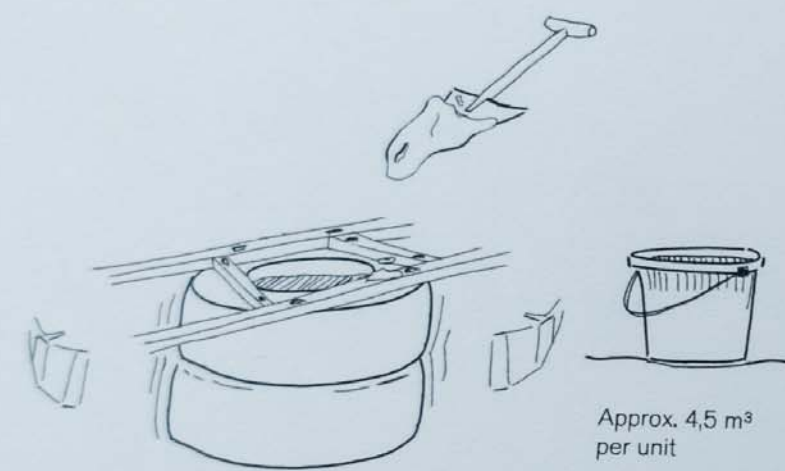
## Construction and design

Instructions and construction of the dwelling

### 2.1.3

#### Add concrete

Fill the tires with the concrete.  
Be sure to shake the tires to let air escape.



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### 2.1.4

#### Floor build-up

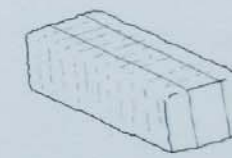
Build up the floor as shown below. Pay special attention to the moisture barrier between the ground and the palettes.

The floor needs to be higher than the base for the wall as shown below.

See page 90, appendix A, 4.A.1 for detail on floor built-up and dimensions.

#### Materials needed:

- Moisture barrier
- Palettes
- Straw
- OSB board



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## Construction and design

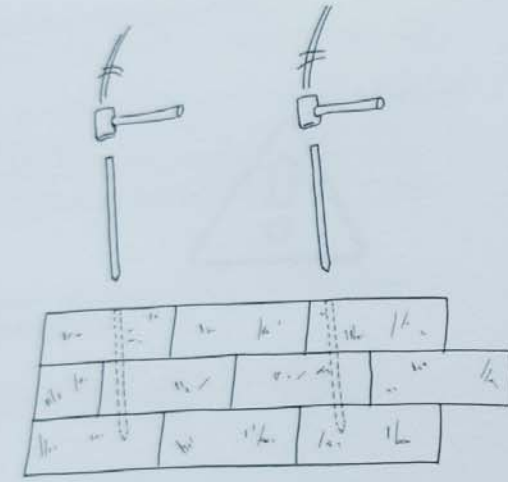
Instructions and construction of the dwelling

### 2.2.1

Stacking the straw bales to create the exterior walls

Drive a wooden **stick** (do **not** use any other material for this) through 2,5 straw bales for extra stability.

See page 97, appendix A, 4.A.8 for floorplan.



x220

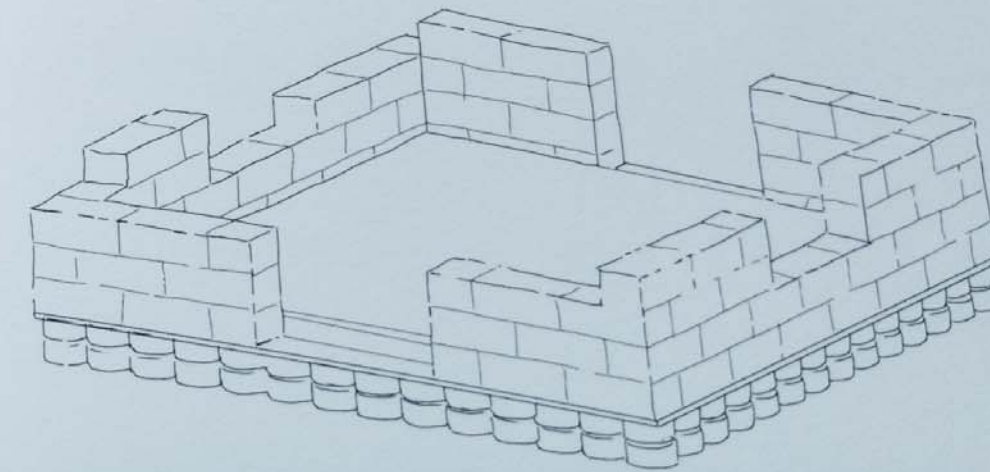


X24

### 2.2.1

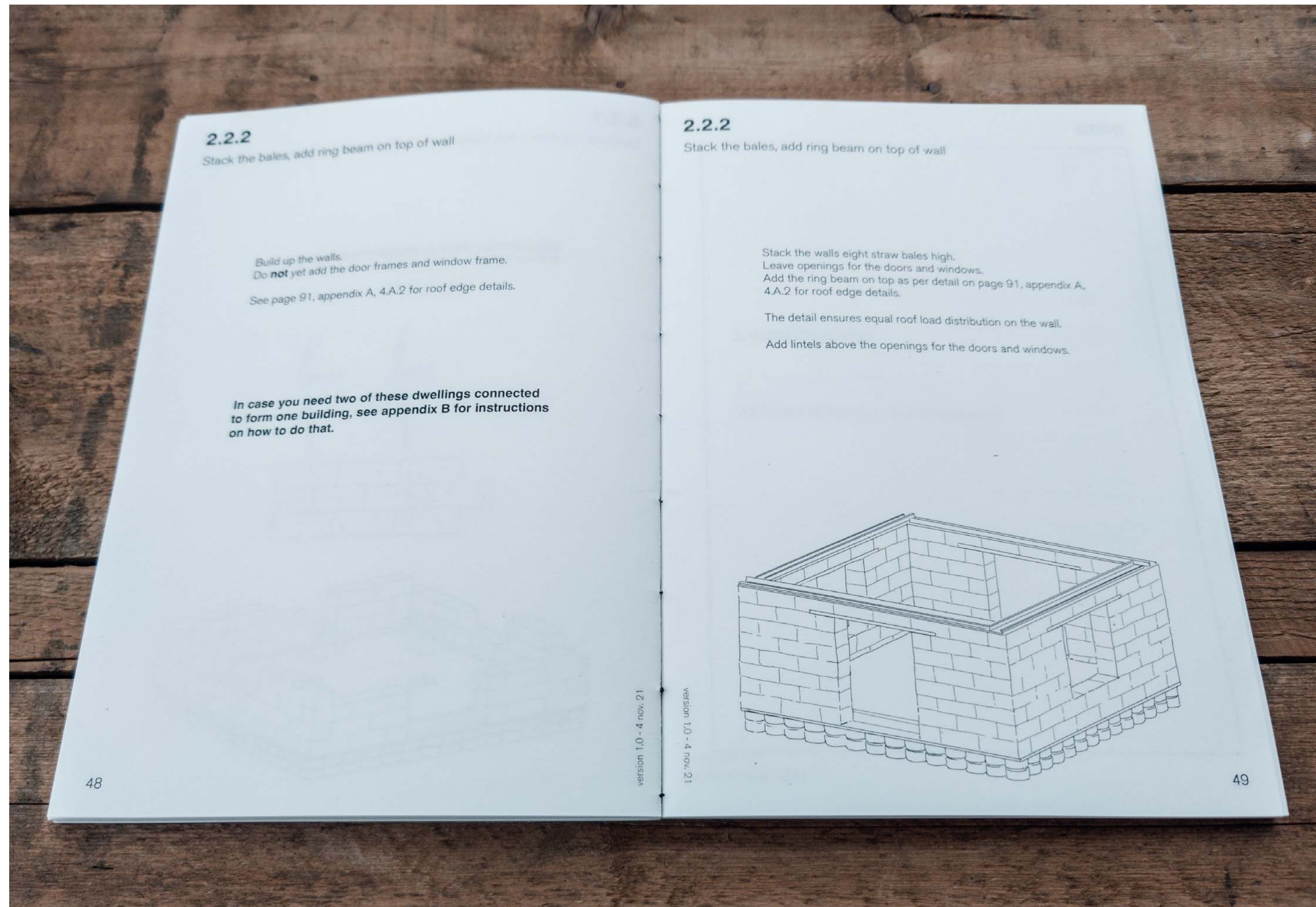
Stacking the straw bales to create the exterior walls

Stack the straw bales in a running bond in the exact way as shown below.



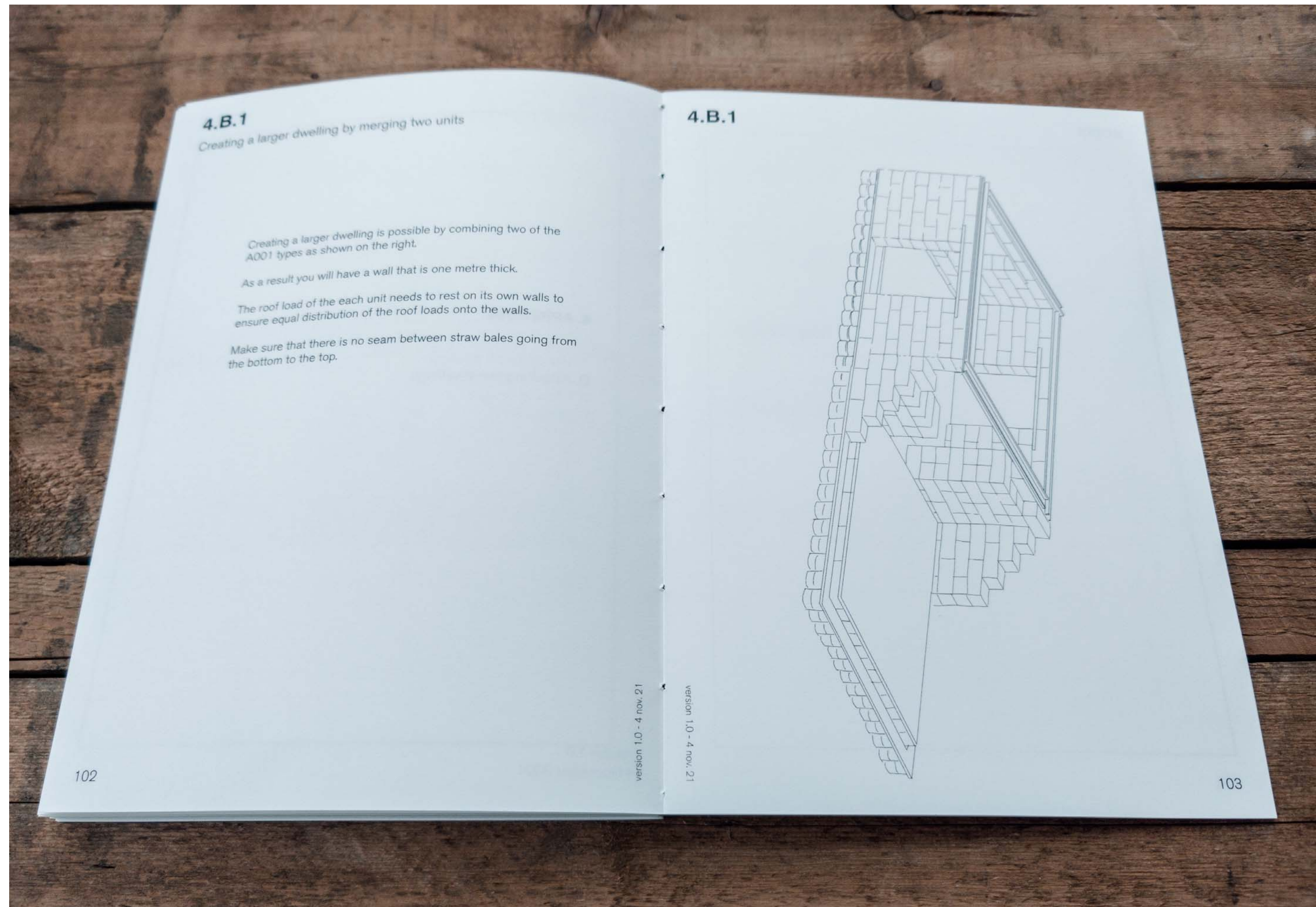
## Construction and design

Instructions and construction of the dwelling



## Construction and design

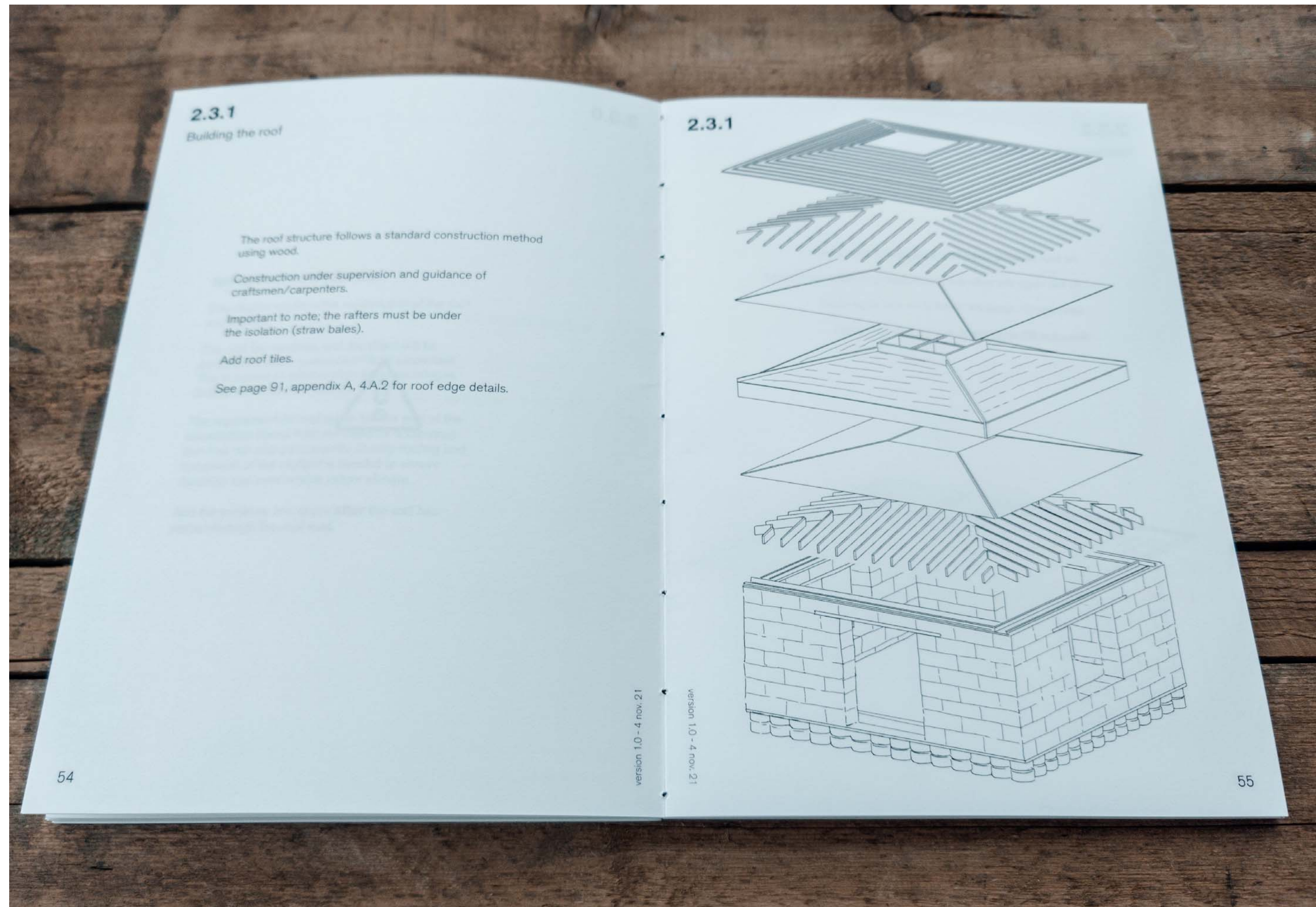
Instructions and construction of the dwelling



## Construction and design

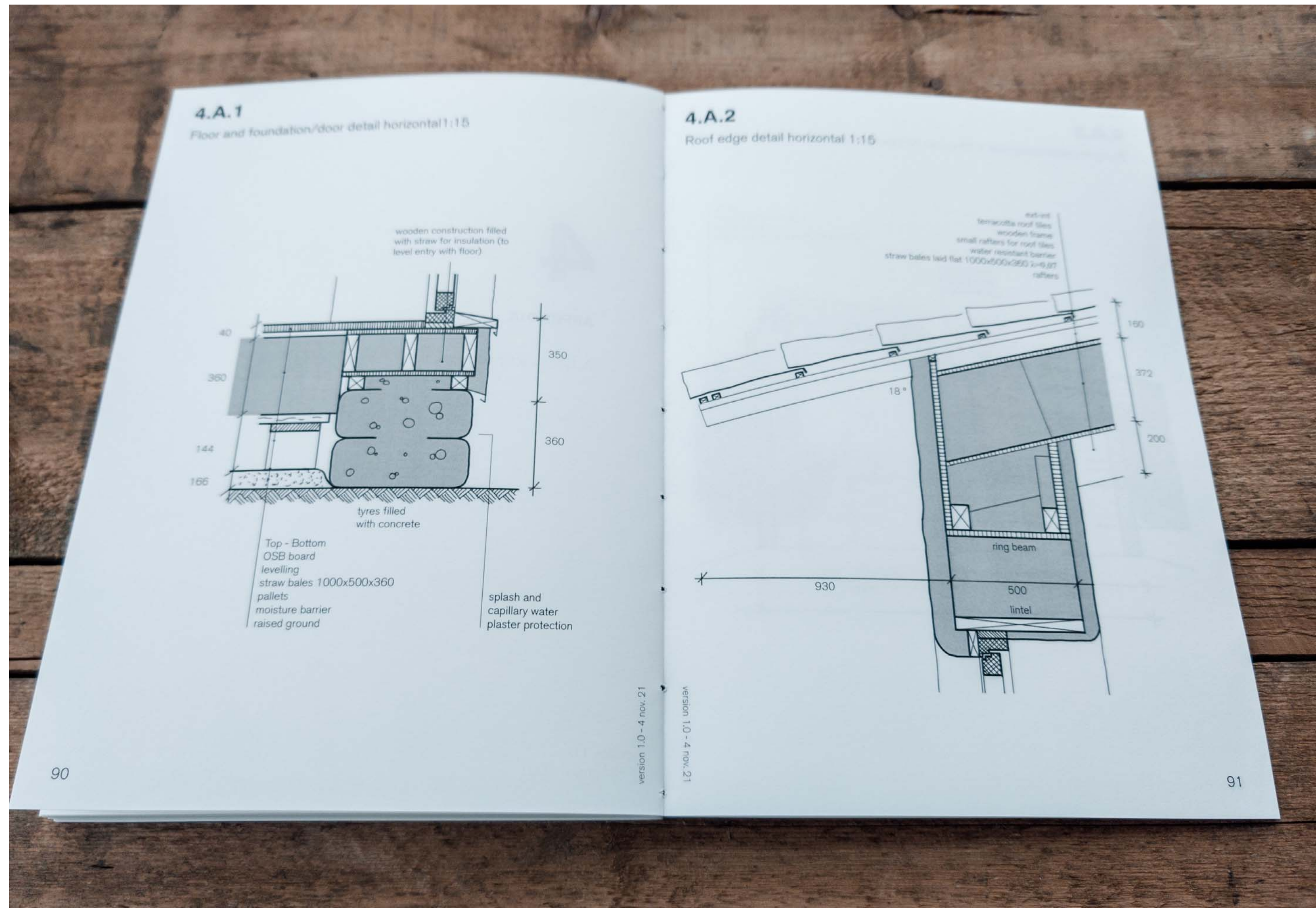
Instructions and construction of the dwelling





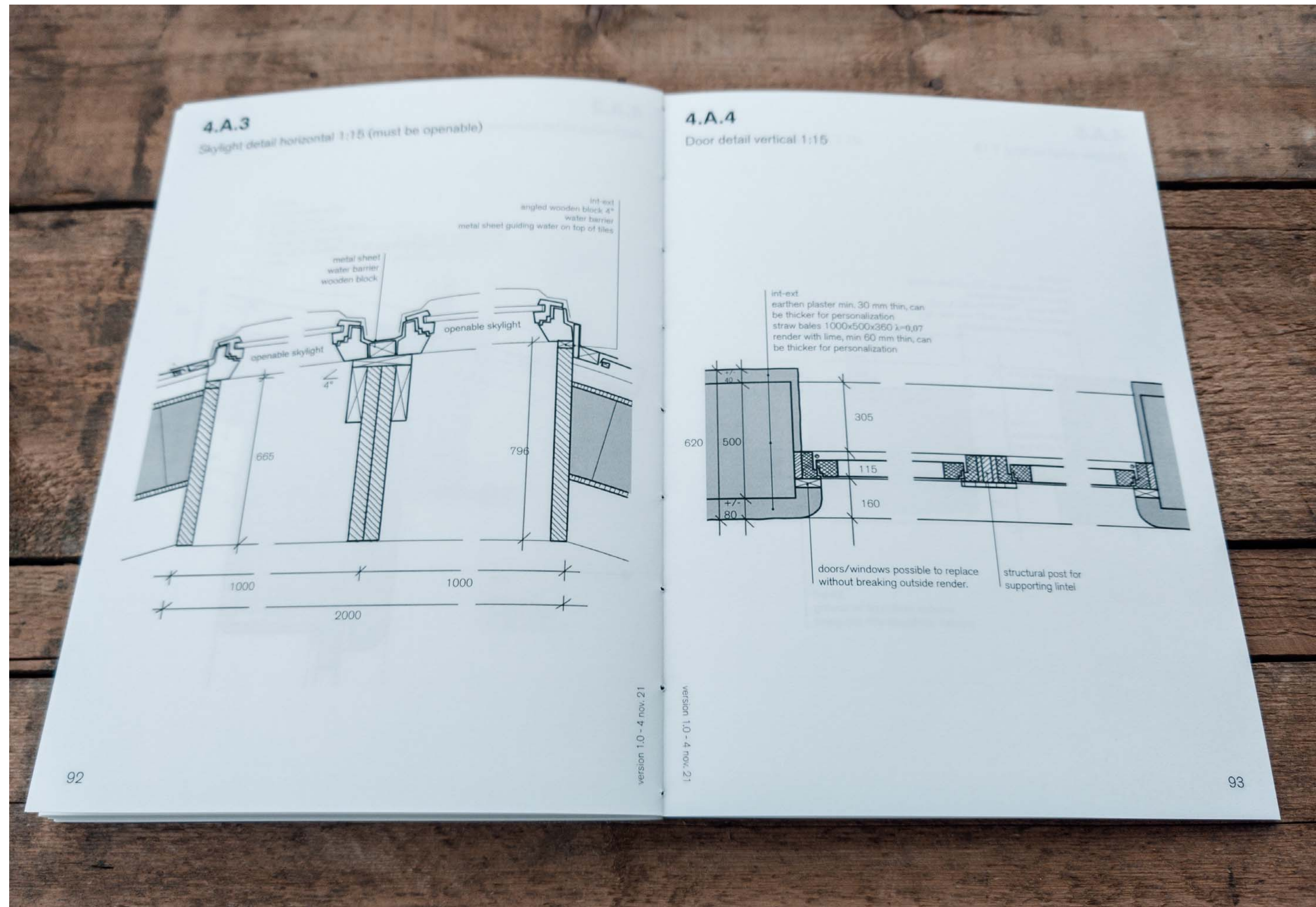
## Construction and design

Instructions and construction of the dwelling



## Construction and design

Instructions and construction of the dwelling



## Construction and design

Instructions and construction of the dwelling

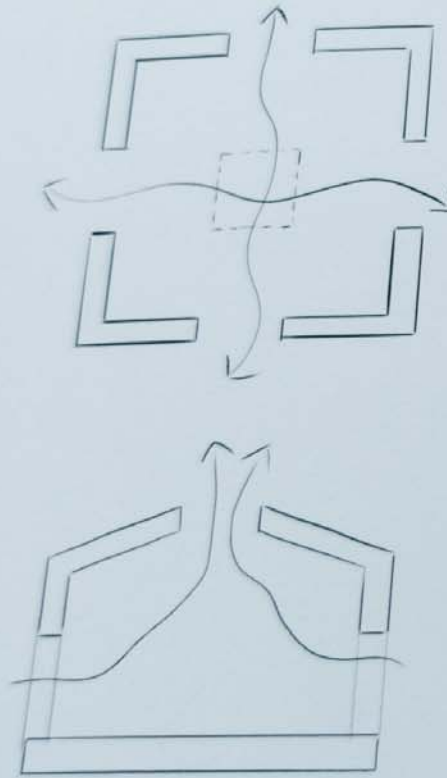
#### 4.C.1

Cross ventilation, openable skylight and night purge

The cooling of this dwelling relies on cross ventilation and letting the heat escape through the openable skylights.

Since the skylights are openable, cooling can also happen through cross ventilation from window or door to skylight.

During heat waves or hot days, night purge is recommended, allowing the unfired earth bricks to cool down more rapidly due to draft. In this way, the bricks can take up more heat during the day, making for a more comfortable indoor climate.



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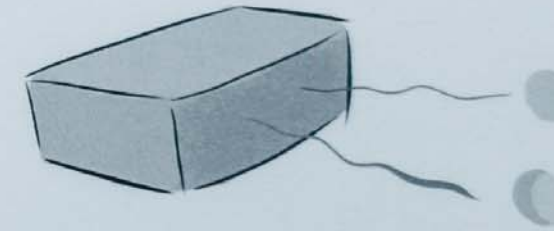
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#### 4.C.2

Thermal mass

Having interior walls with thermal mass is of great essence. The bricks (or other material with a lot of thermal mass) can absorb heat and release them later. This makes for a more stable and comfortable indoor climate.

During consecutive hot days it is of essence that you let the bricks cool through night purging the dwelling.



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## Construction and design

Instructions and construction of the dwelling

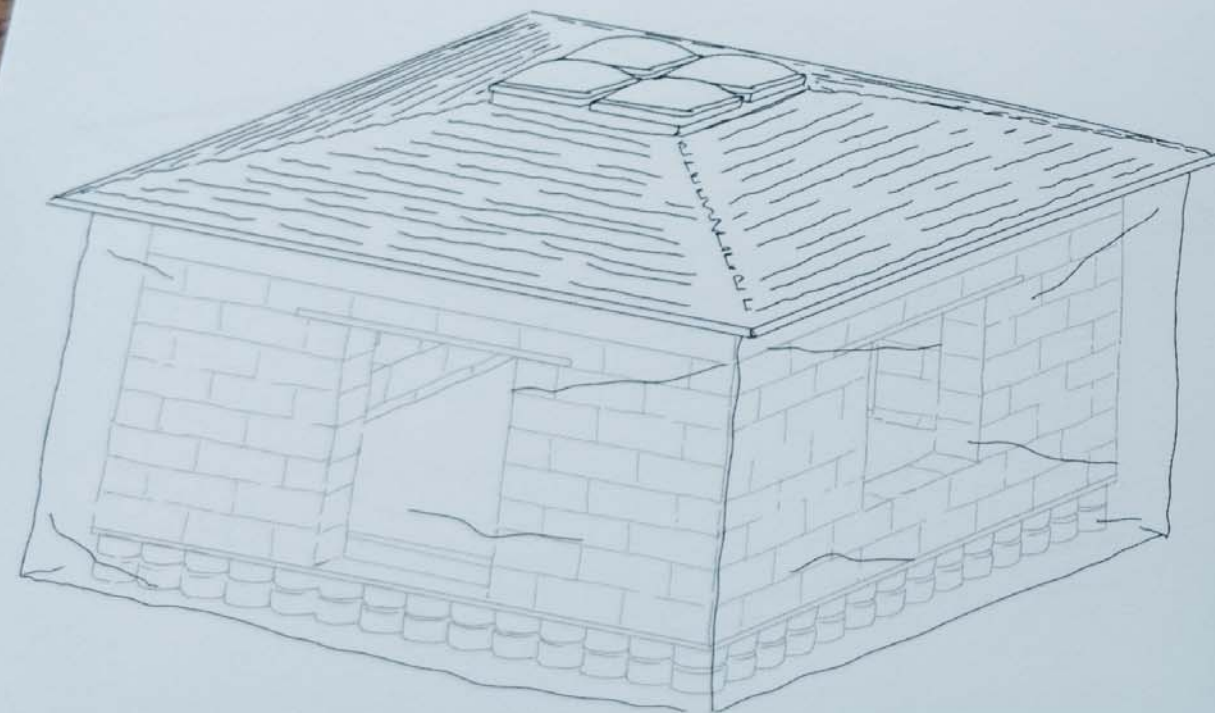
### 2.3.3

Settling of the straw bales through roof load compression

Add a tarp around the outside perimeter of the roof to keep the straw dry.

The load of the roof will compress and settle the straw bales, effectively shrinking the wall.

Measure the height of the wall each day for a minimum of one week, or until no further shrinkage of the wall is observed.



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### 2.3.4

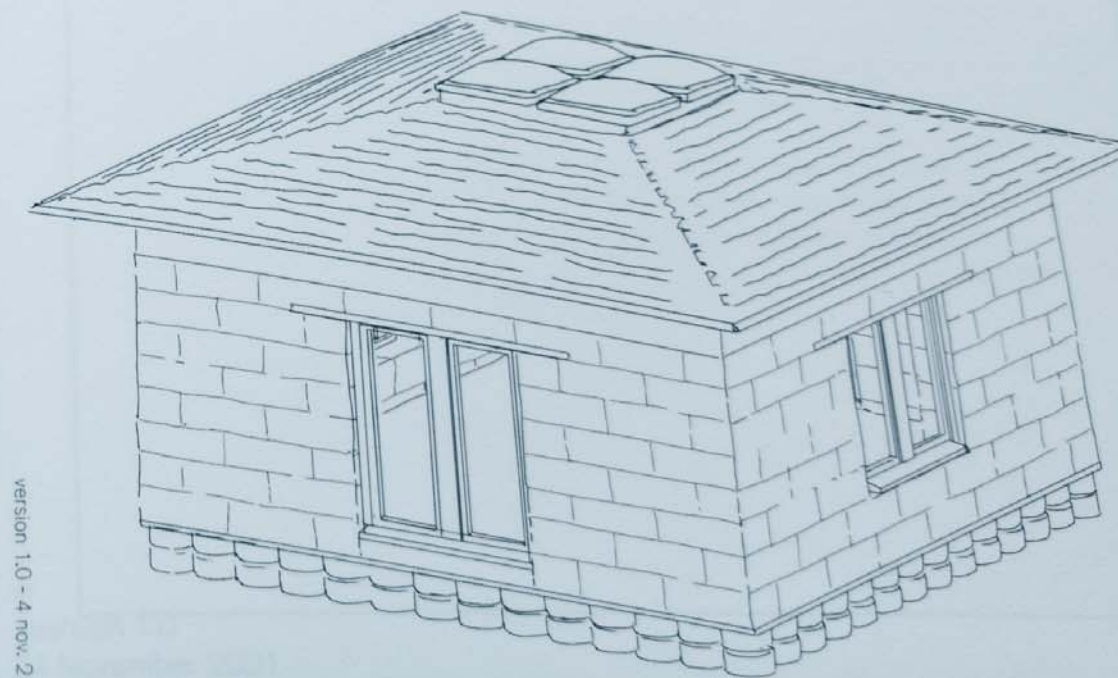
Adding the doors and windows

After walls have settled, add the windows and doors.

Construction under supervision and guidance of craftsmen/carpenters.

See page 93, appendix A, 4.A.4 for horizontal door detail.  
See page 90, appendix A, 4.A.1 for vertical door detail.

See page 94, appendix A, 4.A.5 for vertical window detail.  
See page 95, appendix A, 4.A.6 for horizontal window detail.

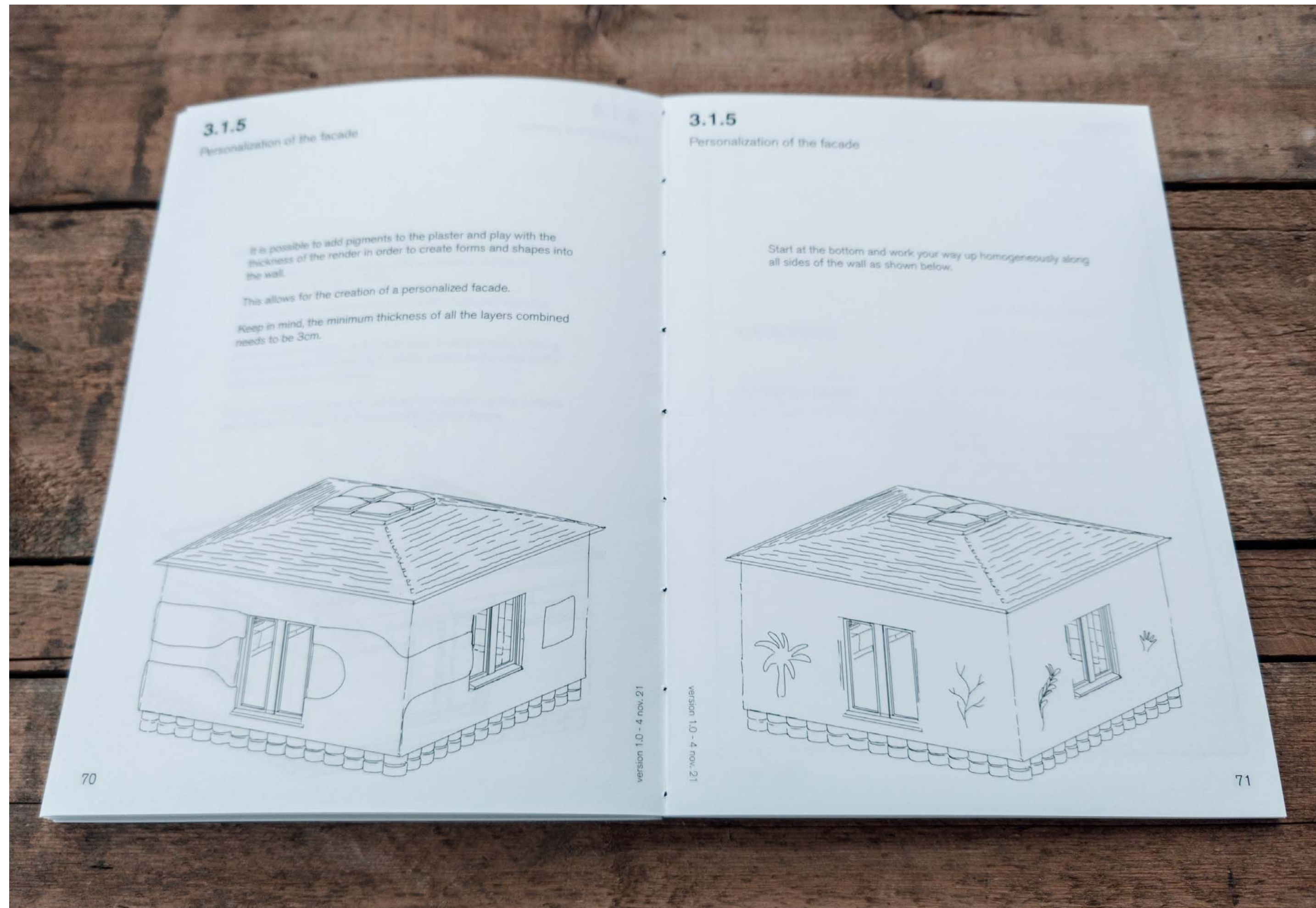


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## Construction and design

Instructions and construction of the dwelling



## Construction and design

Instructions and construction of the dwelling

### 3.3.1

#### Creating the mud for unfired earth bricks

Add water to sand and soil.

The amounts of these ingredients vary depending on the available soil. The right recipe is found through trial and error.

If you find the bricks are not sturdy enough, start off with varying the amount of sand.



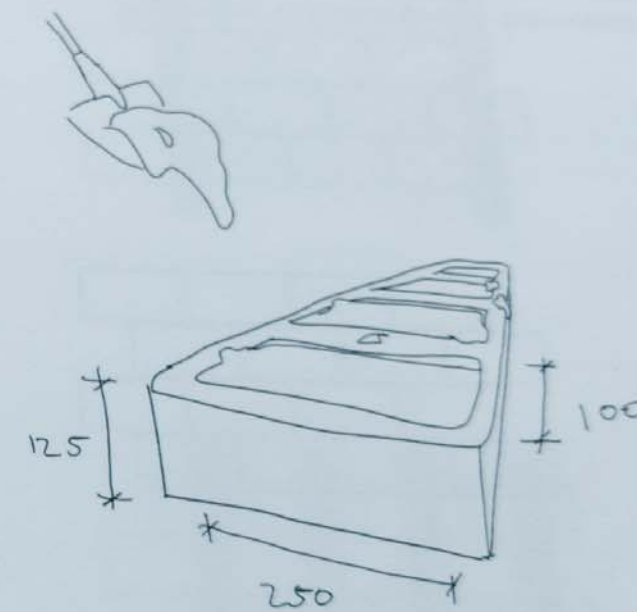
### 3.3.2

#### Creating unfired earth bricks

Put the mud mixture into moulds made of wood with dimensions as shown below.

Let the bricks dry for five days. If cracks appear, take them out of the direct sunlight.

After five days take them out of the moulds and let them dry for at least two more days.



## Construction and design

Instructions and construction of the dwelling

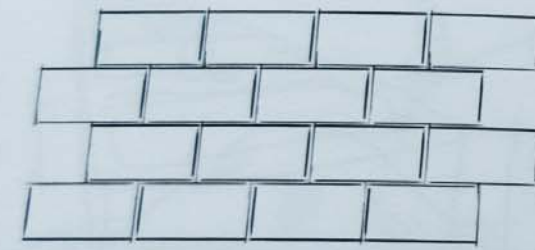
### 3.3.3

#### Creating the interior walls

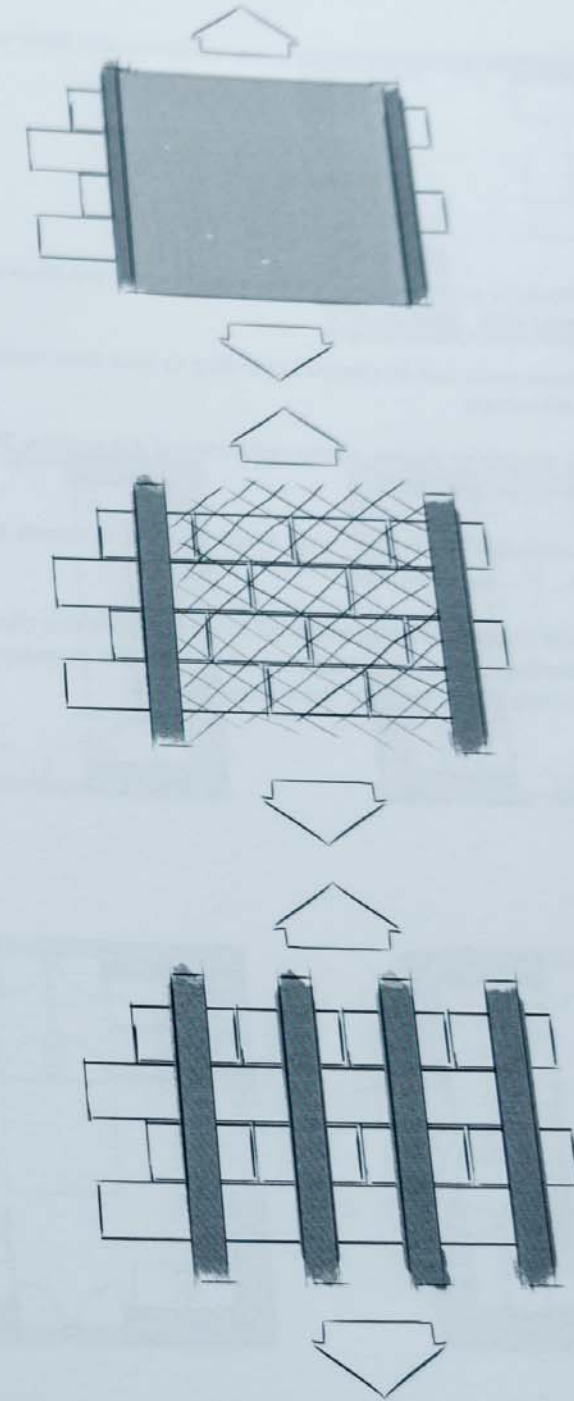
The interior walls are created by laying the bricks in a running bond as shown below.

The bricks can then be attached to the rafters and the OSB floor board in any way possible. Some ideas for this are given on the right hand side.

If more sound insulation is required, you can add locally available noise absorbing material between the bricks and the construction material holding the wall in place.



### 3.3.3



## Construction and design

Instructions and construction of the dwelling



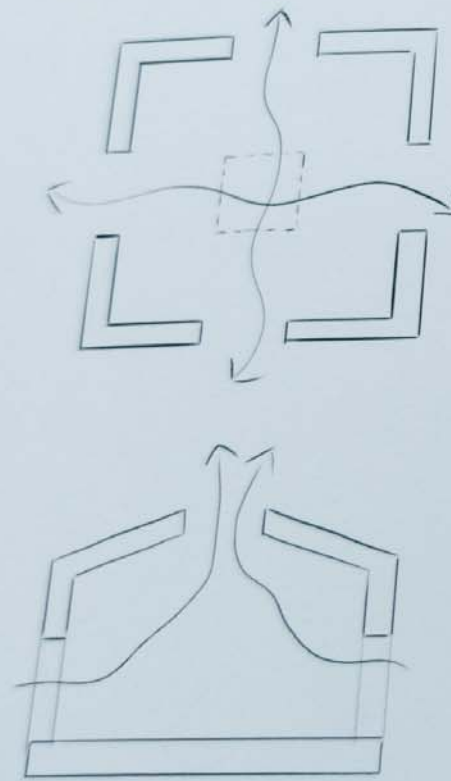
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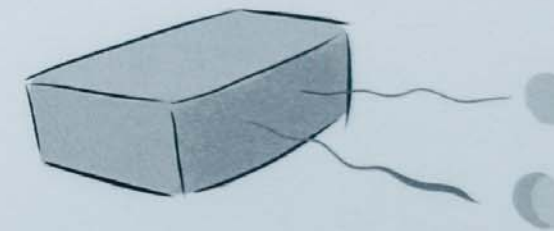
version 1.0 - 4 nov. 21

#### 4.C.2

Thermal mass

Having interior walls with thermal mass is of great essence. The bricks (or other material with a lot of thermal mass) can absorb heat and release them later. This makes for a more stable and comfortable indoor climate.

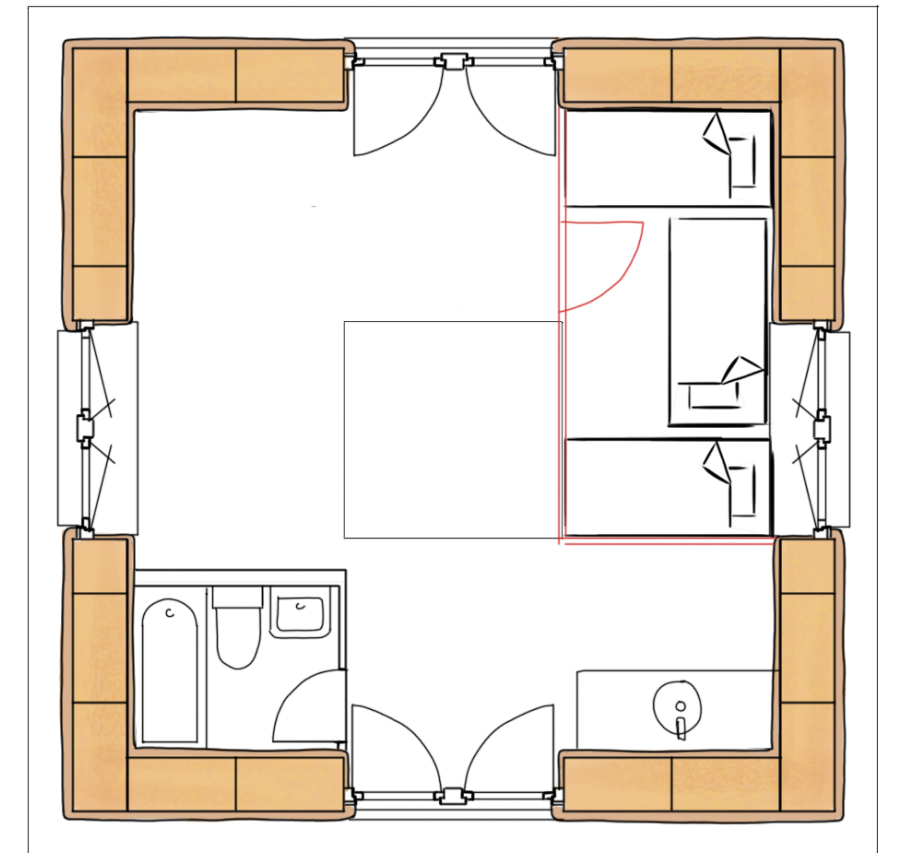
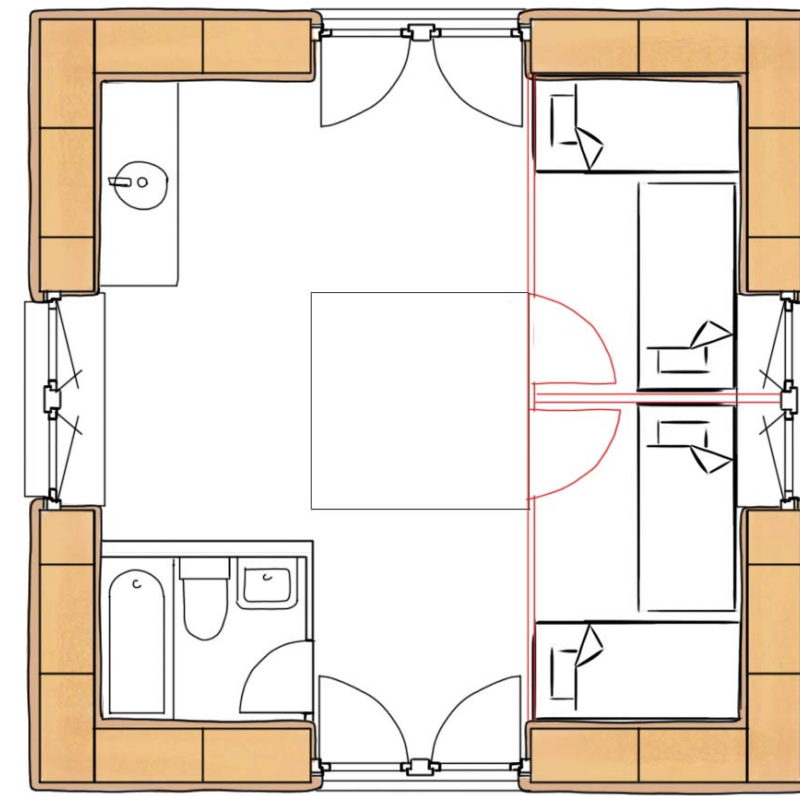
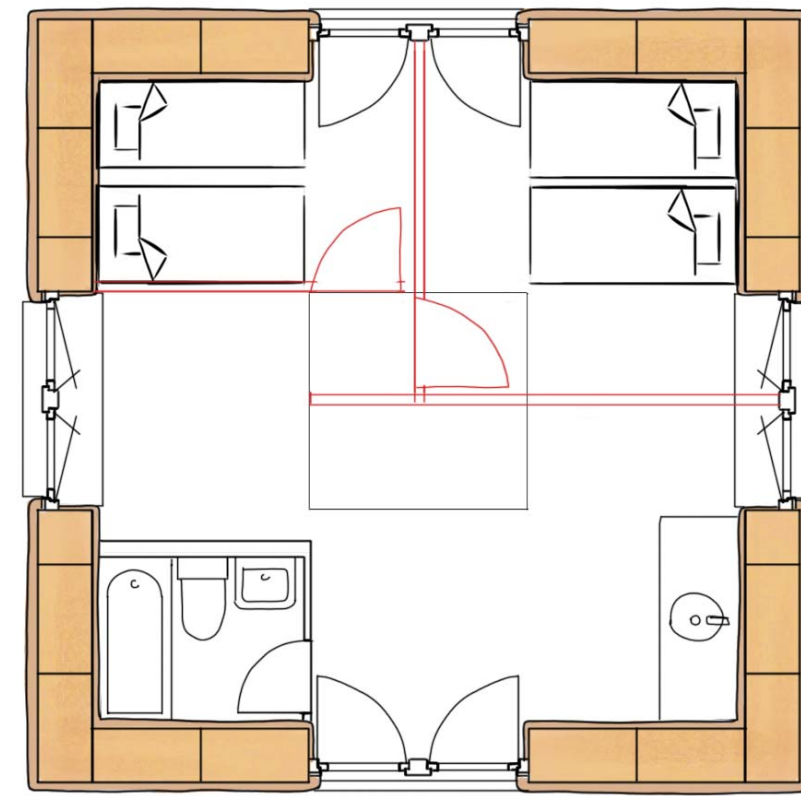
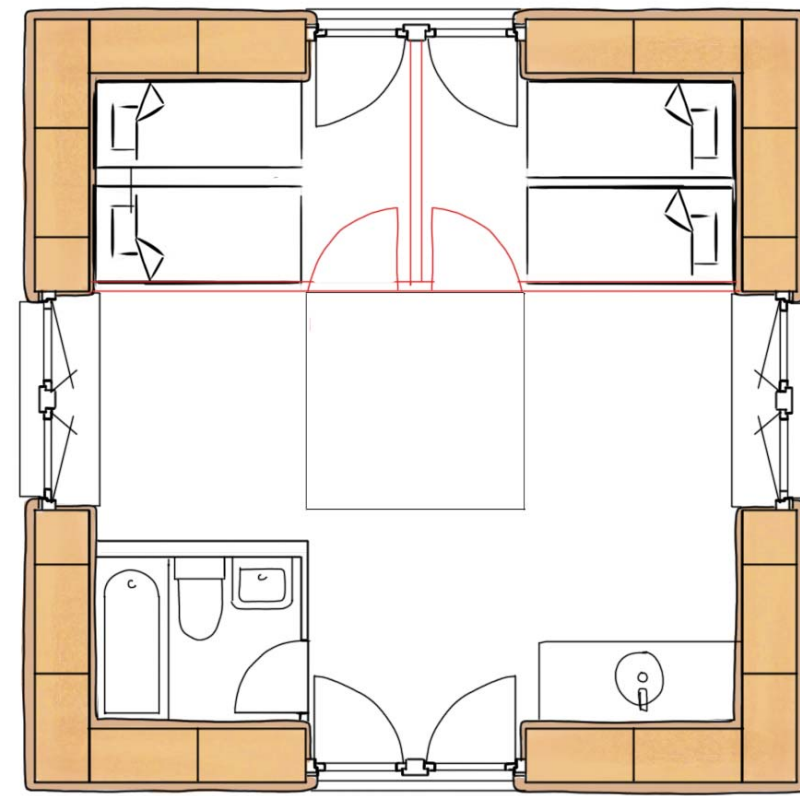
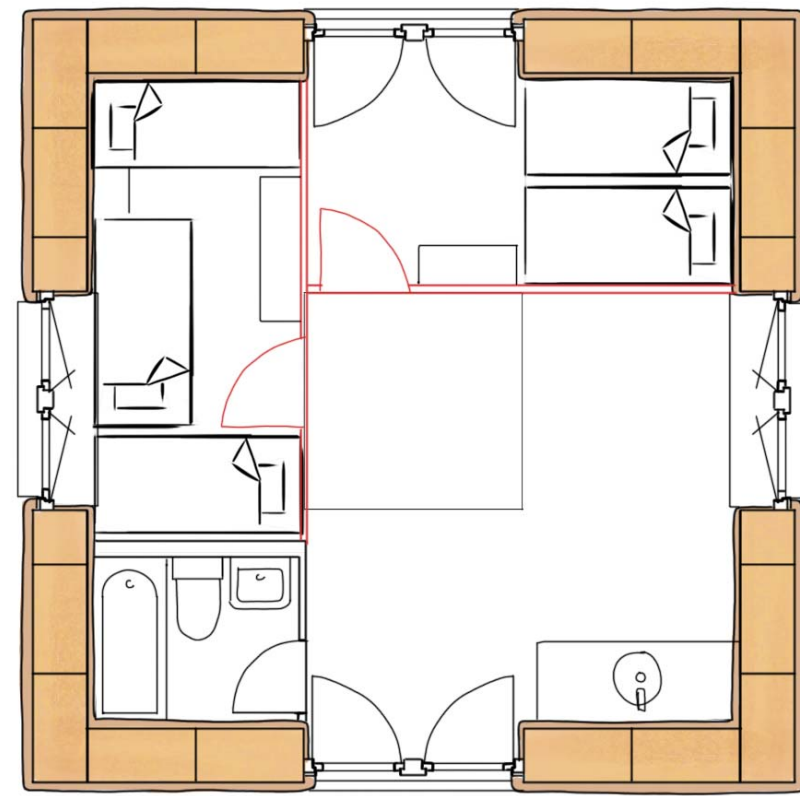
During consecutive hot days it is of essence that you let the bricks cool through night purging the dwelling.



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## Construction and design

Instructions and construction of the dwelling

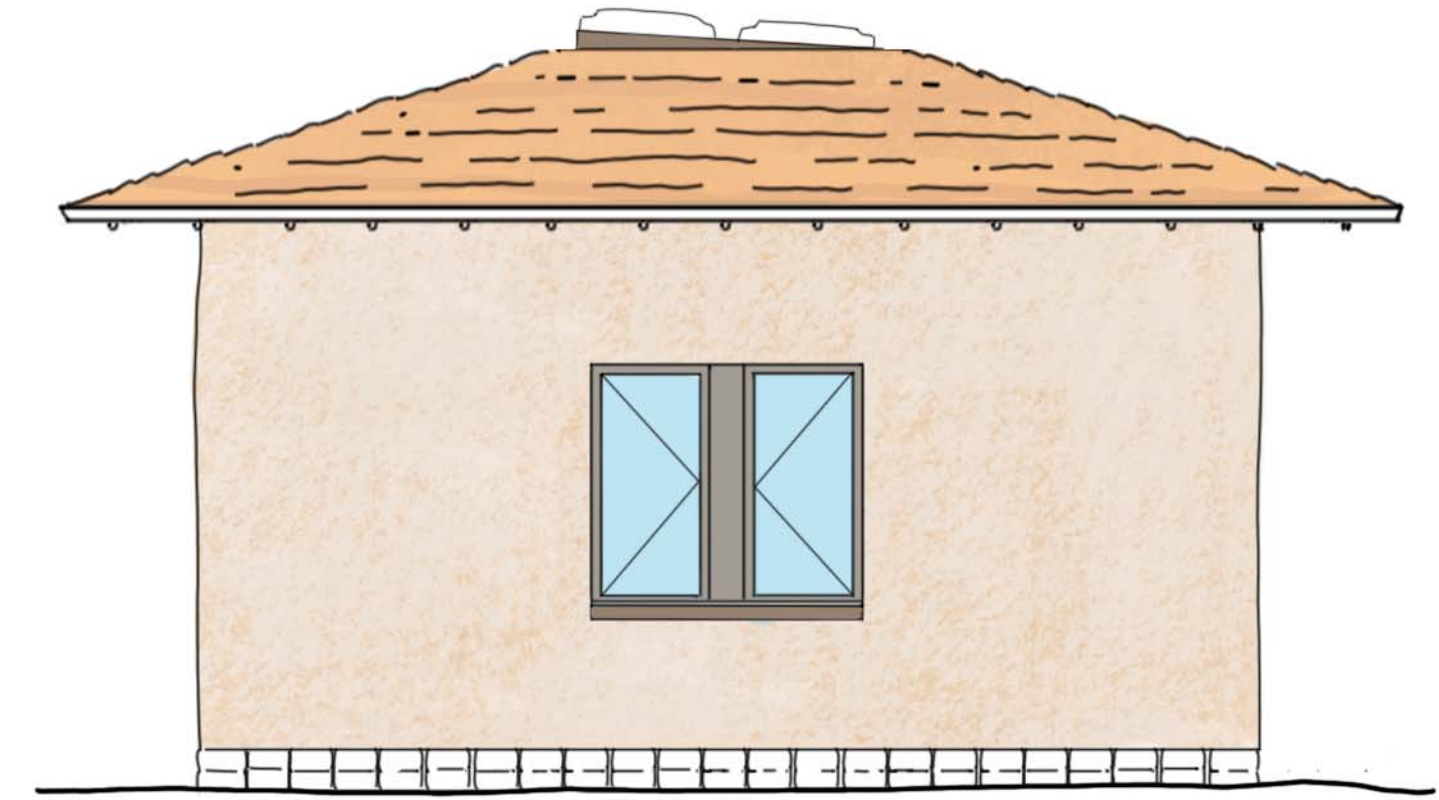


## Construction and design

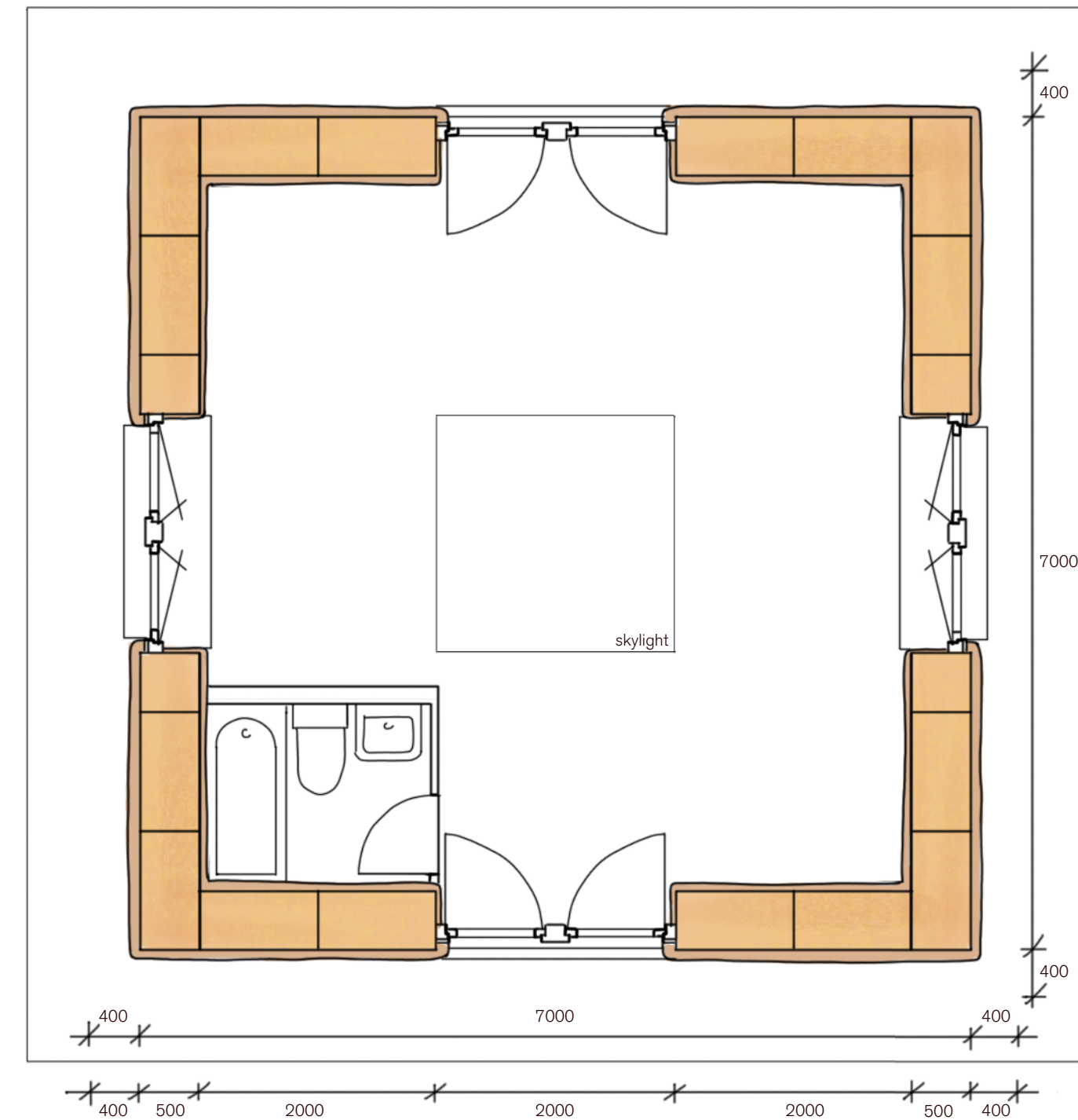
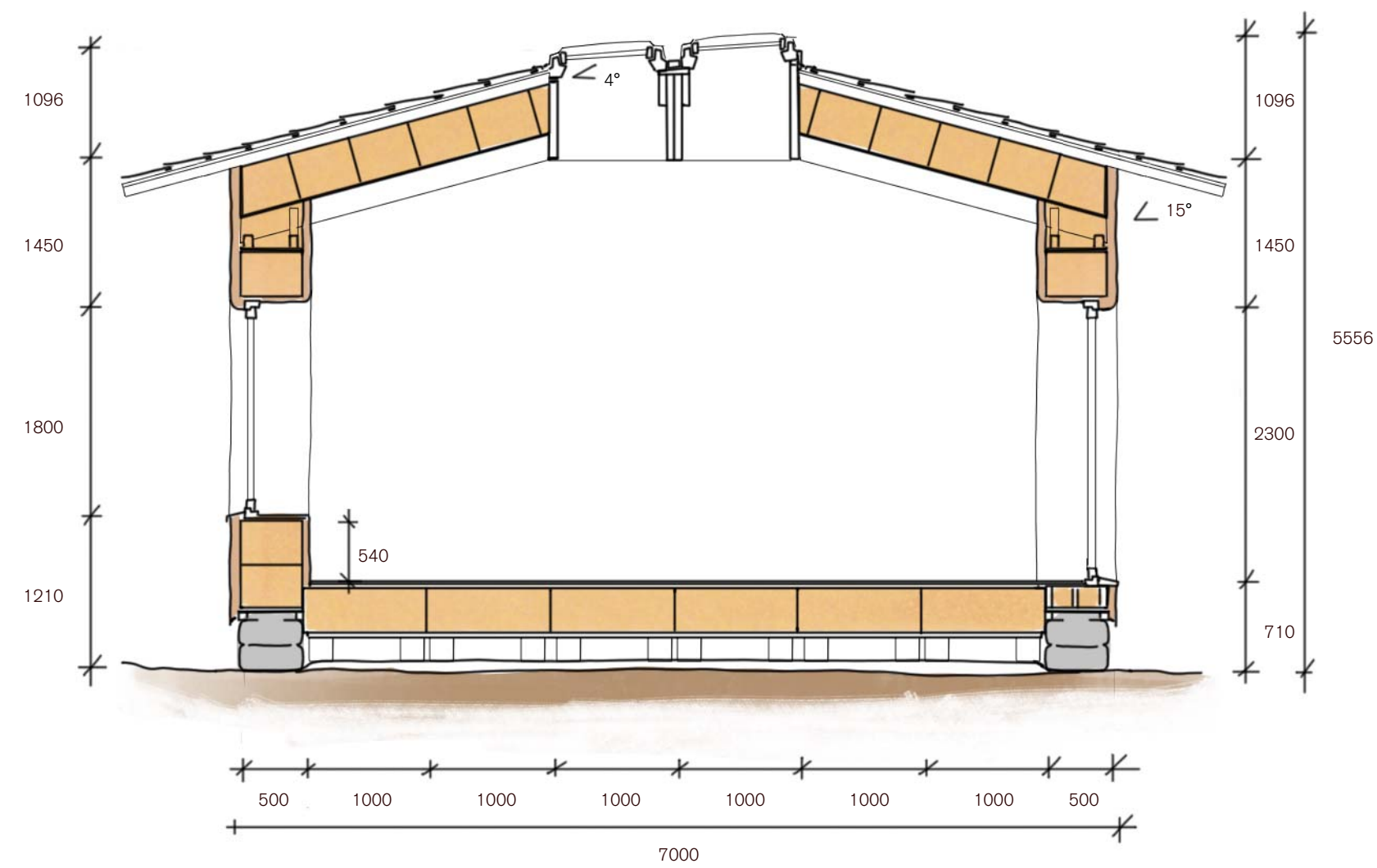
Instructions and construction of the dwelling



facade with door (front/back)  
1:50



facade with window (sides)  
1:50



## Construction and design

Instructions and construction of the dwelling



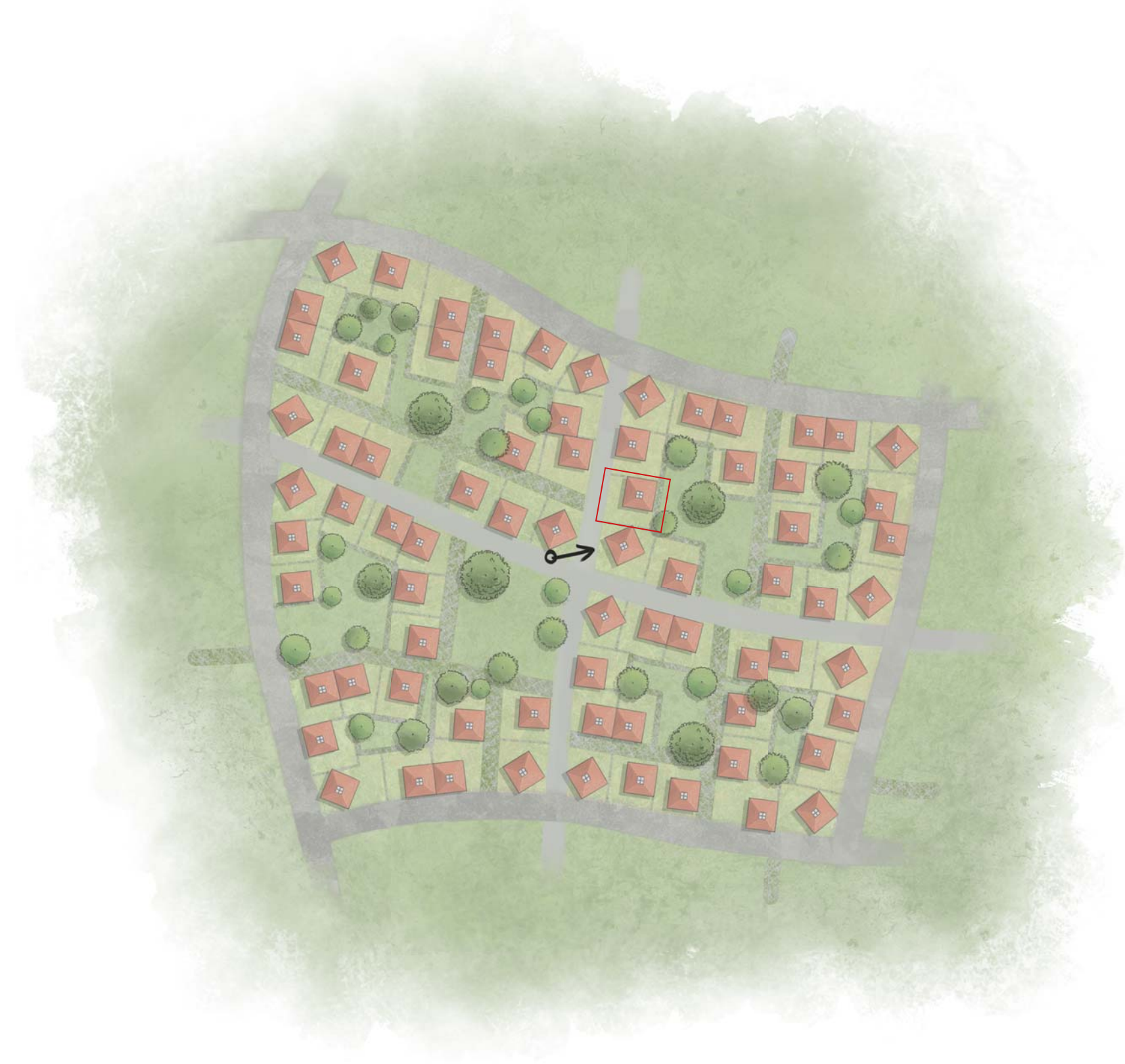
Jobfair - refugee city centre



Jobfair - refugee city centre



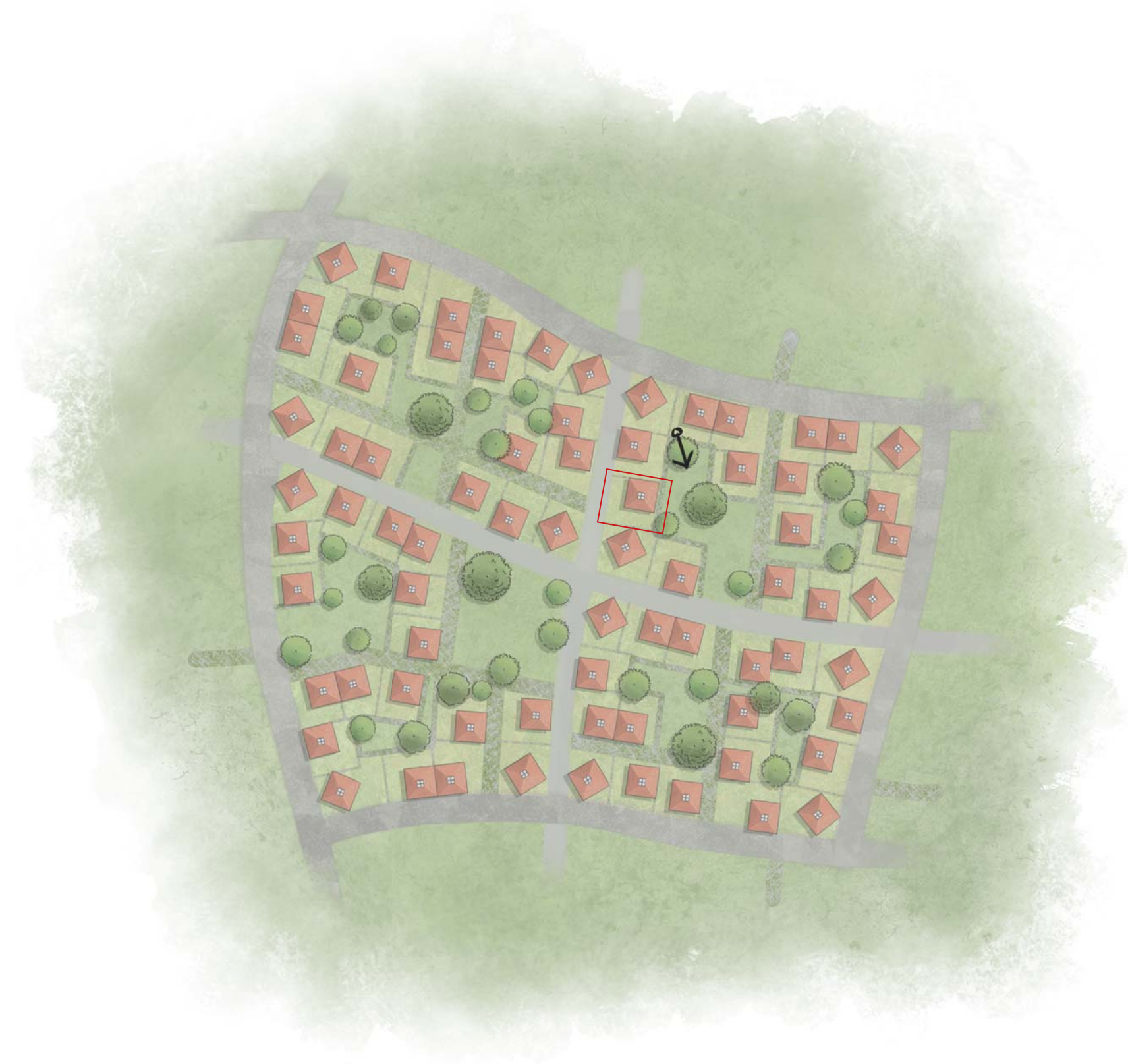
Supermarket - a place of interaction





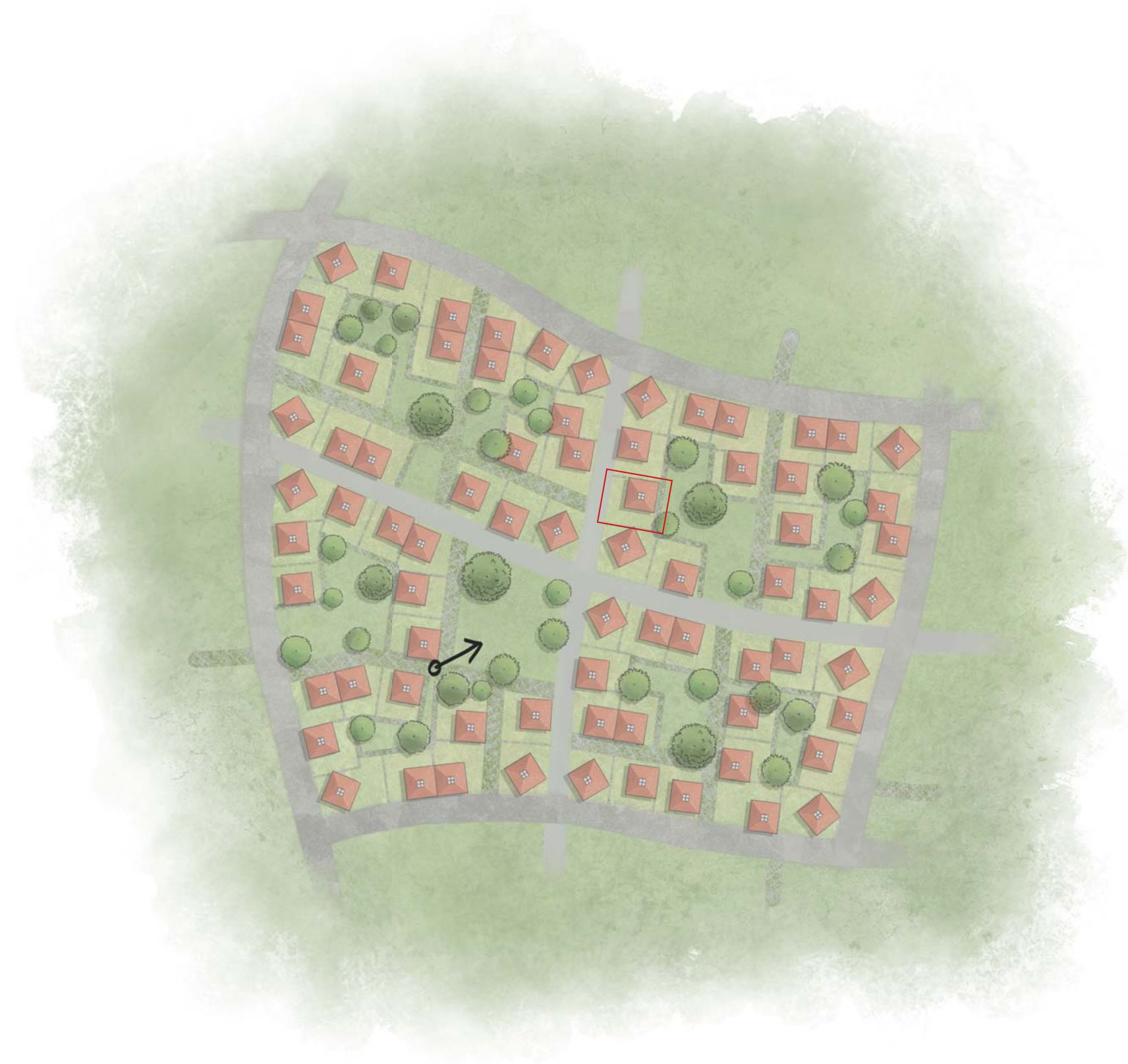
Building new homes







Playing safely in the courtyards



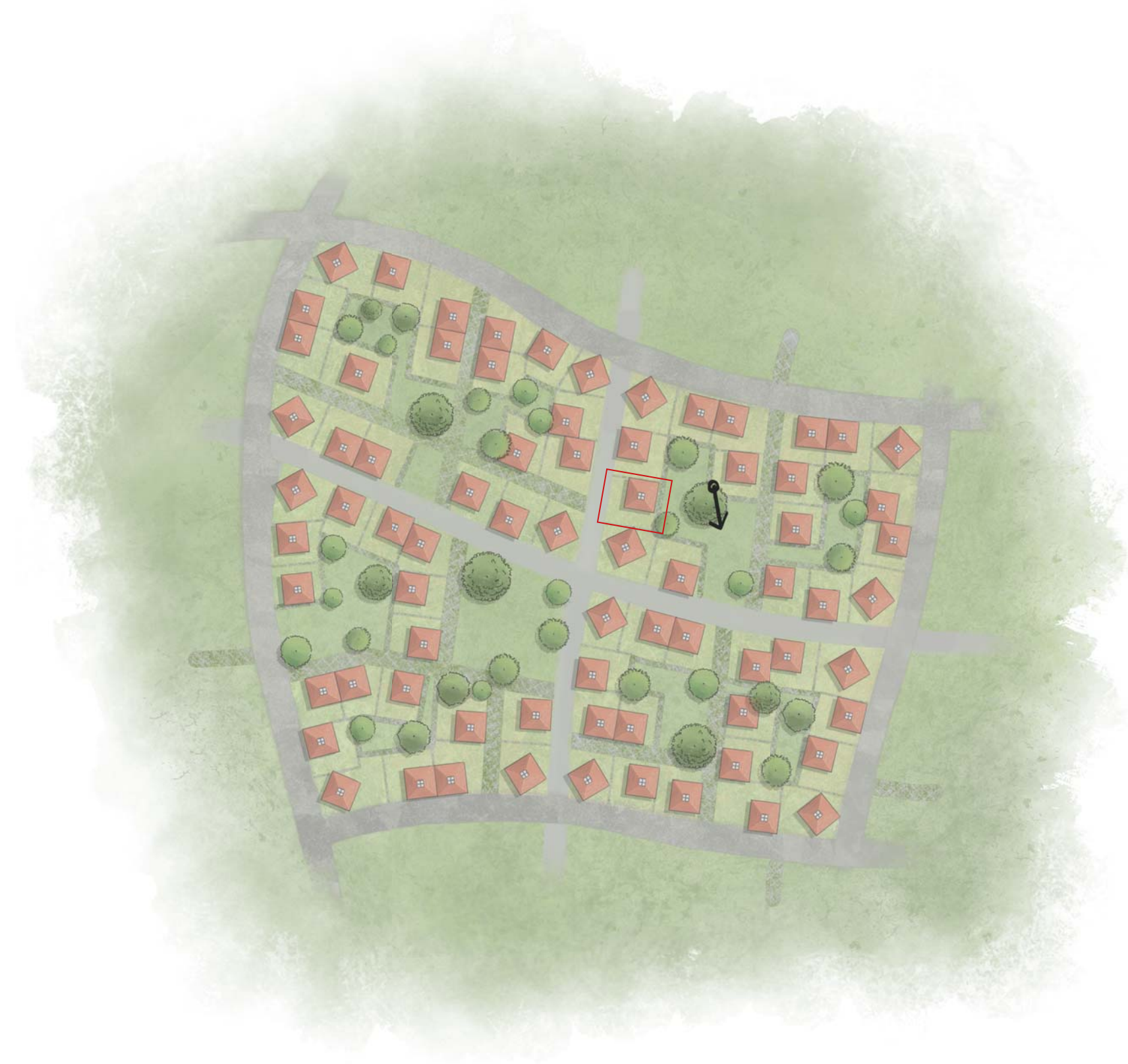


Neighbourhood square - activities





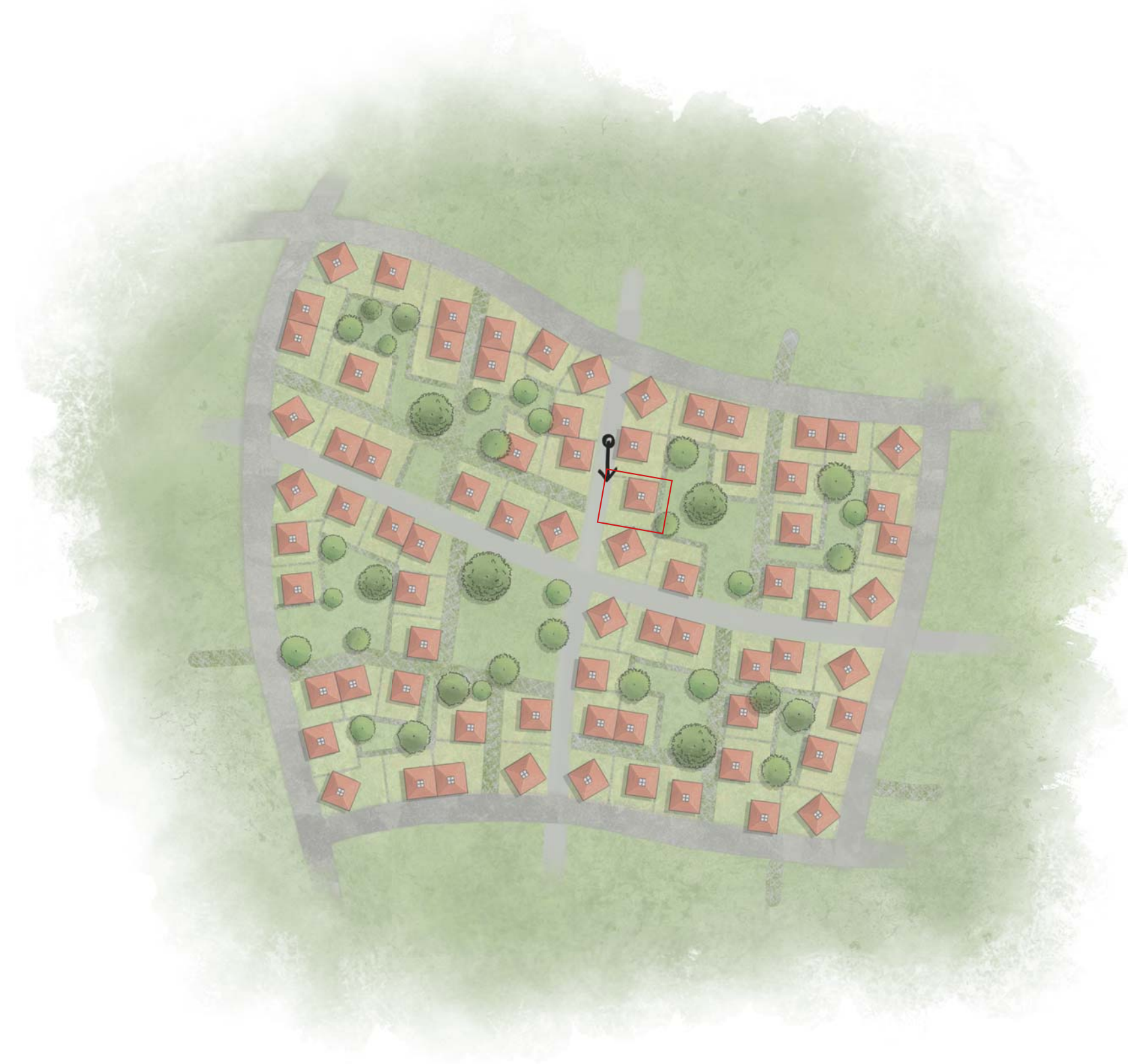
Baker on the corner





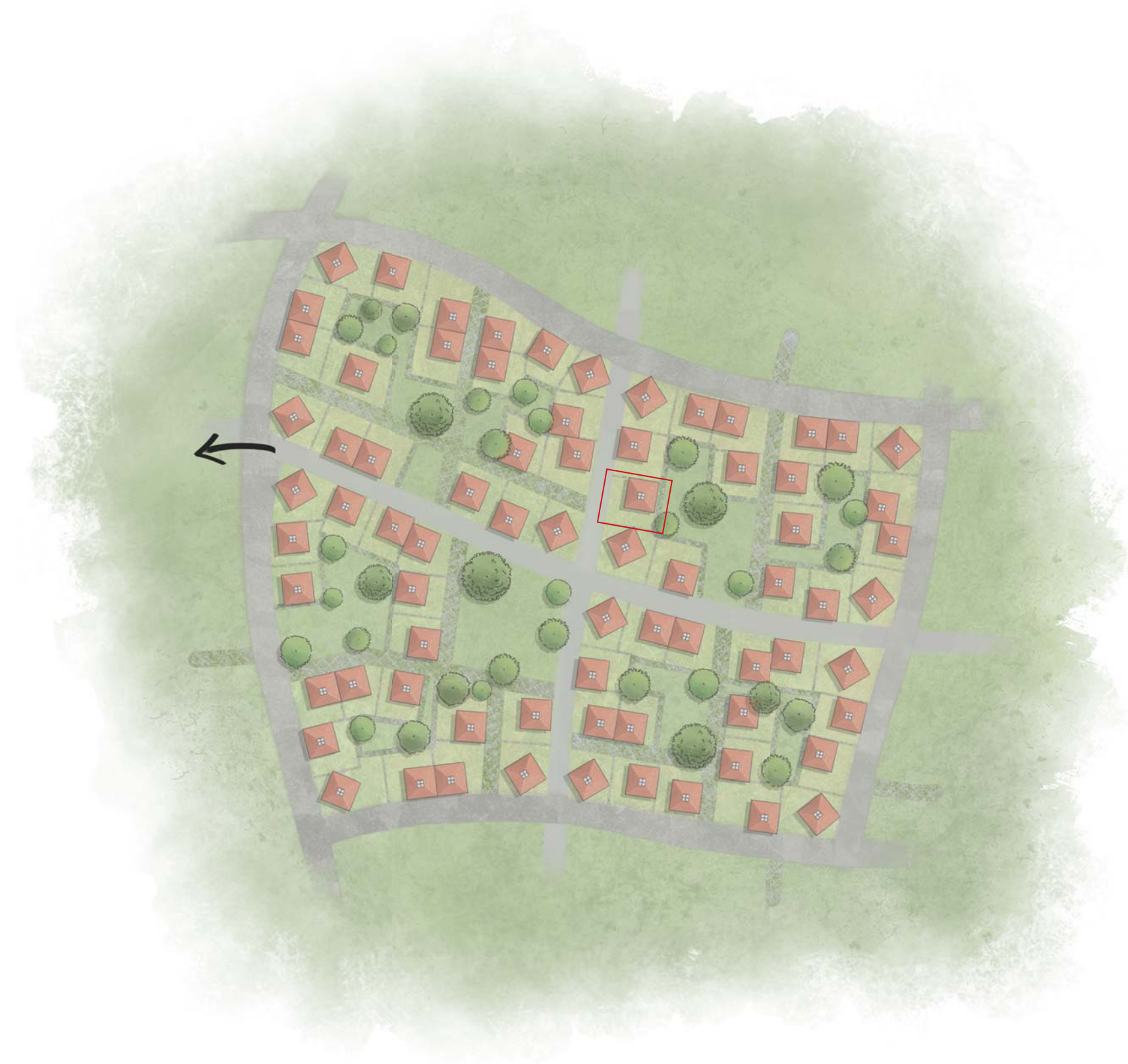
Cluster dinner







Expanding on the restaurant



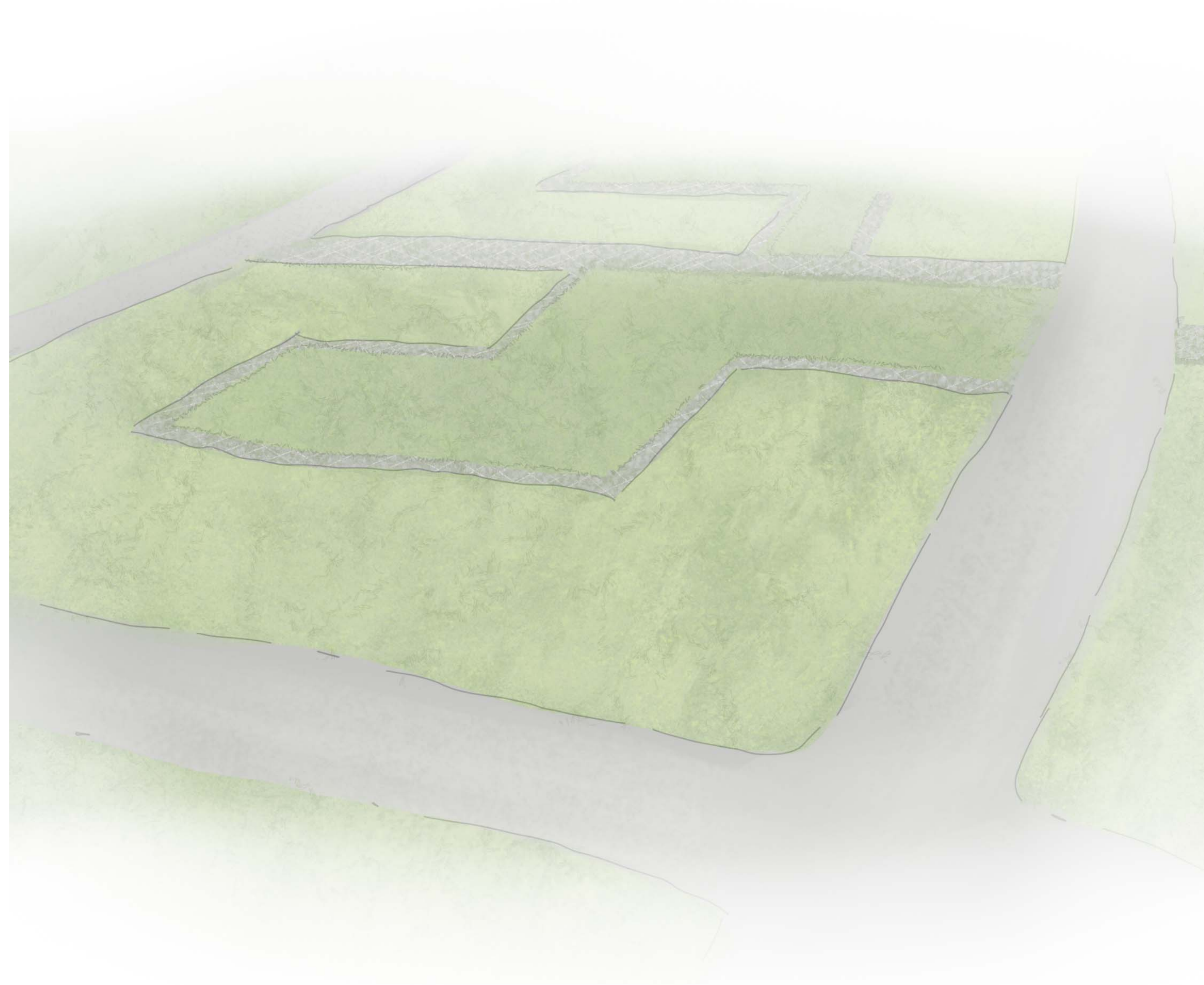


Shopping in other areas of the refugee city





Social cohesion



step 1: empty framework



step 2: early development

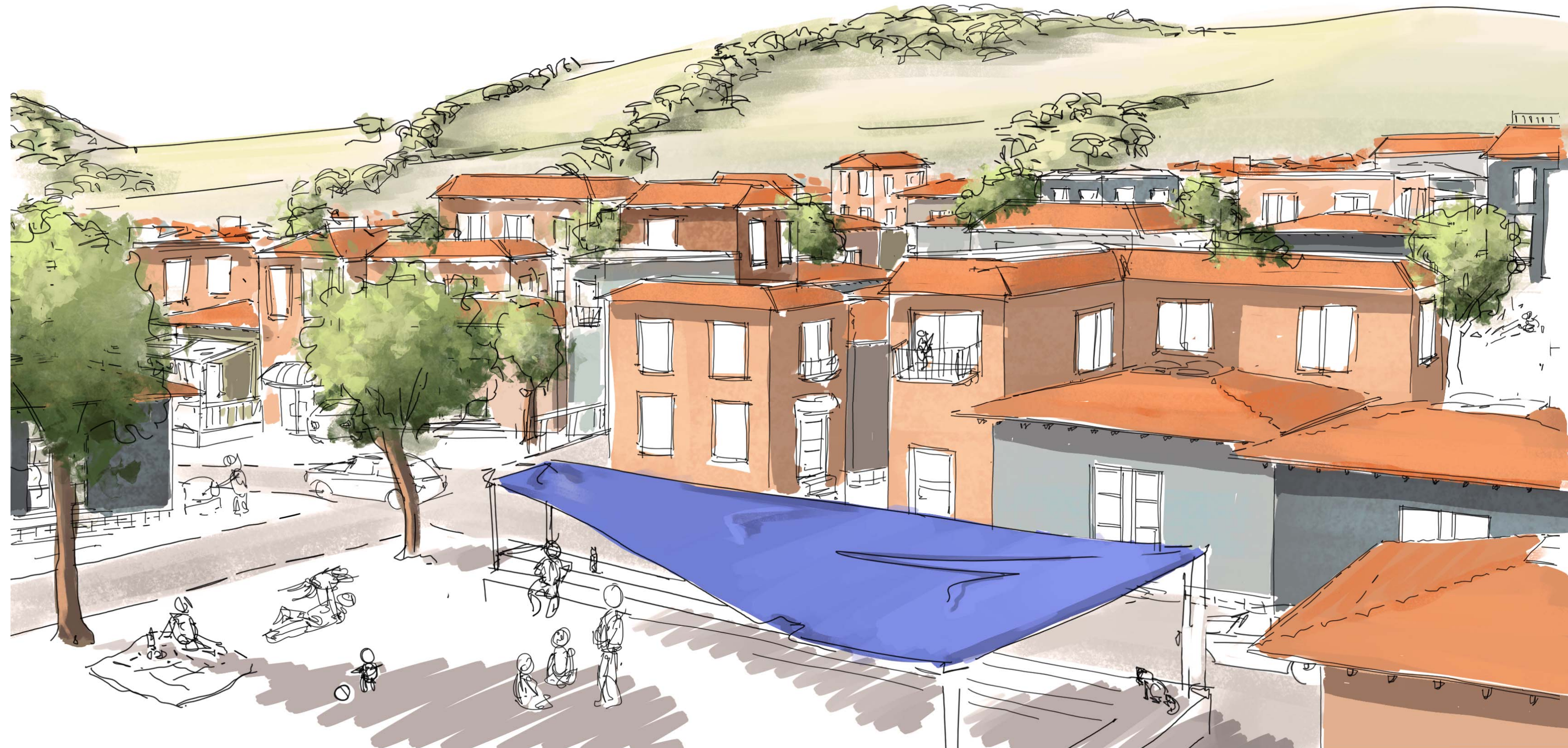




step 3: provided space for (economic) activity is used



step 4: slow but steady development into a city, provided through its original urban framework.



## Rethinking Migration

Redesign of refugee camp Moria, Greece

**THANK YOU**