

# CONSTRUCTION GUIDE FOR STABILIZED COMPRESSED EARTH BLOCKS

SCEB BUILDING BINDER



Schweizerische Eidgenossenschaft  
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Swiss Agency for Development  
and Cooperation SDC

**skat** Swiss Resource Centre and  
Consultancies for Development  
**PROECCO** PROmoting Employment through  
Climate Responsive COnstruction

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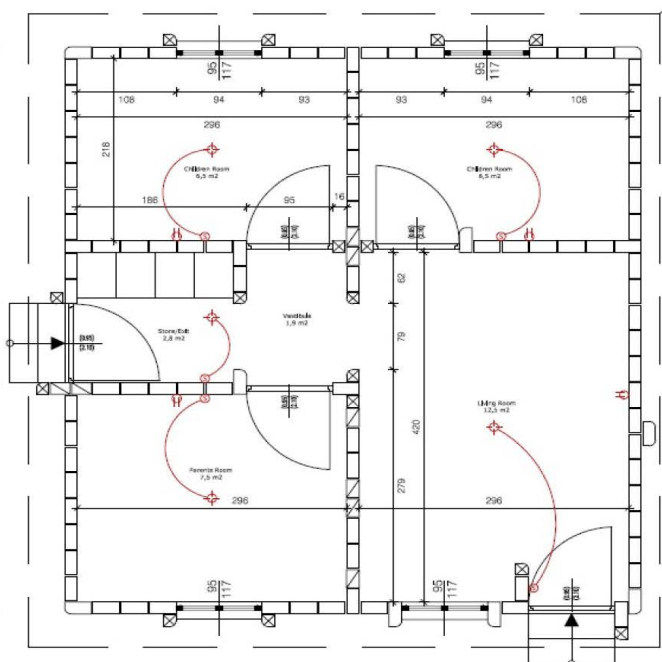
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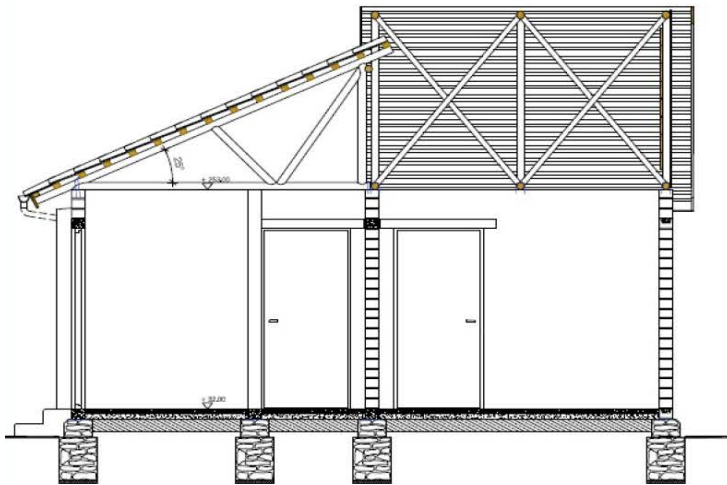
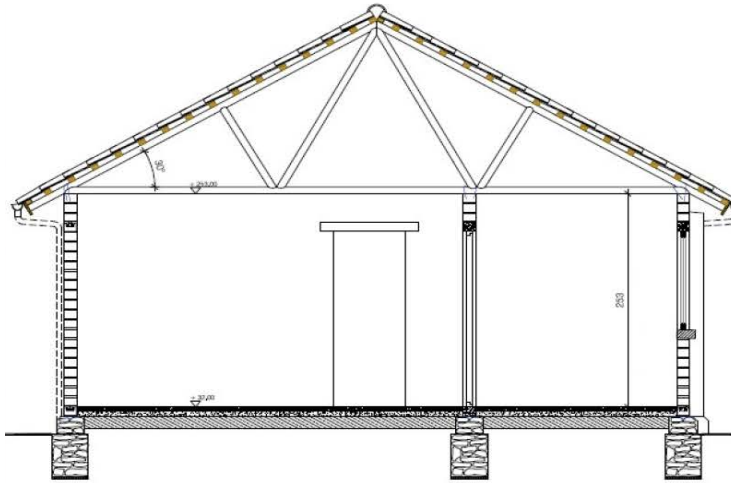
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EARLY STAGE  
ONGOING PROCESS

The aim of this pilot building made out of stabilized compressed earth blocks is to show a further technical option for family units with higher income.

## TECHNICAL DRAWINGS





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## SITE SELECTION

The site was chosen in close cooperation with the authorities involved in the program.



## TERRACING

The steeply sloping of the site has imposed an important work of preliminary terracing.



## SCEB PRODCUTION

After testing several types of soil a suitable option has been found not far from the site.  
The press used for the production is a Testaram.





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## SETTING UP

The position of the building is the result of compromise between the needs of future users and the several constraints of the site.



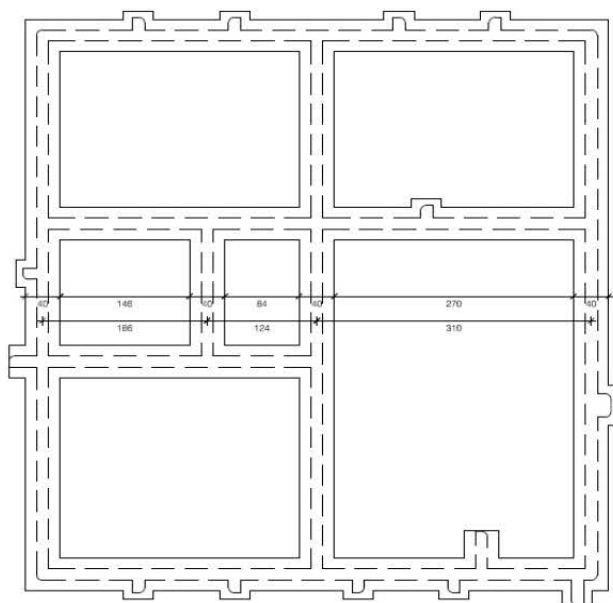
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## IMPLEMENTATION ONGOING PROCESS

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The foundations trenches (see plan above) were 50 cm deep and 40 cm wide.



DIGGING TRENCHES

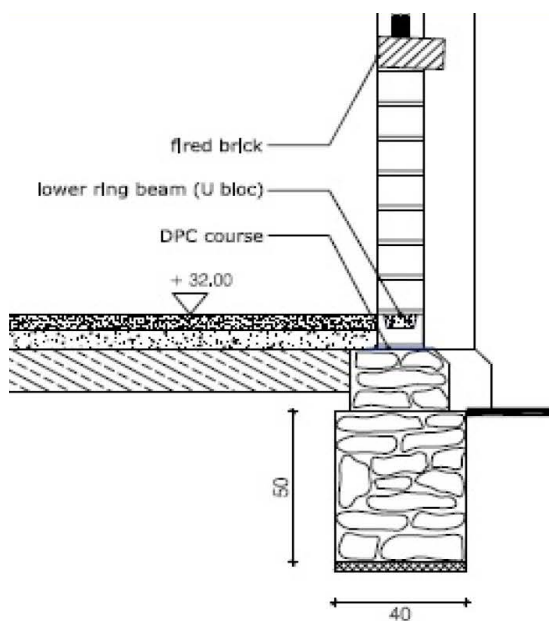


# 03

## MASONRY WORKS ONGOING PROCESS

### STONE FOUNDATION

After laying 3 cm of lean concrete on the bottom of the trench (150kg/m<sup>3</sup>), stones are put in place with cement mortar.





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## STONE FOOTINGS

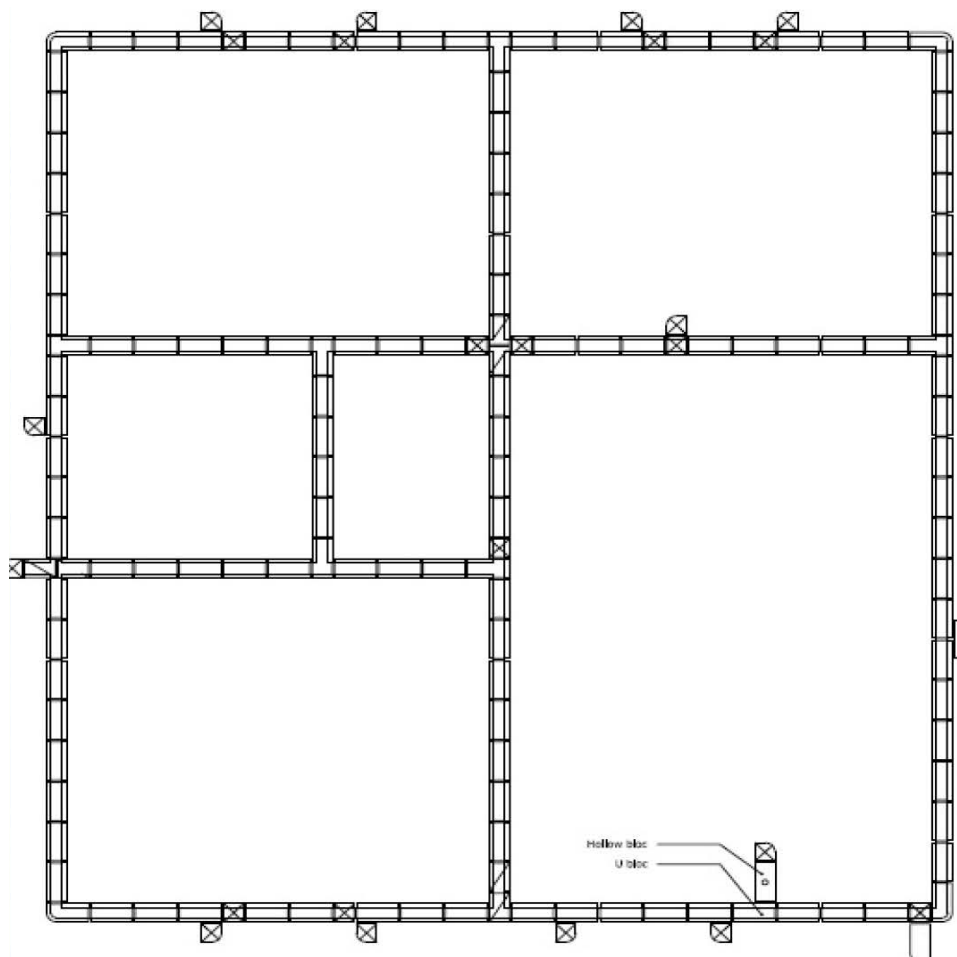
In order to protect the base of the walls from friction and water erosion, a 30 cm high stone cement base has been foreseen.

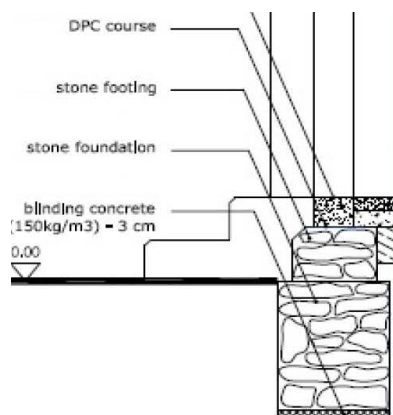
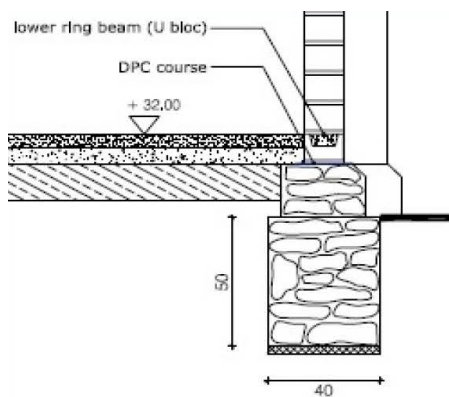
Great attention has been paid to prevent corners damages, to drain rain water away and to make a smooth and good looking external surface.



## LOWER RING BEAM

The lower ring beam has been made out of U blocks filled with reinforced concrete (300kg/m<sup>3</sup>).







## DOOR STEPS

To avoid bricks erosion over time, doorsteps are made out of concrete. This solution allow to keep continuity of the lower ring beam.



## DPC (DAMP PROOF COURSE)

To avoid water to rise into the wall by capillarity, a water proof barrier has been laid just on the lower ring beam.

Materials standing under the DPC must be water resistant.



## MASONRY

SCEB blocks are laid with soil cement mortar (10% ratio).

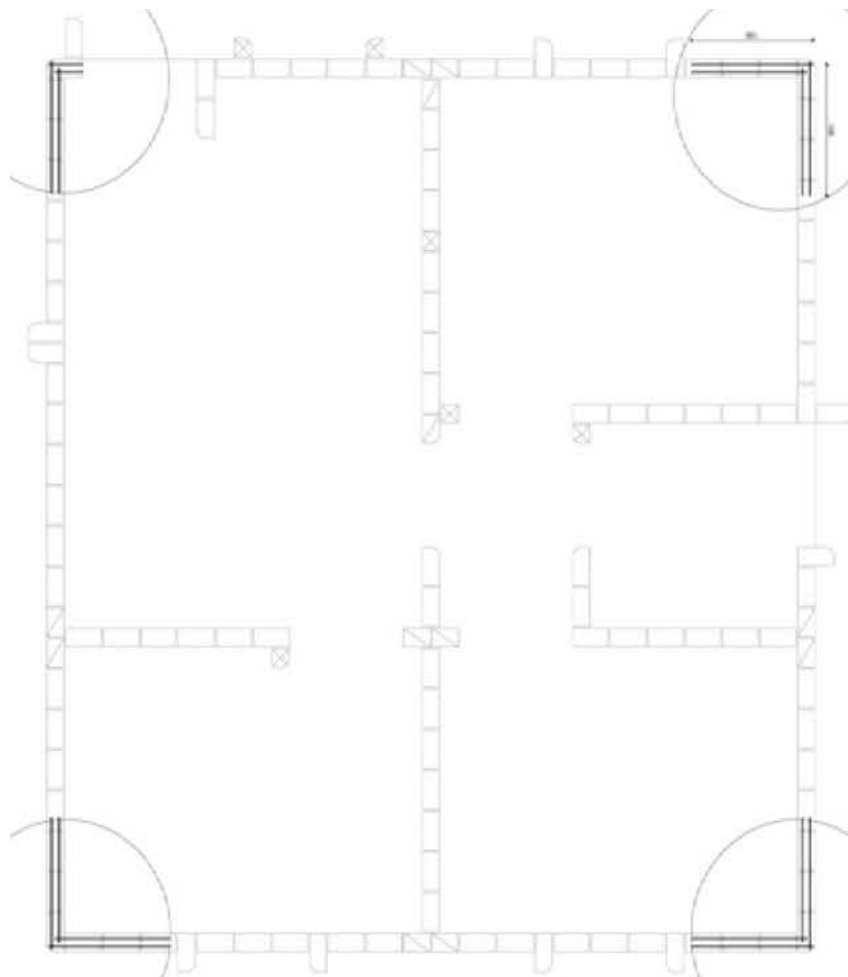
To lay SCEB blocks needs much more attention and skills than needed for adobe masonry works.



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## MASONRY CORNER REINFORCEMENTS

To improve earthquake resistance, reinforcements have been foreseen in the four angles of the building, every four brick courses.





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## MASONRY CORNER REINFORCEMENTS

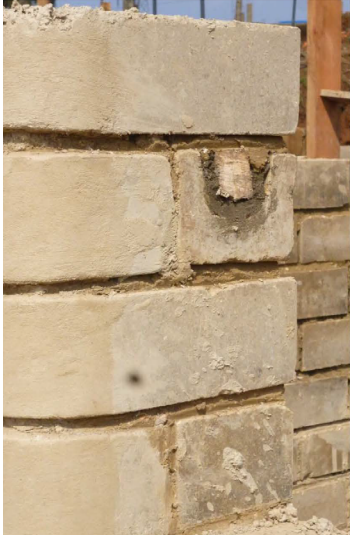
To improve corner resistance, rounded stabilized SCEB have been laid.



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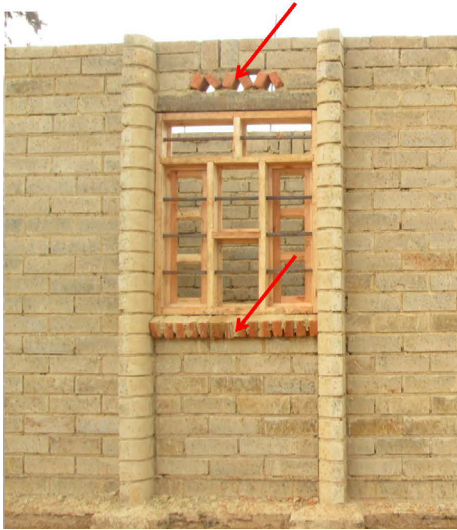
## MASONRY DOORS AND WINDOWS ANCHORING

Some examples of windows and doors anchoring.



## MASONRY DETAILS

- Window sills have been made out of fired bricks laid with lime cement sand mortar.
- Settling joints are made under each window.
- Ventilations have been implemented on the top of the windows.



## MASONRY BUTTRESSES

Since the walls are just 14 cm thick buttresses are essentials to ensure their stability.



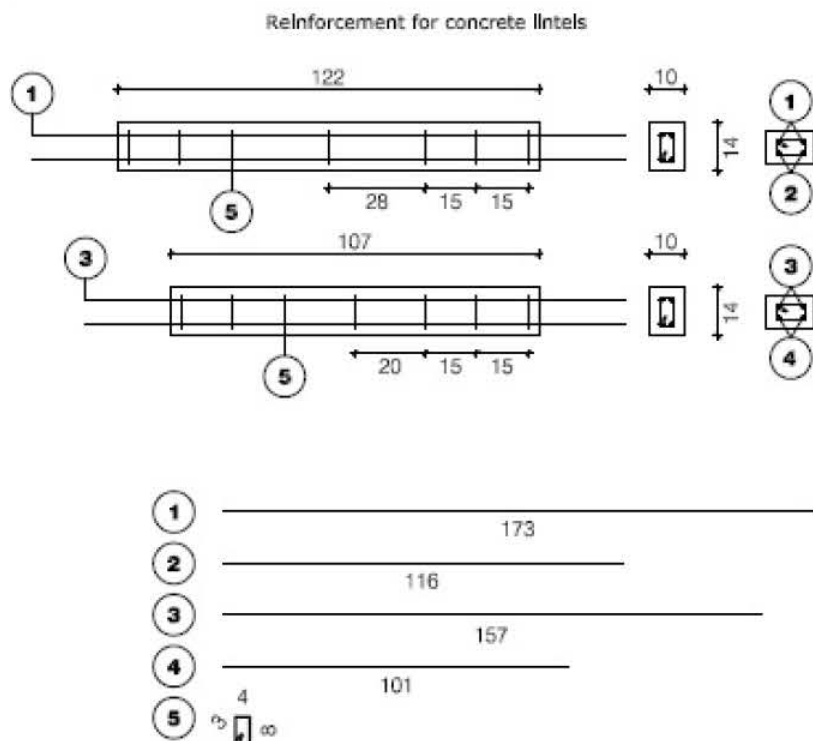
WIRING

Wiring has been implemented during masonry works. Lines pass through hollow blocks.



## PRECAST CONCRETE LINTELS

Concrete lintels have been prefabricated about five weeks before to be laid on. Due to an unforeseen, some of them had to be implemented directly on the wall (see picture on the left).

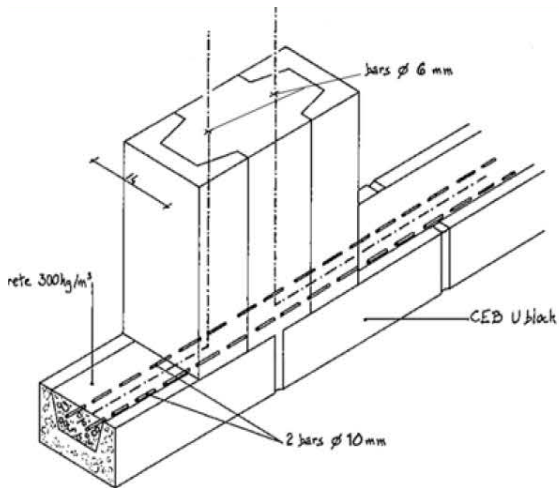


REF.	n	Ø [mm]	Length [cm]
1	18	10	173
2	18	10	116
3	18	10	157
4	18	10	101
5	77	6	34



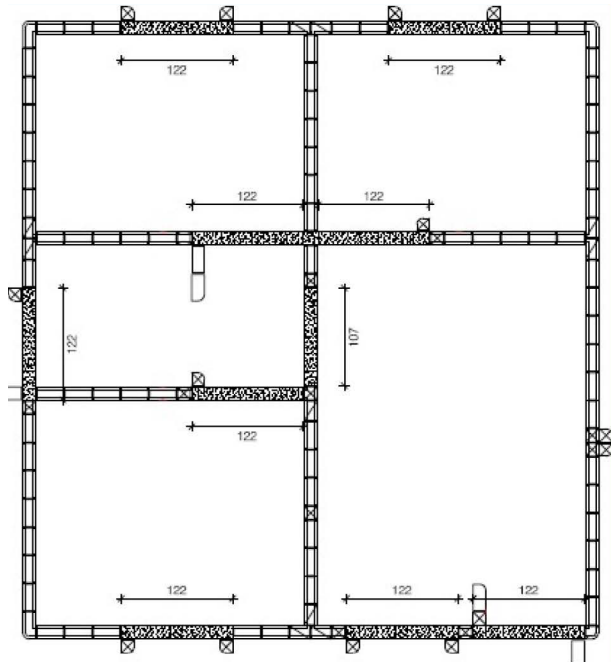
## ROOF ANCHORING

The bearing structure is tied by mean of two 6mm iron bars for each anchor point. These steel bars stay under the ring steel bars to guarantee a strong link.



## UPPER RING BEAM

The upper ring beam is made with U blocks filled with reinforced concrete ( $300\text{kg/m}^3$ ).



# 04

## ROOFING TRUSSES

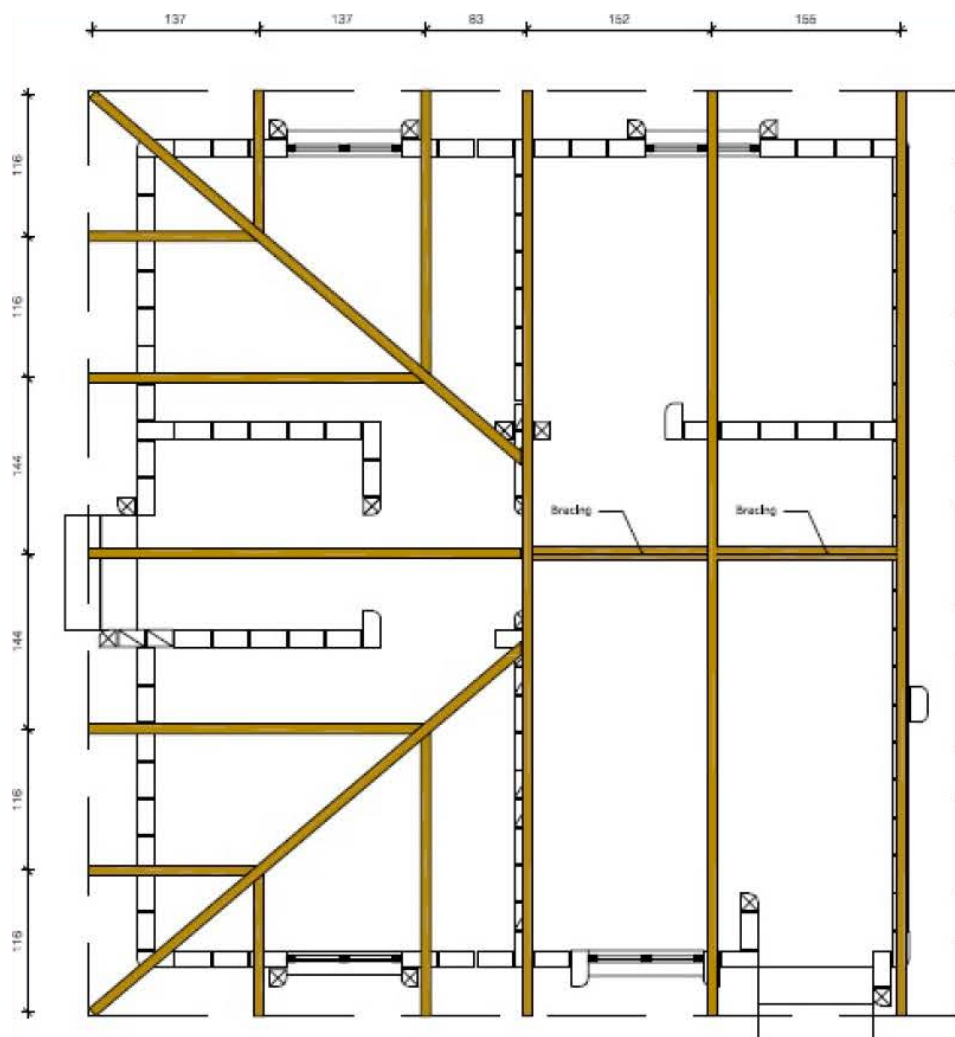
The load bearing structure is composed by five trusses and 6 half trusses making a four slopes roof. To get the openings on the top of the roof, the trusses are 30° sloped instead of the half trusses that are 25° sloped.





## LOAD BEARING STRUCTURE

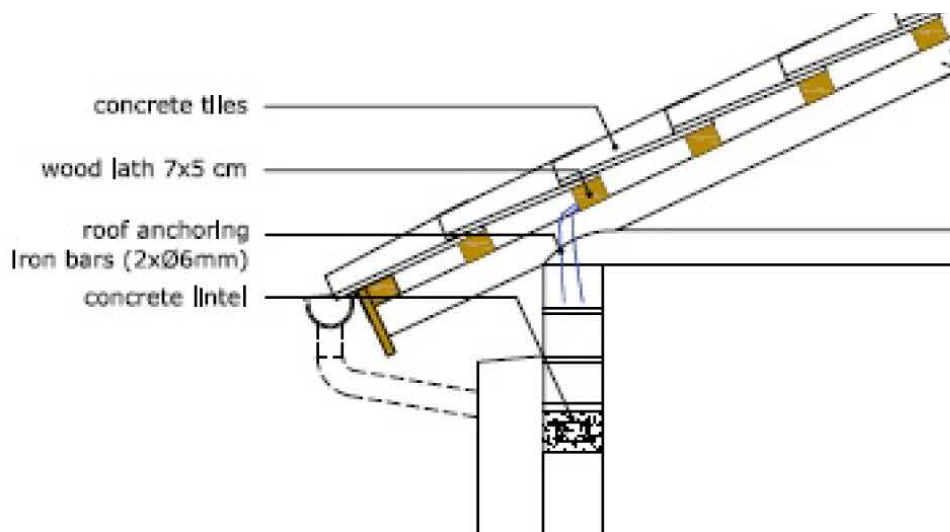
The load bearing structure is composed by three trusses and three half trusses making a three slopes roof. To get the opening on the top the trusses are  $30^\circ$  sloped instead of the half trusses that are  $25^\circ$  sloped.





## PRULINS

Some images and details about roof implementation.



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## DOORS AND WINDOWS

Doors and windows have been produced by a workshop nearby the site.





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## EXTERNAL FINISHING

Since SCEB walls are not plastered, a smooth and good looking masonry work is mandatory. Verticality and horizontality of the blocks must be carefully and constantly checked during wall implementation.



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