



CONSTRUCTION GUIDE FOR ADOBE BUILDING BINDER



Schweizerische Eidgenossenschaft
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skat Swiss Resource Centre and
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PROECCO PROmoting Employment through
Climate Responsive CONstruction

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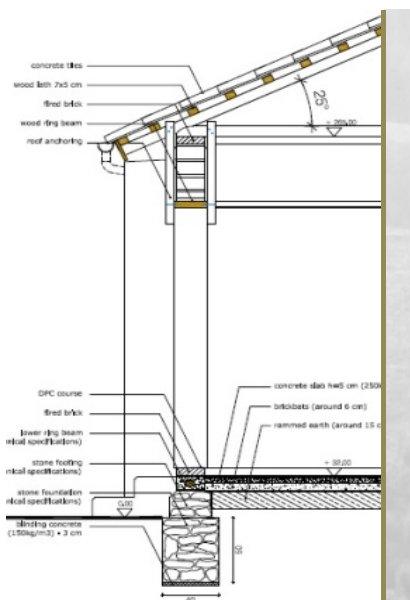
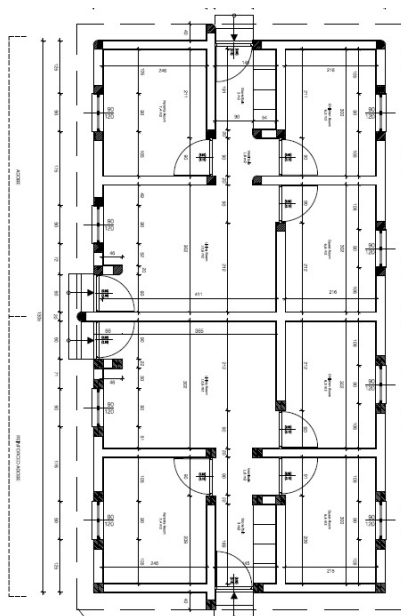
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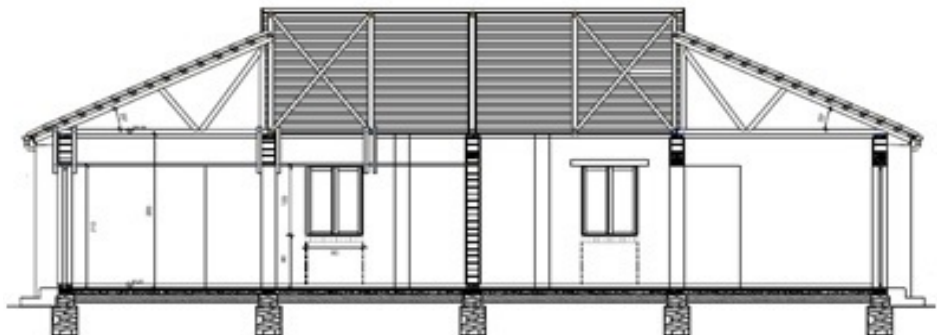
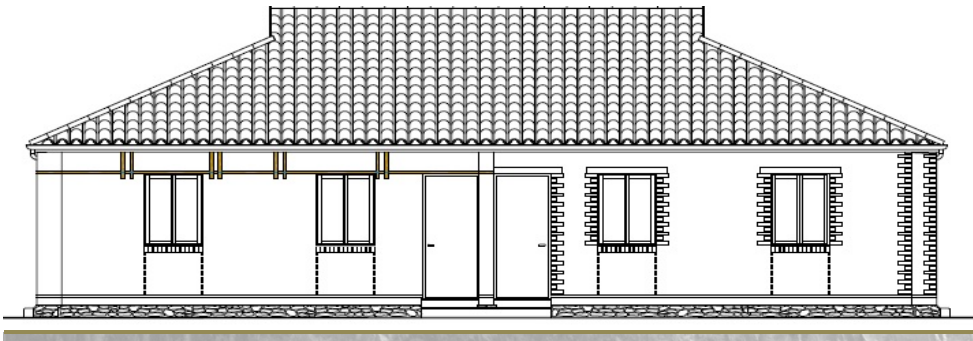
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EARLY STAGE ONGOING PROCESS

This pilot building has been conceived to propose several constructive options. The left half side (A) and the left one (B) have different technical solutions.





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.



ADOBE PRODUCTION

After testing several soil and sand and fiber ratios, the fitting mixture was found.



SETTING UP

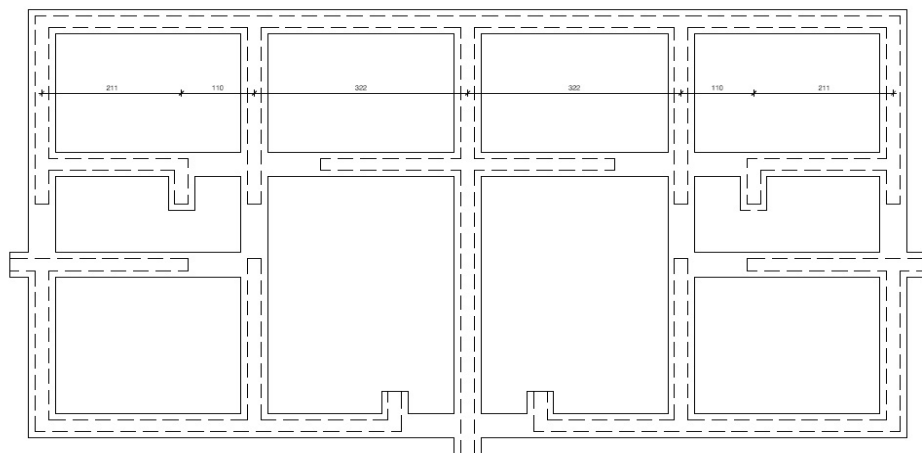
The position of the building is the result of compromise between the needs of future users and the several constraints of the site



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IMPLEMENTATION ONGOING PROCESS

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



DIGGING TRENCHES

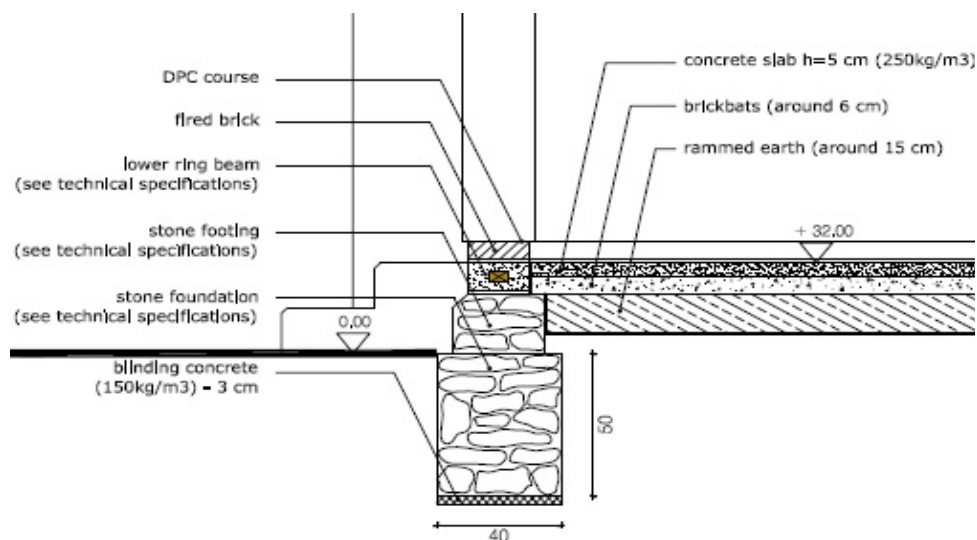


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MASONRY WORKS ONGOING PROCESS

STONE FOUNDATION

After laying 3 cm of lean concrete on the bottom of the trench (150kg/m³), stones are put in place with cement mortar.





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.

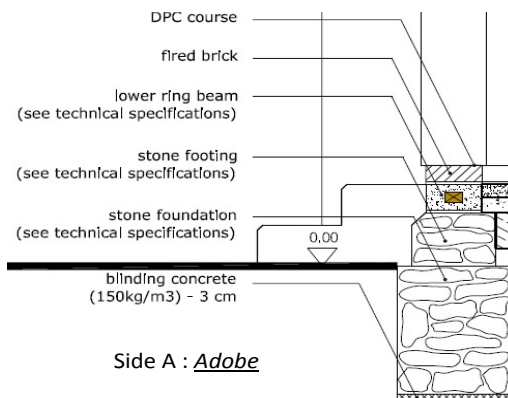
Great attention has been paid to prevent corners damages, to drain rain water away and to make a smooth and good looking external surface.



LOWER RING BEAM

For the lower ring beam two different solutions have been proposed.

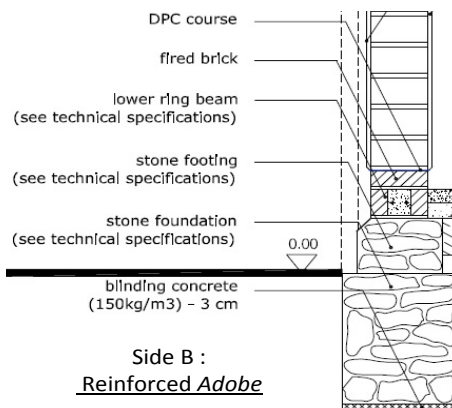
Side A : between two lines of fired bricks as formwork, wood lintels drawn in a lime-sand mortar (350kg/m³)





LOWER RING BEAM

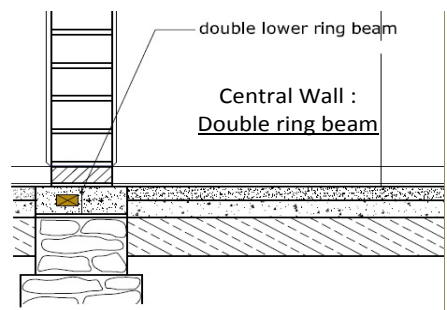
Side B : between two lines of fired bricks as formwork, reinforced concrete beam (300kg/m3)





LOWER RING BEAM

Central Lower Ring Beam : to preserve the effectiveness of both of ring beams, mostly in case of earthquake, the two constructive elements have been kept separated.





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 before the first adobe course.

Materials standing under the DPC must be water resistant.



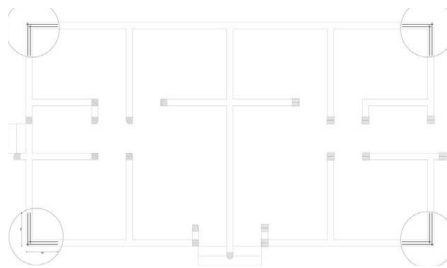
MASONRY

Adobe blocks are laid with soil mortar; for fired bricks, mortar is a sand-cement-lime mixture.



MASONRY CORNER REINFORCEMENTS

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



MASONRY CORNER REINFORCEMENTS

To improve corner resistance, rounded stabilized Adobe (side A) and fired bricks (side B) have been laid.



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.

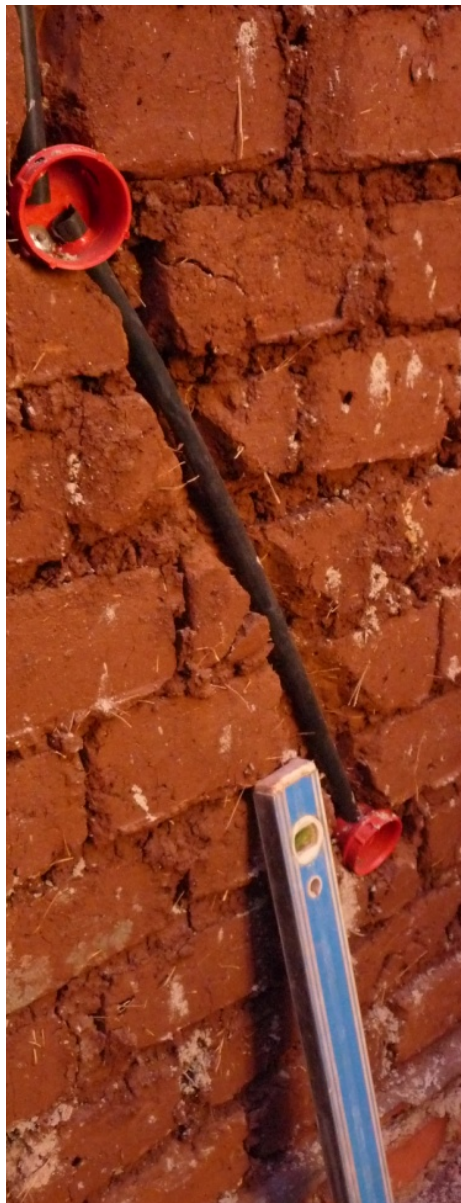
The top of the walls is protected from seepages by a course of fired bricks and lime-cement-sand mortar.

- Ventilations have been implemented on the top of the windows.



WIRING

Wiring has been implemented after masonry works. Lines will be covered by the plaster.

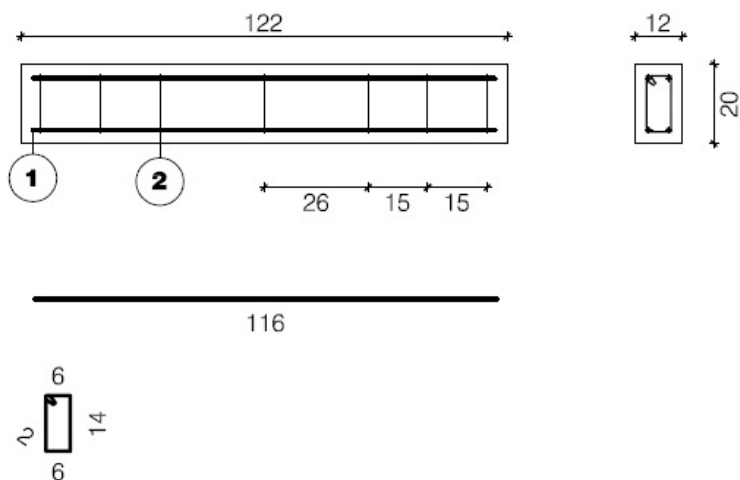


PRECAST CONCRETE LINTELS

Concrete lintels have been prefabricated about five weeks before to be laid on



Reinforcement for concrete lintels



REF.	n	Ø [mm]	Lenght [cm]
1	44	10	116
2	77	6	48



ROOF ANCHORING

Side A : The bearing structure has been nailed to the ring throughout wood vertical.

Side B : The bearing structure is tied by means 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 rings have been laid at a different height. Since sides A and B differ, they behave differently in case of earthquake. Therefore they must be as disconnected as possible from one to another.

Side A : wood ring beam.

Side B : concrete ring beam between two fired bricks as formwork



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ROOFING TRUSSES

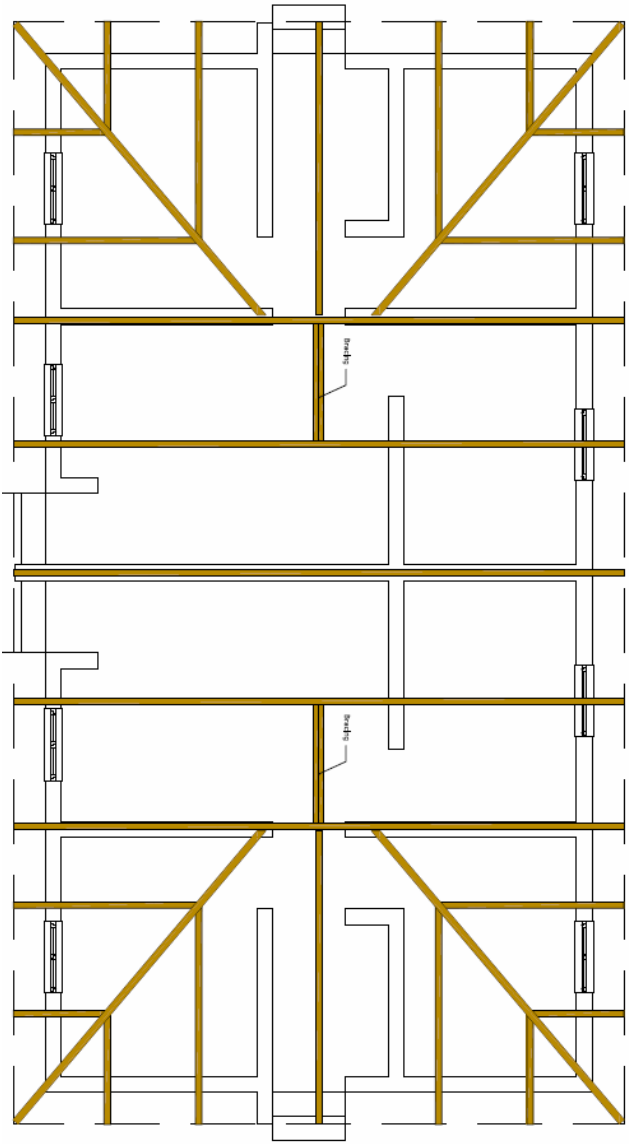
The load bearing structure is composed by five trusses and 6 half trusses making a four slopes roof. To get the openings on the top of the roof, the trusses are 30° sloped instead of the half trusses that are 25° sloped.





LOAD BEARING STRUCTURE

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

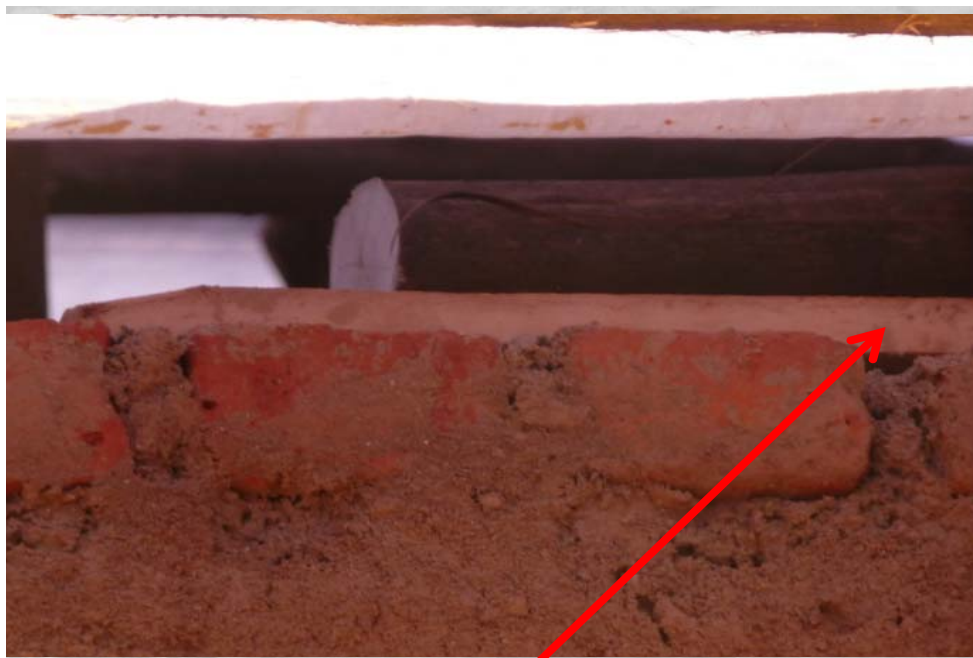
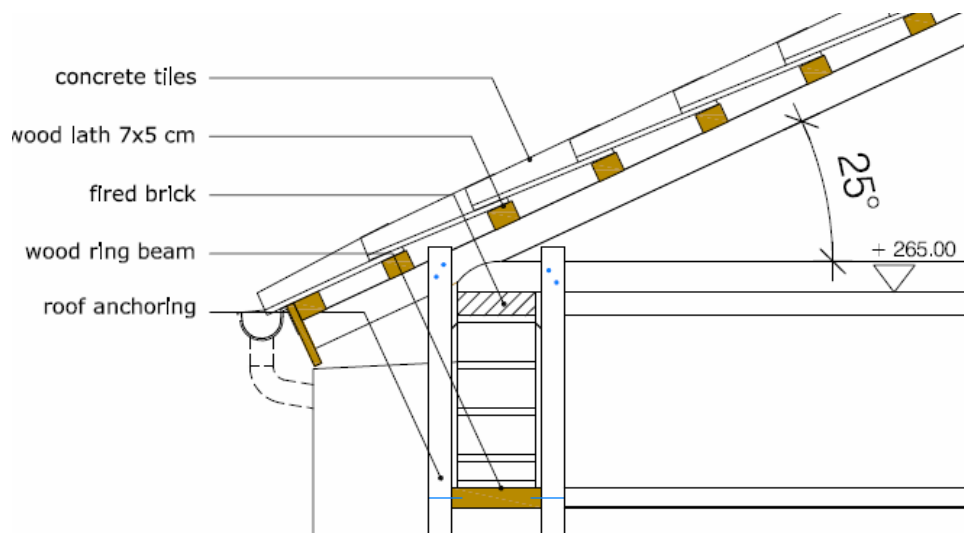




PRULINS

Some images and details about roof implementation.





DOORS AND WINDOWS

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





EXTERNAL PLASTERING

External plaster is a sand-cement-lime mixture at the ratio in volume of 8-1-2. Fired blocks and wood ring beam are not plastered.

It has been implemented in two coats. A first raft layer to level wall surfaces and a second finishing layer.



INTERNAL PLASTERING

Internal plaster is a sand-cement-lime mixture up to 180 cm and a mud plaster from 180 cm up to the top of the wall. Fired blocks and wood ring beam are not plastered.



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