

synopsis

The project deals with an actual problem concerning lack of dwellings for the hospital staff in Masanga, Sierra Leone. The project is made in cooperation with the Danish department of Architects Without Borders.

The aim is to integrate parameters such as material technology, natural ventilation, daylight and cooling/heating in the project and due to the economic frame of the project low tech solutions are in focus. The design will be carried out as a prototype of staff dwellings and an overall master plan of the area wherein the dwellings are placed. The overall basis for the design is the climatic context being warm and humid.

As a point of departure for the project, field work is made in Masanga. Here the sociologic, cultural and topological context is investigated and registrations of the site are made.

Architecture & Design
Aalborg University - Denmark

4th Master semester – Architectural design
1st of February - 2nd of June 2010

Title: Masanga Dwelling
Subtitle: Environmental Architecture in an African Context

Thesis project by: Rasmus Christensen Hamann

Supervisor: Peter Lind Bonderup

Technical supervisor: Asger Hyldgård

In cooperation with: Architects Without Borders - Denmark

Also including Appendix CD and Program and Process folder

Rasmus C. Hamann

introduction

This folder is the presentation of the master thesis project by Rasmus C. Hamann specialized in Architectural Design at the Department of Architecture and Design at Aalborg University.

Besides this folder is the *program and process* which are describing the phases of the project in detail.

The project deals with a sustainable solution for the design of staff housing for Masanga Hospital in Sierra Leone, Westafrica.

The project is made in cooperation with the Danish department of the NGO Architects Without Borders (AWB), which aim is to develop the build environment and to support those who do not have access to the knowledge of an architect. [www.arkitekterudengraenser.dk]. The project is based on field work made in Masanga in Sierra Leone.

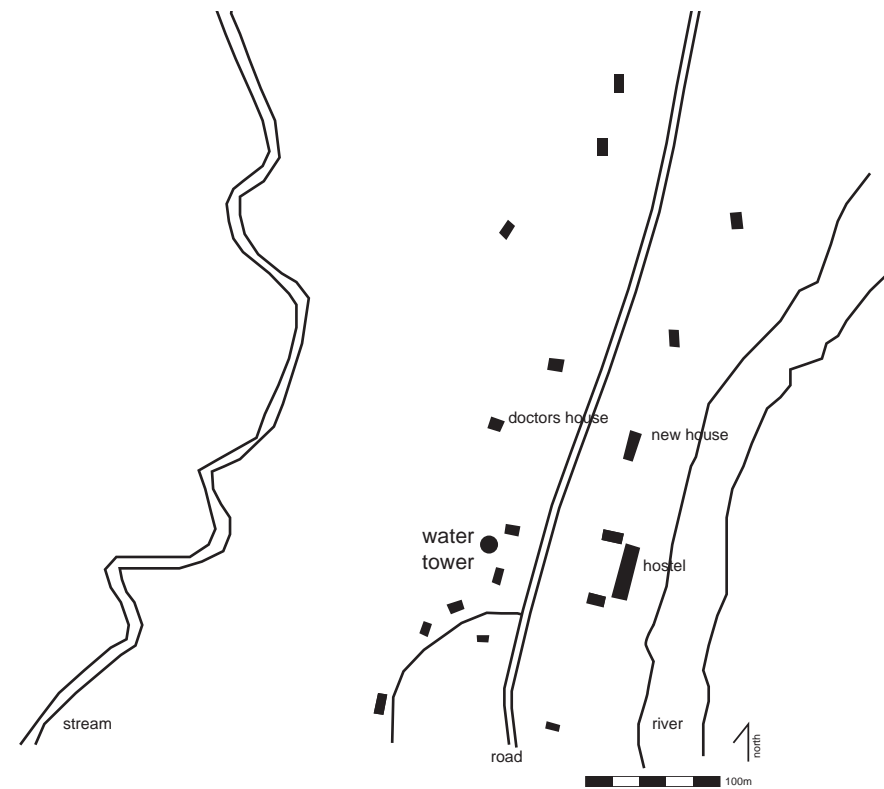
aim

The aim of the project can be summarized as:

To create a social and environmental sustainable solution for the design of a prototype of staff housing and a master plan containing the staff housing , wherein elements as a symbiosis between universal culture and the place, local materials and the climate are taken into consideration.

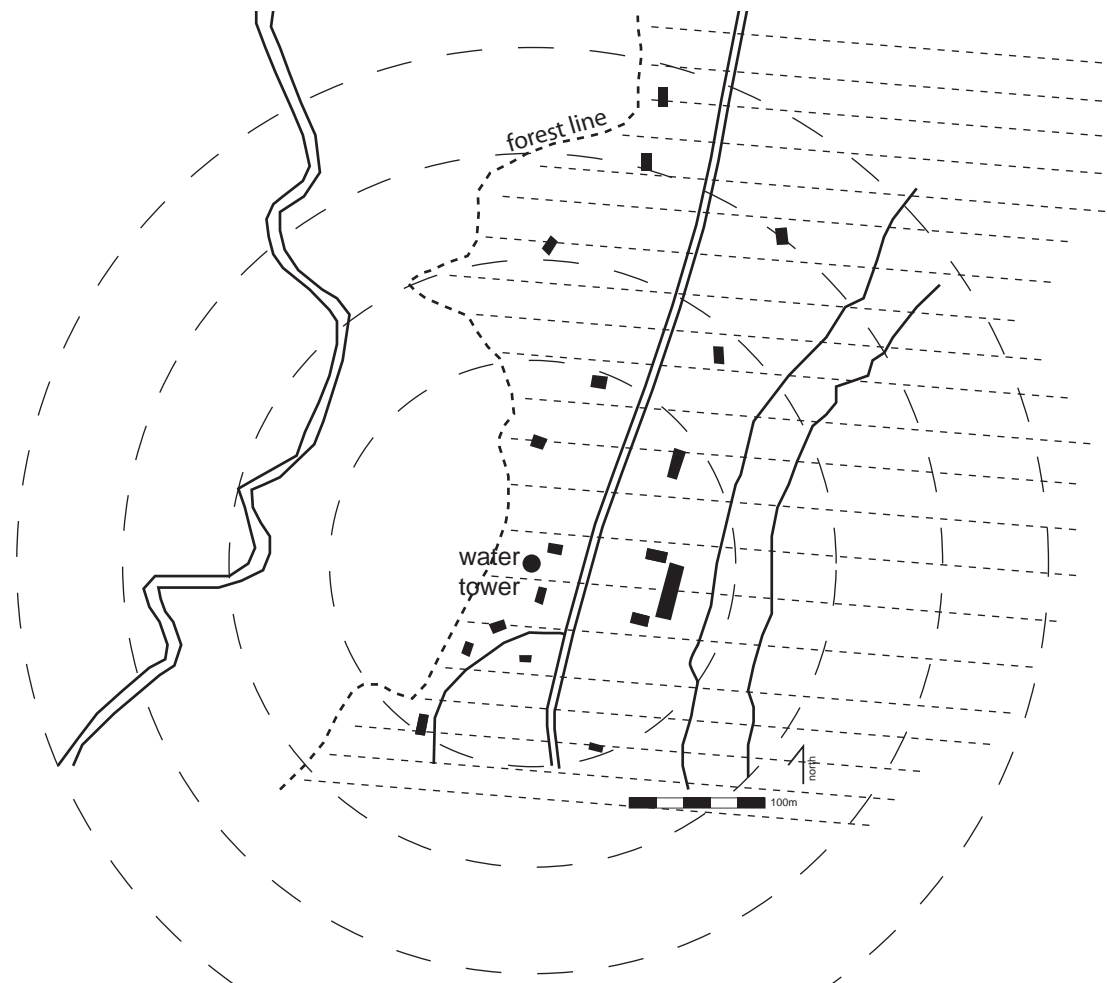
existing conditions

The area around Masanga is primarily former rain forest and is dominated by a main road, a river and a small stream.



master plan concept

The master plan for the new dwellings in the area is determined by the distance to the water tower that is supposed to be reintroduced in the future and the line of where the existing high forest is placed.

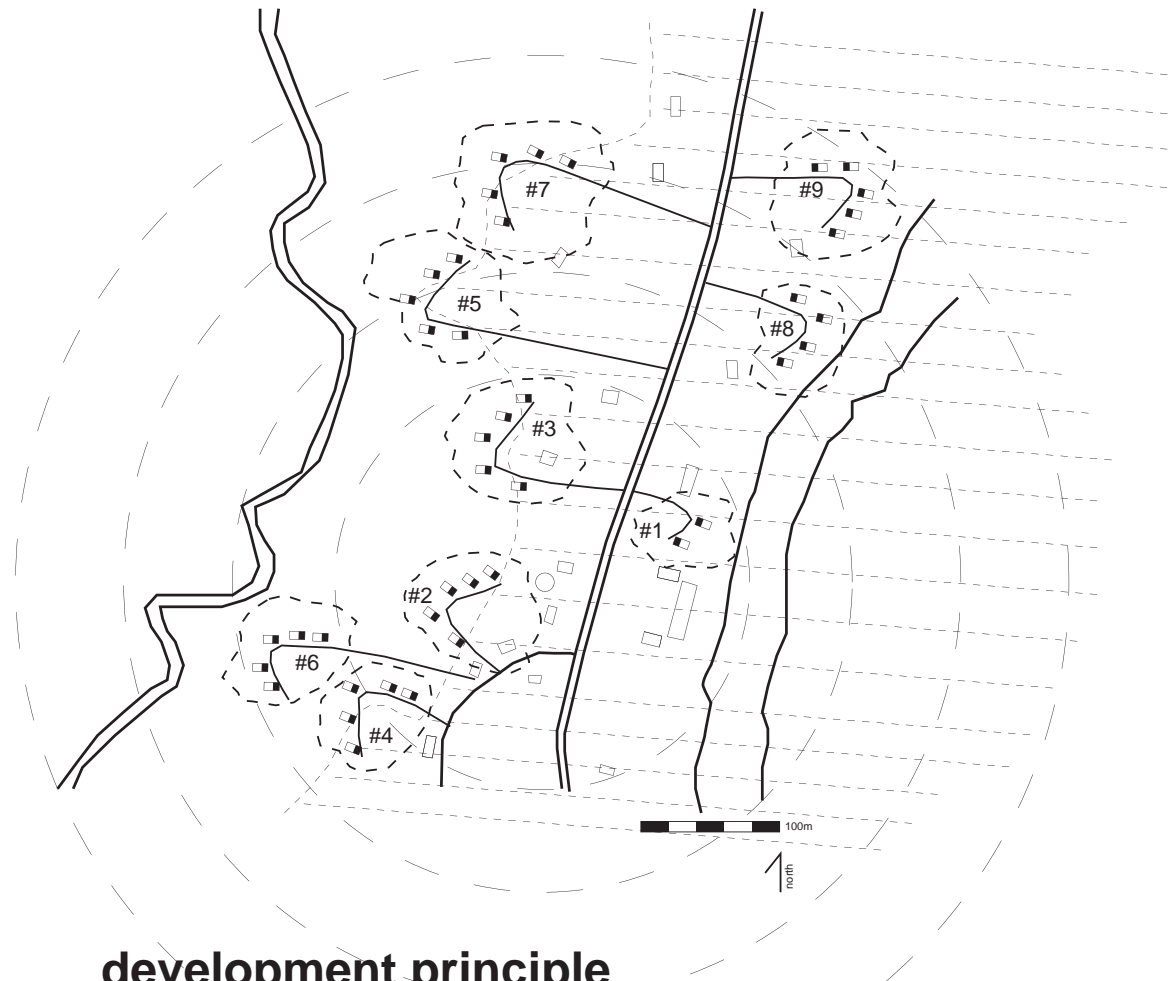


master plan

The master plan of the approximately 40 dwellings are divided into cluster to obtain a *village in the village principle* with a strong relation between the dwellings in a cluster.

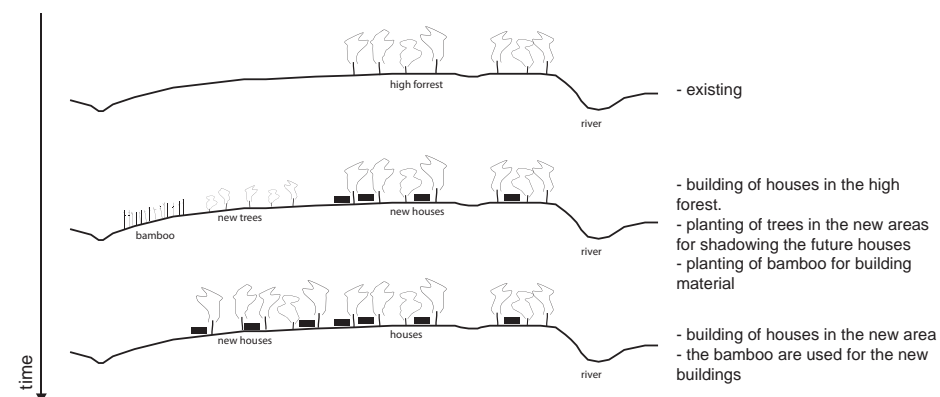
The priority of the cluster are determined to the distance to the water tower - stating that the clusters closest to the water tower to be build first. Furthermore the cluster places in the existing forest are to be prioritized in terms of taken advantage of the shading from the high trees.

The dwellings are placed in the landscape to adapt to the near context and adjacent buildings in terms of orientation and shape.



development principle

The development in the area is thought as while building houses in the existing high forest, the areas now covered with bush can be planted with trees and bamboo respectively to provide shading and create a free source of building material for the future houses.



An architectural sketch of a building complex. In the foreground, a large, open area is covered by the shadow of a large, slatted wooden pergola that extends from the right side of the frame. The pergola's structure is made of light-colored wood. To the left, there is a building with a similar slatted roof and a series of vertical wooden partitions. In the background, a tall palm tree stands prominently, and behind it, a dense line of green trees. The sky is a pale, uniform color. The overall style is a hand-drawn architectural rendering with a focus on light and shadow.

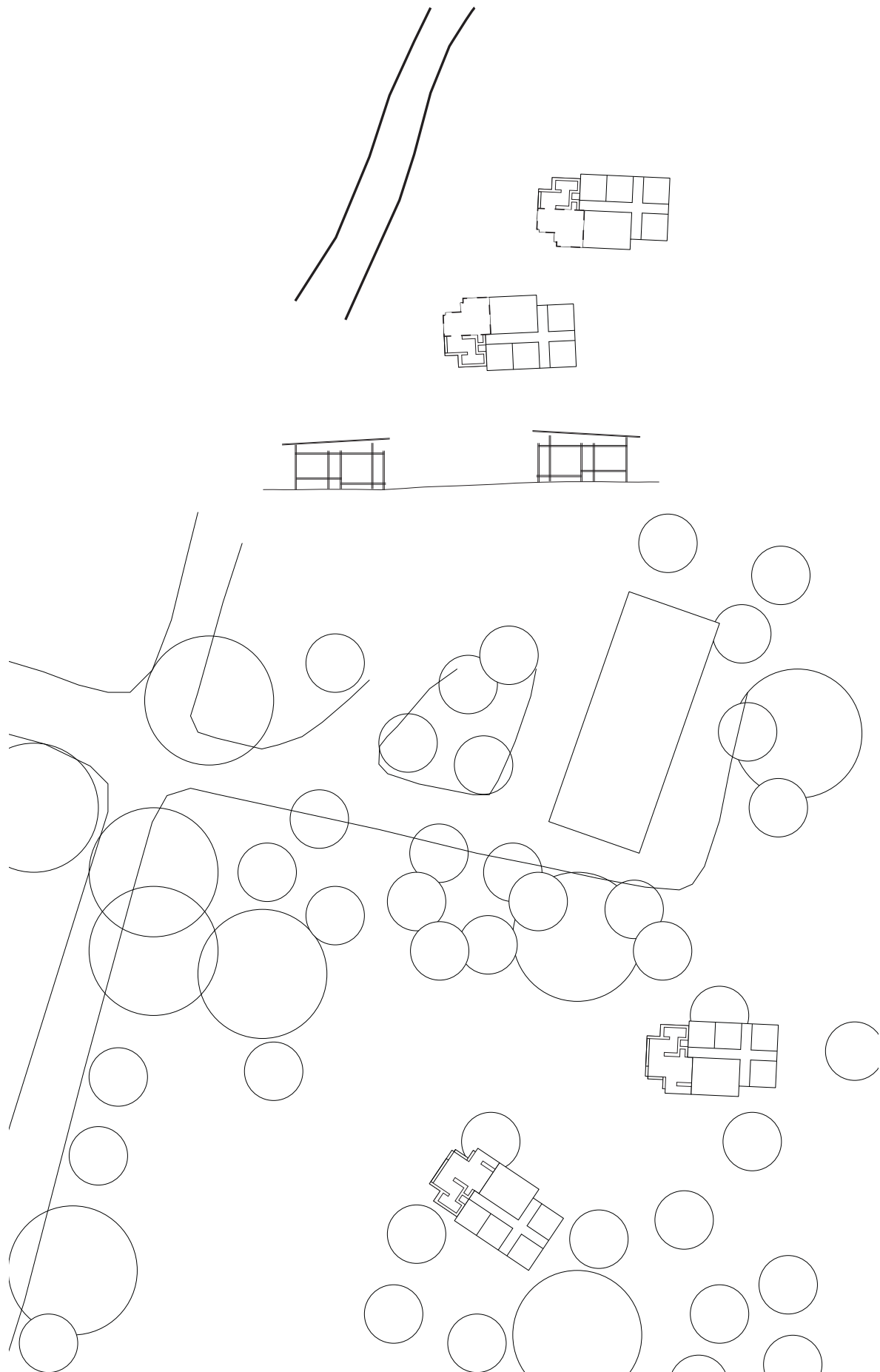
relation between the dwellings

The dwellings are placed in small clusters in the landscape as small villages.

The dwellings are mirrored and rotated to create a social sphere and connection between the dwellings, especially by letting the kitchen part of the dwellings face each other.

The roof is adapted to the specific site and orientation of the dwelling, thus two neighboring dwellings will vary from one another.

cluster





relation to the surroundings

The kitchen part of the dwelling connects the dwelling to the surrounding dwellings. Furthermore the terrace of the lower level reach out and connect inside and outside. By making an interior level the transition between inside and outside becomes more diffuse.

dwelling concept

The dwellings consist of three main elements. The roof, the space/ frame and the base, each having their individual properties and expression.

roof

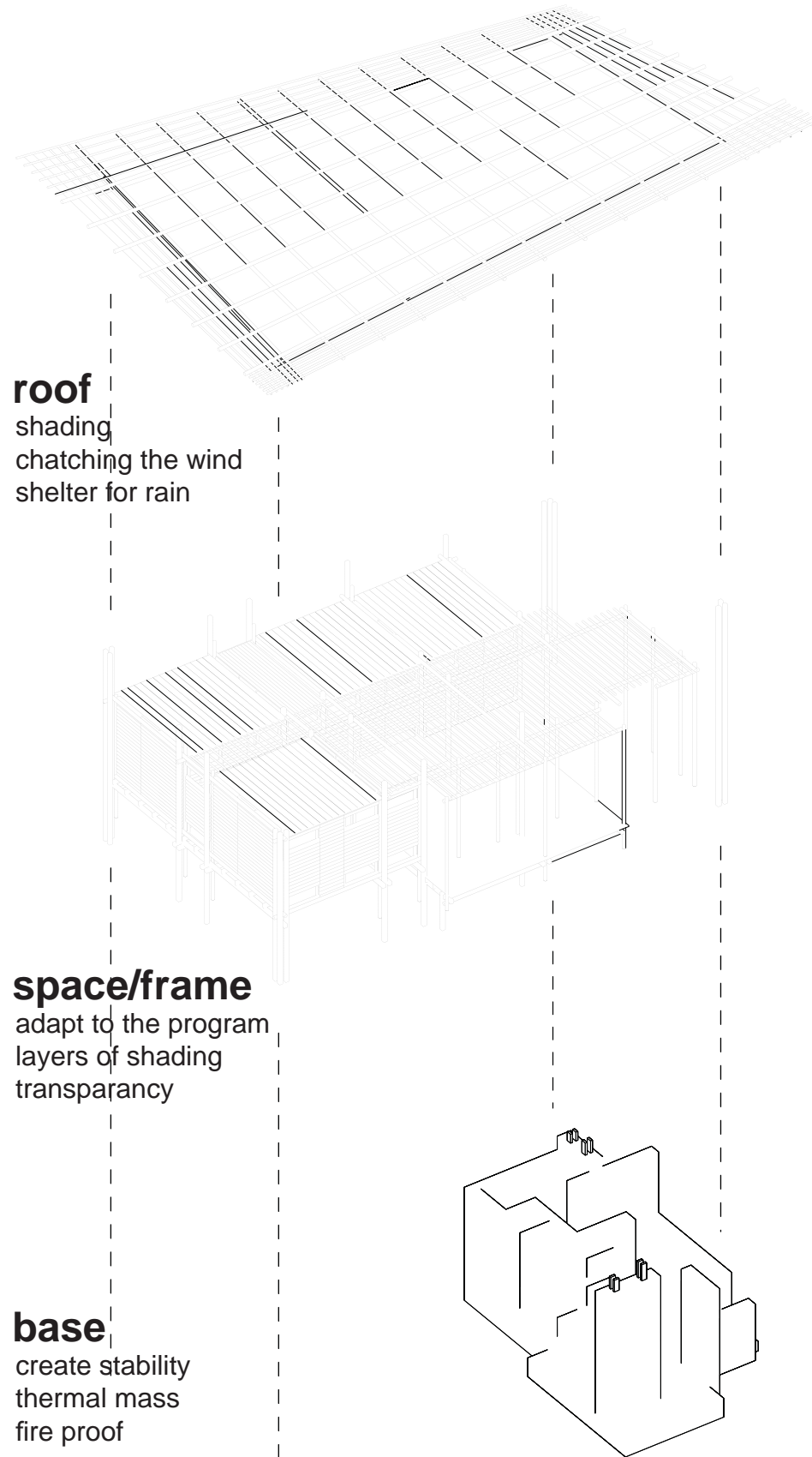
shading
catching the wind
shelter for rain

space/frame

adapt to the program
layers of shading
transparency

base

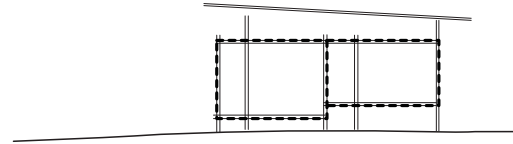
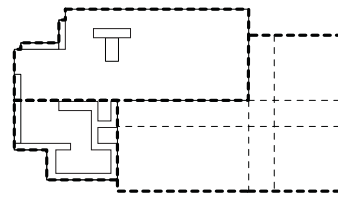
create stability
thermal mass
fire proof
secure
status
relation to topography



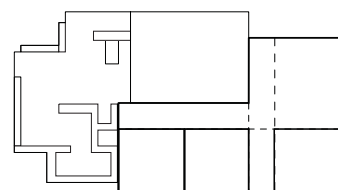
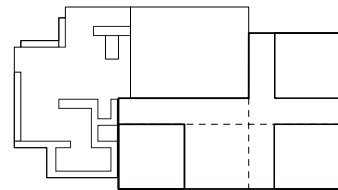
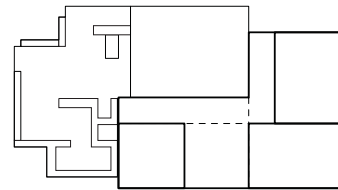
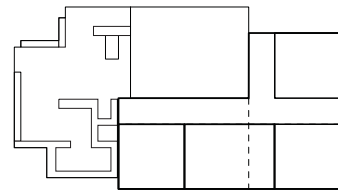
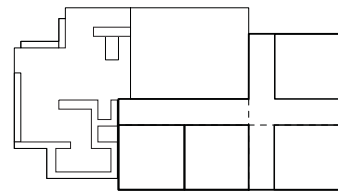
zoning

The zones of the dwelling is accross the materials, thus connection the heavy and light construction with the program.

Mosquito net



flexibility





base, frame and cover

The concept of the dwelling is divided into three parts. A base that relates the dwelling to the landscape, a roof that act as shelter for rain and utilize the wind for cooling, and a frame that defines the place for living, spanned by the base and the roof.



kitchen area

The kitchen area of the dwelling is constructed in rammed earth. The stove is built into the wall element to create the impression of the base of the building being a monolithic mass, referring the earth that it is built of. The kitchen is placed in a zone that can be seen as partly inside and partly outside.



living area

In close relation to the kitchen area is the living area. It contains a level that divides the living in a social orientated part and a more private part. The level can be used as seating and for dining in the absence of furnitures.



flexibility

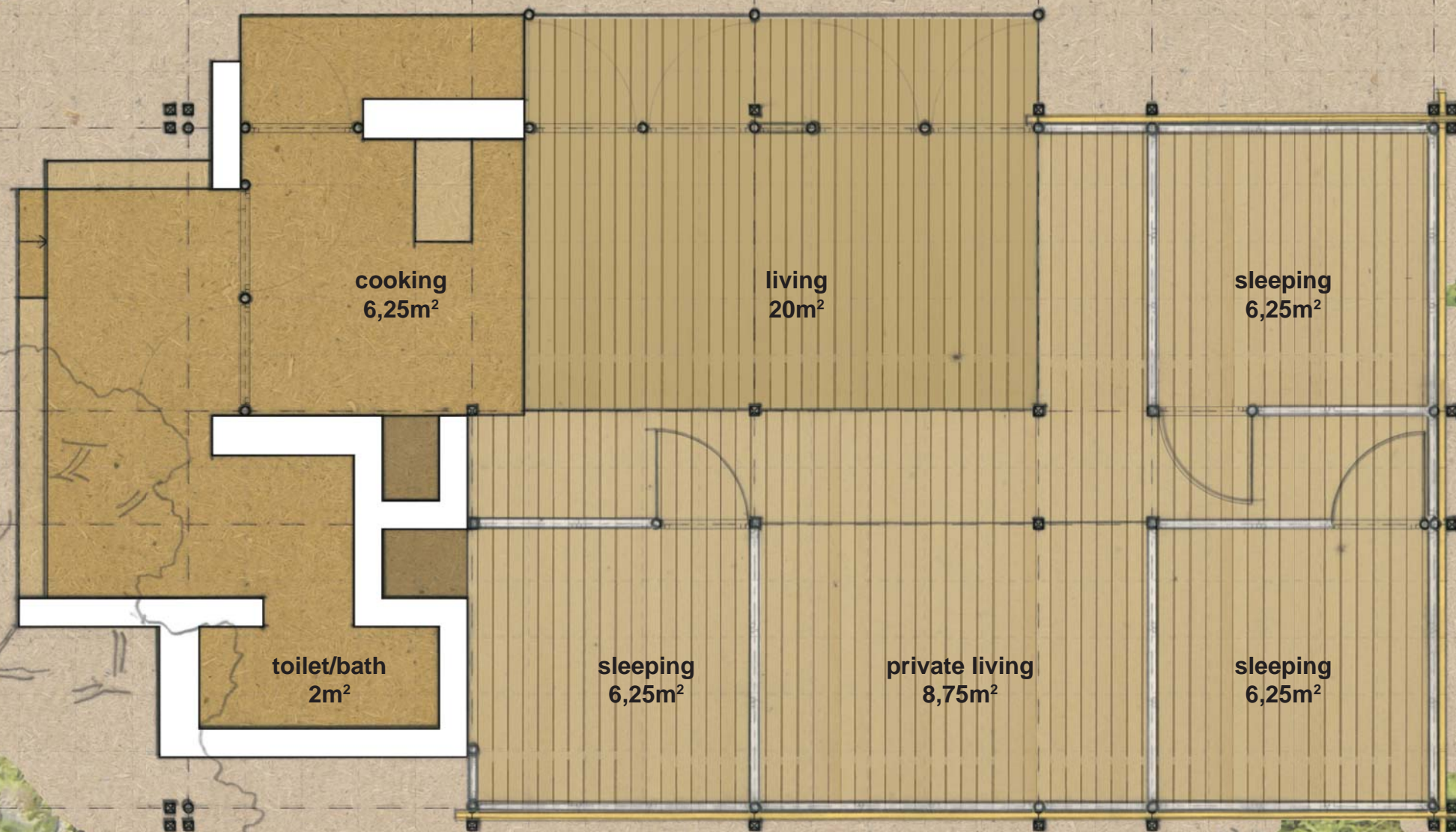
The upper part of the dwelling can be arranged according to the occupants and the specific site. It is constructed from changeable lightweight wall elements applied in a frame structure. The master bedroom is connected to the base where a secure closet is placed for the valuables of the occupants.



north elevation 1:50

The sleeping part of the dwelling is elevated to increase the air movement around and underneath the rooms to cool the dwelling. The relation to the levels of ground will be utilized in the same way for all dwellings, with the base connecting to the ground, and the sleeping rooms taking advantage of the slope to increase the air movement. By rotating and mirroring the dwellings, site specific conditions are met.

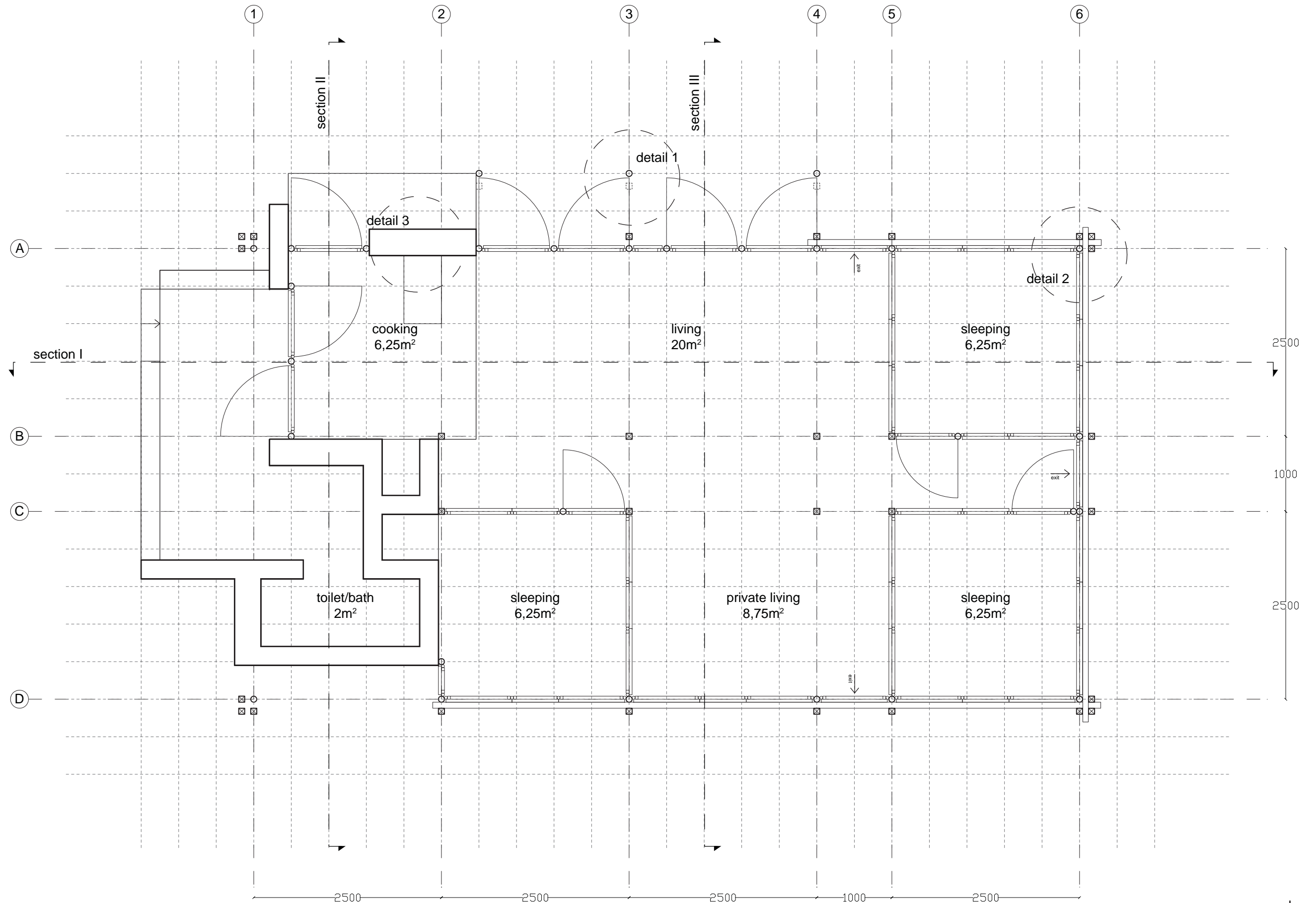
The access to the dwelling is through the base/kitchen.

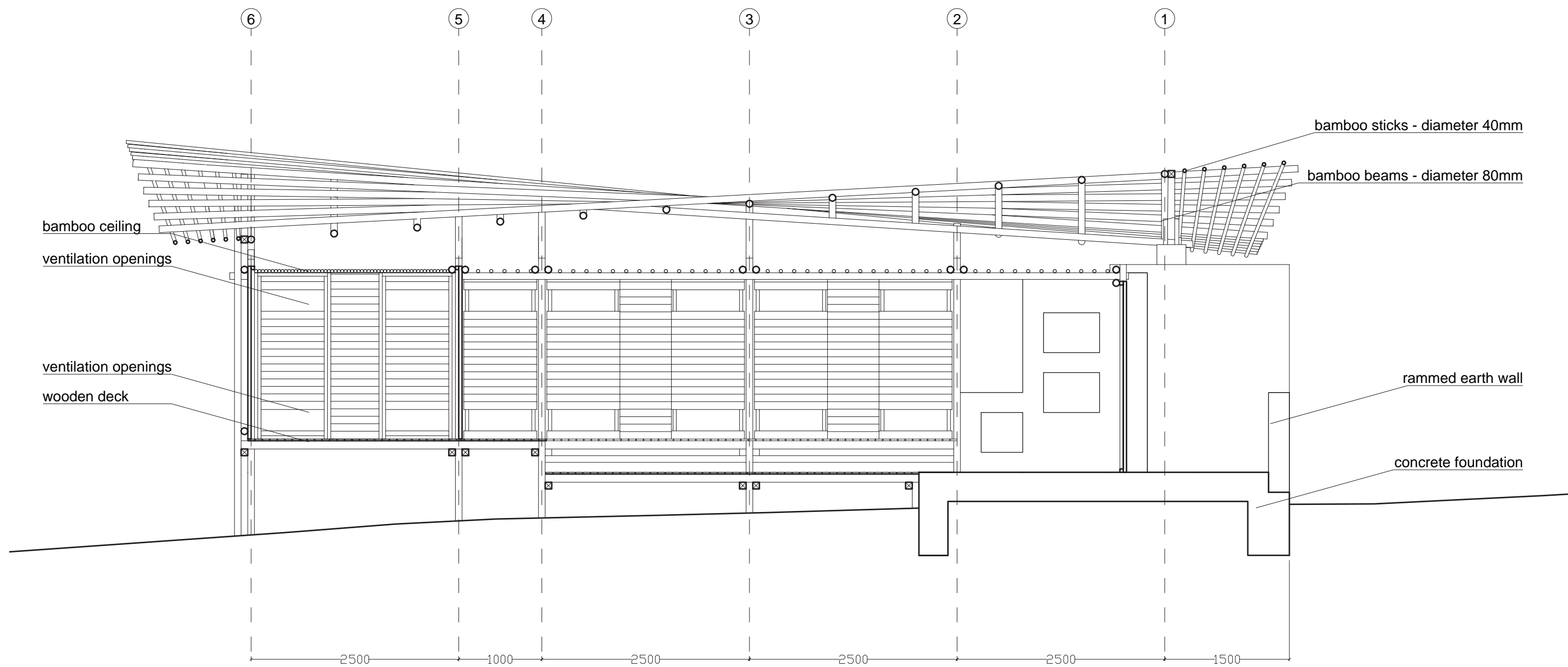


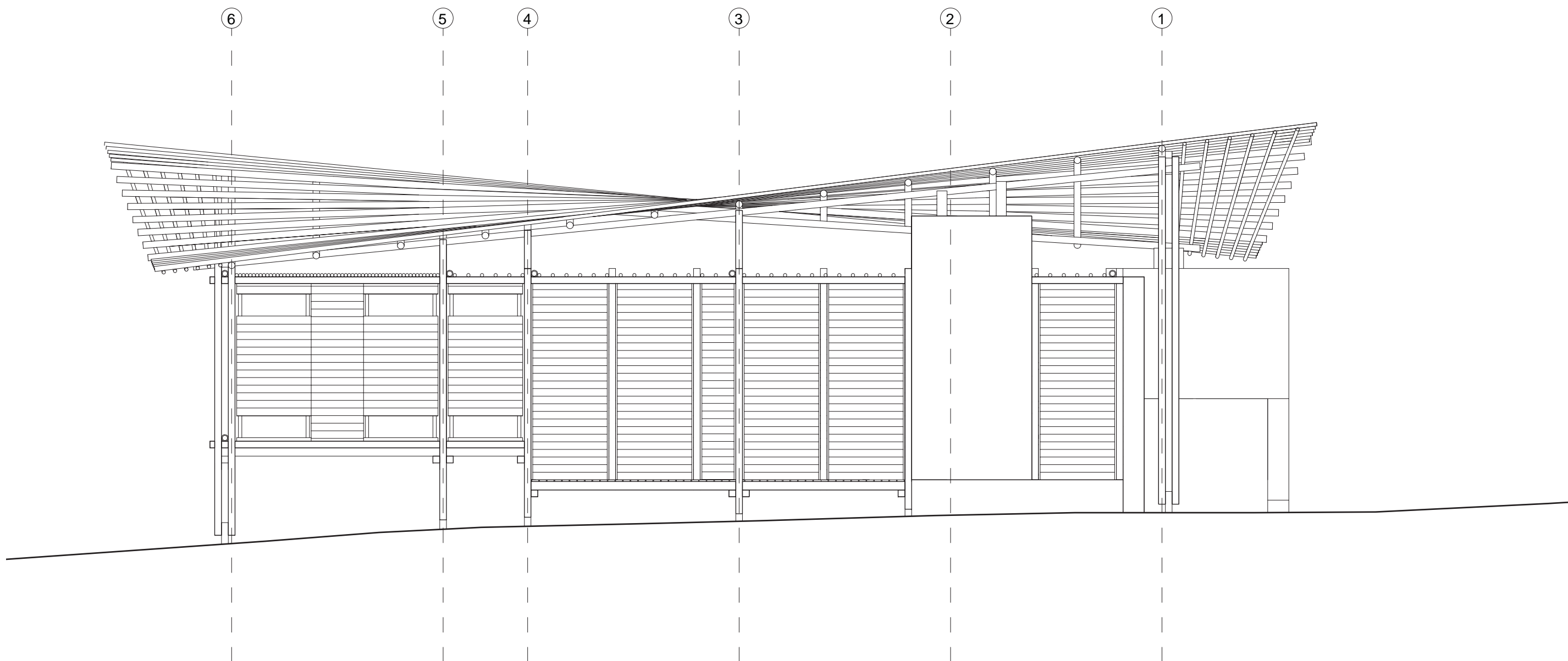
^ north

plan 1:50

The plan is divided into a private area for sleeping/private living and an outward related zone connecting to the surroundings. The materials of the dwelling are rammed earth at the base and wood and bamboo as the frame and roof part. The materials are used according to their individual properties and expression.







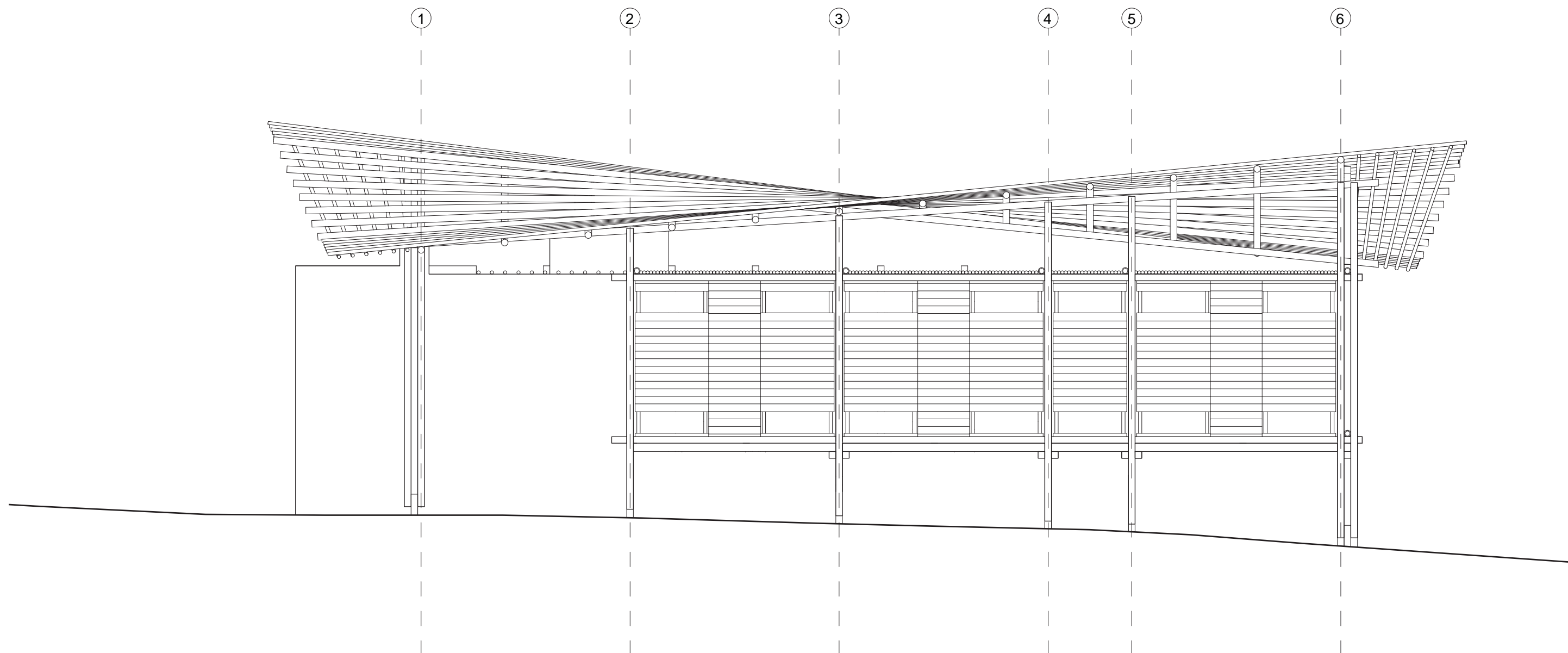
elevation north | no. **3**

project: Masanga Dwelling

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scale: 1:50

date: 02.06.2010



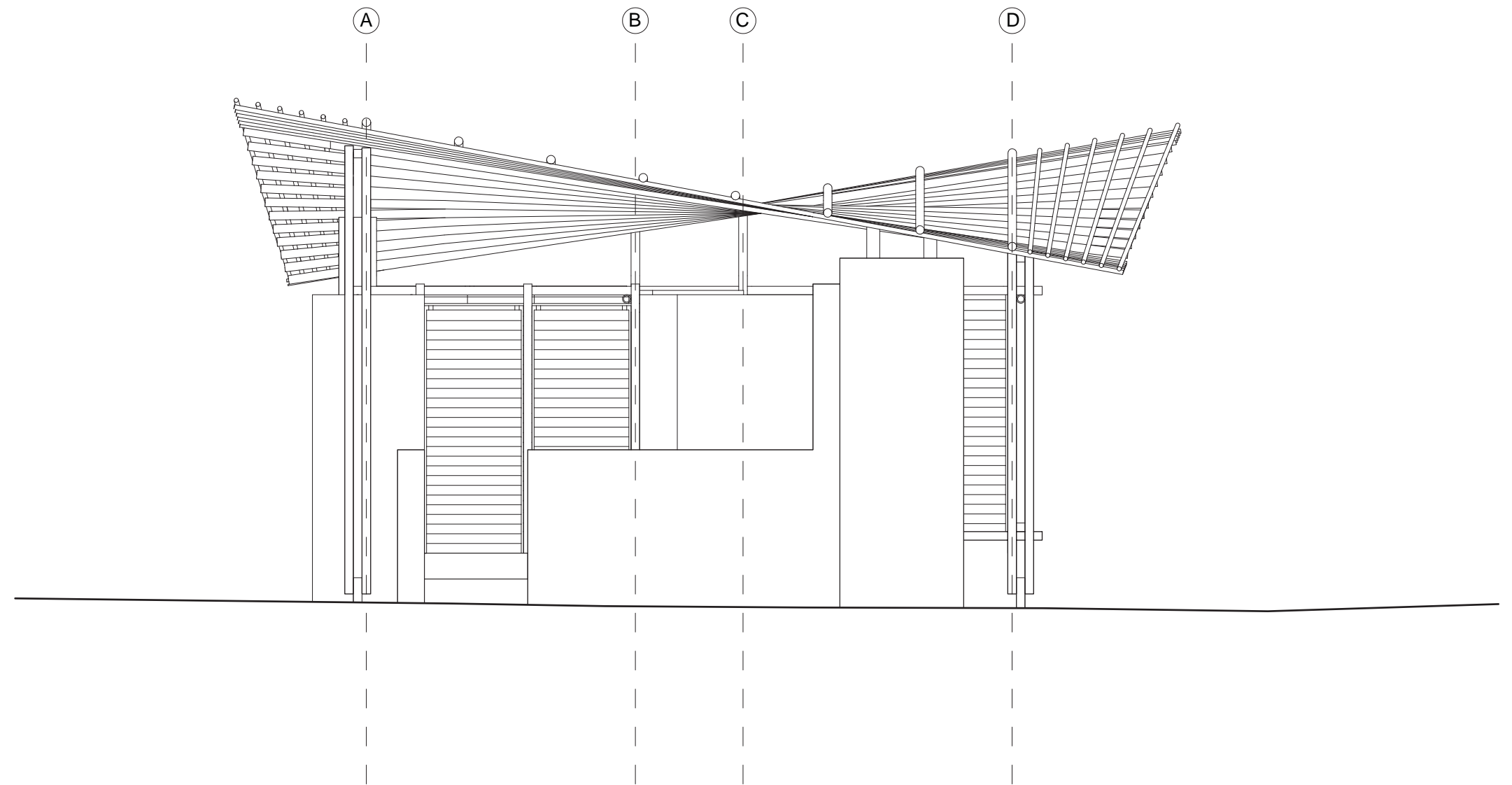
elevation south | no. **4**

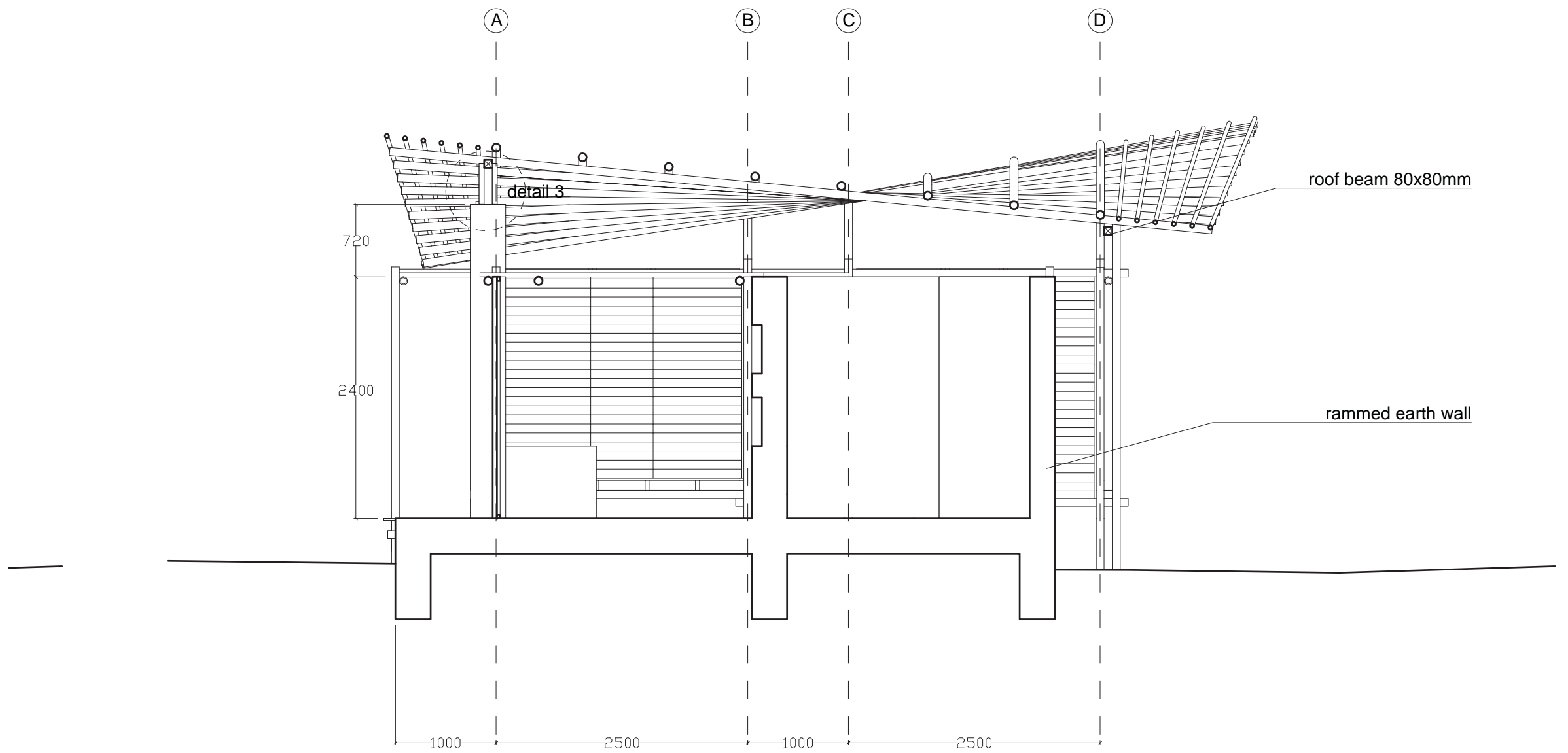
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section II

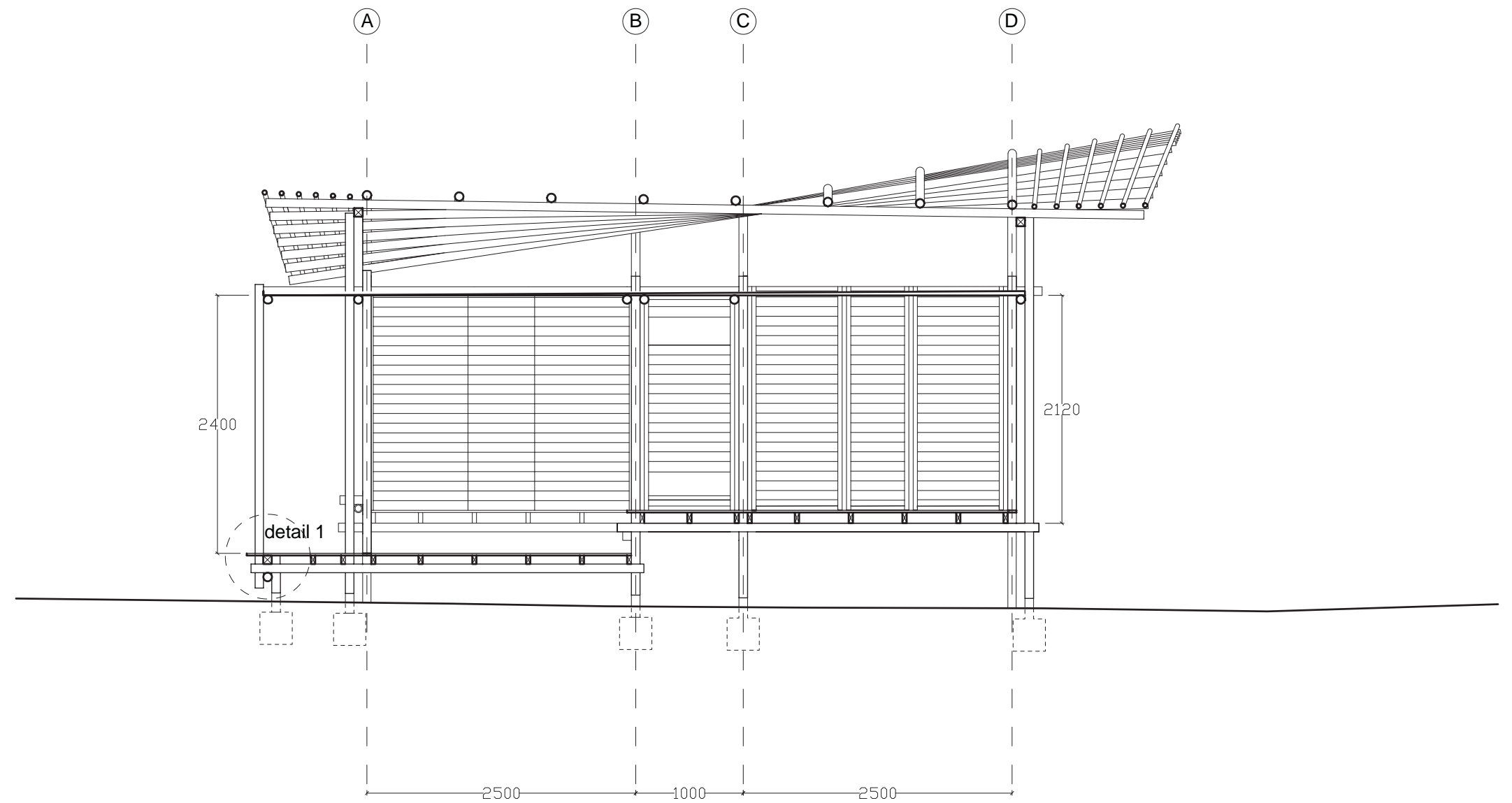
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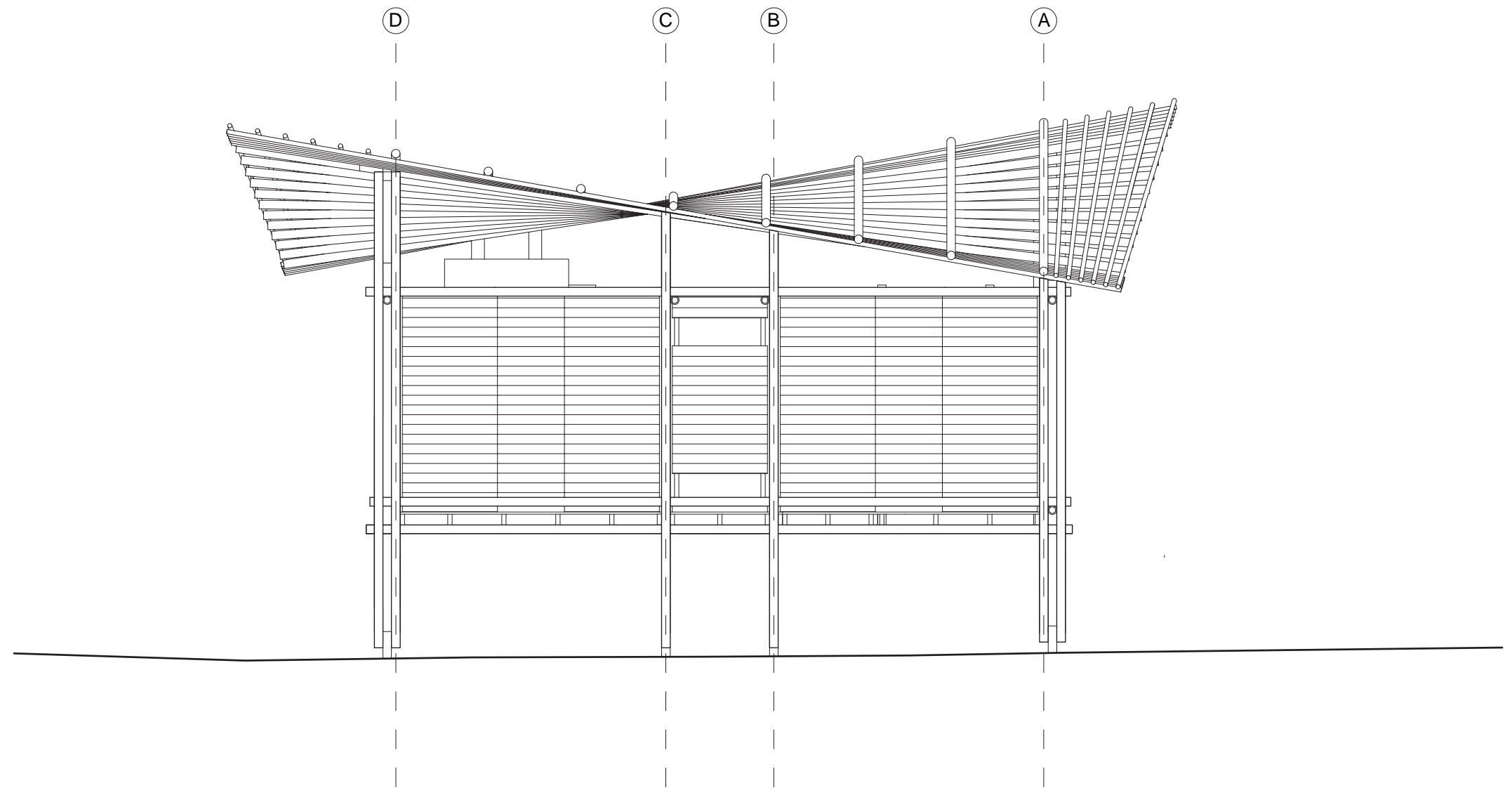
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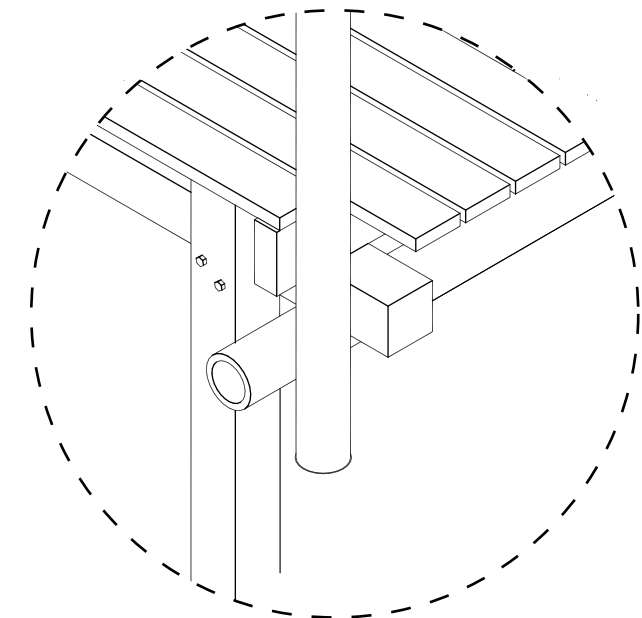
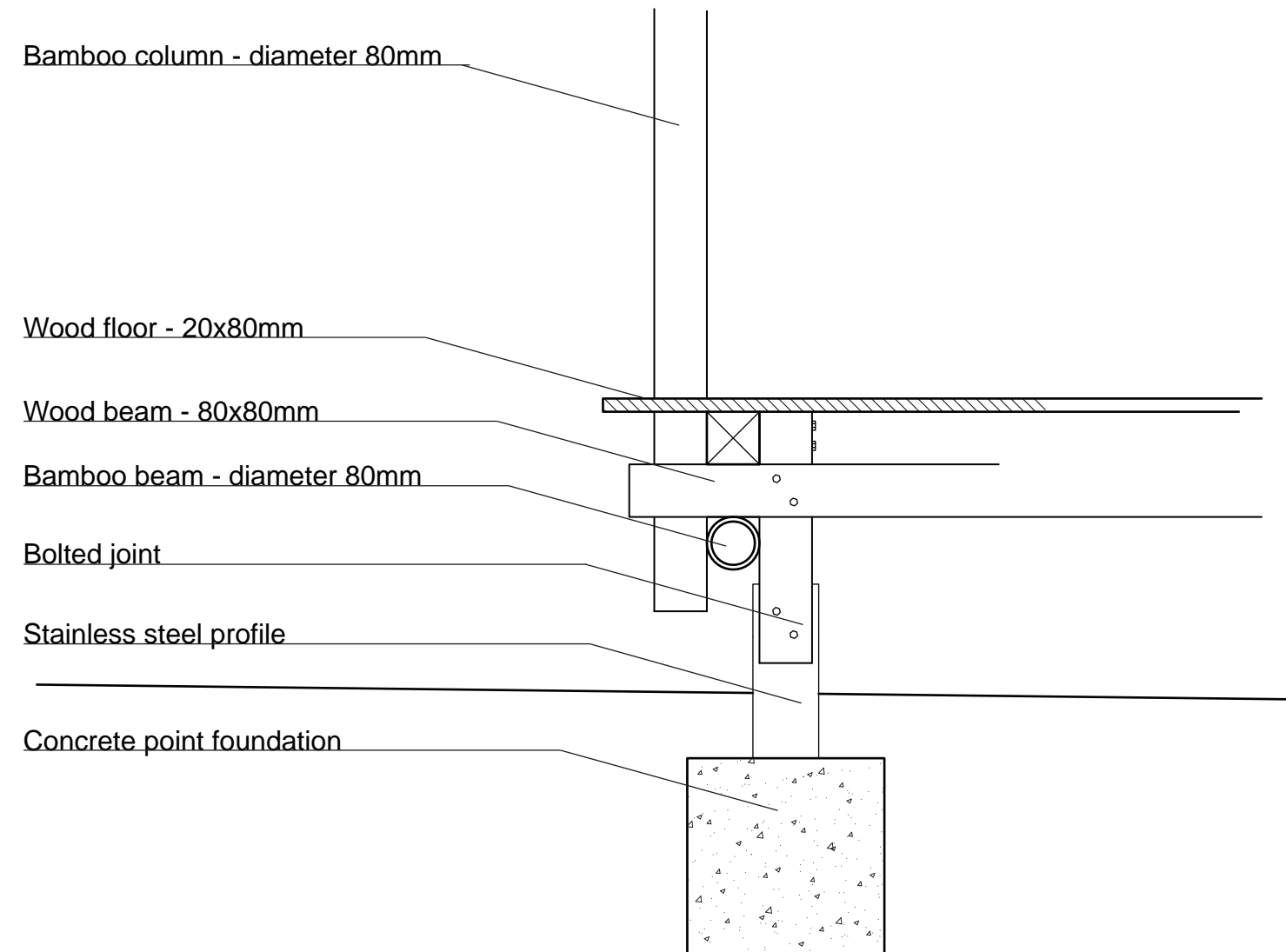
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isometric drawing

detail 1

no. **9**

project: Masanga Dwelling

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date: 02.06.2010

