

POLYTECHNIC OF TORINO  
FACULTY OF ARCHITECTURE 2  
Degree in Architecture  
Honors theses

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**Sustainable architecture for social habitat: the bamboo technology**

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The main aim of the graduation thesis is the appraisal as to the feasibility of building operations that preview use of bamboo as material for the realization of elements of technological and structural systems.

The feasibility has been estimated in function of technical and normative ties pertinent to the productive technology of the technological elements and in function of the economic, social and cultural characteristics of some typical contexts of reference.

To attain the aim shown over, the graduation thesis has been articulated in the following thematic sections:

- Bamboo as material;
- the constructive systems and bamboo technological elements;
- application of technological bamboo elements;
- comparison of performances between structural elements produced with bamboo and with other traditional materials.

In the first section, dedicated to **bamboo as material**, they have been described the physical, chemistries and mechanics characteristics of bamboo to the aim to single out the species that better of the others could be used for the realization of technological elements. Considering that the topic of bottom of the graduation thesis is social-housing, here understanding like

reality strongly tied to the context in which it takes shape, has been analyzed with detail the productive technologies of the material. In these context the analysis of the productive technology it has been extended to the techniques of cultivation and working of bamboo.

The second section, dedicated to the ***constructive systems and the technological bamboo elements***, considers the technical feasibility of useful constructive elements for the realization of foundations, floors, covers, fixtures and inner and external closings for buildings to residential use. Moreover they have been dealt the bamboo technologies like armor for the reinforced concrete and of the bridges.



House built by colombian architect Simon Velez for a social-housing program

The third section, dedicated to ***application of the technological bamboo elements***, is born from an experimental activity lead into Workshop in Vergiate (VR) and aimed to analyse performance of a truss built with bamboo. In the graduation thesis, besides presentation carried out personal activity during the experimentation and of the plan from which this it is born, they have been analyzed the technical difficulties that can be introduced who want to operate in architecture with technologically a little known material, which it is the bamboo.

In the last section, finally has proposed a ***comparison of performances between structural elements produced with bamboo or with other traditional materials***.

For every considered material it has been estimated, in function of the characteristics and ties of the reference context, the suitability to the different realization classes of structural systems. Such judgment of adequacy has been expressed evidencing the consequent advantages and disadvantages to the choice of the bamboo rather than of any other considered material.



Bamboo scaffolds

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