

**MOST FREQUENT PROBLEMS IN WOODEN ROOF STRUCTURES OF THE ARCHITECTURAL HERITAGE  
PAMPLONA - COLOMBIA**

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**Conservation & Management of Historic Buildings**

Course 2005 -2006

**Department HDM – Lund University and  
Swedish International Cooperation Agency**

**APPENDIX 1**

**MOST FREQUENT PROBLEMS IN WOODEN STRUCTURES  
OF THE ARCHITECTURAL HERITAGE  
PAMPLONA - COLOMBIA**

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## **MOST FREQUENT PROBLEMS IN WOODEN STRUCTURES OF THE ARCHITECTURAL HERITAGE**



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# MOST FREQUENT PROBLEMS IN WOODEN ROOF STRUCTURES OF THE ARCHITECTURAL HERITAGE PAMPLONA - COLOMBIA

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# MOST FREQUENT PROBLEMS IN WOODEN ROOF STRUCTURES OF THE ARCHITECTURAL HERITAGE PAMPLONA - COLOMBIA

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## 1. INTRODUCTION

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Wooden structures are the more usual problem of the architectural heritage in Colombia. A lack of knowledge, economical resources and specially a lack of a culture of maintenance makes that these ancient structures collapse quite often.

Since the middle of the XX century this subject has taken more interest of some specialists and in academic circles. The present document is based on a study done by the Colombian architect German Tellez Castañeda, who started to take interest in this subject in the decade of the 60s; research that is going to be published with the name of "Timber structures in the Nueva Granada".

That document has been an important reference to start to understand and organize information of several works and experiences in the historical center of Pamplona – Colombia. The "Casa El Parque" and the "Casa del escribano Real de Pamplona", are two representative colonial buildings from the middle of XVIII century, that used traditional constructive techniques, brought by the Spaniards since they arrived in the XVI century.



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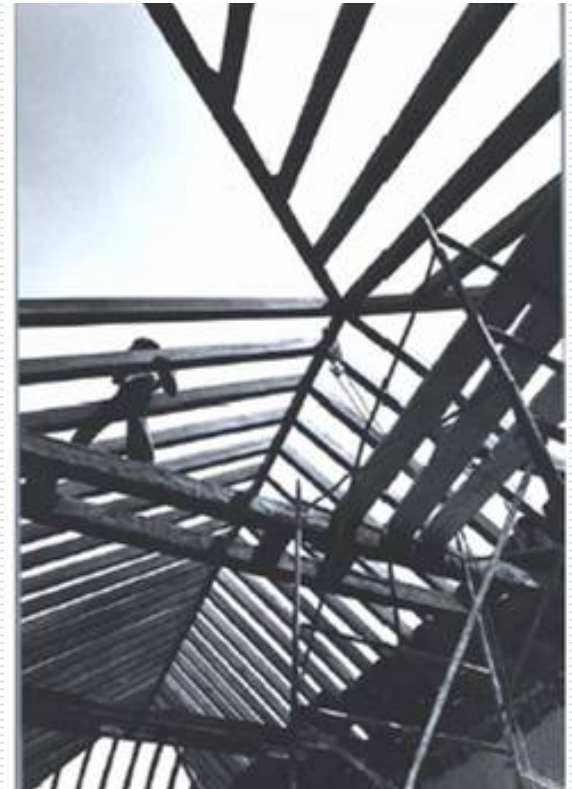
## 2. HISTORICAL OVERVIEW OF WOODEN ROOF STRUCTURES

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The constructive techniques used in the construction during colonial times in Colombia were brought by the Spaniards in the XVI century. This constructive techniques and systems were widely used before in Spain, and also influenced by the roman and the Arabian empire during centuries of domination.

Timber structures used in the colonial architecture in Colombia also came at the same time and were influenced specially from the south of Spain, were was bourn most of the Spanish conquerors and the people who gets involved in the conquer of America.

The main constructive techniques used in houses, churches and public buildings where: foundations in stone, massive earth walls, timber roof structures and ceramic tiles on the roof. In most of the new constructions the courtyard configures the distribution of the building and depending of its location define the typology in O, L, U, etc.



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## 3. TECHNICAL OVERVIEW

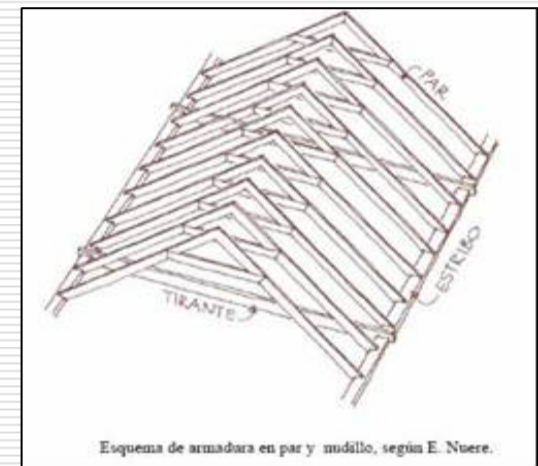
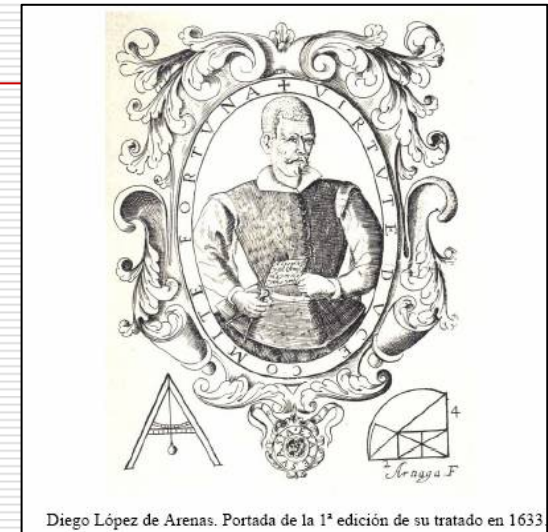
The initial project of the Spaniards when they arrived to America was to exploit the richness of the resources founded in the new territory. But only to conquer the territory in a real way was to found cities to consolidate the empire and establishing its socio-political and religious institutions.

With the settlement of the new cities, it was also necessary to bring skilled people to build up streets and the buildings as houses, churches and public constructions.

Builders and craftsman's brought with them its experience, books and also specialized technical information.

It is well known that in Colombia and the Nueva Granada was widely used this technical information in most of the traditional architecture of the colonial times.

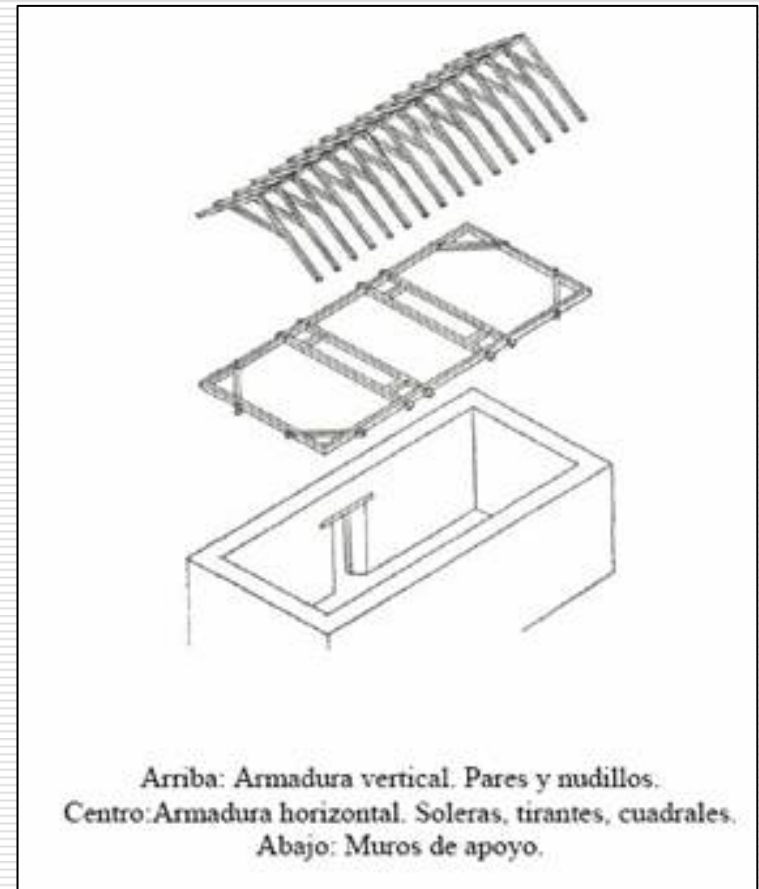
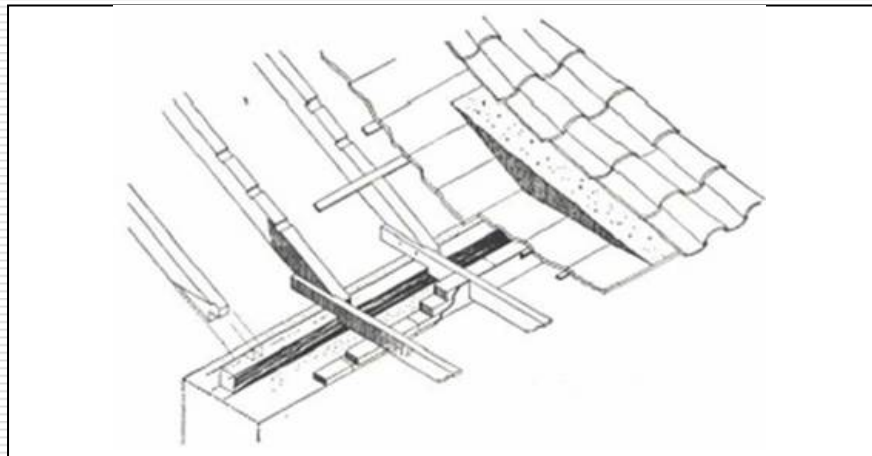
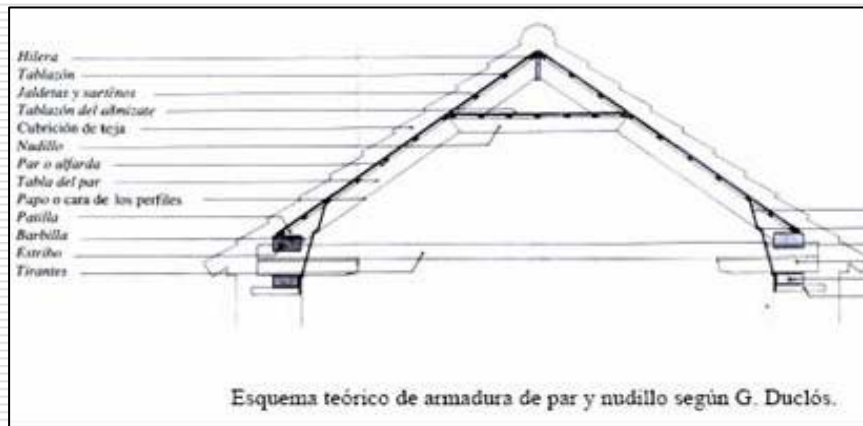
One of the most important references used was a document published in Sevilla Spain written by Diego Lopez de Arenas in 1633. This document shows the technical way to trace, design and build up timber roof structures, with accurate information about dimensions, sections and other indications to cover the roof and also how to protect the timber from humidity and avoid the rot in timber structures.



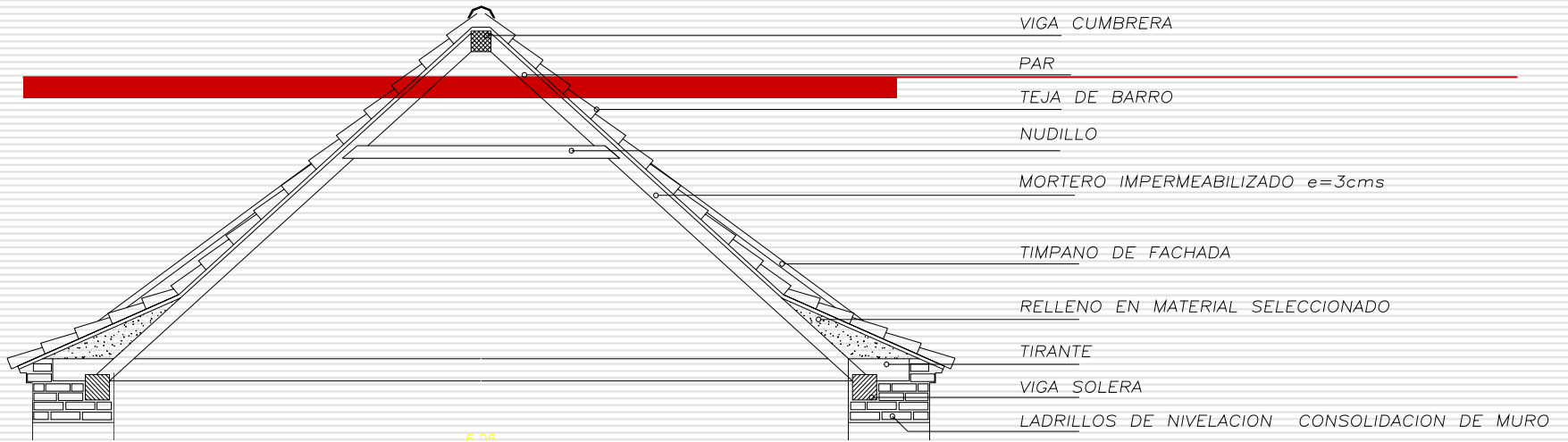
# MOST FREQUENT PROBLEMS IN WOODEN ROOF STRUCTURES OF THE ARCHITECTURAL HERITAGE PAMPLONA - COLOMBIA

## 4. MAIN TIMBER ROOF STRUCTURES USED IN THE NUEVA GRANADA

### 4.1 PAR Y NUDILLO SYSTEM



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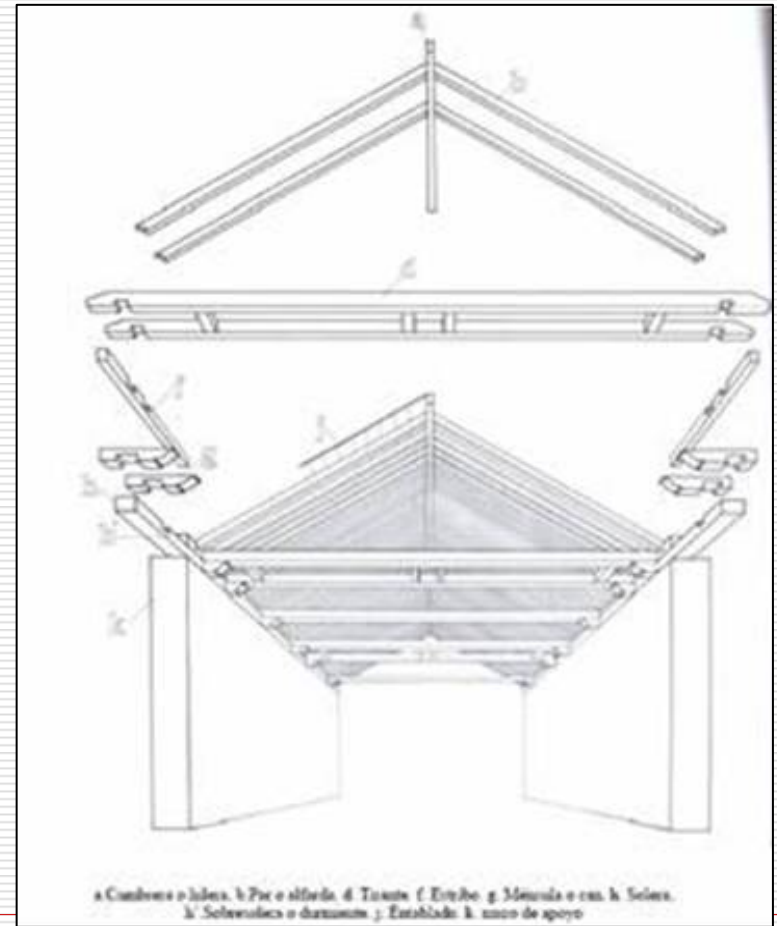
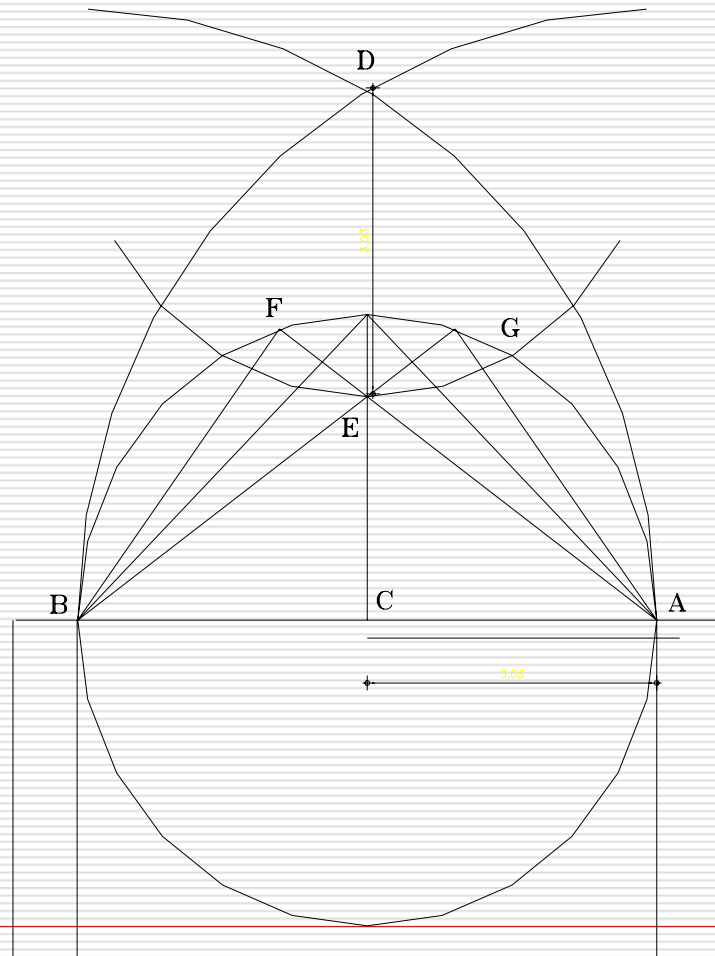


Iglesia de Tópaga ( Boyacá).



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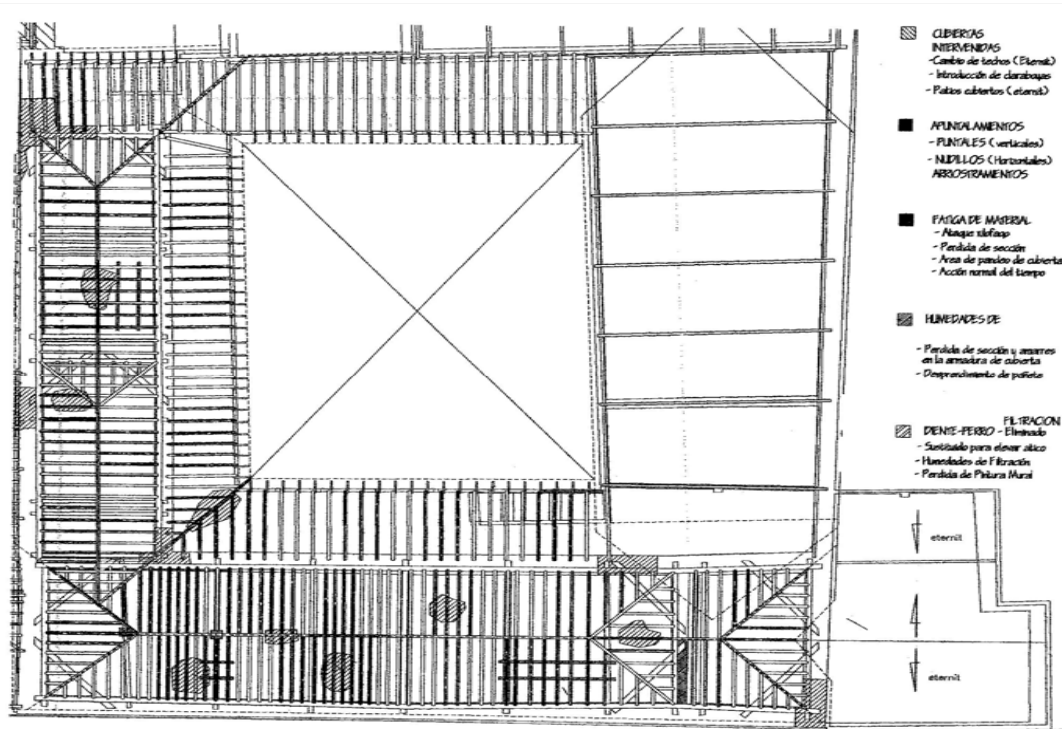
## 4.2 PAR HILERA SYSTEM



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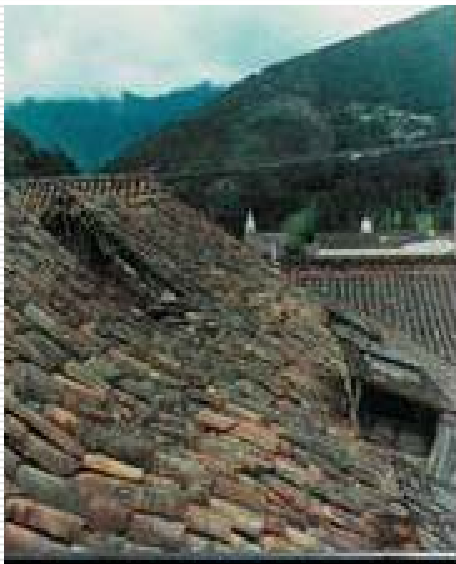
## 5.CASA EL PARQUE - STUDIES OF RESTORATION

### INTERVENTORY OF PROBLEMS

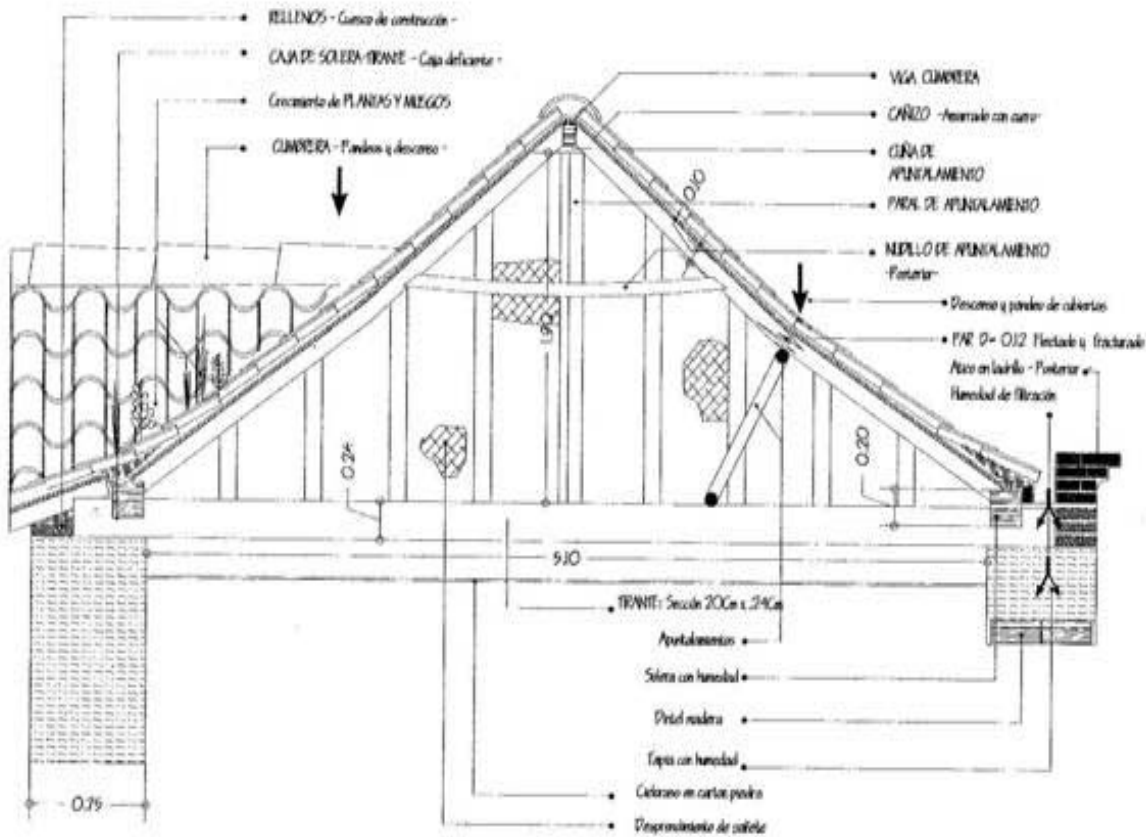


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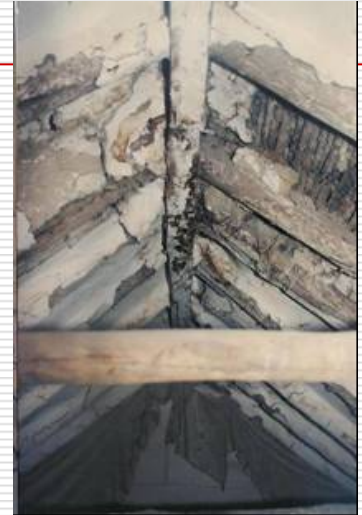


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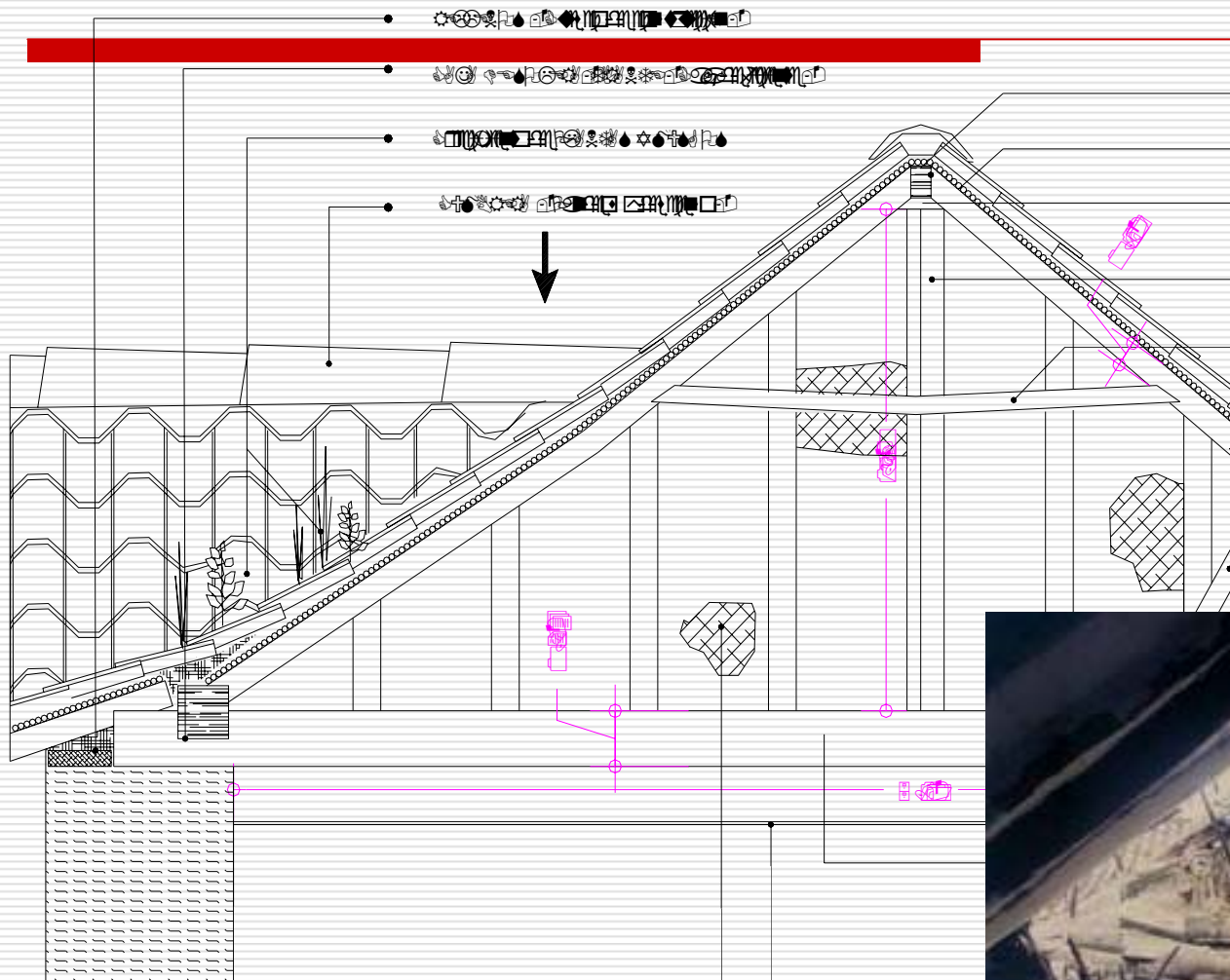


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## 5. CASA DEL ESCRIBANO REAL – PROJECT OF RESTORATION

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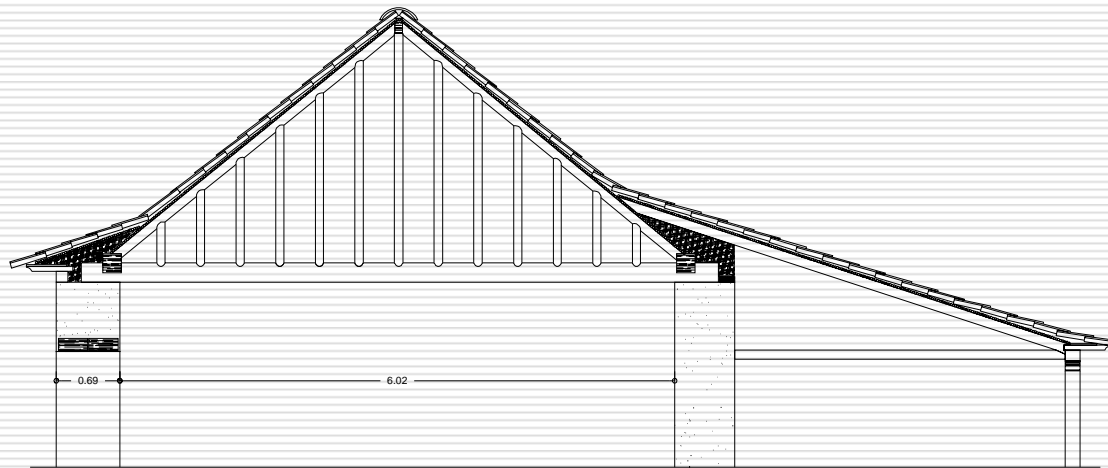


# MOST FREQUENT PROBLEMS IN WOODEN ROOF STRUCTURES OF THE ARCHITECTURAL HERITAGE PAMPLONA - COLOMBIA

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## CASA DEL ESCRIBANO REAL – PROCESS OF RESTORATION

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# MOST FREQUENT PROBLEMS IN WOODEN ROOF STRUCTURES OF THE ARCHITECTURAL HERITAGE PAMPLONA - COLOMBIA

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## CASA DEL ESCRIBANO REAL – PROCESS OF RESTORATION



# MOST FREQUENT PROBLEMS IN WOODEN ROOF STRUCTURES OF THE ARCHITECTURAL HERITAGE PAMPLONA - COLOMBIA

## 6. PRESERVATION PROGRAM

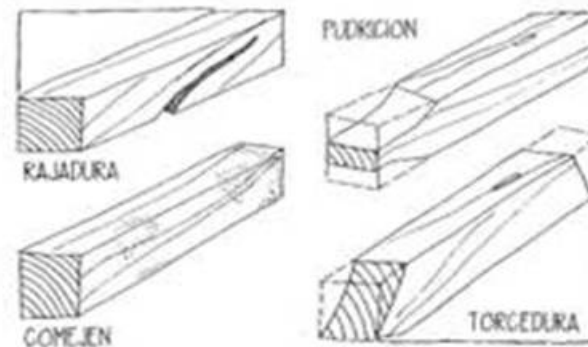
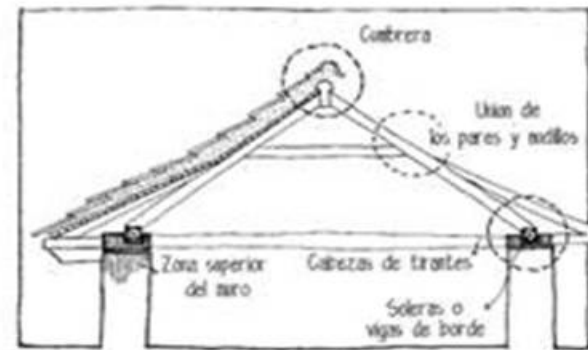
### 6.1 Inventory of problems

#### HOW DEGRADATION SETS IN TO WOODEN STRUCTURES

Water is the most frequent problem on wooden structures.

Leakage from the roof generates strong damages when water comes in contact with the wood. The damages on the wooden structure can be classified as:

- Cracks on the beams
- Wood rotting.
- Bend and deformation of structural elements
- Termites



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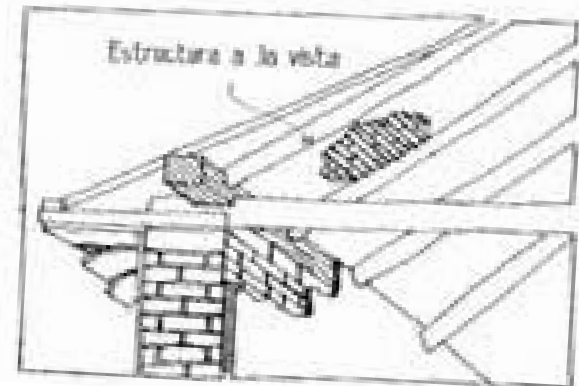
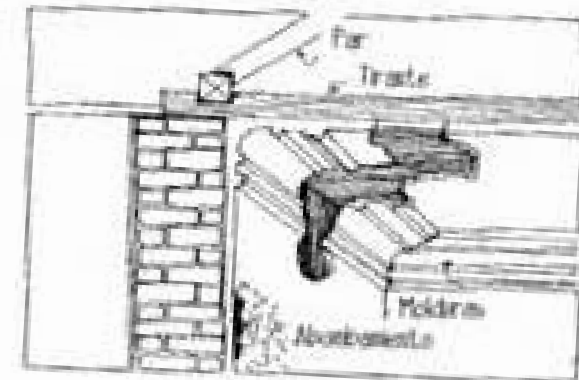
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## FINISHINGS DEGRADATION

Once the water come in contact with the wooden structure it start to generates problems and degradation of several elements as ceilings and adornments of the building.

Another symptoms can be seen in the ruin and spoil of the walls due to the infiltration the rainy water.

Ruptures and disjunctions causing detachments specially of ornamental elements.



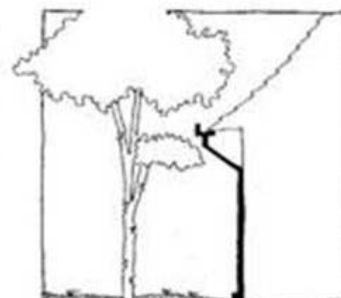
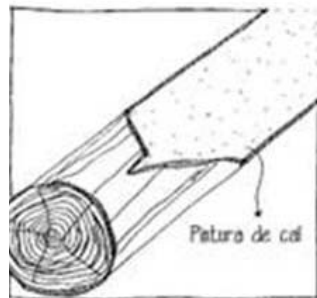
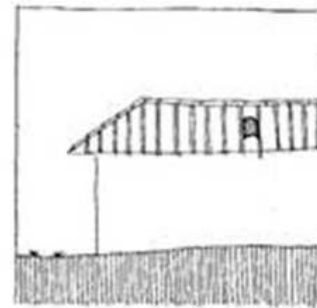
# MOST FREQUENT PROBLEMS IN WOODEN ROOF STRUCTURES OF THE ARCHITECTURAL HERITAGE PAMPLONA - COLOMBIA

## 6.2 CONSERVATION AND PRESERVATION

### WOOD PROTECTION

It is necessary immunize the wood structure in order to avoid humidity and biological attacks from termites and other insects.

It is advisable to protect the wood structure with slaked lime which will reinforce the protection and also will guarantee the duration of the wooden structure.



### CHECKING THE ROOF SURFACE PERMANENTLY

It is advisable to remove permanently herbs and vegetation from the roof. Check constantly the roof tiles to change those which gets broken or missing. Take away animal nests from the roof.

### VEGETATION

It is necessary to remove high trees and shrubs growing near to the building in order to avoid the block of gutters and the drain roof system. Also to protect the building from a falling of a tree branch.

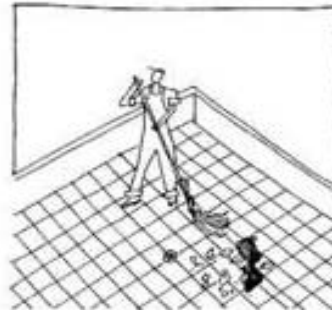
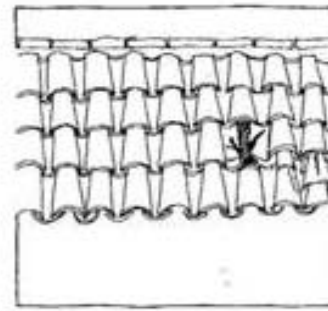
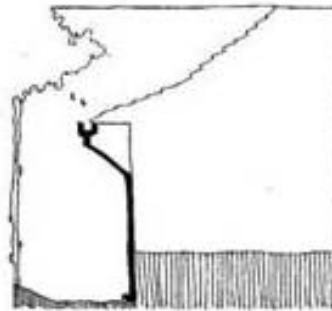
# MOST FREQUENT PROBLEMS IN WOODEN ROOF STRUCTURES OF THE ARCHITECTURAL HERITAGE PAMPLONA - COLOMBIA

## 6.3 MANTEINANCE

### CLEAN OF GUTTER AND DRAIN ROOF PIPES

Its is advisable to clean at least once every six months the gutters and drain roof pipes in order to avoid obstructions of the drain system. The obstruction can generate overflow of the drain system and with the time rot of the wood structure.

It is necessary to check the waterproof of terraces at least one a year and replace it if gets broken or if is not working properly.



It is necessary to remove high trees and shrubs growing near to the building in order to avoid the block of gutters and the drain roof system. Also to protect the building from a falling of a tree branch. It is important to check and replace permanently roof tiles that gets broken or missing, taking care of changing its for tiles of the same size and dimensions. To keep the direction and the align of the roof tiles in order to facilitate the evacuation of the rainy water.

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Villamizar. Oscar

All the pictures were taken by the author, at less the text indicate the contrary.

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