Building techniques :

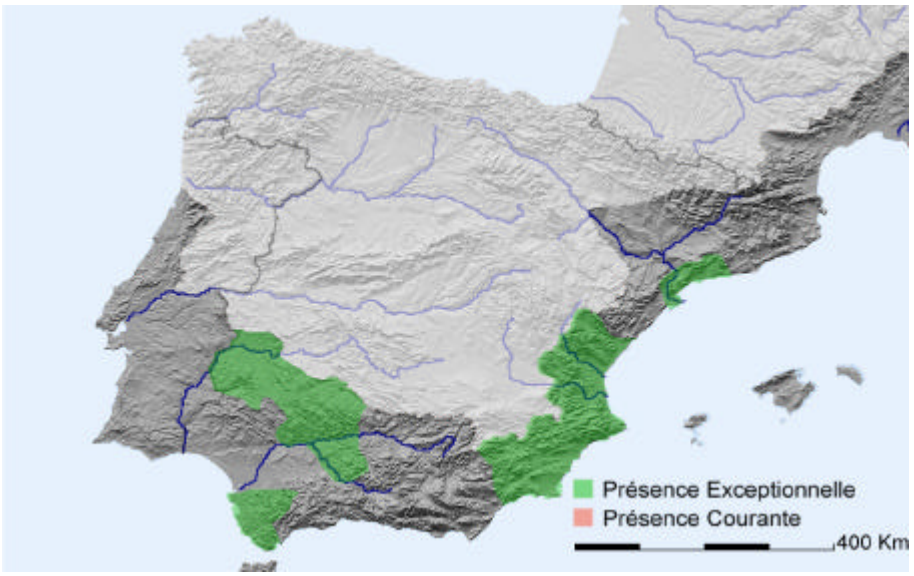
# D7 – Thatch Roofing

Country :

Spain

## PRÉSENTATION

### Geographical Influence




### Definition

***Thatch Roofing***

*- Steep sloping roof, 45% to 120% covered with flattened bundles of straw, attached to a framework of wood or reeds.*

*- The straw consists of graminaceous stems, gorse, s ea reed, wicker or cereal plants.*

*- The roofing, formed by covering rows of straw bundles, rests on a stacked or assembled wooden frame.*

*- This technique, which goes up to Prehistory, almost disappeared; it is still used in the restoration of old constructions, to perpetuate this tradition.*

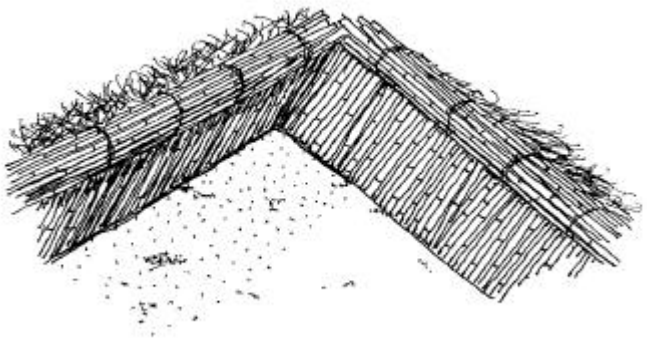
### Environment

*In the MEDA area, thatch roofing is present only in rural environment, seaside and plain, except for Morocco, where it is also present in mountain areas. This type of roofing is rare.*
In Spain, this type of roofing, rare, is present only in rural environment, seaside and plain.

### Illustrations

General view :

Detail close-up :



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## CONSTRUCTION PRINCIPLE

### Materials

**Nature and Availability (in what form)**

*Thatch roofing consists of bits of linked straw. The nature of the plants used is extremely variable: it depends on the resources available nearby: gorse, sea reed, wicker, graminaceous, rye or corn, rice straw.*

In Spain, thatch is prepared from graminaceous straw , rice or corn.

**Modules, Dimensions, Thickness, Dosages**

*The stems have a length varying from 40cm to 80cm. The thickness of the roofing is between 10cm and 25cm.*

In Spain, the faces of roof covered with thatch are between 9m and 10m long and 5m and 6m wide; the thickness of the roofing varies from 20cm to 25cm.

### Type of laying

**Type of laying**

*The stems of straw are tied up in flattened bundles, which are then tied up in vertically on wooden beams.*

In Spain, the bundlesof straw are tied up in the vertical direction with a carpet of tied up reeds, attached on rafters or wooden beams.

**Associated framework**

*The thatch roofing rests on a stacked or assembled frame, rough or squared wood .*

In Spain, the roofing rests on beams, which are sometimes laid on wooden ties making up the structure of the attic floors. You can find two types of frames : in the area of Murcia, the crossed beams are laid on assembled pinions; in the area of Valencia, the frame consists of a framework of posts and beams.

### Drainage

**Adapted slope (%)**

*The slope varies from 45% to 120%. Exposure to wind is lessened when the slope is weak; the slope is generally strong enough to allow a fast flow of water, thus avoiding infiltration.*

In Spain, the slope ranges between 60% and 120%.

**Water collecting and drainage**

*Rainwater is sometimes collected by gutters, or simply isolated from the façades by an overhang of the thatch (projecting roof).*

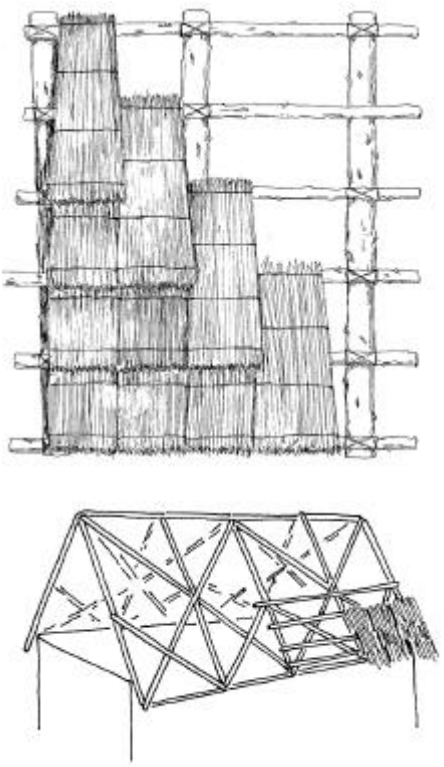
In Spain, the line of thatch bundles is laid projecting approximately 70cm away from the façade. The ridges, in the same way, are laid projecting from the pinions.

**Processing of specific points (bargeboards, runoff, neck gutters, ridge sheathing...)**

*The ridge sheathing is generally processed in a particular way, to guarantee good fixing and waterproofing of the thatch, thanks to mortar.*

In Spain, the ridge sheathing is covered with a mortar of earth and lime; small crosses are laid at each end. The rivets are reinforced using bound bundles of thatch, laid lengthwise according to the slope. The chimneys are subject to specific processing. In the area of Valencia, the eaves, overhanging approximately 70cm, are reinforced by a layer of corn straw, and are protected on their section by a semi-cylindrical sheath made with very fine reeds (senill).

### Illustrations



*Construction principle: materials and type of laying – detail of laying and crossed plan*

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## CONSTRUCTION PRINCIPLE (CONTINUED)

### Tools

*Thatch is cut with a reaper or sickle.*

### Trades

**Trade, Number of people necessary**

*Traditionally, thatch roofing often used to be carried out by craftsmen with the people who lived in the thatched cottages. Two to four people were necessary ,at least, to carry out this work.*

In Spain, thatch roofing was carried out by a craftsman working in the fields and a specialist in the construction of huts (Mestre barraquer) helped by a workman. Two people at least were necessary.

### Performances

**Waterproofing, Protection against bad weather**

*Thatched roofing requires regular maintenance, to guarantee weather resistance. Moreover, this type of roofing is particularly sensitive to fire hazard.*

In Spain, thatch roofing is primarily present in areas with a mild climate, its weather resistance is satisfactory, subject to maintenance every five years.

**Thermal insulation**

*Thatch roofing offers good thermal and acoustic performances.*

### Ageing pathology

**Linked to materials and climatic conditions :**

*The waterproofing of thatch roofing can be threatened by an insufficient flow of rainwater, causing a rotting of the straw.*

**Linked to the technique :**

*The bonds of the bundles of straw, made with string or plant fiber, do not offer a good resistance to rain and dryness; regular repair is necessary.*

### Illustrations

*Construction priniciple: materials and type of laying – assembling detail*

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## CONSTRUCTION PRINCIPLE (CONTINUED)

## REALIZATION DESCRIPTION

***In Spain:***

Conditions of realization :

*The realization must be done in dry weather, to avoid rainwater infiltration; no particular protection is necessary.*

Preliminary works :

*After cutting the straw, the stems are assembled in bundles, flattened and cut to size.*
In Spain, in the area of Valencia, after having placed supports, a framework of reeds is attached in the direction of the slope and horizontally, then covered with a tied bed of reeds. Boards are assembled (costera) to make it possible for the workmen to go on the roof.

Realization :

*The flattened bundles of straw are attached in tight horizontal rows. The laying is carried out from the drainage to the ridge sheathing. The covering of a row with the following row is between one third and two thirds.*
In Spain, in the area of Valencia, the laying of thatch starts with the horizontal row of drainage (polsera) which shapes overhanging eaves, on which a layer of bundlesof straw of corn is attached, to reinforce the rigidity. The ends of the bundles of straw, thicker, are attached to the reeds, on the horizontal framework. The bundles of the following rows, attached in the same way to the framework of reeds, are laid successively, covering the ridge sheathing. The bundles of straw of the higher row, crossed horizontally at the top, are attached to a ridge sheathing of reeds, like the bundles of the higher row of the opposite slope. The ridge sheathing is then covered with a mortar of earth and lime or with a layer of earth. The layer of the eaves is protected by a semi-cylindrical sheath of very fine reeds (senill) which gives the roofing its final touch.

***Original description*** *(Text in English) :*

Prerequisites :

There are two types of *barraca*: those in Murcia, where the gable ends are erected first and then the ridge is placed in position, in which case the roof structure has the same characteristics as a wooden floor structure, and the *barracas* of Valencia which have a *parhilera* or ridge pole structure, and this is the type of construction explained here.

Materials :

*Beams* and *rafters*; Bed of *thatching material*, cut to size; *Long thick reeds* for the battens; *Thin reeds* to finish off the eaves; *Straw*: normally graminaceous (*borró* and *trochera* are found in the *albufera* and *mansega* in the lagoon) and rice and wheat straw*; Earth*

Starting work :

*Preparing the materials:*
- The beams and rafters are cut to size.
- The bed of thatching material is prepared and cut.
- The *senill* is prepared for the eaves.
- The straw is made into bundles.

Construction :
- The wall plate is placed in position on the side walls.
- The principals are nailed to the wall plate, as are the ties which act as the beams for the top floor, known as the *andana*.
- A strongish reed mat is positioned over the ties; this acts as an intermediate floor, capable of withstanding the weight of the harvest.
- To facilitate passage over this light reed floor, a board walk, known as a *costera*, is built.
- Struts are positioned between the principals.
- Reed battens are positioned in the direction of the pitch.
- Reed matting is positioned over the struts and the battens, following the slope of the roof. Reed matting is positioned horizontally.
- Other, thicker reeds are positioned horizontally, 40 cm apart, over this matting, and the outer straw layer is fastened to them.
- The straw is attached to the roof. This process begins at the lower edge or *polsera* which forms the overhang of the eaves. To give this element added rigidity, a layer of wheat straw is attached at the eaves, providing an end element to subject the materials. The thickest end of the straw is fastened to the external horizontal reeds, forming the first, bottom course.
- The second straw course is fastened to the horizontal reed which is immediately above, overlapping the first. This operation is repeated as far as the ridge.
- The final course forms the ridge capping. It is cut along the top to form a straight edge and tied to a ridge reed, along with the final course on the other slope.
- The ridge is covered with a layer of earth.
- The roof extends approximately 70 cm out over the facade to form the eaves.
- The edges of the roof which form the eaves are enclosed in a layer of very fine reed called *senill* with a semi-cylindrical form, which provides protection and a correct finish.

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## USE, EVOLUTION AND TRANSFORMATION

### Use

**Types of buildings**

*Thatch roofing mainly concerns modest dwellings for farmers or fishermen.*
In Spain, thatch roofing concerns modest housing huts of and their sheds.

**Period when the technique first appeared / Period of use of the technique - contemporary or disappeared.**

*Thatch roofing goes up to Prehistory; this technique almost disappeared in the XXth century.*
In Spain, although the technique of thatch roofing is no longer used in new building, some craftsmen still ensure the maintenance for this type of roof.

**Reasons of the disappearing or the modification of the technique**

*The emergence of new resistant and economical roofing materials, as well as the modern social and economic changes have caused the disappearing of this traditionnal technique.*

### Evolution / Transformation

**The materials**

*The relative lightness of thatch, making it easily torn under the effect of wind, as well as rot by water impregnation, requires regular maintenance of the roofing, often too heavy to manage. The sensitivity of thatch to fire and the emergence, at the beginning of XXth century, of resistant and economical roofing materials , such as plates of zinc or coated sheeting, caused the disappearing of this technique.*

**The technical aspects**

*The implementation of thatch roofing , relatively long, ensured by craftsmen, peasants or fishermen in a context of traditional production, was abandoned with the modern social and economic changes, where the time of work realization must be optimized.*

**Evaluation of materials and replacement techniques**

*If the materials of replacement definitely offer superior technical and economic performances, they are not harmonized with remaining thatch roofing. Currently, some thatch roofings are still maintained, in order to perpetuate this old tradition.*

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