Summary
In recent years it has been noticed the progressive disappearance of vernacular building technologies all over the world mainly due to a strong urban rehabilitation process with modern technologies not compatible with ancient knowledge. Simultaneously new dwellings are needed worldwide and in this sense it was decided to study an ecological and cost-controlled building technology of monolithic walls that can combine the use of low carbon footprint materials, such as earth, fibres and air lime forming a corner (prototype 2, Fig.2), several small samples (Fig.3), wallets and a small building forming a corner (prototype 2, Fig.2), several small samples (Fig.3), wallets and a small building (prototype 3, Fig.4 and 5) were built to assess and analyze constructive feasibility, mechanical behavior and anti-seismic performance.

Methodology
To recover and improve ancient knowledge on earth building, as well as creating a new technology applicable for the construction of new dwellings, several experiments were made related to constructive feasibility, hygrothermal behavior and anti-seismic performance. In the conception, production and analysis of the prototypes two architects, three engineers and five engineering students were involved.

In terms of temperature it can be seen (Fig.9) that the amplitude indoors is reduced in comparison with outdoors even with only a heater connected during the night in the end of the winter season (since the first day of measured).

The same happens in terms of relative humidity for the reduction of amplitude and stabilizing between 75-85%. The high values may be related to the building moisture during construction and that the cellule is not rendered and plastered.

These results validate a technology that have a low carbon footprint made with natural materials and have both efficient mechanical properties in terms of flexural and compression strength and thermal resistance.

Comparing with other monoolithic technologies this technology is very easy of implementing: the production and applicability is light weight, machinery or tools in its process. It does not involve the use of complex and heavy machinery or tools in its process. Also, for people without previous experience in construction, the technology is easy to learn.

Conclusion
Compared to other earth walls solutions, this technology generally presents a lower density and higher thermal resistance and high mechanical flexural strength. Its easy implementation has a very high potential to be used for building in developing countries, because of its low cost natural materials (earth and reed) and because of its mechanical behaviour can result in an high resistance quality for seismic hazard areas.

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Strategy of earth walls with reed and lime

REEDCOB - Recover and innovation

Strategy of earth walls with reed and lime

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THÈME 4 - 4.2. ENGINEERING, BUILDING TECHNIQUES AND STRUCTURES, SEISMIC RESISTANCE

Introduction
After the Second World War there was a massive need for reconstruction and new housing in Europe. For this it was fundamental the development of fast setting cement-based technology to respond to these urgent housing needs. Because of its low cost and apparent durability modern technology has been replacing ancient technology and causing a loss in the vernacular knowledge still established in developing countries.

In recent years it has been noticed the progressive disappearance of vernacular building technologies all over the world mainly due to a strong urban rehabilitation process with modern technologies not compatible with ancient knowledge. Simultaneously new dwellings are needed worldwide and in this sense it was decided to study an ecological and cost-controlled building technology of monolithic walls that can combine the use of low carbon footprint materials, such as earth, fibres and air lime forming a corner (prototype 2, Fig.2), several small samples (Fig.3), wallets and a small building (prototype 3, Fig.4 and 5) were built to assess and analyze constructive feasibility, mechanical behavior and anti-seismic performance. In the conception, production and analysis of the prototypes two architects, three engineers and five engineering students were involved.

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These results validate a technology that have a low carbon footprint made with natural materials and have both efficient mechanical properties in terms of flexural and compression strength and thermal resistance.

Comparing with other monoolithic technologies this technology is very easy of implementing: the production and applicability is light weight, made with thin layers of mortar and reed canes. It does not involve the use of complex and heavy machinery or tools in its process. Also, for people without previous experience in construction, the technology is easy to learn.

Conclusion
Compared to other earth walls solutions, this technology generally presents a lower density and higher thermal resistance and high mechanical flexural strength. Its easy implementation has a very high potential to be used for building in developing countries, because of its low cost natural materials (earth and reed) and because of its mechanical behaviour can result in an high resistance quality for seismic hazard areas.

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