

Technology Offer

A Modular Bio-Building System construction process based only in natural materials, timber and rammed earth

Summary

An SME located in Barcelona using his own construction process for designing and building houses which is healthier and more sustainable than conventional building as no waste is produced, offers an innovative construction system of structure, roof and facade, based in timber and rammed earth, as well as the know-how of the system. Partners, manufacturers, construction companies interested for joint-venture, manufacturing and/or commercial agreement with technical assistance are sought.

Creation Date	14 October 2013
Last Update	20 October 2014
Expiration Date	04 May 2015
Reference	TOES20131014002

Details

Description

An SME located in Barcelona, which is about to start projects in Spain, Chile and Tanzania, and with extensive experience in modular-home building, biodegradable and green materials, using his own construction process for designing and building houses which is healthier and more sustainable than conventional building as no waste is produced, offers an innovative construction system of structure, roof and facade, based in timber and rammed earth, as well as the know-how of the system.

The innovation technology is the mix between the timber frame structure and the walls of rammed earth, in modular and prefab system.

It consists of walls formed by a framework of wooden posts and beams braced with timber paneling. The walls are filled with rammed earth (compacted soil) and the roof is made of a simple vegetal soil substrate.

The System is composed of simple resistant wood panel's structure technology and walls of rammed earth. Thus reducing the execution time, labor, and material costs by 40% (700 € / m² in Spain).

1. The construction of the wooden walls system is very simple, just by raising joining panels (platforms) of walls and slabs braced together. The walls are horizontally assembled in modules before rising. The wooden structure will be inside the house protected by the walls of rammed earth. Once the wooden structure is finished, it could be produced the building's envelope made with rammed earth walls. It runs for sections the same size as the timber module. The outside formwork is placed before introducing earth and compacting.

It is necessary to create a base to support the walls and avoid soil moisture, which will be the foundation of concrete.

2. The buildings are designed with bioclimatic parameters based on thermal inertia (of the earth), solar gains, natural insulation and crossed ventilation.

Partners, manufacturers, construction companies interested in building with sustainable and natural materials for joint-venture, manufacturing and/or commercial agreement with technical assistance are sought.

Advantages and Innovations

The advantages of the system are:

-Is healthier than conventional buildings because of its natural materials allow transpiration of the walls, and slow temperature transmission based on inertia of the rammed earth walls. The earth regulates moisture inside the House, maintaining a constant 50% humidity, and then promoting a healthy indoor environment for people.

Moreover, earth walls have a high thermal inertia that tempers indoor climate, damping temperature in more than 8 degrees.

Furthermore, it's a timber structure, neutral and does not produce indoor electro-magnetic disturbance emissions.

-Is more sustainable than conventional buildings because their main materials rammed earth and timber-wood are two materials that strictly emulate the cycles of nature in a closed ecosystem. They are also recyclable and biodegradable, are non-polluting with a negligible energy charge and do not emit CO₂ in their production being disassembled and not polluting the environment.

- The timber structural construction requires no great machinery or large investment of energy. Being manufactured in a workshop and being a dry construction (which only requires bolting), assembly is fast. The building construction produces virtually no waste or scrap, or runtime errors.

Rammed earth building construction is a simple, manually executed without high technical skills. Not being structural it does not require excessive control, which facilitates its implementation.

-Is cheaper and easier build than conventional buildings because being a simple construction system that does not require heavy machinery reduces the execution time and the costs of labor and energy. Also it reduces material and transport costs by using the existing soil on site, not requiring insulation, and using a single structural system for the whole building structure. The construction costs are reduced by 40% over conventional construction, as the costs can be 700 € / m² of construction (in Spain).

Stage of Development

Field tested/evaluated

IPR Status

Patent(s) applied for but not yet granted

Comment Regarding IPR status

The patent has been recently accepted as a Utility Model at Spain and has for now with a temporary world protection of a year.

Utility Model code: U201300449

Spanish "Boletín Oficial de la Propiedad Industrial" (BOPI) 18/10/2013

Profile Origin

Private (in-house) research

Keywords

Technology

002006001 Building Materials, Components and Methods

Market

009007003 Manufacture of pre-fabricated buildings and systems

NACE

F.41.2.0 Construction of residential and non-residential buildings

Client

Type and Size of Organisation Behind the Profile

Industry SME <= 10

Year Established

0

Already Engaged in Trans-National Cooperation

No.

Langages Spoken

English
Spanish

Client Country

Spain

Partner Sought

Type and Role of Partner Sought

- Type of partner sought: Partners, manufacturers, construction companies
- Specific area of activity of the partner: construction, services or real state sector.

- Task to be performed: The company sought according to its own activity, will collaborate and work together to develop construction projects with the system, with technical assistance of the proposer

thanks to a commercial agreement.

Type and Size of Partner Sought

>500

Type of Partnership Considered

Manufacturing agreement

Commercial agreement with technical assistance

Joint venture agreement