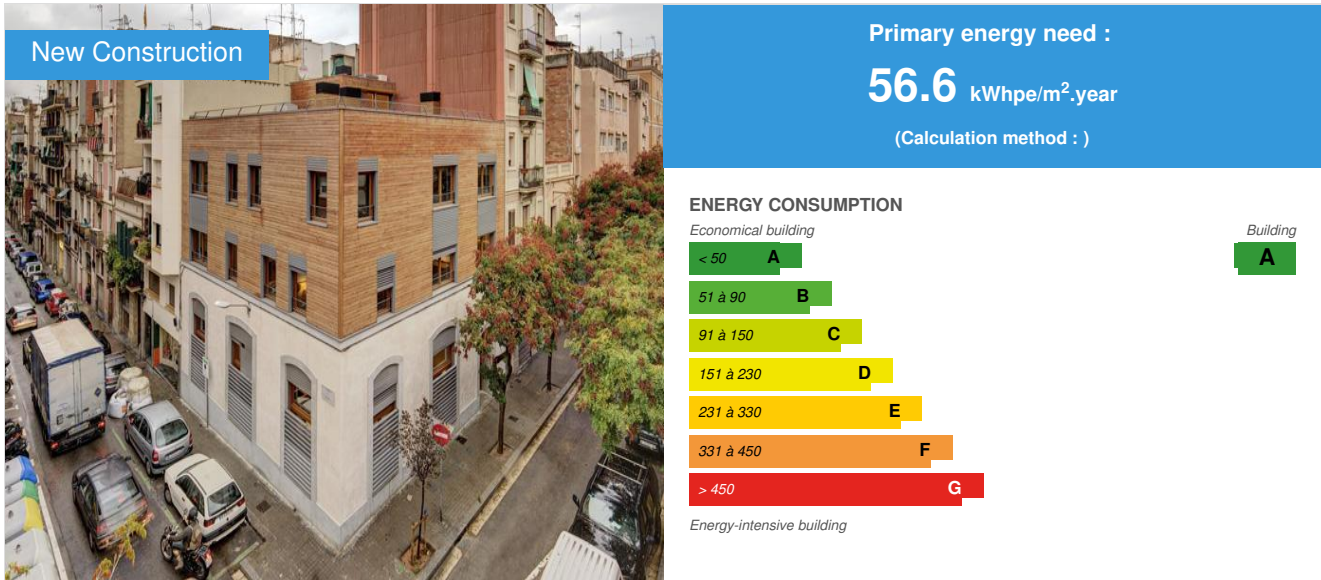


## Multifamily building with a light wooden framework system

by Olga Hernán / 2016-06-20 19:04:44 / Espagne / 12455 / ES



**Building Type** : Collective housing < 50m  
**Construction Year** : 2015  
**Delivery year** : 2015  
**Address 1 - street** : C/Magalhaes, 60 08004 BARCELONA, España  
**Climate zone** : [Csb] Coastal Mediterranean - Mild with cool, dry summer.

**Net Floor Area** : 450 m<sup>2</sup>  
**Construction/refurbishment cost** : 528 905 €  
**Number of Dwelling** : 6 Dwelling  
**Cost/m2** : 1175.34 €/m<sup>2</sup>

**Certifications :**



**Proposed by :**



### General information

Magalhaes building, located in the neighborhood of Poble Sec of Barcelona and designed by Betarq Group, SLP, has 450 m<sup>2</sup>. With 3 floors (ground, first and second with walkable terrace on the roof). It consists of a total of 6 apartments with surfaces ranging from 40 to 70 m, with one or two bedrooms. The building, cornerback, has two facades and two medians. It is made with light frame structure of wood (Surround System Arquima). It was decided to maintain the facades of the ground floor, solid brick from 1890, being the rest of the building newly built. Larch wood natural, without sapwood, has been the material of choice for lining the facade, while the exterior carpentry is wood Iroko. The building is built on sustainability criteria and is certified by the Green Building Council Spain with a very high rating (4 leaves). The main innovation refers to the modular construction system of prefabricated wood, where most of the materials used are local with a low environmental impact. This construction system limits the amount of loose material and accelerates the construction phase. Furthermore, when the life of the building ends, it will allow quickly dismantled and reuse its parts. On the other hand, the thermal insulation system is so efficient that most of the year it is not necessary to use mechanical air conditioning systems.

## See more details about this project

<http://www.betarq.com>

## Data reliability

3rd part certified

## Stakeholders

### Stakeholders

Function : Developer

VALUIZ INVEST

<http://www.valuizinvest.com/>

Function : Construction company

Atres80

<http://www.atres80.com>

Function : Certification company

Chiara Monterotti, consultora del GBCE

## Contracting method

Separate batches

## Owner approach of sustainability

Valuiz Invest is a company that aims at the construction and / or rehabilitation of buildings to start an economic activity within the world of emotions, tourism and leisure, using them as a generators vehicle to sensations: pensions, tourist apartments or other options, but always with ecological, social and economic responsibility. Valuiz Invest is a society and as such its objective is to generate a profit and we have to be profitable, but profitability today is no longer our sole concern. We have other priorities like the rational use of natural resources, particularly water and energy and that means consuming less during use and cause less environmental impact during construction or rehabilitation and even deconstruction. We are convinced that thanks to sustainability we can reduce costs and increase revenue. It is true that the process requires reorganizing management models, technologies and processes, but here is where we have the future.

## Architectural description

Homes are intended to be a perfect suit for its occupants. They should be able to live comfortably, in a way that makes them feel good without knowing why. The homes try to teach their occupants, make them reflect them on the value of things, things made with interest and respect, on the value of simplicity to accompany our projects and actions. Homes should enable its inhabitant to have the feeling of being in place, not wanting to be somewhere else, of being at ease with themselves. We turn now to the analysis of the building on its core construction elements. First, to say that for the realization of the structure, floors, facades and interior partitions has opted for light frame structure of wood, specifically with SEA (Arquima Surround System) system. For the foundation of the building has been justified and maintained the existing two and the two dividing walls and made corresponding to the intermediate wall and around the elevator by micropiling. If we go into the homes we have sought maximum comfort. Distributions without hallways, ceilings and bare wood floors, low windows, preferences for whites and luminous spaces, have sought to harmonize the occupant and into equilibrium with the materials and natural light. The night lighting is designed to offer a relaxing and warm atmosphere.

## Energy

### Energy consumption

Primary energy need : 56,60 kWhpe/m<sup>2</sup>.year

Primary energy need for standard building : 89,50 kWhpe/m<sup>2</sup>.year

Calculation method :

CEEB : 0.0001

Breakdown for energy consumption :

Heating, Cooling 30.6: ACS 4.6: 5.3 Lighting: 16.1

## Envelope performance

Envelope U-Value : 0,22 W.m<sup>-2</sup>.K<sup>-1</sup>

More information :

U cover: 0.32 U floor: 1.16 U glass: 2.20

## Renewables & systems

### Systems

Heating system :

- Heat pump
- Aerotherm Heater

Hot water system :

- Other hot water system

Cooling system :

- Reversible heat pump

Ventilation system :

- Natural ventilation

Renewable systems :

- Heat pump

Other information on HVAC :

A water heater for use by HYDRO KIT ACS high temperature was considered. This HYDRO KIT heat accumulator at 80 ° C. The DHW will catch water as water consumption is on the network. This HYDRO KIT frigorificaly connected to corresponding circuits of variable refrigerant volume heat recovery so that share outdoor unit production units for other uses (indoor units ducts for cooling or heat) pump aerothermal heat covers 100% of the demand for hot water and heating throughout the year. This is achieved since the heat pump is capable of producing ACS from -20 to 35 ° C operating at a temperature of 65C drive. The climate of the city of Barcelona guarantees the operation of the heat pump. The kg of CO2 emitted by the heat pump are lower than kg of CO2 emitted by a gas boiler which could support a solar panels. So installation is dismissed.

## Environment

### GHG emissions

GHG in use : 13,10 KgCO<sub>2</sub>/m<sup>2</sup>/year

Methodology used :

simulation Calener

Building lifetime : 50,00 year(s)

CO2 emissions: 7.6 kgCO<sub>2</sub> heating / m<sup>2</sup>, refrigeration 1.1kgCO<sub>2</sub> / m<sup>2</sup>, ACS 1.3kgCO<sub>2</sub> / m<sup>2</sup>, lighting 3.1kgCO<sub>2</sub> / m<sup>2</sup>

### Life Cycle Analysis

Eco-design material : Structure, partitions, facade, floors, ceilings and other wood finishes

### Water management

118.71l / person day

### Indoor Air quality

The percentage of homes where natural ventilation effective in 95% occupancy times guarantee is 67%

## Products

### Product

SEA system

ARQUIMA

ARQUIMA

<http://www.arquima.net/sp/>

Product category :

Prefabricated facades workshop are 285 mm thick, made from a sandwich panel half-wooden stiles 147x36mm, with OSB OSB 10 mm thick on each side. Outwardly, complete with a breathable waterproof sheet type "Tyvek"; a ventilated air battens 25mm thick and an outer coating pine board Douglas treated without sapwood, 45 mm thick horizontal grooving. It was inside, complete with an air chamber 32 mm thick battens for installations and plate pulp from recycled paper and "Fermacell"; type of 13 mm thick plaster.



The property accepted the novel proposed solution successfully and the result has been very good for the developer of the building. The prefabricated façade was installed by the company that manufactures and the building was "mounted"; in just 9 days. Users are very satisfied with the solution by its finish and comfort in every way.

## Costs

### Construction and exploitation costs

Total cost of the building : 528 905 €

## Urban environment

The building, cornerback, has two facades and two medians and, although it is not a listed building (no architectural interest by the administration), it was decided to maintain the facades of the ground floor, solid brick 60 cm thick, dating from 1890. From the beginning we were interested to maintain, despite not being cataloged, the original ground floor facades, as mentioned above, are from the late nineteenth century. The reasons which led us to this were: On the one hand, it seemed respectful and affectionate with the neighborhood to keep some of its memory deposited in this building, which remains beyond the constant changes. Well, from our consideration, the value of the memory of people is independent of the value of things established by the institutions. On the other hand, from the standpoint of durability and maintenance of the materials, it seemed consistent to keep this strip of ground floor, in order to protect the fragile wood from the pedestrian area. Another reason, in this direction, refers to the compositional fact and also to play and dialogue between the materials. In the area there are public transportation, several bus lines and subway two blocks from the building. There are shops in most of the ground floors of the surrounding buildings. A few streets have an important cultural complex, which contains the Theatre Institute, the flower market, the theater Lliure Montjuic and the Museum of Archaeology of Catalonia.

## Land plot area

Land plot area : 140,00 m<sup>2</sup>

## Built-up area

Built-up area : 100,00 %

## Parking spaces

No parking in the building.

## Building Environmental Quality

### Building Environmental Quality

- indoor air quality and health
- works (including waste management)
- comfort (visual, olfactive, thermal)
- building end of life management
- building process
- products and materials

## Contest

## Building candidate in the category



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