# La Mola - St Andreu

by Jose Antonio González Casado / 🔿 2021-03-31 09:00:23 / España / 💿 5826 / 🍽 ES



 Building Type : Terraced Individual housing

 Construction Year : 2020

 Delivery year : 2020

 Address 1 - street : 1, Calle Montardó 08740 SANT ANDREU DE LA BARCA, España

 Climate zone : [Csb] Coastal Mediterranean - Mild with cool, dry summer.

#### Net Floor Area : 312 m<sup>2</sup> Other Construction/refurbishment cost : 452 400 € Cost/m2 : 1450 €/m<sup>2</sup>

Certifications :



## General information

The plot on which we are working is located in the municipality of Sant Andreu de la Barca (Barcelona). It is an urbanized area with plots for single-family use. The plot has 405.50 m2 with a roughly trapezoidal corner shape. It has two fronts to public roads and the other two to neighboring plots. The orientations of its different fronts are NE, SE, SW and NW.

This project, from its initial conception phase, has sought to be a benchmark and a model to follow from the point of view of energy efficiency as well as sustainability. For this reason, we have worked holistically throughout the process to obtain the maximum corresponding guarantee certificates in each of the areas.

First of all, as is customary in the ARQUIMA building system, the building has been certified with the Passivhaus certification. This time with the PREMIUM category, the most demanding in its field. At the same time, it has worked with the GREEN certification, from the Green Building Council Spain (GBCe). This certification measures the level of sustainability of a project through a scoring system that results in a number of sheets, with a maximum of 5.

## See more details about this project

C https://www.arquima.net/portfolio\_page/casa-sant-andreu-3/

## Data reliability

3rd part certified

## Photo credit

Stefano Carlo Ascione

## Stakeholders

#### Contractor

Name : ARQUIMA Contact : info[a]arquima.net

## **Construction Manager**

Name : ARQUIMA Contact : info[a]arquima.net

# Stakeholders

Function : Designer Eduard Balcells

info[a]arquima.net

Function : Site manager Jordi Collado

Function : Others

info[a]arquima.net

Marian Rigo

info[a]arquima.net

CADWORK elaboration and responsible for motaje

Function: Others Stefano Carlo Ascione

info[a]arquima.net

Photographer

# Contracting method

Lump-sum turnkey

# Owner approach of sustainability

At ARQUIMA we follow a holistic work methodology where all project participants work together from the first design phase. This collaborative approach ensures that all agents contribute to the development of the best project for each case, and in this case, where there are objectives set from the early stages, this integration of specialists and agents is even more necessary.

Our industrialized system is based on construction with wood, the most sustainable construction material on the market. We manufacture buildings, facades or complete envelopes in our facilities in Barcelona, without limits for the designer, achieving exclusive and avant-garde projects that are based on a structural system of load-bearing walls and slabs, making it possible to save large spans, important overhangs and raise buildings in height.

We offer an alternative that is respectful with the environment, with people's health and energy efficient to reduce excess CO2 emissions on the planet. We use materials with the minimum carbon footprint such as wood from sustainably managed forests and certified with PEFC or FSC stamps.

Our buildings comply with the European energy efficiency standards nZEB (nearly Zero Energy Buildings - European directive 2010/31 / EU) and can obtain sustainable architecture certificates with the international entities Leed, Breeam, Passivhaus Institut, Minergie or Verde-GBCe, among other

# Architectural description

The functional program is defined from the first proposals being identical in both houses, although the distributions may be different.

On the ground floor, the day area will be located in relation to the exterior space of the plot, along with 1 bathroom and a room. On the upper floor is the night area with a main room en suite and two secondary rooms with another bathroom, as well as a laundry room. The front of Montardo Street, facing NE, is where the entrances to both the plot and the interior of the houses as well as services are located, leaving the SE and SW orientations for the living room-dining room-kitchen.

The construction system of the façade is made up of an SATE system on the prefabricated walls of the ARQUIMA system. The versatility that the standard wall provides us to apply different facade systems, allows us to propose changes in the surface of the facades. In this case, work began with the possibility of implanting ventilated façade panels with a wood finish. These panels are strategically associated with the gaps in the façade to generate blocks that will gradually dislodge from each other, generating a sensation of movement opposed to the static of such a delimited volume.

#### Energy

## **Energy consumption**

Primary energy need : 5,00 kWhpe/m<sup>2</sup>.year Primary energy need for standard building : 50,00 kWhpe/m<sup>2</sup>.year Calculation method : RD: 47/2007 CEEB : 0.0001

# Envelope performance

#### Envelope U-Value: 0,23 W.m<sup>-2</sup>.K<sup>-1</sup>

#### More information :

The envelope is projected with the ARQUIMA system, which fulfills a structural and enclosure function at the same time. The exterior walls are configured as loadbearing walls like some interiors of the house. These are made up of uprights, sleepers and spruce wood pillars, of KVH quality, 140x60 mm section, 9 mm OSB board on both sides, 140 mm of wood fiber thermal insulation inside the frame, and battens 38x58 mm for interior chamber of installation passage.

In the case of internal load-bearing walls, the section of the uprights is 100x50 mm, and therefore the thermal and acoustic insulation in them is 100 mm. The wooden girders and specific pillars will be made of GL24h laminated spruce wood.

On the outside they are covered with a thermal insulation system on the outside SATE with a white lime plaster finish and combined with a ventilated façade system with a gray wood finish that is associated with the façade openings.

The carpentry is made of pine wood with the exterior face in lacquered aluminum with triple glazing and interior chambers of argon and low-emission glass. On the south-east, south-west and northwest facades there are solar protections to improve the thermal quality of the house.

Building Compactness Coefficient : 2,00 Indicator : n50 Air Tightness Value : 0,49

## Renewables & systems

## **Systems**

#### Heating system :

- Heat pump
- Radiant ceiling

#### Hot water system :

Heat pump

## Cooling system :

- Fan coil
- Floor cooling

## Ventilation system :

- Free-cooling
- humidity sensitive Air Handling Unit (hygro A
- Double flow heat exchanger

#### Renewable systems :

- Solar photovoltaic
- Heat pump

#### Renewable energy production : 100,00 %

#### Other information on HVAC :

The air conditioning of the houses is carried out by means of a radiant floor that will provide heat and cold through the hot or cold water generated by the aerothermal equipment.

Underfloor cooling is only feasible when the demand for cooling is very low. Complying with the Passivhaus certification we make sure that with this system we can cover the demand for cold in the homes.

On the other hand, the temperature of the radiant floor should be controlled very well in cold mode to avoid possible superficial condensation. The home automation equipment will control that temperature based on the indoor ambient temperature and relative humidity to avoid reaching dew point temperature.

The objective of the project was to achieve the Passivhaus Premium certification. This meant that the building had to generate a high amount of renewable energy. To achieve this, 32 solar panels of 440 Wp have been installed. In other words, it is expected that the installation of both houses together can generate a peak power of 14.08 kWp at the time of highest production.

Thanks to the fact that the building is located in a residential area with low-rise buildings, there is no element in the environment that can generate shadows on the plates and thus reduce energy production

# **Smart Building**

#### BMS :

#### Interior lighting control

All light lines in the dining room and kitchen can be controlled from Smartphone, Tablet or Web Browser. At the same time, it is allowed to create scenes that control a different number of points of light. Motion detectors are also installed to control the lights in the staircase and hallway on the first floor.

#### Exterior lighting control

It can be programmed to turn on and off depending on whether it is day or night, in addition to controlling the ignition from Smartphone, Tablet or Web Browser.

#### Shading control

Motorized blinds are programmed to orient themselves based on the position of the sun. In case of manual opening, the system will be automated again the next day. Manual opening can be controlled from the buttons or from Smartphone, Tablet or Web Browser.

#### Ventilation and air conditioning control

By means of a sensor in each plant, the system is programmed to maintain the relative humidity at maximum 60% and the CO2 at 1000 ppm. The ventilation system will increase the flow rate to ensure these values are not exceeded and, in the event of high relative humidity, the supplementary dehumidifier will activate. The air conditioning is carried out through the underfloor heating for both cold and heat. Being a system that takes time to reach working temperature due to its thermal inertia, it will always be on and will regulate demand. Thanks to the relative humidity control of the ventilation system, the flow temperature of the radiant floor water can be adjusted in cooling mode to ensure that no surface condensation is generated.

#### DHW recirculation control

A schedule is established, which the user can adjust to their needs, so that the DHW pump is in operation and thus have hot water instantly at the different consumption points.

### Urban environment

The plot is located to the west of the municipality of Sant Andreu de la Barca belonging to the province of Barcelona in an area of residential development of isolated single-family homes. Sant Andreu de la Barca is located in the Baix Llobregat region and is part of the Barcelona metropolitan area.

#### Land plot area

Land plot area : 405,50 m<sup>2</sup>

## Built-up area

Built-up area: 40,00 %

## **Building Environnemental Quality**

## **Building Environmental Quality**

- indoor air quality and health
- works (including waste management)
- acoustics
- comfort (visual, olfactive, thermal)
- waste management (related to activity)
- energy efficiency
- renewable energies
- building end of life management
- building process
- · products and materials

### Contest

# Reasons for participating in the competition(s)

Este proyecto, cuyo montaje se realizó en dos días, es el único del continente europeo que ostenta la máxima certificación sostenible por partida doble: Passivhaus Premium y 5 hojas Verde del Green Building Council. Esto se traduce en un ahorro energético de más del 90% respecto a viviendas construidas según el Código Técnico de Edificación (CTE) de 2006, y en torno al 50% con la actualización del CTE 2019.

# Building candidate in the category WERED BY Construction21.org Energy & Temperate Climates \_ow Carbon Health & Comfort Sesrovires Mediterrània + \_ Martorell Castellbisbal Sant Cugat del Vallès Sant Llorenç d'Hortons CAN BARGALLÓ nt Andreu Puig Madrona de la Barca Rosanes Gelida El Papiol Sant Sadurní Pallejà d'Anoia Leaflet | Map data © Oper Corbera de Mapbox

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