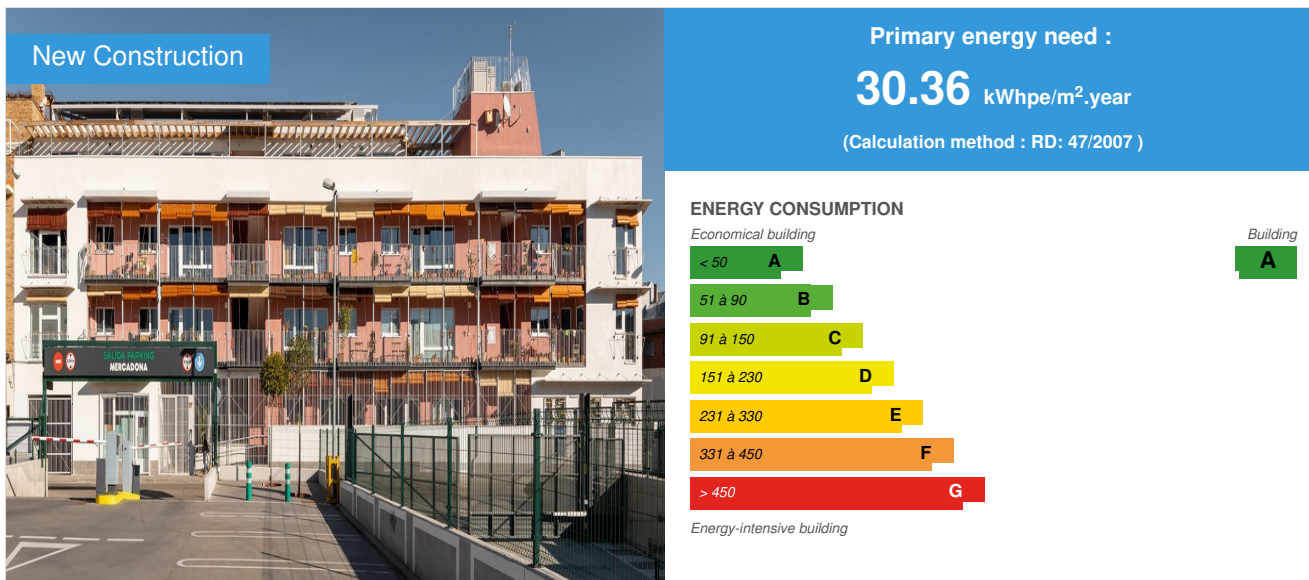


Entrepatrios Las Carolinas: ecological cohousing in rights of use

by [Fernando Campos Alguacil](#) / 2021-04-06 12:37:22 / España / 8110 / ES



Building Type : Collective housing < 50m
Construction Year : 2019
Delivery year : 2020
Address 1 - street : c/ González Feito 19 28041 MADRID, España
Climate zone : [Csa] Interior Mediterranean - Mild with dry, hot summer.

Net Floor Area : 1 404 m² Useful area (es)
Construction/refurbishment cost : 2 134 905 €
Cost/m2 : 1520.59 €/m²

General information

This building was awarded the Energy & Temperate Climates Prize of the Green Solutions Awards 2020-21 at the national level; and a mention for the same category at the international level.

Entrepatrios is the first housing cooperative under the right of use modality in Madrid capital, whose statutes have been approved by the Community of Madrid. Formed by a group of people with a common goal: to live under a coexistence model more consistent with their values and personal, social and environmental concerns. For this, the closest community model is recovered and intertwined with the latest advances in ecological architecture and is developed from the principles of the social economy.

Entrepatrios Las Carolinas is the first promotion developed by the architecture studio **sAtt**. The project is conceived as a **Triple Balance building: environmentally, socially and economically sustainable**. It is a building located in the Madrid neighborhood of Usera, made up of 17 homes and common spaces.

The building was born with the vocation of being a pioneer, and of generating tools that serve individuals and technicians to replicate a model of promotion in right of use in terms of excellence in terms of sustainability.

[See more details about this project](#)

https://satt.es/portfolio_page/cohousing-entrepatrios/

Data reliability

Self-declared

Photo credit

Andrés Valentin-Gamazo

Stakeholders

Contractor

Name : Entrepatrios. Promoción Las Carolinas

Contact : <https://www.entrepatrios.org/contacta/>

<https://www.entrepatrios.org/>

Construction Manager

Name : GEOH

Contact : [info\[a\]geoh.es](mailto:info[a]geoh.es)

<https://geoh.es/>

Stakeholders

Function : Designer

sAtt Arquitectura Triple Balance

[info\[a\]satt.es](mailto:info[a]satt.es)

<https://satt.es/>

Function :

enmadera

[mn\[a\]enmadera.info](mailto:mn[a]enmadera.info)

<http://enmadera.info/>

Function : Construction company

danielpascual.com

<https://www.danielpascual.com/contacto/>

<https://www.danielpascual.com>

Function : Environmental consultancy

Técnica ECO

<http://tecnicaeo.es/contactanos>

<http://tecnicaeo.es/>

Function : Developer

Entrepatrios. Promoción Las Carolinas

<https://www.entrepatrios.org/contacta/>

<https://www.entrepatrios.org/>

Contracting method

General Contractor

Owner approach of sustainability

Entrepatrios is a cooperative formed by a group of people with a common goal, to live under a more coherent model with demanding **environmental, economic and social values**. Its spirit is to establish itself as a network of housing cooperatives in use rights in Madrid, Las Carolinas being the first of the developments.

Entrepatrios originally defined **5 objectives** that the building had to meet: develop according to the **right to housing** model; generate a space for **coexistence in community** with a perspective of **social action**; generate an economically viable use model whose **monthly cost** does not exceed **10 euros / m²** for each housing unit; that it is financed with **ethical banking**; that is designed and built with **ecological criteria**.

Within the group promoting this initiative there are experts in energy transition, renewables, water management, waste management and social economy. Much of the research in the building design process has been related to the definition and concretion together, the technical team and the promoter group, of **what a sustainable building means in an urban context**.

Architectural description

The Entrepatrios Las Carolinas building is located on a longitudinal plot whose main façade faces south, with great possibilities from a bioclimatic point of view. Thus, the building occupies the plot with a large **main facade to the south** and an **interior patio to the north**.

It has **5 floors**: basement, ground floor, two standard floors, and an attic. In the basement there is a car park for 17 places with two charging points for electric cars, the facilities and the **common laundry**. **The 17 homes and 2 common premises** are organized between the ground floor, the two standard floors, and the attic floor, one on the ground floor with the possibility of opening to the neighborhood and the other on the attic floor related to the large **common terrace**.

Regarding the **bioclimatic** use, the plants are organized by orienting the corralas and access galleries to the south and a patio is arranged to the north. [*Corralas are outdoor corridors whereby the main access to interior apartments is gained, in Spanish urban living*]. These corralas to the south allow the maximization of **solar capture** in winter while offering **solar protection** in summer (in addition to the Allicantine blinds). And through the presence of the patio, all homes can be provided with double orientation and **cross ventilation** (to take advantage of passive cooling through night ventilation in summer). Living rooms and kitchens face south, to the corralas and bedrooms to the north, to the patio. The corralas and the communication cores (stairs and elevator) are outside the thermal envelope.

The corralas, together with the common premises and the terrace, represent community spaces that promote the **generation of community**.

Materials with low impact on the environment and people's health are used. Outdoors, the vertical walls are plastered with lime (SATE system finish), the floors are made of washed concrete (ground floor arcades and corralas) or printed (parking) and the ceilings are made of laminated plaster and recycled formwork boards. Indoors, the floors are made of polished concrete, the walls are made of laminated plaster finished with tempera paint, and the ceilings are intended to show the **FSC-certified CLT** of the cross-laminated wooden structure as much as possible.

Building users opinion

Everything is luxurious!

The people of the cooperative are delighted with the climate, the insulation, the acoustics ... with everything!

Energy

Energy consumption

Primary energy need : 30,36 kWhpe/m².year

Primary energy need for standard building : 93,20 kWhpe/m².year

Calculation method : RD: 47/2007

Final Energy : 11,92 kWhfe/m².year

Envelope performance

More information :

OPAQUE HOUSING:

U (cover) = 0.209 W / m²K

U (facade) = 0.214 W / m²K

U (soils) = 0.263 W / m²K

CARPENTRY:

glass solar factor = 0.5

U (glass) = 0.6 W / m²K

U (frame) = 1.3 W / m²K

Indicator : n50

Air Tightness Value : 0,54

Renewables & systems

Systems

Heating system :

- Heat pump
- Tape

Hot water system :

- Heat pump

Cooling system :

- Reversible heat pump
- Tape

Ventilation system :

- Natural ventilation
- Double flow

Renewable systems :

- Solar photovoltaic

Other information on HVAC :

- Air conditioning (heating and cooling): individual system per home or premises. Generation by air-air heat pump and indoor unit with emission through ducts to each room.- DHW: centralized system: air-water heat pump plus accumulation.

The photovoltaic solar energy installation has 90 panels and 33.3 kWp installed. The building has an electricity contract with a 100% renewable marketer.

Solutions enhancing nature free gains :

Double flow mechanical ventilation with high efficiency heat recovery unit.

Smart Building

BMS :

One of the houses, as a prototype, is monitored with a Wibeee device for consumption monitoring and two inBiot sensors (in the living room and bedroom) to measure air quality. The photovoltaic installation is monitored in real time in generation and Building energy consumption with Sunny Portal software from SMA Solar Technology

Environment

GHG emissions

GHG in use : 59,50 KgCO₂/m²/year

GHG before use : 332,00 KgCO₂/m²

Building lifetime : 50,00 year(s)

, ie xx in use years : 5.58

GHG Cradle to Grave : 392,00 KgCO₂/m²

Life Cycle Analysis

Water management

The building has a 5,000-liter rain and gray water storage and reuse tank, for later use in irrigation (and pre-installation for toilets when permitted by regulations). Annual savings of 750,000 liters / year are expected.

Indoor Air quality

Interior materials with **low toxic emissions** (VOCs, formaldehyde ...): CLT, recycled cotton insulation.

Double flow mechanical ventilation with heat recovery unit.

InBiot indoor air quality monitoring sensor in one of the homes as a prototype.

Comfort

Health & comfort :

Bioconstruction strategies are used based on the use of **healthy and low toxicity materials such** as recycled cotton interior insulation, tempera paints, EPDM waterproofing, PVC-free polypropylene-free drainage network.

It implements dual-flow ventilation with a constant air renewal rate and a filter system that ensures good **indoor air quality** , both from external pollutants and from CO2 from breathing.

Being a building free of thermal bridges and with a thermal envelope and high performance carpentry both thermal and hermetic, a high degree of **thermal comfort** (absence of thermal asymmetries) and **acoustic has been achieved**.

A **water management** system is implemented based on the recycling and reuse of rainwater and gray water for irrigation and toilets.

A **geoenvironmental health** study has been carried out on the plot and nearby surroundings to avoid conflictive points in areas of prolonged stay or rest.

Costs

Construction and exploitation costs

Global cost : 3 822 820,00 €

Reference global cost : 2 510 280,00 €

Renewable energy systems cost : 75 688,00 €

Global cost/Dwelling : 224871.76

Reference global cost/Dwelling : 2510280

Total cost of the building : 2 354 927 €

Subsidies : 78 789 €

Energy bill

Forecasted energy bill/year : 4 320,00 €

Real energy cost/m2 : 3.08

Real energy cost/Dwelling : 254.12

Urban environment

The insertion of the building in its surroundings is based on the realization **of the approximation map** , the first of the phases of **HOUSING ECOMETRO** , certification that the building will have. In the approximation map, after data collection and analysis, possible impacts, local materials, climatic conditions, etc. are detected, that is, the different determining factors for the design based on the territory and the participation of the users.

The **conclusions** obtained from the realization of the approximation map for the environment are these:

- The nearby environment (Orcasur neighborhood of the Usera district of Madrid) has green areas distributed. There are several different activities in the neighborhood: residential, industrial, health (hospital Doce de Octubre), educational (public, subsidized and private centers), commercial (medium surface), religious, sports, social public services (center for the elderly, library and administration) and private social (foundations).
- There are no indications of soil contamination or significant potential risk of flooding.
- The plot does not present solar obstruction (this favors solar capture in winter and therefore passive heating). However, there is the heat island effect (it affects comfort in summer), typical of urban environments.
- Regarding air quality, the limits established for NO2 and O3 are exceeded. Other air quality indicators (SO2, CO, PM10, PM2.5) remain below the allowable limits.
- The plot presents ambient air noise indices, both day and night, higher than the desirable limits in terms of acoustic quality of existing urbanized areas.
- There are no geopathogenic areas or electromagnetic pollution. Very good geophysical quality.
- Absence of environmental radioactivity. Absence of radon gas.
- There is a close connection with the urban public transport network: metro, buses and suburban train.
- It is possible to supply electrical energy to the grid.
- There is a supply of drinking water.
- There is a nearby supply of local waste management networks in use: paper and glass containers, mobile clean points, fixed clean point.
- There is a nearby supply of local RCD networks for the management of construction and demolition waste.

Parking spaces

17 car parking spaces in the basement, with 2 charging points for electric cars

Building Environmental Quality

- Building flexibility
- indoor air quality and health
- consultation - cooperation
- comfort (visual, olfactive, thermal)
- water management
- energy efficiency
- renewable energies
- integration in the land
- building process
- products and materials

Contest

Reasons for participating in the competition(s)

Entrepatrios Las Carolinas es su primera promoción, que ha desarrollado el estudio de arquitectura **sAtt**. El proyecto se concibe como un edificio **Triple Balance: sostenible medioambiental, social y económicamente**. Es un edificio ubicado en el madrileño barrio de Usera, formado por 17 viviendas y espacios comunes.

El edificio nace con vocación de ser pionero, y de generar herramientas que sirvan a particulares y técnicos para replicar un modelo de promoción en derecho de uso en términos de excelencia en lo relativo a la sostenibilidad.

Building candidate in the category



Energy & Temperate Climates



Low Carbon



Health & Comfort

