


Detached house in Roses

by Francisco Javier Alvaro Méndez / 2013-07-25 10:02:30 / Espagne / 10600 / ES



New Construction

Primary energy need :

33 kWhpe/m².year

(Calculation method :)

ENERGY CONSUMPTION

Economical building

< 50	A
51 à 90	B
91 à 150	C
151 à 230	D
231 à 330	E
331 à 450	F
> 450	G

Energy-intensive building

Building

A

Building Type : Terraced Individual housing
Construction Year : 2012
Delivery year : 2012
Address 1 - street : Pedrera, 10 17480 ROSES, España
Climate zone : [BSh] Subtropical Dry Semiarid (Steppe)

Net Floor Area : 177 m² SHON
Construction/refurbishment cost : 288 964 €
Number of Dwelling : 1 Dwelling
Cost/m2 : 1632.56 €/m²

General information

From the access, a basalt stone path goes through the house and takes us to the garden, with the double intention of resolving the change in elevation and functionally organizing the interior spaces as it separates the garage from the living areas and allows the night spaces to be independent from the rest of the house.

During the implementation and design of the building, measures were taken to minimize energy consumption, reduce CO2 production and constructive solutions were implemented considering the life cycle of materials used. The construction takes full advantage of the total width of the land to allow all rooms to face south, overlooking the garden with large openings protected by overhangs and sliding wooden shutters that prevent overheating in the summer. To the north, closed and solid volumes are materialized in texturized concrete and stucco to safeguard from Tramontana winds.

To the north, you have a protected and cool patio to promote cross-ventilation allowing to dispense with cooling systems in summer. The outer shell has been designed following environmentally friendly criteria. The façade has a continuous external insulation eliminating thermal bridges and increasing inertia of enclosures. The roof is landscaped to increase insulation and reduce overheating in summer recovering the size of the space of the ground used by the building. Solar factor of openings is improved with sliding solar protection.

Renewal of inside air is resolved with mechanical ventilation incorporating a heat recovery system that uses 50 % of the energy required to condition outside air.

Energy demand is compensated with high performance HVAC equipment. Vacuum collectors for running water and heating (radiant floor) have been installed. A 90% contribution for water and 25% for heating is reached. An A rating is achieved.

Data reliability

Self-declared

Stakeholders

Stakeholders

Function : Designer

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Owner approach of sustainability

The promoter was fully involved in all improvement measures proposed in the design phase, showing a strong environmental commitment and savings in energy consumption.

Architectural description

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Energy

Energy consumption

Primary energy need : 33,00 kWhpe/m².year

Primary energy need for standard building : 115,00 kWhpe/m².year

Calculation method :

Final Energy : 26,00 kWhfe/m².year

Breakdown for energy consumption :

Heating demand = 30.1 kWh/m²

Envelope performance

Envelope U-Value : 0,45 W.m⁻².K⁻¹

More information :

Façade with exterior insulation, U=0.45 W/m2.K

Rooftop garden, U=0.36 W/m2.K

Metallic windows with therma breaking and insulated glass, U=2,92 W/m2K

Building Compactness Coefficient : 0,88

Renewables & systems

Systems

Heating system :

- Condensing gas boiler
- Solar thermal

Hot water system :

- Condensing gas boiler
- Solar Thermal

Cooling system :

- No cooling system

Ventilation system :

- Natural ventilation
- Nocturnal ventilation
- Double flow heat exchanger

Renewable systems :

- Solar Thermal

Renewable energy production : 77,30 %

Environment

GHG emissions

GHG in use : 8,60 KgCO₂/m²/year

Building lifetime : 75,00 year(s)

Water management

The building has a discrimination system for sewage and rainwater that takes advantage of rainwater for the irrigation of green spaces. It is stored in a 3000-liter tank, sized for irrigation service:

The capturing surface of the roofs is 150m².

Yearly rainfall regime of the municipality is 485mm/year.

150m² x 485mm year = 72750 L /year.

Irrigation: 500 x 187m² L/m² year = 93500 L / year. Covers 78% of annual irrigation needs.

5 l / day. m² (summer) x 187 m² x 0.5 = 467.5 L / day. With a deposit of 6.5 days irrigation 3000L covered

Indoor Air quality

The use of night ventilation is foreseen to minimize the demands of cooling taking advantage of the building closures inertia. The use of natural ventilation inside the house is foreseen for when external conditions are better than indoors. Thanks to the courtyard located on the northern façade the circulation of indoor air will occur naturally.

Products

Product

Coteterm

PAREXGROUP

PAREX MORTEROS SAU. 93 701 72 00

<http://www.parex.es/>

Product category :

EIFS consists of a number of layers that are installed in the following order: A layer of foam insulation (EPS) attached with adhesive. A reinforced layer that applied onto the face of the insulation, consisting of a fiberglass reinforcing mesh embedded in a cementitious adhesive. A final topcoat, or finish, which is a colored, textured paint-like material. This layer is called the finish. It is acquired by floating



We have been able to solve the thermal bridges issue of the façade and placed the ceramic sheet on the inside, providing high thermal capacity to the enclosure with a system of exterior insulation and finish (EIFS). This allowed us to cushion the harsh environmental conditions, reduce transmission losses in winter across the façade and take advantage of night cooling systems, eliminating cooling equipment.

Urban environment

It is located in the urban center of the town of Roses, in a low-density residential area. The plot is irregular and has a considerable slope. Access is from the side of the seashore, therefore the building is located on the upper side of the plot north facing and the unbuilt space at the bottom is south facing. This plot lets you place the building semi-buried and with all the rooms facing south.

Land plot area

Land plot area : 458,00 m²

Built-up area

Built-up area : 281,00 %

Green space

Green space : 308,00

Parking spaces

1 private parking located inside the building

Contest

