SYSTEM IMPROVEMENT FOR BUILDING EXPANSION: THE CASE OF ENRIC GRANADOS 69, BARCELONA

by carlos delgado garcia / 2016-06-21 10:24:14 / España / @ 15626 / ES

Extension + refurbishment

Primary energy need:
16.2 kWhpe/m².year
(Calculation method: RD: 47/2007)

ENERGY CONSUMPTION
Economical building

Building Type: Collective housing < 50m
Construction Year: 2015
Delivery year: 2016
Address 1 - street: 08008 BARCELONA, España
Climate zone: [Ceb] Coastal Mediterranean - Mild with cool, dry summer.

Net Floor Area: 161 m² NGF (de)
Construction/refurbishment cost: 279 205 €
Number of Dwelling: 2 Dwelling
Cost/m²: 1734.19 €/m²

Proposed by:

General information

A new architectural system, management and financing, has been developed by La Casa por el Tejado, for the improvement of existing buildings and their completion. It is based on the use of vacant buildability that some buildings have. Enric Granados 69, one of several projects, involves the rehabilitation of a centuries-old estate (ground floor and three upper) and a freeboard with industrialized construction (floors 4 and attic). Enlargement, made with materials that store CO2 and qualified A in energy certification, provides economic resources to improve the existing building.

See more details about this project
Data reliability

3rd part certified

Stakeholders

Function: Developer
La Casa por el Tejado
info@lacasaporeltejado.eu
http://www.lacasaporeltejado.eu

Function: Designer
MIBA Architects
miba@mibaarq.com
http://www.mibaarq.com/about/

Function: Facility manager
AT-3 Oller Peña
AT3@AT3SCP.com
http://www.at3.cat

Function: Environmental consultancy
Societat Orgànica
so@societatorganica.com
http://www.societatorganica.com

Function: Construction company
Atres80
info@atres80.com
http://www.atres80.cat

Function: Manufacturer
Novadomus hábitat
info@novadomushabitat.com
http://novadomushabitat.com

Function: Construction Manager
Vegas del Valles
Builder

Contracting method

Separate batches

Owner approach of sustainability
La Casa Por el Tejado has created its own quality tool called Senda. Senda is a help system and evaluation of environmental quality of the projects of La Casa Por el Tejado, ie for attics that the company is developing in Barcelona, Madrid, Pamplona, Bilbao and other medium and large cities in Spain. Created by Societat Orgànica, Senda follows the philosophy of a life-cycle assessment simplified vision which allows to consider buildings under the same system of analysis and decision-making, from the extraction of raw materials and its manufacture, to the limit of its durability, deconstruction, reuse or recycling of resources invested. Besides taking into account the entire life cycle, the system assists and performs an assessment of various environmental impacts like: changes in biodiversity, consumption of non-renewable energy, deterioration of drinking water, impacts caused by materials and generation of pollutants.

Architectural description

The multifamily building were the freeboard is performed finds itself between party walls and is aligned to the boundary of a plot of approximately 164 m². It has a ground floor where there is a shop, and three floors, with one dwelling per floor. The two new housings, 161 m² of usable area, are in the same plane of the existing facade on the street Enric Granados, in order to respect the composition. In the rear, however, the 4th floor is adapted to the current built depth, but on the 5th floor 1.70 m is removed creating a terrace overlooking the interior of the block. To facilitate the entry of natural light in the rooms and promote cross ventilation, the inner courtyard of the estate extends to the new cover, extending its diameter in the freeboarded plants. An additional partially walkable courtyard is created. These interior spaces are closed by some woodworks.

If you had to do it again?

Building on an existing building requires a lot of coordination and agreement among all actors involved in the process from the inhabitants of the building to work technicians, not to mention public administration. This process requires a great experience and management capacity by the project developer team.

Building users opinion

Of the two new floors, the attic is inhabited, but not the lower floor. The owner of the penthouse said "pleased to have found a home of this type, of which there are no more in the city, similar to a house because it has a terrace, sun, views, but with the wealth of being part of a historic building in a central urban area, with all amenities within walking distance."

Energy

Energy consumption

Primary energy need : 16,20 kWhpe/m².year
Primary energy need for standard building : 82,90 kWhpe/m².year
CEEB : 0.0002
Final Energy : 6,20 kWhpe/m².year
Breakdown for energy consumption :
Heating = 2.9 kWh / m² year Cooling = 1.6 kWh / m² year ACS = 1,7kWh / m² year
More information :
Not required solar thermal instalation of vacuum tubes. This is beyond regulations, and commitment to non-renewable energy consumption
Initial consumption : 6,20 kWhpe/m².year

Envelope performance

Envelope U-Value : 0,20 W.m⁻².K⁻¹
More information :
FACADE (inside to outside):
gypsum plasterboard PYL 750 Oriented strand board OSB d<650 e=15mmMW
Mineral wool e=160mm
Oriented strand board OSB d<650 e=15mm
Slightly ventilated air chamber
Finishing aluminum facade e=2mm
Indicator : HE1 BD

Real final energy consumption

Real final energy consumption/m² : 6,10 kWhpe/m².year
Real final energy consumption/functional unit : 6,00 kWhpe/m².year
Year of the real energy consumption : 2 015
Renewables & systems

Systems

Heating system :
- Heat pump

Hot water system :
- Heat pump
- Solar Thermal

Cooling system :
- Reversible heat pump

Ventilation system :
- Natural ventilation
- Single flow

Renewable systems :
- Solar Thermal
- Heat pump

Renewable energy production : 74,00 %
Solar collector system for vacuum tubes

Solutions enhancing nature free gains :
Detailed study of natural lighting, solar protection, insulation and ventilation

Smart Building

Smartgrid :
Does not exist in the district

Users’ opinion on the Smart Building functions : right

Environment

GHG emissions

GHG in use : 4,00 KgCO₂/m²/year
Methodology used :
Calculation Method of Real Decree Spanish: 47/2007
Building lifetime : 100,00 year(s)
A specific study has been performed, but similar approach to building systems (wood-based in almost all components) is at the lowest level of industrialized building systems.

Water management

Consumption from water network : 116,00 m³
Water Consumption/m² : 0.72
Water Consumption/Dwelling : 58

Products

Product
Fermacell Aestuver
Fermacell
Robert.walendy@xella.com
Product category:
Plasterboard with noncombustible fire behavior A1, dimensions 1250x2600x18

OK. It has solved the fire insulation issue with a dry solution and absolute control of the necessary thickness.

Wooden structure

Novadomus Hábitat
info@novadomushabitat.com

Product category:
Steel-wood composite beam with epoxy binding resins. Protects steel wood fire heat and steel provides greater flexural strength. Novadomus Hábitat

OK. It has been possible to work with a minimum thickness of forged increasing flexural strength. This is particularly interesting when the limit height between floors is very restrictive.

aluminum sliding window Technal Lumeal.

technal

Product category:
"Lumeal XXL is the new slide Technal for glazed spaces of dimensions out of the ordinary. The bearing system allows sheets of up to 600 kg weight that slide smoothly and maximum precision. Its central reinforced profile ensures wind resistance glazing allowing the realization of remarkable heights. At the vision level, the top profile and side can hide in work, while the central core and the lower profile sheet small size, offer a very slim and minimalist image. Lumeal XXL is an industrial product easy to manufacture by professionals enclosure, with services tailored to compliance with the CTE."

OK. It has allowed to perform a carpentry with minimum framework thicknesses while maintaining low thermal conductivity and low leakage. This is sought to give great visual breadth to the environments in a narrow estate.

Costs

Construction and exploitation costs

Reference global cost: 1 375,00 €
Renewable energy systems cost: 18,00 €
Reference global cost/Dwelling: 1375
Cost of studies: 4 200 €
Total cost of the building: 402 027 €

Urban environment

The building is located in the Eixample district in Barcelona, perfectly connected by public transport, surrounded by trade and on the pedestrian street Enric Granados.

Land plot area

Land plot area: 165,00 m²

Built-up area
Built-up area: 80.00%

Parking spaces

NO

Building Environmental Quality

- comfort (visual, olfactive, thermal)
- energy efficiency
- renewable energies
- building end of life management
- integration in the land
- building process
- products and materials

Contest

Reasons for participating in the competition(s)

Con este sistema se aportan viviendas nuevas en el centro de la ciudad, de alta calidad energética y con espacios al aire libre, ayudando a la redensificación y evitando la dispersión de las áreas urbanas.

Se mejoran las condiciones de vida en los edificios existentes, gracias a la actualización de sus espacios e instalaciones, así como la instalación de ascensores y rampas.

Se revaloriza las fincas existentes tanto en lo económico (mayor valor por mejoras, menos gastos comunes por más vecinos) y de patrimonio histórico (se recuperan los elementos y el aspecto originales).

El parque edificado reduce su consumo energético, gracias a las mejoras térmicas que se introducen en cubiertas y medianeras que no disponen de aislamiento, así como a cambios en carpinterías e instalaciones.

Se renueva el paisaje urbano, con la armonización de la altura edificación, la desaparición de medianeras, la rehabilitación de fachadas, etc. Aumenta la recaudación municipal y su capacidad de acometer mejoras.

Building candidate in the category

Energía y Climas Templados

Premio de los usuarios