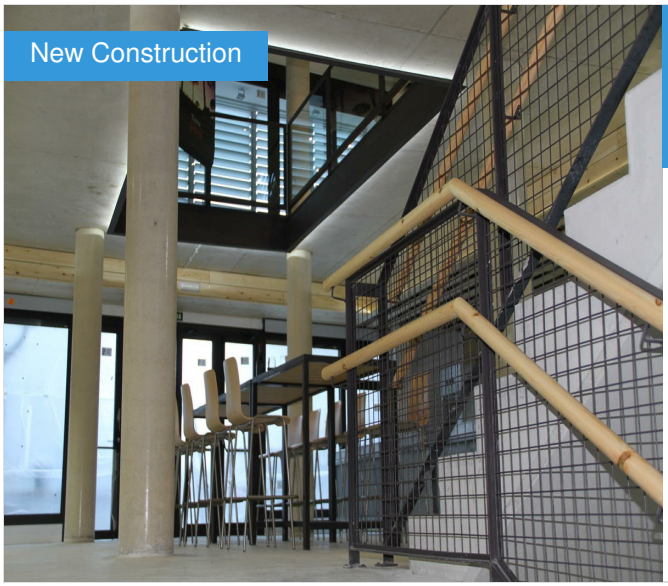
Local products center in Cebreros

by Iban Jaén Rodriguez-Carrascal / 2016-04-25 13:16:08 / Espagne / 10676 / ES



Primary energy need :

115.9 kWhpe/m².year

(Calculation method :)

ENERGY CONSUMPTION

Economical building — *Building*

< 50	A	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 Type : Other commercial buildings
Construction Year : 2015
Delivery year : 2015
Address 1 - street : 05260 CEBREROS, España
Climate zone : [Csa] Interior Mediterranean - Mild with dry, hot summer.

Net Floor Area : 587 m²
Construction/refurbishment cost : 609 976 €
Number of Visitor : 219 Visitor
Cost/m2 : 1039.14 €/m²

General information

The thermal inertia is one of the fundamental elements of passive architecture and has been present as a thermal regulator in buildings constructed ever since man began building. Therefore, it is surprising that in the current context, where energy efficiency is essential and the goal of building nearly zero energy buildings is commonly shared, thermal inertia is not in the center of the debate and of the architectural proposals. This building intends to claim the thermal inertia as a fundamental element of the design of an almost zero building energy consumption, considering fundamental part of the climate control system, supported by passive systems, which are given priority in front of the machinery, and use local energies. This, coupled with the commitment to a simple technology that facilitates full maintenance, and the flexibility to adapt to new uses, aims to demonstrate that it is possible and affordable to build a sustainable public building, adapted to the end user, against the excesses of our recent construction of public buildings in the rural p.

See more details about this project

https://www.facebook.com/Iban-Ja%C3%A9n-Arquitectura-133937450027217/

Data reliability

Self-declared

Stakeholders

Function : Developer

Ayuntamiento de Cebreros

Plaza de España, 1 05260 Cebreros (Ávila)

http://www.cebreros.es/

Function : Designer

Iban Jaén Rodríguez-Carrascal

c/ Luis Larraínza, 1 28002 Madrid

www.ecoolstudio.com

Basic and Execution and construction management projects

Function : Construction company

Energías Renovables Elia Solar S.L.

Javier Durán c/ Condesa de Venadito, 20, 28027 Madrid

www.elia-solar.net

Project and construction management of facilities

Function : Others

Jose Ignacio Ramos Morais

c/ Hornos Caleros, 35 05001 Ávila

Construction management

Function : Others

Juan Antonio Jiménez Barrera

c/ Finisterre, 5 28029 Madrid

Director of the execution of the work and the Health and Safety Coordinator

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Function : Contractor

El Corte Inglés S.A. División Empresas

P.I. San Cristobal, c/ Cobalto 199-200, 47012 Valladolid.

https://www.elcorteingles.es/empresas/

Contracting method

Other methods

Owner approach of sustainability

The City Council aims to create a cultural tourism resource, that is a reference for agrifood in the region. The aim is to promote a food companies incubator where small local producers display their products and tourists can taste them and buy them. In addition, the Center will offer agrifood training courses, events, product presentations and connect producers together to create synergies.

Architectural description

In the context of an economic crisis and bad recent experiences in raising public buildings in rural areas, and with a budget of less than 850 € / m2, the main goal we set ourselves was to design a building with a minimal environmental impact that has the lowest energy consumption. Measures have been implemented to REDUCE THERMAL DEMAND lowering the overall transmittance of the building with a continous envelope of high isolation (SATE and efficient joinery) and lowering consumption peaks for cooling through the High Thermal Inertia of the building. It also acts as a heat reservoir, causing a reduction of the thermal demand at their maximum and minimum points. In addition the building is protected from the summer sun by cantilevered, mobile lattices and thermal blinds driven by sun sensors and space advantage by thermal recovery mattress with hot air in winter. The other important measure is the use of local energy: solar gain in winter through windows with blinds operated with solar sensors, passive use of geothermal energy through bioclimatic gallery, night cooling, passive ventilation system. With these measures, energy demand is reduced to more than 50% energy demand and it is possible to avoid having to install a mechanical refrigeration system which increases the initial cost and burdens to the municipality with significant energy costs and maintenance, understanding that in this climate, and applying correctly passive measures is not necessary. The other objectives that have conditioned the design are ease of maintenance, designing systems to operate by the end user simple, easy technology, and does not depend on skilled labor; cleanability, especially of timber and soils; Building flexibility to accommodate different activities, including a future change of use to help amortization; and integration into the urban center of Cebreros, gaining prominence for

its use and not for their visual impact.

Energy

Energy consumption

Primary energy need : 115,90 kWhpe/m^2.year

Primary energy need for standard building : 181,30 kWhpe/m^2.year

Calculation method :

CEEB : 0.0001

Final Energy : 100,00 kWhfe/m^2.year

Breakdown for energy consumption :
Heating: 44 503 kWh / m2año; Cooling: 0 kWh / m2año; ACS: 10,153 kWh / m2año; Lighting: 5,592 kWh / m2año

More information :
The consumptions indicated are calculated in the Calener VyP official program for energy certification. It must be stated that in this program it is not possible to consider passive strategies as surface geothermal energy, cross ventilation and thermal inertia, key in reducing consumption of this building, so the actual consumption is expected to be less. It a measuring station for monitoring the building has installed but still do not have data.

Envelope performance

Envelope U-Value : 0,40 $W.m^{-2}.K^{-1}$

More information :
Facades: system of continuous insulation SATE, with 10 cm insulation and U = 0.31
Cover: Double panel 8 cm contrapeado insulation to 16 cm in total isolation and U = 0.29
Woodwork: aluminum with thermal break and double glazing (3 + 3) camera 15mm + 6mm, with bajoemisiva sheet, with U = 1.9
Solera: plate 6mm thick, U = 0.38 the intended use of the building is discontinuous, opening weekend and remaining closed weekdays, except events point. Therefore, thermal blinds have been installed during the winter unused open or close depending on the sun strikes them, capturing the sun's energy which helps to keep the hardened edifcio. If the sun ceases to influence and evening, they remain closed to conserve heat. In summer the blinds are closed if there is no use to prevent heat gain, and open when you start to use. To avoid capture solar energy in summer, on the southwest façade they have been installed movable louvers that protect the building. These strategies implemented in the envelope intended to maintain as stable as possible inside temperature while the building is unused, something that contributes thermal inertia. The night ventilation system that dissipates heat accumulated inside during the day, take advantage of the significant temperature swing between the day and night in this climate zone.

Building Compactness Coefficient : 0,42

Indicator : HE1 BD

Users' control system opinion : A "low tech" air conditioning systemwas chosen; control with a simple, easy-to-use technology by the end user and easy to maintain. The temperature control is controlled by conventional thermostats and the ventilation rate with a time clock. It has installed a domestic home automation system that controls the raising and lowering of blinds according to the sun that falls on them and the time of year.

Renewables & systems

Systems

Heating system :
- VAV System
- Wood boiler
- Canadian well

Hot water system :
- Wood boiler

Cooling system :
- Canadian well

Ventilation system :
- Natural ventilation
- Nocturnal ventilation
- Canadian well

Renewable systems :
- Biomass boiler

Renewable energy production : 75,00 %

Other information on HVAC :

Thermal Inertia acts as a thermal reservoir of the building, so that gives off heat when the building is cooled and accumulates when the building is heated. This effect produces a reduction in heat demand at their maximum and minimum points. This cycle of accumulation / transfer of heat is reducing the need for external heat input, enhancing the energy efficiency of the air conditioning. To maximize the interaction between thermal inertia and air conditioning, the whole structure of the building, consisting of load-bearing walls of brick and reinforced concrete slabs, it is seen inside and protected from the outside by the continued isolation. To facilitate ventilation, ground and first floors are connected by a central hole topped with an openable skylight and all floors are connected by the stairwell which, in turn, has a moving grid at the top. This configuration promotes cross ventilation and chimney effect, combined with night ventilation automatic opening of several uprights on opposing walls to cool the large masses of thermal inertia in summer and allow them to absorb heat from the air during the day . The air conditioning uses peripheral injection of hot / cool air comes out overpressure. This combination causes walls and floors are in continuous contact with the air-conditioning, which involves the construction elements that act as a heat reservoir depending on the demand of the building.

Solutions enhancing nature free gains :
An installation of shallow geothermal energy or bioclimatic gallery is used to preheat and pre-cool air ventilation and air conditioning of the building, installed by 60 cm deep under the sill tubes, and an air intake in the according

Smart Building

BMS :
A "low tech" control system has been chosen; with a simple, easy-to-use technology by the end user to maintain. The temperature control is controlled by conventional thermostats and ventilation system with a clock

Environment

GHG emissions

GHG in use : 3 887,00 $KgCO_2/m^2$/year

Methodology used :
RD 47/2007

Building lifetime : 30,00 year(s)

Water management

Consumption from water network : 475,00 m^3

Water Consumption/m2 : 0.81
Water Consumption/Visitor : 2.17

Indoor Air quality

The ventilation system is performed through a geothermal gallery taking outside air and making it circulate through by three pipes buried under the floor of the basement, and after passing through the filters, the air is driven into the building preheated or pre cooled. In this way air changes are ensured and indoor air quality rises . On the other hand, the building has mechanical extraction in bathrooms and kitchens as well as in front uprights and the skylight, controlled by automation, for a night ventilation in summer or a controlled opening if necessary.

Comfort

Health & comfort : The building adapts to changing external conditions facades to provide greater interior comfort and greater energy savings, without relying on a complicated technology to handle. Natural lighting is guaranteed in every room where an activity is performed (classrooms, sale and exhibition of products, kitchens) and designed a skylight so that, without grasping the sun, through reflections of light, illuminate the central area the building throughout the day, reducing electricity usage and creating a healthier atmosphere.

Products

Product

Caldera de biomass LASIAN BIOSELECT PLUS kW

LASIAN ESPAÑA

Sin contacto

http://www.lasian.es/

Product category :

55kW biomass boiler rated power, supporting pellet and bone splinters as fuel

The product meets expectations.

Costs

Construction and exploitation costs

Renewable energy systems cost : 19 935,00 €

Total cost of the building : 609 976 €

Subsidies : 609 976 €

Urban environment

The building is located in the center of Cebreros, near the plaza, between two of the most important public buildings, the church and the Cabildo (cultural center). Its integration strategy is to visually and physically connect the two buildings, as a covered square, and establish itself as the protagonist of the urban scene for their activities, not its visual presence.

Land plot area

Land plot area : 199,00 m^2

Built-up area

Built-up area : 199,00 %

Parking spaces

No parking

Building Environnemental Quality

Building Environmental Quality

- Building flexibility
- comfort (visual, olfactive, thermal)
- energy efficiency
- renewable energies
- maintenance

Contest

Building candidate in the category

Energía y Climas Templados

Green Building Solutions Awards 2016 powered by Construction21.org

Premio de los usuarios

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