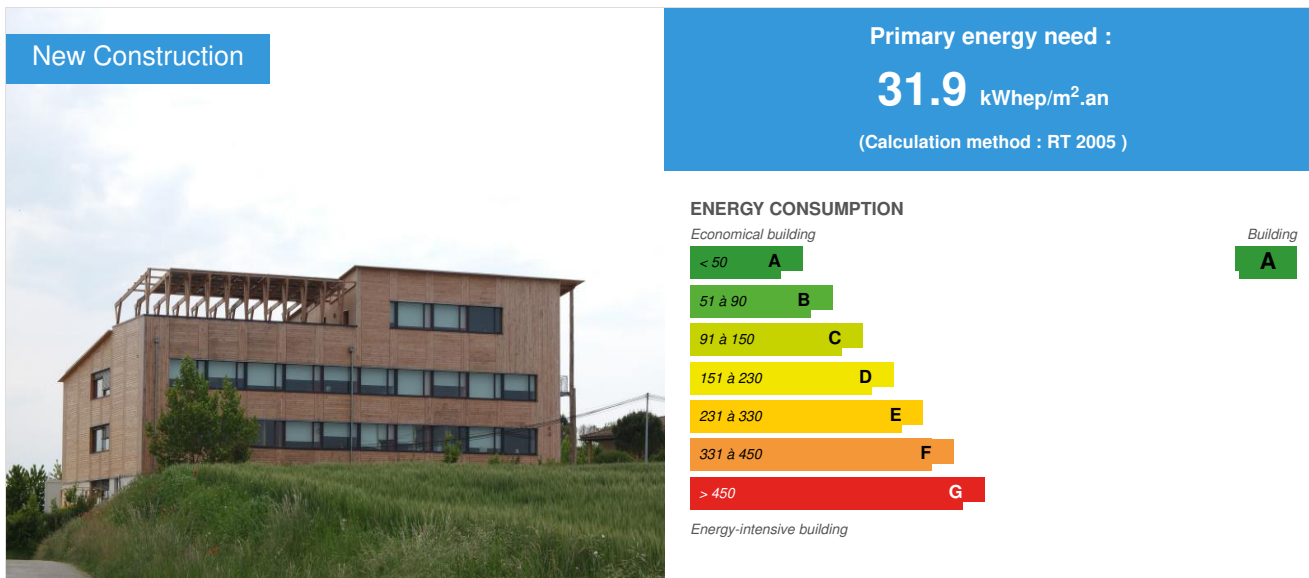


BUILDING OF E + ECOCERT

by Jonathan Kuhry / 2013-12-20 09:23:13 / France / 11767 / FR



Building Type : Office building < 28m
Construction Year : 2013
Delivery year : 2013
Address 1 - street : Ecocert, Lieu-dit Lamothe 32600 L'ISLE-JOURDAIN, France
Climate zone : [Csa] Interior Mediterranean - Mild with dry, hot summer.

Net Floor Area : 2 025 m² SHON
Construction/refurbishment cost : 3 240 000 €
Cost/m2 : 1600 €/m²

General information

After building its first bioclimatic building in 1997, then a second one (dome buildingtype) in 2004, Ecocert, a certification company, has just completed another pioneer building on its site in l'Isle Jourdain (South West of France, in Gers), with positive energy systems and low carbon footprint.

This compact building is composed of a wooden column-beam structure supporting solid wood floors on three levels above a semi buried concrete ground floor. A central core composed of earth coated concrete (gathering bathrooms, elevator and stairs) stabilizes the whole building. The façades are made of timber cribs, insulated with straw bales like curtain walls (they do not carry the floors).

The chosen spatial organisation creates large workspaces, alternating individual offices, meeting rooms, relaxation areas, and opwelcoming for a hundred people, while achieving the highest energy efficiency with low environmental impact materials and solar panels to reach positive energy.

LEED Certification in progress.

Total cost of the operation: 2000 € /sqm SHON
Cost control lumber, engineering 168 €/ sqm SHON
Building cost (excluding roads, networks and green spaces): 1600 € /sqm SHON
Operating costs (energy and water): 3.5 €/ sqm of floor area per year

Sustainable development approach of the project owner

Ecocert wanted a green building on many aspects, while being compatible with its internal organization: use of materials bio-based materials, restricted use of

chemical or transformed products, very good energy performance, user comfort, low-impact construction, renewable energy production... Both in the conception and realization phases, the project owner wanted each of these points studied, optimized, and checked and promoted. For the sake of consistency, an environmental approach must be global!

The most sensitive part of the project is related to the structure and woodworking. The architect, calculists and the Tournee du Coq company, owner of the lot, produced a remarkable technical work during the conception phase, taking into account the technical constraints of a heavy building of this size (charge ground, wind resistance, bracing, curtains walls, limitation of thermal bridges, etc...), but also by optimizing the early implementation of the blueprints (integration of straw, implementation of the vapor barrier, or the sealing). This crucial step was rewarded with very good sealing tightness results of 0.37 m3/h.sqm during the tests, while the wooden buildings are known to be difficult to seal. These points are all the more remarkable that the building company, local SME organized as a cooperative structure, realized its most important project, while being particularly involved and reactive to environmental demands from Ecocert (material traceability, compliance with the green construction site charter, limitation of toxic chemicals products).

Users were accompanied in their appropriation of the building from end to end. Very early in the project, they were able to express their wishes on the field, and managers were consulted until an advanced design stage so that the spaces correspond as closely to the needs of their service (need for confidentiality of storage, proximity to other services, etc...). Several presentations were organized from the design views and visits during the construction phase. Finally, in the early days after moving in, a global tour was organized so that everyone can identify the new distribution of offices and employees, by integrating also the old buildings. After several years in dense or temporary offices, salaries had high expectations on this building, and showed some skepticism including on the comfort planned in landscape offices. Early after installation, the feedback was very positive on many aspects: good quality of light, warm atmosphere, space and practical improvements...

The quality of the acoustics were particularly well received. Thermal comfort, necessitating numerous settings under real conditions of use, a very good work during the first few months, but has a little trouble during periods of high temperatures before finding the appropriate settings.

Architectural description

Composed of a wooden column-beam structure supporting solid wood floors on three levels above a semi buried concrete ground floor. A central core composed of earth coated concrete (gathering bathrooms, elevator and stairs) stabilizes the whole building. The façades are made of timber cribs, insulated with straw bales like curtain walls (they do not carry the floors). The spatial organization has chosen to create large work spaces, alternating individual offices, meeting rooms, spaces conviviality and open spaces.

Building users opinion

Warm atmosphere
Ergonomic workstations
Thermal, visual and acoustic comfort

If you had to do it again?

Expanded glass foam was used for the insulation of the buried part. The project owner would have preferred more ecological materials such as cork, used in other European countries. The cork was selected but as a precaution, after observing some termite attack on buried cork panes, expanded glass foam was chosen to replace cork panels.

See more details about this project

http://www.cercad.fr/IMG/pdf/batibuzz_du_cercad_-_batiment_d_ecocert_-_102013_v2-2.pdf

Stakeholders

Stakeholders

Function : Contractor

Sarl de Lamothe Groupe Ecocert

Ecocert, Lieu-dit Lamothe, 32600 L'Isle-Jourdain

<http://www.ecocert.com/>

Function : Designer

AGENCE COLLART

6, place du château | 31590 VERFEIL

<http://www.collart-archi.com/>

Function : Assistance to the Contracting Authority

ECO-ETUDES

Lieu dit En Pommel | 31570 LANTA

<http://www.eco-etudes.com/>

Function : Structures calculist
EURL GAMBA ACOUSTIQUE
163 rue du Colombier | 31670 LABEGE
<http://www.acoustique-gamba.fr/>

Function : Structures calculist
SARL INGEBAT BE
185 Av des États Unis | 31200 TOULOUSE

Function : Structures calculist
BATUT STRUCTURE BOIS
64 rue de la résistance | 82000 MONTAUBAN

Function : Other consultancy agency
BET Fluides : ECO2 WATTCONSEIL
8 rue Jacques Babinet | 31100 TOULOUSE

Function : Thermal consultancy agency
SARL ADDENDA
Route nationale d'AUCH | 32300 MIRANDE

Function : Other consultancy agency
BET VRD : VRD CONCEPT
201 Bd d'Allemagne BP 444 | 82000 MONTAUBAN

Type of market

Global performance contract

Energy

Energy consumption

Primary energy need : 31,90 kWh/m².an

Primary energy need for standard building : 132,30 kWh/m².an

Calculation method : RT 2005

Breakdown for energy consumption : Conventional consumption by item: Heating: 3.1 Hot water systems: 0.1 PSOP: 5.4 Lighting: 11.8 Auxiliary: 11.5

Envelope performance

Envelope U-Value : 0,37 W.m⁻².K⁻¹

More information :

Framing and roofing

2 types of roofing:

- Pitched roof: ventilated, 30 cm of cellulose wadding insulation (Uparoi = 0.13 W /sqm² K).
- Roof terrace: ventilated 30 cm cellulose wadding insulation and 22 cm wooden slab (Uparoi = 0.11 W / sqm K).

Walls and Partitions

Exterior walls:

- Level 1: shuttered concrete, 18 cm of insulation from the outside, expanded glass foam in the buried section and wood fiber for the rest (Uparoi = 0.21 W/sqm K).
- Levels 2 to 4: timber cribs with 36 cm of straw bales, siding vents (Uparoi = 0.17 W/sqm.K). Straw insulation is supplemented by wood fiber to avoid any thermal bridges.

Floors:

Foundations by studs and sills (concrete). The ground slab is a slab scope of 20 cm concrete. This slab is not ventilated (only 5 cm vacuum) or insulated (Uplancher = 0.27 W/sqm.K). Floors between levels are solid wood. They have many benefits: low thickness for a large scope, installation and implementation, prefabrication in a workshop, average inertia, participates to sound reduction thanks to a "sawtooth" layout "sawtooth" of the floor's underside.

Indicator : I4

Air Tightness Value : 0,37

More information

Wait one year of full exploitation

Renewables & systems

Systems

Heating system :

- Geothermal heat pump
- Fan coil
- Others

Hot water system :

- Individual electric boiler

Cooling system :

- Geothermal heat pump
- Fan coil
- Others

Ventilation system :

- Double flow heat exchanger

Renewable systems :

- Solar photovoltaic
- Heat Pump on geothermal probes

Renewable energy production : 130,00 %

Environment

Urban environment

Location: rural areas.

Densification of an already occupied plot.

The land, sloped, is oriented east overlooking the lake and the city center of L'Isle Jourdain.

A wooden building construction choosing a bioclimatic approach conducted by Collart architecture agency in 1997, occupies the upper part of the field.

Then a second dome-building was implanted in 2001. This building was moved 50m away to leave the place to the new building. The urban and landscape context is fairly common with a recent suburban residential development in the south.

Products

Product

A non-carrier curtain wall to the absence of thermal bridges and continuity of the vapour barrier

AGENCE COLLART - Architectes DPLG

contact@collart-archi.com

<http://www.collart-archi.com/>

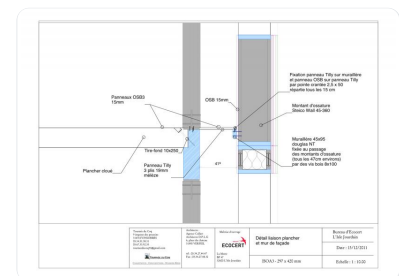
Product category : Gros œuvre / Structure, maçonnerie, façade

This non-carrier façade curtain wall allows:

- No thermal bridges
- And the continuity of the vapour barrier

This way, we obtain maximal reduction of ventilation and surface losses of the envelope.

A sectional view of the entire building is attached below.



This solution required a significant design work involving all project stakeholders to define maximum detail and thus to ensure quality construction.

PAC / water Alpha Innotec on drilling for geothermal power wall heating / refreshing and 7 exchangers Water / air

Innotec

Innotec

<http://www.innotec.com>

Product category : Génie climatique, électricité / Chauffage, eau chaude

Model Alpha Innotec model SWG 670Production of heating heat pump geothermal probes. Issue by heating the core coating raw land, hydraulic batteries to the main CTA for open spaces and fan coils in multipurpose rooms wall. Power: 88 kW.

Thermal comfort binds to the central core radiation

Health and comfort

Water management

Waiting for an entire year operating

Carbon

GHG emissions

GHG in use : 1,00 KgCO₂/m²/an

Methodology used :

Thermal study

Life Cycle Analysis

Eco-design material : Volume of bio-based materials in the building:1213 m³, Including 250 m³ of certified organic farming straw + Wooden structure + wood fiber + cellulose wadding

Contest



