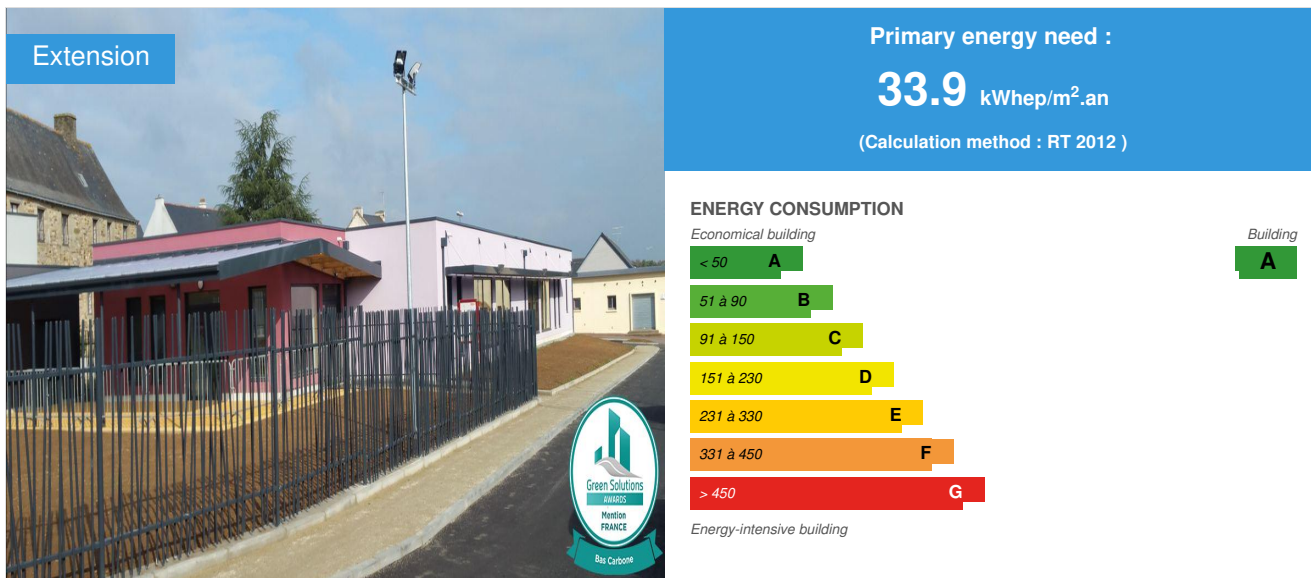


## ALSH Rieux

by Tugdual ALLAIN / 2018-04-11 17:00:51 / France / 6557 / FR



**Building Type** : Other building  
**Construction Year** : 2015  
**Delivery year** : 2016  
**Address 1 - street** : 56350 RIEUX, France  
**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 565 m<sup>2</sup>  
**Construction/refurbishment cost** : 700 000 €  
**Number of none** : 30 none  
**Cost/m2** : 1238.94 €/m<sup>2</sup>

**Certifications :**



### General information

The extension of the leisure building has been designed according to the criteria of **the German Passivhaus label** with a heating requirement of less than **15kWh / m<sup>2</sup>.year** for a heating set point of 20 ° C and a very high airtightness (test final at 0.51 volume per hour at 50 Pascal) .To achieve this exceptional thermal quality in a controlled budget, important work on the thermal envelope, the bioclimatic design, the airtightness and the choice of materials was carried out . Thus the walls and the roof are made of wood (framework and frame) of French origin, certified PEFC, integrating an insulation **cellulose wadding infused and outer wood wool** support mineral coating. A highly insulated concrete slab and wood-aluminum joinery in **triple glazing** complete this thermal envelope. A centralized double flow ventilation system with very high efficiency guarantees the air quality of the premises with very low thermal losses.

**With respect to the Passivhaus label**, the heating requirements are very low (according to the RT2012 thermal study carried out, only 4.2 kWh / m<sup>2</sup>.year of final energy, ie around € 122 / year electricity for the heating of the extension). In addition, the need for domestic hot water is limited to a few lavas sanitary. Thus, to guarantee a great ease of operation, maintenance and economic viability, the residual heating of the premises is realized by direct electric transmitters and the

production of sanitary hot water by electric balloons located near the needs. Feasibility studies have indeed shown that the choice of renewable energies on these two positions generates disproportionate investments compared to the savings made. The choice of materials is also a major axis of project design, with, in addition to the bio-based materials present in the insulation and the structure, the choice of interior coatings with a low environmental and sanitary impact (example: mineral paint without VOC), the choice of materials favorable to the hygrothermal comfort of the users (wood fiber, choice of a roof waterproofing of white color and 100% recyclable allowing an attenuation of the temperature up to 5 ° C). The passive calculation with the PHPP software indicates a total primary energy consumption of 89kWh<sub>ep</sub> / m<sup>2</sup>.year, including computer uses and appliances, all for less than 1200 € HT / m<sup>2</sup>.

## Sustainable development approach of the project owner

The commune of Rieux wished for a place for children healthy and perennial in time.

The interior materials are mainly biobased (wood frame, rubber floor, VOC-free paint ...). Particular attention has been given to the quality of air (renewal rate higher than the norm in force) The level of passive energy efficiency guarantees low charges to the municipality and is part of the local fight against global warming.

## Architectural description

A sober but contemporary architecture has been adopted for the project to fit naturally into the urban landscape.

It was asked for a lime plaster finish on the wood frame to ensure easy maintenance for the municipality.

## Building users opinion

The premises are pleasant to live in both winters and summer.

## Stakeholders

### Contractor

**Name :** Commune de Rieux

**Contact :** René TORLAY - Marie, Place de l'Eglise, 56350 RIEUX - rene.torlay@orange.fr

[http://www.rioux-morbihan.fr/index.php?option=com\\_content&view=category&layout=blog&id=20&Itemid=101](http://www.rioux-morbihan.fr/index.php?option=com_content&view=category&layout=blog&id=20&Itemid=101)

### Construction Manager

**Name :** KASO Architecte

**Contact :** Bruno MARTIN - 52 avenue Paul Duplaix, 56000 VANNES - bruno.martin@kaso-archi.fr

<http://www.kaso-archi.fr/>

### Stakeholders

**Function :** Thermal consultancy agency

Equipe Ingénierie

Tugdual ALLAIN - 4 rue du Val de Loire, 49300 CHOLET - t.allain@equipe-ing.fr

<http://www.equipe-ingenierie.fr/>

Office of thermal study and any body of state

### Contracting method

Separate batches

### Type of market

Global performance contract

## Energy

### Energy consumption

**Primary energy need :** 33,90 kWh<sub>ep</sub>/m<sup>2</sup>.an

**Primary energy need for standard building :** 115,40 kWh<sub>ep</sub>/m<sup>2</sup>.an

**Calculation method :** RT 2012

**CEEB :** 0.0001

Breakdown for energy consumption : Heating = 14.5kWhEP / m<sup>2</sup>.year ECS = 3.4 kWhEP / m<sup>2</sup>.year Lighting = 9.5 kWhEP / m<sup>2</sup>.year Ventilation = 6.2 kWhEP / m<sup>2</sup>.year Auxiliary and cooling = 0 kWhEP / m<sup>2</sup>.year

## Real final energy consumption

Final Energy : 33,90 kWhEP/m<sup>2</sup>.an

Real final energy consumption/m<sup>2</sup> : 35,69 kWhEP/m<sup>2</sup>.an

Year of the real energy consumption : 2 017

## Envelope performance

Envelope U-Value : 0,19 W.m<sup>-2</sup>.K<sup>-1</sup>

More information :

Façades = wood frame with cellulose fiber filling + wood fiber in external insulation: U = 0.147W / m<sup>2</sup>.K

Wood roof U = 0.116W / m<sup>2</sup>.K

Insulated concrete slab under screed (polyurethane to limit thickness): U = 0.175W / m<sup>2</sup>.K

Exterior joinery wood / aluminum triple glazing Uw = 0.94W / m<sup>2</sup>.K (including thermal bridge implementation)

Building Compactness Coefficient : 0,87

Indicator : n50

Air Tightness Value : 0,51

Users' control system opinion :

There is nothing to manage apart from the annual maintenance of the dual flow ventilation unit.

## More information

Consumption according to PHPP calculation = 89 kWhEP / m<sup>2</sup>.year

## Renewables & systems

### Systems

Heating system :

- Electric radiator

Hot water system :

- Individual electric boiler

Cooling system :

- No cooling system

Ventilation system :

- Nocturnal ventilation
- Free-cooling
- Double flow heat exchanger

Renewable systems :

- No renewable energy systems

Other information on HVAC :

- CTA Helios KWL EC 2000D Pro certified PHI
- Electric radiators Noirot Shocks R21 6 orders for a total power of 14kW
- ECS electric with a ball under sink of 15L and a suspended balloon of 50L

Solutions enhancing nature free gains :

Les gains passif sont réalisé grâce à la conception bioclimatique et l'enveloppe de niveau Passivhaus: larges baies vitrées Sud, enveloppe thermique très performante, dalle avec chape béton pour inertie,... Cette conception est complétée par une étanchéité

## Environment

### Urban environment

Land plot area : 2 500,00 m<sup>2</sup>

Built-up area : 30,00 %

The building is part of the extension of the old ALSH granite rubble.

The site is located in the village center

## Products

### Product

CTA Helios KWL EC 2000D Pro certified PHI

Helios

<https://www.helios-fr.com/>

Product category : HVAC, électricité / ventilation, cooling

Extra-low flow dual-flow power station with energy recovery, for suspended ceiling mounting. Ideal for centralized ventilation of residential, tertiary and industrial premises.

High energy efficiency, tested according to PassivHaus Institute criteria.

Very compact unit with numerous equipment variants.

Flexibility of connection, simplicity of installation.



## Costs

### Construction and exploitation costs

Cost of studies : 59 500 €

Total cost of the building : 436 000 €

## Health and comfort

### Water management

not measured

### Indoor Air quality

Passivhaus certified double flow ventilation with filter F7 / G4

In occupation, the ventilation rate is 1065m<sup>3</sup> / h, ie 0.71vol / hFlexible soft Forbo class A + Mineral paints KEIM COV <1g / L

### Comfort

Health & comfort :

South facade very largely glazed with 39m<sup>2</sup> of joinery is 47% of the facade. Presence of a horizontal sun breeze from BUGAL (Calero model) with a depth of 1.2m to avoid dazzling and thermal discomfort in summer.

Sun protection supplement with external roll-up blinds of the SOLTIS 86 type for joinery not protected by the BUGAL sun breeze. These protections also make it possible to avoid glare while guaranteeing natural illumination, even when the protection is lowered, except in the nap rooms where the fabric is blackout. The lighting of the living spaces has a manual dimming which makes it possible to adapt the light. lighting to activities and external conditions. All facades have opening frames allowing natural ventilation through mid-season and summer providing additional comfort. Finally, the concrete screed provides the necessary inertia for the attenuation of the thermal load of the building.

Calculated thermal comfort : PHPP calculation: Frequency of overheating = 7% at 25 ° C

## Carbon

### GHG emissions

GHG in use : 2,40 KgCO<sub>2</sub>/m<sup>2</sup>/an

Methodology used :

Calculation method of the E + C- label (software pleiad)

GHG before use : 716,48 KgCO<sub>2</sub>/m<sup>2</sup>

Building lifetime : 50,00 année(s)

Use in use years : 298,53

GHG Cradle to Grave : 836,51 KgCO<sub>2</sub>/m<sup>2</sup>

Calculation method of the E + C label

## Life Cycle Analysis

Resultat E2 C2

Material impact on GHG emissions :

0.8

Material impact on energy consumption : 0,57 kWhEP

Eco-design material :

Frame building + timber frame, from français and certified PEFC

Insulation of cellulose wadding walls and wood wool panels Installation of triple glazed wood-aluminum joinery Interior coatings with ecolabels and low VOC content (class A +) for mineral paints, for Forbo PVC floors

## Contest

### Reasons for participating in the competition(s)

- ENERGIE: Bâtiment passif (en cours de certification) avec consommations totales inférieures à 89kWh/m<sup>2</sup>.an, y compris usages informatiques et électroménagers et besoin de chauffage inférieur à 13kWh/m<sup>2</sup>.an pour une consigne de 20°C
- SANTE: Usage de matériaux intérieurs sains (peinture minérale sans COV, carrelage, sols PVC de classe A+) couplé à une ventilation double flux avec filtration de l'air entrant et débit adapté à l'usage
- CARBONE: Usage de matériaux biosourcés et recyclés: charpente et murs en ossature bois isolés en ouate de cellulose et fibre de bois, menuiseries mixtes bois-aluminium
- CONFORT: Confort hygrothermique accru par la mise en place d'une bonne inertie dans le bâtiment (mur de refend en pierre, dalle béton), d'une isolation de niveau passif, de protections solaires extérieures fixes et mobiles, de couleurs claires des revêtements extérieurs qui renvoient la chaleur.

### Building candidate in the category



Bas Carbone

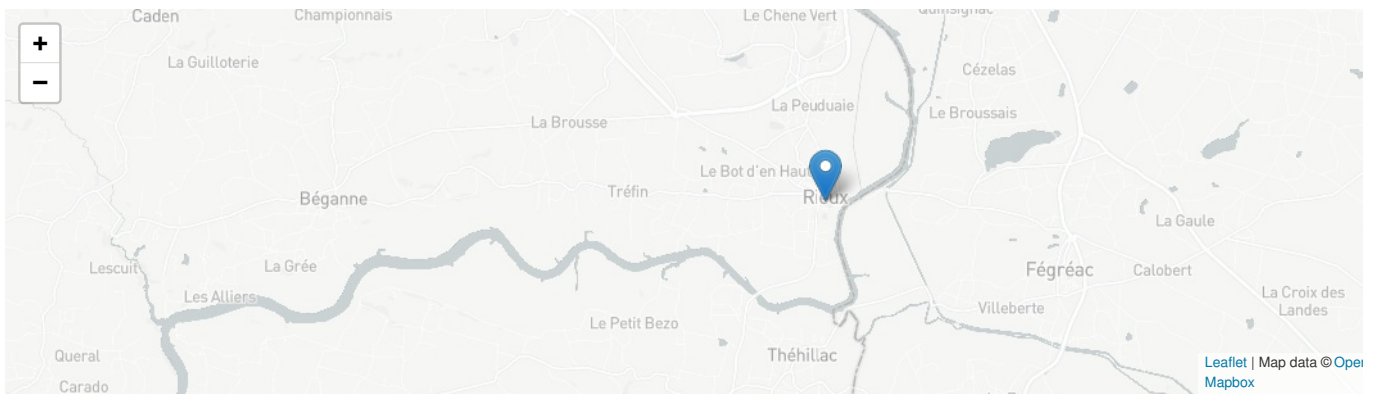


Coup de Cœur des Internautes





## Prix des Etudiants



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