


## Health House Billé

by Rémi Boscher / © 2017-04-12 17:24:30 / France / © 2692 / FR



**Primary energy need :**

56 kWhep/m<sup>2</sup>.an

(Calculation method : RT 2012 )

**ENERGY CONSUMPTION**

*Economical building* *Building*

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

*Energy-intensive building*

**Building Type** : Public or private hospital  
**Construction Year** : 2013  
**Delivery year** : 2015  
**Address 1 - street** : 5 rue de Fougères 35133 BILLÉ, France  
**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 384 m<sup>2</sup> SHON RT  
**Construction/refurbishment cost** : 629 000 €  
**Number of Bed** : 1 Bed  
**Cost/m<sup>2</sup>** : 1638.02 €/m<sup>2</sup>

**Proposed by :**  
**BATYLAB**

### General information

The SIVOM (Syndicat Intercommunal à Vocations Multiples) of BILLÉ - COMBOUTILLÉ - PARCÉ is made up of 3 municipalities which include, on 1 January 2012, 2277 inhabitants. These are rural communes located in the North-East of the department of Ille-et-Vilaine, about 10 kilometers south of Fougères. As of 2008, the grouping of health professionals and the construction of a health center is mentioned.

### Sustainable development approach of the project owner

The project was awarded the call for projects "Building Low Consumption" of Ademe and the Region in 2013. This application, initiated by the Adviser in Shared Energy allowed to accentuate the energy performance of the project originally planned. Priority objectives: - Mutualize and group care offers - Build an efficient and easily accessible building

### Architectural description

In the programming, it is mentioned that the project manager will endeavor to use materials that are healthy and have little impact on the environment. Several responses in the choice of materials reflect this desire as the choice of a constructive mode integrating wooden framework. The structure of the building is

composed of a wooden frame inserted between concrete sails ensuring bracing, all on one foot. A wooden frame studio was built upstairs. The orientation of the building and its mixed wood-concrete construction are the result of a bioclimatic approach. Indeed, it has been made the choice to couple concrete sails to the wooden framework in order to bring in inertia. A compactness has also been sought to limit dewatering surfaces.

## Building users opinion

The idea of the project was born in 2008. Many hazards, independent of the will of the contracting authority, led to the project being born later. The main difficulties were linked to the statutes of the SIVOM (Syndicat intercommunal with multiple vocations) and to the taking of competence for the realization of a health establishment. Today, the Local Health Contract of the Pays de Fougères, enables local communities and healthcare professionals to support their healthcare projects through regional health promotion.

Funding for the project, including the fact of not obtaining several subsidies such as the DETR (Equipment for rural territories) and the FNADT, was problematic.

## If you had to do it again?

Taking into account the needs of health professionals, support by the Shared Energy Advisor, the will of the project owner (SIVOM) and the interest of the project management team for the project have been Determinant for its realization. The monitoring of consumption and the taking into account of the feelings of the occupants must make it possible to establish the success of the project in the months to come.

## See more details about this project

[http://www.reseau-breton-batiment-durable.fr/retour\\_experience/maison-de-sante-bille](http://www.reseau-breton-batiment-durable.fr/retour_experience/maison-de-sante-bille)



### Stakeholders

#### Stakeholders

**Function :** Contractor

SIVOM de Billé-Combourtillé-Parcé

sandrine.morelle.communedebille@orange.fr

<http://www.communedebille.fr/spip.php?article107>

Project management

**Function :** Construction Manager

Gilles Delourmel et Vincent Le Faucheur

contact@gilles-delourmel.fr

<http://www.gilles-delourmel.com/agence/>

The project management team consisted of two people, one of whom followed the worksite while being involved in the design, which facilitated the follow-up of the implementation

**Function :** Thermal consultancy agency

Thalem

thalem@thalem-ing.fr

<http://www.thalem-ing.fr/>

Thermal study

### Energy

#### Energy consumption

Primary energy need : 56,00 kWh/m<sup>2</sup>.an

Primary energy need for standard building : 75,00 kWh/m<sup>2</sup>.an

Calculation method : RT 2012

**Breakdown for energy consumption :** Electricity consumption between 17/11/2014 and 10/11/2015 was 18,399 kWh, based on the building's electricity bills and actual meter readings. To compare this real consumption with the theoretical consumption resulting from the thermal study it is necessary to apply the coefficient of primary energy which is 2.58 for the electricity (only energy in this building). In primary energy, the real consumption is thus 47 469 kWh for the first year of operation of the building. The difference between the theoretical electricity consumption and the actual consumption of the first year of operation is important! Indeed, the actual consumption is multiplied by 2 compared to the theoretical consumption resulting from the thermal study. There was no specific implementation instrument on this project, the monitoring of consumption to be carried out by the CEP on the basis of regulatory sub-meters. However, the statutory sub-metering has not been fully respected, it is therefore impossible to separate the consumptions of the different VMCs of the heat pump. A take-back must therefore be

carried out at least to isolate the heating consumption from consumption related to ventilation. Similarly, the consumption of the two hot water storage tanks can not be isolated from other electrical outlets. Meanwhile, other strategies have been put in place to control the consumption of the building more precisely.

## Real final energy consumption

Final Energy : 60,40 kWh/m<sup>2</sup>.an

Real final energy consumption/m<sup>2</sup> : 120,00 kWh/m<sup>2</sup>.an

## Envelope performance

### More information :

Exterior walls concrete: Concrete / glass wool / glass wool / gypsum board, 20/10 / 4,5 / 1,3 - U = 0,216 W / m<sup>2</sup>.K

Exterior walls wood frame: Cladding / air knife / wood fiber board / OSB / glass wool between wood frame pillar / steam brake / glass wool between metal frame pillar / air gap / gypsum board, 2/3/6/2 / 14.5 / 6/3 / 1.3 - U = 0.135

Floor on solid ground: Expanded polystyrene / concrete slab / polyurethane / screed, 10/13 / 4.8 + 8/10 - U = 0.093

Floor studio on pole of health: glass wool / concrete slab, 10/20 - U = 0,289

Roof: glass wool on false ceiling / glass wool under roof, 24/24 - U = 0.091

Joinery: Alu - double glazing with argon blade / Alu - triple glazing to the north, U<sub>w</sub> = 1,5 W / m<sup>2</sup>.K - U<sub>w</sub> = 1 W / m<sup>2</sup>.K

Air Tightness Value : 0,30

## More information

Ventilation : Offices and waiting rooms: double flow with heat recovery ( $\eta > 80\%$ ), Sanitary and premises with pole specific pollution: single flow self-adjustable with box low consumption, Studio single flow hygro B with individual microphone Watt + Heating: Pole of health: Heating by PAC air / water (P = 16 kW, COP > 4 to + 7/35 °) Emission by medium temperature radiators equipped with thermostatic valves (time variation = 0.42) Floor (Studio and circulation): heating by electric radiant panels (CA = 0,14) Lighting : Offices: installed power 10 W / m<sup>2</sup> managed by switch on off, Sanitary installations: installed power 8 W / m<sup>2</sup> managed by presence detectors Meeting room: installed power 9 W / m<sup>2</sup> managed by presence detectors and brightness threshold Expectations / reception: installed power 9 W / m<sup>2</sup> managed by switch on off and brightness threshold

## Renewables & systems

### Systems

#### Heating system :

- Heat pump
- Electric radiator
- Solar thermal

#### Hot water system :

- Individual electric boiler
- Heat pump

#### Cooling system :

- No cooling system

#### Ventilation system :

- Single flow
- Humidity sensitive Air Handling Unit (Hygro B)
- Double flow heat exchanger

#### Renewable systems :

- Solar Thermal
- Heat pump

#### Other information on HVAC :

Health center and Studio: DHW produced by the air / water PAC Main tank 200 l  
30 L buffer balls for nurse 1 and nurse 2 areas

A sensor has been positioned on the general meter. The objective is to analyze the overall consumption over time and to identify the calls of powers and the daily consumption. The device is based on the pulse reading on the meter. The data is transmitted once a day to the CPE.

#### Solutions enhancing nature free gains :

Un capteur a été positionné sur le compteur général. L'objectif est d'analyser les consommations globales dans le temps et de relever les appels de puissances et les consommations quotidiennes. L'appareil est basé sur le relevé des impulsions sur le compt

## Environment

## Urban environment

Land plot area : 384,00 m<sup>2</sup>

Built-up area : 89,00 %

The health center built in the commune of Billé is a joint project between three municipalities and thus optimizes and limits the consumption of land. The project takes place in the heart of an urbanized area in the town of Billé and fill a "hollow tooth". The proximity of the pharmacy was also a decisive criterion and allows to truly create a complete health center.

## Products

### Product

Wood frame

Alban Darras

02.99.98.81.14

<http://abibois.com/darras#adhérent>

Product category : Gros œuvre / Structure, maçonnerie, façade

In the programming, it is mentioned that the project manager will endeavor to use materials that are healthy and have little impact on the environment. Several responses in the choice of materials reflect this desire as the choice of a constructive mode integrating wooden framework. Another example is the protection of wood structures (frameworks) against underground termites (in accordance with the provisions of the decree of 27 June 2006 on the application of Articles R112-2 and R112-3 of the Construction Code and Of the Habitation) it was prohibited the use of chemicals and insecticides. A physical barrier has been prescribed.



## Costs

### Construction and exploitation costs

Total cost of the building : 629 000 €

## Health and comfort

### Indoor Air quality

The choice of finishing materials was made in order to ensure a healthy air. All wall coverings are VOC free and the soft flooring is natural linoleum. Ventilation rates shall ensure adequate air exchange

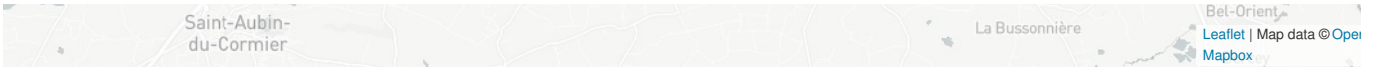
### Comfort

**Health & comfort :** Despite the inertia of the concrete sails, summer discomfort is noted by the occupants. Overnight ventilation should be tested next summer

**Measured thermal comfort :** Tic (°C) : 26,10 (logement) 29,1 (Pôle de santé) ; Tic - Tic ref = - 4,5

**Acoustic comfort :** Sound insulation adjustments between consultation rooms and waiting areas have been found necessary to satisfy the discretion of the consultations. Glazed walls were also added between the entrance hall and the two waiting rooms. Indeed, the created space formed a long corridor that had to be partitioned for the comfort of the patients and the reception staff. The choice of the glass walls makes it possible to preserve the good management of the contributions of light.





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