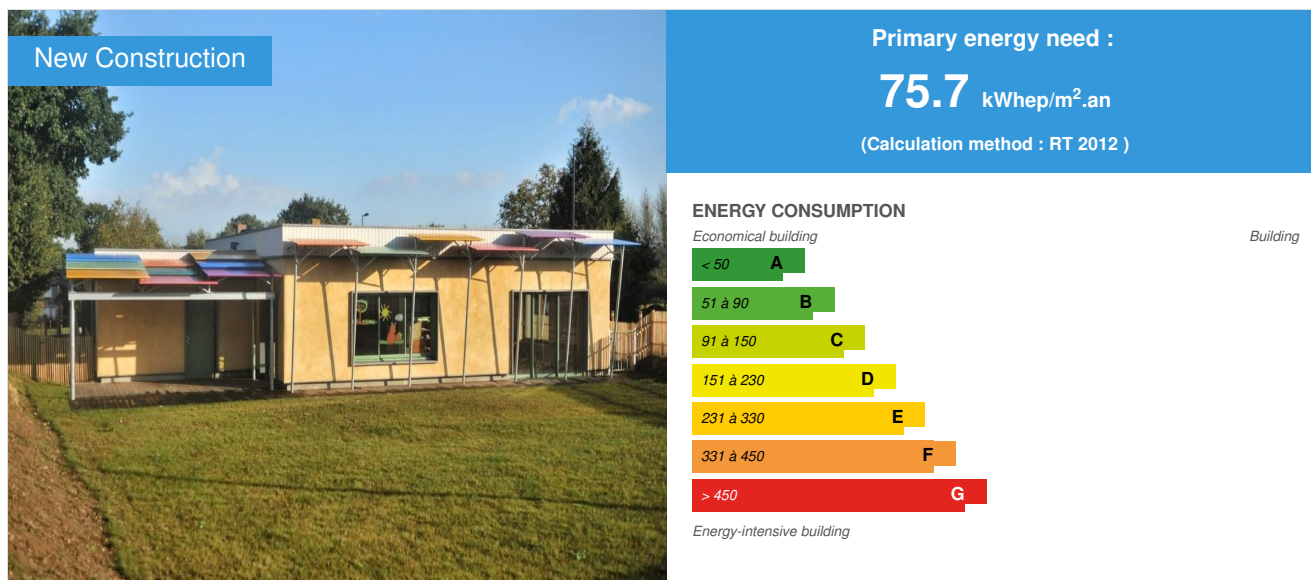


Creche in bunch of straw Muël

by Rémi Boscher / 2017-04-03 18:01:39 / France / 5072 / FR



Building Type : Preschool, kindergarten, nursery
Construction Year : 2014
Delivery year : 2014
Address 1 - street : 35290 MUËL, France
Climate zone : [Dfb] Humid Continental Mild Summer, Wet All Year

Net Floor Area : 430 m²
Construction/refurbishment cost : 634 198 €
Number of Children : 12 Children
Cost/m² : 1474.88 €/m²

Proposed by :

BATYLAB

General information

The Community of Municipalities of the Pays de Saint-Méen Montauban has decided to build an early childhood facility to respond to a lack of infrastructures of this nature on the territory. This decision follows a study carried out in 2010 that led the Community of Commons to set up an investment plan for early childhood. The Early Childhood Commission proposed that the building should contain 90% natural materials, possibly local, to reduce the environmental impact and preserve indoor air quality.

Thanks to the conviction of the elected representatives, and in particular the Mayor of Muel who had already carried out projects integrating natural materials, the building was constructed with straw bales, wood and clay. The specifications of the architect thus recommended the use of 90% natural materials.

In order to accommodate 12 children under the best conditions, an approach of consultation made it possible to collect the expectations of all the stakeholders. The inhabitants were also able to take part in a participatory project.

The system retained is a mixed structure wooden frame and post-beam resting on a masonry overhang. It is not braced by panels but with crosses of Saint-André in solid wood to allow the installation of coating on both sides of the wall.

For living areas, the framework is insulated with straw bales, the technical parts and the roof are insulated in cellulose wadding.

Sustainable development approach of the project owner

The system retained is a mixed structure wooden frame and post-beam resting on a masonry overhang. She is not Not braced by panels but with crosses of Saint-André in solid wood (douglas) to allow the installation Of coating on both sides of the wall. For the areas to be lived, the framework is insulated with straw bundles, the technical parts and the roof are insulated in cellulose insulation.

Architectural description

The building was deliberately designed on the ground floor to facilitate access to parents and young children and thus contribute to their well being inside the premises.

Building users opinion

"The community of municipalities has wished to make an exemplary equipment in terms of environmental quality and Well-being for children. We wanted the project to also serve to raise the awareness of the inhabitants of the territory. " Marcel Minier, Vice-President of the community of communes, Mayor of Muel.

If you had to do it again?

Technically, the greatest point of vigilance was not the straw but rather the risk of condensation in the roof. The timber company would have preferred wooden panels, without contact with a cold wall. However, the office The ventilation was sufficient and the vapor barrier had a high Sd coefficient.

See more details about this project

http://www.reseau-breton-batiment-durable.fr/retour_experience/une-creche-en-bottes-de-paille

Stakeholders

Stakeholders

Function : Construction company

SBK

02 96 25 21 73

<http://www.sbk-batiment.com/>

Big work

Function : Construction company

BRIERO

02 97 22 70 54

<http://www.habiozone.fr/>

frame-cover

Function : Construction company

TOTEM / TERRE ET COULEUR

02 99 06 60 58

<http://www.totem-terre-couleurs.fr>

Land and lime plasters

Function : Construction company

ECHO PAILLE

0890210436

http://www.le-site-de.com/contacter/echopaille_6978.html

Straw

Function : Contractor

Communauté de communes de Saint-Méen-le-Grand

02 99 06 54 92

<http://www.stmeen-montauban.fr/>

Owner

Function : Construction Manager

Jean-Pierre Ingrand

02 97 73 30 30

<http://www.archiliste.fr/architectes/atelier-jean-pierre-ingrand>

Architect

Function : Thermal consultancy agency

Fluditec

02 97 74 18 66

<https://www.fluditec.com/>

Thermal study

Energy

Energy consumption

Primary energy need : 75,70 kWh/m².an

Primary energy need for standard building : 93,50 kWh/m².an

Calculation method : RT 2012

Breakdown for energy consumption : Heating -> 16 KWHEP / m².year DHW-> 6 KWHEP / m².an Lighting -> 39 KWHEP / m².an Ventilation -> 24 KWHEP / m².an

Envelope performance

More information :

- Floor on solid ground (concrete slab / projected polyurethane / concrete screed), thickness 12cm / 12cm / 6cm, U = 0,206 W / m².K
- Exterior wall straw coated lime sand + plaster earth / straw + framing wood / straw / Plaster, thickness 5cm / 22cm / 23cm / 4cm, U = 0.173 W / m².K
- Walls exterior frame wood steico universal / OSB / cellulose wadding + framework wood / blade Ventilated air / plasterboard, thickness 1.8cm / 0.9cm / 2cm / 2cm / 4.4cm / 1.3cm, U = 0.172W / m².K
- Roofing of cellulose wadding + wooden framework / OSB, thickness 30cm / 1,8cm, U = 0,145 W / m².K
- Combined wood / aluminum windows, Uw = 1.5 W / m².K Sw = 0.47
- Combined wood / aluminum window doors, Uw = 1.3 W / m².K Sw = 0.52
- Roof windows, Uw = 1,4 W / m².K
- Glazed entrance doors, Ud = 1.9 W / m².K
- Full external doors, Ud = 1.8 W / m².K

Indicator : I4

Air Tightness Value : 0,46

More information

The energy consumption forecast for heating and electricity is 26 000 kWh per year.

Renewables & systems

Systems

Heating system :

- Low temperature floor heating
- Wood boiler

Hot water system :

- Solar Thermal

Cooling system :

- No cooling system

Ventilation system :

- Single flow
- Double flow heat exchanger

Renewable systems :

- Solar Thermal

Thermal solar panels provide a part of the production of hot water. In practice, it turns out that the solar hot water network connecting the panels to the balloon also provides part of the heating of the building. A study is underway to correct this flaw.

Environment

Urban environment

Land plot area : 2 386,00 m²

Built-up area : 18,00 %

The Community of Municipalities of Saint-Méen-le-Grand has decided to set up the multi-hospital center in Muel for its central character in the south of the canton and to meet the needs of the families of the surrounding communes. The Local Urban Plan of Muël had planned a plot dedicated to this equipment

Products

Product

Straw

Echopaille

echopaille@yahoo.fr

<http://www.echopaille.fr/p/contact-et-rencontres.html>

Product category : Finishing work / Partitions, insulation

Part of the insulation of the building is in straw bundles. The straw used (triticale) was grown without herbicides or pesticides in a nearby commune. It was bundled and then stored for drying for 1 year in a well ventilated shed with a roof overhang to prevent it from taking the rain. 450 boots of 30 x 40 x 90 cm were used. Their density, size, weight and moisture content (20% maximum) were verified.



Thanks to the conviction of the elected representatives, and in particular the Mayor of Muel who had already carried out projects integrating natural materials, the building was constructed with straw boots, wood and clay. The specifications of the architect thus recommended the use of 90% natural materials.

Costs

Construction and exploitation costs

Cost of studies : 14 863 €

Total cost of the building : 687 409 €

Subsidies : 520 000 €

Health and comfort

Water management

A rainwater harvesting tank of 5 m³ is provided for watering the garden and washing the room with garbage. It has been designed to allow the supply of sanitary facilities if the regulations permit it in the near future.

Comfort

Health & comfort : The choice of natural materials for the structure helps to ensure good indoor air quality. The contracting authority demanded compliance with the rules of professional straw construction published in 2012 to avoid dealing with specificities inherent in the implementation of "non-standard techniques". Beyond the envelope of the building, the floor coverings are made of latex in the activity rooms and marmoleum in the rooms. Solid wood furniture contributes to the low emission of pollutants in indoor air.

Calculated thermal comfort : Le nombre d'heures pendant lesquelles la température est inférieure à 17°C ou supérieure à 27°C en période d'occupation est le plus important pour la salle de vie avec 79h sur l'année, essentiellement en période estivale.

Life Cycle Analysis

Eco-design material : The ecological footprint of the building was a real concern for the project owner who wanted to privilege local or recycled resources: • The timber frame comes from the sawmill of Merdrignac, 25 km from the site, which is sourced from Brittany or western France • Wood siding (Country spruce) is also produced in Brittany, at Saint-Nicolas-du-Tertre (56); • The straw used in insulation comes from a holding located in Saint-Onen-la-Chapelle (35) which practices a reasoned agriculture, it is triticale wheat straw. During drying, it was stored in Mauron (35), a neighboring commune located 7 km from the site • The land intended for plaster was taken directly from the site and then stored by the company to be screened and pigmented before adding lime • Cellulose wadding is produced by the company Cellaouate, located in Morlaix (29), from recycled newspapers • Roofing membrane is produced from recycled tires.

Contest

