The School of the "Chat Perché" (France)

by Florence Devernay / 2023-01-10 00:00:00 / France / © FR

New Construction

Primary energy need :
-34.9 kWhep/m².an
(Calculation method : RT 2012)

ENERGY CONSUMPTION

Economical building

<table>
<thead>
<tr>
<th>Building Type</th>
<th>School, college, university</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Year</td>
<td>2021</td>
</tr>
<tr>
<td>Delivery year</td>
<td></td>
</tr>
<tr>
<td>Address 1 - street</td>
<td>1 Rue Pierre de Coubertin 56310 QUISTINIC, France</td>
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<tr>
<td>Climate zone</td>
<td>[Cfb] Marine Mild Winter, warm summer, no dry season.</td>
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</tbody>
</table>

Net Floor Area : 706 m²
Construction/refurbishment cost : 1 310 000 €
Cost/m² : 1855.52 €/m²

General information

This school located in the town of Quistinic, was built in an integrated design process with future users, thus meeting their needs. With the aim of bringing together the facilities dedicated to children on the same site and pooling the spaces, the school was built as a continuation of the existing children's centre. Oriented around a central courtyard, the classes benefit from spaces common to both entities (school and centre), with a library and a motor skills room.

This equipment is built from biosourced materials, with an untreated wooden frame, chestnut cladding, straw and wood wool insulation, raw earth interior plaster and natural linoleum floors. This particular know-how has been enhanced thanks to participatory projects, in particular for insulation using straw bales and raw earth coatings.

The orientation of the building, the double flow ventilation, the solar protections and reinforced insulation make it possible to obtain a building with high performance, a low energy impact and few energy needs. Large openings to the south make it possible to optimize the contribution of heat and natural light, while solar protections protect the spaces from overheating. The large installation of photovoltaic panels on the roof allows to cover the electricity needs of this school.

Building users opinion

The feelings of the users can be summed up in the testimonies in the press of the director and her team, when they returned to the school:

"This is an exceptional start to the new school year: we are going to explain to the children the design of the school by involving the volunteers and professionals who have worked on this achievement. We will introduce them to the environment. Each window is located opposite a tree!"
“The imposing classrooms of 80m² each have tremendous light. A workshop shared between the classes allows experiments in science, arts, cooking, DIY, etc.). The location of the establishment is pleasant and soothing because we are surrounded by greenery and forest, which allows us to work on the environment.”

The figures speak for themselves given this first observation, the numbers are up with 69 students.

If you had to do it again?

The COVID-19 pandemic has made it difficult to maintain the link with future users during the construction period. Initially, it was planned to continue the participatory approach during the construction site, by creating an observatory on site, which would later become a playground, which was made impossible.

A long period without direct exchanges put some distance between the participants and the project management team, but this was later made up for by organizing several open days adapted to different audiences (children, parents, partners...).

We retain this need to create a link from the design to the delivery of the equipment, in order to allow users to better accept new constructions.

See more details about this project

https://www.devernay-architectes.fr/batimentsbioclimatiques/ecole-le-chat-perch%C3%A9

Photo credit

Devernay Architectes

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**Stakeholders**

**Contractor**

Name : Commune de Quistinic  
Contact : M. Le Maire  
[https://www.quistinic.fr/](https://www.quistinic.fr/)

**Construction Manager**

Name : Florence Devernay  
Contact : Florence Devernay - florence[aj]devernay-architectes.fr  
[https://www.devernay-architectes.fr/](https://www.devernay-architectes.fr/)

**Stakeholders**

**Function :**  
**KONSTRUKTIF**  
Stéphane Saltzmann  

**Function :** Thermal consultancy agency  
**BATITHERM CONSEILS**  
Guillaume TOBIE  
[https://www.batithermconseils.com/](https://www.batithermconseils.com/)

**Function :** Structures calculist  
Acoustique et environnement nord ouest  
Maxime CAUCHETEUX  
Acoustic

**Function :** Company  
**Echopaille**  
Sébastien Chameroy  
[https://www.echopaille.fr/](https://www.echopaille.fr/)

Wood construction and straw insulation, exterior joinery
Contracting method

Other methods

Energy

Energy consumption

Primary energy need: -34,90 kWhE/m².an
Calculation method: RT 2012
Breakdown for energy consumption:
- Heating: 14.3
- Cooling: 0
- DHW: 2.2
- Lighting: 11.1
- Auxiliaries: 12.2
- Photovoltaic: -74.9

Real final energy consumption

Final Energy: -13,70 kWhE/m².an

Envelope performance

Envelope U-Value: 0,20 W.m².K⁻¹
More information:
- Strong insulation of opaque walls: thermal transmission coefficient Up < 0.15 W/m².K for walls, floors and roofs.
- High performance glazed walls: thermal transmission coefficient Uw < 0.80 W/m².K for joinery.
- Absence of thermal bridges: in addition to the specific performances of the opaque and glazed walls, the latter must be implemented in such a way as to avoid thermal bridges.

Renewables & systems

Systems

Heating system:
- Electric radiator

Hot water system:
- Individual electric boiler

Cooling system:
- No cooling system

Ventilation system:
- Double flow heat exchanger

Renewable systems:
- Solar photovoltaic

Renewable energy production: 132,00 %

Other information on HVAC:
Ventilation: double-flow central CTA Gold RX 14
Smart Building

BMS :
Installation by the municipality of a GTB to manage the municipal buildings.

Environment

Risks
Hazard to which the building is exposed :
- Earthquake
- Snow weight

Risks measures put in place :
Sizing of structures according to the snow and seismic hazards of the site.

Urban environment
The school is located in a rural environment, on land on the edge of the forest. Pedestrian traffic is planned from the town center via gentle paths, crossing existing and valued sunken paths. Connections with school transport have been studied in order to offer a stop as close as possible to the entrance to the site, while securing pedestrian crossings.

The green spaces are managed by the technical services of the municipality, engaged in a Zero phyto approach since 2010. The fence of the site, made of chestnut fence, more durable and requiring no treatment.

Land plot area : 7 235,00 m²
Built-up area : 15.12 %
Green space : 5 624,00

Products

Product
Straw
Iso/en Paille
contact@isolenpaille.fr
https://www.isolenpaille.com/
Product category : Finishing work / Partitions, insulation
Producers of straw bales in different sizes
This supplier allowed us to supplement the local production of straw on the site of the municipality for the realization of the project of the public school of Quistinic. The Echopaille company regularly trusts this supplier for its isolated straw bale projects.

Glued laminated timber (BLC)
MM Masterline
olsberg@mm-holz.com
https://www.mm-holz.com/en/
Product category : Structural work / Structure - Masonry - Facade

Wood wool
Steico
contact@steico.com
https://www.steico.com/fr/
Product category: Finishing work / Partitions, insulation
Biosourced insulation, construction systems for roofs, walls and floors
Easy to install, very high thermal performance

Wood joinery
Menuiserie Le Bodic
Menuiserie Le Bodic - Bieuzy-Lanvaux 56330 Pluvigner - Tél. : 02 97 56 01 76
https://www.menuiserie-le-bodic.com/

Product category: Structural work / Carpentry, cover, tightness
High performance local wood joinery

Natural linoleum flooring
Forbo
Forbo Flooring Systems France - 63, rue Gosset BP 62717 51055 Reims Cedex - France

Marmoleum is a unique linoleum floor covering made from natural raw materials such as linseed oil, wood flour, limestone, resin and jute. Marmoleum has been recognized by organisations, third parties and independents: notably the Nordic Swan, Blue Angel and Nature Plus labels.
In addition, Marmoleum linoleum floors contribute to meeting the HQE, BREEAM or LEED certification procedures for buildings, or within the framework of a "bio-sourced building" label.
Ease of installation and long-term maintenance.

Costs

Construction and exploitation costs

Cost of studies : 152 220 €
Total cost of the building : 1 358 445 €
Subsidies : 800 000 €

Additional information on costs:
The photovoltaic panel installations were taken care of by Morbihan Energies

Circular Economy

Reuse: same function or different function

Batches concerned by reuse:
- Indoor joineries
- Outdoor joineries

For each batch: Reused Materials / Products / Equipments:
Exterior joinery: reuse of the 2 existing exterior joinery on the adjoining wall with the Childhood Centre.
Interior joinery: reuse of 18m² of chestnut cladding located on the north face of the Childhood Centre.
Field of use and material origin:

Exterior wood furnishings:
- Joinery 1 - Le Bodic joinery in chestnut reusing a 100x120cm tilt and turn leaf - triple glazed
- Joinery 2 - Le Bodic joinery in chestnut reusing a 100x120cm inward opening leaf – triple glazed

Interior woodwork: reuse of 18m² of chestnut cladding placed on the north face of the Childhood Centre, to create the interior paneling.

Health and comfort

Water management

Consumption from water network: 12.00 m³
Water Consumption/m²: 0.02
Water Consumption/Pupil: 0.14

Comfort

Temperature level:
Conventional interior temperature "Tic" = 33.7°C, lower than the reference TIC (37.6°C)

Carbon

Carbon sink

Local wood (regional and national), local straw (grown and harvested in the municipality), local soil

Initiatives promoting low-carbon mobility

Installation of electric charging stations in the bicycle shelter, promotion & securing of pedestrian circuits in the town, installation of occasional school transport on donkeys ("the ânibus").

GHG emissions

GHG in use: 1,80 KgCO₂/m²/anné
Methodology used:
Calculations made with ThermACV version 1.5.12 of 04/24/2019
Calculations made with the Inies Base of 04/23/2019
GHG before use: 1 266.00 KgCO₂/m²
Building lifetime: 50.00 année(s)
, ie xx in use years: 703.33

Life Cycle Analysis

Contest

Reasons for participating in the competition(s)

Ce projet est situé dans la commune de Quistinic, engagée dans le développement durable depuis plusieurs années, à travers la revitalisation de son centre-bourg, et de la construction d’un Pôle Enfance Jeunesse en matériaux biosourcés en 2014, qui a été primé aux Trophées du Développement Durable. L’objectif est de créer un site dédié à l’enfance, autour du Pôle Enfance existant, permettant de mutualiser les besoins (bibliothèque, salle de sieste et salle de motricité).

Ce projet collectif, impulsé par et pour les habitants, s’est déroulé de la conception (ateliers participatifs pour réaliser un programme ambitieux) à la réalisation (chantiers participatifs isolation paille et enduits terre) avec le soutien des futurs usagers.

Cette construction, où l’on prend conscience en faisant, sert d’outil pédagogique, depuis sa conception jusqu’à son usage quotidien, afin de sensibiliser ses usagers aux techniques de la construction durable.

Building candidate in the category
Prix du public