


School in Montrottier

by [Tekhne Architectes](#) / 2013-02-04 18:42:27 / France / 10913 / FR

New Construction



Primary energy need :

-2 kWhep/m².an

(Calculation method : RT 2005)

ENERGY CONSUMPTION

Economical building *Building*

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

Energy-intensive building

Building Type : School, college, university
Construction Year : 2011
Delivery year :
Address 1 - street : Grand'rue / Place des Cèdres 69770 MONTROTTIER, France
Climate zone :

Net Floor Area : 1 465 m² SHON
Construction/refurbishment cost : 3 883 000 €
Cost/m2 : 2650.51 €/m²

Certifications :



General information

SUB Award 2013 :

Located in the heart of the village, school strengthens village life and becomes a support to teach children the ecological transition through a low consumption and positive energy building.

Winning project of Prebat 2010 and monitored by ADEME for two years, the school Montrottier infrastructure already incorporates the city of tomorrow.

The bold choice of the client to implement the new kindergarten and elementary school in the village center, the result of the willingness of the municipality to strengthen the heart of the medieval village and refocus its urban development.

Fragmentation of the school shifted two bars (one cozy kindergarten and other elementary), installs the equipment in the topography while managing courses flat and sheltered from the wind. Classes benefit from this privileged position balcony: the distant views are spectacular. Very advanced in its environmental features, like all projects of the agency Tekhne, the project led by the mayor enthusiastically shows no ostentatious effects, but already promise performance.

The narrow and elongated tenement is oriented in the long axis NNE / SSW, along shady and cold winds from the west, he wore a contradiction between the most favorable solar orientation, comfortable outdoor spaces and the development of exceptional views. To answer this context, the project is close to the natural terrain of its contours: two rectangular strips oriented SE / NO but not parallel, hosting the program simply, for each school building. The adjoining walk-in are well protected vents.

Underground parts, constituting the base of the equipment, are reinforced in concrete and treated to be similar to the set of stairs and walls around. Above, the wood takes over the frame, cover and cladding. The galleries of distribution, real spaces servants comforts thermal, luminous and acoustic classes and workshops, emerging blankets to take the day to the north.

Their pan roof sloping field receives a photovoltaic sensors, still claiming their role energy to the project. Energy design of this project is guided by sobriety triptych / efficiency / renewable energy. The objective of forecast consumption reached a CEP ref. least 65% of the level of the BBC + RT 2005.

With regard to sobriety, the envelope has been made to ensure a very important level of isolation and a perfect air tightness (25 cm by 24 cm walls and roof). Regarding efficiency, the original design of the double-flow ventilation plays a major role:

- In winter mode, the heat from the exhaust air preheated by the solar circulation galleries facing south, are returned by the Central turbofan fresh air blown into classes. The recovery rate is maximum and heating almost guaranteed. Complement achieved by low temperature underfloor heating.

- In mid-season, when outside temperatures allow it, teachers are encouraged to open the windows for fresh air. Blue light associated with a CO2 sensor informs the air quality in their class. When the windows are open, the fan motors stopped. The school staff is expected to be an actor aware of the energy savings of the building.

- In summer, the refresh uses local asset altitude. The free-cooling: fresh air sweeps night classes and is extracted by natural draft through the chassis high circulation galleries whose windows are controlled by the PLC of Management Systems.

Finally renewables are not left behind. The wood boiler installed at the bottom of the school supplies a heating network serving the school, the cultural center with a nursery, a library, a cinema room and elders room. Two photovoltaic powers cover whole sections of roof on 314 m², producing 39,440 kWh / year, which is twice the power consumption of the school.

Beyond the energy issue, the environmental provisions of this equipment are multiple green roofs and permeable soils, gardens and orchards educational recycling rainwater for watering parks and sanitation, healthy materials, High sound quality premises and circulation, natural light very generous in all local ...

Finally, although the tender was European companies used come mainly from a radius of 100 km around the village nearest the framing business, has his studio at the entrance Montrottier. The economic vibrancy and artisanal Monts du Lyonnais has limited footprint of the site.

Sustainable development approach of the project owner

Chaverot Bernard, Mayor of Montrottier since 2001, has made his school project mandate. "We took our time with the parents." Then makes a long work program definition and visits many buildings to set a very precise specifications. "This is the total of good ideas that matter!" Its commitment to environmental issues led him to convince his fellow citizens of the effectiveness of bioclimatic design and renewable energy. On the findings of a feasibility study conducted by the CAUE 69, he decided to install the new school on reserve land available in the village center. Everyone agrees on the idea of the school, a real village square. The project aims to construct a building simple, "low consumption", with rainwater, creating a network of wood heat boiler replacement and gas very energy photovoltaic equipment. Beyond the building, traffic and service to the school was a sensitive issue for citizens: Bernard Chaverot took advantage controversial "make room for the car but not the whole place." Today the car finds its place in the background under the trees. Points of the most successful achievement for this former teacher are "non-noise" so difficult to get to places of childhood, the "vast natural light" and "non-loss" of energy .

Architectural description

Fragmentation of the school shifted two bars (one cozy kindergarten and other elementary), installs the equipment in the topography while managing courses flat and sheltered from the wind. Classes benefit from this privileged position balcony, which is "fit" the great scenery in theaters: the distant views are spectacular. To hoist the kindergarten level up, stand in the way of a municipal parking Gouttevine home whose location participates in the economic balance of the transaction. The elemental, she is also installed on two levels, with a manway double height that introduces lighting, natural ventilation and solar gain winter. Classes, which have berries on these circulations sunny calm and enjoy the landscape agriculture and forestry, without fear of overheating in mid-season. A fully glazed gallery for whiling away the distant views from the square and the entrance to the school group, the connection between the modules, including the common lobby located in the north gable Elementary. To demonstrate the institution in the public space, the courtyard of the smallest sprocket and the room change form a fine line instead.

Building users opinion

Occupants have noted from the relocation of classes in the new school a marked improvement in the concentration of children they attribute to the sound quality premises and the quality of ventilation.

Daylighting ubiquitous and distant views of the landscape are much appreciated.

The court, as for him, is the joy of bowlers.

See more details about this project

http://www.tekhne-architectes.com/#/architectures/groupe_scolaire_bepos_a_montrrottier_11/

Stakeholders

Stakeholders

Function : Construction Manager

Tekhne architectes

s.viricel@tekhne-architecte.com

<http://www.tekhne-architectes.com/>

Type of market

Global performance contract

Energy

Energy consumption

Primary energy need : -2,00 kWhep/m².an

Primary energy need for standard building : 172,13 kWhep/m².an

Calculation method : RT 2005

Envelope performance

Envelope U-Value : 0,43 W.m⁻².K⁻¹

More information :

level: wood frame and glass wool between joists 20 cm + 10 cm glass wool continues below: concrete isolated from the outside with 15 cm of PES, roof insulation (24 cm) and floors (15 cm), green roof, double glazing insulation and 4/16/4 argon filled with woodwork and sunscreens

Indicator : I4

Air Tightness Value : 0,88

More information

The building is the criterion BBC + Effinergie 2005, but the production of its photovoltaic exceeds the primary energy needs which achieves performance BEPOS (positive energy building).

Renewables & systems

Systems

Heating system :

- Low temperature floor heating

Hot water system :

- Individual electric boiler

Cooling system :

- No cooling system

Ventilation system :

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

Renewable systems :

- Solar photovoltaic
- Wood boiler

Renewable energy production : 102,00 %

Smart Building

BMS :

GTC driver overventilation the natural night ventilation regime classes according to the seasons and the rate of CO2 scenarios heating mode "occupation", the closing of sunscreens circulations, as well as all data

Smartgrid :

The GTC data are sent by internet to the service provider.

Environment

Urban environment

The new kindergarten and elementary is located in the town center following the will of the community to reinforce the heart of the medieval village and refocus its urban development. The opportunity to sufficient land but very steep (9 m elevation), near to which the equipment as the creche, the library and the cinema were, was set up to benefit a school group in a new public space high quality, became central in the town. From the surrounding hills, the storied new building on the slope, fits into the general shape of the village stronghold occupying the top of a hill. He participated in its morphological unit, which is a density of bati, while affirming its contemporaneity, through a wood architecture amidst a singular universe granite.

Products

Product

KWB TDS130

KWB

<http://www.kwb-france.fr/fr/>

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

Boiler 130 kW, 91% yield

Expert Solaire

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

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

In the construction, the two photovoltaic plants are covering whole sections of roof on 314 m², producing 39,440 kWh / year, which is double the power consumption of the school.

Costs

Construction and exploitation costs

Global cost : 3 883 000,00 €

Renewable energy systems cost : 171 000,00 €

Contest



