



Rehabilitation of the family pension "Le Lubidet"

by Emmanuel d'Envirobot Centre / 2019-06-06 13:00:00 / France / 4980 / FR



Primary energy need :
40.1 kWhep/m².an
(Calculation method :)

Extension + refurbishment



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 : Terraced Individual housing
Construction Year : 1900
Delivery year : 2015
Address 1 - street : rue du lubidet 41100 VENDÔME, France
Climate zone : [Cfb] Marine Mild Winter, warm summer, no dry season.

Net Floor Area : 783 m²
Construction/refurbishment cost : 1 256 500 €
Number of Dwelling : 14 Dwelling
Cost/m² : 1604.73 €/m²

Proposed by :



General information

The existing buildings meet an old industrial town with homes that were very outdated. The whole is transformed into a boarding house intended for the reception of people in social difficulty. The facades of housing redeveloped in their original volume keep the memory of places with their southern facade in rubble and brick, while the common premises are the object of a contemporary construction with low consumption. Particular care is taken in the study of the pathways, the organization, the treatment and the framing of the views.

Built around 1900, this site has been **fully renovated to accommodate housing and allow the implementation of a collective space performance and innovative**. This project, combining new construction and renovation, was carried out with the aim of emphasizing the energy and environmental performance of buildings. Thus, the straw material was highlighted as well as the lime-hemp plaster or collective heating wood pellets.

The will of the actors of the project was to rehabilitate the site of this former workers' city (housing of the old stationery built in the 1900s and closed in 1970), in a family pension:

- by keeping the identity and the memory of the site, - by implementing environmental solutions, for a better comfort of the residents,

- by seeking a good balance between energy performance, investment and operating costs, while taking into account the specific characteristics concerning the reception of residents.

Renovation action:

- Of the 10 existing homes, two are destroyed to open the space overlooking the new building which is a collective space.
- The remaining 8 dwellings are redistributed to accommodate 12 duplex units and 2 DRC dwellings fully accessible to people with reduced mobility.
- Demolition and reconstruction of the extension overlooking the street to accommodate the toilets in the DRC
- Two wood pellet boiler rooms are installed in the attic of the two DRC housing units.

Sustainable development approach of the project owner

The choice was made to carry out an exemplary operation on the environmental plan, which was a strong will of the owner, accompanied in this will by the architect and the master builder Fluid BET. Successive adjustments were necessary to achieve this objective and to respect the budget allocated to the operation. After the study of different options, the technical choices were focused on: - A straw insulation for the new building (with an investment in studies and training, followed by a specific straw training of 5 days, made by the architect, and the development in consultation with the wood frame / straw company). Straw is a biobased material, available in close proximity without significant transportation, without excessive cost, sustainable, renewable, and thermally efficient. This choice makes it possible to treat the airtightness and to realize a strong insulation with a capacity of important phase shift, which is very appreciable in summer as in winter (which was even found during construction). - Detailed studies and proposal of Fiabibat BET fluids, in order to arrive at a relatively low operating cost to the tenants (wood pellet boilers, double flow ventilation for common premises, etc ...). For existing dwellings, a thermal correction has been provided by a 8 cm hemp lime insulation of the walls facing the outside (allows to ensure hygrometry regulation and good comfort, while keeping the existing masonry apparent)

Architectural description

A circulation gallery serves housing open to the South; it establishes the link with the common premises located in central part, while the North facade is closed. The accessible toilets consist of small protruding volumes that punctuate the northern facade wood cladding of red blood ox, on the bottom of the rubble wall. The 14 dwellings are served by the gallery on the South facade and benefit from solar gain. For common premises created in a new building, they are located in the central part with an entrance open on street and in communication with the gallery serving dwellings. The slope of the ground being quite marked, the volumetry of the building marries this relief and treats the difference of levels (movement accompanied by both the volume and the recess of roof, and by the shape of the internal staircase). The building largely open to the South allows to take advantage of solar gains while protecting itself from overheating of summer by its overflowing roof; East and West side it is open on outdoor terraces protected by a wide roof overhang, to create spaces conducive to meetings and exchanges between residents who need to renew social ties. On the roof of the common building, the recess between the two parts of roofs allows to provide a high complementary lighting. The different volumes benefit from excellent, well-distributed natural lighting that contributes to the comfort of the premises. On the principal axis of circulation of the building: North-South axis, strongly affirmed, visual breakthroughs are provided and answer each other all along the axis of circulation, (glazed slit North on street, paved glass of the airlock, skydome on circulation and staircase, vertical frame on entrance of the common room). Accessibility has been thought through in detail (with in particular the complete removal of thresholds on 2T2 entrances and access to common East and West terraces).

See more details about this project



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<http://www.lanouvellerepublique.fr/Loir-et-Cher/Communes/Vend%C3%B4me/n/Contenus/Articles/2013/10/02/Une-pension-de-famille-a-la-cite-du-Lubidet-1634602>

<https://www.construction21.org/france/articles/fr/green-solutions-rehabilitation-de-la-pension-de-famille-le-lubidet.html>

Stakeholders

Stakeholders

Function : Contractor

PACT du Loir et Cher (41)

accueil@pact41.fr

<http://www.pact-habitat.org/centre.html>

Project management

Function : Contractor representative

PACT d'Indre et Loire (37)

pact37.tours@wanadoo.fr

<http://www.pact-habitat.org/centre.html>

Assistance with project management

Function : Construction Manager

SCP Lemaire - Jean Marie LEMAIRE

02.54.73.19.77

<http://www.scp-archi.fr/index.php>

Mastery of work and architecture

Function : Thermal consultancy agency

FIABITAT

contact@fiabitat.com

<http://www.fiabitat.com/>

Thermal study

Function : Structures calculist

BET 3IA

troyes@3ia.fr

<http://www.3ia.fr/>

Study of the structure

Function : Others

SOCOTEC BLOIS

02 54 55 76 70

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

Control office

Function : Construction company

CONSTRUIR'ECO

contact@construireco.org

<https://www.construireco.org/contact/>

Bio-based materials company

Function : Construction company

MENUISERIE Entreprise BMCC

b-m-c-c@wanadoo.fr

<http://www.bmcc.fr/photos>

Joinery, carpentry hedges

Energy

Energy consumption

Primary energy need : 40,10 kWh/m².an

Calculation method :

Breakdown for energy consumption : The consumptions quoted above refer to the "built" part of the building knowing that no standard calculation has been made.

Envelope performance

More information :

For the new part: Wooden frame boxes with I beams, outdoor rain panel made of wood fiber, panel internal bracing, isolated in straw bales, (prefabricated caissons in the workshop), arched roof with I-beams, isolated in straw bales laid on site and complementary glulam beams according to the staves.

For the renovated part: hemp lime plaster on the walls and timber / straw frame on the roof.

Indicator :

Air Tightness Value : 2,42

Users' control system opinion :

Building airtightness The final tests gave the following results: Rehabilitation: Q4 = 0.64 m³ / m² / h -n50 = 3.32 vol / h Nine: Q4 = 0.53 m³ / m² / h - n50 = 1.51 vol

More information

Part rehabilitated (Housing): - Conventional consumption: 155 kWh / m².an - Of which heating: 97 kWh / m².an New part (Reception building): - Conventional consumption: 103 kWh / m².an - Of which heating: 20.5 kWh / m².an

Renewables & systems

Systems

Heating system :

- Water radiator
- Wood boiler

Hot water system :

- Individual electric boiler
- Wood boiler

Cooling system :

- No cooling system

Ventilation system :

- Single flow
- compensated Air Handling Unit
- Double flow heat exchanger

Renewable systems :

- Wood boiler

Other information on HVAC :

The two wood pellet boilers of 12kW are relayed by low temperature radiators. The overall regulation is by housing with thermostatic valves per room. The ducts are made in isolated volumes.

One of the wood boilers ensures the production of DHW as well as additional heating.

Environment

Urban environment

Land plot area : 783,00 m²

The building is located near agricultural plots but has some shops nearby as well as a shopping center. It is also close enough to the city center of Vendome. Located on the edge of a busy street, but with a narrow sidewalk and facing a hill, the whole was "turned over" so that the accesses are done South side formerly garden, thus opening large collective spaces and a view on A non-constructible meadow. The original style of the workers' buildings has been preserved and they continue to "respond" stylistically to the premises of the old paper mill which are a hundred meters on the banks of the Loir. These, now renovated welcome shops and are part of different industrial groups of the same period spread throughout the city of Vendome. The immediate area of the center of Lubidet consists of old houses or pavilions of the immediate after the war. The bias of keeping the style was logical.

Products

Product

Box of straw

CONSTRUIR'ECO

contact@construireco.org

<https://www.construireco.org/>

Product category : Gros œuvre / Structure, maçonnerie, façade

The caissons (37.2 cm) are to be filled directly on site because the shape of the roof does not allow prefabrication.

In addition these boxes are delivered closed on the site.



The initial project did not involve bio-based materials and was based on a classic construction method. The proposal to use bio-sourced materials was made by the thermal design office and adopted very quickly. The project manager as well as the companies did not know this constructive mode and this generated some difficulties (technical descriptions, need for the architect to follow a formation to be assured, ...)

Costs

Construction and exploitation costs

Total cost of the building : 1 256 500 €

Additional information on costs :

Cost of the new operation: € 815,000 excluding tax

Cost of the rehabilitation operation: 441 500 € HT

Health and comfort

Comfort

Health & comfort :

In addition to the use of biobased materials mentioned above, particular care has been taken in the new common room, which enjoys high energy performance, enabling residents to meet in a comfortable place. The VMC double flux is equipped with a CO2 sensor. Moreover, the concept of comfort for this type of structure is a little different from a traditional habitat. Social contact is an integral part of comfort. Building a comfortable, well-oriented walkway leading to homes on the south side, encourages meetings between people. It brings, as the comfortable common room, a space of "comfort" or social reintegration to people in difficulty. The choice was also made to stay on traditional solutions in housing regarding ventilation, manual opening or the presence of small hot water balloons. Combined with the renovation of the old building, this offers a very good comfort, while limiting the cost of maintenance and repairs in case of damage. The choice to promote manual gestures for ventilation in the private areas is also an interesting bias, knowing that the public welcomed requires some tenants to get back to the reality of everyday life and its small gestures. To support the residents in the management, in complete autonomy of their home, acts of their daily life and support them in the expression within a group, a professional team is present and occupies part of this building.

Carbon

Life Cycle Analysis

Eco-design material :

Wood, straw, lime plaster, hemp plaster

Contest

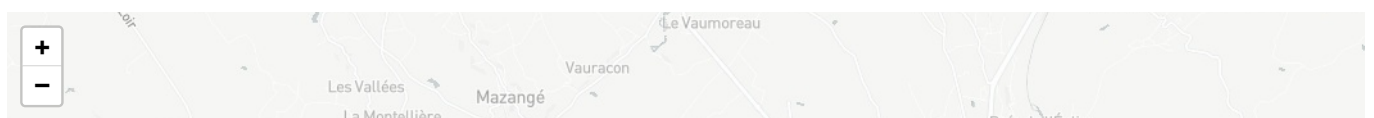
Reasons for participating in the competition(s)

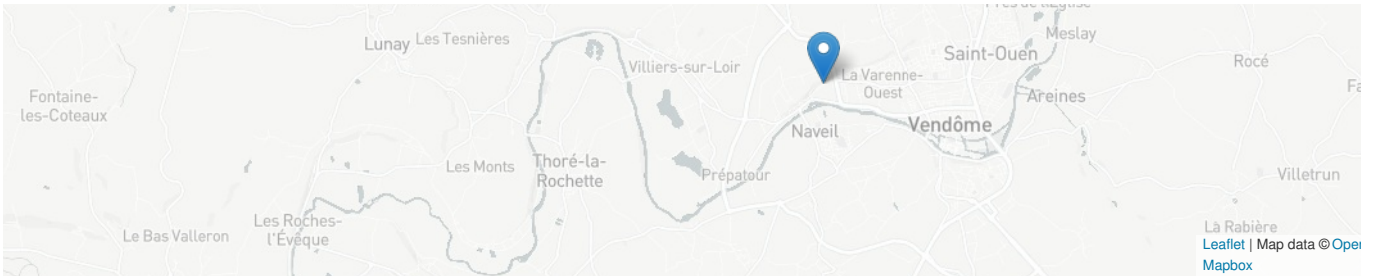
The approach to the Lubidet project is based on a **compromise between energy performance, respect for heritage and the economic constraints of construction and maintenance** .

Also aimed at vulnerable people, this housing complex has been renovated in order to promote "socialization" and meetings. The central houses have been razed to allow the establishment of an efficient and innovative collective space, while a circulation gallery serves housing on the southern side. Accessibility has been thought through in detail (with in particular the complete removal of thresholds on 2T2 entrances and access to common East and West terraces). The comfort sought is different from a traditional, but real, residential building.

The architectural aspect of the existing facades has been preserved, limiting the thermal performance of the one to the south. Nevertheless, solutions have been found (lime / hemp plaster) to reduce the cold wall sensation which directly impacts on the sensation of thermal comfort and therefore of energy consumption.

Finally, the choice has been made to give **priority to wood and biobased materials for a better comfort of residents** with the use of wood / straw boxes, wood wool (rain cover), laminated wood and coated lime / hemp .





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