Farmhouse in Lurais

by Emmanuel d'Envirobat Centre / 2019-06-17 20:55:50 / France / 6132 / FR

Primary energy need :
kWhep/m^2.an
(Calculation method :)

Building Type : Isolated or semi-detached house
Construction Year : 1700
Delivery year : 2017
Address 1 - street : Le bourg 36220 LURAIS, France
Climate zone : [Cfb] Marine Mild Winter, warm summer, no dry season.

Net Floor Area : 75 m^2
Construction/refurbishment cost : 137 000 €
Number of Dwelling : 1 Dwelling
Cost/m2 : 1826.67 €/m^2

General information

This small farmhouse (late eighteenth), although it is modest by its architecture, occupies an important place in the center of the village of Lurais. It closes the public space located between the inscribed church MH, the Town Hall, classified patrimony of the twentieth century and the castle of Lurais which dominates the Creuse. This has determined the municipality to undertake the heavy rehabilitation of this rental housing.

This could be done in the framework of the experiment "Low Consumption Heritage" of the Regional Natural Park of Brenne because this house presents the typology traditional of the rural houses of the territory and the solutions of rehabilitation biosourced experimented here will be able apply to a large number of private homes.

This house was built on the principle of the farmhouse, that is to say several modules of 4.5 m wide (corresponding to the length of wood available for the joist), contiguous to walls of 0.45 to 0.55 depending from the time of construction. Even though it was still living a year ago, it had been without long-term maintenance. The choice was made of biosourced materials that are or can be produced locally (hemp and straw), in order to propose the development of short circuit solutions for the general public.
Hemp lime renders in thermal improvement respond particularly well to the question of the airtightness of the walls. Although less efficient in terms of insulation, they improve thermal comfort and maintain summer comfort-high quality of the old building.

Sustainable development approach of the project owner

Project based on biosourced materials that are or can be produced locally (hemp and straw), in order to propose the development of short circuit solutions to the general public.

Architectural description

This house was built on the principle of the farmhouse, that is to say several modules of 4.5 m wide (corresponding to the length of wood available for the joist), contiguous to walls of 0.45 to 0.55 depending from the time of construction. The roof had to be redone completely identical, including the frame, with removal and rests of the dormers of origin. A gable wall, strongly pushed by the frame, was cut down and rebuilt. The first wall of roof was cut down to create a large living room and a bedroom. The chimneys have been demolished and the bathroom space -WC has been enlarged to meet disabled accessibility standards. This allows to have a bathroom lit by a direct day. The outdoor area is also equipped for disabled accessibility. However, the dimensions of the doors of the house have not been modified to maintain the original facade

See more details about this project

http://www.envirobatcentre.com/envirotheque/observatoire-des-realisations/fiches-envirobat/biosource/longere-lurais-277.html?article=2971
https://www.parc-naturel-brenne.fr/telechargements/category/25-patrimoine-culturel-architecture-paysages

Stakeholders

Contractor

Name : Commune de Lurais
http://www.communedelurais.com/accueil.htm

Construction Manager

Name : Pascal Dies
Contact : maisons.en.brenne[at]wanadoo.fr
http://www.maisonsenbrenne.fr/

Stakeholders

Function : Thermal consultancy agency

Energio

accueil[at]energio.fr

http://www.energio.fr/

Function : Company

Bremaud Charpente

02 54 28 61 32

http://www.bremaud-charpente.fr/

Function : Company

Entreprise Kavinski

02 54 37 32 86

Function : Company

Les bâtisseurs du Berry

batisseurs.du.berry[at]wanadoo.fr

http://www.batisseursduberry.fr/

Function : Company

Entreprise Duval

dumartial[at]wanadoo.fr

https://sarl-duval.jimdo.com/

Function : Company

BHM Barre

02 54 37 93 80

http://www.bhm-barre.fr/

Energy

Energy consumption

Breakdown for energy consumption : Need for heating: 50 to 60 kWhep / m2.an

Initial consumption : 489,00 kWhep/m^2.an

Real final energy consumption

Final Energy : 56,00 kWhef/m^2.an

Envelope performance

More information :

- Low floor: R = 2.5 m2.K / W

Completely filed to make a concrete slab hemp lime 25 cm thick. The finish is done traditionally with re-used terracotta tiles laid on a natural lime mortar screed.

- Roofing: The frame was deposited and rebuilt in oak in a traditional way. The roof was made of flat tiles for re-use. Supply and installation of a screen of under roof with contre-liteaunage.The dormers are rested with the identical with realization of a valley crossed in tiles. In the attic, a lime flashing is placed on the periphery to achieve a mechanical seal. On the whole surface of the high floor: Installation of a steam brake membrane SD = 12 glued on the flashing on the periphery of the building and taped between them to ensure the airtightness.Above this membrane poses d insulation in straw bales R = 7.1 m².K / W. Residual spaces are filled with straw or wood wool. Realization of a rodent protection on the thermal insulation.

SAS: Bathroom and laundry: insulating wall in wood frame including (Ext to int):
-Woodwood side woodwork + 12mm OSB bracing,
-Wooden structure of 145 mm insulated between uprights by 140 mm of wood wool (λ = 0.038 W / m.K-structure on a basement wall, waterproof resi-binding),
-Fresh steam
-Woodenwood Grab + Fermacell Plates
-Management of the airtightness of the connection between wood frame, ceiling and penetrations of joists.

Peripheral walls: The walls are built of sandstone limestone mounted on sand (sandy clay soil which serves as a binder).
West gable wall: Demolished and rebuilt on foundation in BA, external buried waterproofing and waterproof arase. Wall masonry made of bricks (Type Bio'Bric - R> 1,45m².K / W). Projected hemp lime rendering (λ ≤ 0,07 W / K.m) to the machine with a thickness of 15 cm + 2 cm of finishing.
North wall (without opening): Plaster lime hemp sprayed with the machine of a thickness of 15cm + 2 cm of finish.
South wall: Plaster hemp lime projected thickness of 5cm + 2cm of finish.
East Sprocket (laundry side): Stone plaster facing the room side. Extension insulation wood frame + wood wool

Joinery and shutters full

Air Tightness Value : 0,55

Renewables & systems

Systems

Heating system :

- Electric heater
- Wood boiler

Hot water system :

- Other hot water system

Cooling system :

- No cooling system

Ventilation system :

- Humidity sensitive Air Handling Unit (Hygro B

Renewable systems :

- No renewable energy systems

Other information on HVAC :

Heating and Emitters: Pellet stove (1 to 4.5 KW 90% efficiency) & electric radiator dry towel for the bathroom (Power 500 W).

Hot Water Sanitary: Thermo-dynamic water heater, vertical, on base floor insulation of 30 cm, (200 liters -COP> 3) Air intake in the attic (temperate, or even preheated during hot periods).

Ventilation: Simple humidity-controlled flow type B-low extractor con-summation. The unit and the ducts are placed in the attic. The rejection of the air is channeled at the outlet by the conduit paired with that of the chimney

Environment

Urban environment

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Products

Product

Bio'Bric

https://biobric.com

https://biobric.com

Product category : Structural work / Structure - Masonry - Facade

Costs

Construction and exploitation costs

Total cost of the building : 137 000 €

Health and comfort

Indoor Air quality

The measurement of the air quality was planned before occupying the dwelling.

Comfort

Health & comfort :

The instrumentation set up after work allows:

- Measure heat efficiency gains in consumption and comfort.
- Check the drying and moisture management of hemp lime renders

Carbon

Life Cycle Analysis

Eco-design material :

Materials implemented

- Structure: Walls of limestone rubble and bone-wood
- Insulation: Wood wool / Straw boots
- Thermal correction: Hemp lime
- Exterior coating: Lime plaster

Quantity Bio-based materials

- Total project area: 75 m² (S.Plancher)
- Total mass of MBS implemented: 165 Kg / m²
- Mass non-wood work and layout: 91 Kg / m²

Complementary elements

- Straw from local agriculture.
- Reuse of materials from deconstruction.

Contest

Reasons for participating in the competition(s)

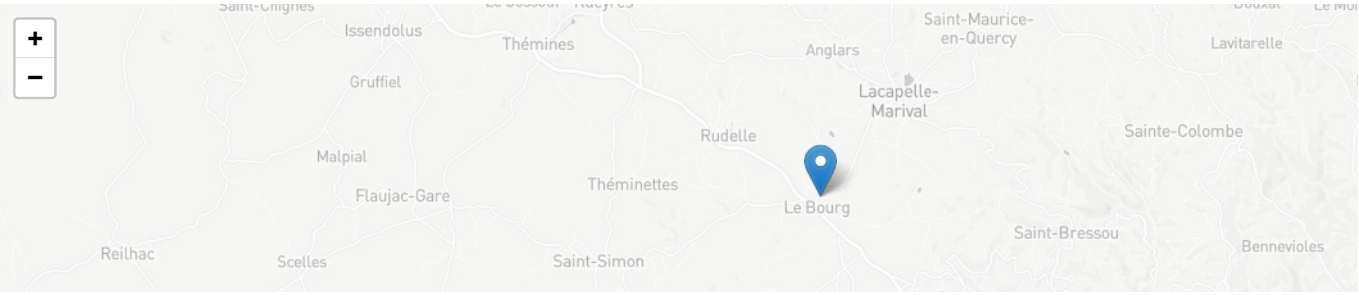
- Rénovation patrimoniale biosourcée
- Respect du bâti ancien
- Performances énergétiques de premier ordre

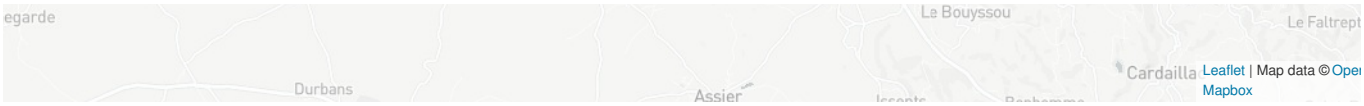
Building candidate in the category

Energie & Climats Tempérés

Prix du public

Prix des Etudiants





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