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BEST PRACTICES AS FOR SUSTAINABLE CONSTRUCTION AND RETROFITTING OF BUILDINGS IN THE RHÔNE-ALPES REGION

EXAMPLE OF GOOD PRACTICES RESTRUCTURING AND REHABILITATION OF THE PAJAY TOWN HALL

RhôneAlpes Région

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Introduction

Works correspond to the restructuring of the town hall also involving the construction of a new board-room and the rehabilitation of two units on the first floor of town hall. The set is 330 m². The operation was delivered in February 2012 Thermal calculation shows that the building performance approaches BBC standard (Low consumption building) with a consumption of primary energy of - 45% of the conventional reference.

Context and objectives

Elected reprentatives wanted to make this city hall an exemplary project and in collaboration with the CAUE (Architecture, town planning advice centre) they have defined an ambitious objective. Works for energy savings : reinforced insulation, airtightness (two infiltrometer tests conducted), and humidity sensitive ventilation and efficient joinery, while keeping the historic facade.

Description

Building use
The existing part consists of a ground floor which houses the reception of the town hall and offices and at the 1st floor two flats. The extension includes the boardroom and toilets.

Heating
Pelets automatic boiler (HARGASSNER 32 kW)

Domestic Hot Water
Solar/Electric dual energy preparer
Solar collectors DE DIETRICH NEO 2.1, collectors surface: 4.2m ²
A dual energy tank of 370 domestic water liters by housing

Ventilation.
Simple Controlled Mechanical Ventilation flow B.

Lighting and electrical equipment.
Low consumption light fittings, presence detection, brightness adjustment based on the light.

Final energy consumption (heating, operating auxiliaries, ventilation and lighting).
36 kWh/m².year for heating

Insulation and joinery

Existing part
Walls : Pebbles + insulation with cellulose wadding 200mm (R = 5,5 m².°K/W) + vapor barrier
Roof : Mineral wool insulation in attics 300mm (R = 7,75 m².°K/W)
Joinery : Wood, double glazing low emissivity (Uw = 1,4 W/m².°K)
Low floor : Insulation 40mm de polyurethane in concrete pavement (R = 1.70 m².°K/W)
Floor between town hall and flats : Wood, underside insulation 100mm of mineral wool (R ≥ 2.50 m².°K/W)

Extension
Walls : wood frame + mineral wood insulation 200mm (R = 6,6 m².°K/W) + vapor barrier
Roof : wood terrace, polyurethane insulation 200mm (R = 8,3 m².°K/W)
Joinery : wood, triple glazing low emissivity (Uw = 1 W/m².°K)
Low floor : Insulation 100mm Polyurethane (R>4,35) + concrete pavement

High Environmental Quality approach
The environmental approach has resulted in the adoption of a High Environmental Quality approach articulated around the concepts of energy efficiency, water management (with the initial retrieve water rain), and indoor air quality in particular.

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Budgets, costs and financing

Investments :
893 000€ all taxes included

Public financing

Main results

	Energy performance
PEC* reference (net surface)	149,60 kWhep/m² /year
PEC* project (net surface)	81,72 kWhep/m² /year
Expected gain	45,37%
$Q_{4PaSurf}$ (test result)	0,57 m³/(h.m²)

***** - *for heating, domestic hot water, lighting, ventilation, cooling and electrical auxiliaries***

The objective BBC renovation is not reached.

Analysis of information and success factors

The difficulty lies in the fact that the building of the cure, transformed in town hall is a traditional building in “pisé” (adobe) whose situation is central to the village. It was therefore necessary to conciliate the energy performance and the architectural character of the façade.

- **The thermal insulation** is not sufficient for the BBC renovation performance level. All surfaces have been treated : walls, glazed surfaces, roof and low floor. The objective is to make a continuous insulating layer floor-wall-ceilings. The quality of insulation and its good implementation are the main elements for the thermal performance of the building.
- **Airtightness** is obtained by placing a continuous film impervious to air acting as a barrier between the interior and the exterior. An airtightness test has been carried out after the placing of the film and some airtightness defaults have been corrected. A second test was performed at the end of construction to ensure that the value of air permeability was consistent with the regulatory calculation.

Dates and duration

Start of the project : July 2009
Beginning of construction : October 2010
Moving : February 2012

Contact

Town hall of Pajay
Mairie de Pajay - 15 place du 19 mars 1962 - 38260 Pajay
mairepajay@orange.fr Tel 33 4 76 38 11 05

info@mountee.eu - www.mountee.eu

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