Rehabilitation of an old barn and transformation into an associative and intergenerational house

by Marc-Olivier Luron / 2022-06-17 00:00:00 / France / 1109 / FR

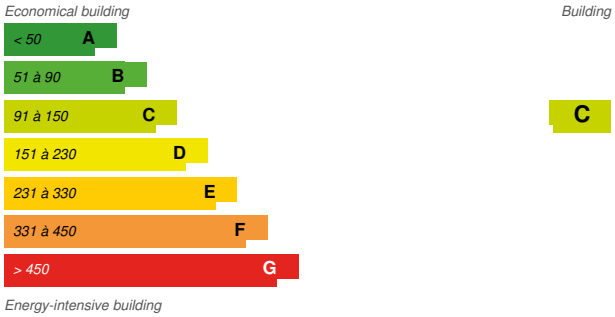
Extension + refurbishment

Primary energy need :

144.7 kWhep/m^2.an

(Calculation method : RT 2012)

ENERGY CONSUMPTION



Building Type : Other building
Construction Year : 2020
Delivery year : 2021
Address 1 - street : rue Neuve 57330 ROUSSY-LE-VILLAGE, France
Climate zone : [Dfb] Humid Continental Mild Summer, Wet All Year

Net Floor Area : 778 m^2 SHON
Construction/refurbishment cost : 2 300 000 €
Number of none : 1 none
Cost/m2 : 2956.3 €/m^2

General information

The town hall project in Roussy-le-Village aims to rehabilitate the existing heritage of the town and **develop community life** in the heart of the village by **promoting accessibility** for all.

The old barn-cowshed and the fortified house of Roussy-le-Village are remarkable **heritage elements**, listed, and contributing to the identity of the town. They are not monuments but built testimonies of the organization of the village during its history. In addition to recalling the presence of the post office and the Maginot line, they create through their location an **explicit urban situation** on what were the limits of the municipality, in extension of the route of the current counter-alley of the of Liberty.

This characteristic of the urban form caught our attention, at the same time as, on the back of the land, the visual clearing of the pre-flood, highlighting the trees and the bed of the Altbach.

The project is based on the search for a functional response to the program and the enhancement of the barn-cowshed.
Intervening in the existing, in the context of a reconversion of this nature, is a real opportunity: it is a question of maintaining in the fabric the "current heritage", which conceals traces of the history of men and techniques , while taking advantage of spatial qualities that are sometimes impossible to justify in new construction.

For the new town hall, the beautiful volume of the barn was perfectly adapted to receive the large activity room. The rest of the program takes place in a compact

extension, in the second body of the building.

The new town hall includes a **large multipurpose room** of 287 m², a **multi-activity room** of 90 m² divisible into two spaces by a movable wall, a **reception hall** with equipped bar, multiple **storage rooms** and **dedicated service rooms** (kitchen , sanitary rooms, technical rooms).

The layout of the site is intended to be qualitative but also logical and rational. Automobile and pedestrian flows are quite distinct. The car park occupies the back of the land, in a flood zone. It does not impede the natural expansion of the Altbach floods, but protects the equipment thanks to the creation of planted embankments between the building platform and the parking lot. Thus structured, the topography forms the separation between the influence of the constructions and the pre-flood.

Land in flood zone

The land has been redesigned to **build above the floodplain** , the car park is located below the project and therefore contributes to the floodable volume. A study of the water law file was carried out to explain the design of the outdoor facilities allowing the neutrality of the volumes added or subtracted in the flood zone.

The car park and its driveway occupy an area equivalent to that of the buildings; it is essential to take into account its visual impact on the site, or from the periphery of the site (voie de la Liberté). Its location below the building platform has the effect of largely hiding the parked vehicles, and leaving the view free on the landscape.

From an environmental point of view, the objective of our project is to **limit energy consumption** by reducing needs and improving energy efficiency. This type of equipment is not subject to RT2012, however the design of the project has endeavored to comply with this standard as a minimum. The project is also a winner of the Climaxion renovation plan.

In addition to the constructive choices (rehabilitation of the existing and wood construction), the implementation of insulation and biosourced materials at all scales of the projects have been valued (lime-based coating, wood cladding without external chemical treatment, wood in walls, interior wood fiber ceilings...).

Photo credit

Benoît BOST

Stakeholders

Contractor

Name : Commune de Roussy-le-Village
Contact : Monsieur le Maire - M. STEINMETZ

Construction Manager

Name : BAGARD & LURON architectes
Contact : M. LURON
http://www.bagard-luron.com

Stakeholders

Function : Company

MULLER TP

VRD / GREEN SPACES

Function : Company

FLB

GO / DEMOLITION

Function : Company

LEBRAS FRERES

WOOD FRAME / MOB

Function : Company

BARTHES B.E. BOIS

structure/VRD

Function : Other consultancy agency

EOLE INGENIERIE

Fluid bets

Function : Structures calculist

VENATHEC

Function : Company

TOUZANNE et associés

Construction Economist

Function : Assistance to the Contracting Authority

MATEC (Moselle Agence Technique)

Energy

Energy consumption

Primary energy need : 144,70 kWhep/m^2.an

Primary energy need for standard building : 150,00 kWhep/m^2.an

Calculation method : RT 2012

Initial consumption : 1 000,00 kWhep/m^2.an

Envelope performance

More information :

Better phase shift with the use of wood wool insulation for vertical walls.
Particular attention paid to airtightness in order to avoid thermal bridges and acoustic bridges (significant requirement on the large room in the existing one).
MainBen of all the existing windows of the barn on the south facade and glazing by Bel of the carriage doors (despite the acoustic constraints) on the south facade as well.
Low-emissivity glazing, very efficient UG 0.9, UW between 1.3 and 1.5.
Double frame system with double glazing for the street facade (attenuation of noise towards the outside).

Renewables & systems

Systems

Heating system :

- Condensing gas boiler

Hot water system :

- Condensing gas boiler

Cooling system :

- No cooling system

Ventilation system :

- Double flow heat exchanger

Renewable systems :

- No renewable energy systems

Environment

Risks

Hazards to which the building is exposed :

- Flooding/Slow flood
- Geotechnical drought (Clay soil shrinkage and swelling)

Risks measures put in place :

The land of the old barn is bordered by the "La Boler" stream. Part of the land is located in a flood zone.
The previous owner carried out demolitions on the building. The rubble was scattered over the plot. The volume of the flood zone is therefore modified over an area greater than 400 m². A water law file should have been filed.

The DDT has therefore given formal notice to the municipality of Roussy-le-village to regularize this situation. The Hydratec agency provided the B&L agency with a topographical survey of the area, carried out via aerial photographs. B&L was therefore able to model the terrain according to the documents used to study the flood zone of the municipality.

B&L's work made it possible to establish a proposal for adapting the terrain. Compensations are proposed in the immediate vicinity of the ground, the aim being to achieve neutrality of the volumes added or subtracted from the flood zone.

To do this, the architects referred to five states of the land:

- The notation "**initial terrain**" refers to the terrain as it was before any interventions, as it was taken into account during the study of the flood zone. This is the reference state for the water policy.
- The notation "**land before dispersion of the rubble**" refers to the terrain as it was after reception of the demolition rubble, but before the piled up rubble was dispersed.
- The notation "**current terrain**" refers to the terrain as it currently is, as the surveyor noted it after dispersing the rubble. This is the state on which the project was built.
- The notation "**planned land**" refers to the land as it is planned after construction of the project, its geometry stems from adaptations made to the current land (extension of the building, development of outdoor spaces, creation of a car park).
- The notation " **planned land with developments** " refers to the proposal for compensation in the immediate vicinity of the site. This final state aims for neutral volumes in the flood zone.

This design was accepted and the project was thus able to exist.

Land in a flood zone : the land has been redesigned to build above the flood zone, the car park is located below the project and contributes to the flood volume. The study provided explains the design of the outdoor facilities allowing the neutrality of the volumes added or subtracted in the flood zone.

Land with clay shrinkage/swelling : design of specific drainage systems under paving and on the outskirts of buildings.

Urban environment

Land plot area : 5 400,00 m^2

Built-up area : 15,00 %

The project is located in the heart of the village.

The site has two entrances from rue Neuve: car access at the south-west corner of the plot and pedestrian access at the south-east corner on the fortified house side.

The pedestrian access is accessible to people with reduced mobility and leads to the forecourt.

This access contributes to the qualification of the entrance to the village through careful landscaping, and offers a functional and secure public space, away from traffic flows.

The forecourt is placed along the east facade of the single-storey building and gives access to the main entrance of the association house.

The car access runs along the south-west boundary of the land, and serves the landscaped car park located at the bottom of the land. The service yard and the catering car park are also served by this road; these technical areas are not visible from spaces accessible to the public.
A 34-space car park is located below the site in order to limit its visual impact by taking advantage of the topography of the land. A staircase to the right of the forecourt allows users to reach the associative house.

Two places for people with reduced mobility are set up at the highest point of the site and are connected to the forecourt by a path along the south facade of the building.

The northeastern part of the land will be slightly revised in its topography in order to maintain the floodable volume of the area as it was originally. These disbursements will offset the earthworks contributions of the project and its car park. Sodding, planting shrubs and trees are also planned.

Products

Product

Weber.cal F - mineral lime plaster allowing the support to breathe on old buildings

WEBER

Product category : Gros œuvre / Structure, maçonnerie, façade

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STEICO flex F 038 - semi-rigid ecological insulating wool made from wood fiber

STEICO

Product category : Second œuvre / Cloisons, isolation

Dual-flow air handling unit

STEICO

Product category : Génie climatique, électricité / Ventilation, rafraîchissement

Costs

Construction and exploitation costs

Cost of studies : 240 000 €

Total cost of the building : 2 300 000 €

Circular Economy

Reuse : same function or different function

Batches concerned by reuse :

- Structural works

For each batch : Reused Materials / Products / Equipments :

Structural work lot :

The major challenge was to keep part of the existing building despite its very serious state of degradation. This bias was a difficult choice given the impact on the work execution schedule. It was nevertheless important to restore the existing heritage and take advantage of the resources of the site rather than rebuilding a "pastiche" of the old barn with new materials.

Three out of four walls of the old building have been preserved and consolidated (significant underpinning).
The arched cut stone openings on the main façade have also been reinforced and restored (staples).

Contest

Reasons for participating in the competition(s)

The town hall project in Roussy-le-Village aims to rehabilitate the existing heritage of the town and develop community life in the heart of the village by promoting accessibility for all. The challenges of this project are of several orders:

- carry out this program in a site in the heart of the town (very strong acoustic regulatory constraint vis-à-vis the neighborhood) ;
- build on a partially floodable area (do not reduce the floodable volume, work and specifically adapt the location of outdoor facilities, etc.) ;
- preserve and enhance a modest heritage building of the town and enlarge it with contemporary and bio-sourced architecture.

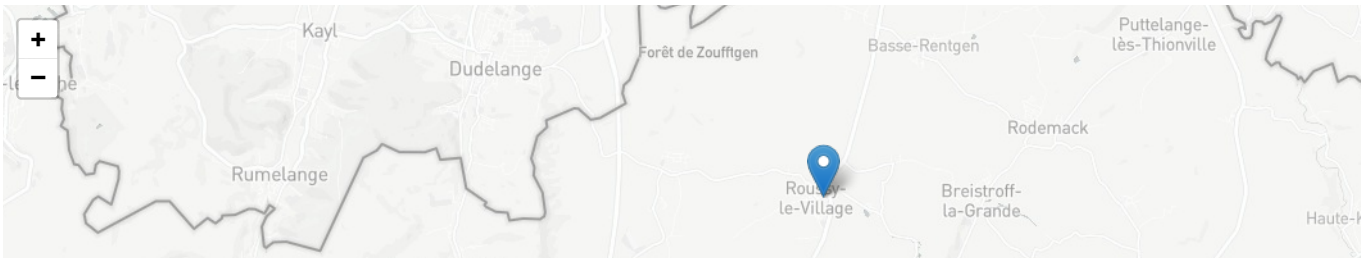
Building candidate in the category

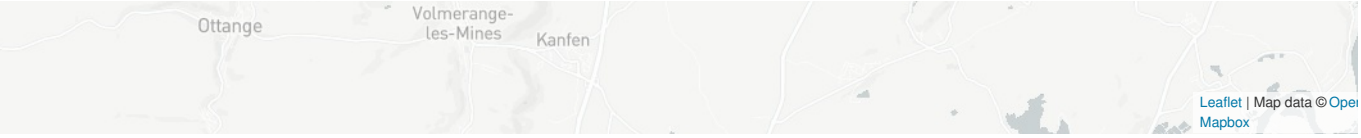
Prix Tertiaire & Industriel

Édition 2022

Trophées

Bâtiments résilients





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