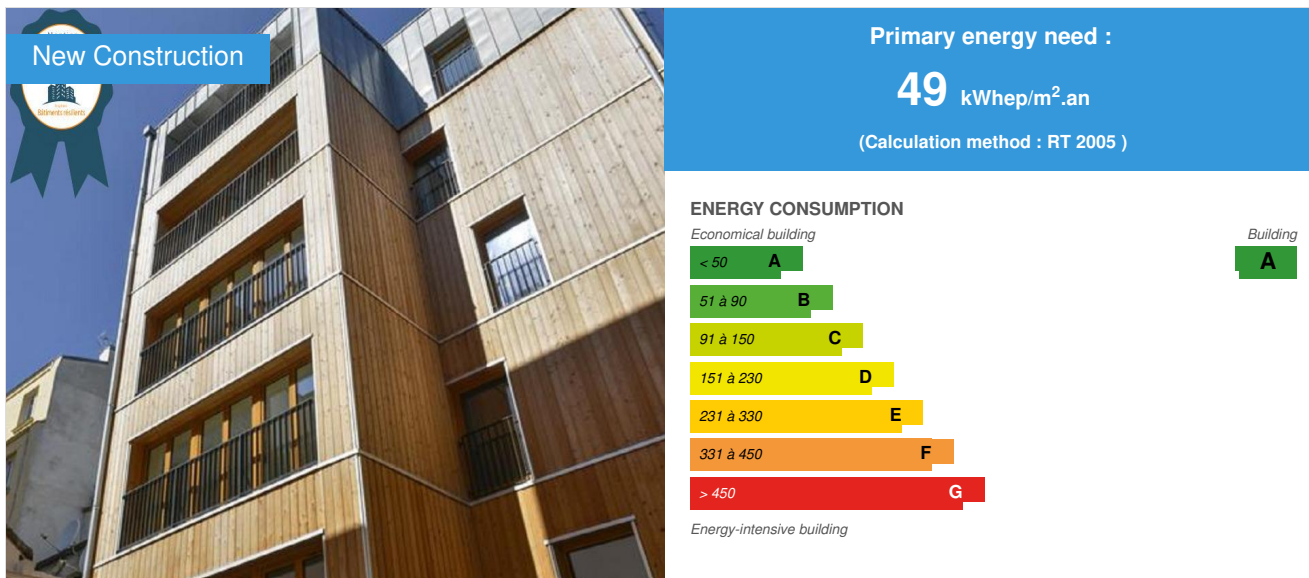


37, rue Myrha

by LM Ingénieur / 2020-07-10 17:52:44 / France / 15229 / FR



Building Type : Collective housing < 50m
Construction Year : 2013
Delivery year : 2014
Address 1 - street : 37, rue Myrha 75018 PARIS, France
Climate zone : [Cfb] Marine Mild Winter, warm summer, no dry season.

Net Floor Area : 570 m²
Construction/refurbishment cost : 1 574 900 €
Number of Dwelling : 4 Dwelling
Cost/m2 : 2762.98 €/m²

Certifications :



General information

The building of 37 Myrha Street in the 18th arrondissement of Paris comprises 4 social housing units (3 T3 and 1 duplex) as well as an activity space. The project, which meets the standards of the Climate Plan of Paris and the Habitat & Environment certification, is the result of a thoughtful environmental approach, notably through the use of an innovative material: hemp concrete. The establishment of two opposite facades, one on street, sober and legible and the other on garden, open and warm, enriches the project by contrast. The search for a constant pattern also gives a profound meaning to these facades which establish a strong dialogue beyond their apparent opposition. The ground floor includes a shelter for bicycles and strollers as well as a commercial space entirely autonomous and adaptable to various functions in order to be perennial and scalable. From R + 1 to R + 3, the houses are T3 of 73m² largely open on the garden. The rooms to be live deployed on the South side, on garden, while on the North, on street, are positioned the rooms and the bathroom. On the R + 4 and the R + 5, a duplex of type T4 / 5 with a surface of 102m² develops which enjoys, on its two levels, a small outdoor space overlooking the garden. In the R + 5, a common terrace accessible to all the inhabitants and bordered by a green roof is set up. The garden imposes itself in the project as a unifying space. Of the apartments, it is the place towards which all the glances converge. It articulates spaces by creating visual links and common uses. Hemp concrete, the main element of the physical and thermal envelope, is a non-structural material combining the qualities of hemp and lime. It brings the following environmental qualities: thermal comfort (inertia and hygrothermal regulation), reduction of losses (treatment of thermal bridges and reinforced insulation), reduced environmental impact of the material (renewable

resources, positive carbon footprint, clean site) Lightweight structure (wood frame) and a wall with a high deformation capacity.

Sustainable development approach of the project owner

As part of the redevelopment of the Château Rouge district entrusted to SEMAVIP by a public development agreement, the City of Paris entrusted the RIVP with the contracting authority for the construction of the building at 37 Myrha Street. The RIVP is committed to this project by requesting that it comply with Habitat & Environment certification. The RIVP enabled the realization of this ambitious project in terms of sustainable development by supporting the use of hemp concrete, an innovative material both in terms of construction and energy performance. Thus, the building at 37 Myrha Street reaches the "A Performance Profile" and is a "Low Consumption Building". It combines an approach of respect for the environment and quality of its architectural dispositions. Indeed, the label H & E allows a reflection on the comfort of the inhabitant, in particular in the logic of use of apartments and in the organization and layout of common spaces.

Architectural description

The difficult terrain and the desire to reinterpret the architecture faubourienne have led the project manager to choose a light construction principle associating metal structures and hemp concrete. Respect for the site and architectural sobriety, the response to technical constraints and the pursuit of sustainable development objectives have been the priorities of the project management. For a good integration of the project in its environment, obedience of the lines of composition to a strong horizontal logic has been opted. It is a question of balancing the verticality of the volume by the use of several devices: the ground floor forming a substructure, the formal partition of levels, the partition of materiality on the façade, and the cornice to avoid water run-off. Thus, the façades revert to the faubourian codes. On the street side, the project displays a smooth façade creating a continuity and a reading of the ordinary city of Faubourg. On the garden side, it is the look towards the nature which is privileged, with a planted garden and a warm diversity of the facades. This one is perceptible from the street and the building creates a set of transparencies from the public space. The building on 37 Myrha Street is an interpretation of the furbish building, taking into account today's realities of use and sustainability.

Stakeholders

Stakeholders

Function : Contractor

RIVP

<http://www.rivp.fr>

Function : Designer

North by Northwest Architectes

Christine Désert et Richard Thomas - 42, rue d'Avron - 75020 Paris - Tél : 01 47 70 03 08

<http://nxnw.fr/>

Function : Other consultancy agency

LM Ingénieur

Laurent Mouly - 13, rue Chapon - 75003 Paris - Tél : 01 40 29 96 92

Design office, thermal, envelope

Function : Others

MDETC

Patrick Gouffran - 13-23, avenue Jean Alcard - 75011 Paris - Tél : 01 43 38 84 38

<http://mdetc-economie.fr>

Economist

Function : Company

Tempere Construction

Philippe Casanova - 1, rue Lavoisier - 95660 Champagne sur Oise - 01 39 37 91 60

<http://tempere-construction.fr>

General Enterprise

Contracting method

General Contractor

Type of market

Realization

Energy

Energy consumption

Primary energy need : 49,00 kWhEP/m².an

Primary energy need for standard building : 101,30 kWhEP/m².an

Calculation method : RT 2005

Breakdown for energy consumption : Heating: 21.1 kWhEP / m².year

Hot water: 14.5 kWhEP / m².year

Auxiliaries: 6.7 kWhEP / m².an

Lighting: 7.1 kWhEP / m².an

Envelope performance

Envelope U-Value : 0,46 W.m⁻².K⁻¹

More information :

Envelope made of hemp concrete outside structures
Exterior wall: 27cm hemp concrete coated or barded with wood or zinc
Adjacent wall: 12cm of hemp concrete
Roof: 27 cm hemp concrete under a zinc cover
Thermal bridges reduced by the continuity of the envelope between facades, gable walls and roof

Building Compactness Coefficient : 0,53

Indicator : I4

Air Tightness Value : 1,00

Renewables & systems

Systems

Heating system :

- Condensing gas boiler

Hot water system :

- Condensing gas boiler
- Solar Thermal

Cooling system :

- No cooling system

Ventilation system :

- Humidity sensitive Air Handling Unit (Hygro B)

Renewable systems :

- Solar Thermal

Renewable energy production : 2 150,00 %

Environment

Urban environment

Land plot area : 179,00 m²

Built-up area : 115,60 %

Green space : 52,50

The building of 37 rue Myrha is located in the heart of "Château rouge" area, in Paris in the 18th arrondissement. The project's foundation is located in the ANRU area which extends over 11.5 ha. SEMAVIP, an area planner, wants to make this piece of renewed city an exemplary neighborhood from the point of view of sustainable development. The project pays particular attention to the intrinsic qualities of the urban fabric in which it develops and tries to combine this reinterpretation with the consideration of contemporary urban and architectural realities of uses and sustainable development. In this project context, hemp concrete was gradually introduced, because it naturally echoed the sobriety of the project, enriching it with its multiple responses.

Products

Product

Tradical Hemp Concrete

Tradical



<http://www.bcb-tradical.com/fr-beton-de-chanvre-pour-une-isolation-naturelle.html>

Product category : Finishing work / Partitions, insulation

Contrary to what its name suggests, hemp concrete has nothing to do with traditional concrete. Non-structural, it is an insulating and ecological filling material. Its installation on supporting framework (generally in wood) is apparent to the historical constructive principles of dense urban environments: constructions with pan of wood and pan of iron. Conjugating the qualities of hemp and lime, it is projected horizontally on a temporary or permanent formwork bottom. It ensures a distributed insulation of the construction, significantly reducing thermal bridges. The hygroscopic nature of hemp gives the walls a healthy and natural breathing, avoiding the effect "tight box". Its inert character improves the comfort of summer and winter. Finally, hemp concrete is not limiting and allows to realize all types of facade (wood cladding, zinc, plaster ...) The use of hemp concrete allows an energy sobriety, a sobriety constructive and an environmental sobriety . On this building, Tradical Hemp Concrete is used for 2 applications. In a wall with distributed insulation, it constitutes the walls of the exterior facades walls street and side courtyard. It is applied mechanically in filling between slabs. It is also used in roofing with distributed insulation.

Costs

Construction and exploitation costs

Global cost : 1 574 900,00 €

Reference global cost : 1 950,00 €

Renewable energy systems cost : 40 000,00 €

Global cost/Dwelling : 393725

Reference global cost/Dwelling : 1950

Energy bill

Forecasted energy bill/year : 3 511,00 €

Real energy cost/m² : 6.16

Real energy cost/Dwelling : 877.75

Health and comfort

Water management

Consumption of harvested rainwater : 38,00 m³

Indoor Air quality

Walls made of hemp concrete, producing no emission harmful to health and participating in the regulation of hygrothermal comfort

Carbon

GHG emissions

GHG in use : 5,00 KgCO₂/m²/an

Methodology used :

RT 2005

GHG before use : 4,38 KgCO₂/m²

Building lifetime : 50,00 année(s)

, ie xx in use years : 0.88

GHG Cradle to Grave : 9,38 KgCO₂/m²

Life Cycle Analysis

Contest

Reasons for participating in the competition(s)

Système constructif léger

Ce projet est implanté dans le secteur d'aménagement de Château Rouge, celui-ci se compose de multiples projets d'améliorations, qu'ils soient de réhabilitation, de démolition ou de reconstruction.

Ces projets sont pour la plupart établis avec un système constructif dit « classique », composé de voiles en béton armé. Dans ce quartier, l'état du sol pour la construction est assez médiocre, en effet celui-ci regorge de cavités et de poches de gypse s'apparentant à construire sur du gruyère. Afin de trouver un bon appui, ces projets descendent avec des fondations, quelquefois à 30, 40 et même 50 mètres. Pour un bâtiment qui fait 20 à 25m d hauteur.

Nous avons choisi de construire avec un système constructif léger, une ossature principale métallique et une ossature façade en bois, avec un remplissage de béton de chanvre. Ce système pèse 330 kg/m³ au lieu de 2300 kg/m³ pour un béton classique qui donne un système 5 fois plus léger qu'un système classique. Cela nous a permis de limiter nos travaux d'infrastructure à 3m de sous-sol technique avec des fondations superficielles de 3m de profondeur.

Confort d'été

Le béton de chanvre n'est pas qu'un simple isolant. Si on tranche le chènevotte en deux, on trouve des micro-pores qui permettent au chanvre d'absorber et de stocker la vapeur d'eau quand l'air ambiant est humide, et inversement, de libérer la vapeur d'eau quand l'air est sec. Cette régulation naturelle d'humidité dans l'espace permet de régulariser la température et donc de créer un phénomène d'inertie. Grâce à ce phénomène, qu'on appelle la déphasage, et malgré les fluctuations de la température extérieure entre jour & nuit (des fluctuations qui peuvent monter jusqu'à 13,5°), l'écart à l'intérieur reste toujours inférieur de 5°. Ce confort entraîne une baisse sensible des besoins en énergie.

