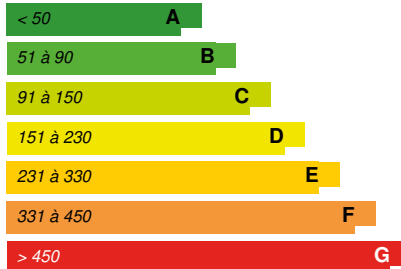


# Collective housing "the countryside in Paris"

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2



**Building Type** : Collective housing < 50m  
**Construction Year** : 2016  
**Delivery year** : 2016  
**Address 1 - street** : 35, rue du Capitaine Marchal 75020 PARIS, France  
**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 649 m<sup>2</sup>  
**Construction/refurbishment cost** : 1 300 000 €  
**Number of Dwelling** : 11 Dwelling  
**Cost/m2** : 2003.08 €/m<sup>2</sup>

## General information

### Atypical housing

The project is located on the edge of the 20th district, "The countryside in Paris", a neighborhood mixing townhouses and small collectives. Its fragmented volume ensures the transition between a townhouse and a multi-family building.

The accommodations all have different amenities, characteristics of townhouses: duplex in the DRC, housing with gardens, volumes dilated on the top floor, wide terraces to the south.

### An innovative light facade

The light wooden facade (MOB) acts as an insulating coat. It is made from industrial components: OSB framing and veture in prefabricated panels of fiber concrete (Ductal). This project was the support of a technical opinion (ATEC).

One of the challenges of this social project was to reduce the burdens for the inhabitants. Thus, the project combines solar thermal collectors and a power pipe system for hot water. Photovoltaics complete the energy system.

The housing bays represent more than 25% of the living space of each housing favoring excellent solarization. Common areas and some bathrooms are naturally lit to limit artificial lighting.

### Sustainable development approach of the project owner

The architectural choices of our project integrate the search for the best balance between construction cost, durability and environmental

qualities.

The cost saving will be achieved by a rapid site management on a small plot (290 m<sup>2</sup>) and whose accessibility is complicated by the narrow width of the street and sidewalk. Compact volumetry ensures good thermal inertia and reduces thermal bridging. In addition, the use of free energy sources, such as thermal sensors offer optimal habitat quality and economy of loads.

### **A simple construction system with wood frame wall (MOB)**

Our choice was oriented towards a simple structure, with load bearing slats, adapted to floor reaches limited to 6 meters. The slabs of the floors are provided with concrete to ensure good inertia. The cladding facade, light and thermally efficient, allows a quick and dry implementation of facades on the street and in the heart of the island, while ensuring excellent thermal insulation. Its small thickness: 32 cm including 23 cm of insulation allows to optimize the surfaces on this small hollow tooth.

### **Renewable energies:**

Solar thermal collectors arranged on a roof terrace on an area of approximately 10m<sup>2</sup>, facing south, produce 40% of domestic hot water. The extra will be provided by the collective boiler. A photovoltaic system of electricity production is installed on the roof terrace.

### **Saving resources**

A rainwater recovery device, with a 2000 L tank is provided for watering gardens and cleaning floors to save drinking water.

## **Architectural description**

### **URBAN INSERTION**

A fragmented built scale:

Inserted between a building in R + 2 and a collective building in R + 4, the project links the two scales by fragmentation work.

On the street, a vertical hollow joint combines two volumetrics:

- A narrow and slender built-up element next to the adjoining building in R + 4, the 3rd floor being an integral part of the composition of the street frontage.

- The second element has a 3rd floor recessed which gives to perceive a building in R + 2, with a third floor set back and its inhabited terrace.

In the heart of islet, the project exploits the depth of the plot.

A game of redents privatizes the terraces of each apartment. Spinning balconies enhance the visual independence of each party from the other.

Plant punctuation, relay for biodiversity.

The charm of the neighborhood comes from green punctuations that protrude from a wall, decorate a terrace.

The project offers each tenant a privatized outside space that he can appropriate and decorate deplantes. Pour allow a maintenance simple and inexpensive for the tenant, the retrieval of rainwater allows the installation of a system of waterageautomatic, reliable and economic.

Withdrawal on the 3rd floor offers the opportunity to plan plantations that benefit from a good feeling.

Special care is given to the quality of the island core. The outdoor open space is divided into two parts dedicated to T3 and T4d. Each in the ground includes the planting of a small deciduous tree to allow sunlight to pass through the winter and protect it in the summer.

On the street, the hollow joint in full terreconstitutes a vegetable respiration, tensioned cables facilitate the hang of the voluble plants.

The east wall, set back in light color, sends the light back into the garden and into the courtyard of No. 33, thus ensuring a fuller breath.

Valuation of an asset constraint:

The implementation of the project involves a decline of 2 m to the right of days of suffering of the adjoining building in R + 6. The courettea thus created allows to naturally illuminate bearings and stairwell.

### **Perennial and contextual materials**

The project offers a voluminous sense of neighborhood identity through a choice of materials in harmony with the tones of the neighborhood. The facade harmonizes with the Parisian hues. The facade cladding takes up the minerality of the limestone Parian.

Given the narrow sidewalk, special attention is paid to the choice of perennial and self-cleaning materials. The cladding of the street façade consists of fiberglass panels, a material with a mineral aspect chosen for its durability over time. The off-white tone blends with the limestone. The layout of the street façade creates a regular rhythm, allowing the development of the bays. The facade back of the gasket full earth on street is treated polycarbonate.

The facades on garden are made of metal rings of off-white color, dito frontage on street.

Joinery and guardrails, dark brown relief underline the modules of the bays and the rhythm of facade. On the balconies in heart of islet, exposed to the sun of the south, south-west, shutters allow the inhabitants to benefit from their balconies by hot weather. The shadows worn balconies and sliding trellises animate the games volume of the facade. Translucent glass, they filter the light while enconserving the light aspect of the structure of the balconies.

The zinc cover blends in the shades of the sky. The skylight treated with panels of tintbronze / gold takes the shade of sliding shutters, changing according to the light and creating subtly different perceptions over the day.

To ensure a 5 th facade harmonious views of the surrounding higher buildings, technical facilities voluntarily grouped in the central part of the building are the subject of a dress integrated in the composition of the roof terrace.

## OPERATION OF THE BUILDING

### Common Circulations:

Vertical circulations including staircase and elevator are centralized and serve all apartments as well as cellars in the basement.

The small courtyard at the right of the day of the building in R + 4 allows the common parts: circulation, landings and stairs to be naturally lit, from the R + 1.

### Atypical typologies of the apartments:

The project comprises 11 apartments divided into different types of apartments: T1, T2, T3 and T4duplex. Nearly half of the dwellings present typologiesatypiques: duplex in Rez dejardin / DRC with garden; large volumes on the top floor with terrace, balconies for other housing

The apartments have all, including T1, a dual orientation favoring natural ventilation. All apartments have views of open planted outdoor spaces.

The day and night parts of the apartments are separate. All living rooms and kitchens open onto large balconies or terrace.

The apartments are all handicapped with simple work and without demolition of hydrocable partitions. The two apartments accessed by the DRC are adapted to disabled standards.

For reasons of acoustic comfort and to limit the number of ducts, the dwellings are superimposed, the debain rooms and kitchens are grouped together.

### Private outdoor extensions and housing intimacy:

To protect the side views, the part of the balconies of T2 and T3 joining the boundary separates is dressed with screens-translucent. A partially closed space is thus created. This space, appropriated by the inhabitants, will guarantee a withdrawal of separative boundaries and the necessary intimacy to housing.

Climbing plants grow in the hollow space laid out in the open ground at the street frontage. This greening visually enhances the interior space and preserves the intimacy of the studios in the narrow street of Captain Marchal.

The luminosity of the apartments is guaranteed by respecting the following percentages regarding the lighting of the different rooms: 20% of the living space of the rooms will be glazed, this percentage will be increased to 25% for floors / stays.

### End of life of the building:

The light facade is deconstructible and its components recyclable.

## Stakeholders

### Contractor

Name : SA d'HLM ERILIA  
Contact : Loïc Toussaint, loic.toussaint@erilia.fr  
<https://www.erilia.fr/>

### Construction Manager

Name : PHILIPPON KALT ARCHITECTES URBANISTES  
Contact : Brigitte Philippon, Jean Kalt, contact@ponka.fr, 01 47 07 32 97  
<http://www.philippon-kalt.fr>

### Stakeholders

Function : Assistance to the Contracting Authority  
SYNAPSE INGENIERIE

Joël Romano, jromanoz@synapse-ingenierie.fr  
<http://www.synapse-construction.com/>  
AMO HQE

Function : Thermal consultancy agency  
CARDONNEL INGENIERIE

Solène Duprat, solene.duprat@cardonnel.fr  
<http://www.cardonnel.fr/>

Function : Structures calculist  
CARDONNEL INGENIERIE

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

Function : Structures calculist  
CARDONNEL INGENIERIE

Function : Company  
FAYAT BATIMENT

<http://fayat.com/Metiers/Batiment>

## Contracting method

General Contractor

Type of market

Table 'c21\_luxembourg.rex\_market\_type' doesn't exist

## Energy

### Energy consumption

Primary energy need : 37,20 kWh/m<sup>2</sup>.an

Primary energy need for standard building : 121,79 kWh/m<sup>2</sup>.an

Calculation method :

CEEB : 0.0001

Breakdown for energy consumption : Heating: 23.93 kWh/m<sup>2</sup> / year DHW: 24.76 kWh/m<sup>2</sup> / year Lighting: 6.36 kWh/m<sup>2</sup> / year

Auxiliary: 6.12 kWh/m<sup>2</sup> / year Photovoltaic: 11.5 kWh/m<sup>2</sup> / year

### Real final energy consumption

Final Energy : 49,70 kWh/m<sup>2</sup>.an

Real final energy consumption/m<sup>2</sup> : 49,70 kWh/m<sup>2</sup>.an

Real final energy consumption/functional unit : 4,50 kWh/m<sup>2</sup>.an

Year of the real energy consumption : 2 015

### Envelope performance

Envelope U-Value : 0,48 W.m<sup>-2</sup>.K<sup>-1</sup>

More information :

Facade OSB coat: U = 0.159 W / m<sup>2</sup> ° C, Glazing: U = 1.138 W / m<sup>2</sup>.

Indicator :

Air Tightness Value : 0,65

## Renewables & systems

### Systems

Heating system :

- Gas boiler
- Water radiator

Hot water system :

- Gas boiler
- Solar Thermal

Cooling system :

- No cooling system

Ventilation system :

- Single flow
- Humidity sensitive Air Handling Unit (Hygro B)

Renewable systems :

- Solar photovoltaic
- Solar Thermal

Renewable energy production : 67,00 %

SOLAR THERMAL

Estimated coverage rate of DHW requirements: 33%

PHOTOVOLTAIC

Estimated consumption of lighting and auxiliaries (distributions, VMC, etc.)

1,668.93 + 486.22 + 963.2 = 3,119.05 kWh / year

Photovoltaic solar production

3,167.88 kWhep / m<sup>2</sup>.an

Rate of coverage of electricity needs (lighting and auxiliary) estimated:  
101% -> 3,167.88 / (3,119.05) = 1.01575

## Environment

### Urban environment

Land plot area : 287,00 m<sup>2</sup>

Built-up area : 237,00 %

#### **The context :**

The project is located in a suburban site characterized by parcels often narrow and an area less than 300m<sup>2</sup>. Townhouses, old converted workshops, buildings of small collectives follow one another in a random rhythm, interspersed with the green breaths of private gardens or planted terraces that give this area its charm.

The existing building is graded from R + 1 to R + 5 in the Rue du Capitaine Marchal, a narrow lane with a width of 8 meters. In order to preserve this domestic scale, the PLU de Paris limits the height of the building. the street frontage at 10 m and the ceiling heights at 13 m.

#### **The parcel :**

The parcel, which is 15.80 m wide and 19 m deep, currently includes a bodyshop and vacant automobile repair shop occupying the entire plot and subject to the demolition permit No. PD 075 120 10P 0020 obtained on 03 / 02/2011 (attachment)

Taking into account the unevenness of the street of the Captain Marchal and the street of the Montiboefus, the level of the RDC of the existing building on the parcel and that of the buildings adjoining in heart of islet (whose access is made by the street of Montiboefus), have an altimetric difference of the order of 3 meters (leveling plan).

A gable wall adjoining R + 4 with a day of suffering, adjoins the plot to the west. On the east, the detached house has just obtained the Building Permit No. PC07512010V0066 for an elevation in R + 2 and removal of the existing opening at level R + 1 and overlooking the parcel of 35 rue du Capitaine Marchal.

The bottom of the plot is delimited by three adjoining walls in R + 2 and R + 1.

## Products

### Product

facade wood frame coat (MOB) and facing DUCTAL

FEHR

Laurent HEINTZ : laurent.heintz@fehr.fr

<https://www.fehr-groupe.com/fr/>

Product category : Gros œuvre / Structure, maçonnerie, façade

MOB facade and ductal siding

The product has benefited from an ATEX



## Costs

### Construction and exploitation costs

Renewable energy systems cost : 48 840,70 €

Cost of studies : 149 686 €

Total cost of the building : 1 979 121 €

Subsidies : 678 513 €

## Health and comfort

## Water management

Recovery of rainwater in a 2000 L tank for garden watering and soil cleaning

## Carbon

### GHG emissions

GHG in use : 12,00 KgCO<sub>2</sub>/m<sup>2</sup>/an

### Life Cycle Analysis

Eco-design material :

The light facade in wood structure (MOB) acts as an insulating coat.

## Contest

### Reasons for participating in the competition(s)

- Photovoltaic panels
- Solar panels
- Recovery of rainwater
- MOB facade
- BBC Cerqual Profile A

### Building candidate in the category



Energie & Climats Tempérés



Coup de Cœur des Internautes



Prix des Etudiants



