


Suresnes - the Louis Blériot residence

by Michèle Grassiot / 2023-05-04 14:12:09 / France / 441 / FR



Renovation

Primary energy need :

79.9 kWhep/m².an

(Calculation method : RT 2012)

ENERGY CONSUMPTION

Consumption Range (kWh/m ² .an)	Grade	Category
< 50	A	Economical building
51 à 90	B	
91 à 150	C	
151 à 230	D	Building
231 à 330	E	
331 à 450	F	
> 450	G	
Energy-intensive building		

Building Type : Student residence
Construction Year : 1990
Delivery year : 2023
Address 1 - street : 12 rue Pasteur 92150 SURESNES, France
Climate zone : [Cfb] Marine Mild Winter, warm summer, no dry season.

Net Floor Area : 21 000 m² Autre type de surface nette
Construction/refurbishment cost : 24 000 000 €
Number of Dwelling : 271 Dwelling
Cost/m2 : 1142.86 €/m²

Certifications :



General information

The former Airbus laboratories, along the Seine in Suresnes (92) were acquired by Vilogia in 2019. The transformation of the "SU1" building, which until then housed office space and R&D laboratories, makes it possible to offer 271 student accommodation, two shops and tertiary activity areas. The project, carried out with teams from Tecnova, DGM and Bouygues, was designed with an approach of reusing a maximum of materials, and Zero Net Artificialisation.

Building users opinion

The very first inhabitants take possession of their rooms in April 2023, and are very satisfied with the residential quality, in particular the quality of use.

If you had to do it again?

We would take care to anticipate even better the diversity of uses and their technical consequences on the design of the project, already well worked on this operation.

BIM approach

A BIM approach came to feed the operating modes of the structural work and the demolition, carried out by the general contractor.

The BIM approach was not used during the selective cleaning period and was not used for the reuse of materials.

Photo credit

Maxime DUFOUR for Vilogia

Stakeholders

Contractor

Name : Vilogia

Contact : Etienne ANDREOLETTI - Responsable du pôle promotion

<https://www.vilogia.fr/>

Construction Manager

Name : Conception-réalisation : Entreprise Générale (Bouygues Bâtiment IDF - Habitat Social), Architectes (TECNOVA et DGM & Associés), BET (CET ingénierie et Amiex) et AMO (PIBA).

Contact : Anthony MERLIN, chef de service adjoint Travaux - Bouygues Bâtiment IDF - Habitat Social

<https://www.bouygues-construction.com/>

Stakeholders

Function : Designer

DGM & Associés

Yann DELHEMME

<http://www.dgm-architectes.fr>

Function : Designer

Tecnova Architecture

Imen NEFFATI

<https://www.tecnova-architecture.fr/>

Function : Other consultancy agency

CET Ingénierie

Sébastien BISSON

<http://cet-ingenierie.fr/>

Function : Company

Bouygues Bâtiment IDF - Habitat Social

Anthony MERLIN, chef de service adjoint Travaux - Bouygues Bâtiment IDF - Habitat Social

<https://www.bouygues-construction.com/>

Contracting method

Lump-sum turnkey

Type of market

Design and implementation

Allocation of works contracts

Build and sell construction

Energy

Energy consumption

Primary energy need : 79,90 kWh_{ep}/m².an

Calculation method : RT 2012

Initial consumption : 300,00 kWh_{ep}/m².an

Real final energy consumption

Final Energy : 46,10 kWh_{ep}/m².an

Envelope performance

Envelope U-Value : 0,49 W.m⁻².K⁻¹

Indicator : I4

Air Tightness Value : 0,80

Renewables & systems

Systems

Heating system :

- Gas boiler
- Electric heater

Hot water system :

- Gas boiler
- Heat pump

Cooling system :

- Others

Ventilation system :

- Humidity sensitive Air Handling Unit (Hygro B)
- Double flow heat exchanger

Renewable systems :

- No renewable energy systems

Renewable energy production : 15,90 %

Other information on HVAC :

An air handling unit (CTA) generates and distributes hot (or cold, depending on the season) air in the common areas of the residence.

Environment

Biodiversity approach

The tall chestnut trees, several decades old, on the edge of the plot, have been preserved, and their space has been reworked to create a new low plant stratum (flowering meadow with honey and requiring little maintenance). The inner courtyard is vegetated over 314 m² with ornamental shrubs, again requiring little maintenance.

The non-accessible roof of the first level, above the shops on the street, is fitted out in favor of biodiversity. Different eco-systems are recreated thanks to different plant strata and the installation of wildlife refuges.

The distribution of admissible loads on this roof makes it possible to vary the heights of the substrate and to obtain 4 types of vegetation. This graphic layout frame is visible from the accommodation above, ensuring the aesthetic quality of the space. Heaps of millstones of varying sizes, heaps of logs, birdhouses and heaps of

sand are spread over the roof to promote urban biodiversity.

Mitigation actions on soil and biodiversity :

The land sobriety approach was integrated from the design of the project: the transformation into residential required doubling the thickness of the east wing of the building. In return, a shortening of this same portion guaranteed a Net Zero Artificialisation balance sheet, the deconstructed surface being returned to the open ground. In addition, an operator specializing in urban biodiversity has designed and deployed tailor-made systems for part of the roofs.

Risks

Hazards to which the building is exposed :

- Flooding/Slow flood
- Flooding/Fast Recession

Risks measures put in place :

The residence is fully lined (the initial casing has been preserved, and doubled with an intelligent system for capturing dripping water on the periphery of the walls, with a lifting pump connected to the rainwater network), and the technical rooms are fitted out to that sensitive installations are protected against flooding.

Urban environment

If the residence fits into the very qualitative urban fabric of this residential district of Suresnes, its transformation contributes directly to the improvement of local services:

- The 271 student accommodations will support the existing local commercial activity,
- Two commercial shells totaling 1,600 m² increase the local offer,
- A space of 39 m² acquired by the RATP on the ground floor makes it possible to create an EVB (Espace Vie Bus), a regulatory rest room essential for the extension of two bus lines serving the district.
- On two underground levels, a 6,400 m² "last mile logistics" cell offers businesses and individuals rental space to store their goods.
- On the top level of the basement, 61 parking spaces are assigned to the operator Yespark, which offers them, via an application, for short-term rental, promoting interconnection between the private vehicle and the public transport offer (in particular the nearby Suresnes-Mont-Valérien station) to travel in the inner suburbs and in Paris.

Land plot area : 6 587,00 m²

Built-up area : 3 692,00 %

Green space : 1 410,00

Costs

Construction and exploitation costs

Cost of studies : 1 655 000 €

Total cost of the building : 45 000 000 €

Additional information on costs :

The cost of the works amounts to 24 million euros excluding taxes.

Circular Economy

Circular economy strategy

Phase in which reuse has been integrated : Consultation of the companies

Type of circular economy strategy implemented :

- Maximization of the number of impacted batches
- Maximization of quantities on targeted products
- Maximization of the mass of waste avoided

Type of circular economy strategy implemented :

Preparation of the cleaning phase with a design office specializing in advice on selective cleaning: ELAN Preliminary selections of the 20 most recoverable flows. Framing of markets and choice of companies and service limits on cleaning.

Quantified targets for reuse? :

Objective of 85% material recovery (reuse and recycling) of all waste from the cleaning and demolition phase. Objective not quantified for the share of reuse but objective of maximizing reuse during cleaning.

Integration of reuse into the written contract documents : Integration of the approach in the general clauses

Validation protocol for reused materials : Yes

Validation protocol for reused materials :

Validation protocol produced for in-situ reuse --> production of reuse specifications for facade stones only – See Annex 0: Notice for the reuse of cladding.

The validator of reuse in situ --> The technical controller of the operation for the technique (validation period of 18 months) and for the aesthetics the validation submitted (like the rest of the facades) to the project management and to project management.

For ex-situ reuse, no specific validation protocol except on packaging (for false floor and false ceiling slabs). The materials validator for ex-situ reuse is the third party who will reuse the materials.

Deposit validation form : No

Reuse : same function or different function

Batches concerned by reuse :

- o Facades
- o Locksmithing-Metalwork
- o Indoor joineries
- o Outdoor joineries
- o Floorings
- o Partitions
- o Isulation
- o Suspended ceilings
- o Raised floors
- o Electricity
- o Heating ventilation air conditioning
- o Plumbing
- o Landscaping
- o others...

For each batch : Reused Materials / Products / Equipments :

In-situ reuse (CO2 column calculation based on end-of-life materials via ESF)

Name	Available quantity	Unit	Quantity reused	% reused	Tonnage	CO2 avoided (t eq. CO2)
Concrete facade cladding panels	2749	M²	900	33%	51,75	58,5

Ex-situ reuse (CO2 column calculation based on end-of-life materials via ESF)

False floor slabs (ex situ)	1498	M²	1498	100	43,58	9,23
Topsoil	350	M3	30	8,6%	35,5	//
Flexible flooring	1281	M²	200	16%	0,3	2,75
Carpet	4297	M²	50	1,16%	0,25	0,02
Glass partitions	150	MI	75	50%	3	0,54
High-height partitions	243	MI	40	16,4%	1,6	0,29
Interior blinds	110	U	110	100%	0,33	0,04
Cooling units	3	U	3	100%		39,27
Generators	1	U	1	100%	54,02	4,95
Inverters	2	U	2	100%		//
Overhead travelling cranes	2	U	2	100%	1,5	//
Wooden staircase	1	U	1	100%	0,25	0,16

Reused materials rate :

Reuse of in-situ materials - facade stone:

- o Careful removal of the facade stones then storage at R-3 of the operation (see methodology).
- o Selection, palletization and control of the stones by the installation company and by BY.
- o Return to factory (located in IDF) for shaping.
- o Delivery on site (at the foot of the scaffolding) for refitting on site.

Ex-situ material reuse:

Ex-Situ reuse - Donations to associations

- o Careful removal by a specialized company or by the BOUYGUES BATIMENT IDF teams.
- o Storage in premises associated with the operation's living quarters (not requiring PPE to be worn for access).
- o Appointment with the buyers. Signing of a certificate of recovery in the state of support for the discounts to standards if necessary

Name	Available quantity	Unit	Quantity reused	% reused	Tonnage	CO2 avoided (t eq. CO2)
False ceilings	12891	M²	1000	7,75%	1,36	0,059

Protective steel barriers	2	U	2	100%	0,02	0,22	by the buyer. ◦ Recovery of materials/equipment by the buyer in the storage room.
Cabinets	35	U	8	22,8%	0,72	0,83	
Opaque chipboard doors	44	U	44	100%	1,1	0,52	Note: For the false floor and false ceiling slabs, the carriers were loaded by the company in charge of cleaning (ADC DEMOLITION).
Fire doors	10	U	3	30%	0,1	0,60	
Electric cabinets	10	U	10	100%	0,44	0,95	Logistics
Air conditioning	1	U	1	100%	0,13	0,01	
Hot-air curtains	3	U	3	100%	0,08	//	
Granite edging	24	ml	24	100%	3,24	//	
Insulated false ceilings	//	M ²	150	//	0,45	1,02	
Safety equipment	//	U	119	//	1,5	0,11	
Velaid board	20	U	20	100%	0,42	//	
Steel gate and grille	2	U	1	50%	1,8	1,9	

Rehabilitation and reconditioning operations (if project concerned by a cleaning/demolition stage) : Yes

Storage of materials for reuse in situ (if project concerned by a cleaning/demolition stage) :

- On site, on a dedicated area in a covered location
- On an external platform, in combination with reconditioning operations

Insurance

Consultation of the technical controller : No

Insurance broker on the project : Yes

Insurance broker : Verspieren

Consultation of the broker : No

Insurer : SMA

Consultation insurer : No

Discussion with the insurer :

Specific TRC (Construction All Risk) insurance to cover the storage of stones on site to be reused. Cover the storage of stones during construction and before refitting.

Additional premium :

There was no additional premium identified by the client.

Environmental assessment

Impacts avoided : water, waste, CO2 :

- Compared to a demolition-reconstruction for an equivalent final building, a total of 1,700 (one thousand seven hundred) tonnes of carbon were saved.
- In terms of waste, 6,273 tons of waste were recovered, reused or recycled.
- The water saving impacts have not been calculated.

More details on the avoided impacts :

Economic assessment

Total cost of reuse : 190 000 €

Reuse quantified in the companies' offers? : No

Purchasing process for reused materials :

No materials purchasing process. The only materials reused on site come from the site (particularly facade stone).

Fees of the contracting authority support : 26 000 €

More details on the economic balance :

- Income on resales: -20 k€
- Cost of removal of facade stones and storage at R-3 (demolition company): +€70 k

- Additional cost of selecting and installing facade stone from reuse (compared to new stone): +€35k
- Supervision of works for the follow-up of buyers ex-situ, for the control of stones: +32 k€
- AMO fees (ELAN company): +€26k
- Overheads (General Contractor) for the administrative framework of procedures and third parties (orders, contracts, insurance, financial management/monitoring, specific support for CSR managers, communication, etc.): + €30k
- Production of furniture from reused materials by the Emmaüs integration workshops: €40,000.

Total --> + €213k

New business model and financial balance :

The reuse on the SURESNES operation has an additional cost, which is part of the more global financial commitment of a site transformation, always more expensive than a demolition-reconstruction. This is a bias of the project owner, committed to a structuring CSR approach.

Communication

Communication on the process : Yes

If so, please specify :

- Active press relations during the site launch event (November 2021) and the official formal inauguration in May 2023.
- Promotion of the project in application for various prizes, and on the architects' village of the USH Congress 2023.

Project visit : Yes

Social economy

Social economy and professional integration :

The project was marked by a very important component of **social and solidarity economy** : the objective set of 10,000 hours of work to be dedicated to the integration of unemployed people was largely exceeded, since a total of **14,430 hours** were actually been carried out. This hourly volume did not respond to any regulatory obligation or linked to financing, but rather to the wishes of the contracting authority.

In addition, a special mission has been entrusted to the **Compagnons d'Emmaüs** : through integration workshops devolved to the public of the association, the companions and their "apprentices" have produced **all the furniture in the 4 study rooms** (one per floor) by renovating salvaged furniture. Estimate: 8 work tables and 32 chairs.

In addition, the 'Agora' common room was **furnished to measure** by the Compagnons d'Emmaüs, again within the framework of integration workshops, by creating very specific furniture with recycled materials. This mission, the material volume of which is difficult to estimate, represented a cost of 40,000 euros.

Circular design

Responsible consumption :

- Rehabilitation of the former Airbus headquarters into a student residence.
- Change of use: Transformation of an office building into housing.
- Adaptation of the project to the geometry and structure of the site. Integration of the structure inside the student rooms (concrete posts). Creation of common lounges and projection rooms in surfaces that cannot be adapted to housing.

Functionality economy :

- Rehabilitation of the former R-3 car park to provide 23 parking spaces for the student residence and 65 spaces for rent to third parties neighboring the operation.
- Creation of an EVB (Bus Life Space) room on the ground floor to allow RATP staff to have a break in direct proximity to their bus line (bus line passing in the immediate vicinity).
- Realization of a student residence in front of a business school (SKEMA BUSINESS SCHOOL) with the conservation of an adjoining footbridge between the residence and the school during the works for the future exploitation of the residence (Possibility for female students to integrate the premises of the school directly from the residence and without going through the street).

Industrial and territorial economy :

- Reuse of the old basements of the buildings in storage rooms of the last KM on all the surfaces of R-1/R-2 with access from the ground floor (6400 m2) --> Allowing neighbors to have a room in addition to rent in a very urbanized environment.
- Realization of commercial volumes (1900 m2) on the ground floor of the project to allow development by the neighboring business school (SKEMA BUSINESS SCHOOL) --> Creation of a local student association, a sports hall, others.
- Temporary site installation made with 93.5% reused furniture and materials coming either directly from the site (cabinets, desk, wooden claustra, courtyard) or from two former sites (various furniture, sofa, etc.). It should be noted that all of the furniture used in the living quarters of the SURESNES site was then reused again for two other operations currently in progress (In the municipalities of Pontoise and Bessancourt - 95).
- Donations of materials and equipment to associations in the town of SURESNES (see table of reused materials above). Communicated via the city's facebook page, in partnership with the municipal services of the town hall. Recovery of materials in a dedicated room by the associations and schools of SURESNES.

Sustainable supply :

See furniture made by Emmaüs.

Recycling :

- The selective sorting approach was also maximized throughout the life of the site (in addition to the achievement of 93.5% of materials reused or recycled in demolition / cleaning).
- The 7-stream sorting lasted throughout the construction phase.

Additional information (PDF documents)

Health and comfort

Comfort

Visual comfort :

The architectural project enhances large bay windows in each dwelling, to promote natural light.

Ergonomic design :

The project was indeed a restructuring project, with structural constraints. These constraints were integrated into the quality of use approach for the building, from the start of the project. The needs were expressed very clearly by the manager, and all the intermediaries (project management, general contractor, architect, subcontractors) were keen to co-integrate housing solutions in perfect harmony with the envelope and existing volumes. The excellent progress of the site and the agility of the general contractor gave all the players the time and the autonomy to deploy all the necessary creativity around these comforts of use.

For the comfort of residents, a tools library will be deployed at the start of the 2023 school year: it will allow students to rent, for a few euros, household appliances (vacuum cleaner, pastry robot, steam generator, sewing machine) or small DIY (drill, tool box). This approach aims to promote responsible consumption.

In addition, local shops and a gym at the foot of the residence and in the immediate surroundings, as well as easy access to public transport and a large supply of bicycle parks will contribute to the amenities of use.

Quality of life and services

Vilogia has also ensured that each floor includes services designed for students: shared study room, laundry, luggage room and video projection area. The exteriors and an agora have been set up to allow residents to meet outside their homes. They also benefit from bicycle parking and a tool library to encourage responsible consumption: vacuum cleaner, pastry robot, drill or iron are available for hire for a few euros.

The management of the residence has been devolved to Arpej, who is signing his third collaboration with Vilogia in Ile-de-France. *"We have anticipated this commissioning a lot: the volume of housing is exceptional, as is the residential diversity offered by the cluster housing and the variety of surface areas and morphologies of the housing" specifies Anne Gobin, Managing Director of Arpej. "Similarly, the richness and plurality of shared equipment (work rooms, projection rooms, Agora, laundries, luggage storage, tools library, etc.) gives it a particular appeal. Inclusive for many mobility losses, this residence opens the door to many ways of living; in this it is surprisingly protean. Moreover, students who have already moved in are not mistaken, and their initial feedback is extremely positive as to the quality of use. »*

Qualitative work on the volumes on the ground floor, in consultation with the project manager, has given the district two commercial areas of more than 1,000 m², supplemented by a sports hall and student living spaces. In addition, the RATP is taking 39 m² of premises which will become a "Space Life Bus": these regulatory rest rooms for employees are essential for the opening of new lines, and therefore contribute directly to the quality of the transport service. In common. Suresnes-Mont-Valérien train station is a 15-minute walk away, and the T2 is 500 meters away.

Sixty-one parking spaces of G-3, not dedicated to the student residence, are also enhanced thanks to a partnership with the company Yespark, opening the site to the neighborhood and making it accessible to local residents.

Carbon

General infos

In total, the transformation has a largely positive carbon balance compared to a demolition and reconstruction of at least 1,700 tonnes of CO₂.

Initiatives promoting low-carbon mobility

- Specific carbon-free travel day for the site management team and the project management of the operation (August 2022 - A day of travel to the SURESNES site by bike).
- Site close to many transport facilities favoring travel by public transport (Project management, Project management, Project management assistant and 20% of the supervising team).
- Integration of the RATP EVB (Espace de Vie Bus) to sustain a bus line, and eventually to deploy new ones.

GHG emissions

GHG in use : 8,00 KgCO₂/m²/an

Building lifetime : 60,00 année(s)

Life Cycle Analysis

Note: IC ENERGY / IC CONSTRUCTION calculation: calculation based on a Static LCA (E+C- BBCA).

Reasons for participating in the competition(s)

The transformation of the former Airbus R&D laboratories took place with a final rate of 93.5% of reused or recycled materials: it made it possible to create a student residence with 271 approved rooms (10,000 m² of living space), and 8,300 m² of tertiary activities such as local shops, two levels of 'last mile logistics' for local SMEs and individuals, an RATP space necessary for the sustainability of two bus lines, 61 short-term parking spaces 'Yespark' and of course the mobility equipment (bike room, parking) dedicated to the student residence.

The process of maximizing reuse in situ or ex-situ, with a systematic search for a recycling solution when reuse was impossible, was coupled with a process of land sobriety integrated from the design of the project: the transformation into residential required doubling the thickness of the east wing of the building. In return, a shortening of this same portion guaranteed a Net Zero Artificialisation balance sheet, the deconstructed surface being returned to a vegetated terrace. In addition, an operator specializing in urban biodiversity has designed and deployed tailor-made systems for green roofs.

