CentraleSupélec

Large-scale renovation of the Breguet building on the Paris Saclay campus.

CLIENT

CentraleSupélec

TEAM

Autumn | Patriarche (Main contractor)
Atelier Kempe Thill (Architecture)
Patriarche (Architecture, Interior Architecture, MEP Engineering, EBQ, Cost, BIM, Urban Planning, Landscape, Narrative Design, Signage, Graphic Design, Communication)
Partners:
EVP Ingénierie, Duverney Ingénierie, Casso & Associés, Lisi Ingénierie, Omega, Land'Act, Iatec, Sinteo, LASA, INEX, Vinci energies, Delta partners
Credits: © Sugar Visuals

KEYPOINTS

Refurbishment.
Performance commitment.
Suburban context.

SUSTAINABILITY

Bio-sourced materials.
Low-carbon concrete.
Reuse.
Target labels: BBC effinergie, BBCA Renovation V1, Biodivercity V1.

After inaugurating the Gustave Eiffel and Francis Bouygues buildings, which frame the main square of the district known as the “Carré des Sciences”, CentraleSupélec continues the transformation of its campus with the renovation of the Louis-Charles Breguet building.

Originally designed in the 1970s by Michel Longuet and Michel Herbert, the Breguet building is a striking structure situated in a landscape marked by a strong contrast between nature and urbanity. The renovation aims to reconnect the building with the district's development and enhance its presence within the Carré des Sciences.

A key feature of the project is the transformation of the central courtyard into a hall that becomes the new social heart of the building. The renovation respects the original architecture and emphasizes material reuse.

Typology
Renovation, Eduation

GFA
36 300 m²

Construction cost
NC

Location
Gif-sur-Yvette, France

Status
On going

Type of contract
General planning mandate (public sector)

A broad facility with a variety of functions

The program includes a wide range of functions, from dining areas, lecture halls, and classrooms to private offices and laboratories. The main challenge was to plan these various spaces while ensuring clear wayfinding and overall cohesion, so as not to disrupt the flow.

The creation of a central hall, the core element of the building, provides spaces for relaxation, work, dining, and interaction, fostering encounters and serendipity.

The campus is designed to be open to the world and to businesses, with experimentation and laboratories at the core of student education. The central hall fosters interaction, offering spaces for relaxation, work, dining, and informal meetings.

The common areas gradually extend from the central hall, the most frequented zone, to each wing of the building. These spaces are thoughtfully integrated into the existing structural “grid” to highlight its value and avoid any unnecessary demolition.

This guiding thread weaves a spatial and symbolic connection between the different entities, while giving them a shared identity.

Central Volume and Hall Serving Interaction

Axel Springer Campus - OMA / Rem Koolhaas

Centraal Beheer Apeldoorn - Hermann Hertzberger

The surrounding terrain on which the Breguet building is located had to adapt to an old and complex landscape context, requiring numerous modifications. The resulting level differences complicate the building's accessibility and its connection to the outside.
The lack of visual transparency and physical porosity between the various spaces in most parts of the building creates fragmentation, further intensified by the limited presence of natural light in circulation areas.

A Central Volume – The Hall

The concept begins with the transformation of the constructed void located at the heart of the built complex. The goal is to turn it into a covered “capable volume” that enhances the user experience within the building.

This design approach draws inspiration from reference buildings such as Centraal Beheer by Hermann Hertzberger (1980s), HSBC Headquarters by Norman Foster (1980s–90s), and the Axel Springer Campus by OMA / Rem Koolhaas (2020). These three examples share a common goal: to optimize spatial communication within the building, while ensuring acoustic comfort through sound-absorbing measures.

The hall concept allows for clear visibility of activities, enlivens the space, inspires researchers and students, and creates a unique environment for interaction.

Perspective cross-section of the heart volume

New ways of working

The halls support new forms of pedagogy, based on flexible and diverse spaces. In addition to improving internal communication and spatial generosity, they enable and facilitate unplanned activities such as conferences, symposiums, and international professional exchanges. Working in groups, finding solitude, walking, attending a presentation, reading—there are many ways to learn, whether focused on collaboration or concentration.

A comprehensive design approach was undertaken to propose usage scenarios for the adaptable ground-floor spaces. A functional floor grid allows the layout to be adjusted according to the events planned.

The creation of two monumental staircases in the central hall and peripheral walkways enhances both the spatial and functional quality of the space. Wayfinding within the building and the functional distribution of programs are significantly improved.

This transformation highlights certain areas as “showcases,” reinforcing the building's identity and the pride of its students, administration, and broader user community. This staging meets the need for visibility of innovative activities and strengthens interaction around this meeting space for educational purposes.

A considered and measured, large-scale renovation

Enhanced the architectural heritage, renovation, and improved energy performance are at the heart of the project.

Reuse

This approach is at the crossroads of a number of issues.

Firstly, environmental:

- Limiting the amount of waste produced
- Carbon impact avoided in the production of new products
- Reduced pressure on natural resources

Secondly, economic:

- Substantial cost of recycling waste on the site
- Can be optimised by better sorting and limiting the quantities to be managed

The first step is to identify possible sources of waste for re-use on site (see diagram opposite).

Secondly, the fate of the items deposited is studied in order to find a second life for them in the project, through re-use or material recycling. The aim is to maximise on-site re-use and thus control the whole process while avoiding carbon emissions.

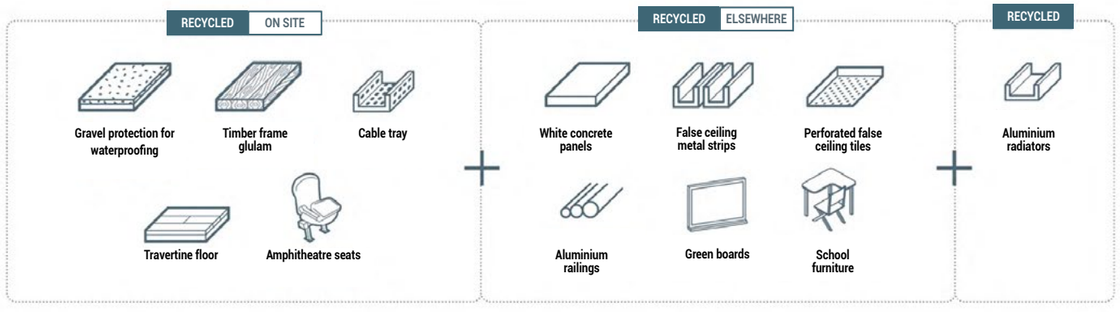
Energy performance

The aim of the renovation was to improve energy performance as much as possible, while respecting the original architectural design.

In order to preserve the identity of the minimalist white prefabricated concrete façades, the choice was made to use internal insulation. The glazed area has been enlarged to improve thermal performance and light levels. In addition, this new frame incorporates Italian-style windows, which ensure the comfort of users by providing natural ventilation and the option of leaving them open for night-time ventilation.

Sun protection is provided by reflective blinds positioned inside. These are automatically controlled on the most exposed façades to control solar gain according to the time of day.

All non-accessible roofs are planted with vegetation or fitted with photovoltaic panels.



The white concrete panels are emblematic of the architecture of Centrale Supélec's architecture.

We are reusing these panels on the new façades of the project in order to preserve the overall architectural coherence as much as possible.

Panels that are removed and not reused for the same purpose can be reused for exterior furniture such as benches, steps, steps or Japanese steps.

White concrete panels

Timber frame

With more than 305 tonnes of material, glued laminated timber is a major source of waste for the project.

We want to make the most of this material, which is in very good condition, by extending its lifespan and reworking it into lattice girders and joists, which will be reused to create the framework for block 13.

The existing building contains a significant amount of metal (false metal ceilings, metal radiator panels), which we are recycling to limit the amount of waste.

We will be using the metal radiator strips to create adjustable ceiling slats for the bioclimatic pergola-type meeting areas in the business areas.

Metal blades

Travertine floor

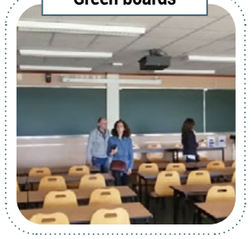
In excellent condition, travertine has a very long residual lifespan. The re-use of this flooring is a wise choice.

After a test of its removal and re-installation on cement mortar, we propose to reuse it as a floor covering, either as solid slabs or as terrazzo in the event of breakage during removal.

As teaching practices become more modern, the need for green boards in classrooms is becoming clearer.

We propose to accompany the metamorphosis of this teaching building by transforming these elements into blackboard panels to create a co-working type layout that students can make their own.

Green boards



Cable trays

From a technical point of view, cable trays are inert elements that do not wear out and have not been subject to any regulatory changes for decades, so they are easy to re-use.

We have opted for the solution of re-use for the same purpose, which is more virtuous than a carbon-emitting recycling process.

Main avenues for re-use.

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