


Metal 57 - Paris

by Constant Bary / © 2023-03-10 00:00:00 / France / © 1339 / FR

New Construction



Primary energy need :
66 kWhep/m².an
(Calculation method : RT 2012)

ENERGY CONSUMPTION

Economical building Building

< 50	A	
51 à 90	B	B
91 à 150	C	
151 à 230	D	
231 à 330	E	
331 à 450	F	
> 450	G	

Energy-intensive building

Building Type : Office building < 28m
Construction Year : 2018
Delivery year : 2022
Address 1 - street : 50 cours de l'Île Seguin 92100 BOULOGNE-BILLANCOURT, France
Climate zone : [Cfb] Marine Mild Winter, warm summer, no dry season.

Net Floor Area : 37 152 m²
Number of Work station : 3 300 Work station

Certifications :



General information

At the gates of Paris, in Boulogne-Billancourt, BNP Paribas Real Estate has imagined the commercial building of tomorrow: METAL 57. Integrated into its environment, modular and flexible, offering a positive work experience, and resolutely committed to biodiversity and eco-responsibility, METAL 57 is sprouting new uses in real estate, while preserving the industrial memory of the former Renault factory which occupied the premises.

[See more details about this project](#)

<https://www.construction21.org/france/infrastructure/h/agora.html>

Photo credit

Xavier Alexandre Pons
Vincent Fillon
DR BNP Paribas Real Estate

Stakeholders

Contractor

Name : SNC METAL 57 représentée par BNP Paribas Immobilier Promotion Immobilier d'Entreprise
Contact : constant.bary[at]realestate.bnpparibas
<https://metal57.realestate.bnpparibas/>

Construction Manager

Name : ARTELIA
<https://www.arteliagroup.com/fr>

Stakeholders

Function : Designer
Dominique Perrault Architecture
Dominique Perrault
<https://www.perraultarchitecture.com/fr/homepage/>

Function : Other consultancy agency
OMNIUM GENERAL D'INGENIERIE OGI
<http://www.ogi2.fr/>
VRD

Function : Other consultancy agency
TECHNOSOL
<https://technosol-gengis.fr/>
Soil study

Function : Other consultancy agency
BARBANEL
<https://www.barbanel.fr/>
Fluids

Function : Other consultancy agency
ASCAUDIT
<https://www.ascaudit.com/>
Lift consulting engineer

Function : Other consultancy agency
GESYS INGENIERIE
<https://www.gesys-ing.com/>
Fluids VDI

Function : Structures calculist
JP LAMOUREUX
<http://www.lamoureux-acoustics.com/>
Acoustic consulting engineer

Function : Assistance to the Contracting Authority
ARCADIS ESG

<https://www.arcadis.com/fr-fr>
AMO environmental pollution / HSE

Function : Assistance to the Contracting Authority
LE SOMMER

<https://www.lesommer.fr/web/index.php>
AMO environment

Function : Other consultancy agency
ICR RESTAURATION
Restoration consulting engineer

Function : Others
SOCOTEC

<https://www.socotec.fr/>
Technical control

Function : Others
SSI CONSULTING

<https://www.ssiconsulting.fr/>
ISS coordinator

Function :
KHEPHREN

<https://khephren.fr/>

Function :
ARCORA

<https://arcora.com/>
Facades

Function : Assistance to the Contracting Authority
ENEOR

<https://eneor.com/fr/>
AMO commissionment

Function : Others
SXD

<https://www.sxd-groupe.fr/>
BIM

Function : Assistance to the Contracting Authority
INTERFACE RESTAURATION

<https://www.interfacegroup.fr/>
AMO restoration

Function : Other consultancy agency
COMMENT
Auditorium

Function : Others
C2L

SPS Coordinator

Contracting method

Other methods

Type of market

Not applicable

Energy

Energy consumption

Primary energy need : 66,00 kWh/m².an

Calculation method : RT 2012

Renewables & systems

Systems

Heating system :

- Urban network
- Geothermal heat pump
- Electric floor heating
- Radiant ceiling

Hot water system :

- Individual electric boiler
- Urban network
- Heat pump

Cooling system :

- Reversible heat pump
- Urban network

Ventilation system :

- Double flow heat exchanger

Renewable systems :

- Heat pump (geothermal)

Other information on HVAC :

Heating output:

Energy production is provided by the following mix: connection to Idex urban hot and cold networks, supplemented by independent production provided by CARRIER brand heat-refrigeration pumps on the water table (operating priority being given to heat-refrigeration pumps).

The powers of each thermorefrigerator pump are approximately 400kW hot and 600kW cold.

Groundwater collection is carried out in the East and South technical rooms, in SS1, under the rehabilitated building.

The equipment is selected for occupancy of the building during the daytime for the office spaces, daytime and nighttime for the service spaces accessible to the public.

Implementation of predictive management of energy production facilities based on climate data.

New building office:

The office spaces are treated by a LINDNER brand radiant ceiling system divided into islands supplied by a 4-pipe hydraulic network (hot water and chilled water there and back), implemented exposed, it being specified that it is not no provision for radiant ceilings in the circulations.

Each facade frame of the new building (1.35m) is made up of "active" steel slabs connected together using flexible hoses, and supplied from the circulation by a 2-tube network distributing hot water or chilled water. via 6-way regulation valves, installed every 2 frames of facades in common cases and having clarinets allowing the connection of 3 frames of radiant ceilings.

Ventilation :

The office spaces are supplied with air (from the CTA network) to allow the renewal of hygienic air via exposed ventilation networks, with thermal insulation.

The fresh air is pre-treated by dual-flow AHUs with energy recovery by exchanger with an efficiency of more than 75% on the extracted air, and distributed via exposed aeraulic networks, with heat insulation.

Local management of fresh air is carried out by variable flow control modules (air valves placed every 2 frames of the facade) controlled by presence detectors or CO2 sensors.

The blowing grilles are implemented under the radiant ceiling, laid out in the functional axis of the facade. Particular care is given to the quality of the air flow in the choice of diffusers.

The recovery will be from the circulations, in a centralized way by several grids per compartment at the level of the nuclei or the toilets.

Special cases :

- The office space on the ground floor of the renovated building is treated by a technical installation similar to the offices, but will allow the installation on the entire space of meeting rooms with a maximum surface area of 100m² per room.

- The office space on R+1 of the renovated building is treated by a technical installation similar to the offices and allowing the installation of meeting rooms with a

maximum surface area of 100m² on the entire space, excluding circulation and landing.

- The office space on R+2 of the renovated building under a shed is treated in all air by CTA with a supply of fresh hygienic air. Linear diffusion grilles are installed in the ceiling under the lower parts of the sheds to treat the volume.
- In the case of partitioning in these 3 levels, the adaptation of the heat treatment system of these zones will have to be the subject of a specific study.

Catering areas:

The climatic treatment is carried out as follows:

- Installation of a hood in the laundry room with extractor and specific duct;
- The air conditioning air intakes and all the extractor hoods provide negative pressure in the kitchen work areas;
- The kitchens are treated by a single-flow AHU operating with all fresh air and are maintained under negative pressure in relation to their environment via the hoods and/or filtering ceilings, cooking and laundry;
- The catering areas are treated by an all-air system independent of the offices by air handling unit;
- The roof-top café of R+7 will be treated by a dedicated CTA allowing the supply of fresh hygienic air, as well as climatic treatment. Heated ducts on the ground will provide additional heat treatment for the roof-top café in winter.

Fitness:

- Treatment by dedicated dual-flow CTA with energy recovery by exchanger with an efficiency greater than 75% on the extracted air, and terminal batteries with regulation by room, on the basis of a workforce of 100 people to cover the thermal needs and fresh air supply.

Interior streets:

- The interior galleries are treated by CTA with energy recovery by exchanger with a yield greater than 75% on the extracted air, with fresh hygienic air supply and diffusers and/or air movement, with additional underfloor heating connected to a dedicated plate exchanger.

Hall lot 2:

Heat treatment, heating and air conditioning, by CTA with energy recovery by exchanger with an efficiency greater than 75% on the extracted air, with hygienic fresh air supply allowing an overpressure of the Hall and heated floor connected to a plate exchanger dedicated.

Additional heating by electric radiant panel is provided in the reception desk, or nearby.

Auditorium:

- The auditorium is climatically treated by a double flow system ensuring the renewal of hygienic air and thermal comfort on the basis of 285 people.
- Air is diffused through high-induction long-range ceiling diffusers and air intake is via a network of bulk ducts in the auditorium ceiling.
- The regulation will operate using a temperature and CO2 sensor.
- There is no provision for blowing behind the stage.

Hot water :

- The production of domestic hot water in the offices is ensured by individual electric hot water tanks of the Atlantic brand (1 tank of 30L capacity per insulated toilet block or 1 tank of 50L capacity for 2 back-to-back toilet blocks) with rapid heating.

The production of domestic hot water (DHW) for the kitchens and kiosks will be of the semi-instantaneous type and will consist of:

- In the primary, a plate heat exchanger supplied from the IDEX substation;
- In the primary, a plate heat exchanger supplied from the heat-refrigeration pump installation where the excess calories associated with refrigeration production will be used;
- On the secondary side, 2 DHW storage tanks with a capacity of 1500L, common to all the catering areas, connected to a network looped by pumps.
- The Fitness will have its own DHW production of the semi-instantaneous type, by a hot water exchanger coupled to a 1,500L tank, connected to a looped network.

The DHW production of the M/F locker rooms located on the ground floor is ensured as follows:

- PCSI life base: by an electric tank of 100L capacity;
- Personal life base: by an electric tank of 100L capacity;
- Cycling locker rooms: by an electric balloon with a capacity of 500L.

Rooms with specific pollution such as toilets and changing rooms are equipped with a specific air extraction system connected to VMC type extraction boxes.

The technical rooms will be ventilated at the rate of 0.5 volume/hour.

Car park :

- The car parks are mechanically ventilated. The fans will have a fire resistance of 2 hours at 400°C.
- The low to high speed controls and "rockers" are slaved to a CO/NO detection system.
- The forced controls of these fans are made available to the security services at the entrance to the car park ramps.
- Status returns and faults are recorded on the BMS.

Smart Building

Users' opinion on the Smart Building functions :

62% of employees believe that BNPPRE stands out from its competitors partly thanks to the innovations present in its buildings.

For M57, we can cite for example the connectivity of the building with its 3 applications:

- o **The M57 application** , which gives visibility on free positions and those that remain occupied for the half-day or the day, as well as knowing the availability of meeting rooms. It also allows you to view the site map, report an incident, register for site activities, harvests, current events or even the gym.
- o **The Arval Mobility MAAS (Mobility As A Service) application** to optimize journeys and make reservations for shared mobility solutions (bicycle, car and scooter) located in car park -1.
- o **The TimeChef application** to have access to all the catering offers of our service provider Arpège, which are distributed within the inner street. It also allows you to recharge your card.

Biodiversity approach

Biodiversity is an integral part of METAL 57. Symbol of a resilient city, which promotes the well-being of those who find themselves there, the rooftop offers much more than just a breath of fresh air: it is a permacultural place that aims to recreate ecosystems conducive to life. This is why BNP Paribas Real Estate is committed to adopting a resolutely voluntary approach in favor of biodiversity and respect for the natural environment during the design of its rooftop.

First of all in the choice of plants: whether grasses in the flowering meadow, fruit trees in orchards or even trees and shrubs in refuge areas, these belong to local, non-invasive and living in complementarity. This will allow the three plant layers present on the rooftop (herbaceous, bushy and arboreal) to develop naturally by limiting watering and without the addition of inputs such as phytosanitary products. In addition, their different flowering periods will follow one another over the months, offering visitors a rooftop that changes naturally with the seasons and flowers at all times.

The rooftop will also be a place of welcome for many species of birds and insects, thanks to the installation of nesting boxes, bundles of dead wood, wetlands and insect hotels.

It is divided into 4 parts:

The flower meadow

Pleasure garden cultivated in continuous substrate with an orchard comprising two varieties of apple trees, peach trees and pear trees, and a meadow of melliferous and certain edible flowers. The estimated annual production reaches around 360 kg of fruit, not to mention 14 kg of edible flowers.

The aromatic garden

Rich in enticing colors, aromas and scents; produce couldn't be fresher!. Moroccan mint, oregano, laurel sauce, tarragon, sage, Pointe du Raz rosemary, not to mention many other lesser-known aromatic plants, take their place in the garden among 25 plant species. In total, 117 kg of aromatics should be harvested every year.

The biodiversity refuge

Not accessible to employees, this 2,100 m² interior space maintains the link between METAL 57 and its natural environment. It is a plant sanctuary intended to accommodate living organisms (insect hotels, nesting boxes, sandpits and valleys). Species monitoring will be carried out by an ecologist. Particular attention was paid to the topography, by varying the height of the substrate which reaches up to 80cm, and which makes it possible to accommodate three plant strata (herbaceous, bushy and arboreal).

The gourmet vegetable garden

With access to seasonal fruits and vegetables, employees have the opportunity to grow their own produce. Also used as a place of experimentation, they will be able to learn about urban agriculture thanks to its 235 m² from which no less than 1,300 kg of organic fruit and vegetables should be produced each year. Two methods of market gardening were chosen to make the building a demonstrator in terms of urban agriculture: vertical gabions, light and compact, as well as metal battens cultivated according to the principles of association and crop rotation.

While it is both a place for meetings and work, the M57 rooftop is also a teaching and learning area. Indeed, in addition to the collaborators who are expected for regular harvests and plantations, workshops will be offered to schools and EPHADs in the surroundings!

Metal 57 received the Biodiversity label ABAB label (performance level) in the design phase, confirmed in the construction and operation phase.

Mitigation actions on soil and biodiversity :

Cities today occupy 3% of the Earth's continental surface, produce more than 70% of its CO₂ emissions and consume between 60 to 80% of the world's energy. It is therefore becoming urgent to find this balance for the preservation of Man and the environment on which he depends. If the responsibility involves all sectors, town planning and real estate must question the spaces and receptacles dedicated to biodiversity, while allowing the sustainable development of economic activity. This is what BNP Paribas Real Estate is committed to as part of its CSR policy, by defining a policy and a roadmap for each business line with the operational teams. The commitments are summarized in our Biodiversity Charter.

Urban environment

The land on which the "METAL 57" building is built, mainly used as offices, is located on a plot delimited by the rue du Vieux Pont de Sèvres, the place Georges Besse, the cours de l'île Seguin and the quai Georges Gorse . This land is part of the joint development zone Seguin Rives de Seine in Boulogne-Billancourt.

The site is accessible by Metro line 9, Tramway 2, several bus lines, and is close to electrically assisted Vélib' stations.

BNPPRE has set up a mobility HUB on its site, integrating 2 shared electric vehicles, 1 shared hybrid vehicle, 1 shared thermal vehicle, 18 shared electrically assisted bicycles and 8 shared scooters. All these means of transport are accessible thanks to the Mobility As A Service application via Arval Mobility.

Green space : 3 500,00

BNPRE

Product category : Management / Others

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Costs

Circular Economy

Reuse : same function or different function

Batches concerned by reuse :

- Floorings
- others...

For each batch : Reused Materials / Products / Equipments :

Established on a 500m² platform, the Customer Experience Center (CXC) will welcome the partners of the BNP Paribas Real Estate ecosystem in order to tell, present, exchange, immerse, co-create and meet around the projects and challenges of the real estate of tomorrow.

Via connections thanks to the Reuse Booster, we find 500 m² of carpet from Orak, 10 tiles from Backacia, 28 chairs and 4 tables from the former BNPPRE site in Issy les Moulineaux.

Social economy

Social economy and professional integration :

- Integration of 4 disabled garden maintenance workers (ESAT) with Merci Raymond;
- Coaching of student job seekers;
- Provision of services in operation (inclusion clause in contracts);
- Employment of people with disabilities at Arpège, site restorer;
- Employment of people in professional integration and reintegration at La Providence;
- Regularly, it is set up for solidarity collections such as clothes for the Mamamama association or toys for Rejoué. Workshops are also offered to employees, such as the composition of bouquets with Fleurs d'ici, for the Gustave Roussy hospital.

Circular design

Sustainable supply :

- The wall coverings of the 4 meeting rooms were made from: vegetable leather made from pineapple fiber (Pinatex company), hay (Oberflex company) and compressed recycled textile (Kvadrat company).
- 35 cushions are in vegetable leather based on pineapple fiber (Pinatex company).
- 12 tables and 4 lights come from Kataba.

Recycling :

Recycling : recycled plastic from SAS Minimum was used to make up certain elements of the 10 pieces of furniture that are present in the Customer Experience Center.

Upcycling : use of ventilation ducts to make seats and the 10 pieces of furniture are made from scaffolding and old LEID tiles.

Health and comfort

Water management

The metering architecture will allow the monitoring of drinking water consumption for each cold water outlet, using a SENSUS brand digital meter.

The planned meters will be of the communicating type, under M-Bus protocol, and taken up on the BMS.

A HYDRELIS type SWITCHFLOW leak detection system will be installed on each of these feeders.

Counting will be carried out at two sub-counting levels: 1st count per lot, 2nd count per floor or per department.

Sub-counting is also planned for each service: fitness, conference center, auditorium, all ground floor and G+1 catering areas, and one sub-counting per kiosk and for the changing rooms dedicated to the kiosks.

For flat roofs collected without siphoid effect (terraces of G+9), the vertical rainwater drops passing through the sheath in the superstructure are made of PVC as well as the collectors circulating in the infrastructure. For flat roofs collected by siphoid effect (sheds), the chutes and collectors will be made of Saint-Gobain

brand EPAMS.

For rainwater from the G+9 terraces, forecourt and patios on the ground floor, it is planned to create a retention tank, in infrastructure, with a discharge by lifting pump respecting the leak rate of 2l/s /ha imposed by the departmental sanitation regulations and the City of Boulogne Billancourt. This discharge will be connected to the rainwater drainage network located under the Georges Besse road. The retention tarp will also be equipped with a high overflow level flowing into the height of the 4th basement.

Part of the rainwater, from the shed roofs, is collected and stored in an EP reuse tarpaulin in the basement, with access by ladder with a stainless steel or aluminum crinoline, for watering green spaces and I WC supply (without distinction of priority). The selection of the power source is made via a set of solenoid valves.

Indoor Air quality

The basis is an air renewal of 25m³/h/occupant.

A system of opening windows has been set up on the floors in order to supply the offices directly, as well as a hygienic air distribution system: adaptation of the air flows according to the occupancy rate.

After an HQE survey carried out between February and September 2022, it was established that:

- With regard to benzene, the values measured are lower than the most restrictive air quality objective level, recommended by ANSES, which is 2 µg/m³. The program complies with the values mentioned in Articles 9 and 10 of Decree No. 2012-14 of January 5, 2012.
- For formaldehyde, the values measured are well below the level of the limit value of the French regulations which is 100 µg/m³, also below the objective level of quality air, recommended by ANSES, which is 30 µg /m³, representing the most restrictive level.
- NO₂ values are below WHO guideline values.
- With regard to TVOCs, the values measured are at the most restrictive level 1, i.e. 300 µg/m³.
- For particles, whether in PM_{2.5}, the measurement points show concentration levels below WHO recommendations

Comfort

Temperature level :

The temperature level is 19° in winter, and 26° in summer.

Acoustic comfort :

Radiant ceilings have been installed, as well as sound-absorbing furniture and carpeting.

Visual comfort :

Overall, the workspaces show good light. There are high ceilings, full height windows and access to the outside all around the building. In addition, the windows are electrochromic.

M57 has undergone Osmoz NATU 1 certification. This requirement requires estimating the percentage of spaces with views of natural exterior elements and respecting minimum thresholds. Considering the spaces occupied, 67% of surfaces less than 7m from the facade have a view of the surrounding nature, which means that the 3/3 threshold has been reached. Considering all of the project's windows, 82.3% of them offer views of the surrounding natural elements, thus criterion 2 (2/3 points) is achieved.

Quality of life and services

Interior fittings

- Wide variety of rooms and spaces for work and meetings.

Connectivity

- Métal 57 application: booking rooms, controlling light/blinds/temperature, access to information, various services for occupants (restaurants, fitness, etc.);
- IT equipment and screens in meeting rooms and work positions.

Occupant Services

- Concierge, fitness, breastfeeding room, rooftop;
- Mobility hub;
- Varied catering offer, evaluated according to the nutriscore grid;
- Urban farm workshops on the rooftop.

rooftop

The rooftop of M57 is the demonstrator of our know-how and our commitments in terms of biodiversity. It includes 3,500 m², more than a hundred local, non-invasive plant species, without the use of phytosanitary products. He understands:

- Around 3,500m² dedicated to biodiversity in the city;
- A refuge area of 2,100m² dedicated to wildlife, insects, birds, which can nest and feed there;
- At some points, up to 80 centimeters of soil intended to accommodate a variety of vegetation;
- Three plant strata have been planted: herbaceous, bushy and tree-like, i.e. around fifty different tree species;
- 2 vegetable gardens: the gourmet vegetable garden and the old and perpetual vegetable garden (1,300 kilos of vegetables on approximately 235 m² representing 300 baskets for employees);
- Aromatics present: more than 25 different species (117 kg per year);
- Animation: workshops led by Peas & Love or Merci Raymond, in total about ten per year on different themes: learning to cook certain vegetables,

- preparation of herbal teas, gardening (cuttings, sowing and planting, etc.);
- Regular collection and distribution with employees;
- Visits open to outsiders: Boulogne schools, retirement homes, but also customers and partners.

The operation is in partnership with:

- The Senaris company has developed the green spaces of Métal 57;
- Thank you Raymond who will maintain and manage the vegetable gardens, orchards in the ground with an ESAT specialized in garden maintenance;
- Peas and Love for vertical vegetable gardens.

[More information on the rooftop](#)

Workshops and awareness actions

M57 is fully committed to its employees by regularly offering workshops to raise awareness of sustainable development. We can cite as an example:

- Bicycle repair shops;
- Rooftop harvesting workshops;
- A challenge from the klaxit company to encourage carpooling;
- A shared library;
- A running club has been created for the occupants with races offered such as the Soli'Run or the Boulogne-Billancourt half-Marathon;
- Solidarity collections at the concierge for Ukraine, the homeless in winter, children at Christmas, sportswear, etc.;
- Collections to encourage recycling: glasses, mobile phones, corks, batteries, etc.;
- During the week of quality of life at work: yoga classes, step challenge, "healthy" menus, shiatsu sessions, etc.;
- During sustainable development week: feedback on the implementation of the circular economy with the CXC, do it yourself herbal teas via the rooftop, bike and scooter outings, etc.;
- During the week of waste reduction: conferences to raise awareness of waste, Virtual Reality visit to a waste collection centre, planting workshops, etc.

Carbon

General infos

Before use of the building, emissions related to construction products were C1,284.2 kg eq. CO2/m² SDP. In the use phase, emissions related to operation are 272.1 kg eq. CO2/m² SDP. In total, the total GHG emissions generated by the building over its lifetime, including products and construction, use and end of life (deconstruction, recycling, reuse and energy recovery, waste disposal, transport) are 1556.3 kg eq. CO2/m² SDP.

The calculation was established according to the E+C- method.

Contest

Reasons for participating in the competition(s)

- Préservation de la biodiversité grâce à une toiture végétalisée comprenant des carrés de potagers, des arbres fruitiers, des ruches, des zones refuges, etc. ;
- Création d'un hub de mobilité avec des véhicules, vélos et trottinettes partagés ;
- Bâtiment connecté au réseau urbain pour le chauffage et l'eau chaude sanitaire ;
- Production d'énergies renouvelables pour le chauffage, l'eau chaude sanitaire et le rafraîchissement grâce à une pompe à chaleur géothermique sur nappe ;
- Suivi des consommations d'eau potable et mesures de prévention des fuites ;
- Réemploi de mobilier et de revêtements de sols, création d'assises et de meubles en upcycling, utilisation de matériaux biosourcés pour des revêtements muraux, du mobilier et des coussins ;
- Excellente qualité de l'air intérieure mesurée par l'enquête HQE en vue de la labellisation ;
- Organisation de nombreux ateliers de sensibilisation à destination des collaborateurs et du grand public ;
- Retranscription de l'empreinte patrimoniale de l'ancienne usine Renault qui occupait les lieux ;
- Un immeuble de bureaux connecté au service de ses collaborateurs grâce à 3 applications, dont une dédiée à Métal 57.



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