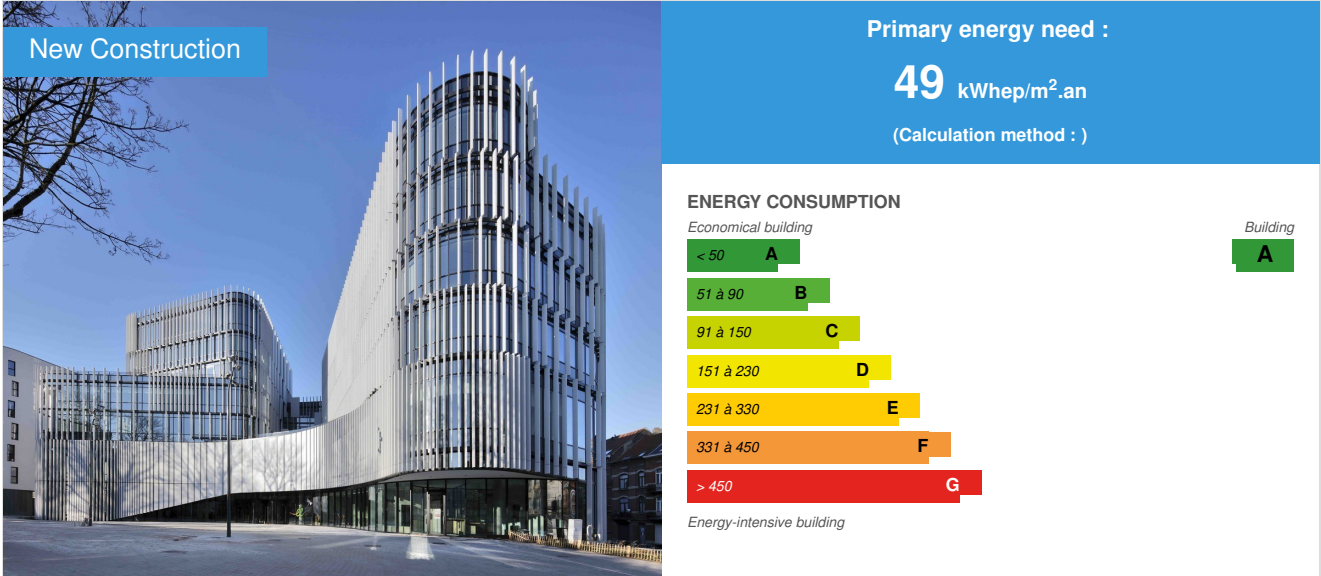


Etterbeek Administrative Center

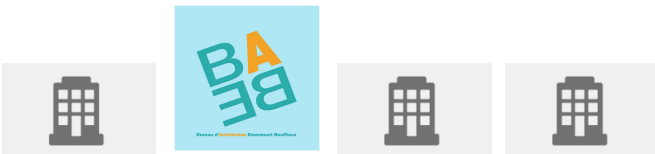
by Emmanuel Bouffioux / © 2021-02-22 15:02:13 / Belgique / 6984 / FR



Building Type : Office building < 28m
Construction Year : 2017
Delivery year : 2021
Address 1 - street : 29 avenue des Casernes 1040 ETTERBEEK, Belgique
Climate zone : [Cfc] Marine Cool Winter & summer- Mild with no dry season.

Net Floor Area : 15 381 m² Other
Construction/refurbishment cost : 35 263 862 €

Proposed by :



General information

The new administrative centre of the Commune of Etterbeek, located at the corner of Avenue des Casernes and Rue Beckers, represents the central jewel in the crown of the urban revitalisation of the former military barracks of Etterbeek on the site of the Jardins de la Chasse. This is an exceptional opportunity for the renewal of an entire neighbourhood, a piece of the city and a municipality that cares about its image.

The primary purpose of the new headquarters is to replace the old municipal administrative centre dating from 1978, which, over the years of use, has become an environmental burden and a functional weakness due to the progressive development and increasing complexity of the administrative services.

The second is to improve the synergy between the administrative services and their services to the population.

The new administrative centre of the Municipality of Etterbeek is also a centre that is intended to be multifunctional. In fact, in addition to the administrative services of the municipality of Etterbeek, it includes a neighbourhood police station and a Public Centre for Social Welfare (CPAS), thus considerably improving

the visibility and accessibility of these other public services.

The co-relation of these two objectives is inseparable from the need to take part in this urban revitalisation of the former military barracks by means of a fair siting proposal that serves the public space.

Thus, the location of the buildings (administrative centre + adjoining housing, not developed within the framework of this application) is clear and dissociated in order to encourage communication between the existing neighbourhoods and the new development envisaged for the whole site (masterplan).

The new administrative centre is positioned at the corner of Avenue des Casernes and Rue Beckers for maximum visibility, while the housing is positioned in the continuity of Avenue des Casernes and the new housing planned for the interior of the block near the new park.

The separate siting of the two buildings allows for the creation of a pedestrian link between the planned park, located at the rear of the building, and the Avenue des Casernes and the new forecourt created by the setback of the administrative centre.

Indeed, the organic form of the municipal headquarters and this setback from the property line allows the creation of a generous public space on the scale of the new building.

The environmental challenges are also significant for such a building and must be adapted to the current regulations and standards within the city of Brussels.

Thus, the passive resolution of the energy performance of such a building is quite a challenge. This was achieved by means of the following actions:

- the development of a triple glazed curtain wall with solar control technology
- the development of an efficient airtightness.
- the development of a thermal model studying the solar run in order to determine the distance between axes and the number of concrete slats suspended from the curtain wall, thus compensating for the additional solar shading required
- the installation of photovoltaic solar panels on the roof and the development of geothermal technology in the basement to provide heating and cooling needs, thus overcoming the need for fossil fuels
- the use of double flow ventilation with heat recovery.

Data reliability

3rd part certified

Photo credit

Georges de Kinder
Philippe Van Gelooven

Stakeholders

Contractor

Name : Commune d'Etterbeek - Travaux Publics

Contact : Dmitri DIELENS, ddielens@etterbeek.irisnet.be, +32 2 627 26 51

<https://www.etterbeek.be/>

Construction Manager

Name : BAEB - JASPERS-EYERS ARCHITECTS

Contact : Emmanuel Bouffioux, baeb@skynet.be, +32 2 376 06 10

<http://www.baeb.eu/>

Stakeholders

Function : Designer

Jaspers-Eyers Architects

Stefaan Van Acker

<https://www.jaspers-eyers.be/>

Function : Construction company

BPC

Vincent Peeters

<https://www.bpc.be/>

Function : Company

CIT Blaton

Arauxo David

<https://www.citblaton.be/fr>

Function :

Bureau Greisch

Franck Gazzard

<https://www.greisch.com/>

Function : Thermal consultancy agency

NEO & IDES

Mathieu Leroy

<http://neo-ides.be/>

Function : Other consultancy agency

TPF Engineering

Didier Debauche

<https://www.tpf.eu/>

Function : Environmental consultancy

BUREAU D'ETUDES PS2

Olivier Louette

<https://www.bureaups2.com/>

Health & Safety coordinator

Function : Structures calculist

D2S International

Geert Desanghere

<https://www.d2sint.com/>

Function : Environmental consultancy

Socotec

Philippe Collard

<https://www.socotec.be/fr/>

Risk management and performance improvement

Function : Thermal consultancy agency

Energie Verbeke

<http://www.energie-verbeke.com/fr/>

Geothermal

Contracting method

General Contractor

Owner approach of sustainability

The wishes of the municipality can be summed up in three main objectives:

- The creation of a quality interior environment to serve; the reception of citizens when they visit the administrative centre, the staff, their fulfilment and cohesion in their workplace, and the service of political life through the development of a strong and inspiring architecture.
- The design of a central building as a connection point at the heart of the urban revitalisation of the former military barracks of Etterbeek into a housing district corresponding to contemporary societal, social and environmental issues.
- The proposal of an efficient and sustainable building corresponding to passive standards, and to the strong policy undertaken by the Brussels-Capital Region, in order to perpetuate the building while minimising operating costs.

Architectural description

In order to take part in this urban revitalization of the former military barracks of Etterbeek on the site of the Jardins de la Chasse, the proposal of a fair

implantation at the service of the public space is essential.

Thus, the implantation of the administrative center and the housing building adjacent to it is clear and dissociated in order to favor the communications between the existing districts and the new development envisaged for the whole site (see masterplan).

The new administrative center is positioned at the corner of Avenue des Casernes and Beckers Street for maximum visibility while the housing is positioned in the continuity of Avenue des Casernes and the new housing projected in the interior of the block near the new park.

The distinct implantation of the two buildings allows the creation of a pedestrian link connecting the projected park, located at the rear of the building, to Avenue des Casernes and the new square generated by the implantation of the administrative center. This link allows a clear separation between the administrative building and the future housing, thus exposing the mix of uses present on the site.

The organic form of the communal headquarters accentuates the setbacks established with respect to the surrounding built and unbuilt context, confirming its position in the public space by creating and enhancing resilient voids and sub-spaces at the service of the urban composition. In front of the building, the square created by the implantation of the buildings allows to give a more important visual frame and an environment adapted to the scale of the new administrative center.

The new administrative center of the Commune of Etterbeek is also a center that is multifunctional. In addition to the administrative services of the municipality of Etterbeek, it includes a Police Station and a Public Centre for Social Action (CPAS), thus considerably improving the visibility and accessibility of these other public services.

Administrative center

Beyond the replacement of the old administrative center of Etterbeek, the new municipal headquarters aims to improve the synergy of the administrative services between them as well as their services to the population.

The large reception hall accessible directly from the square created on Avenue des Casernes represents the heart of the project. The various reception points and counters of the different services are located there. This visibility of the different services, from the entrance of the administrative center, reinforces the image of an administration at the disposal of its inhabitants and not the opposite.

The general shape of the building positions the main entrance intuitively under the central point of the curve generated between the two high points of the building.

The reception hall on two levels links all the flows and services. It also allows the crossing of the building towards the park and the new district located at the back of the building.

CPAS

The reception of the CPAS is separate, with its own reception desks and entrance, while remaining accessible from the general hall.

Police

The new police station is positioned on the main façade under the highest point of the building in order to have an optimal visibility as well as a great accessibility and independence concerning the opening hours. It is also accessible from the main reception hall.

The realisation of a building hosting services specific to the authority and security is a symbolic and functional challenge.

Thus, with the general image of the administrative center, we propose a building with a facade highlighting the functions it hosts. The police station, by its position on the square, takes full advantage of the symbolism of the façade and its prestige.

A global environmental and energy strategy

Our proposal for the construction of a new administrative center and housing in Etterbeek is fully in line with a sustainable development approach of the municipality and responds to energy and environmental concerns in order to perpetuate the building while minimizing its operating costs.

The design philosophy we have applied is based, from the very first sketches, on a sustainable approach combining global environmental thinking and a Rational Use of Energy approach (URE):

- In order to be able to objectify our approach, we referred to the most widespread and successful environmental assessment method for buildings, namely the BREEAM method.

The project is designed to achieve a Very Good performance level, which will place it at a level of environmental performance higher than 75% of new buildings with BREEAM certification.

- For the assessment of the project's energy performance, we used the "PEB Passif 2015" regulatory framework, which came into force in Brussels in 2015. The project is designed to achieve a passive performance level, tending towards "zero-energy".

Our environmental design approach

The design choices made for this project are based on the ambition to achieve a sustainable, homogeneous and long-lasting design of the project, encompassing all aspects of a global sustainable approach. Our choices focus in particular on the following points of attention

- the choice of building materials

Both inside and outside the building, simple and proven materials were chosen.

Simple elements such as warm wood (FSC certified), neutral grey concrete, dark steel elements and many touches of natural green were chosen to enhance and echo the environment.

The façade is entirely made of glass, protected by sunshades.

By combining green roofs and solar panels, it is not surprising that the new administrative centre in Etterbeek has an excellent energy score.

- water management

The project foresees the majority of the roofs as vegetated roofs and water retention basins in order to relieve the sewage network while recovering water for applications that do not require drinking water such as toilets and urinals, maintenance of the building and its surroundings as well as the cleaning of service vehicles. The green roofing and water retention system is also at the service of biodiversity.

The consumption of sanitary water (hot and cold) will be controlled through the adoption of systems to limit water consumption such as dual-flush toilets or flow-limiting taps. The project will have a grey water circuit supplying water to the toilets and urinals from the rainwater recovery tank, thus limiting the building's consumption of drinking water.

The project will have a leak detection and water consumption metering system at each toilet block, which will also allow for the detection of any leaks.

The building is also equipped with a leak detection system on the main water supply with a signal sent to the GTC

- waste management

The construction site was the object of a very particular attention in terms of treatment of waste, their accounting and their minimization. In particular, no waste has been taken to a technical landfill.

- The tenant commits himself to use correctly the room dedicated to the storage of the waste placed at his disposal in the R-1 of 66m². This one is labelled to allow an effective sorting of operational waste.

Our energy design approach

In parallel to our environmental design approach, the project was subject to an energy optimization that is realized by first reducing, and as a priority, the energy needs of the building mainly through choices related to the envelope via passive design strategies. These choices make it possible to meet a primary objective in the design of a passive building: the minimization of energy needs while guaranteeing a high level of comfort. These are the following passive design strategies:

- Optimization of the building shape, allowing to reach a very high compactness (C=4,75), favorable to obtain high energy performances.
- Design of the envelope to meet the passive criteria by combining reinforced insulation, air tightness and optimization of the constructive nodes.
- Solar architecture combining a thoughtful choice of the building's location on the site, an optimization of the facades and their shape as well as the choice of the location and ratio of glazed surfaces. For the administrative center, the design of the exterior solar protection is based on a modulation of the geometry of fixed elements according to the summer solar gains to be protected for each zone of the façade. The choice of fixed elements also simplifies their maintenance as much as possible. These fixed elements are found in the form of architectural concrete slats and panels, directly suspended from the curtain wall.
- The choice of glazed surfaces also stems from a desire to maximize the natural lighting of the living areas, thereby increasing the level of visual comfort while reducing the associated electrical consumption.

The efforts made on the envelope allow us to greatly limit the complexity of the systems, and to use simple, efficient and proven technical systems, adapted to the limited remaining energy needs.

The primary purpose of a building is to protect its occupants from external conditions and to provide them with a high level of comfort throughout the year as well as optimal health characteristics. The design choices made and validated by the BREEAM approach will ensure

- A high quality of air thanks to the choice of VOC-free materials and the generalized double-flow ventilation allowing to ensure a hygienic air renewal in compliance with the PEB regulation.
- High hygrothermal comfort, thanks to the passive design of the project.
- A high level of visual comfort, thanks to the visual access to the exterior and the high levels of natural light.
- A high level of acoustic comfort (the building will comply with the NBN S01-400-1 standard).

Energy

Energy consumption

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

Primary energy need for standard building : 85,00 kWhep/m².an

Calculation method :

Final Energy : 49,12 kWh_{ef}/m².an

Breakdown for energy consumption :

Net heating requirement: 14.06 KWh / m².year - Specific humidification requirement: 1.7 KWh / m².an - Net cooling requirement: 14.97 KWh / m².an - Net lighting requirement: 5.6 KWh / m².an - Net need for ventilation & domestic hot water: 12.8 KWh / m².an Total: 49.12 KWh / m².an

Real final energy consumption

Real final energy consumption/m² : 49,12 kWh_{ef}/m².an

Real final energy consumption/functional unit : 49,12 kWh_{ef}/m².an

Year of the real energy consumption : 2 021

Envelope performance

Envelope U-Value : 0,36 W.m⁻².K⁻¹

More information :

Energy optimisation is achieved by firstly reducing the energy needs of the building, mainly through choices related to the envelope via passive design strategies. These choices make it possible to meet an essential objective in the design of a passive building: minimising energy requirements while guaranteeing a high level of comfort. The following passive design strategies are used:- Optimisation of the building shape, allowing a very high compactness (C=4.75) to be achieved, which is favourable to high energy performance;- Design of the envelope to meet passive criteria by combining reinforced insulation, high air tightness and

optimisation of the constructional nodes;- Solar architecture combining a well thought-out choice of the building's location on the site, optimisation of the façades and their shape, as well as the choice of the location and ratio of glazed surfaces. For the administrative centre, the design of the external solar protection is based on a modulation of the geometry of fixed elements according to the summer solar gains to be protected for each zone of the façade. The choice of fixed elements also makes it possible to simplify maintenance as much as possible. These fixed elements are found in the form of architectural concrete slats and panels, directly suspended from the curtain wall. - The choice of glazed surfaces also stems from a desire to maximise the natural lighting of the living areas, thereby increasing the level of visual comfort while reducing the associated electricity consumption - The development of a highly insulated, triple-glazed curtain wall with solar control technology that allows the passage of light and sunlight while reducing solar gain to a strict minimum

Building Compactness Coefficient : 4,00

Indicator : n50

Air Tightness Value : 0,50

Renewables & systems

Systems

Heating system :

- Condensing gas boiler
- Individual gas boiler
- Geothermal heat pump
- Water radiator
- Low temperature floor heating
- Radiant ceiling
- Solar thermal

Hot water system :

- Individual gas boiler
- Heat pump
- Solar Thermal

Cooling system :

- Geothermal heat pump
- Radiant ceiling

Ventilation system :

- Double flow heat exchanger

Renewable systems :

- Solar photovoltaic
- Solar Thermal
- Heat Pump on geothermal probes

Renewable energy production : 75,00 %

Other information on HVAC :

- Surface of hot / cold ceilings developed 9,814 m² - Double flow ventilation with heat recovery (> 80%)

- Geothermal heat pump on probes 33% of the heating needs of the residential building (37 housing units) & 75% of the cold / heat ratio for the administrative center are provided by the geothermal heat pump on probes - Total area of thermal & photovoltaic solar panels developed 700 m²

Solutions enhancing nature free gains :

- Optimisation of the building shape, allowing to reach a very high compactness (C=4,75), favourable to obtain high energy performances. - Design of the envelope to meet passive criteria by combining reinforced insulation

Environment

Urban environment

Etterbeek is a central municipality in the Brussels-Capital Region, adjacent to the European quarter and the famous Parc du Cinquantenaire. It was almost completely urbanized during the 19th century and today presents a homogeneous architectural character.

Close to both the city center and the Sonian Forest, this town is crossed by the prestigious Louis Schmidt and Saint-Michel boulevards which allow quick access to the European road network. This ideal geographical location is confirmed by the proximity of a series of services:

- 10 minutes walk from the ULB university campus
- 11 minutes walk from Etterbeek station
- 1 minute walk from tram and bus services

- 1 minute walk from the shopping center
- 12 minutes by car from the European district and its institutions
- 9 minutes by car from the exit of Brussels

It is also a commune that is very well known for the importance of its green spaces. In the lively district of "La Chasse", Rue des Tongres and Place Jourdan are privileged places for their local shops and famous markets.

Etterbeek asserts its reputation as a mixed municipality where offices, shops and quality housing intermingle and complement each other. The urban revitalization of the former military barracks of Etterbeek on the Jardins de la Chasse site is a concrete example of this desire.

In order to take part in this revitalization, the proposal of a fair establishment in the service of public space is essential.

Thus, the location of the administrative center and the adjoining housing building is clear and separate in order to promote communications between the existing neighborhoods and the new development planned for the entire site (see masterplan).

The new administrative center is positioned at the corner of Avenue des Casernes and Rue Beckers for maximum visibility while the housing units are positioned in the continuity of Avenue des Casernes and the new housing units planned inside the block. near the new park.

The separate layout of the two buildings allows the creation of a pedestrian link connecting the planned park, located at the rear of the building, to the Avenue des Casernes and the new square generated by the retreating layout of the administrative center. This connection allows a clear separation between the administrative building and the future housing thus exposing the diversity present on the site.

The organic form of the municipal seat accentuates the setbacks established with respect to the surrounding built and non-built context, confirming its position in the public space by the creation and enhancement of resilient voids and sub-spaces in the service of urban composition. In front of the building, the square created by the layout of the buildings provides a more important visual framework and an environment adapted to the scale of the new administrative center.

In order to compensate for the footprint of the building, most of the roofs are vegetated. Their use is also coupled with that of a water retention basin so as to be able to relieve the drainage network while making use of the recovered water for applications that do not require drinking water such as toilets and urinals, building and surrounding maintenance applications as well as cleaning service vehicles. The communion of green roofs and water retention is also at the service of the surrounding biodiversity.

Land plot area : 7 577,00 m²

Built-up area : 2 896,00 %

Products

Product

High-performance architectural concrete - in the form of passive solar shading directly attached to the curtain wall

Vicat

4 Rue Aristide Bergès - Les Trois Vallons 38080 L'Isle d'Abeau / +33 4 74 27 59 00

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

Product category : Structural work / Passive system

The most innovative part of the project is undoubtedly its multiform organic envelope composed of lamellae & panels in high-performance architectural concrete suspended directly from the curtain wall. These, beyond the aesthetic aspect underlining the monolithic aspect of the building, ensure solar protection and develop differently over the whole façade according to the summer solar gains to be protected for each zone of the façade. The analysis of the sunlight patterns throughout the day in all seasons made it possible to draw up a thermal map of the building surface expressed as a percentage in order to establish a gap to be respected (see diagrams). As mentioned above, the ultra-high performance concrete slats and panels are also an important external architectural element. As mentioned above, the ultra-high performance concrete slats and panels are also an important external architectural element, giving the façade a vertical momentum and accentuating the organic curves of the volumes. All the facades have been treated in a regular way, according to the thermal maps mentioned above, in order to obtain an optimal access of daylight and a minimal solar impact. This also creates exciting and differentiated interior and exterior experiences. The vertical momentum of the building disappears in the night, the interior light emanates from the office spaces and underlines the horizontality of the internal open spaces (see day/night photo).

Costs

Carbon

GHG emissions

GHG in use : 10,00 KgCO₂/m²/an

Reasons for participating in the competition(s)

- Bâtiment entièrement passif
- Bâtiment compact, implantation et orientation du bâtiment afin de minimiser l'impact solaire et les pertes énergétiques
- Façade rideau à haut degré d'isolation, triple vitrage, muni de la technologie de contrôle solaire, d'une étanchéité à l'air à haut degré de performance et de lamelle béton et caissons en béton architectonique ultra performant fixés directement sur la façade rideau comme pare-soleil
- Toitures vertes au service de la biodiversité assurant également le rôle de bassin de rétention d'eau afin de stocker d'une partie de l'eau de pluie et ainsi éviter un risque de surcharge des réseaux d'égouts en cas de fortes pluies
- Réutilisation de l'eau de pluie pour l'ensemble des chasses d'eau et équipement sanitaires de seconde nécessité
- La mise en place de panneaux solaires photovoltaïques (± 700 m²) sur la toiture et le développement de la technologie de géothermie en sous-sol afin d'assurer les besoins de chauffage et de refroidissement comblant la nécessité d'avoir recours à des énergies fossiles
- L'utilisation de ventilation double flux avec récupération de chaleur (> 80%)
- Système intelligent pour les lumières intérieures
- Espaces de parking vélos intérieurs dimensionnés à l'échelle du bâtiment et équipés de douches et de vestiaires pour les employés
- Espaces de parking vélos extérieurs pour les visiteurs

Building candidate in the category



Energie & Climats Tempérés

