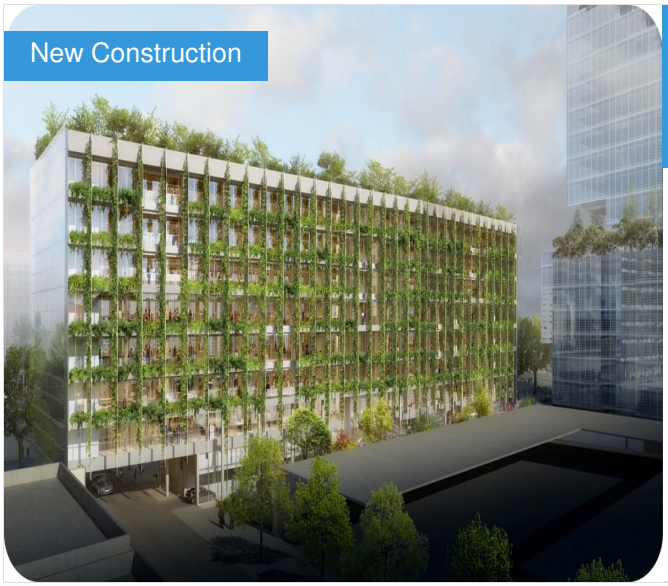
Themis

by Alain Guisnel / 2018-05-22 11:40:15 / Francia / 12678 / FR



Primary energy need :

48.6 kWhep/m².an

(Calculation method : RT 2012)

ENERGY CONSUMPTION

Economical building

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

Energy-intensive building

Building **A**

Building Type : Office building < 28m
Construction Year : 2018
Delivery year : 2018
Address 1 - street : 75017 PARIS, France
Climate zone : [Cfb] Marine Mild Winter, warm summer, no dry season.

Net Floor Area : 11 124 m²
Construction/refurbishment cost : 30 500 000 €
Number of Work station : 970 Work station
Cost/m2 : 2741.82 €/m²

Certifications :

Proposed by :

General information

The Thémis is an office building of 10,655 m², located on Lot N4 ZAC Clichy-Batignolles (Paris 17th), in a lively neighborhood, changing and very well served. The original architectural design of the Themis, the structural innovations and the pioneering E + C label have contributed to making this pioneer building a landmark building in sustainable real estate.

Designed and produced under BIM by the architect Corinne Vezzoni & Associés, it develops a linear of 80 meters on the device which creates an optical dynamics thanks to the inclined glass walls as well as an emblematic south facade, offering a real green living tableau , with more than 260 climbing plants that dress the facade of the building. The predominance of wood, with the mixed wood-concrete structure and CLT floors, makes Themis a building of architectural

excellence, serving sustainable development.

This commitment by ICADE for sustainable development, which is expressed through Thémis, was notably recognized by the award of the first E + C label awarded to a tertiary building. Themis has also achieved a high level of performance. rewarded by the E2C2 rating which highlights a very good energy performance and a level of excellence in terms of reducing the carbon footprint. Having participated in the pilot project of the label, the Thémis demonstrates that it is possible to reach high objectives of greenhouse gas reduction from construction, as well as in operation as it was evaluated during the projections. Themis is a pioneering building for low-carbon labeling, demonstrating the real estate sector's carbon-saving potential. To demonstrate its overall environmental quality, Thémis is also labeled HQE Excellent (2015 reference), BREEAM Excellent (2013 reference), Effinergie + (RT 2012), Biosourcé (2015 reference) and BBCA (Bas Carbone building).

Thémis' reasoned construction, linked to its mixed wood-concrete structure, and its controlled exploitation, thanks to geothermal energy production, allow it to be exemplary in environmental terms. The 235 m² of planted spaces, in close connection with the ground floor, and the 890 m² of green roof are also a key element of this achievement, The Thémis project is the real showcase of sustainable development of ICADE .

Architectural description

The location of the building and ICADE's commitment to sustainable development and innovation have led to strong and structuring architectural choices that make Thémis a unique building. As such, Themis is the first tertiary building to be awarded the E + C label, which rewards energy-efficient buildings and the reduction of their carbon footprint.

First, the location of the building played a key role in the design choice. Indeed, the parcel on which the building was erected is located near the High Court. It is a very tall building, 38 floors, which is in the form of several boxes resting on each other. So we had to deal with this imposing building. From then on, two choices were offered to the architect: to work in a certain continuity or to create a very differentiating building. The bias was to work in harmony with the existing. The Themis is therefore a particularly luminous, transparent and eye-catching building, while remaining in the continuity of its predecessor, but creating its own image.

Secondly, the location of the building required a unique architectural treatment that managed to unite in symbiosis architectural ambitions and environmental performances. Indeed, the building is located in the perimeter of the City of Paris and its construction was therefore subject to the Climate Plan of the capital. ICADE has chosen to capitalize on the context conducive to the fight against climate change as a lever to enhance its ambitions, both from the point of view of energy consumption and greenhouse gas emissions.

Then, the north facade of the plot along the ring has given rise to other strong choices. In addition to the appropriate treatment of noise and air quality factors, this northern facade required a distinctive idea from an outside point of view to animate the ring road, and from an interior point of view to the building. , enjoy an interesting light: the northern light.

In order to deal with these issues, a particularly imaginative idea arose from the spirit of the architect, Corinne Vezonni (from Corinne Vezzonni and Associates). Indeed, she was inspired by designers of perfume bottles. In particular, she asked them how the vials were designed to produce such shifting light reflections, the idea being to animate the visual of the peripheral side facade through changes in light. Thus was born the concept of double skin, with a straight outer skin, continuity of the court, and an inner skin inclined to produce these changes of light. The double skin on the north facade was also an opportunity to accentuate the insulation, to better protect the building from the noise of the device, as well as to allow a better entry of natural light through the use of glass.

Finally, the south facade overlooks a future bus parking. There are two challenges on this side. First, an integration of summer comfort to limit the need for cooling, and on the other, a need to present a facade attractive and pleasing to the eye. The chosen concept is a cladding of the facade with potted vegetation. The chosen plants will climb on supports designed to limit the entry of direct light, and therefore heat, into the building. This largely vegetated facade will also act as a purifier of the outside air while animating in a very pleasant way the future place.

With respect to the interior of the building, the bias was focused on the use of low-carbon materials, such as linoleum flooring, mixed wood-concrete structure and CLT floors. The choice of eco-materials results in a high-quality interior and the obtaining of low-carbon and E + C- building labels.

The architectural theme at the heart of Thémis is clear: the promise of unparalleled comfort for the end user, with a high level of environmental performance at the service of a low-carbon energy transition.

Building users opinion

The building was delivered two weeks ago, there are no occupants yet.

If you had to do it again?

The choice of BIM was quickly made, especially at the request of the architecture team. This choice made it possible to work in a collaborative way between the different actors of the design. BIM is a design tool that informs many parameters of a project, including building components. This is why the life cycle analysis part (LCA) could have been done under BIM. Indeed, one of the interests of the BIM is there: by informing the LCAs of the components in the BIM tool, it is possible in the short term to obtain the global LCA of the automatically generated building. However, despite the willingness of ICADE to go far in the use of LCA and BIM, this was not the case on this project. This is the next step to be achieved, and this will be the case in future ICADE projects, because as part of its participation in the Digital Transition Plan in the Building (PTNB), ICADE is working on new construction projects with the incorporation of LCA tools directly into BIM. This will go further in monitoring and achieving the environmental performance objectives of buildings.

See more details about this project

http://www.vezzoni-associes.com/fr/ici-maintenant/pose-de-la-premiere-pierre-de-limmeuble-themis-2.html
http://www.leparisien.fr/paris-75/paris-le-themis-avec-vue-sur-le-periph-est-une-vitrine-ecologique-08-01-2018-7488897.php
https://www.actu-environnement.com/ae/news/batiment-neuf-label-energie-carbone-28650.php4

Stakeholders

Contractor

Name : Icade
Contact : Alain Guisnel
http://www.icade.fr

Construction Manager

Name : Corinne Vezzoni & Associés
Contact : Michelle Lenne-Haziza
http://www.vezzoni-associes.com/fr/

Stakeholders

Function : Construction Manager

Artelia

Alexandre Duverger

https://www.arteliagroup.com/fr
Coordination of Studies, Mastery of Implementation, OPC, BET Environment & Energy Performance, Structure, SSI

Function : Thermal consultancy agency

SFICA

Pascal DOGNON

http://www.sfica.fr/
BE Fluids & Thermal

Function :

Lamoureux Acoustics

Bruno SOUDAN

http://www.lamoureux-acoustics.com/

Function : Structures calculist

Barthès Bois

Nicolas Barthès

https://www.barthesbois.fr/
BE Wood structure

Function : Investor

Covéa

https://www.covea.eu

Function :

ENGIE

Macro-Lot Techniques

Function : Other consultancy agency

VS-A

Léa Richert

http://www.vs-a.eu/fr/
BE Façade

Function : Other consultancy agency

Ozévert

Angélique Le Néel

Grounds

Function :

Léon Grosse & Mathis

Macro-Lot Gros-Oeuvre and Architectural State Corps

Function :

Castel Alu & ACML

Macro-Lot Façades

Contracting method

Macro packages

Type of market

Table 'c21_spain.rex_market_type' doesn't exist

Energy

Energy consumption

Primary energy need : 48,60 kWhep/m^2.an

Primary energy need for standard building : 110,00 kWhep/m^2.an

Calculation method : RT 2012

Breakdown for energy consumption : Heating: 6.1 kWhEF / m².an Cooling: 1.7 kWhEF / m².an ECS: 2.05 kWhEF / m².an Lighting: 5.69 kWhEF / m².an Auxiliaries: 8.37 kWhEF / m².an

Real final energy consumption

Final Energy : 22,57 kWhef/m^2.an

Envelope performance

Envelope U-Value : 0,77 $W.m^{-2}.K^{-1}$

More information :

The building envelope is the result of committed and innovative architectural choices: a double skin on the north facade and a façade dressed with plants on the south facade. In order to achieve high levels of performance, a specific mission has been entrusted to a specialist design office for the envelope. The result is a measured contractual air tightness of 0.8 (final measurements in progress in relation to the last reserves), which is a very good objective result. To achieve this performance, glass wall systems were selected to clad the facade with aluminum studs, which are found behind the windows. The envelope is thus triply effective in terms of the reduction of energy consumption, the entry of natural light and the level of soundproofing. It is a high performance envelope that guarantees a certain comfort and high users.

Building Compactness Coefficient : 0,80

Indicator : I4

Air Tightness Value : 0,80

Users' control system opinion :

The building was delivered two weeks ago, there are no occupants yet.

More information

At the time of today, the building is not occupied because it has just been delivered. However, in order to guarantee purchasers optimal building performance, ICADE has awarded an energy performance contract for the first two years of occupancy at Artelia. Indeed, the consulting firm is committed to a performance of the equipment to be achieved and will ensure that the systems put in place work as planned. This is called "enhanced commissioning", or "commissioning continues": Commitments taken follow the temporal logic of construction and occupation of the building. Thus, in the programming phase, the energy performance objectives are defined according to the uses and the climate. Then, from design to operation, these objectives are set according to a commissioning mission, a quality assurance process that aims to ensure that the building is designed, installed and tested in accordance with the energy performance objectives set . Finally, during operation, the objectives are established with a statement of consumptions, and adjustments are possible if differences (not related to the operation) are recorded in relation to the commitment. The performance is all the more important as the energy consumed on site is low and decarbonated with the use of the urban heat network and geothermal energy. Obtaining the E + C label is thus the mark of a bias resolutely turned towards the reduction of the carbon footprint.

Renewables & systems

Systems

Heating system :
- Urban network
- Low temperature floor heating
- Radiant ceiling

Hot water system :
- Individual electric boiler

Cooling system :
- Geothermal heat pump
- Others
- Floor cooling
- Radiant ceiling

Ventilation system :
- Double flow heat exchanger

Renewable systems :
- Solar photovoltaic
- Heat pump (geothermal)

Other information on HVAC :
Concerning ventilation, Themis provides a supply of fresh air of 20% more than the level required by the Labor Code. The systems consist of heat recovery double-flow air handling units, with a performance of 75%. In addition, an adiabatic system reduces the need for cooling in the summer, through the indirect cooling of the air entering through the water. The principle of an adiabatic system is as follows: If hot, dry air passes through a trickle of water, it causes evaporation. As the heat needed to vaporize water is extracted from the air, it cools down, bringing cooler air into the building.
On the subject of heating, in addition to a reduction of the need thanks to a high-performance envelope, the implementation of the project in the ZAC of Clichy-Batignolles gives access to a heat network. This network is very largely powered by deep geothermal energy (650 meters deep) and offers a low temperature heat of 45 ° C. The distribution of this heat is done via radiating ceilings, allowing an excellent comfort to the users, in addition to a high energy efficiency and a reduced maintenance.
Finally, the cooling, when it is necessary, is done by geo-cooling. As a reminder, the south facade has benefited from special treatment to maximize summer comfort and avoid overheating. Indeed, adjustable sun breezes have been installed pending the deployment of the plant system that will subsequently take over to provide summer sun protection. The cold, as for him, comes from a tablecloth situated under the parcel. Two geothermal wells are needed to use the cold. A booster is possible thanks to a cold unit in extreme conditions.

Photovoltaic panels on roof
Geocooling on tablecloth: the comfort in summer is maintained without recourse to the CAP (direct exchange on tablecloth). The latter is used only in extreme cases of hygrothermal energy by making it possible to reduce the temperature regime of the cold accumulators of the CTAs, in order, in return, to increase the temperature regime of the radiating panels and thus to avoid condensation.

Solutions enhancing nature free gains :
Façade largement vitrée au sud permettant de profiter des apports solaires gratuits en été, et efficacement protégé en été via des BSO

Smart Building

Users' opinion on the Smart Building functions :

The building was delivered two weeks ago, there are no occupants yet.

Environment

Urban environment

Land plot area : 1 979,00 m^2

Built-up area : 81,00 %

Green space : 924,00

The Thémis is located in the ZAC Clichy-Batignolles which will eventually have a large park of 10 hectares and more than 500,000 m2 of mixed programs. The revitalization of this sector of the 17th arrondissement is also part of the metropolitan dynamic at work in northwestern Greater Paris. Clichy-Batignolles is involved in the EcoQuartier certification process issued by the state. Moreover, since the ZAC is on the territory of the city of Paris, the constructions that are planned there must respect the ambitious Climate Plan of Paris. As a result, buildings with high energy and environmental performance are expected, and Themis fits in very well.

With regard to mobility and transport, Themis is pampered. Located on Lot N4 of the ZAC Clichy-Batignolles developed by Paris Batignolles Aménagement, Themis is in the immediate vicinity of the ring road and the Porte de Clichy. The accessibility of the site is remarkable thanks to the presence of a vélib 'station, several bus stops (54, 74, 138, 173, N15 and N51), line 13 of the metro and the RER C. In addition , the commissioning of the effective T3b tram in December

2017 created a stop located 450m from Themis. Finally, the creation of a new station on metro line 14, scheduled to open in 2019, will be located 250m from Themis.

In terms of carbon emissions during the operation phase, obtaining the E + C label is a testament to anticipatory work and high objectives formalized in the design phase. In particular, the location of the site allows users to take advantage of public transport and thus generates a reduction in the number of parking spaces. This encourages users to abandon the car and thus reduce their carbon emissions, which is taken into account in the E + C- label. The location of Themis, which is an important element of the E + C label, has been integrated since the design of the building.

Products

Product

Glued laminated wood

Scierie Mandray

commercial.mandray@wanadoo.fr

http://www.scieriemandray.fr/fr

Product category : Table 'c21_spain.innov_category' doesn't exist SELECT one.innov_category AS current,two.innov_category AS parentFROM innov_category AS oneINNER JOIN innov_category AS two ON one.parent_id = two.idWHERE one.state=1AND one.id = '6'

The choice of structure was quickly focused on a mixed wood-concrete structure. The posts and lighters are made of laminated wood, PEFC certified. The wood chosen to play this role is a wood of French origin, it comes from the Vosges.

The main difficulty in using this product is the wood-concrete mix of the structure. Wood is a living material and concrete is a mineral material. Wood prefabrication always requires an on-site fit between the concrete structure and the wood structure.

Costs

Construction and exploitation costs

Total cost of the building : 30 500 000 €

Health and comfort

Water management

Consumption from water network : 5 680,00 m^3

Consumption of harvested rainwater : 203,00 m^3

Water Self Sufficiency Index : 0.03
Water Consumption/m2 : 0.51
Water Consumption/Work station : 5.86

Indoor Air quality

Air flows:

the flows are 20% higher than the RSDT: 30 m3 / h.pers

Indoor Pollutants: Special attention has been paid to the emissions of TVOC and formaldehyde from selected materials: GUT carpet, Emicode EC1 + adhesives

As with the environmental, and more particularly energy, plans, the comfort of the users is placed in the heart of Themis. Thus, the quality of the air was a central point of the reflection to allow a good use of the building. Indeed, from ICADE's point of view, a building can only be described as sustainable if it achieves high standards in terms of quality of life, that is to say that it is above all a human imperative, and must be a pleasant place to live, work and meet.

Given the particular geographical location along the building's ring road, and in order to guarantee fresh air quality, several filters were put end to end to purify the outside air before entering the building: first a system M5 prefiltration, followed by an F7 filter and an F9 filter with in between, an activated carbon filtration. Activated carbon has been used to specifically treat exhaust gases from the device. Filters M5, F7 and F9 ensure that they capture up to 99% of the fine particles.

To go further in terms of indoor air quality, the air flow has not been left out: Thus, it exceeds the legal standard of 20% (30 m3 / h.pers) . This choice ensures a constant renewal of the air and to limit the high concentrations of carbon dioxide in the ambient air.

Finally, in addition to the important work done on the quality and quantity of fresh air entering the building, special attention has been paid to the choice of materials

for interior finishes in order to limit contamination of indoor air over time. . The materials are all at least labeled "A +" for TVOCs and formaldehyde. For example, all the carpets used are labeled GUT and the glues have the Emicode EC1 plus label. Most of the other materials used are from wood and are PEFC labeled.

To ensure the actual performance of these measurements, indoor air quality tests have been completed. Results will be available soon.

To ensure the actual performance of these measurements, indoor air quality tests are being conducted. Results will be available soon.

The target levels are:

- Formaldehyde: <10 µg / m3

- TVOC: <300 µg / m3

- Benzene: <2ug / m3

- Nitrogen dioxide: <40 µg / m3

- PM2.5: <10 µg / m3

- PM10: <20 µg / m3

Comfort

Health & comfort :

ICADE was particularly keen to build a comfortable building. In addition to measures on indoor air quality, the architectural choices made were in favor of the comfort of users. The important natural light is a factor that contributes largely to the comfort of the building. However, natural light can become troublesome when it is accompanied by a significant amount of heat. This is why the south facade is composed of many orientable sun breezes. These limit the glare and overheating of the building. Eventually, they will be supported by a vegetal cover. Elegantly arranged on the facade, pots will allow climbing plants to grow along specially designed devices for plants to act as sunshades. The great interest of plants in this type of device is that they let in light and heat when it is needed most, in winter, since the leaves fall. On the other hand, in summer, when light and heat can become troublesome, they play their full role as a refreshing regulator. Finally, these plants create a very elegant coat for the building from the point of view of the exterior designer and contribute to the quality of the interior space for the user with a green facade with soothing virtues and facilitating laconcentration. Another building attraction for users is the available ceiling height of 2.90m. The resulting perception for users is a sense of space. This is important, especially in open-plan offices. Finally, the reversible radiating ceilings provide much better thermal comfort than conventional fan-coil type air handling systems.

Calculated thermal comfort : PMV/PPD : Catégorie B

Acoustic comfort :

Particular attention has been paid to the acoustics of the building, particularly with regard to external noise. This attention led to the creation of a double skin on the north facade along the ring, a great noise transmitter. The double skin allows a sound insulation of high quality. The work done at the acoustic level was done with the professionals of an acoustic study office. As a result, the requirements of the high standard of the NF S31-080 standard are met.

Carbon

GHG emissions

GHG in use : 3,93 $KgCO_2/m^2/an$

Methodology used :

The use phase here covers the greenhouse gas emissions related to the building's energy consumption on all uses covered by the E + C- label (5 RT uses + Movable / real estate uses).

Building lifetime : 50,00 année(s)

GHG Cradle to Grave : 1 005,00 $KgCO_2 /m^2$

The methodology used is that of the Energy-Carbon standard

Life Cycle Analysis

Material impact on GHG emissions :

75

Material impact on energy consumption : 25,00 kWhEP

Eco-design material :

Concerning materials, a particularly important effort has been made, as evidenced, on the one hand, by the BBCA (Low Carbon Building), Biosourcé and E + C- labels, and on the other hand, the very high level attained in several targets. HQE certification, as well as the targets "sanitary quality of spaces" and "integrated choice of products, systems and construction processes". Emphasis was placed on low-carbon, biobased and health-efficient materials. It was by using the LCA method that the choice of materials was made. Indeed, the LCA carried out in parallel with the design of the project made it possible to directly obtain a result on the environmental impact of this or that component of the building. Thus, the choice fell on a mixed wood-concrete structure, a linoleum floor covering and wooden false ceilings. The result is impressive, with the achievement of the C2 level, the maximum level, on the carbon component of the E + C label and a reduction in GHG emissions estimated at 30% in the construction phase and 70% in the operation phase. compared to an equivalent building. And this has been achieved by increasing the attractiveness of the building for users. It should also be noted that all the wood comes from Europe, with a part coming directly from the Vosges, in particular the wood used for the glulam structure. Finally, the wood is PEFC certified.

The final rendering of the building gives the impression of a living place with the remarkable presence of wood in the interior spaces.

Contest

Reasons for participating in the competition(s)

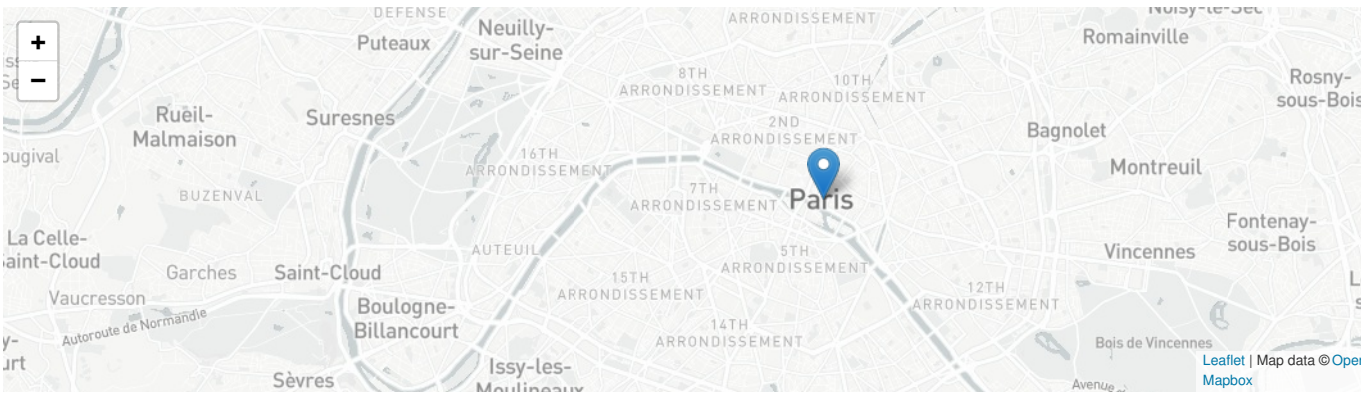
- Biosourced level 3 certification
- Certified BBCA (low carbon building)
- First tertiary building labeled E + C-, level E2C2, certification that rewards low carbon buildings.
- Effinergie + with geothermal energy and urban heat network. ICADE Performance Commitment and High Performance Envelope
- HQE AND BREEAM Excellent, with high quality interior spaces (comfort and health)
- Mixed wood-concrete structure, with wood from the Vosges and PEFC certified.
- CLT floor from Eastern Europe

Building candidate in the category

Bas Carbone

Coup de Cœur des Internautes

Prix des Etudiants



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