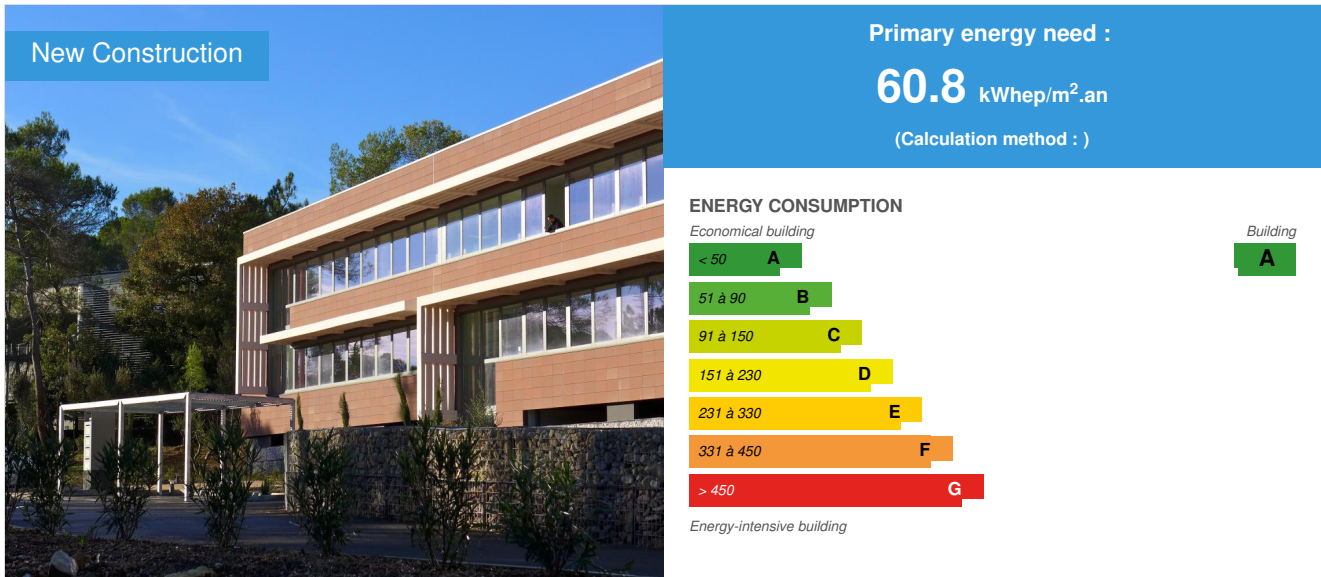


## Natura ENR

by Eric Daniel-Lacombe / 2015-06-22 17:44:51 / Francia / 10322 / FR



**Building Type** : Office building < 28m  
**Construction Year** : 2013  
**Delivery year** : 2014  
**Address 1 - street** : 06250 MOUGINS, France  
**Climate zone** :

**Net Floor Area** : 2 885 m<sup>2</sup>  
**Construction/refurbishment cost** : 4 200 000 €  
**Number of Work station** : 210 Work station  
**Cost/m<sup>2</sup>** : 1455.81 €/m<sup>2</sup>

**Certifications :**



### General information

Natura 2nd generation, 2885 m<sup>2</sup> floor area of office building looking to the environmental and energy performance:

- Mediterranean Green Building label Gold level
  - Winner of the call for PREBAT project "100 exemplary buildings in Provence Alpes Côte d'Azur"
- The building Video: <https://www.youtube.com/watch?v=um1upi4MLM4>

### Sustainable development approach of the project owner

The objective of the project owner was to realize an exemplary building both in terms of environmental quality as its energy costs. Already, with its Natura 1 (set of five office buildings with a total floor area of 6550 m<sup>2</sup> surface area), Perial Development building has reached the goal Very High Energy Performance on the Sophia Antipolis site. Eager to go much further and in the continuity of an overall environmental approach, Perial Development has referred to its new building "Natura REC" in Mougins, a labeling Mediterranean Sustainable Buildings Gold level and a real performance to Positive Energy Building. It is indeed a real "Positive Energy" covering all uses beyond regulatory consumption, plus compensation of part of embodied energy construction. The Client is also committed in

the Emergence program on solar cooling even if that solution was not selected. Naturally, the views of ambitions for this building, the Client wanted to achieve exemplary operation registering in the process PREBAT Act-which he won in 2010. The Natura BEPOS REC is a 2 copies Buildings complex on the map Energy and Environmental. From an environmental point of view, the project received the recognition level of the Mediterranean Sustainable Buildings Gold issued by the BDM Association (<http://polebdm.eu/>) following the evaluation stage of the project design and implementation. Its strengths are a global, cross-reflection: **La** bioclimatic design, including its perfect north-south orientation (compact, high inertia, effective protection, according to solar orientation factor, no solar mask, ...), **Le** visual comfort **Le** dimensioned façade by façade with dynamic thermal simulation thermal insulation **La** preservation and increase website Biodiversity, **Le** choice of the construction product with little or no VOC, **La** awareness and training of users, **Le** side ... Power engineering, Natura ENR has won the call for projects PREBAT "100 best buildings in Low Energy PACA". These are also two buildings POSitive Energy (BEPOS) according to the requirements of Negawatt approach: energy **Sobriété**, of removing waste and unnecessary **Efficacité** energy needs, reducing energy consumption for a defined need renewable **Energies** by employing energy-efficient systems with reduced impact on the environment to do this, we initially achieved low energy consumption, by physical calculation and not by a single regulatory calculation, limiting the energy consumption to an absolute necessary. Then we set up renewable energy (50 per kWp photovoltaic building) to compensate all expenses consumption. This is indeed a real "Positive Energy" covering all uses, that is to say both regulatory consumption (Heating, Cooling, ECS, ventilation and lighting) and all other consumption (elevators, IT, ...). Phase program, it was considered the possibility of a maximum occupancy of the property complex of up to 240 people throughout the year. This worst case helped calibrate the wider future use.

## Architectural description

The project involves the completion of two office buildings that are organized along a southern slope (the slope varies between 12% and 5%) and the landscaping of the plot located on the Sophia Antipolis site Mougins. The buildings located in the natural slope of the terrain are made according to the same general principle: 1. A parking DRC semi buried advantage of the slope. The facades level Ground floor, occupied by the parking lot will be built with the stone gabions which fills evoke the rocky stratifications of the ground. 2. two floor covered by a single roof slope facing south, more or less parallel to the natural slope that receives photovoltaic panels to meet the requirement of BEPOS in terms of energy production. 3. The facades, isolated from the outside, are coated with clay or lazuré concrete cladding panels. 4. A concrete structure covered with a mineralization, horizontal shading support will punctuate the south facade while providing sun protection for windows. 5. En west and east facade, to meet a side solar protection, solar shading will also be implemented. 6. The gears will be embellished in cassette holder vegetated steel structure and provide users with large terrace overlooking the surrounding pine forest. The access road is an extension of the existing track, the subject of a winding route to fit better to the slope of the terrain and to cope with the existing plantations. The will of the project is to maintain the current quality of the site linked to its visual openness and walk. Thus no fence is planned for parcel boundary. The water flow on study foreshadows a most natural as possible and landscaped device; ponds, ditches, planting, slopes, Noues ... The porosity of the program in 2 buildings avoids too great breakthrough in the existing pine forest, and instead play a better distribution between pine forest and buildings.

## See more details about this project

<http://www.sophianaturaenr.com/presentation.html>

## Stakeholders

### Stakeholders

**Function :** Contractor

Perial Développement

Eric Journault

<http://www.perial.com/nos-metiers/perial-developpement>

**Function :** Construction Manager

Eric Daniel-Lacombe Architecte DPLG / BET SLH

**Function :** Assistance to the Contracting Authority

Aubaine

Dominique Chevriaux

<http://www.be-aubaine.fr>

### Contracting method

Macro packages

### Type of market

Table 'c21\_spain.rex\_market\_type' doesn't exist

## Energy

### Energy consumption

Primary energy need : 60,80 kWhep/m<sup>2</sup>.an

Primary energy need for standard building : 132,00 kWhep/m<sup>2</sup>.an

Calculation method :

Breakdown for energy consumption : Lighting: 14.96 Ventilation: 14.29 ECS: 2.66 Heating: Air conditioning 1.63: 2.8 Auxiliary: 0.88

## Real final energy consumption

Final Energy : 23,60 kWh/m<sup>2</sup>.an

## Envelope performance

Envelope U-Value : 0,56 W.m<sup>-2</sup>.K<sup>-1</sup>

More information :

Exterior wall Facade North: concrete shuttered + ITE 14 cm rock wool + coating (Risolant = 3.65) outside wall Facade South / East / West: concrete shuttered + ITE 14 cm rock + siding Terreal wool (Risolant = 3.65) Roofing terrace: concrete + Rockwool 14 cm (Risolant = 3.65) PV support roof: steel double tray with 19 cm of rock wool (Risolant = 5.3) Floor of Parking: concrete + 14 cm of rock wool (Risolant = 3.65)

Indicator : n50

Air Tightness Value : 1,70

## More information

Use consumption Estimate: 60kWhep / m<sup>2</sup> / year Building delivered in 2014. Having not yet a full year of consumption, we have not yet actual performance. A mission on the subject entrusted to the AMO who has been able to participate in all phases impacting the project (design, construction, commissioning operation)

## Renewables & systems

### Systems

Heating system :

- Heat pump
- Others

Hot water system :

- Individual electric boiler

Cooling system :

- Reversible heat pump
- VRV Syst. (Variable refrigerant Volume)

Ventilation system :

- Nocturnal Over ventilation
- Double flow heat exchanger

Renewable systems :

- Solar photovoltaic

Renewable energy production : 171,00 %

Although not considered renewable energy, coupled with a airzone VRV system with a higher COP and EER 3.5, could be considered as such. Solar power plants consist of high-efficiency monocrystalline panels

Solutions enhancing nature free gains :

Brise-soleil fixes

## Smart Building

BMS :

see supplementary information

## Environment

### Urban environment

The building of the implantation site is located approximately 2.30 km north east of the village center of Mougins. It is built at the perimeter of Sophia Antipolis business park and more precisely in the ZAC du Fond de l'Orme (west of the perimeter of the business park) on the Vallon du Colombier and the town of Mougins. Neighbourhood and immediate environment: The field boundaries are bordered to the north by the first real estate program PERIAL Development (Natura 1), to the west by an older property program, to the east by a heavily wooded natural watershed and south by a tarmac path and green space and the golf of Mougins. Topography: The project is organized along a southern slope with a slope between 12% and 5%, oriented valley of Colombier.. (mostly low slope 5%) Access: Avenue du Docteur Maurice Donat D98 is north of the land and provides service viarie buildings. It is lined part of a bike path. Currently the Avenue du Docteur Donat is served by county bus lines (CG 06) No. 630 and No. 650. Areas of interest for biodiversity: The future developed area is located in the southwestern boundary of ZNIEFF Ground Type II "Forests Brague, Sartoux and Valmasque" and code of 06-124-100 an area of 756.34 ha.

## Products

### Product

Daikin VRV - System Airzone

Daikin

+33 1 46 69 95 69

<http://www.daikin.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 = '19'

There are 8 units per building Daikin VRV Small, providing hot and cold, associated with the installation of ducted indoor units. Each feeds 3 VRV indoor units 4 which leave ducts. Each duct the air is blown to each partitioned space via a Airzone engine that allows a distribution of air with independent regulation. Airzone The system is completely autonomous and connects to the "indoor unit" Daikin to optimize settings based on user requests (or orders of GTC).



Despite its high performance, the system is used as a conventional VRV system. it has therefore generated no particular nuisance for users and permit easy in operation. The operation time of the couple VRV / AIRZONE (especially at the interface in case of problems) remains to be seen.

## Costs

## Health and comfort

### Water management

cf sizing study underground tank

### Comfort

**Health & comfort :** The integration of all property within its natural area has been the subject of particular attention by the strategy of the group PERIAL well as the natural setting in which the transaction is registered. A daylighting study was conducted in Phase program to maximize comfort parameters. The study shows better results than the regulation and approaching high reference levels HQE. The operation was voluntarily under densified. Work premises and offer a clear view of the landscape (with fanlight partitions are required for interior design workspaces to keep this view and this access to daylight at each workstation). The choice of systems implemented to NATURA ENR has been customary in a quality concern, taking into account the specific environmental characteristics of the site (Mediterranean area) and by adapting the architectural features of the building. This requires: - Limitation of heat loss (exterior insulation, efficient windows, etc.) - Effective ventilation (free cooling) - Sealing of the building 0.6 Flight / h under 50Pa (I4 <1) - The use of solar gain through proper orientation of buildings and the lack of masks - The limitation of overheating in summer (adapted sunscreens, pergolas on terraces ...).

**Calculated thermal comfort :** cf Simulation Thermique Dynamique

## Carbon

### GHG emissions

**GHG in use :** 1,07 KgCO<sub>2</sub>/m<sup>2</sup>/an

**Methodology used :**

Next conversion factor decree of September 5, 2006

**Building lifetime :** 50,00 année(s)

on GHG, the building has only electrical consumption because the heating mode / PAC refresh is a VRV air / air. The set of all consumption purposes (regulatory and other) amounted to 46 kWh / m². Photovoltaic production

## Life Cycle Analysis

**Eco-design material :** The building wished to be copy into its operations through the use of materials, products and systems that respect the environment. This particularly involves the realization of a sustainable building scalable and efficient to ensure sustainability and comfort for future tenants and users. In order to enhance as much as possible local industries and reduce CO2 emissions from transport, the choice of products and materials will maximize product available in the PACA region. Some of these are: - Concrete sailing (reducing transport-related pollution and reducing construction waste - gabion walls, local aesthetic elements - floor coatings and paints labeled and ensuring little or no VOC emissions - notification future users for their choice of office furniture (low to zero VOC and formaldehyde)

## Contest

### Building candidate in the category



Smart Buildings



Bâtiment zéro énergie

