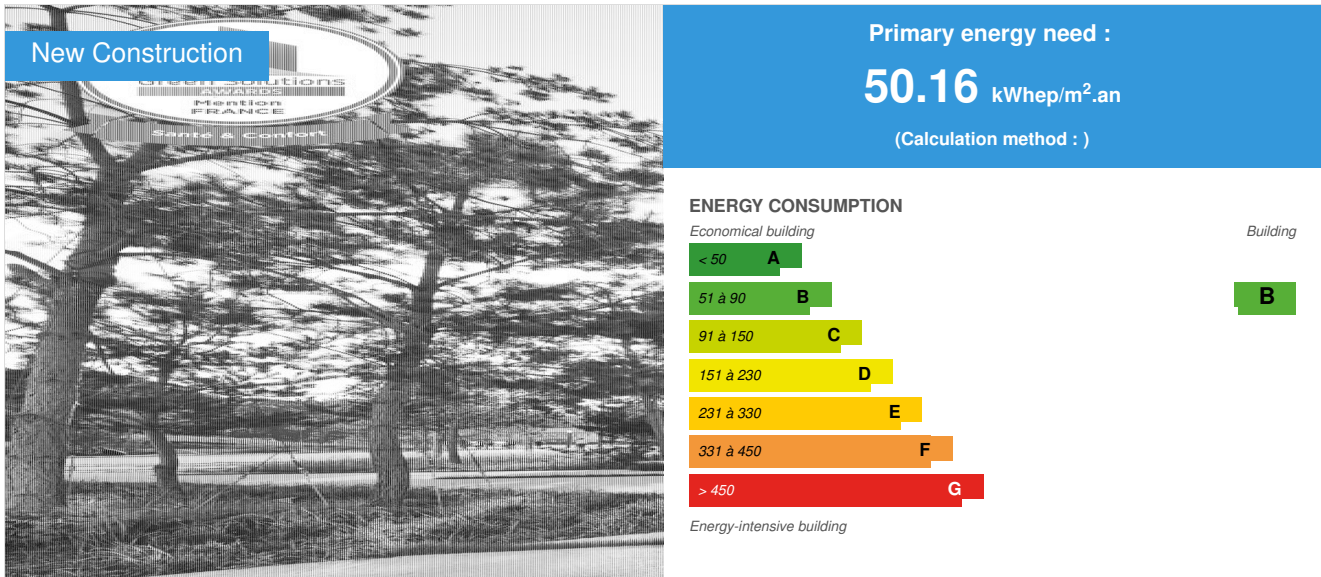


## CNSD - National Center for Defense Sports

by Clémence Le Van / 2018-06-19 18:00:39 / Frankreich / 10818 / FR



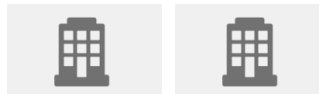
**Building Type** : Other building  
**Construction Year** : 2012  
**Delivery year** : 2014  
**Address 1 - street** : Camp Guynemer, Rue des Archives 77305 FONTAINEBLEAU, France  
**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 40 000 m<sup>2</sup>  
**Construction/refurbishment cost** : 5 185 000 €  
**Cost/m<sup>2</sup>** : 129.63 €/m<sup>2</sup>

**Certifications :**



**Proposed by :**



### General information

The National Sports Center of Defense in the heart of the exceptional site of the Fontainebleau forest was renovated and extended by ADIM Paris Ile-de-France, within the framework of a 30-year long Public-Private Partnership (PPP) contract, on behalf of the Ministry of Defense. The guiding principle of this project was its thoughtful insertion into the surrounding site of the Fontainebleau forest in order to give it a strong identity that respects local biodiversity.

The works, carried out on a busy site, included the rehabilitation of 5 accommodation buildings, the construction of 2 sports halls and a large artificial climbing wall, an office building and a reception house of a surface totaling 40,000 m<sup>2</sup> or only 7% of building on the available space. On the other hand, each carried out development is thought in the optics to enhance the surrounding site. The project thus reflects on the protection and conservation of existing flora and fauna, soil protection, stormwater management on the plot, recycling of materials and the rational use of the available space on the site. site.

**Thespecificities of this renovation project and conservation of the environmental heritage are as follows:**

- Insertion of premises in the unique and exceptional environment of the forest of Fontainebleau in the constant respect of biodiversity and the site through a study convention with the National Museum of Natural History

- Development of the site in the spirit of a large clearing with facilities and living spaces concentrated in the heart and a minimum of built spaces. The project shows the strong desire to build a place of reference in terms of environmental and landscape quality
- Providing the Ministry of Defense with a complete package of services including the management of green spaces
- Support for the opening of the site to the public in a pleasant and green setting outside the slots reserved for the military

Certifications :

- HQE® (Offices),
- PEQA (sports areas),
- PH&E (certification for accommodation and approach for housing)

Labels :

- BBC Energie Neuf (tertiary buildings),
- THPE (sports equipment)
- and BBC Renovation (housing)

The cost of this global project is 45 million euros and the cost of green space is 981,000 euros. Given the unique site that hosts the project, the sustainable development approach does not represent a major part of the financial investment but above all a permanent involvement and adaptation in synergy with all stakeholders.

## Sustainable development approach of the project owner

The site of the Fontainebleau forest, where ADIM Paris Ile-de-France proposed a real strategy to respect the site via a convention of study with the National Museum of Natural History, is classified Natura 2000. The expertise of the Museum has been used in the dynamics of preservation of local fauna species, surrounding flora and the development of a sustainable life.

Faced with the unique and fragile ecosystem of the Fontainebleau forest, the actors have led a policy of sustainable development from the design stage, and at all levels, minimizing the impact of the operation and promoting respect and inclusion. surrounding biodiversity in the development project. Many approaches have been made, both in design (design of the VRD to minimize the impact on the roots, choice of lighting to avoid nocturnal light pollution, reintroduction of certain species, measures to prevent the proliferation of invasive species ... ..) that on site (strong awareness, numerous specific audits with the Museum, phasing of the specific site not to disturb the cycles of reproduction / hibernation of local populations) that in operation with many recommendations tailored or even differentiated management so to perpetuate our actions.

The project has also implemented a triple environmental certification (HQE®, PH&E and PEQA) to respond to the diversity of uses.

Finally, the real highlight of this project was the partnership we have especially initiated with the National Museum of Natural History, in order to better understand the issues related to the exceptional Biodiversity present on the site (forest and fountain area Natura 2000).

## Architectural description

The main axis of the architectural approach is to limit the dispersion of the buildings, to restructure the site and to highlight its intrinsic qualities by giving a large place to the forest atmosphere. The desire to include this project in this perspective results in the implementation of the following actions:

- Integration of buildings in the site and the forest landscape:

The height of the trees conditions the architectural writing and the design of the buildings by limiting their height so that they do not emerge from the forest. The architects also cleared the campus to reduce the footprint of the building and develop landscaped land reserves to find a clear atmosphere and a forest heart atmosphere. Only a small proportion of the site is built and the boundaries between activities are redesigned. The site offers beautiful clearings on the edges of the adjacent forest, and undergrowth areas planted mainly with species typical of the forest are developed. The wooded areas are densified, new copses created, and planted valleys make it possible to store the runoff water and to create tree masses. The living areas are also embellished with tall trees.

Less than 3% of existing trees on site are felled and 500 new trees are planted.

- Preservation of existing biodiversity and respect of the life cycle of the different species:

Throughout the construction phase, local biodiversity impact studies are conducted and the work is phased according to the life cycles of the species present. Thus, during demolitions, the life cycle of animals in the undergrowth (nesting period) is scrupulously respected and the buildings are demolished only over the period possible without nuisance is from August to September. Areas of green space with differentiated management are also created. These "high meadows" have a landscape quality and reduce the number of mowing to enhance the natural appearance. Planted species can be used to control invasive plants present on site. Finally, equipment such as outdoor lighting, are completely modified to avoid light pollution and direct the flow only to pedestrian paths.

- Mobility:

The use of gentle movements is favored by the presence of a pedestrian mall.

## If you had to do it again?

The approach put in place is specific to the exceptional site that is the Forest of Fontainebleau. Nevertheless, any site of this size can obviously be the object of an environmental and sustainable strategy of this type.

## See more details about this project

[http://www.adim.fr/france/adim/minisites.nsf/975F540AA2A966CBC1257BDC00774968/\\$FILE/FICHE%20REFERENCE%20ADIM%20PIDF.pdf](http://www.adim.fr/france/adim/minisites.nsf/975F540AA2A966CBC1257BDC00774968/$FILE/FICHE%20REFERENCE%20ADIM%20PIDF.pdf)

<https://www.construction21.org/france/city/fr/centre-national-des-sports-du-ministere-de-la-defense.html>

### Contractor

Name : ADIM Paris Ile de France

[http://www.adim.fr/france/adim/adim.nsf/web/entreprise\\_adim\\_paris\\_ile-de-france.htm&noprehome=1/](http://www.adim.fr/france/adim/adim.nsf/web/entreprise_adim_paris_ile-de-france.htm&noprehome=1/)

### Construction Manager

Name : Barthélémy-Griño Architectes

<http://barthelemygrinoarchitectes.eu/>

### Stakeholders

Function : Construction company

GTM Bâtiment

<https://www.vinci-construction.fr/>

General Construction Company

Function : Others

D'ici là Paysages & Territoires

<http://www.d-ici-la.com/>

Grounds

Function : Environmental consultancy

Museum National d'Histoire Naturelle

<http://www.mnhn.fr/>

Biodiversity expert

Function : Environmental consultancy

TP Goulard (Eurovia)

VRD company

Function : Other consultancy agency

RFR Eléments

Environmental Studies Office

Function : Other consultancy agency

SNC Lavalin

Fluid studies office

Function : Structures calculist

T/E/S/S Atelier d'ingénierie

Function : Others

Oasiis

MOA HQE

Function : Contractor

Ministère de la Défense

### Contracting method

Public Private Partnership

Primary energy need : 50,16 kWhep/m<sup>2</sup>.an

Primary energy need for standard building : 103,07 kWhep/m<sup>2</sup>.an

Calculation method :

Breakdown for energy consumption : Hot: 16.72 Kwhef / m<sup>2</sup>.year

Ventilation: 7 Kwhef / m<sup>2</sup>.year

Lighting: 6 Kwhef / m<sup>2</sup>.year

## Envelope performance

Envelope U-Value : 0,61 W.m<sup>-2</sup>.K<sup>-1</sup>

More information :

The largely glazed building envelope captures solar energy in winter while avoiding glare and direct solar penetration in hot weather thanks to the installation of outdoor screen blinds in offices. Thus, the high-performance envelope enhances solar intake in winter and fights the fight against summer overheating. A generous amount of opening allows for efficient through and through ventilation.

## Renewables & systems

### Systems

Heating system :

- Heat pump
- Water radiator
- Low temperature floor heating
- Radiant ceiling

Hot water system :

- Other hot water system

Cooling system :

- No cooling system

Ventilation system :

- Double flow

Renewable systems :

- Heat pump

Other information on HVAC :

Double-flow ventilation with a wheel exchanger with efficiency of over 80% is also implemented.

## Smart Building

BMS :

Digital regulation of the heating circuit according to the outside temperature in the dwellings

## Environment

### Urban environment

Land plot area : 500 000,00 m<sup>2</sup>

Built-up area : 40 000,00 %

The CNSD site has 50 hectares located in the heart of the Fontainebleau forest. The Fontainebleau massif, emblematic site in many ways, has joined the European network of Natura 2000 sites because of its particularly rich and diverse fauna and flora, to the point that some scientists consider the forest as the richest in Western Europe. It is home to Europe's richest arthropod fauna (3,300 species of beetles, 1,200 Lepidoptera) and about 60 protected plant species.

Located 60 km south of Paris, 40 minutes by train from Gare de Lyon and 1 hour by car from Porte d'Orleans, this renowned tourist region is a major attraction for the organization of any sporting event .

## Products

## Product

Recycling crushed concrete demolition products on site

MEL Eurovia

<https://www.eurovia.fr/agences/4272-m-e-l>

<https://www.eurovia.fr/agences/4272-m-e-l>

**Product category :** Table 'c21\_germany.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 = '22'

The original site has a number of dilapidated and unused buildings that were demolished. The demolition waste is then crushed directly on the site and then reused within the VRD lot especially for roads and filter nets.



## Costs

### Construction and exploitation costs

Total cost of the building : 5 185 000 €

## Health and comfort

### Water management

Natural valleys are created to collect rainwater and thus reform the water table present under the site. This allows the site to be fed with drinking water. The planned sanitation system is of the separative type: a rainwater network for outdoor and roof spaces, and a wastewater network. The recovery tank located on the roof allows the cleaning of roads or the watering of green spaces. The waterproof surfaces are optimized and robust plants requiring little watering are also put in place.

### Indoor Air quality

Natural ventilation of privileged buildings

Low Emitting Materials VOC (Systematic A + Labeling for Interior Coatings) and Chemical Agents (CMR)

## Comfort

### Health & comfort :

Visual comfort: site with high density of green spaces, optimal natural lighting of premises

Comfort of use: project located in the heart of forest in a green setting where common green spaces are highly developed and in perfect integration in the site

Thermal comfort: the radiant panels, the renewal of the air and the openings allowing a natural ventilation ensure the maintenance of the temperatures of comfort in summer as in winter. The heating and dehumidification of the pool hall is provided by a thermodynamic chilled water system and a fresh air modulation system. Finally, the solar factors in the tertiary zone are much lower than those fixed by the regulations to obtain maximum comfort in summer without the need for air conditioning.

Daylight factor:

Matches the HQE requirements. For an office, the average daylight factor is 4.4%

### Acoustic comfort :

Strategic location of car parks and technical equipment.

Specific treatment of materials especially in sports halls to avoid sound reverberations.

## Carbon

### GHG emissions

GHG in use : 4,00 KgCO<sub>2</sub>/m<sup>2</sup>/an

Methodology used :

BBC and THPE label

Building lifetime : 100,00 année(s)

## Life Cycle Analysis

Eco-design material :

Use of bio-based materials:

The wood used in facade is durable and perennial. Local species are preferred or where the local resource is not adapted or non-existent, wood from sustainably managed forestries (FSC and PEFC label) are used.

VOC:

Interior coatings and finishing products are systematically selected for their low emissivity with A + labeling.

Recycling of demolition products via specialized subsidiaries in the construction phase

To limit the impact of the operation on the environment, the demolition products are recovered by reuse and recycling on site for the realization of the VRD. In this way, building site waste is crushed into recycled concrete and used especially for roads.

## Contest

### Reasons for participating in the competition(s)

Remarkably: Strong Ambition and challenge teams to incorporate respect and renewal of the fauna and flora surrounding from conception to realization.

### Building candidate in the category



Santé & Confort



Coup de Cœur des Internautes



Prix des Etudiants





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