


## Tour D2

by C21 France La redaction / 2018-05-29 13:54:33 / Francia / 11559 / FR



**New Construction**

**Primary energy need :**  
118.03 kWh<sub>ep</sub>/m<sup>2</sup>.an  
 (Calculation method : )

**ENERGY CONSUMPTION**

*Economical building* *Building*

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

*Energy-intensive building*

**Building Type** : High office tower > 28m  
**Construction Year** : 2011  
**Delivery year** : 2015  
**Address 1 - street** : 17 bis Place des Reflets 92400 COURBEVOIE, France  
**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 48 756 m<sup>2</sup>  
**Construction/refurbishment cost** : 178 000 000 €  
**Number of Work station** : 4 200 Work station  
**Cost/m2** : 3650.83 €/m<sup>2</sup>

**Certifications :**



**General information**

Completed in 2015, the D2 tower replaces the office building Veritas, erected in 1984. Atypical by its form, it is one of the most iconic achievements of the Franco-American duo Anthony Béchu and Tom Sheehan. Its ovoid shape classifies it into a generation of buildings, including the Agbar tower in Barcelona, produced by Ateliers Jean Nouvel, and that of 30 St Mary Ax in London, signed by Norman Foster, are the icons. Its facade is covered with a metal mesh contributing 50% of its stability.

The first defense tower with a steel exostructure, the D2 tower is a real urban project that transforms the circular Boulevard de la Défense into an urban boulevard where life can resume. Its implementation removes the existing divide between the Esplanade and the city and recreates space for the public with a square, a gallery, restaurants, and new traffic lines.

The tower D2 is an architectural icon that, reflecting on its neighbors, brings them a refreshing modernity.

Its ovoid shape, often compared to that of a lawyer coming out of the ground, offers an atypical architecture that changes traditional geometric shapes. It develops 3 different facades: a large slender facade on Paris, an elongated silhouette turned on Courbevoie, and a gentle curve back focused on the perspective of the urban boulevard.

Thought like an inhabited tree, D2 takes root at the level of the gallery, its core represents the trunk with the stages which are the branching. At its summit, the Cloud Garden culminates at 171 meters above the ground and symbolizes the canopy. With its steel exostructure, the complexity of its design and the innovations in the processes used to make it, the D2 tower has achieved 30% material savings.

## Sustainable development approach of the project owner

The Client has decided to retain the principle of a HQE approach on the operation leading to certification of the operation by CSTB. The chosen profile includes 6 targets in the Very Performing level, and 4 targets in the Performing level; it corresponds to an "Excellent" passport.

Beyond the French HQETM certification, the Client has decided in the works phase to seek the English certification BREEAM, targeting the Very Good level. In this context, Etamine carried out a feasibility study and carried out the final audit as "BREEAM assessor".

## Architectural description

Thought like an inhabited tree, D2 takes root at the level of the gallery, its core represents the trunk with the stages which are the branching. At its summit, the Cloud Garden culminates at 171 meters above the ground and symbolizes the canopy. In terms of materials, steel has established itself by its flexibility and low environmental footprint.

Organic, the silhouette of D2 offers a new architecture to La Defense and participates in its aesthetic renewal.

Its interior spaces intended to accommodate mainly workers, invite to feel good. Indeed, declining the allegory of the tree, users enter common spaces (lobby, corridors, ...) clear and spacious whose materials evoke the sap and therefore life. The flexible trays are released from almost any pillar. Thus, the absence of breakage and broken line, their circular shape gives them a rotunda side that resocialises the open spaces and leaves thoughts free.

At its summit, the "Garden of clouds", Zen garden, offers a breathtaking view of Paris and a unique green space in the city.

## Building users opinion

Occupants fully satisfied!

## See more details about this project

### Stakeholders

#### Contractor

Name : Sogecap

Contact : 50 avenue du Général de Gaulle 92800 Puteaux

<https://www.assurances.societegenerale.com/fr/>

#### Construction Manager

Name : Atelier d'Architecture Anthony Bechu - Tom Sheehan

Contact : M. Régis Lassausse - 82 rue Lecourbe 75015 Paris - 01 47 34 97 91

<http://www.anthonybechu.com/fr>

#### Stakeholders

Function : Contractor representative

Sogeprom

Immeuble Ellipse La Défense - 01 46 35 60 00

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

Function : Contractor representative

Bouygues immobilier

150 route de la Reine Boulogne-Billancourt

<https://www.bouygues-immobilier.com/>

Function : Designer

Agence d'Architecture A.Bechu

<http://www.anthonybechu.com/fr>

Associate architect

Function : Construction company

Vinci

<https://www.vinci-construction.com/fr/nous-contacter/>

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

---

Function : Thermal consultancy agency

Setec

M. Jean-Pierre Nony - Tour Gamma D – 58 quai de la Rapée 75583 Paris Cedex 12 - 01 40 04 68 66

BET Structure - Fluids

---

Function : Thermal consultancy agency

DVVD

M. Daniel Vaniche - 12 rue des Frigos 75013 Paris - 01 40 40 96 10

BET Facades

---

Function : Thermal consultancy agency

Etamine

Mme Marie BOYER - 10 avenue des Canuts 69120 Vaulx-en-Velin - 04 37 45 34 20

BET HQE

---

Function : Certification company

## Energy

### Energy consumption

Primary energy need : 118,03 kWh<sub>ep</sub>/m<sup>2</sup>.an

Primary energy need for standard building : 202,19 kWh<sub>ep</sub>/m<sup>2</sup>.an

Calculation method :

Breakdown for energy consumption : Heating (20.71%) Cooling (14.47%) Domestic hot water (6.62%) Fan (42.04%) Lighting (14.81%) Auxiliary (1.34%)

### Real final energy consumption

Final Energy : 63,49 kWh<sub>ef</sub>/m<sup>2</sup>.an

### Envelope performance

Envelope U-Value : 1,01 W.m<sup>-2</sup>.K<sup>-1</sup>

More information :

With its steel exostructure, the complexity of its design and the innovations in the processes used to make it, the D2 tower has achieved 30% material savings. The structure is broken up into meshes, in the shape of vertical lozenges. The mesh height, originally 4 levels, has been optimized to 6 levels in order to reduce the cost of the structure and limit thermal bridges.

Air tightness (m<sup>3</sup> / h):

Incoming flow: 19,605.99

Outgoing throughput: -27 781.84

### More information

The office floors of the tower comply with the 2012 thermal regulations; this will enable them to obtain the BBC RT2005 label by equivalence, thus guaranteeing a 50% gain on the reference consumption determined by the 2005 thermal regulations.

## Renewables & systems

### Systems

#### Heating system :

- Urban network
- Others
- Fan coil

#### Hot water system :

- Urban network

#### Cooling system :

- Urban network
- Fan coil

#### Ventilation system :

- Double flow heat exchanger

#### Renewable systems :

- No renewable energy systems

## Smart Building

#### BMS :

- Sensors measure the environments (temperatures, humidity) of the premises, as well as the indicators of operation of the technical systems (temperatures, flows, powers, ...)
- A supervision system, under the name of Technical Building Management (BMS), was adopted for Tower D2. This system collects and analyzes all sensor data to optimize system controls.
- The GTB also identifies abnormal states and alerts in case of system failure.
- The measurements of the sensors are recorded in order to analyze the evolution of the behavior of the building over time.

#### Users' opinion on the Smart Building functions :

- The GTB is accessible to the maintenance teams, from the PC security station (low lobby level).
- Maintenance teams are trained to use GTB.

## Environment

### Urban environment

Land plot area : 54 000,00 m<sup>2</sup>

Because the D2 tower helps to eliminate the existing gap between the Esplanade de la Défense and the city of Courbevoie, this project drains a pedestrian life that could not exist until then and mitigates the enclaved aspect of the famous slab. A living link is created, which has a plant walk participates in the greening of the neighborhood and therefore its best breath.

The silhouette it offers also enhances La Défense skyline, resolutely dense and monotonous. This new organic landscape offers a new horizon to the inhabitants and refreshes its environment.

At the urban level, the impact of well-being is clearly identifiable by all, and is reflected by the many positive reviews that we receive very regularly from people who live with a view of D2 and thank us for falling asleep by watching every night the turn to illuminate. Indeed, outdoor lighting brings another added value. LEDs installed at each intersection of the structure serve as beacons. This device was designed by Benoît Laloz, light artist. These beacons, white or amber, describe a cycle that follows the calendar of the Moon to animate the facade at night, to its summit where the headdress is also equipped with a particular lighting.

## Products

### Product

SOLTIS@99

Serge Ferrari

<https://www.sergeferrari.com/fr-fr/contact>

<https://www.sergeferrari.com/fr-fr>

**Product category :** Table 'c21\_italy.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 = '13'

Soltis Master 99 limits glare for optimum working comfort on screens. Thanks to its small size, this screen is ideal for aesthetic and discreet interior blinds.

Very well accepted, optimizes visual comfort for people working on computers:

- homogeneous diffusion of light
  - natural light supply preserved without glare
- Optimizes thermal comfort:
- its dark side guarantees an excellent external visibility
  - its white, highly reflective side protects users from heat



## Costs

## Health and comfort

### Water management

Water is also saved:

The pressure in the network is reduced, the fittings are infrared detection, and the flush toilets are double flow.

### Indoor Air quality

Obtaining good air quality in the building is a central point of HQE certification. The target on air quality is reached at the "Very Performing" level, which reflects the good treatment of this issue. In concrete terms, the systematic demand for the best labels has been made for materials in contact with indoor air:

- For adhesives: Ecodec EC1 label
- For paintings: eco-label, for example European
- For carpets: German label "GüT"
- And for wood interior joinery: minimum class A and sustainable forest management certified by the FSC or PEFC label

The air of the premises is constantly renewed in occupancy, with a flow of more than 25 m<sup>3</sup> / h / person, regulation flow. The air entering the building is filtered. The airflows are controlled, and the indoor air is healthy and quality!

### Comfort

#### Health & comfort :

A part made of plant:

The technical equipment being integrated into the floors thanks to the use of the urban heating and cooling networks, an outdoor garden composed of many species of trees and shrubs was created on the roof. It is rare to have a plant space in an office tower!

Optimization of glazing:

Control of solar radiation and maximized natural lighting Solar control of glazing was optimized for each radiation exposure, according to a study of shadows due to surrounding buildings. All glazings are equipped in addition to interior blinds. The windows were chosen as transparent as possible, with a high light transmission, so as to ensure a comfortable natural lighting.

Certification requires a relatively low minimum daylight factor (FLJ) for offices, even with a Base level for Target 10 "visual comfort". This is a tricky issue given:

- the depth of open spaces,
- the important masks of neighboring towers,
- the maximum solar factors also imposed by the certification.

Significant natural lighting studies have been conducted. The windows were therefore chosen as transparent as possible, with a high light transmission: 76% for clear glazing ( $g = 0.55$ ), 68% for solar control glazing ( $g = 0.37$ ).

The artificial lighting is realized by ceiling lights with T5 fluorescent tubes; the overall luminous efficiency is greater than 80 lumen / Watts, resulting in an installed power of less than 6 / m<sup>2</sup> (reference RT2005 being 12 W / m<sup>2</sup>). In addition, to take advantage of natural lighting and reduce electricity consumption, luminaires located on the first day are automatically graded according to natural light, and managed on presence detection.

Post free trays allow all kinds of office layouts. The club floor located on the 34th floor, higher ceiling, will host VIP restaurant, board room, meeting spaces, lounges etc. The Garden of Clouds is linked to the club and includes a putting green of 50 m<sup>2</sup>, a walk "zen" among the trees and especially an exceptional point of view on the capital.

Some floors are "densifiable" to install a trading room for example. Another floor houses a fitness room. The tower also hosts a conciergerie as in hotels, three

levels of restaurant, a cafe and a brasserie on the square. Finally, we wanted to install in the tower a number of amenities for what is pleasant to live and it can accommodate large groups outdoor lighting also provides added value. LEDs are installed at each intersection of the outer structure to serve as a beacon. This device was designed by Benoît Lalloz, light artist. Beacons or white or amber describe a cycle that follows the lunar calendar to animate the facade, at night, to its summit where the headdress is also equipped with special lighting.

## Carbon

### GHG emissions

GHG in use : 13,00 KgCO<sub>2</sub>/m<sup>2</sup>/an

Building lifetime : 50,00 année(s)

### Life Cycle Analysis

Eco-design material :

The **bungalows** , used during 2 years of building site, justified the respect of the thermal regulation RT2005; they are equipped with presence detection lighting, heating programmer, rebate contacts on joinery, timed faucet, etc.

The rigorous monitoring of the site by Etamine, with a monthly site visit, has resulted in an **overall recovery rate of construction waste greater than 90%** , material and energy valuations combined. During most of the project, despite the constraints of space, a **sorting at source** was carried out on site.

**Water and energy consumption** were monitored weekly.

All materials used have been previously validated by Etamine, in order to ensure their **environmental performance** according to market criteria. The **health characteristics** of materials and their **environmental impacts** are provided for most families.

## Contest

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

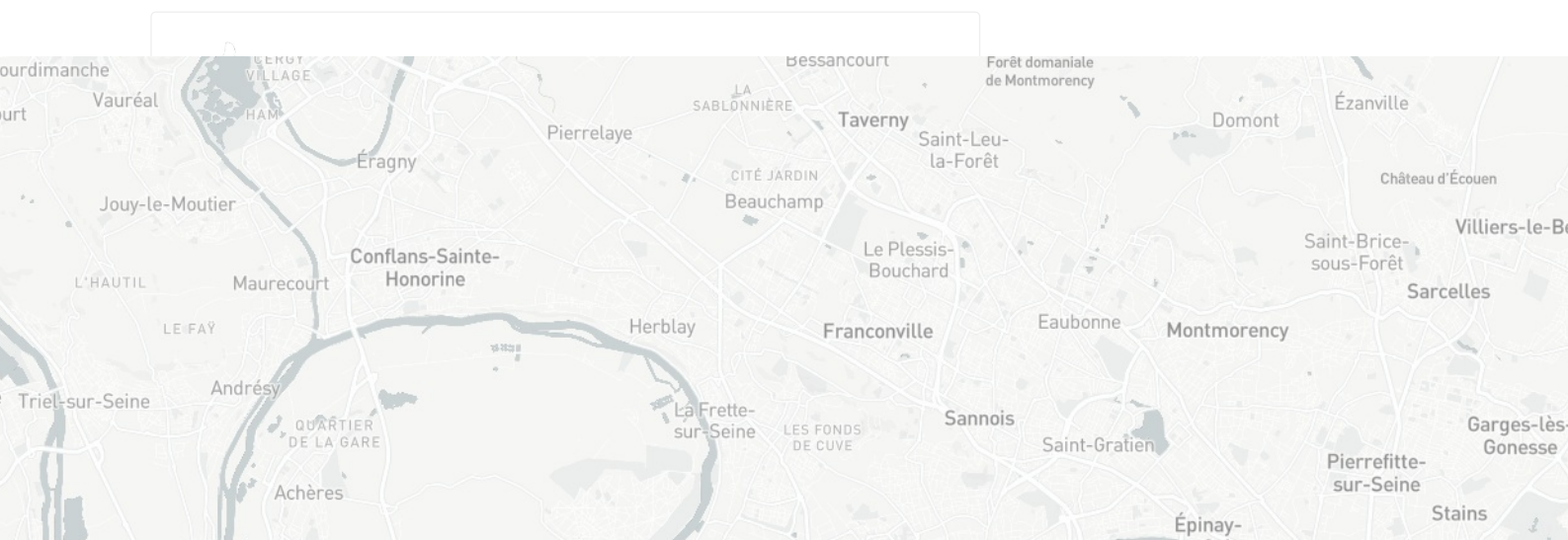
The tower has a regulatory consumption RT2005 40% lower than the reference consumption: **Cep = Cep ref - 40%** , well beyond the **label ThPE RT2005** (Cref - 20%) targeted.

In addition, the office floors of the tower comply with the 2012 thermal regulations, whether in terms of requirements of means or results, which allows them to obtain the **BBC RT2005 label** by equivalence.

### Building candidate in the category



Santé & Confort





Prix des Etudiants



Date Export : 20230531071658