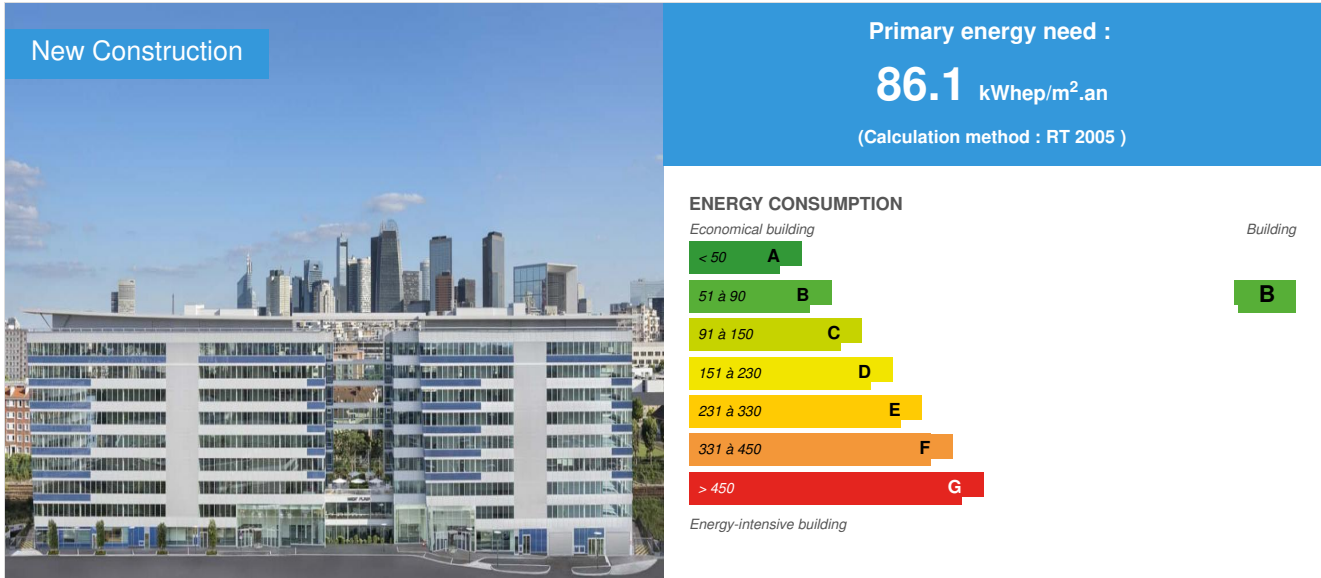


## WEST PLAZA

by Virginie SCAGLIA / © 2015-06-16 10:40:17 / France / © 10518 / FR



**Building Type** : Office building < 28m  
**Construction Year** : 2013  
**Delivery year** : 2013  
**Address 1 - street** : 9-11, rue du Débarcadère 92700 COLOMBES, France  
**Climate zone** : [Cfc] Marine Cool Winter & summer- Mild with no dry season.

**Net Floor Area** : 30 684 m<sup>2</sup> SHON  
**Construction/refurbishment cost** : 75 000 000 €  
**Number of Work station** : 2 214 Work station  
**Cost/m2** : 2444.27 €/m<sup>2</sup>

**Certifications :**



**Proposed by :**

**CERTİVEA**

### General information

West Plaza is an office building with a net floor area of 31,000 m<sup>2</sup> which is designed according to the highest environmental standards as testified by its multiple certifications:

- HQE (Out-standing 12 stars),
- BREEAM (Excellent 74.1%),
- BBC (Low consumption building certification french Label) ,
- HQE Technical scheme building in operation-sustainable buildings (Excellent) and Sustainable Management (Out-standing),
- The BREEAM In-use part1 certification is on going.

The installation of an "All Air" air-conditioning system in complement of high-performance equipment and materials makes West Plaza a very low consumption building.

A centralized Building Management System controls and reduces the overall cost of operation without loss of efficiency.

WEST PLAZA has a strategic location at the entrance of the largest European international business district and offers easy and quick connections by car (Boulevard Charles de Gaulle, A86) but also in terms of public transportation (the proximity to the T2 tramway and several bus lines positioned along the Charles de Gaulle boulevard that encourages the use of public transportation and the train station "La Garenne Colombes") and "gentle links" or alternative greenways (cycle paths, Autolib').

A study was conducted to encourage occupants to use gentle transportation modes such as cycling (2 wheels area of 1 310m<sup>2</sup> planned on 1st basement level directly accessible for bicycles, on the north side of the building by a dedicated elevator from the Débarcadère street) or even the electric car (a parking area is reserved for electric vehicles with charging stations), for an improved carbon footprint.

Beyond the benefits of a very high quality construction, it also offers a rare set of high-level services: a restaurant, four club lounges, a cafeteria, an auditorium, a gym and concierge desk. West Plaza received the Grand Prix SIMI 2013 New Building category.

## Sustainable development approach of the project owner

BRP3 wanted to propose an attractive building in the heart of a renewed area and with remarkable potential for development. This objective has imposed to focus the project on the relationship of the building with its immediate environment. The emphasis was put on accessibility and treatment of outdoor spaces.

The integration of the building in the Champs Philippe business area was a priority. Therefore, the realization of a low- nuisance site also became a priority. To make the building attractive, BRP3 wished ensure good management during the operation stage by facilitating maintenance. The management of energy, water and waste is naturally a parameter BRP3 wished to optimize so as to ensure an efficient and effective building.

The Contractor also emphasized the importance of ensuring a level of comfort and quality of interior spaces for future users of the building WEST PLAZA, including hygrothermal, acoustic and visual comforts as well as quality of spaces and water.

The specifications of the assistant of general contractor HRO for International standards match the latest requirements (for construction stage for High Environmental Quality (HQE, 2008 - Low consumption building certification). WEST PLAZA got the BBC label (French Low consumption building certification) with a reduction of energy consumption by 25% compared to the latest building carried by HRO, River Ouest (also HQE Construction / Operation certified). West Plaza also participated in the HQE Performance Test 2012 with the assistance of HQE association.

## Architectural description

In the immediate area of influence of La Défense district, West Plaza unveils sleek and seamless architecture at the crossroads of major communication routes.

- 31 000m<sup>2</sup> of new offices for 8 levels with unobstructed views of La Defense.
- Designed for maximum flexibility, West Plaza is structured around two wings connected by a central block hosting the restaurant on the ground floor, the cafeteria and bar on the second floor as well as gateways located on the 6th and 8th floors
- Two separate and independent entrance halls
- Aerial and dynamic architecture signed by International d'Architecture
- Modern and elegant facades combining clear glass with a violet blue glazing, aluminum or coated.

The design of the West Plaza office spaces meets the user expectations in terms of flexibility and comfort. Optimized spaces, combined with the implementation of highly qualitative technical services, that offer a complete freedom for arrangements and furnishing.

## See more details about this project

<http://www.westplaza.fr>

## Stakeholders

### Stakeholders

**Function :** Contractor

BRP3 SARL

**Function :** Assistance to the Contracting Authority

HRO France

**Function :** Construction Manager

International d'Architecture

Architect

**Function :** Construction company

Campenon Bernard Construction (Groupe Vinci)

General Contractor

**Function :** Assistance to the Contracting Authority

GreenAffair

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**Function :** Environmental consultancy

Cabinet Alberto Pinto

interior decorator

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**Function :** Environmental consultancy

Eric Ciborowski

Landscaper

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**Function :** Company

Lefort Francheteau (Groupe Vinci)

CVC

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**Function :** Company

Santernes (Groupe Vinci)

Electricity

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**Function :** Company

SAGA (Groupe Vinci)

Plumbing

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## Contracting method

Lump-sum turnkey

## Energy

### Energy consumption

**Primary energy need :** 86,10 kWhep/m<sup>2</sup>.an

**Primary energy need for standard building :** 177,50 kWhep/m<sup>2</sup>.an

**Calculation method :** RT 2005

**Breakdown for energy consumption :** Consumption on the floor area of the project:

- Heating: 240062.6 kWh ep
- Cooling: 71873.46 kWh ep
- Hot Water: 159606.5 kWh ep
- Ventilation Auxiliaries: 303837.9 kWh ep
- Generation Auxiliaries: 42297.8 kWh ep
- Distribution Auxiliaries heat/cold: 453.37 kWh ep
- Lighting: 177705.7 kWh ep

### Envelope performance

**Envelope U-Value :** 0,88 W.m<sup>-2</sup>.K<sup>-1</sup>

**More information :**

Strips facade with extrenally insulated concrete aprons

**Indicator :** I4

## Renewables & systems

### Systems

**Heating system :**

- o Heat pump
- o Electric floor heating
- o Fan coil

- VAV System

#### Hot water system :

- Individual electric boiler

#### Cooling system :

- Reversible heat pump
- Fan coil
- Floor cooling

#### Ventilation system :

- Nocturnal ventilation
- compensated Air Handling Unit
- Double flow heat exchanger

#### Renewable systems :

- Energy recovery from waste

## Smart Building

#### BMS :

The BMS commissioned on the building is Johnson Controls, and operates under the BACNET LON protocols.

## Environment

### Urban environment

Land plot area : 5 716,00 m<sup>2</sup>

Built-up area : 100,00 %

Within close proximity to the La Défense business district, West Plaza is at the heart of an economic development area. As a modern and attractive economic showcase for the 1st business district in Europe, it seduces renowned international companies attracted by this new urban trend along the T2 tramway line:

- A high concentration of installed companies
- The 5th HRO international quality project developed in this new business area.
- The renovation and improvement of the Champs Philippe neighborhood, of the Place de Belgique, Mission Marchand and Charles de Gaulle Boulevards.
- Close proximity of La Défense, 1st European business district with 1.500 head offices including 15 of the 50 first international companies.

## Products

### Product

Central Air Treatment

FLAKTWOODS

4, avenue Laurent Cély 92600 Asnières sur Seine

<http://www.flaktwoods.com/>

Product category : Génie climatique, électricité / Ventilation, rafraîchissement

Every open space into offices compartment is treated individually by his own central air handling unit with turbofan no recycling and 100% fresh air. These units take air from the outside through the front of technical rooms. The air is heated or cooled by the use of a transfer wheel. The air is discharged through a chimney to the roof to keep out air discharges from air intakes.

Filters are placed upstream of the airducts supplied to an air filtration nine hygienic. All units are equipped with powerful filters. Technical specifications of the central air handling units : Classification: Their construction are self-supporting, without frame, to minimize thermal and acoustic bridges, guaranteeing excellent air tightness. They comply with the new European standards EN 1886, EN 13053, EN 13779 applying to air handling units.

Classes:

- Aluzinc sheet in 0.7 mm thick
- Resistance of the envelope: D2 Class
- Leakage of the envelope: L2 Class (leakage rate: 0.44l / sub s.m<sup>2</sup> a negative pressure of 400 pa) (leakage rate: 0.63l / s.m<sup>2</sup> under a positive pressure of 700 pa)
- - Leakage of the filter bypass: F9 Class
- Thermal conductivity: T3 class
- Thermal bridges: TB3 Class
- Thickness of panels: 50mm rockwool
- Density: 70kg / m<sup>3</sup>
- Corrosivity class (environmental class): standard C4 / C5 version unpainted stainless steel complying with the standards BSK94 / 99, ISO 12944-2 and ISO



9223, the eQ units are recyclable.

No product is ordered without prior acceptance of the client.

## Costs

## Health and comfort

### Water management

Consumption from water network : 2 091,00 m<sup>3</sup>

Consumption of harvested rainwater : 153,00 m<sup>3</sup>

Water Self Sufficiency Index : 0.07

Water Consumption/m<sup>2</sup> : 0.07

Water Consumption/Work station : 0.94

Rainwater recovery is planned for watering green spaces only. Two watering basins are provided respectively in the basements -2 and -3.

Capacity : 32.52 m<sup>3</sup> and 74.49 m<sup>3</sup>.

Water is provided to the sprinkler system from the rainwater collecting tank; if low, the system automatically switches to main water grid.

Lack of space on the project does not allow to recycle treated wastewater on site. The re-use of treated water is more suitable for high water use (eg for bathing water). In addition, the ground surface does not allow to integrate a waste water recycling system.

### Indoor Air quality

An audit of the air quality was done with sampling points chosen to reflect the different sources of influence on parameters including the quality of the indoor air, CTA and the influence of materials and products used in the building. The following results of VOCs and formaldehyde are below the standard recommended values:

- Inter entreprise restaurant, dining room: 64.56µg / m<sup>3</sup> VOC including 3.45 g / m<sup>3</sup> Formaldehydes

- Auditorium: 89,56µg / m<sup>3</sup> VOC including 4.90 g / m<sup>3</sup> Formaldehydes

- Salon 1: 55,39 g / m<sup>3</sup> VOC including 1.73 g / m<sup>3</sup> Formaldehydes

Office spaces are treated only with renewed air, thus ensuring hygienic air flows way above the regulatory hygienic air flows. The building has a mechanical ventilation in all rooms.

- Flow of fresh air toilet on office space = 250 111 m<sup>3</sup> / h

- Maximum occupancy is 2,214 occupants.

- Flow of fresh air per occupant = hygienic minimum of 25m<sup>3</sup> / h / occupier and up to 113 m<sup>3</sup> / h / occupant

The CO<sub>2</sub> sensors are installed in the lounges club and the auditorium (areas relevant for slaved airflows ).

### Comfort

**Health & comfort :** One of the main concerns of the contractor is to promote the comfort and well being of users. For West Plaza, the contractor rethought the way office building is heated and cooled. The air conditioning system is an "All Air" type, meaning there is no air recycling in spaces and provides only 100% new air, thus ensuring hygienic air flows well above the regulatory hygienic air flows (optimized according to occupation). Each rental has its own central air handling unit.

Through a reasoned ventilation, and a long thought positioning of heating and cooling emitters, the sensation of cold or warm air currents is suppressed. CO<sub>2</sub> sensors are installed in the meeting rooms and the auditorium (relevant areas for slaved air flows).

The temperatures are maintained based on occupancy hours and presence detection. Users can also vary according to a comfort temperature range with remote controls. The mechanical ventilation vents are auto-adjustable.

An acoustic ambience quality is adapted to different spaces:

- Optimizing the level of sound insulation between the plates,

- Installation of high acoustic performance facades (against outside noises),

- Selection of equipments based also on low acoustic nuisance.

The building offers access to daylight and views through large window bays. All office spaces are located along the sides of the building and therefore have access to natural light and views. Cafeteria, Inter Enterprise restaurant, gym, kitchen and VIP rooms on the ground floor overlook the façades and thus also have access to natural light. All windows of office space are provided with sunscreens (inner fabric blinds over the entire periphery of the building). Wooden Venetian blinds are installed in VIP lounges, the restaurant and the gym, and aluminum blinds in the kitchen and cafeteria. The office floors have an optimal artificial lighting comfort providing superior illumination uniformity 0.6. The lighting level of 300 lux on the working plan for every office space. The selected office lights come from DEBBAS with very low luminance and 94% efficiency (2x14W) and used to validate a color temperature of 4000 K and a color rendering index (CRI) of 85. The UGR values (Unified Glaring Ratio) of less than 19 to ensure comfortable conditions for glare.

Remote controls are installed in the office floors and configured on the GTB. Presence sensors help provide sufficient lighting according to the kind of occupation.

Spaces that could emit odors are located in specifically positioned areas of the building (toilets, Inter Enterprise Restaurant, Waste) and have an efficient air treatment (pressure reduction) and an optimal air circulation.

Specific hygiene conditions are created to facilitate the maintenance of ponds by the choice of materials (wall tiles is quite high). The floors are provided with two local maintenance rooms per office space, sized for storing products.

Prevention of pollution risks and preservation of water quality to ensure water at 55 ° C in all parts of the loop network. The temperature of the loop system is monitored by the BMS, which will alert when temperatures go below 53 ° C. The cold water pipes are insulated with a vapor barrier to prevent condensation.

Sampling taps are implemented near the users outlets to control the efficiency of the water treatment.

#### Measured indoor CO2 concentration :

RIE, salle de restaurant : 482 ppm ; Auditorium : 455ppm ; Salon N°1 : 562 ppm

**Acoustic comfort :** Acoustic measurements were performed on site to determine the minimum requirements in terms Sleeving facade and analyze more precisely what are the main sources of external noise to the site: the railway lines to 10 m (cat.1), traffic Road to the Charles de Gaulle Boulevard (cat.3) 100 m, traffic on the street Landing, air traffic, production or ventilation equipment businesses surrounding the site of the project. The results of acoustic measurements are:

- Facade Insulation

Acoustic insulation goals for office spaces on facades concerning the outside :

- Façade Nord :35 DnTA,tr ;

- Façade Est : 39 DnTA,tr ,

- Façade Sud : 42 DnTA,tr ,

- Façade Ouest : 39 DnTA,tr

Measured facade insulation performances in DnTA,tr (dB):

- Office space on 2nd floor Northern Facade: 38 DnTA,tr ;

- Office space on 2nd floor Northern Facade : 44 DnTA,tr ;

- Office space on 2nd floor Eastern Facade: 41 DnTA,tr ;

- Office space on 2nd floor Southern Facade: 42 DnTA,tr ;

- Office space on 3rd floor Southern Facade: 43 DnTA,tr ;

- Office space on 3rd floor Southern Facade: 45 DnTA,tr

Insulation for aerial noises:

Measured performances (DnTA (dB))

- Emission : 4th floor Office space Building #1 – Reception : 3rd floor office space Building #1: 49

- Emission : 3rd floor Bathrooms Building #1 – Reception: 3rd floor office space Building #1: 49

- Emission : 4th floor Office space Building #2 - Reception : 3rd floor office space Building #2: 50

- Emission : 3rd floor Bathrooms Building #2 – Reception : 3rd floor office space Building #2: 46

- Emission : 10th floor Terrace Building #1 – Reception : 9th floor office space Building #1: 60

- Emission : 10th floor Terrace Building #1 – Reception : 9th floor office space Building #1: 53

- Emission : 1st floor VIP Room - Reception : 2nd floor Office space Building #2 : 55

- Emission : 1st floor Auditorium - Reception : 2nd floor Office space Building #2: 53

- Emission : 1st floor Gym – Reception : 2nd floor Office space Building #2: 60

- Emission : 1st floor Restaurant - Reception : 2nd floor Office space Building #2: 55

- Emission : 1st floor Delivery area Building #1 - Reception: 2nd floor Office space Building #1: 53

Sound reverberation duration and Equivalent Absorption Area

Measured reverberation durations in 3rd floor Office space Building #2 :

Durations per octave bands (Hz):

3rd floor Building #1 bât1: 125: 0.8 / 250: 0.9 / 500: 0.6 / 1000: 0.8 / 2000: 1.4 / 4000: 1.4

R+2 bât2: 125: 0.8 / 250: 0.7 / 500: 0.6 / 1000: 0.8 / 2000: 1.3 / 4000: 1.3

Average sound reverberation duration Tr (500, 1000, et 2000 Hz): R+2 bât1: 0.9 -R+2 bât2: 0.9

Insulation against impact sounds

Measured performances L'nT,w (dB):

Emission : 4th floor office Space Building #1 - Reception : 3rd floor Office Spaces Building #1: 39

Emission : 3rd Floor Bathrooms Building #1 – Reception : 3rd floor Office spaces Building #1: 56

Emission : 4th floor office Space Building #1 - Reception : 3rd floor Office Spaces Building #2: 41

Emission : 3rd Floor Bathrooms Building #1 - Reception : 3rd floor Office Spaces Building #2: 33

Emission : 1st floor VIP Room – Reception : 2nd floor Office space Building #2: 33

Emission : 1st floor Auditorium - Reception : 2nd floor Office space Building #2: 38

Emission : 1st floor Gym – Reception : 2nd floor Office space Building #2: 32

Emission : 1st floor Restaurant - Reception : 2nd floor Office space Building #2: 30

Emission : Cafeteria – Reception : 2nd floor Office space Building #1: 41

Noise level of equipments in spaces to be arranged

Normalized levels with reverberation durations measured in office spaces:

1 GE on 10th floor terrace to 9th floor office spaces Building #1: 31.7

2 GE on 10th floor terrace to 9th floor office spaces Building #1: 32.32

Heat pump on 10th floor terrace to 9th floor office spaces Building #1: 31.1

Central air handling unit on 8th floor Compartment D – Measure 1 to 8th floor Office space Building #2: 36.1

Central air handling unit on 8th floor Compartment D – Measure 2 to 8th floor Office space Building #2: 35.4

Central air handling unit on 8th floor Compartment D – Measure 3 to 8th floor Office space Building #2: 33.0

Central air handling unit on 8th floor Compartment D – Measure 4 to 8th floor Office space Building #2: 30.7

Central air handling unit on 8th floor Compartment D – Measure 5 to 8th floor Office space Building #2: 33.2

## Carbon

### GHG emissions

GHG before use : 22,96 KgCO<sub>2</sub> /m<sup>2</sup>

Building lifetime : 50,00 année(s)

GHG Cradle to Grave : 1 148,00 KgCO<sub>2</sub> /m<sup>2</sup>

The test was done during the HQE Performance Test in 2012 and led by the HQE association. We used the ELODIE software to get all the necessary data.

## Life Cycle Analysis

<https://www.construction21.org/france/data/sources/users/813/resultats-west-plaza-50-ans---14112012.xls>

Material impact on GHG emissions :

12.13

Material impact on energy consumption : 42,43 kWhEP

## Contest

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

#### Air conditioning and airhandling

The architectural arrangements, choice of materials and technical equipments have been thought for the project to provide maximum user's comfort while favoring their health.

- The offices are air-conditioned by an "All Air" system with variable rate without recycling and 100 % fresh air, ensuring hygienic air flows way above the current regulation and is optimized depending on the occupation.
- The atmospheres are controlled by a radio frequency and MFPs (integrated temperature sensor) remote control and the BMS.
- HVAC terminal start and stop depending on the occupation with an anticipation algorithm in case of significant ambient temperature difference.
- The "All Air" system allows users to enjoy the "free-cooling" while providing an important hygienic air flow and thus ensuring an over-ventilation of spaces.
- The "Dynamic" type terminal diffusers possess a trim that corrects the air jet according to the temperature of the primary air, limiting cold air flows on users.
- The sanitary extract units are self-adjustable and certified.
- CO2 sensors are installed in the lounges club and the auditorium (areas relevant for slaved air flows). Possible addition CO2 sensors based on spatial arrangements by the tenant.

Cool and hot water needs in the building are covered by last generation heat pumps, and the sizing of the installation and distribution of calories / negative calories takes into account:

- Solar gains
- Sensible and latent gains (1 person for 10 m<sup>2</sup> useful net office area or outside traffic and health)
- Gains from equipments ( lighting and power) : 19W/ m<sup>2</sup> net floor space of offices, out of sanitary
- The equipment is 10% oversized (CTA batteries, fans) engine set drives 15% , 5% pumps, terminal units and 5% to 10% of heat pumps. Each office has its own compartment air handling unit.

This air is filtered and heated or cooled according to the office atmosphere conditions. This the central air-conditioning system is located in a central equipment room located in the office compartment . Reheating and cooling is provided by heatpumps, four tubes installed on the deck and simultaneously producing hot water and frozen water. These air-conditioning plants are equipped with an energy recovery wheel on the exhaust air.

Each tenant can operate independently their equipment and control their consumptions through individualized access to graphical views of the BMS. Each HVAC equipment room has its own supervision screen.

#### Natural/Artificial Lighting

Users have access to daylight and views through large window bays for primary light source and a high quality natural lighting source. A natural lighting study allowed to achieve a daylight factor > 1.5% to 80% of the surface of the first row, and in more than 80% of working spaces ( application of - 0.5% because work on computer screens is planned).

Office lighting in central and peripheral work spaces is controlled by the BMS and depending on the occupation of spaces. In addition, the lights are equipped in peripheral areas with a cell to modulate artificial lighting depending on the natural light.



- Control of treatment performance : Placing samples taps in the end of the networks close to the taps .



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