

## PRESS KIT

# BOUYGUES CONSTRUCTION AT LA DEFENSE

VISIT OF FRIDAY, 3 FEBRUARY 2006



*Vista building*



*Exaltis building*



BUILDING SOLUTIONS FOR A DEMANDING WORLD

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## PRESENTATION OF BOUYGUES BATIMENT ÎLE-DE-FRANCE

Bouygues Bâtiment Ile-de-France is the Bouygues Construction subsidiary for the Paris region. It possesses recognised expertise in **new construction** and **rehabilitation** that has been developed in four major fields:

- Public-sector facilities
- Private-sector commercial facilities
- Housing
- Industrial civil engineering.

It provides clients with comprehensive skills calling on the specialities of its operating units:

- Rénovation Privée (private-sector renovation)
- Construction Privée (private-sector construction)
- Habitat Résidentiel (private housing)
- Ouvrages Publics (institutional construction)
- Habitat Social (social housing)
- Brézillon (industrial civil engineering, environment, and rehabilitation)
- Sodéarif and Élan (property development and project management).

### KEY FIGURES...

- Sales of €1.15 billion in 2005
- 4,100 staff, including 1,800 site workers
- 400 projects per year between €100,000 and €100 million
- More than 10% market share in the Paris region

### SOME RECENT REFERENCES

- Museum of Primal Art (Quai Branly, Paris)
- Exaltis building (La Défense)
- Renovation of Salle Pleyel concert hall (Paris)
- Renovation of office building at 96 Boulevard Haussmann (Paris)
- Actualis building (Boulevard Haussmann, Paris)
- Head office of Natexis Banque Populaire bank (Charenton le Pont)
- Vincennes-Pommiers nursing home (Vincennes)
- Head office of Le Monde newspaper (Paris)

## PROJECTS CURRENTLY UNDER CONSTRUCTION

### VISTA BUILDING

Bouygues Bâtiment Ile-de-France is main contractor for the renovation of this 23-storey, 20,000-m<sup>2</sup> office building with three basement levels that stands astride a road (Boulevard Soljenitsyne) leading to the Le Défense ring road.



*(architect's impression)*

Start of works: March 2005  
Handover: November 2006  
Contract amount: €35 million  
Architect: B.D.V. Associés

This project involves several special features:

- Very restrictive urban environment (90,000 cars passing by per hour, adjacent buildings, etc). To limit disturbance as much as possible and to compensate for the shortage of available storage space, stringent management of materials deliveries and storage was required to work on a just-in-time basis. An additional complication was the absence of a site crane, so everything had to be raised on hoists.
- Upgrading: having been built in 1970, the building did not comply with the most recent wind and snow loading regulations. It was upgraded to the 2005 regulations by consolidating the original structural framing.
- The ventilated double-skin façade enables air-conditioning air to be recycled. Such "active façades" are more environmentally friendly.

## EXALTIS BUILDING

Bouygues Bâtiment Île-de-France is main contractor for construction of a 15-storey, 23,000-m<sup>2</sup> office building with four basement levels that has a staff restaurant and a 230-space car park.



Start of works: May 2004

Handover: March 2006

Contract amount: €52 million

Architects: Arquitectonica, Bridot Willerval architectural agency.

Located at the centre of La Défense, where the Gambetta viaduct used to be, the Exaltis building stands amidst a very restrictive environment. Shortage of space, dense pedestrian and vehicle traffic, and the presence of adjacent buildings all constitute difficulties that have to be worked around and integrated into the construction process. The shortage of storage space called for special logistics in order to work on a just-in-time basis.

The complexity of the fabric of the Exaltis building is due to the shapes of the eastern and western façades (convex and concave respectively). The concrete structure replicates the architectural shape by means of rectangular columns at varying angles on each floor. Special steel formwork was required to cast the concrete.

## T1 TOWER

In the La Défense business district, Bouygues Bâtiment Île-de-France is main contractor for construction of a 38-storey tower with four basement levels. The 70,000-m<sup>2</sup> building has vast panoramic open-plan floors. A 580-place eight-level underground car park will be built alongside the tower.



*(architect's impression)*

Start of works: May 2005  
Handover: March 2008  
Contract amount: €155 million  
Architects: Valode & Pistre

Located in the immediate vicinity of the La Défense ring road, the 185-metre-tall T1 tower will stand as high as the tallest towers in La Défense, namely the Areva and Total buildings (formerly the Fiat and Elf Aquitaine buildings). Depending on the angle from which it is seen, the tower will symbolise either the prow of a ship (seen from the south), an immense sail (seen from the east and west), or an enormous staircase climbing skywards (seen from the north).

Controlling subsidence (settlement of load-bearing members as a result of loads) is particularly important for this 38-storey building with a slender structure in the façades. If no corrections are made, global subsidence of up to 200 millimetres can be expected. The phenomenon is hardly new, but is accentuated by recent design features.

## MAIN PROJECTS ALREADY BUILT

### OPUS 12



Start of works: February 2002  
Handover: August 2004  
Contract amount: €49 million  
Architects: Valode & Pistre  
Total area: 53,000 m<sup>2</sup>

The renovation of this 26-storey building involved:

- transferring part of the office space previously in the basements to upper floors
- making the building 3.50 metres wider
- transforming the top floor (previously accommodating plant) into landscaped office space.

A light shaft – a hardscaped patio – brings light into three floors of offices remaining in the basement area. All the works improved the lighting levels in working areas and enhanced the view out onto the esplanade of La Défense.

## AUSONE BUILDING



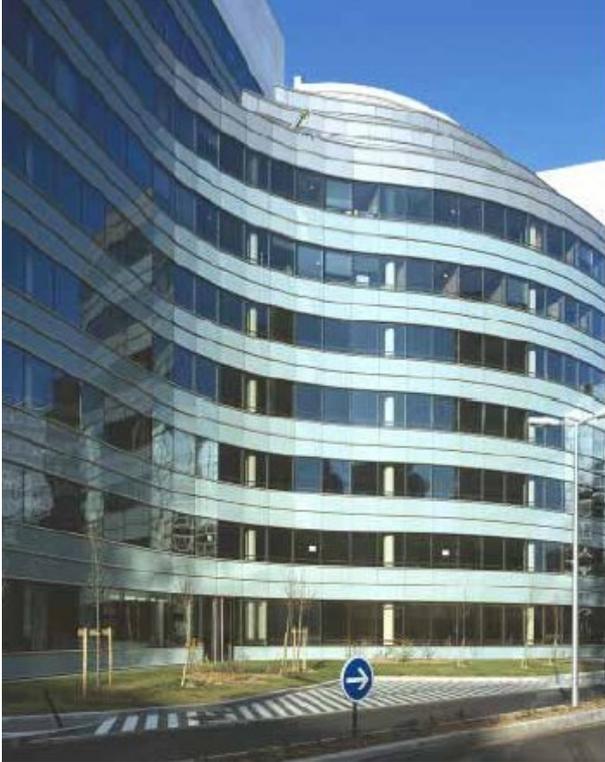
Start of works: January 2001  
Handover: June 2002  
Contract amount: €64 million  
Architects: Jean-Pierre Charpentier, Pierre Clément  
Total area: 45,000 m<sup>2</sup>

Bouygues Bâtiment Ile-de-France rehabilitated the Ausone office building (15 above-ground storeys and five basement levels).

The building has landscaped offices, a management floor, a multi-company restaurant, an auditorium, a fitness centre, etc.

## LE GUYNEMER

Bouygues Bâtiment Île-de-France was main contractor for construction of an eight-storey office building with four basement levels. It includes a 530-service staff restaurant, plant rooms, and a 190-space underground car park.



Start of works: December 2000  
Handover: May 2002  
Contract amount: €17.6 million  
Architects: Hervé Metge, Jean Rouit  
Total area: 12,800 m<sup>2</sup>

The earthworks and foundation-construction stages were the most difficult phases of the project because of the proximity to the site of a raised portion of the La Défense ring road, a fibre-optics cable connecting the entire area to the Internet, and a major high-pressure water pipe. Along the ring road, a “Berlin wall” piled-sheeting earth-retaining structure was used for foundation construction: concrete piles were installed to a depth of 12 metres before excavation began in order to prevent subsidence of the road.

## COEUR DÉFENSE



Start of works: September 1998  
Handover: May 2001  
Contract amount: €366 million  
Architect: Jean-Paul Viguier  
Total area: 350,000 m<sup>2</sup>

Bouygues Bâtiment Ile-de-France built an office complex comprising:

- two 40-storey twin towers,
- three nine-storey buildings.

The complex is built on a podium made up of six parking floors and five floors with plant rooms, a conference room, shops, and restaurants.

The complex of the three small buildings is roofed in with slope glazing, forming a vast atrium connecting the three buildings together.

## GRAND ARCH OF LA DEFENSE



Start of works: January 1985  
Handover: June 1989  
Contract amount: €61 million  
Architect: Johan Otto von Spreckelsen  
Total area: 224,000 m<sup>2</sup>  
Weight of the Arch: 300,000 tonnes

Built in a straight line with the Arc de Triomphe in Paris, the Grand Arch is a gigantic 100-metre-wide open arch standing 110 metres high. The entire building is clad with glass and white marble.

The top deck is supported by four 110-metre-long, 9.5-metre-deep prestressed megabeams with a clear span of 70 metres that were cast in place at the top of the building using steel falsework. Because of the density of transport infrastructures beneath the site (rail, metro, motorways), the 300,000 tonnes of the building are supported at just 12 points.

## HEAD OFFICE OF TOTAL (FORMERLY ELF AQUITAINE BUILDING)



Start of works: January 1982

Handover: February 1984

Contract amount: €21.3 million

Architects: Overcash, Predag Krgovic, Cabinet Saubot et Jullien

Total area: 50,000 m<sup>2</sup>

Standing 207 metres high, this "organ-pipe" office building comprises five blocks of different heights: a 48-storey central section, two wings of 38 and 45 storeys, and two nine- and 11-storey buildings forming a 250-m<sup>2</sup> inner courtyard beneath slope glazing. The façades are clad with curtain walling of reflective glass on aluminium framing.

## HEAD OFFICE OF IBM EUROPE



Start of works: March 1981  
Handover: August 1982  
Contract amount: €10.5 million  
Architect: Henri La Fonta

The two office buildings (19 and 28 storeys) represent a total floor area of 60,000 m<sup>2</sup> and have a further seven basement levels (40,000 m<sup>2</sup>) fitted out as archives storage, plant rooms, and parking.

Because of the cramped conditions of the site, hemmed in by various existing works, construction was complicated and furthermore required substantial consolidation of the excavation walls. Alongside the adjacent shopping centre, it was necessary to install very deep foundation piles equipped with 22 300-tonne jacks to compensate any differential settlement of the ground.

## AREVA BUILDING (FORMERLY FIAT BUILDING)

Bouygues Bâtiment Île-de-France built this 180-metre-tall tower. The external walls were built using very elaborate self-climbing forms for which hydraulic cylinders were used for placement, striking, and raising, thereby limiting crane requirements to hoisting of reinforcement and concrete.



Start of works: February 1972

Handover: February 1974

Contract amount: €13.5 million

Architects: Skidmore Owings and Merrill, Cabinet Saubot et Jullien

The bracing system for the Fiat building is a singular system in which the external walls constitute a rigid reinforced-concrete tube. This system is the logical result of analysis of the wind response of buildings, depending on the construction materials used and the slenderness of the structure. The façades are clad with large panels of polished black granite fixed to steel frames.