

Buildings

F Tower: a rising star in Abidjan

At the initiative of the Ivorian Ministry of Construction, Housing, and Urban Development, in partnership with PFO Construction, the project's developer, BESIX is actively involved in erecting the 74-storey F Tower in Abidjan, Ivory Coast. Responsible for both structural works and site management, BESIX ensures seamless execution. The scope of structural works entrusted to BESIX involved design and BIM elements. Additionally, BESIX oversees other project contract packages, including planning and coordinating concrete works and managing overall logistical support, such as crane installation.

Steady progress: achieving two-thirds of the height milestone

Work started in July 2021 with structural work based on existing foundations. The BESIX team has progressed to level 47 with the tower's core, while floor construction has reached level 40. Encouraging progress indicates that structural work is slated for completion of the core by the end of 2024, with the tower soaring to a height of 333 metres across 74 levels. Overall, the tower will stand at 421 metres, including the spire.

Unique challenges

The structural aspects of the project present several unique challenges, notably the variation in design and construction methodology required for each level. This complexity also arises from the use of pre-tensioned high-resistance concrete beams throughout the structure. To meet these exacting standards, a dedicated concrete plant has been established near the site, tailored specifically to the project's needs, surpassing the conventional practices in the region.

Impressive execution methods

The core of the tower, a square section of 20 metres per side rising to 333 metres in height, houses around twenty elevators and two stairwells. It is constructed using a self-climbing formwork consisting of 31 platforms operating in 2 phases of concrete pouring.

The floors have variable geometry on all levels and are built by connecting to the core. These slabs are constructed in four successive quadrants advancing in a 'rising helix' pattern. Each column on every floor has a unique inclination and direction, with rapid and practical implementation made possible by custom-made 'corner pieces' meticulously designed using 3D models.

Wind and fall protection, consisting of 19 self-hoisting segments, each 10-metre high, encircles the floors under construction and is designed to adapt to the variable geometry of the different levels.

Pre-stressed prefabricated beams and prefabricated walkways (a kind of balcony at the edge of the slab) of varying lengths optimise execution cycles.

Several material lifts enable the formwork elements of the slabs to circulate in a closed circuit without having to return to the ground between each quadrant.

Project details

F Tower

Location

Abidjan, Ivory Coast

Client

Ivorian Ministry of Construction, Housing, and Urban Development

Partner

PFO Construction

Architect

Pierre Fakhoury

Contract type

Build

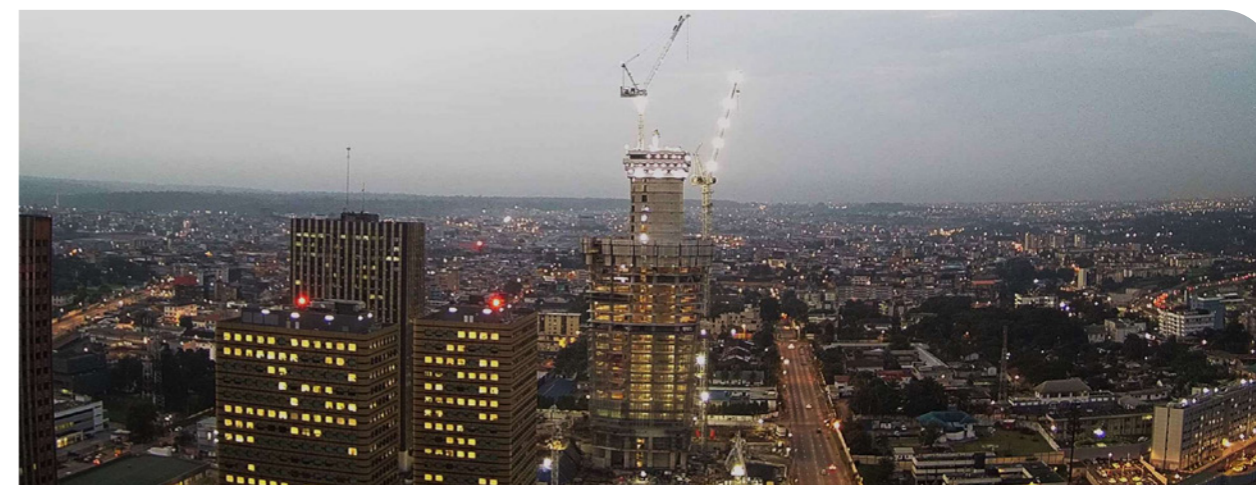
Construction period

2021 - 2024

67,000 m³
of concrete poured

103,000 m²
of floors

8,732 tonnes
of structural steel



Regarding lifting operations, two luffing cranes supply the construction fronts. The first, supported on the ground, is located on the side of the tower, and is telescoped by adding mast elements as the floors to which it is attached are constructed. The second is suspended by 2 frames fixed to the walls at the top of the core at a height of only 19 metres. It always overlooks the core by regular hoisting every five levels using a specific hydraulic jack.

A strong Ivorian team

In executing the project, BESIX Group has proudly enlisted a predominantly Ivorian team, with a significant representation of women. "We stand as a formidable team, greatly valuing the local workforce. It's worth noting that some of our most skilled workers are women," remarks Michaël Eeckhout, Area Manager BESIX West Africa, Ivory Coast, with a smile. "Their meticulous focus on detail proves invaluable for the exacting work ahead."

High-rise expertise

Over the years, BESIX has forged recognised expertise in the design and construction of high-rise buildings. The group's name is associated with those of the Burj Khalifa, Emirates Hotel, ADNOC or Dubai Uptown Towers in the United Arab Emirates, the Aspire and the Qipco Towers in Doha (Qatar), the Four Seasons Hotel in the Kingdom of Bahrain, the Mohamed VI Tower in Morocco, the Dexia and Carpe Diem towers in Paris, and the Montevideo, New Orleans, Maas, and Terraced Towers in Rotterdam.

BESIX's expertise in skyscrapers extends beyond traditional building practices, encompassing specialised fields like dynamic behaviour, building motion control, high-performance materials, soil structure interaction, thermal regulation of concrete, solar radiation, and wind dynamics. With extensive experience and in-house capabilities, BESIX adeptly tackles the challenges inherent in these areas, relying on sophisticated engineering calculations, analysis, and advanced project management. The construction of the new high-rise in Abidjan serves as further evidence of BESIX's prowess in executing technically intricate projects.

Situated in the heart of the Plateau district, the F Tower, designed by Pierre Fakhoury, serves as a prominent landmark in the Ivorian capital's administrative district. Together with the La Mé drinking water plant, the Palais des Expositions, and the Abobo tunnel, the F Tower is the fourth project associating PFO Construction and BESIX in Ivory Coast.



BESIX is immensely proud to contribute to the construction of the F Tower. Partnering with PFO Construction, the premier construction company in Ivory Coast, has been instrumental in ensuring top-notch quality. BESIX's forte lies in executing highly intricate projects across various domains, from buildings to ports, terminals, and environmental infrastructure. This capability is attributed to the expertise cultivated within its internal Engineering department, as well as the extensive experience garnered over the past 115 years, notably across Europe, Africa, the Middle East, and Australia.

Michaël Eeckhout, Area Manager BESIX West Africa