04

110 years of global expertise

Areas of Expertise

Thanks to its expertise and in-house engineering know-how, BESIX is always ready to come up with high-quality and cost-efficient solutions across its many activities.

BESIX Invest

BESIX Invest devises tailor-made solutions covering the complete asset life cycle, such as in the waste, water, or infrastructure sectors. With its broad experience in European and Middle Eastern Public Private Partnerships, BESIX recognises that each project, client, and community has a unique set of challenges and takes pride in being able to form collaborative partnerships to deliver on their aspirations. Together with its client partners and applying a range of financing options, BESIX devises a pragmatic approach to achieve a shared interest over the complete asset life cycle. More recently, BESIX Invest has also strengthened its diversification efforts through investment in PropTech start-ups and VC funds.

BESIX Construction

Buildings

From world-famous skyscrapers to low-impact housing developments, BESIX's impressive track record speaks for its professionalism and mastery. Today, BESIX continues to design, develop, and deliver fully integrated buildings and real-estate properties with unique architecture, cutting-edge technology and performance, complex logistical and environmental requirements, and extreme construction deadlines. BESIX is especially known for its sound experience in carrying out sophisticated large-scale projects, such as high-rise buildings, hotels, hospitals, schools, shopping malls…

Infrastructure

BESIX takes on the most challenging and large-scale civil construction plans for both public and private clients. Building on its engineering skills and its powerful implementation resources, BESIX constructs or renovates complex public works such as tunnels, bridges, roads (from motorways to interchanges), railways, locks, and dams. BESIX also provides maintenance services for these infrastructures through long-term public-private partnerships.

Marine Works

The market for modern port infrastructure is one of the most dynamic in which BESIX operates. Benefitting from its in-house engineers' know-how, BESIX carries out projects mostly on a Design & Build basis, and owns and operates its specialised marine construction equipment. This comprehensive design and equipment approach yields considerable cost savings. BESIX executes coastal marine works all around the world: breakwaters, jetties, quay walls, locks, marinas, water intakes, shore protection, and refurbishment.

Industry

In the niche market of industrial structures, BESIX designs and builds data, logistic and handling centres, warehouses, and processing plants, as well as infrastructure for power providers.

Sports & Leisure

BESIX builds places that turn people into participants. World-class football stadiums, multipurpose arenas, theme parks, and swimming pools are some of the iconic examples of outstanding infrastructure for entertainment and sporting events BESIX has built over the years, over the continents.

BESIX Real Estate Development

BESIX RED has proven itself a responsible player in revitalising cities and acquiring prime locations across Benelux, France, and Portugal. It covers three lines of activities: Offices, Residential, and Retail & Services. In addition to its 30 years of experience, BESIX RED relies on a team of great talents, whether it be architects, engineers, or entrepreneurs. They serve the specific interests of clients with high-performance developments: maximising convenience of occupancy and optimisation of environmental, economic, and technical factors.

BESIX Subsidiaries & Affiliates

Environment

BESIX has established itself as a key player in environmental contracting. BESIX provides innovative and tailor-made integrated solutions for today's growing water and waste challenges, and energy needs. It includes the design, engineering, execution, start-up, and commissioning of wastewater and potable water treatment plants, pumping stations and hydroelectric installations, treatment capacity upgrades, sludge drying and valorisation (digestion, biogas re-use…), and the polishing of treated effluent to near potable water standards (ultrafiltration, reverse osmosis…). BESIX also focuses on the creation of by-products from waste, such as biogas, biofuel, biosolids, heat recovery… Recoverable resources and energy optimisation are a must in times of rapid demographic changes and a global transition to green energy.

Infrastructure

Several affiliates owned by BESIX Group are also active in the field of infrastructure, particularly in the Benelux. This is the case of BESIX Infra in Belgium and in the Netherlands, and Socogetra in Belgium, both figuring among their region's leading roadwork companies. They specialise in the construction, renovation, and maintenance services of roads, tunnels, bridges, and railways.

Utilities

The group is active in the utility sector, both through BESIX and through some of its specialised entities such as BESIX Unitec in Belgium. This field comprises a variety of competencies, such as the laying of underground infrastructure, including sewage, cable, optic fibre, and duct networks. In the field of technical installations, the group offers services for the construction of high and low-voltage infrastructures. Several entities also offer specific expertise in the railway sector, including signalling systems.

Foundations

From deep foundations to retaining walls, BESIX provides foundations for infrastructures and buildings of all types, including the most demanding ones such as skyscrapers. BESIX Group's subsidiary Franki Foundations is itself specialised in deep foundation techniques and is a European leader in this field.

Construction Materials

Several entities in the group represent a vertical integration that is extremely valuable for the quality and reliability of their work. Several entities in Belgium and the Netherlands, such as BESIX Infra or Socogetra, have aggregates quarries, asphalt plants, and asphalt binder production units. In Belgium, several group entities also have facilities to produce prefabricated concrete elements, rebar, and formwork. The group also has ready-mix concrete plants and recycled products, notably in Belgium and the Middle East.

Buildings

Saint-Denis Pleyel: a major station of the Grand Paris Express

Saint-Denis Pleyel station, which is currently under construction in northern Paris by Société des Grands Projets, is part of the new Grand Paris Express metro. The station, designed by renowned architect Kengo Kuma, will be the largest out of the 68 new stops of the Grand Paris Express. It will interconnect lines 14, 15, 16, and 17 and is expected to handle 250,000 passengers a day. Saint-Denis Pleyel is an essential component of the network that will provide better service to the Great Metropolitan region around the French capital.

With the Paris 2024 Olympic Games approaching, Line 14 will be incredibly important as it will serve the main Olympic venues, transporting sports fans to the Athletes' Village, Olympic Aquatics Centre, Stade de France, and the Orly Airport. This means there is a clear deadline. The station must be finished in time for the Olympic Games this summer.

Scope of works

The €115 million contract BESIX France signed with Société des Grands Projets encompasses all architectural and technical trades (including façades and MEP works), as well as all external works of the Esplanade of the station. Saint-Denis Pleyel covers a total area of 34,000 m² spread across nine levels, four of which are underground, extending down to 28 metres below ground. Also included in the contract are four separate access structures with shafts, to ensure passenger safety in case of emergencies, ventilation, and smoke extraction of the tunnels.

"The contract we won in 2019 to develop the station is the result of the high-quality work our Engineering Department and Business Development teams have done throughout the tender process. This involved coming up with cutting-edge solutions to optimise the project in line with the client's objectives," says René Jordens, Commercial Manager BESIX France. BESIX Group takes particular pride in building the iconic Saint-Denis Pleyel station. "Winning this public-sector tender against the backdrop of the Grand Paris underlines that BESIX has firm foundations and demonstrates our technical capacity in France", adds Andres Penaloza, Director BESIX France.

A marathon with a challenging deadline

Construction work on the station began in mid-2020, with delivery scheduled for June 2024. BESIX's involvement in the project started with no less than 10 months of coordination ('synthèse') with both civil engineering works and tunnel equipment works (rails, catenary, etc.) already done by the co-contractors. Between 2018 and 2022, the underground volume of the station was excavated, and the walls and levels were built to a depth of -28 metres. In 2023, it was time for the above-ground part of the station to materialise. By mid-2023, the structure reached its highest point, 35 metres, and has been gradually cladded in glass and wood façades.

The biggest challenge was the logistics and coordination with co-contractors directly managed by Société des Grands Projets, including metro wagon systems and other systems related to the operation of the station (ticketing, passenger information, WiFi and SSI systems, etc.). "Another significant challenge we faced was the vast number of change orders received right up until the final days before the station's handover to the authorities. Despite the tight timeline, we successfully implemented all necessary adaptations in time, ensuring we met the authorities' expectations for the Olympic Games", says Marta Sagui, Head of the Technical Office of the project.

"During a critical phase of the project, we initiated an aggressive acceleration to overcome hurdles, notably those arising from substantial change orders, successfully recouping more than a year's worth of delay. This strategic push involved ramping up our resources, optimising our workflows, and deepening our collaboration with all partners and co-contractors. We not only caught up to our original timeline but also enhanced the project's efficiency and productivity, ensuring we remained on track for the scheduled completion", says Carlo Scheurs.

In July 2023, the first train drove through the station on the tracks of the extended line 14. From this point onwards, a series of tests have been carried out to check the infrastructure. Since February 2024, more than 500 trains have passed through the station each day for testing purposes.

"Every project we undertake is a part of BESIX's DNA. It is when faced with the most complex challenges, such as the construction of this station to a tight deadline, that we demonstrate the greatest creativity and flexibility. Since the start, we have been striving to excel as engineers and to coordinate the many people involved in the project to ensure the station opens on time", says Jean Di Paolo, BESIX Construction Manager for the Saint-Denis Pleyel project.

Project details

Saint-Denis Pleyel Station

Location
Saint-Denis, France

Category
Infrastructure, Buildings

Client
Société des Grands Projets

Architect
Kengo Kuma

Engineer
Egis

Contract type
Build

Construction period
2020 - 2024

Contract value
€115 million

Care at the core

"At BESIX, we prioritise safety above all, which is why we conduct regular management safety walks across every one of our projects, including the Saint-Denis Pleyel project", explains Paul Callebaut, Project Director. These safety walks are more than routine checks. They are a vital practice through which leadership and workforce collaboration come to life, embodying the spirit of ISO 45001 standards for occupational health and safety management.

Driss El Ouazzani, QHSE Manager for BESIX France explains "Just like with our safety walks, we pride ourselves in our BE SAFE programme, which achieves safety through behaviour and positive reinforcement. This programme is not just about following rules; it is about creating a safety mindset that permeates every level of our operations. At the Saint-Denis Pleyel project, we are proud to have more than 30 dedicated BE SAFE ambassadors championing this cause."

More about the Grand Paris Express

The Grand Paris Express is an ambitious public transport project underway in the Île-de-France region, encompassing Paris and its surrounding areas. It represents one of the largest infrastructure projects in Europe and is aimed at transforming the urban mobility landscape of the Paris metropolitan area. The project includes the construction of four new automatic metro lines (15, 16, 17, and 18) and the extension of existing lines (11 and 14). These new lines form a network designed to connect suburban areas directly, bypassing the city centre, to alleviate congestion on existing lines and improve connectivity.

Over 60 new stations are being constructed, designed by a range of renowned architects. The new lines will add approximately 200 kilometres of tracks to the Paris metro network. The Grand Paris Express is being built in phases, with the first new lines expected to open in the mid-2020s and full completion slated for the 2030s.

"I saw the station take shape before my eyes, thanks to the remarkable commitment of the Société des Grands Projets teams and numerous partners, such as BESIX. Their investment is palpable in bringing into service the largest station of the Grand Paris Express. This is an exceptionally complex project, the completion of which will have a profound and lasting impact on the daily lives of the people of Ile-de-France. I would like to thank BESIX for its successful involvement!"

Bernard Cathelain, Board Member Société des Grands Projets

Buildings

BESIX's Guggenheim Abu Dhabi: A pioneering achievement in the world of art and construction

BESIX-Six Construct is proud to be at the forefront of creating the Guggenheim Abu Dhabi (GAD). This monumental museum, designed by renowned architect Frank Gehry, will not only transform the cultural landscape of the United Arab Emirates but also showcase BESIX-Six Construct's expertise in delivering complex and innovative construction projects. Set to be unveiled in 2025, GAD will take its place as the newest and largest among the illustrious family of Guggenheim museums worldwide.

Project details

Guggenheim Abu Dhabi

Location
Saadiyat Island, United Arab Emirates

Client
Department of Culture and Tourism - Abu Dhabi

External partner
Trojan General Contracting LLC

Construction period
2021 - 2025

Contract type
Design & Build

Architect
Frank Gehry

The project

The Guggenheim Abu Dhabi, a partnership between the Guggenheim Foundation and the Abu Dhabi government, will span over almost 30,000 m², making it the largest Guggenheim Museum in the world. The project's design combines cutting-edge aesthetics with traditional Arabic elements, reflecting the rich heritage and cultural diversity of the region.

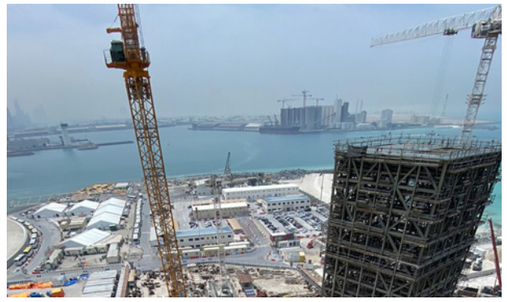
BESIX-Six Construct has worked closely with the Guggenheim Foundation and local stakeholders to ensure that the GAD serves as a platform for Middle Eastern and North African artists, and their unique cultural expressions.

BESIX-Six Construct has prioritised environmental sustainability throughout the GAD project, implementing energy-efficient technologies and eco-friendly building materials to minimise the museum's environmental impact.

The role

As the main contractor for the GAD project, BESIX-Six Construct has taken on the ambitious challenge of turning Gehry's visionary design into a reality. Our team of expert engineers and project managers has worked closely with Gehry and other stakeholders to ensure that the museum's construction meets the highest standards in terms of engineering and sustainability, as well as design.

> **BESIX-Six Construct stands at the forefront of innovation and construction excellence as we embark on the remarkable journey of bringing the Guggenheim Abu Dhabi to life. This architectural masterpiece underscores our unwavering commitment to delivering complex projects.**
>
> Jean-Pol Bouharmont



The significance of GAD

The Guggenheim Abu Dhabi will play a pivotal role in establishing Abu Dhabi as a global centre for arts and culture. BESIX-Six Construct is proud to contribute to this vision, by constructing a museum that will not only attract international tourists and art enthusiasts, but also promote local artists and foster creativity within the community. Furthermore, GAD's environmentally friendly design will serve as a benchmark for future construction projects in the region.

- An impressive 88.5 % reduction in total potable water consumption versus the baseline building consumption
- A significant 70 % of timber used sourced from managed renewable sources
- An impressive 90 % post-consumer recycled composition across all reinforcing steel
- A commendable 75 % diversion of construction waste from landfill

Excellence in progress

The BESIX-Six Construct team has faced various challenges during the design and construction of the Guggenheim Abu Dhabi, including the proper integration of state-of-the-art technologies and traditional Arabic design elements into the final form. Successfully tackling these challenges required close collaboration and innovative problem-solving.

As the Guggenheim Abu Dhabi nears completion, BESIX-Six Construct is proud of its role in constructing this iconic museum that will have a lasting impact on the city's cultural scene. With its pioneering design, vast art collection, and environmentally sustainable characteristics, GAD will stand as a testament to BESIX's expertise and dedication to excellence in the world of construction.

Championing sustainable practices

BESIX-Six Construct fully recognises the importance of sustainable construction practices. For example, GAD aligns with Estidama Pearl 3 sustainability rating requirements and includes the following targeted features:

- A 23.7 % reduction in building energy consumption beyond the baseline building consumption

> **The Guggenheim Abu Dhabi represents the union of art, culture, and sustainable construction on a grand scale. BESIX-Six Construct's relentless pursuit of excellence and our harmonious collaboration with all stakeholders have allowed us to create a museum that will not only inspire global audiences but also elevate Abu Dhabi's stature as a vibrant hub for the arts.**
>
> Abderrazak Nalouti

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

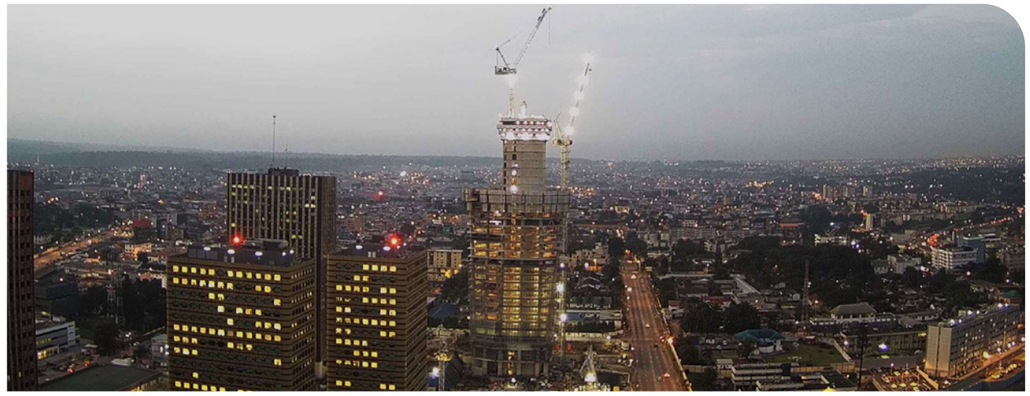
Contract type
Build

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

Buildings

Complex, state-of-the-art STEM building for North Queensland

Situated amidst the landscapes of tropical North Queensland, the Engineering and Innovation Place (EIP) at the James Cook University (JCU) Bebegu Yumba Campus has been delivered as a leading-edge building for STEM disciplines. Spanning four stories and covering an impressive area of 10,033 m², this facility has been meticulously crafted to serve as a hub of innovation, fostering collaboration and learning amongst students, industry partners, and researchers.

The interdisciplinary teaching and learning spaces include:

- Advanced Manufacturing Studio
- Computational Digital Studio
- Collaborative Digital Studio
- Shared Wet / Dry Laboratory
- Shared Research Laboratory
- Multi-Modal Studio Peer-to-Peer Learning / Student Hub
- Structures Laboratory
- Garage Innovation Space
- Observation Studio

Trusted delivery partner

BESIX Watpac recently wrapped up work on its third project at the JCU Bebegu Yumba Campus, marking another milestone in its collaboration with the university. The EIP now stands proudly alongside other major buildings constructed by BESIX Watpac: the Australian Tropical Science & Innovation Precinct (ATSIP) and the Australian Institute of Tropical Health & Medicine (AITHM) Translational Research Facility (TRI). The company has also completed the Ideas Lab for JCU in Cairns and was recently awarded stage 2 managing contractor status for the JCU Cairns Tropical Enterprise Centre (CTEC) – the fifth project with their long-term client. With a client-contractor relationship spanning 15 years, BESIX Watpac's collaborative approach was instrumental in successfully delivering the highly complex EIP building.

I commend the way the BESIX Watpac team has come together and collaborated with the client and consultancy team to resolve multiple challenges. This building is an iconic structure and one we can all be proud of at BESIX Watpac.

Glen Watson, BESIX Watpac Northern Area Manager

Project details

James Cook University Engineering and Innovation Place

Location
Townsville, Queensland, Australia

Timeline
2021 - 2024

Client
James Cook University

Architect
KIRK

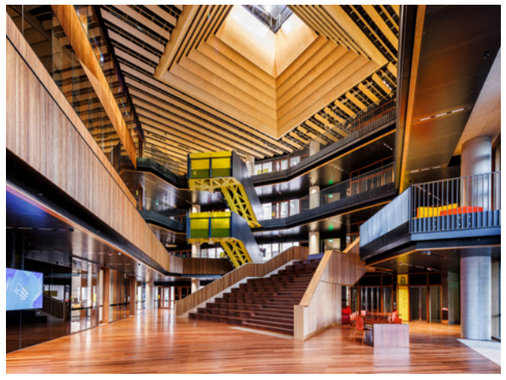
Contract type
Build

Complexity

A remarkable building unlike any other that BESIX Watpac has delivered in the region, almost every aspect is bespoke. The building features challenging design elements and multiple teams have worked together seamlessly to bring the finished product to life, faithfully realising the vision of project architect, KIRK.

Features include a sizable overhang to the front corners of the building and an expansive atrium showcasing an internal steel cantilevered stairwell and extraordinary timber-lined oculus that welcomes natural light. Timber features prominently in both the interior and exterior of the design, which also incorporates glass and zinc finishes into the façade.

The building has several important features engineered to withstand the extreme environmental conditions of the region. This includes a façade that is impact-resistant to wind-borne debris. The entire building, including fit-out and services, is built to stringent EDCII earthquake standards. Building to these requirements meant the team carried out exhaustive performance tests on almost every individual component of the exterior skin. The building envelope is also tightly sealed to protect against heat and humidity, with the team having drawn on their expertise to develop the best methodology for insulating this intricate structure.



Sustainable solutions

Social

The project is a shining example of BESIX Watpac leading the way in creating opportunities for Indigenous participation, local engagement, and providing pathways for the next generation of construction professionals.

BESIX Watpac is committed to building meaningful and sustainable opportunities for Australia's First Nations people. To achieve this, the company embeds systems and practices within its projects to engage with the Indigenous workforce and businesses. At the outset of the project, a goal of achieving 3 % Indigenous participation was established. Through a collaborative relationship with our subcontractors, steering committee, and JCU, combined with a highly committed team, BESIX Watpac not only exceeded this target but achieved close to 5 % Indigenous participation.

BESIX Watpac also worked closely with JCU, industry bodies, and local schools to provide education and employment pathways, and frequently engaged with the University's engineering students to elevate their learning.

Environment

The building is targeting the international LEED Gold rating and is designed to maximise passive cooling by leveraging low-energy active systems. Building a large-scale institutional facility that heavily utilises passive cooling is a benchmark for a tropically located building.

The central atrium will operate in a mixed-mode environmental setting controlled by a Building Management System (BMS). This will provide it with the ability to run as an air-conditioned space during hot and humid conditions and also as a naturally ventilated space during cooler seasons with lower humidity.

Given the educational setting, the sustainability strategies are straight-forward and not reliant on expensive or specialised, technically-driven systems. The aim was to demonstrate to students that sustainable design is about innovation and should work in harmony with the natural environment.

Infrastructure

Huccorgne Viaduct: the rehabilitation of a major axis in Wallonia

The Huccorgne viaduct, located on the E42/E25 motorway between Liège and Namur, is a crucial part of the E42 motorway, linking the west and east of the Walloon region, across Belgium. With a total length of 547 metres and a height of 60 metres, the viaduct features two separate decks, each for one direction of traffic, and carries 60,000 vehicles daily. The comprehensive rehabilitation project was carried out by BESIX and its partner, on behalf of SOFICO and the Service Public de Wallonie Mobilité & Infrastructures, the entities responsible for the road network infrastructure in the Walloon Region. The rehabilitation has substantially been completed and the motorway fully reopened on Sunday 30 July 2023, slightly ahead of schedule, offering three lanes in both directions.

Rehabilitation in two parts

Originally built in the 1960s, the Huccorgne viaduct was in need of a comprehensive makeover. The works included a complete rehabilitation of the entire structure, including the replacement of the beams, the deck, and the support structure. New waterproofing, surfacing, and sound walls were also installed. This challenging renovation project has been the region's largest infrastructure project in recent years.

The rehabilitation started in August 2021 with preparatory works. In January 2022, renovation works began on the bridge supporting the lanes in the direction of Namur-Liège. This first half of the viaduct was completed and inaugurated by the Walloon authorities in July 2022. The opening of the lanes to traffic allowed the second part of the works to begin, in the direction of Liège-Namur.

Precise planning

Ensuring uninterrupted traffic was of utmost importance, as 60,000 vehicles cross the viaduct every day, making it a major challenge to minimise traffic disruption. In order to do so, BESIX's teams adhered to an extremely strict plan to keep two lanes open in each direction throughout the entire project. This was possible thanks to meticulous planning, communication, and collaboration among all partners.

"The project was extremely well-prepared, and there was excellent communication and collaboration with our client SOFICO and partners", says Jean-François Deswijsen, Operations Manager Wallonia-Luxembourg. "This is essential for large infrastructure projects like this, where timing is tight and unforeseen challenges are inevitable. I would like to thank our partners, subcontractors, and suppliers for their contributions to the success of this project. We are proud to say that we even finished slightly ahead of schedule", he adds.

Heavy lifting

Another challenge was the removal and replacement of 36 concrete beams on both sides of the viaduct. With each beam measuring 30 metres long and weighing 60 tonnes, this manoeuvre was visually spectacular. The crane had to lift the beams up to 60 metres high, adding to the complexity of the manoeuvre.

This was a particularly impressive operation that, despite some windy weather, remained on schedule. "On windy days, the wind was monitored every hour to determine if it was safe to lift the beams. If the wind was too strong, work was postponed until the evening or night, so that the schedule could be maintained," states Jean-François Deswijsen. Despite the challenges, the placement of the new beams was completed right on schedule in less than a month.

Safety and sustainability

The completion of the Huccorgne viaduct rehabilitation project is a major milestone for the road network in the Walloon Region. The project has significantly improved the safety and durability of the viaduct, and it will ensure that it continues to serve the travelling public for many years to come.

"Planning and organisation were essential in this project, as traffic had to be maintained at all times. We proposed a plan that would minimise traffic disruption.

Jean-François Deswijsen, Operations Manager Wallonia-Luxembourg

Project details

Huccorgne Viaduct

Location
E42/E25 motorway Liège-Namur, Belgium

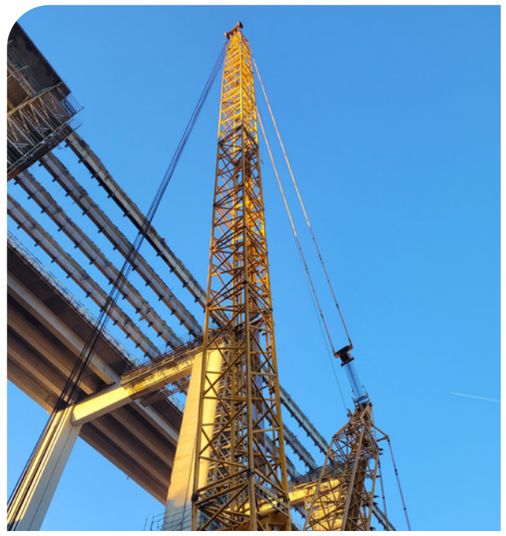
Client
SOFICO & Service Public de Wallonie Mobilité & Infrastructures

Partner
Galère

Contract type
Build

Construction period
2021 - 2023

Contract value
€23 million



Infrastructure

Abobo Tunnel: improving accessibility and traffic in Abidjan

The Abobo Tunnel project, situated in the bustling city of Abidjan in Ivory Coast, symbolises how strategic infrastructure development can enhance urban mobility and accessibility. Officially inaugurated on January 10, 2024, this project is a part of the larger Abobo Town Hall roundabout initiative, designed to improve traffic flow in this major residential and commercial area inhabited by over one million people.

Improving traffic and safety

Under the initiative of PFO Construction and representing the Ivorian Ministry of Public Works and Road Maintenance, BESIX Ivory Coast was awarded the contract in September 2021 for the project management and execution of this critical infrastructure. The works began in March 2022 and, demonstrating the commitment and efficiency of BESIX's teams, were completed by June 2023, ahead of schedule.

The project involved the construction of a 560-metre-long infrastructure that includes the Abobo Tunnel, the roundabout, and access ramps. The tunnel itself stretches 210 metres and, along with the ramps, accommodates the A1 national road which now passes beneath the roundabout with three lanes in each direction. This key route links the districts of Abobo, facilitating smoother connections to the East and North-East of the country.

Cut-and-cover

The construction of the Abobo Tunnel utilised the 'cut-and-cover' method. This technique involves excavating a large trench, constructing the structure within it, and then covering it. Specifically, the project required the excavation of 130,000 m³ of earth, the placement of 2,200 tonnes of reinforcement, and the pouring of 20,000 m³ of structural concrete. To ensure the tunnel's durability against weathering and leaks, a waterproofing membrane was meticulously applied over the concrete cover slab, following a thorough cleaning to remove all impurities and secure optimal adhesion. The tunnel is also equipped with state-of-the-art operational facilities, including a gravity system for efficient drainage of rainwater, ensuring that it remains functional under all weather conditions.

"The construction of the Abobo tunnel confirms our strong presence in Ivory Coast and the quality of our partnership with PFO Construction. The Abobo site allows us to introduce one of BESIX's other major areas of expertise, infrastructure, to Ivory Coast. And we are particularly proud to participate, under the aegis of PFO Construction, in the realisation of this first-class project for the benefit of Abidjan and the country.

Philippe Dessoy, General Manager Business Development at BESIX Group.

Project details

Abobo Tunnel

Location
Abidjan, Ivory Coast

Client
PFO Construction on behalf of the Ministry of Public Roads and Road Maintenance of Ivory Coast

Contract type
Build

Construction period
2022 - 2023

Contract value
€17.132 million

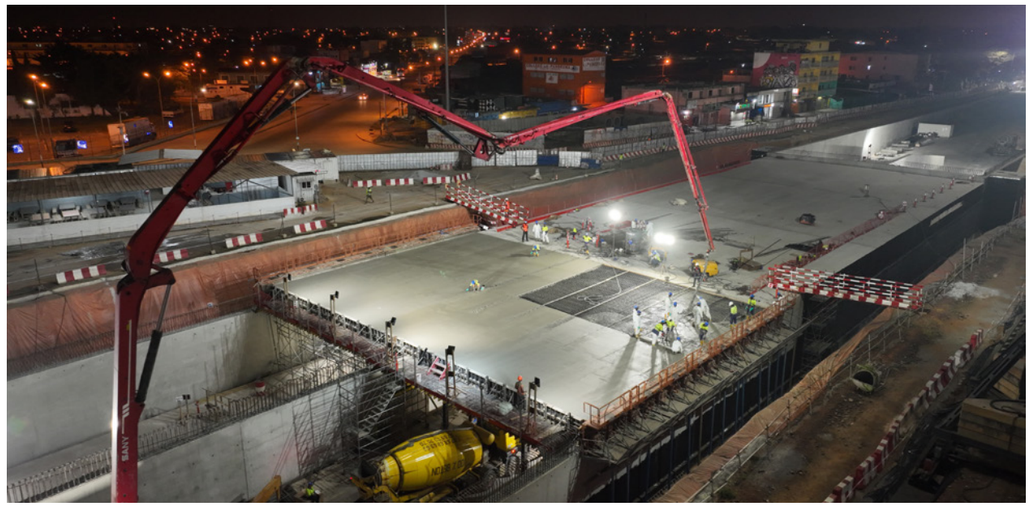
Strong partnership

In past years, BESIX has participated in four significant projects in Ivory Coast.

- In 2021, BESIX successfully delivered the largest drinking water treatment plant in the Abidjan region, located in La Mé, serving the greater Abidjan area.
- The same year, BESIX started works on the F Tower, designed by architect Pierre Fakhoury, located in the heart of Abidjan and the sixth tower of the city's Administrative City. BESIX is in charge of the project management, as well as the execution of the structural works. The project is a partnership with PFO Construction, supported by the Ivorian Ministry of Construction, Housing and Urban Planning.
- The Abidjan Exhibition Centre, also designed by architect Pierre Fakhoury, was inaugurated in 2023. BESIX was in charge of carrying out the structure, concrete shell, and the installation of the roof and its cladding. The complex has a multi-purpose area surface of 12,000 m² and the flexibility to extend through modular spaces. It has a capacity of 11,000 people, offering seating for 5,000 people. The exhibition centre officially opened its doors in July 2023 and will host trade fairs, cultural and sporting events, and international conferences. It will also help boost business tourism thanks to its conference centre.
- The Abobo Tunnel completes the circle. As the longest tunnel in Ivory Coast, its delivery marks a significant milestone in the region's ongoing development and commitment to improving the safety of the countless commuters navigating this vital junction daily.

Builders of a symbol

At the beginning of 2023, the Prime Minister of Ivory Coast, Patrick Achi, honoured the Abidjan Exhibition Centre with his visit, together with several ministers of his government. They witnessed the commitment of BESIX's teams, whom they called the 'builders of a symbol'. They also underlined the remarkable quality of the construction.



Infrastructure

BESIX gearing up to deliver the Nachtigal Hydropower Plant

In a remote stretch of Cameroonian rainforest along the Sanaga River, about 65 km from the capital Yaoundé, BESIX spearheads the civil works for the Nachtigal Hydropower Plant. The project, being constructed in collaboration with partners NGE Contracting (France) and SGTM (Morocco), is one of the most significant public-private partnerships in Africa. The driving force behind the development, Nachtigal Hydropower Company, comprises EDF, the International Finance Corporation, Stoa Infrastructure and Energy, Africa 50, and the Government of Cameroon, all of whom have provided funding for the project. The hydropower plant encompasses two roller compacted concrete dams of 1.3 km and 0.5 km, a 3.3-km-long and 14-metre-deep artificial canal, and a powerhouse with seven 60 MW turbines to generate power. The Nachtigal hydroelectric project will cover an impressive 30 % of Cameroon's energy needs, with a production capacity of 420 MW.

Project details

Nachtigal Hydropower Plant

Client
Nachtigal Hydro Power Company (NHPC)

Location
Nachtigal, Cameroon

Contract type
Design & Build

Construction period
2018 - 2025

An atypical project site

The project site being located in the rainforest presented unique environmental and logistical challenges. To house all site staff, a new and well-equipped village was built, which included an electricity distribution network, a water treatment plant, and sewerage installations. As the upstream to downstream site is seven kilometres long, a comprehensive network of roads was also created. Due to the site's remoteness, BESIX and its partners decided to lower dependency on external transport by installing a crusher plant which produces aggregates for concrete production and asphalt production for the waterproofing of the canal. The vast majority of the crusher plant's raw materials came from on-site mining activities. In addition to the crusher plant, the site team also installed three concrete batching plants, two asphalt plants, a cut and bend workshop, and a carpentry on site. In addition to saving both time and money, this independence proved extremely valuable during the COVID-19 pandemic.

2023, a pivotal year for BESIX on site

With over 80 % of the civil works finished by the end of 2022, 2023 was a pivotal year for the Nachtigal Hydropower Plant, filled with crucial milestones. At the end of May, water flowed for the first time along the 3.3-km-long and 14-metre-deep inlet canal as part of the first sealing tests. These successful tests were required to check the construction and coating for any leaks, and to confirm the function of the asphalt and concrete connection along the canal. In mid-July, a commemorative ceremony was held to officially mark the start of the impoundment of the reservoir in the presence of the Minister of Water and Energy, Gaston Eloundou Essomba, and representatives of local and traditional authorities, main actors of the energy sector, NHPC, and the consortium partners. The impoundment involved filling the dam for the first time to create the water reservoir that will supply the plant. With this step, the entire project reached 87 % completion. A few weeks later, the plant's labyrinth spillway, which has a capacity of over 6,000 m³/s, was successfully put into service for the first time. Its essential purpose is to safely evacuate excess water in the event of flooding. By the end of 2023, the inlet canal was ready to be filled again, this time permanently after the tests earlier in the year. The canal transports the water from the reservoir to the plant for energy production. Alongside these important milestones for BESIX, the other partners on site also completed vital steps, including finalising the installation of the seven penstocks, completing the main dam, and preparing the instream flow turbine plant for operation.

Final stages

As the project moves into its final stages, the site teams have begun to dismantle installations and return certain areas of the site to their natural state. To help the rainforest thrive once more, indigenous trees and plants are being re-planted. Finishing works include the last concrete works on the small powerhouse and turbines, and on an administrative building. The electromechanical works on the upstream side are also nearly finished. Once all finishing works have been completed, there is only one final step to go: finalising the testing and commissioning of the various components of the project. BESIX and its partners expect to deliver the project fully by early 2025.

Marine Works

The Oxagon project: developing port infrastructure

Project details

Port of NEOM

Location
Saudi Arabia

Client
NEOM

External partners
Modern Building Leaders (MBL), Boskalis

Construction period
2023 - ongoing

Contract type
Design & Build

Total value
€741 million

“This monumental endeavour in modernising and expanding port infrastructure is poised to set new industry standards and leave behind a transformative legacy.

Bruno Mendiaux, Project Director

In the heart of remote yet strategically vital maritime routes around the Suez Canal, the Red Sea, and the Persian Gulf, lies the Oxagon project - an ambitious endeavour that exemplifies BESIX-Six Construct’s unwavering commitment to excellence in marine construction. Focused on modernising and expanding port infrastructure, the Oxagon project is set to play a pivotal role in facilitating the transportation of goods by large and medium-sized container ships, feeder ships, and bulk carriers in the region. The completion target for this monumental project is set for March 2025.

Defining the project scope, confronting challenges, and assembling the right team

The Oxagon project is a comprehensive transformation of the port that involves several key goals. These include deepening the access channel for larger vessels, expanding the harbour basin, constructing various quay walls for different purposes, demolishing, and upgrading existing facilities, installing port equipment and infrastructure, and setting up rails for gantry cranes.

However, building quay walls in this project comes with significant challenges. The varying soil conditions, ranging from extremely hard ground to soft soil, require specialised approaches in different areas. The project’s scale and equipment requirements demand careful planning and execution. Employing an adequate number of skilled professionals is crucial for effective project management. Additionally, operating in a remote location presents logistical complexities in sourcing materials, although BESIX-Six Construct anticipates improvements in this area soon.

Collaboration stands as the linchpin for Oxagon project’s success. BESIX’s primary focus lies in carefully selecting and deploying the right individuals to ensure seamless teamwork. With approximately one thousand professionals engaged in the joint venture during peak periods, its paramount objective continues to be cultivating a unified team spirit.

Innovative construction methods

Central to the success of the Oxagon project is the construction method employed by BESIX-Six Construct: the use of sheet piles combined with H-beams (known as King Piles) to form a robust combi wall. Sheet piles are sections of sheet materials with interlocking edges, driven into the ground to provide earth retention and excavation support, and King Piles are rolled H-beams with embedded interlocking clutches and form the structural core of the combi wall. In the case of the Oxagon project, King Piles measuring approximately 1.44 metres by 35 metres play a pivotal role in creating stable quay walls.

However, the unique challenge faced by BESIX-Six Construct is the diverse soil composition across the project site. While some areas feature extremely hard ground, others consist of soft soil requiring advanced geotechnical engineering by our in-house design office. To tackle this, BESIX-Six Construct’s approach involves replacing the existing soil with sturdier material in specific locations. This flexible method allows for the successful installation of between 75 to 100 metres of combi wall per month.

Pioneering sustainable practices

The Oxagon project underscores BESIX-Six Construct’s commitment to sustainability. The company employs sheet piles manufactured using green energy, significantly reducing CO_2 emissions. This environmentally friendly approach aligns with the client’s priority of executing the project in the most sustainable way possible.

A noteworthy detail is that a total of 41,000 tons of ‘green’ steel, produced by a Luxembourg-based company, will be utilised in the project. This choice reflects a conscious decision by the client to prioritise environmental friendliness, even at a higher cost.

Moreover, BESIX-Six Construct shall process, and incorporate in the works, approximately half a million rocks that are a by-product of NEOM’s blasting works, to reduce the carbon footprint of the project by re-using normally leftover material.

Committed to diversity, inclusion, and worker welfare

“At BESIX-Six Construct, we prioritise diversity, inclusion, and worker welfare. This commitment is evident in projects like Oxagon, where our diverse team hails from various countries - Egypt, South Africa, Romania, India, Pakistan, Sudan, the Philippines, and more.

Our focus on worker welfare includes ensuring a safe working environment, fair compensation, and strict adherence to labour laws and regulations, reflecting our dedication to the well-being and dignity of every individual on our team”, explains Geert Aelbrecht, Chief People Officer at BESIX Group.

Marine Works

Transforming Portonave's port infrastructure in Brazil

In August 2022, Portonave awarded BESIX and Empresa Construtora Brasil (ECB), part of Mota Engil, the EPC contract to enhance its port infrastructure within the Port of Navegantes, Brazil. The project involves constructing a new quay wall in the same location as the existing structure, whilst maintaining port operations. To achieve this, a two-phase approach has been adopted. Construction commenced in January 2024, following an extensive period of Early Contractor Involvement and thorough preparations.

Located in the city of Navegantes in southern Brazil, Portonave stands as Brazil's first privately owned port terminal. The site is owned by Terminal Investment Limited (TIL), one of the world's largest container terminal operators. The upgrade aims to accommodate larger vessels, and therefore enhance the port's container capacity. While the current infrastructure lets ships of up to 350 metres in length carrying 11,000 six-metre containers dock, the optimisation will accommodate ships of up to 24,000 containers and 400 m length.

Continuous operations and optimised design

To ensure uninterrupted port operations whilst the capacity expansion project was underway, the partners proposed a sequential approach to the client. By dividing construction activities into two distinct phases, each corresponding to one half of the terminal, this approach allows construction activities to proceed seamlessly while maintaining continuous port functionality.

The permanent works at the port commenced in early 2024 with rockfill, which entailed stabilising the walls to allow the demolition of existing structures and construction of the new infrastructure. Subsequently, deep foundation works, with foundations reaching 60 metres in the ground, will begin. To facilitate part of these complex works, BESIX has called in the help of its deep foundations specialist Franki Foundations, which has been playing an instrumental role in providing the necessary equipment and expertise.

Prior to the permanent works, BESIX, ECB, and Portonave adopted an Early Contractor Involvement approach extensively. During this period, they worked collaboratively to identify the most effective technical solutions, hone the design, and develop methods to optimise project cost and estimate prices through an open-book collaboration.

A majority Brazilian workforce

For the execution of the project, BESIX Group committed to a largely Brazilian team. With 90 % of the site staff being Brazilian, Portuguese is the predominant language on-site. Given that some of the expats working on the project do not speak Portuguese, various initiatives, such as Portuguese classes, have been adopted to foster effective communication. These initiatives have proven successful thus far, and language disparities are not perceived as barriers on-site. "We're a strong team, merging effectively. It's definitely something we take pride in," concludes Quentin Michel, BESIX Group's Project Manager at Portonave.

The project for Portonave signifies BESIX Group's inaugural venture into the Brazilian market. This entry was facilitated by the company's intrinsic openness and flexibility, coupled with the collaboration with ECB, providing valuable local insights. Additionally, the Early Contractor Involvement approach was beneficial, as it allowed BESIX Group to learn about the country ahead of time and prepare for the project meticulously.

In 2023, activities in Brazil primarily encompassed site mobilisation and installation, preparing the site for the permanent works, which commenced early 2024. Throughout 2024, efforts will continue to focus on the project's first phase, including demolition of the older infrastructure, and construction of the new quay wall. Final delivery of the project is planned for 2026.

> **Although our colleagues from Franki Foundations usually don't work outside Europe, their contribution here is most valuable. This collaboration between experts exemplifies the strength of co-creation within BESIX Group.**

Quentin Michel, BESIX Project Manager

Project details

Portonave

Location
Navegantes, Brazil

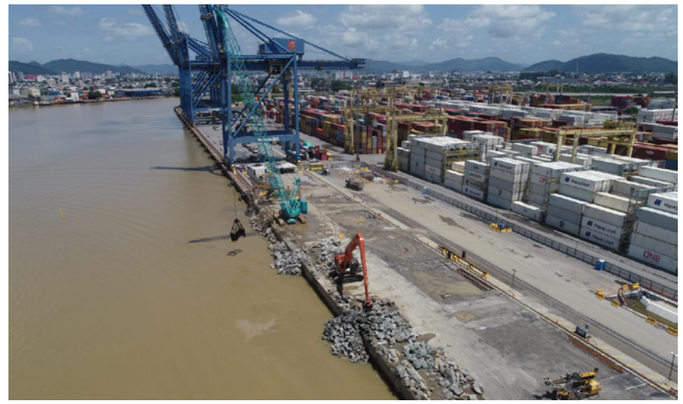
Client
Portonave - a subsidiary of Terminal Investment Limited (TIL Group)

Partner
Empresa Construtora Brasil

Contract type
Engineering, Procurement, and Construction (EPC)

Construction period
2023 - 2026

Contract value
€167 million



> **The Early Contractor Involvement approach enabled us to thoroughly explore all aspects of the project in advance and to refine the project scope with the client, assess resources, address, and mitigate risks, and apply value engineering. Thanks to the ECI approach, we were able to present a strong, competitive solution to the client."**

Jean-Baptiste de Ghellinck, General Manager, BESIX International

Industry & Logistics

Armoured Fighting Vehicle Facility Programme LAND 400

Construction has concluded on a state-of-the-art defence infrastructure facility aimed at supporting, sustaining, and training Australian Army personnel in the operation of the next generation of Armoured Fighting Vehicles. This project also marks an extension of BESIX Watpac's involvement in the LAND 400 programme.

BESIX Watpac was granted the project contract in 2021. The facility features newly built and upgraded maintenance and simulation facilities located at Adelaide's Edinburgh Defence Precinct in South Australia.

This endeavour follows the successful completion of the Military Vehicle Centre of Excellence: a large-scale industrial facility commissioned by Rheinmetall Defence Australia in 2020 responsible for producing the BOXER CRVs.

The BOXER Combat Reconnaissance Vehicle (CRV) fleet represents a significant advancement in reconnaissance capabilities, intended to replace the aging Australian Light Armoured Vehicle, which has served for nearly 3 decades. The CRV, built on the Rheinmetall Boxer platform, offers enhanced size and capabilities compared to its predecessor.

Project overview

The project consisted of three main components: maintenance facilities, a simulation centre, and site works.

Maintenance facilities

The JLU-S Vehicle Workshop includes 16 vehicle maintenance bays, grit blasting and wash bay, engine/hydraulic room for petrol oils and lubricants, working accommodation, and amenities for workshop staff.

AFV Simulation Centre

The AFV Simulation Centre is a two-storey facility comprising classrooms, a lecture theatre, and offices for Field Service Representatives, along with workspaces and amenities.

Site works

Site works involved the creation of vehicle hardstands for parking and temporary storage of vehicles under repair, as well as circulation areas. Additionally, there were 12 trickle charging stations, a new HV kiosk, car park, and a central energy plant.

Innovative modular construction methodology delivers significant programme savings

A groundbreaking modular construction method was employed to expedite the construction of the Simulation Centre. This involved building the structural steel plant platforms on the ground, allowing for the installation of mechanical and hydraulic services on the platforms before lifting them into position. This approach not only saved time completing the project in just 60 days with a total of six 25-tonne lifts, but also improved efficiency and safety by eliminating the need for rooftop installations.

Strong defence and secure facilities capabilities

BESIX Watpac has a robust and long-standing partnership with Defence dating back to 1995. Over the past decade alone, they have delivered more than AU$1 billion in Defence capital facilities and infrastructure throughout Australia.

Project details

Armoured Fighting Vehicle Facility Programme LAND 400

Location
Adelaide, Australia

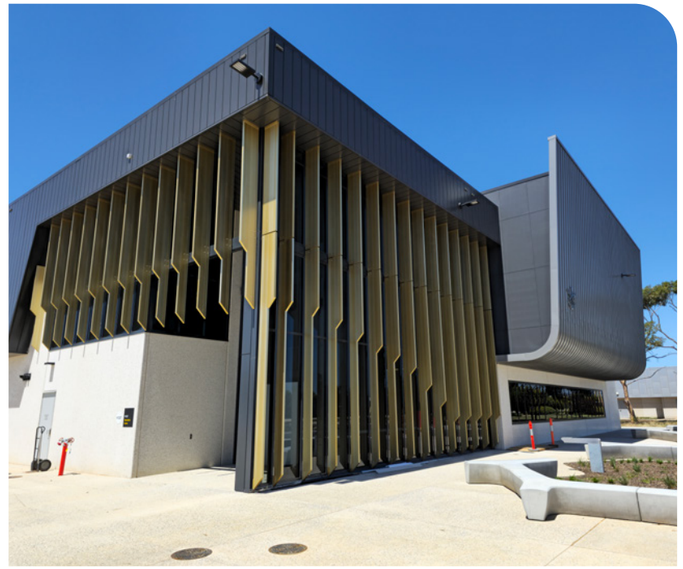
Client
Government of Australia - Department of Defence

External partners
AECOM, Aurecon

Role
Head Contractor

Contract type
Build

Construction
2021 – 2023



Our team tackled various challenges to provide innovative project solutions, including redesigning duct pathways to accommodate seismic bracing, optimising roof beams and sheets to improve buildability and provide installation efficiencies, and adjusting cable tray locations to meet seismic and logistic constraints.

Richard Stead, BESIX Watpac National Defence Manager

Industry & Logistics

Expertise in collaboration: the success story behind the PALLAS reactor

A SPECIAL PROJECT IN THE PETTEN DUNES

Since the 1960s, the Petten Dunes in North Holland have been home to a nuclear reactor dedicated to researching and producing medical isotopes. However, the High Flux Reactor (HFR) at this site is now 60 years old, posing a risk of shutdown that could disrupt medical treatment for thousands of patients. To address this, PALLAS has initiated the construction of a new reactor in Petten, ensuring a reliable supply of medical isotopes for the 30,000 patients who depend on them every day.

The excavation work for the construction of the PALLAS reactor building has been underway since early 2023. Collaborative efforts between two sister companies, Franki Grondtechnieken, and BESIX Netherlands, are expected to complete this phase by the end of 2024, paving the way for the next phase: the reactor's actual construction. The reactor is designed to be so robust that it remains intact even under the most extreme conditions. This necessitates high-quality standards throughout the construction process. Each aspect of the construction undergoes thorough preparation and multiple checks to ensure compliance with all specified standards and requirements, highlighting the importance of effective coordination and cooperation.

Project details

PALLAS Reactor

Location
Petten, The Netherlands

Client
PALLAS

Partners
BESIX Nederland and Franki Grondtechnieken

Contract type
Design & Build

Construction period
2023 - 2024

Contract value
€33 million

Integrated cooperation

Effective collaboration is like a successful marriage: it requires commitment, good communication, and occasional constructive conflict to last. Working with diverse teams and partners presents its challenges, emphasising the importance of prioritising collective goals over individual preferences. The close partnership between BESIX Nederland and Franki Grondtechnieken on the PALLAS project exemplifies this collaborative spirit.

From the project's inception, the two sister companies have collaborated closely. "It is quite unique that we have established a cohesive team right from the start, with the right colleagues in the right roles, to execute the work in an integrated manner," says Jan Leen van der Vlies, Director of Execution at Franki Grondtechnieken. The combined knowledge and expertise of BESIX Netherlands (in project management and concrete work) and Franki Grondtechnieken (with their specific understanding of complex foundation techniques) were shared early on, complementing each other seamlessly. "Building a reactor is a relatively new endeavour for everyone involved, and projects of this scale have not been undertaken in the Netherlands before. This necessitates continuous coordination and cooperation to ensure success. We rely heavily on each other's expertise," explains Robbert Brand, Manager of Industry, Energy & Water at BESIX. The project holds special significance for all involved, as the work is conducted in an extraordinary environment, demanding meticulous attention to quality and safety.

Foundation for good project results

"Open dialogue and effective decision-making between PALLAS, BESIX Nederland, Franki Grondtechnieken, and the subcontractors are crucial for project success. Regular discussions to reflect on collaboration and communication patterns allowed for greater connection, trust, and mutual understanding to be built, laying the groundwork for a successful project outcome", Jan Leen and Robbert explain.

Sietsche Eppinga, Construction Director PALLAS: "BESIX Nederland has been a reliable partner, with whom we have maintained open communication since the project's inception. Their expertise will be invaluable as we proceed with the construction of the new PALLAS reactor. Time is truly of the essence for us to ensure that in the future, patients can count on nuclear medicine from Petten."

The building excavation in numbers

- **30 diaphragm** wall panels (each 7.5 metre wide, 1.5 metre thick and 35 metre deep) with 1,500 tonnes of reinforcement steel
- **12,000 m³** of concrete
- **50,000 m³** of soil excavated from the site
- Depth of building excavation: **22 metres**
- Area of building excavation: **52 x 50 metres**
- **164 stem** anchors with lengths of **50-65 metres**
- **380 screw** injection piles with lengths of **33.5 metres** (applied from a pontoon with a water depth of 20 metres)
- **3,750 m³** of underwater concrete
- Bearing slab with a thickness of **1.5 metres**; total **3,000 m³**

Industry & Logistics

Axis Alexandria: a carbon-neutral industrial development delivered in South Sydney

Axis Alexandria is a multi-level industrial facility consisting of nine units ranging from 1,000 to 7,000 m² and a 36-metre-wide shared hardstand for vehicles. Requiring significant design engineering and incorporation of advanced technologies, each unit includes a light-duty car park for each office, heavy-duty hardstands, and composite structure multi-level warehouse, with a two-storey office and solar power.

It sits on a prime 1.69-hectare brownfield site in south Sydney and is the first multi-storey facility of its kind in Australia, for Australia's largest industrial owner and developer, Goodman.

Innovative sustainability

Regenerating the brownfield site, innovation, and sustainability were at the forefront of the design process. Envisioned in collaboration with architects FJC Studio (formerly FJMT Studio), Axis Alexandria sets new benchmarks for sustainability with a 410 kW PV solar array directly benefitting the customers occupying the building. It features water harvesting, electric vehicle charging, diverse drought-resistant landscaping, smart meters to help manage electricity consumption, and LED lighting and daylight harvesting to reduce energy use by 60-80 %. It's targeting 5-Star Green Star Design and As-Built v1.3.

Reducing environmental footprint

Early in the design phase of Axis Alexandria's development, the project team identified recycled steel as a key material that could be incorporated into the industrial facility's construction. BESIX Watpac's partnership with a trusted supplier played a pivotal role in the successful execution of this initiative.

Together, the teams navigated the complexities of sourcing and repurposing recycled steel, ensuring it met stringent quality standards. Throughout delivery, over 1,500 tonnes of 80 % recycled steel was incorporated into the main structure of the project. This saw significant cost efficiencies and displayed BESIX Watpac's dedication to closing the material loop and achieving a more circular construction model.

Indigenous outcomes key to project success

Axis Alexandria is committed to achieving positive social outcomes. The project engaged seven indigenous businesses including surveyors, craneage, plant and equipment hire, signage, and scaffolding. The total spend related directly to Indigenous businesses amounted to AU$1.3 million (€790,000), meeting the project target of 3 % of the original contract value. Project commencement was marked with a Welcome to Country ceremony by the Metropolitan Local Aboriginal Land Council to acknowledge the traditional owners of the land.

Unique site restrictions create innovative delivery methodology

Site restrictions for the project include a 6 metre proximity limit from the building to the site perimeter and a transgrid easement running through it adding complexity to the construction process. To overcome the challenge, an innovative methodology of building the warehouse from the inside-out was employed. Crane lifts were carefully planned and executed to lift materials over the steel structure from the inside-out and into position, remaining at all times below Sydney Airport's capped ceiling height restriction (RL47.5).

Aesthetic and amenities focus on environmental well-being

Goodman's Axis Alexandria is a prominent facility balancing raw industrial style with a refined premium aesthetic. The development focuses on environmental well-being, featuring superior air ventilation, natural light penetration, and the use of sustainable materials.

Best-in-class amenities will help deliver a more productive and enjoyable working day for the building's occupants, with the expansive green spaces of Sydney Park enhancing the focus on well-being.

Project details

Axis Alexandria

Location
Sydney, Australia

Client
Goodman

External partners
FJC Studio – Architect (formerly FJMT Studio), SBA Architects, Costin Roe Consulting Engineers

Contract type
Design & Build

Construction period
2021 - 2023

Contract value
AU$45 million (€27 million)

16,081 m²
multi-level industrial warehouse and office development

Environment

Pioneering renewable hydrogen production in Belgium

BESIX, BESIX Environment, and John Cockerill Hydrogen Belgium have signed an Engineering, Procurement, and Construction (EPC) contract with client Virya Energy (generation and sale of renewable energy, Colruyt Group), to design and build a power-to-gas facility that can convert renewable electricity (from the offshore wind parks in Zeebrugge) into green hydrogen, named Hyoffwind. Green hydrogen is not only a crucial building block for a renewable energy economy, Hyoffwind will also contribute to the flexibility and balance of the energy system by providing an effective solution for the increased variability created by renewable electricity production.

Why hydrogen?

Hydrogen holds promise as an energy source for a multitude of applications, like mobility (for example, to power fuel cell vehicles without CO_2 emissions), industry (replacing fossil fuels in hard-to-abate industries), or even storage if reconverted into electricity. However, hydrogen is not found in its pure state, and requires a production process, either by thermochemical processes or electrolysis. The latter separates oxygen and hydrogen atoms by passing an electric current through water. When the electricity used in this process comes from green sources, the obtained hydrogen is green. However, while promising for the energy transition, hydrogen remains relatively expensive. For green hydrogen to become competitive, the price of green electricity must continue to fall, electrolysers become more cost-effective, and economies of scale allow production costs to be reduced. Thankfully, the constraints linked to the use of fossil fuels, such as the carbon tax, indicate that hydrogen will be adopted more and more. This is why BESIX Group is very interested in becoming a pioneer in facilitating its production process.

A well-thought-out project

Hyoffwind has been in the pipeline since 2019. Following the outcome of the feasibility study carried out with the support of the Federal Energy Transition Fund, a tender process was started involving multiple parties. At the end of this tender process, John Cockerill Hydrogen Belgium, BESIX, and BESIX Environment were selected as partners for the design and construction of the facility. Hyoffwind will have an initial capacity of 25 MW, with the possibility for future expansion.

Zeebrugge, located on the Belgian coast and home to one of the biggest ports of Belgium, is the perfect location for the project because of the presence of many established industrial actors, who could become future consumers of the produced green hydrogen. Additionally, Zeebrugge is connected to wider European networks, which is promising for future developments in the Belgian renewable hydrogen market.

Renewed public support

This project is co-funded by the European Union (NextGenerationEU) and the Flemish government (VLAIO). This funding merges and replaces two earlier grants allocated to Virya Energy and Hyoffwind Infrastructure, and further highlights the region's support for the project. With this project and the allocated subsidies, Jo Brouns, Flemish minister of Economy, Innovation, Work, Social Economy, and Agriculture, supports the general development of a hydrogen value chain in Flanders and Belgium.

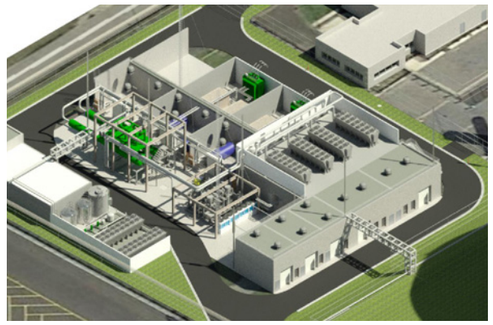
All set for a successful collaboration

BESIX and BESIX Environment are proud to be pioneering the green hydrogen market in Belgium with this project. Both companies look forward to gaining more experience as an expert in this domain which will certainly help BESIX Group support even more developers, also outside of Belgium. Previous successful collaborations between BESIX and BESIX Environment have proven that the group is the perfect partner for Virya Energy to carry out this EPC contract efficiently and at optimal cost. John Cockerill's expertise in the production of electrolysers on the Belgian market is the perfect addition to this pioneering triumvirate.

All that is needed now for the consortium to begin the first phase of the works is the granting of the Environmental Impact Permit and the final investment decision. Obtaining these milestones would set Hyoffwind on track to produce the first hydrogen molecules in Zeebrugge in 2026.

Hyoffwind is at the forefront of Europe's green hydrogen initiatives. We are extremely proud to contribute to this leading project by offering BESIX's construction experience in handling complex industrial projects, and BESIX Environment's electromechanical expertise in designing, executing, and commissioning the plant. The collaboration between our teams, alongside John Cockerill and Virya, in developing solutions, promises to set this project as a benchmark in our collective journey towards decarbonising our economies.

Adrien Theunissen, Senior Manager BESIX Environment



Project details

Hyoffwind

Location
Zeebrugge, Belgium

Client
Virya Energy (Colruyt Group)

Partners
BESIX, BESIX Environment,
John Cockerill Hydrogen Belgium

Contract type
EPC

Construction period
2024 - 2026

Sports & Leisure

GMHBA Stadium at Kardinia Park: Stage 5 Redevelopment

The Kardinia Park Stage 5 Redevelopment has increased the GMHBA stadium's capacity to 40,000, further cementing its status as Australia's largest-capacity sporting and entertainment venue in regional cities.

With the new northern grandstand (known as the Joel Selwood Stand) now complete, remaining components of the redevelopment – the entry plaza (named Djilang Plaza), the Geelong Sports Museum, unisex changing rooms, event spaces, a regional cricket hub, and the addition of operational areas such as media facilities and a crowd management centre – are on track for completion in the first quarter of 2024. The redevelopment enables GMHBA stadium to become a truly multipurpose venue.

A roof above: engineering marvel unveiled

A standout feature of the new stand is its impressive roof structure, which extends 30 metres over the seating bowl and covers 75 % of the stand's area. Comprising 17 roof modules, each boasts a fully clad truss spanning 43 metres in length and 10 metres in width, capable of bearing more than 50 tonnes in weight.

Each roof module underwent comprehensive pre-assembly, incorporating structural steel elements, cladding, PV panels, AV systems, lighting, and stormwater drainage. Pre-assembly took place within the Kardinia Park Precinct at two satellite sites around the existing stadium, utilising purpose-built assembly jigs. This approach effectively eliminated the risk associated with completing work at heights and resulted in no lost time injuries during pre-assembly and installation.

Innovative design and construction strategies

BESIX Watpac's commitment to excellence extends to innovative design and construction strategies. Close collaboration with stakeholders ensured meticulously coordinated design and documentation, as well as compliance with authority and regulatory requirements. The implementation of alternative building precast and roof module structural systems optimised construction programmes and minimised day-to-day running and maintenance costs.

Community-centric commitment

BESIX Watpac is committed to the communities in which it operates. The GMHBA project successfully achieved its goal of allocating a minimum of 1 % of procurement to Indigenous-owned companies. It was also committed to purchasing goods and services from social enterprises, fostering partnerships with local organisations such as GROW, the Geelong Chamber of Commerce, Kinaway, and Social Traders, underscoring its dedication to local engagement. Additionally, BESIX Watpac sponsored the local Geelong Women's Cricket club, providing a pathway into construction for two young cadets.

Community enrichment beyond construction

BESIX Watpac's commitment extends beyond construction, injecting AU$56,000 (approximately €34,000) into the Geelong community. The BESIX Watpac Community Fund has supported over eight organisations, including Geelong Mums, GenU, Ladder, and the Koori Aspirations and Career Day. Staff members also actively participated in charitable drives, showcasing a holistic approach to community engagement.

Project details

GMHBA Stadium

Location
Geelong, Australia

Client
Kardinia Park Stadium Trust

Contract type
Design & Build

Construction period
2021 - 2024

Contract value
AU$142 million
(approx. €86 million)

BESIX Invest

Delivering the Antwerp Police Force's new HQ

A GAME-CHANGER AND BESIX'S LARGEST PPP BUILDING PROJECT TO DATE

In 2023, BESIX was proud to deliver the cutting-edge headquarters of the Police of Antwerp to its clients AG Vespa and the City of Antwerp, as well as its future occupants, the Antwerp Police Force. The building, one of its kind in Europe, boasts specific and remarkable features tailored to the needs of its occupants and their unique day-to-day activities. Notably, sustainability was a key focus throughout, earning the project multiple certifications. For BESIX Group, successfully delivering the biggest PPP-building project ever in its portfolio to the satisfaction of all parties involved marks a significant venture into diversified projects, further solidifying its expertise in PPPs.

Evolution from contracting to full DBFM responsibility

BESIX's role in the new headquarters for the Antwerp Police Force has evolved over the years from purely contracting to assuming a leading role in a Design, Build, Finance, and Maintain (DBFM) structure. In July 2020, BESIX Group acquired 100 % of shares in the project company from its prior owner, transforming what was 'just' a Build contract into the biggest PPP-building project ever in its portfolio of concessions. After signing an amended DBFM agreement with the City of Antwerp, rescheduling the Engineering, Procurement, Construction (EPC) contract, and reaching a new financial close for long-term debt funding to the project with three major Belgian banks, construction works resumed at the site of the Antwerp Local Police Tower in October 2020, following a year-long hiatus.

Centrally located

The building, situated on the former site of the Antwerp postal sorting centre right next to the Borsbeeksebrug, between the Singel and the Antwerp ring road, is easily accessible for all types of transport and also centrally located. It consists of two towers with ten above-ground floors, connected by a central core of four floors. A large part of the building features an impressive glass façade, offering not only plenty of daylight but also a spectacular view of the city of Antwerp. In addition to the atrium, which serves as the beating heart of the building destined to be a meeting place for its occupants, and featuring a glass roof and a communal catering area, the HQ also offers specific spaces suited to the needs of the Antwerp Police.

Project details

New Headquarters for the Antwerp Police Force

Location
Antwerp, Belgium

Client
AG Vespa, City of Antwerp, Antwerp Police Force

Architect
Jaspers-Eyers, Beel Architects

Contract type
DBFM

Construction period
2018 - 2023 (incl. interruption in 2019 - 2020)

Total surface
78,000 m²

Not your average office building

The two towers of the building are designated for offices and sports, respectively. The office tower contains a museum space dedicated to the heritage of the police force, as well as a state-of-the-art control centre from which the majority of the police force's interventions are managed. This command centre, unique of its kind in Europe, is considered to be the building's centrepiece.

Drivers on the Antwerp ring road might be surprised to see an open space in the building. This is actually an exercise area, designed to simulate the actual conditions in which the police force works, enabling them to perform under pressure. In addition, the building features a shooting range, two gyms, a large exercise area which can accommodate even vehicles, as well as short-term holding cells.

Strict output specifications and certifications

These specific spaces, which didn't allow for much standardisation nor repetition in the design and construction phases, along with the strict output specifications of the building, posed numerous challenges for the construction teams of BESIX. Given its purpose, safety was of the utmost importance, as was acoustic isolation. In addition, due to the timing of the project, BESIX had to navigate both the Covid-19 crisis and the scarcity of construction materials, exacerbated by the inflation following the Russian invasion of Ukraine. Despite these hurdles, BESIX was able to deliver the project on time.

Furthermore, specifics such as thermal and acoustic isolations, solar panels, technological innovation, a roof herb garden, and exceptional attention to the livability of the building, led to the project being awarded both the BREEAM-label Very Good as well as the WELL Building Standard certification.

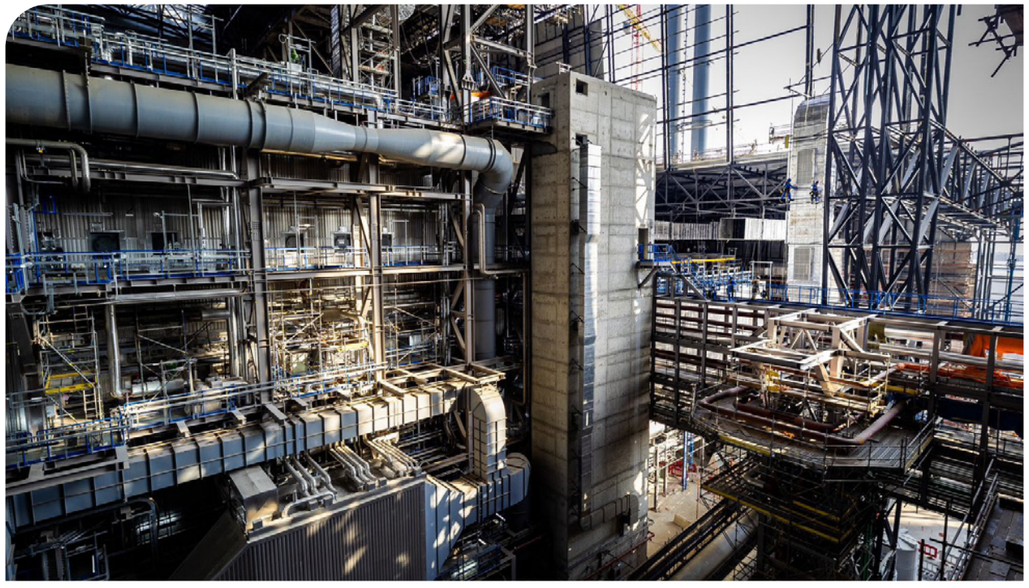
Collaboration

BESIX and all of its partners and stakeholders in this DBFM project are proud to reflect on the collaborative teamwork that led to the successful delivery of these new headquarters for the Antwerp Police Force. Together, they embraced the PPP spirit, fostering a culture of teamwork and mutual success. Upon delivery of the project in May 2023, the maintenance period of 25 years, during which BESIX Group remains the 100 % shareholder in the project company, has commenced.

BESIX Invest

Shou'alah: O&M excellence fuels Dubai's Waste-to-Energy plant

In the heart of Dubai, a remarkable transformation is taking place at one of the largest 'Energy from Waste' plants in the world. This transformation is powered by Shou'alah, a joint venture between BESIX-Six Construct and Hitachi Zosen Inova. Shou'alah plays a pivotal role in the operation and maintenance (O&M) of the Dubai Waste-to-Energy facility, revolutionising waste management while contributing significantly to Dubai's sustainability goals, and the broader UAE vision for a greener future.



A triad of engagement

BESIX is actively engaged in the Dubai Waste-to-Energy project across three key domains: investment, construction, and operations. As the lead investor and Engineering, Procurement, and Construction (EPC) contractor for the Dubai Waste-to-Energy project, BESIX played a crucial role in the project's initiation and construction phase, ensuring the successful development and commissioning of this world-leading facility. Once completed, Shou'alah, the O&M provider (partly owned by BESIX), will provide operation and maintenance services for an impressive 35 years.

Shou'alah: enabling sustainability

Shou'alah represents a dynamic partnership with a clear mission: to ensure the safe, efficient, and reliable operation of the Dubai Waste-to-Energy facility. With an impressive capability to handle 1.9 million tonnes of waste annually, this facility will produce 220 MW of electricity, thereby providing power to approximately 135,000 households in the region.

At the heart of this sustainable marvel is a complex process that commences with the delivery of municipal solid waste stored in a bunker. A highly skilled crane team meticulously feeds the waste onto the reciprocating grate, and the plant's fully integrated control system ensures stable and efficient operation.

As the waste is incinerated, it generates flue gas which undergoes treatment with state-of-the-art technology to optimise combustion with minimal emissions of pollutants such as CO, NOx, and VOC. This aligns directly with the sustainability objectives of Dubai and the UAE. Simultaneously, the steam produced powers a turbine, efficiently generating energy that can be fed back into the grid.

Sustainable operations for a greener future

While the Dubai Waste-to-Energy facility itself stands as an architectural marvel, Shou'alah serves as its operational backbone. Equipped with industry-leading experience, expertise, and know-how, Shou'alah's specialised team is pivotal in guaranteeing the facility's seamless performance. This team undergoes rigorous training and development by both joint venture partners, emphasising the highest standards of operational excellence, aimed at ensuring the plant's availability and service while adhering to stringent environmental standards and safety protocols.

Transitioning for long-term success

BESIX, as the EPC contractor, plays a crucial role in ensuring Shou'alah's ongoing success. They will actively participate for one year following the Commercial Operation Date (COD) to facilitate Shou'alah's transition into full O&M management. During this Defects Liability Period, they will establish KPIs and address any remaining issues.

Subsequently, Shou'alah will assume a range of responsibilities critical to the operation of the Dubai Waste-to-Energy facility. These encompass daily operational oversight, equipment maintenance, strict adherence to safety and environmental regulations, continuous monitoring of key performance indicators, energy optimisation, and waste stream quality management. Their commitment to minimising emissions, efficient supply chain management, staff training, quality control, data analysis, and environmental impact tracking is complemented by community engagement, research and development, and emergency response preparedness.

Shou'alah truly represents a partnership shaping the future of waste management in the region, helping Dubai and the UAE realise their vision of a greener and more sustainable tomorrow.

> **"Shou'alah's exceptional team, combined with BESIX's proven O&M success in various projects, creates an ideal foundation for success in managing the Dubai Waste-to-Energy facility. Their collective expertise and experience ensure the facility's operational excellence, environmental compliance, and long-term effectiveness in supporting Dubai's sustainability goals.**
>
> Eric Tranchant, Head of O&M, BESIX Middle East

BESIX Invest

State-of-the-art sewage sludge treatment plant will recover energy from the wastewater of 4 million citizens in Flanders

Water treatment company Aquafin is to build a sewage sludge processing installation on the ArcelorMittal site in the port of Ghent, to be operational by 2027. Both companies will utilise the green energy produced to further reduce their CO_2 impacts. Aquafin is also planning the large-scale recovery of phosphorus which is used in fertiliser, among other things. The contract for the design, construction, and financing of the installation, and maintenance until 2046, has been awarded to the BESIX-Indaver consortium.

Project details

Mono-treatment plant for sludge derived from urban wastewater treatment

Location
Ghent, Belgium

Client
Aquafin

Partner
Indaver (50/50)

Contract type
DBFMO

EPC
2023 - 2026

O&M
20 years

Contract value
€150 million

Maximum recovery of energy and materials

The purpose of the installation is to process the biomass that remains after the purification of domestic wastewater. This biomass, created by the growth of the purifying micro-organisms, contains a wealth of energy and raw materials. The new treatment plant in Ghent should be operational by 2027, and will make additional use of the biomass delivered to it. As this is a mono-processor, the sludge will not be diluted with other substances, enabling efficient maximum recovery of energy and raw materials.

Partnership

Using a European tender procedure with competition-oriented dialogue, Aquafin hunted for a partner for the design, construction, financing, and maintenance of the mono-processor. The Design, Build, Finance, Maintain & Operate (DBFMO) contract was awarded to the BESIX-Indaver consortium, which set up the Special Purpose Vehicle 'FOSTER' for this purpose.

Indaver and BESIX are two international, respected, and value-driven industrial partners on the Belgian market. Each has already successfully completed numerous large-scale industrial projects in their respective specialist fields, in both Belgium and abroad. A key shared priority is the creation of added value for the customer and society by putting first their care for people, safety, and the environment. To make a success of this sludge mono-processor project, the two firms are purposefully and skilfully combining their largely complementary knowledge and experience.

Pierre Sironval, CEO of BESIX Group: "BESIX is particularly proud to have been selected for the design, construction, financing, operations, and long-term maintenance of this state-of-the-art mono-combustion sludge treatment plant. The installation is exemplary in terms of circularity and net environmental impact. BESIX has built up a global portfolio of different industrial projects of similar or greater size that take advantage of the diversity of expertise available in the group: project financing, design, engineering, environmental considerations, construction, operations, and maintenance. We look forward to developing the project together with our partner Indaver, a top player in many different types of waste processing installations."

On the ArcelorMittal site

The location of the new installation has been determined for some time. ArcelorMittal is granting Aquafin a building within the existing site, and will purchase 100 % of the steam produced by the sludge processor. For the steel company, this is an additional green energy source for their internal steam network, further reducing the use of fossil fuels. The direct uptake of the entire steam production, combined with the focus on raw material recovery, makes this installation an exemplar illustration of circularity and environmental responsibility within Europe.

Sustainable recovery of phosphorus

In a follow-up phase, Aquafin is planning to commence full-scale phosphorus recovery, representing some 3,000 tonnes of pure phosphorus a year. By opting for mono-processing, phosphorus can be recovered more efficiently from biomass. Phosphorus is an essential building block for life and is also a basic component in mineral fertilisers for agriculture and horticulture. Phosphate ores are, however, a finite resource, with only limited supplies naturally present in Europe. Phosphorus finds its way into domestic wastewater via food, it is from here that Aquafin will resourcefully recover it with the new sludge processor.

The sludge mono-processor will carry out the end treatment of two-thirds of all Flemish sludge from domestic wastewater. The project aligns seamlessly with Aquafin's ambition to cease using fossil fuels by 2030, and to evolve towards climate-neutral business operations in the long term.

Next steps

In 2023, efforts were focused on designing the project and securing the environmental permit. The application was officially deemed complete and acceptable by the authorities in the latter half of the year. Detailed engineering work is scheduled for 2024, preparing for the commencement of construction. This is anticipated to begin towards the end of 2024, with operation initiating in 2027.

> **"BESIX is incredibly proud to be involved in this outstanding PPP project in which we can present our extensive expertise in project finance, design, engineering, environmental processes, construction, operations, and maintenance.**
>
> Tom Neyrinck, General Manager BESIX Invest

Real Estate

Unveiling ICÔNE: where vision meets reality

With its inauguration in Belval in January 2023 and keys handed over to Société Générale Luxembourg as tenant and AG Real Estate as acquirer in the first quarter of 2023, ICÔNE stands as a testament to visionary design and operational excellence.

Developed by BESIX RED and envisioned by renowned architects Foster + Partners and local partner Beiler François Fritsch, ICÔNE is not just an office building; it's a distinctive 18,830 m² workspace meticulously crafted to redefine the traditional office experience. With a design philosophy that permeates from the interior outwards, ICÔNE is a reflection of the changing dynamics of work, seamlessly integrating the New Way of Working and stringent environmental standards, earning it the BREEAM Excellent rating. This iconic development is now home to Société Générale Luxembourg, leasing its entirety, and is proudly owned by investor AG Real Estate.

Project details

ICÔNE

Location
Belval, Grand Duchy of Luxembourg

Area
18,830 m² of Gross Leasable Area (17,373 m² of office space and 1,457 m² of retail & restaurant space, plus 680 m² of archives and 237 parking spaces)

Client-occupant
Société Générale Luxembourg

Acquirer
AG Real Estate

Contractors
BESIX GROUP (BESIX and LUX TP)

Architects
Foster + Partners and Beiler François Fritsch

Certification
BREEAM 'Excellent' Building

Delivery
23 February 2023

ICÔNE: redefining the office experience

In a significant achievement, ICÔNE, BESIX RED's pioneering and sustainable project, was delivered to Société Générale on February 23, 2023, following nearly three years of construction. Covering 18,830 m², this distinctive building is not just a conventional office space. It embodies forward-thinking, innovative concepts, prioritising the well-being of its occupants. Conceived in 2018 prior to the disruptions of COVID-19, with a focus on the evolving nature of workspaces, the design anticipated a shift in work dynamics. The outcome is an architecturally innovative and sustainable space that offers a distinctive and future-ready work experience.

"In witnessing ICÔNE come to life, we celebrated a significant milestone in the recognition of our expertise and commitment in the Luxembourg market. It underscores the competitive position of BESIX RED Luxembourg, showcasing our capacity to deliver ambitious, attractive, and strategically located developments," says Geoffroy Bertrand, Country Director BESIX RED Luxembourg.

Forward thinking architecture and sustainable approach

ICÔNE's architectural brilliance, a collaborative work by Foster + Partners and Beiler François Fritsch, redefines the Belval skyline. Its distinctive wings envelop a central atrium, a vibrant hub promoting creativity and connectivity. The structurally glazed and environmentally conscious façade features green loggias, showcasing the flawless integration of nature and infrastructure. More than a mere building, ICÔNE stands as a 'smart building,' proactively anticipating and adapting to evolving needs of occupants and prioritising their well-being. Awarded the prestigious BREEAM Excellent rating, ICÔNE pioneers sustainability through energy efficiency, eco-friendly materials, and a harmonious fusion of nature into the urban fabric and industrial heritage of Belval. The inclusion of openable windows, a sedum green roof, and carefully designed green spaces attests to ICÔNE's commitment to a unique work experience.

Success with investors, occupants, and international recognition

ICÔNE's success is evident in its ability to attract prestigious tenants and international investors before completion. Société Générale Luxembourg committed to the entire building with a 15-year lease in 2021, showcasing ICÔNE's appeal and alignment with modern workspace trends. AG Insurance, represented by AG Real Estate, also recognised the building's potential, leading to the acquisition of 100 % of the shares of B-9 S.A., the company owning ICÔNE, in early 2022. This transaction reflects the confidence of renowned investors in ICÔNE's economic viability, solidifying its standing as a sought-after and financially robust asset.

Gabriel Uzgen, CEO BESIX RED, comments: "When reality surpasses the design of a project, a developer might claim that a project has been successful. If, on top of that, all ESG-elements have been pushed to their greatest extremes and correspond to the current needs of the real estate market, it's a double success. The fact that ICÔNE meets the expectations of a well-established investor like AG Real Estate and is in line with the demands of a tenant like Société Générale Luxembourg demonstrates that ICÔNE is a reference in terms of post-covid work experience".

"By joining forces with a renowned architect like Foster + Partners and leveraging on the in-house multidisciplinary expertise of BESIX for the construction of ICÔNE, we were able to turn our vision into reality", he concludes.

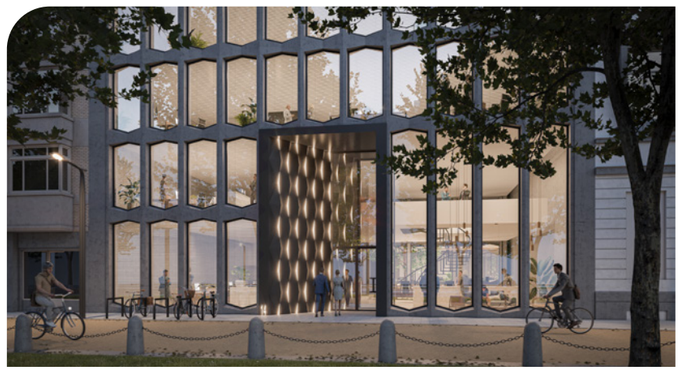
ICÔNE's success has been recognised with prestigious awards, including the 'Best Office Building' at the LuxReal & Paperjam+Delano Business Club Real Estate Awards 2023. The development also received a 5-star award as the 'Best Office Development Luxembourg' in the 2023-2024 European Property Awards.

ICÔNE is not just a building; it's an enduring legacy of innovation, sustainability, and success.

Real Estate

Transforming the past, sustaining the future: BESIX RED's ESG commitment to renovation and sustainability

In the dynamic landscape of real estate, BESIX RED stands as a responsible and ambitious actor committed to shaping a sustainable and innovative future through its developments.
Gabriel Uzgen, CEO of BESIX RED, says: "In alignment with our ESG strategy, we are constantly progressing on our journey towards renovation. With Lighthouse and Anthea, we have extended the Cosmopolitan's legacy in Brussels, demonstrating our dedication to developing properties that have a minimal environmental impact. By doing so, we aim to benefit the planet, the local community, and, of course, our clients."
This article explores two transformative projects in Brussels: Lighthouse and Anthea.



LIGHTHOUSE: PRESERVING THE PAST, ILLUMINATING THE FUTURE

Situated on Avenue des Arts in Brussels' Central Business District, Lighthouse is being transformed from an outdated office building into a modern workspace that prioritises environmental and well-being standards.

A renovation integrating architectural legacy and subtle modernisation

Lighthouse was originally built in 1962 by architects Jean and André Polak, the same renowned architects who designed the Atomium for Expo 58. Lighthouse's renaissance, led by BESIX RED and B2Ai architects, maintains and magnifies the remarkable façade designed by the Polak brothers. The addition of a transparent glass dome rooftop ensures high visibility and a unique identity for the future occupants. The building's interior is designed to encourage collaboration, with open floor plans, meeting areas, and green outdoor spaces to enhance the occupants' well-being.

The low carbon footprint of the building, kept under 300 $kgCO_2/m^2$, is achieved through the preservation of the 1960s structure. The concrete structure is carefully conserved and adapted, which includes opening plateaus and reinforcing the structure to meet the load-bearing requirements of the dome.

Preserving architectural elements is at the core of Lighthouse's renovation. An ongoing pre-demolition audit is in progress, proposing recycling measures in accordance with the project's programme, a critical step in achieving BREEAM Outstanding certification. Despite challenges, the iconic helical staircase is partially reused, with a focus on preserving its architectural significance. In addition, some elements, such as RF doors and guardrails, are conserved and meticulously restored, maintaining the historical fabric of Lighthouse.

Engaging with circular experts for second-hand construction materials is also a strategic initiative under analysis.

Concrete steps to sustainability

Lighthouse prioritises the well-being of its future occupants, incorporating innovative features to enhance sustainability and connectivity. A planted patio, accessible from the first floor and adorned with a notable species of ash tree (Fraximus Ornus), along with accessible terraces at levels 1, 2, 5, 10, and 11, contribute to a vibrant environment that encourages biodiversity and offers occupants a pleasant green outdoor space at the heart of the city.

Fossil-free heating, facilitated by heat pumps and integrating 193 m^2 of photovoltaic panels, will enable Lighthouse to be a very low-energy building with an EPB Label level A.

The use of efficient techniques and rainwater recovery via a 50 m^3 tank for sanitary facilities highlights Lighthouse's commitment to optimise water consumption.

Lighthouse is adopting cutting-edge connectivity and building monitoring technologies, in particular Square Sense technology, to achieve high levels of SmartScore and WiredScore certifications. These technologies optimise energy usage, resource management, and overall operational efficiency, marking a significant leap forward in creating a state-of-the-art and more sustainable office experience.

"With Lighthouse, we are revitalising an outdated office building to create an inspiring workspace, that prioritises sustainability and occupant comfort. It's not just a landmark; it's a demonstration of renovation's transformative power, with goals of achieving very high levels of BREEAM and WELL certifications", concludes Raphaël Legendre, Country Director Belgium, BESIX RED.

Project details

Lighthouse

Project type
Offices

Location
Avenue des Arts 14, Brussels, Belgium

Total area
5,513 m^2 over 11 floors

Parking
20 parking spaces

Architect
B2Ai architects

Expected delivery
Q4 2026

Certifications
BREEAM Outstanding, WELL Platinum

Project structure
BESIX RED (100 %)

Real Estate

ANTHEA: A SUSTAINABLE URBAN METAMORPHOSIS

Anthea, named after the goddess of flowers, gardens and trust, undergoes the transformation of an office building into a primarily residential development. The project features 48 high-end apartments and 385 m² of office space, located on Boulevard du Souverain 360 in Brussels and facing the majestic Val Duchesse domain.

Architectural evolution through a deconstruction approach

Guided by BESIX RED and Urban Platform, Anthea embarks on a deliberately crafted architectural metamorphosis.

Based on a meticulous deconstruction approach, the project prioritises maintaining core structures for the existing edifice's robustness, implementing targeted demolitions with stability in mind. Once the structure is laid bare, the project will be reconstructed primarily using elements from dry construction methods, such as wooden façade panels, new structures, and partitions. Additionally, reclaimed façade elements will be utilised for ground floor cladding and landscape design.

"This deliberate preservation and reuse of existing elements serves as a tangible homage to the building's history. Our commitment to historical continuity remains strong, even without specific heritage protection measures", explains Raphaël Legendre, Country Director Belgium, BESIX RED.

The choice of natural stone for the façade further strengthens this connection, echoing existing elements in materiality and tone, paying indirect tribute to the building's past. Additionally, the project proposes a conversion of the existing technical floor into a residential space.

The renovation of façades and upper levels aims to improve insulation efficiency, resulting in significant reductions in heating energy consumption. The introduction of terraces represents a deliberate architectural choice to alter the building's vertical orientation with a view to create a more unified and horizontally extended structure. The strategic placement of façades follows a calculated oblique arrangement, serving practical purposes such as framing scenic views, minimising visual impact on neighbouring structures, and contributing to an enhanced overall horizontal aesthetic.

Sustainability and well-being at its core

The apartments at Anthea, averaging 110 m², feature plenty of natural light in spacious living areas, large bedrooms, and well-equipped kitchens. Anthea comprises 3 studios, 42 apartments, and 3 penthouses, each with a terrace or garden, and some offering beautiful views of Val Duchesse's greenery.

Anthea's apartments all achieve an EPB A energy classification. Solar panels on the rooftop contribute significantly to renewable energy utilisation and reduce the project's carbon footprint.

Architecturally, Anthea prioritises energy efficiency through high-quality insulation, reducing heating requirements. This pragmatic approach aligns with environmental goals while offering economic benefits to residents.

The sustainability focus extends to Anthea's terrace design, intelligently addressing overheating concerns and negating the need for air conditioning.

In terms of water conservation, Anthea incorporates rainwater harvesting, efficiently repurposing it for common areas and outdoor taps. The project also provides charging stations for electric bikes and cars, promoting eco-friendly transportation alternatives.

Transitioning from concrete to green

The metamorphosis of Anthea involves replacing the concrete ground level with a Boulevard-side garden featuring distinct sections, a landscape trench for rainwater storage, and indigenous shrubs and hedges along property boundaries.

Emphasising green and outdoor spaces, each apartment at Anthea offers balconies or private gardens.

Guided by strong landscaping principles, efforts focus on preserving open soil areas, ensuring permeability, and incorporating indigenous species to enhance biodiversity. The sustainable reuse of prefabricated concrete elements, particularly for flooring, adds an eco-conscious dimension.

Conclusion

BESIX RED's commitment to renovation and sustainability, inspired by past successes like The Cosmopolitan, finds new expression in transformative projects like Lighthouse and Anthea. These endeavours not only breathe new life into outdated structures but also pave the way for a future where buildings seamlessly integrate with the environment, promoting well-being and reducing our ecological footprint.

Project details

Anthea

Project type
Residential

Location
Boulevard du Souverain 360,
1160 Brussels, Belgium

Total area
6,389 m²

Number of apartments
48

Office space
385 m²

Parking
51 parking spaces, 117 bicycle bays (including cargo bikes)

Architect
URBAN PLATFORM

Expected delivery
Q1 2026

Project structure
BESIX RED (100 %)