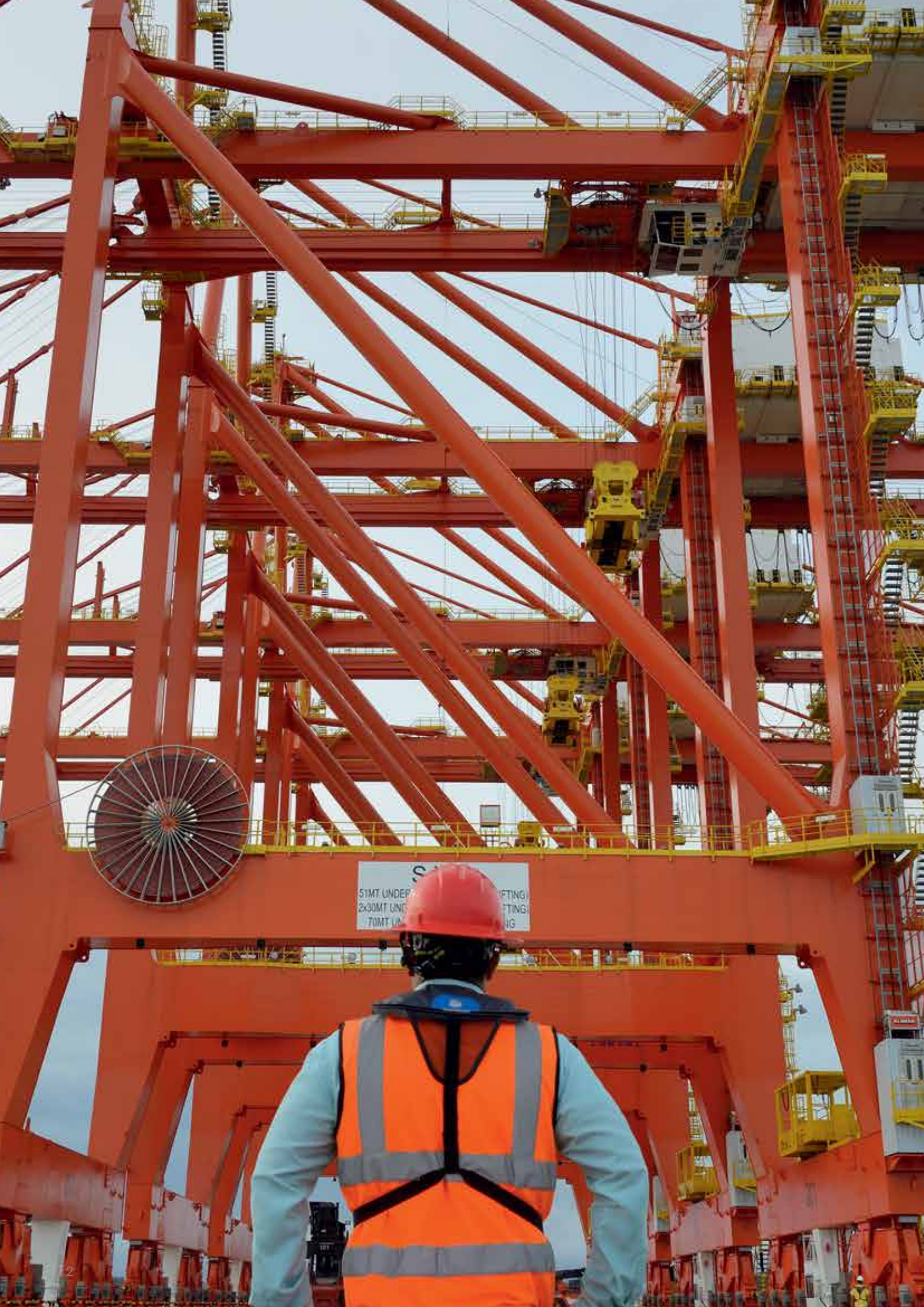


**FOR
SHORE**
BY SOLETANCHE BACHY



Maritime works



about us



Maritime trade is booming. Ports are therefore key infrastructures and major economic resources.

Construction and development projects for maritime structures are multiplying on every continent: creation of new terminals, quay extensions, deepening of docks, etc.

ForSHORE supports its customers in their port infrastructure projects with a strong geotechnical component.

We mobilize the best of Soletanche Bachy's port and maritime expertise to guarantee maximum control of the risks associated with the soil-infrastructure interaction.

And because today's structures must meet tomorrow's environmental challenges, ForSHORE designs ports capable of withstanding the consequences of climate change, and implements solutions that reduce the carbon footprint of projects.

To build resilient structures that last.

OUR VALUES

Reliability

ForSHORE continually strives for excellence, ensuring reliability and durability of its constructions.

Agility

ForSHORE demonstrates its agility through its adaptation to each situation and proposes different solutions depending on its clients' needs.

Entrepreneurship

ForSHORE works with its clients as a dedicated partner, taking a joint approach to achieve a shared objective.

Innovation

ForSHORE can draw on Soletanche Bachy's R&D capabilities, equipment, and innovative digital solutions.



BRIDGE
FOUNDATIONS



QUAYS



DRY DOCKS
AND LOCKS



LOGISTICS BASE
FOR OFFSHORE
WIND TURBINES



QUAY UPGRADE
deepening,
widening



JETTIES



SEA OUTFALL/
INTAKE



FOUNDATIONS
for platforms,
storage tanks,
buildings



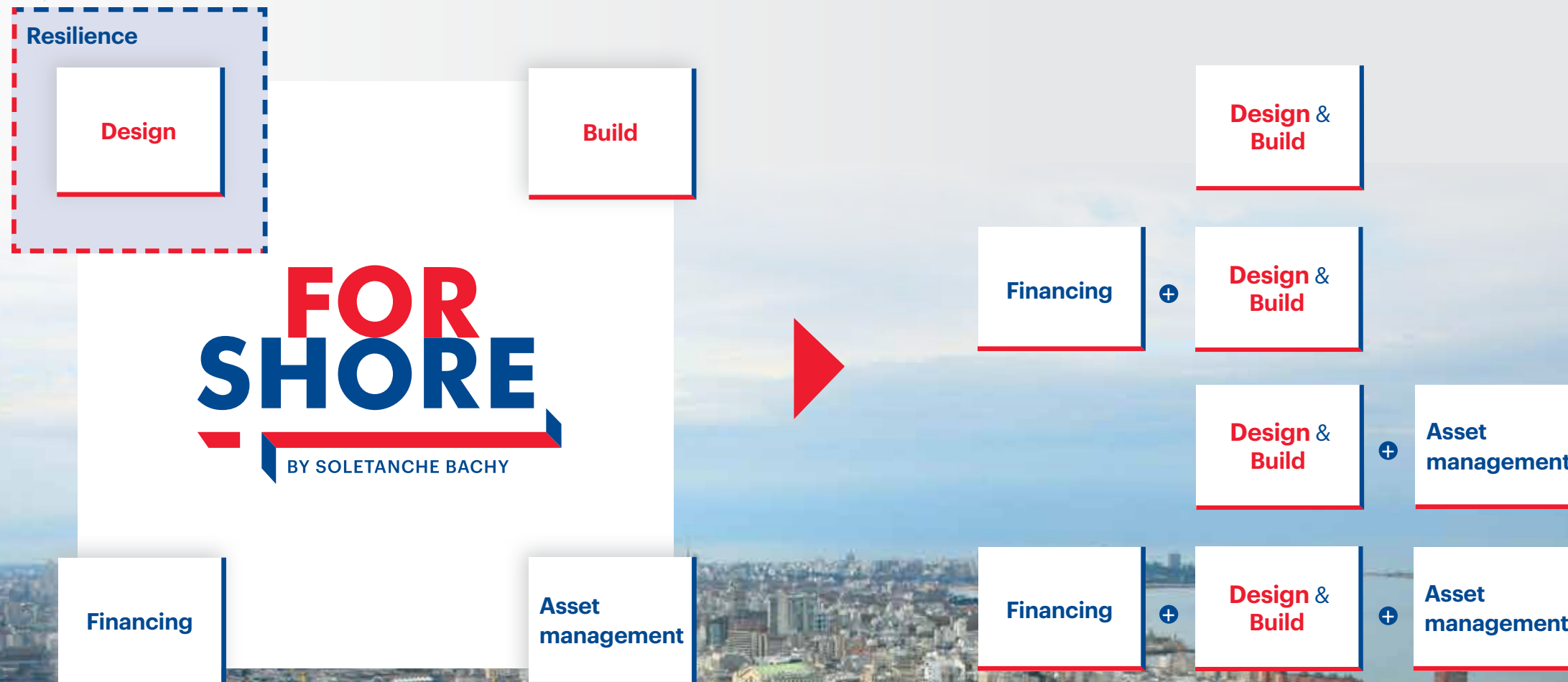
BREAKWATERS



DOLPHINS

ForSHORE
offers a full range
of port infrastructure
capabilities

ForSHORE operates as a General Contractor to deliver all four stages in the development of port infrastructure projects: financing, design, build, and asset management.



THE ADVANTAGES OF FORSHORE

- + Expertise**
 Soletanche Bachy's geotechnical expertise and quality standards.
- + Vision**
 A global vision of your marine works project.
- + International**
 ForSHORE relies on the presence of Soletanche Bachy's presence in over 60 countries.
- + Innovation**
 Access to Soletanche Bachy's R&D, machinery and digital solutions.
- + Environment**
 A commitment and technical solutions to reduce the carbon footprint of your projects.

Financing

For those leading large-scale port projects, raising financing for works on existing or new infrastructure can be a difficult process.

ForSHORE brings you the support you need to facilitate this key step in your project. We draw on our international contacts to help you source the financing.

ForSHORE is neither a bank nor an investor, but does offer two services:

Identification of investors who might take a share in port infrastructure

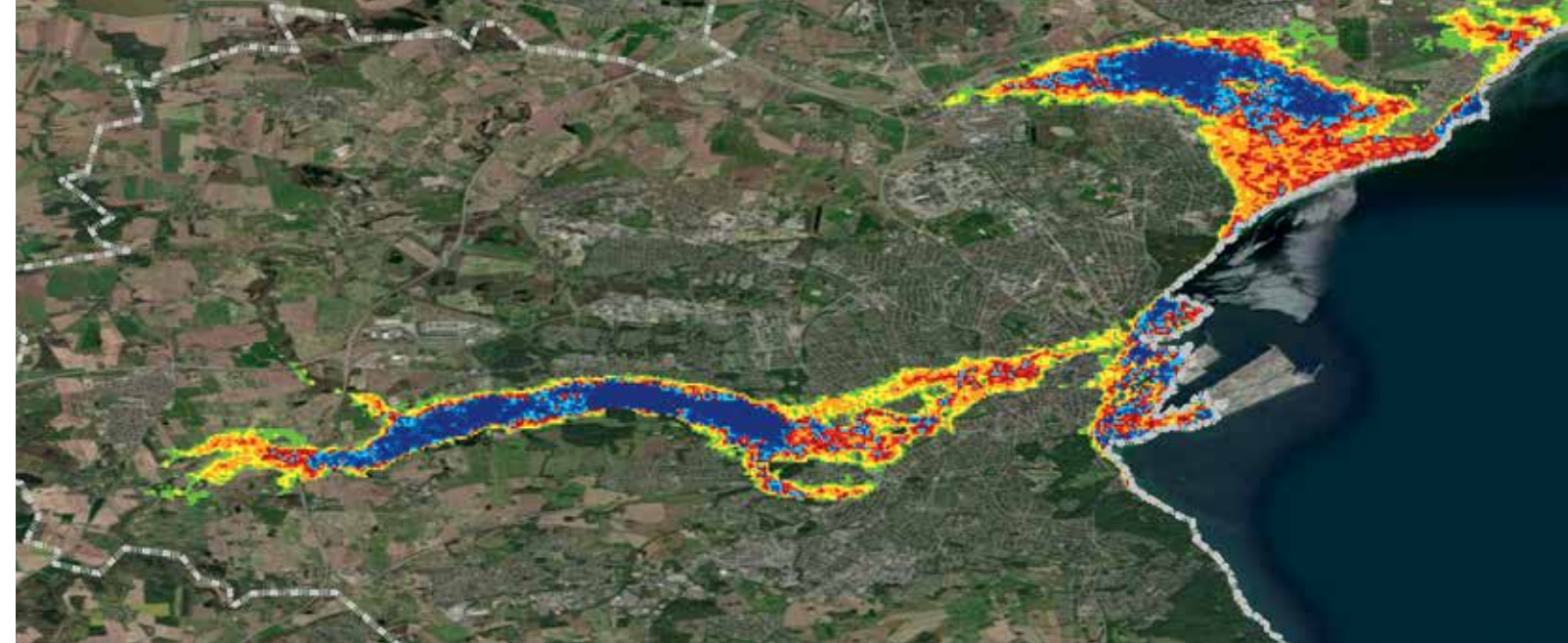
We put our clients in contact with:

- + Investment funds
- + Venture capitalists
- + Sovereign wealth funds

Sourcing of credit solutions

We can solicit:

- + Financing on the markets, through bonds to finance infrastructure projects or corporate bonds
- + Financial institutions (banks)



During the design phase of a port project, it is imperative to take into account the preservation of the site's immediate environment and to anticipate the effects of climate change on the structure.

Anticipating climate change

ForSHORE and its partner **RESALLIENCE** provide you with a team of experts around the world to support you at various key stages:

Consulting

- Technical and financial assessment
- Training
- Audits

Diagnostics

- Assessment of:
- Climatic resilience,
 - Resistance to natural phenomena,
 - Environmental performance

Project coordination

- Integrated technical solutions
- Project management
- Collaborative engineering

Modeling

- Predictive maintenance and monitoring
- Sensitivity studies

Resilience





Design

The choices made during the design phase have a direct impact not only on the carbon footprint and climate resilience of a maritime structure, but also on its use, lifespan and ability to evolve.

Owners of port infrastructure projects therefore need to surround themselves with specialists who can help them anticipate and make the right decisions from the outset.

Our approach

With ForSHORE, you are in direct contact with Soletanche Bachy's design offices, present within the Group's subsidiaries worldwide, to build port facilities adapted to your needs and constraints. To offer you the best geotechnical processes and solutions that correspond to your project, ForSHORE takes on board a range of parameters from the design stage:

Environmental factors

- Soil conditions • Climate
- Tides • Sedimentation • Wind



The specifics of the port structure

- Vessel size • Life expectancy • Handling equipment • Services
- Storage facilities
- Mooring

Purpose of the port

- Oil & gas • Ores • Containers • Cruise liners • Roro
- Bulk and Goods

Thanks to Soletanche Bachy's expertise, ForSHORE optimizes the design of your structures to reduce their environmental impact:

- **Design variants** to use fewer materials,
- **Technical processes** with environmental benefits,
- **Less carbon-intensive materials.**

ForSHORE acts as a General Contractor for the construction of your new port infrastructure, or to remediate, adapt or upgrade existing facilities. This means you can rely on one company to handle your port project from A to Z. ForSHORE can assist you with the construction of all types of maritime structure:

Quays

- ⊕ Decks on piles
- ⊕ Bulkhead walls: diaphragm walls, prefabricated walls, sheet piling, or combiwalls
- ⊕ Gravity walls: closed or open cells, concrete caissons or concrete blocks

Jetties

Related facilities

- ⊕ Dry docks
- ⊕ Locks
- ⊕ Breakwaters
- ⊕ Sea water intakes/outfalls
- ⊕ Bridges
- ⊕ Foundations for storage platforms, buildings and tanks



Build and upgrade



Asset Management

Port infrastructures represent major financial investments and are often sources of economic activity for entire regions. Ensuring their correct day-to-day operation and optimising their lifespan are key challenges. ForSHORE proposes asset management services for all types of port infrastructure, through the following three stages:

Step 1 • Monitoring

Our teams can carry out all types of inspection:

- visual (safety, routine, detailed, special) • aerial
- underwater • radar • endoscopy • bathymetry
- physical controls • coating measurements • etc...

Our added value

Thanks to our tailor-made inspections, you benefit from a detailed description of the general condition of your existing infrastructures, and a mapping of their weaknesses and areas for improvement.

Step 2 • Analysis

To help you optimize your maintenance strategy, ForSHORE provides you with experts and a wide range of tools to analyze your infrastructures in real time and predict deterioration.

Maintenance calculations and recommendations

- Non-destructive testing
- Laboratory testing
- Corrosion analysis
- Ageing prediction
- Maintenance modeling and optimization

Real-time monitoring of your assets with our dedicated software

Beyond Asset

Control the operation of your infrastructures by leveraging their data.

Centralize and track:

- infrastructure visits
- asset status
- maintenance operations

Atlas InSAR

Monitor ground movements and infrastructure stability from space.

Carapace



Monitor and manage prefabricated block dykes.



Step 3 • Maintenance

Depending on the lifespan of the elements making up the port infrastructure, ForSHORE replaces them at the predicted date:

- cathodic protection
- paint on moorings
- protective coating on piles
- road surfaces
- etc.

ForSHORE carries out the necessary repair work depending on the Step 1 Inspection and Step 2 Analysis.



Environment

We are strongly committed to reducing the environmental footprint of our activities. This is reflected in the implementation of an Environmental Action Plan applied to ForSHORE's maritime and port worksites.

This action plan targets 3 pillars:

Waste

Minimize our waste and maximize its recycling and recovery (destruction, storage, recycling).



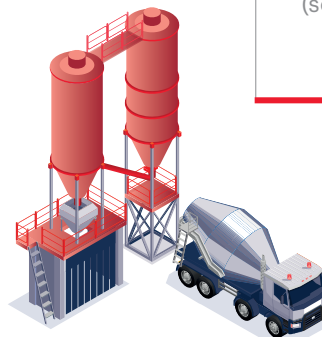
Energy

Reduce our carbon footprint by 40% by 2030 by cutting our fuel and electricity consumption (scopes 1 and 2).



Cement

Reduce our indirect CO2 emissions by 20% by 2030 (scope 3) by reducing our cement consumption, using less concrete and employing cements with a reduced carbon footprint and alternative binders.



ForSHORE also implements numerous measures to reduce the environmental impact of port infrastructure construction:

Biodiversity preservation

- + Conservation plans (Muelle IPM, Mexico)
- + Monitoring (Hong Kong airport)
- + Schedule adaptations (Port 2000 Le Havre, France)
- + Bubble curtains (Port-la-Nouvelle, France)

Water quality control

- + Suspended matter barriers (Port-la-Nouvelle, France)
- + Controls
- + Anti-pollution kits

Energy savings

- + Solar panels on barges (Brady Marine & Civil, Australia)
- + Modular generators
- + Eco-mode on machines
- + Equipment with electric power pack (Hydrofraise®)

Resource management

- + Alternative designs to reduce steel quantities (Puerto Bolivar, Ecuador)
- + Low-carbon concrete and grout (Port 2000 Le Havre, France)



exegy Our low-carbon concretes

With EXEGY, ForSHORE offers a package of materials and services to provide the most suitable Low Carbon / Very Low Carbon / Ultra Low Carbon concrete and grout for each project. Our aim is to help you reduce the environmental footprint of your projects.



Over 60 km
of quays built

Central & North America

- 1 Port of Sept-Îles Canada
- 2 Eireann Quay, Toronto Canada
- 3 East Bayfront, Toronto Canada
- 4 Cherry St. Stormwater & Lakefilling, Toronto Canada
- 5 Port of Oshawa Canada
- 6 Randle Reef, Hamilton Canada
- 7 Tampico Mexico
- 8 Port of Altamira, terminal McDermott IPM + DPH Mexico
- 9 Terminal Carnival Cruise Roatan Honduras
- 10 Puerto Cortes Honduras
- 11 Roatan Honduras

South America

- 12 Puerto Brisa Colombia
- 13 Port of Buenaventura, SPIA, Boscoal Colombia
- 14 Puerto Colombia Colombia
- 15 Port of Tolú Colombia
- 16 Barranquilla Colombia
- 17 Port of Brighton, quay n°2 Trinidad-and-Tobago
- 18 Larivot Bridge French Guyana
- 19 Puerto Bolivar Ecuador
- 20 Guayaquil CGSA Berth 1 Ecuador
- 21 Port of Montevideo, Muelle C et D Uruguay

- 22 Terminal Cuenca del Plata Uruguay
- 23 Terminal M'bopicua Uruguay
- 24 Port of Bahia Blanca, Guillermo Brown jetty Argentina
- 25 Port of Belgrano, dique de carena Argentina

Europe

- 26 Port 2000 Le Havre France
- 27 Rollet Quay Rouen France

- 28 Hautot-sur-Seine turning basin France
- 29 Port of Honfleur France
- 30 Port of Cherbourg, quai des Flamands France
- 31 EPR Flamanville France
- 32 Port of Concarneau, dry dock France
- 33 Quai de La Rotule Fos-sur-Mer France
- 34 Quai Grand Aulnay Rouen France
- 35 Port of la Vigne France
- 36 Langon Quay France
- 37 Port of Sète, quay H France
- 38 Port-Saint-Louis-du-Rhône, quay Gloria France
- 39 Port-la-Nouvelle France
- 40 Fort-de-France cruise ship terminal France
- 41 Port Réunion France
- 42 Port of Zeebrugge Belgique
- 43 Debicki Canal Pologne
- 44 Kalocsa-Paks Bridge Hongrie

Africa

- 45 Port of Lomé Togo
- 46 Port of Cotonou Benin
- 47 Moma Sands Jetty Mozambique
- 48 Port of Ngqura South Africa

Middle-East

- 49 ICDAS Biga shipyard dry dock Turkey
- 50 Port of Turkmenbashi Turkmenistan
- 51 Port Jebel Ali, terminal 3 Dubai, United Arab Emirates
- 52 Drydocks World, Safina project Dubai, United Arab Emirates
- 53 Ocean View Dubai, United Arab Emirates

Asia & Oceania

- 54 Maritime works for the international airport extension Hong-Kong China
- 55 Brisbane International Cruise Terminal Brisbane Australia
- 56 Garden Island cruise ship wharf Sydney Australia
- 57 Geelong Point Wilson Australia
- 58 Devonport Terminal 3 Tasmania Australia
- 59 Downtown infrastructure Development Programme Auckland New Zealand

Port of Sept-Îles Canada

The port of Sept-Îles on the northern bank of the Saint Lawrence River 650 km downstream from Quebec City is ideally located along one of the major shipping routes between North America, Europe and Asia. It is one of the largest bulk ore ports in North America. In 2014 the port acquired a multi-user dock that can accommodate Chinamax VLOCs. Between October 2012 and June 2014, Bermingham and Balineau – respectively a local and a specialist subsidiary of Soletanche Bachy – combined their marine works capabilities to install the piles to support the main wharf and the approach jetty. The teams paid careful attention to the many species of marine mammals living in the area and introduced a series of systems to reduce noise during the works.

- ⊕ Owner
Port of Sept-Îles
- ⊕ Main contractor
Pomerleau

**FOR
SHORE**
BY SOLETANCHE BACHY

**FOR
SHORE**
BY SOLETANCHE BACHY

Port of Brighton Trinidad-and-Tobago

With its sheet piling in disrepair and its structure weakened by corrosion, Berth 2 at Port of Brighton near the city of La Brea in the southeastern part of the island was in need of repair. Rising to the challenge, Soletanche Bachy International and local subsidiary Soletanche Bachy Cimas worked for 25 months to build a 352-metre retaining wall about five metres in front of the existing berth and a heavy loading area resting on piles. The work – part of the Group's range of infrastructure solutions and services for the oil and gas industry – was successfully completed in time for British Petroleum to launch its new Juniper offshore platform from Berth 2 in January 2017.

- ⊕ Owner **National Energy Corporation of Trinidad and Tobago**
- ⊕ Main contractor **Consortium Soletanche Bachy International – Soletanche Bachy Cimas**

Port of Aguadulce Colombia

Buenaventura, home to the port of Aguadulce, Colombia's main port on the Pacific coast, is a strategic city. Most of the Andean country's exports and imports pass through the port, which was recently upgraded in a project that sets a standard for the entire region. Soletanche Bachy helped achieve the modernisation by working within the SBCC joint venture and designed and built a 600-metre container terminal (SPIA). This was followed by a 250-metre bulk terminal (Boscoal), where the first cargo ship docked in December 2016 carrying maize loaded at the Louis Dreyfus terminal in the Argentinian port of Bahía Blanca. In Buenaventura, several innovations were introduced to boost the efficiency and quality of the onshore and offshore works, optimise costs and accelerate the construction process.

- Owner **Sociedad Puerto Industrial Aguadulce pour SPIA, Compas pour Boscoal**
- Main contractor **Consortium SBCC (Soletanche Bachy Cimas – Soletanche Bachy International – Conconcreto)**

**FOR
SHORE**
BY SOLETANCHE BACHY



**FOR
SHORE**
BY SOLETANCHE BACHY

Tolú Colombia

The COMPAS terminal at Tolu, south of Cartagena, is the Colombian deep-water port closest to the Panama Canal. Its activities are growing and diversifying, which is why the COMPAS Group, owner and operator, has invested in transforming the existing quay to accommodate larger vessels and to add a berth. The project included a new 150 m x 30 m platform aligned with the existing quay to serve two Super Panamax vessels simultaneously.

This platform features independent access to the coast via a 270-meter-long, 8-meter-wide viaduct for two-way truck traffic. The quay consists of a concrete slab on vertical steel piles, and is suitable for dredging to a depth of 13 meters. The design was carried out by the American company WSP under the coordination of the technical office of Soletanche Bachy Cimas (Soletanche Bachy's Colombian subsidiary).

- Owner **Compañía de puertos asociados S.A.S. – Compas S.A.**
- Main contractor **Soletanche Bachy Cimas**



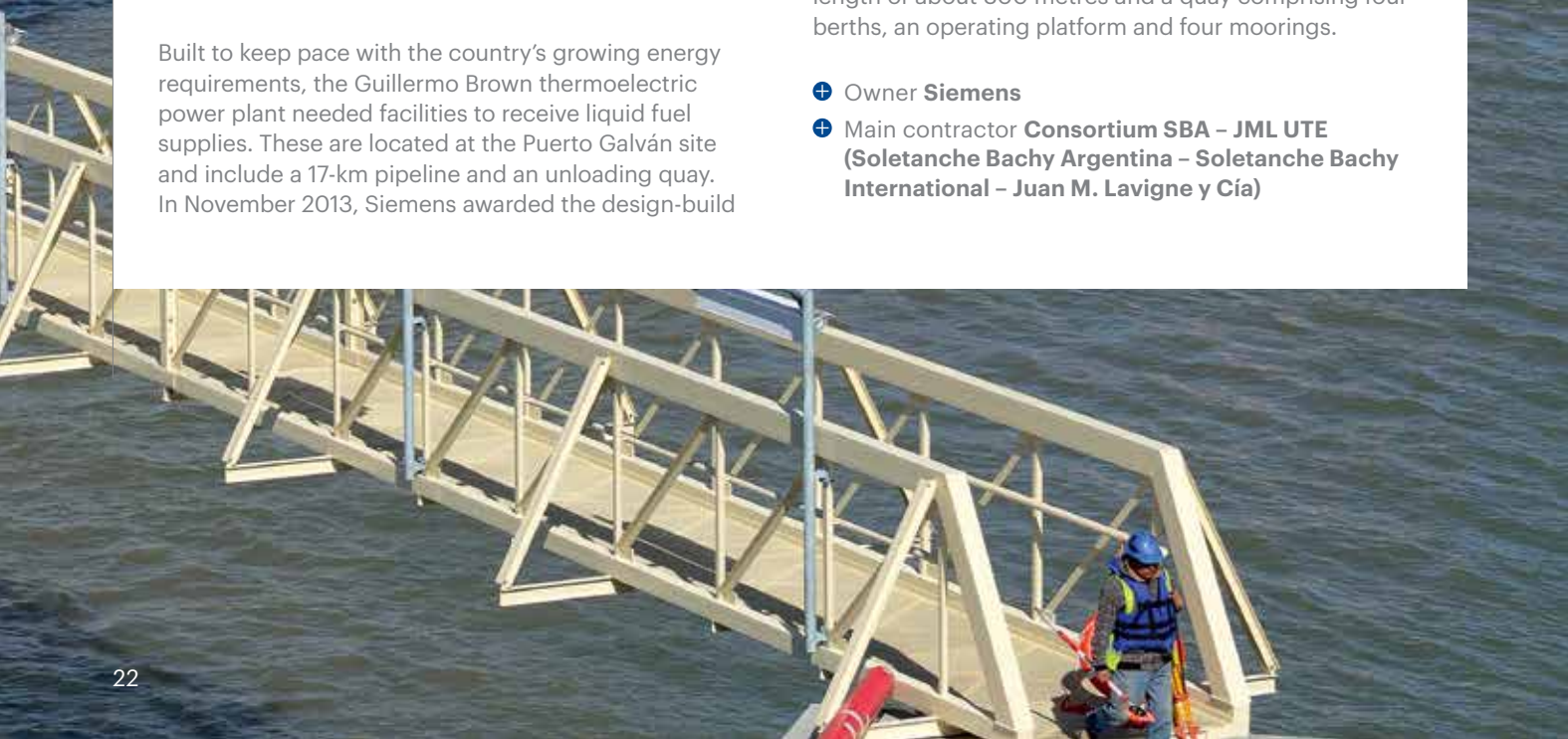


Guillermo Brown Jetty Argentina

Built to keep pace with the country's growing energy requirements, the Guillermo Brown thermoelectric power plant needed facilities to receive liquid fuel supplies. These are located at the Puerto Galván site and include a 17-km pipeline and an unloading quay. In November 2013, Siemens awarded the design-build

contract for the jetty and associated berthing and mooring facilities to the SBA – JML UTE joint venture. The work consisted in building an offshore trestle with a length of about 800 metres and a quay comprising four berths, an operating platform and four moorings.

- + Owner **Siemens**
- + Main contractor **Consortium SBA – JML UTE (Soletanche Bachy Argentina – Soletanche Bachy International – Juan M. Lavigne y Cía)**



Muelle C + D, Montevideo Uruguay

The design-build project involved the construction of a new 383 m long, 33 m wide, 14 m draught port terminal at the end of the port of Montevideo, together with an adjoining 36,000 m² esplanade for container storage. The future multi-purpose quay was designed to accommodate both gantry cranes and mobile cranes. It is of the Danish quay type, consisting of prefabricated superstructure elements and a cast-in-place concrete slab, all supported by 256 bored concrete piles from a mobile platform and a pontoon.

This project called on a wide range of techniques used by the Group: sheet piles, bored piles, precast elements, vibrofracturing, vibrocompaction and civil engineering work. A few years later, this quay was extended by the same consortium, including a connecting structure between the 2 quays, a 180 m long quay, a 6,700 m² esplanade and the necessary modifications to accommodate 330 m long ships.

- + Owner **Administración Nacional de Puertos de Uruguay (ANP)**
- + Main contractor **Consortium Soletanche Bachy (France) ; SACEEM (Uruguay), Dredging International (Belgium)**



Drydocks World Dubai, United Arab Emirates

Dubai, one of the world’s leading ports, is also a shipbuilding hub. Dubai Drydocks, which long specialised in ship repair, branched out into construction with the Safina project in 2005. A new dry dock for ship being built and repaired was commissioned in the summer of 2006. The lift, built on a general contracting basis by the Soletanche Bachy – NSCC joint venture, enables

the vessel to be moved vertically and horizontally and operates like a slipway but incorporates a reverse hydraulic process. The structure is made up of a transfer platform set above sea level, an adjacent basin that opens to the sea, two abutments and a sill, a quay platform, two gates and two mooring dolphins.

- + Owner **Dubai Drydocks**
- + Main contractor **Consortium Soletanche Bachy – NSCC**



Jebel Ali Port Dubai, United Arab Emirates

The Jebel Ali Port, the region’s main container port, increased its capacity to 19 million TEU in 2014 by adding a third terminal. The 1,860-metre long, 17-metre deep quay with a 70-hectare storage yard can accommodate the next generation of Post-Panamax container ships. DP World awarded the contract to the TOA – Soletanche Bachy joint venture to design, build,

commission and equip the terminal infrastructure. In addition to building the diaphragm wall and barrettes, Soletanche Bachy undertook ground improvement works to support temporary and permanent backfill for the quay wall and supplied and installed ground anchors.

- + Owner **DP World**
- + Main contractor **Consortium TOA Corporation – Soletanche Bachy International**

Port of Lomé Togo

The port of Lomé, which has undergone substantial upgrades in recent years, is now one of West Africa's most efficient and modern ports. To enable the port to handle container ships with a capacity of up to 7,000 TEU, Togo Terminal awarded in 2012 a contract to a joint venture led by Soletanche Bachy to design and build a new quay. The project included the construction of a 450-metre quay wall and the port's turning basin and access channel. The combi-wall quay was built with 30-metre long large-diameter (1,412 mm) metal piles and sheet piling. The access channel was dredged to a depth of 15 metres and the turning basin was built. More than a million hours of work were required to complete the project and it featured very strong involvement of Togolese and other African workers and supervisory staff.

- + Owner **Bolloré Africa Logistics subsidiary Togo Terminal**
- + Main contractor **Consortium Soletanche Bachy – Sogea-Satom – EMCC**

**FOR
SHORE**
BY SOLETANCHE BACHY

Port of Cotonou Benin

The capacity of the port of Cotonou, often described as the “economic lungs of Benin”, was increased under programme designed to boost access to the country's market. As part of the extension project, Soletanche Bachy was awarded a contract in August 2009 to design and build a 660-metre long quay with a draft of 15 metres. Carried out by a joint venture that also included

Sogea-Satom and Dredging International, work on the south quay, like that on the north quay, consisted in building two parallel diaphragm walls connected by a layer of tie rods, followed by general earthworks, civil engineering, quay equipment (apart from rolling stock) and dredging.

- + Owner **Port Autonome de Cotonou**
- + Main contractor **Consortium Soletanche Bachy International – Sogea-Satom – Dredging International**

**FOR
SHORE**
BY SOLETANCHE BACHY

Grand Aulnay, Rouen France

As part of its ongoing program to improve maritime access, the Port of Rouen, located on the strategic Seine axis between Paris and Le Havre, has launched a project to modernize the Grand Aulnay wharf operated by Rubis Terminal, a European leader in the distribution of liquid energy products and the storage of bulk liquids.

As part of this project, Balineau was awarded the contract to build six new mono-tubular dolphins, metal tubes anchored in the ground, for berthing and mooring ships.

To achieve this, Balineau had to mobilize exceptional ramming equipment. The tubes, weighing 82 tonnes, 34.5 m long and 2200 mm in diameter, were driven using a crane barge and an IHC S250 hydraulic hammer capable of mobilizing energy up to 250 kJ. These new dolphins will increase the berthing and loading/unloading capacities of the berth. From now on, “long range” ships including tankers and chemical tankers of 230 m in length and a loading capacity of around 53,500 tonnes, will be able to be accommodated.

⊕ Owner **HAROPA - Port de Rouen**

⊕ Main contractor **Balineau**

Port de La Vigne France

With the quay, built nearly 60 years ago, in a very poor condition, Balineau was entrusted with its complete reconstruction from October 2019, as well as its dredging in order to have a harbor with water at any tide.

For this reason, a new 540 m long curtain was plugged to enlarge the basin. Temporary sheet piles were used in line with the existing anchors, before being replaced by permanent sheet piles once the new anchors had been installed.

The old quay could then be removed and the new capping beam poured. The dredging of the 10,000 m³ of polluted sediments put a stop to the grounding of certain boats in high coefficients.

To preserve this sensitive site (fauna and flora, oyster farming, beach, etc.), measures have been put in place to avoid any risk of spreading suspended matter: a floating and bubble barrier, and control of turbidity, salinity, PH, dissolved oxygen and water temperature at the port outlet.

The work added around twenty berths and improved navigability.

⊕ Owner **Société Nautique du Port de La Vigne**

⊕ Main contractor **Balineau**

Port 2000 phase III, berths 11 & 12, Le Havre France

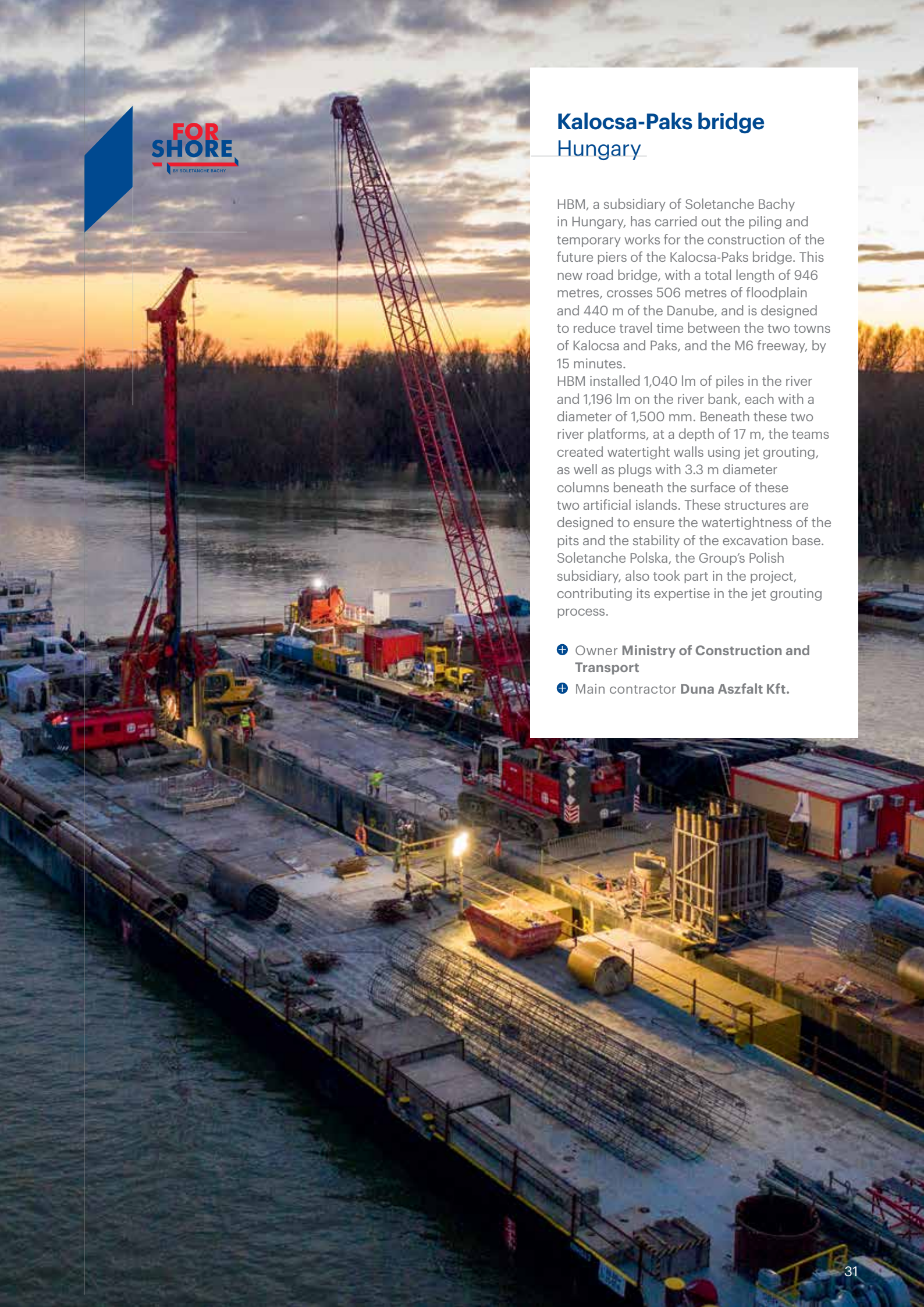
As part of phase III of Port 2000 in Le Havre, Soletanche Bachy has built two new berths, each 350m long, for container ships, with a draught of up to 17m. These two berths follow on from the first ten built by Soletanche Bachy in the 2000s, during phases I and II.

The contract also included the construction of a 111 m return quay, a capping beam, associated dredging, anti-scour protection, two 360 t dolphins, and the development of 47 ha of quaysides. Last but not least, the project included a number of environmental measures: use of low-carbon concrete under the EXEGY by Soletanche Bachy brand, optimization of resources by proposing technical variants, improved management of slurry, use of water in a closed circuit at the concrete plant, and protection of neighboring ecosystems.

- + Owner **Grand port maritime du Havre**
- + Main contractor **Consortium Soletanche Bachy France – Bouygues – Atlantique Dragage**



FOR SHORE
BY SOLETANCHE BACHY



Kalocsa-Paks bridge Hungary

HBM, a subsidiary of Soletanche Bachy in Hungary, has carried out the piling and temporary works for the construction of the future piers of the Kalocsa-Paks bridge. This new road bridge, with a total length of 946 metres, crosses 506 metres of floodplain and 440 m of the Danube, and is designed to reduce travel time between the two towns of Kalocsa and Paks, and the M6 freeway, by 15 minutes.

HBM installed 1,040 lm of piles in the river and 1,196 lm on the river bank, each with a diameter of 1,500 mm. Beneath these two river platforms, at a depth of 17 m, the teams created watertight walls using jet grouting, as well as plugs with 3.3 m diameter columns beneath the surface of these two artificial islands. These structures are designed to ensure the watertightness of the pits and the stability of the excavation base. Soletanche Polska, the Group's Polish subsidiary, also took part in the project, contributing its expertise in the jet grouting process.

- + Owner **Ministry of Construction and Transport**
- + Main contractor **Duna Aszfalt Kft.**

Quai de la Rotule, Fos-sur-Mer France

To increase container traffic, the Grand Port Maritime de Marseille has entrusted the consortium led by Soletanche Bachy France with the construction of a new 240 m long quay with a 17 m draught at Fos-sur-Mer. Work began in April 2018 with the construction of a breakwater, which was then consolidated by vibrocompaction by Soletanche Bachy's sister company Menard. Soletanche Bachy then started on the diaphragm walls, followed by the civil engineering works, with the installation of a 240m-long quay girder after dewatering. Operations then continued: anchoring, earthworks, construction of the piles supporting the beam, reinforcement, concreting and installation of equipment. The platform was successfully delivered in September 2020.

Numerous environmental measures have been implemented to protect the shellfish farms, including the installation of a suspended matter barrier and daily turbidimeter measurements.

- + Owner **Grand port maritime de Marseille**
- + Main contractor **Consortium Soletanche Bachy France/Buesa Menard/Eurovia**

**FOR
SHORE**
BY SOLETANCHE BACHY



Port-la-Nouvelle France

As part of the modernization of the port of Port-la-Nouvelle, the Occitanie Region launched the rehabilitation of sections C and D of the East II quay. The aim was to secure 175 m of quay by restoring reception conditions, while increasing storage capacity on the rear platform to 15 t/m2. The consortium's variant using a wall of grout-reinforced barrettes was particularly appealing. The idea was to build a discontinuous structure behind the existing curtain wall, while maintaining the anchors, in order to take up the thrust forces through the vault effect between the bars.

The same consortium was then commissioned to build a 200 m long heavy-duty quay (quay no. 2) with an 11.50 m draught, earthworks and dredging. Part of the quay was dimensioned at 30 t/m2 to support future offshore wind turbines. For this sensitive site, located on the edge of a channel linking the sea to a pond, our teams implemented numerous environmental measures (water and air quality controls, regular inventory of marine species).

- + Owner **Région Occitanie**
- + Main contractor **Consortium Soletanche Bachy France/Buesa/Menard/VCMF/SDI/GTM**

**FOR
SHORE**
BY SOLETANCHE BACHY



International airport (3rd runway) Hong-Kong, China

To cope with exponential traffic growth, the airport hub wanted to build a third runway, reclaiming 650 ha from the sea. A project on an unprecedented scale, it faced a number of challenges.

Firstly, an environmental challenge: it was impossible to use the dredge-and-fill method, which would have re-suspended the sometimes polluted marine deposits in the soil and threatened the ecosystem.

The project was therefore carried out using Deep soil mixing, the only solution capable of treating the soil in place without manipulating it, and thus protecting the endemic dolphin species. Soletanche Bachy's expertise in this field is unrivalled. A low-carbon binder was also used.

Secondly, a technical challenge: the immediate proximity of the airport meant that teams had to work

at limited heights, without the airport's activity ever coming to a halt. In addition, most of the work was carried out from barges, by sea, using CSM workshops specially designed by all the parties involved in the project, and thanks to the decisive know-how of Soletanche Bachy's Material Department, Eurofrance's Material Department, TEC System and the Korean experts from Sambo E&C.

A total of 16 workshops were mobilized 24 hours a day, at every stage of the project.

This CSM operation was the largest ever carried out not only by BSG, but also by the Soletanche Bachy Group. It involved laying 92,000 2.8 x 1.2 m panels at depths of between 15 and 20 m, through marine deposits and loose alluvium. These operations required extensive testing, drilling and sampling.

- ⊕ Owner **Hong Kong International Airport**
- ⊕ Main contractor **Bachy Soletanche Group Limited (BSGL), Sambo E&C**



Downtown infrastructure Development Programme, Auckland New Zealand

To host international events, the city of Auckland launched the Downtown Infrastructure Development Programme (DIDP). The aim was to make the waterfront more earthquake-resistant, pleasant and functional. The works include the seismic reinforcement of the road and networks behind the existing quay wall, the modification of the existing pier with the creation of 6 berths for ferries and the creation of a public space along the quay, as well as the redevelopment of Quay Street.

The special works mainly concern reinforcement behind the existing quay wall. As part of the "Early Contractor Involvement", Soletanche Bachy International developed an alternative solution combining bored piles, anchors and jet grouting, in order to optimize planning and adapt to the dense urban environment and different geological conditions of the waterfront.

- ⊕ Owner **Auckland Transport**
- ⊕ Main contractor **Consortium Soletanche Bachy International/Downer/HEB**



Garden Island Naval Precinct, Sydney Australia

To increase its capacity for military vessels, the Australian Department of Defence commissioned Brady Marine and Civil to build the new quay for HMAS Kuttabul at Garden Island, Sydney Harbour. The new 430 m long quay is constructed from offshore piles and prefabricated elements. The project involved the supply and driving of over 1,000 tubular steel piles for the new quay structure, as well as the supply and assembly of precast concrete structural elements weighing around 12,000 tonnes. The chosen methodology required the use of two large barge-mounted cranes to install the piles, and extensive temporary works to support the onshore crawler cranes responsible for placing the precast concrete.

- + Owner **Department of Defence**
- + Main contractor **Consortium Brady Marine & Civil – Georgiou**



Brisbane International Cruise Terminal Wharf Australia

To provide southeast Queensland with a facility capable of accommodating the world's largest cruise ships, and to give the region a tourism boost, Port of Brisbane Pty Ltd (PBPL) commissioned Brady Marine and Civil to build a new 200 m long quay and access bridges. The contract also included the installation of a temporary loading jetty, the driving of over 100 steel marine piles, the supply and installation of a precast

concrete quay deck and access bridges, and the design, supply and installation of four single-pile mooring dolphins. A design-build variant proposed by Brady replaced the traditional inclined dolphin piles with single 4.3 m diameter piles, resulting in cost savings for the client.

The close collaboration between Brady Marine and Civil and the Port of Brisbane enabled the project to be delivered safely, on time and on budget.

- + Owner **Port of Brisbane Pty Ltd**
- + Main contractor **Brady Marine & Civil**





HEAD OFFICE

280 avenue Napoléon Bonaparte
92500 Rueil Malmaison, France
+33 1 47 76 54 35

contact@forshore-ports.com
www.forshore-ports.com

Africa

Egypt

Soletanche Bachy International Egypt

Morocco

Solsif Maroc SA

North America

Canada

Soletanche Bachy Canada

United States

Nicholson Construction Company, Inc
Soletanche Bachy International Inc.

Latin America

Argentina

Soletanche Bachy Argentina SA

Chile

Soletanche Bachy Chile SpA

Colombia

Bessac Andina
Soletanche Bachy Cimas S.A.
Geofundaciones S.A.S.
Soletanche Bachy Prefa

Costa Rica

Rodio - Swissboring Costa Rica, S.A.

Guatemala

Rodio - Swissboring Centroamérica, S.A.

Honduras

Rodio - Swissboring Honduras, S.A.

Mexico

Cimentaciones Mexicanas S.A. de C.V.
(Cimesa)

Nicaragua

Rodio - Swissboring Nicaragua, S.A

Panama

Rodio - Swissboring Panamá, S.A.

Paraguay

Soletanche Bachy Paraguay

Peru

Soletanche Bachy Perú

Salvador

Rodio - Swissboring El Salvador, S.A.

Trinidad-and-Tobago

Soletanche Bachy International
Trinidad and Tobago

Asia

Azerbaijan

Zemin Teknolojisi Uluslararası a.Ş. –
Baku Branch

Hong Kong

Bachy Soletanche Group limited

India

Soletanche Bachy International -
India Branch
Soletanche Bachy Engineering (India)

Malaysia

Geotechnical Alliance

Singapore

Bachy Soletanche Singapore PTE LTD
Foundation Alliance

Vietnam

Bachy Soletanche Vietnam CO. LTD.

Europe

Belgium

Bachy Belgique
Fontec SA

Czech Republic

Soletanche Česká republika s.r.o.

France

Agence France Nord
Agence France Sud
Agence La Réunion
Bachy Fondaco
Balineau

Hungary

Hidépítő Soletanche Bachy
Mélyalapozó Kft. (HBM)

Ireland

McDonnell

Monaco

Soletanche SAM

Poland

Soletanche Polska Sp. z o.o.

Romania

SBR Soletanche Bachy Fundatii s.r.l.

Slovakia

Soletanche Bachy Slovensko

Spain

Rodio Kronsa

Turkey

Zetaş Zemin Teknolojisi A.Ş.

United Kingdom

Bachy Soletanche Limited
Roger Bullivant Ltd
Soil Engineering Geoservices Limited

Middle-East

Oman

Soletanche Bachy LLC

Qatar

Soletanche Bachy Qatar WLL
Zemin teknolojisi Uluslararası A.Ş. –
Doha Branch (Zetaş Qatar WLL)

United Arab Emirates

Soletanche Bachy Dubai Branch

Oceania

Australia

GFWA Pty Ltd
Brady Marine & Civil
Rob Carr Pty. Limited

New Zealand

March Construction Ltd



www.forshore-ports.com



SOLETANCHE BACHY

Soletanche Bachy is a world leader in foundations and soil technologies, operating in 60 countries via a network of 80 subsidiaries and branches.

Through its subsidiaries, Soletanche Bachy operates as a general contractor and a specialist subcontractor to design, build, rehabilitate and maintain ports, dams, car parks, metros, tunnels, energy facilities, buildings, etc.

The Group provides environmental solutions by participating in the construction of structures with a positive impact, by implementing optimised technical solutions and by carrying out daily actions on our worksites.

www.soletanche-bachy.com

A subsidiary of



SOLETANCHE FREYSSINET