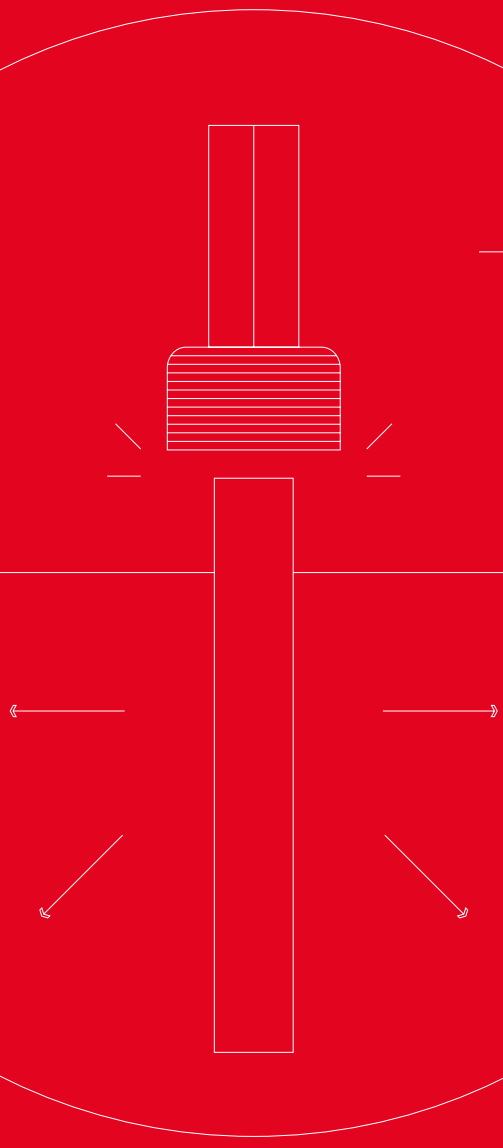
Precast solutions



Build on us SOLETANCHE BACHY

Processes

Techniques and applications

50 years of experience in precast solutions

1960s

FIRST CONCRETE PRECAST PILES

Rodio Kronsa has been a pioneer in precast concrete driven piles since 1956. The company developed the piles in various geometries, cross-sections and lengths to cover a wide range of bearing capacities. It also developed its own pile driving rigs. In 1966, Rodio Kronsa developed the renowned hexagonal Herkules pile.

1970s

THE PIONEERING YEARS

Soletanche Bachy completed its first precast diaphragm wall "industrial project" in 1970, in Issy-les-Moulineaux, France and continued to develop techniques further:

- First composite use with water tightness (1971)
- First project with lightly loaded application, incorporating a bentonite cement slurry mix (1971)
- Project with medium loaded application incorporating cast in-situ concrete base (1971)

1980s-1990s

THE DEPLOYMENT ON MAJOR PROJECTS

Soletanche Bachy started delivering major cut-and-cover projects using precast diaphragm walls, mostly in France, for highways (A13, A86) and metros (Paris line 10, subway lines in Lyon and Lille). Our teams also worked on the Meurthe River Bank Project in 1991 in Nancy as main contractor with a precast value-engineered solution.

2000s

INTERNATIONAL EXPANSION

The Ibero-American region is now a leader in precast solutions within the Group. Its expertise dates back to the 2000s, when our business units in Spain and Colombia constantly carried out numerous projects and came up with new technical solutions. New precast capabilities are currently developed in countries such as Panama or Argentina.

The piling industry continued to evolve with the first prestressed concrete piles and diaphragm walls developed and used in Colombia. In 2013, Rodio Kronsa created the VINCI Innovation award-winning hollow precast pile, which offered a precast solution for geothermal heating tubes for the first time.

During this period, Roger Bullivant, a major player in precast piles in the United Kingdom, joined the Soletanche Bachy group. In 2018, Roger Bullivant commissioned its brand new fully-automated precast factory in Swadlincote, England. The factory supplies the site teams with piles and house foundation elements.

Precast solutions, a key part of our business

A year of precast business in Soletanche Bachy:

- **+1,500,000lm** of precast piles
- **+15,000m²** of precast retaining structures
- **+150,000m³** of concrete
- **+28,000lm** of tunnel segments
- **+13,000ml** of microtunnel pipes

Precast references worldwide

1 Norris Cut tunnel
Miami, USA

6 Puerto Madero - Raghsa Oficinas Dique IV
Buenos Aires, Argentina

11 Bridge over the Wouri
Douala, Cameroon

2 Mexico La Salle
Mexico, Mexico

7 Barking Riverside
London, United Kingdom

12 Fisherman's Wharf
Abu Dhabi, UAE

3 Terminal Compas Puestos de atraque 3 y 4
Baranquillas, Colombia

8 Scientia Academy School
Burton-on-Trent, United Kingdom

13 Sawaco - Package CW1
Ho Chi Minh City, Vietnam

4 Autopista Sur
Cali, Colombia

9 Parking Arvieux
Marseille, France

5 Muelle C
Montevideo, Uruguay

10 Nave Fruveco
Murcia, Spain

Precast experts in the Group

SOLETANCHE BACHY · PREFA · FOR SHORE · ROGER BULLIVANT · BESSAC · RODIO KRONSA · SOLETANCHE BACHY COLOMBIA · SOLETANCHE BACHY ARGENTINA

Why use precast solutions?

Superior quality

- **Smoother finish**, thanks to production in a controlled factory environment.
- **Better quality control**, which reduces the need for second phase works and repairs.
- **Monitoring of key quality factors** (curing, temperature, mix design, formwork, etc.).
- **Factory-reliable performances**, even for high volume of pieces.

Control of operations

- **No reliance on batching plants**, truck deliveries, traffic, weather or production rates.
- **Allows the use of high performance concrete mixes** (fiber-reinforced, fire-resistant, very high resistance...) in a strictly controlled environment.
- **Less quantity and risk from polluted ground** for some of the precast applications.
- **Eliminates risks associated with fresh concrete** in challenging or polluted ground conditions.
- **Suitable in a wide range of soil conditions** and depths.

Environmentally-friendly

- **No risk of spilling or pollution**, especially in maritime environment.
- **Greatly reduced overconsumption of concrete**.
- **Less use of chemical additives in concrete:** workability retention admixtures and cold weather admixtures/adjustments are not required.
- **Half as much concrete and steel per project.**

Cost competitive

- **Precast diaphragm wall:** this technique becomes very competitive compared to poured-in-place solutions when considering the multiple possibilities of precast technologies.
- **Piles:** high-performance concrete and in-situ refusal allow for a high level of optimization of materials.
- **Precast productions rates can be significantly higher**, thus reducing labor and equipment costs.
- **Less materials required** (half as much concrete and steel).

Quick & easy

- **Quicker and easy implementation**, often combined with higher production rates.
- **Immediate load-bearing capacity** (no curing time to be programmed).
- **Short lead-in times** (stock approach with immediate availability).

Efficient

- **Reduced urban impact, with less heavy operations** (concreting, trimming, slurry waste evacuation...).
- **No spoil creation for certain techniques** (e.g. pre-cast driven piles).
- **Less manual labour** operation required.
- **Limited future earthworks operations**, by allowing temporary retaining structures.

! Misconceptions

"Precast piles are only suitable for small depth foundations with vertical charges."

> In fact, piles may be driven to **great depths (60m or more)**. They can be designed to accommodate compressive, tensile and bending forces by incorporating moment transfer joints.

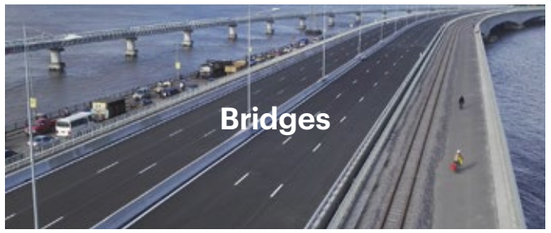
"There is a risk of joints opening or bad integrity of the driven pile."

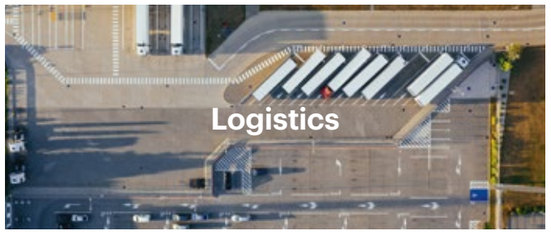
> Pile joints are now standardized products, available with all required certifications, and regular testing ensure they meet all required specification. Also, rig instrumentation, testing and data analysis enable **control and prevention of integrity risks**.

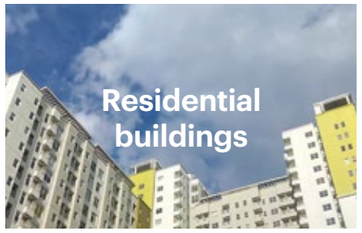
"Noise vibration and dust disturbance."

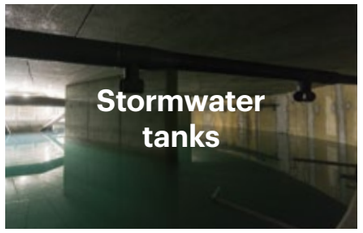
> Many precast applications deliver **a cleaner worksite with less transport** to and from the site. Not only does this cut CO_2 emissions, but it also benefits the local urban environment. Noise and vibration are similar to traditional techniques.

For what kind of project?









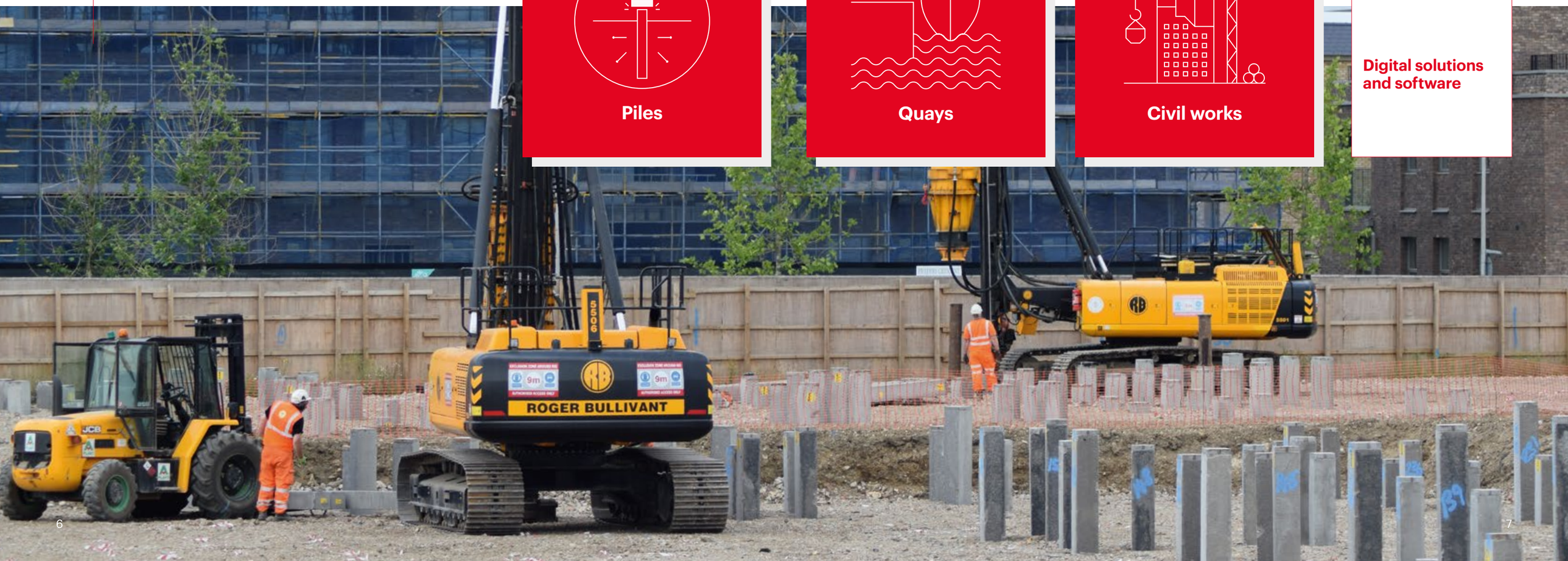
Our precast **solutions**

- Retaining walls
- House foundations
- Tunnels
- Piles
- Quays
- Civil works

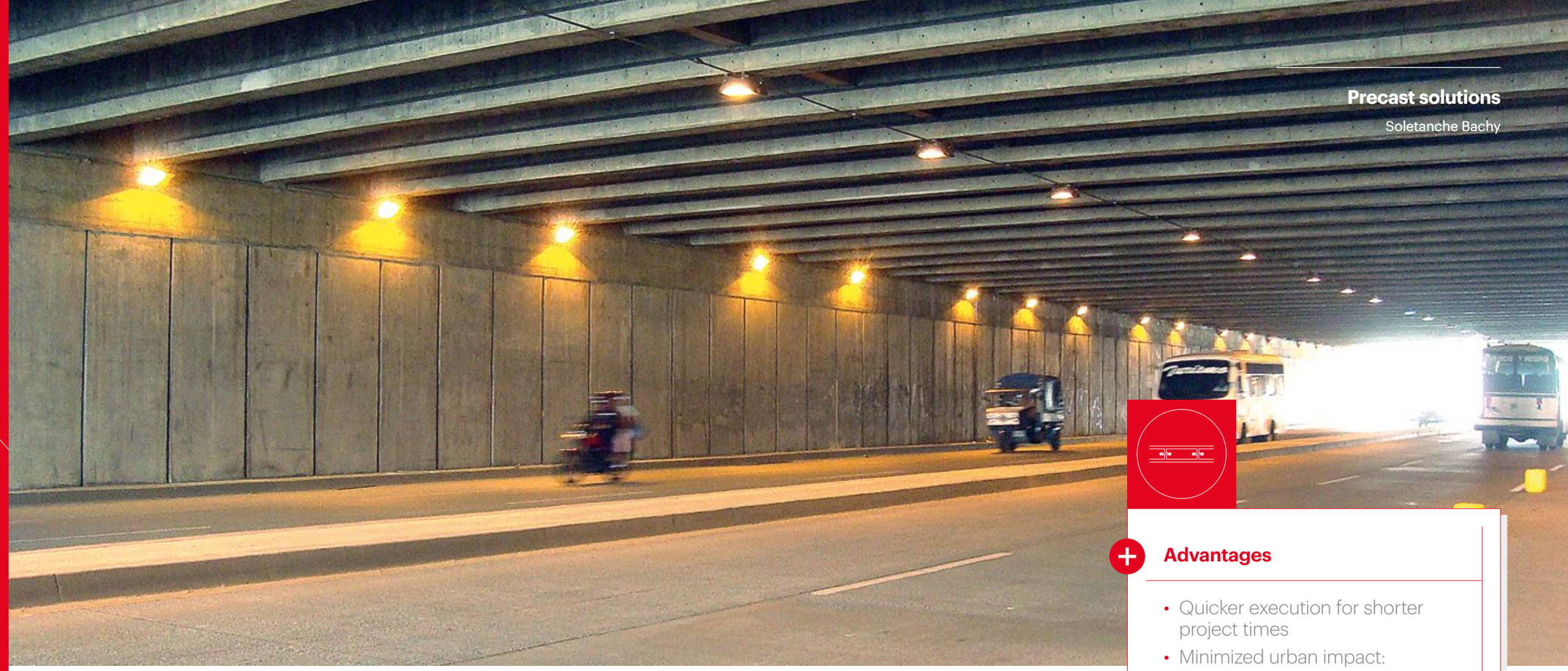
6
precast plants in 5 countries

4
precast design offices

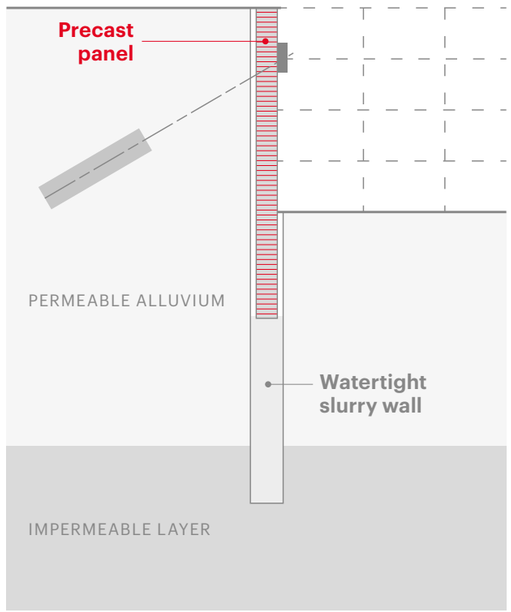
Digital solutions and software



Precast retaining wall



Precast diaphragm wall principle



Precast retaining wall solutions were first developed to allow composite wall construction: cement bentonite slurry in the bottom for cut-off, and precast concrete elements above acting as a retaining structure offered a cost-effective solution.

The precast diaphragm wall (PDW) delivers all of the benefits of precast solutions, such as final aspect and rigorous quality control. Construction sites do not rely on batching plants, notably in areas where concrete quality or supply is challenging. A factory-manufactured, quality-controlled product can be guaranteed. This industrial process also enables special concrete mixes to be employed that might otherwise not suit tremie pipe concreting operations, such as fire-resistant and fiber-reinforced concretes for example.

The precast diaphragm wall industry has seen significant innovation and evolution over the past decades. Geometries and jointing systems have been revolutionized, and driven solutions for diaphragm walls utilizing slender sections now offer a diaphgram wall (DWall) system with no pre-excavation.

Advantages

- Quicker execution for shorter project times
- Minimized urban impact:
  - › Less noise
  - › No slurry evacuation
  - › Less equipement on site
- Cost-effective for composite use
- Quality control of concrete
- No reliance on batching plants
- Thinner walls with use of prestressing
- Compliant with fire resistance regulations

Challenges

- Today’s limitations for precast DWalls reside mostly in the weight of each element, both in terms of transportation costs and cranage limitations on site.
- But precast DWalls have been utilized over 4 stories to depths of circa 18m.

Precast retaining solutions are particularly adapted to meet challenges associated with urban projects and high environmental impact operations such as concreting, trimming and wall finishing. They also renove the need for slurry evacuation and heavy slurry treatment. In addition, preinstalled temporary retaining structures can be incorporated in the upper part of the panels, thereby limiting future earthwork operations.

Precast DWalls can offer a lower cost than regular DWalls when considering the composite possibilities of precast solutions and the gains over traditional slurry evacuation, trimming and the associated quality risks. When comparing the overall duration of a project, the precast option is quicker, as there are fewer operations after the completion of the retaining wall.

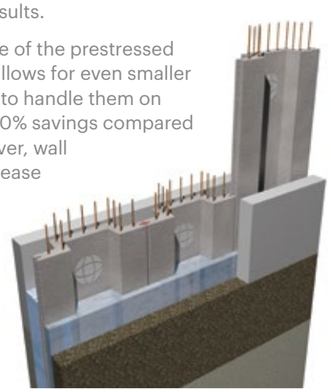
After the creation of DWall panel Panosol, the precast solutions portfolio has continued to evolve in recent years. Major developments include CZSol (an improvement of Panosol with redesigned shape), and HincaSol. The latter offers a precast retaining structure solution in soft soils without the need for preexcavation.

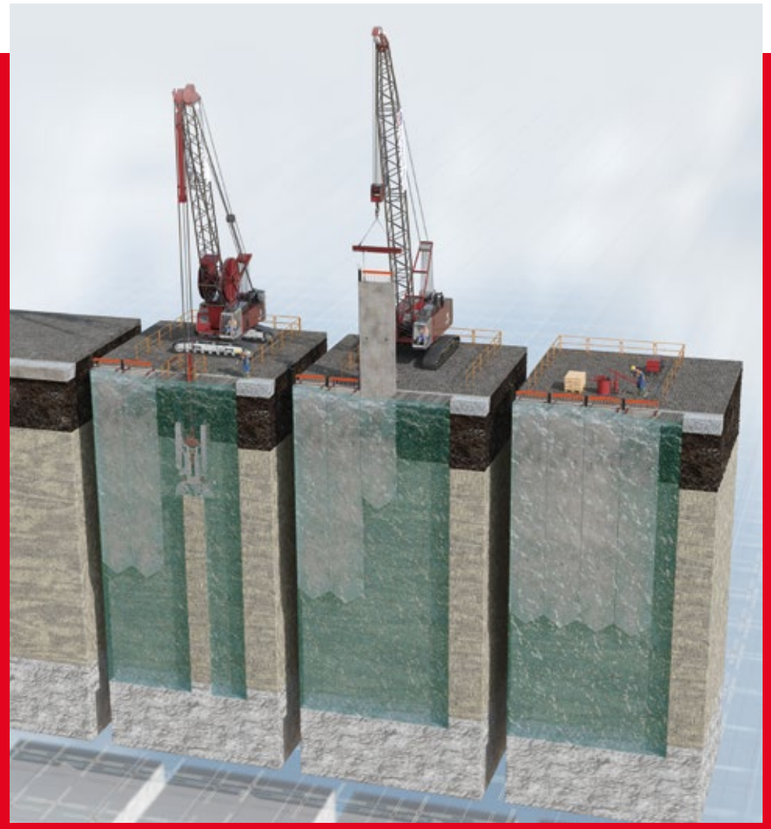
Improvement of process with pre-stressing and shape

CZSol

CZSol was implemented for the first time in 2013 with very promising results.

The slender profile of the prestressed concrete panels allows for even smaller lifting equipment to handle them on site and enables 10% savings compared to Panosol. However, wall deformations increase by circa 20% and increased volumes of bentonite-cement slurry are required.





Precast DWall: Panosol/CZSol

The phasing of precast DWall is as follows:

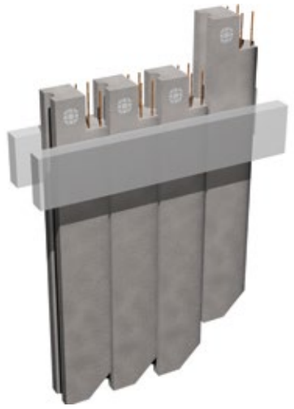
1. **Panel preparation:** installation of steel guide and water-stop. In the case of a low cut-off, a guiding post is required.
2. **Construction of reinforced guide walls** to guide and support the precast elements' weight.
3. **Excavation of the trench** with bentonite slurry or bentonite cement slurry with no subsequent substitution.
4. **Lowering of the precast panel** into the trench.
5. **Water-stop grouting.**
6. **In case of excavation with bentonite slurry,** a subsequent substitution with bentonite cement slurry is carried out.

HincaSol

HincaSol is a retaining technique developed for soft and dry soil conditions with low retained heights above ground water. It was inspired by the concrete precast pile industry, with the first project carried out in 2009.

Slender precast elements are driven sequentially, with a special geometry that avoids any discontinuity risk, whilst assisting the driving process.

The main benefits are a quick installation process combined with a lower material requirement to carry out the project. The equipment is comparable to a precast pile project and the technique can be employed on sites with constrained access.



Today, when required, watertightness is achieved by a supplementary grouting program.

Precast Fascia Panel (PFP) DWall patent

The methodology for producing a PFP DWall is identical to a conventional DWall: a prefabricated element is lowered into the trench after placing the reinforcement cages. It achieves the structural performance of a cast in-situ DWall combined with the smooth finish of a precast wall. This technique can be implemented for all types of projects.

A project reference for PFP DWall is Fisherman's Wharf in Abu Dhabi. In this case, the aim was to have a specific finish, but this panel offers other interesting properties: protection, color, smoothness for water management projects...

PREFA
By SOLETANCHE BACHY

PREFA is the leader in the Group in terms of fabrication and innovation for retaining precast walls

PREFA is based in Colombia and is closely affiliated to other local Group business units who implement these solutions. The team possesses concrete casting expertise and is extremely flexible in meeting clients' special geometry demands.

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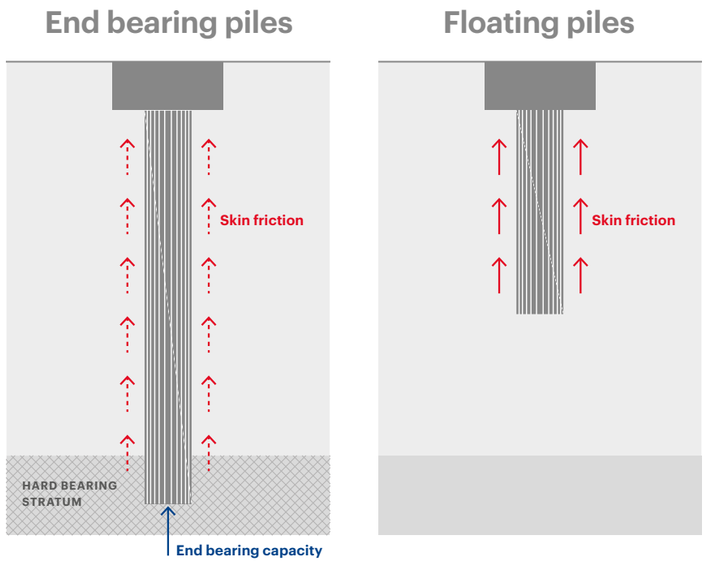
Precast piles

Precast piles design principle



Precast piles are formed from structural members capable of withstanding the design load required almost as soon as they have been installed. They are generally very quick to install, and cost-effective in most ground conditions. This type of piles can be used for all types of structures and foundations, but typical applications include housing and industrial buildings, bridges and pylon foundations.

This technique is particularly adapted to difficult conditions that could cause issues for bored piles such as polluted and aggressive soils, very soft or unstable soils, high water table and very low temperatures.

There are two main categories of precast concrete piles, each with its own installation technique. The pile will either be floating, hence only working in friction with the ground, or driven to refusal with the bearing stress transmitted to a hard stratum.

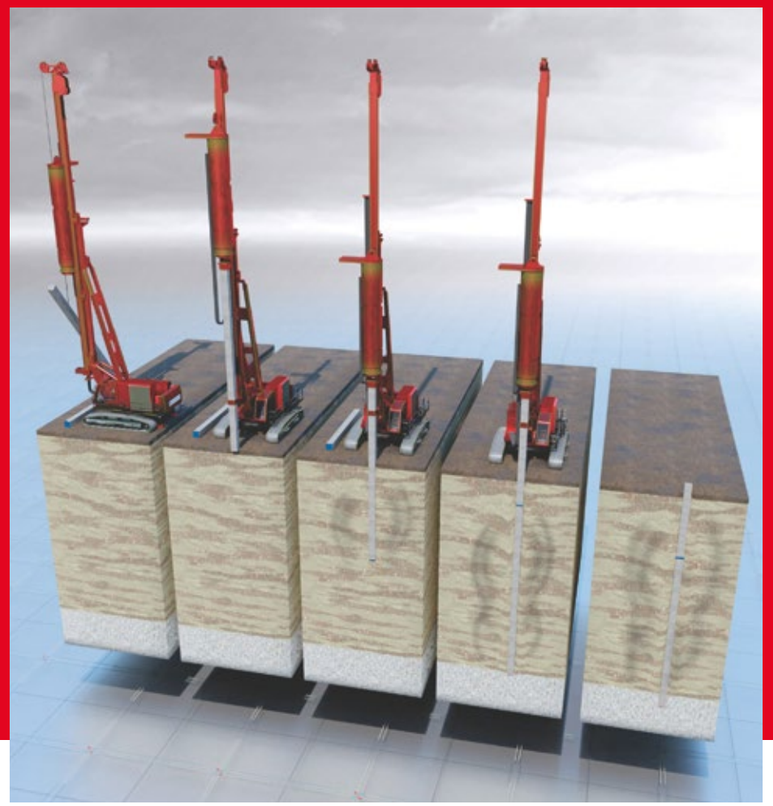
Working with smaller vertically jointed precast elements allows for smaller handling and installation plants, whereas a 100 to 150-tonne CFA rig would be required for an alternative method.

Advantages

- Quick mobilization and installation
- Ease of implementation
- Very limited spoil creation
- No curing time before bearing capacity is achieved
- Technical reliability, with bearing capacity measured on each pile
- Especially suitable in soft, contaminated ground
- No spoil removal and precast units can be manufactured to resist aggressive ground conditions
- Cost-effective

Challenges

- Limitations due to hard soils
- Requires monitoring of soil heave, which can be mitigated by appropriate measures
- Potential soil displacement effects from large sections (heave)



Driven piles

The driven piles installation is carried out in three main steps:

1. **The pile is positioned.**
2. **The pile is driven** by a hydraulic hammer, vibrator, or jacking systems.
3. **Elements can be added to reach the designed depth;** they are linked with special joints depending on the stress.

Press-in piles

In softer soils, a driven pile can be installed by pressure (pile jack-in) rather than percussive techniques. The weight of the machine is used as reaction as the piles are pushed into the ground with hydraulic jacks. For soft soil conditions, the driving production rate is usually increased by up to 15% when compared to impact methods.

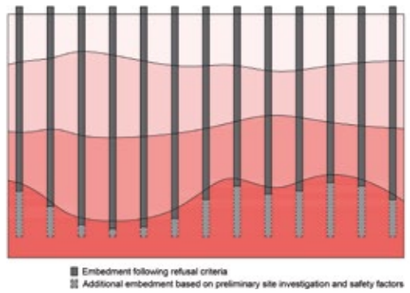
Strength of piles to refusal

- **Design codes allow a higher allowable concrete compression stress for precast piles (70% more on average).**
  - › A smaller precast section is required to reach the same structural capacity
  - › The consumption of materials is reduced
- **Optimized embedment**
  - › When designing bored piles, the embedment is estimated based on site investigations. A design depth is defined and increased by a safety factor.

The embedment cannot be tested before the concrete cures, usually 14 days after concreting.

› With precast piles, a refusal “set” is specified for the driving. Piles can therefore be inserted to optimized lengths with capacity being achieved in “real-time” from the local ground conditions.

› Hollow piles have been developed to enhance precast piles with second phase grouting, underpinning with micropiles, the installation of geothermal loops.



These two factors enable theoretical savings of up to 40% in materials and a reduction in equipment size.

Class 2 piles

According to loads and ground specifications, Eurocode lists various classes of piles and joints that can be combined to optimize the design.

Class 2 piles are very cost-effective and incorporate just a single, centrally placed reinforcement bar. Class 2 piles can be used in case of:

- Absence of or limited traction and shearing effort
- Absence of or limited bending moment

Piles

CLASS	PILE TYPE
1	Piles or segmental piles with distributed reinforcement and/or prestressed reinforcement with or without an enlarged pile toe
2	Piles or segmental piles reinforced with single centrally placed bars

Joints

CLASS	CAPACITY	VERIFICATION
A	Compression and bending	Static calculations verified by impact testing and subsequent bending
D	Compression	Static calculations verified by impact testing

The first objective of the design is to consider how the loads change over the length of the pile. If the stresses do not require any reinforcement under a certain depth, for example if shear forces and bending moments have dissipated, then unreinforced elements can be supplied.

Based on this analogy, Roger Bullivant has developed Class 2 piles with D joints which generate major savings for projects.

Floating piles

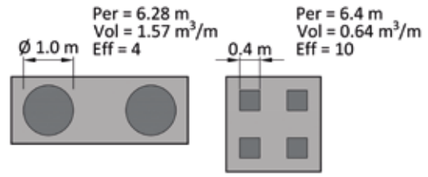
Floating piles achieve their bearing capacity through skin friction. The efficiency of a floating pile can be calculated by dividing the skin surface by the concrete volume.

The precast industry adds a significant environmental benefit to floating piles, as precast square piles have a higher efficiency and require less concrete than traditional piling methods for the same bearing capacity.

This technology can contribute to Soletanche Bachy’s environmental action plan, which focuses on lowering its use of cement in order to reduce the Group’s carbon footprint.

In addition, CFA or LDA piles require heavier equipment than precast piles during their installation.

The drawing below shows two solutions for a similar skin friction surface per meter of depth, one with cast in-situ circular piles and one with square precast piles. The former’s efficiency is only 4 while the latter’s reaches 10. In fact, both configurations have a similar perimeter and therefore bearing capacity, but cast in-situ circular piles solution uses more than twice as much concrete.



RODIO KRONSA

Rodio Kronsa is a pioneer in the driven of precast concrete piles and has registered numerous patents

With over 50 years of experience, Rodio Kronsa has carried out a vast array of precast projects in Spain and Portugal, providing technical support to its clients from design to execution.

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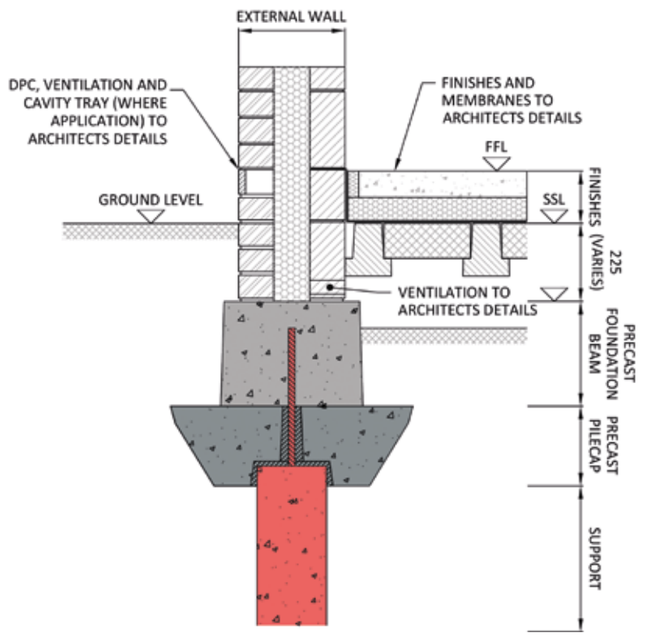
Other subsidiaries ROGER BULLIVANT PREFA

House foundations & integrated model

Precast solutions for house foundations



Roger Bullivant proposes a fully standardized and integrated solution for house and building foundations.

These buildings can be single storey, two-storey or multi-storey projects, e.g. flats and apartments. Both private and social housing developments can benefit from Roger Bullivant's foundation and ground floor packages, as well as other structures such as nursing homes, student flats, sheltered housing and hotels.

Roger Bullivant provides precast concrete ground beams designed and installed by specialist teams. Thanks to its expertise in precast piling and precast beams, Roger Bullivant offers highly efficient value-engineered solutions with a wide range of benefits. The modular foundation elements can cater for all types of ground conditions on both flat and sloping sites.

With more than 2,000 projects completed by Roger Bullivant every year, the company had to evolve and streamline its operations by optimizing the range of products offered and modernizing its precast facility. With deeply rooted knowledge of the market and detailed data analysis of previous projects, Roger Bullivant redefined an efficient and versatile range of products.

Advantages

- Value-engineered designs based on project-specific ground conditions and requirements
- Reduced lead-in times and tendering costs
- Reduced earthworks and excavations
- Reduced construction time
- Reduced interfaces with other players involved
- Budget security
- Health and safety improvements
- Reactivity

Challenges

- Stock management

Yearly production by
Roger Bullivant precast plant

- **1 million ml**
  of precast piles
- **180,000ml**
  of precast beams
- **2,000**
  projects carried out

An integrated model

House foundation piling starts to compete when trenched excavation exceeds 2.5m, in presence of contaminated soil. Suspended ground floor design or sites with low working platform levels will also make these solutions more competitive.

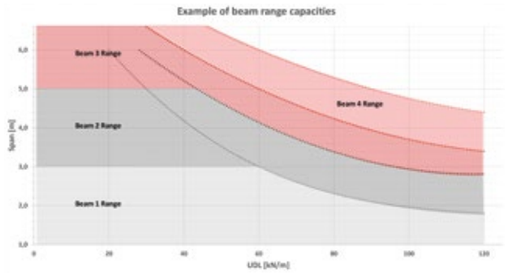
Precast ground beam systems reduce the time needed to build foundations, are not weather-dependent. They also reduce waste compared to traditional trench fill foundations, save resources on enabling works and reduce the health and safety risk associated with trenched excavations and uneven ground surfaces.

In terms of cost, clients often appreciate the budget security precast solutions can offer compared to cast in-situ foundations, which price may vary depending on quantities.

Standardized offer

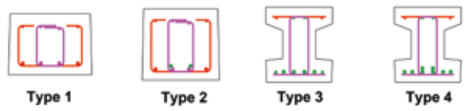
The beam products developed by Roger Bullivant are suitable for use in residential and commercial building projects. The system can be utilized for low rise developments in accordance with standard regulations and can be used with a range of piled foundation techniques in many different soil types and ground conditions.

The design strategy is to utilize a range of stock products suitable for the vast majority of the loading conditions of the projected superstructure. Each beam section type is selected to offer the most economical utilization of the materials used. The system is comprised of a range of standard lengths and capacities which allows the design team to produce highly efficient foundation solutions for projects.



Standardized beam sections must be selected and designed carefully to ensure the range:

- Closely matches the market requirements in terms of loads and spans
- Limits the number of different beam sections
- Limits the storage of underutilized stock in the precast plant



Example of a range of beams

When it comes to precasting components on an industrial scale, it is necessary to analyze the market conditions and requirements at all times to optimize the profitability of the business. All the phases of a project, from tender through to completion, should be streamlined and integrated into the business model: market prospects, typical size of projects, design constraints, equipment for installation, plant and equipment, production rates, stock management, transport costs...

Benefits of a standardized offer

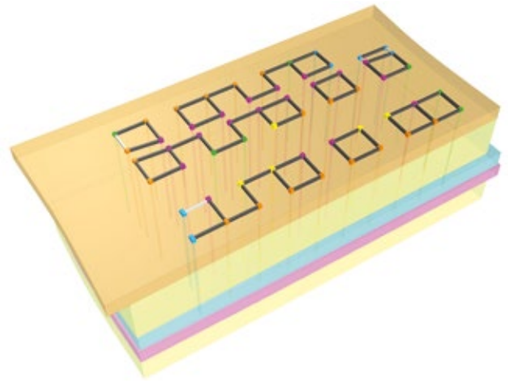
Design Expertise

Roger Bullivant can mobilize two internal design offices for piles and house foundations, including pile caps and beams. The predetermined section types allow software to be easily programmed to create 3D models with intelligence to transfer information to spreadsheets, thus producing automated 2D plans, schedules for production stock call off, and delivery schedules. Standard project calculations are completed for each foundation design to identify the superstructure loadings on each foundation beam and at each pile location. For each foundation layout, a set of standardized layout drawings are produced in CAD, in conjunction with the project calculations and associated typical sections.

Precast plant expertise

By continually analyzing workload and historical projects, Roger Bullivant can adapt its range and stock to match the current market conditions.
In doing so, the teams optimize the fine balance between stock carried in the precast facility, and time to mobilize prefabricated elements for their projects.

With this secure information Roger Bullivant modernized its precast plant to be better connected with the market. With its new plant, the company has a great reaction time, making it possible to deliver an order in 3 days ‘early-release’ if necessary and in less than 3 weeks for special orders.



ROGER BULLIVANT

Roger Bullivant is part of Soletanche Bachy group, specialized in house foundations in the UK

Roger Bullivant offers a wide range of precast solution: piles, piles caps and beams, and carry out the installation in a colossal number of projects each year. Roger Bullivant’s business model includes the production of their own rigs, in-house design teams and a modern precast plant.

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A great experience in maritime construction with ForSHORE

A variety of precast solutions for deep water piled wharfs and jetties have been designed and executed on several projects around the globe.

Precast elements are most commonly used for piled quays in all types of ground and environmental conditions. It has also been used in conjunction with diaphragm wall (DWall) construction, where precast structural elements such as capping beams can avoid time-consuming formwork operations. Precast panels have also been used to enhance surface finishing for the upper, exposed portions of the quay, a technique known as the PFP DWall.

Quays are structures where ships can berth and can be located on the sea, a lake or a river, or inside a harbour or canal. These structures are equipped with the necessary superstructure and accessories (bollards, fenders, cranes, etc.) to allow the loading and unloading of cargo.

Precast is commonly used in projects involving steel sheet piling. Most projects include structural elements that can be precast and assembled efficiently on site. If access and transportation routes are not preclusive, the use of precast can deliver benefits in terms of program and quality.

The design and specification of the precast units depend upon:
- service life (durability)
- size of ships that will berth (draught)
- loads (storage areas, cranes, bollards, fenders, etc.)
- specific requirements from the final user, port authority, etc.

Advantages

- Schedule gain
- Optimisation of maritime construction activities
- Reduced labour requirement
- Safer work environment
- Reduced pollution risk for marine ecosystems
- Further optimization possible by prestressing concrete elements

Challenges

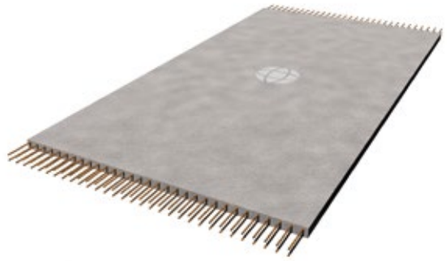
- Space available for storage
- Geometries of precast elements
- Dimensional and weight limitations with respect to cranage

Typical structural elements

Most precast elements must include “cast-in items” designed to allow them to be handled and installed safely.

Fender

This element can be linked to a transversal beam in some cases. The dual function is to carry loads from equipment on the dock, and resist lateral loading when restraining the boats. Vertical loads are transmitted into the piles beneath.



Preslab

Installed on top of the beams, it can be of the full platform depth or act as a soffit to an in-situ slab. The front element may differ to avoid unnecessary formwork.

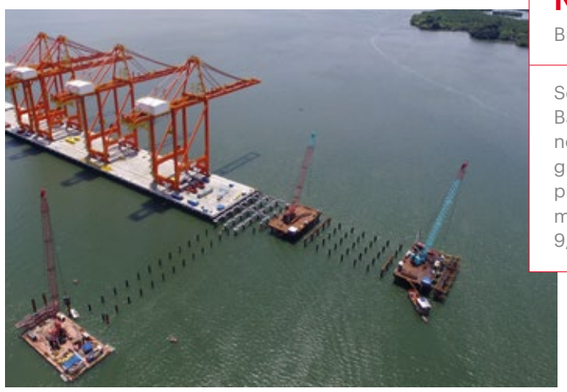
Pile cap

The cylindrical portion is installed into the top of the steel pile, thus allowing transversal and longitudinal beams to span between them. The precast elements are usually connected with a cast in-situ concrete patch.

Beam

Most projects feature two types of beams: longitudinal and transversal. A cast in-situ concrete patch is usually performed to connect them to the preslabs.

Projects



New Boscoal quay in Aguadulce

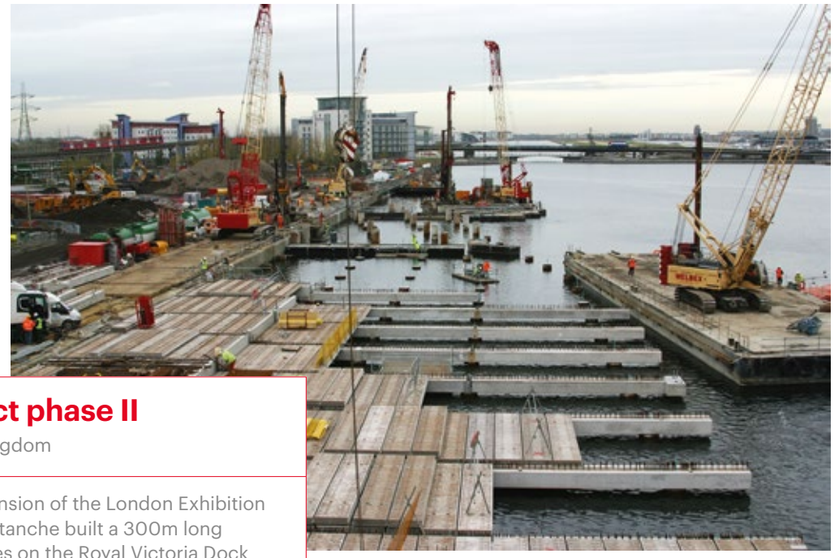
Buenaventura, Colombia

Soletanche Bachy International and Soletanche Bachy Cimas completed the construction of the new Boscoal cereal and coal terminal (COMPAS group) of Aguadulce port in Colombia. The project required 1,247 prefabricated elements, mainly beams, deck sections and pile caps, some 9,000m³ of concrete, and 1,400 tonnes of steel.

Muelle C quay extension

Montevideo, Uruguay

Led by Soletanche Bachy Uruguay and Soletanche Bachy International, this design and build project included a connecting structure between the two quays, a 180m platform, a 6,700m² esplanade and the modifications necessary to accommodate 330m vessels. It was constructed in the same way as the previous platform: Danish quay on bored piles and a structure made from precast elements and a slab cast in-situ.



Excel project phase II

London, United Kingdom

As part of the expansion of the London Exhibition Centre, Bachy Soletanche built a 300m long Danish deck on piles on the Royal Victoria Dock site. Our solution included placing 88 precast concrete beams and 7,000 m² of precast concrete decking, as well as boring 148 piles.

FOR SHORE BY SOLETANCHE BACHY

ForSHORE is Soletanche Bachy’s brand dedicated to ports and maritime works

It operates as a general contractor to deliver all 4 stages of port infrastructure projects: financing, design, build, and maintenance. ForSHORE offers a full range of port infrastructure capabilities: jetties, quays, dry docks, locks, breakwaters, dolphins, foundations for platforms, storage tanks and buildings, and sea outfalls/intakes.

CONTACT

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Tunnels

Bessac is built around its dual competence as a public works contractor and a tunnel-boring machine manufacturer. The company has acquired unparalleled experience in the construction of tunnels and microtunnels, as well as in the design and manufacture of specialized equipment, for over 40 years.

Precast concrete is at the center of the Bessac group's skills and needs. For large diameter tunnels segments, or for microtunnels concrete pipes, the supply of precast reinforced concrete parts is essential for the smooth running of projects. Bessac's expertise resides in the capability to transfer its know-how to any project around the globe. The relocation is done either via the installation of a temporary batching plant and the import of special formwork, or via local contracts with local precast plants adapted to the project.

Bessac has a large portfolio and annual turnover. In the past decade, the company has constructed over 90km of microtunnels and more than 100km of large diameter tunnels in more than 30 countries.

The field of activity and geographic implantation of projects, together with the complexity of design-and-build projects make Bessac an expert in terms of local precast implantation and mobile organization around the globe.

Bessac is ISO 9001 certified for the quality management of its precast segments and pipes.

For each project, Bessac takes responsibility for:

- Importing its geotechnical concrete precast expertise
- Designing the precast elements
- Finding local partners for the project and the concrete supply
- Concrete mix design assisted by the Group's dedicated materials laboratory
- Supply of bespoke precast molds
- Fabrication of precast elements

BESSAC

CONTACT

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Civil works

Precast solutions

Soletanche Bachy

In addition to its geotechnical expertise, Soletanche Bachy and its subsidiaries carry out a vast number of projects as main contractor.

Concrete precast solutions are often used in projects outside the foundations or retaining wall structures scope. They are mostly implemented for:

- Schedule gain
- Financial benefits
- Material quantities optimization

Soletanche Bachy civil works projects are frequently carried out in very constrained, urbanized areas requiring optimization of means and methods. Precast elements often achieve this goal by:

- Reducing size and quantity of plant required
- Minimizing labor resources
- Facilitating or simplifying work at height
- Creating a safer working environment on constrained projects

Wide-ranging civil works applications include:

- Beams and slabs for circular water management projects or parking
- Formwork for quays capping beams
- Architectonical struts

SOLETANCHE BACHY

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Internal laboratory expertise

Soletanche Bachy's Material department, located near the Group headquarters, part of the Technical division of the Group, comprises a team of 10 engineers and technicians with a fully equipped laboratory.

It gathers more than 60 years of expertise on projects located all over the world. The department covers a large field of expertises on materials, design and treatment of support fluid for deep foundations and concrete technology.

This team of experts can support Soletanche Bachy's subsidiaries on the various aspects of concrete technology, to reach a high level of quality with more sustainable, cost-effective and value-added concrete products.

Regarding concrete for precast, the Material department's expertise includes:

- Concrete mix design optimization
  - › Cost reduction
  - › Sustainable mix design and carbon footprint reduction
  - › Increased service life
- Precast Process improvement
  - › Mix design/curing optimization
  - › Fiber introduction
- R&D
  - › New type of concrete/zero cement concrete/ geopolymer
  - › Fire-resistant concrete optimization
  - › New technology for aggressive environments (geopolymer/expertise in special cements)

Precast solutions and the environment

Soletanche Bachy is committed to reduce its carbon footprint by 40% by 2030 (scopes 1 and 2) by reducing its direct and indirect consumption of fossil fuels.

In addition, the Group will put a lot of effort to reducing its cement consumption (scope 3). In this context, precast solutions can deliver environmental benefits to construction projects and geotechnical works, especially in scope 3.

Lower impact for concrete

- Overconsumption is greatly reduced
- Precast enables design optimization, allowing for up to 40% less concrete
- Precast solutions do not require deliveries on site by mixing trucks
- Precast plants can be established close to quarries to optimize transportation costs and environmental impacts
- Concrete formulas for precast are more simple than poured-in-place as workability retention admixtures and cold weather admixtures/adjustments are not required.

Reduced pollution

- Precast methodology is less invasive; it does not require batching plants on site nor heavy equipment.
- The risk of spilling material is very limited.
- For the piles, there is no spoil produced.

Our partners

Terre Armée is a key partner of Soletanche Bachy, as both companies are part of the Soletanche Freyssinet group. Terre Armée is a major player in terms of its precast capabilities. In addition to its standard precast solutions such as TechSpan or Reinforced Earth matrix, Terre Armée is also an expert in precast and prestressed concrete for beams and special shapes products. The company can count on 3 major precast plants but has also developed a solution of highly relocatable temporary facilities for major precast projects.

Group-wide precast capabilities

Our Business Units' precast expertise is available worlwide thanks to Soletanche Bachy's global/local approach.

	Plant management	Precast pile		Precast retaining structures		Precast Pipes / Tunnels		Precast major marine works		Other civil Works	
		PLANT	WORKS	PLANT	WORKS	PLANT	WORKS	PLANT	WORKS	PLANT	WORKS
› Spain and Portugal Rodio Kronsa	✓	✓	✓	✓	✓						
› Latin America PREFA Colombia Soletanche Bachy Colombia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
› UK Roger Bullivant	✓	✓	✓							✓	✓
› Worldwide Soletanche Bachy International			✓		✓		✓		✓		✓
› France, Belgium, Switzerland, Monaco, French West Indies Soletanche Bachy France					✓						✓
› Worldwide BESSAC	✓					✓	✓				
› Worldwide Terre Armée	✓									✓	✓

Build on us

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. The Group delivers the full range of geotechnical processes and provides innovative, effective solutions as either a lead or specialist contractor to design, build, rehabilitate and maintain infrastructure: ports, dams, car parks, metros, tunnels, energy facilities, buildings, etc.

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