



The benchmark for
specialized civil engineering



FREYSSINET



Design, Build, Maintain



Freysinet: vertical integration of technologies



Jérôme Stubler
Freysinet Chief Executive Officer

Freysinet brings together an unrivaled set of skills in the specialized civil engineering sector.

With its expertise in the design of structures and technologies, the production of materials and equipment and their implementation on site, Freysinet offers integrated technical solutions in two major fields: **construction** and **structural repair**.

For over 70 years, Freysinet has been involved in numerous projects on five continents, making it the **world leader** in its specialized areas of prestressing, construction methods, cable-stayed structures, structural accessories and the repair, reinforcement and maintenance of structures. These activities are performed on a **wide range of structures**, including civil engineering ones, buildings, skyscrapers, industrial installations, power production plants, offshore platforms, transportation infrastructures, sporting facilities and more.

Placing **skills at the heart of its organization**, Freysinet is committed to achieving **excellence** and **professionalism** through the **continuing professional development** of its employees at the **Freysinet Academy**. Freysinet constantly strives towards improved **quality of service** and **zero accidents** on all of its sites.

By aiming to build with as few materials as possible, continuously improving quality to extend the service life of structures, and saving distressed structures through the use of innovative techniques, **Freysinet consistently provides environmentally-friendly solutions, as witnessed by the “Sustainable technology” signature.**

Key figures

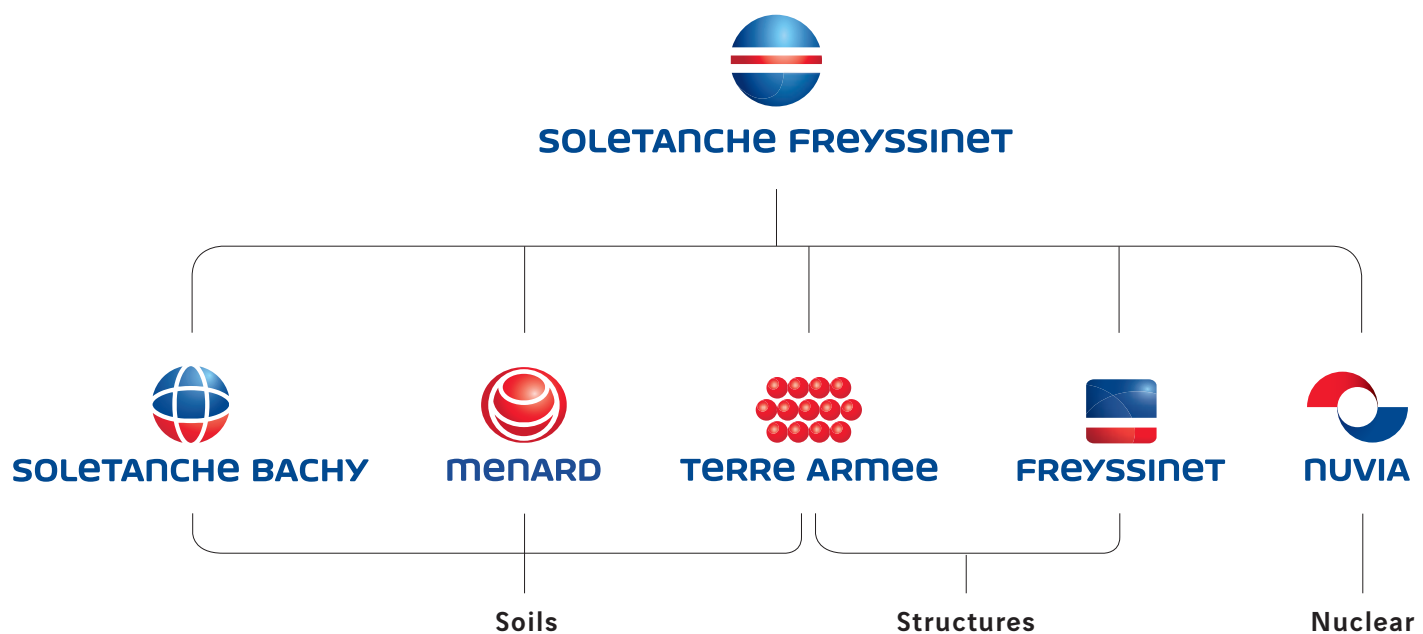
- **More than 5,000 employees**
- **6,000 projects a year in over 100 countries**
- **75 subsidiaries in 60 countries**



Freyssinet, subsidiary of Soletanche Freyssinet

Soletanche Freyssinet is the world's leading group of companies specialising in soils, structures and nuclear:

- Turnover of €2.2 billion;
- 17,000 employees;
- Present in almost 100 countries on 5 continents;
- Involved in most major construction projects around the world;
- Constant innovation with over 350 inventions protected by more than 1,500 patents.





Soils

Soletanche Freyssinet has the widest range of expertise available in the field of foundations and soil technologies. **Soletanche Bachy** specializes in geotechnical processes, special foundations, underground work and soil improvement and remediation. It uses turn-key installation skills for major infrastructure projects in a variety of contractual frameworks.

Menard has become a benchmark through its exclusive soil reinforcement and improvement methods, which allow for building on previously unbuildable ground.

Terre Armee, half way between soils and structures, is the world leader in mechanically stabilised earth (MSE) retaining structures and for precast arches in underground structures.



Structures

Freyssinet has developed a unique skill set in the design, building, repair, reinforcement and maintenance of structures. Its services cover all types of civil engineering structures, from major bridge or tunnel projects to nuclear containment vaults, tanks, silos, hydraulic structures, buildings, etc. Its exclusive solutions are implemented through a network of 60 subsidiaries worldwide.



Nuclear

Nuvia is involved in every life cycle stage of nuclear facilities, from construction, maintenance, operation and service life extension, to decommissioning. **Nuvia** delivers turn-key solutions, including nuclear processes. It provides its customers with technological expertise in the fields of clean-up, dismantling, waste management, civil engineering work, mechanical maintenance, monitoring, fire protection, sealing and biological protection and HVCA.

Nuvia is a major player in radiation protection and operates on a variety of nuclear sites all over the world.

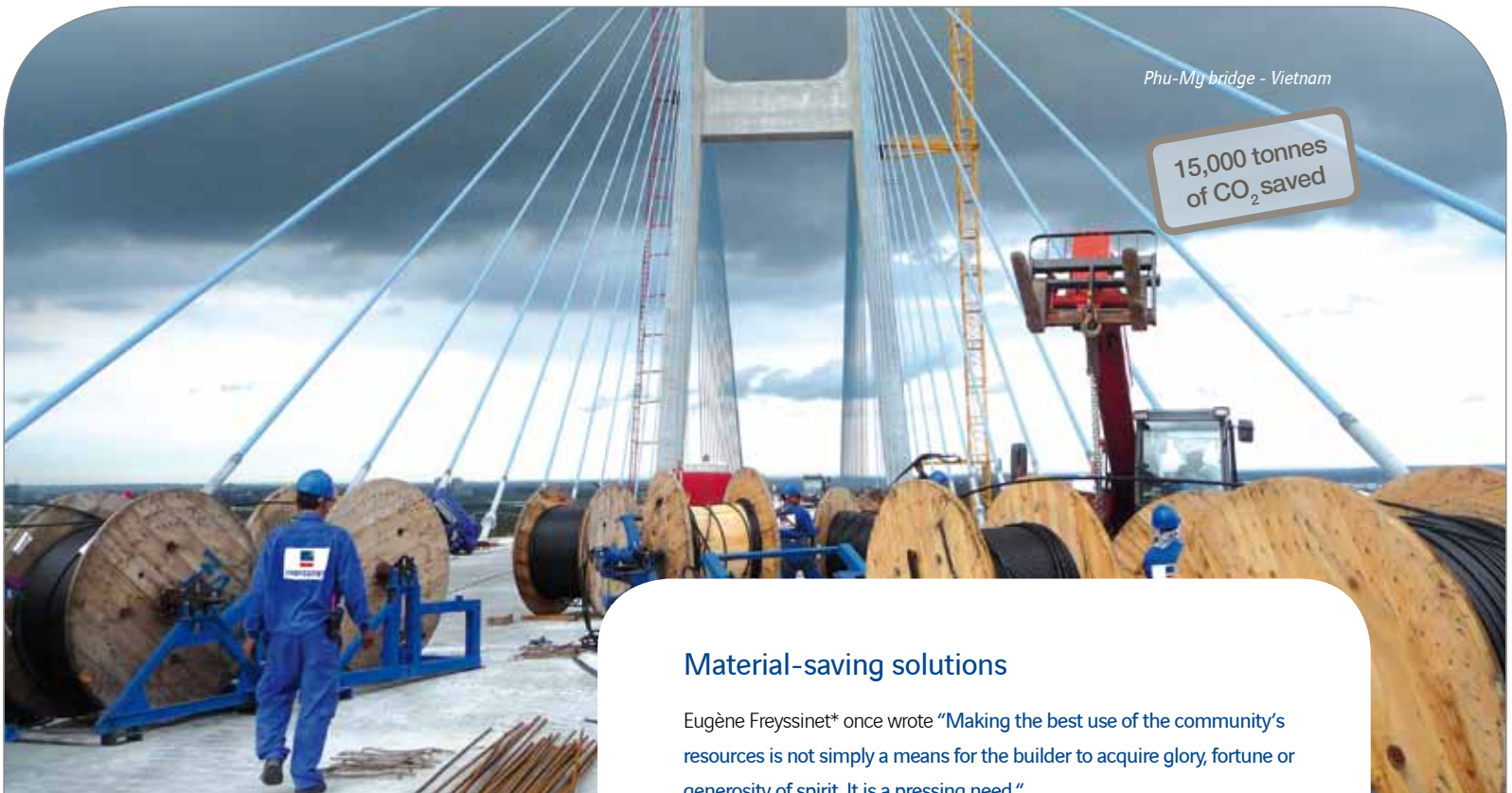
*Integrated solutions for fabrication
and transport of offshore wind turbine*

“Since our creation, we preserve the planet’s resources”

Sustainable technology Our solutions for the future

Phu-My bridge - Vietnam

15,000 tonnes of CO₂ saved



Material-saving solutions

Eugène Freyssinet* once wrote "Making the best use of the community's resources is not simply a means for the builder to acquire glory, fortune or generosity of spirit. It is a pressing need."

In 1928, having just invented prestressing and therefore saving vast quantities of materials, Eugène Freyssinet* pulled off the feat of building 3 bridges with the budget allocated to a single structure.

This is still true today. Thanks to prestressing, stay cables and innovative construction methods, **our solutions bring significant reductions in materials** (such as a 20 to 30% saving on concrete).

For example, using prestressing in building or car park reduces the amount of concrete used by 30% or more, and therefore reduces **the CO₂ emitted by 1 tonne for every 30m² of floor space.**

A reduction of 1 tonne of CO₂ per 30m²



Prestressed floor - Dubai

More sustainable solutions

Working on the corrosion protection, fatigue resistance and resistance to attack by radiation and chemicals of our materials, our laboratories are constantly looking for solutions that provide **better quality**, in other words **increased service life** for the structures that we build or repair.

For example, when Freyssinet supplies 1,000 tonnes of stay cables with a **service life of 100 years**, compared with competing technologies with a service life of around 30 years, **the reduction in terms of CO₂ emissions is 15,000 tonnes on a single structure.** This provides increased comfort for the owners and users of the structures.

Solutions to preserve existing structures

In 1934, Eugène Freyssinet* saved the marine terminal at Le Havre using his invention: prestressing.

Nowadays, using Foreva® solutions to extend the service life of existing structures, the company is contributing to **the reduction of CO₂ emissions** worldwide. As an example, in Lebanon, repairing the Maameltein bridge instead of demolishing and rebuilding it allowed to save **7,700 tonnes of CO₂**.

A 7,700-tonnes reduction in CO₂



Maameltein bridge repairment - Lebanon

* Eugène Freyssinet (1879-1962), inventor of prestressing.



Construction

Structural
accessories

Prestressing

Construction
methods

Cable-stayed
structures

Rion Antirion - Greece



Construction methods - Dubai



Slab on ground - Australia

The product of 65 years of continuous R&D effort, Freyssinet solutions meet the highest standards of modern civil engineering and major building projects.

Freyssinet sets itself stringent performance criteria generally positioned above the usual industry standards. This demand for quality applies not just to products developed in the company's factories and laboratories, but also to implementation, adherence to deadlines and sustainability.

Freyssinet's aim is to provide the best possible responses to major challenges from clients in terms of technical and economic performance, reliability and durability.



Stay cables, Terenez Bridge - France



PT Slabs, Landmark Skyscrapers - Vietnam

Construction



Prestressed slab
Ireland



Rotterdam LNG Tank
Netherlands



Dam ground
anchor - USA



Nuclear power station

Prestressing and anchor tie rods

Internal and external prestressing tendons for civil engineering structures, buildings (prestressed beams and floors), bridges, nuclear containment vaults, liquefied natural gas (LNG) tanks, water towers, silos, wind turbines (Freyswind).

Solutions implemented:

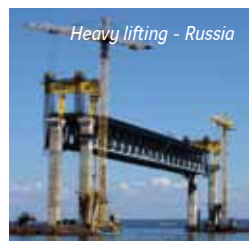
- C range, cryogenic or electrically insulated system C for civil engineering structures,

- B and F ranges, anchors and flat ducts for prestressed slabs,
- X range for circular prestressing of tanks or pipes.

Construction methods

Deck construction: Incremental launching, sliding and rotation; progressive cantilever span-by-span construction; precast beams and segments; industrial-scale underpasses; Autoripage®; Autofonçage®

Handling and lifting: Using jacks or cables, with APS (Air Pad Sliding) systems.



Heavy lifting - Russia



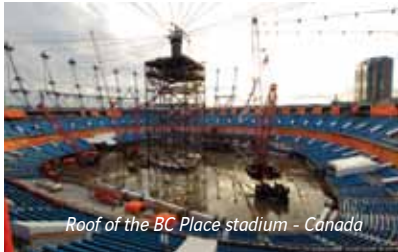
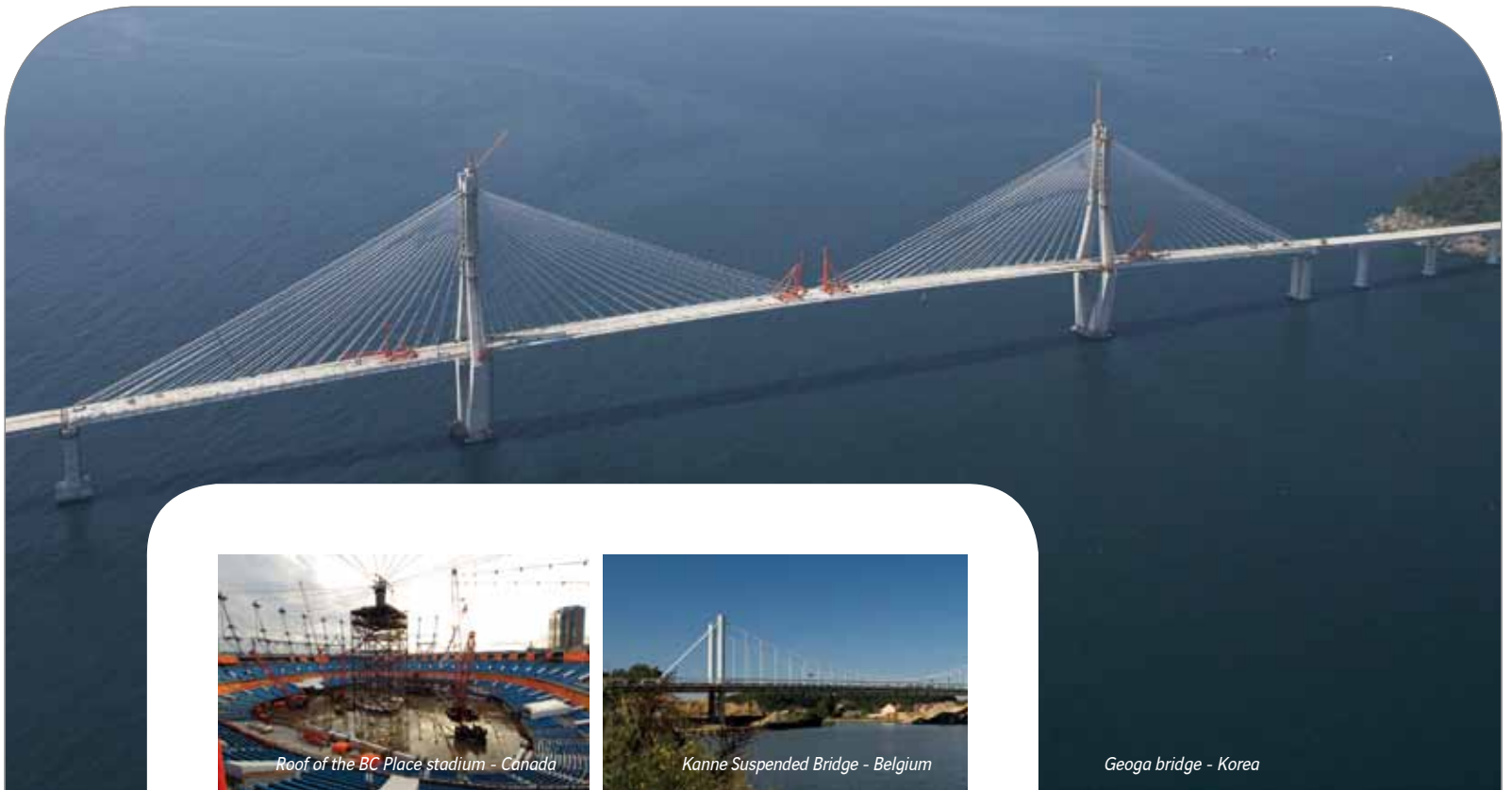
Air Pad System
APS Hebetec



Autoripage 20 000 tonnes
Micheville - Luxembourg



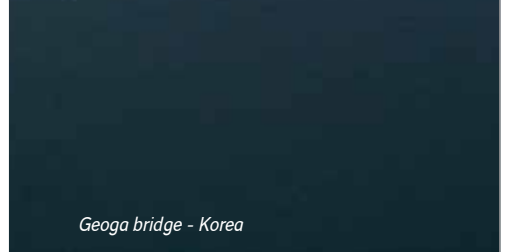
Segmental construction,
LRT Metro - Dubai



Roof of the BC Place stadium - Canada



Kanne Suspended Bridge - Belgium



Geoga bridge - Korea

Cable-stayed structures

Freyssinet high-performance stay cables: innovative and unrivalled solutions in term of mechanical fatigue and corrosion resistance; flexibility of installation (Isotension patented tensioning system); individual replacement or adjustment capability, damper, fire protection.

Cables for suspended structures and hangers: H2000, H1000 systems, carbon cable, cohesive strand - including the new system Cohestrand (service life in excess of 100 years) and the F-Spinning anchor solution.

Structural accessories

- **Expansion joints** (complete range, elastomeric, teeth, bridge, modular...), **bearings** (elastomeric, pot, spherical);
- **Seismic protection devices** (isolators, dampers, shock transmitting connectors);
- **Barrier connectors.**



Cipec WP joint
Le Havre Viaduct



Transpec



Mechanical bearing

Protect

Repair

Repairs

Reinforce

Maintain

Shotcrete - France

Historic buildings



Industrial structures repair

A double skill: structural and chemical to improve, preserve, secure

The ageing of structures generates a growing need for renovation, exacerbated by the increasing stringency of regulatory requirements. As an extension of its new build business, Freyssinet has developed expertise and know-how in structural repair through exclusive solutions under the **Foreva®** label.

Foreva® Solutions bring together Freyssinet's skills in structural design, manufacturing and product development and application on site by specialist teams.



Balcony reinforcement - France

Extending the service life of structures, the **Foreva® solution** has numerous areas of application:

- bridges and civil engineering structures,
- buildings,
- water civil engineering structures,
- industrial structures,
- historic buildings,
- tunnels.

For a variety of materials:

- concrete • steel
- wood • stone

Repair



Electrochemical treatment against corrosion



Foreva® CP Mesh cathodic protection

Foreva® GP Zinc galvanic protection

Protect

Protecting concrete

- Protective coating
- Physical and chemical surface treatment using corrosion inhibitors
- Electrochemical treatment of concrete coating
- Galvanic protection
- Impressed current cathodic protection

Repair

Concrete repair and protection

- Crack treatment
- Concrete re-profiling
- Sealant for water civil engineering structures



Dam repair

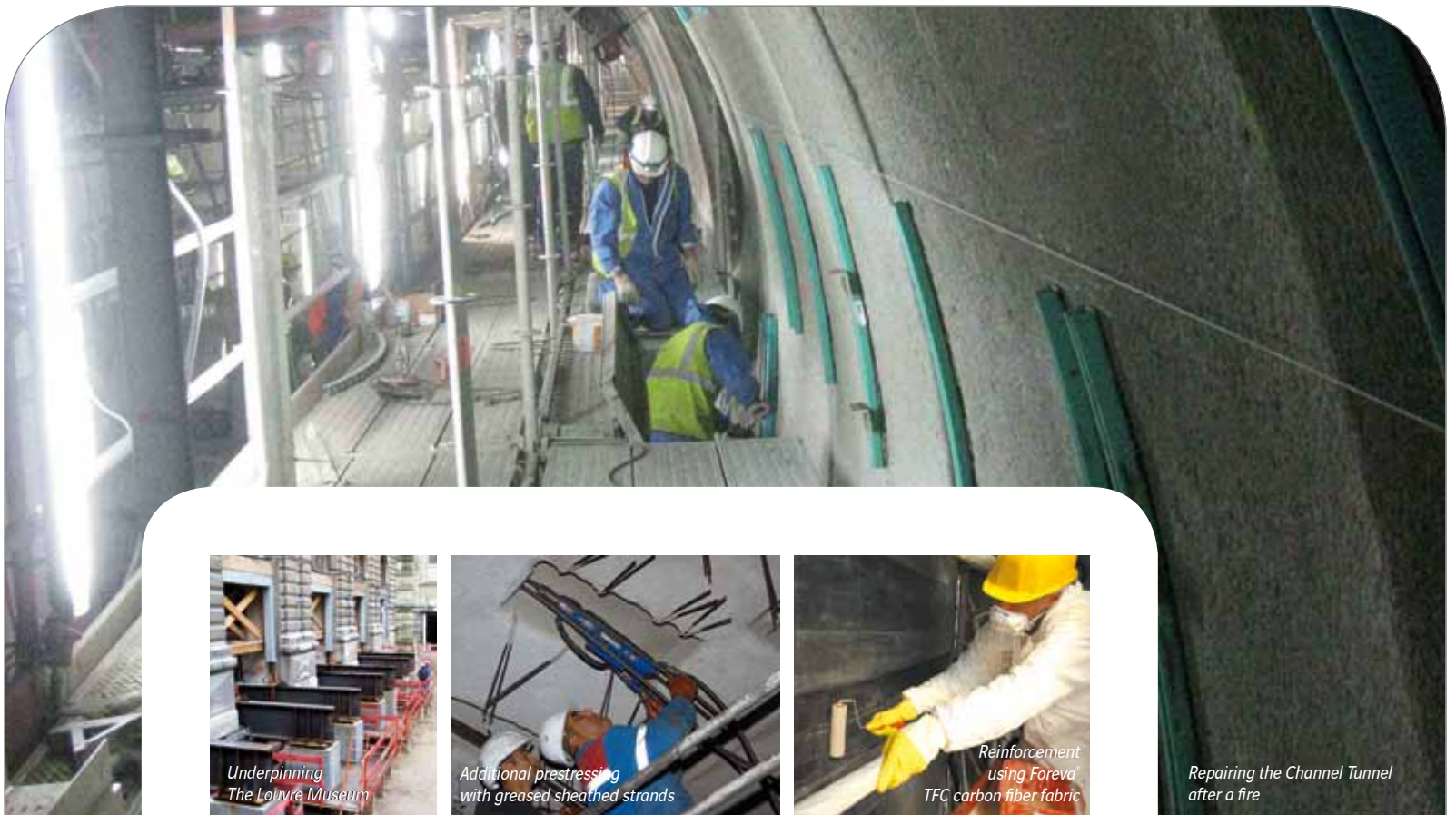


Sealant application



Reconstructed and treated concrete





*Underpinning
The Louvre Museum*



*Additional prestressing
with greased sheathed strands*



*Reinforcement
using Foreva[®]
TFC carbon fiber fabric*

*Repairing the Channel Tunnel
after a fire*

Reinforce

- Additional prestressing • Dry process shotcrete • Carbon fiber bonded composite
- Reinforcement of metal structures • Reinforcement of timber frameworks • Underpinning with micropiles

Maintain

- Replacement of expansion joints and bearings • Maintenance and replacement of stay cables
- Replacement of carrier tendons and hangers on suspension bridges • Structural inspection and instrumentation
- Maintenance of concrete, timber and steel structures



*Replacing stay cables
on the Penang Bridge
Malaysia*



*Replacing
expansion joints*



*Structural inspection
Cooper Bridge - USA*

Technical expertise at customers' service

Freyssinet is involved along the entire length of the project value-added chain, from design, examining construction methods, engineering and equipment supply to the performance of the work, and further in the proactive inspection and maintenance of structures (asset management). Its **engineer/contractor** culture guarantees viable and durable solutions that benefit from substantial feedback and are truly matched to the constraints and opportunities pertaining to every situation.



Design

Each of our subsidiaries has extensive engineering capabilities, allowing them **to work alongside clients in analyzing their objectives** and putting together solutions incorporating all of the specific local constraints, which in the long term constitute the overall expertise of the company.



Manufacturing

The exclusive products and processes manufactured at its Freyssinet Product Company (FPC) plant and tested in its laboratories meet the most precise standards in terms of technical performance and durability, giving **Freyssinet complete control over the quality of its products.**



Implementation

Committed professional teams share one culture, which combines the quest for technical excellence, a sense of service and unfailing fulfilment of commitments made to the customer.

Freyssinet also places great emphasis on training, and pursues its training policy through the **Freyssinet Academy.**

The innovation gene

Freyssiwind, turnkey construction of hybrid wind towers

Innovation is in Freyssinet's blood. Since Eugène Freyssinet invented prestressed concrete in 1928, the company has based its growth on **dynamic innovation**, as evinced by numerous technological advances that have changed the civil engineering world. To perpetuate the pioneering spirit of its founders, the company implements and invests heavily in an **active research and development policy**, lead by a Technical Department and a worldwide network of experts working closely with research laboratories and universities. Evidence of this innovative drive can be found in the constant enhancement of the company's expertise to the benefit of its clients, and includes stay cables, suspension cables, regeneration of materials, structural maintenance, the Foreva® repair label, and more.

Freyssinet develops exclusive products and processes in all its areas of operation, for which almost 200 patents have been filed over the past two decades.

Some recent innovations

Construction



Cohestrand®, the cohesive strand for suspended structures (bridges, stadium roofs, etc.)

B range floor prestressing anchors



High fatigue resistance, compact sheath stay cables



Freyssiflow high stability prestressing grout



Transpec hydraulic dampers without seal

Repair



Foreva® solutions for repairing, reinforcing and protecting structures



Carbon fiber fabric composite (Foreva® TFC Solution) for reinforcing structures



Cathodic corrosion protection (Foreva® CP Mesh Solution)

Quality, Safety, Environment: Freyssinet's commitment



QUALITY, SAFETY AND ENVIRONMENT POLICY

« Sustainable technology » expresses our commitment to offering our customers lasting and **high-quality solutions** that **respect the environment**, and to providing our employees with an environment where **safety, risk management and innovation** are a constant state of mind. The satisfaction of our customers, the health and safety all personnel as well as environmental preservation, are fundamental issues at stake in our activities.

Our management system will progressively revolve around a **single document** incorporating three processes covering the concepts of **Quality, Safety and respect for the Environment**.

Each organisation must implement and **ensure effective and integrated** compliance with this unique management system.

MANAGEMENT COMMITMENT

I am calling for managers' attention and energy to disseminate this focus on excellence and professionalism through daily actions.

NEED FOR TRANSPARENCY

No organisation is perfect, transparency, highlighting areas for improvement, solutions to achieve progress and best practices are our strongest assets for the future, to distinguish us from our competitors, control our risks and consequently our profitability.

QUALITY

The quality of our products, solutions and services ensures the satisfaction of our customers and maintains a long-term image of technical expertise. Each of our employees, by understanding their individual added value, must sign up to this quest for quality.

SAFETY

Managing health and safety on our sites is a **non-negotiable objective** within our company. This is our first duty to our employees. Notifying our partners and customers of any risk situation is one of our key specialist duties.

Our tools (H & S Plans, site induction, tool-box talks, HAZID HAZOP, etc) must be deployed in line with the specific features of our technical solutions.

PROTECTING THE ENVIRONMENT

Construction is a major activity that has an impact on the environment.

Our company often plays a role in the selection of the processes and materials used.

Protecting the environment on the level of our activities represents a series of simple and often cost-effective actions.

- Minimising the materials used by making better use of our technologies
- Reducing transportation of materials, equipment and staff through better planning and the use of video conferencing
- Incorporating the environment in our design work and investments
- Taking daily action to ensure that our repetitive tasks are less polluting and use the minimum of resources.

IT'S UP TO US ALL

Each individual, in his or her role, must follow the procedures in the QSE plans with an open mind in relation to progress and transparency. Compliance with this policy plays an important role in evaluating all employees, in particular those with managerial responsibilities.

This commitment is in the interests of our employees, our customers and our shareholders, because it contributes towards our productivity and consequently our economic success.

Jérôme Stubler



FREYSSINET
SUSTAINABLE TECHNOLOGY



SOLETANCHE FREYSSINET



Quality as a guarantee of performance and customer satisfaction

From design to implementation, the Freyssinet Quality Management system is completely integrated into all areas of the business.

It guarantees total quality of products and services and enables the company to meet its customers' challenges and needs. Freyssinet has developed a networked management system in order to promote communication between its various subsidiaries.

This work structure optimizes processes and ensures optimum performance levels at all company locations worldwide.



Freyssinet's primary concern: ensuring everyone's safety

In order to ensure everyone's safety and prevent accidents, the company has produced a set of common international safety rules. The sole aim of these rules is to safeguard the physical well-being of its employees.

This commitment is reflected through risk analyses, health and safety plans and regular audits of its facilities and sites.

It is accompanied by an extensive communication and risk awareness program, implemented at all of Freyssinet's subsidiaries worldwide. Every measure is taken to achieve the goal of accident-free work.

The safe way is the only way



Water tower repairment with Foreva® solutions

Protecting the planet's resources through innovation

Through the obvious advantages resulting from the use of high-performance materials-saving technologies for building new structures, the use of Foreva® solutions to extend the service life of existing structures, and Freyssinet's development of renewable energies, Freyssinet contributes to sustainable development in all business areas.

Freyssinet has also created the Program for Impact of Construction (PIC), which is used to assess the environmental benefits of alternate solutions compared with the basic solution.

The solutions developed by Freyssinet bring notable benefits in terms of materials and design life, reducing CO₂ emissions and maintenance of existing structures.



Our locations



Freyssinet has a presence in 60 countries with more than 5,000 employees across five continents. Its global structure combines strong local roots and service with worldwide expertise.

NORTH AND SOUTH AMERICA

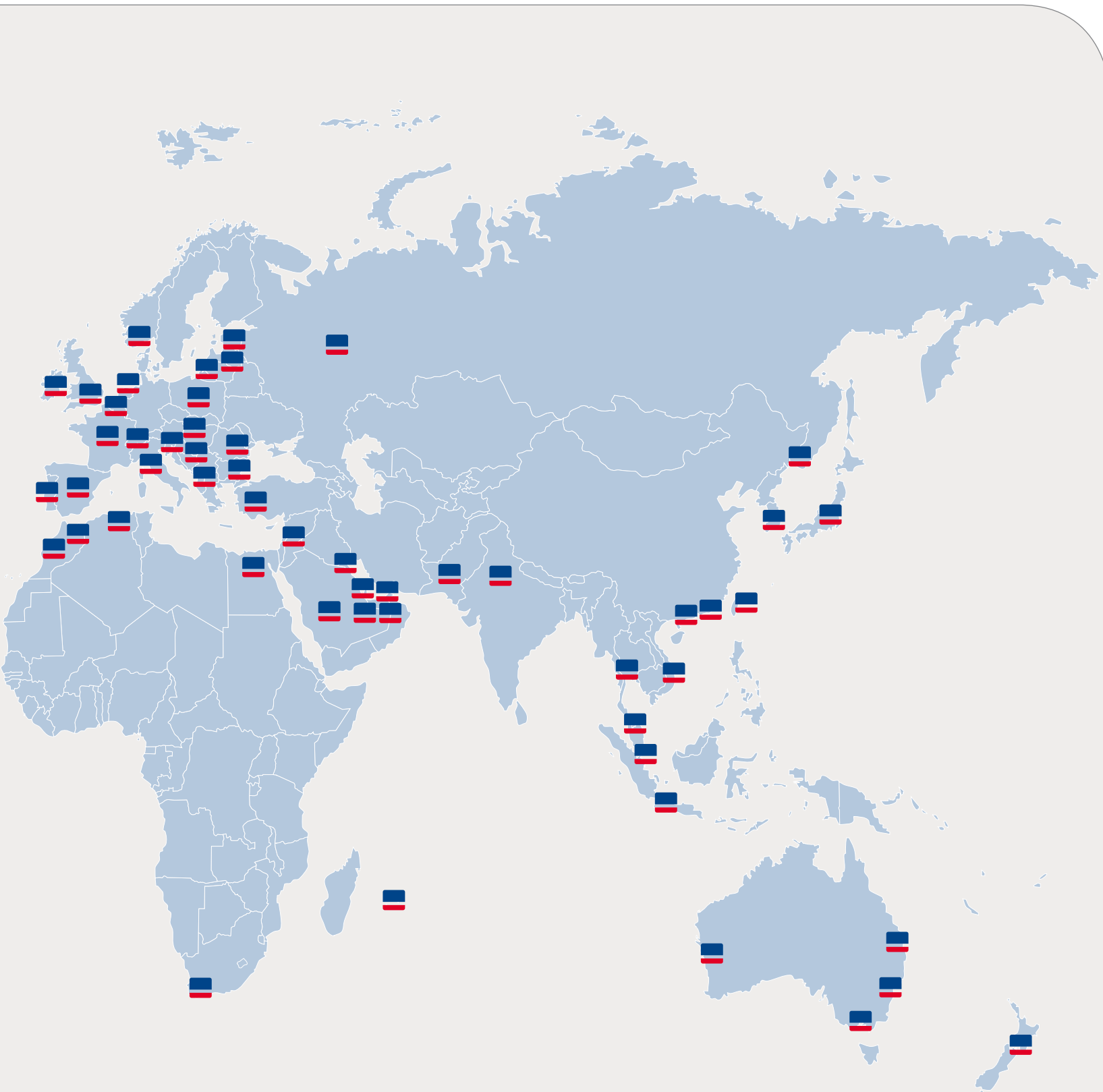
- Argentina
- Brazil
- Canada
- Chile
- El Salvador
- Mexico
- United States
- Venezuela

EUROPE

- Belgium
- Bulgaria
- Estonia
- France
- Hungary
- Ireland
- Italy
- Latvia

- Lithuania
- Macedonia
- Netherlands
- Norway
- Poland
- Portugal
- Romania
- Russia

- Serbia
- Slovenia
- Spain
- Switzerland
- Turkey
- United Kingdom



**AFRICA
AND MIDDLE EAST**

- Abu Dhabi
- Algeria
- Dubai
- Egypt
- Jordan
- Kuwait
- Morocco

- Oman
- Qatar
- Saudi Arabia
- Sharjah
- South Africa
- Tunisia

ASIA

- Hong Kong
- India
- Indonesia
- Japan
- Macau
- Malaysia
- Pakistan
- Singapore

- South Korea
- Taiwan
- Thailand
- Vietnam

OCEANIA

- Australia
- New Zealand



Consolidating social commitment and corporate citizenship

The need for sustainable development is one of Freyssinet's key concerns, which is why the company has an innovative, **forward-looking social policy**. Every year, Freyssinet devotes 5% of its turnover to train its employees in order to give each individual the opportunity to acquire new skills and thus ensure his or her professional development within the company.

Furthermore, Freyssinet is keen to promote integration, diversity and equal opportunities, seeing them as guaranteed means of developing corporate spirit, cohesion and sharing know-how worldwide. Always attentive to its surroundings, Freyssinet also supports joint initiatives from its employees for local development and education.

Finally, with the aim of contributing to the society around its operating sites, the company strives to employ local personnel.



"House of Hope" project developed by Freyssinet in Malaysia

“ Together
for the success of your projects ”



FREYSSINET

www.freyssinet.com