

SOLETANCHE FREYSSINET  
**2020**



**Soletanche Bachy**  
**Menard**  
**Terre Armée**  
**Freyssinet**  
**Nuvia**  
**Sixense**

**W**ith faces bathed in the vibrant glow of fireworks, their laughter chiming with the lightheartedness of the moment, friends and family wished each other the best for the coming year. The time was four minutes after midnight, and it was the first day of 2020. Meanwhile, on the other side of the world, a virus with a curious name – coronavirus – continued to spread, causing the disease that would be called Covid-19. None of the French media were yet talking about the infection that had appeared in a Chinese province a few weeks earlier and had already claimed many lives.

Very soon, the mirth gave way to concern. Information trickled in, and each day's news would contradict that of the day before. One thing was certain: Covid-19 was spreading around the world and no one really knew how to stop it. On 30 January, the WHO declared a global health emergency. In February, the epidemic made its entrance into Europe. Italy, Spain and then France felt the brunt of the blow. The following month, the virus spanned the Atlantic and made the Americas the new epicentre of the epidemic.

On 11 March, the WHO declared the Covid-19 epidemic a pandemic and urged governments to take every possible step to curb the virus' spread. Many countries responded by enforcing lockdown and quarantine measures. The enemy we were fighting was an invisible one that had taken the lives of thousands of people who had crossed its path. The whole world set to covering their faces with masks, applying hand sanitiser systematically and keeping their distance from one another.

We were experiencing an unprecedented public health and social crisis. People no longer interacted spontaneously. The novel disease was a constant preoccupation, but despite that – despite the fear of losing a loved one, despite the stifling solitude of hunkering down at home – women and men in every country refused to yield to inertia and continued to push ahead. Covid-19 had met its biggest opponent.

At Soletanche Freyssinet as well, our teams formed a united front in the face of unanticipated adversity and challenges, showing extraordinary resilience in an equally extraordinary situation.

At every worksite worldwide, they adapted the way they worked to accommodate additional protective measures, keep everyone safe and move forward on projects that were essential to the stable development of cities and countries.

In many regions of the world, our teams joined in an impressive show of support for their fellow citizens, enabling us to assist care workers by supplying masks and hand sanitiser, amongst other actions. Our customers and partners were steadfast in their commitment to help keep business going.

Looking beyond the numbers and our notable achievements in 2020, it is undoubtedly this outstanding engagement, dedication and courage that we will remember most from these 12 months. There is indeed tremendous promise for the future.

# Thank you, one and all.



Watch the highlights of 2020  
for Soletanche Freyssinet

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They  
**trust**  
us with  
their future

TANGIBLE ACTIONS  
FOR GREENER PROJECTS

Explore  
Soletanche Freyssinet



## Six brands serving an array of specialty networks

Soletanche Freyssinet encompasses an unparalleled range of expertise and brands in the field of construction and engineering.

**Soletanche Bachy, Menard, Terre Armée, Freyssinet, Nuvia** and **Sixense** embed their technical excellence into the performance and sustainability of projects across four main business activities: soils, structures, nuclear and digital services applied to construction and infrastructure.



## **Soletanche Bachy**

Soletanche Bachy is a world leader in foundations and soil technologies. The company has around 80 subsidiaries and branches operating in 60 countries, which provide both public- and private-sector customers with high-performance, innovative geotechnical solutions. It operates both as a general contractor and as a specialist subcontractor to design, build, rehabilitate and maintain all types of structures including ports, dams, car parks, metros, tunnels, energy facilities, and buildings.

## **Menard**

A key soil investigation, improvement and remediation provider, Menard develops foundation solutions based on ground improvement and reinforcement technologies. It operates throughout the infrastructure life cycle and also offers its expertise in soil investigation and remediation through its ConeTec and Remea brands.

## **Terre Armée**

Designers and suppliers of civil engineering solutions that retain, cross, and protect, Terre Armée has unrivalled experience in the field of reinforced backfill solutions and soil-structure interaction. Its techniques' wide range of applications provide solutions for a variety of markets, including highways, railways, industrial and energy, as well as environmental and water engineering projects.

## **Freyssinet**

Freyssinet sets the standard in specialised civil engineering. Post-tensioning, construction methods, cable-stayed structures, structural fittings, structural reinforcement, concrete repair, reinforcing steel protection, earthquake protection and specialised maintenance – Freyssinet puts its specialist services to work in two major areas: construction and structural repair.

## **Nuvia**

Drawing on its experience in the nuclear industry, Nuvia supports its industrial customers in sensitive and highly regulated environments throughout the life cycle of their installations. Nuvia operates in numerous business sectors, including nuclear energy, civil and military defence, health and the environment, offering its clients a full range of support services, engineering and the products necessary for the design, construction, operation and dismantling of their industrial installations. Nuvia works alongside its clients, guaranteeing the best levels of safety and performance to build a safer, cleaner and sustainable world.

## **Sixense**

Sixense supports clients during the design, construction, maintenance and deconstruction phases of their facilities and infrastructure. Its mission is to monitor the condition and behaviour of structures and infrastructure, to secure their construction and operation, and to optimise their maintenance. Sixense's activities are organised around four areas of expertise: engineering, monitoring, software solutions and process digitisation, and digitisation of existing systems.



# Nurturing trust

AN ECOSYSTEM  
OF GROUNDBREAKING EXPERTISE

The women and men at Soletanche Freyssinet put passion into their work every day to improve the daily lives of thousands of people around the world. Because each city and region is different, each project has unique challenges. That's why the management team's trust in the people at Soletanche Bachy, Menard, Terre Armée, Freyssinet, Nuvia and Sixense is both essential and enduring. The range of expertise possessed by these companies make Soletanche Freyssinet a major, trusted player in the building of the world we live in and the world to come.

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# Looking back at 2020, and our path forward

**MANUEL PELTIER,**  
SOLETANCHE FREYSSINET CHAIRMAN



## What is your takeaway from 2020?

— **Manuel Peltier:** The Covid-19 pandemic is probably one of the most severe crises that we have ever experienced. Thanks to a very strong recovery in the second half of the year, we were nevertheless able to finish the year with revenue of €3.26 billion, only a 2% decrease from 2019. We owe this achievement to the significant efforts made by our dedicated teams, who were always active, even in countries where the public health situation was very challenging. Our performance also reflects the trust placed in us by our customers worldwide.

## What were the consequences of the Covid-19 crisis for Soletanche Freyssinet's activities around the world?

— **M. P.:** The Covid-19 crisis impacted our activities to varying degrees. Among our companies, Freyssinet was hardest hit by the effects of the pandemic, reporting a 15% decline in its revenue compared to 2019. With regard to locations we mainly experienced worksite shutdowns

in Europe, Latin America and Asia, where a variety of stay-at-home measures were enforced. This negative impact was mostly offset by the organic growth of our markets and the robust activity in North America and Oceania in particular, where, notwithstanding the many measures taken to protect our teams, business was able to continue.

## What visibility do you have for the first months of 2021?

— **M. P.:** Despite the ongoing health crisis, our order intake remains high and our backlog stands at €3.8 billion. This record level is slightly higher than in 2019, which gives us good reason to be optimistic about the coming year.

## What were the most emblematic contracts signed in 2020?

— **M. P.:** There are so many... it's always hard to pick just a few! At Soletanche Bachy, what first comes to mind are the C5 and C7 packages for the City Rail Link metro line in Auckland, New Zealand. We were also thrilled to have signed onto the Puerto Bolívar port extension

project in Ecuador. Menard's teams won a major soil remediation contract in Bydgoszcz, Poland. In the United States, Terre Armée signed a contract to design and install Terre Armée® walls along the I-635 motorway in Texas. Again in the United States, Freyssinet will undertake repairs for the Fort McHenry Tunnel in Baltimore, Maryland. Freyssinet's teams were also awarded the contract for the supply of prestressed concrete to the Paks nuclear plant in Hungary. For Nuvia, a key win was the signing of the LTCC (long-term civil work contract) framework contract for the international ITER project. Last but not least, Sixense secured a number of monitoring contracts, including for the HS2 high-speed rail project in England.

**Will today's global crisis require Soletanche Freyssinet to adapt its business model?**

— M. P.: Our geographic diversification and decentralised operations are more appropriate than ever. They are assets that enabled us, in an unfavourable context, to make the right decisions and stay close to our customers. Our order backlog attests to the resilience of the specialty works sector on an international scale. It also shows that Soletanche Freyssinet's areas of expertise are well matched to the needs of its markets. However, although we achieved encouraging results in 2020, we were forced to reshape our organisation in regions where activity had shrunk, by limiting hiring and, sometimes, freezing wages. These are always difficult decisions to make, but such collective efforts are critical to enabling the company to weather the crisis.

**“Our geographic diversification and decentralised operations are more appropriate than ever. They are assets that enabled us, in an unfavourable context, to make the right decisions and stay close to our customers.”**

**How is Soletanche Freyssinet rising to the challenges of the environmental transition?**

— M. P.: Soletanche Freyssinet has committed to reducing its carbon emissions by 40% by 2030. This is an ambitious, but also necessary, target for the world we live in. We are a key player in the transformation of cities and regions, so we have a pivotal role to play for current and future generations.

**In more concrete terms, what steps are you taking?**

— M. P.: To reach the target we set, we will focus on two factors: reducing our consumption of fossil fuels and retooling our techniques to make them more environmentally virtuous. For example, we cut back on fuel consumption by electrifying our entire fleet of forklifts at Roger Bullivant in England and developing an electric Hydrofraise® for the Testimonio project in Monaco. This is just the beginning, and we need to do more. We are adapting the way we work by massively increasing our use of low-carbon concrete from the Exegy brand. Since the technology is mature, the next step is to deploy it on a very large scale, working together with our customers, architects and engineering offices. And I haven't forgotten the many individual initiatives we are taking in our business units, such as installing solar panels on several of our projects.

**Does your company ActivSkeen have a key role in this environmental strategy?**

— M. P.: Absolutely! With ActivSkeen, which designs and manufactures photovoltaic building envelopes, we are investing in new markets for energy-neutral construction. As standards grow more stringent, low-footprint technologies will become indispensable in coming years. We have a long journey ahead of us, but what's most important is to start and to never stop moving forward.

**Soletanche Freyssinet has a long tradition of innovation. Do you continue to innovate? In what areas?**

— M. P.: Innovation is part of our DNA, and each Soletanche Freyssinet company regularly engineers new methods and techniques to meet its customers' needs. These evolutions to our working methods and solutions are powered by major innovations – the same innovations that will shape our future construction methods. This is the case, for example, for the partnership that Freyssinet has entered into to build a 3D-printed concrete footbridge by 2024.

**How is business for Sixense, the new brand you created in 2016?**

— M. P.: Sixense's activities are organised into four divisions, two of which are long-standing – namely, Engineering and Monitoring – and two more recently created divisions for digital projects, which are Mapping and Platform Solutions. In 2020, the Engineering and Monitoring divisions saw rapid growth in France and abroad. The Mapping and Platform Solutions divisions are investing in the development of new services for the construction industry. In 2020, we acquired a company called Helimap to round out our digital terrain mapping capability.

**“We are a key player in the transformation of cities and regions, so we have a pivotal role to play for current and future generations.”**

**What are you doing to attract new talent and employ more women?**

— M. P.: Undeniably, we need to recruit today the talent that will be driving our company tomorrow. That's why we have not cut back on the hiring of young people, regardless of the pandemic. We are also particularly committed to gender equality and are aiming to place more women in technical and operational roles. Our HR teams are attuned to this goal and taking every step to achieve it. Soletanche Bachy has therefore been collaborating with "Elles bougent", an organisation that runs concrete initiatives to promote engineering careers among women.

**A last word?**

— M. P.: With our order backlog, we can be optimistic about 2021. Our close-knit teams are dedicated and passionate about their work. Our Group is solid and our performance this past year has demonstrated, once again, that our decentralised business model is truly an asset. The trials of 2020 have strengthened our bonds of trust with our loyal customers. Trust – that probably says it all!

# Governance

Spearheaded by the Chairman of Soletanche Freyssinet, the Coordination Committee's 12 members work together to develop and implement the Group's strategy.



**CHRISTOPHE DAUCHY**  
CHIEF EXECUTIVE OFFICER,  
SOLETANCHE BACHY

**How did Soletanche Bachy do in 2020?**

Soletanche Bachy pulled through the health crisis rather well, mainly thanks to the local strategies implemented by our subsidiaries and our teams' strong effort to adapt to the new situation. Our revenue in 2020 reached €1,579 million, comparable to 2019. Our order backlog is increasing, which is proof that our markets are growing.

**What is the outlook for 2021?**

Despite the uncertainty brought on by the pandemic, we are optimistic for 2021. We are well equipped now to move forward. Given our large order backlog and the upswing observed at the end of 2020, we are expecting steady growth for our activity.

**What event stood out the most in 2020?**

In 2020, we launched our environmental action plan, along with its local versions, in all our subsidiaries. We aim to reduce our CO<sub>2</sub> emissions by 40% by 2030. This is a strategic goal that we must act on immediately by offering our customers solutions to address environmental and climate change issues.

**STÉPHANE ABRY**  
MANAGING DIRECTOR, SOLETANCHE BACHY

**“** I would like to applaud the resilience and professionalism of our teams, who enabled Soletanche Bachy to dampen the shock of 2020. In 2021, more than ever, we must support our customers as closely as possible, stay rooted in our markets and keep focusing on operational and commercial excellence, without which nothing can be achieved. **”**





**MARC LACAZEDIEU**  
CHIEF EXECUTIVE OFFICER, MENARD

**How did Menard do in 2020?**

With revenue at €411 million, earnings were almost identical to those of 2019. This strong performance shows how effective our decentralised model is. Our soil remediation (Remea) and soil investigation (ConeTec) businesses were the most impacted by the crisis.

**What is the outlook for 2021?**

Our business outlook is positive because our markets are growing. In addition, there are still many regions in the world where we can expand our activities further. Our Scale it Up strategy, launched at the end of 2019, should continue to create value.

**What event stood out the most in 2020?**

2020 shone a clear light on our teams' courage and engagement. Our people stayed united, supportive of each other and dedicated to their work, despite all the difficulties. Well done!

**VINCENT OUDIN**  
CHIEF EXECUTIVE OFFICER, TERRE ARMÉE

**How did Terre Armée do in 2020?**

Terre Armée posted revenue of €262 million, up 30% from 2019. This outstanding performance was largely driven by activity in the United States, which was especially strong. Our order backlog is stable and remains high.

**What is the outlook for 2021?**

2021 will be the first year of implementation of our four-year strategic plan, which we have called Advance 2024. The plan will guide the expansion of Terre Armée into new growth markets and also enable us to develop and to diversify our business. We can look to 2021 with optimism.

**What event stood out the most in 2020?**

The absolutely unprecedented value creation by The Reinforced Earth Company USA of over €200 million, including a record-setting contract of \$50 million for the I-66 motorway!





**PATRICK NAGLE**  
CHIEF EXECUTIVE OFFICER, FREYSSINET

#### How did Freyssinet do in 2020?

Our activity was impacted by the pandemic, with revenue at €620 million, down 15% from 2019. The decline was sharpest in the Middle East, our Spanish-speaking markets, and in Major Projects. Nevertheless, business bounced back in the fourth quarter to a level comparable to 2019, with a high order intake, showing promise for 2021.

#### What is the outlook for 2021?

We are entering 2021 with an order backlog of more than €800 million, boosted by major contracts recently won by the Major Projects division. This pipeline is supported by growth regions such as Asia, the United States and Australia and by our robust innovation capabilities, particularly in structural repairs.

#### What event stood out the most in 2020?

I would like to commend our teams for their resilience in weathering the storm in 2020. Our decentralised model gave us the agility to adapt. I would also like to applaud our teams' perseverance in continuing to diversify our repair activities, win new markets and promote our innovations, such as 3D-printed concrete.

**BRUNO LANCIA**  
CHIEF EXECUTIVE OFFICER, NUVIA

#### How did Nuvia do in 2020?

2020 was dominated by Covid-19 and its impacts on our business activities. Without exception, all our subsidiaries experienced shutdowns, project interruptions and/or delays, leading to a decline of about 10% in our revenue, which stood at €290 million. However, most of our teams remained on the job, including throughout the challenging lockdown periods, to ensure the continuity of those operations involved in providing electricity for our customers.

#### What is the outlook for 2021?

We expect to see a high level of activity in 2021, after a year of disruptions due to the implementation of exceptional health protection measures. We will take this opportunity to optimise our projects' performance and deepen customer support, providing ever more reliable and effective assistance, for example, by fostering a culture of shared project management. In today's context of critical environmental issues, our teams are proud to be contributing to the production of low-carbon energy.

#### What event stood out the most in 2020?

During the different lockdown periods imposed in the countries where we do business, our teams working at nuclear plants remained on the front line, participating in collective efforts by locally sustaining the strategically important energy production sector.





**PASCAL BERGER**  
CHIEF EXECUTIVE OFFICER, SIXENSE

**How did Sixense do in 2020?**

Despite the strong impact of Covid-19 during the year, our revenue for 2020 increased by 5% to reach €88 million, while our order intake rose significantly. This growth is due to the innovative nature of our activities as well as our construction and infrastructure solutions that address highly strategic issues, such as environmental protection, sustainability of structures, and so on.

**What is the outlook for 2021?**

In line with our performance in 2020, growth in 2021 will be driven by large infrastructure projects worldwide, the acceleration of digital technologies in all construction and infrastructure management activities and the pressing need to maintain existing infrastructure in secure, operational condition.

**What event stood out the most in 2020?**

Sixense's ability to respond quickly to the health crisis in all its international entities and to fully mobilise its teams on certain strategic projects, such as our activities in the nuclear sector and the Grand Paris Express worksites.

**MARK DEARY**  
CHIEF ADMINISTRATIVE AND FINANCIAL  
OFFICER, SOLETANCHE FREYSSINET

**“** 2020 proved to us once again that our geographic diversification is a major asset, empowering us to balance the effects of the crisis in different countries. It is thanks to this diversity that we were able to end the year with revenue nearly equivalent to the previous year’s. **”**





**LORENZO ALESSI**

QUALITY, SAFETY, ENVIRONMENT DIRECTOR,  
SOLETANCHE FREYSSINET

“ Safety is a constant challenge: we must continuously improve, innovate, adapt and change. We have made significant progress [...] thanks to our transparency and by learning from our mistakes [...]. We must continue on this path to change people's behaviours; this is the key to safety excellence. In 2020, we also launched our new environmental ambition with action plans for all our business units. We are striving to find solutions to shrink our environmental impact.”

**XAVIER PLANCHON**

HUMAN RESOURCES DIRECTOR,  
SOLETANCHE FREYSSINET

“ Throughout the health crisis, we focused our attention on the women and men in our workforce. In every country where we operate, our teams showed impressive levels of engagement and solidarity. Their concrete and effective local initiatives constitute our strength.”





**GUILLAUME BILLAROCH**  
COMMUNICATIONS DIRECTOR,  
SOLETANCHE FREYSSINET

“ On projects around the world, everywhere we operate, what stands out is that we all share the same passion. It's a passion for technical excellence, for reaching new heights, for crafting innovations that will enable us to overcome obstacles – and the joy of experiencing these achievements together. Once again, despite the hardships of 2020, we were all in this together! ”

**ÉDOUARD SIRET**

CHIEF INFORMATION OFFICER,  
SOLETANCHE FREYSSINET

“ Information systems have gradually become a vital organ in companies' core operations and support functions alike. For several years, the IT department at Soletanche Freyssinet has been undergoing an international transformation, by scaling up infrastructure, implementing digital services and securing our IT environment. ”



# Soletanche Freyssinet

Six brands across four major business activities  
– soils, structures, nuclear and  
digital applied to construction –  
generating **€3,267 million** in revenue.

**22,600**

EMPLOYEES  
IN NEARLY

**100**

COUNTRIES

Argentina  
Australia  
Austria  
Azerbaijan  
Barbados  
Belgium  
Benin  
Bolivia  
Botswana  
Brazil  
Brunei  
Bulgaria  
Cameroon  
Canada  
Chile  
China

Colombia  
Costa Rica  
Côte d'Ivoire  
Croatia  
Cyprus  
Czech Republic  
Denmark  
Ecuador  
Egypt  
El Salvador  
Eswatini  
Ethiopia  
France  
Georgia  
Germany  
Greece

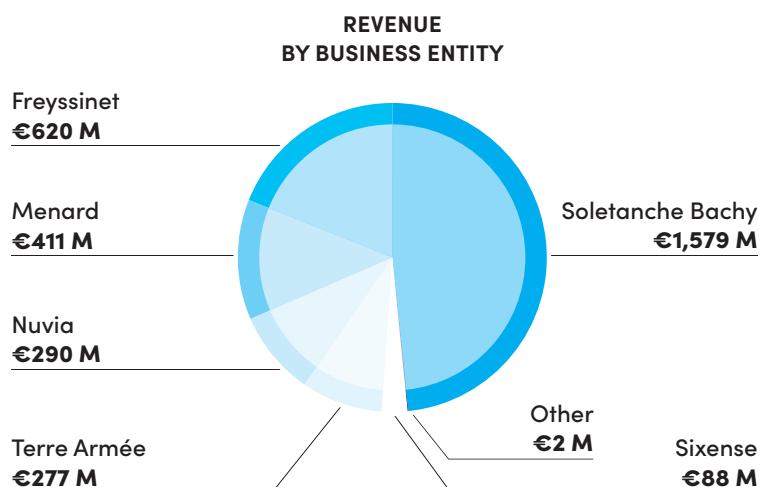
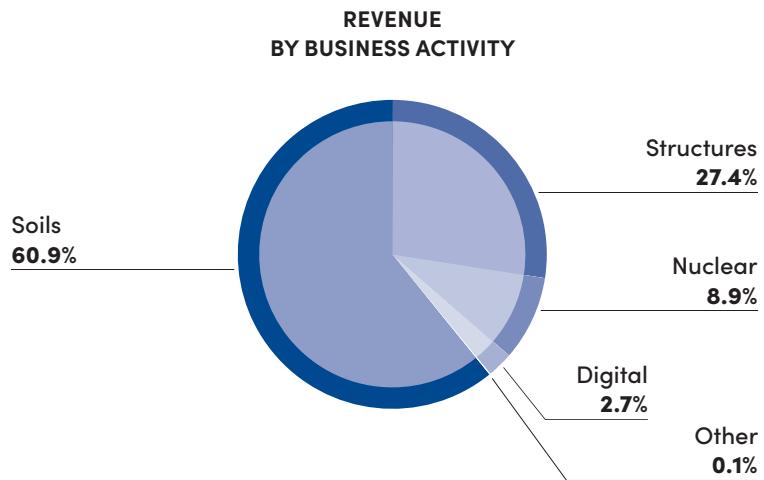
Guadeloupe  
Guatemala  
Honduras  
Hong Kong  
Hungary  
India  
Indonesia  
Iran  
Ireland  
Italy  
Japan  
Jordan  
Kazakhstan  
Kenya  
Kuwait  
Luxembourg

Macao  
Macedonia  
Madagascar  
Malaysia  
Mexico  
Monaco  
Morocco  
Mozambique  
Myanmar  
Namibia  
Netherlands  
New Zealand  
Nicaragua  
Norway  
Oman  
Pakistan

Panama  
Paraguay  
Peru  
Philippines  
Poland  
Portugal  
Qatar  
Romania  
Russia  
Saudi Arabia  
Serbia  
Singapore  
Slovakia  
Slovenia  
South Africa  
South Korea

Spain  
Sweden  
Switzerland  
Taiwan  
Thailand  
Tunisia  
Turkey  
Ukraine  
United Arab Emirates  
United Kingdom  
United States  
Uruguay  
Venezuela  
Vietnam  
Zambia

## Key figures



REVENUE

**€3,267 M**

ORDER BACKLOG

**€3,680 M**



# Earning trust

TECHNICAL EXCELLENCE  
TO SERVE OUR CUSTOMERS

Always looking ahead... that's the spirit in which the teams at Soletanche Freyssinet tackle new projects every day around the world. Here, deep foundations where we will build a beautiful performance hall. There, high-tech equipment to check that a nuclear power plant is operating safely. Over here, a drone on a mission to ensure safety at a worksite. And over there, stay cables that will hold up that bridge that will connect two riverbanks and bring regions together... Whatever the project, Soletanche Bachy, Menard, Terre Armée, Freyssinet, Nuvia and Sixense improve the daily lives of thousands of people worldwide.

Our purpose and our fundamentals **22**



**Jade**

Home care nurse  
Age 29  
Lille  
France

Interests

Gourmet cuisine  
Brunches with friends  
Yoga and Pilates

**I've been working as a home care nurse in the north of France for five years. What I love most about my job is being with people. When it's not vital, it's at least social. I spend the better part of my days on the road to go and see people who cannot leave home.„**



The purpose of Soletanche Freyssinet and its six companies is to improve people's daily lives and meet the major challenges facing the world today. Whether it's roads, tunnels, viaducts, metro tracks or airport runways, our teams contribute every day to designing and building the infrastructure of tomorrow.

#makingyour  
dayeasier

## Excellence in customer relations

Soletanche Freyssinet is committed to delivering excellence at every level of its projects. In addition to our technical innovation and competitive service, we seek to achieve **excellence in our customer relations**. That means providing **quality service** and ensuring that **our companies meet their commitments**.

We focus on operational excellence, especially when it comes to completing projects and honouring our contracts. **Productivity** (cost control), **delivering on schedule** (time management) **and meeting our contractual obligations** (rules) **are our top priorities**.

Rigorous management, tight spending, sound cash management and accurate forecasts are all ways we strive to achieve **operational excellence**.

## Our fundamentals



### Dam – COLOMBIA

Loyal customer: second project on the Ituango dam following its collapse.

**Soletanche Bachy**



### Railway – POLAND

New customer: soil improvement for the embankment of the Gdańsk Port railway.

**Menard**



### Avalanche barrier – ICELAND

Loyal customer: a second avalanche barrier was awarded to Reinforced Earth UK.

**Terre Armée**



### Bridge – MEXICO

Loyal customer: overall rehabilitation of the Papaloapan Bridge after initial repairs in 2015.

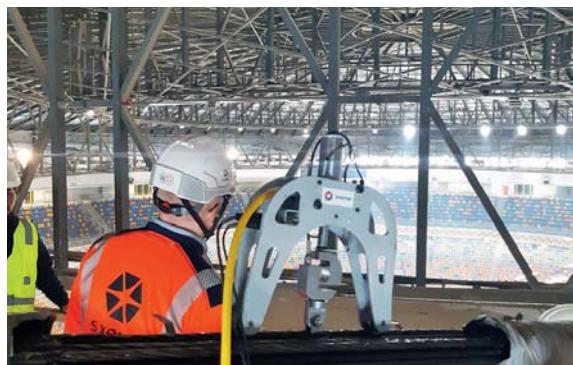
**Freyssinet**



### Nuclear power – FRANCE

Loyal customer: waterproofing at the Golfech nuclear power plant.

**Nuvia**



### Stadium – EGYPT

New customer: Measuring cable tension in the roof of Cairo Stadium to ensure infrastructure safety.

**Sixense**

By building offices, stadiums, ports and museums on five continents, Soletanche Freyssinet contributes to the economic development of the regions that are home to its projects. More than ever, construction is a way of serving people and supporting what they do.

#fostergrowth





## Elsa

Ceramic artist  
Age 33  
Auckland  
New Zealand

### Interests

- My cats
- Pizza
- 1950s rock and roll

“

I spend my days at my studio, which I set up three years ago in a so-called “underprivileged” area... The workshop actually created a tiny spark in the neighbourhood, which is now booming. Pottery is my primary passion, but as I've started something that contributes to the economic development of my neighbourhood, it also brings meaning to my life.”

# Engineering

Today we are a world leader in our businesses and specialties. One of the ways we have achieved that is by channelling our efforts into bringing excellence to our engineering. Excellence is what sets our services apart, defines our DNA and drives our companies. We nurture entrepreneurship, by challenging the status quo, optimising processes, inventing new techniques and bringing them to market.



## Development of ultra-high-performance strands

The first cable made up of 2,160 MPa strands was installed on the Saemangeum bridge in South Korea, after passing acceptance tests developed by the International Federation for Structural Concrete in November 2020. Testing is also in progress on 2,400 MPa cables used for bridge prestressing.

**Freyssinet**

## New applications for airport security

Our innovative solutions have enabled Nuvia to branch out into airport security systems by installing detection equipment and NuVISION gamma imaging cameras used to identify sources of radiation.

**Nuvia**





## Rollout of generative design

Generative design is a promising digital process that automates and speeds up low-value-added tasks to enhance productivity and profitability. Using dedicated design and visualisation software, a vast number of potential solutions meeting different specific constraints can be explored. By adjusting one or more parameters in a project, the software automatically produces a set of different technically viable iterations that can then be compared to select the solution that is best suited to the project. Thanks to generative design, engineers can devote more time to studying soil parameters, interpreting outcomes and developing models, while investigating a larger number of solutions.

**Soleilanche Bachy**



## Launch of Novia

Using artificial intelligence, Novia learns to recognise sounds from a site or its urban environment automatically and in real time.

**Sixense**

## Record crash test of a wall

Terre Armée completed a full-scale strength test in June 2020. A Terre Armée® wall sustained more than 5,000 kilojoules of impact force, thereby surpassing what had been, until then, the known limits of soil-structure interaction. The successful test set a world record for Terre Armée.

**Terre Armée**

## Widespread rollout of Omnibox

Menard subsidiaries are continuing to roll out the Omnibox solution on a large scale. This digital system monitors worksites and soil improvement machines from design through to production and maintenance, up to record drawings. The device interconnects different sensors, and features a touchscreen interface for operators and an online platform used to store and view data, prepare worksites and generate reports.

**Menard**



A photograph of a family of four in a study room. A man in a blue jacket stands behind a young boy who is sitting at a desk, drawing with colored pencils. A woman in a denim jacket sits on a chair, smiling. Another young boy sits at the desk, also drawing. The room is filled with bookshelves packed with books. A large white lamp hangs above the desk. A green poster with the alphabet is on the wall.

## Willem

Stay-at-home dad  
Age 49  
Lübeck  
Germany

Interests

- Interior design
- Cooking

“

Eight years ago, I inherited this charming little house in Lübeck in northern Germany. Droughts had led the facade to crack considerably. We had to carry out a lot of renovation work to create a healthy environment for my family to live in.”

In health and safety, Soletanche Freyssinet companies provide safe, actionable solutions, such as upgrading industrial or residential sites to seismic standards, monitoring worksites and engineering structures, implementing safety systems at nuclear facilities, and reinforcing buildings.

#careforall

# Safety

We are building the world of tomorrow. So we owe it to our employees and the thousands of people, including future generations, who will live in this new world to have a flawless safety record.



## Dissemination of our HSE manual

Soletanche Bachy has circulated a guide throughout its subsidiaries that covers all the health, safety and environmental issues that should be taken into consideration at a worksite. This illustrated, easy-to-read manual designed for all staff members lays down safety rules, procedures, best practices and major risks, including prevention and protection measures that should be implemented to eliminate or reduce risk.

**Soletanche Bachy**

## Automatic drain cutting system

Menard has patented an automatic drain cutting and installation system that can reduce risks associated with manual cutting when vertical drains are installed. This system was created and implemented for the first time in 2020 on a ground reinforcement project in the United States.

**Menard**

## Safety DNA Programme

Launched by Freyssinet France to elevate attitudes and managerial behaviour regarding safety, the Safety DNA Programme is planned to last three years and will involve 230 managers.

**Freyssinet**

## Award from the Royal Society for the Prevention of Accidents

For the eighth time, Nuvia has won an award for its occupational health and safety efforts from the Royal Society for the Prevention of Accidents (RoSPA). This award programme is the most important and oldest of its kind in the United Kingdom. It recognises the commitment to preventing occupational accidents and illnesses, and is open to organisations of all sizes from all industries in the UK and further afield. The programme focuses not only on accidents, but also on organisations' health and safety management systems.

**Nuvia**

**3.9%**

**0.34%**

**808,592**

### FREQUENCY RATE

number of lost-time workplace accidents  
× 1,000,000 / number of hours worked.

### SEVERITY RATE

number of days lost  
due to workplace accidents  
× 1,000,000 / number of hours worked.

### HOURS OF TRAINING ON HSE ISSUES

(Health, Safety and Environment)  
four times more than in 2019

## Benicio

Age 11  
Córdoba  
Argentina

Interests

- Attack on Titan
- Demon Slayer
- Jujutsu Kaisen

“

I love the last episode of Attack on Titan. The titan is huge! It's my favourite series. The story is so good. I watch it on mom's computer because I'm not allowed to touch my tablet during the week... But now I'm almost done with my homework. ”





We all charge our smartphone, turn on the heat, stream our favourite programme, turn on the tap or heat our oven without thinking about it. But all that consumes resources. The companies of Soletanche Freyssinet work every day to develop, build and upgrade dams, silos, nuclear power stations, water towers and wind farms on five continents.

#accesspower

# Corporate Social Responsibility

Soletanche Freyssinet serves its customers but also society at large.

Each entity takes its responsibility seriously, integrating sustainable development into its business operations in a pledge to address CSR issues. We are aware that, for our worksites to be successful, they must also respect the human values that form the foundation of our corporate culture.



## School supplies for a school in Colombia

In Colombia, Soletanche Bachy takes action to support the local population: 130 students at a city school received a supply kit, and their school was renovated with the support of the company and help from the community's employees, families and volunteers.

## Artists in Ghana promoting diversity

In Ghana, in partnership with the Ghana Association of Visual Artists (GAVA), a number of local artists deployed their talent on a Terre Armée® wall to capture the diversity of local cultural values and embellish the urban environment of the city of Accra.



## Tribute to Indigenous groups

In the United States and Chile, several Terre Armée® walls were painted with murals illustrating the history of Indigenous populations and local celebrities.



### Support for healthcare workers in Poland

In Poland, Soletanche Bachy and Freyssinet took part in #Razemdlaszpitali, an initiative to support local medical workers in fighting Covid-19. The programme helped 21 healthcare facilities in 16 cities across the country to buy 30,000 surgical masks, 3,000 litres of disinfectant, 1,630 face shields and 570 packs of protective gloves.



### Help for local organisations in Canada

In Canada, Sixense, Soletanche Bachy and Menard, via the Fondation VINCI pour la Cité, worked to set up exceptional assistance programmes to help local non-profit organisations. These solidarity-focused initiatives aimed to help people to cope with health, social and economic difficulties together.

### Dedicated to helping the needy

In December, Soletanche Freyssinet made a donation to the French organisation Les Restaurants du coeur. This gift helped provide 25,000 meals to those most in need.



### 3D-printed masks

In the Czech Republic, Nuvia used its 3D printers to print face masks in support of charity organisations in the Třebíč region.

### Professional integration

Staff at Freyssinet France took action to promote professional integration, such as hiring a trainee from an underprivileged area, and training two Afghan refugees on professional training contracts in collaboration with the French national agency for adult vocational training (AFPA).

### Breast Cancer Awareness

October is Breast Cancer Awareness Month in France, and to mark the occasion, Sixense was partner to a charity sporting event, the La Chartraine virtual race. A total of 217 participants registered, raising €2,170 for France's Ligue contre le cancer.



### Respectful partnerships with Canada's Aboriginal communities

Nuvia completed the first step in the certification programme developed by the Canadian Council for Aboriginal Business. The certification confirms Nuvia's commitment to create a diversified, inclusive and fair work environment for Aboriginal communities and to conduct its operations with due regard to human rights, while limiting environmental impacts.

To meet the great environmental challenges of the 21st century, Soletanche Freyssinet companies offer a wide array of techniques, and work every day to decontaminate soil, install solar panels on building facades, dismantle nuclear facilities and build prestressed concrete wind turbines to capture the highest and strongest winds.

#greenisgreat





## Emma, John, Terry and Franklin

Vernonia  
United States

### Interests

- Positive education
- Walks in the forest
- Vegetables from our garden

“

We left Portland to settle in Vernonia, 80 kilometres further north. That was something John and I both wanted, to raise our sons close to nature. Teaching them to respect the environment is the least we can do, but we believe it is up to them to shape the future of ecology.”



# Building the world on trust

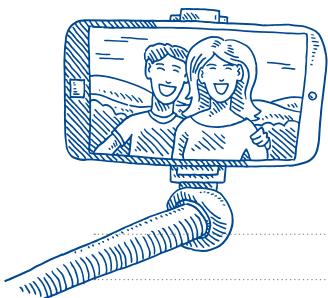
A WORLD TOUR  
OF OUR ACHIEVEMENTS

This is Valentina. Originally from Marseille, she moved to Hamburg four years ago to complete her studies. She loves to travel and shares her passion whenever she can on Instagram with her little community. She hopes one day to make a living from her stories about adventures and good places to eat. And that's Jørgen. He's a 22-year old Danish architecture student, who loves engineering and anything technical. Like her, he's a strong advocate of environmental causes and is always looking for ways to be more eco-friendly. Two years ago, it was love at first sight and a promise to travel around the world for a year to combine their passions and write their story beyond borders. But the health crisis in 2020 upended those plans. Our couple transformed their promise into an e-journey from their living room. No change of scenery, but much better for the environment. Together, they wrote about another kind of trip around the world: their world tour 2.0.

World tour **42** / Europe **44** / North and South America **55** / Asia Pacific **59** / Africa & Middle East **64**







48° 53' 32.723" N  
2° 12' 55.192" E

Our e-world tour begins in Paris. After visiting Montmartre, we head to the Grand Paris Express project. Its 200 km of tracks make it the largest urban project currently under way in Europe.

## Urban transport

### Grand Paris Express

PARIS, FRANCE

Construction work continued on the future train stations and metro lines of the Grand Paris Express. For sections T2A and T3A of Line 15 South, Soletanche Bachy's teams are deploying a wide range of techniques, including soil mixing, diaphragm walls, jet grouting, soil treatment, and of course tunnel boring. Soletanche Bachy is also implementing an innovative freezing technique to dig out the future cavern of the Vert de Maisons station. Scheduled to open in 2025, this line will make travel easier for hundreds of thousands of passengers.

**Soletanche Bachy**

#makingyourdayeasier



We head off to Nanterre, to visit l'archipel, VINCI's future head office! With five buildings spanning 74,000 sq. metres, the project is colossal. Jørgen can't believe his eyes!

## Building

### L'archipel project

NANTERRE, FRANCE

The project for VINCI's new headquarters aims to showcase all the expertise of VINCI companies by integrating the most innovative digital technology. Sixense has deployed all of its Beyond DigitalSite modules: Document Management System (DMS), quality monitoring, and defects management. This technology optimises worksite performance and makes the job easier for everyone involved.

**Sixense**

#makingyourdayeasier



48° 51' 23.81" N 2°  
21' 7.999" E



49° 38' 1.432" N 1°  
37' 19.693" W

**Conquering the West!** We head to one of the largest ports in Europe: Le Havre. We find its containers, quays and impressive logistics fascinating! Jørgen is also a fan of French architect Auguste Perret.

## Port

### Port 2000

LE HAVRE, FRANCE

Nearly fifteen years after an initial project, Soletanche Bachy's teams are taking part in the design and building of two 350 m quayside berths and a closing quay at Port 2000. The project is being carried out with Soletanche Bachy's maritime expertise brand ForSHORE. A number of environmental measures have been implemented, which include using low-carbon concrete under the new Exegy brand, optimising resources (sludge, water) and preserving protected areas. The work will optimise capacity at France's busiest container port.

**Soletanche Bachy**

#fostergrowth



Since we are in Normandy, we head over to Cherbourg to visit the French Navy's nuclear submarine dismantling yard in Cherbourg. The harbour is huge, it is protected by 8 forts!

## Nuclear decommissioning

### Naval Group nuclear submarine

CHERBOURG, FRANCE

As client-side engineer on the project to safely dismantle the former nuclear-powered ballistic missile submarine Le Tonnant, Naval Group called on Nuvia to design and custom-build protective equipment, such as double-layer containment scaffolding and a weather-resistant rail-mounted protective tarpaulin. The satisfied client then entrusted Nuvia with another project, which is to dismantle the submarine L'Indomptable.

**Nuvia**

#greenisgreat #careforall



49° 28' 18.955" N  
0° 8' 51" E





43° 15' 39.82" N 5°  
22' 54.998" E



*"I come from the South, and I always find my way back," goes the French song, and here we are in Marseille. In the southern part of the city is Parc Borély, our next destination.*

## Environment

### Parc Borély

MARSEILLE, FRANCE

Menard subsidiary Remea dredged the lake in Marseille's Parc Borély to remove sediment that had built up over many years. More than 4,000 cu. metres of sludge were removed and dried in situ. The organic residue thus extracted was transformed into compost. The water removed during the drying process was checked for its chemical composition before being poured back into the lake. Remea's staff also organised a public awareness campaign to inform park visitors about the project and the work being carried out.

**Menard, Remea**

#greenisgreat

We're taking advantage of our time in the south of France to explore the largest tokamak ever built.

The International Thermonuclear Experimental Reactor (ITER) is one of the most ambitious energy projects in the world on which no less than 35 countries are collaborating.

## Nuclear energy

### ITER CSB

SOUTH-EAST FRANCE

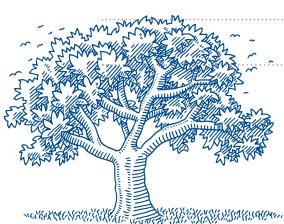
In the tokamak complex deep within the ITER project, Nuvia's teams have completed a monumental job. After three years spent on design, qualification and manufacturing, the cryostat support bearings are now installed. The bearings are built to absorb the extraordinary forces at work within the machine, which is designed to produce energy by large-scale nuclear fusion. This achievement represents another step in the ambitious scientific programme leading us to the energy of the future.

**Nuvia**

#accesspower



43° 41' 13.434" N  
5° 42' 28.591" E





48° 29' 33.446" N  
3° 29' 53.394" E



We travel back up the Rhône to Nogent-sur-Seine to visit a nuclear power plant that employs nearly 700 people! Nuclear power accounts for 70% of the electricity used in France.

Jørgen often says that I'm full of energy... always juiced up! He's not totally wrong, and when we're about to tour the inside of a nuclear power plant run by Électricité de France (EDF), I'm a real powerhouse!



## Nuclear energy

**EDF waterproofing project co-contracted with Nuvia**

FRANCE

In partnership with Nuvia, Sixense was contracted by EDF to carry out waterproofing work on the containment structures enclosing its nuclear reactors. The project covers a first phase to inspect the walls, followed by a defect quantification phase in which the envelope will be pressure-tested. This is done to assess the condition of the structure as accurately as possible and optimise potential future repairs.

Sixense

#accesspower #careforall

## Nuclear energy

### Worksite assistance for EDF

NOGENT-SUR-SEINE, FRANCE

EDF chose Nuvia and its partner OMS to perform a new comprehensive worksite assistance contract for the nuclear power plant in Nogent-sur-Seine, and renewed its contract with Nuvia for its Cruas-Meysses facility. These major contracts strengthen Nuvia's position as a leading provider of support services on sensitive, highly regulated industrial sites.

Nuvia

#accesspower



46° 13' 39.497" N  
2° 12' 49.496" E



The Highlands offer such breathtaking scenery that Jørgen can't put his camera down. Further north the Dounreay Nuclear Research Facility awaits.

## Nuclear decommissioning

### Decommissioning the Dounreay site

DOUNREAY, SCOTLAND

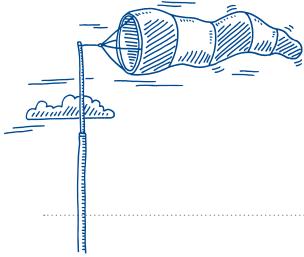
In northern Scotland, Nuvia and its partner Graham Construction were awarded the contract to decommission the Dounreay Nuclear Research Facility. The project involves preparing the site for decontamination and eventually dismantling it. The Advanced Transition Works, or ATW, are an essential step in the decommissioning plan for the site.

**Nuvia**

#greenisgreat #accesspower

“ The support of a competent, highly qualified logistics chain is fundamental to decommissioning Dounreay in the best safety conditions. In addition to its experience on a number of similar operations, Nuvia has been working with us for many years on this flagship project to rehabilitate the site for future generations.”

**Paul Hetherington**  
Head of Communications, Dounreay Site Restoration Limited



46° 13' 39.497" N  
2° 12' 49.496" E

Belgium



Welcome to the UK! Bring on the pudding,  
Marmite and teatime!  
And let's not forget the country's nuclear  
energy facilities, which generate  
one-sixth of the country's electricity.

## Nuclear decommissioning

R&D for the Nuclear Decommissioning Authority

UNITED KINGDOM

In the United Kingdom, the Nuvia-led Envision consortium of companies has recently won a contract to provide R&D services for the Nuclear Decommissioning Authority (NDA). The four-year contract aims to support the NDA in the field of integrated waste management, site remediation and decommissioning by bringing technical expertise and delivering innovation across the UK's nuclear estate.

**Nuvia**

#greenisgreat #accesspower



55° 22' 40.984" N  
3° 26' 9.503" W

50° 27' 45.133" N  
4° 27' 31.756" E



On arriving at the Brussels South Charleroi Airport, I show Jørgen the runway extension work. It's incredible! Traffic continues even during construction.

## Airport

Brussels South Charleroi Airport

CHARLEROI, BELGIUM

Menard completed the soil improvement works to lengthen the runway at Brussels South Charleroi Airport, the second-largest airport in Belgium. The longer strip means that aircraft can use less fuel for take-off and landing. As part of operations to install the 6,500 stone columns and 2,300 controlled modulus columns, teams ensured that the necessary processes were in place to maintain air traffic (8 million passengers annually) throughout the works phase.

**Menard**

#fostergrowth #greenisgreat  
#makingyourdayeasier



47° 29' 59.82" N 8°  
44' 15.234" E



46° 49' 5.477" N  
8° 13' 39.043" E

Switzerland



Here, below the towering Ringelspitz (alt. 3,247 m), the Hinterrhein and Vorderrhein converge to form the Rhine River.

## Building

### Office building

TAMINS, SWITZERLAND

ActivSkeen subsidiary Ertex Solar designed and manufactured 33 photovoltaic modules featuring screen-printed patterns as part of an office building construction project in Tamins, Switzerland. This was quite an accomplishment due to the original architecture of the building's facade. What could be more appropriate than an energy company producing its own electricity to power its new headquarters?

**ActivSkeen**

#greenisgreat

## Building

### Facade renovation

WINTERTHUR, SWITZERLAND

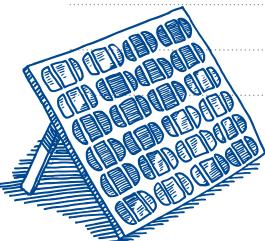
On a project to renovate six residential buildings in the old city of Winterthur, ActivSkeen created 212 black photovoltaic modules that were seamlessly built into the facades. In total, the modules generate enough power to cover the average monthly electricity needs of 200 households in France. The result is an elegant building envelope.

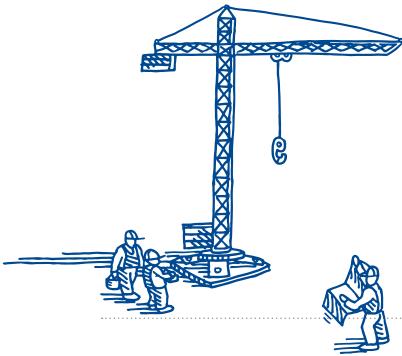
**ActivSkeen**

#greenisgreat



46° 49' 41.135" N  
9° 24' 22.734" E





Europe



48° 5' 7.426" N 16°  
19' 13.231" E

47° 30' 58.432" N  
14° 33' 0.259" E

Austria



Tafelspitz, Schweinsbraten, Knödel...  
Austrian gourmet food is much easier  
to eat than it is to pronounce!

## Building

**Building renovation**

WIENER NEUSTADT, AUSTRIA

Aboard our horse-drawn carriage, our guide explains that Austria is targeting an electricity mix that will be 100%-sourced from renewable energy by 2030.

The city of Wiener Neustadt, south of Vienna, has commissioned a noteworthy project to renovate one of its older buildings, GreenPoint. Ertex Solar, a subsidiary of ActivSkeen, manufactured 144 black solar modules that have been built into the balcony balustrades, and are thus invisible to the naked eye. The panels generate power equal to the amount of electricity used by 180 dishwashers in one year. This will be a key advantage for GreenPoint's future housing units and offices!

**ActivSkeen**

#greenisgreat



## Building

**Energy wave**

WIENER NEUDORF, AUSTRIA

ActivSkeen's subsidiary Ertex Solar designed, produced and installed an "energy wave" on the new city hall esplanade of Wiener Neudorf, a suburb of Vienna. The pavilion structure, with its curved photovoltaic modules, generates enough power to cover the average electricity consumption of a French household over two years. And its colourful display of built-in LED lights delights passers-by.

**ActivSkeen**

#greenisgreat



47° 48' 10.044" N  
16° 13' 59.448" E



Europe



47° 22' 8.843" N  
13° 43' 32.804" E

A return back to childhood with a tour of the beautiful palace where Empress Sisi once lived. I warn Jørgen: today I'm a princess.

## Car park

### Schönbrunn Palace car park

VIENNA, AUSTRIA

Schönbrunn Palace in Vienna is undergoing renovation works to improve services for the millions of visitors it welcomes every year. Ertex Solar, an ActivSkeen subsidiary, designed, produced and installed a carpark solar canopy that will not only protect visitors from the sun or rain, but also supply electricity for the site. The 120 large panels installed in the roof generate total power that equals the electricity used by 70 hairdryers running for a half an hour.

**ActivSkeen**

#greenisgreat



Austria's energy installations blend in perfectly with the country's gorgeous scenery!

## Building

### Lärchkogelbahn Planai chairlift

AUSTRIA

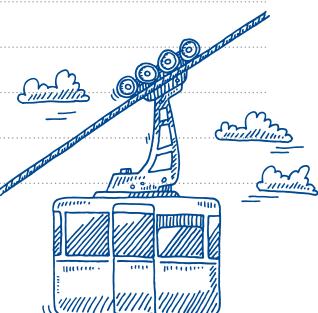
At the famous Planai ski resort, the Lärchkogelbahn chairlift has recently opened after being fully renovated. The chairlift stations now offer greater comfort with heated seats, reduced wait times and a modern, eco-friendly touch. Created by the highly reputed Italian design firm Pininfarina, they incorporate photovoltaic modules by ActivSkeen, which produce electricity for the chairlift and protect users from poor weather conditions.

**ActivSkeen**

#greenisgreat



48° 12' 29.426" N  
16° 22' 25.748" E





Europe



47° 9' 44.978" N  
19° 30' 11.894" E

Hungary

I just can't decide which I like more:  
Buda or Pest. The "Pearl of the Danube" is  
an amazing city. But for Jørgen, it's Buda,  
hands down, with its Fisherman's Bastion.

## Bridge

**Komárom Bridge**

HUNGARY – SLOVAKIA

Sixense teams designed, produced and installed the EverSense® Structural Health Monitoring System (SHMS) on the cable-stayed Komárom Bridge that links Hungary and Slovakia. The solution, which was already in operation during the construction phase, monitors the behaviour of the structure, notifying operators of any abnormal activity and ensuring user safety. The bridge operator can also use the data generated to plan maintenance operations.

**Sixense**

#makingyourdayeasier #careforall



47° 44' 20.706" N  
18° 7' 36.124" E

49° 49' 2.971" N  
15° 28' 22.663" E



Prague has been sung about by a great many artists around the world. The historical centre of the City of a Hundred Spires was declared a World Heritage Site by Unesco, but Prague is also known for its pioneering research in nuclear medicine!

## Healthcare

**Quality control for radiopharmaceuticals**

CZECH REPUBLIC

Nuvia signed an agreement with a radiopharmaceuticals manufacturer covering the design, procurement and installation of a new production and quality control system for Kr/Rb radiopharmaceutical generators. The products manufactured with this new line will be used to perform diagnostics tests in a number of research and nuclear medicine centres across Europe.

**Nuvia**

#careforall

My friends, family and especially Jørgen know what a great admirer I am of Frédéric Chopin. It would have been unthinkable to miss Warsaw, his home town.

## Urban transport

### Warsaw metro (Bródno station)

WARSAW, POLAND

In Warsaw, extension work continues on the M2 metro line. Soletanche Bachy subsidiaries Soletanche Polska (Poland) and Zetaş (Turkey) are currently creating the diaphragm walls and waterproof jet-grouted bottom slab on the line's biggest project, which comprises the future Bródno station and another underground station that will be used to store and reverse the direction of trains. The extension will significantly improve traffic running east-west within the Polish capital.

**Soletanche Bachy**

#makingyourdayeasier



52° 13' 46.834" N  
21° 0' 44.024" E

## North and South America



52° 13' 46.834" N  
21° 0' 44.024" E



We're taking off for Montreal! As soon as we land at the airport, we notice the work to automate the metro, the largest public transit project carried out in Quebec in the past 50 years.

## Metro

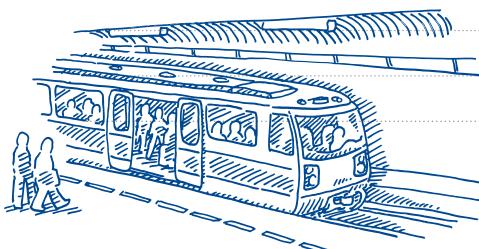
### Montreal metro

MONTRÉAL, CANADA

The Réseau express métropolitain (REM) is a project to build an automated light rail system in the Greater Montreal area. The Reinforced Earth Company Ltd., a subsidiary of Terre Armée, designed and manufactured all of the retaining walls for the new 67 km line and its 26 stations. The REM will, among other advantages, also cut the trip between Montreal's international airport and the city centre to just 20 minutes.

Terre Armée

#makingyourdayeasier #fostergrowth



56° 7' 49.318" N  
106° 20' 48.376" W



Canada



Little travel reminder: never leave Canada without visiting a sugar shack and tasting the country's maple delights.

## Mine

### Geotechnical mining site investigation

CANADA

As part of a project to close a mine in Canada's central provinces, Menard subsidiary ConeTec carried out a geotechnical investigation to map the soil profile. Carried out in partnership with Mud Bay Drilling, this comprehensive survey was conducted via soil sampling probes and on-site testing. This is a key step before cleaning up the soil for use after the mine closes.

Menard, ConeTec

#greenisgreat



56° 7' 49.318" N  
106° 20' 48.376" W



Here we are in Missouri, in the US of A! This is where Lewis and Clark set off on their expedition to explore the American West. Note of interest, the famous Gateway Arch was built in their honour.

## Railway

### Merchants Bridge

MISSISSIPPI, UNITED STATES

The Merchants Memorial Mississippi Rail Bridge, which opened in 1889, has been undergoing extensive renovation. The Reinforced Earth Company, Terre Armée's subsidiary in the United States, provided a unique solution for reinforcing the bridge's west approach. The company came up with an innovative modified MSE wall design allowing for the existing trestle to be left in place. As a result, the railroad was able to continue operating throughout most of the construction, and completion times were shortened.

**Terre Armée**

#makingyourdayeasier #fostergrowth



38° 40' 29.777" N  
90° 11' 7.487" W

40° 45' 2.113" N  
111° 43' 15.416" W



The second leg of our US tour takes us to Salt Lake City. I learn that the city was founded in the 19th century by Mormon pioneers.

## Dam

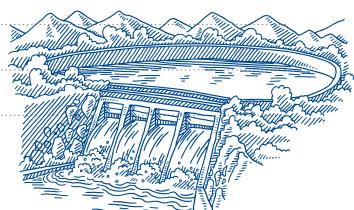
### Mountain Dell Dam

SALT LAKE CITY, UNITED STATES

As part of the project to renovate Mountain Dell Dam, a structure completed in 1925 to supply Salt Lake City with water, the teams of Freyssinet subsidiary Carpi put their waterproofing expertise to work by installing a geomembrane across the dam's 16 arches. Implemented in two phases to avoid disrupting dam operation, the geomembrane will help reduce the effects of erosion and risks of leakage.

**Freyssinet**

#fostergrowth





North and South America



35° 40' 30.529" S  
71° 32' 34.688" W

"Purple Rain, Purple Rain..." Helloooooo  
Minneapolis, Prince's home town!  
Coming in on the motorway from  
the south, we drive by the  
new stormwater storage facility.

## Motorway/water management

### Stormwater storage on the I-35

MINNEAPOLIS, UNITED STATES

Workers from Soletanche Bachy subsidiary Nicholson, in a joint venture with Kraemer, have built a new stormwater storage facility along the I-35 West, south of Minneapolis. The main processes implemented were diaphragm walls and jet grouting. The Minnesota Department of Transport (MnDOT) awarded the consortium the contract to build six independent storage tanks connected in a series and leading to a high-capacity pumping station. The system will considerably reduce the risk of flooding along this busy freeway.

**Soletanche Bachy**

#careforall



44° 58' 39.911" N  
93° 15' 54.04" W

23° 39' 3.341" S  
70° 23' 51.007" W

Chile



We leave the United States for one of the southernmost countries on the planet, Chile! We head to the copper mine run by Codelco (Corporación Nacional del Cobre), the world's largest copper producer, with reserves for 200 years.

## Mine

### Avalanche barrier

CHILE

In this open-cast mine located 3,500 m above sea level, Terre Armée has built a 110 m Techspan® tunnel as well as two Geotrel™ MSE walls. The third wall is under way and will measure 270 m in length and 25 m in height. In this region where winters are especially harsh, the walls will serve to protect the mining facilities from avalanches.

**Terre Armée**

#careforall #fostergrowth



After Chile, it's Mexico! We Land in Mexico City, where Jørgen is going wild over the tropical rhythms...

# Energy

## Dos Bocas refinery

TABASCO, MEXICO

Samsung Engineering awarded Soletanche Bachy subsidiaries Cimesa and Rodio Kronsa a contract to drive 6,000 piles 30 metres deep at the construction site of the new Dos Bocas refinery. In parallel, Menard carried out ground improvement under the future tanks. Located in the state of Tabasco, the refinery will be the largest ever built in Mexico. The project is part of a comprehensive government plan to reduce petrol imports and consolidate the country's energy independence.

**Menard / Soletanche Bachy**

#accesspower

“ We are delighted with the relationship we have developed with Soletanche Bachy. Its safety indicators fully meet our standards. Soletanche Bachy's service has clearly made a positive difference on the first part of the project at the Dos Bocas refinery. We're convinced that the second part will be just as beneficial.”

**Jong-Mun Oh**

Project Manager for Phase 1 and Construction Manager for Phase 2  
Samsung Engineering Mexico



23° 38' 4.204" N  
102° 33' 10.022" W



35° 54' 27.925" N  
127° 46' 0.919" E

22° 23' 47.141" N  
114° 6' 34.189" E

Hong Kong



*Leopards. Bears. Tigers. Vampire deer. Where on Earth are we? South Korea, of course! And the country wants to protect its amazing wildlife by building animal crossings known as "eco-bridges".*

## Environment

### Eco-bridges

SOUTH KOREA

As part of its environmental protection programme, South Korea's government formed a partnership with Freyssinet in 2010 to create wildlife crossings. The company has since delivered some 30 crossings using the TechSpan® solution developed by Terre Armée. These "eco-bridges" built over major roads ensure that both animals and drivers stay safe. The country is going to great lengths to protect its rare species, some of which are endangered.

**Freyssinet**

#greenisgreat

*Atop Victoria Peak, you can look down onto the bustling bay of Hong Kong. From here, you can observe the city's transformation, especially in the Kowloon district.*

## Public buildings

### West Kowloon Cultural District

HONG KONG

As part of a large-scale project to create a cultural hub in the district of West Kowloon, Bachy Soletanche Group Limited is carrying out foundation, excavation and lateral support works in a consortium with Fujita Corporation. Once built, West Kowloon Cultural District (WKCD) will be the site of art and culture venues, as well as residential properties. An immense landscaped park will also form part of the complex.

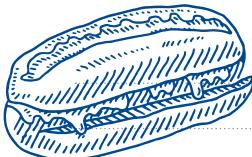
**Bachy Soletanche**

#fostergrowth #makingyourdayeasier



22° 19' 6.841" N  
114° 10' 46.582" E





N 46°10'395  
E 5°11'866

Australia



28° 5' 1.057" N  
80° 36' 29.192" W

In Ho Chi Minh City, the aromas from the street-food blending with the noise from the chaotic, ever-denser traffic create a unique sensory experience. We set off, Banh mi in hand, for the Thủ Thiêm 2 bridge.

## Bridge

### Thủ Thiêm 2 bridge

HO CHI MINH CITY, VIETNAM

Freyssinet's teams are busy building the Thủ Thiêm 2 cable-stayed bridge, whose curved pylon measuring 113-metres is becoming the new symbol of Ho Chi Minh City. Spanning 1,465 metres, the structure will link the new Thủ Thiêm urban area to the city centre, easing the flow of traffic in the city's eastern districts.

**Freyssinet**

#makingyourdayeasier



Here we are in Australia!

In this immense and exciting country, our first stop is a new viaduct under construction. Like a surfer who's tired of waiting for his wave, Jørgen can't hold still.



10° 46' 47.849" N  
106° 42' 33.638" E

## Bridge/motorway

### West Gate Tunnel

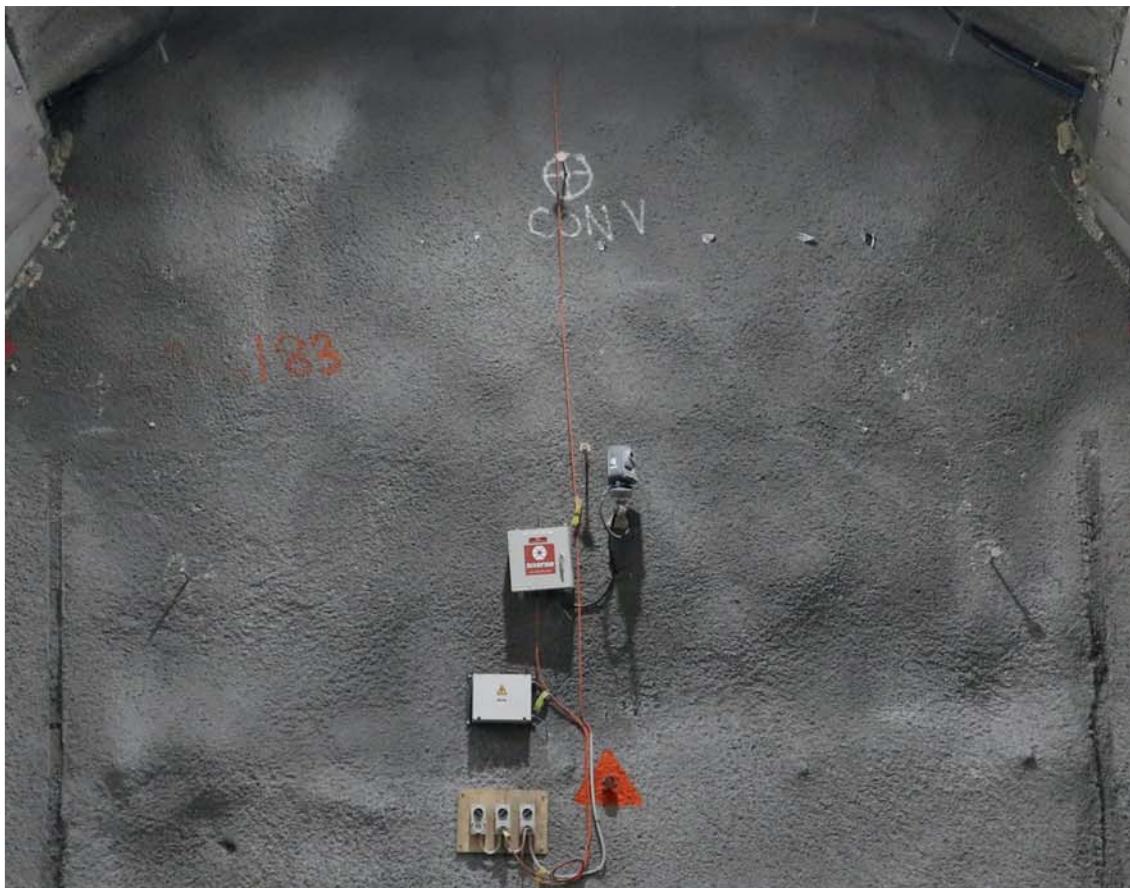
MELBOURNE, AUSTRALIA

In the heart of Melbourne, Australia, Freyssinet was contracted to build 4 km of a new viaduct on the Maribyrnong River as part of the West Gate Tunnel project. The teams are overseeing the installation of 90 spans using a custom-built launching gantry and 216 precast piers incorporating more than 1,000 tonnes of prestressing bars. These new structures will eventually alleviate traffic congestion between the Port of Melbourne and the city centre.

**Freyssinet**

#fostergrowth #makingyourdayeasier





After a day of surfing in Torquay, we wander through the charming cobbled streets of Melbourne... This feeling of being on the other side of the world is unique.

## Metro

### Melbourne Metro

MELBOURNE, AUSTRALIA

The city of Melbourne has just begun its largest-ever rail project, the Metro Tunnel, which will add new capacity to the existing metro system, the City Loop. Real-time monitoring of the City Loop is essential so as to avoid any structural impact from construction of the Metro Tunnel. Sixense has fitted four City Loop tunnels with its patented Cyclops system to ensure the underground transport network can continue to operate safely during construction.

**Sixense**

#makingyourdayeasier #careforall

“ Sixense was involved very early on in the Melbourne Metro construction phase. Sixense teams have been working very closely with the construction crews and have provided innovative solutions such as the Centaure contactless measurement system. Despite the many challenges and a delayed start to construction due to stakeholder approvals, Sixense was always there for us, very professional; they provided high quality service and had the best interest of the project at heart.”

**Simon Auvergne**

MSc, CGeol, CEng Geotechnical Manager CBD - Cross Yarra Partnership Design & Construction Joint Venture



Asia Pacific



22° 33' 35.003" S  
118° 27' 12.33" E



Today, we travel to Robe Valley, West Australia, and are truly struck by how vast this country really is! Off to the iron ore mine, one of the country's largest...

## Mines

### Concrete arch tunnel

ROBE VALLEY, AUSTRALIA

The Robe Valley mining operation is currently expanding. This major development project will include new infrastructure (roads, storage warehouses, water supply, etc.) for which The Reinforced Earth Company, the Australian subsidiary of Terre Armée, has designed and supplied two Techspan® arch tunnels, as well as Terre Armée® abutments. The work will contribute to developing iron ore mining operations and optimising production.

**Terre Armée**

#fostergrowth

After the surfers come the rugby players. We head over to the North Queensland Cowboys rugby team's training centre, which is being rebuilt... "Go-Go-Cowboys"!

## Buildings

### North Queensland Cowboys High Performance Centre

TOWNSVILLE, AUSTRALIA

The North Queensland Cowboys, one of Australia's premier national rugby teams, are eagerly awaiting the construction of their new training facility. Because the ground at the site was too soft to withstand the loads associated with the proposed project, Menard designed and built a network of controlled modulus columns (CMC) to reinforce the soil and create a stable foundation for the new building. The latter should be up and running in time for the 2021 rugby season.

**Menard**

#fostergrowth #makingyourdayeasier



19° 14' 59.453" S  
146° 48' 24.221" E



Bangalore is India's 3rd-busiest airport.  
I feel dizzy, but Jørgen takes to it like a duck to Ganges water...

## Airports

### Kempegowda International Airport

BANGALORE, INDIA

Work is under way at Bangalore's Kempegowda Airport to help it cope with the more than 30 million passengers that pass through it every year and the sharp increase in traffic expected by 2022. Terre Armée India is constructing over 15,000 sq. metres of Terre Armée® and TerraLink™ walls as part of the project to add two lanes to the access road.

**Terre Armée**

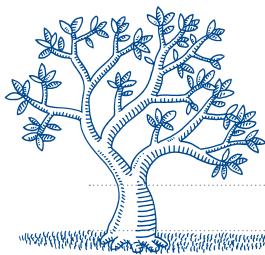
#fostergrowth

“ Terre Armée’s professionalism helped us clinch the Kempegowda airport contract; they came on the project as co-contractors for the design and supervision of the work. Terre Armée has always proven capable of dealing with unforeseen circumstances and finding safe, quick and economical solutions that do not entail delays. We are delighted with this collaboration which began two years ago.”

**Y. V. Raman**

Chief Executive Officer, Vijay Nirman Company Pvt Ltd

12° 58' 17.756" N  
77° 35' 40.427" E



Deep in the primary forest of Kourabahi, the FarmStrong Foundation is leading a large-scale reforestation project. Ninety percent of the country's forests have disappeared in the space of 60 years...

24° 39' 29.002" S  
25° 54' 43.999" E

## Environment

### Pilot project for the FarmStrong Foundation

KOURABAH, CÔTE D'IVOIRE

As part of the Kourabahi reforestation programme in Côte d'Ivoire, Sixense carried out a pilot data-capture mission combining LiDAR technology (laser remote sensing) and orthophotography (geometrically rectified aerial images). The data thus collected produced a topographical picture which made it possible to objectively measure the impact of actions taken to restore the primary forest. One more step towards sustainable reforestation!

Sixense

#greenisgreat



A short stopover in Botswana, also known as "The African miracle"!



5° 54' 26.021" N  
6° 41' 30.307" W

## Motorway

### Highway interchange

GABORONE, BOTSWANA

Terre Armée designed and supplied retaining walls for the new Ramotswe-Boatle highway interchange, south of Botswana's capital, Gaborone. This new structure will contribute to easing the flow of traffic and significantly reducing the number of accidents on this very busy road network near the city.

Terre Armée

#careforall #makingyourdayeasier



23° 50' 48.296" N  
54° 25' 34.723" E

United Arab Emirates



We are now in Madagascar.  
We board the country's only railway  
line and look down from the  
breathtaking Sahasinaka viaduct!

25° 55' 35.231" N  
56° 3' 13.223" E



## Bridges

### Sahasinaka Viaduct

MADAGASCAR

In 2020, Freyssinet, working in a joint venture with Sogea-Satom, completed the reinforcement work on the Sahasinaka viaduct. This included reinforcing two central arches, repairing cracks in the piers, overlaying a concrete slab atop the existing deck, carrying out waterproofing work and replacing 350 linear metres of track. This major project for the island will ensure the long-term viability of freight and passenger traffic on this heavily used railway line, as well as make it safer.

**Freyssinet**

#careforall #fostergrowth  
#makingyourdayeasier



24° 39' 29.002" S  
25° 54' 43.999" E

We stop over in a country where everything is exceptional: the United Arab Emirates. Driving through Dubai at night is just magical. The infrastructure, the luxury hotels... everything is dazzling in this ultra-modern city!

## Bridges

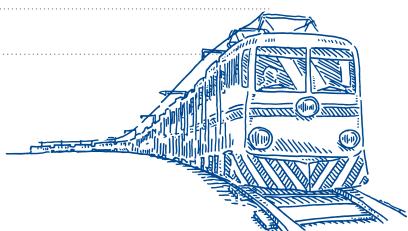
### Ras al-Khaimah bridge

RAS AL-KHAIMAH, UNITED ARAB EMIRATES

In the United Arab Emirates, Sixense teams carried out a detailed condition survey and materials analysis of the Ras al-Khaimah bridge. Built in 1977, it is located in the heart of the city and is the only route across the harbour. After performing a visual inspection combined with non-destructive investigations and laboratory tests, Sixense drafted repair and maintenance recommendations.

**Sixense**

#makingyourdayeasier #careforall



After arriving in Istanbul, we drive to the city of Çanakkale to take a look at the incredible highway viaducts being built in the region. On the way, we are blown away by the stay cables of the Yavuz Sultan Selim bridge.

# Bridges

## Çanakkale viaducts

ÇANAKKALE, TURKEY

Freyssinet is continuing its involvement in the major "Kinalli-Balikesir" motorway project and is working on the last section linking Malkara to Çanakkale. The company is responsible for designing and building two viaducts, as well as constructing the deck of the approach viaducts and prestressing the piers and anchor blocks of this engineering structure over the Dardanelles Strait. The innovative technical solutions developed by Freyssinet for the construction of what will ultimately be the world's longest suspension bridge have resulted in a 35% reduction in the quantity of concrete and reinforcement steel used.

**Freyssinet**

#makingyourdayeasier #careforall

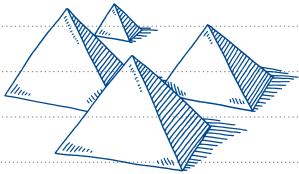
“ The design suggested by Freyssinet made it possible to optimise costs and deadlines. We have been impressed by the company's professionalism and regard it as a true partner when it comes to quality control, safety and environmental protection procedures and more... Thanks to the team's constructive approach, worksite issues were resolved swiftly.”

**Metin Özcan**

Deputy Project Manager of ÇOK - Çanakkale 1915 Motorway Project JV



40°20'33.16"N  
26°37'50.52"E



30° 50' 9.91" N  
31° 28' 44.188" E

Magnificent, sublime, grandiose... no superlative can adequately describe the Egyptian landscape. Ever since we arrived, Jørgen has done nothing but eat... he has a bigger appetite than a barracuda!

## Waste water treatment plants

### Bahr al-Baqar wastewater treatment plant

EGYPT



Menard was awarded the contract to build 2.2 million linear metres of PVDs (prefabricated vertical drains) and to carry out monitoring operations on the solar sludge-drying facilities of the future Bahr al-Baqar wastewater treatment plant. With a capacity of 5 million cubic metres per day, the plant will be able to treat wastewater from households, industry and agriculture. The decontaminated water will be used to irrigate crops in the Sinai Peninsula.

**Menard**

#greenisgreat



We have come to the end of our unusual travel experience. Jørgen and I will never forget the faces of these passionate men and women who have shared with us their compelling stories and projects. This may not be the end of our digital postcard...





# They trust us with the future.

TANGIBLE ACTIONS  
FOR GREENER PROJECTS

Their names are Apolline, Joseph, Léa, Olympe... They are so young and yet amaze us every day. You can see kindness, joy, love and happiness in their eyes. And perhaps a little admiration as well. As parents, we are their heroes, and they look to us for everything. As builders, we must ensure a better future for all the world's children and do everything we can to look after our planet. This is our greatest challenge.

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"I have a question!"

# "I have a question!"

"Do you plant trees?" "Do you protect animals?" "Do your machines pollute?" Children around the world care about the planet, and view what we do with admiration as well as with concern. Children of Soletanche Freyssinet employees aged 7 to 15 put their questions to Lorenzo Alessi, the group's QSE director.

Others sent in drawings of their vision.

**Alexander** age 13, Mexico

**Angel** age 12, Mexico

**Augustin** age 10, France

**Bence** age 13, Hungary

**Brissa** age 15, Peru

**Camille** age 11 ½, United Kingdom

**Cielo** age 13, Peru

**Diego Luis** age 12, Chile

**Edi** age 10, Slovenia

**Edwin Alexander** age 8, Mexico

**Emma** age 15, Peru

**Ezequiel** age 7, Chile

**Gregory** age 11, United Kingdom

**Heloise** age 5, France

**Isabella** age 10, Argentina

**Lina** age 13, Peru

**Louis** age 8 ½, France

**Louis** age 7 ½, France

**Louis** age 7, New Zealand

**Maria Fernanda** age 9, Peru

**Misael** age 12, Mexico

**Pablo** age 14, Germany

**Thoi Minh** age 11, Vietnam

**Timéo** age 9, France

**Tomi** age 8, Slovenia

**Valentina** age 9, Mexico

**Violeta** age 11, Spain

**William** age 9, United Kingdom

**How does Soletanche Freyssinet protect the environment? What steps are you taking to reduce pollution around the world?**

— **Lorenzo Alessi:** Each and every day, Soletanche Freyssinet takes action for the environment, thanks to the many initiatives undertaken by our brands (such as the deployment of pollution control kits and noise abatement measures on construction sites), but also by our employees (measures applying to worksites as well as at the office or at home). Today, as players in the transformation of cities and regions, we want to take things further. We have therefore set ourselves major objectives in response to the substantial challenge of climate change.

**Do you have some sort of environmental pledge?**

— **L. A.:** Yes we do. We have set ourselves ambitious goals, to which everyone contributes in their own way.

Our first commitment is to slash 40% off our CO<sub>2</sub> emissions by 2030. To this end, we have developed a pledge called Green is Great, which was signed by all the members of our

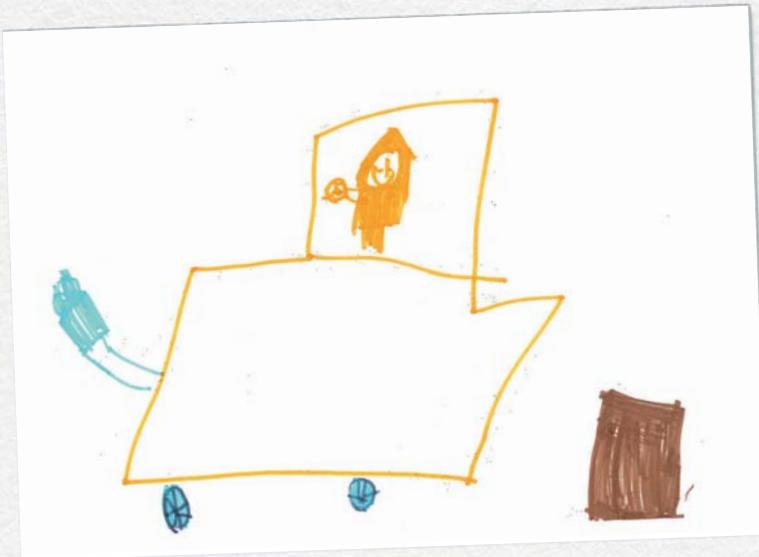
Coordination Committee. Under this pledge, our actions fall into three main areas: the climate, natural environments and biodiversity, and the circular economy.



"I have a question!"



"I have a question!"



**How many trees do you cut down every year? And do you replant any afterwards?**

— L. A.: It is sometimes necessary to cut down trees to make a building, a bridge or a subway shaft. When we come in on a project, this kind of operation has already been carried out by the prime contractor (who is in charge of the entire site). Before these activities are carried out, there is always a preliminary study; in many cases, new trees are planted, or those that have been removed during construction are replanted. Trees that are not cut down are protected so that they do not get damaged during the work. Some of our entities have also partnered with the company Reforest'Action to plant new trees to offset the CO<sub>2</sub> emissions generated by work-related travel and commutes.

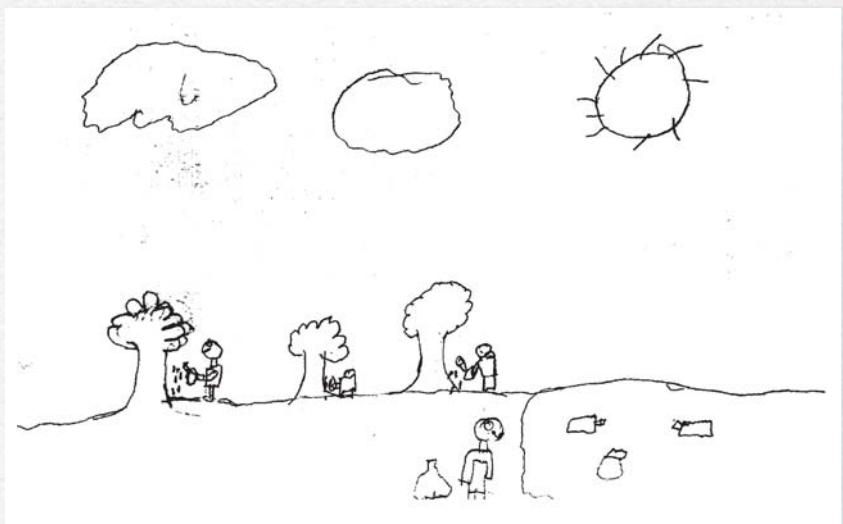
**Do you know whether you are destroying animal habitats? More specifically, do you inspect trees before cutting them down to see if there are nests in them? What are you doing to prevent this?**

— L. A.: In general, a lot of attention is given to preserving biodiversity on construction sites. For example,

a barn owl was spotted during work under a bridge in the United Kingdom, and a protection area was immediately set up.

In areas considered as sensitive, all projects begin with a preliminary biodiversity assessment performed in consultation with local communities. This study is often carried out by the prime contractors. It is then up to us to

follow recommendations and apply measures to help protect this biodiversity. That is what we did on the Hong Kong airport project, for example, where a monitoring system was set up to ensure that no pink dolphins were present in the construction area. We also took steps to protect whales in Reunion Island during construction of the New Coastal Highway. Another example is a construction site in Port-la-Nouvelle, in south-west France, where specific measures were taken to avoid disturbing protected plant and animal species, such as a type of eel that lives between the lagoon and the sea, exactly where the worksite is located. Environmental protection measures also included making 3D-printed concrete shelters for endangered bats in the south of France.



"I have a question!"

**What do you do with all the dirt that is removed when you excavate? Do you just leave a big mountain after construction is finished?**

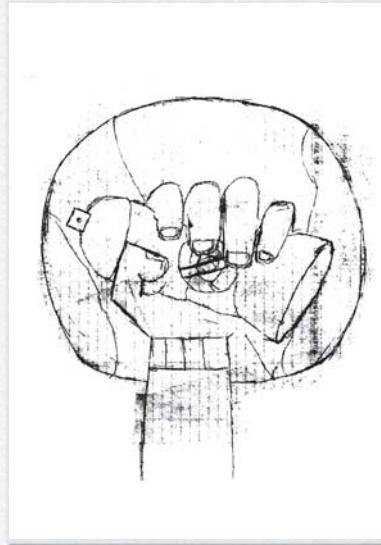
— L. A.: We can do several things. In some cases, we use the soil to create new spaces on the same site. In other cases, the soil is reused on other worksites. And sometimes, the excavated soil is contaminated and cannot be reused as is. In that case, a different company comes in to take that soil off to be decontaminated or processed. This is what one of our companies called Remea does.

**How do construction cranes generate pollution?**

— L. A.: Construction cranes pollute because they are powered by combustion engines (like the ones in cars) which consume fuel and emit CO<sub>2</sub>. Our machines are very powerful and therefore they need a lot of fuel. When it is burned, this fuel produces greenhouse gases, including CO<sub>2</sub>, which is a major cause of pollution. We have deployed a programme to reduce fuel consumption associated with our cranes; it includes limiting engine power, real-time monitoring of emissions and using particle filters. We are also developing electric cranes which produce much less pollution.

**Are your machines electric or do they use petrol? Do your machines use a lot of petrol? Do they cause a lot of pollution?**

— L. A.: Just like with the cranes, our aim is to use hybrid or electric machines wherever possible. For example, we have just electrified our entire fleet of forklifts in the United Kingdom and developed an electric Hydrofraise® (this is a machine that digs into the ground so that we can



**In what ways does the company encourage recycling? Are there any rewards, like in my country, where you get money back for returning glass bottles?**

— L. A.: All our companies, on worksites as well as in the offices, apply strict rules in terms of waste separation. However, there is no reward system. Everyone must become more aware of environmental issues; we all need to be proactive and take responsibility. We alert all staff to the importance of waste separation via information campaigns, training sessions and awareness workshops.

**What does Soletanche Freyssinet do with the waste from its worksites?**

— L. A.: Our goal is to make the most of our waste: reduce, reuse and recycle wherever possible. For example, on some of our construction sites in France, we use an application called Waste Marketplace, which facilitates waste management on the worksite. Crews can plan waste



disposal operations and trace them, because the system is very transparent. It then connects the site with the closest and most suitable waste management companies.

**Why do you travel so much? Can't you do the same job without leaving your country?**

— L. A.: Our group is international, and we are strong because employees around the world get to meet up and share best practices. In some situations it is important to be able to go and visit a construction site or talk to colleagues and customers. Which means we need to travel all over the world. That being said, we try and be travel-smart, and so we limit ourselves to essential trips.

**Does Soletanche Freyssinet organise information sessions on the protection of the environment?**

— L. A.: Numerous training and information sessions are held throughout the year to raise environmental awareness among our employees. We also organise games and challenges on this theme as a way of getting everyone involved, so that together, we can make a difference.

**Do you have solar panels on any of your own office buildings?**

— L. A.: Only in rare cases do we own the premises we occupy. Nevertheless, some of our buildings or factories are already equipped with solar panels, such as the Roger Bullivant facilities in the United Kingdom.

As a major player in the solar energy sector through our company ActivSkeen, we do encourage this type of technology and this is definitely something we need to work on with the owners of our buildings.



**You say you use a lot of concrete on your worksites. But you also say that concrete releases CO<sub>2</sub> and generates solid waste. Are there solutions to use less concrete or a kind of concrete that would generate less CO<sub>2</sub>?**

— L. A.: All our entities have developed resource-lean techniques, such as Terre Armée® with its mechanically stabilised earth solutions, Freyssinet with its prestressing systems, or Soletanche Bachy with its semi-reinforced diaphragm walls. In addition, our design teams carry out a great deal of research to develop new techniques and expertise that will help us to do even better. This was the process that led up to

formulating Exegy, a low-carbon concrete (less CO<sub>2</sub> is emitted when it is manufactured) developed by Soletanche Bachy, and which we encourage our suppliers to use.

**Do you use a lot of concrete on your projects? What are you doing to reduce the quantities you use? What do you do to optimise water consumption, since water belongs to all of us?**

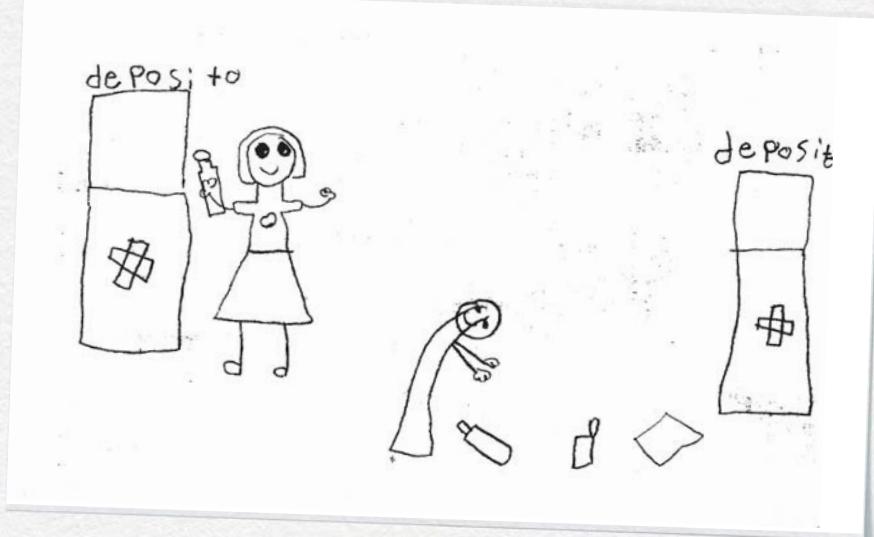
— L. A.: Water consumption is one of the key areas of our environmental programme. Numerous initiatives have already been implemented on our sites, aiming, whenever possible, at reusing water and separating

"I have a question!"

water streams (drinking water vs. non-drinking water) in order to avoid wastage (in particular of drinking water). Examples include a worksite in Monaco where drilling water is recycled in a closed loop and another in Lyon, France, where groundwater is also reused.

**Do you use recycled metal materials and/or recycle them when they need changing?**

— L. A.: The metal items used on our construction sites are sorted and then recycled by specialised companies. In addition, whenever possible, we choose recycled materials for our construction projects. However, this sector is still very small and it is not always possible to source recycled metals.



## **Our commitment to protecting the planet**

As we face challenges related to climate change, the environment is at the forefront of our business and strategy. We must set an example for our customers and for future generations, in particular by reducing the environmental footprint of our businesses. At Soletanche Freyssinet, we are committed to slashing our CO<sub>2</sub> emissions by 40 % by 2030.



#green  
is great

Our businesses contribute to the transformation of cities and territories; thus, reducing the environmental impacts of our activities is a moral obligation for the sustainable development of our companies.

To achieve this, we concentrate our efforts on preserving natural resources, managing and recycling waste, saving energy and reducing our greenhouse gas emissions.

These challenges are being addressed by all Soletanche Freyssinet employees as a central part of their activities, each playing a role in this shared goal.

*Coordination Committee of Soletanche Freyssinet*

M.Peltier L.Alessi C.Dauchy P.Nagle M.Lacazeieu X.Plancon  
M.Deary B.Lancia S.Abry P.Berger U.Oudin G.Billaroch



## Environmental commitment



### GROUP AND BUSINESS LINES

Support entities in implementing their environmental strategies and developing our environmental culture.



### BUSINESS LINES AND BUSINESS UNITS

Implement an annual action plan aimed at reducing the environmental impacts of each Business Line, tailored by each Business Unit.



### WORKSITES

Apply these action plans on each site.

@SoletancheFreyssinet #GreenIsGreat

agence-excom.com

## Our business-related achievements

As we face challenges related to climate change, we must set an example for our customers and for future generations, in particular by reducing the environmental footprint of our businesses. This effort begins "at source", by ensuring our businesses are intrinsically focused on the environment. Below are a few examples.

### Resallience

Resallience is a design office within Sixense dedicated to adapting projects, geographies, infrastructure and their uses to climate change. Resallience's services include consulting, modelling and project management services for innovative technical solutions, integrated engineering and business models that are climate-change compatible. Resallience's projects are aligned with the sustainable development objectives set out in the Paris Agreement. The fields it covers include, among others, energy, water, biodiversity, health, the built environment, living conditions and mobility throughout the life cycle of assets (design, construction and operation).

**RESALLIANCE**  
by  **SIXENSE**

### ActivSkeen

ActivSkeen develops and deploys building-integrated photovoltaics (BIPV) which are designed to optimise the energy balance of buildings and the comfort of their occupants. ActivSkeen aspires to transform a building's envelope into a carbon-free energy-producing surface, without compromising on aesthetics. The facades and roof produce electricity for the users, and depending on their position, photovoltaic cells can also act as mini *brise-soleil* to control glare and solar gain. ActivSkeen has deployed its expertise across more than 350 projects worldwide, thus contributing to the emergence of energy-plus buildings and reducing the carbon footprint of cities and infrastructure.

**ACTIVSKEEN**

### Remea

Soil remediation is a major issue for industrial companies and land developers alike. Remea, which specialises in this sector, has been developing extensive expertise in three areas over the past 15 years: remediation of polluted sites (soil and groundwater), management of polluted effluents (pumped water, soil, air) during construction works and the treatment of industrial ponds and tanks on active sites.



### Terre Armée®

Developed over 50 years ago, the Terre Armée® technique, known in English as Reinforced Earth®, uses less materials and generates less CO<sub>2</sub> than conventional solutions.



## Our technical achievements

Since their inception, the companies that make up Soletanche Freyssinet have grown thanks to major technical innovations. This strong R&D and innovation component is also put to work when it comes to protecting the environment.



### Terre Armée

Near Seattle, Terre Armée teams played a role in the building of a new type of salmon pass by designing and supplying Terre Armée® spandrel walls for a fiber-glass-concrete composite arch bridge, which is faster to erect than traditional concrete solutions. The innovation holds promise for conservation efforts, and demonstrates that technology can benefit the environment.

### Soletanche Bachy Exegy by Soletanche Bachy

Cement is responsible for 85% of all CO<sub>2</sub> emissions from concrete although it makes up only 12% of its ingredients. Clinker, its main component (obtained by firing limestone and clay) is responsible for the high carbon footprint of cement since kilns are heated to a temperature of 1,500°C (generating one-third of emissions), and the firing process triggers a chemical reaction which releases carbon (two-thirds of total emissions). Thus the key to reducing the carbon footprint of concrete is cement and, more specifically, replacing a proportion of the clinker with industrial by-products (blast-furnace slag, fly ash) and/or natural materials (pozzolana, calcined clays, limestone filler). Soletanche Bachy has developed the 'Exegy by Soletanche Bachy' brand, which offers tailor-made materials and services incorporating the most suitable low-, very-low- and ultra-low-carbon concrete and foundation grout for our customers' projects.



### **Soletanche Bachy Electric powerpack HF, Testimonio (Monaco)**

On the site of the Testimonio II project, Soletanche Bachy commissioned the electric HC05G (a Hydrofraise® with grippers and electric powerpack), a first in France and Monaco. It offers improved acoustic comfort (fourfold reduction of noise level) and will allow direct savings of over 60,000 litres of fuel (5,000 l/week reduction), thus significantly lowering greenhouse gas emissions.

### **Freyssinet**

The unique construction technologies and methods developed by Freyssinet – such as prestressing – are, in essence, frugal in resources. In 2020, following a validation phase on the Grand Paris project, Freyssinet brought to market a technology for post-tensioned concrete diaphragm walls designed in close collaboration with Soletanche Bachy. Thanks to this innovation, walls are 20% less thick than conventional reinforced-concrete diaphragm walls, resulting in a lower overall quantity of concrete and reinforcement steel. The technology thus contributes to preserving the planet's resources and fighting global warming.

## Our teams take the initiative

The environmental commitments made by Soletanche Freyssinet stretch beyond its inherently green activities and the technical innovations of its brands. Across the Group, our teams engage in a multitude of ecological initiatives in connection with local projects. Each of these actions takes us another step forward in our journey.

Remember, tall oaks from little acorns grow.



### Freyssinet Tierra Armada Argentina

At a precast concrete plant, our teams developed a sustainable and environmentally conscious circular economy system. It optimises water consumption at the plant by allocating water of different quality (drinkable or otherwise) to different uses. Non-industrial wastewater is recycled using a biodigester, while industrial wastewater is treated in drying beds. Residue from the drying process is sorted and a portion used as fertilizer in agriculture.

[Circular economy](#) | [Natural environments](#)

### Soletanche Freyssinet, worldwide

In October, the company celebrated Environment Day to motivate employees and remind everyone of the importance of our environmental commitment. A number of awareness-building events were held on our projects around the world. An Environment Award, which distinguishes the best initiatives implemented at worksites worldwide, was launched for the occasion.

[Climate](#) |  
[Natural environments](#) |  
[Circular economy](#)



### Menard, United States

To produce stone columns, the teams at Menard USA came up with the idea to replace the ballast extracted from quarries with recycled concrete easily sourced in most urban areas, thereby significantly reducing the environmental impact of stone extraction and transportation.

[Circular economy](#) | [Natural environments](#)





## Nuvia

Nuvia consumes about 20,000 PVC cartridges each year. They are used with applicator guns to seal joints, for example at nuclear plants. The used cartridges add up to a total annual volume of over 11 cubic metres of waste and the mere production of the packaging generates more than 2 tonnes of CO<sub>2</sub>. The new solution being deployed aims to replace the rigid cartridges by flexible plastic pouches and to insource the filling of the pouches on Nuvia's facilities, located close to the chemical production site.

[Climate](#)



## Freyssinet, France

Freyssinet France continued to improve its processing of worksite waste, collaborating with Freyssinet's Techniques and Materials teams to develop new equipment that mechanically separates the high-density polyethylene sheath and the steel in strands from dismantled stay cables, to facilitate the recycling and recovery of these materials. The innovation will be tested and rolled out in the first half of 2021, following the replacement of three stay cables of the Normandy bridge in France.

[Circular economy](#) | [Climate change](#)



## Freyssinet, New Zealand

The Golden Bay Cement project north of Auckland is a good example of the economic and environmental value brought by proposing alternative strategies to rehabilitate and reinforce existing structures, instead of demolishing and rebuilding them. The five silos of the cement-making facility were in such poor condition that specialists declared no corrective solution could save them, until Freyssinet's teams devised a repair strategy that would not only restore the silos' storage capacity but also extend their lifespan by at least 25 years.

[Circular economy](#) | [Climate change](#)



## Nuvia

The company launched a campaign to recover waste at one of its logistics sites. Wood pallets and all other wooden waste are now reused, either for compost or for building outdoor furniture to enhance the work environment for employees. In addition to reducing the amount of waste produced at the site, the initiative sharpened employees' awareness of environmental issues. So far, 450 kg of wood have been recovered.

[Circular economy](#)

## Sixense

Some Sixense subsidiaries decided in 2020 to stop purchasing new telephones for business use. Employees now only use refurbished equipment.

**Circular economy**

## Soletanche Bachy, France

Soletanche Bachy France is gradually installing an eco-mode setting by default on all Liebherr crawler cranes offering this feature. The energy-saving mode reduces engine power for lighter duty applications that do not require high performance. Based on the manufacturer's data, this will generate fuel savings of 18%.

**Climate**

## Terre Armée, Colombia

The Terre Armée teams in Colombia are preparing to replace the wood used in Terre Armée® walls with recycled plastics. The initiative doubly benefits the environment: first, by reducing the number of trees that are cut down, thereby preventing damage to ecosystems, and second, by recycling materials not once but many times and extending their lifespans – in this case, tenfold.

**Circular economy | Natural environments**

## Sixense, France

Sixense is testing and rolling out the use of methanol-powered autonomous data-acquisition units. Besides electricity, the use of methanol as a fuel produces only residual heat, water vapour and a small amount of carbon dioxide. Currently, about 140 methanol power sources are being used on equipment at worksites in France, such as for the Grand Paris Express.

**Climate**

## Soletanche Bachy, Singapore

The electrical power required to carry out our work varies from project to project. By replacing a single stand-alone generator by a series of smaller generators, which can be activated or deactivated at any time based on a project's energy needs, Soletanche Bachy was able to reduce its weekly fuel consumption by 1,000 litres during a trial run at a worksite in Singapore.

**Climate**

## Sixense

The use of solar panels at worksites is gaining ground, such as at the Carlton Hotel in Cannes, in the south of France, and in Ventimiglia, Italy.

**Climate**

## Menard, head office

The company delivered three webinars on the environment addressing all employees worldwide. The training was offered at all Menard subsidiaries and attended by a large number of participants.

**Climate | Natural environments | Circular economy**

## Soletanche Bachy, United Kingdom

Roger Bullivant replaced its entire fleet of diesel forklifts with 10 new electric units and installed solar panels at its manufacturing plant. The company has also partnered with The National Forest to donate a sum of money for every precast pile it makes, to be put toward replanting trees. To date, 1,000 trees have been planted as a result, offsetting 1,000 tonnes of the company's carbon footprint.

**Climate | Natural environments**

Our teams take the initiative

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We could never have produced this report without such a passionate and motivated team!

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