Meet Menard Oceania

Your local specialist in foundation solutions based on ground improvement and reinforcement technologies

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About Us

We improve unstable or compressible soft soil into solid foundations to ensure the success of your project!

What do we do?

Menard is a specialist contractor for geotechnical and civil engineering activities operating throughout Australasia and the South Pacific region.

Our expertise in ground improvement, specialist foundations, all methods of grouting and environmental remediation has facilitated the delivery of cost-effective solutions for the construction of a wide range of projects.

How do we do it?

Our in-house design capabilities underpin our strength in undertaking contracts in both subcontractor and main contractor capacities at the highest level of technical excellence. As the only ground improvement dedicated contractor in Oceania, we have established ourselves as industry leaders in both design and construction by pioneering techniques needed to get your job done ahead of schedule and budget.

Our first projects in the region can be traced back to the 1970s. Since then, we have delivered some of the largest ground improvement projects within both public and private sectors in Oceania such as the NSW Pacific Highway upgrade, the Brisbane International Cruise Terminal, the Parakariore Sports and Recreation Centre in Christchurch, the Melbourne Metro or the Sydney Gateway.

With more than 50-years of local experience, we are familiar with both the Australian and New Zealand incredible geotechnical diversity, the many challenges they bring as well as local codes and design guidelines.

*"Excellent **Design** and **Construct** services, great **working relationship** during tender, design and delivery. A great plus was the **confidence and knowledge** demonstrated by the design team during complex stakeholder geotechnical discussions to design and deliver a ground improvement system in challenging geotechnical conditions. They always exceeded our expectations and provided expertise with a professional approach."*

Tim Perry | Project Manager | Brookfield Multiplex | **Perth Optus Stadium** | May 2017

Who are we?

Menard is a *family feel* company with 1,900 employees in more than 80 countries.

We have a local approach supported by a global network.

We are the Oceania subsidiary of Menard and part of Soletanche Freyssinet group which is world leader in geotechnical, structural and nuclear engineering.

Every year, Menard works on 4,000 projects worldwide. From improving the ground that will stabilise the foundations of wind turbines in Tasmania to the launchpad of the Spaceship Ariane 5 in Kourou, we are optimising grounds to support your projects.

With offices in Sydney, Brisbane, Melbourne and, Perth we cover every Australian state plus Papua New Guinea. Our new office in Christchurch also manages our local New Zealand projects.

We have worked on some of Oceania most technically challenging construction sites. This includes everything from major sporting stadiums to wind turbines, tank farms and large-scale infrastructure projects, along with several bridges, highways, and rail links that connect Australia.

"At Menard, we are working every day to provide the people of Oceania with a solid foundation for their infrastructures, industrial facilities and their homes. We pride ourselves in building tomorrow's world on solid ground.

Our team is passionate and has years of local experience in Oceania. You can rely on our expertise to deliver your project on time and budget."

Philippe Vincent, Managing Director

Our Values

#1 HOME SAFE

At Menard we always strive to be the contractor of choice that clients can trust on and off site. We pride ourselves on being quality driven, and our clients can always bank on the strength of our foundations. However, it is health and safety that forms our first and foremost priority.

"Safety is not just our first priority. Safety is not just the most important moral obligation to ourselves, peers, colleagues and industry partners. Safety is simply the way we do things. It's a mindset to be adopted that enables us to plan, encourages us to communicate and empowers us to act for the health and well-being of all. So, all of us make it home safely every day."
Olaf Duwer | QSE Manager

Our Health and Safety Performance:

Consistently outperforming the Australian Piling Specialists Federation in incident frequency rates.

Lost Time Injury free in 2021.
Total recordable injury frequency rate < 15 and falling.

#2 LESS IS MORE MENARD

We live in a world in which resources are becoming increasingly scarcer, so we develop optimal solutions using the **least amount** of material possible with a view to improve the sustainability of your projects.

The Less is More Menard attitude relies on several simple principles:

- less quantities through better designs, better operation, better organization
- less 'big toys' but instead ones that are adapted to the task
- less carbon-emitting resources when replacements are available through the supply chain.

The group has set the goal to reduce our Scope 1(1) & 2(2) emissions by 40% and our Scope 3(3) emissions by 20% before the end of 2030.

The Environmental Management System (EMS) ensures Menard recognises that its commitment extends to the protection, care and responsibility for the environment including the environmental impact, together with the implications of responsibility to the workforce under the company control.

#3 INNOVATION IN OUR BLOOD

In 1954, Louis Ménard, a young French mechanical engineering student, invented a device to measure the soil's stress - deformation relationship at various depths in a borehole to calculate its bearing capacity and settlement. The **pressuremeter** was a drastic innovation in the geotechnical industry that continues to inspire the Menard spirit to this day!

Since then the group has invented and developed the **Dynamic Compaction** technique for granular soils as well as the **Menard Vaccum™** for cohesive soils and the **Controlled Modulus Columns (CMC)** technology for high-level control of ground deformations accommodating higher loads.

Working on the most demanding projects our engineers, technicians and operators concentrate on bringing value to our clients by keeping up to date with the **latest state-of-the-art technologies**.

The performance of thousands of successful projects each year provides a constant flow of information to support our local and group R&D teams in generating a **continuous flow of innovations**.

(1) Scope 1 (direct emissions): Greenhouse gas emissions directly produced by Group operations, in particular from fossil fuels used by vehicles, equipment and generators owned or controlled by the Group. — **(2) Scope 2 (direct emissions)**: Emissions from the generation of energy purchased by the Group. — **(3) Scope 3 (indirect emissions)**: Downstream activities.

Major Projects

Barangaroo South Stage, Sydney (2012)

Techniques

Diaphragm wall, Rock anchors

Industry:

Infrastructure, Building

Wheatstone LNG, Onslow (2014)

Technique

Stone columns

Industry:

Marine structures

Parakiore Recreation and Sports Centre, Christchurch (2019)

Technique

Stone columns

Industry:

Infrastructure, Building, Sport facility

Melbourne Metro (2020)

Techniques

Grouting (jet+rock), Drilling

Industry:

Transport, Metro, Tunnelling

Brisbane Airport (2014)

Technique

Vertical drains

Industry:

Infrastructure, Building, Airport

Optus Stadium, Perth (2016)

Techniques

Vertical drains, CMC, Dynamic compaction, Sheet piling

Industry:

Infrastructure, Building, Sport Facilities

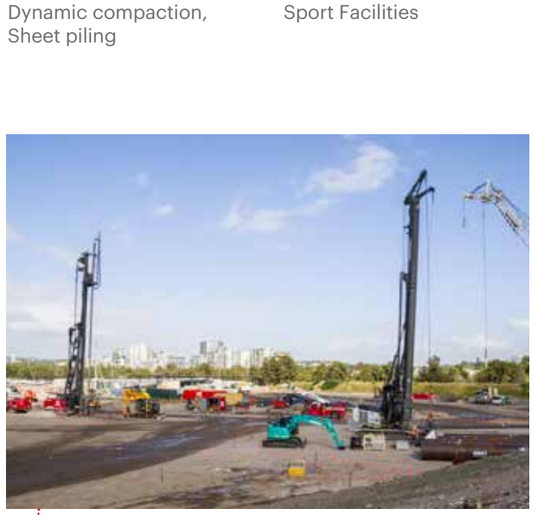
Woodlark 2.4 MPTA Gold, Papua New Guinea (2021)

Technique

Drilling (micropiling)

Industry:

Mine (gold)



Sydney Gateway (2022)

Techniques

CMC, Soil Mixing

Industry:

Roads

A wide range of geotechnical options for the benefit of your project

Our broad range of techniques (many developed within the Group), combined with our 50+ years of experience in Oceania, guarantee that we will determine the best-suited solution to meet your ground engineering challenges.

Our Techniques

Consolidation

- Vertical Drains
- Menard Vacuum™

Drilling

- Anchoring
- Micropiling
- Mine Backfilling

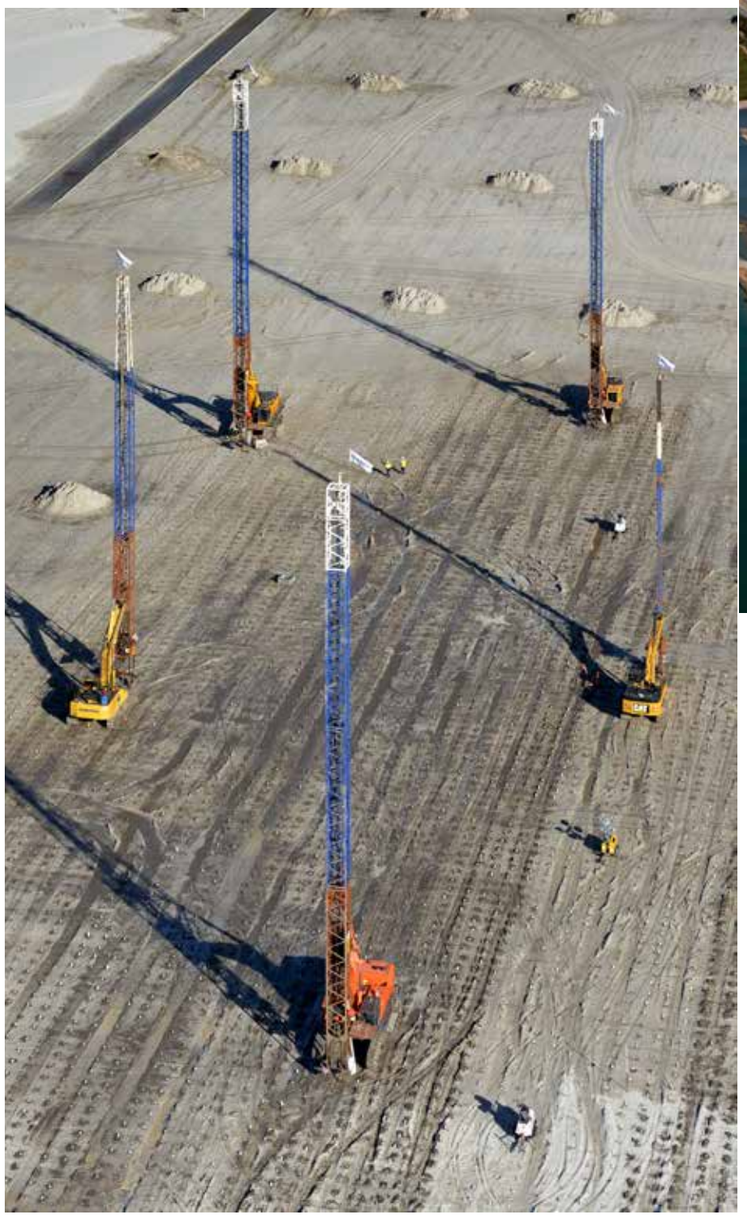
Densification

- Dynamic Compaction
- Rapid Impact Compaction (RIC)
- High Energy Impact Compaction (HEIC)
- Vibrocompaction

Reinforcement

- Controlled Modulus Columns (CMC)
- Stone Columns
- Bi-modulus Columns
- Soil Mixing
- Slurry Wall
- Jet Grouting
- Dynamic Replacement
- Compaction Grouting

Consolidation



Vertical Drains

What is it?

Vertical drains often called wick drains or prefabricated vertical drains, are made up of a plastic core encased by a geotextile that acts as a filter to prevent clogging.

The vertical drains create paths that accelerate water drainage and consolidation of saturated cohesive compressible soils. The drains are installed in a grid that is designed to satisfy the settlement requirements.

There are various types of vertical drains (round and flat) and various sizes to suit every project requirement.

When and why use it?

Fine cohesive soils have low permeability and it takes relatively long periods for them to consolidate under loads. Installation of vertical drains greatly shortens the water drainage path and significantly reduces the consolidation time.

The machines used can conventionally install drains up to depths of about 50 meters.

Menard's tip

The combination of vertical drains with preloading or a surcharge program accelerates the consolidation period.

Menard Vacuum™

What is it?

Menard Vacuum™ is an atmospheric consolidation system. The procedure consists of installing a vertical and horizontal drainage networks that are combined with a vacuum pumping system under an airtight impervious membrane.

This creates a depression under the airtight membrane that has been lain over the soil, which imposes an isotropic pressure on the soil matrix whose magnitude is close to the atmospheric pressure!

When and why use it?

Menard Vacuum™ is a technique created and developed by Menard to control long term residual settlement in saturated cohesive compressible soils.

The drainage of water and soil consolidation can be a very lengthy process. Menard Vacuum™ accelerates the process so you can safely develop your projects.

Menard's tip

Menard Vacuum™ is particularly relevant for deep layers of highly compressible cohesive soils. Because of the stabilising effect of the isotropic pressure, it is effective in reclaimed coastal environments and other projects where the stability of the earthworks and additional embankments may be of concern.

Drilling

Micropiling

What is it?

Drilled micropiles are piles with diameters of up to 300 mm. They are constructed by installing reinforcement bars or casings and grouting them.

When and why use it?

Micropiling is most commonly utilised as a direct structural underpinning to support existing structures.

This cost-effective technique is often employed when space constraints do not allow the utilisation of conventional piling equipment.

Menard's tip

Micropiles can also be installed in closely spaced groups or grids as an alternative to conventional piling schemes on remote sites or under bridge abutments.

Anchoring

What is it?

Ground anchoring is a technique that connects structures with the soil or underlying rock formations and provides a reaction that supports structures and excavations.

There are many different types of anchors that we can design, supply and install:

- Permanent (with monitoring) or temporary anchors
- Above or below ground level
- Various anchoring systems: post-tensioned bar or strand anchors, passive bar anchors, rock bolts, cable bolts, soil nails... That can be used separately or in combination. We have locally introduced several innovative anchoring solutions such as MASB (Multiple anchors Single Bore) and Self-Drilled Freyssibar system, etc.
- Cement-based and/or chemical bonding grouts

When and why use it?

Ground anchors are commonly used to provide stability and reduce deformations of retention walls.

A wide variety of structures, including dams, wharves, retaining walls and foundations are subject to hydraulic uplift forces. Rock anchors can tie down these structures to counteract these forces.

Menard's tip

Post-tensioned systems have been developed in-house for load capacities of up to 1,500 tonnes in strand anchors.

Rock anchors represent the first ground engineering activity established by Menard in Australia.

Mine Backfilling

What is it?

Mine backfilling, is a technique where filler material (sand, fly ash or gravel) is mixed with cementitious material to fill and stabilise underground cavities.

We have an in-depth knowledge of grout mix composition and can tailor the selection of grouts mix used to suit strength and rheology technical requirements with consideration of cost and material availability.

When and why use it?

Mine backfilling can be used in mining operations: it stabilizes the mine, provides safe working areas, enables extraction from condemned areas and reduces the amount of material stored at the surface. It is also used for the stabilisation of new urban developments located on derelict historical mine shafts and galleries.

Menard's tip

We have access to a large fleet of drilling rigs able to reach treatment depths over 100 meters!

Densification

Dynamic Compaction

What is it?

Dynamic compaction is a technique that uses large pounders weighing between 12 to 40 tonnes to densify the soil. The pounder is dropped in free fall from heights of 10 to 40 meters.

The impact transmits high energy waves through the compressible soil layer to reduce the soil matrix void ratio and improve its geotechnical properties.

When and why use it?

Dynamic compaction is applicable to any type of granular soil.

This technique is particularly well-adapted to nonorganic heterogeneous fill, made ground and reclamation areas with varying characteristics, even when large boulders are present. Dynamic compaction is effective in both unsaturated and saturated soils.

Since the late 60s, the Menard group has applied this technique to thousands of sites for very different types of structures and conditions (port and airport platforms, heavy storage, buildings, landfills...) to reduce settlement, mitigate liquefaction, stabilize or treat hydraulic fill, limit lateral earth pressure behind quay walls, etc.

Did you know?

The technique was invented and developed by Mr. Louis Ménard!

Rapid Impact Compaction (RIC)

What is it?

Rapid Impact Compaction is a high-frequency, controlled energy, soil compaction technique. A compaction plate is placed on the targeted ground area. A hydraulic hammer, generally weighing less than 10 to 15 tonnes, is fitted to an excavator and used to transmit compaction energy to the soil via repeated impact.

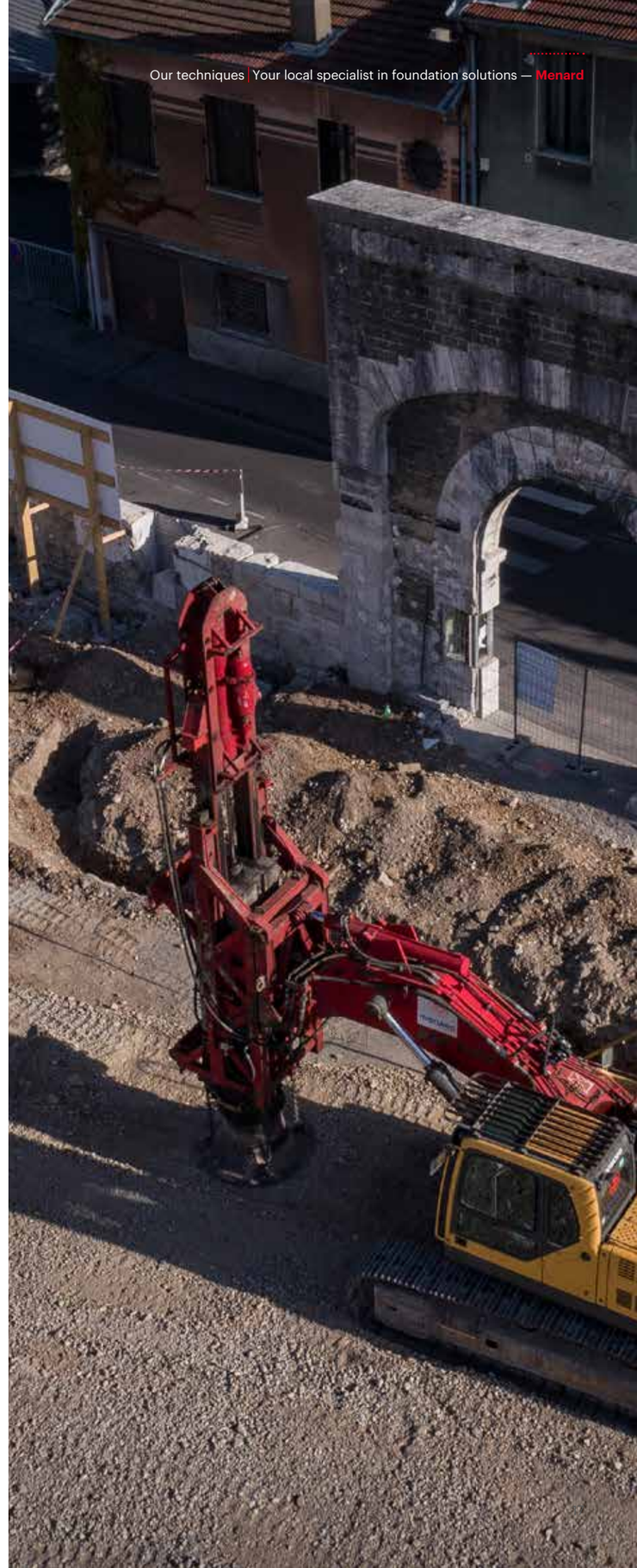
When and why use it?

Rapid Impact Compaction is widely used to densify loose granular soils (sand or gravel) as well as loam fill and industrial brownfield sites for surface compaction, foundations and floor slab support, liquefaction mitigation and waste stabilisation.

The principle of the technique is the transmission of energy into a compressible/ loose soil layer to improve its geotechnical properties.

Menard's tip

Without specific site precautions, a safe working distance to sensitive structures can usually be defined on the order of 8 to 10 m, as a distance of 5 to 6 m can usually be adapted for classical structures. At that distance, noise levels are lower than 90 dBA!



High Energy Impact Compaction (HEIC)

What is it?

High Energy Impact Compaction, or Impact Roller Compaction, relies on rollers at the ground surface that transmit high energy impacts and compact the ground.

Impact roller module cross-sections are 3-sided, 4-sided, or 5-sided to increase compaction depth compared to conventional circular rollers.

As with conventional roller compaction, ground treatment is achieved by applying HEIC in several passes. The number of passes depends on ground conditions, the targeted level of compaction, roller shape and roller weight.

When and why use it?

This technique can be applied to loose, compressible granular soils.

Menard's tip

High Energy Impact Compaction can be performed in thicker lifts compared to conventional roller compaction which means lesser cost and time!

Vibrocompaction

What is it?

Vibrocompaction is executed using a vibratory probe. Under the effect of its weight, the jetted water, and the sustained horizontal vibrations, the vibratory probe rapidly reaches the desired depth.

The probe is then gradually lifted in successive steps, producing a cylinder of compacted ground that is 2 to 4.5 meters in diameter.

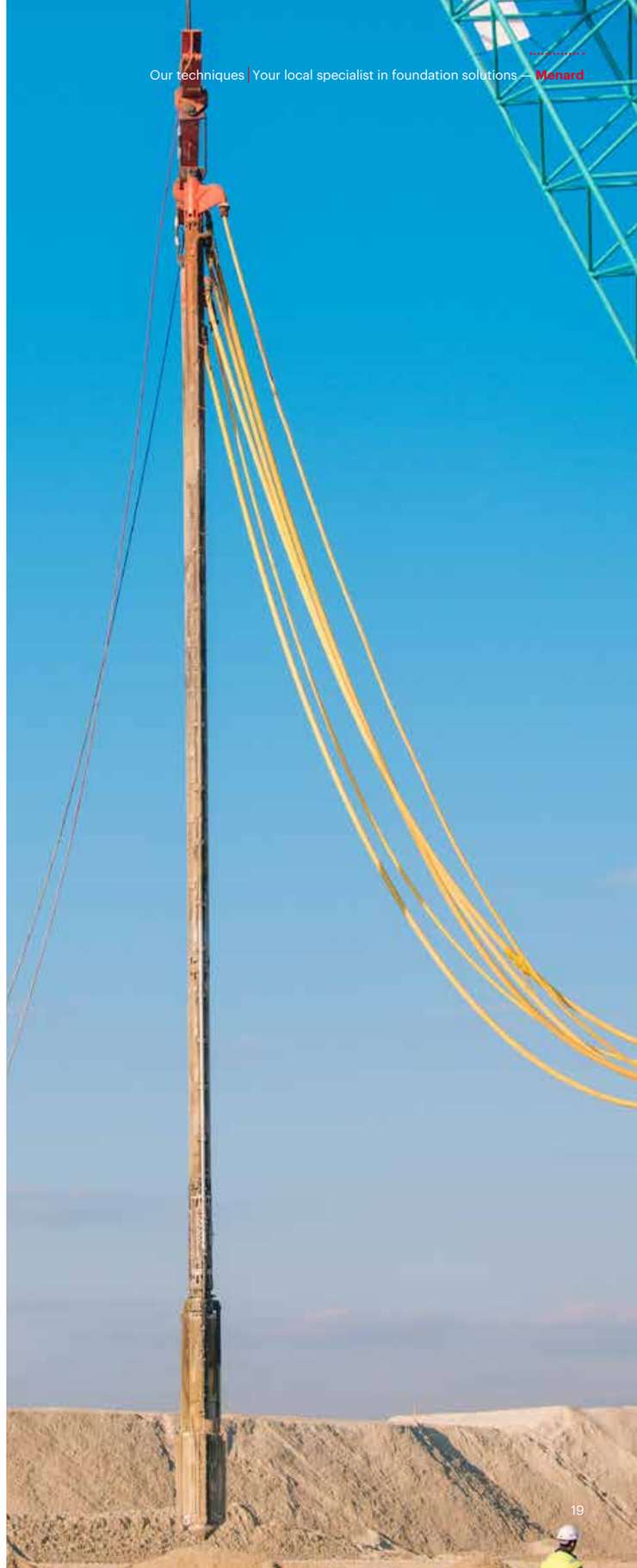
When and why use it?

Loose soil or fill can be compacted at depth through the insertion of vibratory probes with large volumes of water to generate localised liquefaction of the soil. This enables the particles to rearrange themselves in a denser formation and thus increases the overall density of the soil.

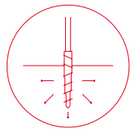
It is used to control and reduce settlement, mitigate liquefaction, stabilize or treat hydraulic fill and limit lateral earth pressure behind quay walls.

Menard's tip

Vibrocompaction generally generates settlement amounting to 7 to 10% of the thickness of the soil treated.



Reinforcement



Controlled Modulus Columns (CMC)

What is it?

Controlled Modulus Columns (CMC) are used to improve the mass properties of compressible soils to reduce their compressibility using a grid of rigid inclusions.

Rigid inclusions are installed using a simple and efficient process with or without soil displacement during drilling. Grout or concrete is injected at low pressure through the hollow stem of the drilling tool. CMC diameters are generally between 280 to 450 mm.

When and why use it?

The objective of this solution is to provide an equivalent improved soil mass stiffness to globally reduce total and differential settlements by sharing loads of the structure between the ground and the CMCs.

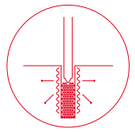
There is no limitation in use for any type of weak grounds, including soils with significant organic content (peat, organic clays, etc) and the technique can uniformly support slab-on-grade and shallow footings, spread footings, strip foundations and retaining walls. The use of a rigid inclusion ground improvement enables to reduce the cost of the structure (decrease of concrete thickness and steel reinforcement).

The entire process is vibration-free and does generate a very limited amount of surface spoil, which allows a cleaner job environment and limits the risk of contamination.

They are an economical alternative to traditional deep foundation solutions and in most cases, can prove to be beneficial for the global design of the overlying structure.

Menard's tip

Our CMC can provide significant savings on both cost and time over more traditional techniques.



Stone Columns

What is it?

Stones columns, also known as aggregate piers, reinforce the soil with a grid of compacted semi-rigid columns.

Menard uses a vibratory probe that penetrates the soft soils to the necessary depth and compacts the material incorporated. These vertical inclusions can be made of stone are installed in a grid pattern beneath the structure.

When and why use it?

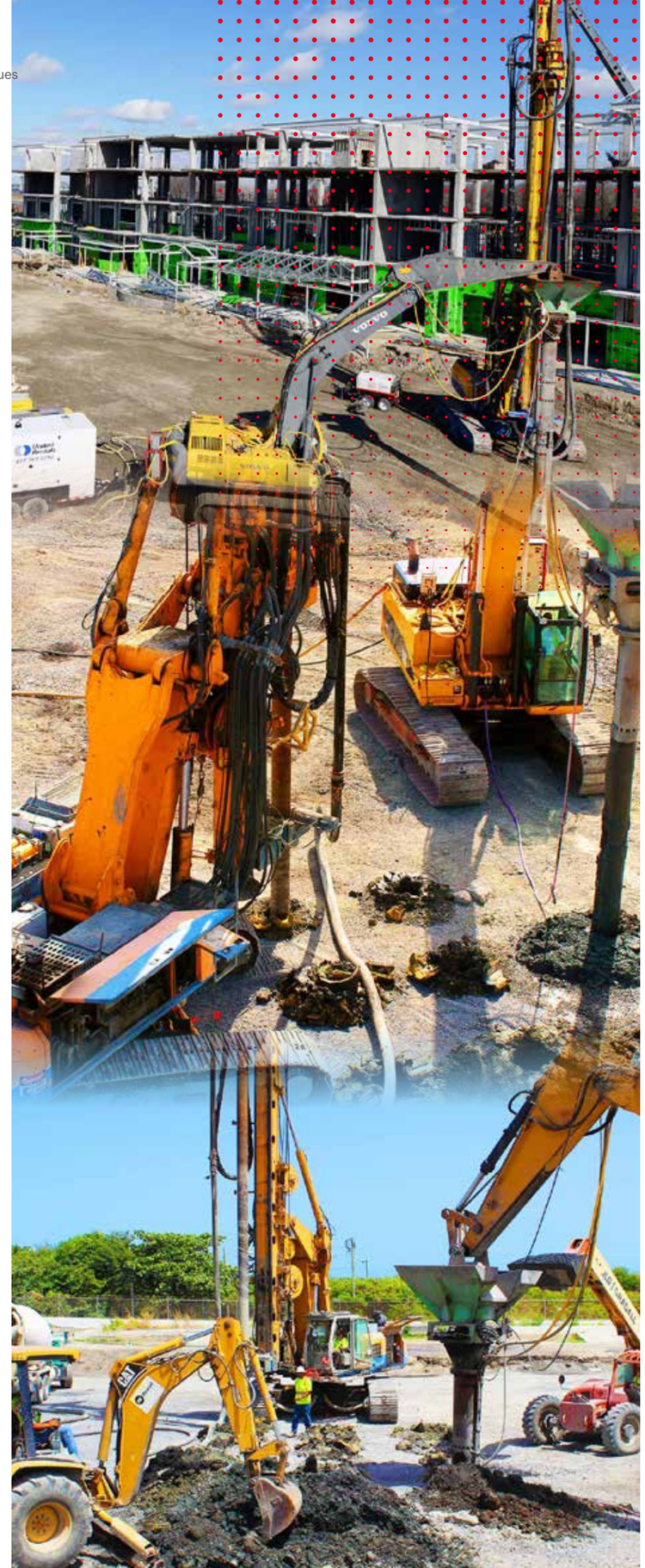
Stone columns are well suited for the improvement of soft or loose soils as they create vertical inclusions with high stiffness, shear strength and draining characteristics.

The result is an increased bearing capacity and a reduction of the total and differential settlements.

They are particularly effective in improving slope stability and preventing liquefaction by increasing the ground's shear strength.

Menard's tip

There are a wide variety of construction methods for stone columns: dry and wet, vibratory probes in the top or bottom of the tool, crane mounted or mast-guided system.



Bi-Modulus Columns

What is it?

Bi-modulus columns are a combination of stone columns and the CMC technique. First, CMCs are installed in the ground.

Then, stone columns interpenetrate the CMC heads thus creating a hybrid Stone-CMC column.

When and why use it?

Bi-modulus columns combine the advantages of both techniques and can be applied to very soft soils where a stone column solution could not work due to the lack of lateral confinement and the risk of bulging.

Bi-modulus columns result in an increased bearing capacity, reduction of total and differential settlements as well as improved stress distribution from the structure to the inclusions which leads to an optimization of the thickness of the load transfer platform between the structure and the inclusions.

Menard's tip

In 2009, Menard developed a specification for this technique that we are now using on every project.

Soil Mixing

What is it?

Soil mixing is a technique that mechanically mixes the in-situ soil with a cementitious binder.

In this method the soil is ripped using specially designed augers or mixing tools, then a binder is injected and mixed with the soil to create a columnar inclusion. Solid blocks can be formed by overlapping columns.

When and why use it?

Soil mixing is used for a wide variety of applications: controlling and reducing settlement under structures, increasing the bearing capacity of the soil, ensuring stability, reducing liquefaction risk, mass stabilization, reducing earth pressure behind retaining structures, blocking groundwater, increasing lateral reaction around foundation piles, etc.

It is a very flexible technique as we have developed several methods of treatment. Binder dosage and mixing parameters are selected according to soil characteristics and specifications to be achieved.

Menard's tip

Menard can apply different specialised soil mixing techniques such as Deep Soil Mixing or Mass Soil Mixing.

Slurry Walls

What is it?

Slurry walls are non-structural underground barriers with specific hydraulic and permeability characteristics.

A trench is excavated under slurry and backfilled. In cut-off walls backfilling is with a homogeneous stable mix of excavated soil, bentonite slurry and clay. In permeable barriers the trench is backfilled with a permeable material and may include special products to neutralise contaminants.

When and why use it?

Slurry walls are most often used to intercept groundwater migration for pollutant containment for landfills or heavily contaminated industrial sites.

It is a cost-effective method for the environmental containment of water-borne contaminants, the installation of reactive groundwater barriers or drainage barriers.

Menard's tip

Slurry walls have been installed to depth of approximately 50 m. Soil-bentonite slurry walls create reduced volumes of spoil because excavated material is reused as backfill material.

Jet Grouting

What is it?

Jet grouting uses fluid jetting with a very high kinetic energy to erode the soil structure and mixes the soil particles in-situ with grout. It creates a homogeneous mass of high strength reinforced soil-cement material.

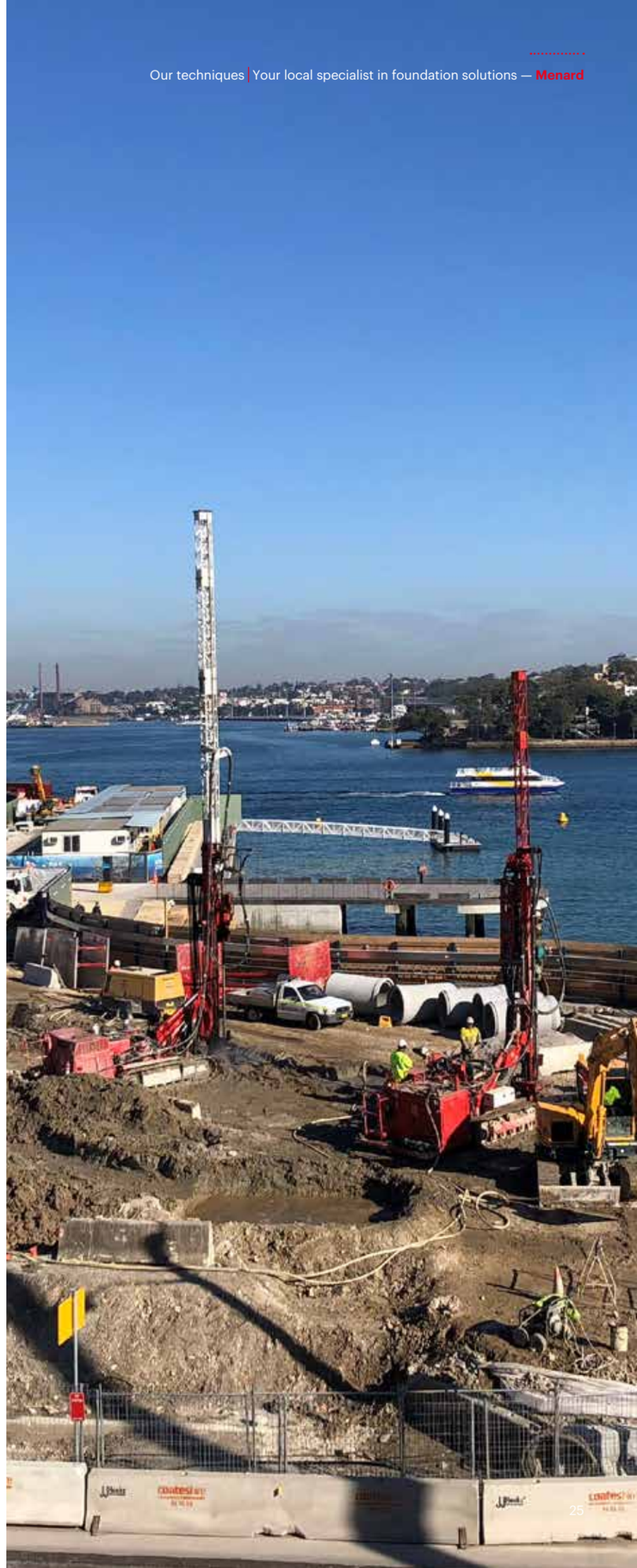
When and why use it?

Jet grouting is used to control and reduce settlement under structures, increase bearing capacity, create an impervious cut-off wall or impervious bottom for excavation, install retaining walls, underpin existing structures, reinforce soils with existing utility lines and buried structures.

Depending on the overall design and soil conditions, several methods of treatment have been developed (single or double curtain walls, secant columns walls, plugs, isolated columns, etc.) making jet grouting a flexible technique.

Menard's tip

Jet grouting can be applied in areas that are difficult to access using inclined columns, directional drilling and masts of different sizes to fit within tight spaces.



Dynamic Replacement

What is it?

This method combines dynamic compaction and stone columns techniques by creating large-sized dynamic replacement inclusions with high internal shear resistance.

In this application, the tamping energy drives granular material down through the compressible soils to form large-diameter reinforcement columns (with column diameters ranging from 2 m to 3.5 m).

When and why use it?

If the ground cannot be dynamically compacted directly due to high fines content within the soil, a granular material must be added.

This technique is well suited to highly compressible and weak soils and can be applied to structures with high loading (high embankment, storage tanks, etc.). It improves the bearing capacity of the poor soils and the subsequent reduction and control of total and differential settlements. An additional benefit is that dynamic replacement pillars allow for rapid drainage of the ground.

Menard's tip

The technique can be carried out with or without pre-excavation!

Compaction Grouting

What is it?

Compaction grouting is a pressure grouting technique that forms cylinders of grout and densifies the surrounding soils.

Global improvement of a volume of compressible soils requires sequencing the grouting work into a series of primary, secondary and even tertiary grid locations.

When and why use it?

Compaction grouting is classically used to densify loose sands for liquefaction mitigation or to improve the bearing capacity of the ground.

Compaction grouting is particularly well-adapted to liquefaction mitigation for the following reasons:

- It increases the relative density of sandy soils
- It increases the horizontal coefficient of earth pressure at rest Ko
- It induces aging of the soil by low strain shear deformation

Did you know?

In addition to jet and compaction grouting, Menard undertakes a variety of specialist grouting techniques such as classical permeation grouting of rocks and soils.

These techniques can be utilised for a range of applications from the improvement of dam foundations, waterproofing of tunnels and deep basement located beneath groundwater level to structural retrofitting for stabilisation of rock mass and structural underpinning.

Providing solutions across a broad range of sectors

As a ground improvement specialised contractor, Menard has a track record of providing solutions for small to large projects, for both private and public stakeholders.

Applications

Our experience and wide range of techniques allow us to work across various sectors, including:

Buildings

- Commercial and Residential
- Industrial

Infrastructure

- Ports and Airports
- Roads and Railways

Process and energy

- Dam Engineering
- Mining

Buildings

Commercial and Residential

Commercial, institutional, and residential building projects are generally driven by a financial model that requires a high-quality product under the umbrella of very demanding cost constraints.

Menard can help you:

- Control total and differential settlements
- Provide good bearing capacity under spread footings
- Allow for conventional and economical shallow foundations
- Reduce the need for off-site soil disposal

It is imperative that well-performing, warranted and cost-conscious construction techniques are used for these projects.

Menard's innovative and economical ground improvement solutions have been implemented numerous times to help developpers meet their project's cost and schedule constraints.

A wide range of ground improvement technologies such as:

- Menard Vacuum™ consolidation
- Dynamic Replacement
- Jet grouting, an attractive solution to get you out of trouble on sites with tight access and enclosed structures.
- Controlled Modulus Columns with high load carrying capacity and speedy construction

Industrial

We have a proven track record of delivering ground improvement works for industrial buildings providing great beginnings through strong floor support systems.

If specific solutions are not applied, warehouse structures that are located within poor soil areas may be subject to excessive total and differential settlements under the footings and floor slabs.

Ground improvement for warehouses optimises in-situ ground usage to satisfy settlement criteria, this removes the need to bridge poor soil conditions with structural piles and a thick structural slab.

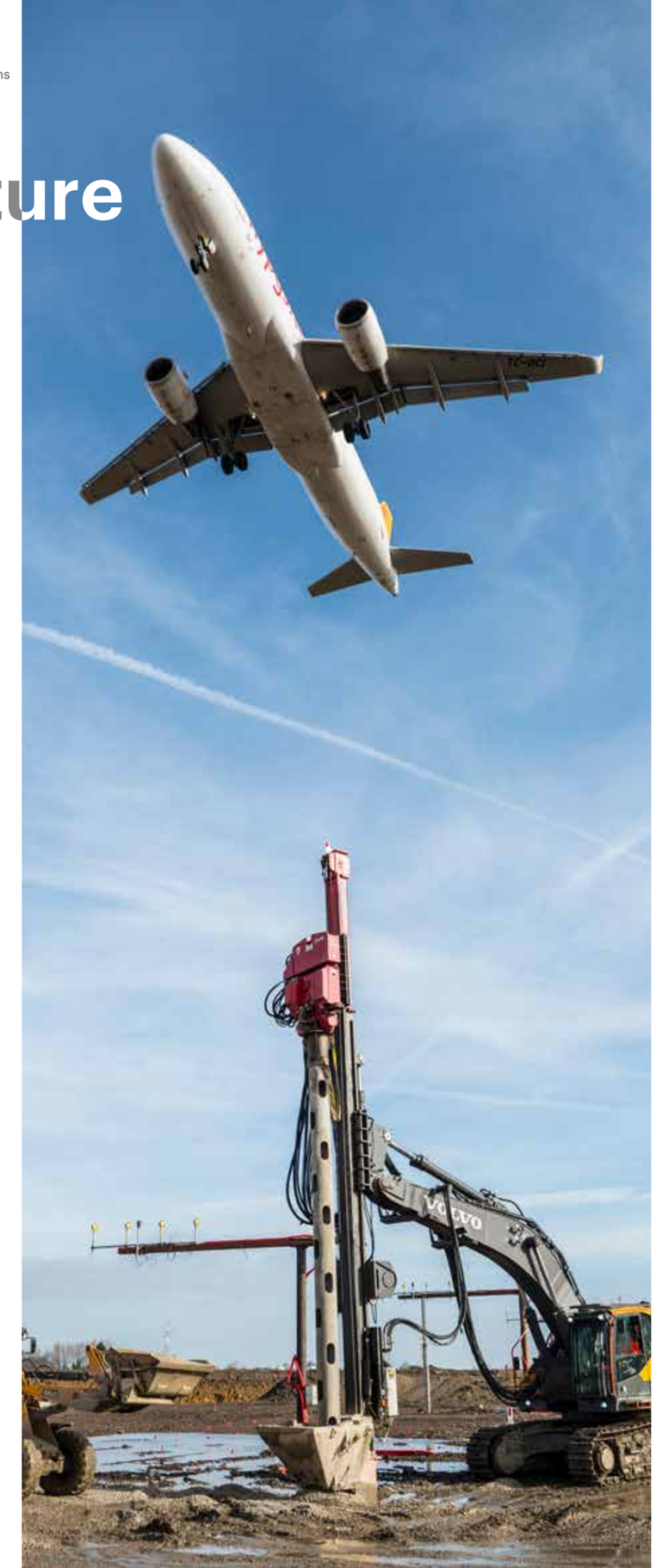
Our technologies are well adapted to the loads induced by factories and warehouses, such as slab-on-grade and isolated footings. Typically, the load intensity is not too high and the floor area to be treated is large.

For structures to be built on non-cohesive soils, dynamic compaction or vibrocompaction will most likely be the ground improvement method selected.

The reinforcement method using either dynamic replacement, stone columns or Controlled Modulus Columns (CMC) is more suited for structures to be built on saturated cohesive soils.

CMCs is by far the most suitable method due to its speed and cost-effectiveness.

Infrastructure



Ports and Airports

Given the large surface areas (several hectares in many cases) which are generally required, lands for ports or airports platforms are often reclaimed from the sea using hydraulic or terrestrial backfill.

Cost-effective ground treatment techniques are very commonly used to treat such sites:

- To ensure the self-bearing and stability of the fill and existing soils
- To accelerate subsoil consolidation
- To improve retention systems
- To reduce long term residual settlements
- To reduce loads on quay walls

For these facilities to be built, our techniques provide economical solutions to consolidate these soils within a reduced timeframe.

In cases of strong seismic loading, the treatment can include measures to reduce or mitigate the risk of liquefaction. This type of project calls for the use of substantial resources to treat large surface areas within a relatively short period.

Roads and Railways

Transport infrastructures – roads and railway systems – are frequently built in areas such as swamps, marshes or areas near watercourses. In such cases, substantial consolidation work is required to avoid shear failure of embankments.

This type of project requires simultaneous management of multiple sites along the alignment and can often involve the use of a variety of solutions to meet various geotechnical conditions or risk/hazards and specific constraints of the terrain.

To ensure the long-term integrity of the infrastructures and the safety of the vehicles using them, these areas must be “over-consolidated” to reduce and control primary, creep and differential settlements.

For engineering structures built along the alignment, the embankment generates very high loads associated with strict settlement limitations.

These critical areas generally require even more extensive treatment and careful management of the interfaces.

As our cities expand, more projects are heading underground as available space on the surface becomes scarcer. Tunnelling is being utilised more often than ever before, with the requirement for ground treatment, specifically at cross-passage locations where soft or mixed ground conditions exist.

Menard specialised knowledge in all forms of grouting allows us to develop solutions, whether it is to improve the stability of the ground and or provide groundwater ingress control.

Process and Energy

General

Industrial plants and equipment consist of unique structures that are often very heavy and sensitive. When foundations are built on compressible soils, careful consideration must be taken during design and execution to ensure the safe operation of the plant within the structures.

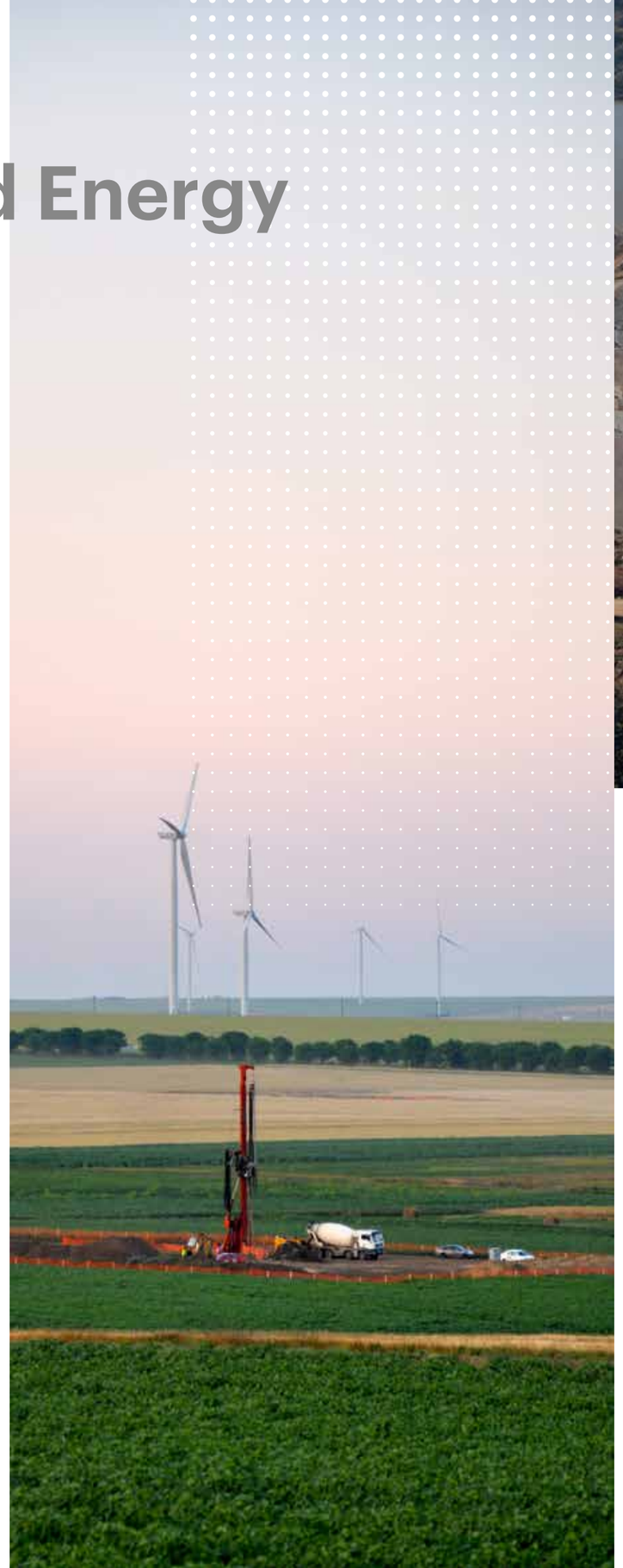
Our ground improvement techniques make it possible to:

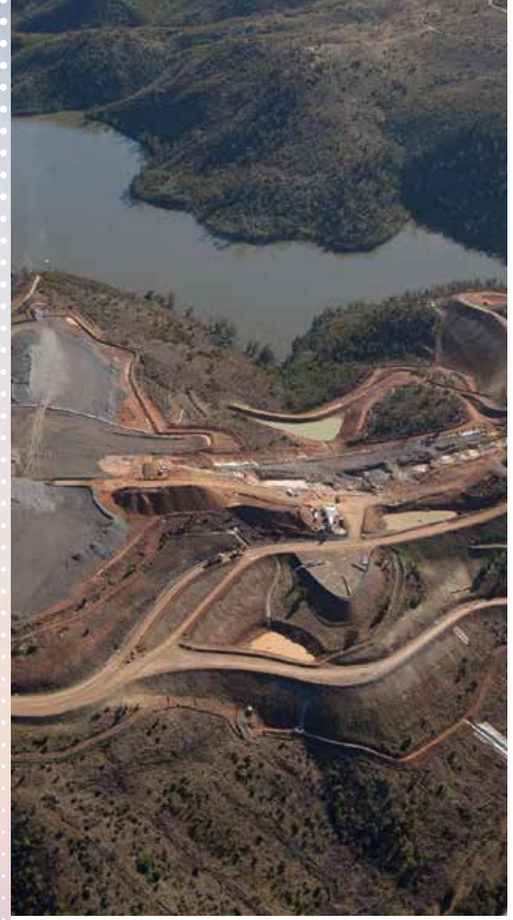
- Support heavy uniform loads (water, oil and gas storage)
- Support individual loads (pipeline supports, industrial equipment)
- Support dynamic loads (oscillations, vibrations, seismic loadings)
- Reduce absolute and differential settlement of structures
- Mitigate the risk of soil liquefaction.

This type of project calls for a sound knowledge of the constraints and specifications of each structure to be treated and a familiarity with the potential technical issues which could arise during the various stages of the project from concept to handover.

We have more than 30 years of experience in ground improvement in the industry including:

- Tank farm
- Wind energy
- Oil
- Gas
- Power plant





Mining

When it comes to mines, ground improvement and geotechnical services have become an increasingly important topic: settlement controls and mitigation requirements must always be studied to avoid any potential technical issues.

To avoid the issues and facilitate mining activity, Menard can assist on the following:

- Slope stabilisation
- Settlement controls
- Mitigation
- Mine tailings

Settlement controls and mitigation requirements must always be studied to avoid any potential technical issues.

For an optimal result, the mining application often calls for a combination of techniques including, but not limited to: soil mixing, grouting and slurry walls.

Dam Engineering

Design criteria for dams are constantly evolving, generating the need for the adoption of upgraded parameters when building new dams; and additional work to ensure compliance with changing standards in the maintenance or extensions of existing dams.

The Soletanche Freyssinet group has the widest range of foundation and soil technologies. As part of the group, Menard has become a benchmark through its exclusive soil reinforcement and improvement methods.

The principal areas where Menard can assist with these matters are in:

- Seismically deficient dams
- Tailings impoundment stabilisation
- Water, Seepage and erosion control or reduction
- Safety margin against failure improvement

To do so, we use techniques such as:

- High capacity vertical rock anchors
- Soil mixing
- Upgrade or replacement of the dam core
- Installation of cut-off walls and drains as well as spillway and slap anchors often combined with monitoring of dam performance

Neutralize pollution to build a future

We develop state-of-the-art containment and soil remediation methods to treat sites affected by subsurface contamination.

Environmental Remediation

In addition to its core competencies of ground improvement specialist, we also offer expertise in soil remediation, giving a fresh future to contaminated sites.

Applications

- Treating sites

Techniques

- PRB Walls
- In situ stabilisation
- In situ treatment

Applications

Treating sites

Despite our best efforts, humans continue to extract, produce and consume materials that can have a potentially damaging impact on the environment and human health.

In response, Menard has developed state-of-the-art containment and soil remediation methods to treat sites affected by subsurface contamination.

Our techniques can either completely cut-off contaminated groundwater flows or facilitate passive treatment whilst providing means to perform long term monitoring and management of contaminated sites.

We can efficiently treat former gasworks sites, petrochemical or PFAS sites.

The following techniques are used to treat contamination:

- Soil mixing,
- Pump and treat
- Jet grouting
- Cut-off walls
- Permeable reactive barriers, funnels and gates
- Trench support by polymer is also used when permeable backfills are required to create collector drains or reactive barriers

Techniques

PRB Walls

What is it?

Permeable Reactive Barriers (PRB) walls are narrow trenches that are excavated under slurry and backfilled with materials that decontaminate groundwater passing through them.

When and why use it?

Ideally when in-situ remediation of contaminated sites is required without impacting the groundwater flow.

Menard's tip

Menard is Australia's leading contractor for the installation of Slurry and PRB walls.

In-situ stabilisation

What is it?

In-situ stabilisation is a method for stabilising or solidifying soils in place and utilises cementitious material to create low permeability properties that help reduce the impact of the contaminants.

When and why use it?

In situ stabilisation is typically used to limit the spread of contaminants in soil and groundwater. It does not remove the contaminant but prevents leaching and migration by trapping it in the soil.

This technique applies to various types of organic and chemical contaminants.

Menard's tip

Solidification does not actively promote chemical changes in the contaminants.

In-situ treatment

What is it?

In-situ an in-place method to treat contaminated soils. This is conventionally achieved by absorption, reduction or precipitation.

It actively promotes chemical changes in the contaminants, converting them to less harmful or inert products.

In-situ treatment methods will depend on the subsurface conditions and contaminant characteristics.

When and why use it?

In situ treatment is typically used to neutralise contaminants present in soils.

This technique is very versatile and can be applied to various soils and contaminants such as working sites and soils located under existing buildings.

Menard's tip

In-situ treatment is a simple, cost-effective treatment that has very little environmental impact.

Menard CMC Rigs, Sydney Gateway, 2022 Picture by Aran Anderson

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