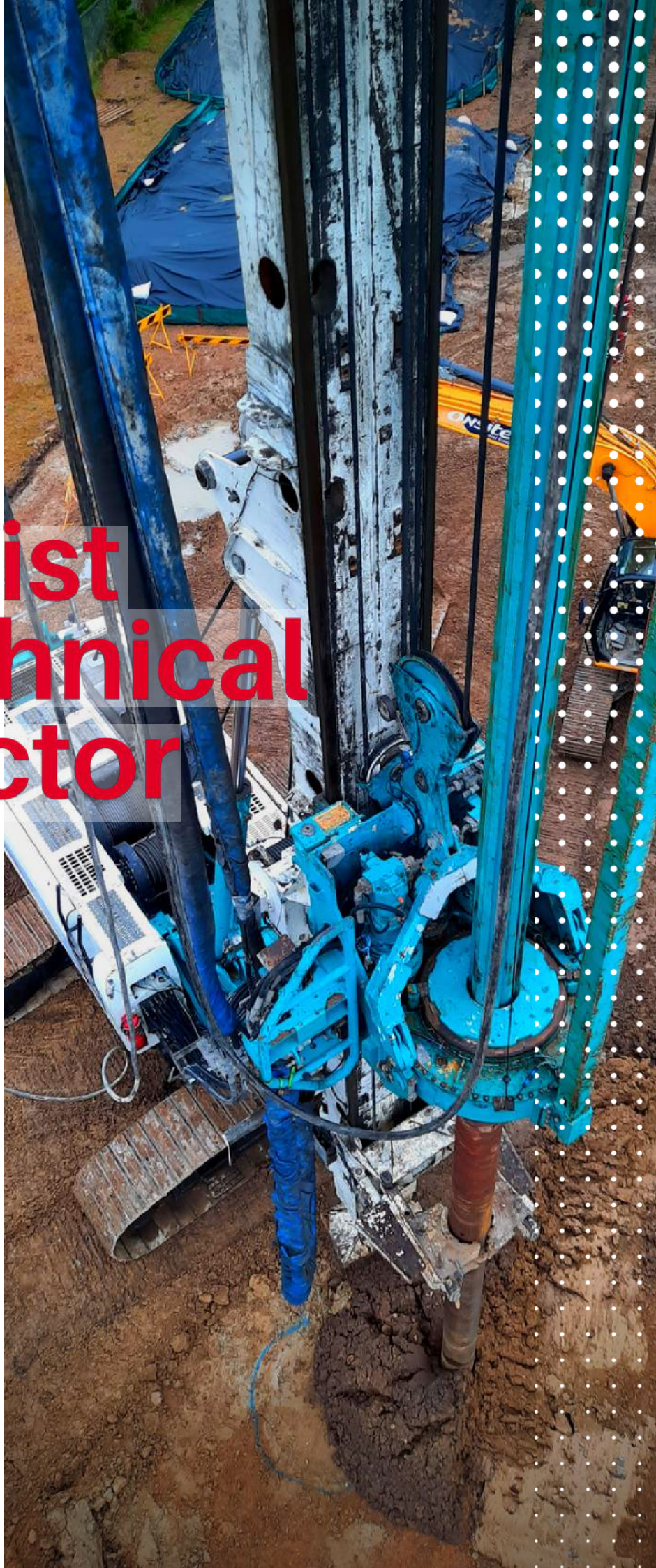
menard

Specialist Geotechnical Contractor



Soil Mixing

Menard
About us

1,470
employees

+80
countries of operation

+1,200
projects a year

415
million of revenue

Who We Are

Menard Oceania is the Australian subsidiary of Menard and part of Soletanche Freyssinet Group, world leaders in geotechnical, environmental and civil engineering construction.

The combination of Menard Oceania's local resources with the vast experience and history of the Soletanche Freyssinet group generates an unrivalled capability in design and execution of geotechnical projects.

SoilTeam

Soletanche Bachy
World leader in special foundations and underground structures

Menard
Recognised world specialist in ground improvement and soil remediation

What We Offer

With an emphasis on value added design and innovation, Menard Oceania brings its extensive experience to the planning and design development phases of projects, providing optimal geotechnical solutions.

Our in-house design capabilities fortify our strength in undertaking contracts in both subcontractor and main contractor capacities, allowing us to perform at the highest level of technical excellence.

Our Techniques

What We Do

Menard Oceania is a specialist contractor for geotechnical and civil engineering activities operating throughout Australasia.

With a reputation for innovative solutions, our expertise in ground improvement, specialist foundations, grouting, and environmental remediation has facilitated the delivery of cost effective solutions for construction projects across the South Pacific.

Ground Improvement

- Dynamic Compaction
- Dynamic Replacement
- Stone Columns
- Vacuum Consolidation
- Vertical Drains
- Vibro Compaction
- Rapid Impact Compaction

Ground Reinforcement

- Controlled Modulus Columns
- Jet Grouting
- Soil Mixing
- Bi-modulus columns

Drilling

- Anchoring and Soil Nails
- Micropiles
- Mine Backfilling
- Grouting

Environmental Remediation

- Permeable Reactive Barrier Walls
- Slurry Walls
- Soil Remediation

What is Soil Mixing?

Soil mixing involves modifying the properties of weak soils to improve their geomechanical and permeability characteristics.

It consists of using specially designed augers or special tools to mechanically mix the soil with an in-situ binder. The process simultaneously breaks up the soil without removing it, injects a binder at low pressure and thoroughly mixes the binder with the soil.

The machine is equipped with one or more mixing tools (augers, blades, rotating head) to directly inject the binder into the required areas. The stabilizing agent is introduced into the soil to be treated and vigorously mixed by the mixer blades. The process parameters are adjusted to the soil's resistance and the desired characteristics.

Advantages of Soil Mixing

Why Use it?

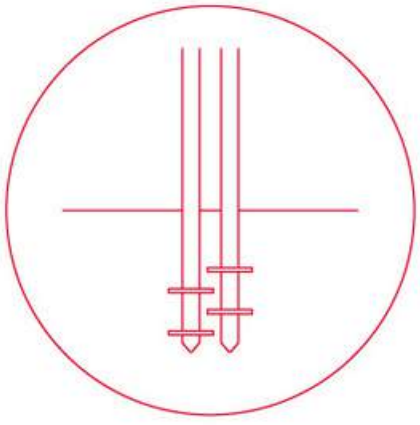
- Increase load bearing capacity of the soil
- Reduce total and differential settlements
- Increase global stability
- Reduce liquefaction
- Reduce permeability (Cut off walls and impervious plug)
- Encapsulate contamination for in situ treatment
- Retention system and excavation support
- Reduce thrust behind retaining structures
- Increase reaction around piled foundations

Application

- Foundations of low-rise buildings and houses
- Commercial/industrial hardstanding, foundations and floor slabs with high tolerances
- Infrastructure schemes including road & railway embankments, water treatment plants, nuclear plants, tanks and windfarms
- Slope stabilisation
- Contaminated and landfill sites
- Working platform

Advantages

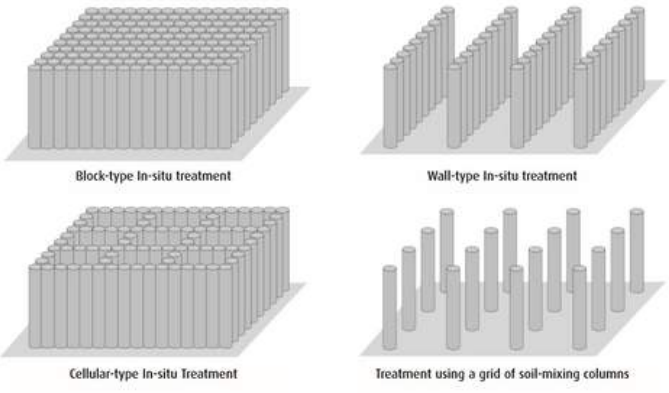
- Easily adaptable to a broad range of structures and applications
- Simple solution to complex geological environments
- Vibration free and can be used in the close vicinity of sensitive structures
- Limited spoil
- Cost effective alternative to excavate & replace and conventional deep foundation
- Highly adaptable to compressible soils
- Elimination of complex and expensive connections between foundations and structures



Dig Deeper into Soil Mixing

This technique is usually used for the stabilization and mass improvement of soft clays and organic soils. Depth of treatment of up to 40 m can be
achieved. Depending on the overall design and soil conditions, several methods of treatment have been developed:

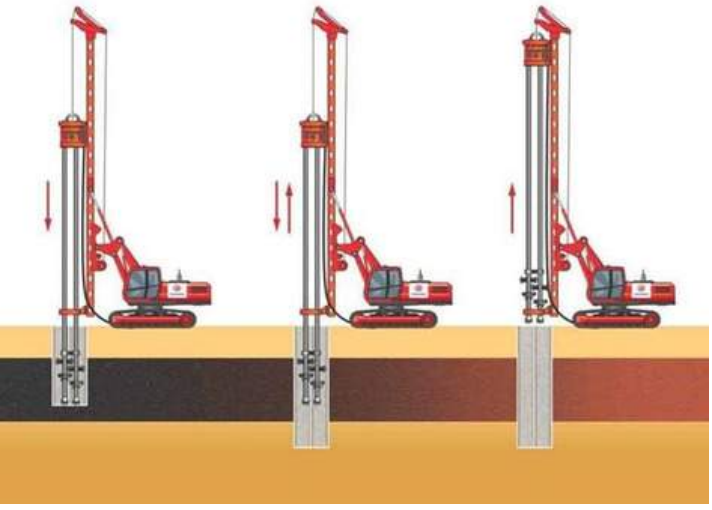
The technique can be used to create a wide variety of treatment geometries (isolated elements, grids, walls, cells, blocks) and can therefore be easily adapted to a wide range of structures and applications.



Different Types of Soil Mixing

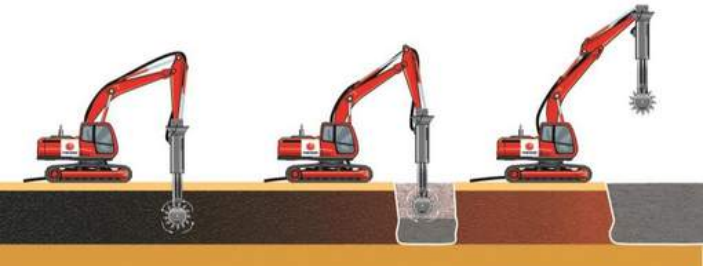
Menard predominantly uses two different types of soil mixing for ground improvement: Deep Soil Mixing (DSM) and Mass Soil Mixing (MSM).

Deep Soil Mixing



Deep Soil Mixing involves the use of a single, dual or triple circular paddle mixing tool which mechanically mix the soil vertically during penetration and extraction. A binder can be injected as either a dry powder or wet slurry to create the soil mix matrix.
Treatment is possible to depths of 40 meters using a 75-100T rig.

Mass Soil Mixing



Mass Soil Mixing typically involves the use of a dual drum mixing head which mechanically mixes the soil. The binder is injected as either a dry powder or a wet slurry during mixing to create the soil matrix.
Treatment is possible to depths of 7 meters using a 50T excavator.

Highlighted Projects

Menard Oceania has completed soil mixing projects across Australia, tackling numerous ground conditions and offering a range of geotechnical solutions to meet varied challenges.

Brisbane International Cruise Terminal

Mudgeeraba to Varsity Lakes Pacific Hwy Upgrade

Telegraph Road Open Level Crossing Elimination Project

Brisbane International Cruise Terminal

The Brisbane International Cruise Terminal project is the first dedicated facility in south-east Queensland capable of accommodating mega cruise ships instead of docking at Brisbane's main Cargo Port. The need for a purpose-built terminal has been made even more pressing with vessels increasing in size with cruise ships such as the Symphony of the Sea measuring more than three times the length of a Rugby league field.

The Brisbane International Cruise Terminal was built over highly compressible soils involving complex marine and geotechnical works.

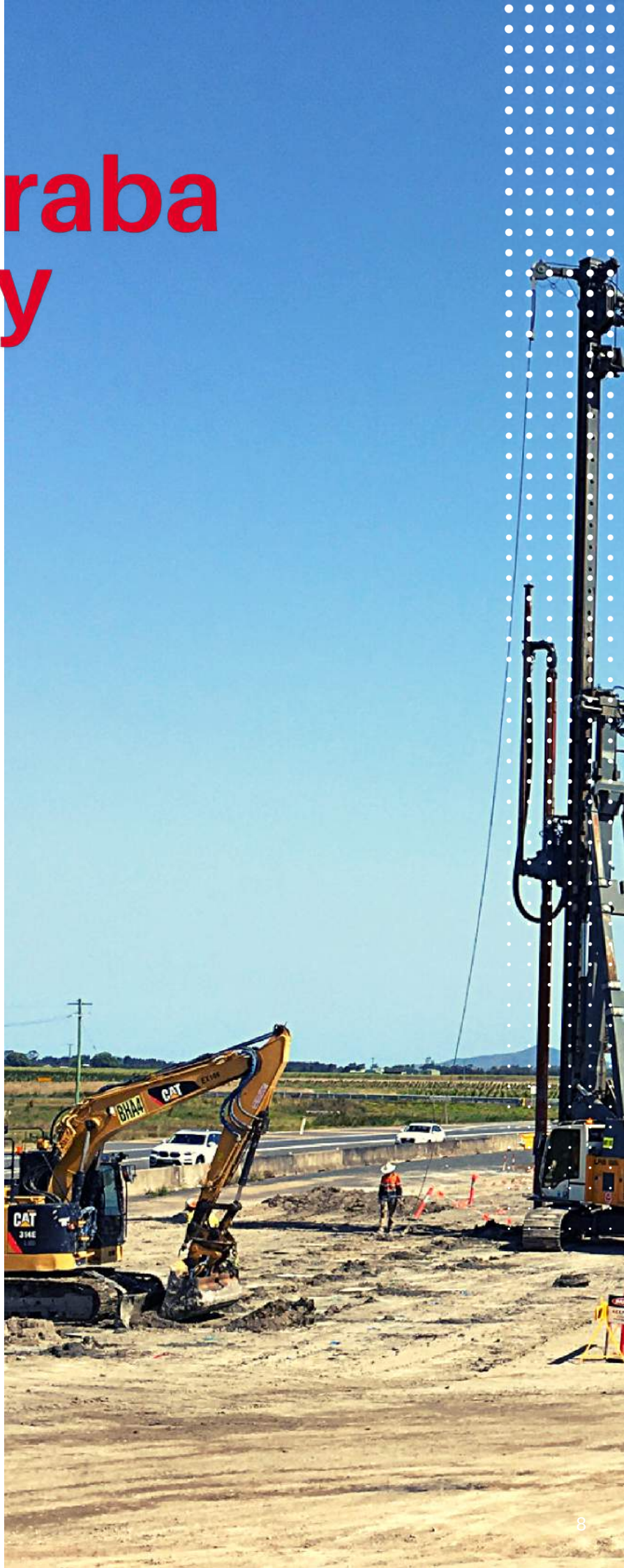
Menard was contracted to provide a cost-effective ground improvement solution that would limit long term settlements. To achieve this, Deep Soil Mixing (DSM) was required and executed in the form of shear panels to provide stability under four building cores that were subject to high lateral loads and overturning moments.

1.5m diameter were installed to over 12m depths and reinforced with steel beams and tied onto core foundation.

Mudgeeraba to Varsity Lakes

Menard Oceania was engaged to conduct the soil mixing works associated with The Department of Transport and Main Roads project known as Pacific Highway Upgrade Mudgeeraba to Varsity Lakes (M2VL).

Menard's scope of works involved the construction of deep soil mixed panels with a varying depths of 0.75m to 7m below ground level. The panels were used to strengthen the soil, providing a solid foundation of road embankments leading up to bridge abutments.



This project called for the use of a 1.5 diameter deep soil mixing tool set up.

Telegraph Road

The crossing of this project is located at the intersection of Telegraph Road and Lacey Road in the northern Brisbane suburb of Bracken Ridge. The works involved realigning widened pavement with the existing Telegraph Road, while managing the construction of a road over the rail bridge and associated high embankments.

Mass soil mixing was required to improve the soil properties of the underlying foundations, thereby reducing both total and differential settlements at both bridge abutments and approaches.

Menard performed Mass Soil Mixing (MSM) of approximately 2,700m3 with an average depth of 2m in the structure zones and approximately 10,500m3 with an average depth of 1m in the transition zones.

Various stages of bridge construction.

Quality Assurance

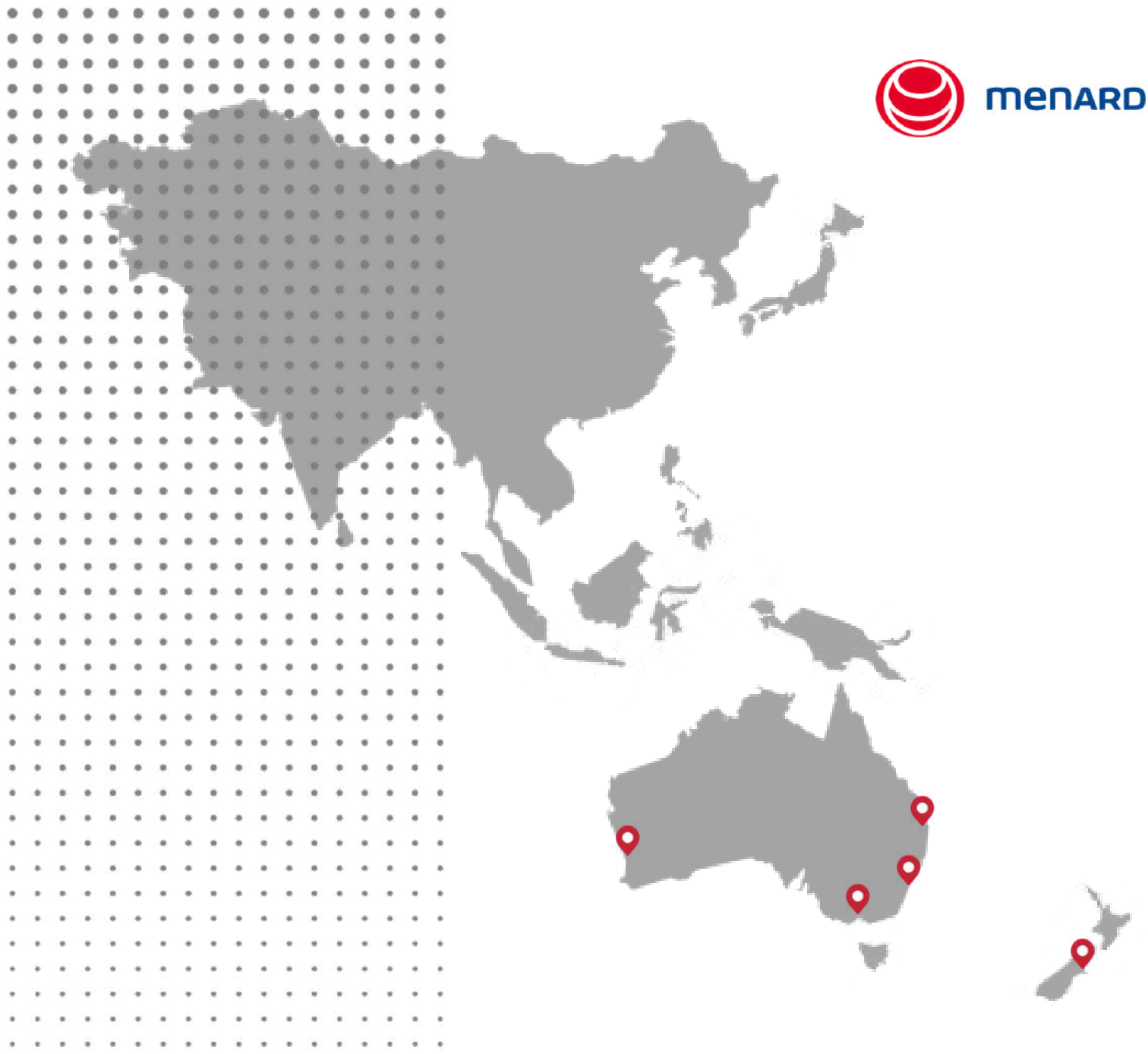
Soil mixing costs can be rationalised through detailed binder mix optimisation. Extensive laboratory trials are generally undertaken using soil samples from site in order to tailor a binder content to watch the performance criteria with soils encountered on-site.

The mechanical characteristics of soil-mix material is then verified by compressive strength testing to establish strength development of the soil mix over time.

Throughout production works, ongoing field verification testing is maintained. This enables to keep a baseline and track the evolution of site conditions.

Above: Operator recording and checking quality control

Left: Inspection of recovered core on a soil mix column



Our Regional Offices

Regional Head Office
Sydney
13-15 Lyonpark Road
Macquarie Park, NSW, 2113
Tel: +61 2 9491 7100

Brisbane
6 Chapman Place
Eagle Farm, QLD, 4009
Tel: +61 7 3354 9100

Perth
113 Radium Street
Welshpool, WA, 6106
Tel: +61 4 5040 2239

Melbourne
217 Arden Street
North Melbourne, VIC, 3051
Tel: +61 3 9321 1360

Christchurch
Office 8, First Floor
Admiralty Buildings, Conway Lane
176 High Street, Rangiora, 7400
Tel: +64 3 365 3005

www.menardoceania.com.au
info@menard.com.au