menard

Ground Improvement Specialist

Contents

Company Overview

Menard brings over 30 years of experience in the design and build of specialist ground improvement solutions in the UK. We offer a broad range of ground improvement techniques and combined with innovative designs we can provide practical and sustainable solutions which are more cost effective than traditional piles. We pride ourselves in being able to deliver solutions for a wide range of soil conditions and provide a seamless service between initial contact and delivery on site.

Our success is based on the people we employ. We aim to create a culture in which our people are empowered to express their skills and knowledge through their work. We encourage and support development and create teams who work with passion and commitment. **We believe wholeheartedly in working hard, adding value and having fun.**

Our most important principle is the health and safety of our work colleagues and anyone affected by our activities. Our aim is to provide a safe place to work for all, which requires a collaborative effort from everyone, including subcontractors and suppliers, to create a culture in which we all make safety personal. Making safety personal has been built on the integrity and trust of our people, as well as continual improvement of our working practices. **Our goal is always to ensure all our people go home safe and in good health every day**.

Design Philosophy

We view every project as a unique challenge. Our approach is to question the norm and understand what your needs are and where we can add value to your overall project delivery. Our people's expertise in geotechnics will be used to provide you with the most economical solution that **guarantees technical performance**.

Our design engineers are able to draw on the Menard Group worldwide network of designers and 50 years worth of real performance data from jobsites around the world. Through the work of our research and design department and the adoption of cutting edge software we are able to **explore and expand** on traditional solutions and deliver value to our customers everytime.

Scotland
Suite 1M
Avondale House
Phoenix Crescent
Bellshill
ML4 3NJ

N.Ireland
23 Lisburn Road
Royal Hillsborough
Co. Down
BT26 6AA

North
Henderson House Langley Place
Higgins Lane
Burscough
Lancashire
L40 8JS

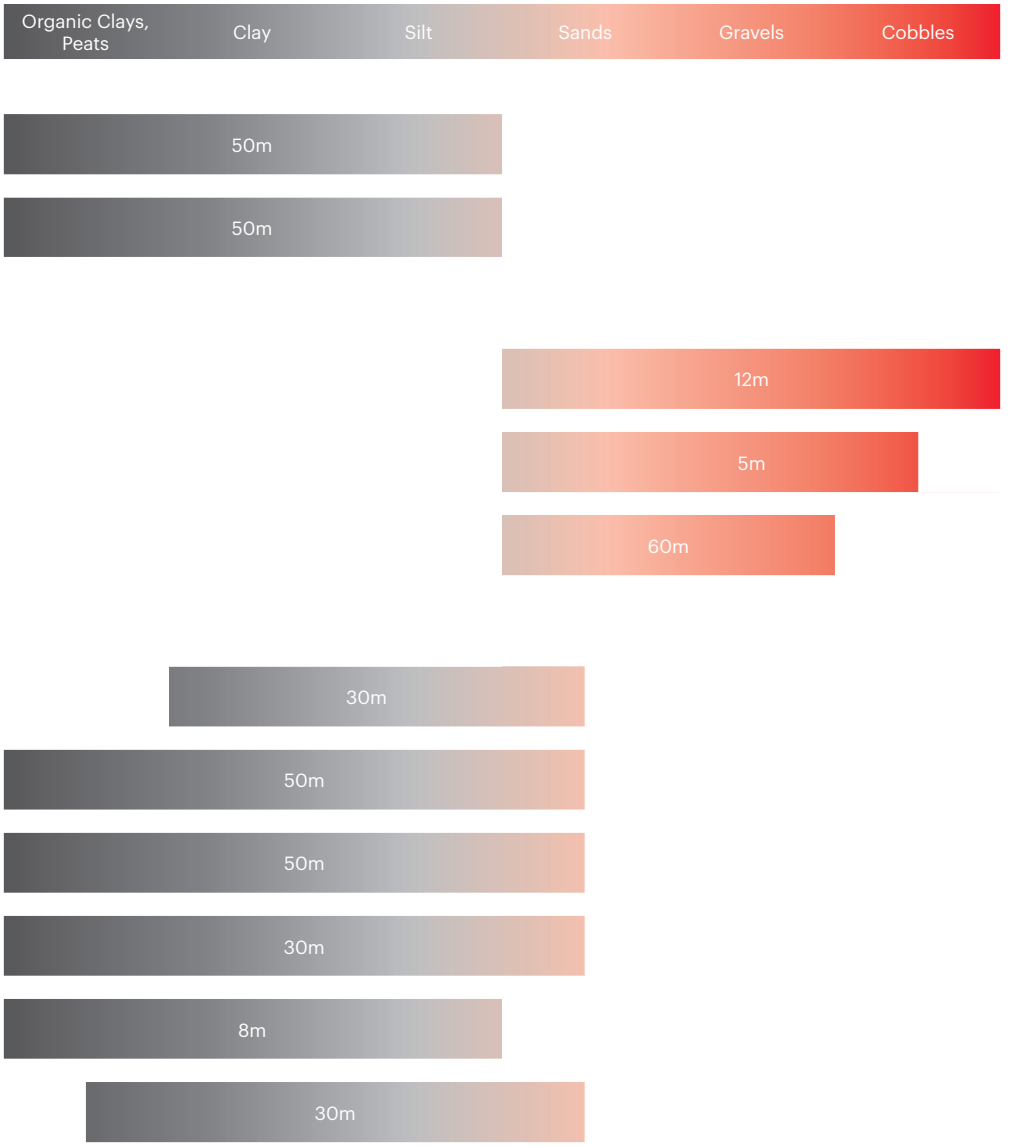
Central
Pure Offices
Lake View House
Wilton Drive
Warwick
CV34 6RG

South
Building 3, Suite 2.4
Riverside Way
Watchmoor Park
Camberley
Surrey
GU15 3YL

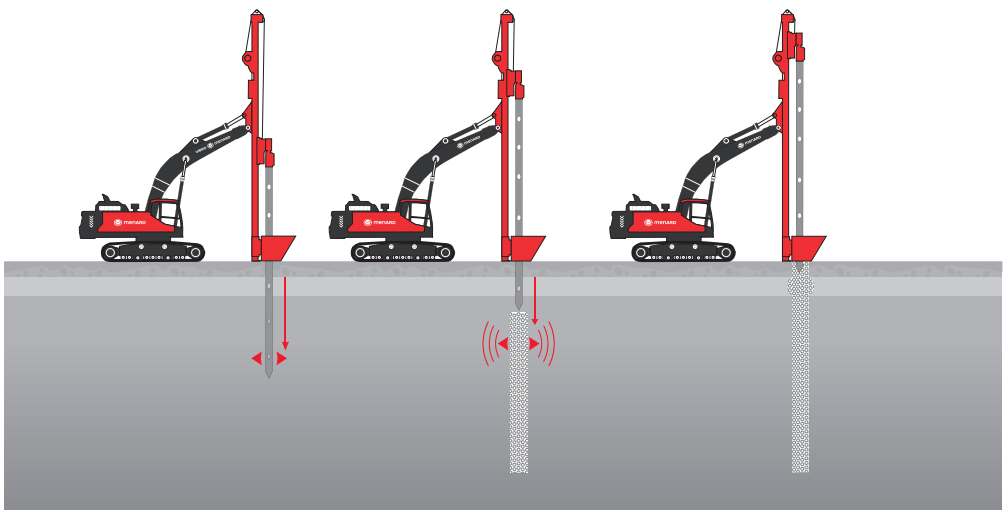
sales@menard.co.uk
+44 (0)1704 891 039

Techniques & Soil Application

Suitable soil types and maximum depth of treatment for each technique



Vibro Stone Columns



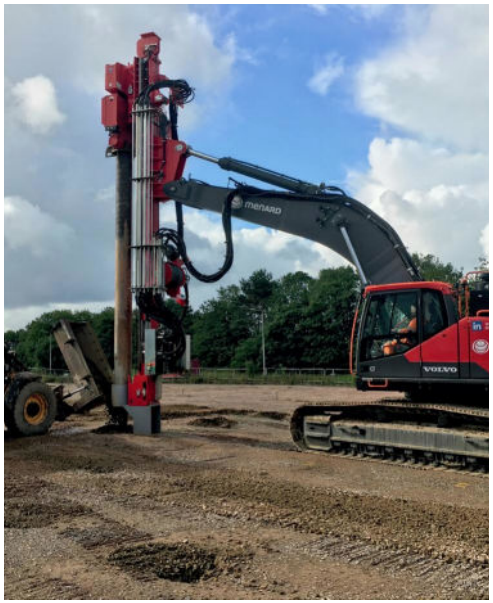
Vibro stone columns are installed into soft to firm cohesive or loose to medium dense granular natural soils or made ground. Depending on ground conditions the stone columns can be installed using either our top feed (stable soils) or bottom feed (unstable soils) systems to ensure a continuous dense column from the base of the treatment to the working surface.

Benefits:

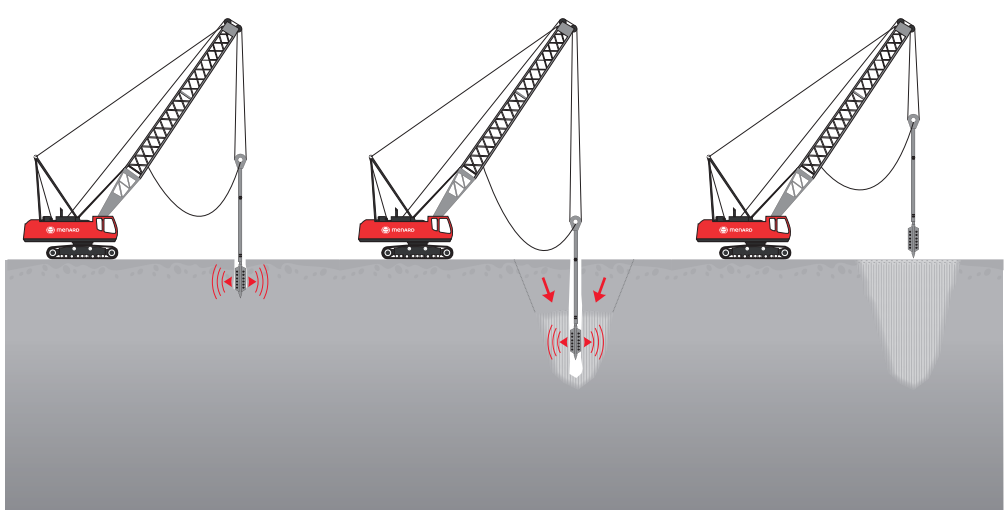
- Enhanced bearing capacity
- A reduction in the total and differential settlements
- An increase in the permeability, allows acceleration of anticipated settlements
- Ground bearing foundation solutions can be adopted reducing the need for reinforced foundations
- The displacement process creates no spoil

Application:

- Foundations of low-rise buildings and houses
- Commercial/industrial foundations and floor slabs with high tolerances
- Infrastructure schemes including embankments, water treatment plants and windfarms



Vibro Compaction



Where sites are underlain by sands and gravels, we are able to use our vibrating poker technology to improve the density of these soils. The vibrating poker generates horizontal vibrations which allows the sand and gravel particles to be rearranged into a denser configuration, by first destroying the existing fabric and then allowing them to reconfigure themselves into a denser arrangement.

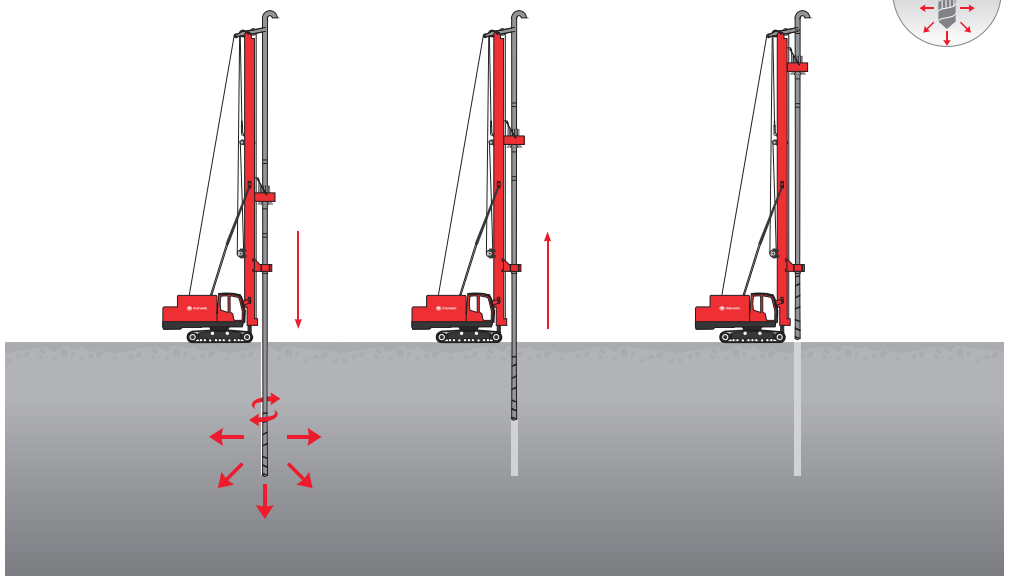
Benefits:

- Reduction in the risk of liquefaction in earthquake areas
- Enhanced bearing capacity
- A reduction in the total and differential settlements
- Ground bearing foundation solutions can be adopted reducing the need for reinforced foundations
- No need for imported material
- No spoil generated

Application:

- Reclaimed land areas (e.g. ports) are created from dredged sands and gravels
- In seismic zones where sites are underlain by sands and gravels

Controlled Modulus Columns



Where traditional ground improvement techniques may not be suitable due to either poor soil strength, high loadings or tight settlement criteria, controlled modulus columns (CMCs) provide a fast and economical ground improvement alternative to piling. The technique installs low strength concrete columns, 280mm to 500mm in diameter, up to 50m in depth using our displacement tools.

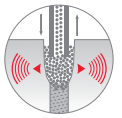
Benefits:

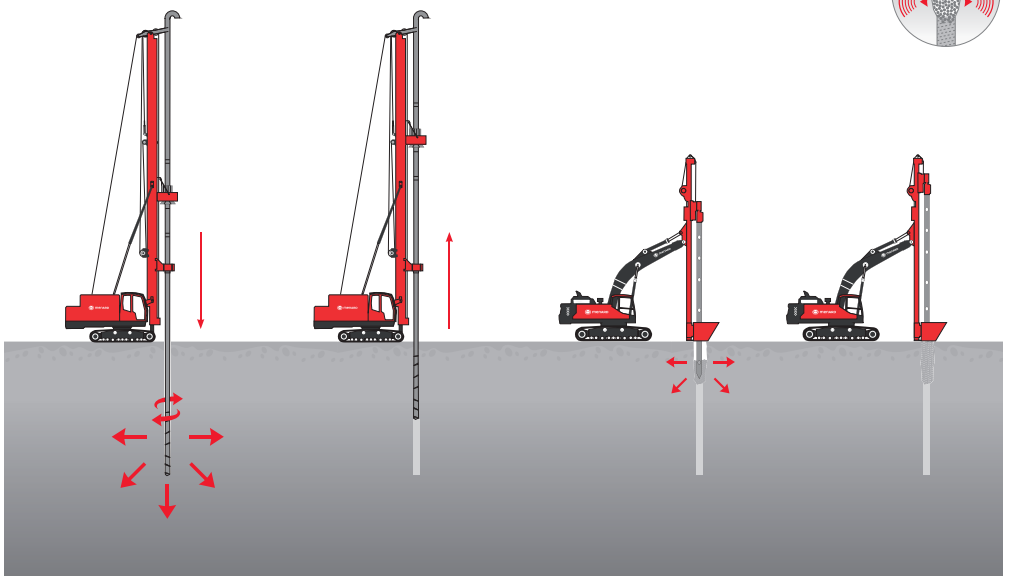
- Suitable across a range of soil types including soft to very soft organic clays
- Enhanced bearing capacity
- A reduction in the total and differential settlements
- Ground bearing foundation solution utilising a distribution mattress
- The rig working platform can be used as part of the distribution mattress
- No breaking down of CMCs. Trimming is undertaken while the CMCs are still wet
- The vibration free displacement process creates minimal spoil

Application:

- Heavily loaded commercial/industrial floor slabs
- Road and rail embankments
- Silos, tanks and wind turbines
- Residential buildings traditionally founded on driven piles

Bi-Modulus Columns





Where CMCs are adopted on sites with near surface granular or mixed soils, the top of the CMC can be replaced with stone aggregate to produce a composite column, known as a bi-modulus column (BMC). The BMC optimises the transfer of the building loads into the column and is constructed in two stages: The CMC is formed first to the surface followed by the construction of a stone column at the top.

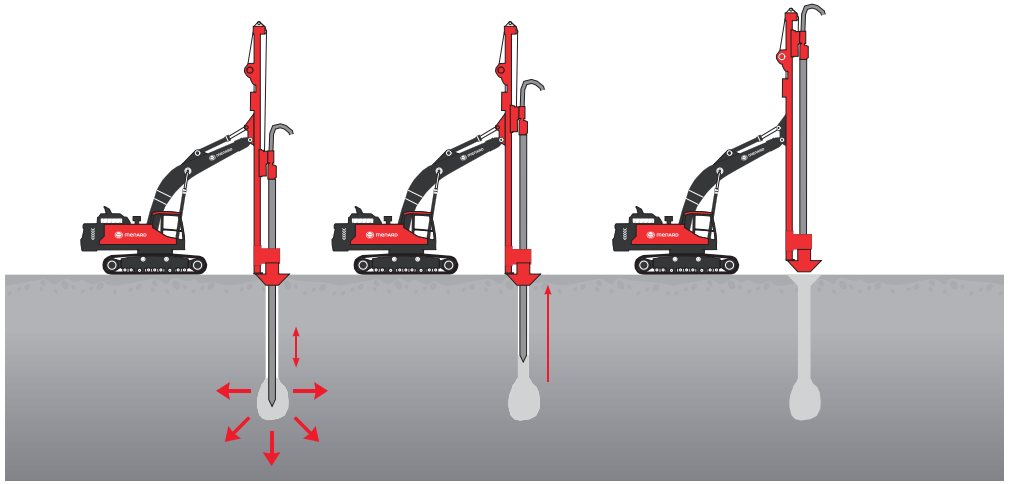
Benefits:

- Enhanced bearing capacity
- A reduction in the total and differential settlements
- Easy excavation for foundations
- The displacement process creates no spoil
- Very high production rates reducing costs

Application:

- Heavily loaded commercial/industrial floor slabs
- Road and rail embankments
- Silos, tanks and wind turbines
- Residential buildings traditional founded on driven piles

Vibrated Concrete Columns



On sites where weak soils are underlain by more competent granular soils, vibrated concrete columns (VCCs) can be adopted. By using our vibratory tools, the end bearing granular layer can be densified and an enlarged basal bulb created resulting in an enhanced bearing capacity at the toe of the VCC. With the adoption of our enlarged head forming tools, the edge to edge distance between VCCs can be reduced.

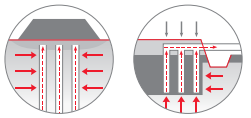
Benefits:

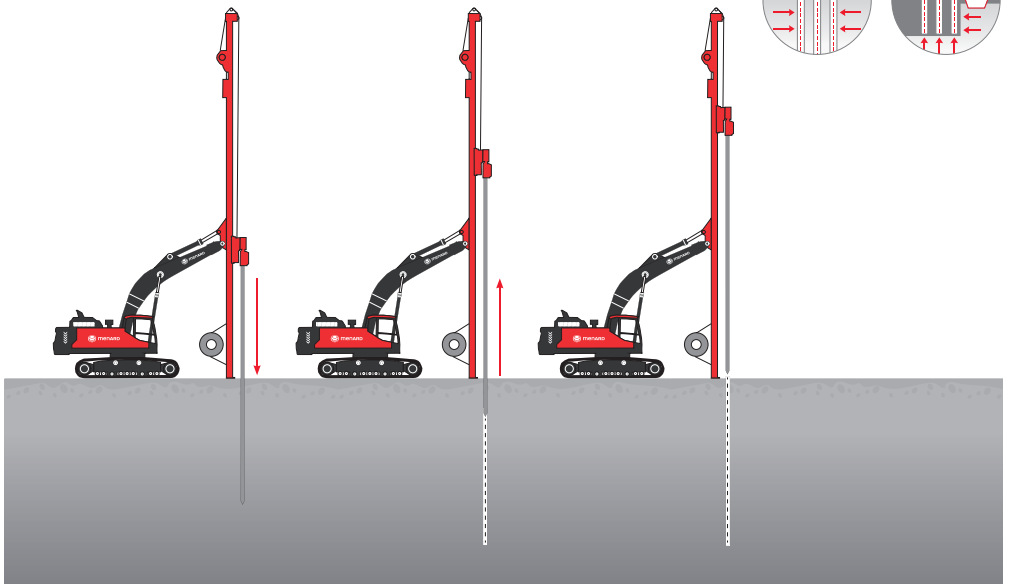
- Load capacity of VCCs up to 900kN, depending on soil
- A reduction in the total and differential settlements
- VCC toe, shaft and head constructed in a single operational process, thus avoiding cold joints
- Limited horizontal loads can be accommodated
- Adoption of enlarged heads up to 1m in diameter reduces the need for spanning
- The displacement process creates minimal spoil

Application:

- Foundations of low-rise buildings and houses
- Commercial/industrial foundations and floor slabs with high tolerances
- Infrastructure schemes including embankments, water treatment plants and windfarms

Vertical Drains & Vacuum Consolidation





An economical way to accelerate consolidation in saturated soils is to create vertical pathways by the introduction of vertical drains, on a tight grid. As the load is applied, the resulting increased pore pressure is permitted to dissipate via the vertical drains to the surface. Where surcharging by applying load is not economically viable, vacuum consolidation can be adopted, whereby a reduction in atmospheric pressure (vacuum) at the head of the vertical drain, creates an upward flow of water from the soils.

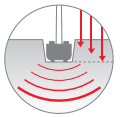
Benefits:

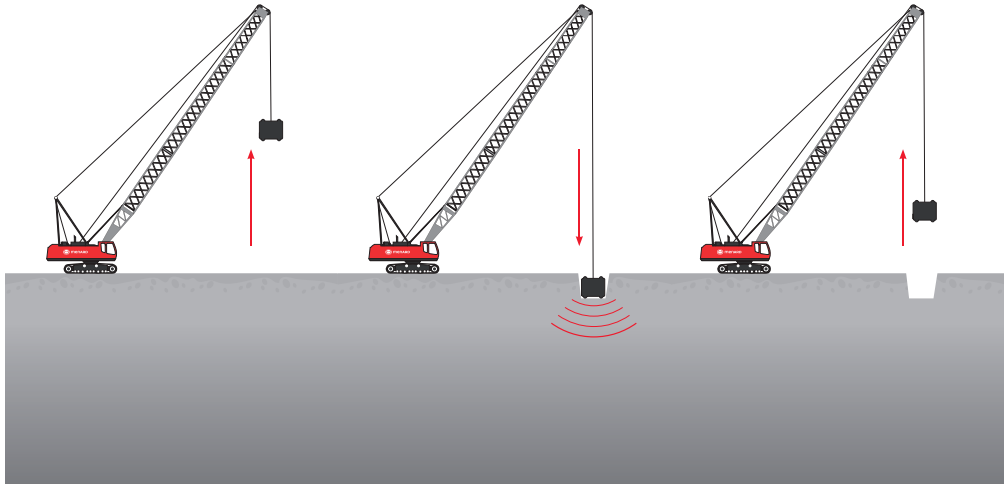
- Enhanced bearing capacity
- Accelerated settlements
- Particularly suitable to non-organic, non-homogeneous fill, made ground, and reclamation areas with variable characteristics
- Ground bearing foundations can be adopted following treatment
- High coverage making it economical for large areas

Application:

- Commercial/industrial foundations and floor slabs with high tolerances
- Infrastructure schemes including embankments, water treatment plants and windfarms
- Reclaimed land, raised sites or backfilled pits/quarries

Dynamic Compaction





Large sites underlain by loose materials can be effectively treated using our dynamic compaction process. The technique involves dropping heavy weights (8-40 tonnes) from heights of up to 30m to create very high energy impacts, which results in the immediate reduction of void spaces improving both bearing capacity and settlement characteristics.

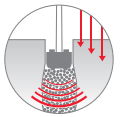
Benefits:

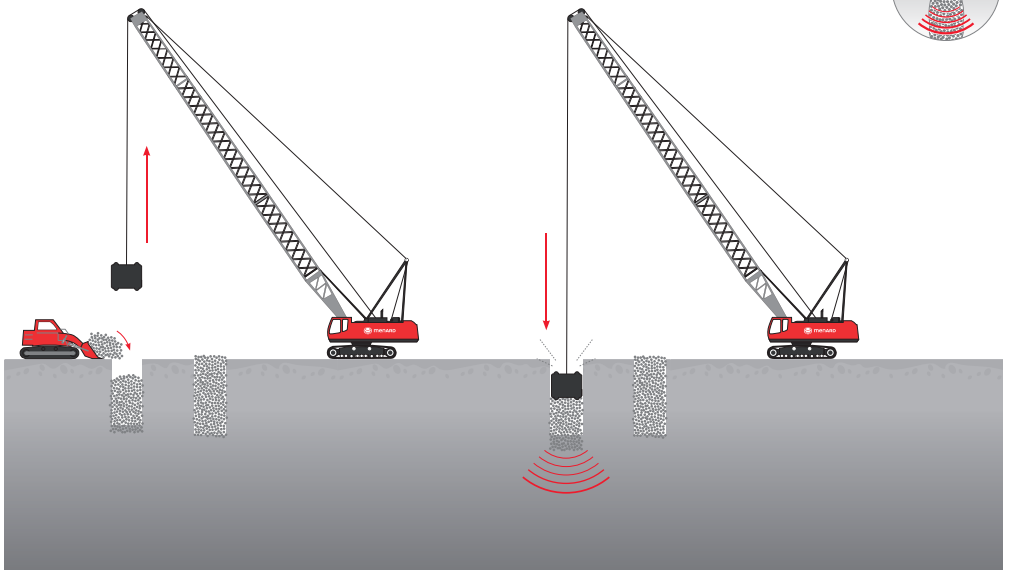
- Enhanced bearing capacity
- A reduction in the total and differential settlements
- Particularly suitable to non-organic, non-homogeneous fill, made ground, and reclamation areas with variable characteristics
- Underground obstructions (e.g. boulders) do not hinder the process
- Ground bearing foundations can be adopted following treatment
- High coverage making it economical for large areas

Application:

- Commercial/industrial foundations and floor slabs with high tolerances
- Infrastructure schemes including embankments, water treatment plants and windfarms
- Ports and reclaimed land
- Treatment of landfill sites (volume reduction)

Dynamic Replacement





Dynamic replacement is an adaptation of the dynamic compaction process for organic, saturated or weak cohesive soils. The operational process is similar to that of dynamic compaction, involving dropping a heavy weight, but in this instance, coarse stone aggregate is introduced at the surface. This coarse aggregate is punched into the soils to create large diameter pillars of stone typically up to 2m in diameter.

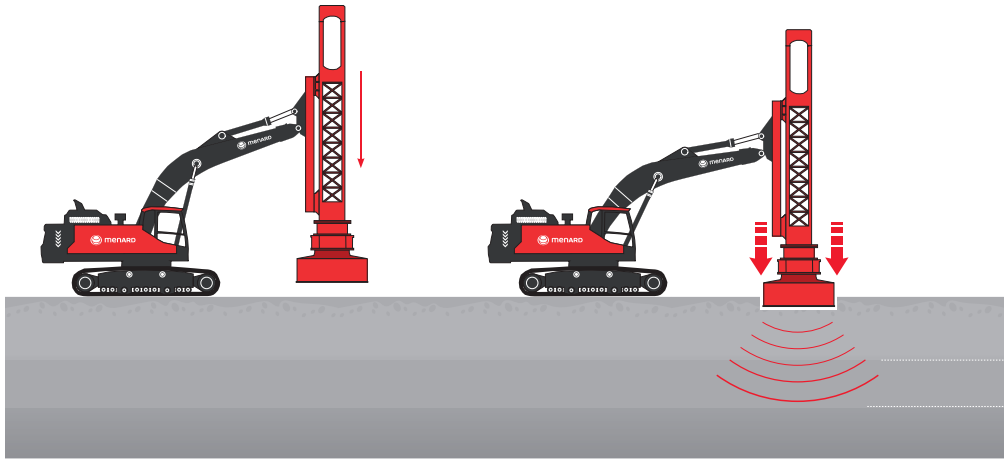
Benefits:

- Enhanced bearing capacity
- A reduction in the total and differential settlements
- An increase in the permeability allows acceleration of anticipated settlements
- Ground bearing foundation solutions can be adopted reducing the need for reinforced foundations
- The displacement process creates no spoil

Application:

- Commercial/industrial foundations and floor slabs with high tolerances
- Infrastructure schemes including embankments, water treatment plants and windfarms

Rapid Impact Compaction



The compaction of near surface granular or mixed soils, can be achieved by the introduction of high frequency energy impacts, using our rapid impact compaction technique (RIC). The RIC consist of a compaction foot which is placed on the ground and this is repeatedly struck by a 7-12 tonne hydraulic hammer, resulting in top down compaction of the soils.

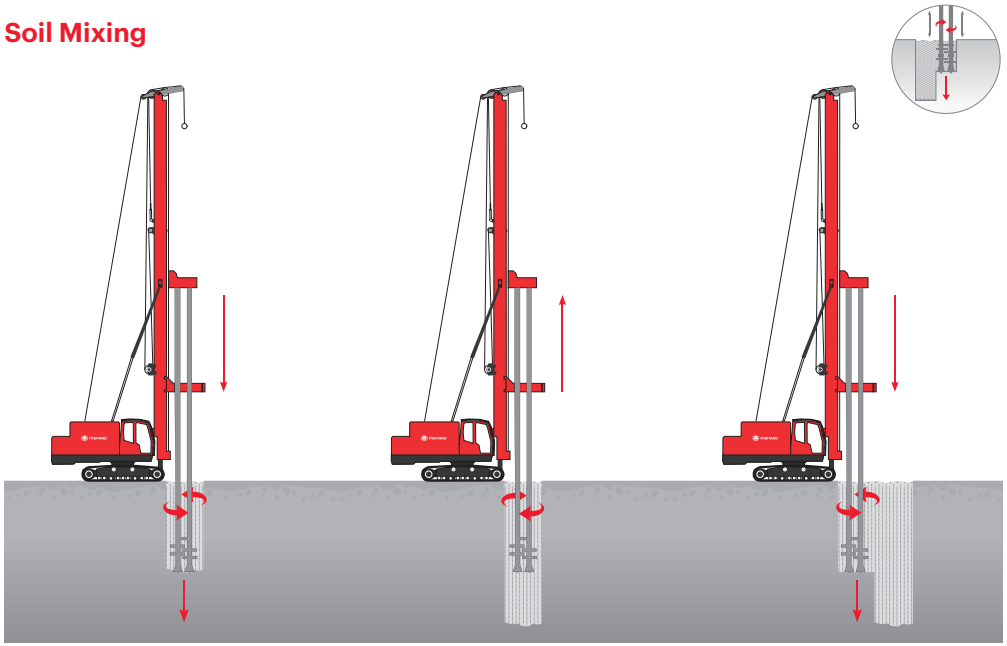
Benefits:

- Enhanced bearing capacity
- A reduction in the total and differential settlements
- Ground bearing foundation solutions can be adopted reducing the need for reinforced foundations
- The displacement process creates no spoil

Application:

- Foundations of low-rise buildings and houses
- Car parks and hardstandings
- Reducing contaminated soil volume to avoid cart away costs and fees
- Commercial/industrial foundations and floor slabs with high tolerances
- Infrastructure schemes including embankments, water treatment plants and windfarms

Soil Mixing



Soil mixing involves modifying the properties of weak soils to improve their load carrying and permeability characteristics. The process involves using a single or multiple tool auger to break up the soil and then inject at low pressure a specifically designed binder, which is then thoroughly mixed with the soil. The mixing can be designed to be done as isolated columns or as a mass treatment.

Benefits:

- Enhanced bearing capacity
- Reduction in settlements
- Reduced liquefaction
- Reduced thrust behind retaining structures
- Increased reaction around piled foundations
- Reduce permeability, blocking water movement and containing contamination

Application:

- Foundations of low-rise buildings and houses
- Commercial/industrial hardstanding, foundations and floor slabs with high tolerances
- Infrastructure schemes including embankments, water treatment plants and windfarms
- Contaminated and landfill sites


menard
menard

menard

A subsidiary of  SOLETANCHE FREYSSINET

www.menard.co.uk