PERMEATION GROUTING

Stabilising Soil Prior to Excavation or Construction
Permeation Grouting is a cost-effective, low-invasive alternative to piling

In parts of Australia and New Zealand, buildings are often constructed on weak coastal sandy soils. These unstable sandy soils or gravels can cause unique structural problems during and after the construction process.

Settlement, sinkholes and rock fractures can result in lasting damage to property and significant construction delays. These problems can be solved by stabilising the weak or shifting sandy soils beneath and adjacent to the structures being built.

Permeation Grouting from Mainmark is a proven technique for strengthening sandy and non-cohesive soils. It works by filling the spaces between the soil, creating a solidified mass that can support increased load and stabilise sunken structures.

Permeation Grouting is a fast, cost-effective and time-efficient alternative to piling, that leaves a clean and undisturbed site.

Mainmark is a market leader in innovative ground engineering techniques, including Permeation Grouting.

<table>
<thead>
<tr>
<th>FEATURES</th>
<th>BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>No ground disturbance or soil displacement</td>
<td>• No spoil to manage.</td>
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<td>Minimal mess</td>
<td>• Quick and easy clean up at the end of a project.</td>
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<td>Once treated, soils can reach 2MPa to 5MPa</td>
<td>• Suitable for high-traffic areas and large on-ground structures.</td>
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<td>Equipment is easy to set up and operate</td>
<td>• Projects can be completed faster.</td>
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<td>Equipment is compact and non-invasive</td>
<td>• No disturbance of the surroundings and neighbours.</td>
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<td>Equipment can be set up in spaces as small as 60cm wide x 2m high</td>
<td>• Ideal for confined sites or those with limited access.</td>
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<td>Environmental inert</td>
<td>• Fulfils sustainability obligations.</td>
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<td>Predictable, long-lasting results</td>
<td>• A cost-effective solution that delivers on its promise.</td>
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Solving your ground instability issues

SAFER EXCAVATION WORK

When construction or renovations require excavation, it can put adjacent buildings at risk, particularly if they are set on sandy or non-cohesive foundation soil. If the excavation proceeds without stabilising the ground first, these other structures can be at risk of collapse.

Similarly, when adding an in-ground or underground structure like a swimming pool or carpark, the surrounding soils must be stabilised to prevent any collapse-in on the excavated worksite.

It is essential to put safety first by stabilising the surrounding soil. Permeation Grouting strengthens and stabilises that soil, making subsequent excavations safer.

MODIFYING GROUND QUICKLY AND COST-EFFECTIVELY

In situations where structures are to be built on unstable sandy soils, or untreated soils are unlikely to support the weight of fixed structures or traffic, it may be necessary to modify the ground. Permeation Grouting fills the sand pore spaces without disturbing or displacing individual sand grains, instead of changing the structure.

It modifies the ground to make it fit for purpose in the fastest, most cost-effective way, without damaging the environment.

CREATING LOW PERMEABILITY IN-GROUND BARRIERS

Permeation Grouting substantially decreases the permeability of sandy soil. In other words, it makes soil almost watertight. This makes Permeation Grouting a good choice for applications such as chemical cut off barriers or other applications that requires a barrier against in ground water or water borne contamination.
The Mainmark group of companies are leaders in advanced ground engineering and asset preservation technologies. For more than 20 years, Mainmark has led the world in offering unique, innovative solutions for foundation repair, and rectifying problems in residential, industrial, commercial, civil engineering, and mining situations.

In Australasia, the Mainmark group of companies has been in operation since 1995, with seven offices throughout Australia and New Zealand. Since 2001, we have also operated wholly-owned subsidiaries in Thailand and Japan.

We are a privately-owned company with highly-trained technicians and state-of-the-art equipment. Our solutions are all non-toxic, inert, and environmentally neutral. All of our works are planned, supervised, and executed by our own experienced personnel. We guarantee our products.

Companies of the Mainmark group present creative, effective solutions to many types of ground engineering problems in a wide range of sectors: industrial; commercial; residential; civil; and mining. Some of the companies offer related solutions in the building and construction areas. Many of these solutions are unique to Mainmark and its associates.

**TECHNICAL INFORMATION**

Permeation Grouting can be used for the agglomeration and solidification of unstable sands and other non-cohesive soils at depths as great as 60 metres.

Microfine or Ultrafine cement, sodium silicate or other chemicals in liquid form is injected at low pressures into the area at the depths to be treated, bonded and contained. The liquid permeates the soil to bond the particles firmly together.

Permeation Grouting is generally carried out in defined zones utilising injecting lances inserted into the ground at desired distances. This method allows the grout to be injected at a specified location.

It is essential to carefully plan the injection matrix to achieve full cohesion. This involves pre-determining the areas and depths for permeation, then calculating the volume of permeation liquid to be injected at each point in the matrix to ensure thorough soil cohesion.