



# JOG COMPUTER- CONTROLLED GROUTING

Non-invasive Re-levelling  
and Stabilising of Large and  
Complex Structures

mainmark

## A unique re-levelling process by multi-point cementitious injection under computer control

Damage to the ground beneath large buildings and other structures can have costly and dangerous consequences. Unstable soils or those affected by floods, drought or nearby construction can cause foundations to subside, compromising structural integrity.

This can put building occupants at risk or render buildings uninhabitable, often bringing operations to an expensive standstill. Correcting subsidence of large and complex structures requires proven, engineered solutions. As an alternative to costly demolition or major underpinning works, Mainmark offers JOG Computer-Controlled Grouting (also known as Integrated Computer Grouting).

JOG is an extremely precise method for improving ground bearing capacity; raising and re-levelling large sunken structures, to deliver specific,

engineered outcomes, regardless of complexity. It is an advanced and award-winning technology.

JOG was initially developed in Japan to correct the effects of earthquake induced liquefaction. It has since been used extensively in other seismic regions, such as Christchurch, New Zealand, to correct and re-level entire buildings, or large sections of structures, that have subsided.

Mainmark's team draws on decades of experience and close collaboration with independent expert consultants, to interpret geotechnical information and complete risk assessments specific to a site's ground conditions. Using these insights, Mainmark develops an engineered solution that meets specific site requirements.

Mainmark can save you time, money and inconvenience, while re-levelling your structure.

### BENEFITS

<b>JOG uses a computer-controlled system of synchronised grout injections</b>	<ul style="list-style-type: none"><li>• Lifting and re-levelling is controlled to the millimetre and there is no undue stress on any part of the structure as it is raised back to level.</li></ul>
<b>Grout is delivered via small injection points that are precisely and discreetly placed around the structure</b>	<ul style="list-style-type: none"><li>• Provides a proven and cost-effective alternative to piles, jacks and other expensive, invasive foundation repair processes.</li></ul>
<b>Up to 128 injection points controlled by a single computer and computers can be banked together, enabling hundreds of injection locations if required</b>	<ul style="list-style-type: none"><li>• Large sections - or even entire structures - can be gently brought back to level in this synchronised process.</li></ul>
<b>JOG is likened to 'keyhole surgery', using non-invasive equipment and techniques</b>	<ul style="list-style-type: none"><li>• Little or no excavation is required, which means little or no mess, noise or vibration. Premises don't usually need to be vacated. Neighbouring properties remain unaffected.</li></ul>
<b>JOG uses cementitious grout</b>	<ul style="list-style-type: none"><li>• The environmentally inert grout won't contaminate soil or groundwater.</li></ul>

## How the JOG system works:

### Computer-Controlled

The re-levelling process is co-ordinated with Computer Control Units (CCU) that are programmed with an “injection sequence” designed for the target structure, taking into consideration the structure’s current contour and position, structural capacity and the amount and rate of lift required. This helps ensure that the re-levelling process is gentle, uniform and incremental, effectively “floating” the structure, a millimetre at a time.

### Plant and Equipment

JOG equipment is designed to be compact, self-contained and mobile to ensure that various project requirements can be easily accommodated. Automated containerised units are easily segmented when required to facilitate difficult site access. All production plant and materials can be established within an area as small as 40m<sup>2</sup>. These can readily be transported to remote locations, including between countries.



JOG material formation reflects the laminar injection and lifting sequence.

### Monitoring and Surveying

Critical to every re-levelling project is the ability to continuously and accurately monitor the building’s response throughout the correction process. Mainmark utilise systems and equipment that range from traditional surveying through to fully automated robotic stations and 3D virtual models. The monitoring data is fed, back to the CCU where the information is processed to manipulate the injection sequence, as required, completing the circuit of the JOG process.

### Androids and Injectors

“Injectors” are strategically positioned across the target structure and are surgical by nature as they are only 25 to 40mm in diameter, and can be installed to 10 metres or more. “Androids” actuate each individual injection location according to the CCU injection sequence and can be positioned at every injection location or banked together remotely from the injection point.

## Re-levelling and stabilising large and complex structures

### Commercial/Retail



33,000-tonne Christchurch Art Gallery re-levelled in just 44 days

### Multi-Storey



Re-levelled in just 1 week

### Heritage



Gently re-levelled 110mm

### Residential



Entire home re-levelled 175mm

### Infrastructure/Pipeline



Underground pipeline/culvert raised

### Warehouse



No operational interruption

The Mainmark group of companies are leaders in advanced ground engineering and asset preservation technologies. For more than 25 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 we formed the Mainmark group in 1995 and have offices throughout Australia and New Zealand. We also have subsidiaries in Japan and most recently in the UK.

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.

#### United Kingdom

Mainmark Ground Engineering (UK) Ltd.  
mge.uk@mainmark.com | 020 3355 9711

0800 975 0507

[www.mainmark.com](http://www.mainmark.com)