

Sinking floors?  
Cracked walls?  
Weak ground?

We can solve your  
problems quickly  
and cost effectively

Contact us now!

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

Teretek® engineered  
resin injection solution

mainmark



## MAINMARK PRODUCTS AND SOLUTIONS

Leaders in Advanced Ground  
Engineering and Asset  
Preservation Technologies

mainmark

## MAINMARK CAPABILITIES

Mainmark methods provide ideal solutions for numerous applications, such as: level correction of sinking floors and buildings; strengthening weak and unstable ground; filling holes, voids and pipes; earthquake remediation; and revitalising ageing infrastructure.

### Introducing Mainmark

Mainmark is an internationally recognised leader in ground engineering and asset preservation, offering some of the most innovative and advanced solutions to address site specific challenges, such as sunken foundations, in the residential, industrial, commercial, civil and mining sectors. Our expertise extends to the remediation or safe decommissioning of infrastructure and addressing ageing or decaying concrete and steel assets including culverts, tunnels, pipes, tanks and manholes.

For more than 25 years Mainmark has led the world in developing and delivering advanced resin injection techniques for ground engineering, successfully treating more than 30,000 sites across Australasia.

The Mainmark group of companies has been in operation since 1995, with nine offices throughout Australia and New Zealand to service the region. We have a global footprint across 14 locations with more than 200 staff worldwide. We also operate wholly-owned subsidiaries in Japan and the UK.

Our reputation has been built on providing unique solutions for complex problems, delivered cost effectively and efficiently. Our people are committed and focused on providing customers with superior service and quality outcomes, working to the highest standards of local and international compliance.

We are an award-winning, privately-owned company with highly trained technicians and state-of-the-art equipment. Our solutions are all non-toxic, inert and environmentally neutral. Every project is planned, supervised and executed by our own experienced personnel. We warrant our products.

Companies of the Mainmark group present creative, effective solutions to many types of ground engineering and asset preservation problems across a wide range of sectors. Some companies also provide related solutions for the building and construction industry. Many of these solutions are unique to Mainmark and its associates.



Mainmark’s non-invasive, cost and time efficient technologies are suitable for any organisation, from commercial, industrial and heritage sites through to infrastructure, mining and resources. Our methods have been successfully applied to thousands of buildings and structures of all types and sizes.

## COMMERCIAL AND INDUSTRIAL SOLUTIONS

Our specialised solutions and technologies address a wide range of ground engineering issues that can impact businesses, while keeping downtime to a minimum. In many situations, a site can continue to operate as normal and buildings can often remain occupied and open for trading as we raise the building or re-level a sunken floor. We work with you to ensure the process is as convenient as possible for your business, staff and clients, minimising the need to re-locate furniture, stock or machinery wherever possible. Mainmark’s re-levelling technology is non-invasive with no excavation required, reducing worksite hazards.

Mainmark won the International Project of the Year Award at the Ground Engineering Awards in London for our Christchurch Art Gallery project in New Zealand. The re-levelling of Christchurch Art Gallery set a new benchmark in earthquake remediation for large scale buildings.

### Office buildings and retail outlets

Mainmark understands the importance for commercial offices, shopping centres and retail outlets to stay fully operational at all times, and the need to address maintenance and repairs seamlessly and quickly. Facility managers and building owners also have a duty of care to rectify hazards on their site that may impact occupants and the general public. The ground beneath foundations or slabs, including external paved areas, can be visibly impacted by settlement resulting in structural issues and safety concerns. Mainmark uses proprietary engineered solutions to raise and re-level and re-support floors and buildings, reducing the likelihood of further damage. The application processes are undertaken with minimal interruption to businesses and trading hours, reducing inconvenience and potential financial losses for both tenants and property owners.



### Factories and warehouses

Sinking foundations and unlevel concrete floors are common problems in factories and warehouses, including delivery docks, driveways and hardstand areas. Mainmark has a range of void filling and ground improvement solutions to re-level and re-support sinking slabs and floors quickly and cost effectively, helping to improve the lifespan of commercial and industrial facilities, removing safety hazards, and minimising secondary issues including water ingress and damage to equipment and machinery.

## TRANSPORT AND INFRASTRUCTURE SOLUTIONS

Mainmark has a wealth of experience with transport and infrastructure projects, delivering successful outcomes by developing bespoke technical solutions. We re-level and re-support concrete slabs and pavements, bridge approaches, highways, railways, airports and seaports, culverts on roads, buildings and other structures. We also fill holes, voids and abandoned pipes and provide technologically advanced solutions for revitalising ageing infrastructure and rehabilitating sewer assets. With non-invasive application methods, disruption to the site is kept to a minimum. Works can be conducted day or night and programmed to allow for any traffic movement, rail or airside operations. Large scale projects can usually be completed in sections.

### Culverts and underpasses

Many steel culverts and underpasses have reached their end of life, and asset owners are facing the impending cost and disruption of removing and replacing the ageing infrastructure. Mainmark has extensive experience in the structural restoration of culverts and underpasses. Combining our experience of protective coatings, cementitious grout placement, and coated steel liners, Mainmark works with the asset owner to identify and then deliver the optimum rehabilitation solution.



### Roads, rail and ports

As roads, railways and port infrastructure ages, it becomes more susceptible to damage caused by the increasingly heavier loads of cars, trucks, trams and trains. Repeated and intense mechanical vibrations, coupled with heavy rains or poor drainage, can weaken the ground under transport corridors, leading to possible subsidence and underlying voids. The resulting unevenness of road surfaces, railway lines and runways can present serious operational safety hazards. Mainmark raises, re-supports and rehabilitates damaged infrastructure. We also conduct abandonment of below ground infrastructure and voids. Works are undertaken cost-effectively while working around transport operations to minimise downtime.



### Utilities (water/wastewater)

Repairing ageing and damaged infrastructure is most often more cost effective than replacing it. Mainmark uses proven ground engineering and asset rehabilitation solutions and techniques to help asset owners including local councils to extend the life of utilities. We remediate assets for electricity, gas, waste management and telecommunication providers, as well as water authorities. Our solutions usually eliminate the requirement for excavation, ensuring minimal disruption. When preparing to decommission or abandon below-ground assets, Mainmark provides cost effective alternatives to excavation and removal, by filling the asset with structural fill. Depending on the complexity of the project, our specialist solutions will be developed and tested to meet the unique requirements of the site.



## MINING AND RESOURCES SOLUTIONS

Mainmark has completed numerous mining and resources projects, providing effective and economical ground engineering services to the sector for more than 25 years. Our non-invasive technologies raise, re-level and re-support moving and sunken infrastructure; stacker-reclaimer rails, conveyor belt supports, tanks, machinery, roads, and pavements. We also have extensive experience with void filling and recovery treatments following a partial collapse, as well as water and gas ingress control.

Mainmark specialises in techniques that deliver results with minimal disruption to the site. Works can often be completed during operational hours, conducted by experienced technicians following site induction procedures. Our innovative solutions minimise safety risks by controlling the potential for hazardous ground movement and instability.

### Ground problems (subsidence or weak soil)

Mainmark is an expert in solving ground problems for the mining sector. Poor compaction, sub-standard ground material, flooding and repeated vibration can all impact the ground's long-term behaviour under load. Underground voids and surface cracks can cause serious safety issues for roads which support heavy, off-highway vehicle traffic. Weak ground can also contribute to movement and damage of fixed equipment and may impact pipelines, leading to degradation and the potential for costly removal or replacement.



### Damaged infrastructure (shafts, tunnels, vehicles)

Mainmark has extensive expertise in rehabilitating and decommissioning mine site assets. We specialise in solving geotechnical problems in both underground and open cut mines, often developing bespoke solutions to suit access restrictions and other site considerations. Our proven approach delivers engineered outcomes that strengthen and consolidate mine sites for safer and more productive operational outcomes. Our highly experienced team understands how to meet the advanced requirements of modern mines.

*“It was a novel approach that successfully solved an extremely complex engineering challenge. Unlike most of our other mine shaft remediation programs, this project required a unique approach.”*

### SOLUTIONS FOR HERITAGE AND PUBLIC BUILDINGS

Mainmark has delivered successful results for many building owners, including those identified as heritage-listed, or located in World Heritage significant sites. Our non-invasive approach is essential when treating these significant and sometimes fragile structures, helping to raise, re-level and re-support the building with care and efficiency. Our highly trained technicians utilise a range of solutions and technologies to address the causes of structural subsidence, giving important buildings a new lease of life and preserving their historic integrity into the future.



Mainmark has raised, re-levelled and re-supported homes and other residential buildings for more than 25 years, delivering successful solutions to thousands of properties.

### RESIDENTIAL SOLUTIONS

Sinking floors, paths and driveways, cracked walls, jamming doors and windows can all be indicators of structural damage caused by subsidence. From houses to multi-residential complexes, foundation subsidence caused by unstable or weak ground can affect a range of properties. Causes of unstable or weak ground include moisture changes in the soil, erosion following severe weather events, movement due to nearby construction, leaking pipes leading to holes and voids, and earthquake liquefaction.

Our ground remediation solutions are the modern alternative to traditional underpinning methods; a non-invasive approach likened to keyhole surgery, requiring no excavation or damage to floors. Our proprietary solutions are not just for concrete slab floors; we can raise, re-level and re-support strip footings, raft slabs and 'Waffle-Pod' slabs, and infill slabs and driveways.

Mainmark has extensively used ground engineering techniques, including our proprietary Teretek® engineered resin injection solution and JOG Computer-Controlled Grouting, to remediate homes and apartment buildings with minimal disruption to occupants. We work with homeowners, property investors, strata managers and body corporates to determine the appropriate action, often helping to ensure residents can stay at the property while works are conducted in most cases.



## Mainmark offers unique and innovative engineered products and solutions

### TERETEK® RESIN INJECTION SOLUTION

Teretek® is our proprietary two-in-one solution that delivers both improved ground bearing capacity and re-levelling, backed by a 50-year product warranty. Teretek® engineered structural resin injection raises, re-levels and re-supports sunken building foundations fast, economically and with minimal disruption to occupants. Building footings are raised and returned towards level rapidly, without the need for expensive demolition or excavation. The work is typically carried out in a process likened to keyhole surgery, with the Teretek® resin applied through very small strategically-placed holes positioned outside, or in some cases inside, the building. There is usually no need to move furniture or move out.



### Teretek® Deep-Lift

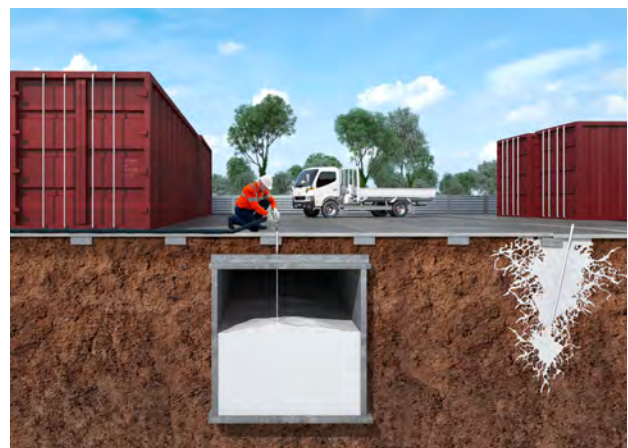
For deeper treatment applications, Mainmark utilises our flagship Teretek® Deep-Lift method. We inject one or more of our Teretek® engineered structural resins beneath the sunken sections of the affected structure, filling any voids encountered to maximise ground support. Then, from deeper underground the structure is carefully lifted as conditions allow, using the controlled force generated by expanding resin.



*Teretek® Deep-Lift*

### Teretek® Void-Fill

We inject our Teretek® engineered structural resin beneath (or into) the structure, filling any voids encountered to re-establish ground support. The Teretek® expanding polyurethane resin rapidly expands when mixed to fill voids in the soil. The method can also be used for arresting water movement, filling abandoned utilities and other man-made voids or pipes.



*Teretek® Void-Fill*



## JOG COMPUTER-CONTROLLED GROUTING

This unique computer-controlled system is extensively used for re-levelling large and complex structures, such as multi-storey residential and commercial buildings.

JOG Computer-Controlled Grouting enables level correction without the use of hydraulic jacks and temporary lifting platforms. Neighbouring properties are not affected, and the grout product is contained within the site. A very high degree of accuracy is achieved, and minimal stress is placed on separate sections of the structure, as all parts are supported and brought up together using small, sequenced injections of high mobility cementitious grout.

## TEREFIRM® RESIN INJECTION FOR GROUND IMPROVEMENT

Mainmark's Terefirm® Resin Injection technique can deliver substantial benefits as a viable, low impact solution for ground improvement to address at-risk buildings and structures susceptible to weak soil conditions. The solution uses proven, scientific testing prior to and after application to validate a required geotechnical outcome. Terefirm® has been extensively researched and tested for use in earthquake prone regions where property owners are grappling with damaged buildings and structures affected by seismic liquefaction.

This bearing capacity enhancement solution targets underlying ground vulnerability and can be applied under existing structures, including critical infrastructure, or directly onto vacant ground in preparation for new construction.

The release of internationally peer-reviewed research into the application of this innovation has found that resin injection is a proven method for increasing soil density, foundation bearing capacity and mitigating liquefaction. The full report is available for review on the New Zealand Geotechnical Society website and information is also included in the MBIE Module 5: Ground Improvement of Soils Prone to Liquefaction.







**TEREFIL®**

Our advanced structural lightweight polymer modified cementitious grout, Terefil®, can solve a wide variety of geotechnical challenges in the construction, infrastructure, and mining sectors. This versatile engineered material is ideal for use as a fill in situations where cellular concrete, foam concrete or foam cement would otherwise be applied. Terefil's capabilities as a structural fill far surpass those of traditional granular fills or aggregate materials. The highly flowable grout can be pumped efficiently over long distances to overcome limited site access and meet tight project timelines. Typically, it is used to fill large holes and voids, abandoned pipes, mineshafts and sinkholes, and for remediation such as landslip repair and backfill for retaining walls. Terefil® mix can be pervious or impervious to suit the application, forming an effective permeable subgrade beneath roads, highways, airport runways and sporting facilities. It will flow into spaces to fill voids with zero bleed and exhibits shrinkage of typically less than 0.1%-0.3%.

**PERMEATION GROUTING**

Permeation Grouting creates ground cohesion before excavation. This well established and widely used pressure grouting technique helps to strengthen sandy soils and unstable gravels, and repairs structural formations in non-cohesive soils at depths as great as 60m. The process produces a solidified mass to support increased load and fills voids in the soil, providing ground stability ahead of site preparation and construction works, while also shoring up adjacent structures. This technology can be applied across both residential and commercial build sites, delivering a fast, cost-effective alternative to piling. Importantly, Permeation Grouting mitigates land slippage and creates a safer environment during excavation.



**STRAAM: STRUCTURAL RISK ASSESSMENT AND MANAGEMENT**

The world's most advanced platform for easily measuring and analysing the performance of structures to determine the cause of damage, risk of further damage, and overall structural stability.

Mainmark's geotechnical engineering experts use STRAAM non-destructive ground monitors to conduct a Structural-Cardiograph (SCG), which establishes the building's dynamic signature and provides real-time reports that accurately assess the stiffness of a structure and changes in the capacity of the structure due to subsidence, ageing, earthquake damage, or other activity.

STRAAM technology can also aid in assigning liability for the purpose of insurance or litigation, and help to manage assets and occupant safety more effectively.

Mainmark specialises in advanced, site-specific solutions for revitalising, sealing, protecting and structurally reinforcing ageing or damaged buildings and infrastructure including tunnels, shafts and basements impacted by weak ground and water ingress.

### Specialised Resins, Gels and Coatings

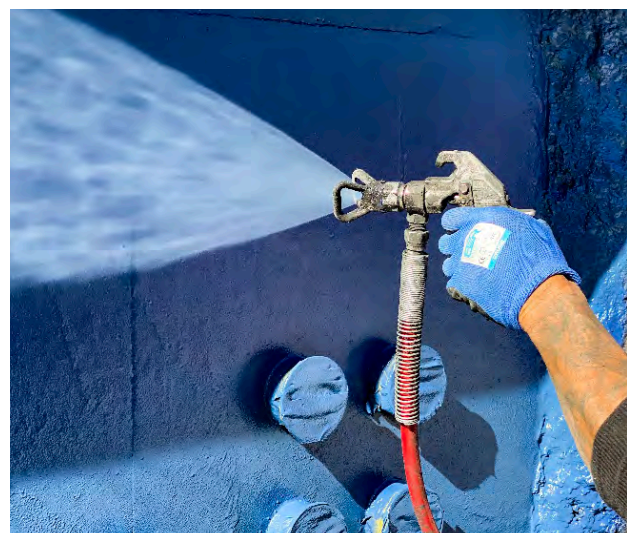
As a world leader in innovative ground engineering solutions and technologies, Mainmark offers a range of specialist applications for rectifying and preserving structures within the commercial, industrial, residential, heritage, civil engineering, infrastructure and mining sectors. Our specialised resins and coatings include engineered coatings and linings for large pipes and utility services; high performance water control treatments that can stop fast flowing water quickly in construction and civil projects, as well as in emergency situations, and waterproofing solutions to seal and stabilise water ingress in dry or water-bearing conditions. Mainmark's industrial strengthening products include a range of concrete and steel coatings for building and infrastructure protection, precisely designed and engineered for site-specific needs. All Mainmark solutions are cost effective, quick to apply and non-invasive.

### COATINGS AND LININGS

Our innovative range of protective resin and gel coatings provide exceptional environmental, chemical and abrasion resistance to protect the long-term structural integrity of civil infrastructure and building assets including manholes, tunnels, lift shafts, pipes, tanks, drains and basements. With superior waterproofing and anti-corrosive qualities, our specialised coatings adhere like a membrane to a wide variety of industrial substrates without splitting or cracking. These solutions can seal, strengthen and stabilise cracks, joints and cavities by creating a physical, hardwearing barrier. Mainmark also offers linings which can be inserted at great distances to cost-effectively preserve and rehabilitate pipelines. Using precise injection points, Mainmark is also able to provide culvert relining works with annulus grouting to fill the void between the new liner and old concrete and metal pipelines. This can help extend the use of the asset, or prepare it for use as a bypass or emergency supply line.

Benefits include:

- non-invasive alternatives to traditional pipe relining or coating methods
- time and cost-effective application process
- hardwearing solutions in wet or dry conditions
- reduced ongoing asset maintenance.

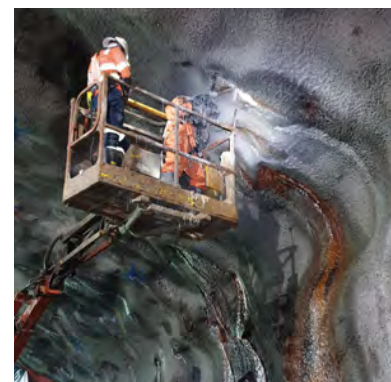
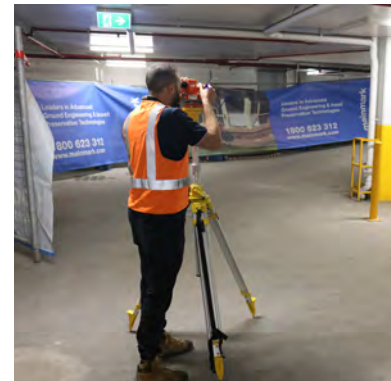


## WATER MITIGATION AND CONTROL

Mainmark has a range of high-performance water mitigation and control solutions for all types of works, such as in below-ground carparks, basements, tunnels, retaining walls, dam walls and other subterranean infrastructure, including for emergency situations. Our hydrophobic polyurethanes are fast-acting foams and gels that expand and solidify on water contact to quickly seal cracks and stop leaks. Further water control solutions are formulated to be injected into soil and rock to deliver superior ground stabilisation in wet environments. For sites requiring permanent water mitigation, cementitious grouting can be applied to consolidate weak and fractured rock. Blended and customised to suit the application, Mainmark uses products that react quickly to create a tough, highly flexible and watertight barrier, helping to maintain the integrity of the structure.

Benefits include:

- permanent waterproof seal that stops water ingress
- suitable for substrates exposed to permanent water contact
- seals voids, cracks and joints
- prevents the leak of water and pollutants.



## CONCRETE AND STEEL REHABILITATION

Mainmark offers a range of structural remediation coatings and protection solutions to repair concrete and steel infrastructure affected by corrosion, concrete cancer and cracking. The products we use are engineered to site-specific requirements and have been proven to chemically bond to concrete surfaces in the most challenging environments with exceptional adhesion capabilities. A range of pure polyurea and polymer coatings permeate, fill and stabilise both large and small areas to address leaking, cracking and surface deterioration. These solutions are easy to apply, can tolerate extreme temperatures and don't flake, peel or blister. Common uses across both civil and commercial sites include sewerage and water assets, tanks, potable water facilities, pools, ponds, bridge decks, rooftops and basements.

Benefits include:

- protection against concrete cancer and cracking
- anti-corrosion, reprofiling and strengthening
- simple and fast application process minimises downtime
- environmentally inert to suit sensitive environments
- tested and proven, including solutions approved for potable water environments, where required.



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