

# Austress Menard Pty Ltd



Exclusive licensee of the SBMA Technology  
In Australasia



Permanent SBMA's at Greystones Sydney



SBMA Hydraulic Synchronised Multiple Ram System



Actively Stressed Soil Nails for testing at Brownriggs,



Temporary SBMA's Queenstown NZ for March Construction

## Single Bore Multiple Anchor Ltd

Licensees of some SBMA systems:-

**Austria:** Keller Grundbau GmbH  
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**Hong Kong:** Ove Arup & Partners Hong Kong Ltd  
albert.ho@arup.com

**Singapore:** L&M Geotechnic Pte Ltd  
jeffreyyu@inmegeo.com.sg

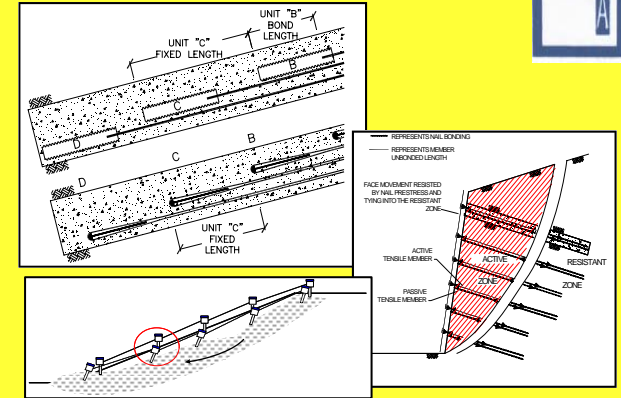
**South Korea:** GMG Ltd  
ktchang@kumoh.ac.kr

**Spain:** Keller Terra S.L.  
jmanuel-fv@terratest.es

**UK + Ireland:** Keller Ground Engineering  
John.judge@keller.co.uk

**USA:** Nicholson Construction Co  
RCrockford@nicholsonconstruction.com

# Single Bore Multiple Anchor Ltd



## SBMA Technology:

- Removable Multiple Anchors
- Permanent Multiple Anchors
- Carbon Fibre Anchor Tendons
- Actively Stressed Soil Nails
- Real Time Monitoring of Geotechnical Structures

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## Single Bore Multiple Anchor (patented)

- Working loads up to 2250 kN already used in soils.
- The system also suitable in weak rocks.
- The system enhances capacities in all standard sized drilled and grouted bores.
- The system allows reduction in the number of anchors used on a project.
- Over 70,000 SBMA production anchors previously installed and tested.
- Over 700 investigatory unit anchors tested to research the anchor performance in a wide range of soils.
- Unit anchors tested simultaneously with hydraulically synchronised multi-ram system – up to 5000 kN!
- Comprehension design package available.
- Anchor tendons fully isolated from the environment for *permanent* works.
- Corrosion protection complies with all code requirements.
- For *temporary* works in urban areas use of the high loading fully *removable* anchor system is advised.
- The entire length of the steel tendon is removed including both the free and fixed length.
- 100 kilometres of strand tendons removed on one contract alone.
- new non-degradable, high capacity, *carbon fibre*, multiple anchors available shortly.
- tendons weigh only 15% of steel tendons and may be site fabricated.

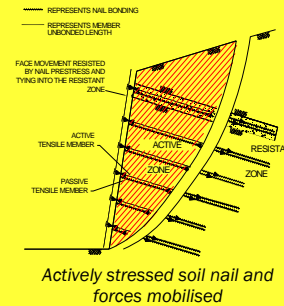


- *Highest capacity soil anchors proven on a World wide basis.*



## The Actively Stressed Soil Nail System (patented)

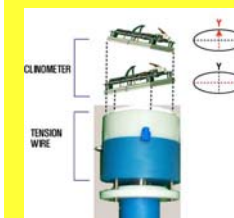
- The tendon is comprises two tensile members. One actively stressed and one passive.
- Both tensile members are installed in a standard size grouted bore.
- The actively stressed member allows load application to *prestress against the facing* or a facing block.
- During active stressing the grout column is not in contact with the back of the facing.
- Active loads of typically 50 to 200 kN are simply applied with a stressing jack.
- After stressing the bore void behind the facing is grouted up.
- The bond resistance is provided in the resistant zone of the soil mass and the member is debonded through the active zone.
- The prestressing of the facing or facing block with the soil behind *reduces the face or slope crest movement* particularly those associated with new slopes and excavation.
- The installed passive member ties the active zone to the resistant zone as in a conventional nail.
- Tensile members comprised of steel materials are isolated from the environment by encapsulation in a corrugated duct
- Tensile members comprised composite tendons are non-degradable.
- Tensile members may consist of *flexible materials* which can be coiled and eliminate use of couplers.
- Tendon system can extend the *life expectancy* of the nail.
- 12m long nails have been *safely tested* to loads of 800 kN only using a 6m bonded length
- The Actively Stressed Soil Nail is particularly suited for *stabilisation of steep faces* and new slopes.
- Where nails are particularly long the active member may be longer than the passive member for overall stability
- The installation of two tensile members *increases the factor of safety* provided and may enhance the *stability in seismic areas*.



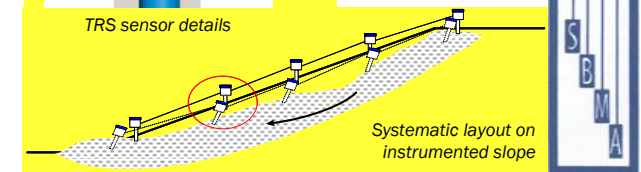
## Real-time Monitoring of Geotechnical Structures (patented)

SBMA Ltd has acquired the license to market and commission the real-time monitoring technology.

- The System has been developed by South Korean consultancy Geotechnical Monitoring Group (GMG) to monitor the real-time behaviour of geotechnical structures.
- It facilitates the early detection and response to slope movements in order to mitigate against loss of life, damage to services and disruption to transportation routes.
- Has specially developed measurement transducers to provide a durable and cost-effective system that quantifies parameters such as displacement, translation, rotation, settlement and rainfall levels with a relatively high degree of accuracy—Such parameters have been used to assist design of remedial support measures and also provide early warning systems by monitoring pre-set trigger levels.
- Has versatile instrumentation which allows it to be easily adapted to existing equipment using the options of wire, wireless or radio frequency technology for data transmission and remote data analysis.
- Includes a distributed strain sensor using an optical fibre as a linear sensing element. This instrumentation provides measurement of strain at any point along the fibre with a great sensitivity (0.002%) and over long distances (> 10km). The sensor is a cost-effective tool for monitoring of soil movements along highways since a single fibre may remotely monitor many kilometres of embankment or any other geotechnical structure such as slopes or tunnels.
- Offers a unique opportunity to implement a new technology which can generate accurate data and incorporate facilities for remote interrogation and analysis of geotechnical structures during and after construction. The monitoring system also facilitates access to real time data via the internet.



TRS sensor details



Systematic layout on instrumented slope

