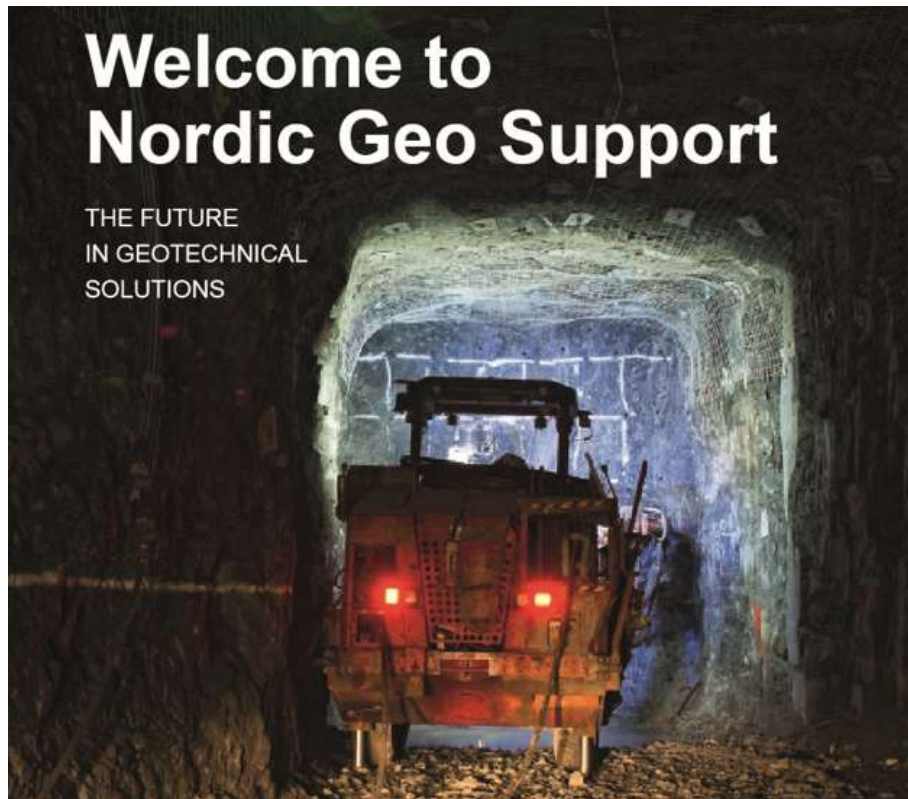




# Overview

Sustainable support for your ground

# About us



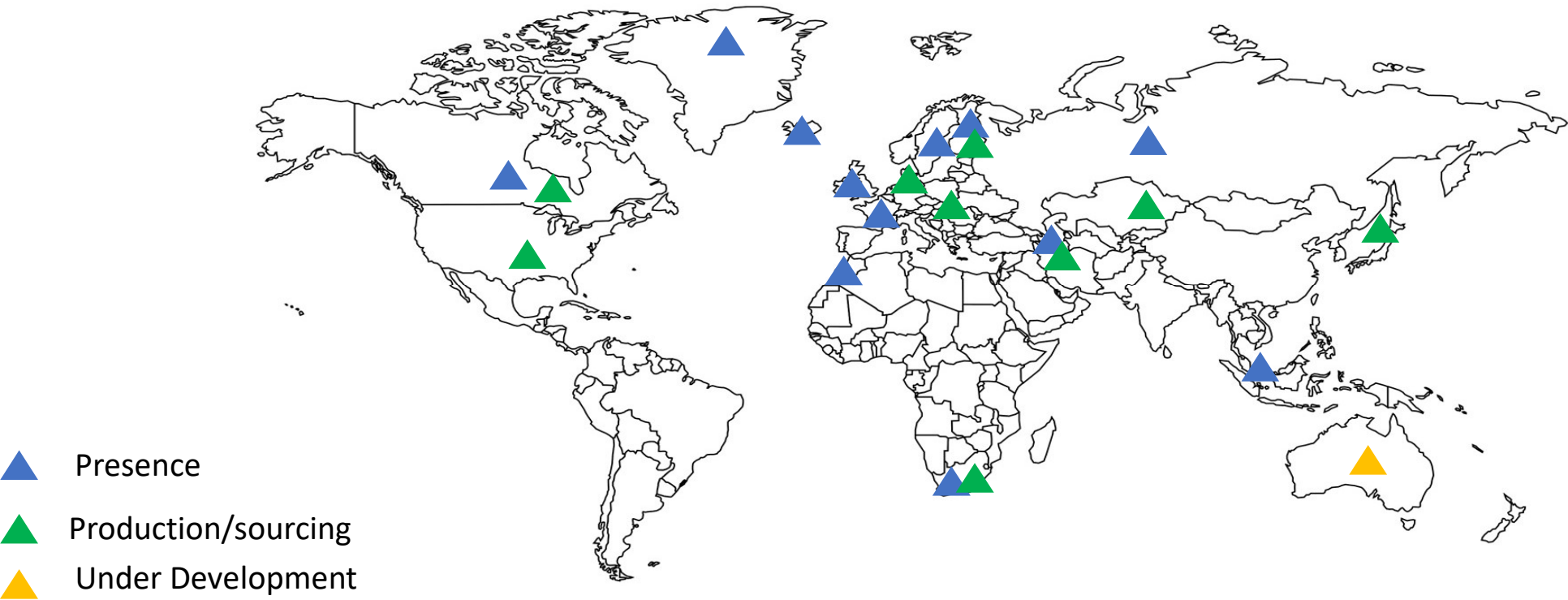
- We specialise in innovative products with an emphasis on improving the environment and project sustainability.
  - Partnering with leading technology companies
  - Our products are application driven and are easily combined to create solutions for everyday problems
  - Our people are empowered to make decisions, we there to help you and your business be successful
- Headquartered in the Sweden for Nordic customers:
  - Nordic Geo Support now has presence in Australia, Canada, South East Asia, Africa and Europe.
- We focus on the following sectors:
  - Drilling
  - Mining
  - Tunnelling
  - Infrastructure and Building construction
  - Asset repair

# Overview

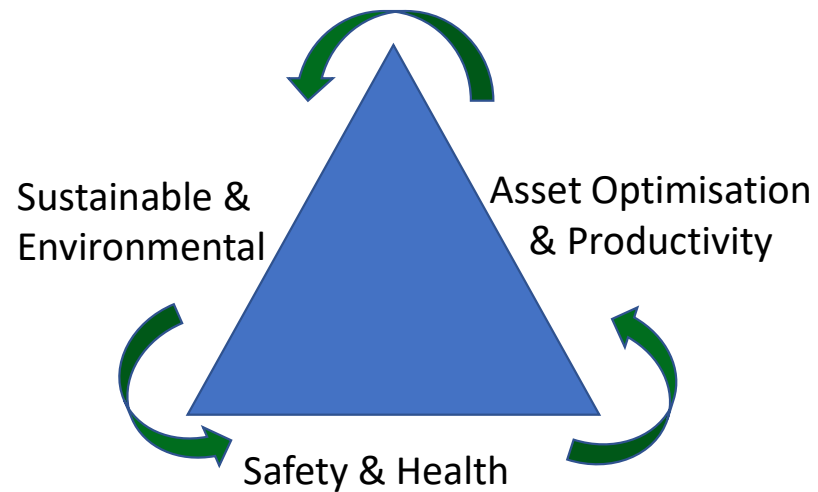


<b>Our offer</b> <ul style="list-style-type: none"><li>Leading technology solutions</li><li>Focus On Sustainability</li><li>Complete solutions</li><li>Branded products under Nordic Geo Support</li></ul>	<b>Our customers:</b> <ul style="list-style-type: none"><li>Mining (surface &amp; underground)</li><li>Tunnelling</li><li>Blasting and energy drillers</li><li>Construction civil (bridge, road...)</li><li>Construction repair (infrastructure and buildings)</li></ul>
<b>Our Values</b> <ul style="list-style-type: none"><li>Customer centric</li><li>Equality in all aspects</li><li>Respect to people and the environment</li><li>Each person in the company is empowered and takes ownership</li><li>Collaboration and cooperation</li><li>Team spirit</li></ul>	<b>Our reach today</b> <ul style="list-style-type: none"><li>Nordic region as core</li><li>Baltics</li><li>Europe (focus southern Europe &amp; UK)</li><li>Africa (Northern and Sub Saharan)</li><li>Turkey</li><li>Canada</li><li>Australia and SEA</li></ul>

# Today's Footprint



# Reducing Project Impacts



**Sustainability & Environmental:** Solutions that drastically reduce CO<sub>2</sub> emissions in manufacture and transport and energy usage as well as solutions offering longer life cycles and reusability.

**Asset Optimisation & Productivity:** Solutions that are faster, more efficient, easier to use and reusable, optimising advance rates and ore recovery as well as reducing maintenance costs.

**Safety & Health:** Solutions that remove humans and equipment from unsecured ground, faster ground securing, stability and consolidation reduce manual operations and weight capacities

# Technical offer

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- Technical offer:
  - Focus On Reducing Project Footprints and Sustainability
  - Complete solutions
  - Branded products under Nordic Geo Support
- Core competency – high performance products
  - Ventilation
  - Ground Water Management
  - Rock and Soil Management technology
  - Drilling solutions
- Additional Suppliers chosen on several factors
  1. Leading edge technologies in their field, patented preferred
  2. Willing to work in a partnership
  3. Willing to grow together to support end customers



# Product range

## Drilling Consumables

High Performance rock drilling tools and consumables:

- DTH Hammers
- Bits
- Shanks
- Rods
- Drill Pipes
- Adapters
- Augers, Accessories

## Injection Grouts

Leading edge resin injection technology for demanding cases:

- Water Stopping
- Sealing
- Ground Consolidation
- Ground Stabilisation
- Construction and structural repairs

## Anchoring & Bolting Grouts

Grouting technologies offering ease of use, clean and fast setting:

- Capsules
- Cartridges
- Pumpable grouts
- Additives

## Anchoring & Bolting

A broad range of rock bolting and anchoring technologies:

- Double and single coated protected steel
- Steel Self Drilling Anchors
- GFRP bolrs of all types
- Standard bolts and meshes

## Cement-Based Additives

Cement based admixtures and additives:

- Concrete Repair
- Admixtures
- Modifiers
- Waterproofing
- Joint Sealants

## Pumps & Accessories

Cement and resin mixing and pumping technologies:

- Cement Pumps
- Resin Pumps
- Transfer systems
- Dataloggers
- Hoses, lances, packers

## Water control

Waterproofing, drainage and pumping:

- TunnelDrain innovative strip drainage system
- Drainage pipes
- Waterproofing grouts, additives and sealants
- A broad range of dewatering pumps

## Ventilation

Air quality, ventilation and safety solutions:

- Ventilation bags and systems, including Mecanica's rigid ducts
- Fans & inline coolers
- Water atomisers

## Re-usable Hangers

Developed in the Nordics, fast, easy to use & reuse:

- Services Hooks for ventilation systems, water and pneumatic lines, electrical cables and distribution boards
- Blasting hooks

## Other products

A range of other products:

- Coatings & sealants
- Personal protective products
- Mining accessories

# Water control

Nordic Geo Support offers a range of products to control water in tunnels and mines:

- For cleaning of water Nordic Geo Support offers a customised technology range for mining, tunnelling and construction customers
- For dewatering, our range offers a robust and economic solution. The Winzemaster pump offers a simpler alternative.
- For management of seepage of ground water, TunnelDrain – the innovative alternative to strip drains.
- Drainage pipes
- For large volume ground water problems – Nordic Geo Support offers the leading range of waterstopping injection resins.





# Innovation for sludge management

## Mud Treatment systems for mining operations

### Benefits:

- Fewer pumps
- Underground water recirculation
- Fast Treatment
- Simple and efficient
- Low cost of ownership: lower operational and maintenance costs
- Suspended materials reduction at the water treatment plant
- No addition of toxic materials in water
- Automatic dosing



# Typical Cleaning Operation



**WATER COMMING IN**



**WATER COMMING OUT**

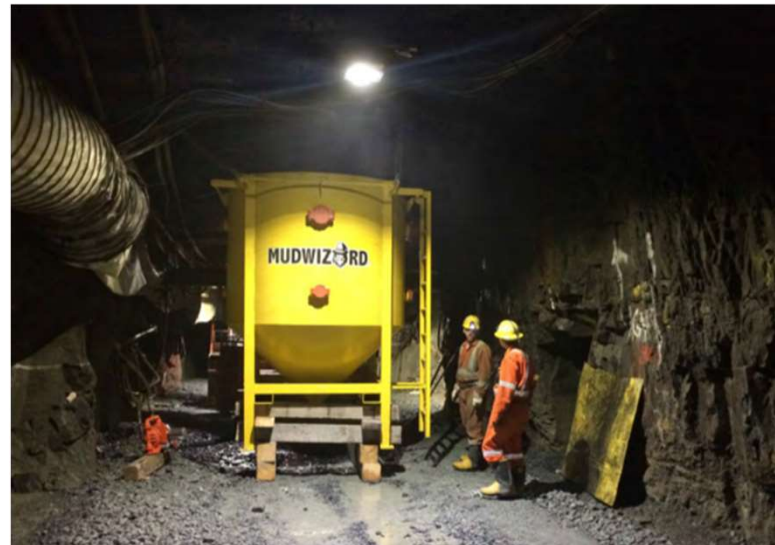
Typical cleaning example from 350,000ppm solids to under 200ppm  
Slurry concentration can be reused for dust suppression applications  
Eliminates sanding in dewatering pipes  
Eliminates the need for pigging the dewatering discharge line

# Technology

## System Description:

Mud water is collected to tank and is then in contact with tablets where mixing activation creates a separation and settling, allowing clean water recovery and easy disposal of waste. A single polymer dosing tablet cleans around 38 000 litres of water.

System capacity in operation is between 115 and 2275 Litres per minute with maximum system design available at 7500 Litres per minute  
Frequency of dispenser refilling is around twice per week taking 30 minutes to refill.



# Typical Systems

Customer	System Description
Agnico-Eagle	440 GPM capacity, slurry concentrate pump to surface. Water recirculated for operations
Fruta Del Norte (Equador)	Water treatment syste, for ramp developoment and wash bay. 600 GPM mining operation capacity, allows for water recirculation at the mine.
Strabag TBM Operation	High flow system mounted to TBM frame for cleaning water, slurry reused for dust suppression
New York Tunnel	450 GPM used in tunnel construction, eliminated sanding and clear water sent to final treatment plant



Flexible, custom made design for mining, quarries, tunnelling and construction applications



# Pumps

Dewatering Pumps



Slurry and Bentonite Pumps



Submersible Sand and Sedimentation Pumps



High Head Pumps



Sludge Pumps



# Tunnel drainage

- Teaming up with Dolenco, we offer an innovative alternative to strip drains, **Tunnel Drain**.
- Quick to apply, this provides a path for water ingress to drains without compromising the bond of sprayed concrete to the ground.
- Ideal in cases where a drained tunnel is envisaged or where there is limited space – e.g. repairing old tunnels.
- Available in a biodegradable version, made from recycled material, for temporary or permanent applications.
- Compatible with other leading edge technologies like systematic pre-grouting and spray applied waterproofing membranes.



*Danish design!*



# Installation

**1** START MOUNTING MODULES FROM TOP DOWN ON EACH SIDE OF THE TUNNEL



**3** MODULE ENDS OVERLAPPING



**2** ATTACHING MODULES AT THE NAILING POINTS WITH A NAILGUN



**4** MODULES ENDS IN THE DRAINAGE CANAL

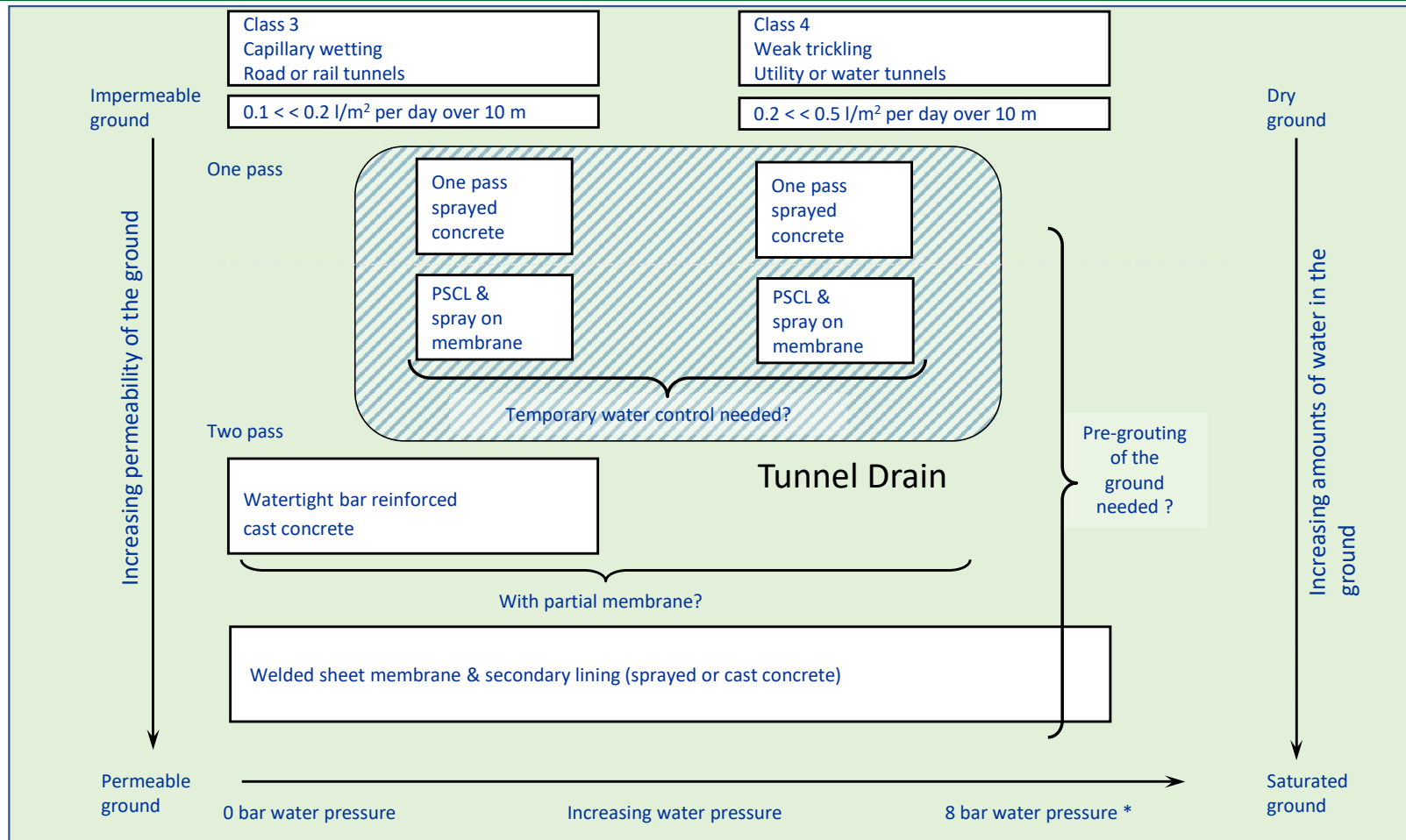
**5** THE MODULES ARE COVERED WITH SHOTCRETE

**6** FINAL LAYER OF 6-10 CM SPECIALLY DESIGNED SHOTCRETE





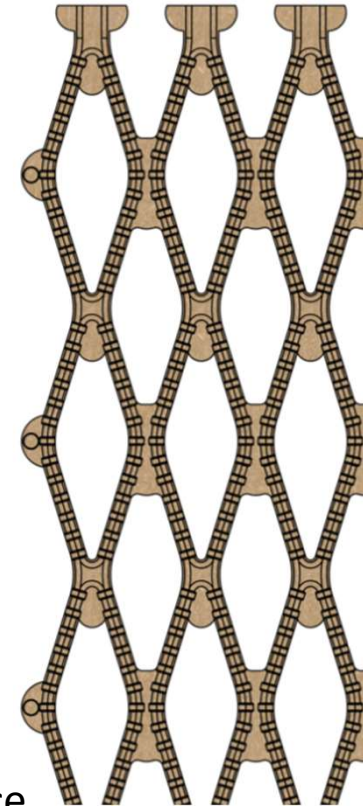
# Range of application



\* Beyond 8 bar pressure some form of permanent drainage will probably be required

# Tunnel Drain advantages

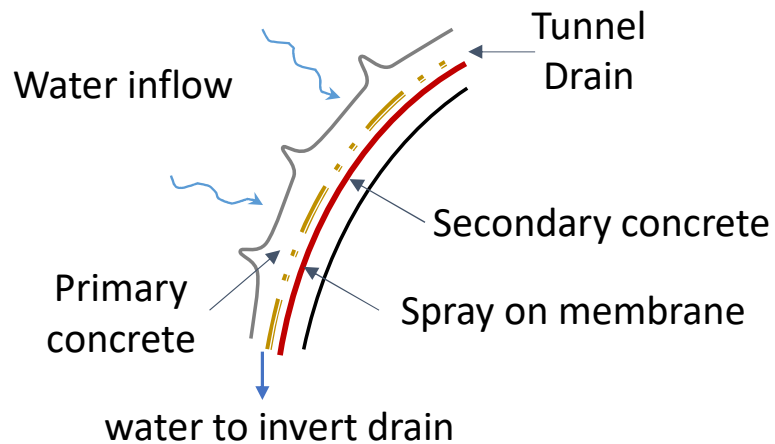
- Comprehensive drainage – an alternative to strip drains
- Quick and easy to apply
- A complementary product to systematic pre-grouting
- Permits sprayed concrete to bond continuously to the rock or previous concrete layers
  - No risk of differential shrinkage cracking as seen with strip drains
- Compatible with [Spray Applied Waterproofing Membranes](#)
  - Tunnel Drain can be embedded in the regulating layer which is normally sprayed before applying the membrane
  - This can serve as temporary drainage so the tunnel is dry enough to apply the membrane
  - Additional permanent drainage behind the membrane for a more robust waterproofing solution
- Scan to detect any blockages & then remove during maintenance



# Tunnel Drain in mined tunnels

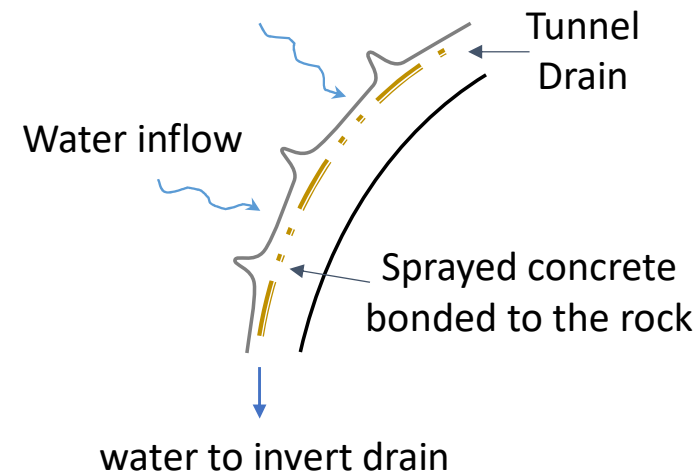
## PSCL with spray on membrane

- Spray primary concrete
- Apply Tunnel Drain & cover with regulating layer
- Spray on membrane
- Spray secondary concrete



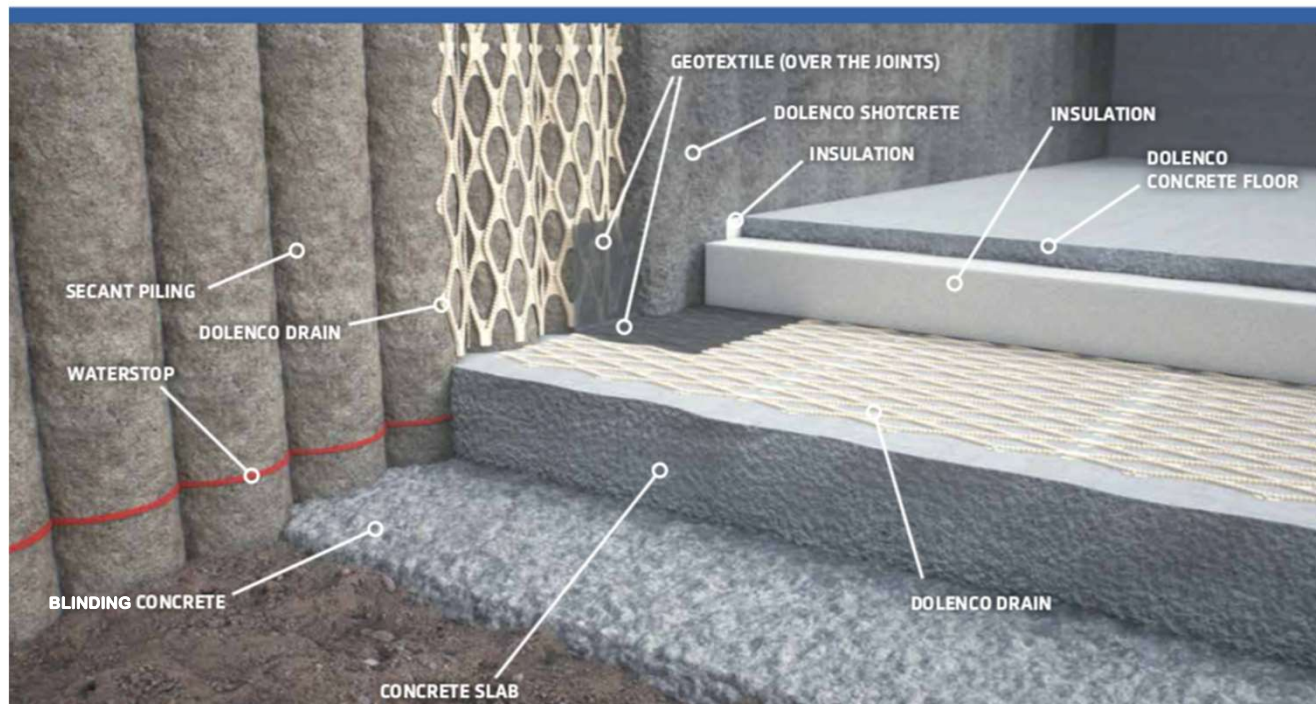
## One pass SCL

- Apply Tunnel Drain directly to the rock / ground surface
- Spray over with rock support sprayed concrete



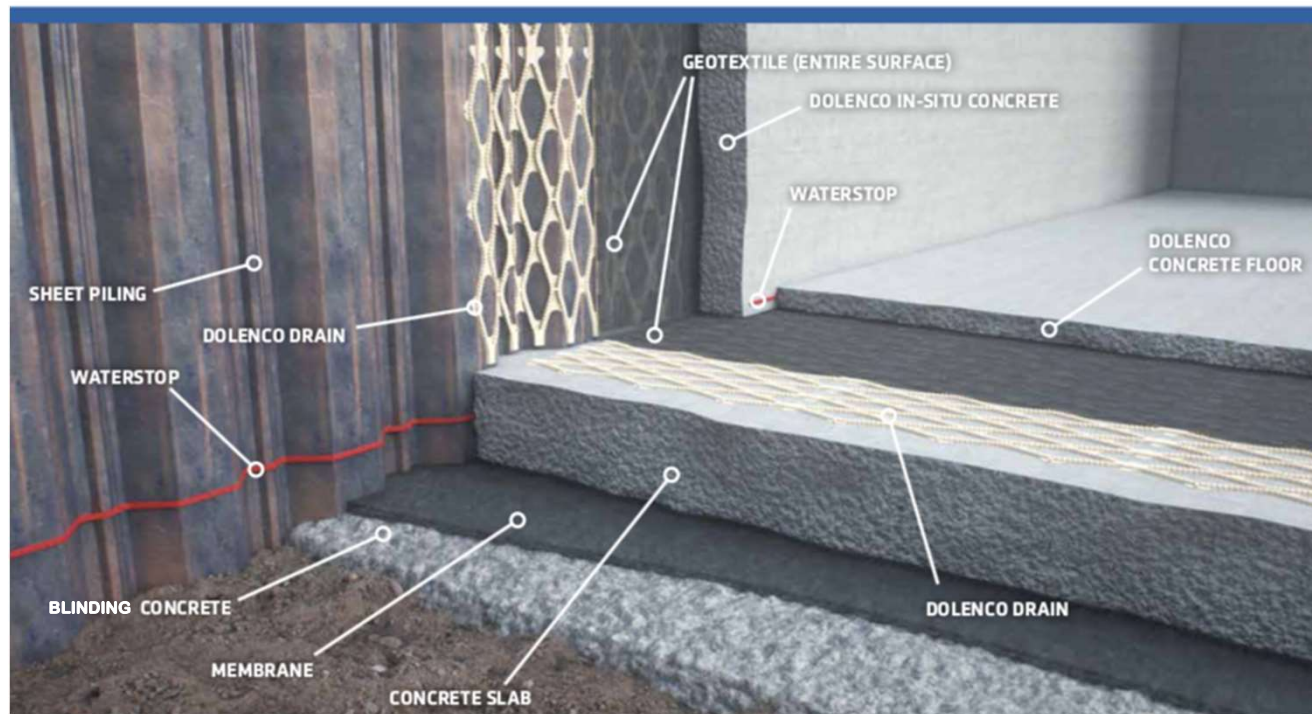
# Secant piled excavation detail

## DOLENCO FLOOR AND WALL DRAIN Secant pile wall and double floor



# Sheet piled excavation detail

## DOLENCO FLOOR AND WALL DRAIN Sheet piling and double floor





# Injection Grout Technology

- **Nordic Geo Support** offers specialist high-performance cement and resin and grouting solutions.
- Our cutting-edge technology in resin-based solutions place our customers at the forefront of sustainable bolting, sealing, consolidation and stabilisation of rock and soils.
- Our expertise in design and application as well as our understanding of the total solution from drilling to grouting and capital equipment means we offer the complete system to our customers.
- Polyurethane, Silicate, Acrylate and Epoxy based technologies.



**The leader in Ground Water and Drinking Water Approved products**



# Thank You

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