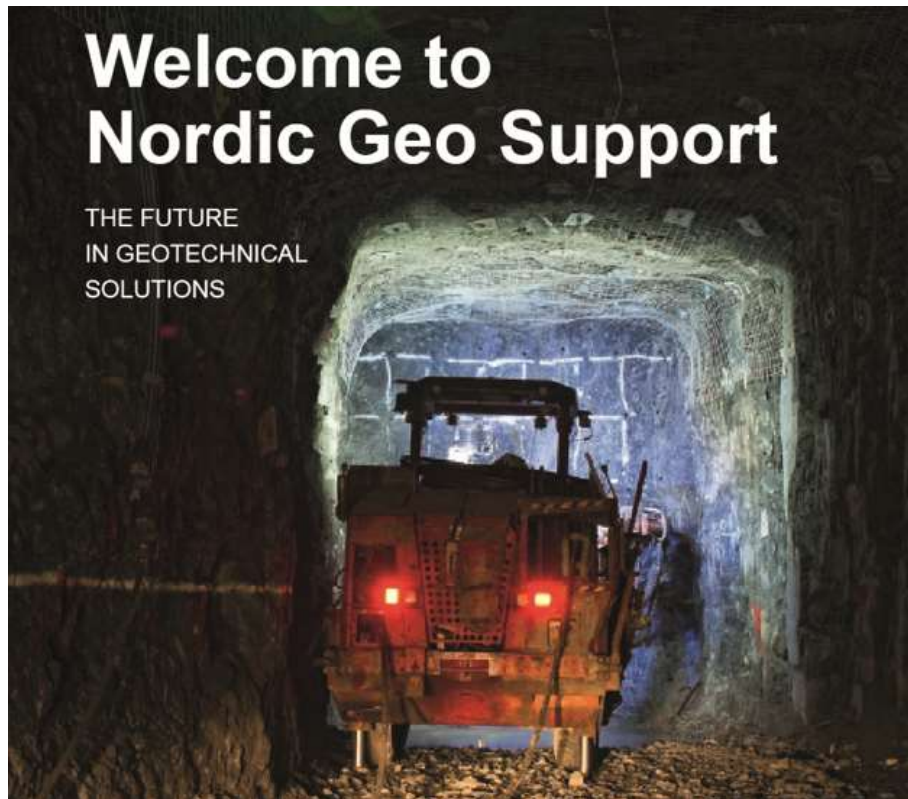




Overview

Sustainable support for your ground

About us



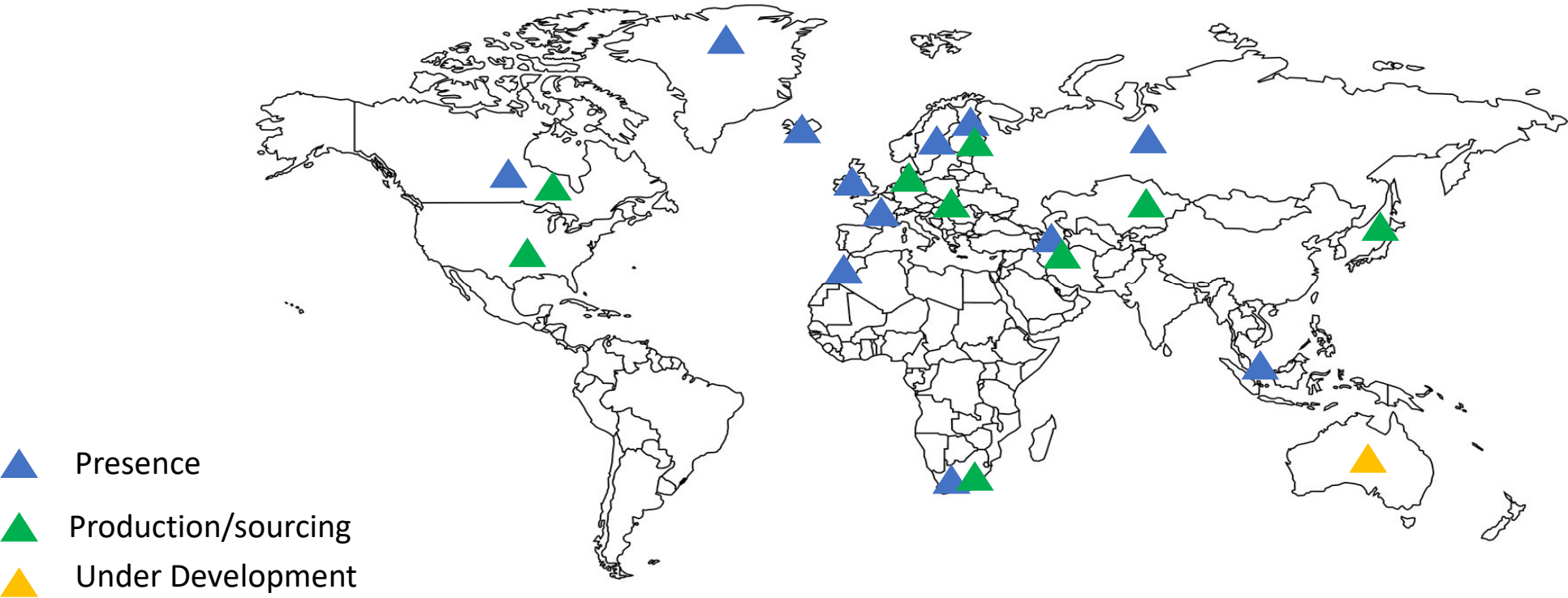
- We specialise in innovative products with an emphasis on improving the environment and project sustainability.
 - Partnering with leading technology companies
 - Our products are application driven and are easily combined to create solutions for everyday problems
 - Our people are empowered to make 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

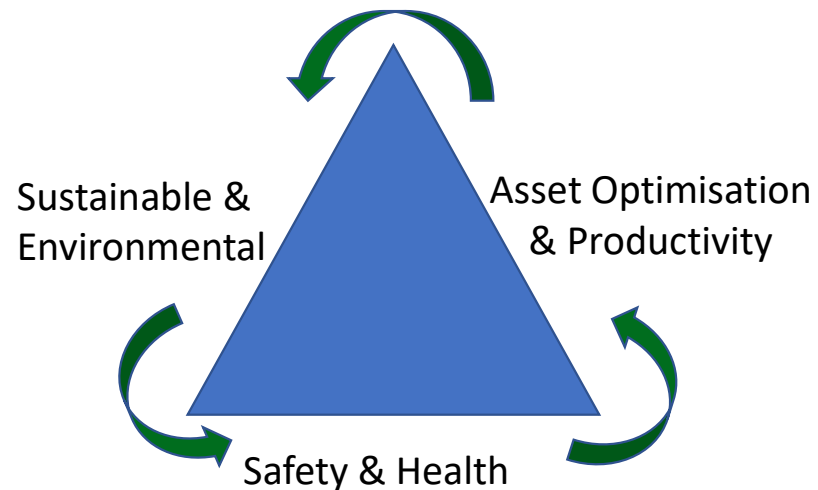


Our offer <ul style="list-style-type: none">Leading technology solutionsFocus On SustainabilityComplete solutionsBranded products under Nordic Geo Support	Our customers: <ul style="list-style-type: none">Mining (surface & underground)TunnellingBlasting and energy drillersConstruction civil (bridge, road...)Construction repair (infrastructure and buildings)
Our Values <ul style="list-style-type: none">Customer centricEquality in all aspectsRespect to people and the environmentEach person in the company is empowered and takes ownershipCollaboration and cooperationTeam spirit	Our reach today <ul style="list-style-type: none">Nordic region as coreBalticsEurope (focus southern Europe & UK)Africa (Northern and Sub Saharan)TurkeyCanadaAustralia and SEA

Today's Footprint



Reducing Project Impacts



Sustainability & Environmental: Solutions that drastically reduce CO₂ 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

- 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 Mecanicad'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

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

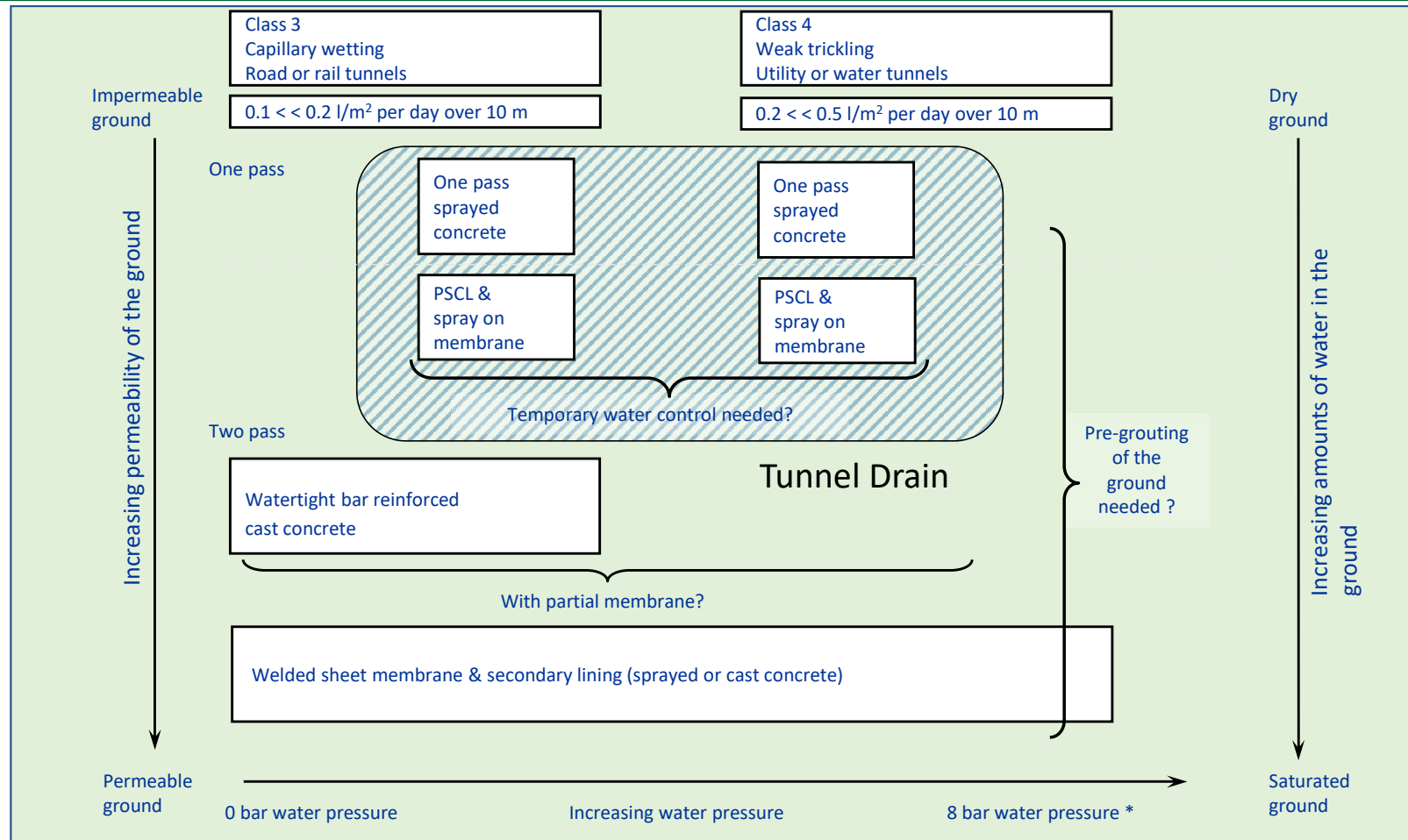


5 THE MODULES ARE COVERED WITH SHOTCRETE

6 FINAL LAYER OF 6-10 CM SPECIALLY DESIGNED SHOTCRETE



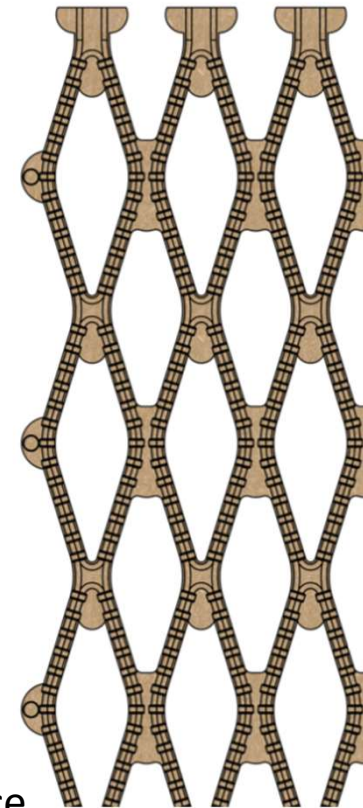
Range of application



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

Tunnel Drain advantages

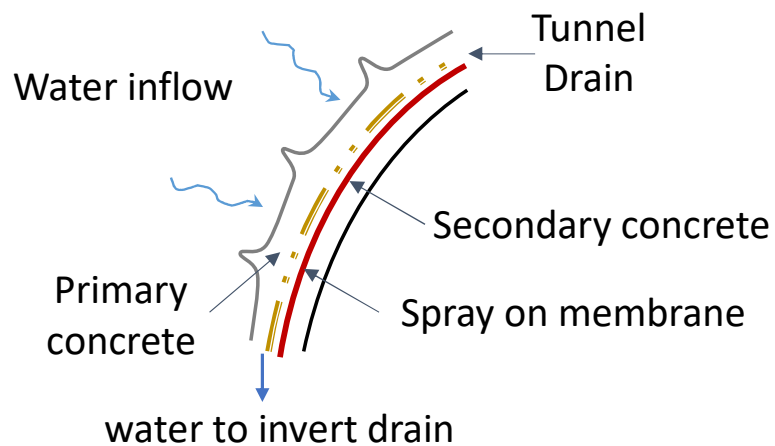
- Comprehensive drainage – an alternative to strip drains
- Quick and easy to apply
- A complementary product to systematic pre-grouting
- Permits sprayed concrete to bond continuously to the rock or previous concrete layers
 - No risk of differential shrinkage cracking as seen with strip drains
- Compatible 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

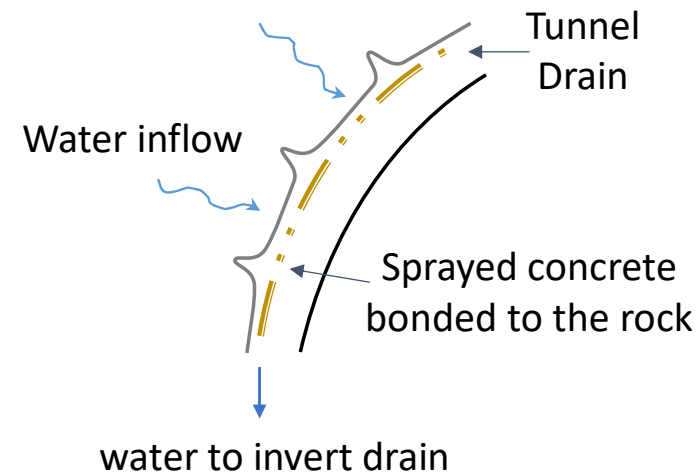
PSCL with spray on membrane

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



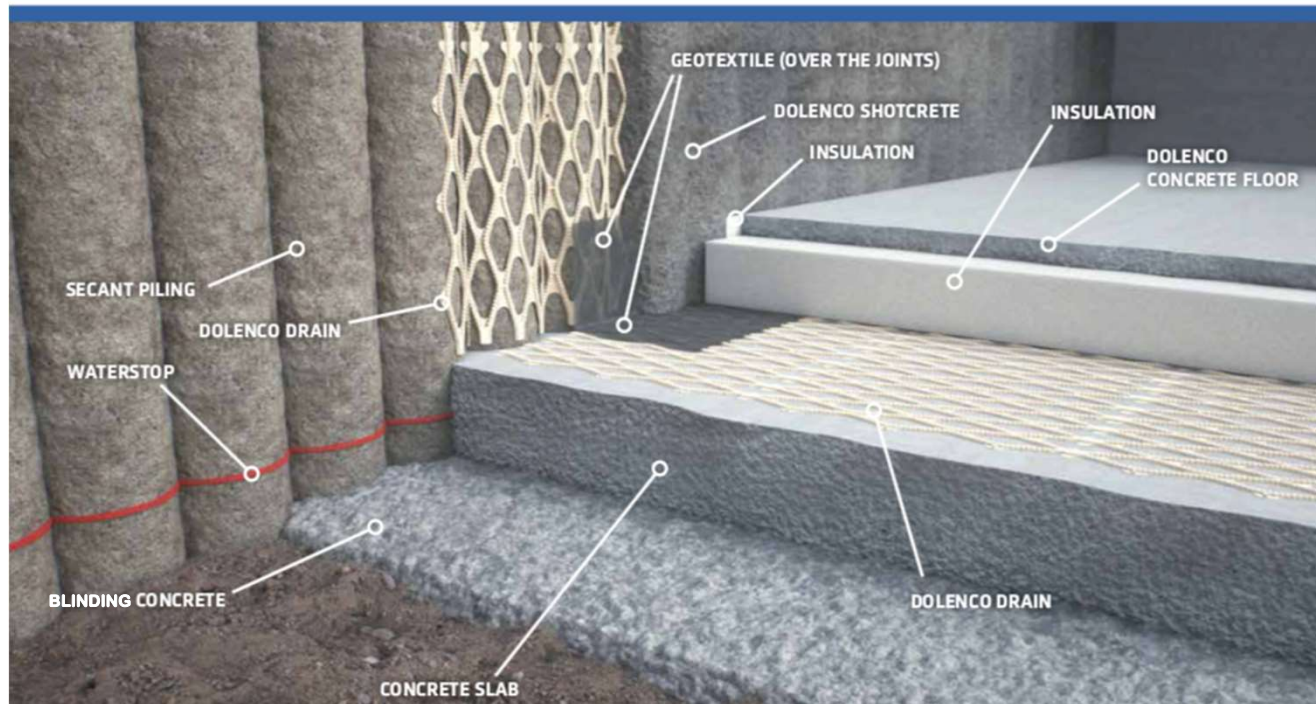
One pass SCL

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



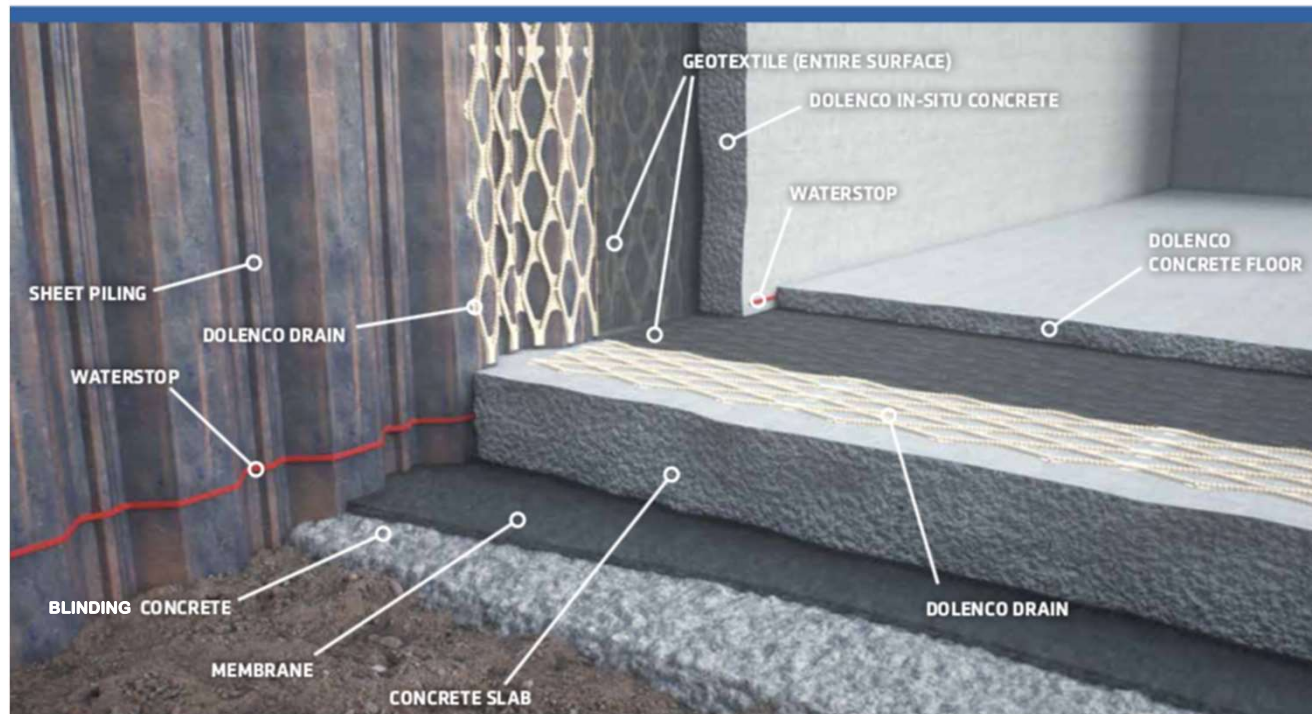
Secant piled excavation detail

Secant pile wall and double floor



Sheet piled excavation detail

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

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 development 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



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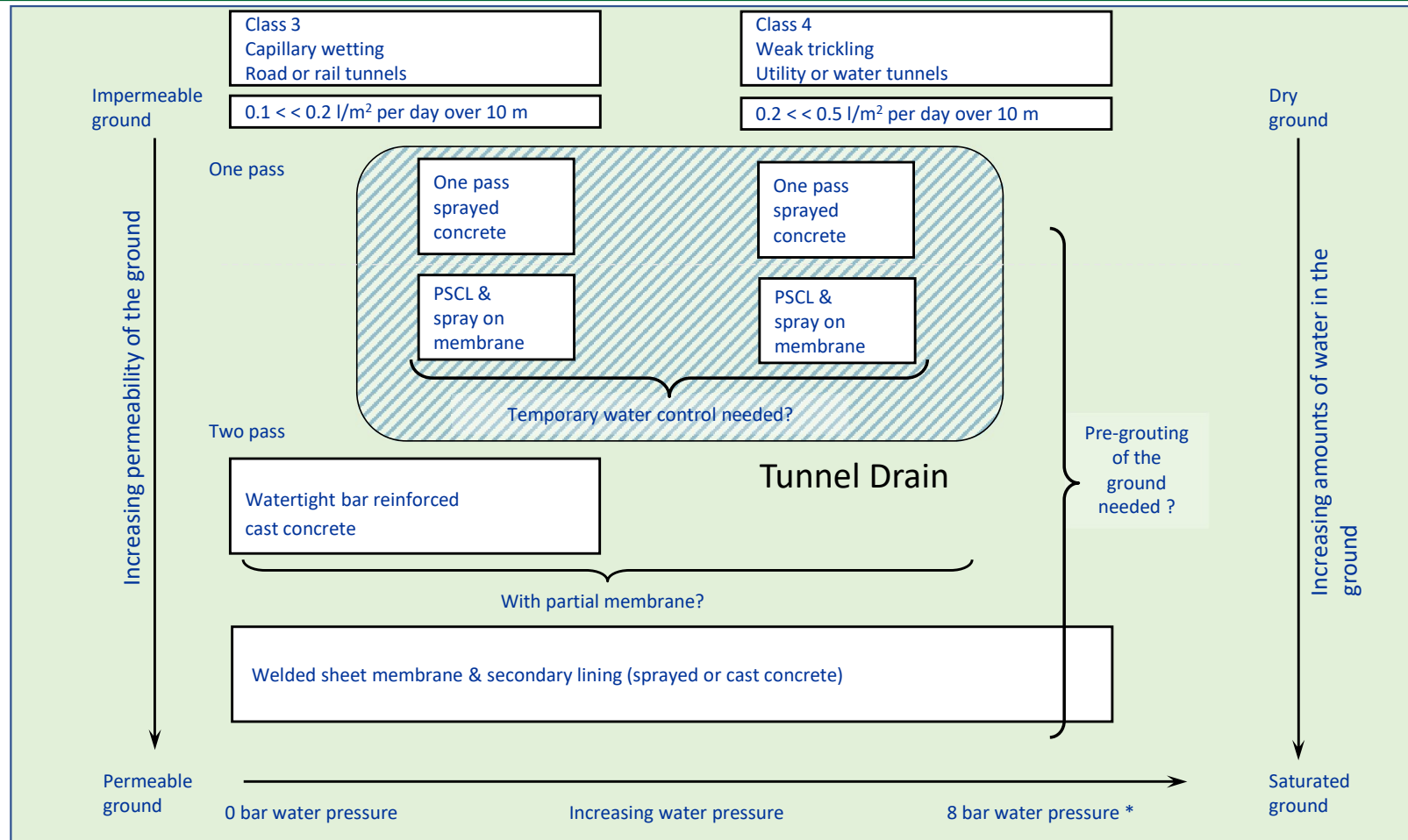
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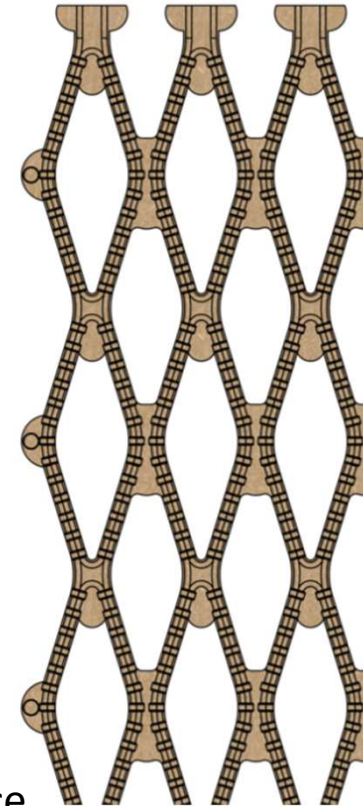
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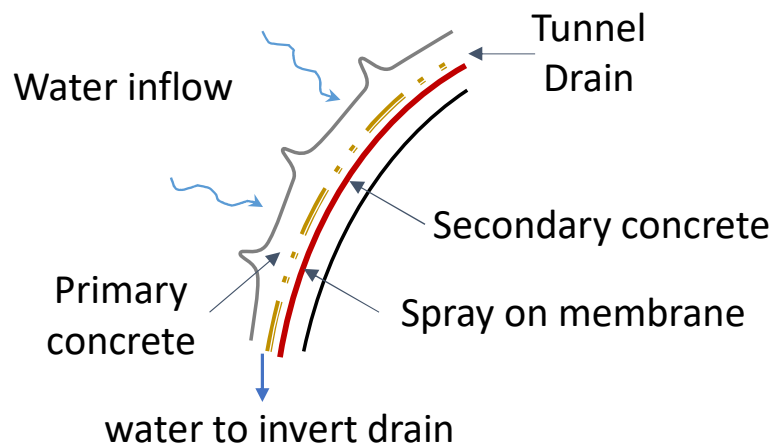
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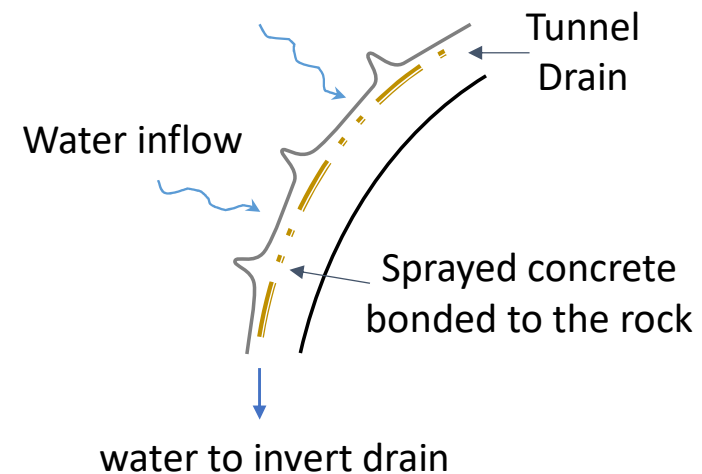
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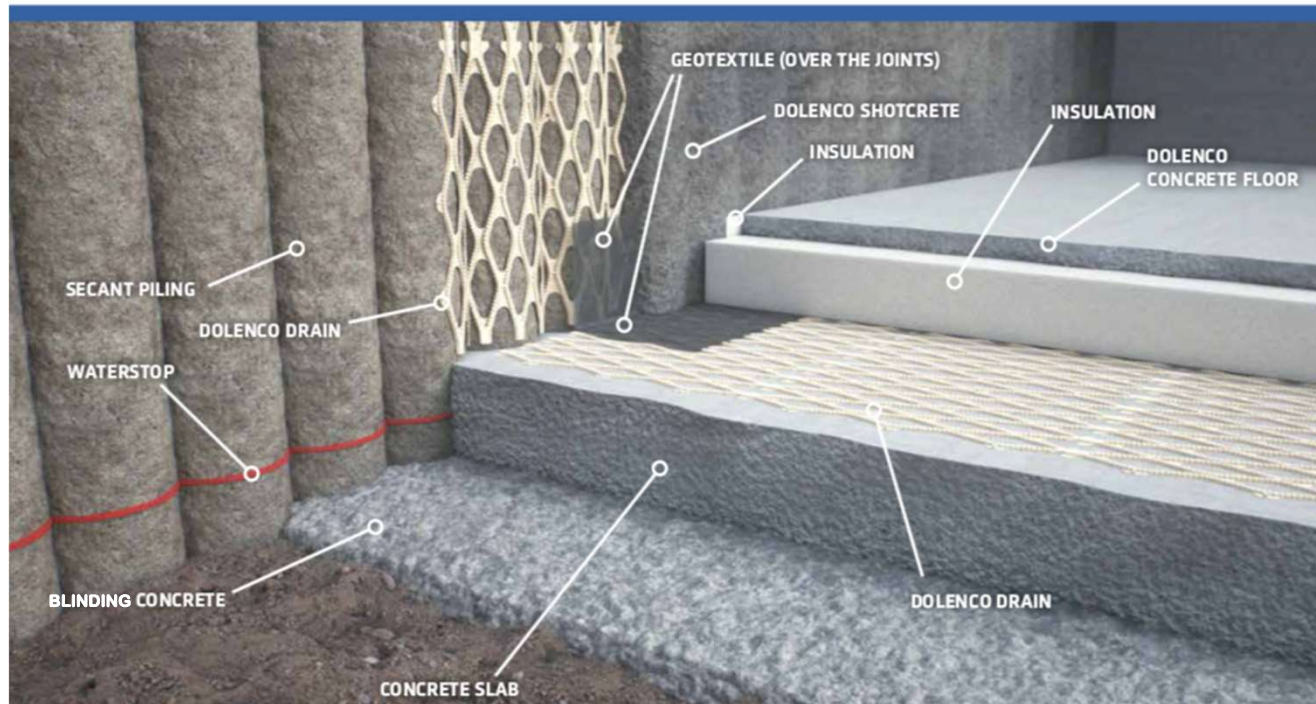
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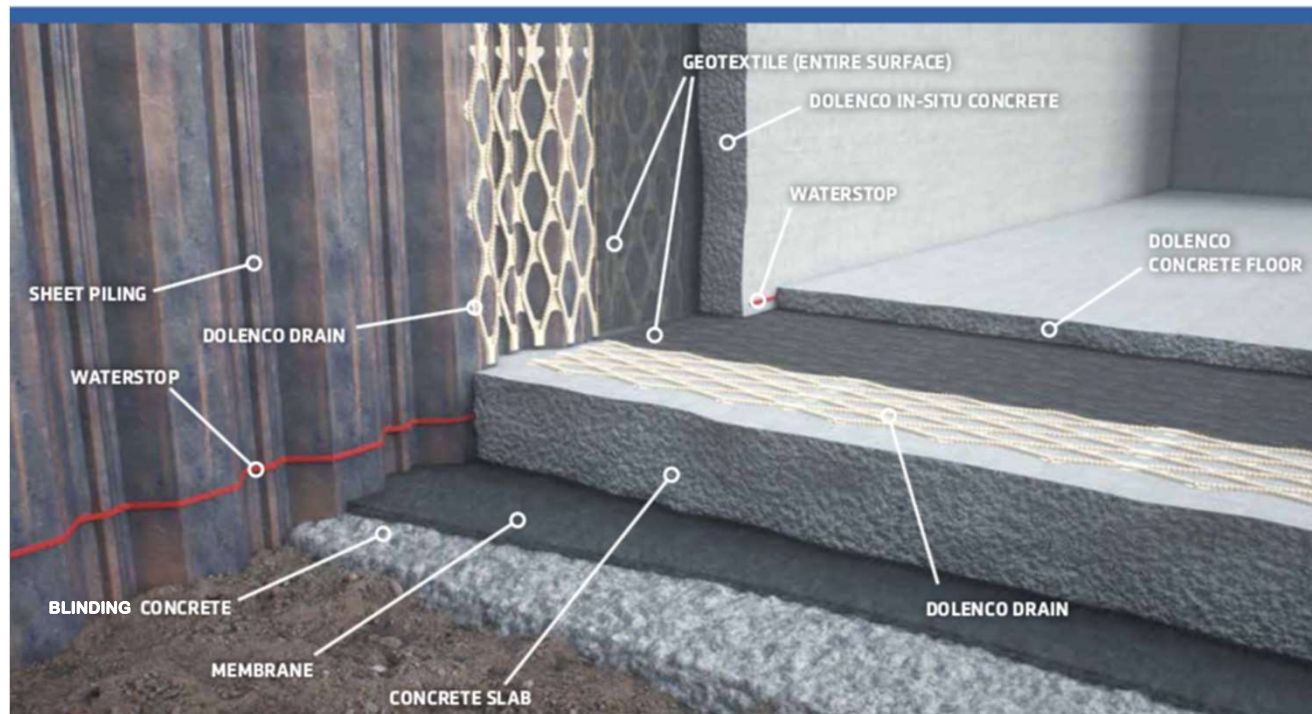
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DOLENCO FLOOR AND WALL DRAIN Secant pile wall and double floor



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DOLENCO FLOOR AND WALL DRAIN Sheet piling and double floor



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Thank You

www.nordicgeosupport.com