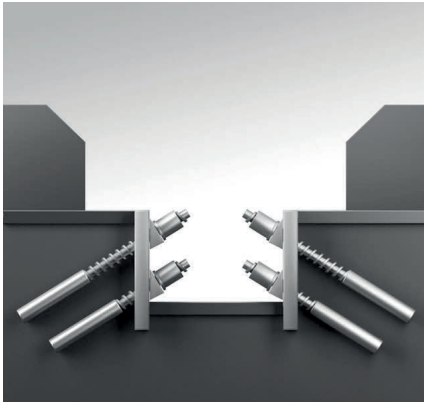




Ground Anchoring and Dam Strengthening

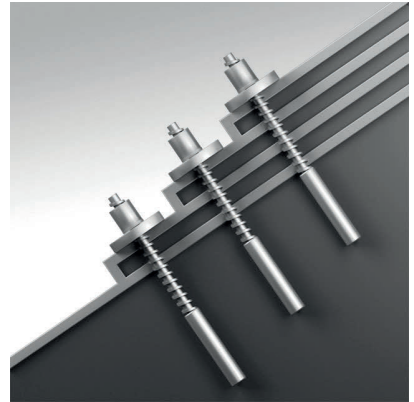
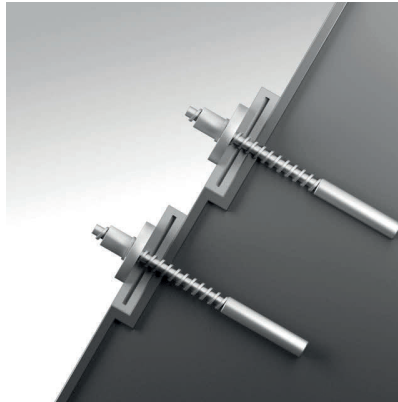
2 Fields of application



Excavations

Ground anchors play a crucial role in large and deep excavations, offering a cost-effective alternative to steel or concrete braces. They ensure safe construction, unrestricted access, and minimal obstruction.

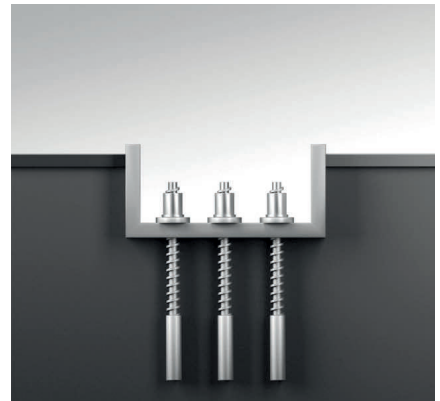
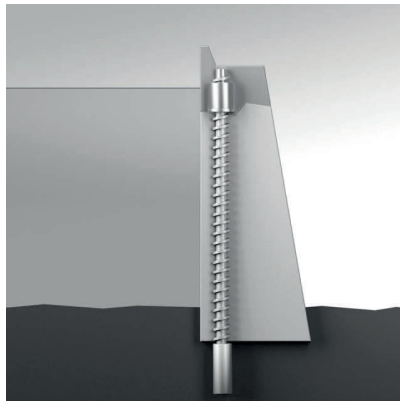
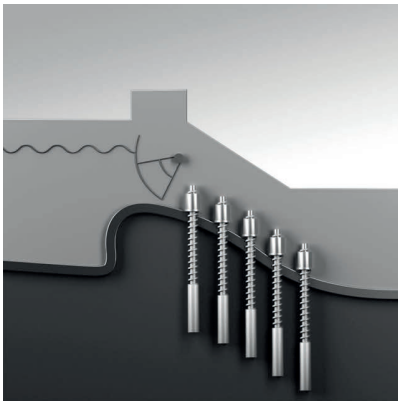
- Bar and strand anchors
- GEWI® Soil nails and rock bolts
- DYWI® Drill soil nails and rock bolts



Slope stabilisation

Slope stabilisation is the process of reinforcing or securing the stability of slopes, hillsides or embankments to prevent or mitigate potential landslides, erosion, or other slope failures.

- GEWI® Soil nails and rock bolts
- DYWI® Drill soil nails and rock bolts
- Bar and strand anchors
- Mesh



Dams

Anchoring techniques strengthen dam structures, providing stability in the face of changing water levels and load conditions.

- GEWI® Soil nails and rock bolts
- Bar and strand anchors
- GEWI® and GEWI® Plus piles
- Tie bars

Uplift control

Tensile piles and tensioned anchors secure foundations against uplift, offering a time-efficient alternative to mass concrete.

- GEWI® and GEWI® Plus micropiles
- Bar and strand anchors
- DYWI® Drill tension piles

Leading geotechnical dam solutions

At DYWIDAG, we stand as Australia's leading geotechnical supplier, offering a comprehensive range of ground engineering products coupled with unmatched expertise.

Globally recognised for our technical competence, quality assurance, and proven product reliability, DYWIDAG has firmly established its presence in the geotechnical ground and civil engineering sector across the globe. Our scope includes geotechnical solutions with specialised monitoring services. With decades of experience in developing, producing, and supporting geotechnical projects, we assure our customers of consistently high-quality products and systems.

Our specialised technical services are tailored to meet the unique requirements of each project, whether it's enhancing technical efficiency, reliability or achieving cost-effectiveness. Our team is dedicated to helping you reach your project goals. Our extensive range of geotechnical products includes ground anchors, including large strand anchors, double corrosion protection systems, prestressing steel threadbar, DYWIDAG GEWI® bar, DYWIDAG GEWI® Plus bar, DYWIDAG DYWI® Drill hollow bar, removable anchors, glass fibre reinforced plastic bar, soil nails and rock bolts.

Alongside our product range, we provide inspection, testing, tensioning and maintenance services as well as equipment hire.

5 Continents. 53 Countries.

As one of Australia's largest manufacturers and suppliers of specialist ground support DYWIDAG's focus is on supplying cost competitive solutions. In Australia, we have recently worked on Sydney Fish Markets Coffey Dam, Dumaresq Dam, as well as Paradise Dam, Rookwood Weir, Avon Dam, Hume Dam, Rowallan Dam, Cotter Dam, Jindabyne Dam and Devils Gate Dam.



4 Manufacturing facilities

DYWIDAG's manufacturing facilities in Newcastle, NSW, are supported by our strategically located facilities around the world and global supply chain.

The new factory increases local capacity, optimizing efficiencies and safety. Our enablers are the right locations, strict processes and maintenance regimes. DYWIDAG's Australian team are specialists in anchor fabrication. Custom strand anchors are created for specific project needs either coiled in our factory, or field fabrication of anchors in an on site factory. Pre-grouted DCP anchors are produced in our factory and shipped to site to assist with project timelines, ease of handling and installation on site.



DYWIDAG is experienced in design detailing, anchor fabrication, grouting and testing procedures with a dedicated team of specialists, supervisors and QA managers.

DYWIDAG provides local manufacturing from international or locally sourced steel. DYWIDAG is backed by a global network of factories and international sourcing, using both European and/or Chinese sourcing, depending on the project requirements.



Products

Strand and Threadbar Anchors

DYWIDAG's double corrosion protection (DCP) bar and strand anchors are engineered to deliver reliable performance for up to 120 years. To achieve this level of corrosion protection, two impermeable barriers are required to surround the steel tendon involving factory pre-grouted encapsulation of the bar or strand within a plastic sheath. DYWIDAG's DCP strand and bar systems have approvals with ACRS and TfNSW specifications. DYWIDAG has EPD's for our German high-quality hot rolled steel bars and thread bar. The billets of steel are produced using scrap metal from the German car industry. The steel is produced using renewable energy from two company owned hydro plants. There is also a focus on developing 'green' steel to significantly reduce material usage while maintaining the same performance characteristics of the bar. This 'green steel' produces less Carbon emission per kilo to the Australian Industry average.

Corrosion resistance

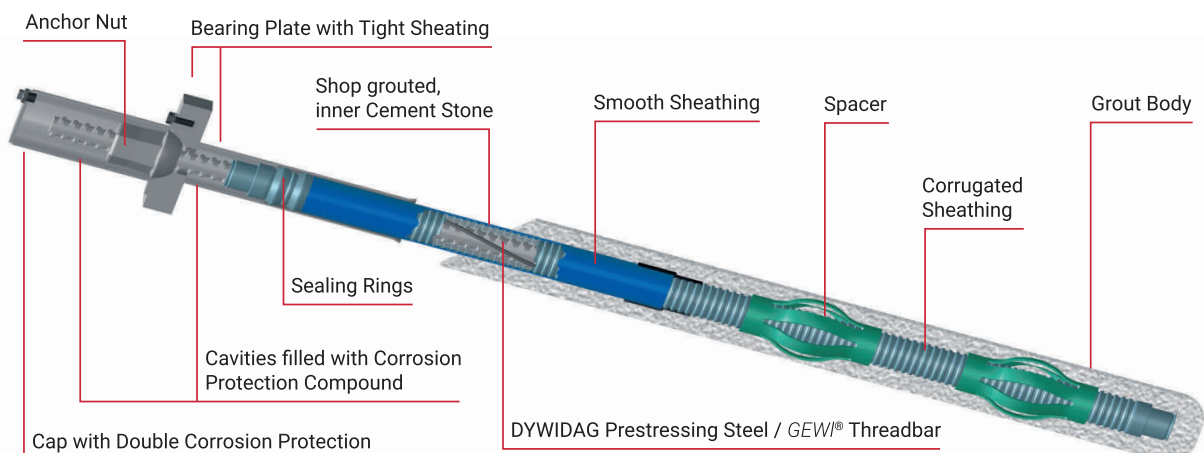
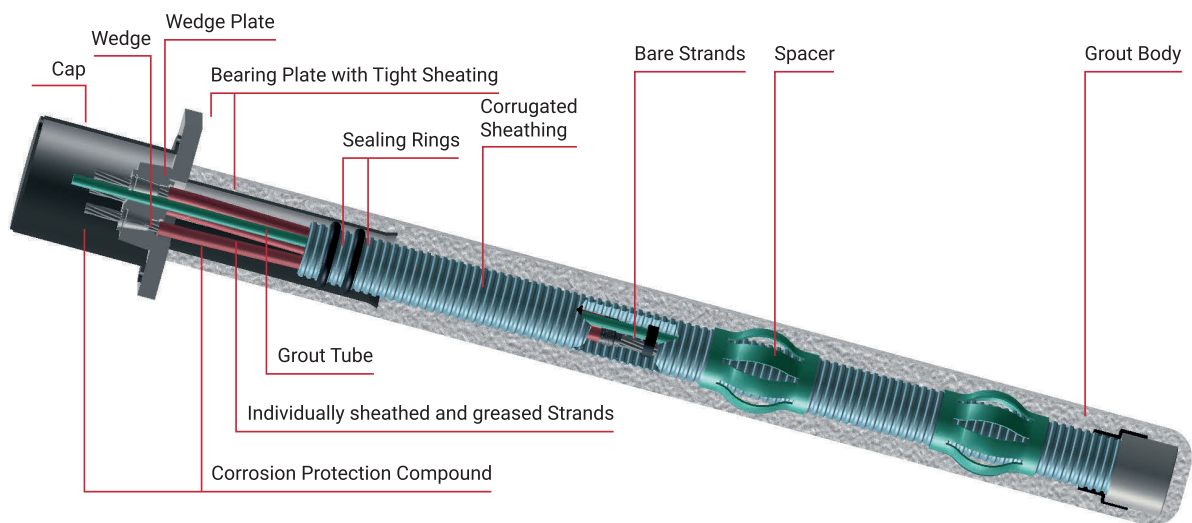
Designed to withstand the effects of corrosion in harsh environments, providing long-term durability and reliability.

Dual protection

They have dual layers of corrosion protection, such as factory pre-grouted encapsulation and specialised coatings.

High load capacity

These anchors can support high loads, making them suitable for use in demanding applications where strength and stability are paramount.



6 Oroville Dam Remediation, USA

PRODUCTS

DYWIDAG Threadbar anchors

UNIT

DYWIDAG-Systems International
USA Inc., BU Geotechnics, USA

LOCATION

USA

SCOPE

Supply

DYWIDAG played an integral part in the remediation of Oroville Dam in the US.

In 2017, the wettest winter in 100 years resulted in extremely high water flow resulting in erosion to the bottom of the weir and the possible collapse of the spillway gate.

Issues with the spillway required an emergency response causing the evacuation of 180,000 residents.



DYWIDAG was part of the emergency recovery team. DYWIDAG produced and supplied 7096 epoxy coated DYWIDAG THREADBAR® 36mm anchors in varying lengths 4.6m – 7.6m long. DYWIDAG anchors were also used for the anchoring of the concrete slab

Sydney Fish Market

Coffer Dam – Sydney

UNIT

DYWIDAG APAC

LOCATION

Sydney, Australia

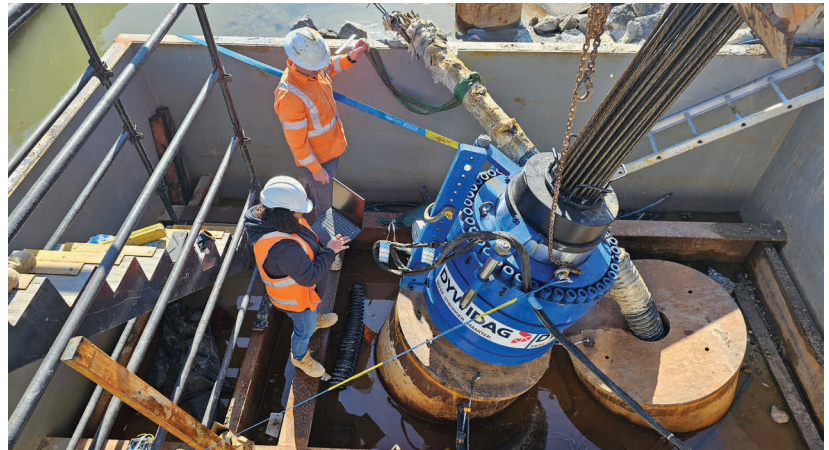
TIMELINE

2023

SCOPE

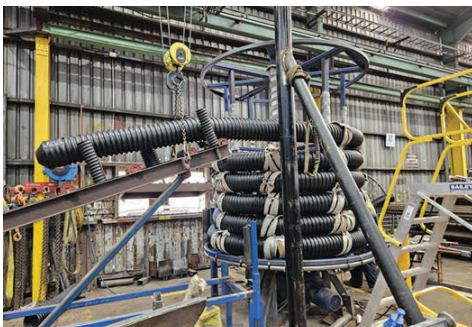
Design assistance, manufacturing, coiling, supply and stressing supervision of 61 strand anchors up to 40 m long. DYWIDAG also supplied 2200kN stressing equipment.

The construction of the new Sydney Fish Market, a landmark project located at Blackwattle Bay, Sydney, required a robust foundation capable of withstanding seismic activity. The challenge was to prevent seismic uplift of the foundation piles, which are crucial for maintaining structural integrity in the event of an earthquake. With over 6000 square meters of new public open space, the market is set to become one of Australia's leading tourist destinations, meaning that safety and long-term stability were of utmost importance. The project demanded innovative solutions to meet both seismic protection and longevity requirements.



DYWIDAG provided a comprehensive solution through the design, manufacturing, and installation of advanced multistrand anchors. These 61-strand anchors, reaching lengths of up to 40 meters, were installed within large steel foundation piles, which were driven at an angle into the seabed rock. The bond length of the anchors extended through these piles into the deeper bed rock, securing a strong connection between the subsea rock and the market's foundation.

The 61-strand anchors were coiled onto drums with a diameter of less than 2.2 meters. DYWIDAG's local expertise was supported by knowledge from the dam strengthening projects in the USA where multistrand anchors have been produced up to 90 strands. A 2200kN hydraulic stressing jack was specially commissioned to handle the demanding load requirements, ensuring precise installation and tensioning. Collaboration with the geotechnical drilling team was crucial, as the equipment and methods were developed together to guarantee safe and efficient coiling, uncoiling, and stressing operations.



DYWIDAG's multistrand anchor system has provided the new Sydney Fish Market with a foundation designed to withstand seismic forces and ensure stability for the next 100 years. The innovative coiling and stressing methods allowed for a seamless and safe installation, reducing risk on-site and contributing to the project's overall efficiency. With these anchors in place, the Sydney Fish Market is well-prepared for future seismic events, ensuring the safety of its infrastructure and the thousands of visitors it will host daily. The project's success underscores DYWIDAG's expertise in delivering custom-engineered solutions for complex and high-stakes construction challenges.

Seven Mile Dam, BC, Canada



DYWIDAG has expert experience by successfully supporting and supplying to many challenging projects, in respect of the highest safety standards.

The Pend d'Oreille River in the southeastern part of British Columbia, consists of a gravity dam (approx. 70 m high) with power intakes in the present river channel near the right bank and a spillway on the left bank.

The four unit powerhouse is located immediately downstream of the power intakes. BC Hydro planned to improve the dam to reduce dam safety risk. 90-0.6" DYWIDAG Restressable Double Corrosion Protected Multistrand Anchors (using micro-wax and extruded PE sheathing for corrosion protection of strands) with a length of 98 m each were designed, supplied, installed and successfully tensioned.



Dumaresq Dam, Australia

UNIT

DYWIDAG APAC

LOCATION

Australia

TIMELINE

2019–present

SCOPE

Supply DYWIDAG ANCHORS &
Monitoring

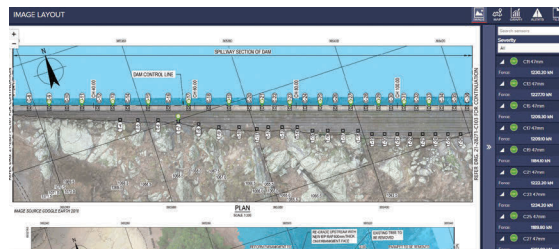
OWNER

Armidale Council NSW

Dumaresq Dam was the first major water supply in Armidale NSW built on Dumaresq Creek in 1897. The wall is a concrete gravity dam with the right abutment flanked by an earthen embankment. The dam does not meet modern day safety criteria and poses a risk to downstream properties in the event of a flood.



Dam reinforcement with DYWIDAG Anchors



This project will ensure the stability of the dam wall and ensure the dams continued use as a recreational area. The dam wall is tied into the rock below using post tensioned reinforcing bars which will minimise any change in the appearance of this historic structure. DYWIDAG supplied a total of 60 x 47mm WR & 57mm high tensile pre-grouted DCP Threadbar anchors up to 40m in length, to AS 4672. The DCP Threadbar anchors supplied are permanent with a design to last over 120 years.

DYWIDAG is providing 24/7 monitoring of 16 anchors (14 crest and two at the toe) which is presented on DYWIDAG's Digital twin IOT platform Infrastructure Intelligence.

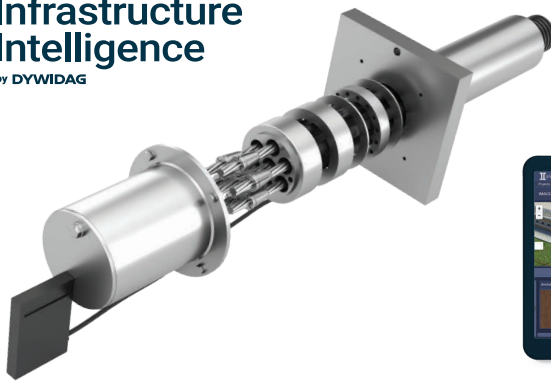
10 DYWIDAG Smart anchor

DYWIDAG Smart anchor is a plug-and-play integrated monitoring device that acquires, processes and alerts on real-time sensor data.

The overall solution provides an integrated view of the foundation condition of the structure. Especially designed to fit threadbar anchors and strand anchors, the DYWIDAG Smart anchor is an anchor which feeds into a cloud-based platform, Infrastructure Intelligence. Its load is monitored at frequent, regular intervals, by a unique force measurement sensor, and the field data provides access to analytics and reporting, so users can monitor a structure's performance remotely in real time from any connected device.

Key features

- Information can be shared via email and/or SMS alerts.
- Technology is secure and easily manageable from the Cloud.
- Delivers vital asset health data via plug-and-play sensors.
- 3D digital twin enables users to navigate the virtual site from their desks.
- Provides up-to-date digital representation of the site's environment using live telemetry updates. Charts (timed based and observation-over-depth) are available.
- Works on all devices including desktops, tablets and mobile phones using devices' native mobile browser.



Innovative monitoring of anchors for cableway

PROJECT

Ground Engineering Awards 2024
International Project of the Year -
Highly Commended

PRODUCTS

DYWIDAG Smart Anchor Systems
Infrastructure Intelligence (II)

LOCATION

Mt Messenger, New Zealand

SCOPE

Design
Material Supply
Testing | Inspection
Reporting

OWNER

New Zealand Transport Agency

GENERAL CONTRACTOR

Groundfix
Project Alliance
New Zealand

The Te Ara o Te Ata project exemplifies how DYWIDAG, Groundfix, and Alliance New Zealand's collaborative efforts and advanced technology overcame challenges in a remote, ecologically sensitive area. Utilizing a cableway and smart anchor technology minimized environmental impact and enabled efficient, simultaneous work, offering significant time and cost savings.

Implementing a 1,100-meter cableway for machinery transport allowed successful passage over the top of dense forests, minimizing ecological impact and eliminating the need for a damaging haul road. This approach accelerated the construction schedule by approximately one year, optimizing project efficiency without harming the environment and reducing the disruption and congestion of the existing road. The project included the installation of multi-strand anchors, which reached depths of 18 metres on the north side with 11 strands, boasting ultimate loads of 2871 KN, and 15 metres on the south side with ultimate loads of 2317 KN and 200mm boreholes in the mudstone.

Acknowledging the critical function of these anchors for the cableway's integrity, a monitoring system was implemented using DYWIDAG's Smart Anchor technology. This system allows for the real-time tracking of anchor loads and relays this data to a remote platform. This method facilitates ongoing monitoring of the anchor loads, eliminating the need to physically access difficult anchor locations. Designers found the real-time load data extremely beneficial, prompting the decision to install additional anchors before starting the cableway construction, enhancing the project's safety and efficiency.





Get in touch

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