

cuttable • non-corrosive • non-magnetic • non-conductive • high strength • light weight

Burj al Arab Hotel, Dubai, UAE

Reinforcement of 1,500 SHED concrete armor units protecting the iconic Burj al Arab hotel.

The Burj al Arab hotel is an iconic 7 star hotel located on a man-made island in Dubai.

The Burj al Arab hotel was completed in 1999, and is undergoing a scheduled routine maintenance and upgrade process.

In the 20 years since the Burj al Arab Island was constructed, advances in corrosion resistant construction materials, such as Pultron Composites mateenbar™ GFRP rebar, have become available.

The Burj al Arab Island is protected by an existing layer of wave energy dissipating SHED units. Design studies found there would be benefit in using mateenbar™ in 1,500 SHED units in the 3 layers of the tidal zone to ensure the long term durability and corresponding aesthetic quality of the main island are retained.

Alternative proposals were considered by the design consultant Atkins, but rejected as unsuitable. These included black steel reinforcement (limited durability), epoxy coated (reliability issues), galvanized (reliability and environmental issues) and stainless steel reinforcement (increased cost).

To achieve the service life requirement, Atkins recommended the use of mateenbar™ to reinforce the 1.5m high SHED cubes. The project required design life is 50 years. mateenbar™ has given Jumeriah Group the opportunity to extend the structure design life and realize long term capital and operational cost savings.

mateenbar™ is a rust-free, salt resistant reinforcement rod, and is an ideal application for marine environments.

mateenbar™ is manufactured of high performance composite materials including vinyl-ester resin and ECR glass fibers.



Client: Jumeirah Group
Consultant: CH2MHill
Precast Units: Dubai Precast
Designer: Atkins
Year: 2015
Location: Dubai, UAE

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Dibba Harbour, Sharjah, UAE

Marina development with a 600m long access canal for a housing project near the beaches of Dibba Harbour, on the east coast of the United Arab Emirates.

To form the canal, soil is excavated to a 6m depth, the canal banks are then retained by Mechanically Stabilized Earth (MSE) quay walls. Required service life of the MSE quay wall is 75 years.

Alternative proposals were initially considered, but rejected for the quay walls. These included black steel reinforced pre-cast concrete panels (reduced durability) and mass concrete panels (increased cost).

To achieve the service life requirement, the consultant decided on the use of Pultron Composites' mateenbar™ (GFRP Rebar) to reinforce over two thousand 220mm thick pre-cast decorative quay wall panels. The total solution gives a design life of over 100 years. Concrete cover requirements can be reduced using non-corrosive mateenbar™.

mateenbar™ is a rust-free, salt resistant reinforcement rod, and is an ideal application for marine environments.

mateenbar™ is manufactured of high performance composite materials including vinylester resin and ECR glass fibers.

Main Quantities

Earthwork Excavation:	108,000 m3
Concrete:	2,200 m3
mateenbar™ Reinforcement:	15t
Geo Textiles:	180,000 m2
Rock Materials:	9,000 m3
Gravel:	1,440 m3
Paving Blocks:	4,320 m2
Design Life:	75 years



Client:	Government of Sharjah, Directorate of Public Works
Consultant:	Halcrow
Contractor:	Darwish Engineering
Designer:	VSL
Year:	2011
Location:	Sharjah, UAE

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Doha Metro, Qatar

mateenbar™ used as cuttable reinforcement in underground metro stations.



The cuttable properties of **mateenbar™** keeps the TBM moving without delays speeding up the construction time



Client: Qatar Rail
Consultant: Atkins, SSF IngenieureAG
Contractor: Gold line: ALYSJ Joint Venture
Green line: NSCC International
Red line: RLS Joint Venture
Location: Doha, Qatar

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E311 Highway Ext. Interchanges, UAE

- 130km Road, 8 Main interchanges
- Over 320,000 x 32mm bars of mateendowel™ installed
- Resistance to highly saline (Sabkah) desert soils
- British Board of Agrément (BBA) certified solution



Client: DOT, Abu Dhabi Municipality
Consultant: CH2MHill
Contractor: ECO
Location: UAE

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EMAL Phase II Expansion, Abu Dhabi UAE

The Emirates Aluminium (EMAL) smelter in Taweelah near Khalifa Port in Abu Dhabi is the largest single-site primary aluminum producer in the world with a capacity of 1.3 million tpa.

mateenbar™ reinforcement was used in the EMAL phase II expansion project, which comprised of potline 3, the worlds single-longest potline (1.7km) with a design capacity of 520,000 tpa.

The use of mateenbar™ non-conductive reinforcement in potline 3 lowered the operating costs by limiting the induced currents and the loss of electrical efficiency that occurs when steel reinforcement is used. Combined with EGA's new-generation DX technology, mateenbar™ helps to produce some of the most efficient reduction cell technologies in the world.

Additionally, mateenbar™ reinforcement has been used in the following smelter projects:

- EMAL Phase I project – Emirates Aluminium
- DUBAL Smelter – Dubai Aluminium
- Qatalum Smelter – Qatar Aluminium
- Sungun Refinery – National Iranian Copper Industries

mateenbar™ is a rust-free, salt resistant reinforcement rod, and is an ideal application for marine environments.

mateenbar™ is made from a high performance, extremely durable composite of vinyl-ester resin & corrosion resistant ECR glass fiber.



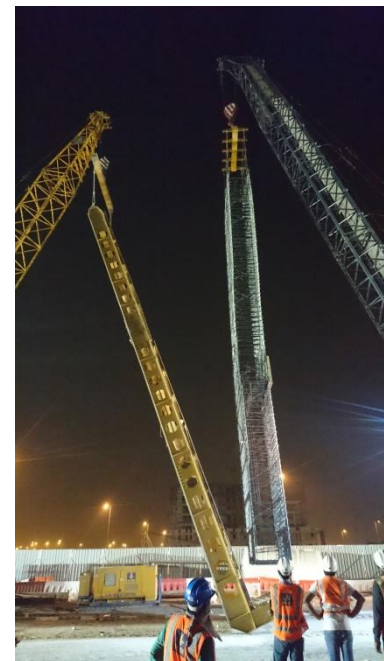
Client:	Emirates Global Aluminium (EGA)
Consultant:	SNC-Lavalin International
Contractor:	Leighton Contracting, Mammut Technocrete
Year:	2011 / 2012
Location:	Abu Dhabi, UAE

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Expolink 2020, Dubai Redline Extension, UAE

mateenbar™ was used in the diaphragm walls as cuttable temporary reinforcement for the breakthrough section.

The cuttable properties of **mateenbar™** keeps the TBM moving without delays speeding up the construction time.



Client: RTA
Consultant: CH2M / Parsons/SYSTRA
Contractor: Acciona Gulermak CWJV
Sub-Contractor: Bauer
Location: Dubai, UAE

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pultrusion technology

pultron
COMPOSITES 

Mateen™ range effective March 2008. Pultron™ reserves the right to adjust products without notification.
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Gisborne Cenotaph, New Zealand

The Gisborne Cenotaph erected on the bank of Turanganui River in 1923, suffered significant structural damage during a 6.8 magnitude earthquake that struck in December 2007. The earthquake left this nationally significant monument at risk of serious damage in future seismic events.

Major strengthening of the foundations to the cenotaph were necessary to protect the Cenotaph. These works included the removal of soil surrounding the foundations, demolishing portions of the original foundation and casting a substantial foundation ring beam around the central core of the Cenotaph. This new foundation was supported directly on screw piles and designed to support the entire Cenotaph structure.

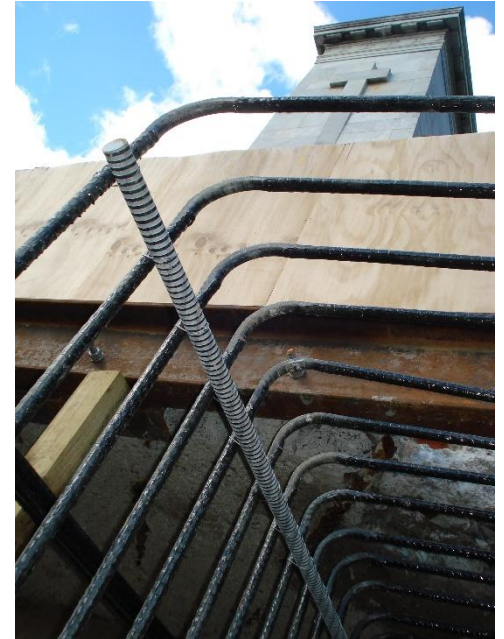
The client and the forward looking team of consultants wanted to ensure that the repairs were undertaken in such a way that they gave longevity and minimised any necessity for future repairs to the Cenotaph. A significant feature of the remedial works was to ensure that the Cenotaph was not damaged through long term corrosion of any reinforcing present in the foundations. As a result Pultron Composites mateenbar™ was specified for the stirrups and longitudinal steel reinforcing the foundations. Unlike steel, mateenbar™ does not need any extra form of protection as it does not corrode, an important feature considering the salinity of the Cenotaph's coastal environment.

“mateenbar™ is the ideal solution to achieve long-term durability in an important historic monument”

Peter Smith – Spencer Holmes

A significant benefit to the contractor was the lightness and cleaner surface of the mateenbar™ which allowed for easier installation and tying. As mateenbar™ is one quarter of the weight of steel, the 8m lengths of #10 (32mm) rebar were able to be installed by 1 or 2 people. Mark van Wijk of Currie Construction stated “its weight made it far easier to handle.”

Using mateenbar™ in the newly built upgraded foundations of the Cenotaph not only saved time during installation but also insures that it will still be standing for another 100 years.



The Cenotaph's foundations using mateenbar™ and mateenbend



mateenbar™ ring foundation in situ, with formwork held by mateenbolt

Client:	Gisborne District Council
Project Manager:	Architects 44
Consultants:	Spencer Holmes, Salmond Reed Architect & McManus Geotech
Contractor:	Currie Construction
Year:	2014
Location:	Gisborne, New Zealand

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Interchange 63, Maine, USA

mateenbar™ is being used as an electrically neutral reinforcement for an RFID Toll Plaza on the Gold Star Memorial Highway.



Client: Maine Transport Authority
Consultant: HNTB Corporation
Contractor: Shaw Brothers / CPM Constructors
Location: Maine, USA



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Interstate I5, Washington, USA

mateendowel™ baskets supplied ready to use with slip form paver



Client: Department of Transportation,
Washington

Contractor: Interstate Improvement & Penhall
Construction

Location: Washington, USA



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Interstate I84, Idaho, USA

70,000 bars of **mateendowel™** inserted using dowel bar machine for expansion joints.



Client: Department of Transportation, Idaho
Contractor: Concrete Placing Co.
Location: Idaho, USA



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Jebel Ali Port, Terminal 4, UAE

mateenbar™ was used as a non-conductive reinforcement to ensure that there is no electromagnetic interference with the power pick up for the crane.

- Non-conductive, non-corrosive reinforcement
- 1,200 metre long quay with an 18 metre draft
- 13 of the world's largest and most modern quay cranes
- 35 automated rail mounted gantry cranes (ARMG)



Client: DP World
Consultant: Royal HaskoningDHV
Contractor: Bam Engineering
Location: UAE



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Kaikoura State Highway Repair, New Zealand

In November 2016 a magnitude 7.8 earthquake struck the South Island of New Zealand.

The greatest impact was around the town of Kaikoura, which was completely cut-off, with significant damage to State Highway 1, the most critical North-South road in New Zealand, and the Coastal Pacific rail line.

Kaikoura relies on the tourism industry for the town's survival, so repair to the road and rail infrastructure was a project of national significance, and the largest repair to the New Zealand road network in over 75 years.

As State Highway 1 and the Coastal Pacific rail line hug the coast for much of the journey around Kaikoura, corrosion of reinforcement was a major concern.

To accelerate the speed of repair, pre-cast concrete blocks were used. To address the durability problems of a coastal environment, the blocks were reinforced with **mateenbar™**, then anchored in place with a combination of **mateendowel™** and **mateenbolt™**.

The use of **mateen™** reinforcement products will ensure maximum longevity for this asset which is so critically important to the people of Kaikoura.

Project: State Highway 1 Repair - Kaikoura
Client: North Canterbury Transport Infrastructure Recovery (NCTIR)
Consultant: NCTIR
Contractor: Various
Location: Kaikoura, South Island, New Zealand



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Kwinana Desalination Plant, Australia

Largest plant of this type in Southern Hemisphere.

140 Mega litres per day.

Client: WA Water Corporation

Consultant: Southern Sea Water Alliance

Contractor: Southern Sea Water Alliance

Location: Australia



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Marriott Hotel, Bellevue, Washington, USA

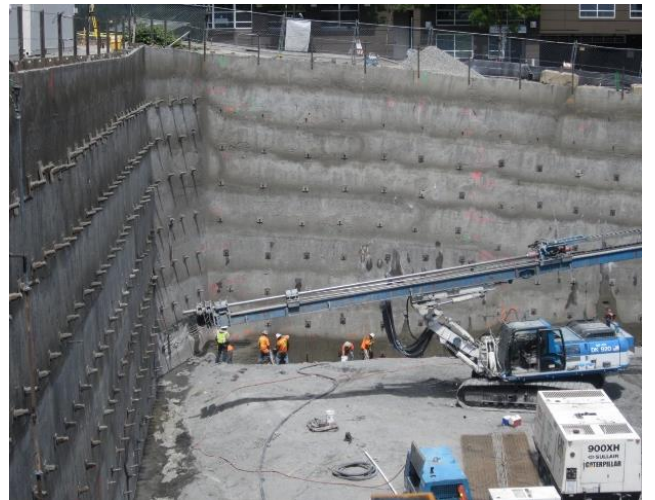
With the prospect of a future “cut and cover” on one side of a deep foundation in Bellevue, Washington; Malcolm Drilling’s John Kvinsland partnered with Williams Form Engineering Corp. (WFEC) to deliver two Glass Fibre Reinforced Polymer (GFRP) soil anchors that can hold 54 and 44 tonnes respectively and can easily be cut in the future.

Historically, the bearing connection end of GFRP bars were the weakest link to maximising the strength of GFRP soil anchors. Using B7X GeoDrill bar supplied from WFEC Engineering and mateenbar (a GFRP rebar) supplied by Pultron, gave Malcolm Drilling the required shear strength needed for their design and allowed WFEC the ability to terminate the mateenbar internally using Wil-Bond Resin. WFEC Engineering provided full documented testing along with manufacturing recommendations.

DeeJay Mott and the Portland manufacturing crew quickly adapted to using the new product as the lightweight nature of the mateenbar made the assembly and handling of the anchors much easier than before. The benefits of the lightweight revolutionary anchors allowed quick instalment on site.

At the completion of the deep foundation wall, using the mateenbar anchors had only 25% of the anticipated movement, a huge success. A success that has allowed WFEC to enter into a strong working relationship with Pultron.

This job demonstrates the progressive thinking required to keep soil anchor’s improving and Williams Form Engineering Corp has shown this in their innovative way to use a non-corrosive and cuttable reinforcement in conjunction with their B7X GeoDrill, to create an innovative solution to a tough situation.



Client:	Marriott Hotel
Consultant:	Williams Form Engineering Corp
Contractor:	Malcolm Drilling
Year:	2013
Location:	Bellevue, Washington, USA

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Marsa Al Seef Development, Dubai, UAE

Reinforcement of hundreds of corrosion resistant formwork boxes on pile caps on the Dubai creek.

The Marsa Al Seef project is a development located on the shore of the Dubai Creek in the popular Bur Dubai heritage tourist area of Dubai. The waters in the Dubai creek are tidal and highly saline leading to an aggressive environment with challenging construction issues.

Several large buildings and infrastructure elements are constructed in the shore area based on hundreds of bored piles with a 1,200 mm diameter.

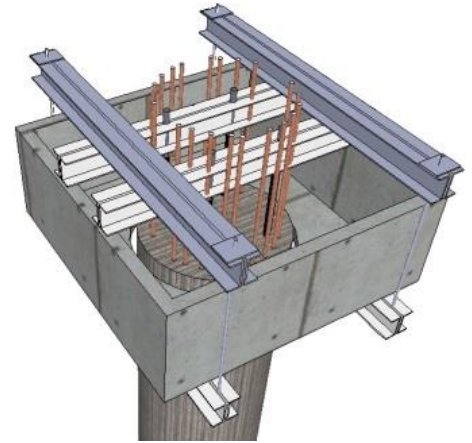
To achieve the durability of the structures in this highly corrosive area, the pile head foundation plays a key role. The pile head is designed with a completely durable mateenbar™ reinforced precast formwork box to protect the underlying structure.

To achieve the service life requirement, the consultants Atkins and CH2MHill specified the use of mateenbar™ FRP Rebar for the reinforcement of the different types and shapes of formwork boxes. Pultrusion Composites supplied straight and bent mateenbar™ reinforcement to the project and designs the formwork box reinforcement for the installation of mateenbar™.

mateenbar™ is a rust-free, salt resistant reinforcement rod, and is an ideal application for marine environments.

mateenbar™ is made from a high performance composite of vinyl-ester resin & corrosion resistant ECR glass fiber.

Client: Meeraas Development
Consultant: Atkins / CH2MHill
Contractor: Dutco Balfour Beatty
Year: 2015
Location: Dubai, UAE



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Schools, Marshall Islands

- **mateenbar™** reinforcement used in 10 new schools
- High corrosion low lying sandy soil
- Reduce contractor risk



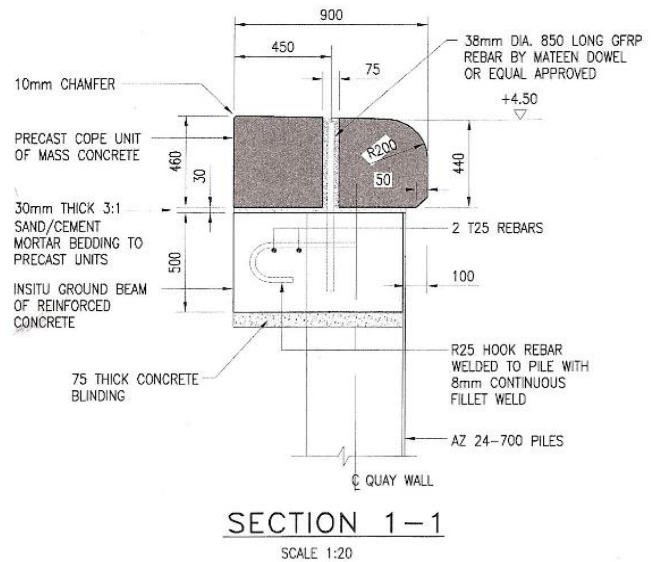
Client: Republic of Marshall Islands
Consultant: Beca Carter Holdings and Ferner
Contractor: Pacific International
Location: Marshall Islands



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Port Rashid, UAE

mateendowel™ acting as a Shear Pin in-between the Capping beam and the Pre-Cast cope unit.



mateendowel™ was specified due to:

- Non-corrosive material properties
- Cost reduction

Client: DP World

Consultant: COWI

Location: UAE

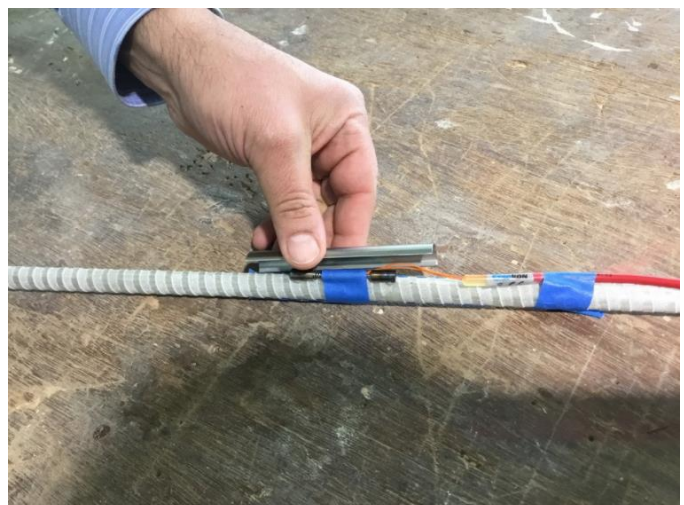


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Potash Concrete Replacement, Safi, Jordan

The Carnallite Structure is a 25-meter, five-story-high, open steel-framed structure constructed in the 1980s. An elevated concrete slab with the steel framing supports several centrifuge machines, which serve as an integral part of the hot leach production line at this potash plant. The equipment, which runs continuously, induces vibration into the supporting slab and sprays hot leach product, which is highly deleterious to both concrete and steel, directly onto the slab.

mateenbar™ was used as the only reinforcement for the concrete slab due to its durability in concrete structures exposed to chlorides and other salts. The use of **mateenbar™** solved the issue of corrosion in the concrete reinforcement helping to ensure the continual operation of the Carnallite Structure for over 60 years.



Project: Carnallite Structure Replacement
Client: Arab Potash Company
Consultant: WJE
Contractor: Construction Experts Co.
Location: Safi, Jordan

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Rail Detection Loops

Detection loops are required by rail and tramway networks and represent a critical part of the safety and train management systems to keep trains clear of each other at all times.

Non-metallic areas are required to be designed into the rail network foundations at areas where detection loops are placed to ensure the loops operate correctly and the position of trains can be accurately determined at all times.

The non-magnetic and electrical insulation properties of mateenbar™ GFRP rebar make it the ideal reinforcement in this vital safety application. These properties plus the quality and strength of mateenbar™ has seen it utilized in a number of leading rail, metro and light rail projects throughout the world.

Projects recently conducted by Pultron Composites:

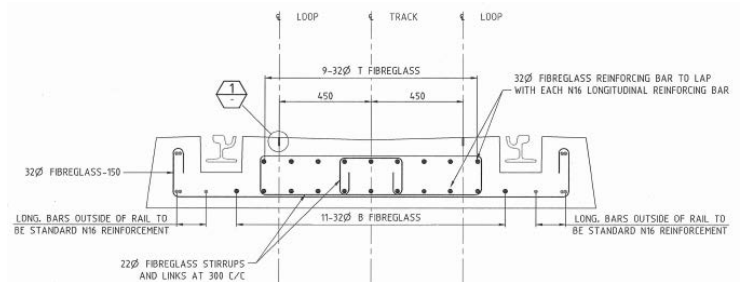
- Canberra Light Rail Network, Australia
- Sydney Light Rail Network, Australia
- Gold Coast Light Rail, Australia
- Melbourne Metro Rail Project, Australia
- London Overground, Australia
- Education City Light Rail Transit, Australia

Advantages of mateenbar™

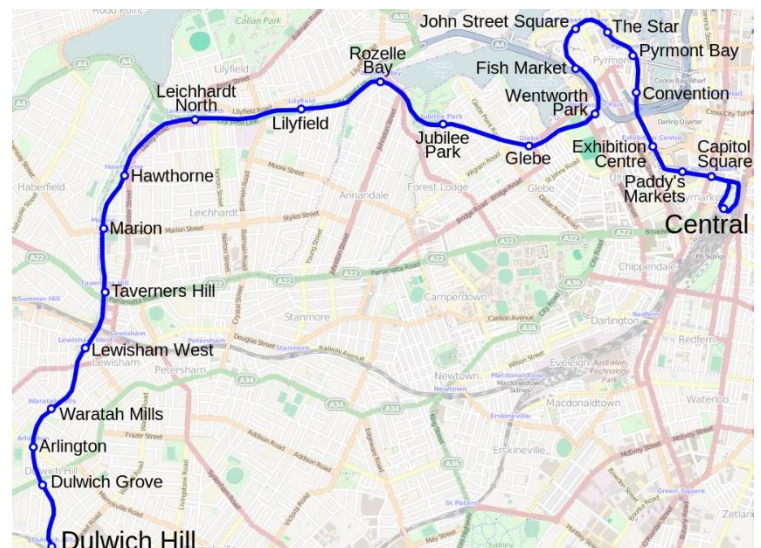
- 100% corrosion free
- Non-conductive and non-magnetic
- 50-60% lower price than stainless steel
- Low thermal conductivity
- ¼ the weight of steel
- Tensile strength twice that of steel
- Easily cut by Tunnel Boring Machine (TBM)
- Low carbon imprint and long-life product
- Reduced whole of life project costs.



G:link – Gold Coast Light Rail, Australia



Reinforcement plan near detector loop



Dulwich Hill Line, Sydney Light Rail, Australia

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Singapore MRT

Used in the soft eye reinforcement due to the cuttable properties of **mateenbar™**. This allows the TBM to keep moving forward without delays, speeding up the construction time.



Client: Land Transport Authority, Singapore

Consultant: Connel Wagner

Contractor: Alstom

Location: Singapore

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Sokhna Power Plant, Egypt

To provide security rods for the water intake for a 2 x 650 Mega Watt Gas / Oil Fired Power station.

The leading mechanical properties of mateenbar™ have seen it used in many marine projects, both in the GCC region and in other parts of the world as a non-corrosive reinforcement and to provide substantial cost savings compared to stainless steel in extreme environments.

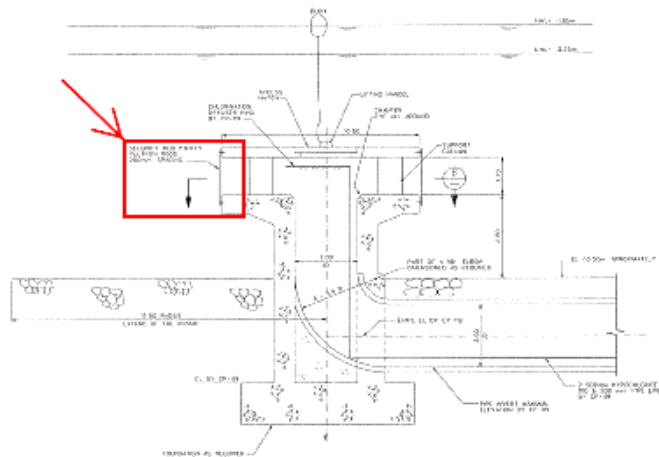
Required service life of the mateendowel™ high durability rods is 100 years.

mateendowel™ security rods were specified to resist design wave loads, potential impact loads from large objects, fish, and people and to prevent flow induced vibration.

mateendowel™ is a rust-free, salt resistant and non-corrosive rod, and is an ideal application for marine environments.

mateendowel™ is manufactured by Pultron Composites utilizing high performance composite materials including vinylester resin and ECR glass fibres.

High quality materials and over 30 years of Pultron’s production experience provide a product and service you can trust.



Key Facts

- mateendowel™:** Diameter 38mm
- Bar Length:** 2,500mm
- Bar Spacing:** 200mm
- Design Life:** 100 years

- Client:** East Delta Electricity Production Company
- Contractor:** Besix / Orascom Construction Industries
- Designer:** Power Generation Engineering & Services Co
- Year:** 2012
- Location:** Egypt

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Sungun Copper Refinery, Iran

mateenbar™ non-conductive reinforcement used in the structure of the copper smelter to improve operating efficiency by reducing electrical loss due to electrical induction

Client: National Iranian Copper Industries

Contractor: Mohde Omide Arian Co.

Location: Iran



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Sydney Harbour Ferry, Australia

To protect against corrosion issues from the corrosive salt water environment, **mateenbar™** was chosen as the reinforcement of choice in three Sydney Harbour Ferry station upgrade projects.

- Meadowbank Wharf
- McMahons Point Wharf
- Rhodes Wharf

Client: New South Wales Government

Consultant: Royal HaskoningDHV

Contractor: Hansen Yunken

Location: Sydney, Australia



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Sydney Northside Tunnel, Australia

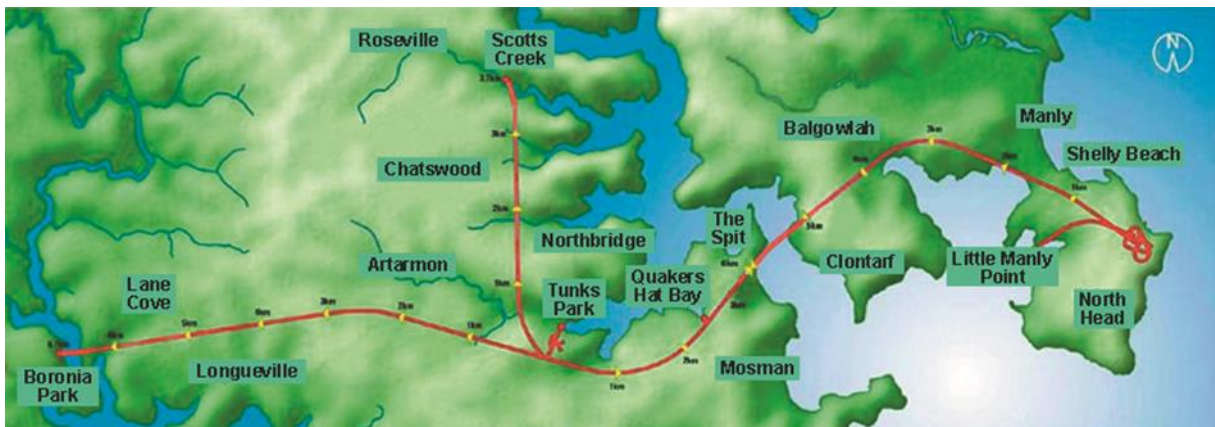
mateenbolt™ used as non-corrosive strata support in the storm water tunnel to ensure safe operations for over 60 years.

Stainless steel life-span not sufficient due to the corrosive nature of chemicals present.

20km long tunnel from Lane Cove to North Head.



- Client:** Sydney Water
- Consultant:** Connel Wagner
- Contractor:** MWH, Transfield
- Location:** Sydney, Australia



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Toko Toru Tapu, Gisborne, New Zealand

The Toko Toru Tapu church in Manutuke, Gisborne, is one of the most important Maori churches in New Zealand and has a rich history from the involvement of Rev. W. Williams and renowned artist Rukupo.

With the current fourth church dedicated in 1913, built from brick and mortar, time has taken its toll. A complete restoration was required. mateenbar™ manufactured by local Gisborne company, Pultron Composites, was specified for the works of seismic stabilising and crack stitching.

Structural engineer Peter Smith of Spencer Holmes and local architect James Blackburne of Architects 44 considered current solutions and specified mateenbar™, as it met all key properties and ensured a build that will last. Unlike steel that can corrode and cause concrete and masonry to rupture, mateenbar™ is non-corrosive and has a 100yr design life.



The finished restoration of the 4th Toko Toru Tapu church

“An economic product with zero risk of deterioration and can be near surface mounted”

James Blackburne – Architects 44

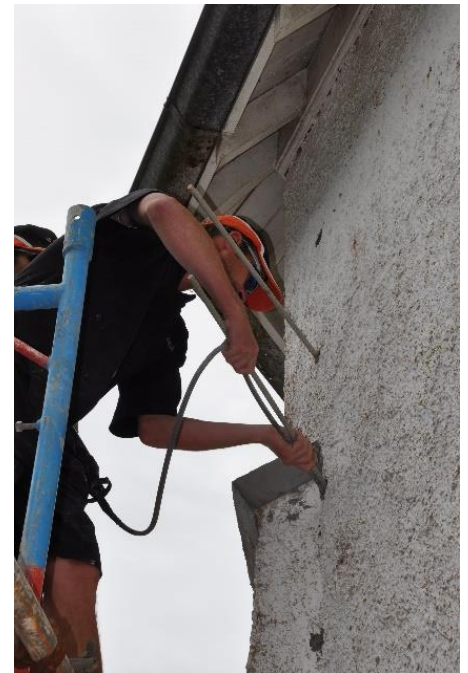
James Blackburne considered all traditional options but specified mateenbar™ “because it was best for the job”. All the key requirements lined up and, being locally manufactured, mateenbar™ was a perfect solution.

Peter Smith commented, “mateenbar™ was the best choice as it doesn’t corrode.” This will ensure that the restoration work is one that will last, unlike black steel that will rust out in the porous, alkaline conditions of the masonry.

City Construction enjoyed working with mateenbar™ and said “it’s lightweight and easy to cut”.

The use of mateenbar™ will see that the Toko Toru Tapu church stays standing for many generations to come and everyone can enjoy the rich heritage of a key historical place of New Zealand.

mateenbar™ being injected into the walls for seismic stabilising



Client:	Manutuke Church Trust
Consultant:	Architects 44 & Spencer Holmes
Contractor:	City Construction
Year:	2011
Location:	Gisborne, New Zealand

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YAS Island Formula 1 Track, UAE

Non-corrosion **mateenbar™** reinforces the foundation for generations to come.

Non-electro conductive properties guaranteed that the precision timing required at the finish line for the speed of the Formula 1 cars would not be impeded.



Client: Abu Dhabi Motorsports
Consultant: Tilke/ Forty Two
Contractor: Al Naboodah
Location: UAE

