

WINN & COALES INTERNATIONAL LTD

Denso Digest



Volume 35 - Number 1

Bridge timber piles protected with the SeaShield 500™ System, Yellowstone Park, USA - See story pages 8-9.

QUALITY & INNOVATION FROM 1883 INTO THE 21st CENTURY



WINN & COALES INTERNATIONAL LTD

For further information on our products and their suitability for your particular project, please contact any of the Denso companies listed below:

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Fax: +44 (0) 20 8761 2456

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Website: www.denso.net



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United States of America

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LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

Denso Protection for New Tensioning Cables in Water Dam Upgrade

A project to increase Hazelmere Dam's water capacity from 17 to 37 million cubic metres was recently undertaken by contractors Group Five for customer DWAF.

The extra 20 million cubic metres of water capacity was to be achieved by raising the existing dam wall by 3 metres.

The design called for the insertion of vertical tensioning cables to restrain the new raised wall and Denso Void Filler was

The new extended dam wall under construction.

chosen to protect the cables.

Denso Void Filler (also known as the Denso Steelcoat 50 System) was pumped into the cavity between the steel cable and cable duct to completely encapsulate the cables.

By completely excluding air and

For quick identification of the relevant product type used in each story we have used the following colour codes:	
Protective coatings for.....	
	BURIED PIPELINES & LPG VESSELS
	EXPOSED STEEL & PIPEWORK
	SUB SEA PIPELINES & JETTY PILES
Protective linings for.....	
	STORAGE TANKS, PUMPS ETC
Sealing & waterproofing.....	
	SEALING MASTICS
	MEMBRANES & FLASHINGS
	INDUSTRIAL TAPES

water the risk of corrosion is eliminated and the condition of the cables can be easily monitored when required.



Project Summary

Product type:
Coatings for Exposed Steel

Country: South Africa

Object: Tensioning Cables

Problem: Corrosion prevention

Product

solution: Denso Void-Filler™



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

Two Corrosion Prevention Solutions Provided with One Denso System

Denso has established itself as a well-respected solutions provider for corrosion related problems as well as issues where sealing technologies are needed. Recently, a project in Hamilton, Ontario Canada, faced both of the above and required a solution.

The busy Hamilton Harbour.

Long since established as an economic hub in Ontario, Hamilton has a history of heavy manufacturing from steel to Studebakers to having the first ever Tim Horton's donut shop.

Due to heavy industry and redevelopment goals however, some of the waterfront needed environmental remediation and construction.

The Hamilton Harbour project has been ongoing and in the process of remediation and redevelopment, a section of the harbour was dredged and two piers designed for construction.

During this process sheet piling was used with anchor rods and wale bolts to secure the structure. A problem arose when holes in the piles where the anchor rods passed were allowing uncontrolled water egress.

This problem was exacerbated by the fact that corrosion of the holes was active and allowing water to escape at a growing pace causing environmental concerns.

To address the issue of water exfiltration and corrosion prevention, Denso suggested and supplied three components. First, the failing caulking and rigid foam was removed and the surface cleaned with a wire brush. Then, Densyl Mastic™ was chosen to fill the cavity because of the product's rigidity and ability to maintain its form even under significant pressure. Then, the rod, mastic and a section of the sheet wall around the orifice were covered with Denso Hi-Tack Primer™.

Project Summary

Product type:

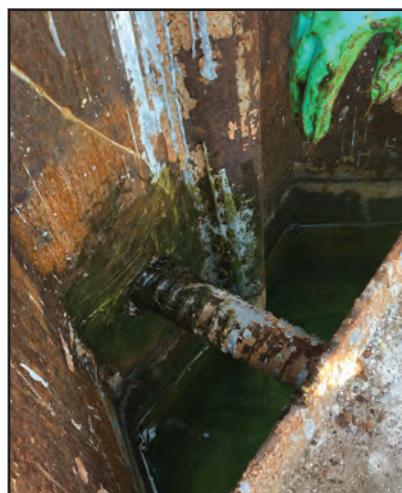
Coatings for Buried Steel

Country: Canada

Object: Sheet piling

Problem: Corrosion prevention

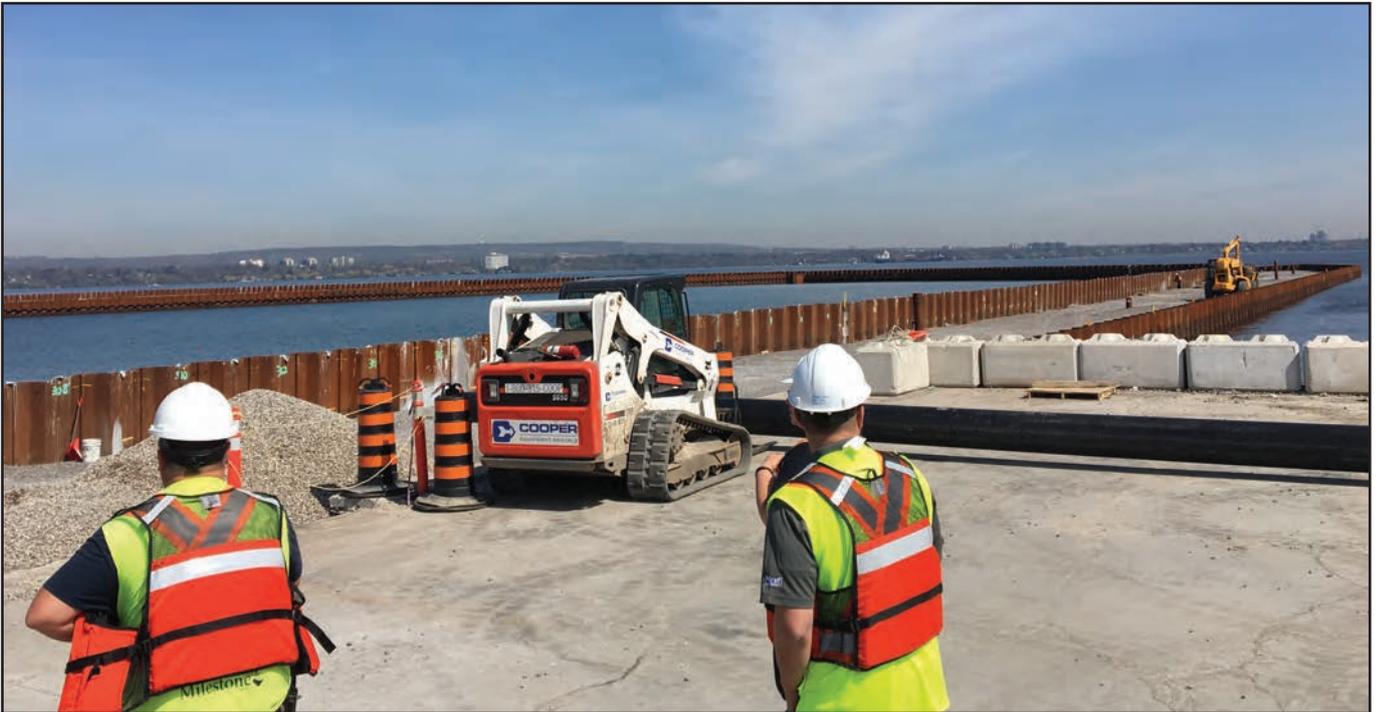
Product solution: Denso Hi-Tack Tape™ and Densyl Mastic™



One of the anchor rods passing through the sheet piling.



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY



The installation of the sheet piling.

This provided additional corrosion inhibition by blocking contact of the substrate with any moisture as well as ensuring long-term adhesion of the tape. Finally, Denso Hi-Tack Petrolatum Tape™ was applied, weatherboard style, onto the rod, over the Densyl Mastic™ and onto the sheet pile.

This system will stand up against the pressure of water and later, endure the installation of backfill during the pier construction process. Additionally, it will prevent corrosion of the steel and expansion of the rod hole and protect the rods and wale bolts for the life of the piers.



Above: First Densyl Mastic™ is used to seal around the hole where the anchor rod passes through the sheet piling. Then a coating of Denso Hi-tack Primer™ is followed by a weatherboard style application of Denso Hi-Tack Tape™ completing the application.



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

Denso Protection for Cooling Tower Pipework

In India, Bosch is a leading supplier of technology and services in the areas of Mobility Solutions, Industrial Technology, Consumer Goods, Energy and Building Technology.

Additionally, Bosch has its largest development center in India outside Germany, for end to end engineering and technology solutions. The Group operates through twelve companies and originally set-up its manufacturing operation in 1951. The Group's operation has grown over the years to include eighteen manufacturing sites, and seven development and application centres.



Pictures: New cooling tower pipework protected with the Denso system.



Project Summary

Product type:
Coatings for Exposed Steel

Country: India

Object: Cooling tower pipes

Problem: Corrosion prevention

Product: Denso Petrolatum

solution: Tape System™



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

Recently, due to severe corrosion of cooling tower pipework at one of Bosch's sites, they decided to dismantle the pipes and install new ones. They didn't want to have corrosion issues with the new pipework and were looking for a better solution than the FRP systems that were used on the original pipes.

After discussions with Denso they chose the Denso Petrolatum Tape System™ taking



Above: Close up of protected valve.

into consideration the ease of application, flexibility of the system and also the large number of successful case histories Denso have collected over the years in similar situations.

After the installation of the Denso System on the new pipework by contractor BBR, Bosch now want to use Denso systems for other structures as well.

Below: More associated pipework also protected with the Denso system.

The Denso Petrolatum Tape System comprises a primer coat of Denso Paste™, then Denso Mastic™ to fill any voids for a smooth profile followed by a wrap of Densyl Tape™





LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

SeaShield™ System Protects Historic Yellowstone Bridge

The historic Fishing Bridge was built in 1937 in the heart of Yellowstone National Park, Wyoming. It was once an attraction for fishermen from all over the country due to the abundance of cutthroat trout. It is now one of the featured attractions for hundreds of thousands of Yellowstone Park tourists on an annual basis.

The structure is supported by 162 x 15" timber piles that, over the years, were beginning to see deterioration from water line to mud line. The SeaShield Series 500™ System was selected as the system for the complete encapsulation of all 162 piles using 17" dia. SeaShield Fiber-Form™ jackets that yielded a minimum ½" annular space. The jackets were constructed 3/16" thick and in a special brown color to closely match the existing piles. The annulus was then pumped full with the SeaShield 550 Epoxy Grout™. The epoxy grout kits consisted of 3 gallons of 2-part epoxy and 2.5 x 50 lb. bags of Part C Aggregate yielding 1.2 cu ft per kit.

Project Summary

Product type:
Sub Sea Splash Zone Coating

Country: USA

Object: Bridge timber piles

Problem: Pile deterioration

Product

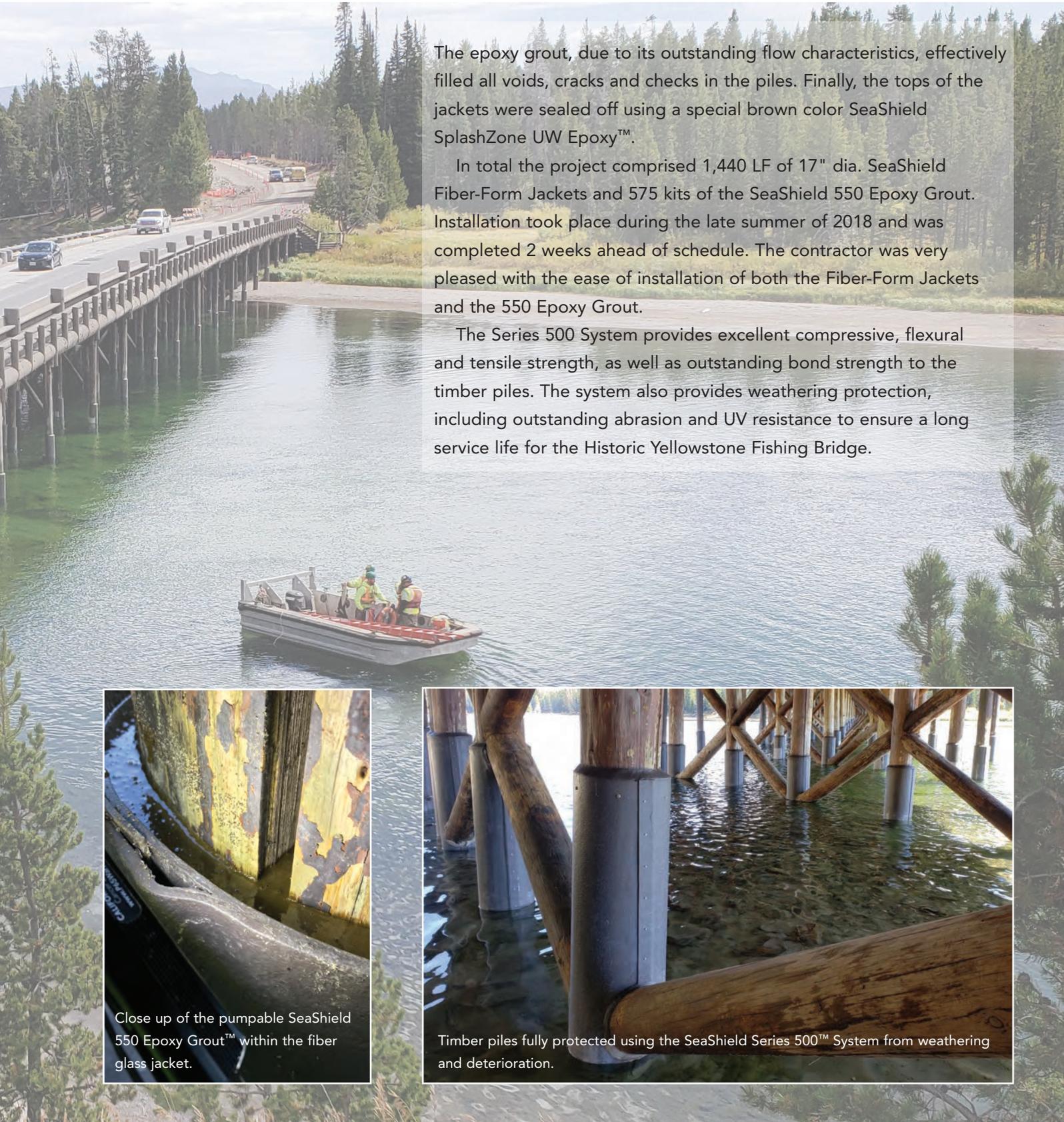
solution: SeaShield Series 500™



Contractor preparing deteriorated timber piles for the installation of Denso's SeaShield Series 500™ Fiber Glass Jacket System.



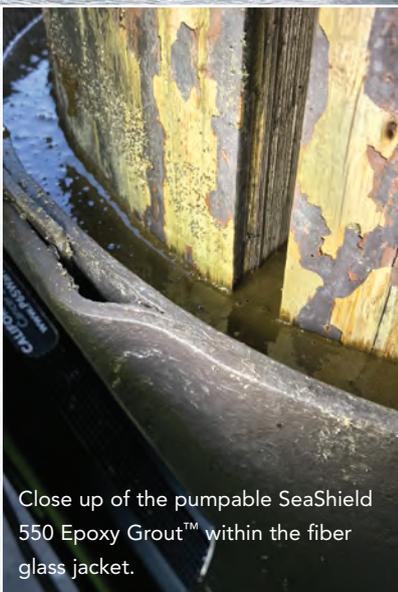
LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY



The epoxy grout, due to its outstanding flow characteristics, effectively filled all voids, cracks and checks in the piles. Finally, the tops of the jackets were sealed off using a special brown color SeaShield SplashZone UW Epoxy™.

In total the project comprised 1,440 LF of 17" dia. SeaShield Fiber-Form Jackets and 575 kits of the SeaShield 550 Epoxy Grout. Installation took place during the late summer of 2018 and was completed 2 weeks ahead of schedule. The contractor was very pleased with the ease of installation of both the Fiber-Form Jackets and the 550 Epoxy Grout.

The Series 500 System provides excellent compressive, flexural and tensile strength, as well as outstanding bond strength to the timber piles. The system also provides weathering protection, including outstanding abrasion and UV resistance to ensure a long service life for the Historic Yellowstone Fishing Bridge.



Close up of the pumpable SeaShield 550 Epoxy Grout™ within the fiber glass jacket.



Timber piles fully protected using the SeaShield Series 500™ System from weathering and deterioration.



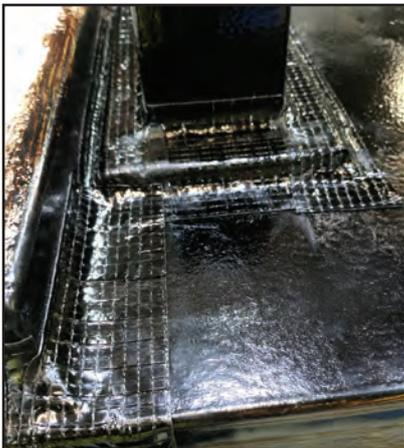
LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

Denso Steelcoat™ Protects Radial Stacker Box Beam

Dampier Salt (DSL) approached Denso Australia late in 2017 for a long term solution to protect a fabricated box beam that will be installed in a high salt spillage area on a radial stacker. This is a highly corrosive area that was determined to require a higher level of surface protection than a typical blast and paint solution.

The Denso Steelcoat 400™ System was specified to extend the life of the beam due to its ability to exclude the environment from the underlying steel beam.

Dampier Salt (DSL) has three Salt operations in Western Australia located at Dampier, Port Hedland and Lake Mcleod. Salt production is achieved by pumping seawater through progressive ponds resulting in concentration via evaporation.



Denso Conforming Tape™ used for profiling complex shapes.

The salt is harvested and then transported to the wash plant by 180 tonne, bottom dump trucks.

Thereafter, the salt is washed to remove insoluble materials and fed onto a static screen where brine and seawater sprays remove the residual liquor that surrounds the salt crystals. The product salt is then fed onto a radial stacker, which moves through an arc of 180 degrees to form a stockpile with storage capacity of over 750 000 tonnes.



The completed box beam protected by the Denso Steelcoat 400™ System.

Project Summary

Product type:
Coatings for Exposed Steel

Country: Australia
Object: Box beam
Problem: Corrosion prevention
Product solution: Denso Steelcoat 400™ System

The Denso Ultraseal Tape™ application



The Denso Steelcoat 400 System:

- Denso Primer D™
- Denso Conforming Tape™
- Denso Ultraseal Tape™
- Denso Acrylic Topcoat™

STEELCOAT™



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

Protal™ Used As Field Joint Coating for Gas Pipeline

In 2018, APA Group awarded Nacap Australia the construction of a 198km gas pipeline running from the Eastern Goldfields Pipeline to the Gruyere Gold Mine Site in the eastern Yilgarn to fuel the Yamarna Power Station.

Nacap elected to use Protal 7200™ for all Field Joint Coating (FJC) initially adopting specially sized 800ml manual kits for the 6" FJ. The material was supplied over 2 deliveries in Denso's 40' refrigerated container with the kits being applied by brush and roller.

Due to time constraints with manual application, spray application of bulk 800 litre kits was introduced in conjunction with the manual application

where an additional 5 x 800 litre bulk material was supplied midway



The installation of the new gas pipeline underway.



Application of Denso Protal 7200™ to a gas pipeline field joint.

Project Summary

Product type:

Coatings for Buried Steel

Country: Australia

Object: Pipeline field joints

Problem: Corrosion prevention

Product

solution: Denso Protal 7200™

through the project.

The Manual Spray application was applied through a Graco XP70 pump at a 3:1 mix ratio and applied between 1,000 and 2,000 microns in thickness. The project saw the delivery and application of over 14,000 litres of Protal 7200™ supplied in manual and bulk 800 litre kits delivered and applied on site.

The successful construction of the pipeline was completed on time in June 2018 seeing 198 km of pipeline constructed within 4 months from mobilisation.



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

Densostrip™ Used On Refurbished Ross Fountain

As part of a recently completed £1.5million project to refurbish the historic Ross Fountain in Edinburgh, Winn & Coales (Denso) Ltd supplied Densostrip™ and Densostrip Primer™ to provide a permanently watertight seal between precast concrete units.

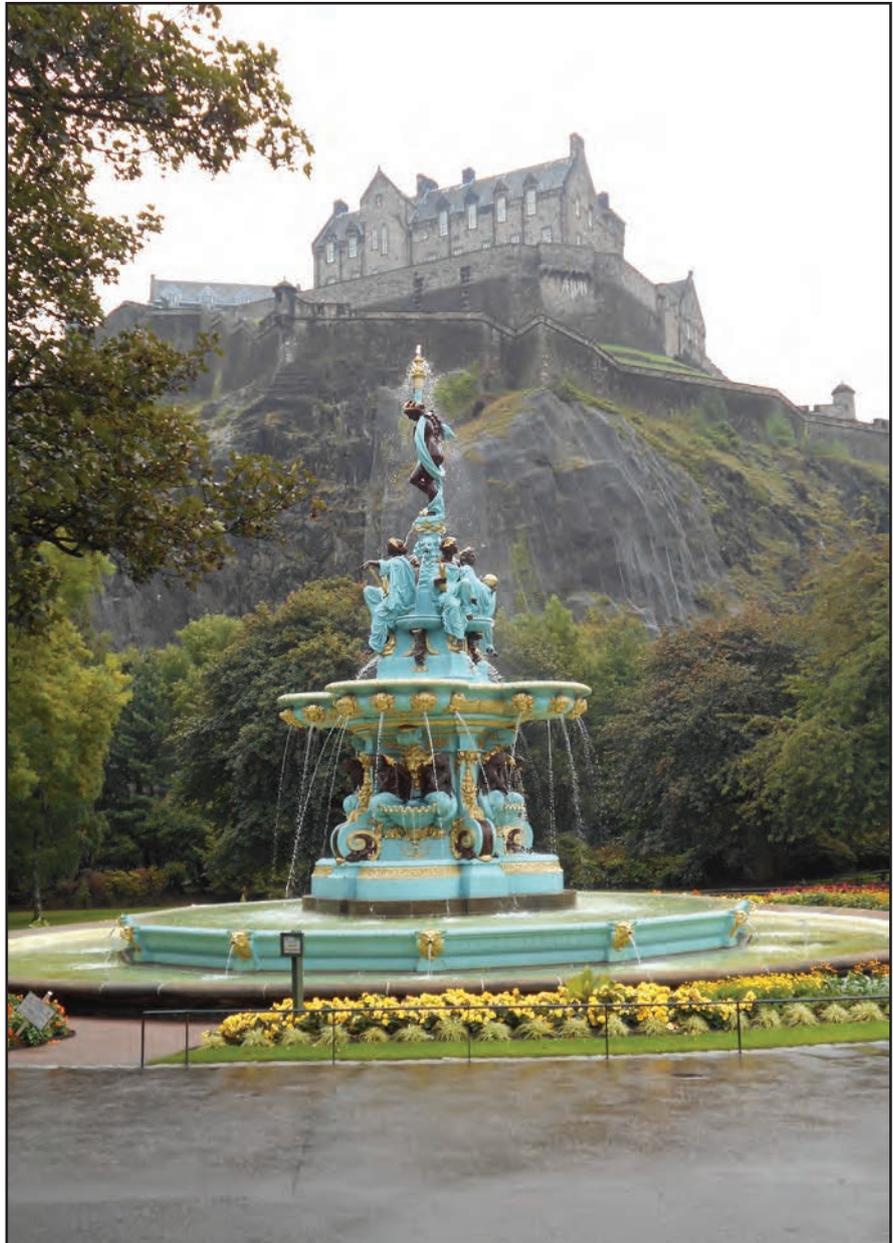
These precast units form the trenches which house the underground supply of services to the fountain and were both supplied and installed by Creagh Concrete Products.

The year-long restoration project on the new foundations and waterworks (under the Ross Development Trust) now enables the fountain to operate for the first time in years. Industrial Heritage Consulting Ltd were the project managers on the fountain conservation works.



Densostrip™ was used to seal the joints of the precast concrete unit trenches that carry services to the fountain.

The historic Ross Fountain.



Project Summary

Product type:
Sealing Mastic

Country: Scotland

Object: Precast concrete units

Problem: Sealing

Product solution: Densostrip Primer™ and Densostrip™



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY

SeaShield™ Protection at Falmouth Fuel Piers

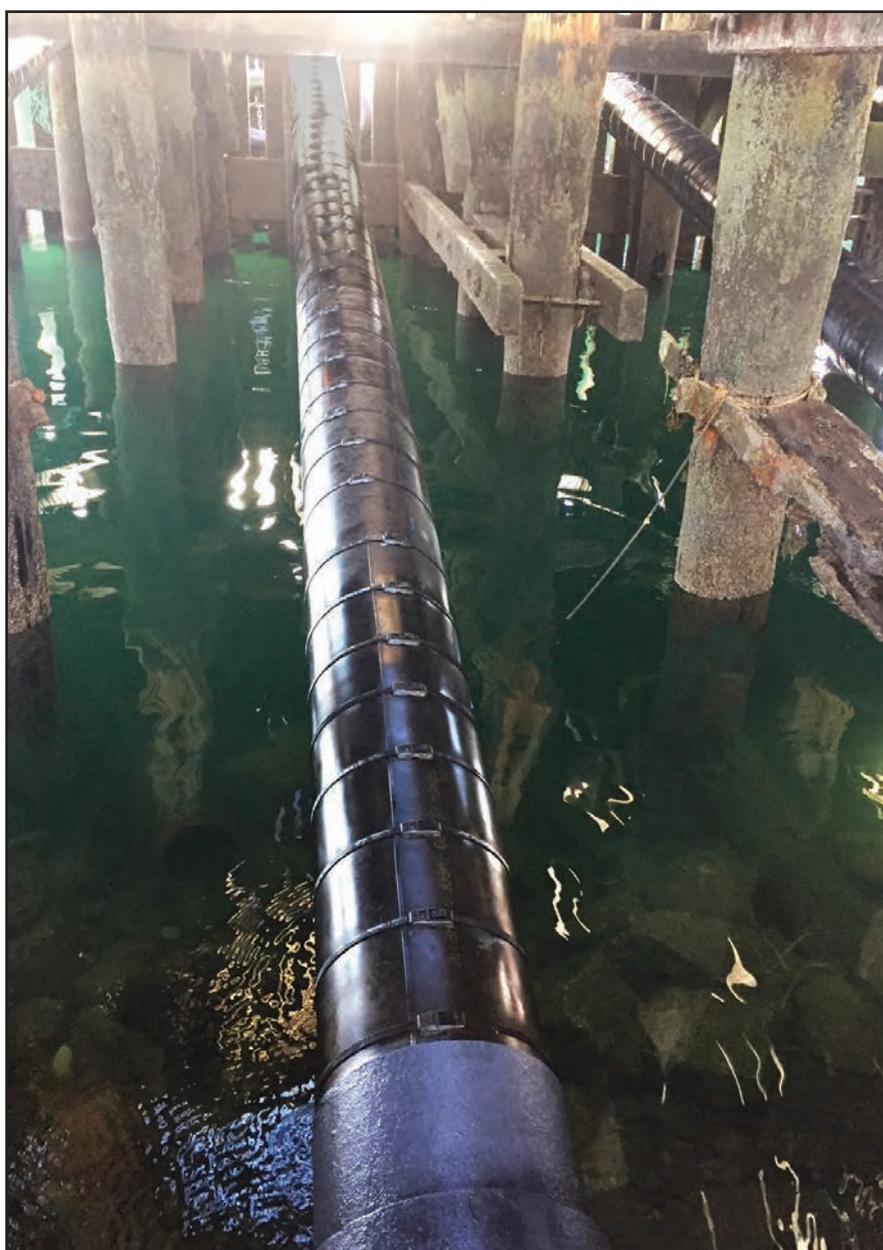
World Fuel Services Europe Ltd has recently installed Winn & Coales (Denso) Ltd's SeaShield™ systems to protect both of their fuel piers, which are also part of the Eastern Breakwater project at Falmouth.

Sixteen support pipes on the old pier have been protected with SeaShield 100™ and nine SeaShield 2000 FD™ jackets have been applied on the new pier. The materials were applied on both piers using rope access.

SeaShield systems provide long-term corrosion control for steel, concrete and timber structures in the splash and intertidal zones. They accommodate piles (such as at Falmouth) with cylindrical, hexagonal, square and H cross sections.



One of the jetty piles on the new pier protected with SeaShield 2000 FD™.



Pipes under the old pier protected with SeaShield 100™.

Project Summary

Product type:
Sub Sea Splash Zone Coating

Country: United Kingdom

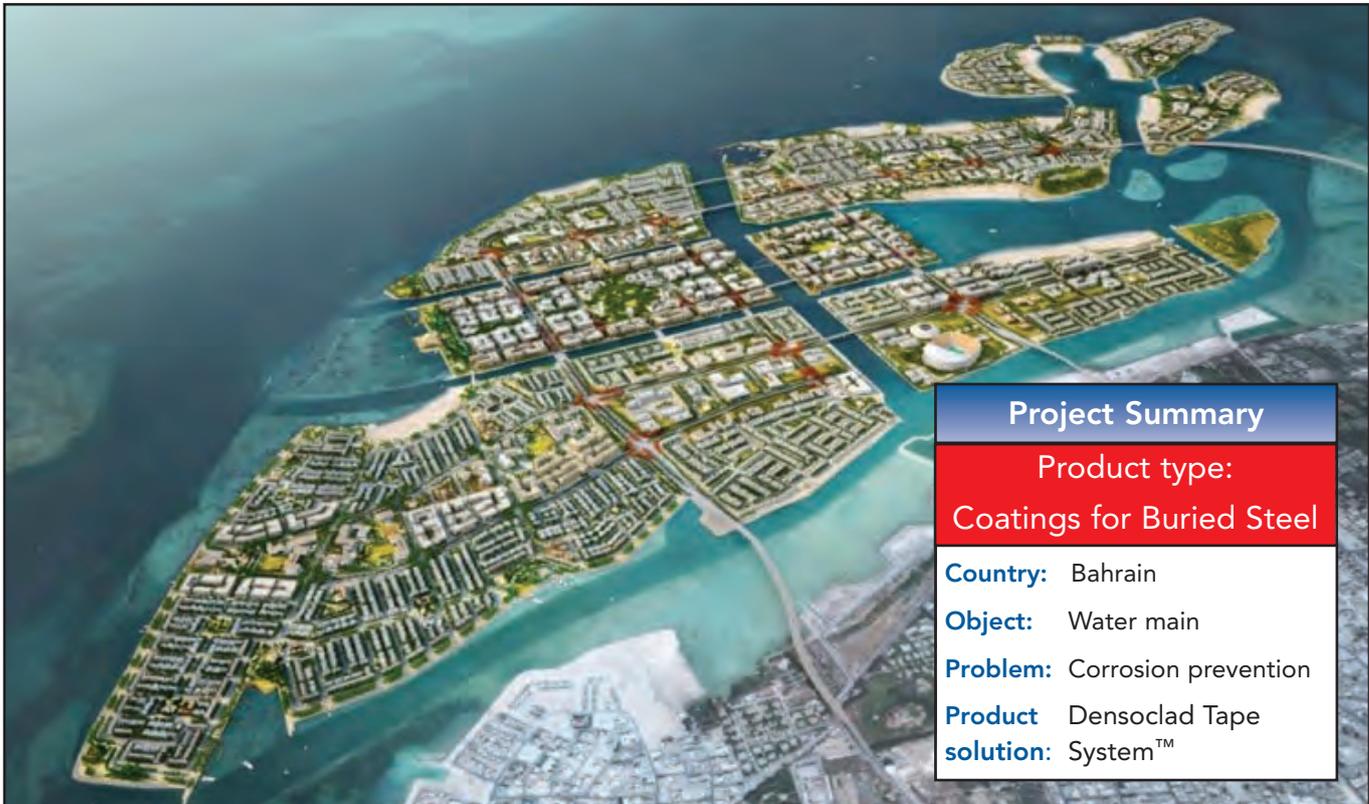
Object: Support Piles & Pipes

Problem: Corrosion prevention

Product solution: SeaShield 100™ and SeaShield 2000 FD™



LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY



Project Summary

Product type:
Coatings for Buried Steel

Country: Bahrain
Object: Water main
Problem: Corrosion prevention
Product solution: Densoclad Tape System™

The Madinet Salman islands development.

Denso Protects Water Pipeline in Madinat Salman Bahrain Project

AECOM has been engaged by the Ministry of Housing to provide the masterplanning, detailed design and cost management services for a project in the Kingdom of Bahrain. Madinat Salman (previously known as Al Madina Al Shamaliya), is a group of 10 reclaimed islands situated on the northern coastline of the Kingdom of Bahrain. The islands are located within a twenty-minute drive of Manama city and a ten minute drive from the Seef District.

Designed primarily as a residential development, it will also boast a mix of lifestyle, commercial and retail outlets to

support the community. The overall site covers approximately 750 hectares. Al Madina Al Shamaliya will provide a total of





LEADERS IN CORROSION PREVENTION & SEALING TECHNOLOGY



The pipe lengths were wrapped prior to installation.



15,519 dwelling units with the capacity to support a total residential population of 98,935 people.

A Densoclad™ Tape system was chosen to protect the buried ductile iron water main that serves the new development and all of the pipe lengths were pre-wrapped above ground prior to their installation.

The Densoclad Tape system comprises a coat of Denso Primer D™, followed by Densyl Mastic™ to create a smooth profile over joints etc. Finally a wrap of Densoclad 55HT™ was applied to the pipe lengths with a 55% overlap forming a double layer wrap.

If you would like more information about our long-term corrosion prevention and sealing systems that deal with the problem areas listed below, simply tick the boxes and email back this completed page and we will supply you with more information.

BURIED ONSHORE COATINGS

- External corrosion prevention for underground pipelines, welded joints, valves and fittings.
- Protection of mounded LPG vessels and fuel tanks.

EXPOSED SURFACE COATINGS

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- Corrosion prevention for metal roof purlins and metal roof sheets.
- Protecting pre-stressing and post tensioning bridge cables and ground anchorages.

SUB SEA/SPLASH ZONE COATINGS

- Maintenance corrosion protection for steel jetty piles.
- Subsea pipelines and outfalls.
- Protection of timber and concrete piling.

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- External abrasive wear protection.

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- Joint sealing for airport runways.
- Sealing of cable entry ducts.

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- Protecting and bonding.

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