TRENCHLESSWORKS

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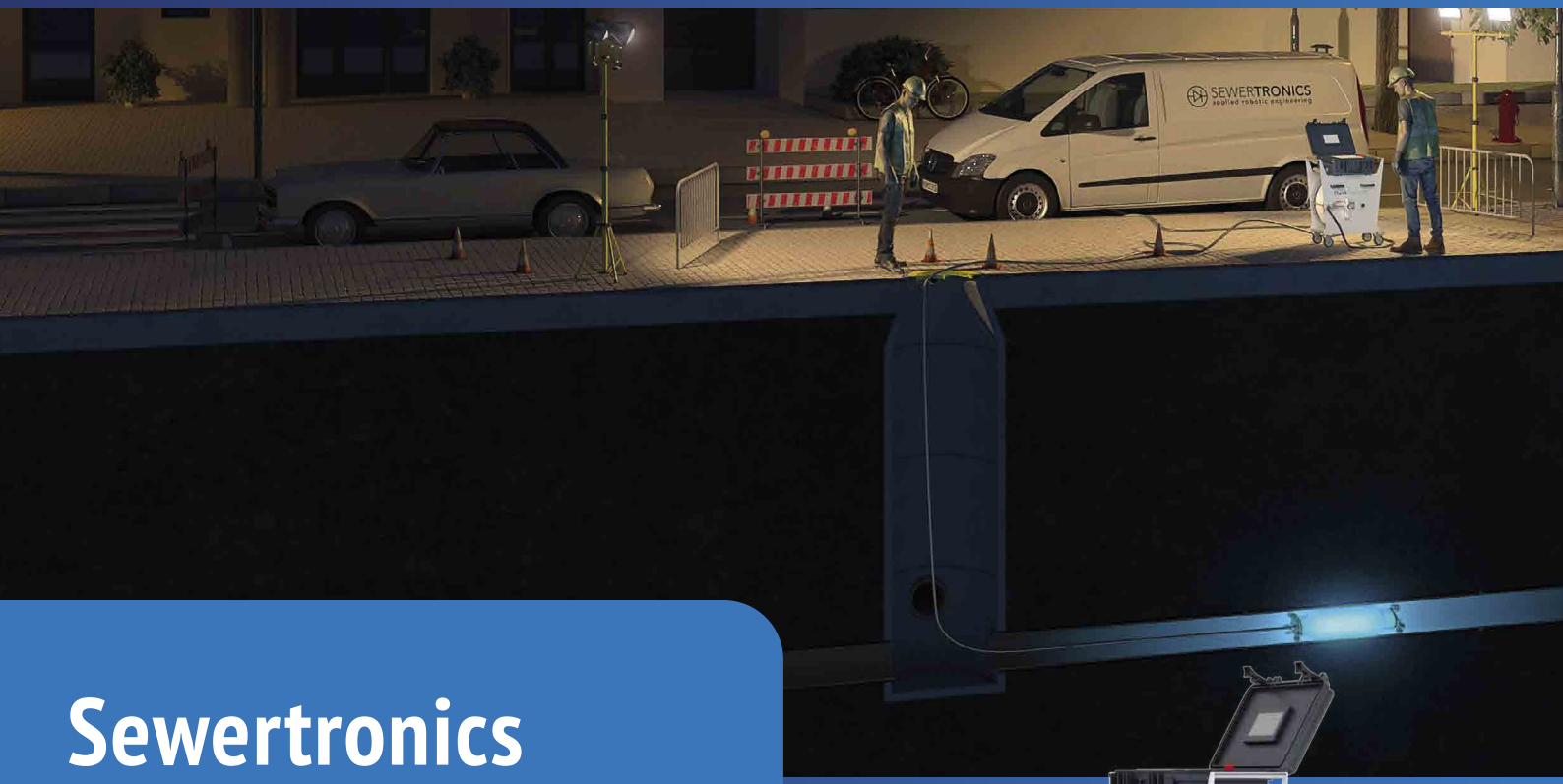

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CONTENTS

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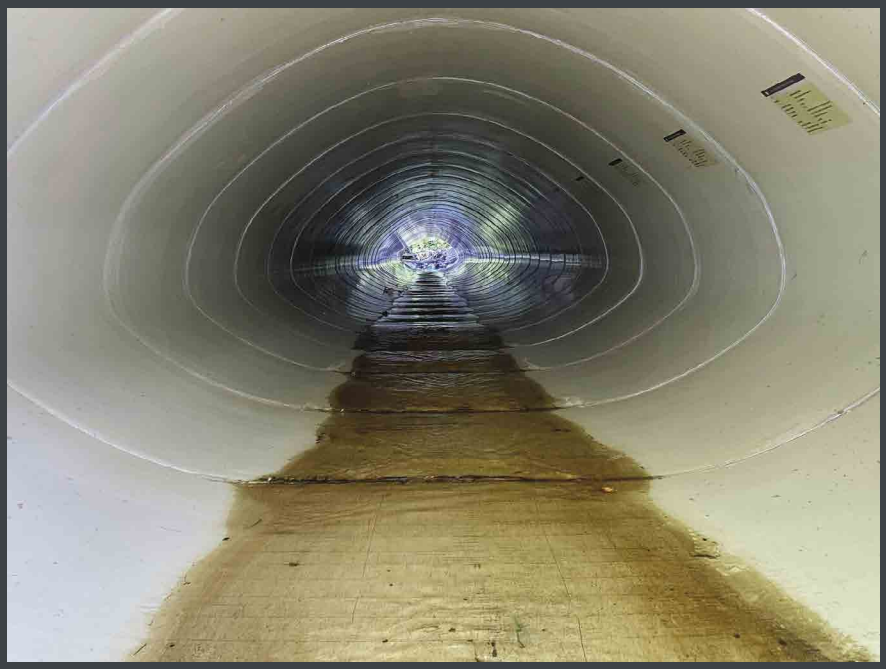
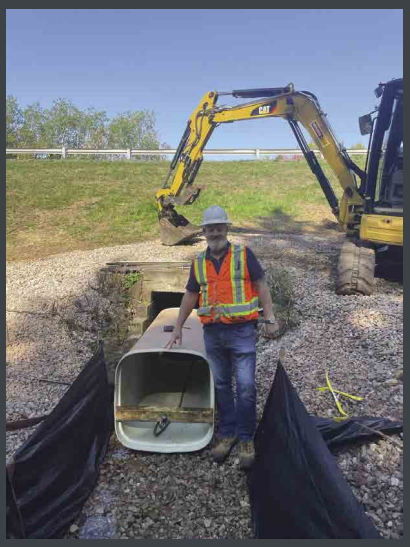
GRP Structural Lining Systems





Beyond the Ordinary

Large diameter pipelines and culverts represent the backbone of any city's utility network for the collection and disposal of sewerage and effective drainage of stormwater. The need arises to consider the means by which the structural rehabilitation of these pipelines and ducts can be achieved whereby a new, 100-years plus life expectancy can be provided with a high degree of confidence. Channeline international has been providing bespoke Structural Glass Reinforced Plastic (GRP / FRP) lining systems since the early 1980's, during which time we have accumulated unrivaled engineering and manufacturing experience for both Circular and Non-circular buried infrastructure worldwide. **At Channeline, we are proud of our heritage and are committed to offering economic custom solutions to our existing and future customers in the Storm and Wastewater Sectors.**

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CHANNELINE
Beyond the Ordinary

ANY SHAPE – ANY SIZE

SPOTLIGHT

Ian Clarke, Editor-In-Chief, Trenchless Works

"Thank you to all those that have supported the new look magazine over the course of its first year."

Hello all!

Well, here we are issue 12 of the new design and a year that many of us would sooner forget given the events of the past 18 months.

This is just to wish you all a Merry Christmas/Happy Holidays and to thank all those that have supported the new look magazine over the course of its first year, alongside the new website and Trenchless TV outlets with editorial and of course advertising, without which we would not be able to bring these productions to you.

It is also a gentle reminder that we will always consider your latest project reports, product releases and industry news for future issues. Just be sure to get your copy and pictures in before the 12th of the month so we can get you into the next issue.

On a personal note, I would like to thank the team at Westrade that has worked so hard to make this happen. Without some long hours and much dedication to the publishing process our magazines, the website and the TV shorts would never have made it to you our readers and watchers.

Here is looking forward to a better 2022 for us all in the hope that the dreaded Covid virus is at last showing signs of becoming something a little milder than its predecessors.

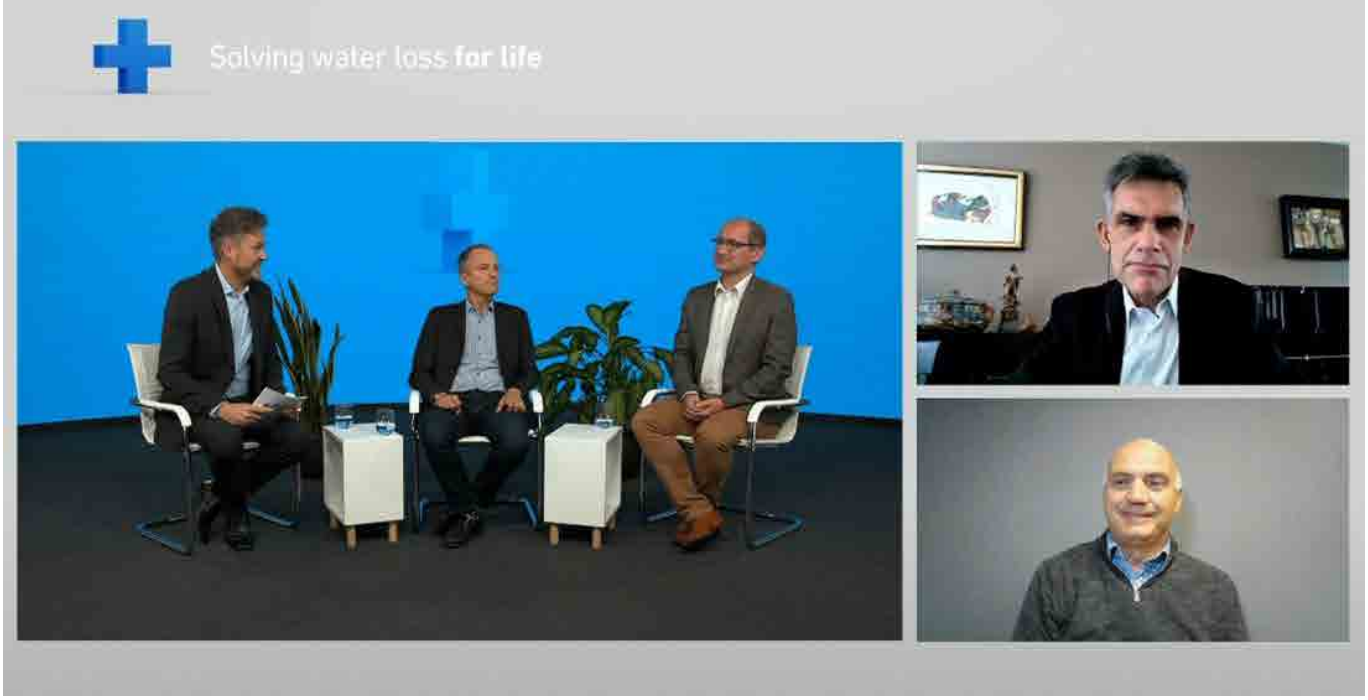
See you all in the New Year

My best wishes for 2022

Ian

HOW ARE EXPERTS USING INNOVATIVE TECHNOLOGY TO SOLVE WATER LOSS?

Episode two of the "Solving water loss for life" webcast series by GF Piping Systems will go live on 20 December 2021. >



Water experts agree that intelligent, simple, and cost-effective technical solutions help win the fight against water loss. But what are these solutions and how can utilities implement them? Episode two of the "Solving Water Loss for Life" webcast series presented by GF Piping Systems and moderated by Andrew Walker will answer these questions. The episode will air on 20 December 2021 and is streamed for free. >

"Episode two will focus on concrete technical solutions that utilities can implement in their water networks. In addition to introducing the cutting-edge pressure management technologies currently available, guests will present reference cases to demonstrate innovative applications of intelligent pressure management and digitalised water networks that will help utilities improve on water loss."

In episode one of the new series, a panel of water experts from across the sector discussed the effects of water losses on utilities worldwide. Collectively, the experts concluded that a two-part approach is needed to beat non-revenue water. Firstly, utilities must address commercial challenges that contribute to water loss by improving governance and management within their organisations, and secondly, manufacturers must offer effective technical solutions that address physical water losses.

Episode two will focus on concrete technical solutions that utilities can implement in their water networks. In addition to introducing the cutting-edge pressure management technologies currently available, guests will present reference cases to demonstrate innovative applications of intelligent pressure management and digitalised water networks that will help utilities improve on water loss.

Guest speakers of episode two in the "Solving Water Loss for Life" webcast series include:

- Jurica Kovac: International Water Association Fellow and Director at Aqua Libera Ltd
- Dragan Savic FREng: Chief Executive Officer, KWR Water Research Institute (Netherlands) and Professor of Hydroinformatics, University of Exeter (UK)
- Chris Evans: Chief Operations Officer at Detection Services, Australia
- Vangelis Balokas: Technical Director Olympios S.A., Greece
- Victor Pinedo: Senior Business Development Manager Utility at GF Piping Systems

Sign up today to learn more about how GF Piping Systems is solving water loss for life, and to view the first episode in the webcast series on November 30:

https://www.gfps.com/solvingwaterlossseries

NEW MANAGING DIRECTOR FOR INTERFLOW

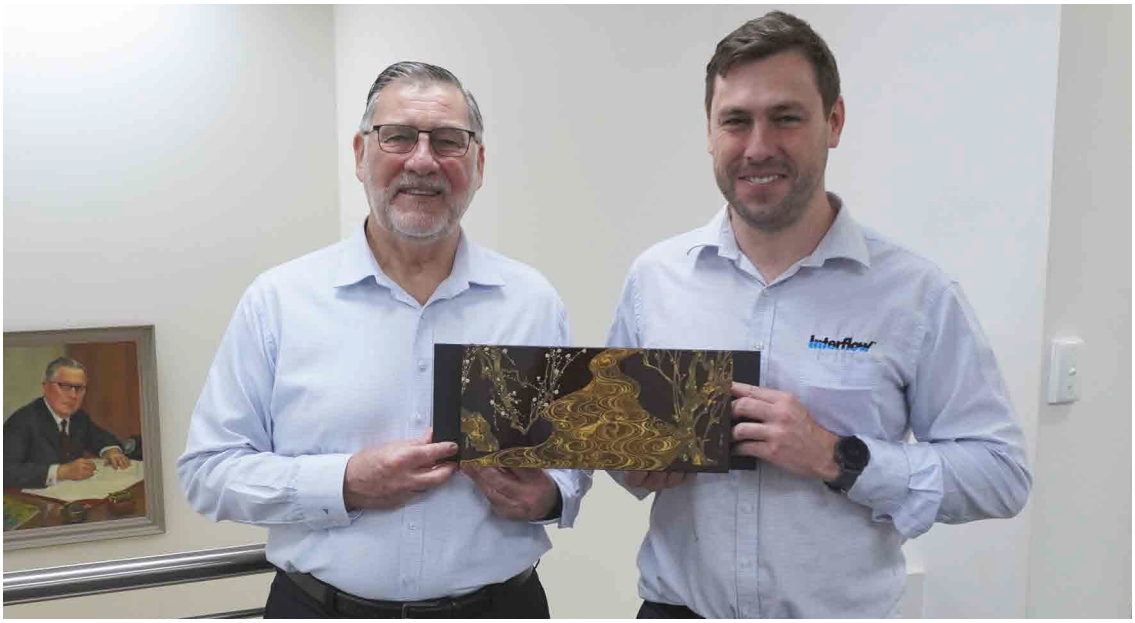
Daniel Weaver.

Leading pipeline infrastructure company, Interflow, has announced the appointment of Daniel Weaver as its new Managing Director. He will assume responsibilities on 1 January 2022, succeeding his father, Geoff Weaver, and is proud to continue the tradition of this now fourth generation family-owned business.

This announcement was made to Interflow's employees on the organisation's 85th Anniversary, which was celebrated on 11 November. Coinciding with the launch of the company's new strategic framework, 'Our Interflow', this leadership transition signifies the start of an exciting new chapter for the organisation.

A fourth generation-led

Daniel Weaver has been part of the Interflow team since 2003. During the early years, he worked in many areas of the company, moving between departments to gain a comprehensive understanding of how the business functioned. >



Geoff and Daniel Weaver.

"Under my leadership, and with the support of Geoff and the leadership team, Interflow's people, and our network of valued customers and suppliers, we will deliver Interflow's vision to be the leading provider of pipeline infrastructure solutions in Australia and New Zealand."

In 2019, Daniel was appointed Chief Operating Officer, with responsibility for all regional operations and customer delivery.

Interflow's current Managing Director, Geoff Weaver, will retain the role of Chairman of the Board, and will support and guide Daniel through this leadership transition.

Geoff has been with Interflow for 45 years, 30 of which as Managing Director. He shares what this next phase of the company's journey will mean for its people, customers, and community. "Each generation of leadership has contributed something unique to the business that has helped shape its success." he said. "Daniel's legacy will be underpinned by the company's new strategic framework, 'Our Interflow', which carries forward Interflow's rich history of innovation whilst laying out new goals for growth and development."

Daniel shares his ambition and excitement to guide Interflow into the next chapter of its growth. "I am honoured and grateful to assume the position of Managing Director and continue my great grandfather's legacy," he said. "Under my leadership, and with the support of Geoff and the leadership team, Interflow's people, and our network of valued customers and suppliers, we will deliver Interflow's vision to be the leading provider of pipeline infrastructure solutions in Australia and New Zealand." He added: "We will continue to improve the lives of the people we work with, the communities we serve and the environment we work in, for generations to come."

www.interflow.com.au

SVI WINS WATER DRAGONS HEAT

Steve Vick International (SVI) is delighted to announce that Iain Fisher, Technical Support Engineer, has won the Water Dragons Heat at Networks November.

Six companies took part in the virtual event and had the opportunity to pitch their innovative products to a panel of water sector specialists. Each entrant had 8 minutes to showcase their product followed by questions from the judges.

Iain presented the Steve Vick International Perpetual Pipe Pusher, an excavator attachment used to continuously insert PE from 63 mm (2 in) up to 180 mm (6 in). The Pipe Pusher pushes at speeds of 25 m/min, with typical lengths in excess of 300 m being pushed in at any one time. A key benefit of the Perpetual Pipe Pusher is that it can handle a complete range of PE sizes by means of a simple adjustment to the rollers which accommodate the various pipe diameters.

The competition at Water Dragons was fierce but Iain delivered an excellent presentation and answered some challenging questions which, combined with the innovative product, won the judges over on the day.

Commenting on the judge's outcome, Alastair Moseley, Water Dragon Judge Chair & Future Water Board Member said: "All six of the innovations presented to us today were high quality and all will have a part to play in the future transformation of the water sector. Choosing a winner was therefore extremely challenging but, in the end, it came down to the innovation that the judges felt was really breaking new ground and doing something that has not been available before. Our winner, Steve Vick International Ltd, presented a technology that has the capacity to transform the rehabilitation of water and gas mains."

"Choosing a winner was therefore extremely challenging but, in the end, it came down to the innovation that the judges felt was really breaking new ground and doing something that has not been available before. Our winner, Steve Vick International Ltd, presented a technology that has the capacity to transform the rehabilitation of water and gas mains."

www.stevevick.com

ROGER ATHERTON BOWS OUT AFTER 40 YEARS

Trenchless industry stalwart, Roger Atherton, has hung up his no-dig boots after 4 decades in the sector.

He has witnessed continuous evolution of the technology during that time, the last 31 years of which were with TRACTO UK, inventor of the legendary 'Mole' and one of the early pioneers of directional drilling machinery. As part of the Senior Management team at the company, Roger's roles have included Area Sales positions in the UK and latterly in export sales. Roger Wahl, Managing Director of TRACTO UK paid tribute to his long and successful career saying: "Roger has been a hard-working and dedicated colleague achieving great success during his 30-year tenure with us. We thank him for his vast knowledge and experience and dedication to excellence which has no doubt benefitted the industry as a whole. We are sad to see him retire, but wish him all the best for a long and happy retirement."

2023

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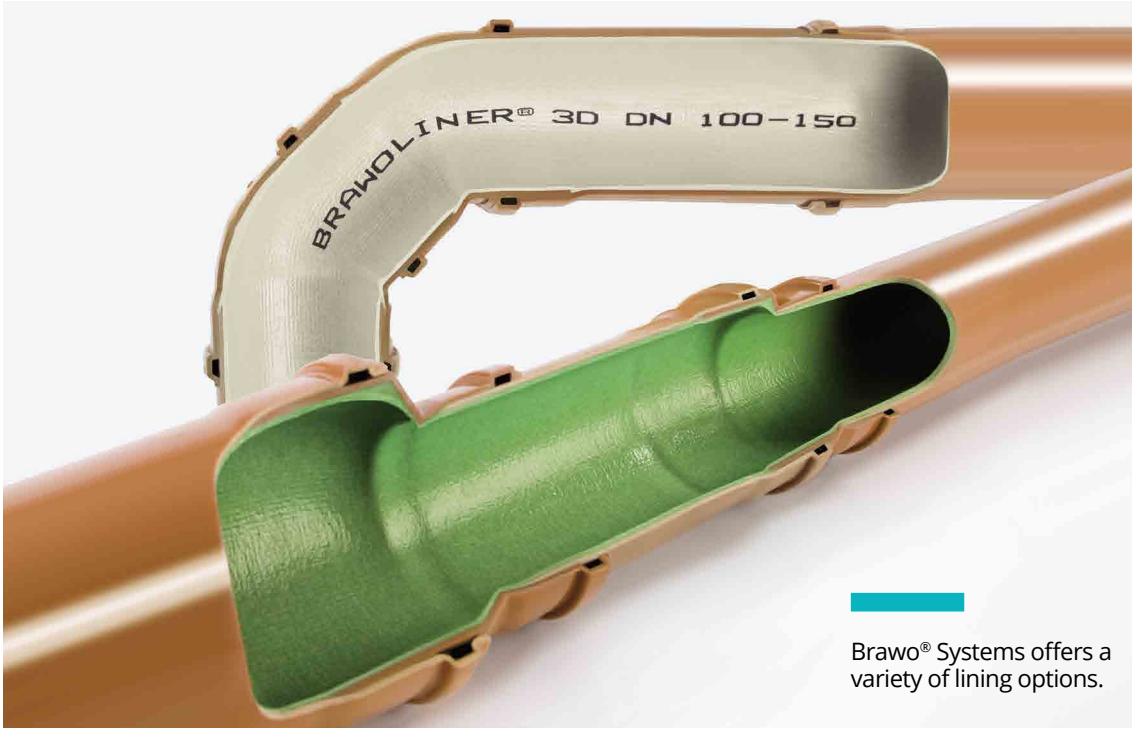
BRAWO® SYSTEMS GROWTH



Brawo® Systems offers a variety of lining options.

The BRAWO® SYSTEMS business unit has been carved out from KOB GmbH and now operates independently as BRAWO SYSTEMS GmbH.

The KOB Group is a leading supplier of medical textiles. In addition to this core business, it has very successfully established the business of trenchless rehabilitation of sewage pipes over the past 20 years. This is known in the market under the name BRAWO® SYSTEMS. The products and application solutions of BRAWO® SYSTEMS allow the rehabilitation of sewage pipes without digging up ground or breaking open ceilings or walls.

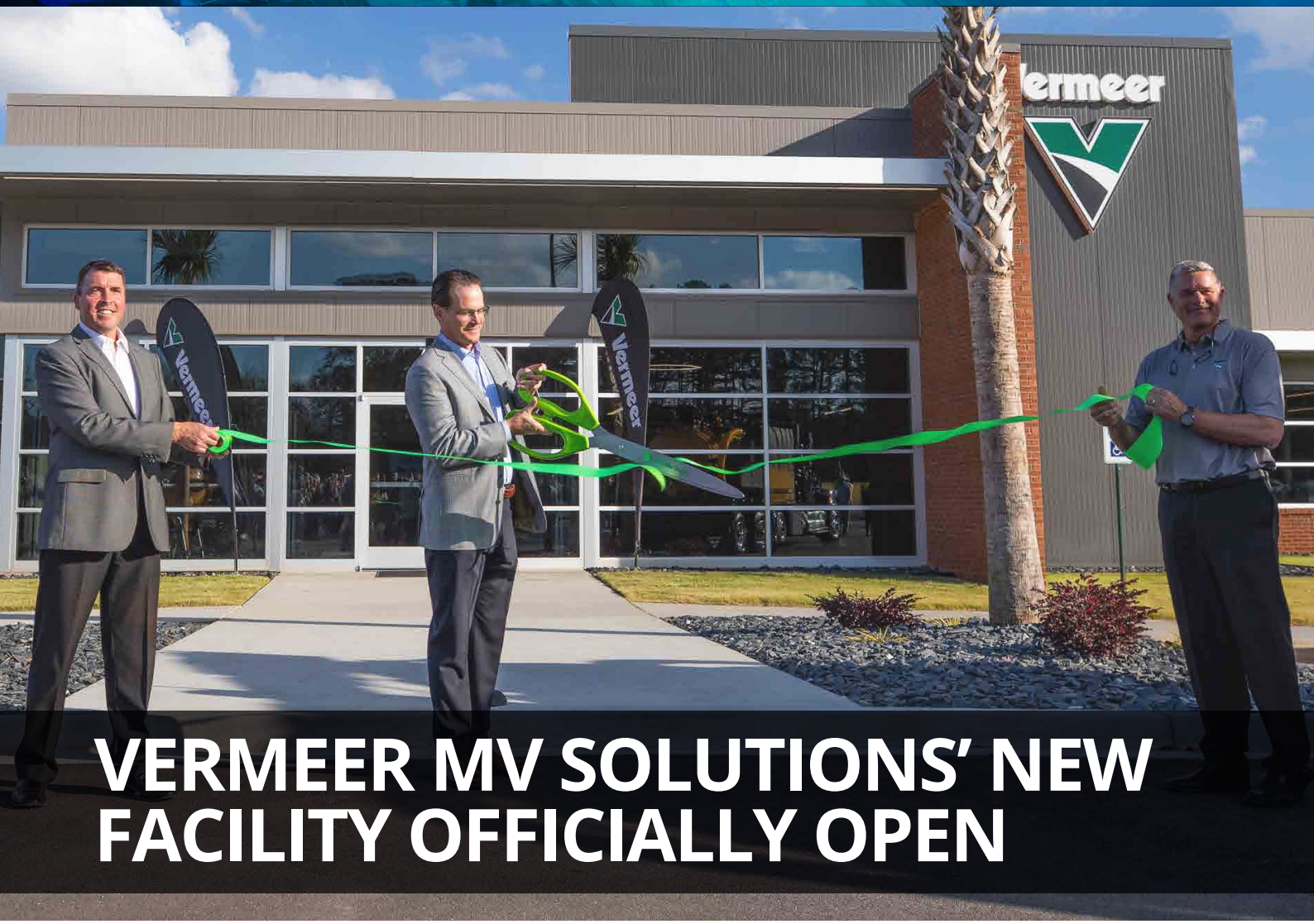
Due to the continuous investment in the development of consumables, machines, rehabilitation equipment and the set-up of a training centre for customers, BRAWO® SYSTEMS now claims to be a European technology leader in its market segment and has specially trained and qualified employees.

In future, this successful growth will be supported through the company, which operates independently on the market under BRAWO SYSTEMS GmbH. The new company structure allows BRAWO® SYSTEMS to expand better within the construction supply industry.

The existing business will continue unchanged in the new legal form and will continue to enable successful growth in the future.

BRAWO SYSTEMS GmbH is represented by Dr Achim Hehl, Dr Christian Ferck and Gunter Kaltenhäuser as Managing Directors BRAWO SYSTEMS.

www.brawosystems.com



VERMEER MV SOLUTIONS' NEW FACILITY OFFICIALLY OPEN

Cutting the ribbon on the new Vermeer MV production facility.

Vermeer MV Solutions celebrated the grand opening of its new, 130,000 sq ft (12,077 m^2) manufacturing facility in Piedmont, South Carolina, USA with a ribbon-cutting event. Formerly known as McLaughlin Group, Inc., Vermeer MV Solutions has been an industry leader in vacuum excavation innovation for 100 years.

In November 2018, Vermeer Corporation announced its purchase of Vac-Tron Equipment, and its plans to bring the Florida-based company together with McLaughlin Group, Inc. which was purchased by Vermeer in 2017 and start Vermeer MV Solutions. This acquisition and integration of the two companies built on the Vermeer strategy to provide a comprehensive suite of vacuum excavation technology, equipment, training and support to the growing underground utility and soft dig markets.

"Thank you to the team members that are going to work in this facility for many years to come, designing, building and supporting the incredible equipment that is going to come out of this facility." stated Vermeer President and CEO Jason Andringa. "We are excited to see what you will do with this facility." >

"The Vermeer MV Solutions team everyday here and in Florida come to work and lead the market in vacuum excavation." said Vermeer President, Industrial Solutions Doug Hundt."

This new facility marks an intentional investment by Vermeer Corporation to keep more than 150 manufacturing jobs in South Carolina for the growing Vermeer MV Solutions business and the strengthening vacuum excavation industry.

"The Vermeer MV Solutions team everyday here and in Florida come to work and lead the market in vacuum excavation." said Vermeer President, Industrial Solutions Doug Hundt. "We anticipate a lot of volume through this facility and it will become Vermeer's centre of excellence for truck vac excavation."

This all-new, state-of-the-art manufacturing facility provides more than 130,000 sq ft (12,077 m^2) of manufacturing workspace on 43 acres of land featuring air-conditioned break rooms, conditioned air on the factory floor and a market offering healthy break options for all team members. The facility has the option to expand the footprint even further with future growth. With more than 150 team members already working in the facility and a growing need for skilled talent, there has never been a better time to work at Vermeer MV Solutions.

"Great job to the Vermeer MV Solutions team." stated General Manager of Vermeer MV Solutions David Van Wyk. "It has been a long time coming, but it is so great to see it and well worth it for the building that we have."

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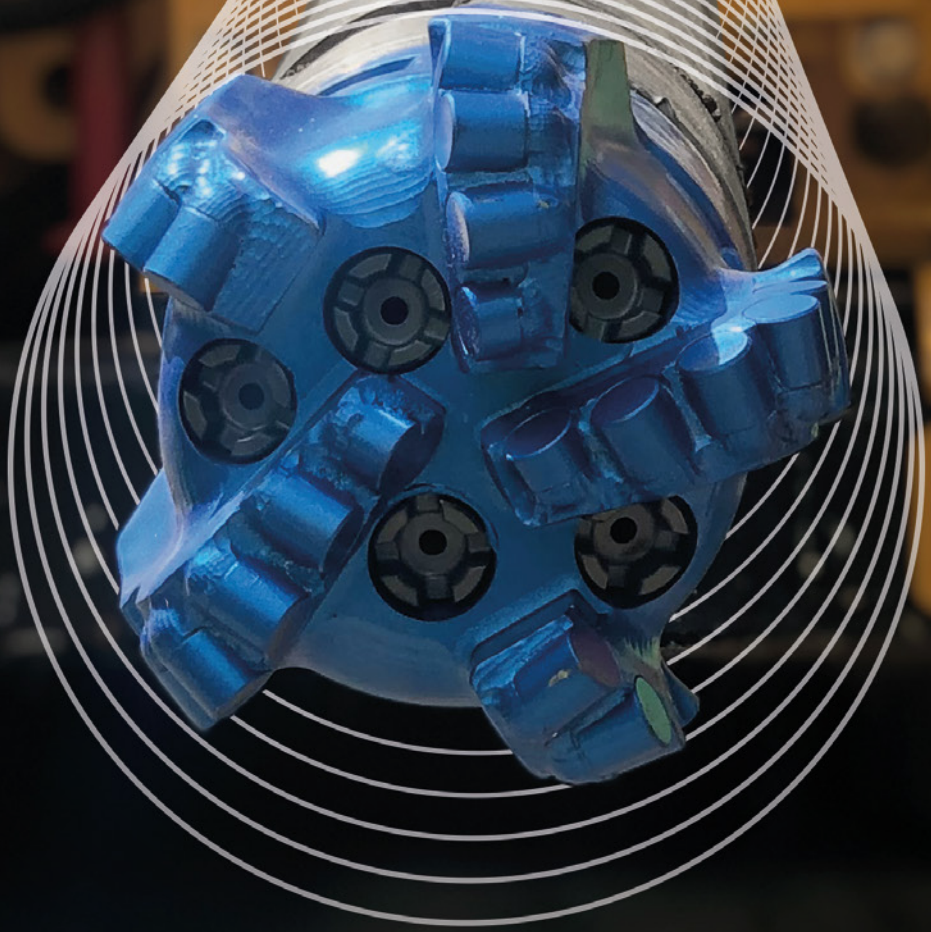
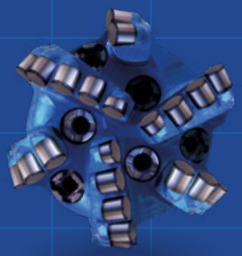


TRICONE HOLE OPENERS

TRICONES



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WORK TO UNCOVER VICTORIAN SEWER COMPLETED AT VICTORIA EMBANKMENT FORESHORE

Exposing the Victorian sewer.

Teams working at Tideway's Victoria Embankment Foreshore site have completed work to uncover the original Bazalgette sewer at the site, taking another important step towards Tideway's integration with London's existing sewer system.

In order to connect to Bazalgette's sewers to divert sewage into the main tunnel, the team at Victoria Embankment had to uncover part of the Northern Low-Level Sewer, which formed part of the original Victorian sewerage system.

While works were carried out, a temporary flume pipe was installed within the existing Victorian brick sewer to ensure sewage can continue to flow through during work. An interception chamber has also been constructed that will redirect sewage flows towards the new super sewer via a 48m deep shaft.

Adnan Noor, Project Manager at Victoria Embankment, said: "This milestone, after 13 months of civil engineering and demolition work, represents an important step towards our mission to clean up the River Thames from sewage pollution. Making these connections with Bazalgette's existing system are a great reminder of the scale of his work and its contribution to London. We're proud of our part in updating it for future generations."

"Tideway is a huge project and we are proud to be playing our part in upgrading London's infrastructure not only to meet existing demand but also for generations to come."

The Ferrovial Construction and Laing O'Rourke (FLO) joint venture, the principal contractor for the 12.7 km central section of the 25 km Thames Tideway Tunnel, appointed Barhale to carry out the works at Victoria Embankment Foreshore.

Barhale Regional Director Phil Cull, said: "The completion of the breakout of the Northern Low-Level Sewer at Victoria Foreshore and the construction of the interception chamber is an important step in the integration of London's systems – old and new."

"We are very pleased to have successfully delivered this key element of the Tideway project at Victoria Embankment Foreshore. Tideway is a huge project and we are proud to be playing our part in upgrading London's infrastructure not only to meet existing demand but also for generations to come."

The Victoria Embankment Foreshore site will be used to control the existing local Combined Sewer Overflow (CSO), known as the Regent Street CSO. After commissioning, the connections will allow overflows at the CSO to be intercepted and carried into the 25 km Tideway "super sewer" tunnel, before being treated at Beckton Sewage Treatment Works.

Northern Low-Level Sewer No.1 starts in Hammersmith in the west of the city then runs beneath Fulham before joining, and becoming an integral part of, the Thames Embankment at Cheyne Walk in Chelsea. Its flows are ultimately raised at the Abbey Mills pumping station to join the Northern Outfall Sewer.

NEW HEAD FOR BARHALE SCOTLAND

Lee Hollywood.

"His excellent understanding of site operations, commercial management and track record of working across the country means he is ideally suited to the role."

Civil engineering and infrastructure specialist Barhale has announced the appointment of Lee Hollywood as the new lead for its Scottish operation.

Lee originally joined Barhale in January 2020 and moves into the role from his previous position as senior contracts manager for Scotland. He previously held positions at Morgan Sindall, Farrans and Balfour Beatty Construction. He takes up his position as regional manager immediately.

Originally from Saltcoats, Ayrshire, Lee has a BEng (Hons) in civil engineering from the University of the West of Scotland.

Barhale director Andy Flowerday welcomed the appointment. "We are very pleased that Lee has agreed to take on the leadership of our business in Scotland," he said. "His excellent understanding of site operations, commercial management and track record of working across the country means he is ideally suited to the role. Barhale has ambitious plans for development in Scotland. Our philosophy is grounded in working closely with clients to develop innovative, cost-effective solutions. We are already seeing benefits from this approach which is enabling us to develop long term relationships with both the key utilities and also with the public sector."

Lee Hollywood believes that Barhale is well placed to continue its recent progress and further develop the business in Scotland. "We have built a very solid name as a problem-solving business that is not afraid of difficult civil engineering challenges." he said. "I am keen to build on that reputation and look forward to driving the continued commercial success of our operations."

ATLAS TAKES ITS EXPERTISE AROUND THE GLOBE

The Atlas winch on route to Rothera base.

Atlas Winch & Hoist Services recently completed an order to supply a range of specialist utilities equipment for a pipe pulling project taking place in Antarctica.

The equipment is destined for the Rothera Research Station, based on Adelaide Island, Antarctica. Located 1,860 km south of the Falkland Islands the facility is the largest operated by the British Antarctic Survey, and as well as being a biological research centre it is also a hub for supporting deep field and air operations. The island is 140 km long, is mountainous and heavily glaciated. Its highest peak is 2,565 m. Rothera supports a wide range of BAS, UK University and international collaborative science programmes. During the summer months it is home to more than 100 personnel as the most is made of the milder weather conditions. However, in winter this can fall to just 22 people as temperatures drop to -20°C and activities are greatly reduced. The station has recently been undergoing a process of modernisation with a range of the facilities being upgraded and improved. In particular, the wharf and quayside facilities have been developed and expanded to 74 m to accommodate the new and larger Polar ship the RRS Sir David Attenborough.

Left: Atlas 3 t and 4 t winches.

Right: The Rothera base airstrip.

The utilities equipment supplied includes 3 t and 4 t Grundowinch trailer-mounted hauling winches with data-logging capability, 10 t Cable Drum Jack Towers, 8 t Cable Drum Trailers with a drum drive system and various other ancillaries as well as general lifting and pulling equipment that will be used for installing a new fuel pipeline for the Rothera facility. Atlas worked closely with manufacturers to find the best technical solutions as well as a very challenging timescale to ensure the equipment was completed and delivered to meet the required shipping deadlines. The cable drum trailer and the cable drum jack towers also used a special design that will accommodate a larger than usual range of drum sizes thereby reducing the total amount of equipment needed to do the job. This detailed knowledge of the equipment, a genuine appreciation of the application and close working relationships with manufacturers such as SEB International meant that the right equipment was delivered on time and on budget.

Atlas supplies a wide range of winches, cable drum trailers and associated equipment to the utilities sector as well as having one of the largest and diverse rental fleets of its kind in the UK or Europe. Atlas can also design and engineer bespoke solutions where standard equipment does not quite fit the bill. Operating from two locations in Essex and central Scotland, Atlas provides its specialist equipment and services to Construction, Engineering, Marine, Oil & Gas and the Renewable sectors as well as to the Utilities industries. With activities throughout the UK, Europe and beyond, Atlas can take their equipment and expertise to every corner of the globe.

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VSM 10000 for a shaft inner diameter of up to 10 meters in operation in Doha, Qatar.

Population growth goes hand in hand with the need for today's cities to develop sustainable infrastructures for traffic, supply and disposal networks. As space is restricted on the surface, more and more utilities like power cables are moved underground. Existing sewage networks have to be expanded or new large-capacity schemes have to be built to meet future requirements in volumes or growing challenges in flood protection. Due to a rising density of underground installations, urban planners are considering new routes at greater depths.

This also applies to the metropolitan areas in the MENA region, where mechanized tunnelling solutions have been well-known for decades. Within large-scale projects such as Abu Dhabi's Strategic Tunnel Enhancement Programme (STEP), a wide diameter range of AVN and EPB machines can be used to construct pipe jacking and segment lining tunnels safely and in time. The long tradition of pipe jacking, technological advance and valuable experience gained by

Starting a new shaft in Buraidah, Saudi Arabia.

the contractors create the desire to push the boundaries in terms of achievable drive length and tunnel diameter in pipe jacking. At the same time, small-diameter segment lining can be considered, as was the case for the Inner Doha Resewerage Implementation Strategy (IDRIS) project, where two EPBs for 3-meter inner diameters have completed more than 16 kilometers of sewage tunnels in 2018. Four shafts of up to 32 meters depth have been built within 9 months using the mechanized VSM shaft sinking technology.

In Saudi Arabia, several AVN machines are currently in operation for two large-diameter pipe jacking projects (up to OD 4,265 mm) for storm water networks. In Jeddah, the 4-km-long Al Salaam Tunnel is under construction as part of the Jeddah Storm Water and Master Plan (JSWM). In Buraidah, several AVN slurry machines are in operation to complete a total of approx. 22 km for the Main Line Stormwater project in depths of up to 50 meters.

In similar depths, Singapore is currently implementing Phase 2 of its Deep Tunnel Sewerage System. As a leading innovator in sustainable planning and managing its underground space to answer the lack of land above ground, Singapore counts on mechanized tunnelling and shaft sinking to realize the ongoing Phase 2 to the benefit of all parties involved. A total of 40 km of deep tunnels as main collectors are mainly constructed by Mixshields for segment lining in the diameter range of 3.5 to 7.5 meters (OD). Slurry pipe jacking equipment is predominantly used to install a total of 60 km of link sewers in the smaller diameter range below 3.5 meters. Some of the required tunnelling shafts of up to 60 meters in depth are sunk by a Herrenknecht VSM equipment, with a shaft diameter of 11.2 m (OD) and a combined lining of in-situ concrete and concrete segments.

After starting design and testing in early 2004, the first Herrenknecht VSM equipment went into operation in Kuwait and Saudi Arabia in 2006 for the construction of microtunnelling shafts for sewers in Kuwait and Jeddah. Until today, 98 shafts have been built worldwide by VSM technology in depths of up to 115 meters. The latest shafts installed in Nanjing, China, will serve as a U-Park® system for automatic underground parking.

Herrenknecht looks back on 30 years of experience in the MENA region, marked by a close partnership with customers, who have completed countless tunnelling projects successfully. With local service and reliable technology not only for tunnelling, but also for pipeline installations and shaft sinking, we do our best to provide solutions for ambitious future projects and their successful completion.

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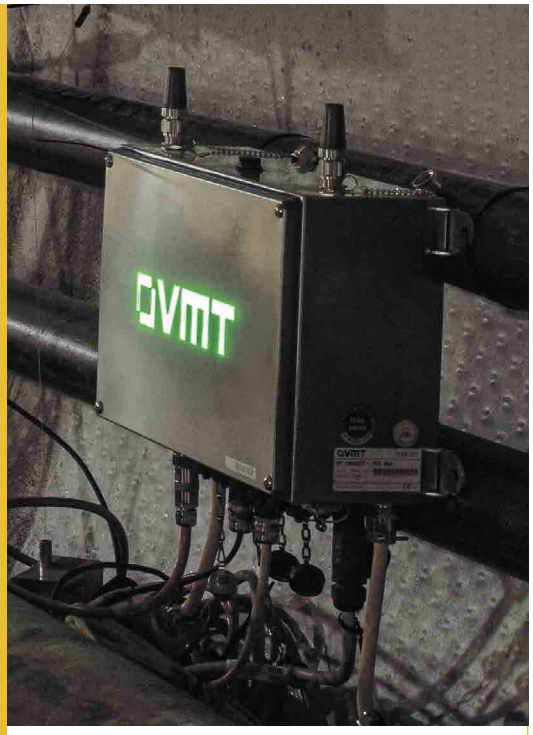

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VMT

ROBBINS CROSSOVER XRE – WORLD'S FASTEST

Personnel from contractor Kolin Construction and Robbins celebrate the breakthrough of a Crossover (XRE) TBM after it completed Turkey's Esme Salihli Railway Tunnel.

In October 2021, the breakthrough of a Robbins Crossover XRE TBM was the cause of much celebration. A team of personnel from Kolin Construction, Turkish State Railways (TCDD), and Robbins field service gathered to watch the breakthrough of the world's fastest TBM over 13 m (43 ft) diameter.

The 13.77 m (45.18 ft) XRE TBM set world records three times over, beating its own records in May and June with a set of records over the summer, including a best day of 32.4 m (106 ft), a best week of 178.2 m (584.6 ft), and a best month of 721.8 m (2,368 ft). Launched in March 2021, the machine bored 3.05 km (1.90 mile) on the Esme-Salihli Railway Tunnel as part of the Ankara-İzmir High Speed Railway Project for the TCDD.

"When the strength, force and torque generated by our Crossover TBM are taken into account, we consider it to be a beast. It has performed extremely well in this tunnel." said Onur Kansu, TBM Manager for project contractor Kolin Construction. He added: "We are proud we have accomplished such high performance." >

The Robbins Crossover TBM set multiple records, including a best day of 32.4 m (106 ft), a best week of 178.2 m (584.6 ft), and a best month of 721.8 m (2,368 ft), making it the fastest TBM over 13 m (43 ft) in diameter.

Guided by an expert crew, the Robbins machine swiftly bored through gneiss, sandstone, claystone, mudstone, quartz, and silt.

The Robbins Crossover XRE TBM broke through in October 2021 to much fanfare.

> "When the strength, force and torque generated by our Crossover TBM are taken into account, we consider it to be a beast. It has performed extremely well in this tunnel."

The machine began its bore in altered gneiss, then passed through mélange consisting of gneiss, sandstone, claystone, mudstone, quartz, and silt. By the end of the bore the machine was excavating in mainly mudstone. Core drillings were taken every 200 m prior to boring so the crew felt confident with the geology, just one of several factors that contributed to the record rates.

"A proper geological analysis, choosing the right TBM, a professional crew and a contractor that believes that it can break records are all key." said Kansu. "Scheduled maintenance periods, an expert team, availability of sufficient spare parts, and good logistics also made it possible for us to reach our targeted advance rates."

The project is particularly important for the Turkish tunneling industry, showing what is possible at larger TBM diameters. "We have disproved the idea that it is difficult to reach high advance rates while boring in EPB mode with large diameter TBMs. Crossover TBMs enable us to find quick solutions in changing ground, so we believe they will be the preference for future projects." said Kansu.

With tunnel excavation finished, work will continue on the 508 km (316 mile) line that will connect Polatlı in Ankara Province to Izmir, the third most populous city in Turkey. Once completed, the Ankara-İzmir High Speed Railway will be the longest rail line in the country, conveying passengers at top speeds of 250 km/h (160 mph) in a railway journey of about 3.5 hours.

www.robbinstbm.com

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REHABILITATING AN AGEING ASBESTOS CEMENT PIPELINE IN SARDINIA

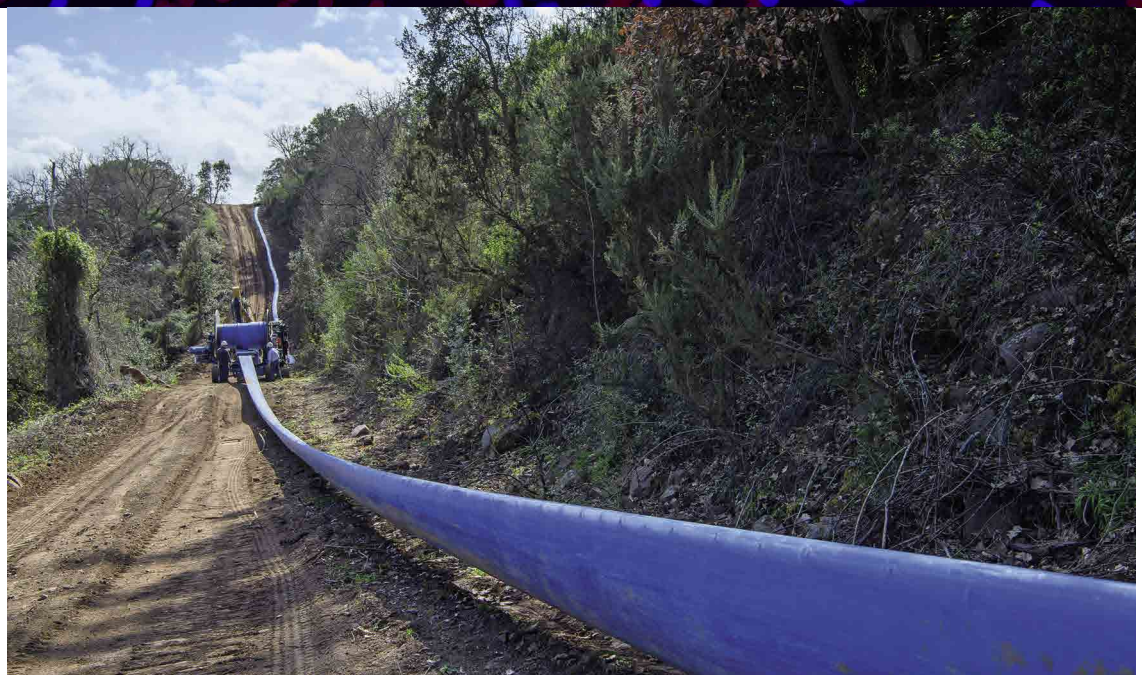
Numerous environmental regulations protect the Temo River valley through which the pipeline runs.

The ageing asbestos cement pipeline, which supplies the region around Bosa, Sardinia with drinking water, runs for 6 km through a nature reserve without public access roads and required a comprehensive large-scale rehabilitation project exclusively with trenchless technology.

The requirements of this €3 million project showed that trenchless technologies for the rehabilitation of pressure pipelines are quite suitable as a complete solution for comprehensive reconstruction projects. Their performance is by no means limited to rehabilitation of individual, smaller critical points on a pipeline route, such as crossing of a traffic route.

The initial situation

The age of the DN 500 water main led to frequent failures causing leaks. The repairs repeatedly led to interruptions in the water supply to the municipality of Bosa with its ±8,000 inhabitants and the surrounding region, which is also a tourist attraction. Since this is the only source of water supply, the construction of a bypass was planned for the duration of the rehabilitation project. >



Construction of the bypass with Primus Line to supply the residents with drinking water during the work.

The choice of the rehabilitation method and the implementation were also influenced by the nature of the pipe which was asbestos cement. In Italy, as in many countries, asbestos-cement pipes were used for the construction of water networks as of 1916. Especially between the 1950's and 1980's, their use continued steadily due to their 'optimal' characteristics, unsuspected of the dangers of asbestos fibres. Its use in Italy is estimated at about 125,000 km with diameters ranging from 150 to 500 mm.

However, the decisive factor in the choice of the rehabilitation technology was ultimately the geography of the Temo river valley, through which the 6 km long remediation section runs. The area between the start point, a bird watching area, and the end point at a dam is protected by numerous environmental regulations and has no public access roads.

Under these conditions, an open rehabilitation of the pipeline was impossible and ruled out from the start. But planning an intervention with trenchless technologies was also extremely difficult and quite daring. It took a high degree of specialisation and close cooperation of Benassi Srl and the manufacturer Rädlinger Primus Line GmbH to achieve a smooth and high-quality execution of the project.

The technology

The trenchless technology selected by the network operator was the Primus Line® system. Its basis is a flexible, multi-layer aramid-reinforced high-pressure liner with specially developed connectors.

The outer layer, which protects the inner aramid core during the installation process, is made of abrasion-resistant polyethylene (PE). The aramid fabric absorbs the tensile force during pull-in and the entire operating pressure. The inner layer is adapted to the transported medium and, in the case of drinking water, is made of polyethylene suitable for drinking water. With the flexible high-pressure liner from Rädlinger Primus Line GmbH, pull-in lengths of up to 2,500 m with several bends in one section, as well as a nominal pressure of up to PN40 can be achieved. >

Pulling in the Primus liner DN 500 via a shaft.

The connectors for medium pressure pipes consist of an inner profile core and an outer sleeve. During installation, a two-component resin is injected through a valve located on the outer sleeve, which presses the pipe into the shape of the inner core. After the resin has cured, the joint is permanent and has a high strength.

The implementation

Access to the pipeline was provided via several shafts with valves and fittings along the route, so that even selective excavations for foundation pits could be completely avoided. The intrusion and impact on the pipeline and the surrounding area could therefore be reduced to a minimum.

The precise organisation of the intervention phases ensured optimum execution of the work and minimised pipeline downtime. The project was divided into just three construction phases, mainly enabled by the special and efficient bypass solution, also installed using Primus Line® technology.

Each of the three construction phases took place as follows:

- Preparation of the bypass – For constructing the bypass under the difficult logistical working conditions, the high flexibility of the Primus Liner was of advantage. In each of the three construction phases, approximately 2 km long sections of the pipeline were rehabilitated. For this purpose, 1,000 m of the Primus Line medium pressure system DN 400 and 1,300 m of the Primus Line medium pressure system DN 350 were available for the bypass. Using the Primus Line® system, it was possible to guarantee a hydraulic capacity that was higher than or equal to the minimum that would have been achieved with the network operator's original solution. This alternative solution would have provided for the laying and preparation of eleven bypasses with 1,000 m of DN 300 pipes each. For optimum practicality, Benassi's trenchless division decided to supply the bypass liner in nine sections with an average length of 255 m, equipped with flanged end connectors and wound on 2 m wide transport reels each. For a speedy installation and to protect the material, a specially designed and manufactured hydraulic winding machine was used during installation, which was pulled along the line by an excavator. >

Folded into a U-shape and wound onto drums, the Primus Liner is delivered ready to be drawn in.

- Separation of the old pipe in the shafts – After commissioning the bypass and draining the pipeline, the special fittings that were present in all intermediate manholes of the bypassed section were dismantled and the inlet and outlet pipes in the manholes were cut close to the concrete wall using suitable equipment.
- Video inspection – Next, a video inspection was conducted from shaft to shaft to examine the pipe from the inside for damage or obstructions that would impede the Primus Liner from being pulled in.
- Pulling in the liner and mounting the Primus Line® connectors – The liner was then pulled into the pipe by means of a winch. In some cases, installation lengths of up to 1,000 m were achieved in one piece. For this purpose, the technicians from Benassi and the material manufacturer Primus Line carried out a feasibility test in advance for each pull-in section, considering the frictional forces that would arise. In doing so, an attempt was made to precisely determine the optimum ratio between the greatest possible care for the material and optimum utilisation of its performance capability and high tensile strength. In view of the asbestos cement of which the old pipe was made, the underground work was carefully planned. Compared to the classic open construction method, the risk of spreading asbestos fibres is lower with trenchless rehabilitation technologies anyway. Nevertheless, appropriately trained personnel are needed to carry it out. >

Trained staff monitored the leakage of the liner from the asbestos-cement pipe.

"For this project, Primus Line provided a custom solution for anchoring to the pit wall so that each connector could be inserted into the existing structures to save space. This allowed maintenance of the existing shafts and avoided additional excavation for the new construction."

In addition, Benassi provided a mobile cleaning system that cleaned the winch's cable immediately after it exited the pipe. This reduced the risk of dispersing asbestos fibres by sliding the winch cable along the walls of the pipeline during insertion. After the liner was pulled in, the specially designed connectors were used to reconnect the pipeline. For this project, Primus Line provided a custom solution for anchoring to the pit wall so that each connector could be inserted into the existing structures to save space. This allowed maintenance of the existing shafts and avoided additional excavation for the new construction.

- Insertion of the new special fittings into the shafts – After the Primus Line® system was installed, new valves and fittings, which were in the finished shafts of the connections, were installed in all shafts of the rehabilitated section.
- Pressure test and recommissioning – At the end of the rehabilitation work, pressure testing of the rehabilitated pipeline section between the initial and final sections of the bypass was performed. This test was carried out with a pressure of 20 bar at the lowest point of the pipeline. The pipeline was disinfected with chlorine solution in sections of about 2 km. This was followed by reconnection of the sections to the rest of the pipeline. >

Customised, space-saving special solution: connector for anchoring to the pit wall.

- Draining and removing the bypass – After the rehabilitated pipeline section was put back into operation, the bypass was drained and finally rolled up for the next re-laying of the subsequent section of pipeline to be rehabilitated.

Tailored project workflow

Vital to the success of the project was not only the specialisation of all those involved, but also the close interaction between those responsible for the product and those responsible for its implementation throughout the course of the project. Finally, this guaranteed an economical implementation of the project.

An initial variant study considering different trenchless solutions such as sliplining with HDPE, CIPP and Primus Line® showed significant technical and economic advantages, whilst at the same time reducing the installation risks. In addition, the challenging site conditions due to the difficult-to-access terrain made open trench construction much more expensive and time-consuming, which made the renovation with Primus Line® the preferred solution.

“Only the extraordinary application possibilities of the Primus Line® technology made it economically possible to carry out this otherwise extremely costly and impractical maintenance work.” concluded Project Manager Matteo Lusuardi from Benassi.

www.primusline.com

SECURING POTABLE WATER SUPPLIES FOR VALENCIA

Fig. 2 - Full structural load capacity: the SAERTEX-LINER H2O for trenchless rehabilitation of potable water lines in the UV-CIPP procedure.

Fig. 1 – Removed sample of the old pipe.

With the successful installation of the SAERTEX-LINERS H2O, the potable water supply for over 1.6 million people in Valencia, Spain, was secured in the late summer of 2020. The more than 500 m of pressure line were rehabilitated using the advantages of the UV-CIPP trenchless rehabilitation method - the largest project of its kind on the Iberian Peninsula.

Securing the potable water supply of the metropolitan region of Valencia is the task of Empresa Mixta Metropolitana S.A. (EMIMET). A large distribution network transports the high-quality potable water from the treatment plants to the municipal distribution points of the 51 municipalities. To guarantee the continued supply of the northeastern suburbs of the city, and due to the structural condition, it was necessary to repair an existing gray cast iron pipeline (Fig. 1) with a nominal diameter of DN 600 and a length of just under 500 m. The route of the pipeline through the center of the Quart de Poblet district posed a major challenge. In addition to securing the economic supply of potable water, the impact of the construction work on residents and the existing infrastructure of the district was to be kept to a minimum. >

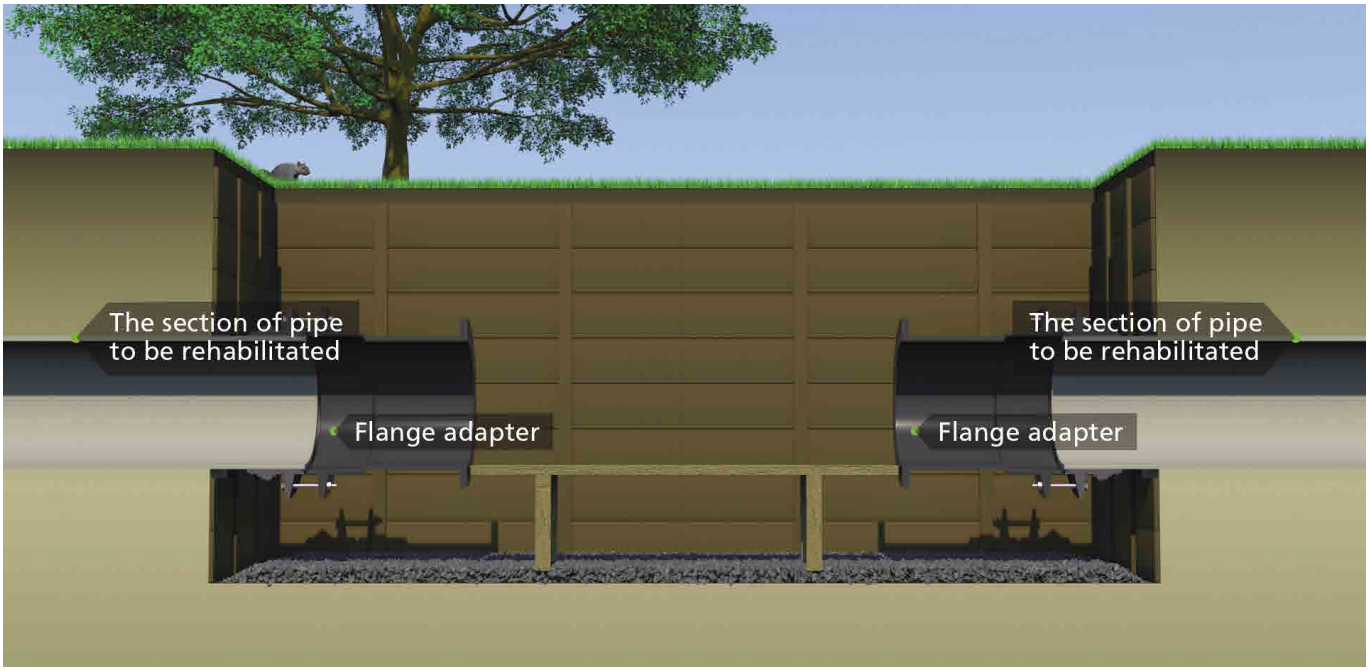


Fig. 4 – Schematic illustration: Construction of the excavation pits and preparation of the pipe ends.

Supporting services from planning to implementation

The contract for this project was awarded to the Spanish company GRUPO CANALIS - Soluciones Tecnológicas, which specialises in trenchless rehabilitation work, in combination with the SAERTEX-LINER H2O from SAERTEX multiCom GmbH. This product, which won the ISTT Innovations Award in 2019, allows the advantages of the trenchless Cured-In-Place-Pipe (CIPP) procedure to be applied to pressure lines as well. In addition to economic efficiency, sustainable rehabilitation with a technical service life of 50 years and minimal road and earthworks required for installation, the issue of project safety was also a key aspect for EMIMET.

The complete solution portfolio with services from planning to implementation was used to carry out the project. Professionally qualified civil engineers from SAERTEX multiCom supported the customer's project management and with their experience helped to implement the project in the most economic and targeted manner.

Several weeks before the start of construction, a site inspection was carried out with the participation of the client, the contractor and the suppliers. Many questions and problems could already be clarified at this early stage in the planning phase of the project. It also provided all the responsible authorities with an initial impression of the terrain conditions along the rehabilitation route, the traffic possibilities, the neighboring buildings and the storage facilities. >

Fig. 5 + 6 - Preparation for rehabilitation: Cleaning process.

Full structural load capacity

Another important point of project preparations and planning is the calculation of the required statics for the glass fiber reinforced (GFRP) pipe liner. The calculation of the necessary statics for the SAERTEX-LINER H2O is offered as a supporting service. There is no need to outsource the services.

In terms of its static classification, the liner is tight-fitting in the old pipe and fully absorbs both external and internal loads. This corresponds to the international standards of Class A according to DIN EN ISO 11295 and Class IV according to AWWA M28 (Fig. 2).

Execution, trenchless advantages and control of process parameters

For quality assurance purposes, a two-day theoretical and practical training course was organised and held on site for the employees of GRUPO CANALIS – Soluciones Tecnológicas. The theoretical training covered topics such as the installation of the SAERTEX-LINER H2O, process limits and quality assurance. During the final practical training, participants practiced the installation using a test liner in the warehouses provided by EMIMET.

During construction, the rehabilitation route was divided into a total of five sections with lengths between 58 and 128 meters. For the installation of the liner, which has been specifically approved for use in potable water lines, only a few excavation pits were created in these defined sections of the rehabilitation route, thus ensuring access to the system. All the necessary work could be carried out over the excavation pits with depths up to 6 m without any problems (Fig. 4). >

"For quality assurance purposes, a two-day theoretical and practical training course was organised and held on site for the employees of GRUPO CANALIS – Soluciones Tecnológicas."

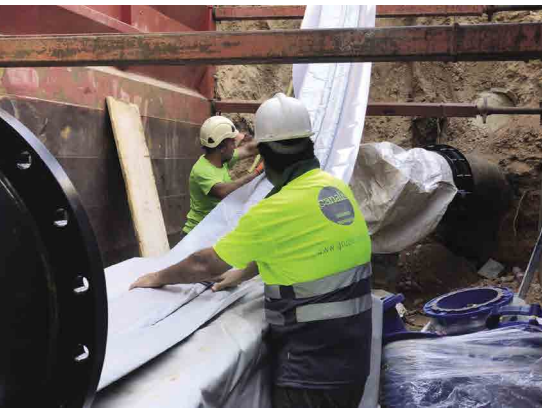


Fig. 7, 8, 9 – Pulling the SAERTEX-LINERS H20 into the old pipe

In order to react flexibly to unpredictable developments in the project during execution, the high storage stability of the pre-impregnated SAERTEX-LINER with a high shelf life of up to six months is a decisive advantage.

The installation of the pipe liner was carried out by the trained installation team of GRUPO CANALIS - Soluciones Tecnológicas. The supporting services of SAERTEX multiCom also came into play here. The company's application technology was able to provide advisory support for a large number of project steps by providing on-site assistance.

To perfectly optimise the site equipment to the specific application, CANALIS supplemented its own equipment with the necessary packers, conveyors and plant technology from the SAERTEX multiCom rental range.

A summary of the essential installation steps:

- Preparation of old pipe (such as cleaning (Fig. 5 + 6) and optical inspection)
- Pulling in the pipe liner pre-impregnated with resin (Fig. 7 + 8 + 9)
- Installation and calibration of the liner
- Curing the liner with UV light
- Connecting the liner ends with a liner end sleeve
- Quality assurance: Sampling, optical inspection and leak test >

After pulling in the GFRP pipe impregnated with styrene-free resin, it was cured with UV light. A major advantage of this technology is the continuous and digital control of the process parameters during the entire curing phase. The camera integrated on the UV light chain and integrated sensor technology provides real-time data to the control center of the rehabilitation vehicle on site. This enables the highest level of process reliability.

Restoration of potable water supply

The professional and pressure-tight transition between the SAERTEX-LINER H2O and the old pipe was achieved using liner end sleeves specially manufactured for this application. The inclusion of in this case maximum operating pressure of 10 bar is possible without problems. Finally, the pressure test was successfully mastered and nothing stood in the way of restarting the potable water supply of this pipeline section.

The entire installation, including training of the participants, could be realised within only 14 days. This is by far the largest project for the liner's deployment on the Iberian Peninsula. In the meantime, this product innovation has been successfully installed in over 100 projects worldwide.

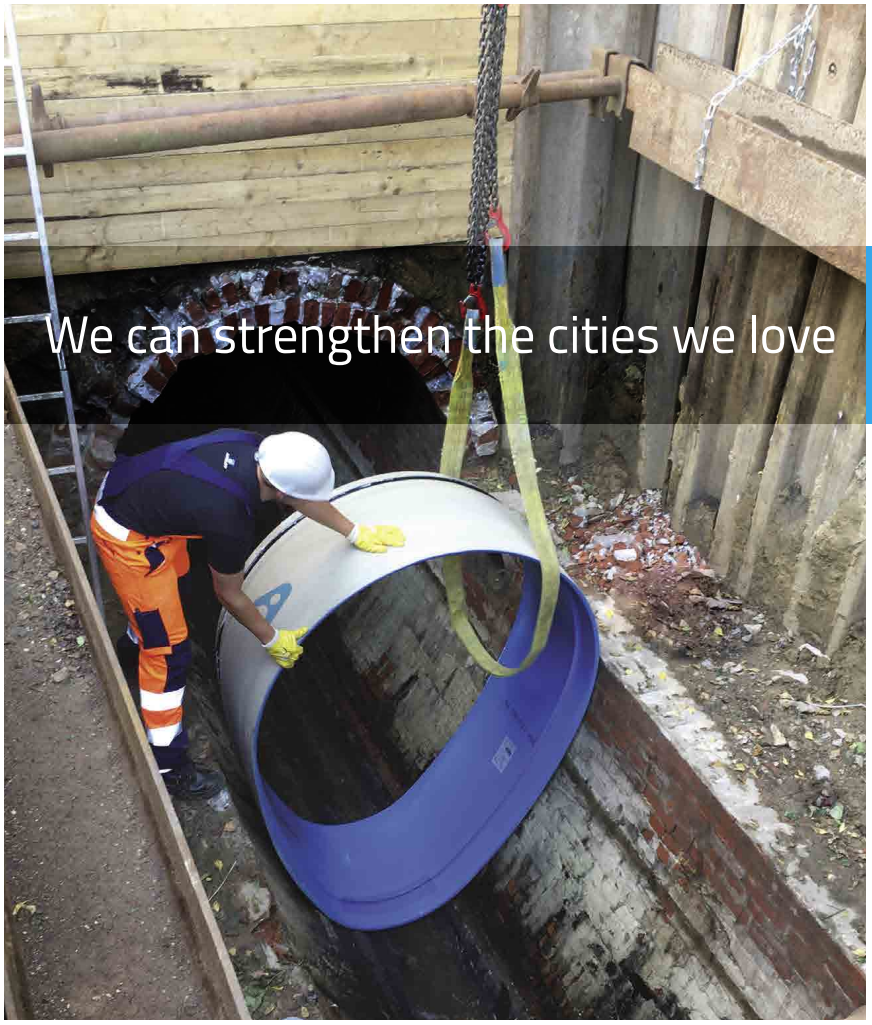
Approval in twelve countries of the world

The SAERTEX-LINER H2O is manufactured in the ISO 9001 certified plant in Münsterland. A special feature is also the unique vertical integration - from the textile reinforcement materials made of glass fibers to the resin-impregnated pipe liner system. The entire manufacturing process, from the production of dry goods to impregnation and subsequent storage, takes place under standardised, temperature-controlled conditions.

> "The entire manufacturing process, from the production of dry goods to impregnation and subsequent storage, takes place under standardised, temperature-controlled conditions."

Production under these optimal, clean and hygienic conditions enables an excellent standard for use in the potable water sector. The SAERTEX- LINER H2O has now been approved for use in potable water lines in twelve countries - including Germany, the USA and Spain.

www.saertex-multicom.com



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INTELI-COAT is designed to revolutionise the trenchless pipe lining operation, bringing tighter controls regarding coating ratio and coating application thickness.

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- Real time Flow and Ratio monitoring at the point of application (giving a massive increase in ratio assurance)
- An On-board Camera offering a live feed during coating
- Highly accurate lining thickness using data collected at the application head
- Super smooth Linings with zero rings, with the unit running on individually powered tracks/wheels
- The ablity to negotiate various Pipe bends and vertical climbs

Other benefits include:

- Coating Rig could be used to replace CCTV equipment
- Modular system that will allow 3D pipe scanning/Pipe cleaning in the future
- Works with the company's industry 1st A.V.O.S Automatic Coating Launch System

The system has been 12 months in the design phase and is now beginning the build phase with a view to testing in mid-2022.

https://schurltd.co.uk

SMALL – EFFICIENT – COMPACT!

Caption

With the new generation of compact drill rigs Prime Drilling sets new standards in this performance category with the PD 30/12 CU. Due to perfected design and optimised components both weight and sizes and thus transport and set-up costs have been reduced to a minimum.

The mounted CAT 7.1 ACERT motor with latest emission standard and adjustable cooling system minimises the consumption. Feed as well as pull back functions of the hydraulic power rotary head are carefully driven by an internal rack & pinion (RP) feed system.

Based on a lengthy development and a thorough selection of material the manufacturer is getting the maximum of efficiency out of every component. Further advantages to guarantee a fast, uncomplicated, and economic operation for customers are, among others, the fully automated drill pipe magazine for 32 pipes and the incorporation of a new hydraulic system enabling to achieve full performance of the rig.

Owing to the powerful on-board mud pump and the low weight the rig is always operational and ready for big jobs. In continuous consultation with customers and understanding their requirements as well utilising Prime Drilling´s +20 years of experience the company has succeeded in developing a drill rig which is tailor-made to meet the user´s demands.

As usual customers can choose from the full line of options and accessories here as well as rely on an experienced service team at any time.

www.prime-drilling.de/en/

VERMEER ADDS DIESEL-POWERED MIXING SYSTEM

The new Vermeer MX300 mixing system.

One of the horizontal directional drilling (HDD) industry's most widely used mix systems, the Vermeer MX300, is now available in a diesel-powered model.

The Vermeer MX300D mixing system is equipped with a Caterpillar 3 cylinder 24.7 hp (18.4 kW) diesel engine to power two pumps for a two-tank mixing system. This design delivers a constant supply of fluid to the drill by moving fluids between tanks. After one tank is empty, HDD crews can begin mixing to replenish the fluid supply without impacting fluid pressure to the drill.

The MX300D uses a single hopper and venturi and is paired with narrow rectangular tanks that allow many customisable mounting configurations. The mixing system's compact footprint and ability to support two tanks with one engine give crews more room on the truck or trailer to carry mixing additives to the job.

Clint Recker, product manager for trenchless products at Vermeer, said a diesel-powered mixing system can reduce or eliminate the need to keep gasoline onsite. "Most equipment found on a typical HDD jobsite is powered by diesel engines." he said. "While having a few extra gas cans onsite is easy to do, crews appreciate the ability to use the same fuel type across their entire equipment fleet. Also, the MX300D runs quietly, which can be an important feature for contractors working in communities with sound level ordinances."

Like the gas (petrol)-powered MX300 mixing system, each pump on the new MX300D can produce up to 350 gal/min (1,324.9 l/min) of flow and can be paired with 750 gal (2,839.1 l) or 1,000 gallon (3,785.4 l) tanks. The tanks are designed with a tapered bottom to help prevent additives from settling, building up and assisting with efficient drainage. With a 40 in (1,016 mm) tank width, the MX300D paired with two tanks can fit inside a standard-sized enclosed truck.

The MX300D has a 16 gal (60.6 l) fuel tank and is convenient to service with access to the roll jets through the top of the tank and two drainage points operated by two accessible valves.

www.vermeer.com

REPLACING CORRUGATED STORM WATER PIPELINES USING PIPEBURSTING

A view along the pipe burst route.

Murphy Pipeline Contractors of Jacksonville, Florida, USA was recently employed by two municipal authorities in Florida, USA for the replacement of two corrugated (CMP) storm sewer pipelines using the pipe bursting technique. The two projects were undertaken for the City of DeLand and Hillsborough County.

However, whilst many trenchless lining/rehabilitation methods exist that could be used to renew or renovate a CMP storm sewer, these options generally will not work when the original pipe has a partial or full collapse.

In the City of DeLand, Florida, after recently rehabilitating all of the storm drains in a neighbourhood, there was still one pipe that could not be cleaned properly or fully inspected due to a partial collapse. The 18 in (450 mm) diameter CMP storm drain ran from a retention overflow structure and between two houses to a lake. The location of the pipe meant that an open cut operation was simply not an option. Ground conditions across the site >

The busrting rig on the Hillsborough site.

comprised wet sandy soils. On this project the launch pit for the pipe bursting system was located next to the lake.

In Hillsborough County, Florida, after a partial collapse of an 18 in (450 mm) diameter CMP storm sewer, a homeowner's back yard started to flood. The local utility first sliplined the main with a new 8 in (200 mm) diameter) HDPE pipe, which was the largest size of new pipe that could be installed through the collapsed section. However due to flow requirements during wet weather events, the utility needed to replace the storm sewer with a new 18 in (450 mm) diameter pipeline. For this operation the pipe bursting system was located in a start pit next to the nearby storm retention pond with the sandy soil ground conditions again being wet.

Trenchless Option

Murphy Pipeline Contractors was able to offer both clients a trenchless option for replacement of both of the CMP pipes using the Static pipe bursting technique. This option allowed the collapsed CMP pipes to be replaced size-for-size with new HDPE pipe, with the pipe bursting operation being to operate through the partial collapses. In the case of the Hillsborough County operation, the recently slip lined HDPE pipe was split and expanded out simultaneous with replacing the CMP pipe.

To complete both installations Murphy Pipeline Contractors utilised a TT Technologies Grundoburst 2500G with a specifically designed cutting tool and expander head. Each project replaced around 200 ft (61 m) of CMP pipe with the new HDPE DR 11 pipe.

According to Murphy Pipeline Contractors, GIS maps were used for the design with minimal route design being required as the static pipe bursting technique follows existing utility path.

For both installations the new 18 in (450 mm) diameter HDPE DR 11 pipe was butt fused to the required length using McElory fusion equipment. >

Left: The new pipe arrives at the launch pit.

Right: The new pipe is floated on the lake.

On the Deland project just 4 days were required from the start of works to completion. Similarly, the Hillsborough County project was also completed in just 4 days.

According to Todd Grafenauer, of Murphy Pipeline Contractors: “No problems were encountered during either of the static pipe bursting operations. This was most likely due to the custom tooling and expander design ed for and utilised on the projects.”

Todd continued: “Both projects required floating of the fused HDPE pipe used for the replacement installations. On the DeLand project the pipe was floated in the lake and for the Hillsborough County site it was floated in the nearby storm retention pond. This enabled the launch pit located next to the water to be used as the insertion pit. In Hillsborough there was some concern on the part of the home owner when moving the HDPE pipe that it would not disturb the property’s mature landscaping and earth works, so the contractor utilised a hand cart to move HDPE pipe, eliminating any potential disturbance to the landscaping.”

One of the client organisations commented that: “Static pipe bursting was the only solution to address problem. Lining methods were ruled out due to the partial collapse and open cut options were ruled out due to proximity to homes. The only other option was installing a lift station and re-routing the main to an area more that was more accessible, however this option was extremely costly.”

For Murphy Pipeline Contractors, Todd closed by saying: “CMP replacement with static pipe bursting is no longer prohibitive due to the advancements in the available burster and expander tooling.”

www.murphypipelines.com

NEW SMALL STAGE V COMPRESSORS

Doosan Portable Power Stage V compressors.

Doosan Portable Power has launched a new range of small portable compressors for the European market, offering four new models with free air deliveries from 2.5 to 5.0 m³/min (90-180 cfm) and designed with a focus on simplicity, durability, reliability and transportability.

About 70% of the EU portable compressor market is represented by machines between 2.0 and 5.0 m³/min. The main European markets are the UK, GAS (Germany, Austria and Switzerland), France and Benelux (Belgium, Netherlands and Luxembourg), which together represent more than 70% of the industry covering many sectors including rental, construction, utilities, demolition and general industry.

In the new small compressors, the first number in the model name indicates the pressure in bar, the second number represents nominal air flow in cubic metres per minute, while the number 5 at the end indicates a Stage V compliant engine. There are three models operating at 7 bar nominal >

Doosan Portable Power Stage V compressors.

pressure – the new Stage V Yanmar-powered 7/25, 7/45 and 7/55 with outputs of 2.5, 4.0 and 5.0 m³/min (90, 140 and 180 cfm), respectively. The small compressor range is completed by the new 14/35 higher pressure model providing 3.0 m³/min (105 cfm) of compressed air at 13.8 bar.

More environmentally-friendly

Jan Moravec, General Manager, Doosan Portable Power for Europe, the Middle East and Africa, said: "The design complexity required for the implementation of the latest Stage V engines led us to completely rethink the design of the small compressor range, while maintaining the well accepted, superior durability of our products, improving the serviceability and fulfilling all possible transportability requirements, at the same time as expanding our focus on environmentally friendlier solutions. As a result, like in our larger compressor ranges, a leak-free bunded base is now fully integrated into the bottom frame of the new small compressors and includes the central drains for all fluids. For the Stage V units with electronic control, we have also introduced the option of the ECOmizer feature, which reduces emissions, noise and fuel consumption."

Machines equipped with the ECOmizer option will automatically recognise the working phase and will act on pressure and engine speed without the intervention of the operator to optimise the fuel consumption and to reduce noise and emissions. As soon as the operator activates a pneumatic tool being powered by the compressor, the machine will automatically recognise the demand of flow and pressure, providing the maximum performance immediately. For example, in a working cycle with 50% full load and 50% idle speed, the ECOmizer provides 60% savings in fuel. >

Doosan Portable Power Stage V compressors.

Compressors with a fresh new look and features

Michele Corsi, Product Manager, Doosan Portable Power, added: "The most immediate, noticeable change in the 7/25, 7/45, 7/55 and 14/35 Stage V units is the new dynamic and modern appearance, thanks to an updated design, bringing a fresh new look. The success of the previous Tough Top (polymer) canopies has led Doosan Portable Power to offer this solution as standard. The new easy-to-open canopy creates a fantastic line with the newly designed polymer mudguards and bumpers. The newly integrated LED lights are also offered as standard for all the machines. And of course, the long-standing metal canopy versions will still be available to customers as an option."

"The most immediate, noticeable change in the 7/25, 7/45, 7/55 and 14/35 Stage V units is the new dynamic and modern appearance, thanks to an updated design, bringing a fresh new look."

Other improvements in the new small compressor range include the updated control panel, which has been repositioned for more ergonomic access and is now protected by a lockable cover. A simple mechanical manometer reports the pressure, and on models with electronically controlled engines, there is an additional switch to force DPF regeneration. For machines with the generator option, there is also an additional 3-position switch and voltmeter.

All the new small portable compressors are equipped with unbraked or fully-braked running gear, both available in fixed and variable height configurations. All the new models have been designed to guarantee a weight below 750 kg, even with additional options, such as an aftercooler or lubricator. This means that anyone with a standard Category B driver's license can tow the units behind their vehicle. All the models are also homologated up to 950 kg, helping those customers who need to install even more options for maximum flexibility.

Michele Corsi concluded: "The new generation of small portable compressors is the perfect response to meet what our customers have been asking for. To satisfy any customer needs, we also offer a wide range of options and customisations. So, I urge customers to get in touch with their local dealers to find out more."

www.doosanportablepower.eu

istt.com

SOCIETY NEWS

ISTT News brought to members by Trenchless Works

WHAT'S ON THE TABLE
A MESSAGE FROM THE CHAIR

Jari Kaukonen, Chair, International Society for Trenchless Technology

Hi ISTT members!

I was wondering if it was worth travelling to Dubai for Trenchless Middle East this week, but I am happy that Peter pushed me to fly there. It was a great success! I have met so many people in this industry, wow, what possibilities I had. We had a meeting with some people active in the Gulf region to discuss and establish a society in the region and we agreed to go on with our ideas. Thanks to those active people I met on Sunday and especially David Henderson who promised to work to find the right contacts here. Our committee chair Mark Haebler promised to lead the group, which will meet the 10th January next year to discuss further details about the subject.

I met a local municipality representative who promised to call all his colleagues to a meeting for that reason. The show itself was very nice in a new venue, and all delegates and exhibitors I met were satisfied. I also had many good meetings where I could promote the next international No Dig show in Helsinki from the 3rd to 5th October 2022. We are well prepared to meet all experts round the world there. The call for papers is now open and to keep you updated about the arrangements visit the show website: www.nodighelsinki.com and book the week from your calendar to send your paper in.

We had our council meeting the 15th November, virtually. Before that we had our trustees meeting. That was nice to meet you all in my screen, but still I am waiting to see you in Helsinki next year the 2nd October when we have our council and trustees meeting. By the way, we will elect the new chairman to our society, and I will stay as a past chairman after that. Then I will be the second longest chairman in the society's history! How fast it has gone!

The next year we have many nice conferences locally where I will try to pay a visit and all the year, I will prepare the Helsinki show which will be something special I can promise.

Welcome to see the Helsinki secret!

Now I want to wish You all a Merry Xmas and Happy New Year from the land of Santa Claus!

With best regards,

Jari

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SOCIETY NEWS

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Society News brought to members by Trenchless Works

HELLO FROM THE CHAIR

Dawn Greig, Chair, UKSTT

"The positivity, passion for the industry and camaraderie was both tangible and touching. The Trenchless Industry really is a community and we are very honoured to be part of that."

It's the most wonderful time of the year...So, I would like to say a HUGE thank you to all of our Patrons and Members for the fantastic support you have given UKSTT throughout 2021.

Thanks to you we have held some exceptional technical events, both online and more recently in person. Let's face it, it was a tense waiting game to find out whether or not No-Dig Live would take place after the rescheduled event was cancelled in March, and our Awards Evening & Gala Dinner along with it. However, I am sure you will agree it was well worth the wait when we finally reconvened face-to-face in September. The positivity, passion for the industry and camaraderie was both tangible and touching. The Trenchless Industry really is a community and we are very honoured to be part of that.

Alongside the face-to-face events, which also included an excellent Roadshow in my native country of Scotland, we had a full online schedule of Trenchless Tea Breaks, Mini Masterclasses and Member webinars. Additionally, we launched the Green Alliance in collaboration with the Pipeline Industries Guild, to highlight the importance of working together towards Net Zero, which I am delighted to report has been a resounding success. We look forward to continuing with this important work next year.

As a token of our gratitude to our Members for their unswerving loyalty to the Society, even throughout the challenges of the pandemic, we created loyalty pins to represent the number of years that each company has been a Member of UKSTT. Please be in touch if you have not yet received yours. We also have the badges in a digital format for your marketing.

Finally, I would like to once again thank the Board, our Business Development Manager Lynn, and our Admin Assistant Linda for their diligence behind the scenes, which is vital and much appreciated.

Have a Merry Christmas and Happy New Year. Here's to 2022! Take care and stay safe.

Dawn x

On the 8 February 2022 at 2 pm, UKSTT's Technical & Education subcommittee Chair, Tom Sangster will be delivering a presentation for ISTT.

DESIGN METHODS FOR CIPP LINERS IN GRAVITY AND PRESSURE PIPES – AN OVERVIEW

The UK Society for Trenchless Technology (UKSTT) held the first in person Masterclasses since March 2020 at the National Motorcycle Museum in Solihull on Large Diameter Circular and Non-Circular Rehabilitation.

The design of CIPP liners in both gravity and pressure pipes has evolved significantly since the first somewhat empirical designs. There are now well-established methods for gravity pipe liners in the USA, the UK, Germany and France, to name but a few. These are evolving as more research and empirical evidence shows that the modified Glock method is more accurate than the Timoshenko method formerly used. France and Germany have already made the transition and the UK is doing so at present. The USA is expected to follow as well. In pressure pipes the situation is less clear and significant challenges remain in understanding the interactions between the liner and the host pipe. This webinar will review the design approaches for both gravity and pressure liners and will identify the key areas where more research and information is required, especially in the design of pressure pipe liners.

The ISTT webinar series is free to attend and open to UKSTT members and all affiliated societies.

Register for this webinar https://www.istt.com/index/webapp-registrant-form/id.14

About Tom Sangster

Tom Sangster is a professionally qualified Civil Engineer with 35 years of experience in geotechnical engineering and underground pipe networks and is Managing Director of Downley Consultants, an internationally renowned consulting engineer specialising in trenchless technology projects worldwide.

His experience in underground infrastructure encompasses inspection, assessment, and rehabilitation and in developing strategies for managing rehabilitation programmes including risk management. He is a member of the Council of UKSTT and a past President of the Swiss Society for Trenchless Technology, CHSTT.

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Mentioned every year in the Chair's speech at the Annual Dinner & Awards Ceremony, the UKSTT website has a dedicated link for visitors to raise technical enquiries they may have concerning the world of trenchless working. In addition, the administration team at Kenilworth receive many calls seeking help.

As part of the Corporate & Corporate PLUS Membership benefits package many of these works associated potential advisory / problem solution queries generate business directly or indirectly for our members.

The service is co-ordinated through the administration team and managed by the Society's Technical & Education sub-committee. After receipt the team review the information and often contacts the enquirer to better understand the problem and improve the information to be circulated to the Society's corporate membership. All Corporate members, who are able to offer help, service or

The estimated approximate value of the potential work circulated to our corporate members through this system each year regularly exceeds £1million.

So if you have a question then feel welcome to use the service www.ukstt.org.uk or even better support part of the work of the Society and become a corporate or corporate PLUS member. What's to lose give it a try.

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EVENTS AND MEETINGS

2022

March 7-10: 17th Pipeline Technology Conference
Estrel Congress Center, Berlin, Germany

April: SAO Paulo No-Dig Show
Sao Paulo, Brazil. Details from: www.saopaulonodig.com.br

April 15–17: ITTC China 2022
26th China International Trenchless Technology Conference (ITTC) & Exhibition
Suzhou International Expo Centre, Suzhou, China
Details from:
http://www.cstt.org.cn/Yhome/Index/index.html

May 16-17: 4th Trenchless Balkans Conference and Exhibition in conjunction with 4th Water Loss Forum Balkans
Grand Hotel Italia in Cluj-Napoca, Romania

May 30-June 3: IFAT 2022
Munich, Germany.
Details from: https://www.ifat.de/en

June 17-24: North American Tunnelling Conference (NAT) 2022
Philadelphia, USA.
Details from: http://natconference.com/

July 27-28: Trenchless Asia 2022
Kuala Lumpur, Malaysia.
Details from: www.trenchlessasia.com

13-15 of September: No-Dig Live 2022
Peterborough, UK.
Details from: www.nodiglive.co.uk
Includes the UKSTT Gala Dinner and Awards Ceremony

October 3-5: No-Dig Helsinki 2022
Helsinki, Finland
Details from: www.nodighelsinki.com

October 24–30, 2022: bauma
Munich, Germany
Details from: www.bauma.de/

November 2-3: No-Dig Turkey 2022
Istanbul Lutfi Kirdar
International Convention and Exhibition Centre

If you have an event, course or meeting scheduled and would like to add it to this listing please forward details to: editorial@trenchless-works.com