TRENCHLESSWORKS

THE VOICE OF THE TRENCHLESS COMMUNITY

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CHANNELINE
GRP Structural Lining Systems

ANY SHAPE – ANY SIZE

The general concept of the Channeline product is that a remarkably stiff and strong panel section is constructed, but with a relatively thin wall. The product differs from that of standard GRP hand or filament wound pipework in several fundamental and important ways. Normal GRP pipework consists of windings of layers of resin-saturated glass, which is impregnated with sand, achieving its stiffness by building up ever increasing wall thickness. Channeline however, derives its strength and stiffness through a different method, employing the mechanics of sandwich panel design, incorporating a unique polymer and aggregate core.

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CHANNELINE
Beyond the Ordinary

Beyond the Ordinary

SPOTLIGHT

A CAREER OF CONTRIBUTIONS TO TRENCHLESS TECHNOLOGY

Samuel Ariaratnam, professor and chair of the construction engineering programme in the Del E. Webb School of Construction at Arizona State University

Samuel Ariaratnam, professor and chair of the construction engineering programme in the Del E. Webb School of Construction at Arizona State University (ASU), USA has been named the Beavers-Ames Chair in Heavy Construction after years of involvement with the organisation.

The Beavers-Ames Chair in Heavy Construction was established at ASU to bolster construction management and engineering education for undergraduate students and to promote the heavy construction industry.

"Sam's passion, energy and enthusiasm for all that we do in our enterprise is unparalleled. He is the first to step up to help advance an initiative or champion a cause." said Ram Pendyala, the director of the School of Sustainable Engineering and the Built Environment, one of the six schools in the Ira A. Fulton Schools of Engineering. "He always makes time to engage, collaborate and brainstorm new and exciting ideas. Even in the midst of the pandemic replete with Zoom meetings and virtual engagements, Sam has consistently walked the halls of College Avenue Commons to knock on doors, connect in person and check on the welfare of others."

The position honours Bill Ames and Wink Ames, who passed away in late 2020, and was established by trustees of the Beavers Charitable Trust in recognition of the Ames family's generations of support of the construction industry and construction education in California and Arizona.

"I want to recognise Wink Ames, as he was a wonderful man and he was such an inspiration to our programme." Ariaratnam said. "Since I arrived here on faculty in 2001, he was always a big supporter of what we do at ASU and in the construction programmes, and I am honoured to be the Beavers-Ames Chair of Heavy Construction to be able to continue some of the great things that he did."

The Beavers' investment in the professorship is with the goal of encouraging students to pursue careers in the heavy construction industry and help them foster connections with professionals in the industry.

"In today's environment, the typical hiring for permanent employment of graduates involves summer internships that provide both the student and a company time to determine if they are a good fit." said Dave Woods, the executive director of the Beavers. "We hope that >

SPOTLIGHT

partnering with Dr Ariaratnam will create opportunities for students to find internships and permanent jobs with heavy civil contractors, ideally Beavers member companies."

A Career Of Contributions

Ariaratnam's contributions to the heavy construction industry are extensive. He has served on the North American Society for Trenchless Technology board of directors from 2001 to 2006, and was the chairman of the International Society for Trenchless Technology from 2010 to 2013 and chair of the American Society of Civil Engineers Pipelines Division Executive Committee from 2017 to 2018.

Throughout his career, Ariaratnam has earned five patents, written eight books, and published more than 300 technical papers in his research area, which focuses on trenchless construction methods, horizontal directional drilling and trenchless pipe replacement. Ariaratnam was elected to the Canadian Academy of Engineering in 2018 and the National Academy of Construction in 2019.

"The heavy construction industry has been my focus in teaching and research and I want to continue to be a champion of that, representing ASU and the Beavers-Ames Chair"

Serving The Next Generation Of Students

Ariaratnam plans to use this new endowed chair to promote heavy infrastructure and heavy construction education in the School of Sustainable Engineering and the Built Environment.

"I am going to help build on and enhance the curriculum." Ariaratnam said. "Any of our students in construction management, construction engineering and civil engineering could be interested in pursuing that pathway for heavy construction. So, one of my most important roles is to help connect students with mentors in the industry."

Ariaratnam also noted that many people in the heavy construction industry are also members of the Beavers Trust, and he hopes to engage students through those connections. Besides residential, commercial and industrial construction, there are several different areas of the industry for ASU students to explore including heavy construction.

"The heavy construction industry has been my focus in teaching and research and I want to continue to be a champion of that, representing ASU and the Beavers-Ames Chair." Ariaratnam said. "That includes sharing my research at various conferences and different industry events, getting students more engaged in research activities and helping them gain an appetite for being part of the heavy construction industry."

Ram Pendyala, the director of the School of Sustainable Engineering and the Built Environment said of Ariaratnam's honour: "It is truly a well-deserved title that recognises his 25 years of teaching, research and service, 20 of which he has devoted to ASU."

PIG BECOMES OFFICIAL SUPPORTER

Norman Howell, chief executive officer, Pipeline Industries Guild

I am delighted to announce that The Pipeline Industries Guild (PIG) is joining the team following an agreement to become an official supporter of Trenchless Works.

This arrangement provides Guild members with access to the Trenchless Works multimedia platform that includes a monthly online magazine, website and social media allowing them to gain the latest information on trenchless pipeline installation and rehabilitation from around the world. The agreement allows the Guild and their members to use the Trenchless Works platform to promote their activities, projects and products.

Norman Howell, Chief Executive Officer of The Pipeline Industries Guild commented: "This is an exciting opportunity for the Guild and its members to gain access to a wider global market and forge new business alliances. Trenchless Works is the official publication of the ISTT and UKSTT and offers the prospect for the Guild to develop closer ties with these organisations as the pipeline industry, as a whole, looks to tackle some of the major issues that we now face such as digital transformation, climate change, biodiversity and moving to net zero. As this new venture develops it will provide additional opportunities for mutual co-operation and the prospects for new events that will further enhance the benefits we provide to our members. >

"The support from the Guild will bring Trenchless Works to an even greater audience, helping to promote the amazing work of this highly relevant and fast growth sector"

Trenchless Works publisher Paul Harwood, commented, saying: "The support from the Guild will bring Trenchless Works to an even greater audience, helping to promote the amazing work of this highly relevant and fast growth sector. We look forward to working with the Guild in promoting the environmental and commercial benefits of trenchless technology to companies, stakeholders and influencers across the globe."

Additionally, I am excited about the Green Alliance joint initiative by UKSTT and The Pipeline Industries Guild. The initiative will include a live seminar hosted jointly by UKSTT and Pipeline Industries Guild at this year's No-Dig Live focusing on the 'Road to Net Zero'. More details will be announced soon.

On the subject of No-Dig live, due to exhibitor demand additional space has been taken across both the indoor and outdoor areas, the conference programme is shaping up nicely and visitor registration will soon be open. Please do contact the Westrade team for further information or simply visit the show website www.nodiglive.co.uk to be part of the springboard for the underground infrastructure sector.

PIPETRONICS SUPPLIES 100TH SEWER ROBOT SYSTEM TO KATEC

From left to right: Matthias Kast (Pipetronics Branch Manager Röthenbach), Gerd Müller (KATEC Owner and Managing Director), Armin Heydt (KATEC Managing Director), Christian Noll (Pipetronics Managing Director), Steffen Roll (Pipetronics Sales Manager)

"We are very proud that in our relatively short company history, we have been able to deliver the 100th robot system and we would like to thank KATEC for their great trust"

For the first time, the successful renovation company based in Vulkaneifel, Germany will be relying on electrically powered multifunctional systems for milling, filling and grouting.

In January 2021, sewer robot systems with the serial numbers 99 and 100 were supplied to KATEC-Kanaltechnik Müller & Wahl GmbH. KATEC, with its headquarters in Jünkerath in the Eifel and a branch in Breithenthal in the Hunsrück is one of the leading companies in the sector within Germany. Initially, the rehabilitation specialist invested in 16 sewer robots with two electrical multifunctional systems from Pipetronics. These are now the company's 7th and 8th robot systems from this supplier.

At the final assembly plant in Röthenbach an der Pegnitz, Managing Director Christian Noll and the Pipetronics team handed over the first two electrically-powered eMULTI systems to KATEC Managing Directors Gerd Müller and Armin Heydt and Fleet Manager Gerhard Bach.

"We are very proud that in our relatively short company history, we have been able to deliver the 100th robot system and we would like to thank KATEC for their great trust." said Christian Noll at the handover. We received our very first robot order from KATEC in January 2016." The two new eMULTI systems from KATEC each feature the electric milling robot eCUTTER and the PI.TRON filling and grouting system for use in pipe diameters DN 150 to DN 800 (including ovoid profiles). >

The eMULTI system.

Quiet, Fast and Economical

The exceptionally quiet and electrically-powered ‘eCUTTER’ milling robot was the first innovation in the short history of Pipetronics. The performance benchmarks during development were the proven, high-performance hydraulic systems. Electrically powered multifunctional systems, or ‘eMULTI’ for short, have been supplied since 2017, the eCUTTER in one system with the proven PI.TRON filling and grouting process.

In addition to the multifunctionality of the eMULTI systems, a significant advantage is also provided by the electric drive of all systems, which is based on a safe 48 V on-board network. The systems are usually powered by a rechargeable battery, which enables an entire day of work without any additional external power supply. “The systems are significantly quieter and more economical than conventional milling robot systems powered by air or oil hydraulics. This is clearly demonstrated by the energy balance.” explained Pipetronics Managing Director Christian Noll. The quiet, electrically-powered milling work could also be undertaken in the evening or at night, as the disturbance to residents is reduced to a minimum compared to loud background noise of other options.

In the meantime, more than 90% of the robot systems at Pipetronics are ordered and delivered as electrical eCUTTER or eMULTI systems. >

“The systems are significantly quieter and more economical than conventional milling robot systems powered by air or oil hydraulics. This is clearly demonstrated by the energy balance”

Pipetronics equipment fitted into a works van

The Future for Trenchless Pipe Rehabilitation

Electric, multifunction eMULTI systems from Pipetronics are attracting increasing interest from sewer rehabilitation companies. They allow operators to carry out several necessary tasks on the construction site with one system and one crew. This multifunctionality that Pipetronics offers is claimed to be unique worldwide. The system design is based on a robot system that is equipped with an eCUTTER and the PI.TRON filling and grouting process. The other systems can be easily attached to the filling robots using a bayonet lock. All of the systems are now operated solely via a control station. Each customer can assemble their system individually so that it can be easily retrofitted with additional technologies later if necessary. The eMULTI therefore offers a wide variety of possible uses with up to seven technologies in one system including:

- eCUTTER Milling work (DN 150 – DN 800; circular/ovoid profiles)
- PI.TRON filling procedure filling cracks, shards, etc. with epoxy resins (DN 150 – DN 800; circular/ovoid profiles)

Van interiors are fitted-out to customer specifications

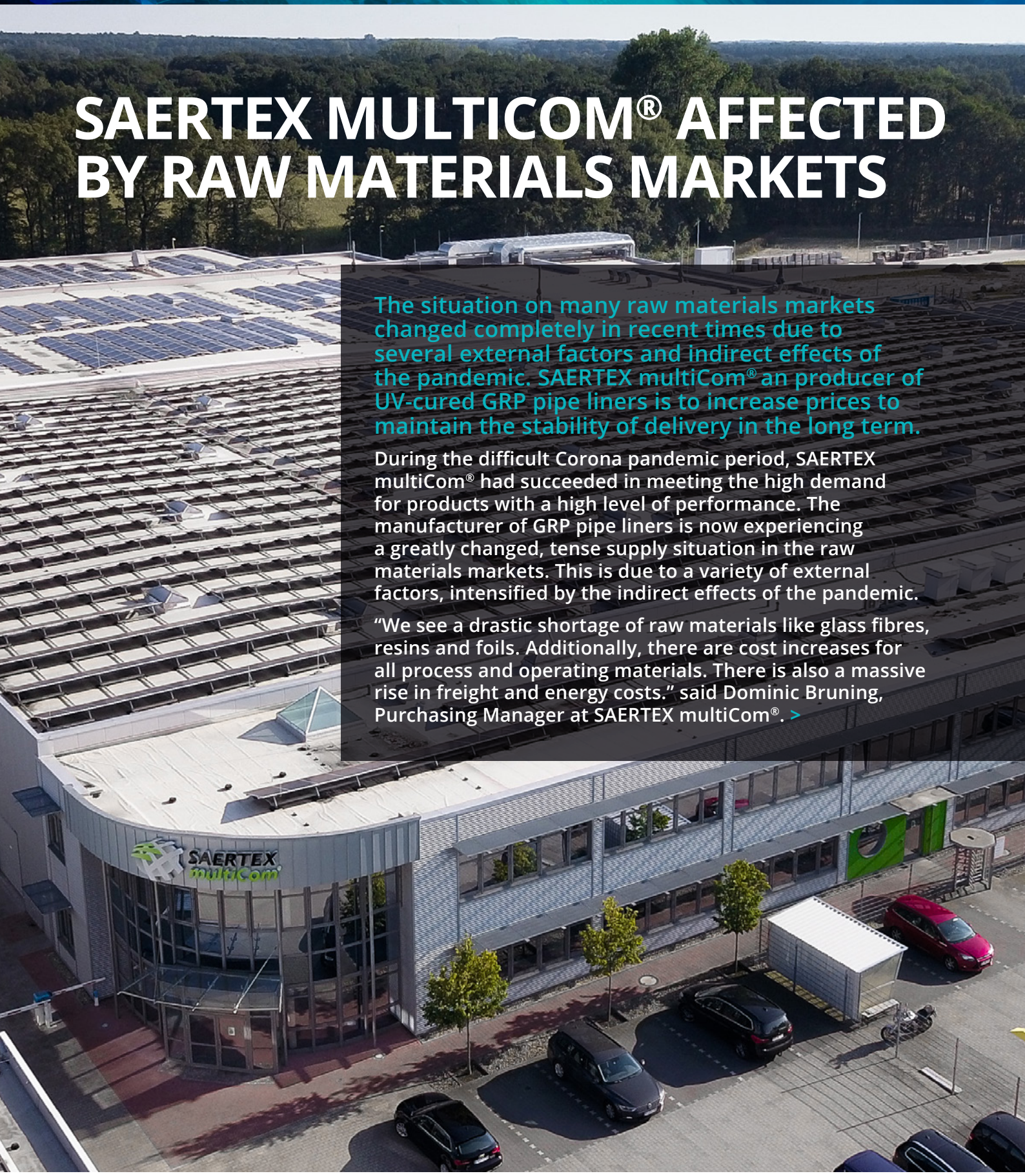
"Electric, multifunction eMULTI systems from Pipetronics are attracting increasing interest from sewer rehabilitation companies"

- PI.TRON formwork procedure grouting with epoxy resins of sockets, side inlets or connecting pipe liners in the inlet area using formwork (DN 150-DN 800; circular/ovoid profiles)
- PI.TRON HatSet – setting device to set heated setting device for hat profiles, e.g. connection of pipe liners in the inlet area
- PI.TRON WaterStop pre-sealing of water infiltration before installation of a liner (DN 150 – DN 800; circular/ovoid profiles)
- HydroJet kit for hgh-pressure milling with massive deposits and obstacles (adaptation for e.g., HD systems from Falch)
- Connection of sleeve systems adaptations for offset packers for setting V4A stainless steel sleeves, e.g., Pipe Seal or Quick-Lock

With the newly developed ovoid profile chassis, the eMULTI technologies can also be used in these profiles. They are uniquely equipped with a remote-controlled, electrically freely adjustable chassis for use with both milling and other techniques in ovoid profiles.

www.pipetronics.com

SAERTEX MULTICOM® AFFECTED BY RAW MATERIALS MARKETS



The situation on many raw materials markets changed completely in recent times due to several external factors and indirect effects of the pandemic. SAERTEX multiCom® an producer of UV-cured GRP pipe liners is to increase prices to maintain the stability of delivery in the long term.

During the difficult Corona pandemic period, SAERTEX multiCom® had succeeded in meeting the high demand for products with a high level of performance. The manufacturer of GRP pipe liners is now experiencing a greatly changed, tense supply situation in the raw materials markets. This is due to a variety of external factors, intensified by the indirect effects of the pandemic.

"We see a drastic shortage of raw materials like glass fibres, resins and foils. Additionally, there are cost increases for all process and operating materials. There is also a massive rise in freight and energy costs." said Dominic Bruning, Purchasing Manager at SAERTEX multiCom®. >

Installing a Saertex liner

SAERTEX multiCom has therefore announced that with immediate effect (18/3/21) it will adjust its prices to this dynamic development. The increase will be 9.3% for SAERTEX-LINERs® in Europe, Africa, and South America. These areas are supplied from the European SAERTEX multiCom® site, which is now the first production centre affected by the price increases in the raw materials markets.

Due to the pandemic, many large manufacturers of glass fibres have shut down the global capacities of their blast furnaces. Furthermore, there is news about force majeure (shortfalls due to force majeure) from well-known manufacturers in the chemical and glass fibre industry. Therefore, the demand for raw materials such as glass fibres, resins and foils are much higher than the available supply. Not only are raw materials for the production of the GRP pipe liners becoming scarce but also packaging materials and container capacities. Through a global production network and long-term partnerships with suppliers, SAERTEX multiCom® has a proven, stable supply chain. The company has a confident outlook on the challenges ahead.

"We will keep our customers informed with absolute clarity about the dynamic developments in the raw materials markets." said Kai Diecks, Managing Director of SAERTEX multiCom®. "We are confident that we can manage these extraordinary times together with our partners."

www.saertex-multicom.de

"We see a drastic shortage of raw materials like glass fibres, resins and foils. Additionally, there are cost increases for all process and operating materials"

2021
NO-DIG LIVE

NO-DIG LIVE 2021

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- Seminars

www.nodiglive.co.uk

For more details regarding exhibiting and sponsorship opportunities please contact: Gary King at gking@westrade.co.uk or Trevor Dorrell at tdorrell@westrade.co.uk or call +44 (0)1923 723990

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in Association with Westrade

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TRACTO PAVES THE WAY TO THE FUTURE

Trenchless technology full-range supplier TRACTO takes an active role in developing the NODIG market

With the claim to be the only full-range supplier of trenchless technology, TRACTO delivers advanced NO-DIG solutions for all areas of pipe installation and renewal.

Since the invention of the GRUNDOMAT displacement hammer some sixty years ago, the German manufacturer has had a decisive influence on the industry and is now working on the vision of autonomous drilling. However, TRACTO's decades of experience are not only incorporated into its innovative products. The company also uses its expertise specifically to further develop the NO-DIG market and pave the way for pipeline construction into a more sustainable future.

"Trenchless technology is the only answer to the challenges of modern infrastructure"

Educating the Public and Decision-Makers

'Trenchless technology is the only answer to the challenges of modern infrastructure'. TRACTO is completely convinced of this and created the central 'Trenchless Development' division last summer. The declared goal is to further develop, promote and sustainably establish trenchless construction as an alternative to classic civil engineering both internationally and nationally. Stefan Schmitz is responsible for Germany, Austria and Switzerland (D-A-CH) and Thorsten Schulte for the rest of the world (ROW). In order to create more trust in the technology, the experts are focusing on targeted educational work towards the public and decision-makers in civil engineering. With a whole series of measures, they are demonstrating the ecological and economic advantages of trenchless technology. >

Targeted Measures for More Trenchless Projects

TRACTO's Trenchless Development measures are primarily aimed at network operators, utilities, planners, municipalities and associations. The service ranges from tender texts, studies and specialist information to individual advice via video chat and webinars explaining the use of trenchless technology for current areas of application. The free webinars will outline the resource-saving effect of trenchless technology in important trend topics such as smart city, fibre optic expansion and pipe renewal and highlight these added values as an alternative to the classic open construction method.

To ensure that pipeline construction projects are increasingly carried out and put out to tender using trenchless technology in the future, Stefan Schmitz and Thorsten Schulte are also actively working with various international associations and committees to shape global standards and regulations. In this way, not only the client-side but ultimately the entire industry benefits from Trenchless Development at TRACTO.

> "The free webinars will outline the resource-saving effect of trenchless technology in important trend topics such as smart city, fibre optic expansion and pipe renewal"

TRACTO Trenchless Development free online webinars inlcude:

02.06.2021, 14:00 h: TRENCHLESS TECHNOLOGY FOR A MODERN FTTX INFRASTRUCTURE
Info and registration at:
https://www.tracto-technik.com/Services/Help-support/Training/47/30

24.06.2021, 14:00 h: TRENCHLESS SOLUTIONS FOR THE INSTALLATION OF GAS PIPELINES
Info and registration at:
https://www.tracto-technik.com/Services/Help-support/Training/46/29

04.11.2021, 14:00 h: TRENCHLESS SOLUTIONS FOR THE INSTALLATION OF PIPELINE INFRASTRUCTURE IN SMART CITIES
Info and registration at:
https://www.tracto-technik.com/Services/Help-support/Training/48/31

Contact TRACTO Trenchless Development:

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www.TRACTO.com

ROBOTICS INVESTMENT FOR JET AIRE

Jet Aire has made another significant investment in its drainage remediation resources following the acquisition of additional robotic cutting equipment.

Jet Aire Robotic cutter

"Providing advanced technology and equipment for our site operations is a vital part of Jet Aire's service delivery"

Further enhancing its exceptional IMS Robotics fleet, the new DN80-250 IMS Micro Automatic Plus is a highly versatile and flexible robotic cutter designed for jobs in difficult pipe situations. Providing both automatic and manual feed with climbing and creeping function, the equipment can operate vertically or horizontally, through 90° elbows and small access openings.

Jet Aire's engineers use robotic cutters to open any laterals that are covered up when a liner or patch is installed. In addition, they are also employed when an item in a drain run cannot be removed using traditional high pressure water jetting attachment.

Providing 50 metres of solid hose, the DN80-250 IMS Micro Automatic Plus has high work efficiency due to its axial feed of approximately 100 mm. The robot head is remote-controlled and a powerful air motor offers an extremely high cutting force. The cutting robot incorporates detachable individual components, which reduces the length of maintenance operations.

Jet Aire Managing Director, Darren Pavan, said: "Providing advanced technology and equipment for our site operations is a vital part of Jet Aire's service delivery. The DN80-250 IMS Automatic Plus is another superb investment which supports the quality and efficiency of our maintenance and remediation. It enables our engineers to carry out a technically demanding work with maximum precision, assisting a faster turnaround of projects."

www.jetaire.co.uk

TBM Engineer Christina using the total station joystick function on the TUNIS.app to determine a new backsight prism for the moving station

THAMES TIDEWAY – NAVIGATING THE CHALLENGES

For over 160 years London, UK has been served well by the underground sewers constructed by Sir Joseph Bazalgette after The Great Stink of 1858. Although these brick-built sewers are still in good condition, over the years the growth in population to some 16 million has simply overwhelmed the system. >

Mounted total station inside the laser window for a fixed distance to the video target. Good in tight curves. A solid bracket for the AD12 on the gantry is essential for easy use of the moving station.

To alleviate this problem there is currently a new 'Supersewer' known as the Thames Tideway under construction, probably one of the largest utility installations currently underway in the UK.

The installation of the new sewer means that excess flows currently diverting into the River Thames will be collected and transferred to a treatment plant before cleaned effluent is discharged into the environment.

The Tideway route runs for some 25 km from Acton in the West London Borough of Ealing to the Beckton Sewage Treatment Works in the East London Borough of Newham at a diameter of 7.2 m and at depths of up to 60 m below surface.

After approval for the scheme in 2014, construction started in 2016, with tunnelling works for the new sewer commencing in 2018. The plan is to complete the tunnelling works in 2023 with all testing and commissioning works being finalised and the sewer in operation by 2025.

THAMES TIDEWAY WEST

Over the course of the tunnelling works, six TBMs will excavate the Tideway sewer and two smaller connecting tunnels. Tunnelling is being undertaken 24 hours per day and at the time of writing three of the six planned tunnelling sections have been completed. Once completed, tunnels are to be secondary lined to ensure water-tightness. >

"The installation of the new sewer means that excess flows currently diverting into the River Thames will be collected and transferred to a treatment plant before cleaned effluent is discharged into the environment"

Glued back sight prism for when it's difficult (or not allowed) to drill into segments

A normal prism mounted on tunnel wall. The moving station uses 3 prisms for the free stationing, but can work with a minimum of 2

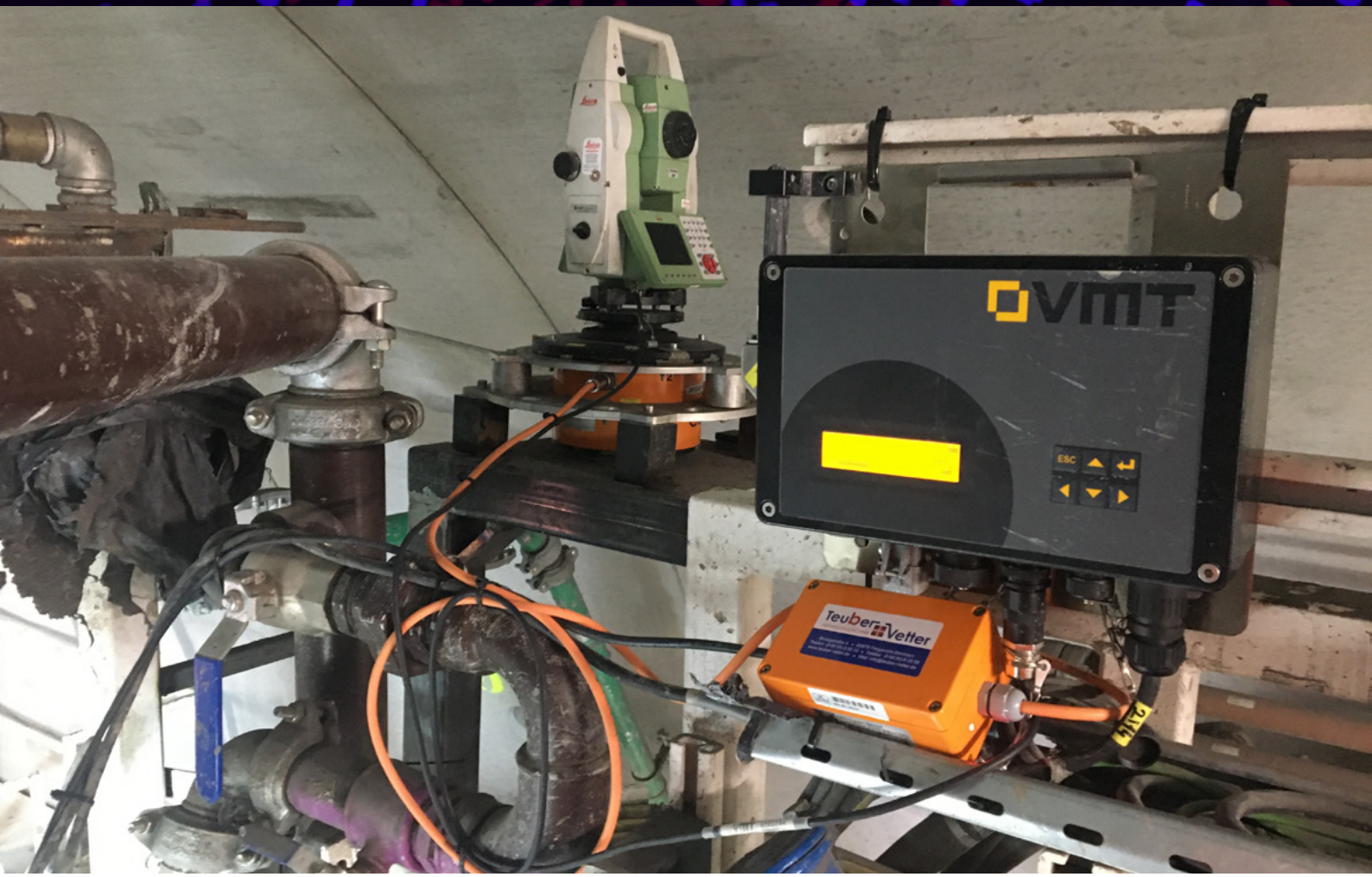
As part of the tunnelling works, Herrenknecht has provided one large diameter, EPB-type TBM for the construction of the Tideway Tunnel section designated Thames Tideway West C405. This section runs from Acton to Wandsworth over a length of 6,942 m using a TBM of outside diameter 8,100 mm, which allows for the installation of the secondary lining to bring the sewer to its operational diameter of 7.2 m. The contractor for this section of the project is BMB JV.

With the tunnelling being affected for use as a gravity sewer, the line and level of the route are vital to the success of the installation over the whole project.

For this particular section, specialist guidance system designer and manufacturer VMT (based in Bruchsal, Germany) provided several tunnelling support systems to guide and aid the TBM through its challenging route.

For the tunnel guidance operation, VMT provided:

- TUnIS Navigation TBMLaser – the initial primary navigation system which can be used for EPB, mixed shields and hard rock TBMs. The system is based on the use of a total station and a target unit installed within the TBM shield, which determine the current advance position of the TBM. When using segment machines using a small or limited laser window, the TBM position is continuously calculated during short-term interruptions. TUnIS Navigation TBMLaser offers high reliability as it provides temporary navigation through the thrust cylinders of the TBM.
- TUnIS.moving station – a new assistance system that enhances a laser and target-based navigation system in large diameter tunnelling. With TUnIS.moving station the total station is not mounted on the tunnel wall, but travels on the gantry of the TBM.
- TUnIS Office – a system that provides real-time navigation and ring data from one or more TBMs. The navigation system may be directly monitored from the site office. The user may immediately analyse and document current and historical data, and all persons involved in the project may track the tunnelling process: on the machine, in the site office, through web server, or on mobile terminals. Several users may simultaneously access the entire functionality of the navigation system in real-time without affecting the construction process. >



Hard wired cables at the moving station. But easy to switch back to the standard TBM laser system, with the total station mounted on the tunnel wall.

"Supporting and simplifying the surveyor and TBM engineers' day-to-day activities was the latest development from VMT's navigation range, the TUnIS. moving station"

- VDMS.Process – a web-based process data management system developed by VMT to handle complex infrastructural building projects. The system processes and correlates data from a variety of different sources, analyses them and displays them in user-friendly form so that they can be made available to project managers worldwide in a wide range of output forms. VDMS ensures full information transparency and supports the efficient control of both the TBM and many other operating processes within the tunnelling project.

Tunnelling works on this section started on 26 April 2019, with breakthrough on 24 September 2020. The customer was satisfied with the breakthrough accuracy.

Supporting and simplifying the surveyor and TBM engineers' day-to-day activities was the latest development from VMT's navigation range, the TUnIS.moving station. The TUnIS.moving station determines and calculates all data and information that is necessary for navigating the TBM along a tunnel axis. The high information content of the data displayed ensures optimum control of the machine position, thus helping to maintain a uniform shield run with minimal deviations from >

the desired route. The position and tendencies are continuously displayed to the shield operator, allowing vertical or horizontal curves to be easily and precisely controlled.

Three prisms installed on the tunnel wall with an active electronic laser target in the shield of the TBM are used for exact determination of position. In the first step, the exact current position of the total station is determined using the prisms. In the second step, the current position of the laser target is determined - and thus, the position of the TBM.

This new system undertook its earliest and very effective trials on the London Tideway Tunnel, in parallel with the initial primary navigation system (which was also provided by VMT). The trials were so successful that the tunnelling operation was moved onto the new TUnIS.moving station system, replacing the primary VMT standard navigation system for 560 metres of the advance.

Also tested on the site was the new SLuM.Connect hardware central box, as part of the existing automatic tailskin clearance measurement system, SLuM Ultra. The ring build is a decisive part of mechanised tunnelling with segmental lining. To determine the optimal installation of the ring it is necessary to observe the current position and orientation of the TBM, plus the position of the last built ring. SLuM Ultra enhances the ring build process by measuring the reference ring position relative to tail-skin axis with millimetre-accuracy. The TUnIS.App was also widely used by site engineers and surveyors, allowing remote operation of the navigation system from outside the control cabin.

Roy Behrend, Chief Surveyor Tunnel for the BMB-Joint Venture on the project said: “Communication was really good with VMT and their site engineers for the testing and implementation of the new TUnIS.moving station system. There was always immediate ongoing support for VMT’s navigation systems and TUnIS software. Support was also available remotely. The TUnIS software package is well developed and its menu systems allow for ease of use. The system is very well supported by VMT. VMT Support Engineers also have remote access to the system which allows for easy system maintenance and testing. I would not hesitate to recommend or use VMT products again.”

www.vmt-gmbh.de/en/

“Communication was really good with VMT and their site engineers for the testing and implementation of the new TUnIS. moving station system. There was always immediate ongoing support for VMT’s navigation systems and TUnIS software”

CHINA'S LARGEST ROBBINS CROSSOVER TBM LAUNCH

The largest ever Crossover (XRE) TBM in China launched in late March 2021 in Guangzhou for contractors Sichuan Jinshi Heavy Equipment Leasing Co., Ltd and CREC Bureau 2. >

China's largest Robbins Crossover TBM launched in late March 2021 to bore the 2.5 km (1.6 mile) long Pazhou Line Lot PZH-1 of the Pearl River Delta Intercity Railway Project.

The 9.16 m (30 ft) diameter Robbins Crossover (XRE) TBM was built using Onsite First Time Assembly (OFTA), a process that took just five months from the start of assembly to machine launch.

Onsite First Time Assembly (OFTA) was utilised to build the 9.16 m (30 ft) diameter Robbins TBM, taking just five months from the start of assembly to machine launch. The hybrid machine is boring the 2.5 km (1.6 mile) long Pazhou Line Lot PZH-1 of the Pearl River Delta Intercity Railway Project, which will offer better commutes for Guangzhou residents travelling to and from University City.

The machine will encounter various ground types during its bore, from moderately to strongly weathered argillaceous shales and sandstone to mixed face conditions. Much of the rock is fractured, while the quartz content is as high as 50%. “Not only are there poor ground conditions such as soft to hard uneven, fractured zones and full-face hard rock, but these sections appear to alternate frequently, which is the biggest challenge of the project. It will be a test of performance and tunnelling efficiency for the machine.” said Yongsheng Qi, Project Manager for Robbins China. The tunnel is also expected to cross under rivers and other bodies of water with a cover of 20 to 31 m (65 to 100 ft). The ground strata connects to the river and is highly permeable, resulting in expected water pressures above 7 bar. The project’s success lies in stabilising the water pressure at the face while ensuring acceptable advance rates and construction safety. >

The machine is optimised for rapidly changing conditions with two-speed gear reducers known as the Robbins Torque-Shift system for efficient tunnelling in hard, mixed, and soft ground.

"Not only are there poor ground conditions such as soft to hard uneven, fractured zones and full-face hard rock, but these sections appear to alternate frequently, which is the biggest challenge of the project"

The Crossover TBM features both hard rock and EPB modes and is optimised for the rapidly changing ground found on the project. An adaptable cutterhead design and two-speed gear reducers known as the Robbins Torque-Shift system enable efficient tunnelling in hard, mixed, and soft ground. An adaptable screw conveyor can be mounted in the centre or bottom of the mixing chamber depending on the mode. To combat high water pressures the machine is fitted with high pressure seals and can statically hold up to 30 bar. The XRE TBM began its excavation in EPB mode and will shift to hard rock mode to continue excavation after 1.5 km (0.9 mile) has been bored.

The unique project is one of several mixed ground operations using Robbins Crossover TBMs in China. Two 6.91 m (22.6 ft) diameter XRE machines are currently boring sections of the Chongqing Metro Phase 2 in ground conditions ranging from weathered mixed granite to weathered pegmatite and adamellite. The project is being undertaken by the same contractors as the Pearl River Delta bore. "At the Chongqing Metro project, we won the trust of the contractor with the performance of the Crossover machines. To date the highest monthly advance rate in Chongqing is 365 m (1,197 ft). This is one of the main reasons the contractor again selected a Robbins Crossover TBM for the Pearl River Delta project." observed Qi.

With rates at Chongqing Metro as a precedent, the Pearl River Delta tunnel is scheduled to be completed by the end of 2021 and put into operation in 2023.

www.robbinstbm.com

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TEAMWORK MAKES UV LINING SUCCESS

Pit bottom during the curing process

"Coming together is the beginning. Keeping together is progress. Working together is success." A quote from Henry Ford. ProKASRO and iMPREG took this saying from the automobile pioneer to heart in mid-March 2021 in Reggio Emilia, Italy, and in turn together became pioneers in the sewer rehabilitation industry with the installation of a DN 2000 UV cured lining in Italy, which is claimed to be a milestone in sewer rehabilitation. >

Installing the iMPREG GL16 DN 2000 liner into the pipelne

"iMPREG is consistently continuing its tradition of leading the way around large profile rehabilitation"

Faster and in less time

In 2018 ProKASRO Mechatronik GmbH developed the new high-performance POWER UV system with the goal of curing liners of unprecedented size in the near future. By coupling three KASRO POWER Jumbo UV cores with an output of 3 x 6 x 2,000 W and with the help of a newly designed packer for diameters of DN 1,600 to DN 2,000, the basis of a system was created by equipment manufacturer ProKASRO. By increasing the standard 1,000 W to 2,000 W UV bulbs and the resulting maximum output of 36,000 W, pulling speeds, especially in large diameters, and therefore also the curing times, can be drastically reduced.

Further development in large profile rehabilitation

Since the summer of 2020, the liner manufacturer iMPREG has expanded production with a correspondingly larger impregnation system up to DN 2000 and developed the necessary raw materials with the various suppliers for foils and glass. In this way, iMPREG is consistently continuing its tradition of leading the way around large profile rehabilitation. Nothing stood in the way of the cooperation between ProKASRO and iMPREG to implement the plan to install a DN 2000 liner. >

Preparing to install the UV light train into the liner

"The iMPREG Liner GL16, with very good material characteristics and a new fibreglass design, enables finely nuanced gradations of wall thicknesses"

The ready-to-install liner was picked up from the factory in Ammerbuch with a heavy-duty transporter and arrived at the construction site in Italy at the same time as the installation equipment, so that lining work could start immediately without any loss of time.

Designed for large dimensions

An iMPREGLiner GL16, with a wall thickness of 11 mm (without peroxide), a total length of 164 m and a significant weight of 22 t was used. The iMPREG Liner GL16, with very good material characteristics and a new fibreglass design, enables finely nuanced gradations of wall thicknesses. At the same time, there is a technical benefit, as the liner makes it easier to deal with larger dimensions. So perfect requirements for the DN 2000 construction site, where the team of ProKASRO and iMPREG application technicians in Italy, was deployed on March 17, 2021.

The client Consorzio di Bonifica Dell 'Emilia Centrale instructed Campania Sonda Srl in cooperation with the installation subcontractor Danphix S.p.A. to rehabilitate an irrigation >

Preparing the KASRO Jumbo UV core with a wheel extension for DN 2000

canal with a diameter of two meters using UV lining. The old pipe to be rehabilitated was stable and had no deformations. Small cracks and leaky sockets, which in the long term would have endangered the adequate water supply for the adjacent wheat fields through exfiltration required prompt action. By installing the liner, the sewer could be sealed and the supply of sufficient water to the agricultural area assured before the summer months where extreme heat could endanger the harvest.

Milestone in trenchless sewer rehabilitation

After preparation of the construction site with liner and packer installation, calibration of the liner and insertion of the KASRO triple jumbo cores, curing of the DN2000 liner was completed in just four hours. A milestone in sewer rehabilitation has been set and everyone involved is more than proud to have participated in this event. Thanks to the combination of the new POWER UV rehabilitation system from ProKASRO and the GRP liner from iMPREG, as well as the professional site preparation from Danphix, the task, unprecedented anywhere in the world, was mastered with flying colours and at record speed.

www.prokasro.de

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- Operation of all POWER KASRO light sources
- Working diameters DN 150-2000
- Reduced curing times
- FIRST DN2000/80" liner worldwide

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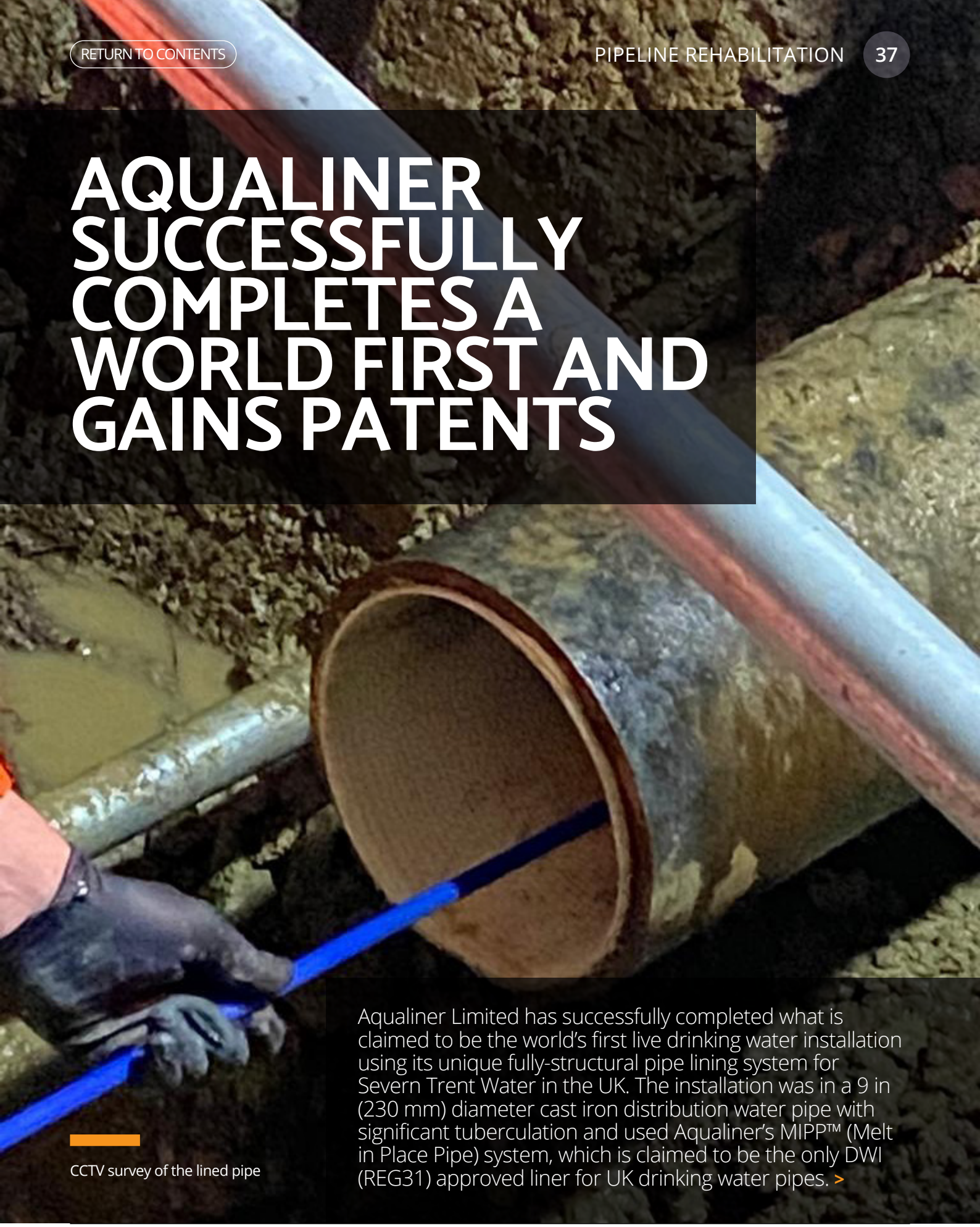
AQUALINER SUCCESSFULLY COMPLETES A WORLD FIRST AND GAINS PATENTS



CCTV survey of the lined pipe

Aqualiner Limited has successfully completed what is claimed to be the world's first live drinking water installation using its unique fully-structural pipe lining system for Severn Trent Water in the UK. The installation was in a 9 in (230 mm) diameter cast iron distribution water pipe with significant tuberculation and used Aqualiner's MIPP™ (Melt in Place Pipe) system, which is claimed to be the only DWI (REG31) approved liner for UK drinking water pipes. >

The entry pit and exit pit set-up

"This is a key achievement for Severn Trent Water and Aqualiner in the planned development of our MIPP process that offers the water companies a more efficient, less disruptive way of renewing their aging network of pipes by structurally lining them."

Aqualiner Limited, a company commercialising a unique trenchless pipelining technology for the water markets and Severn Trent Water, one of the largest water companies in the UK, completed the installation near Wrexham, Wales, for Hafren Dyfrdwy which is part of the Severn Trent Group.

The installation was on the 9 in (230 mm) diameter cast iron pipe was the equivalent of replacing the pipe, especially in terms of improvement in water quality, but without having to dig the pipe up. Pipe renewal options are currently limited to open cut replacement, pipe bursting or slip lining. They all have an impact on the customer or on the capacity of the network. The water industry is continually seeking new and innovative ways to reduce these issues. After many years of research and development, a novel structural liner has been developed by Aqualiner, in conjunction with Severn Trent, Yorkshire Water, Anglian Water and Wessex Water.

Aqualiner's fully structural stand-alone liner, comprising of glass fibre reinforced Polypropylene, is environmentally friendly as it involves no hazardous chemicals/resins and uses minimal amounts of power to install. The liner is thin-walled (3 mm), minimising any loss of hydraulic capacity, yet strong enough to withstand all the internal pressures and external ground loads thereby extending the life of the pipe for up to 60 years. Once the lining process is completed and cooled it can be rapidly returned to service and requires minimal future maintenance.

Aqualiner was provided with excellent project and site support by the operational teams from both Hafren Dyfrdwy and Severn Trent Water. Severn Trent Water is the UK's second biggest water >

The Aqualiner Inversion Drum

The liner being pulled into the host pipe

company serving more than 4.2 million homes and business customers in England and Wales. The company delivers almost 2 billion litres of water every day through 46,000 km of pipes.

"This is a key achievement for Severn Trent Water and Aqualiner in the planned development of our MIPP process that offers the water companies a more efficient, less disruptive way of renewing their aging network of pipes by structurally lining them. We are extremely excited by the significant commercial implications having completed our first live drinking water installation." stated Archie Adams, Aqualiner's Managing Director, who added, "Aqualiner now plans to raise additional investment to rapidly focus on the expansion of its lining capabilities by producing 'utility contractor ready' commercial equipment with 100 mm to 300 mm diameter capability, increase the lining length and develop associated lining materials. At the same time, Aqualiner plans to expand the business to meet the demands of global licensed contractors conducting commercial installations."

"2021 has become a milestone year for Aqualiner's patent portfolio... as the total issued patents in various countries increases from 1 to 8"

Patents

Further to this, 2021 has become a milestone year for Aqualiner's patent portfolio (excluding licensed patents) as the total issued patents in various countries increases from 1 to 8 with a further 11 applications currently pending. >

The liner in place at the exit pit

The lined pipe on completion of the installation

Aqualiner recently announced that it has received confirmation from UK Patent Office of the grant of its Patent - GB2571127. This Patent covers Aqualiner's unique design necessary to achieve even air flow and temperature as it exits the heated pig. The Company has also filed patent applications for European coverage along with US, Canada, Japan and Australia. These applications remain pending.

In addition, the Company has also received confirmation of the grant of its European Patent – 3519723, covering the unique internal design of the heated Pig that melts the material in the pipe, in France, Germany, Spain, Switzerland, Ireland and Liechtenstein. Further applications for this patent are pending in US, Australia, Japan, Belgium, Netherlands and Italy.

The Company continues to build its patent portfolio extending its life to 2038 and beyond. Aqualiner was originally granted, by a consortium including Severn Trent Water, Anglian Water and Yorkshire Water, exclusive worldwide rights for the use of patents covering the lining process and related equipment. These patents covered the applications of the original Aqualiner prototype, but additional patent protection has been and is being sought by Aqualiner as the design and applications develop. During 2016, the Company started to make applications for patents covering the new inventions.

"Aqualiner has made a huge financial investment researching and developing our pipe lining technology. Protecting that investment through a deliberate and calculated patent strategy is core to our long-term business plan. We are excited about the grant of these patents as they significantly extend the life and coverage of our intellectual property portfolio." stated Archie Adams, Aqualiner's Managing Director, who added, "The Company now has patents with a longer life than when Aqualiner was originally formed. Aqualiner's ownership of intellectual property is critical to obtaining competitive advantage along with corporate value and strengthening licensing terms."

www.aqualiner.co.uk

CIPP LINING QUALITY ASSURANCE AND THE ANNUAL IKT LINERREPORT

Flexural strength testing establishing the point at which the liner cracks and fails.

The IKT LinerReport, produced annually for the last 17 years, is a long-standing contribution to the international debate about quality assurance for Cured-In-Place-Pipe (CIPP) lining of gravity sewers.

Based on the results of short-term performance tests on samples from newly installed CIPP liners, it compares the findings between contractors and liner types. This article considers its origins, development and the trends that have been observed over time. English language versions of the annual reports can be viewed at www.ikt.institute under 'downloads'.

In response to the growing realisation amongst German sewer network owners of their need to address the problems of ageing infrastructure, IKT - Institute for Underground Infrastructure was formed in the mid-1990s, as a not-for-profit engineering research organisation. Trenchless rehabilitation techniques have since been a particular focus as the network owners need to understand the solutions and products available to them, their actual performance, their limitations and consequently what quality assurance measures they need to apply. So, in the early 2000s IKT was commissioned to inspect and test a range of installed CIPP liners to assess quality, performance and expected lifetimes. >

Modulus of elasticity testing establishes the ability of the liner to resist loading.

That research included excavating and removing ten 2 m long sections of CIPP lined pipe from different sewers for laboratory evaluation and testing. The liners were from a range of suppliers, had been installed for between 5 and 14 years and their diameters ranged from DN 250 to DN 900. Although, their overall performance was generally good, defects were found and these could mostly be attributed to issues during installation – such as insufficient 'wetting out' (distribution of resin throughout the carrier material), incomplete curing of the resin and folding of the liner. A fundamental cause for all of these was determined to be inadequate quality control during installation.

To further investigate the installation issue, IKT examined the use of short-term performance tests on samples from newly installed liners. Between January 2003 and June 2004 evaluations were undertaken on 769 samples from 9 different types of CIPP liner installed by 9 different German contractors.

Four short term tests were used:

- Modulus of elasticity – ability to resist loading
- Flexural strength – the point at which the liner cracks and fails
- Wall thickness – wall thickness and modulus of elasticity determine the strength of the liner
- Leak tightness – through the liner wall to assess wetting out/curing

Further information on these tests, their requirements and relevant standards can be found in the LinerReports. They have been >

"What is particularly noticeable is that a period of continuous improvement, in the proportion of samples passing each test, occurred over the first decade. The pass rate subsequently levelled off, but then a recent slight, but continuous, decline has occurred in recent years."

incorporated into German Association for Water, Wastewater and Waste (DWA) regulations (DWA A 143-3 and M 144-3) and into the criteria used by the German Institute for Building Technology (DIBt) for the approval of CIPP liner products.

EVALUATION

The evaluation focused on how each sample performed against either the 'declared' minimum value for the product, as stated by the manufacturer, or the specific performance requirement of the customer for that installation. Meeting these values determined the pass/fail criteria applied to each sample accordingly for each test.

The findings of this programme in 2003/4 showed that pass rates varied for each of the four tests and between contractors with achieving 100%, but some others scoring in the low 70%s (Figure 1). Publishing the report prompted much debate among suppliers, contractors, engineering consultancies and the sewer network owners concerning the approach and conduct of the tests. Above all, the sewer network operators were demanding a high level of quality for installed CIPP liners and quality testing, since their requirement was the supply of reliable, long-lasting sewer renovations with a service life of up to 50 years. Consequently, IKT was asked to continue to produce the report annually, covering samples tested during the previous calendar year. Seventeen years later, it continues to grow. The 2020 LinerReport is based on more samples (2,613), more contractors (27) and more countries (Germany, the Netherlands, Switzerland, Czech Republic, Belgium, United Kingdom and France) than in any previous year. >

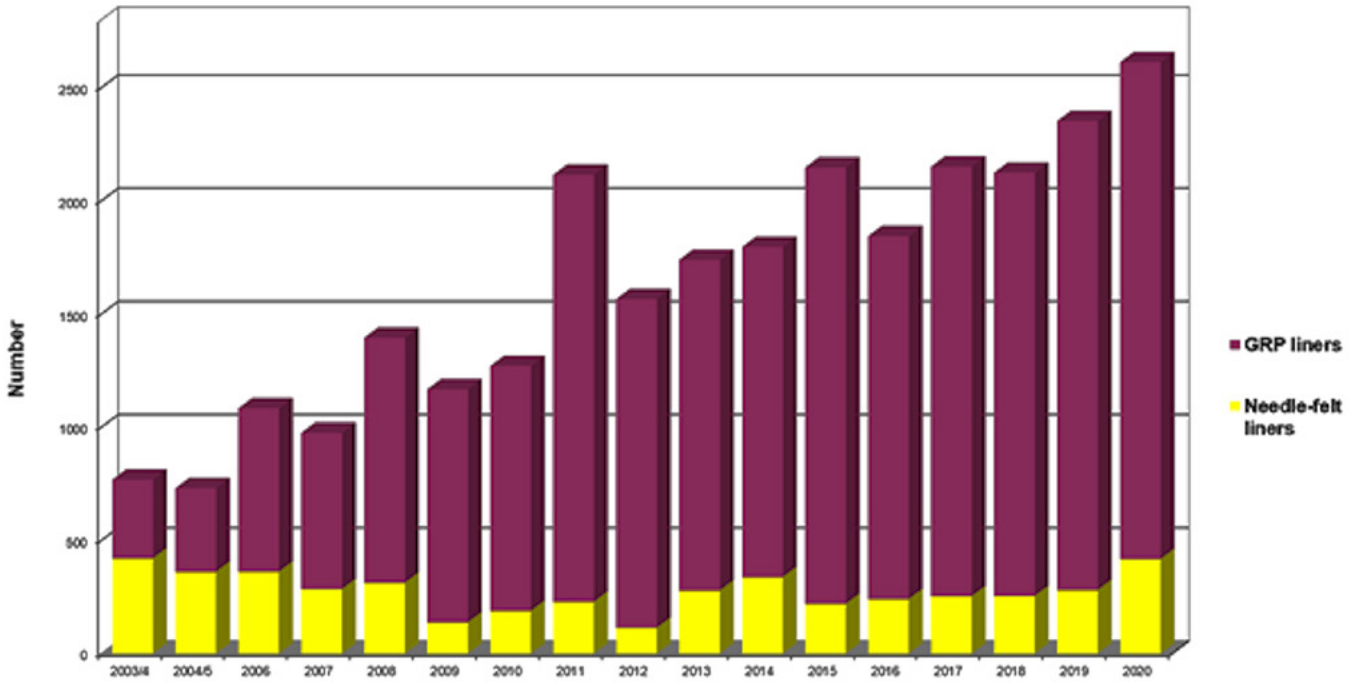


Figure 1: Number of GRP and Needle Felt CIPP liner samples included each year in the IKT-LinerReports from 2003 to 2020

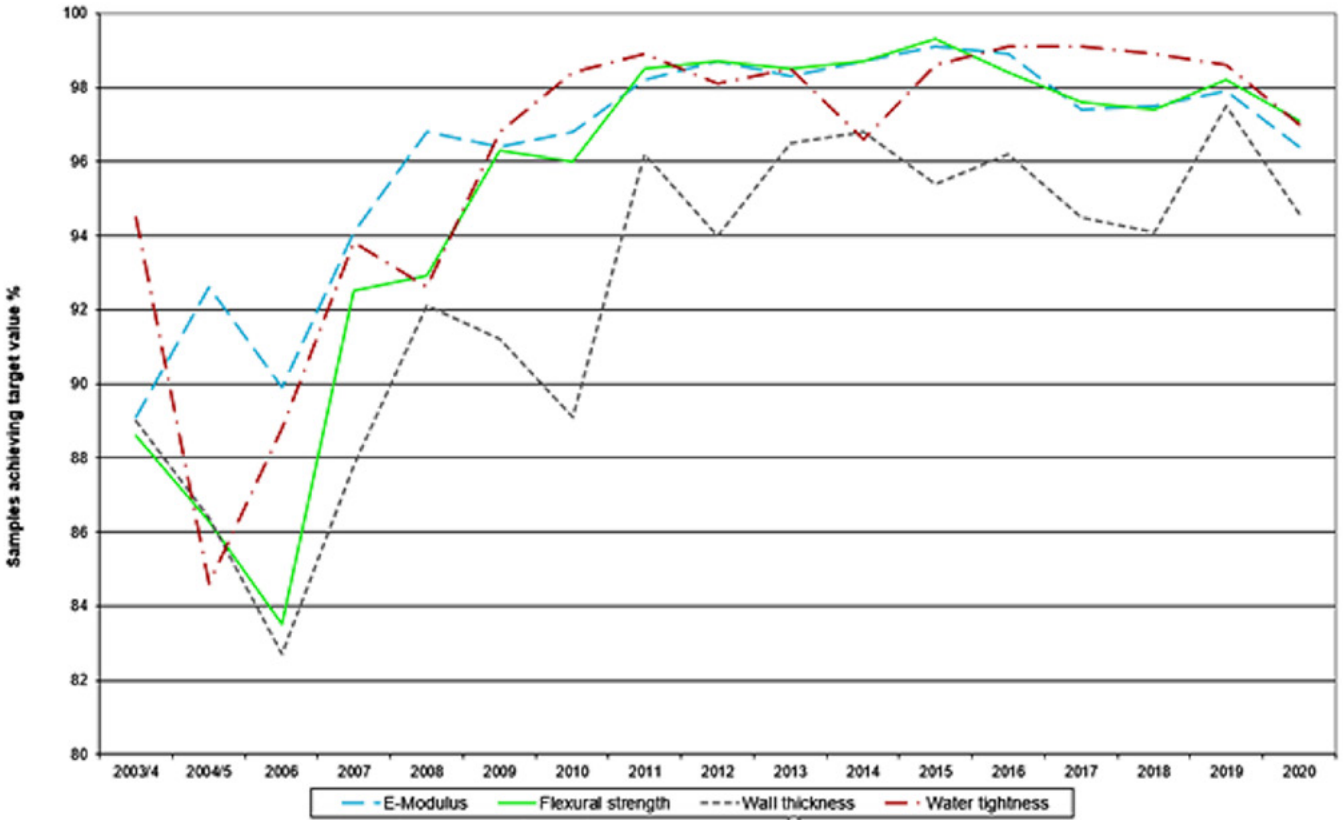


Figure 2: Percentage of CIPP liner samples that met their expected performance values for each of four short-term tests each year from 2003 to 2020.

To be included in the LinerReport a contractor or network owner needs to submit a minimum of 25 samples from liners installed in at least five different sites and they need to be of the same liner product type and be installed by the same contractor. Contractors can, and do, submit the required samples from more than one liner type. About one quarter of the samples are submitted by contractors themselves, the other three quarters are submitted by the sewer network owners who paid for the installations. If a sample fails, it is permitted for the contractor to go back and cut out a second sample from that liner for submission.

Figure 1 shows that the market and its growth has been dominated over the years by Glass Reinforced Plastic (GRP) liners, whilst the number of Needle-Felt liners submitted in 2020 is little changed from the 2010s.

Figure 2 shows the trends over time in the pass rate for each of the four tests and how these vary between the two generic liner types – GRP and Needle Felt. What is particularly noticeable is that a period of continuous improvement, in the proportion of samples passing each test, occurred over the first decade. The pass rate subsequently levelled off, but then a recent slight, but continuous, decline has occurred in recent years in the pass rate across all four tests. Overall, in 2020, one in eight samples did not meet the expected value for one or more of the test criteria. >

Establishing the liner wall thickness and modulus of elasticity determines the strength of the liner.

"When viewing the figures, it is important to note that CIPP liner design incorporates factors of safety. So, a liner that does not achieve its declared or expected value may still be capable of performing its function."

However, when viewing the figures, it is important to note that CIPP liner design incorporates factors of safety. So, a liner that does not achieve its declared or expected value may still be capable of performing its function. Consequently, when interpreting the results from short term testing of CIPP liners it is very important that both the client and contractor have a thorough understanding of what they actually indicate. What this method of reporting a pass/fail against expected values provides is a consistent measure of installed liner performance for the industry in support of continuous improvement programmes for quality assurance by manufacturers and installers. Detection of derogations, particularly when a systematic pattern is developing, enables investigation of the reasons for them and their resolution.

Underpinning, this approach of testing samples from installed CIPP liners is the fact that a pipe that is expected to last 50+ years but is only created on the day of installation, by a liner positioning process and then a curing process that are out of sight underground. By contrast, a new lay pipe is quality controlled and can be rejected at many stages: in the factory as it is extruded or cast, following a period of storage, after transportation, and then finally in the trench as it is laid.

Author: Iain Naismith, Senior Research Fellow, IKT - Institute for Underground Infrastructure E: naismith@ikt.intitute;

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Trenchless pipeline rehabilitation with UV-cured GRP pipe liners makes environmentally-friendly rehabilitation of pipeline systems possible. Besides low noise pollution and minimised excavation work, trenchless pipeline rehabilitation causes less CO_2 than open-trench construction.

Saerbeck-based SAERTEX multiCom® is now setting additional milestones in order to save even more CO_2 with this environmentally-friendly technology and make its product range even more sustainable. Together with Scott Bader, one of its strategic partners, the company has now implemented a significant innovation in the sustainable production of GRP pipe liners known as SAERTEX-LINER® UPgreen.

UPgreen technology is a sustainable process optimisation in the production of glass fibre reinforced pipe liners. For impregnation of the SAERTEX LINER® carried out at the factory,

SAERTEX multiCom® relies on unsaturated polyester resins (UP resins) from Scott Bader which are manufactured with a new, climate-friendly production method. Since the last quarter of 2020, 70% of the UP resins supplied have been produced with the new technology. As a result, in the last quarter of 2020 alone, 270,000 kg of CO_2 have already been demonstrably saved with around 160,000 running meters sold. That corresponds to the CO_2 footprint of 723 flights from Frankfurt am Main to New York.

"The new SAERTEX-LINER® UPgreen results in a targeted total CO_2 savings of more than one million kilograms of CO_2 a year" said Kai Diecks, Managing Director of SAERTEX multiCom. "UPgreen is an important step towards more sustainability, and many others are to follow soon."

"The new SAERTEX-LINER® UPgreen results in a targeted total CO_2 savings of more than one million kilograms of CO_2 a year"

UPgreen technology is used for all SAERTEX-LINERs in the product range that use UP resins. These GRP pipe liners are used for trenchless rehabilitation of municipal sewers and pipelines. The environmentally-friendly changeover of the UP resin system has no impact on the technical properties of the products. Therefore, customers do not have to take any technical changes into consideration for their projects. In addition, all further developments are in harmony with all globally-existing product approvals, so they remain valid. So far, SAERTEX multiCom® has launched the UPgreen technology in Europe. China and the USA will follow in the future.

The verifiable results in CO_2 optimisation from SAERTEX-LINER® UPgreen are passed on by SAERTEX multiCom® to its customers each quarter. Customers receive a certificate for this purpose with an individual calculation of the CO_2 savings for their orders in that time period. Customers can also substantiate their part of the CO_2 savings with this certificate. The first certificates have already been sent.

www.saertex-multicom.com

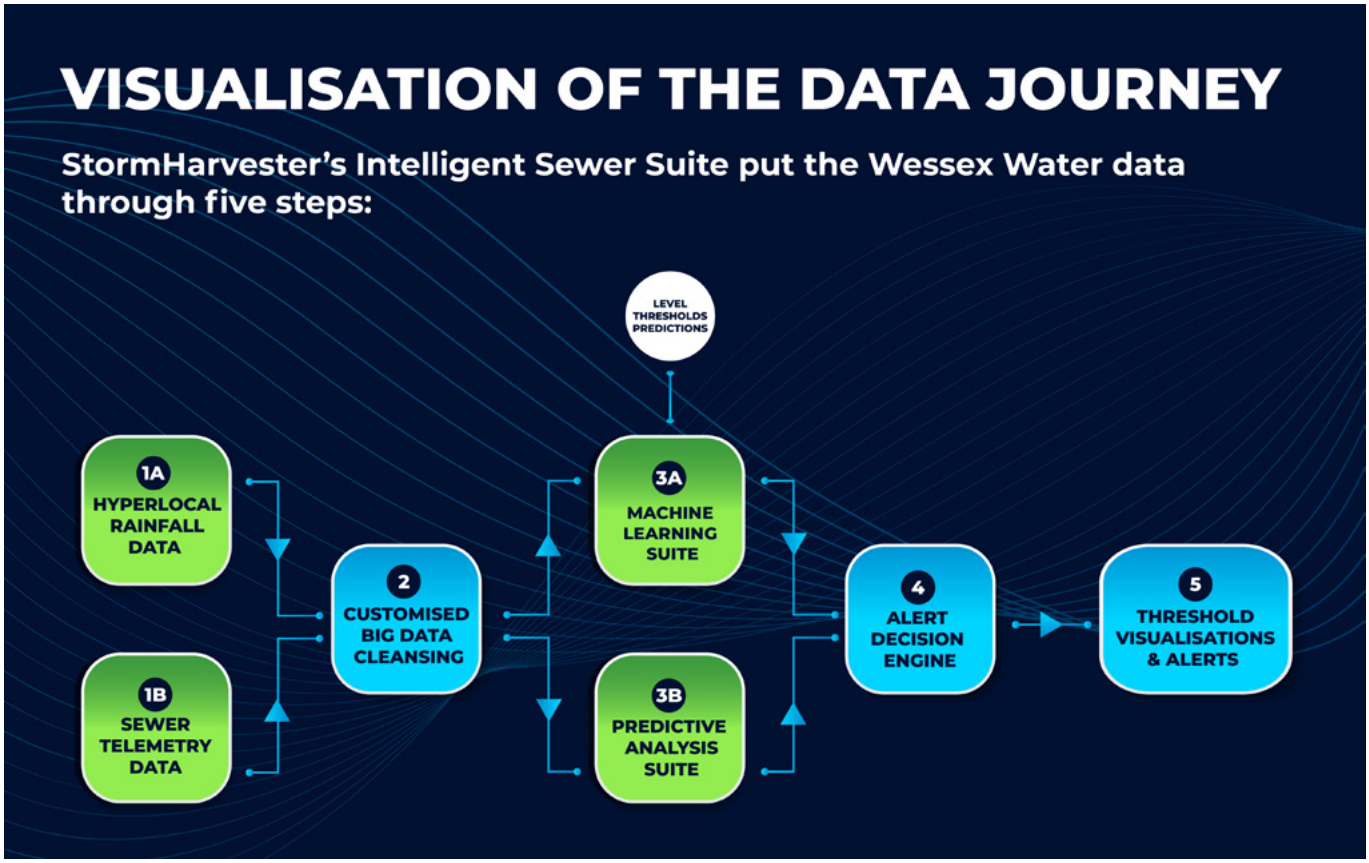
AI SUCCESSFULLY DETECTS BLOCKAGE FORMATIONS FOR WESSEX WATER

Rainy day in Bath – hyperlocal rainfall was a major input into creating dynamic thresholds used to achieve such accurate forecasting.

"Machine-learning technology trialled on part of Wessex Water's sewerage network has identified early forming sewer blockages in real-time with a 92% accuracy rate, whilst also enabling an operational shift to condition-based maintenance approach." said Brian Moloney, managing director, StormHarvester.

The potential for artificial technology (AI) to transform sewer network management has been demonstrated during a three-month trial of StormHarvester's Intelligent Sewer Suite with Wessex Water in the city of Bath, UK. The technology quickly demonstrated its value, with over 60 early blockage formations detected in real-time and control room alerts reduced by a staggering 97 per cent.

Managing sewer blockages represents a significant operational challenge for water and wastewater utilities. As well as problems arising from the blockages themselves, heavy rainfall events often trigger hundreds of alarms simply because of high levels within



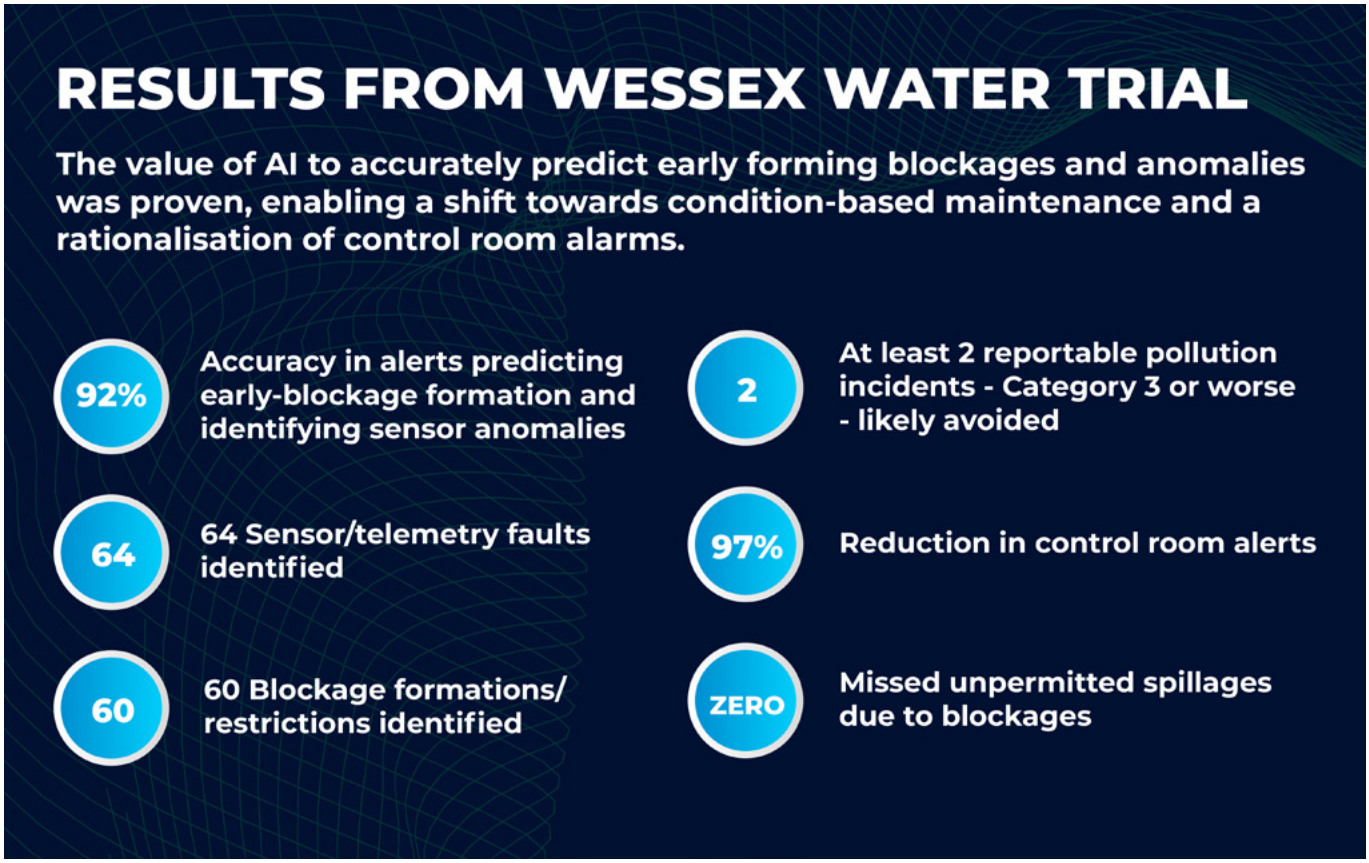
StormHarvester's Intelligent Sewer Suite put the Wessex Water data through five steps.

the sewer network caused by rainfall runoff. The volume of these alarms during wet weather periods can be overwhelming for operational and maintenance teams.

The incumbent rules-based alarm system operating in the Wessex Water control room generated some 4,500 alarms during the trial period, yet StormHarvester's Intelligent Sewer Suite of AI tools was able to mute alarms where the high sewer levels were predicted by the AI software due to rainfall, reducing the total to 138, of which 124 were genuine blockage formations or sensor faults. This gave the utility's operational and maintenance crews capacity to respond rapidly to each alarm, even during periods of heavy rainfall.

The initiative started in Spring 2020 when Wessex Water invited 16 technology companies from around the world to demonstrate the value of applying artificial intelligence to the wastewater network. As a finalist, Belfast-based StormHarvester was invited to run a three-month trial to carry out proof of concept.

The trial took place from June to August 2020 in the wastewater catchment of the historic city of Bath, Somerset, UK which comprises 3,500 km of sewerage, representing 10% of Wessex's total network. Intelligent Sewer Suite was applied to an array of 98 level sensors already present in the network - 89 at combined sewer overflow (CSO) sites and the remainder at pumping lift stations.



The value of AI to accurately predict early forming blockages was proven.

Machine-learning

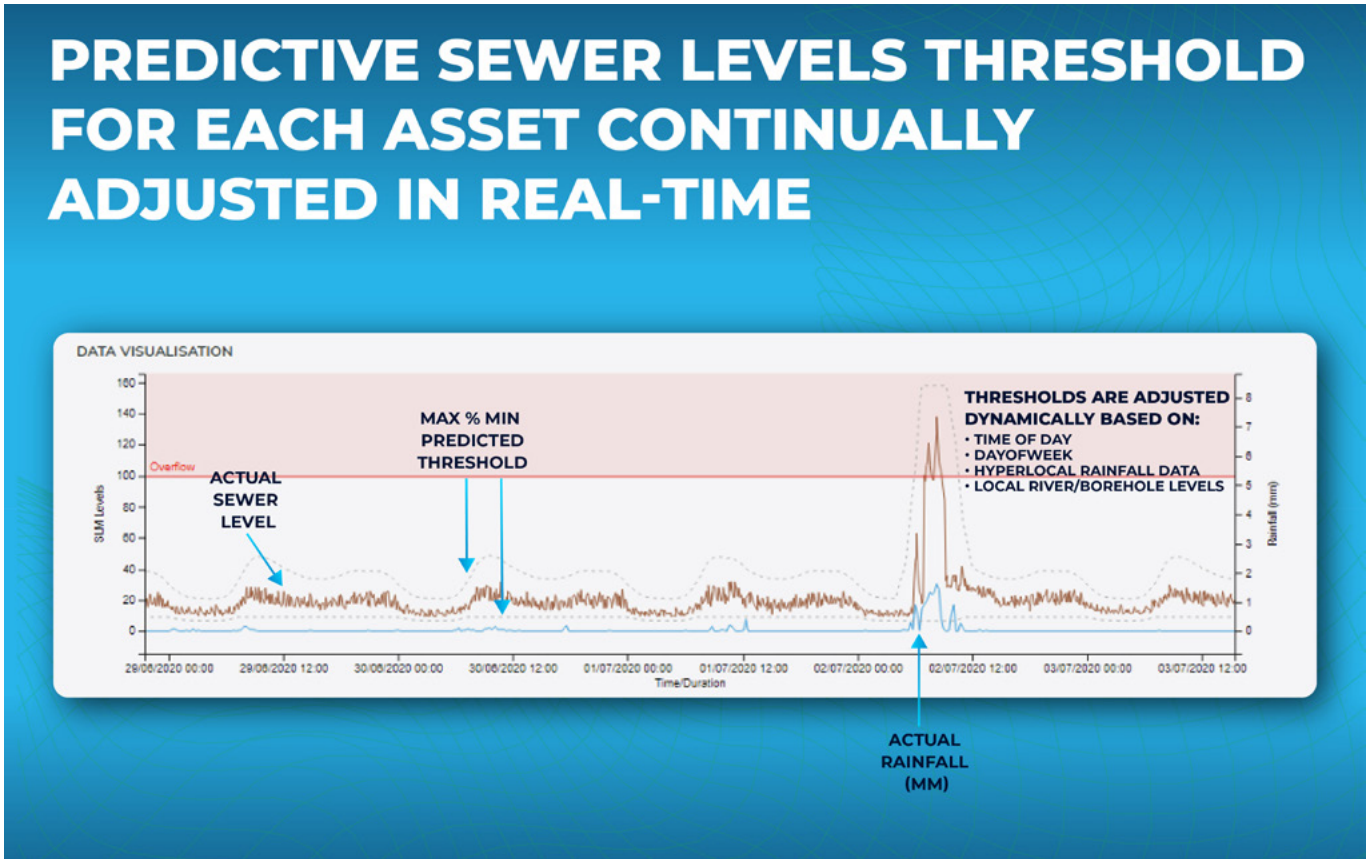
Intelligent Sewer Suite uses machine-learning, an AI application that enables systems to automatically learn and improve from experience without being explicitly programmed to do so. The StormHarvester system's smart machine-learning algorithms and predictive analysis tools were applied to catchment sensor data and corresponding hyperlocal rain forecasts to predict the wastewater flow levels and detect potential early blockage formations in real-time.

Wessex Water wanted to test the ability of machine-learning to:

- Predict blockage formations in sewer pipes and pumping stations early and intervene before they became service failures
- Better separate genuine control room alarms from alarms triggered because of high volume rainfall during wet weather
- Dramatically improve the response time to service failures

Blockages can lead to costly service failures including pollution or flooding events, but if spotted early enough, they can be quickly remedied. Wet weather makes it difficult to differentiate expected high sewer levels caused by heavy rainfall volumes from those arising from restrictions such as partial or total blockages.

"This condition-based sewer maintenance versus the scheduled cleaning regime will be key to making operational teams more productive and efficient going forward."



Predictive sewer level thresholds for each asset were continually adjusted in real-time.

By deploying AI with the capacity to differentiate between these different events, both an improvement in alarm quality and alarm rationalisation is made possible.

Easy set-up

Intelligent Sewer Suite took only three weeks to set-up before it started providing usable results and did not require any hydraulic models.

The process included the extraction of historic sewer-level data and rainfall levels within a 1.5 km^2 grid for each of the 98 monitored assets. Tens of millions of iterative machine-learning calculations were then undertaken in order to 'learn' sewer asset behaviour in both dry and wet weather periods.

Accurate threshold forecasting

Safe operating windows for assets in the network were predicated based on a number of factors including time-of-day, day-of-week, hyperlocal rainfall and local river levels. These dynamic thresholds are predicted for six hours into the future and are updated every 15 minutes, at asset level, which is one of the keys to such accurate forecasting.

The real-time predictions and blockage alerts are used to identify potential non-compliant, out-of-sewer pollution events before

Intelligent Sewer Suite visualisation of Bath wastewater catchment divided into 1.5km2 squares showing sewer assets aligned with hyperlocal weather forecasting grid.

they occur. Maintenance crews can be proactively directed to these locations to remedy issues before they arise or worsen, mitigating service failures.

Edmund Willatts, asset reliability engineer, Wessex Water said: "The StormHarvester system used machine-learning to set safe operating windows or thresholds for each asset. Each time these had a significant breach, we received alerts, which in turn were passed to the operations team so that they could respond."

Pollution reduction

The Environment Agency is seeking a zero level of pollution incidents for the water industry in England and puts incidents into four categories, with Category 4 being the least serious and having no impact on company performance. Category 3 incidents can impact on performance commitments and risk breaches of environmental protection and water industry legislation. They can also lead to significant costs, including emergency response charges and penalties from regulators.

Results from the three-month trial showed significant alarm rationalisation and a high degree of accuracy in blockage detection. Over 60 early blockage formations were detected in real-time, at least two of which were likely to have caused pollution incidents – Environment Agency Category 3 or worse.

Left: Unrestricted sewer flow in Bath catchment

Right: Reduced flow due to sewer blockage in Bath catchment

Over 60 telemetry and sensor faults were also detected.

Jody Knight, asset technology manager at Wessex Water said: "The StormHarvester team identified sewer blockages that using our normal working processes we may not have spotted until they had resulted in unwanted sewer overflow events."

Deployment of StormHarvester's AI approach was shown to be 92% accurate, with no blockages missed. Additionally, a 97% reduction in control alarms was achieved with only 138 in total – little more than one-a-day over the period.

Wessex Water considered the alerts provided by StormHarvester to be a major improvement on the status quo, where operational staff were regularly overwhelmed by the large number of high-level and overflow alarms occurring during periods of heavy rainfall. It also makes the potential for predictive maintenance very realistic in the near future.

Willatts said: "This condition-based sewer maintenance versus the scheduled cleaning regime will be key to making operational teams more productive and efficient going forward."

Multiple capabilities

The Wessex pilot revealed that StormHarvester technology has the capability for:

- High blockage prediction accuracy – 92% of alerts were relevant and required and not a single blockage resulting in a pollution incident was missed
- Few false positives – 8% of alerts were false positives

- Long-range blockage prediction - early blockage formations identified up to eight weeks before they would have resulted in service failures
- Condition-based maintenance - the three-month trial has enabled a shift in approach.
- Control room alarm rationalisation - a 97% reduction in control room alerts was achieved versus business as usual

Knight said: "One of the biggest problems we have serving our customers is not knowing where and when blockages will occur, or are likely to occur, in the wastewater network. During the three-month trial, StormHarvester identified at least two incidents that we are fairly confident would have resulted in Category 3 spillages, or worse, if it was not for the early blockage detection alerts received and the subsequent action taken by Wessex operational staff."

"The results have been excellent. Wessex Water have been great to work with and this trial has proven that Intelligent Sewer Suite is effective at scale"

Neil Macdonald, co-founder of StormHarvester said: "The results have been excellent. Wessex Water have been great to work with and this trial has proven that Intelligent Sewer Suite is effective at scale. This is further endorsement of our five-year journey and multimillion pound investment to build an effective AI solution combining machine-learning, predictive analytics and hyperlocal rainfall forecasting leading to intelligent sewers that serve customers, communities and the environment."

Macdonald added: "Our technology proves that predictive maintenance is possible, with early blockage detection occurring from hours to weeks in advance. This represents a significant increase in the available time for operational crews to recover and repair assets. StormHarvester sees this as a real game-changer, with a clear route to achieving efficiencies for wastewater utilities, reducing wastewater pollution and both internal and curtilage flooding."

Based on the value brought by the StormHarvester alerts during the proof-of-concept trial, Wessex Water has maintained the solution running on the Bath wastewater catchment into 2021

www.stormharvester.com

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www.trenchlessasia.com

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The SPiDER is a scanner which can calculate its position in the manhole shaft by using its sensor data to measure its incremental motion instead of the payout cable. SPIDER weighs less than 30 lb (13.6 kg) and can be hand-carried to easements or other previously difficult to access sites. This wireless portability is possible because the processing computer and battery supply are built into the scanner.

SPIDER collects millions of three-dimensional (3D) measurements during each manhole inspection so the manhole can be measured to less than 5 mm accuracy. The point cloud can be used to evaluate the structural changes in a manhole before and after rehabilitation. The SPiDER also provides live-video stream and recorded mpg video, making it an ideal wireless tool for Infiltration and Inflow studies.

www.cuesinc.com

istt.com

SOCIETY NEWS

ISTT News brought to members by Trenchless Works

A MESSAGE FROM THE CHAIR

Jari Kaukonen, Chair, International Society for Trenchless Technology

"The Trenchless Works website provides ISTT members with a fantastic online resource and forms an important part of the partnership"

Welcome to the latest edition of our partner magazine Trenchless Works. Following my 'spotlight' piece in the March edition I wanted to provide members with some more detail on the media partnership agreement with Westrade which covers far more than the monthly magazine. The Trenchless Works website also provides ISTT members with a fantastic online resource and forms an important part of the partnership. Westrade are also actively investigating the development of other digital platforms including Trenchless Works TV that will carry a host of content including webinars, masterclasses and other ISTT video resources.

Distribution of Trenchless Works is estimated to be around 50,000 worldwide, so it is vital that we make the best possible use of this exposure to promote member successes in every corner of the world. The editorial team at Trenchless Works accept press releases and content in a society's native language which they will then translate and use across the magazine, website and newsletters.

Each month Trenchless Works will feature one of our member societies. This month it is one very close to my heart and one of which I am proud to have been the former chairman. The Finnish Society of Trenchless Technology (FiSTT) was founded in 1999 with 22 members. Over time it has grown to become an experienced but youthful association boasting some 87 members, placing it in the top 10 of the ISTT's biggest associations by membership. Over to the current chairman Timo Kyntäjä to tell us more.

www.fistt.net

SOCIETY FOCUS

Monthly news from a regional ISTT Society

FiSTT AND ITS INFLUENCE ON THE FINNISH TRENCHLESS MARKET

Timo Kyntäjä, Chairman, FiSTT

The association's chairman since the beginning of 2020, Timo Kyntäjä is now in his second year at FiSTT. Timo's predecessor Jari Kaukonen is currently chairman of ISTT (the International Society for Trenchless Technology). Timo has been associated with FiSTT's board for almost all of the past ten years.

FiSTT has greatly developed its operations in recent years. Just a few of the activities that might merit extra attention are members, education activity and industry cooperation development. In addition to which the organisation has also expanded its work in specific topic areas. At the beginning of 2021 FiSTT was involved with specific topics including condition examination, education and for the renovation of pipelines in premises. Its aim is to support the industry to develop and to gather information for the good of the trenchless business. Additionally, the objective for 2021 has been to establish topic areas covering materials and quality examination.

The Board of FiSTT is also proud that the Society has been trusted with the organisation of 2022 ISTT international conference and is avidly awaiting the visit of members of ISTT, and all of the industry's operators and those who are interested in the technology to come visit the event in Helsinki. Details of the programme can be found on the website: https://www.nodighelsinki.com/.

Commenting on the place of FiSTT in the Finnish market, Osmo Seppälä, Managing Director of the Finnish Water Utilities Association, said: "FiSTT is the Finnish national focal point for key participants in the No-Dig >

SOCIETY FOCUS

FiSTT conference in Hämeenlinna
Speaking mrs Minna Hanski as a representaive of our Ministry

"FiSTT is the Finnish national focal point for key participants in the No-Dig technology sector and brings together professionals from water and wastewater utilities, contractors and consultants, as well as materials and technology suppliers"

technology sector and brings together professionals from water and wastewater utilities, contractors and consultants, as well as materials and technology suppliers. This provides utility professionals with an excellent forum for up-to-date information on trenchless technologies and active peer contacts. Based on a recent study on future investment needs in the Finnish water and wastewater utilities, total annual investments need to be doubled over the next 20 years. Water and wastewater network rehabilitation needs are about 60% of these total investment requirements. An additional challenge is that usually rehabilitation of networks is more costly with new construction or reconstruction. With trenchless technologies rehabilitation costs, especially in densely constructed urban environments, can be kept moderated and disturbance to city functions is minimised.

Looking at the trenchless sector in Finland Kia Aksela, Head of Network Department, Helsinki Region Environmental Services (HSY) said: "In Finland, the attitude towards trenchless methods is positive and open. Water utilities see trenchless as a real option for traditional open excavation. In the era of resource wisdom and striving for carbon neutrality trenchless methods offer an attractive alternative to the traditional way of implementation. Especially, because at the same time, people living in or passing through the area demand increasingly less disruptive ways to implement the construction. "

She continued: "The trenchless market is developing in two ways. There is a clear need for new methods alongside long-established methods. On the other hand, requirements for sustainable quality throughout the life cycle of the outcome are commonplace, the quality achieved must be at the same level, or higher, as compared to the quality achieved using open excavation. In Finland methods that have been on the market for water supply networks for a long >

SOCIETY FOCUS

CIPP in Helsinki 2001

"In the era of resource wisdom and striving for carbon neutrality trenchless methods offer an attractive alternative to the traditional way of implementation"

time include Sliplining, Pipe Bursting and Horizontal Directional Drilling (HDD) as well as Hammer Drilling. In sewer networks commonly used methods include Sliplining with discrete pipes, Cured-In-Place-Pipe and Close-fit pipe. Less commonly used methods include Guided Auger Boring as well as Microtunnelling and Pipe jacking. According to a market survey in 2020, which was inspired by the FiSTT, no independent contractors were found in Finland for microtunnelling or pipe jacking. Based on the market survey, it was positive that Finnish companies saw the technologies as interesting and that cooperation with European players was possible and even desirable. On the other hand, several European companies presented themselves as being ready to enter the Finnish market. For some companies, quality assurance was at the heart of their operations. They presented credible options for achieving high quality for example for tightness and self-cleaning of sewers, by ensuring a constant slope without depressions as well as in precise drilling location accuracy. It would be great to have the method range expanded in Finland in order to be able to choose the best possible technology for each circumstance. >

SOCIETY FOCUS

Pipe bridge during CIPP installation in a roundabout Helsinki 2006

How Contractors see the Role of FiSTT

Looking at the role of FiSTT in the Finnish trenchless sector from the contractor viewpoint, Paavo Syrjö, MD of the Finnish Infrastructure Association said: "FiSTT has a key role using its own expertise in Finland. It is the only organisation that gathers all stakeholders with trenchless technology interests around the same table. Membership of FiSTT is a gateway to knowledge. For a single contractor, FiSTT membership means that they can learn not only of the technologies themselves but from real-life cases from other members such as contractors, designers, suppliers, and customers as well. By sharing experiences and thoughts with other members become better industry players and at the same time help the whole sector develop and become better. For a single contractor, a place at the same table with all the other stakeholders within the trenchless area is also an opportunity to share references with future customers and market a company's knowledge for them. To keep it short,
FiSTT membership means more turnover and more profit in the long run."

"FiSTT has a key role using its own expertise in Finland. It is the only organisation that gathers all stakeholders with trenchless technology interests around the same table"

Meeting Industry Needs

Jukka Huusko, MD of Johan Lundberg Oy (and currently also Executive Director of FiSTT and who has been heavily involved in organising the National Conferences observed: "FiSTT has arranged >

SOCIETY FOCUS

Worksite visit CIPP in Oulu 2002

"In the mainstream of the general No-Dig market development, Finnish innovation and comprehensive know-how in Horizontal Hammer Boring or Horizontal Hammer Drilling as it is sometimes known is at the top level"

a National Conference four times since 2013, with a fifth coming in November 2021. The venue has provided an excellent discussion forum for professionals around trenchless technologies. FiSTT also has active working committees where cooperation between different companies and professionals has brought trenchless to the forefront of thinking and encouraged all parties to take part in spreading the No-Dig message. For the future, the Society has a main target of increasing membership to 100 and to arrange the best ever No-Dig show in Europe in 2022."

Finnish Expertise

Finland has become a centre for some specific technologies with the trenchless sector with its influence in these areas becoming internationally well-known. For example said Kimmo Juvani, CEO of Geonex Oy: "In the mainstream of the general No-Dig market development, Finnish innovation and comprehensive know-how in Horizontal Hammer Boring or Horizontal Hammer Drilling as it is sometimes known is at the top level. The history of the technology dates back to the early 1990s, and today Finland's expertise in the Horizontal Hammer Boring market is recognized and valued internationally. The activities of FiSTT and its stakeholders have significantly contributed to the appropriate use and application >

SOCIETY FOCUS

Worksite visit CIPP in Oulu 2002

Worksite visit year 2007

of the method. FiSTT has also recognised the Horizontal Hammer Boring method as an equal No-Dig method amongst all others. Developments in the industry have also created faith and significantly guided my company Geonex, which is currently the only Horizontal Hammer Boring brand in the world."

Mechanical pipe cleaning is another area where Finnish companies have shown very innovative activity. For example, Mika Lokkinen, Chief Inventor with Picote Solutions Oy commented: "Sewers in Europe have been cleaned with mechanical tools since 2000. Mechanical cleaning is usually used when the purpose is to repair internally either a repaired or leaking sewer pipe. Mechanical cleaning is more effective than high pressure washing with water. In order for the sewer pipe to be rehabilitated, it must be made as clean as possible, following the old shape of the pipe. There are dozens of different types of mechanical cleaning tools. The tools range from very gentle to very efficient as well as everything in between. The tool used is always selected according to the condition and material of the pipe to be cleaned. Two decades of mechanical cleaning have taught us that sewer materials and strengths vary widely between decades.

The general view in the art is that the older the pipe, the better material suitable for sewer use has been used during installation. Without exception, even hundred-year-old pipes have been and are thicker and of higher quality than younger or newer pipes. >

SOCIETY FOCUS

The new pipes, especially those manufactured and installed over the last two decades, are made of low-quality recycled metal and therefore these pipes have aged surprisingly fast. They can leak as quickly as 2 to 20 years after installation."

All types of sewer pipes are used. It is therefore very important that the tools, materials and methods used in the industry, both in new pipes and repairs, strive in the best possible way to provide value to customers, all over the world. It is natural to understand that the experience gained from the above has been accumulated, as about 500,000 meters of sewer pipes are mechanically cleaned in Europe every year. The FiSTT organisation has been very active in this area and a lot of information about cleaning methods has been accumulated. The knowledge now therefore exists to view the wide range of suitable methods and tools for cleaning pipes without damaging them.

"FiSTT has for over 20 years been able to bring together, provide information to and contacts for and help guide the local Finnish trenchless market exceedingly well"

Where to for the Future

Krista Sampolahti, Marketing chief Aarsleff Oy, an FiSTT member, has considered how FiSTT has aided the development the trenchless market saying: "Awareness of the existence of liners has, of course, increased from zero to almost 100% (particularly in water utilities), here the role of FiSTT has certainly been significant, for example with seminars in its early years at the Aviation Museum. Its subscriber base has remained quite constant at about 20 to 25 water utilities per year for the last 10 years, with the largest water utilities being involved from the beginning, but it is nice to note that even smaller subscribers are now joining every year which bodes well for the future of the industry as well as FiSTT." In closing Krista commented: "The biggest and most revolutionary development has been on the real estate side."

So, FiSTT has for over 20 years been able to bring together, provide information to and contacts for and help guide the local Finnish trenchless market exceedingly well. It also continues to do so, which may be highly valuable for the future as pressure for all industry sectors to perform at best value for money whilst remaining very environmentally-sustainable increases.

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GRAVITY SEWER REHABILITATION

KEYNOTE LECTURE: GRAVITY SEWER LINER DESIGN, Olivier Thépot, Eau de Paris, France

Design of Liners in Germany according to A143-2, Mark Klameth, IKT, Germany

WRc Sewer Rehabilitation Manual - Key Changes in Design Methodology, Nick Orman, WRc, UK

External Pressure Tests on Large Diameter Jacking Pipe Systems, Högni Jónsson Amiblu Technology, Norway

"Real-time Monitoring of UV Lamps as Requirement for Controlled and Protocolled Curing of Large Diameter Liner with Big Wall Thickness", Firmino Barbosa, Reline Europe, Germany

Questions & Discussion Dec Downey

SESSION 2
PRESSURE PIPE REHABILITATION

KEYNOTE LECTURE: PRESSURE PIPE REHABILITATION, John Gumbel, JG Pipeline, UK

Status Quo of the CIPP Product Standards for Water & Gas Networks, Ricky Selle, Selle Consult, Germany

Key Design Considerations for PE80 and PE100 Pressure Pipe Liners, Steve Brogden, Die Draw Ltd, UK

"Response of a Cured In Place Liner in Cast Iron Water Pipe due to Joint Expansion due to Permanent Ground Deformation or Seismic Wave" Olivier Thépot, Eau de Paris, France

"A Unique Example of Close Fit Lining Technology for the Renewal of Water Pipes aling the Bridge ""Ponte Punta Penna"" in Taranto", Federica Fuselli, Rotech SrL, Italy

Questions & Discussion, Dec Downey

Closing Remarks by Conference Chairman, Dec Downey

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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

Spring is in the air at last! It has been all systems go here at the UKSTT, and we have a really jam-packed calendar of online events to keep you going until we can all meet up again in person, including several Mini Masterclasses and Trenchless Tea Breaks.

I am delighted to also introduce the all-new Green Alliance. The Pipeline Industries Guild has joined forces with us to highlight the importance of working together to reduce carbon emissions across the industry. Read more about this exciting initiative and learn about our first ever Green Alliance webinar which follows - enjoy!

Stay safe Dawn x

"The Pipeline Industries Guild has joined forces with us to highlight the importance of working together to reduce carbon emissions across the industry"

THE GREEN ALLIANCE WORKING TOGETHER TO ACHIEVE NET ZERO

"Throughout this year The Green Alliance will be hosting a series of webinars leading up to a face-to-face seminar at No-Dig Live "

The Pipeline Industries Guild and UKSTT have joined forces to form The Green Alliance to explore, share and promote the industry's drive towards net zero carbon emissions and reduction in environmental impact.

Throughout this year The Green Alliance will be hosting a series of webinars leading up to a face-to-face seminar at No-Dig Live which is due to take place in Peterborough between 14 and 16 September 2021.

The first webinar will be held on 11 May with speakers from SGN focussing on 'Introducing Hydrogen to the Gas Networks'

If you would like to be involved with The Green Alliance and to discuss presentation and sponsorship opportunities, please contact Lynn Maclachlan at UKSTT lynn@ukstt.org.uk or Kate Byfield at The Pipeline Industries Guild events@pipeguild.com.

MEET THE TEAM BEHIND THE UKSTT

The UKSTT is an active, thriving Society, and the driving force behind this is the 20 dedicated volunteers who make up the Council. Over the next few months, we will be taking a look at the faces behind the Society and how they got involved in Trenchless Technology and the UKSTT. This month we catch up with Ian Ramsay, Vice Chair and Paul Henderson who was recently elected in 2020.

Ian Ramsay – UKSTT Vice Chair & Director of IRR Trenchless

Ian Ramsay – UKSTT Vice Chair & Director of IRR Trenchless

Q: What is your background and what brought you into the trenchless industry?

A: After University I worked in Aerospace and was based out of the USA for a while. I was offered an opportunity to join a company that supplied the fabrics used in the manufacture of cured in place liners based near where I was born. I joined them as an export manager in 1996 and have stayed in the industry since.

Q: How/why did you get involved in UKSTT?

A: I was friendly with Russell Fairhurst a previous UKSTT Chair. I also attended some early events and liked the aims of the Society and felt that I could contribute. I joined in 1999 and have been involved ever since.

Q: What goals do you want to achieve as a UKSTT Council Member?

A: I am a strong believer in education and also young engineer's development programmes. I would like to see more educational events and development with Patrons and Universities. Also with the zero-carbon initiative, innovation within the industry is essential. I think that developing the webinar programme and events engaging with the water companies will really support this.

"I am a strong believer in education and also young engineer's development programmes"

"A Society where contracting companies, supply chain, consultants and water companies turn for information and also want to engage with us on future events"

Q: What do you see as being your own greatest personal achievement in the trenchless industry?

A: This is a hard one. I am lucky enough to have travelled extensively around the world and been able to see trenchless projects and programmes in action. I have also been able to help with specification approvals and to introduce and see the benefit of trenchless programmes into various cities and countries around the world.

Q: What do you currently see as the industry's most urgent challenges?

A: Leakage and clean water supply throughout the world is a major challenge. Sealing sanitary systems to avoid contamination of clean water is also a serious issue. The technology exists as we know to correct these issues, however awareness and economics need to be addressed.

Q: Where would you like to see UKSTT in 5 years?

A: Growing, more masterclasses, more online webinars, a Society at the forefront of trenchless. A Society where contracting companies, supply chain, consultants and water companies turn for information and also want to engage with us on future events.

Paul Henderson, business development manager, Lanes for Drains

Paul Henderson – Lanes for Drains

Q: What is your background and what brought you into the trenchless industry?

A: I have been part of the utility sector my whole career. In 1998, after studying Civil Engineering at Liverpool University I joined a small family contracting firm, its focus being potable water asset maintenance (service reservoirs, contact tanks, distribution mains). Over the next 19 years we expanded nationally supporting all of the major water companies and their Tier 1 partners.

Some of our work included commissioning of new pipeline assets and involved trenchless techniques such as swabbing, plus robotic works which allowed inspection and cleaning without the need for confined spaced entry.

"I think getting to carbon neutral is going to be a massive challenge for the sector, some companies are already working hard towards this but many others have a lot of work to do"

After a period working freelance, I joined Lanes Group in 2019, and now support its specialist Sewer Renovation team. Our works focus on inspection, cleaning and repair of drainage and sewer pipe using trenchless methods including CIPP lining and robotic cutting.

Q: How/why did you get involved in UKSTT?

A: I was aware of UKSTT through our company membership at Lanes Group, and I was invited to get more involved by some contacts in the industry, when the opportunity arose I applied for a place on the Council. The reason for getting involved was to strengthen my knowledge of trenchless technology, to expand my professional network and to support others in the sector.

Q: What goals do you want to achieve as a UKSTT Council Member?

A: My main goal as part of the UKSTT Council is to widen their reach using my connections from other trade bodies, and other areas of the utility sector, as this will be for the benefit of all parties.

Q: What do you see as being your own greatest personal achievement in the trenchless industry?

A: During the early 2000's I worked with a number of colleagues to develop the use of robotic technology in the potable water sector, this allowed projects that were previously impossible to be completed.

Q: What do you currently see as the industry's most urgent challenges?

A: I think getting to carbon neutral is going to be a massive challenge for the sector, some companies are already working hard towards this but many others have a lot of work to do.

Q: Where would you like to see UKSTT in 5 years?

A: I would hope the UKSTT can continue to expand its reach across the various sectors in the UK, supporting businesses as they seek continual improvement in QHSE.

UKSTT MINI-MASTERCLASS WEBINAR SERIES WITH TRACTO-TECHNIK UK LTD

Following on from the first two webinars in the Traditional Pipe Reinstatement Mini Masterclass series, Tracto-Technik UK Ltd is concluding with Pipe Ramming on the 13 May.

13 May, 11am - Pipe Ramming

Strictly more of a pipe installation process, pipe ramming can also play a vital role in the renewal or replacement of underground infrastructure. The simplicity and power of the ramming process makes it versatile and often highly cost effective.

Click here to register

UTILITY MAPPING & DETECTION MINI-MASTERCLASS

The Mini Masterclass Series was introduced in April 2020 to promote awareness in trenchless technology and offer training to as many people as possible during a time when we have been unable to run our usual biannual events in person.

The next mini-masterclass in this series is taking place on the 2 June 2021 at 11am. Presentations will be delivered by Paul Nicholls, BIM & Digital Engineering Manager at Skanska; Dr Neill Brammall, CEng MIGEM, CEO Utility Survey Exchange and UKSTT's Colin Tickle and Andy Gundry will complete the programme and host the event.

A registration link will be issued shortly, however if you would like notification when registration is open, please email Lynn admin@ukstt.org.uk

UKSTT GALA DINNER & AWARDS CEREMONY 2021

Join us on Wednesday 15 September 2021 for the UKSTT Gala Dinner & Awards Ceremony. The Gala Dinner is one of the highlights of the UK trenchless calendar and during the evening we will be raising funds for 'Mates in Mind' a charity that provides advice and support to anyone experiencing a mental health problem across all industries with a special focus on the construction industry. Such a worthwhile cause!

Tickets include a sparkling drinks reception, amazing food, fantastic entertainment as well as the opportunity to rub shoulders with industry colleagues and friends.

For further information please visit the website https://www.ukstt.org.uk/annual-dinner-awards-ceremony-2021/

Tickets and table bookings can be purchased by contacting
Hollie Liddle at hliddle@westrade.co.uk or calling 01923 723990.

Sponsorship opportunities are available, for more information please contact Trevor Dorrell tdorrell@westrade.co.uk

SCOTTISH WATER SUPPORTING NO-DIG ROADSHOW IN GLASGOW

2021
NO-DIG ROADSHOW GLASGOW

UKSTT and Westrade are delighted to announce a confirmed date for No-Dig Roadshow Glasgow 2021, which will take place on Thursday 7th October 2021, at the Hilton Glasgow Westerwood Spa & Golf Resort.

Scottish Water, the official supporter of the Roadshow has been taking action to mitigate greenhouse gas emissions and to adapt to the impacts of climate change on services for around a decade and remain absolutely committed to doing all they can to reduce the impact we have on the environment. They have also embarked on the most ambitious carbon targets of any UK utility to date and have a lot to say about how the industry will need to help it get to carbon neutral by 2035. Fitting in with the company's Carbon Neutral Challenge will be a Keynote Speech from Gordon Reid, General Manager for Net Zero Emissions.

Phil Beardmore, Water Response Manager at Scottish Water will also present on 'Supporting a Flourishing Scotland – working to increase customer trust by reducing disruption'.

"We will play our full part in achieving the Scottish Government's climate change commitments through an ambitious plan to secure net zero emissions by 2040"

"We will play our full part in achieving the Scottish Government's climate change commitments through an ambitious plan to secure net zero emissions by 2040" said Phil Beardmore.

UKSTT is once again pleased to be supporting Westrade Group and looks forward to another successful event. For further enquiries about this event contact: Alice Nolan anolan@westrade.co.uk

For sales enquiries, please contact Gary King gking@westrade.co.uk or Trevor Dorrell tdorrell@westrade.co.uk T:01923 723990

https://nodigroadshows.co.uk/

£1500 +vat

CORPORATE PLUS

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SPONSORED LINK ON UKSTT HOMEPAGE WORTH £2400!

Get noticed with your company logo prominently displayed on the UKSTT Homepage for the entire year, worth £2400!

SAVE UP TO £3K WITH TRENCHLESS WORKS

Trenchless Works, official media partner of UKSTT, are offering Corporate PLUS Members 30% off ALL advertising including annual packages, potentially saving up to a whopping £3k !!

MASTERCLASSES

TWO TICKETS to one of our UKSTT Masterclasses per year, including CPD Certification, worth £300 in total!

+ GUARANTEED MONTHLY SOCIAL MEDIA POSTINGS
+ QUARTERLY AD IN UKSTT TRENCHLESS BUZZ ENEWS
+ DEDICATED CORPORATE PLUS MEMBER LOGO

TECHNICAL ENQUIRY SERVICE

The Technical Enquiry service is free and available to everybody through the UKSTT website. Anybody thinking of trenchless technology for a project, or with a problem for which they think there may be a trenchless solution, for example, can submit an enquiry and we will respond to the best of our ability and knowledge.

"The Technical Enquiries are a good way to help people solve problems and also to make the knowledge of trenchless technology and its benefits more widely known"

Last year UKSTT received a number of enquiries from a very wide range of people and organisations. Most are from contractors or consulting engineers who find themselves involved in projects where they think trenchless may be a viable option but need to know more about feasibility. Some are looking for specific product information, and some, for market information. They cover rehabilitation and new installation as well as inspection and detection. Several relate to health and safety and quite a few come from abroad.

We have a filtering system to decide how to respond to enquiries received. If there are no concerns with confidentiality or commercial sensitivity, they are circulated to the Society's corporate members so they can then respond if they wish to do so.

We can often take knowledge of trenchless technology for granted but it remains relatively unknown across a broad swathe of the civil engineering and utilities sector. The Technical Enquiries are a good way to help people solve problems and also to make the knowledge of trenchless technology and its benefits more widely known.

www.ukstt.org.uk

5th EDITION

Trenchless Romania

Conference & Exhibition

SAVE THE DATE 19-20th of October 2021 **Bucharest**

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www.trenchless-romania.com

EVENTS AND MEETINGS

2021

April 29, 11am: Mini Masterclass Series 2 of 3
Presented by Tracto-Technik UK Ltd - Static & Dynamic Pipe Bursting
Register: https://bit.ly/3tV2fHa

May 13, 11am: Mini Masterclass Series 3 of 3
Presented by Tracto-Technik UK Ltd - Pipe Ramming
Register: https://bit.ly/2OZnOYA

June 13-16: RETC
Las Vegas, USA. Details from: www.retc.org

June 16: Trenchless Romania
Bucharest, Romania.
Details from: http://trenchless-romania.com/

June 20-24: Singapore International Water Week
Marina Bay Sands, Singapore.
Details from: www.siww.com.sg

September 8 to 11: bauma CTT RUSSIA
Crocus Expo in Moscow
Details from: https://www.bauma.de/

September 14-16: No-Dig Live 2021
Peterborough, UK.
Details from: www.nodiglive.co.uk
Includes the UKSTT Gala Dinner and Awards Ceremony

September 15: European No-Dig Conference
Peterborough, UK. In conjunction with No-Dig Live 2021 Details from: www.nodiglive.co.uk

September 15-18: Geofluid
Piacenza, Italy. Details from: www.geofluid.it

October 5-8: No-Dig Down Under
Sydney, Australia
Details from: www.nodigdownunder.com

October 7: No-Dig Roadshow 2021
Glasgow, Scotland.
Details from:
www.nodigroadshows.co.uk

October 13-14: 8th NSTT No-Dig Event
Nijkerk, The Netherlands.
Details from: www.no-dig-event.com

November 16-17: (NEW DATE) Trenchless Asia 2020 featuring the ISTT International No-Dig
Kuala Lumpur, Malaysia.
Details from: www.trenchlessasia.com

December 13-14: (NEW DATE) Trenchless Middle East 2021
Dubai, UAE.
Details from: www.trenchlessmiddleeast.com

2022

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

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/

May: Trenchless Asia 2022
Manila, Philippines

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/

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