TRENCHLESSWORKS

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BIG POTENTIAL – LACK OF INCENTIVES

By Dipl.-Ing Jörg Brunecker, General Manager of Swietelsky-Faber Kanalsanierung

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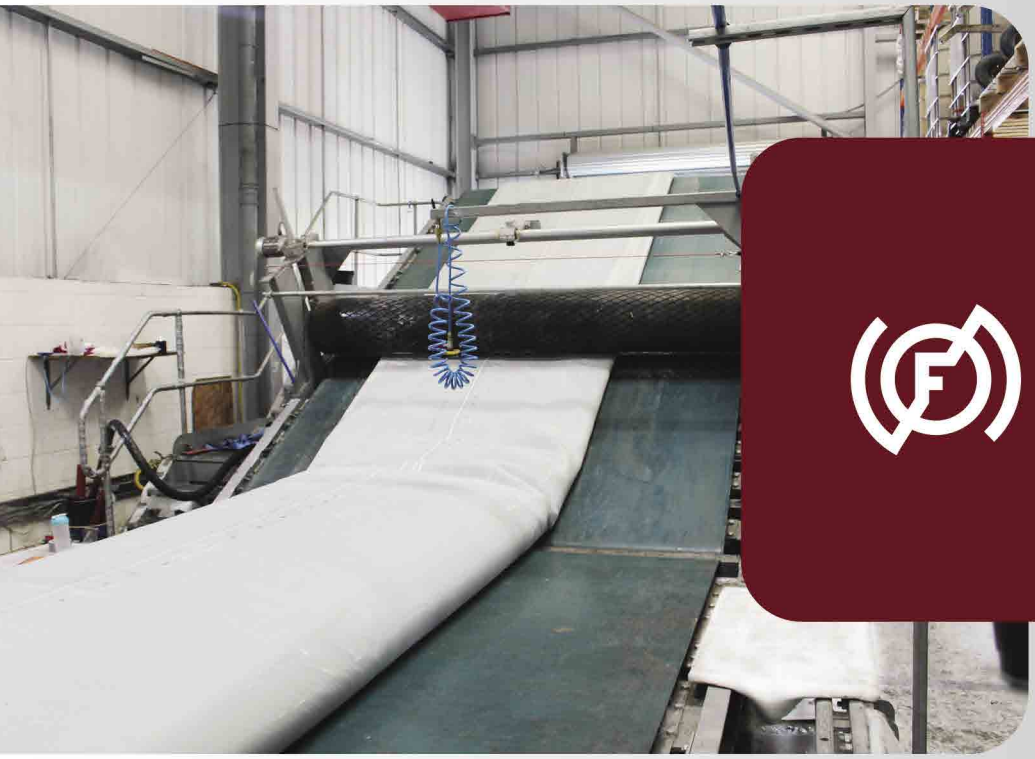

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To submit editorial for Trenchless Works next issue please email copy and images to: editorial@trenchless-works.com by the 12th of the month.
For Trenchless Works sponsorship and advertising rates email gking@westrade.co.uk

Paul Harwood, Publisher
pharwood@westrade.co.uk

Ian Clarke, Editor-in-Chief
editorial@trenchless-works.com

Austen Lees, Editorial
marketing@westrade.co.uk

Gary King, Group Sales Director
gking@westrade.co.uk

Trevor Dorrell, Group Sales Manager
tdorrell@westrade.co.uk

Stuart Hillyard, Sales Manager
shillyard@westrade.co.uk

Leigh Abbott, Group Marketing Manager
labbott@westrade.co.uk

Julie Harris, Design & Production

Lexi Di, Chinese Agent
lexi.di@bestexpo.cn

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Channeline International Fiber Glass Manufacturing L.L.C.
P.O. Box 8091 Dubai,
United Arab Emirates
Tel: +971 4 8848383
Fax: +971 4 8848384
E-mail: timwebb@apsdubai.com /
sales@channeline-international.com
Website: www.channeline-international.com

Channeline International North America
Tel: +1 514 2424495
E-mail: andysherwin@channeline-international.com

CHANNELINE
Beyond the Ordinary

Beyond the Ordinary

SPOTLIGHT

Paul Harwood, Managing Director of event organiser Westrade Group Ltd, Publisher, Trenchless Works, Liaison, Board of Directors, International Society for Trenchless Technology

"I am also pleased to be able to share our plans to launch a more media rich version of our market-leading Trenchless Works magazine early in 2023."

Trenchless Technology is set to be an important component of Finland's sustainable infrastructure development programme, and those attending the 38th ISTT International No-Dig event being held in Helsinki, Finland on 3-5 October will benefit from a world-class exhibition and conference programme.

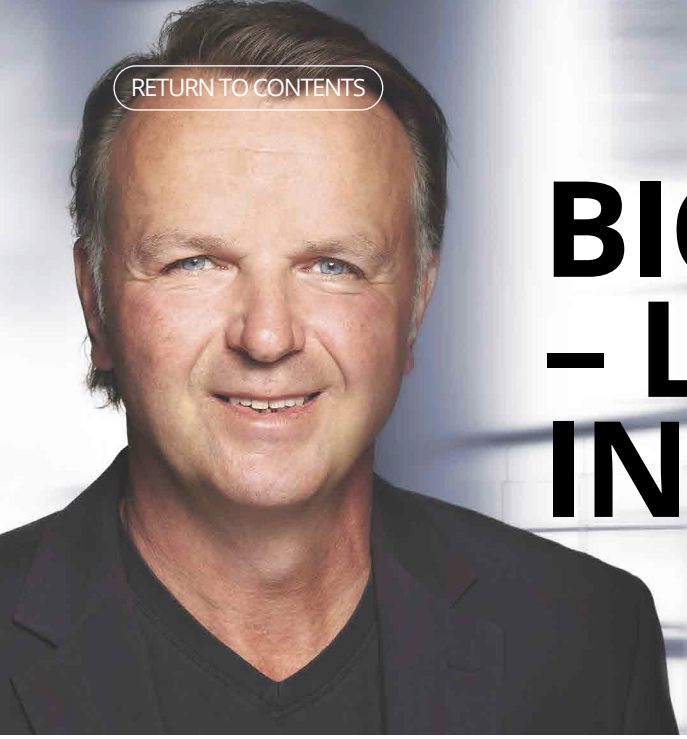
The exhibition in Helsinki will showcase the latest innovations in trenchless equipment, products and services from around the world while the conference delegates will hear from a stellar line up of speakers across a multi-track programme. The conference content has been specifically collated to create an environment that supports learning and the sharing of knowledge and skills and will incorporate a site visit giving visitors the opportunity to benefit from live demonstrations.

International No-Dig Helsinki is also delighted to be delivering a Student Programme. The programme will introduce young engineers to the basic principles and fundamental economic and environmental benefits of this highly sustainable technology.

I am also pleased to be able to share our plans to launch a more media rich version of our market-leading Trenchless Works magazine early in 2023. The new platform will enable us to feature video and interactive features giving even greater access to trenchless resources and innovation. For you, the reader, it means you do not just get to read the stories that matter, you get to see the details too.

This is an exciting time for the industry with many opportunities and challenges coming from all directions. Sometimes these issues can be complex and multi-faceted and the new look Trenchless Works will enable you to dip in and out or deep-dive into the stories that matter to you.

Finally, I would like to take this opportunity to recognise and thank the outgoing chair of the ISTT, Jari Kaukonen. Under his leadership the ISTT has further strengthened its position in the global sustainable infrastructure market and societies around the world have benefitted from his experience and expertise. Personally, I will miss his counsel and the variety of unusual locations from which he would appear on our teams calls!



BIG POTENTIAL – LACK OF INCENTIVES

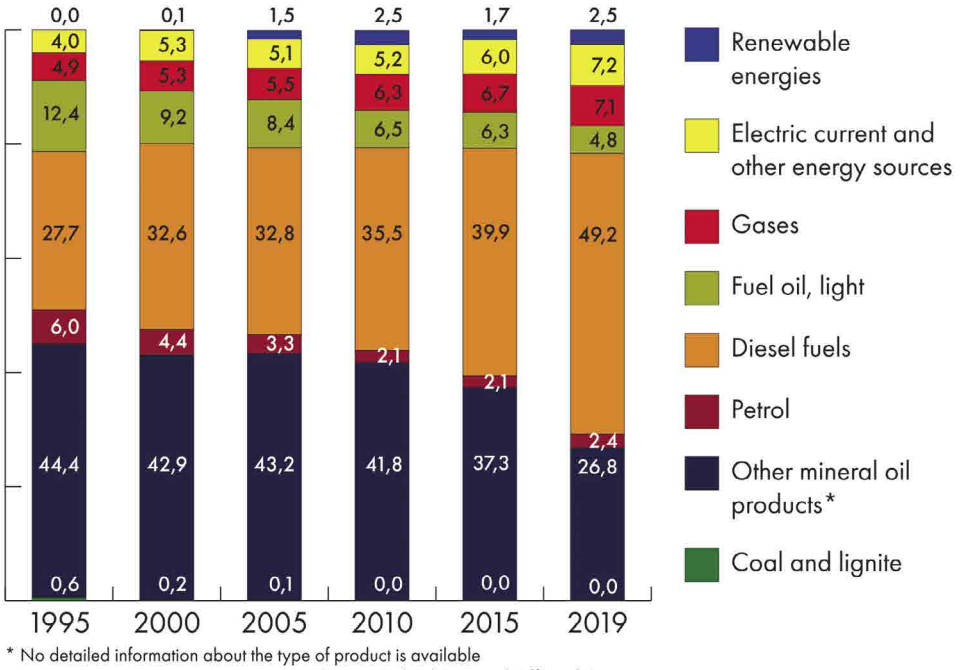
By Dipl.-Ing Jörg Brunecker, General Manager of Swietelsky-Faber Kanalsanierung

Whereas in many sectors the energy transition is being expedited and encouraged with financial incentives, Germany's construction sites are evidently not top of the list for the country's politicians. Yet, it is a field with huge potential for reducing consumption of fossil fuels and switching to clean energy sources on a significant scale.

A TREMOD study conducted on behalf of the German Environment Agency and published in March 2020 found that construction machinery in Germany consumes 72,440 terajoules of energy per year. That is roughly equal to 20 billion kilowatt hours of energy, the amount of electricity consumed by 10 cities of one million inhabitants each.

Since the nature of the sector's work dictates that mobile plant and machinery has to be deployed on construction sites, it is hardly surprising that diesel/fuel oil makes up the lion's share of the German construction industry's energy consumption, accounting for more than 50%. That is because, if no electricity supply is available in the site area, the necessary power is generally provided by diesel generators. >

THE CONSTRUCTION SECTOR BY ENERGY SOURCES



* No detailed information about the type of product is available

Source: Federal Statistical Office of Germany

Energy consumption and climate protection in the construction sector (Kraus/Stand 02.05.2022), Hauptverband der Deutschen Bauindustrie e.V.
Diesel fuels account for half of all fuels used on construction sites. Other mineral oil products (bitumen) account for 27%, electric current and other energy sources for 7%, gases for 7%, light fuel oil for 5%. Renewable energies only account for 2.5%.

Installing a liner.

But even in the days before the current shortage of fossil fuels began to take hold, there was already significant potential for savings in the construction sector, potential which, unfortunately, is still far from being taken full advantage of. What is more, it is not only the contracting sector that has a strong interest in utilising this potential for energy efficiency. In view of drastically increasing energy prices across the globe and the desire to minimise climate-damaging CO_2 emissions as soon as possible, it goes without saying that all the construction industry's stakeholders are called on to develop effective measures too. In the meantime, the project principals and machinery manufacturers are extremely interested in the energy efficiency of their projects and products as well. Because in the face of climate change, responsible use of our resources is everybody's business. Furthermore, Germany's act governing energy efficiency measures (EDL-G) requires all companies (apart from small firms) to be able to provide information about their energy usage.

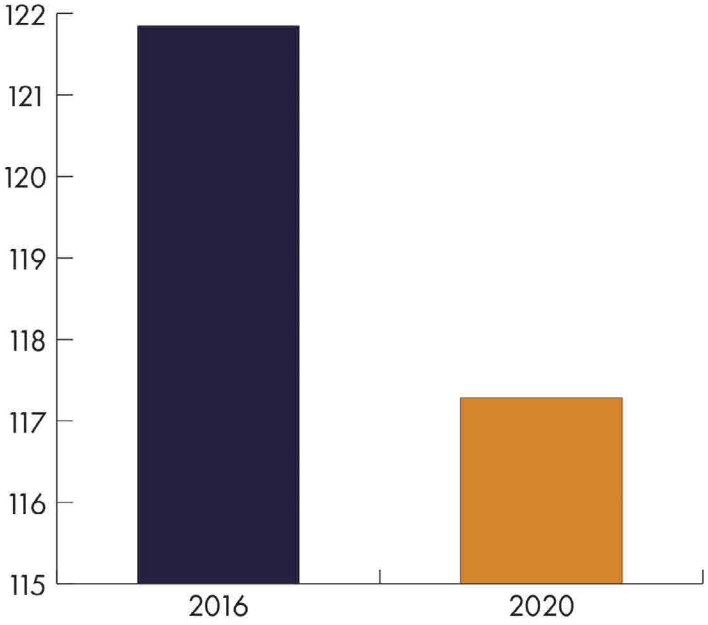
Optimising energy efficiency

Swietelsky-Faber GmbH Kanalsanierung, like many other construction companies, operates a lot of mobile machinery that has mainly been powered by diesel.

For many years now, Swietelsky Faber has been actively optimising its energy efficiency and determines its energy usage in compliance with EN-16247-1 as part of its energy audit. >

Energy consumption in relation to turnover is one of the many key figures included in the energy audit. Shown here: kWh from diesel/turnover.

KWH FROM DIESEL PER €1,000 OF TURNOVER



Source: Federal Statistical Office of Germanyt

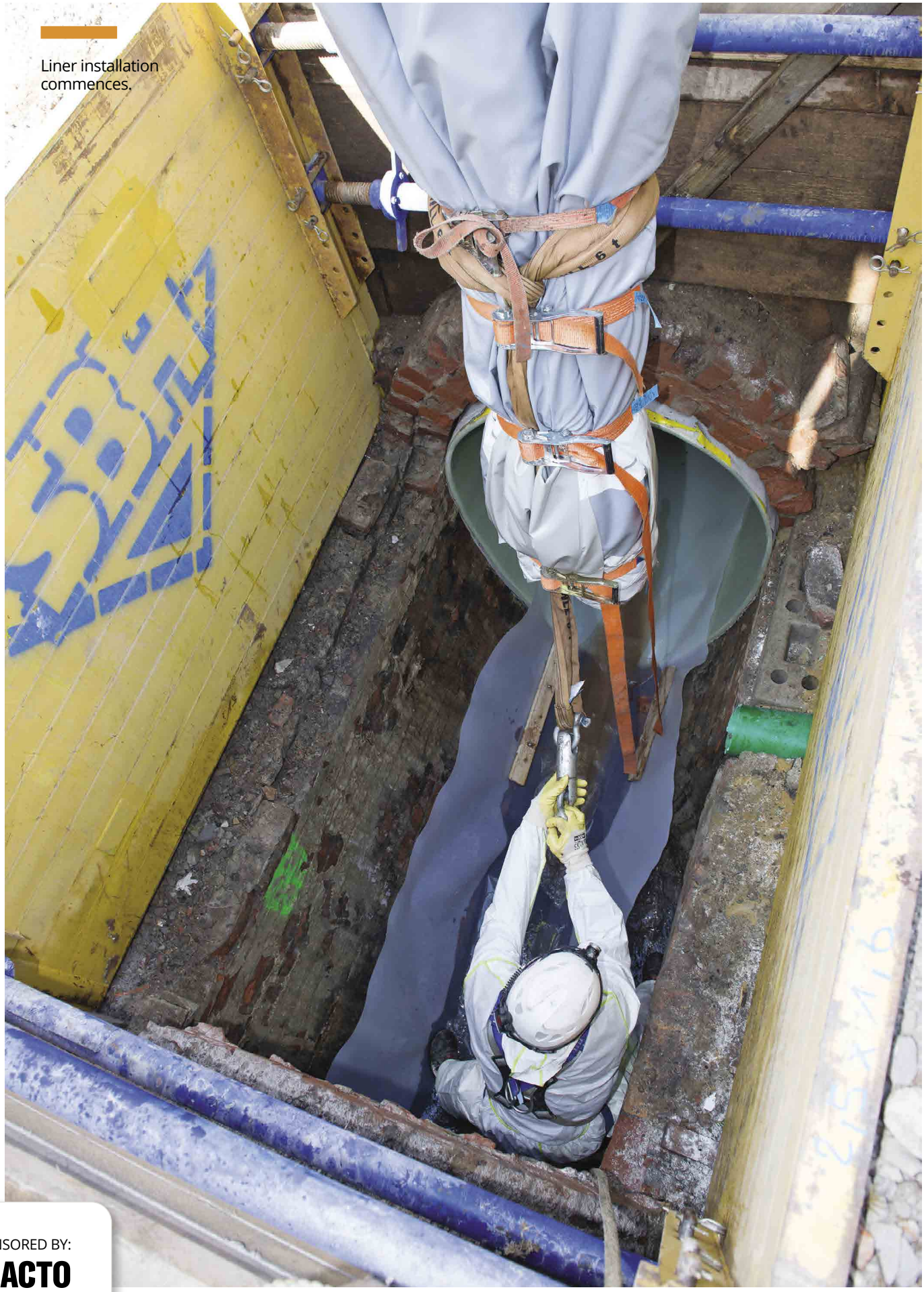
The potential identified for efficiency-enhancing measures is huge. In 2020, for instance, Swietelsky Faber consumed almost 7 million kWh of energy in the form of diesel, which still accounted for the lion's share (96%) of the company's energy consumption in 2016. Thanks to various measures to optimise its machinery, its repeat audit in 2020 showed that it had optimised its fuel consumption in relation to turnover by 8%.

Unfortunately, various steps need to be taken before the development of hydrogen fuelled cells reaches the marketable stage. In general, depending on the use case, the hydrogen either has to be highly compressed or cooled/liquefied using methods that are still relatively complex. Therefore, solutions for viable mobile hydrogen tanks and general transportability will first have to be developed before the construction sector can use hydrogen on a broader scale. Nevertheless, similarly to the rapid development seen in the e-mobility sector, it seems safe to assume that viable solutions will be developed in the foreseeable future, leading to the launch of hydrogen-fuelled construction machinery in the longer term.

For the time being, this means that the increasing electrification of machinery and equipment is currently the only path towards a climate-neutral construction site. The consumption of fossil energy sources can be reduced by purchasing systems that are powered entirely by electricity. In the case of mobile construction sites in the infrastructure preservation sector, however, that electricity is generally supplied by diesel generators. But, by using various types of energy storage device (rechargeable batteries), the use of diesel generators can be avoided or at least drastically reduced.

In addition, the greater efficiency of rechargeable batteries as compared to diesel generators can result in an energy saving of approximately 40%. On top of that, using charging current from PV systems can reduce the amount of primary energy consumed by a further (approximately 40%). That is not all, in view of current price developments in the fossil fuel sector, an investment in energy efficiency will reach break-even point considerably earlier than was the case just a few years ago. >

Preparing a liner installation.



Liner installation commences.

In addition, these measures result in a drastic reduction in the levels of noise and air pollutants at the construction site. That is a very welcome side effect, not just for our principals but for local residents and site-based employees as well.

It is time to update funding programmes!

Bright prospects, then. However, the purchase of rechargeable batteries and the conversion of plant and machinery call for enormous investments by the construction companies. That is why, several years ago, Swietelsky–Faber applied to Germany's Federal Office for Economic Affairs and Export Control for funding. However, to this day the application has been rejected on the grounds that the machinery is not eligible for subsidies due to its mobile deployment on construction sites.

This exposes a fundamental problem. The transformation of the construction equipment sector towards greater energy efficiency and lower emissions calls for huge investments by both the construction companies that use the equipment and the manufacturers who develop the powertrains and machinery. The bottom line is that the purchase of energy-efficient plant and machinery generally calls for considerably higher investments than conventional equipment.

In order to create genuine incentives for the development, purchase and operation of energy-efficient plant and machinery for the construction sector, the general exclusion of plant and machinery that is not used exclusively on company premises needs to be dropped from the Federal Funding Programme for Energy and Resource Efficiency in Business. Alternatively, it would be feasible to initiate a special incentive programme for mobile plant and machinery in the construction sector, which should however involve genuine subsidies and not merely financing options.

Subsidies are a necessary incentive in order to offset the additional costs as compared to conventional equipment and thus encourage acceptance of energy-efficient plant and machinery. Germany's construction industry association has been aware of this issue for some time now and has already presented its case to the German Government multiple times. The energy transition is already underway on construction sites. It will be interesting to see whether any support is forthcoming from the political side.

In the construction sector in general and the field of trenchless sewer rehabilitation in particular, these principals can also send a clear signal when it comes to environmental protection by demanding an energy audit. Because in view of growing public pressure to meet climate protection goals, it would make a lot of sense if, during the planning phase for trenchless rehabilitation projects, if principals were to demand that bidders have an operating and audited energy efficiency system in place as a criterion for being awarded the contract.

While it would not cost the principals anything, it would nevertheless be a huge benefit in terms of the project's ecological footprint and economic efficiency.

"In order to create genuine incentives for the development, purchase and operation of energy-efficient plant and machinery for the construction sector, the general exclusion of plant and machinery that is not used exclusively on company premises needs to be dropped from the Federal Funding Programme for Energy and Resource Efficiency in Business."

PLASTIC PIPE MANUFACTURER ON COURSE FOR GROWTH

Steffen Saur, the new egeplast Managing Director for Sales, Product Management and Marketing.

The current two-member management of the plastic pipe manufacturer egeplast will be strengthened by another member from 1 September 2022. Joining the team will be Steffen Saur, an internationally experienced leader in the areas of sales, product management and marketing.

"With Steffen Saur, we are pleased to have gained a top-class manager who is in a position to consistently advance our growth strategy." said Dr Ansgar Strumann, Managing Partner of the Grevener plastic pipe manufacturer. "We want to grow, open up new markets and make ourselves fit for the future. Mr Saur has repeatedly successfully implemented these tasks under complex conditions." Strumann continued.

"egeplast is an outstanding and market-leading family business in many areas. One example is the current new construction of egeGigaFab, a state-of-the-art factory for microducts. As one of the leading suppliers, egeplast enables the rapid expansion of fibre optics for broadband Internet in Germany. I am convinced of the further growth potential at egeplast." Saur stated. "I am honoured to be able to further develop this traditional company together with my colleagues and a first-class team. I will do everything in my power to make my contribution to the continuation of egeplast's successful course and to the profitable growth of egeplast." he said.

The 49-year-old Saur joins egeplast from the Saurer Group, an international mechanical engineering company. Previously, he held successful management positions at thyssenkrupp, Oerlikon, Hochtief and Vaillant, among others. Saur completed his academic training at the University of Mainz and Harvard Business School.

The owner-managed family business, egeplast international is a highly innovative manufacturer of plastic pipe systems. System solutions from egeplast are used in drinking water and gas supply, cable protection for electricity and glass fibre, wastewater disposal, industry and irrigation in over 30 countries. At its headquarters in Greven, Westphalia, Germany egeplast employs around 450 people in production, logistics and administration/sales. The egeplast Group also includes two pipe production sites in Sweden (Extena) and England (Westwood). >

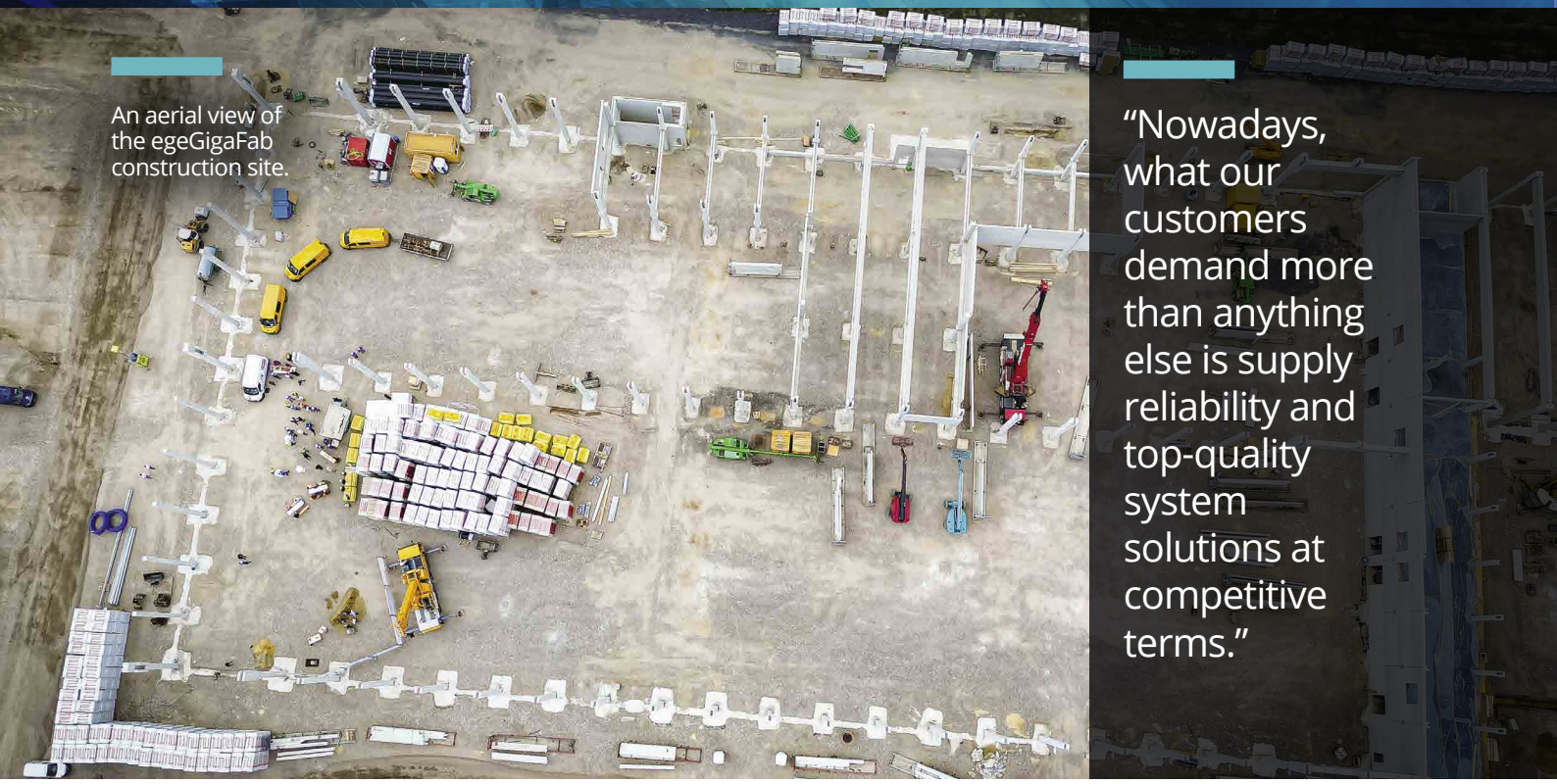
egeplast microduct reels

DUCT EXPANSION

Further to the appointment of Steffen Saur, egeplast has also recently announced that it is building a New egeGigaFab at its headquarters in Greven, Germany, a new production facility for Microducts. The company will increase its capacity for manufacturing Microduct pipes which is needed for the envisioned Europe wide broadband expansion (FttH/FttB).

"The investment volume is by far the biggest one ever made in the 114 years of our company's history." said Dr Ansgar Strumann, egeplast Managing Director and Majority Shareholder on the occasion of the ceremonial laying of the cornerstone for the new egeGigaFab. The new production facility will measure 11,000 m^2 (118,403 ft^2) and will be complemented by approximately 40,000 m^2 (430,556 ft^2) of storage space. As a result of removing Microducts production from the existing production hall, egeplast will set up a completely new manufacturing logistic and well as expand its existing capacity and will become one of the top 3 pipe suppliers for fibre-optic expansion in Europe.

egeplast Microducts are already supplied to all of the notable investors related to fibre networks. Microducts made by egeplast grants investors long-lasting protection of the fibre-optic cables. High-quality fibre-optic networks are their most important assets. >



An aerial view of the egeGigaFab construction site.

"Nowadays, what our customers demand more than anything else is supply reliability and top-quality system solutions at competitive terms."

Laying the corner stone of the new facility with from left to right: Bernhard Müther of Brüninghoff, Steffen Saur, Managing Director at egeplast, Ralf Utsch, Business Unit Manager Cable Protection Systems at egeplast, Dietrich Aden, Mayor of the City of Greven, Anja Karliczek, Member of the German Bundestag and former Federal Minister of Education and Research.

Ralf Utsch, the Division Manager of Cable Protection Systems at egeplast is well aware of this fact saying: "Nowadays, what our customers demand more than anything else is supply reliability and top-quality system solutions at competitive terms. Increasing our production capacity will improve delivery prospects and will result in greater flexibility."

"The egeplast Microducts meet the high-quality specifications stipulated by the major network operators in Europe. The product range for pipes is supplemented by customised accessories for any kind of construction project. For particularly challenging construction projects associated with additional safety requirements, e. g. projects involving flush drilling, the Microduct Protec product range provides extra protection of the media pipes. The entire system has been designed for a useful life of 50 years minimum and has been tested accordingly."

Compared to current manufacturing conditions, the level of automation will be increased significantly, which in view of the general lack of skilled staff was a must in planning. This step will allow for longer plant runtimes while at the same time effectively reducing set-up times and downtimes. The operational processes involved in the two-stage production were designed based on lean production principles by the engineering team led by Dr Tobias Hallmann. The manufacturing technology is state-of-the-art and also features numerous in-house innovations. As the Manager of Technical Procurement, Sonja Kloppenborg made sure that all planning complied with the most recent energetic standards. Customers will be able to benefit from the larger capacity for premium-quality Microducts for the expansion of their networks from summer 2023.

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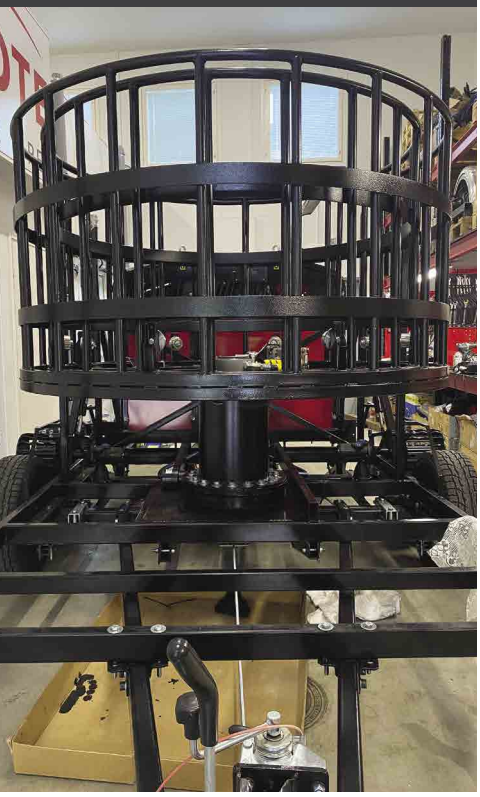
MEETING THE CHALLENGES OF THE MODERN WATER INDUSTRY

Picote Mega Miller Prototype outside.

Picote is a CIPP lining contractor in Finland, as well as an innovator and manufacturer of trenchless tools, machines and solutions for the global market, with over 250 patents to date. Picote's well-known, high-speed Millers and tools are deployed on worksites worldwide in sewer networks ranging from DN32 to DN300 (¼ in to 12 in).

It is widely acknowledged that the global need for renovating water and sewer pipes is growing. Access to water is becoming an issue in a growing number of areas. For Picote, the question was how to develop a solution to decrease the time and money needed to renovate aging and leaking water pipelines around the world? Also, how to help rehabilitate pipes over longer distances where linings have failed? It was clear that a multi-solution machine was needed, utilising No-Dig technologies and allowing a faster, more cost-efficient rehabilitation process which also offers a lower carbon footprint and a reduced use of water during the rehabilitation process. >

"Picote Mega Miller is designed to provide improved capabilities and make a substantial impact in the current Trenchless rehabilitation market."



Picote Mega Miller frame assembly.

Picote's expert international technical team, working closely with its Finland-based R&D team have come up with a unique solution. Based on industry needs, Picote Team's own experience and a commissioned market research report, the Picote Mega Miller is designed to provide new opportunities in rehabilitating both wastewater and clean water pipes over long distances, up to about 100 m (328 ft) from a single access point, with the option of doubling the distance with the second shaft. A large range of tools allow the machine to be used for many types of work, including cleaning and descaling heavy tuberculation, as well as removing failed liners and concrete in DN70- DN300 (3 to 12 in diameter) pipes.

The Mega Miller features a new, hollow 49 mm (1.9 in) diameter shaft for DN150 to 300 (6 to 12 in diameter) pipes, fabricated from a line of couplers, a complete change from current Miller setups. This pioneering flexible shaft design transmits 1,000 Nm of torque and rotates between 150 and 300 rpm. A two-directional pressure plate allows the shaft to also be rotated in either direction, with the same output. The hollow shaft weighs around 750 kg (1,653 lb) compared with around 3,000 kg (6,613 lb) for 120 m (393 ft) of the traditional shaft, offering significant material and weight savings. The hollow shaft comes with a cooling channel, allowing self-cooling with pressurised air during works. Water is added to the air stream after which the air and water are mixed in the channel. Reduced amounts of water are required during the cooling process due to the new technology. The water and air mixture is also used during the cleaning process and as a shaft lubricant.

The team decided it would be highly advantageous to add a second, smaller shaft to Mega Miller (27 mm or 1.06 in diameter), allowing higher rpm, as well as access to smaller pipe sizes down to DN70 or 3 in diameter (straight pipes only in 70 mm/3 in diameter). This would effectively mean doubling the potential working range, as the shafts could be operated simultaneously, in opposite directions from the same access point, making it possible to work on 200 m (656 ft) at any one time. The 27 mm (1.06 in) diameter shaft is designed for DN70 to DN150 (3in to 6 in diameter) pipes.

A Mega Miller prototype has been developed and is ready for testing at live worksites. Based on field testing, the prototype will be re-designed and updated as required, until all testing has been finalised. After this, the prototype will be approved and transferred to the production phase.

Picote Mega Miller is designed to provide improved capabilities and make a substantial impact in the current Trenchless rehabilitation market, made possible by new innovation, which is necessary to make the maintenance and rehabilitation of the world's sewer and water networks meet the challenges of rehabilitation, leakage reduction and net zero targets, through faster and more efficient No-Dig techniques, while decreasing costs and increasing safety.

Come along to the presentation on Wednesday 5 October, 2022 to learn more about this cutting-edge R&D project and visit us at stand 48 at the Helsinki event to see the prototype. Also, there is a Picote Open House at Porvoo on 6 and 7 October.

U.S. AGAIN HAS A VOICE IN UNDERGROUND PIPE REHAB STANDARDS

David Kozman

After more than a two-year absence, the United States once again has a vote in pipe rehabilitation standards established by the International Organization for Standardization (ISO). In June, David Kozman, Sr. Applications Engineer at HammerHead Trenchless, was appointed as a technical expert representing the United States on ISO Technical Committee 138 (TC138), Subcommittee 8 on Rehabilitation of Pipeline Systems.

Kozman joins Patrick Vibien, head of ANSI Technical Advisory Committee to ISO TC138 and Technical Director of the Plastic Pipe Institute (PPI), in representing the United States on ISO topics relating water supply pipe and drainpipe rehabilitation.

ISO is one of the most widely known independent, international organisations that develop standards promoting quality, safety, and efficiency of products, services, and systems. The work of preparing ISO standards is normally carried out through technical committees of all participating countries.

Although ISO's non-governmental standards are voluntary, industries worldwide look to its standards as a trusted, objective means of ensuring that products and techniques are suitably developed to match specific applications and conditions in a given market. Therefore, input, collaboration and consensus from the broadest range of global expertise is intrinsic to the standards development process.

Wim Elzink, convenor of Working Group 2, welcomed Kozman to TC 138 Subcommittee 8 (TC 138 / SC 8) with gratitude. "Participation of the USA is very much welcomed." Elzink said.

Having a vote in ISO standards development, Kozman explained, benefits the U.S. in two, key ways. It keeps the U.S. abreast of new and evolving technologies that have uses in the American market, and it enhances the ability of U.S.-based companies to participate in the global market.

Kozman is spearheading the development and coordination of the team of U.S. subject matter experts for considering new proposals and amending current standards relevant to SC 8 / WGs 1, 2 and 3, which cover plastic piping rehabilitation systems for underground non-pressurised drainage and sewerage systems and water supply networks.

He brings 23 years of experience in the trenchless industry to the position, from hands-on, in-field application and consultation to manufacturing research and development. Much of his career has been spent in close collaboration with accomplished industry experts he will now be working with again in his new ISO position.

Vibien, who heads the US mirror committee for ISO TC138 on behalf of ANSI, had supported the United States return as a voting member of SC8. Kozman works closely with Vibien and other US technical experts to articulate U.S. perspective and workgroup findings for each draft.

"It is a tremendous honour to represent the U.S. in these discussions." Kozman said. It is a responsibility he does not take lightly. "The U.S. has a lot to contribute to the global standards discussion from its unique perspective from the North American market, just as I know our participation can benefit countries around the world." he said, "I am eager for the advantages we receive here at home from our close collaboration with experts abroad and their valuable insights."

MAMMOTH-MTS CONTINUES GROWTH

Mammoth-MTS has invested and strengthened its team with the appointment of a new Business Development Manager, Service Manager and Sales Administrator to help ensure the highest levels of support and service are available to the companies increasing client base.

Jason Smith joins as the Business Development Manager, bringing with him a wealth of experience in both Trenchless and Suction Excavation equipment gained over 30 years working with companies including U-Mole, TT UK and Vermeer. In this time, he has built up a knowledge of both the utility and construction industry viewed from the contracting, rental and sales perspectives in equipment ranging from small tools such as moles, through to large pieces of capital plant including HDD rigs, Tracked Trenchers and Suction Excavation equipment.

Chris Cunningham starts with the company as Service Manager, a key role responsible for the after sales support for both Trenchless and Suction Excavation equipment. Chris brings over 10 years of experience with him in the support of Suction Excavation equipment with one of the UK's largest and most established providers of operated Suction Excavation Equipment. Aside from the day-to-day operational control of the companies engineering support operatives, Chris is also responsible for the establishment and running of a new, Northern based MTS service centre for the Suction Excavation business.

Will Ashwell, has taken on the role of Sales and Support Administrator, acting as first line team member for many clients contacting the company by phone or email. Although new to the industry, Will has a proven administration background and has taken to his role quickly building up his knowledge of both the company products and the associated spares etc. This will enable him to respond too, or route through client enquiries quickly and efficiently to the relevant team members.

These recent appointments are only part of the ongoing investments Mammoth-MTS is making with further expansion in backroom support services and the provision of additional engineers planned to handle the increasing demands of their growing customer base.

Jason Smith, Business Development Manager.

Chris Cunningham , Support Manager.

Will Ashwell, Sales & Support Administrator.

PSS GAINS WRC APPROVAL FOR THE CONDOR ROHR SHORT MODULE PIPE SYSTEM

The Condor Pipe Type S – Pulling Head.

A Section of Condor Pipe Type S.

Public Sewer Services (PSS) one of the leading providers of No-Dig technology throughout the UK is pleased to announce that not only has the Condor Rohr System received WRc approval but PSS has also been accredited as the first WRc approved installer of the system.

This rehabilitation system provides an economical method of lining or pipe bursting lengths of sewers or drains for non-pressure applications within the confines of existing manholes. Which means no excavation and no interruption of traffic flow.

In addition to sliplining, the threaded short PP modules are particularly suited for use on applications employing static pipe bursting techniques where size-for-size or upsizing pipe bursting of non-man entry sewers is possible.

The operation can be carried out from an existing access chamber/ manhole, house basement or small excavation to the next access chamber/ manhole.

Back-support for these threaded module pipes is always required during insertion, because of their proven capacity to take high pulling forces.

The Condor pipe Type T is available in the following range ; 110 mm through to 400 mm o.d. in either 0.60 m or 1.10 m lengths which provide 0.50 m and 1.00 m construction lengths respectively.

The system also has WRc approval in the ranges:

- Sliplining Type S (Snaplock) joints, HDPE or PP, 110 mm to 1,000 mm diameter.
- Sliplining and Pipe bursting CONDORfuse® HDPE, 110 mm to 1,000 mm diameter.
- Pipe bursting Type S (Snaplock) joints, PP, 110 mm to 1,000 mm diameter.

MD Lee Freeman said: "The CONDOR ROHR short pipe modules are the only WRc approved product and service listed for sliplining/pipe bursting applications. We are hoping that this will give us a good advantage in the market place and is a great achievement for PSS Less Dig/No-Dig applications growth within the water industry."

The New X40

Compact, lightweight, battery operated CCTV camera system, with unrivalled connectivity. Allowing you to complete a professional video survey using your mobile phone or tablet.

The X40 is the first of a new range of products enabling you to create full video reports with text, titles and distance counter overlays directly on a mobile device. This eliminates the need for cumbersome, often expensive, custom designed control boxes that require regular servicing.

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ESH CONSTRUCTION INVESTS IN NEW DIVISION

The ESH management team.

A new delivery arm which will specialise in providing complete drainage solutions to the commercial and utility sectors has been launched by Esh Construction.

The North of England firm has invested £1.5 million to create Esh Drainage Solutions which will deliver planned and reactive trenchless drainage maintenance, repairs, and cleansing services. More than 15 new jobs have also been created, including operative, administrative, trainee and management roles, with this number set to increase in the coming months.

Operating across the Northeast and Tees Valley, Esh Drainage Solutions will enhance the delivery offering of Esh Construction and will use the latest and most environmentally friendly technology to offer trenchless solutions for drain repairs.

Services will include CCTV surveys, high-pressure water jetting, sonar tracing, drain and sewer unblocking and cleansing, as well as UV Cured-in-place pipe (CIPP) lining, Bluelight LED lining, localised patch repairs and robotic cutting.

David Pratt, divisional director at Esh Construction, said: “Officially launching Esh Drainage Solutions is a huge milestone for Esh and is testament to a significant amount of hard work which has gone on behind the scenes to make it possible. At a time of growing uncertainty within the economy, >

it is great to welcome a full new team into Esh through the creation of 15 jobs. Esh Drainage Solutions will bolster our offering to clients across frameworks and internally to our group divisions, giving us the capability to self-deliver trenchless drainage solutions while building on the solid foundations we have with supply chain partners to collaboratively provide a complete approach to drainage repairs and maintenance."

Significant investment in equipment to date has grown the division's kit and fleet to include CCTV and Vactor units, the Bluelight lining system, patch lining equipment and jetting units.

Pratt added: "In the coming weeks we will add bespoke designed UV Lining and lateral cutting rigs to our fleet which will be key to offering less intrusive trenchless methods and improved customer service for our clients."

"At a time of growing uncertainty within the economy, it is great to welcome a full new team into Esh through the creation of 15 jobs."

The ESH team at the company headquarters.

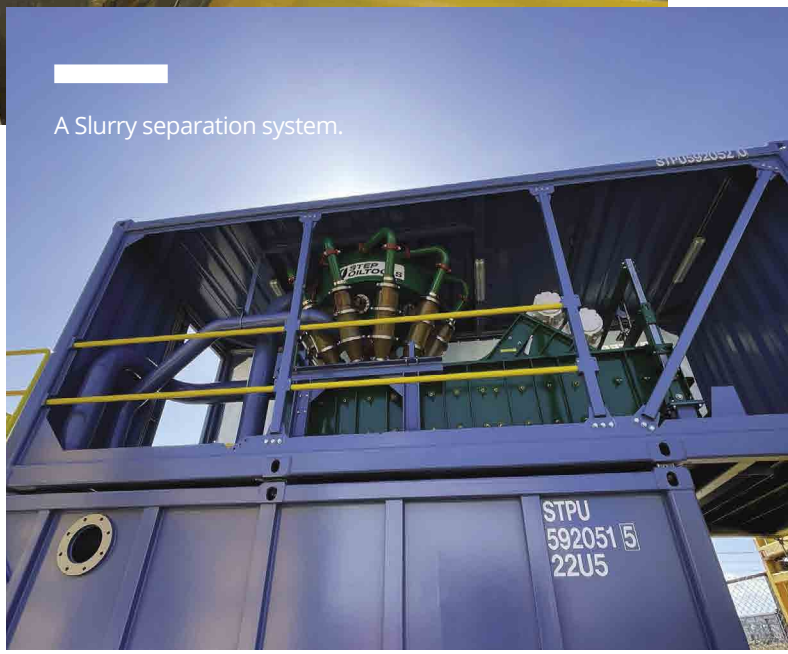
STEP OILTOOLS ANNOUNCES ROCK TOOLING PARTNERSHIP

STEP Oiltools (UK) Limited is pleased to announce an exciting new partnership with Infinity Tool MFG, the American rock tool manufacturer. The agreement which commenced in May 2022 includes the distribution of Infinity's full range of HDD rock tools which provide products for the HDD, Water well Drilling, Geo-Thermal, Construction and Mining sectors.

Since 2009, Infinity Tool Manufacturing has been synonymous with manufacturing and supplying market leading rock tools to the drilling industry. Its products are manufactured in a state-of-the-art facility to ISO 9001 international quality management standards. The manufacturing facility is located in Benton, Illinois, USA with distributors and agents located across the globe.

STEP Oiltools offers premium slurry separation systems, de-sanding units, fluid mixing packages and solids control equipment to the Civil Engineering Industry. Operational support bases are located in Germany, the UK, Singapore and Australia. >

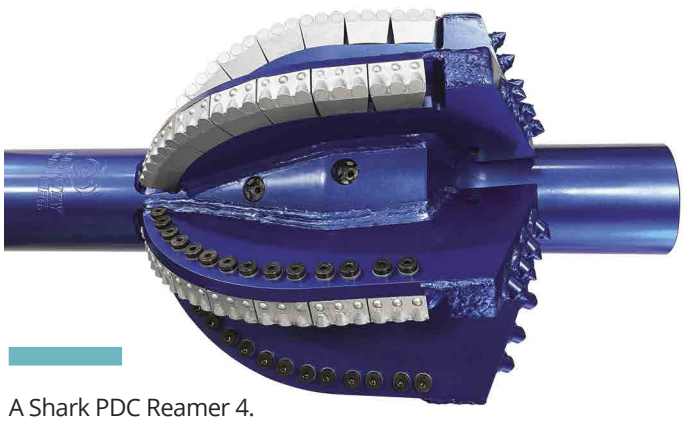
Detail of a Step Oil Tools slurry separation system.



A Slurry separation system.

These locations stock equipment, spare parts and consumables, providing a solid distribution network for the industry leading Derrick Equipment™ products. Its experience in this industry spans 30 years and during this time several innovations have been brought to the market that help to increase performance and reduce costs.

Rohan Cree, Country Manager for STEP Oiltools UK said: "We are delighted to announce this partnership with Infinity Tool MFG as this will enable us to further support our customers with a complete portfolio of very high-quality drilling tools that can tackle a huge range of ground conditions. Infinity Tool MFG have shown real innovation and understanding of its customers' needs which can be seen in the design and quality of the tooling. An example is their PDC Shark Reamer which has the ability to be re-dressed with new cutters on location by the customer, reducing the amount of reamers needed for a project and reducing the cost of operations."



A Shark PDC Reamer 4.

TRACTO GRUNDODRILL FOR FCH CONSTRUCTION SERVICES

FCH takes delivery of its new 'The King of Rocks' 18ACS GRUNDODRILL.

An 18ACS GRUNDODRILL was specified as the drilling rig of choice by Fife-based FCH Construction Services for their work in the water and utilities sectors. Known as The King of Rocks, thanks to its ability to drill in all ground conditions, it was purchased outright by FCH to ensure the availability of the correct technology to complete a number of contracts for Scottish Water. The machine has now been fully branded with the corporate colours of FCH Construction Services to complement its existing fleet of trucks and construction equipment.

Fraser Hart began the business in 2009 after spotting the need for a trenchless contractor in Scotland. He has been working with the TRACTO team based in the Kirkcaldy depot; hiring in a number of specialist rigs for complicated installations. This includes the GRUNDOPIT PS60 fluid-assisted mini drilling rig which, with the support of TRACTO's specialist operator support team, was successfully used to complete a water main that had to cross a small stream between Perth and Dundee. He has since bought GRUNDOMAT moles and enrolled his team in a range of EUSR training courses at TRACTO including GRUNDOWINCH.

After the successful completion of the small stream crossing, achieved in under a day despite a number of problems and challenges with the terrain, Fraser enquired about using the same unit for another potential project. Kevin Pate, TRACTO's Scotland-based Area Sales Manager, conducted a site visit with Fraser and Dave Stewart from FCH and recommended the larger 18ACS GRUNDODRILL due to the size and nature of the project. The trio visited the Bedford HQ of TRACTO to undertake an inspection of the drill in the flesh and a negotiation was successfully concluded.

According to MD, Fraser: "The location of the depot just down the road from FCH Construction Services and the support of both Kevin Pate and Kevin Macintosh of TRACTO's depot in Kirkcaldy were key reasons involved in the decision to buy the unit. The knowledge and support from the TRACTO team over the last few years has been invaluable. From advice, machines, parts and service support to site visits they have really helped us to complete some of our challenging projects. The access to other models in the TRACTO range, including pipe bursting products, and close location to the depot further supported our decision to buy the 18ACS GRUNDODRILL. It is a superior machine that can work in both soft and ultra-hard ground conditions and has already been deployed successfully on jobs following intensive on-site training from TRACTO."

TRENCHLESS WORKS SET TO LAUNCH NEW MEDIA PLATFORM

"This is the official magazine of the ISTT and we are ensuring it reflects the needs and achievements of the entire No-Dig industry. We will continue to keep our readers informed and supported through what is now the largest and most influential media in the global trenchless market."

Trenchless Works is the biggest and most read publication for the No-Dig industry. Over the years it has been at the forefront of the industry, charting new innovations and practices and giving a clear and necessary voice to those who work in the sector and it is about to get even better.

The publication is set to harness the very best of online interactivity in media production, launching a more media rich magazine, packed with information for the industry. It will feature video, interactive features and offer more access to industry resources than ever before.

For you, the reader, it means you do not just get to read the stories that matter, you get to see the details that matter too, discovering the facts, figures and trends behind the stories. You can find out more about the people and the businesses that are moving the No-Dig industry forwards.

This is an exciting time for the industry. There are many challenges and advances coming from different directions. Sometimes these influences can be complex and multi-faceted. The new look Trenchless Works will enable you to take a deep-dive into the important stories, discovering how trends may affect you and your business, or find out how you can benefit from what is happening.

While increasing the coverage of the industry, we are also making sure that readers can still access the information they need swiftly and easily. The new interface is easy to navigate, requires no additional downloads or instructions. It is just click on the information you are interested in and we will show you what you need – clearly and concisely.

As the industry moves forward and continues to make a significant contribution to the world's economies and businesses, it deserves a modern, cutting-edge publication that recognises, promotes and details the work it does. With our new look and interface, Trenchless Works will be that resource.

As Paul Harwood, publisher of Trenchless Works said: "This is the official magazine of the ISTT and we are ensuring it reflects the needs and achievements of the entire No-Dig industry. We will continue to keep our readers informed and supported through what is now the largest and most influential media in the global trenchless market."

PNEUMATIC HAMMERS FOR DIFFICULT GROUND

Two different site set-ups for different models of the Geonex hammer drilling machines.

Scandinavian ground conditions can be extremely onerous requiring utilities to be installed through extremely strong 350+ MPa (50,000+ psi) unconfined compressive strength (UCS) rock and soft ground littered with boulders. This has forced contractors to think outside of the box to find reliable cost-effective solutions to install underground ducts.

Pneumatic hammer well drilling technology from the 50s commonly referred to as Down-The-Hole (DTH) hammers provided a solution. Driven by compressed air the hammer mechanism has rapidly reciprocating piston arrangement that percussively strikes a drill head assembly, that drives through the ground. Exhaust air from the piston flushes spoil cuttings to the surface. This technology has been utilised in Scandinavian trenchless technology for over 30 years.

In 2012 Geonex Oy launched a concept for:

1. A pneumatically powered horizontal hammer that uses exhaust air and augers to return excavated spoil down the casing.
2. A hydraulically powered rig with a rotary drive unit to guide casings and drive the augers.
3. A system controlling power pack unit, had been devised

With this, the company Geonex Oy was founded. Designs were finalised, and supply chains formed allowing for production and sale of the first HZR 400 system in 2013. Further designs to create four systems to cover casing installation in the range from 140 mm (5½ in) to 1,220 mm (48 in) diameter were completed by 2017. These included:

a. The HZR 220 + PP 180HA for casings from 140 mm (5½ in) to 219 mm ($8^{10}/_{16}$ in) diameter
b. The HZR 400 + PP 90 for casings from 168 mm ($6^{10}/_{16}$ in) to 406 mm (16 in) diameter
c. The HZR 610 + PP 180 for casings from 273 mm (10¾ in) to 813 mm (32 in) diameter
d. The HZR 1200 + PP180 for casings from 610 mm (24 in) to 1,220 mm (48 in) diameter

Key system benefits include the ability to operate in all ground conditions with the same cutter head. Installation rates of 2 m (7 ft) per hour through hard rock and >

6 m (20 ft) per hour in mixed ground with boulders that are reliable and fast. Control via a wireless lightweight hand portable control unit allows the operator to be safely positioned remote from the rig, where required. Set up costs are low, due to self-propulsion of the hammer shafts which are not always required. This in turn allows for economical use of long 12 m (40 ft) casing elements. Labour requirements are also low, typically systems up to 610 mm (24 in) diameter can be manned with just 3 operatives with 1 being a coded welder. For diameters 762 mm (30 in) and above it would be recommended to have 2 welders taking the crew requirement to 4. With remotely activated hydraulic legs for lateral and height adjustment, rigs can be set up and ready to bore in half a day shift. All-in-all, a reliably robust efficient solution that can install 100 m (330 ft) long bores within a week.

The equipment is almost completely retractable, only leaving behind the peripheral cutter bit and starter casing allowing blind hole bores such as starter and receiving casings for horizontally drilled crossings to be undertaken. Cased bores are limited to approximately 100 m (330 ft) to 150 m (500 ft) in length. Active steering is currently not available however when launched and correctly operated accuracy of approximately 0.5 to 2% over bore lengths is achieved. It is important to monitor that the hammer assembly and lead casing are installed on the designed alignment and use the hydraulically adjustable legs of the rig to make as required adjustments. Impact forces generated by the hammer disturb ground at the excavation face that trend to a slight downward movement of the hammer along the bore. The 'Rule of Thumb' is, the harder, denser, or better load bearing the ground the better the accuracy. Operators also need sophisticated controls to adjust hammer impact frequency to suit project conditions and/or changed project conditions, higher than required frequency will induce greater downward movement trends.

Uncased open hole bores in competent rock can extend 300 m (1,000 ft) to 500 m (1,500 ft) and have the ability to be steered via the initial 6 in (150 mm) diameter pilot bore using sonde detection equipment for guidance.

Over 50 Geonex systems have been sold globally. In Switzerland the versatility of the system has been recognised and Geonex has been nominated for projects to minimise the risk of bore failure due to unforeseen natural ground conditions. Successful trials have been undertaken in Finland with an actively steerable 8 in (200 mm) diameter guided pilot casing. Pilot casing will be used as a guide rod for larger diameters.

DTH and HHB hammers are not new to market, but the cleverly adapted Geonex package certainly is and offers ease of market entry to customers. For engineers and contractors, it puts on the table a 'go to solution' for the installation of small diameter tunnels in the 'rock and the hard places'.

A TOUR OF SCANDINAVIA – FROM A CIPP POINT OF VIEW

'Don't choose a product. Choose a partner' - this is the slogan at Per Aarsleff Pipe Technologies (PAPT). To see why this slogan, what follows is a tour around some of Scandinavia to look at different projects where the company's experience in renewing pipes was beneficial to the client.

Long installations requires long transport.

Per Aarsleff Pipe Technologies comes from a history of developing, producing, and installing needle felt liners since 1979. However, in the recent decades it has concluded that if it wants to maintain a leading position in the relining market, it needs to master all products. Therefore, the company started to produce glass fibre liners about 10 years ago, but also to test close-fit systems and precast glass fibre reinforced pipes. PAPT has a strong feeling that having experience with different kinds of systems, both on the production and the installation side, will benefit clients as well as its business since it can optimise the project execution.

On a clear and cold winter morning in February 2022 the renewal of 3,000 m of DN800 began in Fredrikstad, Norway. The client had some concerns about the project since the pipe was located under farmland and under the Gamle Fredrikstad Golf Club. How could Olimb, a part of the Aarsleff group, ensure that the least possible harm was done to the ground while the rehabilitation of the 3,000 m was executed? With many years of experience from different systems Olimb chose a solution with the glass fibre. The size of the pipe, the access to the manholes and the length of the bypass pumping all pointed in the direction of a glass fibre liner. The bypass pumping was a key to success in this project. After some weeks with perfect weather conditions for installing >

Installations at Gamle Frederikstad Golf Club

liners, the weather changed into a more mild and wet period. Therefore, the people on the ground struggled with both installations, and massive water volumes. However, after three months, lots of water and ensuring the golf players game during installations, 3,000 m of glass fibre liner was installed with success and with the client's satisfaction and approval.

Interesting Facts from the Fredrikstad project include:

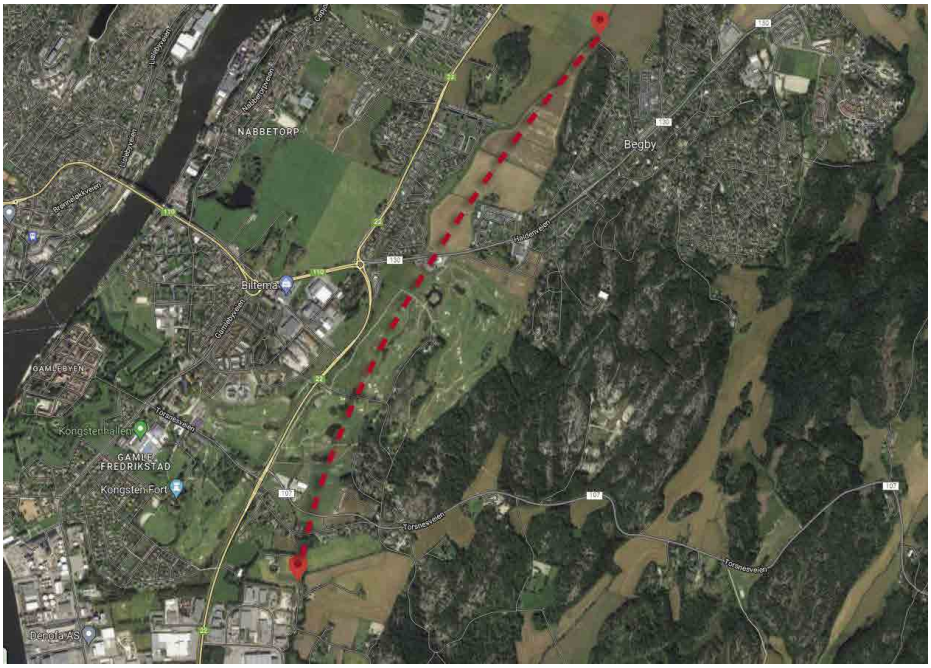
- 2,941 m of renewed pipe
- 22 installations
- 3 months duration
- Difficult ground conditions
- Challenging bypass pumping

Cooperation

Not only technical solutions but also cooperation is important when having a partner. In Esbjerg in the Southern part of Denmark a 6 km long pipe underneath a breath taking and vulnerable nature area had to be renewed.

The client had the option to replace the existing pipe and manholes with a new system. But it would affect the area for many years and with that in mind the client asked for a CIPP solution. This was both more sustainable and less time consuming. However, it was still a concern that big vehicles had to enter the area to perform the installations. Aarsleff was chosen for the job and immediately set a team with two other well-known contractors to solve this complicated project. As it was in Fredrikstad in Norway, the bypass pumping was also an important part of the project. The bypass pumping set-up was designed to deal with up to 1,075 l/s with several pumps being used to ensure the function of the existing pipe. Needle felt liner cured with steam was chosen for smaller diameters or shorter installation for mid-range diameter. Needle felt liner cured with water was chosen for large diameter and long lengths and UV cured glass fibre liners were chosen for manholes and mid-range diameter pipes. For the very small diameters LED curing technology was used, and the laterals were >

Road crossing.



Overview of the Pipe Line.

rehabilitated with Aarsleff long top hat profiles. The project was started in April 2021 and handed over in December 2021. Beside the technical solutions the coordination between all the parties were essential to be successful. The relevant authorities, biologist, client, consultants, partners, and users of the area were involved in the project. All with a positive mind before, during and after the project.

Salient facts about this project include:

- 600 m of renewed pipe between DN150 and DN1000
- 44 installations
- 6 months execution time
- Difficult ground conditions
- Challenging bypass pumping
- Combining different CIPP solutions to be as efficient as possible
- Coordination and professional Project management

Malmö

In the summer 2022 the city of Malmö had to renew some of its big collectors. The pipes were either DN1400 or DN1500 and had transported wastewater from the residents of Malmö for almost 100 years. The client was VA SYD and they had cleaned and evaluated the pipe. It had several cracks in the crown and therefore it was decided to rehabilitate the pipe. Because of the traffic, fire station and schools the client wanted as few excavations and installations as long as possible a CIPP solution was chosen. The Swedish part of Aarsleff analysed the job site on-site and had three solutions in mind. A GRP system where precast glass reinforced pipes could be pushed into the existing pipe, a UV cured glass fibre liner, or a heat cured flexible liner. Due to the requirement of client in terms of excavation and long lengths a solution with a flexible needle felt liner was chosen. The existing pipe also had a lot of bends and here the flexibility of the needle felt liner was preferred. The entire length of the existing pipe could be renewed with only six installations in total. Only a few excavations were necessary. Both the GRP and UV cured liner solution required extra excavations. >

"The Swedish part of Aarsleff analysed the job site on-site and had three solutions in mind. A GRP system where precast glass reinforced pipes could be pushed into the existing pipe, a UV cured glass fibre liner, or a heat cured flexible liner."

Job Site in Malmö

Supervision is important.

The client was satisfied with the project and in terms of sustainability. A CIPP solution saved up to 650 t of CO_2 compared to excavating and installing new pipes. Also, the saved execution time was very valuable for the client.

Interesting Facts pertaining to the Malmö project include:

- 1,200 m of renewed pipe of DN1400 or DN1500
- 6 installations
- 1 month execution time
- 1000 l/s by-pass pumping
- High density traffic area, schools, fire station etc. in the installations area.
- Choosing one method to optimised installation lengths.
- Saving CO_2 compared to excavation projects.

The processes in the three projects highlighted in this article are typical of how Per Aarsleff Pipe Technologies analyses and chooses methods in CIPP projects. Because the company has many years of experience with most of the products and methods in the market, it can also choose the most optimal solution for the client. For the project in Norway, UV cured liner was the best solution due to the size and location of the existing pipes. For the project in Denmark, PAPT had to use almost all its methods due to the variety in pipe sizes and in Sweden curing long lengths with water was the best solution to avoid extra excavations.

TRENCHLESS FOR ONE OF SWEDEN'S LARGEST PIPELINE RENEWALS

In the spring of 2020, Aarsleff Pipe Technologies carried out one of the largest and most complex pipeline renewal projects ever carried out with flexible linings in Sweden. The project was carried out on behalf of the municipal water and waste company Nodra AB.

Norrköping's largest sewer pipeline was near collapse, the starting point was more or less acute with investigations carried out in 2015 showing that Norrköping's largest sewage pipeline was in danger of collapsing in five to seven years. It was an unusually large and hard-to-reach pipeline, located 3 to 4 m below the asphalt surface, in a very centrally paved tree alley lined with 1,800 building-protected trees.

The solution proved to be group strength and tailor-made solutions. Thanks to borrowed group expertise, Aarsleff was able to solve the project and in total a pipeline section of as much as 3 km was renovated. Meanwhile, all the wastewater in the city was pumped down to the treatment plant through temporary pipes, which was the largest bypass of its kind to be done in Sweden. Several types of flexible linings and installation techniques were used in the project, including installation with water, steam, UV and well renovation, all of which were carried out to ensure optimal operation of the new pipe. >

Caption

Preparing the site for the over-pumping installation.

Over-pumping installations were designed to minimise disruption to everyday life.

The results offered a time-saving, cost-effective and sustainable future investment and streets and squares that did not need to be dug up and furthermore carbon dioxide emissions could therefore be kept down. Nodra was able to save valuable resources and minimised disruption to residents, traffic and businesses in the area. The project has made it possible for the wastewater to be fed to the treatment plant in a safe and reliable way before it is discharged into Bråviken, making this an important investment for Norrköping to function and grow sustainably.

“When it was time for procurement, it was difficult to get tenders due to the complex nature of the assignment. Aarsleff was the only one that could shoulder the challenge. Magnus Ålstam, water and wastewater engineer at Nodra said: “I do not think anyone could have imagined what attention the project would get in the media. Both Norrköping’s newspapers and Folkbladet raised the project on large spreads on a number of occasions.

“Radio, industry media and private individuals in social media have also shown great interest in following this project. Now that this stage is coming to an end, it feels like ‘what happened, didn’t the job take longer?! I am very pleased with the cooperation with Aarsleff.” said Jonas Törnvall, project manager for Nodra.

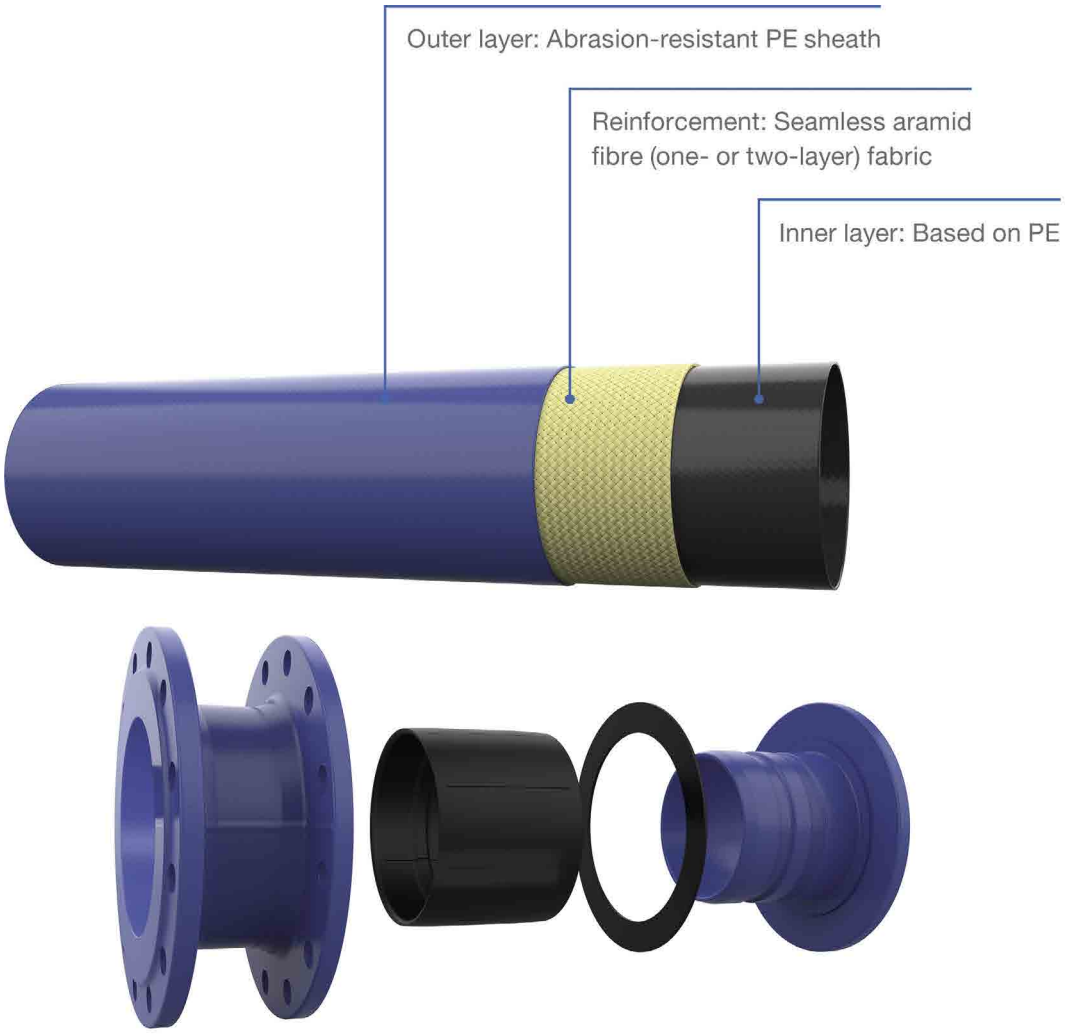
REHABILITATING A PETROCHEMICAL PLANT MAIN

Some preparations were required prior to lining.

A very tight time frame and several long installations of up to 1 km and more are only a few of the challenges that a petrochemical plant pipeline renewal project in Spain entailed. To meet these challenges, the pipeline owner decided to renovate the existing asset with the aramid-reinforced pipe-in-pipe system Primus Line®, a trenchless solution, which has the benefits of reduced down times due to its rapid installation. As a result of the swift project execution, the production process was not affected at any time.

The petrochemical plant was built in 1966 to produce petroleum derivatives. Currently, this plant has a production capacity of 120,000 tons of styrene-butadiene-styrene (SBS) and styrene-ethylene/butylene-styrene (SEBS) per year. For its operation, the plant needs a continuous water flow for cooling and fire protection. Therefore, it has a water supply system made up of a pumping station, and a 6 km long main supply pipe. The first 3,600 m of the pipe has a diameter of DN600 and consists of concrete, reinforced with a sheet metal jacket and asbestos cement. The following 2,400 m are made of asbestos cement with a diameter of DN350. >

A breakdown of the liner fabric used on site. Below right: Various site operations underway.



The industrial water pipe, with an age of nearly 50 years, began to show symptoms of being close to the end of its life due to successive leakages in recent years, particularly in the asbestos cement section. The fortuitous leakage of the concrete pipe at the beginning of and under the intersection with a RENFE railway platform accelerated the need to undertake action.

The DN600 pipeline of the initial section runs parallel to the platform of the Santander to Bilbao railway line, so any intervention in this area required special access permits. This is the reason why a construction system that would minimise the damage to that infrastructure had priority.

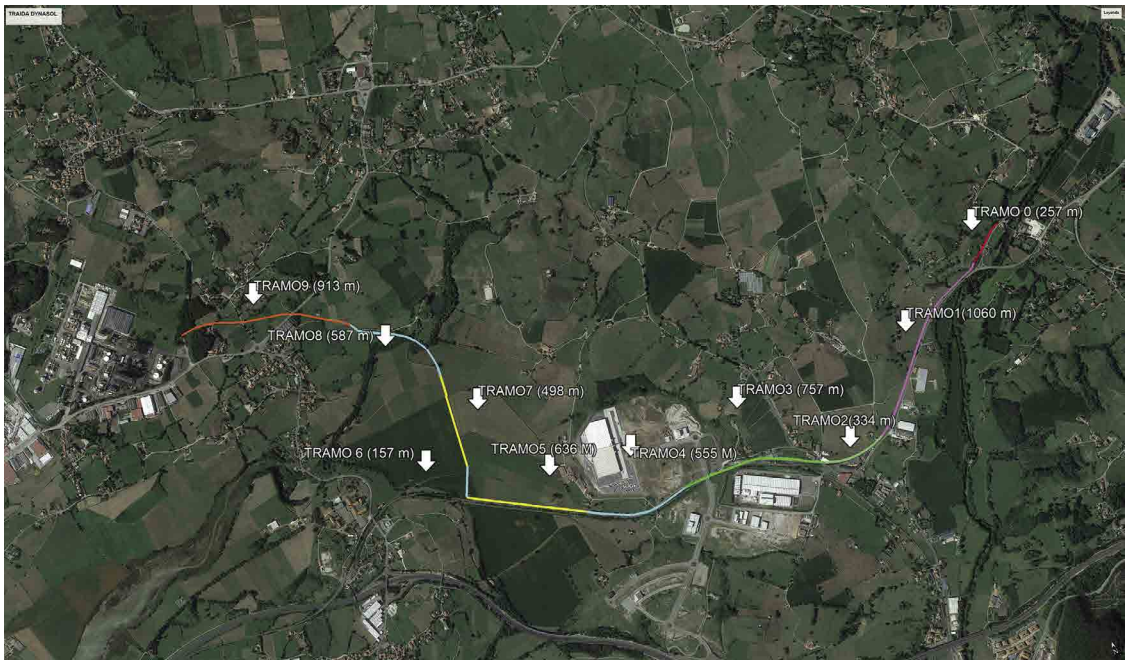
The petrochemical plant opened a consulting process with companies specialised in trenchless technologies and civil works so they could propose solutions to renovate or rehabilitate the existing pipeline according to exact criteria:

- Renovation works compatible with the plant's operation
- Maintaining the system's hydraulic capacity
- Minimal effects on private properties and environment

Three offers with different characteristics were submitted:

- New pipe installed using traditional methods with open trench
- Sliplining with HDPE pipe
- Sliplining with the Primus Line® system >

Detail of each liner section in overview.



The option of a new pipe by traditional method with open trench was rejected due to its cost, the need of numerous land permits and the technical challenges at the crossings with urban environments, railways, roads, and rivers.

The option of renewing the main using sliplining with HDPE pipe was rejected due to the reduction of the hydraulic capacity, the number of pits required and therefore the number of land permits required. In addition, the potential installation length of each section was shorter than the option selected.

The option selected for the works' execution was the one presented by SinzaTEC, a company specialising in the trenchless rehabilitation of pipes. SinzaTEC proposed to reline the existing main using the aramid-reinforced Primus Line® system. The company's offer included the renovation with the medium pressure DN500 reinforced flexible pipe for the DN600 pipe sections and the medium pressure DN350 reinforced flexible pipe for the DN350 pipe sections.

The decision was taken based on various factors including:

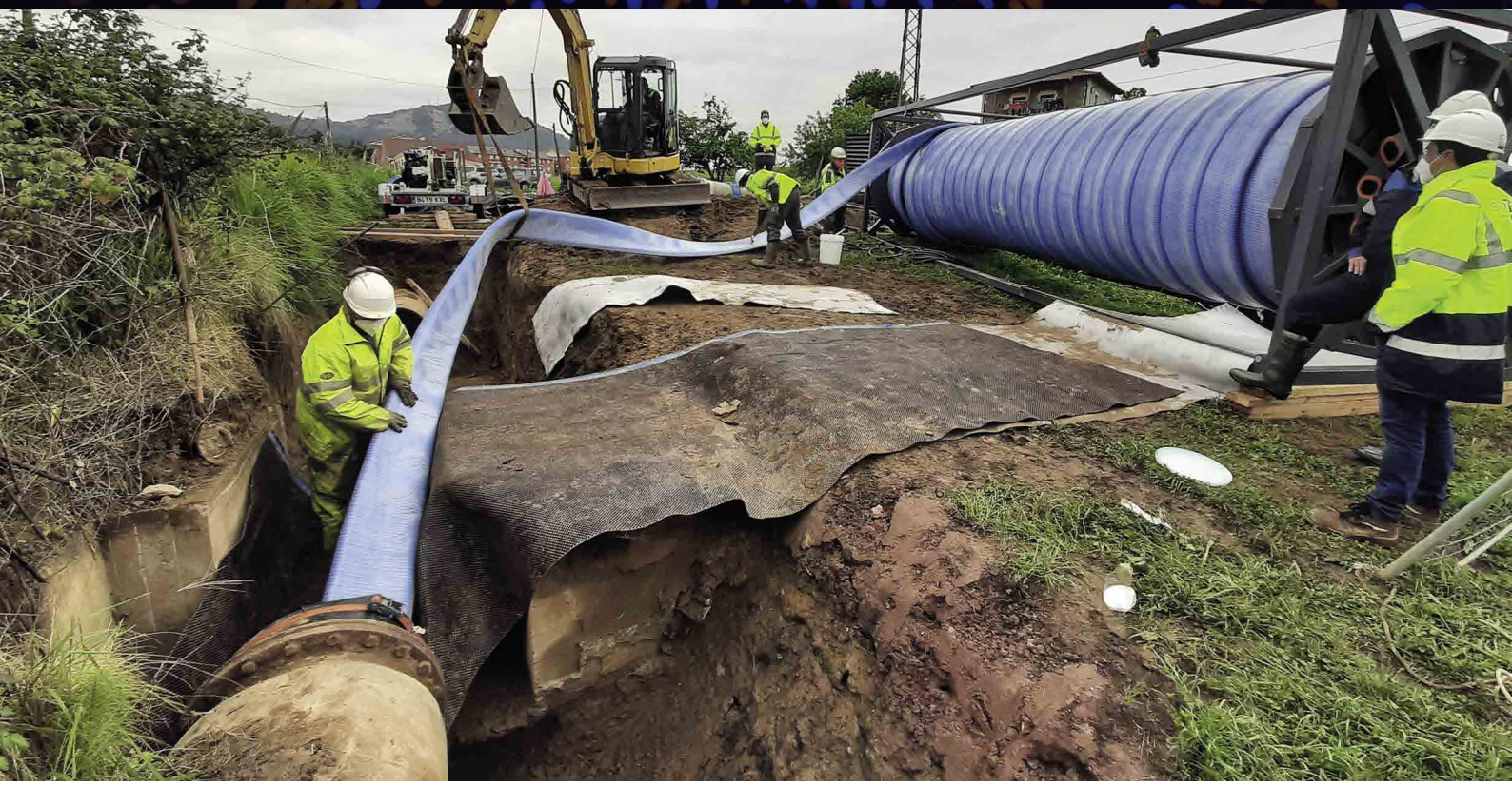
- Practical absence of land permits thanks to the rehabilitation design in long sections and from existing manholes where drains and vent valves are located
- Possibility of carrying out all the rehabilitation work in windows of 30-hour water supply cuts, the estimated time in which the cooling storage tanks descended below the critical level that would have forced production to stop
- Minimal reduction of the hydraulic capacity due to the small wall thickness of the Primus Liner of only 6 mm for PN16

Project execution

The works' execution was already planned between 2018 to 2021, following the investment capacities of the plant, and adapting the work needs to the capacities of the plant.

The pipe rehabilitation works were carried out based on the following criteria:

- Organisation in phases with short-term tasks based on the scheduled supply cuts
- Minimise the necessary number of connectors by installing long sections depending on existing elements
- Coordination with Adif, the railway network operator, to eliminate effects on the operation of the RENFE railway >



A liner installation underway on the DN500, 1,060 m section.

The activities were planned accordingly and designed to carry out the installation of the 5,800 m of pipe to be renovated in ten installation sections. The duration of the execution phases for all sections was short, including two cuts of the supply service per installed section.

The first supply cut of about twelve hours was scheduled for the removal of the existing asbestos cement pieces, which required a specific health and safety protocol. After dismantling these elements, temporary hazard-free pipe pieces were installed that allowed the supply to be restored and a subsequent simple disassembly to shorten times in the rehabilitation phase.

The second supply cut of about 30 hours allowed disassembly of the temporary pieces, carrying out of a camera inspection of each section, installation of the Primus Liner and corresponding connectors. A cleaning process was not necessary as the host pipe did not present any debris or sediment.

The two-component resin in the Primus Line® connectors needed to harden for at least six hours, which in this case coincided with the nightime. Work could be resumed the next day with the connection of the remaining elements at the ends and commissioning of the pipe.

After completion of each section, each chamber was reconstructed, and the land was reconditioned.

Conclusion

The works were carried out with absolute precision as scheduled, so the operation of the plant was not affected at any time and the pipe was rehabilitated to the customer's satisfaction.

In view of these results, it can be concluded that trenchless technologies already play an important role and will play an even more important role in the future, since the current policies related to the maintenance of the environment at the cities and their surroundings require measures to be taken in all sectors to reduce CO_2 pollution and waste, and to eliminate the effects on the environment and on the daily life of citizens caused by the construction works.

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OSLO VAV TESTS FULL-STRUCTURAL LINER FOR POTABLE WATER

Bends are a part of the test options.

Old, ailing water pipes become like new with a liner. Or is it too good to be true? Oslo VAV in Norway is now conducting its own tests on highly topical liners for excavation-free renewal of water pipes, thanks to technology funds from FHI. Pipeliner AS is the first in the test, with IBB 16 full structural liner from IBG HydroTech. Now Pipeliner is also developing a robotic technology for milling and sealing liners in house connections without digging.

Putting a liner in water pipes is a VA area many are interested in, but where few have taken the steps and gained their own experience. The City of Oslo VAV has now initiated its own tests, and will, among other things, investigate how fully structural liners can be installed in bends.

"Yes, we are going to look at water liners in bends. Both installing the products and to see what they can withstand and examine mechanical properties. This is very exciting." Elisabeth Hovda said.

Elisabeth is chief engineer and chair of the materials committee in the City of Oslo's Water and Sewerage Department. She is the municipality's chief responsible for the quality of the products used in the water supply.

This autumn (2022), the municipality is conducting its own tests on several types of materials and products in the Potable Water area. This will take place in a robust test >

environment that has been built with funds from a new fund for technology development at the Institute of Public Health (FHI). The funds are available to all municipalities.

Full-structural liner for water mains

One of the products Oslo VAV is carefully examining is a liner for the renewal of water pipes. Specifically, fully structural liners that are installed in an existing water pipe, but which after installation are completely independent of the existing pipe. In other words, there is no liner adhesion to existing pipes, but a product inflated and hardened to stand firmly in its own.

Here you may be a little surprised that this is presented as a novelty. Pipe renewal with lining is nothing new. This has been done for decades, but that's on sewage pipes. Now we are talking about liner renewal of water pipes. It is quite a different 'sport'.

"It is an important mapping. Renewal with liners on water pipes is completely new to us, and we need to acquire knowledge. We have the knowledge on sewer lining, but that is something else. It is not as similar as you might think." said Hovda. "Lining of wastewater pipes is a mature market. On water there is unploughed ground. There are quite big differences between renovating sewage and water pipes with lining." said Sales and Marketing Manager Tor Heggernes of Pipeliner AS.

The pipe renewal contractor headquartered in Bergen was the first of two contractors to test their products and solutions for Oslo VAV. During the autumn, Oslo VAV and Pipeliner have together tested the installation of IBB 16, a liner system approved for use in drinking water.

Robot finds house-connections after lining

The liner system from Pipeliner and IBG HydroTech is approved for dimensions from 1,600 mm down to 300 mm. The manufacturer of IBB16 is in the process of obtaining approval down to 150 mm, which is expected to be ready in October. On such dimensions, one quickly meets the number one challenge when it comes to liner renewal of water pipes – House connections.

In Oslo and Trondheim municipalities, the Renvann project is currently underway, where a few sub-projects are looking at various solutions for No-Dig renewal of water pipes using liners. As part of this, Pipeliner is in the process of developing a robot that will enable renewal with liners on House connections also. >

Oslo VAV is very proud of its test rig.

Top: Lining in the test rig.

Bottom: The test rig pipe.

The pre-installed water liner is 6 to 15 mm thick, depending on the dimension, pressure class and fall. As of today, it is not possible to have the IBB16 liner installed in water pipes with house connections without digging on the connections, but that is about to change.

Pipeliner's solution consists of a robot that is sent into a water pipe with a newly installed liner, it finds the existing house connection, mills up the liner and installs a plug that seals the house connection against the new liner.

The system will be ready for testing a prototype over the coming winter and will enable renewal with structural liner also on 150 mm diameter water pipes with house connection without digging. This is an important prerequisite for both Oslo and other municipalities to be able to use lining on water pipes.

"It is not easy to find water pipes without house connections in Oslo." said Elisabeth Hovda. "We talk to a lot of municipalities. Everyone is anxiously watching the outcome of this project. It is very positive that Oslo VAV is leading the way in renewing water pipes with structural liners. The capital has long been considered reluctant to try out new technology, but now they are leading the way. It is incredibly inspiring to be involved in development and testing together with such a large and strong environment, with a lot of different expertise. This is a development project for all parties. It is very educational to be a part of it." said Tor Heggernes.

Pressure test to 21 bar

The IBB 16 water liner from Pipeliner & IBG HydroTech consists of two individual liner installations that becomes one full-structural liner. First a fibreglass liner is inflated and cured against the pipe wall with UV light. Then a felt liner with a PE coating is cured with steam and adheres to the fibreglass liner. Together they form a new pipe that is flexible enough to follow the pipe, even around bends. The IBB16 liner is used on pressurised drinking water pipes in pressure classes PN 10 and PN 16. After installation, the liner is pressure tested.

"In normal installations, the liner is pressure tested up to 15 bar. Here we push it up to 21 bar. For us, it is very interesting to be part of a test like this. Out in the field on existing water pipes, it is hard to do tests like this. There everything needs to be under control and to be correct. Here it is allowed to explore the boundaries and to fail a little. Then both we, as a contractor, and the municipality, as the water line owner, will be confident in the solution." said Heggernes.

Renewal with a liner is a necessary method for renewing the drinking water network. There are a lot of bends on the water pipe network. Therefore, there is a need to know if there is good enough quality in these liner products. Will they help? For example, is it possible to install them in bends without too many wrinkles in the inner turn? These are the kinds of things being looked at here, and which are very important to gain knowledge about." said Elisabeth Hovda.

Oslo VAV has set up its own test rig for water products, in the form of a container furnished with a jig for simulation of many different assembly situations, bends and types of products. The IBB16 liner is installed in a 22.5° bend of a ductile cast iron pipe. In the test rig, the pipe is divided in two longitudinally, so that observers can see >

The test rig installed in its container.

exactly how the liner behaves in the critical inner side of the bend. “Straights are easy. It is in bends where the problems arise, and that is what we need to investigate carefully.” said Elisabeth Hovda. Later this autumn, a similar test will be carried out with a IBB16 liner in 45° bends.

The container has been built with funds the municipality has received from the Norwegian Institute of Public Health’s fund for technology development in drinking water supply. Here, FHI makes a pot of Kr5 million per year available for various types of technology development in the area. These are funds for which all municipalities can apply. Drammen municipality has also received funding from here, which has been used to test pipe-in-pipe systems for use in branch pipes from the main water line. Norsk Vann and the upcoming Water Centre at Ås have played key roles in the application process at both Oslo and Drammen.

Proud of the test rig

Elisabeth Hovda and her colleagues at Oslo VAV are very pleased with and proud of the test rig, not least for the opportunities it provides when it comes to exploring technology together with suppliers.

“We are so pleased! Skilled and creative people in our own mechanical department have created a fantastically flexible test rig. Here we have a great opportunity, and we have a great cooperation with two contractors and liner manufacturers. This is a new area for us. We have no knowledge of this today.” said Hovda. “Can we give examples of specific information we have received in the early phase of testing together with the contractor? Very much so! Not only good product knowledge, but also a lot of knowledge about the ‘water liner’ product type in general. What is it? How long should it last? What about drinking water approval? What about what is happening in the EU now, with new drinking water approval due to be completed in 2025? What about installation? How much needs to be dug? Where is this product suitable? There are so many water liners. We have been through semi-structural water liners, and we have PU coatings. Collaborations like this give us unique opportunities to go deeper into the products and see it towards what we know we need.” she said. “Where will Oslo VAV be in this area in five years? That is a good question. By then we will know much more about where and how it is appropriate to use water liners to renew our water supply. We are now taking some important steps that give us competence and security so that we know what we are doing when choosing renewal methods.” Said Hovda.

MAJOR ENVIRONMENTAL BENEFITS WHEN RENOVATING A 117-YEAR-OLD PIPELINE

The site set up in Malmö.

Recently, one of the carriageways along Drottninggatan in Malmö, Sweden needed to be closed. This was because contractor VA SYD was carrying out a necessary renovation of a sewer pipeline. Thanks to trenchless technology, the work could be carried out without completely shutting down one of Malmö's busiest streets. In addition, hundreds of tons of carbon dioxide were saved on the project.

In connection with flushing works, VA SYD discovered cracks in the 117-year-old pipeline. The situation was assessed as acute as there was a risk that in the worst case it could pose a danger to the public. In addition to this, a collapse would mean extensive renovation where the street would have to be closed for at least a year.

"It is not unusual for a pipeline so centrally located in Malmö to date from 1905. Sweden has a large national renovation debt that we are now working on, among other things, we continuously CCTV our pipes to detect this type of cracking in time." said Tobias Karlsson, project manager at VA SYD.

Cost-Effective Multi-Profit Project

VA SYD uses a modern lining technology where the sewer pipe can be renovated and strengthened from the inside instead of being replaced completely. This saves resources for society in several different ways including:

- Reduced traffic disruptions and social costs – Since the method involves less excavation work, the project took two months to complete instead of eight. When the project was carried out with an open carriageway, the total social costs are estimated to be almost half that as compared with a closure of both carriageways. >

- Reduced carbon dioxide emissions – Thanks to the lining method, more than 650 t of CO_2 were saved in the project compared to digging out the entire pipeline. It also reduced the requirement for backfill materials, asphalt, energy and transport that contribute to the reduced emissions.
- Drinking Water Savings – In pipeline work, large amounts of drinking water are normally used to flush and cure. In this project, drinking water was saved by using stormwater from a nearby pipeline. The estimated savings are estimated at 5,000 m^3 of clean drinking water, which was used in Malmö residents' taps instead.

On this particular project all the lining materials required were provided by Danish liner manufacturer Per Aarsleff.

Prior to the project, VA SYD initiated a study that pointed to major differences in how much different methods of management work on Drottninggatan cost society. Social costs can be calculated, among other things, based on bus routes that are temporarily rerouted, loss of revenue for the business community on the street or that people lose working hours when they have to drive a longer route to work. By keeping the transport route open, the costs to society are reduced.

Liner insertion underway.

EXPANDING OPTIONS FOR UK SEWER MAINTENANCE

National drainage and wastewater maintenance specialist Lanes Group plc has installed its largest ever ultraviolet liner and one that could be the largest to have been installed in the UK. >

The liner as it was being strapped up ready to be winched through the storm drain.

The UV cured in place pipe (CIPP) liner was 1,800 mm diameter, tall enough for a man of average height to walk along without having to stoop.

It is the first 1,800 mm diameter UV liner installed by Lanes and the first to be supplied in the UK by its German manufacturer, IMPREG.

In a significant development, given the recent UK heatwave, Lanes selected a new type of liner that can be more easily controlled in hot weather, which gave its lining team greater flexibility in carrying out the installation.

Lanes installed the 42 m long liner into a storm drain in Corby, Northamptonshire, for developer Urban&Civic to prepare for its adoption into the public sewer system.

The drain had been found to have deformities and open joints so had to be strengthened before it could be handed over to Independent Water Networks, which would own and maintain the asset.

Sue Kenyon, Lanes Reline Division Manager, said: "The technical challenges created by the size of the liner make this one of the most complex lining projects we have ever undertaken. It shows how we can deliver cutting edge, No-Dig pipe rehabilitation technologies, at the biggest possible scale, that give our clients highly sustainable and cost-effective pipe strengthening and rehabilitation solutions. Thanks to meticulous planning, the expertise and determination of our lining professionals, and the excellent support from IMPREG and ProKASRO, which supplied the specialist UV lining rig, the installation has been a complete success."

IMPREG UK Technical Manager Jack Talbott said: "This is the largest diameter UV liner we have supplied to a UK contractor and we have not heard of any as big as this being installed in the UK before. The project demonstrates an expansion of what can be achieved by UV CIPP by matching advances in manufacturing and UV lining systems with the installation expertise of Lanes as a contractor."

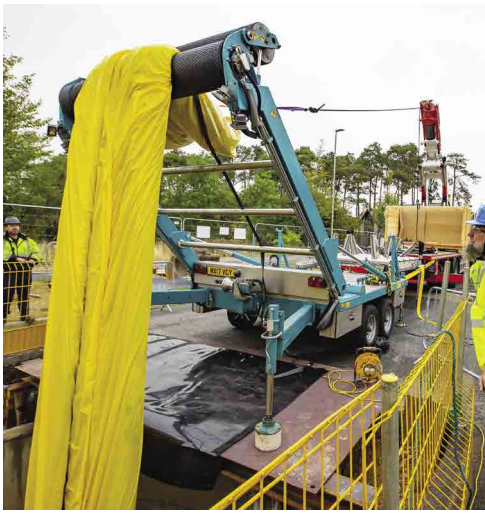
Lanes, which claims to be the UK's largest independent drainage and wastewater maintenance service specialist, has more than 25 years of experience lining of sewers and industrial pipe systems.

In a planning phase that lasted 12 months, Lanes worked with IMPREG and ProKASRO on an installation procedure that has broken new ground in the UK in more ways than one.

To provide the 100-year design life required by Independent Water Networks, the IMPREG GL16 liner had to be 15.5 mm thick.

The power of the UV light train was also supercharged. Its three mega light cores each had six 2,000 W bulbs, creating a combined power output of 36,000 W.

That compares with a UV power output of 12,000 W for a conventional light train used to cure a 1,200 mm diameter liner. >



Lanes brought over a high-capacity folding conveyer from Germany to safely manage the liner's large diameter.

Ready for inflation – the 1,800 mm diameter liner after being pulled through the drain and before the end cans were fitted.

Curing complete – the 15 mm thick liner after being installed.

The installation site was overlooked by homes on a new housing estate – high safety standards were observed throughout the project.

A key reason this extra power was needed was Lanes' decision to install one of IMPREG's latest non-thermal liners, which do not contain a curing accelerant, peroxide.

Gary Carey, the Lanes Lining Supervisor, who led the project, explained: "Peroxide makes the resins more reactive to heat from the UV bulbs, speeding up the curing process. The disadvantage is that peroxide liners have to be transported in a refrigerated truck which can cost more than using standard delivery trucks. Liners containing peroxide must be installed more quickly than conventional liners, especially in very hot conditions. Given the heatwaves we have experienced this summer, using the new non-thermal resin was a wise choice. IMPREG's use of more advanced fast-curing resins, combined with ProKASRO's more powerful light train, means peroxide is not needed, even to cure a record-breaker like the Corby liner. The technology's been developed to extend the use of UV lining in countries with hotter climates. This project demonstrates how, thanks to climate change, it will have advantages in the UK as well."

The installation site was right next to a new housing estate. This made managing works sensitively, and liaising closely with Urban&Civic throughout a key priority.

As the main contractor, Lanes carried out all enabling works for the project, which required a road closure and traffic management on an adjacent road.

A Lanes civils team exposed two 3 m diameter concrete chambers beneath the road, between which the liner would be installed. >

Big drop – the liner enters the downstream chamber as it is pulled through the pipe with a 10 t winch.

A steel lintel and plate, designed by a structural engineer, was placed above the downstream chamber for the liner folding conveyor to stand on.

ProKASRO deployed one of its newest and most powerful UV lining control trucks, with an experienced technician. Lanes also collected a large-diameter folding conveyor from Germany.

In a final preparation, with the UK's heatwave coming to an end and rain forecast as being more likely, a Lanes tanker was set up to vacuum a small volume of water flowing through the pipe during the installation process.

In an 18-hour operation, a 10 person Lanes team carried out the installation on 17 August 2022, pulling the liner though the storm drain with a 10 t winch.

With such a super-sized liner, key elements of the process, such as fitting the liner end cans and the sluice bag, were physically more demanding and time-consuming.

The liner was inflated from both ends by two compressors, initially, with the final inflation to the full operational pressure of 250 millibars carried out by the ProKASRO truck alone.

The curing speed was set by IMPREG at between 500 mm and 700 mm per minute, giving a total curing time of 70 minutes.

The following day, six lateral connections were reopened. Finally, the Lanes civils team returned to reinstate 155 m^2 of roadway to its original standard.

Gary Carey said: "This very challenging lining project was a success because everyone involved pulled together as one team. The Lanes sewer rehabilitation division's partnership with IMPREG and ProKASRO worked extremely well.

Also, excellent support throughout from Urban&Civic meant the installation phase went very smoothly. It has been a privilege to work on what, for Lanes, has been a groundbreaking project."

www.lanesfordrains.co.uk

BRAWO® SYSTEMS REVOLUTIONISES LIGHT CURING

Top: Brawo's new UVPox light-curing resin.

Bottom: A Brawo Magnavity light-curing system

After years of intensive development work, BRAWO® SYSTEMS is now launching the new BRAWO® UVPox light-curing epoxy resin. Light curing in buildings and on properties is now even more efficient.

Together with the BRAWOLINER®, BRAWO® UVPox fits tightly in the old pipe so that there is basically no annular gap. Water column tests have proven that the installation can be carried out in such a way that there is no penetration of water behind the liner.

The rehabilitation is therefore even safer, with exfiltrations and moisture damage in the building being avoided. When rehabilitating underground pipes, root ingress is prevented as a matter of principle and cases of infiltration and exfiltration are eliminated.

Outstanding technical characteristics

BRAWO® UVPox is characterised by a high E-modulus, which significantly increases the stability of the cured liner after completion of the rehabilitation compared to conventional light-curing, styrene-free resin systems. A short-term E-modulus greater than 3,000 N/mm² is safely achieved.

Another advantage of BRAWO® UVPox is the pigmentation of the resin. For the first time, light-curing resins have made it possible to visually check the impregnation before installation. This ensures that the soaking of the entire carrier material can be inspected in a very simple way. The light transmission of the soaked BRAWOLINER® is not affected by this. A reduction of the curing speed is not necessary.

BRAWO® UVPox is the first pigmented light-curing epoxy resin on the market that can be used for innovative curing with UV and LED light in combination with the BRAWOLINER®. The additional work that was previously necessary when using light curing for the rehabilitation of building and property drainage systems, such as the installation of a liner end collar to close the annular gap or a connection collar for the watertight connection of side inlets, is now no longer mandatory. This saves time and costs.

In addition, the system ensures high installation reliability and targeted control of rapid curing by light. Furthermore, BRAWO® UVPox is styrene-free and low-odour.

Comprehensive tests in preparation for approval by the DIBt – German Institute for Building Technology, Berlin – have already been carried out.

BRAWO® UVPox rounds off the smart light curing range provided by BRAWO® SYSTEMS. Together with the BRAWO® Pico light curing units for the diameter range DN 50 to DN 100 and BRAWO® Magnavity for the diameter range DN 100 to DN 300, the rehabilitation expert from Kaiserslautern offers the light portfolio for all applications in building and property drainage systems.

RELINEEUROPE SETTING NEW STANDARDS

RELINEEUROPE's tried-and-tested TQM system continued to be actively embraced and expanded further over the past year. Measures to optimise processes and products, such as the new exterior protection for the Alphaliner, new elements in production, and the topic of knowledge transfer are right at the top of the agenda for the company's new global quality offensive.

TQM = Total Quality Management. Since the foundation of the company, TQM stands for an extremely successful, process-related management system with a clear focus on customer orientation and quality. The dynamic development of the market, especially over the past two years, has shown the industry that quality must be considered and ensured even more. >

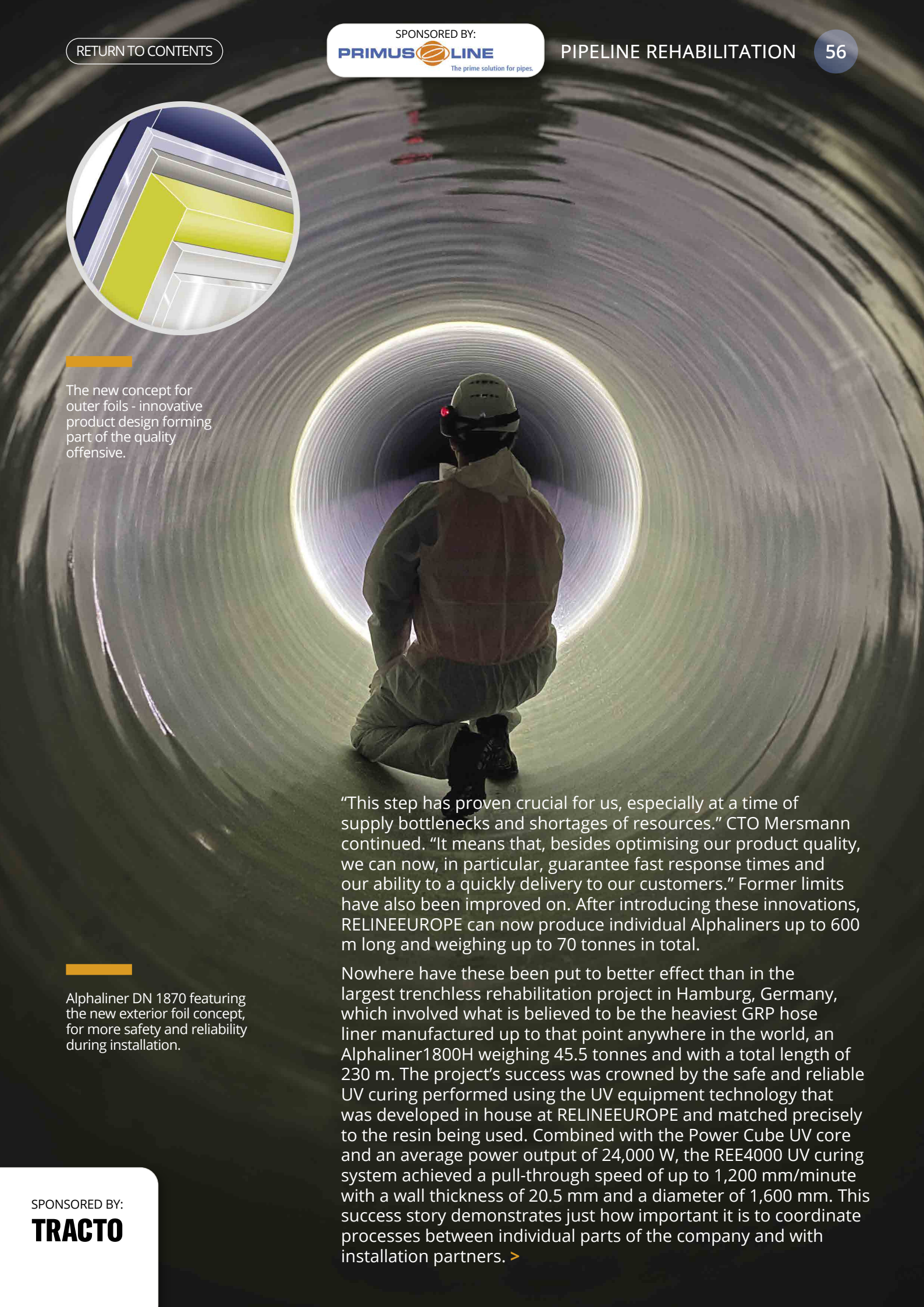
A record: the heaviest Alphaliner manufactured to date ready to be transported to northern Germany.

"For us, improving our quality is one of the most important tasks that we work hard on day in, day out." said Frank Mersmann, CTO of RELINEEUROPE GmbH. "We are also thinking all the time about how we can develop our products further. Alphaliners up to DN 2000, high-strength, extra-stretchable glass fabrics, and a curing process that delivers optimised quality while also saving resources are just a few of the projects that we are working on alongside our continuous quality improvements. In particular, the option with extra-stretchable glass fabrics will be used in various applications in the future, such as manhole liners and liners for changes in dimensions, but those are just two examples. Overall, the demands placed on products and services are highly individual, so the all-round package that we are constantly developing further has to be right for every single customer."

"Processes – Quality – Future"

Entitled "Processes – Quality – Future", the new quality offensive was launched in 2020. The first step began with optimising the production processes and increasing capacity. The go-ahead for renovating and expanding the production buildings at Rohrbach, Germany was given at the beginning of December 2020. The construction work was completed as early as the end of January 2021. Furthermore, a dedicated production line for high-quality glass fabrics was also being built in the same year. This technology enables RELINEEUROPE to bring the production of stretchable and particularly UV-transparent glass fibre fabrics in-house from high-strength, chemical-resistant glass fibres. >

The new concept for outer foils - innovative product design forming part of the quality offensive.



Alphaliner DN 1870 featuring the new exterior foil concept, for more safety and reliability during installation.

"This step has proven crucial for us, especially at a time of supply bottlenecks and shortages of resources." CTO Mersmann continued. "It means that, besides optimising our product quality, we can now, in particular, guarantee fast response times and our ability to a quickly delivery to our customers." Former limits have also been improved on. After introducing these innovations, RELINEEUROPE can now produce individual Alphaliners up to 600 m long and weighing up to 70 tonnes in total.

Nowhere have these been put to better effect than in the largest trenchless rehabilitation project in Hamburg, Germany, which involved what is believed to be the heaviest GRP hose liner manufactured up to that point anywhere in the world, an Alphaliner1800H weighing 45.5 tonnes and with a total length of 230 m. The project's success was crowned by the safe and reliable UV curing performed using the UV equipment technology that was developed in house at RELINEEUROPE and matched precisely to the resin being used. Combined with the Power Cube UV core and an average power output of 24,000 W, the REE4000 UV curing system achieved a pull-through speed of up to 1,200 mm/minute with a wall thickness of 20.5 mm and a diameter of 1,600 mm. This success story demonstrates just how important it is to coordinate processes between individual parts of the company and with installation partners. >

Testing is part and parcel of the trade, only a product that has been put through its paces will be allowed to leave for the construction site.

A key component of quality

"For us, quality mainly means taking responsibility and having the right attitude." explained Philipp Martin, Director Sales Europe. "By using our UV curing technology, which is tailored precisely to the Alphaliner, we are giving our customers an extra guarantee of a cost-effective, high-quality installation process." He added: "But our quality offensive does not stop there, by any means: You need our constant product optimisation measures, the associated knowledge transfer, and our 360° service before the quality elements are all present and correct."

Since 2021, for instance, all Alphaliners have been manufactured and shipped complete with an innovative concept for the exterior protection system. This product innovation is made up of an 'integrated sliding foil' (IGS) and an 'integrated preliner' (IPL). Among other things, the optimisation of the product maximises the robustness of the exterior protection for all Alphaliners.

New outer foils concept

In addition, two large-scale projects incorporating the new outer foil concept were completed successfully in late 2021. Long-time partner DIRINGER & SCHEIDEL ROHRSANIERUNG GmbH & Co. KG installed an Alphaliner DN 1870 with a total length of over 130 m using the REE4000 professional UV curing system underneath the train station in Unna. Contractor Erles Umweltservice GmbH successfully rehabilitated an approximately 150 m long pipeline in DN 1000, which runs under a production hall in Ober-Ramstadt in the Odenwald region. An Alphaliner1800H with a wall thickness of 15.6 mm was installed in order to handle the high structural loads. In these two major projects, the feedback from users also showed of the outer protection of the Alphaliner has significantly increased safety and reliability during the draw-in process.

As Philipp Martin has already emphasised, an innovative product design and precise engineering are not the only guarantees of quality when RELINEEUROPE is involved. Two more elements are deemed just as important to meet customers' requirements across the board. The first of these is customer service, which is hugely significant not only in face-to-face contact but also with its digital equivalent, for which RELINEEUROPE provides the RE.DESK, the partner area on its website. Here, the company uploads installation-related information such as the current installation recommendation, which has just been optimised with various updates such as to working pressures and the related pressure levels, as well as technical documentation and safety data sheets, standards and guidelines, calculation tables, order forms, and many other documents. The second element is the wide-ranging topic of knowledge transfer, one of the most important standards to which RELINEEUROPE first dedicated itself successfully some years ago with its RELINEACADEMY. >

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Training at the RELINEACADEMY, either on site, in the factory, or in house

Fast-changing times call for continuous professional development

"The requirements for trenchless pipe rehabilitation project are changing rapidly on the global market." said Werner Reiner, Director Sales Overseas. "Demand for larger sizes, resistance to all manner of different effluents, and faster-acting UV curing technology is increasing all the time. We are the only provider in the world who can not only deliver customised GRP hose liners to any corner of the globe but can also offer perfectly matched UV equipment to go along with it." He continued "This means that the people who have to install these products are facing tougher requirements. Hence, training in how to handle them properly is the key to a professional, top-quality and thus cost-effective installation that will deliver an outstanding result." Expertise and ongoing training will guarantee the safe, reliable, and high-quality installation of GRP hose liners over the long term and ensure that the UV curing technology is being used in the best possible way. This is exactly where RELINEEUROPE's successful RELINEACADEMY comes in. From ongoing and further training for rehabilitation specialists or job site managers, basic training and exchanges of experience through to teaching theoretical and practical knowledge and organising individual seminars for installation partners, local authorities, and water management associations, its range is certainly diverse.

"Naturally, the RELINEACADEMY is about traditional knowledge transfer driven by experienced speakers, technicians, and engineers." said Stefan Reichel, Managing Director QS and Innovations at RELINEEUROPE. "But we go much further than that and, besides courses on handling trenchless rehabilitation projects cost-effectively, also put on further training and fact-finding events on other issues relating to pipeline refurbishment and environment protection, for instance. Of course, we do this in our in-house training centre in Rohrbach as well as online, but also on site at the premises of our installation partners worldwide. We firmly believe that this strategy is a key component of our quality offensive, so we are delighted to have been able to strengthen our team with some expert additions in this area too under my leadership."

An expansion of hands-on training is also planned for later this year. New programmes are being developed and existing ones updated, more target groups are being added, and, needless to say, the issue of digitalisation is being taken to a new level. After all, as John Ruskin once said: "Quality is never an accident; it is always the result of intelligent efforts."

www.relineeurope.com

RELIABLE HDD TECHNOLOGY IN A LONELY REGION

The power line in need of renewal (the power pole on the other side of the river is marked with a red arrow).

Finland is almost as large as Germany, but its population is much smaller, only 5.4 million people. A myriad of lakes and many islands without names give distinction to the country. Not very far away from Suonenjoki, a city with 7,500 inhabitants, approximately 300 km to the north of Helsinki, a very sophisticated drilling operation (in more ways than one) was carried out in a nature sanctuary.

The existing power supply line was to be renewed across a river from one side to the other side including an island in the river. Only manual work and no appliance of construction machines was allowed on the island, therefore the tender for this 294 m long section demanded trenchless underground cabling installation with a cable protection pipe of ND200 using the horizontal directional drilling method. Because the work was carried out from one side of the river, disposal of the drilling fluid volume was easy to perform and according to regulations. >

The Grundodrill 18ACS drilling the pilot bore.

Top left: Hard rock.

Top right:
The cable protection pipe into which the power cable was to be installed.

Bottom left: The GRUNDODRILL18ACS in action on the pull-in.

The local fishery supervision authority was rather worried about the breeding area of the fish living in the river, particularly in the river bank region, and accompanied the drilling operation with a critical eye, particularly where output and whereabouts of the drilling fluid were concerned.

The greatest challenge, however, was the ground itself. At a depth of 10 m, the crew faced hornblende rock and granite with an Unconfined Compressive Strength (UCS) exceeding 300 MPA. This rock is one of the hardest formations known and it dates back to primeval times. The layer close to the surface was also very hard to drill, it being ground moraine rubble generated by 'erratic glaciers' during the Ice Age.

All these marginal conditions demanded a high performance, eco-friendly drilling method with a particularly thrifty consumption of resources, no more than 10.4 l/h of diesel fuel and 32 t of drilling fluid at most. Like all Finish enterprises in general, the company manager Ville Husso of Savon Suuntaporaus attached great importance to using a robust drilling technology, given that a technical drop-out in the lonely vastness of Finland would mean many days of shutdown time. >

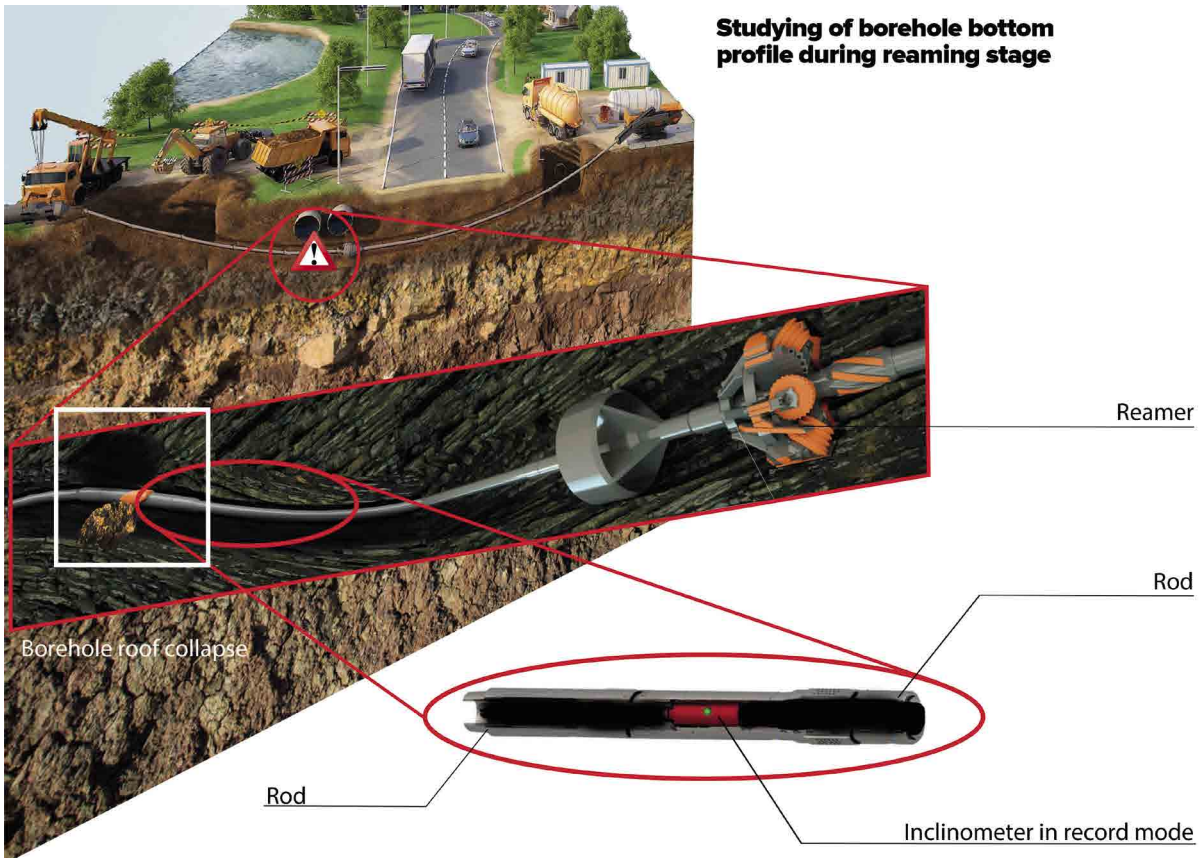
This was found with the for the capabilities of the GRUNDODRILL18ACS rock drilling rig belonging to a boring contractor from Iislami. The pilot bore of 6½ in (165 mm) diameter taxed the patience of the drilling crew time and again, although in the end, the drilling progress was 3 to 4 times as high as that of comparable HDD rigs. The pilot bore was tracked with a DCI F5 tracking system mounted in a boat.

Partially, depths up to 10 m beneath the blind level were reached. The reaming of the pilot bore hole to 12 in (300 mm) diameter was no small ordeal, either. In the end however, the ND200 cable protection pipe was pulled in with a 10 in (250 mm) diameter rock reamer without further ado.

Company manager Ville Husso said: "Drilling surely tested our limits, there were times when I was not so sure that we would make it at all. Now we are happy and very proud of our achievement."

The pulled-in pipe.

SENSE HDD SOLUTIONS AT NO-DIG HELSINKI



A schematic of the Sense HDD Inclinometer in operation.

A developer and manufacturer of HDD electronics since 1998 Sense HDD will be attending the International No-Dig event in Helsinki.

On show will be a new simple locating system for small HDD projects, the SNS 1t New Vision. It is a one frequency system with segment display, internal battery and all main functions for maximum productivity. It offers real-time depth display, distance, predicted depth and all other required information.

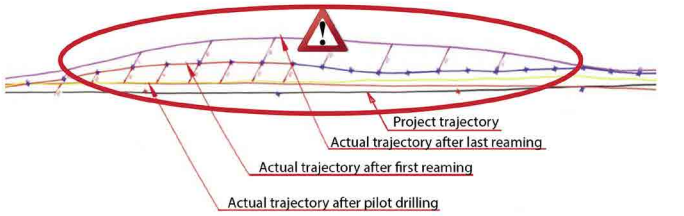
This system is part of the line of modern locating systems from SENSE. There are multi-frequency and multi-mode wireless locating systems also available.

The company also produces different types of sondes across various dimensions to fit all types of housings and several types with different productivity capabilities including: powerful ones (up to 100 m depth), cable kit and sonde for tracing plastic pipes.

The main showpiece at the No-Dig event will be the HDD Inclinometer, the company's newest patented device for the reaming stage of the HDD process which has been created to give the control of borehole bottom trajectory during reaming stage. >

Creating actual profile in Inclinometer's software

Designed data		Data from Inclinometer					
Distance from start point, m	Zenith angle of drill path, degree	Data	Time	Angle, deg	Rot, deg	Temp., °C	Distance from start point, m
300	180	01.08.2020	10:10:58	182,14	279	21	300
301	180	01.08.2020	10:11:12	182,56	185	21	301
302	180	01.08.2020	10:11:42	185,61	175	21	302
303	180	01.08.2020	10:12:38	185,78	245	20	303
304	180	01.08.2020	10:13:47	187,23	265	20	304
305	180	01.08.2020	10:14:52	190,02	90	20	305
306	180	01.08.2020	10:15:33	190,12	65	20	306
307	180	01.08.2020	10:17:03	192,33	78	20	307
308	180	01.08.2020	10:18:18	192,47	118	20	308
309	180	01.08.2020	10:19:44	191,12	54	20	309
310	180	01.08.2020	10:20:25	190,49	201	20	310
311	180	01.08.2020	10:21:16	189,2	220	20	311
312	180	01.08.2020	10:22:08	187,28	237	20,5	312
313	180	01.08.2020	10:22:56	185,43	302	21	313



Output from the drilling data using the Sense bore monitoring system.

Potentially dangerous area during pipe installing process

"Getting information after every reaming run allows the customer to have dynamic information about changes in borehole bottom that allows it to see critical points of possible problems early."

The SNS A100 Inclinometer is intended to control zenith angles of the borehole bottom during reaming process in horizontal directional drilling, by fixing angles of the drill rod line using special algorithm. In general the user sees angles, trajectory of borehole bottom after reaming and changes in that trajectory after multiple reaming runs.

A feature of the SNS A100 Inclinometer is its autonomous work capability of up to 4 days in record mode and the simple way of installing it between drilling rods some 30 to 50 m behind the reamer to let it sit down on the borehole bottom. This positioning allows the fixing of angles of the trajectory. The time required for each reamer stage increases on only by a few minutes for installation or removal of the flow sub and for Inclinometer angle calibration.

After each reaming stage the Inclinometer should be uninstalled and connected to PC/ SmartPhone/Tablet by Bluetooth. After transferring data to a special program the user can see all angles and obtain a drawing of the actual borehole trajectory.

Installation or removal of the Inclinometer, transferring and recognition of its data does not require special technical knowledge or extensive training for personnel and takes a short period of time.

The algorithm of trajectory control consists of fixing angles of drill string using two independent accelerometers. Accelerometers are controlled using a microprocessor that sorts all data using internal software and stores it on an internal flash-drive.

As a result, in general the user experiences:

- fast operational information about borehole condition including its angles and trajectory
- dynamic information about changes in trajectory during multiple reaming.

Getting information after every reaming run allows the customer to have dynamic information about changes in borehole bottom that allows it to see critical points of possible problems early. Using the inclinometer and its information will provide information to the user to make additional reaming runs before pulling the pipe or to change the start trajectory for the installation by changing the start angle and pipelayers positions and/or height of the trolley pendants to avoid accident or problems during the installation of the pipe.

PRIME DRILLING: NOW ALSO ELECTRIC!

A range of hybrid and electric drill rigs is now available from Prime Drilling.

Prime Drilling has enlarged its drill rig spectrum and now also offers hybrid and electric machinery.

The innovative new hybrid and electric rigs manufactured by Prime Drilling provide a variety of benefits for the customer. Thanks to their electric power packs these machines run much quieter than conventional rigs and allow reduction in the overall noise level to a minimum.

Their special feature 'Power on Demand' enables significant energy savings since the majority of drilling sequences rarely require higher performance levels. In contrast to fuel-operated machines only the actually required power is generated.

Furthermore, the rigs can be operated independent of local engine directives or diesel quality, not to mention the substantially minimised risk of oil leaks or hydraulic hose bursts.

Low-maintenance technology and elimination of engine service requirements boast the advantage of their smooth on-site operation with next to no downtime. The machines' vibration-free drives, noise reduction and sensitive adjustment range increase working comfort significantly.

The electric drill rigs do not require any fuel logistics (if connected to the existing electrical network) and the available power packs are optional for any individual emission regulations. The company also uses standard industrial components to ensure their high local availability.

The state-of-the-art electric motor is a permanent magnet synchronous motor that is installed and equipped with a four-quadrant frequency converter. A transformer oil cooler with biodegradable oil serves for optimum heat dissipation.

The compact drive solution for each motor features a 140 kW S1 continuous output at 650V DC nominal voltage. The motors are protected to IP 69k. All load-sequence data can be saved and retrieved.

Offering high customer satisfaction, customers worldwide value the company's innovative technology and Prime Drilling has, it is claimed, sold more electric drill rigs on the market than any other vendor so far.

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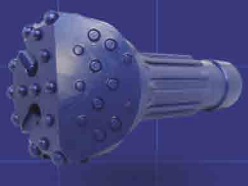

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TRENCHLESS BUILDING A TRUNK WATER MAIN

Hammer drilling a steel casing pipe under a street.

Tampere Water is currently building a trunk main water pipe, using 800 mm diameter spheroidal graphite cast iron, which connects the two waterworks at Kaupinoja and Rusko in Tampere, Finland.

The overall length of the main is approximately 14 km. Trenchless construction methods have been utilised on several sections and Sitowise plc was the main designing consultant and is now working with the final part. The drilling contractor was Lännen Alituspalvelu plc.

Tampere Water is responsible for the supply, treatment and distribution of clean water; the construction and maintenance of networks; the conveyance of wastewater, the maintenance of the sewer system; and the treatment of wastewater in the city of Tampere and in Pirkanmaa region in Finland. More than 250,000 people live within Tampere Water's operating area. Sitowise is a Nordic expert in the built environment with over 2,000 employees and offers sustainable design and consulting services for projects of all sizes. Lännen Alituspalvelu and its sister company Eesti Horisontaalpuur have a total of 50 employees and form together a €16 million annual revenue. They provide horizontal drilling with all known methods and are specialists in hammer drilling. Lännen Alituspalvelu operates in Finland and Scandinavia, Baltic countries, and Europe with over 30 years of experience.

In an exemplarily cooperation, Tampere Water, Sitowise and Lännen Alituspalvelu have carried out trenchless construction in several locations along the new trunk main. First cooperation took place in 2017 and the latest trenchless construction project was completed in 2021. >

HDD pilot hole.

A chute installed close to the pilot hole before pulling the pipe.

The construction site where the trenches were located. The site was completely restored.

Altogether 700 m of horizontal directional drilled (HDD) 800 mm diameter water pipe and three 140 mm diameter plastic casing pipes were installed in two sections. This was done to conserve the environment and because of the challenging ground conditions. Along the pipeline is an adjacent main ditch which meant groundwater levels were quite high. The work also included three hammer drilling installations of 1,200 mm diameter steel casing pipe with the length of approximately 70 m each. The trenchless alternative was deemed suitable from both technical and economic point of view, as the excavation costs would have been high due to soft and wet soil conditions. Excavation would have also created more significant climate impacts compared to trenchless methods.

In the design phase of the work, ground penetration radar was used to investigate three separate alignments at about 5 m apart. It was possible to conclude the distance of soft soil from the main ditch based on the ground penetration and ground survey results and to design the optimal route for the water pipe installed with HDD. At the site, previous ground fills prevented the use of HDD further away from the main ditch.

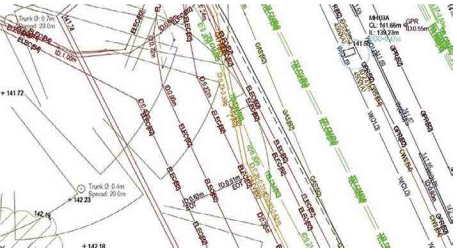
Designs were further developed together as a site service with the contractor, resulting in a smaller number of drilling trenches. The installation and pulling of the pipes were done with a specially made chute, which consisted of a split-steel pipe. The installed pipe was pulled towards the mouth of the pilot hole along the chute.

The work progressed with first installing steel casing pipes with hammer drilling under two streets and on the edge of the old ground fill area, after which HDD was conducted through the steel casing pipes. Pipe assembly to sockets was done in the assembly trench in the middle of the drilling line. The assembly trench was also used as a trench for hammer drilling and from this trench the pipe was pulled in two directions in HDD. By utilising one trench for several tasks in the project, excavation and transportation of the soil could be minimised and climate impacts of the construction were decreased.

Bentonite slurry used in HDD was dried after drilling in a specifically constructed land-based pool. The pool was used to filter water through a bank made of crushed stone, and water also evaporated from the pool over a period of one to two months. After drying, bentonite was so dry it could be mixed with other soil making it unnecessary to transport it elsewhere to be processed. Overall, the bentonite management in such a manner promoted the sustainability of the project.

This case of trenchless construction was a great example of how cooperation between the work group and stakeholders brings out the environmental, technical and temporal benefits. Therefore, trenchless construction is a very responsible way of civil engineering.

SAVINGS FOR RETAILER WITH TECHNICS' COMPLETE UTILITY MAPPING SOLUTION



Top: Vacuum Excavator exposing the utilities discovered.

Bottom: Technics' Utility Survey of the area.

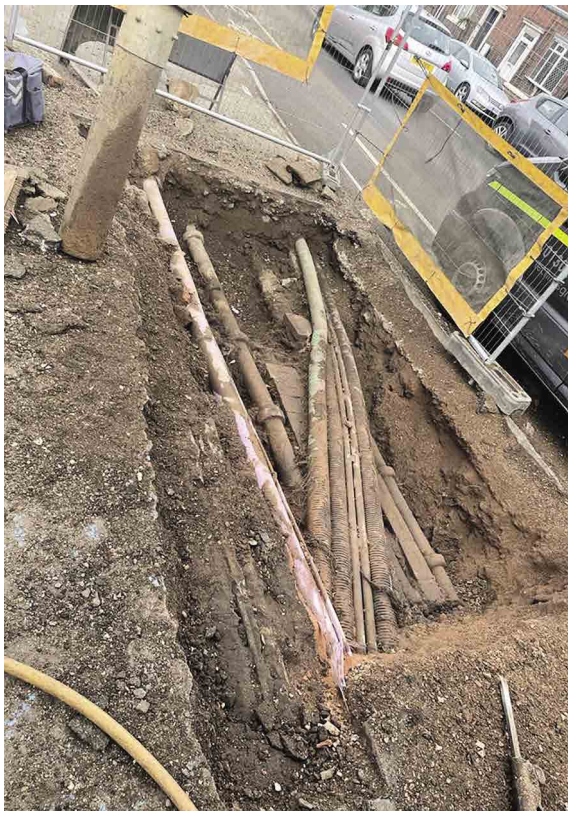
Technics Group, a geospatial consultancy company, have been an approved supplier for a well-known blue-chip retailer since 2017. As part of the retailer's extensive growth plan, Technics was commissioned to carry out several surveys including utility and topographical, CCTV survey and utility verification for a new store to open in Stoke-on-Trent, Staffordshire, UK.

An initial utility survey (PAS 128 QL-B) carried out by Technics identified a number of utilities including telecoms, fibre optic ducts and electrical ducts running across the area of the store's proposed entrance. Further investigation was required to provide evidence to the client that these utilities were buried deep enough to allow for the safe construction of the new store's bell mouth entrance.

Failure to get this information at the beginning of a project can be extremely costly. Diverting or lowering existing utilities once construction has started can cause big delays and increased costs to projects and in some cases is not possible at all.

Using the information already collated from Technics' Desktop Utility Report and Utility Survey, Technics was able to investigate further using its Vacuum Excavation service to give the client and asset owners complete peace of mind that the utilities were buried at or could be lowered to a sufficient depth to safely allow for the new store entrance to be constructed. The use of suction excavation offers a safe method to expose utilities and will, in a lot of cases, prevent unnecessary diversions which are expensive and disruptive to the project timeline and surrounding environment.

The experts at Technics knew, from years of experience, that standard trial hole excavation may not provide enough information to assess the potential impact to the existing utilities. Instead, the team carried out a much larger excavation than normal to give the utility companies the exact location and depth of the utilities as well as the clear space around them for the utilities that needed to be lowered. >



Left : Exposed utilities for further examination and mapping.

Right : A larger excavation was undertaken to evaluate lowering utilities to minimise diversions.

As a result of the information provided by Technics, the client was able to identify and safely lower the required utilities to construct the entrance to the new store without the need for any unnecessary diversions. In total the work carried out by Technics saved the client over £80,000 and meant it could open its new store without costly delays to the project.

Lee McNichol, Senior Projects and Suction Excavation Manager at Technics commented: “Using our complete utility mapping solution is invaluable for this type of project. Not only does it make the process easier for clients, by having one point of contact throughout, but we were also able to use the information and knowledge we had gathered from the initial surveys to advise on what further information was required for our client to construct the store opening without costly and time-consuming utility diversions.”

According to a client representative: “Technics was instrumental in assisting me when a network of services was identified underneath the proposed entrance bell mouth at our new supermarket. Technics provided the GPR survey to meet our requirements and went above and beyond by removing a large section of the public footpath so that we could inspect the services ahead of the delivery of the proposed highways scheme. Technics carefully removed the spoil from the affected area, and a small works builder manually lowered the utilities below formation level with a watching brief from each of the statutory undertakers present. The project was a success, five of the utilities were lowered, in advance of £80,000 was saved, and an estimated 6 to 8 weeks removed from the highways construction programme. I cannot thank Technics enough and would not hesitate in recommending them.”

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TRENCHLESSWORKS

CCTV INSPECTION DOWN THE WOODED MOUNTAIN SLOPE

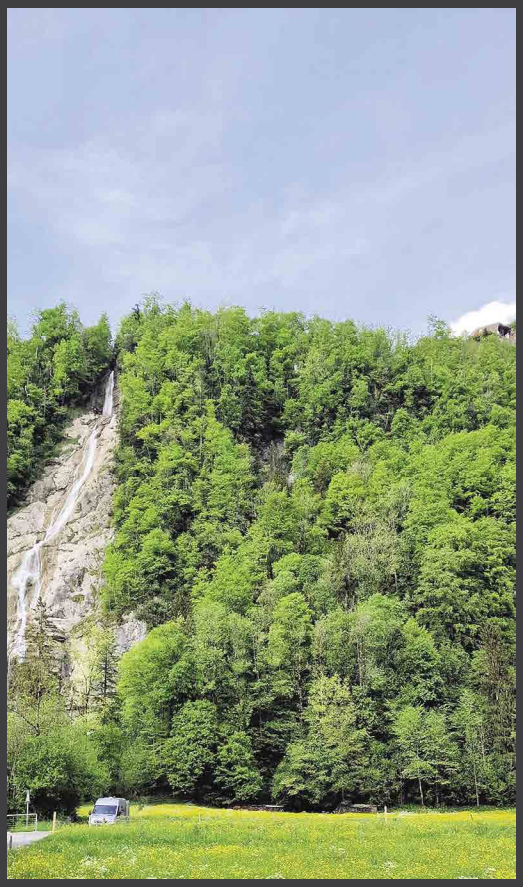
Without a doubt, a fully equipped inspection van with clearly structured operator's and equipment sections is the best base from which to perform a wide variety of inspection jobs with equal comfort and efficiency. But how can usres do a successful professional inspection if the sewer reaches are located at operating sites that are inaccessible to an inspection vehicle?

The MicroGator Air is a main line cutter system, working in the diameter range from DN200 (relined) up to DN800, which is completely embedded in the IBAK MainLite concept.

This was the task facing the Steinauer Kanalservice AG in May 2022. The family-owned company that was established in 1932 and which is based in Einsiedeln in the Swiss canton of Schwyz was commissioned by the municipality of Illgau for the cleaning and CCTV inspection of its mainline sanitary sewer.

A Hiking Path Down into the Valley

What at first sight seems to be a commonplace job turned out to be a challenge when taking a closer look at the surroundings of the idyllic village with a population of 790. Illgau is situated in the Alpine foothills in central Switzerland between the Muotathal and the Ibergeregg with a pass elevation of 1,406 m above sea level. From the lowest point in the municipality in the village area to the highest point in the municipality, the Huusmätteli on the Hessisbohlerfirst, there is a difference in altitude of almost exactly 1,000 m. The plastic mainline sanitary sewer with pipe diameters of DN 200 to DN 250 runs from the village at the top of the hill down the mountain slope into the valley. The sewer with a total length of 1 km was laid 40 years ago in the softer subsoil under the steep woods in order to avoid a considerably longer distance in the hard rocky stone around the slope. The last inspection took place 10 years before so its condition was to be documented again according to the normal schedule. >



The waterfall only cascades down a part of the full length of the mountain slope; the starting point of the mainline sanitary sewer to be inspected is located higher up.

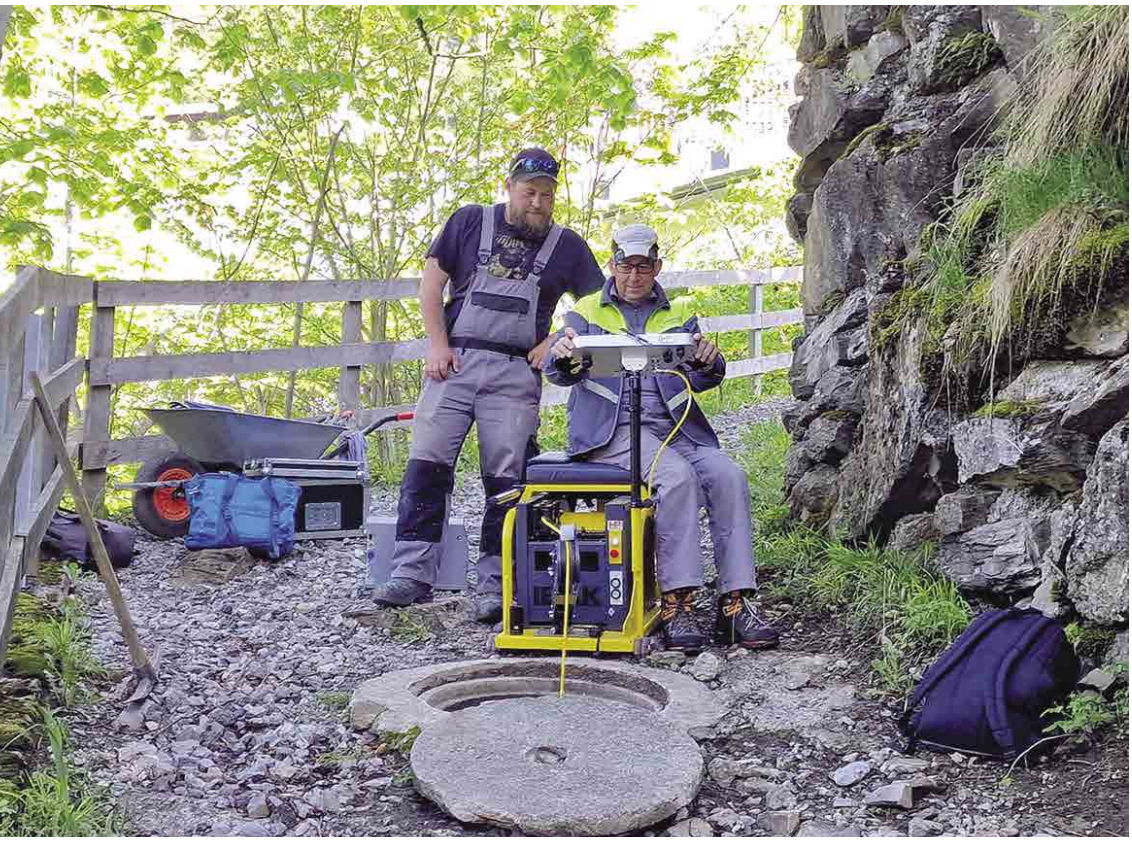
"The CCTV inspection began at the top of the hill. For this, the compact sewer tractor system MainLite fit was transported to the starting point in the village. From there, the sewer sections were accessed via the manholes located along the extremely steep hiking path down into the valley."

In order not to overload the retention tank, the inspection was performed in beautiful weather during a dry period. The sewer section was cleaned beforehand. For this purpose, the sewer cleaning truck was driven to the village which is accessible by road and a tunnel. The start section was then cleaned, beginning from the highest point of the sewer. Similarly, the other end was cleaned, beginning from the lowest point in the valley. The section between the beginning and end points could only be flushed because it was inaccessible to a vehicle.

Inspection with a Mobile Solution

The CCTV inspection began at the top of the hill. For this, the compact sewer tractor system MainLite fit was transported to the starting point in the village. From there, the sewer sections were accessed via the manholes located along the extremely steep hiking path down into the valley. IBAK Helmut Hunger GmbH & Co. KG is the manufacturer of the versatile inspection system for mainline sewers. This is available both for vehicle installation and as a mobile solution. The latter is operated with the BP 100 control console which features a touchscreen and a fully-fledged PC. Two joysticks are used to operate the camera and the tractor. Just like with an inspection vehicle, all jobs in mainline sewers from simple video recordings through to comprehensive data transfer to euro norm standards with all measuring functions can be performed with the MainLite fit.

In Illgau, the T66 camera tractor and the ORION 2.9 pan and rotate camera were operated with the Mainlite fit. The motor-driven winch with 200 m of camera cable and an integrated length counter is located under the comfortable seat. The mobile system was powered by the LPS portable power supply unit. >



During the challenging descent with an elevation loss of 1,000 m, the inspectors from the Steinauer Kanalservice AG were thankful for the comfortable seat of the MainLite fit; this enabled them to rest their feet during the inspection, until they could proceed down the slope to the next manhole.

Results Right on Target

Four employees from the Steinauer Kanalservice AG were on site to clean and inspect the mainline sanitary sewer. The work on the hillside in Illgau took a total of 2 days. The condition of the sewer sections was fully documented. Even though they were 40 years old, only very few isolated minor defects that did not require immediate repair were detected.

Because of the topographically complex landscape with a high percentage of forest, the Swiss company is quite often faced with operations in hard-to-access sewer reaches. Nevertheless, the inspection job in Illgau was a particular challenge which was successfully mastered with the MainLite fit. If the team of the Steinauer Kanalservice AG should encounter pipes with bigger dimensions during future mobile operations, they can operate the T 76 tractor and the Orpheus pan and rotate camera with the versatile camera tractor system. If a greater amount of information is required to check the condition and proper functioning of a pipe, the run of the sewer section can be recorded with this during the camera inspection and a profile dimension measurement can be performed over the entire length of the reach.

An Orpheus HD pan and rotate camera is also included in the new full HD inspection van that will enhance the company's fleet of vehicles. A Mercedes Sprinter is being equipped by IBAK. Steinauer Kanalservice AG is technically advised and supported with competent service by the company H & P Technik AG, located in Switzerland.

Multifunctional System

The MicroGator Air is a main line cutter system, working in diameters from DN200 (relined) up to DN800, which is completely embedded in the IBAK MainLite concept. The modular design components can be flexibly adapted, combined with each other and extended with other functions at any time so that they can be used for both rehabilitation and inspection work.

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CREATIVE SOLUTIONS FOR AN AGING COLLECTION SYSTEM IN RICHLAND

Richland today.

In 1943, the U.S. Army purchased the small town of Richland, Washington, USA and its surrounding area to build a nuclear production complex. The City lies in south-eastern Washington state at the confluence of the Yakima and the Columbia Rivers. The community was quickly converted into living quarters for the thousands of soldiers working at what became known as the Hanford Site. The plutonium manufactured at the complex was instrumental to the Manhattan Project, which produced the world's first nuclear weapons during World War II.

Uncommon Challenges

The influx of soldiers caused Richland's population to boom suddenly during World War II and by 1945 it had reached over 17,000 residents. Today, the City of Richland has a population of approximately 60,000. The City's unique history means that its infrastructure, particularly its underground utilities, has proved challenging to maintain over the years.

"This city was built for temporary workers." explained the City's wastewater and stormwater maintenance supervisor, Hector Moreno. "The race for that war, the nuclear drive was the factor for building in this area. They were not planning on keeping these homes or infrastructure around for this long, but we are still maintaining it, so it is a unique challenge."

Richland's collection system was constructed haphazardly as soldiers, scientists and engineers and their families poured into the area. As a result, they navigate a particularly complicated network of easements and access challenges during day-to-day work. Some older residential areas utilise common sewer pipelines for their laterals, many of which lack manholes or raised cleanouts.

Moreno started working for the City in 2015 and has been supervisor for the last three years. He manages a team of 12 that oversees 300 miles of sewers and 150 miles of stormwater pipelines. The City's utilities have their work cut out for them when it comes to their collection system. >

"Our system is 70 years old in some areas. We have clay pipe and even Orangeburg pipe. Two years ago, we helped the water department with an old wooden line. We deal with the challenges of the whole collection system on a daily basis and support other departments."

"Our system is 70 years old in some areas. We have clay pipe and even Orangeburg pipe. Two years ago, we helped the water department with an old wooden line. We deal with the challenges of the whole collection system on a daily basis and support other departments." Moreno said. (Orangeburg pipe, also known as 'fibre conduit', 'bituminous fibre pipe' or 'Bermico', is bituminised fibre pipe made from layers of ground wood pulp fibres compressed with and bound by a water resistant adhesive which is then impregnated with liquefied coal tar pitch. It was used from the 1860s through the 1970s.)

The City's wastewater and stormwater workers face a variety of unique problems, including two inverted siphons, with the infrastructure they oversee. Moreno's solution to these difficulties? Research, new assessment equipment, and a renewed investment in his crew.

New Ideas and Investments

Because of the collection system's antiquated pipe materials and advanced age, it is often in need of repair. Moreno looked to older municipalities across the USA to learn how their teams dealt with aging infrastructure. This was particularly difficult because the City lacks neighbouring communities that are comparable in age.

After researching management practices in Midwest and East Coast cities, it soon became clear to Moreno that "We needed to change the way we approached our work."

Moreno decided to direct more of his team's efforts towards proactive, preventative maintenance. However, he knew that the City needed more powerful inspection equipment to enact these changes.

Enter Envirosight's custom inspection vehicles. With help from Jim Brown of True North Equipment, Envirosight's sales partner for the region, the City purchased a CCTV truck designed to support its utilities' unique inspection needs. Equipped with a ROVVER X sewer inspection crawler, a Verisight Pro+ smart push camera, a spacious office and even a restroom, the truck provides the inspection crew with everything they could need for a day in the field.

Prior to investing in the new vehicle, the crews used a variety of assessment equipment, including an older ROVVER X model and several Envirosight Supervision crawlers.

Verisight is an essential part of the City's inspection toolbox. With this push camera, the crew can get deep insights into hard-to-access areas in the collection system, including deteriorated and defective pipe.

Moreno hss been extremely pleased with how the new equipment has performed so far. "Now we have the right tools, the right crawlers to manage our system. The workers are thrilled with the new truck. It provides us with a clean slate."

A Dedicated New Crew

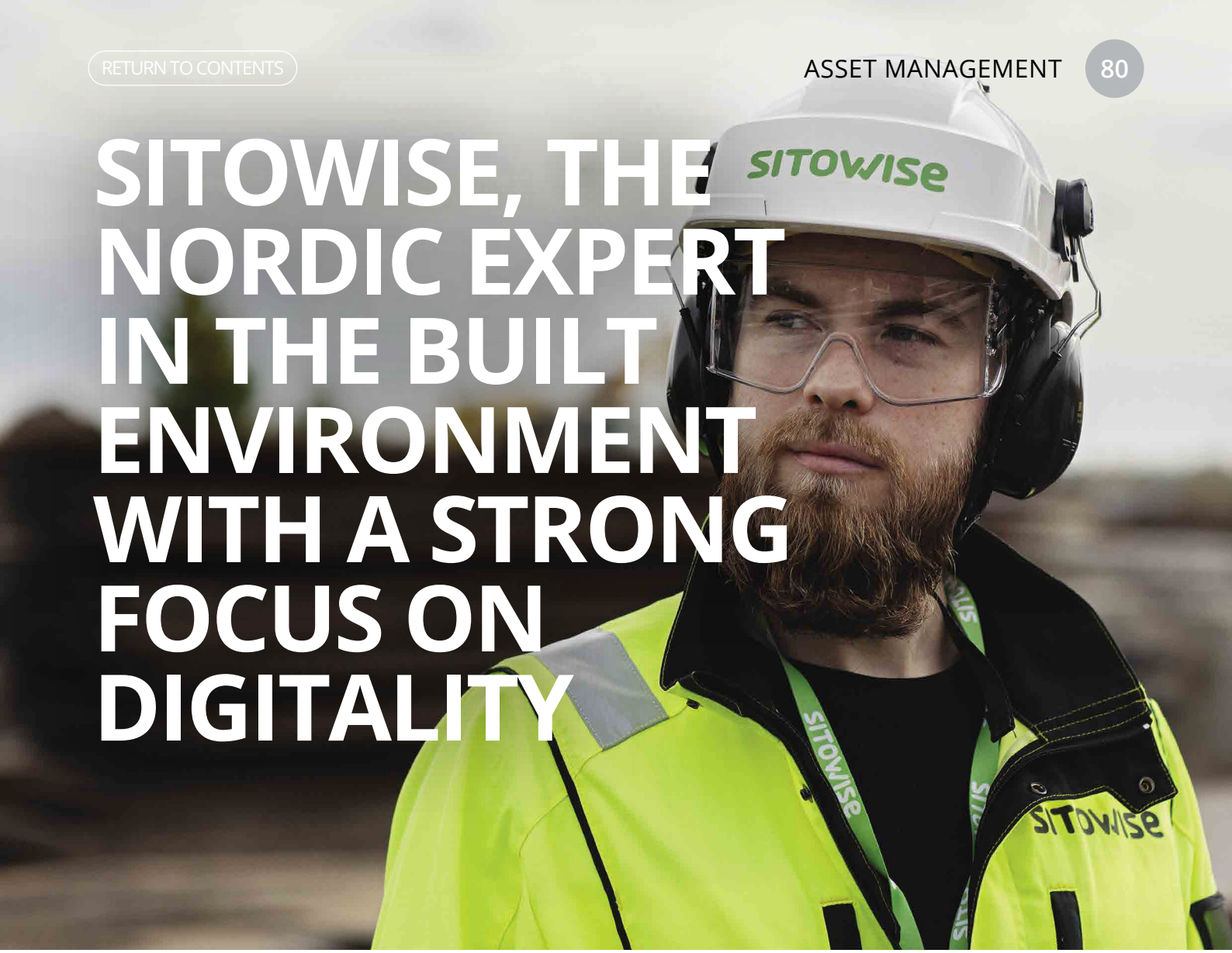
This 'clean slate' also applies to the City's employees themselves. In recent years, many of Moreno's crew have reached retirement. In their place, Moreno has taken on the challenge of creating a cohesive unit with mostly freshman workers.

He estimates that on average, his crew members have worked for the City for only two years. But these newer members have played an integral role in reshaping the stormwater and wastewater crews for the better.

"There is a bit of a learning curve for the newest employees in learning how to use the truck." he said. But just a month into using the vehicle, the team is inspecting 1,500 to 3,000 ft/day (425 to 915 m/day).

"It is a really unique challenge on a daily basis, dealing with the problems around here." Moreno remarked. "Having the right equipment that runs consistently and delivers results is key, and that is what we have had with Envirosight."

SITOWISE, THE NORDIC EXPERT IN THE BUILT ENVIRONMENT WITH A STRONG FOCUS ON DIGITALITY



Sitowise has world-class experts with the goal of making daily life run smoothly.

Smart cities, smooth travelling and spaces for living where daily life finds a durable foundation and making sustainable choices is easy. That is what Sitowise does. It is busy working away in the background so that transportation, infrastructure and the built environment is able to offer the best possible setting for a safe and carefree daily life. Most regular city-dwellers probably would not even notice its hand in things – unless it was missing altogether.

The company is driven by world-class experts with the goal of making daily life run smoothly. When its team of engineers, developers and other top talents join forces, they create fresh, brave and even unforeseen solutions to tackle clients' challenges.

Sitowise operates mainly in Finland and Sweden, and additionally has offices in Estonia and Latvia. The company offers a total of more than 2,000 experts at clients' disposal for various projects of all sizes and budgets. Its Nordic heritage can be seen in its love for nature and strong desire to implement responsible, environmentally friendly solutions. This is the root of its ambition as a company and sets the tone for everything it does, wanting to make the world a fairer and more functional place for everyone. To enable this, Sitowise harnesses smart solutions which draw upon on digitality and the application of state-of-the-art technologies.

The company sees trenchless technology as a one such smart solution and therefore, why it, as an expert, wants to offer customers the opportunity to integrate trenchless solutions into their projects. In cooperation with customers, Sitowise can identify potential trenchless technologies to be used on their projects and then design the right solutions to enable the best possible outcome. >

Sitowise is proud to be actively developing the industry in partnership with its stakeholders.

Sitowise believes that the integration of trenchless technologies enables engineering solutions that not only support biodiversity, carbon footprint reduction, minimisation and reduction of noise and air pollution but also reduce disruptions during construction, lower overall costs and generally offer safer and smarter solutions. Therefore, it see trenchless technology as a prime example of a responsible engineering in modern civil engineering practice.

Award-winning consulting firm

Sitowise is a multi-award-winning consulting firm that operates in the infrastructure and built environment sectors. In 2020, it was awarded the national 'No-Dig Award' by the Finnish Society for Trenchless Technology (FiSTT) for its innovative trenchless technology solutions in partnership with a Finnish water utility and a trenchless technology contractor. The No-Dig award is the most significant recognition in Finland for the promotion, implementation, and development of No-Dig technology best-practice. The project successfully combined the opportunities created by different technologies such as hammer drilling and horizontal directional drilled (HDD) in difficult soil conditions, where groundwater levels presented their own challenges. This project was an excellent example of how smart solutions, high-quality engineering, effective cooperation and courageous decision making enabled a high-quality outcome for the community and client.

Sitowise is proud to be actively developing the industry in partnership with its stakeholders. It also strives to be a leader in actively promoting and developing the use of trenchless technologies in its industry through active participation and involvement in various industry platforms and associations such as e.g., Finnish Society for Trenchless Technology, FiSTT.

The company is driven by its participation in interesting and challenging projects, overcoming technical challenges and implementing new technology in partnership with clients and industry peers. It welcomes the current engineering challenges that it faces which require it to think and re-think best-practice and enable real change towards more responsible, long-term and environmentally sustainable solutions. Sitowise wants to be the most responsible operator in the industry and aims to be a leading and trend-setting organisation in the utilisation of new technologies so it can help clients and stakeholders in developing industry wide, best-practice, smart No-Dig solutions.

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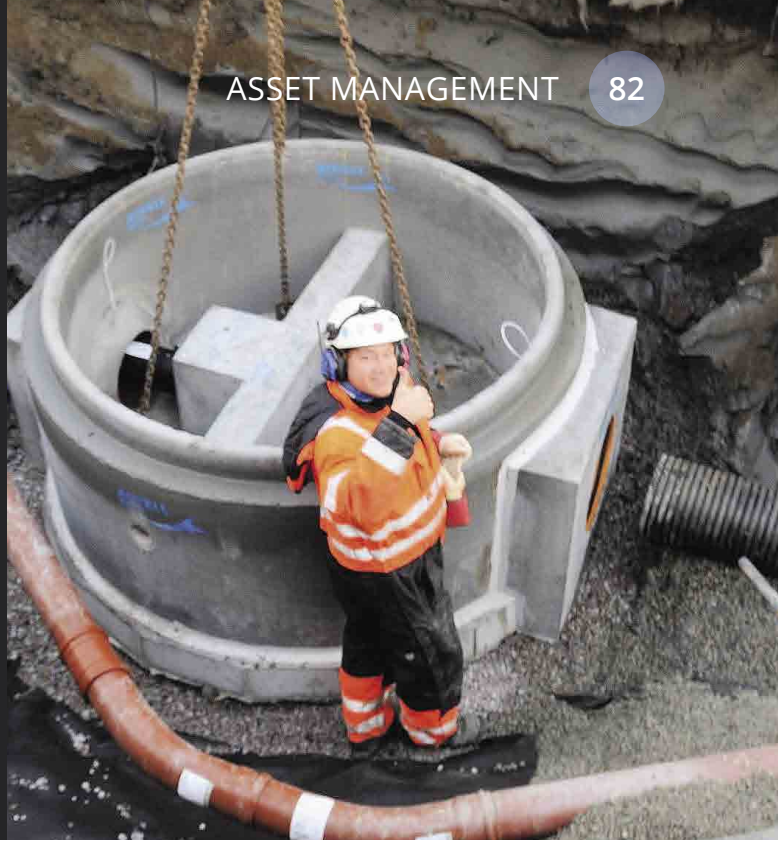
SIPHONIC DRAINS PROJECT IN ASKER



Installing infrastructure for a Siphonic drainage system.

Aiwell Water is working on a new pilot project to prevent the excavation of a water and sewage pipe system in Solveien, Asker municipality in Norway. The founder and general manager of Aiwell Water, Asle I. Johnsen, believes the company's full-current (Siphonic drainage) solution can reduce the need for the excavation of existing pipelines that work poorly due to lack of falls or setbacks.

Aiwell and Aiwell Water has a long tradition of collaborating with universities and colleges on the development of technical solutions and products where they have a patent. It is three years since Aiwell signed a letter of intent with the University of Southeast Norway that extends over five years and facilitates collaboration at Bachelor, Master, and PhD levels where the theme is the development of smart cities with new ways of dealing with surface water, wastewater and roof drainage.

A typical problem

The problem in Solveien is a typical problem in storm water systems with very little slope. The water enters with a good fall into a flat area where there are deposits in the ground, or by mistake, during the construction work, a counter fall occurs.

The problem was solved by pulling a PE 200 mm diameter pipe about 340 m into the existing 300 mm diameter pipe.

The company will have three new wells to bring in its siphonic valve and measuring equipment that Ph.D. student Roar Elias Georgsen will work with, and is very pleased that to have an innovative municipality like Asker that is willing to take both risk and extra costs to develop new solutions that can provide major savings in the next project.

The aim of the project was to increase capacity by approximately 35% up to 41 l/s. The PE 200 SDR 17 pipe was designed to take 7 l/s as a gravity system and 43 l/s as siphonic drainage, so this 200 mm diameter pipe alone should handle the desired increase in capacity.

In the period 26 to 28 June 2022, the region had a rainstorm that was heavy enough to carry out a test and see what the actual capacity was in the plant. The diagrams show the intensity of the rain in the period as well as the amount of water that the PE 200 pipeline actually took away. When the plant switched from gravity to siphonic drainage, what was seen was that during the short moment the entire line is 100% filled with water, the maximum capacity is 44 l/s. But because there is not enough water to maintain 44 l/s, the water speed drops and the capacity drops and follows the rain intensity until the amount of water falls below 7 l/s, then the plant switches back to gravity. The rain intensity increases and the plant switches >

Schematic showing the operation of a siphonic system.

"The advantage of using full Siphonic power is that in addition to increased capacity, fluctuations and setbacks do not matter because at full current it is only the length, the height difference down to the recipient, and the roughness of the pipe that determines the capacity."

back to siphonic drainage. The plant worked perfectly, and the capacity doubled from 25 l/s to 44l/s in the PE 200 pipeline + 7 l/s in the residual volume between the 200 mm and 300 mm diameter pipe, therefore the total capacity in the new plant is 51 l/s. This has been achieved without digging, only Aiwell Water's siphonic drainage system has been installed to create this improvement.

The advantage of using full Siphonic power is that in addition to increased capacity, fluctuations and setbacks do not matter because at full current it is only the length, the height difference down to the recipient, and the roughness of the pipe that determines the capacity. Flat areas have no impact on capacity. Another advantage is that sand and dirt tend to build up in the pipes in flat stretches. Therefore, regular rinsing must be performed. This is avoided by using full power because the water speed is much higher, and one therefore achieves self-cleaning of the pipes.

Together with Drammen municipality, the company built the first siphonic system in 2017 and now Drammen wants a new project with Aiwell Water and USN. Here the increase in the capacity in the 1,000 m long culvert will be from approximately 5.2 m^3/s to 13 m^3/s by putting a new 12,000 mm diameter pipe into the existing culvert. Also, approximately 8 branch pipes will be connected to the system.

In project in Asker, Aiwell chose a smaller pipe inside of pipe. However, its is working with solutions to use pipe liners in order to use the entire capacity of the pipes, recycling the old ones and further reducing costs.

To understand more of Aiwell Water's principle, the attached links offer short films to view. It is important to emphasise that the valves are mechanical, so no control electronics are therefore necessary. However, it is recommend that some central parameters are monitored so if errors occur, they can be notified very early.

https://www.aiwellwater.no/project-drammen-en.html

https://www.theexplorer.no/solutions/increased-drainage-capacity-to-prevent-urban-flooding

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ARTIFICIAL INTELLIGENCE AUTOMATIC DEFECT CODING FOR CLEANING VIDEOS

Sewer Robotics C70 video nozzle.

Sewer Robotics has added artificial intelligence empowered automatic defect coding for videos that are recorded with the C70 video nozzle in the (free) Sewer Analytics web cloud.

Pipeline cleaning and surveying can be extremely tedious work, but there are options available to streamline the process. From recording high-definition video with a cleaning nozzle, to training AI-powered software to code defects automatically, Sewer Robotics has created effective solutions that make it easier and more efficient to clean and survey large amounts of pipes and to report their defects, even without human eyes reviewing the videos.

What follows takes a look at how AI can be used to automate defect coding in cleaning videos and how it can help streamline the pipeline asset management process, from data collection and analysis to efficiently prioritise actions and define the measures to be taken.

C70 Video Nozzle

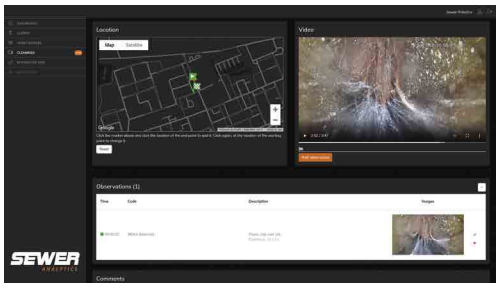
With the advancement of technology and engineering, new ways to clean pipes with advanced equipment have become available. One such equipment, the C70 video nozzle, is a jetting nozzle for pipe cleaning with an integrated forward lighting and battery powered, self-levelling, high-definition camera to record while cleaning pipes.

The C70 video nozzle is made of durable stainless steel and is compatible with any jetting truck by threading it onto the hose. The integrated pressure-switch activates the lighting and starts the recording when the pressure is on, so the cleaning operator focuses on operating the jetting truck and cleaning the pipe.

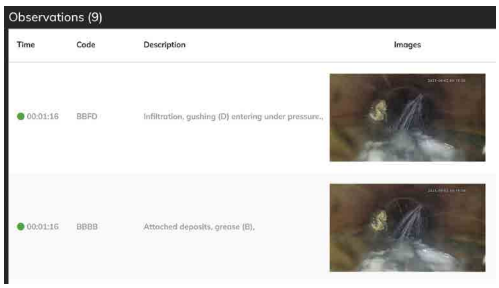
After the pipe has been cleaned, the video can be downloaded for an instant visualisation of the pipe status to help the operator select the right cleaning approach. In majority of cases, when cleaning proceeds without anomalies, the video is not reviewed in the field. But at the end of the day it is automatically uploaded to the Sewer Analytics online cloud along with the GPS coordinates, time and date of the cleanings. >

AI Is Added For Cleaning Videos

Sewer Analytics c70 infiltration and grease.



Sewer Analytics C70 Video Nozzle observation ROOT BALL.



Sewer Robotics AI reported defects.

Artificial Intelligence, or AI, refers to machines that are capable of making smart decisions. These machines are not robots with arms and legs, but software programs that we use to make our lives easier by performing tasks that normally require human intelligence, such as understanding natural language, responding to images and sounds, and playing games.

Artificial intelligence can also be used to automatically code defects in cleaning videos. This is done by first training the AI on pipe defects with a huge set of coded defects. Once trained, the AI then looks for patterns in the new video that matches the patterns it learned from the defective videos. Finally, the AI outputs a list of defects for the cleaning video, along with the required screenshot and defect code according international standards.

Users do not have to necessarily look at the video as the AI will inform them that there is a grease deposit attached and a gushing infiltration inside the pipe, and classify the pipe segment as a number 5 high priority. Other common reported defects include roots, displaced joints, surface damage, fissures, cracks, settled deposits and intruding connections.

AI For Wastewater Infrastructure Management

As the world becomes more digital, organisations are turning to artificial intelligence (AI) for a variety of tasks. AI is even being used in wastewater infrastructure management. By using sensors and data analytics, AI can help identify issues with storm, water and sewer systems before they cause problems and is expected to revolutionise our industry to save organisations time and money by preventing damage to infrastructure and avoiding disruptions to service.

When it comes to cleaning and surveying pipes, users can use a video nozzle like the C70 and record a video in HD format during cleaning, and they can download it as soon as the cleaning process is completed. Indeed, it also allows the asset managers and cleaning crews to record high-definition videos at a minimal cost during pipe cleaning operations.

Economic Benefits

Video nozzles are devices used for simultaneous pipe cleaning and video recording and can be used instead of conventional cleaning nozzles on any high-pressure cleaning truck during regular- or pre-inspection cleanings and do not require changes in methodology. The (video) data is therefore gathered at minimum additional cost and effort compared to regular cleaning, which is always required before inspection.

As there is only a small part of the system, estimated between 15 to 30%, that does require additional measures and therefore the utilisation of a video nozzle to collect video data will result in a significant cost reduction.

Although a video nozzle will not entirely replace a detailed CCTV crawler inspection, it comes at a much lower cost and it will tell you if there are any defects in the pipe. Depending on the reported defect and their priority, the right measures could be defined and implemented based on the cleaning video, or if preferred, a detailed CCTV crawler inspection could be carried out in the few cases where a detailed look is desired.

Furthermore, an HD video nozzle, like the Sewer Robotics C70, will provide video proof of the pipe segments that are perfectly clean and without issues to focus resources where they are required.

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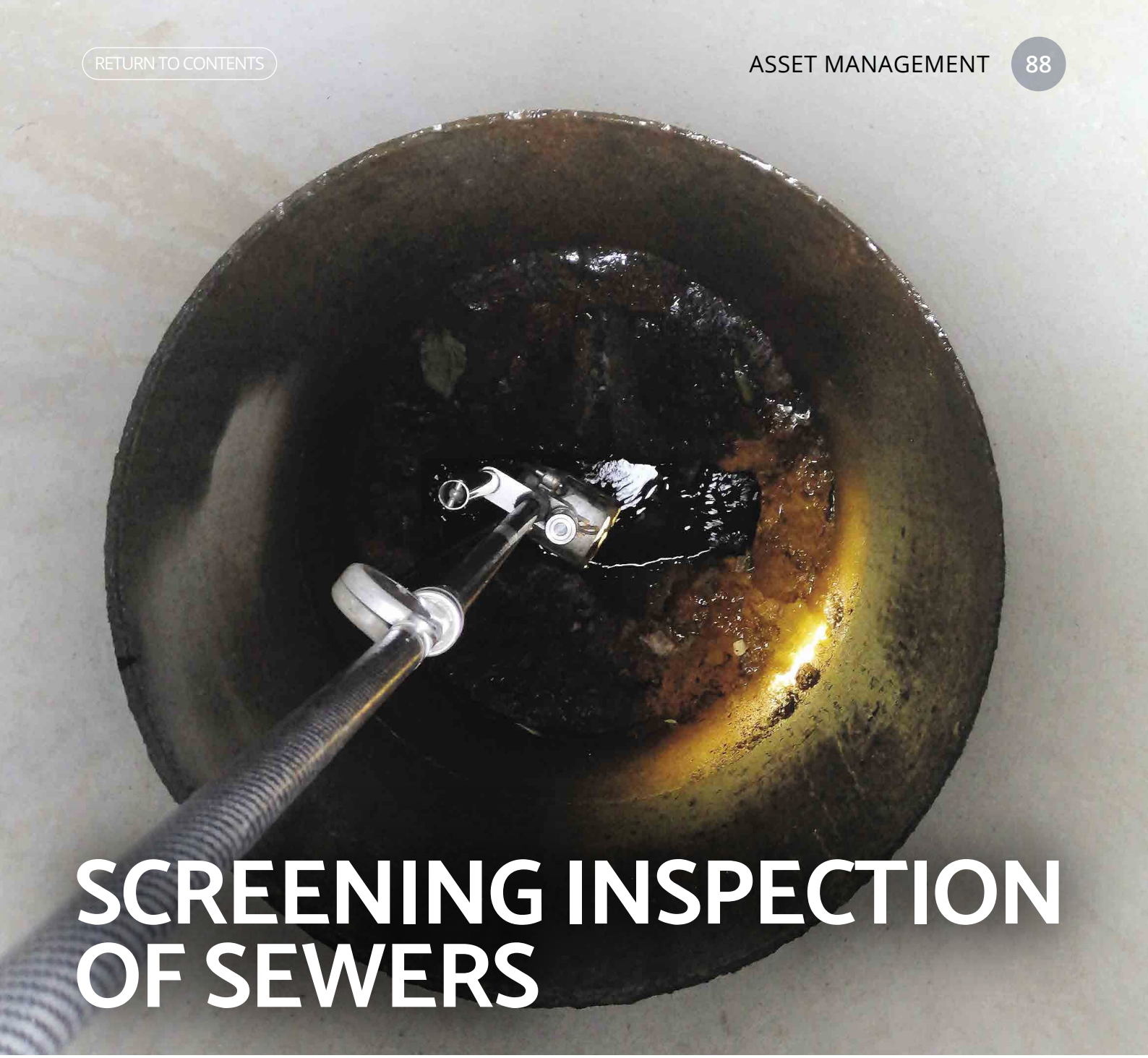


SCREENING INSPECTION OF SEWERS

The UC screening tool.

The volume of sewer inspections in Finland have been quite low. Inspections with robotic crawlers started at the end of the 1970's. Since then, the volume of inspections has increased, however the total volume of inspected sewers has been less than 4% of the total length per year.

The calculated operational age of sewers and water mains in Finland has been up to 350 years, which is not an acceptable level. One reason for such a slow renovation level is the low volume of sewer inspection. There have been many discussions among the experts on how to increase the inspection volume to a level which allows the operators enough knowledge of their network assets. It will help to focus better on maintenance and renovation as well. Following these discussions, the Finnish Water Association (FIWA) and the Finnish Society for Trenchless Technology (FiSTT) as well as several water utilities have been in key roles in starting projects to increase inspection volumes of sewers. >

Typical view of a pipe.

Publications

The Condition Assessment and Sewer Inspection (CASI) Methods – Guide Book's Finnish original was published in 2018. It describes inspection methods for sewers which are in use worldwide. It describes also, how to increase volumes of sewer inspections from the current levels, as well as methods to help in focusing on the most severe parts of networks and methods for maintenance and asset management. The translation from Finnish to English was funded by the ISTT.

Viemäreiden kunnon tutkiminen (in Finnish, 'Inspection of sewers') was published in 2021 and funded by FIWA, FiSTT and several water utilities. The guide book describes how to inspect sewers visually, either manually or with robotic device, including manholes, gravity sewers, and sewer tunnels. The guide book describes both screening method of sewers and more detailed inspection with robotic crawlers.

FIWA and FiSTT with support from water utilities have also produced a guide book for water mains (Vesijohtojen kunnon tutkiminen, in Finnish, 'Water main inspections'), which was published in 2022. Similar funding has been used for the publication of 'Data Transfer Development Between Water Supply Network Information Systems and Inspection Software In Finland'. Next year will be published a guide book for life cycle management of water mains and sewers for sustainable operational condition assessment.

Screening method for sewer inspections

The UC screening inspection method was started between 2017 and 2019. The main focus of the UC screening method is to have the data transferred to the UC user interface including all acquired data from manholes, pipes etc. UC screening inspection is achieved with a camera device with high zooming properties and with a strong light bulb. The UC screening inspection is undertaken in an uncleaned pipe that is currently in use, which shows the operational condition and pipe defects, such as roots, inflow and infiltration, breakages, failures in gasket etc. >

Surveyor using the UC tool.

When the surveyor arrives at site, the inspection starts by lowering the camera into the manhole, and filming is started. The filmed data is transferred directly from the site to the UC used interface. The UC screening inspection results up to several kilometres of inspected pipes per one working day, as long as the manhole covers are easily accessible.

Typically, UC screening inspection is focused on large areas, for example several kilometres of sewers at a time. The screening method shows the operational condition of the pipes, and defects such as inflow, roots, gasket failures, breakages, surface failures, grease, fat etc.

The screening inspection is good for finding problems with, for example, water main leakage into pipes or manholes, stormwater connections into pipes, blockages in the sewers etc. It is a very efficient and highly affordable way of finding the pipe sections which are in good condition and do not need any further maintenance work. Typically, 60% or more of inspected pipe is found to be in good condition. On the other hand, with the screening inspection, it is easy to focus on the pipe sections that need precleaning and more detailed inspection with robotic crawlers.

It is easy to include manhole inspections with filming or photos, and analyse that data in the UC interface, too. The data is analysed afterwards. The analysed material is highly visual with colour coding (red = bad, yellow = mediocre, green = good). There is no limitation of the user amount on the UC interface. The data is saved and secured, for up to three years. Client can make their own marks and analyses to the data for maintenance or rehabilitation work.

The UC screening method is an easy and affordable way to inspect and increase knowledge of operational condition and condition assessment of sewers. It can be used to focus maintenance and repair work in a right way in a right time. The UC interface is a good tool for operation, maintenance, and rehabilitation of sewers. >

Case study: Riihimäki Vesi

There are approximately 250 km of water mains, 215 km of sewers and 150 km of storm water pipes in the city of Riihimäki, Finland. Only a small fraction, less than 1%, of sewers has been inspected annually, while water mains and storm water pipes are not inspected at all.

The inflow and infiltration (I/I) has been quite large, with up to 50% of the sewer's average flow coming from either the combined sewers or from other sources than that billed from the clients. The I/I ratio must be lowered in order to save money at pumping stations and sewer treatment plants.

A zoom-camera inspection was used for sewer pipe inspections. Manholes are inspected with a CleverScan camera device. The main goal of the project is to inspect all of the sewers within a 5-year time frame using the UC screening method and the UC user interface.

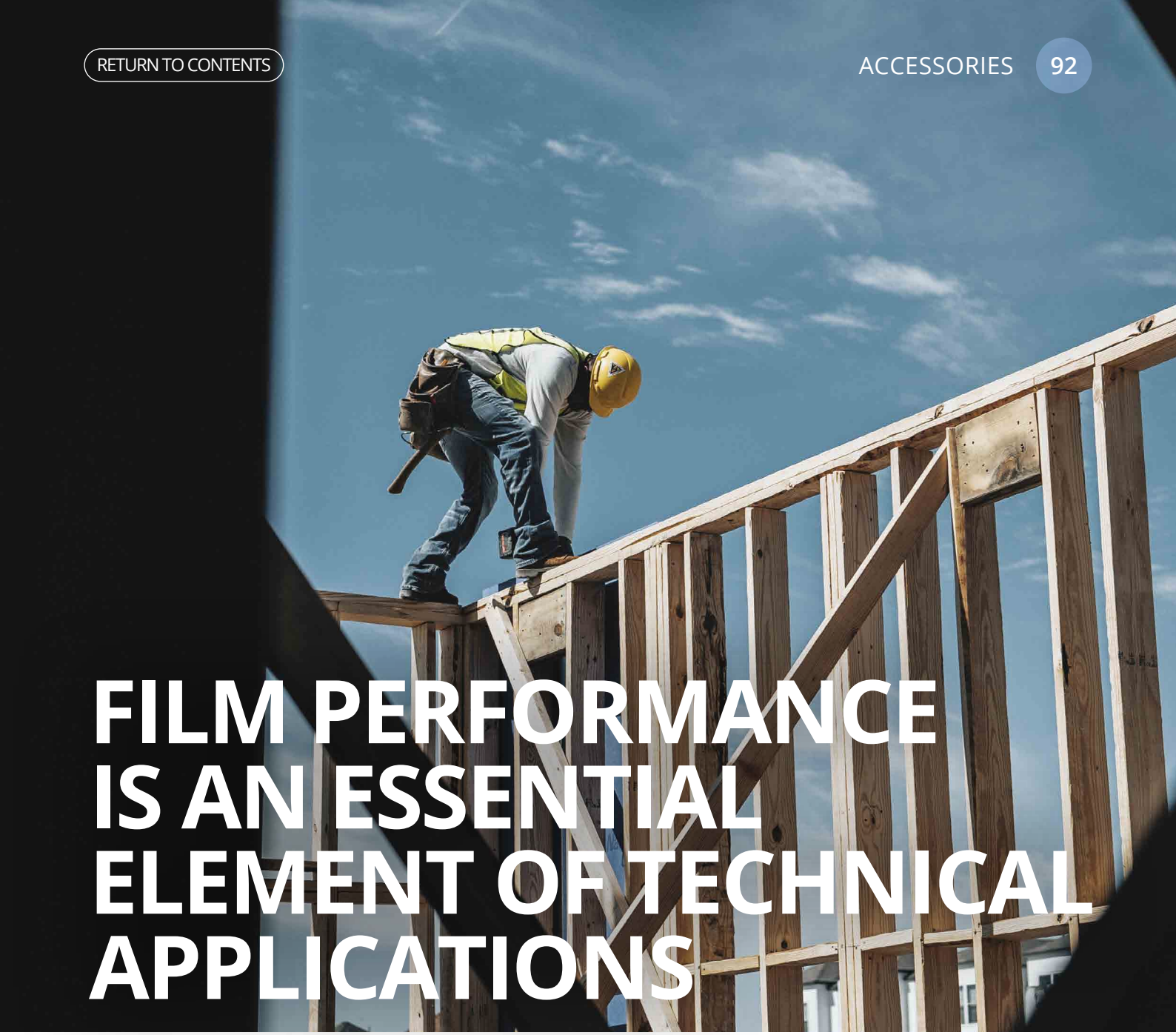
During the first half-a-year, more than 30 km of sewer has been inspected. Surveyors found I/I sources, several blockages, roots, and other defects to be corrected. The most significant findings result in management and renovation, while the less significant ones have increased knowledge of the network. The material will be used when programming, either for more inspections and/or renovation projects. Most of the inspected pipes are in good condition, and those pipelines do not need any specific maintenance activities for many years. More than 200 manholes have been inspected with the CleverScan-device. Also in this case, the conditions of the inspected manholes have been exposed, and some renovation has been undertaken.

With the zoom-camera and CleverScan device surveyors can inspect both sewer pipes and sewer manholes within a reasonable amount of time (five years). The methods used have been found to result in highly visible and understandable information from sewers and manholes. This has gained important knowledge of the pipes and manholes, and the contrcator will continue with this project until all the sewer network has been inspected. A project has also started to inspect water mains.

The screening zoom-camera inspection offers considerably reduced energy consumption and working time as compared to the CCTV inspection. The zoom-camera inspection achieves several kilometres per day, and the data is directly transferred to a cloud-based data service. The most severe leaks, inflow and infiltration cases, roots, and other defects are recognised, and the information is transferred in real time. Also, when undertaking inspections in large quantities, defects such as water leakage or pipe blockages can be found using the material, whereas when undertaking traditional CCTV such problems are not as easily seen. Typically, up to 70% of the inspected pipes are in good condition, while the rest of the pipes are easily examined and the more detailed inspection methods can be focused in these pipes. The energy consumption of the zoom-camera inspection can be as much as 90% lower than in the CCTV inspections.

"With the zoom-camera and CleverScan device surveyors can inspect both sewer pipes and sewer manholes within a reasonable amount of time."

A clean and whole pipe.



FILM PERFORMANCE IS AN ESSENTIAL ELEMENT OF TECHNICAL APPLICATIONS

SÜDPACK aims to maintain sustainable construction.

SÜDPACK will be attending the 38th International No-Dig Conference and Exhibition in Helsinki, Finland where it will present its comprehensive portfolio of high-performance films for technical applications and above all, its outstanding expertise with regard to tailor-made concepts.

'Competence meets innovation' is not just a motto at SÜDPACK, but also a necessity, especially when it comes to technical films and compounds. "The quality of the raw materials, semi-finished products and films ultimately determines the performance and safety of an entire system. Which is why we never make any compromises when it comes to our special technical films." said Bülent Kasap, Head of Sales BU FF&C (Functional Films & Compounds) at SÜDPACK.

Thanks to its extensive portfolio, the technology and innovation leader meets the highly diverse requirements of many industrial applications. Its range includes films that are used as insulation film or sturdy primary and secondary packaging for industrial products and adhesives. As well as those that are used as semi-finished products in the manufacture of technical products for the building and construction sector, for example. >

Outstanding material properties

These multi-layered films are extremely durable and sturdy. SÜDPACK's comprehensive expertise in the coextrusion of high-performance films allows its products to be extensively customised with a variety of properties. For example, they are highly resistant to chemicals and mechanical forces, or boast antistatic properties. "Be it in civil engineering, water and energy supply or infrastructure in general, SÜDPACK products must always meet the highest standards in terms of quality, functionality and flexibility." said Bülent.

Demand for sustainable solutions is growing

"By using recycled materials, we can significantly reduce the carbon footprint of our products, thereby helping to meet our customers' sustainability targets."

Bülent Kasap is also expecting a great deal of interest regarding sustainability. The company group adapted to the changing needs of the market at an early stage, adjusting both its portfolio and processes accordingly. In terms of technical films, SÜDPACK's sustainability offensive primarily focuses on producing recyclable materials and increasing the proportion of recycled material in its products, to ensure that recycled materials from various sources can be easily incorporated into its films. "By using recycled materials, we can significantly reduce the carbon footprint of our products, thereby helping to meet our customers' sustainability targets." said Bülent. SÜDPACK therefore assesses the carbon footprint of its films and packaging along the entire process chain, not just at the end of their life cycle. From late 2022, an intelligent LCA tool will be available that allows a wide range of sustainability concepts to be compared and decisions to be taken based on facts.

Multi-faceted added value

Thanks to its unique plant and technology park, as well as its dedicated, highly motivated R&D, Application Technology and Market Specialist teams, SÜDPACK is able to combine various manufacturing processes in such a way that the necessary film properties can be achieved with maximum efficiency. Customers therefore not only benefit from its core coextrusion competence, but also its extensive experience of polymers and process engineering, as well as the lamination and printing of plastic films.

Another fundamental building block for an efficient and significantly more sustainable development process, with a faster time-to-market, less waste and reduced energy consumption, is its 'multiXtrusion' pilot plant that is used for customer sampling and trials at its headquarters in Ochsenhausen, Germany.

Last but not least, close collaboration and excellent networking with institutes, universities, associations and industrial partners also help SÜDPACK to use its position as market leader to promote pioneering initiatives and repeatedly provide new impetus for product innovations, especially those involving sustainability. As recently as June 2022, SÜDPACK was ranked the 36th most sustainable company out of around 4,000 businesses by the renowned business magazine, WirtschaftsWoche, and then Germany's 2nd most innovative SME in August.

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A MESSAGE FROM THE CHAIR

Jari Kaukonen, Chair, International Society for Trenchless Technology

Hi ISTT members!

I can remember how I was elected as a new chair of ISTT in Cape town four years ago. I was afraid of what would be ahead of me. Now I know what that was and I have to step down from that position. After this period, I am very satisfied to have had the possibility to serve ISTT for my period. This has opened my eyes in many different directions that I have not understood before. I did not have any idea about the period ahead. We had a pandemic. We had a war in Europe. But in spite of these the use of trenchless continued to grow. The purchasers have a better understanding about the benefits of trenchless. There are a lot of benefits for example less new material use, less disturbance, lower costs and lower environmental impact when using trenchless. So why dig when there are better solutions!

When I started as a chair, we established many committees and also a chairman's advisory board. The committees have been a very positive way involving more trenchless professionals to combine with ISTT's activity. In that way we have much stronger and larger view when estimating our activities. From those who are active in committees we will find the future new board members and chairs of ISTT. The chairman's advisory board has been a very valuable background support to me. I appreciate that a lot and I have had many valuable discussions with president of ISTT Dec Downey. My sincere thanks to him for his support. We have also changed the ownership from Guarantor's to Trustees. Now we can say that we are a more open and a more democratic organisation than we were when I started. In Helsinki we will have a new chair of ISTT when Albert Shou takes that position at the end of the council meeting in Helsinki. We will see what his thoughts are for our organisation. I will remain on the board as a past chair for Albert's period. We will miss one really good member of the board when Enrico Boi steps down from the board. My sincere thanks to Enrico for his wisdom on the board. >

"Now we can say that we are a more open and a more democratic organisation than we were when I started."

I had very positive discussions in Cracow, Poland for combining two societies together as an Affiliated Society of ISTT. That is not an easy thing but doable if the two societies understand how they can offer more benefits to the Polish trenchless market. We will see how this will continue in the future.

Now we are ahead of our international conference and exhibition in Helsinki, my home town. We will have so nice an event with a lot of professionals in trenchless. The Scandinavian Society (SSTT) will host its annual meeting in the ship when travelling from Stockholm to Helsinki and they will have so many present that visitors have a great opportunity to exchange thoughts with them during the conference. There is a lot of interest also here in Finland to take part in the conference. We also have many local companies exhibiting, so visitors have a great opportunity to discover the high-level products and services originally from northern Europe.

We will have two nice tours pre- and post-event. Both with very interesting programmes. On Wednesday we will have site tours where visitors can discover how to bore a route in the very hard rock for a pipe diameter of 900 mm. The second site will show a CIPP installation inside a house for a small sewer. The third tour is a wastewater treatment plant which became ready this fall. We received almost 70 papers from where our professional team selected the best ones to the programme to be presented from Monday to Wednesday. When visitors register on the page at www.nodighelsinki.com for the conference they can at the same time buy tickets to the tours, Gala Dinner and the Finnish language conference.

I and the FiSTT team will wish you all welcome to Helsinki to enjoy the week of trenchless.

With best regards,

Jari Kaukonen

Chair, ISTT

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NO-DIG MEXICO CONFERENCE & EXHIBITION

The date has been set and the location decided. Next year, ISTT's 39th Annual No-Dig Conference and Exhibition will be held at the Expo Santa Fe in Mexico. Between 17 and 19 October 2023, this will be the place to be for the very latest ideas, information and hardware for trenchless technology.

The location is very fitting. The Mexican Government is currently in the middle of an ambitious infrastructure plan set to run until 2024 and worth a total of US$44 billion. Whilst Government backed, investment is mainly coming from the private sector. Having commenced in 2020, maintenance, upgrading and new build work is being targeted at highways, railways, ports and airports, alongside telecommunications and water networks. The intention is to enhance Mexico's reputation as a place for inward investment, as well as making the country more ready to communicate and work with international markets.

Given that these investments need to be seen to deliver value for the public sector, while also being efficient and effective to be worthwhile for private sector involvement, the need for low-impact and highly cost-effective methods of construction, upgrade and maintenance work cannot be questioned.

This then is not just a place where trenchless technology is required, it is a place which could be the proving ground for new techniques and practices. >

Paul Harwood, Managing Director of event organiser Westrade Group Ltd, Publisher, Trenchless Works, Liaison, Board of Directors, International Society for Trenchless Technology

"ISTT's 39th Annual No-Dig Conference and Exhibition will be held at the Expo Santa Fe in Mexico. Between 17 and 19 October 2023, this will be the place to be for the very latest ideas, information and hardware for trenchless technology."

Time is of the essence for the country. The manufacturing sector is already growing impressively and a trade agreement with the US and Canada is providing more fuel to the fire for improvement and upgrading. International supply chains, local industry and, naturally, the local population all stand to gain massively as Mexico continues down this path.

The country is already attracting foreign investment, with China, the US, South Korea and Europe among those working in the country or ready to get on board. Already methods including Mircotunnelling, Pipe Bursting, CIPP, HDD, Auger Boring and TBM are being used in earnest. The importance and role of the trenchless industry is also demonstrated clearly by the emergence of some strong No-Dig organisations based in Mexico City itself.

Here, then, is the potential for attendees at the No-Dig Expo and Conference. Not just to be at the world's premier gathering for the industry, but to be on the ground at the point where trenchless work is truly needed and valued by both the private and public sector of a country, where the techniques are on show and being directly experienced – the point where No-Dig practices can be truly evaluated and appreciated.

This is a time to be able to witness how the industry is helping to push a country forward, keying in to its needs and requirements as diverse industry sectors continue to develop. It is also a chance to prove the true value of trenchless technology in terms of delivering economic impact at a reduced environmental cost. In short, this is a way to help businesses and countries do more while incurring less cost and disruption.

Global Reach

As is the case with every annual No-Dig Conference and Exhibition, attendees will be coming from all over the world. Some may be coming in order to understand the current programme of works in Mexico, others will be attracted by the chance to meet, discuss and share ideas with industry colleagues, researchers and those working at the leading edge of the trenchless industry.

Attendees come from a wide range of backgrounds. There will be leading figures from across the utilities industries – water, sewerage, telecoms as well as oil and gas. There will be Government personnel, civil engineering consultants and city planners; indeed anyone and everyone who will benefit from knowing more about the trenchless approach. This is the annual chance to discover the projects, ideas and practices that are making a difference in the industry and making a difference for clients it serves, revealing how No-Dig can deliver more value among its customers around the world. >

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The event includes a leading-edge industry conference where a range of new papers will be presented, exploring the latest practices in the industry and showing how trenchless is innovating and carefully investing in the technology and practices which make a difference for customers. Papers will come from academics, practicing businesses and thought leaders from around the world. A range of sectors will be represented and explored, with presenters on hand to take questions and help draw out lessons and approaches that could be transferred between projects and sectors.

Alongside the conference will be a comprehensive student programme offering a series of masterclasses in trenchless technology for young engineers. These will introduce attendees to the basic principles and fundamental economic and environmental benefits of key No-Dig technologies giving them a swift and secure background to this innovative and effective practice. Students will also learn about vital supporting technologies including geotechnical and condition assessment surveys. There will also be a closing session offering a hosted tour of the exhibition to see first-hand the latest innovations in technology and service provision. In this way the event will also be investing in the future of trenchless works.

Most importantly, however, the No-Dig Exhibition offers a unique space which brings together the latest in trenchless technology in an environment where attendees can explore and experience the techniques first hand. Rather than simply hearing about developments, the No-Dig Exhibition lets you see exactly what is possible and what is currently on offer from the leading suppliers in the industry. Whatever your requirement, the right solution provider will be here to help discuss your needs and move your business forwards.

The Venue

Expo Santa Fe México is the venue for ISTT's 39th Annual event and it is more than ready for the job. The venue has maintained constant growth throughout its history, being the location of choice for important conventions, industrial, business, commercial and social events. It has hosted events such as World Business Forum, National Entrepreneur Week, International Motorcycle Show, manufacturing group TECMA and many more. The venue has all the space and facilities required for a successful show and is ideally located, just 12 km from the centre of Mexico City, 20 km from the International Airport of Mexico City and 25 minutes from the alternate airport of Toluca. The Santa Fe hotel zone is just three minutes away.

We look forward to seeing you there.

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ISTT ANNOUNCES 2022 AWARDS

The International Society for Trenchless Technology (ISTT) has announced the winners of the International ISTT Award programme for 2022.

Five winners were selected in different categories from over forty entries. The ISTT Awards are given annually, but due to the pandemic, the programme was suspended in 2020 and 2021. "The quality of the entries presented the jury with a difficult task of selecting the winners. It shows how the industry is continuously evolving." said Jari Kaukonen, Chair of ISTT.

The 2022 Award Winners

Trenchless Project: New Installation. Awarded to the Taipei Water Department for a water trunk project that overcame numerous faults and geological variations in Taipei, Taiwan. One reviewer noted that the work represented a 'challenging project with good design and construction adaptations'. The China Taiwan Society for Trenchless Technology is the sponsoring society.

Trenchless Project: Rehabilitation. Awarded to Ludwig Pfeiffer for rehabilitation of wastewater network in the city of Guayaquil, Ecuador. The project consisted of CCTV inspection and cleaning 450 km of sewer pipes. Some 93 km of pipeline was rehabilitated using trenchless techniques. The project was lauded by one reviewer as a major trenchless rehabilitation project in a country with little trenchless experience. The German Society for Trenchless Technology is the sponsoring society.

New Technology. Awarded to Jiangsu Dilong Heavy Machinery Company for the submersible directional drilling machine that operates at a depth of 50 m underwater using continuous pipe drilling technology. Quoted one reviewer: "This is extremely useful in underwater drilling that may have a huge future in servicing coastal and high groundwater areas." The China Society of Geology-Trenchless Technology Committee is the sponsoring society.

Academic Research. Awarded to the Trenchless Technology Center at Louisiana Tech University for the study on mitigation of styrene emissions from steam-cured CIPP projects. The study found that styrene emissions, while present, were not in concentrations reported in previous research studies. The study presents a number of safe working recommendations. One reviewer noted, "Excellent research programme and important results." The North American Society for Trenchless Technology is the sponsoring society.

Student Award. John Kraft from the Trenchless Technology Center at Louisiana Tech University received the ISTT Student Award for his student paper on "Alternative Approach for Assessment of Hydraulic Design Basis for Pressure Pipe Liners." As part of his doctoral research, this paper describes an alternative and innovative approach to conducting an ASTM test that reduces the time and cost of the test and results in better conditions for rehabilitation projects. The North American Society for Trenchless Technology is the sponsoring society.

The 2022 Awards will be presented at the 38th International No-Dig Conference, 3 and 5 October 2022 in Helsinki, Finland.

www.nodighelsinki.com/

ISTT International Society for Trenchless Technology

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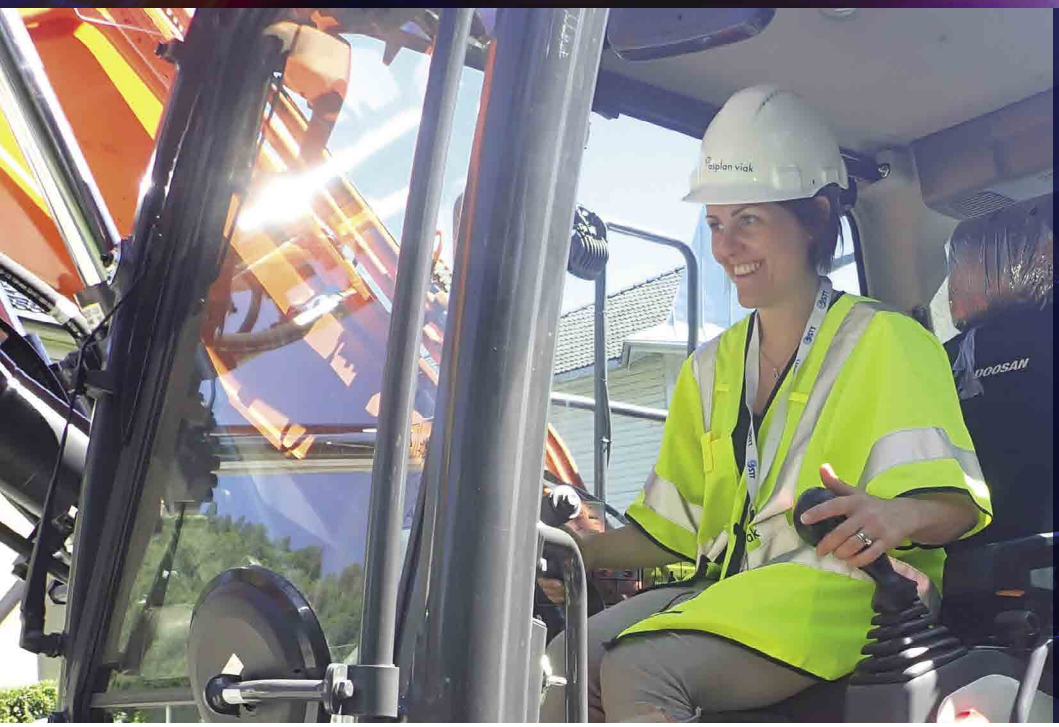
SSTT – FACING THE CHALLENGES OF THE SCANDINAVIAN TRENCHLESS INDUSTRY

The temporary pipeline on the Lofoten project.

What signifies construction works in Scandinavia are high demands on sustainability, a great interest in and good ability for innovation, as well as a very close collaboration between different actors. These features are also characteristic of the work within SSTT (Scandinavian Society for Trenchless Technology).

The overall purpose of SSTT is to spread knowledge about No-Dig technologies to ensure that maintenance, renewal and new construction of pipeline networks are done with smart, resource efficient and sustainable No-Dig.

"Something that is also special with SSTT is that it is a joint organisation between Norway and Sweden, although we continue to develop our own technologies within each country as well. The close collaboration between our two countries helps both countries to improve No-Dig methods faster since we have opportunities to learn from each other." explained Borghild T Folkedal, Chairman of the Board of SSTT. >



"The close collaboration between our two countries helps both countries to improve No-Dig methods faster since we have opportunities to learn from each other."

Borghild T Folkedal has been the Chairman of the Board of SSTT since 2021. She works as an Advisorwithin infrastructure as Aspan Viak A/S.

Demands for special working skills in Scandinavia

SSTT's tools for achieving the obvious benefits of No-Dig methods are to gather scientific achievements, knowledge and experience and disseminate this to suppliers, contractors, consultants and academia, as well as inspire pipe network owners and clients to make informed decisions on climate, environment, society and the economy.

"Working with pipes for water and sewage in Scandinavia also requires some special skills due to large variations in weather conditions, the mountainous nature and different geological conditions. It is completely different working with the pipe network below minus 20°C in snowy and icy conditions, than during summertime." Borghild stated.

The first No-Dig technical solutions were launched in Scandinavia in the late 1950s and had their breakthrough in 1980s. In 1989, the SSTT association was formed by a number of pipe network owners, suppliers, contractors, consultants and pioneers who early on saw the great potential of the No-Dig technology in Scandinavia. Today an elected board leads the operations, while the national working groups are responsible for the operational work in each country.

A Knowledge Centre

To spread knowledge and inspire, SSTT has the ambition to be a solution-oriented knowledge centre that arranges industry meetings, trainings, conferences, seminars and open forums.

"We work continuously to build new knowledge platforms that our members can benefit from. Currently we are for example working to produce Planning Guidelines for the various methods with the aim of raising the quality level in completed projects. The fact that Scandinavia ranks at the top of innovative countries is also evident in SSTT's field of activity. We are early adopters of new technology, one example is that the electrification of equipment for No-Dig methods has come a long way, such as electrically driven hammer drilling rig for horizontal drilling. In Norway CIPP use for drinking water is also already accepted." Borghild explained.

High Requirements For Sustainable Solutions

SSTT also acts on the basis of the increasingly significant climate and environmental threat that puts a growing strain on people and society.

"From our perspective we are an important part of the solution. Our mission is to increase and support the use of No-Dig methods, a technology with less environmental impact that is both resource- and cost-effective and reduces nuisance to the environment as well as greatly reduces carbon dioxide emissions. To realise this mission, SSTT collaborates with >

During the project in Lofoten a helicopter was used to carry all equipment up in the mountains.

regions and municipalities which have high requirements for sustainability in their procurement. One example is the Asker municipality which is the first in Norway to use a fossil-free pipe system. The municipality has ambitious climate goals, for example by 2025 all the municipality's building and construction sites must be emission-free." Borghild said.

Another example is Oslo municipality, its goal is that all building and construction activities in the municipality must be emission-free by 2030.

"From 2025, all construction and construction work commissioned by Oslo municipality must be carried out emission-free. The use of No-Dig methods and electrically-driven machines is an important part of reaching the goal. Ahead lie many new projects with the ambition to minimise carbon footprints of maintenance, renewal and new construction of pipe networks. In Scandinavia we have a culture of close collaboration between different players which is very helpful in SSTT's vision to be an important part of the ambitious work for a sustain and prosperous future." Borghild concluded.

Special Conditions In The Mountains

One of the significant aspects of Scandinavian water and sewer projects is that there is a big variation in topology, with a lot of mountainous regions and different types of soils. In those regions No-Dig techniques are often to be preferred.

To describe some of the special challenges in renovating pipes up in the mountains a project in Lofoten, northern Norway, carried out by Kjeldaas A/S is typical. The project revolved a renovation of a water pipe (1,100 meters of DN 300 pipe) that provides a small village with water from a lake higher up in the mountains. Among the challenges were:

- The project area was situated 1,500 km north of Oslo, where Kjeldaas has its main office, which meant 23 hours driving for personnel and equipment. >

- The intake opening of the pipe was in a lake high above the treatment plant where it ended. Some 500 of the 1,100 m were located in steep hillside, with no possible access by any kind of vehicle.
- The pipe to be renovated was the only water supply for the village.
- The area around the pipe was prone to landslides of rocks and snow. It had as well a high environmental value.

Various alternatives were assessed for improving the situation, from the intake of the pipeline in the lake Vestredalsvatnet to Justad water treatment plant, on the basis of the advantages and disadvantages they had and their costs.

Three alternatives were considered:

1. Drill a new route on the steepest section and conventional open cut for the less steep/'flat' sections.
2. Build a new pipe on pillars above ground on the steepest section and conventional open cut for the less steep/'flat' sections.
3. Relining with inserted liners
4. With options 1 and 2, the existing pipe could be in use. With option 3 a temporary water supply would be needed to provide water to the village to execute the project. The tender was based on design and construct agreement. Based on being less expensive and much more environmentally-friendly, as well minimising the time spent for the project, option 3 waschosen by the Municipality of Vestvågøy.

Challenges Appear

The first step in carrying out the project was to install the temporary water supply with Primus Line Overland pipe system. This is a Kevlar reinforced liner, which had to be drawn through lakes, along rocks and be tightly secured in the steepest parts. Since the steepest part was unreachable by any kind of land-based equipment, a helicopter was used to get the bypass in place.

"The next step was to inspect the pipe to be renovated using CCTV cameras. Amongst the things we discovered was that the pipe suddenly changed from 300 mm diameter to 150 mm, a problem we were able to handle, but it highlights the potential issues one can encounter when there is very little information available regarding the pipe's construction." explained Hendrik Panman, No-Dig manager at Kjeldaas.

Because of the operational pressure of 16 bars, multiple bends, challenging or no access, proofed lifetime regarding ISO 9080 and long installation length, Primus Line was the optimal method for this project. >

Lofoten mountain side.

The Kevlar reinforced liner had to be tightly secured in the steepest parts.

The Helicopter Saved The Project

Before installing the liner, the cast iron pipe was cleaned several times using a scraper combined with a plunger in order to rinse it. A winch was used to pull the scraper as well to pull in the liner. Because of the weight of the winch, this was placed in the bottom part of the steep hill as was the drum with Primus Line as well other equipment needed for installation. This was flown up by helicopter.

"Once the winch was in place and pipe was cleaned, the flexible lining was to the pulled through the pipe. A compressor was used to calibrate the liner followed by installation of the Primus Line connectors with standard flange, so the connection to the network could be made." said Hendrik.

Hendrik concluded that in all it was a project with a lot of challenges, all that could be solved, but not an unusual project for the Scandinavian countries, saying: "The example shows some of the special conditions we have to handle when we work in mountainous areas, and during wintertime a few more challenges are added."

Certificate Requirements For Plastic Welders

Sweden has fully implemented the requirement for Plastic Welders to be certified according to the European guideline EWF581. The intended purpose is securing a higher quality on installed plastic pipes used for water and sewer application.

It is EWF, the European Federation for Welding, Joining and Cutting, that has agreed on minimum requirements for the education, training, examination and certification of European Plastics Welders.

"In Sweden it is now required in the procurement of construction works that plastic welders need to be certified in accordance to EFW 581/EN13067. That is important for many reasons, one being that plastic pipes have been rumoured to be a worse choice due to bad quality. With the requirement for certified plastic welders, I hope that rumour will go away, because plastic pipes are a very good choice in many applications." said Tomas Helenius, chairman of the Swedish working group of SSTT and a member of the Board of SSTT. >

EWF 581 is designed to provide a harmonised scheme for the comprehensive education and training of Plastics Welders. The guideline provides a combination of high skill and the necessary theoretical background, leading to examinations in accordance with EN 13067. Welders successfully completing the examination in specific modules or combinations of modules will be awarded the relevant EWF certificate in accordance with EN 13067.

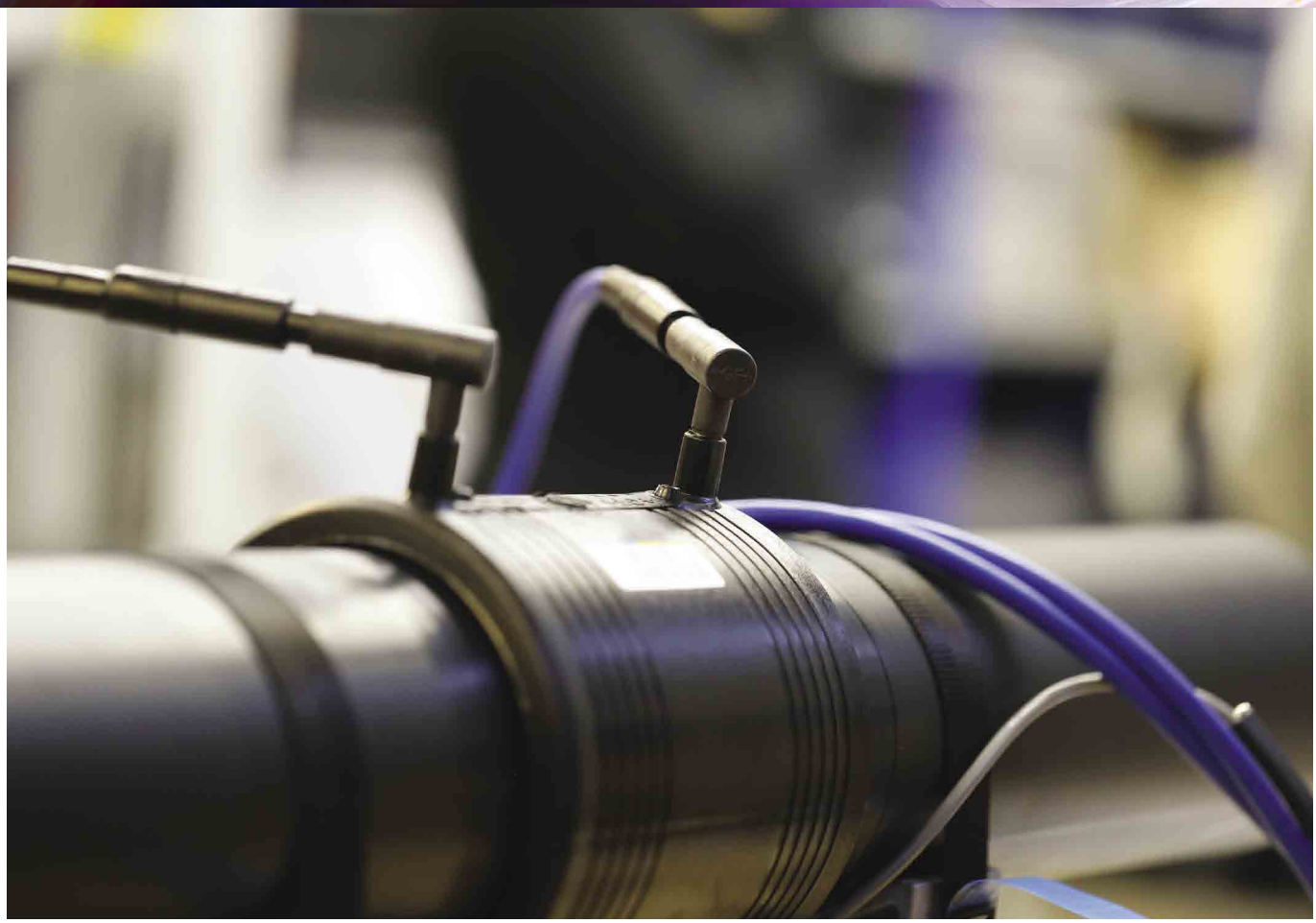
“In Sweden it has been the municipalities that has been leading the process to get the requirement of a certificate for Plastic Welders into the framework of procurement. For No-Dig technologies it is especially when methods like horizontal directional drilling and pipe bursting is used, where the welds are subject ed to large forces, that the demand for a high quality of the welds is important.” Tomas continued.

According to Tomas the Swedish municipalities are very good at making demands for the work that they order, which the inclusion of a demand for a certificate for plastic welders is an example. “But I also see that the independent contractors are good at adopting new rules and acquires adequate education to meet the demands.” he said.

The New Requirements Differ A Lot From Earlier

In Sweden there are a handful of educators that are approved by the Swedish ANB – Svetskommissionen, to educate in accordance to EFW 581, one of them is GPA Flowsystem where Daniel Ejdeholm is the Technical Manager. According to Daniel the new requirements in EFW 581 differ a lot from earlier educations for plastic welding. >

Lofoten helicopter access.



Plastic welding.

"Different courses in plastic welding, including issuing of certificates, has been given since the 1980's, with varying quality. What makes this new education different is that the examination is done by independent third party, where we as an approved training body (ATB) cannot approve our own students. The certificate is also only valid for two years, after that the certificate holder is required to send in an attestation from his/her employer that shows a required minimum time of welding practice over the past two years. Four years after the certification process it needs to be done all over again to refresh both the theoretical and practical skills." he said.

The certification process consists of three parts: a theoretical part with an examination at the end, a practical part where the certificate applicant has to do a number of welds in front of an examiner and finally the performed welds are sent to a third party test institute for destructive testing, to make sure that the welds are approved.

"A less well made weld may withstand pressure testing, but after some time in service they will fail and start leaking. That is why it is important to use destructive testing in order to ensure that the weld is of good quality." Daniel concluded.

Cold Winter Challenges

In Scandinavia the weather conditions vary more than in many other countries. It may differ up to 60°C between a warm summer's day and an icy cold winter's day, which in turn puts some special demands on both the workers and the project managers.

One example of how it may be during wintertime was a project that was carried out during wintertime in a community just outside Oslo, with a good mix of apartment blocks, terraced houses and some detached houses. The residential area was particularly cramped and with large height differences. >

"After several days of heavy snowfall, it was a challenge to get through with the pipe renewal vehicles. This is where the No-Dig methods have their great advantage. There would have been chaotic conditions if the Oslo Municipality had chosen the traditional excavation method to renew the pipeline network, where an entire district would almost be isolated. Instead, only a couple of small trucks were idling, and the open wells were well secured." explained Svein Arne Havik, Operations Manager at NCC No-Dig AS.

Although the cold did not stop them they had to constantly monitor the temperature since water tends to turn to ice when winter strikes. To work with water pipes during wintertime requires great planning and knowledge of how fast it may turn into freezing temperatures.

"We have to start preparing for winter in September as it may get cold at night even then. The main stem of the temporary water pipe is not a problem since it has a large diameter, from 63 to 160 mm. The problem will be the smaller pipes leading to the residences.

NCC solves that problem by using a PE hose with heating cable, an isotherm. In November/December they also insulate the main stem with etafoam, as well as insulating all brass parts since that is where it freezing first starts.

"If there is snow then it is actually fine for the temporary water pipe, as snow insulates quite well. We also make sure the water is circulated when working during the winter, as moving water does not freeze so easily. The colder it gets, the more circulation we need. We have to follow the weather forecast closely since we prefer not work at weekends because the water freezes, although we have a 24/7 emergency telephone for emergency calls if needed.

Regarding the equipment used during work with waterpipes in winter, it is the same as during summer.

"Collaboration is an important part of the Scandinavian culture, and we are truly working together throughout the industry, pipe network owners, entrepreneurs and consultants. That is a huge strength since we then know that the guidelines are likely to be followed in most projects."

Planning Guidelines

One focus area for SSTT is the production of Planning Guidelines for different No-Dig methods. Currently it is guidelines for sliplining with continuous pipelines that is under production.

The first Planning Guideline was published last year and focused on horizontal directional drilling. For SSTT members there is a need to produce such guidelines to get better project performance. Another purpose of the guidelines is to interest and inspire an increased use of No-Dig methods.

"The Planning Guidelines are aimed to secure that a uniform planning of projects is used, and since SSTT includes both Norway and Sweden the guidelines are written for both countries. The guidelines set a level for the work that the industry in both countries have agreed upon." said Fredrik Johansson, Specialist at the municipality of Gothenburg and member of SSTT. He is the project manager of the production of the guidelines, and he sees a big advantage in Scandinavia when it comes to producing this kind of documents.

"Collaboration is an important part of the Scandinavian culture, and we are truly working together throughout the industry, pipe network owners, entrepreneurs and consultants. That is a huge strength since we then know that the guidelines are likely to be followed in most projects." he said. >

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T. +90 212 352 03 93

For Exhibition and Sponsorship Enquiries
Ms. Nurdan BAYRAM
nurdan@maven.events

For General Enquiries
Ms. Zumra KAYA
zumra@maven.events

Welder training and certification has become the 'normal' requirement.

The Planning Guidelines are produced exclusively for SSTT's members and are a further development of the more general method overview that has been produced earlier. The guidelines are primarily aimed at designers and pipe network owners as well as clients, the purpose being that the guidelines should constitute a detailed description of the method's execution and a deeper description of design requirements.

"Since SSTT provides many courses during the year and the Planning Guidelines are used as part of the course materials, the guidelines are widely spread within the industry." said Fredrik.

Fredrik also sees the Planning Guidelines as an example of the extensive work that SSTT is doing in producing different information materials, courses and seminars which aim at spreading the knowledge of No-Dig methods to different groups in order to make them more widely used.

"It is only if we have to excavate because of holes in the water pipe that the equipment differs, then we have a heat-work that we use to thaw frozen ground. Otherwise, it is only warm clothes that apply." he said.

Svein Arne Havik concluded by stating: "Since we live up in the northern part of Europe, we know that winter is coming every year, and everybody working with waterpipes has the knowledge and competence needed for work during both summer and winter. Wintertime does not require any special expertise except that we have skilled plumbers who can work in all conditions."

second edition

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Conference ITALY

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Topics

The scientific articles submitted should fall under the following topics:

A. Preliminary investigations
B. Laying pipes by Horizontal Directional Drilling
C. Microtunnelling
D. Relining
E. Safety on working sites
F. The Trenchless Technology energy saving and environmental impact
G. Materials

★ **Final date for Abstract submission:**
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AFFILIATED SOCIETIES

ISTT Affiliated Societies around the world

Austrian Association for Trenchless Technology (AATT)
c/o TU Wien Resselgasse 5,
1040 Wien, Austria
Phone: +43 664 5184084
Email: office@grabenlos.at
Web: www.grabenlos.at

Brazilian Association for Trenchless Technology (ABRATT)
Alameda Santos, 1773 – Jardim
Paulista Sao Paulo
01419-002 Brazil
Phone: +55 11 983893450
Email: hrosas@abratt.org.br
Web: www.abratt.org.br

Australasian Society for Trenchless Technology (ASTT)
18 Frinton Place Greenwood,
6024, WA, Australia
Phone: +61 (0)8 9420 2826
Email: jeffpace@astt.com.au
Web: www.astt.com.au

Bulgarian Association for Trenchless Technology (BATT)
Kaprinka Lake Village Kazanlak
6100, Bulgaria
Phone: +359 2 4901381
Email: info@batt-bg.org
Web: www.batt-bg.org

China Hong Kong Society for Trenchless Technology (CHKSTT)
Tsimshatsui Post Office 91499 Kowloon
Hong Kong
Phone: +852 9201 1952
Email: chkstt@gmail.com
Web: www.chkstt.org

China Society of Geology – Trenchless Technology Committee (CSTT)
Xicheng District Room 151, 26
Baiwanzhuang Street, Xicheng District,
Beijing 100037 China (PR)
Phone: +86 10 6899 2605
Email: yan64843889@126.com
Web: www.cstt.org

Chinese Taipei Society for Trenchless Technology (CTSTT)
3F, No 92, Roosevelt Rd., Sec. 4,
Zhongzheng Dist, Taipei City, 100
Taiwan
Phone: +886 2 2362 0939
Email: zoradcrc@gmail.com
Web: www.ctstt.org.tw/en_index.asp

Czech Society for Trenchless Technology (CzSTT)
Bezova 1658/1 ,147 14 Praha 4 Czech
Republic
Phone: +420 244 062 722
Email: office@czstt.cz
Web: www.czstt.cz

Danish Society for Trenchless Technology – NoDig Infra (DKSTT)
Odinsvej 29 Silkeborg Denmark
Phone: +45 50894489
Email: tina@juul-consult.dk
Web: www.nodiginfra.dk/nodig-infra/startside

Finnish Society for Trenchless Technology (FISTT)
c/o Sari Pietilä, Haapasuonkankaantie 10
90830 Haukipudas, Finland
Phone: +358 504132484
Email: info@fistt.net
Web: www.fistt.net

French Society for Trenchless Technology (FSTT)
4 rue des Beaumonts, F-94120
Fontenay Sous Bo, France
Phone: +33 1 53 99 90 20
Email: contact@fstt.org
Web: www.fstt.org

German Society for Trenchless Technology (GSTT)
Kurfürstenstr. 129 (Building:
German construction association)
Berlin, Germany
Phone: +49 30 81 45 59 84
Email: beyer@gstt.de
Web: www.gstt.de

Italian Association of Trenchless Technology (IATT)
Via Ruggero Fiore, 41 Rome Italy
Phone: +39 06 39721997
Email: iatt@iatt.info
Web: www.iatt.it

Iberian Society for Trenchless Technology (IBSTT)
C/ Josefa Valcarcel, 8 – 3a
PTLA 28027, Madrid, Spain
Phone: +34 913 202 884
Email: ibstt@ibstt.org
Web: www.ibstt.org

ISTT International Society for Trenchless Technology

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AFFILIATED SOCIETIES

ISTT Affiliated Societies around the world

Japan Society for Trenchless Technology (JSTT)
3rd Floor, Reed-C Bldg., 2-11-18,
Tomioka, Koto-ku, Tokyo 135-0047 Japan
Phone: +81 3 5639 9970
Email: office@jstt.jp
Web: www.jstt.jp

Latin American Society for Trenchless Technology (LAMSTT)
Medellín Highway (Calle 80) KM3.5
via Bogotá-Siberia south side, Bogotá
Terrestrial Cargo Terminal, Office C-12,
Cota – Cundinamarca, Colombia
Phone: +57 1 8764675
Email: cistt.arlex.toro@lamstt.org
Web: www.lamstt.org

Malaysia Association for Trenchless Technologies (MATT)
No 44, Jalan Dungun, Damansara Heights,
Kuala Lumpur 50490 Malaysia
Email: trenchless@matt.org.my
Web: www.matt.org.my

North American Society for Trenchless Technology (NASTT)
22722 29th Drive SE, STE 100,
Bothell, WA 98021
Phone: +1 888 993 9935
Email: info@nastt.org
Web: www.nastt.org

Netherlands Society for Trenchless Technology (NSTT)
Postbus 79, 3769 ZH Soesterberg,
Netherlands
Phone: +31 346 723450
Email: info@nstt.nl
Web: www.nstt.nl

Polish Foundation for Trenchless Technology (PFTT)
Ul. Warkocz 14, 25 - 253 Kielce, Poland
Phone: +48 41 34 24 450
Email: parkaa@tu.kielce.pl
Web: www.pftt.pl

The Russian Society Trenchless Technology Association (RSTT)
Severny proezd 12, Balashikha Moscow
region, Russian Federation
Phone: +7 (495) 521 78 82
Email: gnb.06@mail.ru
Web: www.s-gnb.ru

Southern African Society for Trenchless Technology (SASTT)
1053 Hyde Avenue, Eldoraigne ext 1,
Centurion Gauteng, South Africa
Phone: +27 (0) 82 551 7458
Email: director@sastt.org.za
Web: www.sastt.org.za

Singapore Society for Trenchless Technology (SgSTT)
84 Toh Guan Road East, Singapore Water
Exchange , #02-02 608501, Singapore
Phone: +(65) 97124054
Email: singaporestt@gmail.com
Web: www.sgstt.org.sg

Scandinavian Society for Trenchless Technology (SSTT)
SSTT Service AB, Box 22 307 104 22,
Stockholm, Sweden
Phone: +46 8 508 938 00
Email: Kontakt@sstt.se
Web: www.sstt.se

Trenchless Romania Club
Kucukbakkalkoy Mah. Ali Ay Sok.
No:3/2 Roma Street, No. 16, District 1
Bucharest Romania
Phone: + 40724 550 830
Email: maria.nae@trenchlessromania.ro
Web: www.trenchlessromaniaclub.ro

Turkish Society for Infrastructure and Trenchless Technology (TSITT)
Kucukbakkalkoy Mah. Ali Ay Sok. No:3/2
Atasehir 34750 Istanbul, Turkey
Phone: +90 216 469 75 65
Fax: +90 216 469 75 69
Email: info@akated.com
Web: www.akated.com

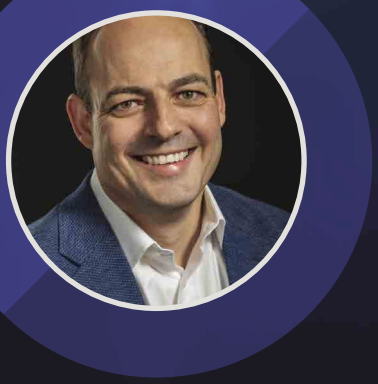
Ukraine Association for Modern Trenchless Technology (UAMTT)
83A Srednyaya Str., Odessa 65005 Ukraine
Phone: +380 50 3953280
Email: trenchless.as@novatec.ua
Web: www.no-dig.odessa.ua

United Kingdom Society for Trenchless Technology (UKSTT)
Camden House, Warwick Road,
Kenilworth, Warwickshire, CV8 1TH, UK
Phone: +44 (0)192 651 3773
Email: admin@ukstt.org.uk
Web: www.ukstt.org.uk

NASTT SOCIETY NEWS

nastt.org

NASTT News brought to members by Trenchless Works



Matthew Izzard, Executive Director, North American Society for Trenchless Technology (NASTT)

Hello and welcome to this month's update from NASTT. 'Conference Season' is here again with several of our twelve Regional Chapters holding their annual events around the Unites States, Mexico and Canada – including Northeast, Rocky Mountain and West.

Many of our members find local networking more relevant through their Regional Chapters for specific projects or providing career opportunities through our Student Chapters which are affiliated to various engineering academic institutions in that area. This is also the focus of NASTT's Canadian event, No-Dig North, which takes place between the 18 and 19 October in Toronto, which now provides this on a national level.

The event grew as a result of the successful conferences of three Chapters – British Columbia, Northwest and Great Lakes and the hard work of many volunteers, combining to become a major national event in the Canadian utilities and pipeline sector.

We also profile ourselves internationally at the ISTT No-Dig which is taking place in Helsinki, Finland in early October. NASTT joins the other 27 Affiliated Societies in contributing to the global development and understanding of trenchless technology, where we are proud to be represented on the ISTT Board of Directors as well as participating in the various sub-committees. Many of our members are benefitting from their involvement in attending, presenting technical papers and creating business links that are formed as part of our community.

For many years the International No-Dig event has provided the platform to develop trenchless technology. From the first event at London, United Kingdom in 1985, to the 38th in Helsinki 2022, it is amazing to think where these have been held for over 35 years and the legacies they have created. NASTT is proud to have hosted the conference on several occasions and now works with various societies in providing publications, training courses and also provides internationally accessible free webinar series, social media and video platform learning to all. Sharing information in this way allows us to bring in new technologies and ideas while promoting our own innovations.

In life the more you put out the more you get back in return. The opportunities to apply the latest technologies, manufacturing, training, and design engineering in North America are achieved through promoting our activities. ISTT grants allow us to put additional programme investment into creating multi-language publications and training courses. As an example of the return on this is the growth of interest in Mexico, where a new Regional Chapter has been formed and will host the Trenchless Technology International Seminar in November as a launch to the next International No-Dig in Mexico City 2023 – esperamos ver tú allí (we hope to see you there)!

Matthew

Underground Infrastructure Sustainability

OCTOBER 17-19 | TORONTO, ON
NO-DIG NORTH
2022

OCTOBER 17-19

Beanfield Centre
Toronto, ON Canada

• In-Person • Over 80 Peer Reviewed Presentations • Exhibit Hall

REGISTRATION now OPEN

nodignorth.ca

For Sponsor & Exhibit Info please contact Hannah Stakolich at Hstakolich@benjaminmedia.com.

No-Dig North is owned by the North American Society of Trenchless Technology (NASTT).
For more information about NASTT or other NASTT events, please visit nastt.org.

UPCOMING CONFERENCES, COURSES & EVENTS

2022

SEPTEMBER 22
Gas Distribution Good Practices Course
Virtual

OCTOBER 17
Municipal Sewer Grouting Good Practices Course
Toronto, Ontario, Canada

OCTOBER 17
HDD Good Practices Course
Toronto, Ontario, Canada

OCTOBER 17
New Installation Methods Good Practices Course
Toronto, Ontario, Canada

OCTOBER 17
CIPP Good Practices Course
Toronto, Ontario, Canada

OCTOBER 17-19
No-Dig North 2022
Toronto, Ontario, Canada

OCTOBER 19
Trenchless Elevated 2022
West Valley City, Utah, USA

OCTOBER 26-27
CIPP Good Practices Course
Virtual

NOVEMBER 7-8
16th Annual Western Regional No-Dig Conference
Concord, California, USA

NOVEMBER 8
New Installation Methods Good Practices Course
Concord, California, USA

NOVEMBER 14-15
6th Annual Northeast Regional Chapter Trenchless Conference
Portland, Maine, USA

NOVEMBER 16-17
HDD Good Practices Course
Virtual

NOVEMBER 30
International Trenchless Seminar
Santa Fe, Mexico City, Mexico

DECEMBER 14-15
Pipe Bursting Good Practices Course
Virtual

2023

APRIL 30 - MAY 4
NASTT 2023 No-Dig Show
Portland, Oregon

2024

APRIL 15-17
NASTT 2024 No-Dig Show
Providence, Rhode Island

2025

MARCH 30 – APRIL 3
NASTT 2025 No-Dig Show
Denver, Colorado

APRIL 30-MAY 4 | PORTLAND, OR

NO-DIG SHOW 2023

GREEN ABOVE. GREEN BELOW.

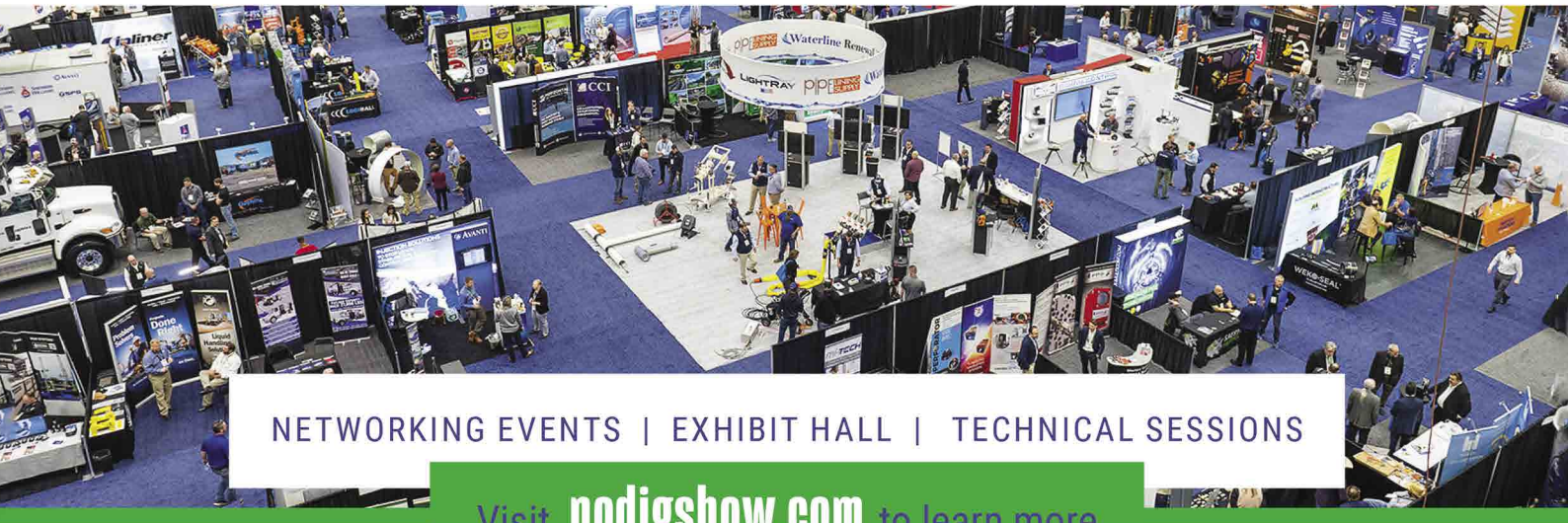
THE NASTT 2023 NO-DIG SHOW MUNICIPAL & PUBLIC UTILITY

Scholarship Program

The NASTT No-Dig Show Municipal & Public Utility Scholarship Award has been established to **provide education and training** for North American municipalities, government agencies and utility owners who have limited or no travel funds due to restricted budgets.

Selected applicants will be awarded **complimentary full conference registration** to the NASTT 2023 No-Dig Show in Portland, Oregon, April 30 – May 4, 2023. One day conference registrations will also be available. Registration includes **full access to all exhibits and technical paper sessions**... all you have to do is get yourself to the conference! Selected applicants will also be eligible to receive **overnight accommodations**. Selection based on responses to the application as well as need.

APPLY TODAY! Application deadline is November 1, 2022.



NETWORKING EVENTS | EXHIBIT HALL | TECHNICAL SESSIONS

Visit **nodigshow.com** to learn more

The No-Dig Show is owned by the North American Society for Trenchless Technology (NASTT), a not-for-profit educational and technical society established in 1990 to promote trenchless technology for the public benefit. For more information about NASTT, visit our website at nastt.org.

APRIL 30-MAY 4 | PORTLAND, OR

NO-DIG SHOW 2023

GREEN ABOVE. GREEN BELOW.

Save the Date

NASTT 2023 NO-DIG SHOW | APRIL 30-MAY 4 | PORTLAND, OR

Educational & Networking Opportunities Await

The No-Dig Show is the trenchless industry's flagship educational and networking event. Each year No-Dig attendees are privileged to the best industry-related content and access to the leading companies and individuals in trenchless technology.

- **Technical papers & presentations**
- **Large exhibition hall**
- **Specialized trenchless training courses**
- **Engaging networking programs & events**
- **Prestigious industry related awards**

Visit **nodigshow.com** to learn more

NETWORKING EVENTS | EXHIBIT HALL | TECHNICAL SESSIONS

The No-Dig Show is owned by the North American Society for Trenchless Technology (NASTT), a not-for-profit educational and technical society established in 1990 to promote trenchless technology for the public benefit. For more information about NASTT, visit our website at nastt.org.

SOCIETY NEWS

UKSTT

ukstt.org.uk

Society News brought to members by Trenchless Works

HELLO FROM THE CHAIR

Dawn Greig, Chair, UKSTT

Hello everyone,

Wow, time really does fly! I can't believe that it's been three years since I became Chair of the UKSTT. It's true to say that it didn't quite turn out the way I expected, the pandemic certainly provided unforeseen challenges for everyone, including the Society, however, it has been a true privilege and a time that I will certainly look back on with many fond memories.

For those of you who joined us at our wonderful UKSTT Awards Evening & Gala Dinner during No-Dig Live, you will perhaps remember my gratitude to everyone who has helped me throughout my tenure. I would just like to reiterate those thanks and say once again that we really have a great team. Even though I am stepping down as Chair, I will be delighted to continue to do what I can for UKSTT as the Immediate Past Chair over the next two years. There is still so much to do - working together is key. Not only our Council and Members but the wider trenchless community. If we collaborate we can achieve so much more. We can't stop until everyone 'thinks Trenchless first'.

I will be handing over the role of Chair to Ian Ramsay, who has been a huge support throughout my time at the helm and who has many great ideas to take the UKSTT even further, with the backing of our incredibly active Council and of course our amazing Associate Director, Lynn McLachlan.

I am currently compiling a report of my time as Chair which will be circulated after the AGM. Thank you to everyone who has believed in me; being the first female Chair of UKSTT felt like a huge responsibility, but in the end it was just such a pleasure. What a wonderful industry we belong to!

Finally, I would like to remind everyone that we have some excellent educational events coming up, with the Infiltration Workshop at Tortworth Court on 27 October, supported by our Patron Wessex Water, as well as the next UKSTT Roadshow in Warrington on 22 November, supported by Patrons United Utilities and Cadent.

Thanks for everything you lovely trenchless people!

Dawn x

The UKSTT Awards 2022

in Association with Westrade

The UK Society of Trenchless Technology (UKSTT) held its 28th Annual Dinner and Awards Ceremony, in association with Westrade Group, on 14 September, 2022, at the Atrium, East of England Showground in Peterborough.

Hosted by the Society's Chair Dawn Greig and Comedian Paul Sinha, the evening had James Bond theme running through it. Escorted to the stage by Westrade's Paul Harwood and Gary King, Chair Dawn Greig opened the evening with an emotive speech mentioning this will be her last one as she is now coming to the end of her 3-year term as Chair of the UKSTT. In between each course the winners for each category was announced.

SPONSORED BY

RSM Lining Supplies
CHOICE AND TECHNOLOGY

Category: New Installation – Horizontal Directional Drilling

Winner: Peter Mccormack & Sons Ltd, Kier Utilities & Rail & UK Power Network

Title: Little Barford to Eaton Socon - A cable route that, 'Could not be built'

SPONSORED BY

TRACTO

Category: New Installation – Techniques other than Horizontal Directional Drilling

Winner: Allen Watson Limited & Cappagh Group of Companies

Title: Grayshott Road London SW11 5UE Flooding Project

SPONSORED BY

PROKASRO

Category: Pipe Rehabilitation – Cured in Place Pipe Lining

Winner: Clancy Group & Anglian Water

Title: Cottenham Rehabilitation Scheme 2021 – 2022 >

SPONSORED BY

Category: Pipe Rehabilitation – Techniques other than Cured in Place Pipe Lining

Winner: Danaher & Walsh, Anglian Water Services Ltd & Wilkinson Environmental Ltd

Title: 4m Depth Collapsed Sewer Repair, Grand Parade, Skegness, Lincolnshire

SPONSORED BY

Category: Innovative Technology

Winner: WRc Ltd, SGN, Cadent & ALH

Title: Bonded service fitting on a cured-in-place pipe (CIPP) lined live gas main

SPONSORED BY

Category: Environmental

Winner: Picote Solutions, Picote UK, Lanes Group PLC & Thames Water

Title: Concrete removal project with Picote Millers inside DN150 Clay Pipe in London

SPONSORED BY

Category: Detection, Location & Inspection

Winner: Electro Scan (UK) Ltd, Cappagh Browne & Southern Water

Title: Southern Water Sewer Condition Assessment Project of 51km

SPONSORED BY

Category: Lifetime Achievement

Winner: Ian Vickridge

UKSTT are proud to award their prestigious 'Lifetime Achievement Award' this year to longstanding Council Member and ex Chair Ian Vickridge.

Congratulations Ian!

Many thanks to all of the judges, the sponsors and all of the companies who entered an award. Your continued support is greatly appreciated, and we look forward to doing it again next year!

Lastly, and certainly not least, a special thanks goes to Paul Harwood and the team at Westrade Group who once again made the evening a fantastic event.

EVENTS AND MEETINGS

2022

October 11-12: British Tunnelling Society Conference and Exhibition
QEII Conference Centre, London
Details from: www.btsconference.com/

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

October 27: Educational Day
Wotton-Under-Edge, UK
Details from: www.ukstt.org.uk

November 2-3: No-Dig Turkey 2022
Istanbul Lutfi Kirdar
International Convention and Exhibition Centre
Details from: www.nodigturkey.com/

November 8: UKSTT Energy & Communications Masterclass
The Woodland Grange Conference Centre,
Leamington Spa, Warwickshire
Details from: www.ukstt.org.uk

November 22: No-Dig Roadshow 2022
Warrington. UK
Details from: www.nodigroadshows.co.uk

November 30: Trenchless Technology International Seminar
Westin Hotel, Santa Fe, Mexico
Details from: www.trenchlessmexico.com

2023

April 30-May 4: NASTT 2023 No-Dig Show
Portland, Oregon

May 17-18: Trenchless Asia 2023
Kuala Lumpur Convention Centre, Malaysia.
Details from: www.trenchlessasia.com

October 17-19: International No-Dig Mexico 2023 ISTT's 39th International No-Dig Conference and Exhibition
Expo Santa Fe, Mexico

November 2023: Trenchless Egypt 2023
Cairo
Details from: www.trenchlessegypt.com

November 1-2: No-Dig Turkey 2023 Conference and Exhibition
Darulbedai Cad. No 4 Harbiye Sisli,
Istanbul 34367, Turkey

November 8-9: STUVA-Expo 2023 in Munich
Messe München, Messegelände, Hall C1
81823 München, Germany

2024

November: International No-Dig Dubai 2024 ISTT's 40th International No-Dig Conference and Exhibition
Dubai World Trade Centre, Dubai

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