Pipe World

The Uponor Infra customer magazine › issue 1/2021

Blue is the new green

uponor

Ultra Rib 2 Blue

Having a ‘green’ product is not enough.

Ultra Rib 2 Blue is the first plastic gravity sewer pipe with up to 70% reduction in carbon footprint. Based on renewable raw material, and with the same quality and performance than the traditional Ultra Rib 2.

With Uponor Blue, you can be confident of acquiring a truly sustainable product that will help you reduce your environmental impact.

Blue is the new green with Ultra Rib 2 Blue.

uponor | Moving > Forward

Dear reader,

In the spring of 2021, Covid-19 still continues to impact our personal and professional lives. In spite of the pandemic and the uncertainty it has caused, the infrastructure construction market has largely been resistant to its challenges. Whilst the pandemic continues to require much attention and focus from all of us, it is important to continue our long-term efforts towards a more sustainable future.

Uponor has recently set new Green House Gas emission reduction targets that have also been approved by the Science Based Targets initiative. The new targets are based on the Paris Climate Agreement and aim to limit the global temperature rise to 1.5°C.

All Uponor Infra manufacturing facilities have now switched over to green electricity. This is a big step – but just one of many we are undertaking to meet our ambitions. For example, we have recently changed to using biogas in our rotational moulding production in Sweden, reducing CO_2 emissions by 500 tons annually at this one facility alone.

More sustainable product innovations are also required. We have recently introduced to market our first product based on fossil-free materials. The Ultra Rib 2 Blue sewer pipe reduces carbon footprint by up to 70% compared to the existing Ultra Rib 2 product.

The word "Blue" will in the future differentiate our most sustainable products, giving our customers the confidence that they have chosen a truly unique sustainable alternative. The colour blue is also the colour that Uponor is known for and emphasises our commitment to sustainability. Blue is the new green.

Comparing the environmental impact of products and using sustainability-related purchasing criteria requires that comparable and reliable information must be available. To promote this transparency we have recently published our first Environmental Product Declarations (EPD), fully disclosing the environmental impact of the products. You can read more about our sustainability targets and efforts as well as the new Ultra Rib 2 Blue product on page 6.

I wish you good reading!

Sebastian Bondestam
President, Uponor Infra

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Uponor Infra 360° Project Services has a refreshed look

UPONOR INFRA 360° Project Services has been given a fresh look and feel. The new look focuses on Uponor's own experts who are highly involved in infrastructure and industry projects from design to installation.

Uponor Infra 360° experts will be the focus point of Uponor Infra 360° Project Service marketing and communication as a whole. They will be the faces of Uponor's know-how and present the reliability of our solutions. Customers will have peace of mind in the knowledge that they made the best choice when selecting Uponor. No matter what kind of project, WE CAN DO IT! The refreshed Uponor Infra 360° look will be introduced on Uponor Infra's website as well as in all other marketing and communication material during the spring and summer 2021. ■

Read more about Infra 360° Project Services at Uponor's website!

Chamber portfolio expands

THE ACCESSO CHAMBER FAMILY is expanded with a 1,000mm inspection chamber.

Uponor Accesso 600 was launched during 2020 and is now joined by Uponor Accesso 1000, the next dimension in the inspection chamber range for sewer and stormwater networks.

The wide range and many options make it suitable for use in many types of projects. Installation is easy and fast, with adaptable plug-n-play design for control of both time and money spent on site.

The assortment includes seven different bases made from injection moulded polypropylene (PP). The connections are provided with sealing rings for smooth pipes in dimensions of 200–400mm.

The system consists of base, extension rings, sealing rings, eccentric cone and connectors. The system is suitable for use with standard top solutions.

The Uponor Accesso 1000 inspection chamber is available in Sweden, Denmark and Norway. ■

The Accesso range is versatile and adaptable when it comes to both design and installation. The base design gives excellent flow properties and secures the performance of sewer and stormwater networks.

Uponor Infra fully into sustainable salmon farming

UPONOR INFRA OY and Quality Salmon Sotenäs AB, owned by Lighthouse Finance AS, have signed a letter of intent to plan and construct the largest circular industry park for land-based salmon farming in Europe. Once fully developed, Quality Salmon Industry Park will produce up to 100,000 tonnes of Atlantic salmon per year.

As part of the initial phase, Uponor Infra will pre-design a solution for marine intake pipelines and underground process water pipelines. After all the environmental assessments and legal requirements are in place, Uponor Infra will design and build the entire water management solution for an area of 140 hectares, located outside the city of Kungshamn on Sweden's west coast.

The facility will operate almost entirely under a circular economy scheme, including a feed factory and salmon farm as well as slaughter, processing, management of residual products and water purification.

"We are pleased to collaborate with Quality Salmon to create the largest land-based sustainable salmon farming facility, from marine intake pipelines to a comprehensive water management solution, empowering Quality Salmon's advanced recirculating aquaculture system to reach its fullest potential," says **Sebastian Bondestam**, President of Uponor Infra.

"Investing SEK 17 to 20 billion (EUR 1.7 billion to EUR 2 billion) in the circular industry park and aiming for future production of 100,000 tons of salmon per year demonstrates our level of ambition pretty clearly," says **Roy W. Høiås**, CEO of Lighthouse Finance AS.

"We want to do more than just promote the production of salmon. That is why we have chosen to partner with Uponor as we share a mutual vision that sustainability and innovation are key drivers for the success and development of Quality Salmon," Høiås sums up. ■

Ultra Rib 2 Blue – 70% reduction of carbon footprint

ULTRA RIB 2 BLUE is a new generation of pipes with a significant reduction of carbon footprint* over their lifetime.

This significant reduction is achieved because over 50% of the raw material inside Ultra Rib 2 Blue pipes comes from certified renewable and waste feedstocks.

The specifications of Ultra Rib 2 Blue are the same in terms of properties and performance as the standard Ultra Rib 2. The pipes are manufactured at the Fristad factory, Sweden, which has been ISCC-certified. The certification means, among other things, that the customer receives a declaration of the amount of renewable raw material in the delivery of Ultra Rib 2 Blue.

"Ultra Rib 2 Blue maintains the same high level of safety, tightness and strength as Ultra Rib 2. The customer can be assured that the pipes have a service life that extends well over 100 years," says **Rickard Granath**, Product and Marketing Manager at Uponor Infra AB.

* An estimated 70% CO_2eq reduction. The exact reduction will be confirmed in a full externally verified Environmental Product Declaration currently under preparation that will be published later in 2021.

Smooth transitions

THE NEW HIGH-QUALITY connector available later in 2021 ensures a smooth transition and an even flow level when making connections between smooth and corrugated pipes. It is also perfect for use with the Accesso inspection chamber range or other chamber bases with sockets for smooth pipes to connect corrugated pipes. A long spigot end ensures a gap-free connection and the injection moulded PP provides accurate tolerances and ensures watertight installations. The Eccentric Connectors can be used with outer diameter 200, 250 and 315mm Ultra Rib 2, Ultra Double, and IQ pipes.

An unique Cable Protection System

UPONOR CABLE PROTECTION SYSTEM makes it easier for wholesalers and users to get an overview of what cable protections are available, and when they should be used.

"As more and more cable is laid, we thought it was time to compile a system where our cable protections, chambers and parts are categorised according to, among other things, material, delivery times and durability. Cable Protection System also contains product categorisations for recycled plastic and recycling," says **Robert Burén**, Sales Manager, Cable Protection System at Uponor Infra AB.

Uponor Infra develops and manufactures solutions for the protection of power cables and all kinds of data transmission, such as cable TV and telephone networks of copper or fibre optics.

"We have not seen anyone else in the market work as we do with a system. With Cable Protection System, we not only make things easier for customers – the overview also makes it easier for us to see any gaps in our offer so that we can develop new innovative solutions," concludes Robert Burén.

Uponor published its first EPDs

ONE PART OF Uponor's sustainability work is to increase product transparency with Environmental Product Declarations (EPD).

EPDs are based on lifecycle assessment calculations that evaluate a product's environmental impact throughout its lifecycle from raw material, manufacturing, packaging, distribution and use to end-of-life disposal. These declarations are externally verified and standardised descriptions of the environmental profile of a product or material over its lifetime.

The first EPDs for Uponor Infra have now been approved and published. These are for the Ultra Rib 2 and IQ sewer and stormwater pipe systems. The EPDs are available in the Building Information Foundation RTS sr database for download and can be found on Uponor websites.

More EPDs will be published in 2021.

Leading the way to the next level

Becoming a leader in sustainable building and infrastructure solutions requires clear goals, concrete actions and long-term commitment – for instance, committing to the Science Based Targets initiative to keep global warming to 1.5 degrees, and introducing the first product based on fossil-free materials. These are a few of the many steps Uponor has recently taken towards a more sustainable future.

TEXT Outi Järvelä › PHOTOS Uponor, Shutterstock ›

At the end of 2020, Uponor set its new greenhouse gas emission reduction targets, which have now been approved by the Science Based Targets initiative (SBTi). According to the initiative, targets are considered science-based if they are in line with what the latest climate science deems necessary to meet the goals of the Paris Agreement, limiting global warming to well-below 2°C and pursuing efforts to limit warming to 1.5°C.

To date, approximately a thousand companies worldwide are leading the zero-carbon transition by setting emissions reduction targets through the Science Based Targets initiative. Uponor is one of some 500 companies – and one of the very first companies in its business sector – that are committed to the most ambitious target of the Paris Agreement: limiting the global temperature increase to 1.5°C above pre-industrial levels.

"To us, this means that we aim to reduce the GHG emissions from our own operations by 46% and from purchased goods and services, including raw materials and inbound transportation, by 14% by 2030. In addition to this, all our purchased electricity will be renewable by 2025," sums up **Ilari Aho**, Vice President, Sustainability & Regulatory Affairs at Uponor.

The Science Based Targets initiative defines and promotes best practices in target setting and independently assesses companies' goals. Aho says that he was impressed by the approval process: "It was very professional and precise, and they really immersed themselves in our targets – how we had ended up to these figures, and what was taken into account. All of this has been very valuable for us, as our climate roadmap for the next 10 years will be built on these targets."

Cooperation across the whole value chain

"We have already taken many big steps – for instance, all of Uponor Infra's manufacturing facilities have now switched over to green electricity. Naturally, continuing our work to improve the energy and resource efficiency of our manufacturing processes is on top of our agenda. In addition to efficiency improvements, we will be also working towards the electrification of fuel-driven processes in manufacturing."

The main sources of Uponor's scope 3 GHG emissions – all indirect upstream and downstream emissions that occur in the value chain – lie upstream of operations, that is to say, purchases of raw materials as well as transportation. "First of all, it is essential to analyse the sources closely to ensure that we focus our reduction efforts to achieve the best results."

Aho stresses that companies can't get results by trying to do it all alone: cooperation across the whole value chain is essential to drive impactful action and develop practices and solutions that benefit all.

Collaboration is key also when it comes to the indirect use-phase emissions of Uponor's products from buildings and infrastructure, mainly in the form of heat loss from heat and water distribution systems. "We're committed to working together with our customers and the whole value chain to further develop the ways in which our products are installed, integrated, used and maintained in the built environment to enable reduction of indirect use-phase emissions."

Blue is now the new green

Uponor has a long history of industry-changing product innovations that help its customers become more efficient and sustainable. For years, all of Uponor Infra's products have been recyclable or reusable. Long service life of products is also a major contributor to sustainability: a product design life time of over 100 years reduces the environmental impacts of maintenance, repair and replacement works considerably.

Another milestone was achieved recently as Uponor introduced to market its first product based on fossil-free materials – the Ultra Rib 2 Blue sewer pipe. It reduces the carbon footprint by up to 70% compared to the standard Ultra Rib 2 pipe.

"This is truly a groundbreaking step towards carbon-neutral products. In the plastic product industry, reducing the environmental impact of raw materials is a major sustainability issue. These kinds of new raw materials really have an effect," Aho says.

Uponor's aim is to reduce the use of virgin fossil raw materials. That is why the company also participates in a number of standardisation groups to enable wider

use of recycled raw materials. "Currently, many aspects of the product standards can prevent the use of recycled materials. However, even if increasing the use of recycled raw materials is extremely important in developing a circular business, this cannot lead to deterioration of product quality or for example uncertainties regarding impacts on water quality. While we develop standards and our products, we also need to improve the traceability of recycled plastic materials and the transparency of the recycled plastics market."

In the future, customers will recognise all of Uponor's most sustainable products by the label 'Blue'. To ensure transparency regarding the environmental impact of its products, Uponor has also now published its first Environmental Product Declarations (EPDs). "In line with awareness about environmental impacts, there is an increasing need for comparable and reliable information. We want to transparently disclose the impact of our products and help our customers to use this data to improve the sustainability of their projects."

The first products with EPDs are the sewer pipe Ultra Rib and stormwater pipe IQ. In the future, EPDs will be published throughout the product portfolio.

The new generation of sustainable pipes

Based on fossil-free materials, the new Ultra Rib 2 Blue sewer pipes can reduce the carbon footprint by up to 70 per cent – with the same high level of safety, tightness and strength that Ultra Rib 2 pipes have been providing since 1999.

The Ultra Rib 2 system was launched in 1999 to meet the strictest tightness, durability and strength requirements for wastewater drainage. Last year, the renewed version of the product was launched, making it even better. Now, it is time to introduce Ultra Rib 2 Blue, a pioneering solution with the same well-known quality but up to 70% reduction of carbon footprint.

A significant part of the new raw material used in Ultra Rib 2 Blue pipes consists of certified renewable and waste feedstocks instead of fossil fuels. The manufacturing of the pipes is based on the mass balance approach, which is a reliable, transparent method to trace, measure and report the amount of recycled or bio-based materials allocated to manufactured products when sustainable inputs are mixed with traditional fossil fuel-based inputs. The mass balance process is third-party certified by the ISCC, an international certification system for sustainable, traceable supply chains.

No compromise on performance. The Ultra Rib 2 Blue pipes are manufactured at Uponor's Fristad factory in Sweden, which has now been ISCC-certified. The certification means, among other things, that the customer receives a declaration of the amount of renewable raw material in the delivery of Ultra Rib 2 Blue.

Rickard Granath, Product and Marketing Manager at Uponor Infra, has been working for more than a year to develop the new groundbreaking pipe.

"We've received nothing but positive feedback. Municipalities and network owners are increasingly setting their climate targets. We have succeeded in creating a sustainable product with the same quality our customers are used to. This is of course important, as no one wants to compromise on performance. The customers can be assured that the pipes have a service life that extends well over 100 years."

He adds: "Just like standard Ultra Rib 2 pipe, this sustainable new product meets double the Nordic Poly Mark requirements."

First installations ongoing. The first deliveries of the Ultra Rib 2 Blue pipes have already taken place.

In Sigtuna, east central Sweden, a total of 1,296 metres of pipes with diameters of 200–450mm will be installed during an expansion of a logistic centre.

"Given the environmental policy of Sigtuna municipality, we want to do our best to constantly run sustainable projects. Uponor Infra's effort to reduce the carbon footprint with this new product is completely in line with our philosophy," says **Agneta Holm** of utility company Sigtuna Vatten.

And it is not only the pipes that are more sustainable – the delivery vehicles used by DVS are powered by fossil-free raw materials, too. In collaboration with Uponor Infra, DVS aims to increase fossil-free transportation.

"To minimise environmental impacts, the solutions that are developed together with customers are key," says **Hanna Haglund**, Senior CSR Manager at DSV.

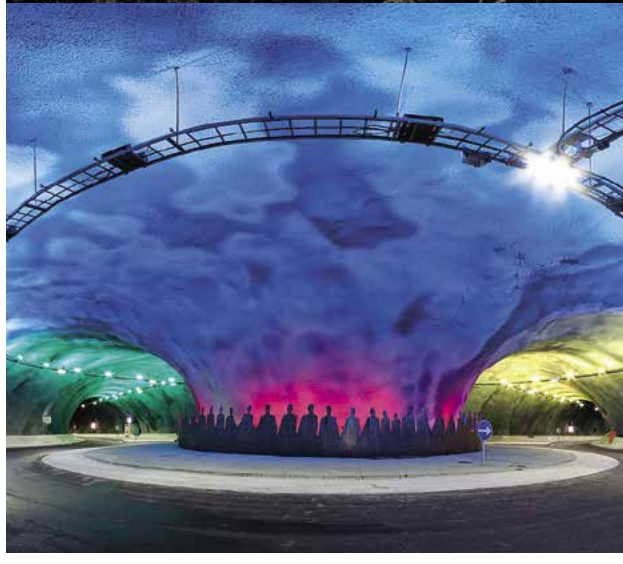
"With shared interests and efforts, we can achieve so much more," she concludes. ■

TEXT Uponor › PHOTOS Faroephoto.com ›

Under the sea, safety comes first

In December 2020, the Faroe Islands opened the country's longest undersea tunnel, which considerably reduces travel time between the most populated islands. The 11.2-kilometre tunnel represents a significant infrastructure investment, which also boasts the world's first undersea roundabout. Beneath the road, a sophisticated system of pumps and kilometres of plastic pipework ensure that the road is kept free of water and safe for motorists.

The 11.2-kilometre tunnel runs at its deepest 189 metres below sea level.



The Faroe Islands consists of 18 islands in the North Atlantic Ocean, about halfway between Norway and Iceland. The construction of road tunnels through the steep mountains of the islands began in the 1960s. The archipelago now hosts a total of 19 tunnels.

When the country's longest undersea tunnel, the Eysturoy Tunnel, was finished in December 2020, islanders could cut almost 50 minutes off their trip from the capital, Tórshavn, to the towns of Runavík and Strendur, which can now be reached by road in just 15 minutes.

The tunnel is impressive 11.2 kilometres long, and links the two most populated islands, Streymoy and Eysturoy. At its deepest, the tunnel runs 189 metres below sea level. The tunnel is hugely popular with the island nation's residents, who can now also boast the world's first ever undersea roundabout.

Safety hidden beneath the roadway

As motorists drive into the tunnel, they come into a stylish entrance of harmonic arches, and then to a roundabout flooded with light. Here travellers can experience the local artist **Tróndur Patursson's** multicoloured light show with an 80-metre sculpture that reaches around the roundabout. The steel ring illustrates people dancing the traditional Faroese dance.

Beneath the road, a sophisticated system of pumps and kilometres of plastic pipework ensure that rain and surface water

are kept away from the roadway and technical installations, so that motorists can enjoy the tunnel's aesthetics safely and securely. Gravity leads water into drains and pipes and down to the tunnel's lowest point. Here, large 16 bar pumps send the water back to the surface and out into Skálafjørður fjord.

The system operates with 160-metre water columns and pumps out between 1,200 and 1,500 litres of water a minute. However, it is built to deal with four times this amount, keeping the tunnel safe for motorists at all times.

The largest ever infrastructure project

The pressure pipes, tanks and ten kilometres of pipework for the project were supplied by Uponor, which has delivered plastic pipe solutions for several earlier tunnel projects on the Faroe Islands – each time in partnership with Faroese company KJ Hydraulik. And there's a reason for this, according to **Jonn Sólheim Thomsen**, Sales Engineer at KJ Hydraulik. "We have been working with Uponor for over 15 years. As there are such strict safety requirements on a project like this, Uponor's expertise and knowledge of their products' strengths and weaknesses have been absolutely crucial. This was a major reason why we chose to work with them again," says Jonn Sólheim Thomsen. "Plastic is a very strong material with a guaranteed service life of over 100 years, and it's also far easier to handle and install than equivalent pipe systems in other materials."

The Eysturoy Tunnel is the third undersea tunnel in the Faroes. It´s the largest ever infrastructure project in the Faroe Islands and it took almost four years to complete. The tunnel opened for traffic on 19 December 2020.

Uponor has previously supplied similar rain and wastewater systems for projects including the Øresund Fixed Link and the Great Belt Fixed Link. ■

TEXT Marianna Salin · PHOTOS Uponor

Securing safe water distribution with a prefabricated solution

In an ordinary village with less than 1,000 residents, a low water tank would normally be unnecessary, but Tuuri in Southern Ostrobothnia in Western Finland is not an ordinary village. Over time, the local village store has become Finland's biggest department store and a hugely popular tourist destination with up to six million visitors annually. The water supply of the village will now be secured even for the busiest holiday season by two new, 100-cubic-metre Weholite low water tanks, which were delivered to the site ready for installation.

The village of Tuuri is part of the town of Alavus, and the attraction of the village is Veljekset Keskinen Oy's Keskisen Kyläkauppa, a 'village store' that has grown over the decades from an actual village store to Finland's biggest department store and the most popular tourist destination of the country with around six million visitors annually. A number of other services have also been built around the Kyläkauppa, including a hotel, a caravan site with 500 caravan pitches, several restaurants, a Moomin playground and a miniature golf course. In summer, tourists are attracted by a funfair and numerous other events – from dog shows to rock festivals. For several years, the active life in Tuuri has also been the focal point of a popular reality TV show.

Water consumption doubles in the summer

From the viewpoint of the Alavus water utility, the growth of the Kyläkauppa area in Tuuri has meant repeated measuring reviews on their water supply network. The water comes from two intake facilities, which are located about 10 and 15 kilometres from the village. If one line would fail, the other line could supply enough water – provided, that they were lucky enough. If such failure took place in the middle of the summer, a shortage of water would be a very likely scenario.

"Summer brings big crowds to the area, and the water consumption can be as high as 300 cubic metres per day. On the other hand, 130 cubic metres per day is more than enough

Uponor delivered the tanks and the pressure boosting station ready for installation.

PROJECT FACTS

- **Two 100-m³ Weholite tanks and a pressure boosting station with relevant anchoring:** Uponor Infra
- **Control cabinet for the electrical and automation systems:** Mipro Oy
- **Project management, installation of piping, electrical and automation systems:** Alavus water utility
- **Earthworks:** Maanrakennus Tukeva Oy and Alavus water utility
- **Design:** Ramboll Finland Oy

WEHOLITE TANKS

- Customised according to the site and the customer's needs, Weholite tanks are suitable for foodstuff and potable water use, and are also very resistant to, for example, acids, alkalis and solvents. The tanks are delivered, among other things, for use as low water, fire water, septic and chemical tanks, alkalisation plants, retention basins, and separators.
- The tanks are made from Weholite pipe, whose layered structure guarantees the durability, flexibility and tightness of the tanks. Furthermore, the layered structure of the pipe allows the manufacturing of tanks with an inner diameter exceeding 3.5 metres.
- When made of polyethylene or polypropylene, the tanks have no risk of corrosion, and they are durable, lightweight and easy to handle.
- Weholite tanks are delivered with all fittings completely installed at the factory, so their installation and commissioning is fast.

in winter", says Plant Manager **Timo Seppä** from the Alavus water utility.

"The Tuuri area has grown rapidly over the last ten years and continues to grow. We decided to install two 100-cubic-metre low water tanks on the area to balance consumption peaks and help in preparing for potential failures."

Ready from the factory

Before making the decision to purchase the low water tanks, the water utility studied other options. These included, for example, increasing the size of the supply lines, but soon it was clear that storing the water is the way to go. Seppä had cost estimates calculated for both concrete and plastic tanks.

"It turned out that plastic is more cost-effective than concrete. Following a competitive tendering, Uponor won the contract, and they built the tanks and a pressure boosting station ready for installation at their factory."

Both the tanks and the pressure boosting station were made from Weholite polyethylene pipe with an inner diameter of 2.4 metres. The length of each tank is 23.4 metres.

Straight into the trench

Uponor delivered the products to the site in Tuuri in September 2020. The Alavus water utility had commissioned the necessary excavation work and the construction of foundations, on which the tanks and the pressure boosting station were lifted and anchored by Uponor's installation team. After the anchoring was completed, the water utility connected the tanks to the pressure boosting station and water supply network and filled the trench. Now the only things that are visible above ground are three manhole covers and two control cabinets for the electrical and automation systems.

"Installation was quick and smooth. The inlet and outlet fittings were exactly where they supposed to be, so it was easy for us to fit the pipes and valves between them."

During the winter, the water utility's own team continued to install the electrical and automation systems, and a decision was made to postpone commissioning so that it will take place closer to the summer, the high season of Tuuri. By that time, the installation of the remote monitoring of the tanks and the pressure boosting station will also be completed. ■

An imaginary city shows the sustainable infrastructure of the future

Kulvertstaden is a creative initiative developed by Uponor Infra and Tekniska verken in Linköping, southern Sweden, using social media to inform and inspire new ideas for sustainable infrastructure projects.

TEXT Beyond Communication, Borås › PHOTOS Beyond Communication, Borås, and Uponor ›

Tekniska verken is a regional utility company with around 280,000 private and corporate clients. Every day, Tekniska verken's plants produce electricity, heat and biogas, and treat water for the inhabitants of both the city itself and the region of Linköping. Work is also under way to achieve the vision of becoming the world's most resource-efficient region.

A large and unique project in the development of the city and region, involving both Tekniska verken and Uponor Infra, is the district of Vallastaden. This new district, which has the vision of creating a varied living environment with people at its heart, was built in five years and presented at a major exhibition in 2017. The buildings in the district are densely spaced and small-scale, with considerable variation. With its strong focus on social, ecological and economic sustainability, Vallastaden is an inspiring example for future urban development.

A new way of laying pipes

A new way of laying pipes was also developed, offering a number of sustainability benefits. The densely built urban environment and difficult soil conditions made it hard to lay pipes in Vallastaden using traditional methods. The solution was to install all pipework and lines for all media in an underground 1,800-metre infra utility tunnel supplied by Uponor Infra, which included pipes for electricity, fibre optic internet, district heating, sewerage, water and automated waste disposal system. That is how the partnership with Uponor Infra began.

"The exhibition, "Bo och Samhällsexpo, Vallastaden" in 2017 and the infra utility tunnel were, and still are, a great success. Along with Uponor Infra's employees, I have guided many interested groups of architects, urban planners and consultants through the tunnel. However, when the exhibition was over and everything got back to normal, we asked ourselves the question: What do we do to get more people to discover all the benefits of an infra utility tunnel?" says **Martin Ansell-Schultz**, Business Developer at Tekniska verken.

Annika Georgson, Marketing Coordinator at Uponor Infra in Sweden, and one of those who has worked on the project for Uponor Infra, developed a marketing plan for the infra utility tunnel together with Martin Ansell-Schultz, and set out goals for the future. They then contacted a PR and communications agency to get ideas on how to continue to inspire and tell people about the benefits of infra utility tunnels. That is how the idea for Kulvertstaden was born.

"Kulvertstaden is quite simply a site and a partnership between Uponor Infra and Tekniska verken. On the site, we post everything that is written about infra utility tunnels, we explain all the benefits simply and clearly and conduct our own interviews. We then work actively with posts from Kulvertstaden on social media," says Annika Georgson.

Inspiration and information

If you visit Kulvertstaden.se, you will encounter a completely different format than you might expect for technical products and services. The site has a graphic expression which leads the readers' thoughts in the direction of a community for the green city of the future, rather than products for infrastructure. The content is a mixture of educational explanations for those who are not so familiar with the subject matter, to articles and research reports. The same applies to the social media posts. One day, it might be a post about fire safety in Vallastaden's culvert, while the next day, it might be a post about how London can be called Britain's greenest city.

"The whole idea of Kulvertstaden is to not only talk about the product and the solution, but also to point out the benefits that an infra utility tunnel can bring to a city and its inhabitants. We want to both inspire and inform people at the same time," says Martin Ansell-Schultz.

For Linköping Municipality and Tekniska verken, Vallastaden infra utility tunnels are important projects that continue to be developed and attract attention. For example, the agency, 02 Landskap was awarded the Architects Sweden´s prize for best landscape architecture project in 2020 fort is "Paradis Park" in Vallastaden. "It may not be something that we are writing about on Uponor Infra's website or something that Tekniska verken is announcing, but via Kulvertstaden's social feed, we can bring it up and talk about the infra utility tunnel at the same time. In this way, we show how all parts of the smart city, both above and below ground, are interconnected and impact on each other," says Annika Georgson.

"The fundamental idea behind Kulvertstaden's social media accounts has not been to gain a lot of followers, although that would be nice of course. Instead, the idea is to make ourselves relevant and searchable through interesting content both on the site and in social media, with growing content when customers search for infra utility tunnels."

"Given Uponor Infra´s magazine's name, you could perhaps build a fictitious world with all the underground infrastructure, a "Pipeworld". But that might be a little too big," laughs Martin Ansell-Schultz. ■

AN INFRA UTILITY TUNNEL IN VALLASTADEN

- All pipes – electricity, fibre internet, district heating, sewer water, potable water and a waste disposal system – are collected together in a 2,200 metre-long infra utility tunnel with a diameter of 2.4 metres.
- The infra utility tunnel pipe is manufactured from Weholite, a PE-pipe that is 100 percent recyclable.

In addition, using a prefabricated infra utility tunnel enables value land to be developed and means that streets rarely, if ever, need to be dug when maintenance is carried out in the future.

TEXT Uponor › PHOTOS Uponor ›

Good air quality guaranteed

The New Aarhus University Hospital in Denmark will soon gain access to its new landmark and multifunction building, AUH Forum. When finished, the building will measure up to high standards set for constant temperatures, good air quality and healthy indoor climate. Weholite pipes with diameters of up to DN/ID3,000mm were used to ensure that the ventilation solution of the new hospital building is condensation-free, durable and safe.

AUH Forum is the final large piece in the construction of the largest hospital project in the history of Denmark, the New Aarhus University Hospital. AUH Forum will be a 14-storey building measuring 22,800 sqm that will serve as one of the hospital's five main arrival areas. When finished, it will accommodate a number of research units from the central Denmark Region and Aarhus University, a new diabetes centre, facilities for the National Church of Denmark and a patient hotel with approximately 60 rooms on the upper floors.

Construction is scheduled for completion in mid-2022 and the site is already a hive of activity – the foundations for the building's extensive ventilation plant are currently being laid.

Assembly in two days

A building of this size and height calls for an exterior air intake large enough to meet the high demands set for ventilation. The solution for the ventilation system was Weholite pipes, with diameters of up to DN/ID3,000mm.

Construction Manager **Nikolaj Laustsen Kæmsgaard** of the contractor KPC A/S was involved in the decision to choose Uponor Infra as the supplier of ventilation pipes. "It soon became clear in the planning phase that we would need large, secure ventilation ducts for the project, as very strict requirements were set for the volume and quality of air being brought in. That's why it's hugely important that the pipes are tightly sealed to ensure that the air stays clean. Uponor Infra could deliver a solution that meets the necessary demands on tightness and insulation," says Kæmsgaard.

According to Kæmsgaard, the delivery and assembly time was also a crucial factor in the decision. "The prefabricated Weholite solution offered quick and easy installation – the pipes and fittings were delivered to the building site in ready-to-install condition, so relatively few welds were needed to complete the system.

Assembly of the lightweight pipes only took two days. This is a huge improvement on equivalent elements that rely on materials such as concrete, which can take weeks to cast on site."

Weholite is a structured-wall, reusable and durable PE pipe with a design life of over 100 years. The elements are assembled by welding in situ, which ensures that the pipe system is tightly sealed, eliminating any risk of leakage from inside or penetration from outside.

Safety and materials are crucial

"The fact that the Weholite pipes are made of plastic is advantageous in terms of assembly. But the same is also true for cleanness and safety," says **Torben Juler**, the head of planning and design at Sweco, who has been the advisor on the project.

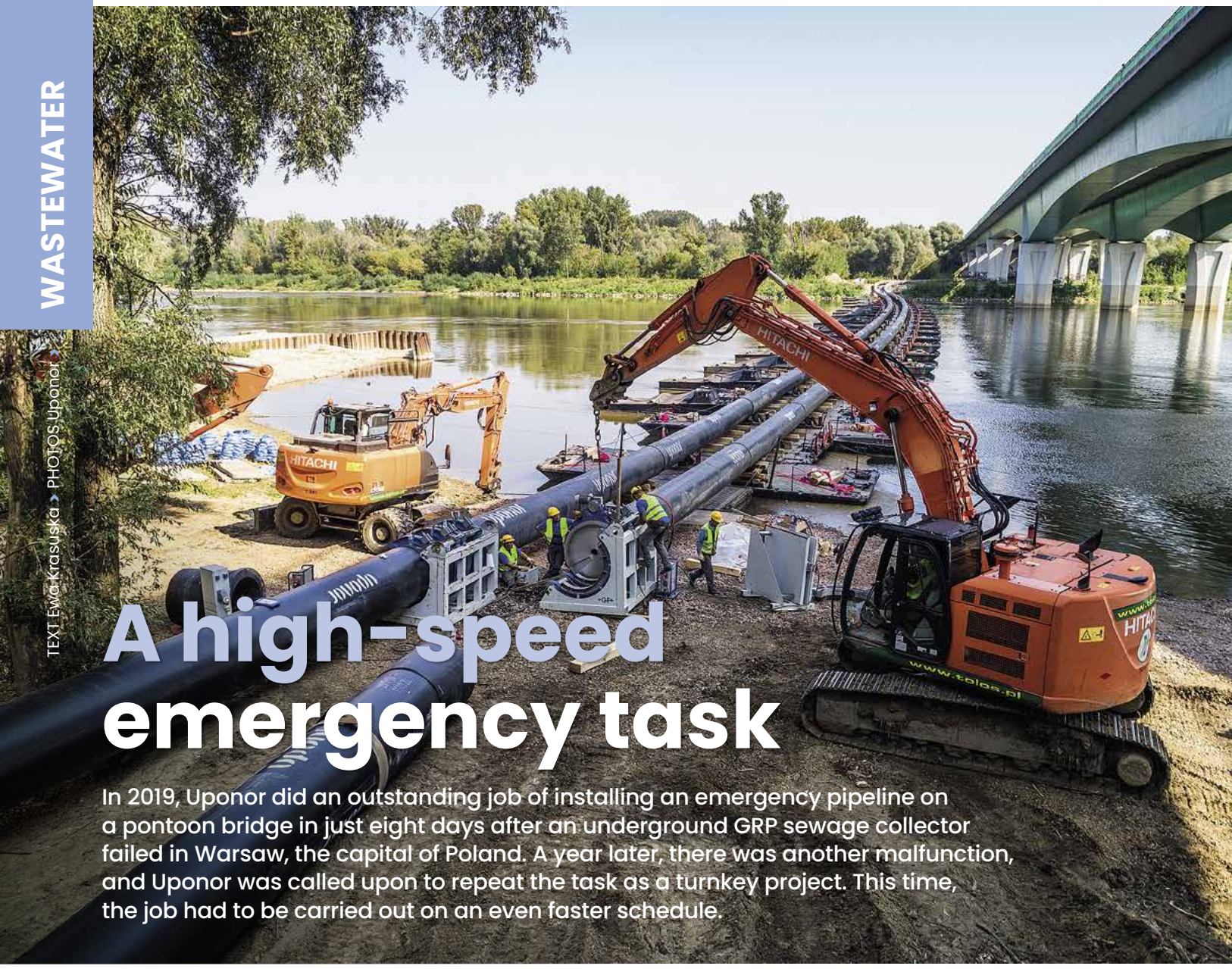
"To safeguard air quality and indoor climate in the building, it is absolutely crucial that the ventilation pipes are well insulated and tightly sealed to ensure that water does not collect in the pipes, and thereby keep damp and condensation at bay. Plastic is a good material for this, as it is smooth, secure and has a very long design life. Weholite pipes have documented insulation properties, protecting the pipes against condensation and minimising the risk of mould formation. Mould should be avoided in any building, but particular care must be taken in hospitals," says Juler.

He continues: "We have good experience of working with Uponor from previous projects, and now again in the AUH Forum project. We appreciate the combination of a dependable business partner and reliable products that are easy to handle and install. Furthermore, Uponor is one of the few pipe suppliers capable of calculating whether condensation poses a risk based on actual, real-life conditions, and also of determining whether additional insulation might be needed." ■

VENTILATION SOLUTION FOR AUH FORUM

- 130 metres of DN/ID600mm Weholite pipes with 16 bends
- 30 metres of DN/ID1,800mm Weholite pipes with three DN/ID1,400mm manifold branches
- 60 metres of DN/ID3,000mm Weholite pipes with three DN/ID1,800mm manifold branches and bends

TEXT Ewa Krasuska ▸ PHOTOS Uponor ▸



A high-speed emergency task

In 2019, Uponor did an outstanding job of installing an emergency pipeline on a pontoon bridge in just eight days after an underground GRP sewage collector failed in Warsaw, the capital of Poland. A year later, there was another malfunction, and Uponor was called upon to repeat the task as a turnkey project. This time, the job had to be carried out on an even faster schedule.

In August 2019, a wastewater collector transferring sewage from seven city districts to the Czajka wastewater treatment plant in Warsaw failed – resulting in the emergency discharge of raw sewage into the Vistula River at 3,000 litres per second. To avert an ecological disaster, a decision was made to build a temporary pipeline on a pontoon bridge across the river. The new pipeline was designed to take over the functionality of the damaged collector running under the Vistula riverbed in order to stop the sewage discharge and buy the time required to carry out repairs.

Usually, projects like these take months to complete but in this case speed was of the essence. In an amazing feat, Uponor Infra was able to deliver and join the pipes required for the emergency pipeline in only eight days. The total length of the two lines of the DN1,000mm pipes was 2,200 metres, with two 250-metre sections resting on a pontoon bridge built by the Polish Army. To meet this unique challenge, Uponor mobilised all its resources: the production schedule at the company's factory in Kleszczów was adjusted to meet the urgent demand for pipes, with around-the-clock deliveries to the installation site, six service teams were delegated to the project and extra welding machines were brought in from other building sites from all over Poland. Thanks to the expertise, experience and tireless work of the Uponor crew, the new pipeline took over the functionality of the damaged collector after just 12 days, stopping the discharge of sewage into the Vistula River.

PE-HD pipes – versatile and reliable

The success of the project provides yet more proof of the benefits and versatility of PE-HD technology. PE-HD pipes are resistant to corrosion and chemicals, damage by abrasive transported media and adverse environmental factors such as acid rain, extreme temperatures or wind. Their light

The pipes were connected by extrusion butt welding.

History repeating itself

A year after the first malfunction, the sewage collectors transporting waste from left-bank Warsaw to the Czajka wastewater plant failed once again. The municipal authorities considered many options to rectify the situation, including installing a new line on the North Bridge, submerging it across the Vistula River or building an entirely new underground pipeline by means of horizontal directional drilling. Once again, emergency discharge of untreated waste into the river was necessary – at an even greater rate than the year before due to heavy rainfall. Finally, a decision was made to use the well-proven solution of setting up a temporary PE-HD pipeline over a pontoon bridge. In recognition of its first-hand role in the successful installation the previous year, Uponor was chosen as the general contractor and commissioned with handling the project from beginning till end.

This time, the total length of two DN1,000mm emergency lines was 3,200 metres. Extending the pipeline by 900 metres in total made it possible to connect it directly to the Farysa treatment facility, enabling the pipeline to operate even if water levels increased on the Vistula River. The project used the same pipes as in 2019 with additional sections delivered as a matter of priority from Uponor's factory in Kleszczów. Before work began, Uponor conducted comprehensive lab tests – checking the pipes for surface scratches – as well as weld rupture strength tests. All pipes were found to be fully suited for reuse. As before, thanks to the determination and dedication of Uponor's personnel and service crews, the pipeline was fully operational within 13 days of the commission. Due to the excellent properties of the PE-HD technology, as well as failsafe installation by means of butt welding, the pipeline had the potential to operate for years. It functioned without issues and was only disassembled again when the pontoon bridge had to be removed due to risk of damage from ice sheets forming on the river in October 2020. ■

weight and easy handling enable swift and cost-effective assembly while installation by means of extrusion butt welding results in 100% leak-proof joints and a homogenous pipeline surface. These qualities make PE-HD pipelines extremely robust and durable with a life expectancy of over 100 years. That is why they are well-suited not only to municipal sewage systems but also to demanding applications such as slurry-carrying industrial networks. While the emergency pipeline to Czajka was intended to serve for months rather than years, the pipeline's durability, resistance to adverse factors – including hydraulic shock – as well as flexibility provided a quick and efficient solution to the serious problem caused by the broken collector. The PE-HD emergency pipeline operated on the pontoon bridge for two months until the repairs on the damaged underground pipeline were completed. Elements of the disassembled lines were disinfected and placed in storage by the project investor, the National Water Management Authority.

Fighting against flooding

TEXT Uponor › PHOTOS Uponor ›

Storm surges and flooding are a recurring problem in Jyllinge Nordmark, located on Roskilde Fjord near Copenhagen, Denmark's capital. Since 2018, a major stormwater protection project has been under way in order to protect the area against flooding. One of the solutions is a new pumping plant designed to secure the safety of local residents for decades to come.

When water levels rise and the wind gets up, Denmark's fjord and coastal areas are in the danger zone for storm surges. The residents of Jyllinge Nordmark on Roskilde Fjord are painfully aware of this: far too many of them have been left standing in water up to their waist when the fjord and local streams flooded their homes. This has happened several times over the past decade.

After several years of political toing and froing, a major stormwater protection project was kicked off in 2018 in order to protect the area against flooding in the future.

The new pumping plant is designed to send excess water from the River Værebro back to the fjord if the river breaks its banks.

The lightweight plastic material simplifies and shortens the process.

One of these coastal protection initiatives is a large new pumping plant supplied by Sulzer, a specialist in fluid engineering and pumping technologies for fluids. The plant is designed to send excess water from the River Værebro back into the fjord when the river breaks its banks. Construction of this brand-new facility is now entering its final phase – the supplier is putting the finishing touch to it.

Long lifespan in a salty environment

The plant pumps have been installed in a custom-made Wehopanel structure of polyethylene (PE) plastic, delivered by Uponor Infra.

Wehopanel was selected for a specific reason: "When we put our solution out to tender, we specified that the structure had to be made of PE plastic. The pump structure from Uponor Infra has a design life of over 100 years, and thanks to the Wehopanel material it can withstand chemical influence from the very salty water passing through the system," says **Kenneth Larsen**, Technical Manager at Sulzer.

The highly durable Wehopanels developed by Uponor Infra can be dimensioned and equipped individually for countless applications, such as tanks, support structures, pumping station buildings and floating or submerged marine structures. In recent years, many innovative new products and structures have been developed using Wehopanel.

Kenneth Larsen states that Wehopanel is particularly well suited to Jyllinge Nordmark: "Due to the large dimensions – with exterior frames measuring 11 x 7 x 5 metres – it is a huge advantage that the structure can be prefabricated in just four parts at the factory, and then quickly and easily welded together in the excavation. The lightweight plastic material simplifies and shortens the process. That's why we knew straight away that Uponor was the right company to deliver the solution."

He continues: "A system of this kind must not go wrong. This is why it was so important for us that solutions and results are so well documented, so we know we can rely on every component living up to our requirements. In combination with our state-of-the-art pumps, we're now delivering a total solution with extremely high operational reliability and long lifespan."

The pumping plant was completed in February 2021, and the coastal protection facility as a whole was finished during the spring.

A nationwide problem – and only getting worse

Roskilde Fjord is far from the only location facing similar challenges in Denmark. In the future, there will even be growing demand for reliable stormwater solutions.

"The residents of Jyllinge Nordmark have repeatedly been plagued by extreme weather, resulting in flooded basements and costly damage. And Roskilde Fjord is not even one of the biggest risk areas in Denmark," says **Bent Rønfeldt**, Project Engineer at Uponor Infra.

"If you're hoping that the Danish Meteorological Institute will give you better news, you'll be disappointed. A report on future climate change in Denmark concluded that climate changes are expected to increase towards 2100. This will mean higher temperatures, more winter precipitation, more frequent and more extreme weather events as well as a rising sea level. We can expect that the most severe precipitation events we have seen to date will pale in comparison to future water volumes." ■

Together we are more

Uponor Infra gained nearly 40 years of experience, expertise and pioneering work in underwater construction when the company acquired the entire share capital of the Finnish company Insinööritoimisto Sukellus-Kotka in October 2020. The merger of these two specialists will provide Nordic customers with end-to-end solutions for even the most demanding of projects – both above and below the surface.

TEXT Outi Järvelä › PHOTOS Uponor Infra, and Ari Nakari ›

Although last autumn's acquisition is still fresh, Insinööritoimisto Sukellus-Kotka and Uponor Infra already have ten years of cooperation and numerous joint projects behind them. In recent years, these have included a new raw water pipeline for UPM's production facility in Kaukas and waterway installations for the Savilahti district cooling plant in Eastern Finland.

"Our expertise is highly complementary and we have always worked really well together. By joining forces, we can offer even more extensive and seamless end-to-end services to both existing and potential customers," says Sales Manager **Tom Karnela** of Uponor Infra's 360° Project Services.

Just like Uponor Infra, Sukellus-Kotka has long sought end-to-end solutions in which the company can get immediately involved in the project at the planning stage.

"All the pieces fell into place here as well," says CEO **Lasse Mustamaa**.

Innovation and tricks of the trade

Insinööritoimisto Sukellus-Kotka was established in 1978 and specialises in underwater construction, repairs and design. It has been both a pioneer and, for many years also the largest company in its field in Finland. Now, the company continues to grow as Uponor Infra Marine Services Oy.

Since 2000, the company has systematically expanded in terms of both equipment and personnel, and further developed its own products and working methods.

"These are also things that make us stand out from other companies in the industry. For example, no other Nordic company has comparable equipment," says Lasse Mustamaa.

The company's extensive range of equipment includes, among other things, barges with hydraulic feet, excavators, crawler drills, hydraulic rock splitters, boats, and its own tugboat.

However, Mustamaa points out that even the best equipment is worthless unless you have skilled personnel to use it.

"Permanent, skilled employees are the heart and soul of our business. We're constantly developing new solutions and procedures – these are trade secrets that we don't want to reveal to others."

Sixteen of the company's twenty employees are qualified divers.

"We maintain and supplement our professional skills with active training. For example, some divers have trained as blasting technicians and one as a master builder," says Mustamaa, who has himself obtained a master's degree in technology alongside his work.

From lakebed to nuclear reactor tank

Mustamaa says that professional divers must be able to do "almost everything"

UPONOR INFRA
MARINE SERVICES OY

- Specialises in the inspection, repair, design and implementation of underwater structures. Also specialises in underwater excavation
- 20 employees, of which 16 are qualified divers
- Customers include power plants, ports, companies in the infrastructure sector, and industrial facilities located next to waterways

and be ready to get their hands dirty – quite literally. The construction site might be a muddy lake bottom or even the reactor tank at a nuclear power plant.

"Building things underwater is just like building things on land: welding, casting, rebaring, measuring and moulding. It´s just the techniques that differ, and the conditions are often quite challenging. Work is often done in confined spaces, visibility might be no more than about half a metre, and there may be strong currents. In winter, the water temperature in Finland may be subzero."

It goes without saying that safety is always ensured before any work is begun. Extensive safety assessments and surveys are carried out for every project.

"On the construction site, everyone must know exactly what they are doing, where and when."

Safety has also been integrated into the company's quality system. The company uses an ISO 9001:2015 quality system and an ISO 14001 environmental management system. Mustamaa says that compliance with these certified systems and their accurate reporting procedures also provides a competitive edge.

End-to-end deliveries and multiyear projects

The company's customers include nuclear and other power plants, ports, companies in the infrastructure sector, and industrial facilities located next to waterways, such as paper mills.

Contracts can involve anything from quick inspections of underwater structures to extensive end-to-end projects that last for years, such as quay repairs and sluice gate upgrades.

"For example, floodgates and sluice gates for power plants are usually end-to-end deliveries in which we're responsible for the design, manufacture, installation and commissioning of the product."

Underwater excavation is another important area in which specialist expertise is required.

"A lot of excavation work is carried out at ports and in shipping lanes. Laying underwater pipelines often requires the route to dredged and excavated before installation can begin."

Longterm maintenance contracts with customers are also an important aspect of this work.

"Underwater structures are put under a lot of pressure. Regular maintenance ensures that the customer's processes continue to run smoothly and reliably."

A market beneath the surface

The market for underwater construction has been growing for several years. Both Lasse Mustamaa and Tom Karnela are expecting a further increase in demand.

"There's a great deal of potential. In Finland, as in the other Nordic countries, there are a great many hydroelectric power plants that will be making major upgrades to their equipment over the coming years. There are plenty of projects both ongoing and in the pipeline," says Lasse Mustamaa.

There's also plenty of work on offer in the replacement of pipelines that have reached the end of their lifecycles or no longer have sufficient capacity for today's needs.

"When underwater pipelines are replaced, environmental regulations often require the old pipes to be removed. These are major projects and, in most cases, are also extremely demanding," says Mustamaa.

Tom Karnela notes that the general increase in environmental responsibility will generate opportunities for developing new, energy-efficient solutions that are more sustainable.

"For example, harnessing waterways for heating and cooling is just one way in which cities, municipalities and companies are seeking carbon neutrality. District cooling, which utilises cold water from the depths of a lakebed or seabed, has become commonplace in major cities in recent years. For example, Helsinki is currently investigating whether seawater from the Gulf of Finland could be used in the capital city's district heating system."

There is also an underwater path to growth outside Finland's borders. According to Mustamaa, modernisation of hydro power plants and building of fish farms are good example of this – and Uponor has already delivered several fish farms to Norway, for example. The company has also decided to expand its operations to other Nordic countries as well.

"The future looks very bright indeed." ▶

Dam project takes builders underwater

Over the next few years, the energy company Fortum will be renovating the regulating dam at its Tainionkoski hydroelectric plant in Imatra, Eastern Finland. Before work can begin on this colossal multiyear and multimillion-euro project, a temporally dam construction must be built in front of the dam.

The regulating dam at the Tainionkoski power plant was built in the 1920s. Many renovations have been carried out over the years, but the largest to date is due to begin in 2023.

"It's time to ensure that the dam remains safe to use by completely renovating the rolling gates and sluice outlets. This will take several million euros per outlet," says **Juha Laasonen**, Fortum's Project Manager.

"It is not only the Tainionkoski power plant that needs the dam to be in good working order – it serves the entire waterway from Lake Saimaa in Finland to Lake Ladoga in Russia."

Water is released through the Tainionkoski power plant via three rolling gates, both according to the water release schedule and as necessary in the event of a fault. Within the framework of this schedule, contractor GRK Infra Oy and its subcontractor Uponor Infra Marine Services Oy will build a temporally dam construction that will stop the water just before the actual dam. This will enable the dam to be renovated on completely dry land, probably for the first time in its history.

"The contractors have done a great job under extremely difficult conditions," says Laasonen.

Not an everyday job

The Tainionkoski dam has three approximately 20-metre rolling gates separated by launching noses that channel the river water into three streams. These concrete walls will now be extended by about five metres to create partition walls for the temporally dam construction as well. This will enable each outlet and rolling gate to be examined and renovated in turn by closing only the corresponding gate in the temporally dam construction.

"You build a dam as if you were building an upside-down bridge. The deck is cast onto the riverbed and the launching noses rise up out of it. This would be challenging to do on dry land, and is extremely demanding underwater," says Construction Site Manager **Ville Lonka** from GRK Infra.

Construction of the dam began by cleaning the surface of the bedrock in preparation for casting. The riverbed was dredged to remove lumps of rock, scrap from earlier construction work, and layers of sand and clay that reached up to three metres in depth. Holes were then drilled so that sealant could be injected into the rock – that is, it was pumped full of concrete. Although an excavator and crawler drill were used from a pontoon, some of the holes had to be drilled by hand at a depth of 9–10 metres. The divers also handled the injections, rebaring and levelling of the riverbed.

UNDERWATER WORK AT THE TAINIONKOSKI POWER PLANT

- excavate 2,400 m^3
- rock strengthening by injection
- dismantle concrete and steel structures
- lay approx. 2,000 m^3 of concrete
- about 200,000 kg of rebaring
- install approx. 900 m^2 of moulds
- install structural steel elements

Careful planning is essential

While a diver is working underwater, two other people will supervise from the pontoon. One of them keeps in contact with the diver by phone and video, while the other raises and lowers things and helps the diver to move around underwater.

"Hoses and wires would quickly get tangled if there were several divers in the water. The divers are not in voice contact with each other and visibility is poor," says Dive Supervisor **Nino Kinnunen** from Uponor Infra Marine Services.

As working conditions are challenging underwater, work stages are planned as carefully as possible and components are built on land as far as possible. A trio consisting of one site manager and two dive supervisors are engaged in planning for the dam site. "Every day, we consider solutions to technical challenges so that nothing will come as a surprise on the day of the installation. We also use methods that may not have been used before, or at least have not been described anywhere," says Lonka.

Careful planning is also essential for safe working. The risks are always thoroughly assessed on site, not in advance at the office, as conditions can change in a flash.

Currents dictate the pace of work

Throughout the ages, the Vuoksi has been known as a mighty river that must be crossed with caution. Its power also poses a challenge for divers. "The current never gives up. It's always trying to sweep you away, and divers have to employ a special technique to stay put at the work site," says Nino Kinnunen.

The first three metres thick and ten metres high launching nose mould was lowered at the end of October 2020. The underwater concrete structures will be completed by June 2021. ■

TEXT Uponor › PHOTOS Uponor ›

Keeping the beaches clean

Pattaya, on the east coast of the Gulf of Thailand, is one of the most popular beach destinations in Southeast Asia. With millions of tourists every year, keeping the beaches and the city clean is increasingly important. A new Weholite outfall will help ensure a healthier and cleaner environment for both residents and visitors.

Pattaya is a resort city with a population of approximately 100,000 – and up to ten million tourists every year. From a small fishing village, Pattaya has become one of the most famous and popular beach destinations in Southeast Asia. Due to the Covid-19 pandemic, most visitors to Pattaya over the past year have mainly been domestic. However, vaccines are now sparking hope of a revival of foreign tourists.

Previous project four years ago

Four years ago, Uponor Infra Project Services completed its first Weholite marine project in Thailand, also in Pattaya. At that time, Uponor was given the task of constructing two new outfalls as the old ones were in urgent need of replacement. Since the installation site was located right in the heart of the tourist area, fast and precise execution was a must.

Last year, the story seemed to repeat: there was a clear need for a new marine outfall, 1,015-metre SN4 DN/ID1,800 Weholite, storm rain alleviation to prevent floodings in the city. Again, the time and visual impact had to be reduced to the minimum: as a major tourist city, Pattaya couldn't afford to keep the beaches closed for too long. Both the fabrication yard, located in the Bang Lamung district, and the installation site, Phra Tamnak beach, are usually fully crowded places.

The pandemic posed challenges

Even though Weholite was the clear option from the beginning due to its excellent technical advantages and faster installation, two burning questions remained to be answered: would it be feasible to get the outfall working before 2020 New Year's Eve? How would these activities be affected by the pandemic? Four flanged 225-metre strings and one 115-metre in addition to a diffuser section had to be manufactured, welded and submerged before the end of 2020 in order to satisfy the requirements of the local municipal authorities.

After a deep analysis of all the specific conditions, the Project Services Department at Uponor Infra accepted the challenge.

The works on site led by Project Manager **Pablo Ramon** started at the end of October 2020. Lots of travel documentation, several swab tests, and fifteen quarantine days for all the Project Services crew were required before any pipe could be welded.

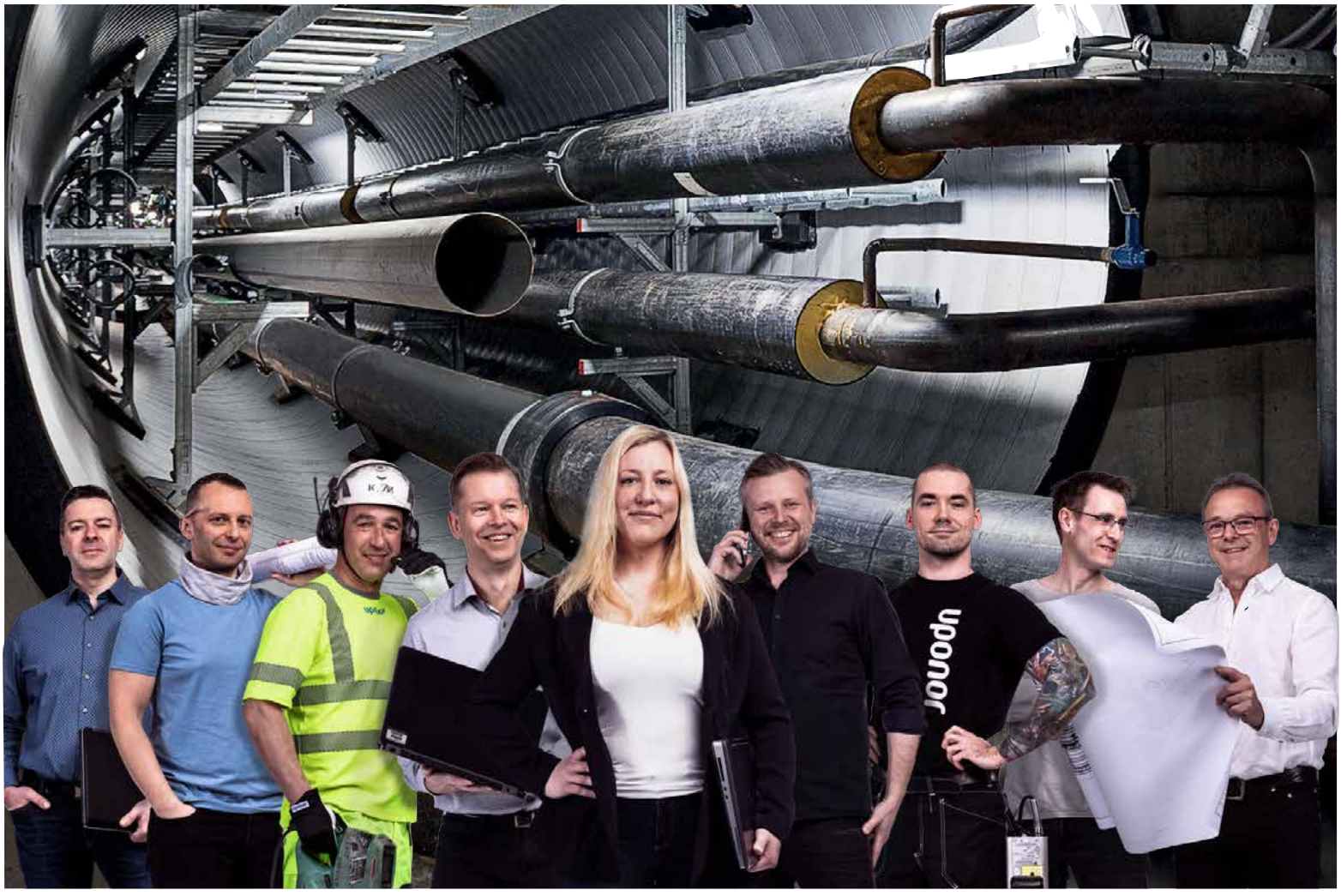
The pipes were manufactured in the Amata City Factory that Wiik Public Co. Ltd, a Weholite licensee, owns in Thailand.

"The work was carried out by two teams, one from Vaasa and one from Pattaya," tells Pablo Ramon.

All the Uponor works were finished by the middle of December, waiting for the marine contractor to conclude the dredging works.

Despite the tight schedule and the challenges posed by the pandemic, everything was completed on time. However, the outfall didn't go into service until the end of January 2021, because a new Covid-19 outbreak in Thailand forced a temporary lockdown of the whole area of Chonburi.

Once again, Weholite has played the main role in a project that will keep the Pattaya beaches and the city cleaner – and ready to, hopefully soon, welcome tourists from all over the world. ■



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