

THE UPONOR INFRA CUSTOMER MAGAZINE » ISSUE 1/2020

# pipe world

UPONOR BARRIER PLUS  
PROTECTS POTABLE  
WATER LINES IN RISK AREAS

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WEHOLITE ENSURES  
A SAFE PROCESS  
IN A NEW  
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# uponor

## Ultra Rib 2

The best pipe is now even better

The Ultra Rib 2 sewer pipe system is completely watertight, safe and strong. Municipalities, industries and contractors can be confident in a pipe system with a service life of well over 100 years.

But we like to offer more than that. That is why we have looked over all the details, and found one detail that could be improved – the socket design is now even better and the safest system has become even safer.

[www.uponor.com](http://www.uponor.com)

Dear reader,

**2020** has been an unusual year for all of us with the Covid-19 pandemic impacting us both professionally and in our private lives. The uncertainty will likely continue well into 2021 and we are yet to see what the “new normal” will look like.

Even in these uncertain times, it is important that we all continue in our efforts to create a more sustainable future. At Uponor, we have built our sustainability strategy around the United Nations sustainable development goals. In addition, we are endorsing the World Green Building Council's aim of net zero built environment in 2050.

Actions are what matter most – and we have also taken plenty of them. From the start of 2020, we have introduced green electricity at all of our manufacturing plants in the

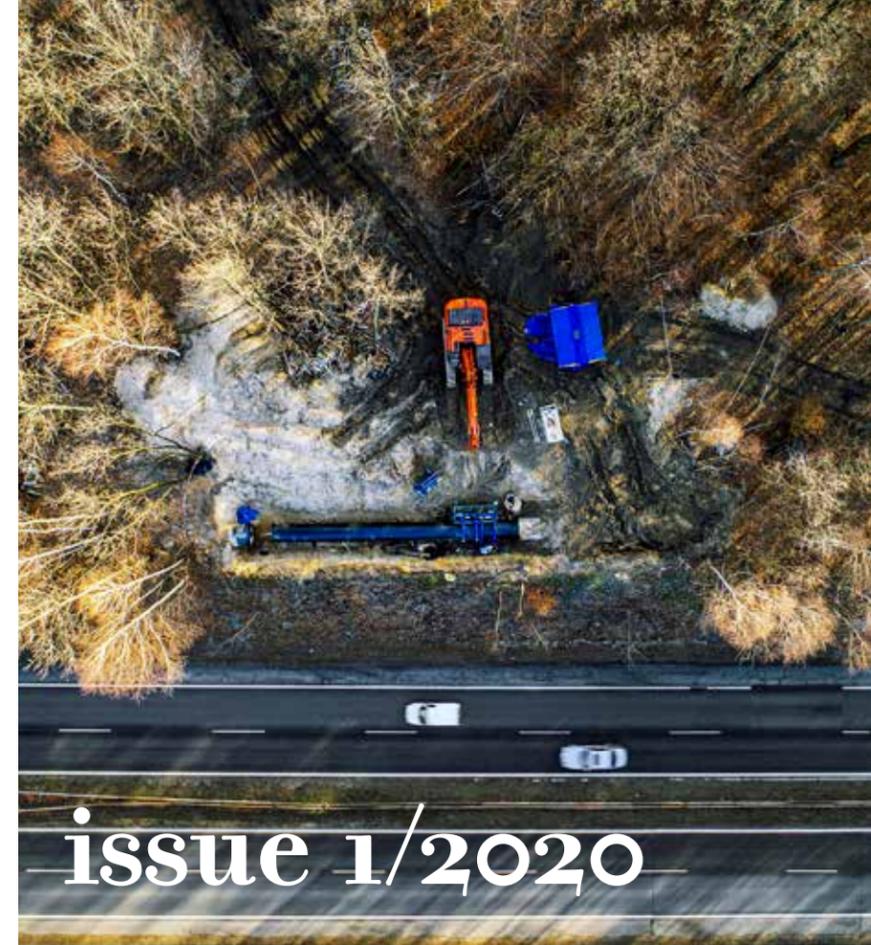
Nordics, reducing the carbon footprint of our operations significantly.

In 2021, all Uponor Infra manufacturing facilities will operate on green electricity. Uponor is also committed to Operation Clean Sweep, an initiative to ensure that manufacturing processes do not contribute plastics to the environment.

Furthermore, we are in the process of setting our new CO<sub>2</sub> reduction targets for the next 10 years.

On page 14, you can read more about Uponor's commitment to becoming a leader in sustainable building and infrastructure solutions. We also have a number of interesting stories of how our Uponor Infra 360° Project Services have helped our customers solve demanding challenges, and how our new Barrier PLUS is protecting drinking water in contaminated soil. *I wish you a good reading!*

**Sebastian Bondestam**  
President, Uponor Infra



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pipe world

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## Smart and quick cable protection



**UPONOR INFRA AND GREENPIPE OF SWEDEN** have entered into a cooperation agreement under which Uponor Infra will have exclusive rights to the sale of Snipp & Snapp® pipes in Sweden.

Uponor Snipp & Snapp® is a wide range of split duct cable protection pipes made from 100% recycled plastic. An innovative design and a well-developed locking system provide secure and reliable cable protection in both temporary and permanent installations. Cable protection is essential in sensitive applications, where cable damage can have dramatic consequences.

Uponor Snipp & Snapp® is easy to install and assemble quickly without tools. The smart locking system and secure connection between the pipes ensure that the pipes cannot slide apart or be opened. The cable protection solution is easy to handle, as the pipe length is 1 and 1.2 metres and it can be angled in any direction.

Its launch in the Swedish market started in September 2020. ■

**Uponor Snipp & Snapp® is easy to install and assemble quickly without tools.**



## New design yields greater security

**AS A RESULT** of innovative product development, the new and improved Access pipe 110 complements the Uponor HTP and Decibel house drainage systems. The new design provides security against the occasional pressure rises of a sewer and rainwater gravity pipeline and increased tightness for a long-lasting installation.

The streamlined design of the lid significantly improves the flow and sound properties of the product.

The lid also has a completely new additional component that gives superior tightness to a gravity line.

Thanks to the rib in the lid, tightening and opening is now easier than ever, especially in cramped spaces. ■



## Better than ever

**THE UPONOR** Ultra Rib 2 sewer system with rib-stiffened pipes and fittings has always outperformed the demands of the market. It has extremely high tightness, safety and strength. Municipalities, landowners and contractors can be confident in a lasting and sustainable system.

The system's reliability has now been further improved by the construction of the in-line socket. Thanks to injection moulding, the in-line socket system is now even better and safer. With its perfect shape, it ensures easy installation as well as smooth flow also in the jointing area. With an in-line socket system, 50% fewer seams are needed, minimising the risk of leakage.

The white inside of the pipes makes camera inspection easy, facilitating maintenance work.

Uponor Ultra Rib 2 fulfils the Nordic Poly Mark (NPM) requirements twice over, guaranteeing that the system can withstand demanding northern conditions all year round. ■

**Uponor Accesso 600 is a bottom-to-top chamber system that provides excellent hydraulics.**

## Efficiency from bottom to top

**THE NEW WIDE** assortment of 600mm inspection chambers for sewer and stormwater networks expands Uponor's chamber portfolio.

Uponor Accesso 600 is a bottom-to-top chamber system that is easy to install, provides excellent hydraulics and can withstand heavy wear and tear. The flat, stable and modern design of the chamber bottom provides excellent properties for effective backfilling.

The assortment includes six different bottoms with an optimal construction made from injection moulded polypropylene (PP).

The connections are provided with sealing rings for smooth pipes in dimensions of 160, 200, 250, 315, and 400mm. The same bottom can be used with corrugated and ribbed pipes like Uponor IQ, Ultra Double and Ultra Rib 2 using eccentric connectors. The adjustable socket allows 7.5° angle deviation in all directions, which makes installation and on-site adjustment easier.

The new Uponor Accesso 600 inspection chamber system has been launched in Denmark, Sweden and Norway. ■

# Infra Culvert demonstrates enormous potential



The Infra Culvert used in Sollentuna is a Weholite pipe with an internal dimension of 2,200mm.

The municipality of Sollentuna near Stockholm, the capital of Sweden, carried out a trial installation of 50 metres of Uponor's Infra Culvert in an existing urban environment in the area of Väsjo. After work had begun based on a traditional approach, the project proved to be both expensive and time-consuming. With the conventional approach, the estimated rate of advance was 0.6 to 1 metres per day. However, the calculation for a new section using Uponor Infra's culvert solution yielded a rate of 6 to 12 metres per day.

**BEFORE THE POSSIBILITY** of using an Infra Culvert-based solution came up in Sollentuna, substantial work had been carried out using the traditional approach – and progress had already been made. When Uponor Infra became involved in the project, the installation work on the sheet-piled cofferdam was expensive, slow and disruptive for local residents. The traditional method used to install sheet piles generated a lot of noise. It is normally necessary to dig up the ground several times due to the position of the conduit beds.

"Concrete pipes are both expensive and heavy, but the culvert is very light and flexible. We don't need to have any crew in the shaft when we install it, which makes the whole process much safer. That's how the idea for a solution using Infra Culvert came about," explains **Jonas Tjernberg**, consultant for Sollentuna Energy & Environment (SEOM).

### Flexible, reliable and fast

The Infra Culvert used in Sollentuna is a Weholite pipe with an internal dimension of 2,200mm. The material is flexible and can easily be machined without any impact on internal pipelines. Inspection and modifications are not only faster and easier, but also result in improved reliability.

With the conventional approach, the estimated rate of advance was 0.6 to 1 metres per day. However, the calculation for a new section using Uponor Infra's culvert solution came up with a rate of 6 to 12 metres per day.

"We realised this approach would be both cheaper and faster than traditional construction techniques. When we looked at a slightly longer section from Väsjo to Edsviken in Sollentuna, we immediately saw that we

### UPONOR INFRA CULVERT

» The Uponor Infra Culvert for all underground infrastructure is a smart alternative for both new-build and established construction projects. It is a unique, prefabricated solution, which offers fast and efficient installation, as well as lower operating and maintenance costs in the future.

could plan, build and save time in a completely different way by using a culvert," recalls Jonas Tjernberg.

As another example, he mentions the construction project at Backvägen. The plan there is to install a culvert at the property boundary without affecting the buildability of the property itself. With a traditional installation, it would not have been possible, and it could have become a costly factor given that accessibility and traffic would be affected over a long period of time, especially in an industrial area.

"We would be able to complete a section which would normally have taken a year in just six to eight weeks. It's pretty incredible really. Roads can also remain open and only the actual area where excavation is under way is affected."

### Sustainable solution for the future

Infra Culvert is a sustainable solution with a much lower environmental impact than traditional installations using sheet-piled cofferdams. As an added benefit for society and the environment, district heating, electricity and fibre conduits can all be placed in one single culvert. There are many possibilities for adding conduits or easily expanding existing networks.

"The approach also reduces the carbon footprint. Using the culvert approach also eliminates leakages into the environment. This is also a very important consideration in the case of installations close to industry. With the culvert, you have much more control over the situation. The culvert solution is good for the environment in every way and offers huge potential for the future," declares Jonas Tjernberg. ■

# Clean potable water – regardless of the soil

As cities and their populations grow, new residential areas are increasingly often located on sites such as former industrial areas and landfills, whose soil can pose challenges to the safety of the potable water network. Uponor Barrier PLUS is the first 100% plastic pressure pipe system that makes it possible to safely build potable water lines in risk areas and contaminated soil.

**C**ontaminated soil in urban areas can pose challenges to the safety of the potable water network, as some of the chemicals in the soil can penetrate into ordinary polyethylene potable water pipes. For example, landfills can contain numerous hazardous chemicals and the soil in industrial areas can include solvents, paints and a variety of hydrocarbons. Risks are also posed by traffic accidents, industrial spills and sudden natural phenomena such as floods. In swampy areas, methane can adversely affect the taste of potable water.

“These challenges will increase, particularly in urban areas that are expanding and becoming denser, in which land is constantly being adapted for new uses,” says **Tommi Kurhinen**, Local Application Manager at Uponor.

However, Kurhinen says that awareness of such risks is increasing all the time – one good example of this in Finland is the WSP (Water Safety Plan), an action programme introduced by water utilities. This programme aims to identify the risks associated with the entire water production chain and environment as well as manage them to ensure the quality of household water.

## An impermeable polymer layer protects potable water

Uponor Barrier PLUS is the first 100% plastic pressure pipe system that makes it possible to safely build potable water lines in high-risk areas. The pipes are flexible and are both easy and quick to install – a long-lasting solution for both new construction and renovation. They are fully compatible with standard PE potable water pipes.

The durable Barrier PLUS pipes feature a seamless and non-permeable polymer layer structure that protects potable water against hazard-



ous substances and both taste and smell problems. Barrier PLUS wrap ensures tight and secure seams.

“Diffusion barrier materials have been used for decades in the food and chemical industries,” notes Kurhinen.

Seven years of rigorous testing in laboratory and field studies has demonstrated that Uponor Barrier PLUS stands up to even the most harmful chemicals in the soil. In addition, TCE (trichloroethylene), a byproduct of solvent decomposition, cannot pass through the pipes.

Kurhinen points out that Uponor Barrier PLUS pipes are also an environmentally friendly choice, as they are long-lasting and fully recyclable.

Uponor Barrier PLUS pipes come in sizes of 32–250mm and pressure grades of PN10 and PN16.

## Safe, fast and easy

Durable, non-permeable Uponor Barrier PLUS pipes are being used to protect a water main against pollutants and ensure rapid, easy installation in an old industrial area in Mikkeli, eastern Finland, where many new apartment blocks will be erected in the next few years.

**During the next few years**, construction company YIT intends to build 15 new apartment blocks in a former industrial area located about two kilometres from downtown Mikkeli. The site lies on the shore of Lake Saimaa. YIT has owned it since 1991, when the company and the City of Mikkeli made an agreement on the zoning, construction and development of the area.

It was formerly used by the wood industry – a steam-powered sawmill was established there back in 1890. In 1938–1986, a plywood mill and wooden house factory operated next to the sawmill. However, the company went bankrupt and the buildings were demolished in the 1990s.

Decades of industrial activity have left their mark on the site – for this reason, soil remediation has now been carried out.

“Soil studies found substances such as petroleum hydrocarbons and heavy metals. During the remediation work, thousands of cubic metres of contaminated soil were removed and replaced with clean new soil,” says **Petri Pynnönen**, Supervisor at Talpa Oy, which is currently carrying out a contract to install a new water main that will serve around 2,000 residents.

Slightly less than 200 metres of the kilometre-long pipe runs through the remediated area.

Even though the soil is now clean, the developer, the Mikkeli Water Utility, wanted to be absolutely sure that the water main would be safe. Uponor Barrier PLUS pipes with a diameter of 225mm will be used for the section of the water main that passes

through the previously contaminated area. The rest of the main will be built using ordinary Uponor PE water pipes.

Pynnönen says that the first apartment buildings were erected on this peninsula in the 1990s.

“The plastic pipes available back then did not provide protection against pollutants, so the water lines were made using cast iron pipes.”

**Easy to handle, quick to install.** Talpa wanted to use plastic pipes for the project – and, after hearing about the new Uponor Barrier PLUS pipes, decided to choose them.

“This is our first project in which we’re using Barrier PLUS pipes,” says Pynnönen.

They proved to be very easy to handle and install.

“The pipes are light and flexible, thanks to which they are easy and fast to install. Their flexibility also means that small changes in direction can be implemented safely.”

He also praises the speed and ease of installing wraps around the pipe seams. There are just under 20 seams on the 200-metre section of pipe.

“The work is going very smoothly – it only takes about 10 minutes to wrap each seam. Once the plastic wrap has been installed around the protective jacket of the pipe, a shrink sleeve is heated over it to seal it tight. The wraps and shrinks are pre-dimensioned for the pipe, so there is no need to measure or cut them to fit.”

# Safety comes first

Citizens' safety was key when a Danish water utility sought to protect the municipality's drinking water from toxic chemicals at a former industrial site with busy traffic. By choosing Uponor Barrier PLUS pipes, the utility company now has a fully plastic barrier pipe system with an expected lifespan of more than 50 years.

TEXT Uponor » PHOTOS Uponor »

When planning a new main water pipeline in Thisted, northern Denmark, utility company Thisted Vand faced a major challenge. The area had a pollution degree rating of 2, indicating a serious risk of toxins getting into the water carried by the new pipes. The company was concerned because some toxins from the area's contaminated soil could penetrate standard polyethylene water pipes. This would, of course, present a serious risk to public drinking water.

## A long-term solution once and for all

Jacob Bertelsen, Manager responsible for the drinking water of Thisted Vand, outlines some of the reasons why the company opted for the Barrier PLUS pipe system.

"The main thing for us was that the pipeline should be able to prevent toxic chemicals, bad taste and odours from getting into the drinking water for many years to come," he specifies.

The area's pollution degree rating of 2 dates back to a time when there was a gasworks on the site – aromatic substances can still be traced to that source. Later on it was home to a wood business that impregnated wooden posts, releasing chlorinated solvents that can still be detected in the soil.

But there were also design and construction factors.

"The area where the water pipeline was to be laid had fairly busy traffic, including some heavy vehicles. Therefore, it was vital to establish a sustainable long-term solution once and for all, one that would not cause too many traffic disruptions in the construction phase," says Bertelsen.

## 100% plastic – 100% safe

Product Manager Karsten Højlund of Uponor Infra is all too familiar with the reasons behind the contamination concerns.

"For many years, Danish water companies have been asking for pressure pipes with a totally secure plastic barrier inside the barrier layer, as they want to install a solution that's 100 per cent safe. Like Thisted Vand, others have also expressed concern about the chlorinated solvents in the soil: corrosion can occur when substances like trichloroethylene (TCE) in the soil come into contact with an aluminium barrier."

With the Barrier PLUS system, Thisted Vand now has a fully plastic barrier pipe system, which also includes PE Barrier Wraps for wrapping the connections. This eliminates issues related to the potentially harmful effects of TCE.

"The company can rest fully assured that the plastic barrier layer in Barrier PLUS will protect the municipality's drinking water against contamination from chemicals, crude oils and pesticides in the soil, as well as external environmental factors," says Karsten Højlund.

"The Barrier PLUS pipe system has an expected life of more than 50 years. Barrier PLUS pipe is also a plus for the environment as it is fully recyclable for other purposes, thereby contributing to a sustainable solution," he adds.

Jacob Bertelsen noted that contractors and welders were very satisfied with how easy Barrier PLUS pipes and wraps are to work with. The solution included OD50mm and OD110mm SDR17 coils. ■

# A SMART STORMWATER SYSTEM PREVENTS ENVIRONMENTAL POLLUTION

Untreated stormwater run-offs carry pollutants into bodies of water. These harmful substances must be recovered as close to the point of origin as possible.

Climate change increases heavy rainfall intensity. At the same time, urbanisation leads to growth in the areas covered by impermeable surfaces. When storm drains overflow, the streets are flooded.

Underground pipes do not have enough capacity, as for the most part they were dimensioned and built for smaller flows and before the climate change. The pipes are part of the stormwater system whose primary function is to channel stormwater run-off safely and efficiently from roads, yards, parking areas, and other locations to a point of discharge.

Stormwater systems also prevent waterborne pollutants from ending up in bodies of water. Higher flows affect the capability of stormwater systems to effectively hold back sediments, heavy metals, plastics, oils, and other pollutants. The concentration of pollutants is so high that stormwater run-offs are the most significant cause of water pollution in industrialised countries.

## Many approaches to minimising harm

However, the harmful effects of stormwater run-offs on bodies of water can be minimised in many ways.

"Pollutants should – and must – be recovered from stormwater run-off as early as possible," says Ari Sillanpää, Application Manager of Water Technology at Uponor Infra.

Pollutants are, for example, collected using sand traps in chambers, with separators and with green sinks. Structures that attenuate stormwater – such as attenuation tanks and basins – help control flow. Stormwater run-off can also be infiltrated as close as possible to its point of origin.

"Attenuation tanks and basins slow down stormwater so that the flow into the sewer system or to the point of discharge site is roughly equivalent to the natural flow from the area. The steadier the flow, the easier it is to separate pollutants."

## Reusing recycled plastic and waste material

Environmental responsibility is evident not only in Uponor's products, but also in its operations on a wide scale.

The company seeks to actively reduce production waste and to utilise recycled plastic as a raw material, in line with the relevant product standards and without compromising quality and long lifetime of products.

The products are designed to be easy to maintain. They are produced as close as possible to the customer and delivered ready for installation. "We want to reduce the environmental burden caused by logistics and unnecessary packaging. We provide our customers with products whose total cost of ownership is as low as possible over the entire product lifecycle," says Sillanpää. ■



# Now that's truly fast!

The construction of a new community centre in Nastola, Southern Finland is proceeding at a rapid pace. Its new tenants will be able to move into the building in early autumn 2021. The installation of the plot's stormwater system was carried out at a rate that surprised everyone involved in the work. In fact, the site's new Uponor IQ infiltration and retention pipes were in place within a few days.

Construction of the new community centre began in summer 2019, and the building is expected to be completed in late summer 2021. A primary school, a daycare centre and the Nastola Library will move into the two-storey building by early autumn at the latest. The new community centre will also provide rental spaces suitable for meetings and classrooms, handicraft activities, and sports as well as exercise.

Special attention is being paid in the project to the quality of the build, moisture management, and clean indoor air. In particular, careful management of the dry chain and weather protection is important to reducing the risk of moisture damage throughout the building's life cycle.

## New groundwater with infiltration

The construction work is also progressing well in the site's outdoor yard area, where the new community centre's stormwater system was

installed in March 2020. Uponor IQ infiltration and retention pipes were chosen, as the decision had been made for the rain and stormwater to be mainly infiltrated into the soil.

"The new building is situated in the groundwater recharge area, so we don't want to drain the stormwater away. Instead, it's infiltrated into the sandy ridge to form new groundwater," says Local Application Manager at Uponor, **Tomi Kurhinen**.

The new community centre will be bordered by an asphalted and paved outdoor yard area, for which a 100m<sup>3</sup> infiltration and 26m<sup>3</sup> retention field was designed to handle the stormwater run-off.

The run-off area consists of almost 10,000m<sup>2</sup> of asphalt and roof surfaces.

## Installations with one pair of hands

The decision to use Uponor IQ infiltration and retention pipes was influenced by the speed of installation, as well as the system's long lifespan and low maintenance costs.

In fact, the work was so speedy it even surprised everyone involved in the job. Kurhinen had intended to get a photographer on site to capture the installation work in progress, but the contractor soon realised that the pipes were already in place.

According to the installer in charge of the installation, **Joni Fält** from Kuljetus- ja Maansiirtoliike K. Timonen Oy, the IQ pipes were put in place within a few days – even faster than he had thought possible.

The job went smoothly, even though Fält had no previous experience of working on such a large construction project.

"The pipes were really easy to install. I could have done the job alone, but I was helped by the drivers of the two excavators involved in the contract."

After completing the five-metre-deep trench, the pipes were lifted into place by excavator.

"The geotextile was not even needed at the bottom of the trench, as the pipes could be fitted directly on top of the trench's base course."

Tomi Kurhinen also noted that using other solutions would have taken much more time.

"Installing pipe systems is bread and butter for municipal engineers, which naturally makes it even easier to install the IQ pipes," he remarks.

## Easy maintenance

Kurhinen reveals that the solution's convenience has already been noted by many others, and the number of contacts is constantly increasing.

Installers do not need much supervision when installing the IQ pipes. And once the pipe selection had gone through the usual approval process with the contractor, customer, designer and supervisor, it was not long before the installation work got under way in Nastola, too.

Among other things, Kurhinen has heard the IQ pipe system praised for not needing a large excavation, as would be the case with stormwater cassettes, for example. Once the pipe has been installed, it can be covered immediately, ready for the next one to be installed.

"The benefits of IQ pipes also include their long lifespan, up to 100 years, as well as their ease of serviceability. If necessary, the pipes can even be serviced with scrubber machines and vacuum trucks."



## STORMWATER SOLUTION FOR A COMMUNITY CENTRE

- » 3 x 20m, 1,200mm diameter IQ infiltration pipes
- » 3 x 20m, 800mm diameter IQ retention pipes

## UPONOR IQ INFILTRATION PIPE SYSTEM

- » Perforated infiltration pipe system suitable for handling both small and large amounts of stormwater.
- » Thanks to their open structure, the pipes have a large effective volume, ensuring effective infiltration and retention.
- » Applications include parking areas, retail plots, roads and crossings, and industrial areas.
- » Light, durable and safe system that is quick to install and easy to maintain.
- » The required pipes can be installed in one pipeline or several parallel lines. Dimensioning is easy thanks to the tool provided.
- » IQ infiltration pipes can also be connected to a pre-existing stormwater drain.
- » Geotextile is only required on the edges of the excavation. Only the bottom of the excavation under the pipe is levelled.

## Support for design

Designer **Simo Suurnäkki** from Etteplan Oyj had never previously designed a stormwater solution using IQ pipes.

"I contacted Uponor's experts and got great support and help with the planning."

"The job was straightforward and went ahead with ease. The installer also praised the system for the speed and ease of working with it."

Suurnäkki says he will be happy to continue using IQ pipes.

"From a designer's point of view, one of the main advantages of using the IQ pipes is the clear information on what load they can withstand and how deep they need to be in the ground."

According to Suurnäkki, asphalted surfaces are becoming increasingly common and the capacity of stormwater sewer networks is no longer sufficient.

"Real estate plots must have solutions that infiltrate and retain stormwater run-offs." ■

Three IQ infiltration pipes and three IQ retention pipes were installed on the plot.

# A perfect fit

The new Weholite retention tanks at the busy railway station in Konin, western Poland, will ensure trouble-free operation of the underground stormwater system while trains run at a speed of 160 km/h on the surface above.

Infrastructure projects – including railways, roads, ports or runways – are without exception highly demanding ventures. They pose numerous challenges during construction and place considerable requirements on the technologies and materials used. There is no room for compromise – only high quality, durable materials meeting strict resistance criteria will do.

In 2019, Uponor Infra was handpicked to deliver retention tanks for the installation of a stormwater system at the railway station in Konin. Construction works in Konin were part of a larger overhaul of a 230-kilometre section of the railway line connecting Warsaw and Poznań. The project is worth almost 110 million euros and includes extensive modernisation and numerous engineering components. The project contractor is Torpol S.A., experts in railway construction and modernisation. For the past 30 years, the company has carried out a number of major railway projects all over Poland.

Weholite is uniquely suited to infrastructure applications as it withstands difficult soil conditions and varying loads generated by traffic.

## Durable and reliable

Initially, the contractor planned to use retention tanks made of glass fibre-reinforced plastic (GRP) but ultimately decided upon Uponor's Weholite PE-HD technology. The excellent qualities of Weholite structural piping made it a perfect fit for the Konin installation. Weholite PE-HD pipe systems are uniquely suited to infrastructure applications as they withstand difficult soil conditions and varying loads generated by traffic. This is absolutely key, even more so when one considers the speed, composition and cargo loads of the trains running above ground. That said, Weholite PE-HD technology boasts even more advantages. Pipes used to build tanks in Konin are also leakproof and completely resistant to corrosion and damage by abrasive transported media.

## Trouble-free construction

Uponor delivered the Weholite PE-HD elements to the construction site in January 2020. By March, the extrusion welding part of the construction work was completed. The tanks were constructed using Weholite DN3,000mm, ring stiffness SN8 kN/m<sup>2</sup>. The first tank was 16.4 metres long with a volume of 100 cubic metres, the second was 61.4 metres with a volume of 387 cubic metres. Both tanks were lowered by crane into 4.5-metre trenches and founded on a 30-centimetre layer of well-compacted gravel. Additionally, as a precaution against upsurge in groundwater levels, the tanks were anchored to the continuous footing. The project also included two pumping stations with a capacity of Q = 10 l/s, installed behind the tank outlets. Lightweight and flexible Weholite was easy to handle and ensured trouble-free construction. This was an added advantage since the tanks were installed between existing railway tracks, in narrow trenches with parallel walls.

Thanks to the use of PE-HD technology, the stormwater tanks in Konin are expected to last at least 100 years. The effects of the modernisation of the entire 230-kilometre section of the Warsaw-Poznań railway line will include doubling of the line's capacity, the use of more powerful locomotives, increased train speed of 160 km/h for passenger trains and 120 km/h for freight trains, and capacity to serve 750-metre long trains. In all-encompassing, demanding projects such as this, only the most reliable partners and technologies have a place at the table. ■



Both tanks were lowered by crane into 4.5-metre trenches.

# Committed to becoming a leader in sustainable building and infrastructure solutions

The world needs more sustainable products and solutions, both now and especially for future generations. Companies can and should act as engines of change in climate action. For this reason, Uponor also aims to continuously reduce the overall environmental impact of its business operations.



Sustainability is a core attribute of Uponor's purpose and vision. The company's purpose statement – rethinking water for future generations – describes how water, longevity and sustainability are the heart of its operations and actions. Uponor's vision – to become a leader in sustainable building and infrastructure solutions – states its aspiration and commitment to achieve a sustainable future. The company has a passion for innovation, engineering and technology as well as strives to safeguard water, a scarce resource, for future generations.

## Sustainability in daily operations

Uponor's sustainability approach is built on the United Nations' 17 Sustainable Development Goals (SDG), with a focus on four of them: clean water and sanitation, decent work and economic growth, responsible consumption and production as well as climate action. Uponor feels that these four SDGs enable it to truly contribute and make a difference.

## A more sustainable built environment

Buildings and construction are responsible for 39% of global energy-related carbon emissions. These emissions need to be decreased in order for the world to have any chance of achieving the targets set by the Paris Accord. In September 2019, the World Green Building Council's report outlined an accelerated action plan for reducing embodied carbon, whose emissions are associated with materials and construction processes throughout the whole lifecycle of a building or infrastructure. Uponor is one of the signatories of the report. According to the plan all new buildings, infrastructure, and renovations should have at least 40% less embodied carbon, and all new buildings must be net zero operational carbon by 2030. Uponor's endorsement is a call to others to join and work together to fully decarbonise buildings and infrastructure by 2050.

## Solutions that make a difference

Uponor understands that its purpose and vision are not enough to enhance more sustainable buildings and infrastructure solutions. Making a difference requires actions and an offering

that supports the purpose and vision. Uponor's broad offering covers a wide range of products and solutions that enable a more sustainable lifestyle. Some of these are presented in this magazine.

## Recycle and reuse

Sustainable production is based on resource and energy efficiency. Uponor pursues an environmental management system in line with ISO 14001 and an energy-management system compliant with ISO 50001 in order to reach its environmental and energy targets systematically.

The typical waste from Uponor's manufacturing facilities comprises either plastic or metals. The company aims to recycle all metal and plastic waste, and to reduce the amount of waste with the aim of zero waste to landfill. Uponor Infra has already taken big steps in reusing and minimising waste. Infra reuses all scrap generated during production in line with the appropriate standards. In addition, Uponor Infra's products can be recycled or reused at the end of their life.

Uponor is committed to Operation Clean Sweep (OCS), which is an initiative to ensure that plastic pellets, flakes and powders that pass through manufacturing are handled with care and do not end up in the environment. OCS will be implemented in all Uponor's manufacturing facilities by the end of 2021. Stormwater filters will be installed in every manufacturing facility to prevent plastic granulates from entering the sewer system and waterways.

## Continuous analysis of materials

Uponor's aim is to reduce the use of virgin raw materials. The company participates in a number of R&D initiatives that investigate alternatives to oil-based resins. Through a continuous focus on high-quality production processes, the company avoids excess use of materials.

Plastics belong to the circular economy. Therefore, Uponor wants to increase and enhance the recycling of plastics.

Uponor produces plastic products with a long lifetime. Plastic pipes' expected lifetime can be over 100 years.

## Work continues

Uponor's commitment to its vision means that the company will continue to work towards a more sustainable built environment and infrastructure. The company has a long history of industry-changing innovations and continues to engage in diligent research and development to launch new products to help its customers become more efficient and sustainable.

Uponor's target is to reduce scope 1 and scope 2 greenhouse gas emissions by 20% per net sales by 2020 from the 2015 levels. Based on the progress so far, the company expects to achieve this target in 2020 as planned. The work continues and Uponor is currently working on setting its new CO<sub>2</sub> reduction targets for the next 10-year period. In addition, the company is finalising its first Environmental Product Declarations (EDP) to provide better visibility about its products' environmental footprint to its customers. ■

## MOVING TOWARDS CARBON NEUTRAL PRODUCTION

- » The key environmental impacts of Uponor's 16 manufacturing facilities are greenhouse gas emissions, waste and water usage. Uponor has taken concrete steps to decrease the overall impact of its business operations and is moving towards carbon neutral production.
- » As of 2020, all seven of Uponor's Nordic manufacturing facilities use green electricity. With this change, the carbon dioxide emissions of the company's manufacturing facilities will decrease notably. These Nordic manufacturing facilities account for approximately half of the total electricity consumption of the company's manufacturing facilities. In Germany, Uponor's manufacturing facilities have already switched to green electricity, and in the U.S. a third of all the electricity that Uponor's manufacturing facilities use is renewable.
- » Solar panels have been installed at manufacturing facilities in Nastola, Finland and Apple Valley, Minnesota, USA. The company's distribution centre in Lakeville, Minnesota, USA now receives 100% of its electrical power from wind energy.
- » Uponor uses modern manufacturing methods and technologies. This is why it is a natural choice to enhance the use of green electricity in manufacturing. Uponor continues its work to decrease the environmental impacts of its production and business operations.

# MAKING THE DIFFERENCE

Halosep is a new groundbreaking technology for recycling and reusing waste streams from incineration plants. Denmark's largest waste and energy company, I/S Vestforbrænding, is now putting this technology into practice at the world's first full-scale Halosep plant near Copenhagen, the capital of Denmark. A total of 17 Weholite tanks ensure a reliable and safe process in which hazardous fly ash is converted into pure, harmless ash and recyclable materials.

I/S Vestforbrænding is Denmark's largest waste company. Every year its waste incineration plant in Glostrup burns 500,000 tonnes of waste for the benefit of 80,000 electricity customers and 75,000 households on district heating. Burning waste to create energy is an old tradition in Denmark, combining the incineration of non-recyclable waste with energy production.

Waste incineration creates energy and electricity, but also a very dangerous residual product, fly ash. In particular, the ash's toxic salts and heavy metals make it hazardous to humans and the environment. Therefore, fly ash – according to EU rules – must be deposited in special secured landfills within or outside EU borders. A total of 15,000 tonnes of toxic fly ash are deposited each year from Vestforbrænding alone. However, this is about to change: a cutting-edge technology called Halosep has been integrated at Vestforbrænding's incineration plant to remove the dangerous elements from fly ash. This innovative technology

was invented between 2003 and 2007 by the Danish company Watech. Halosep was later bought by the Swedish company Stena Recycling, which has developed the technology and tested the process at smaller experimental plants. Now, Stena Recycling, together with Vestforbrænding, has built the world's first full-scale Halosep plant, putting the technology into practice.

## Everything can be recycled and reused

At the Halosep plant, the hazardous fly ash, together with oxidising agents from flue gas purification, is converted into harmless ash and recyclable materials. This means that much less toxic waste will have to be transported to landfills in the future. The Halosep process uses 80% less chemicals than previous methods of treating fly ash and oxidising agents. This, of course, benefits the environment. But the revolutionary thing about this process is that it does not merely eliminate toxic substances from fly ash with less chemicals – the substances removed from the ash can

also be recycled and reused. Metals such as zinc, lead and cadmium can be recycled for several purposes within the industry sector, and the salt becomes so pure it can be used as road de-icer in the winter. In addition, the total amount of ash is reduced by 40%.

Vestforbrænding is now testing ways of utilising cleaned ash, metals, and salts. The pure ash is very fine-grained and is thus well-suited for use as a construction material. It can serve as a filler in concrete or cement, yielding yet another environmental benefit by helping to lower the concrete and cement industry's CO<sub>2</sub> emissions.

"There is great potential to extend the Halosep technology further to several waste incineration plants in Denmark and the rest of the world. We have high expectations for this, and there is increasing interest among waste incineration plants," notes **Erik Rasmussen**, Project Manager at Stena Recycling.

He says that Stena Recycling has just started a similar project in Norway as well.

## Weholite withstands the process

Halosep technology has been integrated into the existing framework at Vestforbrænding's incineration plant. The Halosep developers have always had the goal of improving the plant's existing facilities so that no new buildings are needed. This reduces resource consumption when installing the technology.

All of the 17 Weholite tanks used in the Halosep process are supplied by Uponor – they include reaction tanks, where many of the purification processes take place, mixing tanks and tanks for storing the purified ash.

"Since the Halosep process involves several strong chemical compounds, the choice of material was very limited," says Project Engineer **Bent E. Rønfeldt** at Uponor Infra. The solution was structured-wall, durable Weholite, manufactured from PE profile, which can withstand most acids and bases. The Weholite pipe also enables very large applications, since the pipe is manufactured with a diameter of up to 3.5 metres. Ten of the tanks used by Vestforbrænding are of DN3,000mm, three of DN2,400mm, and one of DN2,000mm. The other three tanks are smaller in size.

"Weholite is easy to work with. It is effortless to establish connecting pipes and install equipment. In addition, making adjustments is easy, since you do not depend on special tools or moulds."

Rønfeldt praises the close cooperation between Stena Recycling, Vestforbrænding and Uponor, thanks to which the delivery of the tanks has amounted to an easy 'plug-and-play'.

## Great potential for both the environment and business

Vestforbrænding is highly satisfied with the new plant and the prospect of no longer having to dispose of large quantities of toxic fly ash. The plant will start up in 2020, and will then run for one year as a development and demonstration project. After that, Halosep will become a standard fixture.

The project is part of the development drive to constantly ensure optimum use of the power plant's processes.

"We not only have a responsibility to supply electricity and heat to people, we also have a responsibility to limit our environmental impact and to optimise the way we use our resources. We constantly try to make things better by implementing new technology and making the most of operations," says **Samuel Moore** at Vestforbrænding.

"Uponor's vision is to become a recognised leader in sustainable building and infrastructure solutions. We strive to take part in projects that make a difference to people, society and the environment. It really has been an honour to participate in this pioneer project," concludes Bent E. Rønfeldt. ■

Weholite tanks used in the Halosep process include reaction tanks, mixing tanks, and tanks for storing the purified ash.

# TROUBLE-FREE FUNCTIONING FOR DECADES

Renovating a pipeline that supplies potable water to almost one million people is a huge challenge by any standard. A smart choice of pipes in Katowice, southern Poland allowed for safe and fast repairs in an area notorious for mining damage.

The Upper Silesia Agglomeration in southwestern Poland is home to around 3.5 million people. It is one of the most densely populated regions in the country. Its history and landscape have been strongly shaped by heavy industry, especially mining. The mammoth task of supplying the region with water sits with the Silesian Waterworks PLC (GPW). The company manages an impressive network of 11 pumping stations, nine water treatment stations and nine expansion tanks linked by over 900 kilometres of pipeline, up to DN1,800mm. The water supply network is set up as a ring system, which means that water can be redirected to any given section of the network if necessary.

## Heavy-duty pipeline

The smooth running of this complex network requires substantial and systematic maintenance as well as continuous modernisation. The biggest cause of malfunctions on the pipeline is corrosion. Over time it inevitably damages the steel piping that comprises a large portion of the Upper Silesian system. This is exacerbated

by production cycles in heavy industry, which dominates in the region. During periods of reduced manufacturing output, water flows through the network decrease. The water volume and speed often drop to a required working minimum, heightening precipitation and encrustation of the steel pipes.

Another region-specific issue affecting the network is mining damage. Upper Silesia is the main coal basin in Poland. In 2019, there were almost 20 active mines in this region, with almost 60 active as late as 2015. The centuries old tradition of mining in the area has had significant and long-lasting consequences for the environment. Mining activity routinely causes rock mass deterioration and instability. The secondary effects include deformation of land surface, changes in groundwater levels and occasional tremors. This puts enormous pressure on underground pipelines and makes renovation especially challenging.

## PE pipe does it all

All this had to be considered when an important two-kilometre segment of the DN1,600mm water main came up for repairs in

2019 due to massive corrosive damage. The pipeline's extension joints had also been damaged by subsidence in an active mining area. The main is situated between the Paprocany pumping station in Tychy and the reservoirs on Wanda Hill in Katowice. Although relatively short, it is a key route in the network, providing between 90 and 110 million litres of water to almost one million residents every day.

In Poland, land disturbance caused by mining is divided into five classification categories: 1 indicates mild changes to terrain, while 4 and 5 point to severe damage. The latter categories mean that the area is potentially hazardous to further extraction activity and to the safety of building objects on surface level. The renovated section of the pipeline lies within the perimeter of ongoing mining activity from the Murcki-Staszic mine and is classified as Category 3 in terms of land disturbance.

"It was definitely a difficult terrain for this type of installation," says **Piotr Nowacki**, Site Manager on behalf of Tolos, the general contractor for the project.

Due to the challenging conditions and the need for fast installation, a decision was made to use PE-HD

pressure pipes manufactured by Uponor Infra. In total, Uponor delivered 719 metres of PE pressure pipes PE100 DN1,400mm and 1,172 metres of PE pressure pipes PE100 DN1,300mm for the project.

Flexible and durable, PE pipe is perfectly suited for installation in demanding hydrogeological conditions as it guarantees exceptional reliability and long life for an underground pipeline. The "superpipe," as it is sometimes referred to at Uponor, is resistant to corrosion, chemicals and damage by abrasive transported media. It's also resistant to hydraulic shock and has a low roughness coefficient (k). GPW, the pipeline's operator, certainly appreciates the benefits of PE pipes.

"The PE-HD technology used in the renovation guarantees that the pipeline will withstand mine subsidence as well as ongoing mining extraction operations. This technology ensures the long life of our pipeline," says **Henryk Drob**, CEO of GPW.

## Going to great lengths

Initial plans for the renovation were based on open-trench technology. However, this would have required the exclusion of portions of land from forest production (the land belongs to State Forests), which would have delayed the project by three to four years. For this reason, a decision was made to carry out the renovation by means of long length relining. This technology allowed for the introduction of long sections of the new pipeline in one go and assured safe and easy installation in challenging terrain.

The task was to reline the old steel pipeline DN1,600mm with new PE-HD pipes DN1,300 and 1,400mm. The larger diameter pipes were installed along a 719-metre section, while the smaller diameter ones were used to reline 1,172 metres of the old channel.

Pipe deliveries were carried out by Uponor from May to November 2019. The pipes were manufactured in 15-metre sections and joined at the installation site by means of extrusion butt welding, which guarantees a leak-proof and monolithic pipeline. The new pipes were slipped through starting trenches using a hydraulic machine exerting a pulling force of 190 tons. The biggest challenge of the installation was the pulling of a

single 1,172-metre section of the pipe into the old steel casing. Thanks to PE pipes' smooth outer surface, monolithic joints, flexibility and low weight the operation was a success, setting a new Polish length record for relining with the DN1,300mm pipe.

"The use of relining made it possible to shorten the design process by a few years and allowed for savings of at least 20–25% in terms of project costs," points out **Henryk Gawel** of HMG Ltd., Engineering Designer for the renovation.

**Edyta Zalewska**, Sales Director at Uponor Infra, stresses that the PE-HD technology will ensure trouble-free functioning of the system for several decades. The new installation took over all the functionalities of the old main. It's an excellent example of a circular economy solution – the products and materials are high in value, so the goal is to implement lasting, efficient solutions rather than interim ones.

"We're pleased to have been part of such an important investment. On the one hand, the use of DN1,600mm for the renovated pipeline was quite impressive. On the other, the sheer length of the pipes used in the project was remarkable, especially when one considers that the installation took place in an active mining area," says Zalewska.

Slowly but surely most of the water and sewage networks in Europe that were originally made from concrete, steel and cast iron are nearing the end of their service life. The need for innovative, efficient and longer-lasting solutions is greater than ever. That is why renovation – instead of replacement or repair – is increasingly the method of choice for both investors and contractors. GPW has already rehabilitated over 15 per cent of their system through relining. Environmental protection is another consideration. Engineering projects need to address not only existing environmental challenges but also the long-term impact of the new proposed technologies. The highest marks given to PE-HD and Uponor Infra's service on the Katowice project once again prove that the company is the perfect partner for up-to-the-minute projects. ■

## PROJECT FACTS

- » **Project:** Renovation of a water main
- » **Products:** PE pressure pipes:  
PE100 DN1,400 x 53,5 PN6,3 SDR26  
PE100 DN1,300 x 77 PN10 SDR17
- » **Construction technology:** Relining
- » **Customer:** Silesian Waterworks PLC (GPW)
- » **Contractor:** Tolos

# A WIN-WIN SOLUTION

A great deal of sewer and stormwater work is required to prepare former farmland for industrial use in Ishøj, southwest of Denmark's capital Copenhagen. Uponor IQ pipes will play a major role in the extensive work and ensure a robust and durable system for the reformed area and its 16 new lots.

**A** new industrial area, Pilemølle Erhverv, has been established between Copenhagen and Ringsted due to railway construction. The area was previously used for agriculture – but when the railway split the area in two, it became obvious that the land next to an existing industrial site should also be used for commercial purposes. Ishøj Municipality and the utility company Ishøj Forsyning are now preparing the area with stormwater pipes and sewage pipes. Stormwater tanks will be built south of the industrial zone in a recreational area. These tanks will retain stormwater before releasing it into the nearby Vejleå river.

## Long lifespan is key

The project originally planned to employ a concrete solution. But together with the contractor Gorm Hansen A/S, Ishøj Forsyning quickly became convinced of the benefits of plastic material for both the stormwater pipes and sewage pipes.

Ishøj Forsyning had various strong arguments for a solution using plastic pipes. Durability and a better work environment were important considerations, but the financial benefit of using plastic pipes with a longer lifespan was a crucial deciding factor.

“The choice between plastic, fibreglass and concrete is always a balance between budget, work environment, timetable and physical conditions. And obviously, overall economy is always a major factor,” says **Peter Dreier**, Engineer at Ishøj Forsyning.

“We’ve used plastic pipes in several of our projects with good results.”

Construction company Gorm Hansen A/S is the main contractor on the Pilemølle Erhverv project. Department Manager **Jacob Nielsen** lists several benefits of using plastic pipes for large-scale sewer and stormwater works: “Plastic pipes have a very long service life, and

they are easy to work with, as they are just one-tenth the weight of concrete pipes. This saves both machine and labour resources. An added challenge in Pilemølle Erhverv is that the work site is close to a large road, with a lot of large supply lines and cables running underneath. To get under these, plastic pipes offer the most flexible solution.”

## Flexible IQ pipes for complicated pipe-laying

The product chosen for the project was the durable and flexible Uponor IQ piping system. Uponor has supplied a total of 990 metres of IQ stormwater pipes in dimensions ranging from 400mm to 800mm for the project.

Plastic pipes are easy to work with, as they are just one tenth the weight of concrete pipes.

“Uponor IQ pipes will play a major role in this extensive work and ensure a robust and durable sewerage system,” says Jacob Nielsen.

According to Nielsen, the characteristics of the compatible IQ piping system, in particular, are attractive. Installation is easy thanks to the ability to combine the sewage pipes with wells, in addition to the low weight of the pipes.

“At this time of year in particular, when the weather can be a challenge, our people on site are delighted to have such an easy pipe to work with,” says Nielsen.

Gorm Hansen A/S has plenty of experience in installing plastic pipes. Although Nielsen used to be somewhat sceptical about using plastic pipes for sewerage, the development of products and methods has proven that plastic is absolutely on a par with other materials. The Department Manager can therefore also count on a high-quality end result in Ishøj.

“I fully expect us to finish the project with the same quality we’re already renowned for, and with a sewerage system the client will benefit from for many, many years to come,” Jacob Nielsen concludes.

Peter Dreier of Ishøj Forsyning expects the finished project to be a win-win-solution: “If both the construction company and the client have achieved a good result thanks to the chosen solution, it’s a success. Ishøj Forsyning anticipates a smoothly functioning pipe network, one that will prove its value over time.” ■

A 25-tonne section of the 2,200-metre-long pipeline was lifted into position by a crane on a construction site.

# Retaining THE BALANCE

In an effort to finally end its problems with cyclical flooding, the city of Mielec in southeastern Poland undertook one of its largest investments to date. A new stormwater system with a battery of high-volume Weholite retention tanks will manage excess stormwater and store it for future use.

In recent years, Poland has been experiencing a new and troubling weather pattern of alternating flooding and droughts. It's a paradox brought on by climate change. On the one hand, we are seeing a significant increase in torrential rain – on the other, persistent depletion of surface water. Urban flooding during extreme rainfall is closely linked to the growing number of impervious surfaces like roads, parking lots, and sidewalks in our towns and cities. Forest and farm land are also subject to urban expansion, which amplifies the problem. Instead of infiltrating into the soil, water runs off the ground, resulting in lower water tables, less moisture in the topsoil and, consequently, droughts. When heavy rainfall occurs, it has a limited ability to penetrate the sealed ground and flows freely through roads and streets, accumulating in low-lying areas.

Ineffective or outdated stormwater systems are unable to drain massive water volumes, which leads to flooding with disastrous consequences.

## No more flash flooding

For years, the residents of Mielec have been grappling with cyclical flooding in the city centre. Intense storms have regularly caused flash floods, cutting off roads, paralysing traffic, and spilling into basements and garages. Firefighters tirelessly pump out the water and the city and its inhabitants count their losses. In order to finally solve this issue, the municipality decided to build a battery of high-volume retention tanks. The project – called “Construction of a storm and melt water retention system in the municipality of Mielec” – is one of the largest in the city's history. Valued at over EUR 7 million, it's co-financed by the

EU's Operational Programme Infrastructure and Environment as part of the climate adaptation objective. It proposes the construction of a new stormwater system along with manholes, retention tanks as well as a pumping station with power supply connection and a control system. It also includes the construction of parking areas and ground preparation for future sports fields at the surface level.

## Reliable PE-HD meets the requirements

The investment was divided into three stages, covering areas of the city at the biggest risk of flooding. The first contractor agreement was signed in September 2019 and work on-site began in October. Uponsor Infra was asked to deliver the retention tanks for the project. Stormwater retention tanks, made using the

Weholite piping system, are one of the company's flagship products. The layered structure and welded joints ensure their flexibility, tightness and durability. They are also highly resistant to soil sedimentation, chemicals and damage by abrasive transported media. Other benefits include low weight as compared to tanks made from other materials available on the market and easy handling and installation. Depending on the available space and design requirements Weholite tanks can be manufactured in custom shapes and sizes, complete with fittings. A typical tank is a single-body structure but it is possible to join tanks into batteries of virtually any capacity, just like in Mielec. Tanks are available in inner diameters of 1,000mm up to 3,000mm, with ring stiffness of SN2 to SN10 which makes them perfectly suited to demanding applications, for instance under communication routes. The smaller tanks can be prefabricated and delivered installation-ready, saving work stages and time on-site. These are significant advantages, especially in city projects where customised solutions are often indispensable because of space requirements and tight schedules.

## Installation ready way ahead of schedule

The first stage of the project was planned between Solskiego and Kusocińskiego, two streets near a football training ground. The design called for long tanks measuring 110 metres, 90 metres and 50 metres, which made them too large to prefabricate. For this reason, the elements for the tanks were transported to the construction site in sections of up to 15 metres. Uponsor Infra made its first delivery of tanks and fittings in November 2019. The elements were lowered into the trenches by crane and extrusion welded by Uponsor Infra's service team. This stage of the project produced two batteries of Weholite retention tanks SN10 DN 1,000mm: a battery of 10 tanks, with a total length of 110 metres, and a battery of six tanks



The installation was finished an impressive three months ahead of schedule.

third and final stage of the project, located on a popular housing estate, are planned for September 2020.

## A retention system of any capacity

The investment has so far produced three batteries of retention tanks with pumping stations able to contain 4,000m<sup>3</sup> of stormwater. During intense storms the system will prevent excess rainwater from blowing up manhole covers and flooding the city's streets. Instead, the water will flow into the new tanks. After the rain stops, the

water will be pumped out and transported into a collector.

The main objective of the Mielec investment was to eliminate flooding but the municipality is already considering uses for the captured stormwater. Ideas include watering the city's parks and local sports pitches. In fact, use of retained precipitation is becoming a matter of necessity. According to the Polish Institute of Environmental Protection, Poland's surface water resources amount to 1,600m<sup>3</sup> per inhabitant per year while the European average is 4,560m<sup>3</sup> per inhabitant, which is almost three times as high.

Improving water retention is a crucial part of our effort to fight climate change: mitigate the impact of droughts and prevent cyclical flooding. Weholite retention tanks are ideally suited to the task. Lightweight, durable, tight and environment-friendly, they can be manufactured to create a retention system of virtually any capacity. Designed as a module technology, they can be customised to accommodate the most demanding installation conditions, soil characteristics and surface loads. Moreover, supplementary control systems can easily be installed inside the tanks to help manage retained stormwater and use it for purposes such as flushing toilets in buildings, watering green areas, washing roads and sidewalks, and supplying water for pressure wash vehicles. Pressing issues call for fool-proof solutions and Weholite tanks certainly meet the brief. ■

# Uponor

## How often do you want to dig here?



## Use your IQ

Keep in mind that the stormwater pipes you dig down need to work for a long time. Pipes may look the same, but if you look a little closer you'll notice big differences in quality and functionality. For example, ours can last more than a hundred years and are certified and tested in accordance with Nordic conditions.

