Holywell Row Stormwater Storage

five interconnected rows of Weholite pipe designed to capture stormwater before gradually release it back to a pumping station when conditions stabilise

by Anglian Water's @one Alliance

Anglian Water

Holywell Row is a village in the Mildenhall area of Suffolk in the east of England. The Street, a key residential area within the village, is home to families and businesses who have weathered years of infrastructure challenges. Anglian Water are always committed to supporting these communities and ensuring their essential services are resilient to change. In Holywell Row, this means addressing the persistent issue of flooding caused by an outdated sewerage system.

Installation of the five rows of 1500mm diameter Weholite pipes within the cofferdam - Courtesy of Anglian Water's @one Alliance

The issue

For over past five years, residents of The Street have endured frequent flooding events. Prolonged rainfall overwhelms the receiving outdated sewerage system, leading to external flooding affecting 18 properties and a vital highway. Two properties have borne the worst of it, suffering 11 and 9 flooding incidents respectively in this period.

Contributing to the issue are occasional pump blockages and pumping station (PS) failures. At the heart of the problem is the undersized Eldon Lane Pumping Station in Holywell Row, which cannot handle the increased flow from upstream pumping stations during storms. With climate change amplifying the frequency and severity of rainfall, this incapacity poses a growing risk to residents and infrastructure.

The solution

Anglian Water, as part of its commitment to delivering resilient and customer-focused services, tasked @one Alliance to implement a comprehensive solution to mitigate flooding risks in Holywell Row. The proposed measures were designed to address the root cause of the issue while ensuring long-term sustainability and adaptability. The initial consideration was to install a new rising main from The Street Pumping Station directly to the terminal pumping station; bypassing three smaller pumping stations on The Street and Eldon Road. However, the solution revealed several challenges, including the need to upgrade pumps at Holywell Row No. 2 Pumping Station to manage the increased pumped total head, crossing the Exolum oil pipeline three times, and navigating permissions for work near the RAF base at Mildenhall. The route also passed through areas of high archaeological interest and posed significant disruption to a nearby business park. These risks, combined with a high project estimate, led us to revisit previously discounted options to identify a more feasible and cost-effective solution.

Therefore, the resulting solution the team implemented was an advanced off-line attenuation storage system connected to the upstream pumping station; Holywell Row No. 2 Pumping Station.

This robust design incorporates five rows of 1500mm diameter Weholite pipes, each 45 meters long from SDS Limited. Together, these pipes provide a total storage capacity of 390 cubic meters.

During storm events, the system captures excess flow that would otherwise overwhelm the existing sewerage network. Once the storm subsides and water levels return to manageable levels, the stored flow gravitates back to the pump station, ensuring a controlled and gradual return of water to the system. This storage system is connected to the pump station through a 500mm diameter concrete link pipe.

To optimise functionality, a new level sensor has been set up at the Holywell Row No. 3 Pumping Station. The sensor inhibits pump operation during peak flows, redirecting water into the storage system. This automated process ensures the network is not overloaded while maintaining a steady and efficient return flow after storm conditions abate.

To ensure the seamless operation of these systems, significant upgrades have been made to the pump and sensor technology at The Street Pumping Station. The motor control centre (MCC) has been modified to incorporate a pump inhibit control system, enabling precise regulation of pump activity during storm events. A new level sensor has been set up at Holywell Row No. 3 Pumping Station to continuously monitor flow levels and optimise the pumping regime.

These upgrades have enhanced the responsiveness and efficiency of the system, reducing the risk of overloading while maintaining operational stability.

Finally, the design includes measures to improve system ventilation. A 160mm PVC vent pipe and a dedicated vent chamber have been incorporated to support the attenuation storage system. This ensures proper airflow and pressure regulation, maintaining the performance and longevity of the infrastructure. By addressing potential pressure issues proactively, this enhancement helps ensure the storage system operates at peak efficiency, even under challenging conditions.

Holywell Row Stormwater Storage: Supply chain - key participants

- **Client**: Anglian Water
- **Project design & delivery**: @one Alliance
- **Temporary works/shoring**: Groundforce
- **Weholite stormwater storage pipes:** SDS Limited
- **Motor control centre**: Paktronic Engineering Co Ltd
- **Plant hire**: Mervyn Lambert Plant Ltd

The benefits of this solution

The proposed measures deliver both immediate and long-term benefits to the community and infrastructure, addressing key challenges while creating a foundation for future resilience.

One of the most significant advantages is the reduction of flood risk. The newly implemented attenuation storage system directly addresses the flooding issues affecting the 18 properties and the nearby highway. By capturing and temporarily holding excess stormwater, the system prevents water from overwhelming the sewerage network. This ensures that residents experience fewer flooding incidents and a marked reduction in the severity of such events, fostering a sense of security within the community.

The enhancements also contribute to infrastructure resilience. By resolving the capacity limitations of the Eldon Road Pumping Station and bypassing the inundated existing sewer system, the upgraded sewerage system is now better equipped to handle peak flows during extreme weather events. These improvements significantly reduce the likelihood of system failures, ensuring reliable service even under challenging conditions.

The solution also incorporates a forward-looking approach to climate adaptation. By designing the system to manage a 1-in-30-

The cofferdam - Courtesy of Anglian Water's @one Alliance

Weholite pipe installation - Courtesy of Anglian Water's @one Alliance

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year storm event with allowances for climate change, the project ensures the infrastructure remains robust and functional as weather patterns continue to evolve. This proactive planning underscores a commitment to long-term sustainability and adaptability. In addition, the capital carbon reduction of 81% was achieved by using carbon-friendly materials and by removing the need to install a new pumping station and a 2.9km pipeline.

The use of Weholite pipework in the attenuation system further enhances the project's longevity and cost-efficiency. With a life expectancy exceeding 120 years, this durable infrastructure minimises the need for frequent maintenance and replacements. This long-term reliability translates into significant cost savings over time, benefiting both Anglian Water and the community it serves.

From an economic and social perspective, the project represents a substantial investment of £1m into the well-being of Holywell Row residents. The reduction in flooding incidents decreases the financial burden of repair and recovery for homeowners while minimising disruptions to daily life. These improvements enhance the overall quality of life and support the local economy by preventing costly damages.

Lastly, the project demonstrates environmental benefits by managing stormwater more effectively. By reducing the frequency and impact of flooding, the initiative helps protect local ecosystems and minimises the environmental consequences of stormwater runoff. This holistic approach ensures that the community's needs are met while preserving the natural environment for future generations.

Working with the community

In addition to the large-scale infrastructure enhancements, Anglian Water has implemented community-focused measures to reduce the impact of rainfall at the household level. Through these, water butts have been offered to residents in the 18 affected properties. These water butts provide a simple yet effective method for homeowners to manage rainfall and reduce surface runoff. By reusing rainwater for non-potable uses such as gardening, residents can decrease the volume of water entering the sewer system. To date, 15 waterbutts have been supplied, as agreed with the customers. This initiative not only mitigates flooding risks but also fosters sustainable water management practices within the community.

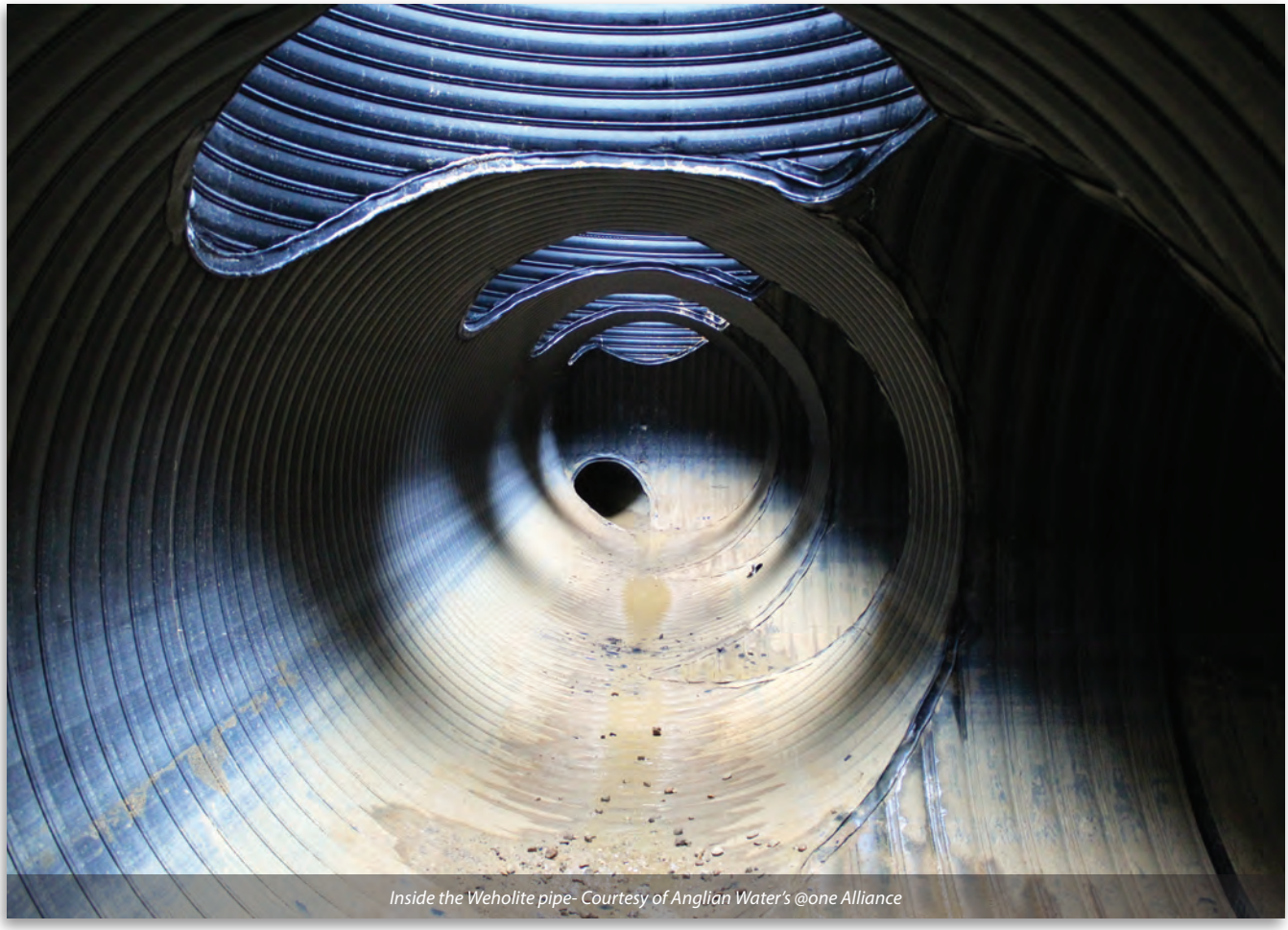
Conclusion

Anglian Water's mission is to deliver reliable, sustainable water management solutions that meet the needs of our customers and the environment. The flooding challenges at The Street, Holywell Row, highlight the importance of investing in infrastructure that can adapt to modern demands. This project exemplifies Anglian Water's commitment to resolving systemic issues, empowering communities, and preparing for the future. By combining innovative engineering with community-focused initiatives, they are not just solving today's problems, but are laying the foundation for a resilient tomorrow.

Together, with the residents of Holywell Row, Anglian Water's @one Alliance have provided a solution that protects homes, supports livelihoods, and ensures that life flows smoothly, even in the stormiest of conditions.

The editor and publishers would like to thank Anglian Water's @one Alliance for providing the above article for publication.

The @one Alliance is a collaboration of eight partner companies that each provide specialist knowledge allowing the Alliance to deliver complex delivery projects in the most efficient way, reducing the cost to Anglian Water's customers. The partners are Anglian Water Asset Delivery, Balfour Beatty, Barhale, Binnies, Mott MacDonald Bentley, Sweco, Skanska, and MWH Treatment.



Inside the Weholite pipe- Courtesy of Anglian Water's @one Alliance