

ENCOURAGING SUDS IN COMMUNITIES AND TACKLING WATER SECTOR DRIVERS THROUGH COMBINED EXPERTISE



How many career paths allow you to use your ingenuity, knowledge, and passions to protect the environment around you? How many let you create solutions lasting generations that tackle urgent societal concerns? Engineering in the water sector allows us, as industry professionals, to design and implement solutions that positively impact our communities.



by Jordan McMullan
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The public concerns, growing pressures, and legislative change we're seeing around storm overflow discharges is forcing change in the sector. As engineers, we must use our expertise deployed through engagement, listening, and learning to support our industry in rolling-out innovative solutions that help create climate resilient communities and protect the environment.

While there has been significant investment in the water industry since privatisation, the amount of new investment needed to fulfil the obligations of the Environment Act in England is unprecedented for the sector,

and it's not an easy fix by any means. We need cross-sector collaboration and deep knowledge sharing to be front-and-centre of our efforts, harnessing ideas that are then backed up by robust evidence, pushing the envelope in surface water and wastewater management. These requirements are applicable throughout the United Kingdom and Ireland.

Good enough for today, just isn't good enough for tomorrow. The infrastructure and solutions we put in place now not only need to improve resilience and water quality, but they must also leave a long-lasting and positive legacy.

The place of SuDS in the challenge of overflows

While new developments are required to include separated surface water and foul drainage, many parts of the UK have combined sewers, meaning that foul flows from toilets, sinks and baths mix into a single pipe with runoff from rainfall. It then becomes the responsibility of the water company to convey and treat all of that mixed flow, even though, during rainfall events the majority of flow can be surface water runoff from roads, roofs, and any overland flow that finds its way into the combined sewer.

By managing surface water entering the combined system either through full disconnection, i.e. rerouting flows to a watercourse, infiltrating surface water into the ground, or by slowing the flow entering it, we can have a positive, measured impact on storm overflow discharges. Crucially when we do this, we also need to consider controlling the flows within the combined sewer to maximise use of existing assets.

Traditionally, we would use sewers and tanks to direct and store excess water, dedicating significant land parcels to concrete solutions, and increasing the requirement to treat more water. While these schemes will be unavoidable in some instances – large infrastructure issues require large solutions – we're already seeing some fantastic results and societal gains by managing water using nature-based solutions including SuDS (Sustainable Drainage Systems).

Time and again, we've seen these environmentally enhanced projects provide multiple benefits such as improved biodiversity, community wellbeing, and even traffic calming, alongside flood prevention and overflow spill reduction. But what does deployment of SuDS look like at scale? What are the challenges and obstacles standing in our way? What are the true long-term costs, carbon reduction possibilities, timescales, and opportunities we will need to grasp if we make greater use of nature-based SuDS?

At Stantec, we're now helping answer some of these questions as we lead a UK Water industry Research (UKWIR) project: Understanding the long-term costs and wider benefits of surface water removal using SuDS to tackle sewer flooding and storm overflow operation.

The aim of this project is to create an evidence base for UK and Ireland practitioners with a supporting costing and carbon tool to give the water industry and other stakeholders confidence to promote and deliver SuDS. Working with our partners, HR Wallingford, Gardiner & Theobald, and ICS Consulting we're also exploring how to model SuDS to understand hydraulic performance, what the impact on water quality would be from SuDS and surface water discharges, and the key deliverability issues with retrofitting them.

What we're doing

Using a bottom-up costing method, we're triangulating cost and carbon estimates against industry data of built schemes, providing whole life (capital and operational / maintenance) cost and carbon models for a range of SuDS features, including rain gardens, swales and attenuation basins.

We know the delivery timescales for these retrofit projects tend to be longer than traditional solutions because of the many stakeholders involved, and a greater need for community conversations to outline benefits around performance. Retrofitting SuDS poses different challenges to integrating into new build developments.

This project is unearthing these challenges and lessons around key deliverability issues faced when retrofitting via case studies and historical accounts (through conversations) from those involved in the delivery of SuDS. For example, considerations for soil types depending on location of the feature such as additional complexities with soil types for highway SuDS.

We're also considering the hydraulic performance of SuDS, looking at how we can model interventions using the typical industry simulators to represent features in the network. We're intending on presenting case studies that show how we utilise models to direct our tactics and controls in the sewer network and the impacts upon hydraulic conditions.

The research will provide the opportunity for clarity on the practical and deliverability challenges to retrofit and what this means through the lens of the multi-billion-pound programmes being proposed over the next 5 years, and beyond.

The insight from this UKWIR project will directly benefit water companies, and other stakeholders, such as regulators, local authorities, community interest groups, and campaigners helping them promote SuDS with confidence.

The work programme

The UKWIR project is a multi-phase study which started in January this year and has a yearlong programme, with the results being published in a report in early 2024. The report will contain a range of regulatory and policy recommendations which will help facilitate the delivery of SuDS, as well as an innovative estimation tool.

Making the most of our combined expertise

Knowledge sharing and collaboration is at the heart of this UKWIR project, at Stantec, we're proud to be leading a team of dedicated experts. HR Wallingford is helping to understand how to model hydraulic performance, and also advise on policy and regulatory matters.

Gardiner & Theobald is involved as cost consultant providing assurance around the assumptions that underpin the costing tool. The Project Steering Group also includes representatives from 13 sewerage companies across the UK and Ireland.

Better design coupled with innovative engineering is the answer to many of our challenges today and I'm proud to be working in such a progressive and dynamic industry.

We know we can't simply use traditional methods to build our way out of the huge infrastructure issues we face as a global community. As an industry, we need to work together, gather evidence, embrace nature and promote solutions that we know have multiple benefits to improve the communities we all share.

To find out more about career opportunities in Stantec water teams, scan the qr code to see the latest vacancies.



To find out more about UKWIR, visit www.ukwir.org.