Case Study

Smarter Drop Street, Newmarket

SDS smart rainwater harvesting system addresses water scarcity and flooding

SDS Products
SDS Intellistorm® Rainwater Management System and SDS SYMBiotIC™.

SDS Customer
Anglian Water.

Client
Residential properties on Nat Flatman Street, Newmarket.

Project
Part of Anglian Water's 'Smarter Drop Street' pilot project to research retrofit solutions to drought and flooding.

Purpose
To identify practical, cost-effective and efficient ways to address the impacts of climate change and human behaviour on water availability, surface water flooding and environmental pollution.

Brief to SDS
To install, monitor and assess residential rainwater recycling systems.

Timing
July 2019 – Dec 2022
(project extended by COVID-19 pandemic).

Project Background Information
East Anglia receives roughly a third less rainfall than the rest of the country. The incumbent Water Company, Anglian Water, is working with more than 100 partners on 62 different projects to save water, fix problems before they happen and help protect the environment.

Anglian Water selected Nat Flatman Street in Newmarket as a typical, terraced street of the area, that has limited space outdoors and is connected to combined sewer networks. Anglian worked with Groundwork, a social enterprise NGO, and SDS to engage with and encourage residents to have a smart rainwater harvesting tank installed.

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Part of SDS Water Group

Company Registered in England & Wales. Registered Number: 04433740

Project Objectives

To establish the impact that property-based rainwater capture and retention can have on drought mitigation and flood risk prevention.

Project Requirements

To trial and test the appeal, delivery and operation of smart water tanks in a dense urban environment and complete an assessment of their performance and impact.

To carry out a cost benefit analysis comparing this smart tank-based approach with more traditional, 'dumb' rainwater harvesting systems.

SDS Product Features

SDS equipped a standard water tank with a small control box which enables communication between the tank and SYMBiotIC™, SDS's rainwater management measuring and reporting platform. Using SDS Intellistorm® the system calculates the required tank volume based on each forecasted rainfall event and releases water from the tank until it reaches the required capacity level. The tank is then able to attenuate all or part of the ensuing rainfall. The software version currently available ensures that the weather forecast is checked every six hours and the relevant adjustments automatically made.

These "first-generation" smart water tanks are mains-powered, which increases installation time but ensures a very stable power source, and comprise of a strong, 270 litre capacity, slimline, rectangular tank which can be fitted neatly alongside walls and fences, for example, in gardens or other outside areas where there is limited space available.

Issues Overcome

This community-based, distributed attenuation project was delivered during and despite a pandemic.

Any barriers to public engagement associated with the nature of the chosen street, including high levels of rental and transience and low use-case due to small/ paved gardens, were addressed.

Stakeholder Engagement

Groundwork, Anglian Water and SDS worked together to generate interest and enthusiasm for the project, achieving a take-up of 22% following completion of surveys.

Results

Across 13 sites, smart water tanks with a total storage volume of 3.5m^3 were installed, attenuating roughly 520m^2 of impermeable (i.e. roof) area.

Overall, throughout the analysis period, approximately 40m^3 of stormwater was attenuated in the smart tanks, or about 25% of the rainfall; this represents more than eleven times the volume of the tanks installed.

Over 29m^3 of collected rainwater was pre-emptively released in advance of storms by the automated control process, thereby increasing the volume of stormwater attenuated. Improvements made during the project to the weather-based predictive control algorithm resulted in a 50% increase in the average volume of water discharged.

A cost-benefit analysis has shown that this smart rainwater management system, in a relatively early stage of technological development, significantly outperformed traditional water butts in terms of the effective cost per cubic metre of stormwater attenuation.

Andy Bird, Lead Asset Planner – Water Recycling Infrastructure, Anglian Water Services, said: *"We're working with the best and brightest innovators and technology to make the water and water recycling network smarter, by saving water, fixing problems before they happen and protecting the environment. Our key goals include zero flooding and pollution and reducing customers' water usage to record lows of 80 litres per person per day.*

The 'Smarter Drop Street' project is one of the UK's first comprehensive trials of retrofitted smart water tanks that will help us achieve these aims."

L to R: Nat Flatman Street property frontages and example rear garden smart tank installations.

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