

# Woolley Road Sustainable Drainage System flood protection in Maidstone has less impact on the environment

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**T**he Woolley Road Sustainable Drainage System in Maidstone was designed to resolve flooding brought on by storms. During such events, the existing combined sewer and stormwater systems could overflow, flooding a handful of properties in a low-lying area. This scheme formed part of Southern Water's AMP4 hydraulic overload flooding programme. Typically, a resolution is provided by means of either underground storage, pumping stations or the upgrade of existing infrastructure. Here, the project team was able to think outside the box as the site was in a built-up suburban area.



Detention basin

Courtesy of 4Delivery

To the south of the flooding location was a Greenfield area with a combination of natural flora and overgrowth with a scattering of trees. This created the opportunity to look at adopting a Sustainable Drainage System (SUDS) solution. After consultation with the Environment Agency and the local council, a proposal was developed to utilise the land and its natural landscape to form a combined infiltration detention basin that would retain and treat any 'overflow' spill from the existing stormwater system. A conventional overflow chamber was built on the stormwater line to discharge excess flows into the basin, preventing flooding of the properties.

Flooding from the combined system would be resolved using a conventional offline, gravity fill, gravity empty detention tank.

## A more sustainable outcome

The idea of a SUDS solution is far from new. It is popular in Scotland

and America but in England many clients still opt for the more conventional solution. With the ever-growing burden of operational costs and the need to reduce carbon emissions, clients are more willing to look at these types of solutions. SUDS solutions, such as the one adopted at Woolley Road, encourage environmental progression and have less impact on the environment. The project had visual, ecological and recreational benefits.

The SUDS solution also eliminated the need to build additional infrastructure. The original and more conventional solution involved the installation of an underground storage tank combined with a pumping station and rising main for return flows. The site would have needed major excavations, with potential loss of flora and fauna.

The SUDS solution alternative comprised an earth-formed embankment which would be grassed-lined. The detention basin was



Woolley Road Land Reserve – Future SUDS Site

Courtesy of 4Delivery

in a dense area of shrubs and trees so maintenance would be minimal but it would still have to be cleaned to ensure it would operate as designed, especially the inlet and outlet pipes. Comparing a routine clearance of the basin to routine maintenance of a storage tank/pumping station and apparatus it was clear the lifetime cost would be significantly lower for the SUDS option.

Apart from minimal construction, this solution was constructed entirely from natural materials mostly from site. The embankments were from a combination of cut material and excess material from the installation of pipes. The rock filter and benching came from off-site. The only material that had to be exported from site was the surplus excavated material. Soils and rock must meet a certain quality and grade to be suitable for filter material so, unfortunately, not all material could be recycled. The carbon footprint was minimal compared to the traditional construction, as very little concrete and steel were used, no electricity was required for the running of the solution, and the construction involved significantly less plant machinery hours.

#### Business case for sustainability

The dry bed detention basin was more pleasing on the eye than the former weed-infested slope - and far better than a 12m diameter concrete tank under the ground. The client can also use this project as an educational example to local schools and universities.

From an MWH perspective, a project like this opens new doors and creates greater opportunity. The client will look at future opportunities to complete similar schemes. There is a huge potential for them to save money and reduce their carbon footprint.

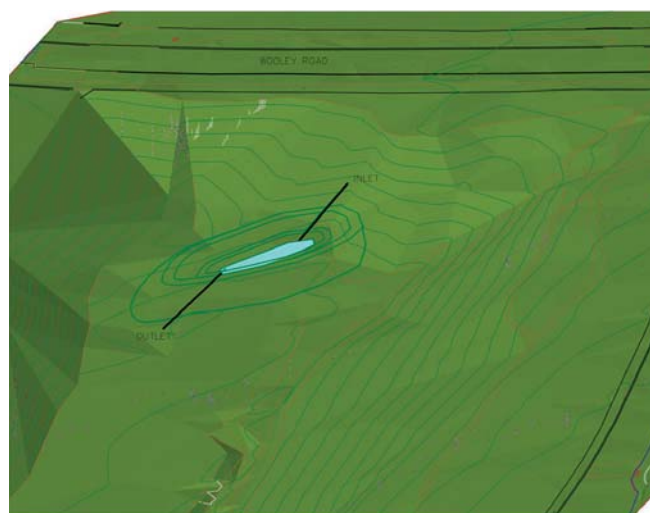
#### Driving change

This project was the first 4Delivery solution, using the concept of stormwater overflow, redirecting it, treating it, and expelling it into green fields. With the success of this project we have turned our attention to lessons learned. Early identification of the solution type was key as these types of solution required considerable more third party engagement. 4Delivery used a decision matrix during the project scoping phase to identify potential solutions. A series of

“trigger” questions were used to identify the front runner solutions. As a result of the work at Woolley Road, 4Delivery updated its decision matrix for flooding projects. Use of 3D visualisation also proved an invaluable tool in communicating both internally and externally. One positive outcome from the project was the willingness for all parties involved to back the sustainable solution. Not only was the risk of property flooding in the area decreased but Southern Water and 4Delivery helped to enhance the natural habitat for all.

4Delivery (4D) is a consortium comprising United Utilities, Costain and MWH, and is carrying out a programme of environmental improvement and water quality schemes for Southern Water until 2015. The improvements are taking place across Kent, Sussex, Hampshire and the Isle of Wight.

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3D Visualization of SUDS Detention basin

Courtesy of 4Delivery