

Retrofitting Sustainable Urban Drainage Systems to industrial estates

Summary report available at:
crew.ac.uk/publication/retrofitting_SUDS



Executive Summary

Research aim

Industrial estates are a well-recognised cause of pollution and Sustainable Urban Drainage Systems (SUDS) have been identified as an important option to address the pollution risk (Kim *et al* 2018, D'Arcy *et al* 2018). This study aimed to investigate the potential for retrofitting SUDS on industrial estates in order to try to reduce pollution of watercourses.

Background

As part of the Scottish Government strategy to manage diffuse pollution (WEWS Act 2003), Ministers directed Scottish Water to implement a capital programme of retrofits for some industrial estates where evidence suggested the surface water discharges had an impact on the quality of the receiving waters. Subsequent investigations by Scottish Water as part of their Quality & Standards investments, in collaboration with SEPA, found serious constraints in many situations for retrofitting adequate size end-of pipe solutions. Therefore, the project reported herein focused primarily on source control SUDS, or at least SUDS on an individual property basis, as well as conveyance types of SUDS¹.

Research undertaken

The principal research site was Houston Industrial Estate, Livingston, which has over 100 businesses (exact numbers and businesses change over time) and includes major, extensive factory premises, as well as intermediate-size factory premises and many small industrial units typically managed by a landlord or agent. In addition, one sector of the estate has been redeveloped since the statutory requirement to use SUDS technology was established in Scotland. That allowed the project to assess the maintenance of the SUDS installed at that time (largely permeable paving) as well as the SUDS awareness of those businesses (mainly commercial, but including one industrial site).

The research methods included:

1. An initial SUDS awareness survey conducted via in-person visits and a written survey.
2. Verification visits to investigate answers given by respondents concerning the presence of example SUDS features on their premises.
3. Detailed follow-up with several premises to explore barriers and opportunities to retrofitting SUDS in their specific circumstances.

4. A breakfast seminar and focus group at which participating businesses could focus on the project aims and offer input without the pressure of an official survey.

Key findings

Over 100 addresses were contacted at Houston Industrial Estate (HIE) and 65 responses were obtained. Of those, 13 claimed to have 3 or more different types of SUDS on their premises. Follow-up visits failed to verify those claims. The only common type of SUDS found in reality was permeable pavement, which has been extensively used for newer areas of car parking. Three examples of genuine filter drain features were also found (each on a redeveloped industrial site out with the commercial sector). It became very clear that there was extremely limited awareness of the various types of SUDS available to a business or a developer. That was not surprising given the nature of the businesses (not generally involved with drainage infrastructure or environment). The permeable pavement areas were often used to accept runoff from conventional sealed tarmac road surfaces; in almost all circumstances they seemed to be blocked.

On the more industrialised sites where gravel drains had been provided, they were only in reasonable condition at the site where the occupying business had been involved in specifying the drainage system (see Chapter 7, Case Study 2). One notable exception was the extensive industrial site described in Case Study 4, Chapter 8, where the surface water drainage from most of the site drains to a treatment pond. That pond is in effect a SUDS end-of-pipe facility treating the runoff from an extensive area which is essentially an industrial estate itself. Without it, the pollution load on the Caw Burn would be even greater and impacts more severe.

The very limited awareness of either the legislation or the technology surrounding SUDS suggests a retrofit programme or initiative without associated education and engagement would at best create features destined to be neglected subsequently. It also has implications for new build and general use of SUDS; there is a major need for a sustained engagement and education effort by all the organisations involved in driving SUDS into routine business.

Conclusions and recommendations

The study identified 3 broad classes of barriers to retrofits: Cost, time, and space. More detailed comments and views were identified in one-to-one dialogue during the initial

¹ Source control SUDS are not the responsibility of Scottish Water to maintain. Scottish Water is responsible for the operational maintenance of vested SUDS out with the curtilage of properties, draining more than one property and built to the standards outlined in Sewers for Scotland, currently the 4th Edition (Scottish Water, 2019).

survey and follow-up visits, in dialogue with the case study businesses, and at the breakfast seminar and focus group. They included:

1. Some of the smaller businesses felt that infrastructure was a matter for the head office and not their concern.
2. Businesses in rented property felt this was an issue for the landlord or agent.
3. Businesses were wary of possible extra costs when they already pay so much in business rates and water charges.

Opportunities identified were:

1. Recovering value from surface water drainage (rainwater harvesting but including end-of-pipe capture in treatment ponds as well as close-to-source roof or yard capture systems).
2. Public sector support for provision of SUDS on individual premises, for example by discounts on water charges or businesses rates, or green business support schemes analogous to energy innovation programmes. This may be complemented by the Scottish Government asking the water industry to undertake an assessment of the alternatives to the current use of rateable value as the basis of charging business premises for drainage.

3. Third party partnership support/funding for retrofits in return for adoption in perpetuity by the businesses including all necessary maintenance and refurbishment.
4. Planning SUDS retrofits as part of scheduled refurbishment work (e.g. road, yard or roof).
5. Retrofits wholly at the expense of the business as part of sustaining a green and progressive image to customers and suppliers.
6. A major inescapable need is for education and engagement with businesses, including support to grasp opportunities as well as understand requirements. There is clearly scope for reviews of public sector charging schemes and scope for cost-effective achievement of retrofits perhaps in partnership initiatives. That applies to the private roads on an estate too (within the larger sites), and also the connecting road networks in the ownership of the private landlords and managed by their agents. For public roads there is already the scope for Section 7 agreements between the local council and Scottish Water.

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