

Optimising regional sustainable drainage systems pond performance using treatment trains

Nicolas Bastien^{a*}, Scott Arthur^a, Stephen Wallis^a, Miklas Scholz^b

^a*School of the Built Environment, Heriot-Watt University, Edinburgh EH14 4AS, UK*
email: nrb5@hw.ac.uk

^b*Institute for Infrastructure and Environment, School of Engineering, The University of Edinburgh, Edinburgh EH9 3JL, UK*

Received 5 October 2009; Accepted 14 January 2010

ABSTRACT

The use of sustainable drainage systems (SuDS) or best management practice (BMP) is becoming increasingly common. However, rather than adopting the preferred “treatment train” implementation, many developments opt for end-of-pipe control ponds. This paper discusses the use of SuDS in series to form treatment trains and compares their potential performance and effectiveness with end-of-pipe solutions. Land use, site and catchment characteristics have been used alongside up-to-date guidance, Infoworks CS and the model for urban stormwater improvement conceptualisation to determine whole-lifecosts, land take, water quality and water quantity for different SuDS combinations. The results presented show that the use of a treatment train allows approaches differing from the traditional use of single SuDS, either source or “end-of-pipe”, to be proposed to treat and attenuate runoff. This outcome provides a more flexible solution where the footprint allocated to SuDS, costs and water quality can be managed differently to more comprehensively meet stakeholder objectives.

Keywords: Sustainable drainage systems (SuDS); Treatment train; Best management practice (BMP); Swale; Pond; Green roof; Permeable paving; Runoff quality

* Corresponding author.