Journal of Environmental Management 183 (2016) 630–636

Contents lists available at ScienceDirect

Journal of Environmental Management

journal homepage: www.elsevier.com/locate/jenvman

Research article

Implementing sustainable drainage systems for urban surface water management within the regulatory framework in England and Wales

J. Bryan Ellis, Lian Lundy*

Urban Pollution Research Centre, Middlesex University, The Burroughs, Hendon, London NW4 4BT, UK

ARTICLE INFO

Article history:
Received 6 July 2016
Received in revised form
1 September 2016
Accepted 4 September 2016
Available online 13 September 2016

Keywords:
Surface water
SUDS
Regulation and planning
Permeable paving

ABSTRACT

The UK 2007 floods resulted in damages estimated to exceed over £4 billion. This triggered a national review of strategic flood risk management (Pitt, 2008) with its recommendations informing and implemented by the Flood and Water Management, Act (FWMA, 2010). Estimating that up to two-thirds of properties flooded in the 2007 event as a direct result of overloaded sewer systems, the FWMA set out an ambitious overhaul of flood risk management approaches including identifying bodies responsible for the management of local flood risk (local municipalities) and the development of over-arching Lead Local Flood Authorities (LLFAs) at a regional level. LLFAs duties include developing local flood risk management strategies and, aligned with this, many LLFAs and local municipalities produced sustainable drainage system (SUDS) guidance notes. In parallel, changes to the national planning policy framework (NPPF) in England give priority to the use of SUDS in new major developments, as does the related Town and Country Planning Order (2015). However, whilst all three pieces of legislation refer to the preferential use of SUDs, these requirements remain "economically proportionate" and thus the inclusion of SUDS within development controls remain desirable - but not mandatory - obligations. Within this dynamic policy context, reignited most recently by the December 2015 floods, this paper examines some of the challenges to the implementation of SUDS in England and Wales posed by the new regulatory frameworks. In particular, it examines how emerging organisational procedures and processes are likely to impact on future SUDS implementation, and highlights the need for further cross-sectoral working to ensure opportunities for cross-sectoral benefits– such as that accrued by reducing stormwater flows within combined sewer systems for water companies, property developers and environmental protection – are not lost.

1. Introduction

The severity of the UK 2007 floods, which inundated 55,000 properties and was estimated to cause over £4.0 billion of damage, triggered a national review of strategic flood risk management (Pitt, 2008) which led to the introduction for England and Wales in 2010 of the Flood and Water Management Act (FWMA, 2010). The Pitt review estimated that up to two-thirds of these properties were flooded as a direct result of surface water from impermeable surfaces (stormwater) overloading the sewer system. Major recommendations of the Pitt review incorporated into the FWMA included local authorities (LAs) having the lead role in the management of local flood risk, including responsibilities for local surface water (pluvial) flooding and coordination of flood risk planning. In addition to this lower tier (i.e. borough and district councils) arrangement, upper tier authorities (county councils and unitary authorities such as metropolitan areas e.g. London, Birmingham etc.) were charged with establishing Lead Local Flood Authorities (LLFAs) to prepare local flood risk management (LFRM) strategies and to review approval of mitigation works for reducing flood risks. LLFAs were given responsibility for flood defence consents and enforcement powers in implementing LFRM strategies. The FWMA further gave LLFAs and highway authorities a duty to contribute towards the achievement of sustainable development when planning flood mitigation works. In association with these activities, many LLFAs and LAs have also produced sustainable drainage system (SUDS) policy statements which include an interpretation of how such schemes are expected to demonstrate compliance with national sustainable drainage standards which are currently only available as non-statutory technical guidance

* Corresponding author.
E-mail addresses: B.Ellis@mdx.ac.uk (J.B. Ellis), L.Lundy@mdx.ac.uk (L. Lundy).

http://dx.doi.org/10.1016/j.jenvman.2016.09.022
0301-4797/

(DEFRA, 2015).

In England and Wales, the Environment Agency (EA) and latterly Natural Resources Wales (NRW) retained the national responsibility for formulation of a strategic overview of and policies for flood risk (including risk assessment procedures) as well as full responsibility for surface water quality. As part of this strategic responsibility these regulators have produced surface water flood maps to help the identification of susceptible flood zones within urban areas to support LLFA and LA local flood risk management planning. In England a reformed national planning policy framework (NPPF) has also been put in place with the intention of recognising the importance of avoiding development in flood prone areas and as a basis to help reduce the causes and impacts of future pluvial flood exceedance events. The NPPF gives priority to the use of SUDS in new major developments and the related 2015 Town and Country Planning Order (TCPO) expects that SUDS should be installed unless demonstrated to be inappropriate in terms of site circumstances or cost. At the same time, the NPPF and TCPO indicate that planning applications should ensure any SUDS installed within a development should meet minimum standards of operation and have clear arrangements for lifetime ongoing maintenance, but that these requirements should remain "economically proportionate". Thus the NPPF and TCPO only carry a presumption in favour of sustainable development and SUDS controls rather than any mandatory obligation.

There are therefore new regulatory and organisational frameworks emerging for urban surface water drainage in England and Wales in respect of new developments with several organisations carrying potentially overlapping duties and responsibilities. These include local authorities, water and sewerage companies, highways agencies and environmental protection agencies. In addition to these, a range of national organisations have also developed their own guidance/statements on surface water drainage and the use of SUDS, including the Royal Society for the Protection of Birds, Wildfowl and Wetlands Trust (RSPB and WWT, 2015), Natural England (2011) and the Blueprint for Water Coalition (2015). At the same time, there is a growing awareness of the need for cross-organisational and cross-sectoral partnerships and associated consultee arrangements in the planning process which also have particular significance for future SUDS implementation (DCLG, 2015). For example, the inclusion of a wider consideration of the benefits and costs of reducing stormwater flows in combined sewers through enhanced uptake of SUDS on sewer network performance, energy footprints and property developers at both local and national scales. This paper examines some of the challenges to the implementation of SUDS posed by the new regulatory frameworks and organisational arrangements. In particular, the paper considers whether the new regulatory and organisational frameworks, procedures and processes are likely to make any substantial difference to future SUDS implementation and introduce an increased awareness of their design, operation and maintenance requirements.

2. SUDS regulatory guidance

Generic national non-statutory technical guidance for SUDS in England has been published by DEFRA (2015) which covers (peak/volume) flow controls and brief considerations for design and maintenance. Consideration of water quality was briefly included in an earlier draft version of the DEFRA (2015) technical guidance, but was omitted from the final publication. Further to the non-statutory technical guidance, a collaborative LA working group has produced a companion guidance manual to the technical standards to help clarify and interpret the proposed standards in respect of national sustainable drainage policy and in terms of drainage design (LASOO, 2015). In Wales, Planning Policy Wales (Welsh Government, 2016a) and the related advice on development and flood risk under Technical Advice Note, TAN 15 (Welsh Assembly Government, 2004) emphasise the benefits of the SUDS approach for new developments; the use of SUDS in re-development contexts is not covered. The 2015 update to TAN 15 included new development advice maps enabling improved flood information and modelling to be incorporated into the site selection process and in the determination of planning applications. Section 8 of TAN 15 sets out recommendations for the use of SUDS referenced against appropriate technical standards. In 2016, the Welsh Government produced its own non-statutory standards which are considerably more comprehensive in nature and scope than the DEFRA (2015) equivalent, taking into detailed consideration water quality, amenity and biodiversity (Welsh Government, 2016b).

Separate to but complementing these activities, the Construction Industry Research and Information Association issued an interim guide to national SUDS practice (CIRIA, 2004) and its updated, comprehensive, SUDS manual covering the planning, design, construction, operation and maintenance of a range of SUDS was more recently published (Woods-Ballard et al., 2015). The Welsh standards are closely aligned with the new CIRIA SUDS manual update (Woods-Ballard et al., 2015). Following the publication of its non-statutory standards for SUDS, the Welsh Government is now proposing to work with stakeholders to consider the best approach to improving the uptake of SUDS in new developments, including the possibility of implementing Schedule 3 of the FWMA which remains unenforced in England.

Schedule 3 of the FWMA requires the inclusion of SUDS in new major developments, giving powers to Ministers to establish SUDS approval bodies (SABs), by default at the upper tier local authority level, whose role would be the approval of proposed SUDS designs and their subsequent adoption and maintenance. In preparation for full implementation of the FWMA (2010), several LAs established pilot SABs e.g. Cambridge, Kent and Greenwich. However, following a government DEFRA-led consultation for England over the summer of 2014 (DEFRA, 2014), where LAs and housebuilders raised concerns over the requirement to, in effect, receive two sets of permission before new development works could commence, the SABs approach was set aside with the government considering that a more effective SUDS delivery mechanism could be delivered through an amended local planning policy arrangement. A significant proportion of UK LAs have now produced formal advice and guidance for developers on SUDS implementation within their local administrative areas and which is readily accessible through their websites and planning portals (e.g. Cambridge City Council, 2015), with water companies also producing planning guides that outline their position on adopting SUDS (e.g. Yorkshire Water, 2014). Under the new governance structures for flood risk management, the LLFA requires that all major developments should have a surface water management plan (SWMP) which may be incorporated into the wider LFRM strategy (BSI, 2013). However in terms of determining whether SUDS are actually included within development plans, it has been argued that the strength of a LA/LLFA SUDS policy statement is much less significant than the role of an active, motivated "champion" or the pro-active presence and implementation of innovative, integrated sustainability principles (White and Alarcon, 2009).

3. The regulatory framework in England

3.1. Organisational structures

Fig. 1 shows the new proposed regulatory framework and