

## **Partnership working and new SuDS guidance**

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This paper seeks to introduce the way flooding and sustainable drainage is managed in Edinburgh through the planning approvals process and the flooding self-certification scheme. It also touches upon how partnership working and early engagement is helping to foster best practice design and ensure that it is implemented delivering sustainable development within the City of Edinburgh.

Sustainable drainage and flood risk mitigation are key topics across the political spectrum, particularly in the recent years following the impacts of a number of named storms hitting Britain and causing millions of pounds worth of damage. Whilst there are large scale national and regional programmes to identify, evaluate, and if appropriate, invest in infrastructure to mitigate the impacts of flooding, it is important not to forget that the implementation of sustainable drainage can go a long way to helping to mitigate the impact and number of receptors affected by flooding in a positive feedback loop.

Land use planning and site-specific design requirements are crucial when addressing flood risk. As a result the way planning applications and drainage designs have been accepted by City of Edinburgh Council (CEC) has changed in recent years. Whilst the principles of sustainable drainage to be demonstrated have not changed, the way in which information is to be presented has. A self-certification scheme was implemented in October 2017 and requires that planning applications must include specific information regarding flooding and drainage and be certified by a Chartered professional of an appropriate discipline and institution membership. It is important to note that flooding is a material consideration of planning and must be addressed for all stages of planning approval, even for developments outside the floodplain. This self-certification system was borne from a need to reduce the burden on resource constrained planning case officers and the flood team. By standardising information requests and defining what details are required to avoid piecemeal submissions it sought to ensure that flooding was addressed at an appropriate stage in the development process rather than being a late consideration. The self-certification scheme also sought to help improve the turnaround times of application determination which would benefit developers, showing progress which can have major impacts in securing funding. The questions we have been asking are whether this change has been beneficial; what improvements in the design of SuDS systems have been achieved and if not, why not. Whilst this change has reduced the onus on the resource constrained local authority to provide the technical check, the opportunity of engaging with the flood officer early in the design process have been reduced. The system also potentially divorces the design thinking around landscape and biodiversity and the associated intrinsic mental health benefits from functionality. This risk is heightened when the client does not employ and correctly brief a multi-disciplinary team at the outset. This can result in difficult decisions for the planning officers, as proposed SuDS schemes work technically but are poor in terms of place-making. The recently introduced SuDS Approval Bodies (SAB) in Wales (and soon to be set up in England) find themselves in a similar position with little influence in the early stages and the onus of checking still on the public purse.

Looking to the future with stretched budgets, CEC promote sustainable development across the city and look to deliver transport links, place creation, biodiversity and sustainable drainage as part of a city-wide vision. To realise these opportunities to their fullest potential it is important that drainage designers and landscape architects are part of the project core design teams and have an influence on the site layout from the earliest stages. For many years CEC chaired the Lothians and Fife SuDS Group which included SEPA, Scottish Natural Heritage (SNH) and Scottish Water which sought to raise the standards and develop a better understanding of the issues affecting local authorities. By posing simple questions around seemingly unconnected aspirations surrounding Scottish Government place-making policy and drainage obligations, an understanding was developed of correlations to the planning cycle. Specifically, discussions were held around how to enact change to a site layout where a high number of units has been linked to economic viability and sale price of the land. Historically CEC has been presented with residential sites where drainage design is the last consideration and it has been made to fit the existing layout. It has been evident that this did not best serve the development and there was little to no consideration of other benefits such as ecological

potential or placemaking. Whilst change was difficult at first, some traction has been made with some developers bringing ideas for discussion at the pre-application stage.

By championing best practice through the CEC self-certification process it strives to integrate decision making at various key stages in a project lifecycle. Smaller and medium developments tend to be troublesome than larger ones as the scale of consultation is significantly less and sometime the hurdles to overcome are more complex. This is exemplified by the requirement for applicants to submit drainage information such as overland flow paths and designs to manage exceedance. As below ground drainage systems are typically only designed to accommodate a 3.33% AEP (annual exceedance probability) event (1:30-year) consideration must be taken for events that would overcome the drainage network capacity and how this flow is managed. By avoiding significant changes to catchment watersheds in the development of the site it helps to maintain current flow regimes and does not increase the risk of flooding to adjacent properties, provided attenuation is included within the design. Designing for exceedance can also identify locations that are vulnerable to water accumulation and how this can be managed safely, it may also form part of the landscape design. Should maintenance of the drainage network not be undertaken to ensure the proper capacity is maintained, a drain is blocked or attenuation sizing or climate change estimates are wrong, then resilience is built in to protect the development. This is often the aspect that engineers struggle with as there are several ways to manage water on the ground surface rather than in a piped, hard engineered solution. Using above ground methods however are generally where the most sustainable and overall beneficial designs can be implemented.

Whilst there is an aim to move away from pre-dominantly below ground piped solutions, there are many sites where this is not practical and as such a more traditional engineered solution is more appropriate. As a result CEC also request a maximum attenuated discharge flow rate. This can in cases be lower than that requested by Scottish Water. Only achieving betterment, or a reduction of the flows discharging from a proposed development site is not in line with the CEC self-certification process. Whilst the sewer network is owned by Scottish Water and their authority is required to connect into the network, CEC are responsible for ensuring that development is sustainable across their administrative boundary area. This is also reflected in the fact that surface water quality improvements (treatment) are required upstream of the disconnection manhole and connection into the combined network.

CEC hopes that by firm application of maximum discharge rates the increase in impermeable area across the city does not detrimentally impact upon natural drainage processes. Ground water recharge and reduction in runoff help to ensure that there is as little impact upon the environment, and maximum gain, as possible. This is relevant both in terms of water quantity, but also water quality and biodiversity and less other less quantifiable factors such as placemaking. In order to support natural processes it is also important to create places where ecosystems can become established and biodiversity can be realised as this also impacts human health and well being.

The requirement to separate out surface water across Edinburgh's extensive drainage network has been driven by a need to ensure connection capacity for new developments and to reduce the requirement to process surface water, something that is unnecessary and uneconomical. As sewer networks are generally close to capacity, and with little money available in the public purse to build more capacity into the network, development is being used as a driver to create opportunities for removing surface water from the combined sewer network. Whilst Scottish Water requirements focus primarily on water quantity rather than water quality, CEC requests that measures to improve water quality are included in development drainage to release the potential for connecting up disparate sections of surface water network in the future. By identifying and including treatment as a necessity as part of the planning process it offers the potential for future disconnection which won't be possible otherwise due to pollutant accumulation and their effect on receiving waterbodies.

Through an accumulation of development of brownfield sites within the city over the coming years it is hoped that sufficient surface water infrastructure will be installed to allow wholesale disconnection from the combined sewer with treatment of surface water already inbuilt through the inclusion of development SuDS. This would reduce the risk of foul flow flooding and reduce the amount of water

that needs to be treated at the wastewater treatment works whilst freeing capacity for new development foul connections.

Even if disconnection were achieved in the near future there are potentially still issues surrounding the design of surface water attenuation storage particularly in inner city sites. It is accepted on brownfield sites where there is limited space that modular below ground tank storage may be a necessary compromise to maintain some site's economic viability however CEC are now clear that there is no capacity in house to maintain underground storage. Therefore it must be vested by Scottish Water or maintained privately.

On greenfield sites it is a requirement that above ground drainage and storage measures are implemented. The expectation is that overall, if well designed, the maintenance of these features is easier and cheaper, and there is a greater opportunity to provide enhancements to the development through placemaking and ecological potential for biodiversity. The situation has been recently highlighted due to attenuation tanks sized to attenuate the 200 year storm being proposed that were assumed wrongly to be adoptable by CEC.

To ensure that specific design criteria are to be met to allow vesting following construction then these should not be prejudiced by an intermittent design that is not realistic. Therefore it is key to understand who will be responsible for maintenance of the assets once constructed and operational. To ensure this happens systems and layouts must be developed to a sufficient level of detail at planning approvals stage, in particular if applying for Planning Permission in Principle (PPP) if proceeding via staged approvals approach. This is crucial as PPP defines a benchmark and has the potential to prejudice best-practice design and impact upon the final outcome of a site design.

An example of how PPP might prejudice site layout includes the standard 1:4 gradient of a slope in an attenuation basin. CEC does not have available machinery that could safely be used to cut grass at 1:4 slope and these features usually require edge protection fencing, the product of design risk assessments. The inclusion of fencing adds to the maintenance burden. A gentler side slope gradient allows the safe removal of fencing whilst creating a more attractive landscape. If a steep sided basin secures planning approval it is difficult to redesign the site layout to accommodate a larger basin footprint in line with more varied gradients based upon developer expectations linked to site economics. In cases where the layout has not been changed this has resulted in unnecessary fencing, safety signs and crater-like features which are an eyesore. Developments such as this results in time consuming complaints to the enforcement team in the council, further increasing the burden on a funding and resource constrained body.

Standardising SuDS design is difficult as it should be site specific. Sewers for Scotland version 4 has improved guidance on designing SuDS features for adoption by Scottish Water and CIRIA 753 The SuDS Manual gives best practice advice in general terms. At present Section 7 of the Sewerage (Scotland) Act 1968 allows agreements between the Local Roads Authority and Scottish Water to establish a framework for partnership working to manage drainage however the majority of Local Authorities have not entered into agreements yet. CEC is working with Scottish Water to finalise the Section 7 agreements noting that Scottish Water will only be responsible for underground drainage features up to the 3.33% annual exceedance probability (AEP) event (30-year), and the above ground aspects falling under CEC liability. CEC has taken the decision that this will be factored and there will be a new process of checks that will occur during both the construction stages of the landscape and on-going operation to ensure compliance with the agreed design and management plan. The developer's landscape architects will be expected to perform the checks during the construction stage. For features to manage up to the 0.5% AEP event (200-year) which should be above ground, CEC are expecting these to be used as multifunctional greenspace in a development and maintained by a site factor.

The legacy of maintenance, particularly by a non-in-perpetuity body such as a private factoring firm is a key issue. SuDS which are either badly designed, improperly maintained or have design criteria insufficient to meet today's requirements have the potential increase flood risk. Similarly, proposed SuDS whose responsibility for maintenance is unclear but is relied upon to ensure sustainable development. There is concern that private factoring companies who are identified at planning stages

as being responsible for maintenance do not fulfil their duties in practice and a subsequent degradation of drainage infrastructure capacity leads to increased flood risk. Record keeping of unadopted systems and policing of private infrastructure that is identified as being non-compliant have been recognised as a risk that need to be addressed going forward. Constraints on resourcing and funding to undertake the record keeping and policing are barriers to implementation and they have been highlighted as a further risk to the council. It is not an issue that can be resolved by one organisation alone and will require close partnership working to gather data and implement appropriate processes.

To support best practice design it is not just the flooding self-certification guidance that is required to enact change. The Edinburgh Design Guidance was updated in December 2018 with a clearer overarching SuDS section. Additions also include a minimum 15m set back of development from all rivers for ecological reasons and the guidance to use drainage engineers and landscape architects as professionals required in design teams. The guidance has recently been expanded to include the New Street Design Guidance that was funded by Sustrans. Sections of this is still on-going and Atkins have recently been commissioned by CEC to develop a more detailed SuDS section. This will look at the issues of retrofitting SuDS into a historic World Heritage Site as well as emphasising the need in new developments for interconnected blue/green infrastructure. For example by using beautifully designed conveyance swales planted to maximise habitat opportunities. This study has also commissioned case studies from Abertay University to exemplify issues. This new guidance will be linked back to a new blue/green infrastructure policy being written for the next Edinburgh Local Plan.

All the while this is set against a backdrop of increased climate change allowances for flood risk assessment in land use planning, as released by SEPA in April 2019. The key take-away point is the requirement to design for exceedance and adaptability which can mitigate for climate change and future flood pathways, whilst fulfilling and maximising place-making and biodiversity opportunities.

In conclusion we can say that the flooding self-certification guidance has helped to clarify the requirements of developers when applying for planning approval, has raised the profile of flooding and drainage in development agendas at an earlier stage but there is still a long way to go. More conversations about good design of SuDS are required across the industry, particularly in terms of future adaptability to climate change and on-going developments. Full implementation of best practice design is an aspiration however this requires significant effort in consultation at early stages with different departments, something that places additional pressure on public resources. Without these discussions there is has often been and will continue to be a disconnect between designers and approvers and those who will ultimately maintain an asset as currently there is no feedback until it is far too late. Moving away from hard engineered solutions with certainty of a single body taking ownership and being responsible for maintenance, to a more holistic method that requires input from a number of different specialisms to develop a design requires a shift in mentality. However without this shift, receptors and their vulnerability to flood and drainage risk increase with the expanding scale of development. Whilst opportunities to incorporate adaptability to climate change are lost, and maintenance legacy problems are likely to increase.