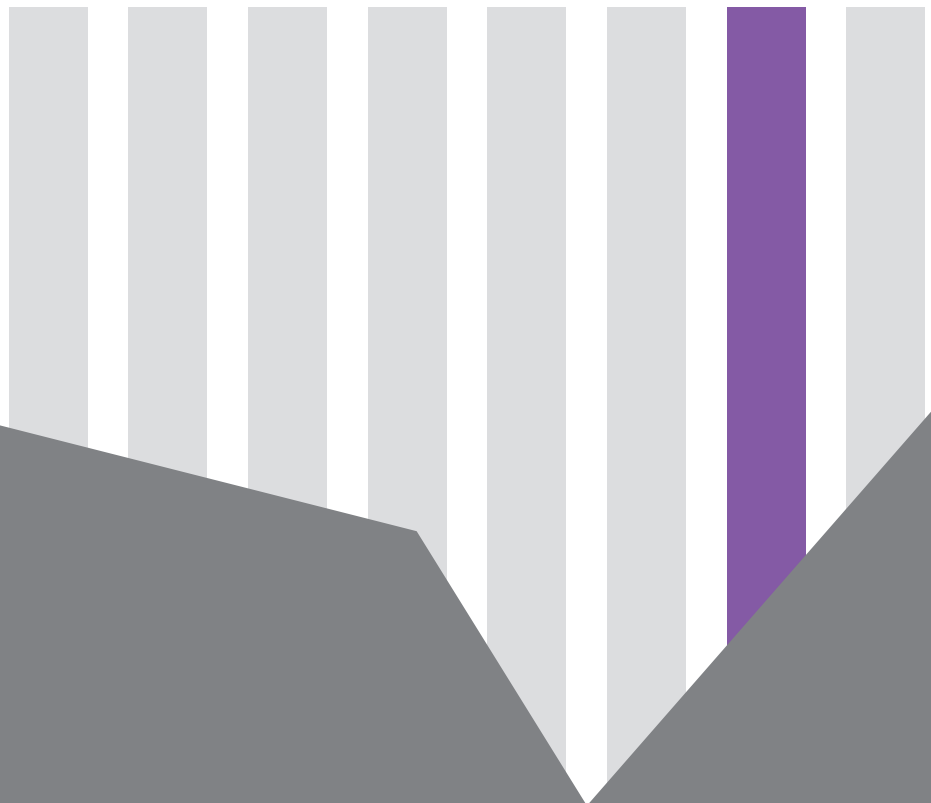


local development plan 2018

Sustainable Drainage Systems (SuDS)

supplementary planning guidance

**consultative draft
February 2019**



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East Lothian Council
Sustainable Drainage Systems (SuDS)
Supplementary Planning Guidance

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Executive Summary

Sustainable Drainage Systems (SuDS) deal with excess water from a site and return it to the water system in a controlled manner, to alleviate flood risk and reduce discharge of diffuse pollutants. Since 2006 SuDS have been a legal requirement for most new developments. SuDS should replace the traditional system of road gullies entering directly into combined surface water and foul water sewers and aims to deal with surface water within the site boundaries.

Scottish Water's latest edition of *Sewers for Scotland* provides advice on the technical standards for SuDS features that they will vest. East Lothian Council will consider adopting SuDS features adjacent to carriageways where these deal with road run-off only. The day-to-day maintenance of SuDS features, such as grass cutting and litter picking, should be covered by a factoring arrangement. CIRIA's latest edition of *The SuDS Manual* provides advice on designing SuDS, some of which Scottish Water will vest if the SuDS also complies with their *Sewers for Scotland* guidance. Unfortunately, existing guidance has often been interpreted in a way which has resulted in a standard, single function solution which occupies a considerable area on many sites.

This SuDS Supplementary Planning Guidance document has been prepared by East Lothian Council's cross-service SuDS Working Group to assist in the design of SuDS features that will look good and add value in terms of recreation and biodiversity, while being straightforward to maintain.



Figure 1: Detention basin providing water detention as well as usable attractive amenity space.

Source: *The SuDS Manual C753*

Credits

All images courtesy of Woods Ballard, B, Wilson, D, Udale-Clarke, H, Illman, S, Scott, T, Ashley, R, Kellagher, R (2015) ***The SuDS Manual C753***, CIRIA, London (ISBN: 978-0-86017-759-3) www.ciria.org

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Overview

Sustainable Drainage Systems (SuDS) manage surface water run-off by treating it as near to source as possible, slowing down the rate of discharge, treating water naturally and releasing it in a controlled way, preferably to watercourses or groundwater rather than into sewers. Since 2006 SuDS have been a legal requirement¹ for most new developments².

SuDS must be considered at the outset of project design. Many types of SuDS require significant areas of land, and sufficient space for SuDS must be safeguarded in site layouts. The design should ensure that the benefits to green networks, flood risk management, water quality, amenity, biodiversity, climate change adaptation and economic gain are maximised. Engineers should work with architects and landscape architects to ensure a holistic approach.

The level of SuDS required is dependent on the nature and size of the proposed development and the environmental risk posed by it.

Following a change to Water Quality parameters in 2015 SEPA now support the use of the “Simple Index Approach” (SIA) to direct designers towards what level of treatment is appropriate for their development. Rather than prescribing levels of treatment the SIA is an online tool that compares land use pollution hazard indices to SuDS mitigation indices. Guidance on use of the SIA can be found in SEPA’s Regulatory Method 08 (WAT-RM-08) or Chapter 26.7.1 of the CIRIA SuDS Manual C753.

SuDS can be designed to integrate with and enhance the built environment and surrounding landscape and contribute to green space. SuDS can offer a wealth of opportunities within developments for both passive and active recreation for the local community. SuDS features include swales, filter trenches, permeable paving, detention basins and ponds. Multiple SuDS features are usually present within a single site, providing the necessary treatment. The type of SuDS feature must be designed for its location and provide additional benefits beyond the engineering requirement.

To be considered as part of the Council’s on site open space requirements for new housing the SuDS need to provide both suitable surface water treatment (including flood attenuation and water quality) and enhanced landscape setting, meaningful habitat value or useable recreational space. East Lothian Council will support well designed SuDS solutions including detention basins, swales and ponds/wetlands or other suitable solutions, within amenity areas.

In terms of public safety for ponds and similar features, the Council promotes soft boundaries (i.e. planting) and avoiding steep drops or sudden changes in level. However, this would always require to be considered via an appropriate risk assessment by the developer.

¹ Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended):

² Exceptions are single dwellings and low-risk direct discharges to coastal waters

Design Guidance

Detention Basins

Detention Basins are indentations which capture surface water run-off in times of flood, and release it slowly into the downstream system. They are expected to be dry for much of the year. Detention basins can be designed for either infiltration or attenuation, depending on site conditions.

If detention basins are to be included as recreational open space, consideration should be given to the following:

- The area must be accessible to all. This means side slopes of a suitable gradient for at least part of the basin or accessible paths across steeper slopes.
- It must be easy for people to escape the basin in times of a flood.
- *Sewers for Scotland* notes that the dual use of detention basins as passive public open space for recreation activities can be considered where the area is subject to flooding from events less frequent than the 1-year return period and where it can be clearly distinguished from the area providing flood storage for more frequent events.
- Where a dual use is proposed, the installation of educational and warning signage i.e. explaining purpose/operation of the basin and the installation of safety equipment
- Detention basins with a flat base size of a minimum of 60m x 40m can form an informal sports pitch.
- Although *Sewers for Scotland* specifies that the side slopes of basins must not have a gradient steeper than 1 in 4 East Lothian Council strongly encourages shallower slopes. Detention basins and side slopes that are grass covered and designed to be cut must not have slopes steeper than 1 in 8, although a variety of slope gradients are expected to create interest.
- Planting should be low maintenance.

If other adequate informal recreational space is delivered elsewhere within the development and within an adequate radius of the housing units then a detention basin can be considered to form part of the landscape setting and potentially biodiversity enhancement. Although detention basins are typically grassed, other vegetation is supported where this enhances the appearance and amenity value of the basin and increases its biodiversity by providing wildlife habitats. Planting can also help prevent erosion and slow flows across the basin thereby increasing sediment settling.



Figure 2: Detention basins with amenity planting and easy access for maintenance

Source: The SuDS Manual C753

Topsoil depths should be appropriate for the type of planting.

- 100mm subsoil for wildflower meadow planting
- 150mm topsoil for amenity grass
- 450mm for shrub planting
- Trees will require individual pits up to 1m in depth

Planting within SuDS basins must be robust plants that are tolerant of a wide range of conditions, wet and dry. Small pools planted with wetland and marginal plants may be included as a feature of a detention basin. However, consideration must be given to the possibility of these drying out completely in summer months and the consequences for the planting; or alternatively a small amount of water remaining and becoming stagnant and unattractive.

A full maintenance schedule should be provided at planning stage to allow assessment of the long-term maintenance burden for the Council. An example of a maintenance schedule is given in table 22.1 on page 483 of the CIRIA SuDS guidance.



Figure 3: Detention basin providing water detention as well as usable attractive amenity space with raised areas for planting and a variety of side slope gradients. Source: The SuDS Manual C753

Swales

Swales are shallow, flat bottomed, vegetated open channels. They can have multiple functions including:

- Water conveyance – the swale collects surface water run-off and moves it to another part of the treatment system
- Water treatment – if the swale includes a filter trench in the base this provides water collection and treatment through a filter medium

- Water retention - swales can also be designed to be wet with a permanent shallow level of water in the base supporting wetland planting

Swales provide the opportunity to introduce green vegetated areas into road corridors where there would be limited open space value of grass as play space. Vehicles must be prevented from parking or over-running the edges. Short sections of swale between driveways are discouraged due to the potential for vehicle encroachment. If these are desired, they should be planted with shrubs or trees rather than grassed.



Figure 4: Shallow formal grassed swale wide and shallow enough to be cut by a ride-on mower. Note low fence to prevent vehicle over-run. Source: The SuDS Manual C753

In any case, as it can be difficult for grass-cutting equipment to navigate the swales alternative planting material should be considered as appropriate for the function of the swale and whether it is expected to be predominantly wet or dry. Where side slopes are to be covered with grass and require cutting the slopes and cross section through the swale must have a gradient no greater than 1 in 8 to allow cutting by a ride-on mower. The side slope gradient and width of any swale will require agreement and approval from the council's amenity services department.

Planting in a swale in natural soil must be robust and tolerant of a wide range of conditions, wet and dry. Planting schemes in an under-drained swale must be drought tolerant. Trees should be kept to the natural soil banks.

As swales are generally shallow surface features they should not present significant risk or danger to the health and safety of the public. However, this needs to be considered as part of an appropriate risk assessment by the developer.

Scottish Water will only vest swales which are 'end of pipe' SuDS.



Figure 5: Examples of wet and dry planted swales.
Source: The SuDS Manual C753

Figure 6: Natural play within a swale. Source: The SuDS Manual C753



Ponds or wetlands

Well-designed and maintained permanent water bodies can offer important aesthetic, amenity and wildlife benefits to development sites. While in dense urban environments, a hard landscaped pond may be appropriate, in the semi-rural setting of East Lothian it is generally expected that ponds or wetlands are naturalistic features with shallow planted and grassed side slopes.

Ponds which are to function as SuDS features should be designed by appropriately skilled landscape professionals in conjunction with engineers in order to ensure aesthetic quality, effective integration within the landscape and performance as a community resource.

Ponds and wetlands provide valuable landscaping and biodiversity value. Depending on their location, the balance of visual amenity and habitat provision can be adjusted accordingly:

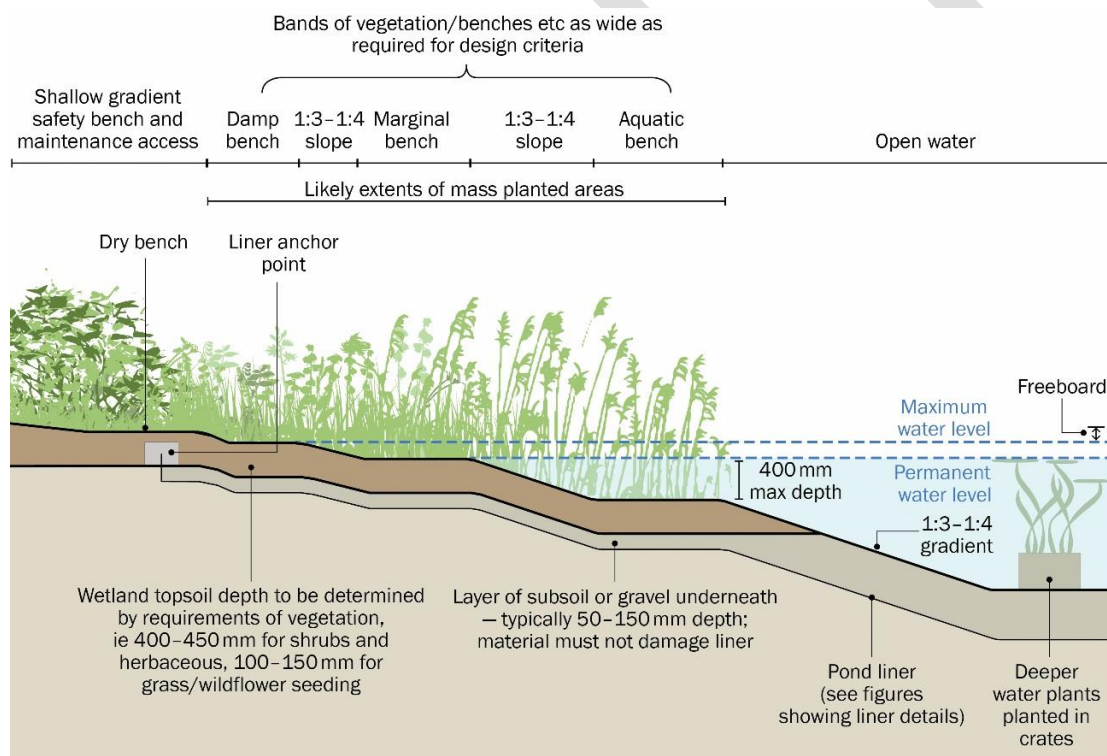
- At the core of the development – a pond or wetland should provide an aesthetically pleasing feature with a range of habitats to suit indigenous and desirable species.
- As part of the wider landscape setting or on the periphery of the site - the focus should be on biodiversity and habitat provision within a landscape that reflects indigenous species. In

such cases the design should demonstrate connectivity with adjacent green corridors to enable species migration.

In terms of public safety, the Council promotes soft boundaries and avoiding steep drops and sudden changes in level. However, this would also require to be considered via an appropriate risk assessment by the developer. This approach also allows efficient maintenance by allowing the use of ride on grass cutting equipment and eliminating the long-term burden of fence repairs. Soft boundaries can be achieved by incorporation of low to medium height marginal planting, varying grass cutting heights and gentle shelves to ponds.

In order to provide effective water treatment functions the 'effective' area of a pond needs to be 1 metre deep. However, there should be a mix of water depths (as indicated in Figure 7 below) and a minimum of 150mm water depth to provide adequate capacity to sustain desirable species. Gentle changes in slope around the pond perimeter as indicated in Figure 7 below allow the development of different types of wetland vegetation. Locating new ponds close to existing water bodies can benefit biodiversity.

Figure 7: Typical Planted Pond Edge Detail. Source: The SuDS Manual C753



Notes: Width, surfacing and extent etc of safety bench and maintenance access all dependent on site, size of pond, maintenance requirements etc

Further information on the design on ponds can be found in Appendix B of this document and in the CIRIA guidance. Information on appropriate planting for ponds can be found in Appendix C.

Figure 8: Examples of design approaches to ponds.
Source: The SuDS Manual C753



Above: barrier planting prevents access to standing water.

Below: dipping platform over shallow water



Filter Trenches

Filter drains or filter trenches are linear features filled with a filter material such as gravel. They may have perforated pipes along the bottom to convey the water that percolates down through the filter material. They can be positioned at the bottom of dry swales or be on their own. They must be protected from silting up through upstream protection. Roadside filter trenches can be of the 'French style' that are open, usually stone filled up to the ground surface, or enclosed under a hard or soft surface. With reference to the following section on permeable paving it is the Council's preference, in residential areas, to have filter trenches located underground, fed by road gullies and interspersed with access chambers at significant changes in direction or at a maximum spacing of 20 metres to facilitate ease of maintenance.

Scottish Water will only vest piped filter trenches which are 'end of pipe' SuDS.

Permeable paving

Permeable paving can be accepted in private parking areas and driveways. Services should not run under permeable paving, as when maintenance access is needed, it is likely that the paving will not be correctly reinstated. East Lothian Council will not generally accept permeable paving on roads and parking areas that will be adopted by the Council.

Further Guidance

A number of examples of best practice exist and applicants are recommended to reference these. In particular, The CIRIA SuDS Manual Version 6 and subsequent updates published by CIRIA, offers detailed guidance on the technical requirements of SuDS design as well as demonstrating how the ethos of combining technical requirements with amenity, aesthetic and biodiversity considerations can be best achieved.



*Figure 9: Swale planted for biodiversity and amenity.
Source: The SuDS Manual C753*

*Figure 10: Wet swale example
Source: The SuDS Manual C753*



Information required for Planning Applications

Sufficient information must be submitted with a planning application to describe all elements of the proposals and allow them to be fully assessed. A drainage impact assessment should be submitted with relevant planning applications. Planning Advice Note 79 Water and Drainage should be referred to. The assessment and accompanying drawings must demonstrate that the SuDS features have been sized to the required Treatment Volume, and confirm that the proposals have been designed to Sewers for Scotland standards.

Although every site and proposal will vary, the following information should be provided, in addition to the engineering and technical details, to allow the full assessment of proposed SuDS features:

Applications for Planning Permission in Principle

- **An overall drainage strategy** - including a flood risk assessment and drainage impact assessment
- **SuDS Plan** - An appropriately scaled annotated site plan should show the approximate locations and land-take of the proposed SuDS features

Applications for Detailed Planning Permission

- **SuDS Plan** - An appropriately scaled annotated site plan should show the locations and land-take of the proposed SuDS features
- **SuDS sections** – Cross- and longitudinal-sections through SuDS basins and pond features to clearly identify the design elements
- **SuDS Features Maintenance Schedule** - Details of the annual and long-term maintenance which will be required for the system.
- **SuDS Maintenance Agreement** – if being carried out by a non-statutory body.
- **SuDS Features Risk Assessment** – Demonstrating that risks have been appropriately mitigated
- **Confirmation of compliance with *Sewers for Scotland***

Formal Scottish Water approval will be required in order to obtain Road Construction Consent, and it is worth consulting Scottish Water as early as possible in the design process in order to confirm the features which they are likely to vest/maintain.

Proposals for enhancement of biodiversity in and around SuDS features should be in line with the East Lothian Biodiversity Action Plan (ELBAP) and reflect connectivity with the wider landscape, helping to implement the ELBAP and Green Network strategies. The location of SuDS and their amenity value should also be considered in relation to providing points of interest along sustainable travel corridors.

Applicants will also have to demonstrate that changes to the existing topography will not have a detrimental effect on existing wetlands, habitat, groundwater or watercourses.

Where a detention basin is proposed, applicants will be required to provide adequate information on the soil permeability rate and water table levels and the balance between that and the site's ability to retain flood water for an adequate period to effect controlled release.

In addition to technical compliance, when considering a SuDS proposal we will be asking:

- Does the SuDS positively contribute to the visual amenity of the development?
- Does it contribute positively to the biodiversity value of the site?
- Is the developer proposing this as part of their open space requirements and if so is it accessible and useable for the majority of the year?
- Why has this location and design been chosen?
- What alternatives have been considered? Why have they been dismissed?

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Appendix A - Planning Policy Relevant to SuDS

Scottish Planning Policy

Scottish Planning Policy 2014 clearly sets out that planning has a role in managing flood risk and drainage. Paragraph 255 states that the planning system should promote, 'avoidance of increased surface water flooding through requirements for Sustainable Drainage Systems (SuDS) and minimising the area of impermeable surface a role'. It also notes that SuDS can form part of Green infrastructure.

Further national guidance is given in Planning Advice Note 61 Planning and Sustainable Urban Drainage Systems and Planning Advice Note 79 Water and Drainage.

Local Planning Policy

The East Lothian Council Local Development Plan 2018

POLICY NH10: Sustainable Drainage Systems

Policy NH10 of the East Lothian Local Development Plan (ELLDP) states:

All development proposals must demonstrate that appropriate provision for Sustainable Drainage Systems (SuDS) has been made at the time of submitting a planning application, except for single dwellings or developments in coastal locations that discharge directly to coastal waters where there is no or a low risk to designated bathing sites and identified Shellfish Waters.

Sufficient space for proposed SuDS provision, including the level and type of treatment appropriate to the scheme of proposed development, must be safeguarded in site layouts. Provision must also be made for appropriate long-term maintenance arrangements to the satisfaction of the Council.

A drainage assessment may also be required to show the impact of a 1 in 200-year rainstorm event. SuDS schemes should be designed with an allowance for climate change.

Proposals must also demonstrate how SuDS will be used to promote wider benefits such as placemaking, green networks and biodiversity enhancement.

The ELLDP refers to SuDS in several places:

- **Open space:** 'SuDS areas may form part of informal open spaces subject to their design and provided they contribute to and do not harm the amenity value of the wider open space (para 3.127).
- **Green network:** 'It will be made up of green spaces (parks, public spaces, woodland spaces etc.) and blue spaces (rivers, streams wetlands and SuDS etc.). Although the Green Network will not compensate for the loss of flood plains, it can provide some mitigation for flooding and some adaptation for climate change. It aims to maintain and improve quality of place, including in relation to the setting and identity of settlements, and address environmental inequalities, promote active travel and enhance health and well-being. The development of the Green Network over time will help improve the quality of life in the area and connections for people and biodiversity (para 5.24).

- **Protecting and Enhancing the Water Environment:** The planning regime is a key tool assisting the delivery of River Basin Management Plans (RBMP), protecting and restoring the water environment through influencing developments. This will help increase the environment's capacity to cope with and support future developments, for example through the protection of existing flood plains or wetlands and the use of Sustainable Drainage Systems (SuDS) (para.6.26).

Paragraph 6.29 states that SuDS should be designed in accordance with:

- CIRIA SuDS Manual C753 (or any revision)
- The current edition of *Sewers for Scotland* where the scheme is to be adopted by Scottish Water,
- The SuDS for Roads Manual where the proposals include roads, or any subsequent revisions of these documents.

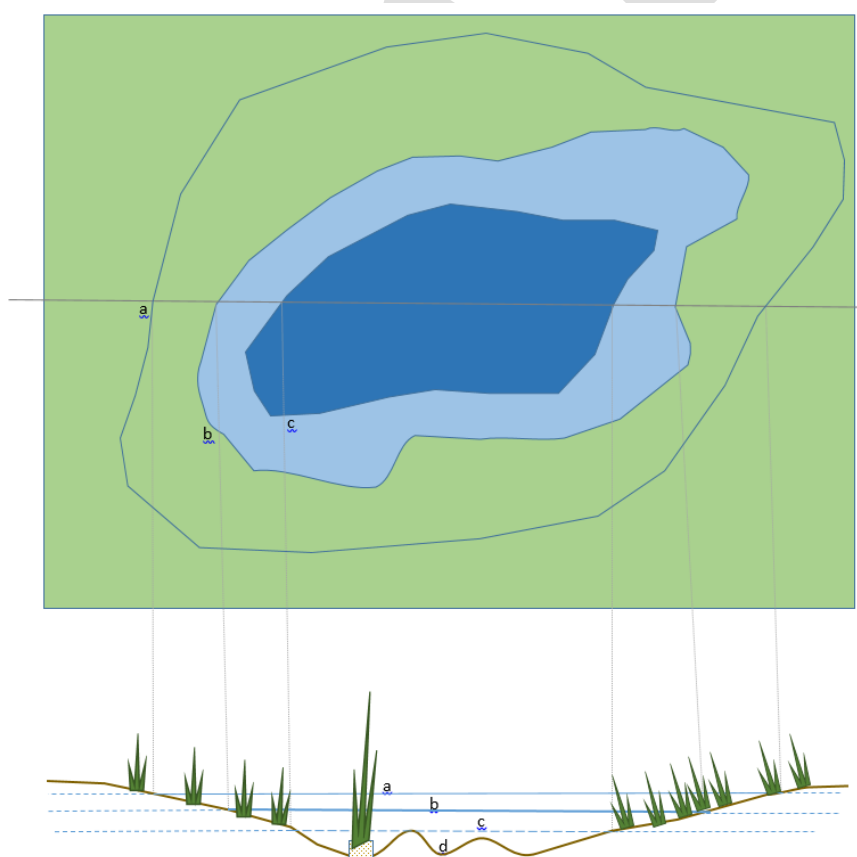
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Appendix B - Design Guidance for Biodiversity Ponds

The following points should be borne in mind when designing a biodiversity pond; for detailed design refer to chapter 23 of the CIRIA SuDS Manual³

- A biodiversity pond should be the last layer of water treatment, not the first
- Pond design should be informed by management requirements, with low maintenance being preferred. A gentle gradient of slope should allow for vehicle-based management of vegetation and for de-silting.
- Biodiversity ponds should be located close to structure planting or natural habitats to provide an appropriate landscape setting.
- Avoid a design that appears overly regular, e.g. concentric circles or ovals, around the different water levels. The best biodiversity ponds have more complex shapes, including undulations across the base of the pond. See e.g. Figure11.
- Plant different areas around the pond with different species to give a diversity of structure and a more natural appearance. See e.g. Figure 12
- Controlled species, where appropriate, should be planted 'downwind' to reduce the likelihood of seeds colonising areas of smaller vegetation.

Figure11: Stylised plan of a biodiversity SuDS pond



a = flood level and maximum level of water, max gradient in slope of XX degrees
b = standard water level, max gradient of slope of XX degrees
c = shallow gradient (max slope of XX degrees) from b to standard depth of water of 400 mm
d = maximum water depth (from standard depth, b) of 1m. Base of pond should have an undulating profile rather than a smooth and uniform profile. Emergent species can be planted in containers to provide patches of vegetation across open water.

³ <https://ciria.sharefile.com/share/view/19403f754e444e2a>

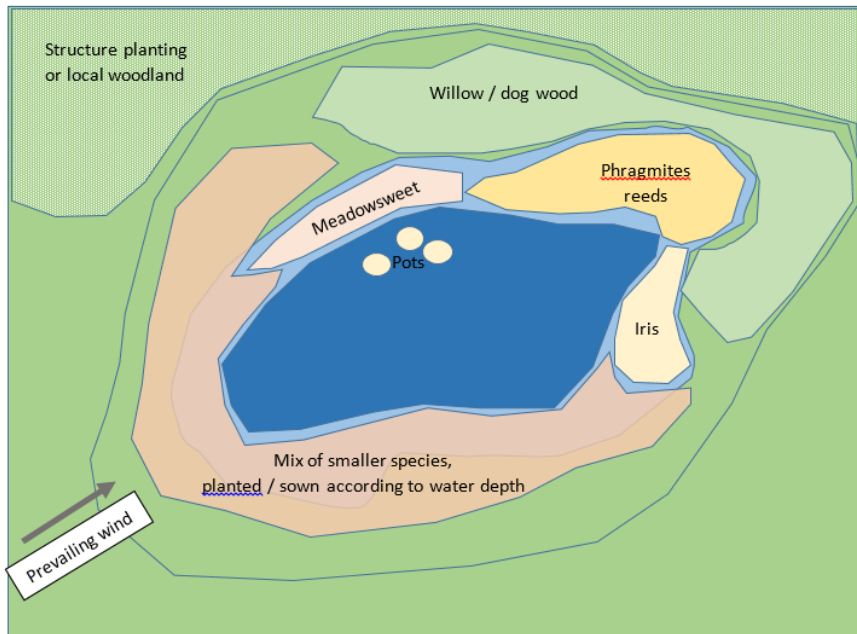


Figure 12: Stylised planting design for SUDS pond, based on Fig. 11

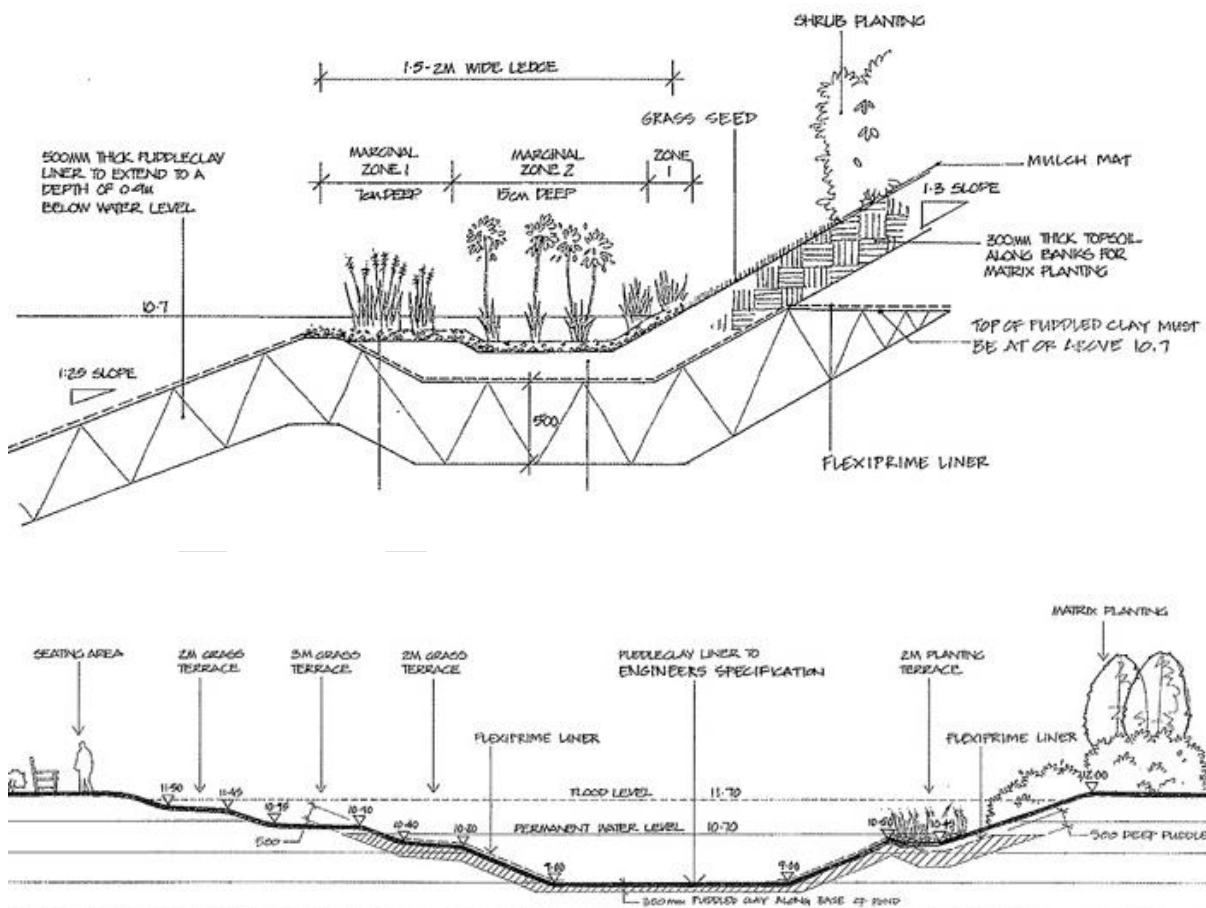


Figure 3: Examples of SUDS pond images from Google and CIRIA to aid discussions

Appendix C - Marginal (marsh) and Aquatic Plants Species

Table 1 lists native species that should grow well in marshy or aquatic conditions in East Lothian. Each species is available from commercial stockists, either as part of a seed mix or as plug plants. The list on the left hand side shows preferred species, which commonly grow as a mix of species to create diverse wetland vegetation communities. The species on the right hand side are taller and more robust, and can become dominant if the conditions suit the species. This will reduce overall plant diversity and can reduce landscape quality by presenting a solid blanket of a single species. These species should only be used where the pond design will restrict their spread, e.g. through soil conditions or water depth.

Note that *Typha* species should **not** be used because they can totally dominate a wetland, excluding most other species.

Acceptable species	Controlled Species	Banned Species
<i>Achillea ptarmica</i> (sneezewort)	<i>Filipendula ulmaria</i> (meadowsweet)	<i>Typha</i> species (reedmace) DO NOT USE
<i>Alisma plantago-aquaticum</i> (water plantain)	<i>Iris pseudacorus</i> (iris)	
<i>Angelica sylvestris</i> (wild angelica)	<i>Juncus</i> spp (all rushes)	
<i>Caltha palustris</i> (marsh marigold)	<i>Phalaris arundinacea</i> (reed canary grass)	
<i>Carex ovalis</i> (oval sedge)	<i>Phragmites communis</i> (common reed)	
<i>Dipsacus fullonum</i> (teasel)		
<i>Eriophorum vaginatum</i> (hare's foot cotton grass)		
<i>Geum rivale</i> (water avens)		
<i>Galium palustre</i> (marsh bedstraw)		
<i>Hypericum tetrapterum</i> (square-stalked St John's wort)		
<i>Lychnis flos-cuculi</i> (ragged robin)		
<i>Lythrum salicaria</i> (purple loosestrife)		
<i>Mentha aquatic</i> (water mint)		
<i>Myosotis scorpioides</i> (water forget me not)		
<i>Polygonum amphibium</i> (amphibious bistort)		
<i>Potentilla palustris</i> (marsh cinquefoil)		
<i>Primula veris</i> (cowslip)		
<i>Primula vulgaris</i> (primrose)		
<i>Prunella vulgaris</i> (selfheal)		
<i>Ranunculus flamula</i> (spearwort)		
<i>Stachys palustris</i> (marsh woundwort)		
<i>Valeriana dioica</i> (valerian)		
<i>Veronica beccabunga</i> (brooklime)		

Table 1: Wetland plant species that are acceptable in a SuDS pond design, those that should be used under controlled circumstances and species that must not be used.

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