Mansfield District Council

Sustainable Drainage Systems (SuDS)

Supplementary Planning Document (SPD)

March 2023

Planning Policy

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Contents

1. Introduction

Purpose of the Supplementary Planning Document

1.1 This Supplementary Planning Document (SPD) seeks to add further detail to policies contained within the Adopted Mansfield District Local Plan 2013 - 2033[1]. In particular, the SPD seeks to elaborate on the '**Sustainable drainage systems'** policy (CC3) but will also add further detail to policies: CC2 (Flood Risk); IN2 (Green Infrastructure); and NE2 (Bio-diversity net gain).

1.2 Supplementary Planning Documents (SPD) build upon, and provide more detailed guidance about, policies in the Local Plan. Legally, they do not form part of the Local Plan itself and they are not subject to independent examination, but they are material considerations in determining planning applications.

1.3 The SPD also seeks to complement and align with the 'Mansfield Sustainable flood resilience - Severn Trent green recovery programme' (the Flood Resilience Programme). Severn Trent Water Limited are working in partnership with Mansfield District Council and other partners to deliver a sustainable surface water management project by March 2025. The Flood Resilience Programme seeks to provide substantial investment in Mansfield District to reduce future flood risk, from all sources, whilst creating a green environment.

1.4 The Severn Trent project seeks to provide some 58,000m^3 of surface water storage through 15,000 blue-green interventions to prevent entry of surface water to sewerage network. This is the equivalent to the volume of 23 Olympic size swimming pools.

1.5 The Programme offers additional time limited financial support for SuDS schemes in Mansfield District for the duration of the project. The SPD seeks to identify the optimum solutions for this additional funding but also sets out longer term guidance for the implementation and management of successful SuDS beyond the timeframe of the project.

1.6 The SPD seeks to align with, and complement, 'Bio-diversity Net Gain' and 'Green Infrastructure' SPDs which are being prepared to set out guidance to

[1] https://www.mansfield.gov.uk/local-plan/adopted-local-plan-2013-2033

ensure Mansfield District strives to deliver Green development. It should also be read in conjunction with the district council's Planning Obligations SPD.

1.7 The SPD will provide more detailed guidance when planning applications are submitted or being developed. The SPD does not form part of the adopted development plan but is a material planning consideration in decision taking.

1.8 This SPD is designed to assist prospective developers and applicants by providing guidance on how proposals can demonstrate they have met the requirements of planning policy related to SuDS in Mansfield district. The SPD seeks to increase certainty in relation to the delivery of SuDS in the development process and also ensure that their delivery and subsequent maintenance is based on a clear and consistent approach.

1.9 This document sets out guidance on a number of issues and potential policy guidance areas. It has been prepared following public consultation in accordance with the Council's Statement of Community Involvement between 29th July and 12th September 2022.

1.10 Following this, the comments made were reviewed and changes made to the Supplementary Planning Document where it was considered necessary. A report was prepared responding to the key issues raised. It was then be taken to the Portfolio Holder and Council to make the decision to adopt the document.

Status of the SPD

1.11 The National Planning Policy Framework (NPPF) sets out that supplementary planning documents (SPDs) are documents which add further detail to the policies of the development plan. They are a material consideration when determining planning applications but do not form part of the statutory development plan.

1.12 The SPD has been prepared in accordance with the Planning and Compulsory Purchase Act 2004[2] and the associated Town and Country Planning (Local Planning) (England) Regulations 2012 (as amended)[3]. The document is also prepared in accordance with the National Planning Policy Framework (NPPF) and National Planning Practice Guidance (NPPG).

1.13 The NPPG (Paragraph: 008 Reference ID: 61-008-20190315) identifies that SPDs should build upon and provide more detailed advice or guidance on

[2] https://www.legislation.gov.uk/ukpga/2004/5/contents
[3] https://www.legislation.gov.uk/uksi/2012/767/contents/made

policies in the Local Plan. They can't, however, introduce new planning policies or add unnecessarily to the cost of development. The NPPG also confirms that SPDs are normally excluded from the requirement for a Sustainability Appraisal (005 Reference ID:11-005-20190722).

1.14 Sections 11 to 16 of the Town and Country Planning (Local Planning) (England) Regulations 2012 set out the legal requirements for the preparation of SPDs. In summary these require:

- a consultation period of at least 4 weeks to allow any person to make representations about the SPD;
- a consultation statement setting out who has been consulted, a summary of the key issues raised and how these comments have been addressed in finalising the SPD.

What are 'Sustainable Drainage Systems?'

1.15 Sustainable Drainage Systems (SuDS) are drainage solutions that provide an alternative to the direct channelling of surface water through networks of pipes and sewers to nearby watercourses.

1.16 SuDS seek to mimic natural drainage and aim to reduce surface water flooding, improve water quality and enhance the amenity and biodiversity value of the environment. SuDS achieve this by regulating the flow of surface water, increasing water storage capacity and reducing the transport of pollution to the water environment.

1.17 SuDS can be delivered through a range of technical solutions which incorporate hard and soft landscaping solutions to regulate water infiltration.

Benefits of SuDS

1.18 In addition to reducing the risk of flooding, SuDS have multiple benefits including contributing to sustainable development, delivering bio-diversity gains, providing green infrastructure and improving the places and spaces where people live, work and play by contributing to the quality of developments as part of high quality urban design.

1.19 The SPD seeks to address SuDs for surface water (rainfall) attenuation as opposed to floodplain storage from river flooding. Flooding from rivers is normally a matter considered during the determination of planning applications. Measures to increase resilience against fluvial flooding are

normally considered by the Local Lead Flood Authority and Environment Agency.

1.20 SuDS related issues in Mansfield District include:

- The need to alleviate Surface Water Flood Risk: Identifying the current areas with potential for flooding and issues with the current drainage system can help inform decision making on the type and location of proposed SuDS interventions. The SuDS SPD and Flood Resilience Programme introduces the opportunity to increase porous surfaces and provide solutions that alleviate the current surface water flooding risk.

- Water quality management benefits: Pollutants (such as oil, micro-plastics and sediments,) are not effectively managed by traditional piped drainage. Pollutants or contaminants can be washed into sewers and eventually watercourses in surface water runoff. Some SuDS interventions provide water quality improvements by reducing sediment and contaminants from runoff.

- Connecting People: In the context of new developments, including those within Mansfield Town Centre, SuDS have the potential to provide blue-green interventions that improve pedestrian connections and public realm improvements. Potential benefits include reducing the physical barriers created by existing vehicle routes and improving the townscape for pedestrian movement, which in turn can help to increase footfall.

- Green Infrastructure (GI): There is potential for SuDS to be incorporated into green infrastructure which provides a linked network of multi-functional green space and other green features. GI includes rivers, streams, canals and other water bodies (sometimes called ‘blue infrastructure’).

- Public realm and urban design enhancement: The provision of blue and green interventions as part of can introduce features of high quality landscaping or open water that helps to create a sense of place and attractive public spaces.

- Enhanced Bio-diversity: The introduction of blue-green SUDS can provide opportunities for the creation of new habitats for flora and fauna. In some cases SuDS may be able to contribute to developer requirements for Bio-diversity net gain introduced through the Environment Act 2021.

- Air quality: The green components of SuDS (trees, green roofs, green walls and swales) can have a positive effect on local air quality by absorbing or remove certain pollutants, including nitrogen dioxide, sulphur dioxide, particulate matter and ozone.

- Climate change – resilience and adaptation: SuDS can help to provide resilience to the impacts of climate change. This is both in terms of developing schemes that avoid embodied carbon but also mitigate some localised impacts of climate change. This includes measures that result in urban cooling and help to moderate the temperature of buildings thereby reducing the need for artificial heat or air conditioning.

- Groundwater recharge: SuDS can increase infiltration to groundwater. This can help maintain natural hydrology, increase availability of water for abstraction or reduce treatment costs.

- Health & well-being: A growing body of evidence suggests the presence of green space improves people's quality of life and health.

- Long term financial benefits for developers: The provision of SuDS allows for the developers to reduce the financial costs of discharging surface water to the combined sewers. A well-designed SuDS scheme (where good designers are engaged early) should not cost more than a traditional drainage system. Early consideration of SuDS and how they can be incorporated into the site design can often reduce costs and additional benefits can be achieved.

2. Policy context

Relevant legislation

2.1 The legislative context for the delivery of SuDS include:

- The Flood and Water Management Act (2010): The Act seeks to secure more comprehensive management of flood risk for people, homes and businesses. The Act encourages the uptake of sustainable drainage systems by removing the automatic right to connect to sewers and providing for unitary and county councils to adopt SuDS for new developments and redevelopments.

- The Building Regulations: The Building Regulations part H (Drainage and Waste Disposal) states that 'infiltration' should be the first considered option for rainwater disposal, followed by discharge to a watercourse. Discharge to a sewer should only be considered where other forms are not practicable. This encourages delivery of SuDS as the preferred option for surface water disposal.

- Town and Country Planning (Development Management Procedure) (England) Order 2010): Local planning policies and decisions on planning applications relating to major development - developments of 10 dwellings or more dwellings; or equivalent non-residential or mixed development are required to ensure that sustainable drainage systems for the management of run-off are put in place, unless demonstrated to be inappropriate.

Government guidance

2.2 Government planning policy is contained in the National Policy Framework (NPPF) and guidance in the Planning Practice Guidance (NPPG). More detailed guidance is contained in the 'Sustainable drainage systems: non-statutory technical standards' which set out the Government's policy, guidance and standards for SuDS.

2.2.1 The NPPF states that:

"When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere…….. Development

should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:……..

c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate…." (NPPF 2021, para 167) and;

"Major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems used should:

a) take account of advice from the lead local flood authority;
b) have appropriate proposed minimum operational standards;
c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and
d) where possible, provide multifunctional benefits." (NPPF 2021, para 169)

2.2.2 The NPPG states:

"Local authorities and developers should seek opportunities to reduce the overall level of flood risk in the area and beyond. This can be achieved, for instance, through the layout and form of development, including green infrastructure and the appropriate application of sustainable drainage systems…" (NPPG: Paragraph: 050 Reference ID: 7-050-20140306)

"New development should only be considered appropriate in areas at risk of flooding if priority has been given to the use of sustainable drainage systems." (NPPG: Paragraph: 079 Reference ID: 7-079-20150415)

"What sort of sustainable drainage system should be considered?

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

1. *into the ground (infiltration);*
2. *to a surface water body;*
3. *to a surface water sewer, highway drain, or another drainage system;*
4. *to a combined sewer.*

Particular types of sustainable drainage systems may not be practicable in all locations. It could be helpful therefore for local planning authorities to set out those local situations where they anticipate particular sustainable drainage

systems not being appropriate." (NPPG: Paragraph: 080 Reference ID: 7-080-20150323)

"In considering a development that includes a sustainable drainage system the local planning authority will want to be satisfied that the proposed minimum standards of operation are appropriate and that there are clear arrangements in place for ongoing maintenance." (NPPG: Paragraph: 081 Reference ID: 7-081-20150323)

During the consultation period on the SuDS SPD, the Department for Levelling Up, Housing and Communities issued additional guidance relating to Sustainable Drainage systems as part of the Planning Practice Guidance[4]. The new guidance is a material consideration in the development of planning policy and the determination of planning applications and should be considered alongside this SPD in developing proposals.

2.2.3 The 'Sustainable drainage systems: non-statutory technical standards' contains non-statutory technical standards for the design, maintenance and operation of sustainable drainage systems. Systems to drain surface water from housing, non-residential or mixed use developments for the lifetime of the developments are identified.

2.2.4 National SuDS Standards: The non-statutory technical standards for SuDS (March 2015) provide guidance for Councils to define their own standards for approval of SuDS proposals within planning applications. This seeks to ensure developments suit local requirements and address common site challenges for SuDS. It indicates that SuDS should be designed with the minimum amount of underground or traditional piped linkage as possible. The designer should aim to use easily accessible features to connect SuDS features where possible. SuDS should address the key stages of design, construction, maintenance, and operation. The standards emphasise that SuDS should be multi-functional creating public-friendly spaces, enhanced and new landscape features and habitats encouraging wildlife to flourish.

Local Context

- Mansfield Local Plan

[4] https://www.gov.uk/guidance/flood-risk-and-coastal-change#para55

2.3 The Mansfield District Local Plan 2013 – 2033[5] was adopted in September 2020. The Local Plan's 'Vision' sets out the council's desire that by 2033:

"…New development will have been designed to minimise impacts and improve resilience to climate change."

2.4 In the context of Mansfield Town Centre, the vision states:

"The town centre will have continued to build on its role as a cultural and leisure destination that is suited to the district's residents, businesses and visitors supporting increased footfall and vibrancy as a place to work, live, shop and play…….".

2.5 Objective 8 of the Local Plan seeks to:

"Ensure new development minimises, and is resilient to, the adverse impacts of climate change by adopting measures to appropriately address renewable and low carbon energy generation, flood mitigation, green infrastructure, resource and waste management..."

2.6 Objective 13 of the Local Plan seeks to:

"Encourage new development to be water sensitive by addressing water efficiency, protecting and enhancing the natural environment and reducing flood risk and pollution, whilst at the same time ensuring the effective design and location of sustainable urban drainage systems (SuDS) and naturalising the river environment to create a more attractive healthy environment for residents."

2.7 Policy CC3 is the primary policy relating to 'Sustainable drainage systems'. A copy of the policy is attached as Appendix A. In summary, the policy seeks to secure measures that reduce and manage surface water to minimise the potential for flooding. The policy seeks both the implementation and subsequent management of SuDS and supports the retro-fitting of SuDS in appropriate circumstances. Place making policies within the Local Plan (P1 to P8) seek to encourage high quality design as part of all new development proposals. Policy P5 supports developments which incorporate high standards of design and construction to reduce, mitigate and adapt to the impacts of climate change. In particular, the policy promotes high quality sustainable drainage and water management measures.

[5] https://www.mansfield.gov.uk/local-plan/adopted-local-plan-2013-2033

2.8 The justification to the policy sets out the SuDS hierarchy for discharging surface water. This indicates that the preference (in ascending order) is for surface water to be disposed of as follows:

1. into the ground (infiltration);
2. to a surface water body;
3. to a surface water sewer;
4. highway drain, or another drainage system; and then
5. to a combined sewer.

2.9 A substantial amount of surface water in Mansfield District is discharged to combined sewers. This increases the risk of flooding and has adverse impacts on water quality and water efficiency. The SPD seeks to ensure that future developments are drained in the appropriate way.

- Mansfield Sustainable flood resilience - Severn Trent Green Recovery Programme

2.10 Severn Trent Water Limited secured funding to deliver a collaborative sustainable surface water management project, in partnership with Mansfield District Council.

2.11 The project seeks to prevent entry of surface water to sewerage network. Severn Trent are managing a trial using a nature-based approach to reduce future flood risk, from all sources, whilst creating a green environment. The project is to be delivered by March 2025.

2.12 For the duration of the Sustainable flood resilience programme, Severn Trent Water Limited are funding public projects including environmental and drainage enhancements in Mansfield District. The town centre SuDS schemes seek to complement the enhancement works identified through the Mansfield town centre masterplan. The SPD seeks to encourage development of SuDS interventions that complement the work that Severn Trent green recovery project and Mansfield Town Centre Masterplan

2.13 For the duration of the project, additional funding is available through Severn Trent in order to encourage developers to enhance their proposed SuDS solutions to add value in terms of their efficiency, function and aesthetics.

- Priority SUDS projects

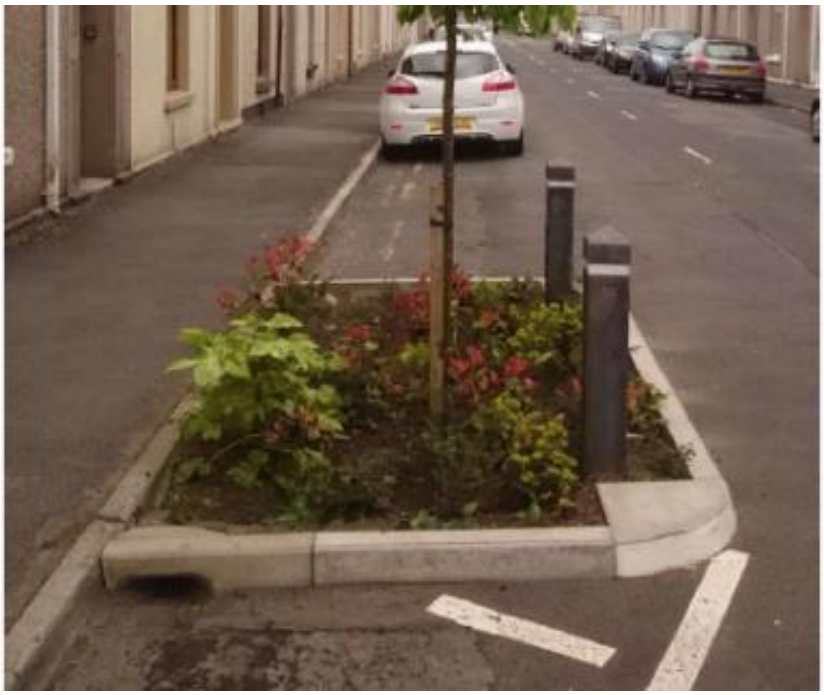
2.14 The Sustainable flood resilience programme has identified multiple projects in Mansfield town centre and in residential and commercial areas within the District. The list of potential projects will grow as the project evolves. The identified projects include development of a range SuDS interventions including:

- permeable paving
- street and verge raingardens
- planted bio-swales
- grassed / planted detention basins
- bio-retention tree pits, and
- rainwater downpipe planters.

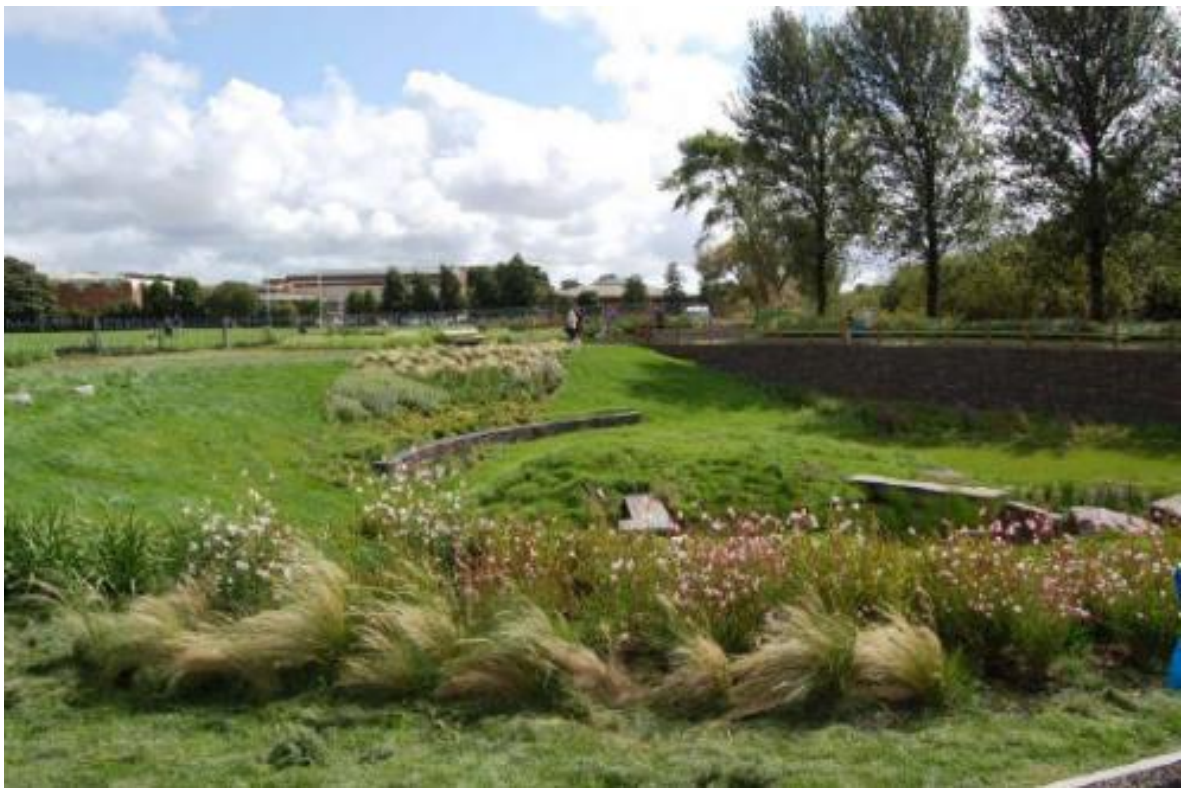
2.15 Examples of different types of solutions are shown in photographs 1 to 5 below.

Photograph 1: Verge raingarden

Photograph 2: Street planters

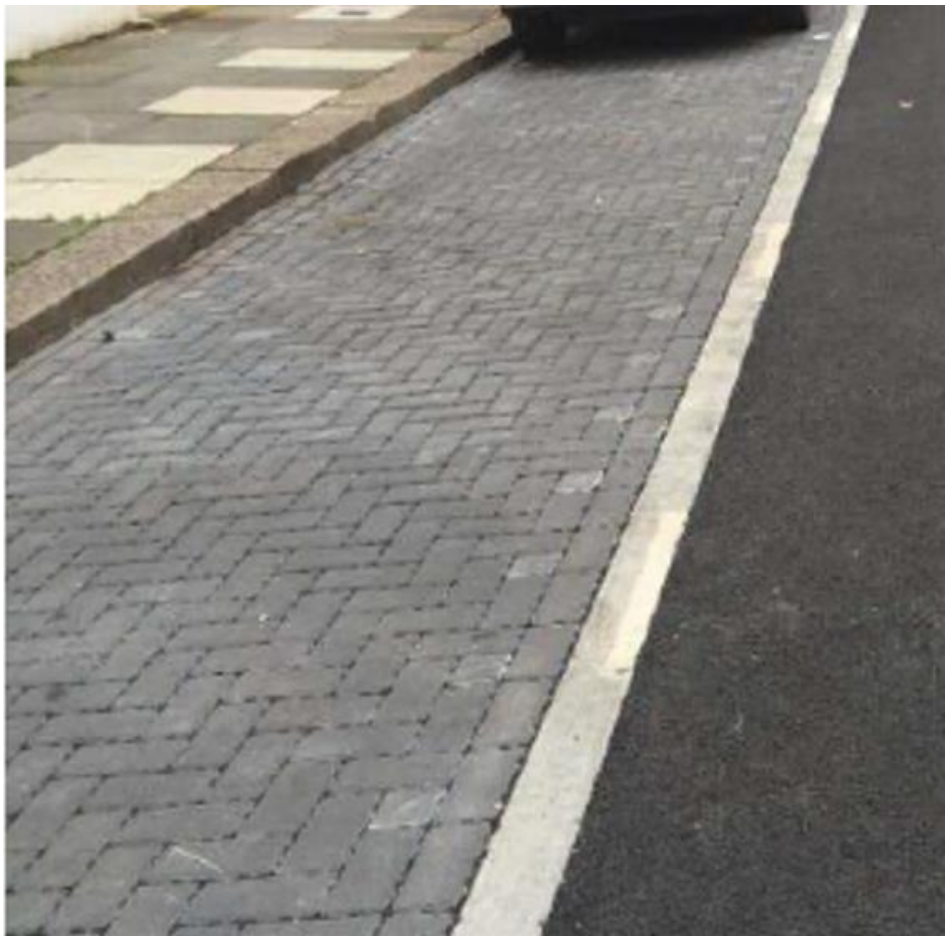


Photograph 3: Planted detention basins



Photograph 4: Planted bio-swales

Photograph 5: Permeable paving



3 Sustainable Urban Drainage principles

3.1 Mansfield District Council are committed to achieving Sustainable Drainage Systems in new developments in order to reduce the potential for flooding, deliver environmental enhancements, making places more resilient and adaptive to climate change and adding value in terms of Green Infrastructure and biodiversity.

3.2 Sustainable Urban Drainage Systems should seek to deliver multiple benefits and apply the following principles - SuDS should:

- be considered at the earliest stages of scheme development and not an afterthought;
- seek to mimic natural drainage in the way that surface water infiltrates the ground;
- be encouraged at both a small scale (domestic) and larger scale (systems);
- follow the drainage hierarchy;
- encourage water infiltration where possible;
- use surface water features where infiltration is not possible;
- contribute to place-making and urban design;
- be sympathetic to the landscape, habitats, flora and fauna;
- be sympathetic to the historic environment including impacts on archaeology ;
- seek to encourage solutions that embed carbon (avoiding concrete and other aggregates);
- seek to enhance biodiversity;
- deliver solutions that can be easily accessed and maintained;
- be well-designed and do not detract from the open space, play or leisure experience where they are accommodated within open spaces;
- be incorporated within streets where possible; and
- be incorporated in all types of development – not just housing.

4 Proposed guidance areas

4.1 The SPD seeks to provide more detailed guidance that builds on Policy CC3 of the Mansfield Local Plan 2013 - 2033. The SPD also seeks to provide planning guidance that will provide a planning context to the Mansfield 'Sustainable flood resilience - green recovery programme' (the programme).

4.2 The SPD covers the following matters:

- optimising opportunities for SuDS enhancements through the Mansfield Sustainable flood resilience - Severn Trent green recovery programme;
- the SuDS Management Train;
- different types of SuDS that could be considered;
- SuDS measures on large sites;
- small scale SuDS;
- the SuDS 'discharge hierarchy';
- design process for SuDS;
- SuDS on previously developed (brownfield) land;
- SuDS on greenfield sites;
- SuDS and design quality;
- Mansfield town centre SuDS;
- development schemes in Mansfield district;
- information requirements;
- retrofitting of SuDS on existing estates;
- SuDS and biodiversity;
- SuDS and blue - green infrastructure;
- SuDS and climate change; and
- long term maintenance of SuDS.

4.3 ‘Sustainable flood resilience – green recovery programme’

4.3.1 The ‘Sustainable flood resilience - green recovery programme’ is a project being led by Severn Trent Limited (the Local Water Company) in partnership with Mansfield District Council. The programme offers a time limited opportunity (up to March 2025) for developers to seek funding to help deliver enhanced SuDS schemes as part of a wider strategic programme to deliver flood mitigation and other benefits across Mansfield District

4.3.2 For the duration of the programme, Severn Trent are designing and implementing a series of high quality Sustainable Drainage Systems. These include interventions in Mansfield Town Centre as part of enhancements associated with the ‘Town Centre Masterplan’. The programme also seeks to retrofit SuDS in established urban areas. In addition to these interventions on public land, Severn Trent and Mansfield District Council are working collaboratively with commercial, residential and other developers to deliver enhanced SuDS proposals as part of other new developments.

4.3.3 For the duration of the Flood Resilience Programme additional funding is available to developers to help deliver enhanced SuDS that exceed minimum standards on suitable and qualifying sites. The availability of additional funding support is time limited but will help to secure opportunities for flood alleviation and other environmental benefits.

4.3.4 Although the Flood Resilience Programme is time limited, the principle of securing high quality SuDS solutions in the longer term is not. Developers are strongly encouraged by the other guidance within this document to seek the delivery of effective, well-designed SuDS that are effective in the short and longer term. Whilst the availability of additional funds will expire in March 2025, the other sections of the guidance will remain.

4.3.5 The Council seeks to encourage all development to be compatible with the objectives of the Mansfield Town Masterplan and the Severn Trent Green Recovery Project. It is important that proposed SuDS schemes compliment these proposals and where possible maximise either the flood risk benefits or Biodiversity Net Gain.

SuDS SPD 1 - Mansfield Sustainable flood resilience - Severn Trent green recovery programme

For a time limited period developers are encouraged to engage with Severn Trent Water Ltd to secure enhancements to proposed Sustainable Drainage Systems.

Top up funding is available to proposals which meeting the following criteria:

- **The opportunity for any brownfield / change of use development can achieve end to end application to build by 31st March 2025.**
- **The proposal is in an area where the development site currently discharges to the foul combined sewerage network[6]**
- **The proposal delivers enhanced SuDS that satisfy Severn Trent standards and are fed direct from impermeable surfaces (roads, footpath or roofs etc.)**
- **The proposal would result in attenuation that should cater for all rainfall events up to and including the Severn Trent critical storm event of 1 in 10-year with a 240 minute duration[7].**
- **The SuDS are capable of being delivered on site or off site where there is explicit agreement to deliver.**

The process for applying to secure top up funding for enhanced SuDS as part of new development proposals is:

- **Seek the informal opinion of Severn Trent water as early as possible in the design process in order to agree whether the proposal is eligible for funding and seeking pre-design advice[8].**
- **Submit a written application to Severn Trent seeking funding for SuDS enhancements[9].**
- **Severn Trent assesses the initial application and seeks clarification on detailed matters.**

[6] Grant funding may also be available where there is a separate system in the area of a Brownfield site for surface water collection that subsequently enters the foul/combined sewerage network outside of the site. The advice of Severn Trent Water should be sought to understand if funding is available.
[6] It is anticipated the SuDS attenuation provided to meet the Severn Trent critical storm requirement will enable the developer's storage, to meet their flood risk assessment, to be significantly reduced with exceedance routes from the SuDS interventions to be demonstrated.

[8] Other private interventions such as rain water harvesting via a 'blue roof' will also be considered in addition to those that meet the new SuDS standards.
[9] Applications can be made via Severn Trent's web-site: https://www.stwater.co.uk/building-and-developing/overview/

- **Top up funding is agreed, and contractual process to provide SuDS outlined in planning application.**

Severn Trent water will also engage with developers seeking to enhance SuDS on greenfield sites through the programme. The key principle is that development on greenfield sites should exhaust all options for surface water disposal through infiltration or other opportunities bar connection to the foul or combined sewer.

Evidence of who will manage and maintain all drainage features for the lifetime of the development will be required prior to construction. Details of this should be provided with the submitted planning application and subsequently controlled through a planning condition or section 106 agreement.

If Severn Trent agree to the ongoing management and ownership of the SuDS intervention, following construction, this should be agreed through a formal agreement. Any areas of land to be maintained and / or managed by Severn Trent or another third party should be identified on submitted plans.

4.4 The SuDS Management Train

4.4.1 SuDs should not be thought of as individual interventions, but an interconnected system which regulates and slows the flow of water from where it falls to a soakage area. SuDS networks can include a series of features that help to treat, store, re-use, convey and use water.

4.4.2 The SuDS Management Train (sometimes called the ‘treatment train’) is an approach which encourages the design of schemes that pass water through several stages of treatment. This helps to: slow surface water flow, remove sediments and other pollutants, minimises the risk of downstream SuDS becoming clogged or blocked. The treatment train can create green corridors and links, add opportunities for engagement and education and match delivery of SuDS to different phases of development.

SuDS SPD 2 - The SuDS Management Train

All developers should seek to pursue the 'SuDS Management Train'. To achieve this, developments should seek to deliver a wide variety of interventions which can be linked together in sequence in order to reduce the potential for downstream flooding and reducing the transition of sediments and other pollutants. Details of the proposed approach to be used should be included in the Drainage Strategy submitted with a planning application

The following sequence should be sought:

1. **Prevention - Prioritise designs which reduce and manage runoff and pollution. Interventions include such as minimising the use of impermeable paved surfaces.**

2. **Source control – Manage surface water as close to the source as possible to prevent run-off and migration of pollution. Such interventions include using green roofs, rainwater harvesting, and permeable paving or filter strips.**

3. **Site control – Manage runoff across a site using a series of SuDS interventions in sequence. Multiple SuDS interventions in a series contributes to water treatment reducing downstream sediment movement. Interventions include vegetation or gravel filtration.**

4. **Regional control – This includes downstream management of runoff for a whole site or catchment. Interventions include retention ponds or wetlands.**

When drainage catchments are unable to be fully linked, are in small sections or sub-divided it is important that developers consider how this affects the whole catchment management and the hydrological cycle. In such cases it is important that SuDS manage surface water by redirecting it away from the sewerage system in a sustainable, controlled manner.

All developments should give priority to flood prevention using the SuDS Management Train to reduce the need for mitigation structures. The requirements for SuDS should take into account the overall layout of the development and the site's natural features including its soil types, geology, topography and existing habitats.

4.5 Different types of SuDS Policy

4.5.1 Policy CC3 of the Mansfield Local Plan 2013 -2033 states that:
"All development proposals should, wherever possible, include measures to reduce and manage surface water through appropriate sustainable drainage systems (SuDS) so as to minimise and manage flooding"

4.5.2 The policy does not specify the nature of SuDS to be used, but indicates that these should be 'appropriate measures'. The type of SuDS that could be used will depend on the circumstances of the site and the development proposed.

4.5.3 The existing drainage system of potential development sites need to be fully understood prior to designing development proposals and their associated SuDS. The type of SuDS that may be appropriate depends on:

- the proposed use;
- scale of built development;
- site layout; and
- physical landscape characteristics.

4.5.4 The natural environment and natural drainage system will also play a part in determining the preferred type of SuDS, natural features include:

- streams and rivers;
- water storage, such as ponds and lakes; and
- reed-beds and peat-bogs which store water.

There are also hidden infiltration and storage features that influence drainage including bedrock and groundwater aquifers (underground water storage).

4.5.5 Much of Mansfield district's built environment contains traditional artificial drainage components that accelerate drainage such as hard-surfacing, hard roofs, down-pipes and gutters, combined surface and foul sewers.

4.5.6 An understanding of the sites built and natural systems needs to be understood before a sustainable drainage system can be designed.

4.5.7 The type of SuDS chosen also has an influence on the built and historic environment. Historic England have produced guidance 'Water Features in

Historic Settings: A Guide to Archaeological and Palaeoenvironmental Investigations' which considers water features such as ponds[10].

4.5.8 Developers are encouraged to pursue a range of interventions to attenuate the flow of surface water. SuDS should be incorporated into all developments, regardless of scale. Types of surface water storage and attenuation measures include:

- Ponds - SuDS ponds have a storage capacity above the permanent water volume and should mimic natural pond systems. Ponds should be designed to receive silt-free surface water runoff. There should be at least one upstream treatment process on the surface water run-off to manage the conveyance of silt.
- Wetlands - These are shallow depressions that are mostly or completely covered in marsh vegetation and contain minimal open water.
- Detention basins - Detention basins are vegetated depressions in the ground designed to store surface water runoff and flow out at a controlled rate.
- Infiltration basins – These are similar to detention basins but are designed to allow water to soak into the ground as well as provide storage.
- Filter strips – These are vegetated strips of land designed to accept overland run-off.
- Filter drains and trenches - These are linear excavations normally filled with aggregate which collect surface water as it runs off from impermeable surfaces. Filter drains and trenches should receive silt free surface water to prevent excessive maintenance being required or clogging of the filter drains.
- Swales – These are vegetated features in which surface water can be stored or transferred. Some swales also allow infiltration.
- Rain gardens - Rain gardens are planted areas designed to provide a drainage function as well as contribute to the soft landscape.
- Canals and rills – These are open surface water channels with hard edges. They channel water flows and can have a variety of cross sections to suit the landscape. Rills and canals can include planting to provide both enhanced visual appeal and water treatment.
- Permeable paving – These are pedestrian or vehicular surfaces that allow surface water to percolate directly through the surface to the underlying base which infiltration can occur.

[10] https://historicengland.org.uk/images-books/publications/water-features-historic-settings

- Geo-cellular structures, oversized pipes and tanks – These are ‘modular’ plastic structures (including structures known as ‘egg crates’) which have a high void ratio to store water underground.

SUDS SPD 3 – SuDS measures on large sites

The design of major new developments (sites of 10 or more dwellings, 0.5 hectares for residential development and 1,000sqm / 1 hectare for other development) should consider a range of interventions to attenuate and store the flow of surface water.

Opportunities should be explored to deliver a range of SuDS interventions including:

- **ponds;**
- **wetlands;**
- **detention basins;**
- **infiltration basins;**
- **filter strips;**
- **filter drains and trenches;**
- **swales;**
- **rain gardens;**
- **canals and rills;**
- **permeable paving; and**
- **geo-cellular structures, oversized pipes and tanks.**

The type of SuDS intervention should be informed by the scale and nature of the development proposed and the existing site conditions and constraints including the site's natural soil types, geology and topography. The advice of the Local Lead Flood Authority should be sought on major applications in order to deliver the most appropriate intervention and to optimise SuDS benefits.

4.6 Small scale SuDS

4.6.1 Surface water attenuation and storage can also be achieved at a domestic scale. Small scale interventions on individual properties can help to slow the rate of run off and allow opportunities for on-site storage (and re-use of rain water). Domestic scale interventions can include:

- Green roofs – These are multi-layered roofs that contain a water-proof membrane below a layer of soil (or granular material) and planting (often sedum).
- Water butts – small scale water storage containers that collect rainwater from impermeable surfaces (normally roofs) via down-pipes.
- Permeable driveways - These driveways that allow surface water to percolate directly through the surface to the underlying base where infiltration can occur.
- Soakaways – These are excavations filled with aggregate or pre-cast storage structures surrounded by granular backfill. They can be located in hard or soft landscaping.

SUDS SPD 4 – Small scale SUDS

Proposals for smaller scale developments (less than 10 dwellings) should seek opportunities to deliver SuDS interventions that keep surface water out of combined sewer systems.

Proposals for small scale developments (including single dwelling houses) should seek to deliver a range of interventions that attenuate and store surface water. Developments should include features that exceed the minimum requirements of the Building Regulations. Potential interventions include:

- **green roofs;**
- **water butts;**
- **permeable driveways;**
- **rain gardens; and**
- **soakaways.**

The development of new impermeable hard surfaced areas within residential property curtilages, including car parking areas, is strongly discouraged.

4.7 The 'discharge hierarchy'

4.7.1 The National Planning Practice Guidance (NPPG)[11] sets out a 'Hierarchy of Drainage' to promote the use of Sustainable Drainage Systems. The hierarchy seeks to align SuDS with natural water processes. The aim of Hierarchy is to drain surface water run-off as sustainably as reasonably practicable.

4.7.2 The hierarchy for surface water drainage is as follows:

1. Into the ground (infiltration)
2. To a surface water body
3. To a surface water sewer, highway drain, or another drainage system
4. To a combined sewer

4.7.3 The NPPG reinforces the principle aim that surface water run-off should be discharged as high up the drainage hierarchy as possible.

SUDS SPD 5 – the SuDS 'discharge hierarchy'

All new developments should seek to implement Sustainable Drainage Systems that follow the 'Hierarchy of Drainage' where Surface water run-off is processed in accordance with the following hierarchy:

1. **Into the ground (infiltration)**
2. **To a surface water body**
3. **To a surface water sewer, highway drain, or another drainage system**
4. **To a combined sewer**

Where drainage is proposed to a surface water or combined sewer, the developer should demonstrate why preferable solutions for infiltration or storage are not possible.

New developments should seek to demonstrate that all surface water discharges have been carried out in accordance with the principles laid out

[11] Paragraph 80 (Reference ID: 7-080-20150323)

within the drainage hierarchy, whereby a discharge to the public sewerage system is avoided where possible.

4.8 Design process for SuDS

4.8.1 Well-designed SuDS can contribute greatly to a development proposal, not only in terms of reducing the risk of flooding but also the quality of spaces green infrastructure and biodiversity. Good design should be central to all proposals but there is no 'one size fits all' solution.

4.8.2 There are multiple guidance documents that seek to inform the effective development of SuDS. Most notably the 'CIRIA[12] SuDS Manual' which gives step-by-step guidance on the SuDS design process.

4.8.3 The key stages in the design of SuDS should follow those of the development design process. Early stages should explore site opportunities and constraints including for delivering SuDS. As development proposals evolve, optimum SuDS solutions should be identified and incorporated as an integral part of scheme design. Early development options should consider a range of interventions and solutions to optimise SuDS. Fine-tuned solutions can be identified as detailed proposals emerge.

4.8.4 The opportunities for development and delivery of SuDS will vary site by site depending on:

- site size and shape;
- topography;
- site features such as trees, hedges, woodland and other vegetation;
- existing surface water drainage; and
- access to existing infrastructure (including drainage infrastructure).

4.8.5 The design of SuDS should follow a logical process from inception to delivery. The key development stages for strategic scale applications are set out in the table below alongside the corresponding SuDS design process:

[12] CIRIA is a neutral, independent, not-for-profit organisation who facilitate a range of collaborative activities that help improve the construction industry. CIRIA

Development stage	SuDS stage
Identify development opportunities, site constraints and capacity	Identify site characteristics and opportunities for SuDS and seek professional advice
Masterplan / concept plan showing broad structure and land uses	Identify potential for SuDS including their broad location and types of interventions and broad flow routes / connectivity of SuDS
Pre-application engagement	Engage with LPA, LLFA and Water Company (Severn Trent)
Outline Planning Applications	Submit a flood risk assessment and develop 'Outline SuDS Strategy'
Detailed applications	Submit Detailed Sustainable Drainage Strategy and details of SuDS interventions
Implementation	Construction in accordance with agreed method statement
Monitoring and management	Management and maintenance in accordance with an agreed plan

4.8.6 The same principles apply in the design of SuDS for small / minor developments. Developers of small sites are encouraged to adopt a proportionate approach to identifying opportunities, submitting and subsequently implementing SuDS.

SuDS SPD 6 - Design and development process for SuDS

The potential for SuDS interventions should be undertaken from the earliest stages and should be integral part of the design process for all new development. SuDS design should align with the design stages in the following ways:

Identifying development opportunities, site constraints and capacity

Pre-application surveys, site assessment and constraints mapping will identify the site characteristics including potential surface water flooding. Survey work should assess topography, soil conditions, existing drainage and vegetation. This will broadly help to identify opportunities for SuDS based on site conditions and characteristics.

Seek professional advice

Seek professional advice and surveys from drainage engineers, landscape architects, ecologists, urban designers and other experts to optimise the provision of SuDS while securing high quality design.

Develop framework for development and masterplan (where required)

Identify potential SuDS solutions and associated land take based around flow paths, low points and catchments. Advice on SuDS opportunities and proposed solutions should be sought from the Lead Local Flood Authority, Severn Trent Water, Local Planning Authority and Highways Authority at this stage.

Outline Planning application stage

In order to demonstrate, in principle, that a site is capable of being satisfactorily drained, the following details should accompany outline applications. In all cases, major outline planning applications should include:

- **location plan;**
- **an indicative drainage strategy and 'flood risk assessment'[1];**

In cases where proposals are within flood zones 2 or 3 or where surface water drainage issues have been identified, the following information should be provided:

- **calculations of run-off rates and storage requirements;**
- **details of site investigation findings;**
- **assessment of flood risk (on and off site);**
- **conceptual design;**
- **outline construction management plan; and**
- **outline maintenance plan.**

[1] See guidance on when flood risk assessment is required in 'Flood risk assessments if you're applying for planning permission' https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications#when-you-need-an-assessment

In circumstances where it is not possible to provide these details as part of outline planning applications, planning conditions will be introduced seeking these as part of detailed or reserved matters planning applications.

Detailed planning application stage

Detailed planning applications should be accompanied by the information required for outline applications plus:

- **details of existing drainage and surface water flow paths;**
- **results of ground investigations;**
- **detailed calculations of existing and proposed run-off rates and storage requirements (including emptying times);**
- **discharge locations (including consents from Environment Agency, Nottinghamshire County Council, Mansfield District Council and other parties where relevant);**
- **conceptual design;**
- **details of how SuDS will provide multiple benefits (water quality, biodiversity, amenity, health & well-being etc.); and**
- **detailed design plans (minimum 1:500) showing SuDS proposals and their 'contributing area', long sections and cross sections, pipe diameters, invert levels and gradients.**

Implementation

Implementation of the development proposal should be in accordance with the agreed Construction method statement, landscape planting strategy and Health and safety report[13].

Management and monitoring

Management and maintenance in accordance with an agreed plan.

Details of formal arrangements for the whole life management and costs of the SuDS and responsible organisation.

[13] Further details and guidance can be found in the CIRIA SuDS manual.

4.9 Brownfield sites

4.9.1 Brownfield sites in Mansfield District have different challenges and opportunities to greenfield sites. Previously developed land (PDL) often contains large areas of hard surfacing where flooding is exacerbated by the fast run-off associated with buildings and parking / storage areas. Some brownfield sites in Mansfield are also located where existing watercourses are polluted by urban drainage.

4.9.2 The provision of SuDS on PDL will help to reduce the potential for localised flood risk and pollution resulting from new development. Many brownfield sites will currently be served by an existing combined sewer system. The incorporation of SuDS and the reduction in storm run-off also have the potential to improve water quality in local watercourses by reducing discharges of untreated sewage from storm overflows in the downstream drainage system.

4.9.3 Implementing SuDS on PDL has the potential to enhance Green Infrastructure and biodiversity on sites that were previously devoid of such. New habitats for flora and fauna and movement networks can be created by SuDS (including bio-swales, infiltration verges, planters ponds and wetlands) which enhance biodiversity.

4.9.4 The surface water run-off reduction requirements for PDL are less onerous than those for greenfield sites. This is as a result of the existing sites often having high run-off rates entailing that ‘net’ benefits can be gained through more modest SuDS interventions. The guidance below sets out the minimum requirements for reduced run-off from brownfield sites.

4.9.5 The DEFRA ‘Non-statutory technical standards for sustainable drainage systems’ (May 2015) gives guidance on both the peak flow and volume control. In relation to peak flow control on previously developed land it states:

“For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event”

4.9.6 In relation to volume control, the guidance states:

"Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event.

Where it is not reasonably practicable to constrain the volume of runoff to any drain, sewer or surface water body in accordance with S4 or S5 above, the runoff volume must be discharged at a rate that does not adversely affect flood risk"

4.9.7 The SuDS SPD endorses the non-statutory DEFRA guidance in relation to reduced run-off on PDL. However, Mansfield District Council strongly encourages developers to seek to exceed the minimum peak flow and volume control requirements on PDL.

4.9.8 Substantial benefits can be achieved by storing surface water runoff on site until the main flood risks within the catchment have passed. In most cases, Surface water runoff which is stored on brownfield sites needs to be retained on site until the main risks to the receiving combined sewer have satisfactorily reduced.

SuDS SPD 7 – SuDS on Previously Developed (Brownfield) Land

Where development is proposed on Previously Developed (Brownfield) Land sites, developers should seek to regulate the discharge rates of surface water run-off and deliver storage volume which controls flows to the sewer to a minimum of 30% reduction on the existing pre-redevelopment rate.

New development proposals on brownfield land should indicate the storage volume of and duration over which surface water runoff will be stored and rate at which it will be discharged. This will be informed by an assessment of critical durations on the receiving sewer system. The advice of Severn Trent Water and Nottinghamshire County Council (Lead Local Flood Authority) should be sought in agreeing storage and discharge solutions.

Surface water storage and discharge on brownfield sites should seek to incorporate solutions that allow for greater interception and effective treatment of sediment and other pollutants. Schemes on PDL must not pose a potential risk to controlled waters, particularly on land which has previous potentially contaminating uses.

SuDS included within developments on PDL should be designed to cater for full attenuation to greenfield runoff rates for the 1 in 100 year event.

4.10 Greenfield sites

4.10.1 The majority of new residential development in Mansfield District will be delivered on greenfield sites. In many cases greenfield sites offer greater opportunities to deliver SuDS to regulate the flows and allow infiltration of surface water. Greenfield sites may not have the viability or contamination constraints of PDL but do have unique problems and opportunities, including access to existing drainage infrastructure.

4.10.2 The provision of SuDS on greenfield sites (particularly those above 10 units or more) will help to reduce the potential for localised flood risk and pollution resulting from new development. The key objective is to maximise infiltration and storage rather than traditional drainage solutions in Mansfield which sought to discharge surface water to the existing combined sewerage system.

4.10.3 Implementing SuDS on greenfield sites also has the potential to enhance Green Infrastructure and bio-diversity where they include features such as ponds and wetlands.

4.10.4 The surface water run-off reduction requirements for greenfield sites need to be 'future-proofed' to accommodate increased incidences of intense storms caused by climate change. The guidance below sets out the minimum requirements for reduced run-off from brownfield sites.

4.10.5 The DEFRA 'Non-statutory technical standards for sustainable drainage systems' (May 2015) gives guidance on both the peak flow and volume control. In relation to peak flow control on greenfield land it states:

"For greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should never exceed the peak greenfield runoff rate for the same event."

4.10.6 In relation to volume control, the guidance states:

"Where reasonably practicable, for greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in

the 1 in 100 year, 6 hour rainfall event should never exceed the greenfield runoff volume for the same event."

4.10.7 The SuDS SPD endorses the non-statutory DEFRA guidance. However, Mansfield District Council strongly encourages developers to seek to exceed the minimum peak flow and volume control requirements on greenfield sites.

SuDS SPD 8 – SuDS on greenfield land

Where development is proposed on greenfield (not previously developed) sites, developers should seek to regulate the discharge rates of surface water run-off and deliver storage volume which controls site drainage to cater for all rainfall events up to and including the 1 in 100-year event including a 40% allowance for climate change.

All greenfield site applications should undertake the appropriate calculations to determine QBAR [14] [15]

New development proposals on greenfield land should indicate the storage volume of, and duration over, which surface water runoff will be stored and rate at which it will be discharged. This will be informed by an assessment of critical durations on the receiving sewer system. The advice of Severn Trent Water and Nottinghamshire County Council (Lead Local Flood Authority) should be sought in agreeing storage and discharge solutions.

Surface water storage and discharge on greenfield sites should seek to incorporate solutions that allow for greater interception and effective treatment of sediment and other pollutants.

4.11 SuDS and design quality

4.11.1 The provision of SuDS can make a positive contribution to the built environment, place making, heritage and amenity. The use of suitably qualified professionals such as landscape architects and SuDS specialists through the design process (inception to implementation) will ensure that SuDS are an integrated part of the site layout and contribute to the landscape and townscape.

4.11.2 Mansfield District Council and Severn Trent are implementing town centre SuDS interventions that not only make positive drainage and flooding

[14] The peak rate of flow from a catchment for the mean annual flood

[15] As a rule of thumb a value of 5l/s per ha should be sought.

contributions but also offer substantial environmental improvements and opportunities for bio-diversity. Securing environmental improvements alongside SuDS should be the norm, rather than just meeting the minimal technical standards.

4.11.3 The scoping stage of scheme development should identify key environmental issues on site. These might include: townscape features, heritage assets, existing amenity spaces and local Landscape Character.

4.11.4 Many SuDS features are recognised as having positive contributions in urban settings. The use of pools and other water areas for example can serve the dual purpose of balancing surface water whilst securing benefits for places and spaces.

4.11.5 Where SuDS interventions are proposed, their environmental contribution is substantially enhanced where they appear to be 'natural features' or where the addition of planting helps to add value.

SuDS SPD 9 - SuDS and design quality

All SuDS interventions should seek make a positive contribution to townscape and landscape. SuDS solutions should not simply seek to meet minimum technical standards in the management of surface water but should seek to enhance the wider area. This should be through their design, landscaping, opportunities for bio-diversity and creating or adding to blue and green infrastructure.

SuDS interventions should, where possible, be designed to appear as 'natural features' in the townscape and landscape. The use of wet balancing areas, bio-swales and planted verges are supported where they provide visual enhancements.

Wildlife habitats and informally landscaped areas associated with SuDS should be planted with native species of local provenance wherever possible to maximise flowering and fruiting periods to benefit invertebrates and birds. All planting that links SuDS features with existing, natural wetlands should use native species from an accredited source to prevent the spread of alien species and protect native habitat.

The 'hard' construction elements of SuDS such as concrete structures, retaining areas, metal inspection ladders and other features should be avoided, and where necessary discreetly located to maintain the natural appearance of interventions.

Well-designed SuDS interventions should be used to 'break up' expanses of hard surface in new developments and as part of retro-fitted solutions.

The following design principles should be employed. All new SuDS interventions should:

- **be designed to appear as 'natural features' in the townscape and landscape and maximise opportunities to enhance biodiversity**
- **be well-integrated and 'seamless' features within new developments and as features introduced into the built and natural environment;**
- **integrate well in the landscape framework and existing and proposed areas of open space and planting;**
- **respect local distinctiveness and protect existing heritage or cultural features and visual importance;**
- **allow for and promote the movement of people particularly walking and cycling through open spaces;**
- **enhance the amenity of open space through the introduction of additional planting, user interaction areas, high quality finishes and planting;**
- **contribute towards enhanced biodiversity. Measures such as the use of wildflower-rich turf and planting with native plant plugs after permanent ground cover has been established are encouraged;**
- **be easily accessible for management and maintenance; and**
- **be safe ensuring that features are not hazardous.**

4.12 SuDs in Mansfield town centre

4.12.1 As part of the 'Mansfield Sustainable flood resilience - green recovery programme' multiple SuDS interventions have, and will be, delivered in Mansfield Town Centre by Severn Trent Water Limited. The objectives of this project seek to: connect people, manage surface water flood risk, and enhance place making. The Green Recovery Programme sits alongside the MDC Masterplan and Nottinghamshire County Council traffic management scheme in seeking to enhance the core of the town. The MDC masterplan seeks to provide a vision and delivery plan that will guide new development, while preserving the town's industrial history and heritage assets.

4.12.2 The initial Severn Trent projects in winter / spring 2021 / 2022 included retro-fitting SuDS interventions including: permeable paving, verge raingardens, street planters, planted bio-swales, grassed and planted detention basins, bio-retention tree pits and rainwater downpipe planters. Some 500+ interventions were planned and delivered during the pilot project.

4.12.3 The town centre SuDS interventions have three main objectives. These are:

- Connecting People: Improving the pedestrian connections and public realm through the implementation of the blue-green interventions. Potential benefits include reducing the physical barriers created by existing vehicle routes, enhanced pedestrian movement - which in turn can help to increase footfall.

- Alleviating Surface Water Flood Risk: Identifying and mitigating potential flooding issues in the town centre and improving the current drainage system. The project increases porous surfaces, creates green space and alleviates the current surface water flooding risk which results from the substantial hard surfaced areas.

- Place Making: Identifying opportunities for public realm improvements in key areas of the town centre. Blue-green interventions are delivered to promote a sense of place and encourage the public to use and enjoy the spaces within the town centre.

4.12.4 Later phases of town centre interventions will seek to realise longer term ambitions to align with the MDC Masterplan and potential traffic alterations. Proposals include Hi-Spec verge raingardens and Street Planters in Market Street, Market Place (Courthouse), West Gate and Buttercross. The Town Hall Car Park Greening scheme sought to incorporate rain gardens and additional street planters.

4.12.5 The publicly funded interventions in Mansfield town centre are only one facet of potential SuDS solutions. Private sector schemes, regeneration and redevelopment opportunities and highway improvement schemes should also seek to maximise high quality SuDS in partnership with Severn Trent and Mansfield District Council. The short term availability of additional funding (up to 2025) will allow commercially led developments to enhance the quality and effectiveness of SuDS interventions.

SuDS SPD 10 – Mansfield town centre

New development, redevelopment, regeneration and infrastructure proposals in Mansfield Town Centre should seek to deliver high quality SuDS. Proposals should, where possible, align with the Mansfield Sustainable flood resilience - green recovery programme schemes.

The method of town centre SuDS intervention will be dependent on individual circumstances and will be influenced by the nature of development, size and location of site, ground conditions and existing and proposed drainage infrastructure. The range of potential solutions is set out in SUDS SPD 3 – SuDS measures.

For the period up to March 2025, additional funding for SuDS enhancements from new development should be sought through Severn Trent Water Limited. Additional funding should be used to add value to the SuDS schemes to see additional benefits in terms of storage and retention or enhanced environmental benefits.

All new developments in Mansfield Town Centre should seek to deliver SuDS that exceed the minimum technical requirements for storage and infiltration and mitigating extreme weather events. Advice on the technical requirements for town centre schemes can be sought from the Lead Local Flood Authority.

SuDS should normally be secured on the proposal site but in some circumstances off-site provision or financial contributions to nearby schemes will be acceptable. These may require the provision of a section 106 legal agreement or other agreed mechanism.

4.13 Development schemes in Mansfield district

4.13.1 Mansfield Local Plan 2013 to 2033 identifies some site allocations that experience low permeability and other constraints to the effective drainage of surface water. Site allocations with identified drainage constraints include: Skegby Lane, Abbott Road and Former Mansfield Brewery. This list is not exhaustive and multiple committed or future schemes will experience low soil permeability or require surface water management solutions. Some development proposals on allocated sites have already secured funding for enhancement of SuDS on site.

4.13.2 It is easier and more cost effective to incorporate SuDS from the earliest stages of the design process by integrating interventions into the overall site design. Early engagement with Severn Trent Water by developers will help to identify potential enhanced interventions and funding opportunities.

SuDS SPD 11 – New Residential and Commercial development proposals

New residential and commercial development proposals in Mansfield district should seek to deliver high quality SuDS. Proposals should seek to exceed the minimum standards for infiltration and storage and should seek to offer

additional benefits in terms of water quality, amenity, biodiversity and landscape.

Planning applications for major development should be accompanied by a drainage strategy or statement for the proposal site that demonstrates how the proposal will deliver high quality and effective SuDS.

The type of SuDS intervention will be dependent on individual circumstances and will be influenced by the nature of development, size and location of site, ground conditions and existing and proposed drainage infrastructure. The range of potential solutions is set out in policy SPD 3.

For the period up to March 2025, additional funding for SuDS enhancements for new development can be sought through Severn Trent Water Limited. Additional funding should be used to add value to the SuDS schemes to deliver additional benefits in terms of storage and retention and / or enhanced environmental benefits.

Early advice on the technical requirements for new commercial and residential schemes can be sought from Severn Trent Water Limited and Nottinghamshire County Council (Lead Local Flood Authority).

4.14 Information requirements

4.14.1 Information on proposed drainage solutions is required alongside submitted planning applications to enable Mansfield District Council to adequately determine planning applications. The information required will be informed by the SuDS interventions proposed and the characteristics of the particular site, its surroundings and constraints.

4.14.2 Planning applications can be either ‘Outline’ (with one or more matters reserved for later determination) or ‘Full’. The level of information needed for each type of application or stage within the planning process will vary depending on the size of the development, flood risk, constraints and proposed sustainable drainage system.

4.14.3 The technical information required can relate to details regarding storage capacity, infiltration and run-off rates, the type design and location of interventions proposed and calculations that relate to climate change and future development allowances.

SuDS SPD 12 – Information requirements

Planning applications for new 'major' developments should be accompanied by proportionate drainage and SuDS information. The following information should be provided:

Outline planning applications[16]:

- **Flood Risk Assessment / Statement;**
- **Drainage Strategy / Statement & outline indicative drainage layout plan;**
- **Outline / indicative layout drawings;**
- **Outline hydraulic calculations;**
- **Outline / indicative landscape proposals;**
- **Ground investigation / infiltration report; and**
- **Evidence of third party agreement for discharge to public sewers (in principle / consent to discharge).[17]**

Full planning applications:

- **Detailed development layout;**
- **Detailed flood & drainage design drawings;**
- **Full Structural, hydraulic & ground investigation reports;**
- **Geotechnical reports including infiltration results;**
- **Detailed landscaping and planting details;**
- **Discharge agreements;**
- **Management & Construction Phasing Plan; and**
- **Details of SuDS maintenance program and on-going management responsibilities.**

Technical information should include:

- **Surface water storage volumes and locations;**
- **Sub-catchment areas;**
- **Design calculations for greenfield or brownfield run-off (suitable assessments of brownfield sites are needed to ensure existing flows are appropriately calculated);**
- **Infiltration rates;**
- **Peak flow rates;**

[16] In circumstances where it is not possible to provide these details as part of outline planning applications, planning conditions will be introduced seeking these as part of detailed or reserved matters applications

[17] Also required for full applications.

- **Surface water volumes – attenuation & storage requirements;**
- **Drain down times;**
- **Exceedance routes;**
- **Temporary drainage during construction;**
- **Climate change allowances;**
- **Future development allowances (where appropriate); and**
- **A flood risk assessment for planning applications for new development in flood zones 2/3 or with high levels of surface water flooding.**

4.15 Retrofitting SuDS on existing estates

4.15.1 Mansfield District Council, Severn Trent and other partners are exploring the potential to improve surface water management and quality through retrofitting of SuDS in existing built up areas.

4.15.2 Retrofitting SuDS helps to provide a more joined up approach to managing surface water across the District and supporting the water cycle as a whole. Retrofitting also helps to 'green' existing urban areas and generates other benefits such as improved bio-diversity and public realm. SuDS can also be cheaper than traditional drainage solutions.

SuDS SPD 13 – Retrofitting SuDS in existing urban areas

Mansfield District Council and its partners will seek to retrospectively fit SUDS interventions in existing urban areas including those which are part of the Council's landholdings.

Where new residential and commercial developments are proposed as infill schemes, redevelopment or regeneration proposals within the built up area developers should seek to manage surface water infiltration and storage using SuDS.

The method of SuDS intervention to be retrofitted will be dependent on the site circumstances. In all circumstances retrofitting of SuDS should seek to offer additional benefits in terms of water quality, amenity, biodiversity and landscape.

For the period up to March 2025, additional funding for retrofitting of SuDS from new development can be sought through Severn Trent Water Limited.

Early advice on the technical requirements for retrofitting SuDS schemes can be sought from Severn Trent Water Limited and Nottinghamshire County Council (Lead Local Flood Authority).

4.16 SuDS and biodiversity

4.16.1 Biodiversity is the variety of life that can be found on Earth (plants, animals, fungi and micro-organisms) and the habitats in which they live. Well-designed SuDS can add substantial value to Mansfield's biodiversity.

4.16.2 The Environment Act (the Act) sets out the Government's intention to improve air and water quality and protect wildlife.

4.16.3 Some SuDS interventions can have substantial benefits for bio-diversity and the creation of new and linked habitats. In particular, Ponds, Wetlands, Filter strips, Bio-Swales and Rain gardens all have the potential to provide vegetation which encourage the development of new habitats. Well-designed SuDS can create new habitats and rehabilitate or enhance existing ones. They can provide shelter, food and breeding opportunities for a variety of wildlife species.

4.16.4 A key part of the Act is to mandate a minimum of 10% Biodiversity Net Gain (BNG) as part of new development proposals. It is likely to become law in November 2023. There is potential for provision of some SuDS to align with and contribute towards achieving BNG.

4.16.5 Biodiversity benefits can be delivered by smaller SuDS interventions with more substantial biodiversity benefits can be delivered where SuDS are planned as part of wider linked green area which assist with wildlife connectivity.

SuDS SPD 14 - SuDS and biodiversity

All new development proposals that incorporate SuDS should seek to maximise the biodiversity benefits and should be designed to deliver the dual purposes of drainage management and supporting healthy habitats. SuDS interventions such as ponds, wetlands, filter strips, bio-Swales and rain gardens should be delivered where they provide potential new habitats for wildlife. The preferred approach to SuDS provision is where they incorporate features that mimic natural processes.

Larger developments which contain strategic green infrastructure or linked networks should seek to create SuDS that allow for linked areas of bio-diversity and the movement of wildlife. SuDS should be strategically placed to support and enhance local nature recovery networks, building ecological resilience into the landscape by connecting attenuation basins, retention /

detention ponds and wetlands at key locations that improve buffers between developed areas and existing valuable habitats.

Using existing ponds or wetlands to treat run-off should normally be avoided and new ponds should be created in order to avoid damaging or disturbing existing wildlife.

Wetland creation should act as the last treatment stage of a SuDS management train in order to reduce avoidable siltation and ongoing maintenance issues.

SuDS solutions are encouraged that optimise biodiversity and:

- **Support and protect natural local habitat and species**
- **Use native species and wildlife friendly plants in landscaping schemes**
- **Contribute to the delivery of local biodiversity objectives**
- **Contribute to habitat connectivity**
- **Create diverse, self-sustaining and resilient ecosystems**
- **Include provision of green SuDS and softer landscape features and vegetation in place of underground pipes or instead of canalising watercourses, and**
- **Include provision of new surface water features and associated waterside vegetation to encourage newts, frogs and toads and other wildlife.**

4.17 SuDS and green infrastructure

4.17.1 Green infrastructure is:

> *"….a network of multi-functional green space and other green features, urban and rural, which can deliver quality of life and environmental benefits for communities."* (Town & Country Planning Association)

4.17.2 Blue and Green Infrastructure includes water features and networks.

4.17.3 Well-designed SuDS can contribute to Green Infrastructure networks in Mansfield District. Nature-based SuDS which deliver Green Infrastructure have been developed in partnership with Severn Trent Water in Mansfield town centre. It is the intention that all large-scale SuDS delivered as part of private developments will contribute to the network of multi-functional green space.

4.17.4 Nature-based SUDS solutions that have the potential to make positive contributions to Green Infrastructure include the provision of Ponds, Wetlands, Filter strips, Bio-Swales and Rain gardens, street trees and planters. Well-designed public open space that incorporate SuDS can have multiple benefits including, enhanced bio-diversity, visual appearance, social cohesion and quality of life improvements.

4.17.5 The Mansfield Green Infrastructure Study 2018 encourages exploring the potential for 'green' sustainable drainage system priority areas and addressing areas that are currently culverted. There is potential for optimising the use of sustainable drainage systems to combat flooding and the impacts of climate change for Green Infrastructure purposes.

SuDS SPD 15 - Green infrastructure and Sustainable Drainage Systems

All new developments should consider the potential to deliver Sustainable Drainage Systems that contribute towards green infrastructure. The following types of sustainable drainage systems which contribute towards GI should be considered:

- **ponds;**
- **wetlands;**
- **filter strips;**
- **bio-swales;**
- **street trees and planters;**
- **raingardens;**
- **permeable paving; and**
- **urban ponds and wetlands.**

Sustainable Drainage systems that create or contribute towards linked networks are encouraged. Development should where possible create and enhanced blue green corridors to protect watercourses and their associated habitats from harm.

Where possible culverts should be removed in order to: enhance biodiversity and green infrastructure, make places more attractive to live and improve people's health and well-being

Proposed development and town centre improvements within Mansfield town centre should seek to align Sustainable Drainage Systems and Green Infrastructure where possible.

4.18 SuDs and climate change

4.18.1 The provision of SuDS has multiple benefits in terms of making places more sustainable overall. In particular SuDS have a key role to play in the creation of places that are more resilient and adaptive to the impacts of climate change. SUDS present additional environmental benefits and opportunities other than regulating the infiltration of surface water. Specifically in relation to Climate Change positive impacts of SuDS include contribution to the creation of microclimates in urban areas by replacing some of the evaporative cooling lost through urbanisation and reducing the impact of Urban Heat Island effects.

4.18.2 Research by 'Urban river corridors and sustainable living agendas'[18] (URSULA) provides evidence which supports the potential benefits of SUDS for climate change adaptation and mitigation as an integral element of high quality urban design.

4.18.3 A key benefit of SuDS in urban areas is that they help to adapt to the adverse impacts of climate change, particularly the increased incidence of extreme flooding events. SuDS help reduce the total volume and flow rate of surface water following flood events resulting in a substantial reduction in the potential for flooding incidents.

4.18.4 Well designed and effective SuDS can also help to reduce energy use which contributes to CO_2 emissions. More traditional drainage solutions such as disposal to surface water or combined sewers can involve the use of electric pumps to move storm water – which inherently need power, requiring electricity generation which overall contributes to the CO_2 emissions. Well-designed SuDS can avoid using man-made elements such as concrete pipes, tanks, headwalls and cascade units thereby avoiding the embodied carbon within these manufactured structures.

4.18.5 Planting of trees and other vegetation associated with green SuDS schemes increases absorption storage of carbon thereby contributing to a reduction in the overall levels of atmospheric carbon. Urban greening can impact the surrounding microclimate by reducing temperatures and improving comfort, contributing to climate change resilience.

[18] Sheffield University et al - Urban river corridors and sustainable living agendas Bulletin 3 (November 2011)

SuDS SPD 16 – SuDS and climate change

Climate change considerations should be central to the design and implementations of SuDS.

The design of SuDS should seek to make places more resilient and adaptive to climate change and seek to minimise contributions towards carbon emissions.

SuDS should seek to make places more resilient and adaptive to climate change through the following measures:

- **The use of green SuDS that include planting of trees and vegetation as well as inclusion of open water areas as part of interventions to allow for urban cooling and shading and storage of carbon.**

SuDS are encouraged to minimise their contribution towards CO_2 emissions and climate change through the following measures:

- **minimising surface water pumping to reduce energy use and associated carbon emissions;**
- **avoiding embodied carbon in manmade drainage and storage structures;**
- **providing rainwater harvesting and storage infrastructure as part of SuDS proposals to reduce the need for pumped water; and**
- **interventions that add to the cooling and / or shading of buildings that subsequently lead to reduced energy use and associated carbon emissions.**

Developers should seek to design and deliver SuDS interventions suitable for the intended purpose, having regard to the latest climate change allowances[19] and with climate change benefits in mind. This is required on both on large and small scale developments.

4.19 Long term maintenance of SuDS

4.19.1 Policy CC3 seeks to secure adequate arrangements for the adoption, management and maintenance of SuDS provided over the lifetime of a development. Maintenance and monitoring of SuDS is essential to ensure

[19] These are compiled by the EA and should be used in Flood Risk Areas to ensure that the interventions are in place to minimise vulnerability to climate change and demonstrate resilience to flooding based on the latest climate predations. https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

their long term effectiveness. The mechanism for securing, monitoring and managing SuDS will normally be through planning conditions and / or Section 106 Planning Obligations, this includes where off-site compensation is sought.

4.19.2 Planning Practice Guidance states:

'In considering a development that includes a sustainable drainage system the local planning authority will want to be satisfied that the proposed minimum standards of operation are appropriate and that there are clear arrangements in place for ongoing maintenance.' and

'When planning a sustainable drainage system, developers need to ensure their design takes account of the construction, operation and maintenance requirements of both surface and subsurface components, allowing for any personnel, vehicle or machinery access required to undertake this work.'

4.19.3 Mansfield District Council encourages planning applications that are accompanied by detailed information relating to the future management and maintenance of SuDS. Planning applications for major development (including Outline and Detailed applications and reserved matters) should include a written explanation of how SuDS will be monitored and managed. Details should include:

- the agency responsible for long term management and maintenance of the SuDS;
- any financial arrangements and contracts with the management company;
- the nature of the agreed management of arrangement including frequency of inspection; and
- a map showing the areas to be adopted and managed.

4.19.4 Where detailed information concerning the management and maintenance of SuDS is not submitted (for example on outline planning applications where final design details are not known) a condition will be sought that seeks to ensure that the development in question cannot be commenced unless details are submitted to and approved by the local planning authority. It is the responsibility of the applicant / developer to develop the management strategy.

4.19.5 Where financial contributions are required in order to deliver and subsequently maintain SuDS, these will be secured through a Section 106 agreement. The amount of contribution will be dependent on the scale and nature of SuDS

being delivered. Where long term management is proposed by a Management Company this should be made clear during the early stages of decision making and will be secured through legal agreement.

4.19.6 The following Management Plans principles should apply in all cases they should:

- seek to deliver benefits for wildlife and people and be simple and easy to understand.
- seek to involve local people in the process and engage communities in SuDS and their wildlife through site interpretation and events programme.
- be aware of the presence of protected species (e.g. bats, birds in the breeding season, water voles and great crested newts), site designations and other legal duties and manage accordingly.
- seek expert advice from ecologists to produce a plan which protects and enhances all wildlife including legally protected species.
- Train and supervise contractors and other practical staff and communities involved in SuDS management.

SuDS SPD 19 – Securing the management, maintenance and monitoring of SuDS in the long term

A. The landowner / developer is the party responsible for ensuring that SuDS component(s) within the land are maintained over the lifetime of the development, including arrangements for SuDS to be adopted.

B. In cases where the developer proposes that the SuDS are adopted by the Local Authorities, Water Company or other organisation agreement should be reached with that body prior to determination of a planning application. Details of the agency responsible and any financial arrangements and contracts should be submitted alongside the planning application. The adopting organisation should approve the detailed design before construction.

C. Detailed Planning applications that seek to provide SuDS should be accompanied by their future management, monitoring and maintenance arrangements. Planning conditions or Section 106 legal agreements will be used to ensure compliance with the approach.

D. Where development proposals are accompanied by an acceptable robust SuDS Management Plan, conditions will be attached to secure compliance with it.

E. Where outline planning applications are permitted, a planning condition will normally be applied that seeks submission of details of the future monitoring, management and maintenance of SuDS at reserved matters stage.

F. Where SuDS interventions are proposed off-site, Section 106 agreements will be required to ensure delivery and on-going maintenance.

G. Inspection and maintenance plans should identify how they intend to adhere to strict biosecurity measures of all equipment and personnel to prevent the spread of invasive, non-native species.

Appendix A – Policy CC3 of the Mansfield Local Plan 2013 to 2033

Policy CC3

Sustainable drainage systems

1. All development proposals should, wherever possible, include measures to reduce and manage surface water through appropriate sustainable drainage systems (SuDS) so as to minimise and manage flooding, improve water quality, complement water efficiency, and enhance biodiversity, place shaping and amenity.

To be supported, proposals are required to satisfactorily demonstrate all of the following:

a. that sustainable drainage systems have been incorporated in the development design unless:

i. for major developments, a SuDS is inappropriate and surface water run-off can be alternatively managed in an appropriate manner; or

ii. for minor developments a SuDS is not viable or technically feasible and surface water run-off can be alternatively managed in an appropriate manner; and

b. that adequate arrangements have been made for the adoption, management and maintenance of any SuDS provided over the lifetime of the development; and

c. that the discharge of surface run-off is as high up the SuDS hierarchy of drainage as possible.

2. Proposals for retrofitting of sustainable drainage systems will be supported.