

Northamptonshire Lead Local Flood Authority



Northamptonshire
County Council

LOCAL STANDARDS AND GUIDANCE FOR SURFACE WATER DRAINAGE IN NORTHAMPTONSHIRE

V1.3 August 2016 (Updated
September 2017)

Document Status

This guidance document is referred to in the adopted Northamptonshire Local Flood Risk Management Strategy as policy. Therefore this document forms a material planning consideration.

This guide is a living document, meaning new information and updates will be continually added as they emerge. This is especially important as this edition of the guide precedes any implementation of Schedule 3 of the Flood and Water Management Act (2010).

Version

Version Number	Date	Purpose	Key amendments
0.1	May 2015	First draft for partner consultation	N/A
0.2	July 2016	Second draft for partner consultation	Significant update to format and content following first consultation
1.0	August 2016	For publication	Minor amendments following partner consultation
1.1	August 2016	For publication	Minor amendments in Appendices C and D to include requirement to use FEH rainfall data
1.2	June 2017	Draft for partner consultation	Updates to specific Standards: <ul style="list-style-type: none">• clarification of L1 to not include all of Northampton;• update to minimum brownfield betterment required;• addition of new L7 to include Urban Creep allowance;• further emphasis placed on the need to provide Long Term Storage in line with S4-6;• L12 update in line with new guidance on freeboards;• L22 correct depth to groundwater. Minor amendments as shown by tracked changes: legislation clarification; clarification of pre-application advice; justification of need to use FEH over FSR; inclusion of new Verification Condition; updates to Appendices C & D to reflect the above.
1.3	September 2017	For Publication	Minor amendments following partner consultation

CONTENTS

1	INTRODUCTION	3
1.1	WHY SUDS?	3
1.2	PURPOSE OF THIS GUIDE	3
1.3	WHO IS THIS GUIDE FOR?	4
1.4	LEGISLATION.....	4
2	ROLES AND RESPONSIBILITIES FOR SURFACE WATER DRAINAGE IN NORTHAMPTONSHIRE	5
2.1	INTRODUCTION	5
2.2	ROLES & RESPONSIBILITIES	5
3	THE PLANNING APPLICATION PROCESS.....	9
3.1	INTRODUCTION	9
3.2	FLOOD RISK ASSESSMENT VS. DRAINAGE ASSESSMENT	9
3.3	PRE-APPLICATION.....	9
3.4	OUTLINE APPLICATIONS FOR PHASED DEVELOPMENTS	10
3.5	OUTLINE AND FULL PLANNING APPLICATIONS	10
3.6	RESERVED MATTERS APPLICATIONS AND PLANNING CONDITIONS	11
3.7	ADOPTION AND MAINTENANCE	11
4	OPPORTUNITIES, CONSTRAINTS AND CONSIDERATIONS FOR SUDS IN NORTHAMPTONSHIRE	12
4.1	GENERAL	12
4.2	GEOLOGY.....	12
4.3	HYDROLOGY	12
4.4	RAINFALL	13
4.5	HISTORIC ENVIRONMENT.....	13
4.6	LANDSCAPE AND TOWNSCAPE CHARACTER	13
4.7	NATURE CONSERVATION	14
4.8	SPECIFIC SUDS FEATURES.....	14
4.9	COMMON MISCONCEPTIONS FOR IMPLEMENTING SUDS.....	17
5	LOCAL STANDARDS AND GUIDANCE FOR SURFACE WATER DRAINAGE DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE IN NORTHAMPTONSHIRE	18
	FLOOD RISK OUTSIDE THE DEVELOPMENT	18
	PEAK FLOW CONTROL.....	18
	VOLUME CONTROL.....	19
	FLOOD RISK WITHIN THE DEVELOPMENT.....	20
	STRUCTURAL INTEGRITY.....	20
	DESIGNING FOR MAINTENANCE CONSIDERATIONS	21
	CONSTRUCTION	21
	RUNOFF DESTINATIONS	22
	WATER QUALITY	22
	MULTI-FUNCTIONALITY	23
	DESIGNING FOR ECONOMIC SUSTAINABILITY.....	23
	LANDSCAPE AND VISUAL IMPACT	23
	ECOLOGY24	
	APPENDIX A: SUDS STANDARDS, GUIDANCE AND USEFUL DOCUMENTS.....	25
	APPENDIX B: DRAINAGE LEGISLATION AND GUIDANCE	26
	NATIONAL GUIDANCE	26
	LOCAL GUIDANCE.....	26
	LINKS TO GREEN AND BLUE INFRASTRUCTURE	28
	APPENDIX C: INFORMATION REQUIRED FOR OUTLINE PLANNING APPLICATIONS	30

APPENDIX D: INFORMATION REQUIRED FOR FULL APPLICATIONS	33
APPENDIX E: INFORMATION REQUIRED FOR RESERVED MATTERS APPLICATIONS.....	38
APPENDIX F: INFORMATION REQUIRED FOR DISCHARGE OF STANDARD CONDITIONS	39
DETAILS OF SUDS DRAINAGE DESIGN	39
ADOPTION AND MAINTENANCE OF SUDS FEATURES	39
VERIFICATION OF INSTALLED DRAINAGE SYSTEM.....	40
APPENDIX G: CLIMATE CHANGE ALLOWANCES FOR RAINFALL.....	41
APPENDIX H: MAPS.....	42
APPENDIX I: GLOSSARY	52
APPENDIX J: ACKNOWLEDGEMENTS.....	53

1 INTRODUCTION

New planning regulations came into force in April 2015, designed to ensure, where possible, that Sustainable Drainage Systems (SuDS) are used on all new developments in England.

Lead Local Flood Authorities have also become statutory consultees to the planning process, to assess major planning applications for their surface water drainage implications, as an alternative to implementation of the 'SuDS Approval Body' as set out in Schedule 3 of the Flood and Water Management Act (2010).

Therefore, new developments now have to move away from traditional below ground piped drainage systems to more efficient, resilient and flexible sustainable drainage systems. SuDS manage rainwater runoff in a way that is more similar to the natural runoff process retaining water at or near the ground surface.

To produce a holistic development proposal with integrated drainage, greater consideration of drainage at the masterplanning stage is required, including the interplay between drainage and all aspects of land use, amenity and biodiversity. It is essential that early consultation with all stakeholders is undertaken before the masterplan is fixed and site layouts are developed.

1.1 WHY SUDS?

Within true SuDS, rainwater is dealt with close to where it falls (at source), allowing as much water as possible to either evaporate or soak into the ground. Remaining runoff is then drained to the nearest water body, ideally via other forms of SuDS, at the same rate and volume or lower as would naturally have occurred prior to development. During this process, SuDS reduce pollutants in the water, such as hydrocarbons, nutrients and heavy metals, by filtering and treating runoff. This ensures that the water soaking into the ground and discharging to nearby watercourses or sewers is cleaner, protecting water quality and wildlife.

Underground piped systems quickly divert surface water runoff to local watercourses or the sewer system without the chance to soak into the ground and enter the natural drainage system. This reduces the amount of groundwater recharge, which can in turn result in disruption to base flow in streams and rivers. Underground piped systems are also prone to blockage, posing a risk of flooding, as well as directing

pollutants, such as oil, organic matter and toxic metals, straight to the natural environment without the opportunity to trap, breakdown or remove them. Thus, draining developed areas in this way can increase the risk of downstream flooding and lead to a deterioration of water quality.

Keeping water at ground within SuDS means any problems with the system can be identified quicker and easier than with a conventional system, and are generally cheaper and more straightforward to rectify.

1.2 PURPOSE OF THIS GUIDE

This Guide is intended to assist developers in the design of surface water drainage systems, and to support Local Planning Authorities in considering drainage proposals for new developments within Northamptonshire.

From 15th April 2015, Northamptonshire County Council as the Lead Local Flood Authority (LLFA) became a statutory consultee of the planning application process, taking on a role previously discharged by the Environment Agency.

This guide sets out standards that are applied by the LLFA for new development proposals in Northamptonshire, which reflect the National Non-Statutory Technical Standards for SuDS. This guide provides Northamptonshire-specific information on the planning, design and delivery of surface water drainage, designed to reduce the risk of flooding and maximise environmental gain, including water quality, water resources, biodiversity, landscape and amenity. The guide also aims to ensure that all new developments and redevelopments in the county are designed to mitigate and adapt to the effects of climate change.

The SuDS philosophy and concepts within this document are based upon and derived from the updated SuDS Manual (CIRIA C753), supplemented by SusDrain, and additional resources specific to Northamptonshire. **Appendix A** provides information on these and other useful SuDS references. Users of this guide should familiarise themselves with the range of additional resources available and incorporate advice from all sources into their surface water drainage proposals.

This guide should be used in conjunction with the above national documents and all relevant legislation and guidance. Consequently, early consultation with all stakeholders should be undertaken to identify potential competing aspirations and agree outline strategies and site-specific techniques.

This guide also sets out the information that is expected to be submitted with planning applications to enable an efficient review and approvals process.

1.3 WHO IS THIS GUIDE FOR?

This guide is primarily for use by developers, designers and consultants who are seeking guidance on the LLFA's local requirements for the design of surface water drainage in Northamptonshire. The guide will also be used by LLFA officers to ensure a consistent approach is taken when assessing plans and designs as part of the planning application process.

1.4 LEGISLATION

Schedule 3 of the **Flood and Water Management Act 2010**

(<http://www.legislation.gov.uk/ukpga/2010/29/contents>) would have required LLFAs to determine applications for drainage systems against national standards and then adopt those SuDS serving more than one property. However this part of the Act has not been implemented, and it is understood that the Government has no plans to do so for the foreseeable future.

In December 2014, the government announced that from the 6th April 2015 they would strengthen existing

planning policy by making SuDS a material consideration for major development.

The **National Planning Policy Framework** (NPPF) sets out the expectation that new development is sustainable and requires that LPAs should avoid flood risk to people and property. Paragraph 103 states that all new developments in areas at risk of flooding should give priority to the use of sustainable drainage systems.

The **Planning Practice Guidance** also supports the use of SuDS, emphasising the hierarchy of discharge of runoff, and stating that "*For major developments (e.g. of ten or more homes or major commercial developments), and for all developments in areas at risk of flooding, sustainable drainage systems should be used*".

In March 2015, government laid a **statutory instrument** making the LLFA a statutory consultee by adding the consultation requirement to Schedule 4 of the Development Management Procedure Order, effective from 15th April 2015.

The **Non-Statutory Technical Standards for Sustainable Drainage** relate to the design, construction, operation and maintenance of SuDS, and have been published as guidance for those designing schemes.

A full summary of the relevant legislation, including local policy, is provided in **Appendix B**.

2 ROLES AND RESPONSIBILITIES FOR SURFACE WATER DRAINAGE IN NORTHAMPTONSHIRE

2.1 INTRODUCTION

The Local Planning Authorities (LPAs) must consult the Lead Local Flood Authority (LLFA) (the County Council for Northamptonshire) on all major planning applications as defined below:

The definition of “**Major development**” is taken from the Town and Country Planning Act as development involving any one or more of the following:

- (a) the winning and working of minerals or the use of land for mineral-working deposits;
- (b) waste development;
- (c) the provision of dwellinghouses where:
 - (i) the number of dwellinghouses to be provided is 10 or more; or
 - (ii) the development is to be carried out on a site having an area of 0.5 hectares or more and it is not known whether the development falls within sub-paragraph (c)(i);
- (d) the provision of a building or buildings where the floor space to be created by the development is 1,000 square metres or more; or
- (e) development carried out on a site having an area of 1 hectare or more;

The LLFA will review drainage strategies and assessments for these applications and provide advice to the LPA on whether the development should be approved on surface water drainage grounds.

The LLFA encourages all new development and redevelopment that requires planning permission to use SuDS in order to reduce flood risk, improve water quality and present options for biodiversity and public amenity. This is consistent with existing national guidance and local planning policy.

2.2 ROLES & RESPONSIBILITIES

2.2.1 LOCAL PLANNING AUTHORITIES (LPAs)

In Northamptonshire, the following authorities are LPAs:

- Borough Council of Wellingborough
- Corby Borough Council
- Daventry District Council
- East Northamptonshire Council
- Kettering Borough Council
- Northampton Borough Council
- South Northamptonshire Council
- North Northamptonshire Joint Planning Unit
- West Northamptonshire Joint Planning Unit
- Northamptonshire County Council.

As LPAs, the District and Borough Councils in Northamptonshire are responsible for preparing Local Plans, outlining proposals for growth and determining planning applications. Under the Flood and Water Management Act, LPAs also have a duty to cooperate and share information in order to reduce flood risk.

LPAs must consult the LLFA in determining 'major' planning applications; and then inform the LLFA of its determination of the planning application.

In considering a development that includes a sustainable drainage system, the LPA will need to be satisfied that the proposed minimum standards of operation are appropriate and that there are clear arrangements in place for ongoing maintenance.

The decision on whether a sustainable drainage system would be inappropriate in relation to a particular development proposal is a matter of judgement for the LPA. In making this judgement the LPA can seek advice from the relevant flood risk management bodies, principally the LLFA, including on what sort of sustainable drainage system they would consider reasonably practicable. The judgement of what is reasonably practicable should be by reference to the non-statutory technical standards and take into account design and construction costs.

2.2.2 DEVELOPERS/APPLICANTS

Developers must submit surface water drainage details and proposals to the LPA for all construction work that will have an impact on drainage of a site. Applications should be in line with the National Non-Statutory Technical Standards for SuDS, should consider the Local Standards provided in this document, and should include all the required information about the site including the surface water drainage proposals, in accordance with the lists in **Appendix C** for Outline applications, **Appendix D** for Full applications, **Appendix E** for Reserved Matters applications, and **Appendix F** for Discharge of Conditions applications, to ensure that the LLFA can advise the LPA appropriately.

Applicants are strongly advised to carry out pre-application consultations with the LPA and the LLFA at the masterplanning stage. They should ensure layouts make space for appropriate SuDS techniques, to ensure that the development maximises benefits in relation to reduction of local flood risk. Further information on pre-application advice is provided in Section 3.3 of this document.

Where it is proposed to use a traditional drainage system, the onus is on the developer to provide evidence to demonstrate that SuDS are not appropriate for the particular development.

The onus is also on the developer to demonstrate that the works will be adopted and maintained for the life time of the development.

2.2.3 CONSULTEES FOR DRAINAGE AND FLOOD RISK PLANNING APPLICATIONS

2.2.3.1 NORTHAMPTONSHIRE COUNTY COUNCIL (NCC) AS THE LEAD LOCAL FLOOD AUTHORITY (LLFA)

Under the Flood and Water Management Act (2010) NCC as LLFA is responsible for the coordination of the management of flood risk from surface water, ordinary watercourses and groundwater in Northamptonshire.

In considering planning applications for major developments, LPAs must consult the County Council in their role as LLFA. The LLFA will provide technical advice on the surface water drainage strategies and designs put forward.

For the avoidance of doubt NCC as LLFA will not comment on the following aspects of an application:

- Water quality
- Contaminated land / landfill
- Risk of flooding from groundwater
- Foul Sewerage Infrastructure Provision
- Landscape
- Visual impact
- Historical aspects
- Biodiversity and ecological impacts
- Fisheries
- Water Framework Directive
- Amenity / Health and Safety
- Navigation

unless they appear to have a direct impact on the potential performance of the SuDS. This responsibility remains with the LPA.

NCC as LLFA provides pre-application and technical advice as set out in Section 3.3.

2.2.3.2 ENVIRONMENT AGENCY

The Environment Agency (EA) is also a statutory consultee to planning applications where:

- The proposed drainage system involves the discharge of water within 20m of a main river¹ either directly or indirectly;
- The development is within an identified flood zone (2 or 3) as shown on the online flood map for planning²; or
- The development is within a high risk Critical Drainage Area as defined by the EA. These are defined areas that flood regularly and are sensitive to increased flows and where new development could impact on the management of EA assets. However there are no Critical Drainage Areas in Northamptonshire.

EA consultation and standing advice related to planning applications can be found at <https://www.gov.uk/government/organisations/environment-agency>.

The EA provide a free, preliminary opinion which will outline their position and any other environmental issues regarding a proposed development. Any further advice, including assessment of reports, follow up meetings or site visits, is offered as part of a paid-for service. Please email LNplanning@environment-agency.gov.uk for further information.

Under the Environmental Permitting (England and Wales) Regulations 2010, a permit may be required

¹ <http://www.floodtoolkit.com/risk/>

² <http://www.floodtoolkit.com/risk/>

from the Environment Agency for any proposed works or structures in, under, over or within eight metres of the top of the bank of designated 'main river'. This was formerly called a Flood Defence Consent. Some activities are also now excluded or exempt. A permit is separate to and in addition to any planning permission granted. Further details and guidance are available on the GOV.UK website at

<https://www.gov.uk/topic/environmental-management/environmental-permits>.

2.2.3.3 SEWERAGE UNDERTAKERS

The relevant sewerage undertaker (Anglian Water, Thames Water, Severn Trent Water or private owner) may comment on applications where the surface water drainage system is proposed to discharge into the sewerage system.

The sewerage undertaker will provide information about the availability and capacity of the sewerage network. The sewerage undertaker may have to carry out a capacity study (possibly at the applicants expense) before it can advise on the available capacity, which may include permitted rate of discharge or point of connection.

The sewerage undertaker may adopt and maintain certain elements of the drainage system. Consequently developers/applicants are strongly advised to undertake early consultation with the sewerage undertaker.

- **Anglian Water:** full details of their adoptions requirements and processes and contact details can be found at www.anglianwater.co.uk/developers/
- **Severn Trent Water:** full details of their adoptions requirements and processes and contact details can be found at www.stwater.co.uk/developers/
- **Thames Water:** full details of their adoptions requirements and processes and contact details can be found at www.thameswater.co.uk/developers/592.htm
- **Private Owner:** please contact the owner direct for advice.

Please note that surface water should never be discharged into the foul sewer system.

2.2.3.4 THE HIGHWAY AUTHORITY

NCC is also the Local Highway Authority and is a statutory consultee on all planning applications. This role is discharged by Northamptonshire Highways.

Northamptonshire Highways may consider the adoption of SuDS features provided that they only take runoff from the highway, are located within the prospective highway and have suitable access arrangements. SuDS features which are located adjacent to prospectively adoptable highway carriageways may, subject to certain criteria and a committed maintenance sum, form part of the works adopted under Section 38 of the Highways Act 1980.

Any features that may hold or retain water must be located with a minimum clearance of 5m between the retained water level and limit of the adjacent existing or prospective operational highway (back of footway/verge) and the maximum retained water level. Clearances less than 5m for soakaway features may be acceptable subject to site specific considerations related to geological testing, water table assessment and infiltration assessments.

If highway-only SuDS features are being considered, these must be discussed and agreed with Northamptonshire Highways before promoting such a solution as part of a planning application. The use of highway-only SuDS features should in general be avoided as this creates potential duplication of systems and inefficient use of available land. Such an approach may, therefore, be limited to sites where surface water sewerage is only required for highway runoff, or for highway-only development such as bypasses.

Northamptonshire Highways will not accept any new connections to its existing drainage systems. Furthermore, developers are expected to be able to demonstrate that their proposals do not lead to an increase in surface water runoff onto the local road network.

Any piped drainage system that may cross an existing or proposed adoptable highway would be subject to an appropriate licence. Pre-application discussions with Northamptonshire Highways are therefore, highly advisable. For further information please email DevelopmentManagement@kierwsp.co.uk.

For the avoidance of doubt, the LLFA with regards to drainage and SuDS approval is independent of Northamptonshire Highways with regards to highway development control, highway agreements and highway adoptions.

2.2.3.5 HIGHWAYS ENGLAND

Highways England will not accept any new connections to its existing drainage systems and it

would expect developers to demonstrate that their proposals would not lead to an increase in surface water run-off onto the strategic road network, as per requirements in Department for Transport Circular 02/2013: 'The strategic road network and the deliverability of sustainable development'.

2.2.3.6 THE CANAL AND RIVER TRUST

The Canal and River Trust is a statutory consultee on all planning applications where the “*development is likely to affect:*

- *any inland waterway (whether natural or artificial) or reservoir owned or managed by the Canal & River Trust; or*
- *any canal feeder channel, watercourse, let off or culvert.*

which is within an area which has been notified for the purposes of this provision to the local planning authority by the Canal & River Trust.”

There are two canals managed by the Canal and River Trust in Northamptonshire; the Grand Union Canal and the Oxford Canal. Where it is proposed to discharge surface water runoff into a canal or associated feature, early discussions will be required to determine any capacity limitations for discharge rates.

2.2.3.7 THE INTERNAL DRAINAGE BOARD

The Internal Drainage Board (IDB) must be consulted on all applications where the surface water drainage system may directly or indirectly involve the discharge of water into an ordinary watercourse within the Board's district.

The administrative area of Northamptonshire contains only one IDB, known as the Bedford Group of Drainage Boards. The IDB covers a small area to the southernmost part of the County, on the periphery of Milton Keynes within the Great Ouse catchment area. **Appendix H** includes a map that shows the extent of the IDB catchment area and watercourses within Northamptonshire.

This consortium provides advice and direction to local authorities as part of the planning application process in relation to flood and water management, and also currently adopts and maintains SuDS within their area. For further details please contact the IDB via <http://www.idbs.org.uk/>.

The consortium is also responsible for undertaking land drainage consenting for works in or around any ordinary watercourse within Northamptonshire, on behalf of the LLFA. The IDB should therefore be contacted where works are proposed within 9m of any ordinary watercourse, as Flood Defence Consent may be required for the works, as set out in the Policy section of the Local Flood Risk Management Strategy.

3 THE PLANNING APPLICATION PROCESS

3.1 INTRODUCTION

This section sets out the various processes and procedures that should be followed to ensure successful implementation of surface water drainage, and specifically SuDS, within a development.

3.2 FLOOD RISK ASSESSMENT VS. DRAINAGE ASSESSMENT

NPPF footnote 20 explains that a site specific **Flood Risk Assessment** (FRA) is required for developments of 1 hectare or greater in Flood Zone 1; all developments in Flood Zones 2 and 3 or in an area within Flood Zone 1 notified as having critical drainage problems; and where development or a change of use to a more vulnerable class may be subject to other sources of flooding. The FRA should, amongst other things, help demonstrate that priority is being given to sustainable drainage systems in areas at risk of flooding.

A **Drainage Assessment** is a specific requirement set by the LLFA for all major applications in Northamptonshire, regardless of whether an FRA has been prepared. The Drainage Assessment may form part of the FRA or vice versa. It should include information on the detailed design, management and maintenance of surface water management systems.

3.3 PRE-APPLICATION

The LLFA strongly recommends early consideration of SuDS when formulating the development design and layout, so as to successfully integrate suitable, efficient SuDS, which offer wider environmental benefits.

Pre-application discussions should involve the LLFA so that any potential issues with the drainage strategy can be rectified prior to the application process. This should be a collaborative approach with the LPA, Northamptonshire Highways and where appropriate/applicable the Environment Agency and other consultees.

The benefits to developers of seeking pre-application advice include:

- Advice on site-specific constraints and opportunities;

- De-risking the surface water drainage solutions;
- Agreement of a drainage strategy, setting the criteria for phases on larger developments or at outline application stage;
- Advice at any stage of the planning/design processes.

The following bodies should be consulted at the pre-application stage, where necessary:

- **The LLFA** for surface water drainage impacts of all Major development. Further information on the LLFA's data provision, pre-application and technical advice services is provided in the following sections.
- **The Environment Agency** for planning applications related to their statutory duties on flood risk, protection of land and water quality, mining operations, waste regulation and fisheries.
- **The LPA** for initial proposals relating to the design of the site and for other key planning, Building Regulation and Code for Sustainable Homes/ BREEAM related issues. The LPA will also be able to advise on matters such as integrated blue/green corridors; appropriate land use areas; urban design; biodiversity and ecology considerations; amenity areas; allocation of play areas and types of recreation facility; and suitable landscaping and planting schemes, all of which should be compatible with the functionality of SuDS.
- **The relevant sewerage undertaker** for availability and capacity of existing sewerage networks and to obtain agreement for the point of connection where necessary. A sewer capacity study may be required (possibly at the applicant's expense) prior to any decision on the rate of discharge or point of connection. It may also be possible to requisition an outfall. The undertaker should also be contacted if it is proposed for any of the drainage system to be adopted.
- **Third party land owners** where there may be requirements to cross land and/or obtain a right to discharge, to enable discharge of drainage to a watercourse or sewer off-site.
- **An ecology expert** for proposed development which may have biodiversity, habitat and protected species issues. A careful balance should be struck over the creation of habitats. The encouragement of certain protected species or

creation of protected habitats may conflict with the regular maintenance works essential to ensuring long term functionality of the SuDS.

- **Northamptonshire Highways** where the proposed SuDS may interact with or fall within the existing or adoptable road network or is proposed to outfall to an existing highway drainage system.
- **Highways England** where the proposed SuDS may interact with or fall within the existing or adoptable strategic (Trunk) road network or is proposed to outfall to an existing strategic highway drainage system.
- **Historic England and an archaeological/heritage expert** where the proposed development, such as excavations for attenuation storage, may have an impact on archaeology or historic features.

3.3.1 FLOOD DATA AND INFORMATION FROM THE LLFA

The LLFA provides a Flood Data and Information service to inform and supplement any flood risk/drainage assessment. The following information will be provided, where available:

- A review of surface water drainage constraints from national mapping;
- A review of site specific local flood risk issues;
- A summary of any historic flood incidents that have occurred on the site or within the related locality;
- A review of flood related assets that are within the related locality;
- A statement of any flood related issues you should consider further;
- Advice on the type and nature of surface water drainage that could be designed into the relevant development; and
- Information about flood risk consenting that may be required for your proposed development.

There is a charge for this service. For details of how to request data, please see www.floodtoolkit.com/planning/surface-water-drainage.

The Environment Agency also provides pre-application advice and data (Flood Products) in relation to flooding and assets on main rivers and should be contacted for this information. For planning advice please email planningkettering@environment-agency.gov.uk and for data requests please email LNenquiries@environment-agency.gov.uk.

3.3.2 PRE-APPLICATION/TECHNICAL ADVICE SERVICE FROM THE LLFA

The LLFA will provide technical advice to developers on surface water drainage and other local sources of risk, on major planning applications or for any other purpose. This can include reviewing documents and plans, providing advice on aligning planning and consenting requirements, and any other specific tasks agreed. The advice provided would be based on desk based analysis, meetings and site visits as agreed on a site by site basis.

There is a charge for this service. For details of how to apply for technical advice, please see www.floodtoolkit.com/planning/surface-water-drainage.

3.4 OUTLINE APPLICATIONS FOR PHASED DEVELOPMENTS

For outline applications for phased developments, to ensure space is allocated and a satisfactory SuDS scheme can be delivered for a phased development, the LLFA will require applicants to produce a Drainage Strategy to which all Reserved Matters applications would need to comply. The Drainage Strategy should contain sufficient detail of typical development layouts to indicate the likely location of all the SuDS features and connecting flow paths (pipes, swales, ditches etc). It should clearly identify peak discharge rates and total attenuation storage volumes required within each package of the overall development. Planning conditions should be applied to the outline consent to ensure that there are no interim phases developed that are unprotected or not served by an appropriate drainage system. Phases can only progress if adequate flood mitigation and drainage measures are in place for that particular phase.

3.5 OUTLINE AND FULL PLANNING APPLICATIONS

Effective and sustainable surface water runoff management should be considered from the outset, and integrated throughout the development. Although specific development information may be limited at outline planning stage, the application will still need to give consideration to, and make a commitment to, the requirements of this guide.

Outline and full planning applications should be accompanied by a Flood Risk Assessment or Drainage Strategy. Failure to provide all the necessary information may result in a delay to the planning process, as the LLFA will be required to recommend refusal of the application on the basis of inadequate information. **Appendix C** and **Appendix D** set out the full requirements for a surface water drainage submission for each type of application. The key requirements are set out below:

- Demonstration that the SuDS Management Train has been appropriately applied.
- Identification of a positive outfall for the drainage. For discharge to ground, this would include soakaway testing results; for discharge to a water body this would include landownership and other agreements; and for discharge to sewer this would include agreement of the maximum allowable discharge rates from the relevant sewerage provider.
- Demonstration that National Non-Statutory Technical Standards for SuDS have been met by the drainage design.
- A SuDS Management Plan which states who will own and maintain all elements of the drainage system, supported by a maintenance plan.
- If a traditional drainage solution is proposed, evidence to demonstrate why SuDS are not viable for the proposed development.

Once the LLFA has received the application from the relevant LPA, the LLFA will provide a formal response to the LPA within 21 days. The LPA will then use this response to determine whether or not to approve the application, and whether any appropriate conditions should be attached to the approval.

3.6 RESERVED MATTERS APPLICATIONS AND PLANNING CONDITIONS

The LLFA may recommend to the LPA that planning conditions are attached to an approved outline, full or reserved matters application. This will depend on the level of detail available at the application stage and the nature/extent of the development proposal.

Where a surface water condition has been requested on an outline permission but this has not been discharged before the reserved matters application, it should be noted that if the layout of the development needs changing to account for the surface water

scheme, a revised reserved matters application may be required to achieve satisfactory surface water drainage arrangements without increasing flood risk off site.

All Reserved Matters applications will need to be supported by a FRA and/or Drainage Strategy. Otherwise there is a risk that drainage solutions proposed at a later stage may have an impact upon the layout and arrangements, including landscaping. As such, it may be prudent to explore such details concurrently with any Reserved Matters Application. This may avoid subsequent changes or constraining the drainage solution unnecessarily with a layout and landscaping would have been approved before drainage details are available. Full details of the requirements for Reserved Matters applications are set out in **Appendix E**.

3.7 ADOPTION AND MAINTENANCE

The LLFA will not adopt or maintain any SuDS features.

The responsibility to ensure that adequate long-term maintenance of any drainage system can be delivered remains with the developer.

The LLFA may require evidence and documentation as part of the planning process (generally as part of a planning condition) to demonstrate that appropriate agreements are in place (at least in principle) for the entirety of the drainage system to be adopted and maintained for the life time of the development. This is particularly important for SuDS in multi-functional spaces.

There are four main options open to developers for the adoption and maintenance of surface water drainage including SuDS:

1. The local sewerage undertaker may adopt and maintain certain features;
2. Adoption could be agreed through a Section 106 (of the Town and Country Planning Act 1990) agreement/separate agreement with the borough, district, town or parish council and pay the Commuted Sums for the maintenance;
3. Set up or use a service management company;
4. Adoption and maintenance by private individuals (only where the SuDS serve individual properties).

In addition, the highways authority may adopt and maintain SuDS that serve only the highway. The final solution for a site is likely to be a combination of the above.

The adoption and maintenance of all surface water drainage within a development would have to be discussed and agreed with the LPA.

4 OPPORTUNITIES, CONSTRAINTS AND CONSIDERATIONS FOR SUDS IN NORTHAMPTONSHIRE

4.1 GENERAL

Northamptonshire extends over an area of approximately 2,360 km² and has a population of more than half a million people. The county retains a strong rural character with urban areas amounting to just 4% of the land area.

The following section provides an overview of the potential opportunities and constraints to SuDS within Northamptonshire, including geology, topography, hydrology, rainfall, historic environment, landscape and townscape character, and nature conservation.

4.2 GEOLOGY

Northamptonshire's solid geology is entirely comprised of sedimentary strata of the Jurassic period, forming part of the belt that stretches almost continuously from the Cleveland Hills in Yorkshire to Lyme Regis in Dorset. Within Northamptonshire, the Jurassic system consists of the Lower Jurassic Lias Group and the Middle Jurassic, which comprise limestones, ironstones, ferruginous sandstone and clay. Some of these may occur near the surface and have permeability rates suitable for the use of infiltration SuDS.

Overlying this solid geology are superficial deposits of Quaternary glacial sands, gravels and till, which date to the Wolstonian glacial cycle, and alluvial deposits that are present in the main valleys and tributaries of the rivers Nene and Welland. The chemical content and physical characteristics of the soils are closely related to the rocks from which they are derived. These superficial deposits may be suitable for infiltration SuDS. However some areas are covered with glacial boulder clay or similar impermeable characteristics, which would not be suitable for infiltration.

The British Geological Survey (BGS) have developed a map that provides an indication of the potential suitability of the subsurface for infiltration SuDS. The 'Infiltration SuDS Map: Summary' is derived from a

combination of 15 BGS national datasets and comprises four GIS layers³:

- significant constraints;
- potential for drainage;
- potential for instability; and
- protection of groundwater quality.

The 'Infiltration SuDS Map: Summary' provides screening-level data with an indication of the likely suitability of the ground for infiltration. It does not provide information about the properties of the subsurface. Please note that this map is only appropriate for strategic level decisions and is not a replacement for a soakaway test as part of site investigations. Extracts of these maps are provided in **Appendix H**. Text summaries of this data specific to a site can be provided as part of the Data Request service provided by the LLFA (see Section 3.3.1).

The potential for infiltration SuDS is highly variable across Northamptonshire. The areas of very significant constraints generally follow the topography of the county and are located within the valleys, although there are larger areas of constraints on plateaus and on higher ground such as around eastern Corby. 14% by area of the county is identified as having very significant constraints to infiltration SuDS (37% of Corby borough, 12% of Daventry district, 15% of East Northamptonshire district, 15% of Kettering borough, 20% of Northampton borough, 10% of South Northamptonshire district, and 17% of the borough of Wellingborough).

It should be noted however that there are many SuDS options that do not involve/require infiltration, which may be suitable in these areas. Constraints to infiltration do not mean constraints to implementation of SuDS.

4.3 HYDROLOGY

The River Nene flows through much of the county, from its source to the west of Northampton in a north-easterly direction towards Peterborough. The river is

³ <http://www.bgs.ac.uk/products/hydrogeology/infiltrationSuds.html>

situated in a broad, flat valley with the perimeter of the floodplain lined by numerous small settlements.

Following the significant flooding to Northampton town centre in Easter 1998 improvements were made to the defences along the River Nene. These were designed to have a 0.5% level of protection. In order to secure the level of protection afforded by the new defence it has been agreed that the standards set for new development should also be improved, beyond industry standards in line with the standard along the River Nene.

Therefore all new development in the Upper Nene catchment will be designed for a flood with a 0.5% probability (1 in 200 chance) occurring in any year, including an appropriate allowance for climate change. This includes design of mitigation for main river flooding (i.e. fluvial defences) and surface water attenuation (i.e. SuDS). This standard applies across the whole of the Upper Nene catchment including all branches and arms of the Nene, upstream of Billing Aquadrome, and all tributaries such as Wootton Brook, Dallington Brook and Bugbrooke. A map of the Upper Nene catchment can be found in [Appendix H](#).

This is supported by an Environment Agency document “Strategic Review of development and flood risk, Nene catchment Northampton and upstream” and reinforced more recently in the West Northamptonshire Strategic Flood Risk Assessment (SFRA) Level 1 (February 2009) www.westnorthamptonshirejpu.org/gf2.tif/278178/6412997.1/pdf/-/sfra_l1_v1.pdf, and is now enshrined as policy in the West Northants Joint Core Strategy (BN7).

4.4 RAINFALL

Northamptonshire receives some of the lowest average annual rainfall volumes in the UK, ranging from between 500mm and 600mm⁴. Rainfall quantities in the East Anglia region are generally low and drought conditions are a risk. Developers should consider opportunities for rainwater harvesting and recycling in these water-stressed areas, and infiltration wherever possible to maximise groundwater recharge.

Due to the additional datasets that have been added to the Flood Estimation Handbook (FEH) since design rainfall events were developed originally in the Flood Studies Report (FSR) (NERC, 1975), rainfall depths obtained using FEH show significant differences from those obtained from FSR in some parts of the country.

⁴ Average Annual Rainfall (1961-1990) FEH

Within Northamptonshire, rainfall depths are often greater using more up to date FEH datasets than those using FSR, therefore for various storm events, greater run-off is produced and additional attenuation is likely to be required. As FEH rainfall data is more up to date, calculations should use FEH data for surface water drainage design, except where the critical storm duration is less than 60 minutes, as it is recognised that FEH data is less robust for short duration storms. If FEH rainfall data is not used as described above, then sensitivity testing to assess the implications of FEH rainfall must be provided.

4.5 HISTORIC ENVIRONMENT

The LLFA will not comment on heritage matters. This responsibility remains within other areas of the planning process. However, it is advised that the consideration of SuDS in relation to the historic environment take place as part of a multi-disciplinary design team approach.

Information and advice on the historic environmental significance of areas affected by new SuDS, and the mitigation that may be needed to reduce their impacts on the historic environment, should be sought at the masterplanning or land use planning stage from Northamptonshire County Council’s Historic Environment Record (<http://www3.northamptonshire.gov.uk/councilservices/archives-and-heritage/northamptonshire-archives/research-and-history/Pages/historic-environment-record.aspx>) and, where relevant, Historic England (<http://www.historicengland.org.uk/>).

4.6 LANDSCAPE AND TOWNSCAPE CHARACTER

The LLFA will not comment on landscape and townscape implications of the proposal. This responsibility remains within other areas of the planning process. However, it is advised that the consideration of SuDS in relation to landscape and townscape character take place as part of a multi-disciplinary design team approach.

Early consultation with the LPA should be undertaken at the masterplanning or land use planning stage to ensure SuDS are integrated with the landscape and townscape character.

Further information on landscape character types and areas can be found in the county-wide Landscape

Character Assessment, undertaken in 2005, available at www.nrpenvironmentalcharacter.org.uk.

4.7 NATURE CONSERVATION

The LLFA will not comment on nature conservation aspects of the application. This responsibility remains within other areas of the planning process.

Information about statutory designated international and national areas can be found at Nature on the Map (<http://magic.defra.gov.uk/>). International and national designations are supported by a network of non-statutory, local designated sites of county value for nature conservation. These sites are known as Local Wildlife Sites and further details about these sites can be found at www.northamptonshirebiodiversity.org.

Where protected species or habitats are in the vicinity of SuDS, care should be taken through appropriate maintenance regimes to discourage colonisation of SuDS features by protected species. If colonisation by protected species does occur the ability to carry out appropriate maintenance may impair the full functionality of the SuDS.

Where a developer does want to create a habitat for a protected species, the system needs to be oversized and on a larger footprint to enable restricted maintenance to take place whilst acknowledging the asset will have a reduced standard of service.

4.8 SPECIFIC SUDS FEATURES

4.8.1.1 GREEN ROOFS

The use of brown/green roofs should be for betterment purposes (in terms of habitat and water quality) and not to be counted towards the provision of on-site storage for surface water. This is because their hydraulic performance during extreme events is similar to a standard roof (CIRIA C697).

Green and brown roofs would however be accepted as a means of removing the first 5mm of rainfall in terms of water quality protection.



Figure 1 An example of an urban green roof in Upton, Northamptonshire

4.8.1.2 RAINWATER HARVESTING

Rainwater from roofs and hard surfaces can be stored and used in and around properties. These systems can work to reduce the rates and volumes of runoff, thereby providing betterment on the site. However the rainwater harvesting volumes are not considered to contribute to the overall attenuation volume for a SuDS system as it cannot be guaranteed that the storage will be empty prior to rainfall.

Rainwater harvesting would however be accepted as a means of removing the first 5mm of rainfall in terms of water quality protection.

4.8.1.3 INFILTRATION SUDS INCLUDING SOAKAWAYS

The preferred means of surface water disposal is through infiltration to the ground. Only where the subsurface geology is not suitable for infiltration should other runoff destinations be considered. The location of infiltration SuDS is likely to be different to other forms of SuDS. Consequently infiltration SuDS should be determined in advance of the masterplan or land use allocation. Thus permeability tests need to be carried out at the outset.

Infiltration testing should be undertaken, and infiltration drainage designed and constructed, in accordance with BRE Digest 365 (2016) and CIRIA Report 156.

To ensure protection of groundwater quality, the maximum acceptable depth for infiltration SuDS is 2.0m below ground level, with a minimum of 1.0 m clearance between the base of infiltration SUDS and peak seasonal groundwater levels. We consider that deep bore and other deep soakaway systems are not appropriate in areas where groundwater constitutes a significant resource (that is where aquifer yield may support or already supports abstraction). Deep soakaways increase the risk of groundwater pollution.

Please refer to 'The Environment Agency's approach to groundwater protection' (March 2017 version 1.0), particularly position statements G1 and G9 to G13.

Soakaways can be used as a source control feature of the SuDS train and for discharge of surface water. They are normally circular or square excavations, filled with aggregate or lined with brickwork, or pre-cast structures surrounded by granular backfill. Aggregate filled chambers are not considered acceptable by the LLFA as they present too great a risk of short term failure due to difficulty in maintenance. House rubble type soakaways, borehole soakaway systems and rubble and/or modular cell filled trench systems are not considered acceptable by the LLFA unless pre-treatment to remove silt is provided.

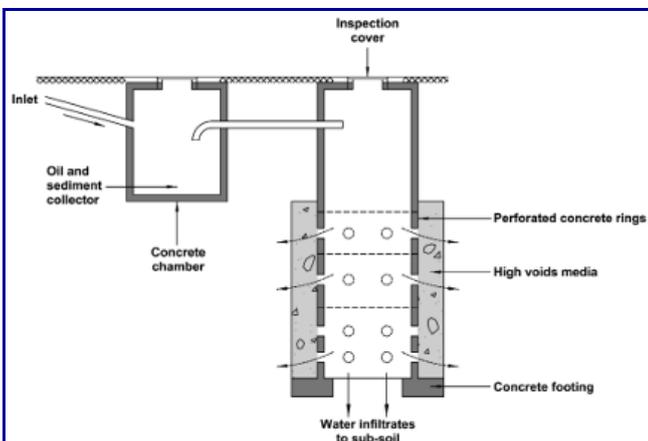


Figure 2 Typical Cross Section of Soakaway

4.8.1.4 UNDERGROUND (E.G. GEOCELLULAR) STORAGE

The Northampton Level 2 SFRA Table 12.1 lists the types of SuDS features that are suitable for Northampton. Underground storage is not listed as an option in the table; therefore justification for using this type of attenuation within any development would need to be provided. Although Table 12.1 does not specifically state that the SuDS features listed are the only form of acceptable SuDS that can be used in the Northampton area, they are considered to be the most appropriate. This position is supported by Northampton Borough Council who has recently adopted Policy 5 for Flood Risk and Drainage in the Northampton Central Area which requires Flood Risk Assessments to be in accordance with the requirements of the Level 2 SFRA (specifically Table 12-1).

Elsewhere within the county, justification for the use of underground storage should still be provided, given the additional maintenance burden that this form of

storage affords, and the lack of additional benefits provided compared to more natural solutions.

Only systems that do not allow silt to enter will be acceptable as an infiltration drainage feature, unless a robust solution for entry, inspection and maintenance is provided. These should avoid confined spaces issues. Geocellular systems under roads where the roads will be subject to construction traffic will not be acceptable unless evidence is provided of its suitability for such loading.



Figure 3 Geocellular system under a car park

4.8.1.5 FILTER STRIPS

Filter strips are gently sloping strips of grass or dense vegetation with a uniform gradient, which improve the quality of the runoff by filtering out sediments and some contaminants. Filter strips are not generally appropriate on steep sites, or where there is a risk of groundwater contamination.



Figure 4 An example of filter strip

4.8.1.6 INFILTRATION AND FILTER TRENCHES

Infiltration and filter trenches are shallow excavations filled with rubble or stone that creates temporary subsurface storage for infiltration or filtration.



Figure 5 An example of infiltration trench

4.8.1.7 SWALES

Swales are shallow vegetated linear depressions with a flat base in which water can be stored or conveyed and pollutants can be removed. Swales are not generally appropriate on steep sites, but can be used with check-dams to slow flow rates and provide attenuation. They can be used on contaminated sites if they are suitably lined.



Figure 6 An example of a swale, Upton

4.8.1.8 DETENTION BASINS AND RETENTION PONDS

Detention basins and ponds are designed to store and attenuate runoff from a site, allowing a restricted outfall to watercourse or sewer, or for infiltration. Basins are often designed to be dry for multi use, whereas ponds have a permanent water level.



Figure 7 An example of a detention pond, Upton

4.8.1.9 PERMEABLE AND PVIOUS PAVEMENTS

Permeable and pervious surfaces are suitable for areas of private pedestrian, parking or lightly trafficked areas, to allow runoff to permeate through the surface. Permeable paving can be used in almost all developments – if there are restricted infiltration rates or contamination risks, the belowground storage can be lined and used for attenuation.



Figure 8 An example of permeable paving, Greens Norton

4.9 COMMON MISCONCEPTIONS FOR IMPLEMENTING SuDS

4.9.1 I CAN'T FIT SuDS WITHIN MY DEVELOPMENT

SuDS should be considered in all developments at an early stage. This allows for allocation of appropriate land take to accommodate adequate SuDS features that are technically appropriate for the environment in which they are to be placed.

High density developments are prime candidates for permeable paving, green roofs, rainwater harvesting and swales. The importance of multi-functional spaces becomes more prevalent in high density developments as allocated open space (if considered early) can integrate SuDS elements.

4.9.2 CLAYEY SOILS PREVENT ME FROM UTILISING SuDS

Ground conditions do not prevent the use of SuDS, only the choice of the elements to use in the system.

Although infiltration SuDS are not suitable in clayey soils, the likes of swales, ponds and wetlands can still be implemented, with water stored at a high level, as can permeable paving directed to alternative storage. Even moderate or small levels of infiltration can provide a benefit so could be considered alongside other methods of discharge.

4.9.3 GROUNDWATER CONTAMINATION IS AN ISSUE FOR MY SITE

Ground conditions do not prevent the use of SuDS, only the choice of the system.

If the site is at risk of groundwater or soil contamination the system should be lined with an impermeable geomembrane liner. This impermeable geomembrane liner may be removed, following receipt of evidence that demonstrates that the contaminants are not mobilised with surface water (leachability testing).

4.9.4 SHALLOW GROUNDWATER LEVELS PREVENT ME FROM UTILISING SuDS

SuDS should be selected and designed to be on the surface, or shallow in depth, to accommodate shallow groundwater.

Use of impermeable geotextile liners (such as a water proof membrane or compacted native clay) can be used to minimise infiltration from the surrounding groundwater.

In these instances, infiltration may be unsuitable. However, SuDS for attenuation or treatment purposes may still be integrated into the development.

4.9.5 CAN SuDS BE LOCATED IN PRIVATE AREAS?

Yes. Some methods are appropriate (e.g. permeable driveways or individual soakaways), but responsibility for management of the systems must be identified. Responsibility for SuDS serving more than one property should rest with a management company or adopting authority rather than individual house owners. Therefore SuDS techniques that serve more than one property should not be located in private gardens.

4.9.6 MY SITE IS TOO FLAT TO INCORPORATE SuDS

Whilst it is challenging to manage surface water runoff on flat sites, the best option is to keep surface water runoff on the surface as much as possible and to manage runoff close to its source. Water can be conveyed on the surface using roadside kerbs and shallow rills and swales, and a designer should explore all alternative means of conveyance before pumping.

4.9.7 MY SITE IS TOO STEEP TO INCORPORATE SuDS

Steep slopes increase runoff velocity creating a challenge for SuDS. However, check dams and storage features can be used to slow runoff rates and accommodate infiltration and/or attenuation.

5 LOCAL STANDARDS AND GUIDANCE FOR SURFACE WATER DRAINAGE DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE IN NORTHAMPTONSHIRE

This section sets out the standards that will be applied by the LLFA for new development proposals in Northamptonshire. Defra's Non-statutory technical standards for sustainable drainage systems (March 2015) are provided below (indicated by S), followed by specific requirements that the LLFA will be using to assess the drainage implications of Major planning applications in Northamptonshire (indicated by L), and guidance for other factors that should be taken into consideration, but which the LLFA will not provide specific comment on.

FLOOD RISK OUTSIDE THE DEVELOPMENT

NATIONAL STANDARDS

S1 Where the drainage system discharges to a surface water body that can accommodate uncontrolled surface water discharges without any impact on flood risk from that surface water body (e.g. the sea or a large estuary) the peak flow control standards (S2 and S3 below) and volume control technical standards (S4 and S6 below) need not apply.

LOCAL STANDARDS

It should be noted that there are no such surface water bodies within Northamptonshire and therefore standards S2, S3, S4 and S6 will always apply.

PEAK FLOW CONTROL

NATIONAL STANDARDS

S2 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.

S3 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.

LOCAL STANDARDS

Where the requirement indicates a 1 in 100 year rainfall event this shall be increased to 1 in 200 for sites in the Upper Nene catchment as per L1 below.

L1 All development within the Upper Nene catchment through and upstream of Northampton must cater for the 1 in 200 year design storm event including an allowance for climate change, with any flooding of the site restricted to designated areas and flow routes.

L2 The greenfield runoff rate will need to be agreed with the LLFA, Environment Agency (EA), relevant sewerage undertaker, Internal Drainage Board (IDB) and Canal and River Trust (CRT), where appropriate, and should take into account the 1 in 1 year, 1 in 30 year and 1 in 100 year rainfall events, including climate change allowances.

L3 Evidence would need to be provided to support a higher rate of discharge than greenfield rates, and would have to be agreed by the relevant authorities as in L2.

L4 In the borough of Corby, major development should limit discharge to 2l/s/ha, as set out in the [Corby Water Cycle Strategy](#).

L5 For brownfield or previously developed sites, where it is proposed to discharge runoff at rates greater than greenfield rates, evidence will be required to demonstrate why it is not feasible to achieve greenfield rates. The capacity of any existing drainage

system within the site should also be assessed in order to determine the current discharge rates.

L6 All flow control devices restricting the rate of flow should have a bypass feature to manage flows when a blockage occurs. The bypass can be an internal weir overflow within the chamber discharging to the outfall pipe or channel. An overflow shall be provided from any basin/pond etc safely routing flows to the discharge location.

L7 For all residential developments, the proposed impermeable area for the site used in all calculations should include an additional allowance of 10% to account for the potential of Urban Creep.

Additional Local Guidance

Detailed guidance on the application of the Environment Agency's climate change allowances are set out in **Appendix G**.

Brownfield sites are strongly encouraged to discharge at the greenfield rate wherever possible. As a minimum, brownfield sites should reduce the discharge by 40% to account for the impacts of climate change, from the existing site runoff OR from the original un-surcharged pipe-full capacity of the existing system, whichever is the lowest.

It is understood that some guidance recommends minimum discharge rates of 5 l/s, to minimise use of small orifice openings that could be at risk of blockages. However, appropriate consideration of filtration features to remove suspended matter and suitable maintenance regimes should minimise this risk and therefore the minimum limit of 5l/s does not apply in Northamptonshire.

The Urban Creep allowance has been set as per CIRIA C753 (version 6) paragraph 24.7.2. Urban Creep is "The conversion of permeable surfaces to impermeable over time, e.g. surfacing of front gardens to provide additional parking spaces, extensions to existing buildings, creation of large patio areas." The effect of Urban Creep over the lifetime of a development can increase impermeable areas by as much as 10%.

VOLUME CONTROL

NATIONAL STANDARDS

S4 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.

S5 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.

S6 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.

LOCAL STANDARDS

Additional Local Guidance

Uncontrolled discharge volumes on developed sites can be up to 10 times greater than the pre-development/greenfield equivalent. This additional volume may cause a risk of flooding to the receiving water body. The difference between existing and proposed volumes of water should not be discharged off site i.e. should be infiltrated wherever possible. Where ground conditions do not allow infiltration, the additional volume must be stored on site to be slowly released – this volume is referred to as the Long Term Storage Volume.

There are two options for providing storage in order to limit peak discharge rates and volumes from the developed site. Either:

- Simple: Limit discharge rates for rainfall events up to and including the 1 in 100 year event (including climate change allowances) to the agreed QBAR rate; or
- Complex: For the greenfield volume, provide variable discharge rates to meet the equivalent greenfield QBAR, 1 in 30 and 1 in 100 rates, and either infiltrate or provide Long Term Storage for the additional volume of runoff produced by the development, to discharge at QBAR or 2l/s/ha, whichever is the greater.

Evidence would need to be provided to support a higher volume of discharge and would have to be agreed by the LLFA, relevant sewerage undertaker, Environment Agency, Internal Drainage Board or Canal and River Trust (where appropriate).

FLOOD RISK WITHIN THE DEVELOPMENT

NATIONAL STANDARDS

S7 The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30 year rainfall event.

S8 The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur during a 1 in 100 year rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water (e.g. pumping station or electricity substation) within the development.

S9 The design of the site must ensure that, so far as is reasonably practicable, flows resulting from rainfall in excess of a 1 in 100 year rainfall event are managed in exceedance routes that minimise the risks to people and property.

LOCAL STANDARDS

L8 Flow across the site must be diverted away from buildings and main access-egress routes. This flooding should be assessed to ascertain if is safe for the sites users. The depth and rate of flow of the flood water should be compared to Table 4 of “Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purpose” May 2008.

L9 The drainage system must be designed to accommodate overland flow from adjacent land if this is likely to be intercepted or affected by the development.

L10 Any infiltration storage features should be capable of half emptying within 24 hours of the rainfall event. This is to ensure capacity for further rainfall events.

L11 It should be demonstrated that high water levels at the outfall for the design storm event would not affect the performance of the system. If the outfall of an attenuation facility is likely to be submerged in the design 1 in 100 year rainfall event, then this should be assessed within any hydraulic modelling. Alternatively, within 24 hours of top water level being attained, the regulation facility must be capable of storing 80% of the run-off arising from a 1 in 10 year

rainfall event.

L12 All surface storage features should provide a minimum 300mm residual uncertainty allowance (freeboard) above the design maximum water level to top of bank and to finished floor levels around the site.

L13 The risk of high groundwater levels must be accounted for in the design of infiltration drainage. The invert of any infiltration device should be at least 1.0m above the maximum groundwater level recorded.

Additional Local Guidance

It should be demonstrated that any blockage within the system and extreme rainfall volumes can be accommodated through safe overflow routes.

The Environment Agency published new guidance on calculating appropriate freeboards – now termed ‘residual uncertainty allowance’ – which can be found at <https://www.gov.uk/government/publications/accounting-for-residual-uncertainty-an-update-to-the-fluvial-freeboard-guide>. This guidance should be followed to calculate the appropriate allowance, with 300mm being recognised as the minimum requirement.

The position of walls, bunds or other obstructions may direct but must not impede flow routes or create ponding.

Green areas, roads and non-highway footpaths/cycleways often provide suitable conveyance corridors. The cross-falls and kerb heights may be adjusted above normal standards to ensure the water is effectively managed – such departures must be agreed with the Highway Authority.

STRUCTURAL INTEGRITY

NATIONAL STANDARDS

S10 Components must be designed to ensure structural integrity of the drainage system and any adjacent structures or infrastructure under anticipated loading conditions over the design life of the development taking into account the requirement for reasonable levels of maintenance.

S11 The materials, including products, components, fittings or naturally occurring materials, which are specified by the designer, must be of a suitable nature and quality for their intended use.

LOCAL STANDARDS

Additional Local Guidance

For any drainage component installed below or adjacent to existing infrastructure such as retaining walls, which are outside the ownership of the applicant, the applicant should have due regard to its existing condition and the design should not have any adverse impact on the existing infrastructure.

DESIGNING FOR MAINTENANCE CONSIDERATIONS

NATIONAL STANDARDS

S12 Pumping should only be used to facilitate drainage for those parts of the site where it is not reasonably practicable to drain water by gravity.

LOCAL STANDARDS

L14 The minimum acceptable pipe diameter is 50mm where the risk of blockage is low (i.e. if flow has already been treated through filtration), or 150mm before such treatment (where risk of blockage is high). The design of controls with smaller diameter may be agreed at the discretion of the LLFA.

L15 Prior to discharge into any underground infiltration system, measures should be provided to remove silt, suspended or floating matter.

L16 Soakaways should be a chamber or geocellular type with access provided for removing silt and a robust inspection and a satisfactory de-silting maintenance system put in place. Rubble filled soakaways are not acceptable unless adequate easily inspected and maintained silt removal devices precede discharge to the soakaway.

L17 The designs of all elements of the surface water drainage system must be accompanied by a maintenance schedule that sets out how and when each element of the system should be inspected and maintained, who is responsible for the maintenance, and when each element may need replacement. The layout of the development must demonstrate that access for maintenance of all elements is possible.

Additional Local Guidance

Maintenance regimes for all SuDS must be fully funded by the developer, except for those that are

being adopted by a statutory body. This could be through a Section 106 agreement/separate agreement with the borough, district, town or parish council with Commuted Sums paid for maintenance; through a service management company; or by private individuals (only where the SuDS serve individual properties).

If the SuDS are not being adopted by a statutory body, maintenance proposals shall be proactive not reactive – blockages should not be allowed to occur with resultant surface flooding or to the detriment to the performance of the SuDS. SuDS features shall be designed and located to facilitate the maintenance regime specified in the guidance documents. Other maintenance regimes may be agreed with the LLFA to mitigate flood risk or the EA regarding water quality and biodiversity etc.

Suitably surfaced access tracks should be provided for accesses to, in and around the SuDS for vehicles, machinery and heavy plant to undertake inspection and physical maintenance, where required.

Controls and de-silting features should be easily accessible from the surface. Small controls (orifice plates, slots etc) shall be visible from the surface without the need for removal or covers or use of special access facilities (e.g. visible through gratings or grids). Thus any blockage can be readily identified by walk-by inspection.

Silt traps should be readily accessible for manual clearance or suction vehicles. Vortex separators should not require man-entry for inspection or emptying.

CONSTRUCTION

NATIONAL STANDARDS

S13 The mode of construction of any communication with an existing sewer or drainage system must be such that the making of the communication would not be prejudicial to the structural integrity and functionality of the sewerage or drainage system.

S14 Damage to the drainage system resulting from associated construction activities must be minimised and must be rectified before the drainage system is considered to be completed.

LOCAL STANDARDS

L18 The drainage system must be operational before construction of any impermeable surfacing, to mitigate the risk of flooding during construction. For large phased developments, any strategic drainage elements that serve more than one parcel or phase must be designed and constructed to be fully functional prior to construction of each parcel.

Additional Local Guidance

For SuDS elements sensitive to siltation, the form of the drainage should be constructed during the earthworks phase, but the final construction should not take place until the end of the development programme, unless adequate provision is made to remove any silt that is deposited during construction operations, and refurbish any areas that have been subject to over-compaction, siltation etc. Establishment of landscaping vegetation and sediment removal should take place once site works have been completed and prior to commencement of the maintenance period.

Surface water runoff from the construction site should not drain into SuDS components unless it has been allowed for in the design and specification. This will avoid silt-laden runoff from clogging infiltration systems or building up in storage systems.

Provision should be made in the construction contract to review the performance of the SuDS when it is completed, and to allow for minor adjustments and refinements to be made to optimise the physical arrangements, based on observed performance.

RUNOFF DESTINATIONS

LOCAL STANDARDS

L19 The submitted documents shall identify sources of water entering the site predevelopment, how flows will be routed through the site, where flows leave the site pre development and where they will leave post development. This should include details of flows from all catchments and sub-catchments discharging into, through and from the site. Any changes to the locations of these sources and points of discharge must be agreed with adjacent landowners or responsible authorities and written agreement from these parties must be provided at the time of application.

L20 Surface runoff not collected for use should be discharged to one or more of the following, listed in order of priority:

- Discharge into the ground (infiltration); or, where not reasonably practicable,
- Discharge to a surface water body or watercourse; or, where not reasonably practicable,
- Discharge to a surface water sewer, highway drain, or another drainage system; or, where not reasonably practicable,
- Discharge to a combined sewer.

When discharging to an existing sewer or drain, evidence will be required to demonstrate that the owner of the sewer or drain (sewerage undertaker for sewers, highways authority for highway drains, or private owner) has accepted the point and rate of discharge, and that there is capacity to accommodate these flows. The owner may request improvements to the sewer or drain, or for discharge rates to be reduced below the Greenfield rate or other rate agreed by the LLFA.

Additional Local Guidance

Dealing with the water locally in sub-catchments not only reduces the quantity that has to be managed at any one point, but also reduces the need for conveying the water off the site. When dividing catchments into small sections it is important to retain a perspective on how this affects the management of the whole catchment and the hydrological cycle.

WATER QUALITY

LOCAL STANDARDS

L21 At least one surface feature should be deployed within the drainage system for water quality purposes, or more features for runoff which may contain higher levels of pollutants in accordance with the CIRIA SuDS Manual C753. Only if surface features are demonstrated as not viable, then approved proprietary engineered pollution control features such as vortex separators, serviceable/ replaceable filter screens, or pollution interceptors may be used.

L22 To ensure protection of groundwater quality, there should be at least 1.0m between the maximum recorded groundwater level and the base of the infiltration system. The Environment Agency may have additional requirements.

L23 Soakaways and other infiltration SuDS must not be constructed in contaminated ground.

Additional Local Guidance

If the surface of an infiltration system is too close to the water table, a rise in water levels during particularly wet periods could cause groundwater to enter the infiltration system, reducing the amount of storage available. Groundwater entering the infiltration system would also result in direct discharge from that infiltration system into groundwater, which may contravene permitting requirements and environmental legislation.

The use of infiltration drainage would only be acceptable if a site investigation showed the absence of any significant contamination or if the design mitigates any risk posed to groundwater. Please refer to 'Groundwater protection: Principles and practice (GP3)' Position Statements G9 Use of deep infiltration systems for surface water and effluent disposal to G13 Sustainable Drainage Systems.

Green and brown roofs, rainwater harvesting, and infiltration SuDS features are all accepted to provide interception of the first 5mm of rainfall from the impermeable area served. Other SuDS features may provide some interception through evapotranspiration and infiltration, but the amount will depend on the size and characteristics of the feature in comparison to the area being served – see Section 24.8 of the CIRIA SuDS Manual for more information.

MULTI-FUNCTIONALITY

LOCAL STANDARDS

L24 Where site use allows, SuDS should be designed as part of multi-functional spaces such as sports and recreational areas, with opportunities for education. The expected design frequency of inundation areas and attenuation function should be determined in order to facilitate and manage multi-function use.

L25 In multi-functional spaces, where dry detention or infiltration basins are proposed, a lower area should be provided to restrict the wet areas during more frequent events and thus maximise the duration and extent of areas available for leisure purposes elsewhere within the feature.

Additional Local Guidance

Where access for the mobility impaired is to be provided at detention and infiltration basins, this should be included in accordance with BS 8300 Section 5.

Any footpaths, mobility paths, and street furniture must be located so as not to obstruct access for maintenance.

DESIGNING FOR ECONOMIC SUSTAINABILITY

LOCAL STANDARDS

Additional Local Guidance

SuDS should be designed to provide an effective 'whole life' sustainable solution, by ensuring that:

- Systems operate efficiently for long periods (20 to 50 years) before replacement or rehabilitation is needed;
- Systems operate efficiently for medium periods (2 to 5 years) before significant maintenance activities are required;
- Regular operation and maintenance needs are easily understood and implemented by relatively unskilled labour; and
- Where possible, natural resources are reused and energy efficient products, processes, operation and maintenance are possible.

LANDSCAPE AND VISUAL IMPACT

LOCAL STANDARDS

The LLFA will not comment on nature, landscape, visual impact, and historical aspects, unless they appear to impact on the performance of the SuDS. This responsibility remains with the LPA and any other statutory consultees as appropriate. Applicants shall consult the relevant stakeholders at the masterplanning stage and take into consideration any features or requirements they identify.

Additional Local Guidance

Water should be kept above the ground surface wherever possible and SuDS should be considered as an integral part of the landscape or urban design.

SuDS features should be visually attractive, such as ponds and wetlands, with details such as channels, canals and cascades to provide visual interest.

Natural drainage features around the site should be retained and enhanced.

Where possible, all hard structures such as inlets, outlets and headwalls should be designed to be unobtrusive. Appropriate cladding such as local stone should be considered.

The shape and depth of swales or basins below surrounding ground should be integrated into the landscape but not be excessive in land take.

ECOLOGY

LOCAL STANDARDS

The LLFA will not comment on nature, landscape, visual impact, and historical aspects, unless they appear to impact on the performance of the SuDS.

This responsibility remains with the LPA and any other statutory consultees as appropriate. Applicants shall consult the relevant stakeholders at the masterplanning stage and take into consideration any features or requirements they identify.

Additional Local Guidance

The primary function of SuDS is flood prevention; consequently the maintenance regime should not be restricted by ecological requirements in detriment of flood prevention. The design of the shape or depth of water bodies or type of vegetation should not be deliberately selected to create habitats for protected species. The SuDS should have a maintenance

regime which discourages the development of protected habitats. Grass strimming, grass cutting and silt removal, dredging etc shall be carried out on a frequent basis to maintain the designed flow regime.

Where a developer does want to create a habitat for a protected species, the system needs to be oversized and on a larger footprint to enable restricted maintenance to take place whilst acknowledging the asset will have a reduce standard of service.

A robust vegetation cover should be established as soon as possible to prevent silt migration and assist the drainage function. This will then develop into a biodiversity asset.

Local indigenous plant material applicable to Northamptonshire should be used where possible to allow natural colonisation of SuDS features. The planting of non indigenous or any invasive or vigorously colonising species is not appropriate. All planting in open SuDS should be native to the UK, ideally of local provenance, and from an accredited source to avoid the introduction of alien species.

A shallow aquatic edge to ponds and wetlands should be included, with a maximum depth of 450mm and minimum width of 1m, for safety reasons.

To discourage excessive vegetation within the main body of water, the bed should be at least 1m below normal water level and thus limit light levels on the bed.

APPENDIX A: SUDS STANDARDS, GUIDANCE AND USEFUL DOCUMENTS

Further information on SUDS can also be found at:

- www.floodtoolkit.com/planning/surface-water-drainage
- www.susdrain.org
- CIRIA – provide a range of advice and publications on SUDS, including the SUDS Manual. www.ciria.org.uk/suds
 - CIRIA Designing for Exceedance. C635.
 - CIRIA Rainwater and grey-water reuse in buildings: best practice guidance. C539.
 - CIRIA Source control using constructed pervious surfaces. C582.
 - CIRIA Designing for exceedance in urban drainage – good practice. C635.
 - CIRIA Building greener. Guidance on the use of green roofs, green walls and complementary features on buildings. C644.
 - CIRIA Structural design of modular geocellular drainage tanks. C680.
 - CIRIA Site handbook for constructing SUDS. C698.
 - CIRIA The updated SUDS Manual. C753.
- The Building Regulations part H, Drainage and Waste Disposal. www.planningportal.co.uk/info/200135/approved_documents/71/part_h_-_drainage_and_waste_disposal
- British Standard BS 7533-13: 2009. Pavements constructed with clay, natural stone or concrete pavers – Part 13: Guide for the design of permeable pavements constructed with concrete paving blocks and flags, natural stone slabs and setts and clay pavers.
- Interim Code of Practice for SUDS - provides advice on design, adoption and maintenance issues and a full overview of other technical guidance on SUDS http://www.susdrain.org/files/resources/other-guidance/nswg_icop_for_suds_0704.pdf.
- Waterscapes: Planning, Building and designing with Water. Edited by Herbert Dreiseitl, Dieter Grau and Karl H. C. Ludwig: Birkhauser.
- Interpave - Guide to the Design, Construction and Maintenance of Concrete Block Permeable Pavements.
- Interpave - Understanding Permeable Paving.
- Environment Agency Green roof tool kit.
- Kellagher RBB and Lauchlin CS Use of SUDS in high density developments, defining hydraulic performance criteria. HR Wallingford Report SR 640.
- Kellagher RBB and Lauchlin CS Use of SUDS in high density developments, guidance manual. HR Wallingford Report SR 666.
- BRE 365 (2016) Soakaway design guide www.brebookshop.com.
- Groundwater Protection : Principles and Practice (GP3)
- BeST (Benefits of SuDS Tool) for evaluating the multiple benefits of SuDS <http://www.susdrain.org/resources/best.html>

APPENDIX B: DRAINAGE LEGISLATION AND GUIDANCE

Sustainable surface water management is increasingly recognised as an important consideration in national, regional and local planning as an effective means to assist in the management of flooding. A number of these policy documents must be adhered to when designing SuDS. The main documents are summarised below.

NATIONAL GUIDANCE

The Flood and Water Management Act (2010) (FWMA) (the Act)

Schedule 3 of the Act provides for Lead Local Flood Authorities to approve, adopt and manage SuDS. However, this part of the Act has not been enacted.

The Act can be viewed at <http://www.legislation.gov.uk/ukpga/2010/29/contents>.

The National Planning Policy Framework (2012) (NPPF)

The NPPF for England promotes the integration of SuDS features within development proposals to control surface water, improve water quality and increase biodiversity.

The new measures must be applied by local planning authorities (LPAs) through local policies and plans, as well as planning application decisions on 'major developments' of 10 or more dwellings and equivalent non-residential or mixed developments. However, this situation might change as the Government intends to "keep this under review, and consider the need to make adjustments where necessary".

The NPPF can be viewed at <https://www.gov.uk/government/publications/national-planning-policy-framework--2>.

The DCLG ministerial statement can be viewed at <http://www.parliament.uk/business/publications/written-questions-answers-statements/written-statement/Commons/2014-12-18/HCWS161/>.

The Non-Statutory National Technical Standards for Sustainable Drainage (The National Standards)

The non-statutory National Standards (April 2015) cover the generic requirements for design of SuDS. They provide requirements for: flood risk outside the development; peak flow control; volume control; flood risk within the development; structural integrity; designing for maintenance considerations; and construction.

In terms of the overall viability of a proposed development, expecting compliance with the technical standards is unlikely to be reasonably practicable if more expensive than complying with building regulations - provided that where there is a risk of flooding the development will be safe and flood risk is not increased elsewhere. Similarly, a particular discharge route would not normally be reasonable practicable when an alternative would cost less to design and construct.

The National Standards can be viewed at www.gov.uk/government/publications/sustainable-drainage-systems-non-statutory-technical-standards.

The Buildings Regulations – Part H (December 2010)

Part H of the Buildings Regulations: Drainage and Waste Disposal, establishes a hierarchy for surface water disposal, which encourages a SuDS approach. This hierarchy is that surface runoff must be discharged to one or more of the following in order of priority:

- An adequate soakaway or some other adequate infiltration system; or, where not reasonably practicable,
- A watercourse; or, where not reasonably practicable,
- A sewer.

The regulations can be viewed at www.planningportal.gov.uk/buildingregulations/approveddocuments/parh.

LOCAL GUIDANCE

Northamptonshire Local Flood Risk Management Strategy (LFRMS)

The LFRMS focuses on local flood risk resulting from surface water, groundwater and ordinary watercourses flooding. The LFRMS sets out the management of flood risk in Northamptonshire for the coming years.

The LFRMS can be viewed on the Flood Toolkit at www.floodtoolkit.com.

Flood Risk Management Plans (FRMPs)

Flood Risk Management Plans (FRMPs) highlight the hazards and risks of flooding from rivers, the sea, surface water, groundwater and reservoirs, within the river basin district, and set out how Risk Management Authorities work together with communities to manage flood risk. Northamptonshire is covered by three

FRMPs, namely the Anglian FRMP, Severn FRMP and Thames FRMP.

There is one agreed measure relating to drainage and development which appears in the majority of sub-catchments, namely: “*seek the inclusion of policies in planning documents for development in areas at risk of flooding to be resilient and for the implementation of Sustainable Drainage Systems (SuDS)*”

Further information on these plans can be viewed at <https://www.gov.uk/government/collections/flood-risk-management-plans-frmps>.

Water Cycle Strategies (WCSs)

These strategies aim to identify the water related infrastructure improvements required to support proposed strategic development sites within the Core Strategies. In Northamptonshire, there are three WCSs: the North Northants WCS; the Corby WCS; and the West Northants WCS.

Each of the WCSs can be viewed at:

- North Northants WCS - <http://www.nnjpu.org.uk/publications/docdetail.asp?docid=1104>
- West Northants WCS - <http://www.westnorthamptonshirejpu.org/connect.ti/website/view?objectId=2759888>
- Corby WCS – <http://www.nnjpu.org.uk/publications/docdetail.asp?docid=823>.

Strategic Flood Risk Assessments (SFRAs)

These assessments evaluate the strategic risk to areas, focusing on fluvial flood risk. There are two key policy requirements within these SFRAs that have been set out below.

Northampton’s SFRA highlights the EA’s Policy Statement for the Upper Nene catchment (through Northampton and within the Nene catchment upstream of Northampton), which states that ‘...*surface water attenuation should be provided up to the 0.5% AEP (1 in 200 annual probability) flood (rainfall) event plus climate change.*’ The general standard of 1 in 100 year plus climate change protection is increased to 1 in 200 year plus climate change due to the history of flooding in the catchment. See **Appendix H** for a map of the catchment.

The Corby Level 2 SFRA contains a specific Policy relating to SuDS which requires developers to limit runoff from their sites to 2l/s/ha, preferably through the use of SuDS.

Each of the SFRAs can be viewed at:

- Northampton and Daventry and South Northants - <http://www.westnorthamptonshirejpu.org/connect.ti/website/view?objectId=2739568>
- Corby - <http://www.corby.gov.uk/planning-and-building-control/planning-policy/plan-making/evidence-base-technical-studies/community>
- East Northants - http://www.east-northamptonshire.gov.uk/site/scripts/documents_info.php?documentID=558&pageNumber=1
- Kettering - http://www.kettering.gov.uk/info/1004/planning_policy/1851/strategic_flood_risk_assessments
- Wellingborough - http://www.wellingborough.gov.uk/downloads/download/2025/sfra_update_main_body.

Surface Water Management Plans (SWMPs)

These plans assess the risk of flooding from surface water sources and the interaction with fluvial (main river) sources. The SWMPs are in progress for all districts and boroughs in Northamptonshire. They will identify key locations within each district/borough which are at high risk of surface water flooding, and indicate potential options for alleviating this risk, including the potential for SuDS in new and re-development.

North Northamptonshire Joint Core Strategy (JCS)

Policy 5 of the Joint Core Strategy states:

“Development should meet a minimum 1% (1 in 100) annual probability standard of flood protection with allowances for climate change unless local studies indicate a higher annual probability, both in relation to development and the measures required to reduce the impact of any additional run off generated by that development to demonstrate that there is no increased risk of flooding to existing surrounding properties”

Paragraph 4.15 of the Joint Core Strategy states:

“In respect of water use, the Government proposes that an optional higher level of water efficiency of 110 litres/person/day (105 litres within the home and 5 litres external use) will be allowed in areas of water stress. This equates to the requirements set out in CSH level 3 and compares to the current Building Regulation level of 125 l/p/d. North Northamptonshire is classified by the Environment Agency as an area of water stress”

Policy 9 of the Joint Core Strategy states:

“Development should incorporate measures to ensure high standards of resource and energy efficiency and

reduction in carbon emissions. All residential development should incorporate measures to limit use to no more than 105 litres/person/day and external water use of no more than 5 litres/person/day or alternative national standard applying to areas of water stress”

Further information on the pre-submission JCS can be viewed at <http://www.nnjpu.org.uk/publications/docdetail.asp?docid=1458>.

West Northamptonshire Joint Core Strategy

The West Northamptonshire Joint Core Strategy is a key part of the Local Development Framework.

The Core Strategy sets out the long-term vision and objectives for the whole of the area covered by Daventry District, Northampton Borough and South Northamptonshire Councils for the plan period up to 2029, including strategic policies for steering and shaping development. It identifies specific locations for strategic new housing and employment and changes to transport infrastructure and other supporting community facilities, as well as defining areas where development will be limited. It also helps to ensure the co-ordination and delivery of other services and related strategies.

The West Northamptonshire Joint Strategic Planning Committee adopted the West Northamptonshire Joint Core Strategy Local Plan (Part 1) on 15 December 2014. Further details can be found at <http://www.westnorthamptonshirejpu.org/connect.ti/webside/view?objectId=5130832#5130832>.

North Northamptonshire Flood Risk Management Study Update

The FRMS update is a technical evidence base to underpin the Joint Core Strategy (JCS) for North Northamptonshire. Its aims are to: provide clear policy recommendations that can be taken forward at all levels of plan making; assess requirements arising from proposed strategic land allocations; and estimate broad costs and potential funding mechanisms to support priority infrastructure projects.

The study can be viewed at <http://www.nnjpu.org.uk/docs/FINAL%20-%20NNFRMS%20Update%20Final%20Report.pdf>.

River Basin Management Plans (RBMPs)

Each RBMP describes the current situation and the consequences for the water environment, along with the actions that will be taken to address the pressures. Northamptonshire is covered by three River Basins, namely: Anglian, Thames and Severn.

The RBMP for each of these areas can be accessed at <https://www.gov.uk/government/collections/river-basin-management-plans-2015>.

Northampton Central Area Action Plan (CAAP) Drainage Plan

The Central Area Action Plan (CAAP) provides specific planning policy and guidance up to 2026 for Northampton town centre, for which significant regeneration and investment is proposed. The Drainage Plan looks at solutions for managing surface water in the Central Area to maximise capacity of the current drainage network. The study indicates that a number of solutions will be required which reflect the draft National SuDS Standards. These include:

- managing the demand for water in new development;
- managing surface water on site, through techniques such as green roofs;
- managing surface water as close to the site as possible; and
- off-site sustainable drainage measures.

The Northampton CAAP can be viewed at http://www.northampton.gov.uk/info/200205/planning_forthefuture/1748/central_area_action_plan_caap.

Northampton Central Area Action Plan (CAAP) Policy 5

The Northampton Central Area Action Plan (CAAP) Policy 5 provides specific development guidance on Flooding and Drainage. The developer must demonstrate adequate consideration of:

- Available area for surface water management measures
- Hydrogeology of the site
- Proximity of appropriate receptors (watercourses or surface water sewer in accordance with CAAP drainage destination hierarchy)
- Conveyance and exceedance routes to appropriate receptor(s)
- Requirement for easements for drainage routes across third party land
- Capacity within existing drainage systems

There is a supporting Developer Guidance Note for Policy 5 which can be viewed at http://www.northampton.gov.uk/downloads/file/6250/caap_policy_5_flooding_drainage_guidance_note.

LINKS TO GREEN AND BLUE INFRASTRUCTURE

The National Planning Policy Framework defines green infrastructure (GI) as ‘a network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities.’ Blue

infrastructure (BI) refers to all water bodies, including the river network.

The Northamptonshire GI Strategy (updated 2010) has been produced in order to enhance, promote and deliver GI and BI within the County. The Strategy highlights GI and BI as mechanisms by which a positive shift can be made towards placing the environment at the heart of planning, economics and decision making. A number of SuDS features provide GI and BI and the associated benefits. The use of SuDS will therefore deliver a number of the Strategy's GI Delivery Principles, helping ensure that a multi-functional GI and BI network is achieved in the County in the long term. These principles include:

- The delivery of multi-functional green infrastructure such as flood management areas used for amenity purposes is fundamental, and proposals should be formulated to secure this wherever possible;
- The delivery of a connected network is important to ensure strategic objectives are achieved with regard to multi-functionality such as managed

overland flood routes for extreme events and wildlife corridors;

- Preference should be given to GI proposals which complement other GI assets and resources in the locality;
- The principle of 'net gain' should be secured where there is to be a loss in a GI resource;
- Ensuring the quality of the GI resource is retained or delivered is essential;
- Opportunities to consider socio-economic as well as environmental gains should be sought during the delivery of GI at all times; and
- Opportunities for GI delivery should be taken as and when they arise; both flagship and small scale projects will therefore be important in delivering change in the long term.

The Northamptonshire GI Strategy can be viewed at http://www.rnrpenvironmentalcharacter.org.uk/data/5.0%20GI_PARTS%201-3.pdf.

APPENDIX C: INFORMATION REQUIRED FOR OUTLINE PLANNING APPLICATIONS

The following information should be provided for every drainage strategy submitted to the LLFA for consideration as part of an **Outline Planning Application**.

Where the requirement indicates a 1 in 100 year rainfall event this shall be increased to 1 in 200 for Upper Nene catchment.

Detail required for Outline Applications	Provided?
<p>Non-Technical Summary Non-technical summary of the proposed drainage strategy.</p>	
<p>Description of the type of development Description of the type of development proposed and where it will be located. Include whether it is new development, an extension to existing development or change of use etc. State the area of the development site itself, how much of the site is currently hard standing, the proposed area to be hard standing post-development, and any proposed areas of public open space.</p> <p>Note that in calculations proposed values of impermeable area should include a 10% allowance for Urban Creep, as taken from CIRIA C753 (version 6) paragraph 24.7.2.</p>	
<p>A location plan Location plan at an appropriate scale should be provided with the application, showing site outline and other adjacent land under the applicant's control.</p>	
<p>Plans Plans showing the existing site layout, its topography, any water features, and how the site currently drains. Plans should also be provided of the proposed layout if available and demonstration that the proposed drainage system and other mitigation measures are achievable and that adequate space has been made for water.</p>	
<p>Assessment of all flooding risks to the site This should include groundwater, overland surface water flows, sewer flooding, infrastructure flooding (from reservoirs/ponds/canals), watercourse flooding and the risk posed by the proposed development.</p>	
<p>Explanation of how each of these flood risks will be mitigated This may require modelling of some sources where significant flood risk is shown on high level datasets. It might mean applying the sequential approach to the site by avoiding building on one part of the site where there is known flooding.</p>	
<p>Explanation of how the drainage discharge hierarchy has been followed, providing evidence why any are inappropriate:</p> <ul style="list-style-type: none"> • Firstly, to infiltration/soakaway • Secondly, to a watercourse or highway ditch (with permission) • Thirdly, to a surface water sewer or highway drain (with permission) • Lastly, to a combined sewer (with permission) 	
<p>Evidence that the site has an agreed point of discharge</p> <ul style="list-style-type: none"> • If a significant portion of surface water is to be infiltrated on site, provide a BRE365 infiltration assessment to prove that this will work effectively. At outline stage it may be acceptable to base infiltration values on typical values for the local geology, as long as an alternative drainage design and agreed point of discharge is provided should infiltration rates prove to be unsuitable. 	

Detail required for Outline Applications	Provided?
<ul style="list-style-type: none"> If discharge is to an ordinary watercourse, evidence will need to be provided to ensure that the system can accept the proposed flows to an acceptable downstream point without increasing risk to others. If the watercourse is not within the boundary of the site, evidence will be required that the developer has a right to cross 3rd party land. If discharge is to a surface water or combined sewer, or highways ditch or drain, letter of confirmation from the Water Company or responsible body will be required, stating their required discharge maximum rates and confirmation that there is adequate capacity in the existing system. This information is generally provided by going through the relevant water company's "Pre-Planning Service". This is a formal process that all developers are expected to go through to inform their planning applications. There is normally an associated cost for this service and a minimum timescale of 15 working days to obtain a response. The advice is then usually valid for a one year period. This process will provide assurance that there are no capacity issues with third party assets, as we as the LLFA are not able to make this type of assumption on behalf of a Water and Sewerage provider. <ul style="list-style-type: none"> Anglian Water: http://www.anglianwater.co.uk/developers/pre-planning-service.aspx Severn Trent Water: https://www.stwater.co.uk/developers/application-forms-and-guidance-notes/ (> application forms > Development enquiry application form) Thames Water: https://my.thameswater.co.uk/dynamic/cps/rde/xchg/corp/hs.xsl/18710.htm 	
<p>Calculations of current runoff from site</p> <ul style="list-style-type: none"> For greenfield sites, existing greenfield runoff rates and volumes can be produced through the UK SuDS website http://www.ukSuDS.com/, or by using the Institute of Hydrology IoH124 method. If brownfield sites, clearly state the existing impermeable area and calculate the rates of runoff from the site. If a piped drainage system already exists within the site, the existing capacity of these pipes will need to be estimated. 	
<p>Calculations of allowable runoff from site</p> <p>Clearly state the proposed impermeable areas for the site and how this compares to existing values.</p> <p>In all calculations, proposed values of impermeable area should include a 10% allowance for Urban Creep, as taken from CIRIA C753 (version 6) paragraph 24.7.2. The Modified Rational Method is considered acceptable only for initial design estimates (i.e. at Outline planning) or for very simple sites (i.e. Minor developments).</p> <ul style="list-style-type: none"> Greenfield sites should discharge at no greater than the current greenfield rate so that the site behaves like the original site across the range of events. Brownfield sites are strongly encouraged to discharge at the greenfield rate wherever possible. As a minimum, brownfield sites should reduce the discharge by 40% to account for the impacts of climate change, from the existing site runoff OR from the original un-surcharged pipe-full capacity of the existing system, whichever is the lowest. Developers have the option to limit discharge for all events to the QBAR flow rate; or install a complex discharge control which reflects the original discharge for run-off rates from the site across the range of storm events. E.g. QBAR, 3.3% (1in30), 1% (1in100), 1% (1in100) plus climate change and provide Long Term Storage for all runoff volume greater than the greenfield volume (as set out in 'Calculation of Storage Volume' below). Please note that for developments within the Borough of Corby, runoff from the site for all design events should be limited to 2l/s/ha. 	

Detail required for Outline Applications	Provided?
<ul style="list-style-type: none"> It is understood that some guidance recommends minimum discharge rates of 5 l/s, to minimise use of small orifice openings that could be at risk of blockages. However, appropriate consideration of filtration features to remove suspended matter and suitable maintenance regimes should minimise this risk and therefore the minimum limit of 5l/s does not apply in Northamptonshire. Due to the additional datasets that have been added to the Flood Estimation Handbook (FEH) since design rainfall events were developed originally in the Flood Studies Report (FSR) (NERC, 1975), rainfall depths obtained using FEH show significant differences from those obtained from FSR in some parts of the country. Within Northamptonshire, rainfall depths are often greater using more up to date FEH datasets than those using FSR, therefore for various storm events, greater run-off is produced and additional attenuation is likely to be required. As FEH rainfall data is more up to date, calculations should use FEH data for surface water drainage design, except where the critical storm duration is less than 60 minutes, as it is recognised that FEH data is less robust for short duration storms. If FEH rainfall data is not used as described above, then sensitivity testing to assess the implications of FEH rainfall must be provided. This should demonstrate that the development proposals remain safe and do not increase flood risk to third parties. 	
<p>A calculation of storage volume Volume of storage required on site for the 1% (1in100) plus climate change storm, in order to meet the controlled discharge rate or available infiltration rate. Where appropriate this should specify the volumes of both attenuation storage and Long Term storage. See also note above about use of FEH rainfall data. An estimation of storage (acceptable only for outline applications) can be produced through the UK SuDS website http://www.ukSuDS.com/, or using the WinDes Quick Storage Estimate tool.</p>	
<p>Plans showing a logical location of storage within the proposed development Attenuation storage within areas at risk of flooding will not be acceptable.</p>	
<p>Explanation of likely forms of SuDS for the site and reasons for the use of these features. If no SuDS methods are proposed then justification and evidence will need to be provided as to why they are not appropriate for the site.</p>	
<p>Explanation of who will maintain the drainage system over the lifetime of the development and evidence that all elements of the drainage system will be fully accessible for maintenance without entering 3rd party land. Ideally, SuDS features should be located within public space.</p>	
<p>Phasing An explanation of how the site will adequately consider flood risk at all stages of the development.</p>	

APPENDIX D: INFORMATION REQUIRED FOR FULL APPLICATIONS

The following information should be provided for every drainage strategy submitted to the LLFA for consideration as part of any **Full application**.

Where the requirement indicates a 1 in 100 year rainfall event this shall be increased to 1 in 200 for Upper Nene catchment.

Detail required for Full Applications	Provided?
<p>Non-technical summary Non-technical summary of the proposed drainage strategy.</p>	
<p>Description of the type of development Description of the type of development proposed and where it will be located. Include whether it is new development, an extension to existing development or change of use etc. State the area of the development site itself, how much of the site is currently hard standing, the proposed area to be hard standing post-development, and any proposed areas of public open space.</p> <p>Note that in calculations proposed values of impermeable area should include a 10% allowance for Urban Creep, as taken from CIRIA C753 (version 6) paragraph 24.7.2.</p>	
<p>Location plan Location plan at an appropriate scale should be provided with the application, showing site outline and other adjacent land under the applicant's control.</p>	
<p>Topography plan Topographical survey of the site, including cross-sections of any adjacent watercourses for appropriate distance upstream and downstream of discharge point if appropriate.</p>	
<p>Layout Plan Proposed layout of the development, clearly identifying areas of impermeable surfacing, public open space, natural features such as watercourses, and allocated areas for surface water storage.</p>	
<p>Ground Investigation which should account for:</p> <ul style="list-style-type: none"> • The presence of constraints that must be considered prior to planning infiltration SuDS; • The drainage potential of the ground; • Potential for ground instability when water is infiltrated; and • Potential for deterioration in groundwater quality as a result of infiltration. 	
<p>Assessment of all existing flooding risks to the site An assessment should be made of the risk to the site from all sources of flooding:</p> <ul style="list-style-type: none"> • Surface water – the Environment Agency's Surface Water flood map can be used to assess the level of surface water flood risk to the site. If this map is disputed or considered inaccurate, the developer would need to model the expected flows across the site and use the results to determine the level of risk to the site. • Groundwater – typically a geotechnical report is required to cover this. See also the Northamptonshire Ground Water Flood Risk Study which can be found on the Flood Toolkit www.floodtoolkit.com • Canals – normally a letter from the Canal and River Trust stating that there is no risk, otherwise modelling of potential overtopping or breach. • Reservoirs –the Environment Agency inundation maps can be used to determine local level of risk. If the mapped inundation extent is disputed, the Environment Agency may require further modelling by developer. 	

Detail required for Full Applications	Provided?
<ul style="list-style-type: none"> • Sewer – typically a letter or model report from the Water Company. • Fluvial (main river or ordinary watercourse) - the Environment Agency have published flood mapping for watercourses with a catchment greater than 3km². They can be contacted to obtain models or data associated with this mapping. The Environment Agency will advise on whether flood risk associated with Main River has been assessed appropriately. If only approximate modelling is available for an ordinary watercourse and it is felt to be inaccurate or is disputed, the developer will be required to model such flooding accurately to ensure their development is safe. In some small catchments, the Environment Agency's Surface Water flood map may be considered as a suitable proxy where there is no fluvial floodplain mapping. 	
<p>Explanation of how each of these flood risks will be fully mitigated</p> <p>This could require detailed modelling of some sources where significant risk is shown on high level datasets. It might mean applying the sequential approach by avoiding building on one part of the site where there is known flooding.</p> <p>Examples of mitigation measures (note: this list is not exhaustive):</p> <ul style="list-style-type: none"> • Setting minimum floor levels of the development; • Utilising the sequential approach by locating more sensitive development out of the floodplain that affects the site; • Works to improve/divert infrastructure to eliminate risk; • Proposals to route flood flows through a development so they do not adversely affect the development; • Avoiding the use of below-ground development or basements adjacent to areas of flood risk unless they are designed for flood storage; • Setting residential development 150mm above the adjacent ground level. 	
<p>Detailed Drainage Plans</p> <p>Showing the layout of the proposed drainage network, the location of storage within the proposed development and how these relate to submitted calculations, including any chamber and pipe numbers that are referenced in Micro Drainage (or similar) reports. The methods of flow control must be detailed, as should non-conventional elements such as ponds, swales, permeable paving etc.</p>	
<p>Full explanation of the forms of SuDS used on the site</p> <p>Including reasons for the use of these features, what flood mitigation, water quality, environmental and social benefits they might achieve. If no SuDS methods are proposed then justification and evidence will need to be provided as to why they are not appropriate for the site.</p> <p>Modelling of the proposed SuDS system for the site, showing the behaviour of the site for the main rainfall events described below ensuring:</p> <ul style="list-style-type: none"> • Typical operation of the system for low rainfall and first-flush events, with indication of how treatment of surface water will be achieved. • No above ground flooding for any conventional element of the system for the 3.3% (1in30) event. • No flooding from the system to property or critical/sensitive infrastructure for the 1% (1in100) plus climate change event. 	
<p>Explanation of how the drainage discharge hierarchy has been followed, providing evidence why any are inappropriate:</p> <ul style="list-style-type: none"> • Firstly, to infiltration/soakaway • Secondly, to a watercourse or highway ditch (with permission) • Thirdly, to a surface water sewer or highway drain (with permission) • Lastly, to a combined sewer (with permission) 	

Detail required for Full Applications	Provided?
<p>Evidence that the site has an agreed point of discharge</p> <ul style="list-style-type: none"> • If a significant portion of surface water is to be infiltrated on site, provide a BRE365 infiltration assessment to prove that this will work effectively. • If discharge is to an ordinary watercourse, evidence will need to be provided to ensure that the system can accept the proposed flows to an acceptable downstream point without increasing risk to others. If the watercourse is not within the boundary of the site, evidence will be required that the developer has a right to cross 3rd party land. The drainage calculations will need to include an analysis of the effects on the drainage system if the outfall is likely to be surcharged during flooding events. • If discharge is to a surface water or combined sewer, or highways ditch or drain, letter of confirmation from the Water Company or responsible body will be required, stating their required discharge maximum rates and confirmation that there is adequate capacity in the existing system. This information is generally provided by going through the relevant water company's "Pre-Planning Service". This is a formal process that all developers are expected to go through to inform their planning applications. There is normally an associated cost for this service and a minimum timescale of 15 working days to obtain a response. The advice is then usually valid for a one year period. This process will provide assurance that there are no capacity issues with third party assets, as we as the LLFA are not able to make this type of assumption on behalf of a Water and Sewerage provider. <ul style="list-style-type: none"> - Anglian Water: http://www.anglianwater.co.uk/developers/pre-planning-service.aspx - Severn Trent Water: https://www.stwater.co.uk/developers/application-forms-and-guidance-notes/ (> application forms > Development enquiry application form) - Thames Water: https://my.thameswater.co.uk/dynamic/cps/rde/xchg/corp/hs.xsl/18710.htm 	
<p>Calculations of current runoff from site</p> <p>Calculated runoff rates for the existing site for the following rainfall events: QBAR, 3.3% (1in30), 1% (1in100) and, 1% (1in100) plus climate change. A range of rainfall events should be assessed and the critical duration rainfall event selected for each case. For greenfield sites, the methodology in the EA/Defra document "Preliminary Rainfall Runoff Management for Development (W5-074/A/TR1)" should be used as the basis for calculations. For brownfield sites, clearly state the existing impermeable area and determine the capacity of any existing drainage system.</p>	
<p>Calculations of proposed discharge from site</p> <p>All hydraulic calculations must be produced using XP Solutions Micro-Drainage software or similar approved, and should model the full drainage system. Provide a supporting explanation of methodology. Please note that it is not considered appropriate to use the Modified Rational Method for design calculations other than initial design estimates (i.e. at Outline planning) or for very simple sites (i.e. Minor developments).</p> <p>Clearly state the proposed impermeable area of the development and how this compares to the existing site. In all calculations, proposed values of impermeable area should include a 10% allowance for Urban Creep, as taken from CIRIA C753 (version 6) paragraph 24.7.2.</p> <p>Use the calculation of current runoff to decide discharge rates on the following basis:</p> <ul style="list-style-type: none"> • Greenfield sites should discharge at a maximum of the equivalent rate so that the site behaves like the original greenfield across the range of events. • Brownfield sites are strongly encouraged to discharge at the greenfield rate wherever possible. As a minimum, brownfield sites should reduce the discharge by 40% to account for the impacts of climate change, from the existing site runoff OR from the original un-surcharged pipe-full capacity of the existing system, whichever is the lowest. 	

Detail required for Full Applications	Provided?
<ul style="list-style-type: none"> • Developers have the option to limit discharge for all events to the QBAR flow rate; or install a complex discharge control which reflects the original discharge or run-off rates from the site across the range of storm events. E.g. QBAR, 3.3% (1in30), 1% (1in100), 1% (1in100) plus climate change and provide Long Term Storage for all runoff volume greater than the greenfield volume (as set out in 'Calculation of Storage Volume' below). Using complex controls is more expensive but reduces the amount of attenuation storage required on the site and is probably worth doing on larger sites. • Please note that for developments within the Borough of Corby, runoff from the site for all design events should be limited to 2l/s/ha. • It is understood that some guidance recommends minimum discharge rates of 5 l/s, to minimise use of small orifice openings that could be at risk of blockages. However, appropriate consideration of filtration features to remove suspended matter and suitable maintenance regimes should minimise this risk and therefore the minimum limit of 5l/s does not apply in Northamptonshire. • Due to the additional datasets that have been added to the Flood Estimation Handbook (FEH) since design rainfall events were developed originally in the Flood Studies Report (FSR) (NERC, 1975), rainfall depths obtained using FEH show significant differences from those obtained from FSR in some parts of the country. Within Northamptonshire, rainfall depths are often greater using more up to date FEH datasets than those using FSR, therefore for various storm events, greater run-off is produced and additional attenuation is likely to be required. As FEH rainfall data is more up to date, calculations should use FEH data for surface water drainage design, except where the critical storm duration is less than 60 minutes, as it is recognised that FEH data is less robust for short duration storms. If FEH rainfall data is not used as described above, then sensitivity testing to assess the implications of FEH rainfall must be provided. This should demonstrate that the development proposals remain safe and do not increase flood risk to third parties. • Based on the existing and proposed discharge cases calculated as above, the applicant should now have detailed calculations of storage volume required on site for the 1% (1in100) plus climate change case. 	
<p>Calculations of storage volume</p> <p>All hydraulic calculations must be produced using XP Solutions Micro-Drainage software or similar approved. Calculations of storage volume that will be required on site for the 1% (1in100) plus climate change case, bearing in mind the controlled discharge rate. Where appropriate this should specify the volumes of both attenuation storage and Long Term storage. See also note above about use of FEH rainfall data. Plans should be provided clearly identifying where this storage will be provided, and the water level within each element for the design storm events. Storage elements should be designed to empty sufficiently within 24 hours to be able to accommodate 80% of the 10% (1in10) storm runoff.</p>	
<p>Infiltration design</p> <p>Where any discharge to ground by infiltration is proposed, details of the infiltration system will be required. Full infiltration testing results are required along with a summary of the infiltration rate taken for each infiltration element. Infiltration elements should be designed to half empty within 24 hours to be able to accommodate further rainfall events.</p>	
<p>Residual Risk</p> <p>As well as the consideration of the modelled events above, there should be a qualitative examination of what would happen if any part of the system fails, demonstrate that flood water will have flow routes through the site without endangering property and where possible maintaining emergency access/egress routes.</p>	

Detail required for Full Applications	Provided?
<p>Landscaping Proposals, where relevant, for integrating the drainage system into the landscape or required publicly accessible open space and providing habitat and social enhancement.</p>	
<p>Designing for exceedence For events with a return-period in excess of 3.3% (1in30), surface flooding of open spaces such as landscaped areas or car parks is acceptable for short periods, but the layout and landscaping of the site should aim to route water away from any vulnerable property, and avoid creating hazards to access and egress routes (further guidance in CIRIA publication C635 Designing for exceedence in urban drainage - good practice). No flooding of property should occur as a result of a 1% (1in100) storm event (including an appropriate allowance for climate change). In principle, a well-designed surface water drainage system should ensure that there is little or no residual risk of property flooding occurring during events well in excess of the return-period for which the sewer system itself is designed. This is called designing for exceedence. The CIRIA publication 'Designing for exceedence in urban drainage-good practice' can be accessed via the following link: http://www.ciria.com/suds/ciria_publications.htm. If the drainage system has been designed to allow flooding on site is during the 1% (1in100) storm event (including an appropriate allowance for climate change), provide a plan clearly identifying where this flooding will occur.</p> <p>Any flooding of the site should be assessed to ascertain if is safe for the sites users. The depth and rate of flow of the flood water should be compared to Table 4 of "Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purpose" May 2008 www.sciencesearch.defra.gov.uk/Document.aspx?Document=FD2321_7400_PR.pdf.</p>	
<p>Hydraulic calculations of the full drainage system All hydraulic calculations must be produced using XP Solutions Micro-Drainage software or similar approved. All elements of the drainage system should be included in the model, with an explanation provided for any assumptions made in the modelling. 'Source control' modelling is not appropriate for a Full planning application. The model results should be provided for critical storm durations of each element of the system, and should demonstrate that all the criteria above are met and that there is no surcharging of the system for the QBAR rainfall, no flooding of the surface of the site for the 3.3% (1in30) rainfall, and flooding only in safe areas for the 1% (1in100) plus climate change. See also note above about use of FEH rainfall data.</p>	
<p>Explanation of who will maintain and fund the maintenance of the proposed system over the lifetime of the development and evidence that access will be physically possible to carry out that maintenance, without entering others land. Ideally, SuDS features should be located within public space and a maintenance manual be produced to pass to the future maintainer.</p>	
<p>Phasing Explanation of how the site will adequately consider flood risk at all stages of the development. Avoiding interim developed phases that are unprotected. Phases can only progress if adequate flood mitigation measures are in place for that particular phase. This should avoid one small phase of the site being allowed to discharge at the calculated rate for a larger part of the entire development. Adequate flood risk measures for each individual phase should be able to stand alone, (until the entire site is completed), without themselves being at flood risk and without increasing flood risk for other parties.</p>	

APPENDIX E: INFORMATION REQUIRED FOR RESERVED MATTERS APPLICATIONS

The following information should be provided for every drainage strategy submitted to the LLFA for consideration as part of any **Reserved Matters application**.

Where the requirement indicates a 1 in 100 year rainfall event this shall be increased to 1 in 200 for Upper Nene catchment.

There may be additional details required where these have been requested as a planning condition on the Outline permission.

Detail required for Reserved Matters Applications	Provided?
<p>Flood Risk Assessment/Drainage Strategy</p> <p>Please include all of the information listed in our guidance on Detail required for Full Application, as per Appendix D.</p> <p>If these details are not provided then there is a risk of drainage solutions proposed at a later stage impacting upon layout and arrangements, including landscaping.</p>	
<p>No development within 9m of any watercourse</p> <p>The detailed layout of the site should demonstrate that there is no development within 9m of the top of the bank of any ordinary watercourse, without prior consent. Access must be available to all reaches of watercourse to enable long term maintenance.</p>	
<p>Phasing</p> <p>Where this reserved matters application relates to one phase of a larger development, demonstrate that any flood risk measures required for this site will be in place prior to occupation (or other appropriate trigger), to avoid any interim developed phases that are unprotected. Phases can only progress if adequate flood mitigation measures are in place for that particular phase. Adequate flood risk measures for each individual phase should be able to stand alone, (until the entire site is completed), without themselves being at flood risk and without increasing flood risk for other parties.</p>	

APPENDIX F: INFORMATION REQUIRED FOR DISCHARGE OF STANDARD CONDITIONS

DETAILS OF SuDS DRAINAGE DESIGN

In order to discharge any condition imposed relating to the detailed design of SuDS features, the details required are likely to vary on a site-by-site basis, however we would likely expect the following:

Detail Required for Standard Detailed Design Condition	Provided?
Details (i.e. designs, diameters, invert and cover levels, gradients, dimensions, materials and so on) of all elements of the proposed drainage system, to include pipes, inspection chambers, ACO drains, storage tanks, outfalls/inlets and swales. These must be supported by calculations.	
Cross sections of the control chambers (including site specific levels mAOD) and manufacturers' hydraulic curves should be submitted for all hydrobrakes and other flow control devices.	
Full specification for any permeable paving.	
Details of the attenuation pond dimensions, to include bank levels in relation to 'normal' and design water levels and surrounding land levels, plus cross sections through any raised sections of bank. This should demonstrate that adequate attenuation storage volume has been provided above 'normal' water level, providing an appropriate residual uncertainty allowance (freeboard) between top design water level and bank level of at least 300mm or that determined as being appropriate by a qualified engineer for safety and other factors, following the Environment Agency's revised guidance at https://www.gov.uk/government/publications/accounting-for-residual-uncertainty-an-update-to-the-fluvial-freeboard-guide . The available storage volume should account for any ballast or other permanent features within the pond.	

ADOPTION AND MAINTENANCE OF SuDS FEATURES

In order to discharge any condition imposed relating to the adoption or ownership and maintenance of SuDS features, we would expect a SuDS Management Plan or Schedule setting out the following:

Detail Required for Standard Adoption and Maintenance Condition	Provided?
Details of which organisation or body will be responsible for vesting and maintenance for individual aspects of the drainage proposals (individual properties/curtilages, roads, special areas etc) with evidence that the organisation/body has agreed to such adoption. Where the agreement is subject to other legalities, it may be acceptable to provide agreement-in-principle.	
Details of which organisation or body will be the main maintaining body where the area is multifunctional (e.g. open space play areas containing SuDS) with evidence that the organisation/body has agreed to such adoption.	
A maintenance schedule setting out which assets need to be maintained, at what intervals and what method is to be used.	
A site plan including access points, maintenance access easements and outfalls. Maintenance operational areas to be identified and shown on the plans, to ensure there is room to gain access to the asset, maintain it with appropriate plant and then handle any arisings generated from the site for example by providing a silt deposit area and cut weed composting area for large ponds.	
Details of expected design life of all assets with a schedule of when replacement assets may be required.	

VERIFICATION OF INSTALLED DRAINAGE SYSTEM

In order to discharge any condition imposed relating to verification of drainage systems being installed as approved, we would expect a Verification Report to be submitted prior to occupation of the site, setting out the following:

Detail Required for Standard Verification Condition	Provided?
A report produced by a suitably qualified and competent drainage engineer. The individual or company should have suitable professional indemnity insurance and will normally be independent of the developer / contractor / subcontractor to ensure there is no conflict of interest.	
Evidence that the drainage has been installed in accordance with the approved details and that any departure from the agreed design is in keeping with the approved principles.	
As-built drawings and accompanying photos.	
Results of any performance testing undertaken as part of the application process (if required/necessary).	
Copies of any statutory approvals, such as Land Drainage Consent for discharges.	

APPENDIX G: CLIMATE CHANGE ALLOWANCES FOR RAINFALL

On 19th February 2016, the Environment Agency published new guidance on the climate change allowances that should be used in the assessment of flood risk. This guidance can be found on the GOV.UK website at <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>.

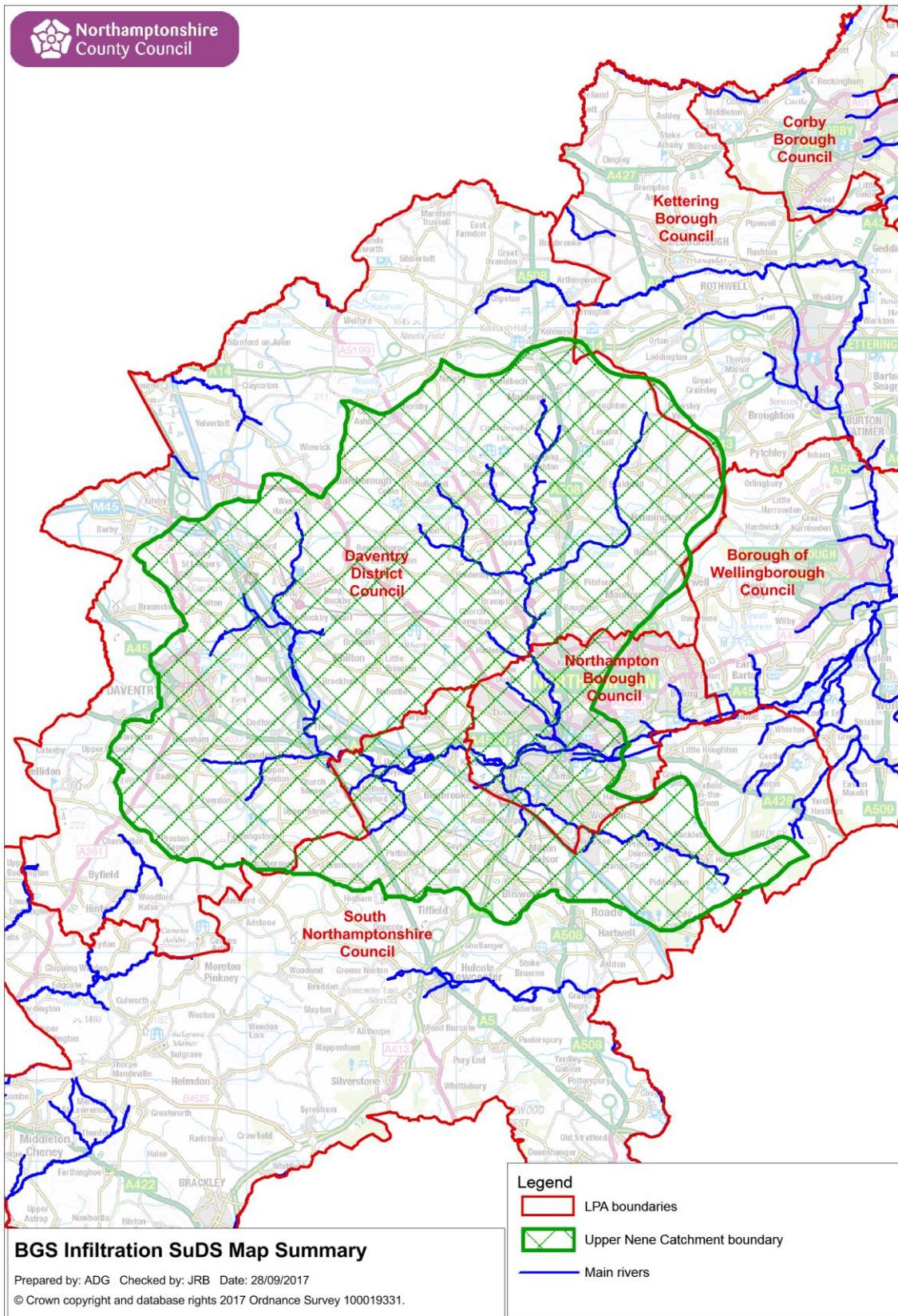
For assessment of rainfall intensity allowances, Table 2 of the guidance provides two allowances based on central and upper end predictions of climate change impacts.

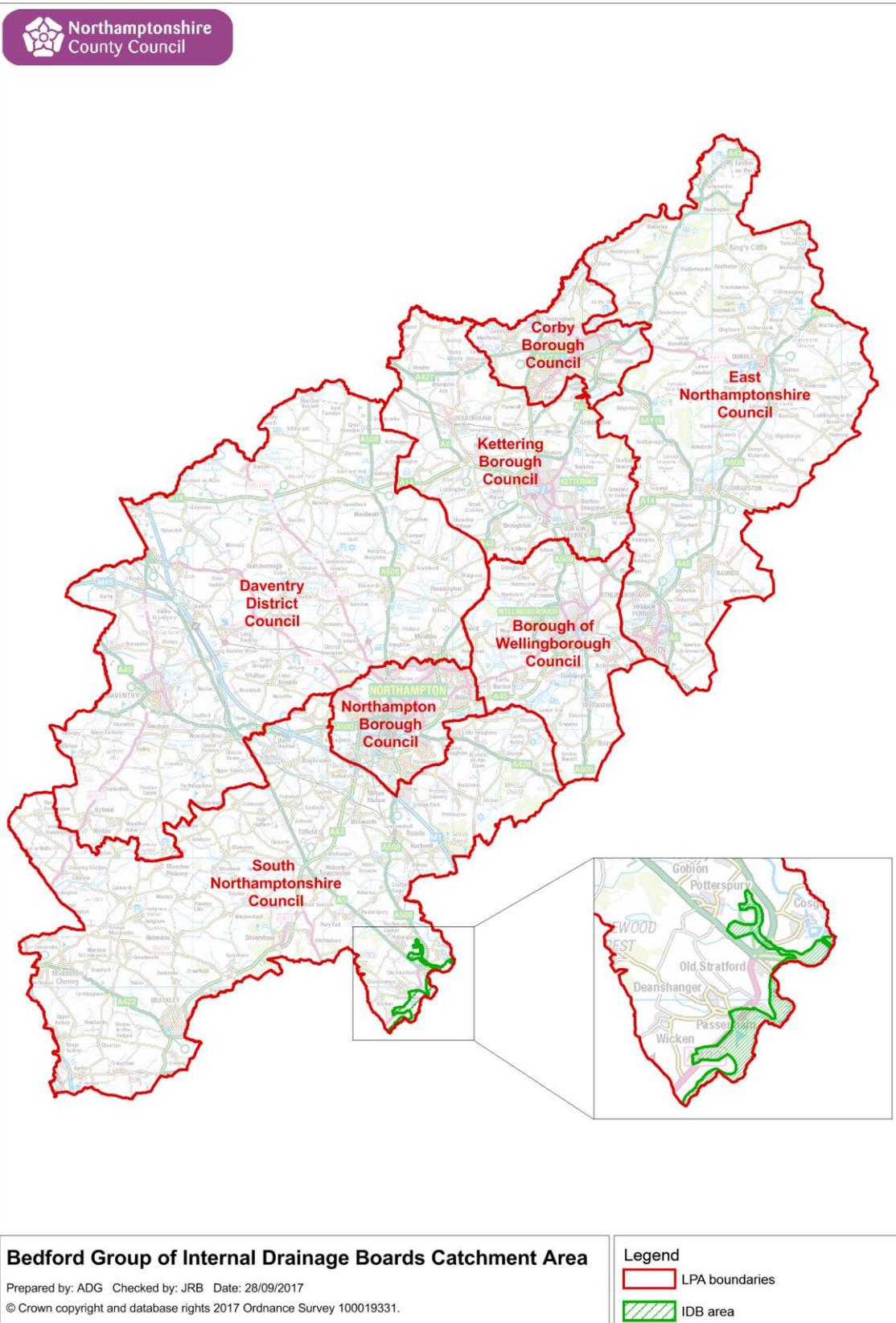
Under the new guidance, for development with a design life to 2060-2115, Northamptonshire County Council (NCC) expects that all developers should design the surface water attenuation on site to accommodate the +20% climate change allowance, and undertake a sensitivity analysis to understand the flooding implication of the +40% climate change allowance. If the implications are significant i.e. the site could flood existing development (by allowing additional flow of runoff from the site) or put people at risk (as a result of increased hazard levels within or off the site) then a view may be taken to provide more attenuation within the drainage design up towards the +40% allowance, or to provide additional mitigation, for example a higher freeboard to ensure no risk to third parties/onsite users for the +40% allowance. This will tie into existing principles for designing for exceedance. NCC may also request that the +40% allowance is accounted for on development sites which could have a direct impact on sites of known flood risk, where no other mitigation is proposed.

Transitional arrangements: The new climate change guidance needs to be considered in the FRA/drainage design for all developments submitted for planning permission on and after 19th February 2016, even if the technical work was completed in advance of this date.

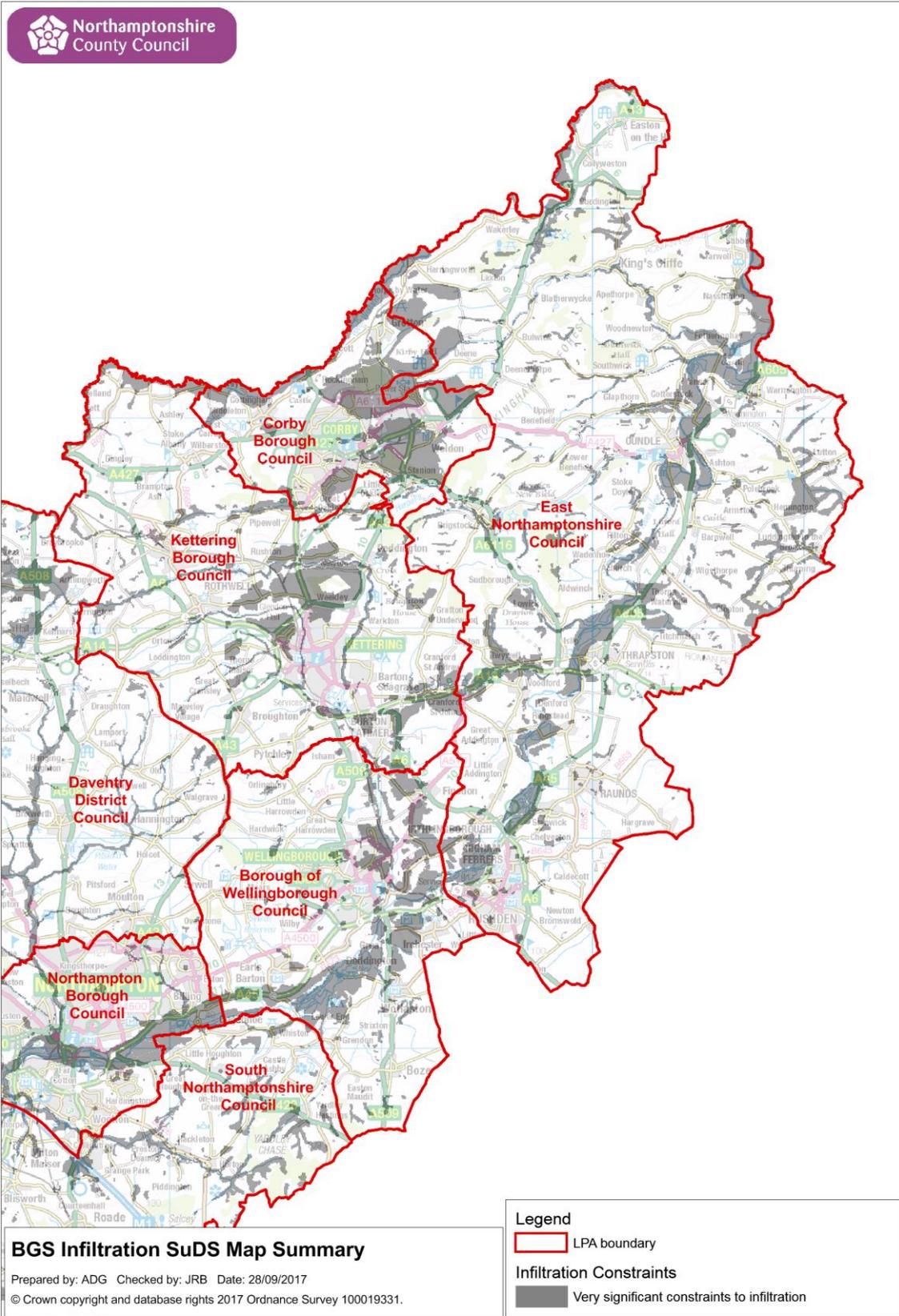
Please note that this advice only considers the surface water drainage impacts of development – for advice relating to fluvial flooding you would need to consult directly with the Environment Agency.

APPENDIX H: MAPS

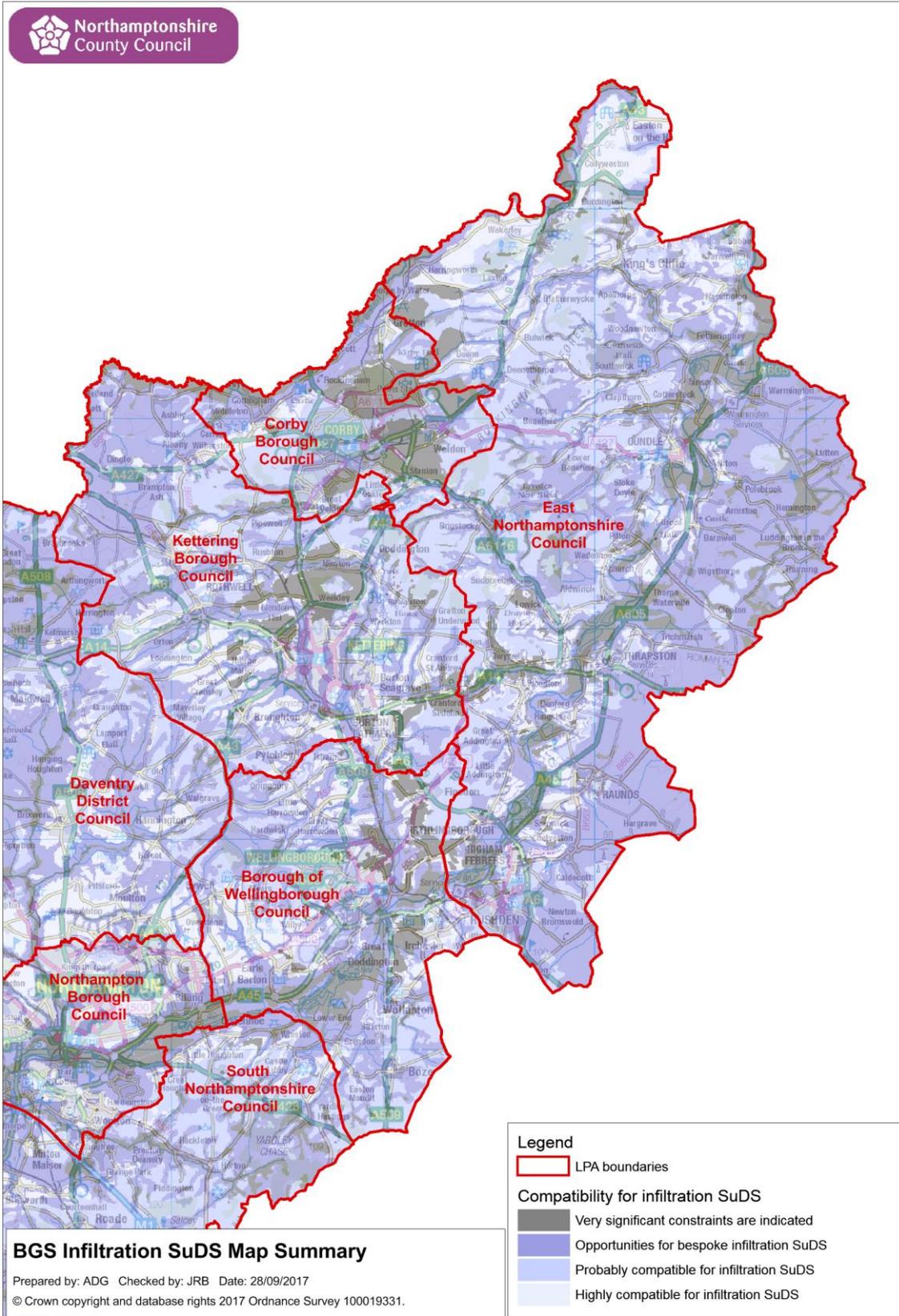








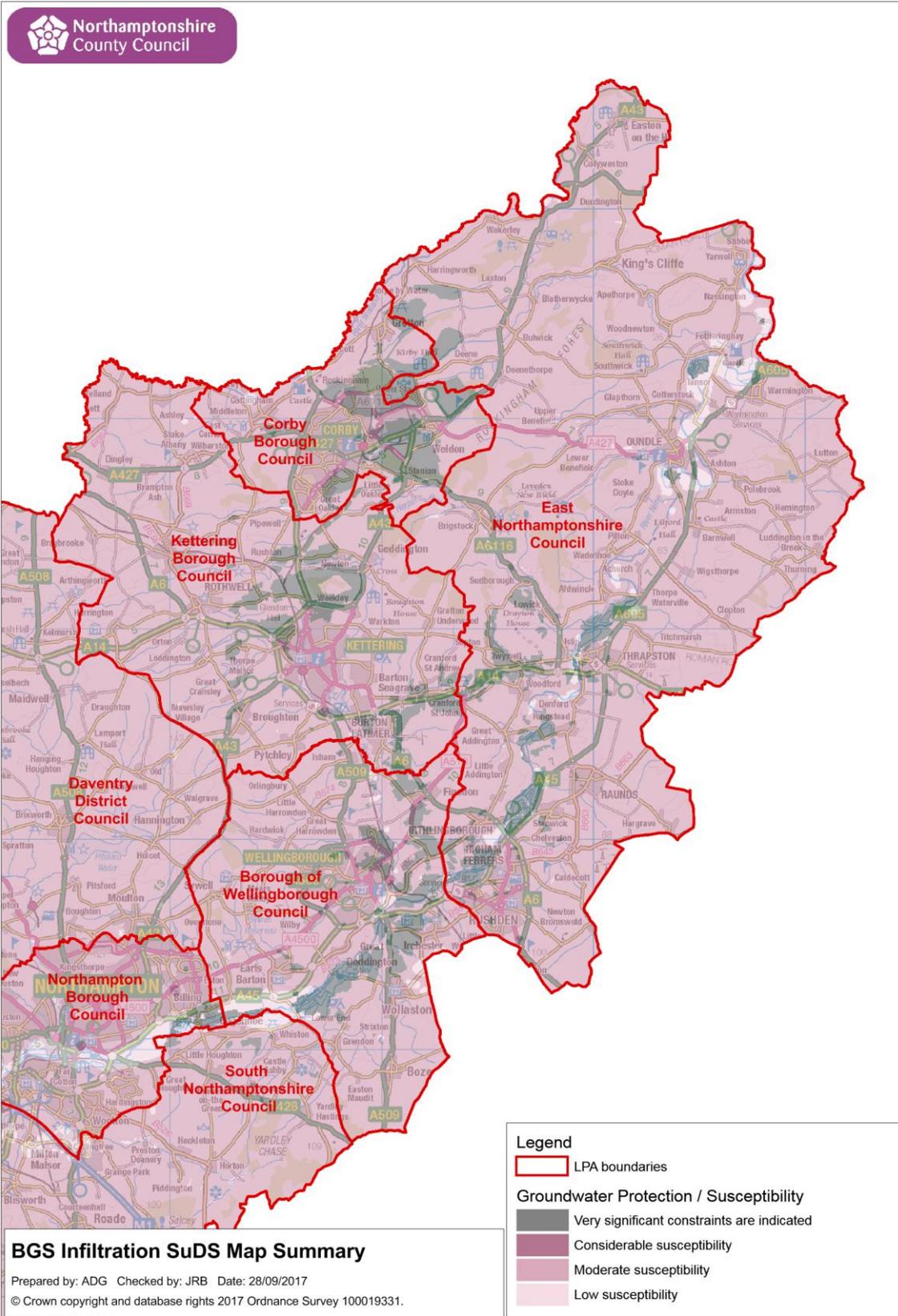












APPENDIX I: GLOSSARY

BGS – British Geological Survey

BI – Blue Infrastructure

BREEAM – Building Research Establishment Environmental Assessment Method

CAAP – Central Area Action Plan

CDM – Construction Design and Management Regulations

CFMP – Catchment Flood Management Plan

CEMP – Construction Environmental Management Plan

CESWI – Current Edition of the “Civil Engineering Specification for the Water Industry”

CIRIA – Construction Industry Research and Information Association

CRT – Canal and River Trust

Defra – Department for Environment, Food and Rural Affairs

DCLG – Department for Communities and Local Government

EA – Environment Agency

FEH – Flood Estimation Handbook

FRA – Flood Risk Assessment

FRMP – Flood Risk Management Plan

FSR – Flood Studies Report

FWMA – Flood and Water Management Act 2010

GI – Green Infrastructure

GIS – Geographical Information System

HE – Highways England

IDB – Internal Drainage Board

JCS – Joint Core Strategy

JPU – Joint Planning Unit

LFRMS – Local Flood Risk Management Strategy

LLFA – Lead Local Flood Authority

LPA – Local Planning Authority

NCC – Northamptonshire County Council

NPPF – National Planning Policy Framework 2012

RBMP – River Basin Management Plan

SDDC – Sustainable Drainage Design Code

SFRA – Strategic Flood Risk Assessment

SHW – Manual of Contract Documents for Highway Works Volume 1 Specification for Highway Works

SuDS – Sustainable Drainage Systems

SWMP – Surface Water Management Plan

WCS – Water Cycle Strategy

WFD – Water Framework Directive

APPENDIX J: ACKNOWLEDGEMENTS

Northamptonshire County Council acknowledges the support and assistance of the following authorities, organisations and companies (listed alphabetically):-

- Anglian Water Services;
- Bedford Group of Drainage Boards;
- Borough Council of Wellingborough;
- Canal & River Trust;
- Corby Borough Council;
- Daventry District Council;
- East Northamptonshire Council;
- Environment Agency;
- Highways England
- Kettering Borough Council
- Lancashire County Council, (for some pictures and figures);
- Northampton Borough Council;
- Northamptonshire County Council as Local Highways Authority;
- Severn Trent Water;
- South Northamptonshire Council; and
- Thames Water.

Northamptonshire County Council would also like to thank the Midlands Service Improvement Group, (MSIG), a collective of local authorities from the Midlands Region sharing best practice and experience, for their advice and support.





Local Standards and Guidance for Surface Water Drainage in Northamptonshire
(v1.3 August 2016 (Updated September 2017))

Northamptonshire County Council
One Angel Square
4 Angel Street
Northampton
Northamptonshire
NN1 1ED