Sustainable Drainage Systems and Flood Risk Assessment

Local Guidance

Date: 05/02/2025

Revision History

Revision Ref	Amendments	Issued to:
Version 1, 16/07/2015		Publication
Version 2, 18/01/2016	3.5 Amendment to brownfield site requirement.	Publication
Version 3, 05/02/2025	Updated to align with GM Places For Everyone Policies	Publication

Bolton Council Sustainable Drainage Systems Local Guidance

Contents

1. Introduction

From 6th April 2015 local planning policies and decisions on planning applications relating to major development (developments of 10 dwellings or more; or equivalent non-residential or mixed development [as defined in Article 2(1) of the Town and Country Planning (Development Management Procedure) (England) Order 2010] will ensure that sustainable drainage systems for the management of run-off are put in place, unless demonstrated to be inappropriate.

Ministerial Statement

A Ministerial Statement directing Planning Authorities on Sustainable Drainage Systems (SuDS) was made on 18th December 2014. [1]

The statement is to be read in conjunction with the policies in the National Planning Policy Framework (NPPF); a Planning Practice Guide [2] is available that supports the NPPF.

This guidance note aims to provide direction to drainage designers for the successful implementation of SuDS and is the basis against which planning consultations from the Local Planning Authority (LPA) will be assessed.

2. Sustainable Drainage Strategy

There are local planning policies in place that require SuDs systems to be in place in addition to national policies. You need to include a sustainable drainage strategy if your application is for:

- major development with surface water drainage
- development with surface water drainage in an area at risk of flooding such as flood zones 2 or 3, or at risk of surface water flooding
- all proposals for 5 or more residential units or creating 500 square metres or more non-residential floorspace (*Policy CG2.2(c), Bolton's Core Strategy*)

The LPA will determine the application in accordance with national and local policies whilst taking into account advice on technical matters from the Lead Local Flood Authority (LLFA).

The LPA will need to be satisfied that:

- any proposals meet national and local policies
- any proposals clearly identify who will be responsible for maintaining the sustainable drainage systems; and there are clear arrangements in place for on-going maintenance over the lifetime of the development
- any proposals set out a minimum standard to which the sustainable drainage systems must be maintained

What is expected from the developer?

- Complete the SuDS Proforma when submitting your application, applications submitted without a proforma will not be validated.

[1] https://questions-statements.parliament.uk/written-statements/detail/2014-12-18/HCWS161

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

- You should make reference to the government guidance "Flood risk assessments: applying for planning permission" this states all information you need to include

- Ensure that any submission has been designed in accordance with the national SuDS guidance [3] , our Local Flood Risk Management Strategy (LFRMS) [4] and the Greater Manchester Places for Everyone Joint Development Plan (see Policy JP-S4: Flood Risk and the Water Environment) [5].

- Use "*Planning for SuDS – making it happen*" CIRIA C687 to guide the planning of the site.

- Consider how to manage the rate of surface water run-off so that it is similar to the conditions of a greenfield site. Also consider the effect this run-off will have on any receiving ground or watercourse.

- Use the "*Code of Practice for Surface Water Management for Development Sites*" BS8582:2013, in developing a drainage strategy for the site.

- Supply a plan or model of the topography of the development showing existing and proposed levels and areas of cut or fill within the development. Existing areas of flooding risk within the site need to be shown to be managed within the site and not displaced onto adjacent land.

- Speak to the LLFA team about the surface water drainage proposals for the site.

- When carrying out the detailed SuDS design, use "*The SuDS Manual*" CIRIA C753 to inform the choice for the development of SuDS components, maintenance, etc.

- Demonstrate in the Flood Risk Assessment (FRA) that surface water will not cause flooding to property on-site or off-site as a result of the proposed development. A simple assessment of surface water flood risk is available on the government website https://www.gov.uk/check-long-term-flood-risk

- Whilst constructing the site, protect adjoining areas from flooding.

- Consider the timetable for construction. Where permeable surfaces are installed, ensure they are not blocked with silt from site activities.

- With regard to planting within SuDS, careful and early consideration of design issues, and the provision of adequate landscape information is needed. In assessing the landscape implications of the application, the site context, proposed layout, future uses and maintenance all need to be taken into account. Larger or more complex sites may require a greater involvement of landscape specialists.

- Ensure there is an adequate management and maintenance system in place to ensure operation of the drainage system.

- Sites where SuDS are deemed by the developer to be inappropriate will need to be supported by a detailed viability report including costings showing why SuDS is inappropriate for the site.

[3] https://www.gov.uk/government/publications/sustainable-drainage-systems-non-statutory-technical-standards

[4] http://www.bolton.gov.uk/website/pages/Flooddefenceandwatercoursemanagement.aspx

[5] Places for Everyone Joint Development Plan Document (greatermanchester-ca.gov.uk)

- Submit details of existing assets within the site including private drainage, public sewers and watercourses. Details of our land drainage records can be obtained by email at floodrisk@bolton.gov.uk

- Submit drainage plans to show clearly how surface water runoff will be conveyed to the suds, any storage tanks, flow controls and any connections to the sewer system

- Submit records of consultation and agreements with other bodies, such as United Utilities, Environment Agency, landowners etc.

The Suds Proforma is available on request by emailing floodrisk@bolton.gov.uk

3. Flood Risk Assessment

As a planning applicant, you may need to carry out a flood risk assessment (FRA) for your proposed development site. Your application may be refused if you do not include a FRA or if it is not satisfactory.

You will need to follow the government guidance on Flood Risk Assessments.

You need to do a FRA for development (including minor development and changes of use) proposed:

- in flood zones 2, 3 or 3b
- within flood zone 1 with a site area of 1 hectare or more
- in areas with critical drainage problems
- within flood zone 1 where the LPA's strategic flood risk assessment (SFRA) shows it will be at increased risk of flooding during its lifetime
- that increases the vulnerability classification and may be subject to sources of flooding other than rivers.

No areas in Bolton have been identified as being an area with critical drainage problems.

You can get information on a what floodzone a site is located at the Get flood risk information for planning in England website.

The FRA needs to consider whether the development will be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk).

Many sites will have a risk of flooding from surface water, you can check the risk at the governments long-term flood risk website. A FRA may be required if your development site at risk of flooding from surface water, groundwater or reservoirs, please contact the LLFA who can advise you on this.

It is important that you consider the surface water risk at a development site. You should be able to identify from the risk maps whether there is a surface water flow route through the site. If this is the case, you will need to examine the site carefully and present details on how the risk from overland flow into the site is to be managed within the development.

If you are required to undertake a FRA, guidance on the objectives of an assessment are to be found in the NPPF planning practice guidance in the site-specific flood risk assessment section.

When a flood warning and evacuation emergency plan is required to keep the development safe, we ask that the Emergency Plan complies with the checklist at the end of the ADEPT document "Flood Risk Emergency Plans for New Development". Emergency Plans are approved by the LPA following consultation with the Greater Manchester Civil Contingencies and Resilience Unit, plans should be submitted to the LPA for approval.

4. Suds Design Principles

4.1 Key Principles

Four key principles to be followed are:

1. Ensure that people, property and critical infrastructure are protected from flooding.
2. Ensure that the development does not exacerbate flood risk off site.
3. Ensure runoff is stored and released slowly.
4. Ensure that resources are secured to maintain the SuD for the lifetime of the development.

4.2 The SuDS Management Train

A useful concept used in the development of sustainable drainage systems is the SuDS management train (sometimes referred to as the treatment train). As in a natural catchment, drainage techniques can be used in series to change the flow and quality characteristics of the runoff in stages.

The hierarchy of techniques to be used is:

1. Prevention - Prevention of runoff by good site design and reduction of impermeable areas.
2. Source Control - Dealing with water where and when it falls (e.g. infiltration techniques).
3. Site Control - Management of water in the local area (e.g. swales, detention basins).
4. Regional Control - Management of runoff from sites (e.g. balancing ponds, wetlands).

Developers should demonstrate how they have considered and used these techniques.

4.3 Runoff Destinations

Surface water runoff not collected for use must aim to be discharged as high up the following hierarchy as possible:

1. into the ground (infiltration).
2. to a surface water body.
3. to a surface water sewer, highway drain or other drain.
4. to combined sewer.

4.4 Flood Risk within the Development

The drainage system must be designed so that, unless an area is designed to hold and/or convey water, flooding does not occur on any part of the site for a 1 in 30 year rainfall event.[6]

[6] Sustainable drainage systems: non-statutory technical standards - GOV.UK (www.gov.uk)

The drainage system must be designed so that, unless an area is designed to hold and/or convey water, 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.

The topographical design of the site must ensure that flows resulting from rainfall in excess of a 1 in 100 year rainfall event are managed using exceedance routes that avoid risk to people and property on and off the development site.

4.5 Greenfield Runoff Rates

The Greater Manchester Joint Development Plan "Places for Everyone" contains the policy JP-S4 Flood Risk and the Water Environment. It states:

"*Expecting developments to manage surface water runoff through sustainable drainage systems and as close to source as possible. Development should achieve greenfield run-off rates unless it is demonstrated to be impracticable. District local plans should consider setting more detailed surface water drainage policies to reflect local circumstances, including alternative surface water discharge rates, such as in areas with critical drainage issues*". This policy took effect on 21st March 2024.

For development sites where infiltration is not viable, the LLFA expects to see that the discharge rates 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. If this is not the case, then evidence is to be provided explaining why.

The greenfield runoff rates provided should be accompanied by their calculations in order to understand if it has been calculated with the correct inputs. It should also be shown that the discharge location is in line with the drainage hierarchy and that the necessary permissions have been granted.

4.6 Calculating Runoff Rates

Runoff rates should be calculated based on the full development site area but not including any areas of open space that will not be draining via the proposed SuDS. The area used to calculate the greenfield run off rate should equal the total area included in your hydraulic model.

The LLFA preference is that greenfield runoff rates should be calculated using the following rainfall data: FSR and FEH, and should be calculated using the IH124 method. Alternatively, the ICP SuDS method can be used which is the IH124 with sites below 50ha having a pro rata applied. These methods should be adjusted as appropriate to site conditions. Calculations of greenfield rates can use a range of calculation methods, as rates and storage requirements will vary depending on different storm criteria it should be demonstrated that the method selected is the most conservative of the options available.

4.7 Flow Controls

Historically, minimum discharge rates have been limited to 5 l/s due to the risk of blockage of flow controls with a small orifice size. However, through the use of appropriate design such as filters, check dams, trash screens, and sufficient upstream treatment, orifice sizes can be small in diameter without causing an unacceptable risk of blockage.

If all surface water first goes through features like permeable/porous paving then the majority of pollution and debris will be prevented from reaching the flow control, therefore the risk of blockage of orifices will be small even for low flow rates.

In designs where debris can enter the control (e.g., where the upstream system is open swales or where the inlets are gullies), exposed orifices with diameters similar to tennis balls and soft drinks cans (66 mm) are vulnerable to blockage. Static controls should have adequate protection upstream so as to prevent the passage of debris of a size likely to cause blockage.

4.8 Peak Discharge and Long-Term Storage – Volume Control

Volume control shall comply with the requirements of S4, S5 and S6 of the National Non-statutory technical standards for sustainable drainage systems [7].

Additional runoff volumes from development can cause increases in flood risk downstream of the site even where peak flows from the site are controlled to greenfield rates.

Therefore, for extreme events, in addition to the standard for controlling the peak rate runoff; there is also a standard that requires runoff volume control for the 1 in 100 year, six hour event. The difference in runoff volume pre and post-development for the 100 year six hour event, (the additional runoff generated) should be disposed of by way of infiltration, or if this is not feasible due to soil type, discharged from the site at flow rates below 2 l/s/ha.

There are two approaches which are set out in section 24.10 of CIRIA Suds Manual - Designing for Long-Term Storage, the variable control method and the Qbar method.

The alternative approach (Qbar Method) to managing the extra run off volume from extreme events separately from the main drainage system is to release all runoff (above the 1 in 1 year event) from the site at a maximum rate of 2l/s/ha or Q_{bar} (greenfield mean annual flood) whichever is the highest value can be used.

4.9 Water Quality Management

SuDS design must ensure that the quality of any receiving water body is not adversely affected and is preferably enhanced. The current status of waterbodies and groundwater and the local objectives of the River Basin Management Plan will be considered when assessing applications.

A sustainable drainage strategy should include an assessment of the hazard posed by the land use activities at the development site and how they are mitigated, as detailed in the SUDS manual Chapter 26. The type of assessment must be appropriate to the site but as a minimum all sites must submit the simple index approach presented in Section 26.7.1 of the Suds Manual.

Resources
Paragraph 180 : NPPF National Planning Policy Framework
CIRIA C753 The SuDS Manual
The Environment Agency's approach to groundwater protection. Environment Agency 2018

[7] https://www.gov.uk/government/publications/sustainable-drainage-systems-non-statutory-technical-standards

4.10 Designing for Exceedance

It must be demonstrated that the site design is such that when SuDS features fail or their design is exceeded, flooding from the site is managed in exceedance routes that do not cause flooding of properties on or off site. This is achieved by designing suitable overland exceedance routes or flood pathways.

Resources
CIRIA C635 - Designing for Exceedance in Urban drainage - Good Practice

4.11 Climate Change

An allowance for rainfall intensities changing due to climate change has to be incorporated into storage capacities.

In May 2022, the Government updated it's 'Flood risk assessments; climate change allowances' document. This guidance provides updated climate change figures which should be used for flood risk assessments and drainage strategies to help minimise vulnerability and provide resilience to flooding and coastal change in the future. Within is an update on the Peak Rainfall Intensity Allowance in small and urban catchments.

The designer will need to refer to the Government's guidance and the peak rainfall allowances maps.

The Bolton Council area spans three separate river catchments; the Irwell, Douglas and Lower Mersey, please ensure that choose the correct catchment for your site.

The allowance you should use is dependent on the anticipated lifetime of the development; use the development lifetime guidance to work out the lifetime of your development.

Resources
NPPF guidance Paragraph: 006

4.12 Urban Creep

Urban Creep describes future urban expansion within a development and activities such as building extensions and paving gardens. These activities increase the impermeable area of a site and often sit outside of the development control process. As such proposed developments must have an allowance for this increase in impermeable area of 10%.

Resources

BS8582:2013 Code of Practice for Surface Water Management for Development Sites - Section 8.

4.13 Highway Drainage

SuDS features constructed specifically to drain highways can be adopted by Bolton Council (as Highway Authority) and maintained as part of the wider highways network subject to an agreement with the Highway Authority. For discussions on the adoption of highway drainage contact our highways department at Highways @bolton.gov.uk

The incorporation of SuDS that involves highway drainage requires the developer either to enter into an agreement under Section 38 of the Highways Act, if involving new development, or an agreement under Section 278 of the Act, if existing highway arrangements are to be modified. A commuted sum may be payable and calculated using the ADEPT Guidance.

TfGM have a Streets for All Strategy this is a people-centred approach to street planning, design and network management. The strategy is supported by a design guide which promotes the use of rain gardens and SuDS enabled street trees as a nature-based drainage solution. The design and construction of adoptable highways may have to comply with this strategy.

5. SuDS Component Design

5.1 SuDS Components

The *SuDS Manual* (CIRIA publication C753) can guide the design process and includes calculations to ensure that sustainable drainage principles have been applied.

5.2 Water Butts and Rainwater Harvesting Systems

Any attenuation provided by water butts or rainwater harvesting systems shall not to be taken into account when calculating site runoff rates or flood storage volumes.

5.3 Infiltration

If infiltration is proposed as a means of disposal of surface water it must be demonstrated prior to approval that the soil on the development site is suitable for this purpose by undertaking an infiltration test in accordance with BRE Digest 365 Soakaway Design and the infiltration testing methods found in chapter 25.3 of the CIRIA SuDS Manual C753. This should include the locations and results. The lowest found rate should be used as a conservative approach.

The minimum acceptable rate of infiltration is $1x10^{-6}$ m/s. Rates found to be slower than this may potentially have to deliver a hybrid drainage solution. If rates are found to be too slow for formal infiltration this does not rule out the possibility of some soakage taking place.

Resources
BRE Digest 365 Soakaway Design. [8]

5.4 Geocellular/Modular Systems

Geocellular or modular attenuation systems are not to be constructed under adoptable carriageways unless approved beforehand by the Highway Authority.

5.5 Conventional Drainage Pipes, Subsurface Drainage and Storage

To be constructed in accordance with the latest version of *Sewerage Sector Guidance* produced by Water UK.

[8] http://www.brebookshop.com/index.jsp

5.6 Silt Removal Devices

Silt removal devices shall be constructed so they are easily accessible by maintenance vehicles.

5.7 Separators/Interceptors

Surface water may be contaminated by oil at a number of different sites. It is good practice that at these sites need to have measures in place to prevent this oil from polluting the environment. These sites include:

- car parks typically larger than 800m2 in area or for 50 or more car parking spaces
- smaller car parks discharging to a sensitive environment
- areas where goods vehicles are parked or manoeuvred
- vehicle maintenance areas
- roads
- industrial sites where oil is stored or used
- refuelling facilities
- any other site with a risk of oil contamination.

Trapped gully pots can provide adequate protection for car parks that are too small to justify the installation of a separator, but they must be properly maintained.

In some instances, you may not require an oil separator if there is a sufficient SuDS treatment train in place (see section 4.2 above). We encourage car park drainage design that discharges to a swale prior to entering a formal drainage system.

Resources

BS EN 858-2: Separator systems for light liquids (e.g. oil and petrol).

5.8 Pumping Stations

Pumping Stations are not considered to be an appropriate or sustainable means of surface water disposal. Surface water pumping stations that accept flows from 'open SuDS' must be suitably protected from blockage, which can be provided by use of an upstream SuDS management train of features and by screening debris prior discharge to the wet well. The pumping rate shall be the greenfield run off rate, as there is little risk of blockage the historic minimum discharge rate of 5 l/s does not apply to pumped flows; pumped flow shall discharge at the 1 in 1 year greenfield run off rate.

6. Construction

Damage caused during the construction phase has the potential to prevent SuDS functioning as required, for example, by contamination with sediments generated during construction. As such appropriate planning must take place during the construction phase.

Resources

BS8582:2013 Code of Practice for Surface Water Management for Development Sites
C698 Site handbook for the construction of SUDS [9]

[9] www.susdrain.org/resources/ciria-guidance.html

7. Maintenance

We will need to be satisfied that the minimum standards of operation are appropriate, that SuDs are completed to standard and that there are clear arrangements in place for ongoing maintenance over the lifetime of the development.

Maintenance requirements for proposed SuDS are to be agreed with the Local Planning Authority.

If the developer intends to maintain the SuDS, the following is required:

a) If constructed, a copy of a maintenance and operation manual for single property SuDS must be supplied to the relevant residents.

b) A whole life cycle plan for the SuDS (i.e. the surface water management for the whole site) to include when elements will require major maintenance or replacement.

c) Details of the organisation responsible for the ongoing maintenance of the SuDS for the lifetime of the development.

d) Details of the funding arrangements for SuDS maintenance. It must be demonstrated how the ongoing maintenance of the SuDS for the lifetime of the development will be funded.

To ensure performance of the system remains as per the agreed design and to ensure the performance of the system is not impacted by future alterations, some features such as flow controls may be designated by the LLFA as flood risk assets under the Flood and Water Management Act 2010.

In certain circumstances you may be required to enter a Unilateral Undertaking with the authority agreeing the maintenance of the SUDS system.

8. Application Information Requirements

The level of information which would need to be submitted for each type of application or stage within the planning process will vary depending on the size of the development, flood risk, constraints, and the proposed sustainable drainage system. Typical information that should be provided is shown in the table below:

Table 1: Planning Application information requirements

Pre-App	Outline	Full	Reserved	Discharge	Document Required
√	√	√			Is this a Phased Development? (Y/N)
√	√	√			Flood Risk Assessment/statement
√	√	√			Drainage strategy/statement and sketch layout plan
	√				Preliminary layout drawings
	√				Preliminary "Outline" hydraulic calculations
	√				Preliminary landscape proposals
	√				Ground investigation report (for infiltration)
	√	√			Evidence of third-party agreement for discharge to their system (in principle/consent to discharge)
		√	√	√	Maintenance program and on-going maintenance responsibilities
		√	√		Detailed development layout
		√	√	√	Detailed flood and drainage design drawings
		√	√	√	Detailed hydraulic design calculations.
		√	√	√	Geotechnical investigations, geotechnical factual and interpretive reports, including infiltration results
		√	√	√	Detailed landscaping details

8.1 Pre-application Discussion

The LPA can engage in direct pre-application discussion with developers, or as part of a multi-disciplinary team including the LLFA. The importance of early discussions cannot be over-emphasized. Should you require a discussion with the LLFA you can request pre-application advice by completing an on-line form on the Bolton council website.

8.2 Outline Planning Application

The following information should be presented in the form of a drainage strategy to enable determination of the application:

a) the technical design criteria used for the development site(s) based upon the national SuDS guidance.

b) any constraints which affect the proposed development, for example, physical restrictions, land contamination, statutory undertakers plant, habitat and species etc.

c) details of any existing land drainage, private drainage and public sewers.

d) topographical survey of the site, including levels and sections of any adjacent watercourses for an appropriate distance upstream and downstream of discharge point.

e) Supply a plan or model of the topography of the development showing existing and proposed levels and areas of cut or fill within the development. Existing areas of flooding risk within the site need to be shown to be managed within the site and not displaced onto adjacent land.

f) proposed approach in the drainage design to deal with flood risk, water quality, conveyance, storage, exceedance routes and multi-functional use of drainage ‘space’ to meet community and environmental requirements.

g) details of any off-site works required.

h) identification of discharge points or receptors i.e. to ground, watercourse or sewer.

i) Approval in principle from water company or NAV (if appropriate)

j) evidence of infiltration capacity at the site and suitability of infiltration drainage.

k) proposed design calculations for peak flow, volume control and greenfield runoff. Based upon the national SuDS guidance showing pre-development and post-development runoff rates, critical storm duration and associated storage estimates with indicative impermeable areas.

l) inclusion of climate change and future development allowances.

m) proposed management of any surface water flows through the site.

The minimum data requirements for a submission is summarised in Appendix A.

For larger sites with a Masterplan (in addition to the drainage strategy information) additional information should include:

a) details of phasing;
b) individual plot discharge and storage constraints;
c) who would be responsible for construction, maintenance and adoption of the regional and/ or linking components of the drainage system;
d) who would be responsible for controlling the overall surface water management of the site;

Due to the nature of outline planning applications and whether or not certain aspects of the proposed development are reserved, the amount of information which would be contained within the drainage strategy (set out above) should be considered to be a minimum.

If the drainage of the site is not reserved (and the layout and landscape design are also not reserved) then the drainage strategy should be more detailed as set out below. It is likely that an outline planning permission will have a pre-commencement condition(s) attached requiring the submission of more detailed drainage information which must be approved before the development can commence.

8.3 Full Planning Application, (or reserved matters application if applicable) or Discharge of Conditions

Detailed design

If a reserved matters application is being made, the submission on the detailed design and layout of the sustainable drainage system should update and enhance the drainage strategy, taking into account the advice from the LLFA team and stakeholder inputs, and be submitted as a detailed drainage strategy.

If a full planning application is being made then the submission should be a combination of the information required for an outline application drainage strategy and the following information, to produce a detailed drainage strategy:

a) Final design calculations to demonstrate conformity with the design criteria for the site for peak flow, volume control and greenfield runoff. Based upon the national SuDS guidance showing pre-development and post-development runoff rates, critical storm duration and associated storage estimates to determine the scale (and associated land take) of conveyance and storage structures.

b) The design shall consider the whole of the site including how run-off from permeable areas is managed and controlled.

c) Supply the hydraulic design software model for verification purposes.

d) Plans of the existing and proposed site including existing and proposed sections and spot heights. Supply a plan or model of the topography of the development showing existing and proposed levels and areas of cut or fill within the development. Existing areas of flooding risk within the site need to be shown to be managed within the site and not displaced onto adjacent land.

e) Long-sections and cross-sections for the proposed drainage system.

f) Plan of the proposed SuDS with sub-catchment areas showing permeable and impermeable areas, and clearly marked showing the total of those areas in square meters.

g) Location details of connections to watercourses and sewers.

h) Location, type and design details of flow controls.

i) Details of SuDs source control features or proprietary products that have been incorporated to improve water quality.

j) Operational characteristics of any mechanical features including maintenance and energy requirements.

k) Plan to demonstrate flooded areas for the 1 in 100 year storm when system is at capacity and demonstrating flow paths for design exceedance, the plan shall include proposed spot heights at a suitable interval for the whole site.

l) Access arrangements for all proposed SuDS.

m) Management plan for all drainage, including the locations of features requiring inspection and recommended inspection frequencies.

n) Landscape planting scheme - if proposing vegetated SuDS.

o) Plan for management of construction impacts including any diversions, erosion control, phasing and maintenance period.

p) the clear arrangements to be put in place for on-going maintenance over the lifetime of the development.

The minimum data requirements for a submission is summarised in Appendix A.

The local planning authority will determine the application in accordance with national and local policies whilst taking into account advice on technical matters from the LLFA.

Due to the nature of full or reserved matters planning applications certain aspects of the proposed development may not be fully developed at the time of submission. The amount of information which would be contained within the detailed drainage strategy (set out above) should be considered to be a minimum.

If the applicant has not fully detailed the drainage design, it is likely that the planning permission will have a pre-commencement condition(s) attached requiring the submission of more detailed drainage information which must be approved before the development can commence.

Appendix A - Design Criteria and Minimum Data Submission Requirements

The purpose of this document is to assist developers to comply with the Council's requirements in relation to flood risk assessment for new developments.

Notes for Guidance

Hydraulic modelling global variables, simulation criteria & Outputs

1. For Bolton, typical global variables are:

    - M5_60 = 19.0mm
    - Ratio r = 0.3
    - Cv (Summer) = 0.75
    - Cv (Winter) = 0.84

2. The following return period storms should be analysed with the durations listed.

    - Return period (1 in x): 1, 2, 30, & 100 (both summer and winter storms)
    - Storm durations (mins): 15, 30, 60, 120, 180, 360, 1440, 2160, 2880, 4320, 5760, 7200, 8640 & 10080.

    The appropriate allowance for climate change should be included in the above return periods.

3. The following outputs / reports are required:

    - Network Details
    - Hydraulic section Table
    - Manhole schedule
    - Pipeline schedule
    - Outfall Details
    - Simulation Details
    - Online / Offline controls
    - Summary of results – Critical by all Return Periods, ranked by Maximum Level
    - Digital copy of hydraulic model

The table below outlines the minimum information required together with the preferred format.

Data to be Submitted on the Proposed Development

Requirement	Format	Comments
A summary of green field run-off rates for return periods up to 1 in 100 years.	PDF of calculation sheet or a table of results including a description of how the values were calculated or the tool used.	
Calculation of Qbar.		Summary output from hydraulic modelling package or a description of how the value was calculated.
If infiltration is proposed Compliance with Building Regulations H3.		Demonstrate that an infiltration check has been carried out. Provide report to BRE365
Schematic layout plan with all pipes, manholes and ancillary features clearly numbered or referenced to the hydraulic model. Pipe diameters and levels should be included.	AutoCad GIS PDF	
The total permeable & impermeable area of the whole development (Ha)	To be shown on schematic layout.	Impermeable areas to be clearly defined and showing their areas in sq metres.
If Microdrainage, InfoDrainage or Causeway design software has been used, a copy of the simulation file.	Microdrainage MDX, InfoDrainage IDDX or Causeway pfd file	
If an alternative hydraulic modelling package has been used, a summary sheet of the global variables used.	PDF	
Evidence that the developed run off rate will not exceed green field rates for storm events up to 1 in 100 years.	Summary output from hydraulic modelling package.	
Evidence that the difference between the volume of run-off during a 1 in 100 year, 6 hour event before and after development can be retained in site.	Summary output from hydraulic modelling package.	
Evidence the proposed drainage design will not result in surcharging for 1 in 1 year return period storms.	Summary output from hydraulic modelling package.	

Requirement	Format	Comments
Evidence the proposed drainage design will not result in site flooding for 1 in 30 year (plus climate change) return period storms.	Summary output from hydraulic modelling package	
Evidence that no property will suffer flooding for 1 in 100 year return (plus climate change) period storms.	Summary output from hydraulic modelling package.	
Evidence that up to 1 in 100 year (plus climate change) flooding can be stored within the boundary of the site.	Summary output from hydraulic modelling package and relevant drawing(s).	
The total volume of attenuation that will be provided both above ground and below ground and the location of both within the site. For above ground storage, provide details of finished ground & floor levels and demonstrate flood pathways to storage areas.	Summary output from hydraulic modelling package and relevant drawing(s).	
An indication of the likely path for flood flows within and from the site during storm events in excess of 1 in 100 years. This should include flows from adjacent the site that may transit through the site	Summary output from hydraulic modelling package and relevant drawing(s).	

Appendix B : Information Resources

Policy & Guidance

DCLG Ministerial Statement on SuDS policy

The National Planning Policy Framework and planning practice guidance

Non-statutory technical standards for SuDS

LASOO Non-statutory technical standards for SuDS: Practice guidance

WaterUK Sewerage Sector Design and Construction Guidance

Places for Everyone Joint Development Plan

Sustainable Drainage Systems (SuDS), green and blue infrastructure

CIRIA (2015) The Suds Manual (C753)

Building with Nature (2022) Building with nature standards framework. Building with Nature.

CIHT (2023) Green and blue infrastructure: a transport sector perspective. Chartered Institute of Highways and Transportation

CIRIA (2017) Guidance on the construction of SuDS (C768).

CIRIA (2006) Designing for exceedance in urban drainage: Good practice (C635). CIRIA

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