EXAMINATION OF THE CITY OF YORK LOCAL PLAN 2017-2033

PHASE 4 HEARINGS

MATTER 9: Environmental Matters

CITY OF YORK COUNCIL STATEMENT

Matter 9 – Environmental Matters

9.1 Will Policy ENV2 properly manage environmental quality?

9.1.1 Policy ENV2 focuses specifically on the natural and built environment aspects of development proposals that could adversely impact human health and well being. In this respect it accords with the NPPF (2012), recognising that impacts on environmental quality are most likely to occur when a development is built in an inappropriate location. The Policy reflects paragraphs 109, 120 and 123 (NPPF, 2012) as it seeks to control development which would result in future occupiers and existing communities being subject to significant adverse environmental impacts such as noise, vibration, odour, emissions/fumes, dust and light pollution, without effective mitigation measures.

9.1.2 Policy ENV2 requires evidence of the impacts of development to be submitted, including at construction and operational phases. The approach allows for suitable mitigation measures to be conditioned, to mitigate and reduce noise and other adverse impacts.

9.1.3 The Policy provides the basis to manage environmental quality for the purposes of safeguarding public health. Its operation is supported by policies in the Local Plan which concern other built and natural environmental issues such as ENV1, ENV3-5, SS1 and D1. Taken together, the policies in the plan provide an appropriate framework for managing environmental quality across York.

9.1.4 The policy approach is appropriate and has been assessed against a Sustainability Appraisal. ENV2 has shown to have a **significant positive effect** in relation to objective 2 (health and well being) of the Sustainability Appraisal Report (SA), Appendix J [CD009]: “Policy ENV2 supports this sustainability objective by helping to manage environmental quality.” (p.120).

9.1.5 Modifications to Policy ENV2 are proposed and included at Appendix 1. The modifications retain the underpinning policy objective but improve its cogency and provide clarity to both developers and decision makers as to the planning application requirements. As modified, Policy ENV2 is justified, positively prepared, effective and accords with national policy.

9.2 Can Policy ENV3 offer sufficient protection in terms of contaminated land?

9.2.1 Yes, the Policy offers sufficient protection. In accordance with Part 2a of the Environmental Protection Act 1990, York has a duty to investigate potentially contaminated sites. The implementation of Policy

ENV3 will assist in identifying and addressing contaminated land within the City.

9.2.2 Policy ENV3 acknowledges that remediation of contaminated and/or brownfield sites has the potential to have a positive effect on human health and potentially features of biodiversity value. The remediation and reuse of brownfield sites also represents an efficient use of land and a means to prevent contaminated surface water being discharged into local watercourses, reflecting paragraphs 109 and 121 of the NPPF (2012).

9.2.3 Paragraph 120 of the NPPF (2012) requires policies to prevent unacceptable risks from pollution and where a site is affected by contamination , it is stated that the landowner or developer bears responsibility for ensuring the land to be safe again. The responsibility to 'remediate' land is instilled in Policy ENV3 to deal effectively with contamination risk, and is expected to be proven with a verification report.

9.2.4 The policy provides an appropriate approach to setting out the requirements for contaminated land studies or risk assessments, and remediation where it is necessary. This is supported by the Sustainability Appraisal findings that ENV2 has shown to have a **significant positive effect** in relation to objectives 2 (health and well being) and 9 (efficient land use) of the Sustainability Appraisal Report (SA), Appendix J [CD009]. Modifications are, however, proposed to provide greater clarity and effectiveness (included at Appendix 1).

9.2.5 Modifications are proposed to Policy ENV2 (included at Appendix 1) to make clear the requirements for applicants and decision makers in accordance with paragraph 154 of the NPPF (2012).

9.3 Does Policy ENV4 accord with national policy, and will it provide an appropriate response to flood risk?

9.3.1 Yes, Policy ENV4 sets out how development should be brought forward in accordance with the assess, avoid and manage and mitigate approach promoted in paragraphs 99, 100 and 103 of the NPPF (2012). The policy is appropriate and has been assessed against a Sustainability Appraisal. ENV4 has shown to have a **significant positive effect** in relation to objective (Flood risk) of the Sustainability Appraisal Report (SA), Appendix J [CD009]: "specifically aim to minimise flood risk, both from new development and on existing development" (p.129).

9.3.2 The operation of Policy ENV4 will be supported by a Strategic Flood Risk Assessment (SFRA) [2013, SD091], which provides the basis for the sequential test approach and the exception test, consistent with

paragraphs 101 and 102 of the NPPF (2012). The SFRA has been updated since the plan's submission [Level 1 SFRA, March 2021 EX/CYC/61] and provides strategic overview of flood risk across the city from all sources based on readily available datasets. It aligns with updates to national guidance and incorporates updated flood modelling (York Detailed Model) which was finalised in 2016 for the River Ouse and River Foss.

9.3.3 The Environment Agency has been engaged in all stages of policy development and all outstanding areas of disagreement around the Plan's appropriate consideration of the Water Framework Directive have been overcome [EX/SOCG/9]. Modifications are proposed to Policy ENV4 (included at Appendix 1) which do not undermine its original intent but provide clarity and improve its effectiveness in accordance with paragraph 154 of the NPPF (2012).

9.3.4 A cross reference to the NPPF and the application of the sequential and exception tests is included in the first part of the policy to eliminate the lengthy wording in paragraph 2, which largely duplicates the NPPF requirements.

9.3.5 Modifications to the third and fourth part of the policy are intended for clarity purposes to assist interpretation by both applicant and decision maker. It is made clear that the requirements relate to development which could be subject to <u>any</u> form of flooding for consistency with the NPPF (2012) paragraph 103.

9.3.6 In accordance with paragraph 99 of the NPPF (2012), a modification to the final part of the policy is proposed to encourage all developments to integrate green infrastructure and natural flood management considerations. The modification also makes clear the requirement for a sequential approach to a site's layout (paragraph 103, NPPF 2012).

9.3.7 Policy ENV4 (incorporating proposed modifications) is consistent with national policy, and will provide an appropriate response to flood risk issues

9.4 Will Policy ENV5 effectively secure sustainable forms of drainage?

9.4.1 Yes, the policy gives priority to the use of sustainable drainage systems (SuDS) reflecting paragraph 103 of the NPPF (2012) and requires all new development to implement SuDS, unless demonstrated to be unfeasible. The policy applies to greenfield, brownfield and retrofitted development.

9.4.1 The policy reflects the Council's approach to drainage, as set out in its Sustainable Drainage Systems Guidance for Developers, 2018 (included at Appendix 2). This guidance was developed by the Council

in response to government's requirement for SuDS to be implemented within all major developments from 6th April 2015.

9.4.2 The run-off rates required by Policy ENV5 align with that detailed in the Council's guidance, which itself is underpinned by its SFRA evidence and is consistent with the approach set out in government guidance on flood risk assessments and climate change allowances.

9.4.3 Policies GI2, ENV2 and ENV4 work concurrently with ENV5 to secure sustainable forms of drainage. The policy is shown to have a **significant positive effect** in relation to objectives 10 (Water efficiency) and 13 (Flood risk) in Appendix J of the Sustainability Appraisal Report (SA) [CD009] "As a result of the implementation of policy ENV5, there could be some potentially significant positive benefits. In terms of water quality, the implementation of SUDs could minimise the risk of pollution and contribute to an improvement in water quality" (p.127).

9.4.4 Proposed modifications to the policy's explanatory text update references to the SFRA and acknowledge the Sustainable Drainage Systems Guidance for Developers is no longer 'emerging'.

Appendix 1 – Proposed Modifications

Policy ENV2: Managing Environmental Quality

Development will ~~not~~ be permitted where it does not unacceptably harm the amenities of existing and future occupants on the site ~~occupiers~~ and ~~existing~~ in neighbouring communities

~~would be subject to significant adverse environmental impacts such as noise, vibration, odour, fumes/emissions, dust and light pollution without effective mitigation measures.~~ Development proposals that are likely to give rise to the following environmental impacts ~~Evidence~~ must ~~be submitted to~~ demonstrate ~~that environmental quality is to the satisfaction of the Council.~~ how these matters have been considered in relation to both the construction and life of the development:

- increase in artificial light or glare;
- Adverse noise and vibration; and,
- Adverse impact upon air quality from odour, fumes, smoke, dust and other sources.

~~Development proposals for uses that are likely to have an environmental impact on the amenity of the surrounding area, including residential amenity, open countryside, local character and distinctiveness, and public spaces, must be accompanied by evidence that the impacts have been evaluated and the proposal will not result in loss of character, amenity or damage to human health, to either existing or new communities. This includes assessing the construction and operation phases of development.~~

Where proposals are acceptable in principle, planning permission may be granted subject to conditions.

~~For proposals which involve development with common party walls a verification report must be submitted to confirm the agreed mitigation works have been carried out.~~

Explanation

12.10 Impacts on environmental quality are most likely to occur when a development is built in an inappropriate location. This may occur due to the existing environment making the site unsuitable or because a development and/or its use introduces new environmental impacts which result in loss of amenity. Environmental impacts may result in damage to the environment and affect people's quality of life. As such, the Council will give considerable weight to ensuring that development proposals do not give rise to unacceptable environmental impacts or human health impacts.

12.11 It is essential that any negative impacts on environmental quality arising from development proposals are fully assessed, including during the construction phase, and that steps are taken to reduce those impacts to an acceptable level. Development should avoid causing detrimental impacts on the environment, however where an impact cannot be avoided mitigation measures should be incorporated into the proposals so that any impacts can be reduced to an acceptable level or controlled.

12.12 Evidence submitted in support of a planning application should consider:

- the existing environmental conditions of the development site, such as the background and ambient noise, vibration, odour, fumes/emissions, dust and light levels;
- how these existing environmental conditions will affect the proposed development;
- how the proposed development will affect the existing environmental conditions; and
- how the construction phase of the development will affect the existing environmental conditions, temporary or permanent, and also the proposed development itself.

12.13 The nature of the assessment required will be dependent on the scale and type of the proposed development. Further guidance can be found in national standards such as the code of best practice for sound insulation and noise reduction for buildings, alongside the Institute of Lighting Professionals guidance on obtrusive light, and DEFRA guidance on the control of odour and noise. Locally specific guidance on interpretation of these standards will be provided in a forthcoming SPD.

12.14 Where the outcome of any assessment identifies that either the location or the proposed end use is unsuitable, mitigation measures may be possible to enable the development to proceed without adverse effect. The mitigation measures required for each site will need to be determined on a site by site basis in consultation with the Council's Environmental Protection Unit. Potential mitigation measures are set out below, however this is not an exhaustive list of measures which could be implemented:

- redesigning the layout of the development;
- re-orientating a property to ensure that noise sensitive rooms are sited away from the noise source;
- providing increased sound attenuation to a facade or window;
- providing a noise barrier; and/or
- limiting hours of operation or use.

12.15 Where mitigation measures have been identified, planning conditions may be used to secure the protection required and maintenance needed in the future to ensure continued benefit. In some cases mitigation measures may still not be sufficient to prevent loss of amenity or to protect human health from environmental impacts. In such cases planning permission will not be granted.

Noise and Vibration

12.16 Noise and vibration present in the existing environment or from the proposed development itself must be considered as part of a planning application. Problems can arise where noise sources or noise generating uses are located near noise sensitive uses. Noise or vibration may occur due to road and rail traffic, industrial or commercial premises, recreation and leisure facilities (including pubs and clubs and their parking facilities in particular), hot food takeaways and restaurants and plant/machinery/equipment.

Odour and Fumes/Emissions

12.17 Introducing developments into areas where there is a risk of adverse effect due to odour, or introducing sensitive receptors into areas where there is a risk of adverse effect due to odour, fumes and emissions should be avoided wherever possible. Sources of odour and fumes/emissions may include industrial or commercial operations, plant/ machinery/ equipment, boilers, smoking shelters, kitchen extraction units, nail bars, etc.

12.18 Overall emissions to air from developments sites need to be considered. Please see Policy ENV1 'Air Quality'.

Dust

12.19 Emissions of dust from sites are most likely to occur during the construction phases of development but may also occur during the operational phases of a development. Excessive dust emissions may result in loss of amenity to neighbours and must therefore be adequately controlled.

Lighting

12.20 Lighting can have a significant impact on the environment and people. Flood lighting is important for security and safety and has other important uses such as lighting key buildings. However, poorly designed or badly directed lighting can cause loss of sleep, illness, discomfort and loss of privacy and obscure the night sky. Lighting can also have a significant and detrimental impact on wildlife through affecting the annual and diurnal rhythms of plants and animals and act as a significant barrier to some species.

12.21 Common sources of complaint about artificial light include:

- domestic security lights;
- industrial and commercial security lights;
- sports lighting;
- car parks; and
- commercial advertising.

12.22 Lighting in itself is not a problem; it only becomes a problem where it is excessive, poorly designed, badly installed or poorly maintained. Unnecessary light also causes excessive CO^2, contributing to air pollution and poor air quality. All forms of exterior lighting can result in light pollution. Light pollution can be defined as artificial light which shines outside the areas it is intended to illuminate, including light which is directed into the night sky, creating 'skyglow'. Policy ENV2 will safeguard against excessive, inefficient and irresponsibly situated lighting, preserving and restoring 'dark skies' and limiting the impact from light pollution on local amenity, intrinsically dark landscapes, and nature conservation. The City of York Streetscape Strategy and Guidance (2014) contains useful information on the use and design of streetlighting, security lighting and floodlighting.

D e l i v e r y

- Key Delivery Partners: City of York Council; and developers

- Implementation: Planning applications.

Policy ENV3: Land Contamination

Where there is evidence that a site may be affected by contamination or the proposed use would be particularly vulnerable to the presence of contamination (e.g. housing with gardens), planning applications must be accompanied by an appropriate contamination risk assessment.

Development of a site known to be or which has the potential to be affected by contamination will be permitted ~~identified as being at risk will not be permitted where a contamination assessment does not fully assess the possible contamination risks, and / or~~ where the proposed remedial measures ~~will not~~ deal effectively with the levels of contamination to ensure there are no significant impacts on human health, property, groundwater or surface water. Where proposals are acceptable in principle, planning permission will be granted subject to conditions.

Where remedial measures are required to deal effectively with contamination, a verification report must be submitted to confirm that the agreed remedial works have been carried out.

Explanation

12.23 A site may be contaminated if potentially polluting substances are present in, on or under the land. Land contamination is often associated with historical industrial activities or former landfill sites. Following a review of historic maps, trade directories, photographs and other records the Council has identified sites which have a past industrial use or have been used for waste disposal. The Council has a duty under Part 2A of the Environment Protection Act (1990) to investigate these potentially contaminated sites. It should be noted that the potentially contaminated sites are based on information currently available to City of York Council and additional potentially contaminated sites may exist. Please contact the Council's Public Protection team for more information about contaminated land in York.

12.24 Developers must submit an appropriate contamination assessment for sites that are identified as potentially contaminated or for sites where the proposed use would be particularly vulnerable to contamination such as housing with gardens. The level of detail required in the assessment will be dependent on the potential contamination identified. As a minimum, a contamination assessment should include a Phase 1 investigation – which consists of a desk study, a site walkover and a conceptual site model. However, if contamination is known or suspected to an extent which may adversely affect the development, a Phase 2 investigation may be required to support the application. Guidance on undertaking a contamination assessment can be found in the British standard for investigation of potentially contaminated sites and model procedures for the management of land contamination. The Yorkshire and Lincolnshire Pollution Advisory Group's development on land affected by contamination guidance is updated annually and also provides technical guidance for developers, landowners and consultants to promote good practice for development on land affected by contamination.

12.25 It is the responsibility of the developer to find out the nature, degree and extent of any harmful materials on their site by carrying out site investigations and to come up with proposals for dealing with any contamination. The developer must be able to demonstrate that a site can and will be made suitable for its proposed use. They should be able to prove that there are no unacceptable short or long term risks to human health, the environment, property and/or controlled waters. All aspects of investigations into possible land contamination should follow current best practice and should be carried out by competent persons with recognised relevant qualifications and sufficient experience.

12.26 If there is potential for contamination to influence the site, planning conditions will be imposed to ensure that the site will be safe and suitable for the proposed use. Conditions may require a full site investigation and risk assessment to be carried out before the development begins or for remedial measures to be incorporated that are necessary to protect human health and the wider environment.

Delivery

- Key Delivery Partners: City of York Council; and developers.
- Implementation: Contamination assessments; remediation and verification; and planning applications.

Policy ENV4: Flood Risk

New development shall not be subject to unacceptable flood risk and shall be designed and constructed in such a way that mitigates against current and future flood events. Proposals will be considered against the NPPF, including application of the sequential test and, if necessary, the exception test.

~~An assessment of whether the development is likely to be affected by flooding and whether it will increase flood risk locally and elsewhere in the catchment must be undertaken. The assessment of proposed development against its flood risk vulnerability and its compatibility with this vulnerability, as defined in the most up to date Strategic Flood Risk Assessment (SFRA), will determine whether development is appropriate, what detailed policies for the resultant flood zone classification, as stated in the SFRA will apply, and whether a further Exception Test (that makes provision for sites in a zone with a higher probability of flooding to be assessed against wider sustainability benefits, provided that the flood risk posed is controlled and mitigated to an acceptable level) is subsequently required.~~

Development located in areas known to be at risk from any form of flooding must demonstrate that:

i. there is no increase in flood risk locally or elsewhere in the catchment; and,
ii. The development will be safe during its lifetime with arrangements for the adoption, maintenance and management of any mitigation measures identified in a management and maintenance plan

~~Where flood risk is present, development will only be permitted when the local planning authority is satisfied that any flood risk within the catchment will be successfully managed (through a management and maintenance plan for the lifetime of the development) and there are details of proposed necessary mitigation measures.~~

A site specific flood risk assessment that takes account of future climate change must be submitted with any planning application related to sites:

i. in Flood Zone 1 larger than 1ha;
ii. in Flood Zone 1 where development could be affected by flooding from sources other than rivers and the sea;
iii. in Flood Zones 2 and 3; and
iv. where development or change of use to a more vulnerable use may be subject to other sources of flooding

~~where flood risk is an issue, regardless of its location within the flood zones. In addition, a site-specific flood risk assessment that takes account of future climate change must be carried out for all planning applications of 1 hectare or greater in Flood Zone 1 and for all applications in Flood Zones 2, 3a, 3a(i) and 3b.~~

~~Areas of greater flood risk may be utilised for appropriate green infrastructure spaces~~ Proposals should adopt a sequential approach to site layout and the potential for

green infrastructure to provide natural flood management and mitigation should be considered and incorporated, where appropriate.

Explanation

12.27 The term "flood risk" is a combination of the probability and the potential consequences of flooding, where land not normally covered by water becomes covered with water, from all sources – including from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources.

12.28 The design and construction of development should take into account flood risk considerations in the National Planning Policy Framework (2012) (NPPF), the National Planning Practice Guidance and the most up to date City of York SFRA.

12.29 The approach taken in the NPPF aims to reduce the risks from flooding to people and both the natural and built environment. It provides national planning principles for the location of new development in relation to flood risk, directing development to the lowest areas of flood risk, advocating a risk-based 'sequential test' approach. The aim of the sequential test is to steer new development to areas with the lowest probability of flooding. Development should not be permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding.

12.30 The Council will apply the risk-based sequential test approach set out in the NPPF~~. However, it may also consider development of land in areas known to be at risk from any form of flooding, and will take a sequential risk-based approach to determining the suitability of land in such areas for development,~~ to ensure that sites at little or no risk of flooding are developed in preference to areas at higher risk. The Council's SFRA provides the basis for applying this test (and the exception test, as appropriate), to assess the vulnerability classification ~~nature~~ of the proposed development against its level of flood risk ~~vulnerability and its compatibility with this vulnerability.~~

12.31 The exception test approach recognises the need to balance wider sustainability issues with flood risk. This test involves the consideration of whether the proposed development contributes to sustainable development in its wider sense, is located on brownfield land and whether a detailed site specific flood risk assessment indicates that the development will be safe and will not increase flood risk elsewhere. The exception test essentially allows a balance to be struck in some instances between flood risk and wider sustainability objectives, for example where a highly accessible brownfield development site lies within a high flood risk zone, which is likely to apply to some parts of York's existing built up areas.

12.32 The level of detail provided within a flood risk assessment will depend on the scale of the development and flood risks posed. The Environment Agency's flood risk matrix gives standing advice on the scope and extent of flood risk assessments. More detailed ~~policies for determining a planning application within the resultant flood zone classification are contained in the SFRA (or its successor). G~~ guidance on the preparation of a flood risk assessment is also available in the SFRA.

12.33 Flood risk mitigation measures will be assessed by the Council's flood risk management team on a site-by-site basis.

12.34 The Local Flood Risk Management Strategy (2015) identifies the wider set of policies and strategic plans that need to be considered in the development of any proposals and applicants should consider its content.

12.35 Sufficient information is required to assess the flood risk and drainage impacts of any proposed development, guidance on the required information is contained in the SFRA and the ~~emerging~~ City of York Council Sustainable Drainage Guidance for Developers. As a minimum, all full planning applications submitted should include:

- a sufficiently detailed topographical survey showing the existing and proposed ground and finished floor levels (in metres above Ordnance Datum (m AOD) for the site and adjacent properties; and
- complete drainage details (including Flood Risk Assessments when applicable) to include calculations and invert levels (m AOD) of both the existing and proposed drainage system included with the submission, to enable the assessment of the impact of flows on the catchment and downstream watercourse to be made. Existing and proposed surfacing shall be specified.

12.36 The extent of information to be provided shall be proportionate to the type, scale and location of development and its potential associated flood risks.

Delivery

- Key Delivery Partners: City of York Council; developers; Environment Agency; and relevant internal drainage board(s).
- Implementation: Planning applications; Sustainable Design and Construction SPD; developer contributions; and flood risk assessments.

Policy ENV5: Sustainable Drainage

For all development on brownfield sites, surface water flow shall be restricted to 70% of the existing runoff rate (i.e. 30% reduction in existing runoff), unless it can demonstrated that it is not reasonably practicable to achieve this reduction in runoff.

Sufficient attenuation and long term storage should be provided to ensure surface water flow does not exceed the restricted runoff rate. Such attenuation and storage measures must accommodate at least a 1 in 30 year storm. Any design should also ensure that storm water resulting from a 1 in 100 year event plus the recommended additional flows from the latest climate change advice, to account for climate change and surcharging the drainage system, can be stored on the site without risk to people or property and without overflowing into a watercourse or adjacent areas.

Where these surface water run-off limitations are likely to be exceeded development may be approved provided sufficient facilities for the long-term storage of surface water are installed within the development or a suitable location elsewhere. Long term surface water storage facilities must not cause detriment to existing heritage and environmental assets.

For new development on greenfield sites, surface water flows arising from the development, once it is complete (and including any intermediate stages), shall be no higher than the existing rate prior to development taking place, unless it can be demonstrated that it is not reasonably practicable to achieve this.

Sustainable Drainage System (SuDS) methods of source control and water quality improvement should be utilised for all new development, to minimise the risk of pollution and to attenuate flood volumes. Such facilities should be provided on-site, or where this is not possible, close to the site.

Where new development is proposed within or adjacent to built-up areas it should be demonstrated that retrofitting existing surface water drainage systems, in those areas for flood prevention, and SuDS within the existing built environment have been explored. Any retrofitting proposals must not damage existing environmental assets including but not limited to landscapes, trees and hedgerows and agricultural land. The authority will support applications where SuDS are enhanced for Biodiversity.

In exceptional circumstances, where SuDS methods of source control and water quality can not be provided, it must be demonstrated that:

i it is not possible to incorporate SuDS, either on site, or close to the site; and
ii an acceptable means of surface water disposal is provided which does not increase the risk of flooding, does not damage existing environmental assets and improves on the current situation.

Measures to restrict surface water run-off rates shall be designed and implemented to prevent an unacceptable risk to contamination of groundwater. The type of SuDS used should be appropriate to the site in question and should ensure that there is no pollution of the water environment including both ground and surface waters.

New development will not be permitted to allow ground water and/or the outflow from land drainage to enter public sewers.

Existing land drainage systems should not suffer any detriment as a result of development.

Explanation

12.37 The current City of York ~~SFRA (2013)~~ SFRA (2021) seeks to restrict surface water runoff from new development to below the extant run-off rates. Further details of how to calculate existing runoff rates are contained in the SFRA and the ~~emerging~~ City of York Council Sustainable Drainage Guidance for Developers. The latest Defra climate change allowance guidance requires developers to assess the life of the development and its vulnerability over this time, developments in York will be required to provide between 15 and 50% increase in flood flows based on the likely climate change uplifts for the Humber River Basin District. Support is available in the Strategic Flood Risk Assessment and the emerging City of York Council Sustainable Drainage Guidance for Developers document in the interpretation of national climate change guidance.

12.38 Examples of SuDs are included in the ~~emerging~~ Sustainable Drainage Guidance for Developers document which links to wider guidance including:

- SUDS Manual (CIRIA C697).
- Non-Statutory Technical Standards for Sustainable Drainage Systems (Defra March 2015).
- Non-Statutory Technical Standards for Sustainable Drainage: Practice Guidance (The Local Authority SuDS Officer Organisation).

12.39 Where it can be demonstrated by the developer that the implementation of SuDS is not feasible, consideration will be given to approving the development where more conventional surface water drainage techniques (e.g. connection to existing surface water drains subject to capacity) are proposed.

12.40 The design and construction of the development should:

- take into account existing land drainage systems; and
- where the development requires the severance or stopping-up of existing land drainage systems, the developer provide sufficient suitable mitigation measures

12.41 Consent may be required for drainage connections to Internal Drainage Board (IDB) managed watercourses under the terms of their byelaws, further information can be found on the York Consortium of Drainage Boards and the Kyle and Upper Ouse IDB websites.

Delivery

- Key Delivery Partners: City of York Council; developers; Environment Agency; and relevant internal drainage board(s).
- Implementation: Planning applications; Sustainable Design and Construction SPD; developer contributions; and flood risk assessments.

Appendix 2 -

City of York Council
Sustainable Drainage Systems
Guidance for Developers

City of York Council Sustainable Drainage Systems Guidance for Developers

For Issue

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Table of Contents

1. Introduction

The information provided in this document provides outline guidance for delivering and integrating sustainable drainage systems (SuDS) into the planning of future developments. This guidance complements existing guidance on SuDS design, maintenance and operation with an emphasis on best practice for the City of York. The following information is best understood and used in combination with the York Strategic Flood Risk Assessment.

In April 2014 the Department for Communities and Local Government issued a Written Ministerial Statement 16 outlining the Government's response regarding the future of SuDS. Following consultations, the Government's formal response was published in March 2015. The Planning Practice Guidance has subsequently been amended to reflect the new approach to implementation of SuDS in development.

From 6th April 2015, Local Planning Authorities must ensure that SuDS are implemented within all major developments[1]. Where appropriate, through the use of planning conditions or planning obligations, clear arrangements must be in place for the ongoing maintenance of the SuDS, over the lifetime of the development. The legislation also encourages the use of SuDS in minor developments[2].

City of York Council require developers to implement SuDS, where possible, for all new development and redevelopment. Proposals are expected to comply with current national standards and the guidance set out in this document.

There are numerous authoritative sources for guidance on the planning, design, construction and maintenance of SuDS. A comprehensive list of these can be found on the susdrain website http://www.susdrain.org/resources/

Figure 1: Example of SuDS integrated into a development

[1] Major development is defined by The Town and Country Planning (Development Management Procedure) (England) Order 2015 http://www.legislation.gov.uk/uksi/2015/595/article/2/made

[2] Guidance on the definition of minor developments can be found at https://www.gov.uk/guidance/flood-risk-and-coastal-change

The requirement for a sustainable surface water management strategy is vital for all new developments within the City of York. If not managed, new development and urban creep leads to a decrease in interception, absorption and transpiration of rainfall and surface water. This generates additional surface flows that have to be discharged via surface water sewers and watercourses. In turn, this leads to an increased risk of flooding from surface runoff and watercourses.

All new development must therefore demonstrate that there is a site level drainage strategy that will be implemented to mitigate any additional impermeable area, and that is consistent with that of the wider area, Ideally surface water should be managed at source, and drainage strategies should also consider the requirements to provide water quality, amenity and biodiversity benefits.

This document sets out the approach and requirements that need to be implemented to satisfy City of York Council's requirements in regards to surface water management.

2. The Purpose of SuDS

SuDS provide an approach to managing direct rainfall and surface water through replication of the natural drainage parameters in an urban environment. A key aim of SuDS arrangements is to manage flow rates and runoff volumes emitted from a site, providing a downstream flood risk reduction.

The inclusion of sustainable drainage offers a wide range of benefits other than reducing the impact of surface water runoff from source to outfall. The four pillars of SuDS design are considered to be Water Quantity, Water Quality, Amenity and Biodiversity as defined by The SuDS Manual[3]. A selection of key SuDS benefits are considered in Table 1 below.

SuDS Benefits

Flood Risk Management	SuDS aim to have an attenuating affect by slowing down and potentially storing surface water runoff reducing the risk of flooding on and off site.
Drainage Resilience	SuDS can be designed to be resilient against climate change by future proofing.
Natural Flow Regime Protection	SuDS mimic natural drainage arrangements to more closely emulate a natural flow regime on and off site.
Water Quality	SuDS act as filters to remove pollutants from surface water runoff before returning cleansed water into the natural environment.
Water Reuse	SuDS can be strategically placed to capture rainwater and surface water for it to be reused as grey water.
Biodiversity and Ecology	SuDS use vegetation and the natural landscape to support biodiversity and ecology through suitable environments.
Amenity/Environment Aesthetics/Green Space	SuDS are able to improve the visual integrity and the desirability of the site by implementing green and blue features.
Carbon Reduction	SuDS can reduce carbon use throughout its lifecycle including construction, maintenance and demolition.
Microclimate	SuDS can regulate local temperatures by introducing water and vegetated features which mitigate the urban heat island effect.
Education	SuDS are able to educate and engage the general public with surface water management.

Table 1: Benefit of SuDS

[3] CIRIA SuDS Manual C753 (2015) http://www.ciria.org/Resources/Free_publications/SuDS_manual_C753.aspx

3. Planning Application Guidance for Developers

3.1 Water management agencies

The following list outlines the main consenting bodies within the York City Boundary who will act as consultees for any development proposals. A local authority/consultee can set local requirements for planning permission that have the effect of more stringent requirements than those found in the National Standards.

1. City of York Council – The council is the Lead Local Flood Authority and Local Planning Authority. City of York Council's responsibilities under these roles include a responsibility for controlling planning and development through the planning system and acting as a consultee for all development (with surface water drainage). The Council is responsible for surface water, ground water and ordinary watercourse flood risk management. Local roads within the City of York are managed by City of York Council. The Council works closely with The Environment Agency, Yorkshire Water, Internal Drainage Boards and The Emergency Services. The Council also acts as Foss Navigation Authority for the publically navigable 1.5 mile length of the River Foss running from the old railway bridge crossing Huntington Road to the confluence with the River Ouse near Blue Bridge. Foss Navigation Authority planning interests include surface water outfalls and development adjacent to The Foss.

2. Environment Agency – The Environment Agency has operational responsibility for managing flood risk associated with Main Rivers and is a statutory consultee for any development proposed within Flood Zone 2 or 3, or works in the bed of or within 8m of a Main River. The Environment Agency is continually improving and updating their Main Rivers flood map and has permissive powers to carry out flood defence works, maintenance and operational activities for these assets. However, overall responsibility for maintenance lies with the riparian owner. The Environment Agency maintain an interest in the rate of any surface water discharge to a main river, to ensure fluvial flood risk is not increased as a result.

3. Yorkshire Water Services Ltd – Yorkshire Water has a duty as a statutory undertaker to provide clean and waste water services across the Vale of York and is responsible for the management, maintenance and operation of surface water attenuation structures. Where the receiving system is an adopted sewer, Yorkshire Water is responsible for surface water drainage from a development, if the system is built to adoptable standards.

4. Internal Drainage Board (IDB) - There are four Internal Drainage Boards within the vicinity of the City of York. The Ainsty, Foss and Ouse and Derwent drainage boards and are administered by the York Consortium of Drainage Boards. The Kyle and upper Ouse IDB is administered independently. IDB's are the 'local land drainage authority' in an IDB District (Land Drainage Act 1991), many IDB's span multiple planning authority and Lead Local Flood Authority areas, IDB's even if jointly managed in arrangements such as consortium are all independent with individual policies. IDB's have permissive powers to carry out works on ordinary watercourses, maintenance and operational activities. However, overall responsibility for maintenance lies with the riparian owner. IDB Bylaws can also constrain planning applications beyond the planning process consultation with IDB's is crucial as they are not statutory consultees in the planning process. (eg constraints of culverts/watercourses running under/through development sites) The IDB districts, where they overlap the City, are shown in Figure 2[4].

[4] https://www.york.gov.uk/downloads/file/11064/sfra_idb_boundaries

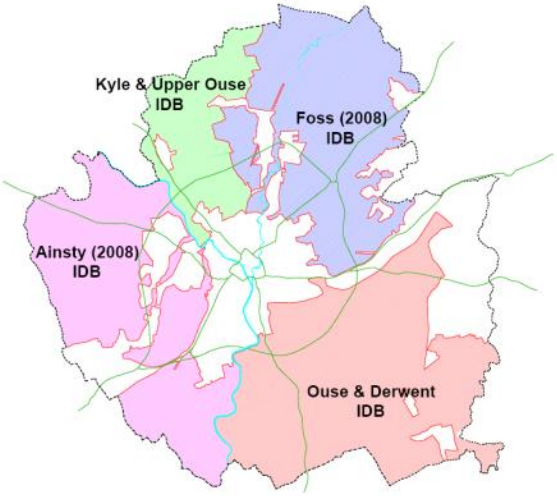

Figure 2: IDB Boundaries

5. Highways England – Highways England is the government company charged with operating, maintaining and improving England's motorways and major A roads. Formerly the Highways Agency, they became a government company in April 2015. Only one road with the Vale of York is operated by Highways England - the A64 running to the south of the city.

6. Canal and River Trust – The trust is a charity with the aim of protecting waterways in England and Wales. Their specialisms include, but are not limited to, maintaining canals and rivers. This includes bridges, embankments towpaths, aqueducts, docks and reservoirs. The trust maintains the River Ouse Navigation throughout the Vale of York, from Ripon to the Humber Estuary.

7. Private/riparian Owners - If the proposed development affects private/riparian surface water drainage/watercourses, the owner is to be consulted but any proposals will still require the approval of City of York Council.

3.2 Planning Gateways

A developer of a site is to initially investigate the requirement for a Flood Risk Assessment. If a Flood Risk Assessment is required, the proposal is required to achieve specific objectives (see York Strategic Flood Risk Assessment 2017) before advancing to the planning applications stage. Figure 3 provides an overview of the planning procedures based on the National Planning Policy Framework

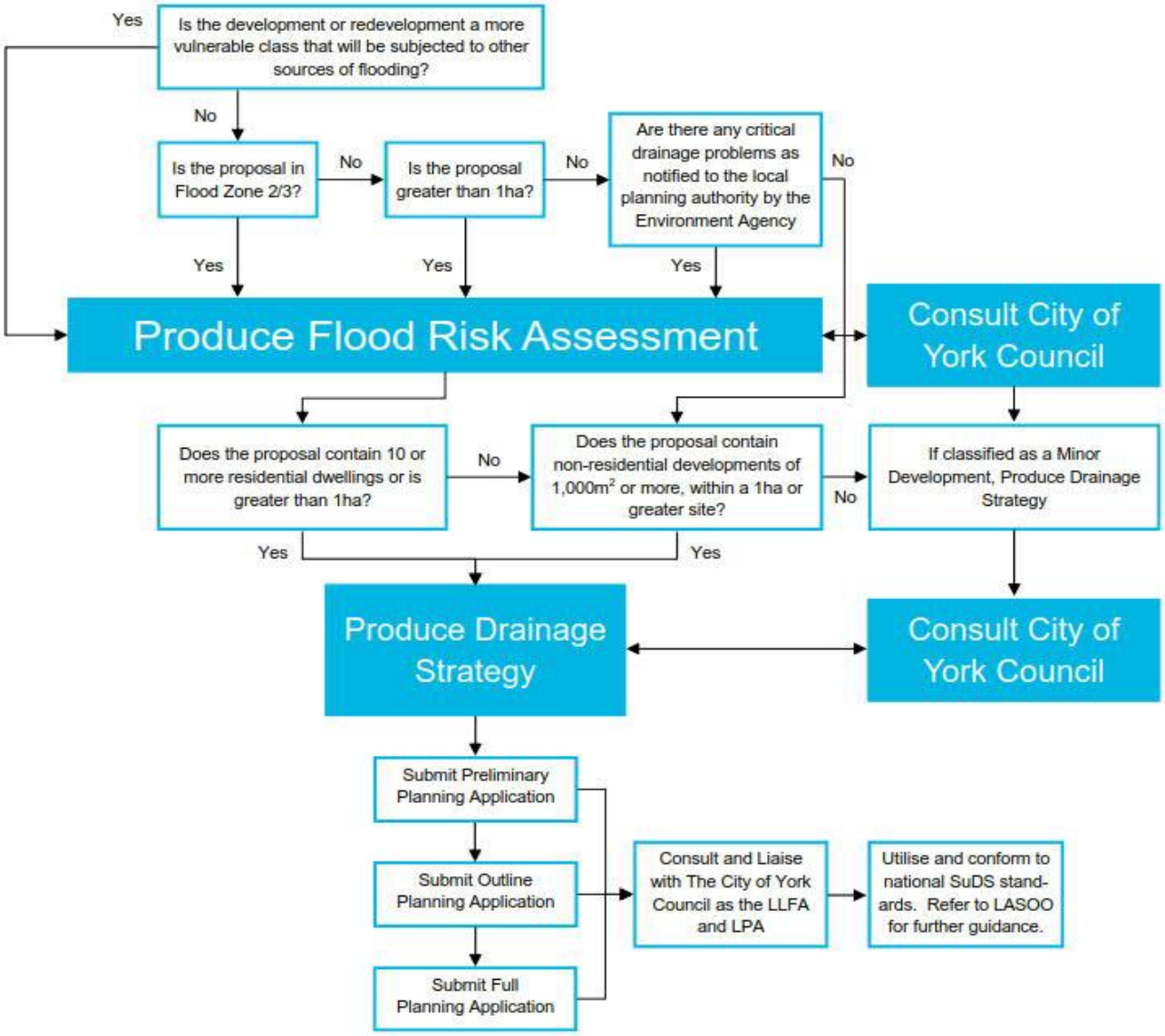

Figure 3: Drainage Planning Requirments Schematic

As Lead Local Flood Authority and Local Planning Authority, City of York Council is the statutory consultee for SuDS applications. They must be consulted on the drainage elements of planning applications for development that falls into the above categories to ensure they conform to necessary national standards and guidance set out in this document. Applications submitted will be assessed on the demonstration of maximising the benefits of SuDS.

SuDS design should be considered early in the planning stage with source control measures and above ground techniques. This ensures the cost effectiveness of SuDS over conventional drainage methods. City of York Council will only consider alternatives to SuDS as an acceptable drainage solution in exceptional cases.

Developers are recommended to pass through a three stage process to ensure a SuDS scheme is developed appropriately. Each stage is listed below:

1. Stage 1: Preliminary Planning Application
2. Stage 2: Outline Planning Application
3. Stage 3: Full Planning Application

The local Authority SuDS Officer Organisation[5] (LASOO) has published guidance regarding the process of delivering sustainable drainage. This document can be used as guidance for details of information required at each stage. An overview of information required by the Lead Local Flood Authority is defined below.

3.2.1 Planning Application Guidance

It is anticipated that as designs are progressed through the planning process the level of detail will be refined by the developer and provided to the LPA as part of a 'Surface Water Drainage Strategy'. To assist developers, the level of detail required at each planning stage is outlined below:

Stage 1: Preliminary Planning Application

The preliminary planning application allows the developer to enter into discussions with the lead local flood authority, local planning authority and any other consultees such as Yorkshire Water Services and the Environment Agency. The objective of this stage is to agree the overarching drainage/SuDS strategy to be implemented. The more issues that can be resolved at the pre-application stage result in time and costs savings along with a more comprehensive design at completion.

Stage 2: Outline Planning Application

The outline planning application can be viewed as a detailed design. All hydraulic calculations are to be completed, and high level plans and sections of the drainage system should be created. The SuDS arrangement should be fully formed hydraulically and physically. The specific level of detail required is to be agreed with City of York Council following review of the Preliminary Planning Application.

Stage 3: Full Planning Application

The full planning application is considered to be a final design stage. The application must provide all details to justify and demonstrate SuDS proposals have been optimised for the site, the development and surrounding area in the present and future. By the time the full planning application is developed it is expected that a robust long term maintenance plan has been agreed with the council and a suitable adopting authority agreed.

Table 2 below outlines the information that should be provided to City of York Council as part of the Surface Water Drainage Strategy at each planning stage. It is anticipated that some of these requirements will need to be further developed and resubmitted as the design passes through the planning gateways.

Table 2: Drainage Planning Requirments

Planning Application Requirements		Preliminary Planning Application	Outline Planning Application	Full Planning Application
General		Stage 1	Stage 2	Stage 3
Site Location	Site location plan	✓	✓	✓
	Site Description	✓	✓	✓
	Current and historical site use	✓	✓	✓
	Site Coordinates	✓	✓	✓
Consultations - Identify and consult with organisations and individuals affected by proposed developments	City of York Council	✓	✓	✓
	Environment Agency	✓	✓	✓
	Yorkshire Water Services Ltd	✓	✓	✓

[5] http://www.lasoo.org.uk/non-statutory-technical-standards-for-sustainable-drainage

Planning Application Requirements		Preliminary Planning Application	Outline Planning Application	Full Planning Application
	Internal Drainage Board	✓	✓	✓
	Highways England	✓	✓	✓
	Canals and Rivers Trust	✓	✓	✓
	Private Proprietor	✓	✓	✓
Existing Site Characteristics	**Application Information**	**Preliminary Planning Application**	**Outline Planning Application**	**Full Planning Application**
Existing Drainage Arrangement and Outfalls - Demonstrate how the site currently drains surface water and links to off site drainage	Existing drainage system plans and schedules with description	✓	✓	✓
	Provide plan and describe existing outfalls	✓	✓	✓
	Provide plan and describe existing waterbodies	✓	✓	✓
	Provide Plan and describe existing overland flow routes	✓	✓	✓
Flood Risk - Identify any historical or potential flood risk	Plan and describe historic, and any existing, sources of flood risk	✓	✓	✓
Site and Surrounding Topography	Provide topographic land survey plans of the site and the surrounding landscape		✓	✓
Geology and Groundwater	Provide description and any available ground investigation information regarding the existing strata conditions		✓	✓
	Identify site ground water levels and ground water protection zones		✓	✓
Existing Runoff Rate - Quantify the existing brownfield or greenfield runoff rate.	Calculate 1in 1 year return period runoff rate	✓	✓	✓
	Calculate 1in 30 year return period runoff rate	✓	✓	✓
	Calculate 1in 100 year return period runoff rate	✓	✓	✓
	Calculate 1in 100 year return period plus climate change runoff rate	✓	✓	✓
Proposed Site Characteristics	**Application Information**	**Preliminary Planning Application**	**Outline Planning Application**	**Full Planning Application**
Proposed Site Details	Provide masterplan and description of proposed development		✓	✓
Proposed Drainage	Provide description, plans and schedules of the overall proposed drainage arrangement		✓	✓
	Provide hydraulic calculations (hand calculation, hydraulic modelling or other).		✓	✓
	Provide construction specification			✓
	Demonstrate Climate Change has been applied		✓	
Proposed SUDS	Provide plans and descriptive overview on proposed SUDS		✓	✓
	Comment on SUDS benefits including Water Quality, Amenity, Biodiversity		✓	✓
	Comment on the management train		✓	✓
	Demonstrate Climate Change has been applied		✓	✓
Proposed Outfalls	Provide plan of outfall/s		✓	✓
	Provide consent to discharge		✓	✓
Site Discharge	Provide calculations of discharge rate based on the final masterplan layout		✓	✓

Planning Application Requirements		Preliminary Planning Application	Outline Planning Application	Full Planning Application
Flow Routes and Flood Risk	Identify proposed overland flow routes with a plan and descriptive overview			✓
	Demonstrate residual and exceedance surface water is controlled on and off site			✓
Drainage Standards - Demonstrate the proposed surface water drainage system complies with national and City of York Council standards.	Demonstrate the level of service		✓	✓
	Exceedance level of service			✓
	Soakaways		✓	✓
	Demonstrate appropriate freeboards have been specified			✓
	Demonstrate the inclusion of climate change		✓	✓
	Specify any urban creep and demonstrate its inclusion within the design		✓	✓
Storage	Specify predicted flow at the inlet and outlet		✓	✓
	Specify the storage volume		✓	✓
	Specify outlet control type		✓	✓
	Specify level of service		✓	✓
Proposed Topography	Provide proposed topography plan	✓	✓	✓
Proposed Impermeable Area	Quantify proposed impermeable area. Identify the % increase of impermeable area from the existing arrangement		✓	✓
Maintenance - Clarify who will adopt and maintain the drainage system and how it will be undertaken.	Submit an Operation and Maintenance Plan		✓	✓

4. SuDS Design Guidance for Developers

The design of SuDS must comply with the parameters and policies detailed within this guidance document. The table below provides an overview of the design limits to be adhered to.

4.1 Catchment and System Parameters

The policies detailed in this guidance should be applied to all new development / re-development, irrespective of which flood zone it resides.

Guidance	Greenfield Sites	Brownfield Sites
Discharge Limit (Catchment Size 0-50ha)	IOH 124 Greenfield Runoff Rate	IOH 124 Greenfield Runoff Rate*
Discharge Limit (Catchment Size Over 50ha)	FEH	FEH*
Level of Service Design	Accommodate a 1 in 30-year storm with no surface flooding in system and storage[6].	

[6] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/415773/sustainable-drainage-technical-standards.pdf

Exceedance Level of Service	Flooding (generated on site) must not occur within buildings, key assets or off site up to and including a 1 in 100 year rainfall event including an allowance for climate change. Climate change values vary dependent on the development type and location[7].
Climate Change	New climate change advice was issued by the Environment Agency in February 2016 and should be applied to all Flood Risk Assessments with 30% used for all drainage designs in the City of York area.
Storage	Source control SuDS methods should be employed to minimise the need for downstream / end of systems storage where possible. Storage volume calculations, using computer modelling, must accommodate a 1:30 year storm with no surface flooding, along with no internal flooding of buildings or surface run-off from the site in a 1:100 year storm. Storage should be designed to empty within 48 hours of any rainfall event.
Soakaway	The developer's attention is drawn to Requirement H3 of the Building Regulations 2000 with regards to hierarchy for surface water dispersal. Consideration should be given to discharge to soakaway, infiltration system and watercourse in that priority order. Surface water discharge to the existing public sewer network must only be as a last resort, therefore sufficient evidence should be provided i.e. infiltration tests to BRE Digest 365 (2016) (preferably carried out in winter) for the viability of infiltration before other dispersal techniques are considered. Storage requirements as per above. CYC will only accept infiltration test results where the test was witnessed by a member of the CYC Flood Risk Management Team.
Freeboard	Freeboard is to be considered in line with national standards and best practice guidance.
Groundwater	The long term level of the ground water table is to be considered during SuDS design (particularly for soakaway design and design of storage systems).
Surface Water Discharge	The surface water collected by a proposed drainage system is to discharge or outfall into one of the following receptors, in order of favourability; Soakaway, Watercourse / Waterbody, surface water system, combined water system.
Urban Creep	A +10% (minimum) increase of urban creep is to be applied to SuDS designs. City of York Council is to be consulted if urban creep is predicted to be more than +10%. Urban Creep guidance is provided in LASOO, page 28-29.

*Where greenfield discharge rates cannot be achieved on brownfield sites consultation should be undertaken with CYC

4.2 Greenfield and Brownfield Runoff

When developing a site, the natural flow regime is disrupted and normally results in an increase of rainfall runoff. To mitigate this effect a pre-development runoff rate must be calculated. Once the site is developed it is required to discharge surface water off site at the pre-development runoff rate, thereby maintaining the natural flow regime. There are two types of pre-development considered in this report: Greenfield and Brownfield.

Greenfield - "Greenfield" is undeveloped land in a city or rural area used for agriculture, recreational grassland or natural rough.

1. Greenfield sites are to limit the discharge rate to the pre developed run off rate. The pre development run off rate should be calculated using either IOH 124 or FEH methods (depending on catchment size).
2. Where calculated runoff rates are not available the widely used 1.4l/s/ha rate can be used as a proxy, however, if the developer can demonstrate that the existing site discharges more than 1.4l/s/ha a higher existing runoff rate may be agreed and used as the discharge limit for the proposed development. If discharge to public sewer is required, and all alternatives have been discounted, the receiving public sewer may not have adequate capacity and it is recommend discussing discharge rate with Yorkshire Water Services Ltd at an early stage.
3. Greenfield sites which are known to become waterlogged, sit low in the catchment or are surrounded by higher land should maintain the same level of surface water storage to ensure the catchment flow regime remains un-changed.

[7] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Brownfield - "Brownfield" is a term used in urban planning to describe land previously developed. When developing Brownfield sites, every effort should be made to ensure that the post development runoff rate is as close to the Greenfield runoff rate for the site as possible. If necessary the following policies should be applied to the redevelopment of Brownfield sites:

1. City of York Council to confirm justification to relax discharge rates is reasonable based on the evidence provided by the applicant.
2. Brownfield sites are to limit the discharge of surface water off site based on 140 l/s/ha of proven connected impermeable areas for the 1 in 1 year storm or better. A site survey of the existing drainage will be required to prove discharge and will not be assumed all impermeable areas drain to sewer.
3. Brownfield sites drainage proposals will be measured against the existing performance of the site based on its proven connected impermeable areas. Proposals are to better the previously developed surface water runoff rate by a minimum of 30%.

Early consultation with the relevant IDB is encouraged to highlight how a development may impact on the wider drainage network that they manage.

4.3 Surface Water Discharge

Based on the requirements of The Building Regulations 2010 Part H: Drainage and Waste disposal[8], the discharge of surface water should follow the hierarchy set out below. The methods are to be prioritised in order; infiltration, watercourse, and combined/surface water sewer. Discharge to an existing public sewer network must only be specified as a last resort with sufficient evidence that other methods are not appropriate.

Soakaway - The suitability of the use of soakaway within York will be limited, due to the unsuitable clay ground encountered throughout most of the city. However, the viability of infiltration may vary and should be determined through physical site specific survey to BRE Digest 365 (2016)[9]. Building Regulations – Shall be located at least 5m from building foundations. CYC will only accept infiltration test results where the test was witnessed by a member of the CYC Flood Risk Management Team.

Watercourse/Waterbody - Any culverting or development that will affect the flow of a watercourse requires the prior written consent of either; the Environment Agency (Environmental Permits for Main Rivers), or City of York Council/Internal Drainage Boards (Land Drainage Consent for Ordinary Watercourses). Formal Byelaw consent may also be required to be obtained by the Environment Agency or Internal Drainage Boards.

Surface Water Sewer - Yorkshire Water should be consulted at an early stage for all developments over 10 dwellings or sites exceeding 0.5ha and where new connections are required as new connections to sewers suffering from under capacity may result in exacerbation of any existing problems downstream. Under capacity sewers may also cause the proposed site to flood due to surcharge during intense summer storms.

Yorkshire Water will not allow the connection of ground water to public sewers, to prevent hydraulic over-loading of the sewerage system and problems associated with siltation.

Highway Drainage –The City of York Council Surface Water Management Plan identified that much of the city's highway drainage infrastructure is unrecorded and its condition is consequently unknown, however considerable work has followed and large parts of the system have been surveyed and is now better understood. Highway drainage generally only serves the highway and should not be used to prevent or reduce the risk of flooding. Any required connection to a highway drain would require agreement from City of York Council.

[8] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/442889/BR_PDF_AD_H_2015.pdf

[9] https://www.brebookshop.com/details.jsp?id=327631

Combined Sewer - Surface water from developments shall not connect to combined drains or sewers, if a suitable surface water sewer is available and unless expressly authorised by Yorkshire Water. Surface water discharge to the existing public sewer network must only be specified as a last resort: the developer is required to eliminate all other means of surface water disposal.

4.4 Exceedance

SuDS should be designed to a specified level of service as defined in this guidance document. Once the system capacity is exceeded by cause of a higher design event, an exceedance level of protection is required to ensure residual runoff is contained on site and is not detrimental to the sites development. Surface water during events larger than the level of service is known as the exceedance flow.

The designer is to initially consider utilising SuDS as flood mitigation, but other techniques can be used if SuDS are not appropriate including; high finished floor levels and car park/recreational areas/minor roads temporary storage. See City of York Council SFRA and Ciria C635 for further information on exceedance design.

4.5 Minor Developments

Minor developments (less than 10 residential properties or non residential less than 1,000m2) not covered by the statutory legislation will still be subject to local planning permission restrictions and by-laws. It is expected that minor developments will also be required to demonstrate a robust drainage strategy that manages flood risk at a local level.

The requirement to manage excess flows on minor development should be consistent with that on larger sites by use of SuDS where care should be taken to ensure that surface water flows post development are no greater than 70% of that of the pre developed site and to a Greenfield run-off rate for the undeveloped site.

In some instances design flows from minor developments may be so small that the restriction of flows may be difficult to achieve. However, through careful selection of source control or SuDS techniques it should be possible to manage or restrict flows from the site to a minimum 0.5 l/sec for individual residential properties, please discuss any design issues with the City of York Council Flood Risk Management Team.

To mitigate against the effect of urban creep, where multiple existing minor developments with unrestricted discharge contribute to increased flood risk over a wider catchment, City of York Council will not accept discharge rates from individual residential properties in excess of 0.5 l/s, unless it can be demonstrated that the discharge rate for pre developed site is greater than this – see 4.2. Planning applicants should also be aware that discharges from minor developments may not be granted to IDB watercourses unless compliant with section 4.2

To achieve these reduced flow rates it is expected that source control techniques or proprietary products are used. However, designers should demonstrate that these systems can be adequately maintained by the end users to prevent blockage or failure.

Where the discharge rates from minor developments may be lower than the minimum required by adopting authorities, such as Yorkshire Water Services Ltd (minimum 75mm orifice for vortex flow controls and is appropriately 3.5 l/s. Minimum 100mm diameter for orifice plate.) it would be the responsibility of the new owner to maintain the surface water system up to the point at which it can be adopted.

Householder Development applications for alteration or renovation of a property not covered by the statutory legislation should consider the above guidance for minor developments, where necessary early consultation with City of York Council or the relevant Internal Drainage Board is encouraged.

5. SuDs Selection

A comprehensive list of SuDS can be found in The SuDS Manual (C753) by CIRIA. SuDS are to be carefully selected based on their drainage benefits along with environmental and economic qualities.

5.1 SuDs Water Management Trains

SuDS are implemented on a site to minimise the impact of runoff from impermeable surfaces and replicate the natural drainage regime. SuDS systems should be designed holistically and interlock by use of a combination of conveyance and storage systems. The following hierarchy of management techniques should be considered:

1. Prevention - the use of good site design and housekeeping measures to prevent runoff and pollution.
2. Source control - control of runoff at or very near its source (e.g. the use of permeable/infiltrating drainage or green roofs)
3. Site control - management of runoff from specific site sections (e.g. routing water from roofs and car parks to infiltration or using swales to transport water through the site allowing infiltration and evaporation).
4. Regional control - management of runoff from the entire site or several sites, typically in a storage arrangement such as a detention basins or wetland.

Design foresight is required to build SuDS into the developable space. A drainage network incorporating SuDS are to initially manage runoff close to its source. This increases the potential treatment of water and minimises the size of downstream storage.

The number of SuDS techniques implemented into a management train from a treatment perspective is proportional to pollution risk on the environment. Generally, a higher risk of pollution normally requires a greater number of treatment levels. In cases where the receiving waters are highly sensitive or protected, an appropriate number of SuDS techniques is to be proposed for a desired level of protection.

5.2 SuDs based on Site Condition

SuDS can be potentially applied to all sites. However, the selection of SuDS very much depends on the site conditions, dictating how SuDS are designed and implemented. Some of these conditions and constraints to be considered are described below:

SuDS Space	Allocation of space for SuDS should be considered as part of the masterplan. Developers should encourage the masterplan designers to have an understanding of how much space should be allocated. Multiple uses of space should be encouraged.
Flood Plain	The City of York is generally low lying. As a consequence the city is susceptible to fluvial (river) flooding. However, SuDS can still be implemented into classified flood zones in accordance with the SFRA.
On Site and Off Site Flood Risk Sources	Implementing SuDS at source or as part of the drainage systems can reduce on and off site flooding by slowing and storing runoff. Consideration of flows affecting the drainage system from outside the site boundary should be considered to maintain the existing flow regime.
Site Topography	The City of York is generally flat as a whole. As a consequence SuDS should be implemented at source to take advantage of treatment trains and maintain an above ground system. Slack gradients are advantageous for treating runoff in all stages of a treatment trains to allow suspended solids and hydrocarbons to drop out before the exit site.
Site Permeability	York is known to be a low lying catchment and generally has unsuitable soil conditions for surface water infiltration. However, site specific test (witnessed by CYC FRMT) to BRE Digest 365 (2016) should still be undertaken to determine the viability of infiltration.
Contaminated Land	Understanding the sites historic and current land use is essential in understanding if land is contaminated. Any contamination is to be isolated from the proposed flow regime and potentially removed to prevent contamination of the natural environment.
Groundwater and Ground Water Protection	SuDS implemented could be detrimentally affected by the ground water

	table. Ground water can damage SuDS and increase system flows from ground water infiltration to the system. SuDS are to take account of environmentally sensitive areas such as groundwater protection zones such as potable water supplies.
Water Quality	The SuDS treatment train needs to consider to quality of the waterbody into which it is discharging. The type and number of SuDS implemented will depend on the nature of the drained surfaces and the quality of the receiving system..
Ecological Environment	SuDS can be blended into the existing natural environment or be designed to replicate what was once there to contribute to biodiversity and ecology. Careful consideration is required if merging with conservation areas or areas with protected habitats and species.
Adoption and Maintenance	City of York council does not adopt SuDS features. An adopting party should be specified as part of the preliminary planning application. The design of SuDS should include a consideration for future maintenance requirements.

The Vale of York is well known to suffer from fluvial flooding. Any development proposed within a flood plain should still look to implement SuDS. Those sites should also increase their adaptability and robustness to variable present day and future rainfall events. The York Strategic Flood Risk Assessment contains guidance on measures to be applied when developing land in a flood risk zone.

Table 3 SuDS Selection Matrix based on Site Conditions

Unsuitable ✓Suitable		Green Roof*	Rainwater Harvesting*	Soakaway	Permeable Paving	Filter Strip	Bio-retention Area	Swale	Hardscape Storage	Pond	Wetland
Flood Plain	Located in the floodplain?	✓	✓	✓	✓	✓	✓	✓			
Ground Water	Groundwater less than 3 metres below ground surface	✓	✓		✓ With liner and underdrain (no treatment)	✓	✓ With liner and underdrain	✓ With liner	✓ If aboveground	✓ With liner	✓
Topography	Sited on a flat site?	✓ Source control	✓ Source control	✓ Source control	✓ Source control	✓ Source control	✓ With short kerb or ill length	✓ Careful to provide some gradient	✓	✓ Try to keep flow above ground	✓ Try to keep flow above ground
	Sited on a steep slope (5 – 15%)?	✓	✓		✓ If terraced		✓ If terraced	✓ If installed along contour	✓ If terraced		✓ If terraced
	Sited on a very steep slope (>15%)?	✓	✓								
Soils and Geology	Impermeable soil type (e.g. clay – based type)?	✓	✓		✓ With underdrain (no treatment)	✓	✓	✓	✓	✓	✓
Contaminated and made ground	Are there contaminated soils on site?	✓	✓		✓ With underdrain (no treatment)	✓ With liner	✓ With liner and underdrain	✓ With liner	✓ With liner	✓ With liner	✓ With liner
Existing Infrastructure	Are there underground utilities in the SuDS area?	✓	✓		✓ If possible relocated into a marked corridor for future maintenance	✓	✓ Possible with structural grid in soil				
Space constraints	Limited space for SuDS components	✓	✓	✓	✓		✓	Rill or channel more suitable	✓		✓ Micro-wetland
Runoff characteristics	Suitable for inclusion in high risk contamination area	✓ Source control	✓ Source control		✓ With liner and spill isolation		✓ With liner and spill isolation	✓ With liner and spill isolation	✓ With liner and spill isolation		✓ If designed for treatment of predicted wastes
Protected species or habitat	Proximity to designated sites and priority habitats	✓	✓	✓	✓	✓	✓	✓	✓	✓ If designed and maintained appropriately	✓ If designed and maintained appropriately
Ownership and Maintenance	Can the Feature be designed for adoption	✓	✓		✓	✓	✓	✓	✓	✓	✓
					Dependant on design and local adoption policies						

*Where Green Roof are proposed to provide attenuation care should be taken by the designer to ensure that any assumed attenuation volume half drains within 24hours and the total discharge rate from the development does not exceed 70% of pre-development or maximum 0.5 l/sec. *Rain Water Harvesting volumes cannot be used solely as a form of attenuation and the calculated attenuation volume should be in excess of any volume stored to be used for recycling.

6. SuDS Adoption, Construction and Maintenance

One of the key objectives of the adoption process is to ensure that any installed SuDS can be maintained easily over the development's lifetime and beyond. Therefore, the SuDS must be designed with maintenance in mind. Proposals for SuDS must include an operation and maintenance document, setting out the following:

1. A description of the SuDS scheme and how it works.
2. 'As built' Drawings.
3. A management plan including a SuDS plan identifying the SuDS techniques used. This should include inlets, outlets and control structures.
4. Inspection and maintenance tasks. Details on who would be best qualified to undertake such tasks should be identified (e.g. standard landscape contractors).
5. A specification for maintenance actions, based on agreed standards and including frequency.
6. A checklist for day-to-day site checks for pre, during and post rainfall events.

Care should also be taken to ensure that SuDS elements are protected from damage or overloading during a developments construction phase. Best practice guidance on the construction of SuDS such as those developed by CIRIA should be employed to ensure that the adopted SuDS features provide the intended design life / level of service.

At the time of writing, based on current legislation, City of York Council does not adopt SuDS systems. It is possible that future developments to legislation may mandate responsibility for the adoption of SuDS. Therefore, it is recommended that developers discuss the current requirements for adoption with City of York Council during the preliminary consultation process to agree an adopting authority. Identification of a long term funding mechanism for the maintenance of SuDS should be agreed at this stage. An adopting party is to be agreed at the preliminary design stage.

At the time of writing, Yorkshire Water is constrained to adopting only pipe systems that have a defined outfall and fall within the legal definition of a "sewer" (as defined in the Water Industry Act 1991) and do not have a duty to accept flows from land drainage. Yorkshire Water works to the Interim Code of Practise for SuDS published in July 2004 which provides guidance on SuDS adoptable by Yorkshire Water.

Appendix A References

A.1 References

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