



Department
for Environment
Food & Rural Affairs

Recommendations to Update Non-Statutory Technical Standards for Sustainable Drainage Systems (SuDS) **Final Report Annex E: Feedback from focus groups**

February 2021



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1 Introduction

This Annex forms part of the Final Report for the research project *Recommendations to Update Non-Statutory Technical Standards for Sustainable Drainage Systems (SuDS)*. Reference should be made to the main body of the report for details of the project aims and objectives and the overall approach taken.

This Annex provides details of the focus groups that were created to enable additional stakeholder engagement as part of this project. All engagement was via online workshops.

There were two rounds of engagement:

- The first round of engagement (which comprised three workshops) took place in July 2020 and this engagement was to understand the opportunities and challenges in setting requirements to deliver multiple benefits. The feedback from these workshops contributed to the review of evidence detailed in Annex A.
- The second round of engagement (which comprised one workshop) took place in October 2020 and this engagement was to review the draft updated standards and to discuss the planned online survey.

1.1 First round

Three online focus groups were delivered via zoom in July 2020, each focus group lasted under two hours. The objectives of the focus groups were to understand the particular opportunities and challenges in setting requirements to deliver multiple benefits. This would complement the information obtained from the survey.

Participants were invited by the project team to represent lead local flood authorities, local planning authorities, developers, consultants (including drainage engineers and landscape architects) and representatives from Water and Sewerage Companies. See Appendix A for a list of focus group members.

The survey indicated that around 90% of the respondents favoured updating the Non-Statutory Technical Standards (NSTS) for SuDS to include multiple benefits with the most popular multiple benefits being the inclusion of:

- Water quality
- Climate resilient developments
- Biodiversity
- Amenity.

The main tasks of the focus groups were to understand what could be achieved and the desired outcomes for revising Standards to include multiple benefits. This included obtaining feedback on the kind of requirements could be used to achieve the outcomes, how could the SuDS be designed and evaluated and what links to other processes, guidance would be useful.

The focus groups were also designed to explore responses to the inclusion of Standards to facilitate the management of every-day rainfall through SuDS design. This is using the SuDS approach to manage, reduce and as far as possible eliminate surface water runoff from smaller rainfall events. This is typically referred to as Interception, preventing runoff from the first 5mm of rainfall, and can be managed by a number of different mechanisms. This approach could be beneficial because:

- It mimics natural (pre-development) drainage.
- Prioritises infiltration and rainwater harvesting.
- Manages local flood risk, reducing the impact on the receiving surface water bodies and drainage systems and potentially reducing frequent CSO spills.
- Prevents pollution of receiving surface water bodied from small events with little dilution of pollutants.

Similar to the discussions on multiple benefits the discussion was to help understand what could be achieved by a new Standard, what might it look like (would it be a fixed requirement, or hierarchy). Do we have suitable simple design tools (e.g. deemed to comply rules)?

Two of the focus groups were to explore these issues, each with 16 participants. The third focus group (21 participants), was set up primarily with a selection of participants from the first two workshops. This workshop looked at the potential for utilising the wording and approach in the Welsh statutory Standards for SuDS.

1.2 Second round

A workshop split into two sessions was delivered via Zoom on 9 October 2020, the first session was for two and half hours and the second session was 2 hours. The objectives of the workshop were to:

- Share wording of the draft interim standards and obtain feedback on:
 - Clarity of standards and clarification statements
 - Ease of delivering and assessing the standards

- Any changes to the wording of the standards or clarification statements
- Understand how the draft standards can be applied to two example development sites
- Discuss the planned approach for the online survey as part of Task 4.

Participants were invited by the project team to represent lead local flood authorities, local planning authorities, developers, consultants (including drainage engineers and landscape architects) and representatives from water and sewerage companies (WaSCs). See Appendix A for a list of participants.

In advance of the workshop, participants were sent updated draft standards (referred to at the time as the Interim Draft Standards) and a PDF of additional materials that participants would be able to refer to during some of the workshop activities.

2 Summary of feedback from first round

The following provides a summary of the main messages received from the focus groups.

Proposed standard: **Water quality management**

Level of support for a new standard: **Significant**

Required outcomes:

- Surface SuDS supporting amenity, biodiversity, climate resilience
- Integrated SuDS (from source to point of discharge)

Feedback on possible content:

- Welsh standard wording applicable, but insufficiently positive
- Should be flexible and practical

Supporting needs/options:

- Clear methodology that recognises challenges on small, high density sites
- Audit trail / deemed to comply / checklist approach that is evidence-based
- Improved and accessible guidance (if SIA approach adopted)
- Links to detailed component design in SuDS Manual
- More guidance on use and integration of proprietary products

Proposed standard: **Amenity**

Level of support for a new standard: **Significant**

Required outcomes:

- SuDS contribute to the creation of beautiful, attractive places
- SuDS features are desirable or useful, in particular enhancing children's play and education opportunities
- Safe, landscape sensitive features in keeping with development objectives
- Clean water in public open space

Feedback on possible content:

- Welsh standard wording applicable
- Needs to promote effective consideration on all sites but remain flexible, recognising challenges
- Focus on appearance (visual quality) rather than functionality

Supporting needs/options:

- Consider value of a hierarchical standard (including addressing biodiversity vs infiltration)
- Demonstration (audit trail ?) of effective SuDS strategy development process (including consultation)
- Evidence consideration of amenity
- Deemed to comply checklist of requirements for any performance metrics
- Guidance on links to Design & Access statements, design codes, NPPF and local policy
- Clear guidance on SuDS and safety

Proposed standard: **Biodiversity**

Level of support for a new standard: **Significant**

Required outcomes:

- SuDS include valuable habitats
- SuDS include wildflowers and trees (linking to amenity, climate resilience and well-being)
- Links to BNG delivery where possible

Feedback on possible content:

- Welsh standard wording applicable
- Needs to promote effective consideration on all sites but remain flexible, recognising challenges
- Keep simple
- Do not explicitly reference BNG in standard

Supporting needs/options:

- Consider value of a hierarchical standard (including addressing biodiversity vs infiltration)
- Deemed to comply guidance for any performance metrics (consider traffic light approach)
- Evidence consideration and integration of biodiversity throughout site
- Deemed to comply checklist of requirements
- Guidance on links to NPPF and local policy
- Leave detailed guidance to local authorities
- Consider use of offsetting

Proposed standard: **Managing everyday rainfall**

Level of support for a new standard: **Significant**

Required outcomes:

- First 5mm is managed/retained on site
- Source control and surface SuDS that support water quality, amenity, biodiversity and climate resilience objectives
- Drive a shift from pipe to pond solutions

Feedback on possible content:

- Welsh standard wording considered applicable and flexible
- Use of term 'managing everyday rainfall' better than 'interception'
- Needs to encourage a positive approach

Supporting needs/options:

- Clarify links to other standards
- Improve understanding and awareness of compliance strategies through clear guidance and tools
- Consider hierarchical standard, with accepted exclusions
- Consider performance/ contribution of on-plot measures

Proposed standard: **Climate resilience**

Level of support for a new standard: **Moderate**

Required outcomes:

- SuDS that help manage climate change impacts on developments (including heat island effects)

- SuDS that support water cycle management and water security

Feedback on possible content:

- Runoff destination hierarchy would be consistent with London Plan and DCG

Supporting needs/options:

- A robust definition would be required to support any standard
- Clear guidance would be needed on consideration of rainwater harvesting as it is recognised as impractical for a large number of developments
- Consider links to local plan and Building regulations

3 Detailed feedback from first round

3.1 Water quality

3.1.1 Outcomes

The key outcome was discussed as being the reduction of diffuse pollution through the treatment of surface water runoff. It was suggested that this Standard could underpin the delivery of multiple benefits (biodiversity, amenity and climate resilience) through managing water on the surface and using SuDS.

It was suggested that runoff needs to be treated through the site, not just at the point of discharge. This approach could support the use of distributed source control SuDS components (rain gardens, swales etc).

3.1.2 Type of requirements

There was consensus that a Standard needed a clear methodology with a simple and accessible process. There was a suggestion that this Standard could be linked to the discharge point for the site and that a hierarchical Standard with greater treatment depending on the point of discharge and the sensitivity/risk of the receptor (e.g. ground water, surface water body, sewer) could be used.

Approaches discussed included:

- Simple Index Approach (SIA as referred to in the CIRIA SuDS Manual and the Welsh SuDS Standards)
- Deemed to comply approach - based on mitigation offered by components

- Microdrainage WQ analysis approach
- The delivery of treatment stages (an obsolete concept predating the current CIRIA SuDS Manual).

There was discussion whether it was sufficient to achieve 'no worsening' of the situation through mitigation and this would require an understanding of the baseline. This may be particularly appropriate for SuDS on pre-developed sites.

There was also some discussion as to whether the SIA approach was simple enough to follow and, where it is not possible to manage water on the surface or use vegetation to treat runoff, whether certification of proprietary products can be used.

3.1.3 Approaches to design/evaluation

It was unclear as to how much of an evidence base is required around the potential for SuDS to provide treatment of water quality. Common practice is for developers to use oil interceptors and deep trap gullies. To overcome this there needs to be awareness raising and training.

The delivery of water quality on small, dense sites can be challenging and the approach to design and evaluation needs to recognise these challenges and circumstances in terms of the risks and opportunities for mitigation through source control, like permeable paving and rain gardens.

There was some consensus that applicants would need to provide an audit trail of a design process for review that considered risk and mitigation. This could potentially be presented with the SIA, or a deemed to comply approach with improved guidance on the necessary characteristics of SuDS components.

There was discussion around the suitability of the SIA, with one participant suggesting it was a barrier, rather than an enabler. It was agreed that it would be necessary to provide additional narrative around the use of the SIA. Another participant suggested the reversion to the use of treatment stages (although this was often applied very poorly in the past).

3.1.4 Links with other processes/guidance

The linkage with the CIRIA SuDS Manual was discussed. It was suggested that the information on the SIA should be improved as the process was accessible to everyone and understood by some practitioners. However, the narrative could be improved and it would be useful for more evidence (particularly on impact on groundwater).

There was also reference to guidance used by LLFAs and Highway Authorities. If LLFAs have their own guidance this should build on the SIA. Similarly, if Highway Authorities

have guidance on drainage and SuDS design there should be synergies with good SuDS design.

3.2 Climate resilient development

3.2.1 Outcomes

It was recognised that a robust definition would be required for this to be included as a Standard to ensure that the development delivers under a future climate scenario.

It was suggested that the outcome should promote the management of climate change impacts on the developments and adaptation that enable sites to accommodate increasing intensity of rainfall, future storage requirements and property resilience for now and the future.

It is also recognised that SuDS on developments can deliver thermal comfort, primarily urban cooling through shade and evaporative cooling to counter potential impacts of urban heat islands.

The Standard would need to recognise potential uncertainty and enable future proofing for both drainage elements and also water resources/supply. There was mention of the development supporting overall water cycle management.

3.2.2 Type of requirements

It was suggested that rainwater harvesting could be introduced as a requirement, through Interception, or a requirement to consider a drainage discharge hierarchy with the use of rainwater being the highest priority. This could be consistent with the London Plan and the Design and Construction Guidance.

It was also suggested that the NSTS shouldn't be changed to include Climate resilient development, but additional guidance should be provided to planners and designers.

3.2.3 Approaches to design and evaluation

Concern was expressed about the LLFA needing to review aspects of development planning and design that should be covered by the LPA. Local Plans and initiatives run by WaSCs and LPAs would be better placed to regulate and incentivise reduced water consumption.

It was remarked that whilst the London Plan uses a discharge hierarchy with rainwater use as the most preferable option it has not been particularly effective at driving rainwater harvesting.

3.2.4 Links with other processes/guidance

It was suggested that the exclusion of rainwater harvesting in the National Planning Policy Framework (NPPF) is a challenge. However, it was recognised as a useful inclusion in Water UK's Design and Construction Guidance and it may become more prevalent following the Environment Agency's focus on adaptive pathways.

It was suggested that existing requirements in planning needed to be considered, but planners require more guidance. It was suggested that potential interactions with planning process were:

- Inclusion in Local Plan
- Appropriate references in national guidance and policy, including building regulations
- Obtaining consistency and ensuring appropriate precedents are set with applications.

Specific reference was made to the need for guidance regarding future rainfall patterns, and the process for considering climate change in terms of time horizons, projections, rainfall intensities and the range of uncertainties.

3.3 Biodiversity

3.3.1 Outcomes

Potential outcomes included synergies and delivery of Biodiversity Net Gain (BNG) and Natural Capital on SuDS schemes. The North West SuDS proforma considers systems and processes that need to be delivered. Specific outcomes included wildflowers and trees in SuDS components.

3.3.2 Type of requirements

It was suggested that this could be a hierarchical Standard with a preference for surface/open SuDS components. The application would require a demonstration that opportunities for biodiversity were considered throughout the site – potentially through the use of checklists.

A statement on how the drainage submission has considered biodiversity and how the scheme will integrate biodiversity would be useful to include. There was some discussion about the difficulties infill developments, constrained and small sites can have when trying to deliver biodiversity. A question was raised as to whether, BNG could be delivered outside the development boundary (offsetting).

There was some suggestion that Flood Risk Assessments and drainage strategies should include a compulsory section on delivering multiple benefits and natural capital gain in every project.

The interaction with BNG is a potential opportunity; it was questioned whether this should be integrated within the SuDS submission or standalone.

3.3.3 Approaches to design and evaluation

Reference was made to Welsh Standards in terms of how applicants and assessors can quantify the maximisation of biodiversity benefits. Concern was expressed about LLFA's not having the competencies to assess biodiversity and the potential need for input from ecologists.

The inclusion of multiple benefits like biodiversity will require input and assessment from multiple experts. Questions were raised about how this can be resourced and managed. This could be particularly challenging in two tier authorities where there is a potential disconnect with drainage and planning policy.

3.3.4 Links with other processes/guidance

A number of Local Plans have policies on biodiversity. There are also a number of Natural Capital calculators available. Any national Standard needs to help consistency and avoid the proliferation of local policies.

Linkage with BNG and any Urban Greening Factors need to be considered.

3.4 Amenity

3.4.1 Outcomes

Outcomes were thought to include the delivery of beautiful places with visual interest and somewhere pleasant to visit. The SuDS component or scheme should be accessible and connected with a pragmatic approach to health and safety.

The SuDS component should be a desirable or useful feature integrated into the development and if possible should include safe places for children to play.

In constrained sites, hard features such as rills, hard edged ponds, etc. should deliver an aesthetically pleasing, landscape sensitive design which is also safe.

The interactions of Standards relating to water quality and Interception need to be recognised to deliver this requirement ensuring that the runoff being managed is relatively clean and that public space can also be used for amenity.

3.4.2 Type of requirements

It was suggested that this could include a hierarchical Standard based on managing water on/near the surface and keeping it visual. A hierarchy could also be related to the opportunities/constraints on a particular site (i.e. differentiating between small, constrained sites or a significant housing development where amenity would be valued (as opposed to an industrial estate).

A two stage Standard was proposed where:

- i. Process led approach – where the applicant presents the strategy for delivering amenity based on the site opportunities and constraints.
- ii. Specific requirements for drainage submissions to include and deliver, e.g. interpretation boards.

There was discussion that it would be beneficial to provide clarity on what is the primary purpose of the SuDS scheme, or component. Whether it was to provide drainage, or amenity.

It was suggested it would be desirable to link to existing requirements and it might be useful to link the requirement for the Standards to the requirement for 'design and access statements'.

It was also suggested that some local authorities may have their own guidance that needs to be followed to set out a common approach to design and evaluation.

3.4.3 Approaches to design and evaluation

Early design consideration is important to achieve multiple benefits like amenity and biodiversity. It was discussed that it might be beneficial to link the delivery of amenity to existing documents like:

- Design codes – standardising design
- Designing for streets

It was suggested that requirements could be included on visual quality and amenity and it would be useful to include an audit trail to explain a design process and demonstrate the consideration of amenity. This could include information on the design, cross sections and plans to demonstrate the amenity value of the scheme.

It was also suggested that there is a need to overcome challenges around safety and SuDS.

3.4.4 Links with other processes/guidance

Linking to requirements for Amenity in the NPPF was considered useful, as were pre-application discussions that included delivering any amenity requirements.

Concern was expressed about the introduction of additional requirements and the benefits of using design and access statements and linkages with landscape delivery.

3.5 Managing everyday rainfall

3.5.1 Outcomes

There was consensus that the Standard needs to be clearly defined. Within the focus group sessions it was agreed that this was where the first 5mm of a rainfall event should be managed, or retained on site.

There was growing recognition that managing the first 5mm, delivering Interception and managing everyday rainfall is necessary as well as the larger rainfall events. Interception helps to deliver:

- Greater runoff volume losses and help reduce peak runoff rates
- The use of nature-based solutions and green infrastructure that utilise evapotranspiration.
- Protection of hydro morphology of small receiving watercourses
- Reduction of diffuse pollution in receiving watercourses
- Underpins other benefits
 - Infiltration (where possible) – base flows and groundwater recharge
 - Water quality – treatment through reducing runoff and the use of vegetated systems treating runoff closer to its source
 - Amenity – vegetative, surface water features
 - Climate resilient development through RWH (reduced water demand), infiltration (groundwater and river base flow recharge) and vegetation (urban cooling, air quality)

The process was described as making developments more spongy. It was recognised that distributing source control over the site would make downstream components more usable and if well designed would reduce the need for pipe-to-pond schemes.

3.5.2 Type of requirements

There was discussion whether the Welsh Standard's requirement for Interception could be replicated for the NSTS. There were some concerns expressed about the subjectivity of the Welsh Standards. A few of the groups discussed whether the inclusion of a hierarchy based on site constraints and opportunities could be included.

There were questions around the wording, could a '1:1 event' be used to define Interception, or would this reduce the chances of achieving evapotranspiration and green SuDS components. It is important that the requirement for Interception is accompanied with guidance and the evidence based.

It was suggested that the applicant needs to demonstrate Interception is delivered via distributed source control and green components to help deliver multiple benefits and reduce the volume of storage that needs to be managed.

There were some key elements that the requirement needs to consider.

- Inclusion of plot systems (i.e. within the individual property/house curtilage) as part of the drainage provision for the development site and how long will they remain in place and whether the householders/property owners are aware of the maintenance requirements.
- Inclusion of some SuDS components needs to be accepted - some LLFAs do not accept certain SuDS components for varying reasons (e.g. permeable paving, RWH).
- Approaches for Interception should be deliverable for different site contexts (ground conditions, sizes, different densities, historic requirements).

The drainage submission needs to include the demonstration of Interception. However, the development and design process needs to consider opportunities for Interception from the outset.

3.5.3 Approaches to design and evaluation

The requirement needs accompanying guidance to help deliver a consistent application and evaluation process. However, the requirement needs to be simple to understand and evaluate, particularly for smaller developers and less experienced designers.

It was commented that the guidance in the SuDS Manual is workable – but some developers find it too complicated.

There were some different opinions on how the implementation of Interception can be achieved. There was uncertainty as to whether simple tools are helpful as it may be

beneficial for practitioners to have a good level of understanding of the design process. It was suggested a checklist could be useful to demonstrate compliance with an appropriate rating/scoring system.

It was also suggested that the 'deemed to comply' approach could include some rules of thumb related to catchment and size of SuDS component. Reference was made to a table in the previous British Standard.

If good SuDS could be described as distributed, source control, whether a Standard is required, as it should be the inevitable outcome. Interception should not be too dependent on expensive modelling software.

3.5.4 Links with other processes/guidance

The need for awareness raising and sharing of evidence was raised by a few groups. It was also suggested that early engagement is critical.

With the introduction of the Design and Construction Guidance there was some discussion around the interaction of Water and Sewerage Companies (WaSCs) and requirements for Interception. WaSCs are likely to be very supportive of managing surface water. However, some WaSCs require SuDS to be lined, which can be perceived as reducing the opportunities for Interception.

4 Feedback on proposed updates to the NSTS (first round)

During the first two workshops a number of participants suggested that the Welsh Standards particularly for Interception (managing everyday rainfall), Water Quality, Amenity and Biodiversity could be replicated in the updated NSTS. The opportunity was also taken to explore thoughts on climate resilient developments

4.1 Managing everyday rainfall

Welsh Standard S2 (part 1): Surface water runoff hydraulic control

Surface water should be managed to prevent, so far as possible, any discharge from the site for the majority of rainfall events of less than 5mm.

4.1.1 Application to NSTS

The wording for the Welsh Standards was considered applicable and achievable and had been delivered elsewhere. The wording of ‘so far as possible’, and ‘majority of rainfall events’ was thought to be flexible and objective.

It was also suggested that “managing everyday rainfall” is a better term than Interception. Good SuDS managing everyday rainfall should be a basic requirement – not just for inclusion in flood risk areas.

Early engagement between the developer and their design team, then the developer and the LPA and LLFA is important to obtain good SuDS outcomes. The opportunities for Interception need to be seen in context with the site. Poor designs can be easily overcome.

The Standard needs to encourage a positive approach to delivering Standards and this will require effective communications and promotion.

4.1.2 Potential challenges

The requirements for Interception could be improved by the inclusion of managing water on the surface. However, there is a lack of understanding across many of the stakeholders about compliance, particularly how Interception can be delivered on challenging sites.

A clear and consistent national approach to deliver Interception is required. It was accepted that delivering Interception would require early engagement (probably pre-application discussions) and that the planning and development process could also influence the delivery of Interception and multiple benefits.

It was suggested that there may be a gap in knowledge, design and modelling tools to support the attenuation of flows and storage on the surface. It was mentioned that modelling approaches may not sufficiently enable an assessment of natural losses from the system.

If a flexible approach is provided by the Standards, care needs to be taken to ensure that it is not abused by tokenistic delivery of green elements that do not deliver Interception sufficiently for the site/catchment.

4.1.3 Suggested changes

It was suggested that there should be reference to managing rainfall close to where it falls and the delivery of effective source control, which was taken forward in the definition of ‘a SuDS approach’.

It was suggested that there could be an expectation to deliver a minimum of Interception, and if this is not possible a justification should be provided by the applicant, which was taken forward in the clarifications for this standard.

It was also suggested that links to resilience and adaptation of developments should be encouraged. This was considered by the Contractor as more relevant for inclusion in additional information.

4.1.4 How can the Standards be measured

It was suggested it would be useful if applicants provided a SuDS strategy, or concept plan that provided a clear presentation of how rainfall and runoff can be managed. A deemed to comply approach is helpful to ensure that the SuDS components are not tokenistic.

A pre-application discussion was considered important. It would be useful to ask for evidence of the design approach (appropriate guidance on evidence and decision making process was thought beneficial). If Interception is not possible the applicant should provide suitable justification.

It was suggested that more accessible (simple and clear) guidance was essential to support design and compliance as multiple benefits need to be delivered. The lack of design and assessment tools was presented as a challenge.

4.2 Water quality

Welsh Standard S3: Surface water quality management

Treatment for surface water runoff should be provided to prevent negative impacts on the receiving water quality and/or protect downstream drainage systems, including sewers.

4.2.1 Application to NSTS

The intent of the Welsh Standard was considered to be very applicable to England. Although some of the wording of the Standard and associated guidance was thought to be confusing as it was thought to be negative (i.e. preventative, not making things worse) and infers the impact of the development needs to be assessed (i.e. the existing water quality must be known and the change resulting from the development must be compared with this). This could also include the impact of the SuDS reducing flows into the sewer (which may not be desirable and the extent of the problem needs to be clarified).

A Standard for water quality shouldn't be seen as a hurdle; it should be flexible and practical. It was suggested that the outcome should be proportionate to the risk and scale of the development.

The approach needs to be based on the available evidence in terms of the risk and potential for pollution prevention and water quality treatment provided by SuDS.

4.2.2 Potential challenges

It was queried whether the wording is negative and could be challenging. It was also suggested that the Standard may require an assessment of pollutant levels before and after the intervention.

There was some discussion around the appropriateness of the Simple Index Approach (SIA). The SIA does not demonstrate whether the runoff and/or mitigation is having a negative impact on the receiving water bodies. The guidance within the Welsh Standards is potentially slightly different and seems more achievable.

It was suggested that guidance could reference a staged/checklist approach identifying where it might be necessary to escalate the mitigation. It was also suggested that more evidence/guidance on proprietary products and their potential role might be useful.

4.2.3 Suggested changes

Potential words to consider include: 'protecting', 'sensitive receiving environments', 'risk' and 'betterment'. This was considered by the Contractor as more relevant for inclusion in additional guidance.

It was also suggested that impact of pollution during the construction phase should also be considered. This was considered by the Contractor as more relevant for inclusion in additional information.

4.2.4 How can the Standards be measured

It was stressed that the approach must be simple and not dependent on testing and sampling, unless in response to a specific EA requirement/conditions.

It was suggested that the Simple Index Approach is relatively simple to follow. However, there may be merit in revisiting and expanding on the information provided as it has limited applicability at present. More guidance may be required, for example, for approaches to deal with a sensitive receptor and obtaining relevant specialist input.

4.3 Amenity

Welsh Standard S4: Amenity

The design of the surface water management system should maximise amenity benefits.

4.3.1 Application to NSTS

It was suggested that the Welsh Standards would be applicable in England and it would be useful to have the similar exception through the inclusion of “maximise”.

4.3.2 Potential challenges

It was suggested that amenity can be quite subjective, in terms of preferences. There may also be situations where amenity is less necessary (e.g. the site is not accessible or visible to the general public), or difficult. Delivering amenity in constrained sites, or where viability is marginal, is likely to involve landscape and urban design (particularly working with hard landscapes and integration of amenity). Amenity could be at the discretion of the LPA and the LLFA and the language needs to be understood by planners. The lack of relevant resources in local government is likely to be a challenge.

The language could be based on what SuDS look like, as well as being functional assets. It is recognised that the drainage function should be the priority – but it can also deliver amenity.

The Welsh Standards has two pages of useful guidance.

Amenity can relate to multifunctional space, in terms of it being usable and safe Public Open Space (POS). Guidance could refer to the site context in terms of what could be achieved.

4.3.3 Suggested changes

It was recommended that the wording should focus on the appearance of the SuDS, rather than the functionality. Although it was recognised that there may be some tension between the drainage function and the aesthetic value of SuDS components that may be slightly more subjective. This was considered by the Contractor as more relevant for inclusion in additional guidance.

The focus of the Standard could be on the opportunity that SuDS provide to deliver improvements to visual quality. This was considered by the Contractor as more relevant for inclusion in additional guidance.

4.3.4 How can the Standards be measured

It was suggested that the runoff needed to be clean to support an attractive SuDS component, however it was mentioned this could be delivered by proprietary components as well. The SuDS components need to be accessible and safe.

It was suggested that as the assessment of Amenity is likely to be subjective, the use of SMART objectives where possible were useful. Some specific requirements for Amenity, were suggested:

- Beautiful/attractive
- Usable
- Accessible
- Safe

It was remarked that landscape architects and urban designers would be well placed to review applications.

4.4 Climate resilient developments

Welsh Standard S1 (part 1): Surface water runoff destination

Priority Level 1: Surface water runoff is collected for use

4.4.1 Application to NSTS

The group was not able to conclude whether this Standard would deliver the outcome of climate resilient developments. Having a priority/hierarchical approach is problematical as it does not necessarily recognise all the benefits of certain approaches.

It was suggested that planning policy may be more beneficial for these types of challenges, particularly water scarcity. The London Plan has a drainage discharge preference that prioritised Rainwater Harvesting (RWH). However, there is pushback from developers. It is not included as a quantified benefit for the hydraulic Standards so this reduced the incentives. Maintenance and security of performance was thought to be a challenge.

It was recognised, however, that RWH technology is improving and active system management could be a benefit. It was suggested the challenge is synergistic with the uptake of water meters; these are installed in new properties and cannot be removed. Could this be the same with RWH?

It was recognised that the NPPF and PPG require climate change considerations in relation to water quantity uplifts. However, other climate resilience challenges like drought, high intensity storms, or urban heat island are overlooked.

4.4.2 Potential challenges

It was not considered practical for all developments to have rainwater harvesting. If the requirements are too complicated or the cost-effectiveness is not clear, the requirement is likely to be bypassed. There was recognition that overall surface water management was still required, so maybe the outcomes need to be complementary.

4.5 Biodiversity

Welsh Standard S5: Biodiversity

The design of the surface water management system should maximise biodiversity benefits.

4.5.1 Application to NSTS

It was recognised that revising the Standards should discourage 'pipe-to-pond', or 'pipe-to-tank' systems. The approach to include biodiversity should not make the application of Standards too complex or specialist.

Linkages with Biodiversity Net Gain (BNG) were discussed and the potential for SuDS to deliver BNG requirements. Linking drainage design, landscape and biodiversity would deliver good outcomes. However, BNG should not be incorporated into the Standard itself, as the LLFA does not have the resources to assess this.

BNG delivery could be challenging when infiltration through soakaways is being delivered. It was also suggested that biodiversity may not be possible to deliver on all sites and the applicability to sites like industrial sites may need to be considered.

The inclusion of Standard on biodiversity will require designers to consider the inclusion of biodiversity and whether an holistic drainage design can contribute to BNG.

4.5.2 Potential challenges

The applicability of the Standard to different types of planning application would need to be considered. For example, is biodiversity always necessary? Should all SuDS components deliver biodiversity?

It was suggested that the Standards need to be clear and consistent. However, the use of 'should' within the wording was questioned and whether it was strong enough.

The Standards need to encourage SuDS design that combine grey and green, integrating below and surface components. It was questioned whether this Standard is the means by which biodiverse solutions can be delivered, or whether such solutions are delivered with Interception and water quality Standards?

4.5.3 Suggested changes

The emphasis on simplicity was made, particularly as the wording of the Standard should enable a discussion to start. Quantification is likely to make it more/too complicated.

It was suggested that the Standard needs to be accessible and that detailed guidance should be left to the LPA and LLFA as the local context will influence appropriate solutions.

There was some discussion about offsetting biodiversity where it may not be possible to integrate biodiversity into the drainage system on the site. The Standard should potentially consider how biodiversity could be offset. This was considered by the Contractor as more relevant for inclusion in additional guidance.

4.5.4 How can the Standards be measured

It was suggested it should be easy to identify preferred options for the delivery of biodiverse schemes and that this is likely to require interaction between drainage engineers and ecologists. This Standard should also link to achievement of local authority policies on biodiversity and landscape.

It was suggested that the pre-application process is crucial.

A traffic light assessment scheme was suggested, which could indicate to the applicant how well the proposed scheme delivers on biodiversity and where to put in more effort. This could be discussed and shared at pre-app stage and discussed later.

4.6 General considerations

It was remarked that some of the responses from the survey suggested that there were still some myths that needed to be dispelled and still a need for greater awareness and education.

There was general agreement that Standards need to remain accessible. It was suggested that the Welsh guidance of 60 pages is too long. However, participants appreciated exceptions being explained.

There was a discussion that the delivery of different types of multiple benefits is likely to be linked and it is difficult for benefits to be considered in isolation.

5 Feedback on proposed updates to the NSTS (second round)

A presentation given during the workshop provided an overview of the updated interim standards including the use of ‘a SuDS approach’ and the development of the proposed updated standards including:

- Standard 1: Prioritising runoff destinations
- Standard 2: Managing runoff from everyday rainfall
- Standard 3: Managing runoff from extreme rainfall
- Standard 4: Managing the quality of runoff
- Standard 5: Implementing SuDS with amenity value
- Standard 6: Implementing SuDS with biodiversity value

For each standard, the rationale in terms of the objectives and desired outcomes were presented to participants, together with the wording for the standards, clarification statements and additional recommendations for using the standards.

5.1 Clarity around the “SuDS approach” definition

Clarity is required around the definition of SuDS components that should be encouraged in terms delivering ‘multi-functionality’ and the use of a variety of processes to manage surface water (conveyance, infiltration etc.). However, it is recognised that some drainage components, particularly ancillaries are not multi-functional (e.g. a flow control).

The terms ‘SuDS components’ and ‘SuDS features’ are used interchangeably. The Design and Construction Guidance and SuDS Manual primarily reference ‘SuDS components’, and this is the recommended terminology.

The aspiration to ‘mimic natural drainage’ within the definition of a SuDS approach should be included as this could discourage the proliferation of underground and end of pipe ponds approaches.

It was recognised that additional guidance could be useful alongside implementation of the standards. The Interim Draft Standards do identify potential requirements for guidance

primarily to identify specific information within the SuDS Manual, but additional guidance should enable such information to be more accessible and aligned with the requirements of the standards in terms of delivery and assessment.

It was suggested that using a “SuDS approach” implies a process. The definition should be explicit that this process requires early engagement, effective integration of SuDS and involves the appropriate professionals both in the planning process and the design of the drainage system. It may also be helpful to list the appropriate professions to involve.

5.2 S1: Prioritising runoff destinations

5.2.1 Clarity of the standard and clarifications statements

The standard and clarification statements were considered to be quite clear. However, it was suggested the hierarchy should focus on the levels 1-3 as described in the Interim Draft Standards, with items for a) to c) considered principles rather than the hierarchy. This would provide a logic of progression and encourage the delivery of better outcomes for discharges.

The option of discharging to foul (clarification 11) should be the very last resort, and only considered once evidence of all other options has been considered.

There was uncertainty around the term “other surface water drainage system” (as part of the Level 2 definition) which could be made consistent with terminology in the NPPF or, refer to ‘other justified surface water drainage system’.

5.2.2 Ease of delivering and assessing the standards

It was suggested that achieving Level 2 could be challenging when connecting to highway drainage. This requires further clarification as some highway authorities reject options for connection.

The difficulty of delivering rainwater harvesting was recognised and it was suggested this may be a viability challenge for some developments.

5.2.3 What changes to the standard or clarifications statements could be made

Within Level 1, it might be worth reviewing terminology within the Land Drainage Act, as a ‘ditch’ can also be considered an Ordinary Watercourse, and it may therefore be more appropriate to replace ‘ditch’ with reference to ‘relevant watercourse’.

It was suggested it might be useful for further clarity on whether shallow, or deep infiltration should be permitted. Norfolk Lead Local Flood Authority (LLFA) guidance has

made the differentiation and explains that deep infiltration would be considered after discharge to a combined sewer. It was also emphasised deep infiltration is not referred to in The SuDS Manual.

5.3 S2: Managing runoff from everyday rainfall

5.3.1 Clarity of the standard and clarifications statements

The wording of the standard (i.e. use of “frequent”) is quite vague, it could be more explicit if related to a return period (i.e. more frequent than 1:1 year event).

Clarification 2 – needed to define ‘losses’.

5.3.2 Ease of delivering and assessing the standards

It was suggested achieving this standard is likely to be problematic for some sites that are very impermeable, on contaminated land or particularly small and constrained sites. The industry is still reluctant to use blue-green roofs. It was also recognised that smaller developers or those developing on small parcels of land are likely to lack knowledge and experience.

5.3.3 What changes to the standard or clarifications statements could be made

It was suggested that more detail regarding interception mechanisms (as included in Table 24.6 in the SuDS Manual) would be useful. Greater clarity may also be required about the SuDS component and the drainage catchment.

It was also suggested that the clarifications could make greater reference to the distribution of SuDS in smaller components across the site.

5.3.4 Specific queries on the standard

It was suggested that approvers and practitioners are likely to require further guidance on assessing and demonstrating the delivery of Interception. It would also be useful to include guidance on Interception for challenging sites.

5.4 S3: Managing runoff from extreme rainfall

5.4.1 Clarity of the standard and clarifications statements

Overall it was thought the standard was clear. However, it was suggested it would be useful to undertake a “sense check” to demonstrate the achievability of the greenfield relaxation rates. Achieving 50% betterment was considered to be challenging for many applicants.

It was also recognised that there is considerable variation in how LLFAs manage runoff from brownfield sites. Where a site has existing development, reducing to the greenfield rate of runoff could be very challenging, particularly where they may only be redeveloping a small part of the site.

It was suggested that rainfall events of intermediate return periods (1:30) could impact capacity of receiving water bodies, particularly sewers for WaSCs. It was suggested reference to this may be better included in clarifications rather than within the standard.

It was suggested that consideration of downstream capacity should be assessed. If there is capacity, it may be possible to allow for relaxation. It was also suggested that exceedance routes should be covered by the standard and/or clarification statements.

5.4.2 Ease of delivering and assessing the standards

It was suggested that the proposed standard together with the clarifications on appropriate approaches would make assessment easier than the current standard.

Assessing the standard for previously developed sites maybe challenging to deliver.

5.4.3 What changes to the standard or clarifications statements could be made

The group encouraged the re-consideration of the greenfield relaxation factor (clarification 5).

It was remarked that there is some discrepancy between authorities in terms of how they use the 2l/s/ha runoff recommendation (Note 1), but they were unsure whether this should be included in the standards or clarification.

Discussions suggested that possible prescription on allowances and approaches should be reduced. Where possible the requirements (urban creep uplift factor of 10%), and/or methodology for urban creep should not be prescriptive in the guidance. However, it was recognised that designers should use the latest and best rainfall models and flexibility would be beneficial.

Within the meeting 'chat' it was suggested that clarity on how an alternative runoff rate can be specified by the LLFA in conjunction with the WaSC for sewers would be useful as this otherwise could cause delays.

5.5 S4: Managing the quality of runoff

5.5.1 Clarity of the standard and clarifications statements

The wording for this standard was regarded as being simple to follow. It was suggested that the term 'bodies' may not be required.

There was concern that the Simple Index Approach (SIA) may undermine the Interception standard as this might encourage a "pipe to pond" approach. It was also suggested that the inclusion of the term 'SuDS treatment train' within the standard should be considered.

5.5.2 Ease of delivering and assessing the standards

There was some discussion around exception clauses and the justification of relaxations. It was accepted the standard should be aspirational but it was suggested that Local Planning Authorities may need to agree exceptions on a site by site basis – particularly for constrained sites.

The clarification statements need to be clear and flexible enough to accommodate unusual sites. Difficult sites require a clear statement to justify the approach and planners should be required to determine where relaxation is justified.

It was thought that the standard and clarification statements should not include 'where possible' within the language as this is already implicit within the planning policy.

Some concern was expressed around highway authorities accepting permeable paving and other SuDS components that are particularly helpful in delivering compliance of the standard.

5.5.3 What changes to the standard or clarifications statements could be made

The standard and clarification statements needed to make it clear that runoff from all impervious surfaces should be treated.

The use of the SIA to assist with applying this standard was discussed. It was suggested that to overcome mis-use of the SIA (to justify pipe to pond approach) additional guidance and clarifications may be required.

Approaches to runoff treatment were also discussed, and it was suggested that a minimum of two SuDS treatment components in series should be included as this would be an aspirational target. It was suggested that the inclusion of manufactured products (e.g. filters in manhole covers) could be a potential 'short cut' and will not effectively deliver multiple benefits.

5.6 S5: Delivering amenity

5.6.1 Clarity of the standard and clarifications statements

Focus should be on how the SuDS components, and/or scheme can deliver the amenity value as part of the overall planning application. There was uncertainty as to whether approvers should expect amenity to be delivered on all sites, e.g. industrial estates. However, amenity should be prioritised where people have access to the site.

It was suggested that amenity could be dependent on the delivery of other requirements and also deliver a vast range of other outcomes associated with blue green infrastructure. There is also linkage between Standard 6 on biodiversity and the delivery of biodiversity net gain.

There was some discussion whether there needed to be differentiation, or integration between the definitions of amenity provision and Public Open Space.

5.6.2 Ease of delivering and assessing the standards

It is challenging to assess and quantify amenity. It was questioned where the responsibility for assessment would lie, whether with the LPA and/or LLFA and if sufficient resources would be available?

It was recognised that it can be difficult to deliver amenity on high density, small sites, e.g. through the delivery of basins.

The challenge of integrating amenity into Public Open Space (POS) was recognised – particularly when SuDS and POS are regarded as separate functions. There are recognised benefits for all if SuDS and POS are integrated. Peterborough City Council has considered allowing SuDS features designed to deal with drainage from rainfall in excess of 1:30 year return period to be included as POS.

Evidence should need to be provided by the applicant as to why amenity could not be delivered by SuDS.

It was also remarked that the definition of amenity is very subjective, e.g. this could include character or provision of visual appeal. It was also suggested that delivering outcomes

requiring the management of runoff on the surface would be a welcome outcome of providing amenity.

5.6.3 What changes to the standard or clarifications statements could be made

Suggested changes to the standard included:

- Making reference to SuDS providing amenity where appropriate
- Making the link between SuDS and amenity by including wording “Design SuDS that have amenity value”.

5.6.4 Other queries

It was recognised that this standard could have a significant impact on changing the *status quo* in terms of more schemes managing runoff at, or close to the surface. It was suggested that it would be useful to encourage involvement of planners to help integrate SuDS into new developments and deliver multiple benefits.

5.7 S6: Delivering biodiversity

5.7.1 Clarity of the standard and clarifications statements

Brevity is good as the Standard is clear.

5.7.2 Ease of delivering and assessing the standards

Delivery and assessment of the standard will be dependent on having the appropriate team involved at the right time. Ecologists and biodiversity specialists should be involved from the outset, i.e. at masterplanning stage for large sites. It was also recognised however that this is unlikely to happen for most sites.

Small developers, or those involved in small sites also need to be encouraged to consider and deliver requirements for biodiversity.

5.7.3 What changes to the standard or clarifications statements could be made

It was asked whether reference to good practice was sufficient and whether quantifiable targets and standards could/should be introduced.

Further clarity was required on the evidence that should be supplied. Points 3 and 4 in the clarifications statements make similar points around supplying evidence. Point 3 is focussed on requirements for biodiversity net gain. Is it appropriate for the standards to simply make reference to BNG?

5.7.4 Other queries

There was further discussion around the assessment of biodiversity and whether LLFAs or LPAs should use 'deemed to comply' rules in terms of delivering local biodiversity objectives. Likewise, there was a query as to whether there were tools (like the SIA) for assessing biodiversity. There was also some discussion as to whether it would be necessary to have professional specialist biodiversity support.

There was discussion that the focus should be on the development, rather than opportunities for offsetting off site, which is a possibility with BNG.

6 Discussion regarding implementation of updated standards (second round)

It was recognised that a decision should be made about what information to include in the clarification statements for all standards, the level of detail and what information should be available, or signposted in guidance.

There was some discussion about how the information should be presented, i.e. should all the standards be presented sequentially, and then the clarification statements presented sequentially? Alternatively, should the standard be presented and then immediately followed by a clarification statement?

6.1 Barriers and enablers

The potential barriers and enablers to delivering high quality SuDS were explored with the workshop participants. These are summarised below.

6.1.1 Barriers

- **Skills** - access to appropriate skills and expertise (landscape and ecological knowledge), particularly for smaller developers.
- **Roles & responsibilities** - clarity of roles and responsibilities and the composition of teams within LPAs and LLFAs – particularly in relation to the assessment of amenity and biodiversity.

- **Planning and development process** – outline approvals for planning often do not include detailed information such as site suitability (site investigations etc.)
- **Resources** – access to the appropriate resources/skills could be a challenge particularly for pre-application discussions.
- **Modelling** – if there is a requirement for LLFAs to review modelled outputs, many LLFAs do not have appropriate software or experience to review modelling outputs.
- **Adoption** – there is uncertainty around the longer-term adoption of SuDS schemes to ensure schemes are maintained and their performance secured (local authorities, WaSCs, charitable trusts).
- **Inconsistent design standards** – the differences in requirements and standards for different asset owners/managers and national regulations and guidance make it challenging to deliver good practice and integrated SuDS.
- **Health & Safety** – there is still a perception of SuDS not being ‘safe’ – particularly for public realm. There is a need to overcome this hesitance and the requirement for fencing. However, existing guidance is available and poor design practice (preference for pipe to pond, and the ‘bomb craters’) should be challenged.

6.1.2 Enablers

- **Skills and expertise** – raise awareness and provide opportunities for developers and consultants to obtain additional skills.
- **Deemed to comply approaches** – introduce and improve potential deemed to comply approaches for designing and assessing benefits, particularly for Interception, biodiversity and amenity. Include typical components (e.g. rain gardens, rain planters) in national guidance.
- **Evolving regulatory framework** – the Environment Bill and Planning White Paper may introduce changes like BNG, National Design Code, and a rules based approach that could facilitate the introduction of a checklist and national drainage proforma.
- **Guidance** – clarity of guidance to be provided at a national and local level, e.g. national guidance on greenfield calculations.
- **Early consideration of SuDS design** – inclusion of SuDS conceptual plans and pre-application discussions prior to detailed planning and design should enable greater integration and efficient use of space, rather than trying to ‘retrofit’ SuDS around a pre-determined layout.

- **Vision for drainage** – a simple SuDS vision and concept should be communicated with the drainage submissions.
- **Value of good SuDS** – integrated SuDS and great attractive spaces where people want to live should help sell developments and be attractive to developers.
- **Discussion and collaboration** – early engagement with the right stakeholders is essential, including input from WaSCs at pre-application stage to understand their requirements and addendums. The DCG introduces a requirement for the discussion.

6.2 Application of draft standards to case studies

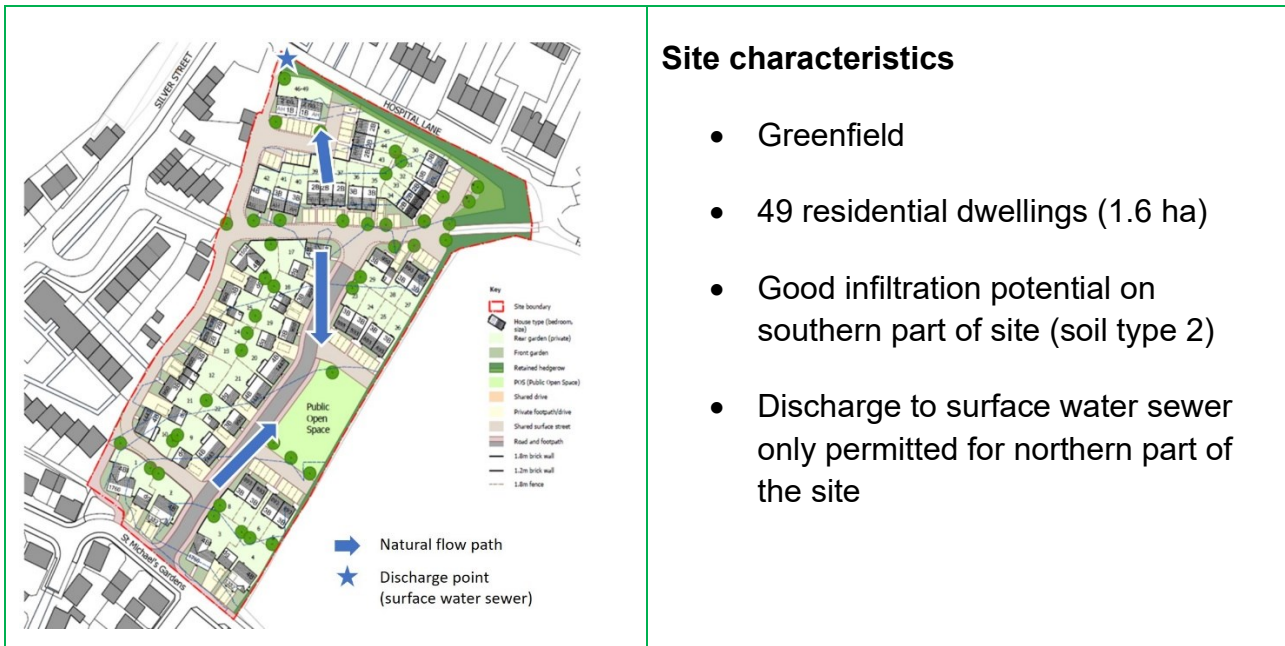
This session was to consider the standards with a view to how they can be applied to typical sites. Two case studies were used covering:

- Site A: Greenfield site
- Site B: Brownfield redevelopment

The breakout sessions were to consider four key questions, these being:

1. How could all of the standards be met for this site?
2. What constraints or barriers do you foresee with respect to delivery/approval of such designs?
3. How could potential designs be assessed for compliance to the standards?
4. What additional guidance would be needed?

6.2.1 Site A: Greenfield site



6.2.1.1 Meeting the standards

Standard 1: destination

- **Rainwater harvesting** - should be maximised where possible.
- **Infiltration** – the specific areas that could be used for infiltration need to be clarified. There could be opportunities for property level infiltration or a more strategic approach. Surface water could be discharged via infiltration in public open space.
- Approaches could utilise geocellular storage across multiple properties. Or rain gardens could be used instead of soakaways. However, it was recognised that continuous monitoring and maintenance could be a challenge to secure.
- **Discharge to sewer** – the green space in the north east could be used for attenuation prior to discharge to the sewer.

Standard 2: Interception

- **Permeable paving** – this could be utilised in the northern part of the site. It was recognised that adoptability of roads and the integration of permeable paving could be a challenge depending on the LLFA and Highways Authority. There may be concerns about maintenance, reinstatement etc.

- **Rain gardens and bioretention** – depending on the design options, the open space in the south could potentially include bioretention. In the north, rain gardens could be used within the individual properties, although maintenance could be challenging.

Standard 3: hydraulics

- Northern part of the site:
 - Assume that infiltration in POS is not possible. This is likely to drive the delivery of source control approach.
 - Rain gardens as part of a SuDS management train could be a potential option. Inclusion of rain gardens within back gardens may be a challenge in terms of maintenance and ensuring there is appropriate overflow.
 - Determine whether accommodating 2l/s/ha is possible.
 - Assess potential for infiltration.
 - Consider storage along Hospital Lane. Highways could have rain gardens and tree pits.
 - Relocate the two houses in the NW corner of the site and include a retention pond adopted by the WaSC.
 - In the NE of the site storage could potentially be included to manage 1:30 – 1:100 year return period rainfall event.
- Southern part of the site:
 - Consider a SuDS management train draining to Public Open Space. (May have to assume the infiltration capacity can accommodate with 1:100 year return period rainfall event).

Standard 4: water quality

- **Simple Index Approach** – this would be applicable and useful for the site.
- **Source control** (rather than end-of-pipe) approach should be accommodated.
- **Permeable paving** – this could be considered in the north of the site, particularly in and around the cul-de-sacs.
- **Bioretention** – bioretention could be used before runoff is discharged to POS in the south.

Standard 5: amenity

- Consider the use of POS and source control components like rain gardens and bioretention. This depends on the needs of the community.

Standard 6: biodiversity

- Similar approach to amenity. Potentially consider the use of an infiltration area as a landscaped area. Bioretention areas adjacent to the roads could deliver biodiversity.

6.2.1.2 Possible constraints and barriers

The discharge to sewer could pose conditions on the how infiltration has been assessed and used.

The interaction of SuDS with highways needs to be understood. Can SuDS within the highways be adopted?

Is single plot source control SuDS acceptable in terms of maintenance and performance? Could information on how the SuDS scheme functions be included in the sales pack? This could also outline the required maintenance.

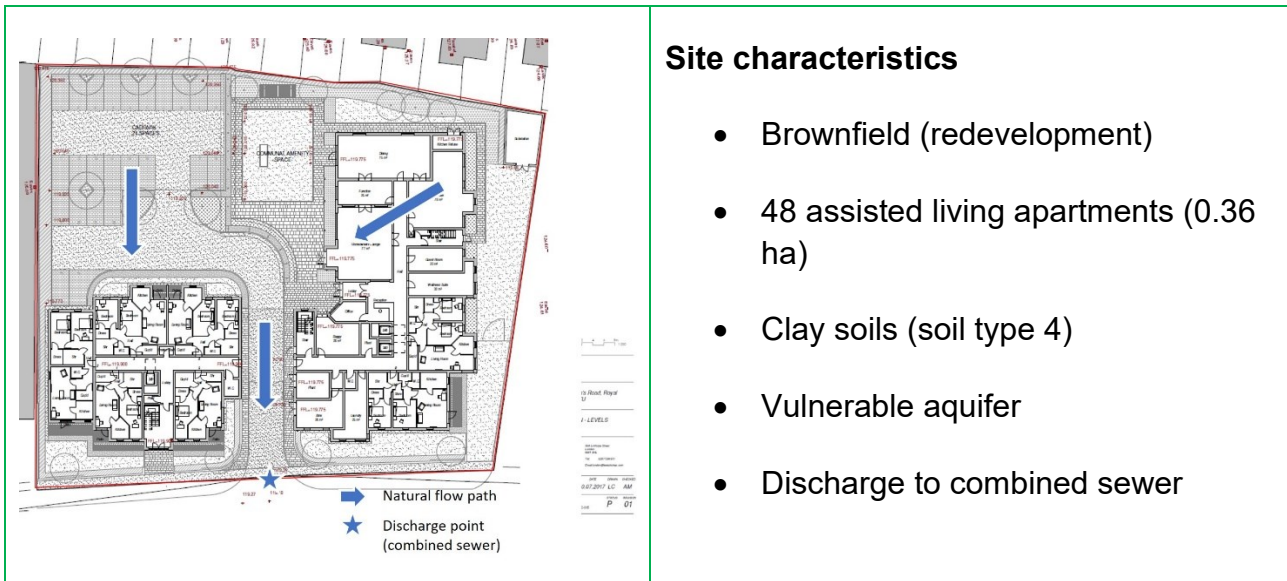
6.2.1.3 Assessing compliance

There was a feeling that SuDS may not have been considered from the outset, with SuDS possibly having to be retrofitted around the site. Opportunities could be maximised if the SuDS were integrated with POS.

A number of assessments would need to be undertaken to help assess compliance, these were listed as:

- Assessment of whether they can deliver 2l/s/ha which would require an assessment of:
 - infiltration capacity over the site
 - Achievable storage volumes
- A discussion with the WaSC would need to take place to determine the capacity of the sewerage system (from the WaSC).

6.2.2 Site B: Brownfield redevelopment



6.2.2.1 Meeting the standards

Standard 1: destination

- **Discharge** – this had already been determined as the combined sewer. However, the discharge hierarchy could still be considered.
- **Rainwater harvesting** – this could supply non-mains water for toilet flushing in communal areas of the assisted living apartments. There could also be opportunities for using harvested rain to irrigate gardens.
- **Infiltration** – even on clay soils some infiltration may be achieved. Permeable paving along the roads and car parking could also be achieved.
- **Attenuation** – what cannot be infiltrated could be attenuated.

Standard 2: Interception

- The approach for delivering the destination standard (standard 1) is likely to assist with delivering Interception.
- Other opportunities with the development could include:
 - Green roofs – flat roofs could be integrated into the SuDS scheme. Green/blue roofs could offset the costs of surface attenuation features.
 - Communal (sunken) spaces could include options for infiltration or bioretention. Accessibility may be a consideration for the residents.

- Downpipes could be connected to rain gardens or rain planters.

Standard 3: hydraulics

- It was thought the green/blue roofs could assist with delivering the hydraulic control required, in combination with the approach to controlling the runoff destination and Interception.

Standard 4: water quality

- A number of components could be used to assist with the delivery of this standard:
 - Permeable driveways and turning areas.
 - Communal sunken spaces could include bioretention or a pond.
 - Rain gardens could treat runoff from roofs and impermeable areas potentially connecting to a swale behind the building in the east.

Standard 5: amenity

- The components and approach used for earlier standards, together with appropriate planting could be helpful in delivering the amenity standard. Raised bed/rain planters could be integrated.

Standard 6: biodiversity

- As discussed for previous standards.

6.2.2.2 Possible constraints and barriers

Some potential constraints and considerations were listed for the components, these being:

- Rainwater harvesting – challenges around client/resident perception of suitability.
- Green roofs – perception of risks and affordability. This will also depend on the vision for the development and the timing of design decisions.
- It was suggested that architects and urban designers (rather than developers) are needed help to understand the potential contribution SuDS could make and how potential risks could be overcome.
- It was suggested that ‘rules of thumb’ or ‘deemed to comply’ rules could assist architects and masterplanners with the initial layout design.

6.2.2.3 Assessing compliance

It was suggested that approaches to assess compliance needed to be simple and concise. An easy approach to determine the proportion of impermeable surfaces and calculate Interception is required.

Rules of thumb, such as Table 24.6 from the CIRIA SuDS Manual, could be helpful for LPAs and LLFAs to assess compliance with requirements like Interception and water quality.

Approaches could also include checklists and proformas for the updated standards (there are many examples) that are developed nationally, but can be amended to be locally specific.

6.2.2.4 Additional guidance

It was recognised that case studies and examples of approaches to cost-effectively deliver Interception and the revised standards would be very welcome. Particularly the inclusion of rainwater harvesting and green/blue roofs.

6.2.3 Conclusions from the example site review

It was generally thought that SuDS that complied with the updated draft standards could be delivered on both example sites.

6.3 Additional points raised

A recap of the earlier outcomes from the workshop was provided. Additional points raised during the discussion were:

- How much information should be included in the clarification statements, and how can the document effectively signpost to further guidance.
- How should the standards and clarifications be presented. Should the standards all be presented sequentially and then the appropriate clarification statements? Or, should the standards and clarification statements be presented together?
- Should there be a standard requiring all development layouts to include provision for SuDS?

Appendix A – Focus group members (first round)

Focus group 1

Bill Blackledge	2B Landscape Consultancy
Doug Mlambo	Anglian Water
Bava Sathan	CampbellReith
Paul Shaffer	CIRIA
Bridget Woods Ballard	HR Wallingford
Helen Udale-Clarke	HW Wallingford
Bronwyn Buntine	Kent County Council
Laura Makeating	Knowsley Council
Martin Riches	Millwood
James Hitching	Northumberland County Council
Patricia Cuervo	Royal Borough of Kensington and Chelsea
Roger Nowell	Sheffield City Council
Simon Bunn	Somerset Drainage Boards Consortium
Andrew Leadbetter	Stirling Maynard
Charles Langtree	The Land Trust
Chris Patmore	WSP

Focus group 2

Paul Shaffer	CIRIA
Helen Renyard	Cumbria County Council
Chris Osborne	Dorset County Council
Simon Maiden-Brooks	Herrington Consulting
John Rumble	Hertfordshire County Council

Bridget Woods Ballard	HR Wallingford
Helen Udale-Clarke	HW Wallingford
Bronwyn Buntine	Kent County Council
Mark Highton	L&Q Estates
Chryse Tinsley	Leicester City Council
Vicky Boorman	London Borough of Hillingdon
Andy Johnson	Patrick Parsons
Kevin Barton	Robert Bray Associates
Martin Spiers	RPS
Daniel Collier	Stantec
Sophie Tucker	United Utilities

Focus group 3

Bill Blackledge	2B Landscape Consultancy
Brian Cafferkey	Ardent
Paul Shaffer	CIRIA
Grant Gahagan	Defra
David Singleton	DSA Environment and Design
Simon Maiden-Brooks	Herrington Consulting
John Rumble	Hertfordshire County Council
Bridget Woods Ballard	HR Wallingford
Helen Udale-Clarke	HW Wallingford
Bronwyn Buntine	Kent County Council
Laura Makeating	Knowsley Council
Stratos Constantinou	L&Q Estates
Vicky Boorman	London Borough of Hillingdon
Priscilla Haselhurst	Medway Council

Martin Riches

Andy Johnson

Simon Bunn

Andrew Leadbetter

Sophie Tucker

Millwood

Patrick Parsons

Somerset Drainage Boards Consortium

Stirling Maynard

United Utilities

Appendix B – Focus group members (second round)

Aimee-Kate Ansell	Somerset County Council
Alex Woolnough	Cambridgeshire County Council
Alys Bishop	Central Bedfordshire Council
Andrew Fisher	Countryside
Andrew Leadbetter	Stirling Maynard
Anna Beasley	JBA
Anthony McCloy	McCloy Consulting
Bill Blackledge	2B Landscape Consultancy
Brian Cafferkey	Ardent
Bronwyn Buntine	Kent County Council (ASA)
Bridget Woods-Ballard	HR Wallingford
Chris Osborne	Dorset County Council
Daniel Collier	Stantec
Doug Mlambo	Anglian Water
Glenn Charles	C & A Consulting Engineers
Glenn Holiday	Redrow Homes
Helen Smith	Somerset County Council
Helen Udale-Clarke	HR Wallingford
James Hitching	Northumberland County Council
Jessica Prest	Cambridgeshire County Council
Kevin Barton	Robert Bray Associates

Laura Makeating	Lancashire County Council
Lee Sencier	Essex County Council
Paul Shaffer	CIRIA
Paul Stewart	Buckland Development Ltd
Robert Webster	Civic Engineers
Roger Nowell	Sheffield City Council
Simon Maiden-Brooks	Herrington Consulting
Sophie Tucker	United Utilities
Sue Illman	Illman Young
Zorica Todorovic	Atkins