

REPORT

East Sussex SuDS Decision Support Tool for Small Scale Development

User Guide - Version 2

Client: East Sussex County Council

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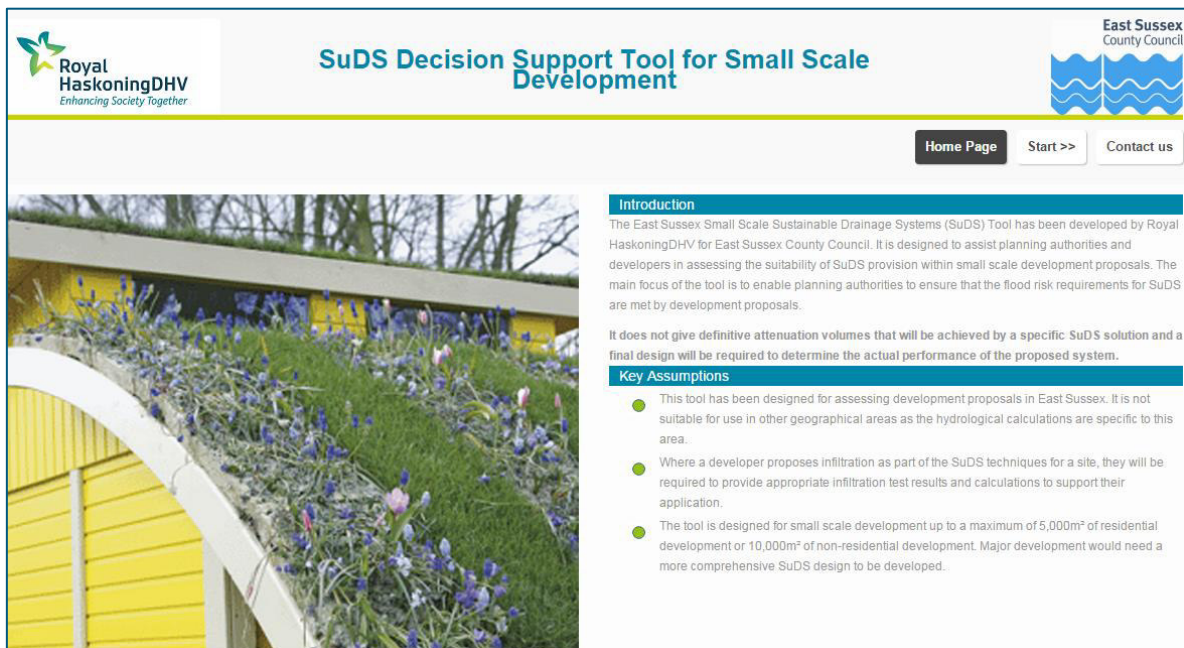
Appendix A - Example Summary Report

1 Introduction

This document gives a brief overview of how to use the East Sussex County Council (ESCC) SuDS Decision Support Tool for Small Scale Development (hereafter referred to as the SuDS Tool). The SuDS Tool is a web based platform; to access the tool type the link <http://eastsussex.suds-tool.co.uk> into a web browser.

The SuDS Tool is designed for individual small scale development planning applications, which will be dealt with independently. The SuDS Tool produces a final summary report unique to the planning application.

Below is the home screen of the SuDS Tool, which sets out the background and key assumptions. Users should read and understand this before using the SuDS Tool. Click 'Start' to begin a SuDS assessment.



The user should particularly recognise that the SuDS Tool **'does not give definitive attenuation volumes that will be achieved by a specific SuDS solution and a final design will be required to determine the actual performance of the proposed system.'**

A 'Contact Us' button is available on the home screen that enables the user to submit a query regarding the use of the SuDS Tool.

The submitted form goes to the Suds Tool developers and they will consider the query and respond using the contact details provided, as necessary.



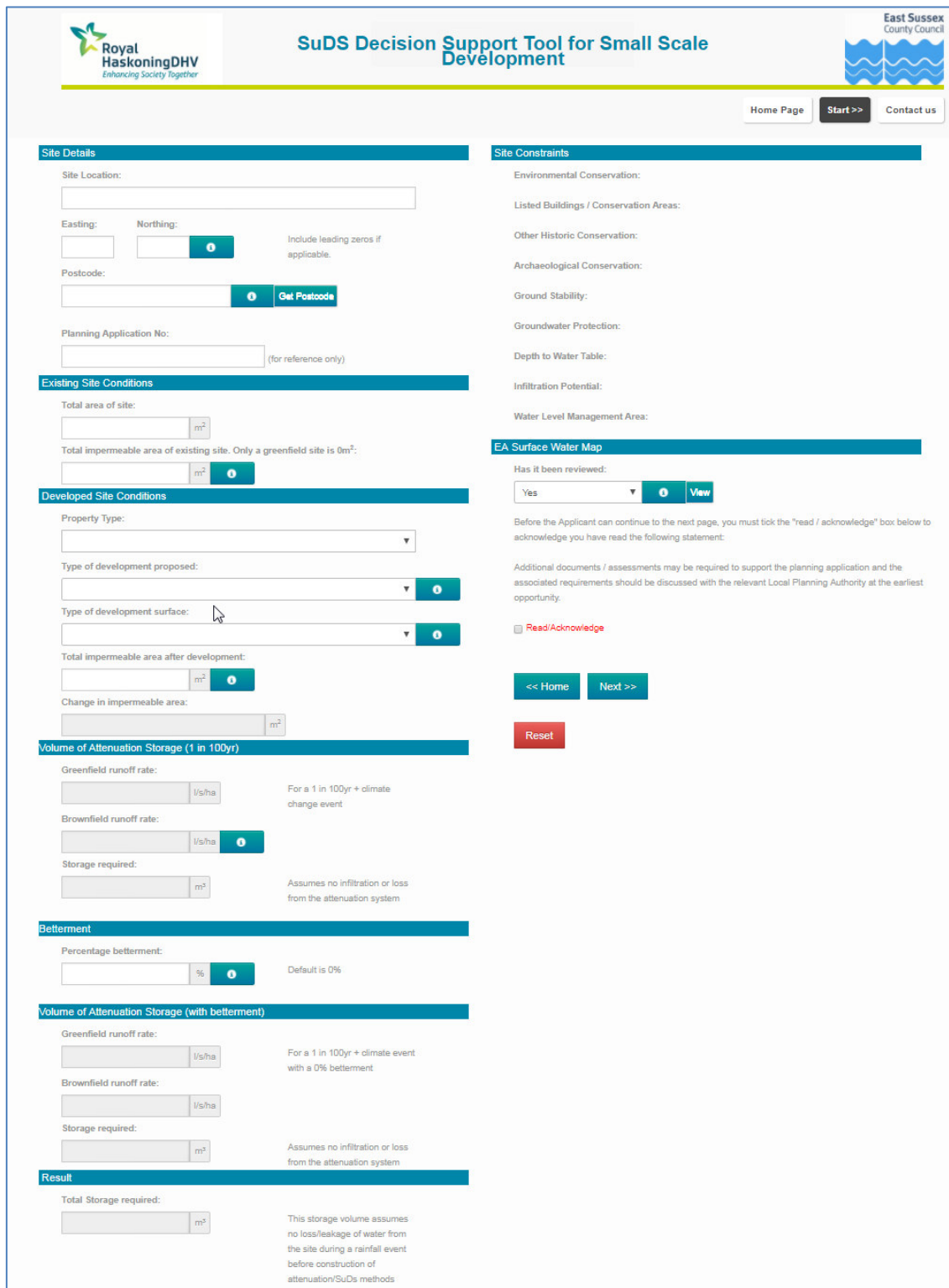
2 Copyrights and Disclaimers

The SuDS Tool provides a final summary report of the SuDS solutions that the user is committing to provide with the development proposal. These will need to be reflected in the drawings submitted with the planning application and should be designed by a suitably qualified professional. The SuDS solutions should be in accordance with the national guidance which requires the development to be 'safe, without increasing flood risk elsewhere' and, where possible, to 'reduce flood risk overall'.

The use of the SuDS Tool and submission of the final summary report is deemed to be a declaration of honesty that the SuDS Tool has been used in the manner it was intended without external amendment or modification.

3 Data Input

The data input page enables the user to input the required information about the development proposal. The data input page is shown below:



SuDS Decision Support Tool for Small Scale Development

Home Page Start >> Contact us

Site Details

Site Location:

Easting: Northing: Include leading zeros if applicable.

Postcode:

Planning Application No: (for reference only)

Existing Site Conditions

Total area of site: m²

Total impermeable area of existing site. Only a greenfield site is 0m²: m²

Developed Site Conditions

Property Type:

Type of development proposed:

Type of development surface:

Total impermeable area after development: m²

Change in impermeable area: m²

Volume of Attenuation Storage (1 in 100yr)

Greenfield runoff rate: l/s/ha For a 1 in 100yr + climate change event

Brownfield runoff rate: l/s/ha

Storage required: m³ Assumes no infiltration or loss from the attenuation system

Betterment

Percentage betterment: % Default is 0%

Volume of Attenuation Storage (with betterment)

Greenfield runoff rate: l/s/ha For a 1 in 100yr + climate event with a 0% betterment

Brownfield runoff rate: l/s/ha

Storage required: m³ Assumes no infiltration or loss from the attenuation system

Result

Total Storage required: m³ This storage volume assumes no loss/leakage of water from the site during a rainfall event before construction of attenuation/SuDs methods

Site Constraints

Environmental Conservation:

Listed Buildings / Conservation Areas:

Other Historic Conservation:

Archaeological Conservation:

Ground Stability:

Groundwater Protection:

Depth to Water Table:

Infiltration Potential:

Water Level Management Area:

EA Surface Water Map

Has it been reviewed: Yes

Before the Applicant can continue to the next page, you must tick the "read / acknowledge" box below to acknowledge you have read the following statement:

Additional documents / assessments may be required to support the planning application and the associated requirements should be discussed with the relevant Local Planning Authority at the earliest opportunity.

☐ Read/Acknowledge


<< Home Next >>

Reset

Site location, grid reference (in Ordnance Survey National Grid format as eastings and northings (e.g. 540897,109967), postcode and planning application reference are entered in the appropriate boxes to enable easy identification of the development proposal.

If the user does not have eastings and northings for the development site it is recommended that either the postcode or location be identified by using an online grid reference finder website to obtain the eastings and northings information. The Tool will not allow the user to proceed without entry of eastings and northings values.

Clicking 'Get Postcode' will look-up the postcode nearest to the grid reference input for the development site.

'i' boxes are used throughout the SuDS Tool to provide guidance. These are accessed by clicking on the  symbol next to the relevant data input box.

Grid Reference

The grid reference should be entered in Ordnance Survey National Grid format as eastings and northings.

e.g. for County Hall in Lewes the grid reference is

Easting	Northing
540897	109967

Include leading zeros if applicable

Postcode

Postcode is mandatory. It can be entered either by selecting the 'Get Postcode' button once a grid reference is entered. Alternatively the postcode can be entered manually.

3.1 Existing Site Conditions


The existing total site area and existing impermeable area of the site are entered into the appropriate boxes.

Existing Site Conditions

Total area of site:

m²

Total impermeable area of existing site. Only a greenfield site is 0m²:

m²


An  button is provided for further assistance.

Impermeable area of existing site

The following surfaces should always be considered to be impermeable:

- Roofs, excluding green roofs and brown roofs
- Hard surfaces at ground level

For permeable hard surfaces at ground level evidence will be required to show they are permeable (e.g. porous asphalt)

3.2 Developed Site Conditions

The developed site conditions required by the SuDS Tool are: the 'property type'; the 'type of development' being considered; the 'type of development surface' being considered; and the impermeable area of the site as a result of the development. A list of possible property types, development types and types of development surface can be accessed from the drop-down lists supplied. Any development types or development surface types not on this list have not been considered by the SuDS Tool.

Developed Site Conditions

Property Type:

Type of development proposed:

Type of development surface:

Total impermeable area after development:

m²

Change in impermeable area:

m²

The property type for the proposed development can be selected from the drop down box.

Developed Site Conditions

Property Type:

▼

Non-Residential

Residential

▼

i

Type of development surface:

▼

i

Total impermeable area after development:

m²

i

Change in impermeable area:

m²

The selected property type determines the maximum size of development site that the SuDS Tool can be used for. This is either 10,000m² for non-residential or 5,000m² for residential.

The selected property type (residential or non-residential) is also used to filter the type of development proposed that is available from the drop down list, see below:

Developed Site Conditions

Property Type:

Non-Residential

▼

Type of development proposed:

▼

i

Extension to existing property greater than 250m²

New single property

New multiple properties with new access road(s)

New impermeable ground areas

Extension to existing basements

Extension with basement extensions

Change of property usage

Non-residential buildings

i

m²

An  button is provided for further assistance.


14/08/2017


The type of development proposed will determine the list of appropriate SuDS features.

The type of development surface present at the proposed development can be selected from the drop down box. The list is filtered based on the property type selected as shown below.

Developed Site Conditions


Property Type:


Type of development proposed:
 

Type of development surface:
 
 Roofs and paved areas with no vehicle access or sources of pollutants
 Roofs, roads, parking areas or commercial zones
 Roads, parking areas or commercial zones
 Roofs, industrial areas, loading bays, refuse areas or highways
 Industrial areas, loading bays, refuse areas or highways
 m²

Developed Site Conditions

Property Type:

Type of development proposed:
 

Type of development surface:
 
 Roofs and paved areas with no vehicle access or sources of pollutants
 Roofs, residential roads or parking areas
 Residential roads or parking areas
 Change in impermeable area:
 m²

An  button is provided for further assistance.

Type of Development Surface

The type of development surface affects the water quality requirements of the proposed SuDS solution. The category selected should most accurately reflect the proposed development. There are three categories for residential and five categories for non-residential developments based upon increasing risk of pollution of the surface water runoff.

Residential Developments

- Roofs and paved areas with no vehicle access or sources of pollutants (Lowest risk)
- Roofs, residential roads and parking areas (Moderate risk, pollutants associated with vehicles on smaller roads)
- Residential roads and parking areas (Moderate risk, pollutants associated with vehicles on smaller roads)

Non-Residential Developments

- Roofs and paved areas with no vehicle access or sources of pollutants (Lowest risk)
- Roofs, roads, parking areas or commercial zones (Moderate risk, pollutants associated with vehicles on smaller roads)
- Roads, parking areas or commercial zones (Moderate risk, pollutants associated with vehicles on smaller roads)
- Roofs, industrial areas, loading bays, refuse areas or highways (High risk, pollutants associated with larger vehicles trucks from industrial sites)
- Industrial areas, loading bays, refuse areas or highways (High risk, pollutants associated with larger vehicles from industrial sites)

The type of development surface present in the development will affect the number of water quality treatment stages required by the SuDS solution. This is based on the guidance provided by the SuDS Manual (CIRIA 2007).

The total area of impermeable ground surface after development is required to calculate the hydrological requirements for the SuDS solution.

An  button is provided for further assistance.

All developed surfaces need to be included, even if the plan is for them to be permeable i.e. permeable pavements.

The SuDS Tool will show the calculated change in impermeable area beneath the developed site conditions, as shown below:

Developed Site Conditions

Property Type:

Non-Residential

Type of development proposed:

Extension to existing property greater than 250m²

Type of development surface:

Roads, parking areas or commercial zones

Total impermeable area after development:

500

m²

Change in impermeable area:

200

m²

3.3 Site Constraints

There are site specific constraints within the county of East Sussex that may affect the use of certain types of SuDS. Once the user has input the grid reference location of the development, the SuDS Tool will consider nine constraints that may apply to the development proposal in question. The nine constraints considered are listed under the 'Site Constraints' box on the right-hand side of the screen.

After the user has input the grid reference, constraints that apply to the selected area will appear in red text below the appropriate constraints heading. An example of which is shown below:

Site Constraints

Environmental Conservation:

Environmental conservation areas in vicinity, applicant should discuss implications with the planning authority. Likely to affect implementation of some SuDS measures.

Listed Buildings / Conservation Areas:

Listed buildings/conservation areas in vicinity, applicant should discuss implications with the planning authority. This may affect implementation of some SuDS measures.

Other Historic Conservation:

None

Archaeological Conservation:

Archaeological sites in vicinity, applicant should discuss implications with the planning authority. This may affect the ability to implement SuDS measures that require excavation.

Ground Stability:

Ground instability problems may be present or anticipated. Increased infiltration is unlikely to result in ground instability.

It is recommended that an assessment of the ground conditions and associated hazards assessment be undertaken by a suitably qualified professional (geotechnical engineer).

Groundwater Protection:

The groundwater is likely to be vulnerable to contamination. Infiltrating water should be free of contaminants.

Depth to Water Table:

None

Infiltration Potential:

The soil is potentially suitable for infiltration, however soakage tests in accordance to BRE365 should be undertaken to determine the actual infiltration potential.

Water Level Management Area:

This site is not within a Water Level Management Board or Internal Drainage Board area.

Please contact the East Sussex County Council Flood Risk Management Team directly to discuss your surface water drainage strategy and the associated required consents.

If constraints are found to apply to the proposed development site, there may be impacts upon the types of SuDS features that can be applied. The red text provides the user with an advisory note and recommendations to assist them going forward through the planning application process.

Constraints highlighted under the 'Site Constraints' box will be carried forward to the final summary report. See Section 7.1 on 'Recommendations'.

3.4 Example Completed Data Input Form

Below is an example of a completed data input form for a theoretical development.

Site Details			
Site Location:			
<input type="text" value="A new development in East Sussex"/>			
Easting:	Northing:		
<input type="text" value="533813"/>	<input type="text" value="121770"/>	<input type="button" value="i"/>	Include leading zeros if applicable.
Postcode:			
<input type="text" value="RH16 4QT"/>	<input type="button" value="i"/>	<input type="button" value="Get Postcode"/>	
Planning Application No:			
<input type="text" value="TEST00001"/>		(for reference only)	
Existing Site Conditions			
Total area of site:			
<input type="text" value="1000"/>	<input type="text" value="m<sup>2</sup>"/>		
Total impermeable area of existing site. Only a greenfield site is 0m ² :			
<input type="text" value="300"/>	<input type="text" value="m<sup>2</sup>"/>	<input type="button" value="i"/>	
Developed Site Conditions			
Property Type:			
<input type="text" value="Non-Residential"/>			
Type of development proposed:			
<input type="text" value="Extension to existing property greater than 250m<sup>2</sup>"/>			<input type="button" value="i"/>
Type of development surface:			
<input type="text" value="Roofs, roads, parking areas or commercial zones"/>			<input type="button" value="i"/>
Total impermeable area after development:			
<input type="text" value="500"/>	<input type="text" value="m<sup>2</sup>"/>	<input type="button" value="i"/>	
Change in impermeable area:			
<input type="text" value="200"/>		<input type="text" value="m<sup>2</sup>"/>	

4 Appropriate Runoff Rates and Volume Requirements

Once the user has input the data relating to the existing site conditions and the proposed development (As listed in Section 3), the SuDS Tool will apply this information to calculate an indicative greenfield and brownfield runoff rate from the site, plus an indicative storage requirement. The following sections explain these outputs in greater detail.

4.1 Indicative Runoff and Attenuation Storage Volumes

The SuDS Tool will automatically generate the indicative greenfield runoff rate and brownfield runoff rate for the development site for the 1 in 100 year storm event, which is in line with best practice. The greenfield and brownfield runoff rates are used by the SuDS Tool to calculate the storage requirement for the specific site.

Volume of Attenuation Storage (1 in 100yr)

Greenfield runoff rate:

15.92

l/s/ha

For a 1 in 100yr + climate change event

Brownfield runoff rate:

34.94

l/s/ha

i

Storage required:

8.00

m³

Assumes no infiltration or loss from the attenuation system

An  button is provided for further assistance.

Brownfield runoff rate

The Brownfield runoff rate represents the total runoff from the site assuming the site is 100% impermeable.

The SuDS Tool provides a value for the required storage in the “*Volume of Attenuation Storage (1 in 100yr)*” box. This storage volume would need to be provided at the development, in order to manage runoff rates and volumes leaving the site. Volume is indicative only and can change depending upon site specific considerations and constraints that may affect the SuDS features.

4.2 No Change or a Reduction in Impermeable Area

If, following development, the site will have no change or a decrease in impermeable area then the SuDS Tool will provide the user with a series of messages and options for consideration.

Should there be no change in the impermeable area the user will be presented with a check box option requiring confirmation that there will be no change, as shown below:

Developed Site Conditions

Property Type:

Non-Residential

Type of development proposed:

Change of property usage

Type of development surface:

Roofs and paved areas with no vehicle access or sources of pollutants

Total impermeable area after development:

500

 m²

Change in impermeable area:

0

 m²

There is no change in the impermeable area of the site. Please confirm this is correct?

☐ Yes

Once the user has confirmed there will be no change in impermeable area, a message is displayed setting out guidance on ESCC's preferred approach, as shown below:

Developed Site Conditions

Property Type:

Non-Residential

Type of development proposed:

Change of property usage

Type of development surface:

Roofs and paved areas with no vehicle access or sources of pollutants

Total impermeable area after development:

500

 m²

Change in impermeable area:

0

 m²

There is no change in the impermeable area of the site. Please confirm this is correct?

☒ Yes

As there is a no change in the impermeable area, no additional surface water storage is required. However we recommend you select SuDs options to mitigate other impacts. Please Click Next

If there is a reduction in the impermeable area the user will be presented with a check box option requiring confirmation of the reduction, as shown below:

Developed Site Conditions

Property Type:
Non-Residential

Type of development proposed:
Change of property usage

Type of development surface:
Roofs and paved areas with no vehicle access or sources of pollutants

Total impermeable area after development:
450 m²

Change in impermeable area:
-50 m²

There is a reduction in impermeable area of the site. Please confirm this is correct?

☐ Yes

Once the user has confirmed there will be a reduction in impermeable area, a message is displayed setting out guidance on ESCC's preferred approach, as shown below:

Developed Site Conditions

Property Type:
Non-Residential

Type of development proposed:
Change of property usage

Type of development surface:
Roofs and paved areas with no vehicle access or sources of pollutants

Total impermeable area after development:
450 m²

Change in impermeable area:
-50 m²

There is a reduction in impermeable area of the site. Please confirm this is correct?

☒ Yes

As there is a reduction in the impermeable area on site, there is no mandatory requirement for additional surface water storage.

However selection of SuDS options to manage other impacts of development on surface water runoff is recommended.

Please Click Next

If the user has identified no change or a reduction in impermeable area, there is no specific requirement for the provision of additional betterment for a site. However, an advisory note indicates that the provision of SuDS solutions to address other impacts associated with a development is recommended.

Details associated with the completion of the SuDS Tool and the provision of an additional betterment value, as a percentage (%), is provided in Section 5.1.

5 Optional Data Input

Once the SuDS Tool has calculated the indicative greenfield runoff rate, brownfield runoff rate and storage requirement for the development site (See Section 4), the user is presented with an additional two data input options: Betterment and EA Surface Water Flood Map. The SuDS Tool provides the user with the option of completing these two inputs. This has the benefit of receiving supplementary decision support for the proposed development.

5.1 Betterment

The user has the option to input a percentage betterment into the SuDS Tool for all scenarios including when there is no change or a reduction in impermeable area. The user will be presented with the following advisory text when there is no change or a reduction in the impermeable area:

Betterment

Percentage betterment:

%

i

Default is 0%

Since there is no change or a reduction in the impermeable area on site, there is no mandatory requirement to provide additional betterment.
However, provision of SuDS to manage other impacts of development on surface water runoff is recommended.
If you wish to provide SuDS to manage other impacts of development, please input as a % betterment/improvement on the total proposed impermeable area.

The betterment option enables the user to provide a percentage improvement to the post-development runoff rate from the development. The user can specify the percentage betterment they would like to include i.e 10%, 20%. An example is shown below:

Betterment

Percentage betterment:

%

i

Default is 0%

An  button is provided for further assistance.

Percentage betterment


An optional percentage improvement to the post-development runoff rate from the site.

Achieved by providing an additional volume of storage at the site, which reduces the rate of runoff to less than the pre-development conditions

A default of 0% is used if the user decides not to input a betterment value. The SuDS Tool is designed so that only a betterment percentage range of between 0% and 50% can be input by the user. The SuDS Tool will not accept values outside of this range, including negative values.

Once the percentage betterment has been added, the SuDS Tool will generate a revised greenfield and brownfield runoff rates from the site. The SuDS Tool also uses the impermeable area and generates an appropriate storage volume based on the proposed percentage betterment. An example is shown below.

The user should note that in generating the required storage volume for a site the calculation assumes no infiltration or loss from the attenuation system.

Betterment	
Percentage betterment:	
<input type="text" value="10"/> % 	Default is 0%
Volume of Attenuation Storage (with betterment)	
Greenfield runoff rate:	
<input type="text" value="14.33"/> l/s/ha	For a 1 in 100yr + climate event with a 10% betterment
Brownfield runoff rate:	
<input type="text" value="31.45"/> l/s/ha	
Storage required:	
<input type="text" value="8.82"/> m ³	Assumes no infiltration or loss from the attenuation system

The user will notice that choosing a percentage betterment reduces the greenfield and brownfield runoff rates.

The total storage volume required at the developed site is confirmed at the bottom of the SuDS Tool webpage and the final generated report.

Result	
Total Storage required:	
0.00	m ³
This storage volume assumes no loss/leakage of water from the site during a rainfall event before construction of attenuation/SuDs methods	

5.2 Environment Agency Surface Water Map

The SuDS Tool provides the user with a link to the online Environment Agency (EA) Surface Water Flood Map. Clicking on the 'View' button, takes the user to the external EA online Surface Water Flood Map webpage. The user will need to enter the postcode on the external page to go to the correct location.

EA Surface Water Map :	
Has it been reviewed:	
Yes	<input type="button" value="i"/> <input type="button" value="View"/>

The SuDS Tool does not consider the risk of flooding from any source. However, this function encourages the user to consider the interaction between surface water flood risk, flow paths and the proposed development. If this has been considered the user should select 'Yes' from the dropdown list.

An  button is provided for further assistance.

<h3>EA Surface Water Map</h3> <p>The Environment Agency flood map allows consideration of the interaction of surface water flooding and flow paths in relation to the site.</p> <p>The SuDS Tool does not consider flood risk to the site. Additional assessments should be carried out to assess the risk of flooding to the proposed development site and if appropriate, a site specific flood risk assessment should be provided.</p>

6 Appropriate SuDS and Volume Requirements

The user can navigate back to the home page, clear all input data or proceed to the next page using buttons at the bottom of the data input page.

The user is also asked to read and acknowledge the advisory text prior to proceeding to the next page,

Before the Applicant can continue to the next page, you must tick the "read / acknowledge" box below to acknowledge you have read the following statement:


Additional documents / assessments may be required to support the planning application and the associated requirements should be discussed with the relevant Local Planning Authority at the earliest opportunity.

☒ Read/Acknowledge


Please tick Read/Acknowledge to continue

The next page offers an indicative appraisal of the applicable SuDS features that could provide the necessary attenuation storage volume required for the development.

The required storage volume for the site is displayed in the box at the top of the page.



SuDS Decision Support Tool for Small Scale Development



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SuDS Requirement

Volume of attenuation storage required:
 m³

Greenfield runoff rate: 2.81 l/s/ha
 Brownfield runoff rate: 29.42 l/s/ha

Minimum no. of linked SuDS treatment features required for water quality:

Appropriate SuDS Solutions

Order of Suitability	Title & Comment	Indicative Storage Volumes	Proposed size of SuDS Option	Potential Volume of Attenuation	Guidance
1	Rainwater Harvesting	2 to 2 m ³ /property	<input type="text"/> properties	0 to 0 m ³	Guidance
1	Green Roofs May be inappropriate due to constraints.	0.025 to 0.115 m ³ /m ²	<input type="text"/> m ²	0 to 0 m ³	Guidance
1	Brown Roofs May be inappropriate due to constraints.	0.025 to 0.115 m ³ /m ²	<input type="text"/> m ²	0 to 0 m ³	Guidance
2	Detention Basins May be inappropriate due to constraints.	0.37 to 0.61 m ³ /m ²	<input type="text"/> m ²	0 to 0 m ³	Guidance
2	Ponds May be inappropriate due to constraints.	0.37 to 0.61 m ³ /m ²	<input type="text"/> m ²	0 to 0 m ³	Guidance
2	Wetlands May be inappropriate due to constraints.	0.37 to 0.61 m ³ /m ²	<input type="text"/> m ²	0 to 0 m ³	Guidance
2	Filter Strips May be inappropriate due to constraints.	0 to 0 m ³ /m ²	<input type="text"/> m	0 to 0 m ³	Guidance
2	Swales May be inappropriate due to constraints.	0.44 to 0.44 m ³ /m	<input type="text"/> m	0 to 0 m ³	Guidance
2	Under-drained Swales May be inappropriate due to constraints.	0.74 to 0.74 m ³ /m	<input type="text"/> m	0 to 0 m ³	Guidance
2	Permeable Pavements May be inappropriate due to constraints.	0.08 to 0.14 m ³ /m ²	<input type="text"/> m ²	0 to 0 m ³	Guidance
2	Grass Pavements May be inappropriate due to constraints.	0.08 to 0.14 m ³ /m ²	<input type="text"/> m ²	0 to 0 m ³	Guidance
2	Geocellular Systems May be inappropriate due to constraints.	0.19 to 0.48 m ³ /m ²	<input type="text"/> m ²	0 to 0 m ³	Guidance
4	Infiltration Devices May be inappropriate due to constraints.	0.03 to 0.07 m ³ /m ²	<input type="text"/> m ²	0 to 0 m ³	Guidance

Total

Potential volume of selected attenuation storage

0 to 0 m³

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The appropriate SuDS solutions are dependent upon the type of development and are listed by their suitability to the site-specific conditions of the grid reference provided.

In addition, the number of SuDS treatment features required to achieve the water quality requirements, based on the development surface type, is also indicated. The user should note that if more than one SuDS treatment feature is shown, then these SuDS techniques will need to be linked in order to provide adequate treatment.





6.1 Order of Suitability

The order of suitability identifies appropriate SuDS Solutions based on the number of associated site constraints.

An  button is provided for further assistance.

Key information on the  button has been summarised as follows:

“Appropriate SuDS Solution are ranked numerically and by colour in order of the number of associated site constraints, as shown by the table below:

	No. of constraints per SuDS measure			
Order of Suitability	0 - 1	2	3	4+
				

SuDS features that are associated with constraints will require site specific investigations in order to confirm appropriateness for use. Recommended site investigations related to the chosen SuDS features will be provided in the preview report.”


6.2 Indicative Storage Volumes

For some of the SuDS features suggested, the user can input a size under the ‘Proposed Size of SuDS Option’ and the SuDS Tool will provide a range of attenuation storage volumes that could be achieved for that feature. These volumes are indicative and are likely to change depending upon site specific considerations and constraints that may affect the SuDS features. The size is input either in terms of the surface area covered by the SuDS feature (e.g. permeable pavements, ponds and basins), length (e.g. swales) or number of properties (e.g. rainwater harvesting).


The total range of attenuation storage that may be achieved by the combination of SuDS selected is given in the box below the individual SuDS types. The colour of the box will change depending upon whether sufficient storage has been proposed or not. If there is too little it will remain red. If the volume required is between the upper and lower estimate of the proposed storage volume it will be amber. The box will turn green once the storage amount required is lower than the lower end of the range that is being proposed.

Project related

An example of a completed form is shown below:



SuDS Decision Support Tool for Small Scale Development



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SuDS Requirement

Volume of attenuation storage required:

4.24 m³

Greenfield runoff rate: 2.81 l/s/ha
Brownfield runoff rate: 29.42 l/s/ha

Minimum no. of linked SuDS treatment features required for water quality:

2

Appropriate SuDS Solutions

Order of Suitability	Title & Comment	Indicative Storage Volumes	Proposed size of SuDS Option	Potential Volume of Attenuation	Guidance
1	Rainwater Harvesting	2 to 2 m ³ /property	<input type="text"/> properties	0 to 0 m ³	Guidance
1	Green Roofs <i>May be inappropriate due to constraints.</i>	0.025 to 0.115 m ³ /m ²	5 m ²	0.125 to 0.575 m ³	Guidance
1	Brown Roofs <i>May be inappropriate due to constraints.</i>	0.025 to 0.115 m ³ /m ²	<input type="text"/> m ²	0 to 0 m ³	Guidance
2	Detention Basins <i>May be inappropriate due to constraints.</i>	0.37 to 0.61 m ³ /m ²	<input type="text"/> m ²	0 to 0 m ³	Guidance
2	Ponds <i>May be inappropriate due to constraints.</i>	0.37 to 0.61 m ³ /m ²	<input type="text"/> m ²	0 to 0 m ³	Guidance
2	Wetlands <i>May be inappropriate due to constraints.</i>	0.37 to 0.61 m ³ /m ²	<input type="text"/> m ²	0 to 0 m ³	Guidance
2	Filter Strips <i>May be inappropriate due to constraints.</i>	0 to 0 m ³ /m ²	<input type="text"/> m	0 to 0 m ³	Guidance
2	Swales <i>May be inappropriate due to constraints.</i>	0.44 to 0.44 m ³ /m	9 m	3.96 to 3.96 m ³	Guidance
2	Under-drained Swales <i>May be inappropriate due to constraints.</i>	0.74 to 0.74 m ³ /m	<input type="text"/> m	0 to 0 m ³	Guidance
2	Permeable Pavements <i>May be inappropriate due to constraints.</i>	0.08 to 0.14 m ³ /m ²	5 m ²	0.4 to 0.7 m ³	Guidance
2	Grass Pavements <i>May be inappropriate due to constraints.</i>	0.08 to 0.14 m ³ /m ²	<input type="text"/> m ²	0 to 0 m ³	Guidance
2	Geocellular Systems <i>May be inappropriate due to constraints.</i>	0.19 to 0.48 m ³ /m ²	<input type="text"/> m ²	0 to 0 m ³	Guidance
4	Infiltration Devices <i>May be inappropriate due to constraints.</i>	0.03 to 0.07 m ³ /m ²	<input type="text"/> m ²	0 to 0 m ³	Guidance

Total

Potential volume of selected attenuation storage

4.485 to 5.235 m³

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If there is no change or a reduction in the impermeable area then advisory text is displayed at the top of the screen. However, the user can continue to input information on this page to provide the storage volume associated with the percentage betterment proposed on the preceding page.



SuDS Decision Support Tool for Small Scale Development



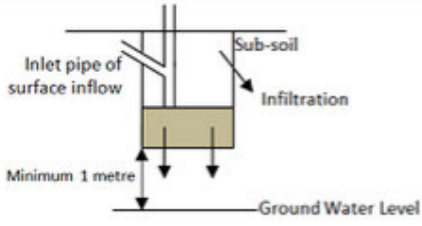
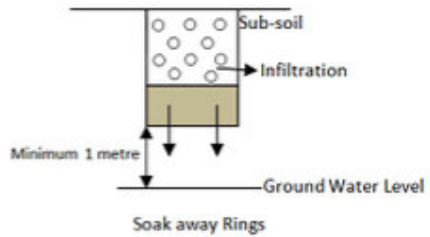
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Since there is a reduction in the impermeable area on site, there is no mandatory requirement to provide additional betterment.
However, provision of SuDS to manage other impacts of development on surface water runoff is recommended.
Please choose the SuDS option to provide the storage betterment you proposed on the first page
Please Click Preview Report

6.3 SuDS Guidance

Additional guidance on the different types of SuDS features is also available by clicking the 'Guidance' button. This displays a new window which informs the user about the SuDS feature selected, basic best practice guidance and also directs the user to sources of further information. These should be consulted to undertake detailed designs. The guidance box for infiltration devices is shown below as an example:

Infiltration Devices

Infiltration devices, such as soakaways, are used to capture surface water runoff and allow it to infiltrate (soak) and filter through to the subsoil layer, before returning it to the water table below.

They can be hollow or filled structures with a high void ratio that provide storage while water infiltrates into the ground. The structures are between 1 and 2m in depth and vary in size and shape dependant on design. Any fill material used within the structure should have a void space of 30% or greater.

Infiltration devices should be a minimum distance of 5m from foundations and a minimum distance of 1m from the base of the structure to the highest groundwater table level.

Typical soakaways were developed to incorporate capacity for storage within the device. A typical configuration would be a 1.5m deep lined perforated ring soakaways that can be assumed to have a void ratio of 0.3. The range of storage volumes suggested is based upon potential infiltration rates that may be achieved.

[Http://www.ciria.com/](http://www.ciria.com/) (select 'Topics' and go to Flood Risk Management and Surface Water Drainage)
<http://www.susdrain.org/>

East Sussex CC accepts no responsibility for data held on other websites, the location of which may be changed by the third party without notice.

Close the guidance window to return to the original SuDS solutions page.

Clicking the 'Quit' button will take the user back to the home page, clearing any previously input information.

7 Reporting

Once the data input and attenuation storage volume forms have been completed, the user can produce a preview report summarising the results of the SuDS Tool. By clicking the 'Preview Report' button at the bottom of the form the user will see the pop-up message below to ensure they are happy with the outputs before moving onto the final report.



The preview report summarises all the relevant information supplied by the user: the existing and proposed site conditions; constraints associated with the site; the hydrological conditions and storage requirements; water quality requirements and indicative sizes of appropriate SuDS. This report can be printed as desired. The report also provides relevant guidance on the SuDS features chosen and websites that can be accessed for further information.

No data is stored by the SuDS Tool, and any changes that are made would need to be re-entered once the "Reset" button has been selected.

7.1 Recommendations

A list of recommendations is provided at the end of the preview report. This acts as a checklist to the user when going through the planning process, enabling them to demonstrate that they have considered and enclosed the documentation relevant to their site in the planning application e.g. Soakage Infiltration Testing to BRE365 Standards. The user can provide a reference for each submitted document to help the planner locate it within the application. An example is shown below:

Recommendations		
Developer to complete		LPA official use only
<input type="checkbox"/>	<p>Flood Risk Assessment</p> <p>Developer should attach a Surface Water Drainage Statement which assesses all sources of flood risk. Any SuDS solutions chosen should be designed by a suitably qualified professional. If there is proposed discharge from the site, a suitable outfall should be demonstrated.</p> <p>EA Flood Map for Planning</p> <p>http://maps.environmentagency.gov.uk/wiyby/wiybyController?x=357683&y=355134&scale=1&layerGroups=default&ep=maptextonly=off&lang=en&topic=floodmap</p> <p>EA Surface Water Flood Map</p> <p>http://watermaps.environmentagency.gov.uk/wiyby/wiyby.aspx?topic=ufmfs&scale=7&ep=map&layerGroups=default&lang=en&y=181500&x=531500#x=531500&y=181500&scale=7</p> <p>Planning Practice Guide on SuDS</p> <p>http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/reducing-the-causes-and-impacts-of-flooding/why-are-sustainable-drainage-systems-important/</p> <p>Developer reference to submitted document</p> <input type="text"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<p>Environment Agency Surface Water Flood Map</p> <p>Option a: The site is shown to be at surface water flood risk. The minimum requirement of a plan and supporting statement identifying surface water flow route originating offsite and entering the site.</p> <p>Option b: The site is not shown to be at surface water flood risk. An extract of the map with site boundary is attached.</p> <p>EA Surface Water Flood Map</p> <p>http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?topic=ufmfs&scale=1&ep=map&layerGroups=default&lang=en&y=355133&x=357682#x=357682&y=355133&scale=1</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/>	<p>Historic Conservation</p> <p>Historic Conservation constraint identified. Consult the Historic Environment Record Officer</p> <p>http://www.eastsussex.gov.uk/environment/archaeology/her.htm</p> <p>Developer comment submitted. Refer to document</p> <input type="text"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No

An example preview report for a theoretical development is shown in **Appendix A**.

8 Exiting the Tool

To exit the SuDS Tool the user should close the current web browser window.

Alternatively, clicking the 'Quit' button will take the user back to the home page, clearing any previously input information.

Appendix A

Example Summary Report

Site Summary

Site Location / Address Details:		Example 1	
Grid Reference:		Easting: 540918 Northing: 109938	
Postcode:		BN7 1RZ	
Planning Appl. No: (if known)		0001 (for reference only)	
Existing Site Conditions		Developed Site Conditions	
Total site area:	1000 m ²	Property Type	Non-Residential
Total impermeable area:	300 m ²	Type of development:	Extension to existing property greater than 250m ²
		Total impermeable area:	500 m ²

Site Constraints

Environmental Conservation	Environmental conservation areas in vicinity, applicant should discuss implications with the planning authority. Likely to affect implementation of some SuDS measures.
Listed Buildings / Conservation Areas	Listed buildings/conservation areas in vicinity, applicant should discuss implications with the planning authority. This may affect implementation of some SuDS measures.
Archaeological Conservation	Archaeological sites in vicinity, applicant should discuss implications with the planning authority. This may affect the ability to implement SuDS measures that require excavation.
Ground Stability	Ground instability problems may be present or anticipated. Increased infiltration is unlikely to result in ground instability. It is recommended that an assessment of the ground conditions and associated hazards assessment be undertaken by a suitability qualified professional (geotechnical engineer).
Groundwater Protection	The groundwater is likely to be vulnerable to contamination. Infiltrating water should be free of contaminants.
Infiltration Potential	The soil is potentially suitable for infiltration, however soakage tests in accordance to BRE365 should be undertaken to determine the actual infiltration potential.

Please refer to the Recommendations Section for the appropriate actions related to the site constraints.

Hydrological Conditions

	1 in 100yr	With betterment
Greenfield runoff rate	3.51 l/s/ha	3.16 l/s/ha
Brownfield runoff rate	36.77 l/s/ha	33.09 l/s/ha

Storage Requirement

Volume of attenuation storage	14 m ³	Note: The volume of attenuation storage is for a 1 in 100 year plus climate change event. This is calculated based on a discharge rate limited to the existing greenfield runoff rate. The attenuation volume serves the additional impermeable area on the developed site. Any betterment included is in addition to the attenuation required.
Percentage betterment	10 %	
Total attenuation storage required	15.44 m ³	

Water Quality Requirement

To remove the major proportion of pollution it is necessary to incorporate an appropriate number of treatment features in the SuDS design.

SuDS treatment features required

3

SuDS treatment features are individual SuDS measures that treat water filtration and detention, the water quality performance varies between different SuDS features. If multiple features are required these must be linked to ensure that adequate treatment is provided before water reaches the receiving water course.

Rainwater harvesting and geocellular systems are not considered as treatment features due to their poor pollutant removal performance CIRIA SuDS Manual C697.

The table below shows the SuDS solutions you are committing to provide with the development proposal and will need to be reflected in the drawings submitted with the planning application. This solution should be designed by a suitably qualified professional in accordance with the national guidance which requires the development to be 'safe, without increasing flood risk elsewhere' and, where possible, to 'reduce flood risk overall'.

Appropriate SuDS Solutions

Order of Suitability			Proposed Size of SuDS Options	Potential Volume of Attenuation
1	Rainwater Harvesting		1 properties	2 to 2 m ³
1	Green Roofs	May be inappropriate due to constraints.	15 m ²	0.375 to 1.725 m ³
1	Brown Roofs	May be inappropriate due to constraints.	m ²	0 to 0 m ³
2	Filter Strips	May be inappropriate due to constraints.	m	0 to 0 m ³
2	Swales	May be inappropriate due to constraints.	m	0 to 0 m ³
2	Under-drained Swales	May be inappropriate due to constraints.	m	0 to 0 m ³
2	Permeable Pavements	May be inappropriate due to constraints.	55 m ²	4.4 to 7.7 m ³
2	Grass Pavements	May be inappropriate due to constraints.	m ²	0 to 0 m ³
2	Geocellular Systems	May be inappropriate due to constraints.	48 m ²	9.12 to 23.04 m ³
4	Infiltration Devices	May be inappropriate due to constraints.	m ²	0 to 0 m ³

Proposed indicative volume of attenuation storage	15.895 to 34.465 m³
SuDS treatment features are individual SuDS measures that treat water filtration and detention, the water quality varies between different SuDS features. If multiple features are required these must be linked to ensure that adequate treatment is provided before water reaches the receiving water course.	
This site is not within a Water Level Management Board or Internal Drainage Board area. Please contact the East Sussex County Council Flood Risk Management Team directly to discuss your surface water drainage strategy and the associated required consents.	

Recommendations

Developer to complete

LPA official use only

☐

Flood Risk Assessment

Developer should attach a Surface Water Drainage Statement which assesses all sources of flood risk. Any SuDS solutions chosen should be designed by a suitably qualified professional. If there is proposed discharge from the site, a suitable outfall should be demonstrated.

EA Flood Map for Planning

http://maps.environmentagency.gov.uk/wiyby/wiybyController?x=357683y=355134scale=1layerGroups=defaultep=maptextonly=offlang=_etopic=floodmap

EA Surface Water Flood Map

http://watermaps.environmentagency.gov.uk/wiyby/wiyby.aspx?topic=ufmfsyscale=7ep=maplayerGroups=defaultlang=_ey=181500x=531500#x=531500y=181500scale=7

Planning Practice Guide on SuDS

<http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/reducing-the-causesand-impacts-of-flooding/why-are-sustainable-drainage-systems-important/>

Developer reference to submitted document

☐ Yes

☐ No

Environment Agency Surface Water Flood Map

Option a:

The site is shown to be at surface water flood risk. The minimum requirement of a plan and supporting statement identifying surface water flow route originating offsite and entering the site.

Option b:

The site is not shown to be at surface water flood risk. An extract of the map with site boundary is attached.

EA Surface Water Flood Map

http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?topic=ufmfsw&scale=1&ep=map&layerGroups=default&lang=_e&y=355133&x=357682#x=357682&y=355133&scale=1

☐ Yes

☐ No

☐ Yes

☐ No

☐

Environmental Conservation

Environmental Conservation constraint identified. Consult the Environmental Conservation Officer

<http://www.eastsussex.gov.uk/environment/conservation/default.htm>

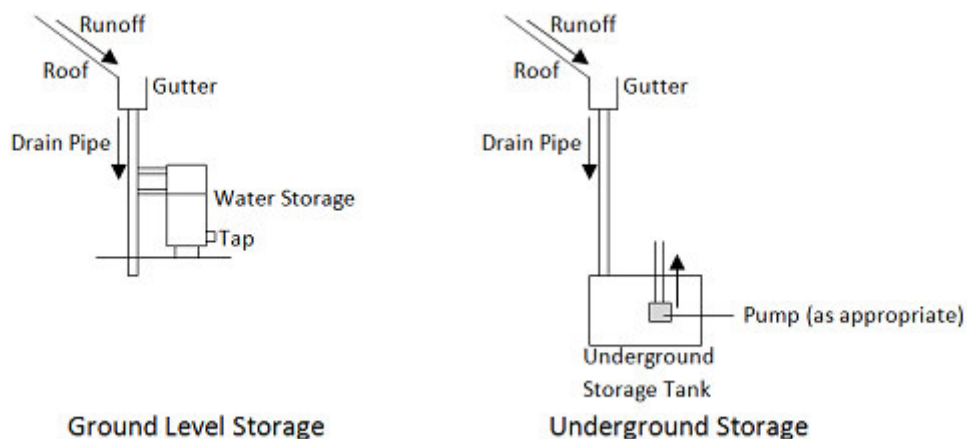
Developer comment submitted. Refer to document

☐ Yes

☐ No

<input type="checkbox"/>	<p>Historic Conservation</p> <p>Historic Conservation constraint identified. Consult the Historic Environment Record Officer</p> <p>http://www.eastsussex.gov.uk/environment/archaeology/her.htm</p> <p>Developer comment submitted. Refer to document</p> <div style="border: 1px solid black; height: 20px; width: 450px; margin-top: 5px;"></div>	<div style="display: flex; flex-direction: column; align-items: flex-end;"> <input type="checkbox"/> Yes <input type="checkbox"/> No </div>
<input type="checkbox"/>	<p>Archaeological Conservation</p> <p>Archaeological Conservation constraint identified. Consult the Historic Environment Record Officer</p> <p>http://www.eastsussex.gov.uk/environment/archaeology/her.htm</p> <p>Developer comment submitted. Refer to document</p> <div style="border: 1px solid black; height: 20px; width: 450px; margin-top: 5px;"></div>	<div style="display: flex; flex-direction: column; align-items: flex-end;"> <input type="checkbox"/> Yes <input type="checkbox"/> No </div>
<input type="checkbox"/>	<p>Groundwater Protection</p> <p>Groundwater Protection constraint identified. The site is shown to be in an area where made ground may be present at the surface. Infiltration may increase the possibility of remobilising pollutants. It is recommended that the Environment Agency is consulted in relation to the proposed development.</p> <p>Developer comment submitted. Refer to document</p> <div style="border: 1px solid black; height: 20px; width: 450px; margin-top: 5px;"></div>	<div style="display: flex; flex-direction: column; align-items: flex-end;"> <input type="checkbox"/> Yes <input type="checkbox"/> No </div>

Rainwater Harvesting

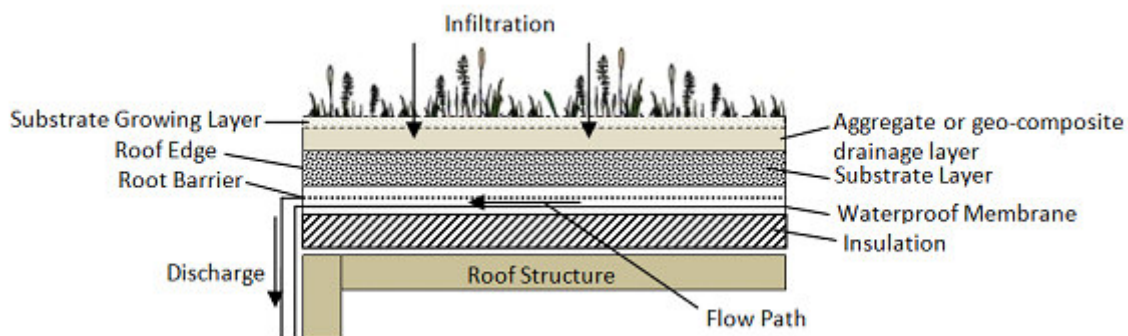


Rainwater harvesting involves storing rainwater that falls onto roof surfaces for use by the property owner. This can vary between relatively small water butts and more complex systems incorporating underground storage tanks. Water butts are not generally designed to provide storage of rainwater in extreme events and therefore cannot be included as part of the storage assessment for a site. This is because if they are already full they will not provide storage in any given rainfall event.

Rainwater harvesting systems are generally larger and offer greater potential for management of storm water in addition to providing water for reuse within properties. The amount of storage that can be provided for dealing with storm water is dependent upon the system installed, however the SuDS Manual suggests that for a standard house the typical storm water component is 2m³ (CIRIA, 2007).

<http://www.ciria.com/> (select 'Topics' and go to Flood Risk Management and Surface Water Drainage)
<http://www.susdrain.org/>

East Sussex CC accepts no responsibility for data held on other websites, the location of which may be changed by the third party without notice.



Green roofs comprise systems that cover the roof of a building with a vegetation cover over a drainage layer. They intercept and store rainwater attenuating flows and improving water quality.

The water storage capacity is highly dependent upon site-specific considerations, however the main factors are vegetation cover, and the size of the drainage layer that the building can support. The range of indicative storage volumes suggested is based upon the impact of different types of vegetation cover in a typical situation. If the roof has the capacity to accept higher than normal loading its storage capacity could increase.

Further information can be found in the SuDS Manual (CIRIA 2007) and the Environment Agency's Green Roof Toolkit. Detailed guidance on the design of green roofs for run-off attenuation has been developed in Germany by Forschungsgesellschaft Landschaftsentwicklung und Landschaftsbau.

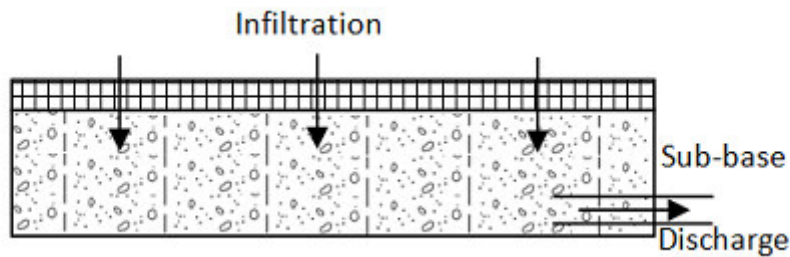
<http://www.ciria.com/> (select 'Topics' and go to Flood Risk Management and Surface Water Drainage)

<http://www.greenroofguide.co.uk/>

<http://www.susdrain.org/>

East Sussex CC accepts no responsibility for data held on other websites, the location of which may be changed by the third party without notice.

Permeable Pavements



Permeable Pavements allow a suitable surface for pedestrian or vehicle access while also allowing water to infiltrate through the surface into the underlying storage layers. Water can be stored in the underlying layers attenuating flows and allowing for water quality treatment. Examples include porous asphalt and gravel surfaces.

The generally accepted guidance for the design of permeable pavements is provided by Interpave (Interpave, 2010). The design of permeable pavements is dependent upon the following factors:

The loading that they need to be able to withstand

If water is expected to infiltrate into the ground below the pavement or is stored and then transferred into either the next element of the SuDS treatment train or the surface water sewer system

The level of the groundwater and whether this is a limiting factor for the depth of the pavement

The amount of water that needs to be stored within the pavement.

The range of indicative storage volumes suggested is based upon the range of typical arrangements for different loading criteria suggested by Interpave (2010). Permeable pavement systems typically can store water from adjacent impermeable surfaces in addition the the area which they occupy.

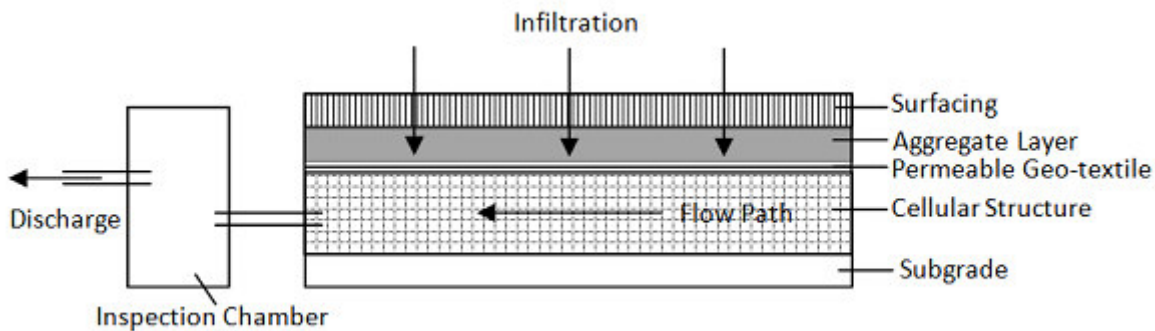
The SuDS Tool only considers permeable pavement systems that convey water onto the next SuDS feature or surface water system.

<http://www.ciria.com/> (select 'Topics' and go to Flood Risk Management and Surface Water Drainage)

<http://www.paving.org.uk/>

<http://www.susdrain.org/>

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Geocellular systems are typically modular plastic systems with high void ratios that can be used to create below ground storage structures. They provide significant storage volumes and flow attenuation, however do not provide any of the other benefits of SuDS such as treatment, ecology or amenity.

The SuDS Manual (CIRIA, 2007) states that geocellular systems should be designed in accordance with Sewers for Adoption 7th Edition (WRc, 2012). The typical void ratio for tanked systems is 0.9; therefore the storage capacity can be taken as 90% of the volume of the storage layer. The typical depths of storage tanks vary between 0.2m and 0.5m depending upon the product used.

The range of indicative storage volumes suggested is based upon the range of systems available on the market. The amount of storage may be increased if products allow multiple layers to be used and there are no other site-specific constraints.

[Http://www.ciria.com/](http://www.ciria.com/) (select 'Topics' and go to Flood Risk Management and Surface Water Drainage)
<http://www.susdrain.org/>

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