

FLOOD RISK SUMMARY STATEMENT & SUSTAINABLE SURFACE WATER DRAINAGE STRATEGY

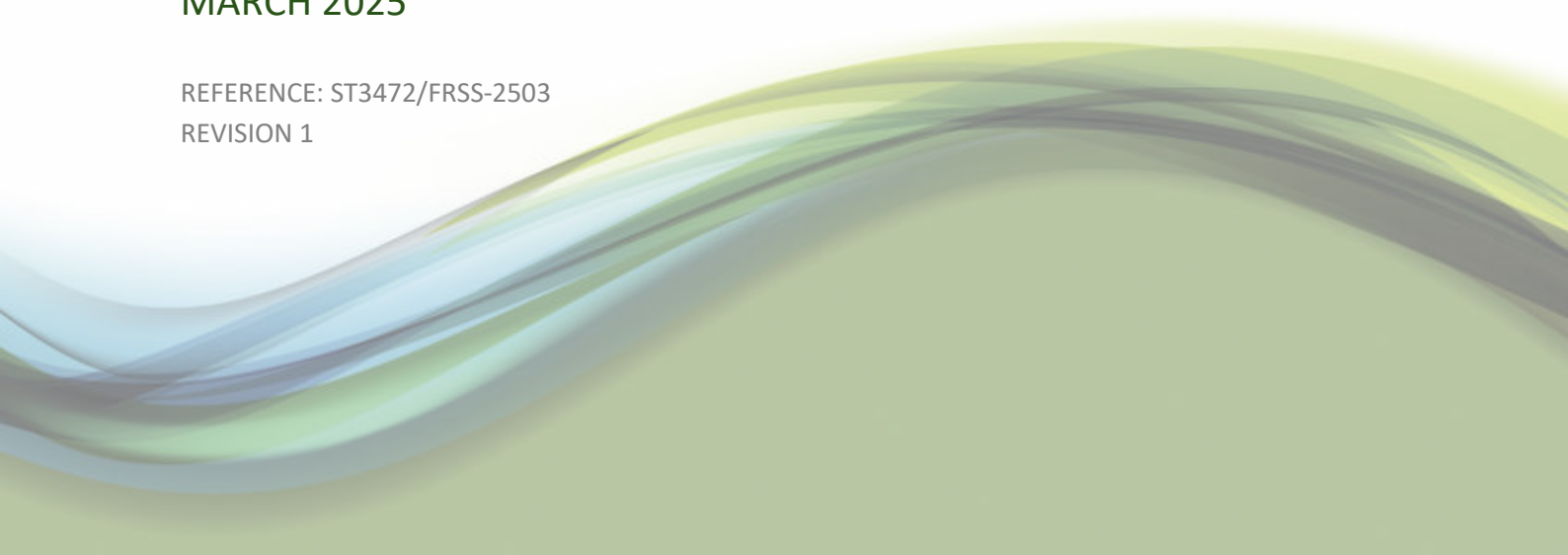
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PROPOSED RESIDENTIAL DEVELOPMENT
DUNCOTS CLOSE, ICKLEFORD

prepared for
PETER DAVID HOMES

MARCH 2025

REFERENCE: ST3472/FRSS-2503
REVISION 1



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<i>Revision</i>	<i>Author</i>	<i>Checked by</i>	<i>Issue Date</i>
<i>0</i>	<i>SJB</i>	<i>KD</i>	<i>24.03.2025</i>
<i>1</i>	<i>SJB</i>	<i>-</i>	<i>08.04.2025</i>

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1. Introduction

- 1.1.1. Stomor Ltd have been commissioned by Peter David Homes to prepare a Flood Risk Summary Statement and Drainage Strategy to support a Planning Application for access, layout, and parking arrangements associated with a proposed residential development at Duncots Close, Ickleford, Hertfordshire. A Site Location Plan is provided in **Appendix A**.
- 1.1.2. The application site is greenfield, currently comprising pastureland. The site has a total area of approximately 0.4 hectares (ha).
- 1.1.3. The proposed residential development comprises 9No. dwellings with associated parking provisions, accessed via a new arrangement from Duncots Close.

2. Site Location & Surrounding Area

- 2.1.1. The application site comprises approximately 0.4ha of greenfield land.
- 2.1.2. The proposed development site lies northeast of Duncots Close on the eastern edge of Ickleford. Residential areas abut the site to the south and west, while greenfield areas abut the site to the north and east.
- 2.1.3. Inspection of the topographical survey shows that the site generally falls towards the northeast. Surveyed ground levels range from approximately 51.50mAOD – 49.50mAOD within the site. A copy of the topographical survey is provided in **Appendix B**.
- 2.1.4. The nearest watercourse to the site is the River Purwell located approximately 100m east. The River Purwell is an Environment Agency (EA) designated Main River which flows northwards along the eastern side of Ickleford.
- 2.1.5. Inspection of the British Geological Survey (BGS) website identifies that the underlying ground conditions of the site comprise of West Melbury Marly Chalk Formation at bedrock with Glaciofluvial Deposits Mid Pleistocene – Sand and Gravel at the superficial deposits strata.
- 2.1.6. Inspection of the Soilscales website indicates that the site lies in a region which is Naturally Wet.
- 2.1.7. A Site Investigation (SI) was undertaken by BRD Environmental Ltd. who concluded that soakaways were not suitable for the disposal of surface water from the site, due to the shallow groundwater table observed during investigations.

3. Flood Risk

3.1. Flooding from Rivers or the Sea

3.1.1. The Indicative Floodplain Map (**FIGURE 3.1**) obtained from the Environment Agency (EA) shows that the site lies within Flood Zone 1, land assessed to have a low probability of fluvial flooding and where all types of proposed development are permitted.

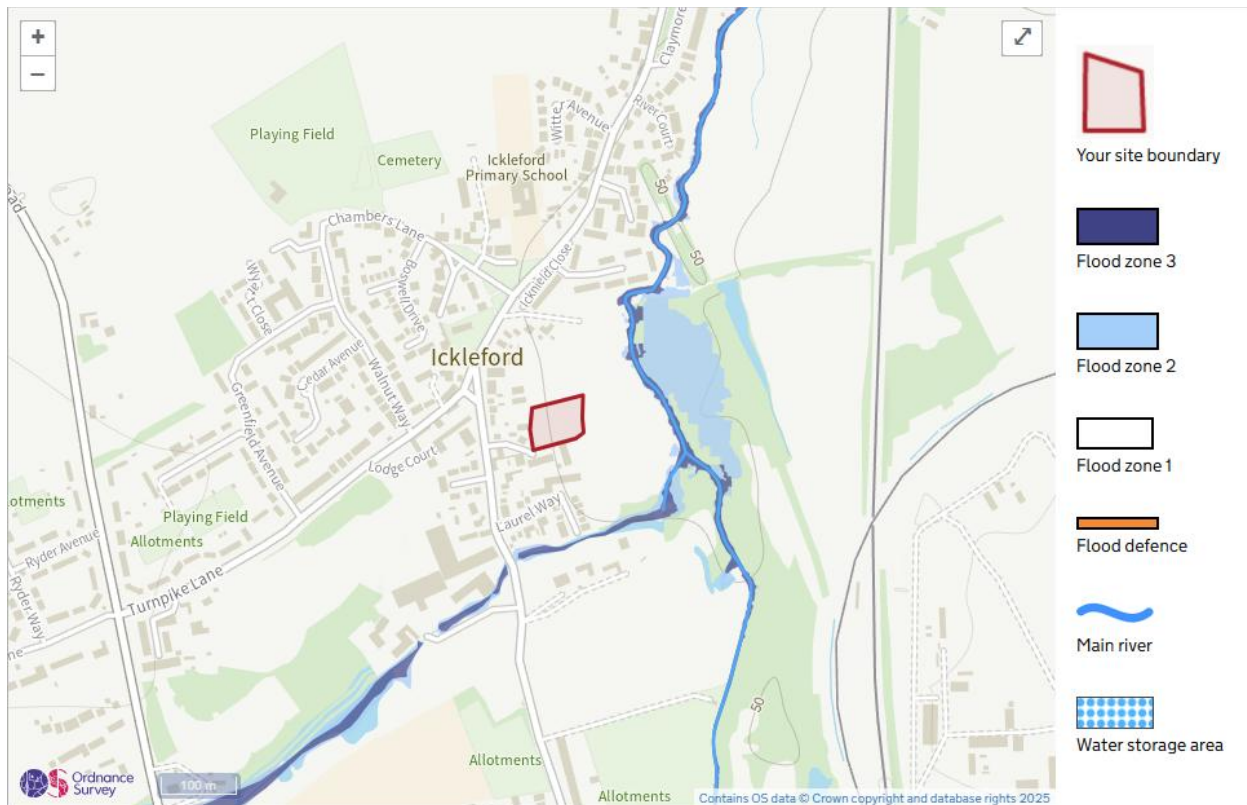


FIGURE 3.1: EA Flood Risk Map for planning

3.1.2. The difference between Flood Zones 1, 2 and 3 are described in Table 1: Flood Zones from the Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government Flood Risk and Coastal Change guidance (updated August 2022), summarised below:

Zone 1 Low Probability	Land assessed as having a less than 0.1% annual probability of river or sea flooding.
Zone 2 Medium Probability	Land assessed as having between a 1% and 0.1% annual probability of river flooding. or land having between a 0.5% and 0.1% annual probability of sea flooding.
Zone 3a High Probability	Land assessed as having a 1% or greater annual probability of river flooding, land having a 0.5% or greater annual probability of flooding from the sea.
Zone 3b The Functional Floodplain	Land where water from rivers or the sea has to flow or be stored in times of flood. Normally comprises land having a 3.3% or greater annual probability of flooding, or land designed to flood (such as a flood attenuation scheme).

- 3.1.3. The Flood Risk and Coastal Change Category (ID7) of the NPPG and associated documents identifies that a Flood Risk Assessment is required for areas at risk of flooding.
- 3.1.4. The Flood Risk and Coastal Change Category of the NPPG and associated documents identify that site-specific flood risk assessments should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account.
- 3.1.5. The proposed development would have a NPPF flood risk vulnerability classification of 'Less Vulnerable'. NPPG identifies that 'Less Vulnerable' uses of land are appropriate within Flood Zone 1 without the need for an Exception Test.

3.2. Flooding from Land (Surface Water)

- 3.2.1. Flooding from land occurs when intense rainfall is unable to soak into the ground or enter drainage systems. Local topography and built form can have a strong influence on the direction and depth of flow.
- 3.2.2. The EA indicative surface water flood map (**FIGURE 3.2**) identifies that the site lies has a very low risk of surface water flooding. Very low risk means that this area has a chance of flooding of less than 0.1% AEP. There is an area of high risk to the eastern side of the site. However, it does encroach into the site boundary.

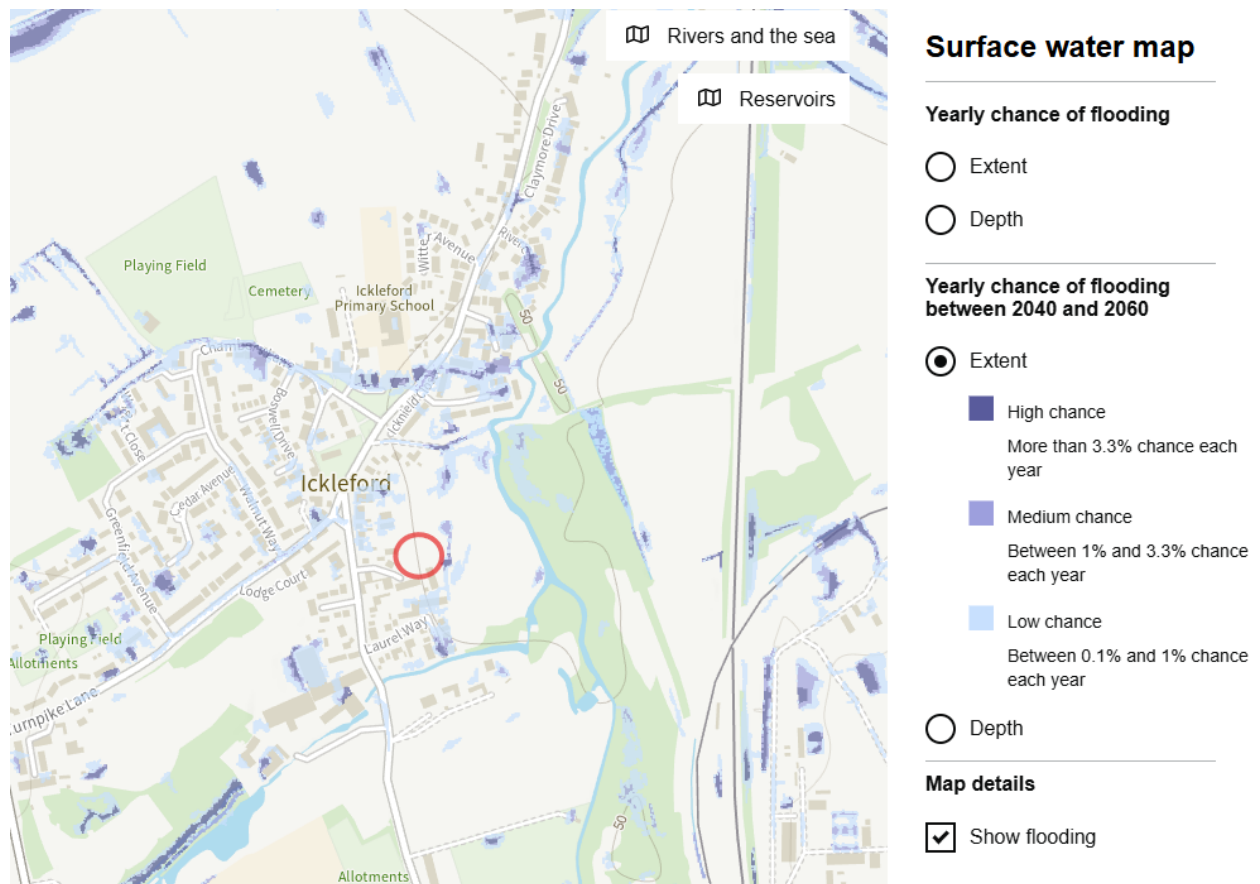


FIGURE 3.2 – EA Indicative Surface Water Flood Map Extract

3.3. Flooding from Groundwater

- 3.3.1. Groundwater flooding occurs when water levels in the ground rise above surface elevations. Groundwater flooding events are most likely to occur in low lying areas underlain by permeable rocks (aquifers).
- 3.3.2. EA flood map data identifies that groundwater flooding is unlikely within the locality of the site.

3.4. Flooding from Sewers

- 3.4.1. The SFRA does not identify any historic surface water flooding incidents within the vicinity of the site.

3.5. Flooding from Reservoirs, Canals and Other Artificial Sources

- 3.5.1. The EA indicative flood map for artificial sources shows that the site does not lie within an area at risk of flooding from reservoirs.

4. Existing Drainage

4.1. Surface Water Drainage

- 4.1.1. Existing surface water runoff from the site currently runs overland to the east, towards the River Purwell.
- 4.1.2. There are no public surface water sewer within the vicinity of the site. The public sewer records are shown in **Figure 4.1**.



FIGURE 4.1 – AWS Sewer Records Map Extract

- 4.1.3. Greenfield runoff rates have been calculated based upon the IH124 Method, for a development area of 0.4ha. Geotechnical information from the WRAP map of the Wallingford Procedure indicates that the underlying soil conditions would reflect Winter Rain Acceptance Potential (WRAP) Soil Class 3, which gives flow rates as follows:

Greenfield Runoff (l/s)		
1 in 1 year	Q1	0.81
1 in 30 years	Q30	2.29
1 in 100 years	Q100	3.33

- 4.1.4. A copy of the runoff calculation sheets is provided in **Appendix C**.

5. Proposed Site Drainage

5.1. Surface Water Drainage

- 5.1.1. The site is currently greenfield with no impermeable area. The proposed development will have a hardstanding area of 0.217ha.
- 5.1.2. In accordance with EA guidance, the order of consideration for the disposal of surface water runoff from a development should be as follows: infiltration methods, watercourses, then public sewer network.
- 5.1.3. The site-specific SI report identified that infiltration methods would not be suitable for the disposal of surface water runoff due to the high groundwater table observed.
- 5.1.4. Surface water runoff from the site would run overland towards the River Purwell, located approximately 100m to the east. Historic mapping information indicates that there was a ditch system which conveyed flows from the eastern boundary of the site to the River Purwell. However, it would appear that this ditch system has been removed from the land located between the site and the river, with no culvert or alternative drainage system observed to be in place. Therefore, it is proposed to convey flows to an existing tributary of the River Purwell located approximately 90m to the north of the site, which lies within land under the applicant's control.
- 5.1.5. An Indicative Drainage Strategy is provided in **Appendix E**. The strategy demonstrates how the proposed development can be effectively drained, and the amount of storage required to avoid flooding within the site during all storms up to and including the 1 in 100-year storm event plus a 40% allowance for climate change.
- 5.1.6. The indicative drainage strategy incorporates SuDS features which will need to have clear, enforceable maintenance regimes in place so that they provide effective flood protection and water treatment for the long term. See attached our SuDS Maintenance Fact Sheet in **Appendix G**.
- 5.1.7. Table 26.2 of the SuDS Manual gives pollution hazard indices for different land use classifications, and tables 26.3 and 26.4 provide typical treatments levels from various different SuDS features discharging to surface water and to ground respectively.
- 5.1.8. To deliver adequate treatment, the selected SuDS components should have a total mitigation index that equals or is greater than the pollution hazard index. Where a single SuDS component is insufficient, additional components in a series would be required, where:

$$\text{Total SuDS mitigation index} = \text{mitigation index}_1 + 0.5 (\text{mitigation index}_2)$$

- 5.1.9. A factor of 0.5 is used to account for the reduced performance of secondary or tertiary components associated with already reduced inflow concentrations. In a series of multiple subsequent components, each is halved.
- 5.1.10. The SuDS proposed on the development would provide more than the adequate treatment for the potential pollution hazards generated by the land uses. See attached our Simple Index Approach Calculation sheet in **Appendix H**.

5.2. Detailed Design and Approvals

- 5.2.1. The proposed drainage strategy is subject to approval by the LLFA and the Local Planning Authority.
- 5.2.2. Proposed detailed drainage systems will need to be modelled in MicroDrainage to confirm required pipe sizes and storage volumes.
- 5.2.3. Overland flow routes have been shown on the drainage plan through the development, to identify proposed flow paths for surface water runoff during extreme storm events. Final external levels will be designed to prevent overland flow routes from entering buildings.

6. Summary and Recommendations

- 6.1.1. Stomor Ltd. has been commissioned by Peter David Homes to prepare a Flood Risk Summary Statement (FRSS) to support the proposed development of Commercial Units at Duncots Close, Ickleford.
- 6.1.2. The application site is greenfield with a total area of 0.4 hectares (ha).
- 6.1.3. Development proposals comprise of the construction of eight residential properties.
- 6.1.4. The proposed development would have a NPPF flood risk vulnerability classification of 'Less Vulnerable'. The application site is situated within Flood Zone 1, where all development uses are considered suitable.
- 6.1.5. The nearest designated watercourse to the site is the River Purwell located 100m to the east.
- 6.1.6. It is considered that the site would be at low risk of flooding from fluvial, surface water, groundwater and artificial sources.
- 6.1.7. The proposed surface water drainage strategy demonstrates SuDS features to provide sufficient storage to avoid flooding within the site during the 1 in 100-year storm event + 40% allowance for climate change.
- 6.1.8. Overland flow paths and exceedance routes will be taken into account in design of levels for the proposed development to direct overland flows away from buildings.









Topographical Abbreviations

A/R	Assumed Route	MKR	Marker
BH	Borhole	MT	Masonry Telecom Cover
BOL	Bollard	OC	Overhead Cable
BT	British Telecom Cover	OP	Overhead Pipe
BW	Barricaded Wire Fence	OSM	Ordinance Survey Bench Mark
BWK	Brickwork	PB	Post Box
CATV	Cable TV Cover	PGM	Permanent Ground Marker
CB	Close Boarded Fence	PR	Post & Rail Fence
CCTV	Closed Circuit TV	PW	Post & Wire Fence
CHLK	Chainlink Fence	PWM	Post & Wire Mesh Fence
CHPL	Chainlink Piling Fence	RE	Rodding Eye
CL	Cover Level	RG	Road Gully
CM	Catch Pit	RH	Road Name
CP	Catch Pit	RS	Road Sign
CPL	Catch Pit Base Level	RW	Retaining Wall
DA	Diameter	RWP	Rain Water Pipe
DK	Drop Kerb	SAP	Sealing
DP	Down Pipe	SC	Stop Code
EJB	Electricity Junction Box	SPR	Spread
EC	Electricity Cover	STA	Traverse Station
EP	Electricity Pole	SV	Stop Valve
ER	Earthed Rod	SVP	Soil Vent Pipe
FI	Fire Hydrant	SW	Storm Water
FIG	Feet Into Ground	TB	Telephone Box
FW	Foot Wall	TBM	Temporary Bench Mark
G	Gully	TFR	Taken From Records
GV	Gas Valve	TJ	Telephone Junction Box
HT	Height	TPT	Trial Pit
IC	Inspection Cover	TL	Traffic Light
IL	Invert Level	TP	Telephone Pole
IR	Iron Railing Fence	U	Unable To Lift
KD	Kerb Outlet	UTT	Unable To Trace
LB	Liter Bin	VP	Vent Pipe
LC	Lamp Column	WKH	Water Key Hole
LP	Lamp Post	WM	Water Meter
MH	Manhole	WV	Water Valve

Survey Station Information

STA No.	Easting	Northing	Level
S1	518312.222mE	231547.973mN	51.227
S2	518320.650mE	231551.565mN	51.205
S3	518331.597mE	231538.365mN	51.280
S4	518359.612mE	231563.372mN	50.631
S5	518321.768mE	231516.988mN	51.706
S6	518371.432mE	231509.210mN	50.667
S7	518399.262mE	231499.662mN	49.990
S8	518311.147mE	231527.639mN	51.931
S9	518308.929mE	231527.568mN	51.678
S10	518261.815mE	231504.108mN	52.685
S11	518282.305mE	231487.554mN	52.290
S12	518272.450mE	231444.440mN	52.077
S13	518333.725mE	231479.342mN	51.792

Notes

Grid is related to OS using GPS
All levels related to OS using GPS

5	-		
4	-		
3	-		
2	-		
1	-		
0	ACC	First Complete Issue	25/09/2023
Rev		Description	



CHINERY LAND
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SURVEYED	RJC	
DRAWN	RJC	PETER DAVIS HOMES
SCALE	1:200	

LAND REAR OF ARLESEY ROAD
ICKLEFORD

TOPOGRAPHICAL SURVEY

JOB No	DRAWING NUMBER
CLS23126	CLS23126001 Rev0

A0 Sheet - 1189mm x 841mm





Calculated by:

Sam Briscoe

Site name:

3472

Site location:

Ickleford

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:

51.96940° N

Longitude:

0.27818° W

Reference:

4177970664

Date:

Feb 10 2025 23:16

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):

0.4

Methodology

Q_{BAR} estimation method:

Calculate from SPR and SAAR

SPR estimation method:

Calculate from SOIL type

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

Soil characteristics

	Default	Edited
SOIL type:	3	3
HOST class:	N/A	N/A
SPR/SPRHOST:	0.37	0.37

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

Hydrological characteristics

	Default	Edited
SAAR (mm):	587	587
Hydrological region:	5	5
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	2.45	2.45
Growth curve factor 100 years:	3.56	3.56
Growth curve factor 200 years:	4.21	4.21

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):	0.94	0.94
1 in 1 year (l/s):	0.81	0.81
1 in 30 years (l/s):	2.29	2.29
1 in 100 year (l/s):	3.33	3.33
1 in 200 years (l/s):	3.94	3.94

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.







Variables

Results

Design

Overview 2D

Overview 3D

Vt

FSR Rainfall

Return Period (years)

Region

Map

M5-60 (mm)

Ratio R

100

England and Wales

20.000

0.416

Cv (Summer)

Cv (Winter)

Impermeable Area (ha)

Maximum Allowable Discharge (l/s)

Infiltration Coefficient (m/hr)

Safety Factor

Climate Change (%)

0.750

0.840

0.225

1.0

0.00000

2.0

40

Analyse

OK

Cancel

Help

Enter Area between 0.000 and 999.999

Variables

Results

Design

Overview 2D

Overview 3D

Vt

Results

Global Variables require approximate storage of between 145 m³ and 192 m³.

These values are estimates only and should not be used for design purposes.

Analyse

OK

Cancel

Help

Enter Area between 0.000 and 999.999



Fact Sheet:

Maintenance of Drainage Features

The design process should consider the maintenance of the components (access, waste management etc.) including any corrective maintenance to repair defects or improve performance of SuDS. Inlets, outlets, control structures or other below ground features should be as shallow as reasonably possible to allow easy access for maintenance and to reduce safety risks, while ensuring that sufficient depth is maintained for structural stability.

A SuDS Management Plan must be provided prior to the first occupation which will identify the following:

- The function of SuDS;
- How and why it works on the site;
- Impacts on amenity and wildlife, indicating how they can be enhanced;
- Health and safety issues;
- Long-term expectations for the SuDS on site.

Usually, SuDS components are on or near the surface and most can be managed using landscape maintenance techniques. Typical inspection and maintenance requirements for surface SuDS features are identified below:



Activity	Indicative frequency	Typical tasks
Routine/regular maintenance	Monthly (for normal care of SuDS)	• litter picking • grass cutting (cuttings to compost, wildlife piles or removed from site) Height and frequency dependent upon amenity of grass area. • inspection of inlets, outlets and control structures.
Occasional maintenance	Annually (dependent on the design)	• silt control around components • vegetation management around components • suction sweeping of permeable paving in autumn after leaf fall • silt and debris removal from inlets, outlets, gratings, catchpits, control chambers, soakaways and cellular storage. • trim wet swale or pond edges in September to October or 3-year rotation for wildlife value • wetland vegetation to be cut to 30% height annually and to 100mm on a 3-year rotation • remove overhanging trees or growth within SuDS features
Remedial maintenance	As required (tasks to repair problems due to damage or vandalism)	• inlet/outlet repair • erosion repairs • reinstatement of edgings • reinstatement following pollution • removal of silt build-up.

For below-ground SuDS such as permeable paving, the manufacturer or designer should provide maintenance advice. This should include routine and long-term actions that can be incorporated into the SuDS Management Plan.

Funding for the maintenance of SuDS systems on the site should be resolved at the start of the development process.





SIMPLE INDEX APPROACH: TOOL



HRW shall not be liable for any direct or indirect damage claims, loss, cost, expense or liability whatsoever arising out of the use or impossibility to use the tool, even when HRW has been informed of the possibility of this same. The user hereby indemnifies HRW from and against any damage claims, loss, expense or liability resulting from any action taken against HRW that is related in any way to the use of the tool or any reliance made in respect of the output of such use by any person whatsoever. HRW does not guarantee that the tool's functions meet the requirements of any person, nor that the tool is free from errors.

- The steps set out in the tool should be applied for each inflow or 'runoff area' (ie each impermeable surface area separately discharging to a SuDS component).
- The supporting 'Design Conditions' stated by the tool must be fully considered and implemented in all cases.
- The process that is automated in this tool is described in the SuDS Manual, Chapter 26 (Section 26.7)
- Relevant design examples are included in the SuDS Manual Appendix C.
- Each of the steps below are part of the process set out in the flowchart on Sheet 3.
- Sheet 4 summarises the selections made below and indicates the acceptability of the proposed SuDS components.
- Interception should be delivered for all upstream impermeable areas as part of the strategy for water quantity and quality control for the site. This is required in order to deliver both of the water quality criteria set out in Chapter 4 of the SuDS Manual

DROP DOWN LIST	RELEVANT INPUTS NEED TO BE SELECTED FROM THESE LISTS, FOR EACH STEP
USER ENTRY	USER ENTRY CELLS ARE ONLY REQUIRED WHERE INDICATED BY THE TOOL

STEP 1: Determine the Pollution Hazard Index for the runoff area discharging to the proposed SuDS scheme

This step requires the user to select the appropriate land use type for the area from which the runoff is occurring

If the land use varies across the 'runoff area', either:

- use the land use type with the highest Pollution Hazard Index
- apply the approach for each of the land use types to determine whether the proposed SuDS design is sufficient for all. If it is not, consider collecting more hazardous runoff separately and providing additional treatment.

If the generic land use types suggested are not applicable, select 'Other' and enter a description of the land use of the runoff area and agreed user defined indices in the row below the drop down lists.

Runoff Area Land Use Description	Hazard Level	Pollution Hazard Indices		
		Total Suspended Solids	Metals	Hydrocarbons
Select land use type from the drop down list (or 'Other' if none applicable): Residential parking	Low	0.5	0.4	0.4
If the generic land use types in the drop down list above are not applicable, select 'Other' and enter a description of the land use of the runoff area and agreed user defined indices in this row:				
Landuse Pollution Hazard Index	Low	0.5	0.4	0.4

DESIGN CONDITIONS			
1	2		

STEP 2A: Determine the Pollution Mitigation Index for the proposed SuDS components

This step requires the user to select the proposed SuDS components that will be used to treat runoff - before it is discharged to a receiving surface waterbody or downstream infiltration component

If the runoff is discharged directly to an infiltration component, without upstream treatment, select 'None' for each of the 3 SuDS components and move to Step 2B

This step should be applied to evaluate the water quality protection provided by proposed SuDS components for discharges to receiving surface waters or downstream infiltration components (note: in England and Wales this will include components that allow any amount of infiltration, however small, even where infiltration is not specifically accounted for in the design).

If you have fewer than 3 components, select 'None' for the components that are not required

If the proposed component is bespoke and/or a proprietary treatment product and not generically described by the suggested components, then 'Proprietary treatment system' or 'User defined indices' should be selected and a description of the component and agreed user defined indices should be entered in the rows below the drop down lists

SuDS Component Description	Pollution Mitigation Indices		
	Total Suspended Solids	Metals	Hydrocarbons
Select SuDS Component 1 (i.e. the upstream SuDS component) from the drop down list: Permeous pavement (where the pavement is not designed as an infiltration component)	0.7	0.6	0.7
Select SuDS Component 2 (i.e. the second SuDS component in a series) from the drop down list: Gravel	0.5	0.6	0.6
Select SuDS Component 3 (i.e. the third SuDS component in a series) from the drop down list: None	0	0	0
If the proposed SuDS components are bespoke/proprietary and/or the generic indices above are not considered appropriate, select 'Proprietary treatment system' or 'User defined indices' and enter component descriptions and agreed user defined indices in these rows:			
Aggregated Surface Water Pollution Mitigation Index	0.95	0.9	>0.95

Note: If the total aggregated mitigation index is > 1 (which is not a realistic outcome), then the outcome is fixed at ">0.95". In this scenario, the proposed components are likely to have a very high mitigation potential for reducing pollutant levels in the runoff and should be sufficient for any proposed land use (note: where risk assessment is required, this outcome would need more detailed verification).

Is the runoff now discharged to an infiltration component?

Yes ? [Go to Step 2B](#)
No ? [Go to Step 2C](#)

STEP 2B: Determine the Pollution Mitigation Index for the proposed Groundwater Protection

This step requires the user to select the type of groundwater protection that is either part of the SuDS component or that lies between the component and the groundwater

This step should be applied where a SuDS component is specifically designed to infiltrate runoff (note: in England and Wales this will include components that allow any amount of infiltration, however small, even where infiltration is not specifically accounted for in the design).

'Groundwater protection' describes the proposed depth of soil or other material through which runoff will flow between the runoff surface and the underlying groundwater.

Where the discharge is to surface waters and risks to groundwater need not be considered, select 'None'

If the proposed groundwater protection is bespoke and/or a proprietary product and not generically described by the suggested measures, then a description of the protection and agreed user defined indices should be entered in the row below the drop down list.

Select type of groundwater protection from the drop down list:	Pollution Mitigation Indices		
	Total Suspended Solids	Metals	Hydrocarbons
None			
If the proposed groundwater protection is bespoke/proprietary and/or the generic indices above are not considered appropriate, select 'Proprietary product' or 'User defined indices' and enter a description of the protection and agreed user defined indices in this row:			
Groundwater Protection Pollution Mitigation Index	0	0	0

DESIGN CONDITIONS			
1	2	3	4

STEP 2C: Determine the Combined Pollution Mitigation Indices for the Runoff Area

This is an automatic step which combines the proposed SuDS Pollution Mitigation Indices with any Groundwater Protection Pollution Mitigation Indices

	Combined Pollution Mitigation Indices		
	Total Suspended Solids	Metals	Hydrocarbons
Combined Pollution Mitigation Indices for the Runoff Area	0.95	0.9	>0.95

Note: If the total aggregated mitigation index is > 1 (which is not a realistic outcome), then the outcome is fixed at ">0.95". In this scenario, the proposed components are likely to have a very high mitigation potential for reducing pollutant levels in the runoff and should be sufficient for any proposed land use (note: where risk assessment is required, this outcome would need more detailed verification).

STEP 2D: Determine Sufficiency of Pollution Mitigation Indices for Selected SuDS Components

This is an automatic step which compares the Combined Pollution Mitigation Indices with the Land Use Hazard Indices, to determine whether the proposed components are sufficient to manage each pollutant category type

When the combined mitigation index exceeds the land use pollution hazard index, then the proposed components are considered sufficient in providing pollution risk mitigation.

In England and Wales, where the discharge is to protected surface waters or groundwater, an additional treatment component (ie over and above that required for standard discharges), or other equivalent protection, is required that provides environmental protection in the event of an unexpected pollution event or poor system performance. Protected surface waters are those designated for drinking water abstraction. In England and Wales, protected groundwater resources are defined as 'Source Protection Zones 1'. In Northern Ireland, a more precautionary approach may be required and this should be checked with the environmental regulator on a site by site basis.

Sufficiency of Pollution Mitigation Indices		
Total Suspended Solids	Metals	Hydrocarbons
Sufficient	Sufficient	Sufficient

Reference to local planning documents should also be made to identify any additional protection required for sites due to habitat conservation (see Chapter 7 of the SuDS design guidance). The implications of developments on or within close proximity to an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered via consultation with relevant conservation bodies such as Natural England.

Note: In order to meet both Water Quality criteria set out in the SuDS Manual (Chapter 4), interception should be delivered for all impermeable areas wherever possible. Interception delivery and treatment may be met by the same components, but interception requires separate evaluation.

SIMPLE INDEX APPROACH: TOOL



HRW shall not be liable for any direct or indirect damage claims, loss, cost, expense or liability whatsoever arising out of the use or impossibility to use the tool, even when HRW has been informed of the possibility of this same. The user hereby indemnifies HRW from and against any damage claims, loss, expense or liability resulting from any action taken against HRW that is related in any way to the use of the tool or any reliance made in respect of the output of such use by any person whatsoever. HRW does not guarantee that the tool's functions meet the requirements of any person, nor that the tool is free from errors.

- The steps set out in the tool should be applied for each inflow or 'runoff area' (ie each impermeable surface area separately discharging to a SuDS component).
- The supporting 'Design Conditions' stated by the tool must be fully considered and implemented in all cases.
- The process that is automated in this tool is described in the SuDS Manual, Chapter 26 (Section 26.7)
- Relevant design examples are included in the SuDS Manual Appendix C.
- Each of the steps below are part of the process set out in the flowchart on Sheet 3.
- Sheet 4 summarises the selections made below and indicates the acceptability of the proposed SuDS components.
- Interception should be delivered for all upstream impermeable areas as part of the strategy for water quantity and quality control for the site. This is required in order to deliver both of the water quality criteria set out in Chapter 4 of the SuDS Manual

DROP DOWN LIST RELEVANT INPUTS NEED TO BE SELECTED FROM THESE LISTS, FOR EACH STEP

USER ENTRY USER ENTRY CELLS ARE ONLY REQUIRED WHERE INDICATED BY THE TOOL

STEP 1: Determine the Pollution Hazard Index for the runoff area discharging to the proposed SuDS scheme

This step requires the user to select the appropriate land use type for the area from which the runoff is occurring

If the land use varies across the 'runoff area', either:

- use the land use type with the highest Pollution Hazard Index
- apply the approach for each of the land use types to determine whether the proposed SuDS design is sufficient for all. If it is not, consider collecting more hazardous runoff separately and providing additional treatment.

If the generic land use types suggested are not applicable, select 'Other' and enter a description of the land use of the runoff area and agreed user defined indices in the row below the drop down lists.

Runoff Area Land Use Description	Hazard Level	Pollution Hazard Indices		
		Total Suspended Solids	Metals	Hydrocarbons
Select land use type from the drop down list (or 'Other' if none applicable):				
Residential roofing	Very low	0.2	0.2	0.05
Landuse Pollution Hazard Index	Very low	0.2	0.2	0.05

DESIGN CONDITIONS	
1	2

STEP 2A: Determine the Pollution Mitigation Index for the proposed SuDS components

This step requires the user to select the proposed SuDS components that will be used to treat runoff - before it is discharged to a receiving surface waterbody or downstream infiltration component

If the runoff is discharged directly to an infiltration component, without upstream treatment, select 'None' for each of the 3 SuDS components and move to Step 2B

This step should be applied to evaluate the water quality protection provided by proposed SuDS components for discharges to receiving surface waters or downstream infiltration components (note: in England and Wales this will include components that allow any amount of infiltration, however small, even where infiltration is not specifically accounted for in the design).

If you have fewer than 3 components, select 'None' for the components that are not required

If the proposed component is bespoke and/or a proprietary treatment product and not generically described by the suggested components, then 'Proprietary treatment system' or 'User defined indices' should be selected and a description of the component and agreed user defined indices should be entered in the rows below the drop down lists

SuDS Component Description	Pollution Mitigation Indices		
	Total Suspended Solids	Metals	Hydrocarbons
Select SuDS Component 1 (i.e. the upstream SuDS component) from the drop down list:			
Permeous pavement (where the pavement is not designed as an infiltration component)	0.7	0.6	0.7
Select SuDS Component 2 (i.e. the second SuDS component in a series) from the drop down list:			
Swale	0.5	0.6	0.6
Select SuDS Component 3 (i.e. the third SuDS component in a series) from the drop down list:			
None	0	0	0
Aggregated Surface Water Pollution Mitigation Index	0.95	0.9	>0.95

DESIGN CONDITIONS	
1	2
3	

SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B

SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B

Note: If the total aggregated mitigation index is > 1 (which is not a realistic outcome), then the outcome is fixed at ">0.95". In this scenario, the proposed components are likely to have a very high mitigation potential for reducing pollutant levels in the runoff and should be sufficient for any proposed land use (note: where risk assessment is required, this outcome would need more detailed verification).

Is the runoff now discharged to an infiltration component?

Yes ? [Go to Step 2B](#)
No ? [Go to Step 2C](#)

STEP 2B: Determine the Pollution Mitigation Index for the proposed Groundwater Protection

This step requires the user to select the type of groundwater protection that is either part of the SuDS component or that lies between the component and the groundwater

This step should be applied where a SuDS component is specifically designed to infiltrate runoff (note: in England and Wales this will include components that allow any amount of infiltration, however small, even where infiltration is not specifically accounted for in the design).

'Groundwater protection' describes the proposed depth of soil or other material through which runoff will flow between the runoff surface and the underlying groundwater.

Where the discharge is to surface waters and risks to groundwater need not be considered, select 'None'

If the proposed groundwater protection is bespoke and/or a proprietary product and not generically described by the suggested measures, then a description of the protection and agreed user defined indices should be entered in the row below the drop down list.

Select type of groundwater protection from the drop down list:	Pollution Mitigation Indices		
	Total Suspended Solids	Metals	Hydrocarbons
None			
Groundwater Protection Pollution Mitigation Index	0	0	0

DESIGN CONDITIONS	
1	2
3	4

STEP 2C: Determine the Combined Pollution Mitigation Indices for the Runoff Area

This is an automatic step which combines the proposed SuDS Pollution Mitigation Indices with any Groundwater Protection Pollution Mitigation Indices

	Combined Pollution Mitigation Indices		
	Total Suspended Solids	Metals	Hydrocarbons
Combined Pollution Mitigation Indices for the Runoff Area	0.95	0.9	>0.95

Note: If the total aggregated mitigation index is > 1 (which is not a realistic outcome), then the outcome is fixed at ">0.95". In this scenario, the proposed components are likely to have a very high mitigation potential for reducing pollutant levels in the runoff and should be sufficient for any proposed land use (note: where risk assessment is required, this outcome would need more detailed verification).

STEP 2D: Determine Sufficiency of Pollution Mitigation Indices for Selected SuDS Components

This is an automatic step which compares the Combined Pollution Mitigation Indices with the Land Use Hazard Indices, to determine whether the proposed components are sufficient to manage each pollutant category type

When the combined mitigation index exceeds the land use pollution hazard index, then the proposed components are considered sufficient in providing pollution risk mitigation.

In England and Wales, where the discharge is to protected surface waters or groundwater, an additional treatment component (ie over and above that required for standard discharges), or other equivalent protection, is required that provides environmental protection in the event of an unexpected pollution event or poor system performance. Protected surface waters are those designated for drinking water abstraction. In England and Wales, protected groundwater resources are defined as 'Source Protection Zones 1'. In Northern Ireland, a more precautionary approach may be required and this should be checked with the environmental regulator on a site by site basis.

Sufficiency of Pollution Mitigation Indices		
Total Suspended Solids	Metals	Hydrocarbons
Sufficient	Sufficient	Sufficient

DESIGN CONDITIONS

1

Reference to local planning documents should also be made to identify any additional protection required for sites due to habitat conservation (see Chapter 7 of the SuDS design guidance). The implications of developments on or within close proximity to an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered via consultation with relevant conservation bodies such as Natural England.

Note: In order to meet both Water Quality criteria set out in the SuDS Manual (Chapter 6), interception should be delivered for all impermeable areas wherever possible. Interception delivery and treatment may be met by the same components, but interception requires separate evaluation.