



# Surface water storage requirements for sites

www.uksuds.com | Storage estimation tool

Calculated by:

Site name:

Site location:

**Site Details**

Latitude:

Longitude:

Reference:

Date:

This is an estimation of the storage volume requirements that are needed 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). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

### Site characteristics

Total site area (ha):	<input type="text" value="0.0451"/>
Significant public open space (ha):	<input type="text" value="0"/>
Area positively drained (ha):	<input type="text" value="0.0451"/>
Impermeable area (ha):	<input type="text" value="0.0451"/>
Percentage of drained area that is impermeable (%):	<input type="text" value="100"/>
Impervious area drained via infiltration (ha):	<input type="text" value="0"/>
Return period for infiltration system design (year):	<input type="text" value="10"/>
Impervious area drained to rainwater harvesting (ha):	<input type="text" value="0"/>
Return period for rainwater harvesting system (year):	<input type="text" value="10"/>
Compliance factor for rainwater harvesting system (%):	<input type="text" value="66"/>
Net site area for storage volume design (ha):	<input type="text" value="0.05"/>
Net impermeable area for storage volume design (ha):	<input type="text" value="0.05"/>
Pervious area contribution to runoff (%):	<input type="text" value="30"/>

### Methodology

esti	<input type="text" value="IH124"/>
Q <sub>BAR</sub> estimation method:	<input type="text" value="Calculate from SPR and SAAR"/>
SPR estimation method:	<input type="text" value="Calculate from SOIL type"/>

### Soil characteristics

	Default	Edited
SOIL type:	<input type="text" value="2"/>	<input type="text" value="2"/>
SPR:	<input type="text" value="0.3"/>	<input type="text" value="0.3"/>

### Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	<input type="text" value="--"/>	<input type="text" value="63"/>
Rainfall 100 yrs 12 hrs:	<input type="text" value="--"/>	<input type="text" value="97.79"/>
FEH / FSR conversion factor:	<input type="text" value="1.27"/>	<input type="text" value="1.27"/>
SAAR (mm):	<input type="text" value="566"/>	<input type="text" value="566"/>
M5-60 Rainfall Depth (mm):	<input type="text" value="20"/>	<input type="text" value="20"/>
'r' Ratio M5-60/M5-2 day:	<input type="text" value="0.4"/>	<input type="text" value="0.4"/>
Hydrological region:	<input type="text" value="5"/>	<input type="text" value="5"/>
Growth curve factor 1 year:	<input type="text" value="0.87"/>	<input type="text" value="0.87"/>
Growth curve factor 10 year:	<input type="text" value="1.65"/>	<input type="text" value="1.65"/>
Growth curve factor 30 year:	<input type="text" value="2.45"/>	<input type="text" value="2.45"/>
Growth curve factor 100 years:	<input type="text" value="3.56"/>	<input type="text" value="3.56"/>
Q <sub>BAR</sub> for total site area (l/s):	<input type="text" value="0.06"/>	<input type="text" value="0.06"/>
Q <sub>BAR</sub> for net site area (l/s):	<input type="text" value="0.06"/>	<input type="text" value="0.06"/>

### Design criteria

Climate change allowance factor:

Urban creep allowance factor:

Volume control approach:

Interception rainfall depth (mm):

Minimum flow rate (l/s):

### Site discharge rates

	Default	Edited
1 in 1 year (l/s):	<input type="text" value="5"/>	<input type="text" value="5"/>
1 in 30 years (l/s):	<input type="text" value="5"/>	<input type="text" value="5"/>
1 in 100 year (l/s):	<input type="text" value="5"/>	<input type="text" value="5"/>

### Estimated storage volumes

	Default	Edited
Attenuation storage 1/100 years (m³):	<input type="text" value="6"/>	<input type="text" value="6"/>
Long term storage 1/100 years (m³):	<input type="text" value="0"/>	<input type="text" value="0"/>
Total storage 1/100 years (m³):	<input type="text" value="6"/>	<input type="text" value="6"/>

This report was produced using the storage estimation 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 <http://uksuds.com/terms-and-conditions.htm>. The outputs from this tool have been used to estimate storage volume requirements. 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 these data in the design or operational characteristics of any drainage scheme.

# CONSTRUCTION OF AN AGRICULTURAL STORAGE BUILDING, WOMBWELL HOUSE, FISHTOFT ROAD, FISHTOFT, BOSTON. PE21 0QR

Planning Permission Ref B/21/0168 was granted 11<sup>th</sup> June 2021 for the erection of an agricultural Storage building.

Witham Fourth District IDB requested consent from the applicant is required to:

- 1 Directly discharge surface water to a watercourse (open or piped). A surface water development contribution (SWDC) will be charged on all rates of discharges.
- 2 Discharge the surface and treated water to a watercourse (open or piped).
- 3 Culvert, pipe or bridge the watercourse.

The aim of this SW strategy is to access the potential for the installation of sustainable urban drainage systems (SUDS) for the proposed development to satisfy The Witham Fourth District IDB.

It is proposed to utilise attenuation techniques to reduce the storm water discharge from the proposed development and to minimise the impact of the development on the surrounding area and to comply with guidelines

It is proposed that the surface water be discharged into a newly constructed pond located within in an area which is an established wildlife area. The outfall will be to the adjacent riparian-maintained watercourse.

The storage shed measures 19.35m x 23.31m) 451m<sup>2</sup>.

An on-line surface water detention and attenuation balancing pond of 6m<sup>3</sup> storage capacity, calculated using the Wallingford Tool for "Surface Water Storage requirements for Sites", provides storage at the flow control location.

A Hydrobrake Optimum flow control device will be provided to attenuate the final discharge flows down to 5 litres/sec for the 2-year, 30-year 5litres/sec and up to the 1-100 year plus 40% climate change standard 5 litres/sec Flows in excess of these figures are stored in the on-line balancing pond where they are stored for a period of time before draining back down again to normal water level.

The pond dimensions will be 24m<sup>2</sup> with a storage depth of 250mm with a 300mm freeboard giving a normal TWL of 550mm below the natural ground level.

**R M ASSOCIATES**

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