Proposed Development at Land to the rear of 40, The Borough, Downton.

FLOOD RISK ASSESSMENT.

Introduction.

It is proposed to carry out a modest development at the above property, which is within the wider flood plain of the River Avon. Any planning application needs to be accompanied, therefore, by a formal flood risk assessment in accordance with the requirements of the Government's National Planning Policy Framework (NPPF). This document fulfils that requirement.

The Site.

The site comprises a roughly rectangular plot of land directly off The Borough, in the village of Downton, Wiltshire. Both vehicular and pedestrian access is via one end of the plot and is from a service road running parallel to The Borough. A full topographical survey is available, with levels related to a local benchmark. The site is essentially flat, varying in level not more than 250mm throughout. The site is currently the rear garden and within the curtilage of No.40 The Borough a 3-bedroom Grade 2 listed thatched cottage fronting The Borough. The floor level of the existing cottage is less that 200mm above the ambient level of the site.

The conversion factor to relate the local datum to Ordnance datum is +25.45m. The bulk of the site lies between levels of 35.68m to the north, rising to 35.84m above OD to the south. Please see Figure 1.

The Proposals.

It is proposed to construct a single two storey, 4-bedroom residential unit at the rear of the existing site. The new unit will be a new 4-bedroom residential dwelling with high ECO credentials. The finished floor level of the new unit is set at 36.00m above OD. The proposals include a residential vehicle parking facility, a garage, garden fencing and landscaping. The NPPF classification for this development is "more vulnerable" and the lifespan is taken to be 100 years.

Environment Agency Information.

The Environment Agency has provided modelled flood height information for this area of The Borough, taken from the 2d Modelled Undefended Hampshire Avon Flood Modelling Study SW772, SW9130 dated 8th December 2014 refers. This data set, when compared with the topographical information, suggests that the site is marginally within NPPF Flood Zone 2, which has a flood level of 35.9m above OD. Flood Zone 3 has a flood level at 35.5m above OD. A portion of the site, close to the footprint of the building and covering the existing dwelling, is above the flood plain, in Zone 1. The Environment Agency published data within the Hampshire Avon Management Plan June 2012 that they are managing the flood risk effectively and that Downton sits within sub area 6 with no planned further works.

Most of the site lies within the Agency's ePlanning tool. The site is away from the main courses of the River Avon. The Borough in the local vicinity is protected by highly invested flood defence system.

What This Means for the Development.

With a floor level fixed at 36.00m above OD, the new residence will be risk-free for the whole of its life. It will enjoy a freeboard of 500mm from the start, although this will diminish as climate change is experienced to perhaps 100mm in 100 years' time. In the gardens adjacent to the site large homes have been built within the same risk zones. The site previously as can be seen withing the Ground Survey show the number of outbuildings that had hard standing bases are now gone will only add to flood plain capacity. The existing non permeable driveway and paths will also be removed. The area of these surfaces (covering 206.91m2) are more than the proposed non permeable surface. The proposed water harvesting system along with ECO credentials of the development negate further attenuation from being required.

Residual Flood Risk.

The NPPF requires that any residual flood risk is considered, together with how that risk can be managed in the future. In this instance, the residual risk may be interpreted as that faced by occupants of the new residence who are caught on the site by a developing extreme event. Whilst the building will remain risk-free and a safe haven, the access to the site from The Borough, will be flooded to depths up to 300mm. The Environment Agency's FD2320 matrix indicates that there may be "danger to some" pedestrians in negotiating floods of this depth. Vehicular movement should not be curtailed.

Flood Resistance and/or Flood Resilience.

Since the new building is within a general flood risk area, it would be prudent to consider flood resilience measures in the design. These would include solid floors, water resistant wall coverings and high-level electrical installation.

Other Flood Risk Sources.

The NPPF requires that the whole range of flood risk sources is examined, as follows: -

- ***Flooding from the Sea.*** Not applicable.

- ***Flooding from Rivers.*** This is identified as the major risk source and is examined fully above.

- ***Flooding from Surface Water.*** The Environment Agency's flood mapping indicates that The Borough is susceptible to surface water flooding but that the risk is low.

- ***Flooding from Groundwater.*** Water table levels at this location are likely to be heavily influenced by conditions on the River Avon. Any problems here are likely to be subsumed by any wider event on the river and should not present an additional risk.

- ***Flooding from Sewers.*** The Borough has an established sewerage infrastructure, but it is not known if this has caused problems in the past.

- ***Flooding from Canals,*** reservoirs etc. Not applicable.

Flood Warnings.

The Environment Agency operates a robust flood warning service, with detailed information daily on their website. The Agency offers a three-stage warning structure on the local and national media. The stages are "Flood Alert", "Flood Warning" and "Severe Flood Warning". Action at the new residence should be necessary only for "Severe Flood Warnings". Information is also available via their national call centre on 08708 506 506. The Agency also offers an automatic telephone warning service which is free to those in risk areas.

Sequential Test.

As stated above, although there is an intensification of residential usage arising from the development. It is considered, that due to previous infill developments in land adjacent and the net reduction in hardstanding areas, that the Sequential Test is not appropriate in this instance.

Notwithstanding the above, the sequential guiding principals have been adhered to. None of the proposed development is within the 1 in 100-year flood plain and the new unit is sited in a part of the site which is least affected by the 1 in 1000-year condition.

Conclusions.

The main conclusion of this assessment is that there appear to be no flood risk reasons why this development should not proceed as proposed. Specifically: -

- The development is for a single dwelling and will provide little intensification of residential usage and provide a net gain to the flood plain capacity on the site. There is, therefore, no increase in flood risk as defined by the NPPF.

- The new unit will remain risk-free for the whole of its life.

- There is an element of residual flood risk arising from the modest flooding of The Borough during extreme events. The risk can be managed by the residents signing up to the Environment Agency's automatic telephone flood warning service.

- There appear to be no other serious sources of flood risk.

- A full SUDs water attenuation survey confirms no additional storage would be required. Figure 2.

- Figure 3 shows a full design for a smaller site to the East which required further attenuation and was passed.

- Proposed rainwater harvesting and grey water usage within the house provides attenuation and ECO capabilities of the proposed dwelling. (Graf 6500l system proposed)



Figure 1; Satellite image showing plot. Surrounding infill development on neighbouring plots

hr wallingford

Surface water storage requirements for sites

www.uksuds.com | Storage estimation tool

Calculated by:	Mark Ward
Site name:	Rear Plot 40 The Borough
Site location:	The Borough, Downton

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 Details

Latitude:	50.99160° N
Longitude:	1.75546° W
Reference:	1213536825
Date:	Jul 24 2023 08:21

Site characteristics

Total site area (ha):	0.1076
Significant public open space (ha):	0.0926
Area positively drained (ha):	0.015
Impermeable area (ha):	[illegible]
Percentage of drained area that is impermeable (%):	100
Impervious area drained via infiltration (ha):	0.015
Return period for infiltration system design (year):	100
Impervious area drained to rainwater harvesting (ha):	0.015
Return period for rainwater harvesting system (year):	100
Compliance factor for rainwater harvesting system (%):	66
Net site area for storage volume design (ha):	0.02
Net impermable area for storage volume design (ha):	0.01
Pervious area contribution to runoff (%):	30

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Methodology

esti	IH124
Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Please choose a more secure password. It should be longer than 8 characters, unique to you and difficult for others to guess.

Registration successful. You are now logged in.

Soil characteristics

	Default	Edited
SOIL type:	2	2
SPR:	0.3	0.3

Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	--	70
Rainfall 100 yrs 12 hrs:	--	90.72
FEH / FSR conversion factor:	1.08	1.08
SAAR (mm):	814	814
M5-60 Rainfall Depth (mm):	20	20
'r' Ratio M5-60/M5-2 day:	0.3	0.3
Hydological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 10 year:	1.62	1.62
Growth curve factor 30 year:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19

Design criteria

Climate change allowance factor:	1.4

Urban creep allowance factor:	1.1	Q_{BAR} for total site area (l/s):	0.23	0.23
Volume control approach	Use long term storage	Q_{BAR} for net site area (l/s):	0.04	0.04
Interception rainfall depth (mm):	5			
Minimum flow rate (l/s):	2			

Site discharge rates

	Default	Edited
1 in 1 year (l/s):	2	2
1 in 30 years (l/s):	2	2
1 in 100 year (l/s):	2	2

Estimated storage volumes

	Default	Edited
Attenuation storage 1/100 years (m^3):	0	0
Long term storage 1/100 years (m^3):	0	0
Total storage 1/100 years (m^3):	0	0

This report was produced using the storage estimation tool developed by HRWallingford 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.

Figure 2; Surface water storage water estimation SUDs designer

100 YEAR EVENT STORMWATER ATTENUATION DESIGN — The Borough, Downton

Assume 100 year storm event. **Site impermeable area to connect to watercourse = 120 sq.m.**

Allow 30% climate change in line with PPS25, effective site area = 120 x 1.30 = 156 sq.m.

Allowable discharge rate limited to 1/1 year storm event = 50mm/hr x 2.78 x 0.012 = 1.67 l/sec

Calculate inline storage needed to accommodate a peak discharge of say 1 litre/sec.

DURATION D(min)	M5-60 (mm)	RATIO R	Z1	M5-D (mm)	Z2	M100-D (mm)	DRAINED AREA (sq.m)	STORM INFLOW (cu.m.)	SEWER OUTFLOW (cu.m.)	IN LINE STORAGE VOL NEEDED (cu.m.)
10	20	0.30	0.48	9.60	1.91	18.34	156	2.86	0.60	2.26
15	20	0.30	0.62	12.40	1.95	24.18	156	3.77	0.90	2.87
30	**20**	**0.30**	**0.80**	**16.00**	**1.99**	**31.84**	**156**	**4.97**	**1.80**	**3.17**
60	20	0.30	1.00	20.00	2.03	40.60	156	6.33	3.60	2.73
120	20	0.30	1.30	26.00	2.01	52.26	156	8.15	7.20	0.95
240	20	0.30	1.60	32.00	1.95	62.40	156	9.73	14.40	-4.67
360	20	0.30	1.80	36.00	1.93	69.48	156	10.84	21.60	-10.76
600	20	0.30	2.15	43.00	1.86	79.98	156	12.48	36.00	-23.52
1440	20	0.30	2.80	56.00	1.77	99.12	156	15.46	86.40	-70.94

Critical 1/100 year storm event will be the 30 minute storm duration highlighted above.

PROVIDE min 3.17 cu.m. onsite inline attenuation storage and discharge control for max 1 litres/sec.

Figure 3; 1/100 year event storm water attenuation design