Mr. Alan Pearson

Flood Risk Assessment
Mead House,
Selham,
West Sussex,
GU28 0PJ

Report LL088
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Summary

This document is a Flood Risk Assessment for the construction of two timber garages at an existing residence. It uses the site-specific flood risk assessment checklist published online[1]. In the text below, checklist items are copied in blue, together with hyperlinks, which are shown as footnotes for clarity. Text in black includes development proposals and the description of how it is recommended that the checklist item should be implemented at the site.

1. Two new garages have been proposed in the grounds of an existing residence at Mead house, Selham, West Sussex, GU28 0PJ.

2. One garage is proposed to the north of the dwelling, close to an existing garage. The other garage is proposed to the east of Mead House, within the current garden.

3. As a non-residential building used for storage, the proposed development would be classed as “less vulnerable” under NPPF guidelines.

4. The Sequential and Exception Tests should not be applied to minor developments, “Householder developments”, such as garages.

5. The site is on land assigned to Flood Zone 2, which means that it would be affected by the 1:1,000-year flood on the River Lod but not the 1:100-year event. There is no history of fluvial flooding at the site.

6. By plotting LiDAR-derived contours on to the Flood Map for Planning, the estimated 1:100-year flood does not rise above the 15 mAOD contour along the River Lod, adjacent to the site. Garage A is proposed on land between about 15.6 mAOD and 15.8 mAOD and Garage B, on slightly higher land between 17 mAOD and18 mAOD.

7. Regional soil mapping indicates that the site is underlain by freely draining soils. It is recommended that surface water runoff from the proposed garages is directed towards the permeable gravel driveway or gravel filled ditches around the margin of the garages, allowing attenuation and infiltration.

8. Apart from fluvial, no other sources of flood risk are known to exist at the site. Flood Zone 2 and Flood Zone 3 are considered appropriate for Less Vulnerable development, such as the proposed garages.

9. Residual risk remains that the site of the proposed garages is located within the 1:1,000-year flood zone and any increase in flood levels, as a result of climate change, may impact on the site. It is recommended that flood resilience measures are considered in the construction of the garages to allow a quick flood recovery after flooding.

10. In summary, the location of the proposed garages puts them at low risk of future flooding. If the recommendations within this report are adopted, then the proposed development would comply with the flood risk provisions of the NPPF.

[1] https://www.gov.uk/guidance/flood-risk-and-coastal-change#Site-Specific-Flood-Risk-Assessment-checklist-section

1 Development site and location

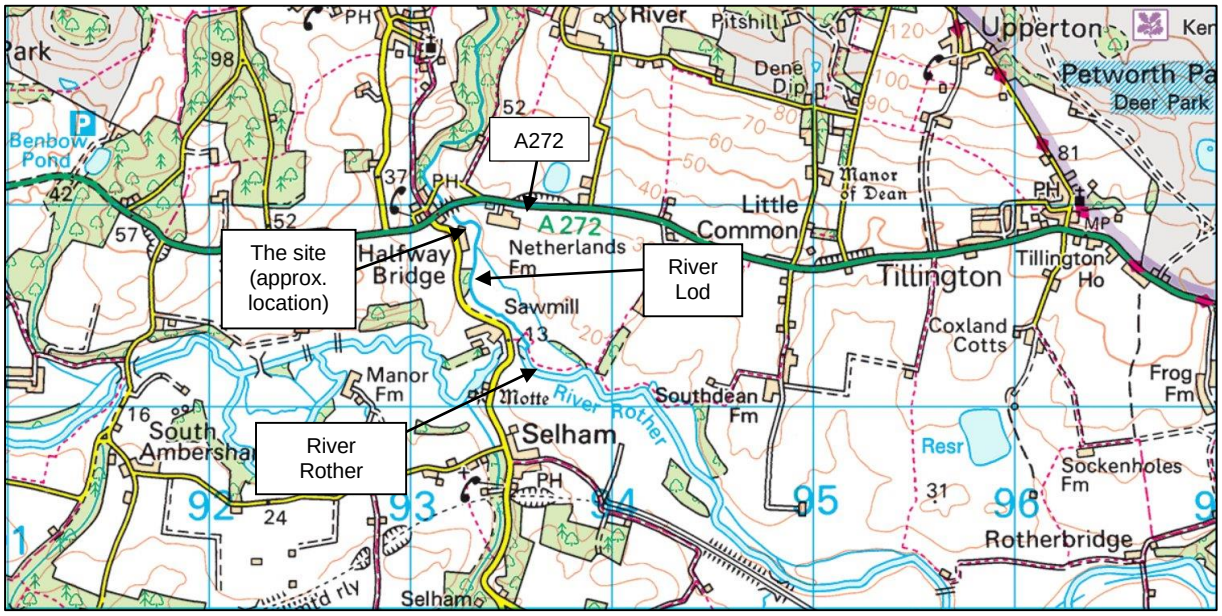
You can use this section to describe the site you are proposing to develop. It would be helpful to include, or make reference to, a location map which clearly indicates the development site.

a. Where is the development site located? (eg postal address or national grid reference)
b. What is the current use of the site? (eg undeveloped land, housing, shops, offices)
c. Which Flood Zone (for river or sea flooding) is the site within? (ie Flood Zone 1, 2 or 3).

As a first step, you should check the Flood Map for Planning (Rivers and Sea)[2]. It is also a good idea to check the Strategic Flood Risk Assessment for the area available from the local planning authority.

Two timber garages have been proposed, within the curtilage at Mead House, Selham, West Sussex, GU28 0PJ, described below as "the site" (Figure 1, Figure 2). The site is just north of Selham and south of the A272 (Figure 1). The coordinates of the approximate centre of the site are reproduced in Table 1. As shown in Figure 9, the eastern margins of the site are located in fluvial Flood Zone 2, beyond the limits of the 1:100-year fluvial flooding but within the 1:1,000-year flood outline.

Figure 1 Map showing the location of the site in relation to drainage, roads and bounding settlements



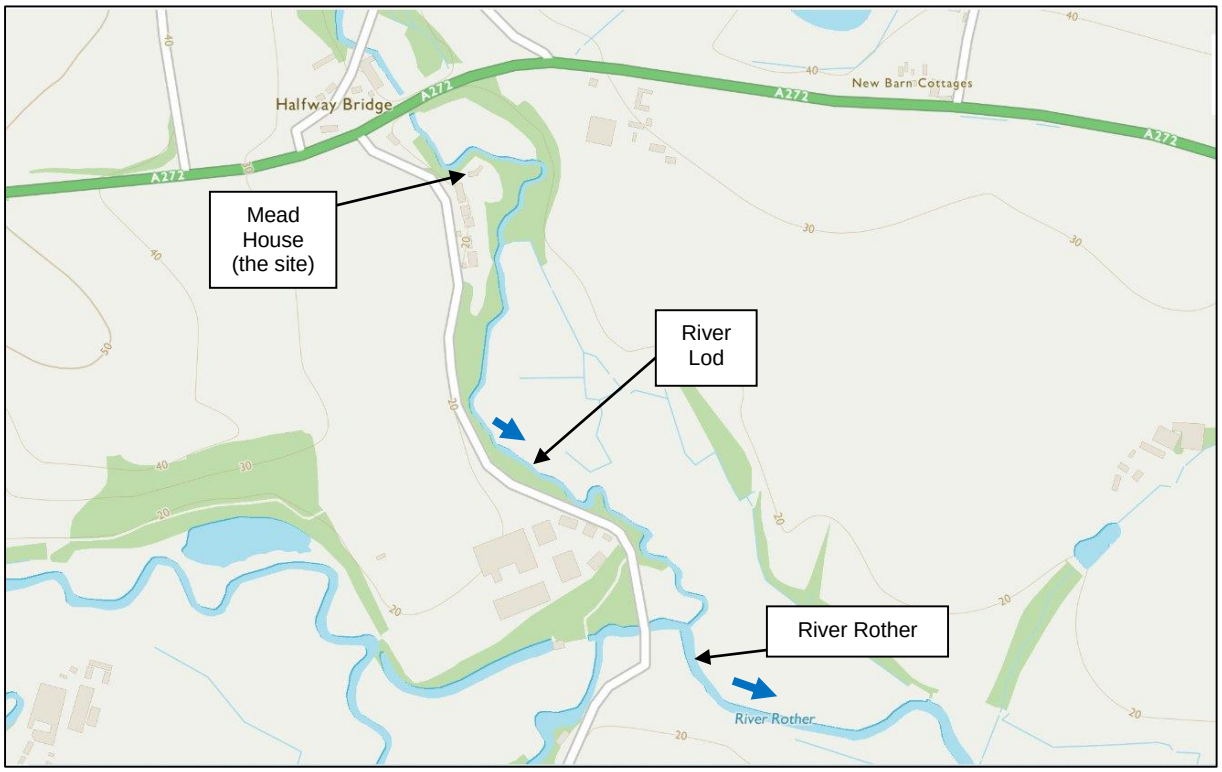
Source: https://maps.the-hug.net/

Table 1 Approximate location of the site

OS X (Eastings)	493253
OS Y (Northings)	121875
Nearest Post Code	GU28 0PJ
Latitude (WGS84)	50.988729
Longitude (WGS84)	W-0.67273986
Nat Grid Ref. (OSGB36)	SU 93253 21875

[2] https://flood-map-for-planning.service.gov.uk/

Figure 2 Ordnance Survey mapping of the site and surrounding area, showing the main rivers



Source: https://osmaps.ordnancesurvey.co.uk/50.98605,-0.66781,16

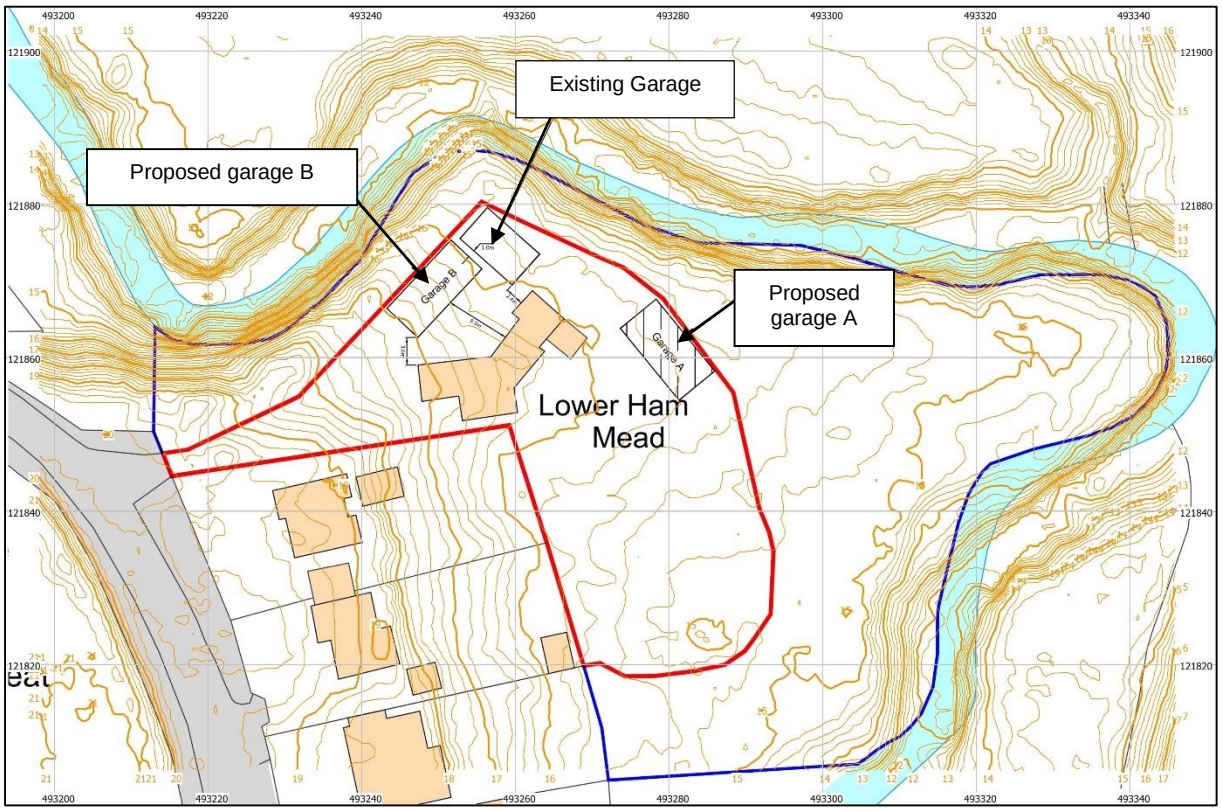
2 Development proposals

You can use this section to provide a general summary of the development proposals. It would be helpful to include, or make reference to, an existing block plan and a proposed block plan, where appropriate.

a. What are the development proposal(s) for this site? Will this involve a change of use of the site and, if so, what will that change be?
b. In terms of vulnerability to flooding, what is the vulnerability classification of the proposed development? See Table 2 of this guidance for an explanation of the vulnerability classifications.
c. What is the expected or estimated lifetime of the proposed development likely to be? (eg less than 20 years, 20-50 years, 50-100 years?). See paragraph 026 of this guidance for further advice on how to assess the lifetime of developments for flood risk and coastal change purposes. (It may also be advisable to seek advice from the local planning authority).

The proposed layout of the site is shown in Figure 3, with the garages labelled A and B. The garages would be timber clad, providing storage for up to four cars in each. They are proposed around the margins of the existing garden area, where they would be shaded and partly concealed by the trees, as shown in the photographs (Figure 4 and Figure 5). In terms of their vulnerability the garages would fit the description of "general industry, storage and distribution; non-residential" and as such would be classified as "less vulnerable". The design life of the garages would be no longer than that of the existing dwelling and probably less than 50 years.

Figure 3 Plan of the proposed layout at the site, with the new garages shown, contour interval 0.2 m



Note: Contours have been added to the block plan, vertical interval 0.2 m

Figure 4 The rear of Mead House looking north, with the location of proposed garage A to the east

Figure 5 Existing garage to the north of the residence and site of proposed garage B.

3 Sequential test

For developments in flood zones 2 or 3 only. (If the development site is wholly within flood zone 1, you can skip this section and go to section 4).

You can use this section to describe how you have applied the sequential test (if needed as set out in paragraphs 101-104 of the National Planning Policy Framework) to the proposed development, and the evidence to demonstrate how the requirements of the test have been met. See paragraph 033 of this guidance for further information. (You are advised to contact the local planning authority to confirm whether the sequential test should be applied and to ensure the appropriate level of information is provided).

a. What other locations with a lower risk of flooding have you considered for the proposed development?
b. If you have not considered any other locations, what are the reasons for this?
c. Explain why you consider the development cannot reasonably be located within an area with the lowest probability of flooding (flood zone 1); and, if your chosen site is within flood zone 3, explain why you consider the development cannot reasonably be located in flood zone 2. See Table 1 for definitions of the flood zones.
d. As well as flood risk from rivers or the sea, have you taken account of the risk from any other sources of flooding in selecting the location for the development?

The sequential test is described in Section 158 of the NPPF[3] as follows:

> "*The aim of the sequential test is to steer new development to areas with the lowest risk of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding. The strategic flood risk assessment will provide the basis for applying this test. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding*".

As shown in Figure 9, the northern and eastern margins of Mead House and its gardens are located in Flood Zone 2, where it would be affected by the 1:1,000-year flood but not the 1:100-year event. As stated under Government guidance[4], it is not necessary to apply the Sequential Test for minor developments, which are defined as including:

> *"Householder development: For example; sheds, garages, games rooms etc within the curtilage of the existing dwelling, in addition to physical extensions to the existing dwelling itself. This definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling eg subdivision of houses into flats"[5].*

The proposed garages clearly fall within this description and will not be associated with any additional people living at the site.

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[3] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf

[4] https://www.gov.uk/guidance/flood-risk-and-coastal-change

[5] https://www.gov.uk/guidance/flood-risk-and-coastal-change#minor-development-to-flood-risk

4 Climate Change

How is flood risk at the site likely to be affected by climate change? (The local planning authority's Strategic Flood Risk Assessment should have taken this into account). Further advice on how to take account of the impacts of climate change in flood risk assessments is available from the Environment Agency[6].

The Environment Agency and NPPF require a consideration of the impacts of climate change on flood risk for any proposed development. In February 2016, the Environment Agency updated the climate change allowances required in Flood Risk Assessments. This advice updates previous climate change allowances to support the NPPF (DCLG, 2019)[7]. The Environment Agency (2016) state:

> "*Making an allowance for climate change in your flood risk assessment will help to minimise vulnerability and provide resilience to flooding and coastal change in the future. The climate change allowances are predictions of anticipated change for:*
> - *peak river flow by river basin district;*
> - *peak rainfall intensity;*
> - *sea level rise;*
> - *offshore wind speed and extreme wave height*."

For river flow, Table 2 shows the anticipated changes in the South east river basin district, recommending a progressive increase, reaching 20% for the 'Central' allowance by 2069. These allowances recommend the increases in flow that are considered to be likely, the effect on flood level needs to be determined through hydraulic modelling.

Table 2 Peak river flow allowances for South eastern river basin district (based on 1961 to 1990 baseline)

South eastern river basin district	Total potential change anticipated		
Allowance Level	**2010 to 2039**	**2040 to 2069**	**2070 to 2115**
H++	30%	60%	120%
Upper end	25%	50%	105%
Higher Central	15%	30%	45%
Central	10%	20%	35%

Source: Environment Agency (2016)[8]

The first column in Table 2 describes the probability of these changes occurring, describing the proportion of possible scenarios that fall below an allowance level. These are defined as:

- Central allowance is based on the 50th percentile
- Higher central allowance is based on the 70th percentile
- Upper end allowance is based on the 90th percentile
- The High++ (H++) allowance is the extreme climate change scenario recommended by the Environment Agency.

This can be illustrated by taking a design life of a garage of less than 50 years, the Environment Agency assess that by 2069, there is a 50% chance that river flow will increase by up to 20%, a 70% chance that flow will not have exceeded a 30% increase and a 90% chance that river flow will increase by 50% or less, over this period. If the site was subject to hydraulic modelling, the Environment Agency would want to see that some consideration had been given to the H++ allowances, shown as 60% in Table 2, as well as the central, higher

[6] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances
[7] https://www.gov.uk/government/collections/revised-national-planning-policy-framework
[8] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#table-1

central and upper end allowances. The choice of which increment to use is a value judgment, usually based on vulnerability and consequence of exceedance. In the case of the proposed garages, the vulnerability is low.

In the absence of detailed hydraulic modelling to assess the potential change in flood risk from future climate change, the South Downs National Park Authority Strategic Flood Risk Assessment[9] applies two methods depending on site location. "Method 2" is applied for all sites outside of Lewes, where the application of a buffer around Flood Zone 2 is used.

> "*A 15 m buffer was placed around the Flood Zone 2 extent, in order to represent the situation where a future climate change-impacted 1:100 year AEP event yields a flood extent that is slightly greater than the current 1 in 1,000 year extent" (Section 4.1.12 p. 36)*

As acknowledged in the SFRA this is a simplistic approach and does not take account of local topography and hydraulic conditions.

[9] South Downs National Park Authority, Level 1 Update and Level 2 strategic flood risk assessment (2017)

5 Site specific flood risk

You can use this section to describe the risk of flooding to and from the proposed development over its expected lifetime, including appropriate allowances for the impacts of climate change. It would be helpful to include any evidence, such as maps and level surveys of the site, flood datasets (eg flood levels, depths and/or velocities) and any other relevant data, which can be acquired through consultation with the Environment Agency[10], the lead local flood authority for the area, or any other relevant flood risk management authority. Alternatively, you may consider undertaking or commissioning your own assessment of flood risk, using methods such as computer flood modelling.

a. What is/ are the main source(s) of flood risk to the site? (eg tidal/sea, fluvial or rivers, surface water, groundwater, other?). You should consider the flood mapping available from the Environment Agency[11], the Strategic Flood Risk Assessment for the area, historic flooding records and any other relevant and available information.
b. What is the probability of the site flooding, taking account of the maps of flood risk available from the Environment Agency, the local planning authority's Strategic Flood Risk Assessment and any further flood risk information?
c. Are you aware of any other sources of flooding that may affect the site?
d. What is the expected depth and level for the design flood? See paragraph 055 of this guidance for information on what is meant by a "design flood"[12]. If possible, flood levels should be presented in metres above Ordnance Datum (ie, the height above average sea level).
e. Are properties expected to flood internally in the design flood and to what depth? Internal flood depths should be provided in metres.
f. How will the development be made safe from flooding and the impacts of climate change, for its lifetime[13]? Further information can be found in paragraphs 054 and 059 (including on the use of flood resilience and resistance measures) of this guidance.
g. How will you ensure that the development and any measures to protect the site from flooding will not cause any increase in flood risk off-site and elsewhere? Have you taken into account the impacts of climate change, over the expected lifetime of the development? (eg providing compensatory flood storage which has been agreed with the Environment Agency).
h. Are there any opportunities offered by the development to reduce the causes and impacts of flooding? See paragraph 050 of this guidance for further advice.

5.1 Introduction

The main source of flood risk to the site is shown by Environment Agency mapping to be fluvial (Figure 9), with the existing garage and eastern margins of the residence being located within Fluvial Flood Zone 2, the area assessed to be affected by the 1:1,000-year flood but not the 1:100-year event. The River Lod flows to the north and east of the site, as shown in Figure 2. There is no record of flooding at Mead House or within the gardens.

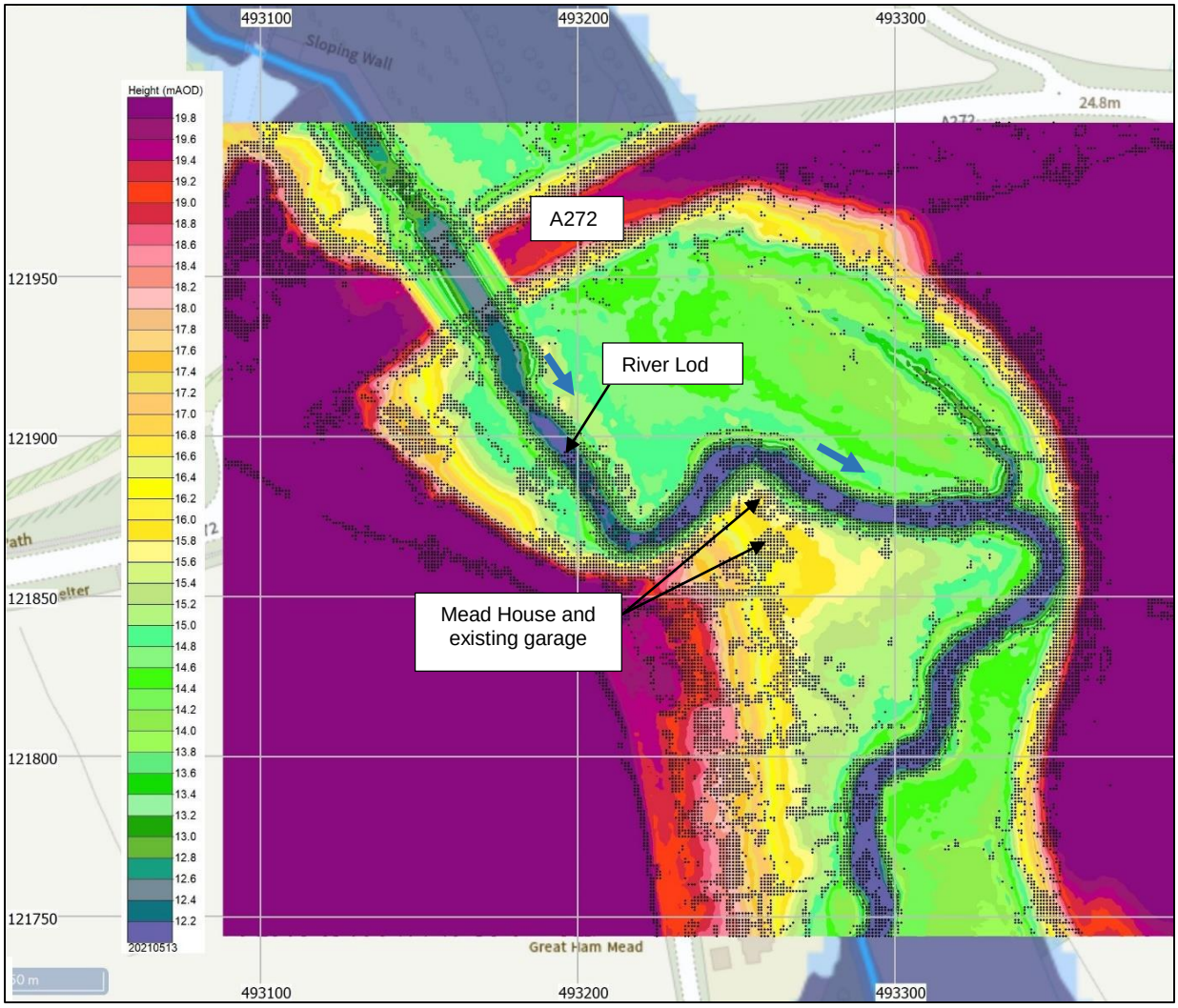
5.2 Topography

The regional topography is shown in Figure 6, plotted from LiDAR digital elevation data. Digital terrain model (DTM) data records the height of the underlying land surface. This is produced from the original data source, which includes information on surface features, such as buildings and vegetation, which are recorded in the digital surface model (DSM). Both data sources are used in Figure 6, with DTM data defining the colours of each layer and DSM data being used define where the surface is above the underlying terrain. This height difference can be varied and a value of 0.2 m is used in Figure 6.

[10] https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications#get-information-to-complete-an-assessment
[11] https://flood-warning-information.service.gov.uk/long-term-flood-risk/map
[12] https://www.gov.uk/guidance/flood-risk-and-coastal-change#design-flood
[13] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Areas where the surface is raised above the terrain are shown using black dots, marking the locations of buildings and areas of woodland. The mapping shows that downstream of the A272, land on the left bank of the River Lod is lower, indicated by the light green shading, with ground levels around 14 mAOD. Mead House and existing garage are located on land shaded yellow, with ground levels between 16 mAOD and 17 mAOD.

Figure 6 Regional topography in the area around site, shown using layer shading



Note: Layer interval 0.2 m

The topography around the site is shown in Figure 7 and Figure 8. Figure 7 uses contours, allowing Mead House and the proposed garages to be clearly seen. The residence, existing garage and proposed garages are outlined in Figure 7 and this outline has been transferred to Figure 8. The layer shading indicates that proposed garage B (blue outline) is on land slightly higher than the existing garage, with current ground levels between 16 mAOD and 17 mAOD. Garage A (green outline) is proposed to the east of Mead House, where ground levels are between 15.6 and 15.8 mAOD.

Figure 7 Contour map showing the area around the site, 0.2 m contour interval

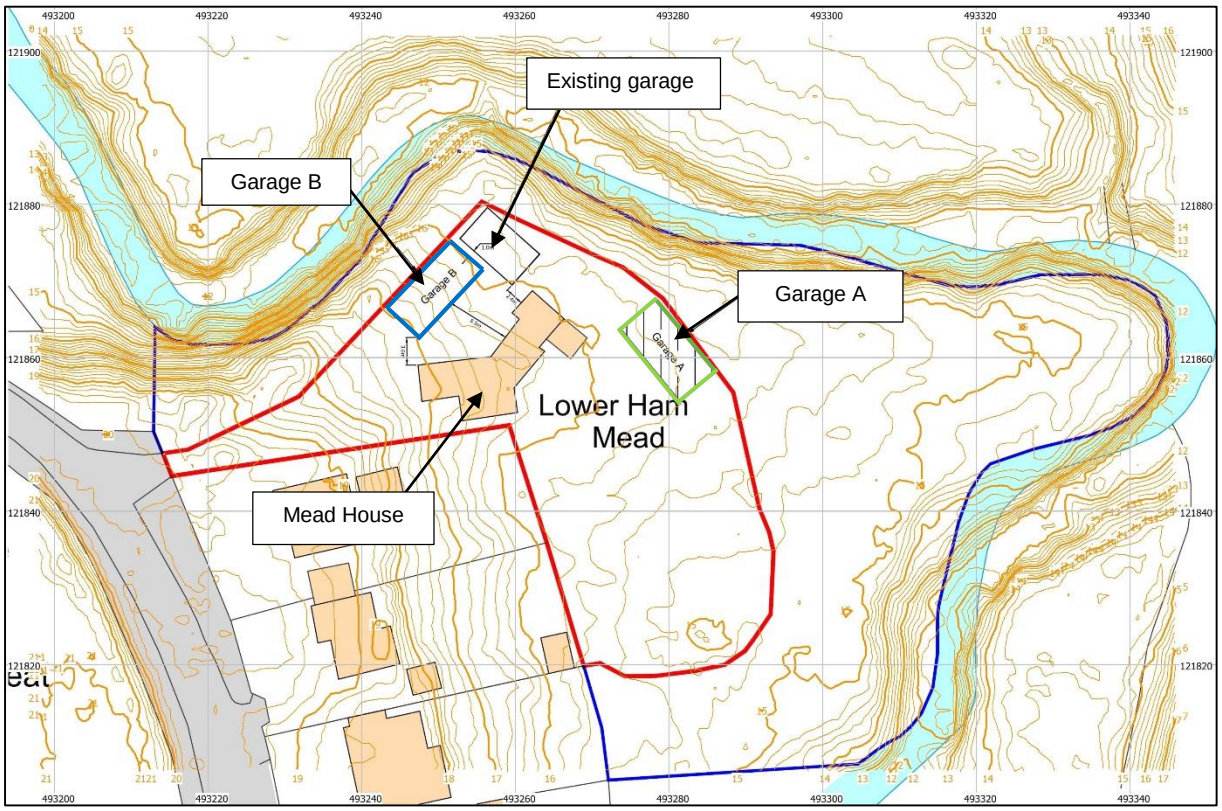
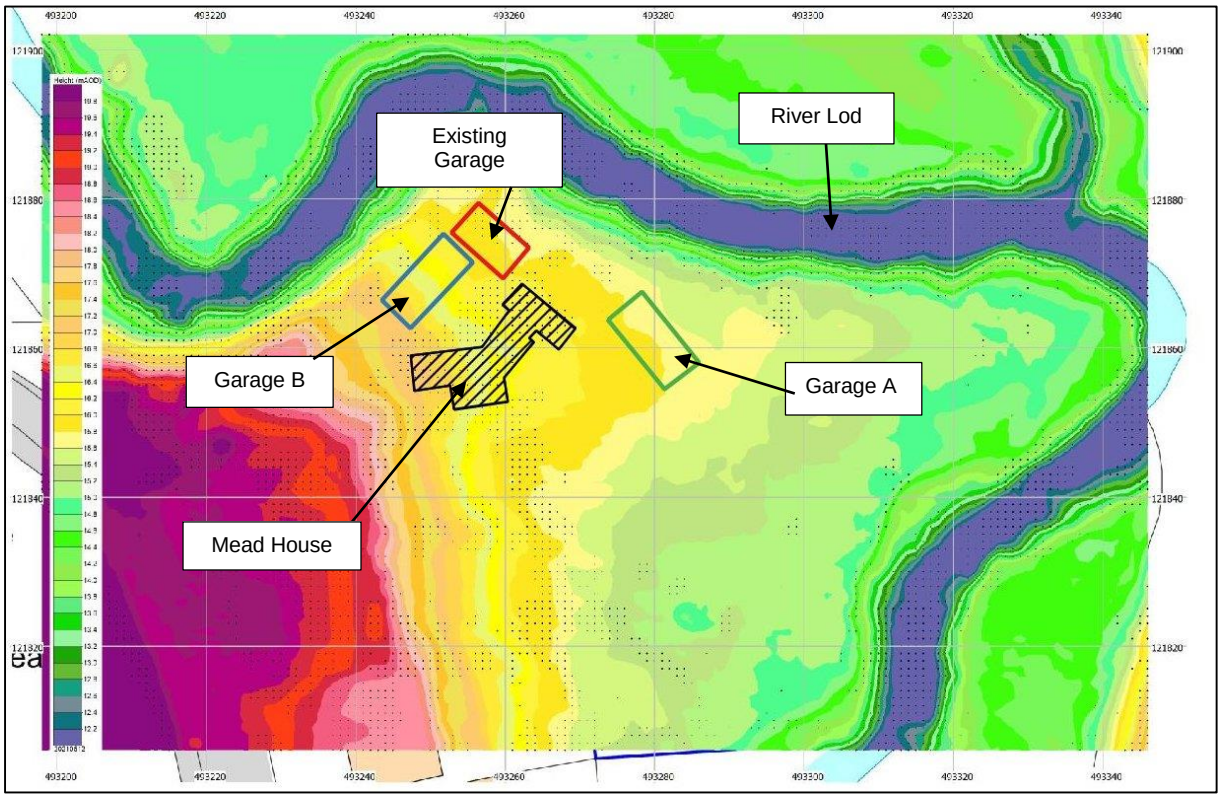


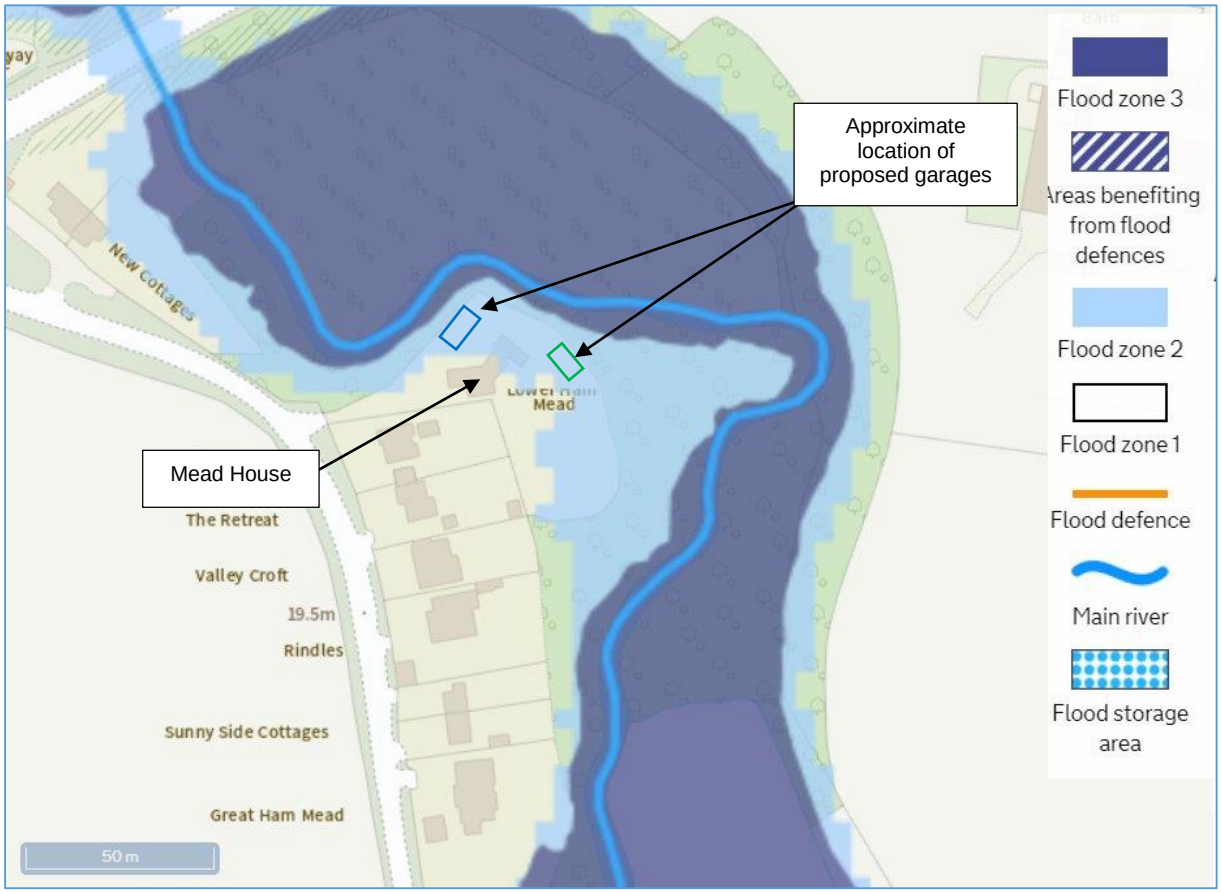
Figure 8 Layer shaded map showing the area around the site, 0.2 m layer interval



5.3 Fluvial Flood Risk

Mapping showing flood risk from rivers and the sea is known as the “Flood map for Planning” and the area around the site is shown in Figure 9. On this map, areas coloured light blue represent Flood Zone 2, land assessed as being affected by the 1:1,000-year flood but not the 1:100-year flood. Areas shown in dark blue would be affected by the 1:100-year event. This designation makes no allowance for climate change, over the design life of the development. The flood map (Figure 9) shows that Flood Zone 3 (dark blue) is predominately on the left bank of the River Lod. The eastern margins of Mead House and the existing garage are shown within Flood Zone 2.

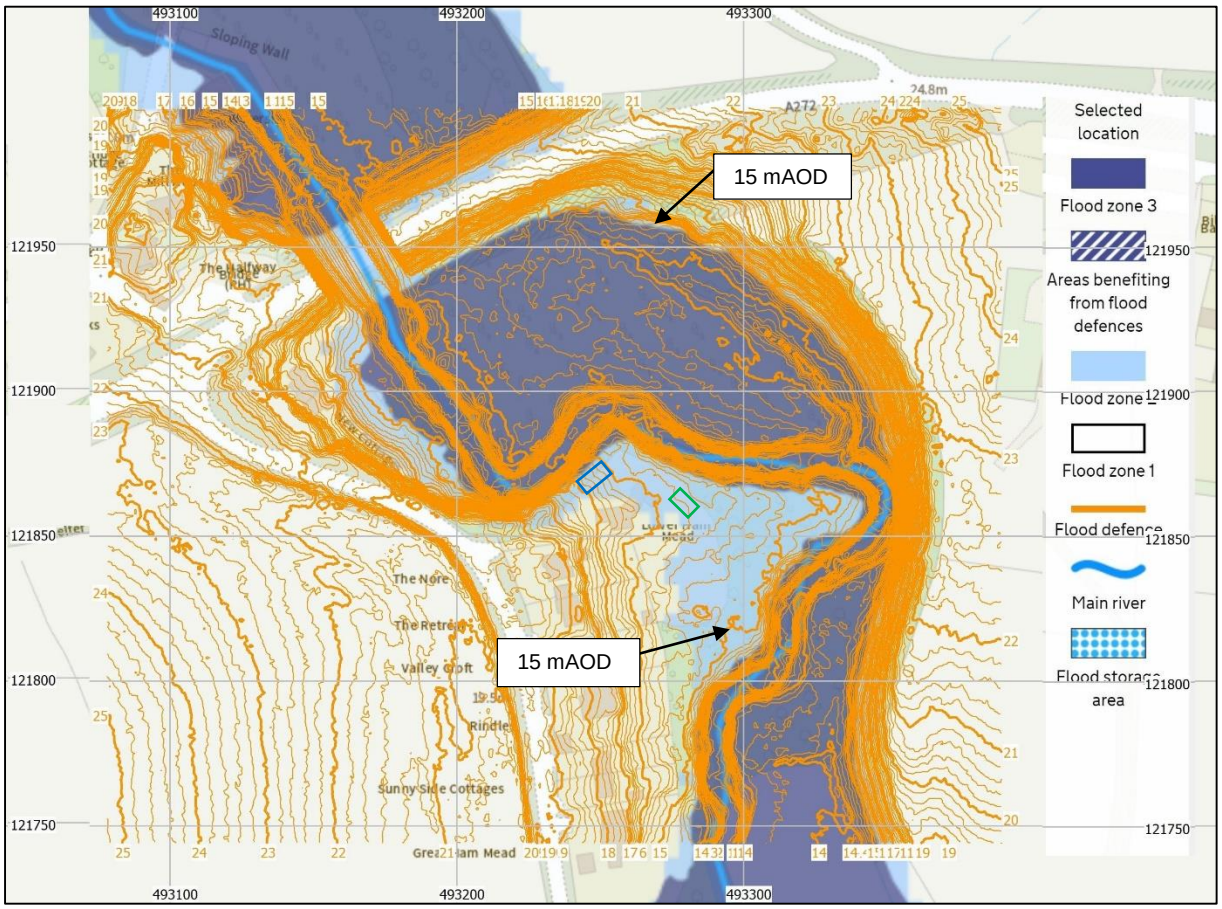
Figure 9 Flood map for Planning, zoomed into the area around the site



Source: https://flood-map-for-planning.service.gov.uk/confirm-location?easting=493254&northing=121748&placeOrPostcode=gu28%20opj

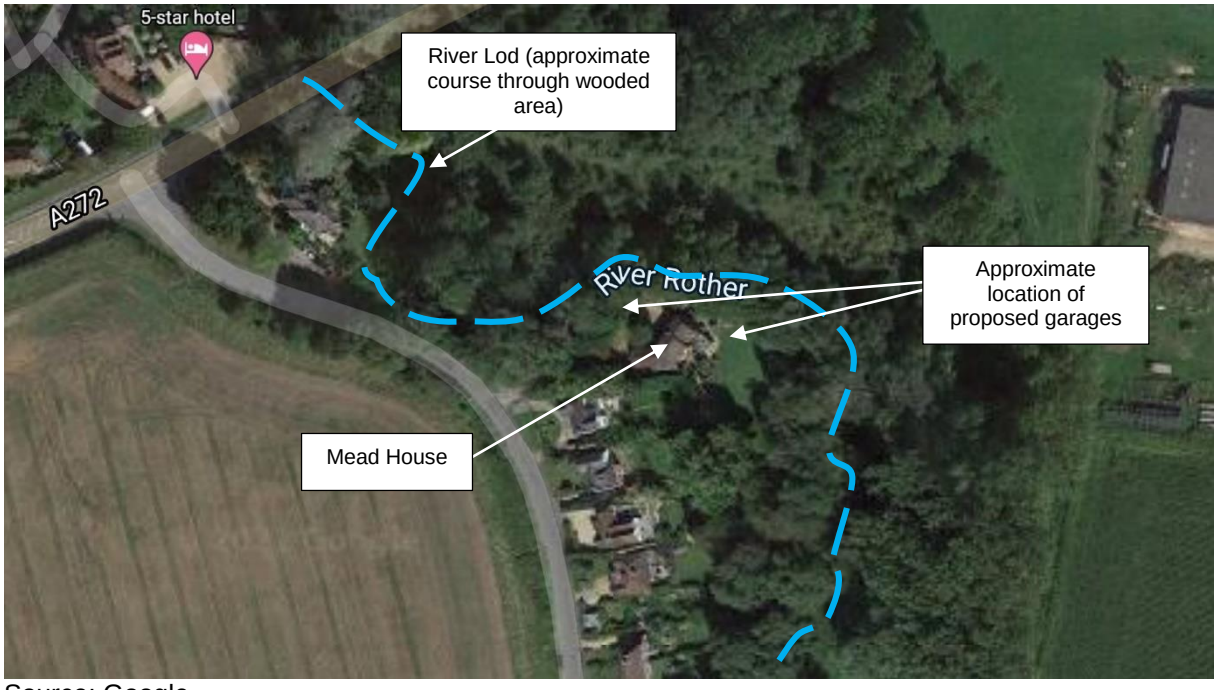
In Figure 10 the flood map has been overlaid with contours extracted from LiDAR data, it can be seen that the 1:100-year flood outline (dark blue) does not rise above the 15 mAOD contour. This is not an accurate calculation of a design flood level, but allows an estimation to be provided. The proposed garages are on ground levels at least 0.6 m to 2 m higher and are located outside Flood Zone 3. During high magnitude flood events, most of the excess flow is likely to be diverted across the left bank, which Figure 6 shows to be the lower of the two. It is only in flood events of a magnitude above that assessed as 1:100-years that flood water may rise to encroach on the proposed garages. In the event of rising water level, flood flows across the site would be slowed by the gentle slope across the garden and the wooded areas bounding the river, which are visible in the aerial photo in Figure 11. The proposed garages are considered to be “Less Vulnerable” and are therefore considered appropriate within both Flood Zone 2 and Flood Zone 3.

Figure 10 Flood Map for Planning with 0.2 m contours



Source: https://flood-map-for-planning.service.gov.uk/confirm-location?easting=493254&northing=121748&placeOrPostcode=gu28%20opj

Figure 11 Aerial photo of the site of proposed development showing wooded areas



Source: Google
Note: River Lod incorrectly labelled as River Rother on Google image.

6. Surface water management

You can use this section to describe the existing and proposed surface water management arrangements at the site using sustainable drainage systems wherever appropriate, to ensure there is no increase in flood risk to others off-site.

a. What are the existing surface water drainage arrangements for the site?
b. If known, what (approximately) are the existing rates and volumes of surface water run-off generated by the site?
c. What are the proposals for managing and discharging surface water from the site, including any measures for restricting discharge rates? For major developments (eg of 10 or more homes or major commercial developments), and for all developments in areas at risk of flooding, sustainable drainage systems should be used, unless demonstrated to be inappropriate – see paragraphs 079-086 of this guidance for further advice[14].
d. How will you prevent run-off from the completed development causing an impact elsewhere?
e. Where applicable, what are the plans for the ongoing operation and/or maintenance of the surface water drainage systems?

The regional soil map in Figure 12 shows that the soils conditions are freely draining at the site, with land to the south having more clayey soils with a high water table. The existing surface water drainage arrangements for the site include infiltration through the permeable gravel driveway and garden area. The existing driveway will be extended to garage A and will be comprised of permeable material to allow rainwater and surface water to infiltrate to the underlying soils.

The proposed garages would not generate any significant additional surface water discharge. The increase in surface water runoff would result from the impermeable surface on which the garages would be built. The surface areas of garage A and garage B would measure 73 m^2 and 66 m^2 respectively and would replace existing grassed areas and permeable driveway.

To manage additional surface water runoff, it is proposed that the surface water drainage from the garages is directed towards the permeable gravel driveways. In order to provide an indication of the volume of surface water runoff that would be generated from the proposed garages, volumes were calculated using the Wallingford Modified Rational Method. The calculation used a conservative estimate of half the proposed pitched garage roof and rainfall data from a local site. The 1:100-year rainstorm, with a 20% allowance for climate change were used and the results are shown in Table 3.

The final column in Table 3 shows the total volume of runoff generated for different rainstorm durations. It is important to understand that having reached the soil surface, this runoff would start to infiltrate so that although the 1:100-year rainstorm with longer duration appears to generate a significant volume of water, much of that will simply infiltrate into the surface. We would advise that consideration be given to constructing shallow gravel-filled swales around the margins of the garages, which could accept surface water runoff from the garage roof. This would provide some attenuation of surface water runoff, while allowing water to slowly infiltrate. In the event of overflow this would soak into the surrounding permeable gravel driveways or grassed garden.

[14] https://www.gov.uk/guidance/flood-risk-and-coastal-change#when-should-sustainable-drainage

Figure 12 Regional soil map covering the site shows the soils to be freely draining

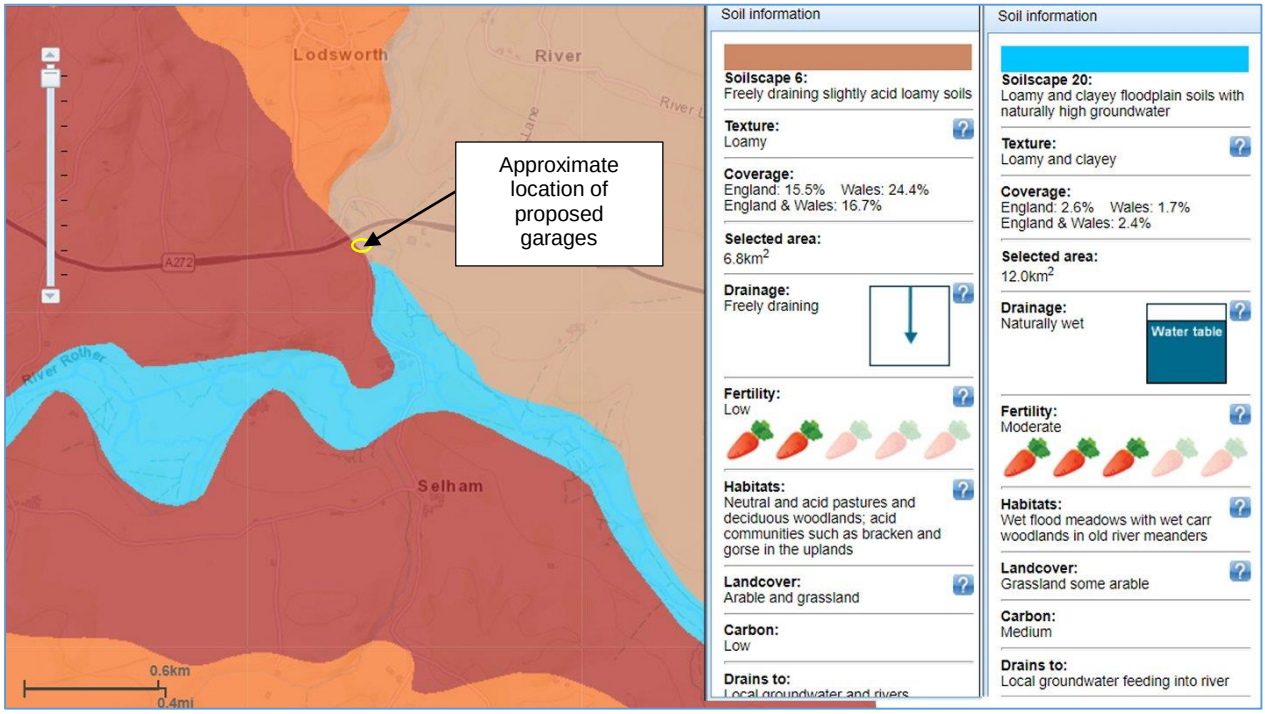


Table 3 Rainfall runoff volumes 1:100-year rainfall with 20% climate change allowance

Duration	FEH Rainfall Depth	FEH Rainfall Depth + CC	Total volume
(mins)	(mm)	(mm)	(m^3)
15	26.2	31.44	1.13
30	35.0	42	1.51
60	44.6	53.52	1.93
120	52.1	62.52	2.25
240	60.8	72.96	2.63
480	70.87	85.044	3.06
920	82.9	99.48	3.58
1440	91.2	109.44	3.94

7. Occupants and users of the development

You can use this section to provide a summary of the numbers of future occupants and users of the new development; the likely future pattern of occupancy and use; and proposed measures for protecting more vulnerable people from flooding.

a. Will the development proposals increase the overall number of occupants and/or people using the building or land, compared with the current use? If this is the case, by approximately how many will the number(s) increase?
b. Will the proposals change the nature or times of occupation or use, such that it may affect the degree of flood risk to these people? If this is the case, describe the extent of the change.
c. Where appropriate, are you able to demonstrate how the occupants and users that may be more vulnerable to the impact of flooding (eg residents who will sleep in the building; people with health or mobility issues etc) will be located primarily in the parts of the building and site that are at lowest risk of flooding? If not, are there any overriding reasons why this approach is not being followed?

The number of people living at the site is not expected to change as a result of the garages being built. Special evacuation measures are not relevant to this assessment, since people will not live in the garages.

8. Exception test

You can use this section to provide the evidence to support certain development proposals in flood zones 2 or 3 if, following application of the sequential test, it is appropriate to apply the exception test, as set out in paragraphs 102-104 of the National Planning Policy Framework[15]. See paragraph 035 of this guidance for further information on the exception test[16]. It is advisable to contact the local planning authority to confirm whether the exception test needs to be applied and to ensure the appropriate level of information is provided.

a. Would the proposed development provide wider sustainability benefits to the community? If so, could these benefits be considered to outweigh the flood risk to and from the proposed development? See paragraph 037 of this guidance for further information[17].
b. How can it be demonstrated that the proposed development will remain safe over its lifetime without increasing flood risk elsewhere? See paragraph 038 of this guidance for further information[18].
c. Will it be possible to for the development to reduce flood risk overall (eg through the provision of improved drainage)? See paragraph 050 for further advice[19].

As indicated in Section 3, it is not necessary to apply the Sequential Test to minor developments, such as householder extensions. For the same reasons, it is not necessary to apply the Exception Test, either.

[15] https://www.gov.uk/guidance/national-planning-policy-framework/10-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para102
[16] https://www.gov.uk/guidance/flood-risk-and-coastal-change#Exception-Test-for-specific-development-proposals
[17] https://www.gov.uk/guidance/flood-risk-and-coastal-change#wider-sustainability-benefits
[18] https://www.gov.uk/guidance/flood-risk-and-coastal-change#development-will-be-safe
[19] https://www.gov.uk/guidance/flood-risk-and-coastal-change#opportunities-for-reducing-flood-risk

9. Residual risk

You can use this section to describe any residual risks that remain after the flood risk management and mitigation measures are implemented, and to explain how these risks can be managed to keep the users of the development safe over its lifetime[20]. See paragraph 042 of this guidance for more information[21].

a. What flood related risks will remain after the flood risk management and mitigation measures have been implemented?
b. How, and by whom, will these risks be managed over the lifetime of the development? (eg putting in place flood warning and evacuation plans)[22].

The site of the proposed garages is within Flood Zone 2 and therefore the residual risk remains that during a flood event in exceedance of the 1:100-year event, flood waters may encroach towards the garages. It is recommended that flood resilience measures are considered in the construction, such measures could include:

- Resilient wall finishes
- Resilient floor finishes
- Raising electrical sockets (if installed) to preserve electricity supply
- Raising tool and equipment to higher levels to minimise damage

These adaptations will not prevent the entry of water into the garages but will greatly shorten the recovery time after a flood.

10. Flood risk assessment credentials

You can use this section to provide details of the author and date of the flood risk assessment.

a. Who has undertaken the flood risk assessment?
b. When was the flood risk assessment completed?

This flood risk assessment was undertaken by Laura Keith of Lidar-Logic. Laura has worked in the area of hydrometry and hydrology for 10 years, undertaking over 100 flood risk assessments while working for Hydro-Logic Services. The report was reviewed and approved by Chris Nugent of Lidar-Logic. Chris has worked since 1981 in areas of hydrology and fluvial geomorphology, specialising in flood risk assessment in 2007. Since then, working for Hydro-Logic Services, he has written and / or managed well over 500 flood risk assessments and flood consequence assessments across the UK, leaving Hydro-Logic Services to form Lidar-Logic in August 2018. The current work was completed in June 2021, for submission to Planning.

[20] https://www.gov.uk/guidance/flood-risk-and-coastal-change#residual-risk
[21] https://www.gov.uk/guidance/flood-risk-and-coastal-change#address-residual-risk
[22] https://www.gov.uk/guidance/flood-risk-and-coastal-change#flood-warning-and-evacuation-plans