

FLOOD RISK ASSESSMENT. Revision A
(Householder Development within Flood Zone 3)

46 Washington Road, Reading, RG4 5AA
Planning Portal Reference: PP-07777902

The proposed development consists of single storey rear extension and internal alterations to provide additional residential accommodation to a semi-detached property.

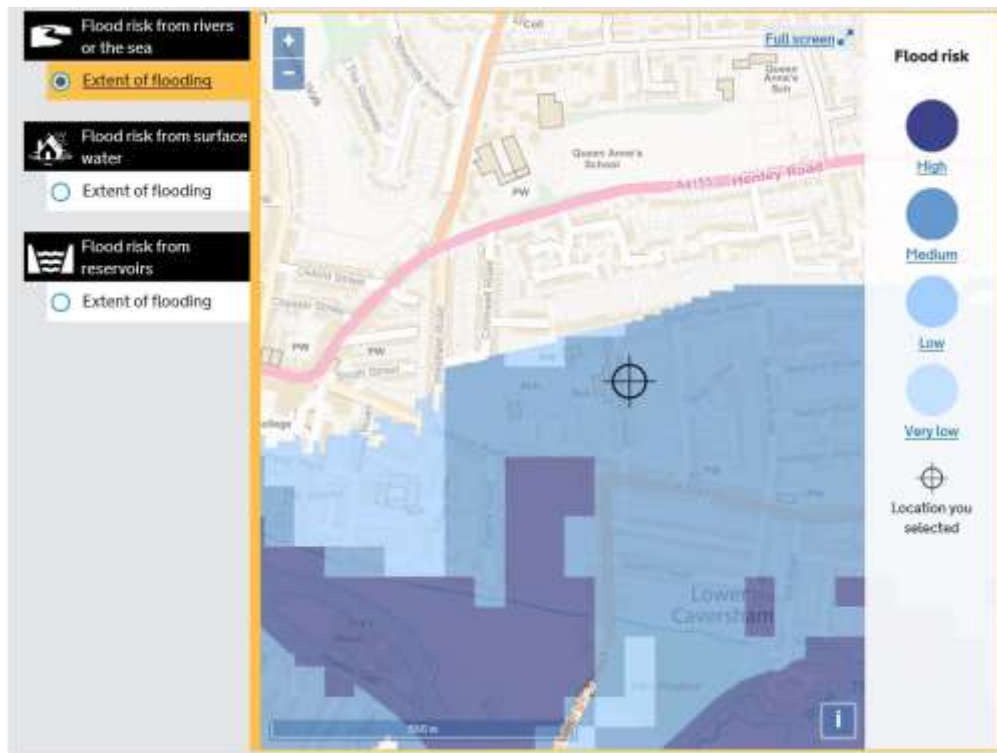
The site is located in a high flood risk area, which is indicated on the Environment Agency website and the interactive flood map. According to the Environment Agency there is a 0.1 to 1 in 100 chance of flooding per year.

Considering the probability of a flood occurring is high, we have proposed the following flood resistance techniques to minimise risk to the property and its surroundings. These are in accordance with the guidance provided in Planning Policy Statement 25 - 'Development and Flood Risk Practice Guide'. According to Map 1 there is a medium flood risk from the rivers and seas, with Map 2 showing there is a low flood risk from the surface water in the street although at the rear of the garden this increases to high.

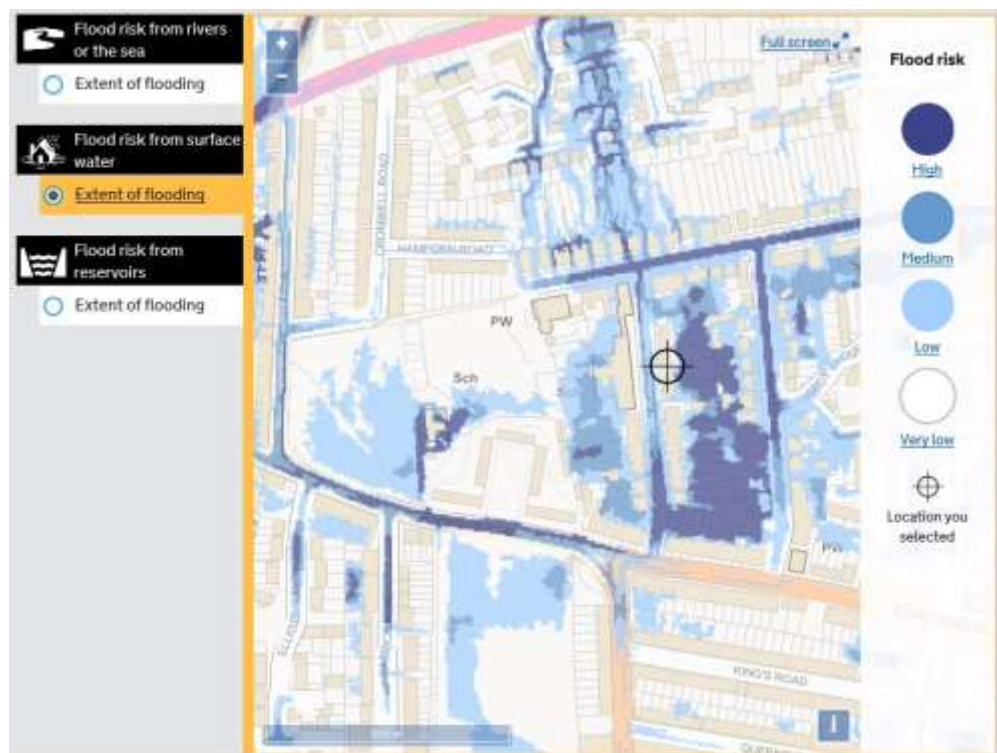
The proposed the floor height of the new extension will be 25.8cm below the estimated flood level of 37.72 (1%AEP +20% increase in flows). As indicated on the architectural drawings accompanying this application.

To mitigate flood risk the design of the extension will keep water out as much as possible, materials used will have a low permeability (materials that water cannot pass through, for example, impermeable concrete).

- The construction detailing of the walls and floor will include impermeable concrete and brick work to at least 300mm, stainless steel ties, lime-based plaster, rigid insulation, lapped DPC/DPM.
- The proposed finished floor level of the new ground floor extension will be 390 millimetres (mm) above the general ground level of the site at the rear.
- The proposed floor build up will consist of impermeable concrete.
- The land slopes away to the rear which will also help mitigate the flood risk
- There will be a brick skirting to the ground floor.
- Hard surfaces will not be significantly increased.
- The proposed bi-folding doors will be sealed to protect from water ingress.
- Any low-level timber elements (eg. Doors etc) will be treated with a water-proof sealant.
- Electrical services will run through the ceiling and the walls rather than the floors.



Map 1 - Flood risk from rivers or the sea



Map 2 – Flood risk from surface water

Product 4 (Detailed Flood Risk) for Washington Road, Reading, RG4 5AA

Our Ref: THM132046

Product 4 is designed for developers where Flood Risk Standing Advice FRA (Flood Risk Assessment) Guidance Note 3 Applies. This is:

- i) "all applications in Flood Zone 3, other than non-domestic extensions less than 250 sq metres; and all domestic extensions", and
- ii) "all applications with a site area greater than 1 ha" in Flood Zone 2.

Product 4 includes the following information:

Ordnance Survey 1:25k colour raster base mapping;
Flood Zone 2 and Flood Zone 3;
Relevant model node locations and unique identifiers (for cross referencing to the water levels, depths and flows table);
Model extents showing *defended* scenarios;
FRA site boundary (where a suitable GIS layer is supplied);
Flood defence locations (where available/relevant) and unique identifiers; (supplied separately)
Flood Map areas benefiting from defences (where available/relevant);
Flood Map flood storage areas (where available/relevant);
Historic flood events outlines (where available/relevant, not the Historic Flood Map) and unique identifiers;
Statutory (Sealed) Main River (where available within map extents);

A table showing:

- i) Model node X/Y coordinate locations, unique identifiers, and levels and flows for *defended* scenarios.
- ii) Flood defence locations unique identifiers and attributes; (supplied separately)
- iii) Historic flood events outlines unique identifiers and attributes; and
- iv) Local flood history data (where available/relevant).

Please note:

If you will be carrying out computer modelling as part of your Flood Risk Assessment, please request our guidance which sets out the requirements and best practice for computer river modelling.

This information is based on that currently available as of the date of this letter. You may feel it is appropriate to contact our office at regular intervals, to check whether any amendments/ improvements have been made. Should you re-contact us after a period of time, please quote the above reference in order to help us deal with your query.

This information is provided subject to the enclosed notice which you should read.

This letter is not a Flood Risk Assessment. The information supplied can be used to form part of your Flood Risk Assessment. Further advice and guidance regarding Flood Risk Assessments can be found on our website at:

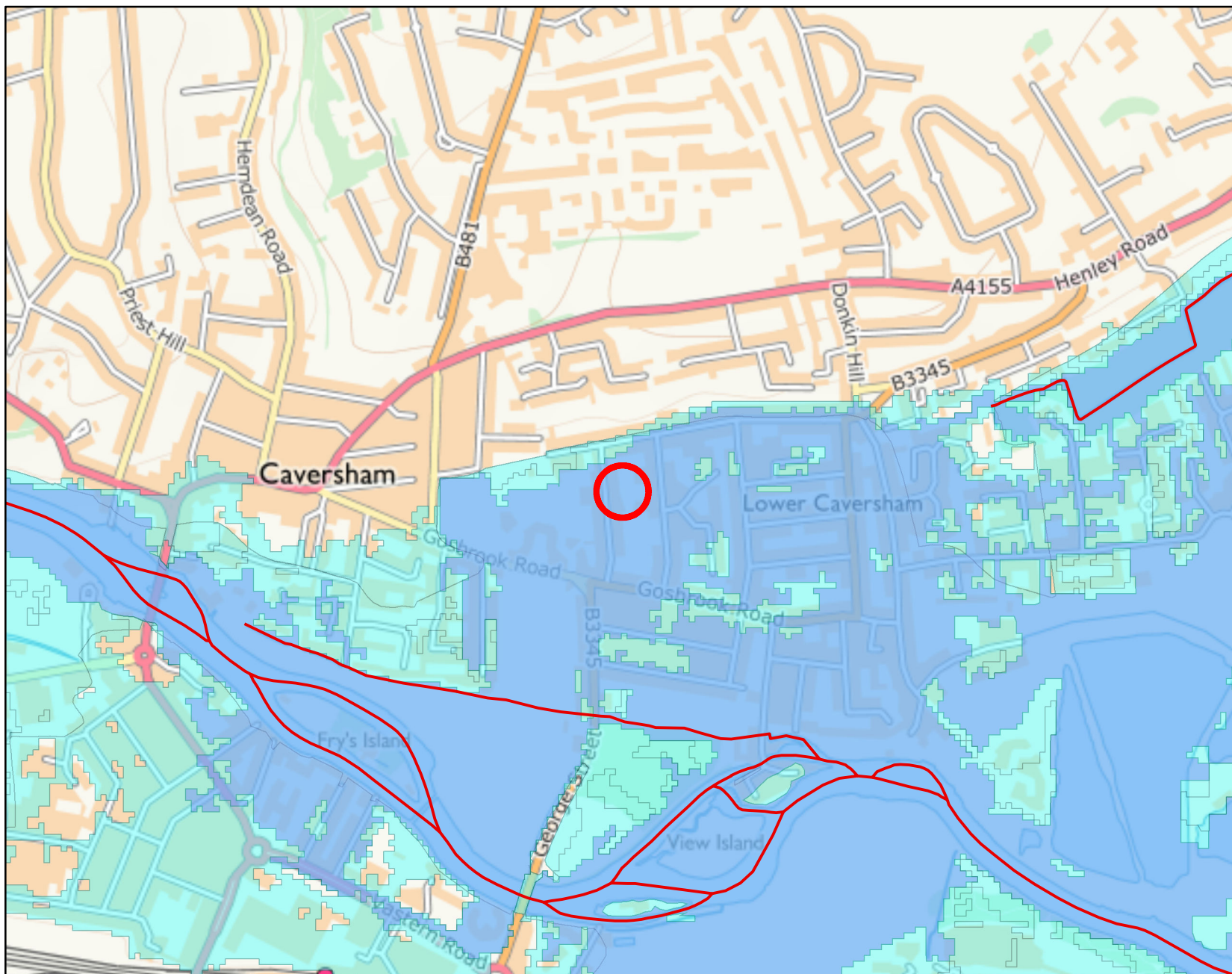
<https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities>

If you would like advice from us regarding your development proposals you can complete our pre application enquiry form which can be found at:

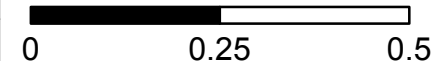
<https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion>

Flood Map for Planning centred on Washington Road, Reading, RG4 5AA

Created on 24/06/2019 REF: THM132046



Kilometres



Legend

- Main River
- Flood defences
- Areas benefiting from flood defences
- Flooding from rivers or sea (FZ3)
- Extent of extreme flood (FZ2)
- Flood Map - flood storage areas

Flooding from rivers or sea without defences (Flood Zone 3) shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

The Extent of an extreme flood (Flood Zone 2) shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Defence information

Defence Location: No defences on Main River

Description: This location is not currently protected by any formal defences and we do not currently have any flood alleviation works planned for the area. However we continue to maintain certain watercourses and the schedule of these can be found on our internet pages.

Model information

THM132046

Model: Thames (Mapledurham to Sonning) 2011

Description: The information provided is taken from the Thames (Reading Complex Change) Flood Alleviation Study completed in June 2011. The study was carried out using 2D modelling software (ISIS-Tuflow).

Model design runs:

1 in 5 / 20% Annual Exceedance Probability (AEP); 1 in 20 / 5% AEP; 1 in 50 / 2% AEP; 1 in 100 / 1% AEP; 1 in 1000 / 0.1% AEP and 1 in 100+20% / 1% AEP plus 20% increase in flows

Mapped Outputs:

1 in 5 / 20% AEP; 1 in 20 / 5% AEP; 1 in 50 / 2% AEP; 1 in 100 / 1% AEP and 1 in 1000 / 0.1% AEP

Model accuracy:

Levels $\pm$ 250mm

Modelled in-channel flood flows and levels

THM132046

The modelled flood levels and flows for the closest most appropriate model node points for your site that are within the river channel are provided below:

Node label	Model	Easting	Northing	Flood Levels (mAOD)							
				20% AEP	5% AEP	1% AEP	1% AEP (+20% increase in flows)	1% AEP (+25% increase in flows)	1% AEP (+35% increase in flows)	1% AEP (+70% increase in flows)	0.1% AEP
06100_MN_36.011	Thames (Mapledurham to Sonning) 2011	471817	174063	36.96	37.30	37.72	37.86	0.00	0.00	0.00	38.04
06100_MN_36.001	Thames (Mapledurham to Sonning) 2011	471972	174091	36.93	37.29	37.75	37.91	0.00	0.00	0.00	38.10
06100_MN_36c.003	Thames (Mapledurham to Sonning) 2011	472193	174287	36.86	37.24	37.73	37.95	0.00	0.00	0.00	38.25
06100_MN_35.081	Thames (Mapledurham to Sonning) 2011	472578	174194	36.50	36.76	37.02	37.17	0.00	0.00	0.00	37.38
06100_MN_35.073	Thames (Mapledurham to Sonning) 2011	472876	174013	36.36	36.58	36.81	36.94	0.00	0.00	0.00	37.09

Node label	Model	Easting	Northing	Flood Flows (m3/s)							
				20% AEP	5% AEP	1% AEP	1% AEP (+20% increase in flows)	1% AEP (+25% increase in flows)	1% AEP (+35% increase in flows)	1% AEP (+70% increase in flows)	0.1% AEP
06100_MN_36.011	Thames (Mapledurham to Sonning) 2011	471817	174063	223.08	281.34	353.30	405.25	0.00	0.00	0.00	476.08
06100_MN_36.001	Thames (Mapledurham to Sonning) 2011	471972	174091	216.09	274.03	336.09	351.47	0.00	0.00	0.00	382.77
06100_MN_36c.003	Thames (Mapledurham to Sonning) 2011	472193	174287	14.26	19.66	30.60	36.18	0.00	0.00	0.00	45.91
06100_MN_35.081	Thames (Mapledurham to Sonning) 2011	472578	174194	220.63	273.20	335.95	378.04	0.00	0.00	0.00	438.02
06100_MN_35.073	Thames (Mapledurham to Sonning) 2011	472876	174013	217.79	267.91	322.32	357.83	0.00	0.00	0.00	414.98

Note:

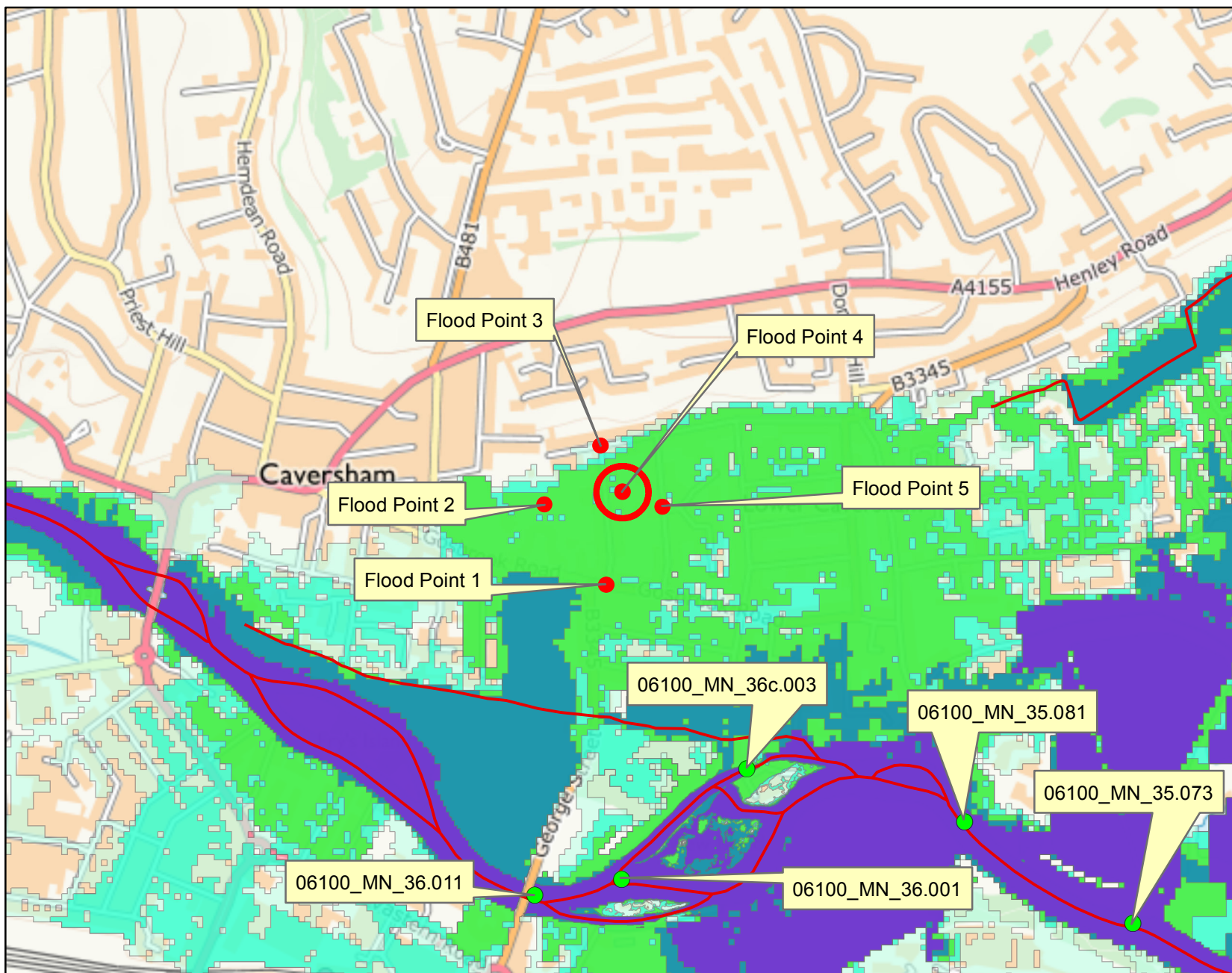
Due to changes in guidance on the allowances for climate change, the 20% increase in river flows should no longer to be used for development design purposes. The data included in this Product can be used for interpolation of levels as part of an intermediate level assessment.

For further advice on the new allowances please visit

<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

Detailed FRA Map (MtoS) centred on Washington Road, Reading, RG4 5AA

Created on 24/06/2019 REF: THM132046



Kilometres
0 0.25 0.5

Legend

- Model Nodes
- Main River
- 20% AEP Flood Outline
- 5% AEP Flood Outline
- 1% AEP Flood Outline
- 1%+20% AEP Flood Outline
- 0.1% AEP Flood Outline

AEP = Annual Exceedance Probability
The probability of a flood of a particular magnitude, or greater, occurring in any given year

Where available climate change extents have been calculated with an additional flow added to an AEP event. An example of how this is written is 1%+20% AEP.

Modelled floodplain flood levels

THM132046

The modelled flood levels for the closest most appropriate model grid cells for your site are provided below:

2D grid cell reference	Model	Easting	Northing	flood levels (mAOD)				
				20% AEP	5% AEP	1% AEP	1% AEP (+20% increase in flows)	0.1% AEP
Flood Point 1	Thames (Mapledurham to Sonning) 2011	471,942	174,613	No Data	No Data	37.86	38.04	38.27
Flood Point 2	Thames (Mapledurham to Sonning) 2011	471,835	174,755	No Data	No Data	37.88	38.08	38.32
Flood Point 3	Thames (Mapledurham to Sonning) 2011	471,934	174,859	No Data	No Data	No Data	No Data	38.20
Flood Point 4	Thames (Mapledurham to Sonning) 2011	471,973	174,776	No Data	No Data	37.80	37.98	38.19
Flood Point 5	Thames (Mapledurham to Sonning) 2011	472,044	174,751	No Data	No Data	37.80	37.97	38.18

This flood model has represented the floodplain as a grid.
The flood water levels have been calculated for each grid cell.

Note:

Due to changes in guidance on the allowances for climate change, the 20% increase in river flows should no longer to be used for development design purposes. The data included in this Product can be used for interpolation of levels as part of an intermediate level assessment.

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Model information

THM132046

Model: Thames (Sandford to Mapledurham) 2018

Description: The information provided is from the Abingdon Flood Schemes mapping completed in June 2017. The previous model 1D model was updated to a 1D-2D model (Flood modeller-Tuflow). The updated model will also be used to assess downstream effects due to flood alleviation options in Oxford and Abingdon.

Model design runs:

1 in 2/ 50% AEP; 1 in 5 / 20% AEP; 1 in 10/ 10% AEP; 1 in 20 / 5% AEP; 1 in 50/ 2% AEP; 1 in 75 / 1.3% AEP; 1 in 100 / 1% AEP, 1 in 100+25% / 1% + 25% AEP with climate change; 1 in 100+35% / 1% + 35% AEP with climate change; 1 in 100+70% / 1% + 70% AEP with climate change; 1 in 200/ 0.5% AEP and 1 in 1000 / 0.1% AEP.

Mapped outputs:

1 in 2/ 50% AEP; 1 in 5 / 20% AEP; 1 in 10/ 10% AEP; 1 in 20 / 5% AEP; 1 in 50/ 2% AEP; 1 in 75 / 1.3% AEP; 1 in 100 / 1% AEP, 1 in 100+25% / 1% + 25% AEP with climate change; 1 in 100+35% / 1% + 35% AEP with climate change; 1 in 100+70% / 1% + 70% AEP with climate change; 1 in 200/ 0.5% AEP and 1 in 1000 / 0.1% AEP.

Modelled in-channel flood flows and levels

THM132046

The modelled flood levels and flows for the closest most appropriate model node points for your site that are within the river channel are provided below:

Node label	Model	Easting	Northing	Flood Levels (mAOD)							
				20% AEP	5% AEP	1% AEP	1% AEP (+20% increase in flows)	1% AEP (+25% increase in flows)	1% AEP (+35% increase in flows)	1% AEP (+70% increase in flows)	0.1% AEP
061_00_2018_002_36.032	Thames (Sandford to Mapledurham) 2018	471075	174646	37.23	37.65	38.19	0.00	38.49	38.57	38.81	38.74
061_00_2018_002_36.028	Thames (Sandford to Mapledurham) 2018	471287	174474	37.18	37.59	38.09	0.00	38.33	38.39	38.57	38.51
061_00_2018_002_36.015A	Thames (Sandford to Mapledurham) 2018	471664	174132	37.05	37.47	38.00	0.00	38.25	38.31	38.49	38.44

Node label	Model	Easting	Northing	Flood Flows (m3/s)							
				20% AEP	5% AEP	1% AEP	1% AEP (+20% increase in flows)	1% AEP (+25% increase in flows)	1% AEP (+35% increase in flows)	1% AEP (+70% increase in flows)	0.1% AEP
061_00_2018_002_36.032	Thames (Sandford to Mapledurham) 2018	471075	174646	218.79	283.66	382.28	0.00	484.80	512.15	624.31	585.50
061_00_2018_002_36.028	Thames (Sandford to Mapledurham) 2018	471287	174474	218.79	282.17	376.75	0.00	474.55	501.04	609.06	571.28
061_00_2018_002_36.015A	Thames (Sandford to Mapledurham) 2018	471664	174132	218.78	271.54	318.67	0.00	375.76	391.67	464.79	437.45

Note:

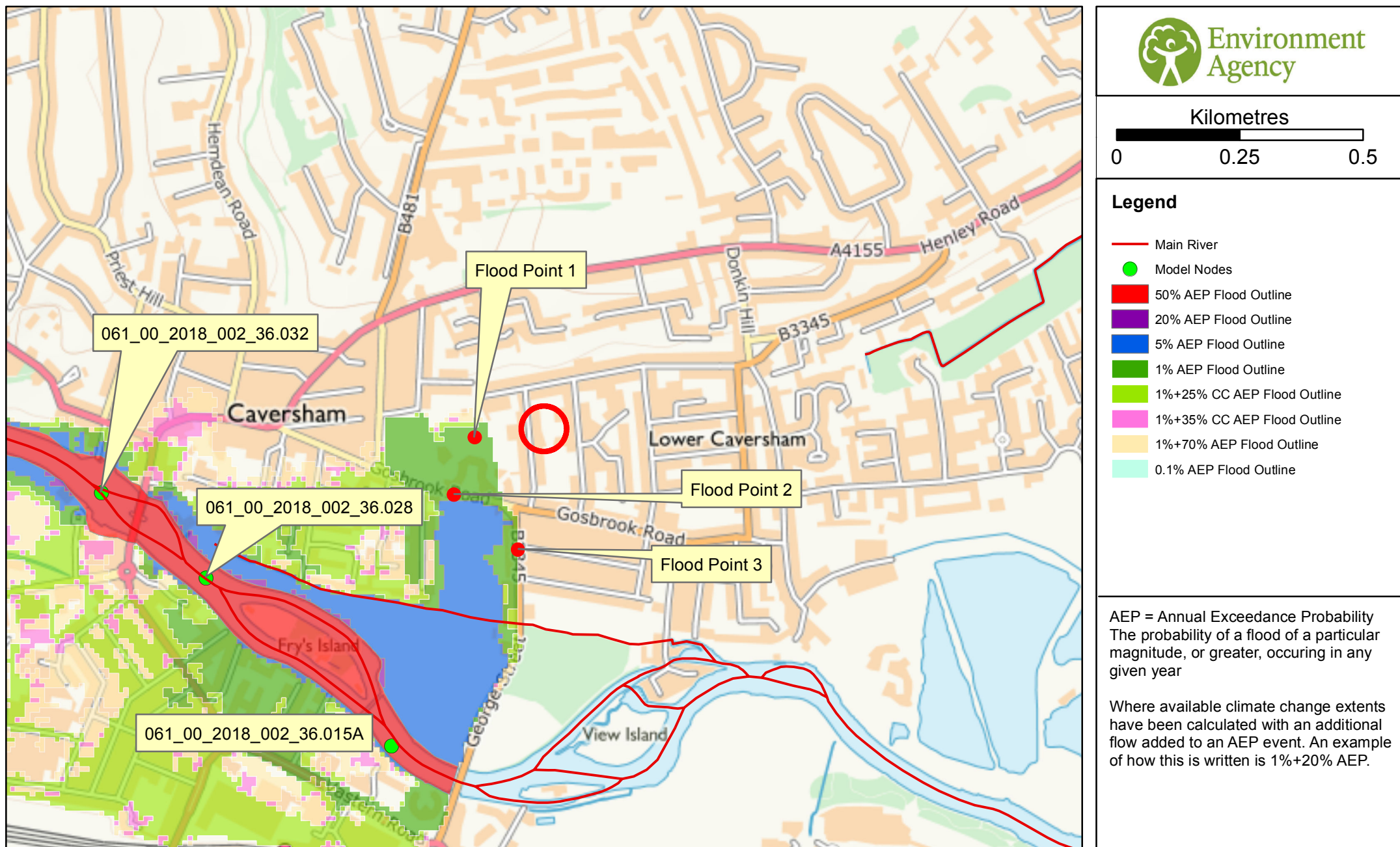
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Detailed FRA Map (StoM) centred on Washington Road, Reading, RG4 5AA

Created on 24/06/2019 REF: THM132046



Modelled floodplain flood levels

THM132046

The modelled flood levels for the closest most appropriate model grid cells for your site are provided below:

2D grid cell reference	Model	Easting	Northing	flood levels (mAOD)					
				50% AEP	20% AEP	5% AEP	1% AEP	1% AEP (+25% increase in flows)	1% AEP (+35% increase in flows)
Flood Point 1	Thames (Sandford to Mapledurham) 2018	471,833	174,759	No Data	No Data	No Data	37.88	38.02	38.05
Flood Point 2	Thames (Sandford to Mapledurham) 2018	471,790	174,644	No Data	No Data	No Data	37.98	38.18	38.22
Flood Point 3	Thames (Sandford to Mapledurham) 2018	471,918	174,530	No Data	No Data	No Data	37.72	37.82	37.84

This flood model has represented the floodplain as a grid.
The flood water levels have been calculated for each grid cell.

Note:

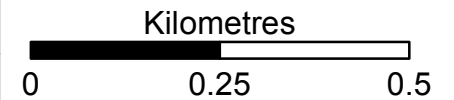
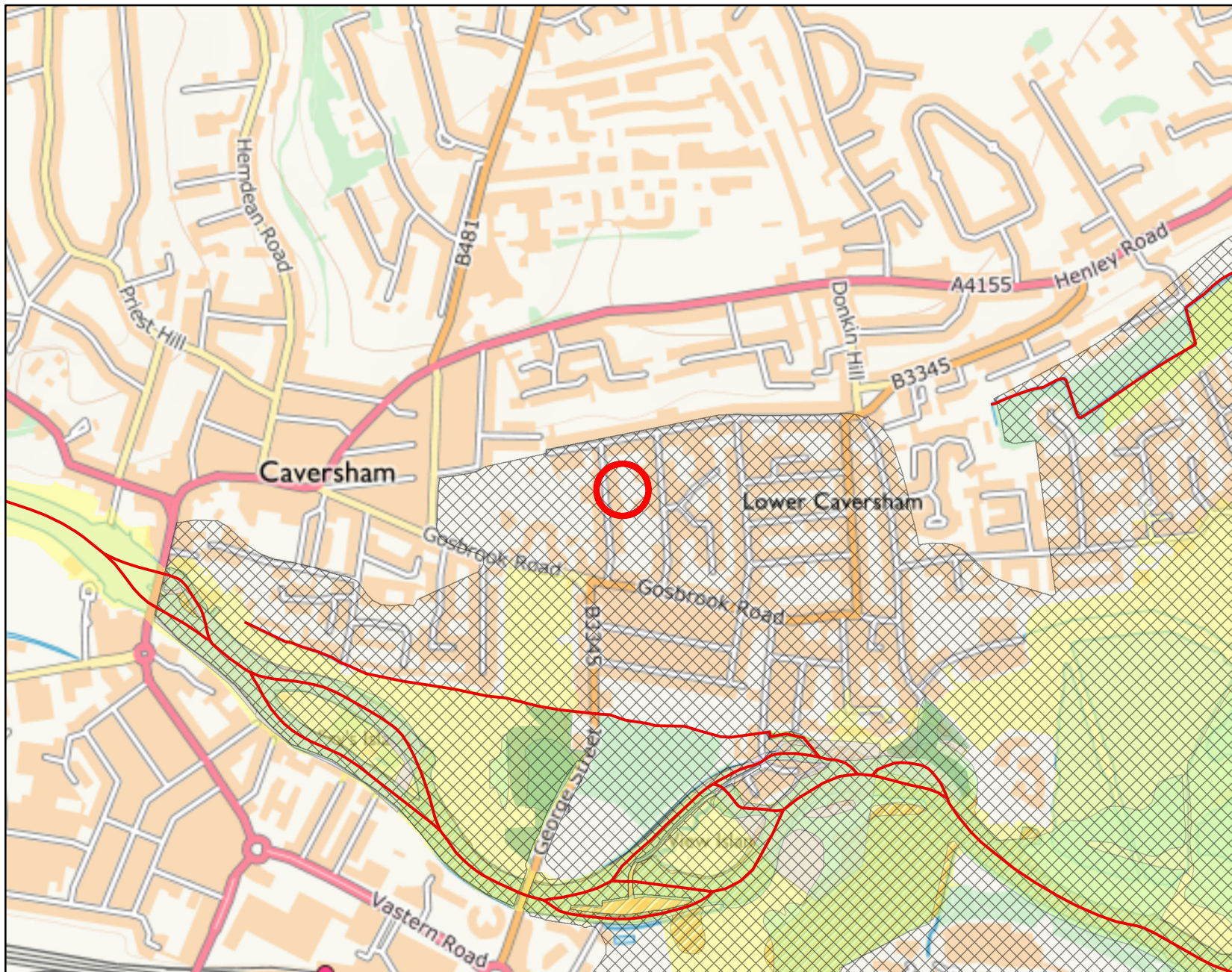
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For further advice on the new allowances please visit

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Historic Flood Map centred on Washington Road, Reading, RG4 5AA

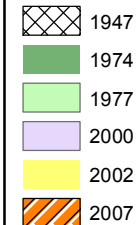
Created on 24/06/2019 REF: THM132046



Legend

— Main River

year



Flooding from rivers or sea without defences (Flood Zone 3) shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

The Extent of an extreme flood (Flood Zone 2) shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Historic flood data

THM132046

Our records show that the area of your site has been affected by flooding.
Information on the floods that have affected your site is provided in the table below:

Flood Event Code	Flood Event Name	Start Date	End Date	Source of Flooding	Cause of Flooding
EA0619470300429	06MarchSpring1947	01/01/1947	12/12/1947	main river	channel capacity exceeded (no raised defences)
EA0619741100359	06NovemberAutumn1974	01/01/1974	12/12/1974	main river	channel capacity exceeded (no raised defences)
EA0619770800237	06AugustSummer1977	01/01/1977	12/12/1977	main river	channel capacity exceeded (no raised defences)
EA0620001200994	06DecemberWinter2000	01/01/2000	12/12/2000	main river	channel capacity exceeded (no raised defences)
EA0620030101899	06JanuaryNewYear2003	23/12/2002	12/01/2003	main river	channel capacity exceeded (no raised defences)
ea061231477	Shiplake CP Fluvial Wate	19/07/2007	29/07/2007	main river	channel capacity exceeded (no raised defences)

Please note the Environment Agency maps flooding to land not individual properties. Floodplain extents are an indication of the geographical extent of a historic flood. They do not provide information regarding levels of individual properties, nor do they imply that a property has flooded internally.

Start and End Dates shown above may represent a wider range where the exact dates are not available.