

## **APPENDIX E**

### **ENVIRONMENT AGENCY PRODUCT 4 DATA**

## Product 4 (Detailed Flood Risk) for Addlestone Road, Addlestone, Surrey, KT15 2UL

Our Ref: THM248675

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>

## Defence information

THM248675

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

THM248675

Model: Wey Lower (Jacobs Well to Weybridge) 2019

Description: The information provided is taken from the Lower Wey (Byfleet/Weybridge) Baseline Modelling Report, September 2019 undertaken by Capita AECOM. The study was carried out using 1D-2D modelling software (Flood Modeller Pro-TUFLOW) along River Wey from Jacobs Well, Guildford and extends to the confluence with the Thames at Weybridge. This is part of a wider project to update the River Wey catchment models.

Model design runs:

1 in 5 / 20% AEP; 1 in 20 / 5% AEP; 1 in 30 / 3.3% AEP; 1 in 50 / 2% AEP; 1 in 75 / 1.33% AEP; 1 in 100 / 1% AEP; 1 in 100+10% / 1% AEP with 10% climate change; 1 in 100+15% / 1% AEP with 15% climate change; 1 in 100+25% / 1% AEP with 25% climate change; 1 in 100+35% / 1% AEP with 35% climate change; 1 in 100+70% / 1% AEP with 70% climate change; 1 in 200 / 0.5% AEP; and 1 in 1000 / 0.1% AEP.

Mapped outputs:

1 in 5 / 20% AEP; 1 in 20 / 5% AEP; 1 in 30 / 3.3% AEP; 1 in 50 / 2% AEP; 1 in 75 / 1.33% AEP; 1 in 100 / 1% AEP; 1 in 100+10% / 1% AEP with 10% climate change; 1 in 100+15% / 1% AEP with 15% climate change; 1 in 100+25% / 1% AEP with 25% climate change; 1 in 100+35% / 1% AEP with 35% climate change; 1 in 100+70% / 1% AEP with 70% climate change; 1 in 200 / 0.5% AEP; and 1 in 1000 / 0.1% AEP.

## Model information

THM248675

Model: Addlestone Bourne 2007

Description: The information provided is taken from the Addlestone/Hale Bourne Detailed Flood Risk Mapping Study completed in July 2007. The Addlestone/Hale Bourne catchments were modelled using ISIS 1D.

Accuracy of the final model in the Lightwater area (at node points L1.007 – L1.011) is less, due to simplification of the model in this area, but the topography at this location means that this increase (or decrease) in level will not significantly affect the flood extent.

Woburn Park Stream: There are larger inaccuracies in Woburn Park Stream, downstream of the Addlestone Gauging Station. The modelled Chertsey Bourne 100-year flood levels at this location are higher than those achieved in this study, as a precaution, the levels for this reach should be taken from the Chertsey model.

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; 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 100 / 1% AEP

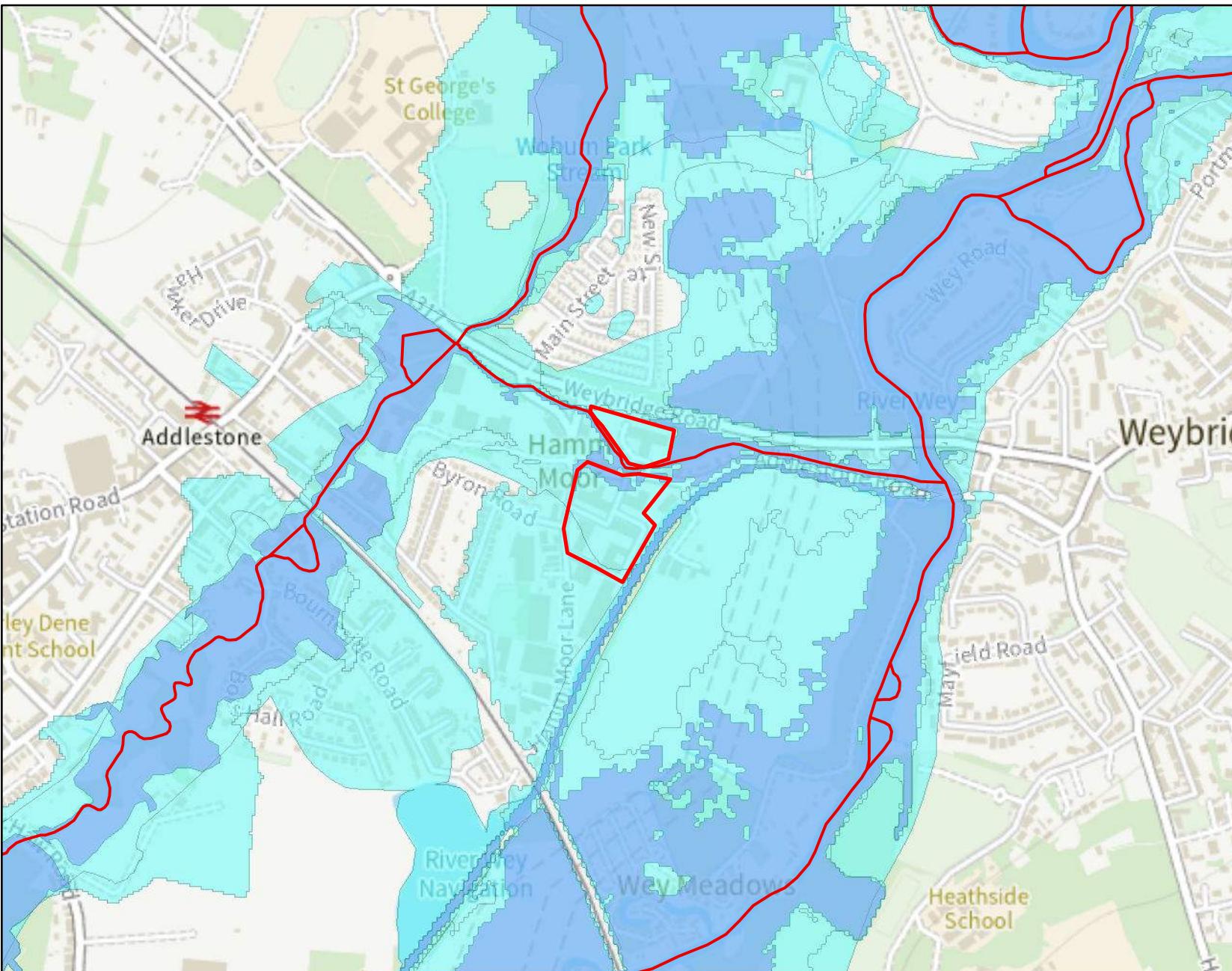
Model accuracy:

Levels  $\pm$  250mm (generally)

Levels  $\pm$  500mm (Lightwater area only see above)

# Flood Map for Planning centred on Addlestone Road, Addlestone, Surrey, KT15 2UL

Created on 06/04/2022 REF: THM248675



Kilometres

0 0.25 0.5

## 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.

## Modelled in-channel flood flows and levels

**THM248675**

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_30_2019_01_1.029	Wey Lower (Jacobs Well to Weybridge) 2019	506746	164995	11.54	78.08	12.15	0.00	12.26	12.30	12.44	12.47		
061_30_2019_01_1.033u	Wey Lower (Jacobs Well to Weybridge) 2019	506905	164714	11.75	77.26	12.48	0.00	12.68	12.75	13.10	13.17		
061_30_2019_01_1.035	Wey Lower (Jacobs Well to Weybridge) 2019	506850	164540	11.83	77.11	12.68	0.00	12.94	13.03	13.35	13.42		
061_30_2019_01_1.037	Wey Lower (Jacobs Well to Weybridge) 2019	506763	164354	11.97	77.09	12.85	0.00	13.10	13.19	13.49	13.55		
061_30_2019_01_1.041	Wey Lower (Jacobs Well to Weybridge) 2019	506561	164015	12.23	76.28	13.18	0.00	13.37	13.43	13.67	13.72		
06330AB_MN_P1.007	Addlestone Bourne 2007	506241	165212	11.26	11.52	11.78	11.87	0.00	0.00	0.00	0.00		
06330AB_MN_P1.009	Addlestone Bourne 2007	506127	165059	11.41	11.73	12.05	12.16	0.00	0.00	0.00	0.00		
06330AB_MN_A1.002	Addlestone Bourne 2007	506000	164961	11.83	12.21	12.74	12.96	0.00	0.00	0.00	0.00		
06330AB_MN_A1.005	Addlestone Bourne 2007	505849	164816	12.12	12.54	12.97	13.15	0.00	0.00	0.00	0.00		

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_30_2019_01_1.029	Wey Lower (Jacobs Well to Weybridge) 2019	506746	164995	55.81	0.74	92.18	0.00	109.35	116.10	139.82	144.36		
061_30_2019_01_1.033u	Wey Lower (Jacobs Well to Weybridge) 2019	506905	164714	58.51	0.73	138.79	0.00	167.24	177.36	191.16	194.68		
061_30_2019_01_1.035	Wey Lower (Jacobs Well to Weybridge) 2019	506850	164540	58.51	0.72	105.39	0.00	113.40	116.33	123.63	124.88		
061_30_2019_01_1.037	Wey Lower (Jacobs Well to Weybridge) 2019	506763	164354	55.35	0.71	99.83	0.00	101.95	102.31	104.67	105.84		
061_30_2019_01_1.041	Wey Lower (Jacobs Well to Weybridge) 2019	506561	164015	56.74	0.71	108.24	0.00	121.01	126.61	146.27	150.95		
06330AB_MN_P1.007	Addlestone Bourne 2007	506241	165212	7.27	11.34	19.14	23.07	0.00	0.00	0.00	0.00		
06330AB_MN_P1.009	Addlestone Bourne 2007	506127	165059	7.27	11.34	19.14	23.07	0.00	0.00	0.00	0.00		
06330AB_MN_A1.002	Addlestone Bourne 2007	506000	164961	3.60	5.31	8.06	8.78	0.00	0.00	0.00	0.00		
06330AB_MN_A1.005	Addlestone Bourne 2007	505849	164816	7.27	11.34	19.15	23.09	0.00	0.00	0.00	0.00		

Note:

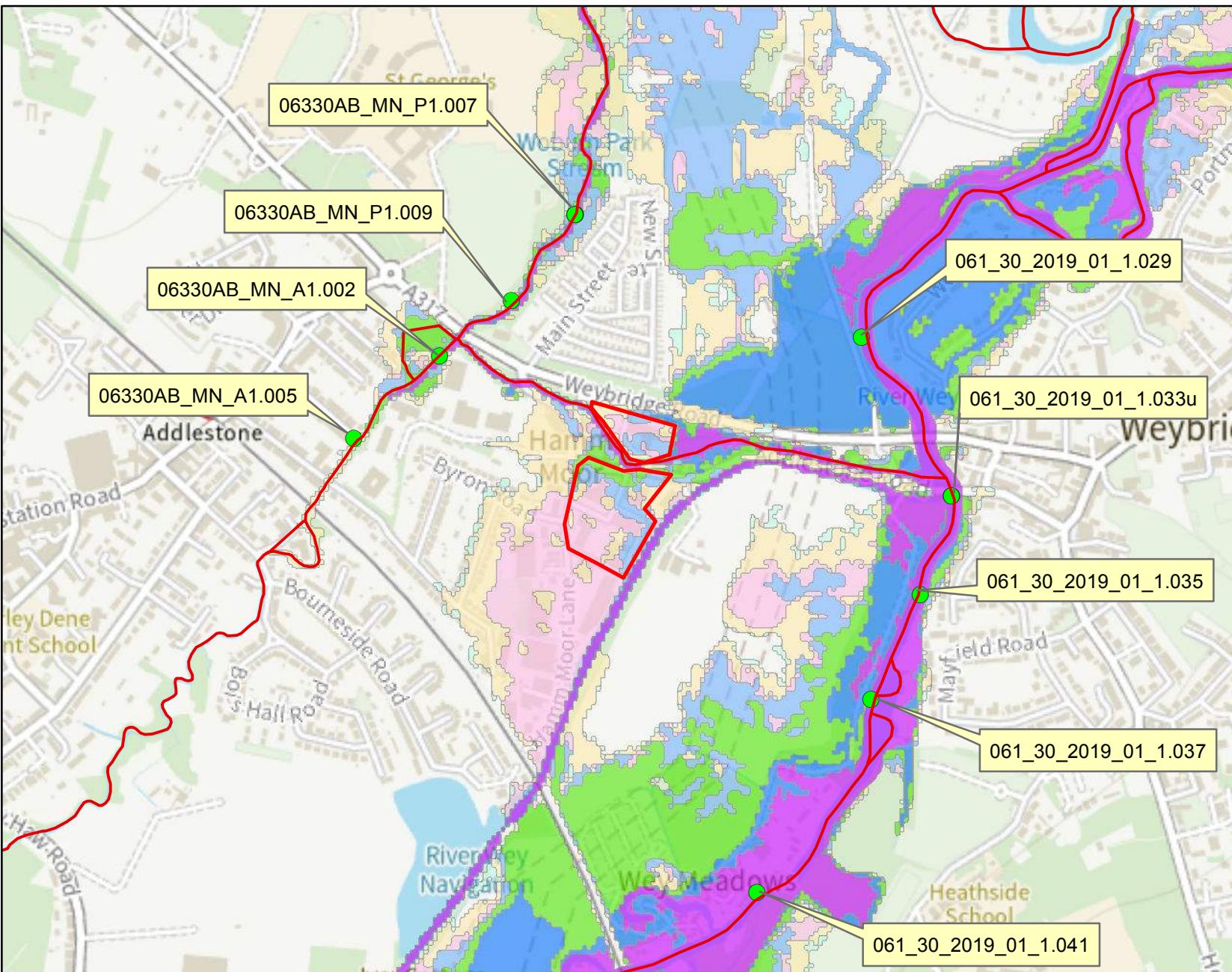
Due to changes in guidance on the allowances for climate change, the percentage increase in river flows above should no longer be used for development design purposes. The data included in this Product can be used for interpolation of levels as part of an intermediate level assessment.

For further advice on the new allowances please visit

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

# Detailed FRA Map (1) centred on Addlestone Road, Addlestone, Surrey, KT15 2UL

Created on 07/04/2022 REF: THM248675



Kilometres

0 0.25 0.5

## Legend

- Main River
- THM Model Node Data selection
- 20% AEP Defended Flood Outline
- 5% AEP Defended Flood Outline
- 1% AEP Defended Flood Outline
- 1%+25% CC AEP Defended Flood Outline
- 1%+35% CC AEP Defended Flood Outline
- 1%+70% CC AEP Defended Flood Outline
- 0.1% AEP Defended 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

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	1% AEP (+25% increase in flows)	1% AEP (+35% increase in flows)	1% AEP (+70% increase in flows)	0.1% AEP
Floodplain 1	Wey Lower (Jacobs Well to Weybridge) 2019	506,314	164,852	No Data	12.55	12.93	12.97
Floodplain 2	Wey Lower (Jacobs Well to Weybridge) 2020	506,380	164,825	No Data	12.55	12.93	12.97
Floodplain 3	Wey Lower (Jacobs Well to Weybridge) 2021	506,499	164,854	No Data	No Data	12.81	12.84
Floodplain 4	Wey Lower (Jacobs Well to Weybridge) 2022	506,319	164,727	12.46	12.54	12.96	13.00
Floodplain 5	Wey Lower (Jacobs Well to Weybridge) 2023	506,314	164,619	No Data	No Data	13.08	13.13
Floodplain 6	Wey Lower (Jacobs Well to Weybridge) 2024	506,224	164,669	No Data	12.69	13.09	13.15
Floodplain 7	Wey Lower (Jacobs Well to Weybridge) 2025	506,171	164,796	No Data	No Data	12.92	12.97

This flood model has represented the floodplain as a grid.

The flood water levels have been calculated for each grid cell.

Note:

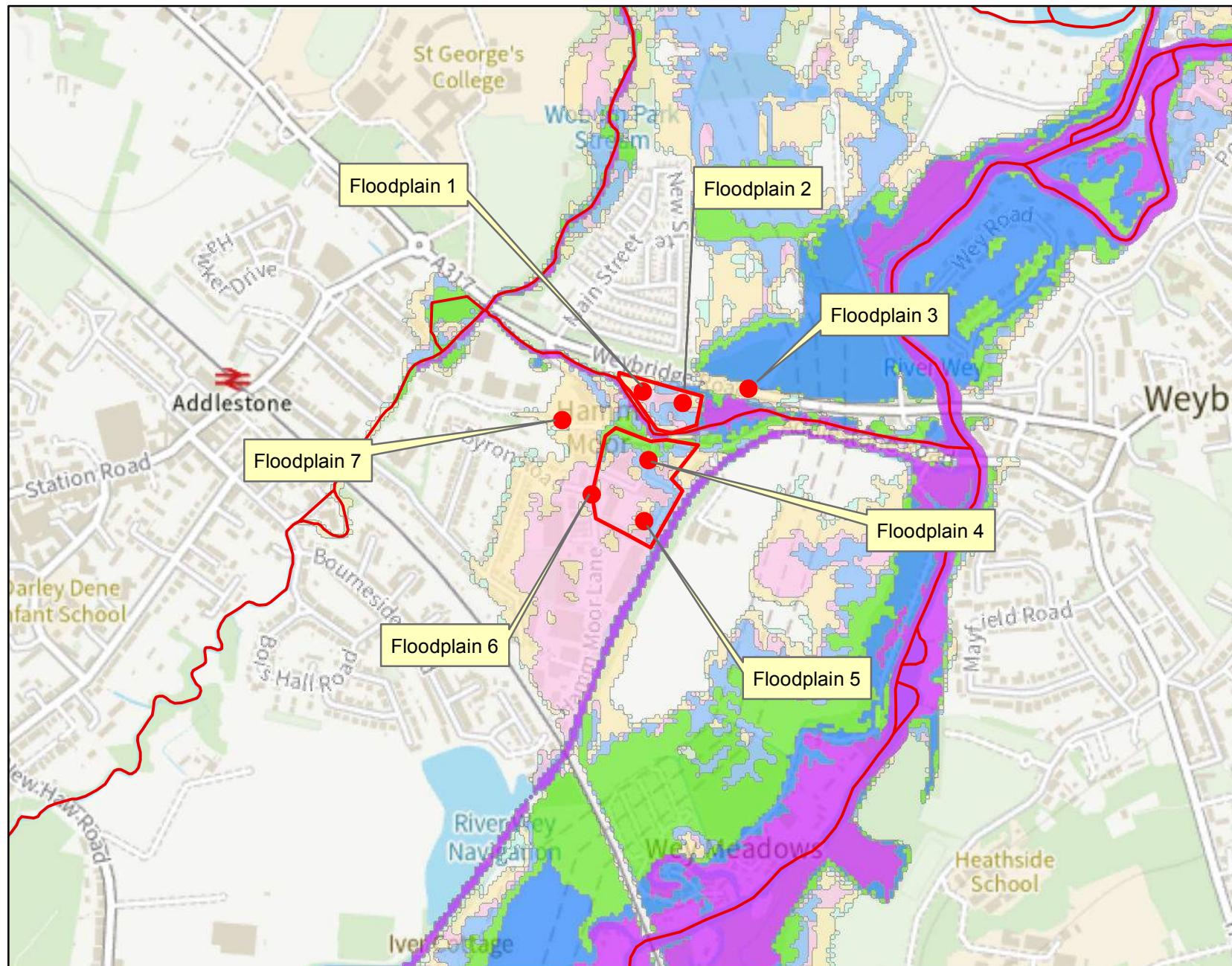
increase in river flows above should no longer to be used for development design purposes. The data included in this Product can be used for interpolation of levels as part of an intermediate level assessment.

For further advice on the new allowances please visit

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

# Detailed FRA Map (2) centred on Addlestone Road, Addlestone, Surrey, KT15 2UL

Created on 07/04/2022 REF: THM248675



Kilometres

0 0.25 0.5

## Legend

- Main River
- 20% AEP Defended Flood Outline
- 5% AEP Defended Flood Outline
- 1% AEP Defended Flood Outline
- 1%+25% CC AEP Defended Flood Outline
- 1%+35% CC AEP Defended Flood Outline
- 1%+70% CC AEP Defended Flood Outline
- 0.1% AEP Defended 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.

## Historic flood data

THM248675

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:

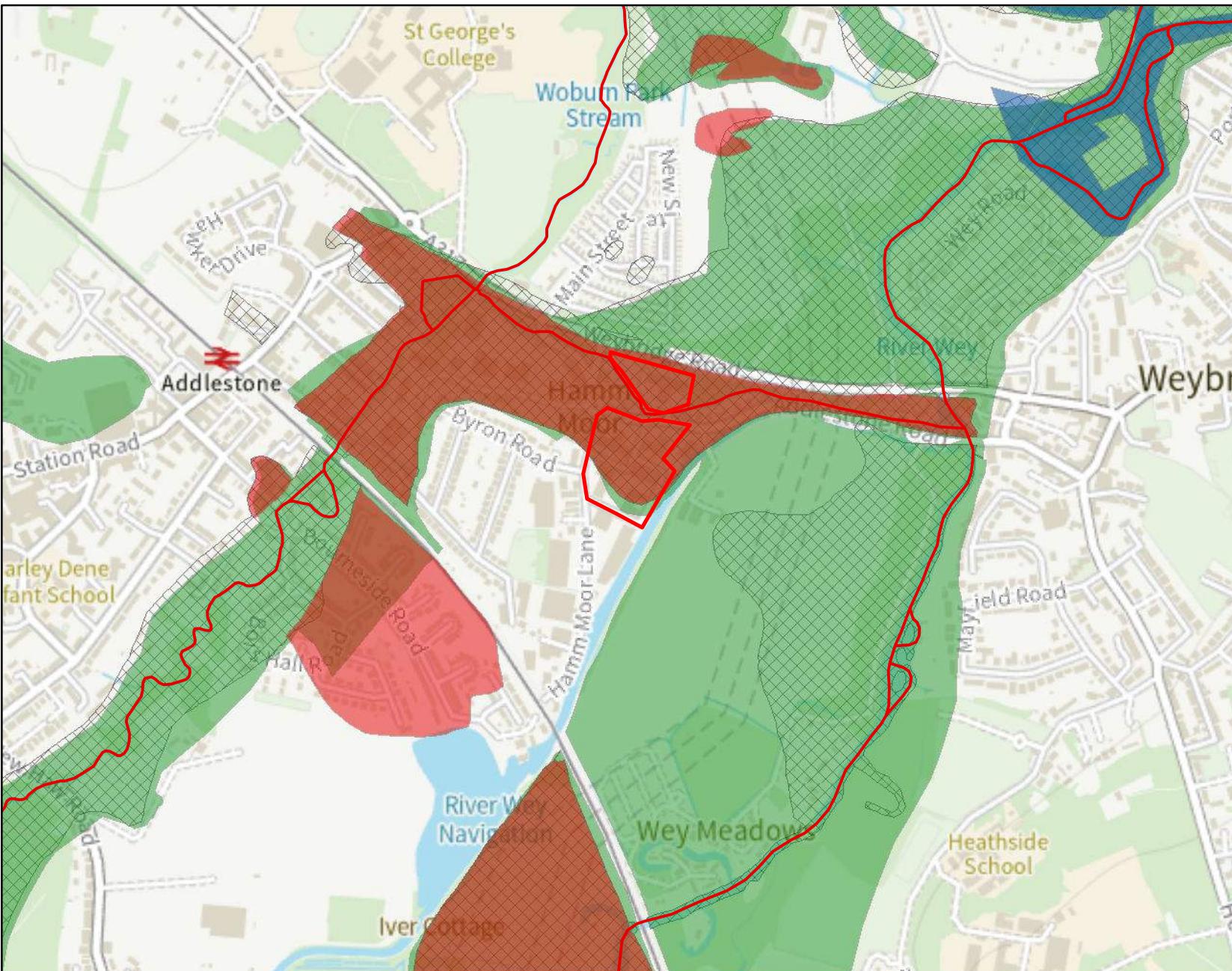
Flood Event Code	Flood Event Name	Start Date	End Date	Source of Flooding	Cause of Flooding
EA0619470300433a	06MarchSpring1947	01/01/1947	12/12/1947	main river	channel capacity exceeded (no raised defences)
EA0619680900461c	06SeptemberAutumn1968	01/01/1968	12/12/1968	main river	channel capacity exceeded (no raised defences)
EA0619741100411	06NovemberAutumn1974	01/01/1974	12/12/1974	main river	channel capacity exceeded (no raised defences)
EA0619880500047	06MaySpring1988	01/01/1988	12/12/1988	other	unknown
EA0619900200228	06FebruaryWinter1990	01/01/1990	12/12/1990	main river	channel capacity exceeded (no raised defences)
EA0620001200326	06DecemberWinter2000	01/01/2000	12/12/2000	main river	channel capacity exceeded (no raised defences)
EA0620030100274	06JanuaryNewYear2003	23/12/2002	12/01/2003	sewer	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.

# Historic Flood Map(1) centred on Addlestone Road, Addlestone, Surrey, KT15 2UL

Created on 07/04/2022 REF: THM248675



Kilometres  
0 0.25 0.5

## Legend

Main River

year

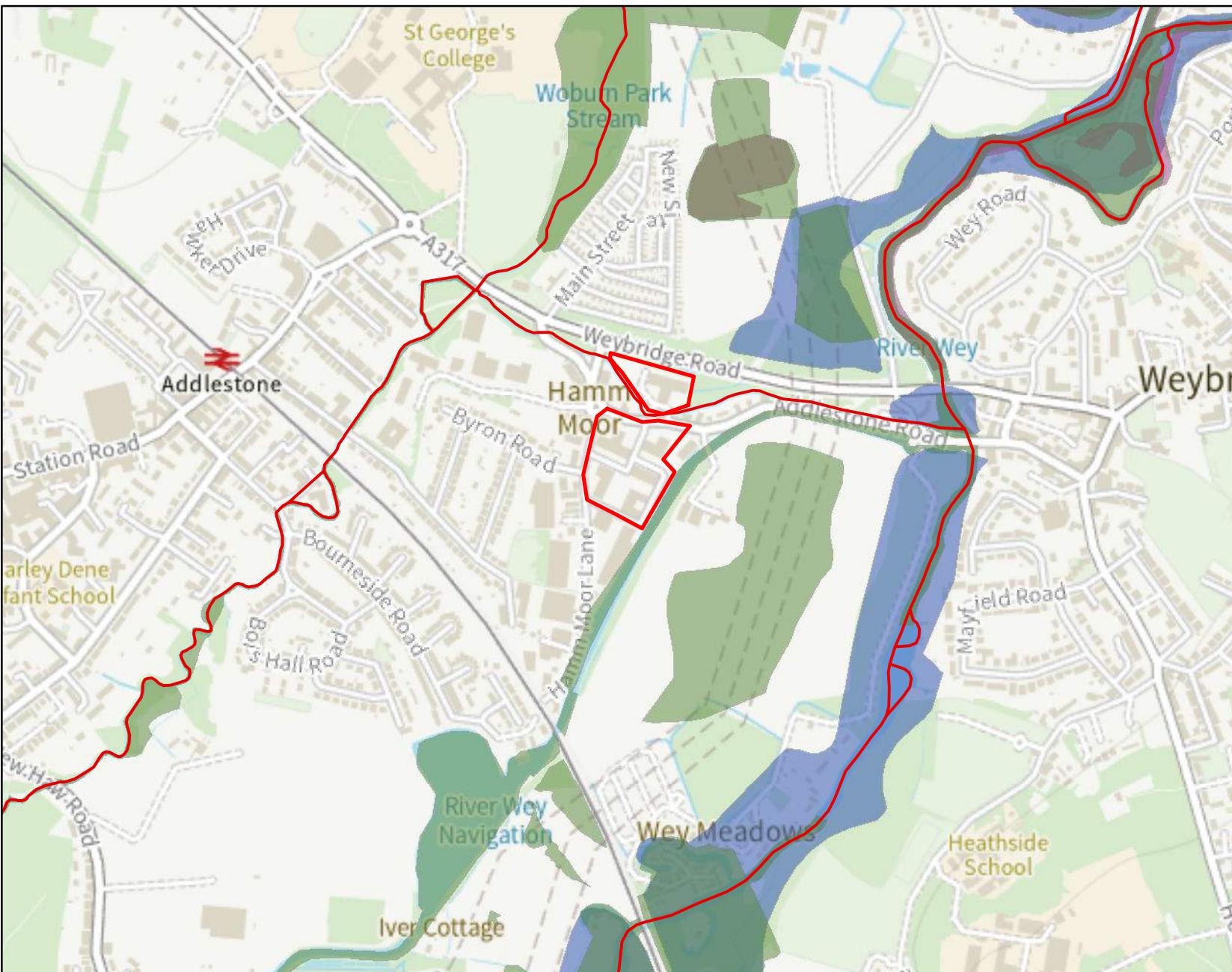
1947
1968
1974
1988

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 Map (2) centred on Addlestone Road, Addlestone, Surrey, KT15 2UL

Created on 07/04/2022 REF: THM248675



Kilometres  
0 0.25 0.5

## Legend

Main River

year

1990

2000

2002

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.

## Hazard Mapping (for the 1%+35% climate change scenario)

**THM248675**

### Hazard Mapping methodology:

To calculate flood hazard with the debris factor we have used the supplementary note to Flood Risk to People Methodology (see below).

The following calculation is used:

$$HR = d \times (v+0.5) + DF$$

Where HR = flood hazard rating

d = depth of flooding (m)

v = velocity of floodwaters (m/sec)

DF = debris factor calculated (0, 0.5, 1 depending on probability that debris will lead to a hazard)

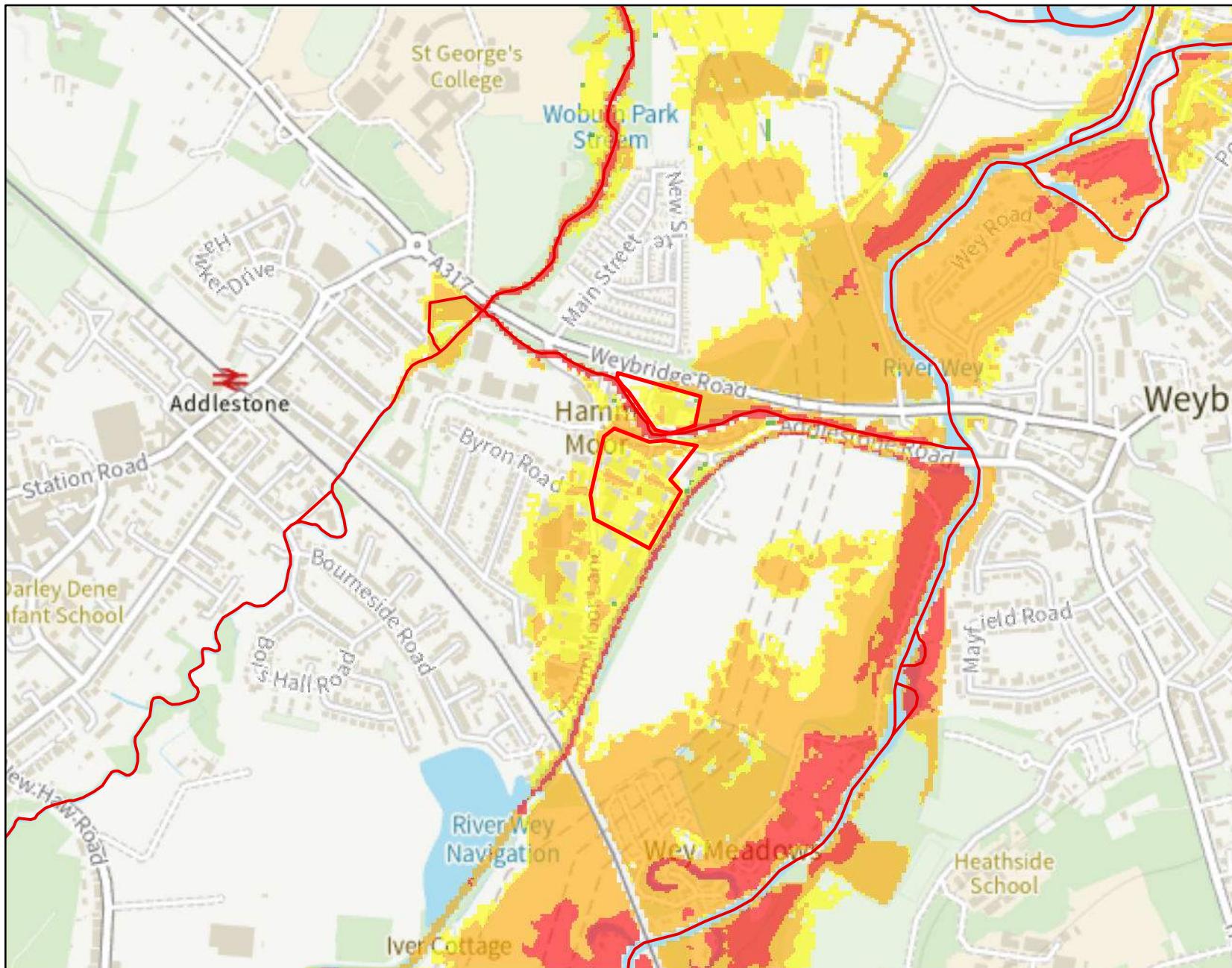
The resultant hazard rating is then classified according to:

Flood Hazard	Colour	Hazard to People Classification	
Less than 0.75	Green	Very low hazard	- Caution
0.75 to 1.25	Yellow	Danger for some	- includes children, the elderly and the infirm
1.25 to 2.0	Orange	Danger for most	- includes the general public
More than 2.0	Red	Danger for all	- includes the emergency services

REF: HR Wallingford and Environment Agency (May 2008) Supplementary note of flood hazard ratings and thresholds for development planning and control purpose – Clarification of the Table 113.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1

# Hazard Map centred on Addlestone Road, Addlestone, Surrey, KT15 2UL

Created on 07/04/2022 REF: THM248675



Kilometres  
0 0.25 0.5

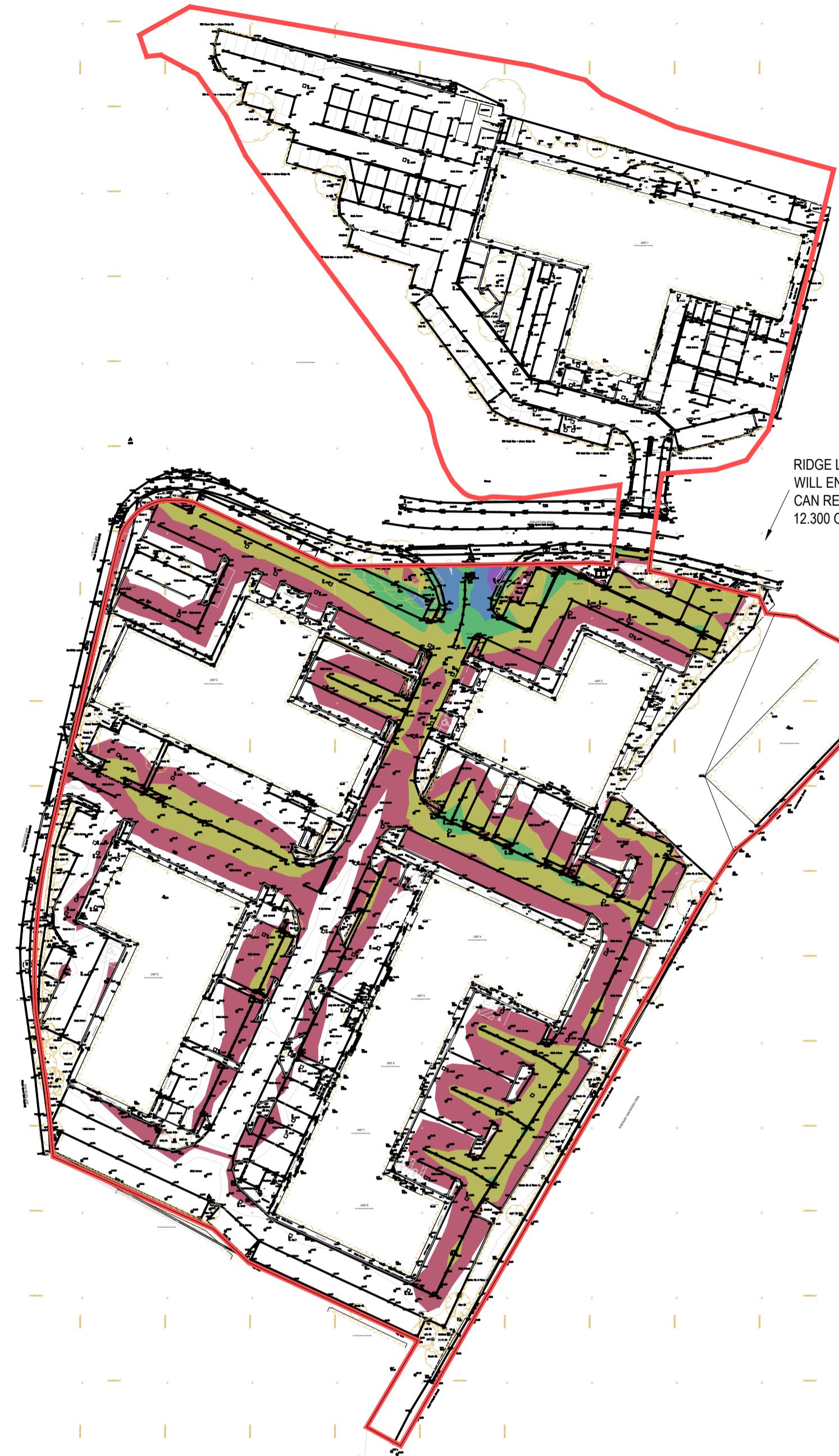
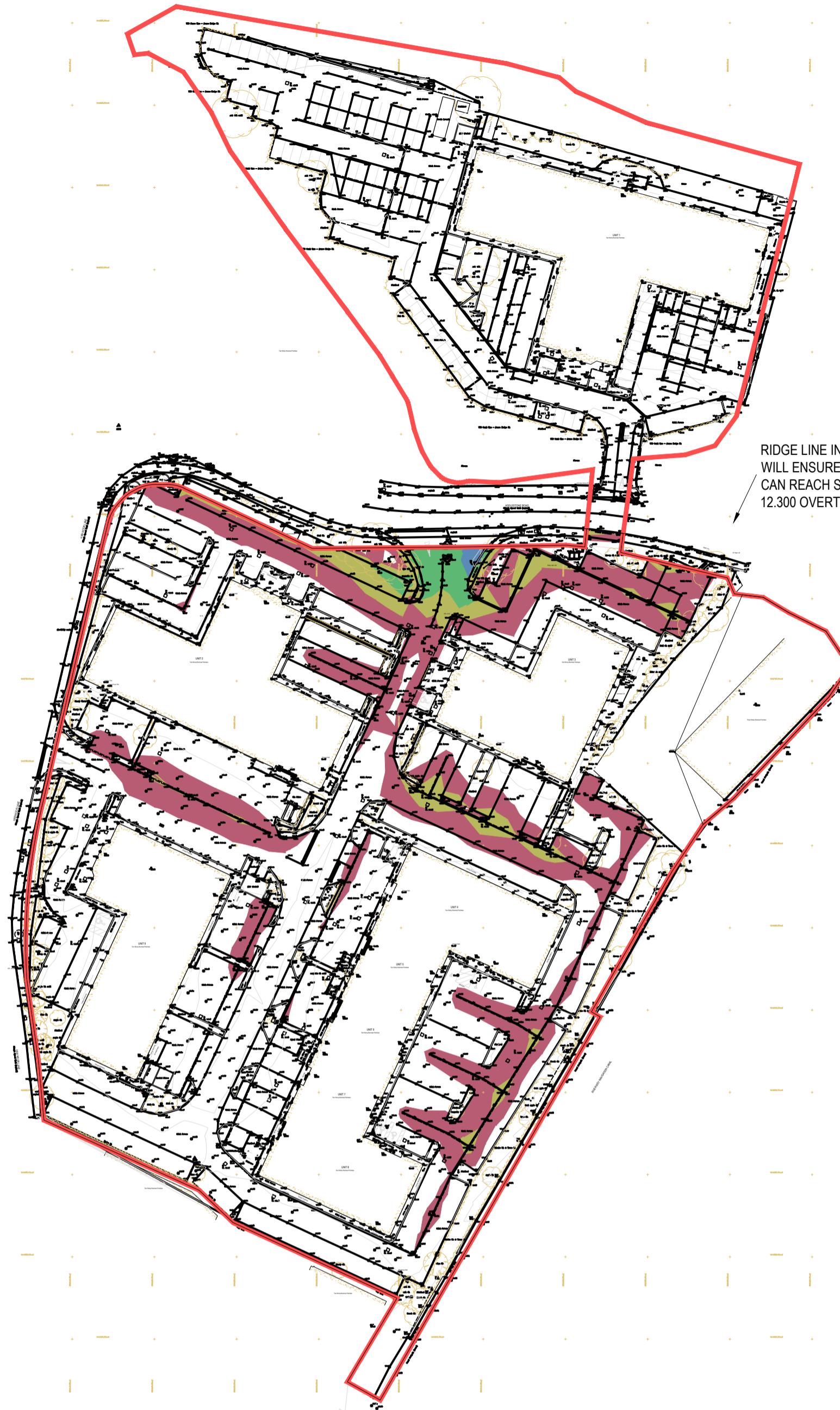
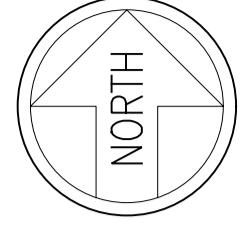
## Legend

- Main River
- Low hazard
- Hazard to some
- Hazard to most
- Hazard to all

For hazard and debris factor we used HR Wallingford and Environment Agency (May 2008) supplementary note on flood hazard ratings and thresholds for development planning and control purpose. The following calculation is used:  
$$HR = d \times (v+0.5) + DF$$
  
HR = flood hazard rating  
d = depth of flooding (m)  
v = velocity of floodwaters (m/sec)  
DF = debris factor calculated (0, 0.5, 1 depending on probability that debris will lead to a hazard)

## **APPENDIX F**

### **EXISTING FLOOD VOLUMES DRAWING**



#### NOTES:

1. FLOOD LEVEL TAKEN FROM RAMBOLL FLOOD RISK APPRAISAL REPORT REF. 1620014229 DATED 05/04/2022.

DRAWINGS:  
TOPOGRAPHICAL SURVEY - SURVEY SOLUTIONS DRAWING NUMBER 12615 se-01 REV - TITLED 'TOPOGRAPHICAL SURVEY'.

SURFACE ELEVATION DATA			
NUMBER	MINIMUM ELEVATION	MAXIMUM ELEVATION	COLOR
1	0.00	0.10	■
2	0.10	0.20	■
3	0.20	0.30	■
4	0.30	0.40	■
5	0.40	0.50	■

ISOPACHYTE BANDS REFER TO DEPTH FROM FLOOD LEVEL TO TOPOGRAPHICAL GROUND PROFILE THEREFORE REPRESENT FLOODING DEPTHS.

1 IN 100 YEAR + 24%  
FLOOD LEVEL = 12.460

P1	NDH	07.04.22	FIRST ISSUE
Rev.	Tech	Date	Description

<b>HDR</b> Bradbrook Consulting
Berkhamsted Office Bourne House Princes Edward Street Berkhamsted Herts, HP4 3EZ United Kingdom
T: +44 (0)20 8669 1903 E: info@bradbrookconsulting.com W: www.bradbrookconsulting.com

Client
<b>BRIDGE</b>

Project Title
WEYBRIDGE BUSINESS PARK, WEYBRIDGE

Drawing Title
EXISTING FLOOD VOLUMES DURING 1 IN 100 YEAR + 24%

Purpose of Issue
Information <input type="radio"/> Preliminary <input checked="" type="radio"/> Approval <input type="radio"/> Tender <input type="radio"/> Construction <input type="radio"/> Record Copy <input type="radio"/>

First Issue Date	Drawn By	Scale	Checked
MARCH 22	NDH	1:1000 @ A1	NRB

Drawing Number	Rev.
10334617-HDR-XX-XX-DR-C-603	P1

FLOOD VOLUMES	
FLOOD LEVEL (mAOD)	FLOOD VOLUME (m <sup>3</sup> )
12.380	300
12.460	750

## **APPENDIX G**

### **PROPOSED FLOOD VOLUMES DRAWING**