

## Rose Cottage, 78 Bridge End, CV34 6PD

Reference: 369 FRA- 001

May-22

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	Section
<b>Introduction</b>	<b>1</b>
<b>Site Assessment</b>	<b>2</b>
<b>National and Local Planning Policy</b>	<b>3</b>
<b>The Sequential and Exception Test</b>	<b>4</b>
<b>Flood hazard assessment</b>	<b>5</b>
<b>Flood Risk Management</b>	<b>6</b>
<b>Off-site Impacts</b>	<b>7</b>
<b>Residual Risk</b>	<b>8</b>
<b>Conclusions</b>	<b>9</b>
<b>Appendices</b>	
Site Location Plan	A
Existing and Proposed Site Layouts	B
Site Characteristics	C
Environment Agency Data	D

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# Flood Risk Assessment

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## Report Limitations

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All comments and proposals contained in this report, including any conclusions, are based on information available to RIDA Reports during investigations. The conclusions drawn by RIDA Reports could therefore differ if the information is found to be inaccurate or misleading. RIDA Reports accepts no liability should this be the case, nor if additional information exists or becomes available with respect to this scheme.

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All Environment Agency mapping data used under special license. Data is current as the data on the correspondence given by the Environment Agency and is subject to change.

The information presented and conclusions drawn are based on statistical data and are for guidance purposes only.

The study provides no guarantee against flooding of the study site or elsewhere, nor of the absolute accuracy of water levels, flow rates and associated probabilities.

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## **Purpose of this report**

- 1.1 RIDA Reports Ltd has been appointed to undertake a Level 2 – Scoping Study Flood Risk Assessment for a development located at CV34 6PD.

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## **Objectives**

- 1.2 The objectives of this FRA are to demonstrate the following:
- \* Whether the proposed development is likely to be affected by current or future flooding.
  - \* Whether the proposed development will increase flood risk elsewhere.
  - \* Whether the flood risks associated with the proposed development can be satisfactorily managed.
  - \* Whether the measures proposed to deal with the flood risk are sustainable.

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## **Documents Consulted**

- 1.3 To achieve these objectives the following documents have been consulted and/or referenced:

The National Planning Policy Framework (NPPF)  
CIRIA C753 document The SuDS Manual, 2015  
Local Flood Risk Management Strategy (LFRMS)  
Level 1 Strategic Flood Risk Assessment (SFRA)  
Aerial photographs and topographical survey of the site  
British Geological Society Records  
Local Council flood Maps  
Environment Agency flood maps  
The CIRIA publication 'C635 Designing for exceedance in urban drainage— Good practice'

### Development Site and Location

- 2.1 The site is located at 78 Bridge End, Warwick. The nearest post code is CV34 6PD. Refer to appendix A for site location plan.
- 2.2 The current use of the site is garden of the property. The current use vulnerability classification of the site is Water compatible. The site is located in the River Flood Zone 2. Refer to Appendix B for more details.

### Development Proposals

- 2.3 The proposed development includes the construction of garage conversion into a garden room. The total development area (shown in within the red line) is approximately 300 sqm. Refer to Appendix B for layout of the proposed development.
- 2.4 The vulnerability classification of the proposed development is More vulnerable with an estimated lifetime between 50 and 100 years.

### Site Hydrology and Hydrogeology

- |                        |   |
|------------------------|---|
| Hydrology              | 2.5 The River Avon is located approximately 130 m away from the development.  |
| Aquifer                | 2.6 The development is located within a secondary aquifer type A. Aquifers type A consist of permeable layers capable of supporting water supplies at a local rather than strategic scale. They are generally aquifers formerly classified as minor aquifers. |
| Source Protection Zone | 2.7 The site is not located within a Source Protection Zone.  |
| Groundwater Levels     | 2.8 The ground water levels for this site are unknown.  |

### Site Geology

- |                      |  |
|----------------------|--|
| Bedrock              | 2.9 The British Geological Society records of the site show that it is located within the Tarporley Siltstone Formation - Siltstone, Mudstone and Sandstone. |
| Superficial Deposits | 2.10 The British Geological Society records show that the superficial deposits are River Terrace Deposits, 2 - Sand and Gravel.                              |

## **National Planning Policy Framework (NPPF)**

- 3.1 The NPPF and its technical guidance is a set of planning policies with the key objective to contribute to the achievement of sustainable development. As part of it, they ensure that flood risk and sustainability are taken into account during the planning process. This ensures that developments are not located in flood risk areas and directs developments to lower risk areas. The NPPF applies a sequential risk-based approach to determining the suitability of land for development in flood risk areas. The NPPF also encourages developers to seek opportunities to reduce the overall level of flood risk through the layout of the development and the application of Sustainable Drainage Systems (SuDS).

## **The Flood and Water Management Act (2010)**

- 3.2 The Flood and Water Management Act aims to reduce the flood risk associated with extreme weather events. It provides a robust management of flood risk for people, homes and businesses and also encourages the use of SuDS for developments. A robust SuDS strategy should take into account the recommendations given in this Flood Risk Assessment.

## **Strategic Flood Risk Assessment (SFRA)**

- 3.3 Planning policy with regard to development and flood risk in the area is detailed in the Strategic Flood Risk Assessment (SFRA) which was published in 2013. The proposed development site is located within the administrative boundary of the Warwick District Council.
- 3.4 The SFRA commits to direct new development to locations at lowest flood risk. The SFRA provides information on the levels and flood hazards that could result from flooding. The Environment Agency flood zone maps and the SFRA ignore the presence of existing flood defences when defining the potential extent of flooding.
- 3.5 This report follows the guidance given in the Strategic Flood Risk Assessment by evaluating the flood risk and providing relevant flood mitigation.

- 4.1 The flood risks were determined by identifying the sources of flooding and assessing their possible impact and likelihood to the development.

## Fluvial Flood Risk Assessment

- 4.2 Fluvial flood risk was assessed using the Environment Agency Flood Zone Maps and the standing advice approach recommended in the NPPF guidelines. The standing advice takes into account the size of the development and the flood risk vulnerability of land uses.

### Standing Advice

- Step 1** 4.3 The proposed development falls within The Environment Agency Flood Zone 2. The Flood Zone 2 is considered to have a medium probability of flooding with a 1000 to 100 years annual probability or 0.1-1.0%AEP.  
Flood Zone categorisation
- Step 2** 4.4 Within Table 2 (Flood Risk Vulnerability Classification) of the NPPF Planning Practice Guide, the proposed development is classified as 'More vulnerable'.  
Flood risk vulnerability
- Step 3** 4.5 The proposed development falls within the remit of the standing advice as it is more vulnerable within flood zone 2.  
Standing Advice

- 5.1 The development has been assessed for all potential flood risks such as river and tidal flood risk, surface water flooding, flooding from groundwater, reservoir flood risk and drainage systems.

## Historic Flooding

- 5.2 The site does not benefit from flood defences. The Environment Agency records shows that the area around the site has potentially been flooded in the past. See appendix C for details.

## Flooding from river and sea

- 5.3 The proposed development falls within The Environment Agency Flood Zone 2. The Flood Zone 2 is considered to have a medium probability of flooding with a 1000 to 100 years annual probability or 0.1-1.0%AEP.

- 5.4 The climate change allowances are as per the vulnerability of the development , the design life of the building , and the flood zone classification. The climate change allowance for this development is 21%. The nearest climate change allowance provided by the Environment Agency has been taken to complete this assessment.

- 5.5 The levels provided by the Environment Agency are shown in table 1 below. Further details are provided in appendix D.

Flood Levels

Return Period	Flood Level (m AOD)
1 in 20 (5%)	45.46
1 in 100 (1%)	46.74
1 in 200 (0.5%)	46.87
1 in 100 + 25%(CC)	Unknown
1 in 1000 (0.1%)	47.22

- 5.6 The Environment Agency has not provided the flood level for the climate change. Therefore the flood risk levels taken to complete this assessment is: 47.22m AOD or 1 in 1000 (0.1%)

### Surface water (overland flows) flood risk

5.10 The Environment Agency maps show that the flood risk from surface water is very low. A residual risk of localised ponding remains unlikely. The Environment Agency surface water flood risk maps are defined through application of a specific procedure based on digital terrain models and assumptions regarding losses to infiltration and/or urban drainage. The surface water flood maps is defined by the Environment Agency as follows.

5.11 *"The nationally produced surface water flood mapping only indicates where surface water flooding could occur as a result of local rainfall. It does not fully represent flooding that occurs from:*

- Ordinary watercourses*
- Drainage systems or public sewers caused by catchment-wide rainfall events*
- Rivers*
- Groundwater*

*Due to the modelling techniques used, the mapping picks out depressions in the ground surface and simulates some flow along natural drainage channels, rivers, low areas in floodplains, and flow paths between buildings. Although the maps appear to show flooding from ordinary watercourses, they should not be taken as definitive mapping of flood risk from these as the conveyance effect of ordinary watercourses or drainage channels is not explicitly modelled. Also, structures (such as bridges, culverts and weirs) and flood risk management infrastructure (such as defences) are not represented.*

*The nationally produced surface water flood mapping does not take account of the effect of pumping stations in catchments with pumped drainage. No allowance is made for tide locking, high tidal or fluvial levels where sewers cannot discharge in to rivers or the sea."*

5.12 The strategic flood risk for the Warwick District Council confirms that the flood risk for the site is Very Low.

5.13 On the basis of Environment Agency and the Strategic flood risk assessment's surface water mapping, together with the presence of surface water drainage systems at the site and surrounding area it is concluded that the site is at Very Low risk of flooding from surface water sources.



## **Flooding from drainage systems in adjacent areas**

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- 5.14 The council records have been reviewed. The flooding from drainage incidents maps were not found in the Strategic Flood Risk Assessment. Therefore, for the purpose of this report, it has been assumed that the risk of flooding from drainage systems is low.

## **Reservoirs Risks**

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- 5.15 The Reservoir Flood Map (RFM) produced by the Environment Agency do not show the risk to individual properties of dam breach flooding. The maps do not indicate or relate to any particular probability of dam breach flooding. The maps were prepared for emergency planning purposes and can be used to help reservoir owners produce on-site plans and the Local Resilience Forum produce off-site plans, and to prioritise areas for evacuation/early warning in the event of a potential dam failure. The RFM shows that the development could be within the possible dam breach flooding path. See Appendix C.

## **Groundwater flood risk**

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- 5.16 The British Geological Survey's flood risk susceptibility maps show that the development has potential for groundwater flooding above ground level. Groundwater levels would tend to vary seasonally and are influenced by ground and meteorological conditions and proximity to water features. The groundwater flooding risk for this site is considered to be high. Refer to appendix C for record drawings.

## **Critical Drainage Areas**

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- 5.17 The Strategic Flood Risk Assessment was reviewed as part of this assessment. However, it does not show the critical drainage areas within the council. For the purpose of this report, it has been assumed that the site is outside of a notified critical drainage area.

- 6.1 The Flood hazard assessment has demonstrated that the site is:
  - In Flood Zone 2
  - At Very Low risk of surface flooding
  - At high risk of groundwater flooding
  - Outside of a critical drainage area
  - Outside of an area with sewer flooding
- 6.2 Under the NPPF it is necessary to demonstrate that, for any new development on the site, it is possible to provide an adequate level of flood protection for personnel working or living at the development.

## **Flood Protection**

- 6.3 Where possible, flood protection for this development is typically provided by establishing the development's floor levels 300mm above the 1:100 year flood level, including allowance for climate change.
- 6.4 The flood levels have been obtained from the Environment Agency. This information is used to make the fluvial flood risk assessment for this development
- 6.5 The flood reference level for the proposed development site is 47.22 mAOD. The existing ground level at the site is an average of 47.35mAOD. The finished floor should be 47.5mAOD.
- 6.6 The building is higher than the flood level. Therefore no flood resilience interventions are required.
- 6.7 The general precautionary measures to mitigate the risk of groundwater flooding in this development are:
  - Ground floor threshold levels are proposed to be raised a minimum of 150mm above ground level as freeboard to allow for uncertainty.
  - Provide flow paths around the proposed development which groundwater will take in the event of groundwater emergence.
  - It is proposed to add a tanking membrane upto 200mm above the ground level.

As these measures would mitigate the risks from groundwater flooding, it is considered the risk from groundwater has been managed.

7.1 The NPPF specifically stipulates that consideration should be given to potential off-site flood impacts of any proposed development. These off-site impacts are in relation to:

- Surface water management
- Flood flow conveyance, storage and climate change

## Surface Water Management

7.2 The surface water run-off will be disposed using SuDS techniques. The aim is to provide a sustainable design that accommodates the proposed attenuation volume and replicated the existing drainage regime using the SuDS hierarchy is shown in the figure below.

7.3 The SuDS techniques highlighted in red below could be used on site. This assessment is based on the ground conditions and the potential discharge points available.

The SuDS Hierarchy (Source:EA Thames region, SuDS a practical guide)

<i>Most Sustainable</i>	<i>SUDS technique</i>	<i>Flood Reduction</i>	<i>Pollution Reduction</i>	<i>Landscape &amp; Wildlife Benefit</i>
	<b>Living roofs</b>	✓	✓	✓
↑	<b>Basins and ponds</b> - Constructed wetlands - Balancing ponds - Detention basins - Retention ponds	✓	✓	✓
	<b>Filter strips and swales</b>	✓	✓	✓
	<b>Infiltration devices</b> - soakaways - infiltration trenches and basins	✓	✓	✓
↓	<b>Permeable surfaces and filter drains</b> - gravelled areas - solid paving blocks - porous paviers	✓	✓	
	<b>Tanked systems</b> - over-sized pipes/tanks - storms cells	✓		
<b>Least Sustainable</b>				

7.4 With no increase in the rate of surface water discharge from the site, compared to the site in its current configuration, the proposed development would have no adverse impact on surface water flood risk at the site or surrounding area. The SuDS should be designed at detailed project stage.

### **Flood Flow conveyance and storage**

- 7.5 Due to the size of the development and its location on the flood zone, flood compensation for this development is not required.

- 8.1 This flood risk assessment has identified the potential flooding mechanisms that could affect the site. This assessment has concluded that the development site requires additional flood risk mitigation strategies so all the flood risk can be addressed.




### Site access and public safety

- 8.2 This assessment has demonstrated that the proposed development will have no adverse impact on flood risk in the area surrounding the site. Available evidence indicates that the development would result in no change in surface water generation. There is therefore no basis to indicate that, with respect to flood risk, the proposed development would have adverse impact on public safety.
- 8.3 It will be necessary to ensure that all building users are fully informed of procedures to be implemented during threat of imminent flooding.

### Flood Warning and evacuation

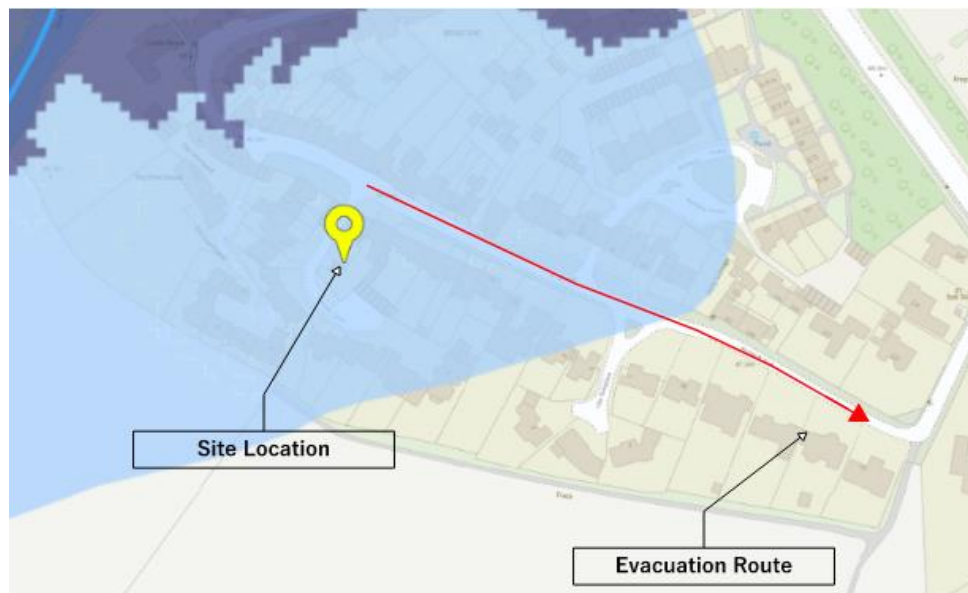
- 8.4 The site is located within an area that is covered by the Environment Agency Flood Alert service. It is recommended that the proposed development is registered with this service to receive early warning of imminent flood hazard.
- 8.6 The occupants of the site are encouraged to sign up to the alerts and should use these to form an appropriate Flood Management and Evacuation Plan tailored to their operations prior to occupation of the site. Table 4 below shows the actions that will be taken for each flood warning.
- 8.7 Action to be taken in the event of Alarm being Raised or Flood Warning Received:
- Raise the alarm and evacuate the site following the established Fire Drill procedures. The main assembly as per the main house fire drill assembly point.
  - Contact Emergency Fire Services (999) if necessary and/or Environment Agency Floodline: (0845 988 1188) if event was not expected.
  - If safe to do so, locate and turn off key services e.g. water, gas & electricity.
  - Follow the routes below to evacuate the site completely.

### Actions that will be taken for each flood warning

Warning	Message	Timing	Action
 FLOOD ALERT	Flooding is possible.  Be prepared.	2 hours to 2 days in advance of flooding.	<ul style="list-style-type: none"> <li>- Be prepared for flooding.</li> <li>- Prepare a flood kit.</li> </ul>
 FLOOD WARNING	Flooding is expected.  Immediate action required.	Half an hour to 1 day in advance of flooding.	<ul style="list-style-type: none"> <li>- Act now to protect your property.</li> <li>- Block doors with flood boards or sandbags and cover airbricks and other ventilation holes.</li> <li>- Move pets and valuables to a safe place.</li> <li>- Keep a flood kit ready.</li> <li>- Move any critical equipment and information to a safe location</li> </ul>
 SEVERE FLOOD WARNING	Severe flooding. Danger to life.	When flooding poses a significant threat to life and different actions are required.	<ul style="list-style-type: none"> <li>- Be ready should you need to evacuate from the property.</li> <li>- Co-operate with the emergency services and call 999 if you are in immediate danger.</li> </ul>
<b>Warning Removed</b>	No further flooding is currently expected for your area.	Issued when a flood warning is no longer in force.	<ul style="list-style-type: none"> <li>- Flood water may still be around and could be contaminated.</li> <li>- If you've been flooded, ring your buildings and contents insurance company as soon as possible.</li> </ul>

8.8 Safe egress is achievable by following Bridge End, which is shown to be beyond the extent of flooding. See figure below for details.

### Evacuation Route



- 9.1 It is concluded that subject to the proposed mitigation measures, the site can be developed in accordance with the provisions of the NPPF and the requirements of the Environment Agency and the local planning authority.
- 9.2 It is proposed that a formal Flood Warning and Emergency Response Plan is developed for the proposed development to communicate flood emergency response procedures to all the occupants of the site.
- 9.3 This report demonstrates that the proposal will be safe, in terms of flood risk, for its design life and will not increase the flood risk elsewhere.

# Appendix A





SITE LOCATION PLAN 1:1250 @ A4 78 BRIDGE END WARWICK CV42 6PD

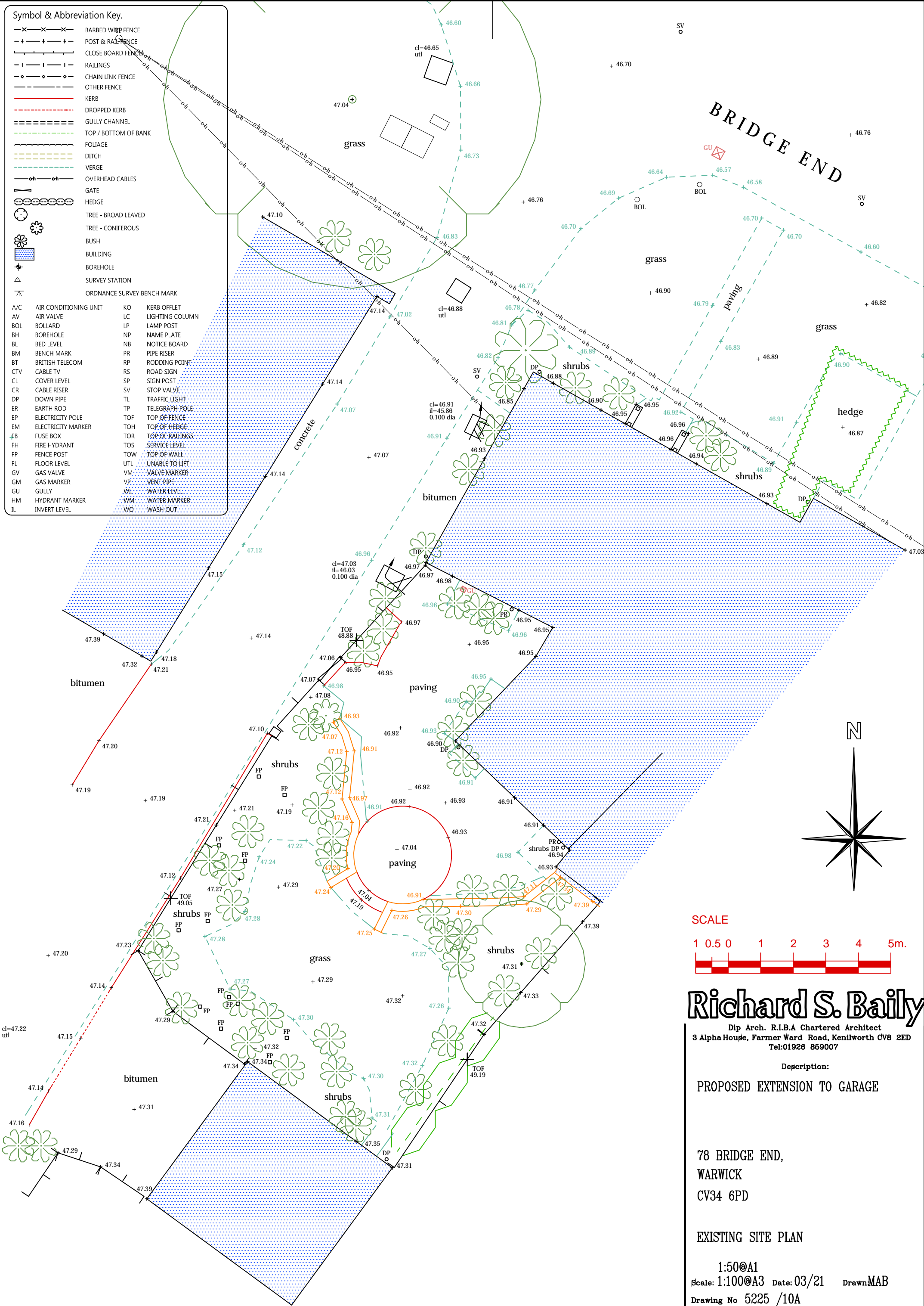
# Appendix B

**Symbol & Abbreviation Key.**

	BARBED WIRE FENCE		POST & RAIL FENCE
	CLOSE BOARD FENCE		RAILINGS
	CHAIN LINK FENCE		OTHER FENCE
	KERB		DROPPED KERB
	GULLY CHANNEL		TOP / BOTTOM OF BANK
	FOLIAGE		DITCH
	VERGE		OVERHEAD CABLES
	GATE		HEDGE
	TREE - BROAD LEAVED		TREE - CONIFEROUS
	BUSH		BUILDING
	BOREHOLE		SURVEY STATION
	ORDNANCE SURVEY BENCH MARK		

A/C	AIR CONDITIONING UNIT	KO	KERB OFFLET
AV	AIR VALVE	LC	LIGHTING COLUMN
BOL	BOLLARD	LP	LAMP POST
BH	BOREHOLE	NP	NAME PLATE
BL	BED LEVEL	NB	NOTICE BOARD
BM	BENCH MARK	PR	PIPE RISER
BT	BRITISH TELECOM	RP	RODDING POINT
CTV	CABLE TV	RS	ROAD SIGN
CL	COVER LEVEL	SP	SIGN POST
CR	CABLE RISER	SV	STOP VALVE
DP	DOWN PIPE	TL	TRAFFIC LIGHT
ER	EARTH ROD	TP	TELEGRAPH POLE
EP	ELECTRICITY POLE	TOF	TOP OF FENCE
EM	ELECTRICITY MARKER	TOH	TOP OF HEDGE
FB	FUSE BOX	TOR	TOP OF RAILINGS
FH	FIRE HYDRANT	TOS	SERVICE LEVEL
FP	FENCE POST	TOW	TOP OF WALL
FL	FLOOR LEVEL	UTL	UNABLE TO LIFT
GV	GAS VALVE	VM	VALVE MARKER
GM	GAS MARKER	VP	VENT PIPE
GU	GULLY	WL	WATER LEVEL
HM	HYDRANT MARKER	WM	WATER MARKER
IL	INVERT LEVEL	WO	WASH OUT



**SCALE**  
 1 0.5 0 1 2 3 4 5m.

**Richard S. Baily**

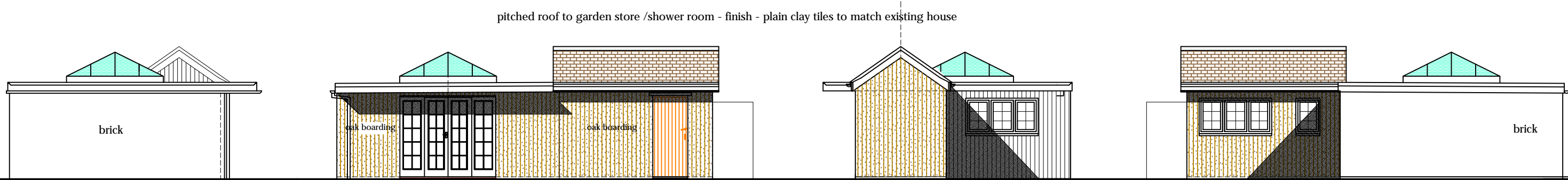
Dip Arch. R.I.B.A Chartered Architect  
 3 Alpha House, Farmer Ward Road, Kenilworth CV8 2ED  
 Tel: 01926 859007

**Description:**  
 PROPOSED EXTENSION TO GARAGE

78 BRIDGE END,  
 WARWICK  
 CV34 6PD

EXISTING SITE PLAN

1:50@A1  
 Scale: 1:100@A3 Date: 03/21 Drawn: MAB  
 Drawing No 5225 /10A



pitched roof to garden store /shower room - finish - plain clay tiles to match existing house

Elevation 7

Elevation 8

Elevation 5

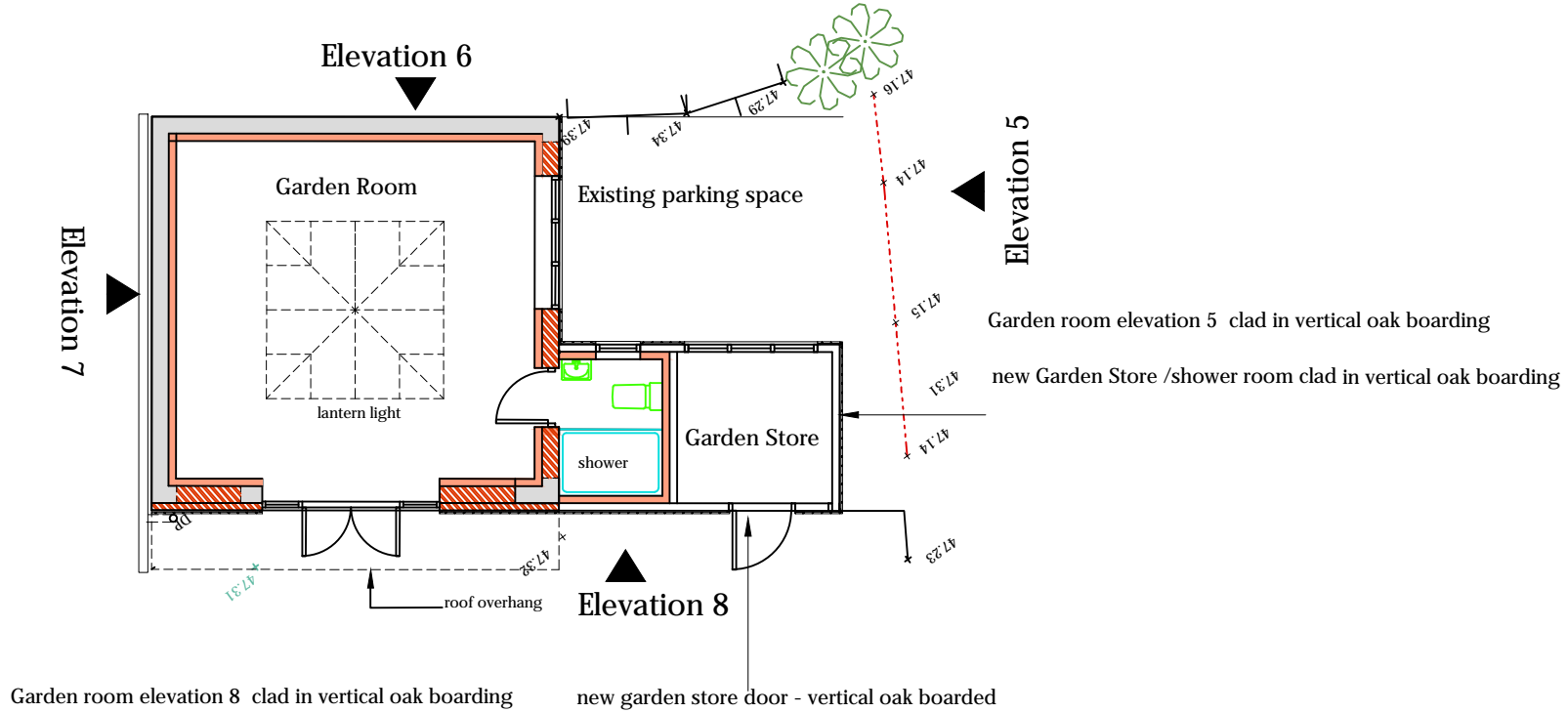
Elevation 6

brick  
 oak boarding  
 garden room door to match house  
 garden store door - oak boarded  
 oak boarding  
 1800 x 880 window  
 oak boarding  
 1800 x 880 window  
 600 x 880 window  
 obscure glazed  
 brick

Garden room elevation 8 clad in vertical oak boarding

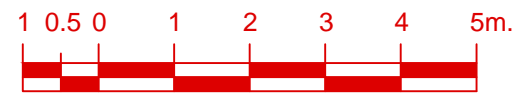
oak boarding

Level Datum 45.00m



GROUND FLOOR PLAN

SCALE



**Richard S. Baily**

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 3 Alpha House, Farmer Ward Road, Kenilworth CV8 2ED  
 Tel:01926 859007

Description:

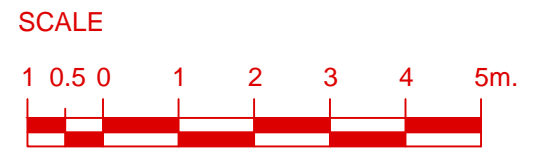
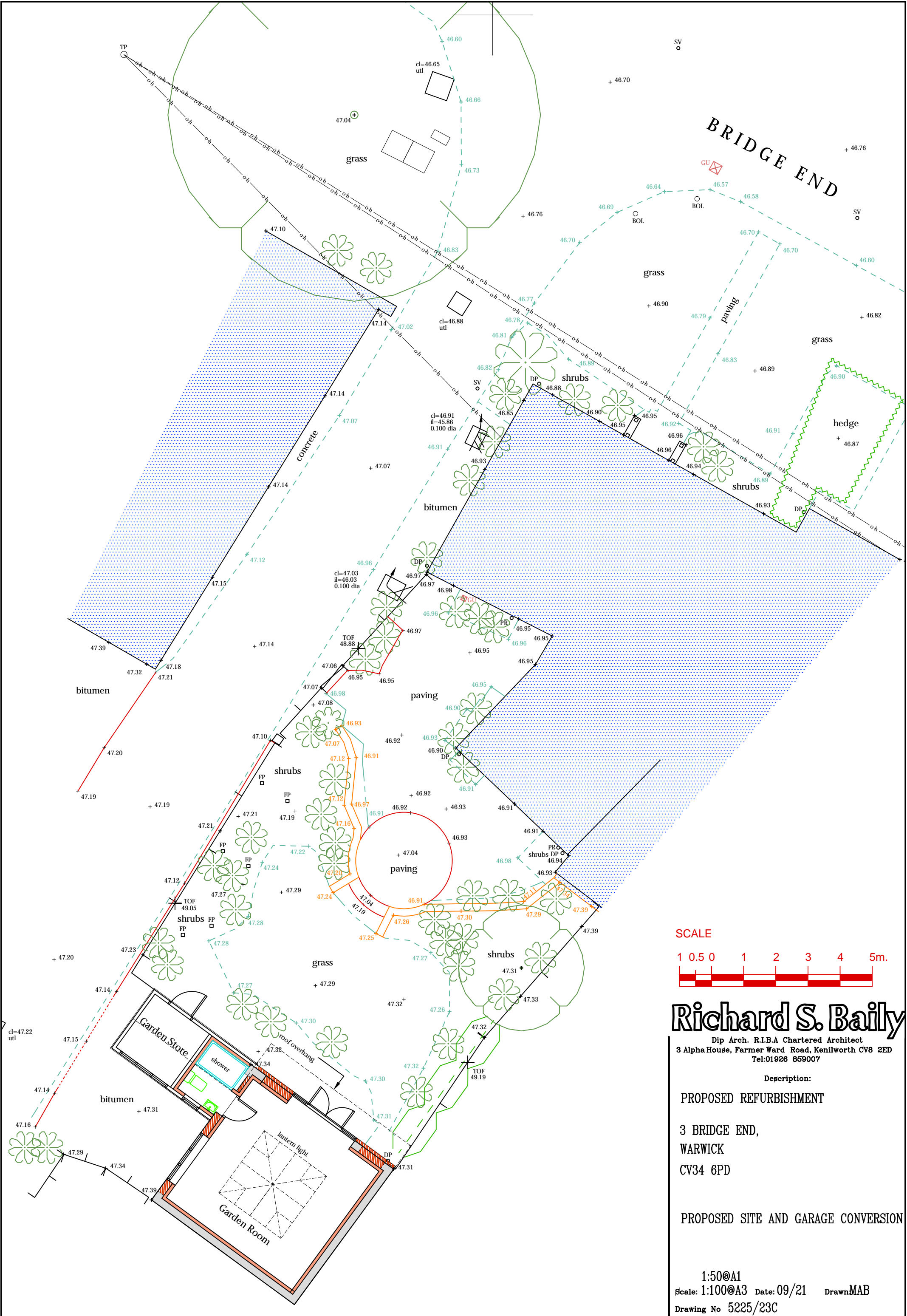
PROPOSED REFURBISHMENT

78 BRIDGE END,  
 WARWICK  
 CV34 6PD

PROPOSED FENCED ENCLOSURE FOR  
 WASTE AND RECYCLING BINS  
 PLANS AND ELEVATIONS

1:50@A1  
 Scale: 1:100@A3 Date: 01/22 Drawn MAB  
 Drawing No 5225/31B





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 Tel: 01926 859007

**Description:**  
 PROPOSED REFURBISHMENT  
 3 BRIDGE END,  
 WARWICK  
 CV34 6PD  
 PROPOSED SITE AND GARAGE CONVERSION

1:50@A1  
 Scale: 1:100@A3 Date: 09/21 Drawn: MAB  
 Drawing No 5225/23C

# Appendix D

# Flood risk assessment data



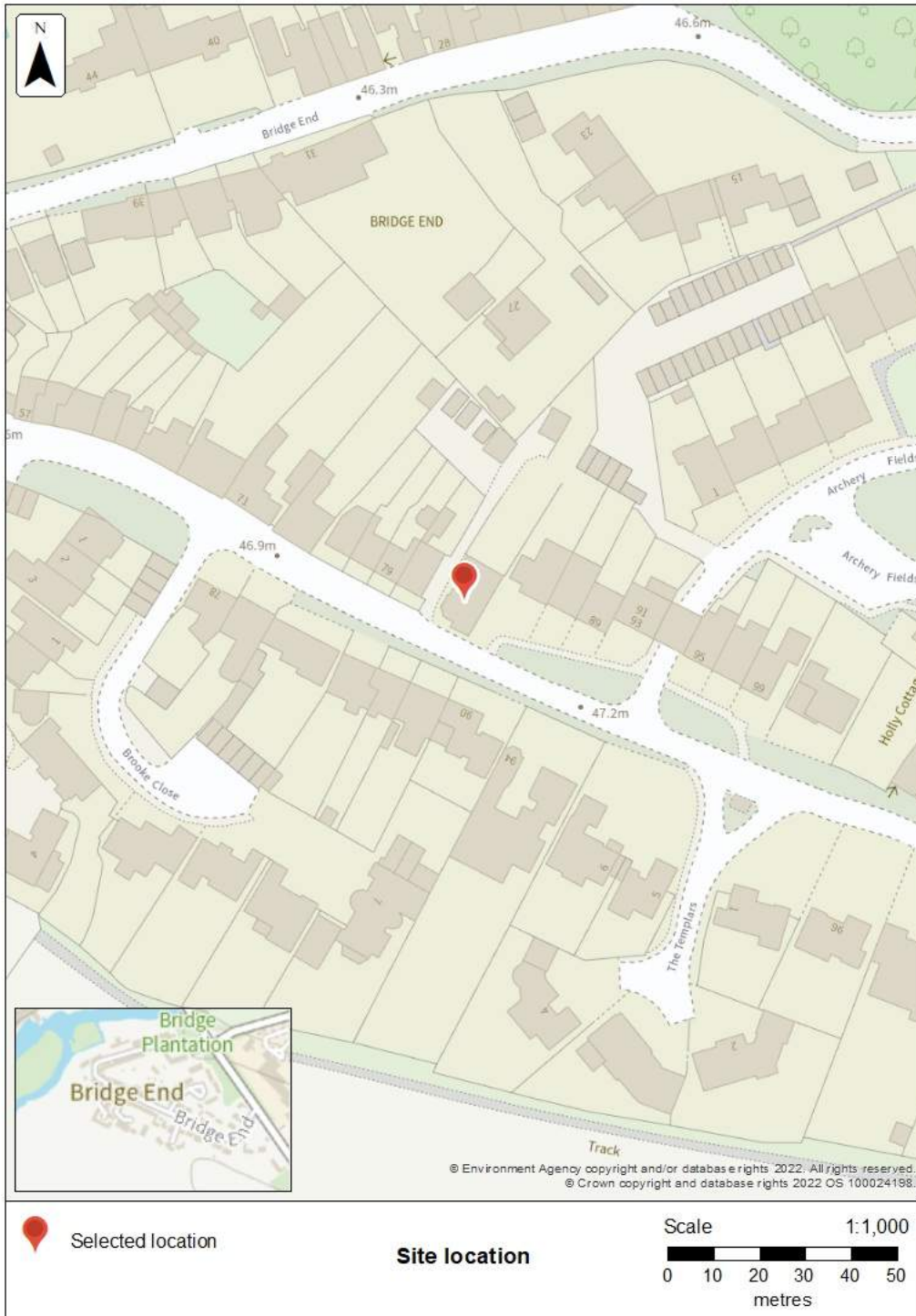
Location of site: 428709 / 264483 (shown as easting and northing coordinates)

Document created on: 21 April 2022

This information was previously known as a product 4.

Customer reference number: FYUTVD1556PR

Map showing the location that flood risk assessment data has been requested for.



## How to use this information

You can use this information as part of a flood risk assessment for a planning application. To do this, you should include it in the appendix of your flood risk assessment.

**We recommend that you work with a flood risk consultant to get your flood risk assessment.**

## Included in this document

In this document you'll find:

- how to find information about surface water and other sources of flooding
- information on the models used
- definitions for the terminology used throughout
- flood map for planning (rivers and the sea)
- historic flooding
- flood defences and attributes
- modelled data
- information about strategic flood risk assessments
- information about this data
- information about flood risk activity permits
- help and advice

## Information that's unavailable

This document **does not** contain:

- climate change modelled data

There is not any modelled climate change data for this location. This is because detailed modelling hasn't been carried out in this area. You will need to consider the [latest flood risk assessment climate change allowances](#) and factor in the new allowances to demonstrate the development will be safe from flooding.



## **Surface water and other sources of flooding**

Use the [long term flood risk service](#) to find out about the risk of flooding from:

- surface water
- ordinary watercourses
- reservoirs

For information about sewer flooding, contact the relevant water company for the area.

## **About the model used**

Model name: River Avon SFRM

Date: 1 August 2010

## **Flood map for planning (rivers and the sea)**

Your development is in flood zone 2.

Flood zone 3 shows the area at risk of flooding for an undefended flood event with a:

- 0.5% or greater probability of occurring in any year for flooding from the sea
- 1% or greater probability of occurring in any year for fluvial (river) flooding

Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- between a 0.1% and 0.5% probability of occurring in any year for flooding from the sea
- between a 0.1% and 1% probability of occurring in any year for fluvial (river) flooding

It's important to remember that the flood zones on this map:

- refer to the land at risk of flooding and do not refer to individual properties
- refer to the probability of river and sea flooding, ignoring the presence of defences
- do not take into account potential impacts of climate change

This data is updated on a quarterly basis as better data becomes available.









### Flood map for planning

Location (easting/northing)  
**428709/264483**

Scale  
**1:10,000**

Created  
**21 Apr 2022**

-  Selected location
-  Main river
-  Flood defence
-  Water storage area
-  Flood zone 3
-  Flood zone 2



## Historic flooding

This map is an indicative outline of areas that have previously flooded. Remember that:

- our records are incomplete, so the information here is based on the best available data
- it is possible not all properties within this area will have flooded
- other flooding may have occurred that we do not have records for
- flooding can come from a range of different sources - we can only supply flood risk data relating to flooding from rivers or the sea

You can also contact your Lead Local Flood Authority or Internal Drainage Board to see if they have other relevant local flood information. Please note that some areas do not have an Internal Drainage Board.

[Download recorded flood outlines in GIS format](#)













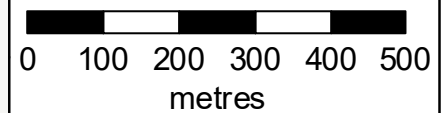
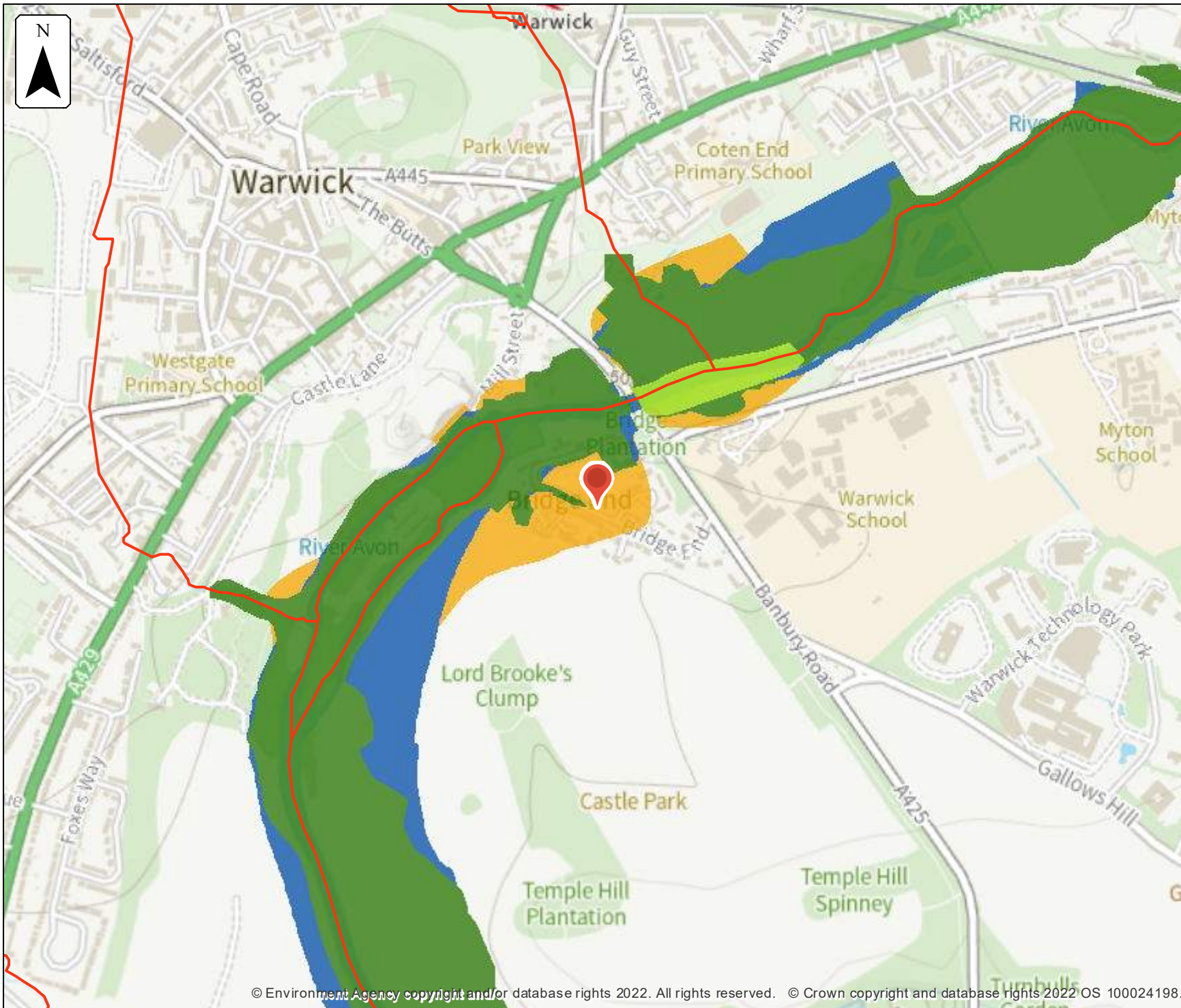
### Historic flood map

Location (easting/northing)  
**428709/264483**

Scale  
**1:10,000**

Created  
**21 Apr 2022**

-  Selected location
-  Main river
- Date of flood event
  -  January, 2001
  -  April, 1998
  -  January, 1992
  -  January, 1985
  -  February, 1979
  -  January, 1939



## Historic flood event data

Start date	End date	Source of flood	Cause of flood	Affects location
1 January 2001	1 January 2001	main river	unknown	No
7 April 1998	13 April 1998	main river	channel capacity exceeded (no raised defences)	No
1 April 1998	13 April 1998	main river	channel capacity exceeded (no raised defences)	No
1 January 1992	22 January 1992	main river	unknown	No
20 January 1985	24 January 1985	main river	channel capacity exceeded (no raised defences)	No
1 January 1985	1 January 1985	main river	channel capacity exceeded (no raised defences)	No
1 February 1979	1 February 1979	main river	unknown	No
1 January 1939	1 January 1939	main river	channel capacity exceeded (no raised defences)	Yes

## **Flood defences and attributes**

The flood defences map shows the location of the flood defences present.

The flood defences data table shows the type of defences, their condition and the standard of protection. It shows the height above sea level of the top of the flood defence (crest level). The height is in mAOD which is the metres above the mean sea level at Newlyn, Cornwall.

It's important to remember that flood defence data may not be updated on a regular basis. The information here is based on the best available data.








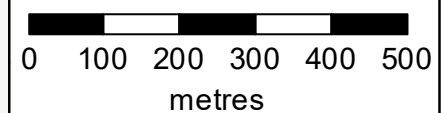
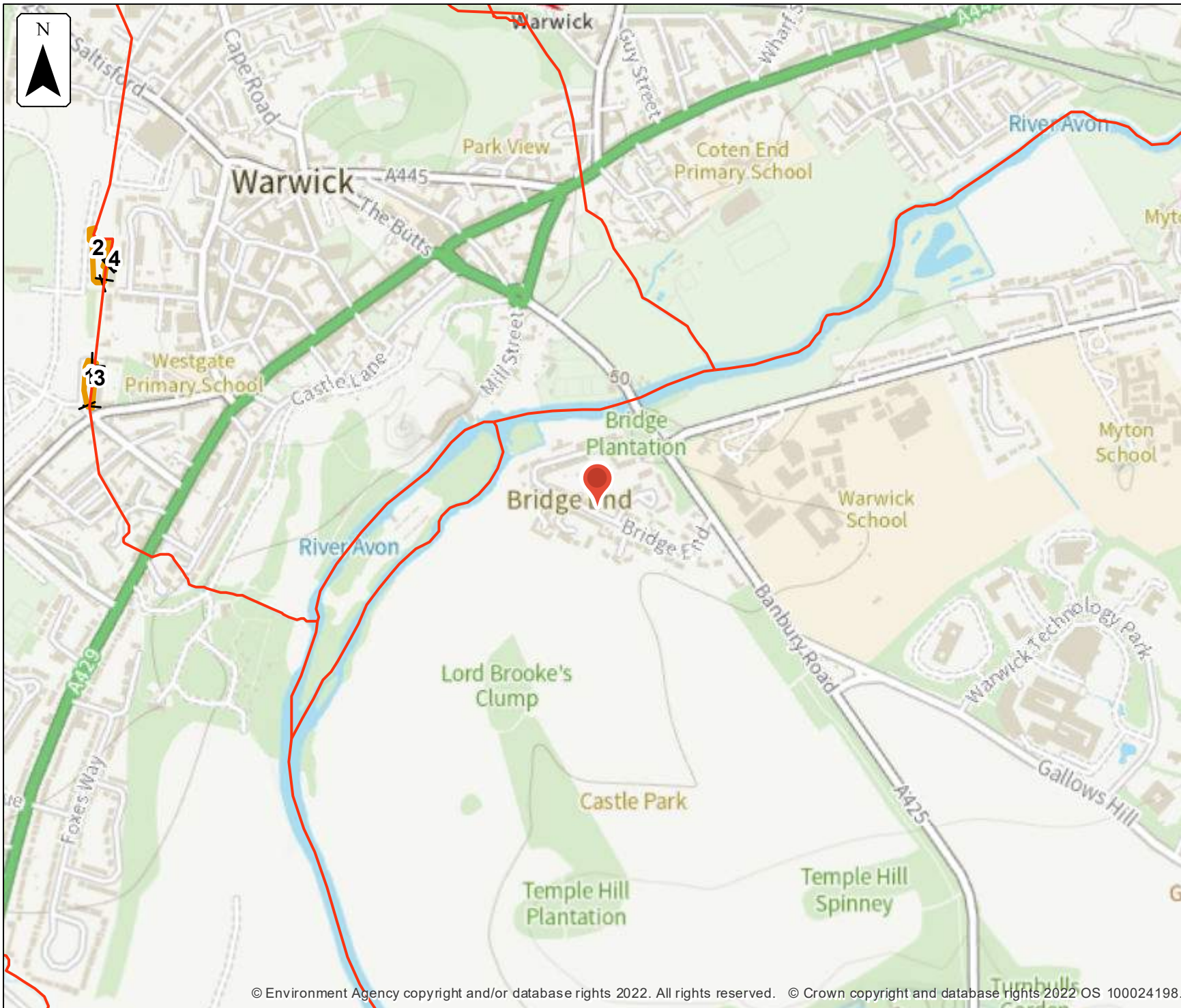
### Flood defences

Location (easting/northing)  
**428709/264483**

Scale  
**1:10,000**

Created  
**21 Apr 2022**

-  Selected location
-  Main river
-  Flood defence





## Flood defences data

Label	Asset ID	Asset Type	Standard of protection (years)	Current condition	Downstream actual crest level (mAOD)	Upstream actual crest level (mAOD)	Effective crest level (mAOD)
1	55290	Engineered High Ground	5				
2	130253	Engineered High Ground	5				
3	39495	Engineered High Ground	5	Fair			
4	39496	Engineered High Ground	5				

Any blank cells show where a particular value has not been recorded for an asset.

## **Modelled data**

This section provides details of different scenarios we have modelled and includes the following (where available):

- outline maps showing the area at risk from flooding in different modelled scenarios
- modelled node point map(s) showing the points used to get the data to model the scenarios and table(s) providing details of the flood risk for different return periods

## **Modelled scenarios**

The following scenarios are included:

- Defended modelled fluvial: risk of flooding from rivers where there are flood defences



### Defended modelled fluvial extent

Location (easting/northing)  
**428709/264483**


Scale Created  
**1:10,000 21 Apr 2022**


Model name  
**Avon Temp**


 Selected location

 Main river

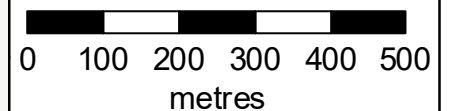
#### Modelled flood extent

 1% AEP

 0.5% AEP

 0.1% AEP

Flood extents may not be visible where they overlap other return periods







### Defended modelled fluvial extent

Location (easting/northing)  
**428709/264483**

Scale Created  
**1:10,000 21 Apr 2022**

Model name  
**River Avon Defended Model**

Selected location

Main river

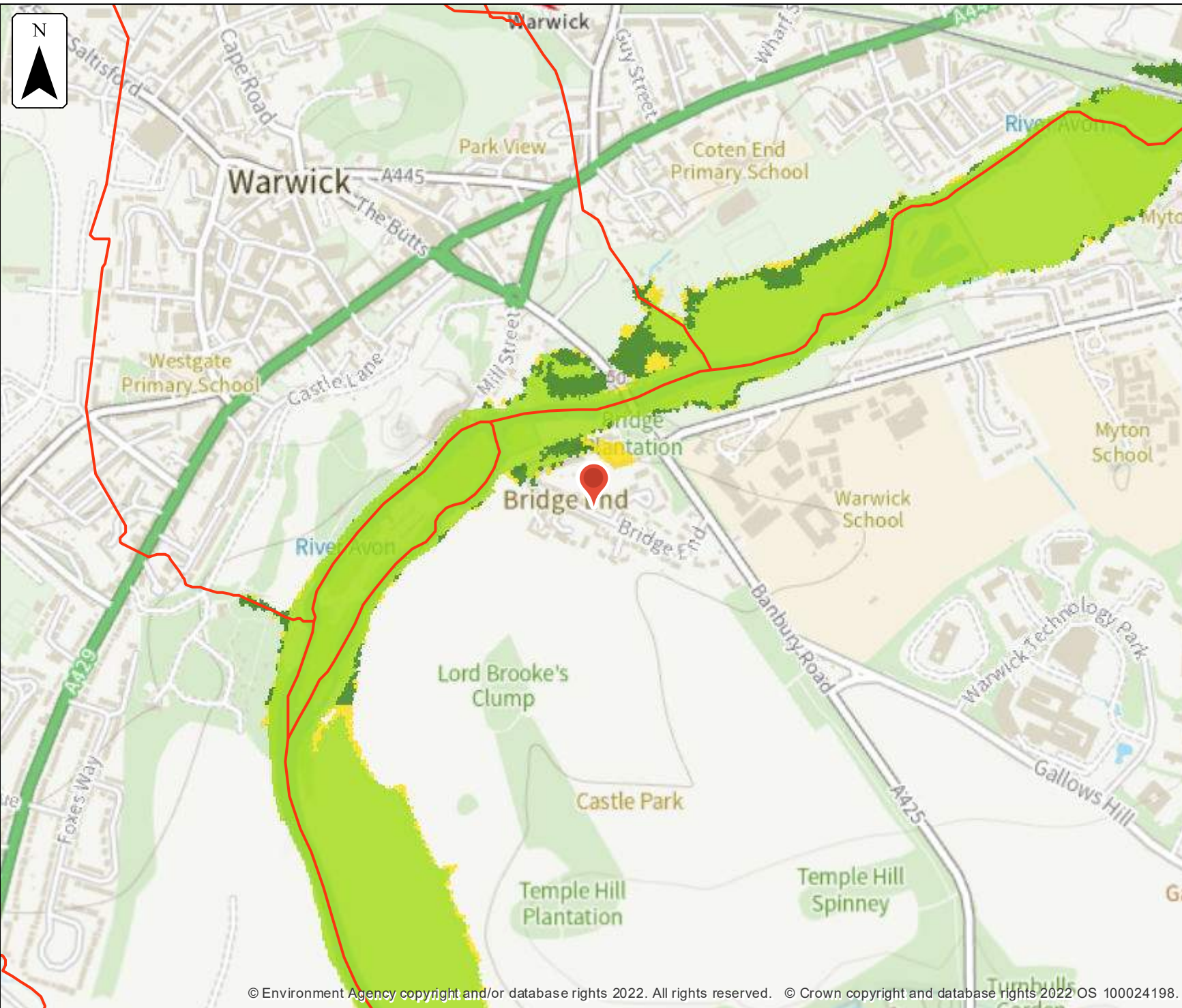
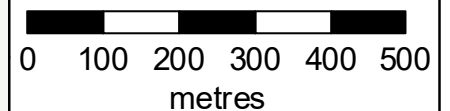
Modelled flood extent

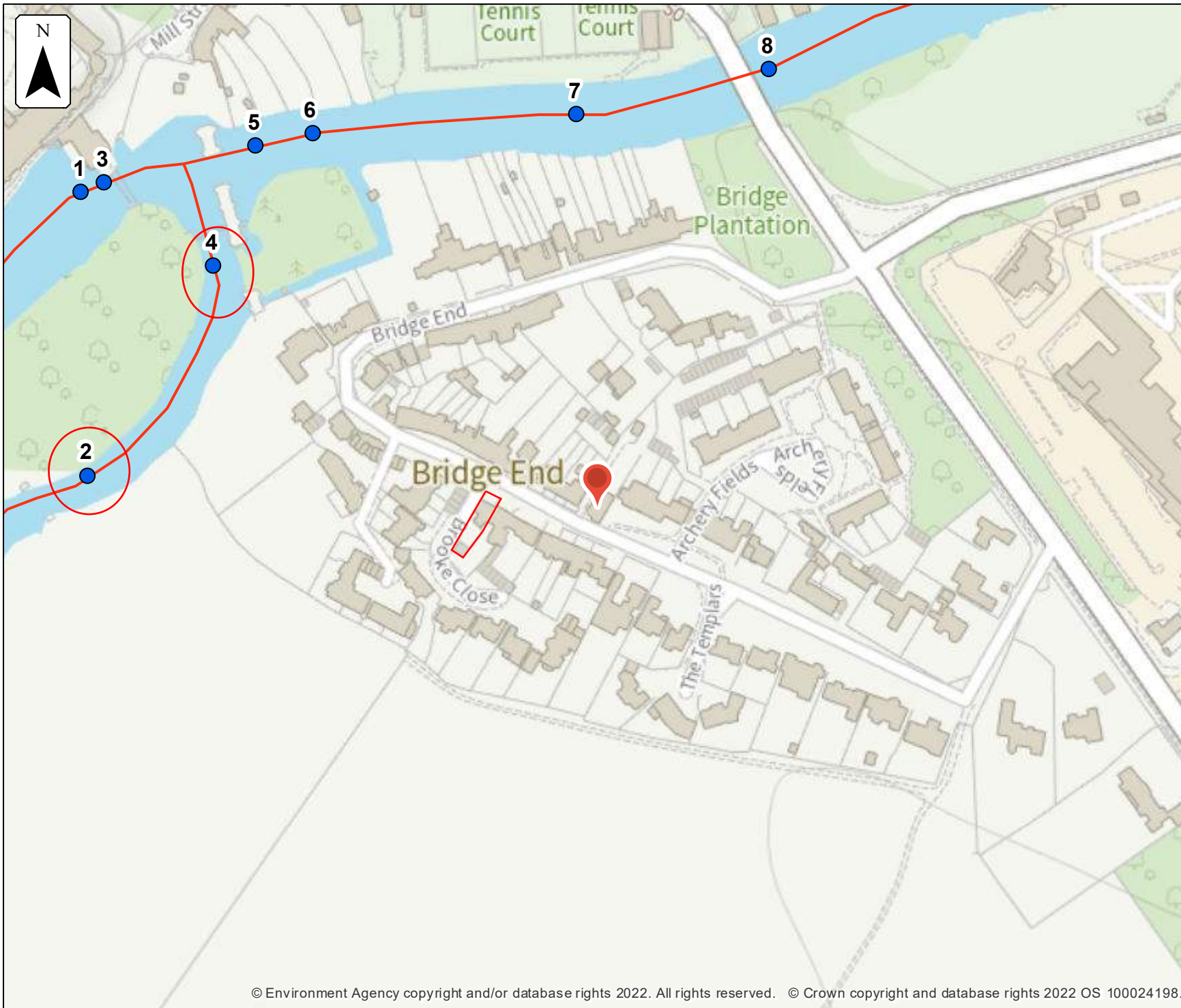
5% AEP

2% AEP

1.33% AEP

Flood extents may not be visible where they overlap other return periods








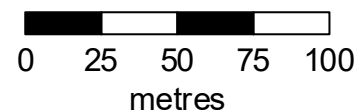
**Defended modelled fluvial node locations**

Location (easting/northing)  
**428709/264483**

Scale **1:2,500** Created **21 Apr 2022**

Model name  
**River Avon Defended Model**

-  Selected location
-  Modelled location
-  Main river





## Modelled node locations data

### Defended

Label	Modelled location ID	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	229914	428459	264635	45.56	0.0	45.86	0.0	45.97	0.0	46.0	0.0	46.23	0.0	46.81	0.0
2	90766	428462	264498	45.46	0.0	45.76	0.0	45.87	0.0	45.91	0.0	46.15	0.0	46.73	0.0
3	170955	428470	264640	46.45	0.0	46.64	0.0	46.71	0.0	46.72	0.0	46.85	0.0	47.20	0.0
4	153877	428523	264599	46.46	0.0	46.65	0.0	46.72	0.0	46.74	0.0	46.87	0.0	47.22	0.0
5	262020	428543	264657	46.47	0.0	46.67	0.0	46.74	0.0	46.76	0.0	46.90	0.0	47.27	0.0
6	307557	428571	264663	46.47	0.0	46.66	0.0	46.73	0.0	46.75	0.0	46.88	0.0	47.22	0.0
7	68767	428698	264672	46.51	0.0	46.72	0.0	46.80	0.0	46.81	0.0	46.97	0.0	47.36	0.0
8	131589	428792	264694	46.52	0.0	46.73	0.0	46.80	0.0	46.82	0.0	46.96	0.0	47.35	0.0

Data in this table comes from the River Avon Defended Model model.

Level values are shown in mAOD, and flow values are shown in cubic metres per second.

Any blank cells show where a particular scenario has not been modelled for this location.

## Strategic flood risk assessments

We recommend that you check the relevant local authority's strategic flood risk assessment (SFRA) as part of your work to prepare a site specific flood risk assessment.

This should give you information about:

- the potential impacts of climate change in this catchment
- areas defined as functional floodplain
- flooding from other sources, such as surface water, ground water and reservoirs

## About this data

This data has been generated by strategic scale flood models and is not intended for use at the individual property scale. If you're intending to use this data as part of a flood risk assessment, please include an appropriate modelling tolerance as part of your assessment. The Environment Agency regularly updates its modelling. We recommend that you check the data provided is the most recent, before submitting your flood risk assessment.

## Flood risk activity permits

Under the Environmental Permitting (England and Wales) Regulations 2016 some developments may require an environmental permit for flood risk activities from the Environment Agency. This includes any permanent or temporary works that are in, over, under, or nearby a designated main river or flood defence structure.

[Find out more about flood risk activity permits](#)

## Help and advice

Contact the West Midlands Environment Agency team at [enquiries\\_westmids@environment-agency.gov.uk](mailto:enquiries_westmids@environment-agency.gov.uk) for:

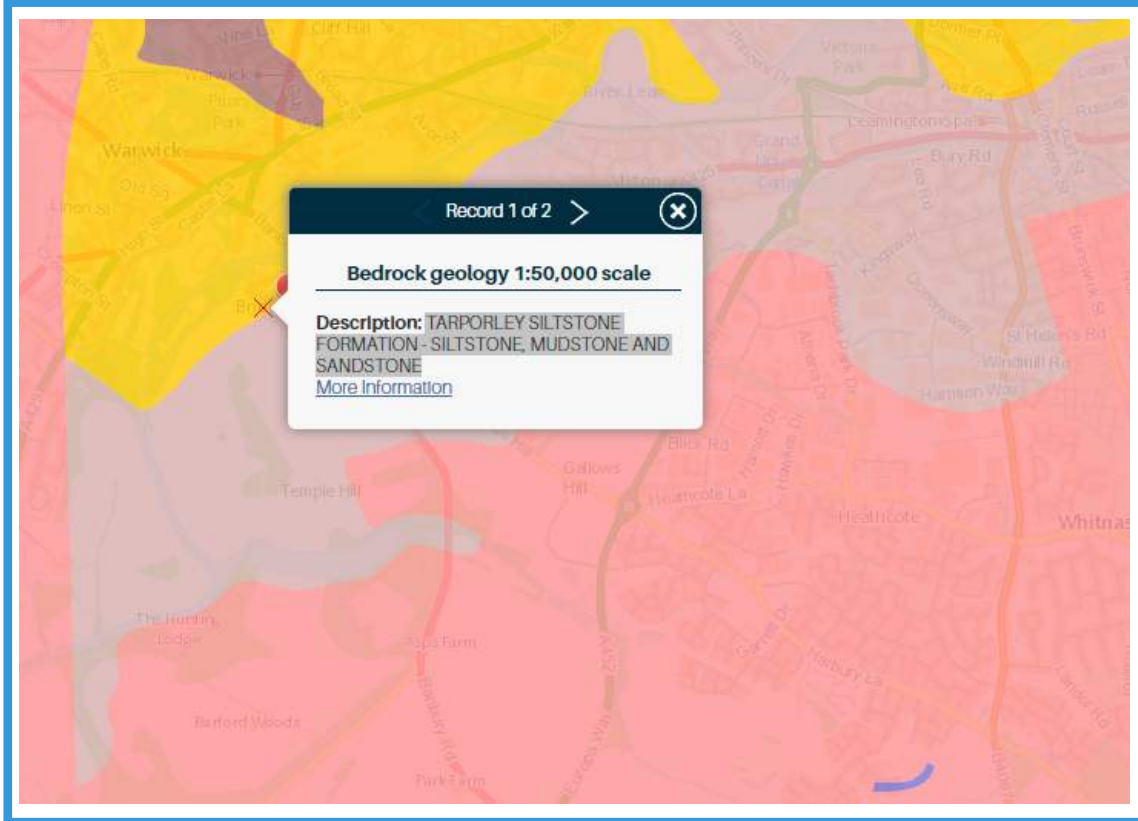
- [more information about getting a product 5, 6, 7 or 8](#)
- general help and advice about the site you're requesting data for

# Appendix C

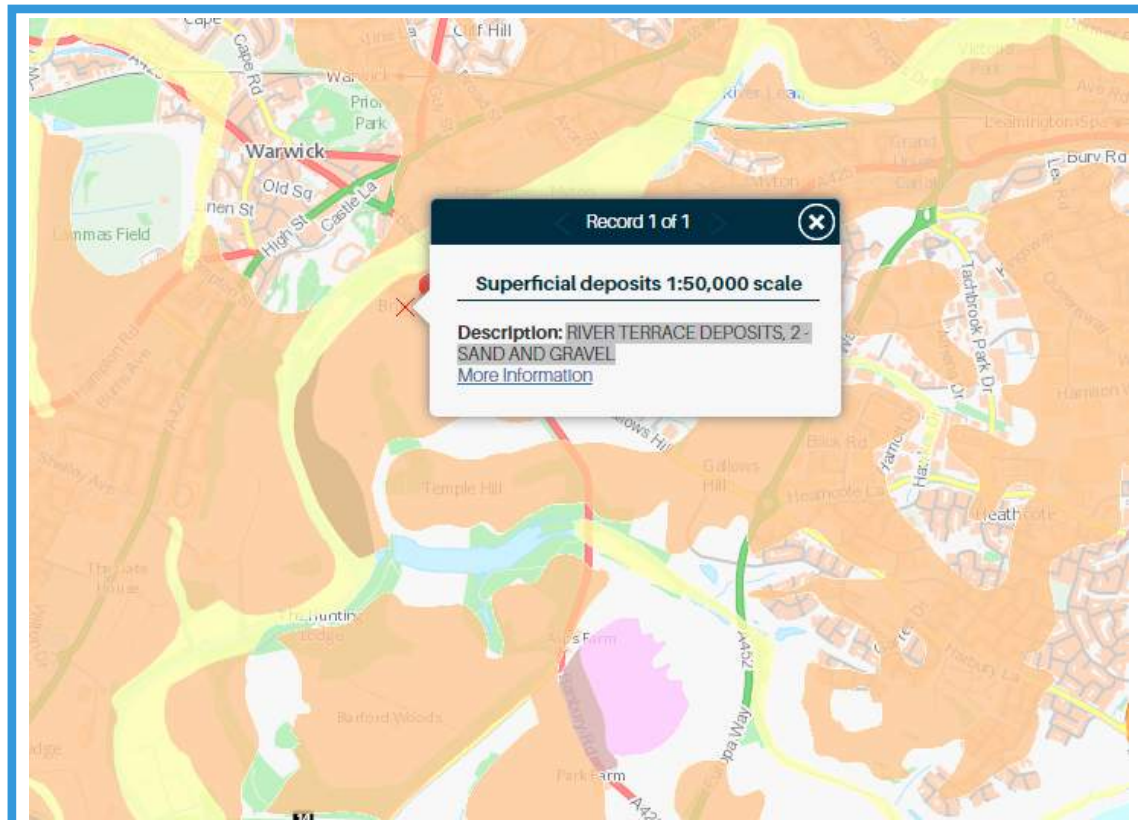




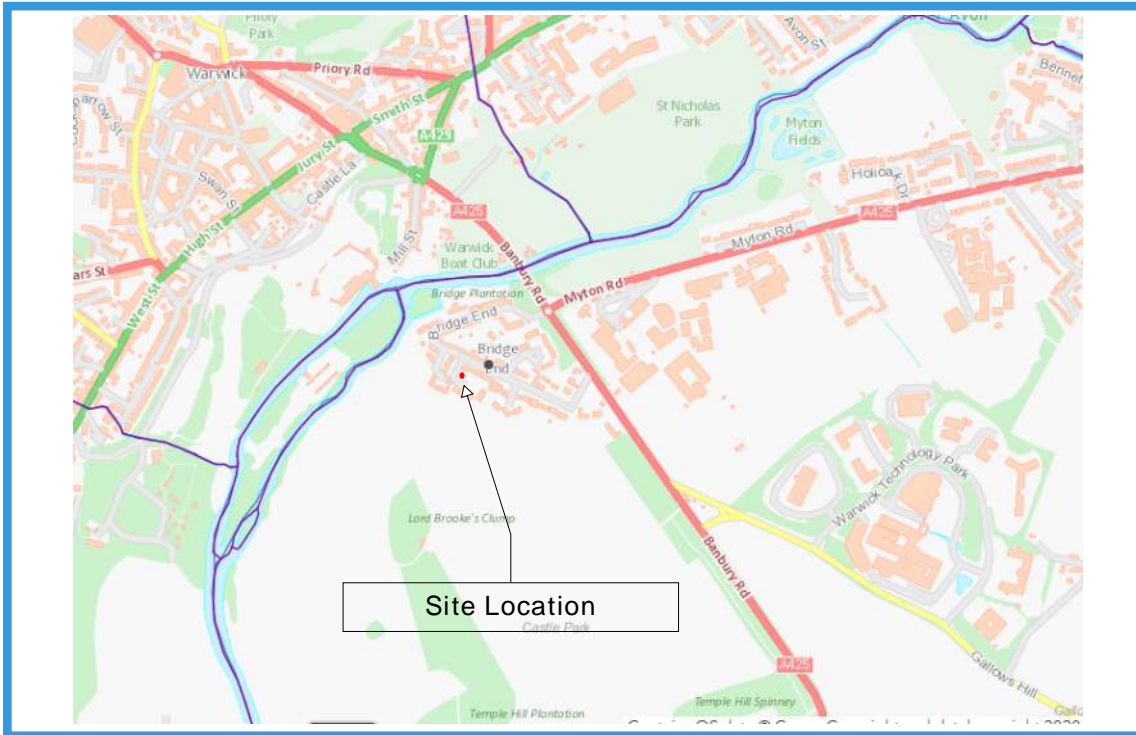
### GEOLOGY - BEDROCK - TARPORLEY SILTSTONE FORMATION - SILTSTONE, MUDSTONE AND SANDSTONE





### GEOLOGY - SUPERFICIAL DEPOSITS - RIVER TERRACE DEPOSITS, 2 - SAND AND GRAVEL

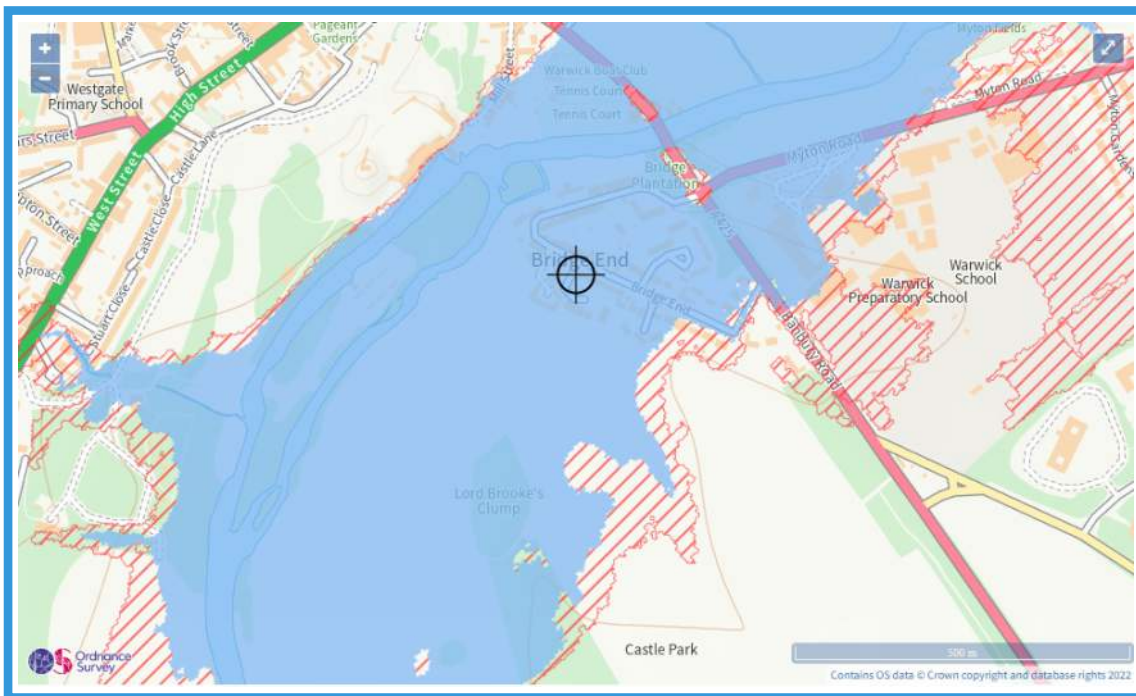


Environment Agency **Main River Map**



 **Flood risk from reservoirs**

 **Extent of flooding**



 when river levels are normal  when there is also flooding from rivers

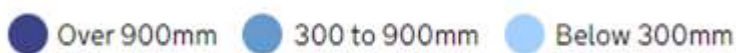
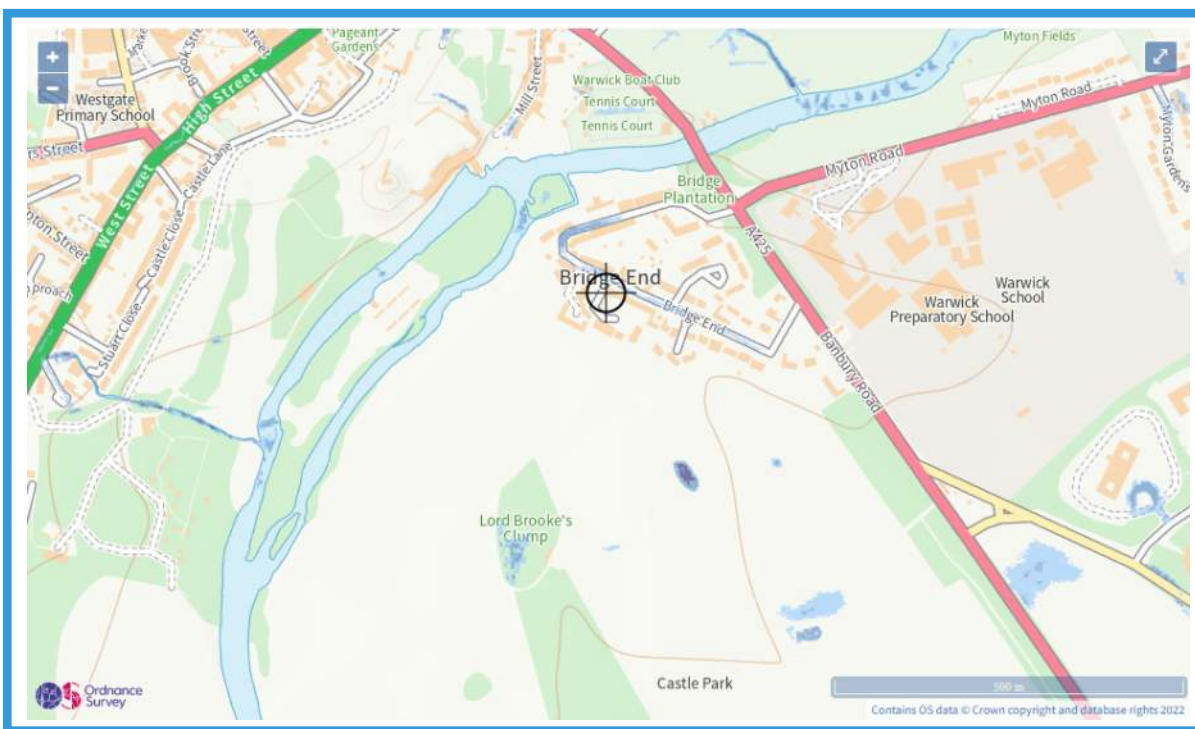


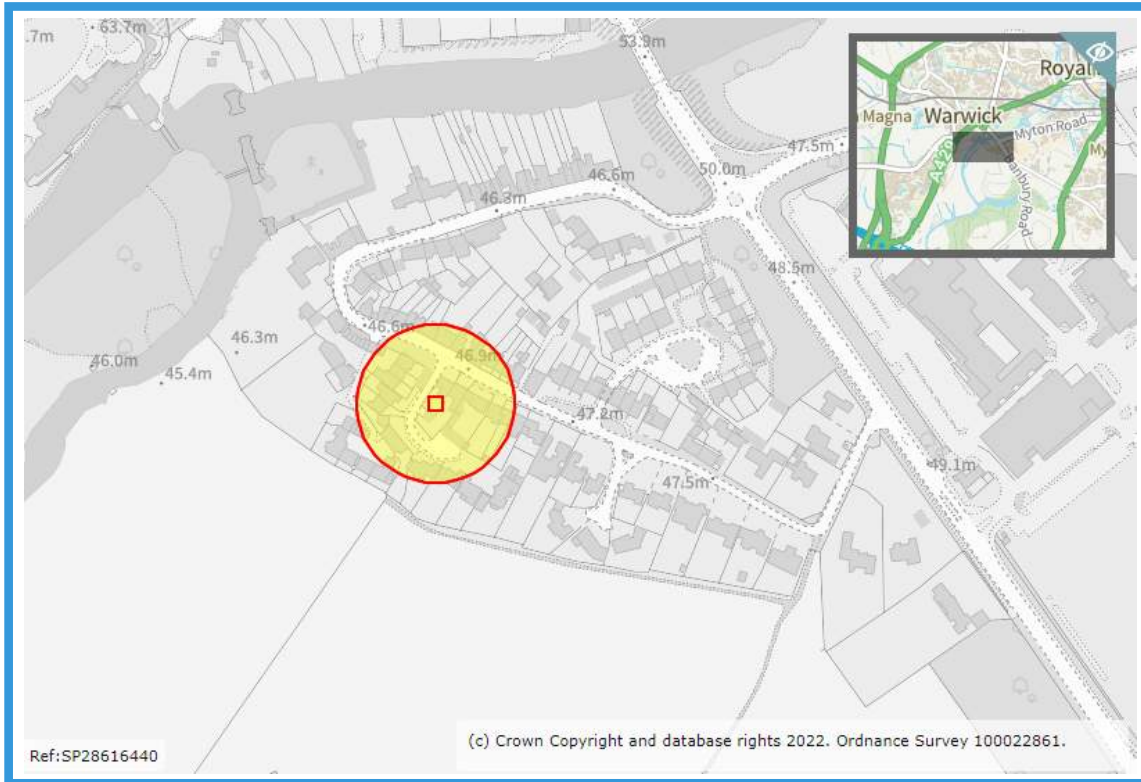
# SITE SURFACE WATER FLOOD RISK

Low risk means that each year this area has a chance of flooding of between 0.1% and 1%. Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding.

Flood risk from surface water

Extent of flooding



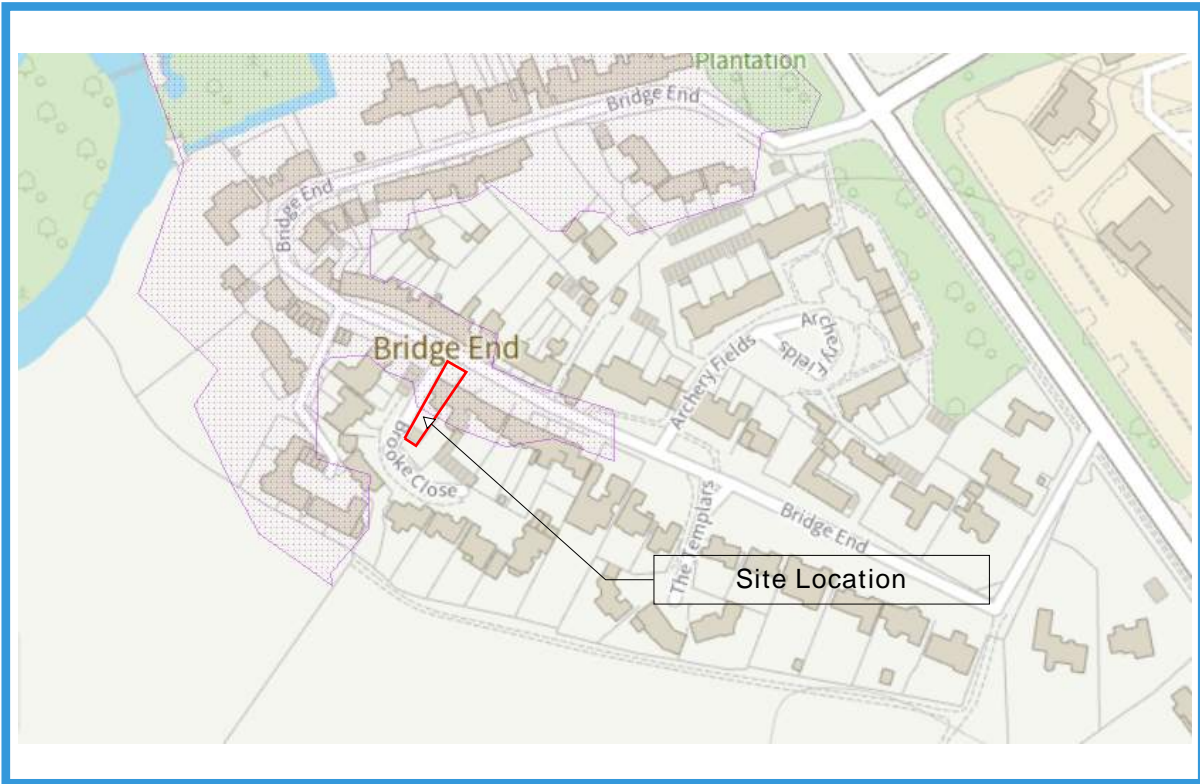


**Site Check Results** ✕

Site Check Report Report generated on Sun May 22 2022  
**You selected the location:** Centroid Grid Ref: SP28646447  
 The following features have been found in your search area:

<b>Aquifer Designation Map (Bedrock) (England)</b>	
<b>Typology</b>	Principal
<b>Typology</b>	Secondary B
<b>Aquifer Designation Map (Superficial Drift) (England)</b>	
<b>Typology</b>	Secondary A
<b>Source Protection Zones merged (England)</b>	
No Features found	

OK Cancel Export to CSV Print



Flood Warning areas

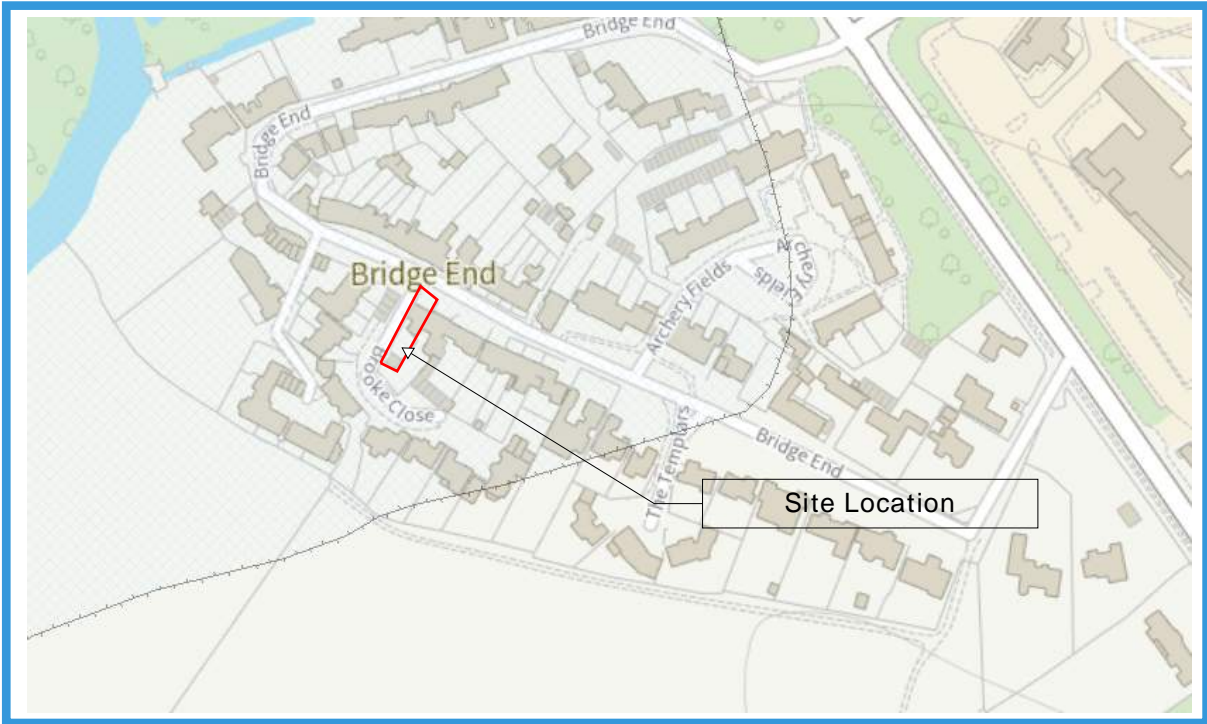
## GROUND WATER FLOOD RISK

Objeto espacial	Valor
187973-1_BGS_GroundwaterFlooding_v6	
LAYER	Unknown Area Type
(Derivado)	
(Acciones)	
LAYER	Unknown Area Type
CLASS	C
FLOODTYPE	Clearwater Flooding
VERSION	GroundwaterFlooding_v6.1
LEGEND	Potential for groundwater flooding to oc...

Modo: Current Layer  
Ver: Árbol



## HISTORIC FLOOD MAP



● Historic Flood Outline

# Flood map for planning

Your reference  
**CV34 6PD**

Location (easting/northing)  
**428646/264465**

Created  
**22 May 2022 16:33**

**Your selected location is in flood zone 2, an area with a medium probability of flooding.**

## **This means:**

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see [www.gov.uk/guidance/flood-risk-assessment-standing-advice](http://www.gov.uk/guidance/flood-risk-assessment-standing-advice))

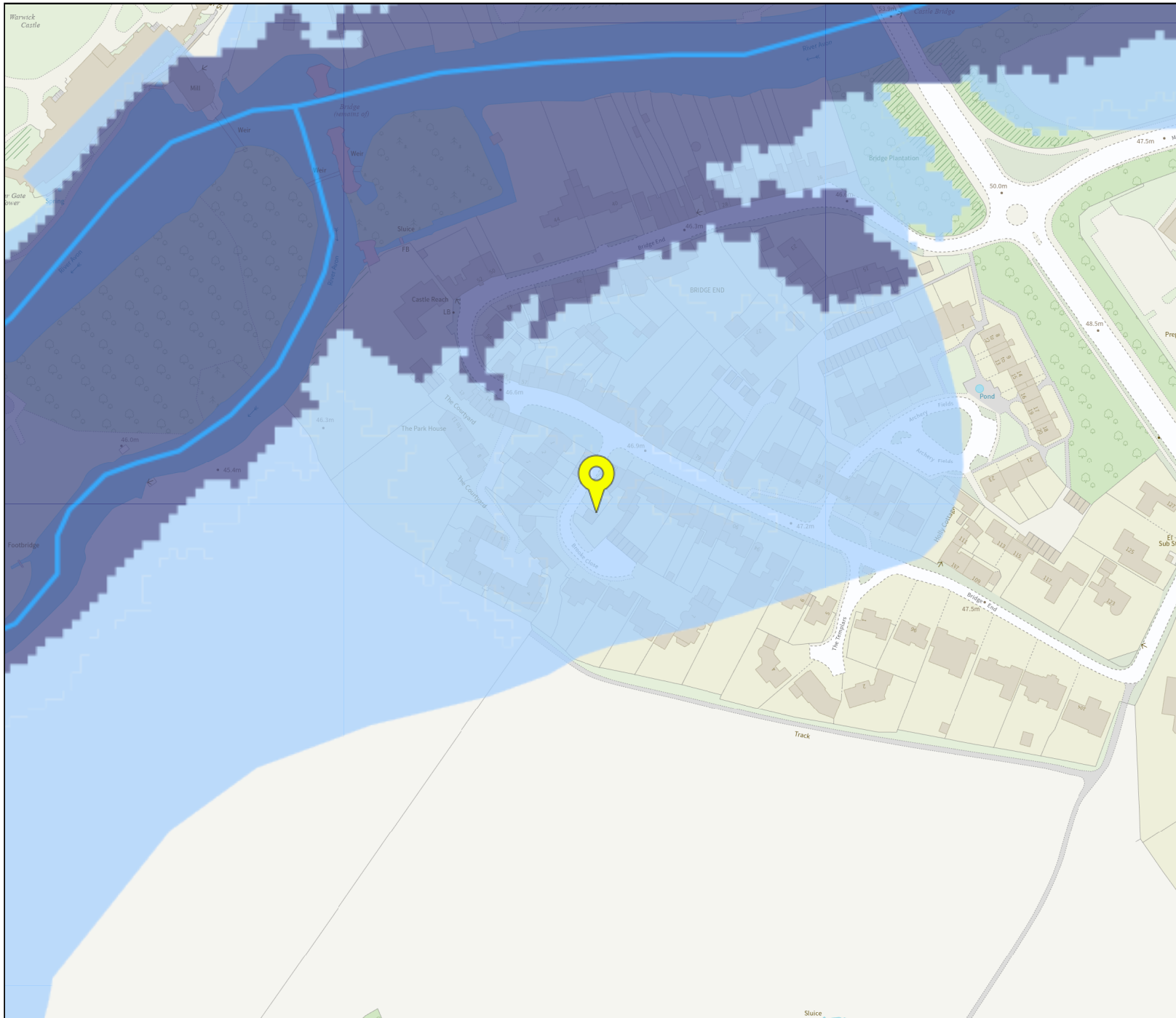
## **Notes**

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2021 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>



### Flood map for planning

Your reference

**CV34 6PD**

Location (easting/northing)

**428646/264465**

Scale

**1:2500**

Created

**22 May 2022 16:33**

-  Selected point
-  Flood zone 3
-  Flood zone 3: areas benefiting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area

