



BROWN FISHER ENVIRONMENTAL REPORTS 4 PLANNING

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FLOOD RISK ASSESSMENT

Yew House
Old Hall Drive
Elford
Staffordshire

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ABBREVIATIONS

AEP	Annual Exceedance Probability
EA	Environment Agency
FEH	Flood Estimation Handbook
FRA	Flood Risk Assessment
LLFA	Lead Local Flood Authority
m AOD	Metres Above Ordnance Datum
NDC	North Devon Council
NPPF	National Planning Policy Framework
SFRA	Strategic Flood Risk Assessment

1 SUMMARY

1.1 Purpose

This flood risk assessment is intended to accompany a planning application to alter and enlarge an existing house at Yew House, Old Hall Drive, Elford B79 9BZ.

1.2 Overview

Site characteristics					
Location	Yew House, Old Hall Drive, Elford B79 9BZ				
NGR	SK 18542 10550 418542,310550	Approx. Size (m²)	3,150	Existing land use status	Residential
Development proposal	Alter and enlarge existing residential house.				

Flooding issues						
Source of flooding	Flood risk				Comments	Further investigation required?
	Very Low	Low	Medium	High		
Rivers	✓				The development site is in Flood Zone 1, but the wider site includes areas of flood zone 3 down by the River Tame	No
Sea	✓				The site is unaffected by current or predicted future tidal levels	No
Surface water	✓				There is no mapped high surface water flood risk at the site or in the surrounding area	No
Groundwater	✓				The site is underlain by a superficial aquifer but the development area is elevated above the local ground level	No
Artificial sources	✓				The site is not within a mapped risk of reservoir failure.	No

Other Issues	
Drainage	The area is currently developed and drains to an existing drainage system. There will be an increase in drained area in the proposed development but there is potential to reduce it by infiltration.
Mitigation	Floor levels should not be lower than existing.
Safe Access	Access may be difficult during flood events around the 1% AEP level due to flooding of surrounding area and access routes. Evacuation of the property prior to a flood event is recommended but the property would provide safe refuge if necessary.

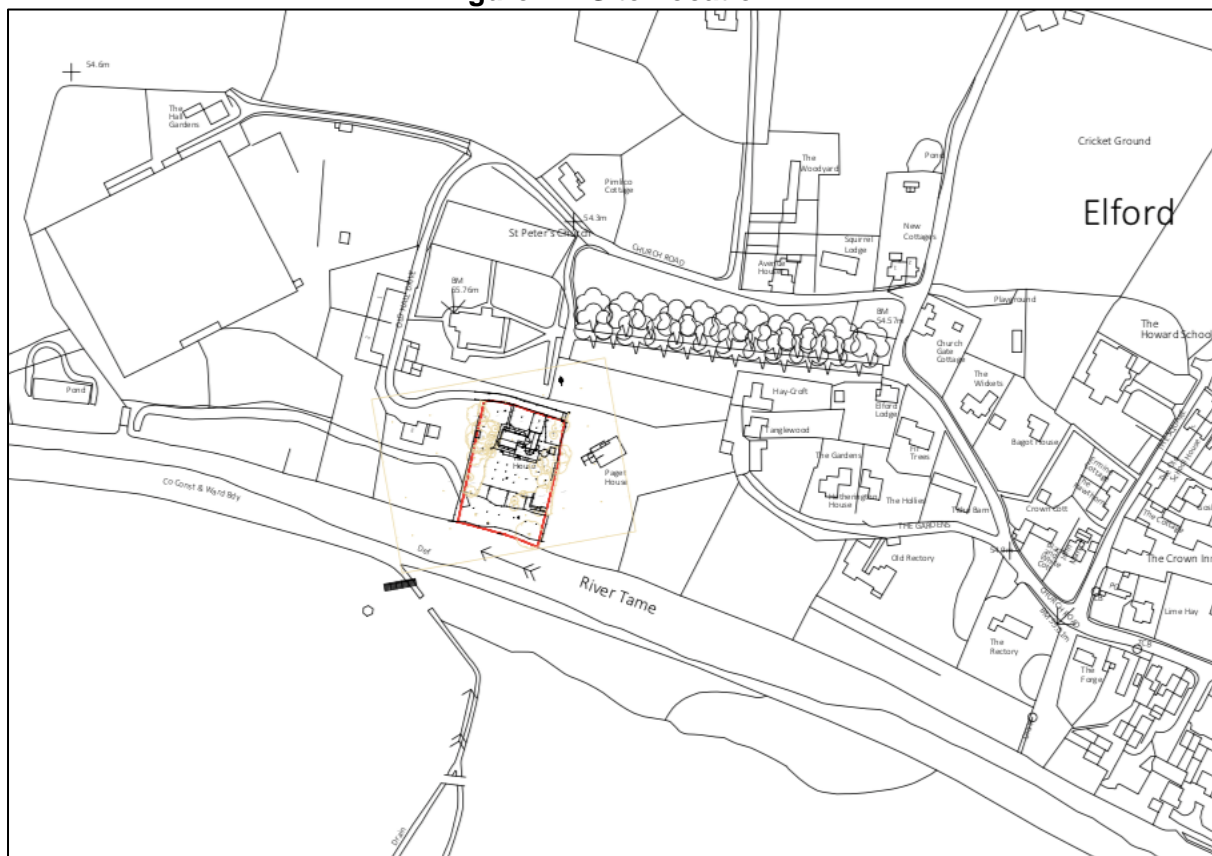
2 DEVELOPMENT DESCRIPTION AND LOCATION

2.1 Proposed development

It is proposed to alter and enlarge an existing detached house at Yew House, Old Hall Drive, Elford B79 9BZ to create a five-bedroom detached house.

The site location is shown in Figure 2.1.

Figure 2.1 Site Location



The existing and proposed development is shown in Appendices 1 and 2 respectively.

2.2 The Site

The site extends to approximately 3150 m² and is currently occupied by the existing building and a garden. It is bounded by Old Hall Drive in the north, the River Tame in the south and residential property to the east and west.

Access to the building is from the north via Old Hall Drive, which is at approximately 54.88 m AOD at this point. The site slopes southwest from 55.00 m AOD in the northeast corner down to 52.57 m AOD in the southwest. A ground survey is included in the plans in Appendix 1.

The ground level at the existing house is approximately 55.10 m AOD and the finished floor level is currently 55.31 m AOD. There is a significant bank part-way down the rear garden between the house and the River Tame where the ground surface drops approximately 1.5 m down to the level of the River Tame. The finished floor level of the existing house was approximately 2.7 metres above the River Tame on the date of the survey.

The River Tame flows westward along the southern boundary of the site, and then turns north to join the River Trent which is some 4 Km away to the north. There are numerous flooded gravel pits along the valley of the River Tame to the south and north of the site.

The River Mease is to the north east of the site and is 2.3 Km to the north east at closest approach. A small watercourse lies 660 m north of the site and flows westwards to join the Tame.

The Coventry Canal lies 2.8 Km to the west and the Trent and Mersey Canal is 4 Km to the north of the site

There are no other nearby watercourses.

2.2.1 Geology

The site is underlain by the Gunthorpe Member, a mudstone, with sand and gravel river terrace superficial deposits recorded at this location¹. The soils are described as “Freely draining”².

The superficial deposits are classified as Secondary A aquifer (permeable layers that can support local water supplies and may form an important source of base flow to rivers) whilst the bedrock is classed as a Secondary B aquifer (mainly lower permeability layers that may store and yield limited amounts of groundwater).

The site is not in a source protection zone.

2.2.2 Flood Defences

There are no significant flood defences associated with the site.

¹ BGS Geology of Britain viewer, <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

² Soilscales online soils viewer, Cranfield University, <http://www.landis.org.uk/soilscales>

3 PLANNING POLICY

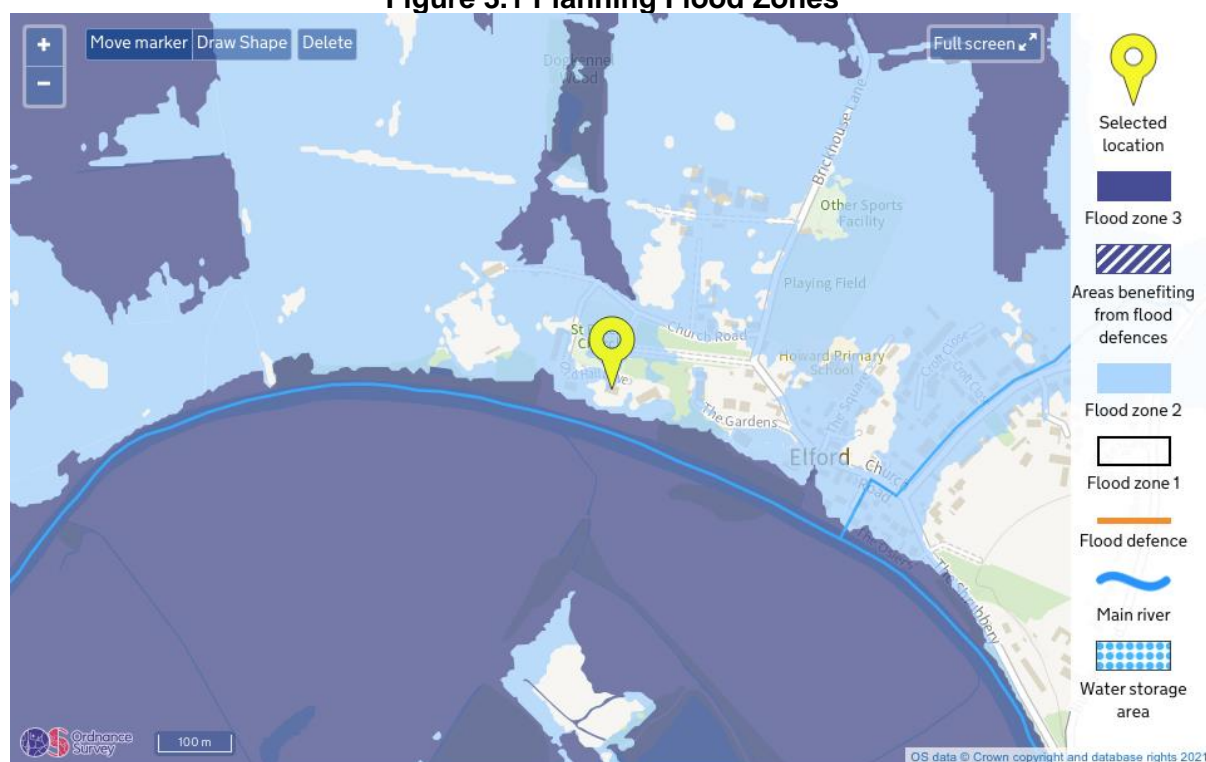
3.1 National Flood Policy

National policy on planning and flood risk is provided by the National Planning Policy Framework (NPPF) and supplementary guidance. Residential development is classified in technical guidance to the NPPF as “more vulnerable”.

Flood risk has been mapped nationally by the Environment Agency to show the flood zones used in the NPPF. Figure 3.1 shows the planning flood zones in the vicinity of the site and indicates that the southern part of the site by the River Tame is in Flood Zones 2 and 3, the existing house is in Flood Zone 1 which has an annual exceedance probability³ (AEP) of less than 0.1%.

These estimated flood risks cover only flooding from main rivers and the sea, not from other flood sources. These other sources are considered in subsequent sections of this report.

Figure 3.1 Planning Flood Zones



More vulnerable development, such as is proposed at the site, is considered by the NPPF as acceptable in flood zone 1 and not usually to the sequential and exception tests.

3.2 Sequential and Exception test

The sequential and exception tests are not required for minor extensions of existing residential property.

³ The annual exceedance probability is the risk of flooding within any one year. An AEP of 1% indicates an annual risk of flooding of 1%, or more loosely a 100 year return period.

3.3 SFRA

The SFRA⁴ provides information on flood risk from all sources across the area and guidance on the measures that can be taken through the planning system to reduce the risks identified. The SFRA has been used in assessing both flood risk and flood risk management at the site.

⁴ Southern Staffordshire Councils Level 1 Strategic Flood Risk Assessment, October 2019

4 DEFINITION OF FLOOD HAZARD

4.1 Historical records

The Environment Agency hold one record of flooding in this area, which occurred on 1/12/1992, as shown in Figure 4.1. This flooding affected the opposite bank of the Tame, but did not extend significantly into the property.

Figure 4.1 Recorded flood outline, December 1992

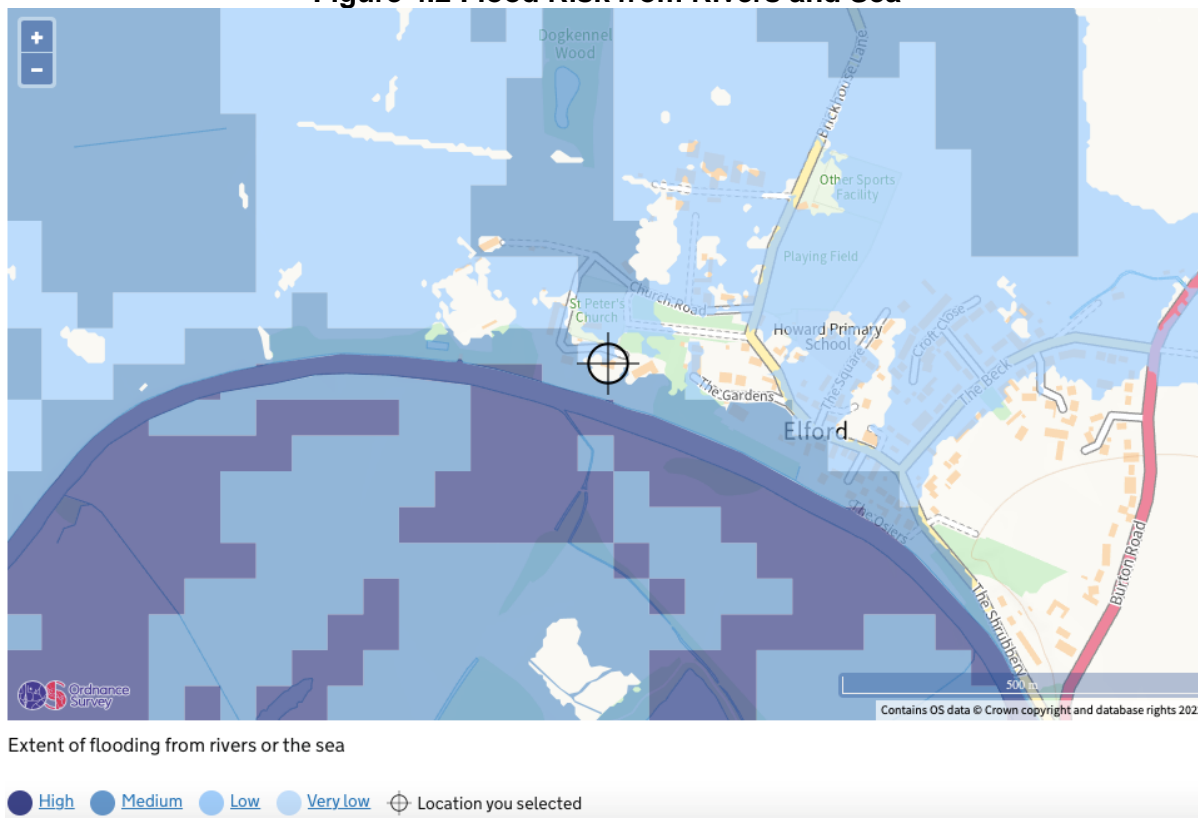


4.2 Sources of flooding

4.2.1 Flooding from Rivers and the Sea

The flood risk arising from rivers and the sea is mapped nationally by the Environment Agency, and their onsite flood map is shown in Figure 4.2. This shows the development site is within an area with a very low risk of flooding, meaning an AEP of less than 0.1%, but is surrounded by lower areas with a higher flood risk. Parts of the site down by the River Tame have a high risk of flooding, but areas to the north, including the access via Church Road, also have a medium risk of flooding. The opposite bank of the River Tame to the south of the site also floods more frequently than the northern side where the site is located.

Figure 4.2 Flood Risk from Rivers and Sea



As the site is adjacent to the River Tame, the Environment Agency were contacted to provide modelled flood levels. Their response is shown in Appendix 3 and modelled flood levels are shown in Table 4.1 for local model nodes. As shown in Appendix 3, model node TM017275 is at the edge of the property and the predicted flood level at this location for the 1% AEP flood is 54.26 m AOD.

Table 4.1 Modelled flood levels

Node Label	MODEL	Annual Exceedance Probability -Maximum Water Levels (mAOD) Defended									
		EASTING	NORTHING	20% (1 in 5)	10% (1 in 10)	5% (1 in 20)	2% (1 in 50)	1% (1 in 100)	1% (CC)	0.5% (1 in 200)	0.1% (1 in 1000)
TM018177	Lower Tame Strategy Model 2013	419195	309952	53.51	53.64	53.94	54.28	54.41	54.64	54.52	55.04
TM017831	Lower Tame Strategy Model 2013	419001	310236	53.47	53.63	53.92	54.26	54.39	54.6	54.5	55.02
TM017649	Lower Tame Strategy Model 2013	418861	310353	53.4	53.57	53.87	54.2	54.33	54.54	54.45	54.97
TM017275	Lower Tame Strategy Model 2013	418504	310470	53.31	53.47	53.78	54.12	54.26	54.47	54.38	54.91

Climate change is expected to cause an increase in fluvial flood risk. The modelled flood level data in Table 4.1 includes a level of 54.47 m AOD 1% plus climate change (CC), but this is for an allowance of 20% which was required when the modelling was done.

Current guidance⁵ requires an increase in peak flow of 22% (central allowance for “2080’s”) to be applied for climate change at this location. This has been estimated by extending the rate of flood level increase modelled between 0% and 20% slightly further to 22%. The modelled 20% flow increase produced a 0.21 m increase in level, so a 22% increase in flow is likely to increase level by $22/20 \times 0.21 = 0.23$ m, resulting in a flood elevation of 54.49 m AOD for the 1% AEP flood with climate change.

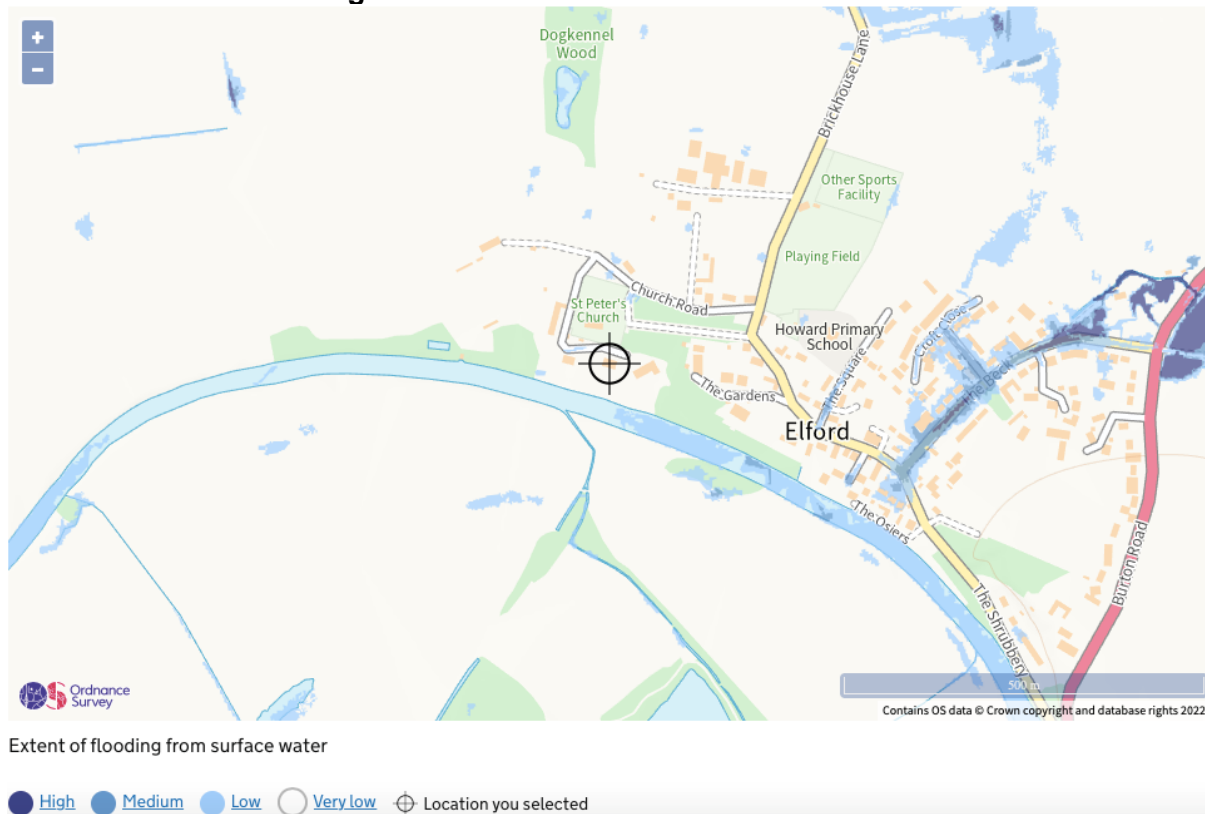
⁵<https://environment.maps.arcgis.com/apps/webappviewer/index.html?id=363522b846b842a4a905829a8d8b3d0c>

This compares to an existing finished floor level of 55.31 m AOD as shown in Appendix 1, providing a freeboard of more than 600 mm above the estimated future 1% AEP flood level.

4.2.2 Surface water flooding

A map of modelled surface water flooding is also available online and is reproduced in Figure 4.3. The risk of flooding from surface water at the site and surrounding area is very low (annual flood risk less than 0.1%).

Figure 4.3 Flood Risk from Surface Water



Surface water is therefore not a significant source of flood risk at the site.

4.2.3 Groundwater flooding

The site is on river terrace gravels, which will contain groundwater. However, as the site is elevated above surrounding areas the risk of groundwater flooding to the site is considered to be low.

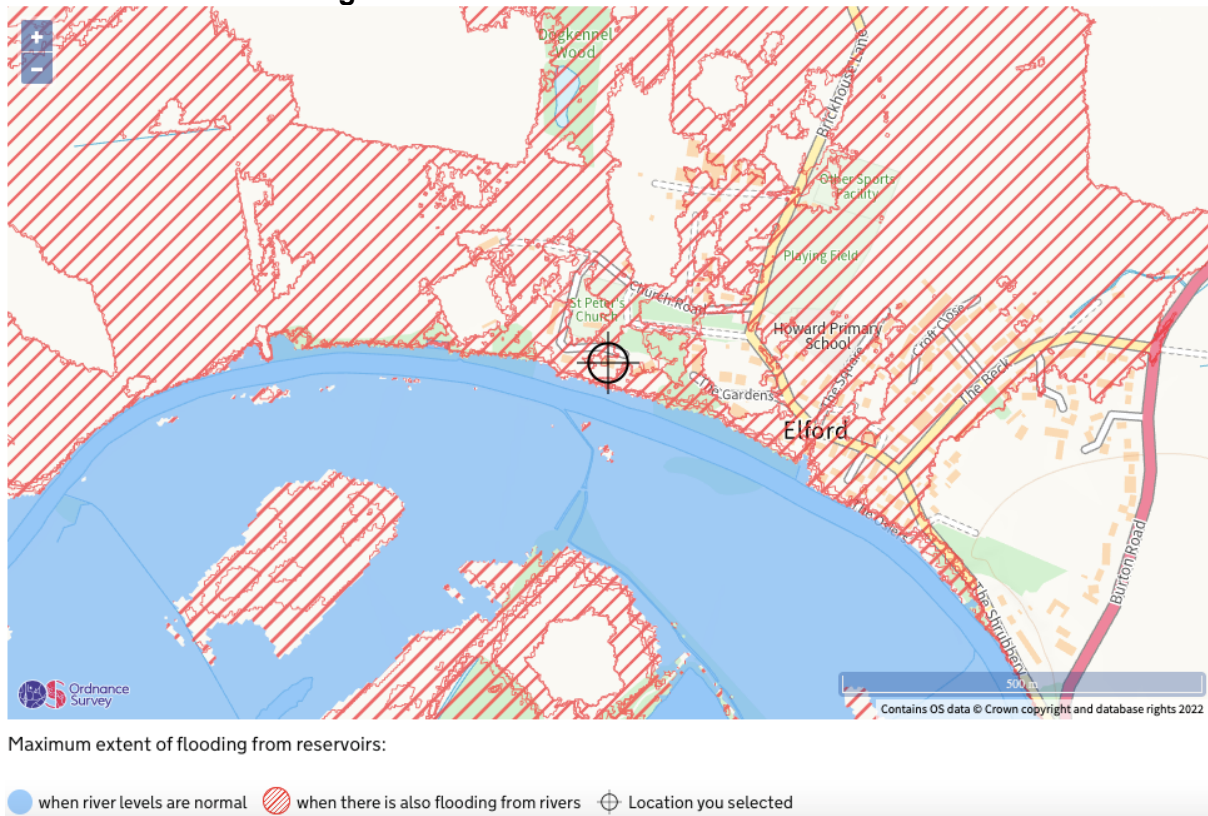
4.2.4 Catastrophic flooding

This source includes release of large volumes of stored water, such as in reservoirs and canals, due to catastrophic failure. The area is mapped as being at risk of potential reservoir failure if this coincides with river flooding, as shown in Figure 4.4, but the development site itself remains unaffected. The risk of reservoir failure is unknown but extremely low.

The Coventry Canal and the Trent and Mersey Canal are not elevated above the surrounding countryside and are located over a kilometre away so the risk of flooding from a breach is negligible.

There are no other known large volumes of stored water above the site.

Figure 4.4 Flood risk from reservoir failure



The risk of catastrophic flooding at the site is therefore low.

4.3 Flood Hazard at the Site

The above review has indicated that the principal flood risk to the site at present is from the River Tame and that the development area is elevated above the current 0.1% AEP flood level. It is likely to remain outside of flood zone 1 for the lifetime of the development.

Flood risk from other sources is considered to be low or insignificant.

5 FLOOD RISK MANAGEMENT MEASURES

5.1 Mitigation

The existing floor level is elevated above the 1% AEP flood level including climate change allowance. Floor levels for the new build should not be lower than the existing. No other property-specific measures should be necessary.

5.2 Safe Access and Egress

The surrounding area, including the property access and egress routes, is at low – medium risk of fluvial flooding. This means the property may be difficult to access or leave in floods around the 1% AEP at present and these may become more frequent in the future.

The house itself should remain free of fluvial flood risk and would provide a safe refuge during these floods. However, emergency services may find it difficult to reach the property during these flood events, and the severity of floods is not known when they start so the property should be evacuated on receipt of a flood warning and prior to any actual flooding.

5.3 Flood Warning

As the property is in flood zone 1 the Environment Agency flood warning service may not be available but residents of the property should be signed up for the Environment Agency flood alert service and know what actions to take on receipt of a warning.

Further information is provided here:

<https://flood-warning-information.service.gov.uk/warnings>

5.4 Runoff

There will be an increase in roof area arising from the proposed development and a sustainable drainage plan will be required to ensure runoff is not increased. As the site is on river terrace deposits drainage via soakaways may be feasible, subject to on-site testing of infiltration rates and groundwater levels on the site.

If infiltration is not feasible then storage of runoff may be necessary to ensure the current runoff rates are not exceeded.

5.5 Off-site Impacts

The building is not in an area of flood risk so there will be no occupation of flood storage volume and compensation storage will not be required.

Surface water flow routes will be unaffected by the proposed development.

There will therefore be no impacts on off-site flood risk.

6 CONCLUSIONS

- It is proposed to alter and enlarge an existing detached house at Yew House, Old Hall Drive, Elford B79 9BZ to create a five-bedroom detached house.
- The site is in flood zones 1 – 3 but the development site is in flood zone 1 and elevated above the surrounding site.
- Extensive areas around the site, including the access routes are also in flood zone 2 and 3.
- There is no mapped risk of surface water flooding in or around the site.
- Flood risk from tidal, groundwater and catastrophic sources are very low or non-existent.
- Climate change is not expected to cause the development site to be in flood zone 3 during the lifetime of the property.
- It is recommended that the finished floor level of the development should not be lower than the existing.
- The property should provide a safe refuge in the event of fluvial flooding but, owing to the potential difficulty of access during the 1% and more extreme floods, it is recommended that the property is evacuated in the event of serious flooding.
- Residents should register for flood alerts from the Environment Agency to ensure the property can be safely evacuated in the event of serious flooding of the surrounding area.

7 REPORT LIMITATIONS

This report has been prepared with all reasonable skill, care and diligence. The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources.

The opinions given in this report have been dictated by the finite data on which are they based and are relevant only to the purpose for which the report was commissioned.

Information reviewed should not be considered exhaustive and has accepted in good faith as providing true and representative data with respect to site conditions. Should additional information become available which may influence the opinion expressed in this report, the right to review such information and, if warranted, to alter the opinions accordingly is reserved.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed.

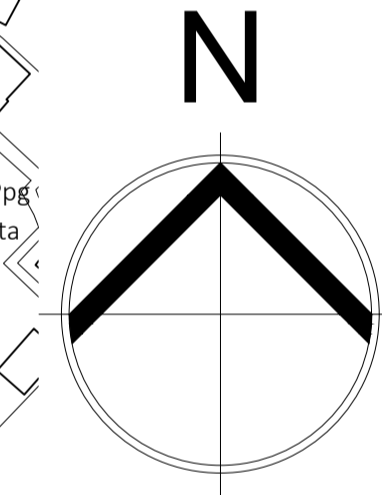
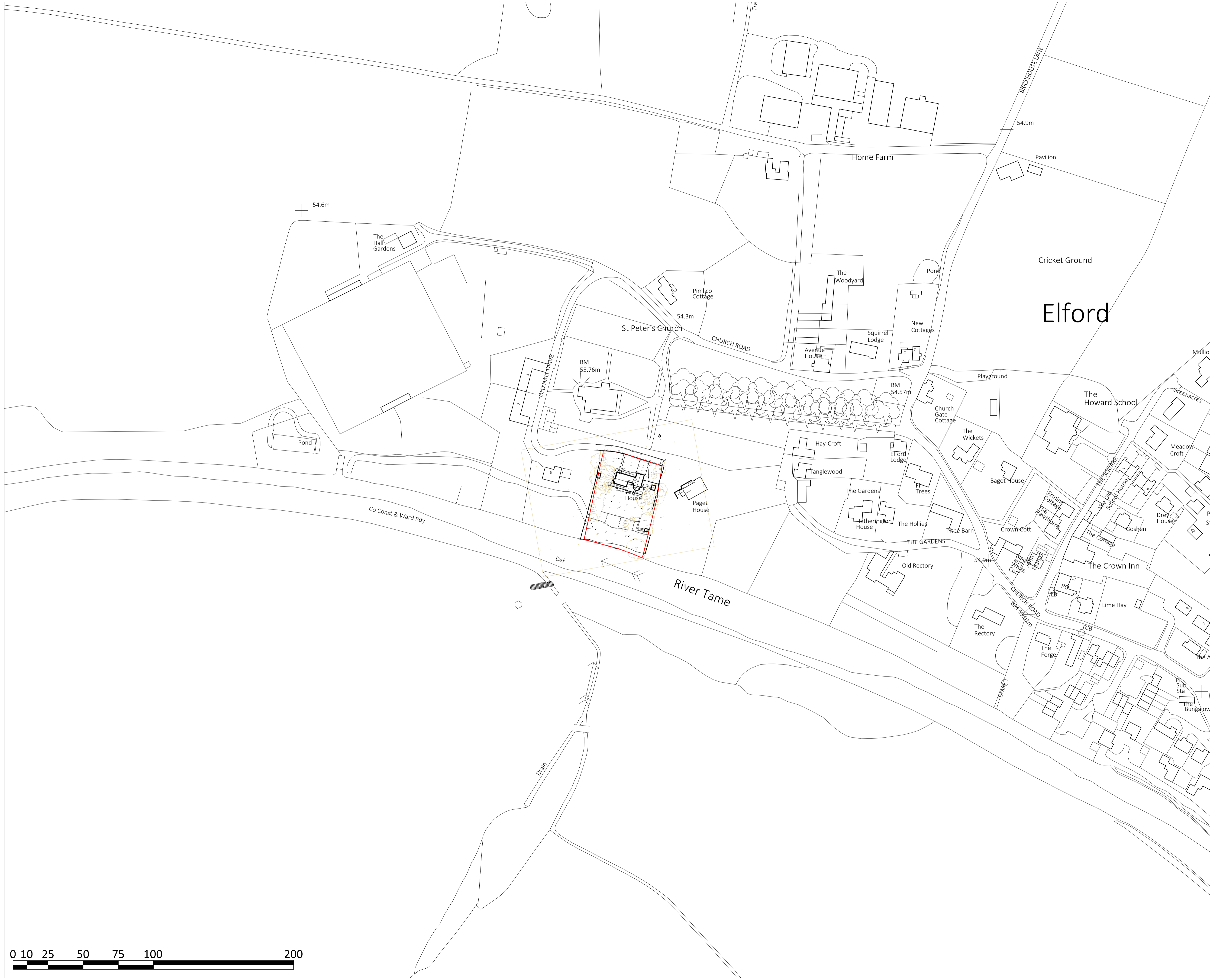
The recommendations contained in this report represent our professional opinions. These opinions were arrived at in accordance with currently accepted industry practices at this time and as such are not guarantee that the sites are free of hazardous conditions.

This report has been prepared solely for the use of the named client, and may not be relied upon by other parties without written consent.

8 APPENDICES

APPENDIX 1 – EXISTING SITE PLAN

The Builder is to check and verify all buildings and site dimensions, levels and sewer invert levels prior to commencement of work.
 Do not scale off this drawing, work to figured dimensions only.
 This drawing must be read and checked with all structural and relevant specialist drawings.
 The Builder is to comply in all respects with the current Building Regulations and latest Codes of Practice.
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Revisions		
No.	Description	Date

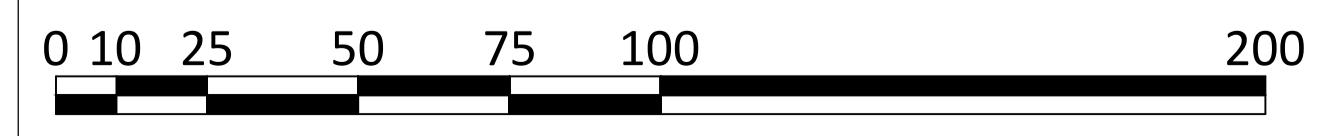
Ms D. Yarnell
 Yew House, Elford

Alteration to Existing Dwelling



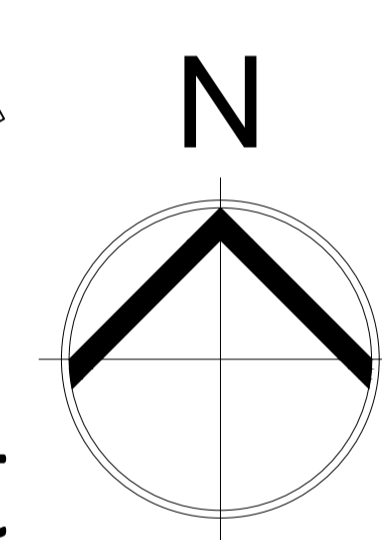
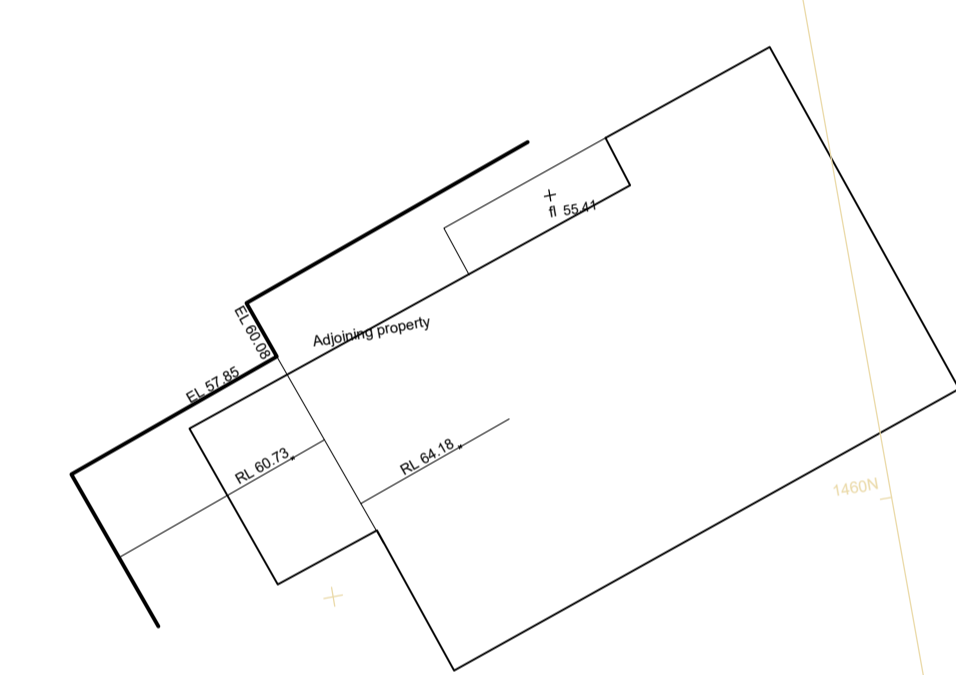
Ritchie & Ritchie Architects LLP
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 Staffordshire, B79 7QF
 +44 (0)1827 62251
 www.randrarchitects.co.uk

Location Plan



Scale	Date	Drawn	Job	Drawing
1:1250 A1	Mar 2021	IDR / MH	7842	100

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Yew House

Paget House

Revisions		
No.	Description	Date

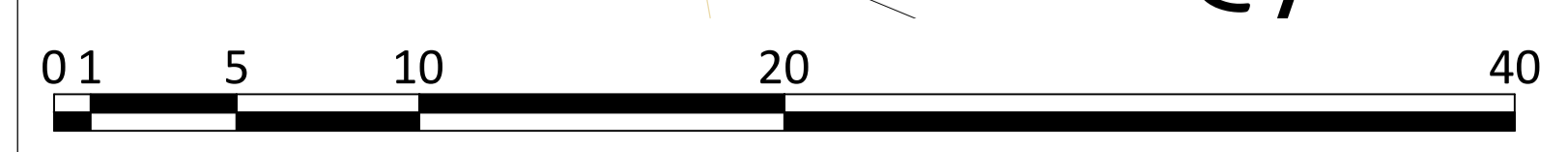
Ms D. Yarnell
 Yew House, Elford

Alteration to Existing Dwelling



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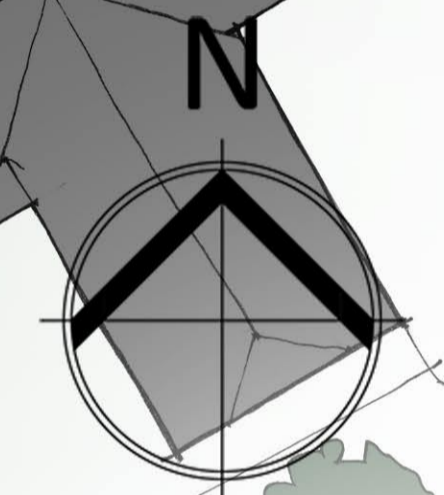
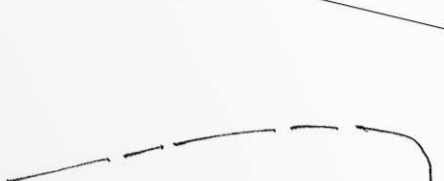
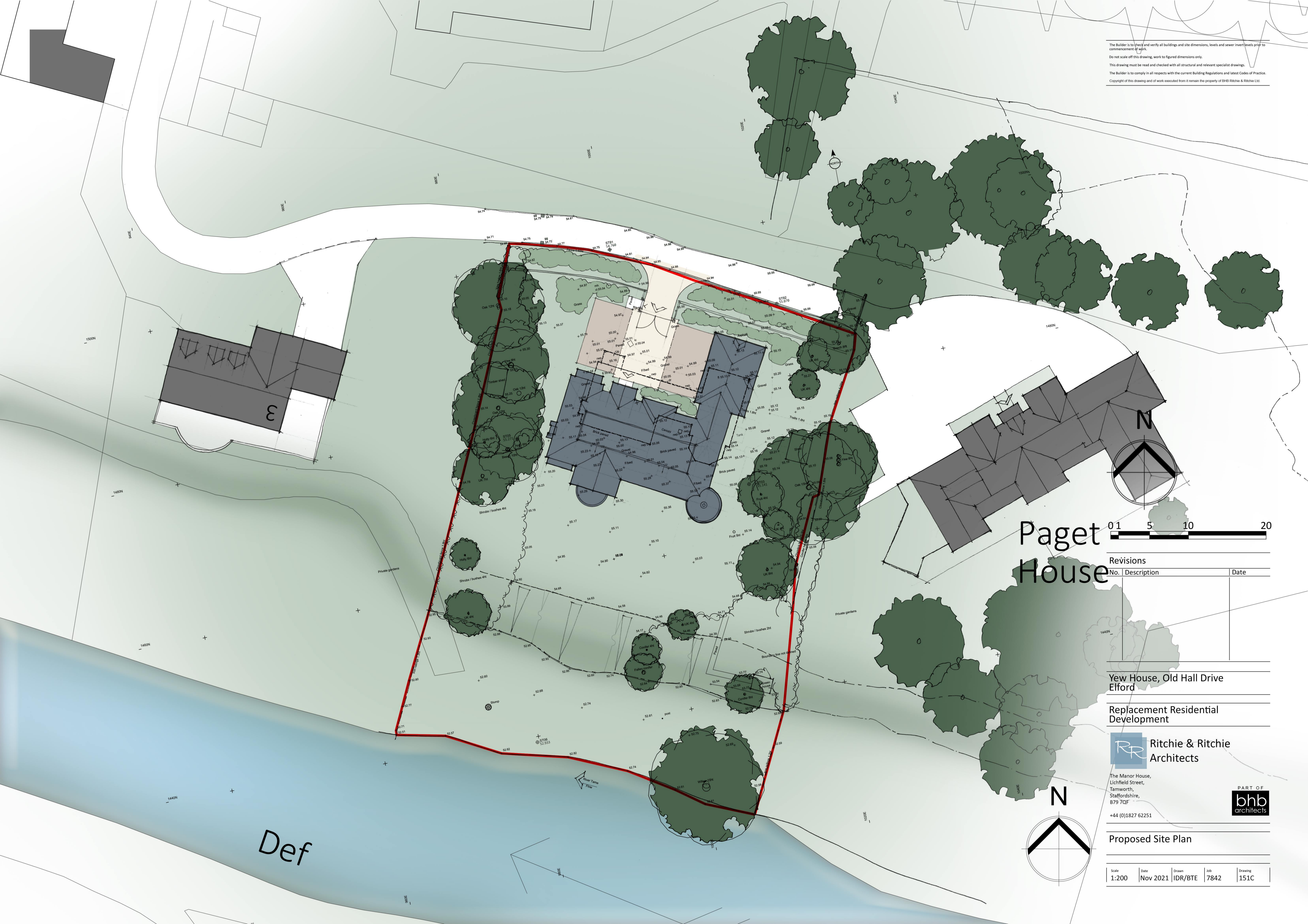
Existing Site Plan



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APPENDIX 2 – PROPOSED SITE PLAN

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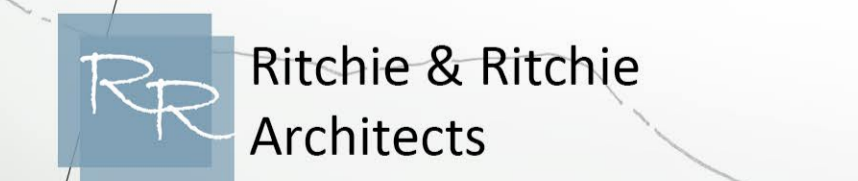


Paget House

Revisions		
No.	Description	Date

Yew House, Old Hall Drive
Elford

Replacement Residential
Development



Ritchie & Ritchie
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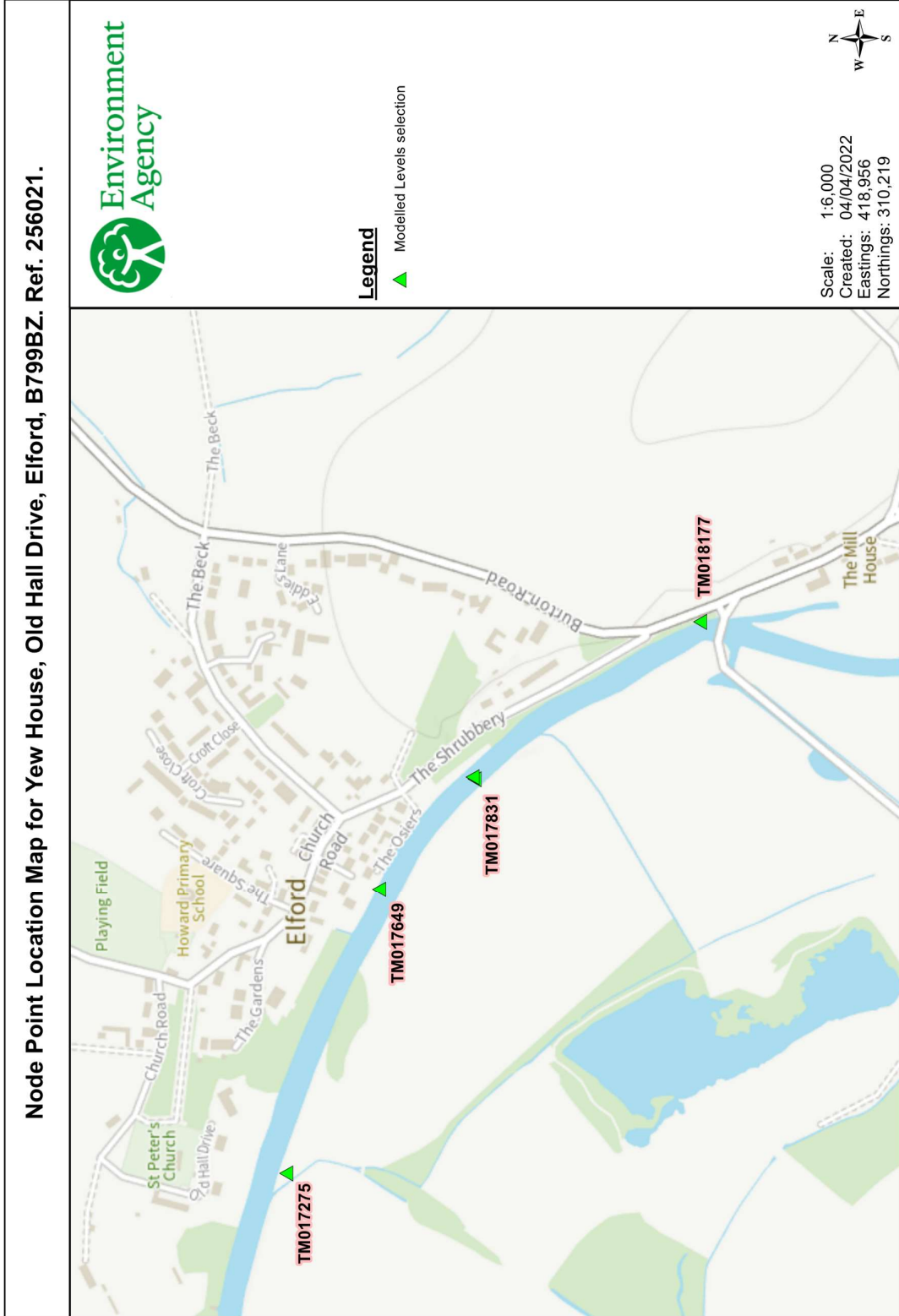
+44 (0)1827 62251



Proposed Site Plan

Scale 1:200	Date Nov 2021	Drawn IDR/BTE	Job 7842	Drawing 151C
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APPENDIX 3 – ENVIRONMENT AGENCY INFORMATION



Product 4 (Detailed Flood Risk Data) for Yew House, Old Hall Drive, Elford, B799BZ. (SK 18539 10548).

Reference number: 256021

Date of issue: 05 April 2022

Model Information

The following information and attached maps contain a summary of the modelled information relevant to the area of interest. The information provided is based on the best available data as of the date of issue.

Model Name	Release Date
Lower Tame Strategy Model	2013
Caveat	
Partial Upload Only	

Flood Map for Planning (Rivers and Sea)

The Flood Map for Planning (Rivers and Sea) indicates the area at risk of flooding, **assuming no flood defences exist**, for a flood event with a 0.5% chance of occurring in any year for flooding from the sea, or a 1% chance of occurring in any year for fluvial (river) flooding (Flood Zone 3). It also shows the extent of the Extreme Flood Outlines (Flood Zone 2) which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater. The Flood Zones refer to the land at risk of flooding and **do not** refer to individual properties. It is possible for properties to be built at a level above the floodplain but still fall within the risk area.

This Flood Map only indicates the extent and likelihood of flooding from rivers or the sea. It should also be remembered that flooding may occur from other sources such as surface water, sewers, road drainage, etc.

To find out which flood zone a location is in please use: <https://flood-map-for-planning.service.gov.uk/>

Definition of flood zones

- **Zone 1** - The area is within the lowest probability of flooding from rivers and the sea, where the chance of flooding in any one year is less than 0.1% (i.e. a 1000 to 1 chance).
- **Zone 2** - The area which falls between the extent of a flood with an annual probability of 0.1% (i.e. a 1000 to 1 chance) fluvial and tidal, or greatest recorded historic flood, whichever is greater, and the extent of a flood with an annual probability of 1% (i.e. a 100 to 1 chance) fluvial / 0.5% (i.e. a 200 to 1 chance) tidal. (Land shown in light blue on the Flood Map).
- **Zone 3** - The chance of flooding in any one year is greater than or equal to 1% (i.e. a 100 to 1 chance) for river flooding and greater than or equal to 0.5% (i.e. a 200 to 1 chance) for coastal and tidal flooding.

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

Areas Benefitting From Defences

Where possible we show the areas that benefit from the flood defences, in the event of flooding:

- from rivers with a 1% (1 in 100) chance in any given year, or;
- from the sea with a 0.5% (1 in 200) chance in any given year.

If the defences were not there, these areas would flood. Please note that we do not show all areas that benefit from flood defences.

The associated Dataset is available here: <https://data.gov.uk/dataset/flood-map-for-planning-rivers-and-sea-areas-benefiting-from-defences>

Node Data/ Modelled Levels

The attached map will show a selection of 1D model node points near to your site. The fluvial levels for these node points are shown below.

Fluvial Flood Levels (m AOD)

The modelled levels are given in m AOD (N), m AOD indicates metres Above Ordnance Datum (Newlyn). The information is taken from the model referenced above.

		Annual Exceedance Probability -Maximum Water Levels (mAOD) Defended									
Node Label	MODEL	EASTING	NORTHING	20% (1 in 5)	10% (1 in 10)	5% (1 in 20)	2% (1 in 50)	1% (1 in 100)	1% (CC)	0.5% (1 in 200)	0.1% (1 in 1000)
TM018177	Lower Tame Strategy Model 2013	419195	309952	53.51	53.64	53.94	54.28	54.41	54.64	54.52	55.04
TM017831	Lower Tame Strategy Model 2013	419001	310236	53.47	53.63	53.92	54.26	54.39	54.6	54.5	55.02
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TM017275	Lower Tame Strategy Model 2013	418504	310470	53.31	53.47	53.78	54.12	54.26	54.47	54.38	54.91

Climate Change

In February 2016 the '[Flood Risk Assessments: Climate Change Allowances](#)' were published on GOV.UK. This is in replacement of previous climate change allowances for planning applications. The data provided in this product does not include the new allowances. You will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding. The fluvial climate change factors are now more complex and a single uplift percentage across England cannot be justified.

The Environment Agency will incorporate the new allowances into future modelling studies. For now, it remains the applicant's responsibility to demonstrate through their proposal and flood risk assessments that new developments will be safe in flood risk terms for its lifetime.

Recorded Flood Outlines

Following an examination of our records of historical flooding we do hold records of flooding for this area, please find tabulated information below for these recorded flood events.

Flood Event Code	Flood Event Date	Source of Flooding	Cause of Flooding
17827	1/12/1992	River Trent	Main River

The corresponding recorded flood outline/s can be accessed here:

<https://data.gov.uk/dataset/recorded-flood-outlines1>

The Recorded Flood Outlines take into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding. It includes flood extents that may have been affected by overtopping, breaches or blockages. Any flood extents shown do not necessarily indicate that properties were flooded internally. It is also possible that the pattern of flooding in this area has changed and that this area would now flood or not flood under different circumstances.

Please note that our records are not comprehensive and that the map is an indicative outline of areas which have previously flooded, not all properties within this area will have flooded. It is possible that other flooding may have occurred that we do not have records for.

You may also wish to contact your Local Authority or Internal Drainage Board (where relevant), to see if they have other relevant local flood information.

Flood Defences

Flood defences do not completely remove the chance of flooding. They can be overtopped by water levels which exceed the capacity of the defences.

If flood defences are located in your area, you can access this data here:

<https://data.gov.uk/dataset/cc76738e-fc17-49f9-a216-977c61858dda/aims-spatial-flood-defences-inc-standardised-attributes>

<https://data.gov.uk/dataset/76828b72-3c9c-4700-83c7-d7c36047d322/flood-map-for-planning-rivers-and-sea-spatial-flood-defences-without-standardised-attributes>

There are no formal raised flood defences owned or operated by the Environment Agency protecting this site. You may wish to contact the Local Authority to obtain further information regarding localised flooding from drains, culverts and small watercourses, and regarding existing or planned flood defence measures.

Planning Development

If you have requested this information to help inform a development proposal, then you should note the information on GOV.UK on the use of Environment Agency Information for Flood Risk Assessments. You can also request pre application advice:

<https://www.gov.uk/planning-applications-assessing-flood-risk>

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

Supporting Information

River modelling: technical standards and assessment guidance

The link below contains standards for the flood risk management industry on how to build and review hydraulic models and provide evidence for flood risk management decisions.

<https://www.gov.uk/government/publications/river-modelling-technical-standards-and-assessment>

Surface Water

Managing the risk of flooding from surface water is the responsibility of Lead Local Flood Authorities. The 'risk of flooding from surface water' map has been produced by the Environment Agency on behalf of government, using information and input from Lead Local Flood Authorities.

You may wish to contact your Local Authority who may be able to provide further detailed information on surface water.

It is not possible to say for certain what the flood risk is but we use the best information available to provide an indication so that people can make informed choices about living with or managing the risks. The information we supply does not provide an indicator of flood risk at an individual site level. Further information can be found on the Agency's website:

<https://flood-warning-information.service.gov.uk/long-term-flood-risk>

Flood Risk from Reservoirs

The Flood Risk from Reservoirs map can be found on the Long Term Flood Risk Information website:

<https://flood-warning-information.service.gov.uk/long-term-flood-risk/map?map=Reservoirs>

Flood Alert & Flood Warning Area

We issue flood alert/warnings to specific areas when flooding is expected. If you receive a flood warning you should take immediate action.

You can check whether you are in a Flood Alert/Warning Area and register online using the links below:

<https://www.gov.uk/check-flood-risk>

<https://www.gov.uk/sign-up-for-flood-warnings>

If you would prefer to register by telephone, or if you need help during the registration process, please call Floodline on 0345 988 1188.

The associated dataset for flood warning areas is available here:

<https://data.gov.uk/dataset/flood-warning-areas3>

The associated dataset for flood alert areas is available here: <https://data.gov.uk/dataset/flood-alert-areas2>

Flood Risk Activity Permits

We now consider applications for works, which may be Flood Risk Activities, under Environmental Permitting Regulations. This replaces the process of applying for a Flood Defence Consent. You may need an environmental Permit for flood risk activities if you want to do work:

- in, under, over or near a main river (including where the river is in a culvert)
- on or near a flood defence on a main river
- in the flood plain of a main river

- on or near a sea defence

Please go to this website to find out more about how to apply:

<https://www.gov.uk/guidance/flood-risk-activities-environmental-permits>.

Please be aware that Bespoke and Standard Rules permits can take up to 2 months to determine and will incur a charge.

Further details about the Environment Agency information supplied can be found on the GOV.UK website:

<https://www.gov.uk/browse/environment-countryside/flooding-extreme-weather>