ML PLANNING CONSULTANCY LTD

FLOOD RISK ASSESSMENT

Proposal: Agricultural worker dwelling (Outline).

Site Location: Roe Farm, Catterall Lane, Nr Garstang, PR3 0PA

Date: 14/09/20

Author: Luke Godden

Introduction

The National Planning Policy Framework (NPPF) sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. Support in the Planning Practice Guidance is also available.

The NPPF sets out the vulnerability to flooding of different land uses. It encourages development to be located in areas of lower flood risk where possible, and stresses the importance of preventing increases in flood risk off site to the wider catchment area.

The NPPF also states that alternative sources of flooding, other than fluvial (river flooding), should also be considered when preparing a Flood Risk Assessment.

As set out in the NPPF, local planning authorities should only consider development in flood risk areas appropriate where informed by a site-specific Flood Risk Assessment. This document will identify and assess the risk associated with all forms of flooding to and from the development. Where necessary it will demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account.

In investigating the flood risk relating to the site, the Environment Agency flood mapping has been reviewed and has confirmed that the site lies within Flood Zone 3. Flood Zone 3 is identified as land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year. The flood zones categorisation refers to the probability of river and sea flooding, ignoring the presence of defences.

STRATEGIC FLOOD RISK ASSESSMENT

The Strategic Flood Risk Assessment for Wyre Borough Council is dated April 2007 and was produced by Wyre Borough Council.

The SFRA states this area is very low lying and flat with the majority of the area in Flood Zone 3. The area is predominately agricultural in nature with sporadic larger villages.

The main risk of flooding within the area is from tidal sources, in a breach of the coastal or estuary defences scenario. This would lead to significant areas being flooded. The area is also susceptible to flooding from fluvial sources due to the low gradients and difficulty in discharging into Morecambe Bay. This is compounded by rising beach levels at the discharge points. Similarly, sewer flooding, groundwater and highway drainage systems can result in flooding problems as they are interconnected to the watercourses and suffer from poor hydraulics and overcapacity in the urban area.

However, this proposal site is not at risk of tidal flooding, but from an overflow of the River Wyre.

CONSULTATION & GUIDANCE

The site is identified on the Environment Agency's flood mapping as lying within Flood Zone 2, and so it at a medium risk of flooding. The main risk of flooding is from the River Wyre.

Satellite image of the site. Development area marked with red edge.

The Proposal

The proposal comprises one agricultural worker dwelling deemed essential by ADAS in their most recent response. The proposal will meet the essential needs of agriculture bring within sight and sound of vulnerable livestock and assets.

Existing Ground Levels and Finished Floor Levels

There is an established OS datum point adjacent to the site which shows the existing ground level of 11m AOD. The topography of the build core of the farmstead means that it is elevated above surrounding land. Indeed areas of land to the north and west serve as functional floodplain.

Existing Site Drainage

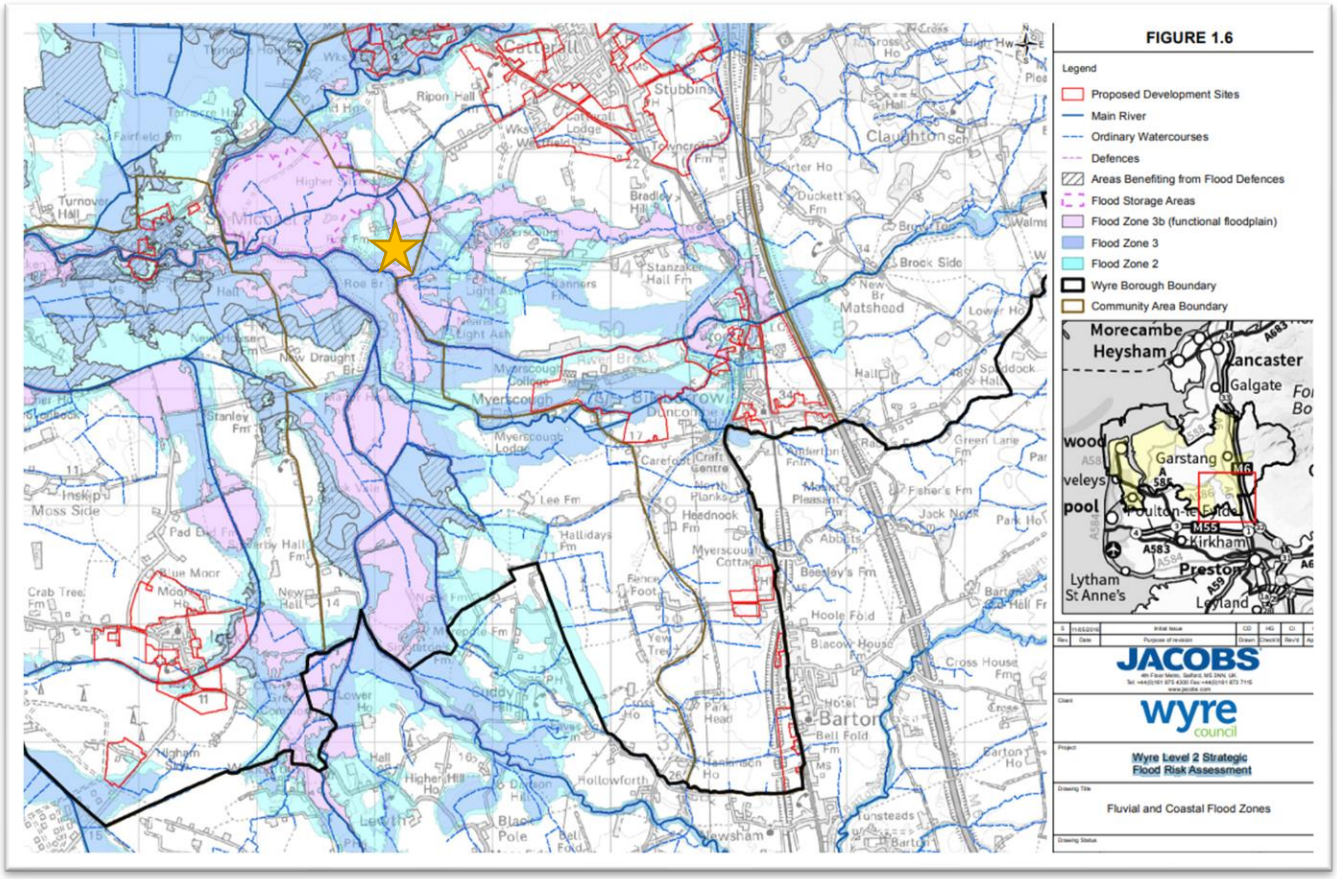
Surface water runoff is collected into a 6inch field drain which runs from north to south along the access track. The overflow from the duckpond enters the field drainage system and discharges to a drainage ditch to the East of the site.

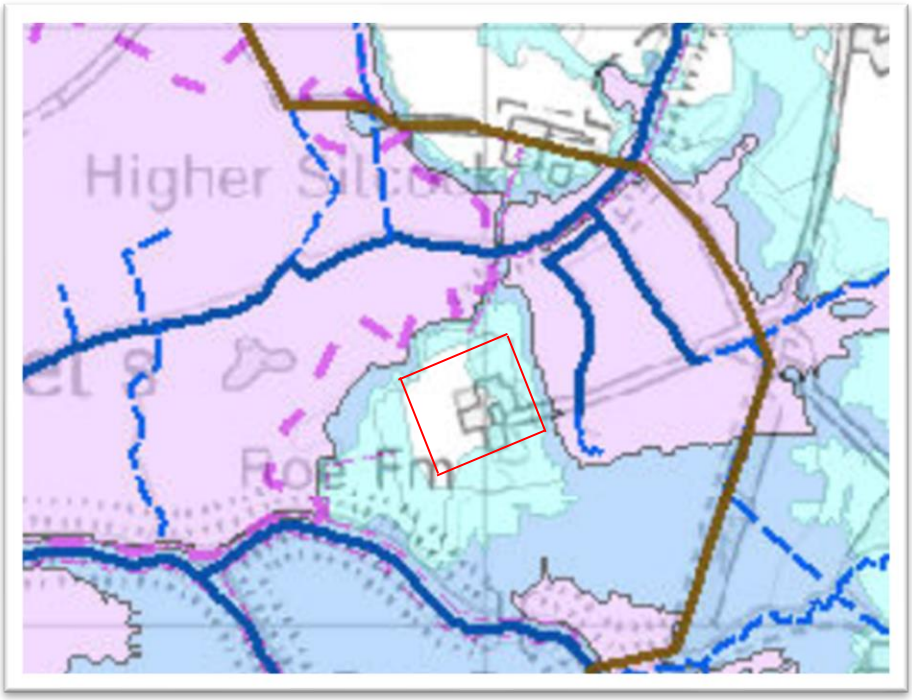
Proposed site Drainage

Surface water for the site will be fed to the pond on site, which has an overflow into a field drainage system that discharges to the watercourses around the site. The dwelling will need a new foul drainage system and this is anticipated to be a package treatment plant.

Wyre Council Strategic Flood Risk Assessment

Wyre Level 2 Strategic Flood Risk Assessment Figure 1.6



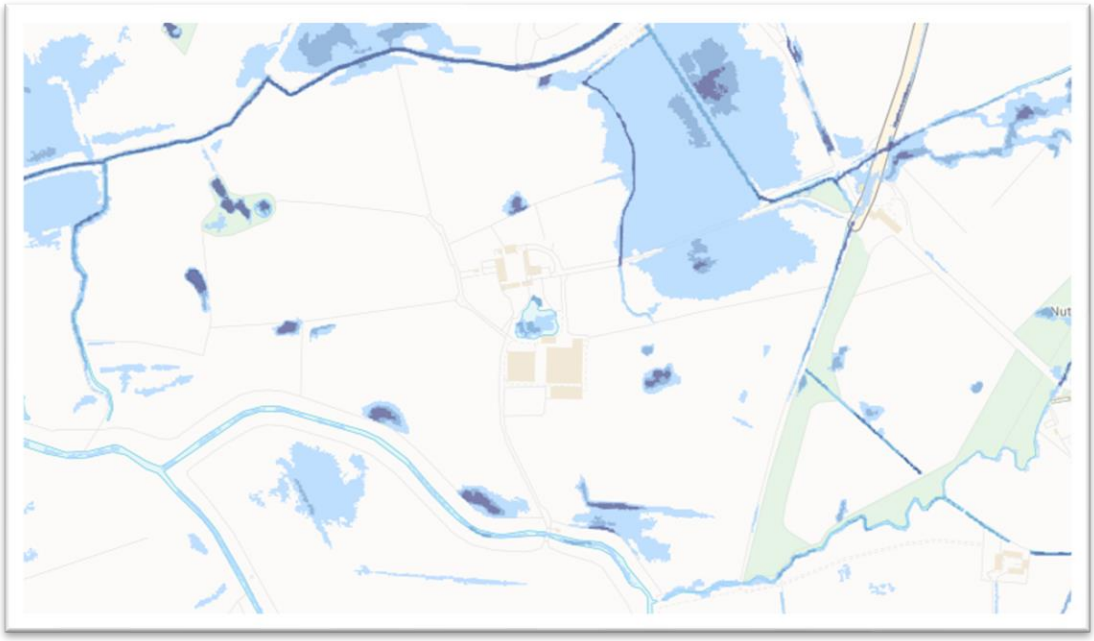


Excerpt from figure 1.6 shows that the built core of the site falls within flood zone 2 and flood zone 1 within the Council's SFRA. Areas of Flood zone 3B are to the north.

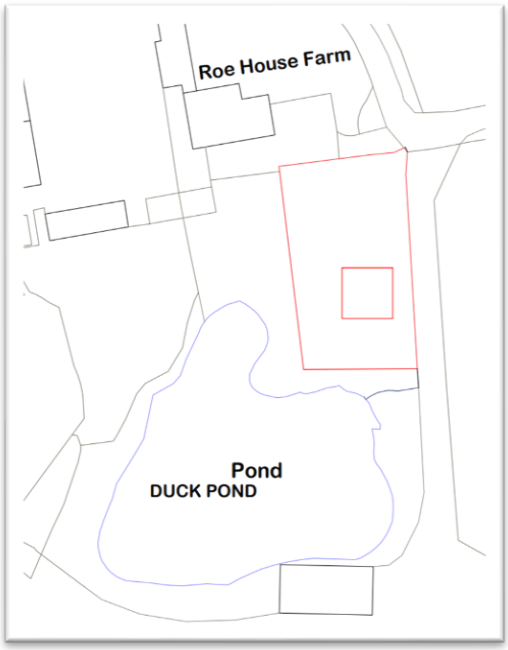
Surface Water Flooding

For all queries relating to flooding from surface water, ordinary watercourses and groundwater flooding, please contact the Lead Local Flood Authority Lancashire County Council in this instance.

Surface Water Maps can be viewed online at https://flood-warning-information.service.gov.uk/long-term-flood-risk/map

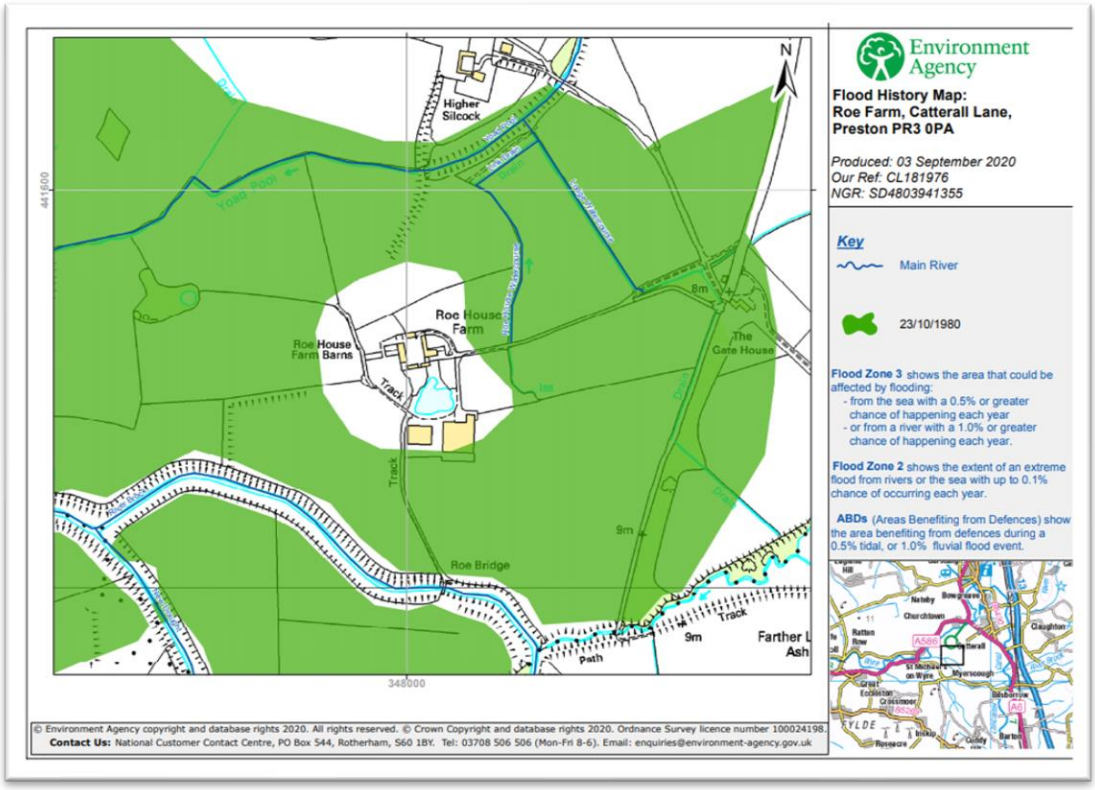


Excerpt from surface water flooding map shows that the existing pond on site is a source of risk on this site.

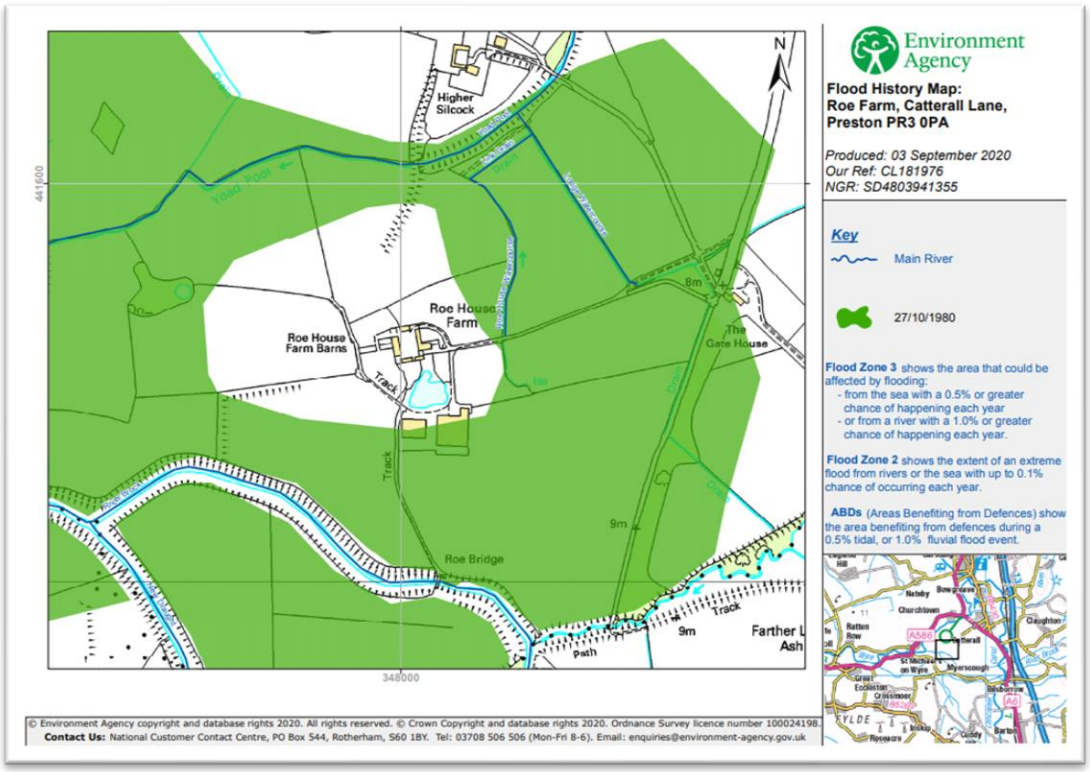


The proposal is in outline form, but indicative plans show that the dwelling is outside of flood risk from surface water.

Historic Flooding



The flood event in 1980 did not affect the site.



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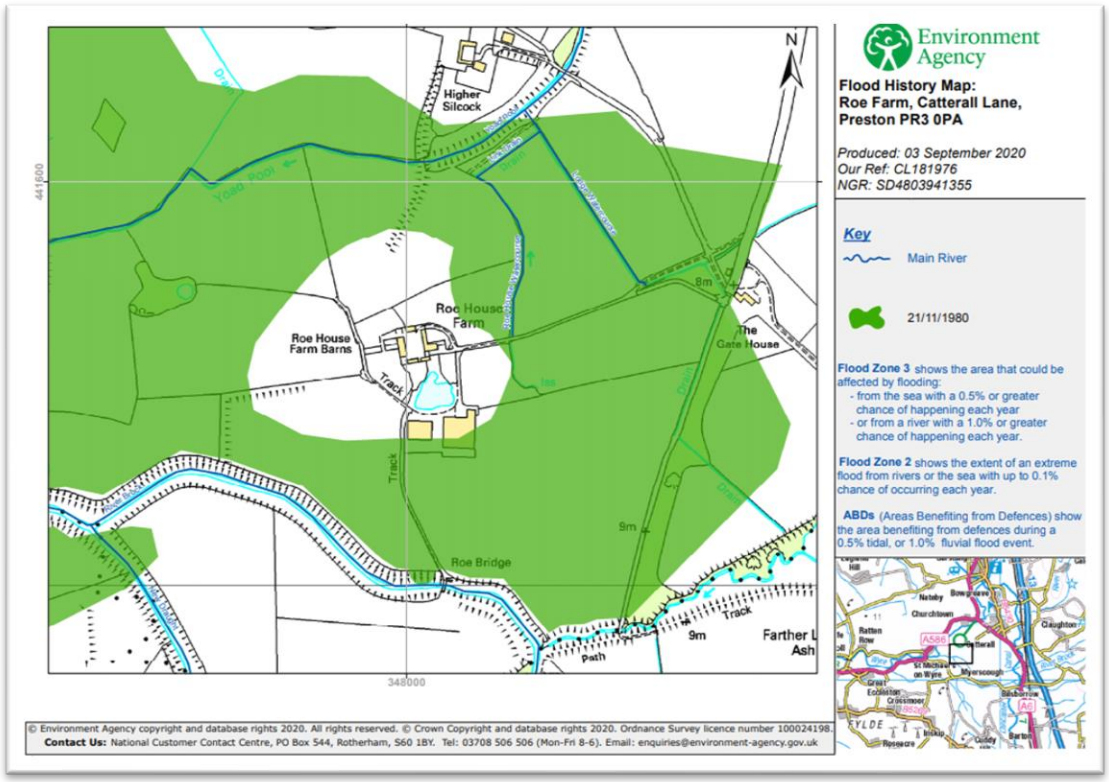

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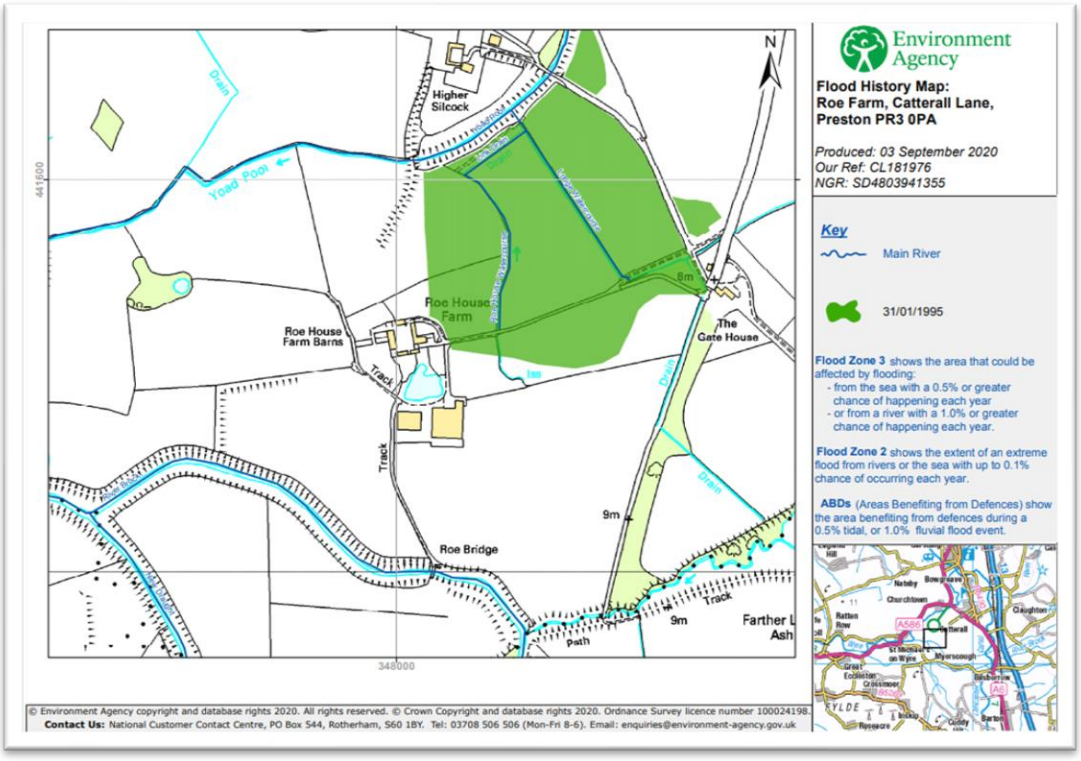
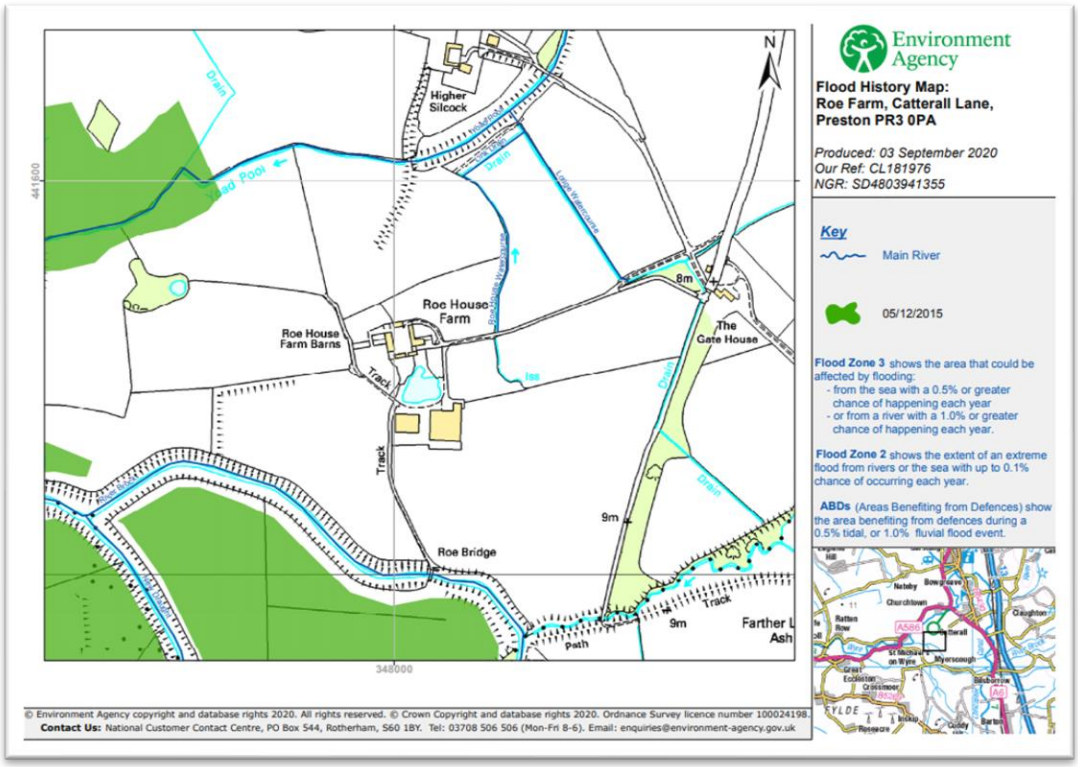


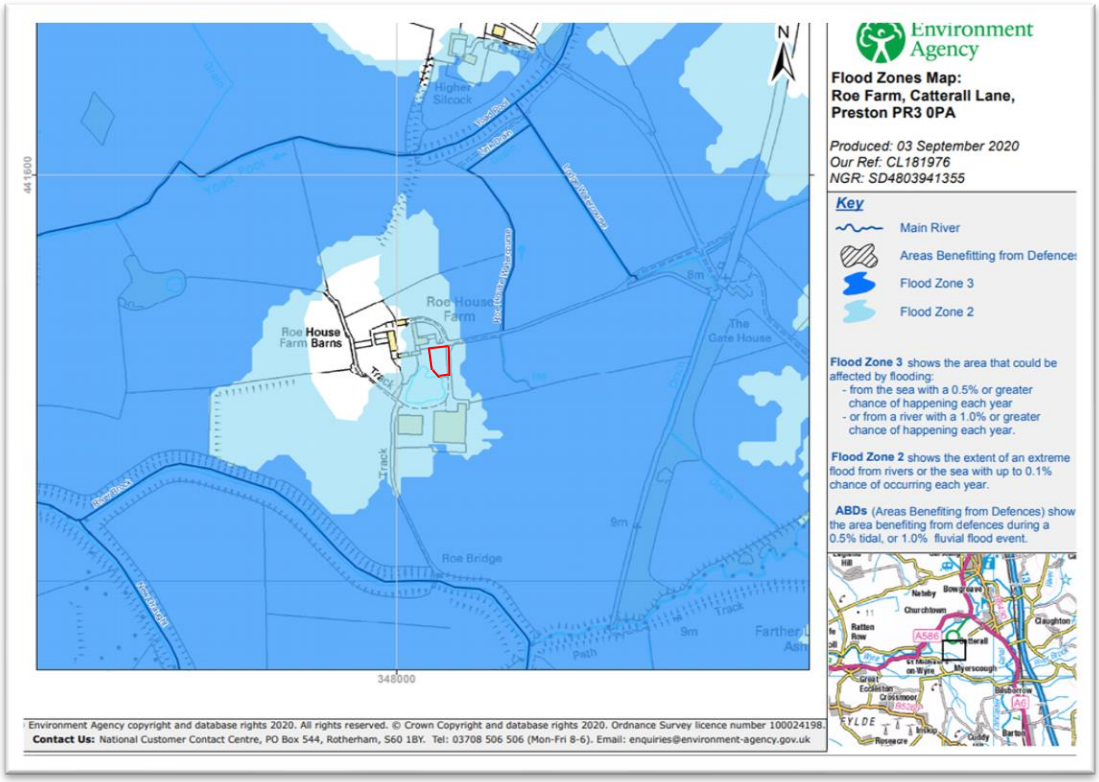
The flood event in 1995 did not affect the site.



The flood event in 2015 did not affect the site.

Product 4 Assessment

The flood map zone in the product 4 pack reflects the flood map for planning public access data showing that the site falls within flood zone 2.



Product 4 Summary

Product 4 response: Roe Farm, Catterall Lane, Preston PR3 0PA.:

- The Fluvial data has been taken from the **Wyre SFRM study** produced in 2014. Caveat for fluvial 20%CC Climate Change Modelled water levels with climate change using +20% flow allowances are not suitable for the majority of planning purposes. New climate change allowances can be checked on the following website**;** www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances.

Climate Change Allowances

Flood Outlines for the 1% Annual Exceedance arising from the fluvial sources at this site has been obtained from the Environment Agency.

> *Caveat for fluvial 20%CC Climate Change*
>
> *Modelled water levels with climate change using +20% flow allowances are not suitable for the majority of planning purposes. New climate change allowances can be checked on the following website**;** www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances.*

In order to establish the appropriate allowance the flood risk vulnerability of the proposal needs to be confirmed and the lifetime of the development considered.

- ***More Vulnerable*** Buildings used for dwelling houses

*For the more vulnerable category the **central and higher central allowances** to assess allowances for climate change.*

Table 3: sea level allowance for each epoch in millimetres (mm) per year, with total sea level rise for each epoch in brackets (use 1981 to 2000 baseline) by river basin district

Area of England	Allowance	2000 to 2035 (mm)	2036 to 2065 (mm)	2066 to 2095 (mm)	2096 to 2125 (mm)	Cumulative rise 2000 to 2125 (metres)
Humber	Higher central	5.5 (193)	8.4 (252)	11.1 (333)	12.4 (372)	1.15

The lifetime of the development is considered to be around 50 years. Sea level rises for each epoch, 2000 to 2035 and 2036 to 2065 is considered to be relevant to the application. The climate change allowance in assessing tidal flood risk in this assessment is therefore a maximum **84 mm** increase in modelled fluvial flood waters affecting the site.

Fluvial Levels Map

The fluvial levels data gives predicted levels for a set of node points in a range of scenarios. Guidance on climate change allowances indicates a further 84mm of potential flood water level needs to be added to the data.

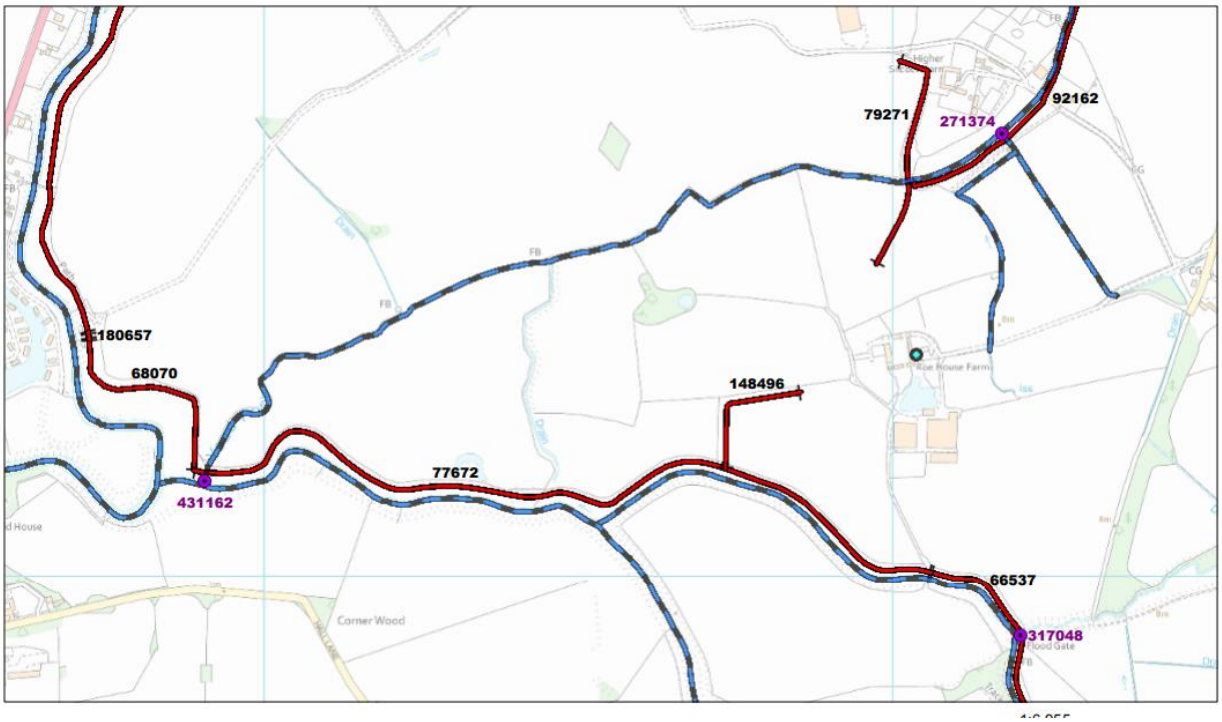
There are four node points on boundary of the site are **ea01209BROC01_0961** and **ea01209BROC01_1107** with the following levels in each scenario:-

Data taken from 2014 Wyre SFRM		
ea01209BROC01_0961		
0.1% Defended	0.1% Undefended	CC Allowance (plus 84mm)
10.21	8.87	9.71
1%+Climate Change (+20%) Defended	1%+Climate Change (+20%) Undefended	
10.17	8.73	9.57
1 % Defended	1% Undefended	
10.15	8.62	9.46
ea01209BROC01_1107		
0.1% Defended	0.1% Undefended	CC Allowance (plus 84mm)
10.22	8.88	9.72
1%+Climate Change (+20%) Defended	1%+Climate Change (+20%) Undefended	
10.18	8.73	9.57
1 % Defended	1% Undefended	
10.17	8.62	9.46

Product 4 Assessment

Fluvial flood defenses

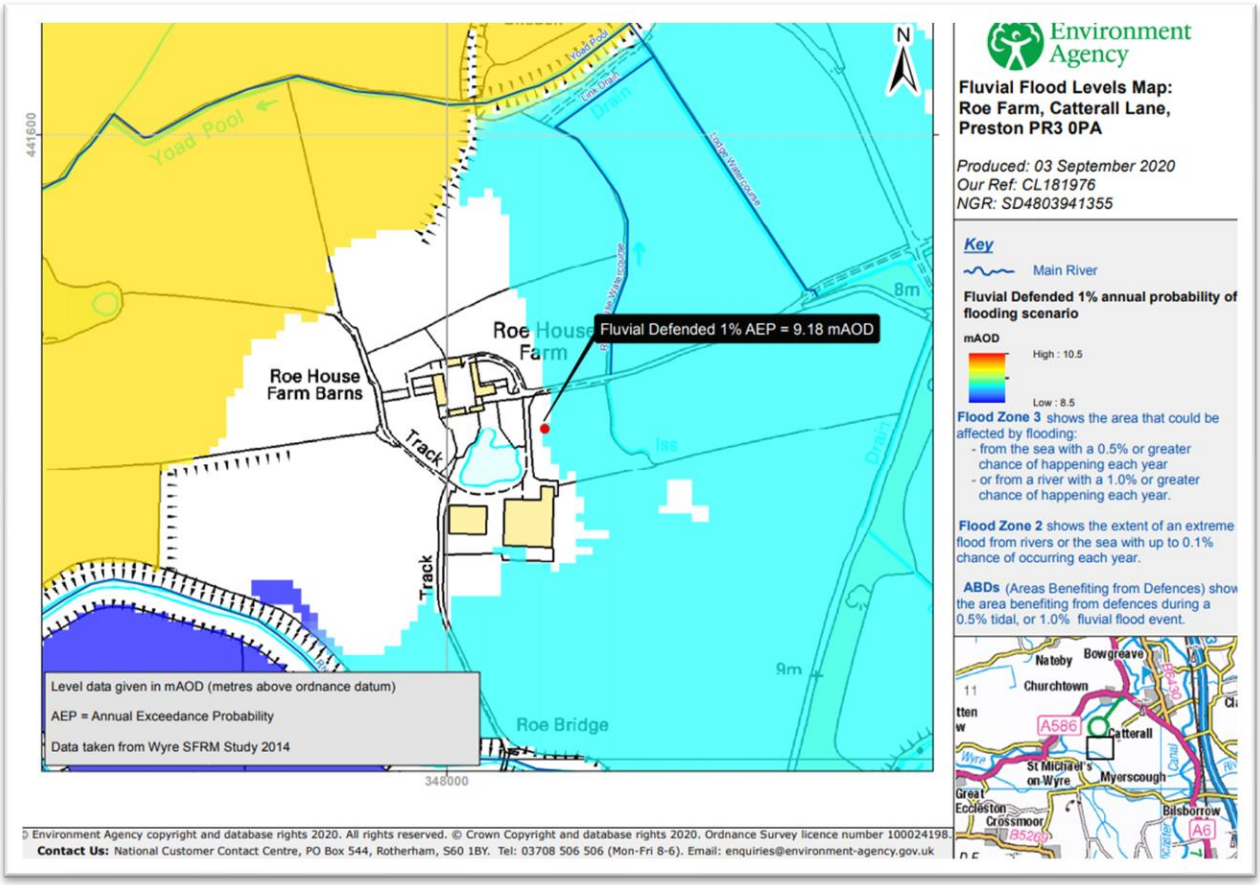
CL181976 Roe Farm, Catterall Lane, Preston



The fluvial defences information indicates that the flood defences benefitting this site are formed by embankments on the northern side of the main channel and further on land to the north. 148496 is an embankment on land directly to the west of the site.

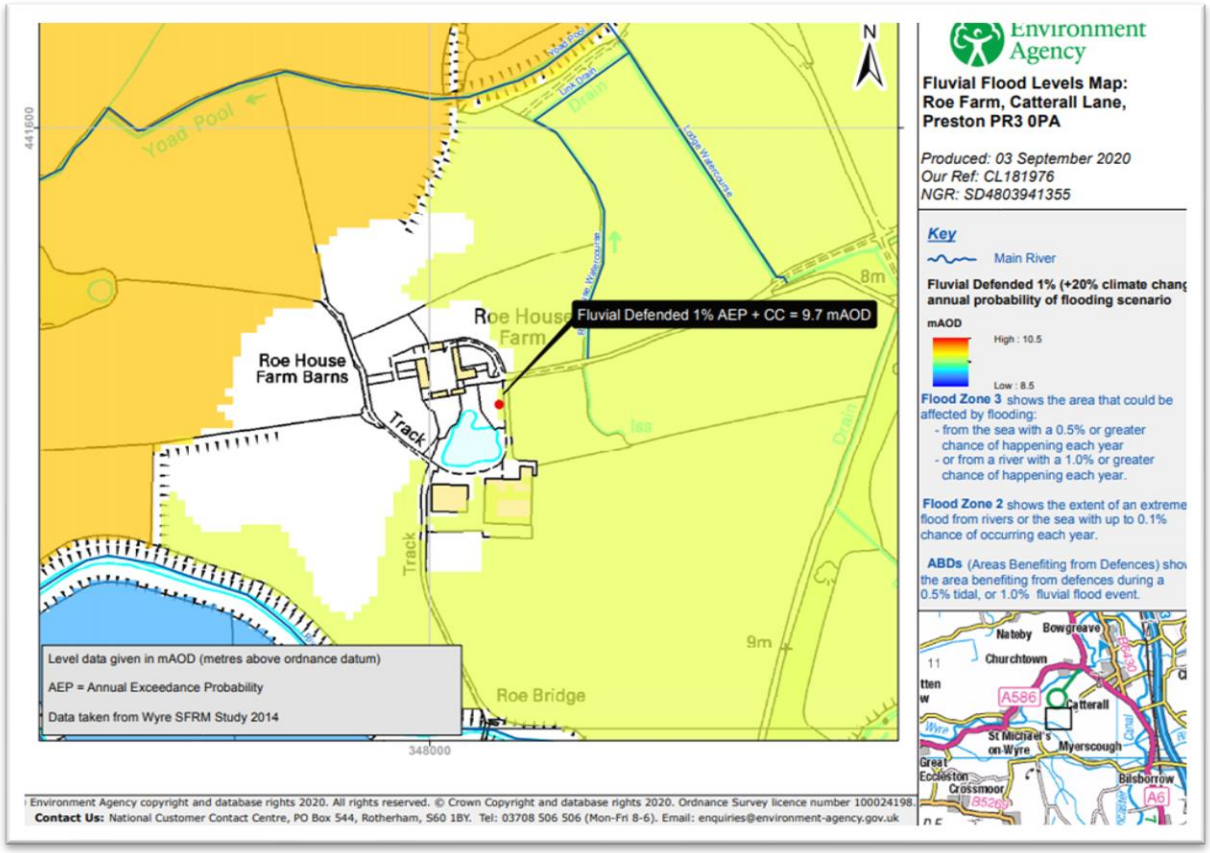
Effective Crest Levels in the undefended and defended scenario are given at 10.24 mAOD (UCL) and 10.28 mAOD (DCL). This gives a design flood level for a breach scenario, relating to overtopping, which is extreme event which is discussed in the FRA.

Fluvial Defended 1%



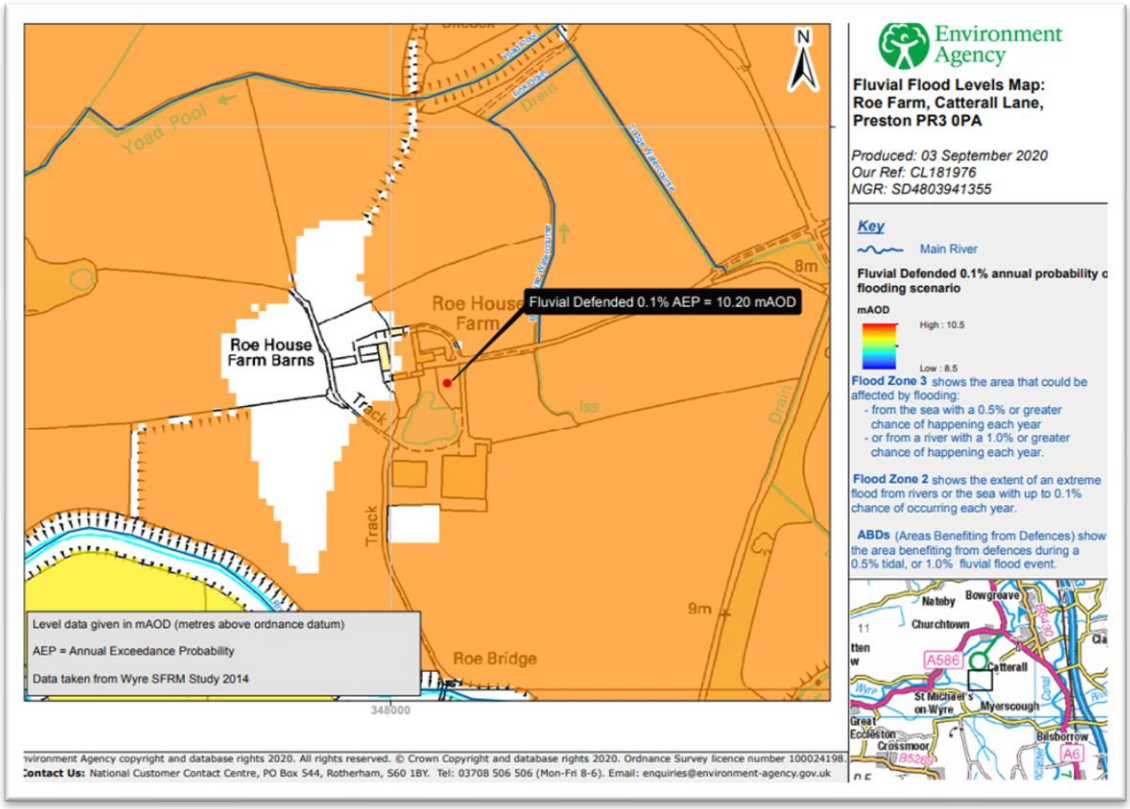
The site is not affected in the Fluvial 1 in 100 annual probability of flooding scenario. Existing ground levels are 11 mAOD and the modelled water levels in this flood scenario are 9.18 mAOD, and with CC Allowance (plus 84mm) equates to 10.02 mAOD.

Fluvial Defended 1% (+20% climate change)



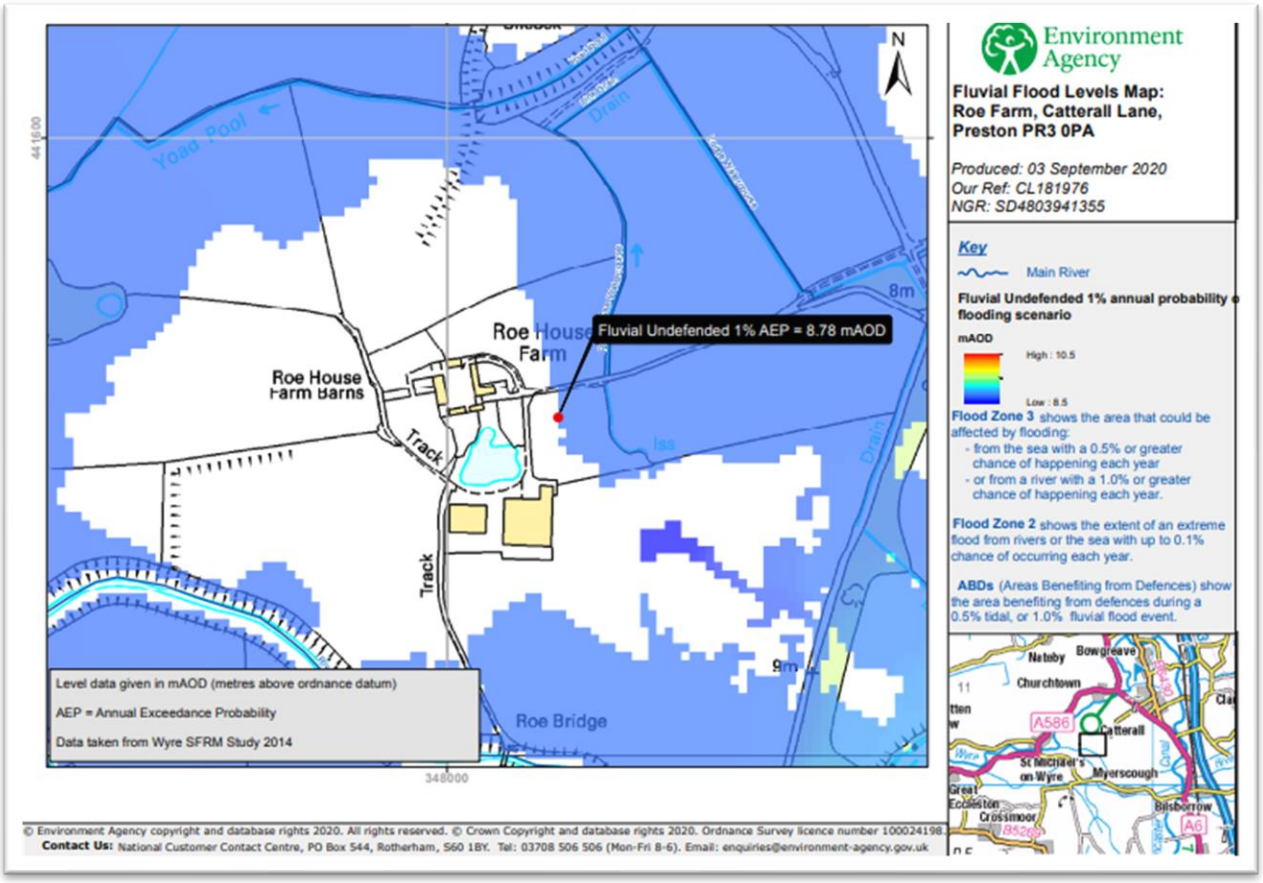
The site is not affected in the Fluvial 1 in 100 annual probability of flooding scenario. Existing ground levels are 11 mAOD and the modelled water levels in this flood scenario are 9.7 mAOD, and with CC Allowance (plus 84mm) equates to 10.54 mAOD.

Fluvial Defended 0.1%



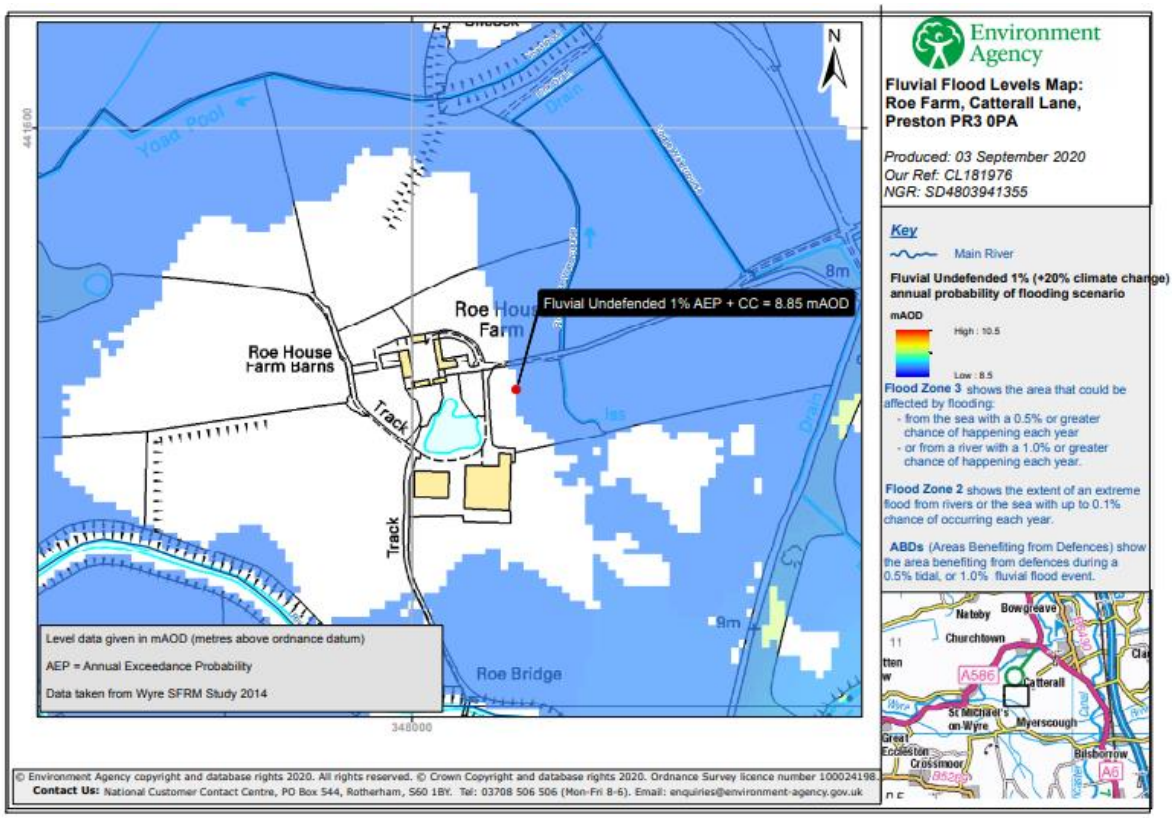
The flood risk in this scenario has a 1 in 1000 annual probability. The levels fall within the mid-range of the colour value chart and gives a level of 10.20 mAOD. With CC Allowance (plus 84mm) equates to 11.04 mAOD.

Fluvial Undefended 1% AEP



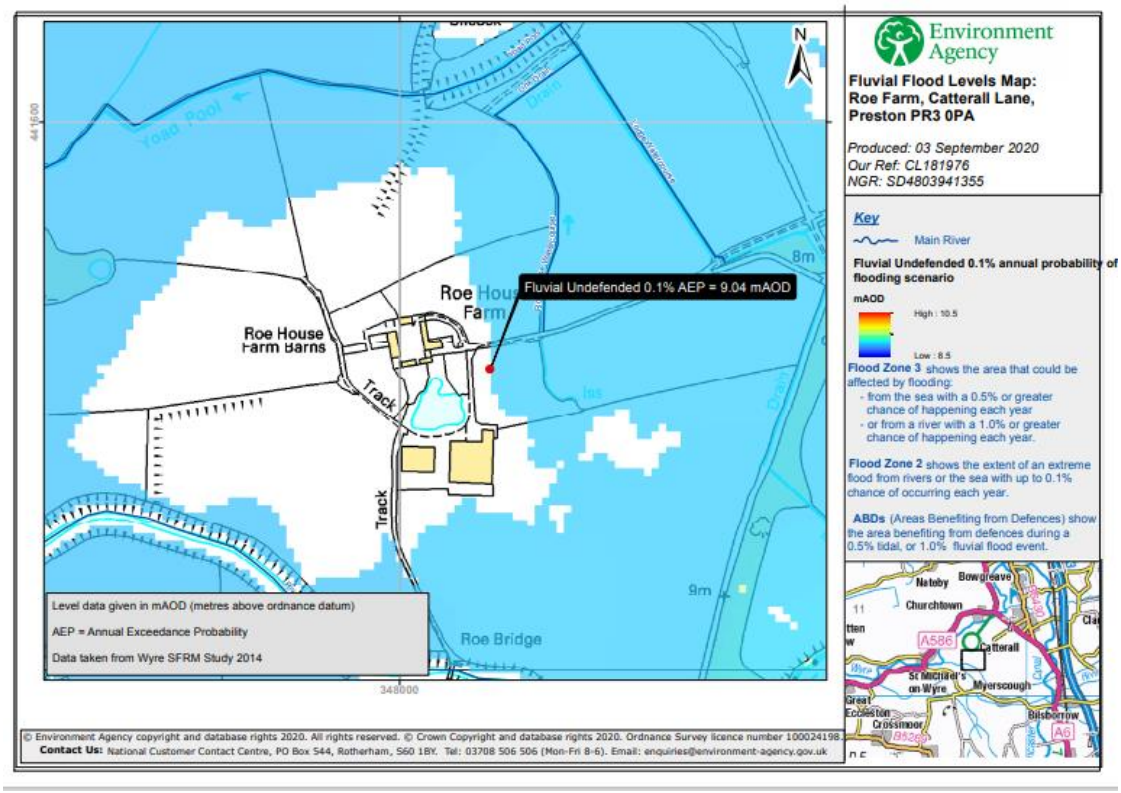
The fluvial undefended scenario has a 1 in 100 annual probability. The site for the application is outside of modelled levels in this scenario fall within the low range of 8.78 mAOD, With CC Allowance (plus 84mm) equates to 9.62 mAOD. This is below the existing site levels of 11 mAOD and therefor the proposal is free from flood risk in this scenario.

Fluvial Undefended 1% plus Climate Change



The fluvial undefended scenario has a 1 in 100 annual probability. The site for the application is outside of modelled levels in this scenario fall within the low range of 8.85 mAOD, With CC Allowance (plus 84mm) equates to 9.69 mAOD. This is below the existing site levels of 11 mAOD and therefor the proposal is free from flood risk in this scenario.

Fluvial Undefended 0.1%



The flood risk in this scenario has a 1 in 1000 annual probability. The levels fall within the mid-range of the colour value chart and gives a level of 9.04 mAOD. With CC Allowance (plus 84mm) equates to 9.88 mAOD.

Mitigation and Building Design

On review of the product 4 information, the flood risk events related to the building which need to be considered in the building design and resilience measures are as follows: -

- Defended Fluvial Scenario 0.1% modelled level 10.20 mAOD and 11.04 mOD (CC allowance) – potential flood waters between 0 m to 0.3m

In this situation the following resistance and resilience measures are considered suitable: -

· using materials with low permeability to at least 0.3m
· using flood resilient materials (for example lime plaster) and design (raised electrical sockets)
· making sure there's access to all spaces to enable drying and cleaning

Safe access and egress

The site is in an area benefitting from the Environment Agency's flood warning service and the business operators are to be registered to receive free flood warnings when flooding is expected to enable the evacuation of people for a range of flooding events up to and including the extreme event.

CONCLUSIONS & RECOMMENDATIONS

The site lies within Flood Zone 2.

The risk of fluvial flooding arises from the main channels identified on the flood map for planning and flood defence map.

There is no tidal source of flood risk at the site.

The risk of flooding from canals, reservoirs and other sources is low.

The flood risk from groundwater is low.

The risk from sewer flooding and pluvial runoff is low.

Development drainage will not change the flood risk up stream or downstream of this location and as the impact of surface water flow from the site will be mitigated with minimal effect to the surrounding area, the risk of flooding from the development drainage is low.

To protect the development the following mitigation measures are to be implemented:

- Using materials with low permeability to at least 0.3m
- Using flood resilient materials (for example lime plaster) and design (raised electrical sockets)
- Making sure there's access to all spaces to enable drying and cleaning.
- The building owners are to be registered to receive free flood warnings when flooding is expected to enable the evacuation of people for a range of flooding events up to and including the extreme event.