FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT ON
BEVIS LANE, WISBECH ST MARY

FINAL REPORT

ECL0374/PETER HUMPHREY ASSOCIATES LTD

DATE NOVEMBER 2020

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1.0 INTRODUCTION

This Flood Risk Assessment has been prepared in accordance with National Planning Policy Framework (NPPF) and supporting planning practice guidance (PPG) on Flood Risk and Coastal Change.

In areas at risk of flooding or for sites of 1 hectare or more, developers are required to undertake a site-specific Flood Risk Assessment to accompany an application for planning permission. This Flood Risk Assessment has been produced on behalf of Mr C Williams in respect of a development that consists of nine residential dwellings on Bevis Lane, Wisbech St Mary.

A planning application for the proposed development is to be submitted by Peter Humphrey Associates Ltd.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is situated at Bevis Lane, Wisbech St Mary, Wisbech, PE13 4RR. The National Grid Reference of the site is 54284/30797.

The location of the site is shown on Figure 1.

Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is on the south western side of Bevis Lane, Wisbech St Mary. The site consists of two grassed paddocks to the south east of The Poplars. There are residential dwellings to the south east of the site and agricultural land to the south west. The area of development is approximately 0.40 hectares.

Environment Agency LiDAR data shows that site levels are typically between +1.9m OD and +2.1m OD. The LiDAR shows that there is a depression within the southern part of the site close to Bevis Lane. Within the depression, measuring approximately 25m by 10m, ground levels are +1.5m OD.

The site is in the North Level Internal Drainage Board's (IDB) area. Surface water at the site would naturally drain through soakaway and hence to the IDB drain system. There is a riparian drain opposite the site on the north eastern side of Bevis Lane. The nearest IDB Watercourses is Vicarage Drain which is on the north eastern side of Bevis Lane at the south eastern boundary of the site.

The online British Geological Survey maps indicate that the site is likely to be underlain by Ampthill Clay Formation mudstone. The bedrock is shown to be overlain with superficial deposits of clay and silt.

2.3 Proposed Development

The proposed development consists of nine dwellings. The dwellings will have two storeys. A Site Plan is provided in Attachment 1.

2.4 Local Development Documents

The Fenland Local Development Plan is the adopted Local Plan for the district. Policy LP14 for Responding to Climate Change and Managing the Risk of Flooding in Fenland states the requirements for flood risk reduction.

The Fenland Level 1 Strategic Flood Risk Assessment (SFRA) was prepared in 2011. A Level 2 SFRA was prepared for Wisbech in 2012.

The Cambridgeshire Flood and Water Supplementary Planning Document has been prepared by Cambridgeshire County Council (as the Lead Local Flood Authority) in conjunction with the other Cambridgeshire local planning authorities and other relevant stakeholders to support the implementation of flood risk and water related policies.

2.5 Available Flood Risk Information

Part of the site is located within Flood Zone 3, an area with a high probability of flooding, of the Environment Agency Flood Maps for Planning as shown in Figure 2.

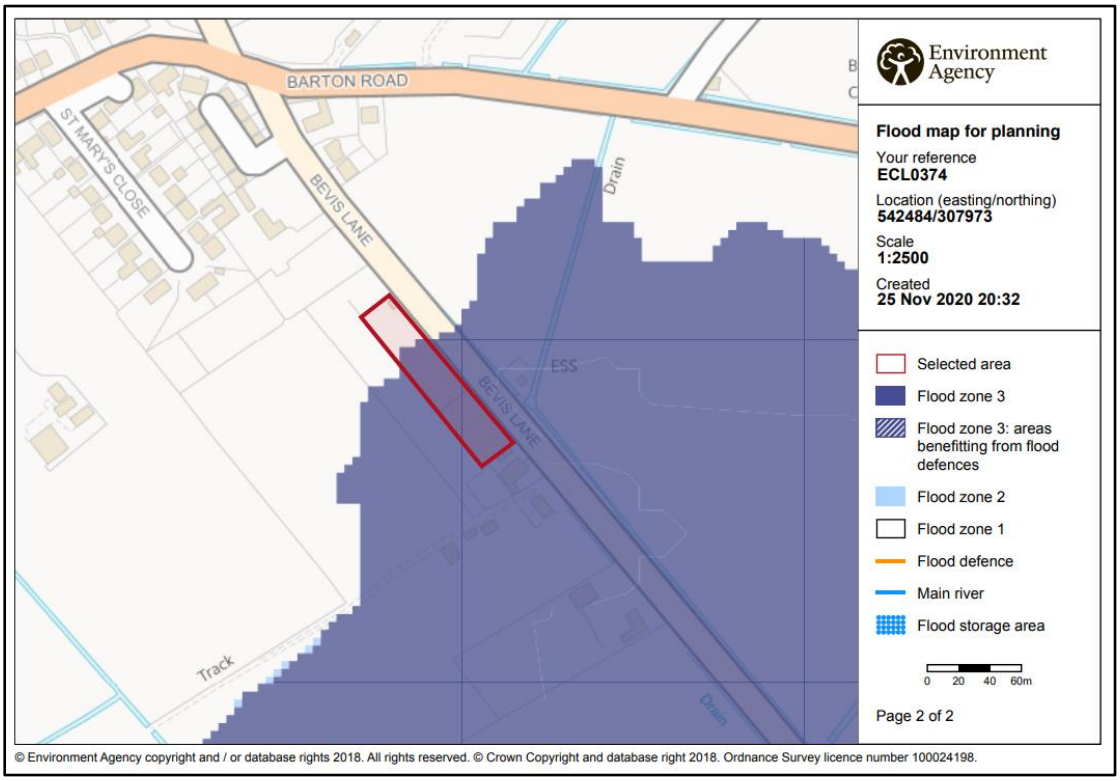


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the risk of flooding from rivers or the sea ranges from very low (annual probability less than 0.1% to medium (annual probability between 1% and 3.3%);
- part of the site has a low risk (annual probability between 0.1% and 1%) of surface water flooding; and
- the site is not within an area at risk of reservoir flooding.

The site is outside the study boundary of the Wisbech Level 2 SFRA however the location and risk of flooding is shown on the SFRA maps. The maps show:

- the Breach Depth Map for the 2115 0.5% annual probability (1 in 200 chance each year) event shows that the site is not at risk;
- the Overtopping Depth Map for the 2115 0.5% annual probability (1 in 200 chance each year) event shows that the site is not at risk; and
- the Surface Water Flood Map for the 0.5% annual probability (1 in 200 chance each year) event shows that part of the site is at risk of surface water flooding with depths between 0.1m and 0.3m.

3.0 FLOOD RISK VULNERABILITY

3.1 The Sequential and Exception Test

The NPPF requires the application of a Sequential Test to ensure that new development is in areas with the lowest probability of flooding.

The Exception Test is a method to demonstrate and help ensure that flood risk to people and property will be managed, while allowing necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available.

3.2 Vulnerability Classification

Table 2 of the PPG Flood Risk and Coastal Change categorises different types of uses and development according to their vulnerability to flood risk. The proposed develop is covered by the description of buildings used for dwellings and is classified as 'More Vulnerable'.

Table 3 of the PPG Flood Risk and Coastal Change sets out Flood Risk Vulnerability and flood zone 'compatibility'. The site is in Flood Zone 3 and the development is 'More Vulnerable' therefore it is necessary to complete the Exception Test.

PPG Flood Risk and Coastal Change defines that the lifetime of the development in terms of flood risk and coastal change is 100 years.

3.3 Application of the Sequential Test and Exception Test

It is for the Local Planning Authority, taking advice from the Environment Agency as appropriate, to consider the Sequential Test.

Large parts of Fenland District in the area around the River Nene lie in Flood Zone 3. The majority of Wisbech St Mary is either in Flood Zone 3 or is at risk on the Environment Agency Breach Hazard Maps. The site is protected by the River Nene tidal defences which were not considered during the preparation of the Environment Agency Flood Maps. When the River Nene tidal defences are considered the actual probability of flooding at the site is low.

Policy LP14 of the Fenland Local Plan states that the completion of the Sequential Test should have regard to the actual and residual flood risks. This Flood Risk Assessment has shown that the actual and residual flood risk are at a level that is the same as Flood Zone 1.

The Cambridgeshire Flood and Water Supplementary Planning Document sets out how the Sequential Test should be undertaken for assessment by the LPA.

Stage A requires determining the geographic area over which the test is to be applied. In most cases this is the settlement within which the development sits. As Wisbech St

Mary has been identified as a Growth Village within the Local Plan the search area considered is the settlement of Wisbech St Mary.

Stage B requires the reasonably available sites to be listed. A review of the development sites currently on the market has identified:

- Bevis Lane – 3 single storey dwellings (F/YR15/0932/PNC04)
- Bunkers Hill – 3 two storey dwellings (F/YR18/1095/0)

Stage C requires obtaining flood risk for the sites and Stage D requires the comparison between the reasonably available sites and the original site. All three sites are defended by the River Nene tidal defences and therefore have a similar level of flood risk. The site that is the subject of this application is partly in Flood Zone 1,2 and 3 and is therefore at a lower level of flood risk that the comparison sites which are entirely within Flood Zone 3.

Stage E requires consideration of whether there any reasonably available sites in areas with a lower probability of flooding. Based upon the assessment undertaken it is not considered that there are any reasonably available sites with a lower probability of flooding and the site is considered to pass the Sequential Test.

The Exception Test requires consideration of the wider sustainability benefits of a development and that the development would be safe and residual risks managed.

The Fenland Local Plan defines the housing distribution for new dwellings across the District. Within the district there is a target of 11,000 new dwellings over the period from 2011 to 2031. The proposed development will contribute to this target and support the rural economy.

Section 5 of this Flood Risk Assessment describes the flood mitigation measures and the management of the residual risks, demonstrating that this development will be safe and not increase flood risk elsewhere. The development is considered to pass the Exception Test.

4.0 SITE SPECIFIC FLOOD RISK

4.1 Local Flood Assets

The site is 1.8km north west of the River Nene tidal defences. The tidal defence at that location consists of a flood embankment at a level of +6.30m OD. This defence is the responsibility of the Environment Agency.

There is a long-term strategy for the maintenance of the Environment Agency defences which is reviewed and updated every 5 years.

There is an extensive local drainage network managed by the North Level IDB. The nearest IDB main drain, Vicarage Drain is on the north eastern side of Bevis Lane at the south eastern boundary of the site. The site is within the Mouth Lane Catchment and the extensive local drainage network drains by gravity to the Mouth Lane Pumping Station. The Mouth Lane Pumping Station discharges to the tidal River Nene.

During the operation and maintenance of its pumping stations, associated structures, and channel systems, the IDB seeks to maintain a general standard capable of providing flood protection to its district. A routine maintenance programme is in place to ensure that the Board's assets are commensurate with the standard of protection that is sought.

Current maintenance standards of the North Level IDB and the Environment Agency's defences are generally good.

4.2 Sources of Flooding

The potential sources of flooding that have been identified during this assessment are:

- surface water flooding;
- local blockages to the IDB main drain system;
- an event in the local drainage network that exceeds the standard of protection;
- failure of Mouth Lane Pumping Station; and
- overtopping and/or breaching of the River Nene tidal defences.

4.3 Probability of Flooding

The Environment Agency Long Term Flood Risk Maps indicate the probability and depth of surface water flooding. During medium risk (annual probability 1%) events the site is not at risk of flooding.

The probability of flooding associated with blockages in the North Level IDB drainage system is low due to the maintenance standards already achieved and managed by the IDB.

The standard of drainage provided by North Level IDB is assessed at 2% annual probability (1 in 50 chance each year), compatible with the Department of the

Environment, Food and Rural Affairs (DEFRA) target level of service for rural drainage and flood defence works. The risk associated with flooding due to events greater than 2% annual probability (1 in 50 chance each year) is lowered due to the North Level IDB main drains incorporating freeboard. This provides storage during events greater than 2% annual probability (1 in 50 chance each year).

The River Nene tidal defences provide protection during the 1% annual probability (1 in 100 chance each year) fluvial event and the 0.5% annual probability (1 in 200 chance each year) tidal event. The 0.5% annual probability (1 in 200 chance each year) tide level in Wisbech is +5.78m OD. The flood level within the River Nene adjacent to the site would be less than +5.78m OD.

4.4 Historic Flooding

During the preparation of this assessment, no evidence was discovered of the site being flooded.

4.5 Climate Change

Climate change is likely to impact the site through increased rainfall intensity and duration affecting the local drainage network and flood levels in the River Nene.

An estimate of the 1% annual probability (1 in 100 chance each year) surface water event with an allowance for climate change can be made from the 0.1% annual probability (1 in 1000 chance each year) event. The extent and depths of flooding during the 0.1% annual probability (1 in 1000 chance each year) event are shown in Figure 3.

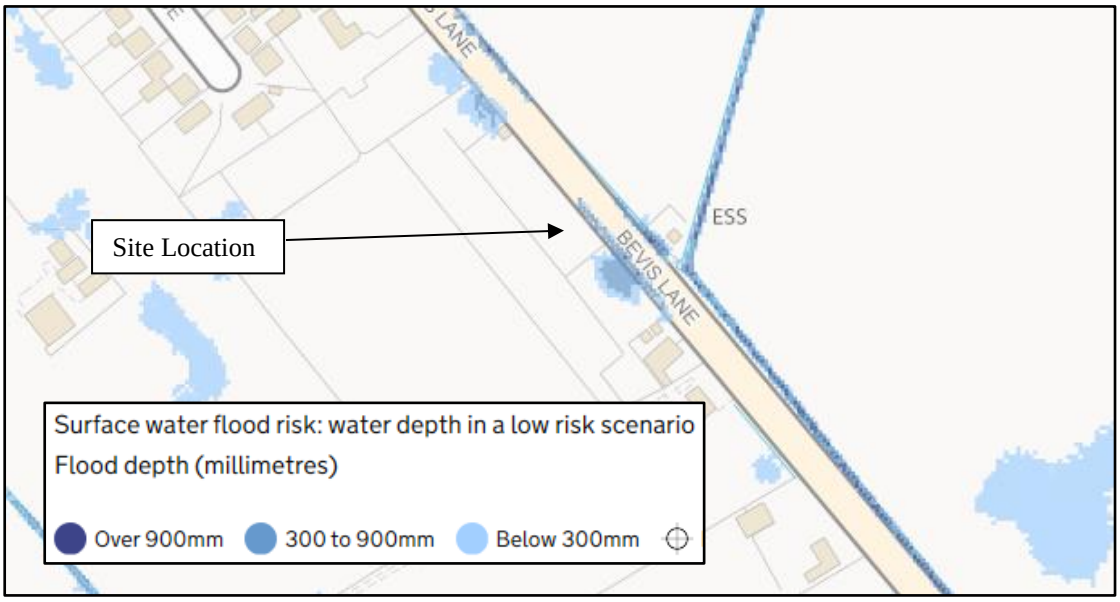


Figure 3 – Environment Agency Surface Water Flood Risk Map – 0.1% Annual Probability

The Surface Water Flood Map in Figure 3 shows that an area within the site is at risk with flood depths between 0.3m and 0.9m. This area at risk is the depression

identified in the terrain data where ground levels are approximately 0.5m below typical site levels.

The River Nene tidal defences are lower than the estimated tide level during the 0.5% annual probability (1 in 200 chance each year) event inclusive of the effects of climate change. The Cradge Bank between the tidal River Nene and the Whittlesey Washes is at a level of +4.5m OD. Water levels in the tidal River Nene above +4.5m OD will be discharged into the Whittlesey Washes. Consequently, the tide level in the River Nene close to the site is highly unlikely to exceed the defence level of +6.3m OD.

In summary the existing systems and defences are appropriate for the design life of the development (i.e. 100 years).

4.6 Residual Risk

There is a residual risk to the land around the tidal River Nene if there was a breach of the tidal defences. The SFRA included a Breach Depth Map for the 2115 0.5% annual probability (1 in 200 chance each year) event. An extract from this map is shown in Figure 4. The site is outside the area at risk.

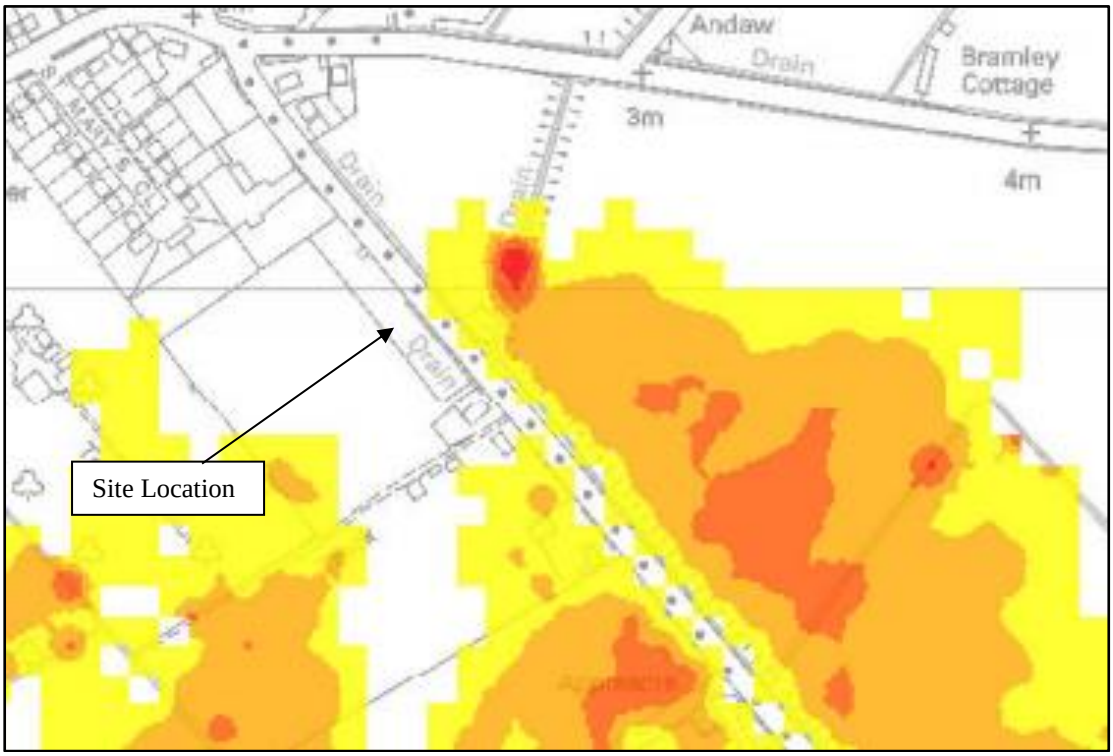


Figure 4 – Breach Depth Mapping 0.5% annual probability (1 in 200) – 2115

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

There is a local depression within the site that is at risk of surface water flooding. The probability of this development flooding from localised drainage systems is low. Failure of Mouth Lane Pumping Station would increase the level of risk at the site.

The probability of the site flooding from any Environment Agency system is less than 0.5% annual probability (1 in 200 chance each year) because of the standards of the existing flood defence systems. Over time there will be a gradual increase in risk to the site due to climate change. During the design life of the development it is not anticipated that the site would flood.

The proposed arrangement increases the impermeable area so there will be an increased volume of surface water. This has the potential to increase flood risk.

5.2 Mitigation Measures

The site has a low 'actual risk' of flooding. Based upon the information available during the preparation of this flood risk assessment, it is recommended that the floor levels of the proposed dwellings are 0.3m above typical ground level at the site with 0.3m of flood resilient construction above finished floor level.

The developer should ensure that the eventual occupiers of the dwellings are sufficiently aware of the risk of flooding, and the standard of the existing defences. The Environment Agency provides a Flood Warning Service which includes Flood Warning Codes and uses direct warning methods where the risks and impacts of flooding are high.

In addition to direct and indirect flood warnings, the Environment Agency operates a 24 hour a day Floodline Service providing advice and information on flooding. The occupiers of the dwellings should register with the Floodline Direct Warnings Service to receive any future flood warnings.

Failure of Mouth Lane Station may occur due to mechanical breakdown or power supply being disrupted. However, in these circumstances, if conditions were such to put properties and land at risk of flooding, the IDB would take emergency action to maintain the drainage level of service by utilising temporary pumping equipment.

It is recommended that surface water run-off is managed so that water from the site will not affect any adjoining properties or increase the flood risk elsewhere.

6.0 CONCLUSIONS AND RECOMMENDATIONS

As a result of the assessment, the following conclusions have been reached.

- The proposed development consists of nine residential dwellings on Bevis Lane, Wisbech St Mary.

- The proposed development is in a defended floodplain. It is in the floodplain of the tidal River Nene which has defences to protect against the 0.5% annual probability (1 in 200 chance each year) event. During the design life of the development, including an allowance for climate change, it is not anticipated that there would be flooding at the site.

- The site is located within an IDB catchment with a minimum standard of drainage of 2% annual probability (1 in 50 chance each year) which accords with DEFRA guidelines for rural development. The risk of flooding is lowered further due to the North Level IDB main drains incorporating freeboard. This provides storage during events greater than 2% annual probability (1 in 50 chance each year).

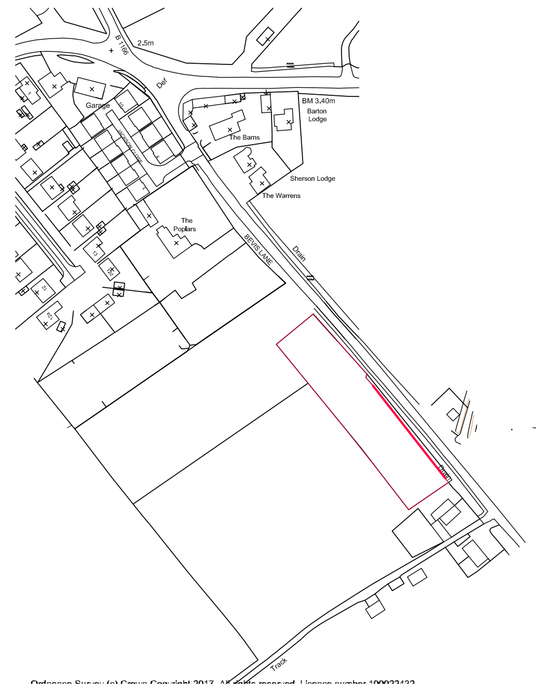
- It is recommended that the finished floor level of the dwellings is 0.3m above the typical ground levels with 0.3m of flood resilient construction above finished floor level.

- The development passes the Sequential Test and Exception Test and is therefore suitable for the proposed location.

ATTACHMENT 1

PLANNING DRAWING
(Dwg 6229-PL01)

SITE PLAN 1:500



LOCATION PLAN 1:2500

Peter Humphrey Associates Ltd.
ARCHITECTURAL DESIGN AND BUILDING

PROJECT
PROPOSED DEVELOPMENT

SITE
BEVIS LANE
WISBECH ST MARY

DRAWING
PLANNING

CLIENT
MR C WILLIAMS

DATE OCT 2020 SCALE As Shown JOB No. 6229-PL01

DO NOT SCALE FROM THIS DRAWING

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Building Design Awards
Category Winner 08,09,10
Overall Winner 2010