FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
35 FLEET ROAD, HOLBEACH

FINAL REPORT

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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 Shayne Andrews Design and Architecture Ltd in respect of a development that consists of seven dwelling at 35 Fleet Road, Holbeach.

A full planning application for the proposed development is to be submitted by Shayne Andrews Design and Architecture Ltd.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is located at 35 Fleet Road, Holbeach, PE12 8LA. The National Grid Reference of the site is 53725/32500.

The location of the site is shown in Figure 1.

Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is currently an undeveloped area of land to the rear of 35 and 37 Fleet Road, Holbeach. The area is predominantly grass with some outbuildings. The area of development is approximately 0.21 hectares.

A topographic survey of the site has been undertaken. The site is flat and ground levels within the site vary between +3.5m OD and +3.7m OD. Fleet Road in the proximity of the site is at a level of +3.65m OD.

The site is in the South Holland Internal Drainage Board (IDB) District. The site and the surrounding land are within the Lutton Leam catchment and drain in an easterly direction to discharge to the tidal River Nene at Lutton Leam Outfall Sluice.

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 seven new dwellings. The dwellings will be two storey and will be accessed from the existing driveway on to Fleet Road. The existing outbuildings will be demolished.

2.4 Local Development Documents

The South East Lincolnshire Local Plan 2011 – 2036, adopted in March 2019, is the Local Plan for the district. Policy 4: Approach to Flood Risk states the requirements for flood risk reduction.

The South East Lincolnshire Level 1 and Level 2 Strategic Flood Risk Assessment (SFRA) was prepared in June 2017.

The Joint Lincolnshire Flood Risk and Drainage Management Strategy has been prepared by Lincolnshire County Council as the Lead Local Flood Authority. The purpose of the Strategy is to increase the safety of people across Lincolnshire by reducing the number of people at risk of flooding, increasing the resilience of local communities and reducing the impact of flooding

2.5 Flood Zones

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.

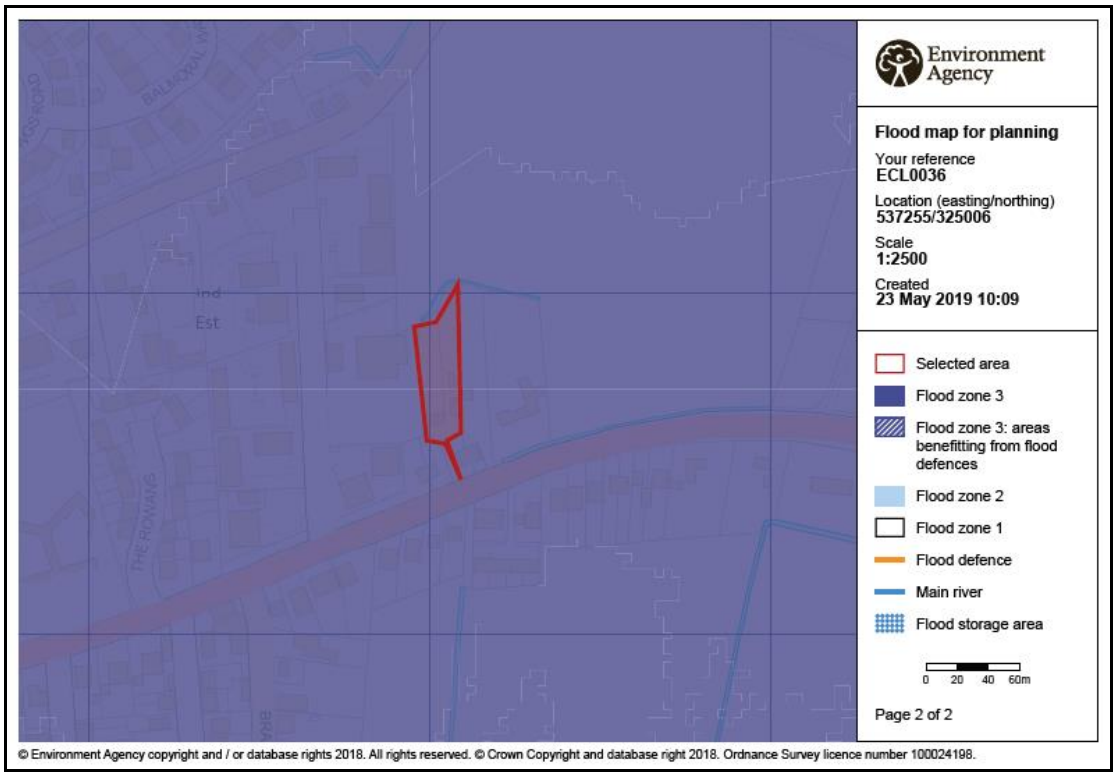


Figure 2 – Environment Agency Flood Map for Planning

Within the South East Lincolnshire SFRA:

- the Residual Flood Hazard Map for the present day 1% fluvial and 0.5% tidal event shows that the site is outside of the 'low hazard' area;
- the Residual Flood Hazard Map for the 2116 1% fluvial and 0.5% tidal event shows that the site is in an area of 'low hazard';
- the Residual Peak Depth Map for the present day 1% fluvial and 0.5% tidal event shows that the site is not within an area of flooding; and
- the Residual Peak Depth Map for the 2116 1% fluvial and 0.5% tidal event shows that at the site the peak depth of flooding is up to 0.25m.

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 development 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 and Exception Test

The Sequential Test and Exception Test are required to be applied by the Local Planning Authority.

Large parts of the South Holland district between the River Welland and River Nene lie within Flood Zone 3. As such it is not possible to undertake the development at an alternative site with a lower flood risk. At this location it is not possible to position the development on higher ground within the proposed site.

The SFRA states that as it is necessary to use the refined flood risk information (hazard and depth maps) to assist with the application of the sequential test. The refined flood risk information contained within the SFRA demonstrates the site is not at risk during the present day 1% fluvial and 0.5% tidal event. The site therefore has a low probability of flooding and 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 Local Plan has a target of a net increase of at least 11,681 dwellings in South Holland over the 25 year local plan period. The Plan considers this new housing is required to ensure the sustainability of the Local Plan area. The proposed development will contribute to this target. Section 5 of this Flood Risk Assessment

describes the flood mitigation measures and the management of the residual risks. The development is considered to pass the Exception Test.

4.0 SITE SPECIFIC FLOOD RISK

4.1 Local Flood Assets

The South Holland IDB district is protected by the Wash tidal defences along the Holbeach Marsh frontage with embankment levels at a minimum of +7.0m OD. The Wash tidal defences are approximately 10km from the site. The River Nene tidal defences are approximately 12km to the east of the site. The River Welland tidal defences are approximately 9 km to the north west of the site. All three defences are 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 South Holland IDB. There is an IDB High Priority Watercourse that runs on the northern side of Fleet Road. Adjacent to the site this watercourse is culverted and considered a High Priority Pipeline by the IDB. The site and surrounding land are part of the Lutton Leam catchment and drain in an easterly direction to discharge to the tidal River Nene at Lutton Leam Outfall Sluice.

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 Boards assets are commensurate with the standard of protection that is sought.

Current maintenance standards of the South Holland Internal Drainage Board and the Environment Agency are generally good.

4.2 Sources of Flooding

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

- local blockages to the South Holland Internal Drainage Board main drain system;
- an event in the local drainage network greater than 2% annual probability (1 in 50 chance each year);
- failure of Lutton Leam Outfall Sluice; and
- overtopping and breaching of the Wash, River Nene or River Welland tidal defences.

4.3 Probability of Flooding

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

The standard of drainage provided by South Holland 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 South Holland IDB high priority watercourses incorporating a freeboard. This provides storage during events greater than 2% annual probability (1 in 50 chance each year).

The Environment Agency Long Term Flood Risk Maps show that part of the site has a low risk of flooding from surface water. Flood depths up to 0.3m can occur in low risk areas.

The site is within an area benefitting from defences. The flood embankments to the Wash and the River Nene and River Welland tidal defences provide protection during a 0.5% annual probability (1 in 200 chance each year) event. The flood risk from the Wash is lowered further by second line defences and various informal banks constructed during the reclamation of Holbeach Marsh.

4.4 Historic Flooding

During the preparation of this assessment, no evidence was discovered of the site being flooded. Previous historic rainfall events of 1968 and 1978, estimated to be greater than 1% annual probability (1 in 100 chance each year), caused no flooding to any residential properties.

4.5 Climate Change

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

The tidal flood level during the 0.5% annual probability (1 in 200 chance each year) event inclusive of climate change to 2115 is estimated to be 7.2m AOD. The minimum defence level of the Wash, River Nene and River Welland embankments is 7.0m AOD. There is a low risk during such an event for wave and wind action to cause overtopping and/or breaching of the tidal defences. However, the second line defences with embankment levels of 6.0m AOD would further reduce the probability of flood water reaching the development site. This level of risk is confirmed by the SFRA.

The South East Lincolnshire SFRA includes maps demonstrating the impact of climate change in 2116. The Residual Peak Depth maps within the SFRA indicate the maximum flood depths associated with a breach of the tidal defences. These show that when the climate change allowances are applied to the combination of a 1% annual probability (1 in 100 chance each year) fluvial event and a 0.5% annual probability (1 in 100 chance each year) tidal event the peak depth at the site would be 0.25m. An extract from this map is shown in Figure 3 below.

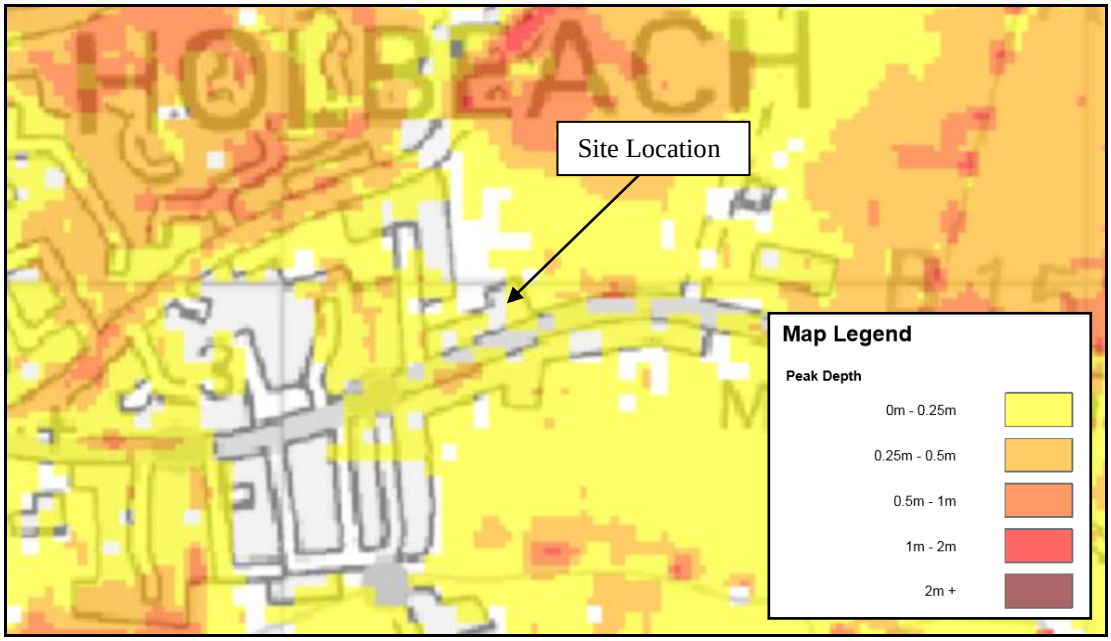


Figure 3 – SFRA 2116 Residual Peak Depth Map

5.0 FLOOD RISK MITIGATION AND RESIDUAL RISKS

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Lutton Leam Outfall Sluice could occur due to long term mechanical breakdown or power supply being disrupted.

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 defences. During the design life of the development the peak flood depth at the site could be 0.25 m.

There is a low level of surface water flood risk which could lead to flood depths up to 0.3m. The proposed arrangement increases the impermeable area and therefore there will be an increased volume of surface water that has the potential to increase flood risk.

Over time there will be a gradual increase in risk to the site due to climate change.

If during extreme events, levels of floodwater rose to such an extent that the site was affected, the situation would not be sudden.

5.2 Mitigation Measures

Based upon the information available during the preparation of this flood risk assessment, in order to mitigate against the remote risk of flooding it is recommended that the floor level of the dwellings are 0.3m above ground levels with 0.3m of flood resilient construction above finished floor level.

It is recommended that surface water run-off is discharged to soakaways to BRE365 design requirements and therefore water from the site will not affect any adjoining properties or increase the flood risk elsewhere.

Should there be a failure of the Lutton Leam Outfall Sluice and conditions were such to put properties and land at risk of flooding, the Internal Drainage Board would take emergency action to maintain the drainage level of service by utilising temporary pumping equipment.

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.

5.3 Residual Risks

The residual risk at the site from extreme events is low because of its location within the South Holland IDB district and the protection provided by the defences to the Wash and River Nene and River Welland.

In the extreme event that leads to inundation at the site, further protection will be provided by the floor levels of the dwellings being 0.3m above ground levels with 0.3m of flood resilient construction above finished floor level.

6.0 CONCLUSIONS AND RECOMMENDATIONS

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

- The proposed development is in a defended floodplain. It is in the floodplain of the Wash, River Nene and River Welland tidal defences and protected during the 1% annual probability (1 in 100 chance each year) fluvial event and 0.5% annual probability (1 in 200) tidal event. During the design life of the development, including an allowance for climate change, the peak flood depth at the site from fluvial and tidal sources is 0.25m.

- The site is located within an Internal Drainage Board 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 South Holland IDB high priority watercourses incorporating a significant freeboard. This provides storage during events greater than 2% annual probability (1 in 50 chance each year).

- The Environment Agency Long Term Flood Risk Maps show that there is a low risk of surface water flooding at the site with potential flood depths up to 0.3m.

- It is recommended that the floor level is 0.3mm above ground level with 0.3m of flood resilient construction above finished floor level to mitigate against a breach of the defences. Surface water run-off from the development should be discharged to soakaways to BRE365 design requirements so that adjoining land and properties are not affected.

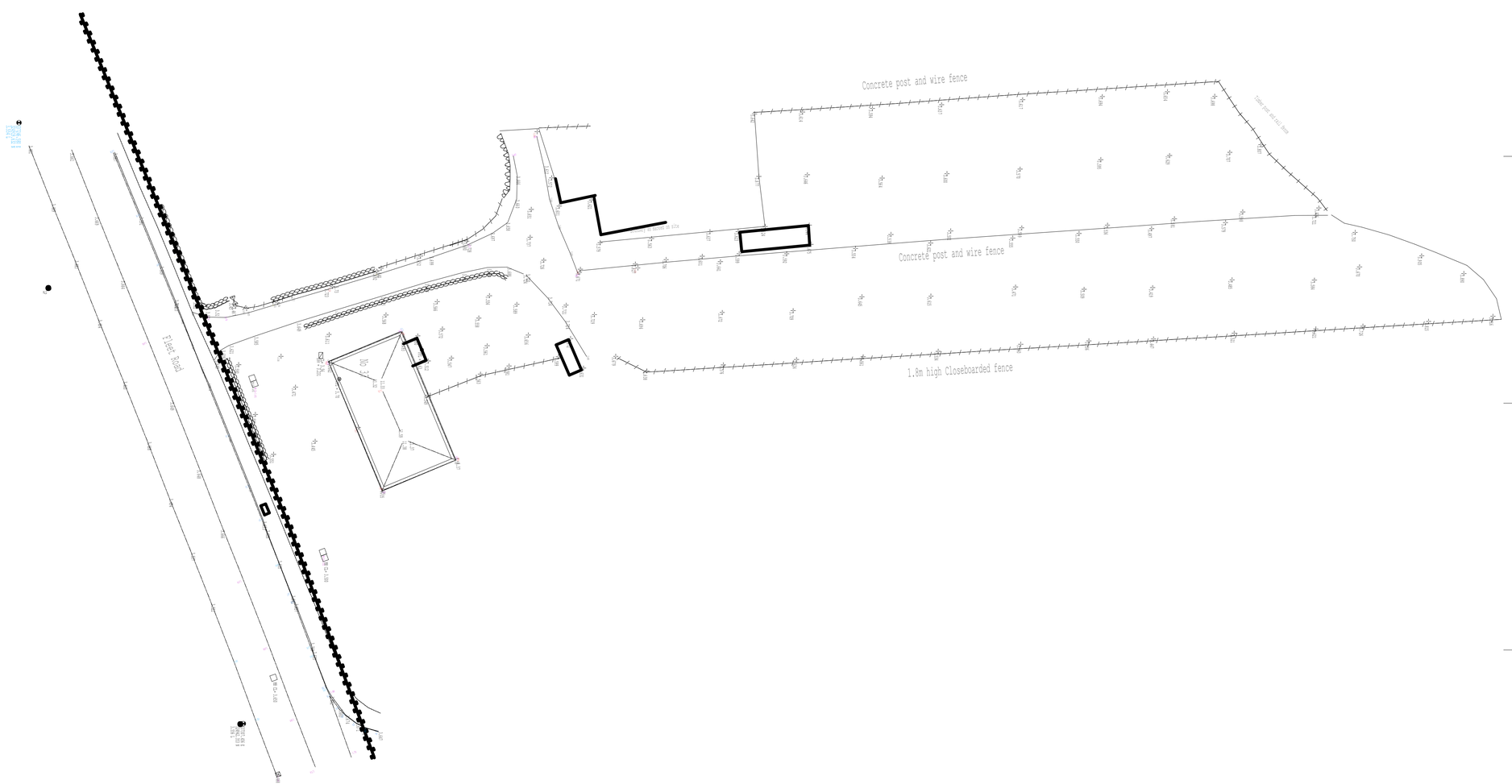
- The development passes the Sequential Test and Exception Test and is therefore suitable for the proposed location.

ATTACHMENT 1

TOPOGRAPHIC SURVEY

Survey undertaken to O.S grid and datum using Leica Smartnet to OSTN15

Date of survey 21st February by Prism Surveys Ltd



Topographical Survey of land to
the rear of
37 Fleet Rd Fleet Holbeach
for Gem Mix Holdings

Scale 1:250 @ A1