

PROPOSED DEVELOPMENT ADJACENT TO CAERLEON, FOXES
LOWE ROAD, HOLBEACH, PE12 7PA
FLOOD RISK ASSESSMENT



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This flood risk assessment has been prepared solely to support the planning application for a development at Foxes Lowe Road, Holbeach. The author has made every effort to provide an accurate assessment of the flood risk but accepts no liability should the information be found to be incorrect or incomplete.

Introduction

This Flood Risk Assessment (FRA) is written to support a planning application for the construction of a new dwelling immediately north of Caerleon, Foxes Lowe Road, Holbeach, Spalding. The proposed building plot is at present used as a garden area alongside the existing house.

The site is within Flood Zone 3(a) as high probability having a 1 in 200 year or greater annual probability of tidal flooding from the River Welland, as shown on the Environment Agency's (EA) Flood Zone map. These maps do not take into account existing flood defences.

The Planning Application requires a flood risk assessment to be carried out as required in the Technical Guidance to the National Planning Policy Framework (NPPF) Development and Flood Risk. The site is within a defended area as specified on the South Holland District Council's Strategic Flood Risk Assessment (SHDC SFRA) map and is located in the South Holland Internal Drainage Board District.

Application Site

The site is located on the north eastern outskirts of Holbeach approximately 1 km north west of the centre of Holbeach and is 200 metres south of the A17 By Pass of the town. It is 8.0 km from the tidal section of the River Welland near Fosdyke Bridge. The National Grid Reference of the site is 537210 325190, and the extent of the site is shown on the plan at the end of this document.

The proposed development is within Flood Zone 3(a) "High Probability" as detailed on the Environment Agency's flood zone maps without defences, as defined in Table 1 of the Technical Guidance to the National Planning Policy Framework. Applying the flood risk vulnerability classification in Table 2 of the Guidance the development is classified as "more vulnerable" and the Table 3 states that the development of a new dwelling requires the sequential and exception test to be considered.

Sequential Test

As the proposed development is located in Flood Zone 3(a) the NPPF requires the sequential test to be applied to determine if there are any reasonably available and suitable alternative sites for this type of development. This site may be considered as a windfall site and there may be some others available in Holbeach. However they are unlikely to have a lower flood risk than the site proposed, as the whole of this area is within Flood Zone 3(a), is at a similar level or lower and therefore will have at least the same flood risk. The land levels of this location are higher than most of the most recent developments that have been carried out in Holbeach

Exception Test

For the Exception Test to be passed:

- a) It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a SFRA;
- b) The development should be on developable previously developed land or, if not, it must be demonstrated there is no such alternative land available; and
- c) A FRA must demonstrate that the development will be safe, without increasing flood risk elsewhere, and, where possible, reducing flood risk overall.

All three parts of this test must be satisfied in order for the development to be considered appropriate in terms of flood risk. There must be robust evidence in support of every part of the test.

Section (a) and (b) will be demonstrated by the planning approval.

This flood risk assessment will demonstrate that Section (c) is passed.

Strategic Flood Risk Assessment

Consultants have produced a Strategic Flood Risk Assessment (SFRA) for the South Holland District Council (SHDC). This document provides details of the flood risk in the Council's area. Reference to the maps in this document give the following information for the flood risk and hazard at the site for the 1% fluvial event and 0.5% tidal event.

Actual Peak Depth	Present day	Zero
	Year 2115	Zero
Actual Risk Extent	Present day	Low to medium risk, but reliant on flood defences
	Year 2115	
Actual Peak Velocity	Present day	No velocity
	Year 2115	No velocity
Residual Peak Depth	Present day	Zero
	Year 2115	Zero
Residual Risk Extent	Present day	Low to medium risk, reliant on flood defences
	Year 2115	Low to medium risk, reliant on flood defences
Residual Peak Velocity	Present day	No velocity
	2115	No velocity

Figure 16 of the general maps show that the site is not within the rapid inundation zone.

Tables in the SFRA show the following details of the predicted extreme tide levels and earth defence bank levels on the east side of the tidal section of the River Welland near Fosdyke Bridge, between chainages 13.5km and 14.5km.

	2007	2055	2115
Peak 1 in 200 year extreme tide level	5.99m OD	6.32m OD	7.13m OD
Peak 1 in 1,000 year extreme tide level	6.28m OD	6.61m OD	7.42m OD

With an average defence crest levels of between 7.34 and 7.65 m OD the average freeboards are as follows:

	2007	2055	2115
Peak 1 in 200 year freeboard	1510mm	1180mm	370mm
Peak 1 in 1,000 year freeboard	1220mm	890mm	80mm

Tables in the SFRA show the following details for the defence bank on the east side of the Coronation Channel between chainage 0 km and 2.0 km.

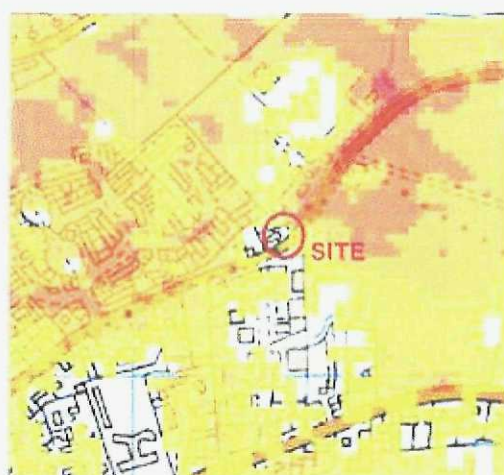
	2007	2115
Peak 1 in 100 year extreme tide level	4.32m OD	4.69m OD
Peak 1 in 1,000 year extreme tide level	4.34m OD	4.69m OD

The bank levels on this section vary between 5.35m OD and 6.0m OD. Therefore it can be seen there is a minimum freeboard of 650mm to the predicted design maximum levels in 2115.

Information from Environment Agency

The latest Environment Agency maps were issued after the latest amendment to the SFRA and give information on predicted flood depths ensuing if overtopping or breaching of the tidal defences occurs. Modelling has been carried out for 1 in 200 year and 1 in 1000 year events, both for the present day and 2115 allowing for climate change.

No flooding is predicted at the site in the present day, and the maps indicate no flooding in the 1 in 200 year or the 1 in 1000 year event in 2115. Extracts of the predicted flood depths in 2115 are shown below.



1 in 200 years



1 in 1000 years

Site Levels

The existing ground levels on the site are shown on page 10 of this report. The general ground level of the plot where the house is to be built is between 3.90m and 4.00m OD. The floor level of the existing house is approximately 3.85m OD, and the level of Foxes Lowe Road in front of the site is approximately 3.78m OD. It is proposed that the new building should have a floor level of 4.20m OD.

Existing Flood Alleviation Measures

The site is within a defended flood plain, as defined in Appendix 1 of the Environment Agency's "Policy and Practice for the Protection of Flood Plains", which is considered to be passive until such time that a flood greater than the defences can withstand occurs. The likelihood of flooding occurring due to overtopping or failures of the defences is considered to be very low.

The site is located approximately 8.0 km from the tidal section of the River Welland east of Fosdyke, 10.0km from the banks of the Wash north of the site near Holbeach St Matthew, 10.5km from the embanked Coronation Channel at Spalding and 12.5km from the banks of the River Nene near Sutton Bridge.

Potential Sources of Flooding

The potential sources of flooding to the site are:-

1. Failure or overtopping of tidal defences of the River Welland
2. Failure or overtopping of tidal defences of the Wash
3. Failure or overtopping of the banks of the Coronation Channel
4. Failure or overtopping of tidal defences of the River Nene
5. Overtopping or blockages in Foxes Lowe Drain (IDB).
6. Failures of IDB assets
7. Blockages or problems in local surface water or sewerage systems

1. Failure or overtopping of tidal defences of River Welland

As shown above, the east bank of the River Welland, which is approximately 8.0 km from the site, provides at a 1 in 200 year standard of protection in 2115. The maps in the SFRA indicate that there is no risk of flooding on the site in a 1 in 200 year flood in 2115. The latest EA flood maps indicate that there will be no flooding to the site in the 1 in 200 or 1 in 1000 year event in 2115.

2. Failure or overtopping of tidal defences of the Wash

The banks of the Wash, which are 10.0km north of the site, provide a 1 in 200 year standard of protection in 2115. The latest maps provided by the EA indicate that there will be no flooding to the site in the 1 in 200 or 1 in 1000 year event in 2115.

3. Failure or overtopping of the banks of the Coronation Channel

The banks of the Coronation Channel are 10.5km west of the site. The maximum design level of in the Channel is 4.69m OD and even if flood water flowed as far as Holbeach the level would be below 4.20m OD which is the proposed floor level of the property. Therefore this source can be discounted.

4. Failure or overtopping of tidal defences of the River Nene

The banks of the River Nene are 12.5 km east of the site. The predicted levels in the SFRA indicate that the west bank of the River Nene between the bridge and the outfall will not be overtopped unless there is an event greater than 1 in 1000 years at the present time. However in 2115 although it will not be overtopped in a 1 in 200 year event, it will be overtopped in a 1 in 1000 year event. However the risk of the site being affected by this source is extremely low as it is 12.5km from the banks, and lower land would be affected before the development site.

5. Overtopping or blockages in Foxes Lowe Drain (IDB).

The water level in the internal dykes and drains in this area is controlled by a pumping station 1 mile north of the A17 on Holbeach Bank. This pumping station pumps water into the Holbeach River which flows north and outfalls into the tidal River Welland at Sluices north of Fosdyke which control the flow. Both of these assets are operated by South Holland IDB, who advise that the standard of protection of the Holbeach New River, which is a high priority watercourse, is between 1 in 75 years and 1 in 100 years working on a 300mm freeboard. The IDB continues to review the standard of protection it provides and will in the future make adequate improvements to ensure there is still the same standard of protection in 2115.

6. Failures of IDB assets

All major drains in the area are maintained by the South Holland IDB who have a regular maintenance programme. The normal water level in the IDB drain north of the site is 1.72m OD, approximately 2.2 metres below the land level of the development site. Even if a large blockage occurred in some part of the drainage system the water level is unlikely to reach 4.2m OD, the proposed floor level of the development because there is a considerable amount of land lower than 3.0m OD which would flood first. Therefore the risk of flooding from this source is extremely low, and can be almost discounted.

7. Blockages or problems in local surface water systems.

There is a possibility that the water or sewerage could flood out onto Foxes Lowe Road if the Anglian Water sewer or the surface water drainage through the gratings were to block up. However this type of flooding in Foxes Lowe Road would not

exceed a depth of 200mm, and would flow northwards where the road is nearly 1 metre lower and find its way into the Foxes Lowe Drain.

Therefore this source of flooding can be discounted.

Extent of known Flooding

During the preparation of this assessment, no evidence was discovered of the site or any of the adjoining properties having been flooded in the last 50 years.

Probabilities and Trends of Flooding

The probability of this development flooding from Environment Agency main river is very low. In an extreme event any effect on this location would not be sudden and there would be time for residents to take precautionary measures to limit the impact of any flooding that may occur.

Residual Risk – Extreme Events

The residual risk from extreme events is very low on this site. The major risk to the site is from a breach or overtopping of the tidal defences

The risk of this happening in this case is low and the hazard from any flooding is also low.

Conclusions

The EA have modelled breaches in banks of all of the tidal rivers and along the frontage of the Wash. The banks are high enough at the present time to prevent overtopping. The latest EA maps indicate that the site will not be affected by tidal flooding in 2115.

The risk of flooding to the building from IDB drains can be considered very low, especially as the proposed floor level is 2.4 metres higher than the normal water level in the Foxes Lowe Drain near the site. In this area the water level is controlled by the pumping station at Holbeach Bank which operates automatically. Even if these pumps failed to operate for a number of days it is very unlikely that the level of any flooding would rise as high as 4.20m OD, the proposed floor level of the development.

The IDB have adequate arrangements to bring in contractors and use their own staff if a failure of any part of the sluices occurred. If drains become full any flooding that occurs would happen very slowly and affect land at levels between 2.50m OD and 3.0m OD before the development site.

The proposed development is not in a functional flood plain as defined by PPS 25.

Although the site is in flood zone 3, and the actual risk of the site flooding from any Environment Agency or IDB watercourse is very low.

If any flooding that did occur it would happen very slowly and residents would have adequate time to prepare themselves for the event.

Recommendations

It is recommended that all new buildings should be designed with all sleeping accommodation located on the first floor. This provides a refuge for occupiers if serious flooding was to occur and ensures occupiers are safe whilst asleep. However the risk of flooding to the site is extremely low.

The ground floor level of the proposed building should be at a minimum level of 4.20m OD, which is between 200mm and 300mm above the existing ground level of the site, and 400mm above the level of Foxes Lowe Road.

Occupiers of the property should register with the Environment Agency's Floodline Warnings Direct Service. The Lincolnshire Resilience Forum has produced a document called the "Multi-Agency Flood Response Plan" that provides a framework by which agencies will respond to a flood emergency. Locally there are flood wardens who will be able to advise residents of the up to date situation.

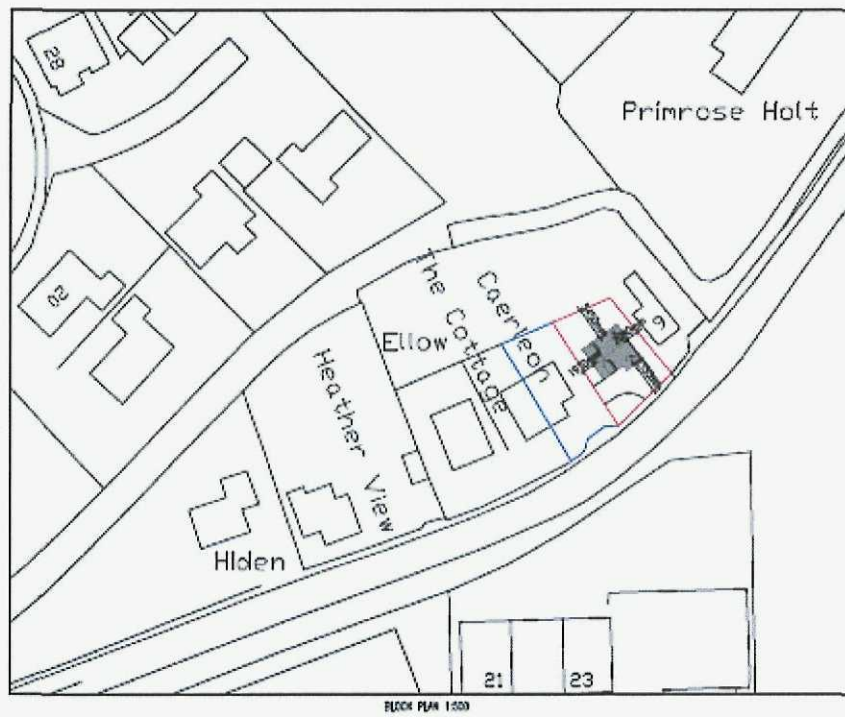
On site surface water drainage should be discharged into soakaways and these should be designed to BRE Digest 363 and approved under Building regulations.

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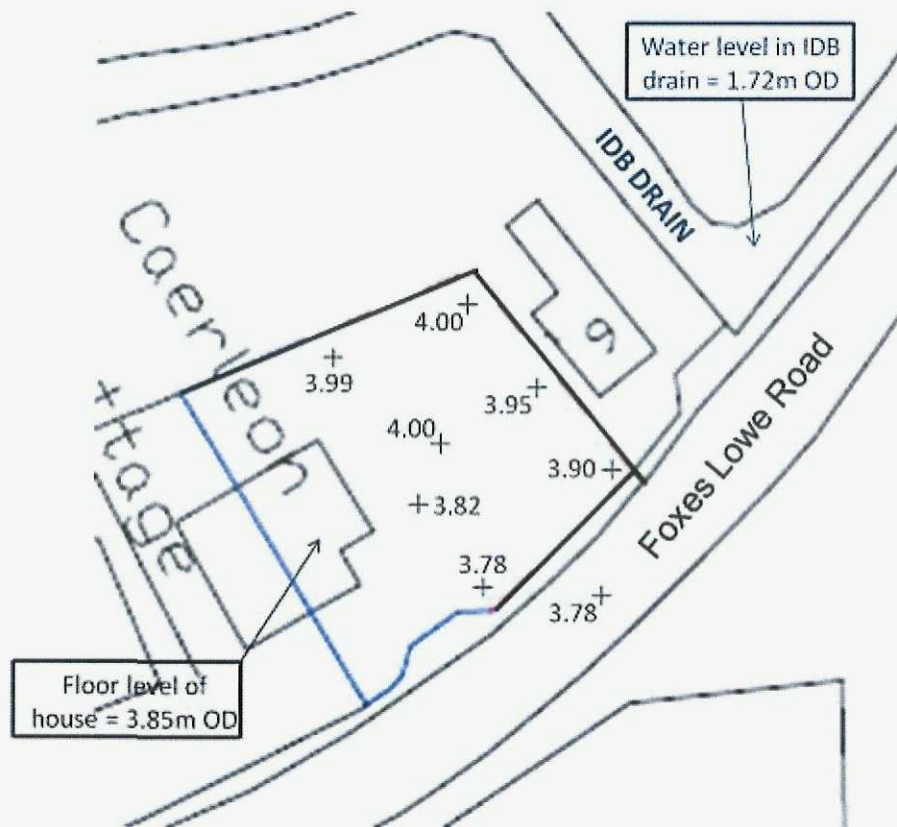
LOCATION PLAN



AREA PLAN



SITE LEVELS



IDB DRAINS

