FLOOD RISK ASSESSMENT

PROPOSED DWELLING ADJACENT TO 76 BOURNE ROAD SPALDING PE11 1JR



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This flood risk assessment has been prepared solely to support the planning application for the proposed dwelling adjacent to 76 Bourne Road, Spalding. 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

An application has been made for Planning Permission to construct a pair of semi detached dwellings on a site west of 76 Bourne Road Spalding, PE11 1RJ.

The site is within Flood Zone 3 as shown on the Environment Agency's Flood Zone Map. These maps do not take into account existing flood defences.

The Technical Guidance to the National Planning Policy Framework Development and Flood Risk states that if a development lies within Flood Zone 3 a Flood Risk Assessment should be carried out to accompany any Planning Application.

The site is shown within the defended area of the South Holland District Council's Strategic Flood Risk Assessment (SHDC SFRA) map and is located in the Welland and Deepings Internal Drainage Board district.

Application Site

The development is located on the western side of the River Welland. The National Grid Reference of the site is 523370 322220.

The location 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.

Applying the flood risk vulnerability classification in Table 2 of the Guidance, the development is classified as "more vulnerable" in Table 3 of the Guidance, which states that residential use is only permitted after the exception test is followed.

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.

Sections (a) and (b) are for the most part demonstrated in the Design and Access Statement, and will be confirmed by the planning authority in their determination of the proposed planning application.

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

Strategic Flood Risk Assessment

The following information about the flood risk to the proposed development has been gained from the maps produced for the South Holland District Council Strategic Flood Risk Assessment:

1. Report Maps

- Map 5 indicates the site to be low or medium risk and protected by flood defences.
- Map 6 indicates the peak depth is zero for the present day 1% fluvial / 0.5% tidal event probability.
- Map 7 indicates the peak velocity is zero for the present day 1% fluvial / 0.5% tidal event probability.
- Map 8 indicates the risk extent is zero for the present day 1% fluvial / 0.5% tidal event probability.
- Map 10 indicates the actual risk extent for the 0.1% event probability is zero.
- Map 12 indicates the actual risk extent is zero.
- Map 13 indicates the 1% fluvial / 0.5% tidal event probability for 2115 for the site is zero.
- Map 14 indicates the actual risk extent for the year 2115 for the 0.1% event probability is zero.
- Map 16 indicates the site is not within a rapid inundation zone.

2. Flood Maps Table D1

- The maps illustrate the actual flood hazard which is as follows:

For the present day	Depth of flooding … zero
	Extent of flooding .. zero
	Hazard …. Nil
	Velocity … Nil
For year 2115	Depth of flooding … zero
	Extent of flooding .. Low or medium flood probability
	Hazard … Nil
	Velocity .. Nil

- The maps also illustrate the residual flood hazard which is as follows:-

  For the present day — Depth of flooding … zero

  Extent of flooding .. Low or medium flood probability

  Hazard … zero

  Velocity .. zero

- For the year 2115 — Depth of flooding … zero

  Extent of flooding .. Low or medium flood probability

  Hazard … zero

  Velocity .. zero

3. The maximum flood levels in the fluvial section of the Spalding Welland is shown in the reports as follows:

	Peak 1 in 100		Peak 1 in 1000	
Year	2007	2115	2007	2115
Level	4.43	4.67	4.45	4.68

The defence level of left bank of Spalding Welland = 5.20m OD

4. The extreme tide levels in the section of the River Welland north of Fulney Lock is shown in the report as follows:

	2007	2055	2115
1 in 100 year	5.98	6.31	7.12
1 in 1,000 year	6.32	6.65	7.46

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The lowest bank level occurs 200 metres north of Fulney Lock, where a section 300 metres long has a minimum level of 6.98m OD.

5. The maximum levels in Vernatts Drain

	Peak 1 in 100		Peak 1 in 1000	
Year	2007	2115	2007	2115
Level	3.92	3.92	3.92	3.92

The bank levels on the south side of Vernatt's Drain vary between 4.30m OD and 4.40m OD.

Site Levels

The level of Bourne Road in front of the site is 4.00m OD. The level of the site is between 1.5 metres and 1.7 metres lower than the road and the adjoining properties. The floor level of No 76 Bourne Road is 3.46m OD and No 78 has a floor level of 3.45m OD. It is recommended that the floor level of the proposed development should be 3.60m 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" and is considered to be passive until such time that a flood greater than the defences can withstand occurs. The likelihood of flooding due to overtopping or failures of the defences is considered to be very low.

The site is approximately 1.3km from the River Welland, which is main river and maintained by the Environment Agency.

This area west of the centre of Spalding is drained by surface water sewers maintained by Anglian Water, which discharge into drainage channels maintained by Welland and Deepings Internal Drainage Board. The water levels in the IDB channels are controlled by the water level in Vernatt's Drain which also is operated by Welland and Deepings IDB.

Potential Sources of Flooding

The following sources of flooding have been identified:

1. Failure or overtopping of the tidal defences.
2. Overtopping of the River Welland.
3. Flooding from Vernatts Drain
4. Flooding from IDB drainage channels
5. Blockages in local surface water sewers (highway or Anglian Water)

1. Failure or overtopping of tidal defences.

The River Welland is tidal north of Fulney Lock, which is approximately 3.2km north of the site. The SFRA states that the defences are adequate to withstand a 1 in 200 year (0.5%) probability event for present day. In the future in 2115 some of the banks could be overtopped with a 0.5% probability event. However one would expect that during the next one hundred years defences will be raised to maintain a 1 in 200 year standard of defence. If overtopping or a breach allowed water to flow westwards from the tidal Welland lower land to the west of the River Welland would be flooded and the central area of Spalding would remain unaffected, unless a high tide of extreme proportions occurred.

The maps in the SFRA indicate that no flooding should occur in a 1 in 1000 year event in 2115 even if a breach develops (residual flooding)

2. Overtopping of the River Welland.

The west bank of the River Welland is at a level of 5.20m O.D. at London Road. This is not a raised defence at this point. The land and the Road are at 5.20m OD and the ground level gradually falls away from the River. Therefore, there is no possibility of failure here. There is a freeboard of at least 500mm above the 1 in 1,000 year maximum design level in the River.

Therefore, as the river is 1.3km from the development, this source of flooding can be discounted.

3. Flooding from Vernatts Drain

Vernatts Drain is 1100 metres north west of the site. It is an embanked watercourse which mainly conveys water discharged from the pumping station at Pode Hole to the River Glen. In addition there are gravity outfalls from the drainage channels on the west side of Spalding which discharge into Vernatt's Drain.

The SFRA states the maximum design water level in Vernatt's Drain to be 3.92m OD which is below the lowest bank level of 4.30m OD. If a breach occurred in Vernatt's Drain Welland and Deepings IDB would be able to reduce the level of water in the Drain to prevent extensive flooding and enable a repair of the breach to be undertaken quickly.

Therefore as the proposed level of the building is only 320mm below the maximum design water level of Vernatt's Drain the risk of flooding from this source can be considered to be extremely low.

4. Flooding from IDB watercourses

The area north of Bourne Road is drained by surface water sewers which discharge into the IDB piped drain alongside Pennygate. This flows westwards into an open drain which discharges through a flapped outfall into Vernatt's Drain.

All of the IDB channels and piped drains are maintained in good condition. Therefore the risk of flooding from this source can be considered to be extremely low.

5. Blockages in local surface water drainage systems

Both Anglian Water and the Highways Authority maintain surface water drainage systems which discharge into the piped IDB drain alongside Pennygate. If a blockage occurs in any highway outfalls or pipes surface water could flow onto the site from Bourne Road. If any flooding occurred from this source the depth of flooding would be only in the region of 100mm and the precaution of raising ground

floor levels by approximately 300mm above levels of the site should prevent flooding from this source.

Therefore the risk of flooding from this source is extremely low.

Extent of known Flooding

During the preparation of this assessment, no evidence was discovered of the site or any of the adjoining properties being flooded.

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 SFRA maps indicate that if a breach occurred in the sea defences during a 1 in 1000 year event in 2115 the site would not be flooded. Therefore the risk of any flooding occurring at this location is very low.

Therefore although this site is within Flood Zone 3 according to the initial classification because of the current standards of drainage and flood risk in Spalding there is a very low risk of flooding to this site.

Summary of Risk of Flooding to the Site

In an extreme tidal event with multiple breaches occurring in the west bank of the tidal Welland it is just feasible that flooding could start to occur in this area of Spalding. If flooding from this source, or from a major failure in the IDB system, did lead to the level of flood water rising to a level of 3.60m OD then it would do so very slowly, and future residents of the proposed dwelling would have adequate time to be warned and to make plans to evacuate the area along Bourne Road or keep safe on the first floor of the building.

Conclusions

The following conclusions can be made:

- The proposed development is not in a functional flood plain as defined by the Technical Guidance.
- Although the site is in flood zone 3, the actual risk of the site flooding from any Environment Agency watercourse is very low.

- The SFRA indicates that no actual or residual flooding is predicted for the 1% fluvial / 0.5% tidal event probability in 2115, or for the 0.1% event probability in 2115.
- The risk of the site becoming flooded from any source is extremely low.
- In a flood risk area there is always a risk of an event occurring of greater magnitude than has been considered in this flood risk assessment.

Recommendations

- It is recommended that the ground floor level of the proposed building should be 3.60m OD. This is 150mm above the level of the adjoining properties and will require the land around the house to be raised to a level of 3.30m OD, which is the same level as the access drive on the east side of No 78 Bourne Road.
- The building should have two stories with all of the sleeping accommodation on the first floor.
- If any flooding started to occur in an extreme flood event residents could safely escape along Bourne Road before flood water rose to the level of the road, or in an extreme event shelter on the first floor of the building.
- If any flooding did occur it would happen extremely slowly over many hours and the Local Authorities and emergency services would have adequate time to warn residents that flooding might occur, and residents would have adequate time to prepare themselves for the event.
- Occupiers of the property should register with the Environment Agency's Floodline Warnings Direct Service.
- If the developer considers it cost effective, considering the level of risk is so low, he could consider designing the new building incorporating flood resistant/resilient techniques to allow it to be refurbished after being flooding to a depth of approximately 300mm. Consideration could be given to the electrics and heating pipes being distributed at ceiling level rather than at floor level.
- On site surface water drainage will be discharged into soakaways and these should be designed to BRE Digest 365 and approved under Building regulations.

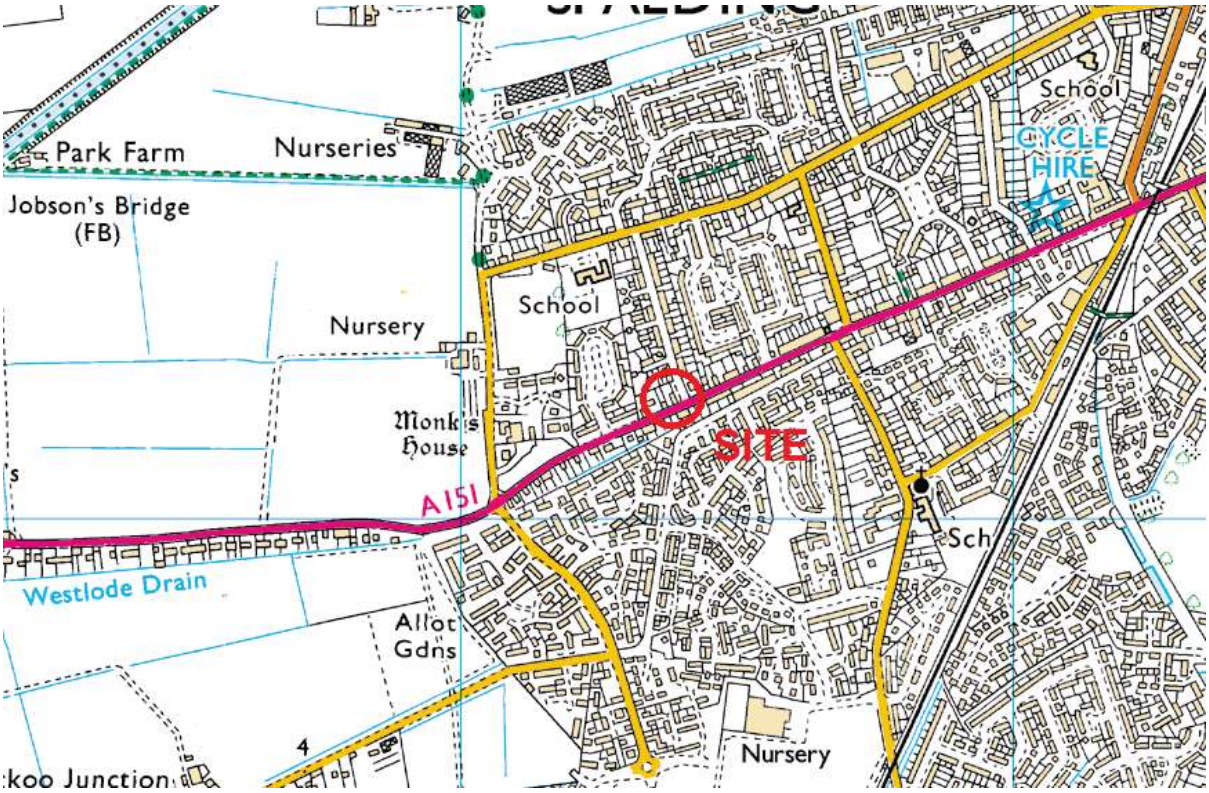
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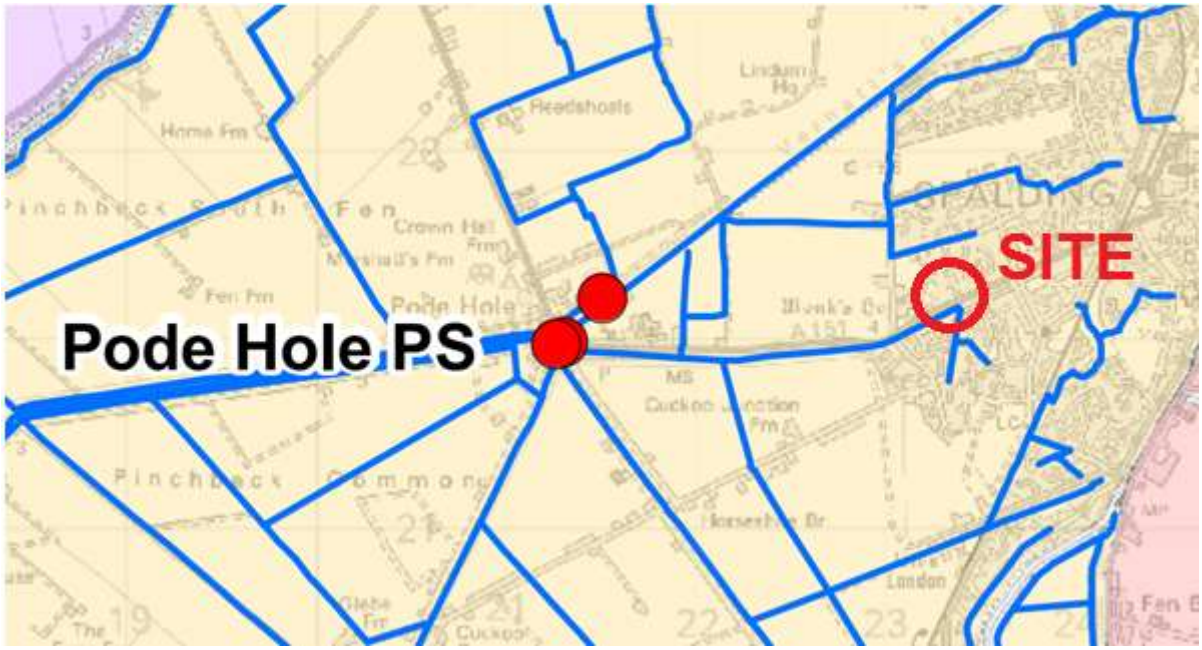
LOCATION PLAN



PLAN OF SITE



PLAN OF IDB DRAINS



PLAN OF SITE LEVELS

