

PROPOSED DEVELOPMENT OF A BUNGALOW BEHIND
55, LANGWITH DRIVE, HOLBEACH, PE12 7HQ.
FLOOD RISK ASSESSMENT



View of rear of garden

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This flood risk assessment has been prepared solely to support the planning application for a development at Langwith Drive, 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

A Planning application is due to be submitted to South Holland District Council to construct a bungalow in what is at the present time the rear garden of 55 Langwith Drive, Holbeach.

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

For the Planning Application to be valid a flood risk assessment needs to be carried out to conform with the requirements of the Technical Guidance to the National Planning Policy Framework Development and Flood Risk. The site is within a defended area as specified in the South Holland District Council's Strategic Flood Risk Assessment and is located in the South Holland Internal Drainage Board District.

Application Site

The site is located 1 km south west of the centre of Holbeach, 9.0 km from the tidal defences of the River Welland north of Spalding, and at least 10km south of the tidal defences of the Wash.

The National Grid Reference of the site is 535328 324710, 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.

Applying the flood risk vulnerability classification in Table 2 of the Guidance, residential development is classified as "more vulnerable". Table 3 of the Guidance states that more vulnerable development in Flood Zone 3(a) is only permitted after the sequential and exception test is followed.

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 in a lower flood risk zone for this type of development. This development can be classed as a windfall site within the town of Holbeach. The development complies with the South Holland District Council's policy on these types of sites. Although the central area of Holbeach is at a slightly higher level, the outskirts of Holbeach are at approximately the same level and therefore it is unlikely to find a residential site with a lower flood risk that has not been developed.

Exception Test

The Sequential Test has demonstrated that it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower probability of flooding. Therefore the Exception Test must be applied and for this to be passed:

- It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risks, informed by the Strategic Flood Risk Assessment; and
- A site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking into account of the vulnerability of its users, without increasing flood risk elsewhere, and where possible will reduce flood risk overall.

Both 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.

The first section will be demonstrated by the Supporting Planning Statement and compliance with South Holland District Council's planning policies.

This flood risk assessment will demonstrate that the development will be safe for its lifetime and it will not increase flood risk elsewhere.

Strategic Flood Risk Assessment

The following information about the flood risk in the location of this development has been sourced from the maps and reports in the South Holland District Council's Strategic Flood Risk Assessment (SHDC SFRA).

Report Maps

Map 3 shows that the site is within flood zone 3.

Map 5 shows that the site is at low or medium risk, but reliant on flood defences for this standard.

Map 6 indicates the peak depth is zero for the present day 1% fluvial and 0.5% tidal event probability.

Map 7 indicates the peak velocity is zero for the present day 1% fluvial and 0.5% tidal event probability.

Map 12 indicates the actual risk is low or medium for the year 2055 1% fluvial and 0.5% tidal event probability.

Map 13 indicates the actual risk is low or medium for the year 2115 1% fluvial and 0.5% tidal event probability.

Map 16 shows that the site is not within a rapid inundation zone.

Flood Maps Table D1

The actual flood hazard for the present day and 2115 is as follows:

Depth of flooding.....	zero
Extent of flooding.....	low or medium, reliant on flood defences
Velocity	nil

The residual flood hazard for the present day and 2115 is as follows:

Depth of flooding..... zero

Extent of flooding..... low or medium, reliant on flood defences

Velocity nil

Maximum flood level and bank levels in the River Welland

The maximum levels in this tidal section of the River Welland 8 km west of the site are as follows:

	2007	2115
Peak 1 in 200 year level	5.98	7.12
Peak 1 in 1000 year level	6.27	7.41

The lowest levels of the east bank of the River Welland around chainage 18km are 7.50m OD, with average levels between 7.60m and 7.70m OD.

Environment Agency Tidal Breach Hazard Mapping

The Environment Agency has published mapping which predicts the depths, velocities and hazard following a breach in the tidal defences for a 1 in 200 and 1 in 1000 year event both for the present time and in 2115. The maps have been produced by modelling breaches along the whole length of the tidal defences and combining these into one map.

The maps show that there is no flooding predicted at the present time.

In 2115 the predicted flood depth for the area of the site is between 0 and 250mm for both the 1 in 200 year and 1 in 1000 year event probability. The hazard for the site does not exceed 0.75, considered as a low hazard, and predicted velocities do not exceed 0.1m/sec.

Therefore a proposed floor level of 3.60m OD is recommended for the proposed bungalow, which is 100mm above the highest predicted 1 in 1000 year flood level.

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 9.0 km from the tidal section of the River Welland and at least 10.0km from the Wash defences at the nearest point. The tidal defence banks to all of these are maintained by the Environment Agency.

The major watercourses in the area are maintained by South Holland IDB, which has carried out improvement schemes so that IDB watercourses generally provide a standard of 1 in 100 years with a freeboard of 300mm in urban areas.

Existing Ground Levels and Proposed Levels of Buildings

The average level of the rear garden is approximately 3.25m OD. The floor level of the existing bungalow is 3.56m OD. The road level of Langwith Drive is 3.30m OD. A plan showing all the levels is shown on sheet 9 of this report.

It is recommended that the floor level of the proposed bungalow should be 3.60m OD.

Potential Sources of Flooding

The potential sources of flooding to the site are:-

1. Failure or overtopping of tidal defences of the River Welland or the Wash.
2. High water levels in IDB drainage channels.
3. Localised flooding in the area.

1. Failure or overtopping of tidal defences of the River Welland or the Wash

As shown above, the east bank of the River Welland, which is approximately 9.0 km from the site, provides at a 1 in 200 year standard of protection in 2115. If the eastern bank of the tidal section of the River Welland or the defences to the Wash breached then the latest EA flood maps indicate that there could be up to 250mm of flood water affecting parts of the site following an event in 2115.

2. High Water Levels in IDB drains

Although the whole of this area is below high tide level and levels in the rivers, the retained water levels in the drainage channels ensure that the risk of flooding is extremely low. South Holland IDB maintains a system of sluices, pumping stations, and drainage channels which convey surface water into the River Nene, the Wash and the River Welland and control water levels throughout the South Holland IDB area.

The development site is located on the south of Spalding Road which is the boundary between the Holbeach River catchment to the north and the Little Holland catchment to the south. South Holland IDB maintain piped drains in this estate which discharge into the Holbeach River (F37) which flows southwards from Spalding Road. This flows southwards into the Little Holland Drain which is approximately 5km south of Holbeach. The levels in Little Holland Drain are controlled by Little Holland Pumping Station which discharges the flow into South Holland Main Drain.

The channels maintained by South Holland IDB in urban areas are classified as high priority watercourses and as such receive a higher maintenance priority.

There are possibilities of failure of outfall sluices, but these are mitigated by the high level of maintenance given to these structures by the IDB. If a failure did occur the IDB would immediately be warned of the problem by their telemetry system and take action to repair the fault or to bring in temporary pumps to reduce the risk of any flooding in the area. Similarly any failures of culverts or other blockages would be dealt with immediately.

IDB systems are designed to provide a freeboard of between 600mm and 1000mm to all land in a 1 in 10 year return period rainfall event. South Holland IDB watercourses generally state that their watercourses provide a standard of 1 in 100 years with a freeboard of 300mm in urban areas. In an extreme event water levels will rise but this will be a slow process and it would be at least 24 hours before levels were high enough to begin to flood low land in the area, and after this the level of the flood water would need to rise another 1.0 metre before the development site would be affected.

Therefore the risk of flooding from IDB drainage channels can be considered to be extremely low.

3. Localised Flooding in the area

There is a possibility that surface water from Langwith Drive could accumulate in this area. However any large accumulations of surface water would find its way into the local dykes and then into IDB drains and as the proposed floor level is 3.60m OD compared with the road level of 3.30m OD it is extremely unlikely that any flooding will occur to the proposed dwelling from this source.

Extent of known Flooding

During the preparation of this assessment, no evidence was discovered of the existing house or garden or any of the adjoining properties having been flooded in the past.

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 state that there is risk of flooding from the tidal section of the River Welland or the Wash in a 1 in 200 year event in 2115. 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. If a large breach occurred in the bank the SFRA indicates that the flood water would not reach this area north of Holbeach, but the EA flood maps issued after the latest version of the SFRA indicate there could be flooding with a maximum depth of 250mm.

It is likely that during the next one hundred years the banks of the tidal Welland and the Wash will be raised by the EA to further decrease the risk of breaches and flooding.

The risk of flooding to the building from IDB drains can be considered low. Water levels in the IDB drainage channels in this area are controlled by Little Holland Pumping Station.

The IDB have adequate arrangements to bring in contractors and use their own staff if a failure of any pumping station occurred. If drains become full any flooding that would follow would happen very slowly and affect lower agricultural land levels before the development site. It would be very unlikely to reach a level of 3.60m OD and enter the proposed building.

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. The site is only likely to flood if a breach occurs in the east bank of the River Welland during a 1 in 200 year high tide in 2115. No flooding would be likely to occur if a breach did not occur.

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

Recommendations

In any area at risk of flooding it is preferable that new dwellings should be of two story construction with all bedrooms at first floor level. This is to provide a refuge for residents if the building becomes flooded after a major breach of the tidal bank, and ensure there is no danger to residents when they are asleep. However in this case as a bungalow is planned with bedrooms at ground floor level the level of the ground floor has been raised above the 1 in 1000 year flood level in 2115.

The ground floor level of the proposed building should be approximately 300mm above existing ground level at a level of 3.60m OD.

Occupiers of the property should register with the Environment Agency's Floodline Warnings Direct Service.

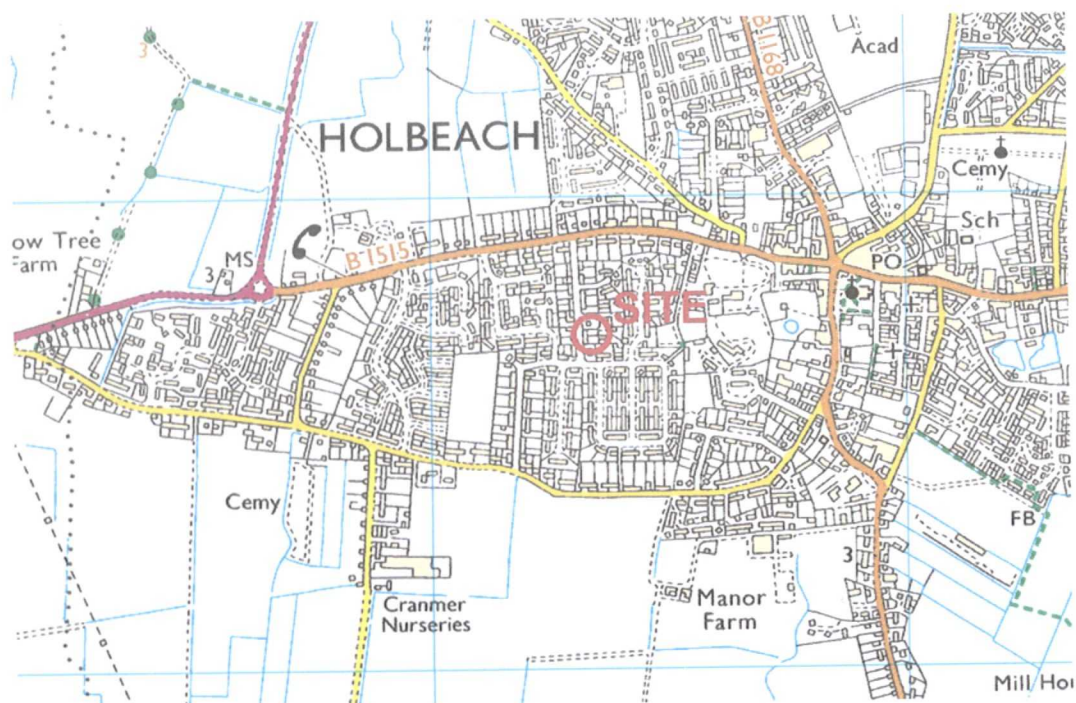
On site surface water drainage should be discharged into soakaways and these should be designed to BRE Digest 365 and approved under Building regulations.

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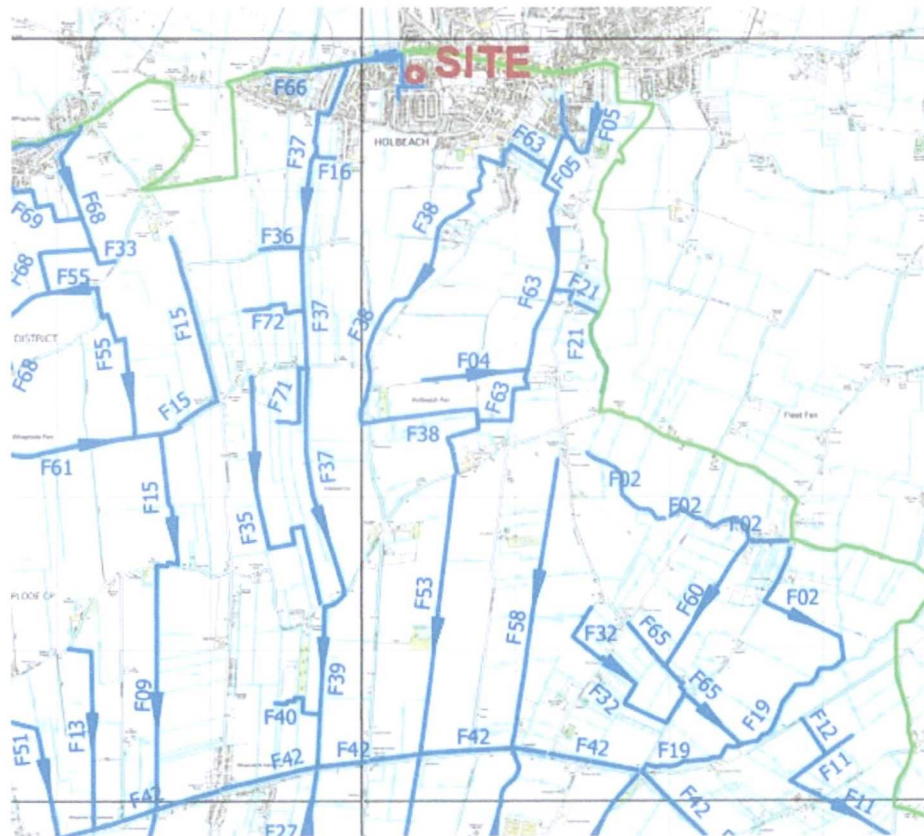
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9th October 2015

LOCATION PLAN



PLAN OF AREA SHOWING IDB WATERCOURSES



PLAN OF SITE SHOWING LEVELS

