

**PROPOSED DEVELOPMENT AT 54 WARGATE WAY, GOSBERTON,
SPALDING, PE11 4HE**

FLOOD RISK ASSESSMENT



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This flood risk assessment has been prepared solely to support the planning application for the proposed new dwellings behind 54 Wargate Way, Gosberton. 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 four new dwellings behind 54 Wargate Way, Gosberton. The proposed building plot is at present used as a garden area behind the existing bungalow.

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 Welland and Deepings Internal Drainage Board District.

Application Site

The site is located approximately 1 km south west of the centre of Gosberton. The National Grid Reference of the site is 523840 331300, 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 new dwellings 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 Gosberton. However they are unlikely to have a lower flood risk than the site proposed, as the site is on the boundary of Flood Zone 3(a) and properties which are at a similar level at the northern end of Wargate Way are classed in Flood Zone 1.

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 supporting planning statement.

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

Strategic Flood Risk Assessment

The following information about the flood risk at the location of 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 for the present day 1% fluvial and 0.5% tidal event probability.
- Map 6 indicates the peak depth is zero for the present day 1% / 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 low but reliant upon protection by flood defences.
- Map 12 indicates the actual risk extent for the year 2055 for the 1% fluvial / 0.5% tidal event probability is low but reliant upon protection by flood defences.
- Map 13 indicates the actual risk extent for the year 2115 for the 1% fluvial / 0.5% tidal event probability is low but reliant upon protection by flood defences.
- 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
	Velocity ... Nil
For year 2115	Depth of flooding ... zero
	Extent of flooding ...zero
	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 .. zero
	Velocity .. Nil
For the year 2115	Depth of flooding ...zero
	Extent of flooding .. zero
	Velocity ... Nil

3. The maximum flood levels in the fluvial section of the River Glen between chainage 3.0km and 4.0 km are shown in the SFRA as follows:

Year	2007	2115
1 in 100 year	4.21 - 4.25	4.65
1 in 1,000 year	4.32 – 4.39	4.68

The bank on this side of the river has a road on top between chainage 3.0km and 4.0km and has an average level of between 4.70m and 4.80m OD but there are some low areas as low as 4.48m OD. West of chainage 4.0km the defences are earth banks with average levels of 4.80m OD but some levels as low as 4.60m OD. banks are is shown to be 4.83m OD.

4. The extreme tide levels in the section of the River Welland at chainage 16.1km is shown in the report as follows:

	2007	2055	2115
1 in 100 year	5.99	6.32	7.13
1 in 1,000 year	6.32	6.65	7.46

The bank levels of the west bank of the tidal River Welland north and south of the River Glen outfall are at a level of approximately 7.50m OD and above, but the bank level at 16.1km, the River Glen outfall is shown to be 7.05m 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 3.5km north of the River Glen, which is the main river and maintained by the Environment Agency.

The site is 5.0km west of the tidal defences of the River Welland.

The site is approximately 7.2 km east of the South Forty Foot Drain, which is the main river and maintained by the Environment Agency.

Existing Ground Levels and Proposed Levels of Buildings

The level of the grassed area of the site behind the existing bungalow varies between 3.55m OD and 3.40m OD. Further east the wooded area is at a lower level of approximately 3.30m OD. The existing bungalow has a floor level of 3.78m OD and it is recommended that the new bungalows should have a floor level of 3.90m OD.

Potential Sources of Flooding

The following sources of flooding have been identified:

1. Failure or overtopping of the tidal defences of the River Welland
2. Overtopping or breaching of the River Glen.
3. Flooding from South Forty Foot Drain
4. Flooding from the IDB drainage system.
5. Flooding from the Dyke on the perimeter of the site.

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

The tidal River Welland is 5.0km east of the site. The predicted levels in this watercourse show that the defences will not be overtopped in a 1 in 1000 year event in 2115. However there is still the risk that the earth bank could breach when the water levels are high. If a breach occurred in the west bank of the tidal Welland water would flow north westwards and if the flood water reached the Gosberton area it would flood the lower land area north east of the village in preference to the village itself. The risk of the level of flood water rising to above 3.90m OD and flooding the proposed bungalows can be considered extremely low.

2. Overtopping or breaching of the River Glen.

The predicted levels shown in the SFRA show maximum 1 in 100 year water level at the present time is 4.25m OD and the predicted 1 in 1000 year water level at the present time is 4.39m OD. These predicted levels are lower than the defence levels on this section of the bank of the River Glen, the average level being 4.80m OD although there are some isolated lower levels.

Predicted water levels with climate change in 2115 shown in the SFRA are 4.65m OD for the 1 in 100 year event and 4.68 OD for the 1 in 1000 year event. These are still below the average level of the defences.

More recent predicted levels from the EA have shown higher levels of 4.91m OD for the 1 in 100 year event and 4.98 OD for the 1 in 1000 year event. It is difficult to envisage levels rising to these levels as before the River reached these levels water would be overtopping many km of bank upstream of Surfleet alleviating the situation.

Although the actual risk is extremely low there is still a residual risk if the defences were to fail. However much of the land between the River and the development site is below 3.00m OD and the flood depth on this area would need to be at least 1.0 metres before the site would be affected.

Therefore the risk of flooding from this source is remote.

3. Flooding from South Forty Foot Drain

The South Forty Foot Drain is 7.2 km west of the site. The maximum possible level in this watercourse is 3.0m OD.

Therefore flooding from this source can be discounted.

4. Flooding from the IDB Drainage System

This area of Gosberton village is drained by an IDB drain which is located on the west side of Wargate Way and flows southwards. It discharges into the Risegate Eau Drain which runs from west to east and is located 600 metres south of the development site.

Risegate Eau provides drainage for the whole fen area of Gosberton and Quadring. The water level in Risegate Eau is controlled at the outfall near Fosdyke Bridge with an outfall sluice and a pumping station. For most situations the water is discharged into the tidal River Welland through the sluices at low tide. However in high flow situations after heavy rainfall the pumps need to be operated to control the water levels in the catchment.

The Welland and Deeping IDB drains have been designed to a 1 in 10year standard with a freeboard of between 800mm and 1.0 metres. This generally provides a standard of at least 1 in 50 years for flooding of the lowest land. Much of the land in the catchment is below 3.00m OD and therefore even if the pumps fail to operate for a considerable time during a rainfall event the site is unlikely to flood. The normal water level in the Risegate Eau is 0.00m OD at the outfall. The maximum design level in the Risegate Eau at Wargate Bridge is 1.05m OD which is 2.9 metres below the proposed level of the development.

Therefore the risk of flooding from the main IDB system can be discounted.

5. Flooding from the Dyke on the perimeter of the site.

There is a dyke around the perimeter of the site with a bed level of 2.48m OD on the southern side of the site. This section of the dyke flows westwards and discharges into the IDB drain on the western side of Wargate Way through a culvert. The dyke was dry on the day of the survey. This provides adequate land drainage for the site. If the culvert became blocked then high water level could occur in this dyke. If the situation was not resolved water could accumulate on the development site, but as it is proposed that the bungalows should be at a level of 3.90m OD they would not become flooded from this source, as the flood water would find its way overground across Wargate Way and flow into the the IDB drain before it reached the floor level of the bungalow.

Therefore this source 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 tidal event the 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

There is a risk that the west bank of the River Welland north of Surfleet Seas End could breach and flood water would flow firstly into the area between the banks of the River Glen to the south, possibly the A16 road and the A17 to the north.

The SFRA indicates that this flood water could be up to 1500mm depth in 2115. However the flooding does not extend past the new A 16 road which is located on the original railway line. Therefore it is reasonable to assume that even in an extreme event the flood water would not extend a further 3.5km to the development site.

The risk of flooding from the River Glen is also extremely low. With a maximum level in 2115 of nearly 4.70m OD this is only 800mm above the proposed level of the new bungalows. With the Risegate Eau intercepting the flood water and directing it to land at lower levels the risk to the development site is extremely low.

Conclusions

The following conclusions can be made:

- The proposed development is not in a functional flood plain as defined by PPS 25.
- Although the site is in flood zone 3, the actual risk of the site flooding from any Environment Agency water course is low.
- Any flooding from the tidal River Welland, or the River Glen, or the IDB system will firstly affect lower areas of land south of Gosberton. This will spread westwards and make it extremely unlikely to rise to a level of 3.90m OD and affect the development.
- If any flooding were to occur from any of the above sources, which is extremely unlikely, levels would rise very slowly and residents would have many hours to assess the situation and act accordingly.
- 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.

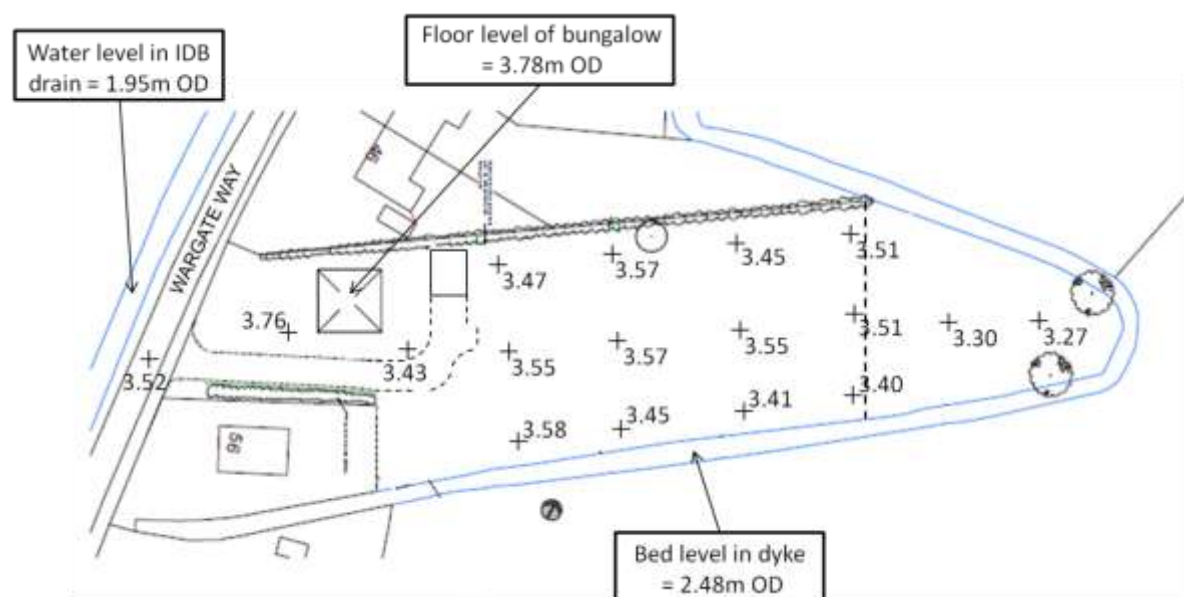
Recommendations

- In any area at risk of flooding it is preferable that proposed buildings should be of two story construction with all bedrooms at first floor level. However the risk on this site is extremely low, and any flooding that did occur would happen over many hours and not quickly. Therefore in this location the construction of bungalows with bedrooms on the ground floor are considered to be satisfactory.

LOCATION PLAN



LEVELS OF SITE



IDB DRAINS



LAND LEVELS SHOWN IN SFRA

