

PROPOSED REDEVELOPMENT OF A SITE AT 43 RESERVOIR
ROAD SURFLEET
FLOOD RISK ASSESSMENT



Proposed site from Reservoir Road

This flood risk assessment has been prepared solely to support the planning application for the dwelling at 43 Reservoir Road, Surfleet. 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 development of two dwellings is proposed on a site where there is at the moment a small storage building at 43 Reservoir Road, Surfleet, PE11 4DH.

The site is within Flood Zone 3 as shown on the map in the Appendix to the South Holland District Council's Strategic Flood Risk Assessment. These maps do not take into account flood defences.

There is an area to the south of the site which is classified as Flood Zone 3(b) functional flood plain. However the site of the proposed development is on top of the north bank of the River Glen and therefore this report will demonstrate that the risk of flooding to properties on this bank is remote.

Application Site

The site is located 50 metres north of the River Glen and 100 metres from the tidal section of the River Welland north of Spalding. The National Grid reference of the site is 527840 329280, and the extent of the site is shown on the plan at the end of this document.

Most of the site is at a level of approximately 7.00m OD, except for the south west corner which is at approximately 6.50m OD. It is presumed that the rear of the site has been built up significantly with additional material, because the site of the adjacent bungalow (No 41) gradually slopes from the road to the lower level at the rear of the plot, and the garden of that property is significantly lower than the rear of the site of the proposed development.

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. The maximum flood level in the fluvial section of the River Glen is as follows:

Year	2007	2115
1 in 100 year	4.09	4.90
1 in 1,000 year	4.12	4.96

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

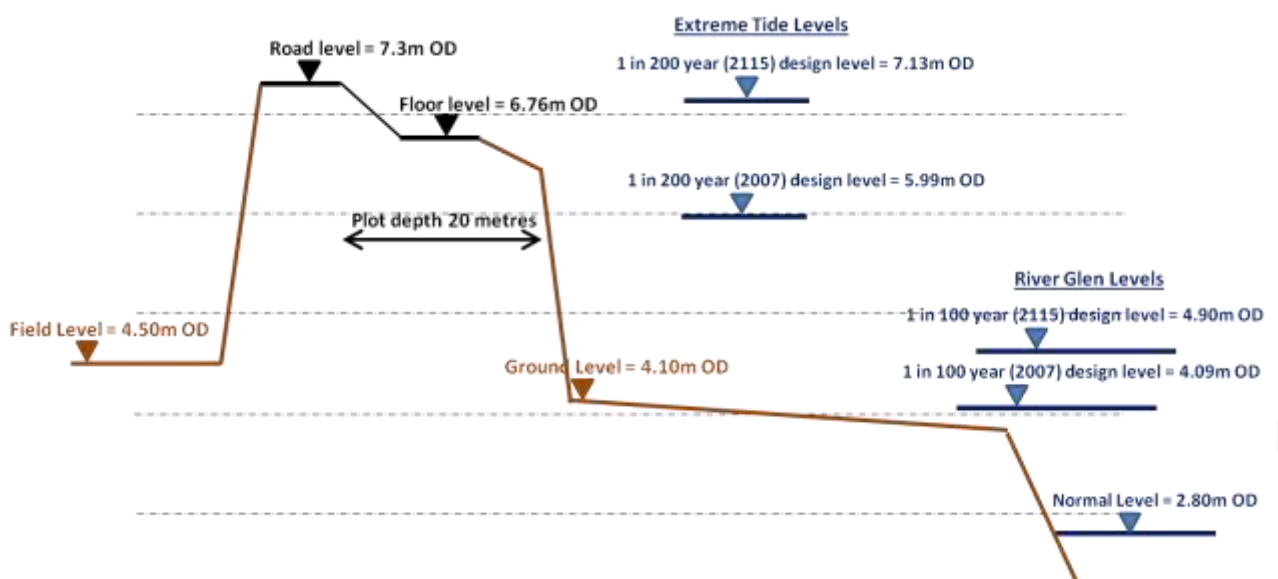
	2007	2055	2115
1 in 200 year	5.99	6.32	7.13
1 in 1,000 year	6.32	6.65	7.46

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.

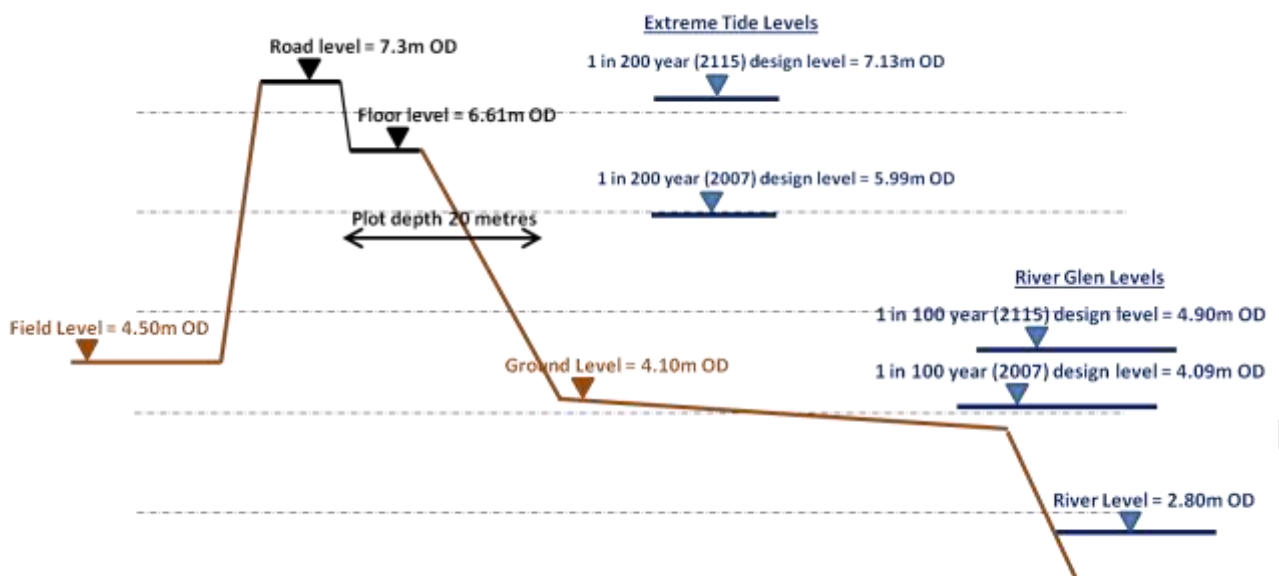
Site Levels

Levels of the site are shown on a plan at the end of this report. The floor level of the existing building on the site is 6.76m OD and the level on Reservoir Road is 7.30m OD. The cross sections below show the site levels compared to the predicted flood levels for the application site and No 41 Reservoir Road, the bungalow to the west of the development site:

No 43 Reservoir Road:



No 41 Reservoir Road:



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.

All of the watercourses north of the site are maintained by Welland and Deepings Internal Drainage Board.

Potential Sources of Flooding

The potential sources of flooding to the site are:-

1. Failure or overtopping of tidal defences in River Welland.
2. Failure or overtopping of fluvial defences of the River Glen.
3. Failure of Surfleet Marsh Pumping Station (IDB)
4. Blockages or problems in local surface water systems

1. Failure or overtopping of tidal defences of River Welland

The predicted 1 in 200 year extreme tide level at this location is 5.99m OD at the present time and this increases with climate change to 7.13m OD in 2115. The bank levels on the west side of this length of the River Welland are at an average level of 7.50m OD, except for a short low section shown to be at 7.05m OD.

Therefore at the present time the banks have at least a 1 in 200 year standard and one would expect that the Environment Agency will over the next 100 years undertake further work to ensure that there is a 1 in 200 year standard.

If a breach occurred in the west bank during a 1 in 200 year event water would flow into the lower fen area north of Reservoir Road. The risk of the water reaching a level of 6.60m OD and flooding the properties along this length of Reservoir Road is remote.

2. Failure or overtopping of fluvial defences of River Glen

The maximum predicted 1 in 100 year level in the section of the River Glen just upstream of the sluice is 4.09m OD at the present time. This increases with climate change to 4.99m OD in 2115. The proposed development is located on the top of the bank and therefore is higher than any predicted flood levels in the River Glen.

Therefore even if there is a breach, unless the breach occurs at the location of the proposed development, flooding from this source can be discounted.

The chance of breach occurring at the present time are remote as the water level will not rise above the base of the bank (see cross sections above). To prevent any

chance of a breach with increased levels with climate change the lower 1.0 metre section of the bank should be reinforced to prevent any chance of instability.

3. Failure of IDB Pumping Station

The water level in the fen area north of Reservoir Road are controlled by Surfleet Marsh Pumping Station which is 500 metres north of the site. If this pumping station fails to operate flooding could occur to the land north of Reservoir Road, but this would not reach the level of the proposed development site.

Therefore this source can be discounted.

4. Blockages or problems in local surface water systems.

If any surface or foul water flooding were to occur this would find its way to lower levels either side of Reservoir Road and would not adversely affect the development site

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

Therefore although this site is within Flood Zone 3 according to the initial classification because of the current standards of drainage, particularly of the Welland and Deepings IDB, there is a very low risk of flooding to this site.

Conclusions

All of the development site is at a level of at least 6.50m OD, and therefore above the level of any flooding that could occur in the area. However there is a very remote possibility that the bank at the development site could become unstable. This would not cause any flooding at the present time but there is a remote chance in 2115.

However there is a much greater risk that instability of the bank could cause damage to any future building, and the foundations of the proposed building will need to be

designed accordingly and the stability of the slope on the southern side of the plot checked. This design of these foundations and the check on the slope stability should take into account the flood risk to the proposed development.

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

The proposed buildings should be constructed with a finished floor level of 6.76m OD similar to the existing building.

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

If on site surface water drainage is discharged into soakaways these should be designed to BRE Digest 363 and approved under Building regulations. Particular care should be taken with the design of this part of the development to ensure that there is no chance of causing instability to the bank itself.

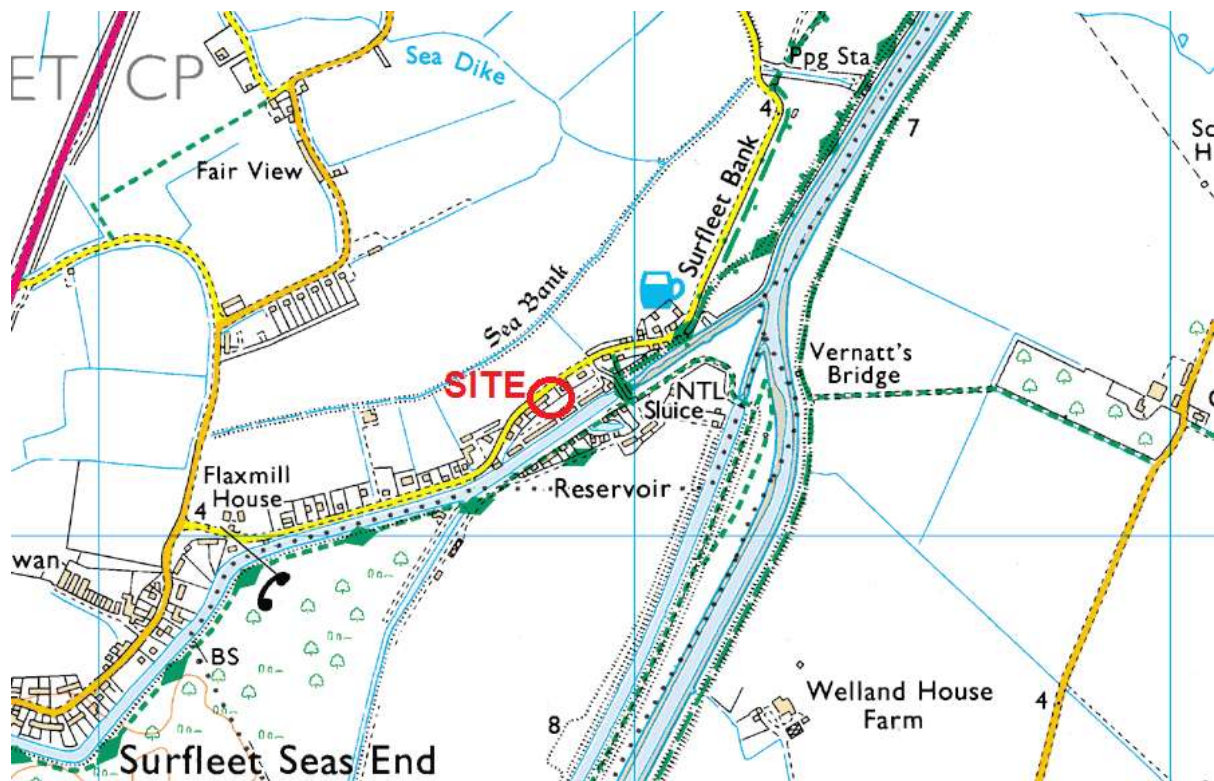
As there is a risk that instability of the bank could cause damage to any future building, the foundations of the proposed buildings will need to be designed accordingly. The stability of the slope on the southern side of the plot should be checked, and the lower 1.0 metre of the bank should be reinforced to prevent any chance of instability. The design of the foundations and the check on the slope stability should take into account the flood risk to the proposed development.

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LOCATION PLAN



SITE PLAN AND LEVELS

