Flood Risk Assessment

in support of proposed office extension @ site currently known as;

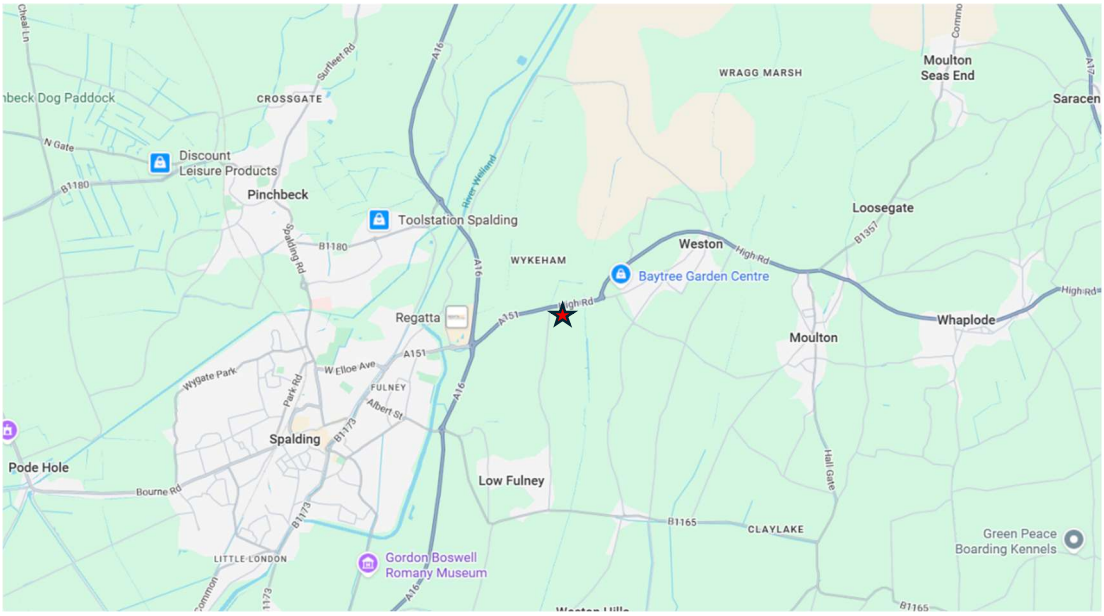
SHDC planning Reference; H16-0780-25

Wykeham Staff Services
Swindlers Drove, Spalding, PE12 6JR
What 3 Words sadly.huts.chiefs

This flood risk assessment has been prepared solely to support the planning application for the proposed office extension. We have 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

Fig 1



Wykeham Staff Services office is located on a site south of Holbeach Road, Spalding. *(Fig 1 & 4)* A Planning Application has been made to South Holland District Council for permission to extend these offices to support growth of the new owners.

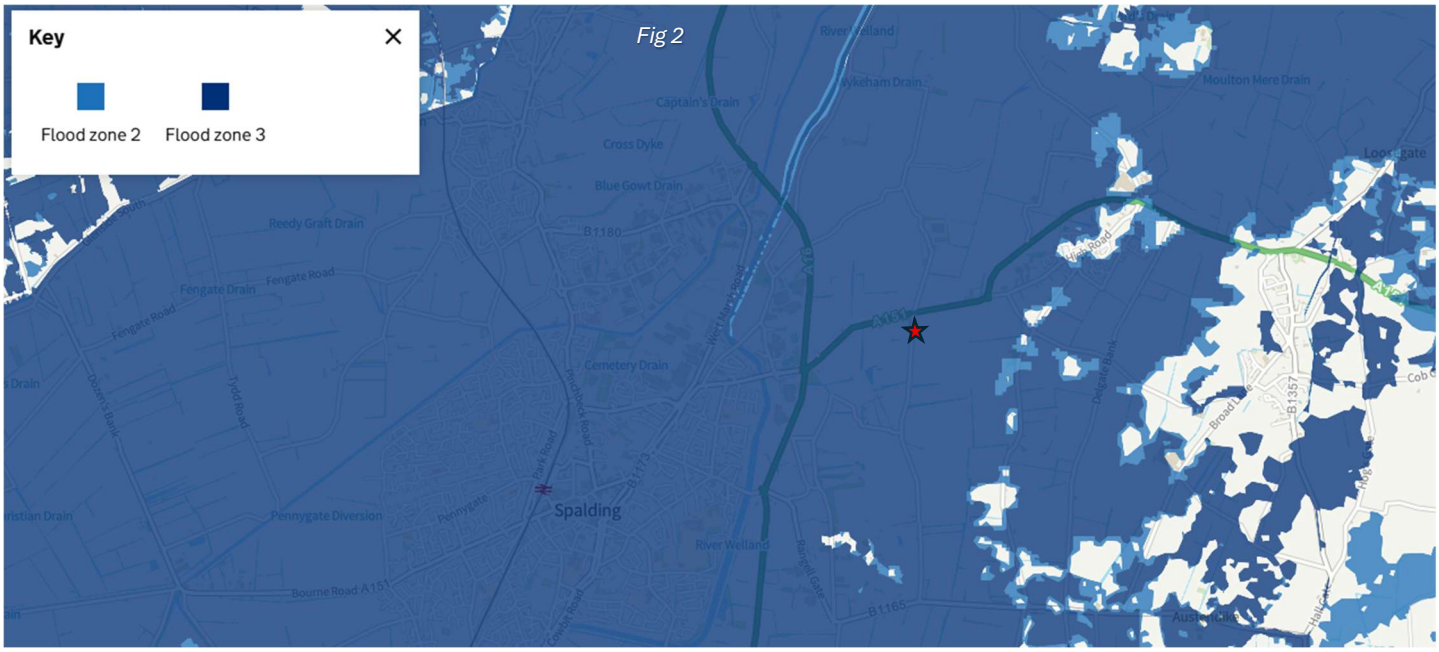
The site is within Flood Zone 3 as shown on the Environment Agency's Flood Zone map below *(fig 2)*. These maps do not take into account flood defences.

The Planning Application requires a flood risk assessment to be carried out as required in Planning Policy Statement 25 (PPS 25) Development and Flood Risk. The site is within the 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.

Environment Agency {EA) Flood Map

The map below *(fig 2)* is taken from the EA website and shows the whole area to be at risk of flooding from rivers and sea assuming no defences.

Fig 2



Application Site

The site is located 1.5 km from the tidal section of the River Welland. The National Grid reference of the site is 527514 324244, 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 one maps without defences, as defined in Table D1 of PPS 25. Applying the flood risk vulnerability classification In Table D2 of PPS 25 the development is classified as "more vulnerable" and the Table D3 states that the development of a commercial office requires the exception test needs to be followed. However, paragraph D16 states that minor development should not be subject to the exception test.

The existing ground level on the site is approximately 3.0m OD.

We have stated that the floor level of the new building should be 850mm above ground level, at a level of 3.85m OD.

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	Not at risk
	Year2115	0-0.5m
Actual Risk Extent	Present day	Low to medium risk, Reliant on flood defenses
	Year2055•	
Actual Peak Velocity	Present day	No flow across site.
	Year2115	Oto 0.1m/sec
Residual Peak Depth	Present day	0- 0.5m
	Year2115	0- 0.5m
Residual Risk Extent	Present day	High flooding probability
	2055	High flooding probability
	2115	High flooding probability
Residual Peak Velocity	Present day	No velocity
	2115	>0.25m/sec

Fig 3 below 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 defence bank on the east side of the tidal section of the River Welland north of the A16 road bridge, between chainage 19.8km and 20.8km.

	2007	2055	2115
Peak 1 in 200 year extreme tide level	5.98mOD	6.31m OD	7.12m OD
Peak 1 in 1,000 year extreme tide level	6.27mOD	6.60mOD	7.41m OD

With an average defence crest level between 7.80 and 7.90 m OD the freeboards are as follows:

	2007	2055	2115
Peak 1 in 200 year freeboard	1870mm	1540mm	730mm
Peak 1 in 1,000 year freeboard	1580mm	1250mm	440mm

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 1.5km from the tidal section of the River Welland, which has a tidal defence bank which is maintained by the Environment Agency.

There is a watercourse on the western side of the site alongside Swindler's Drove which is maintained by South Holland IDB.

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. Overtopping or breach in the Coronation Channel
3. Failure of Wiseman's Pumping Station (IDB)
4. Blockages in IDB drains or culverts
5. Blockages or problems in local surface water systems

1. Failure or overtopping of tidal defences

If the eastern bank of the tidal section of the River Welland breached then the flood water could reach the development site, as shown on EA flood maps. However, as shown on page 2 of this report, there will be a minimum freeboard of 440 mm if a 1 in 1,000-year event occurs in 2115.

Therefore, the risk of the site flooding from this source is very low and the ensuing hazard is acceptable.

2. **Overtopping of Breach in the Coronation Channel**

The SFRA states that the maximum design level in the Coronation Channel is 4.69m OD. With a minimum crest level of 5.14m OD, this gives a minimum freeboard of 450mm. However, generally there is a freeboard of 600 mm on this bank of the Coronation Channel.

If the Channel were to breach water would flow eastwards towards the site. However, it would be retained for a short time by the A16 which is higher than the surrounding land. The SFRA does indicate that with a serious breach water could flood the site but flood depths and velocities would not high enough to place people on the site in danger.

With the site being at least 1.0 km from the Coronation Channel the risk from this source is very low.

3. **Failure of Wiseman's Pumping Station**

The water level in the area Is controlled by Wiseman's Pumping Station which is 9 km south of the development site. This is operated and maintained in excellent condition by South Holland IDB and there the likelihood of flooding due to this source is low.

4. **Blockages in IDB drains and culverts**

South Holland IDB has a regular maintenance programme and the likelihood of flooding from this source is low. The IDB states that there is at least a 1 in 50-year standard of service in this part of the district.

5. **Blockages or problems in local surface water systems.**

There is a possibility that some of the dykes around the site could become overgrown and not function satisfactorily. The occupiers of the site should ensure that these dykes are regularly maintained in the future.

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 overlapping:ofthe tidal defenses

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 South Holland IDB, there is a very low risk;of flooding to this site.

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Conclusions

The risk of flooding from the tidal section of the River Welland can be considered low. If a large breach occurred in the bank the SFRA does indicate that the flood water could reach the site. However, any flooding would occur slowly, and if a velocity of 0.25m/sec and a distance of 1.5km is assumed it will be at least two hours before any flood water reaches the Holbeach Road, and sometime after this that it will flow over the road. By this time the flow into the fen at the breach will have reduced as the level of water in the, tidal section will have fallen. The SFRA indicates that maximum depths of flooding would be less than 500mm and velocities would be less than 0.1m/sec. Dyke and drains would fill with water and then water would slowly seep onto the land. Residents would have ample time to escape towards Holbeach.

Similarly, there is a risk of flood water reaching the site if a breach occurred in the east bank of the Coronation Channel. However, as for the tidal flooding the depth would be less than 500mm and therefore it is most unlikely to enter the proposed building.

The risk of flooding from IDB drains can be considered low. If the pumping stations were to fail then the IDB have adequate arrangements to operate pumps with alternative motive power, or to bring in mobile pumps. If drains did become full any flooding again would happen very slowly.

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 watercourse is very low.

Any flooding that did occur would happen slowly and residents would have adequate time to prepare themselves for theevent.

The information in the SFRA indicates that there is a very low residual risk of flooding from the River Welland, but this would not cause any hazard to occupiers of the house who would have adequate time to escape. The building will be of two story construction so in most unlikely event of the flood depth in this area being greater than 850mm, and the residents having not evacuated, the residents could stay safe on the first floor of the building.

In a flood risk area there is always a risk of an event occurring of greater magnitude than has been considered inthis flood risk assessment.

Recommendations

The client has stated that the finished floor level of the new building will follow the existing building & be at 850mm higher than the existing ground level, which is a level of approximately 3.85m OD.

The new building should be designed incorporating flood resistant/resilient techniques to allow it to be refurbished after being flooding to a depth of approximately 500mm. Consideration should be given to the electrics and heating pipes being distributed at ceiling level rather than at floor level. Materials used for the floor and walls should be able to withstand flooding for a period of at least a week. Further details of these proposals are shown below.

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 363 and approved under Building regulations.

- Construction to first floor level should be carried out with good quality brickwork. Specification for blockwork should be checked and only blockwork that does not absorb water should be used. If possible, brickwork should be used instead of blockwork to first floor level. Construction below DPC should be carried out with engineering brickwork.
- Either precast concrete beams with concrete infill, or concrete above made-up ground should be used. Dense concrete screeds should be used.
- Doors should! be solid construction, or plastic should be considered. Butt hinges should be fitted to allow doors to be removed and placed in a dry area prior to any flooding.
- Install plastic base feet and if possible other plastic items to reduce damage from low level flooding. Raise fitted ovens as high as possible.
- Place all electrical wiring at first floor level and drop wiring down to sockets at least 1.0 m above ground floor.

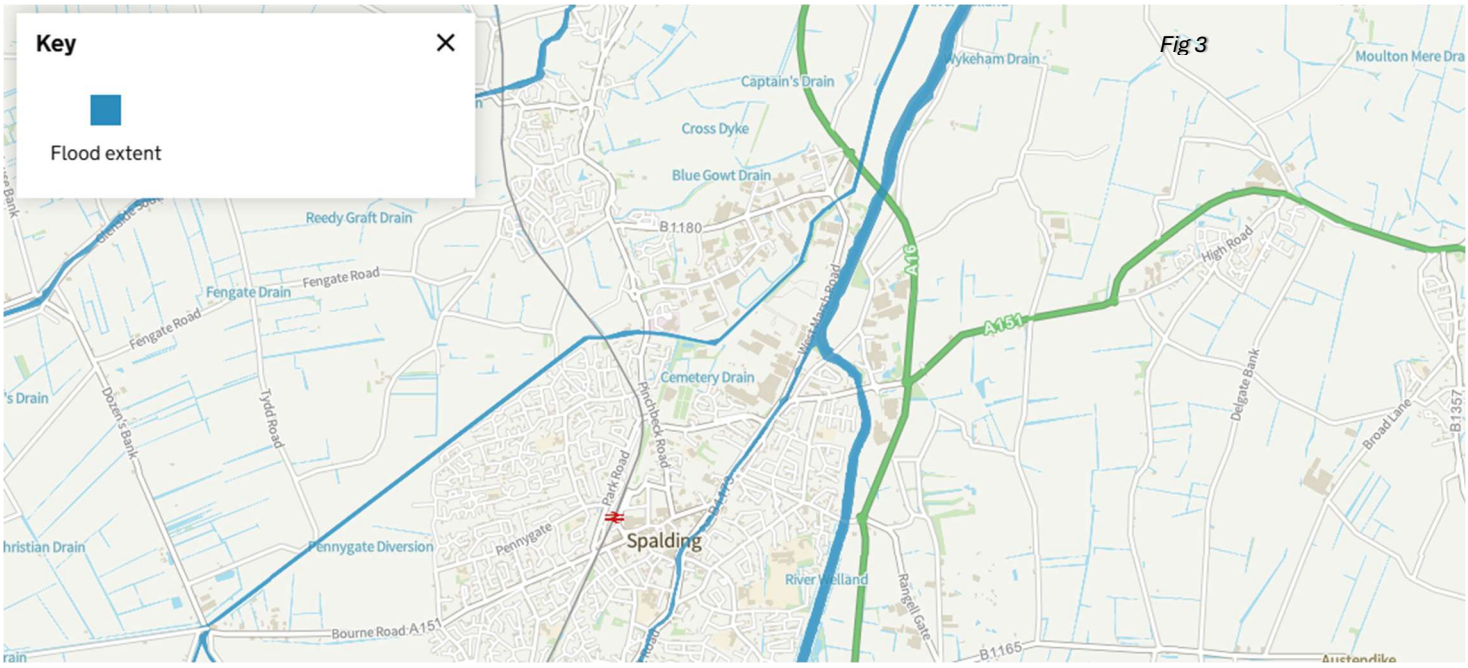
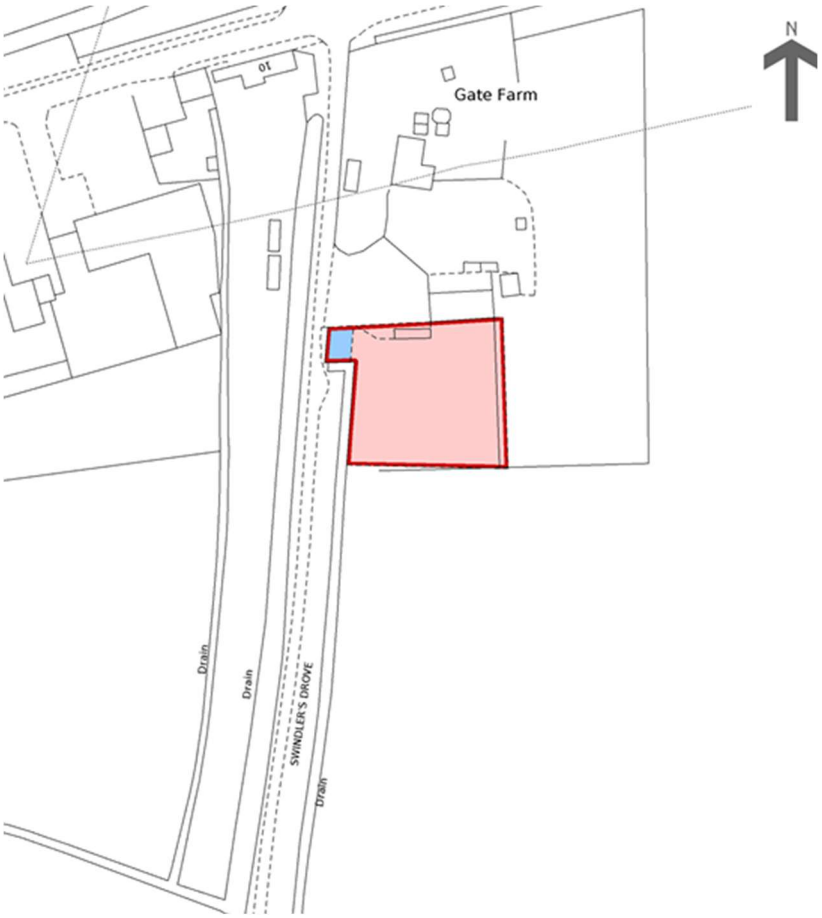

Key
Flood extent
Fig 3
Captain's Drain
Mykeham Drain
Moulton Mere Dra
Cross Dyke
Blue Gowt Drain
Reedy Graft Drain
B1180
Fengate Drain
Fengate Road
Fengate Road
A16
A151
High Road
Cemetery Drain
Tydd Road
Dozen's Bank
Pinchbeck Road
Park Road
Delgate Bank
Broad Lane
B1357
Pennygate Diversion
Pennygate
Spalding
River Welland
Rangell Gate
Bourne Road A151
B1165

Fig 4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Gate Farm
01
Drain
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