

PROPOSED REPLACEMENT DWELLING AT GATE FARM,
HOLBEACH ROAD, SPALDING.
FLOOD RISK ASSESSMENT



This flood risk assessment has been prepared solely to support the planning application for the replacement dwelling at Gate Farm. 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

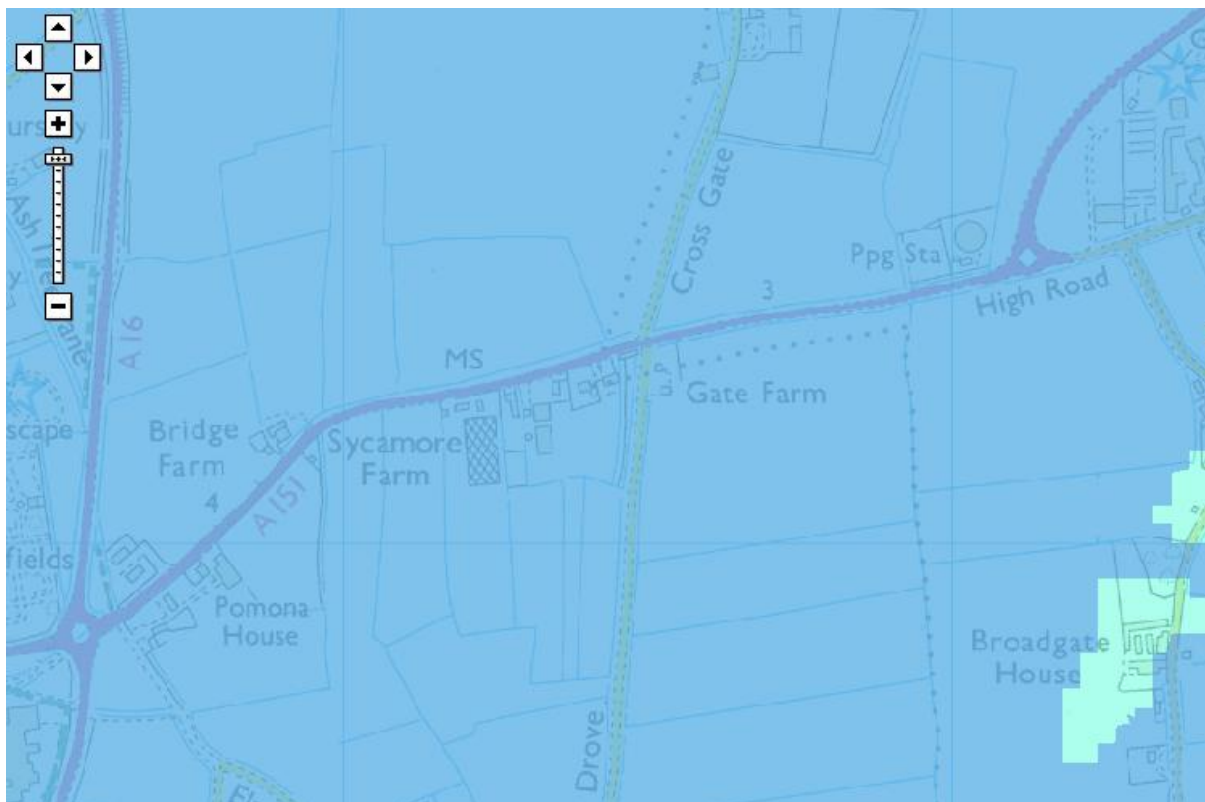
Gate Farm is located on a site south of Holbeach Road, Spalding. A Planning Application has been made to South Holland District Council for permission to construct a replacement dwelling to replace an existing building.

The site is within Flood Zone 3 as shown on the Environment Agency's Flood Zone map. 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 is taken from the EA website and shows the whole area to be at risk of flooding from rivers and sea assuming no defences.



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 527350 324100, 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 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 dwelling house 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.

The developer has stated that the floor level of the new building should be 600mm above ground level, at a level of 3.6m 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
	Year 2115	0 - 0.5m
Actual Risk Extent	Present day	Low to medium risk, but reliant on flood defences
	Year 2055	
Actual Peak Velocity	Present day	No flow across site.
	Year 2115	0 to 0.1m/sec
Residual Peak Depth	Present day	0 - 0.5m
	Year 2115	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

Figure 16 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	5.98m OD	6.31m OD	7.12m OD
Peak 1 in 1,000 year extreme tide level	6.27m OD	6.60m OD	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 eastern 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 overtopping of the tidal defences

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.

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 some time 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 the event.

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 house will be of two story construction so in most unlikely event of the flood depth in this area being greater

than 600mm, 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 in this flood risk assessment.

Recommendations

The client has stated that the finished floor level of the new building should be at 600mm higher than the existing ground level, which is a level of approximately 3.60m OD.

The building should be two story construction with all bedrooms situated on the first floor level.

The new building should be designed incorporating flood resistant/resilient techniques to allow it to be refurbished after being flooded 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 in Appendix 1.

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.

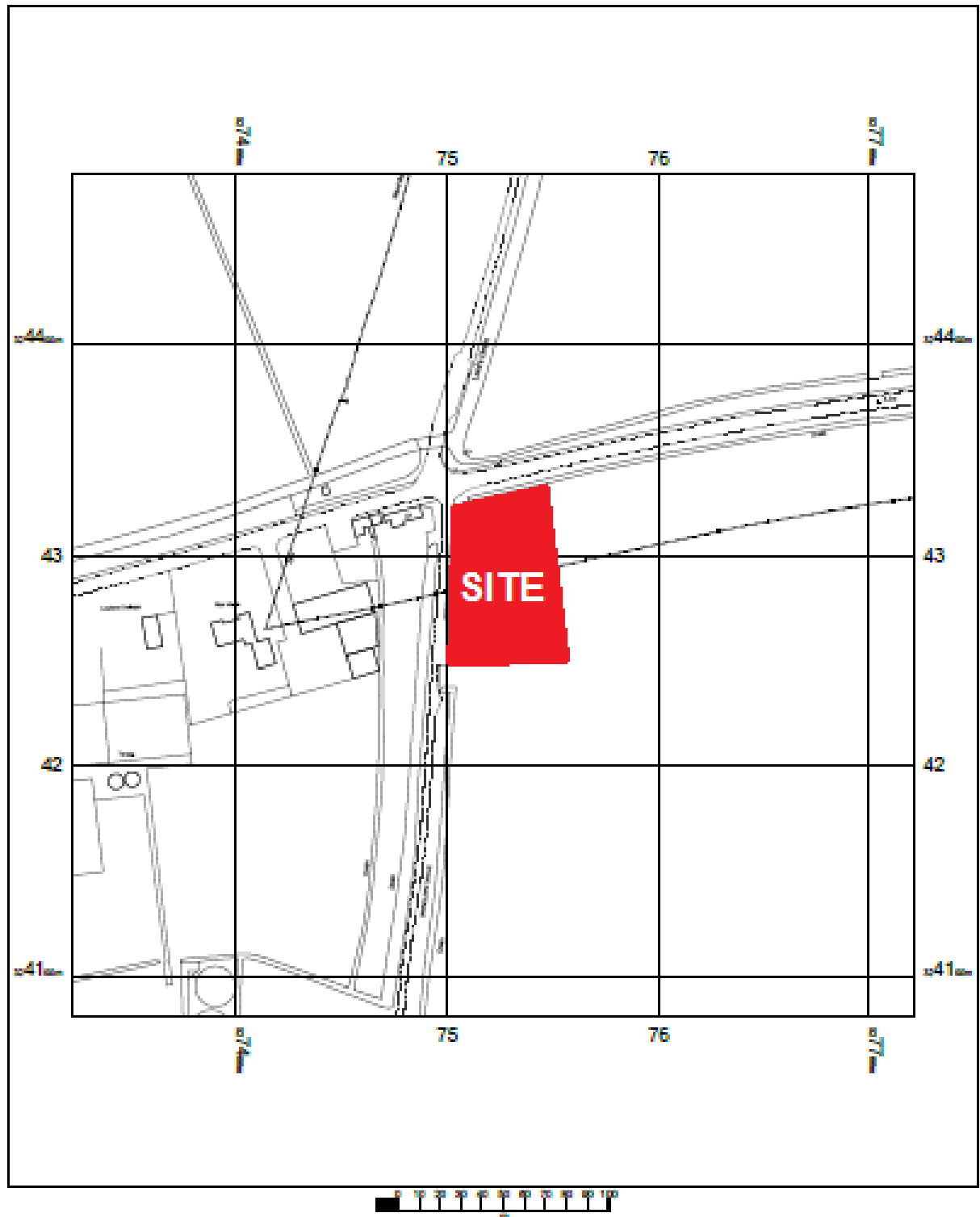
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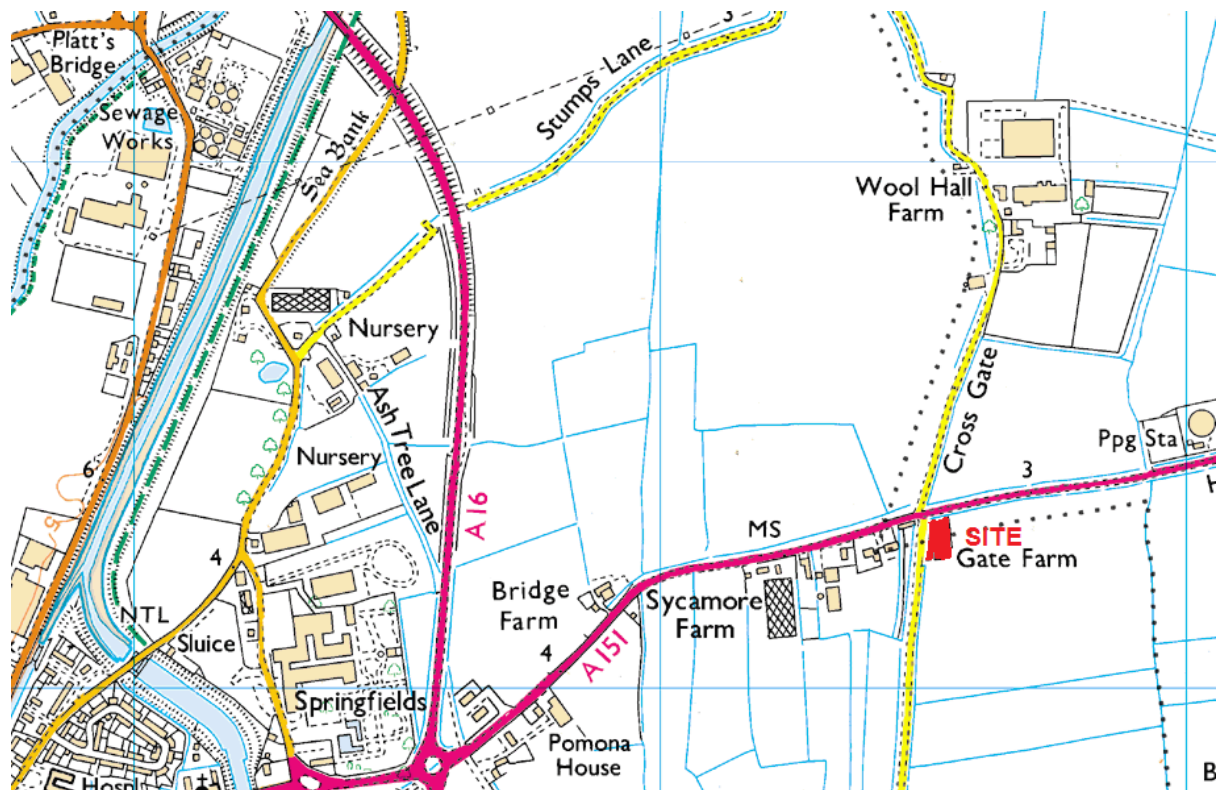
30th March 2012

LOCATION PLAN

Gate Farm



AREA PLAN



APPENDIX 1

RECOMMENDATIONS ON LIMITING FLOOD DAMAGE TO BUILDING

- Walls: 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.
- Ground Floor: Either precast concrete beams with concrete infill, or concrete above made up ground should be used. Dense concrete screeds should be used.
- Doors: 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.
- Kitchens: Install plastic base feet and if possible other plastic items to reduce damage from low level flooding. Raise fitted ovens as high as possible.
- Electrical Services: Place all of electrical wiring at first floor level and drop wiring down to sockets at least 1.0metre above ground level.