

FLOOD RISK ASSESSMENT
PROPOSED NEW BUILDING WITH
AT VICTORIA STREET, SPALDING, PE11 1EA



View of existing building from Victoria Street

S M Hemmings B Sc C Eng MICE MIWEM,
69 Charlotte Way,
Peterborough,
PE3 9ER

This flood risk assessment has been prepared solely to support the planning application for the proposed building at Victoria Street, Spalding. 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

An application has been submitted to South Holland District Council (Application No H16-0146-16) to demolish the existing building north of the Library on Victoria Street, Spalding and construct a new building which will contain six one bedroom self contained flats.

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

The Technical Guidance to the National Planning Policy Framework Development and Flood Risk states that if a development lies within Flood Zone 3 a Flood Risk Assessment should be carried out to accompany any Planning Application.

The site is shown within the defended area of 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 development is located on the western side of the River Welland. The National Grid Reference of the site is 524545 322650.

The location 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. The map below shows that the whole of the central area of Spalding is classified in Flood Zone 3(a).



Applying the flood risk vulnerability classification in Table 2 of the Guidance, the development is classified as “more vulnerable” and Table 3 of the Guidance states that residential use is only permitted after the sequential and exception tests are 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.

The South Holland District Council Core Strategy states that there is a limited number of sites in the town of Spalding available for this type of residential development. The Council also looks to promote “brownfield” development such as this. The site with a level of approximately 4.90m OD is within the central area of Spalding where land levels are higher than most sites in the town. It can be seen from the EA flood zone map that all of the area of Spalding is classed to be in Flood Zone 3. Therefore it is unlikely that a suitable alternative site can be found with a lower flood risk.

With the above evidence it is considered that the proposed site passes the Sequential Test as there are no other more suitable sites in this area in Flood Zones 1 or 2 with a lower flood risk.

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 to 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.
- Map 6 indicates the peak depth is zero for the present day 1% fluvial / 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 zero.
- Map 12 indicates the actual risk extent is zero.
- Map 13 indicates the 1% fluvial / 0.5% tidal event probability for 2115 for the site is zero.
- Map 14 indicates the actual risk extent for the year 2115 for the 0.1% event probability is zero.
- 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
	Hazard Nil
	Velocity ... Nil
For year 2115	Depth of flooding ... zero
	Extent of flooding.. Low or medium flood probability
	Hazard ... Nil
	Velocity .. Nil

- The maps also illustrate the residual flood hazard which is as follows:-

For the present day	Depth of flooding ... zero
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- Extent of flooding .. Low or medium flood probability
 - Hazard ... zero
 - Velocity .. zero
- For the year 2115
 - Depth of flooding ... zero
 - Extent of flooding .. Low or medium flood probability
 - Hazard ... zero
 - Velocity .. zero

3. The maximum flood levels in the fluvial section of the Spalding Welland is shown in the reports as follows:

	Peak 1 in 100		Peak 1 in 1000	
Year	2007	2115	2007	2115
Level	4.43	4.67	4.45	4.68

The defence level of left bank of Spalding Welland = 5.20m OD

4. The extreme tide levels in the section of the River Welland north of Fulney Lock is shown in the report as follows:

	2007	2055	2115
1 in 100 year	5.98	6.31	7.12
1 in 1,000 year	6.32	6.65	7.46

The lowest bank level occurs 200 metres north of Fulney Lock, where a section 300 metres long has a minimum level of 6.98m OD.

Site Levels

The level of the footpath in Victoria Street outside the property is approximately 5.05m OD. The ground floor level of the existing house is approximately 50mm above this at a level of 5.10m OD. It is recommended that the ground floor of the new building should be 200mm above the footpath at a level of approximately 5.25m 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 350 metres from the River Welland, which is main river and maintained by the Environment Agency.

This area west of the River Welland is drained by surface water sewers maintained by Anglian Water, which discharge either into the River Welland or into drainage channels maintained by Welland and Deepings Internal Drainage Board. The water levels in the IDB channels are controlled by the water level in South Drove Drain which also is operated by Welland and Deepings IDB.

Potential Sources of Flooding

The following sources of flooding have been identified:

1. Failure or overtopping of the tidal defences.
2. Overtopping of the River Welland.
3. Flooding from IDB drainage channels
4. Blockages in local surface water sewers (highway or Anglian Water)

1. Failure or overtopping of tidal defences.

The River Welland is tidal north of Fulney Lock, which is approximately 2 km north of the site. The SFRA states that the defences are adequate to withstand a 1 in 200 year (0.5%) probability event for present day. In the future in 2115 some of the banks could be overtopped with a 0.5% probability event. However one would expect that during the next one hundred years defences will be raised to maintain a 1 in 200 year standard of defence. If overtopping or a breach allowed water to flow westwards from the tidal Welland lower land to the west of the River Welland would be flooded and the central area of Spalding would remain unaffected, unless a high tide of extreme proportions occurred.

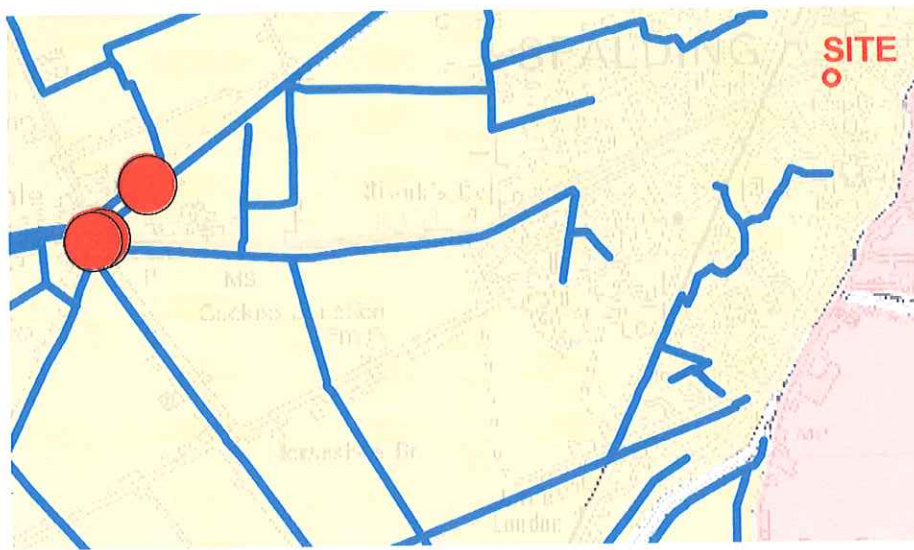
2. Overtopping of the River Welland.

The west bank of the River Welland is at a level of 5.20m O.D. at London Road. This is not a raised defence at this point. The land and the road are at 5.20m OD and the ground level gradually falls away from the River. Therefore, there is no possibility of failure here. There is a freeboard of at least 500mm above the 1 in 1,000 year maximum design level in the River.

Therefore, this source of flooding can be discounted.

3. Flooding from IDB watercourses

The Welland and Deeping IDB maintains a drainage channel to the west of St Thomas Road. The ground levels in this area are approximately 3.40m OD, and therefore any overflowing of this channel will be unlikely to affect the development site.



All of the IDB channels and piped drains are maintained in good condition, as well as the pumping stations that control the water levels in these channels.

Therefore flooding from this source can be discounted.

4. Blockages in local surface water sewers

Both Anglian Water and the Highways Authority maintain surface water drainage systems which discharge into IDB drainage channels or directly into the River Welland. If a blockage occurs in any of these underground sewers Victoria Street could suffer some flooding. However if the flood water reached 100mm deep it would start to flow northwards into roads at a lower level. The precaution of raising ground floor levels of the proposed building by approximately 200mm above the level of the road should prevent flooding from this source.

Therefore the risk of flooding from this source is extremely low.

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, as the proposed level of the

ground floor is higher than any predicted flood levels in the fluvial River Welland or any part of the IDB system.

The SFRA maps indicate that if a breach occurred in the sea defences during a 1 in 1000 year event in 2115 the site is not predicted to be flooded. The risk of any flooding occurring at this location is very low, and certainly less than 1 in 1000 years.

Therefore although this site is within Flood Zone 3 according to the initial classification because of the current standards of drainage and flood risk in Spalding, and the land levels in this part of the town, there is a very low risk of flooding to this site.

Summary of Risk of Flooding to the Site

In an extreme tidal event with multiple breaches occurring in the west bank of the tidal Witham it is just feasible that flooding could start to occur in this area of Spalding. If this flood water did rise to a level of 5.25m OD then it would do so very slowly, and future residents of the proposed dwelling would have adequate time to be warned and to make plans to evacuate or keep safe on the first floor of the building.

Conclusions

The following conclusions can be made:

- The proposed development is not in a functional flood plain as defined by the Technical Guidance.
- Although the site is in flood zone 3, the actual risk of the site flooding from any Environment Agency watercourse is very low.
- The SFRA indicates that no actual or residual flooding is predicted for the 1% fluvial / 0.5% tidal event probability in 2115, or for the 0.1% event probability in 2115.
- Most FRA's for developments west of the central area assume a maximum flood level of between 3.00m OD and 3.50m OD. The proposed floor level of the building is 1.7 metres above this level and it can therefore be seen the risk of flooding to the development site in Victoria Street must be much lower than 1 in 1000 years.
- The risk of the site becoming flooded from any source is extremely low.
- 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

- It is recommended that the ground floor level of the proposed building should be 200mm above the road level in Victoria Street, which is a level of 5.25m OD.

- In an area of flood risk it is prudent to design buildings with all of the sleeping accommodation on the first floor. However in this case as it can be seen that an event of much greater magnitude than 1 in 1000 in 2115 would be required to flood the area it is considered safe to allow sleeping accommodation on the ground floor of the building.
- If any flooding started to occur in an extreme flood event residents could seek refuge in the central part of Spalding where the land is higher.
- If any flooding did occur it would happen extremely slowly over many hours and the Local Authorities and emergency services would have adequate time to warn residents that flooding might occur, and residents would have adequate time to prepare themselves for the event.
- Occupiers of the property should register with the Environment Agency's Floodline Warnings Direct Service.
- On site surface water drainage will be discharged into soakaways and these should be designed to BRE Digest 365 and approved under Building regulations.

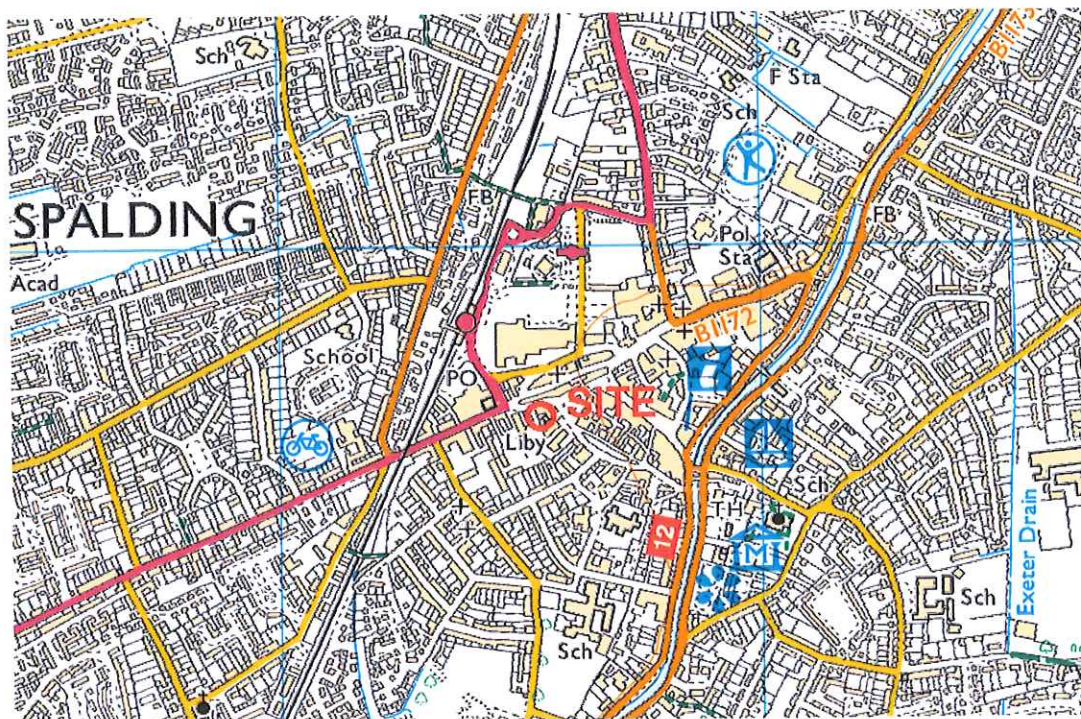
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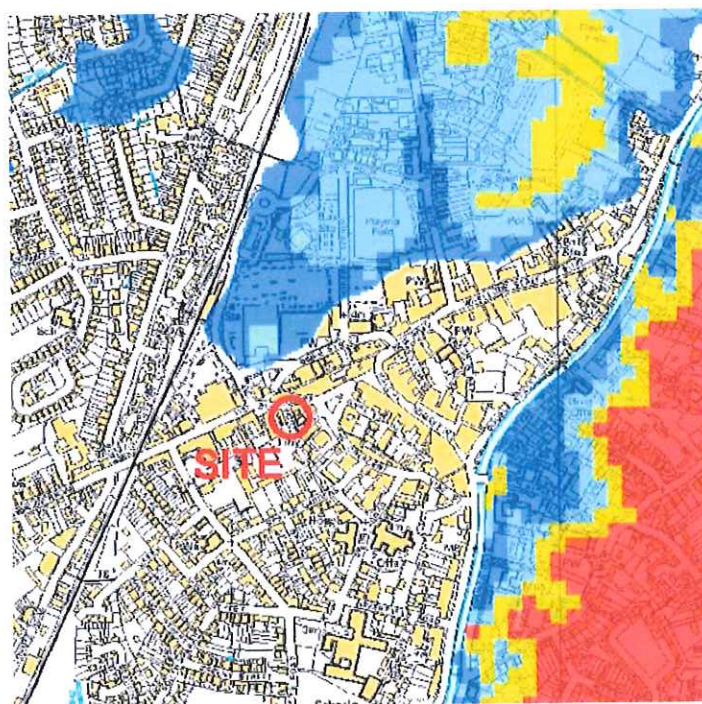
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15th March 2016.

LOCATION PLAN



PLAN OF PREDICTED 1 in 1000 YEAR RESIDUAL FLOOD DEPTHS IN 2115



GROUND FLOOR PLAN OF PROPOSED DEVELOPMENT

