

EN-PLAN

PLANNING & ARCHITECTURE

**FLOOD RISK ASSESMENT
PREPARED BY
EN-PLAN: PLANNING & ARCHITECTURE
FOR & ON BEHALF OF
87 SPALDING COMMON**

Table of Contents

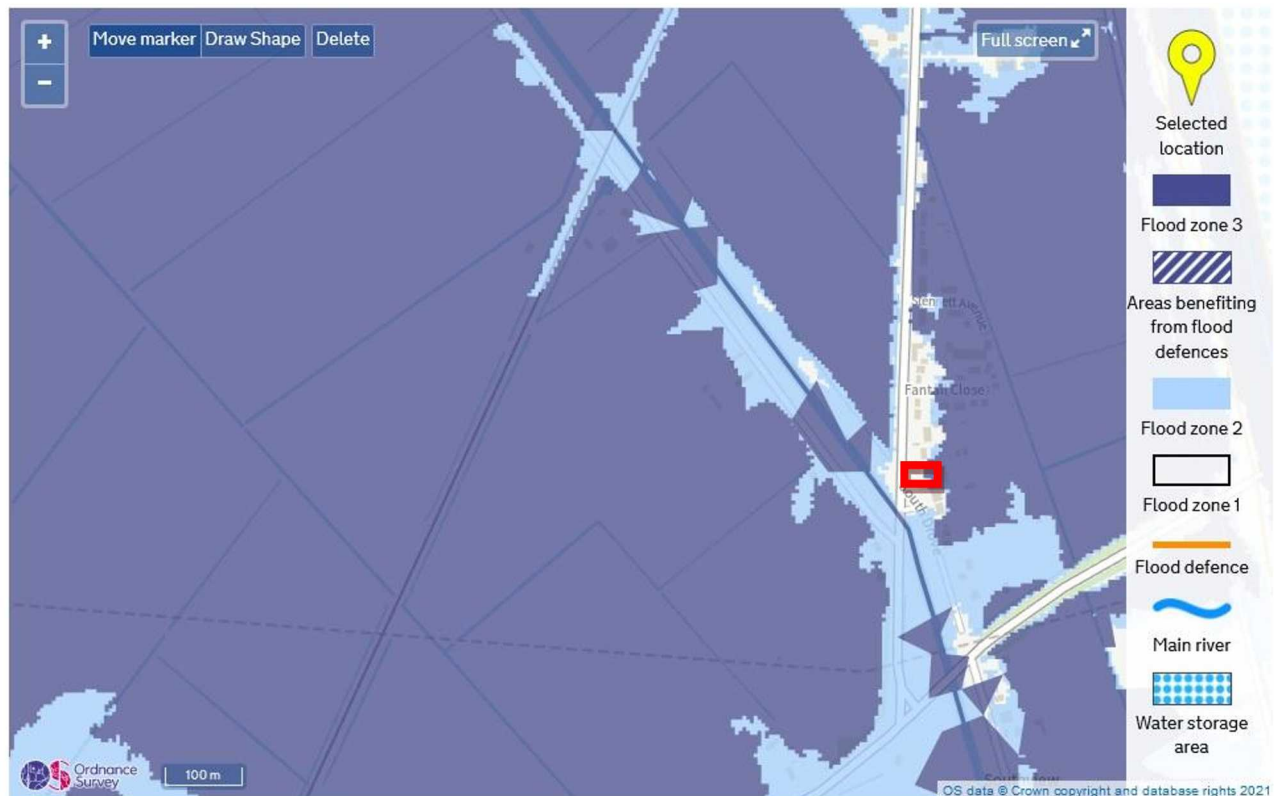
Introduction	3
The Existing Site & Immediate Surroundings.....	3
Existing Building(s).....	3
The Proposals	3
Potential Sources of Flooding	4
Impacts of Flooding.....	4
Preparations for Flooding.....	4
Conclusions	4

Introduction

The following information has been prepared to supplement the recent PLANNING APPLICATION submitted to the Council relating to the application for and on behalf of Mr. Philip Foster for the erection of one detached bungalow and extensions of the existing house at 87 Spalding Common..

The Existing Site & Immediate Surroundings

The site is located off Spalding Common and is adjoined on all sides by existing residential development.



Relevant Planning History in the Locality

Reference	H16-1095-13
Status	Approved
Proposal	Residential development - erection of detached house
Location	88A Spalding Common Spalding Lincolnshire PE11 3AU

Reference	H16-1110-15
Status	Approved
Proposal	Erection of 3 bedroom bungalow and double garage
Location	42B Spalding Common Spalding PE11 3AU

Existing Building(s)

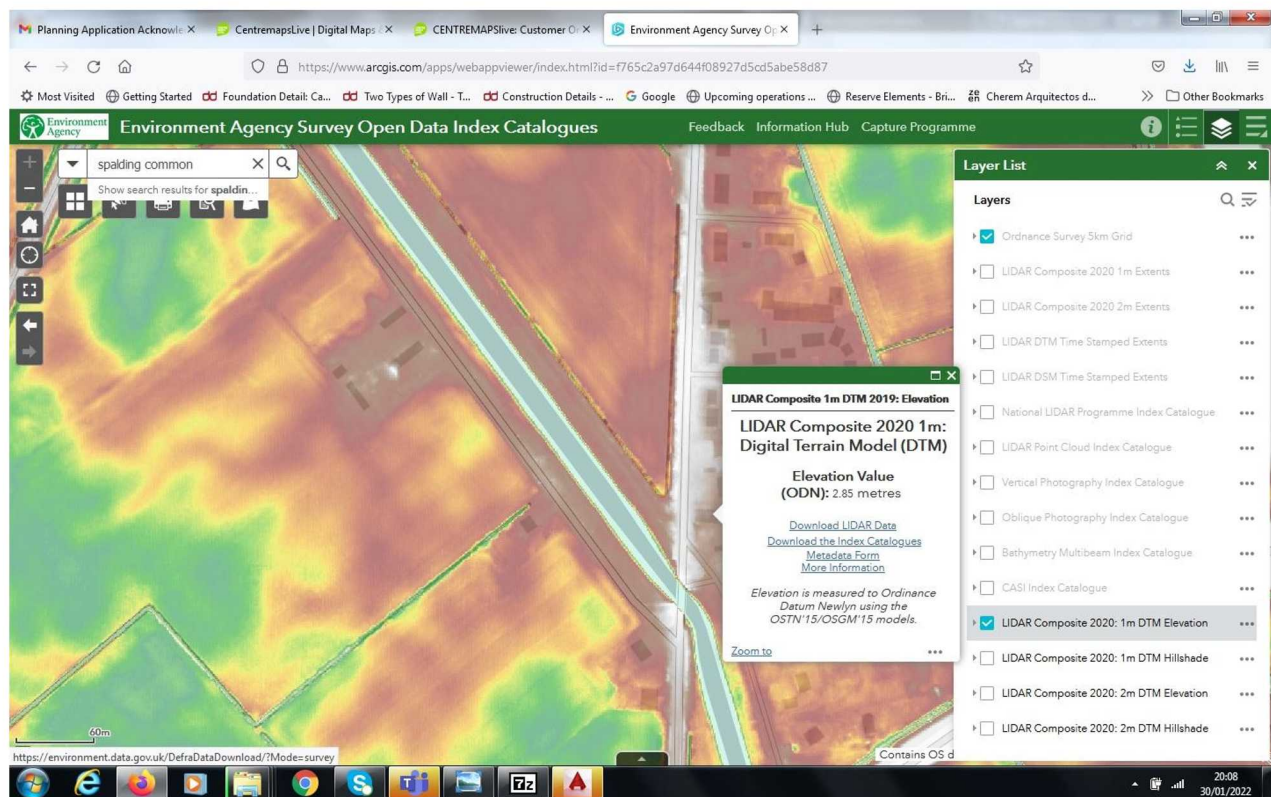
The area is characterised by two storey residential units.

The Proposals and reasoning behind the selection of 87 Spalding Common

The applicants propose to increase the size of the existing unit and erect a bungalow in the extensive rear cartilage. The proposed sit was chosen due to the site being protected by flood defences and residential development being deemed as acceptable in the area.

Elevation and Topography

The existing site generally remains level and this is a characteristic displayed across the broader area. The site is set at 2.85 m above ordnance datum.



The Sequential Test

The principle of development in the locality has been established by the planning history in the locality.

Potential Sources of Flooding

We have identified five sources of flooding:

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)

There is no known flooding at the site within the last 60 years.

1. Failure or overtopping of tidal defences.

The River Welland is tidal north of Fulney Lock, which is more than 5.0km 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 in the west bank of the tidal Welland allowed water to flow south westwards lower land to the west of the River Welland would be flooded and the central area of Spalding would remain unaffected.

Therefore flooding from this source can be considered to be adequately mitigated.

2. Breaching or Overtopping of the River Welland.

The SFRA predict that the flood depth would be between 500mm and 1.0 metres in a 1 in 1000 year event in 2115. In practice flood water would flow into the area between the river and Spalding Common and the level would rise until the flood water started to flow over the road. The flow over the road would be between 100mm and 200mm deep and from this the maximum level of the flood water can be estimated to be 3.35m OD. This would give a depth of water on the site of between 750mm and 1.0 metre over most of the site.

Most breaching of river banks is caused by overtopping eroding the back of the bank and causing failure. In this case the west bank of the River Welland has a freeboard of more than 1.0 metre and the likelihood of overtopping is very low. If the river level approached 5.00m OD two large syphons which discharge water into the Cowbit and Crowland Washes would be activated and this would immediately reduce water levels in the river. The risk of flooding to the proposed new dwellings will be mitigated by raising the ground floor levels of the properties above the predicted flood level in a 1 in 1000 year event in 2115.

3. Flooding from IDB watercourses

This area of Spalding Common is drained by the Welland Soke Dyke which is on the eastern side of Cradge Bank. Welland Soke Dyke is maintained by Welland and Deepings IDB (W & D IDB) and flows into South Drove Drain.

The water level in North and South Drove Drain, which is maintained by W & D IDB is controlled by Pode Hole Pumping Station. There are both electrically operated and diesel powered pumps which are operated at this location to control water levels. W & D IDB have stated that the normal pumping level is -1.20m OD and the maximum design water level in a 1 in 100 year event would be 0.18m OD. With climate change this could increase to around 0.7m OD.

However you would expect the IDB to increase capacity to keep pace with climate change over the next one hundred years.

Although the likelihood of water levels rising to 2.00m ODN in North Drove Drain is remote, if this happened low land around Deeping St Nicholas would start to flood and so the level in the Drain would be unlikely to increase further.

Therefore this source of flooding can be considered to be adequately mitigated as the proposed ground floor levels of the properties will be raised in excess of 1.0 metre above the 2.00m ODN level above.

4. Blockages in local surface water drainage systems

Highway drainage systems along Spalding Common could become blocked and water could flow onto the development site. However as it is proposed that the finished floor level will be at least 1050mm above ground level this will ensure that flooding will not occur from this source to the proposed buildings.

Therefore this source of flooding can be considered to be adequately mitigated.

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. However in an extreme event at this location water levels could rise quickly.

Residual Risk – Extreme Events

The residual risk from extreme events is very low on this site.

There are no records of the Spalding Common area having been flooded in the last 60 years.

Climate Change

The recommendations for flood depths for this flood risk assessment use information mostly taken from the South Holland DC SFRA which was last updated in 2016. It is concluded that no extra mitigation measures are necessary to comply with the new guidance on climate change.

South East Lincs Advice Matrix

Advice can be found on the recommended mitigation required by referring to a spreadsheet on the South East Lincolnshire website.

The development is in flood zone 3 and the flood hazard (see above) is shown to be 1.25 – 2.0 (danger for most). The standing advice for this hazard is shown in column D and row 9 which is shown below. 9

The Environment Agency requires direct consultation on proposals in this hazard zone. The NPPF requires that the proposal is accompanied by a Flood Risk Assessment which contains evidence that appropriate mitigation measures / flood resilience techniques have been incorporated into the development. The Environment Agency also wishes to be consulted on the Sequential Test Evidence. Applicants will need to demonstrate that housing proposals are required to meet an identified local housing need.

The applicant is advised to refer to the document “Improving Flood Performance of New Buildings Flood Resilient Construction (DCLG2007).

FFL should be informed by the predicted flood depth maps (refer to the relevant 2115 1% fluvial or 0.5% tidal maximum depth map) and set as required below (single storey proposals must use the 0.1% event, 2115 scenario for setting FFL).

Depths 1.0m – 1.6 metres:

Proposals must have a minimum of 2 storeys, with FFL set a minimum of 1.0 metre above ground level, with flood resilient construction to a height of 300mm above the predicted flood depth, and demountable defences to 600mm above FFL.

Depths 0.5m – 1metre:

FFL must be set 1.0 metre above ground level, with flood resilient construction to a height of 300mm above the predicted flood depth.

Summary of Risk of Flooding on Site

It can be seen that the predicted flood depth across most of the site is between 500mm and 1.0 metre. The maps showing the 1 in 100 year and the 1 in 1000 year predicted flood depths are almost identical.

If the levels along Spalding Common shown on the topographical survey are compared with the flood depths shown on the section of the site it can be understood that the flood depth will not be above 3.85 ODN..

Therefore the conclusion is that the best estimate of the maximum predicted flood level in a 1 in 1000 year event in 2115 is 3.85m ODN.

The risk of the level of flood water rising to 3.85m ODN in IDB drains can be considered extremely unlikely.

Impacts of Flooding

Although the site is within a Flood Zone the close proximity of flood defences the site is not at risk in the future.

No significant impacts are expected as a result of the proposals and the distance of the site from the river systems gives 2-3 days warning in the event of an incident. The extensive planning history in the locality has accepted residential development in Spalding Common as acceptable.

Preparations for flooding

The Environment Agency provides a Flood Warning Service which includes Flood Warning Codes and uses direct warning methods where the impacts of flooding are high. Flood warning sirens are currently operated in King's Lynn. Indirect warnings are provided in all flood risk areas and even those with a low risk of flooding. The main method is media broadcast via local radio and television and via automated texting and/or telephone messages. The Environment Agency also operate a 24 hour a day floodline service providing advice information on flooding on 0845 988 118.

The finished floor level will be set to 1050 mm above ODN.

On occupation of the premises the new occupants will produce a flood plan which will be kept in an easily accessible place for all to see.

The following flood resilient measures will be adopted to minimise the damage and to enable quick recovery and clean up after the flooding event:

- Electrical sockets will be installed above the flood level for ground floors to minimise damage to electrical services and allow speedy re-occupation.
- Water, electricity and gas meters will be located above predicted flood level.
- Non-return valves will be used in the drainage system to prevent back-flow of

diluted sewage in situations where there is an identified risk of the foul sewer surcharging.

- All service entries will be sealed (e.g. with expanding foam or similar closed cell material).
- Closed cell insulation will be used for pipes which are below the predicted flood level.
- Boiler units and ancillary devices will be installed above predicted flood level and preferably on the first floor of two-storey properties.
- Underfloor heating will be avoided on ground floors and controls such as thermostats will be placed above flood level.
- Wiring for telephone, TV, Internet and other services will be protected by suitable insulation to minimise damage.

Flood Emergency Plan

A Flood Emergency Plan will be developed for the site in conjunction the LLFA.

Flood Warnings & Evacuation

As the site is located within a flood zone area, it will be necessary to make sure that the residents are fully aware of the flood risk and flood warning and evacuation during an extreme event. If necessary, during a flood event the first floor will provide a safe haven for the residents.

Flood Warnings Direct

The residents are advised to utilise the Environment Agency's Flood Warnings Direct which is a free flood warning service called Floodline Warnings Direct (FWD). This service generally gives an advance notice of when flooding is likely to happen and time to prepare for a flood event.

Surface Water Runoff (SuDS)

The proposal consists of change of use to the existing building. There will be no increase in the building footprint area and the area of hardstanding. This means the surface runoff will not be increased post-development.

Assessment of Impact on flow of floodwater

The proposed development consists of change of use. There will be no increase in the building footprint area. This means the amount of displaced floodwater will not be increased. The development will not give rise to backwater affects or divert water towards other properties.

Recommendations

The finished ground floor level of any new bungalows with sleeping accommodation on the ground floor should be raised to a minimum level of 3.85m ODN which is 50mm above the predicted flood level in a 1 in 1000 year event in 2115.

All buildings should include flood resilient construction to a height of 300mm above the predicted flood level.

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

A suitable surface water drainage scheme should be set up for the site which will be approved by the planning authority who will be advised by the Lincolnshire County Council (the lead flood authority) and the Welland and Deeping IDB.

Conclusions

As the proposal is for residential development in an established residential area where the principle of development has been acceptable by the LPA and Environment Agency the site is deemed acceptable.