

**FLOOD RISK ASSESSMENT  
FOR RESIDENTIAL DEVELOPMENT AT  
HORSESHOE ROAD, SPALDING**

**FINAL REPORT**

**ECL1393/SEAGATE HOMES**

**DATE DECEMBER 2024**

**ELLINGHAM CONSULTING LTD**

Email: [tim@ellinghamconsulting.co.uk](mailto:tim@ellinghamconsulting.co.uk)

## CONTENTS

### 1.0 INTRODUCTION

### 2.0 SITE LOCATION AND DESCRIPTION

- 2.1 Site Location
- 2.2 Existing Site
- 2.3 Proposed Development
- 2.4 Local Development Documents
- 2.5 Available Flood Risk Information

### 3.0 FLOOD RISK VULNERABILITY

- 3.1 The Sequential and Exception Test
- 3.2 Vulnerability Classification
- 3.3 Application of the Sequential and Exception Test

### 4.0 SITE SPECIFIC FLOOD RISK

- 4.1 Local Flood Assets
- 4.2 Sources of Flooding
- 4.3 Probability of Flooding
- 4.4 Historic Flooding
- 4.5 Climate Change
- 4.6 Residual Risk

### 5.0 FLOOD RISK MITIGATION

- 5.1 Summary of Risks
- 5.2 Mitigation Measures

### 6.0 CONCLUSION

ATTACHMENT 1 – Topographic Survey (Dwg 24-113-01/02)

ATTACHMENT 2 – Site Layout (Dwg 10035-SGH-AR-SL-002 P01)

#### DISCLAIMER

*This document has been prepared solely as a Flood Risk Assessment in support of a planning application for proposed residential development at Horseshoe Road, Spalding. "Ellingham Consulting Ltd" accepts no responsibility or liability whatsoever for any use made of this document other than by the Seagate Homes for the purposes it was originally commissioned and prepared. All comments and opinions made are based upon information available to "Ellingham Consulting Ltd" during the necessary investigative process, and the conclusions and recommendations, could therefore, differ in the event of material subsequently being found erroneous, incomplete, or misleading. "Ellingham Consulting Ltd" therefore, accepts no liability should this prove to be the case.*

## **1.0 INTRODUCTION**

This Flood Risk Assessment has been prepared in accordance with National Planning Policy Framework (NPPF) and supporting planning practice guidance (PPG) on Flood Risk and Coastal Change.

In areas at risk of flooding or for sites of 1 hectare or more, developers are required to undertake a site-specific Flood Risk Assessment to accompany an application for planning permission. This Flood Risk Assessment has been produced on behalf of Seagate Homes in respect of a development that consists of seventy-six new residential dwellings at Horseshoe Road, Spalding.

A planning application for the proposed development is to be submitted by Seagate Homes.

## 2.0 SITE LOCATION AND DESCRIPTION

### 2.1 Site Location

The site is located at Horseshoe Road, Spalding, Lincolnshire, PE11 3JA. The National Grid Reference of the site is 52299/32162.

The location of the site is shown in Figure 1.



Figure 1 – Location Plan (© OpenStreetMap contributors)

### 2.2 Existing Site

The site is on the southern side of Horseshoe Road. The site consists of agricultural land which has an access track running through the centre. The track has an existing access to Horseshoe Road. The area of development is approximately 3.0 hectares.

A topographic survey of the site has been undertaken and is provided in Attachment 1. Ground levels at the site range between +2.8m OD and +3.3m OD. The carriageway level of Monks House Lane on the northern boundary of the site is typically +3.6m OD.

The site is in the Welland and Deepings Internal Drainage Board (IDB) District. The site and the surrounding land are within the Deeping Fen catchment. There are riparian drains on the eastern and northern boundaries of the site and Broughton Drain, an IDB Main Drain, is 700m west of the site.

The online British Geological Survey maps indicate that the site is likely to be underlain by Oxford Clay Formation mudstone. The bedrock is shown to be overlain with superficial deposits of clay and silt.

## 2.3 Proposed Development

The proposed development consists of seventy-six new dwelling. The development will include both single storey and two storeys dwellings. A Site Layout is provided in Attachment 2.

## 2.4 Local Development Documents

The South East Lincolnshire Local Plan 2011 – 2036, adopted in March 2019, is the Local Plan for the district. Policy 4: Approach to Flood Risk states the requirements for flood risk reduction.

The South East Lincolnshire Level 1 and Level 2 Strategic Flood Risk Assessment (SFRA) was prepared in June 2017.

The Joint Lincolnshire Flood Risk and Drainage Management Strategy has been prepared by Lincolnshire County Council as the Lead Local Flood Authority. The purpose of the Strategy is to increase the safety of people across Lincolnshire by reducing the number of people at risk of flooding, increasing the resilience of local communities, and reducing the impact of flooding

## 2.5 Available Flood Risk Information

An extract from the Environment Agency Flood Map for Planning is shown in Figure 2. The site is located within Flood Zone 3, an area with a high probability of flooding.

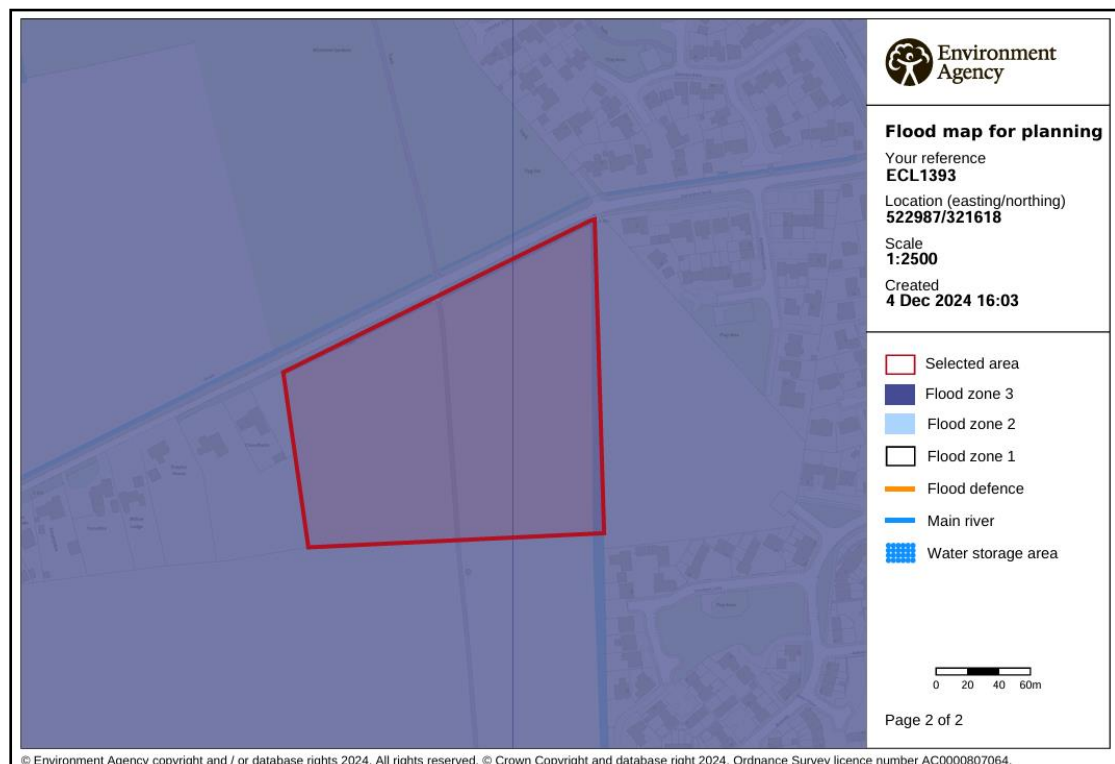


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the site has a medium risk of flooding from rivers or the sea (annual probability between 1% and 3.3%);
- there are isolated pockets of the site with a low risk of surface water flooding (annual probability between 0.1% and 1%) however the remainder of the site has a very low (annual probability less than 0.1%); and
- the site is not within an area at risk of reservoir flooding.

Table 1 shows the level of risk at the site within the South East Lincolnshire SFRA.

<b>SFRA Map</b>	<b>Present Day</b>	<b>2116</b>
Residual Flood Hazard Map for the 1% fluvial and 0.5% tidal event	The site is outside the 'Low Hazard' area	The site is outside the 'Low Hazard' area
Residual Peak Depth Map for the 1% fluvial and 0.5% tidal event	The site is outside the area at risk	The site is outside the area at risk

Table 1 – Flood Risk within SFRA Maps

### **3.0 FLOOD RISK VULNERABILITY**

#### **3.1 The Sequential and Exception Test**

The NPPF requires the application of a Sequential Test to ensure that new development is in areas with the lowest probability of flooding.

The Exception Test is a method to demonstrate and help ensure that flood risk to people and property will be managed, while allowing necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available.

#### **3.2 Vulnerability Classification**

Table 2 of the PPG Flood Risk and Coastal Change categorises different types of uses and development according to their vulnerability to flood risk. The proposed development is covered by the description of buildings used for dwellings and is classified as 'More Vulnerable'.

Table 3 of the PPG Flood Risk and Coastal Change sets out Flood Risk Vulnerability and flood zone 'compatibility'. The site is in Flood Zone 3 and the development is 'More Vulnerable' therefore it is necessary to complete the Exception Test.

PPG Flood Risk and Coastal Change defines that the lifetime of the development in terms of flood risk and coastal change is 100 years.

#### **3.3 Application of the Sequential and Exception Test**

It is for the Local Planning Authority, using the evidence provided and taking advice from the Environment Agency as appropriate, to consider whether an application passes the Sequential Test.

Large parts of the South Holland district close to the River Welland lie within Flood Zone 3. As such, opportunities to undertake the development at an alternative site with a lower flood risk are limited. The Environment Agency Flood Maps for Planning show that the whole of Spalding is within Flood Zone 3. In this context it is noted that SE Lincolnshire Local Plan residential allocations are within flood risk areas due to the lack of availability of sites within areas of lower flood risk.

The River Welland has defences that provide protection during the 1% annual probability (1 in 100 chance each year) fluvial event including climate change. The site therefore has a low probability of flooding and is considered to pass the Sequential Test.

The Exception Test requires consideration of the wider sustainability benefits of a development and that the development would be safe and residual risks managed.

The Local Plan has a target of a net increase of at least 11,681 dwellings in South Holland over the 25-year local plan period. The Plan considers this new housing is

required to ensure the sustainability of the Local Plan area. The proposed development will contribute to this target.

Section 5 of this Flood Risk Assessment describes the flood mitigation measures and the management of the residual risks, demonstrating that this development will be safe and not increase flood risk elsewhere. The development is considered to pass the Exception Test.

## **4.0 SITE SPECIFIC FLOOD RISK**

### **4.1 Local Flood Assets**

The site is 1300m west of the River Welland as it flows through Spalding. To the east of the site the River Welland has an inlet to the Coronation Channel, a bypass channel of the River Welland. The embankments of the Coronation Channel were constructed in the 1950's to convey river flows around Spalding. The Coronation Channel together with the Crowland and Cowbit Washes offer flood reduction to Spalding and the surrounding district.

The River Welland tidal defences are downstream of the confluence of the Coronation Channel and River Welland, however, these defences provide benefit downstream of Spalding and not to the town. The Cowbit Washes, Coronation Channel and River Welland tidal defences are the responsibility of the Environment Agency.

There is a long-term strategy for the maintenance of the Environment Agency defences which is reviewed and updated periodically.

There is an extensive local drainage network managed by Welland and Deepings IDB. The site and the surrounding land are within the Deeping Fen catchment and drain in a northerly direction to Pode Hole Pumping Station. Pode Hole Pumping Station discharges to Vernatts Drain which flows into the River Welland at Surfleet.

During the operation and maintenance of its pumping stations, associated structures and channel systems, the IDB seeks to maintain a general standard capable of providing flood protection to its district. A routine maintenance programme is in place to ensure that the Boards assets are commensurate with the standard of protection that is sought.

Current maintenance standards of the Welland and Deepings Internal Drainage Board and the Environment Agency are generally good.

### **4.2 Sources of Flooding**

A summary of the sources of flooding is provided in Table 2.

Source of Flooding	Level of Risk
Drainage Network Flooding	The risk is assessed in Section 4.3.
Surface Water Flooding	Based upon the EA maps the risk is very low / low.
Fluvial Flooding	The risk is assessed in Section 4.3 and Section 4.5.
Tidal Flooding	The risk is assessed in Section 4.3 and Section 4.5.
Reservoir Flooding	The risk of a breach is considered in Section 4.6.
Groundwater Flooding	Based upon the local drainage network the risk is low.

Table 2 – Sources of Flooding

### 4.3 Probability of Flooding

The probability of flooding associated with blockages in the Welland and Deepings IDB drainage system is low due to the maintenance standards achieved and managed by the IDB.

Through the operation and maintenance of the pumping stations and the channel system the Board seek to maintain a general standard capable to providing flood protection to agricultural land and developed areas of 1 in 20 years and 1 in 100 years, respectively. The risk associated with flood events that exceed the standard of protection provided is lowered due to the Welland & Deeping IDB main drains incorporating freeboard. This freeboard provides storage during the exceedance events.

The Coronation Channel and the Cowbit Washes protect the site from the River Welland. These flood relief measures provide protection during the 1% annual probability (1 in 100 chance each year) fluvial event.

### 4.4 Historic Flooding

During the preparation of this assessment, no evidence was discovered of the site being flooded. Previous historic rainfall events of 1968 and 1978, estimated to be greater than 1% annual probability (1 in 100 chance each year), caused no flooding to any residential properties.

### 4.5 Climate Change

Climate change is likely to impact the site through increased rainfall intensity and duration affecting the local drainage network and increased flood levels.

The River Welland defences have been designed to include an allowance for climate change.

In summary the existing systems and defences are appropriate for the design life of the development (i.e., 100 years).

#### 4.6 Residual Risk

There is a residual risk of flooding in and around Spalding site should a breach occur in the defences. The South East Lincolnshire SFRA includes maps demonstrating the impact of a breach in 2116. The Residual Peak Depth maps within the SFRA indicate the maximum flood depths associated with a breach and overtopping of defences during a 1% fluvial event and 0.5% tidal event. As shown in Figure 3 the site is not within an area at risk.

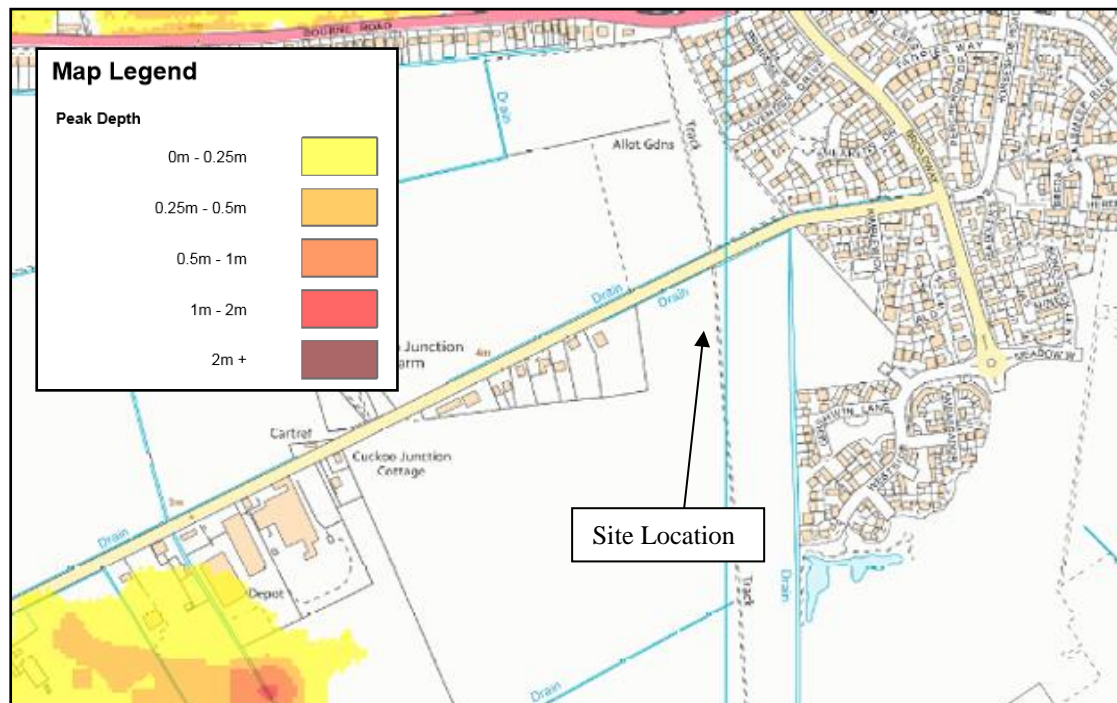


Figure 3 – SFRA 2116 Residual Peak Depth Map during the 1% fluvial and 0.5% tidal Annual Probability Event

The proposed development includes single storey dwellings and therefore the finished floor level within these dwellings needs to consider the 0.1% annual probability (1 in 1000 chance each year) event in 2115. The South East Lincolnshire SFRA includes 0.1% annual probability (1 in 1000 chance each year) maps for 2116 which show that the site is not within an area at risk during.

## 5.0 FLOOD RISK MITIGATION

### 5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Pode Hole Pumping Station could lead to an increased level of risk at the site.

The site benefits from any Environment Agency defences that provide protection during the 1% annual probability (1 in 100 chance each year) fluvial event and 0.5% annual probability (1 in 200 chance each year) tidal event. Over time there will be a gradual increase in risk to the site due to climate change. During the design life of the development, it is not anticipated that the site would flood.

The SFRA considers the residual risk associated with overtopping and a breach in the defences in 2116. During the 0.1% annual probability (1 in 1000 chance each year) event including climate change the site is not at risk.

The proposed arrangement increases the impermeable area and therefore there will be an increased volume of surface water that has the potential to increase flood risk.

### 5.2 Mitigation Measures

The site has a low 'actual risk' of flooding. Based upon the information available during the preparation of this flood risk assessment, it is recommended that the floor level of the dwellings is a minimum of 0.3m above ground level. It is recommended that there is 0.3m of flood resilient construction above finished floor level.

The developer should ensure that the eventual occupiers of the dwellings are sufficiently aware of the risk of flooding, and the standard of the existing defences. The Environment Agency operates a flood warning system for properties at risk of flooding to enable householders to protect life or take actions to manage the effect of flooding on property. Floodline Warnings Service is a national system run by the Environment Agency for broadcasting flooding warnings. The occupiers of the dwellings should register to receive flood warnings.

Should there be a failure of Pode Hole Pumping Station and conditions were such to put properties and land at risk of flooding, the Internal Drainage Board would take emergency action to maintain the drainage level of service by using temporary pumping equipment.

A Sustainable Drainage Strategy has been prepared to support the application so that stormwater from the development will not affect any adjoining properties or increase the flood risk elsewhere.

## 6.0 CONCLUSION

As a result of the assessment, the following conclusions have been reached.

- The proposed development consists of seventy-six residential dwellings at Horseshoe Road, Spalding.
- The site is located within an Internal Drainage Board catchment and through the operation and maintenance of the pumping stations and the channel system the Board seek to maintain a general standard capable to providing flood protection to agricultural land and developed areas of 1 in 20 and 1 in 100 years respectively.
- The proposed development is in Flood Zone 3. The site benefits from defences on the River Welland that provide protection during the 1% annual probability (1 in 100 chance each year) fluvial event and 0.5% annual probability (1 in 200 chance each year) tidal event including climate change.
- During a breach of the defences the site is not at risk.
- It is recommended that the floor level of the dwellings is a minimum of 0.3m above ground level with 0.3m of flood resilient construction above finished floor level.
- The development passes the Sequential Test and Exception Test and is therefore suitable for the proposed location.

**ATTACHMENT 1**

**TOPOGRAPHIC SURVEY  
(DWG 24-113-01/02)**



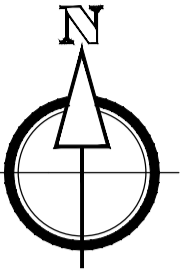


**ATTACHMENT 2**

**SITE LAYOUT  
(DWG 10035-SGH-AR-SL-002 P01)**

# HORSESHOE ROAD, SPALDING

**NOTES:**  
 The details depicted on this drawing are the copyright of Seagate Homes and may not be reproduced without permission. This drawing must not be re-issued, loaned or copied without the consent. Errors omissions and discrepancies should be reported to the originator immediately.  
 All dimensions to be checked on site prior to construction or off-site fabrication by the Contractor, his Sub-contractor or Supplier.  
 Do not scale plans - use figure or grid dimensions where given.  
 Any deviation from the drawing is to be reported to the originator immediately.  
 IF IN DOUBT ASK!



House Type Schedule			
<b>1 Bed Houses</b>			
S102 (53.27 / 542.10m <sup>2</sup> )	10, 11, 12, 13,	4	
S103 (48 / 536.4m <sup>2</sup> )	42, 43	2	
S104 (52m <sup>2</sup> / 559.4m <sup>2</sup> )	44, 45	2	
<b>2 Bed Houses</b>			
S213 V3 (48.617 / 738.5m <sup>2</sup> )	16, 17, 22, 23, 24, 25, 26, 29, 39, 40, 41, 42, 57, 58	14	
<b>3 Bed Houses</b>			
S301 V4 (86.6m <sup>2</sup> / 152m <sup>2</sup> )	46	1	
S303 V2 (83.3m <sup>2</sup> / 894m <sup>2</sup> )	26, 27, 47, 48, 49, 50, 51,	13	
S305 V3 (86.6m <sup>2</sup> / 934m <sup>2</sup> )	9	1	
S306 V3 (86.6m <sup>2</sup> / 934m <sup>2</sup> )	32, 43, 45, 48	4	
S312 V2 (89.3m <sup>2</sup> / 961m <sup>2</sup> )	30, 31,	2	
S318 V2 (77.9m <sup>2</sup> / 828.01m <sup>2</sup> )	15, 19, 21, 33, 35, 34, 47, 49	8	
S319 V2 (83.44m <sup>2</sup> / 898m <sup>2</sup> )	14, 18, 20, 34, 36, 53, 44, 70	8	
<b>4 Bed Houses</b>			
S400 (128.8m <sup>2</sup> / 1279m <sup>2</sup> )	3, 5	2	
S405 (107.44 m <sup>2</sup> / 1154.61m <sup>2</sup> )	4, 7,	2	
S406 (118.8m <sup>2</sup> / 1279m <sup>2</sup> )	2	1	
S409 V1 (118.8m <sup>2</sup> / 1224.9m <sup>2</sup> )	1, 8,	2	
S409 V2 (118.8m <sup>2</sup> / 1224.9m <sup>2</sup> )	4, 44,	2	
S411 (188.1m <sup>2</sup> / 2025.3m <sup>2</sup> )	71, 75	2	
S415 (243.9m <sup>2</sup> / 2425.3m <sup>2</sup> )	72	1	
S420 V3 (124.6m <sup>2</sup> / 1241.1m <sup>2</sup> )	37, 38	2	
S420 (143.4m <sup>2</sup> / 1339m <sup>2</sup> )	74	1	
<b>5 Bed Houses</b>			
S503 (242.98m <sup>2</sup> / 2615.43m <sup>2</sup> )	73, 74	2	
<b>Total = 76</b>			

House Breakdown	
1 Bed Houses	8
2 Bed Houses	14
3 Bed Houses	37
4 Bed Houses	15
5 Bed Houses	2
<b>Total</b>	<b>76</b>

LEGEND	
Application Site Boundary	
Proposed Housing	
Private Gardens/Green Space	
SUDS	
Drives/Parking	
Adoptable road/ Footpaths	
Private Footpaths	
Existing Tree	
Indicative Tree Planting	
Trees to be removed	
House with dummy chimney(s) - <small>These locations take precedent over house type drawings. Refer to house type drawing for positions on roof.</small>	
Garage personnel door	

Rev	Notes	Date	By



Project: PROPOSED RESIDENTIAL DEVELOPMENT, HORSESHOE ROAD, SPALDING, Lincs.  
**DRAFT**  
 Drawn: MD Date: 26.11.2024  
 Status: PLANNING Scale: 1:500 @A1  
 Drawing Number: 10035-SGH-AR-SL-002 Issue: P01

