FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
CEDAR FALLS, SPALDING

FINAL REPORT

ELLINGHAM CONSULTING LTD

ECL0108/ G R MERCHANT LTD

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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 G R Merchant Ltd in respect of a development that consists of extensions to a Care Home and the eight new annex buildings at Cedar Falls, Spalding.

A planning application for the proposed development is to be submitted by G R Merchant Ltd.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is located at Cedar Falls, London Road, Spalding, Lincolnshire, PE11 2UA. The National Grid Reference of the site is 52377/32128.

The location of the site is shown in Figure 1.

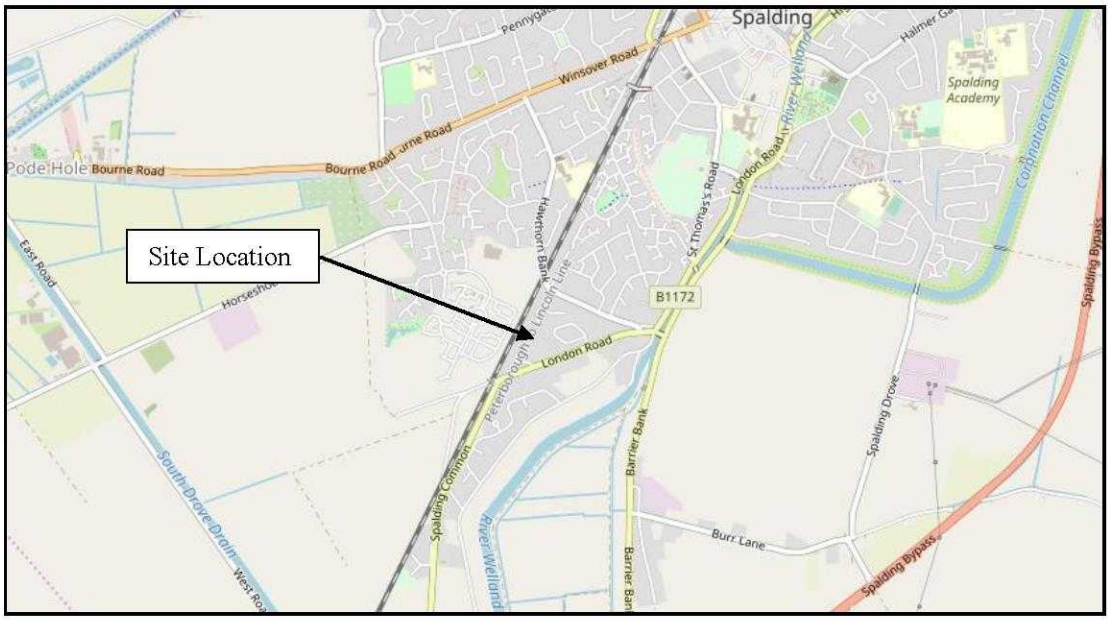

Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is part of Cedar Falls, a Care Home in the Little London area of Spalding. The site consists of the primary Care Home building and three annex buildings providing residential accommodation surrounded by gardens. The area of development is approximately 1.1 hectares.

The Environment Agency LIDAR shows that the site is flat and ground levels within the site are typically between +2.9m OD and +3.1m OD. London Road adjacent to the site is at a level of approximately +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 Urban Spalding catchment and drain in a westerly direction to Pode Hole Pumping Station.

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:

- a two-storey extension to communal areas within the Care Home building;
- a single storey extension to a laundry room within the Care Home building; and
- eight new annex buildings providing residential accommodation. The annex buildings will be single storey and in the grounds of the Care Home.

This FRA has been prepared considering the proposed annex buildings.

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

The site is located within Flood Zone 3, an area with a high probability of flooding, of the Environment Agency Flood Maps for Planning as shown in Figure 2. The site is not within a functional floodplain and is therefore in Flood Zone 3a.

Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the site has a very low risk of flooding (annual probability less than 0.1%);
- part of the site has a low risk of surface water flooding (annual probability between 0.1% and 1%) with potential flood depth less than 0.3m; and
- the site is within an area at risk of reservoir flooding.

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

SFRA Map	Present Day	2116
Residual Flood Hazard Map for the 1% fluvial and 0.5% tidal event	The site is outside of the 'Low Hazard' area	The site is outside of the 'Low Hazard' area
Residual Peak Depth Map for the 1% fluvial and 0.5% tidal event	The site is outside of the area at risk of flooding	The site is outside of the area at risk of flooding
Residual Peak Depth Map for the 0.1% event	The site is outside of the area at risk of flooding	The site is outside of the area at risk of flooding

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 residential care homes 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

The Sequential Test and Exception Test are required to be applied by the Local Planning Authority.

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 very limited. At this location it is not possible to position the development on higher ground within the proposed site.

The SFRA states that as it is necessary to use the refined flood risk information (hazard and depth maps) to assist with the application of the Sequential Test. The refined flood risk information contained within the SFRA demonstrates the site is not at risk during the 0.1% event. 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 highlights the importance of a mix of property types and that 10% of the housing need is for an ageing population

with the likelihood of mobility and disability needs. The proposed development will contribute to meeting this need.

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 400m west of the River Welland as it flows through Spalding. The site is 900m south west of the 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 every 5 years.

There is an extensive local drainage network managed by Welland and Deepings IDB. There is an IDB maintained watercourse, the Railway Delph on the western boundary of the site. The site and the surrounding land are within the Urban Spalding catchment and drain in a westerly 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

The potential sources of flooding that have been identified during this assessment are:

- surface water flooding;
- local blockages to the Welland and Deepings IDB main drain system;
- an event in the local drainage network that exceeds the standard of protection;
- failure of Pode Hole Pumping Station; and
- overtopping and / or breaching of the River Welland defences.

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.

The standard of drainage provided by Welland and Deepings IDB is assessed at 2% annual probability (1 in 50 chance each year), compatible with the Department of the Environment, Food and Rural Affairs (DEFRA) target level of service for rural drainage and flood defence works. The risk associated with flooding due to events greater than 2% annual probability (1 in 50 chance each year) is lowered due to the Welland and Deepings IDB high priority watercourses incorporating a freeboard. This provides storage during events greater than 2% annual probability (1 in 50 chance each year).

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) flood inclusive of climate change.

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 South East Lincolnshire SFRA maps show that the site is not at risk during the 0.5% annual probability (1 in 200 chance each year) tidal event with climate change.

4.6 Residual Risk

There is a residual risk of flooding at the site should a breach occur in the tidal 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. These show that the site is not at risk.

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 probability of the site flooding from any Environment Agency system is less than 0.1% annual probability (1 in 1000 chance each year) because of the standards of the existing flood defences. 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 a breach in the defences. The maps show that the site is not at risk. If during extreme events, levels of floodwater rose to such an extent that the site was affected, the situation would not be sudden.

There is a low level of surface water flood risk at the site with potential depths up to 0.3m.

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

Based upon the information available during the preparation of this flood risk assessment, in order to mitigate against the remote risk of flooding it is recommended that the floor level of the annexes are 0.3m above ground levels with 0.3m of flood resilient construction above finished floor level.

The developer should ensure that the occupiers of the annexes are sufficiently aware of the risk of flooding, and the standard of the existing defences. The Environment Agency provides a Flood Warning Service which includes Flood Warning Codes and uses direct warning methods where the risks and impacts of flooding are high.

In addition to direct and indirect flood warnings, the Environment Agency operates a 24 hour a day Floodline Service providing advice and information on flooding. The Care Home should register with the Floodline Direct Warnings Service to receive any future flood warnings.

The Care Home building, which is two storeys, will provide a safe refuge for residents of the annex buildings should this be required.

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 utilising temporary pumping equipment.

It is recommended that surface water run-off is discharged to soakaways to BRE365 design requirements and therefore water from the site will not affect any adjoining properties or increase the flood risk elsewhere.

6.0 CONCLUSIONS AND RECOMMENDATIONS

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

- The proposed development is in a defended floodplain. It is in the floodplain of the River Welland and protected during the 0.1% annual probability (1 in 1000 chance each year) event. During the design life of the development, including an allowance for climate change, it is not anticipated that there would be flooding at the site.

- The site is located within an Internal Drainage Board catchment with a minimum standard of drainage of 2% annual probability (1 in 50 chance each year) which accords with DEFRA guidelines for rural development. The risk of flooding is lowered further due to the Welland and Deepings IDB high priority watercourses incorporating a significant freeboard. This provides storage during events greater than 2% annual probability (1 in 50 chance each year).

- The Environment Agency Long Term Flood Risk Maps show that there is a low risk of surface water flooding.

- It is recommended that the floor level is 0.3m above ground level with 0.3m of flood resilient construction above finished floor level to mitigate against the risk of surface water flooding. Surface water run-off from the development should be discharged to soakaways to BRE365 design requirements so that adjoining land and properties are not affected.

- The development passes the Sequential Test and Exception Test and is therefore suitable for the proposed location.

ATTACHMENT 1

ANNEX BUILDINGS SITE PLAN AND LOCATION PLAN (Dwg 3524-19)