FLOOD RISK ASSESSMENT
FOR COMMERCIAL DEVELOPMENT AT
GREEN LANE, GOSBERTON

FINAL REPORT

ECL1947/GR 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 GR Merchant Ltd in respect of a development that consists of the change of use of a glasshouse to have a retail use at Green Lane Nurseries, Green Lane, Gosberton.

A planning application for the proposed development is to be submitted by GR Merchant.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is located at Green Lane Nurseries, Green Lane, Gosberton, Lincolnshire, PE11 4PA. The National Grid Reference of the site is 52489/33215.

The location of the site is shown in Figure 1.



Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is within the curtilage of a horticultural holding on the western side of Green Lane and to the north of Boston Road. The site consists of a glasshouse, the hardstanding area on the north eastern and south eastern sides of the glasshouse and the access to Green Lane. The area of development is 0.42 hectares.

Environment Agency LiDAR data shows that the site is flat with ground levels within the site are between +3.1m OD and +3.2m OD. The site access is at +3.3m OD and Boston Road alongside the site is typically +3.8m OD.

The site is in the Welland and Deepings Internal Drainage Board (IDB) District. Surface water at the site drains naturally through soakaway and hence to the IDB drain system. There is a riparian drain alongside Boston Road on the southern boundary of the nursery and an IDB Drain, Marlode Drain, forms the eastern boundary 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 the change of use of a glasshouse to have a retail use. A Site Layout of the proposed development is provided in Attachment 1.

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 1, an area with a low probability of flooding.

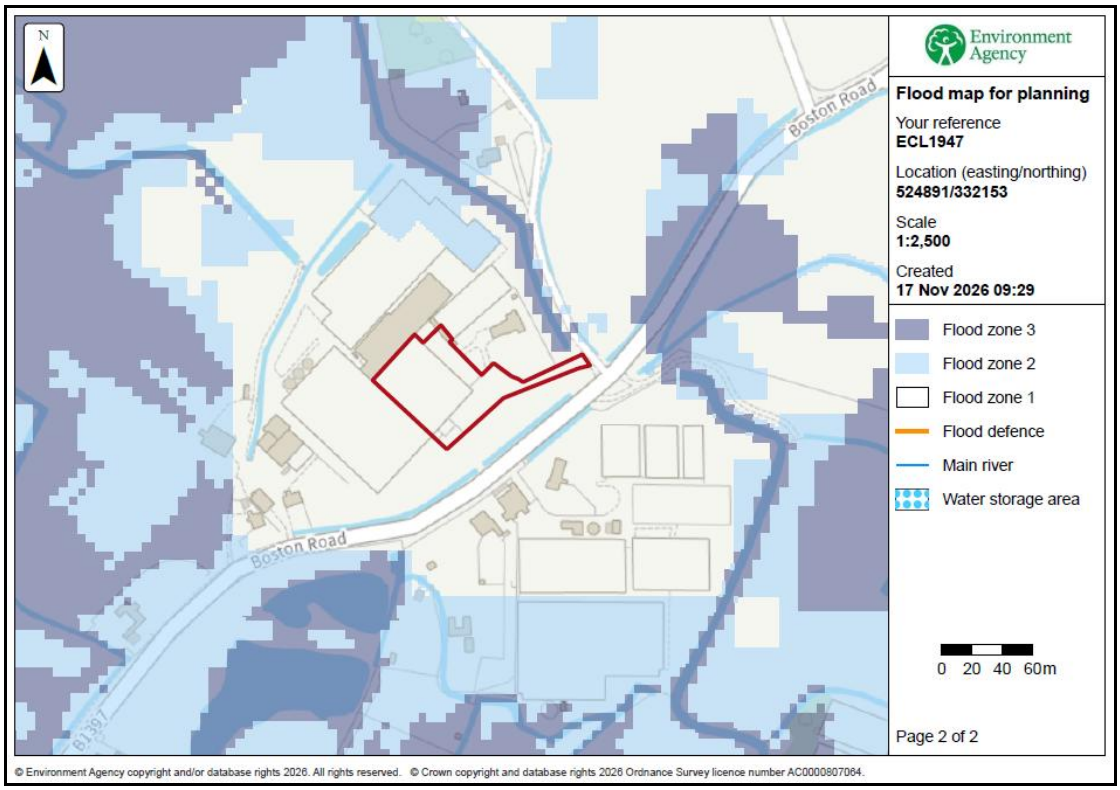


Figure 2 – Environment Agency Flood Map for Planning

The Flood Map for Planning shows that during the event with a 1 in 100 annual likelihood there is an isolated area of surface water flooding to the north east of the glasshouse. When climate change is considered for this return period event the glasshouse and surrounding area is at risk with depths up to 0.15m.

The Environment Agency Long Term Flood Risk maps provide an indication of the risk from the primary sources of flooding. The map shows that the site is outside of the 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 the 'Low Hazard' area	The site is outside the 'Low Hazard' area
Residual Peak Depth Map for the 1% fluvial and 0.5% tidal	The site is outside the area at risk during a breach	The site is outside the area at risk during a breach

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

Annex F (Table 2) of NPPF categorises different types of uses and development according to their vulnerability to flood risk. The proposed development is covered by the description of general industry and is classified as 'Less Vulnerable'.

Annex F (Table 3) of NPPF sets out Flood Risk Vulnerability and flood zone 'compatibility'. The site is in Flood Zone 1 and the development is 'Less Vulnerable' therefore it is not 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 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.

The site is located in Flood Zone 1 and therefore it is not possible to undertake the development at an alternative site with a lower probability of flooding. The site is considered to pass the Sequential Test.

4.0 SITE SPECIFIC FLOOD RISK

4.1 Local Flood Assets

The site is 4.0km northwest of the tidal River Welland downstream of Spalding. The River Glen, a tributary of the River Welland, is 3.5km to the south of the site. The defences on the River Welland and the River Glen 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. An IDB maintained watercourse, Marlode Drain, forms the eastern boundary of the site. The site and the surrounding land drains to the Risegate Eau which is 900m south of the site. The catchment drains in an easterly direction to Risegate Eau Pumping Station which discharges to the tidal River Welland.

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 IDB 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 Flood Map for Planning part of the site has a 1 in 30 annual likelihood of flooding.
Fluvial Flooding	The site is not at risk of fluvial flooding
Tidal Flooding	The site is not at risk of tidal flooding
Reservoir Flooding	Based upon the EA maps the site is not at risk of reservoir flooding.
Groundwater Flooding	There is no evidence to suggest the site is at risk of groundwater flooding.

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 and Deeping IDB main drains incorporating freeboard. This freeboard provides storage during the exceedance events.

The River Welland tidal defences provide protection during the 0.5% annual probability (1 in 200 chance each year) tidal event. The River Glen has defences that 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.

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 tide levels.

The extent and depth of flooding including an allowance for climate change is shown in Figure 3.

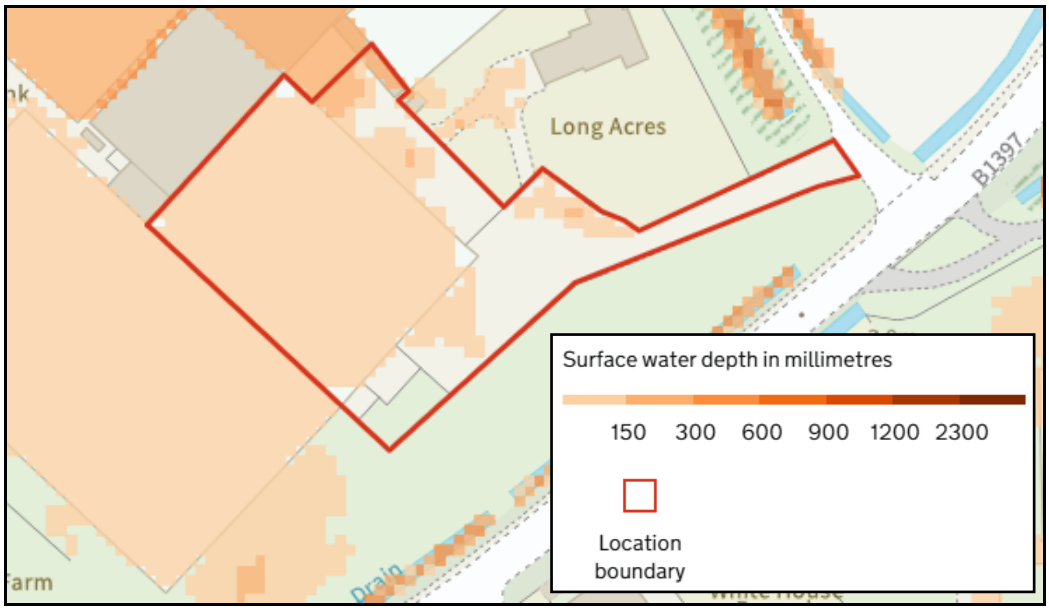


Figure 3 – 2061-2125 1 in 100 Annual Likelihood of Surface Water Flooding

Figure 3 shows that the glasshouse and part of the surrounding hardstanding are at risk with depths up to 0.15m.

The River Welland tidal defences provide protection during the 0.5% annual probability (1 in 200 chance each year) event inclusive of the effects of climate change. The estimated tide level during this event is +7.13m OD and typical defence levels are more than +7.5m OD. In summary the existing systems and defences are appropriate for the design life of the development (i.e., 100 years).

4.6 Residual Risks

There is a residual risk of flooding to land close to the River Welland should a breach of the tidal defences occur. The South East Lincolnshire SFRA includes maps demonstrating the residual peak depth in 2116. The Residual Peak Depth maps within the SFRA show that when the climate change allowances are applied to the 1% annual probability fluvial (1 in 100 chance each year) and the 0.5% annual probability tidal (1 in 200 chance each year) event 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 Risegate Eau Pumping Station could lead to an increased level of risk within the IDB catchment.

Over time there will be a gradual increase in risk to the site due to climate change. The glasshouse is at risk of surface water flooding during the 1 in 100 annual likelihood event including climate change with depths up to 0.15m.

Due to the standards of the existing defences the site is not at risk of flooding from any Environment Agency system during the 1% annual probability (1 in 100 chance each year) fluvial event or the 0.5% annual probability (1 in 200 chance each year) tidal event. During the design life of the development, it is not anticipated that the site would flood.

There will be no increase in impermeable area associated with the development so there is no potential that flood risk will be increased elsewhere.

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, there are no specific mitigation measures proposed associated with the design.

The developer should ensure that the user of the site is 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 user of the site should register to receive flood warnings.

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

It is recommended that surface water run-off is managed so that stormwater from the development will not affect any adjoining properties or increase the flood risk elsewhere.

6.0 CONCLUSIONS

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

- The proposed development consists of the change of use of a glasshouse to have a retail use at Green Lane Nurseries.

- 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 site is in Flood Zone 1. The site is at risk of surface water flooding.

- The development is protected by defences 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 an allowance for climate change. The site is not at risk during a breach of the tidal defences.

- There are no specific recommendations associated with the proposed change of use to reduce the risk of flooding to the development.

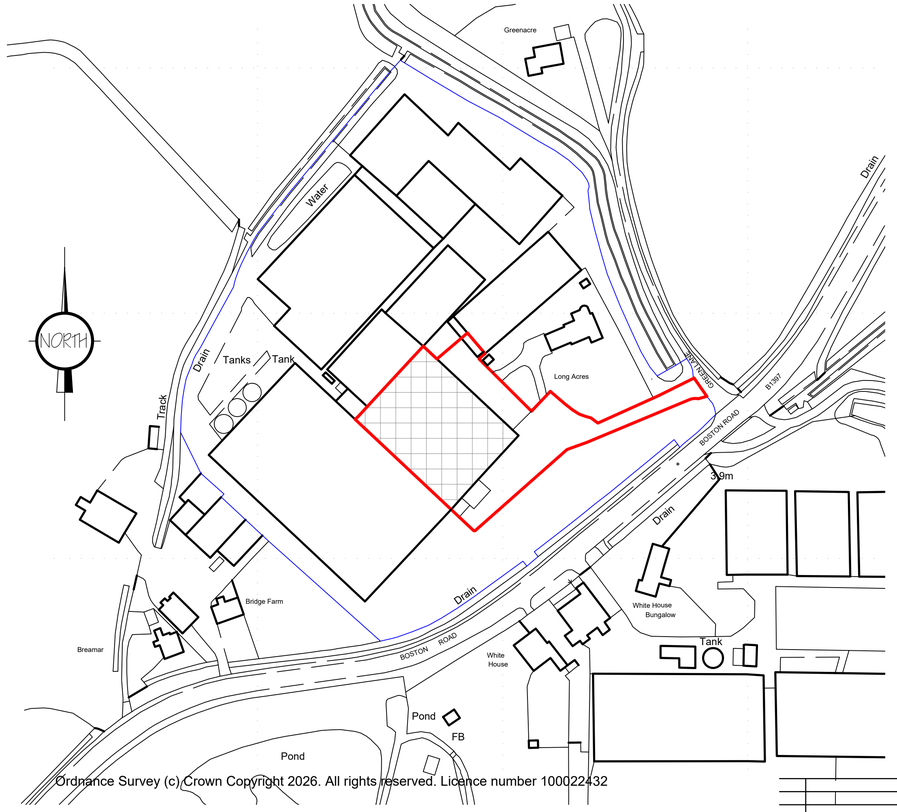
- The development passes the Sequential Test and is therefore suitable for the proposed location.

ATTACHMENT 1

FLOOR PLAN, LOCATION & SITE PLAN
(DWG 4561-26 01)



PART SITE PLAN 1:200



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LOCATION PLAN 1:1250



PART SITE PLAN 1:500

ref:	revision	date

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Client
BRIDGE FARM HORTICULTURE LTD

Drawing
FLOOR PLAN
LOCATION & SITE PLANS

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Date	Drawn
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