

**FLOOD RISK ASSESSMENT
FOR COMMERCIAL DEVELOPMENT
AT HERDGATE LANE, PINCHBECK**

FINAL REPORT

ECL1901/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 a chill store and pack house at Herdgate Lane, Pinchbeck.

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

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is located at Howards Yard, Herdgate Lane, Pinchbeck, Spalding, PE11 3UP. The National Grid Reference of the site is 52581/32729.

The location of the site is shown in Figure 1.

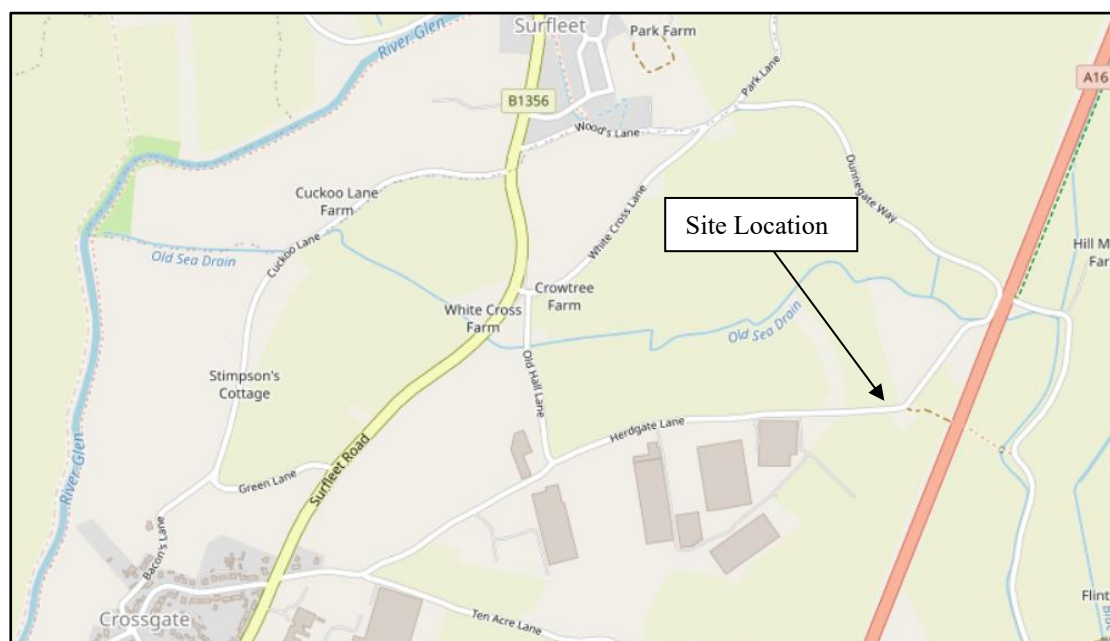


Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is on the northern side of Herdgate Lane. The site is an area of agricultural land. There is a dwelling to the west of the site and agricultural land to the north and east. The area of development is 0.65ha.

Environment Agency LIDAR data shows that site levels are typically between +3.3m OD and +3.7m OD. The carriageway level of Herdgate Lane adjacent to the site is +3.7m OD.

The site is in the Welland and Deepings Internal Drainage Board (IDB) District. Surface water at the site drains through a local network and hence to the IDB drain system. There is a riparian watercourse on the field boundary 100m north of the site and the nearest IDB maintained watercourse, Old Sea Drain, is 250m north 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 is a warehouse that will include a chill store, pack house, loading area, and tractor shed. Details of the proposed development are 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 3, an area with a high probability of flooding.

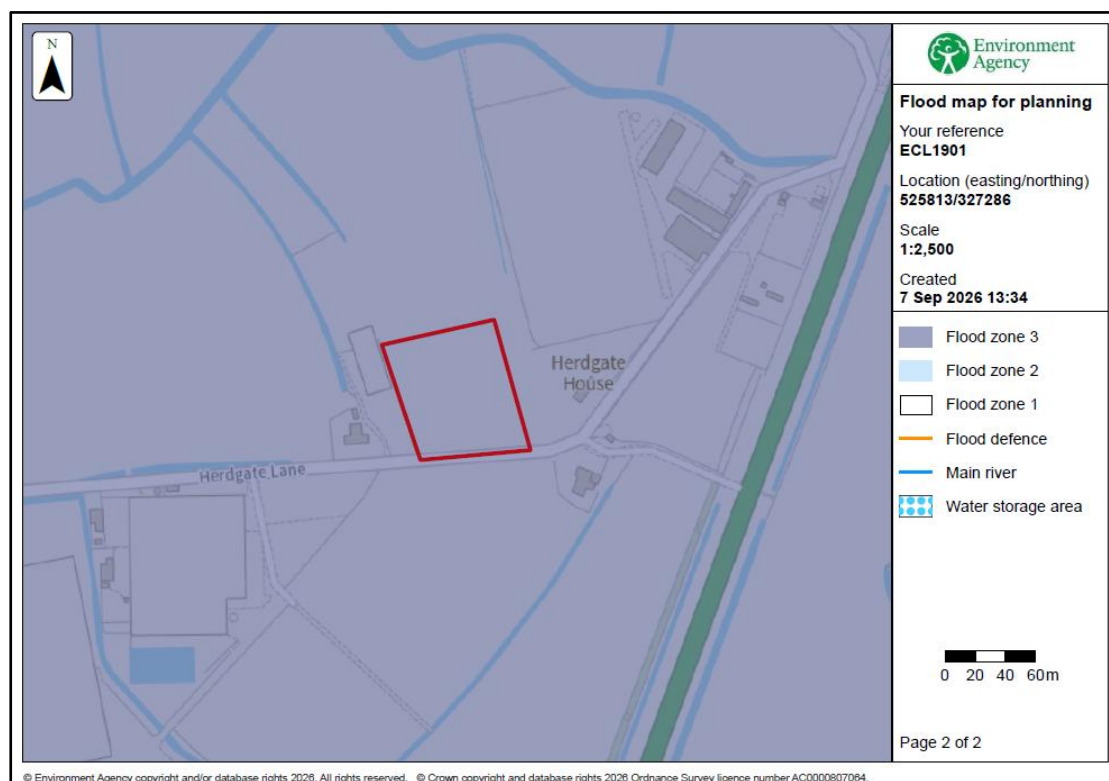


Figure 2 – Environment Agency Flood Map for Planning

The Flood Map for Planning shows that during the event with a 1 in 100 annual likelihood the site is not at risk of surface water flooding. The site is not at risk during this event when climate change is considered.

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 in 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 of flooding.	The site is at risk of flooding with depths between 0.0m and 0.25m.

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 develop 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 3 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.

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. In this context it is noted that SE Lincolnshire Local Plan commercial allocations are within flood risk areas due to the lack of availability of sites within areas of lower flood risk. At this location it is not possible to position the development on higher ground within the proposed site.

The River Welland has defences that provide protection during the 0.5% annual probability (1 in 200 chance each year) tidal event including climate change. The site therefore has a low probability of flooding and is considered to pass the Sequential Test.

4.0 SITE SPECIFIC FLOOD RISK

4.1 Local Flood Assets

The site is 1km west of the River Welland downstream of Spalding. The River Welland tidal defences, which are downstream of the confluence of the Coronation Channel and River Welland, provide protection to the site and surrounding area. The tidal defences are the responsibility of the Environment Agency.

The River Glen is 1.1km north of the site. The River Glen is a Main River and 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. Old Sea Drain, an IDB maintained watercourse, is 250m north of the site. The site and the surrounding land are within the Pinchbeck catchment and drain in a north westerly direction to Pinchbeck Marsh Pumping Station. Pinchbeck Marsh 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 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 EA maps the risk is very low.
Fluvial Flooding	The risk is assessed in Section 4.3.
Tidal Flooding	The risk is assessed in Section 4.3.
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 & 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 including climate change.

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 flood levels.

The River Welland tidal 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 at the site should a breach occur. The South East Lincolnshire SFRA includes maps demonstrating the impact of a breach in 2116. When the climate change allowances are applied to the combination of a 1% annual probability (1 in 100 chance each year) fluvial event and a 0.5% annual probability (1 in 200 chance each year) tidal event the peak depth is between 0.0m and 0.25m. An extract from this map is shown in Figure 3 below.

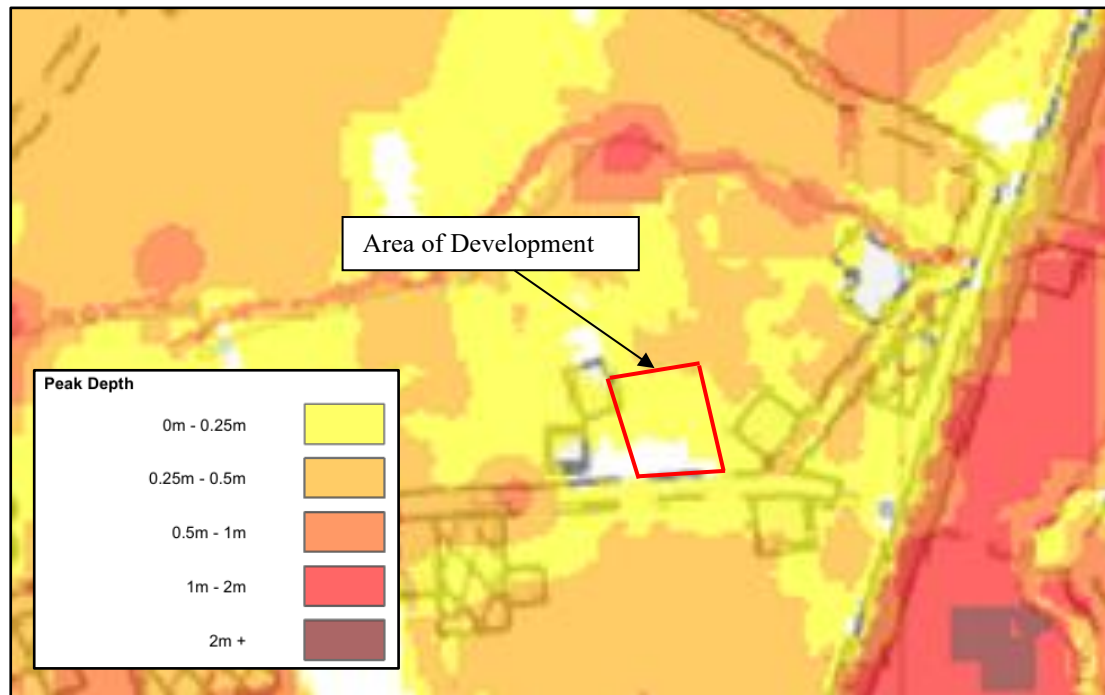


Figure 3 – SFRA 2116 Residual Peak Depth Map

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Pinchbeck Marsh Pumping Station could lead to an increased level of risk within the IDB catchment.

The probability of the site flooding from any Environment Agency system is less than 1% annual probability (1 in 100 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 overtopping and a breach in the defences in 2115. The maximum flood depth within the site is between 0.0m and 0.25m.

The development increases the impermeable area and therefore has the potential to increase the rate of runoff from the site.

5.2 Mitigation Measures

The mitigation measures required at this site are to manage the residual risk from a breach in the defences therefore flood resilience is appropriate. Considering the nature and scale of the risk it is recommended that the following resilience measures are considered during any alterations to form the units:

- there is a water entry strategy allowing flood water to enter the units and drain freely from them;
- the electrical supply and switchboard are elevated above the potential flood level;
- the user of the site should register to receive flood warnings from the Environment Agency to reduce the vulnerability of people at the site; and
- the user of the site should identify the actions to be undertaken in the event of receiving a flood warning.

Should there be a failure of Pinchbeck Marsh 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.

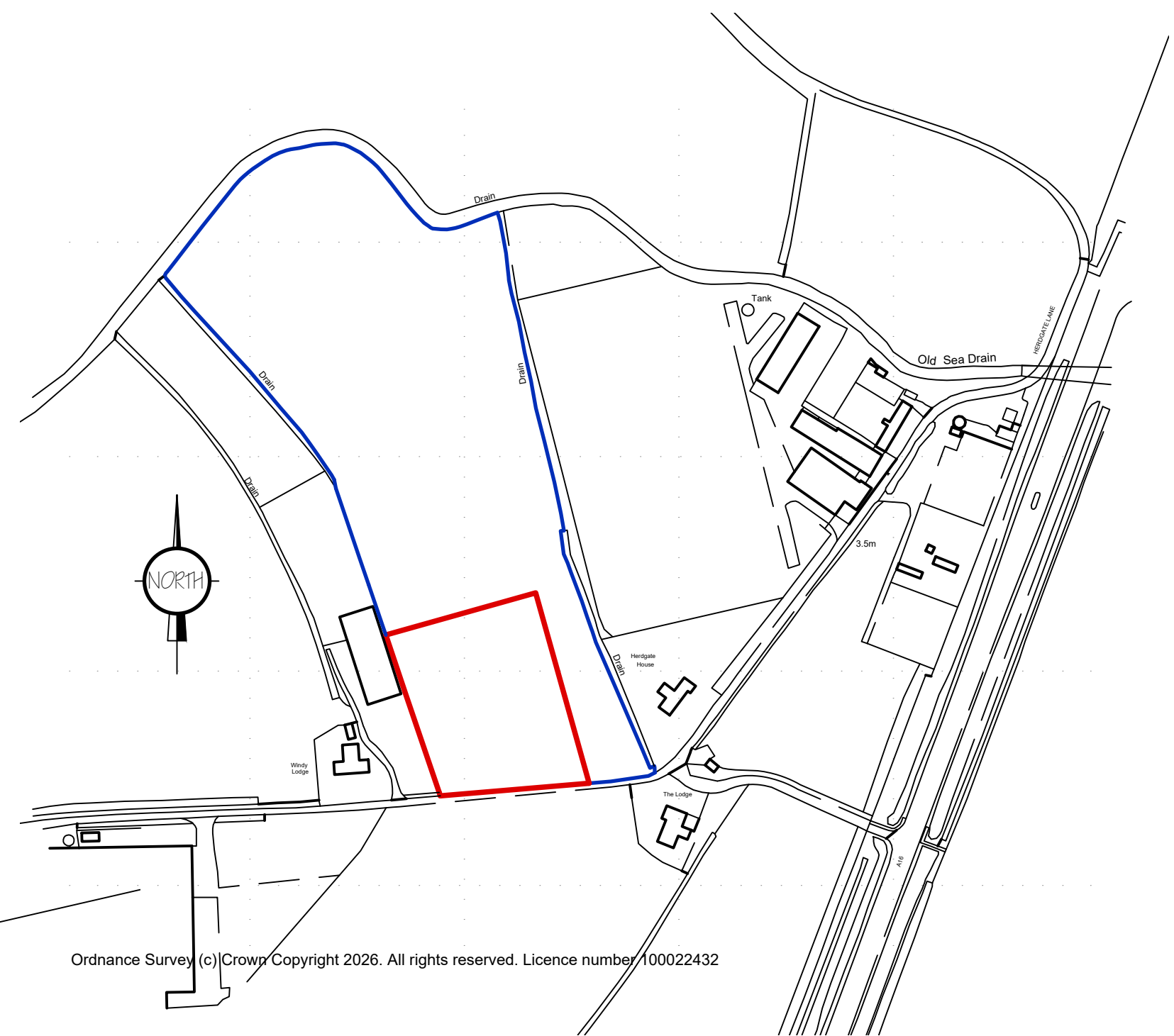
6.0 CONCLUSIONS

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

- The proposed development consists of a chill store and pack house at Herdgate Lane, Pinchbeck.
- 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 proposed development benefits from tidal defences on the River Welland that provide protection 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.
- There is a residual risk associated with a breach of the defences. During the design life of the development, including an allowance for climate change, the peak flood depth is between 0.0m and 0.25m.
- It is recommended that flood resilience measures are adopted to manage the risk of a breach. These include a water entry strategy, reducing the vulnerability of people and safe access and egress.
- The development passes the Sequential Test and is therefore suitable for the proposed location.

ATTACHMENT 1

**SITE PLAN PROPOSED & LOCATION PLAN
(DWG 4512-26-03B)**



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Drain

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The logo consists of the letters 'G', 'R', and 'M' in a stylized, red, serif font. The 'G' and 'R' are positioned above the 'M', with the 'R' partially overlapping the 'G'. The letters are bold and have a slight shadow effect.

Client

NEW HORIZON FLOWERS

Job Ref. 4512-26	Drawing No. 03B

Scales
1:50 & 1:100 (Unless Otherwise Stated)

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