FLOOD RISK ASSESSMENT
FOR AGRICULTURAL DEVELOPMENT (SOUTH) AT
HURN BANK, HOLBEACH HURN

FINAL REPORT

ECL1205-2/GR MERCHANT

DATE FEBRUARY 2024

ELLINGHAM CONSULTING LTD
Email: 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 Test 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 Risks

5.0 FLOOD RISK MITIGATION
- 5.1 Summary of Risks
- 5.2 Mitigation Measures

6.0 CONCLUSIONS

ATTACHMENT 1 – Floor Plans & Elevations Proposed (Dwg 4235-24 07)

Location & Site Plan Proposed (Dwg 4235-24 08)

DISCLAIMER
This document has been prepared solely as a Flood Risk Assessment in support of a planning application for proposed agricultural development at Hurn Bank, Holbeach Hurn. "Ellingham Consulting Ltd" accepts no responsibility or liability whatsoever for any use made of this document other than by the client "GR Merchant Ltd" 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 GR Merchant Ltd in respect of an agricultural building at Hurn Bank, Holbeach Hurn, Spalding.

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 at Grove Farm, Hurn Bank, Holbeach Hurn, Spalding, Lincolnshire, PE12 8JJ. The National Grid Reference of the site is 53871/32806.

The location of the site is shown in Figure 1.

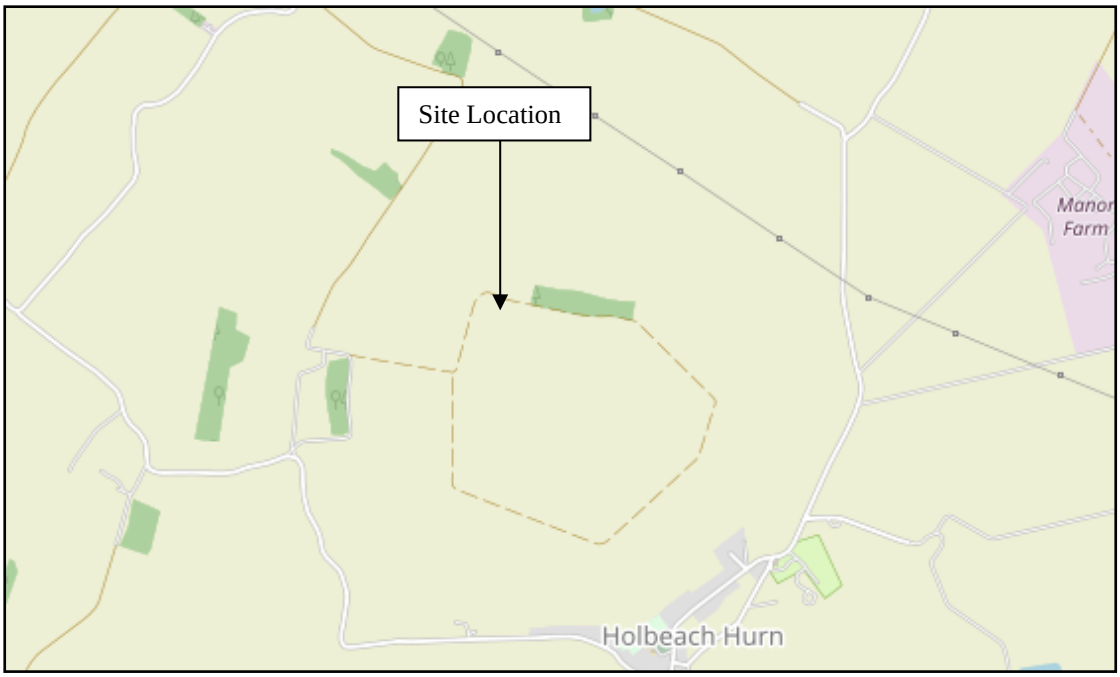


Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is within an agricultural holding on the northern side of Hurn Bank. The site consists of an existing sheep shed, the hardstand and access around the shed, and the agricultural land to the south. The area of development is approximately 0.7 hectares.

Environment Agency LiDAR data shows that the agricultural is flat with a typical ground level of +3.2m OD. The hardstanding and access in the vicinity of the existing shed is between +3.6m OD and +3.7m OD.

The site is in the South Holland Internal Drainage Board (IDB) District. Surface water at the site naturally drains through soakaway and hence to the IDB drain system. There is a riparian drain approximately 50m north west of the site and an IDB High Priority Watercourse 600m north east of the site.

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

2.3 Proposed Development

The proposed development consists of an agricultural building. 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 Flood Zones

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.

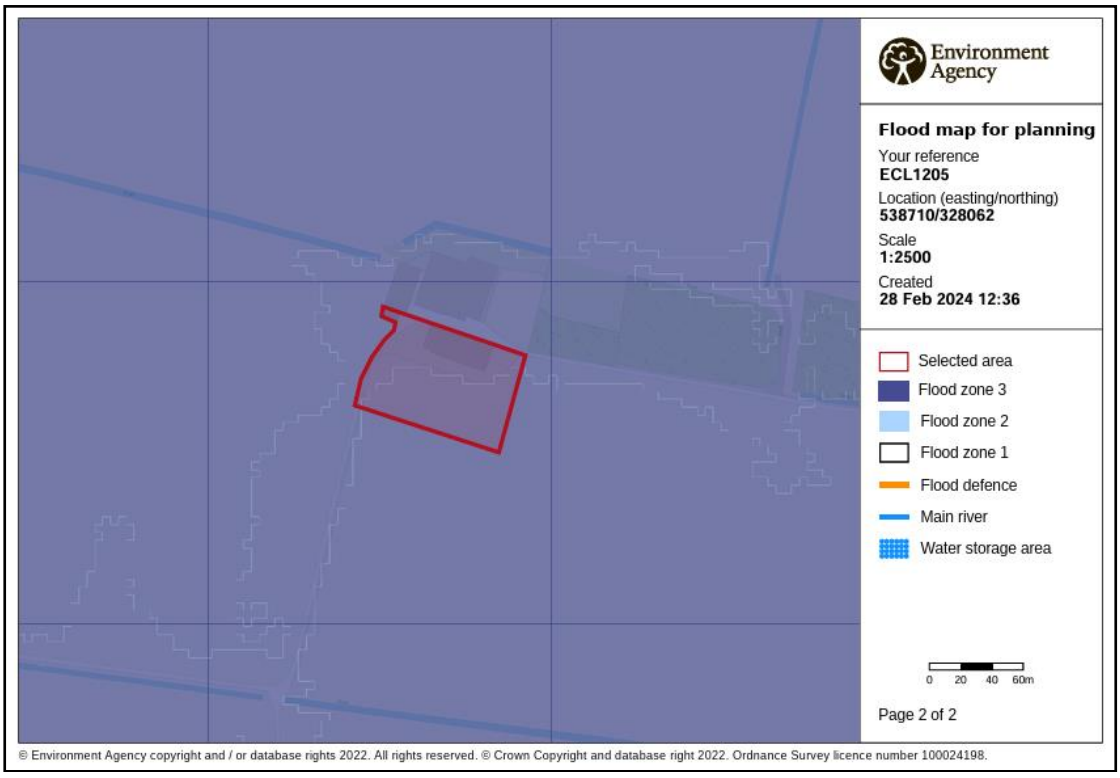


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the site is within an area with a low risk of flooding from rivers or the sea (annual probability between 0.1% and 1%);
- the site has a very low risk of surface water flooding (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.

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 'Danger for Most' 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 0.5m and 1.0m.

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 agriculture and is classified as 'Less 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 '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 between the River Welland and River Nene lie within Flood Zone 3. As such the opportunities to undertake the development at an alternative site within Flood Zone 1 are limited.

The site is protected by the tidal defences on the Wash that were not considered during the preparation of the Environment Agency Flood Maps. The SFRA confirms that site is not at risk during the 1% annual probability (1 in 100 chance each year) fluvial event including an allowance for climate change and the 0.5% annual probability (1 in 200 chance each year) tidal event including an allowance for climate change. When the protection provided by flood defences are considered the 'actual risk' of flooding at the site is low. The development is considered to pass the Sequential Test.

4.0 SITE SPECIFIC FLOOD RISK

4.1 Local Flood Assets

The South Holland IDB district is protected by the Wash tidal defences along the Holbeach Marsh frontage with embankment levels at a minimum of +7.0m OD. The Wash tidal defences are approximately 6.4km from the site.

The River Welland tidal defences are approximately 5.6km to the north west of the site. The tidal defences between Spalding and Fossdyke also have minimum embankment levels of +7.0m OD.

Both 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 South Holland IDB. There is an IDB High Priority Watercourse 600m north east of the site. The site and the surrounding land are within the Fleet Haven catchment and drains in a northerly direction to discharge to the Wash at Fleet Haven Pumping Station.

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 South Holland 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.
Fluvial Flooding	The risk is not at risk of fluvial flooding.
Tidal Flooding	The risk is assessed in Section 4.3, 4.5 and 4.6.
Reservoir Flooding	Based upon the EA maps the site is not at risk of flooding from reservoirs.
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 South Holland 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 South Holland IDB main drains incorporating freeboard. This freeboard provides storage during the exceedance events.

The site is within an area benefitting from defences. The flood embankments to the Wash and the River Welland tidal defences provide protection during a 0.5% annual probability (1 in 200 chance each year) event. The flood risk from the Wash is lowered further by second line defences and various informal banks constructed during the reclamation of Holbeach Marsh.

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 tide levels.

The flood level in the River Welland at Fossdyke during the 0.5% annual probability (1 in 200 chance each year) event inclusive of climate change to 2069 is estimated to be 6.41m AOD. The minimum defence level of the River Welland embankments is 7.0m AOD. The site is not at risk of tidal flooding for the design life of the development (i.e., 100 years).

4.6 Residual Risk

The South East Lincolnshire SFRA includes maps demonstrating the impact of climate change in 2116. The Residual Peak Depth maps within the SFRA indicate the maximum flood depths associated with a breach of the tidal defences. These show that when 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 site is at risk with depths between 0.5m and 1.0m. An extract from the map is shown in Figure 3.

Figure 3 – SFRA 2115 Residual Peak Depth Map during the 1% fluvial and 0.5% tidal Annual Probability Event

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Holbeach River Outfall Sluice 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 0.5% annual probability (1 in 200 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 from overtopping of the defences.

There is a residual risk to the site associated with a breach in the defences. During the 0.5% annual probability (1 in 200 chance each year) event in 2115 the estimated flood depth is between 0.5m and 1.0m.

The development increases the impermeable area and therefore has the potential to increase flood risk elsewhere.

5.2 Mitigation Measures

Based upon the information available during the preparation of this flood risk assessment there are no specific recommendations for the design of the building.

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

Should there be a failure of Fleet Haven 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.

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 an agricultural building at Grove Farm, Hurn Bank, Holbeach Hurn, 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 is protected during the 1% annual probability (1 in 100 chance each year) fluvial event and 0.5% annual probability (1 in 200) tidal event including climate change by the Wash tidal defences and River Welland defences.

- There is a residual risk to the site during a breach of the defences with flood depths up to 1.0m.

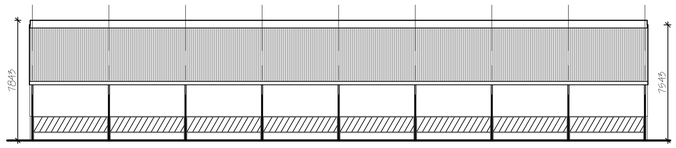
- Based upon the findings of this Flood Risk Assessment there are no specific recommendations regarding the design of the building.

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

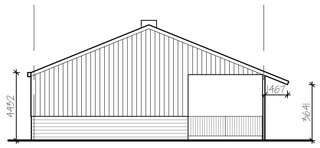
ATTACHMENT 1

FLOOR PLANS & ELEVATIONS PROPOSED
(DWG 4235-24 07)

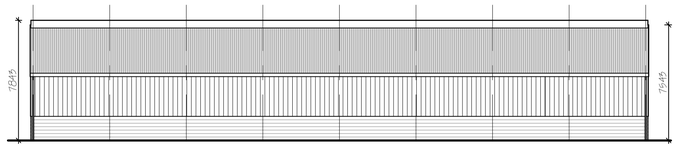
LOCATION & SITE PLAN PROPOSED
(DWG 4235-24 08)



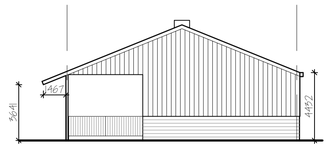
NORTH ELEVATION



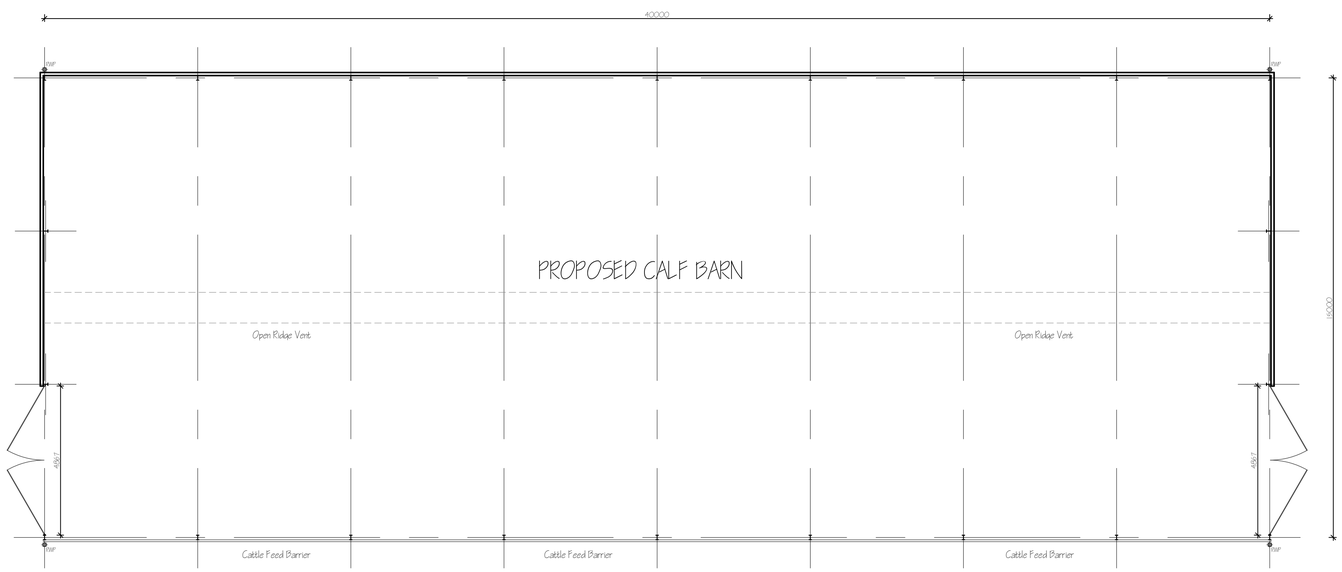
EAST ELEVATION



SOUTH ELEVATION



WEST ELEVATION



GROUND FLOOR PLAN

ref:	revision	date

G. R. MERCHANT LTD.

ARCHITECTURAL CONSULTANTS

4 Wrights Mews
12A Park Road, Holbeach,
Spalding, Lincs. PE12 7EE
Tel: 01406 490800
E-Mail: office@grmerchantltd.com
Website: www.grmerchantltd.com

Project

PROPOSED CALF BARN
HURN BANK,
HOLBEACH HURN
SPALDING, LINCS. PE12 8JJ

Client

RICHARD THOMPSON FARMS LTD

Drawing

FLOOR PLAN - PROPOSED
ELEVATIONS - PROPOSED

Job Ref.	Drawing No.
4235-24	07
Date	**Drawn**
JAN 2024	SLB

Scales

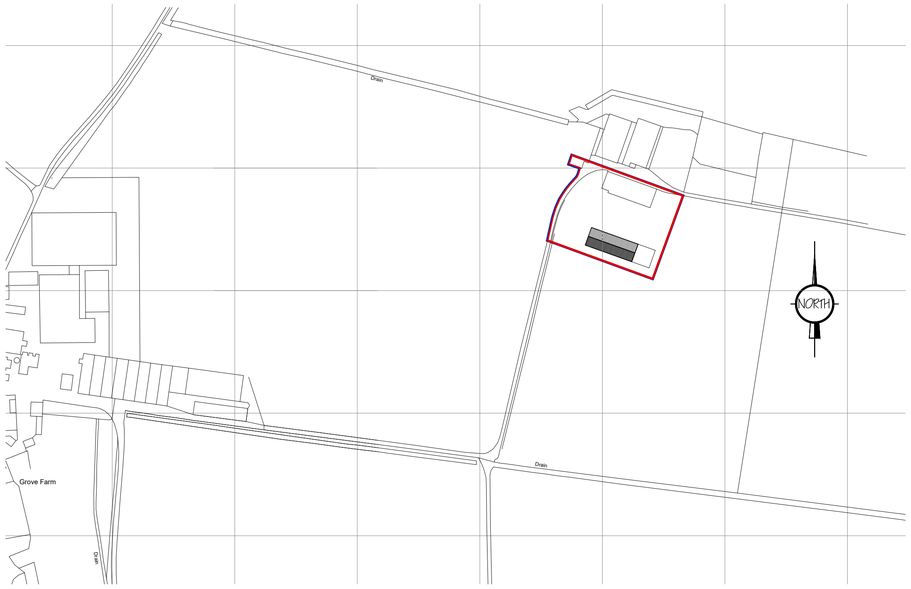
1:100 & 1:200 (Unless Otherwise Stated)

DO NOT SCALE FROM THIS DRAWING

This drawing is copyright and may not be altered, traced, photographed or used for any other purpose other than that for which it is issued. The General Contractor is to check all dimensions on site and report any discrepancies to G. R. Merchant Ltd. All details shown on this drawing including foundations are based upon typical site conditions related to the area. No responsibility can be accepted for abnormal conditions which may be discovered during construction unless reported to the G. R. Merchant Ltd so that design amendments may be considered. Site soil surveys are recommended in respect of foundations to establish specific site conditions before foundation work is undertaken. This drawing is limited in the amount of information contained and does not purport to contain a full specification of the works. It is solely for the purpose of obtaining Planning / Building Regulation approval. This drawing must not be used as a contract document alone. The works will not be supervised or inspected on site by G R Merchant Ltd or any representative thereof. It is the client or their appointed contractor(s) responsibility to control workmanship, substitution of materials, adherance to specification, variations to contract etc.All materials to be new unless otherwise stated and all components and materials etc. to be used fitted and installed etc. in strict accordance with manufacturers instruction and relevant code of practice. Materials shall conform to appropriate British standard specification or BBA certificate or European code equivalent. The Employer / Client shall ensure that the selected contractor is conversant with and adopts all measures necessary to achieve compliance with Health and Safety legislation for Building sites and Work places. The Employer / Client is advised that should the works need to comply with the Construction Design and Management Regulations an independent Principal Designer will be required. The works shall comprise of all that is shown on the drawing and details. Work that may not specifically be shown but may be reasonably inferred as necessary to carry out the works shall be deemed to be included. It is the plot / land owners responsibility to be aware of the Party Wall etc. Act 1996 when building in close proximity to adjoining neighbours boundaries.

Ordnance Survey (c) Crown Copyright 2024. All rights reserved. Licence number 100022432

EXISTING LOCATION PLAN 1:2500



PART PROPOSED LOCATION PLAN 1:2500

PART SITE PLAN 1:500

ref:	revision	date

G. R. MERCHANT LTD.

ARCHITECTURAL CONSULTANTS

4 Wrights Mews
12A Park Road, Holbeach,
Spalding, Lincs. PE12 7EE
Tel: 01406 490800
E-Mail: office@grmerchantltd.com
Website: www.grmerchantltd.com

Project
PROPOSED CALF BARN
HURN BANK,
HOLBEACH HURN
SPALDING, LINCS. PE12 8JJ

Client
RICHARD THOMPSON FARMS LTD

Drawing
LOCATION PLAN - EXISTING
PART LOCATION PLAN - PROPOSED
PART SITE PLAN - PROPOSED

Job Ref.	Drawing No.
4235-24	08
Date	**Drawn**
JAN 2024	SLB

Scales
1:100 & 1:200 (Unless Otherwise Stated)

DO NOT SCALE FROM THIS DRAWING

This drawing is copyright and may not be altered, traced, photographed or used for any other purpose other than that for which it is issued, The General Contractor is to check all dimensions on site and report any discrepancies to G. R. Merchant Ltd. All details shown on this drawing including foundations are based upon typical site conditions related to the area. No responsibility can be accepted for abnormal conditions which may be discovered during construction unless reported to the G. R. Merchant Ltd so that design amendments may be considered, Site soil surveys are recommended in respect of foundations to establish specific site conditions before foundation work is undertaken, This drawing is limited in the amount of information contained and does not purport to contain a full specification of the works, It is solely for the purpose of obtaining Planning / Building Regulation approval, This drawing must not be used as a contract document alone, The works will not be supervised or inspected on site by G R Merchant Ltd or any representative thereof, It is the client or their appointed contractor(s) responsibility to control workmanship, substitution of materials, adherance to specification, variations to contract etc,All materials to be new unless otherwise stated and all components and materials etc, to be used fitted and installed etc, in strict accordance with manufactures instruction and relevant code of practice, Materials shall conform to appropriate British standard specification or BBA certificate or European code equivalent, The Employer / Client shall ensure that the selected contractor is conversant with and adopts all measures necessary to achieve compliance with Health and Safety legislation for Building sites and Work places, The Employer / Client is advised that should the works need to comply with the Construction Design and Management Regulations an independent Principal Designer will be required, The works shall comprise of all that is shown on the drawing and details, Work that may not specifically be shown but may be reasonably inferred as necessary to carry out the works shall be deemed to be included, It is the plot / land owners responsibility to be aware of the Party Wall etc. Act 1996: when building in close proximity to adjoining neighbours boundaries.