

**FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
HAYCROFT LANE, HOLBEACH**

FINAL REPORT

ECL1095/KING

DATE OCTOBER 2023

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DISCLAIMER

This document has been prepared solely as a Flood Risk Assessment in support of a planning application for proposed residential development at Haycroft Lane, Holbeach. "Ellingham Consulting Ltd" accepts no responsibility or liability whatsoever for any use made of this document other than by the client "Mr & Mrs D King" 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 Mr & Mrs D King in respect of a development that consists of one replacement dwelling at Haycroft Lane, Holbeach.

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

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is located at Haycroft, Haycroft Lane, Holbeach, Lincolnshire, PE12 8LB. The National Grid Reference of the site is 53810/32453.

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 south western side of Haycroft Lane. The site consists of a bungalow and the surrounding land. There is a dwelling to the south east of the site and agricultural land to the west. The area of development is approximately 0.36 hectares.

A topographic survey of the site has been undertaken and is provided in Attachment 1. The site is flat and ground levels within the site typically range between +2.8m OD and +3.1m OD. In the area of the proposed replacement dwelling ground levels are above +3.0m OD.

The site is in the South Holland Internal Drainage Board (IDB) District. Surface water at the site drains through the network of local drains and hence to the IDB drain system. There is a riparian watercourse between the site and Haycroft Lane and an IDB watercourse on the northern boundary of the site.

The online British Geological Survey maps indicate that the site is likely to be underlain by Amptill 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 one replacement dwelling. The dwelling will be single storey. Details of the proposed development are 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 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.

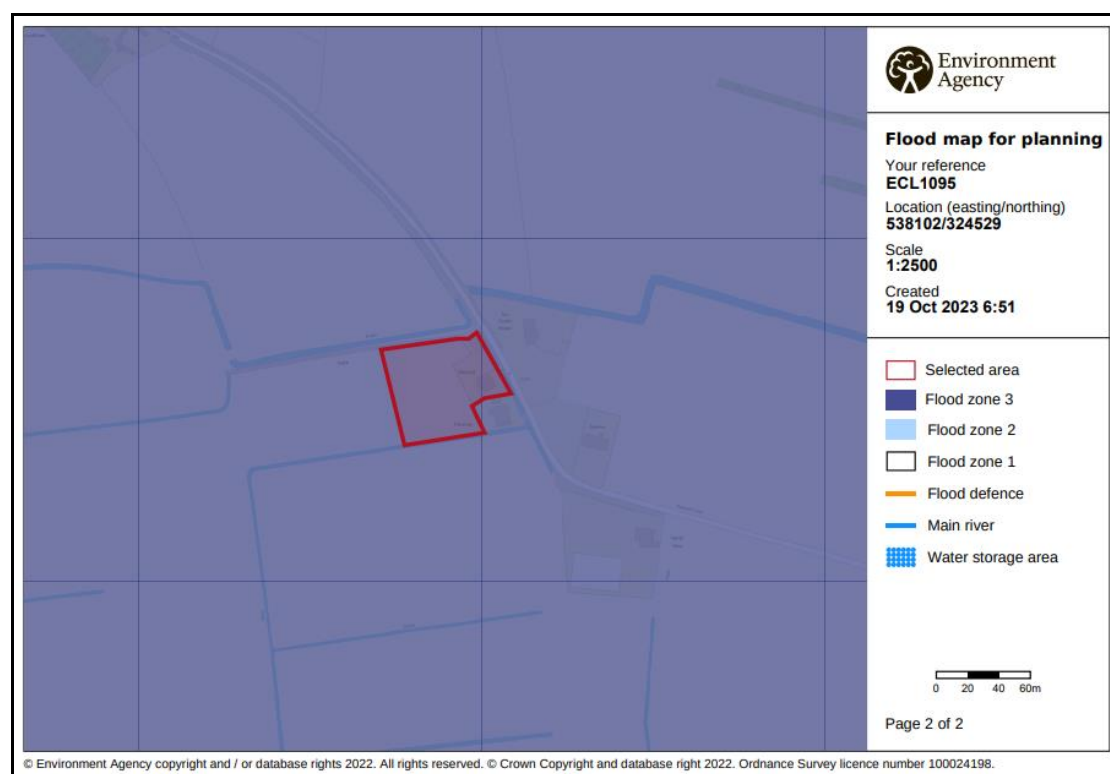


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the site has 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 Some' area
Residual Peak Depth Map for the 1% fluvial and 0.5% tidal	The site is outside the area at risk of flooding.	The site is at risk with a depth between 0.25m and 0.5m

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 Test 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.

The proposed development is a replacement dwelling and therefore it is not necessary to apply the Sequential Test to the development.

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

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 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 10km from the site. The River Nene tidal defences are 10.6km to the east of the site. The River Welland tidal defences are approximately 9.8km to the north west of the site. All three 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 on the northern boundary of the site. The site and the surrounding land are within the Lutton Leam catchment which discharges to the tidal River Nene at Lutton Leam Tidal Sluice.

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 assessed in Section 4.3 and 4.5.
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. Failure of Lutton Leam Tidal Sluice would lead to an increased level of flood risk within the IDB catchment.

Through the operation and maintenance of the pumping stations and the channel system the Board seek to maintain a general standard capable of 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 Nene and 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 tidal flood level during the 0.5% annual probability (1 in 200 chance each year) event inclusive of climate change to 2115 is estimated to be 7.2m AOD. The minimum defence level of the Wash, River Nene, and River Welland embankments is 7.0m AOD. During such an event it is likely that wave and wind action would cause overtopping of the tidal defences. However, the second line defences with embankment levels of 6.0m AOD would further reduce the probability of flood water reaching the development site.

In summary the site is not at risk 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. 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 peak depth at the site from direct overtopping together with breach failure is 0.25m-0.5m. An extract from this map is shown in Figure 3 below.



Figure 3 – SFRA 2116 Residual Peak Depth Map

The proposed development is a single storey dwelling and therefore the finished floor level 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 specific locations, but these do not cover the site.

Through a comparison of the flood depths in the areas covered by the maps during the 0.5% and 0.1% annual probability events for 2115 it can be estimated that flood depths are 0.1m higher for the more extreme event. Based upon the ground levels in the area of the proposed dwelling being 0.2m above the lowest parts of the site, the flood depths around the replacement dwelling during the more extreme event would not exceed 0.5m.

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Lutton Leam Tidal 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.

The SFRA considers the residual risk associated with overtopping and a breach in the defences in 2116. During the 0.5% annual probability (1 in 200 chance each year) plus climate change event the maximum flood depth at the site is between 0.25m and 0.5m. During the 0.1% annual probability (1 in 1000 chance each year) plus climate change event the maximum flood depth around the replacement dwelling would not exceed 0.5m

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 dwelling is 0.5m above surrounding ground levels. Furthermore, it is recommended that there is 0.3m of flood resilient construction above finished floor level.

The developer should ensure that the eventual occupier of the dwelling 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 occupier of the dwelling should register to receive flood warnings.

Should there be a failure of Lutton Leam Outfall Sluice 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 one replacement dwelling at Haycroft, Haycroft Lane, Holbeach.
- 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 Wash, River Nene, and 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) tidal event including climate change.
- The site is at risk from a breach in the defence during a tidal event in 2115 with a flood depth around the replacement dwelling of 0.5m.
- It is recommended that the floor level of the dwelling is 0.5m above surrounding ground levels and there is 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 16170575-LR-HAYCL-TOPO)**

Notes :Legends

[illegible]

Topographical Surveys

The description and heights of trees should be used as a guide only

All below ground survey details have been identified from above ground therefore all details relating to these will be approximate only

Some features or location may not have been surveyed due to obstructions or not reasonably visible at the time of the survey

General

This drawing shows the existing topography of the Cottage located on Haycroft Lane Fleet on the 29th July 2023.

Station	Easting	Northing	Level
LR1	530075.501	324555.418	2.813
LR2	530110.753	324560.741	3.372
LR3	530125.322	324570.724	2.914

DCE 538121.322 324570.72	SURVEY GRID AND LEVEL DATUM
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Ordnance Survey (OS) national grid coordinates have been established for survey control point LR1 using GNSS and related to OSTN15(GB).The survey grid is orientated to OS North with a scale factor of 1.000

All levels relate to the Ordnance Survey (OS) level datum using GNSS OSGM15 (GB) established at LR1

A	Topographical Survey	29.07.23
Revision	Details	Date

Disclaimer:

This plan should only be used for its original purpose. MFM accepts no responsibility for this plan if supplied to any party other than the original client.

All dimensions and or level information shown should be checked on site prior to design and construction.

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

All dimensions in metres

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Engineering Services Ltd

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Client:

Mr & Mrs D KING

Project Title:

Proposed Replacement Dwelling
Haycroft Lane
Fleet
Holbeach

Drawing Title:

Topographical Survey of Existing Land & Buildings
3D

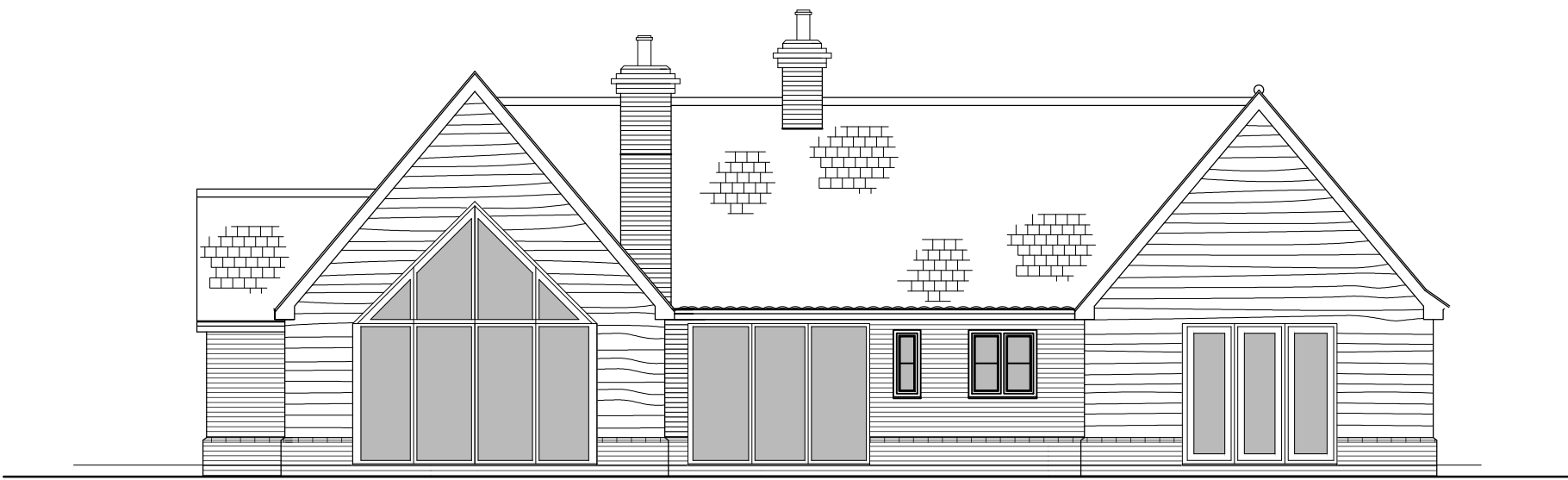
Scale:	Sheet Size:	Drawn:	Date:
1:250	A1	M.M	30.07.23
Drawing Number:			Revision:
16170576-HAYCL-3D-TOPO			A

ATTACHMENT 2

PLANNING DRAWING (DWG PL1000)



Front Elevation



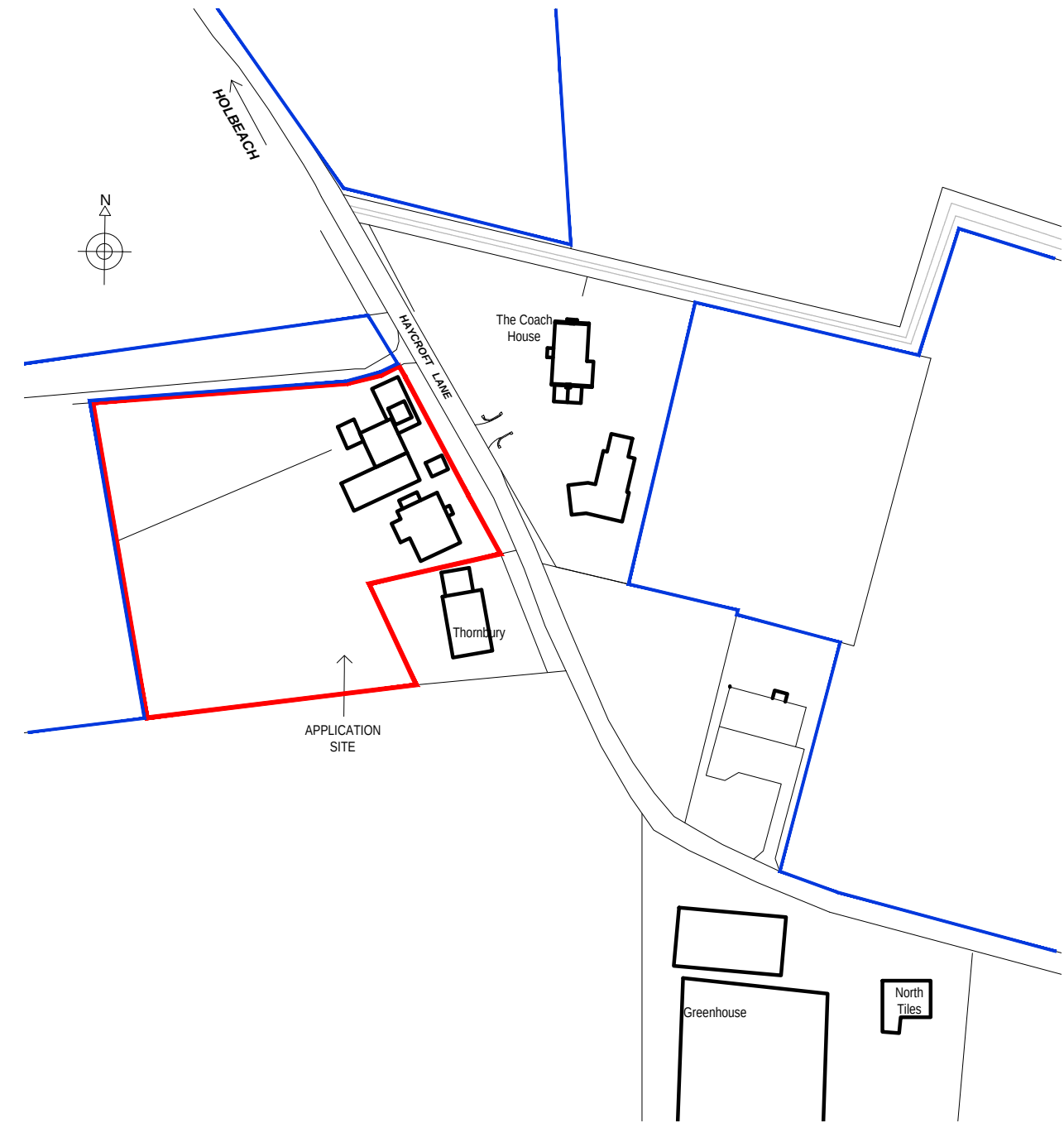
Rear Elevation



Side Elevation



Side Elevation



Location Plan - 1:1250scale



Proposed Floor Plan - 1:50scale



Proposed Site Plan - 1:500scale

Client	Mr & Mrs D.O. KING	Scale	as shown@A1
Project	Proposed Replacement Bungalow Haycroft Lane Fleet Lincolnshire PE12 8LB	Date	AUG 2023
Drawing Title	Planning Drawing	Drawing No.	PL1000
		Revision	