FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
PAX VETERES, HOLBEACH ROAD, SPALDING

FINAL REPORT

ECL1243/GR MERCHANT LTD

DATE MARCH 2024

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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 alterations and extension to an existing dwelling and the addition of an annexe at Pax Veteres, Holbeach Road, Spalding.

As the development is an extension to an existing residential dwelling the Sequential Test and Exception Test have not been applied.

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 Pax Veteres, Holbeach Road, Spalding, Lincolnshire, PE12 6JP. The National Grid Reference of the site is 52669/32383.

The location of the site is shown in Figure 1.



Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is located on the southern side of Holbeach Road. The site consists of a bungalow and the surrounding land. An access track passes through the western part of the site. The area of development is approximately 0.40 hectares.

Environment Agency LiDAR shows that the site is flat with levels between +2.9m OD and +3.0m OD. The carriageway level of Holbeach Road adjacent to the site is +4.0m 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 on the north eastern side of track within the site. The nearest IDB watercourse is 800m east 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 alterations and extension to an existing dwelling and the addition of an annexe. The annexe, which will be two storey, reflects the need for multigenerational living within the dwelling. The proposed site plan is shown 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.

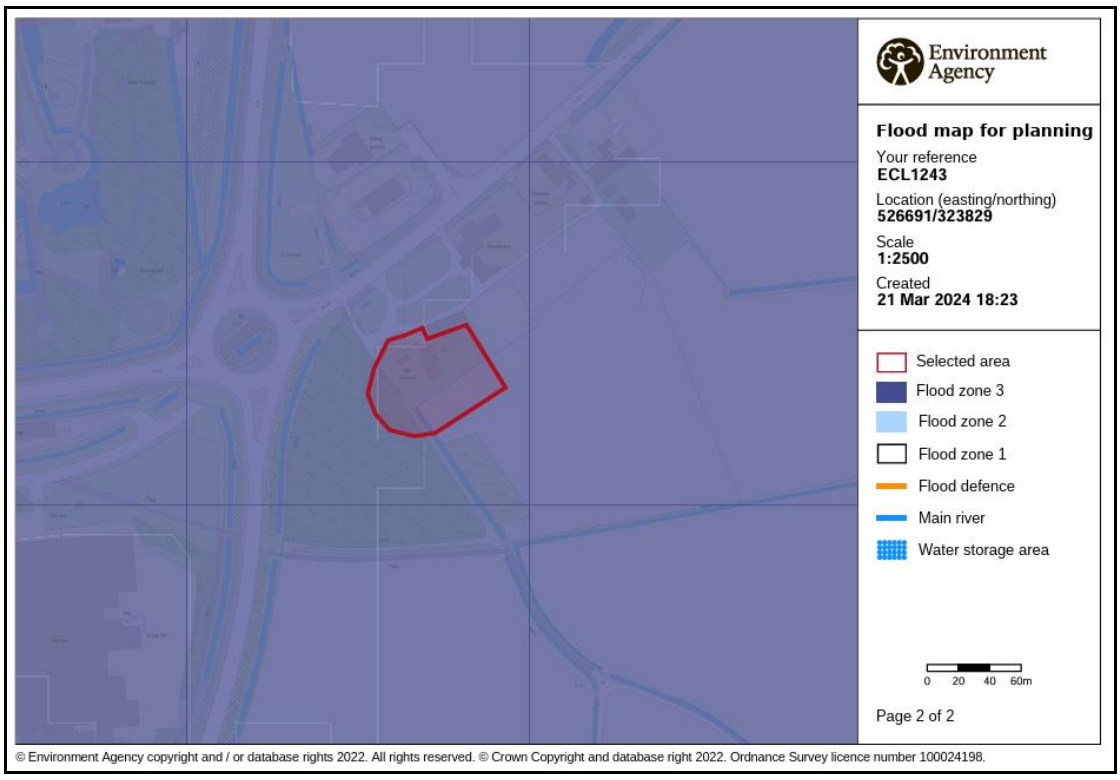


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the site 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 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 in the 'Danger for Some' area	The site is in the 'Danger for Most' area
Residual Peak Depth Map for the 1% fluvial and 0.5% tidal	The site is at risk of flooding with depths between 0.0m and 0.25m.	The site is at risk of flooding with depths between 0.5m and 1.0m.

Table 1 – Flood Risk within SFRA Maps

3.0 SITE SPECIFIC FLOOD RISK

3.1 Local Flood Assets

The site is 450m east of the Coronation Channel. The Coronation Channel is a bypass channel of the River Welland 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.

North of Spalding, downstream of the confluence with the Coronation Channel, the area is protected by the River Welland tidal defences between Spalding and Fossdyke. The defences are 800m west of the site and minimum embankment levels of +7.0m OD. The River Welland and the Coronation Channel 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 Ordinary Watercourse 800m east of the site. The site and surrounding land are within the Wisemans catchment and drain by gravity to Wisemans Pumping Station. The pumped water enters the South Holland Main Drain that discharges to the tidal River Nene at the Sutton Bridge Outfall 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.

3.2 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 3.3.
Surface Water Flooding	Based upon the EA maps the risk is very low.
Fluvial Flooding	The risk is assessed in Section 3.3 and 3.5.
Tidal Flooding	The risk is assessed in Section 3.3 and 3.5.
Reservoir Flooding	The risk of a tidal breach is assessed in Section 4.6.
Groundwater Flooding	There is no evidence to suggest the site is at risk of groundwater flooding.

Table 2 – Sources of Flooding

3.3 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 Wisemans Pumping Station would lead to an increased level of risk at the site.

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 Coronation Channel earth embankment has a minimum crest level of +6.0m OD. The 1% annual probability (1 in 100 chance each year) peak flood level inclusive of climate change during the next 100 years in the River Welland is +5.45m OD. The Coronation Channel embankment provides a standard of protection of 1% annual probability (1 in 100 chance each year) with a minimum 0.55m freeboard.

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

3.4 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.

3.5 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.

In summary the site is not at risk for the design life of the development (i.e., 100 years).

3.6 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 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 flood depth at the site is between 0.5m and 1.0m. An extract from this map is shown in Figure 3 below.

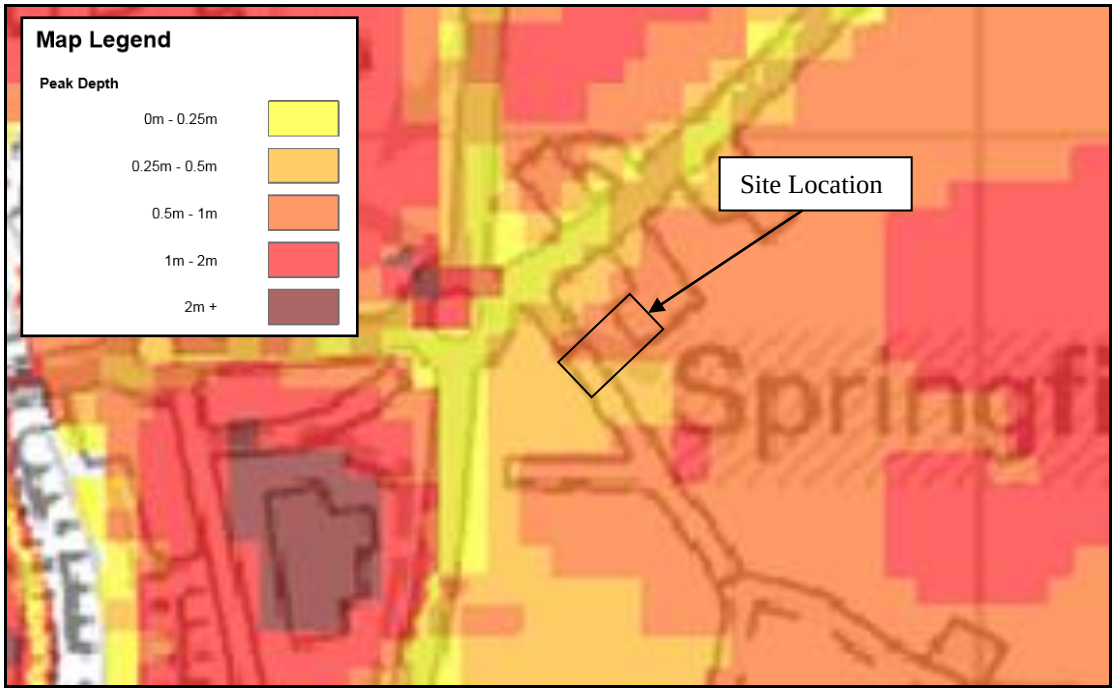


Figure 3 – SFRA 2116 Residual Peak Depth Map

4.0 FLOOD RISK MITIGATION

4.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Wisemans 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 0.5% 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 a breach in the defences in 2116. The peak flood depth during the 0.5% annual probability (1 in 200 chance each year) is between 0.5m and 1.0m.

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.

4.2 Mitigation Measures

Under PPG on Flood Risk and Coastal Change an extension is defined as a minor development. Guidance states that you should follow the Environment Agency's standing advice if you're carrying out a flood risk assessment for a minor extension (household).

The proposed development is a minor extension and the proposals are consistent with the Environment Agency's standing advice for minor extensions. The proposed floor levels are no lower than existing floor levels.

It is recommended that during the alteration and extension the use of flood resilient construction is considered. The addition of a two storey annexe will provide a safe refuge above the maximum flood level and therefore reduce the risk to the occupants.

The developer should ensure that the 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.

During an exceedance event it is anticipated that sufficient time would be available to take precautionary actions to limit the potential impact of flooding.

Should there be a failure of Wisemans 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.

5.0 CONCLUSIONS

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

- The proposed development consists of alterations and extension to an existing dwelling and the addition of a two storey annexe t Pax Veteres, Holbeach Road, 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 benefits from defences on the 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 chance each year) tidal event including climate change.

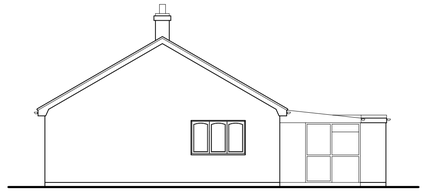
- The proposed floor levels are no lower than existing floor levels and therefore the development is consistent with the Environment Agency's standing advice for minor extensions.

- The first floor of the annexe will provide a safe refuge above potential flood levels, and it is recommended that the occupants receive flood warnings.

ATTACHMENT 1

FLOOR PLAN, ELEVATION,
SITE & LOCATION PLAN EXISTING
(Dwg 4209-23 01B)

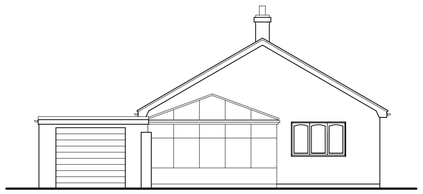
FLOOR PLANS AND SITE PLAN PROPOSED
(Dwg 4209-23 04C)



SIDE ELEVATION



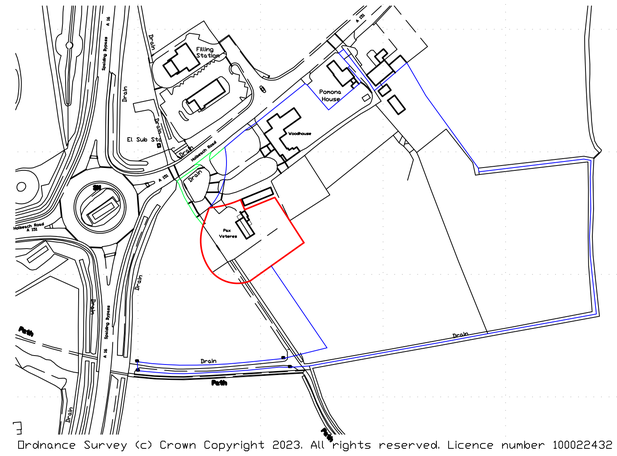
FRONT ELEVATION

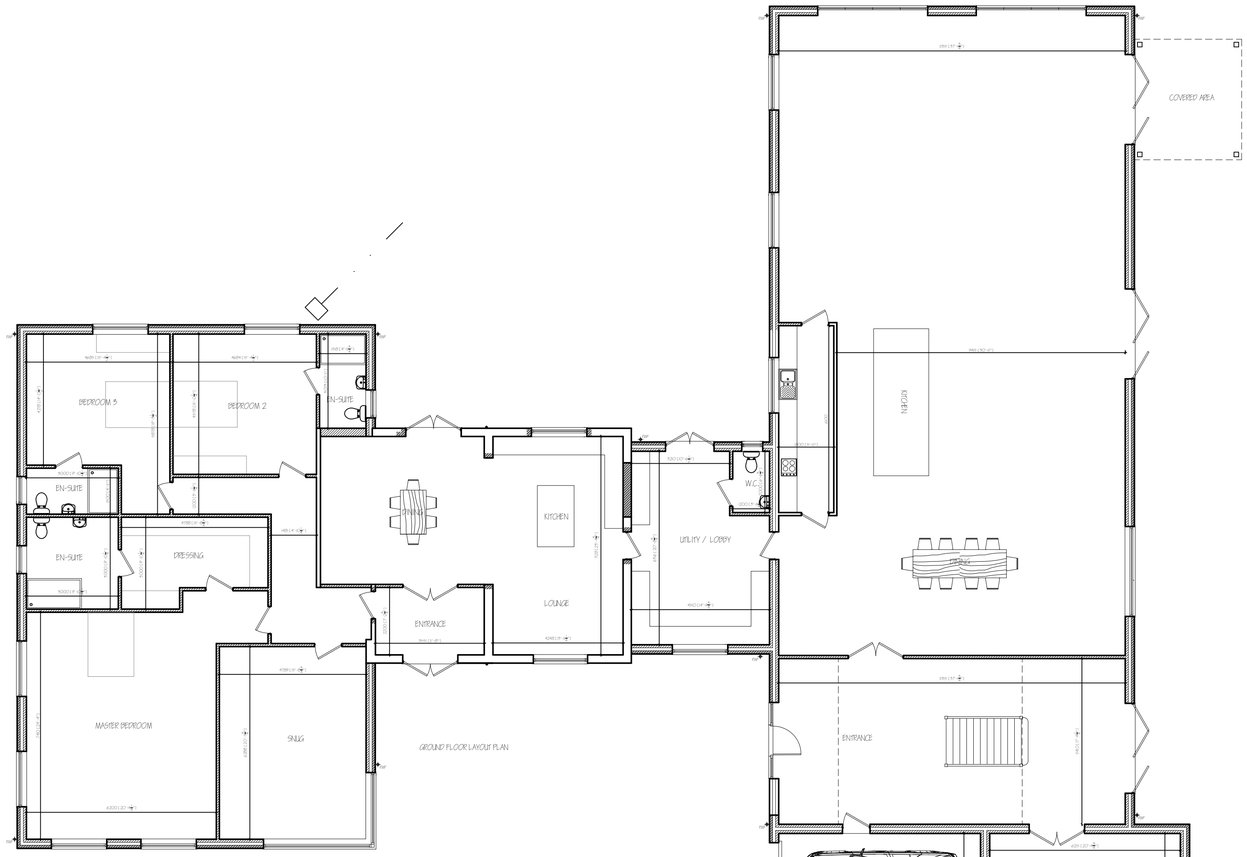


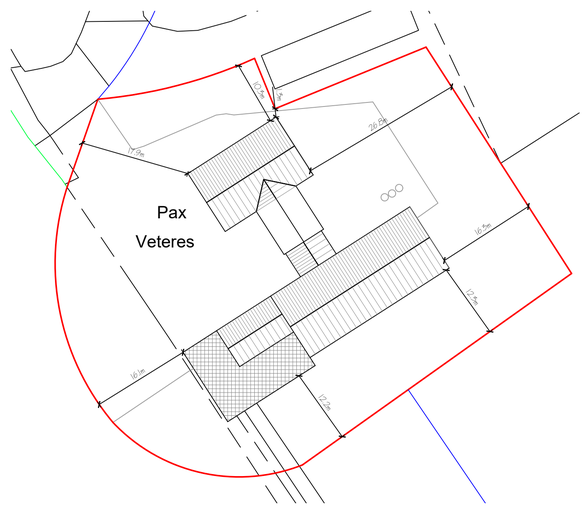
SIDE ELEVATION



REAR ELEVATION


Fishing Lake
Ponds
Ponds
Ponds





SITE PLAN 1:500

GROUND FLOOR PLAN



FIRST FLOOR PLAN

C	CLIENT AMENDMENTS	FEB 2024
B	CLIENT AMENDMENTS	FEB 2024
A	CLIENT AMENDMENTS	FEB 2024
ref:	revision	date

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Project
ALTS & EXTENSION INCLUDING ANNEXE
'PAX VETERES'
HOLBEACH ROAD
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Client
MR P. TURNELL

Drawing
GROUND FLOOR PLAN - PROPOSED
FIRST FLOOR PLAN - PROPOSED
SITE PLAN PROPOSED

Job Ref.	Drawing No.
4209-23	04C
Date	**Drawn**
JAN 2024	SLB

Scales
1:100 (Unless Otherwise Stated)

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