FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
WHARF STREET, SUTTON BRIDGE

FINAL REPORT

ECL0823/G R MERCHANT

DATE AUGUST 2022

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ATTACHMENT 1 – Floor Plans, Elevations, Site & Location Plan (Dwg 4034-22 01)

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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 G R Merchant in respect of a development that consists of one residential dwelling at Wharf Street, Sutton Bridge.

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

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is located on land to the rear of 2 Wharf Street, Sutton Bridge, Lincolnshire, PE12 9UF. The National Grid Reference of the site is 54817/32123.

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 Wharf Street. The site is within the curtilage of 2 Wharf Street and consists of garages and sheds. The site can be accessed from its eastern side from an access road that links Wharf Street and Lime Street. The area of development is approximately 0.03 hectares.

Environment Agency LiDAR shows that the site is flat and ground levels are typically +3.7m OD. The access alongside the site and Wharf Street are typically +3.8m 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 an IDB High Priority Pipeline approximately 900m north west of the site.

The online British Geological Survey maps indicate that the site is likely to be underlain by Ampthill 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 residential dwelling. The dwelling will have two storeys. The 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.

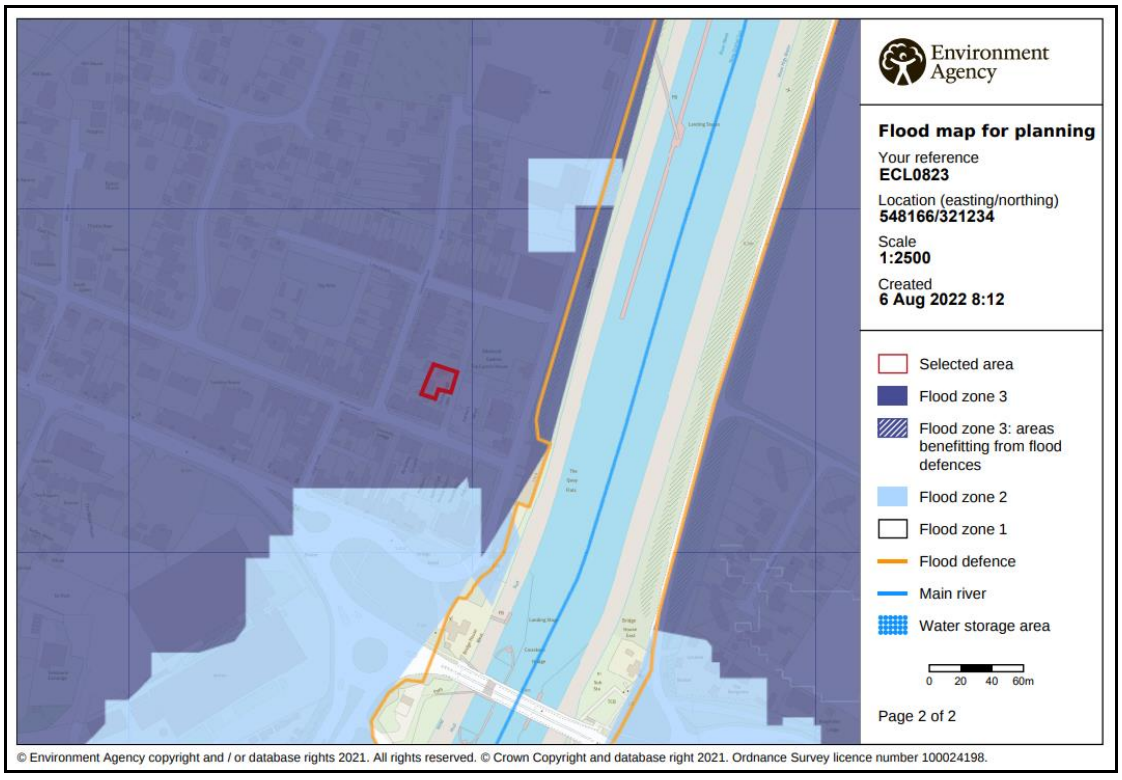


Figure 2 – Environment Agency Flood Map for Planning

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 low risk (annual probability between 0.1% and 1%) of surface water flooding; 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	Year 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 All' area
Residual Peak Depth Map for the 1% fluvial and 0.5% tidal	The peak flood depth is between 0.25m and 0.5m.	The peak flood depth is 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 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 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.

Large parts of the South Holland district that are near the River Nene lie within Flood Zone 3. As such, the opportunities to undertake the development at an alternative site with a lower flood risk are limited. At this location it is not possible to position the development on higher ground within the proposed site.

The River Nene has defences that provide protection during the 0.5% annual probability (1 in 200 chance each year) event including climate change. Therefore the 'actual risk' of flooding at the site is low and is considered to pass the Sequential Test.

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

The site is considered to provide three primary sustainability benefits.

- The Local Plan has a target of a net increase of at least 11,681 dwellings in South Holland over the 25-year local plan period. The Plan considers this

new housing is required to ensure the sustainability of the Local Plan area. The proposed development will contribute to this target.

- The development is located within an existing community. The additional dwelling is a benefit as it will sustain and support the growth of Sutton Bridge.
- The flood risk mitigation measures incorporate climate change allowances and therefore provide a solution that is sustainable for the next 100 years.

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 measures proposed to mitigate this residual risk are in accordance with the Local Authorities Standing Advice. In summary the site is protected to the appropriate standard and the residual risk is mitigated. The development is considered to pass the Exception Test.

4.0 SITE SPECIFIC FLOOD RISK

4.1 Local Flood Assets

The site is 100m west of the tidal River Nene. The site is protected by the River Nene tidal defences through Sutton Bridge. The River Nene is 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 Pipeline approximately 900m north west of the site. The site and the surrounding land are within the Westmere catchment and discharge to the tidal River Nene at the Westmere Tidal Sluice. The site is 1.3km north of the South Holland Main Drain.

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

The potential sources of flooding that have been identified during this assessment are:

- local blockages to the South Holland IDB drainage system;
- an event in the local drainage network greater that exceeds the standard of protection;
- failure of Westmere Tidal Sluice; and
- overtopping and/or breaching of the tidal River Nene.

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 benefits from defences on the River Nene that provide protection during a 0.5% annual probability (1 in 200 chance each year) tidal event and a 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 flood levels in the River Nene.

The River Nene tidal defences have been designed to include an allowance for climate change. In summary the site is not at risk 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 of the tidal defences occur. The South East Lincolnshire SFRA includes maps demonstrating the residual peak depth in 2115. When climate change allowances are applied to 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 the peak depth at the site from direct overtopping together with breach failure is between 0.5m and 1.0m. An extract from this map is shown in Figure 3 below.



Figure 3 – SFRA 2115 Residual Peak Depth Map

Based upon the Environment Agency LiDAR data indicating that ground levels at the site are +3.7m OD and a flood depth of up to 1m the estimated flood level during the 0.5% annual probability (1 in 200 chance each year) tidal event in 2115 is +4.7m OD.

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Westmere 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 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 maps show that the peak flood depth at the site is between 0.5m and 1.0m and the flood level is estimated to be +4.7m OD.

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

5.2 Mitigation Measures

The proposed mitigation measures are in accordance with the South East Lincolnshire Standing Advice Matrix. Based upon the information available during the preparation of this Flood Risk Assessment it is recommended that the finished floor level of the dwelling is 1.0m above ground level. 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 Westmere Tidal 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 CONCLUSION

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

- The proposed development consists of one 2 storey residential dwelling on Wharf Street, Sutton Bridge.

- 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 River Nene tidal defences provide protection during the 0.5% annual probability (1 in 200 chance each year) event. During the design life of the development, including an allowance for climate change, it is not anticipated that there would be flooding at the site.

- The maximum breach depth during the 0.5% annual probability (1 in 200 chance each year) tidal event in 2115 is between 0.5m and 1.0m.

- It is recommended that the finished floor level is 1.0m above surrounding ground level 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

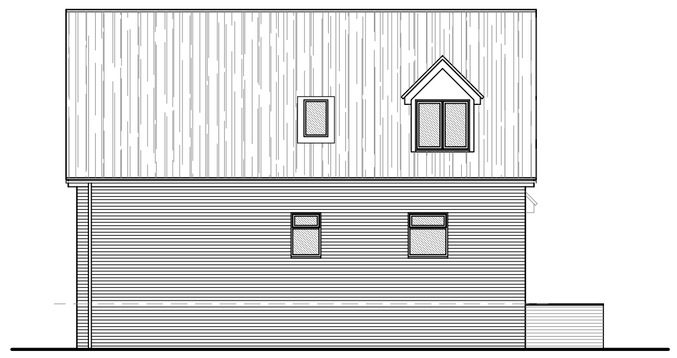
FLOOR PLANS, ELEVATIONS, SITE & LOCATION PLAN (Dwg 4034-22 01)



SOUTH ELEVATION



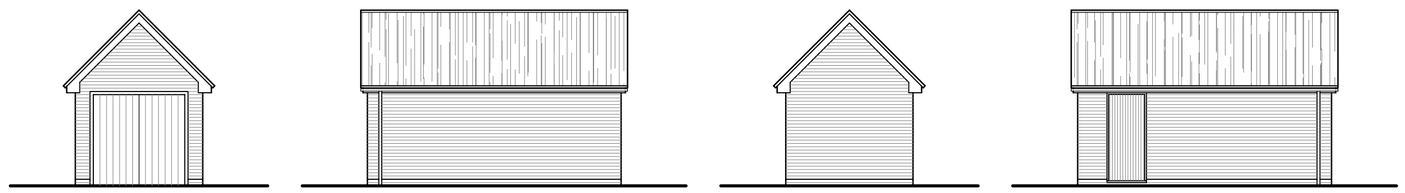
WEST ELEVATION



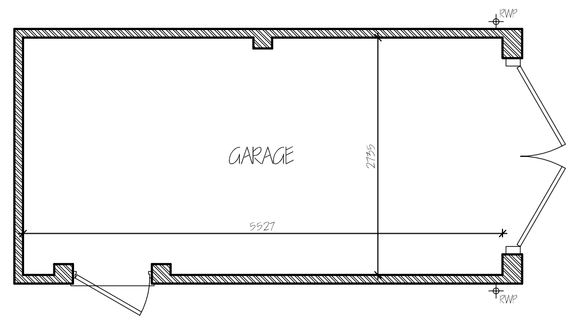
NORTH ELEVATION



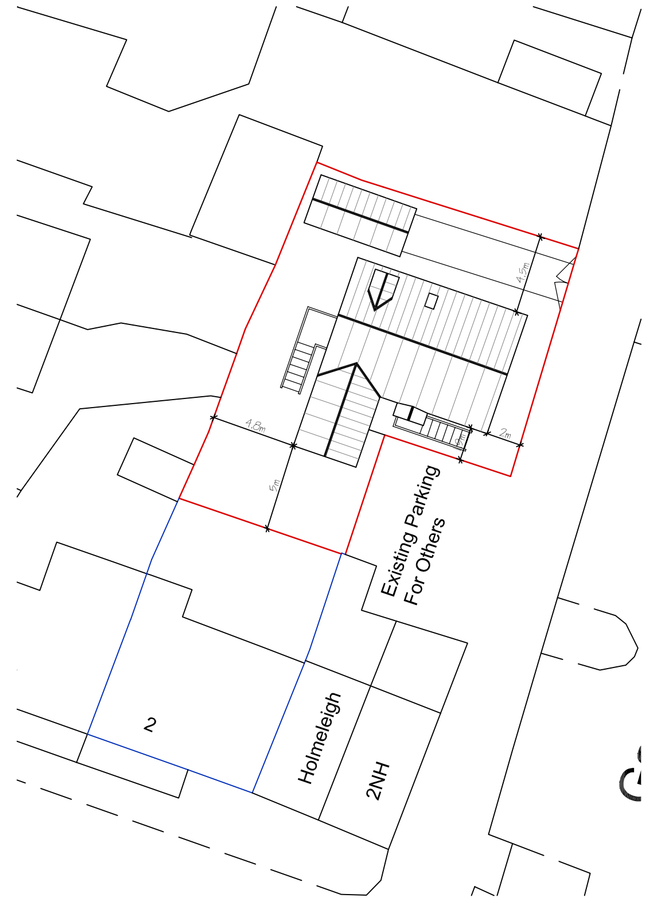
EAST ELEVATION

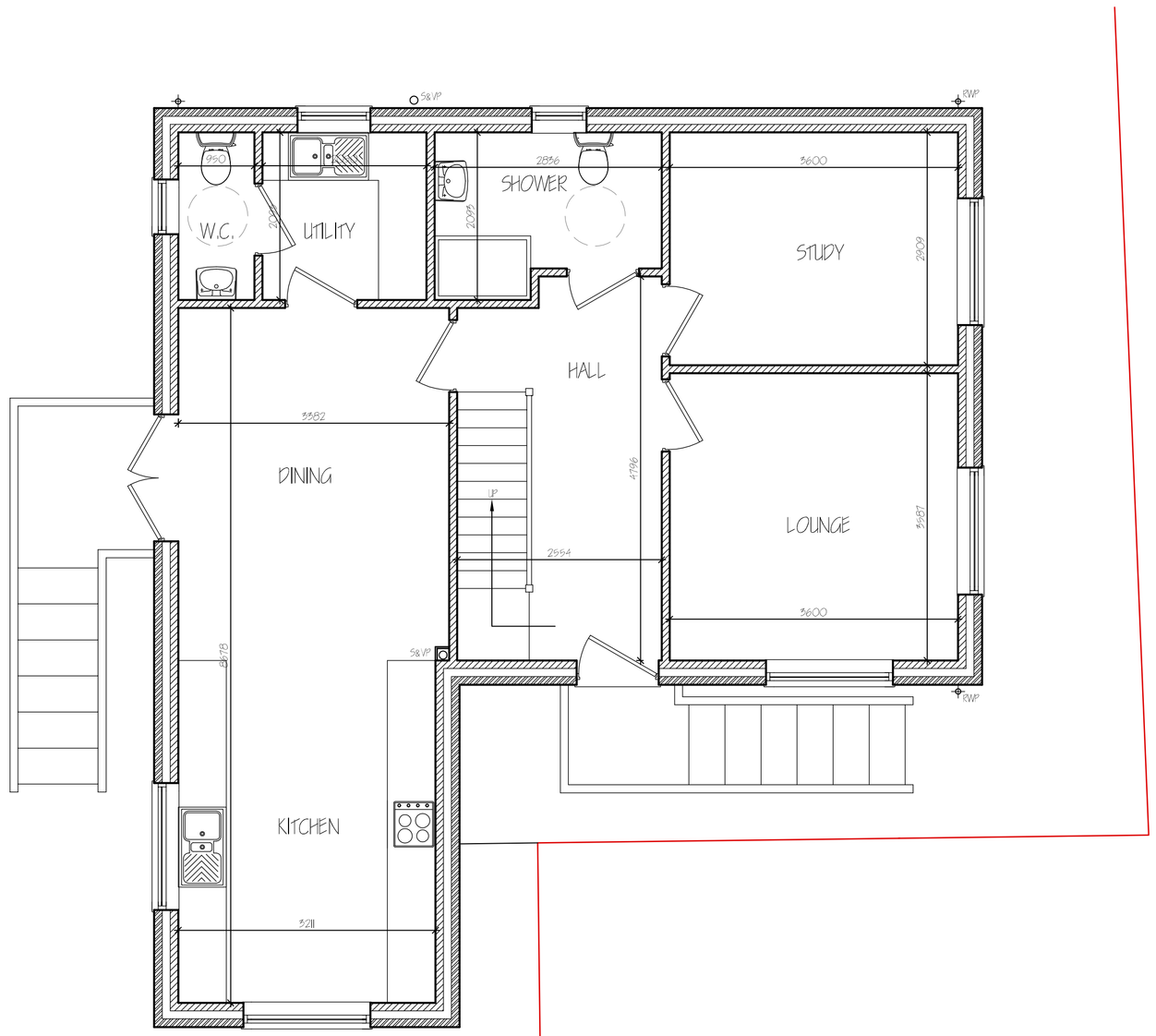


GARAGE ELEVATIONS

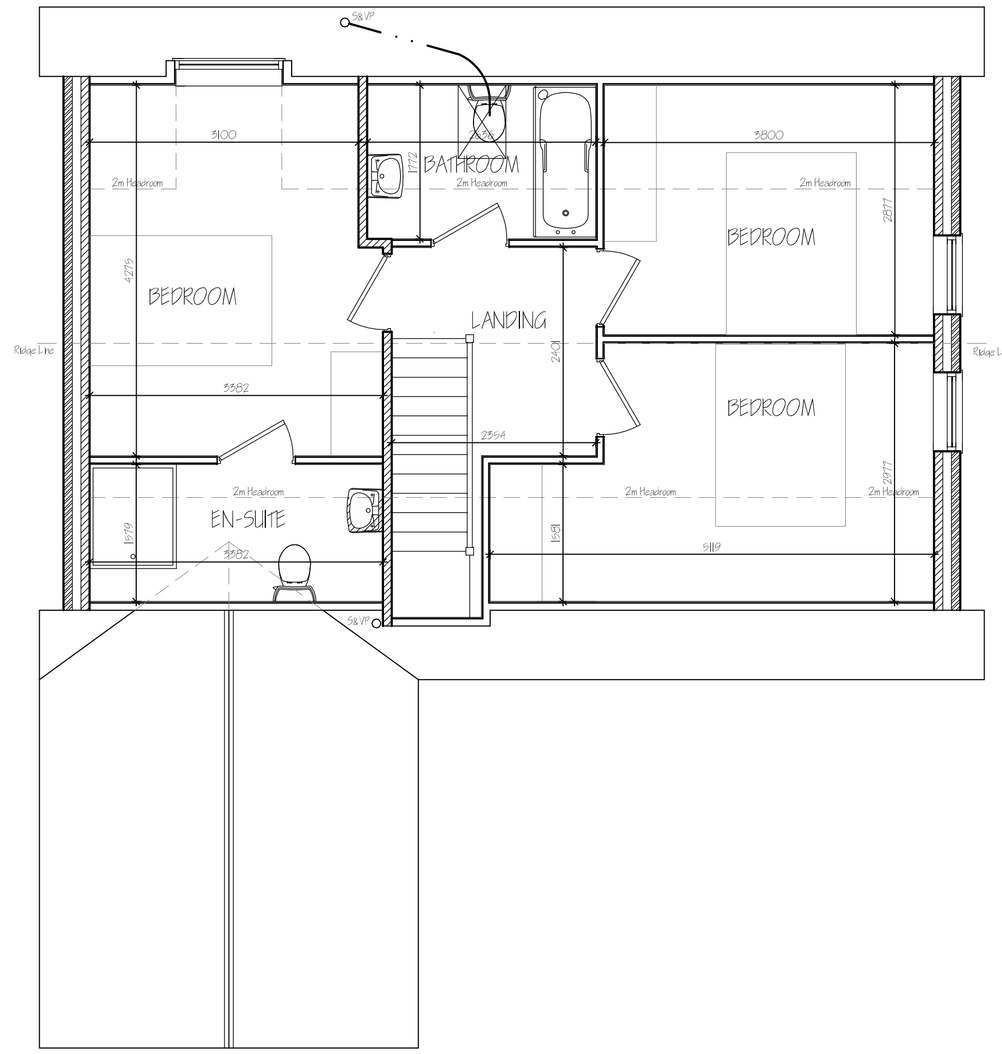


GARAGE GROUND FLOOR PLAN

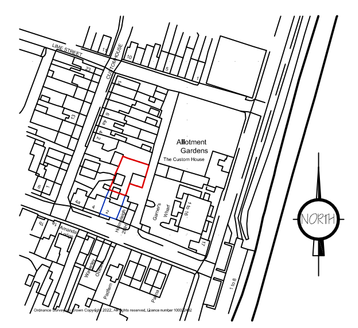




GROUND FLOOR PLAN



FIRST FLOOR PLAN



LOCATION PLAN 1:2500

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Project
RESIDENTIAL DEVELOPMENT
REAR OF 2 WHARF STREET
SUTTON BRIDGE
SPALDING, LINCS. PE12 9UF

Client
R.HOOK

Drawing
FLOOR PLANS - PROPOSED
ELEVATIONS PROPOSED
SITE & LOCATION PLAN

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