

**FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT
MILESTONE LANE, PINCHBECK**

FINAL REPORT

ECL0534/G R MERCHANT LTD

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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 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 AND RECOMMENDATIONS

ATTACHMENT 1 – Floor Plans and Elevations, Site & Location Plan (Dwg 3857-21-03)

DISCLAIMER

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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 Ltd in respect of a development that consists of a residential dwelling on land adjacent to 47 Milestone Lane, Pinchbeck.

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 adjacent to 47 Milestone Lane, Pinchbeck, Spalding, PE12 3XR. The National Grid Reference of the site is 52430/32678.

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 western side of Milestone Lane. The site is part of the garden of 47 Milestone Lane and includes a garage. The site is surrounded by residential dwellings and has an existing access. The area of development is approximately 0.02 hectares.

Environment Agency LIDAR data shows that site levels vary between +3.2m OD and +3.4m OD. The carriageway level of Milestone Lane adjacent to the site is +3.6m 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. The nearest IDB maintained watercourse, Old Pinchbeck Drain, is approximately 40m north west 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 one residential dwelling. The dwelling will have two storeys. 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

The site is located within Flood Zone 3, an area with a high probability of flooding, of the Environment Agency Flood Maps for Planning as shown in Figure 2.

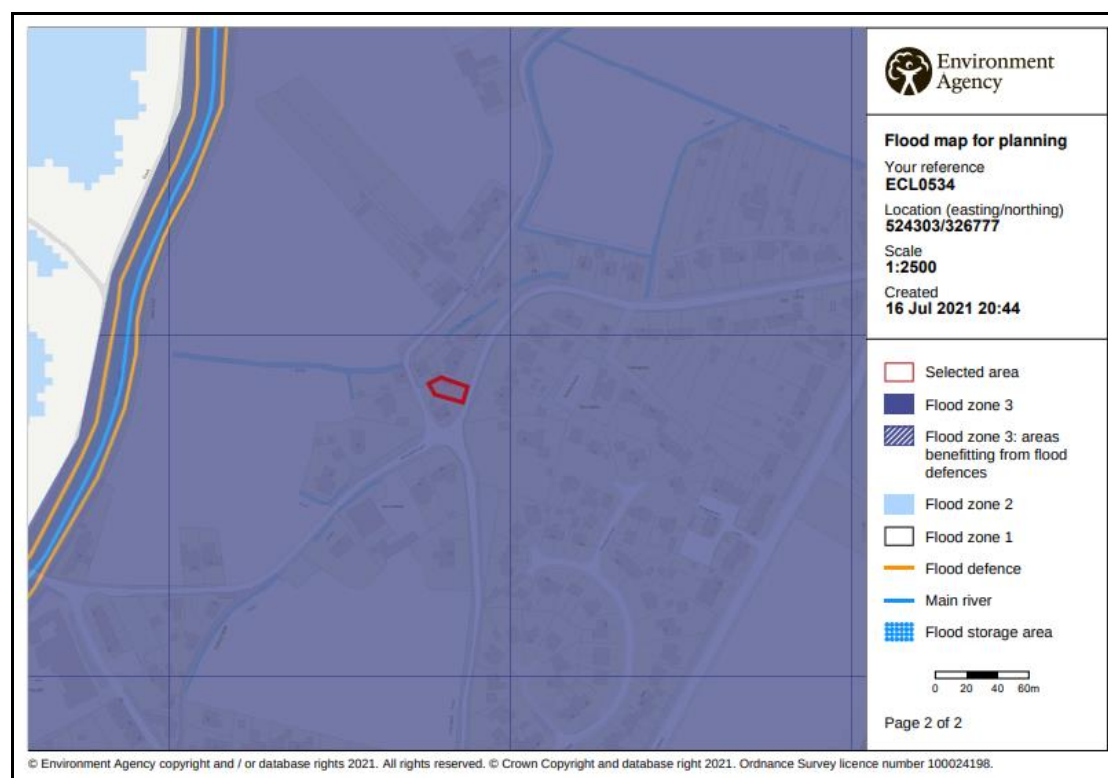


Figure 2 – Environment Agency Flood Map for Planning

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	2115
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 peak flood depth is between 0.0m 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, taking advice from the Environment Agency as appropriate, to consider the Sequential Test.

Large parts of the South Holland district between the River Welland and River Nene lie within Flood Zone 3. As such, opportunities to undertake the development at an alternative site with a lower flood risk are limited and there are no known sites available for development in the limited areas of lower flood risk. In this context it is noted that SE Lincolnshire Local Plan residential 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 1% annual probability (1 in 100 chance each year) fluvial event including climate change. The site therefore has a low probability of flooding 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 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.

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 site is approximately 2.5km 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 Pinchbeck. The tidal 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 Welland and Deepings IDB. The Old Pinchbeck Drain, an IDB maintained watercourse that is 40m north west of the site. The site and the surrounding land are within the Pinchbeck Marsh catchment and drain in an easterly direction to Pinchbeck Marsh Pumping Station. Pinchbeck Marsh Pumping Station discharges to Blue Gowt 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

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

- local blockages to the Welland and Deepings IDB main drain system;
- an event in the local drainage network that exceeds the standard of protection;
- failure of Pinchbeck Marsh Pumping Station; and
- overtopping and / or breaching of the River Welland tidal defences.

Based upon the Environment Agency Long Term Flood Risk Maps the site has a very low risk of surface water flooding. As such surface water flooding has not been considered further in this assessment.

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.

The standard of drainage provided by Welland and Deepings IDB is assessed at 2% annual probability (1 in 50 chance each year), compatible with the Department of the Environment, Food and Rural Affairs (DEFRA) target level of service for rural drainage and flood defence works. The risk associated with flooding due to events greater than 2% annual probability (1 in 50 chance each year) is lowered due to the Welland and Deepings IDB main drains incorporating a freeboard. This provides storage during events greater than 2% annual probability (1 in 50 chance each year).

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

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 flood levels in the River Welland.

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).

4.5 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 2116. An extract from this map is shown in Figure 3 below. 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 100 chance each year) tidal event the maximum flood depth within the site is between 0.5m and 1.0m.

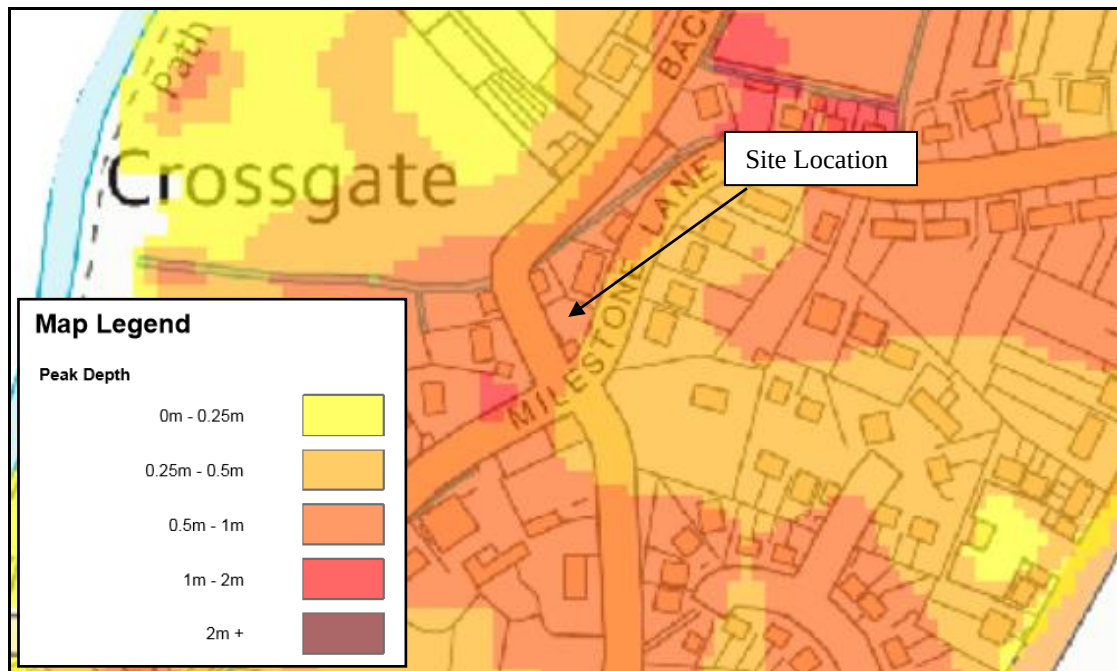


Figure 3 – SFRA 2116 Residual Peak Depth Map during the 1% fluvial and 0.5% tidal Annual Probability Event

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Pinchbeck Marsh 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 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 2116. The maximum flood depth at the site is between 0.5m and 1.0m.

The development 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

Based upon the information available during the preparation of this flood risk assessment, to mitigate against the remote risk of flooding it is recommended that the floor level of the dwelling is 1.0m above the lowest ground levels within the site. It is recommended that there is 0.3m of flood resilient construction above finished floor level.

The risks during a breach are lowered because the dwellings have two storeys with the sleeping accommodation on the first floor.

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 provides a Flood Warning Service which includes Flood Warning Codes and uses direct warning methods where the risks and impacts of flooding are high.

In addition to direct and indirect flood warnings, the Environment Agency operates a 24 hour a day Floodline Service providing advice and information on flooding. The occupier of the dwelling should register with the Floodline Direct Warnings Service to receive any future flood warnings.

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 utilising 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.

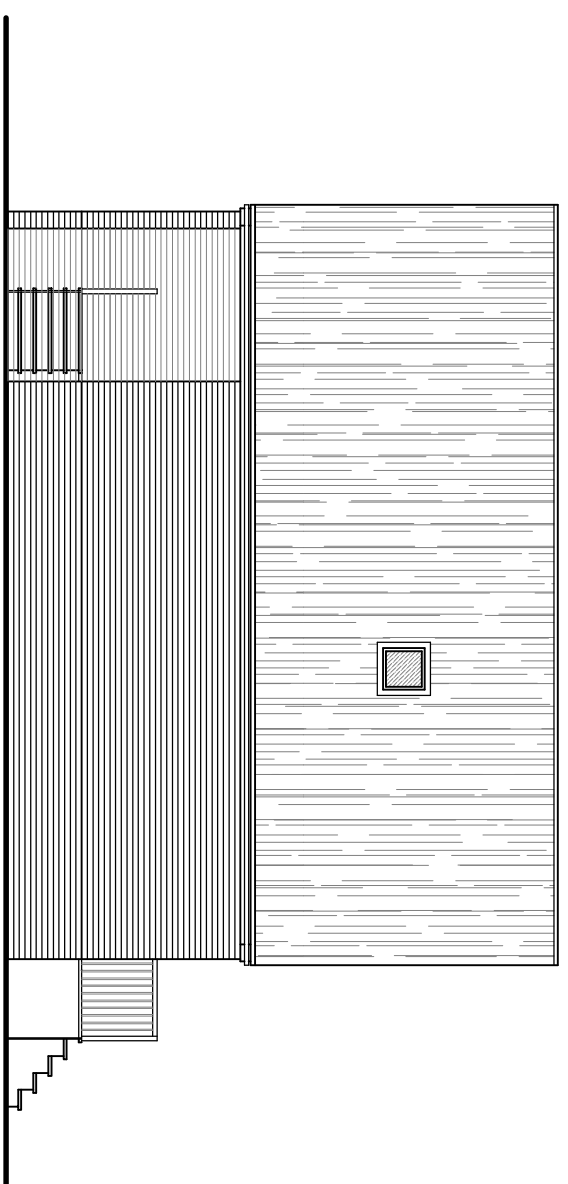
6.0 CONCLUSIONS

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

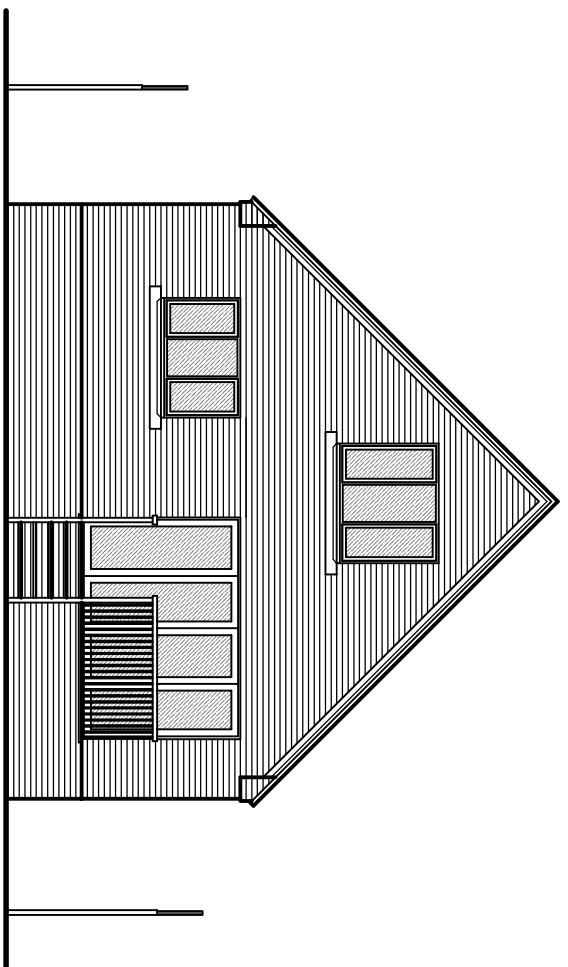
- The proposed development consists of one 2 storey residential dwelling on land adjacent to 47 Milestone Lane, Pinchbeck.
- The proposed development is protected during the 1% annual probability (1 in 100 chance each year) event including an allowance for climate change by defences on the tidal River Welland.
- The site is located within an Internal Drainage Board catchment with a minimum standard of drainage of 2% annual probability (1 in 50 chance each year) which accords with DEFRA guidelines for rural development. The risk of flooding is lowered further due to the Welland and Deepings IDB main drains incorporating a significant freeboard. This provides storage during events greater than 2% annual probability (1 in 50 chance each year).
- It is recommended that the floor level is 1.0m above ground level with 0.3m of flood resilient construction above finished floor level to mitigate against the risk of flooding during the lifetime of the development.
- The development passes the Sequential Test and Exception Test and is therefore suitable for the proposed location.

ATTACHMENT 1

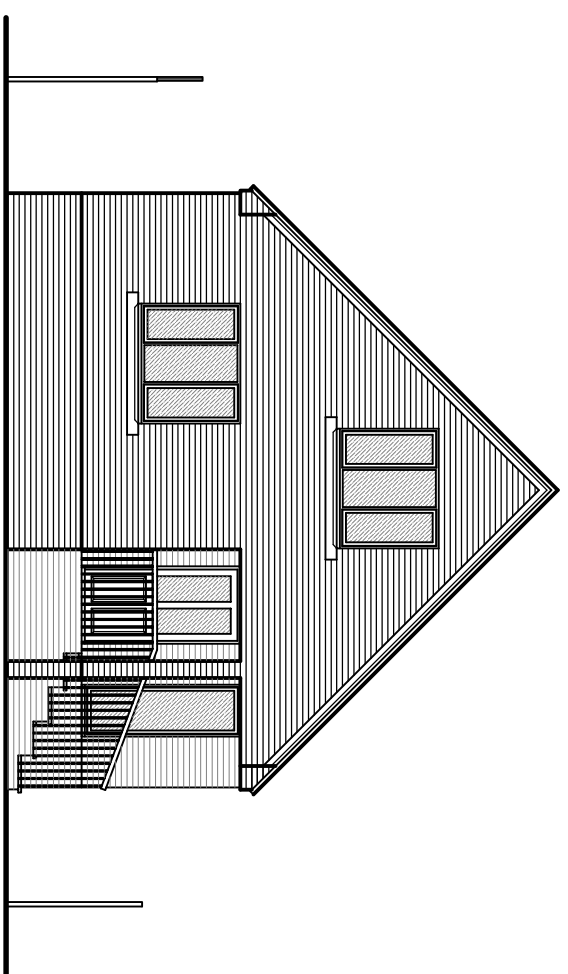
FLOOR PLAN AND ELEVATIONS, SITE & LOCATION PLAN (Dwg 3857-21-03)



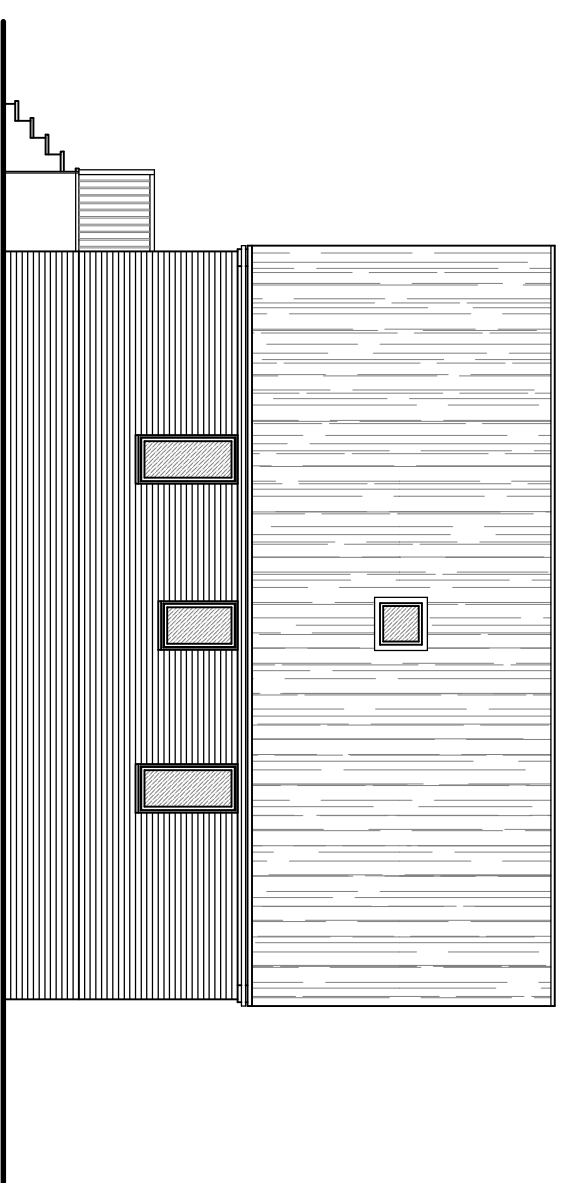
NORTH EAST ELEVATION



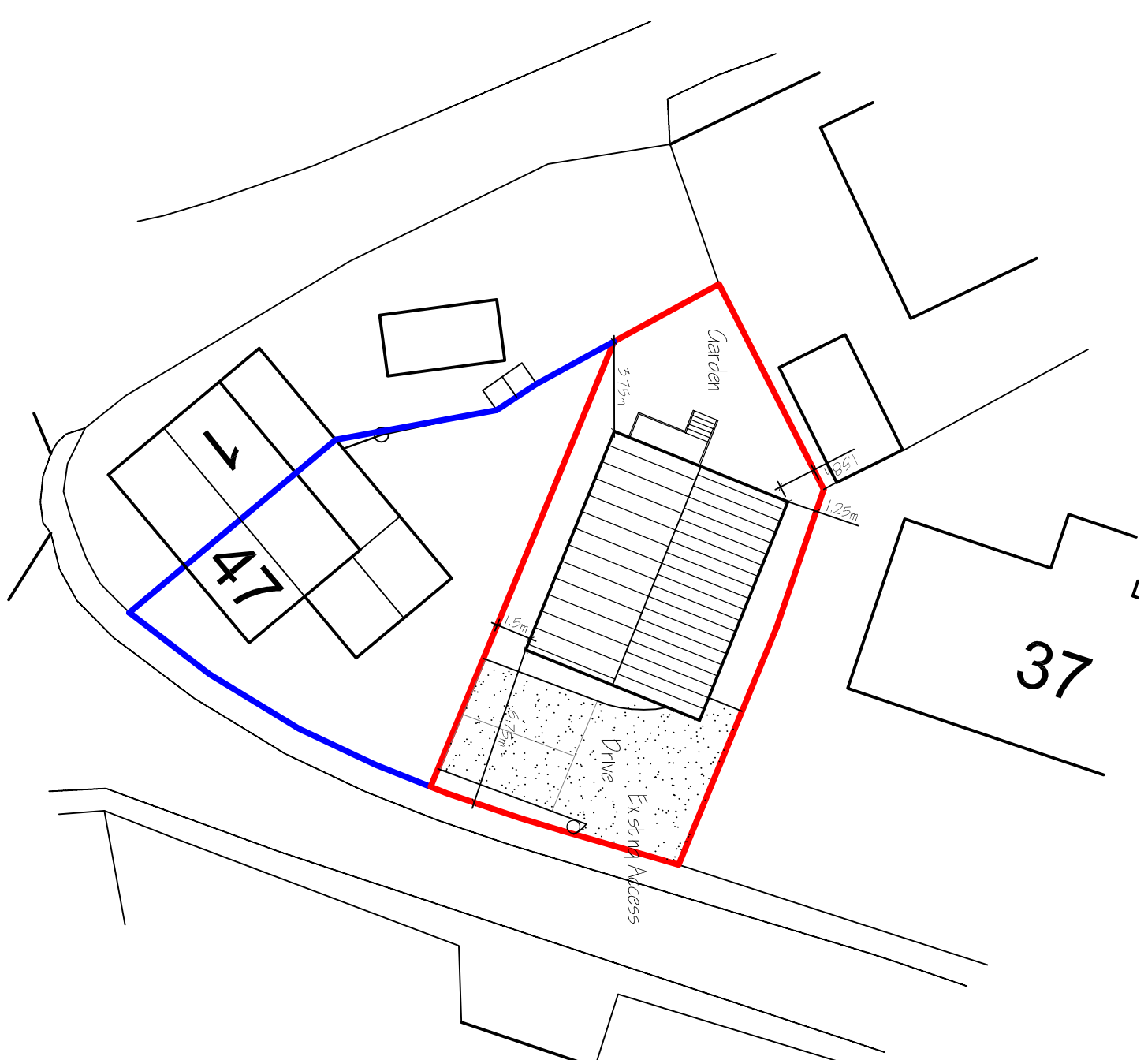
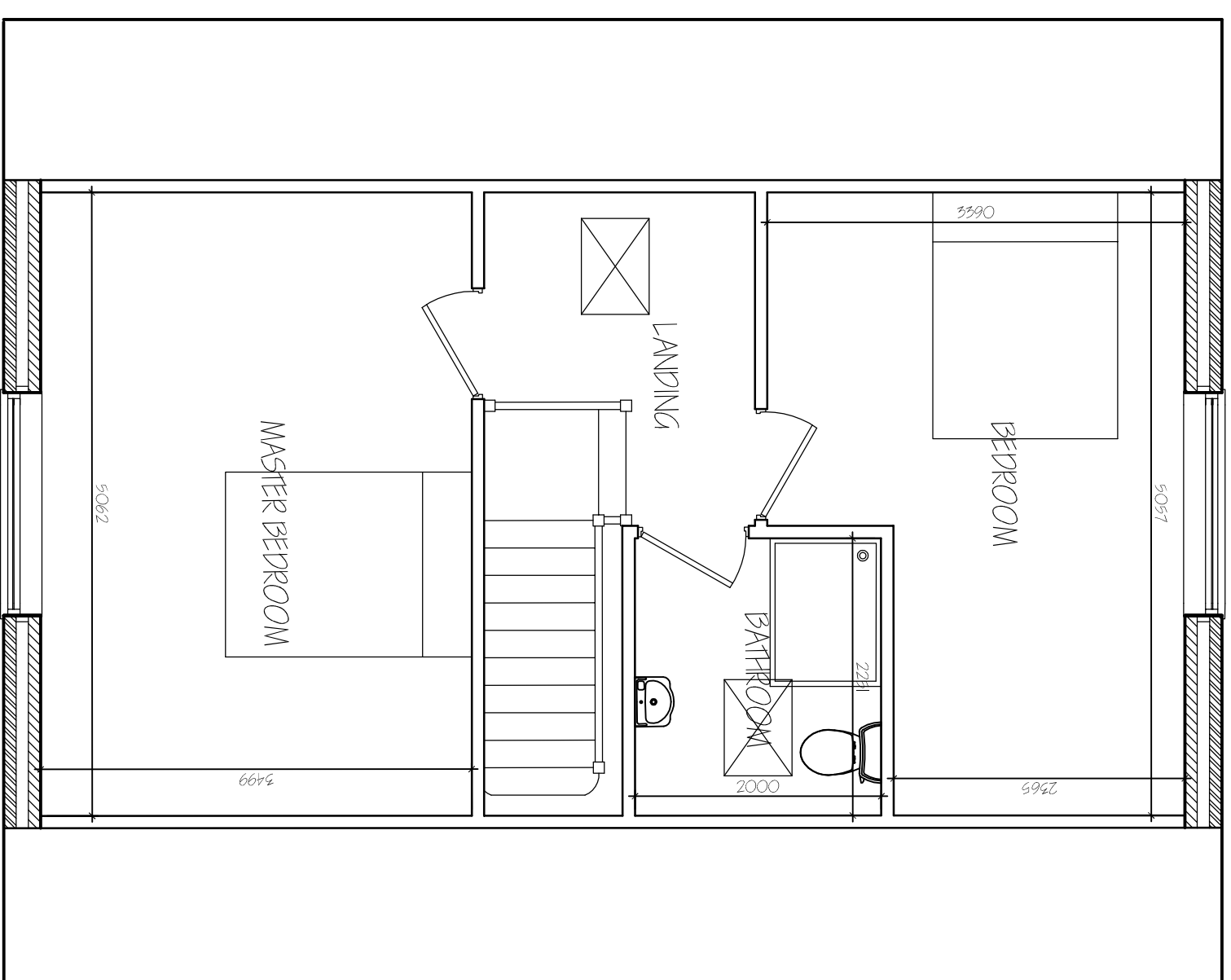
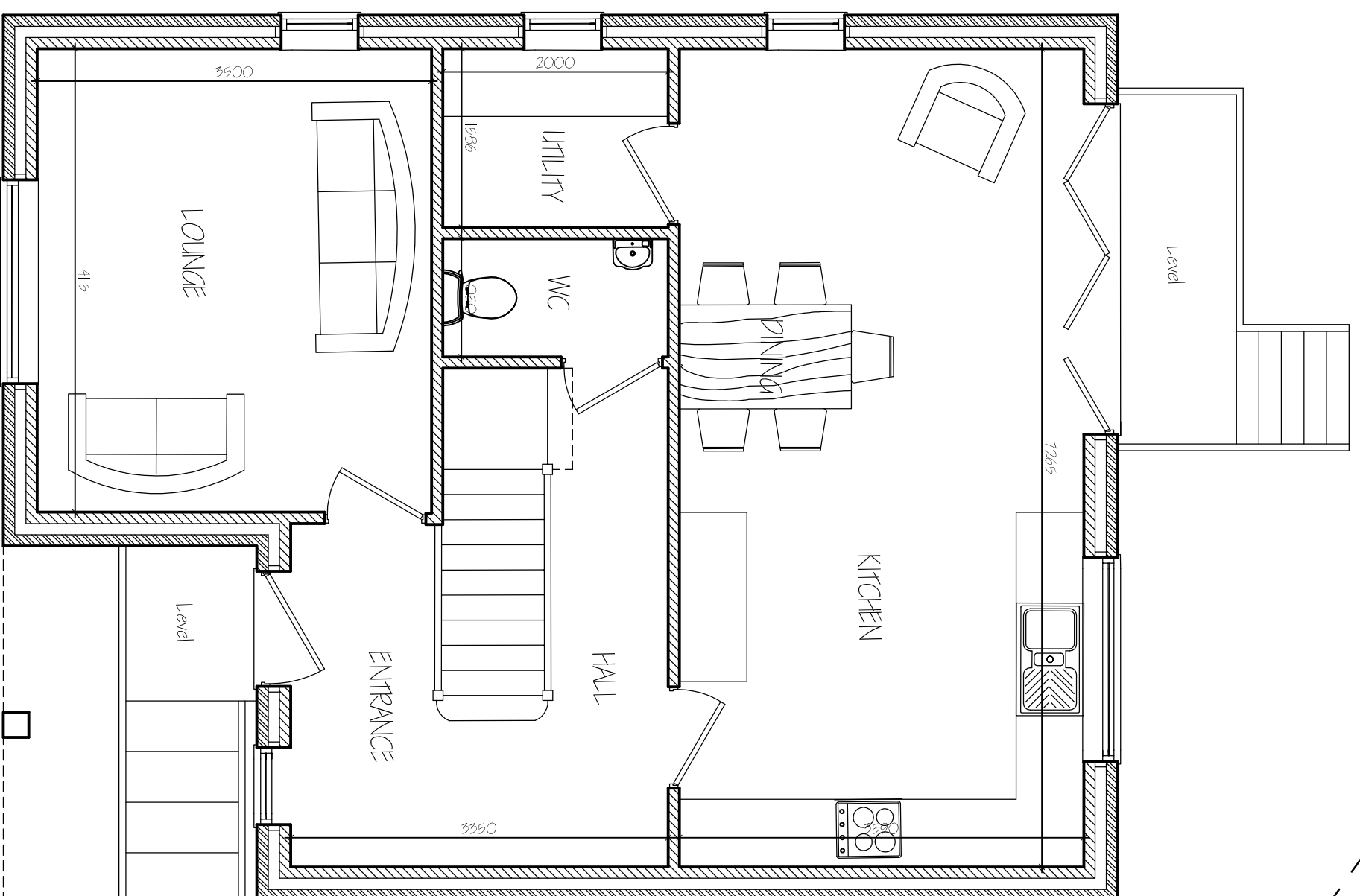
NORTH WEST ELEVATION



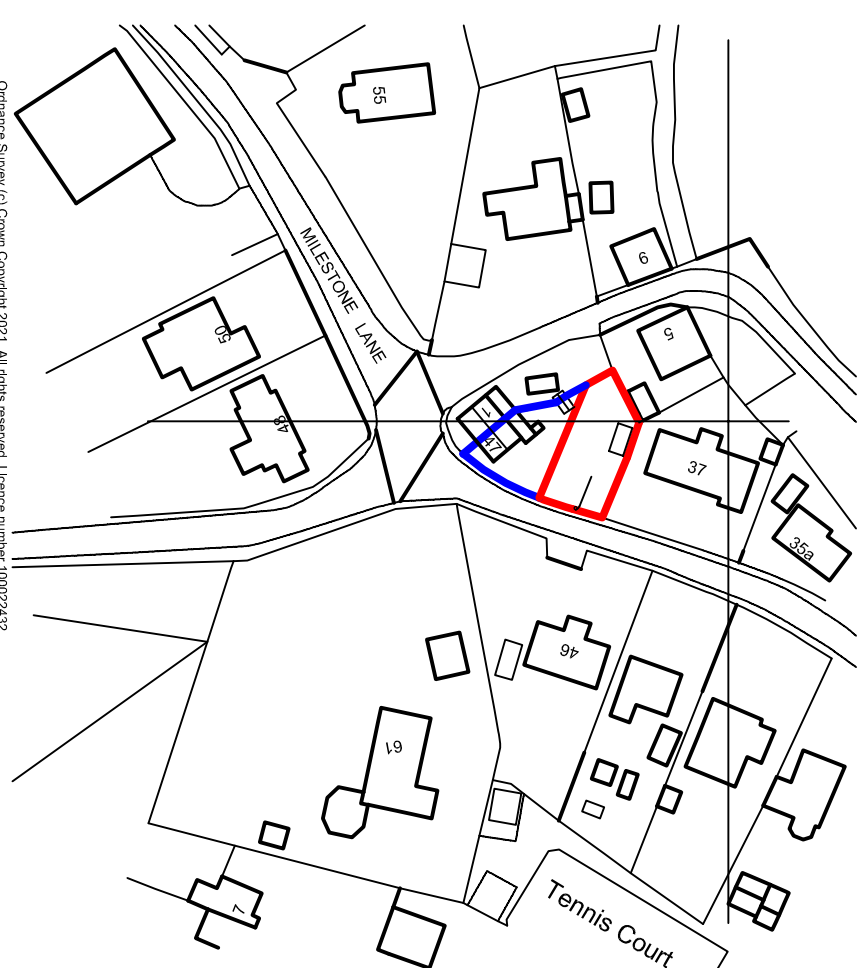
SOUTH EAST ELEVATION



SOUTH WEST ELEVATION



SITE PLAN.
1/250.



LOCATION PLAN.
1/1250.

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FLOOR PLANS & ELEVATIONS
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