

FLOOD RISK ASSESSMENT FOR RESIDENTIAL DEVELOPMENT AT SOUTH DROVE NORTH, SPALDING

FINAL REPORT

ECL0396/G R MERCHANT LTD

DATE JANUARY 2021

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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 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 Risk

5.0 FLOOD RISK MITIGATION

- 5.1 Summary of Risks
- 5.2 Mitigation Measures

6.0 CONCLUSIONS AND RECOMMENDATIONS

**ATTACHMENT 1 – Existing Floor Plans, Elevations, Site and Location Plan
(Dwg 3734-20-01A)**

**Proposed Ground Floor Plans and Elevations
(Dwg 3734-20-02A)**

**Proposed Site Plan and First Floor Plan
(Dwg 3734-20-03A)**

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 T Burrows in respect of a development that consists of the conversion of a barn to form one residential dwelling at South Drove North, Spalding.

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

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is located at South Drove North, Spalding, Lincolnshire, PE11 3BD. The National Grid Reference of the site is 52190/32096.

The location of the site is shown in Figure 1.

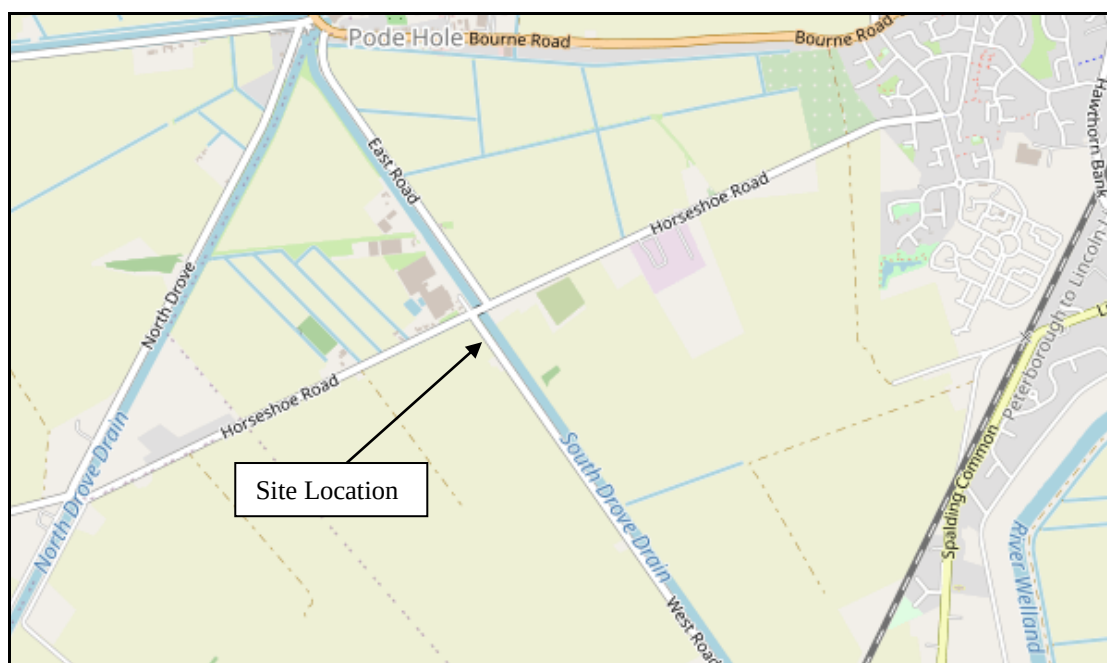


Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is on the western side of South Drove North, Spalding. The site consists of a barn and the surrounding land. There is a dwelling to the south of the site and agricultural land to the west and north. The area of development is approximately 0.1 hectares.

A topographic survey has been undertaken which shows that site levels typically vary between +2.5m OD and +2.75m OD. The spot levels from the survey are shown on the Existing Site Plan in Attachment 1.

The site is in the Welland and Deepings Internal Drainage Board (IDB) District. Surface water at the site would naturally drain through soakaway and hence to the riparian drainage network and then to the Board's main drain system. There are riparian drains on the western side of South Drove North. The nearest Board Drain, South Drove Drain is on the eastern side of South Drove North.

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 a Change of Use of an agricultural building to form 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 2, an area with a medium probability of flooding, of the Environment Agency Flood Maps for Planning as shown in Figure 2.

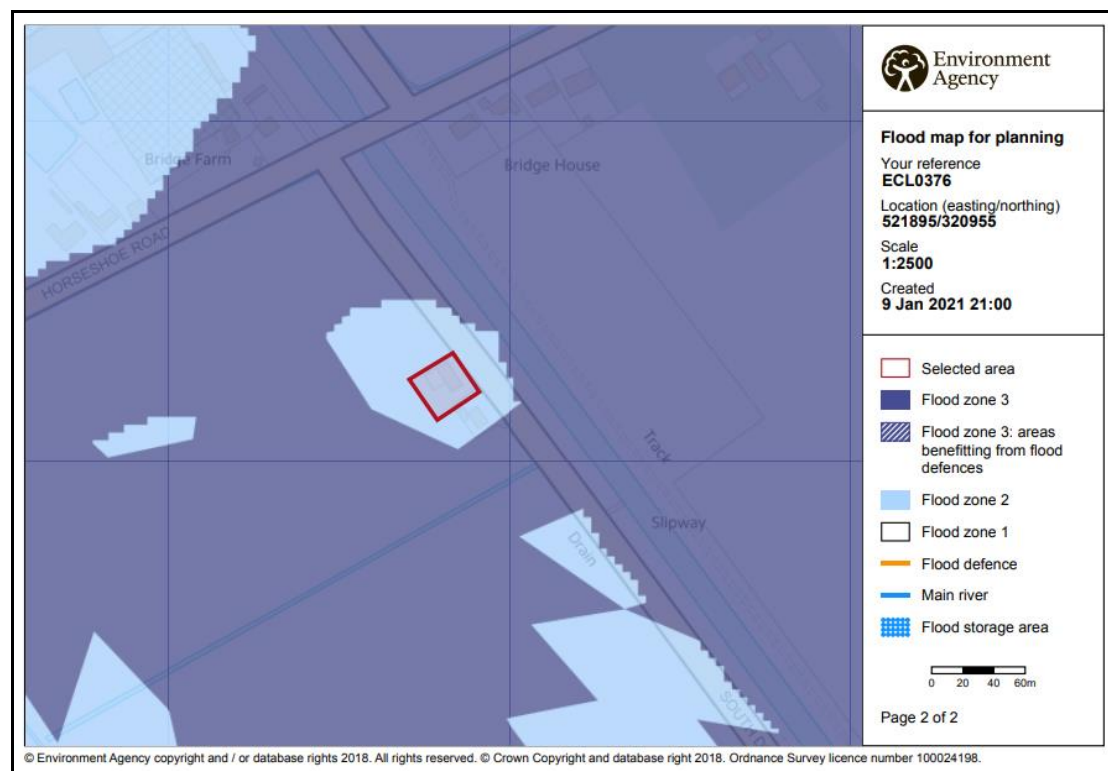


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the site has a low risk of flooding (annual probability between 1% and 0.1%);
- 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% event	The site is outside of the 'Low Hazard' area	Part of the site is in the 'Danger for Some' area
Residual Peak Depth Map for the 1% fluvial and 0.5% event	The site is outside of the area at risk of flooding	The peak flood depth at the site is 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 residential care homes 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 2 and the development is 'More 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

The Sequential Test and Exception Test are required to be applied by the Local Planning Authority.

Large parts of the South Holland district close to the River Welland lie within Flood Zone 3. As such, this site should be considered preferable because it is in Flood Zone 2. There are no known sites available for development in the limited areas of lower flood risk. In this context it is noted that the 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.

4.0 SITE SPECIFIC FLOOD RISK

4.1 Local Flood Assets

The site is 1.7m west of the River Welland as it flows through Spalding. The site is 2.7km south west of the inlet to the Coronation Channel, a bypass channel of the River Welland. The embankments of the Coronation Channel were 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.

The Cowbit Washes, Coronation Channel and River Welland 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 every 5 years.

There is an extensive local drainage network managed by Welland and Deepings IDB. There is an IDB maintained watercourse, South Drove Drain on the eastern side of South Drove North. The site and the surrounding land are within the Deeping Fen catchment and drain in a northerly direction to Pode Hole Pumping Station. Pode Hole Pumping Station discharges to Vernatts 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 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 Welland and Deepings IDB main drain system;
- an event in the local drainage network that exceeds the standard of protection;
- failure of Pode Hole Pumping Station; and
- overtopping and / or breaching of the River Welland defences.

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 high priority watercourses incorporating a freeboard. This provides storage during events greater than 2% annual probability (1 in 50 chance each year).

The Coronation Channel and the Cowbit Washes protect the site from the River Welland. These flood relief measures provide protection during the 1% annual probability (1 in 100 chance each year) flood.

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 Welland.

The River Welland 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).

4.6 Residual Risk

There is a residual risk of flooding at the site should a breach occur. The South East Lincolnshire SFRA includes maps demonstrating the impact of a breach in 2116. 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) event the peak depth at the site is between 0.25m and 0.5m. An extract from this map is shown in Figure 3 below.

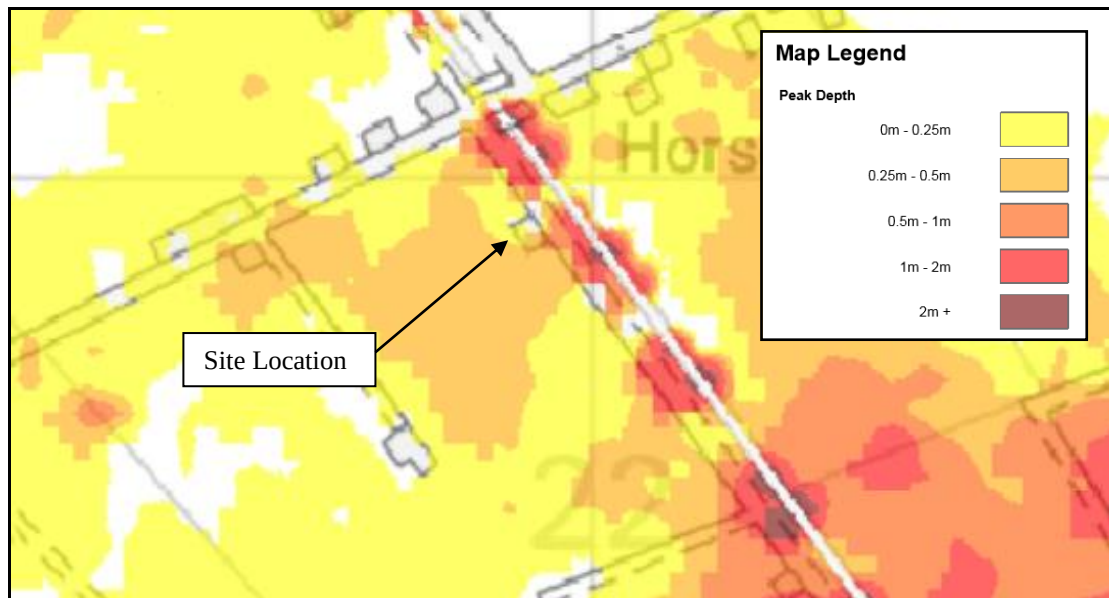


Figure 3 – SFRA 2116 Residual Peak Depth Map

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Pode Hole 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 a breach in the defences in 2116. The maximum flood depth around the proposed dwelling is 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.

These risks will be addressed through the mitigation measures set out below.

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 finished floor level is at +3.25m OD, 0.5m above surrounding ground levels. It is recommended there is 0.3m of flood resilient construction above finished floor level.

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 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 occupant should register with the Floodline Direct Warnings Service to receive any future flood warnings.

Should there be a failure of Pode Hole 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 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 AND RECOMMENDATIONS

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

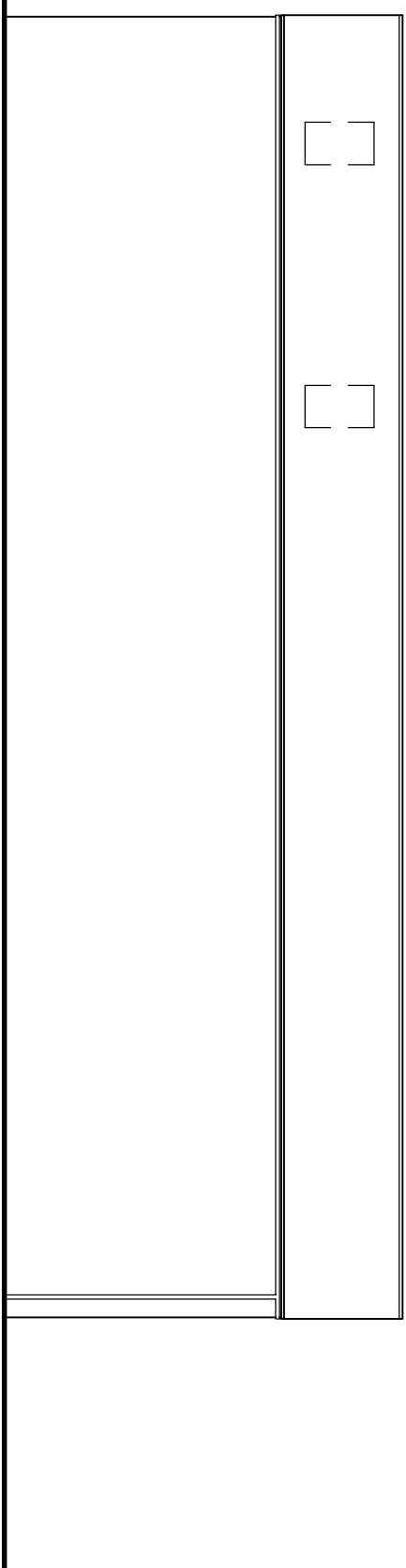
- The proposed development consists of a Change of Use of an agricultural building to form one residential dwelling at South Drove North, Spalding.
- The proposed development is in a defended floodplain. It is in the floodplain of the River Welland and protected during the 1% annual probability (1 in 100 chance each year) fluvial event. During the design life of the development, it is not anticipated that the site will flood.
- 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 high priority watercourses incorporating a significant freeboard. This provides storage during events greater than 2% annual probability (1 in 50 chance each year).
- The peak flood depth at the site during a breach of the defences is 0.5m.
- It is recommended that the finished floor level is +3.25m OD with 0.3m of flood resilient construction above finished floor level to mitigate against a breach of the defences.
- The development passes the Sequential Test and is therefore suitable for the proposed location.

ATTACHMENT 1

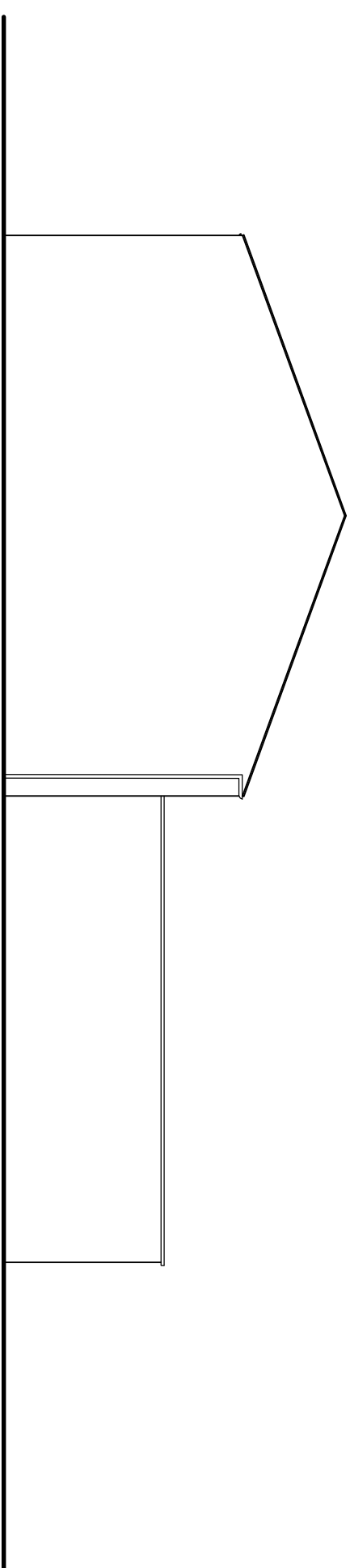
**EXISTING FLOOR PLANS, ELEVATIONS, SITE AND
LOCATION PLAN
(Dwg 3734-20-01A)**

**PROPOSED GROUND FLOOR PLANS AND ELEVATIONS
(Dwg 3734-20-02A)**

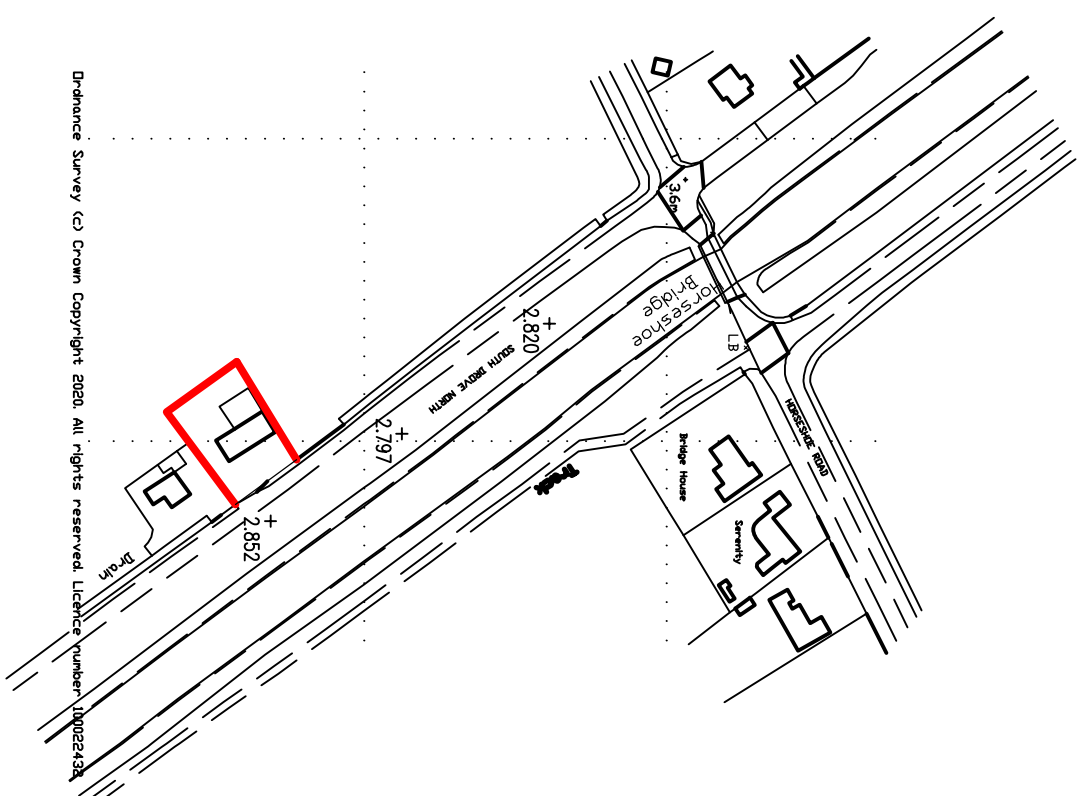
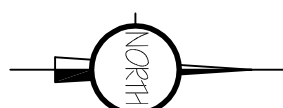
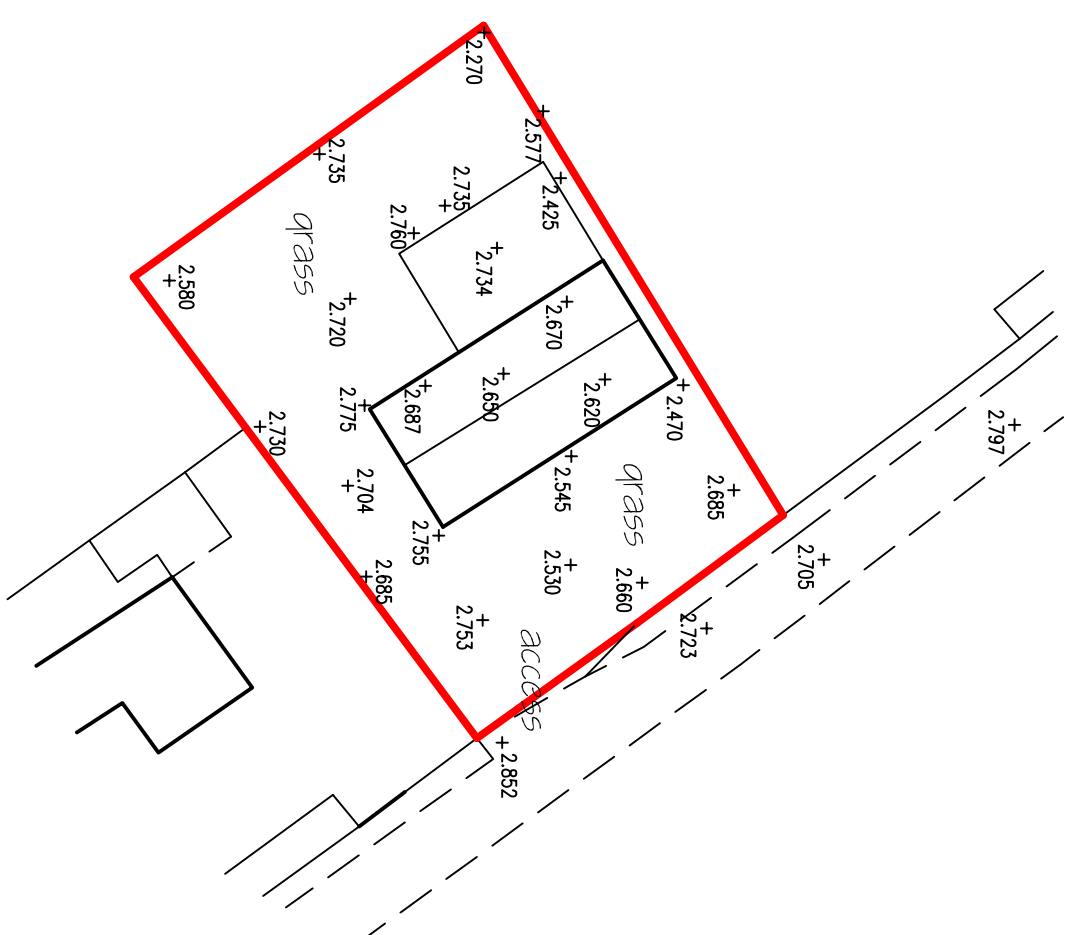
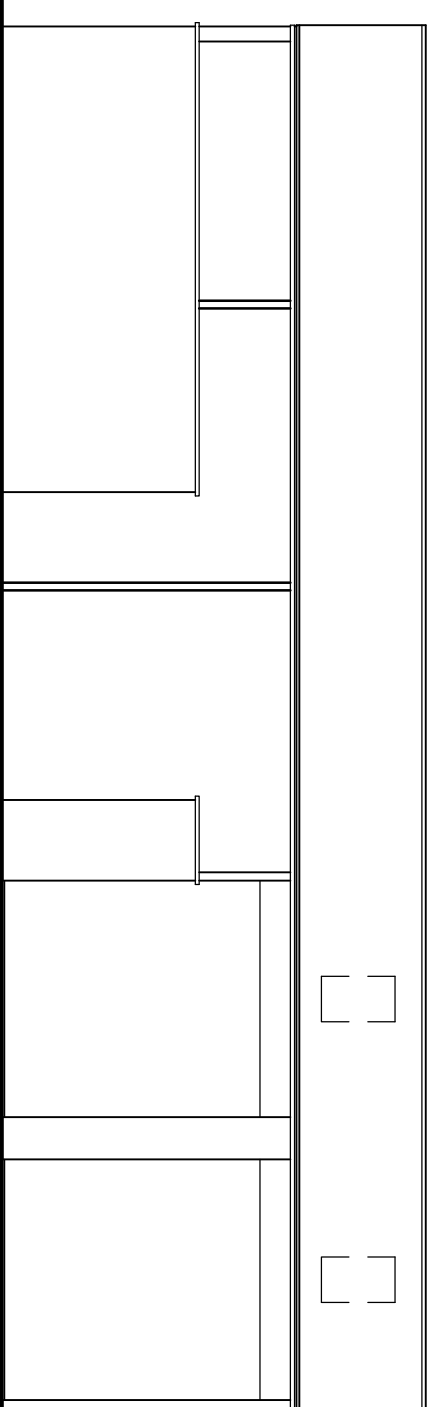
**PROPOSED SITE PLAN AND FIRST FLOOR PLAN
(Dwg 3734-20-03A)**



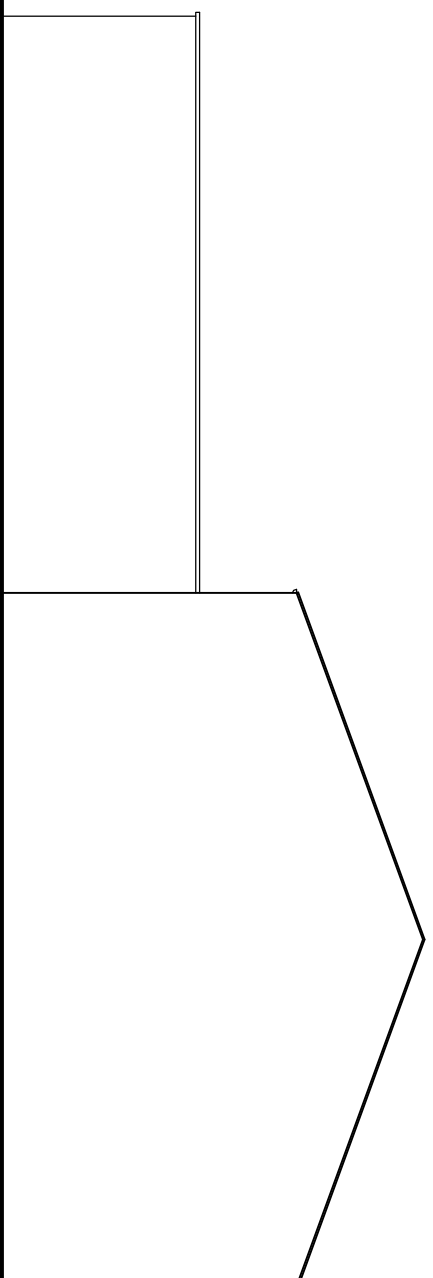
FRONT ELEVATION



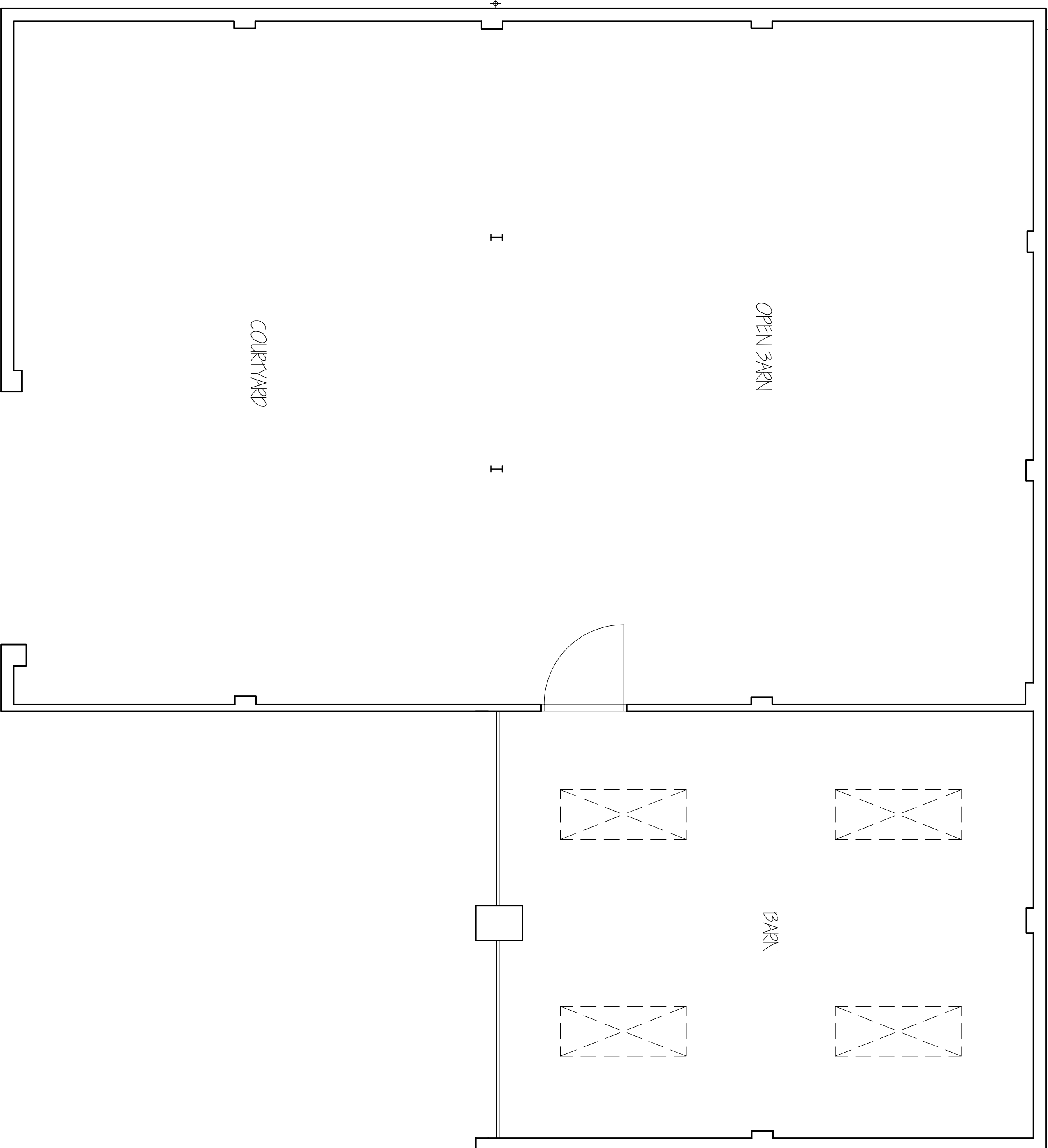
SIDE ELEVATION

LOCATION PLAN
1:2500SITE PLAN
1:500

REAR ELEVATION



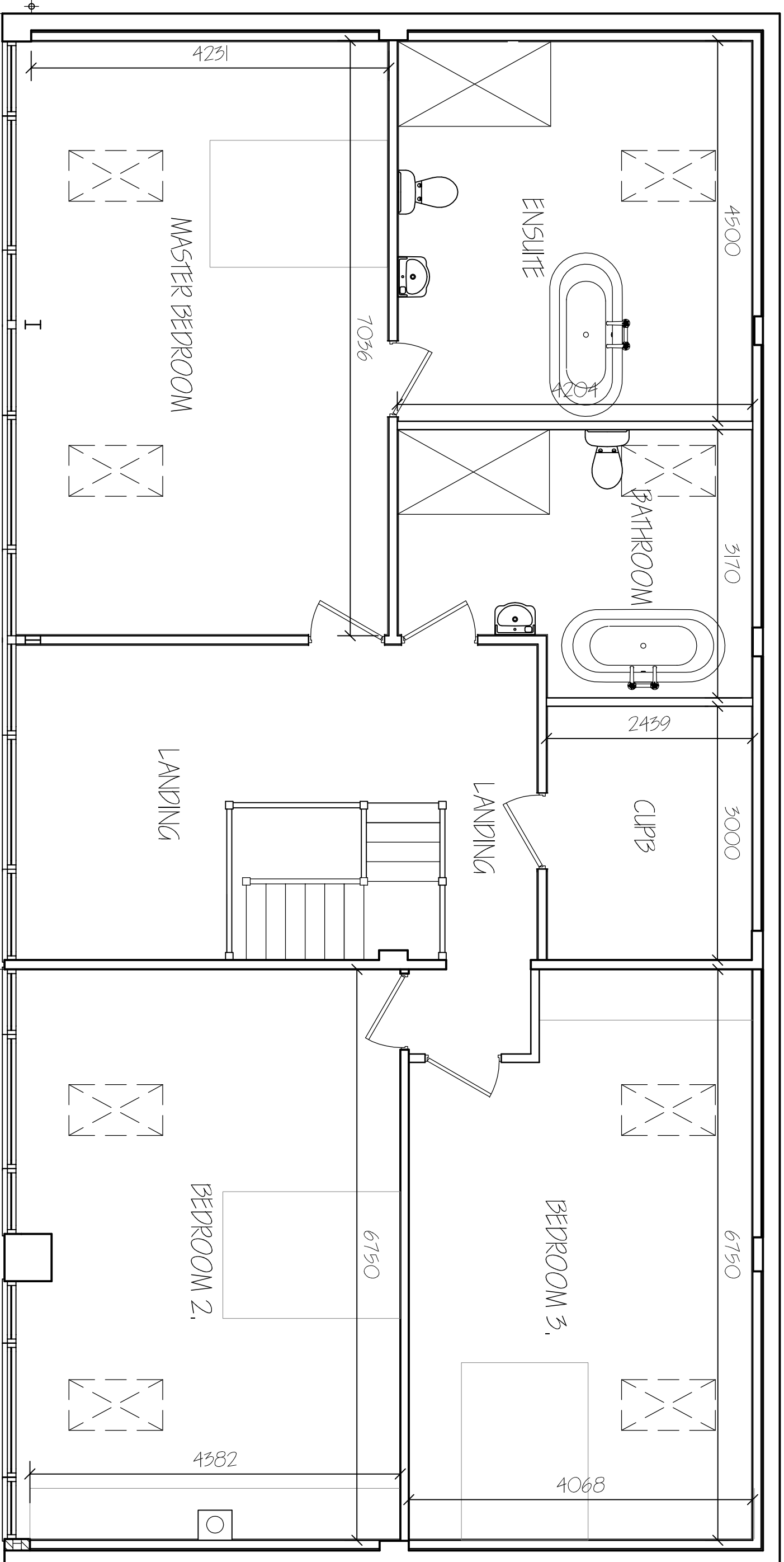
SIDE ELEVATION



EXISTING FLOOR PLAN

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NOTE :-
ALL LEVELS RELATE TO METRES
ABOVE O.D. NEWLY



NOTE :-
FINISHED FLOOR LEVELS TO BE
AT 3.25m ABOVE O. D. NEWL.N.

SITE PLAN & PROPOSED SITE LEVELS
1:500



Existing Access to be upgraded to LC Highways Specification

ref#	revision	date
A.	CHANGES AND COMMENTS & FEEDBACK	JAN 2021

G. R. MERCHANT LTD.
1.ENG AMICE FWO
ARCHITECTURAL, STRUCTURAL
AND LAND DRAINAGE
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BARN CONVERSION (CLASS 02)
SOUTH DROVE NORTH.
SPALDING, Lincs.
PELL 3ED.

MR T BURROWS

SITE PLAN
FIRST FLOOR PLANS
PROPOSED.

Job Ref.	Drawing No.
3734-20.	03A.

Date	DECEMBER 2020.
Drawn	SJD/HLD.

1/50 1:100 (Unless Otherwise Stated)

DO NOT SCALE FROM THIS DRAWING

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