FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
44 BACKGATE, COWBIT

FINAL REPORT

ECL0863/G R MERCHANT LTD

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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 replacement dwelling at Backgate, Cowbit.

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 at 44 Backgate, Cowbit, Spalding, PE12 6AP. The National Grid Reference of the site is 52662/31759.

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 eastern side of Backgate. The site consists of a bungalow, two outbuildings and the surrounding garden. There are dwellings to the north and south of the site. The area of development is approximately 0.05 hectares.

Environment Agency LIDAR information shows that the site is flat with typical ground levels between +2.4m OD and +2.5m OD. The carriageway level of Backgate adjacent to the site is +2.6m OD.

The site is in the South Holland Internal Drainage Board (IDB) District. Surface water drainage from the site discharges to the Board's main drain system. There is an IDB High Priority pipeline / watercourse approximately 50m north of the site which discharges to the Wheat Mere Drain 250m to the east.

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 replacement dwelling. The dwelling will be single storey. The existing dwelling will be demolished. A Site Plan is 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 Flood Zones

An extract from the Environment Agency Flood Map for Planning is shown in Figure 2. The site is located within Flood Zone 2, an area with a medium probability of flooding.

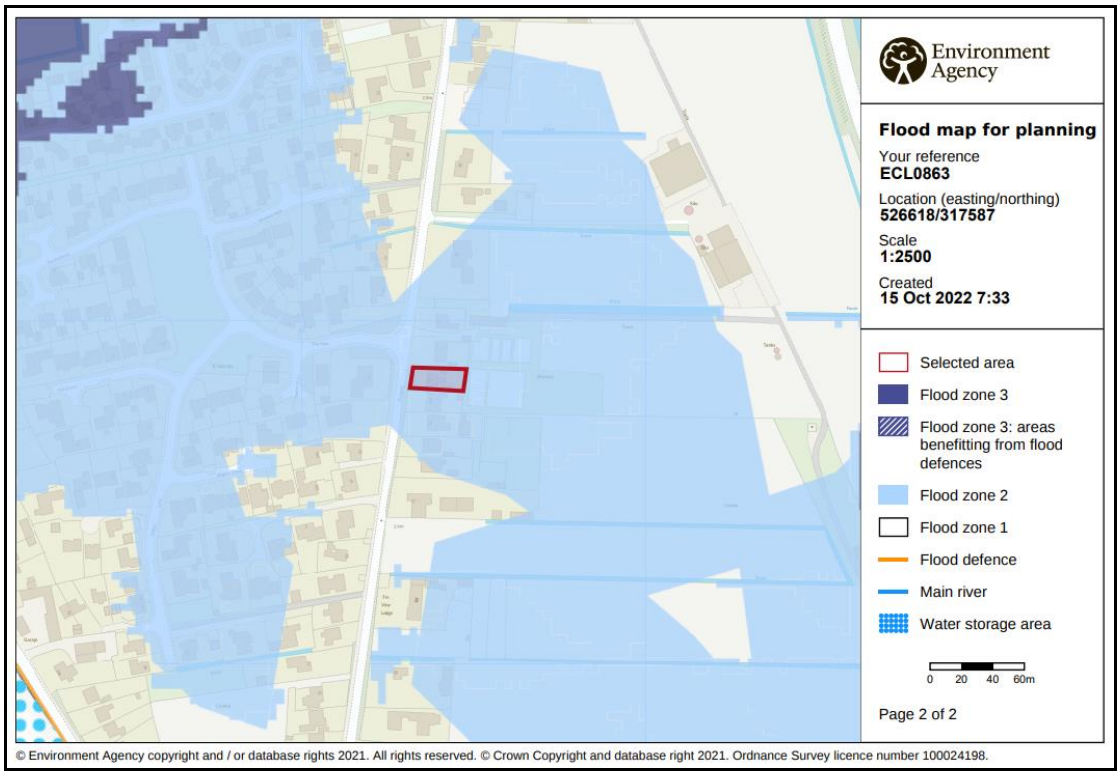


Figure 2 – Environment Agency Flood Map for Planning

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 of surface water flooding (annual probability between 0.1% and 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 outside of the 'Low Hazard' area	The site is outside of the 'Low Hazard' 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 outside the area at risk of flooding

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 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

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 as such it is not necessary to apply the Sequential Test.

4.0 SITE SPECIFIC FLOOD RISK

4.1 Local Flood Assets

The site is 1.5km east of the River Welland. Cowbit Wash is the floodplain to the River Welland and the village of Cowbit is protected from the River Welland by the Cowbit Wash Barrier Bank.

The site is 4.0km south of 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 Wash Barrier Bank 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 High Priority pipeline/watercourse 50m north of the site. The site and surrounding land are part of 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.

4.2 Sources of Flooding

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

- surface water flooding;
- 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 Wisemans Pumping Station;
- overtopping and breaching of the fluvial Coronation Channel defences; and
- overtopping and breaching of the Cowbit Wash Barrier Bank.

4.3 Probability of Flooding

The Environment Agency Long Term Flood Risk Maps show that part of the site has a low risk of surface water flooding. During the present-day medium risk event (1% annual probability) the site is not at risk.

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 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 Cowbit Wash Barrier Bank is at a level of +5.90m OD and therefore provides 0.45m of freeboard above the flood level during the 1% annual probability (1 in 100 chance each year) event with climate change. The Cowbit Wash Barrier Bank falls within the Reservoirs Act 1975 legislation. As such it is regularly inspected by a Supervising Engineer who will assess its structural integrity to provide protection to people and property.

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.

An estimate of the 1% annual probability (1 in 100 chance each year) with an allowance for climate change surface water event can be made from the 0.1% annual probability (1 in 1000 chance each year) event. The extent and depth of flooding during the 0.1% annual probability (1 in 1000 chance each year) event is shown in Figure 3.

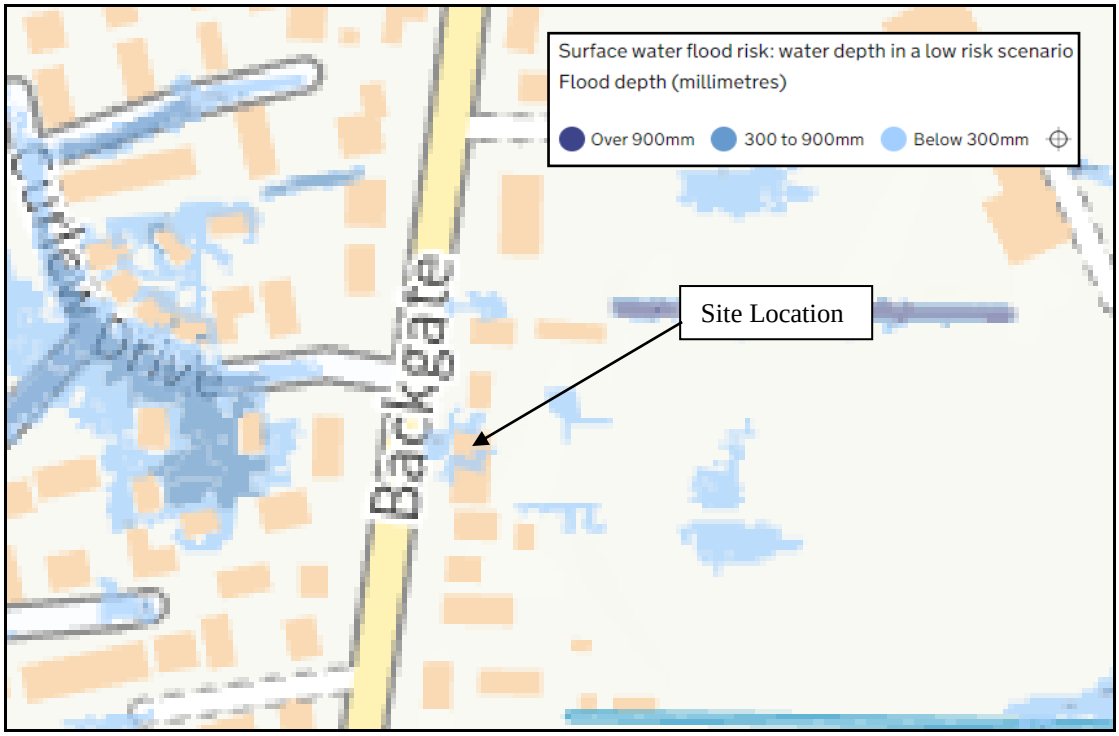


Figure 3 – Environment Agency Surface Water Flood Risk Map
0.1% Annual Probability

As shown in Figure 3 the site is affected by depths below 0.3m during the 1% annual probability (1 in 100 chance each year) event with climate change.

The River Welland tidal defences have been designed to include an allowance for climate change.

4.6 Residual Risk

There is a residual risk of flooding in the area to the north west of the site should a breach occur. The South East Lincolnshire SFRA includes maps demonstrating the impact of a breach in 2116. 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 site is not at risk. An extract from this map is shown in Figure 3 below.



Figure 3 – SFRA 2116 Residual Peak Depth Map

The proposed development is for 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. It is estimated that the breach flood depth during the 0.1% annual probability (1 in 1000 chance each year) event is between 0.0m and 0.25m.

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The site is at risk of surface water flooding with depths below 0.3m during the 1% annual probability (1 in 100 chance each year) event with climate change.

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 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. It is estimated that the breach flood depth during the 0.1% annual probability (1 in 1000 chance each year) event is between 0.0m and 0.25m.

Any increase in impermeable area associated with the development will be minimal so there is no potential that flood risk will be increased elsewhere due to surface water.

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 a minimum of 0.3m 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 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.

6.0 CONCLUSIONS

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

- The proposed development consists of one replacement dwelling at 44 Backgate, Cowbit.

- 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 site is at risk of surface water flooding with depths below 0.3m.

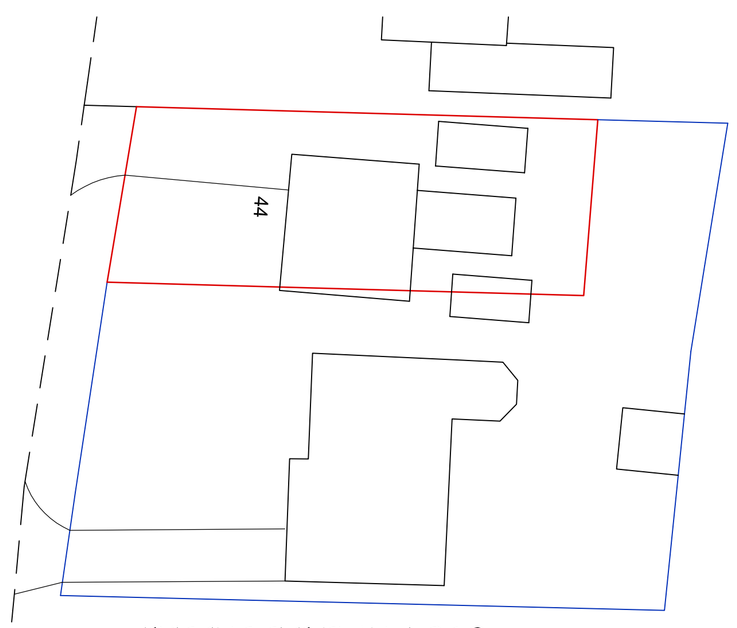
- The proposed development is in Flood Zone 2. The site benefits from defences on the River Welland and Coronation Channel that provide protection during the 1% annual probability (1 in 100 chance each year) fluvial event including climate change. It is estimated that the breach flood depth during the 0.1% annual probability (1 in 1000 chance each year) event is between 0.0m and 0.25m.

- It is recommended that the floor level of the dwelling is a minimum of 0.3m above ground level with 0.3m of flood resilient construction above finished floor level.

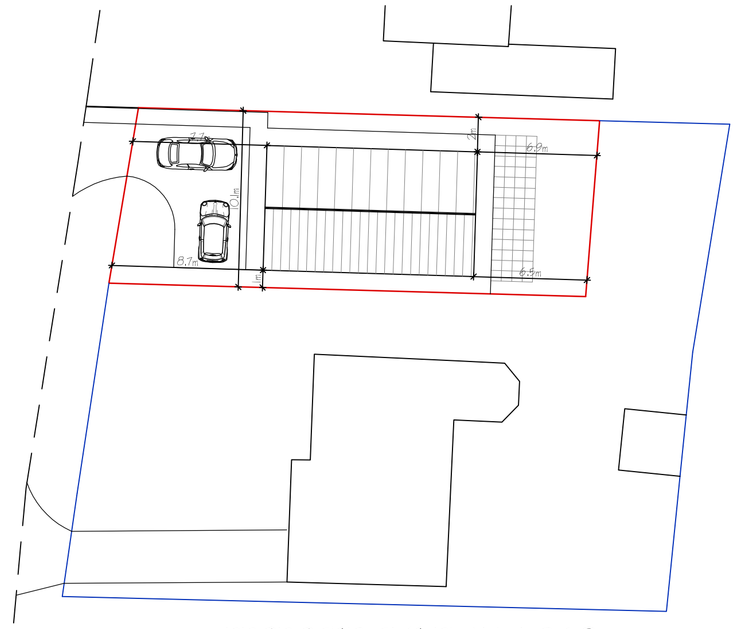
- The development passes the Sequential Test and is therefore suitable for the proposed location.

ATTACHMENT 1

FLOOR PLANS, ELEVATIONS, SITE & LOCATION PLAN (Dwg 4033-22 01B)



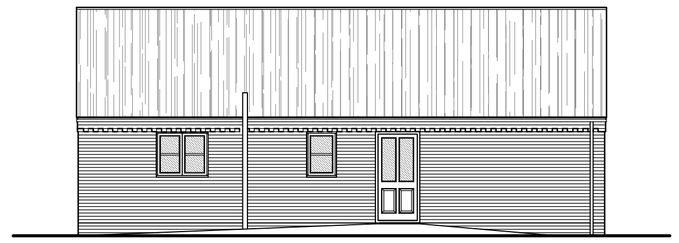
EXISTING SITE PLAN 1:250



PROPOSED SITE PLAN 1:250



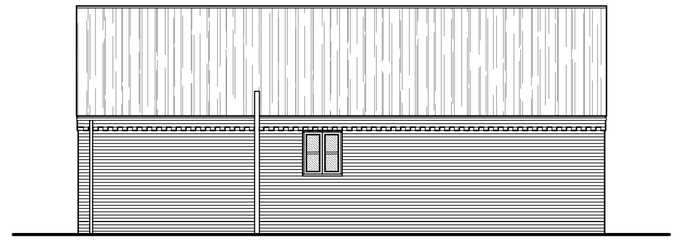
FRONT ELEVATION



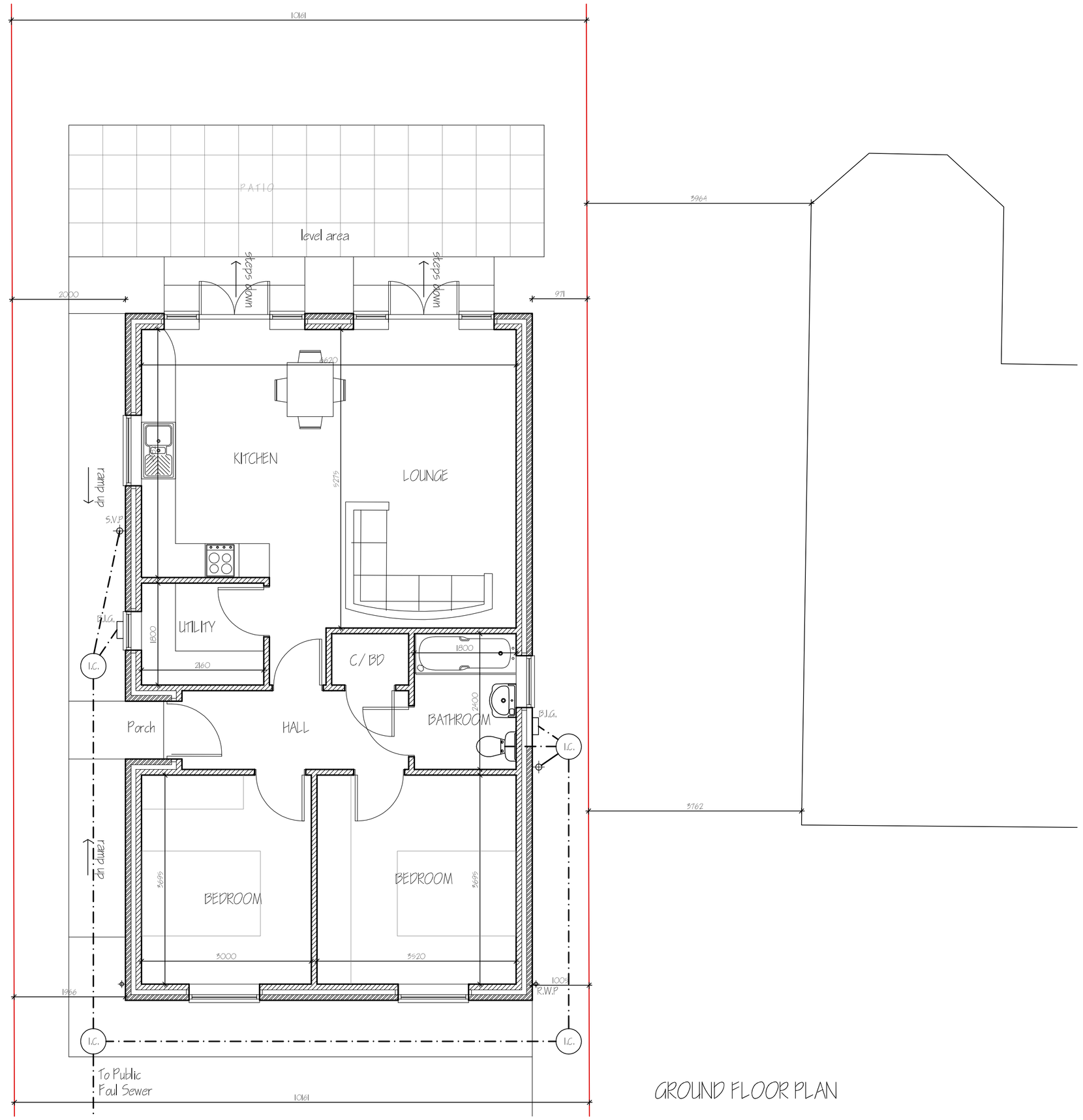
SIDE ELEVATION



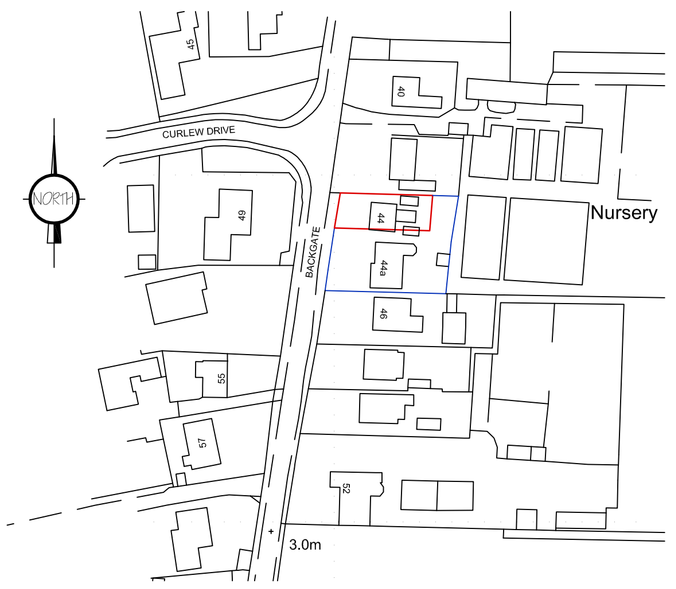
REAR ELEVATION



SIDE ELEVATION



GROUND FLOOR PLAN



LOCATION PLAN 1:1250

ref:	revision	date
B	SCHEME RE-DESIGN	SEPT 2022
A	SCHEME RE-DESIGN	AUG 2022

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Drawing
FLOOR PLANS - PROPOSED
ELEVATIONS - PROPOSED
SITE & LOCATION PLANS

Job Ref.	Drawing No.
4035-22	013
Date	Drawn
JULY 2022	SLB

Scales
1:50 & 1:100 (Unless Otherwise Stated)

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