FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT
AT BRIDGE ROAD, SUTTON BRIDGE

FINAL REPORT

ECL0170/G R MERCHANT LTD

DATE DECEMBER 2019

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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 four residential dwellings at Bridge Road, Sutton Bridge.

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 48-50 Bridge Road, Sutton Bridge, Lincolnshire, PE12 9UA. The National Grid Reference of the site is 54800/32120.

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 north side of Bridge Road and is a derelict retail premises. A location plan and existing floor plan are provided in Attachment 1. The area of development is approximately 0.04 hectares.

Environment Agency LIDAR information shows that the pavement in front of the site is at a level of +4.6m OD. Ground levels to the rear of the development are typically +3.8m OD.

The site is in the South Holland Internal Drainage Board (IDB) District. The site and the surrounding land are within the Westmere catchment and discharges under gravity to the tidal River Nene at the Westmere Tidal Sluice.

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 four residential dwellings. Each dwelling will be three storeys and will not have any habitable accommodation on the ground floor.

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

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.

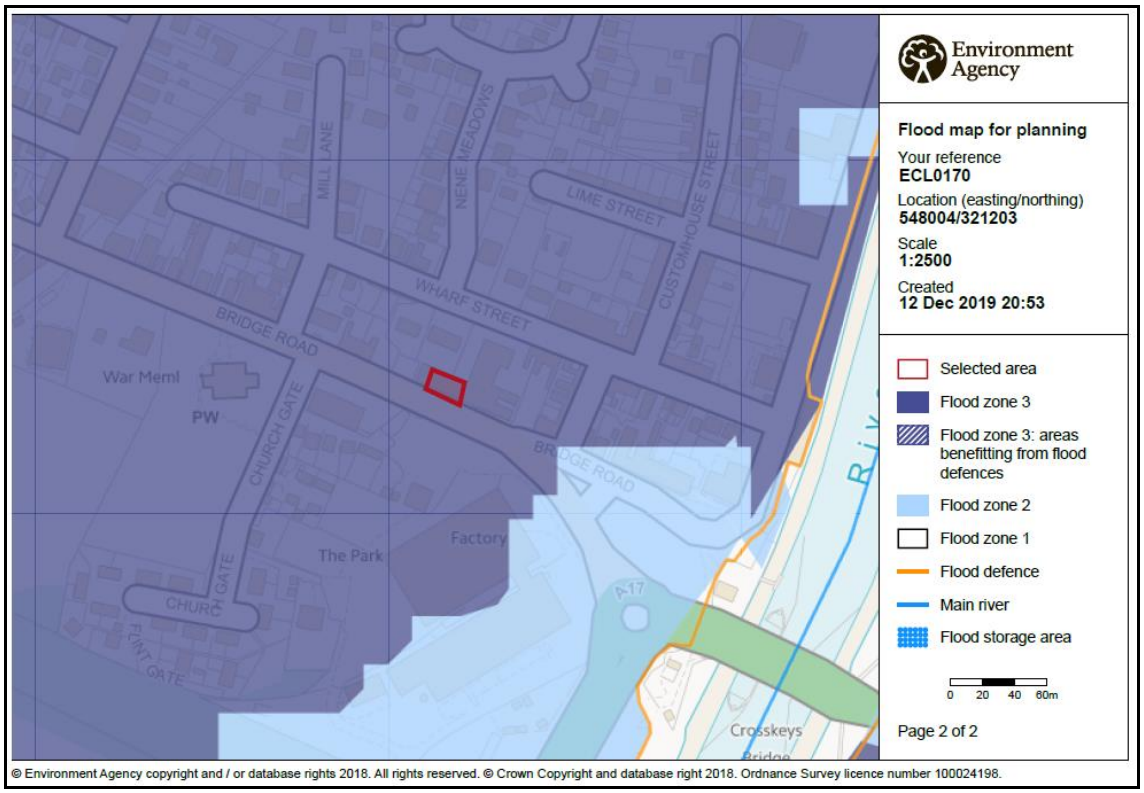


Figure 2 – Environment Agency Flood Map for Planning

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 (annual probability less than 0.1%) 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	2116
Residual Flood Hazard Map for the 1% fluvial and 0.5% tidal event	The site is in the 'Low Hazard' 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 0.0m and 0.25m.	The peak flood depth is between 1.0m and 2.0m.

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

The Sequential Test and Exception Test are required to be applied by the Local Planning Authority. As the proposal is for the conversion of an existing building finding an alternative site is not a realistic option.

Large parts of the South Holland district that are near the River Nene lie within Flood Zone 3. 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 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 250m 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 every 5 years.

There is an extensive local drainage network managed by South Holland IDB. There is an IDB High Priority Pipeline approximately 850m 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 1.2km 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 drainage network 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.

The standard of drainage provided by South Holland 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 South

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

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 100 chance each year) tidal event the peak depth at the site from direct overtopping together with breach failure is between 1.0m and 2.0m. An extract from this map is shown in Figure 3 below.



Figure 3 – SFRA 2115 Residual Peak Depth Map

5.0 FLOOD RISK MITIGATION AND RESIDUAL RISKS

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 2116. The maps show that the peak flood depth at the site is between 1.0m and 2.0m.

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 South East Lincolnshire Standing Advice Matrix sets out the requirements for mitigation measures. For residential developments with a “Danger for All” hazard and flood depths greater than 1.6m it states:

- proposals must have a minimum of two storeys and no ground floor habitable accommodation; and
- the first floor living accommodation must be above the predicted flood depth.

The proposed dwellings will have three storeys. The ground floor consists of a hall, utility room, toilet and store. As such there will not be any ground floor habitable accommodation. Based upon the potential depth of flooding the first floor living accommodation will be above the predicted flood depth.

The developer should ensure that the occupiers of the dwellings are 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 occupiers of the dwellings should register with the Floodline Direct Warnings Service to receive any future flood warnings.

During an extreme 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 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 utilising temporary pumping equipment.

It is recommended that surface water run-off is discharged to soakaways to BRE365 design requirements and therefore water from the site 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 is in a defended floodplain. It is in the floodplain of the tidal River Nene and protected during the 0.5% annual probability (1 in 200 chance each year) tidal 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 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 South Holland IDB high priority watercourses incorporating a significant freeboard. This provides storage during events greater than 2% annual probability (1 in 50 chance each year).

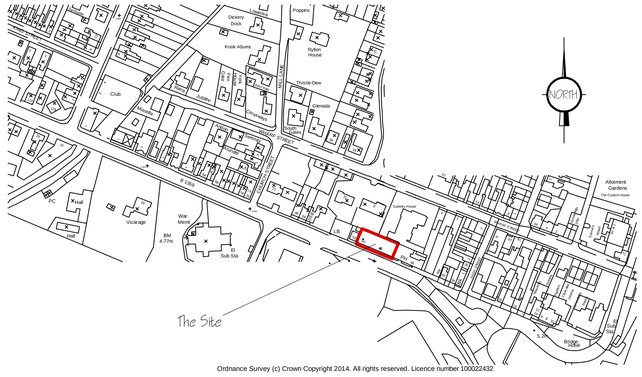
- The proposed development will not have any ground floor habitable accommodation and has first floor living accommodation above the predicted flood level. The development therefore complies with the South East Lincolnshire Standing Advice Matrix.

- Surface water run-off from the development should be discharged to soakaways to BRE365 design requirements so that adjoining land and properties are not affected.

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

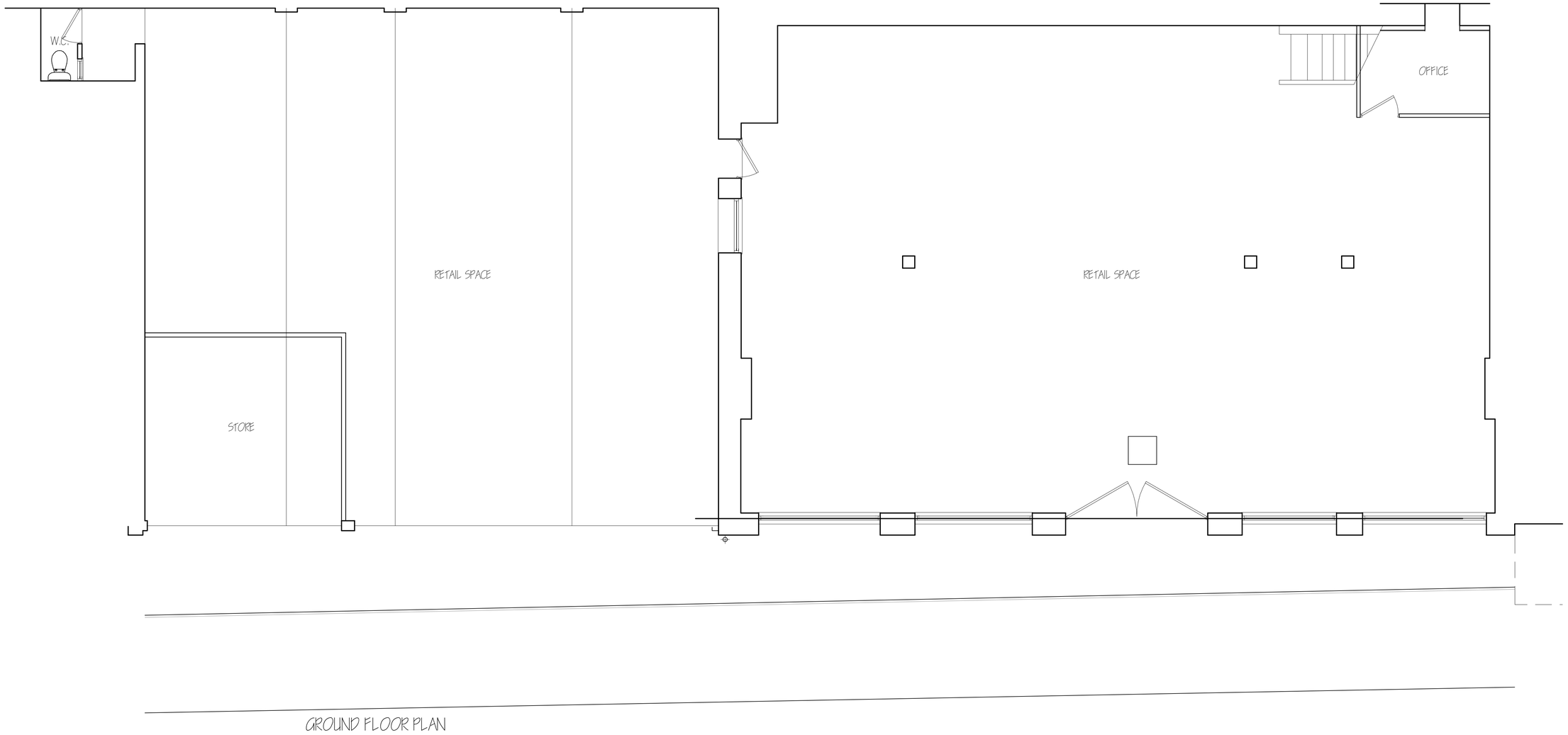
ATTACHMENT 1

LOCATION AND EXISTING GROUND FLOOR PLAN
(Dwg 3564-19)



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LOCATION PLAN
1:2500



GROUND FLOOR PLAN

ref:	revision	date

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Drawing
GROUND FLOOR PLAN - EXISTING
LOCATION PLAN

Job Ref.	Drawing No.
3564-19	01

Date	Drawn
NOV 2019	SLB

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

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