FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
22 STATION ROAD, GEDNEY HILL

FINAL REPORT

ECL0151/ G R MERCHANT

DATE NOVEMBER 2019

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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 Risk

5.0 FLOOD RISK MITIGATION
- 5.1 Summary of Risks
- 5.2 Mitigation Measures

6.0 CONCLUSIONS AND RECOMMENDATIONS

ATTACHMENT 1 – Site and Location Plans (Dwg 3539-19/05)

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 proposed dwelling at 22 Station Road, Gedney Hill.

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 adjacent to 22 Station Road, Gedney Hill, Lincolnshire, PE12 0NP. The National Grid Reference of the site is 53362/31087.

The location of the site is shown in Figure 1.

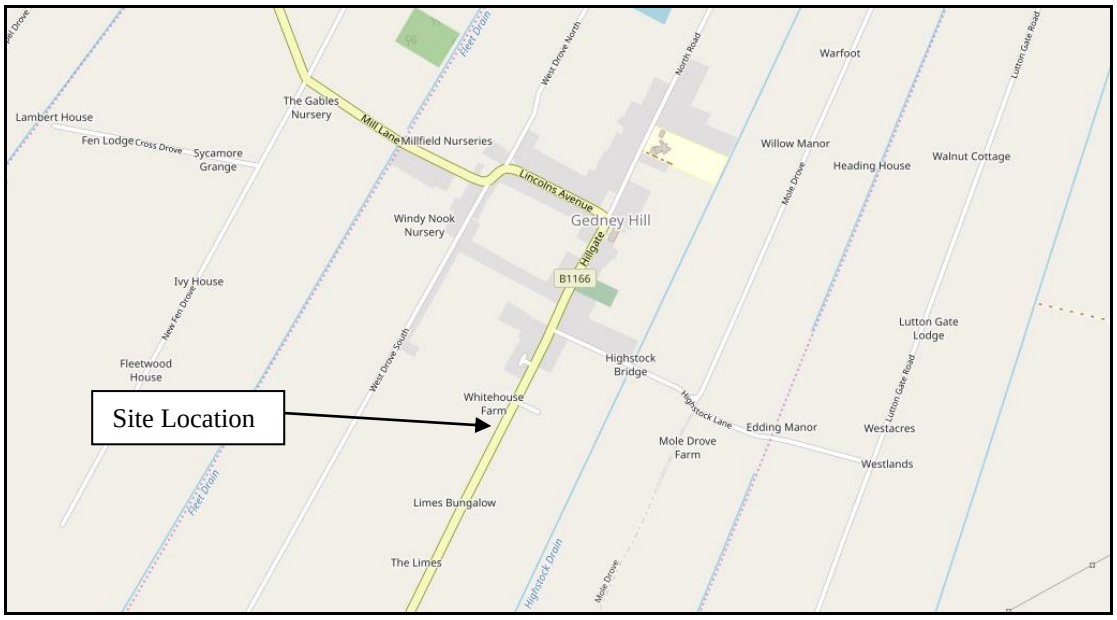


Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is within the boundary of 22 Station Road and to the north of the existing dwelling. The site includes a workshop and a garage. The area of development is approximately 0.05 hectares.

Environment Agency LIDAR information shows that the site is typically between +1.4m OD and +1.5m OD. The level of Station Road adjacent to the site is approximately +1.9m OD and the agricultural land to the west of the site is at a level less than +1.0m OD.

The site is in the South Holland Internal Drainage Board (IDB) District. The site and the surrounding land are within the Fleet Fen catchment and drain under gravity to the Fleet Fen Pumping Station which discharges to the South Holland Main Drain.

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 new dwelling as shown in Attachment 1. The dwelling will be two storey and will use the existing access to Station Road.

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 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 medium risk of flooding from rivers or the sea (annual probability between 1% and 3.3%);
- the site has a very low risk of flooding from surface water (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	2116
Residual Flood Hazard Map for the 1% fluvial and 0.5% tidal event	The site is outside the 'Low Hazard' area	The site is outside 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 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.

Large parts of the South Holland district between the River Welland and 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 and River Welland have defences that provide protection during the 0.5% annual probability (1 in 200 chance each year) event.

The SFRA states that it is necessary to use the refined flood risk information (hazard and depth maps) to assist with the application of the sequential test. The refined flood risk information contained within the SFRA demonstrates that the site is not at risk during the 1% annual probability event in 2115 with breaches. Based upon the SFRA and the standard of protection provided by the Environment Agency defences the site 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 9.2km north of the River Nene. The site is protected by the River Nene tidal defences. The site is 8.6km east of the River Welland. Cowbit Wash is the floodplain to the River Welland and the land to the east is protected by the Cowbit Wash Barrier Bank. The Cowbit Wash Barrier Bank and the River Nene 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 every 5 years.

There is an extensive local drainage network managed by South Holland IDB. Immediately to the west of the property is a field drain and there is an IDB high priority watercourse 160m to the north. The site and surrounding land are part of the Fleet Fen catchment and drain by gravity to the Fleet Fen Pumping Station. The Fleet Fen Pumping Station discharges to the South Holland Main Drain which outfalls to the tidal River Nene at Sutton Bridge Tidal 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:

- local blockages to the South Holland IDB system;
- an event in the local drainage network greater that exceeds the standard of protection;
- failure of Fleet Fen Pumping Station; and
- overtopping and/or breaching of the River Nene or River Welland tidal defences.

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 and River Welland 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. The SFRA indicates the maximum flood depths in the event of a combined breach. These demonstrate the site is not affected should the defences be breached.

4.4 Historic Flooding

During the preparation of this assessment, no evidence was discovered of the site being flooded.

4.5 Climate Change and Residual Risk

Climate change is likely to impact the site through increased rainfall intensity and duration affecting the local drainage network and increased tide levels.

The South East Lincolnshire SFRA includes maps demonstrating the impact of climate change in 2116. The Residual Peak Depth maps within the SFRA indicate the maximum flood depths associated with a breach and overtopping of defences. These show that the site is not at risk.

The residual risk that could cause flooding at the site is during an exceedance event.

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 Fleet Fen Pumping Station would increase the 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 proposed arrangement increases the impermeable area so there will be an increased volume of surface water. This has the potential to increase flood risk.

5.2 Mitigation Measures

Based upon the information available during the preparation of this flood risk assessment the risk of flooding is low. It is recommended that the floor level of the proposed dwelling is 0.3m above ground level at the site with 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 occupier of the dwelling should register with the Floodline Direct Warnings Service to receive any future flood warnings.

Should there be a failure of Fleet Fen 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 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 River Nene and River Welland 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).

- It is recommended that the floor level is 0.3m above ground levels at the site with 0.3m of flood resilient construction above finished floor level. 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.

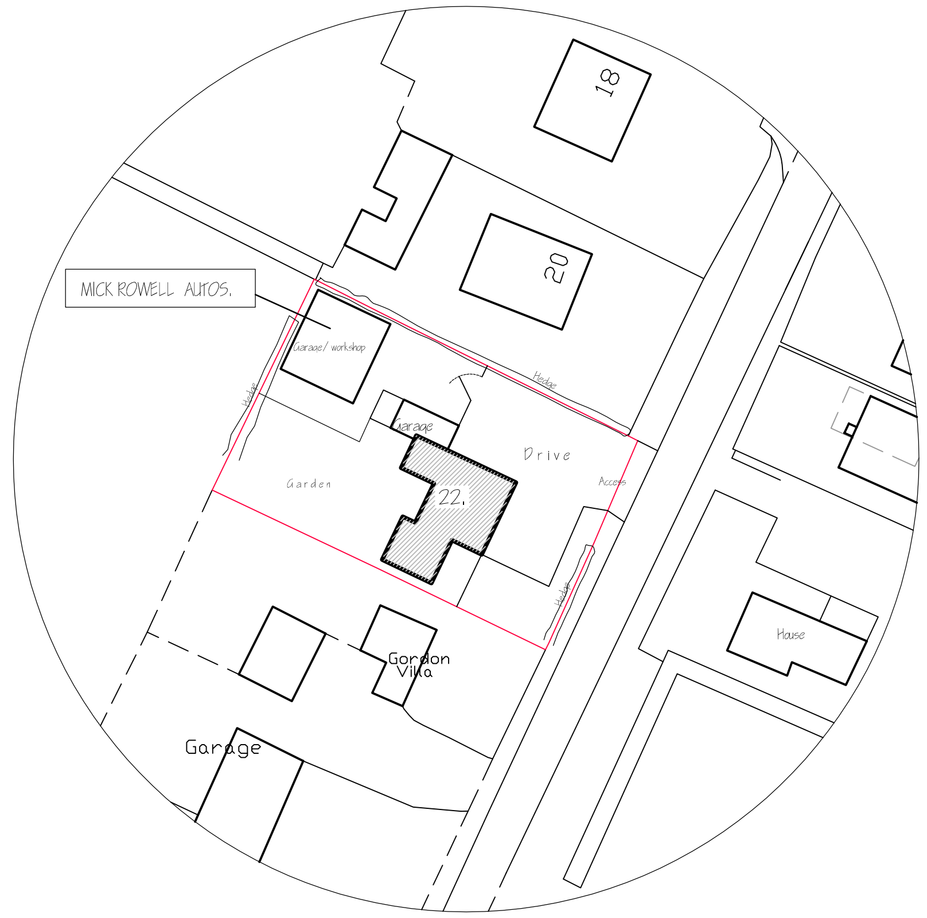
- The development passes the Sequential Test and Exception Test and is therefore suitable for the proposed location.

ATTACHMENT 1

SITE AND LOCATION PLAN
(Dwg 3539-19/05)



SITE LAYOUT PLAN - PROPOSED.
1/ 500.



SITE LAYOUT PLAN - EXISTING.
1/ 500.

LANDSCAPING, TREE PLANTING & FENCING SCHEME.

A - 1.8m high close boarded fence between properties.

B - Lincolnshire Post & Rail Fencing at rear of site.

C - Existing mature hedge to be retained.

D - Gravel Drive

E - Silver birch (Betula pendula) feathered.

F - Maandia Tree (Maandia Liliflora) feathered.

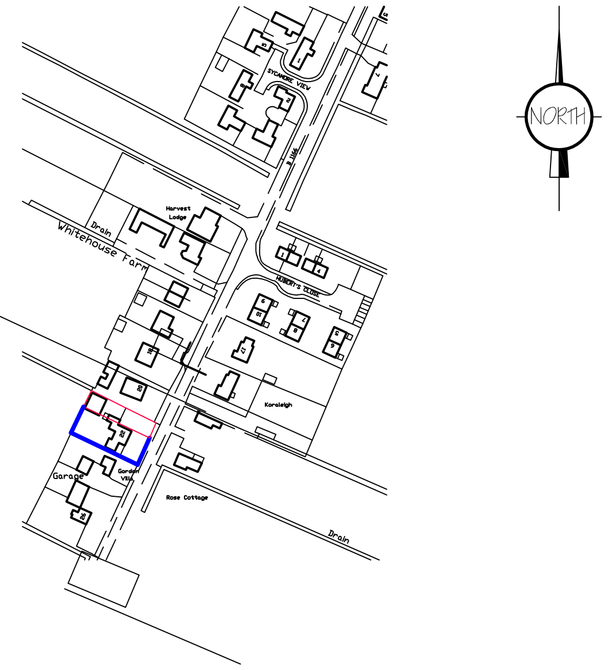
G - Hawthorn (Crataegus laevigata) feathered.

H - Slabbed patio and footpaths

All planting to be in accordance with BS 4428:1989 and amendment No. 1 (1991)

All trees to be planted with minimum 0.6m plastic mulch mat and to be staked, tied and tubed.

1/ 3 to ½ bag of peat free tree and shrub planting compost to be incorporated into backfill for each tree hole.



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LOCATION PLAN.
1/ 2500.

NOTE :-
ALTERED ACCESS TO STATION ROAD
TO THE SPECIFICATION & REQUIREMENTS OF
L.C.C. HIGHWAYS DEPARTMENT.

ref:	revision	date

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I.ENG AMICE FIWO

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Project
RESIDENTIAL DEVELOPMENT.
ADJ: 22 STATION ROAD.
GEDNEY HILL..
LINC'S, PE12 ONP.

Client
MR M. ROWELL.

Drawing
SITE & LOCATIONS PLANS

Job Ref.	Drawing No.
3539-19.	05.
Date	**Drawn**
NOVEMBER 2019.	SLD.

Scales
1/ 50 1/ 100 (unless otherwise stated)

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