FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
STOCKWELL GATE, WHAPLODE

FINAL REPORT

ECL1132b/G R MERCHANT LTD

DATE MARCH 2024

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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 one residential dwelling at Stockwell Gate, Whaplode.

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 Springway, Stockwell Gate, Whaplode, Lincolnshire, PE12 6UE. The National Grid Reference of the site is 53314/32479.

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 Stockwell Gate. The site consist of four paddocks set to the west of the dwellings on Stockwell Gate. The site is accessible through an existing dwelling. The area of development is approximately 0.5 hectares.

Environment Agency LiDAR data shows that ground levels within the site are typically between +3.3m OD and +3.7m OD. In the area of the proposed dwelling the ground levels are approximately +3.5m OD. The carriageway level of Stockwell Gate is approximately +3.1m OD at the entrance to the site.

The site is in the South Holland Internal Drainage Board (IDB) District. Surface water at the site naturally drains through soakaway and hence to the IDB drain system. There is an IDB High Priority Watercourse approximately 100m south of the site.

The online British Geological Survey maps indicate that the site is likely to be underlain by West Walton Formation Mudstone and Siltstone. The bedrock is shown to be overlain with superficial deposits of clay and silt.

2.3 Proposed Development

The proposed development consists of a residential dwelling. The dwelling will be two storey. 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 Flood Zones

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

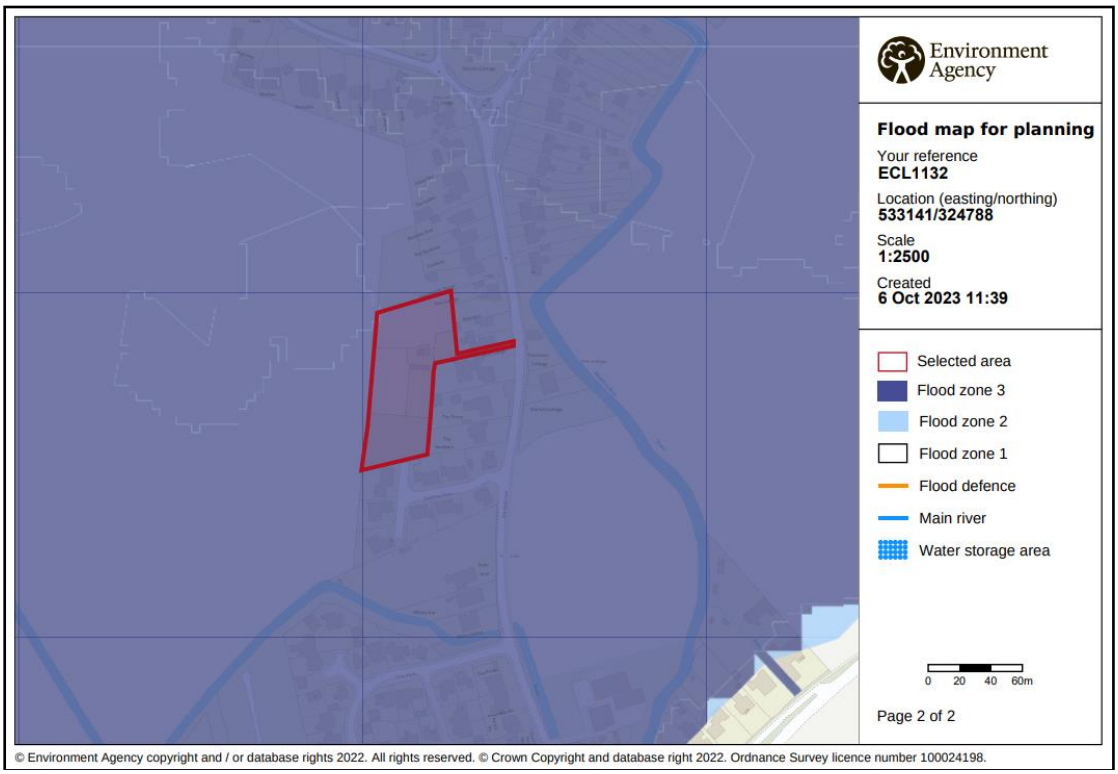


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the site is within an area with a low risk of flooding from rivers or the sea (annual probability between 0.1% and 1%);
- the site has a very low (annual probability less than 0.1%) risk 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 outside the 'Low Hazard' area	The site is in the Low Hazard' area
Residual Peak Depth Map for the 1% fluvial and 0.5% tidal event	The site is outside the area at risk of flooding.	The flood depth at the site is between 0.0m - 0.25m.

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 Test and Exception 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.

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.

The SFRA states that as 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 the site is not at risk during the present day 1% fluvial and 0.5% tidal event. 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 and the provision of rural housing is a benefit.

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 South Holland IDB district is protected by the Wash tidal defences along the Holbeach Marsh frontage with embankment levels at a minimum of +7.0m OD. The Wash tidal defences are 12km from the site.

The River Welland tidal defences are approximately 6.4km to the north west of the site. The tidal defences between Spalding and Fossdyke also have minimum embankment levels of +7.0m OD.

Both 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 South Holland IDB. There is an IDB High Priority Watercourse 100m south of the site. The site and surrounding land are within the Holbeach River catchment and drains in a northerly direction to discharge to the tidal River Welland at the Holbeach River 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

A summary of the sources of flooding is provided in Table 2.

Source of Flooding	Level of Risk
Drainage Network Flooding	The risk is assessed in Section 4.3.
Surface Water Flooding	Based upon the EA maps the risk is very low.
Fluvial Flooding	The risk is not at risk of fluvial flooding.
Tidal Flooding	The risk is assessed in Section 4.3, 4.5 and 4.6.
Reservoir Flooding	Based upon the EA maps the site is not at risk of flooding from reservoirs.
Groundwater Flooding	There is no evidence to suggest the site is at risk of groundwater flooding.

Table 2 – Sources of Flooding

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.

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 site is within an area benefitting from defences. The flood embankments to the Wash and the River Welland tidal defences provide protection during a 0.5% annual probability (1 in 200 chance each year) event. The flood risk from the Wash is lowered further by second line defences and various informal banks constructed during the reclamation of Holbeach Marsh.

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 tide levels.

The flood level in the River Welland at Fossdyke during the 0.5% annual probability (1 in 200 chance each year) event inclusive of climate change to 2069 is estimated to be 6.41m AOD. The minimum defence level of the River Welland embankments is 7.0m AOD.

In summary the site is not at risk for the design life of the development (i.e., 100 years).

4.6 Residual Risk

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 of the tidal defences. 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 peak flood depth at the site is between 0.0m and 0.25m. An extract from this map is provided in Figure 3.

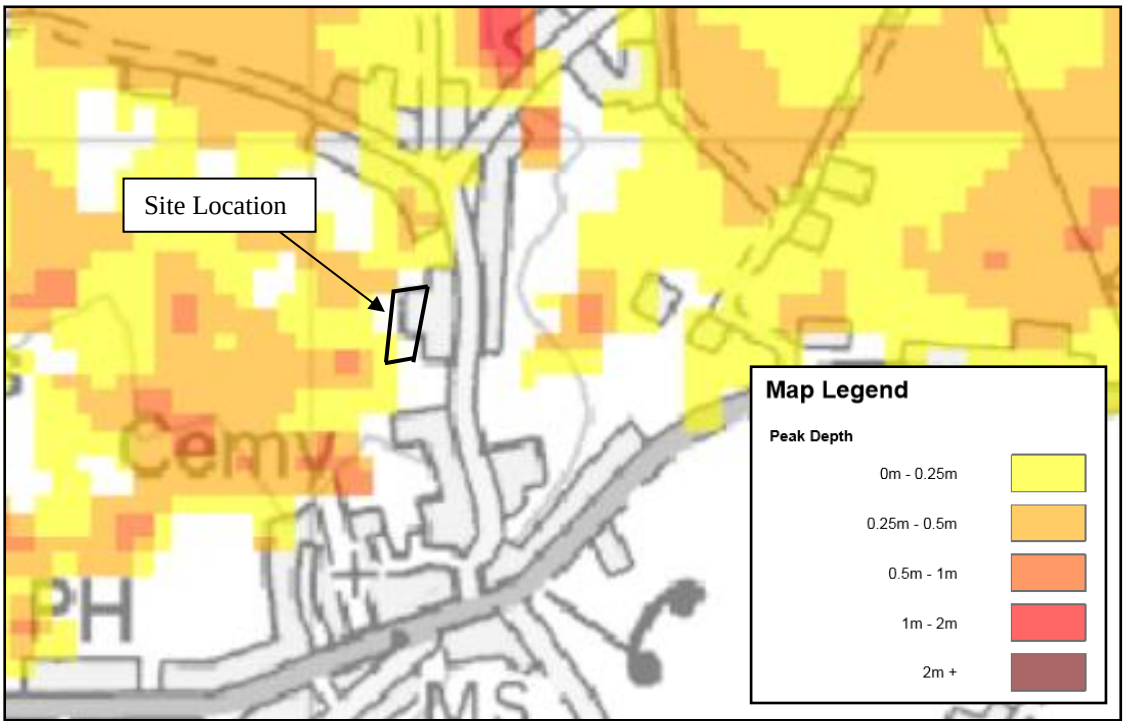


Figure 3 – SFRA 2115 Residual Peak Depth Map during the 1% fluvial and 0.5% tidal Annual Probability Event

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Holbeach River Outfall 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 0.5% annual probability (1 in 200 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 from overtopping of the defences.

The SFRA considers the residual risk associated with a breach in the defences. From the maps the flood depth during the 0.5% annual probability (1 in 200 chance each year) tidal event is between 0.0m and 0.25m.

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.

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 0.3m above typical ground level and 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.

During an exceedance 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 Holbeach River Outfall 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 using temporary pumping equipment.

Surface water within the site will be 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 at Springway, Stockwell Gate, Whaplode.

- 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 proposed development is in Flood Zone 3. The site is protected during the 1% annual probability (1 in 100 chance each year) fluvial event and 0.5% annual probability (1 in 200 chance each year) tidal event including climate change by the Wash tidal defences and River Welland tidal defences.

- There is a residual risk associated with a breach of the defences with depths up to 0.25m.

- It is recommended that the finished floor level of the dwelling is 0.3m above surrounding ground level and that there is 0.3m of flood resilient construction above finished floor level.

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

ATTACHMENT 1

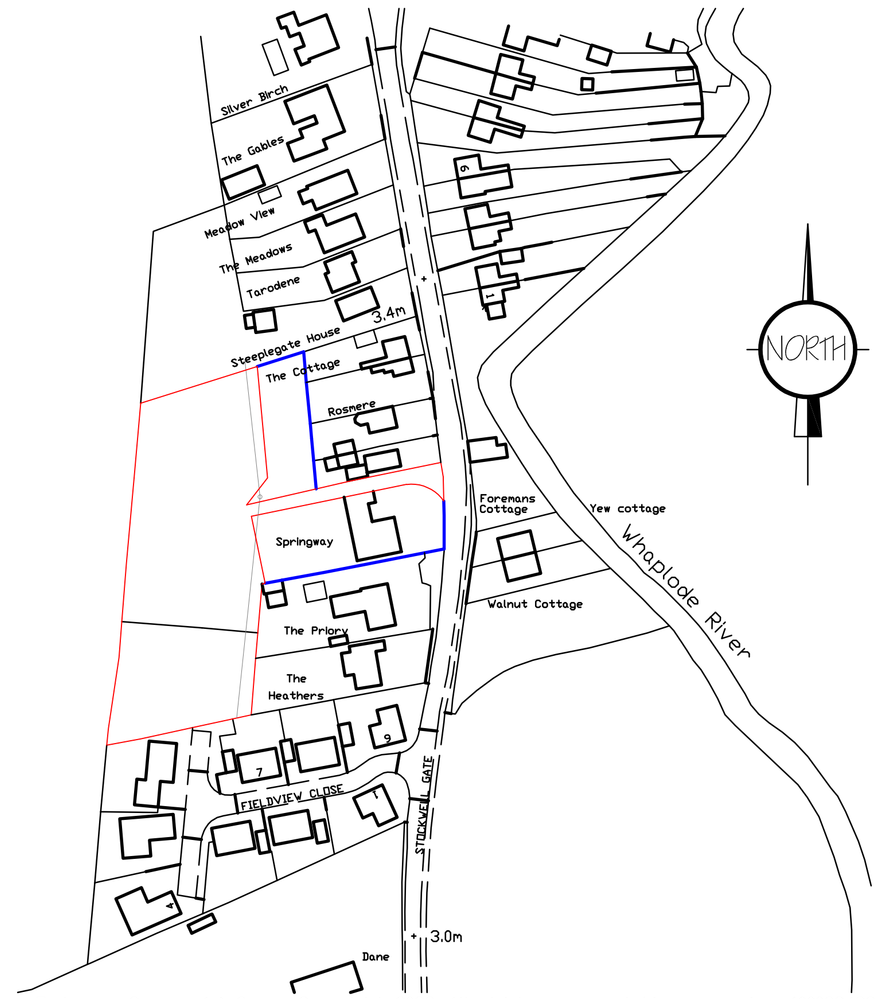
SITE AND LOCATION PLANS
(DWG 4130-23 18)



SITE PLAN
1/250



EXAMPLE OF PLEACHED TREES



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LOCATION PLAN
1/1250

LANDSCAPING, FENCING & TREE PLANTING SCHEME.

A - MIXED HEDGE
(a) Common Hawthorn (Crataegus Monogyna)
(b) Hazel (Corylus avellana)
(c) Blackthorn (Prunus Spinosa)
(d) Field Maple (Acer Campestre)
(e) Midland Hawthorn (Crataegus laeviqata)
(f) Wild Cherry (Prunus avium)
(g) Bird Cherry (Prunus padus)

B - SILVER BIRCH - Feathered
C - HAWTHORN - Feathered
D - WHITEBEAM - Feathered
E - FIELD MAPLE - Feathered
F - HOLLY
G - WILD CHERRY - Feathered
H - Existing trees to remain
J - Existing fence to remain
K - 1.2m Wooden Post & Rail Fence
L - Compacted Stone Driveway
M - Permeable Block Paving
N - 10no. PHOTINIA RED ROBIN PLEASED TREES
- 1.8m to 2.0m HIGH CLEAR STEM
- 1.2-1.5m PLEASED - EVERGREEN
- 3.0 - 3.5m WHEN PLANTED - SEE EXAMPLES ABOVE

Planting of Hedge to be double row staqqered. Distance between plants to be 300mm.
Distance between rows to be 450mm. All as specified by The Woodland Trust.
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.

FLOWER BORDER
Evening Primrose (Oenothera biennis)
Sweet Rocket (Hesperis matronalis)
Honeysuckle (Lonicera sp.)
Lavender (Lavendula sp)
White Jasmine (Jasminum officinale)
Night-scented Catchfly (Silene noctiflora)
Night-scented Stock (Matthiola lonqipetala)
Soapwart (Saponaria officinalis)

FLOWERING LAWNS
Seeded EL-1 Mix From Emorsqate Seeds

WILD FLOWER MEADOW
Seeded EL-1 Mix From Emorsqate Seeds

Once all the external building works have been completed and all plant and machinery have been removed from site, all indicated planting will be completed within the next planting season (March - September)

All trees, shrubs and bushes shall be maintained by the owner or owners of the land on which they are situated for a period of five years beginning with the date of completion of the scheme and during that period all losses shall be made qood as and when necessary.



Wildlife Tower:-
This incredibly versatile tower is a mecca for wildlife. A huge number of species are attracted to this type of environment, away from human activity. In particular kestrels, barn owls and little owls will use the upper chamber; bats, swifts and many garden birds are accommodated within integral nesting boxes fitted in the brick supports.

SOLAR PANEL REQUIREMENTS
Number Of Panels = 24
Based On An Individual Panel Size Of:
2 metres x 1 metre
All to be installed during construction and be operational at completion.

ref:	revision	date

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Project
PROPOSED STORAGE BUILDING
SPRINGWAY
STOCKWELL GATE
WHAPLODE, LINCS, PE12 6LE.

Client
MR S. STEWARD

Drawing
SITE & LOCATION PLANS

Job Ref.	Drawing No.
4130-23	18
Date	**Drawn**
FEBRUARY 2024	SLD

Scales
1:100 (unless otherwise stated)

DO NOT SCALE FROM THIS DRAWING

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