FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
MAZE FARM, HOSPITAL DROVE, LONG SUTTON

FINAL REPORT

ECL1123-2/G R MERCHANT LTD

DATE DECEMBER 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 Maze Farm, Hospital Drove, Long Sutton.

A planning application (H18-1072-23) to convert an agricultural building to form one dwelling was approved in January 2024. The proposed development will supersede the approval granted. A planning application for the proposed development is to be submitted by G R Merchant Ltd.

The mitigation measures proposed within this Flood Risk Assessment are consistent with those recommended within the Flood Risk Assessment prepared to support the previous application.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is located at Maze Farm, Hospital Dove, Long Sutton, Lincs, PE12 9EN. The National Grid Reference of the site is 54555/32419.

The location of the site is shown in Figure 1.

Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is within an agricultural holding to the east of Hospital Drove. The site consists of an agricultural building. The site has an access from Hospital Drove. The area of development is approximately 0.03 hectares.

Spot levels taken to a local datum are shown in Attachment 1. The spot levels show that the site is flat with levels around the building ranging between 10.04m Site Datum to 10.37 Site Datum.

The site is in the South Holland Internal Drainage Board (IDB) District. Surface water at the site would naturally drain through soakaway and hence to the IDB drain system. There is a riparian drain 50m east of the site and an IDB Ordinary Watercourse 600m north west of the site.

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 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 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.

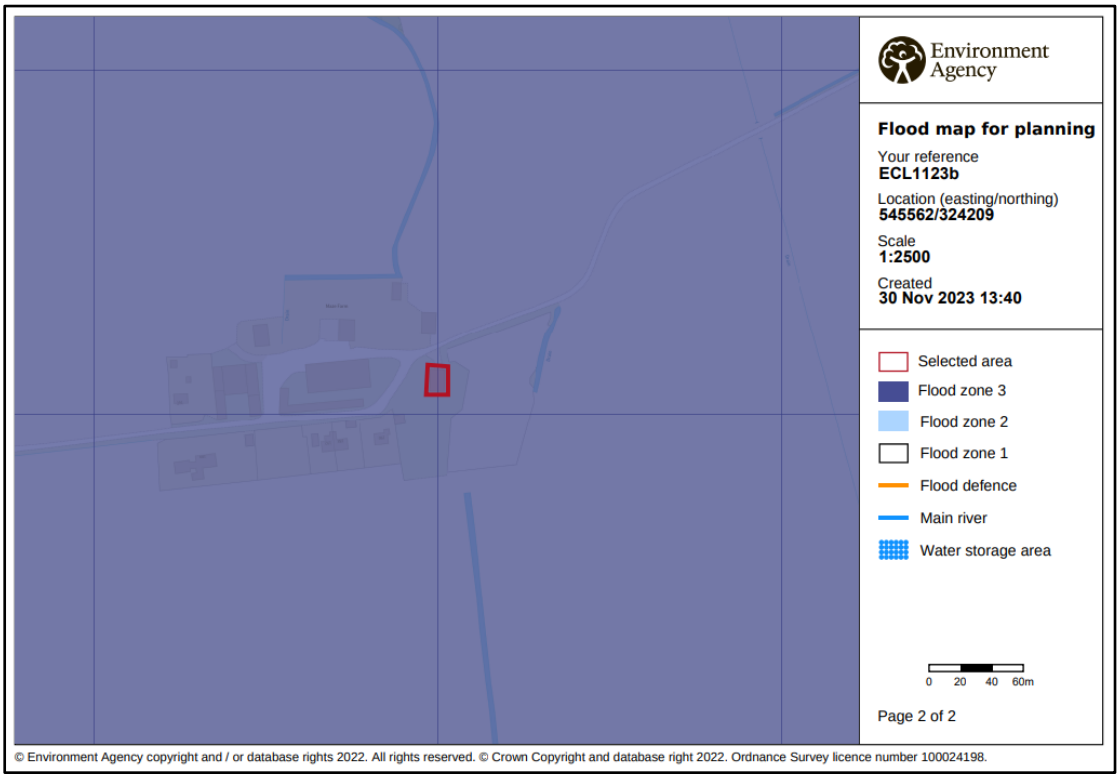


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the site 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 of surface water flooding (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 in the 'Danger for Some' area	The site is in the 'Danger to Most' 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 0.5m and 1.0m.

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

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 site has permission for the conversion of an agricultural building to form a dwelling. It is considered that the permissions for the change of use of the building has established the principle for a dwelling at the site. It is proposed that the dwelling that form this application will replace the existing permission.

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 Gedney Marsh frontage with embankment levels at a minimum of +7.0m OD. The Wash tidal defences are 4.4km from the site. The River Nene tidal defences are 3.4km east of the site. These 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 Ordinary Watercourse 600m north west of the site. The site and the surrounding land are within the Lutton Leam catchment and which discharges to the tidal River Nene at Lutton Leam 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

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 assessed in Section 4.3 and 4.5.
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. Failure of Lutton Leam Tidal Sluice would lead to an increased level of risk within the IDB catchment.

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 benefits from the River Nene and The Wash tidal defences 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 flood risk from the Wash is lowered further by second line defences and various informal banks constructed during the reclamation of Gedney 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 flood levels in the River Nene.

The tidal flood level during the 0.5% annual probability (1 in 200 chance each year) event inclusive of climate change to 2115 is estimated to be 7.2m AOD. The minimum defence level of the Wash and River Nene embankments is 7.0m AOD. During such an event wave and wind action is likely to cause overtopping. However, the second line defences with embankment levels of 6.0m AOD would further reduce the probability of flood water reaching the development site.

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 residual peak depth in 2116. 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 0.5m and 1.0m. An extract from this map is shown in Figure 3 below.

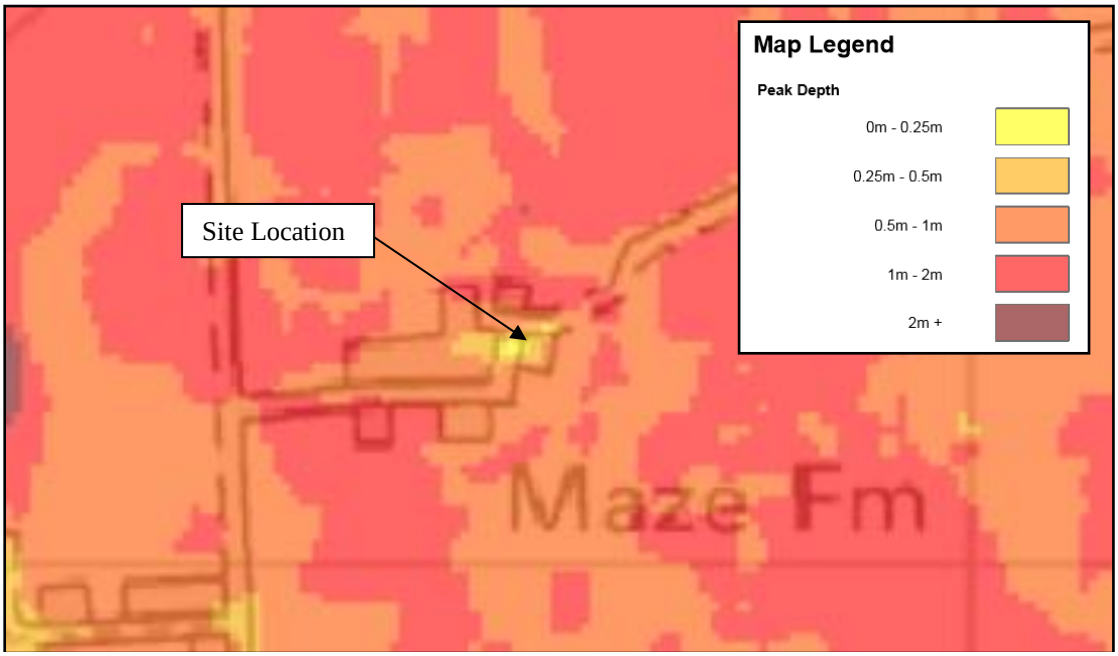


Figure 3 – SFRA 2116 Residual Peak Depth Map

The topographic survey shows that ground levels to the east of the site are 0.2m to 0.3m below the ground levels around the building. The flood depth to the east of the site is between 0.5m and 1.0m therefore the flood depths within the site is estimated to be up to 0.8m.

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Lutton Leam 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 breach depth at the site during the 0.5% annual probability (1 in 200 chance each year) event is between 0.5m and 1.0m. Through a comparison of levels the flood depth is estimated to be below 0.8m.

The development increases the impermeable area and therefore has the potential to increase flood risk elsewhere.

5.2 Mitigation Measures

The site has a low 'actual risk' of flooding. It is proposed that the finished floor level of the dwelling is 11.0m Site Datum, 0.96m above the lowest surrounding ground level. It is recommended that there is 0.3m of flood resilient construction above finished floor level.

The risks during an exceedance event are lowered because the dwelling will have two storeys with the sleeping accommodation on the first floor.

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 Lutton Leam 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.

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 a 2-storey residential dwelling at Maze Farm, Hospital Drove, Long Sutton.

- 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.

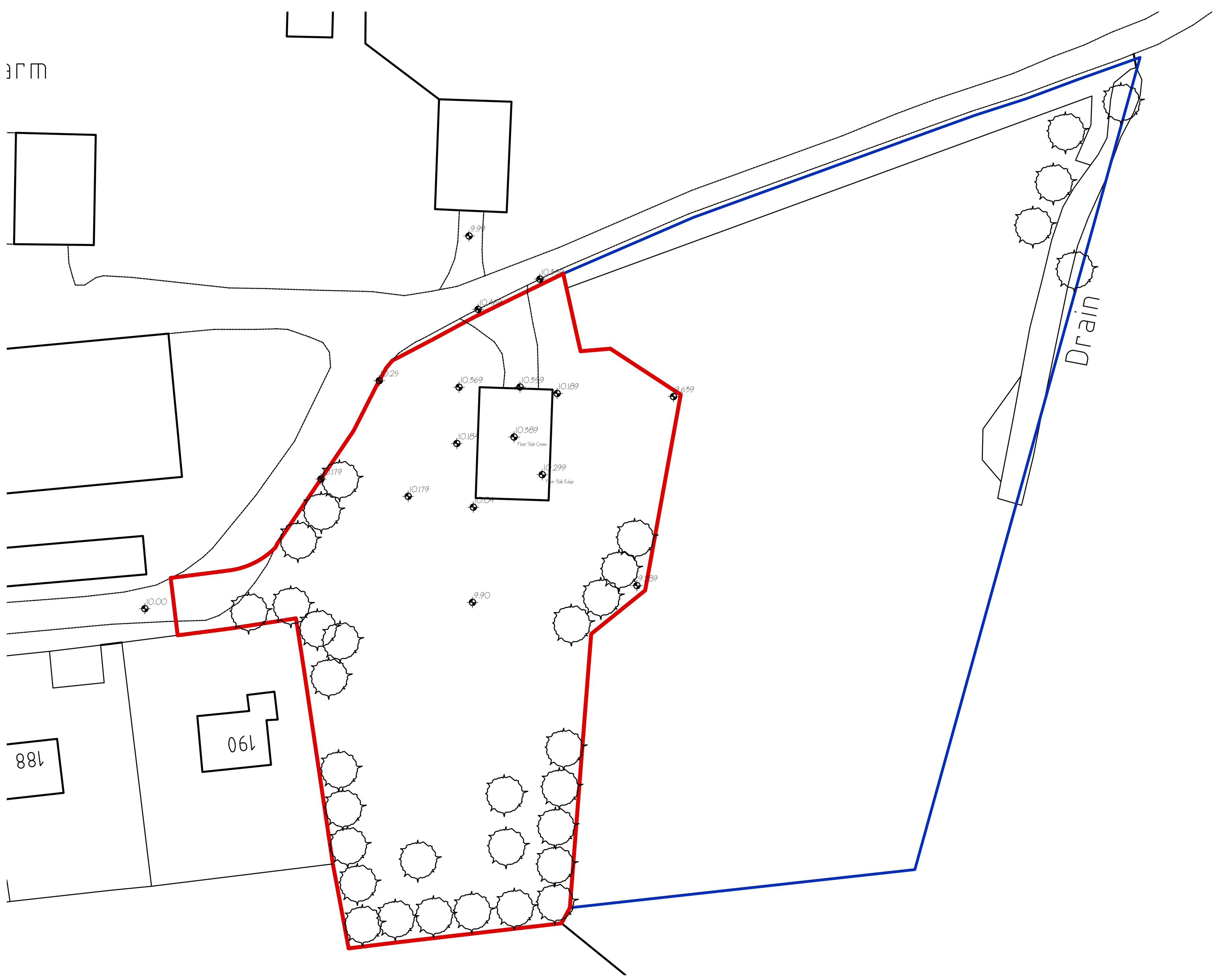
- The proposed development is in Flood Zone 3. The site benefits from the Wash and River Nene tidal defences that provide protection during 0.5% annual probability (1 in 200) tidal event including climate change.

- There is a residual risk to the site associated with a breach of the tidal defences. It is proposed that the finished floor level is 11.0m Site Datum, 0.96m above the lowest surrounding ground level, and 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 PLANS & LOCATION PLAN
(Dwg 4159-23-11A)



SITE PLAN - EXISTING 1:500

LOCATION PLAN 1:1250

LANDSCAPING, TREE PLANTING & FENCING SCHEME.

A - PROPOSED 1.2m LINCOLNSHIRE POST & RAIL FENCE

B - MIXED HEDGE

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

C - EXISTING MATURE TREES TO BE RETAINED

D - SILVER BIRCH (BETULA PENDULA) FEATHERED - 1.5m to 1.8m WITH A TERMINAL SHOOT AND LATERAL SHOOTS

E - WHITEBEAM (SORBUS ARIA) FEATHERED - 1.5m to 1.8m WITH A TERMINAL SHOOT AND LATERAL SHOOTS

F - GRAVEL DRIVE.

G - SLABBED FOOTPATH & PATIOS

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.

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 good as and when necessary.

SITE PLAN - PROPOSED 1:500

ref:	revision	date
A	CLIENTS AMEDNDMENTS	DEC '2024

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Project
REPLACEMENT DWELLING
MAZE FARM, HOSPITAL DROVE
LONG SUTTON
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Client
S. E. KING

Drawing
SITE & LOCATION PLANS

Job Ref.	Drawing No.
4159-23	11A.

Date	Drawn
DECEMBER 2024.	SLD

Scales
AS STATED.

DO NOT SCALE FROM THIS DRAWING