FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
BECK BANK, QUADRING FEN, SPALDING

FINAL REPORT

ECL1085/OGLESBY & LIMB LTD

DATE JULY 2023

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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 Oglesby & Limb in respect of a development that consists of a replacement dwelling at Beck Bank, Quadring Fen, Spalding.

A planning application for the proposed development is to be submitted by Oglesby & Limb Ltd.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is located at The Ferns, Beck Bank, Quadring Fen, Spalding, PE11 4QY. The National Grid Reference of the site is 51867/33227.

The location of the site is shown in Figure 1.

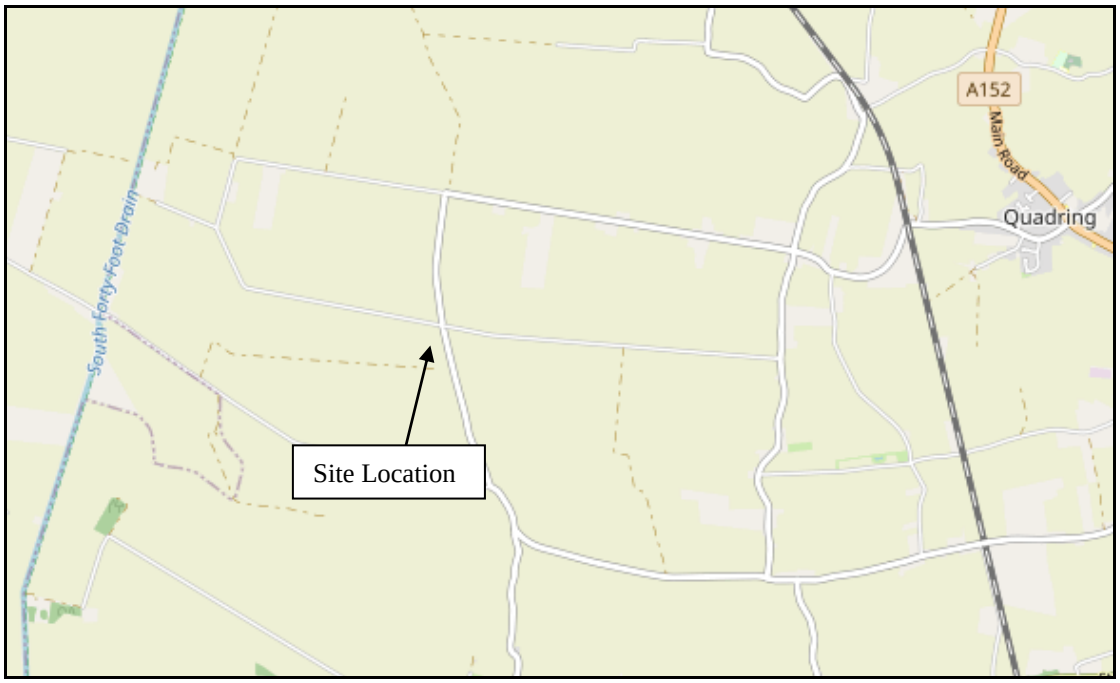


Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is on the western side of Beck Bank 150m south of the cross roads with South Drove. The site is a residential dwelling consisting of a bungalow, garage, and the surrounding garden. There are dwellings to the north and south and agricultural land to the west. The area of development is approximately 0.18 hectares.

Environment Agency LiDAR shows that the site is flat with typical ground levels between +2.4m OD and +2.6m OD. The agricultural land to the west of the site is between +2.0m OD and +2.2m OD and the carriageway level of Beck Bank alongside the site is +2.8m OD.

The site is in the Black Sluice Internal Drainage Board's (IDB) district. Surface water at the site drains through the network of local drains and hence to the IDB drain system. There is an IDB Main Drain, Quadring Gosberton Boundary Drain, 100m south of the site.

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 have two storeys. Details of the proposed development are shown 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 Available Flood Risk Information

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.

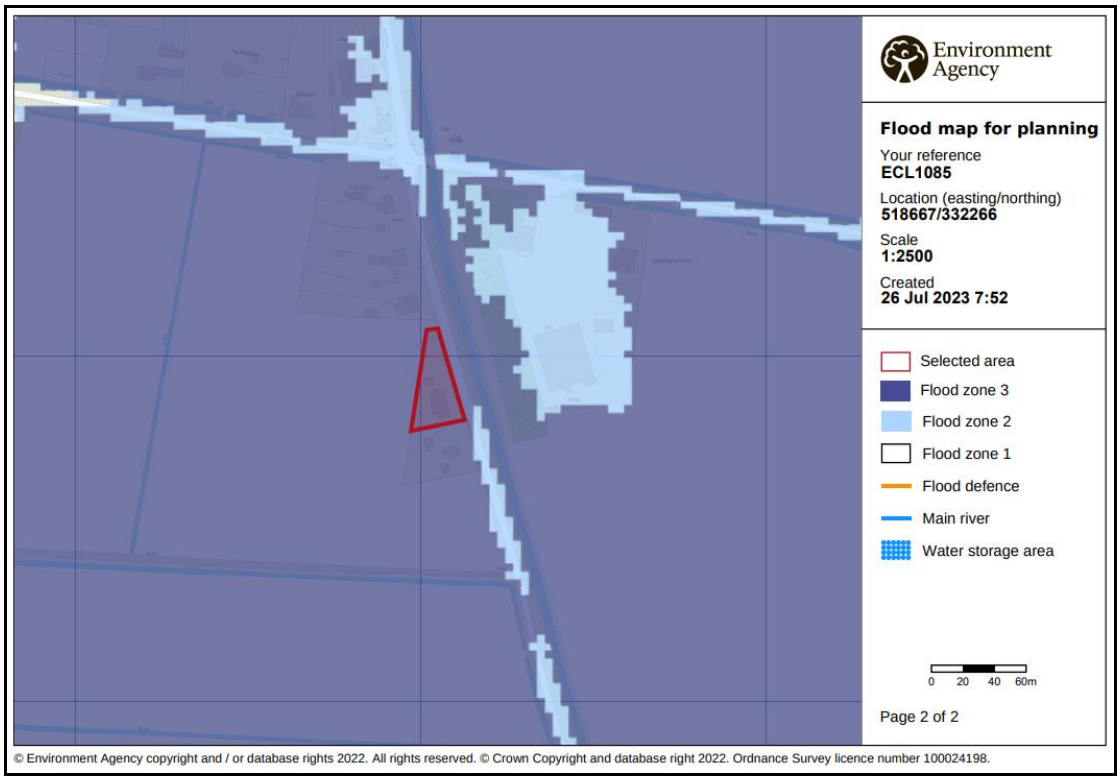


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the site has a medium risk of flooding (annual probability between 1% and 3.3%);
- the site is in an area with a very low risk of surface water flooding (annual probability less than 0.1%); and
- the site is within an area at risk of reservoir flooding when there is also flooding from rivers.

Table 1 shows the level of residual risk at the site as identified 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 during a breach	The site is outside the area at risk during a breach

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 proposed development is a replacement dwelling and as such it is not necessary to apply 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.

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 2.1km east of the South Forty Foot Drain. The South Forty Foot Drain is an embanked high-level carrier conveying run off from south Lincolnshire to the River Witham. The risk of flooding at the site is reduced by an embankment on the right bank of the South Forty Foot Drain.

The South Forty Foot Drain is a main river and 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 Black Sluice IDB. There is an IDB maintained watercourses, Quadring Gosberton Boundary Drain, 100m south of the site. The site is within the Quadring catchment and drains in a westerly direction to the Quadring Pumping Station to discharge to the South Forty Foot 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.

The maintenance standards of the Black Sluice IDB 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.
Tidal Flooding	The site is 10km from the tidal River Welland and therefore not at risk.
Reservoir Flooding	The residual risk of a breach of defences is assessed in section 4.6.
Groundwater Flooding	Based upon the local drainage network the risk is low.

Table 2 – Sources of Flooding

4.3 Probability of Flooding

The probability of flooding associated with blockages in the Black Sluice IDB drainage system is low due to the maintenance standards achieved and managed by the IDB. Failure of Quadring Pumping Station could lead to an increased level of risk in 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 Black Sluice IDB main drains incorporating freeboard. This freeboard provides storage during the exceedance events.

The defences on the South Forty Foot Drain provide protection against the 1% annual probability (1 in 100 chance each year) 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 tide levels.

The defences on the South Forty Foot Drain protect the site during the 1% annual probability (1 in 100 chance each year) event including climate change.

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 to land close to the South Forty Foot Drain should a breach occur in the defences. The South East Lincolnshire SFRA includes maps demonstrating the impact of a breach in 2116. The Residual Peak Depth maps within the SFRA indicate the maximum flood depths associated with a breach and overtopping of defences. An extract from the maps is shown in Figure 3.

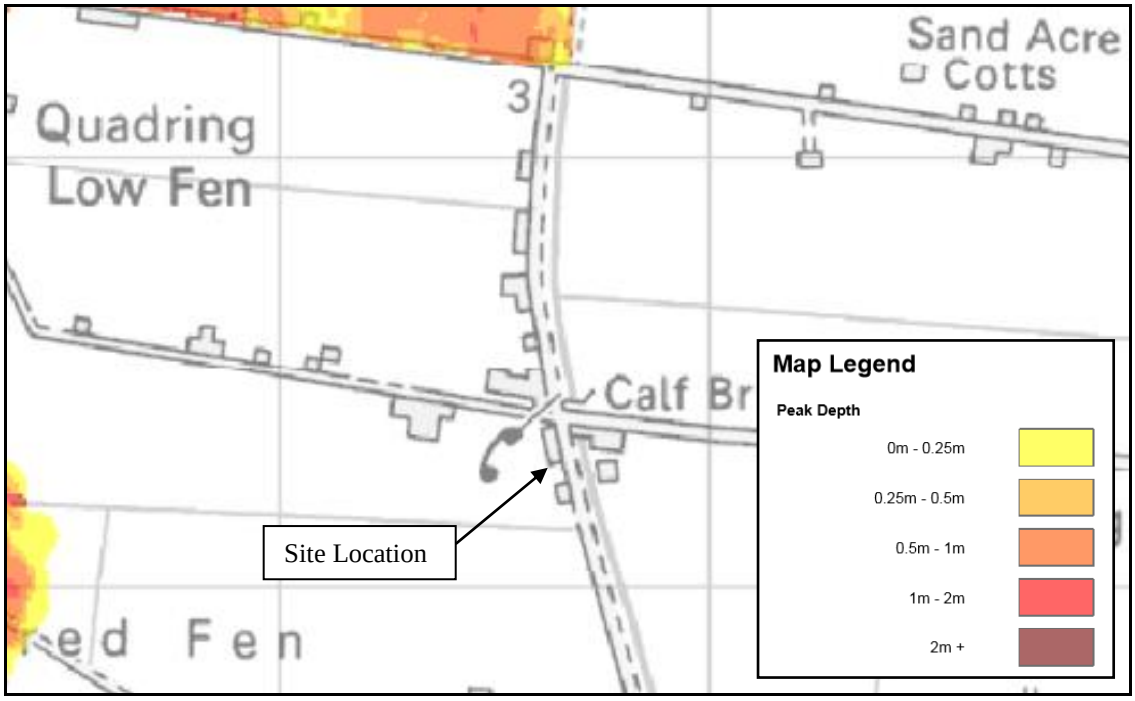


Figure 3 – SFRA 2116 Residual Peak Depth Map during the 1% fluvial and 0.5% tidal Annual Probability Event

As shown in Figure 3 the site is not at risk during a breach of the South Forty Foot Drain.

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Quadring Pumping Station could lead to an increase 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 or a breach in the defences in 2116. The site is not at risk.

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

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

The risk of flooding is lowered as the replacement dwelling has 2 storeys with 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.

It is recommended that surface water run-off is managed so that stormwater from the site will not affect any adjoining properties or increase the flood risk elsewhere. A soakaway for surface water runoff is proposed to the north west of the dwelling.

6.0 CONCLUSIONS

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

- The proposed development consists of a 2 storey replacement dwelling at The Ferns, Beck Bank, Quadring Fen, Spalding.

- 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 defences on the South Forty Foot Drain that provide protection during the 1% annual probability (1 in 100 chance each year) fluvial event including climate change. 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.

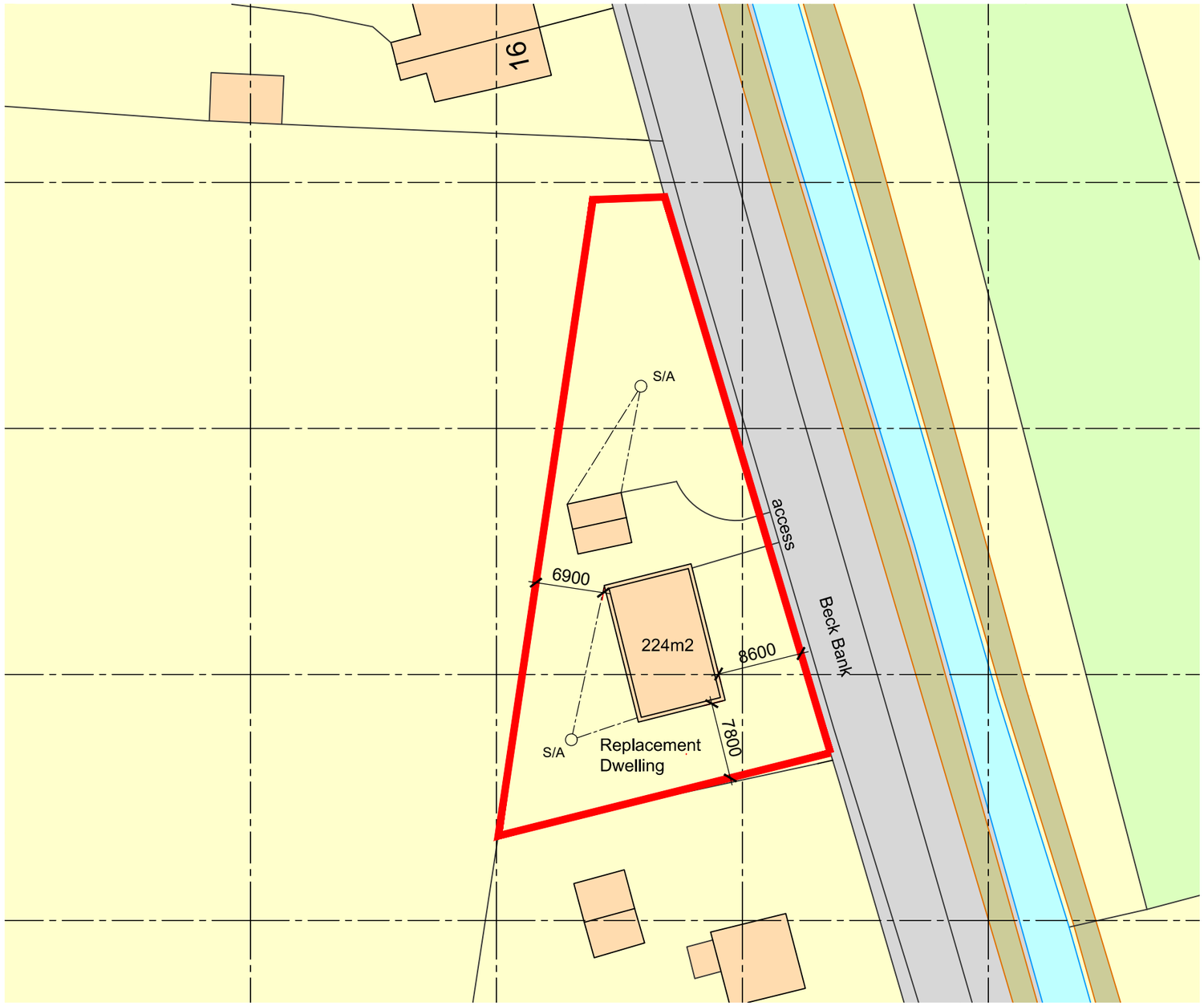
- The site is not at risk during a breach of the defences alongside the South Forty Foot Drain.

- It is recommended that the finished 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 development passes the Sequential Test and Exception Test and is therefore suitable for the proposed location.

ATTACHMENT 1

SITE BLOCK PLAN AND LOCATION PLAN AS PROPOSED (DWG A1642-02)



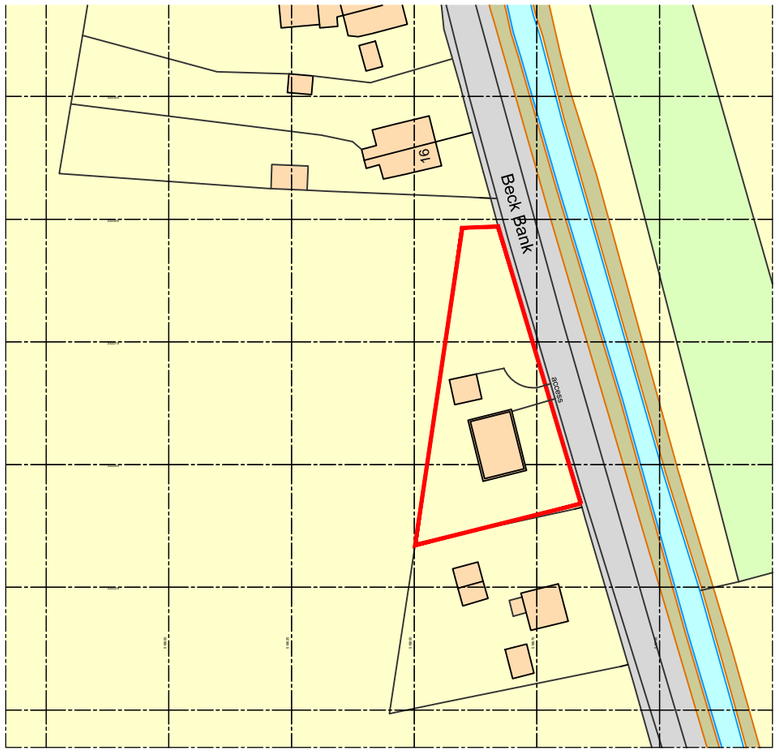
Site Block Plan - As proposed

Scale 1:500 @ A3

Site of proposed works outlined in red

SCALE 1 : 500 0m 5m 10m 20m 30m 40m 50m

SCALE 1 : 1 0m 10mm 20mm 40mm 60mm 80mm 100mm



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Site Location Plan - As proposed

Scale 1:1250 @ A3

Site of works proposal outlined in red.

Other land in same ownership/control outlined in blue.

SCALE 1 : 1250 0m 10m 20m 40m 60m 80m 100m 120m

SCALE 1 : 1 0m 8mm 16mm 40mm 56mm 80mm 100mm

Notes:

Replacement Dwelling footprint shown for illustrative purposes only, at 224m2 as a replacement for the existing 165m2 dwelling.

The site has not been surveyed so the accuracy of information shown cannot be guaranteed. Distances to boundaries are approximate only.

The existing highway access point is assumed to be retained, however all site details are generally for illustrative purposes only.

It is assumed that surface water drainage will be via soakaway, there is sufficient site area to achieve this subject to detailed testing regarding porosity.

Client: **TBC**

Project: **Proposed demolition and construction of replacement dwelling**
The Ferns, Beck Bank, Quadring Fen, Spalding, PE11 4QY

Date: June 2023 | Scale: As shown @ A3

Drawn by: AJO | Checked by: CLS

Drawing Number: **A1642-02** | Rev: **P1**

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Drawing Title: **Site Location and Block Plans as proposed**

PLANNING APPLICATION ISSUE

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