

**FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
SEAGATE ROAD, LONG SUTTON**

FINAL REPORT

ECL1130/SWANN EDWARDS ARCHITECTURE

DATE OCTOBER 2023

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DISCLAIMER

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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 Mrs A Hoey in respect of a development that consists of the stationing of a mobile home for use as an annexe at Seagate Road, Long Sutton.

A planning application for the proposed development is to be submitted by Swann Edwards Architecture.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is located on land at the rear of 184 Seagate Road, Long Sutton, Lincolnshire, PE12 9AD. The National Grid Reference of the site is 54357/32179.

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 Seagate Road. The site is residential and consists of a two storey dwelling, the access and land surrounding the dwelling, and part of a paddock to the rear of the dwelling. The area of development is approximately 0.11 hectares.

Environment Agency LiDAR shows that ground levels within the site vary between +2.8m OD and +3.2m OD. Ground levels in the area of the annexe are between +2.8m OD and +3.0m OD. The carriageway level of Seagate Road adjacent to the site is approximately +3.4m OD.

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 Ordinary Watercourse 250m south west of the site.

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

2.3 Development

The development consists of a residential annexe. The annexe will be a mobile home and will be single storey. The annexe will be incidental to the host dwelling. 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.

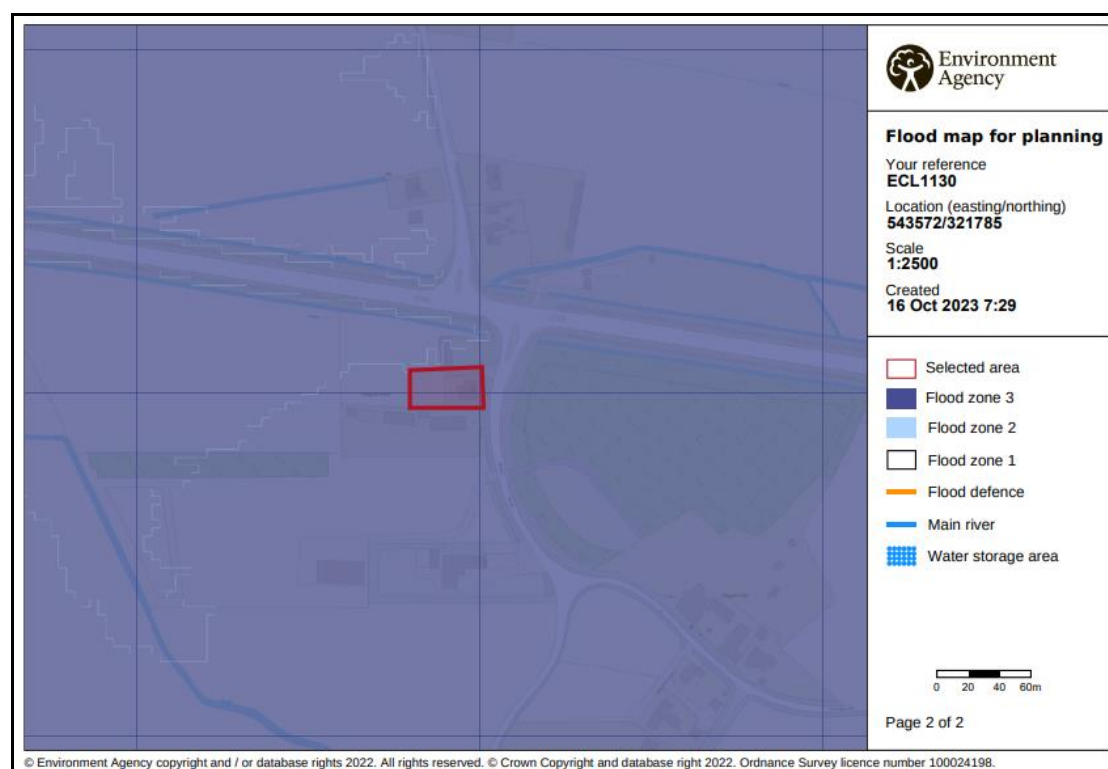


Figure 2 – Environment Agency Flood Map for Planning

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 outside the 'Low Hazard' area	The site is in the 'Danger for Some' area
Residual Peak Depth Map for the 1% fluvial and 0.5% tidal	The site is outside the area at risk	The peak flood depth is between 0.25m and 0.5m.

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 development is covered by the description of mobile homes intended for permanent residential use and is classified as 'Highly 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 3a and the development is 'Highly Vulnerable' therefore the development is inappropriate. Section 3.3 describes the reasons why, in this case, the development could be permitted.

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.

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. It would not be practical to site the annexe at a location away from the host dwelling.

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 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 annexe will contribute to meeting the demand for new housing.

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 4.5km west of the tidal River Nene. The site is protected by the River Nene tidal defences between Wisbech and Sutton Bridge. The River Nene 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 South Holland IDB. There is an IDB Ordinary Watercourse 250m south west of the site. The site and the surrounding land are within the Free Discharge catchment and drain to the South Holland Main Drain and discharge to the tidal River Nene at the Sutton Bridge Outfall Sluice. The site is 2.0km 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

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 Section 4.5.
Tidal Flooding	The risk is assessed in Section 4.3, Section 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 Sutton Bridge Outfall Sluice would 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 of 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 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.

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).

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 tidal breach 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 200 chance each year) tidal event the peak depth at the site is between 0.25m and 0.5m. An extract from the SFRA map is shown in Figure 3 below.

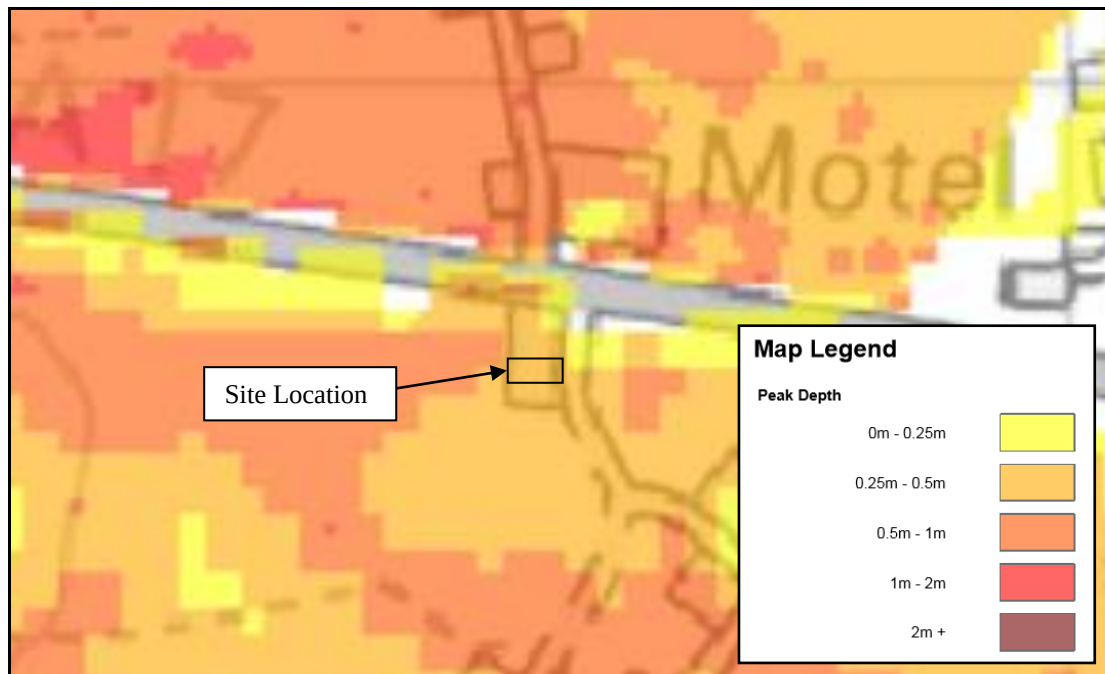


Figure 3 – SFRA 2116 Residual Peak Depth Map

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Sutton Bridge Outfall Sluice could lead to an increased level of risk in the catchment.

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. During the 0.5% annual probability (1 in 200 chance each year) plus climate change event the maximum flood depth is between 0.25 and 0.5m.

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 finished floor level of the mobile home is 0.5m above ground level and the mobile home is secured through the use of ground anchors.

The developer should ensure that the occupier of the annexe is 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 annexe 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 Sutton Bridge 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 using temporary pumping equipment.

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.

6.0 CONCLUSIONS

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

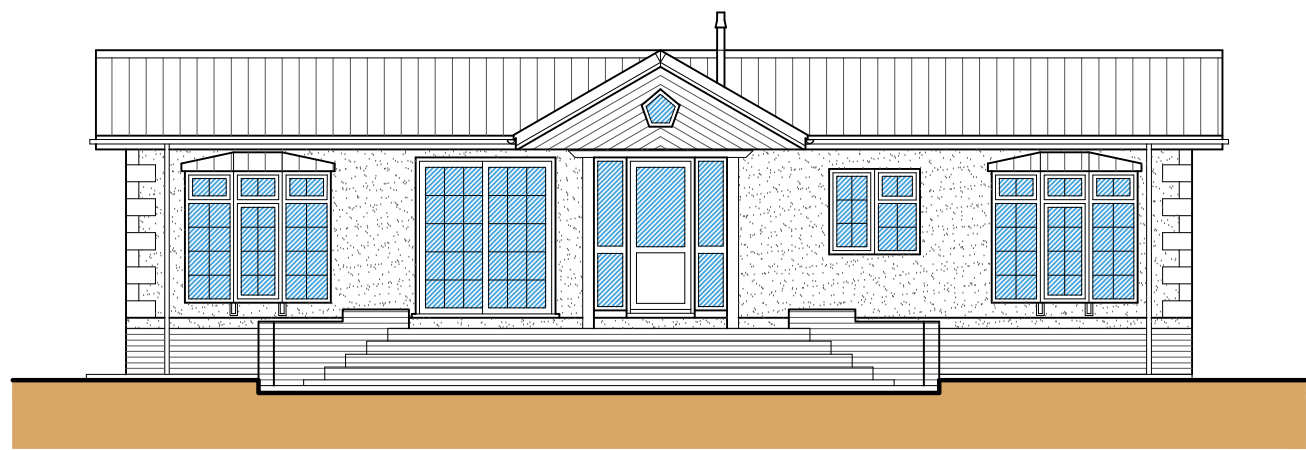
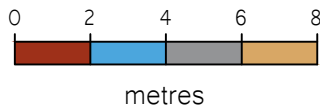
- The development consists of a mobile home to be used as an annexe on land to the rear of Seagate Road, Long Sutton.
- The site is located within an Internal Drainage Board catchment and through the operation and maintenance of the pumping stations and the channel system the Board seek to maintain a 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 defences on the tidal River Nene that provide protection during the 0.5% annual probability (1 in 200 chance each year) tidal event including an allowance for climate change.
- The site is at risk during a breach of the tidal defences with a maximum depth of up to 0.5m during the 0.5% annual probability (1 in 200 chance each year) event in 2115.
- It is recommended that the floor level of the mobile home is 0.5m above ground level and the mobile home is secured by ground anchors.
- The development passes the Sequential Test and Exception Test and is therefore suitable for the proposed location.

ATTACHMENT 1

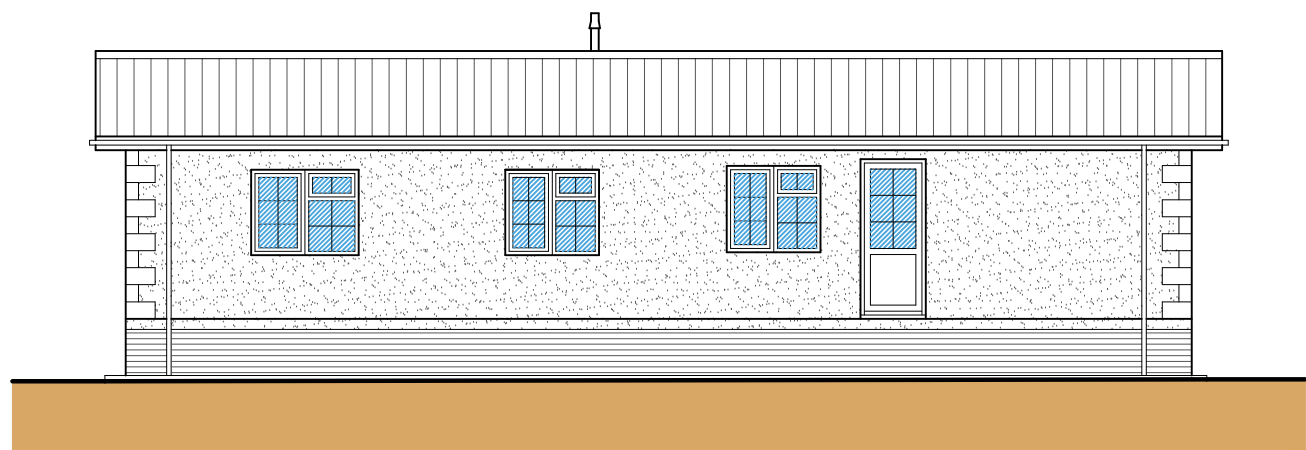
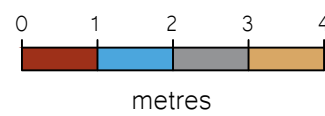
SITE AND LOCATION PLAN, ELEVATIONS (DWG SE-2012 PP1000)



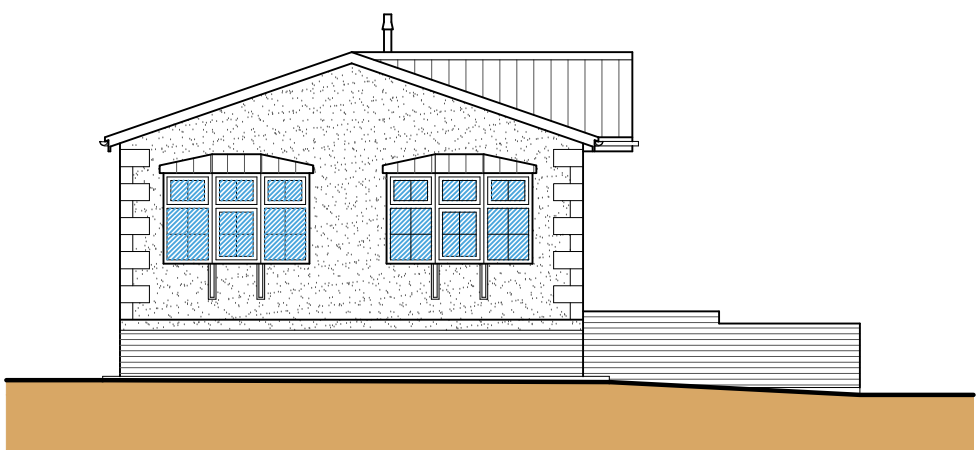
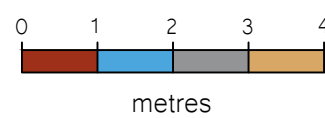
Site Plan
Scale: 1:200



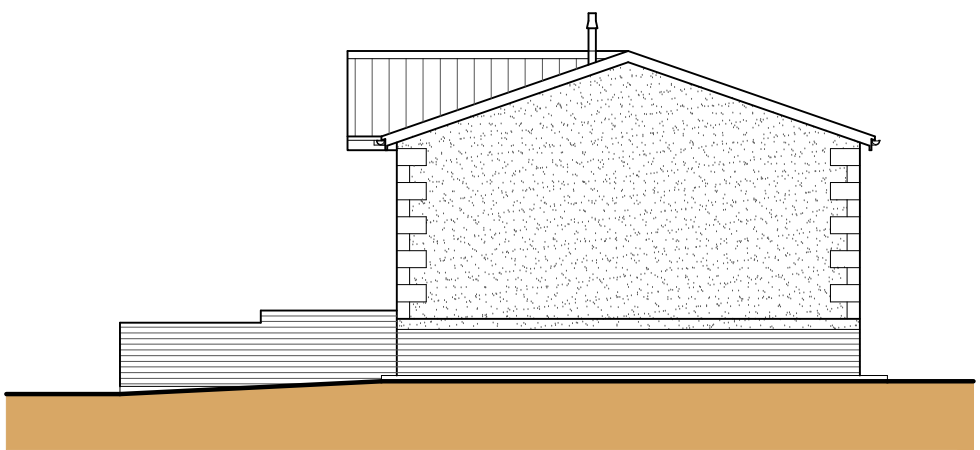
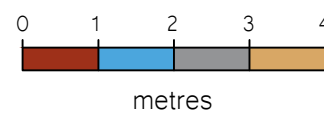
Front Elevation (N)
Scale: 1:100



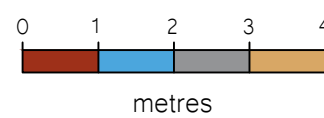
Rear Elevation (S)
Scale: 1:100



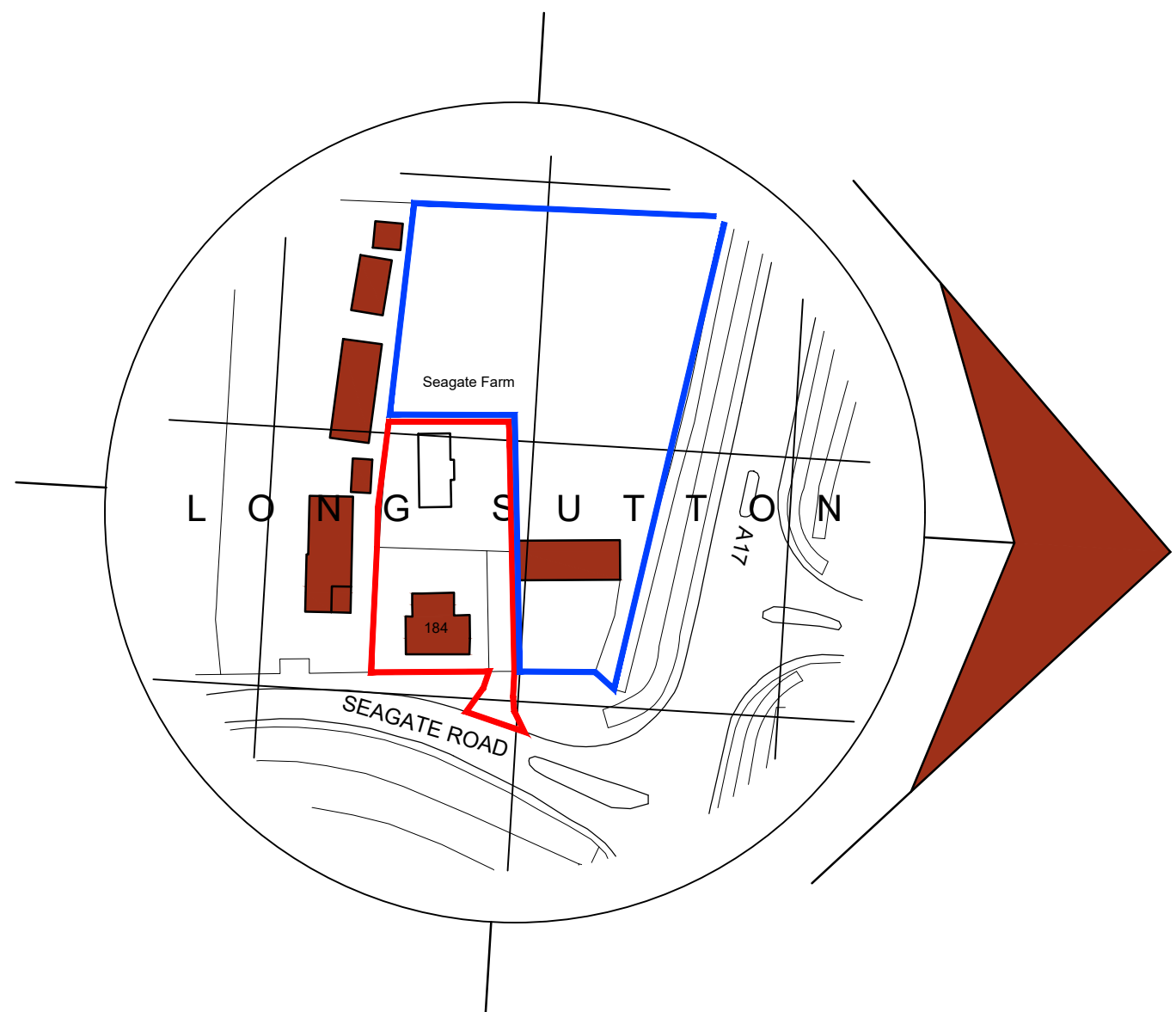
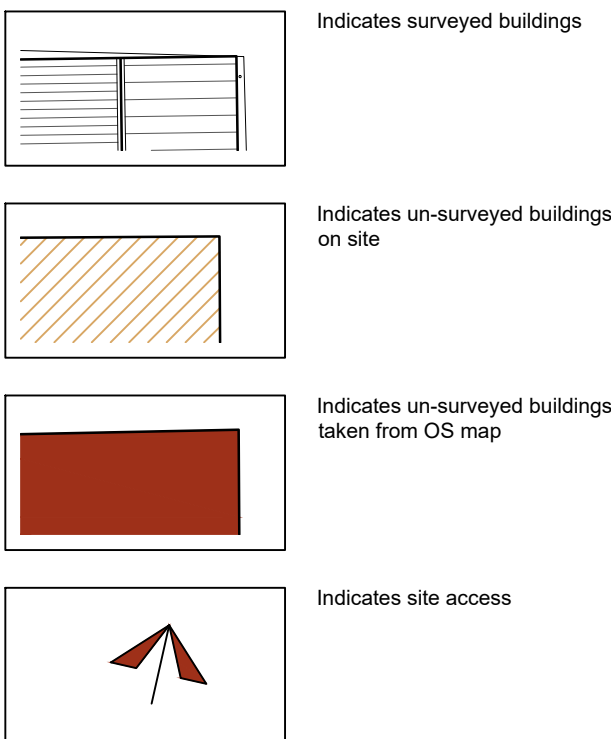
Side Elevation (E)
Scale: 1:100



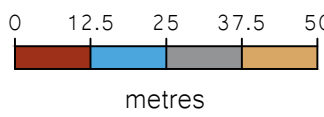
Side Elevation (W)
Scale: 1:100



SITE PLAN KEY

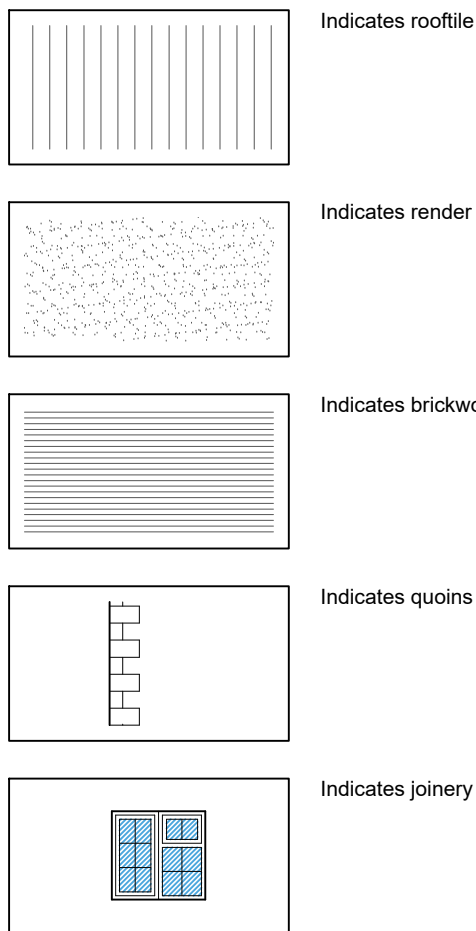


Location Plan
Scale: 1:1250



- General Notes
1. All dimensions are shown in 'mm' unless otherwise stated.
 2. The contractor, sub-contractors and suppliers must verify all dimensions on site prior to the commencement of any work.
 3. This drawing is to be read in conjunction with all relevant engineers and specialist sub-contractors drawings and specifications.
 4. Any discrepancies are to be brought to the designers attention.

ELEVATION KEY



SITE RISK NOTIFICATION KEY
To be used with reference to the accompanying Project Risk Register

S01	Tank	S02	Manhole

Status

FOR APPROVAL

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ARCHITECTURE

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Proposed Unit, Land to the Rear of 184 Seagate Road, Long Sutton, PE12 9AD
For: Mrs A Hoey

Job Title
Date
Sept 2023
Checked by
JB

Job No.
SE-2012
Sheet Size
A1
Dwg No.
PP1000
Revision

Drawing Title
Planning Drawing