FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
OXCROFT BANK, SHEPEAU STOW

FINAL REPORT

ECL0960/SWANN EDWARDS ARCHITECTURE

DATE FEBRUARY 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 Mr D Ford in respect of a development that consists of a change of use of an agricultural building to five residential dwellings at Carlton Lodge, Oxcroft Bank, Shepeau Stow.

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 at buildings adjacent to Carlton Lodge, Oxcroft Bank, Shepeau Stow, Spalding, Lincs, PE12 0TY. The National Grid Reference of the site is 53005/31157.

The location of the site is shown in Figure 1.



Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is part of an agricultural holding on the eastern side of Oxcroft Bank. The site consists of three adjoining agricultural buildings and the access from Oxcroft Bank. The area of development is approximately 0.08 hectares.

A topographic survey has been undertaken and spot levels are shown in Attachment 1. The site is flat with ground levels 0.5m below the carriageway level of Oxcroft Bank. Environment Agency LiDAR Data shows that site ground levels are between +1.8m OD and +1.9m OD. The surrounding agricultural land is typically between +1.1m OD and +1.6m OD.

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 drainage system. There is a riparian drain on the eastern side of Oxcroft Bank and IDB High Priority Watercourse on the western side.

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 the conversion of three agricultural buildings to form five residential dwellings. The dwellings will be single 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 2, an area with a medium probability of flooding.

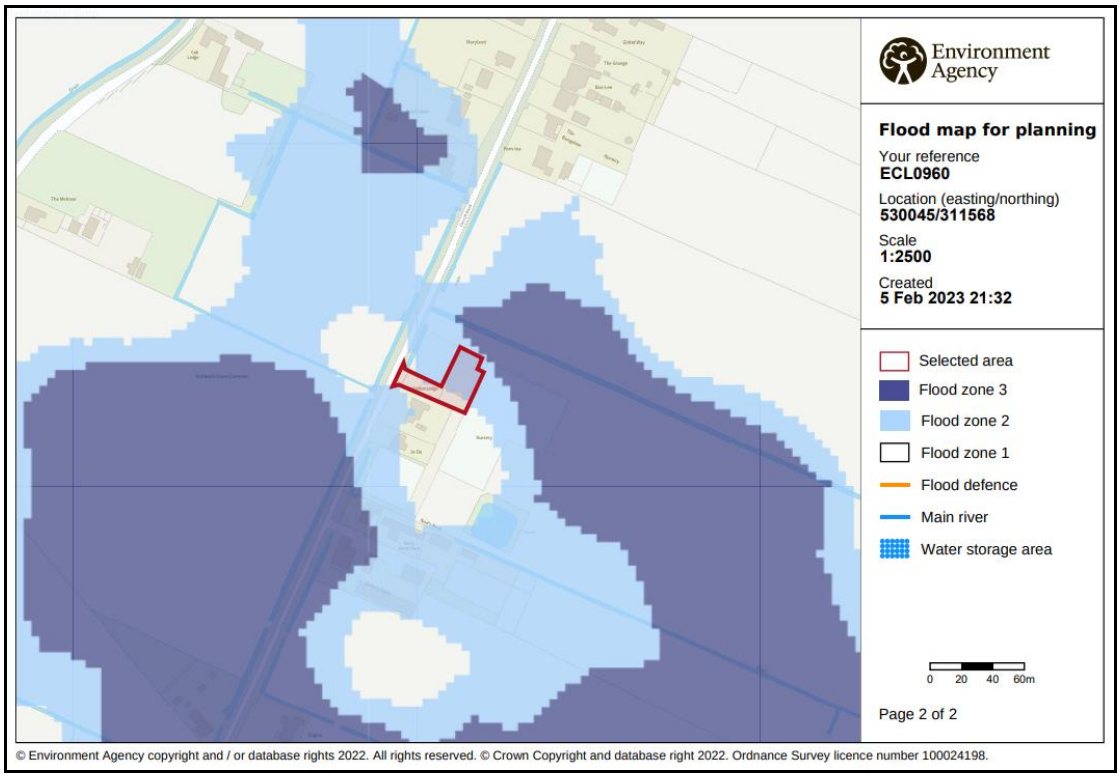


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the site has a medium risk of flooding from rivers or the sea (annual probability between 1% and 3.3%);
- the site has a very low risk of surface water flooding (annual probability of 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	The site is outside the area at risk

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'. Part of the site is within Flood Zone 2 and the development is 'More Vulnerable' therefore it is not 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

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.

Paragraph 033 of planning practice guidance (PPG) on Flood Risk and Coastal Change states that 'The Sequential Test does not need to be applied for applications for Change of Use (except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site)'.

Paragraph 048 of the PPG states that 'A Change of Use may involve an increase in flood risk if the vulnerability classification of the development is changed. In such cases, the applicant will need to show in their flood risk assessment that future users of the development will not be placed in danger from flood hazards throughout its lifetime.' The mitigation measures proposed in Section 5.2 of this flood risk assessment are such that risks to future users are mitigated.

4.0 SITE SPECIFIC FLOOD RISK

4.1 Local Flood Assets

The site is 10.8km north of the River Nene. The site is protected by the River Nene defences between Dog in a Doublet and Guyhirn.

The site is 5.8km east of the River Welland. Crowland Washes provides floodplain storage for the River Welland. The land to the east of the River Welland is protected from the River Welland and Crowland Washes by the Corporation Bank.

The River Nene and River Welland 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 on the western side of Oxcroft Bank. The site and the surrounding land are within the Fleet Fen catchment and drain to Fleet Fen Pumping Station which discharges to the South Holland Main Drain. The South Holland Main Drain discharges 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 drainage 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 Welland or River Nene.

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 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.

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 River Nene and River Welland defences have been designed to include an allowance for 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 in the South Holland IBD area should a breach of the tidal defences 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 200 chance each year) tidal event the site is not at risk during a breach.

The proposed development is for single storey dwellings and therefore the finished floor level within these dwellings needs to consider the 0.1% annual probability (1 in 1000 chance each year) event in 2115. The South East Lincolnshire SFRA includes 0.1% annual probability (1 in 1000 chance each year) maps for specific locations, but these do not cover the site. Through a comparison of the flood extents in the areas covered by the maps during the 0.5% and 0.1% annual probability events in 2115 and the ground levels at the site it is not anticipated that the site is at risk during the more extreme 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 Fleet Fen Pumping Station 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 site is not at risk from the residual risk associated with overtopping and a breach of the defences in 2115.

Any increase in impermeable area associated with the development will be minimal so there is no potential that flood risk will be increased elsewhere due to surface water.

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 dwellings is 0.3m above surrounding ground level. Furthermore, there should be 0.3m of flood resilient construction above finished floor level.

The developer should ensure that the eventual occupiers of the dwellings are 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 occupiers of the dwellings should register to receive 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 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 proposed development consists of the conversion of three agricultural buildings to form five single storey residential dwellings at Carlton Lodge, Oxcroft Bank, Shepeau Stow.

- 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 River Nene and River Welland 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 not at risk during a breach of the tidal defences.

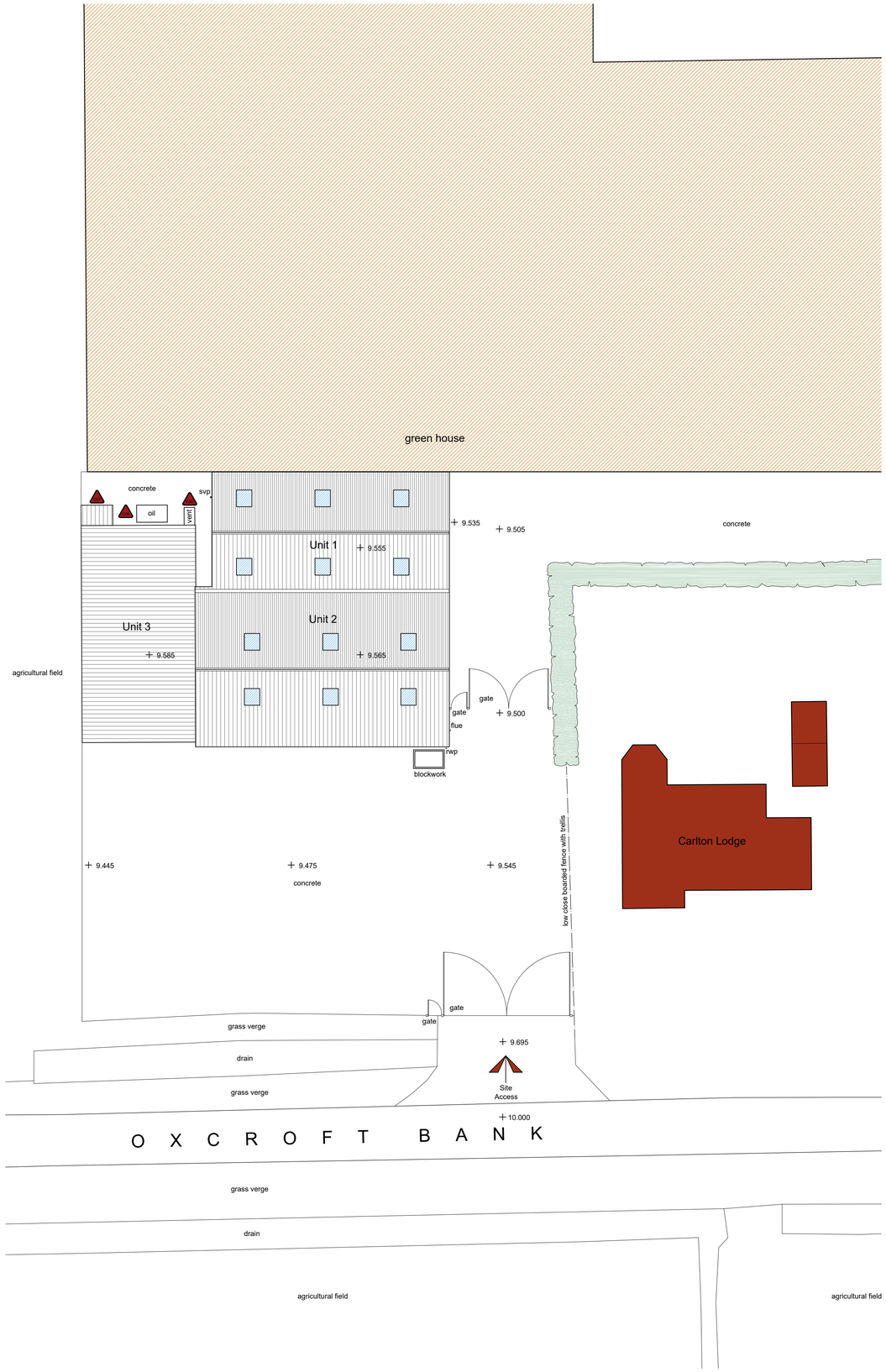
- It is recommended that the floor level of the dwellings is 0.3m above surrounding ground level and there should be 0.3m of flood resilient construction above finished floor.

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

ATTACHMENT 1

SURVEY DRAWING SITE & LOCATION PLAN
(Dwg SE-1910 100)

SKETCH SCHEME SITE & LOCATION PLAN
(Dwg SE-1910 PP1000)



Site Plan
Scale: 1:200

0 2 4 6 8
metres



Location Plan
Scale: 1:1250

0 12.5 25 37.5 50
metres

SITE PLAN KEY

- Indicates surveyed buildings
- Indicates site levels taken from temporary Datum (10.000)
- Indicates un-surveyed buildings taken from OS map
- Indicates site access
- Indicates approximate position of un-surveyed structures on site
- Indicates approximate position of un-surveyed trees and hedges

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.

CONSTRUCTION DESIGN & MANAGEMENT REGULATIONS 2015

The following information must be read in conjunction with the project Risk register. This drawing highlights significant design related Health & Safety Risks present during Construction phase, and Residual Risks which remain post completion. Other Health & Safety Risks associated with Construction Activities may be present, and must be identified by the Principal Contractor prior to works commencing. Design Risks relating to specialist design items must be identified by the relevant specialist designers/ consultants and issued to the Principal Designer.

C05 Ventilation



C06 Oil tank



C07 Electrical equipment



Status

AS EXISTING

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ARCHITECTURE
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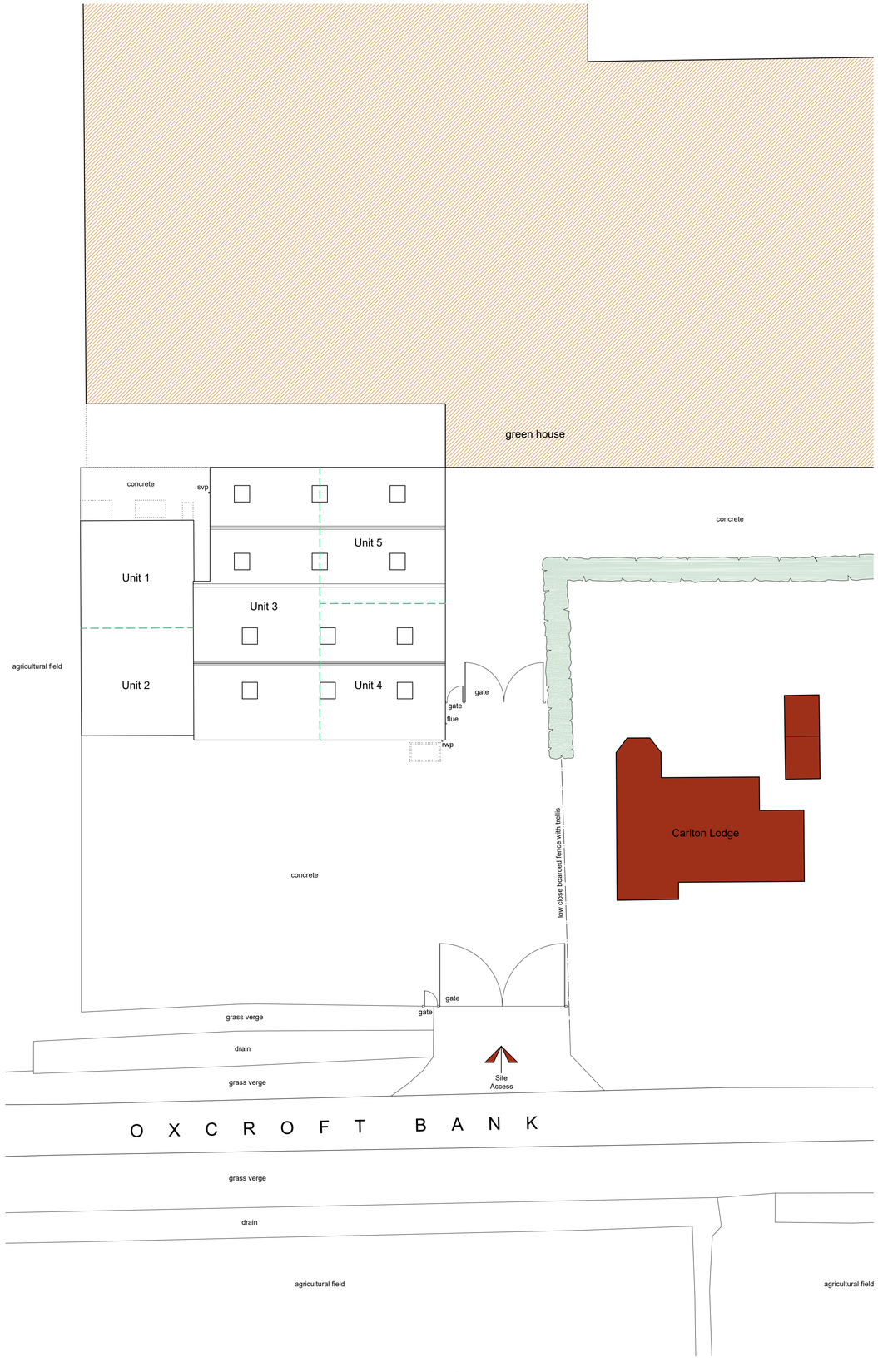
Job Title
Proposed Barn Conversion
Buildings adj. Carlton Lodge,
Oxcroft Bank, Shepeau Stow
For: Mr Ford

Date: December 2022
Drawn by: SHe
Checked by:

Drawing Title
Survey Drawing
Site & Location Plan

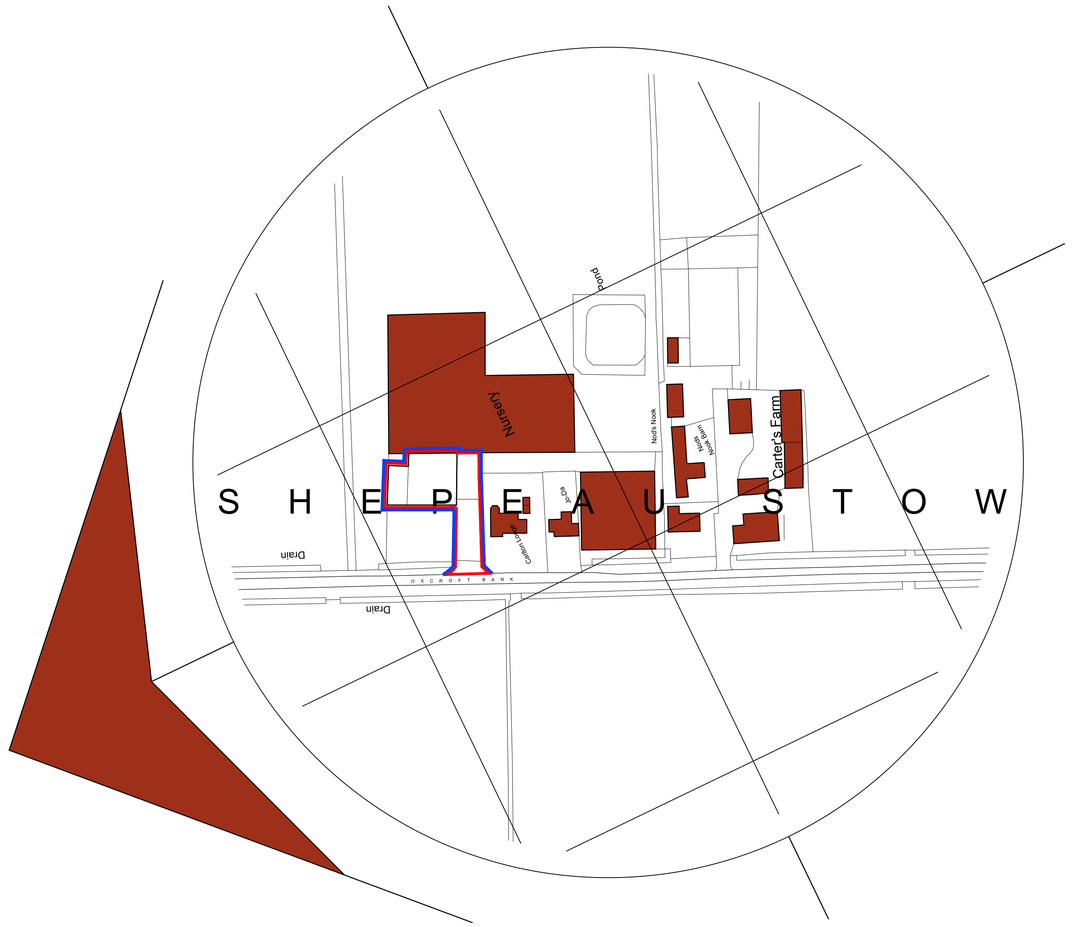
Job No.: SE-1910
Sheet Size: A1
Dwg No.: 100
Revision:

Swann Edwards Architecture Limited ©



Site Plan
Scale: 1:200

0 2 4 6 8
metres



Location Plan
Scale: 1:1250

0 12.5 25 37.5 50
metres

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- Indicates surveyed buildings
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- Indicates site access
- Indicates approximate position of un-surveyed structures on site
- Indicates approximate position of un-surveyed trees and hedges
- Indicates existing features to be removed

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Status
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Job Title
Proposed Barn Conversion Buildings adj. Carlton Lodge, Oxcroft Bank, Shepeau Stow For: Mr Ford

Drawing Title
Sketch Scheme
Site & Location Plan

Date	Drawn by
January 2023	SHe
	Checked by

Job No.	Sheet Size
SE-1910	A1
Dwg No. PP1000	Revision

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