

**FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
BRIDGEFIELD FARM, NEWMARKET ROAD, COWLINGE**

FINAL REPORT

ECL0795a/MDS DESIGN ASSOCIATES

DATE JULY 2022

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ATTACHMENT 1 – Site and Location Plan (Dwg 2199-01)

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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 MDS Design Associates in respect of a development that consists of the reconstruction of a barn for a minor extension to an existing dwelling and conversion of a barn to form an annexe at Bridgefield Farm, Newmarket Road, Cowlinge.

A planning application for the proposed development has been submitted by MDS Design Associates.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is situated at Bridgefield Farm, Newmarket Road, Cowlinge, Suffolk, CB8 9QA. The National Grid Reference of the site is 57169/25507.

The location of the site is shown on Figure 1.



Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site consists of an agricultural holding on the northern side of Newmarket Road. Within the site there is an existing dwelling. To the east of the dwelling there are two barns, one on the northern side of a courtyard area and one on the southern side of the courtyard area. The access into the site is to the east of the barns. The area of development is approximately 0.8 hectares.

Environment Agency LiDAR shows that the site slopes downwards in a southerly direction with typical ground levels around the northern barn of 92.3m AOD and around the southern barn at 91.5m AOD. Newmarket Road alongside the site is between 91.2m AOD and 92.3m AOD.

The River Kennett crosses below Newmarket Road approximately 30m east of the site.

The online British Geological Survey maps indicate that the site is likely to be underlain by Chalk Formation (undifferentiated). The superficial deposits at the site are Head – Clay, Silt, Sand and Gravel.

2.3 Proposed Development

The proposed development consists of the reconstruction of a barn for a minor extension to an existing dwelling and conversion of a barn to form an annexe. The annexe will have 2 storeys. A Site Plan is provided in Attachment 1.

2.4 Local Development Documents

The Forest Heath Core Strategy Development Plan 2001-2026 adopted May 2010 provides the overall vision for the former Forest Heath District Council area. West Suffolk have commenced a review of the local plan which will set out the long term planning and land use policies for the area.

The West Suffolk Level 1 Strategic Flood Risk Assessment (SFRA) was prepared in April 2021. A Level 2 Strategic Flood Risk Assessment (SFRA) for the former Forest Heath District Council area was prepared in 2011.

The Suffolk Lead Local Flood Authority (LLFA) is a statutory consultee for surface drainage proposals for major developments. The Suffolk Flood Risk Management Partnership have produced the Suffolk Flood Risk Management Strategy which is a tool to understand and manage flood risk.

2.5 Available Flood Risk Information

An extract from the Environment Agency Flood Map for Planning is shown in Figure 2.

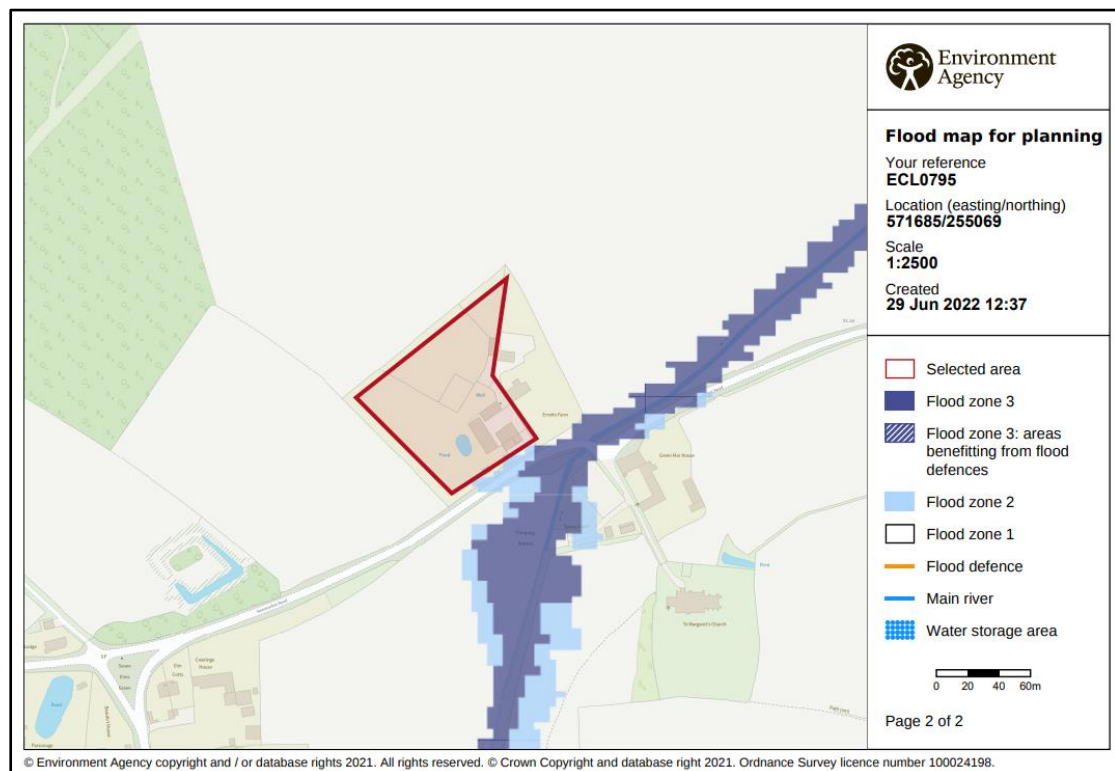


Figure 2 – Environment Agency Flood Map for Planning

The part of the site alongside Newmarket Road is located within Flood Zone 2, an area with a medium probability of flooding. The remainder of the site, including the barns to be developed, are located in Flood Zone 1, an area with a low probability of flooding.

The Environment Agency Long Term Flood Risk Maps show that:

- the site has a very low risk of flooding from rivers or the sea (annual probability less than 0.1%) although Newmarket Road has a medium probability of flooding (annual probability between 1% and 3.3%);
- part of the site has a low risk of surface water flooding (annual probability between 0.1% and 1%) and the southern boundary of the site has a high risk (annual probability greater than 3.3%); and
- the site is not within an area at risk of reservoir flooding.

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 1 and 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.

The two barns to be developed are within Flood Zone 1, the area with the lowest risk of flooding. As such, the development could not be undertaken at an alternative site with a lower risk of flooding. The development is therefore considered to pass the Sequential Test.

4.0 SITE SPECIFIC FLOOD RISK

4.1 Local Flood Assets

The nearest main river, the River Stour, is approximately 4.5km south west of the site. The site is not at risk of flooding from the River Stour.

The River Kennett, a non main river, is approximately 30m east of the site.

4.2 Sources of Flooding

The potential sources of flooding that have been identified during this assessment are flooding from the River Kennett and surface water flooding.

4.3 Probability of Flooding

The River Kennett is a non main river. The flood zones, as shown on the Environment Agency Flood Maps for Planning, give an indication of the risk from the River Kennett. The flood extent and likely depth of flooding from the River Kennett is less significant than the flooding indicated on the surface water flood maps.

The Environment Agency Long Term Flood Risk Maps indicate the probability and depth of surface water flooding. During:

- high risk (annual probability 3.3%) events the southern boundary of the site is at risk of surface water flooding with depths below 0.3m;
- medium risk (annual probability 1%) events the southern boundary of the site and the access alongside the southern barn are at risk of surface water flooding with depths up to 0.3m; and
- low risk (annual probability 0.1%) events the southern barn is at risk of surface water flooding with depths between 0.3m and 0.9m.

The maps show that during the present day 1% annual probability (1 in 100 chance each year) event the southern barn and northern barn are not at risk of surface water flooding although the access into the site is at risk.

4.4 Historic Flooding

During the preparation of this assessment, no evidence was discovered of the site being flooded.

4.5 Climate Change and Residual Risk

Climate change is likely to impact the site through increased rainfall intensity and duration affecting the local drainage network.

An estimate of the 1% annual probability (1 in 100 chance each year) surface water event with an allowance for climate change can be made from the 0.1% annual

probability (1 in 1000 chance each year) event. The extent and depths of flooding during the 0.1% annual probability (1 in 1000 chance each year) event are shown in Figure 3.

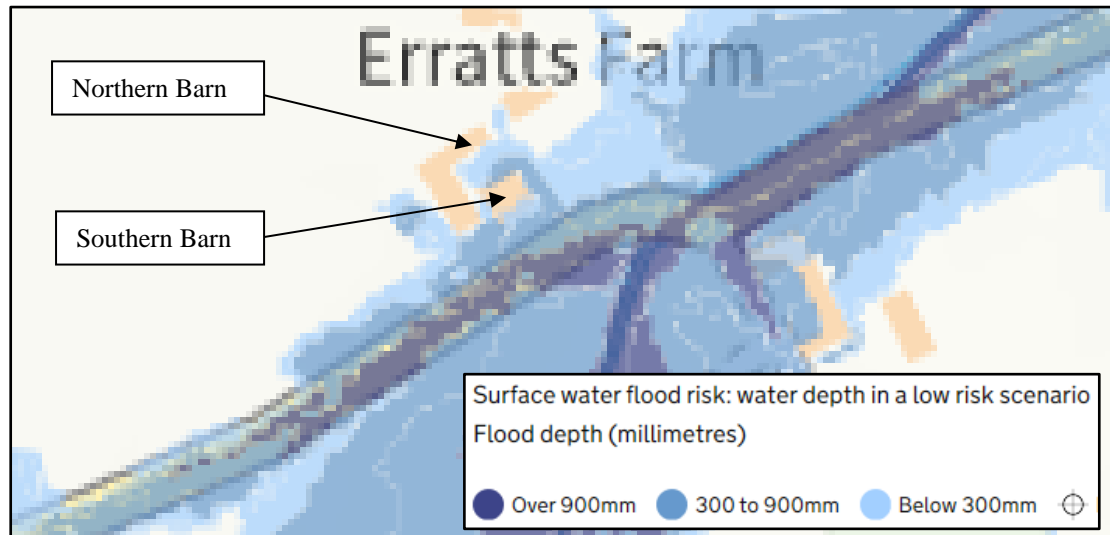


Figure 3 – Environment Agency Surface Water Flood Risk Map
– 0.1% Annual Probability

Figure 3 shows that the surface water flooding does not extend to the northern barn. Flood levels on the northern side and eastern side of the southern barn are between 0.3m and 0.9m. Based upon the ground levels at the site and the extent and depths of flooding shown in Figure 3 the depth of flooding at the site is not anticipated to exceed 0.4m during the 1% annual probability (1 in 100 chance each year) event including climate change.

The surface water flood maps give an indication of the risk. The maps do not consider the geology of the site or local drainage features. Infiltration through the underlying chalk may reduce the duration and risk of surface water flooding.

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The southern boundary of the site is at risk of flooding from the River Kennett during extreme fluvial events. Based upon the flood extent on the Environment Agency Flood Map for Planning it is not anticipated that the two barns to be developed are at risk from a fluvial event in the River Kennett.

Based upon the Environment Agency Long Term Flood Risk Maps the barns are not at risk of surface water flooding during the 1% annual probability (1 in 100 chance each year) event however the southern boundary and site access are at risk. During the 1% annual probability (1 in 100 chance each year) event with climate change event it is estimated that the southern barn is at risk of surface water flooding with flood depths of 0.4m. The northern barn is not at risk of surface water flooding.

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

5.2 Mitigation Measures

The floor levels within the northern barn will be 0.2m above surrounding ground level. In accordance with the advice for minor extensions the floor levels within the northern barn will be 0.3m above the estimated flood level.

The recommended mitigation against the remote risk of flooding has considered the maximum height to which floor levels can be raised. The development utilises an existing building and therefore floor raising is constrained by buildings height and the proposals to have a first floor. It is proposed that the finished floor level of annexe is as the existing barn and that there is 0.5m of flood resilient and flood resistant construction above finished floor level.

It is acknowledged that due to the nature of the flooding that active resistance measures such as flood doors and barriers may not be effectiveness in all circumstances. It is recommended that the flood resilience measures include:

- the ability for water to enter and exit the building;
- water compatible flooring;
- elevated services; and
- resilient insulation and wall finishes.

The risk of flooding is also mitigated by the proposed annexe having two storeys with sleeping accommodation on the first floor.

The vulnerability of people at a site at risk of flooding should be lowered where possible. The occupants of the dwelling should be made aware of the risk of flooding. Due to the nature of the flooding, current flood warning systems are unlikely to provide a reliable indication of when the site is at risk.

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.

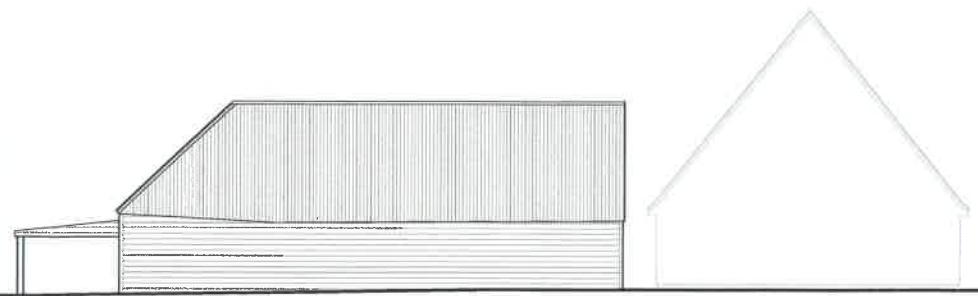
6.0 CONCLUSIONS

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

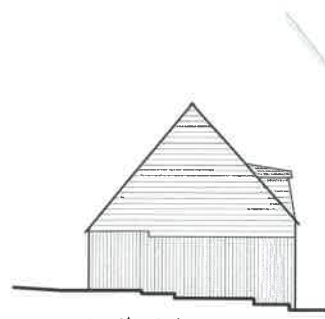
- The proposed development consists of the reconstruction of a barn for a minor extension to an existing dwelling and conversion of a barn to form an annexe at Bridgefield Farm, Newmarket Road, Cowlinge.
- The southern boundary of the site is within Flood Zone 2 however the barns to be developed are in Flood Zone 1. The southern boundary of the site is at risk from the River Kennett.
- During the 1% annual probability (1 in 100 chance each year) surface water flooding event the northern barn is not at risk of flooding and the southern barn is at risk with depths up to 0.4m.
- Floor levels within the extension to the existing dwelling will be 0.3m above the flood level and that the southern barn includes flood resistant and flood resilient construction 0.5m above finished floor level.
- The development passes the Sequential Test and is therefore suitable for the proposed location.

ATTACHMENT 1

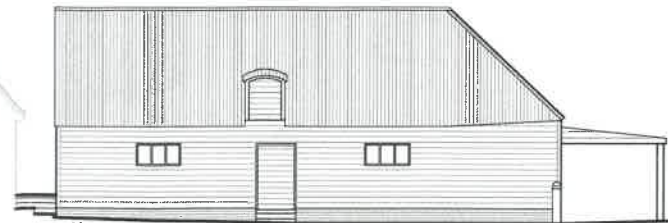
**SITE AND LOCATION PLAN
(Dwg 2199-01)**



northwest



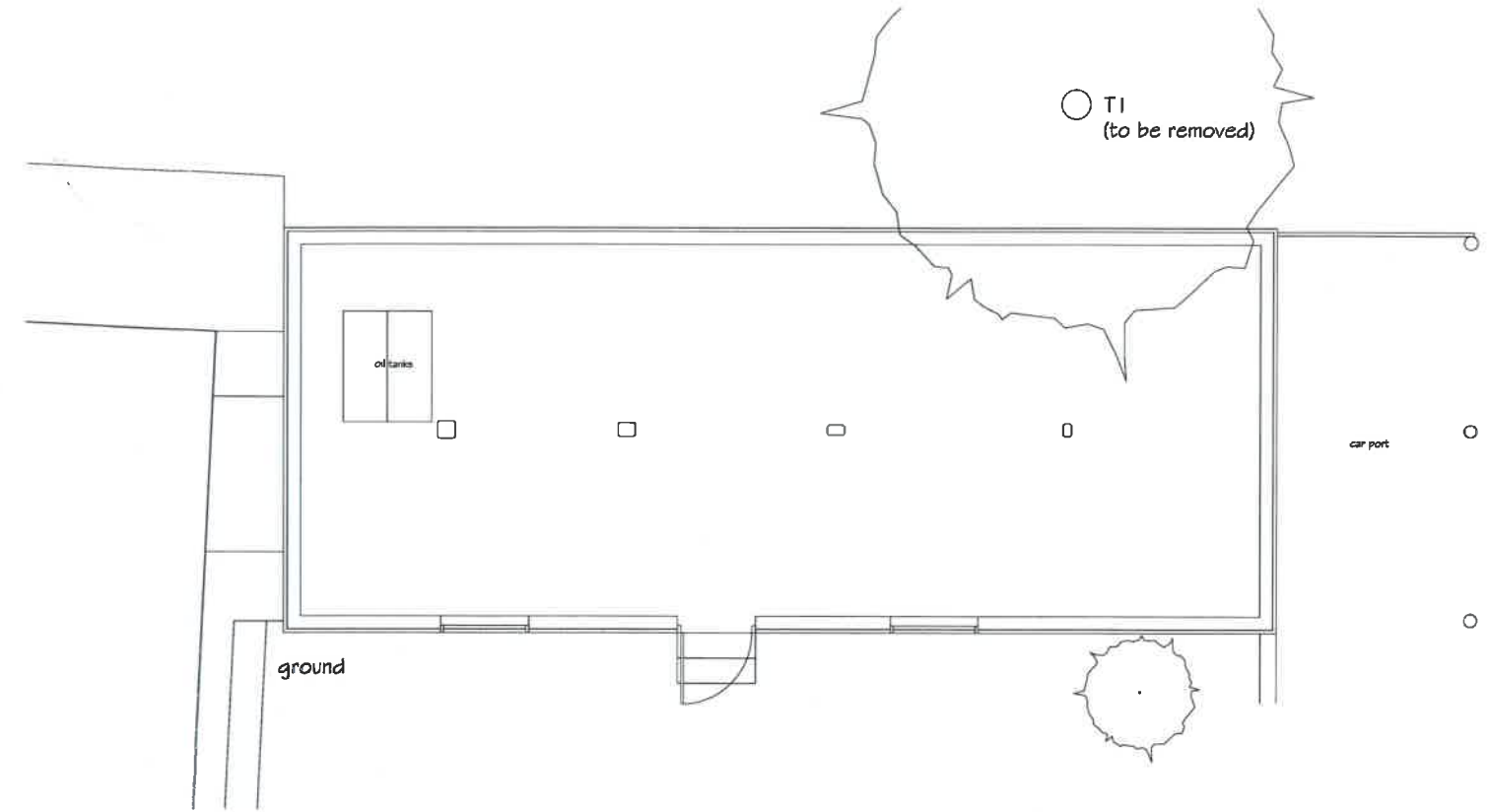
southwest



southeast



northeast



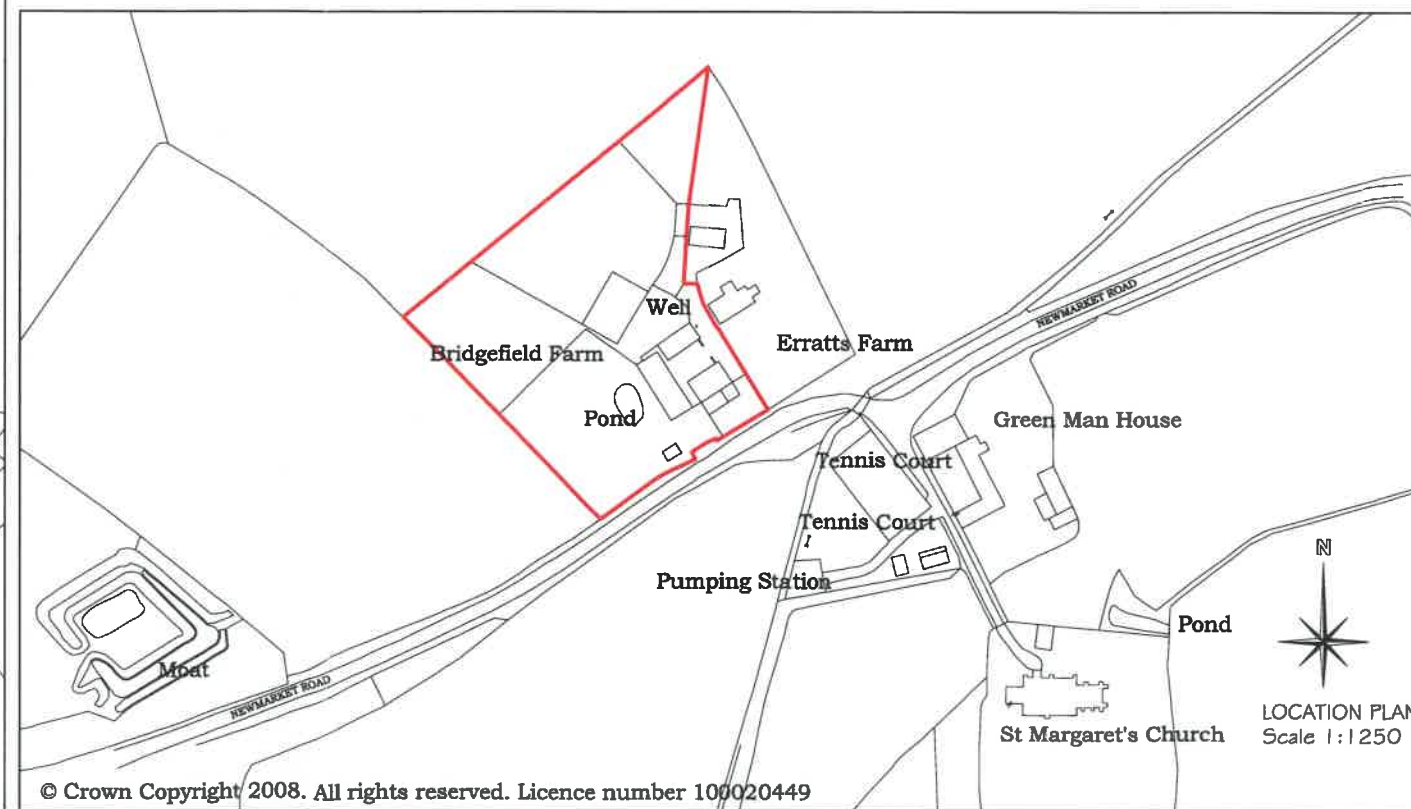
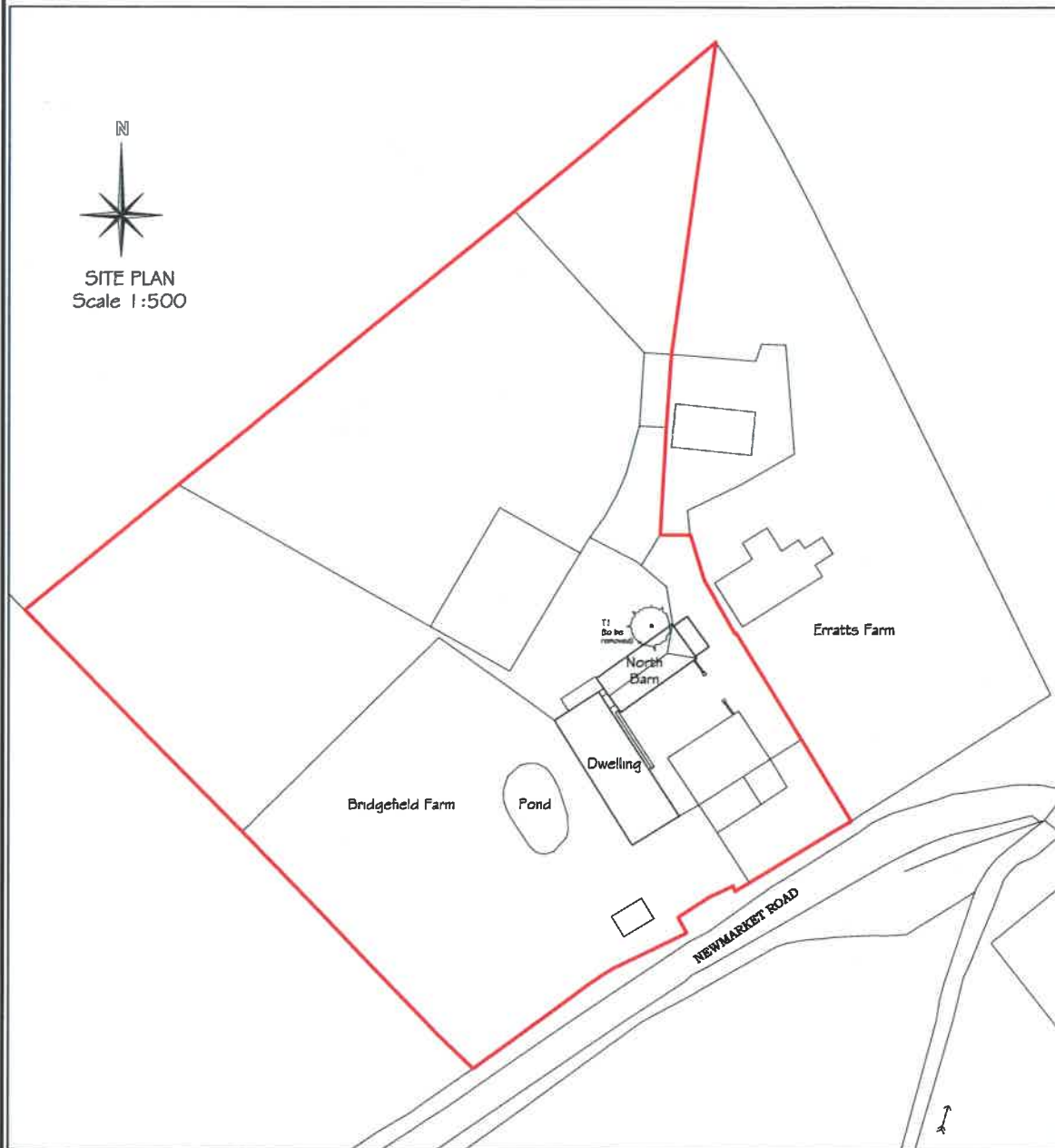
TI
(to be removed)

car port

ground



SITE PLAN
Scale 1:500



LOCATION PLAN
Scale 1:1250

Rev.	Date	Amendment
Roger Peyton BUILDING DESIGN SERVICES 35 STETCHWORTH ROAD DULLINGHAM NEAR NEWMARKET SUFFOLK CB8 9UJ TELEPHONE: 01636 507543 E-MAIL: Roger.Peyton@btopenline.co.uk		
Project Proposed Replacement Barn		
Site Bridgefield Farm Cowlinge Newmarket CB8 9QA		
Client Chris and Jane Linford		
Title As Existing		
Drawing No. 2199-01		Scale 1:100 1:50
Drawn	Date September 2006	Rev.