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

FINAL REPORT

ECL0960-2/JULIAN WARRICK ARCHITECTURAL

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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 & Mrs Balding in respect of a development that consists two residential dwellings at Carlton Lodge, Oxcroft Bank, Shepeau Stow.

Planning application (H23-0335-23) to convert 3 agricultural buildings to form three dwellings was approved in May 2023. The proposed development will supersede the approval granted. A planning application for the proposed development is to be submitted by Julian Warrick Architectural.

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 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 consisted of three adjoining agricultural buildings that have been demolished and the access from Oxcroft Bank. The area of development is approximately 0.08 hectares.

A topographic survey has shown that 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 two dwellings. The dwellings 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 2, an area with a medium probability of flooding.

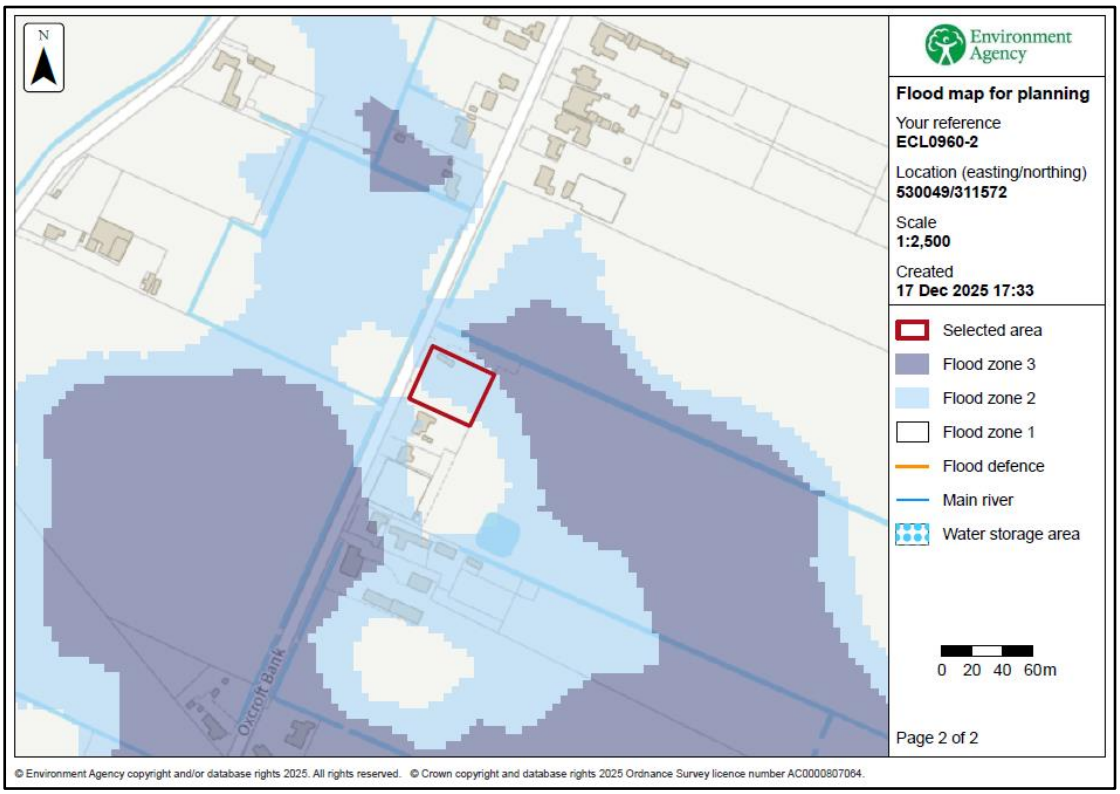


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps provide an indication of the risk from the primary sources of flooding. The details provided with these maps are summarised in Table 1. The depth of flooding identified is the maximum depth that occurs during a low chance (between 0.1% and 1% chance each year) event.

	Present Day		2050 Epoch	
	Chance of Flooding	**Depth (Low chance)**	**Chance of Flooding**	**Depth (Low chance)**
Rivers and the Sea	The site has a medium chance (between 1% and 3.3% chance each year)	No data available	No data available	No data available
Surface Water	The site is outside of the area with a low chance (between 0.1% and 1% chance each year)	Not at risk	The site is outside of the area with a low chance (between 0.1% and 1% chance each year)	Not at risk
Reservoir	The site is outside of the area at risk.			

Table 1 – Environment Agency Long Term Flood Risk Maps

Table 2 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 2 – 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 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.

The site has permission for the conversion of the agricultural buildings to form five dwellings. It is considered that the permissions for the change of use of the building has established the principle for two dwellings at the site. It is proposed that the dwellings that form this application will replace the existing permission.

As the proposed development can be considered to be the same as replacement dwellings it is not necessary to apply the Sequential Test.

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

A summary of the sources of flooding is provided in Table 3.

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 chance of surface water flooding is very low
Fluvial Flooding	The risk is assessed in Section 4.3 & 4.5
Tidal Flooding	The risk is assessed in Section 4.3 & 4.5.
Reservoir Flooding	The risk of a breach of the defences is assessed in Section 4.6.
Groundwater Flooding	There is no evidence to suggest the site is at risk of groundwater flooding.

Table 3 – 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.

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 two 2 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.

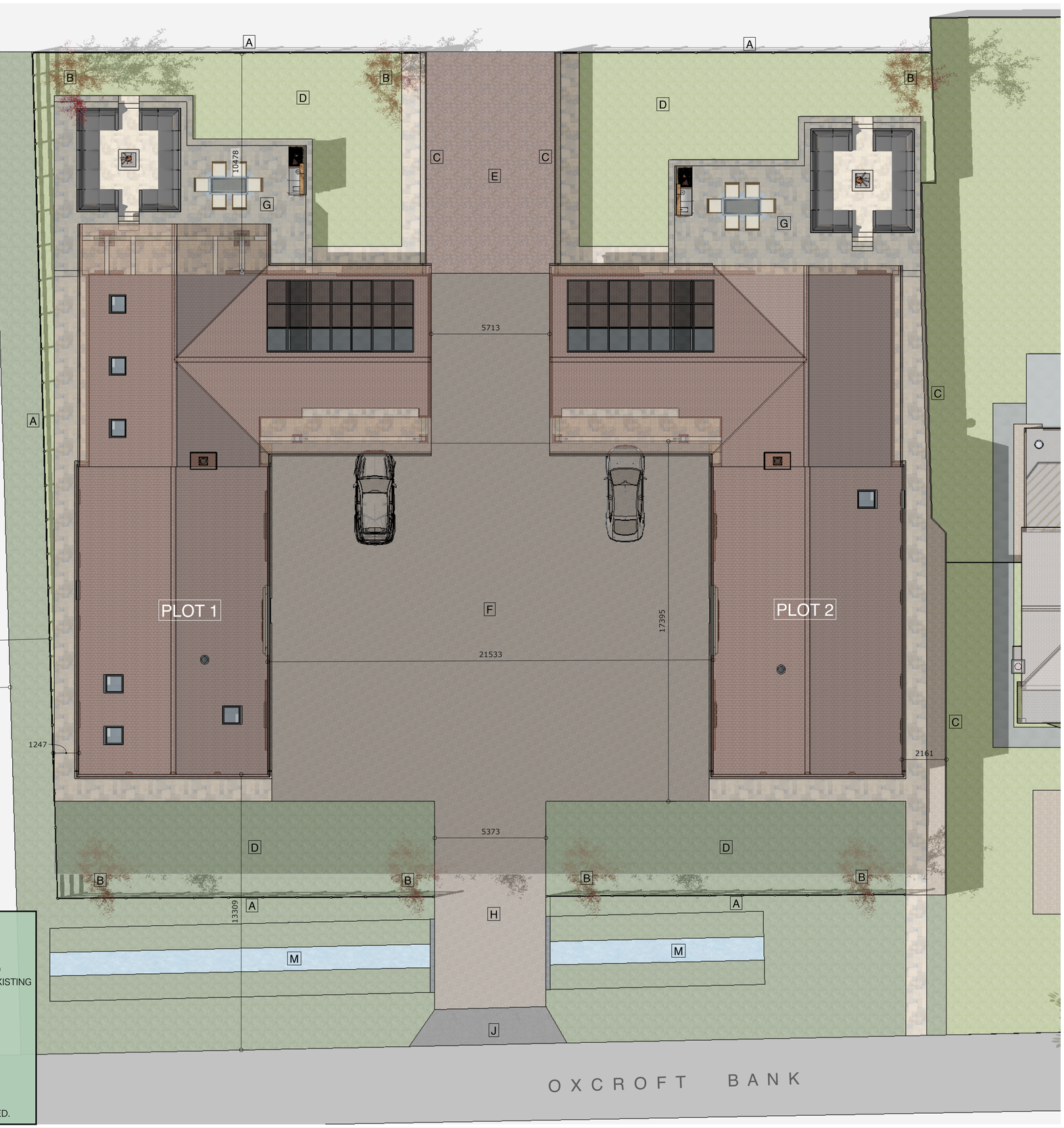
- It is recommended that the floor level of the dwellings is 0.3m above surrounding ground level and there should be 0.3m of flood resilient construction above finished floor.

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

ATTACHMENT 1

BLOCK & LOCATION PLANS
(DWG J204-PL6)

LOCATION PLAN



LANDSCAPING: -

A- 1200mm HIGH POST & RAIL TIMBER FENCING.
B- RED MAPLE TREE PLANTED HEAVY STANDARD.
ACER PALMATUM 'RED EMPEROR' (5M COMPACT HIGH)
C- 1800mm GOOD GRADE TIMBER FENCING REPLACING EXISTING IF REQUIRED.
D- AREAS LAID TO GRASS.
E- GRANITE CHIPPINGS DRIVE.
F- RED / BROWN BRINDLE BLOCK PAVING.
G- PATIO & PATHS IN STONE PAVING.
H- PROPOSED BRIDGE OVER EXISTING DRAIN.
J- ACCESS BUILT TO LOCAL AUTHORITY DETAILS.
K- EXISTING TRACK.
L- EXISTING MAIN DRAIN UNDER CONTROL OF I.D.B.
M- PRIVATE DRAIN AND VERGE GRASSED TO BE MAINTAINED.

2 PROPOSED PROPERTIES
adj CARLTON LODGE OXCROFT BANK
SHEAPEAU STOW PE12 0TY
for MR & MRS R BALDING

This drawing is copyright and may not be altered, traced, photographed or used for any other purpose without permission in writing. Any dimensions relating to existing buildings are approximate only. No responsibility is accepted for errors made by others in scaling from this drawing. Any discrepancies must be reported to the designer before any work is put in hand. Any work carried out before receipt of approval and building regulations is at the risk of the person doing the work. The Contractor must visit the site and be responsible for taking all dimensions relating to his work and for checking any dimensions given on