FLOOD RISK ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT AT GLENSIDE SOUTH, WEST PINCHBECK, LINCS.

FINAL REPORT

GEOFF BEEL CONSULTANCY

JULY 2016

GCB/MERCHANT

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CONTENTS

1.0 INTRODUCTION

2.0 LOCATION

3.0 THE SITE AND SEQUENTIAL TEST

4.0 EXISTING FLOOD ALLEVIATION MEASURES

5.0 POTENTIAL SOURCE OF FLOODING

6.0 EXTENT OF KNOWN FLOODING

7.0 PROBABILITIES AND TRENDS OF FLOODING

8.0 IMPACTS OF FLOODING

9.0 RESIDUAL RISKS – EXTREME EVENTS

10.0 CONCLUSIONS AND RECOMMENDATIONS

Fig 1 - Location Plan; Existing Floor Plan & Elevations – G R Merchant drg. no. 2949-16-01

Fig 2 - Site Plan; Proposed Floor Plan & Elevations – G R Merchant drg. no. 2949-16-02

Fig 3 - Topographical Section – G R Merchant drg.

Fig 4 - Environment Agency Flood Zone Map

Fig 5 - South Holland District Council Strategic Flood Risk Assessment – Residual Depths (2115)

Fig 6 - Welland & Deepings Internal Drainage Board District Plan.

1.0 INTRODUCTION

1.1 A full planning application is to be submitted by G R Merchant Ltd on behalf of Messrs GE Start, JE Casssidy & EO South for proposed residential development at Money Bridge Farm, Glenside South, West Pinchbeck, Spalding, Lincs.

1.2 Planning approval requires a Flood Risk Assessment to accompany the application to meet the requirements and general principles contained in the Planning Practice Guidance to the National Planning Policy Framework (NPPF) and for approval by the Environment Agency.

The site is shown within Flood Zone 3 of the Environment Agency's Flood Zone Map. The latest Flood Zone Maps have been created as a tool to raise awareness of flood risk with the public and partner organisations, such as Local Authorities, Emergency Services and Drainage Authorities. The Maps do not take into account any flood defences.

The site is also shown in Flood Zone 3 with a Low Hazard rating of the South Holland District Council's Strategic Flood Risk Assessment Maps (2115) and located in the Welland and Deepings Internal Drainage Board district.

1.3 Geoff Beel Consultancy was appointed on 21st June 2016 to undertake a Flood Risk Assessment.

2.0 LOCATION

2.1 The development site is located at Money Bridge Farm, Glenside South, West Pinchbeck. The National Grid Reference of the central point of the site is TF 21202525.

2.2 The position and extent of the sites are shown on Fig 1 – Location Plan Existing Floor Plan & Elevations at the end of the document.

2.3 The site, located within the Welland and Deeping's Internal Drainage Board district is shown within Flood Zone 3 as detailed both on the Environment Agency Flood Zone Maps and the Council's Strategic Flood Risk Assessment Maps with a Low Hazard rating.

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is at Money Bridge Farm, Glenside South, West Pinchbeck.

3.2 The total area of development is approximately 0.31 hectare with existing floor level varying between 5.06m and 4.30m aOD whilst Glenside South carriageway is at 5.20m aOD.

3.3 The proposed site layout consists the conversion of the redundant barns to a two storey dwelling with all sleeping accommodation at first floor level.

3.4 The Sequential Test and Exception Test will require to be applied by the Local Planning Authority but the development may be permitted as the site is protected against the 1 in 100 year fluvial event by a combination of defences, pumping stations and sluice gates meeting the requirements of NPPF.

3.5 The development with the inclusion of appropriate mitigation measures would ensure the proposals pass Part 2 of the NPPF Exception Test by ensuring that the development has an adequate water exclusion strategy for the design flood and breach event. The site proposal may be considered as brownfield with no other land available for development in West Pinchbeck at a lower risk of flooding.

4.0 EXISTING FLOOD ALLEVIATION MEASURES

4.1 The site is within a defended floodplain, as defined in Appendix 1 of the Environment Agency's 'Policy and Practice for the Protection of Floodplains' and is considered to be passive until such time as a flood greater than that for which the defences were designed occurs. The likelihood of flooding due to overtopping or failure of a flood defence embankments is considered to be small.

4.2 The site is located within the Welland and Deepings Internal Drainage Board protected by the River Welland and River Glen defences to the 1 in 100 year return period flood event. Existing floor levels within the site vary between 4.30m and 5.06m aOD.

4.3 The site and surrounding land drains to the Reedy Graft Drain and hence the Blue Gowt Drain to Pinchbeck Marsh Pumping Station for discharge to the Blue Gowt Outfall which flows into the River Glen at Surfleet.

4.4 The Welland and Deepings IDB have carried out improvements to the Pinchbeck Marsh catchment over the years such that the combined pumping station capacity is nowadays 3.00 cumecs. The nearest Board watercourse is the Reedy Graft Drain which has a design 1 in 100 year bankfull flood level.

4.5 Current maintenance standards within the Welland and Deepings Internal Drainage Board are generally very good.

During the operation and maintenance of its pumping stations, associated structures and channel systems, particularly those that could affect property, the Board 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. However, bank slips, blocked culverts etc may occur from time to time and these matters are usually dealt with promptly.

4.6 The fluvial River Glen is located immediately to the north-west of the site with a standard of protection of 1 in 100 years return period.

Defence and Flood levels of the River Glen at the site frontage are as follows:

	Present	Present + Climate Change	Defence Level
1%	4.46	4.74	5.50

4.7 Maintenance standards of the Environment Agency's main rivers and defences are well maintained and regularly inspected for their asset condition.

5.0 POTENTIAL SOURCES OF FLOODING

5.1 Four potential sources of flooding have been identified as a result of this assessment:

a) local blockages to existing IDB main drain system.
b) storm return period of 1 in 50 years being exceeded
c) failure of Pinchbeck Marsh Pumping Stations
d) overtopping and breaching of the fluvial River Glen defences

5.2 The probability of flooding from source a) is low due to the maintenance standards already achieved and managed by the IDB.

The probability of flooding from b) is also low due to the Welland and Deepings IDB main drain design standard incorporating a minimum 900mm freeboard to the lowest land level which provides adequate storage in events greater than 1 in 50 years.

5.3 Failure of the Pinchbeck Marsh Pumping Stations may occur due to long term mechanical breakdown or power supply being disrupted. However, in these circumstances, if 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 utilising temporary pumping equipment. The probability of such an occurrence is also considered to be low.

Previous historic rainfall events of 1968 and 1978, estimated to be greater than 1 in 100 year events, caused no flooding to any residential properties at the time and the Boards policy is to provide a standard of drainage which satisfies NPPF requirements of a 1 in 100 year return period for fluvial protection inclusive of the effects of climate change and development. The Boards policy regarding the connection of future developments to the arterial system enables a flexible approach to be adopted and meet the criteria for "sustainable urban drainage". The probability of the site flooding from this potential source is also considered to be low.

5.4 The possible overtopping and breaching of the fluvial River Glen flood defences which may affect the site under extreme conditions is also considered to be very low. The present standard of defence of 1 in 100 years would most probably have to be exceeded to create such conditions. The River Glen flood defences consist of concrete walls and it is estimated that the floodwaters would not affect the development site, as there is sufficient freeboard above the 1 in 100 year flood level inclusive of climate change.

5.5 The South Holland District Council Strategic Flood Risk Assessment has considered the effect of a breach or overtopping to the River Glen as shown in Fig 5. The site is shown as affected by up to 0.50m of floodwaters.

However, the breach analysis of the South Holland Strategic Flood Risk Assessment does not include the most up to date guidance on climate change allowances. Therefore, the depth of floodwaters should be increased to 750mm affecting the site.

To safeguard the barn conversion, finished floor level will be at a maximum of 5.00m aOD with all sleeping accommodation at first floor. Flood resistant measures incorporated up to 600mm above finished floor level.

5.6 The developer should ensure that the eventual occupiers of the barn conversion are sufficiently aware of the risk of flooding, and the standard of the existing defences. The Environment Agency provides a Flood Warning Service which includes Flood Warning Codes and uses direct warning methods where the risks and impacts of flooding are high. Indirect warnings are provided to all flood risk areas, even those at low risk of flooding. The main method is media broadcasts via local radio and also by television.

In addition to direct and indirect flood warnings, the Environment Agency operates a 24 hour a day Floodline Service providing advice and information on flooding contacting 0845 988 1188 and the occupiers should register with the Floodline Warnings Direct Service to receive any future flood warnings.

6.0 EXTENT OF KNOWN FLOODING

6.1 During the preparation of this assessment, no evidence was discovered of the site being flooded or of any adjoining properties.

7.0 PROBABILITIES AND TRENDS OF FLOODING

7.1 The probability of this development flooding from localised drainage systems is very low. It is also intended to construct floor levels varying between 4.50m and 5.00m aOD with flood resistant construction incorporated up to 600mm above finished floor level.

7.2 The probability of the site flooding with water from any Welland and Deepings river system is less than 1% because of the standards of the existing flood defence systems, storage within existing drainage channels and the location of the site. Similarly the same standard is provided by the Environment Agency's main river and defences.

7.3 If under very extreme events, levels of floodwater from any Environment Agency or Welland and Deepings river or arterial systems rose to such an extent that the site was affected, the situation would not be sudden. It is very probable that sufficient time would be available to take precautionary actions to limit the extent and potential impact of flooding.

7.4 The water levels in the drainage channels will tend to rise as a result of the impacts of climate change. However the existing systems and defences together with proposed floor levels varying between 4.50m and 5.00m aOD with flood resistant construction up to 600mm above finished floor level will be appropriate for the design life of the development (i.e. 100 years).

7.5 Safe and dry access to and from the site would be available onto Glenside South and hence to Spalding where land is in Flood Zone 1.

8.0 IMPACTS OF FLOODING

8.1 No significant impacts of flooding are anticipated.

8.2 Floor levels of the development will vary between 4.50 m and 5.00m aOD with flood resistant construction up to 600mm above finished floor level offering additional protection against impacts arising from any extreme short duration, localised events. Surface water drainage will be discharged to soakaway designed to BRE365 specification and Building Regulations approval.

8.3 The general location of the site within the catchment is such that if flooding occurred from any of the Environment Agency or Welland and Deepings river systems, then probably 2 to 3 days warning time would be available.

8.4 No displacement of water from the site will affect any adjoining properties and agricultural land.

9.0 RESIDUAL RISK – EXTREME EVENTS

9.1 The residual risk from extreme events is very low on this site, because of its location, within a pumped sub-catchment of the Welland and Deepings IDB area and its location alongside River Glen fluvial defences consisting of concrete wall defences.

9.2 Although within Flood Zone 3 according to NPPF classification, the site actually has a very low risk of flooding due to the current standards of drainage and flood defence and land levels. The site is not located within a Functional Flood Plain of any 'main river' or 'main drain'. The Environment Agency Flood Zone Maps have been produced irrespective of existing flood defences and standards of protection.

9.3 South Holland District Council in conjunction with the Environment Agency and the local IDB's within the Council area have carried out a Strategic Flood Risk Assessment of the whole District by appointed Consulting Engineers.

The Strategic Flood Risk Assessment has produced more definitive Flood Risk Maps than those published by the Environment Agency and at the same time has analysed flood return periods of all tidal and fluvial defences for year 2115 to account for the effects of climate change.

Breach scenarios of embankments failing and/or being overtopped have also been carried out to establish Flood Risk Zones.

10.0 CONCLUSIONS AND RECOMMENDATIONS

10.1 As a result of the assessment, the following conclusions have been reached:-

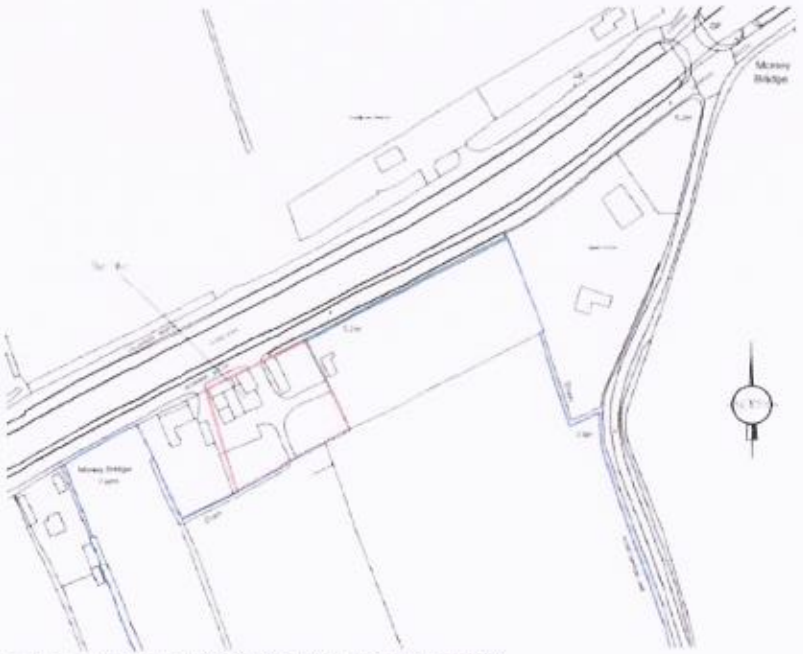
- The proposed development is not in a Functional Floodplain as defined by NPPF. It is located in the Passive Floodplain protected by defences to a 1 in 100 year return period.

- Although the site is in Flood Zone 3, the actual risk of site flooding from any Environment Agency river system is very low.

- Although the site is located within an Internal Drainage District with a minimum standard of drainage of 1 in 50 years, this accords with Defra guidelines for rural development. Freeboard to design water level of 900mm to lowest land level is available for events greater than 1 in 50 years providing further storage within the drainage channels.

- Floor levels of the barn conversion will vary between 4.50m and 5.00m aOD with flood resistant construction up to 600mm above finished floor level. Safe refuge and all sleeping accommodation is located at first floor level of the barn conversion.

- On site surface water drainage will be discharged to soakaway to BRE365 specification and Building Regulations approval.

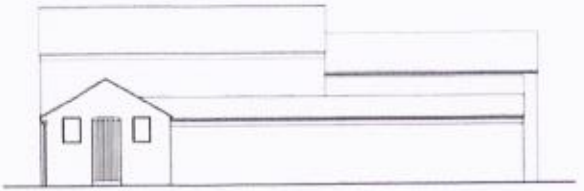


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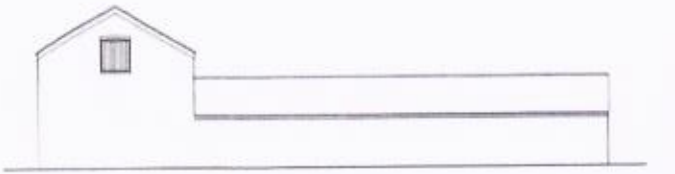
LOCATION PLAN 1:250



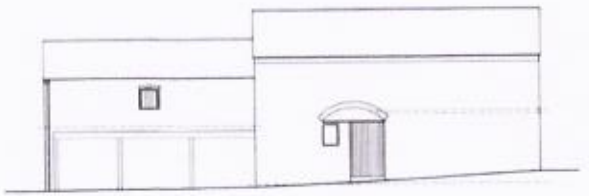
SIDE ELEVATION



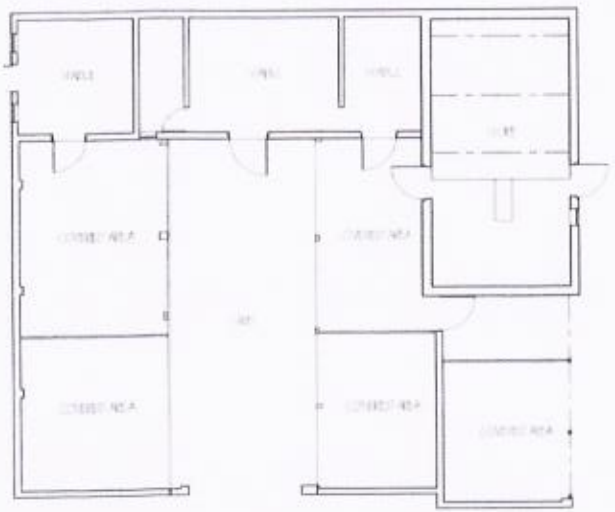
SIDE ELEVATION



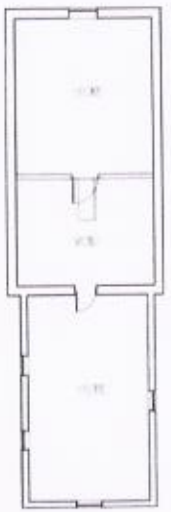
REAR ELEVATION



ENTRANCE ELEVATION



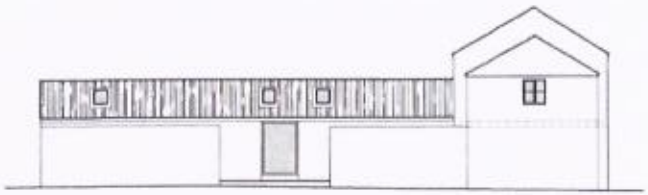
GROUND FLOOR PLAN



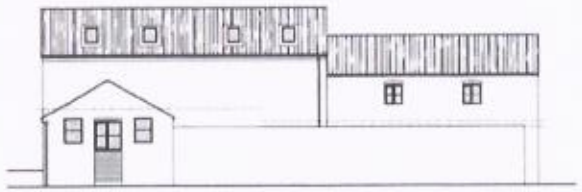
FIRST FLOOR PLAN

G. R. MERCHANT LTD.
LENG AMICE FIWO
ARCHITECTURAL, STRUCTURAL AND LAND DRAINAGE CONSULTANTS
4 Wrights Mews
158 Park Road, Hallesowen,
Spalding, Lincs. PE12 7EE
Tel. 01406 490800
Fax 01406 425744
E-Mail: grmerchant@btconnect.com

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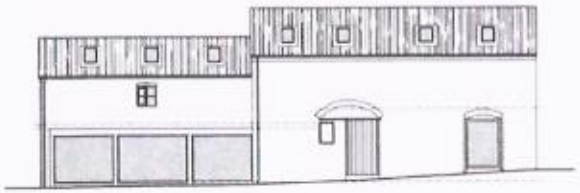
WEST ELEVATION



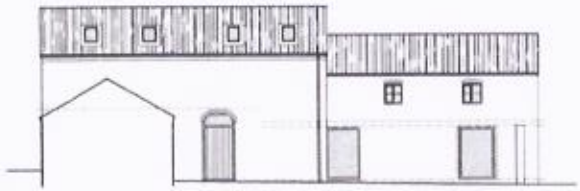
NORTH ELEVATION



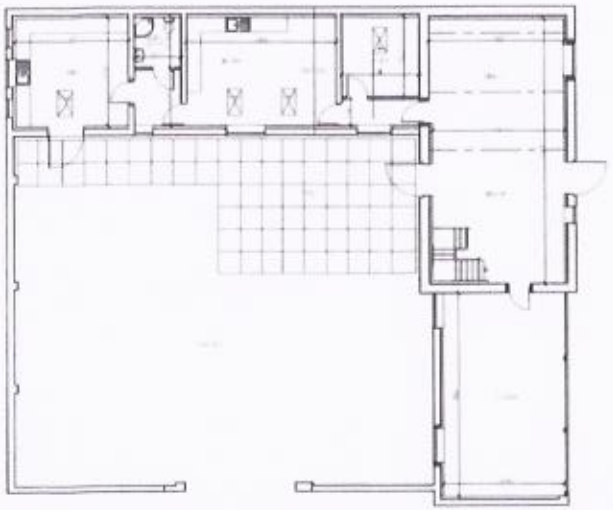
SOUTH ELEVATION



ENTRANCE ELEVATION



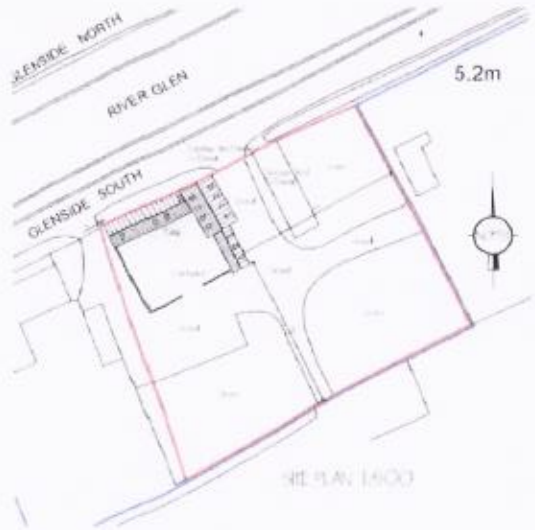
COURTYARD ELEVATION



GROUND FLOOR PLAN



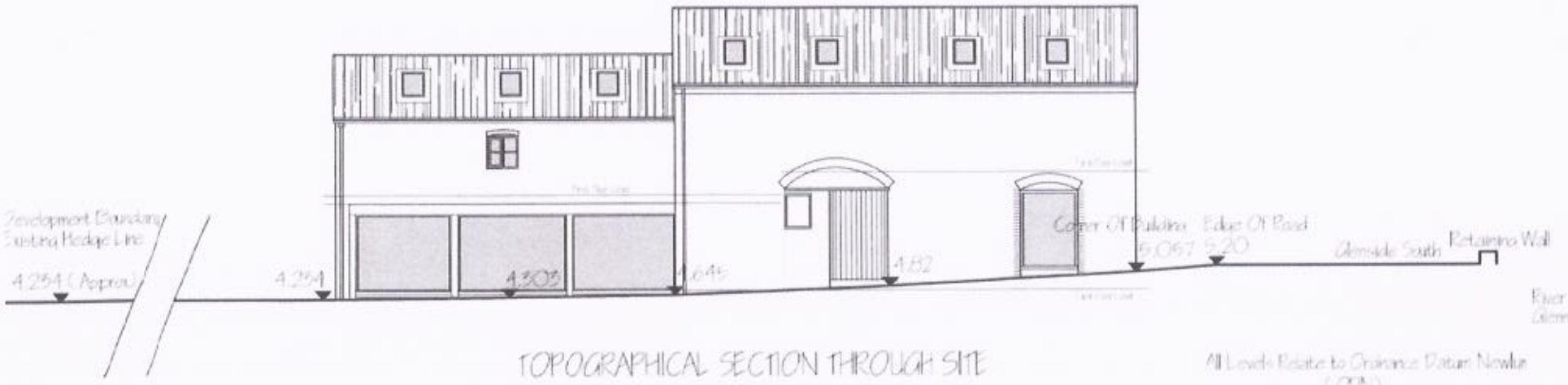
FIRST FLOOR PLAN



SITE PLAN 1:500

G. R. MERCHANT LTD.
I.ENG. AMIE FIWO
ARCHITECTURAL, STRUCTURAL AND LAND DRAINAGE CONSULTANTS
4 Wrights Mews
198 Park Road, Holbeach,
Spalding, Lincs. PE12 7EE
Tel: 01406 490600
Fax: 01406 426744
E-Mail: gr.merchant@btconnect.com

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TOPOGRAPHICAL SECTION THROUGH SITE
SCALE 1:100

All Levels Relate to Ordnance Datum Newlyn
(ODN)

Environment Agency

Enter a postcode or place name:

Pinchbeck West, Lincolnshire

Go

Other topics for this area...

Flood Map for Planning (Rivers and Sea)

Flood Map for Planning (Rivers and Sea)

X: 521,294;Y: 325,228 at scale 1:10,000

Other maps | Data search | Text only version

Map legend

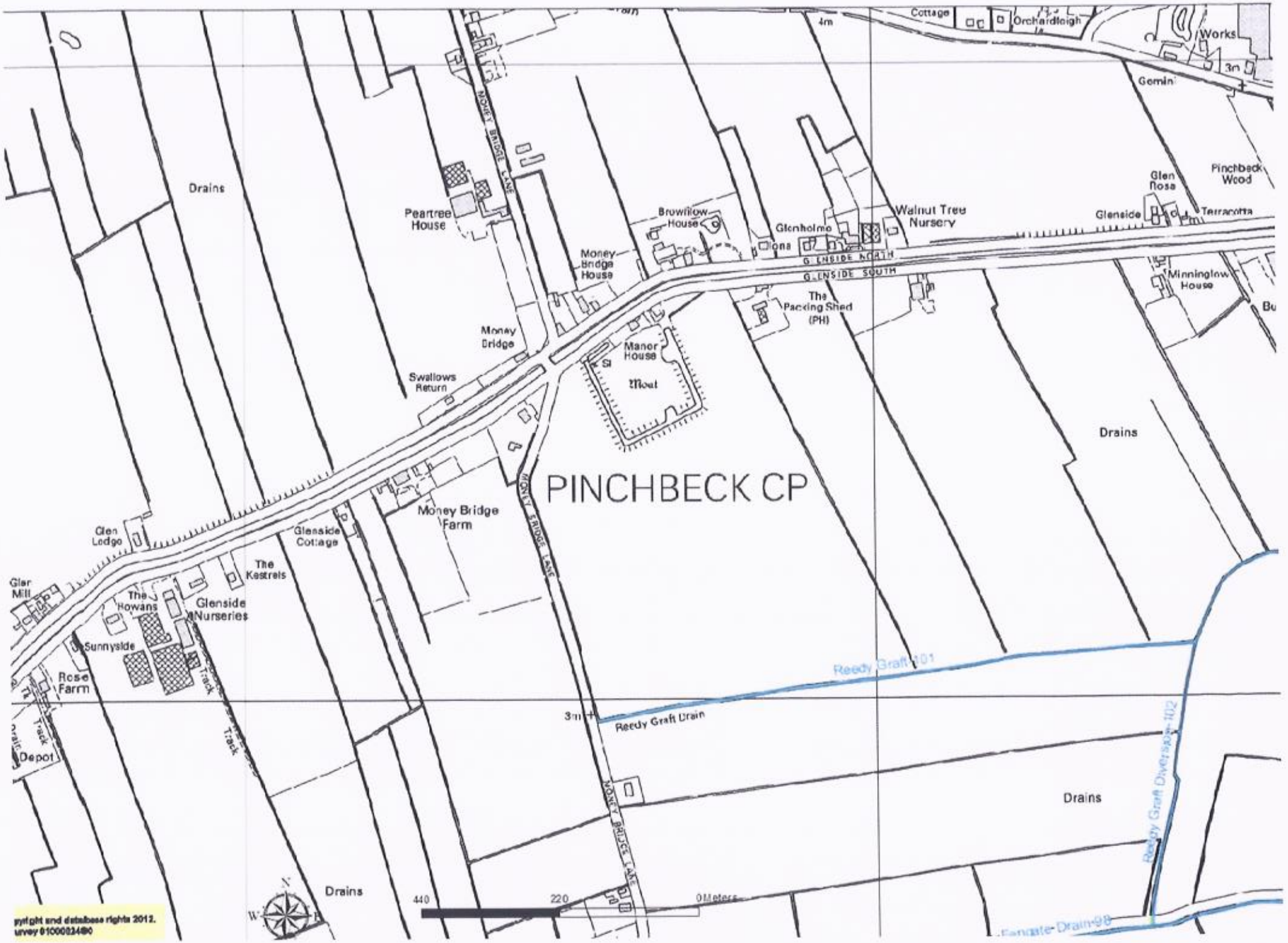
Click on the map to see what Flood Zone (National Planning Policy Guidance definitions) the proposed development is in

- Flood Map for Planning (Rivers and Sea)
  - Flood Zone 3
  - Flood Zone 2
  - Flood defences (Not all may be shown)
  - Areas benefiting from flood defences (Not all may be shown)
- Main River Line
  - Main River Line
- Other national environmental organisations
  - Natural Resources Wales Area of responsibility
  - Scottish Environment Protection Agency Area of responsibility



Customers in Wales - From 1 April 2013 Natural Resources Wales (NRW) has taken over the responsibilities of the Environment Agency in Wales.
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B1350
B1180
Northgate
Enchcleek
West
Mill
Chase Fm
Crossland Fm
North Gate Fm
Westfield Fm
Burley Hill Sandstone
Nunnery
27
26


PINCHBECK CP
Drains
Peartree House
Money Bridge Lane
Brownlow House
Glenholme
Walnut Tree Nursery
Glenside
Terracotta
Glen Rosa
Pinchbeck Wood
Money Bridge House
GLENSIDE NORTH
GLENSIDE SOUTH
The Packing Shed (PH)
Minninglow House
Money Bridge
Swallows Return
Manor House
Moat
Drains
Money Bridge Farm
Glen Lodge
Glenside Cottage
The Kestrels
The Howans
Glenside Nurseries
Sunnyside
Rose Farm
Track
Depot
Reedy Graft Drain
Drains
Drains
Cottage
Orchardleigh
Works
Gemini
440
220
0 Meters