FLOOD RISK ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT AT JUNCTION OF MILESTONE LANE AND CROSSGATE LANE, PINCHBECK, LINCS.

FINAL REPORT

GEOFF BEEL CONSULTANCY

APRIL 2014

GCB/HORNSBY

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Fig 1 - Location Plan – OS Map

Fig 2 - Existing Location Plan & Block Plan – Alan Hornsby Architectural Services Ltd drg. no. 13/22/01

Fig 3 - Proposed Location Plan & Block Plan – Alan Hornsby Architectural Services Ltd drg. no. 13/22/03

Fig 4 – Site Survey Details – Alan Hornsby Architectural Services Ltd drg. 13/22/01

Fig 5 - Environment Agency Flood Zone Map

Fig 6 - South Holland District Council Strategic Flood Risk Assessment – Actual Depths (2115)

Fig 7 - South Holland District Council Strategic Flood Risk Assessment – Residual Depths (2115)

Fig 8 - Welland & Deepings Internal Drainage Board District Plan.

1.0 INTRODUCTION

1.1 A full planning application is to be submitted by Alan Hornsby Architectural Services Ltd on behalf of Mr & Mrs R Hart for proposed residential development at the junction of Milestone Lane and Crossgate Lane, 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 Paragraph 9 of the Technical 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 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 7th April 2014 to undertake a Flood Risk Assessment.

2.0 LOCATION

2.1 The development site is two plots of land on agricultural premises at the junction of Milestone Lane and Crossgate Lane, Pinchbeck, Spalding. The National Grid Reference of the central point of the site is TF 24252665.

2.2 The position and extent of the sites are shown on Fig 3 - Proposed Location Plan and Block Plan at the end of the document.

2.3 The sites, located within the Welland and Deeping's Internal Drainage Board district are shown within Flood Zone 3 as detailed both on the Environment Agency Flood Zone Maps and the Council's Strategic Flood Risk Assessment Maps.

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The sites are on agricultural premises consisting of a barn store; building and ménage all to be demolished.

3.2 The total area of development is approximately 0.16 hectare.

3.3 The proposed site layout consists the construction of 2 two-storey dwellings with vehicular access off Milestone Lane.

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.

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. Site survey shows land levels varying between 3.40m and 4.00m aOD.

4.3 The site and surrounding land drains via Old Pinchbeck Drain north of the site to the Pinchbeck Marsh and Pinchbeck Marsh - Riddington Pumping Stations which discharge into the Blue Gowt Drain and ultimately flows via gravity 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 Old Pinchbeck Drain which has a design 1 in 100 year bankfull flood level of 3.45m aOD.

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 approximately 200m to the 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	4.66	5.10

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 and Pinchbeck Marsh – Riddington 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 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 could affect the development site, as there is insufficient 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 or breach or overtopping to the River Glen as shown in Figs 6 and 7.

An estimated depth of floodwater between 0.50m and 1.00m could be experienced and it is necessary to mitigate against such a risk by raising ground floor levels of the dwellings 500m above existing land levels at a minimum of 4.50m aOD.

It is proposed that floor levels of the development are 500mm above highest ground level at 4.50m aOD with flood resilient construction up to 500mm above finished floor level to safeguard against the remote possibility of overtopping and/or breaching of the River Glen defences.

5.6 The developer should ensure that the eventual occupiers of the properties 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 Direct Warnings 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 500mm above highest land level at a minimum of 4.50m aOD.

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 500mm above existing highest land level at 4.50m aOD 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 Milestone Lane and hence in an easterly direction to land 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 be 500mm above highest land level at 4.50m aOD 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 200mm from the 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.

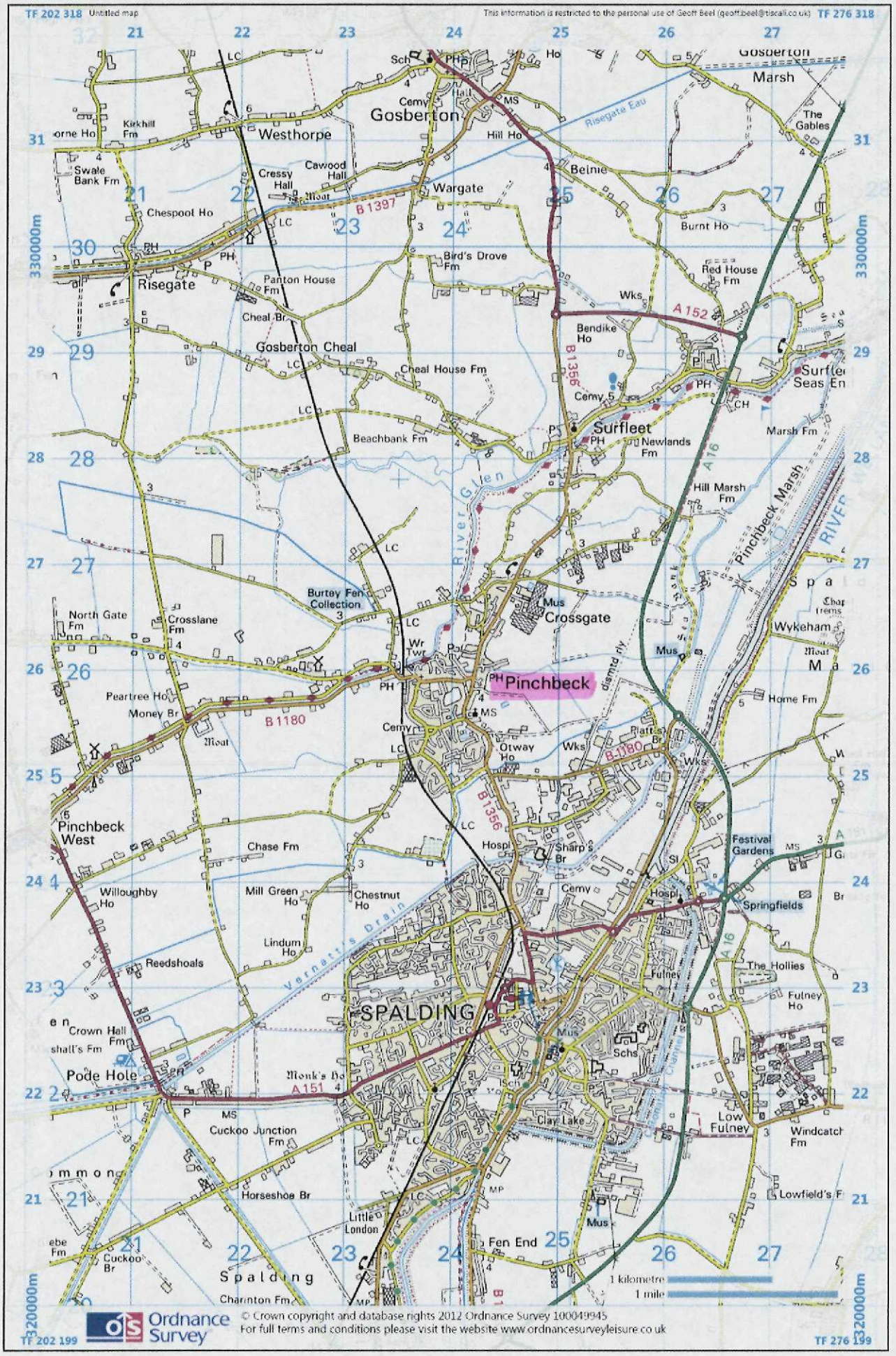
The Strategic Flood Risk Assessment has produced more definitive Flood Risk Maps than those published by the Environment Agency and at the same time has analysed flood return periods of all tidal and fluvial defences for year 2115 to account for the effects of climate change.

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

10.0 CONCLUSIONS AND RECOMMENDATIONS

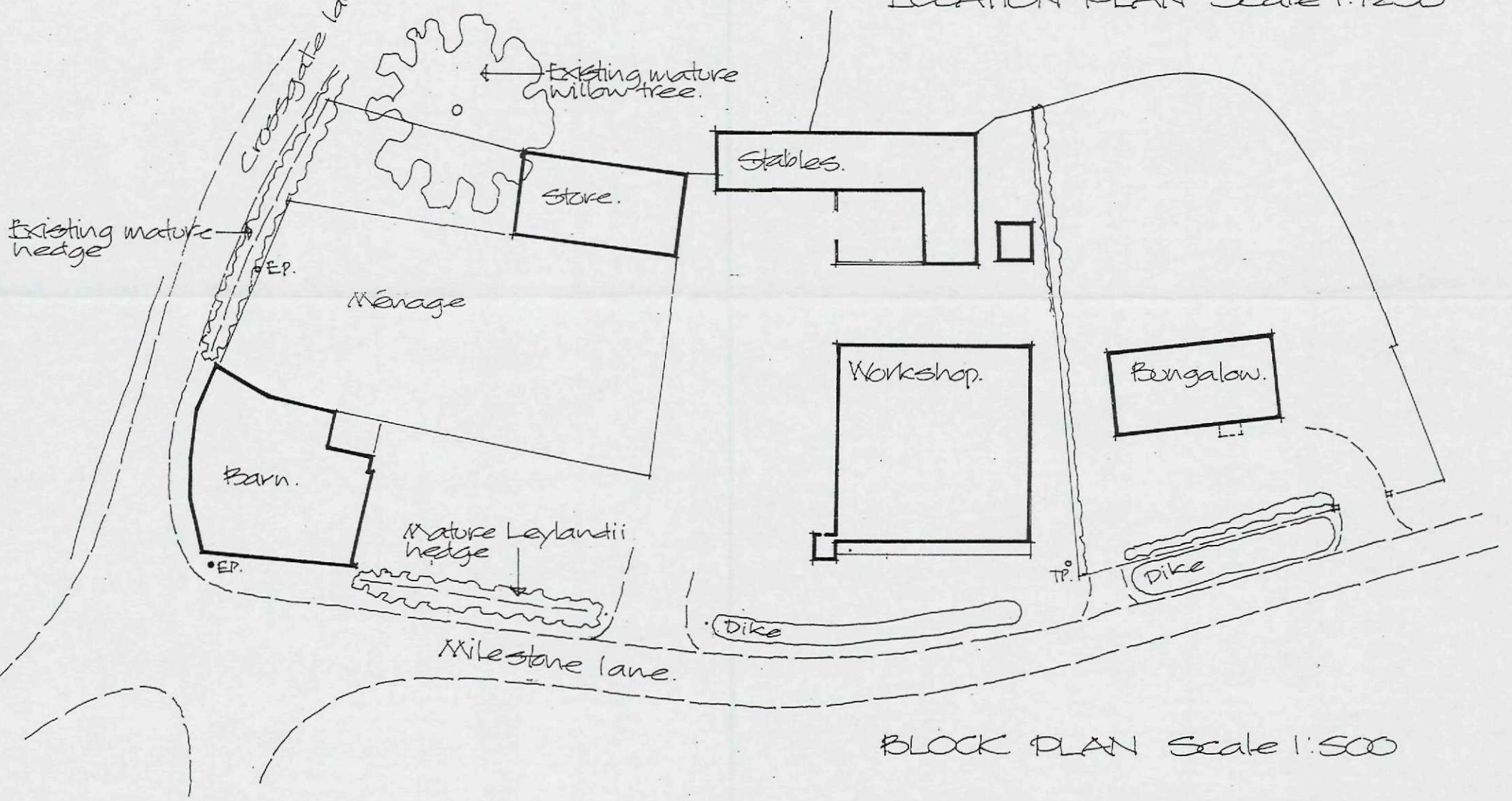
10.1 As a result of the assessment, the following conclusions have been reached:-

- The proposed development is not in a Functional Floodplain as defined by NPPF. It is located in the Passive Floodplain protected by River Glen 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 will be 500mm above highest land levels at 4.50m aOD with flood resilient construction up to 500mm above finished floor level. Safe refuge is available at first floor level with no sleeping accommodation at ground floor level.
- On site surface water drainage will be discharged to soakaway to BRE365 specification and Building Regulations approval.


TF 202 318 Untitled map
This information is restricted to the personal use of Geoff Beel (geoff.beel@tiscali.co.uk)
TF 276 318
Gosberton
Marsh
Westhorpe
Risegate Eau
The Gables
Swale Bank Fm
Cressy Hall
Cawood Hall
Wargate
Belnie
B 1397
Chespool Ho
Burnt Ho
Bird's Drove Fm
Red House Fm
Risegate
Panton House Fm
Wks
A 152
Cheal Br
Bendike Ho
Gosberton Cheal
B 1356
Cheal House Fm
Surfleet Seas En
Surfleet
Beachbank Fm
Newlands Fm
Marsh Fm
River Glen
Hill Marsh Fm
Pinchbeck Marsh
Burtey Fen Collection
North Gate Fm
Crosslane Fm
Crossgate
Wykeham
Pinchbeck
Peartree Ho
Money Br
B 1180
Home Fm
Otway Ho
Pinchbeck West
Chase Fm
Festival Gardens
Willoughby Ho
Mill Green Ho
Chestnut Ho
Springfields
Lindum Ho
Reedshoals
Vernatts Drain
The Hollies
Fulney
Fulney Ho
SPALDING
Crown Hall Fm
Pode Hole
Monk's Ho
A 151
Cuckoo Junction Fm
Clay Lake
Low Fulney
Windcatch Fm
Horseshoe Br
Little London
Fen End
Lowfield's F
Cuckoo Br
Spalding
Charlton Fm
1 kilometre
1 mile
330000m
320000m
TF 202 199
TF 276 199
Ordnance Survey
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LOCATION PLAN Scale 1:1250



BLOCK PLAN Scale 1:500

Project
PROPOSED DEVELOPMENT AT THE JUNCTION OF MILESTONE LANE AND CROSSGATE LANE, PINCHBECK, SPALDING.
SITE LAYOUT AS EXISTING

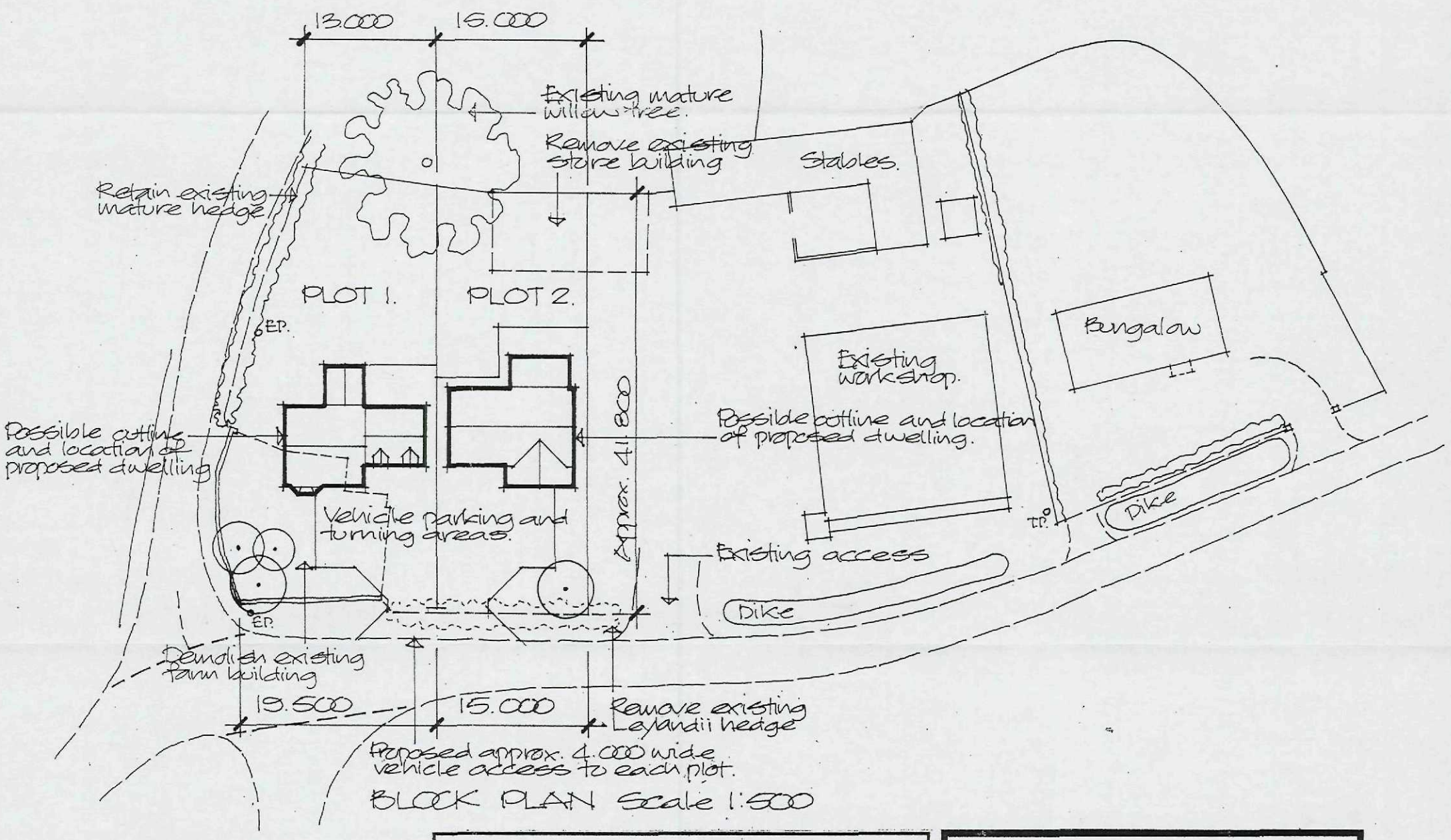
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Tel. Holbeach (01406) 380591

Client
MR & MRS R HART

Scale 1:500 & 1:1250 Drg. no. 13/22/01
Date September 2013



LOCATION PLAN Scale 1:1250



BLOCK PLAN Scale 1:500

Project
PROPOSED DEVELOPMENT OF SITE FOR TWO BUILDING PLOTS AT THE JUNCTION OF MILESTONE LANE AND CROSSGATE LANE, PINCHBECK, SPALDING.

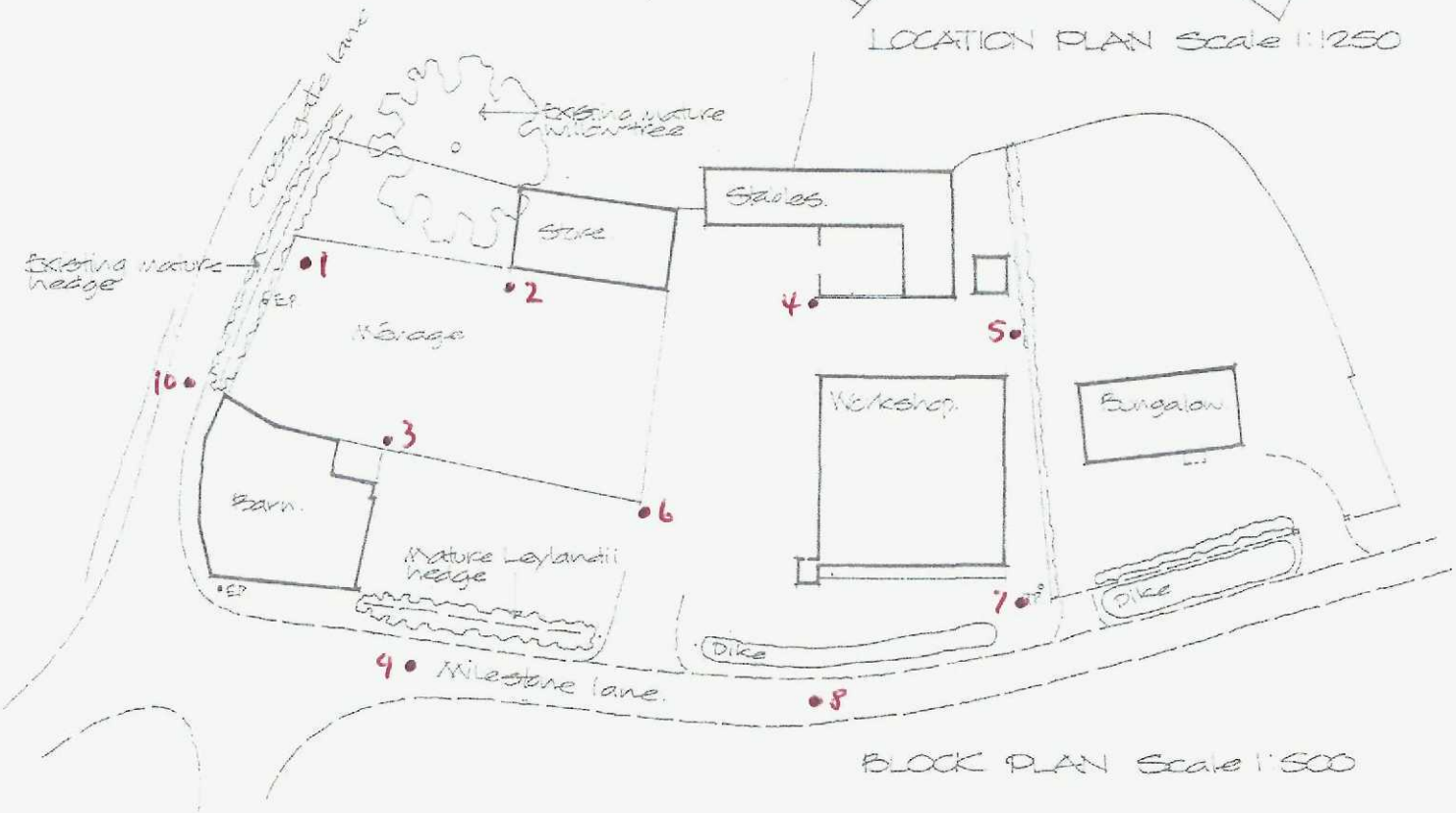
Client
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Scale 1:500 & 1:1250 Drg. no. 13/22/03
Date March 2014



LOCATION PLAN Scale 1:1250



BLOCK PLAN Scale 1:500

✳ • Approx location of levels.

Project
PROPOSED DEVELOPMENT AT THE JUNCTION OF MILESTONE LANE AND CROSSGATE LANE, PINCHBECK, SPALDING.
SITE LAYOUT AS EXISTING

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Client
MR & MRS R HART

Scale 1:500 & 1:1250 Drg no. 13/22/01
Date September 2013

Points Co-ordinates for proposed development at the junction of:

Milestone Lane and Crossgate Lane,

Pinchbeck,

Spalding.

Pts	Easterns	Northerns	Heights
1.	524312.912	326709.515	3.879
2.	524295.368	326701.288	3.905
3.	524297.266	326719.916	3.967
4.	524270.022	326685.436	3.491
5.	524252.152	326677.165	3.748
6.	524272.576	326711.445	3.620
7.	524236.456	326696.219	3.732
8.	524248.202	326717.138	3.511
9.	524285.089	326737.957	3.403
10.	524316.650	326725.736	3.641

Please see PDF for the 10 point locations.

Environment Agency

Enter a postcode or place name:

Pinchbeck, Lincolnshire

Go

Other topics for this area...

Flood Map for Planning (Rivers and Sea)

Flood Map for Planning (Rivers and Sea)

X: 524,294;Y: 326,426 at scale 1:10,000

Data search

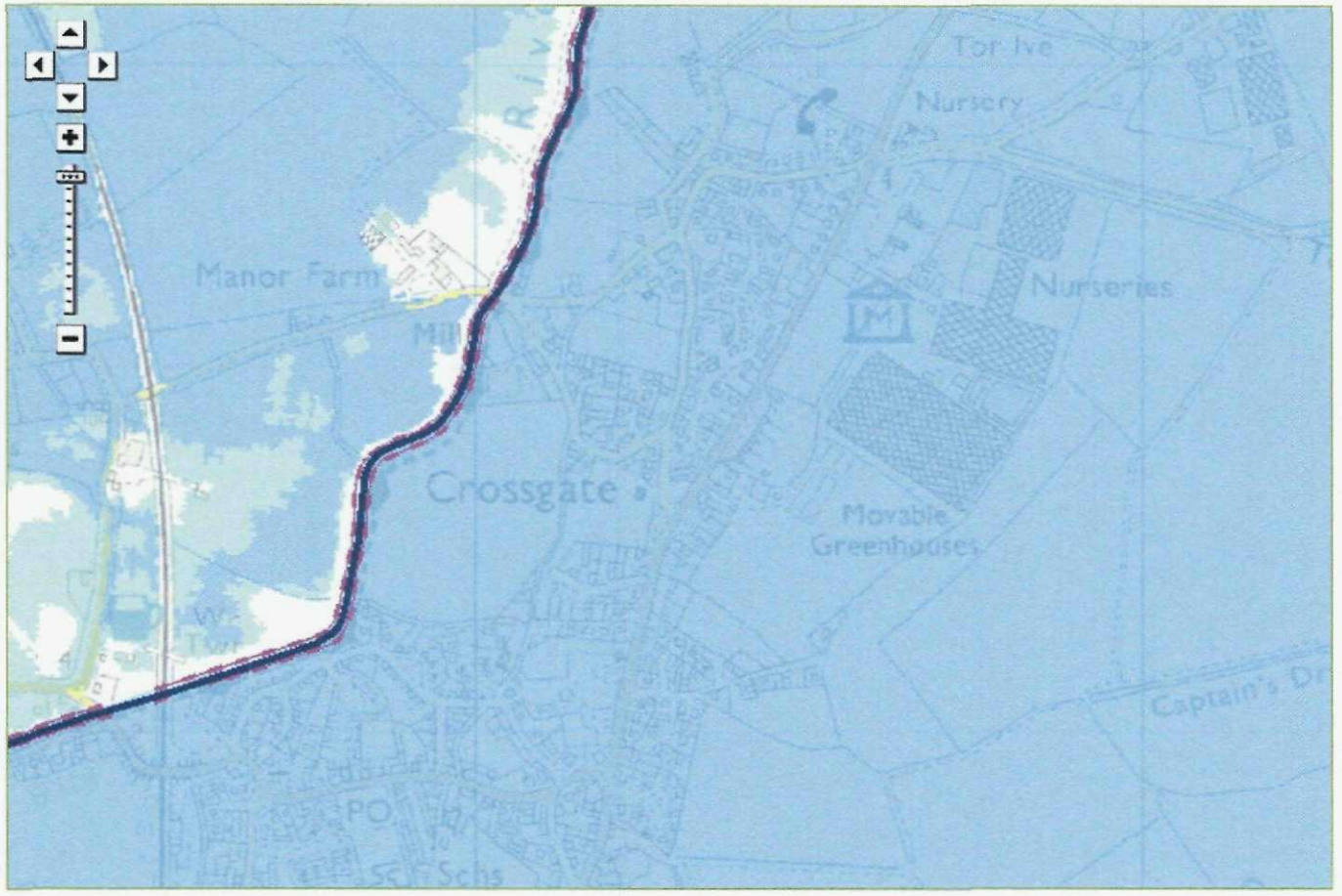
Text only version

Map legend

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

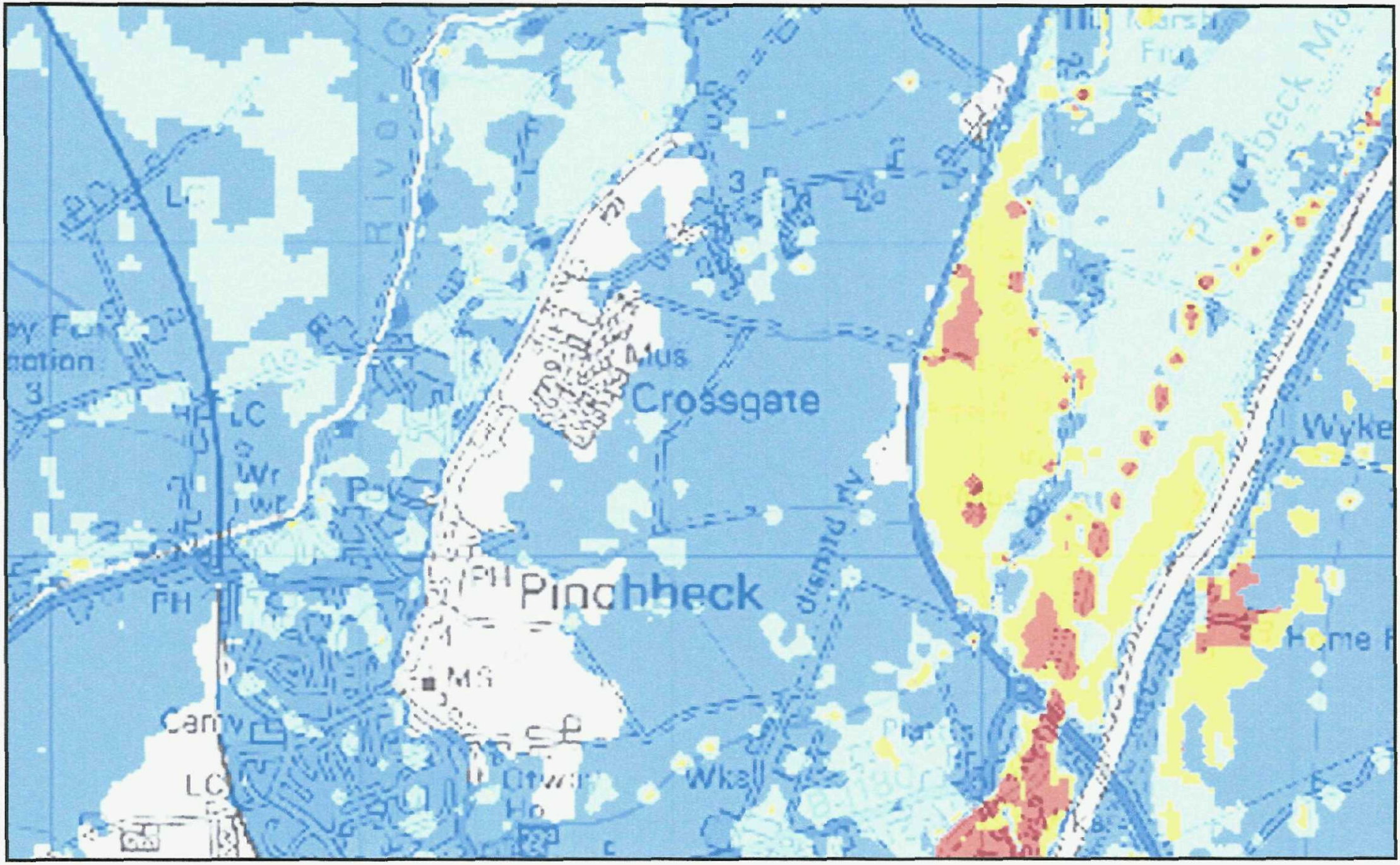
Flood Map for Planning (Rivers and Sea)

- Flood Zone 3
- Flood Zone 2
- Flood defences (Not all may be shown*)
- Areas benefiting from flood defences (Not all may be shown*)
- Main rivers

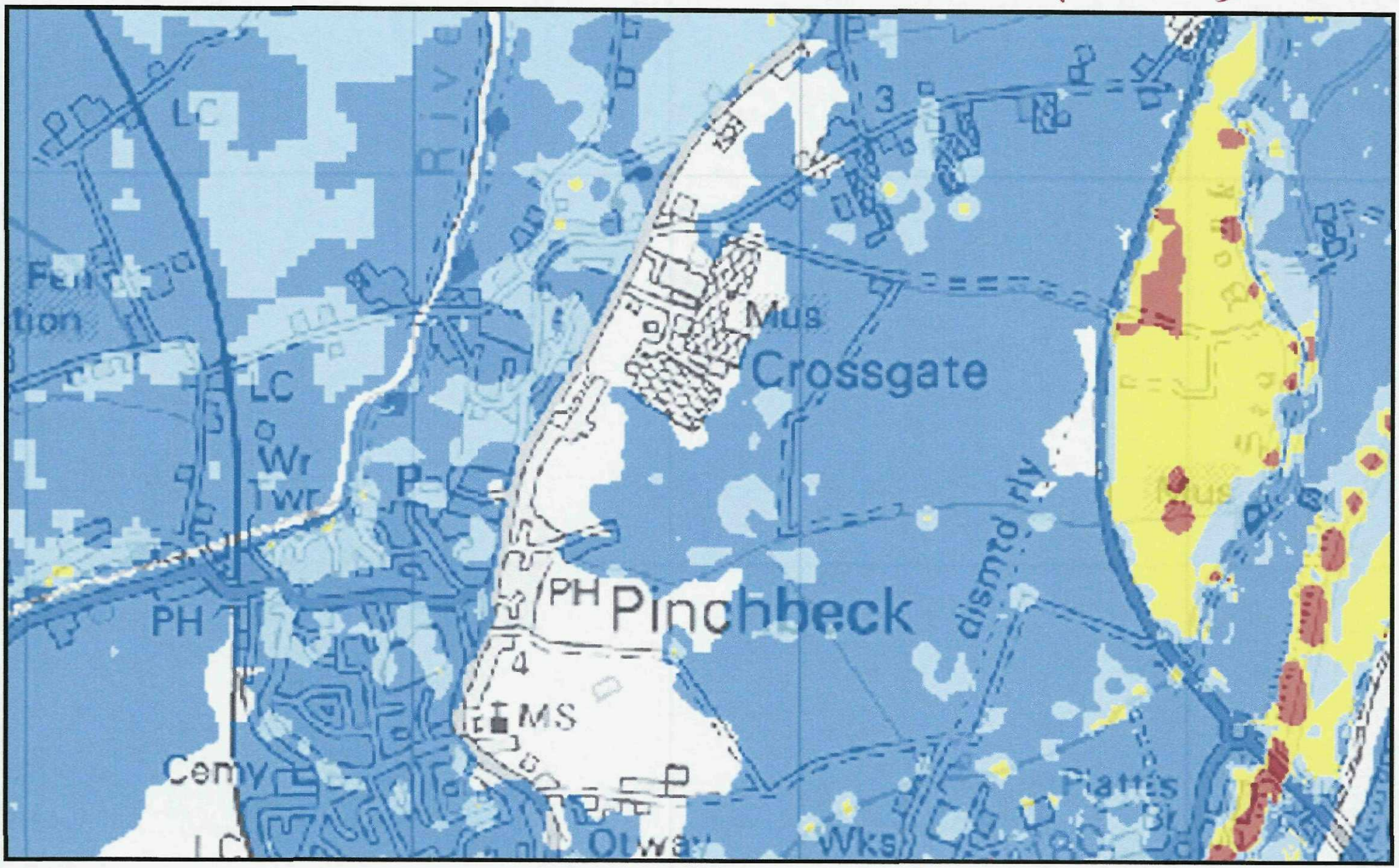


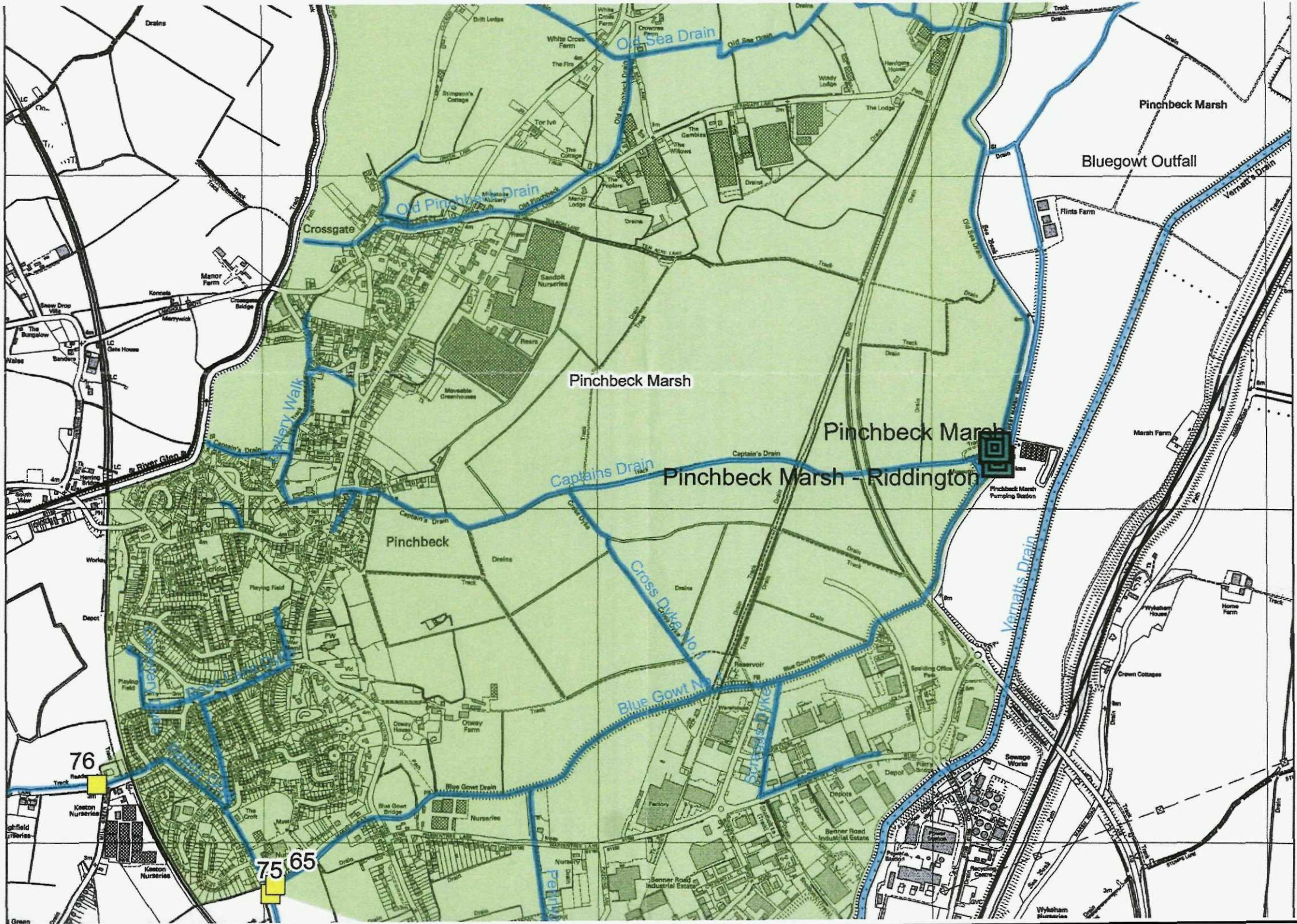
Customers in Wales - From 1 April 2013 Natural Resources Wales (NRW) has taken over the responsibilities of the Environment Agency in Wales.
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Actual Depths of Flooding (2115)



Residual Depths of Flooding (2115)




Old Sea Drain
Old Pinchbeck Drain
Crossgate
Pinchbeck Marsh
Bluegowt Outfall
Vernatt's Drain
Pinchbeck Marsh - Riddington
Captains Drain
Pinchbeck
Cross Dyke No 1
Blue Gowt Main
Blue Gowt Drain
Spring Dyke
Vernatts Drain
Pinchbeck Marsh Pumping Station
76
75
65