

FLOOD RISK ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT AT LOW LANE, HOLBEACH, Lincs.

FINAL REPORT

GEOFF BEEL CONSULTANCY

NOVEMBER 2014

**GCB/STUDIO 11
ARCHITECTURE**

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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 –
Studio 11 Architecture Ltd drg. no. 206.LP.01

Fig 2 - Site Layout –
Studio 11 Architecture Ltd drg. no. 206.SL.01

Fig 3 - Site Survey –
Axis Surveys Ltd drg. no. AS1321/2

Fig 4 - Environment Agency Flood Zone Map

Fig 5 - South Holland District Council Strategic Flood Risk
Assessment (2010) Extent of Flooding - 2115

Fig 6 - Environment Agency Tidal Hazard Mapping –
Depth, Hazard & Velocity – 1 in 200 and 1 in 1000 year
events (2115) – CCN-2014-37888

Fig 7 - South Holland Internal Drainage Board district plan

1.0 INTRODUCTION

- 1.1 A full planning application is to be submitted by Studio 11 Architecture Ltd on behalf of Benchmark Properties for proposed residential development at Low Lane, Holbeach, Spalding, Lincs.
- 1.2 A Flood Risk Assessment is required to accompany the planning application and 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, as situated, is located within Flood Zone 3, of the Environment Agency's Flood Zone Maps. The latest Agency Flood Maps have been created as a tool to raise awareness of flood risk with the public and our partner organisations, such as Local Authorities, Emergency Services and Drainage Authorities. The Maps do not take into account any flood defences.

The site however is also shown in Flood Zone 1 and outside of any Hazard Zone in year 2115 of the South Holland District Council's Strategic Flood Risk Assessment Maps (2010).

The site is also located in the South Holland IDB drainage district.

- 1.3 Geoff Beel Consultancy was appointed on 6th November 2014 to undertake a Flood Risk Assessment.

2.0 LOCATION

- 2.1 The development site is located at Low Lane, Holbeach. The National Grid Reference of the central point of the development is TF 36602550.
- 2.2 The position and extent of the site is shown on Fig 1 – Location Plan at the end of the document.
- 2.3 The site, located within the South Holland Internal Drainage Board district is shown within Flood Zone 3 as detailed on the Environment Agency Flood Zone Maps and in Flood Zone 1 of the Council's Strategic Flood Risk Assessment Maps (2010) as defended by the Agency's tidal defences and the Internal Drainage Board system in year 2115.

3.0 THE SITE AND SEQUENTIAL TEST

- 3.1 The site is currently agricultural land.
- 3.2 The area of development is approximately 0.40 hectare.
- 3.3 The proposed site layout consists the construction of some 43 two-storey residential dwellings. Existing land level varies between 2.90m and 3.14m whilst Low Lane carriageway level varies between 3.24m and 3.60m aOD.

- 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 both the 1 in 200 year return period tidal event and the 1 in 100 year return period fluvial event.

The site is located in Flood Zone 1 in year 2115 of the Council's Strategic Flood Risk Assessment Maps (2010) and hence the Sequential Test is met.

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 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 embankment is considered to be small.

The development site within the South Holland Internal Drainage Board is protected by the Wash tidal defences to the Holbeach Marsh frontage with embankment levels of a minimum of 7.00m aOD.

- 4.2 The site and the surrounding land drains by gravity to Board drains north of the site to the Holbeach River Tidal Sluice and hence to the River Welland.
- 4.3 The existing standard of drainage for the South Holland Internal Drainage Board is 1 in 50 years return period, compatible with the Department of the Environment, Food and Rural Affairs target level of service for rural drainage and flood defence works. Freeboard of 900mm is provided to the lowest land levels.
- 4.4 Current maintenance standards within the South Holland Internal Drainage Board and of the Environment Agency defences 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.

5.0 POTENTIAL SOURCES OF FLOODING

- 5.1 Five potential sources of flooding have been identified as a result of this assessment:
- a) local blockages to riparian drains
 - b) local blockages to IDB main drain system.
 - c) storm return period of 1 in 50 years being exceeded
 - d) failure of Holbeach River Outfall Sluice
 - e) overtopping and breaching of defences of the Wash tidal defences

- 5.2 The probability of flooding from source a) is low as the existing riparian drain within the development site boundary appears to flow beneath Battlefields Lane South in an easterly direction to flow to the Board's main drain system.

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

The probability of flooding from c) is also low due to the South Holland 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.

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 Board's 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 developments to the arterial system enables a flexible approach to be adopted and meet the criteria for "sustainable urban drainage".

- 5.2 Failure of Holbeach River Outfall Sluice may occur due to long term mechanical breakdown or power supply being disrupted. However, in these circumstances, if conditions were such as 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.

- 5.4 The flood embankments to the Wash tidal defences provide a 1 in 200 year return period level of protection.

The 1 in 200 year tidal event to the Holbeach Marsh frontage inclusive of climate change to 2115 is estimated to be 7.20m aOD as against existing embankment levels of a minimum of 7.00m aOD. The tidal surge event of 5th/6th December 2013 reached 6.17m aOD.

There is a low risk during such an event for wave and wind action to cause overtopping and/or breaching of the first line defences. However, the site is further protected by second line defences with embankment levels of 6.00m aOD. Any overtopping/breaching would therefore not reach the development site which is again further protected by land levels at 3.00m aOD which are well above surrounding land levels.

More recent Tidal Hazard Mapping produced by the Environment Agency and shown in Fig 6 of this Flood Risk Assessment shows the site could be affected by floodwaters varying between 0.00m and 0.50m depth above ground level as a result of a breach occurring to The Wash tidal defences in 2115.

- 5.5 The Environment Agency has recently published The Wash Shoreline Management Plan 2 from Gibraltar Point to Old Hunstanton. The summary of the plan between Gibraltar Point and Wolferton Creek is as follows:-

The intent of management for this Policy Development Zone (PDZ) is to sustain flood defence for the communities and their hinterland on the low-lying areas around The Wash. This includes an increase of management as needed to sustain the current level of flood risk in the face of climate change.

- 5.6 Surface water drainage from the development site will be to soakaways designed to BRE365 requirements and Building Regulations approval.

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.
- 7.2 The probability of the site flooding with water from any South Holland IDB main drain 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.
- 7.3 The probability of the site flooding with tidal waters from any main river system is less than 1% because of the standards of the existing flood defences and the location of the site.
- 7.4 If under very extreme events, levels of floodwater from the South Holland IDB main drains 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.
- 7.5 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 the proposed floor levels at 300mm above Low Lane carriageway level will be appropriate for the design life of the development (i.e. 100 years).

8.0 IMPACTS OF FLOODING

- 8.1 No significant impacts of flooding are anticipated.
- 8.2 Floor levels of the development will be 300mm above Low Lane carriageway levels which together with the proposed soakaway drainage system will offer additional protection against impacts arising from any extreme short duration, localised events.
- 8.3 The general location of the site within the catchment is such that if flooding occurred from any of the South Holland IDB main drain 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 as existing soakaway drainage system will be utilised.
- 8.5 Safe and dry access/egress is available to and from the site onto Battlefields lane South in a south westerly direction to Holbeach town centre in Flood Zone 1.
- 8.6 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, contact tel no: 0845 988 1188.

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 the South Holland IDB area and its location 9.00kms. from The Wash tidal defences with secondary defences between the marsh frontage and the site.
- 9.2 The site is within Flood Zone 1 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 (2010) of the whole district by appointed Consulting Engineers.

The Strategic Flood Risk Assessment (2010) 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 to account for the effects of climate change.

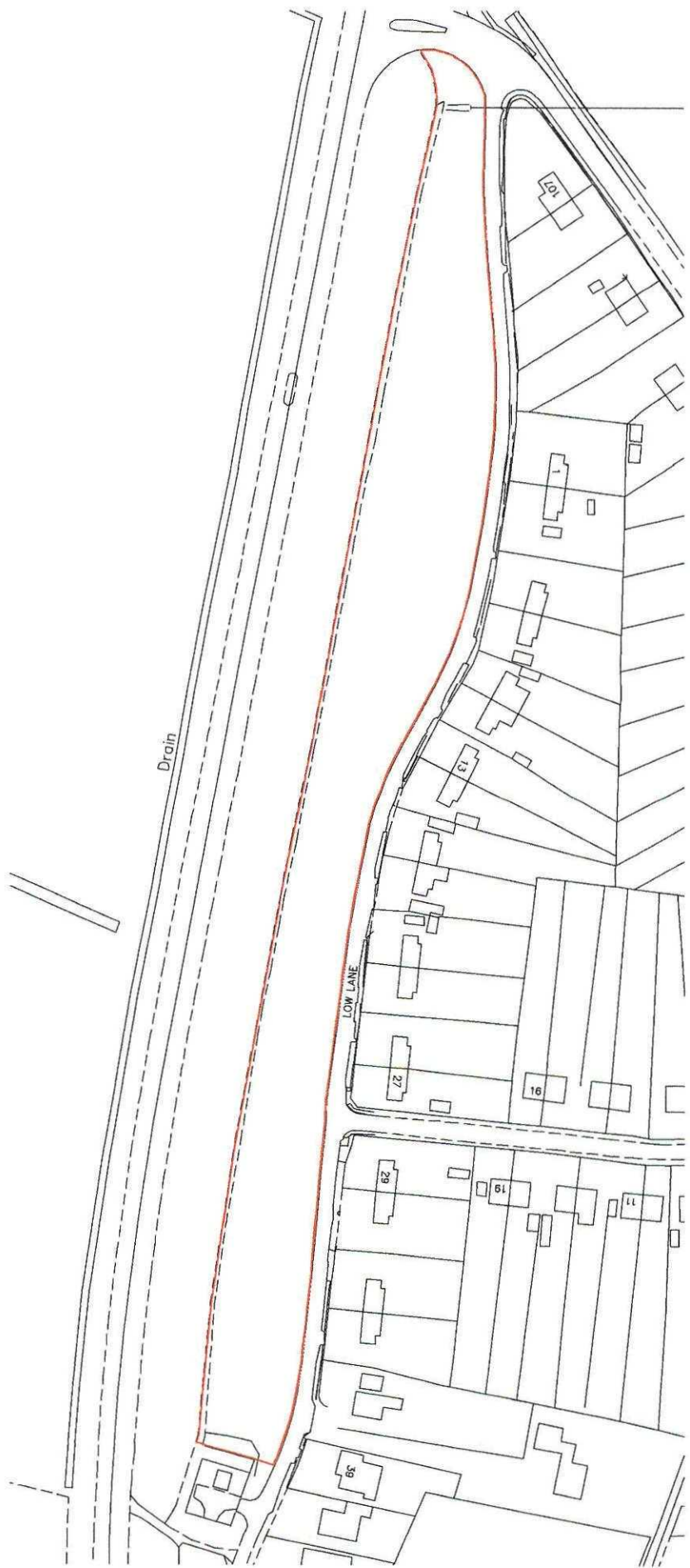
Breach scenarios of embankments failing and/or being overtopped have also been carried out to establish Flood Risk Zones. As a result of the Strategic Flood Risk Assessment (2010) the site is outside any Hazard Zone and defended by tidal defences and tidal doors inclusive of climate change up to 2115.

10.0 CONCLUSIONS AND RECOMMENDATIONS

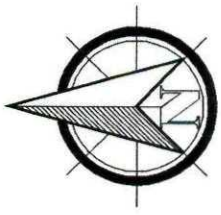
- 10.1 As a result of the assessment, the following conclusions have been reached:-

- The proposed development is in a Defended Floodplain. It is located in the Passive Floodplain protected by defences to a 1 in 200 year return period, (1.0%)
- The site is in Flood Zone 1 with the actual risk of flooding from any Environment Agency river system being very low (less than 0.5%).
- 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.
- On site rainwater from the development will be discharged via soakaway drainage to BRE365 design requirements.
- Floor levels of the development will be 300mm above existing Low Lane carriageway level with safe refuge at first floor level.

Do not scale directly from this drawing. All discrepancies are to be brought to the attention of the below office.
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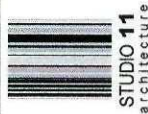


PLANNING APPLICATION



REVISION DATE DRAWN DESCRIPTION

CLIENT Benchmark Properties
PROJECT Proposed residential development at Low Lane, Holbeach
DRAWING Location Plan



STUDIO 11
architecture

SCALE 1:1250 @ A3 DRAWN KB DATE 30.10.2014

DRAWING NO.
206.LP.01

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Housetype Schedule

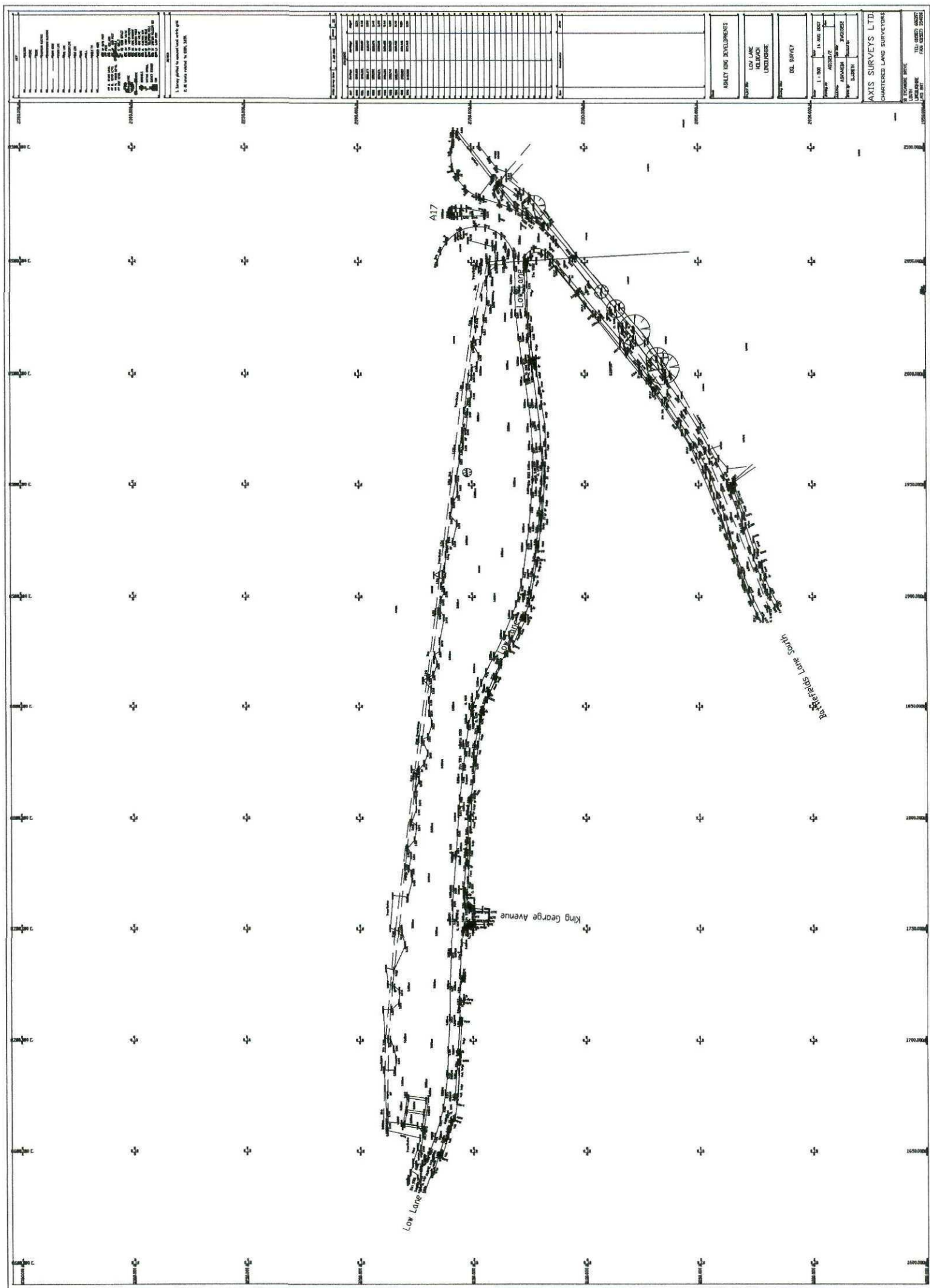
1 Bedroom House		
K231B01-B	Plots 12, 13	2
		2
2 Bedroom House		
K232B01-B	Plots 32, 33, 34, 35	4
		4
3 Bedroom House		
K233B01-B	Plots 1, 2, 7, 8, 9, 10, 24, 25, 26, 27, 39, 40	12
K233B02-B	Plots 19, 20, 21, 22	4
K233B03-R	Plots 36	1
K233B04-B	Plots 11, 18, 23, 41, 42, 43	6
		23
1 Bedroom Affordable House		
Aff-1B2P-01R	Plots 3, 4, 5, 6, 14, 15	6
Aff-1B2P-01SO	Plots 16, 17	2
		8
2 Bedroom Affordable House		
Aff-2B4P-01R	Plots 28, 29, 30	3
Aff-2B4P-01SO	Plots 31	1
		4
3 Bedroom Affordable House		
Aff-3B5P-01R	Plots 38	1
Aff-3B5P-01SO	Plots 37	1
		2
Total		43



KEY

	Existing tree/landscaping to be retained		1.8m panel fence between plots
	Proposed Tree		1.2m estate rail fencing
	Proposed hedge		1.2m post & rail fence
	Proposed shrub planting		1.8m garden wall
	1.8m close board fence		







Enter a postcode or place name:

Holbeach, Lincolnshire

Go

Other topics for this area...

Flood Map for Planning (Rivers and Sea)

Other maps Data search Text only version

Holbeach, Lincolnshire at scale 1:10,000

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

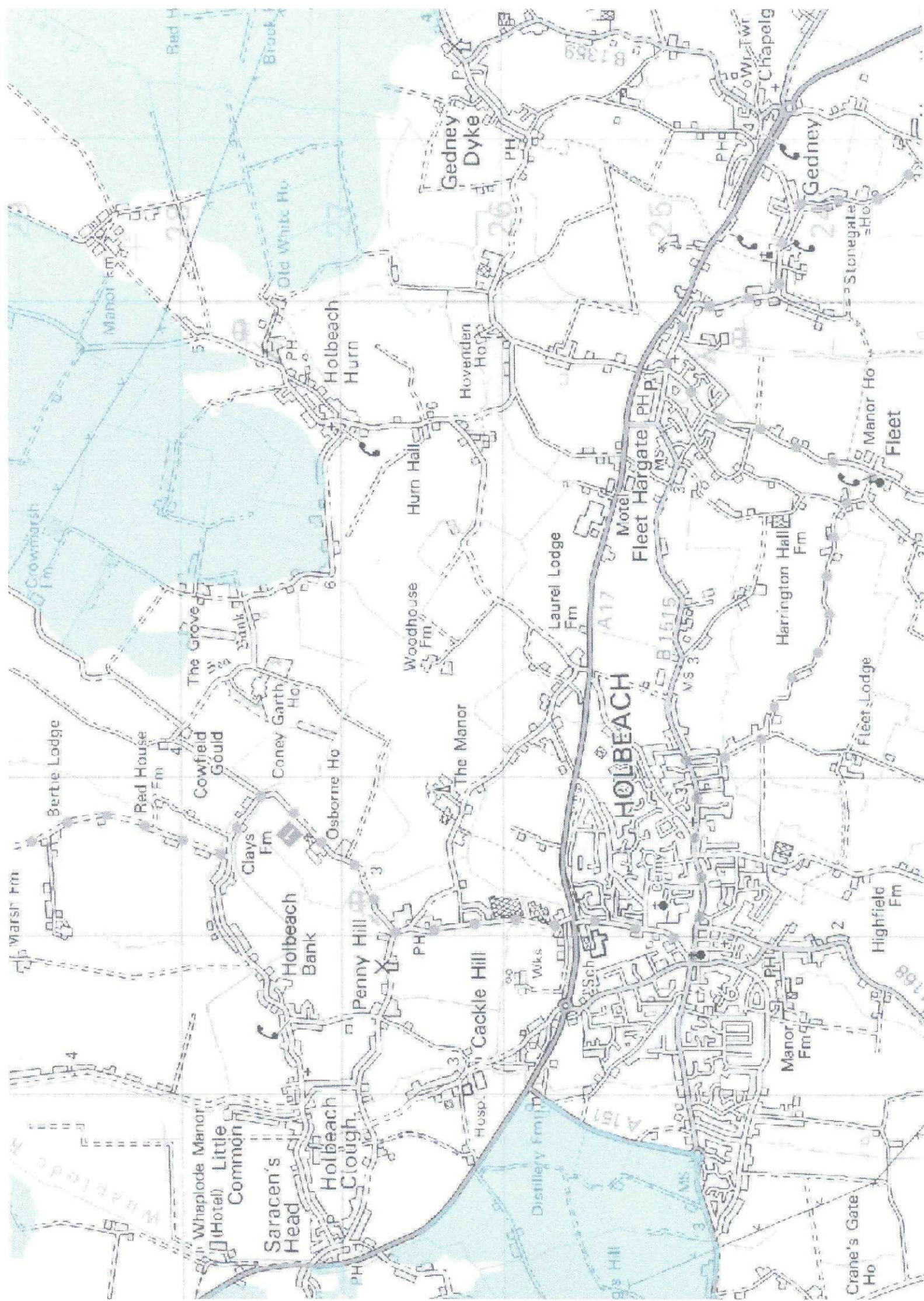
Flood defences (Not all may be shown*)

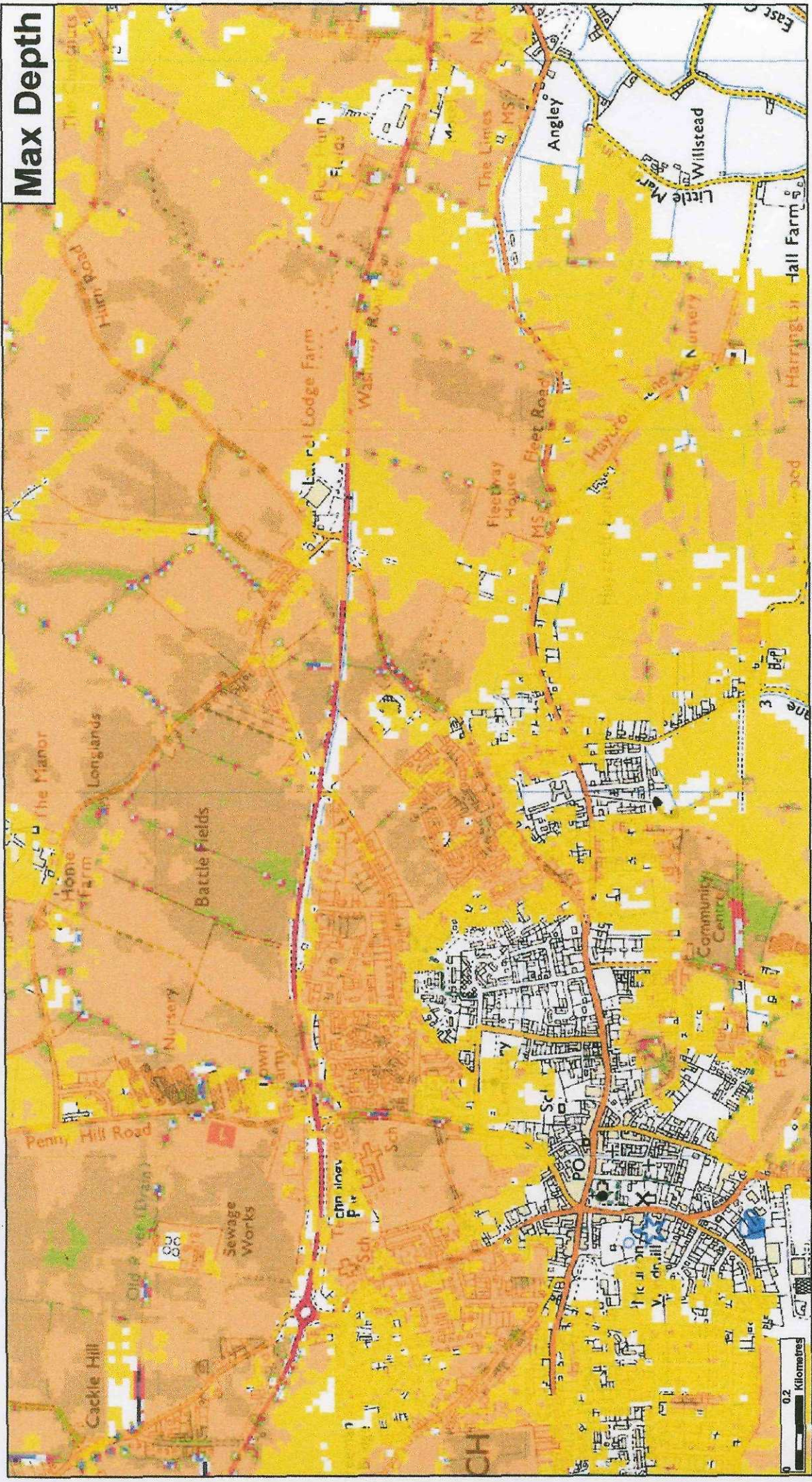
Areas benefiting from flood defences (Not all may be shown*)

Main rivers

The map displays the area around Holbeach, Lincolnshire, with a scale of 1:10,000. It shows various flood zones: Flood Zone 3 (dark blue) covers most of the area, while Flood Zone 2 (light blue) is located along the River Great Ouse. Flood defences are indicated by a red line along the river. Areas benefiting from flood defences are shown with a black and white hatched pattern. Main rivers are shown in dark blue. The map also includes labels for 'Sewage Works', 'Technology Park', 'POB' (Port of Boston), and 'Battle Fields'. A legend in the bottom left corner explains the symbols used on the map.

<http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=536500.0&y=325500.0&topic=floodmap&ep=map&scale=9&locatio...> 20/11/2014





Max Depth

Produced by the Partnerships & Strategic Overview Team, Lincoln

Northern Area Tidal Breaching Hazard Mapping

Map Centered on TF 37134 25318

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This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped.

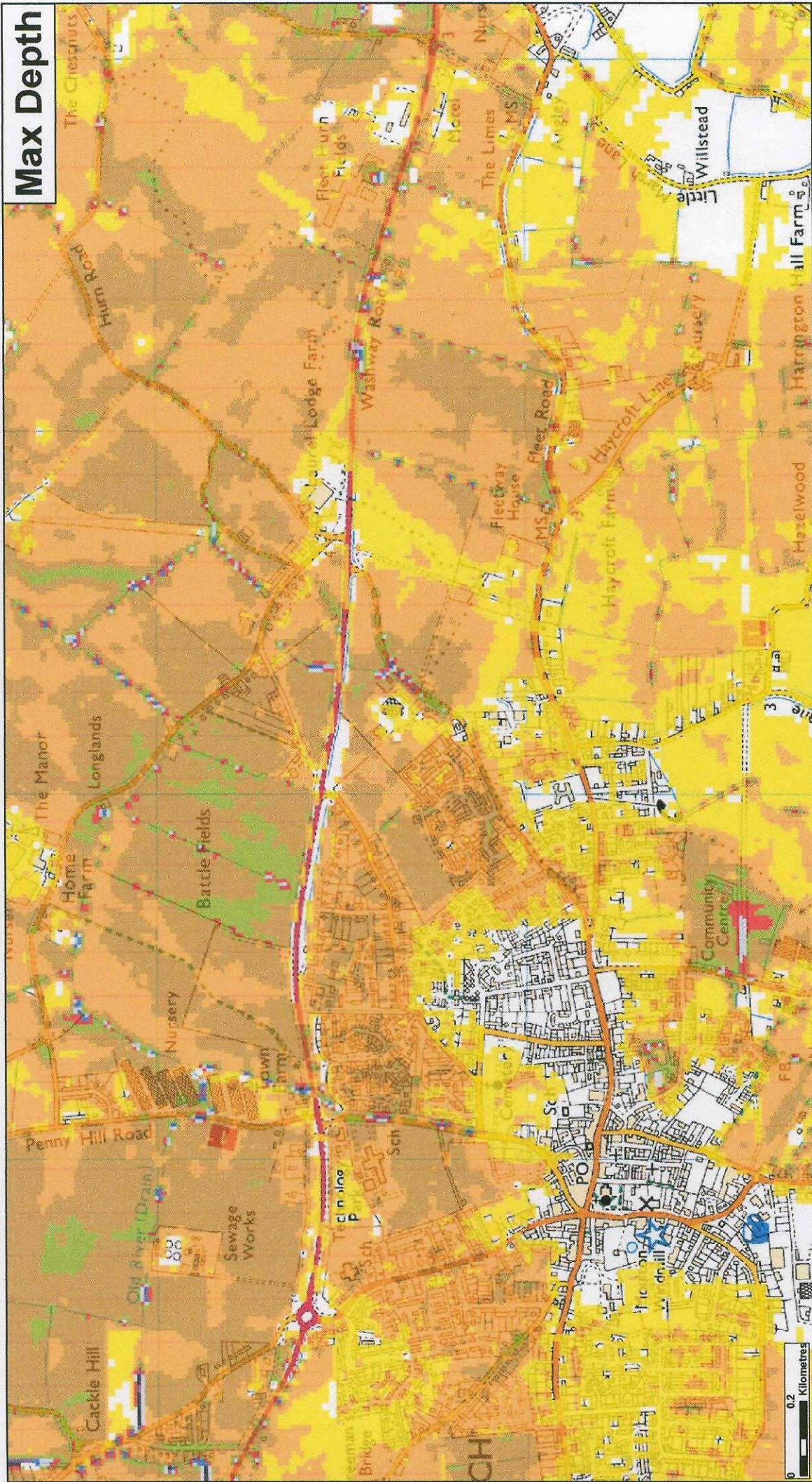
The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results.

The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. The likelihood of a breach occurring will depend on a number of different factors, including the construction and condition of the defences in the area. A breach is less likely where defences are of a good standard, but a risk of breaching remains.

General Enquiries No: 03708 506 506. Calls to 03 numbers cost the same as calls to standard geographic numbers (i.e. numbers beginning with 01 or 02).

Max Depth (m)			Scenario year	2115	Scenario Annual Chance	0.5% (1 in 200)
Date Printed	October 2014					
0 - 0.25	0.75 - 1	1.5 - 1.75				
0.25 - 0.5	1 - 1.25	1.75 - 2				
0.5 - 0.75	1.25 - 1.5	2+				

Max Depth



Max Depth (m)		Scenario		Scenario Annual Chance
Date Printed	October 2014	Scenario year	2115	
0 - 0.25	0.75 - 1	0.1% (1 in 100)		
0.25 - 0.5	1 - 1.25			
0.5 - 0.75	1.25 - 1.5			
	2+			

This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped.

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Produced by the Partnerships & Strategic Overview Team, Lincoln

Northern Area Tidal Breaching Hazard Mapping

Map Centred on TF 37134 25318

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