FLOOD RISK ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT AT MAPLE TREE FARM, LUTTON GARNSGATE, LONG SUTTON, LINCS.

FINAL REPORT

GEOFF BEEL CONSULTANCY

FEBRUARY 2016

GCB/RUSSELL

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Lee Russell drg. no. A100.RevB.

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1.0 INTRODUCTION

1.1 A full planning application is to be submitted by Lee Russell on behalf of Mr & Mrs L Russell for proposed residential development at Maple Tree Farm Buildings, Lutton Garnsgate, Long Sutton, Lincs.

1.2 A Flood Risk Assessment is required to accompany the planning application and meet the requirements and general principles of the Planning Practice 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 is also shown in Flood Zone 1 of the South Holland District Council's Strategic Flood Risk Assessment Maps.

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

1.3 Geoff Beel Consultancy was appointed on 2nd February 2016 to undertake a Flood Risk Assessment.

2.0 LOCATION

2.1 The development site is located at Maple Tree Farm Buildings, Lutton Garnsgate. The National Grid Reference of the central point of the development is TF 41752230.

2.2 The position and extent of the site is shown on Fig 1 – Site 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 Map as defended by the Internal Drainage Board system.

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is currently redundant agricultural buildings.

3.2 The area of development is approximately 0.08 hectare.

3.3 The proposed site layout consists the conversion of the redundant barns to a proposed two-storey dwelling.

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 and located in Flood Zone 1 of the Council's Strategic Flood Risk Assessment Map

3.5 Flood mitigation measures have been incorporated into the design and conversion of the barn with flood resilient construction incorporated up to 300mm above finished floor level to safeguard against the risk of flooding as a result of a breach to the River Nene tidal defences and to ensure the proposals pass Part 2 of the Exception Test with 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 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 South Holland Internal Drainage Board is protected by a combination of the River Welland tidal defences downstream of Spalding, the River Welland fluvial embankments as well as the River Nene tidal defences downstream of Foul Anchor.

4.2 The site and the surrounding land drains by gravity to IDB main drains to the South Holland Main Drain and hence to the tidal River Nene at the Sutton Bridge Sluice. Land level at the site is generally at 3.00m aOD.

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

a) local blockages to IDB main drain system.
b) storm return period of 1 in 50 years being exceeded
c) failure of Sutton Bridge Sluice
d) overtopping and breaching of defences of the tidal River Nene

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

5.3 Failure of Sutton Bridge 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 tidal River Nene provide a 1 in 200 year return period level of protection.

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.

5.5 The proposed drainage system is to soakaways within the development site which will accommodate the 1 in 100 year rainfall event inclusive of climate change. The drainage system will also include rainwater harvesting with the soakaways designed to BRE365 requirements.

5.6 More recent hydraulic modelling wok carried out by consulting engineers on behalf of the Environment Agency has produced Tidal Hazard Mapping and the site is shown to be outside the effects of any floodwaters.

It is however necessary to mitigate against any risks of flooding and flood resilient construction should be incorporated into the proposed barn conversion with floor levels raised and flood resistant construction incorporated up to 300mm above finished floor level.

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 fluvial 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 floor levels raised and flood resilient construction up to 300mm above finished floor level will be acceptable 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 are generally above existing ground levels which together with the flood resilient construction and the proposed 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. The site will have a soakaway drainage system such that surface water drainage is attenuated before discharging to the nearby IDB main drain.

8.5 The developer will ensure that the eventual occupiers of the property 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 Warnings Codes and uses direct warning methods where the risks and impacts of flooding are high. Indirect warnings are provided to all flood risk areas, event 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 and the occupiers of the property should register with the Floodline Direct Warnings Service to receive any future flood warnings.

8.6 Safe and dry access/egress is available after receipt of a flood warning onto Garnsgate Road and hence via the A17 and the B1515 roads to Holbeach where land is in Flood Zone 1.

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 6.50kms from the River Nene tidal defences.

9.2 The site is within Flood Zone 1 with 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 up to 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.

9.4 As a result of the Strategic Flood Risk Assessment; the South Holland Main Drain and associated IDB main drains have been determined as providing protection against a 1 in 100 year return period event up to 2115 inclusive of the effects of climate change.

9.5 The development site has been identified outside of any Flood Risk Zone from the South Holland Main Drain and associated IDB main drain up to the year 2115 but could be affected by floodwaters as a result of breaching of the River Nene tidal defences.

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. It is located in the Passive Floodplain protected by defences to a 1 in 100 year return period, (1.0%)

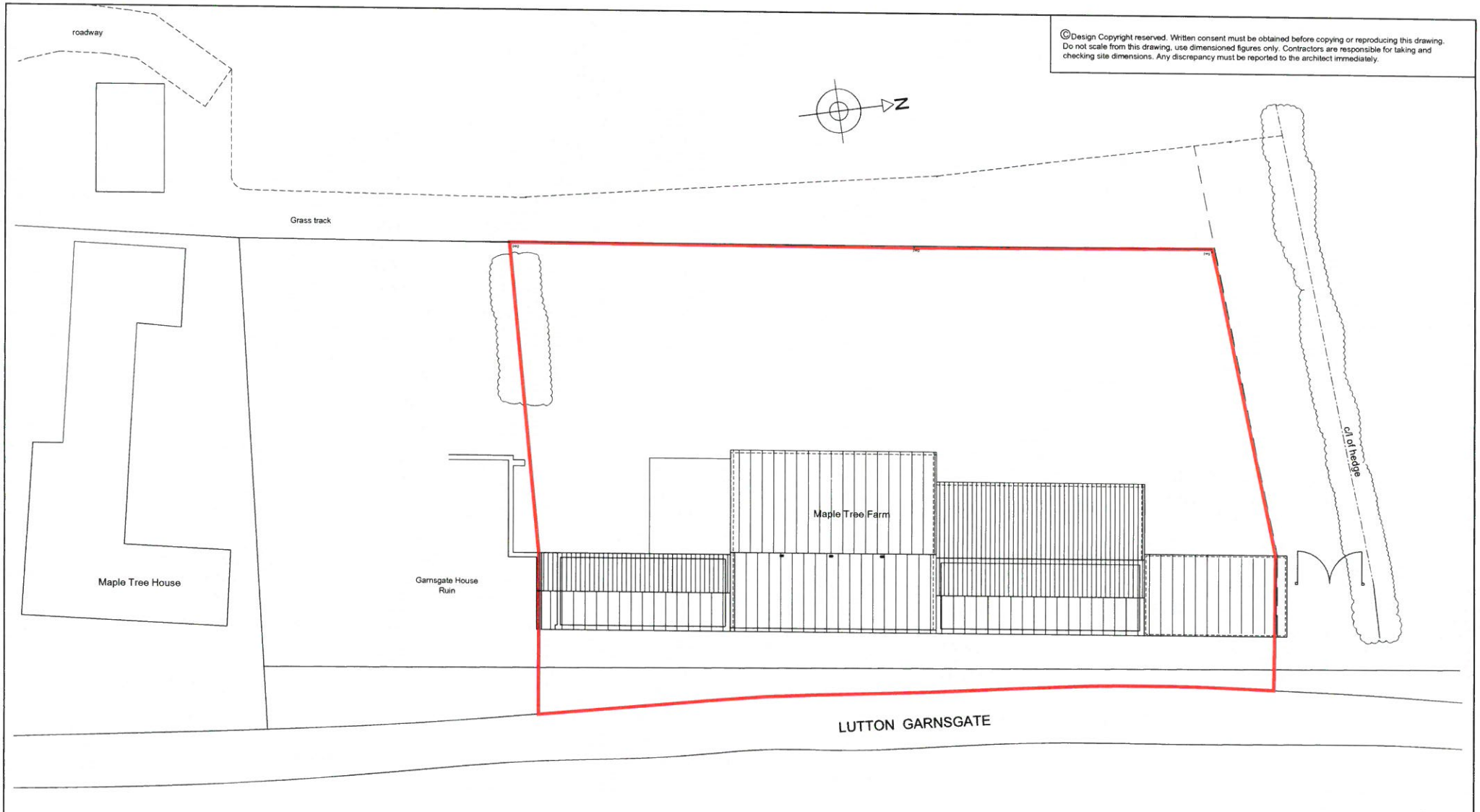
- The site is in Flood Zone 1 with the actual risk of site flooding from any Environment Agency river system being very low (less than 0.5%). The site has been identified in Flood Zone 1 of the South Holland District Council's Strategic Flood Risk Assessment Maps.

- 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 to soakaways to BRE 365 design requirements.

- Floor levels are above existing land level with flood resilient construction up to 300mm above finished floor level.

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Mr & Mrs L Russell

Project
Maple Tree Farm Buildings
Lutton Garnsgate
Long Sutton
Lincolnshire
PE12 9JP

Title
Existing Site Plan

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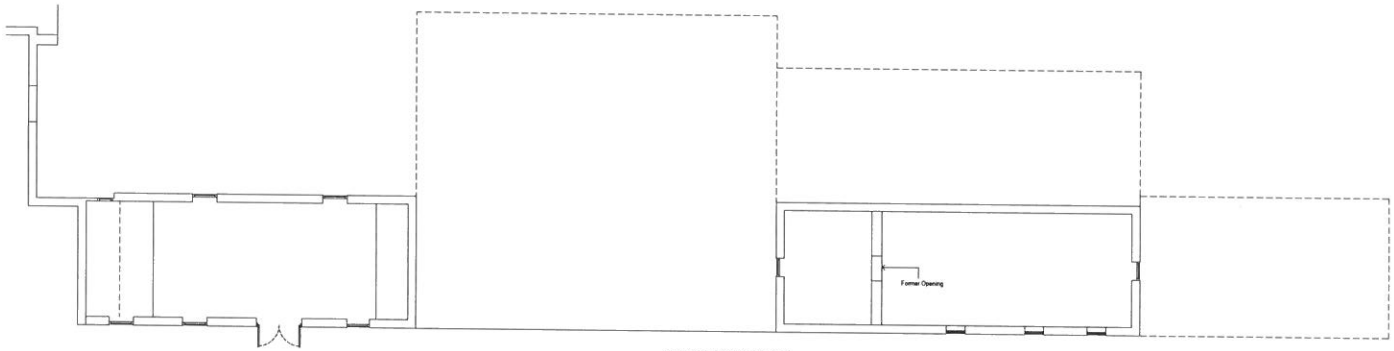
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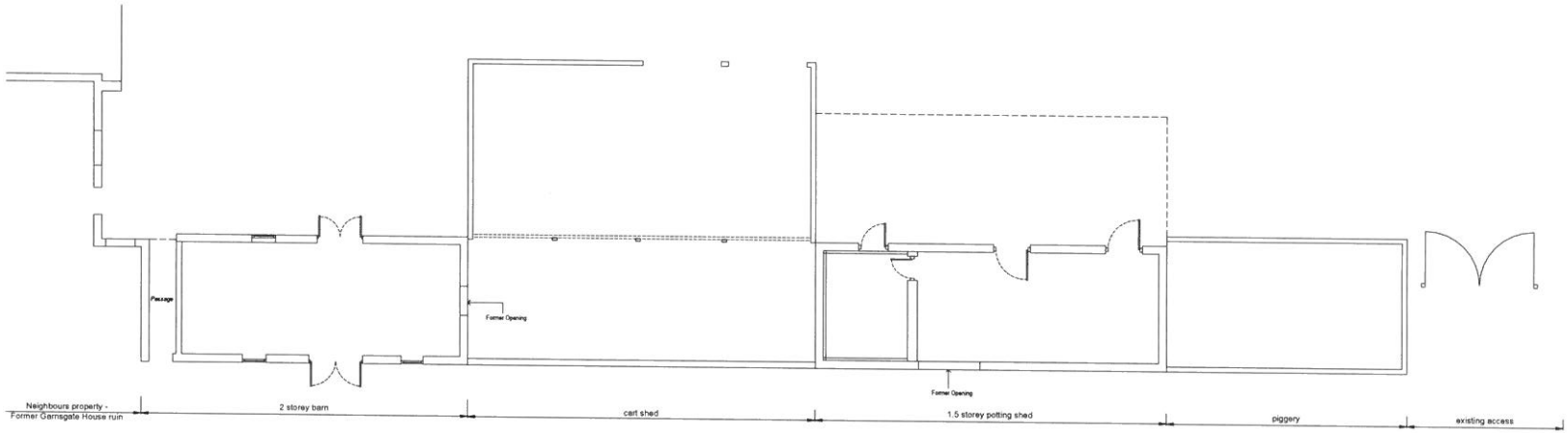
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B

A3

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EXISTING FIRST FLOOR



EXISTING GROUND FLOOR

Mr & Mrs L Russell

Scale
1:100@A1

Project
Maple Tree Farm Buildings
Lutton Garnsgate
Long Sutton
Lincolnshire
PE12 9JP

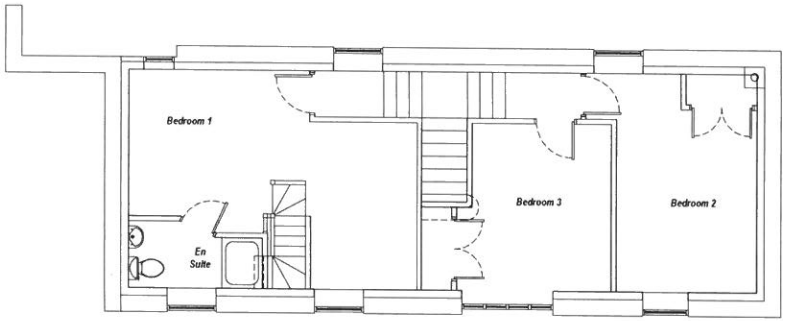
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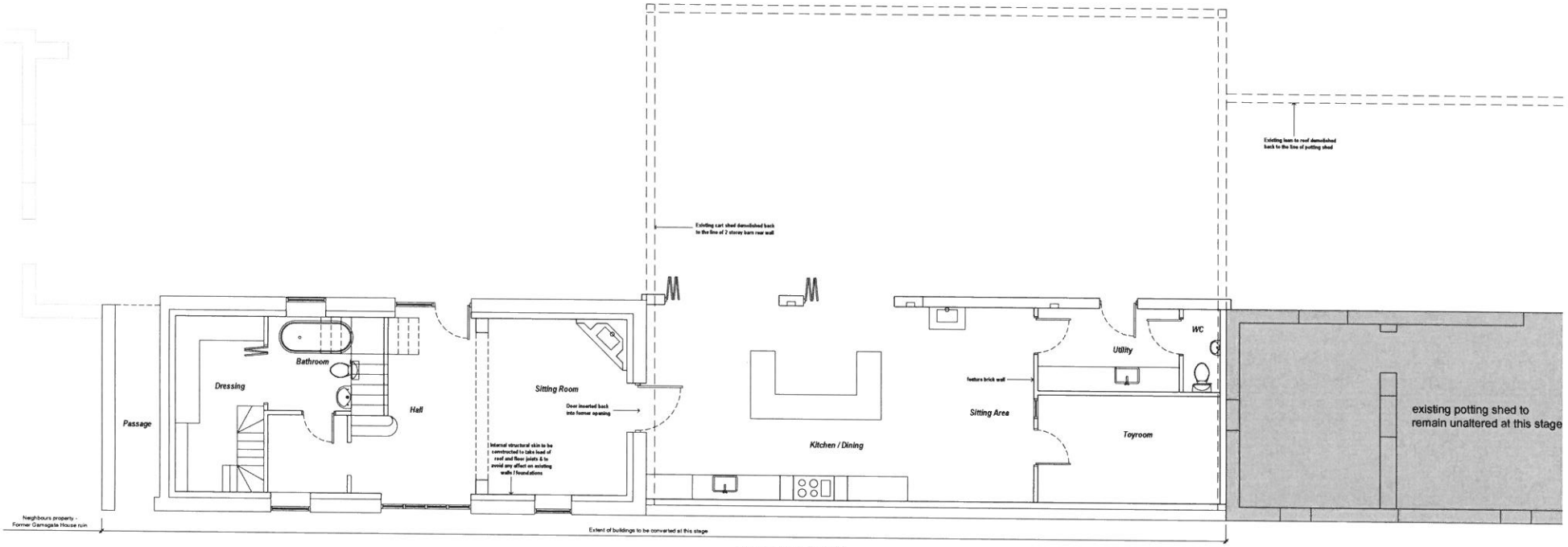
Title
Existing Floor Layouts

Revision

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PROPOSED F/F



PROPOSED G/F

Mr & Mrs L Russell

Scale 1:50@A1

Project
Maple Tree Farm Buildings
Lutton Garnsgate
Long Sutton
Lincolnshire
PE12 9JP

Date Oct 2015

Drawing No. AR2000

Title
Proposed Floor Layouts

Revision

Enter a postcode or place name:

Lutton, Lincolnshire

Go

Other topics for this area...

Flood Map for Planning (Rivers and Sea)

Flood Map for Planning (Rivers and Sea)

Map legend

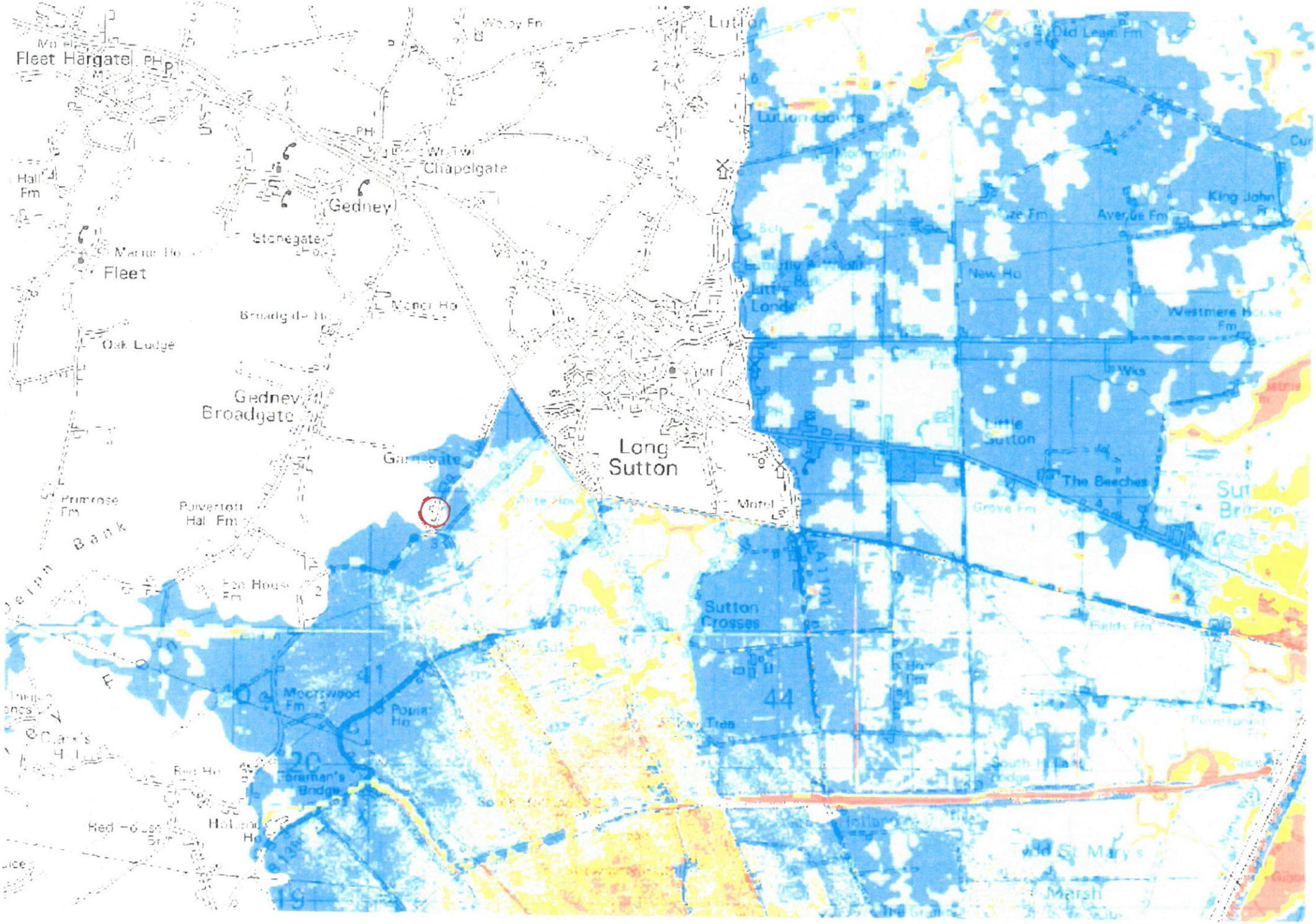
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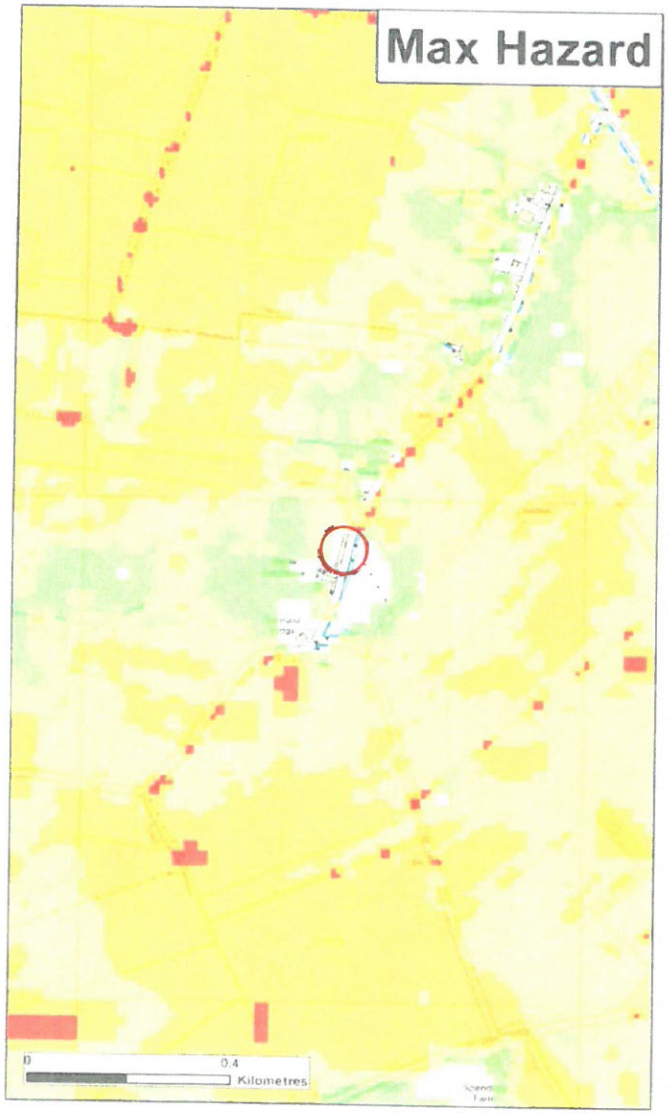
Other maps | Data search | Text only version

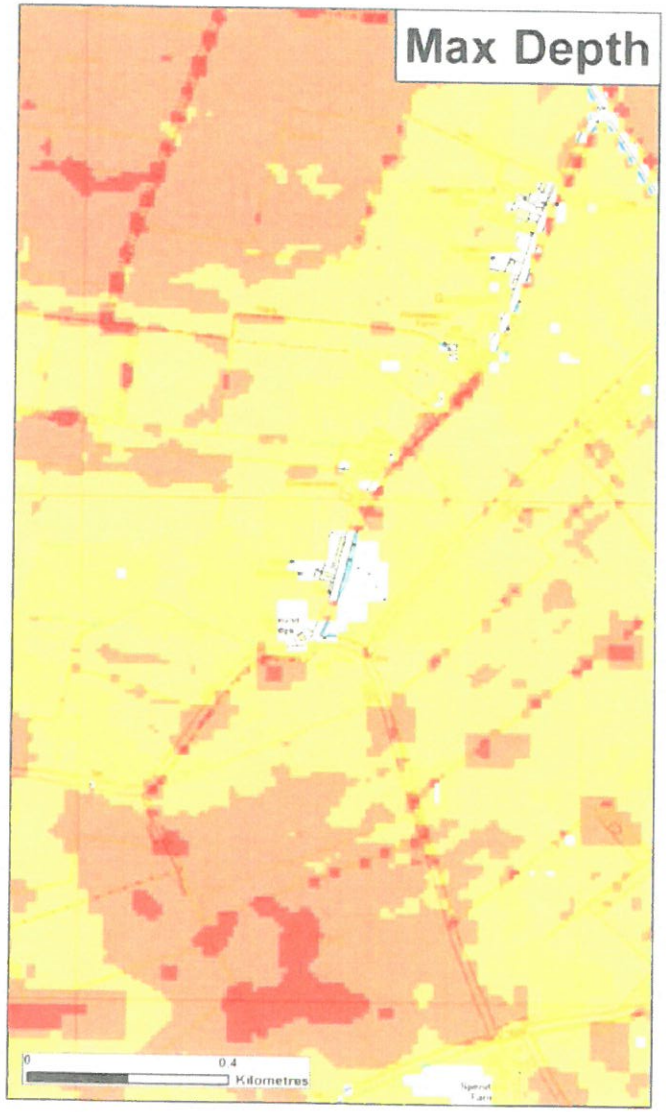
Click on the map to see what Flood Zone (National Planning Policy Guidance definitions) the proposed development is in

- 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




Fleet Hargate
Fleet
Gedney
Chapelgate
Stonegate
Gedney Broadgate
Long Sutton
Little Sutton
Sutton Crosses
Oak Lodge
Primrose Fm
Polvertoft Hall Fm
Moorswood Fm
Bramham's Bridge
Old Leam Fm
King John Fm
Westmere House Fm
New Ho
The Beeches
Old St Mary's Marsh







★ Modelled Breach Locations see also the accompanying plan 'Location of Modelled Breaches'

Max Hazard
(Flood Risk to People - FD2320)

- Less than 0.75 (Low Hazard)
- Between 0.75 and 1.25 (Danger for Some)
- Between 1.25 and 2.0 (Danger for Most)
- Greater than 2.0 (Danger for All)

Max Depth (m)

- 0 - 0.25
- 0.25 - 0.50
- 0.50 - 1.0
- 1.0 - 2.0
- 2.0 +

Max Velocity (m/s)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 +

Date Printed	February 2016	Scenario year	2115	Scenario Annual Chance	0.5% (1 in 200)	CCN Number	CCN-2016-1434

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.

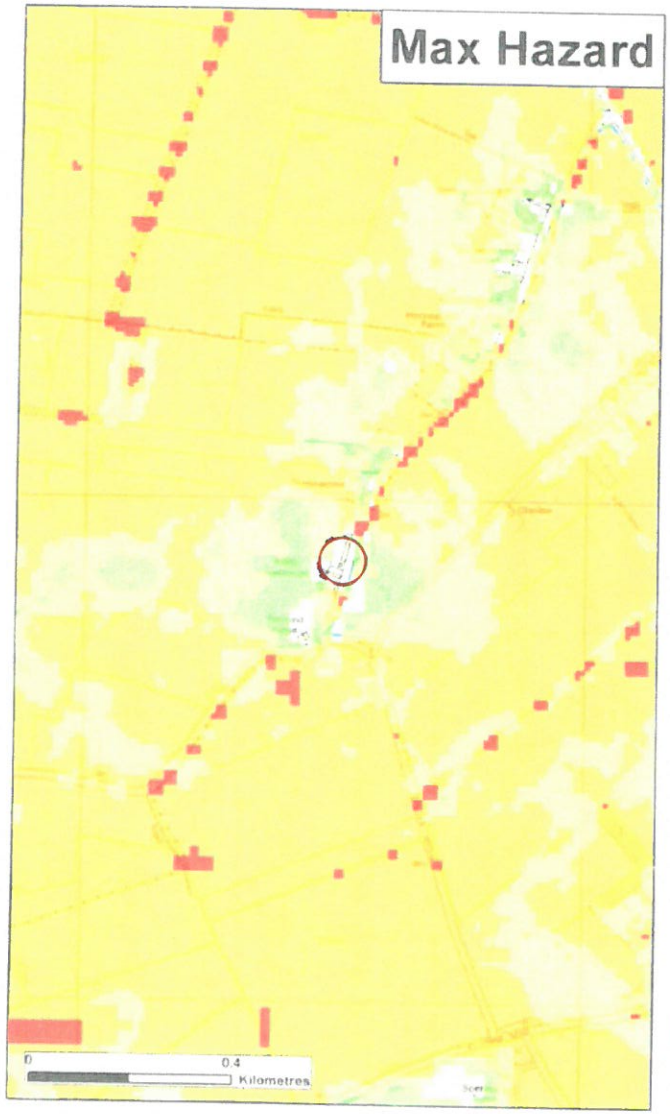
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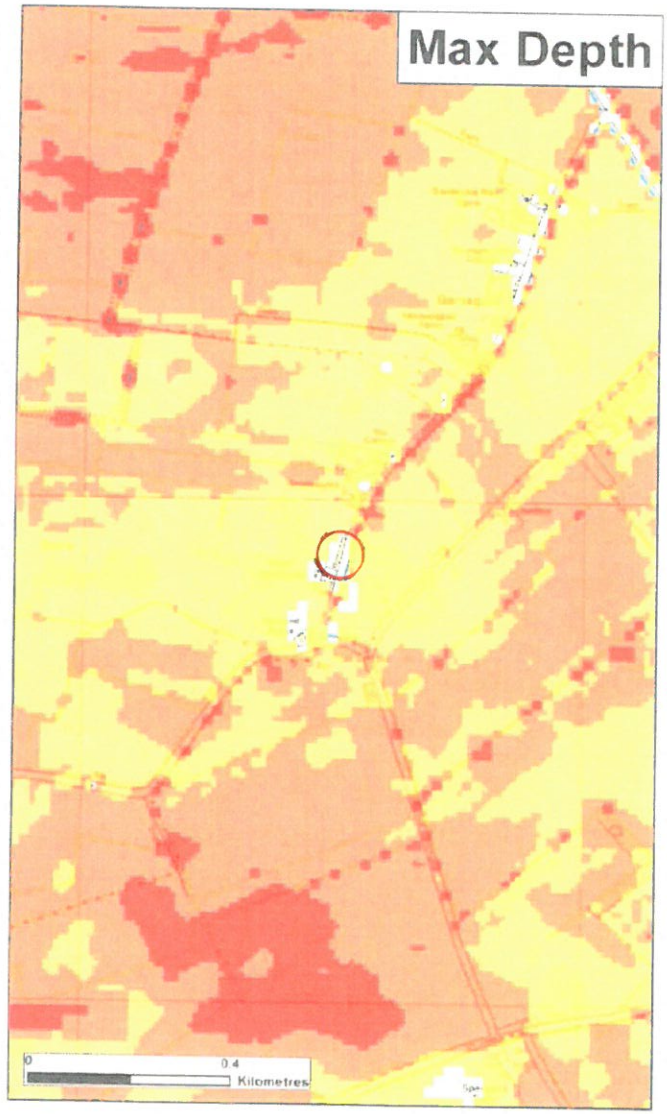
Environment Agency

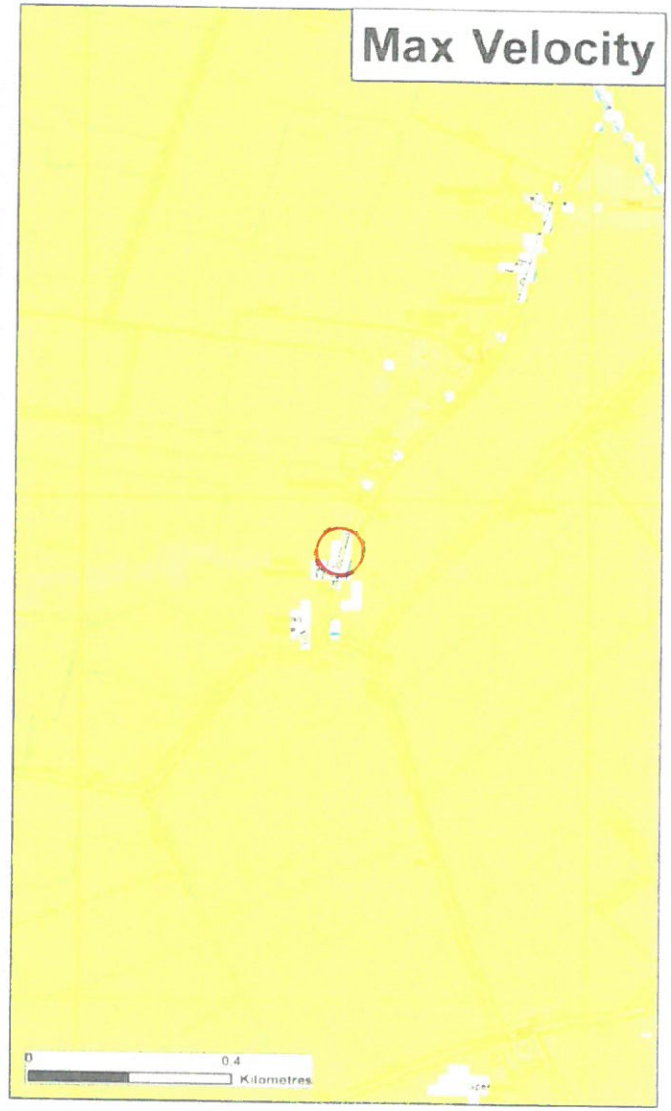
Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping

Map Centred on TF 41503 21885

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Max Hazard
(Flood Risk to People - FD2320)

- Less than 0.75 (Low Hazard)
- Between 0.75 and 1.25 (Danger for Some)
- Between 1.25 and 2.0 (Danger for Most)
- Greater than 2.0 (Danger for All)

Max Depth (m)

- 0 - 0.25
- 0.25 - 0.50
- 0.50 - 1.0
- 1.0 - 2.0
- 2.0 +

Max Velocity (m/s)

- 0 - 0.3
- 0.3 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 +

Date Printed	February 2016	Scenario year	2115	Scenario Annual Chance	0.1% (1 in 1000)	CCN Number	CCN-2016-1434

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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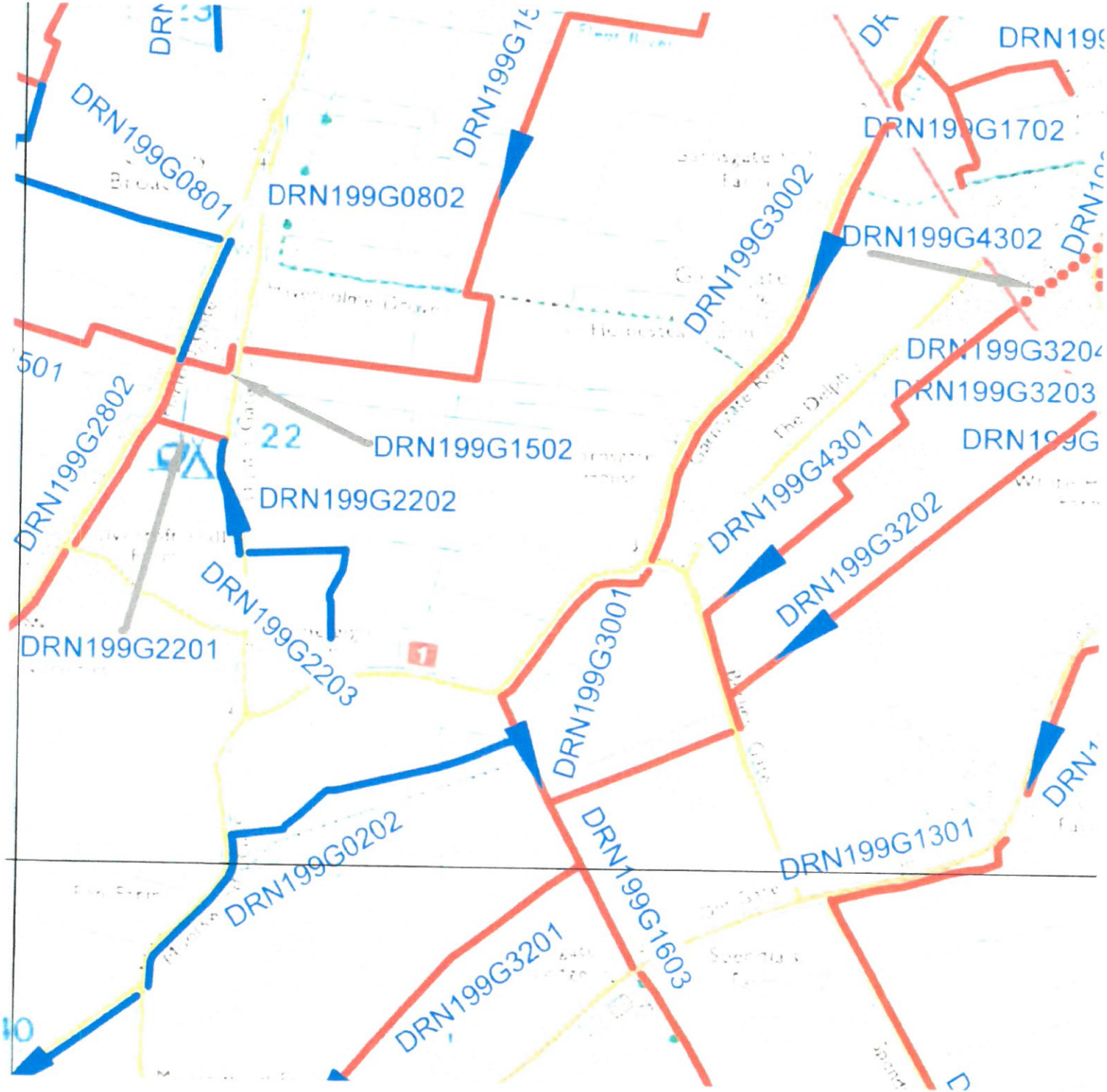
General Enquiries No: 03708 506 506. (Weekday Daytime calls cost 5p plus up to 6p per minute from BT. Weekend Unlimited. Mobile and other providers' charges may vary.

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Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping

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