FLOOD RISK ASSESSMENT FOR RESIDENTIAL DEVELOPMENT AT 185 RAILWAY LANE SOUTH, SUTTON BRIDGE, LINCS.

FINAL REPORT

GEOFF BEEL CONSULTANCY

JUNE 2015

GCB/RDA

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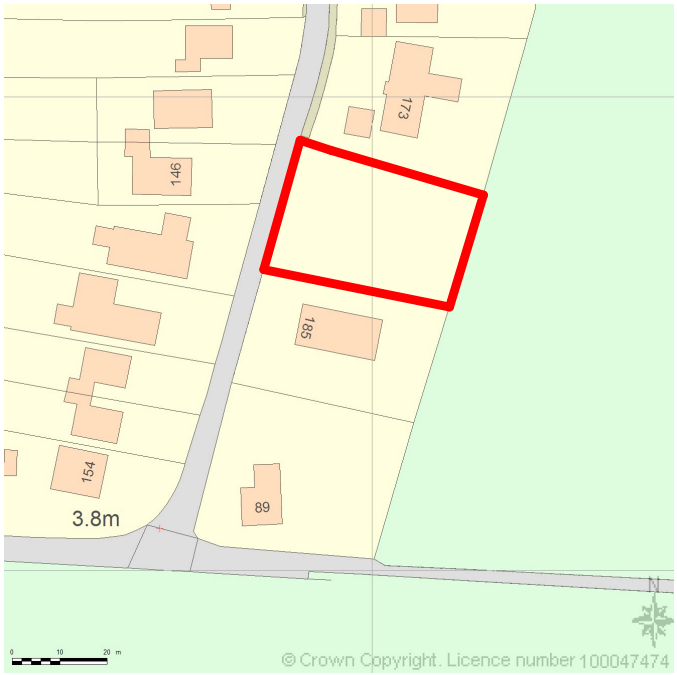
SITE LOCATION PLAN
AREA 2 HA
SCALE 1:1250 on A4
CENTRE COORDINATES: 547193, 320549



Supplied by Streetwise Maps Ltd
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Land Adjacent to ...

185 Railway Lane South
Sutton Bridge
Spalding, Lincolnshire PE12 9UZ

Fig 1

Job	Railway Lane South • Sutton Bridge		RESIDENTIAL DESIGN ARCHITECTS
Title	**Proposed Site Layout / Block Plan**		28 Broadhill Road • Kegworth Derby • DE74 2DQ Tel : 01509 829 746 E-mail : rda123@ntlworld.com
Dwg.No. **1505 / 01**	Scale **1:200 @ A3**	Date **25 - 03 - 15**	

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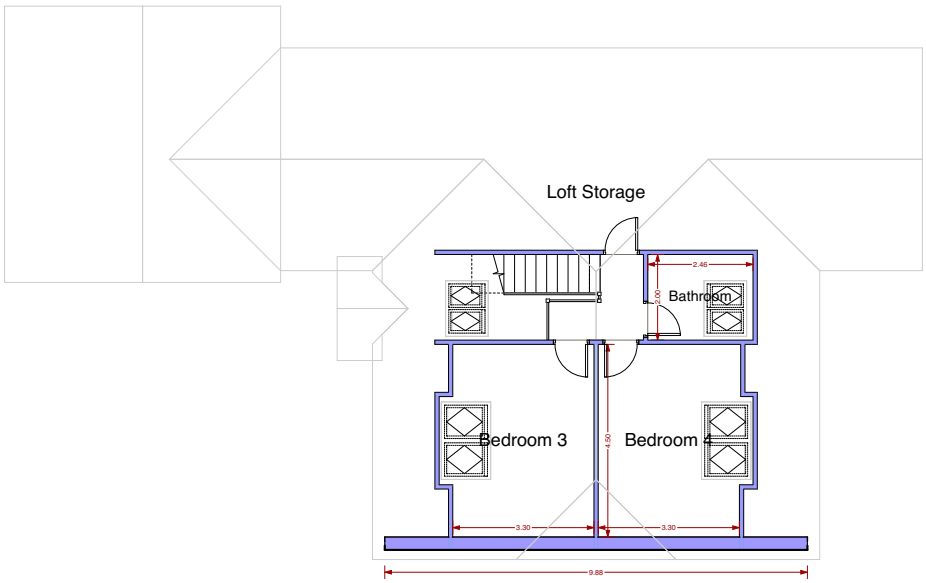
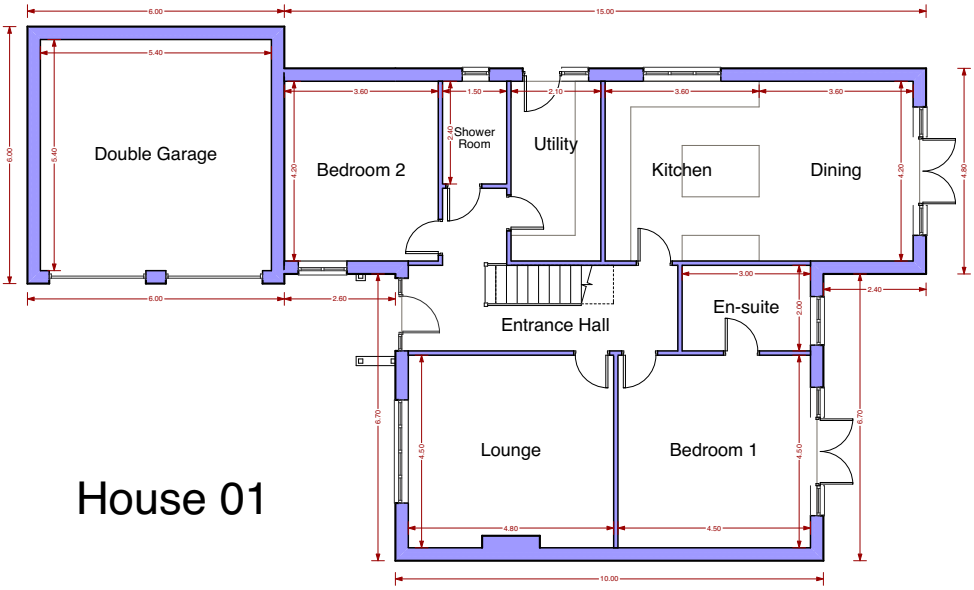
Fig 2



Proposed First Floor Plan

Scale 1:100 @ A3



Proposed Ground Floor Plan

Scale 1:100 @ A3

Job	Railway Lane South • Sutton Bridge		RESIDENTIAL DESIGN ARCHITECTS
Title	House 01 • Proposed Floor Plans		28 Broadhill Road • Kegworth Derby • DE74 2DQ Tel : 01509 829 746 E-mail : rda123@ntlworld.com
Dwg.No. 1505 / 02	Scale 1:100 @ A3	Date 25 - 03 - 15	

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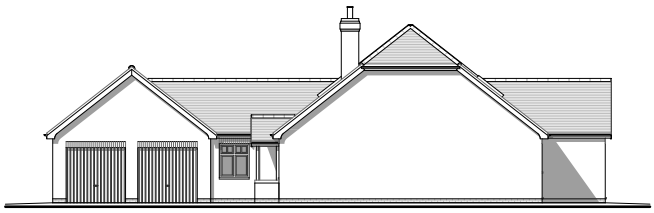
Fig 3

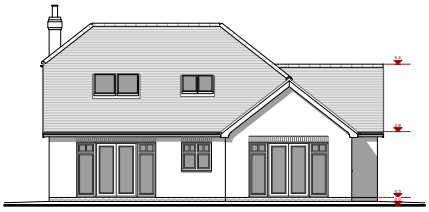
Proposed West Elevation

Scale 1:100 @ A3



Proposed South Elevation

Scale 1:100 @ A3



Proposed East Elevation

Scale 1:100 @ A3

Proposed North Elevation

Scale 1:100 @ A3

Job	Railway Lane South • Sutton Bridge		RESIDENTIAL DESIGN ARCHITECTS
Title	Proposed Elevations • House 1		28 Broadhill Road • Kegworth Derby • DE74 2DQ Tel : 01509 829 746 E-mail : rda123@ntlworld.com
Dwg.No. 1505 / 06	Scale 1:100 @ A3	Date 07 - 04 - 15	

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Fig 4

Fig 5

Environment Agency

Enter a postcode or place name:

Sutton Bridge, Lincolnshire

Go

Other topics for this area...

Flood Map for Planning (Rivers and Sea)

Flood Map for Planning (Rivers and Sea)

X: 547,500;Y: 320,839 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 Rivers
  - River line

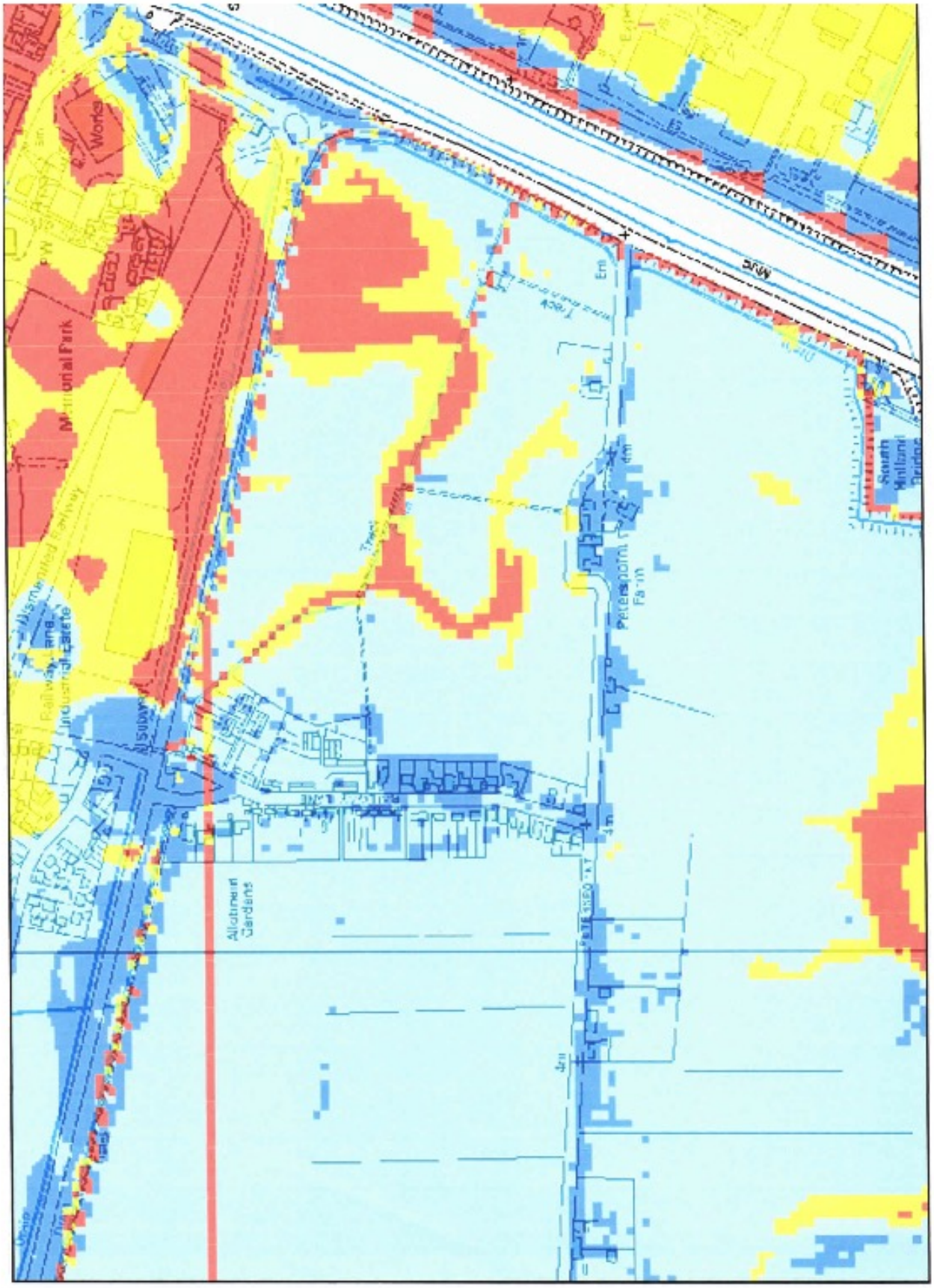

Works
Memorial Park
Allotment Gardens
Petersburg Farm
South Holland Bridge

Fig 6

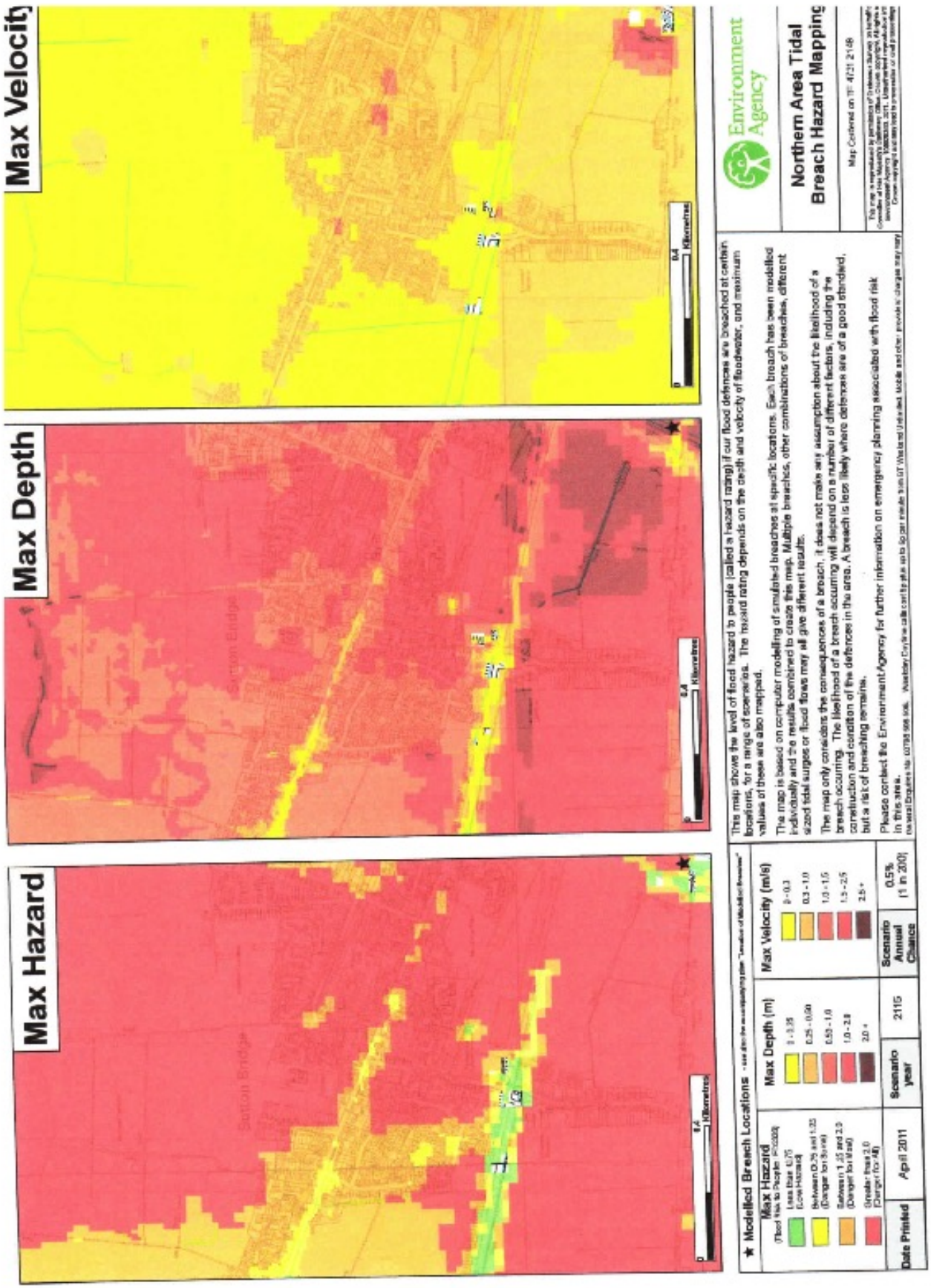

Max Hazard
Max Depth
Max Velocity
Sutton Bridge
Sutton Bridge
0
0.4
Kilometres
★ Modelled Breach Locations
Max Hazard
Max Depth (m)
Max Velocity (m/s)
Scenario year
2115
Scenario Annual Chance
0.5% (1 in 200)
Date Printed
April 2011
This map shows the level of flood hazard to people (called a hazard 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.
Please contact the Environment Agency for further information on emergency planning associated with flood risk in this area.
Environment Agency
Northern Area Tidal Breach Hazard Mapping
Map Centered on TF 4721 2148

Fig 7

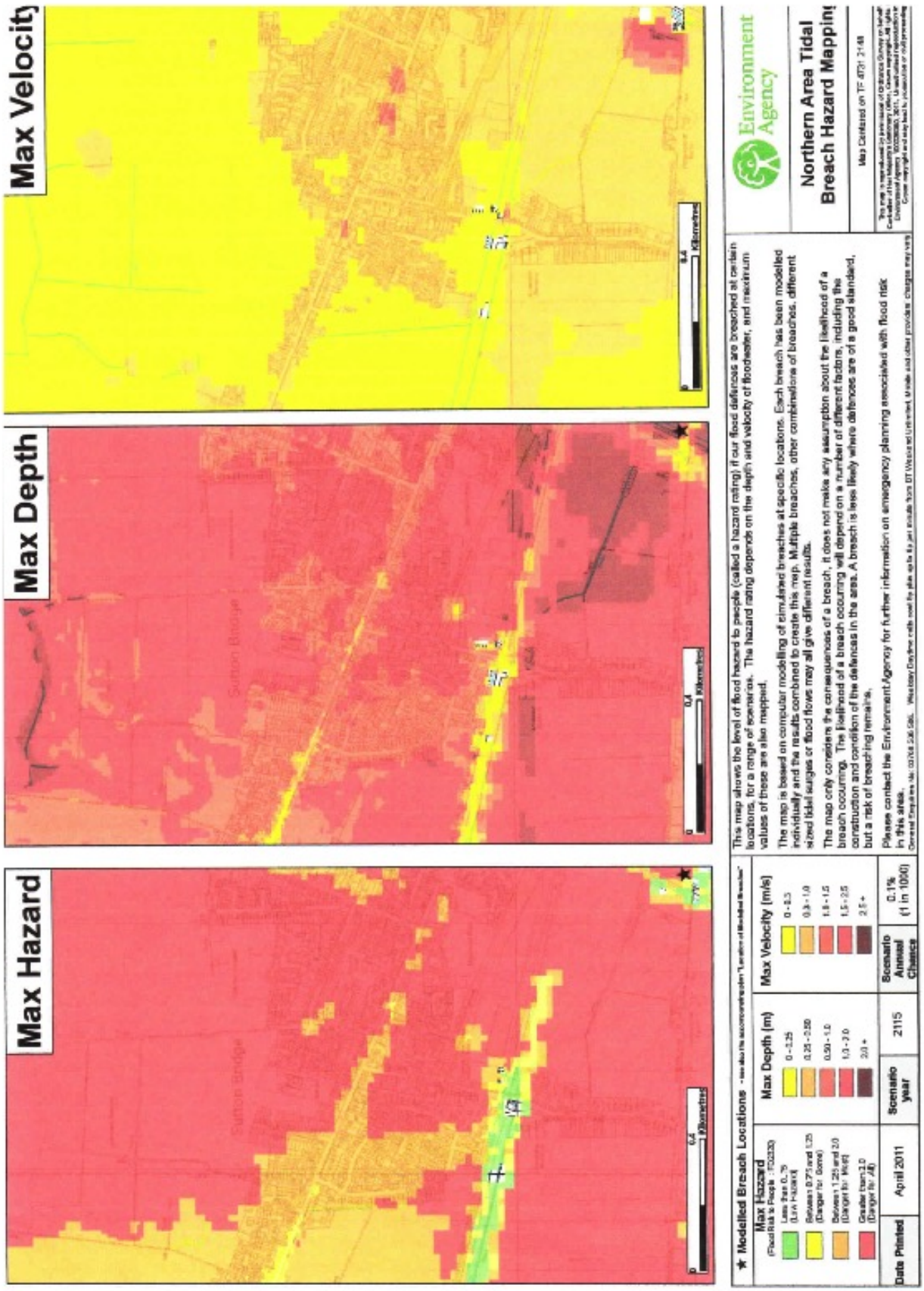
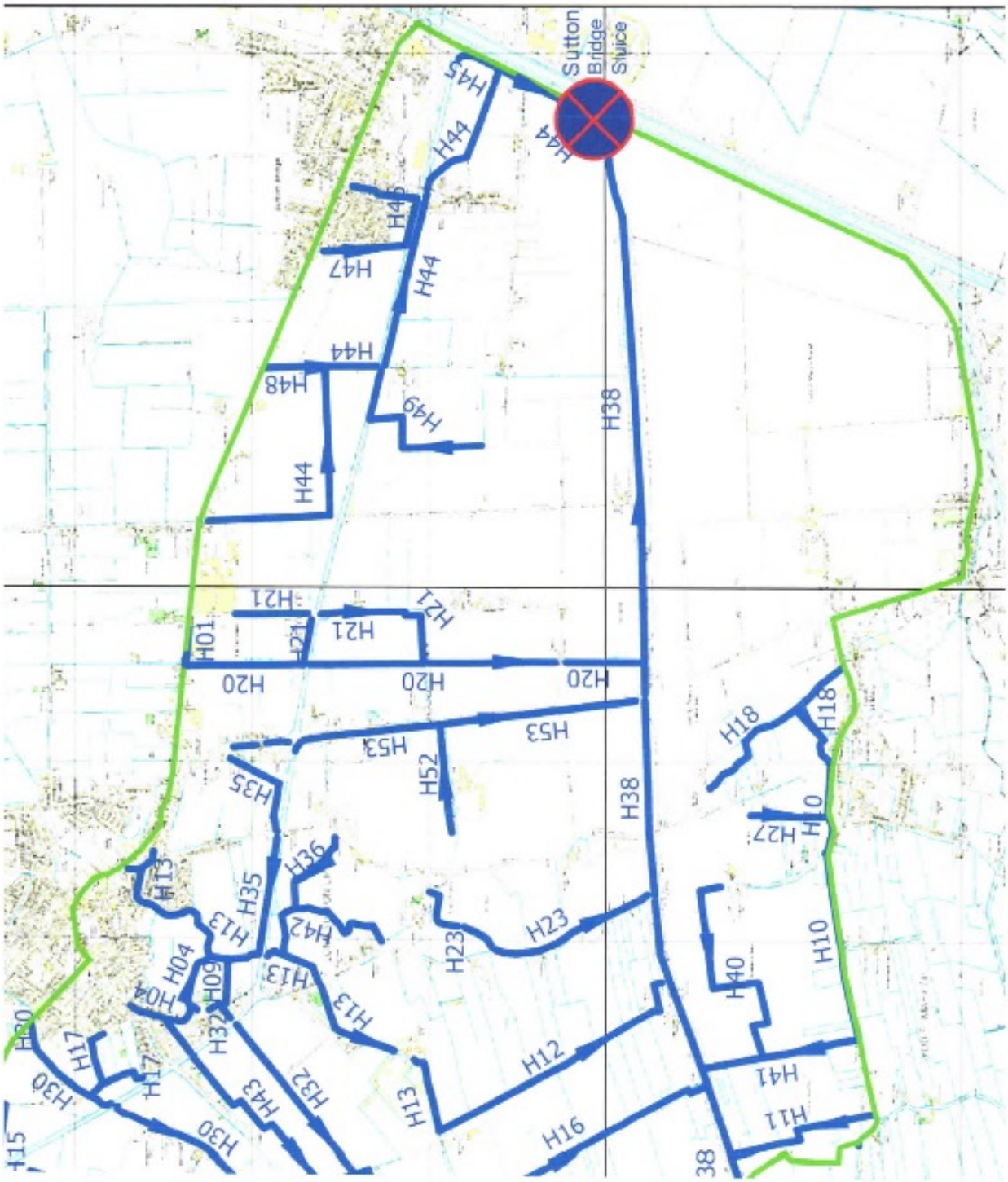

Max Hazard
Max Depth
Max Velocity
Sutton Bridge
Kilometres
Modelled Breach Locations
Max Hazard
Max Depth (m)
Max Velocity (m/s)
Scenario year
2115
Scenario Annual Chance
0.1% (1 in 1000)
Date Printed
April 2011
Environment Agency
Northern Area Tidal Breach Hazard Mapping

Fig 8


Sutton
Bridge
Sluice
H45
H44
H46
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H52
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H04
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H30
H43
H23
H12
H16
H18
H10
H27
H40
H41
H11

Fig 9

1.0 INTRODUCTION

1.1 A full planning application is to be submitted by Residential Design Architects on behalf of Mr S Betts for proposed residential development at land adjacent to 185 Railway Lane South, Sutton Bridge, Lincs.

1.2 Planning approval requires a Flood Risk Assessment to accompany the planning application for approval by the Environment Agency and meet the requirements and general principles contained in Paragraph 9 of the Technical Guide to the National Planning Policy Framework (NPPF).

The site, as situated is shown within Flood Zone 3 of the Environment Agency Flood Zone Maps. The latest Agency Maps have been created 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 existing flood defences.

The site is also shown within a defended area of the South Holland District Council's Strategic Flood Risk Assessment Maps and located in the South Holland Internal Drainage Board district.

1.3 Geoff Beel Consultancy was appointed on 29th May 2015 to undertake the Flood Risk Assessment.

2.0 LOCATION

2.1 The development site is located at the southern limit of the Railway Lane South being west of the River Nene tidal defences at Sutton Bridge.

2.2 The position and extent of the site is shown on Fig 1 – Location Plan at the end of the document. The National Grid Reference for the centre of the site is TF47152050.

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 a defended area of the Council's Strategic Flood Risk Assessment.

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is currently waste land.

3.2 The area of development is approximately 2.00 hectares with existing vehicular access to Railway Lane South. Land level at the site is generally the same as Railway Lane South with a carriageway level of 3.80m aOD. Surrounding ground levels between the site and the River Nene average at 3.40m aOD.

3.3 The proposed site layout consists the construction of 3 two storey houses and garages.

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 100 year fluvial and 1 in 200 year tidal events meeting the requirements of NPPF.

Flood mitigation measures have been included in the development proposals to meet NPPF requirements and allow the occupants to be safe from any 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 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 area at Sutton Bridge is protected by the west embankment of the River Nene tidal defences at a level of 6.30m aOD.

4.2 The site and surrounding areas of development drain in a generally southerly direction to discharge into the tidal River Nene as part of the South Holland Main Drain catchment of the Internal Drainage Board.

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.

Current maintenance standards within the South Holland Internal Drainage Board and of the Environment Agency tidal 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 existing sewerage
b) local blockages to IDB main drain
c) storm return period of 1 in 50 years being exceeded
d) overtopping of River Nene tidal defences at Sutton Bridge

5.2 The probability of flooding from sources a) and b) is low due to the maintenance standards already achieved and managed by Anglian Water Services Ltd and 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.

5.3 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".

5.4 The possible overtopping and breaching of the tidal River Nene defences at Sutton Bridge is also considered to be low. The Environment Agency has carried out the River Nene Strategic Study Report (1995) and concluded that the defences provide a level of protection against 1 in 200 years period tidal event.

Breach and overtopping analysis has been obtained from both the South Holland District Council Strategic Flood Risk Assessment and the Environment Agency Tidal Hazard mapping to satisfy the requirements of NPPF. Floor level of the new building will be raised 1.05m above the existing ground level at 4.85m aOD. Access, utility and garaging will only be at ground level with internal steps to the habitable accommodation. Flood resilient measures will be incorporated into the design and construction of the dwelling up to 5.80m aOD with demountable defences 600mm above finished habitable floor level.

5.5 The latest published Maps of the South Holland District Council Strategic Flood Risk Assessment (January 2010) indicate that the site could be flooded with up to 1.00m of water during modelled events inclusive of climate change. However, the Environment Agency Tidal Hazard mapping shows the site as being affected by floodwaters between 1.00-2.00m.

It is not possible the raise floor levels any higher due to existing street scene of adjoining properties whilst flood mitigation measures have been incorporated to withstand total depth of floodwaters at 2.00m above ground level.

6.0 EXTENT OF KNOWN FLOODING

6.1 During the preparation of this assessment, no evidence was discovered of the site being flooded and adjoining properties during the tidal surge event of January 1978 since when tidal defences have been raised and strengthened to a 1 in 200 year standard of protection.

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 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 0.5% 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 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 raising of habitable floor level 1.05m above existing ground level with flood resilient construction incorporated will be appropriate for the design life of the development (i.e. 100 years).

7.6 Safe and dry access is available onto Railway Lane and hence in a northerly direction to Long Sutton where land is located in Flood Zone 1.

8.0 IMPACTS OF FLOODING

8.1 No significant impacts of flooding are anticipated.

8.2 Habitable floor level of the development will be 1.05m above existing ground level with flood resilient construction offering additional protection against impacts arising from any extreme short duration, localised events. No displacement of water from the site will affect any adjoining properties.

8.3 The general location of the site within the catchment is such that if flooding occurred from any of the South Holland main drain systems, then probably 2 to 3 days warning time would be available.

8.4 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 provides a Flood Warning Service which includes Flood Warning Codes and uses direct warning methods where the risks 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 and the occupiers of the dwellings should register with the Floodline Direct Warnings Service to receive any future flood warnings.

9.0 RESIDUAL RISK – EXTREME EVENTS

9.1 The residual risk from extreme events is very low on this site, because of its location, existing land level and tidal flood defences with the standard of surface water drainage already provided.

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 recently completed a Level 2 Strategic Flood Risk Assessment of the whole District.

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 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 IDB area has been determined as providing protection against a 1 in 100 year return period event whilst the River Nene tidal defences at Sutton Bridge provide protection against a 1 in 200 year return period event.

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 River Nene tidal defences to a 1 in 200 year return period, (0.5%) and South Holland IDB fluvial defences of 1 in 100 year return period (1.0%).

- 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. The Boards policy is to continue to provide a standard of drainage of 1 in 100 year return.

- On site surface water drainage will be discharged via existing sewerage of Anglian Water Services Ltd and hence to a South Holland IDB main drain.

- Habitable floor level of the building will be raised 1.05m above existing ground level at 4.85m aOD with flood resilient measures incorporated into the design and construction of the dwelling up to 5.80m aOD with demountable defences 600mm above finished habitable floor level.

- Safe refuge is available at first floor level of the new dwellings with no sleeping accommodation on the ground floor.