FLOOD RISK ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT AT PRIMROSE FARM, FLEET, HOLBEACH, SPALDING, LINCS.

FINAL REPORT

GEOFF BEEL CONSULTANCY

JUNE 2015

GCB/STATUS DESIGN

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Fig 11 - South Holland Internal Drainage Board district plan

1.0 INTRODUCTION

1.1 A full planning application is to be submitted by Status Design on behalf of Mrs S Smith for proposed residential development at Primrose Farm, Maisedike Lane, Fleet, 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).

The site, as situated, is located within Flood Zone 2 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 of the South Holland District Council's Strategic Flood Risk Assessment Maps (2010) Residual Flood Depths in year 2115.

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

1.3 Geoff Beel Consultancy was appointed on 19th June 2015 to undertake a Flood Risk Assessment.

2.0 LOCATION

2.1 The development site is located at Primrose Farm, Maisedike Lane, Fleet. The National Grid Reference of the central point of the development is TF 38652195.

2.2 The position and extent of the site is shown on Fig 3 – 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 2 as detailed on the Environment Agency Flood Zone Maps and in Flood Zone 1 of the Council's Strategic Flood Risk Assessment Maps (2010) Residual Flood Depths in year 2115 as defended by the Agency's tidal defences and the Internal Drainage Board system.

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is currently a redundant agricultural barn.

3.2 The area of development is approximately 0.10 hectare.

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

3.4 The Sequential Test is met as the site is located in Flood Zone 1 of the Council's Strategic Flood Risk Assessment Maps (2010) and protected against both the 1 in 100 year fluvial event and the 1 in 200 year tidal 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 development site within the South Holland Internal Drainage Board is protected by the River Welland and 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 IDB main drains south of the site and hence via other drains in the South Holland Main Drain catchment to discharge into the tidal River Nene at the Sutton Bridge Outfall Sluice.

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 Outfall Sluice
d) overtopping and breaching of the River Nene tidal 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 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 the Sutton Bridge Outfall Sluice 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.

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

The 1 in 200 year tidal event to the tidal River Nene and 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.

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 as shown on the South Holland Strategic Flood Risk Assessment Flood Zone Maps and the Environment Agency Tidal Hazard mapping.

5.5 More recent Tidal Hazard mapping produced by the Environment Agency shows the site to be outside the effects of any floodwaters as a result of a breach to the River Nene tidal defences – see Fig 10.

5.6 Finished floor level is to be compatible with existing Maisedike Lane carriageway level.

Flood resilient construction will be incorporated up to a minimum level of 300mm above finished floor level with sleeping accommodation and safe refuge at first floor level.

5.7 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.

5.8 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 a minimum of 2.60m aOD and compatible with Maisedike Lane carriageway level will be appropriate for the design life of the development (i.e. 100 years). Safe refuge and sleeping accommodation is at first floor level of the barn conversion.

8.0 IMPACTS OF FLOODING

8.1 No significant impacts of flooding are anticipated.

8.2 Floor levels of the development will be at a minimum of 2.60m aOD and compatible with Maisedike Lane carriageway level, which together with the flood resilient construction and 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 The developer should 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 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 and the occupiers of the new development should register with the Floodline Direct Warnings Service to receive 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, within the South Holland IDB area and its location 9.00kms from The Wash and River Nene tidal defences with secondary defences between the marsh frontage and the site.

9.2 The site is shown in Flood Zone 1 according to NPPF classification 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 (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 of Residual Flood Depths in year 2115 as defended by tidal defences and tidal doors.

10.0 CONCLUSIONS AND RECOMMENDATIONS

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

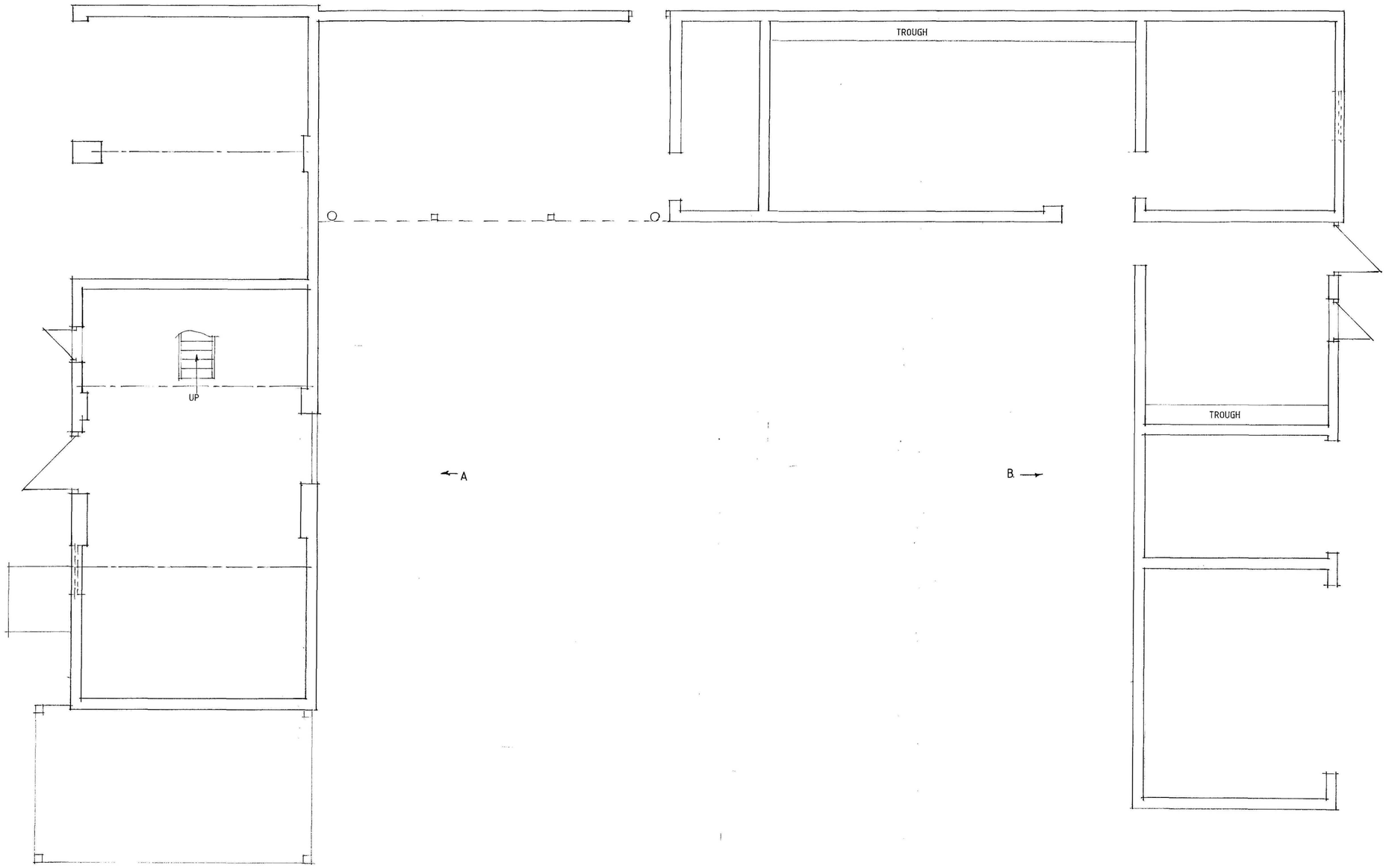
- The proposed development is in a Defended Floodplain. It is located in the Passive Floodplain of The Wash and tidal River Nene and the South Holland IDB protected by defences to a 1 in 200 year and 1 in 100 year return periods respectively.

- 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%).

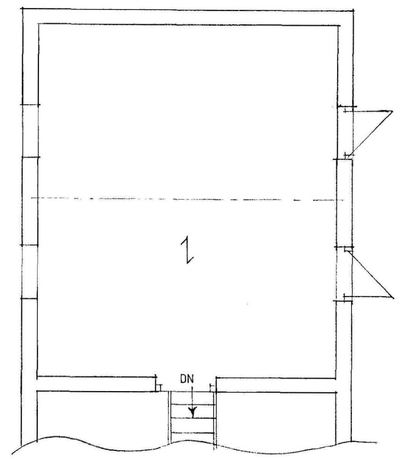
- Although the site is located within an Internal Drainage District with a minimum standard of drainage of 1 in 50 years, this accords with Defra guidelines for rural development. Freeboard to design water level of 900mm to lowest land level is available for events greater than 1 in 50 years providing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

- On site rainwater from the development will be discharged via soakaway drainage to BRE365 design requirements.

- Floor level of the barn conversion will be at a minimum of 2.60m aOD and compatible with Maisedike Lane carriageway level with safe refuge and sleeping accommodation at first floor level. Flood resilient construction will be incorporated up to 300mm above finished floor level.



GROUND FLOOR PLAN



FIRST FLOOR PLAN

Status DESIGN
CONSULTANTS IN ARCHITECTURE & PLANNING

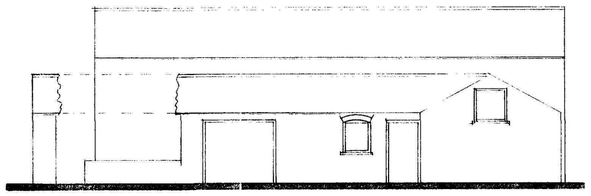
PROPOSED CONVERSION OF BARN TO DWELLING AT PRIMROSE FARM, MAISEDYKE LANE, FLEET FOR

MRS. S. SMITH.

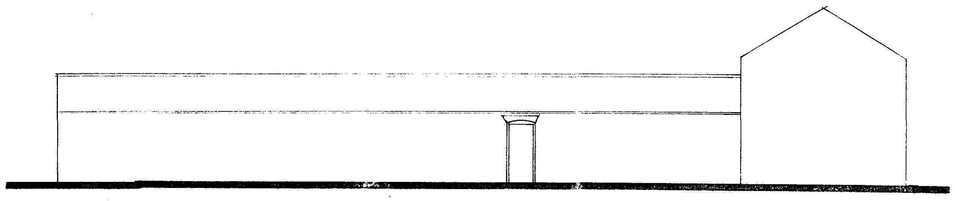
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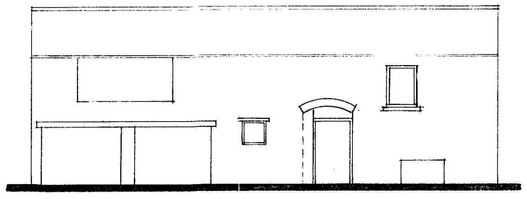
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Spalding, Lincs PE12 7AP
Tel: 01406 424343 Fax: 01406 490702



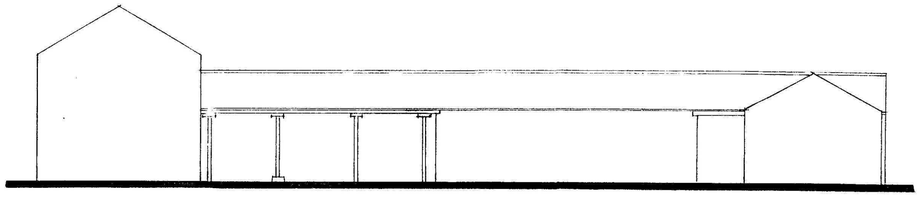
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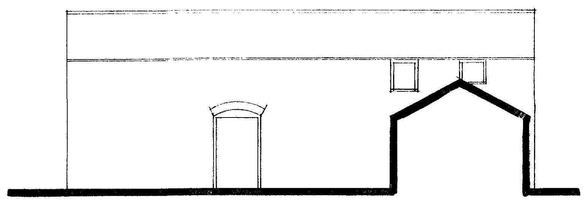
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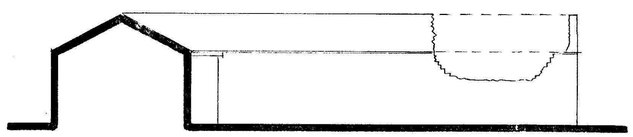
REAR



SIDE



VIEW .A.



VIEW .B.

Status DESIGN
CONSULTANTS IN ARCHITECTURE & PLANNING

PROPOSED CONVERSION OF BARN TO DWELLING AT PRIMROSE FARM, MAISEDYKE LANE, FLEET FOR

MRS. S. SMITH.

ELEVATIONS AS EXISTING.

1:100	SD15-019/2
MAY-15	B.GILHAM.

2 Edinburgh Walk, Holbeach,
Spalding, Lincs PE12 7AP
Tel: 01406 424143 Fax 01406 490792

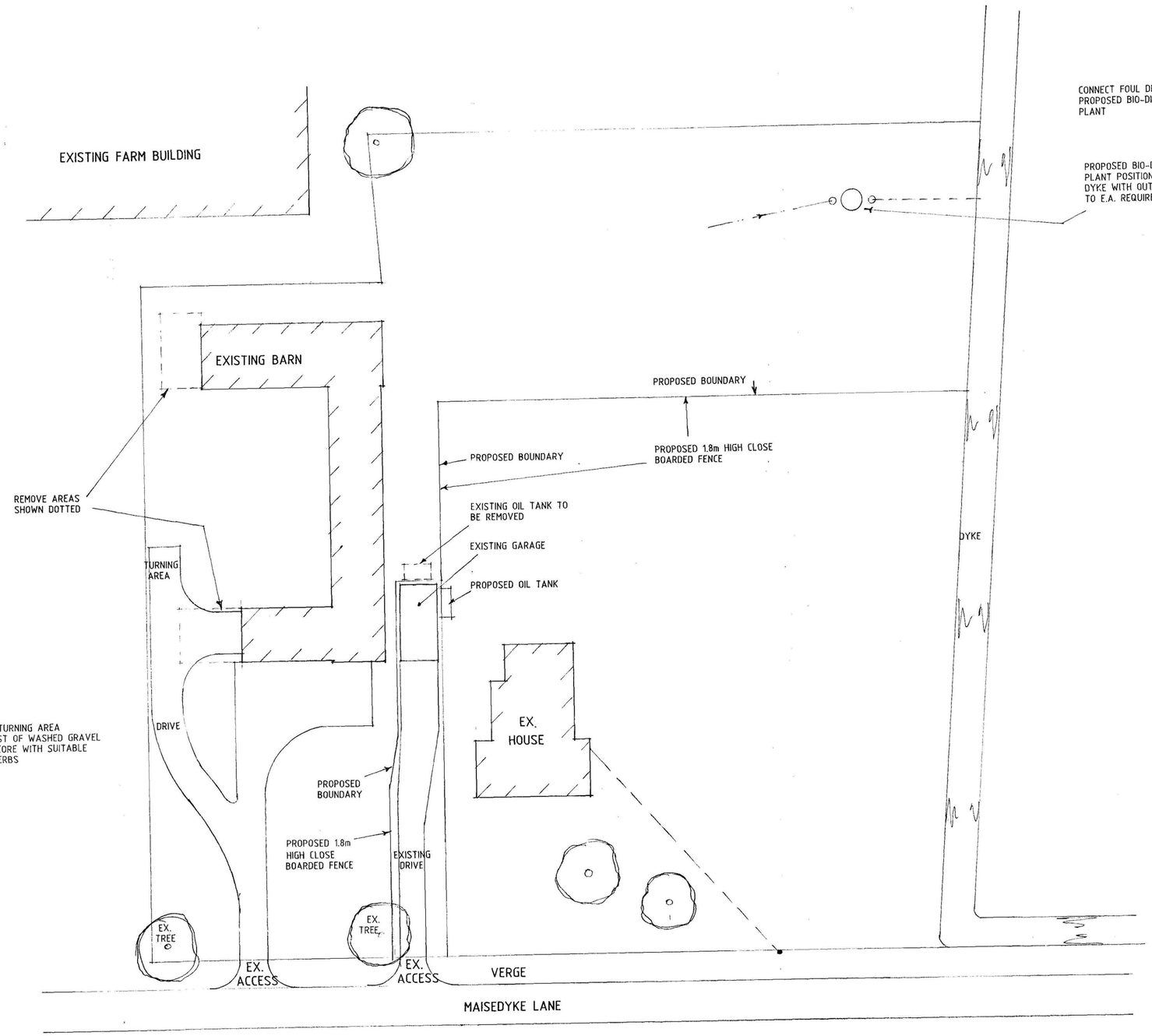
Make good to defective areas of walls and roofs.

To all altered areas use facing bricks and roof tiles to match existing.

All new external doors, windows and screens to be in white painted timber double glazed.

Use existing openings where shown for new doors, windows and screens.

Provide additional windows where shown with brick arches above to match existing.



SITE PLAN

THIS DRG. TO BE READ IN CONJUNCTION WITH
SD15-019/1, SD15-019/2, SD15-019/4, SD15-019/5, SD15-019/6,
STRUCTURAL REPORT BY BRIERLY & CO REF - 15.26.006

General Notes

Do not scale from this drawing.

This drawing is copyright and may not be altered, traced, copied, photographed or used for any purpose other that that for which it is issued without written permission from Messrs Status Design.

The General Contractor is to check all dimensions on site and report discrepancies to the Architect.

All details shown on this drawing are based upon typical site conditions related to the area. No responsibility can be accepted for abnormal conditions unless reported to the Architects so that design amendments may be considered. Site soil surveys are recommended in respect of foundations to establish specific site conditions before foundation work is undertaken.

Please note this drawing is not a conveyance drawing.

Proposed on-site soakaways to be maintained by the owner for the life duration of the property.

This drawing is limited in the amount of information contained and does not purport to contain a full specification of the works. It is solely for the purpose of obtaining Planning and Building Regulations approvals. This drawing must not be used as a contract document alone. The works will not be supervised or inspected by Status Design unless specifically contracted to do so. It is the client or their agent's responsibility to control workmanship, substitution of materials, adherence to specification, variations to contract, etc.

All materials to be new unless stated otherwise and all components and materials, etc. to be used, fixed and installed, etc. in strict accordance with manufacturers' instructions and relevant Code of Practise. Materials should conform to appropriate British Standard specification or BBA Certificate or European Code equivalent.

The Employer/Client shall ensure that the selected contractor is conversant with and adopts all measures necessary to achieve compliance with Health and Safety Legislation for Building Sites and Work Places. The Employer/Client is advised that should the works need to comply with the Construction Design and Management Regulations 1994 (CDM) and Health and Safety at Work, etc., Act 1974 (HSW Act) an independent Planning Supervisor will be required, whom should be supplied with a set of all relevant drawings, etc.

The works shall comprise of all that shown on the drawings and information, etc. Works that may not specifically be shown but may be reasonably inferred as necessary to carry out the works shall be deemed to be included.

These notes relate to this drawing and all associated drawings.

It is the property/landowner's responsibility to be aware of the Party Wall, etc. Act 1996 when building or carrying out alterations in close proximity to adjoining neighbour's boundaries.

B - IMF. ADDED - 11.6.15
A - DESIGN ALTS - 28.5.15

Status DESIGN
CONSULTANTS IN ARCHITECTURE & PLANNING

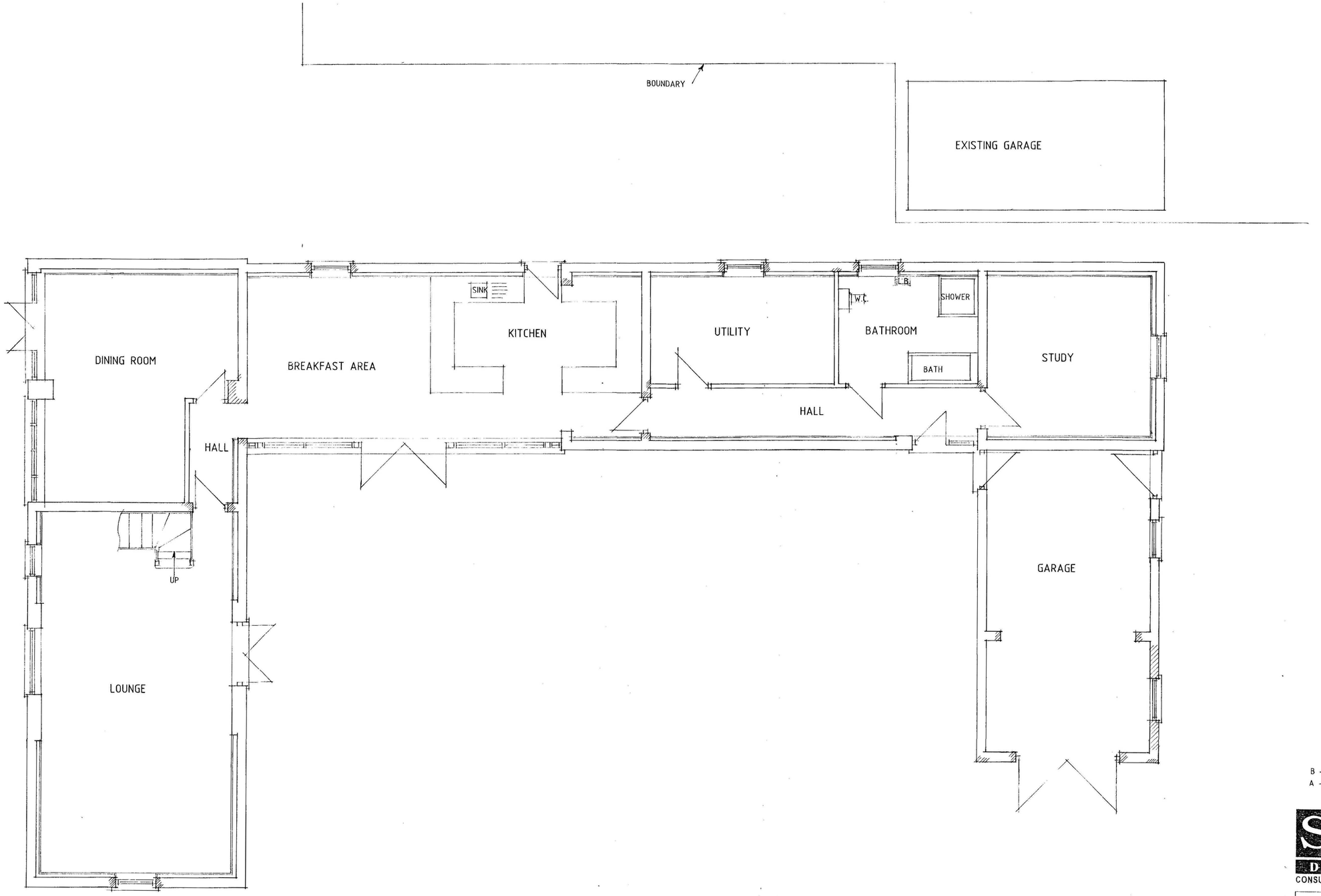
PROPOSED CONVERSION OF BARN TO DWELLING & NEW ACCESS & GARAGE AT PRIMROSE FARM, MAISEDYKE LANE, FLEET FOR

MRS. S. SMITH.

SITE PLAN

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MAY-15	B.GILHAM.

2 Edinburgh Walk, Holbeach,
Spalding, Lincs. PE12 7AP
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GROUND FLOOR PLAN

B - DESIGNALTS - 11.6.15
A - DESIGN ALTS - 28.5.15

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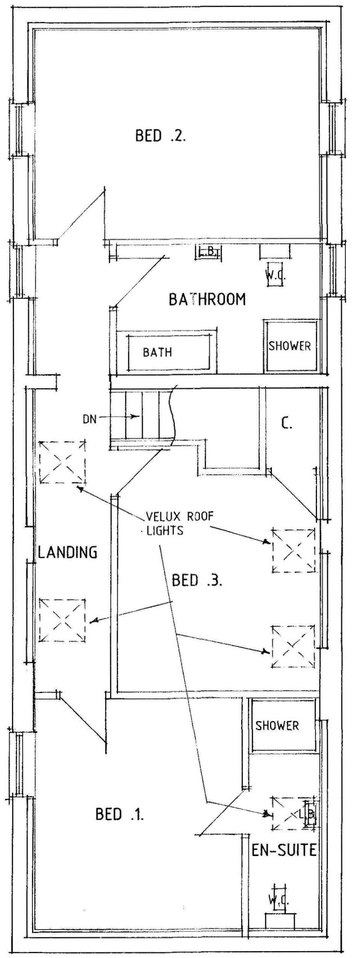
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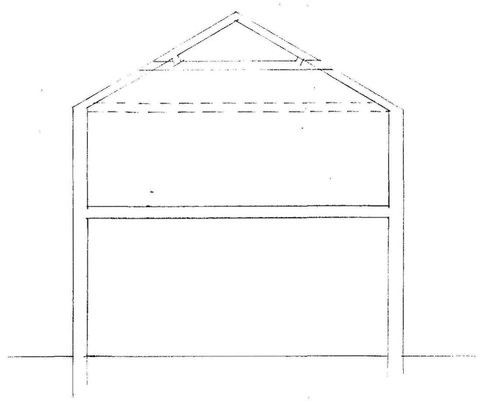
MRS. S. SMITH.

PLAN AS PROPOSED

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MAY-15	B.GILHAM.

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FIRST FLOOR PLAN

A - IMF. ADDED - 16.6.15

Status DESIGN
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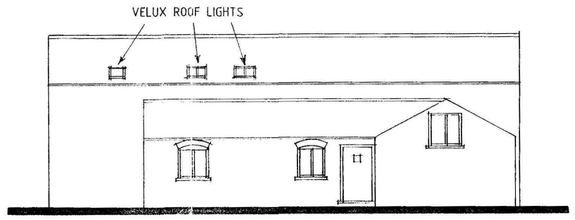
PROPOSED CONVERSION OF BARN TO DWELLING AT PRIMROSE FARM, MAISEDYKE LANE, FLEET FOR

MRS. S. SMITH.

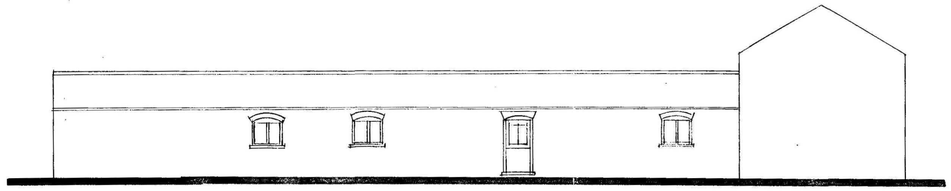
PROPOSED FIRST FLOOR PLAN

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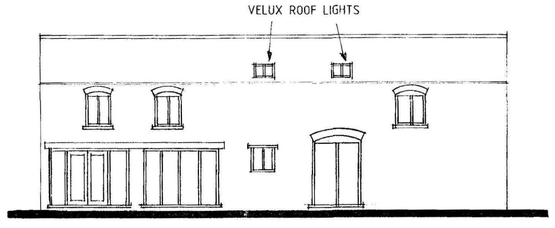
2 Edinburgh Walk, Holbeach,
Spalding, Lincs. PE12 7AP
Tel: 01406 424343 Fax: 01406 490702



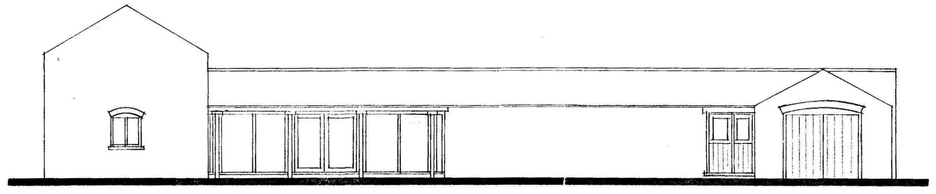
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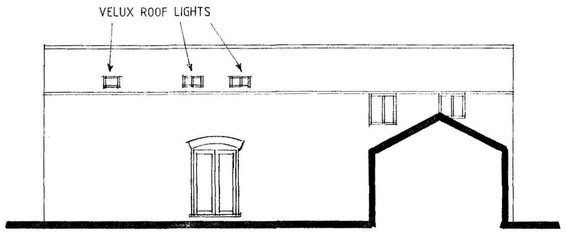
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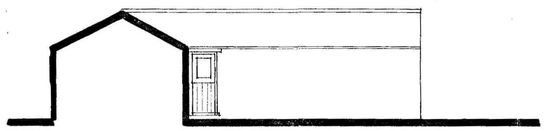
REAR



SIDE



VIEW .A.



VIEW .B.

B - DESIGN ALTS - 11.6.15
A - DESIGN ALTS - 28.5.15

Status DESIGN
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PROPOSED CONVERSION OF BARN TO DWELLING AT PRIMROSE FARM, MAISEDYKE LANE, FLEET FOR

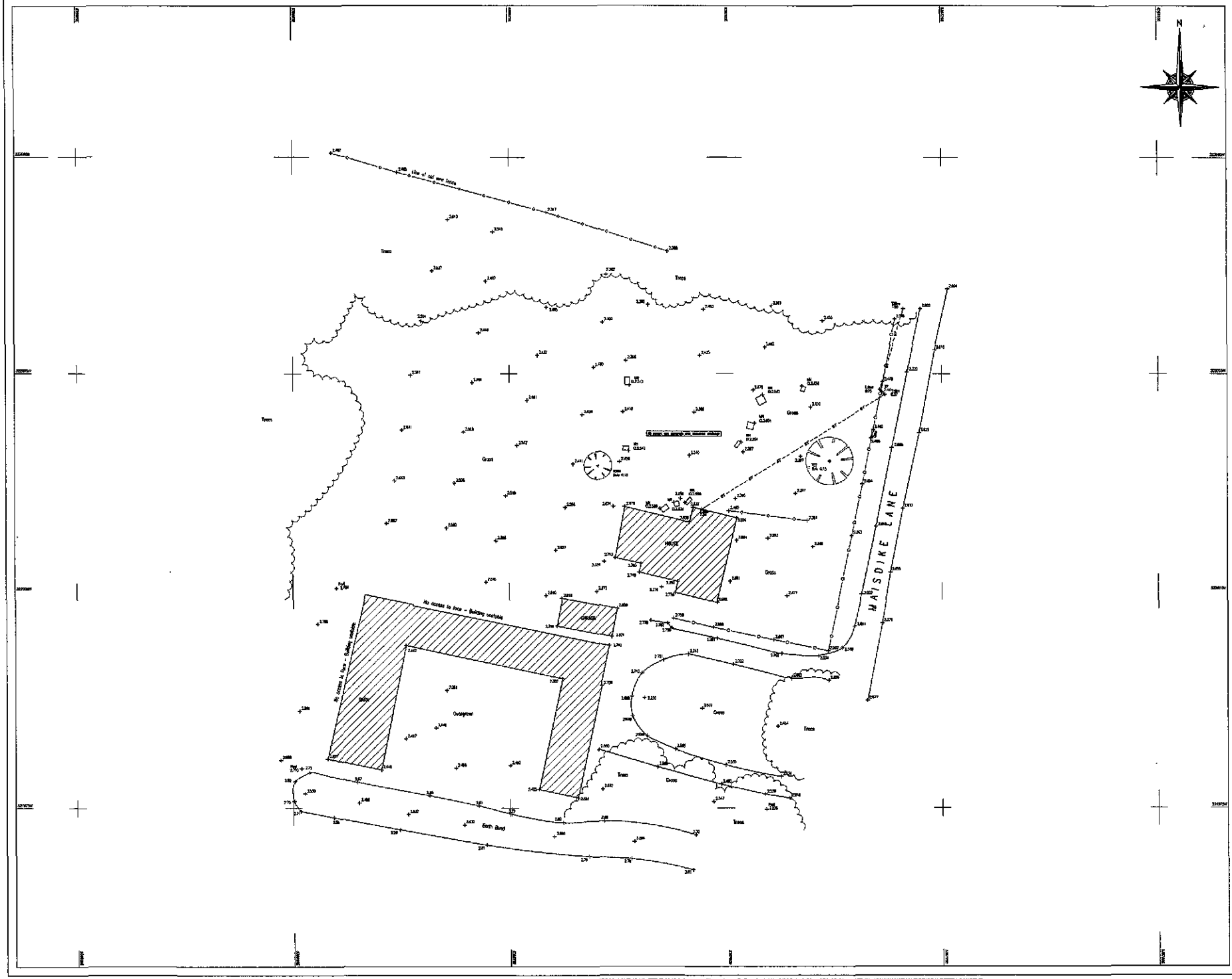
MRS. S. SMITH.

ELEVATIONS AS PROPOSED

1:100	SD15-019/6
MAY-15	B.GILHAM.

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Key

The survey grid is the National Grid obtained from ETRS89 GPS Coordinates with OSTN02 transformation. Levels shown to Ordnance Survey datum using ETRS89 GPS with OSGM02 transformation.

Surveyed boundary features are not necessarily legal boundaries.

All utilities have been identified to the best of the surveyors knowledge. The correct identification can not be 100% guaranteed and should be independently verified prior to use in any design or building works.

Services may be obscured by parked cars, leaf litter or by dulling materials etc.

Rev	Date	Remarks
316316		FOR INFORMATION

SIDEBOTTOM RICHARDSON CHENG LTD
CONSULTING STRUCTURAL AND CIVIL ENGINEERS
15 High Street Spalding Lincs PE11 1TU
Tel 01775 712000
Fax 01775 712000
Email src@srcltd.com

Project
Site Survey at
Primrose Farm
Maisdike Lane, Fleet
Spalding, Lincs

Title
Topographical Survey

Date	June 2016	Scale	1:200 @A1
Drawn	AS	Checked	SRC
Design	-	File Name	22815-01

DRG No. 22815/01 Rev -

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Enter a postcode or place name:

PE12 8NH Go

Other topics for this area...

Flood Map for Planning (Rivers and Sea)

Flood Map for Planning (Rivers and Sea)

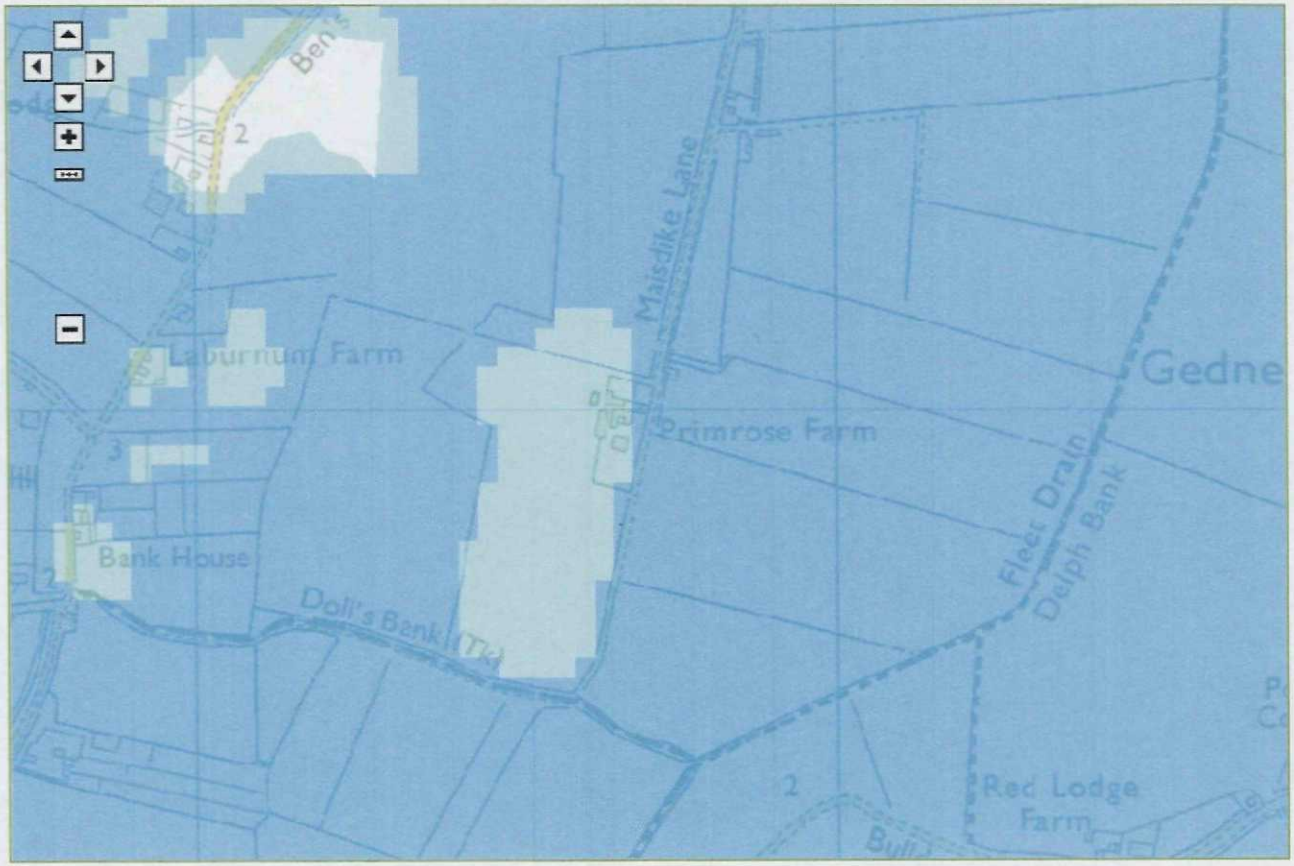
Map legend

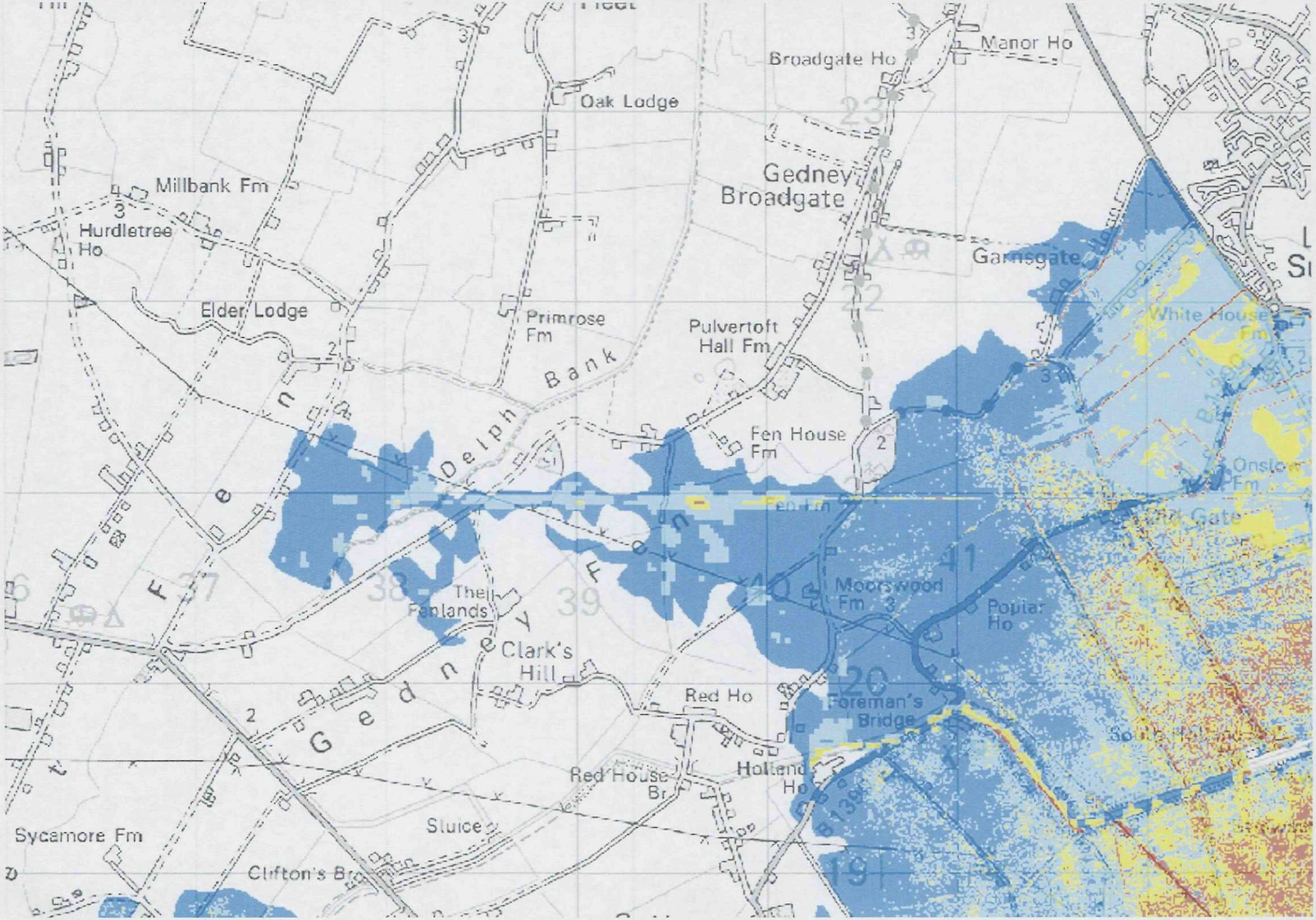
Click on the map to see what Flood Zone (National Planning Policy Guidance definitions) the proposed development is in.

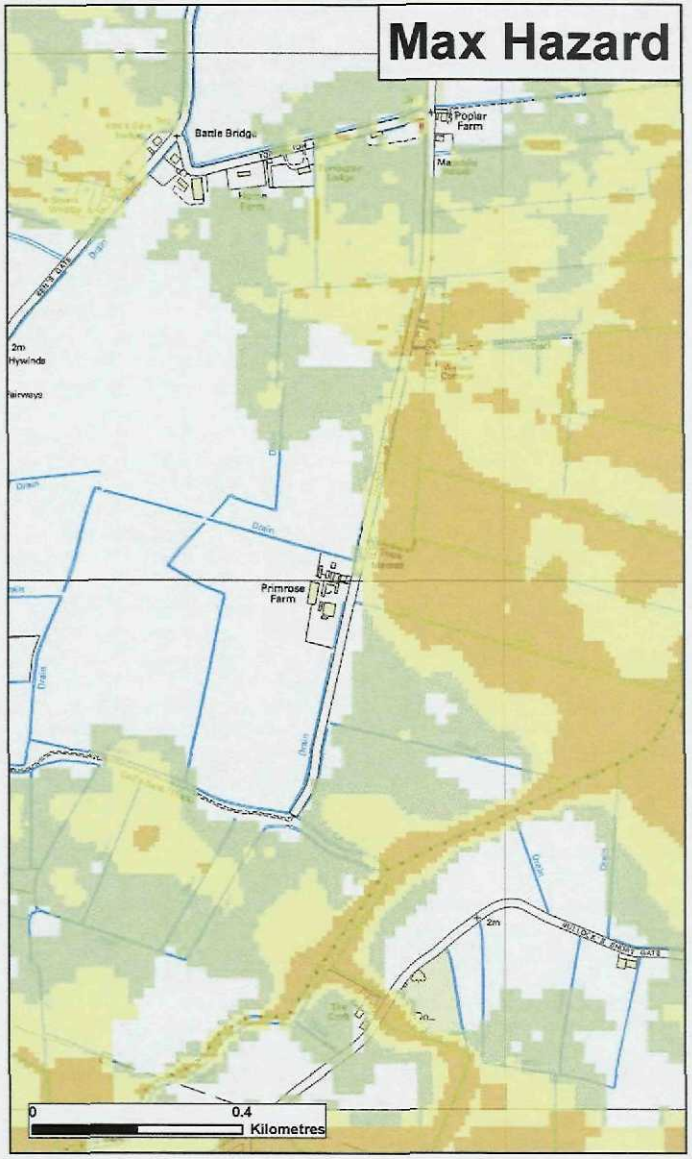
- Flood Map for Planning (Rivers and Sea)
  - Flood Zone 3
  - Flood Zone 2
  - Flood defences (Not all may be shown*)
  - Areas benefiting from flood defences (Not all may be shown*)
- Main Rivers
  - River line

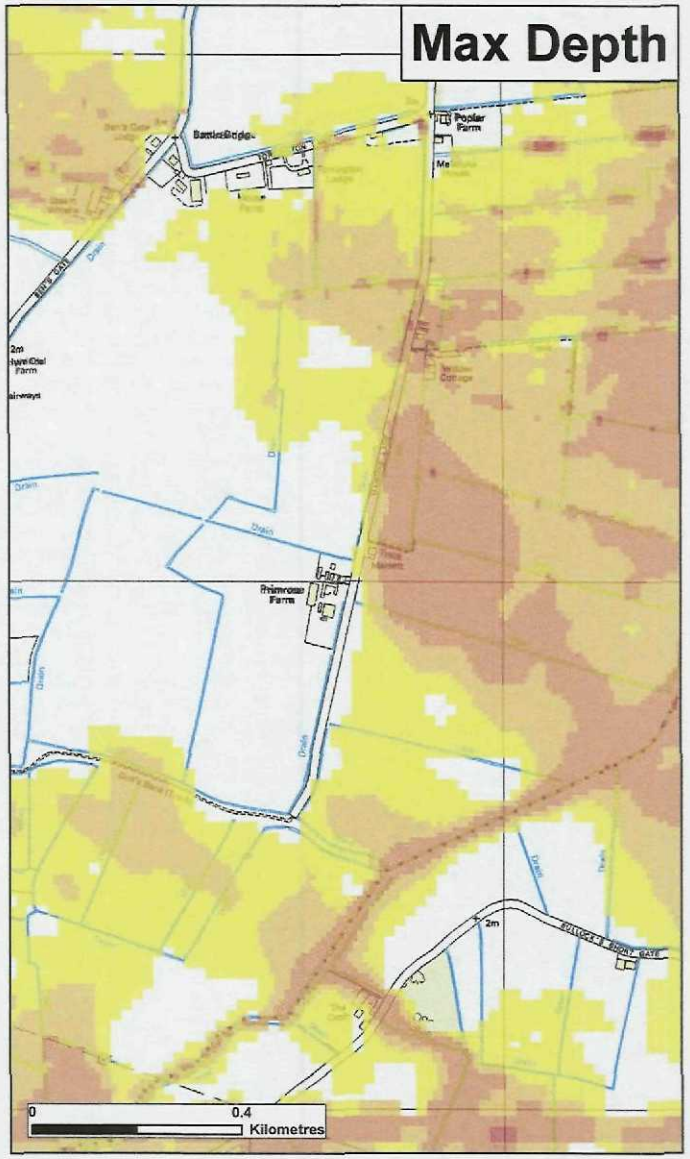
PE12 8NH at scale 1:10,000

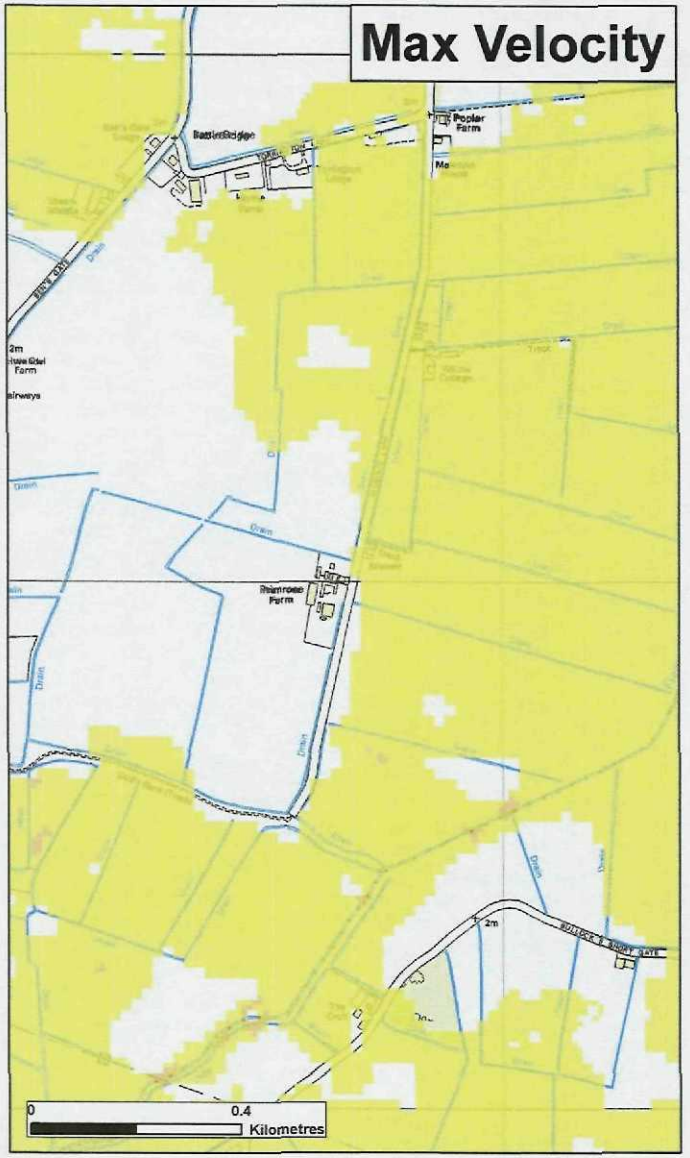
Other maps Data search Text only version




Broadgate Ho
Manor Ho
Oak Lodge
Millbank Fm
Hurdletree Ho
Gedney Broadgate
Garnsgate
Elder Lodge
Primrose Fm
Pulvertoft Hall Fm
Delph Bank
Fen House Fm
Moorswood Fm
Popular Ho
The Fenlands
Clark's Hill
Red Ho
Foreman's Bridge
Red House Br
Holland Ho
Sycamore Fm
Sluice
Clifton's Br
Gedney Drove End
Gedney Hill







★ **Modelled Breach Locations** - see also the accompanying plan "Location of Modelled Breaches"

Max Hazard (Flood Risk to People : FD2320)	Max Depth (m)	Max Velocity (m/s)
Less than 0.75 (Low Hazard)	0 - 0.25	0 - 0.3
Between 0.75 and 1.25 (Danger for Some)	0.25 - 0.50	0.3 - 1.0
Between 1.25 and 2.0 (Danger for Most)	0.50 - 1.0	1.0 - 1.5
Greater than 2.0 (Danger for All)	1.0 - 2.0	1.5 - 2.5
	2.0 +	2.5 +

Date Printed	May 2015	Scenario year	2115	Scenario Annual Chance	0.5% (1 in 200)

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.

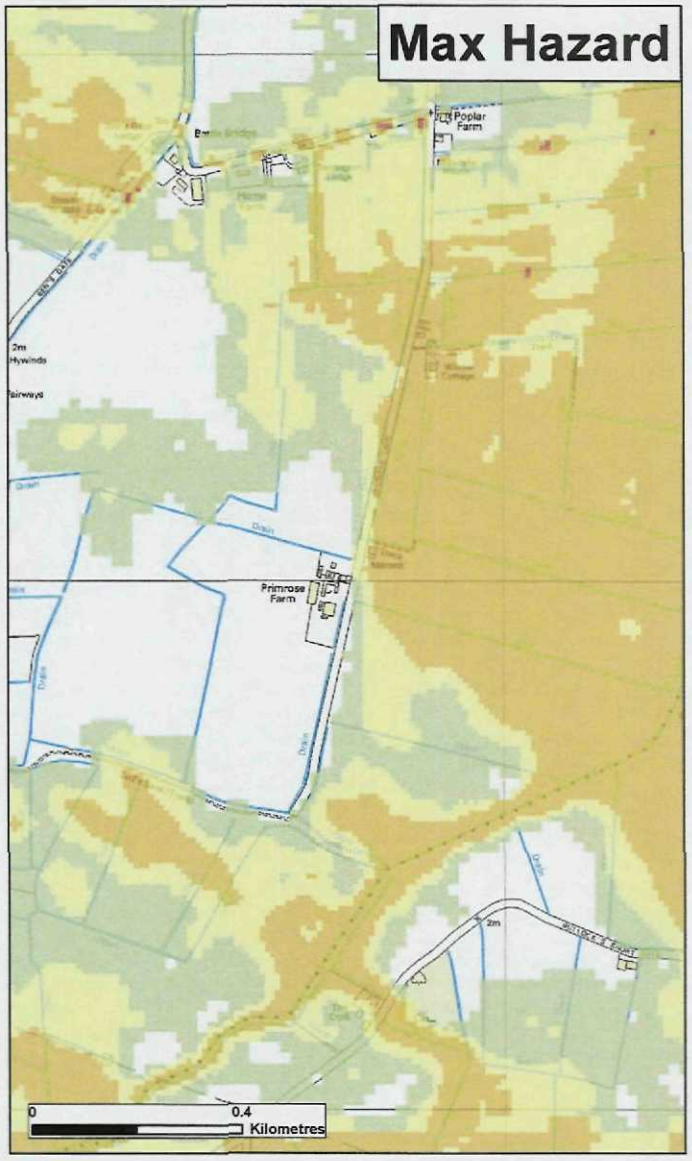
General Enquiries No: 03708 506 506. Weekday Daytime calls cost 5p plus up to 6p per minute from BT Weekend Unlimited. Mobile and other providers' charges may vary

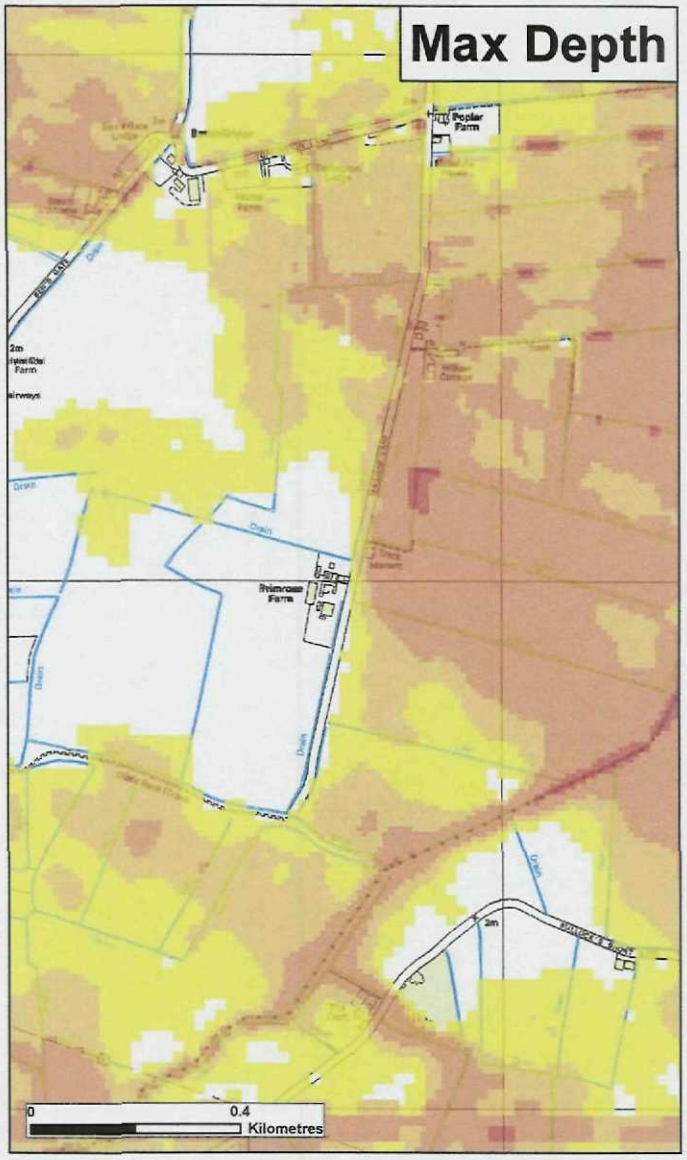
Environment Agency

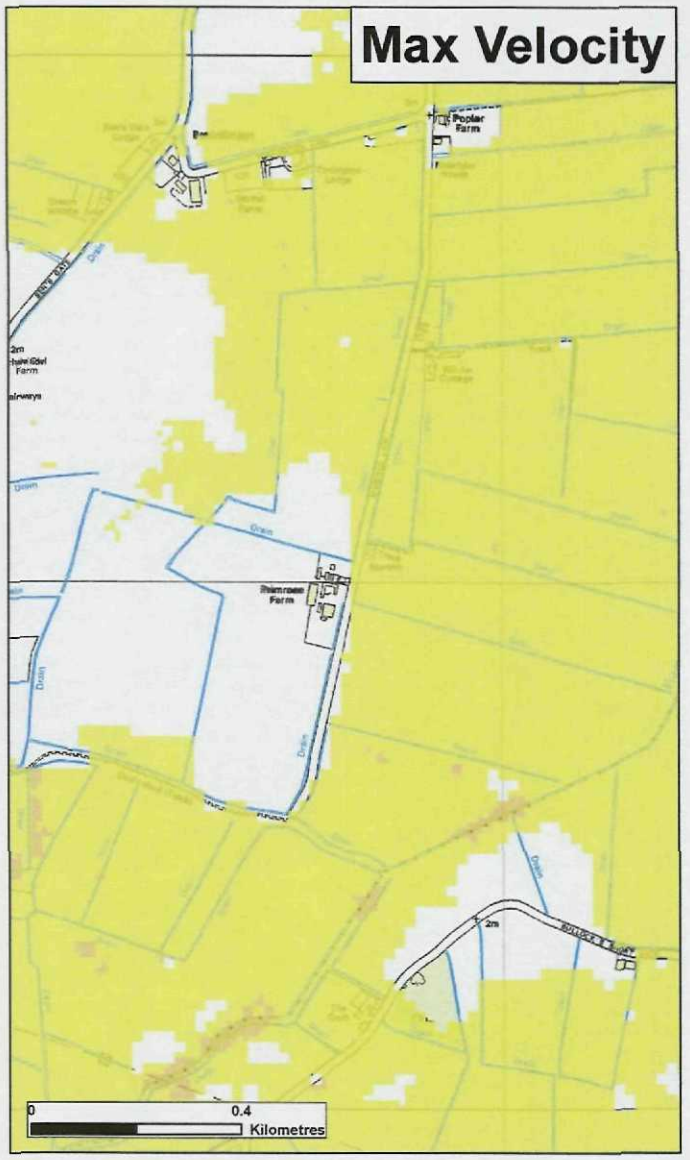
Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping

Map Centred on TF3869722004

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Greater than 2.0 (Danger for All)	1.0 - 2.0	1.5 - 2.5
	2.0 +	2.5 +

Date Printed	May 2015	Scenario year	2115	Scenario Annual Chance	0.1% (1 in 1000)

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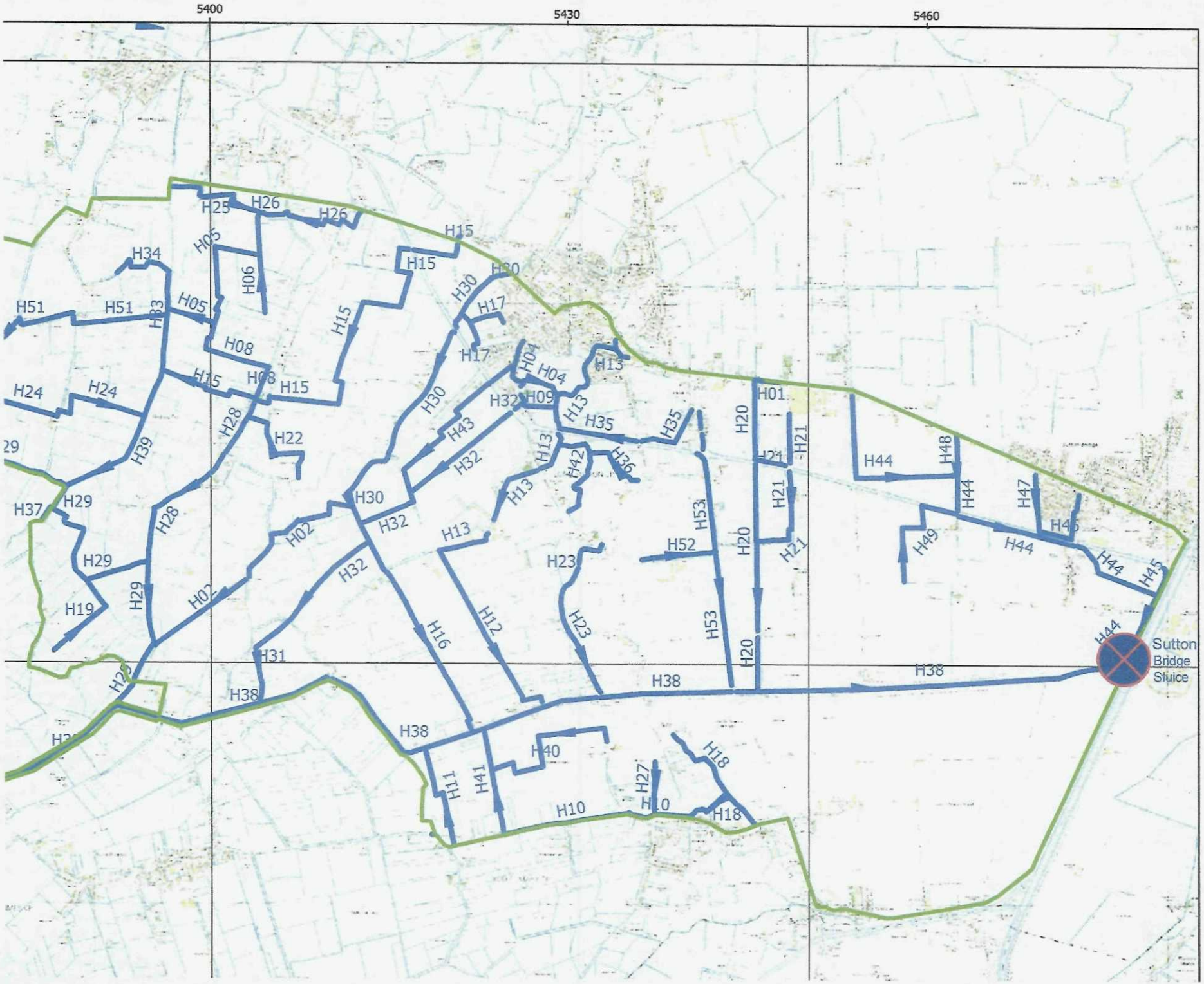
General Enquiries No: 03708 506 506. Weekday Daytime calls cost 5p plus up to 6p per minute from BT Weekend Unlimited. Mobile and other providers' charges may vary

Environment Agency

Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping

Map Centred on TF3869722004

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