FLOOD RISK ASSESSMENT
FOR PROPOSED
RESIDENTIAL DEVELOPMENT AT
TILSONS FARM, MAIN ROAD, GEDNEY MARSH, SPALDING, LINCS.

FINAL REPORT

GEOFF BEEL CONSULTANCY

FEBRUARY 2018

GCB/MERCHANT

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G R Merchant drg. no. 3213-17.03

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G R Merchant drg. no. 3213-17.02

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G R Merchant drg.

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Fig 6 - South Holland District Council Updated Strategic Flood Risk Assessment Residual Flood Depths – District 2116

Fig 7 - South Holland Internal Drainage Board district plan

1.0 INTRODUCTION

1.1 A full planning application is to be submitted by G R Merchant Ltd on behalf of Mr & Mrs M Parnell for proposed residential development at Tilsons Farm, Main Road, Gedney Marsh, Spalding, Lincs.

1.2 A Flood Risk Assessment is required to accompany the planning application and meet the requirements and general principles contained in 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 3 and within a Hazard Zone of the South Holland District Council's Updated Strategic Flood Risk Assessment Maps (2016).

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

1.3 Geoff Beel Consultancy was appointed on 8th February 2018 to undertake a Flood Risk Assessment.

2.0 LOCATION

2.1 The development site is located at Tilsons Farm, Main Road, Gedney Marsh. The National Grid Reference of the central point of the development is TF 43272840.

2.2 The position and extent of the site is shown on Fig 1 – First Floor Plan, Site & Location Plans 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 both the Environment Agency Flood Map for Planning and the Council's Updated Strategic Flood Risk Assessment Maps (2016) as defended by the Agency's tidal defences and the Internal Drainage Board system but liable to flooding as a result of a breach to the existing tidal defences.

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is currently open land at Tilsons Farm.

3.2 The area of development is approximately 0.115 hectare.

3.3 The proposed site layout consists the construction of a two-storey dwelling and detached garage. Existing land level varies between 3.50m and 4.19m aOD. Main Road carriageway level is at 4.10m 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 of the Council's Updated Strategic Flood Risk Assessment Maps (2016).

Flood mitigation measures have been incorporated in the design and construction to ensure the proposals pass Part 2 of the Exception Test with an adequate water exclusion strategy for the design flood and breach event.

There is no other land in Gedney Marsh at a lower risk of flooding and 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 a Board main drain immediately west of the site and hence to the Dawsmere Pumping Station.

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 Three 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) overtopping and breaching of defences of the Wash 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 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.

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 could reach the development site which is again further protected by land levels at 3.50m aOD which are well above surrounding land levels.

5.4 The South Holland Updated Strategic Flood Risk Assessment shows depths of flooding between 0.50-1.00m as a result of a breach to the tidal defences.

The Environment Agency requires the following mitigation measures:

- For areas where flood depths are 0.50-1.00m

  Finished floor level (FFL) should be set a minimum of 1.00m above existing ground level with flood resilient construction incorporated to a weight of 300m above the FFL. Finished floor level will therefore be raised to 4.50m aOD.

5.5 The Environment Agency has recently published The Wash Shoreline Management Plan 2 from Gibraltor Point to Old Hunstanton. The summary of the plan between Gibraltor 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 level at a minimum of 4.50m and 1.00m above ground level will be appropriate for the design life of the development (i.e. 100 years). Safe refuge is available with all sleeping accommodation at first floor level.

8.0 IMPACTS OF FLOODING

8.1 No significant impacts of flooding are anticipated.

8.2 Floor level of the development will be at a minimum of 4.50m aOD and 1.00m above ground 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 Main Road in a southerly direction to Holbeach town centre with carriageway level at 4.10m aOD.

8.6 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: 0345 988 1188 and the occupiers of the new dwelling 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 4.25kms from The Wash tidal defences with secondary defences between the marsh frontage and the site.

9.2 The site is within Flood Zone 3 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 Map for Planning has 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 an Updated Strategic Flood Risk Assessment (2016) of the whole District by appointed Consulting Engineers.

The Updated Strategic Flood Risk Assessment (2016) has produced more definitive Flood Risk Maps similar to 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 (2016) the site is within a Hazard Zone and defended by tidal defences and tidal doors but liable to flooding as a result of a breach to the existing 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 in a Defended Floodplain. It is located in the Passive Floodplain protected by the Wash tidal defences to a 1 in 200 year return period, (1.0%)

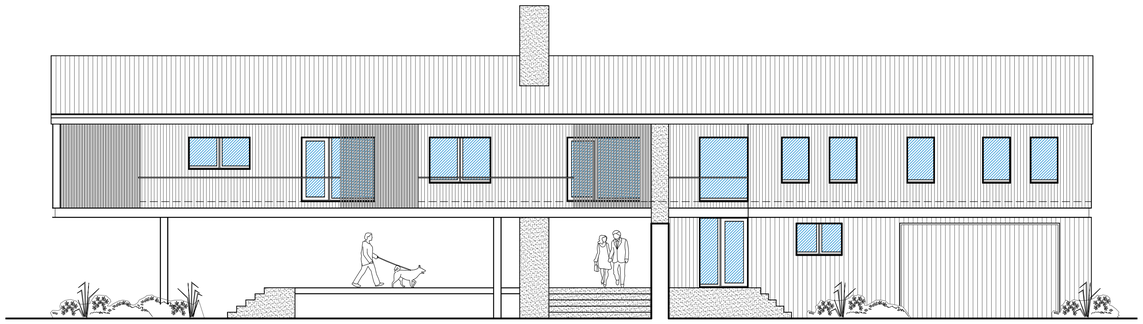
- The site is in Flood Zone 3 with the actual risk of flooding from any Environment Agency river system being very low (less than 0.5%).

- 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 1.00m above ground level at a minimum of 4.50m aOD with a further 300mm of flood resilient construction above finished floor level and all sleeping accommodation at first floor level.

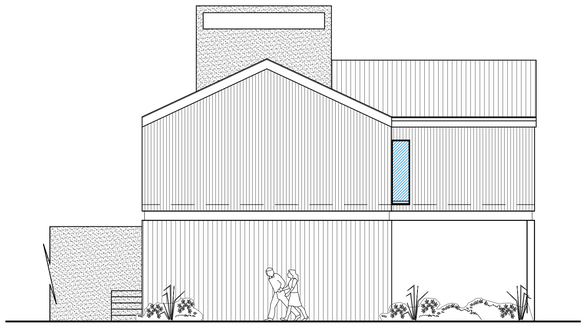
- Any development within 9.00m of the adjoining IDB main drain will require Land Drainage Byelaw Consent from the South Holland IDB.



Front Elevation

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metres

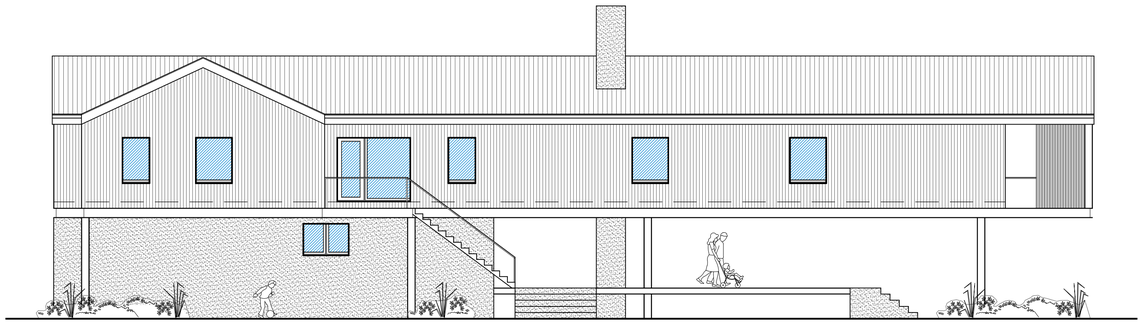
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Side Elevation

0 1 2 3 4
metres

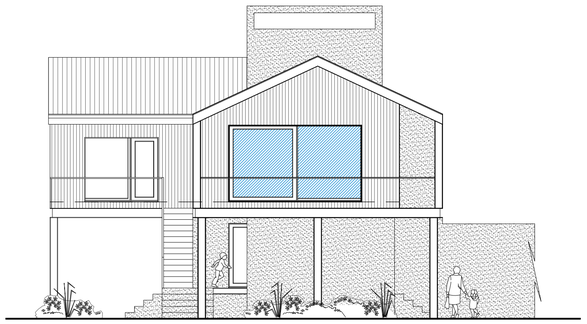
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Rear Elevation

0 1 2 3 4
metres

Scale: 1:100



Side Elevation

0 1 2 3 4
metres

Scale: 1:100

General Notes

1. This drawing shall not be scaled, figured dimensions only to be used.
2. All dimensions are shown in 'mm' unless otherwise stated.
3. The contractor, sub-contractors and suppliers must verify all dimensions on site prior to the commencement of any work.
4. This drawing is to be read in conjunction with all relevant engineers and specialist sub-contractors drawings and specifications.
5. Any discrepancies are to be brought to the designers attention.

ELEVATION KEY

- Indicates white/pale grey insulated cladding panels
- Indicates black insulated cladding panels
- Indicates joinery
- Indicates stone filled Gablon Cages forming spine walls
- Indicates stained timber

Status

FOR APPROVAL

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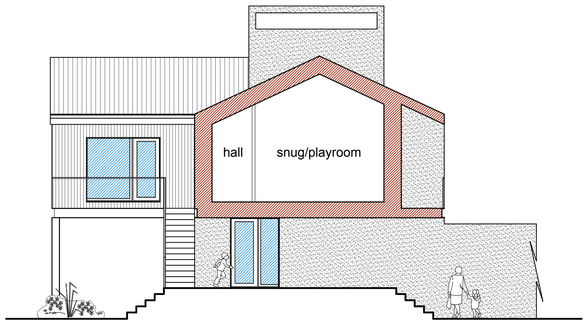
Job Title
Proposed Para 79 House
Land Adj. Tilsons Yard
Gedney Drove End

Date	Drawn by
July 2019	JRB
	Checked by JB

Drawing Title
Planning Drawing
Elevations

Job No.	Sheet Size
SE-1111	A1
Dwg No. 10	Revision

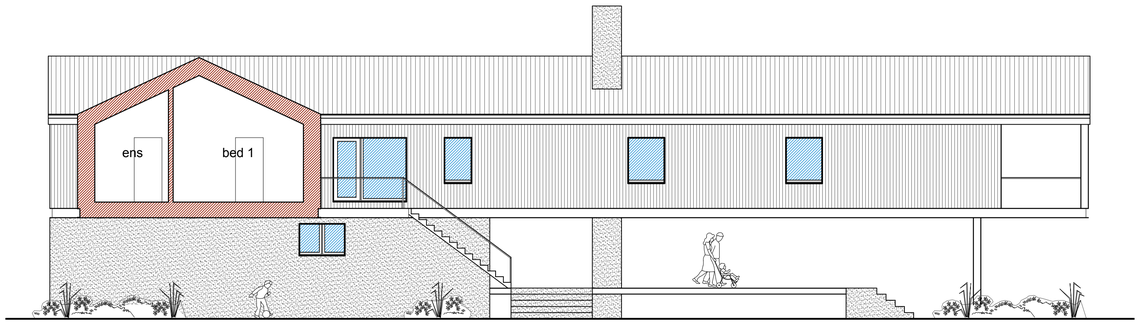
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Section A-A

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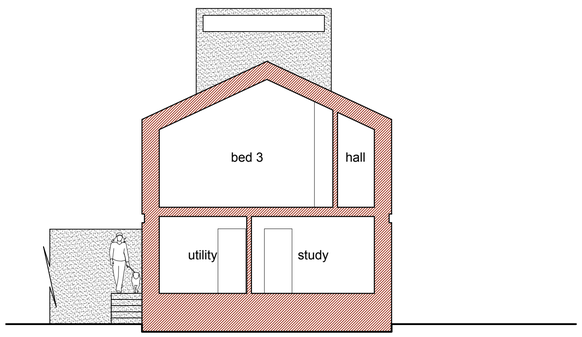
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Section B-B

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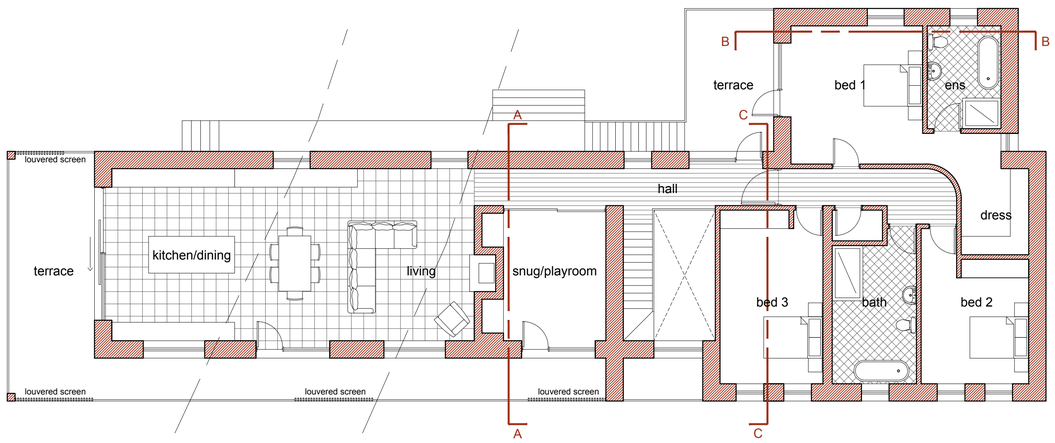
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Section C-C

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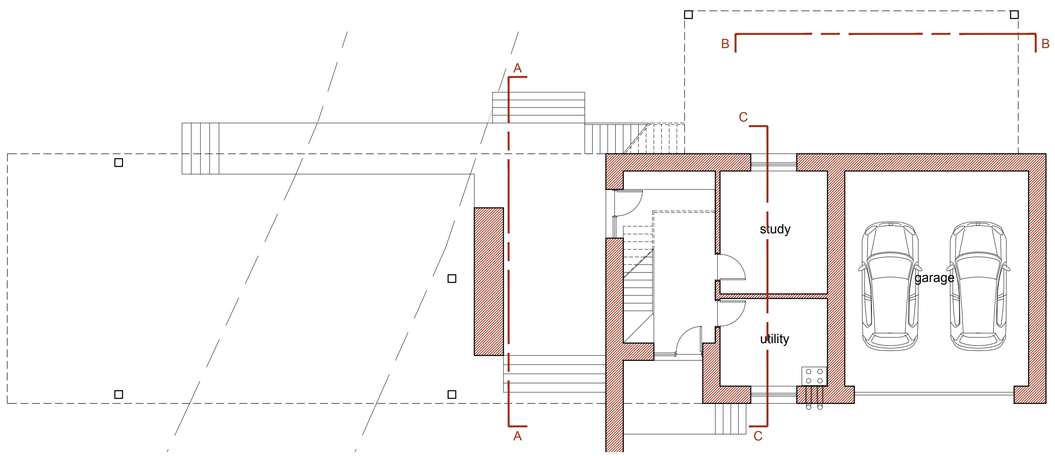
0 1 2 3 4
metres



First Floor Plan

Scale: 1:100

0 1 2 3 4
metres



Ground Floor Plan

Scale: 1:100

0 1 2 3 4
metres

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Job Title
Proposed Para 79 House
Land Adj. Tilsons Yard
Gedney Drove End

Date	Drawn by
July 2019	JRB
	Checked by JB

Drawing Title
Planning Drawing
Floor Plans & Sections

Job No.	Sheet Size
SE-1111	A1
Dwg No. 11	Revision

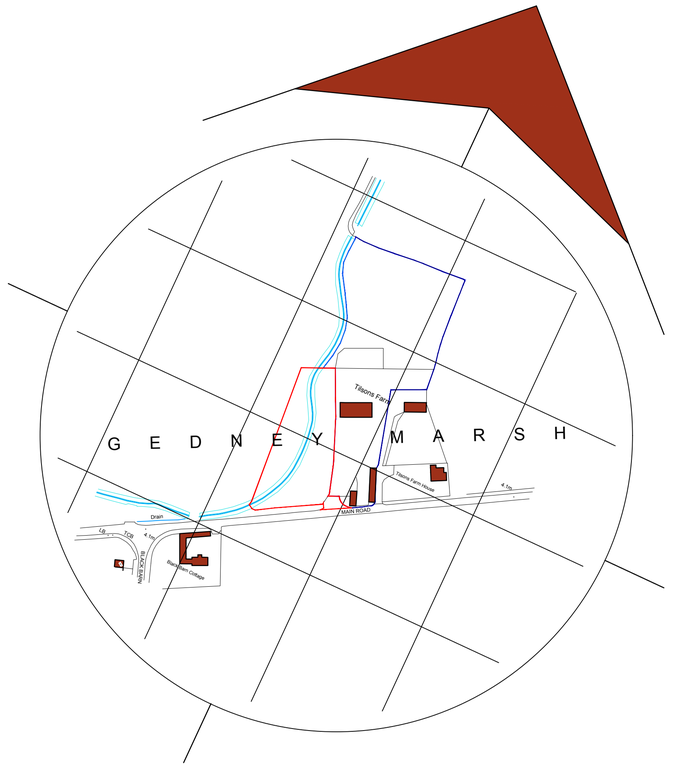
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Site Plan

Scale: 1:500

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metres



Location Plan

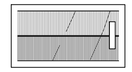
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0 20 40 60 80
metres

General Notes

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SITE PLAN KEY



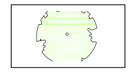
Indicates proposed building



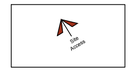
Indicates proposed grass



Indicates proposed gravel



Indicates proposed trees and hedges



Indicates site access

Status

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Planning Drawing
Site Plan & Location Plan

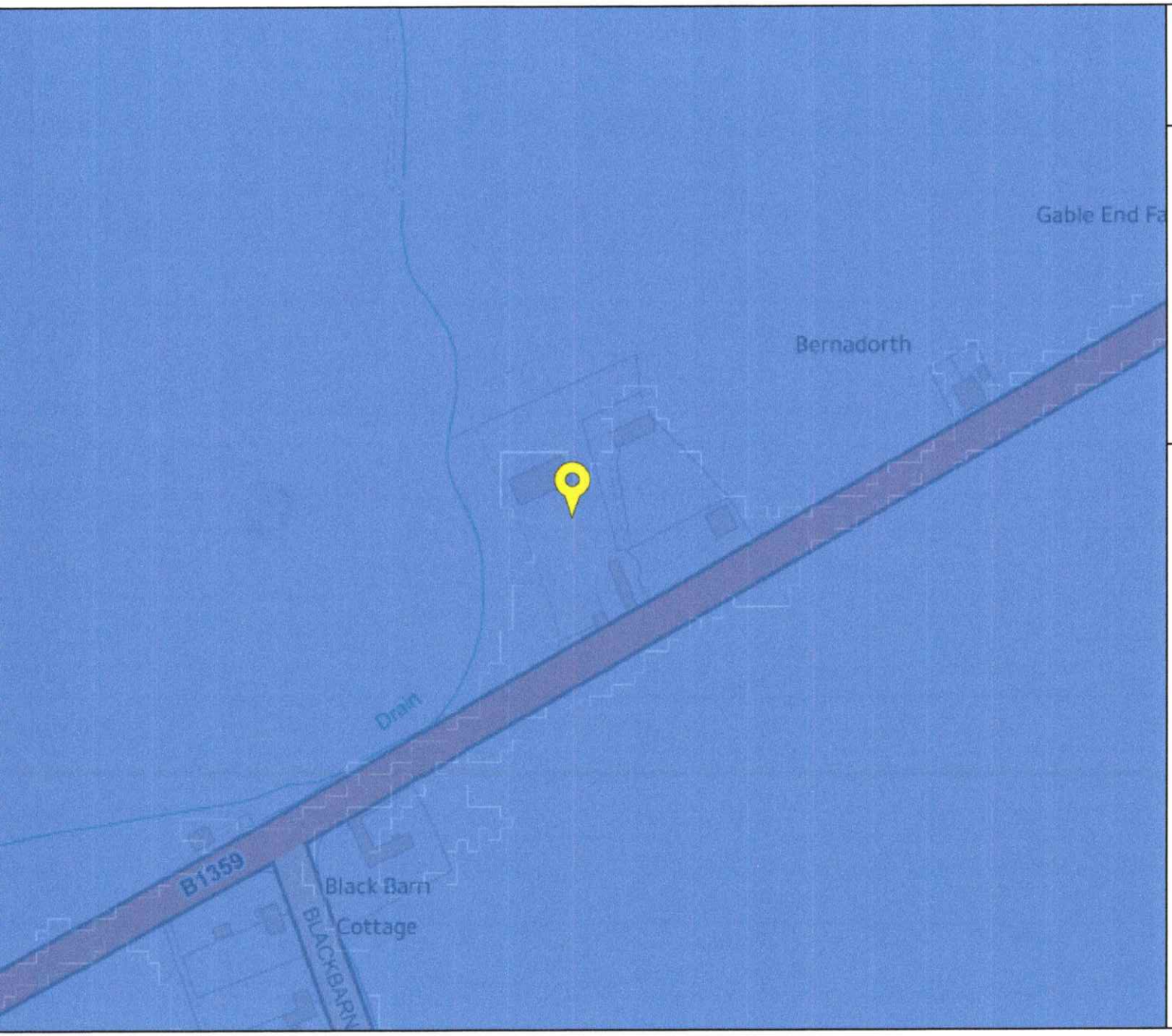
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Dwg No.: 12

Sheet Size: A1

Revision:

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Environment Agency

Flood map for planning

Your reference
GDE

Location (easting/northing)
543292/328420

Scale
1:2500

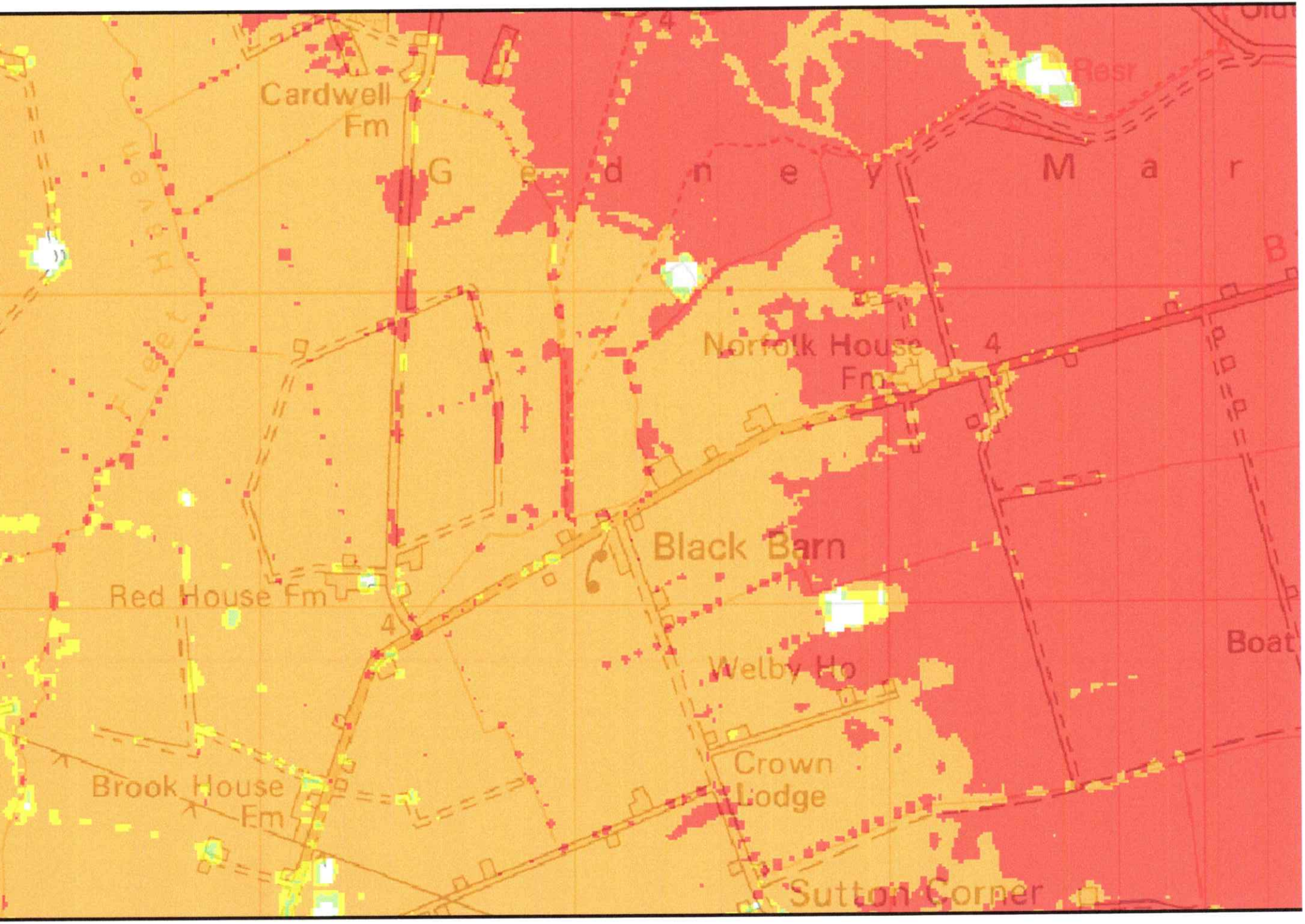
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13 Aug 2019 17:08

- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 20 40 60m

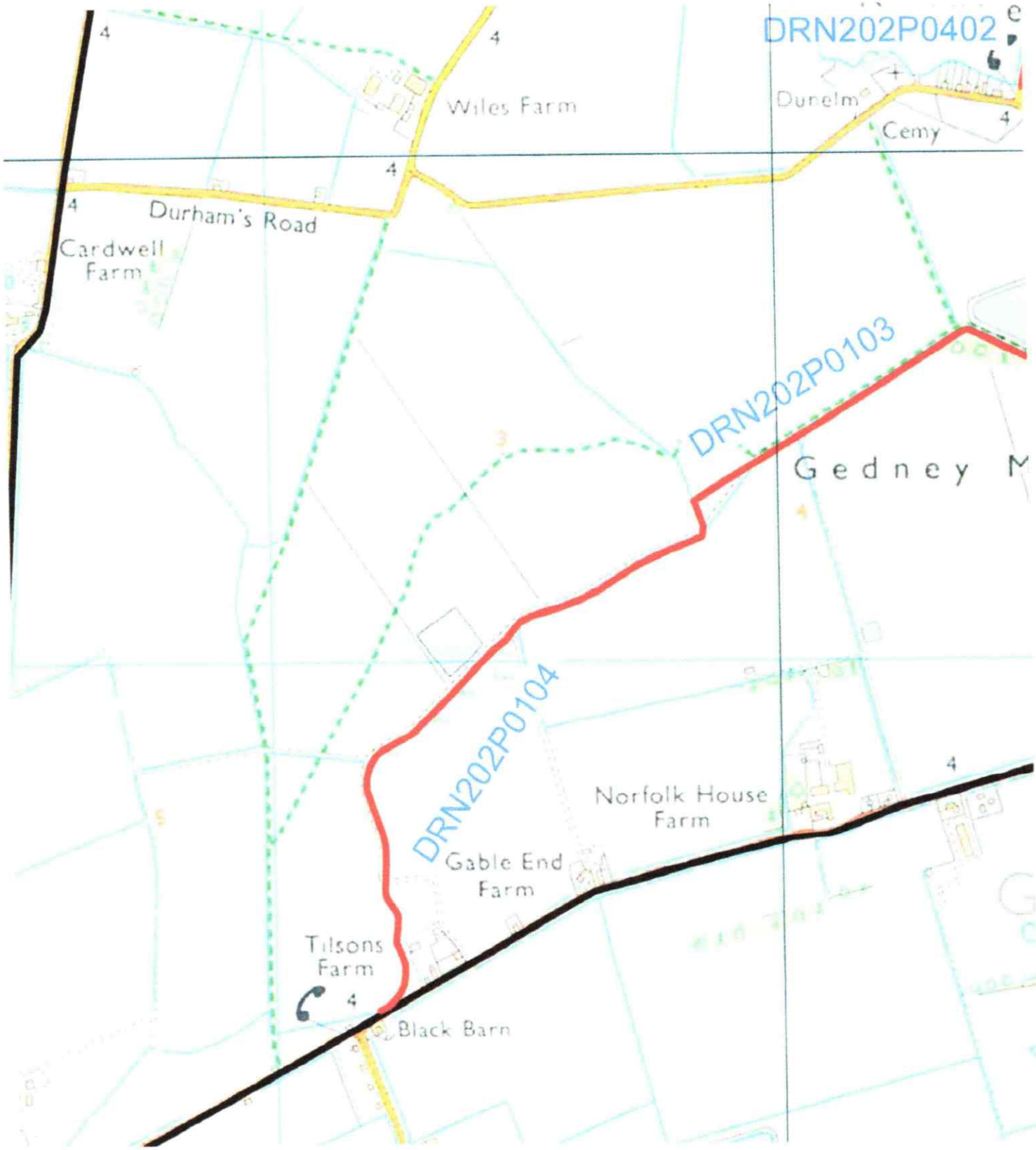
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Hazard.


Cardwell Fm
Gedney Marsh
Norfolk House Fm
Black Barn
Red House Fm
Welby Ho
Crown Lodge
Brook House Fm
Sutton Corner
Fleet Hawe

Depth


Cardwell
Fm
G e d n e y
M a r
Resr
Norfolk House
Fm
4
Black Barn
Red House Fm
4
Welby Ho
Crown
Lodge
Brook House
Fm
Sutton Corner


DRN202P0402
Wiles Farm
Durham's Road
Cardwell Farm
Dunelm
Cemy
DRN202P0103
Gedney M
DRN202P0104
Norfolk House Farm
Gable End Farm
Tilsons Farm
Black Barn