FLOOD RISK ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT AT 37 BROADGATE, WESTON, SPALDING, LINCS.

FINAL REPORT

GEOFF BEEL CONSULTANCY

APRIL 2021

GCB/MERCHANT

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G R Merchant drg. no. 3320-18-01

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G R Merchant drg. no. 3320-18-02

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1.0 INTRODUCTION

1.1 An outline planning application is to be submitted by G R Merchant Ltd on behalf of Mr & Mrs S Ladym for proposed residential development at land adjacent to 37 Broadgate, Weston, 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).

The site, as situated, is located partly within Flood Zones 1 & 2 of the Environment Agency's Flood Map for Planning. 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 Updated Strategic Flood Risk Assessment Maps (2016) – Residual Flood Depths.

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

1.3 Geoff Beel Consultancy was appointed on 24th May 2018 to undertake a Flood Risk Assessment. This Flood Risk Assessment has been updated in April 2021.

2.0 LOCATION

2.1 The development site is located at land adjacent to 37 Broadgate, Weston. The National Grid Reference of the central point of the development is TF 28882479.

2.2 The position and extent of the site is shown on Fig 1 - Location & Site Layout Plan at the end of the document.

2.3 The site, located within the South Holland Internal Drainage Board district is shown partly within Flood Zones 1 & 2 as detailed on the Environment Agency Flood Map for Planning and in Flood Zone 1 of the Council's Strategic Flood Risk Assessment Maps (2016) Residual Flood Depths 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 garden to 37 Broadgate.

3.2 The area of development is approximately 0.04 hectare.

3.3 The proposed site layout consists the construction of a 3 bedroom two-storey cottage with parking space.

3.4 The Sequential Test is met as the site is located in Flood Zone 1 of the Council's Updated Strategic Flood Risk Assessment Maps (2016) 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 nearby IDB main drain south east of the site and hence via other drains in the Little Holland catchment to discharge into the South Holland Main Drain at the Little Holland 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 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 Little Holland Pumping Station
d) overtopping and breaching of the Wash and River Welland 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 Little Holland Pumping Station 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 Welland defences provide a 1 in 200 year return period level of protection.

The 1 in 200 year tidal event to the tidal River Welland and the Holbeach Marsh frontage inclusive of climate change to 2116 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 Updated Strategic Flood Risk Assessment Flood Zone Maps (2016).

Similarly, the River Welland and Crowland Cowbit Washes are located 3.00kms south west of the site and provide protection against the 1 in 100 year plus climate change fluvial flood event.

5.5 Finished floor level has been raised 300mm above existing ground level.

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

5.6 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.

5.7 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 300mm above existing ground level with a further 300mm of flood resilient constriction above will be appropriate for the design life of the development (i.e. 100 years). Safe refuge and sleeping accommodation is available at first floor level.

8.0 IMPACTS OF FLOODING

8.1 No significant impacts of flooding are anticipated.

8.2 Floor levels of the development will be a minimum of 300mm above existing ground 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 a soakaway drainage system to BRE365 design requirements will be installed.

8.5 The developer should ensure that the eventual occupiers of the dwelling 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 2.50kms from the River Welland tidal defences with secondary defences between the defences and the site. Also being 3.00kms from the River Welland fluvial defences and the Crowland & Cowbit Washes.

9.2 The site is within Flood Zone 1 of the Council's Updated SFRA Maps as a result of existing defences 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 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 Updated Strategic Flood Risk Assessment (2016) the site is outside any Hazard Zone and Residual Flood Depths in year 2116 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 defences and tidal and fluvial River Welland defences and the South Holland IDB protected by defences to both the 1 in 100 year and 1 in 200 year return period events.

- The site is in Flood Zone 1 as protected by existing defences the actual risk of site flooding from any Environment Agency river system is 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.

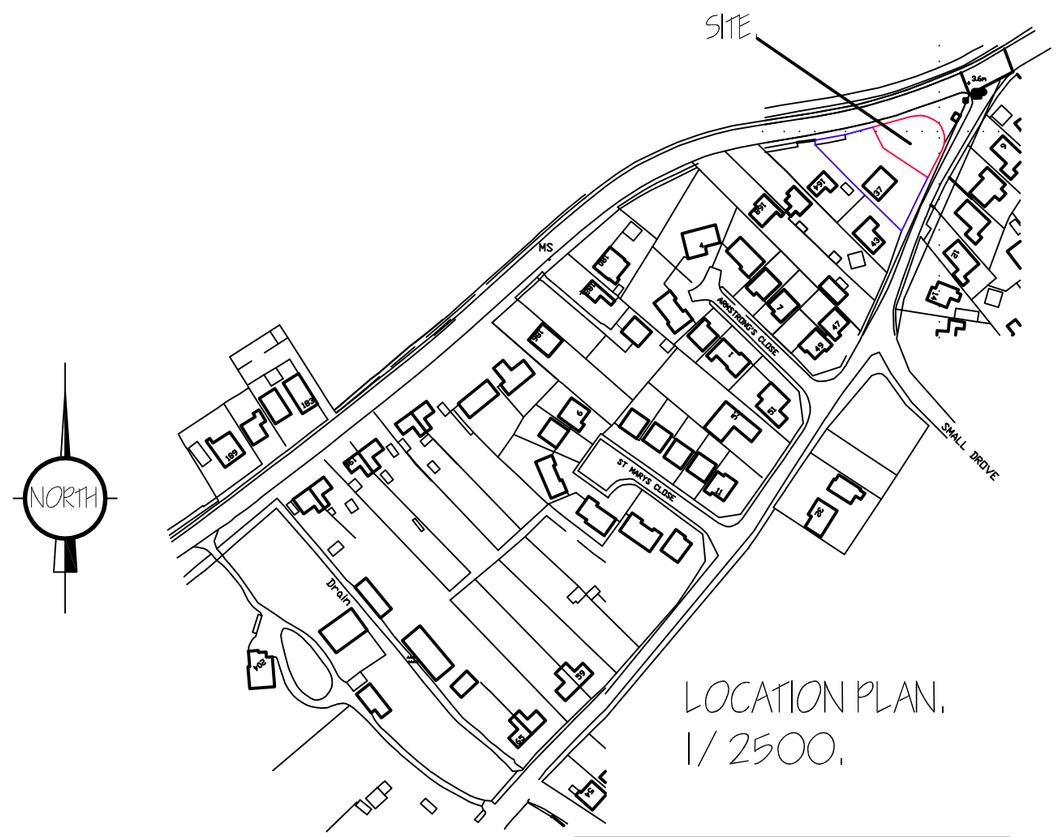
- On site rainwater from the development will be discharged via soakaway drainage to BRE365 design requirements.

- Floor level of the new dwelling will be at a minimum of 300mm above existing ground level with safe refuge and sleeping accommodation at first floor level. Flood resilient construction will be incorporated up to 300mm above finished floor level.

SITE AREA :- 0.04 Hectares.



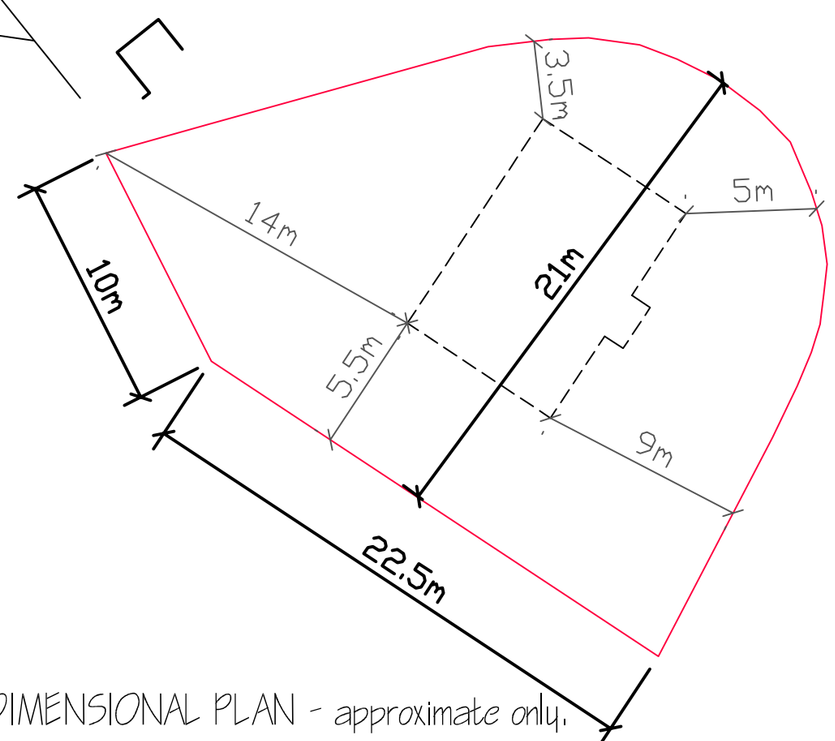
SITE PLAN.
1/ 500.



LOCATION PLAN.
1/ 2500.

INDICATIVE DWELLING :-
3 BEDROOM COTTAGE & PARKING SPACE.

NEW ACCESS TO BROADGATE TO THE REQUIREMENTS & SPECIFICATION OF LINC'S C C, HIGHWAYS DEPARTMENT.



DIMENSIONAL PLAN - approximate only.
1/ 250.

ref:	revision	date

G. R. MERCHANT LTD.
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Project
RESIDENTIAL DEVELOPMENT.
ADJ' 37 BROADGATE.
WESTON. SPALDING.
LINC'S. PE12 6HY.

Client
MR & MRS S LADYM.

Drawing
LOCATION & SITE LAYOUT PLAN.

Job Ref.	Drawing No.
3320-18.	01.
Date	**Drawn**
MARCH 2018.	GRM/ HLD.

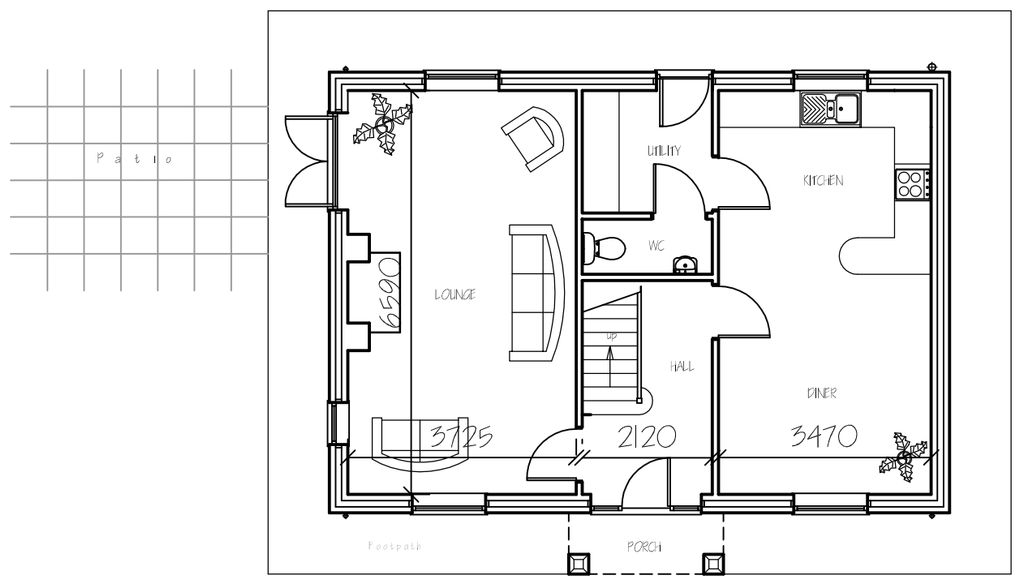
Scales
AS INDICATED.

DO NOT SCALE FROM THIS DRAWING

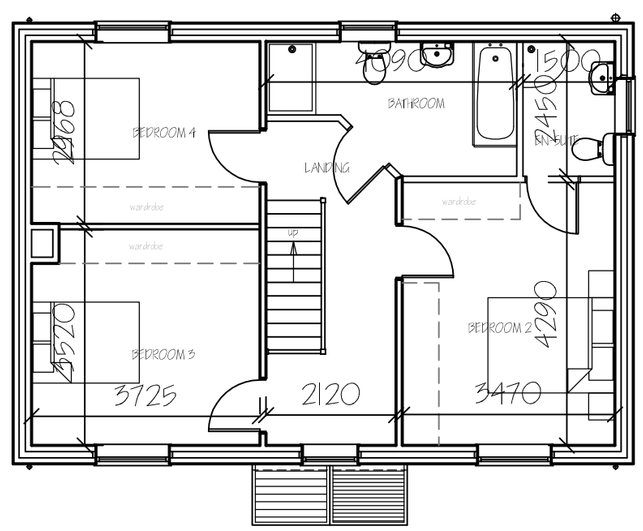
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FRONT ELEVATION.



GROUND FLOOR PLAN.



FIRST FLOOR PLAN.

INDICATIVE ONLY

ref:	revision	date

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WESTON. SPALDING.
LINC'S. PE12 6HY.

Client
MR & MRS S LADYM.

Drawing
INDICATIVE FLOOR PLANS
& FRONT ELEVATION.

Job Ref.	Drawing No.
3320-18.	02.

Date	Drawn
MARCH 2018.	GRM/ HLD.

Scales
1/100.

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Flood map for planning

Your reference	Location (easting/northing)	Created
PE12 6HY	**528889/324795**	**12 Apr 2021 10:27**

Your selected location is in flood zone 2, an area with a medium probability of flooding.

This means:

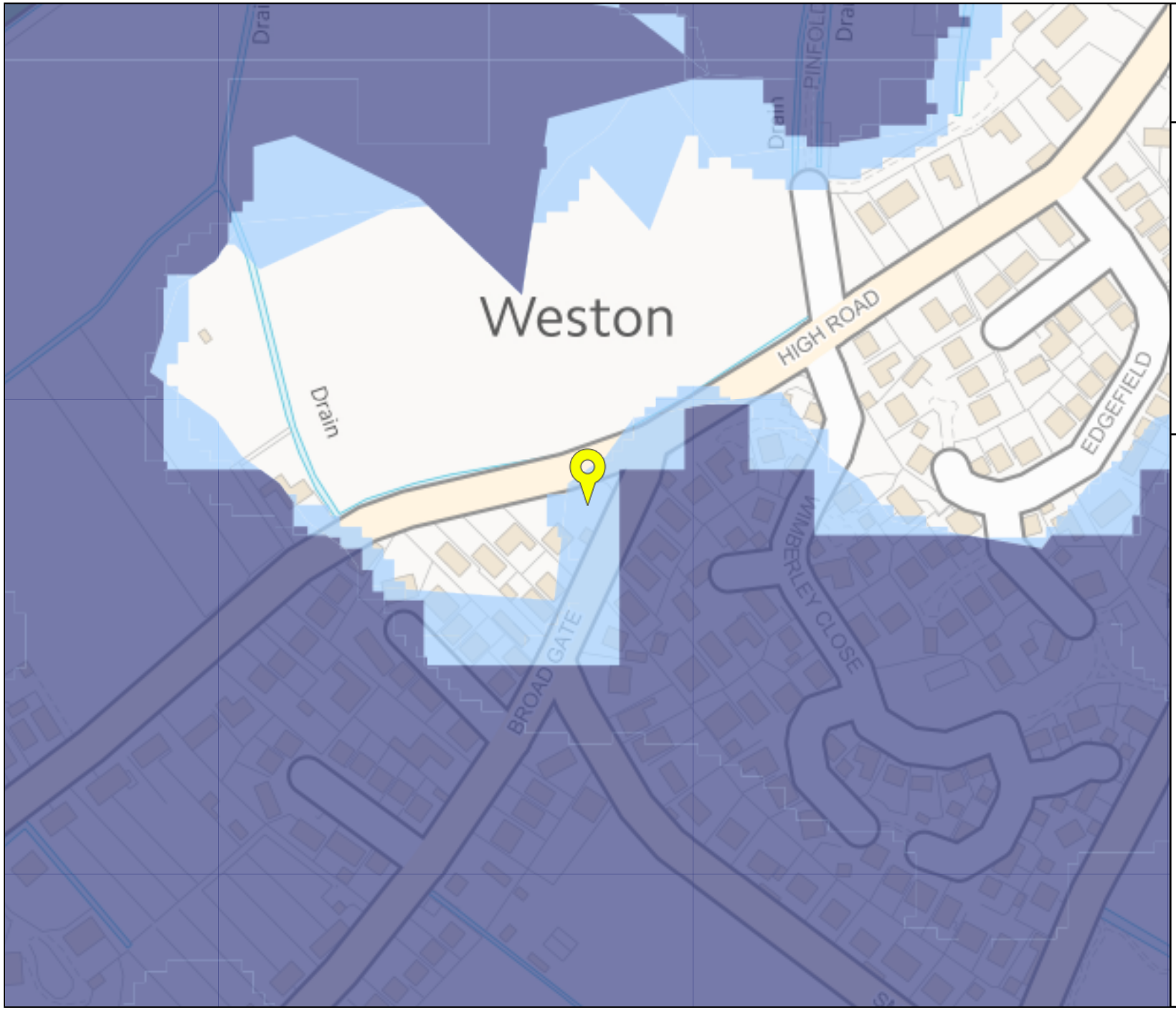
- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see www.gov.uk/guidance/flood-risk-assessment-standing-advice)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

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Environment Agency

Flood map for planning

Your reference
PE12 6HY

Location (easting/northing)
528889/324795

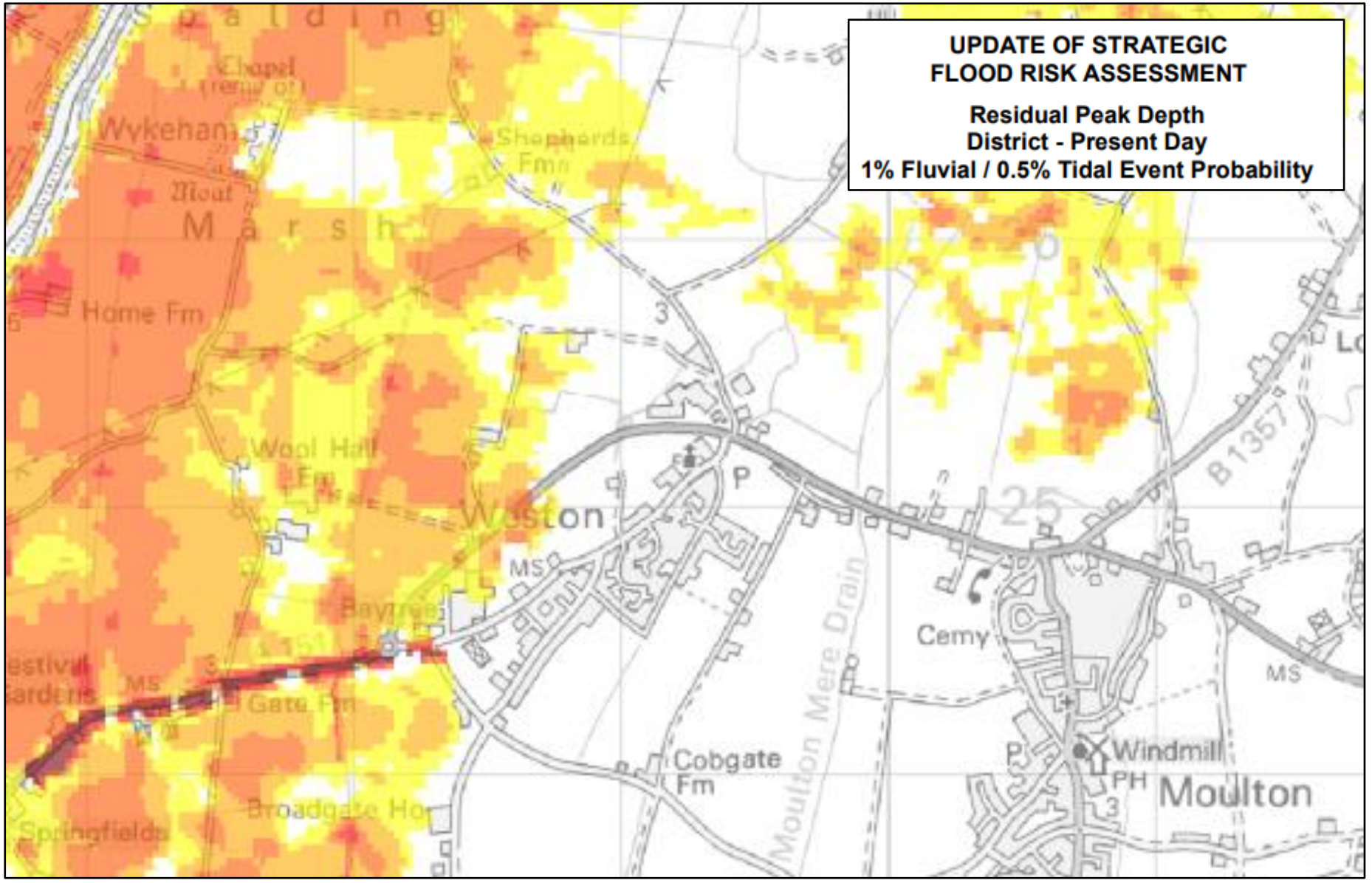
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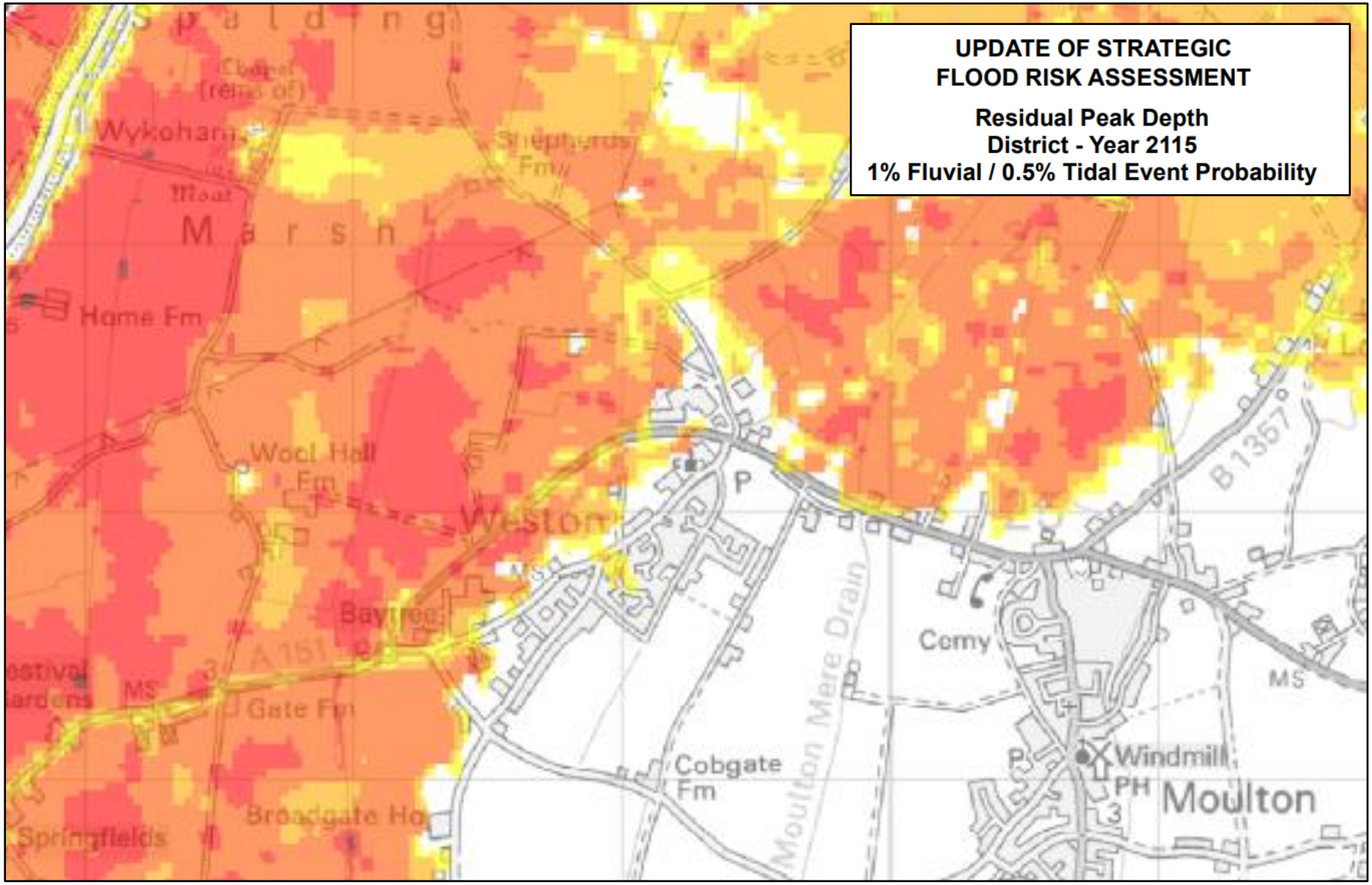
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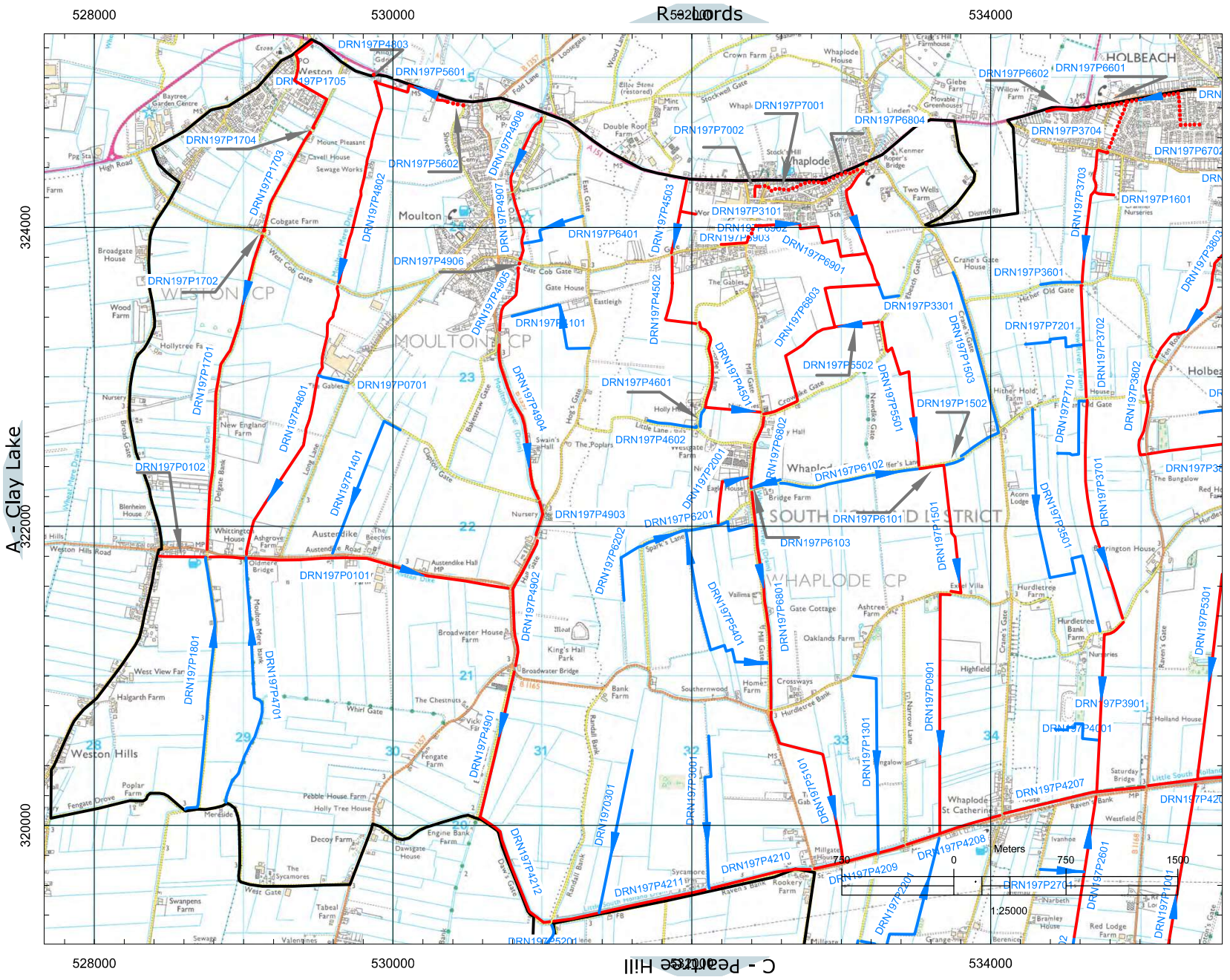
- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 20 40 60m

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UPDATE OF STRATEGIC
FLOOD RISK ASSESSMENT
Residual Peak Depth
District - Present Day
1% Fluvial / 0.5% Tidal Event Probability
Spalding
Wykeham
Moat
Marsh
Home Fm
Wool Hall Fm
Weston
Bayfree
Gate Fm
Springfields
Broadgate Ho
Cobgate Fm
Moulton Mere Drain
Cemy
Windmill
PH
Moulton
B1357
MS
P


UPDATE OF STRATEGIC
FLOOD RISK ASSESSMENT
Residual Peak Depth
District - Year 2115
1% Fluvial / 0.5% Tidal Event Probability
Wykoham
Mount
Marsh
Home Fm
Wool Hall Fm
Weston
Bayfree
A151
Gate Fm
Broadgate Ho
Springfields
Cobgate Fm
Moulton Mere Drain
Corny
B1357
Windmill
PH
Moulton
MS
P



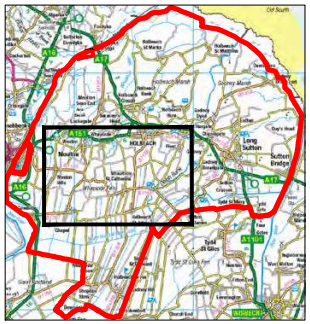
Little Holland (W)

South Holland Drainage Board

LEGEND

- Catchment Boundary
- High Priority Watercourse
- IDB Ordinary Watercourse
- High Priority Pipeline
- Ordinary Pipeline
- Water Control Structure
- Pumping Station
- Inland Sluice
- Tidal Sluice

KEY MAP



N

SCALE	SHEET NUMBER
Best fit	CMT197P
PLOT DATE	
05/01/2016	

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FILE NAME

SHIDB_webmap2013.dwg