FLOOD RISK ASSESSMENT
FOR PROPOSED
RESIDENTIAL DEVELOPMENT
AT 41 CORONATION AVENUE,
THROCKENHOLT, SPALDING, LINCS.

FINAL REPORT

GEOFF BEEL CONSULTANCY

MAY 2018

GCB/BROKER

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Fig 1 - Location Plan – 1:1250

Fig 2 - Environment Agency Flood Map for Planning

Fig 3 - South Holland Updated Strategic Flood Risk Assessment Residual Depth Map (2116)

Fig 4 - North Level Internal Drainage Board District Plan

1.0 INTRODUCTION

1.1 A planning application is to be submitted by David Broker Design Services for proposed barn style dwelling at land adjacent to 41 Coronation Avenue, Throckenholt, Spalding, Lincs.

1.2 Planning approval requires a Flood Risk Assessment to be submitted to the Environment Agency as the site, is shown as situated in Flood Zone 3 of the Agency's Flood Map for Planning. The Assessment is required to meet the requirements and general principles contained in the Planning Practice Guidance to the National Planning Policy Framework (NPPF).

The latest Agency Maps have been created as a tool to raise awareness of flood risk with the public sector and 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 located in the North Level Internal Drainage Board district.

1.3 Geoff Beel Consultancy was appointed on 2nd May 2018 to undertake a Flood Risk Assessment.

2.0 LOCATION

2.1 The development site is located at land adjacent to 41 Coronation Avenue, Throckenholt and north of the River Nene tidal defences. The National Grid Reference of the central point of the site is TF 35160923.

2.2 The position and extent of the site are shown on Fig 1 – Location Plan at the end of the document.

2.3 The site, located within the North Level Internal Drainage Board district is shown within Flood Zone 3 as detailed on the Environment Agency Flood Map for Planning but in Flood Zone 1 of the South Holland Updated Strategic Flood Risk Assessment Residual Depths Map (2116).

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is open ground.

3.2 The area of development is approximately 0.10 hectare with vehicular access off Coronation Avenue.

3.3 The proposed site layout consists the construction of a new 2 storey dwelling off proposed access from Coronation Avenue.

3.4 The Sequential Test and Exception Test will require to be applied by the Local Authority but the development may be permitted as the site is protected against the 1 in 200 year return period tidal event and the 1 in 100 year return period fluvial event and meets the requirements of NPPF.

The site is located in Flood Zone 1 of the Council's Updated Strategic Flood Risk Assessment and hence 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 and Practice 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.

4.2 The site is located within the North Level Internal Drainage Board district with the nearest main drain watercourse immediately south of the development site. Land levels are generally at 3.70m aOD.

4.3 The existing standard of drainage for the North Level 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 a minimum 900mm is provided to the lowest land levels.

4.4 The site and surrounding land drains by gravity in a generally north easterly direction to outfall into the North Level Main Drain and hence to Tydd Pumping Station discharging into the tidal River Nene.

4.5 Current maintenance standards within the North Level Internal Drainage Board and of the Environment Agency defences are generally 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 IDB main drain system.
b) storm return period of 1 in 50 years being exceeded to IDB system
c) failure of Tydd Pumping Station
d) overtopping and breaching of the tidal River Nene embankment at Guyhirn.

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 North Level 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. The New Wryde Drain is located 70m south of the development site.

5.3 Failure of Tydd 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 site is located 5.00kms from the left hand bank of the River Nene tidal defences at Guyhirn. After the 1978 tidal surge event, the tidal defences were raised and strengthened to withstand a 1 in 100 year return period event. As a result existing bank level is 6.30m aOD.

5.5 More recent studies by the Environment Agency have concluded a design water level for the 1 in 200 year tidal event as 4.47 m aOD. Taking into account, sea level rise during the next 100 years predicted 1 in 200 year tide level would have risen to 5.52m aOD.

This would still provide a freeboard above predicted 1 in 200 year level of 0.78 metre to crest of embankment. It is therefore highly unlikely that any overtopping or breaching of the tidal defences would occur.

This freeboard is further reinforced by the fact of the Whittlesey Washes Cradge Bank and the Rings End Outfall Sluice having a protection level of 4.50m aOD. Any increase in tidal flood water is unlikely to reach the estimated level of 5.52m aOD as water will overtop the Cradge Bank and Outfall Sluice to discharge floodwaters into the Whittlesey Wash.

5.6 This evidence is confirmed by the Environment Agency's Consulting Engineers in carrying out the River Nene Tidal Strategy which concluded that the defences meet the indicative standard of 1 in 200 years return period for tidal flooding inclusive of the impacts of climate change over the next 50 years.

5.7 More recent hydraulic modelling by consulting engineers on behalf of the Environment Agency has identified the site to be outside the limits of any Tidal Hazard Mapping in the Council's Updated Strategic Flood Risk Assessment Residual Depth Flood Mapping (2116).

6.0 EXTENT OF KNOWN FLOODING

6.1 During the preparation of this assessment, no evidence was discovered of the site being flooded.

7.0 PROBABILITIES AND TRENDS OF FLOODING

7.1 The probability of this development flooding from localised drainage systems is very low. The IDB main drain systems provides adequate standard of protection for up to 1 in 50 years return period plus freeboard to lowest land levels. Proposed floor level of the dwelling would be 300mm above Coronation Avenue carriageway with no sleeping accommodation at ground floor level.

7.2 The probability of the site flooding with water from the tidal River Nene, main river is less than 0.5%. If the trend of climate change anticipated to occur continues over the next 100 years, the defences are more than adequate to sustain the 1 in 200 year standard of protection.

7.3 If under very extreme events, levels of floodwater from main river 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.

7.4 The water levels in the drainage channels will also tend to rise as a result of the impacts of climate change. However the existing systems and defences together with the proposed floor levels of the development 300mm above Coronation Avenue carriageway level will be appropriate for the design life of the development (i.e. 100 years). Flood resilient measures will be incorporated into the design and construction of the new dwelling up to 300mm above finished floor level.

8.0 IMPACTS OF FLOODING

8.1 No significant impacts of flooding are anticipated due to the existing standards of tidal defence, however a precautionary approach has been adopted to protect against the remote possibility of a tidal breach occurring to the River Nene tidal embankment.

8.2 The developer will ensure that the eventual occupiers of the property are sufficiently aware of the risk of flooding, and the standard of the existing defences. The Environment Agency provides a Flood Warning Service which includes Flood 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.

8.3 Safe and dry access is available across Cloughs Cross Bridge into Parson Drove village where land is in Flood Zone 1.

9.0 RESIDUAL RISK – EXTREME EVENTS

9.1 The residual risk from extreme fluvial events is low on this site, because of the existing standard of drainage provided by the North Level IDB.

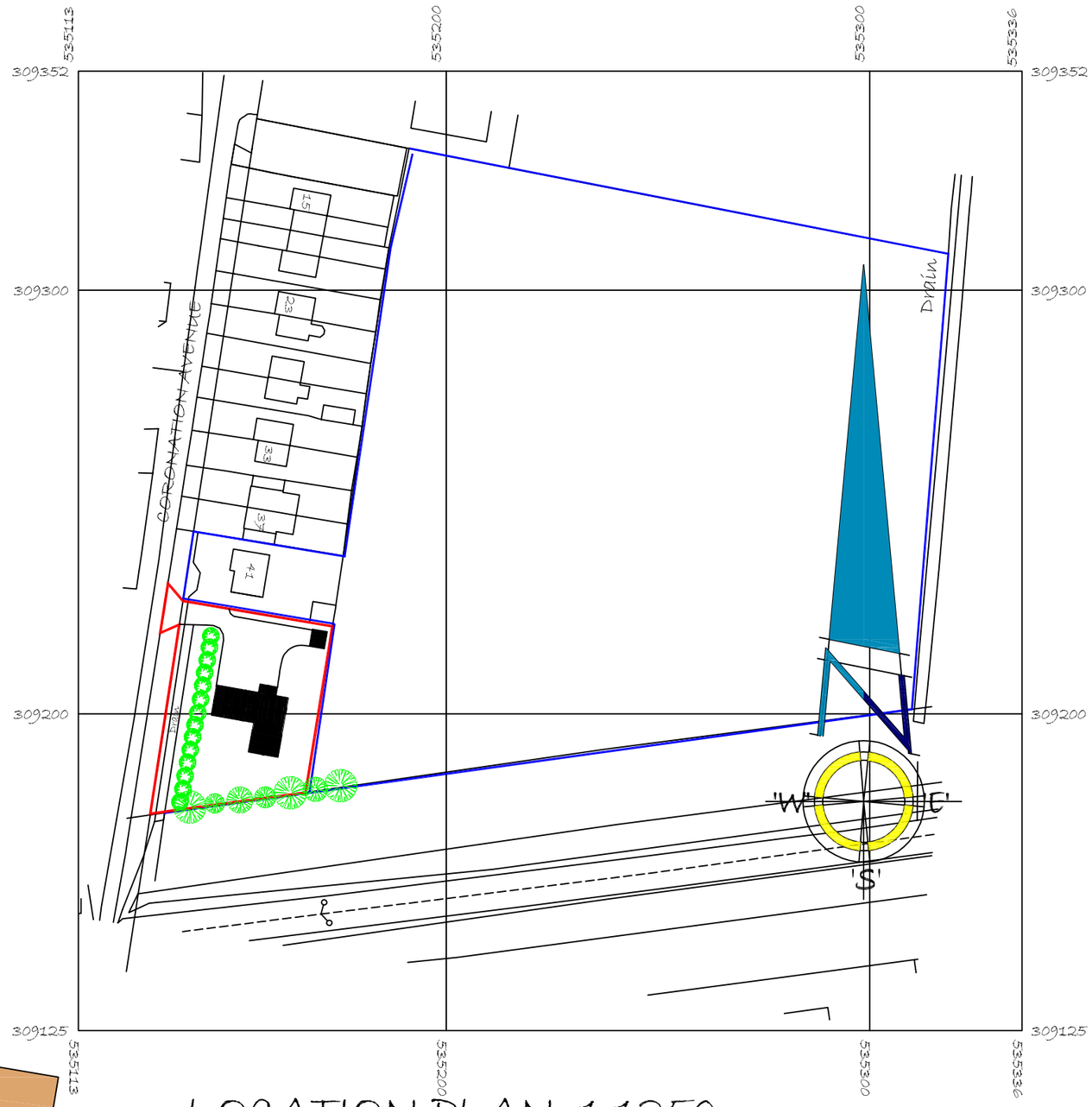
9.2 The site is within Flood Zone 1 according to NPPF classification with a low risk of flooding due to the current standards of drainage and flood defence and land levels. The site is not located within a Functional Flood Plain of any 'main river' or 'main drain'. The Environment Agency Flood Map for Planning has been produced irrespective of existing flood defences and standards of protection.

9.3 The River Nene tidal defences are sustainable over the next 100 years against the 1 in 200 year return period tidal event inclusive of the effects of climate change.

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 in the Passive Floodplain of the River Nene and the North Level IDB.
- The site is in Flood Zone 1 with the actual risk of the site flooding from tidal main river being very low, less than 0.5%.
- Although the site is located within North Level 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.
- Floor level of the new dwelling would be 300mm above Coronation Avenue carriageway level with flood resilient measures incorporated up to 300mm above finished floor level and no sleeping accommodation at ground floor level.
- Surface water drainage will discharge to soakaway designed to BRE365 and building Regulations approval.
- Any works within 9.00 metres of the adjoining riparian drain will require Land Drainage Byelaw Consent from the North Level IDB.



LOCATION PLAN 1:1250

0 20 40 60 80

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100 x 55mm Square edged Hydraulicaly pressed Precast Concrete path edges to Sides of abtess bedded on concrete and haunched min 350mm wide and 250mm deep Concrete Metalled Paved Surface at access points extending 5m into site with falls into site to prevent water running onto road

GRADIENT 1:36

Excavation depth to min 310mm

SURFACE COURSE

25mm compacted thickness of AC 6 dense surf to BS EN 13108-1 and PD 6691 with 100/150 pen binder.The adjacent surfacing shall be trimmed to clean vertical edges and those edges painted with a bitumen based edge sealant in accordance with BS 594987 Surface courses shall be laid and rolled to finish flush with the existing path and the replaced kerbing (as necessary) and as far as possible shall match the existing path appearance.

BINDER COURSE

Binder course to be 60mm compacted thickness of AC 14 close surf to BS EN 13108-1 and PD 6691 with 100/150 pen binder course aggregate shall be crushed rock only.

BASE

Sub base of Type 1 granular sub base (DOT) specification clause 803) or approved recycled equivalent laid and thoroughly compacted with vibrating roller to a finished thickness of 225mm for both pedestrian crossing and for light vehicle crossing.

Proposed new Vehicular Access,to Lincolnshire County Highways spec Splays 2.4x65m available in Verge

HOUSE

DRIVE

Proposed 1.8m High CB fence

Grass Verge

Drain

Existing Grass Track

Existing Hedgerow

Native Hedgerow

19.250

EX Stable

Proposed Dwelling Ground Floor 7.500

Red Maple

Crab Apple

Post and Rail Field Fencing

Existing Grass

10.000

Existing Semi Mature Trees
Horse Chestnut Field Maple Sycamore
planted 6m c-c

BLOCK PLAN 1:200

Site Area 0.10 ha

Tarmac 6M into site Sloping into Site

Gravelled Parking and Turning (EXISTING)

Private Garden Area

SHRUB PLANTING
TO OCCUPANTS CHOICE
BERBERRIS
COTTONEASTER
HEATHERS

All Species planted in combination
Ground to be broken in depth with a chisel plough or similar and bed prepared and furtilised before planting
All trees to be planted in the first appropriate season following the occupation of the Dwellings and there-after maintained
Any diseased or dead items to be replaced at the appropriate time.

Rev	Purpose	By	Date

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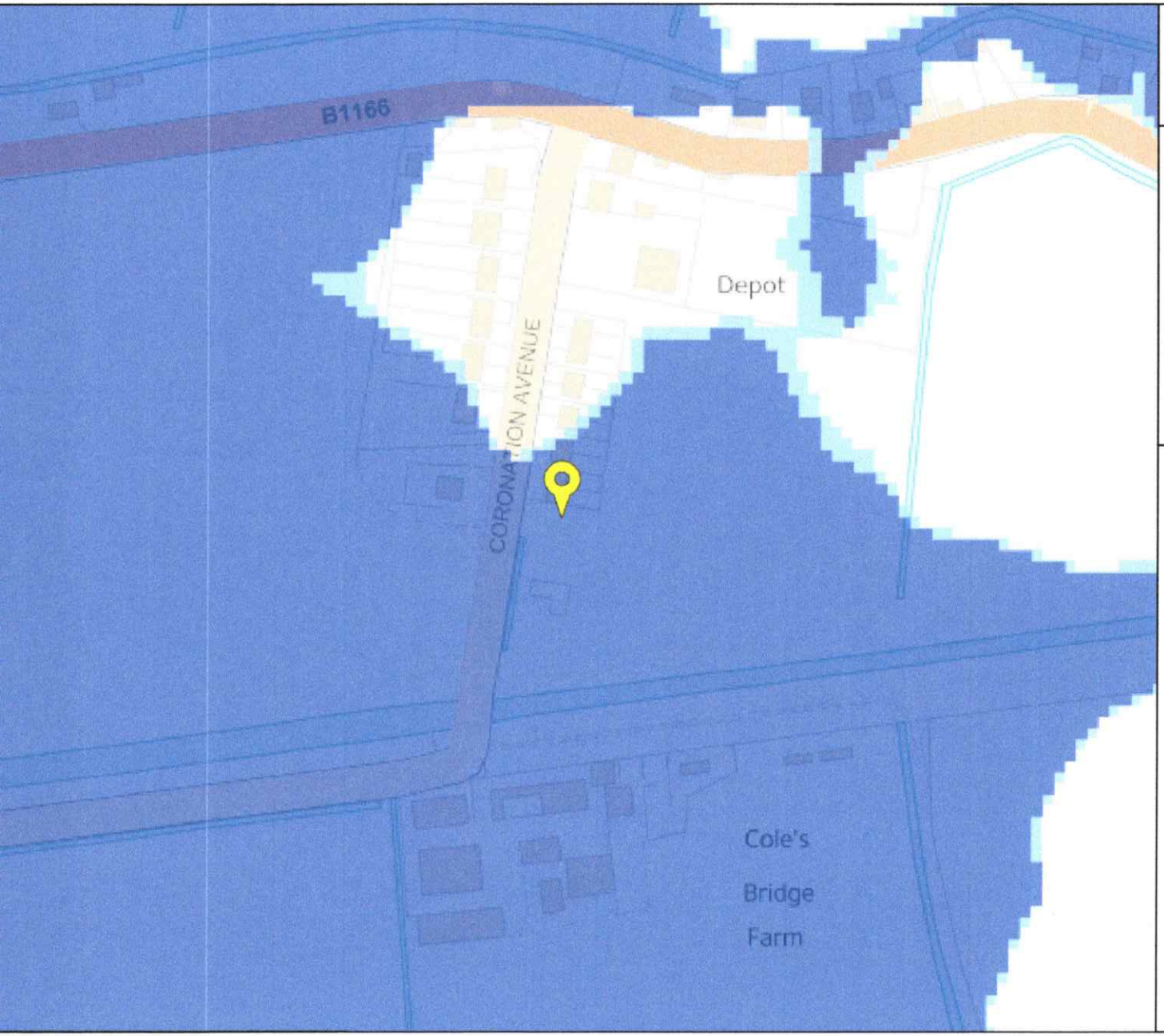
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E-mail- david.broker@btinternet.com
ESTABLISHED 1975

Issue:	
Client:	DAVID BROKER
Drawing No:	2051- G A PLANS ELEVATIONS
Project:	PROPOSED 2 STOREY BARN STYLE DWELLING HOUSE WITH INTEGRAL GARAGE NEW VEHICLE ACCESS FENCING PLANTING AND LANDSCAPING AND STABLE
Site:	LAND SOUTH OF No 41 CORONATION AVENUE THROCKENHOLT

Postcode:	Drawn:	Checked:
PE12 0QT	DB	-
Print Scale:	**Date:**	**Revision No:**
1:50 @ A1	APRIL 18	-

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Environment Agency

Flood map for planning

Your reference
PE12 0QT

Location (easting/northing)
535159/309234

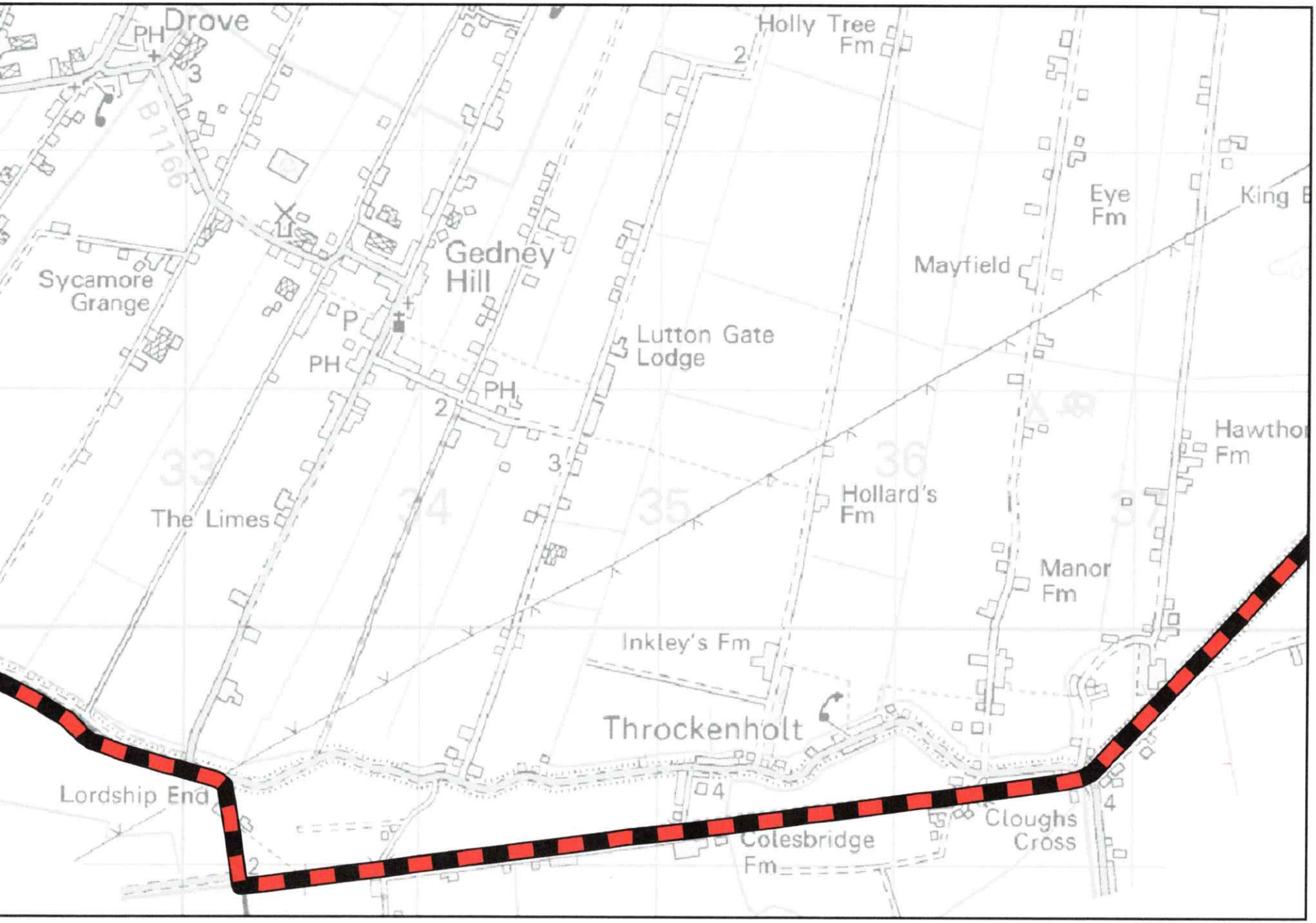
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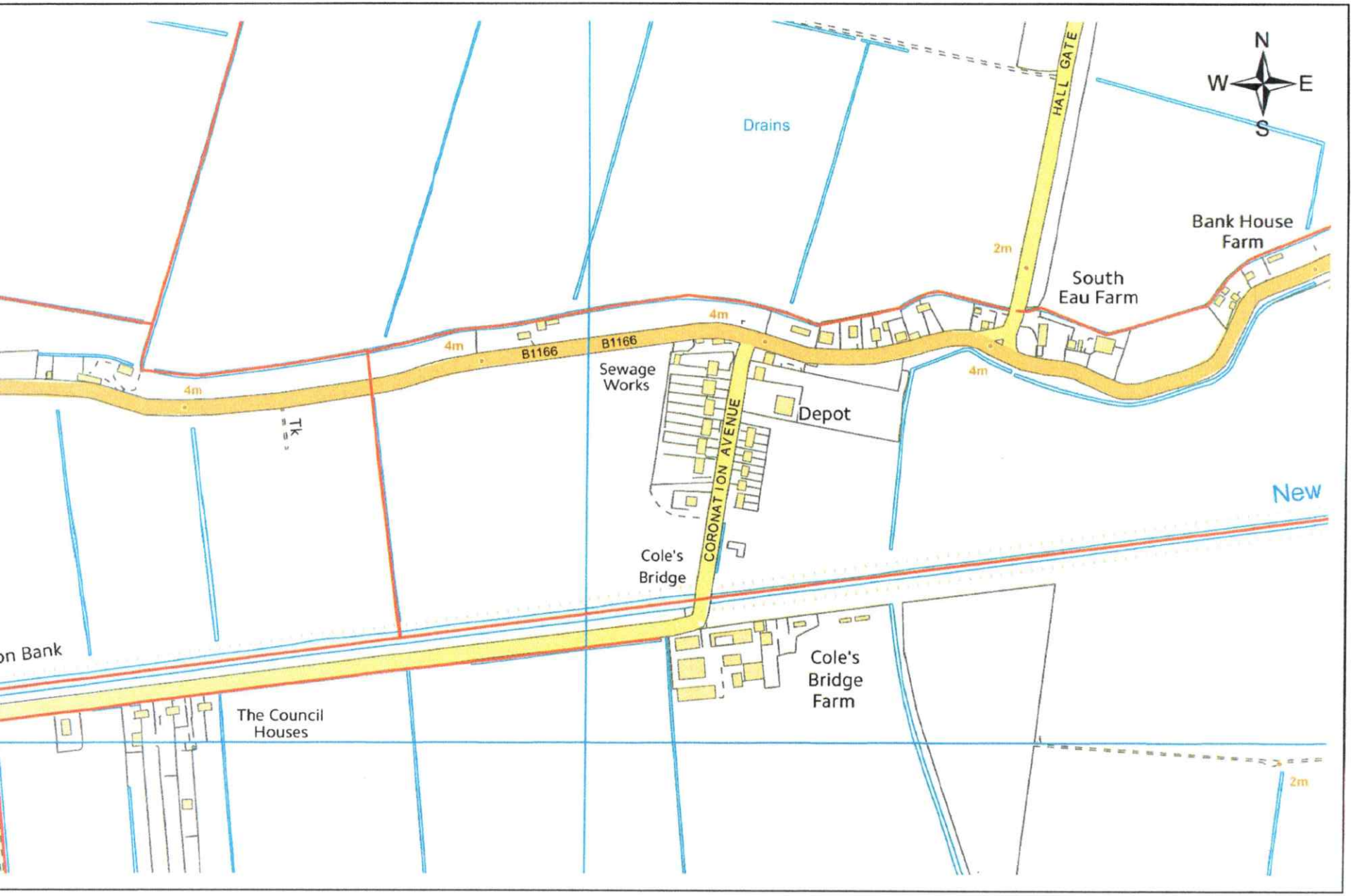
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2 May 2018 9:08

- 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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Drove
PH
3
B1166
Holly Tree Fm
2
Eye Fm
King E
Mayfield
Sycamore Grange
Gedney Hill
P
PH
PH
2
3
Lutton Gate Lodge
Hawthor Fm
33
34
35
36
The Limes
Hollard's Fm
Manor Fm
Inkley's Fm
Throckenholt
Lordship End
4
Cloughs Cross
Colesbridge Fm
2



North Level District Internal Drainage Board Drains highlighted in red.

1:5,000

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