FLOOD RISK ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT AT THE FORGE, COMMON WAY, TYDD ST MARY, LINCS.

FINAL REPORT

GEOFF BEEL CONSULTANCY

APRIL 2018

GCB/BROKER

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Fig 1 - Plans & Elevations –
David Broker Design drg. no. 1653

Fig 2 - Environment Agency Flood Map for Planning

Fig 3 - South Holland District Council Updated Strategic Flood Risk Assessment Residual Depth of Flooding (2016)

Fig 4 - South Holland District Council Updated Strategic Flood Risk Assessment Residual Depth of Flooding (2116)

Fig 5 - North Level IDB District Plan

1.0 INTRODUCTION

1.1 A full planning application is to be submitted by David Broker Design Services on behalf of Mr E Shreeve for proposed residential development at The Forge, Common Way, Tydd St Mary, Lincs.

1.2 A Flood Risk Assessment is required to accompany the planning application to meet the requirements and general principles contained in the Planning Practice Guidance of the National Planning Policy Framework (NPPF).

The site is within Flood Zone 3 of the Environment Agency's Flood Map for Planning. The likely source of flooding is from the North Level Main Drain which is under the jurisdiction of the North Level IDB. As the site is within their area, the Drainage Board should be consulted regarding surface water drainage and flood risk for the proposal.

The Agency's latest Flood Map for Planning has been created as a tool 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 flood defences.

1.3 Geoff Beel Consultancy was appointed on 24th April 2018 to prepare a Flood Risk Assessment.

2.0 LOCATION

2.1 The development site is located at The Forge, Common Way, Tydd St. Mary 1.00km north west of the Middle Level Main Drain and 200m south of School Drain and 2.50kms west of the River Nene. It is also located 1.75kms south of the South Holland Main Drain. The National Grid Reference of the site is TF 44351855.

2.2 The position and extent of the site are shown on Fig 1 – Plans & Elevations at the end of the document.

2.3 The site is located within the North Level Internal Drainage Board district and 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 Flood Depths Map (2016).

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is currently a derelict workshop.

3.2 The area of development is approximately 450 sq. metres.

3.3 The proposed site layout consists the construction of a single storey dwelling fronting Common Way after demolition of the derelict workshop.

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 protected against both the 1 in 200 year return period tidal event and the 1 in 100 year return period fluvial event meeting the requirements of NPPF.

However, the Sequential Test is met as no other land available for development in Tydd St. Mary is at a lower risk of flooding. The site is also located in Flood Zone 1 of the Council's Updated Strategic Flood Risk Assessment Residual Depth Map (2016).

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 in the North Level Drainage Board area, the nearest main drain the Angle Drain is located 200m south of the site. Land levels are generally at 3.30m aOD.

The Angle Drain discharges in a southerly direction to the Shire Drain and hence to the North Level Main Drain at Tydd Gote approximately 1.00kms east from the site.

4.3 The existing standard of drainage for the North Level Internal Drainage Board district is 1 in 50 years return period, compatible with the Department of Environment, Food and Rural Affairs target level of service for rural urban drainage and flood defence works. The North Level Main Drain discharges to the tidal River Nene at the Tydd Pumping Station.

4.4 Tidal flood protection from the River Nene between Wisbech and Sutton Bridge is estimated to be a 1 in 200 years return period. The Environment Agency has recently carried out the River Nene Tidal Strategic Study which covers the tidal River Nene from the Dog in a Doublet Sluice near Peterborough to its outfall in the Wash at Nene Lighthouses, a distance of some 39.5km.

4.5 The Strategic Study has concluded that improvement works are cost effective to meet Department of the Environment, Food and Rural Affairs guidelines in order to sustain the existing tidal defences over the 50 year appraisal period up to a 1 in 200 year standard.

4.6 Current maintenance standards of the Environment Agency for tidal defences; and the North Level Internal Drainage Board for surface water and land drainage are considered to be very good.

During the operation and maintenance of its pumping stations, associated structures and channel systems, particularly those that could affect property, the Board seek 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 riparian drains and Angle Drain
b) storm return period of 1 in 50 years being exceeded
c) failure of Tydd Pumping Station.
d) overtopping and breaching of the River Nene, Wisbech to Sutton Bridge tidal defences

5.2 The probability of flooding from source a) is low due to the maintenance standards already achieved and managed by the riparian owners as well as the North Level IDB for the Angle Drain.

The probability of flooding from source 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 maximum design water level of the North Level Main Drain and Shire Drain is minus 1.35m aOD which offers freeboard of 4.65m against the land level at the site.

There are many hectares of agricultural land that would flood in such circumstances before the development site was put at risk.

5.3 Failure of the Tydd Pumping Station may occur due to mechanical breakdown or electricity power failure. 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 existing tidal defences between Wisbech and Sutton Bridge consist generally of strengthened and heightened earth embankments with a riverside berm. Crest levels are at 7.00m aOD. The recorded tidal surge level reached 5.60m aOD at Wisbech on 11th January 1978 when extensive areas of the town were flooded. More recent tidal surge event of December 2013 reached a level of 6.10m aoD and the town and surrounding areas were protected by the improved defences.

The site is located 2.50kms west of the River Nene tidal defences which were raised and strengthened after the 1978 surge event.

More recent studies by the Environment Agency have concluded a design water level for the 1 in 200 year tidal event between Sutton Bridge and Wisbech to be below existing tidal defence crest level with sufficient freeboard to take into account sea level rise during the next 100 years.

5.5 Hydraulic modelling by the Environment Agency has produced Tidal Hazard Mapping which is included in the Council's Updated Strategic Flood Risk Assessment Residual Depth Maps for year 2116 which identifies the site to be outside the effects of any floodwaters from possible breaching of the River Nene Tidal Defences in both the 1 in 200 year and 1 in 1000 year events in 2116.

5.6 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 and the occupants of the new dwelling should register with the Floodline Direct Warnings Service to receive any future flood warnings

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 contacting 0345 988 1188.

6.0 EXTENT OF KNOWN FLOODING

6.1 During the preparation of this assessment, the site did not flood during the tidal surge events of February 1978 and December 2013 with the defences between Sutton Bridge and Wisbech at the 1 in 200 year standard.

No flooding of this site has been experienced from the adjoining IDB main drains.

7.0 PROBABILITIES AND TRENDS OF FLOODING

7.1 The probability of this development flooding from localised drainage systems is very low. It is also intended to construct finished floor levels of the new dwelling 150mm above the existing Common Way carriageway level at 3.55m aOD with a further 300mm of flood resilient construction above finished floor level. Safe refuge will be provided in the roof space of the dwelling.

7.2 The probability of the site flooding with water from the River Nene tidal river system is less than 0.5% because of the standards of the existing flood defences.

7.3 If under very extreme events, levels of floodwater from the North Level Main Drain or South Holland Main Drain or other IDB 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 tend to rise as a result of the impacts of climate change. However the existing systems and defences together with the proposed floor levels 150mm above existing Common Way carriageway level at 3.55m aOD with a further 300mm of flood resilient construction above finished floor level will be appropriate for the design life of the development (i.e. 100 years). Safe refuge will be provided in the roof space of the dwelling.

7.5 Safe access and egress from the site is available in a southerly direction to Tydd St Giles village where land is located in Flood Zone 1.

8.0 IMPACTS OF FLOODING

8.1 No significant impacts of flooding are anticipated.

8.2 Finished floor level of the development has been raised 150m above existing Common Way carriageway level offering 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 the IDB main drains or the River Nene tidal system sufficient warning time would be available.

8.4 No displacement of water from the site will affect any adjoining properties as the site will be provided with soakaway drainage designed to BRE365 requirements and Building Regulations approval.

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 internal drainage system, existing levels of tidal defences and proposed finished floor level 150mm above Common Way carriageway level.

9.2 The site is within Flood Zone 1 of the Council's Updated Strategic Flood Risk Assessment Residual Flood Depths Map 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. The risk of flooding to adjoining properties in the vicinity is not increased in terms of probability by the proposed development.

9.3 In the extreme event of a serious pumping station failure occurring to the IDB main drain system, or the overtopping of tidal defences, protection will be afforded by the finished floor level being 150mm above existing Common Way carriageway level with flood resilient construction incorporated into the new dwelling up to 300mm above finished floor level.

10.0 CONCLUSIONS AND RECOMMENDATIONS

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

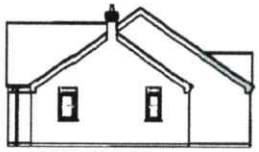
- The proposed development is not in a Functional Floodplain. It is located in the Passive Floodplain protected by existing tidal defences to a standard of 1 in 200 years and fluvial defences to a standard of 1 in 100 years.

- The site is in Flood Zone 1 with the actual risk of flooding from the tidal River Nene being very low (less than 0.5%).

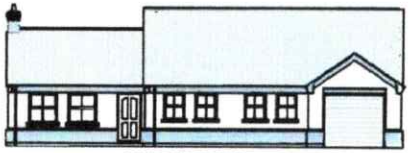
- Although the site is located within an Internal Drainage District with a standard of drainage of 1 in 50 years, this accords with Defra guidelines for rural development. A minimum of 900mm freeboard is provided within the main drain design standard to the lowest land level which provides further storage to cater for events greater than 1 in 50 years.

- On site surface water drainage will be discharged to soakaways to BRE365 design requirements and Building Regulations approval.

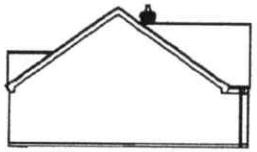
- Finished floor level will be raised 150mm above existing Common Way carriageway with flood resilient construction incorporated into the new dwelling up to 300mm above finished floor level. Safe refuge will be provided in the roof space of the dwelling.



PROPOSED SIDE ELEVATION



PROPOSED FRONT ELEVATION

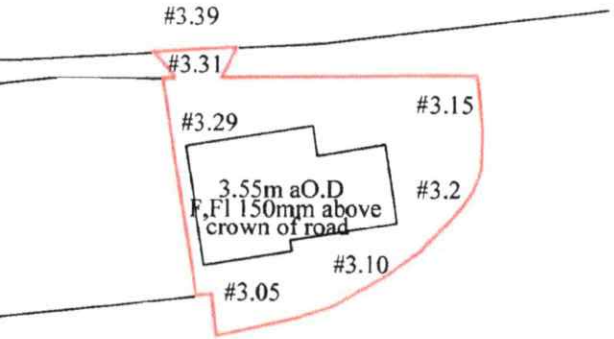


PROPOSED SIDE ELEVATION

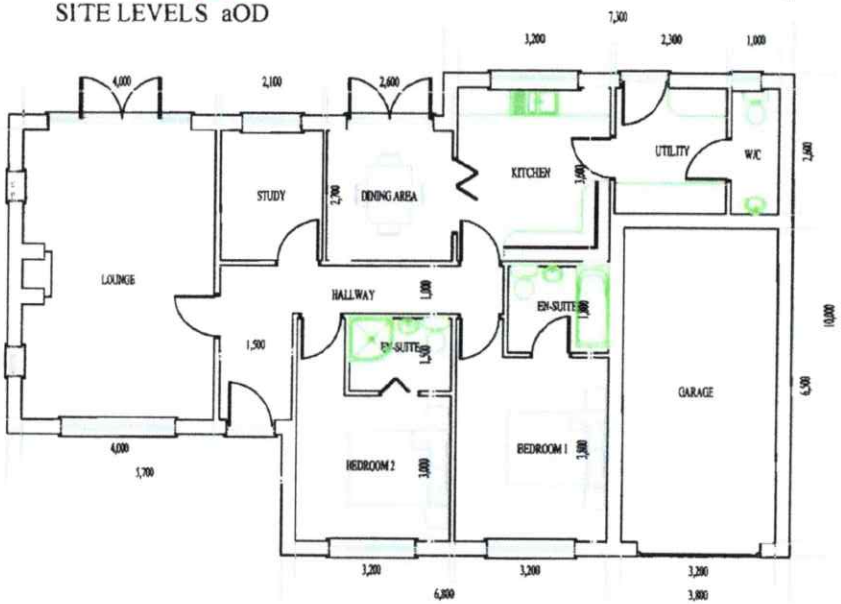


PROPOSED REAR ELEVATION

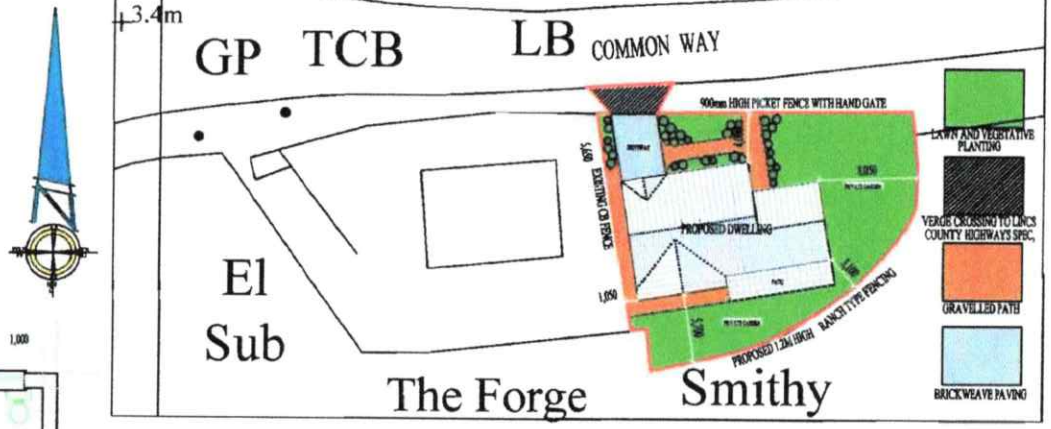
FACING BRICKS TO BE DISIMPEL HATHAWAY BRINDLE
ROOF TILES REDLAND GROVEBURY FARM HOUSE RED DOUBLE PANTILES
WHITE UPVC FRAMES AND BLACK RAINWATER GOODS



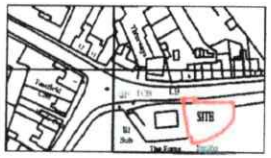
SITE LEVELS aOD



PROPOSED GROUND FLOOR PLAN
SCALE 1:50



BLOCK PLAN
SCALE 1:200



LOCATION PLAN
SCALE 1:1250

LABC

Building Design Awards

DBDS

DAVID BRIDGE DESIGN SERVICES LTD
CONCEPT 2000 DESIGN AND DEVELOPMENT LTD
ESTABLISHED 1975

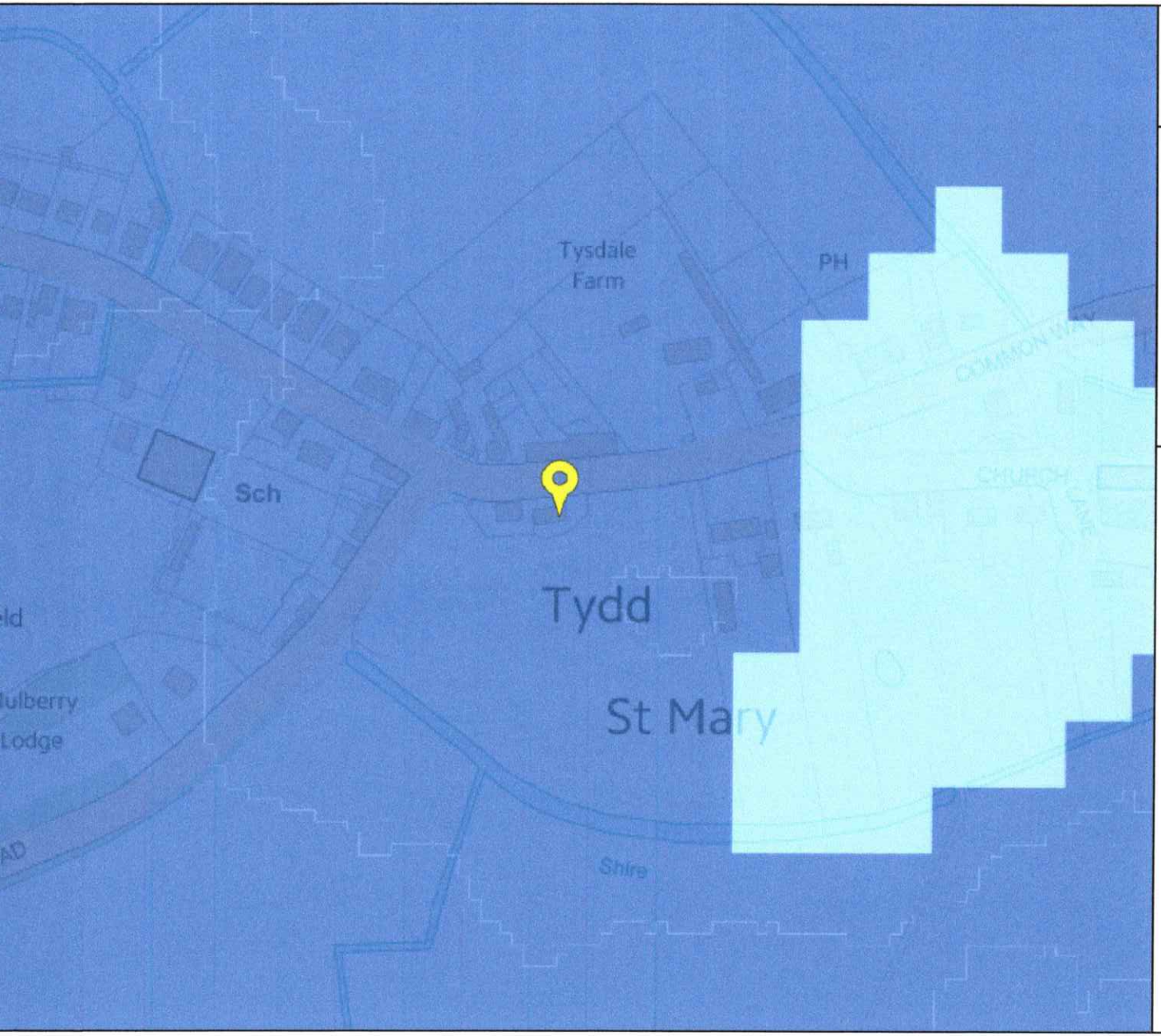
ARCHITECTURAL TECHNICIANS
HAWKINS HOUSE STATION ROAD
WOODHALL CARLISLE CA4 0TW

PROPOSED 3-BED BUNGALOW WITH INTEGRAL GARAGE

THE FORGE
GILSLAND ROAD
NEWTON OF WALL

PB3 5QH | AS | SEP 17

DO NOT SCALE FROM THIS DRAWING



Environment Agency

Flood map for planning

Your reference
PE13 5QH

Location (easting/northing)
544350/318572

Scale
1:2500

Created
24 Apr 2018 1:58

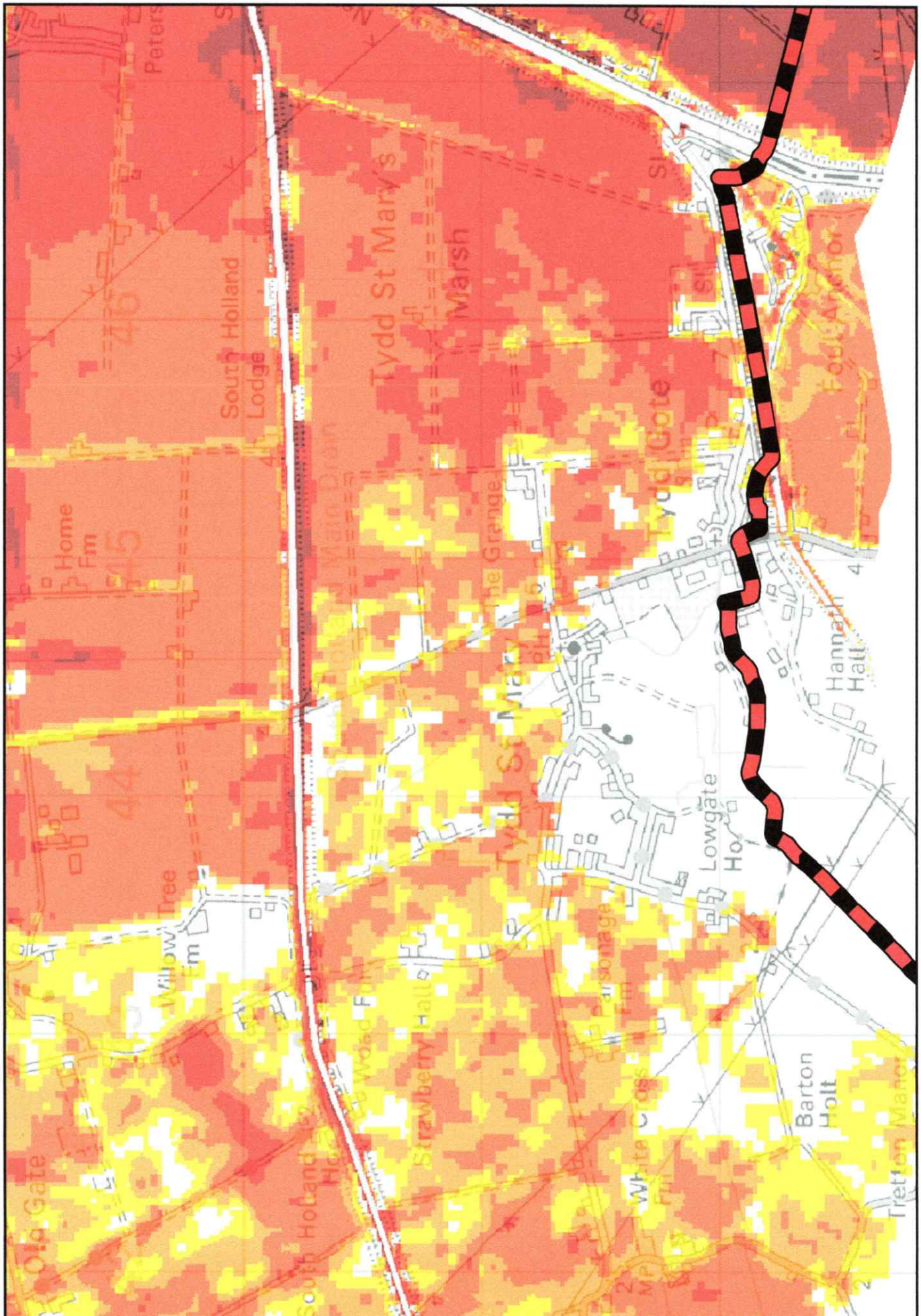
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- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

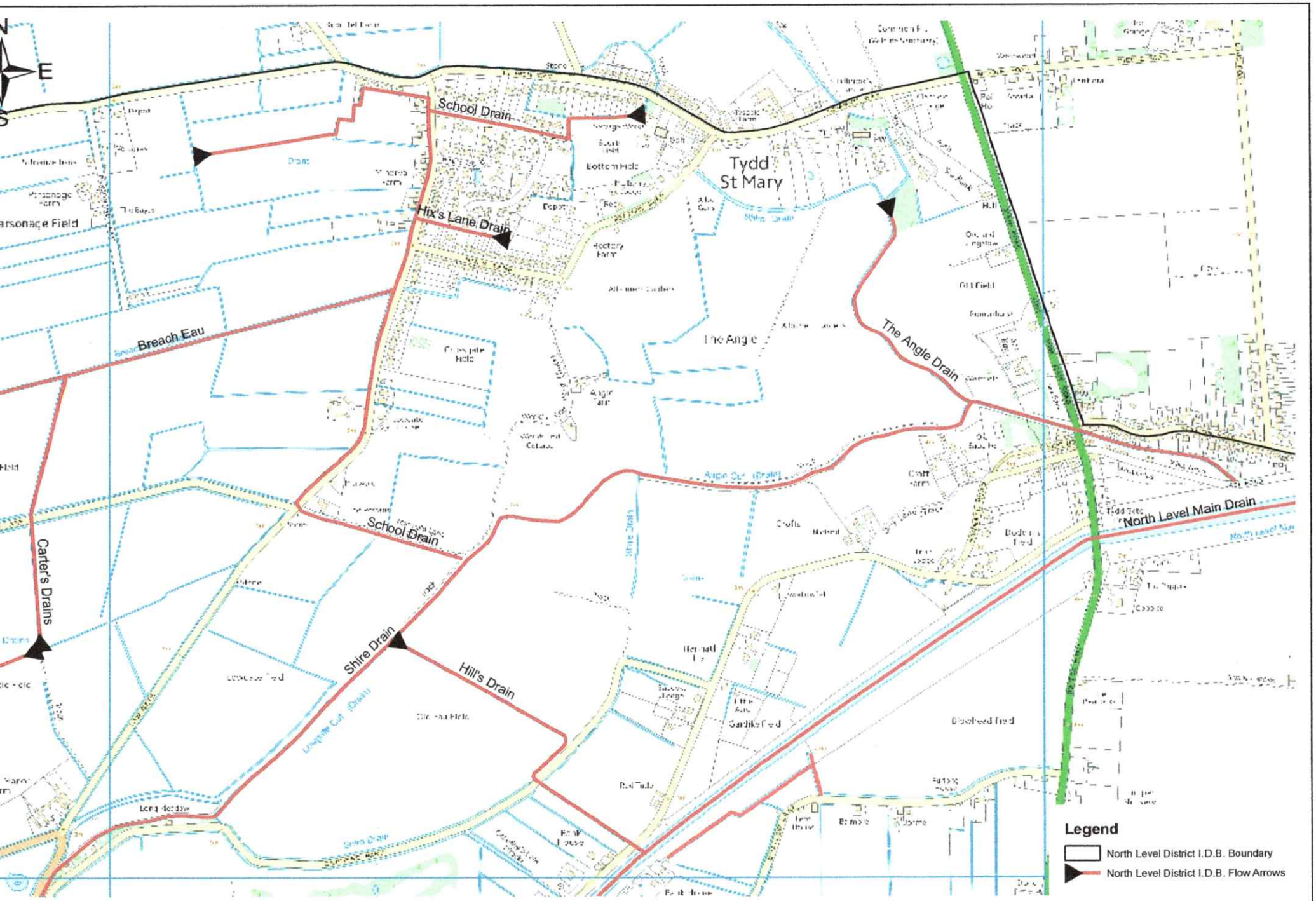
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2016

Tydd St Mary's
Tydd Gote
Tydd St Mary
Lowgate
Hannath Hall
Barton Holt
Tretton Manor
White Cross Fm
Strawberry Hall
South Holland Ho
Old Gate
Willow Tree Fm
Home Fm
South Holland Lodge
Parsonage Fm


Tydd St Mary's
Marsh
South Holland
Lodge
Home
Fm
Tydd Gote
Lowgate
Barton
Holt
Willow Tree
Strawberry
Old Gate
Four Ashes
Hannah
Hall
Tydd St Mary
The Grange
Main Drain
45
44



North Level District Internal Drainage Board
1:10,000 K.Tizzard 2016

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