FLOOD RISK ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT AT HUNT'S GATE, SUTTON ST. JAMES, LINCS.

FINAL REPORT

GEOFF BEEL CONSULTANCY

MARCH 2015

GCB/MERCHANT

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Fig 1 - Site & Location Plans, Floor Plan & Elevations – GR Merchant drg. No. 2727-14-01A

Fig 2 - Environment Agency Flood Zone Map.

Fig 3 - South Holland District Council Strategic Flood Risk Assessment Depth of Flooding (2115) 1 in 100 year fluvial and 1 in 200 year tidal

Fig 4 - North Level IDB District Plan

1.0 INTRODUCTION

1.1 A full planning application has been submitted by GR Merchant Ltd on behalf of Mr & Mrs E Bell for proposed residential development adjacent to Edelweiss, Whitecross, Hunt's Gate, Sutton St. James, Lincs.

1.2 A Flood Risk Assessment is required to accompany the planning application to meet the requirements and general principles contained in Paragraph 9 of the Technical Statement to the National Planning Policy Framework (NPPF).

The site is within Flood Zone 3 of the Environment Agency's Flood Map. The likely source of flooding is from the Shire 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 Zone Maps have 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.

The site, however, is shown in Flood Zone 1 of the South Holland Strategic Flood Risk Assessment maps with no depth of floodwaters affecting the site in 2115.

1.3 Geoff Beel Consultancy was appointed on 16th March 2015 to prepare a Flood Risk Assessment.

2.0 LOCATION

2.1 The development site is located adjacent to Edelwiess, 1.50kms north-west of the North Level Main Drain and 1.50kms north of the Shire Drain and 4.50kms west of the River Nene. It is also located 1.00km south of the South Holland Main Drain. The National Grid Reference of the site is TF 42101823.

2.2 The position and extent of the site are shown on Fig 1 – Site & Location Plans.

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 Zone Maps. However, the site is shown in Flood Zone 1 of the Council's Strategic Flood Risk Assessment maps.

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is currently a redundant cottage adjacent to Edelweiss.

3.2 The area of development is approximately 0.02 hectare.

3.3 The proposed site layout consists the construction of a replacement bungalow after demolition of existing cottage.

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. The site is located in Flood Zone 1 of the Council's Strategic Flood Risk Assessment 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 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 Eldersgate Drain is located immediately alongside the development site. Land levels are generally at 2.00m aOD.

The Eldersgate Drain discharges in a southerly direction and hence to the Shire Drain and the North Level Main Drain approximately 1.50kms south-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 Eldersgate Drain and Shire 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 North Level IDB for the Eldersgate Drain and Shire 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 3.35m against the lowest 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 highest recorded tidal surge level reached 5.60m aOD at Wisbech on 11th January 1978 when extensive areas of the town were flooded.

The site is located 4.50kms 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 Flood Hazard Mapping which identifies the site to be outside any Hazard Zone from possible breaching of the River Nene Tidal Defences.

However the plan shown as Fig 3 of this report from the South Holland District Council Strategic Flood Risk Assessment indicates no risk of flooding in year 2115 as a result of a 1 in 100 year fluvial event and 1 in 200 year tidal event. This would be as a result of the flood events of the tidal River Nene and the South Holland Main Drain combining such that floodwaters overspilled existing channel capacity of the Main Drain in a southerly direction towards the development site.

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.

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 0845 988 1188 and the occupants should register with the Floodline Direct Warning Service to receive any future flood warnings..

6.0 EXTENT OF KNOWN FLOODING

6.1 During the preparation of this assessment, the site did not flood during the tidal surge event of February 1978 and since that date, the defences between Sutton Bridge and Wisbech have been raised to the 1 in 200 year standard. The more recent tidal surge event of 5th December 2013 reached a level of 6.00m aOD on the tidal River Nene but no flooding was experienced.

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 floor levels of the sleeping accommodation 300mm above the existing Hunt's Gate road level.

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 sleeping accommodation floor levels 300mm above existing Hunt's Gate road 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 with roof lights installed for evacuation if necessary.

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 Sleeping accommodation floor level of the development has been raised 300m above existing Hunt's Gate road 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 sleeping accommodation floor level 300mm above surrounding land and road levels.

9.2 Whilst the site is within either Flood Zone 3 or Flood Zone 1 it 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 Zone maps have 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 sleeping accommodation floor level being 300mm above existing Hunt's Gate road level with flood resilient construction incorporated into the dwelling and safe refuge provide in the roof space.

10.0 CONCLUSIONS AND RECOMMENDATIONS

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

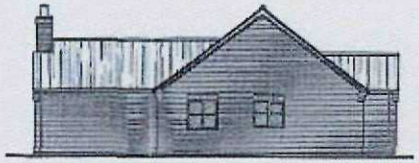
- The proposed development is not in a Functional Floodplain. It is located in the Passive Floodplain protected by existing tidal defences to a standard of 1 in 200 years and fluvial defences to a standard of 1 in 100 years.

- The site is in either Flood Zone 3 or Flood Zone 1 but with the actual risk of flooding from the tidal River Nene being very low (less than 0.5%).

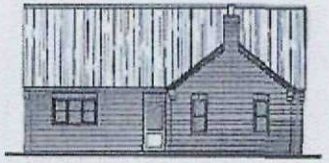
- Although the site is located within an Internal Drainage District with a standard of drainage of 1 in 50 years, this accords with Defra guidelines for rural development. A minimum of 900mm freeboard is provided within the main drain design standard to the lowest land level which provides further storage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

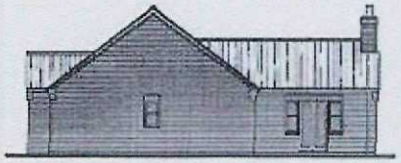
- Sleeping accommodation floor level will be raised 300mm above existing Hunt's Gate road level with flood resilient construction incorporated and safe refuge provide in the roof space.



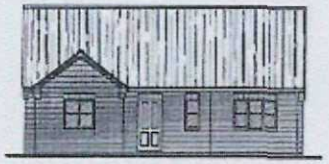
SIDE ELEVATION



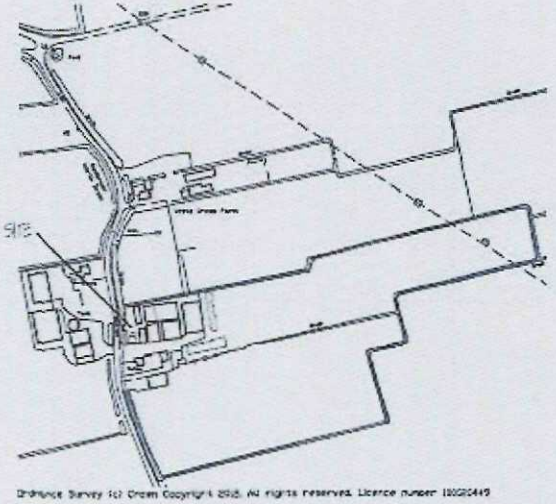
REAR ELEVATION



SIDE ELEVATION

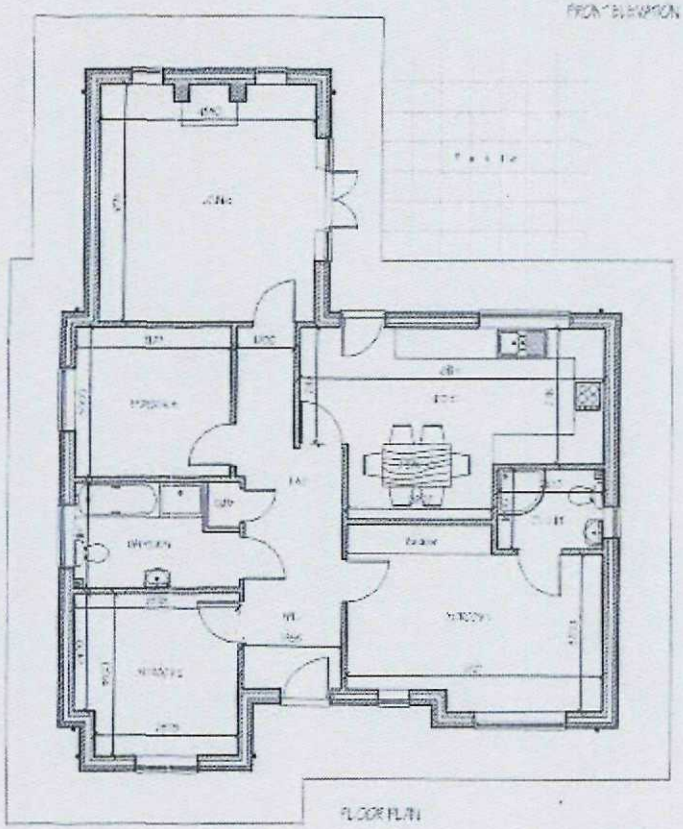


FRONT ELEVATION

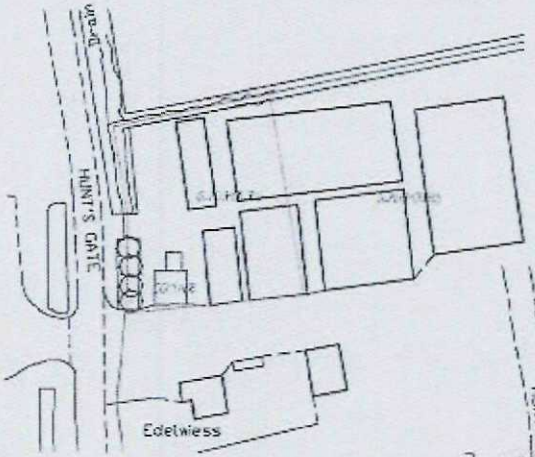


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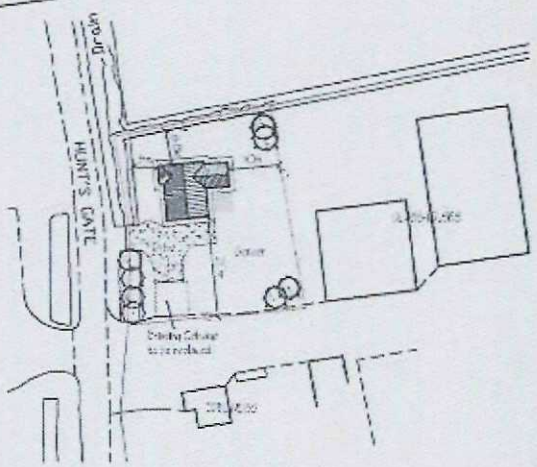
LOCATION PLAN
1/2500.



FLOOR PLAN



SITE PLAN - EXISTING
1/500.



SITE PLAN - PROPOSED
1/500.

G. R. MERCHANT LTD.
LLEND ARMOR FRWD
ARCHITECTURAL, STRUCTURAL AND LAND DRAINAGE CONSULTANTS

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Other topics for this area...

Flood Map for Planning (Rivers and Sea)

Flood Map for Planning (Rivers and Sea)

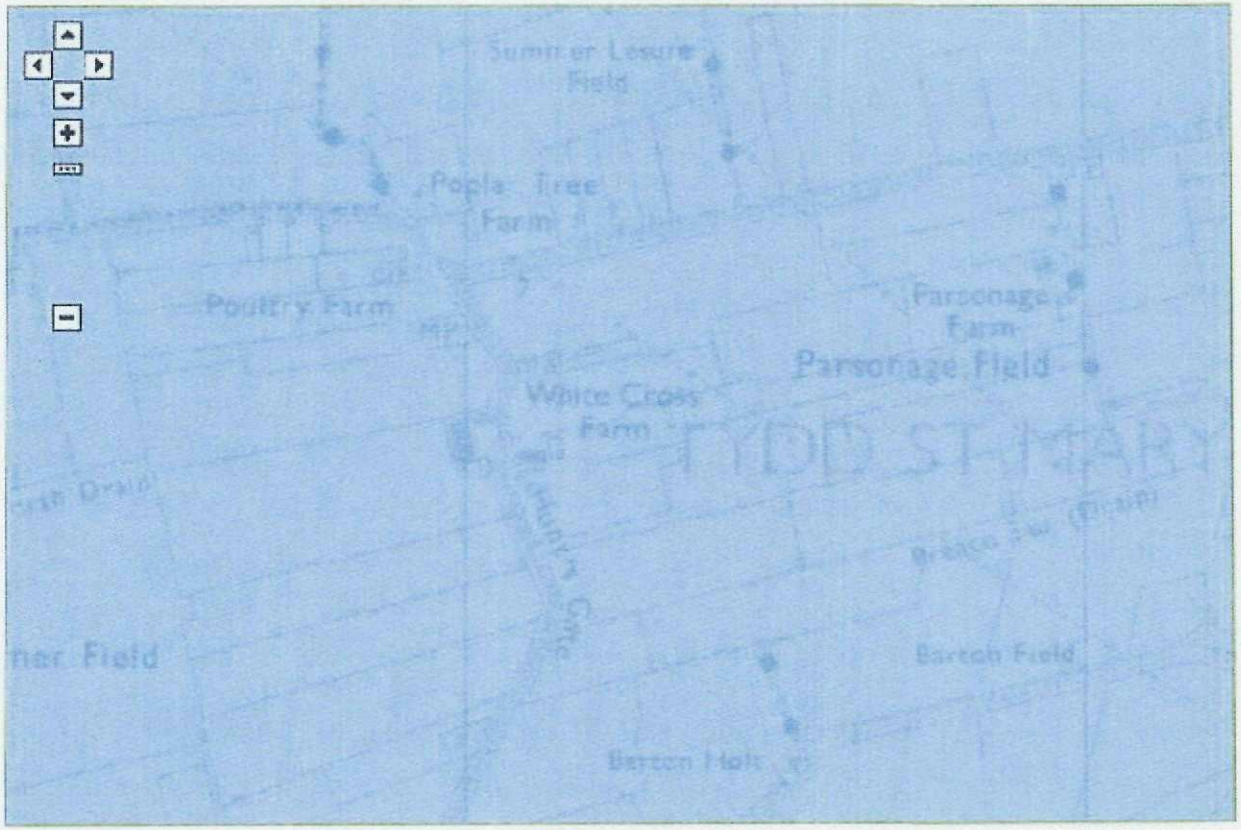
Map legend

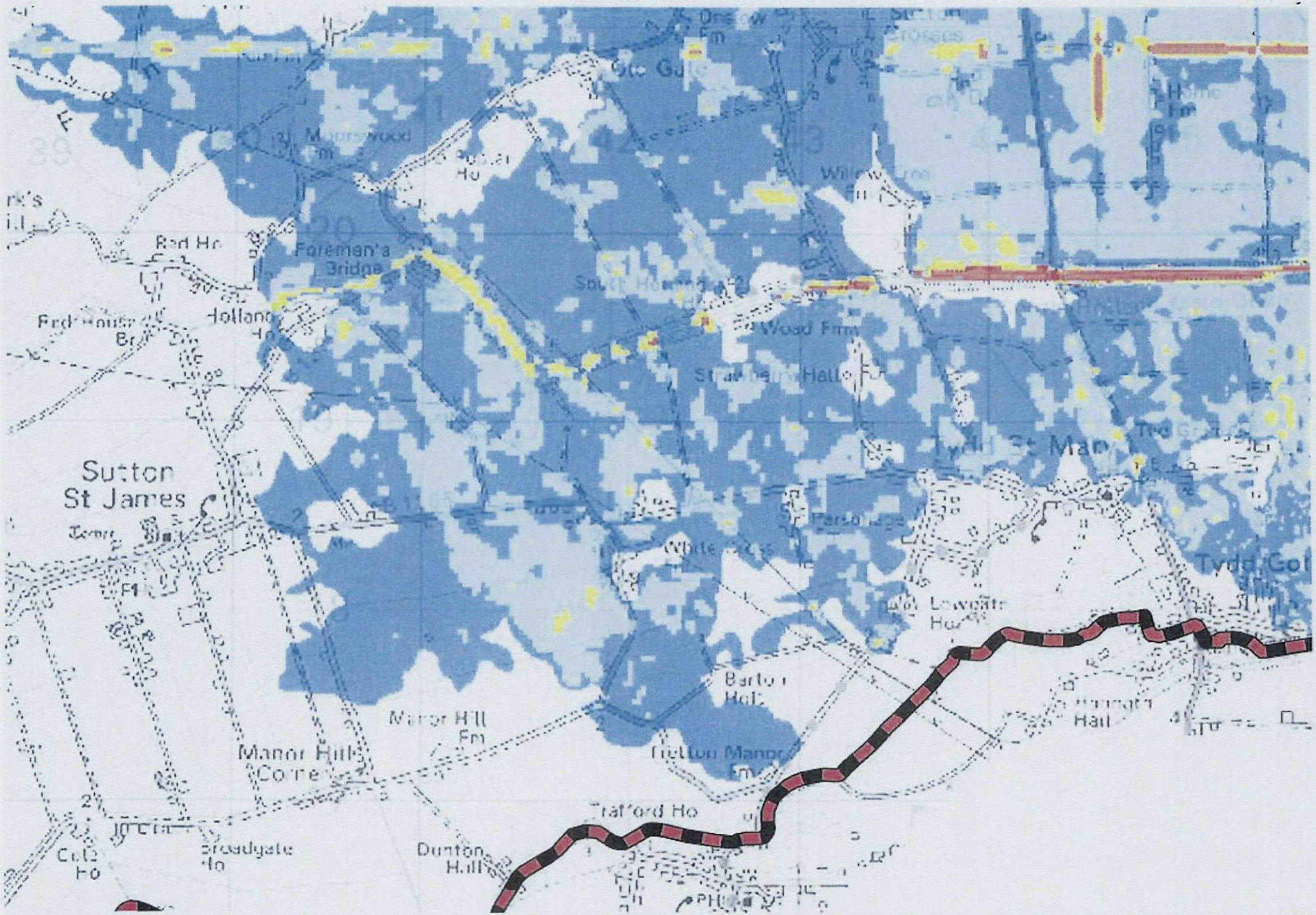
Click on the map to see what Flood Zone (National Planning Policy Guidance definitions) the proposed development is in.

- 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*)
- River and Sea levels
  - Main rivers

X: 542,251;Y: 318,235 at scale 1:10,000

Other maps Data search Text only version




Sutton
St James
Manor Hill
Foreman's Bridge
Red Ho
Holland
Wood Fm
Tydd St Mary
Tydd Gote
Lewgate Ho
Barton Hall
Manor Hill Fm
Trafford Ho
Dunton Hall
Broadgate Ho
Parsonage
Hall



1:10,000

White Cross Farm

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