PROPOSED RESIDENTIAL DEVELOPMENT AT PRIORY COTTAGE BROADGATE SUTTON ST JAMES PE12 0HD.

FLOOD RISK ASSESSMENT



View from east border of site

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69 Charlotte Way,
Peterborough,
PE3 9ER

This flood risk assessment has been prepared solely to support the planning application for a development at Priory Cottage, Broadgate, Sutton St James. The author has made every effort to provide an accurate assessment of the flood risk but accepts no liability should the information be found to be incorrect or incomplete.

Introduction

A Planning application has been submitted to South Holland District Council to construct a replacement dwelling immediately east of the existing house which is called Priory Cottage, Broadgate, Sutton St James.

The site is in Flood Zone 3 as shown on the Environment Agency's Flood Zone map. The flood zone maps do not take into account existing flood defences.

The Planning Application therefore requires a flood risk assessment to be carried out as required in the Technical Guidance to the National Planning Policy Framework Development and Flood Risk. The site is within a defended area as specified in the South Holland District Council's Strategic Flood Risk Assessment and is located in the South Holland Internal Drainage Board District.

Application Site

The site is located 9.1 km from the tidal defences of the River Nene near Wisbech and at least 23km south of the tidal defences of the Wash. Broadgate is the boundary between the South Holland and the North Level IDB.

The National Grid Reference of the site is 538860 315680, and the extent of the site is shown on the plan at the end of this document.

The proposed development is within Flood Zone 3(a) "High Probability" as detailed on the Environment Agency's flood zone maps without defences, as defined in Table 1 of the Technical Guidance.

Applying the flood risk vulnerability classification in Table 2 of the Guidance, the development is classified as "more vulnerable" in Table 3 of the Guidance, and Table 3 states that the development of a new dwelling requires the sequential and exception test to be considered.

Sequential Test

As the proposed development is located in Flood Zone 3(a) the NPPF requires the sequential test to be applied to determine if there are any reasonably available and suitable alternative sites for this type of development. As the development is a replacement for an existing building, and this site has a lower flood risk than many of the other sites in Sutton St James, it can be deemed that the sequential test is passed.

Exception Test

The Sequential Test has demonstrated that it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower probability of flooding. Therefore the Exception Test must be applied and for this to be passed:

- It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risks, informed by the Strategic Flood Risk Assessment; and
- A site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking into account of the vulnerability of its users, without increasing flood risk elsewhere, and where possible will reduce flood risk overall.

Both parts of this test must be satisfied in order for the development to be considered appropriate in terms of flood risk. There must be robust evidence in support of every part of the test.

The first section will be demonstrated by the Supporting Planning Statement.

This flood risk assessment will demonstrate that the development will be safe for its lifetime and it will not increase flood risk elsewhere.

Strategic Flood Risk Assessment

The following information has been sourced from the maps and reports in the SHDC SFRA.

Report Maps

Map 3 shows that site is within flood zone 3.

Map 5 shows that the site is at low or medium risk, but reliant on flood defences for this standard.

Map 6 indicates the peak depth is zero for the present day 1% fluvial and 0.5% tidal event probability.

Map 7 indicates the peak velocity is zero for the present day 1% fluvial and 0.5% tidal event probability.

Map 12 indicates the actual risk is low or medium for the year 2055 1% fluvial and 0.5% tidal event probability.

Map 13 indicates the actual risk is low or medium for the year 2115 1% fluvial and 0.5% tidal event probability.

Map 16 shows that the site is not within a rapid inundation zone.

Flood Maps Table D1

The actual flood hazard for the present day and 2115 is as follows:

Depth of flooding..... zero

Extent of flooding..... zero

Velocity ..... nil

The residual flood hazard for the present day and 2115 is as follows:

Depth of flooding..... zero

Extent of flooding..... zero

Velocity ..... nil

Information from Environment Agency

The latest Environment Agency maps were issued after the last amendment to the SFRA and give information on predicted flood depths ensuing if overtopping or breaching of the sea defences occurs. Modelling has been carried out for 1 in 200 year and 1 in 1000 year events, both for the present day and 2115 allowing for climate change.

When overtopping only is modelled no flooding is predicted in this area of Sutton St James in any of the scenarios. If breaching of the defences is modelled then in the 1 in 1000 year scenario in 2115 flooding is predicted in the field north west of the site. The maps show the flooding would be up to 250mm deep with a low hazard. No flooding is predicted to the actual site, which is higher than the field. Copies of the maps supplied by the Environment Agency are shown on page numbers 10 and 11 at the end of this report.

Existing Flood Alleviation Measures

The site is within a defended flood plain, as defined in Appendix 1 of the Environment Agency's "Policy and Practice for the Protection of Flood Plains", which is considered to be passive until such time that a flood greater than the defences can withstand occurs. The likelihood of flooding occurring due to overtopping or failures of the defences is considered to be very low.

The site is located approximately 7.5 km from the tidal section of the River Nene and 23.0km from the Wash. The tidal defence banks to all of these are maintained by the Environment Agency.

The major watercourses in the area are maintained by South Holland and North Level IDB. Both Boards have carried out improvement schemes so that IDB watercourses generally provide at least a 1 in 50 year standard against flooding of agricultural land and aim to provide a 1 in 100 year standard to urban areas.

Existing Ground Levels and Proposed Levels of Buildings

The general level of the site where the new house is proposed is approximately 1.35m OD. This is 500mm below the level of Broadgate, which is 1.85m OD and nearly 600mm below the floor level of the existing house which is 1.92m OD.

It is recommended that the ground floor level of the new house should be no lower than 1.85m OD. This will be 850mm higher than the field behind, and 600mm above the level of the field to the north and the field on the south side of Broadgate.

Details of all the site levels are shown on page 9 of this report.

Potential Sources of Flooding

The potential sources of flooding to the site are:-

1. Failure or overtopping of tidal defences of the River Nene or the Wash.
2. High water levels in the North Level Main Drain
3. High water levels in the South Holland Main Drain

1. Failure or overtopping of tidal defences of the River Nene or the Wash

The west bank of the River Nene is approximately 9.1 km east of the site of the proposed development, and the Wash Banks are 23km north of the site. The River Nene defence levels are all above the 1 in 200 predicted levels for 2007 but some lengths of the bank may be overtopped in a 1 in 200 high tide in 2115. Therefore there is a risk of the River Nene overtopping and possibly subsequent breaches if the defences are not raised over the next 100 years.

The latest Environment Agency hazard maps available at the present time indicate that any flooding from this source will not affect the site of the proposed development. Particularly any flood water from the River Nene would be arrested by the North Level Drain. A large area of land east of the site is at a level of 0.00m OD and this would store a considerable amount of flood water before the development site would be affected. Therefore as the site is 9.1 km from these defences the risk to the development site is extremely low, and certainly the predictions are that a 1 in 200 year event in 2115 would not cause flooding to the site.

2. High Water Levels in North Level Main Drain

Although the whole of this area is below high tide level and the levels in the rivers, the retained water levels in the drainage channels ensure that the risk of flooding is extremely low. The boundary between North Level and South Holland IDB's is Broadgate, and the development site is just within the South Holland IDB District. North Level IDB control the water levels in the Main Drain, which is 4.7km south east of the site, with a large pumping station at Tydd Gote where there are both electrically and diesel driven pumps. The water level in the drain is generally retained below -1.0m OD and North Level IDB state that the maximum 1 in 100 year level in the Main Drain at Cloughs Cross is -1.0m OD.

The predicted 1 in 100 year level in 2115 with climate change will probably be 0.0m OD, but it is likely that North Level IDB will continue to model trends in climate change and if required install additional pumping capacity, or provide storage solutions over the next 100 years to ensure the standard of service is kept at the same level as present.

Therefore the risk of the proposed property flooding in a 1 in 200 year event in 2115 can be considered extremely low.

3. High Water Levels in South Holland IDB Drainage System

Although the whole of this area is below high tide level and the retained water levels in the rivers, the water levels maintained in the drainage channels ensure that the risk of flooding is extremely low. South Holland IDB maintains a system of sluices, pumping stations, and drainage channels which convey surface water into the River Nene and the Wash and control water levels throughout the South Holland IDB area.

There is a IDB drain north of the site which runs in a north easterly direction and this system eventually discharges into the South Holland Main Drain approximately 1.2km north east of the site. The normal water level in this system is between 1.2 metres and 1.5 metres below the level of the fields from which it can be estimated that the water level is around -0.3m OD, which is the same level as the estimated level in this part of the South Holland Main Drain. It is estimated that the level in a 1 in 100 year event could approach 1.00m OD, which may mean some of this land could only have a 300mm freeboard in this situation. Considering climate change, when it is estimated that flows will increase by 20%, levels would rise above this level but it is inconceivable that levels will reach a level of 1.85m OD and start to flood the road. The channels maintained by South Holland IDB which drain urban areas are classified as high priority watercourses and as such receive a higher maintenance priority.

There are possibilities of failure of outfall sluices, but these are mitigated by the high level of maintenance given to these structures by the IDB. If a failure did occur the IDB would immediately be warned of the problem by their telemetry system and take action to repair the fault or to bring in temporary pumps to reduce the risk of any flooding in the area. Similarly any failures of culverts or other blockages would be dealt with immediately.

IDB systems are designed to provide a freeboard of between 600mm and 1000mm to all land in a 1 in 10 year return period rainfall event. This normally provides a standard of service of between 1 in 50 years and 1 in 100 years against flooding. In an extreme event water levels will rise but this will be a slow process and it would be at least 24 hours before levels were high enough to begin to flood low land in the area, and after this the level of the flood water would need to rise another 1.0 metre before the development site would be affected.

Therefore the risk of flooding from IDB drainage channels can be considered to be extremely low.

Extent of known Flooding

During the preparation of this assessment, no evidence was discovered of the site or any of the adjoining properties having been flooded in the past.

Probabilities and Trends of Flooding

The probability of this development flooding from Environment Agency main river is very low. In an extreme event any effect on this location would not be sudden and there would be time for residents to take precautionary measures to limit the impact of any flooding that may occur.

Residual Risk – Extreme Events

The residual risk from extreme events is very low on this site. The major risk to the site is from a breach or overtopping of the tidal defences

The risk of this happening in this case is low and the hazard from any flooding is also low.

Conclusions

The risk of flooding caused by overtopping or bank breaches in EA rivers has been considered and shown to be low. If a breach occurred in the bank of the River Nene in a 1 in 200 year event in 2115 the latest maps show that this would not cause flooding at the development site. This is also seen by the results of the maps in the SFRA which show that no predicted actual or residual flooding will occur in 2115.

The risk of flooding directly from IDB watercourses has been shown to be extremely low. Even if pumping plant or sluices were to fail there are areas of the South Holland IDB with land levels around 0.0m OD which will flood before fields around the site. In addition to this the proposed floor level of the building is 850mm higher than the lowest field level to the north west of the location of the new house. Any flooding from IDB systems would occur over days rather than hours, would probably only flood the low lying land north west of the site, and residents would have adequate time to make plans to evacuate the area if an extreme situation arose.

Recommendations

In any area at risk of flooding, even though in this case the risk is extremely low, it is preferable that a proposed new building should be of two story construction with all bedrooms at first floor level. This will provide a refuge for residents if the building becomes flooded after a major breach of the tidal bank, and ensure there is no danger to residents when they are asleep.

The ground floor level of the proposed building should be at least 1.85m OD, which is at least 500mm above the ground level at the proposed location of the new house.

Occupiers of the property should register with the Environment Agency's Floodline Warnings Direct Service.

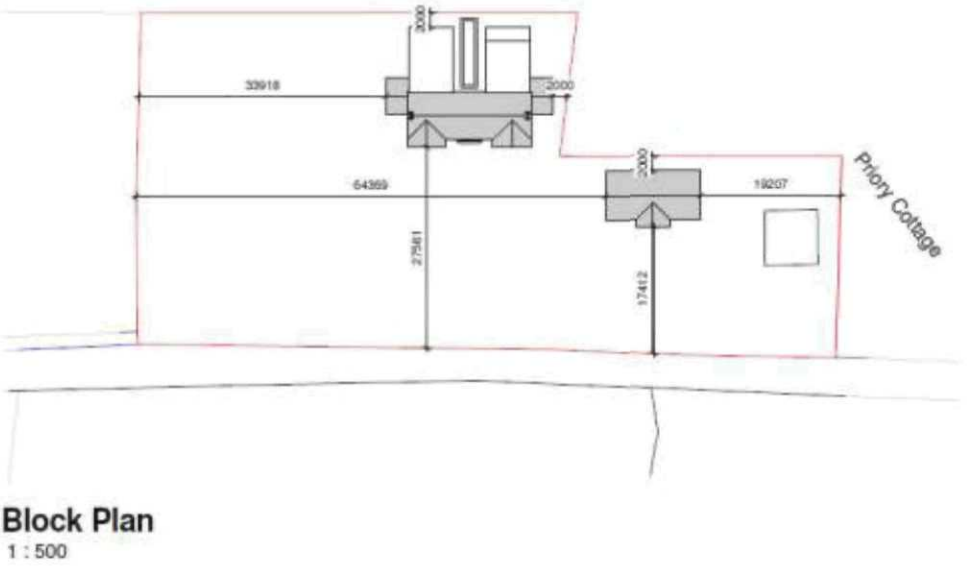
On site surface water drainage should be discharged into soakaways and these should be designed to BRE Digest 365 and approved under Building regulations.

S M HEMMINGS B Sc C Eng MICE MIWEM

stuart.hemmings@btinternet.com

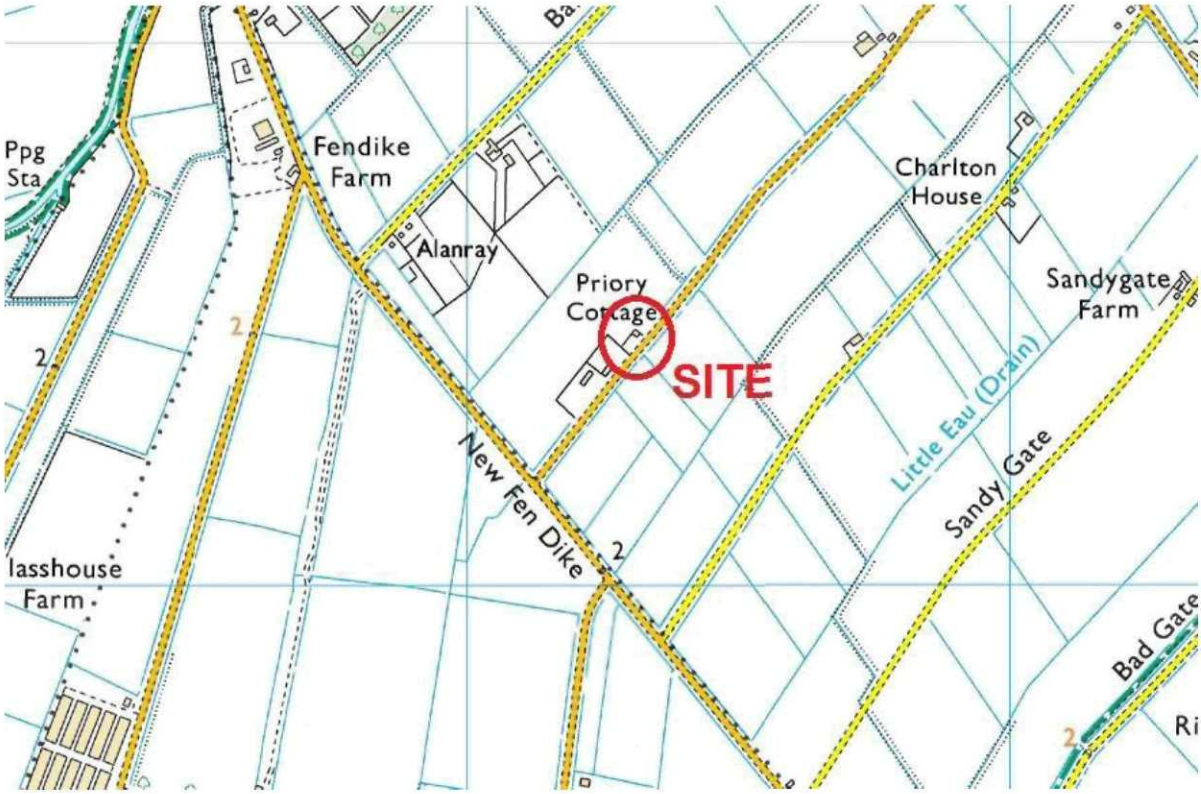
27th March 2015

BLOCK PLAN

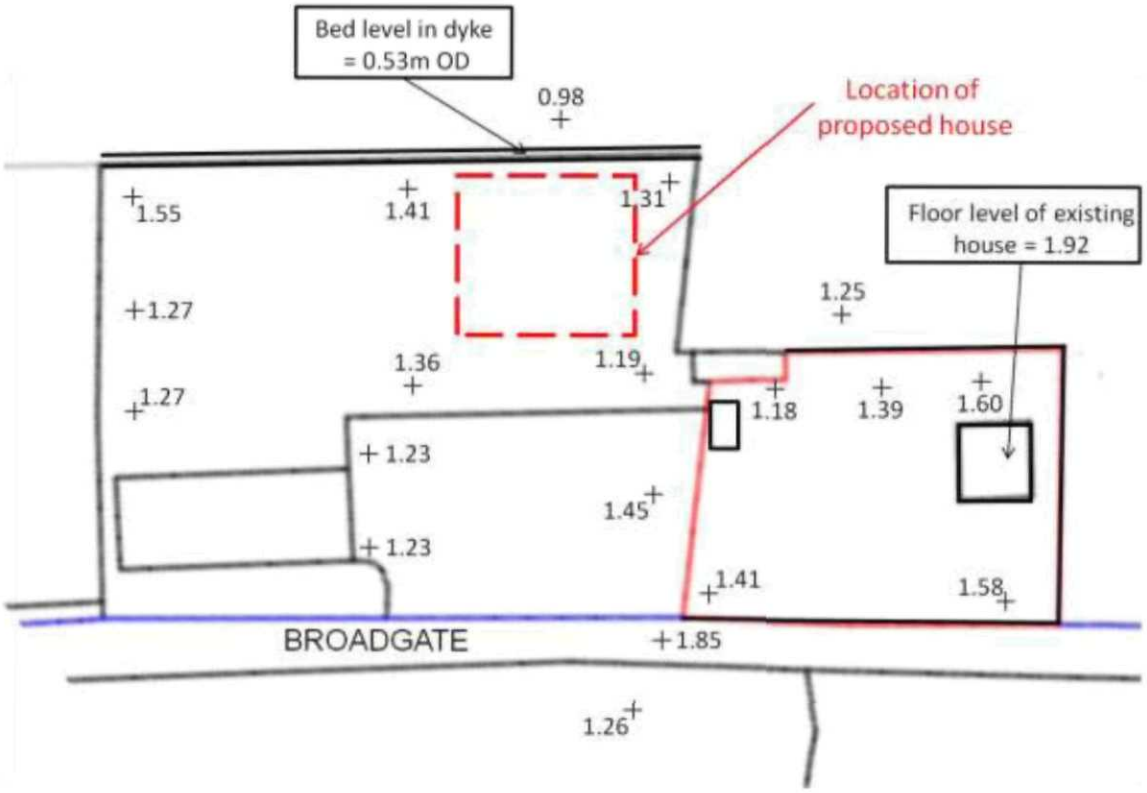


Block Plan
1 : 500

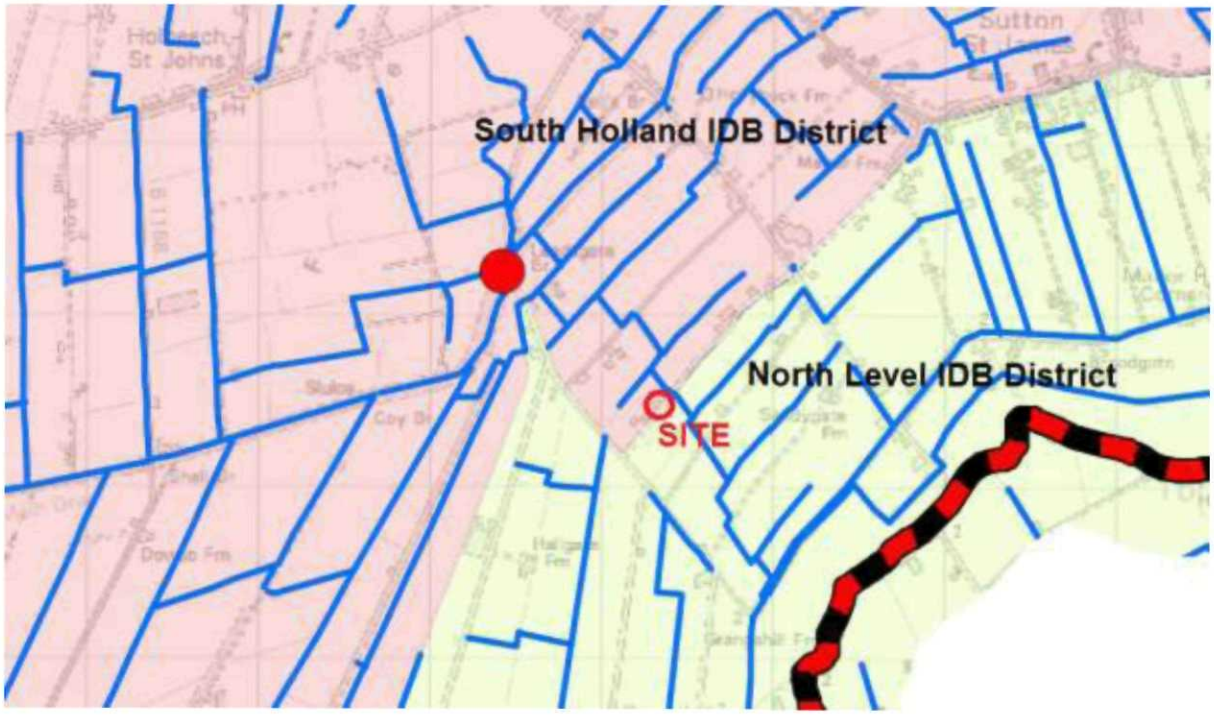
PLAN OF AREA

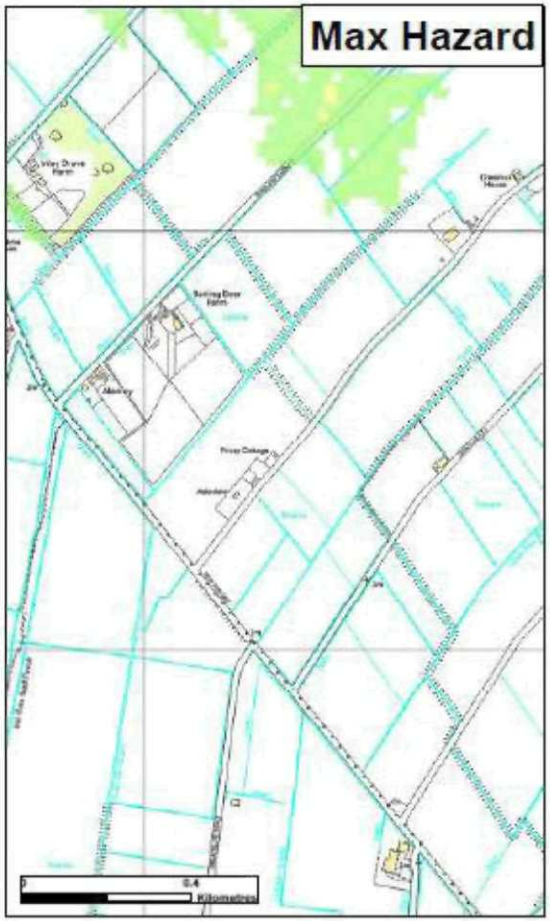


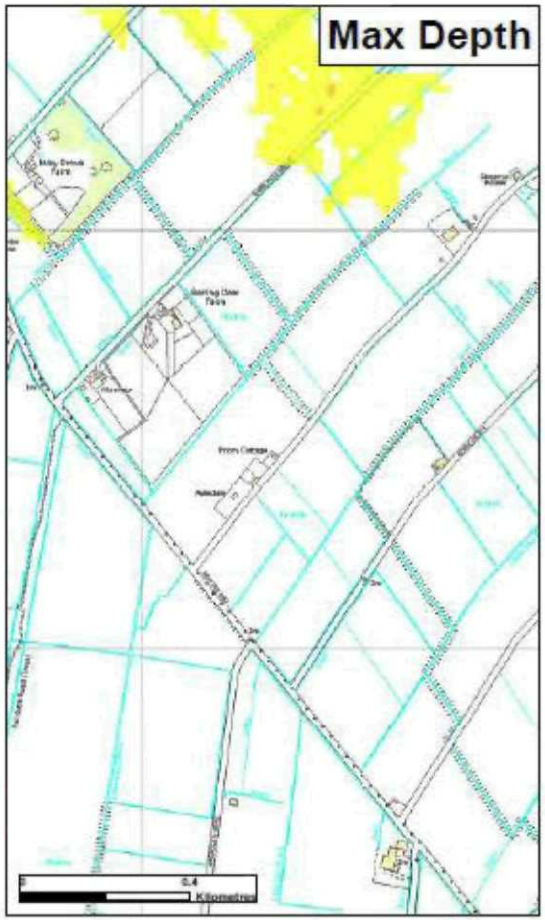
SITE LEVELS

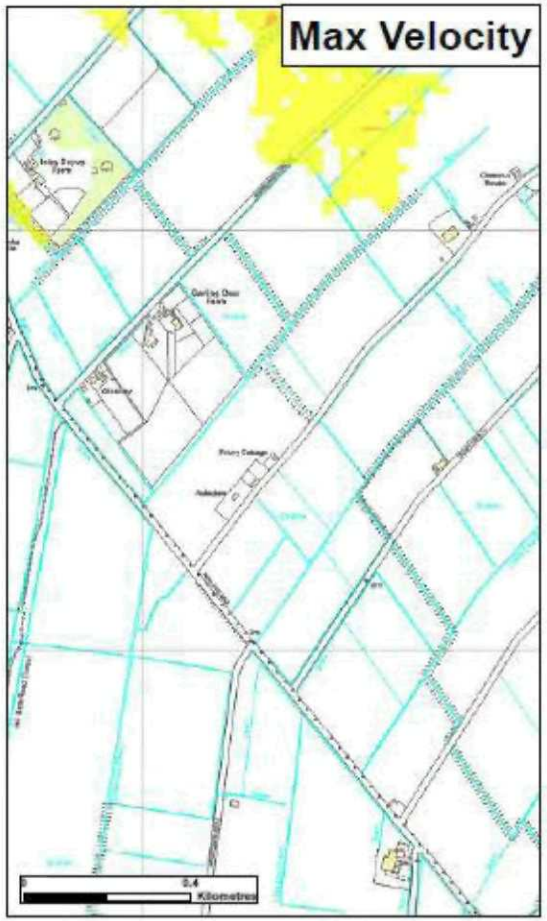


PLAN OF IDB DRAINS









★ Modelled Breach Locations

Max Hazard (Flood Risk to People - FD2320)	Max Depth (m)	Max Velocity (m/s)
Less than 0.75 (Low Hazard)	0 - 0.25	0 - 0.3
Between 0.75 and 1.25 (Danger for Some)	0.25 - 0.50	0.3 - 1.0
Between 1.25 and 2.0 (Danger for Most)	0.50 - 1.0	1.0 - 1.5
Greater than 2.0 (Danger for All)	1.0 - 2.0	1.5 - 2.5
	2.0 +	2.5 +

Date Printed	March 2015	Scenario year	2115	Scenario Annual Chance	0.5% (1 in 200)

This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped.

The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results.

The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. The likelihood of a breach occurring will depend on a number of different factors, including the construction and condition of the defences in the area. A breach is less likely where defences are of a good standard, but a risk of breaching remains.

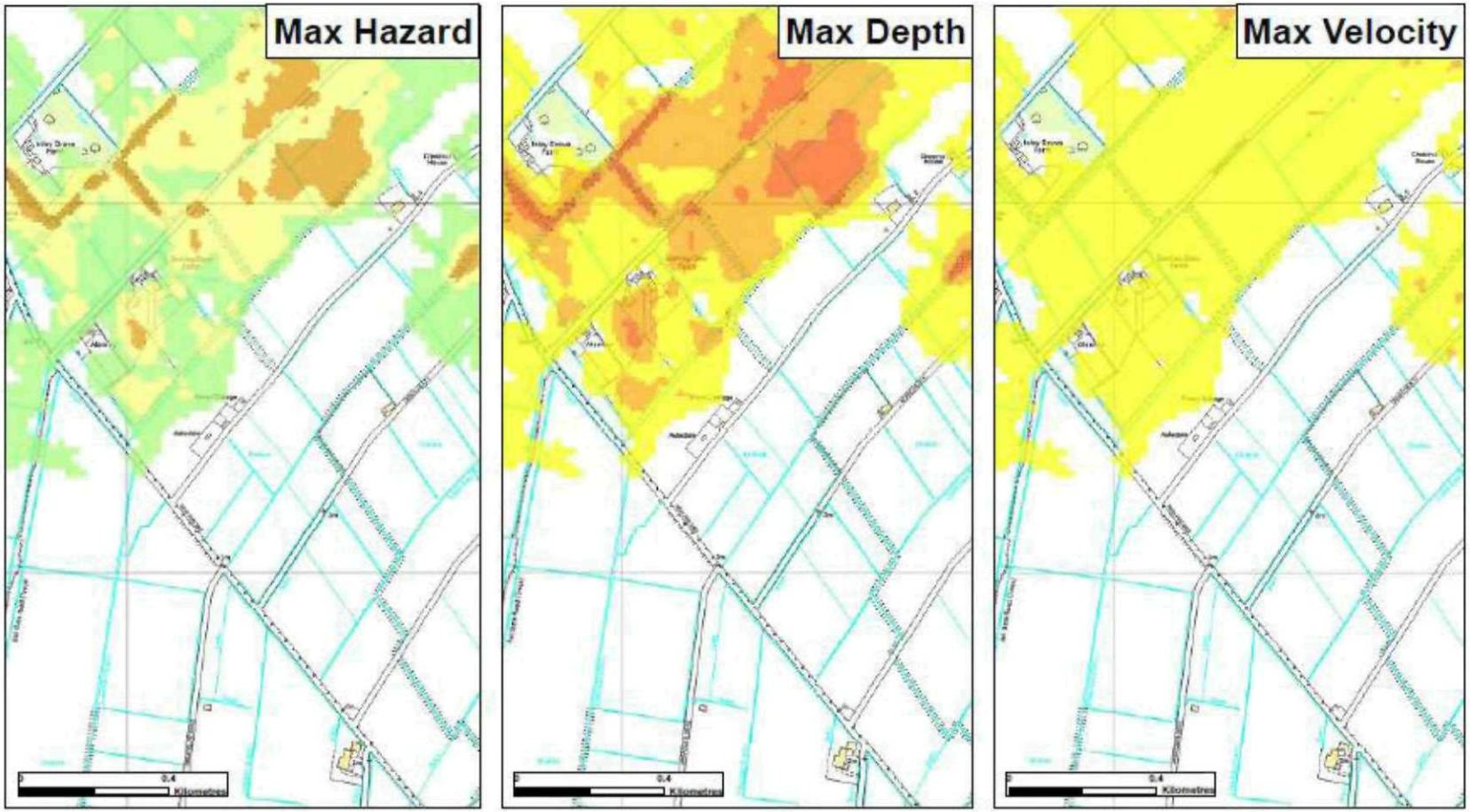
General Enquiries No: 03708 506 506. Weekday Daytime calls cost 5p plus up to 6p per minute from BT Weekend Unlimited. Mobile and other providers' charges may vary

Environment Agency

Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping

Map Centred on TF 37310 18450

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Between 1.25 and 2.0 (Danger for Most)	0.50 - 1.0	1.0 - 1.5
Greater than 2.0 (Danger for All)	1.0 - 2.0	1.5 - 2.5
	2.0 +	2.5 +

Date Printed	March 2015	Scenario year	2115	Scenario Annual Chance	0.1% (1 in 1000)

This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped.

The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results.

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Environment Agency

Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping

Map Centred on TF 37310 18450

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Seymour, Sarah

From: Richard Wenman <richard@wenmanbuildingdesign.co.uk>
Sent: 31 March 2015 11:09
To: _planningadvice
Subject: FW: FRA Priory Cottage Sutton St James
Attachments: 2015_02_30 FRA Priory Cottage Broadgate Sutton St James.pdf

Hi,

Please find attached FRA for application H20-0104-15- Replacement dwelling at Priory Cottage, Broadgate, Sutton St. James. I trust this enables the application to be made valid.

Best wishes,
Richard

Richard Wenman

SOUTH HOLLAND DISTRICT COUNCIL

Council Offices
Priory Road
Spalding
Lincolnshire
PE11 2XE

contacts:
admin: 01775 764723
dc officers: 01775 764703
s/board: 01775 761161
facsimile: 01775 762937
planningadvice@sholland.gov.uk
www.sholland.gov.uk

COPY

Austin John Developments
Rualen
Mill Green Road
Pinchbeck
Spalding
Lincs
PE11 3PU

Scanned SHDC
Planning & Development
12/2
31 MAR 2015
Ref:

Date: 12 February 2015

Dear Sir/Madam,

TOWN AND COUNTRY PLANNING ACT 1990
PLANNING APPLICATION SUBMISSION: REQUEST FOR ADDITIONAL INFORMATION OR FEE

Reference Number: **H20-0104-15**

Proposal: *Replacement dwelling*

Site Location: Priory Cottage Broadgate Road Sutton St James Spalding

Applicant: Mr Terry Griffiths

I am writing with reference to your recently submitted planning application and advise you that the application cannot be registered as it is currently considered to be invalid.

We will require the following before the application can be progressed:

Answer to Question 12 Assessment of Flood Risk is incorrect. The application site lies within Flood Zone 3 defined by the NPPF as having a high probability of flooding. A Flood Risk Assessment is required to be submitted.

Please return one copy of this letter with your reply to enable us to deal with the application without further delay. The application will remain on hold until we are in receipt of the above information. If returning information by e-mail, please use the following address; planningadvice@sholland.gov.uk and include a copy of this invalidation letter in your e-mail.

If you have any queries regarding the above please contact Richard Fidler on 01775 764562, quoting the above reference number.

Yours faithfully

RI Fidler

Richard Fidler
Development Manager

Invgen_e