# FLOOD RISK ASSESSMENT
# FOR PROPOSED
# RESIDENTIAL DEVELOPMENT AT
# KING JOHN BANK, WALPOLE ST. ANDREW, WISBECH.

**FINAL REPORT**

**GEOFF BEEL CONSULTANCY**

**MAY 2018**

**GCB/SWANN EDWARDS**

***DISCLAIMER***

*This document has been prepared solely as a Flood Risk Assessment in support of a planning application for proposed Residential Development at land adjacent to Fenland Lodge, King John Bank, Walpole St. Andrew, Wisbech. "Geoff Beel Consultancy" accepts no responsibility or liability whatsoever for any use made of this document other than by the client "Mr & Mrs Moore" for the purposes it was originally commissioned and prepared. All comments and opinions made are based upon information available to "Geoff Beel Consultancy" during the necessary investigative process, and the conclusions and recommendations could therefore, differ in the event of material subsequently being found erroneous, incomplete or misleading. "Geoff Beel Consultancy" therefore, accepts no liability should this prove to be the case.*

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Fig 1 - Survey Drawing –
Swann Edwards drg. no. SE-984.01

Fig 2 - Outline Planning Drawing –
Swann Edwards drg. no. SE-984.10

Fig 3 - Environment Agency Flood Map for Planning

Fig 4 - South Holland District Council Updated Strategic Flood Risk Assessment Residual Depth Map (2016)

Fig 5 - South Holland District Council Updated Strategic Flood Risk Assessment Residual Depth Map (2116)

Fig 6 - Kings Lynn Internal Drainage Board district plan

## 1.0 INTRODUCTION

1.1 An outline planning application is to be submitted by Swann Edwards Architecture Ltd on behalf of Mr & Mrs Moore for residential development at land adjacent to Fenland Lodge, King John Bank, Walpole St. Andrew, Wisbech.

1.2 A Flood Risk Assessment is required to accompany the planning application and meet the requirements and general principles of the Planning Practice Guidance to the National Planning Policy Framework (NPPF). The site is shown located within Flood Zone 3 of the Environment Agency Flood Map for Planning. The latest Agency 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 is also shown in tidal Flood Zone 3 and in a Hazard Zone of the South Holland District Council's Updated Strategic Flood Risk Assessment Maps (2016) as well as located in the Kings Lynn Internal Drainage Board district.

1.3 Geoff Beel Consultancy was appointed on 27th April 2018 to undertake a Flood Risk Assessment.

## 2.0 LOCATION

2.1 The development site is located at land adjacent to Fenland Lodge, King John Bank, Walpole St. Andrew. The National Grid Reference of the central point of the site is TF 49301914.

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

2.3 The site, located within the Kings Lynn Internal Drainage Board district is shown within Flood Zone 3 as detailed on the Environment Agency Flood Map for Planning and also tidal Flood Zone 3 of the Council's Updated Strategic Flood Risk Assessment Maps (2016) as well as located in a Hazard Zone.

## 3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is currently garden to an existing dwelling at Fenland Lodge.

3.2 The area of development is approximately 0.10 hectare with existing vehicular access to King John Bank and land levels at 3.45m aOD.

3.3 The proposed site layout consists the construction of a two-storey dwelling and separate garage.

3.5 The site is within the hamlet residential area of King John Bank as designated by the South Holland District Council and as such is exempt from the

Sequential Test and Exception Test of NPPF. However, due consideration has been given to the Sequential Test as follows:

3.6 **Sequential Test**.

Initially it is required that other sites for development must be considered in the area that may offer a reduced flood risk, however, it is noted that no sites within a 5.0km radius of the River Nene defences were outside the Zone 3 category and the Sequential Test was therefore passed.

However to ensure compliance these further consideration has been applied as under the requirements of NPPF. From the Environment Agency Flood Map for Planning it shows that the site is within Zone 3 and Category 3 Tidal Flood Risk as detailed on the SHDC SFRA maps and is in Zone 3 an area protected to 1 in 100 years for fluvial events and 1 in 200 years for tidal events; the area as it is protected to this degree can be considered to be a passive flood plain. The development therefore complies with the Appropriate Uses required in the table but is required to pass the Exception Test.

**Exception Test**.

Therefore applying the Exception Test shows that:

a) the development provides wider sustainable economic benefits by utilising an already developed area within existing hamlet

b) the FRA demonstrates that the development will be safe and will not increase flood risk elsewhere nor detrimentally affect any other property

The site is compliant with a) and b).

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 embankments is considered to be small.

4.2 The site is located within the Kings Lynn Internal Drainage Board district which is protected by the Great Ouse Tidal and Sea Defences against a minimum flood return period of up to 1 in 200 years. The nearest 'main drain' is located approximately 350 metres north east of the development site with land levels at 3.45m aOD. King John Bank carriageway level is 3.90m aOD.

4.3 The Kings Lynn IDB drainage system at present achieves a target standard of protection to residential properties of 1 in 50 years return period with a minimum freeboard of 900mm elsewhere in the district to lowest agricultural land levels.

4.4 The site and surrounding land drains by gravity in a generally northerly direction to outfall into the tidal River Nene at the Chalk Lane Sluice operated and maintained by the Kings Lynn Internal Drainage Board.

4.5 Current maintenance standards within the Kings Lynn Internal Drainage Board and of the Environment Agency tidal 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
c) failure of the Chalk Lane Sluice
d) overtopping and breaching of the River Nene tidal 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 Kings Lynn 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. Flooding of some agricultural land would occur but no properties.

5.3 Failure of the Chalk Lane Sluice 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 Kings Lynn IDB 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 shown to be within Flood Zone 3 of the River Nene as detailed on the Environment Agency Flood Map for Planning. However the maps have been prepared irrespective of existing defences which in this location are the tidal defences to the west embankment of the River Nene improved after the 1978 tidal surge event.

5.5 The recorded tide level at Sutton Bridge was 5.20m aOD in 1978 since which improvements to 6.30m aOD for hard defences and 7.00m aOD for soft defences have been carried out. The River Nene tidal defences were designed to a 1 in 100 year return period plus freeboard of 1.1 metres.

A more recent report prepared by Consulting Engineers for the Environment Agency has confirmed that the defences would withstand a 1 in 200 year return period still water level of 6.30m aOD (estimated) NPPF states that development should be safe from flooding for its lifetime of 100 years; after taking into account sea level rise due to climate change the predicted 1 in 200 year tide level at Sutton Bridge would be 7.06m aOD. This would overtop existing soft defences by 0.06 metre.

The South Holland Updated Strategic Flood Risk Assessment includes Tidal Hazard Mapping provided by the Environment Agency and any overtopping or breaching of existing defences between Sutton Bridge and Tydd is estimated to flood the site to a depth of water of 2.00m which is located approximately 1.50kms from the River Nene Tidal Defences.

## 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 within the last 100 years.

## 7.0 PROBABILITIES AND TRENDS OF FLOODING

7.1 The probability of this development flooding from localised drainage systems is very low. The nearby main drain provides adequate standard of protection for up to 1 in 50 years return period plus freeboard to lowest land levels.

7.2 The probability of the site flooding with water from the tidal River Nene main river is between 0.5% and 1%. If the trend of climate change anticipated to occur continues over the next 100 years, without any further improvements to the main river tidal defences, there is a risk of overtopping at the 1 in 200 year return period event.

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 development of the site with proposed floor level at 2.00m above surrounding land level with only access and utility rooms at ground levels will be appropriate for the design life of the development (i.e. 100 years). All habitable accommodation will need to be at 2.00m above existing ground level.

7.5 Safe access and egress is available onto King John Bank in a southerly direction to Walpole St.Peter where land is in Flood Zone 1.

## 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 possibility of overtopping or a tidal breach occurring to the tidal defences.

8.2 The developer should 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 and the occupiers of the property should register with the Floodline Warning Direct Service.

## 9.0 RESIDUAL RISK – EXTREME EVENTS

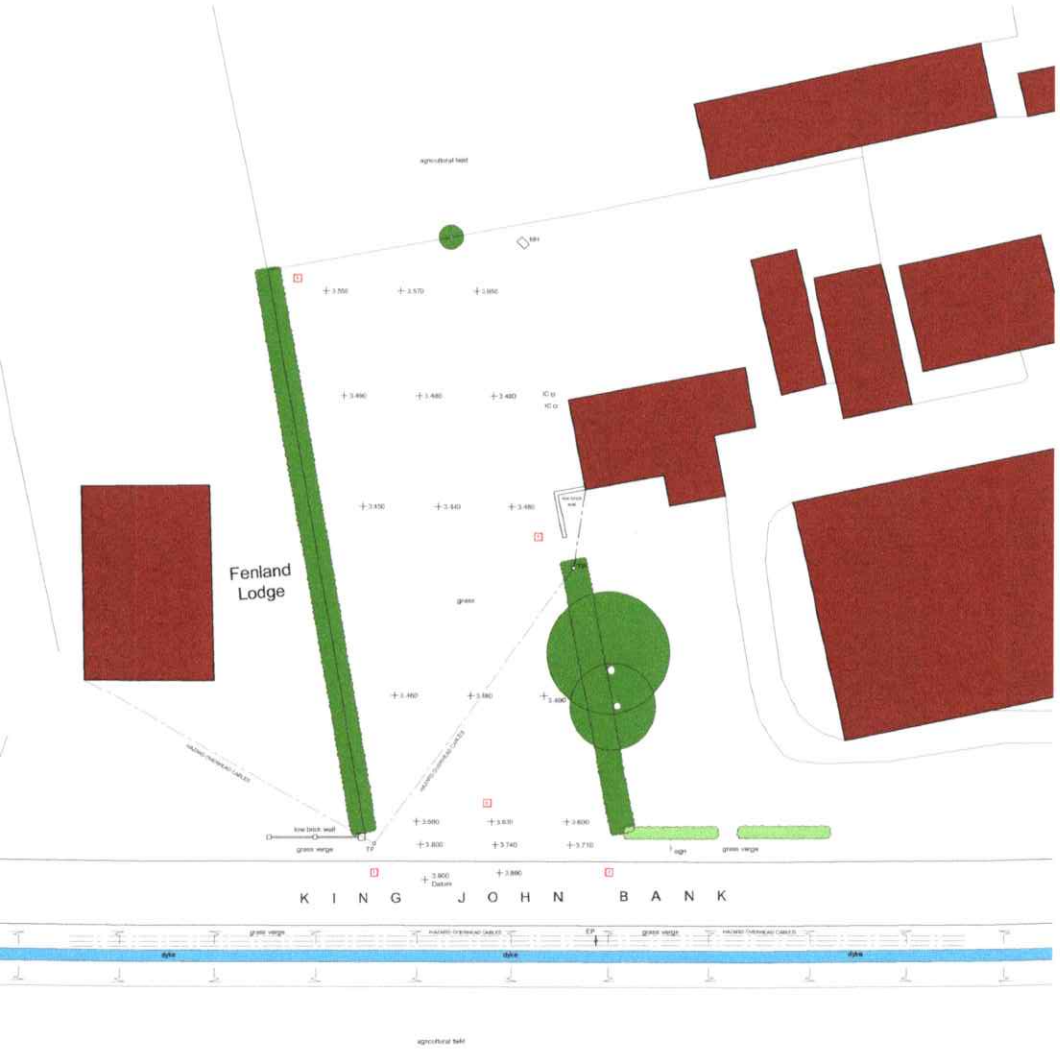
9.1 The residual risk from extreme fluvial events is low on this site, because of the existing standard of drainage provided by the Kings Lynn IDB. The discharge of surface water from the development will be to soakaway designed to BRE 365 and approved as part of Building Regulations.

9.2 Although within Flood Zone 3 according to NPPF classification, the site actually has 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.

## 10.0 CONCLUSIONS AND RECOMMENDATIONS

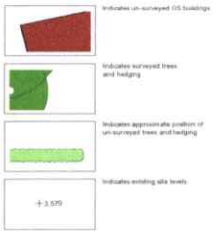
10.1 As a result of the assessment, the following conclusions have been reached:-

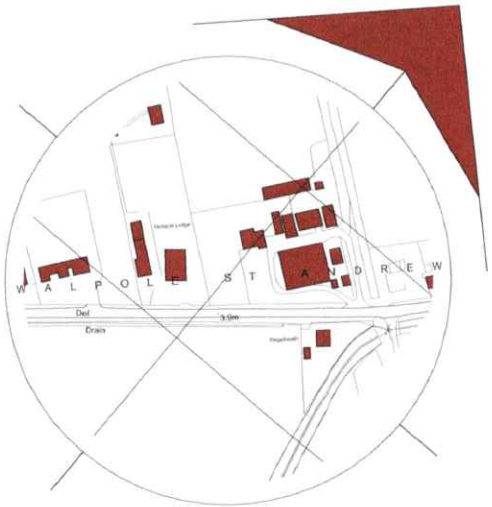
- The proposed development is not in a Functional Floodplain. It is in the Passive Floodplain of the River Nene.
- Although the site is in Flood Zone 3, the actual risk of the site flooding from tidal main river is very low at less than 0.5%.
- Although the site is located within Kings Lynn Internal 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.
- Land level at the site is 3.45m aOD with proposed habitable floor level 2.00m above the existing ground level with only access and utility room at ground level.




Plan
1:200

SITE PLAN KEY




Location Plan
Scale: 1:1250

General Notes:
1. This drawing shall not be scaled, figured dimensions only to be used.
2. All dimensions are shown in mm unless otherwise noted.
3. The contractor, sub-contractors and suppliers must verify all dimensions on site prior to the commencement of any work.
4. This drawing is to be read in conjunction with all relevant engineers and specialist sub-contractors drawings and specifications.
5. Any discrepancies are to be brought to the designers attention.











SWANN EDWARDS
ARCHITECTURE

Swann Edwards Architecture Limited, Fen Road, Guyhirn, Wisbech, Cambs. PE13 1AA.
t: 01945 450760 • e: info@swannedwardsarchitecture.co.uk • www.swannedwardsarchitecture.co.uk

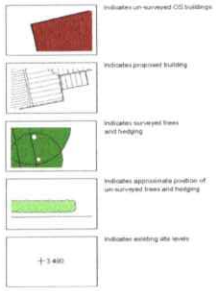
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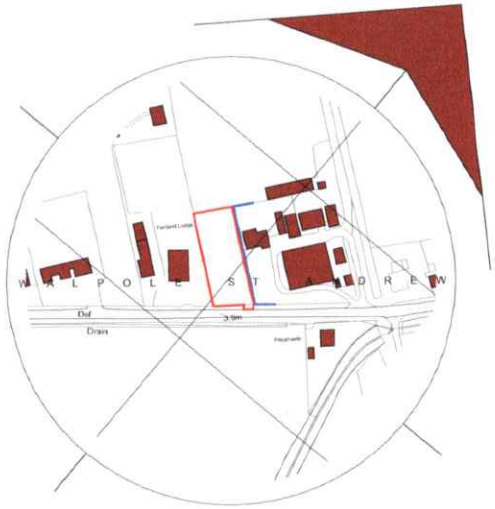
Drawing Title: Survey Drawing

Date: April 2013
Drawn Size: A1
Job No.: SE-934
Drawn by: JHR
Drwg No.: 01
Revision:




## SITE PLAN KEY




Location Plan

Scale: 1:1250

cative Site Plan

:200

General Notes

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Status

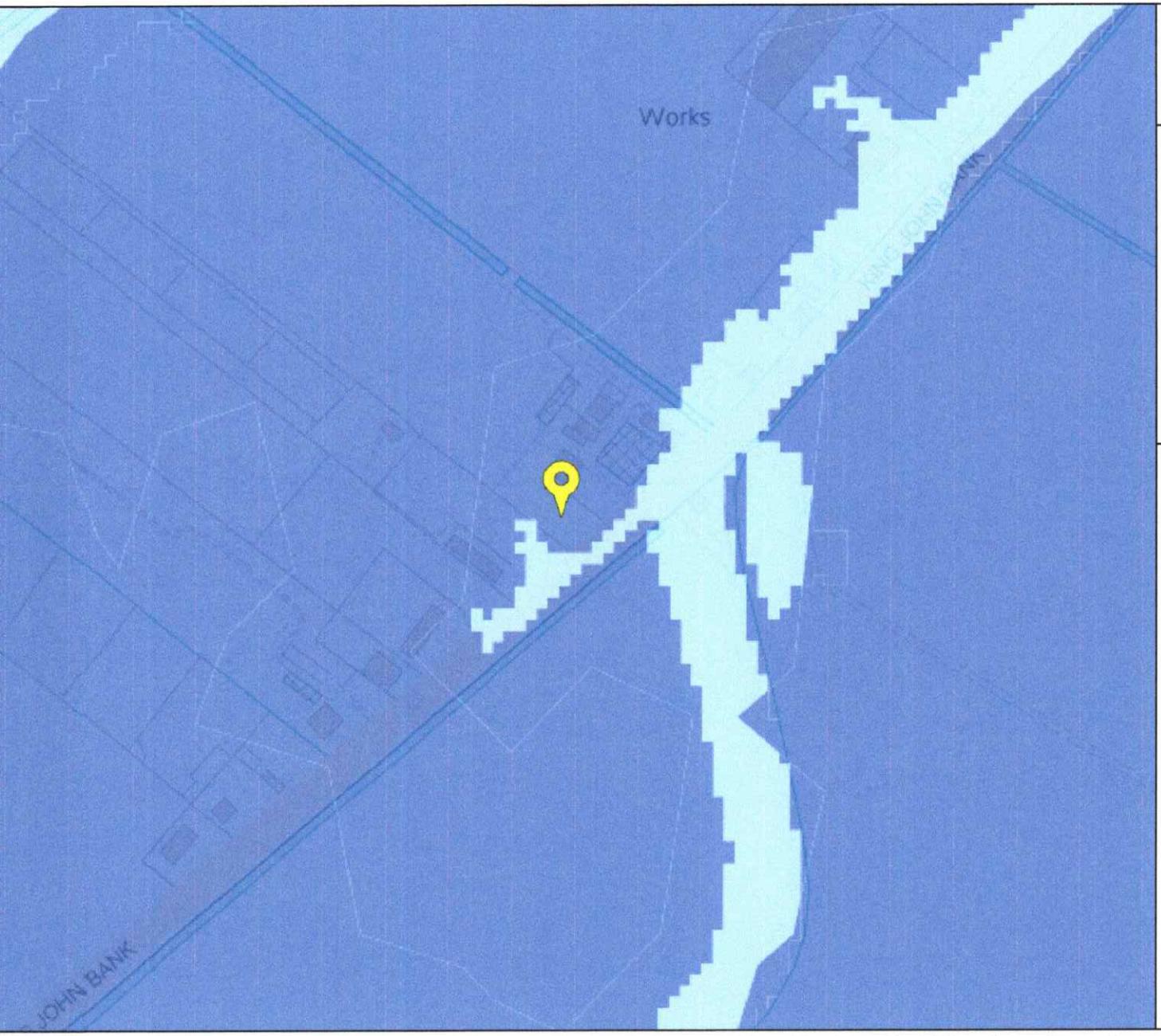
FOR APPROVAL

SWANN EDWARDS
ARCHITECTURE
Swann Edwards Architecture Limited, Fen Pool,
Guyhirn, Wisbech, Cambs, PE13 4AA
t: 01945 466966 • e: info@swannedwardsarchitecture.com • www.swannedwardsarchitecture.com

Job Title
Proposed Dwelling
Land Adjacent Fenland Lodge
King John Bank
Runcton Holme
Mr M and Mrs M Hunt

Drawing Title
Outline Planning Drawing

Date: April 2019
Scale: As Shown
Drawn Size: A1
Job No.: SE-984
Drawn by: SH
Dwg No.: 10
Revision:




Environment Agency

**Flood map for planning**

Your reference
**PE14 7JT**

Location (easting/northing)
**549296/319141**

Scale
**1:2500**

Created
**27 Apr 2018 11:36**

- 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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2016


Bleak House Fm
Power Station
Gibbons Fm
Gunthorpe Fm
Peterspoint Fm
Sluice
Fields Fm
South Holland Lodge
Tydd St Mary's
Marsh

Wingland Marsh
Grange Fm
Bleak House Fm
Power Station
Gibbons Fm
Sutton Bridge
Peterspoint Fm
Fields Fm
Sluice
South Holland Lodge
Tydd St Mary's
Marsh
PH
CH


DRN039G0405
DRN039G0101
DRN039G0106
DRN039G0201
White House Farm
Marigold Lodge
Track
Drain
CENTENARY WAY
Drains
7m
A17
Crosskey
Kennels
The Bungalow
Tyvan
Carnwood
The Lawns
KING JOHN BANK
Depot
Lincolnside
Maristow
Works
Nursery
Marshland
New Marsh
4m
Old Inclosed Marsh