FLOOD RISK ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT AT RIVER LANE, MOULTON, SPALDING, LINCS.

FINAL REPORT

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GCB/WRIGHT

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Fig 1 - Location Plan – Google Map

Fig 2 - Site Survey – Martin Rickman 1609

Fig 3 - Environment Agency Flood Zone Map

Fig 4 - South Holland Strategic Flood Risk Assessment Map – Residual Flood Depths (2115)

Fig 5 - Environment Agency Tidal Hazard Mapping – Depth, Hazard & Velocity of 1 in 1000 year event – CCN-2016-22878

Fig 6 - South Holland Internal Drainage Board district plan

1.0 INTRODUCTION

1.1 An outline planning application is to be submitted by Andrew M Wright Ltd on behalf of Mrs J Rawlings for proposed residential development at land east of 29 River Lane, Moulton, Spalding, Lincs.

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

The site, as situated, is located partly within Flood Zone 3 of the Environment Agency's Flood Zone Maps. The latest Agency Flood Maps have been created as a tool to raise awareness of flood risk with the public and our partner organisations, such as Local Authorities, Emergency Services and Drainage Authorities. The Maps take into account existing flood defences.

The site is also shown in Flood Zone 1 of the South Holland District Council's Strategic Flood Risk Assessment Maps.

The site is also located in the South Holland IDB drainage district.

1.3 Geoff Beel Consultancy was appointed on 30th September 2016 to undertake a Flood Risk Assessment.

2.0 LOCATION

2.1 The development site is located east of 29 River Lane, Moulton. The National Grid Reference of the central point of the development is TF 31132490.

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

2.3 The site, located within the South Holland Internal Drainage Board district is shown partly within Flood Zone 3 as detailed on the Environment Agency Flood Zone Map but in Flood Zone 1 of the Council's Strategic Flood Risk Assessment Map.

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is currently agricultural land.

3.2 The area of development is approximately 0.29 hectare.

3.3 The proposed site layout consists the construction of a two-storey dwelling and garage. Existing land levels are generally at 3.00m aOD.

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 the site is protected against both the 1 in 200 year return period tidal event and the 1 in 100 year return period fluvial event. The Sequential Test is met as the site is located in Flood Zone 1 of the Council's Strategic Residual Depths Map.

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 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.

The development site within the South Holland Internal Drainage Board is protected by the River Welland tidal defences between Spalding and Fosdyke Bridge with embankment levels of a minimum of 7.00m aOD.

4.2 The site and the surrounding land drains by gravity to the Moulton River on the opposite side of River Lane to the Lords Sluice Outfall and hence to the tidal River Welland.

4.3 The existing standard of drainage for the South Holland 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 900mm is provided to the lowest land levels.

4.4 Current maintenance standards within the South Holland Internal Drainage Board and of the Environment Agency defences are generally very 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 soakaways
b) local blockages to IDB main drain system.
c) storm return period of 1 in 50 years being exceeded
d) failure of Lords Sluice Outfall
e) overtopping and breaching of defences of the tidal River Welland

5.2 The probability of flooding from source a) is low due to the maintenance standards by the future owner and the design requirements of BRE36.

The probability of flooding from b) is also low due to the South Holland 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.

Previous historic rainfall events of 1968 and 1978, estimated to be greater than 1 in 100 year events, caused no flooding to any residential properties at the time and the Boards policy is to provide a standard of drainage which satisfies NPPF requirements of a 1 in 100 year return period for fluvial protection inclusive of the effects of climate change and developments to the arterial system enables a flexible approach to be adopted and meet the criteria for "sustainable urban drainage".

5.3 Failure of Lords Sluice Outfall 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 South Holland Internal Drainage Board would take emergency action to maintain the drainage level of service by utilising temporary pumping equipment.

5.4 The flood embankments to the tidal River Welland provide a 1 in 200 year return period level of protection.

The 1 in 200 year River Welland tidal event at Fosdyke Bridge in 2069 is estimated to be 6.41m aOD as against existing embankment levels of a minimum of 7.00m aOD.

There is a low risk during such an event for wave and wind action to cause overtopping and/or breaching of the first line defences parallel with the River Welland. However, the site is located 4.5kms from the River Welland defences and any overtopping/breaching would be minimal.

The Environment Agency has confirmed that the Tidal Hazard mapping shows the site to be unaffected as a consequence of a breach occurring to the River Welland tidal defences.

The development site is protected by land levels generally at 3.00m aOD which are well above surrounding land levels between the site and the river defences.

5.5 Surface water drainage from the development site will be to soakaways to BRE365 design requirements and Building Regulations approval.

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.

7.0 PROBABILITIES AND TRENDS OF FLOODING

7.1 The probability of this development flooding from localised drainage systems is very low.

7.2 The probability of the site flooding with water from any South Holland IDB main drain is less than 1% because of the standards of the existing flood defence systems, storage within existing drainage channels and the location of the site.

7.3 The probability of the site flooding with tidal waters from any main river system is less than 1% because of the standards of the existing flood defences and the location of the site.

7.4 If under very extreme events, levels of floodwater from the South Holland IDB main drains 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.

7.5 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 300mm above existing ground level at 3.30m aOD will be appropriate for the design life of the development (i.e. 100 years).

7.6 Safe access and egress is readily available onto River Lane and hence in a southerly direction to Moulton village in Flood Zone 1.

8.0 IMPACTS OF FLOODING

8.1 No significant impacts of flooding are anticipated.

8.2 Floor levels of the development will be at 3.30m aOD and at least 300mm above existing ground levels which together with the proposed sustainable drainage system will offer 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 any of the South Holland IDB main drain systems, then probably 2 to 3 days warning time would be available.

8.4 No displacement of water from the site will affect any adjoining properties as existing soakaway drainage system will be utilised.

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 South Holland IDB area and its location 4.5kms from the River Welland tidal defences.

9.2 The site is within Flood Zone 1 according to NPPF classification, the site actually 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 taking into account existing flood defences and standards of protection.

9.3 South Holland District Council in conjunction with the Environment Agency and the local IDB's within the Council area have carried out a Strategic Flood Risk Assessment of the whole District by appointed Consulting Engineers.

The Strategic Flood Risk Assessment has produced more definitive Flood Risk Maps than those published by the Environment Agency and at the same time has analysed flood return periods of all tidal and fluvial defences to account for the effects of climate change.

Breach scenarios of embankments failing and/or being overtopped have also been carried out to establish Flood Risk Zones. As a result of the Strategic Flood Risk Assessment for the site is outside any Rapid Inundation Zone and defended by tidal defences and tidal doors.

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 River Welland tidal defences to a 1 in 200 year return period, (1.0%)

- The site is in Flood Zone 1 with the actual risk of site flooding from any Environment Agency river system being very low (less than 0.5%).

- Although the site is located within an 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 providing further storage within the drainage channels.

- On site rainwater from the development will be discharged to proposed soakaway drainage to BRE365 design requirements and Building Regulations approval.

- Finished floor level will be 300mm above existing ground level at 3.30m aOD with 300mm of flood resilient construction above FFL.