FLOOD RISK ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT AT BULL LANE, LONG SUTTON, LINCS.

FINAL REPORT

GEOFF BEEL CONSULTANCY

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GCB/ELENER

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Ken Elener drg. no. S3392-1

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Fig 3 - Photographs of Site

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Fig 7 - South Holland Internal Drainage Board District plan

1.0 INTRODUCTION

1.1 A full planning application is to be submitted by Ken Elener Architectural Design on behalf of Mr P L Sargeant for proposed residential development at The Abbatoir, Bull Lane, Long Sutton, Lincs.

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) and for approval by the Environment Agency.

The site, as situated, is located within Flood Zone 3, of the Environment Agency's Flood Maps for Planning. 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 do not take into account any flood defences.

The site is also shown in Flood Zone 3 of the South East Lincs. Strategic Flood Risk Assessment Map (2016) and located in the South Holland IDB drainage district.

1.3 Geoff Beel Consultancy was appointed on 11th July 2019 to undertake a Flood Risk Assessment.

1.4 A previous Flood Risk Assessment prepared by the author in February 2017 received approval as part of planning permission H11-0146-17 dated 2nd May 2017.

2.0 LOCATION

2.1 The development site is located at The Abbatoir, Bull Lane, Long Sutton. The National Grid Reference of the central point of the development is TF 43102301.

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

2.3 The site, located within the South Holland Internal Drainage Board district is shown within Flood Zone 3 as detailed on both the Environment Agency Flood Map for Planning and the Council's Strategic Flood Risk Assessment Map (2016).

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is currently derelict buildings.

3.2 The area of development is approximately 0.10 hectare.

3.3 The proposed site layout consists the construction of a 2 storey dwelling after demolition of the existing buildings. Ground level is generally at 5.00m 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 planning approval is already in place.

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 South Holland Internal Drainage Board is protected by a combination of the River Welland tidal defences downstream of Spalding, the River Welland fluvial embankments as well as the River Nene tidal defences downstream of Foul Anchor.

4.2 The site and the surrounding land drains by gravity to the Board's main drain system and hence via the Lutton Leam Sluice to discharge into the tidal River Nene downstream of Sutton Bridge.

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 IDB main drain system .
b) storm return period of 1 in 50 years being exceeded
c) failure of the Lutton Leam Outfall Sluice
d) overtopping and breaching the tidal River Nene 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 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 the Lutton Leam Outfall Sluice may occur due to long term mechanical breakdown or power supply being disrupted. However, in these circumstances, if conditions were such as 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 flood embankments to the tidal River Nene provide a 1 in 200 year return period level of protection. Surface water drainage from the site will be to soakaways designed to BRE365 requirement and Building Regulations approval.

5.5 The South East Lincs. Strategic Flood Risk Assessment Residual Flood Depth Maps shows the site affected by floodwaters as does the Hazard Mapping prepared by the Environment Agency such that the development site could be flooded to a depth of between 0.25 – 0.50m. It is necessary to mitigate against such risks but with the development site being totally surrounded by existing buildings finished floor levels may only be raised 300mm above existing ground level with a further 300mm of flood resilient construction above finished floor level.

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 fluvial 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 level raised 300mm above existing ground level with a further 300mm of flood resilient construction will be appropriate for the design life of the development (i.e. 100 years).

7.6 Safe refuge will be available at first floor level of the two storey dwelling with no sleeping accommodation at ground floor level.

7.7 The developer will 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 Warnings Service which includes Flood Warnings 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 be 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: 0345 988 1188. The occupiers of the dwelling should register with the Floodline Direct Warnings Service to receive any future flood warnings.

8.0 IMPACTS OF FLOODING

8.1 No significant impacts of flooding are anticipated.

8.2 Floor level of the development will be 300mm above existing ground level which together with the proposed flood resilient construction 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 soakaways drainage will be to BRE365 design requirements and Building Requirements approval.

8.5 Safe and dry access/egress is available to Bull Lane and hence in a westerly direction to Holbeach where land is in Flood Zone 1.

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 5.00kms from the River Nene tidal defences.

9.2 The site is within Flood Zone 3 according to NPPF classification, 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.

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

The South East Lincs. 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 for years 2002 and 2115 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. The site is shown as being liable to flooding of between 0.25 – 0.50m on the Environment Agency Tidal Hazard Mapping and the South East Lincs. Strategic Flood Risk Mapping as a result of a failure of the River Nene tidal defences.

9.4 As a result of the Strategic Flood Risk Assessment; the South Holland Main Drain and associated IDB main drains have been determined as providing protection against a 1 in 100 year return period event both in year 2115.

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 the River Nene tidal defences and the South Holland IDB to a 1 in 200 year return period, (0.5%).

- The site is in Flood Zone 3 of the Council's Residual Depth Flood Zone map with the actual risk of the site flooding from any Environment Agency river system being very low (less than 0.5%). The site has also been identified as liable to flooding of between 0.25 – 0.50m depth due to the failure of the River Nene tidal defences on both the Environment Agency Tidal Hazard Mapping and the Council's SFRA Residual Flood Depth Maps.

- 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.

- Floor level of the two storey dwelling will be 300mm above existing ground level with flood resilient construction up to 300mm above finished floor level and safe refuge available at first floor level with no sleeping accommodation at ground floor level.

- On site rainwater from the development will be discharged via soakaway drainage to BRE365 design requirements and hence to IDB main drain system.