

**FLOOD RISK ASSESSMENT FOR
PROPOSED RESIDENTIAL DEVELOPMENT
AT MALTING LANE,
DONINGTON, LINCS.**

FINAL REPORT

GEOFF BEEL CONSULTANCY

DECEMBER 2013

GCB/MERCHANT

DISCLAIMER

This document has been prepared solely as a Flood Risk Assessment in support of a planning application for proposed Residential Development at "Alexine", Malting Lane, Donington, Spalding, Lincs. "Geoff Beel Consultancy" accepts no responsibility or liability whatsoever for any use made of this document other than by the client "Mr & Mrs A Dear" 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.

CONTENTS

- 1.0 INTRODUCTION
- 2.0 LOCATION
- 3.0 THE SITE AND SEQUENTIAL TEST
- 4.0 EXISTING FLOOD ALLEVIATION MEASURES
- 5.0 POTENTIAL SOURCE OF FLOODING
- 6.0 EXTENT OF KNOWN FLOODING
- 7.0 PROBABILITIES AND TRENDS OF FLOODING
- 8.0 IMPACTS OF FLOODING
- 9.0 RESIDUAL RISKS – EXTREME EVENTS
- 10.0 CONCLUSIONS AND RECOMMENDATIONS

Fig 1 - Site Layout and Location Plans –
G R Merchant Ltd drg. no. 2575-13.10

Fig 2 - Topographical Survey and Location Plan –
G R Merchant Ltd drg. no. 2575-13.11

Fig 3 - Environment Agency Flood Zone Map

Fig 4 - South Holland District Council Strategic Flood Risk
Assessment – Depths & Extent (2115)

1.0 INTRODUCTION

1.1 A full planning application has been submitted by G R Merchant Ltd on behalf of Mr & Mrs A Dear for proposed residential development at land at "Alexine", Malting Lane, Donington, Spalding, Lincs.

1.2 Planning approval requires a Flood Risk Assessment to accompany the application to meet the requirements and general principles contained in Paragraph 9 of the Technical Guide to the National Planning Policy Framework (NPPF) and for approval by the Environment Agency.

The site is shown partly within Flood Zones 2 and 3 of the Environment Agency's Flood Zone Map. The 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 is however shown in Flood Zone 1 of the South Holland District Council's Strategic Flood Risk Assessment Maps (2115) and located in the Black Sluice Internal Drainage Board district.

1.3 Geoff Beel Consultancy was appointed on 25th November 2013 to undertake a Flood Risk Assessment.

2.0 LOCATION

2.1 The development site is of hardstanding land in the grounds of Alexine, Malting Lane, Donington, Spalding. The National Grid Reference of the central point of the site is TF 20403520.

2.2 The position and extent of the site is shown on Fig 1 – Site Layout and Location Plan and Fig 2 – Topographical Survey and Location Plan at the end of the document.

2.3 The site, located within the Black Sluice Internal Drainage Board district is shown partly within Flood Zones 2 and 3 as detailed on the Environment Agency Flood Zone Maps but in Flood Zone 1 of the Council's Strategic Flood Risk Assessment Maps (2115).

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is a redundant haulage yard in the grounds of Alexine, Malting Lane, Donington.

3.2 The total area of development is approximately 0.12 hectare.

3.3 The proposed site layout consists the construction of two single storey dwellings with safe refuge in the roof space both with shared access off Malting Lane.

- 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 the 1 in 100 year fluvial event by a combination of defences, pumping stations and sluice gates meeting the requirements of NPPF. The site is also shown in Flood Zone 1 of the South Holland District Council Strategic Flood Risk Assessment.(2115)
- 3.5 The development with the inclusion of appropriate mitigation measures would ensure the proposals pass Part 2 of the NPPF Exception Test by ensuring that the development has an adequate water exclusion strategy for the design flood and breach event.

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 Black Sluice Internal Drainage Board protected by the River Glen and South Forty Foot Drain defences to the 1 in 100 year return period flood event. Road level of Malting Lane on the site frontage is at 3.00m aOD.
- 4.3 The site and surrounding land drains via public sewerage to the Black Sluice IDB main drain system.
- 4.4 Current maintenance standards within the Black Sluice Internal Drainage Board 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.

- 4.5 Maintenance standards of the Environment Agency's main rivers and defences are well maintained and regularly inspected for their asset condition.

5.0 POTENTIAL SOURCES OF FLOODING

5.1 Three 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) overtopping and breaching of the fluvial River Glen and South Forty Foot Drain 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 Black Sluice 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.

5.3 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 development. The Boards policy regarding the connection of future developments to the arterial system enables a flexible approach to be adopted and meet the criteria for “sustainable urban drainage”. The probability of the site flooding from this potential source is also considered to be low.

5.4 The possible overtopping and breaching of the fluvial River Glen and South Forty Foot Drain flood defences which may affect the site under extreme conditions is also considered to be very low. The present standard of defence of 1 in 100 years would most probably have to be exceeded to create such conditions. The River Glen flood defences consist of concrete walls and it is estimated that the floodwaters would not affect the development site, as there is sufficient freeboard above the 1 in 100 year flood level inclusive of climate change. Similarly the South Forty Foot Drain embankments provide protection against the 1 in 100 year event.

5.5 The South Holland District Council Strategic Flood Risk Assessment has considered the effect of breach or overtopping to the River Glen and South Forty Foot defences as shown in Fig 4.

The development site is shown to be outside the extent of flooding due to the 1 in 100 year fluvial and 1 in 200 year tidal events in year 2115.

It is proposed to raise finished floor levels some 400mm above existing ground level at 3.00m aOD with flood resilient construction incorporated up to 3.30m aOD.

- 5.6 The developer should ensure that the eventual occupiers of the properties 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 including teletext.

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 occupiers should register with the Floodline Direct Warnings Service to receive any future flood warnings.

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. It is also intended to construct floor levels at 3.00m aOD which is Malting Lane carriageway level and 400mm above existing ground level.
- 7.2 The probability of the site flooding with water from any Black Sluice river system 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. Similarly the same standard is provided by the Environment Agency's main river and defences.
- 7.3 If under very extreme events, levels of floodwater from any Environment Agency or Black Sluice 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 tend to rise as a result of the impacts of climate change. However the existing systems and defences together with proposed floor levels at Malting Lane carriageway level at 3.00m aOD will be appropriate for the design life of the development (i.e. 100 years).
- 7.5 Safe and dry access to and from the site would be available onto Malting Lane and into Donington village where land is in Flood Zone 1 of the Environment Agency maps.

8.0 IMPACTS OF FLOODING

- 8.1 No significant impacts of flooding are anticipated.
- 8.2 Floor levels of the development will be at Malting Lane carriageway level at 3.00m aOD offering additional protection against impacts arising from any extreme short duration, localised events. Surface water drainage will be discharged to soakaway designed to BRE365 specification and Building Regulations approval.
- 8.3 The general location of the site within the catchment is such that if flooding occurred from any of the Environment Agency or Black Sluice river 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 and agricultural land.

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 a pumped sub-catchment of the Black Sluice IDB area and its location 7.00kms from the River Glen and 3.00kms from the South Forty Foot Drain consisting defences consisting of a mixture of earth embankments and concrete walls.
- 9.2 Although within either Flood Zone 1 or Flood Zone 3 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 irrespective of 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 for year 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.

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 as defined by NPPF. It is located in the Passive Floodplain protected by River Glen and South Forty Foot Drain defences to a 1 in 100 year return period.
- Although the site is in either Flood Zone 1 or Flood Zone 3, the actual risk of site flooding from any Environment Agency river system is very low.
- 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 levels will be a minimum of 400mm above existing ground level and compatible with Malting Lane carriageway level at 3.00m aOD. Safe refuge is available in the roof space of each dwelling.
- On site surface water drainage will be discharged to soakaway to BRE365 specification and Building Regulations approval.