

FLOOD RISK ASSESSMENT

Incorporating the Sequential Test

(Retrospective) Conversion and Extensions
At No. 54 & No. 56 Burlington Crescent,
Goole DN14 5EG

To form 8 apartments.



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Appendices

- Appendix A Information supplied by the Environment Agency
- Appendix B Flood Warning Notice

Introduction

- 1.1 This Flood Risk Assessment (“FRA”) is compliant with the requirements set out in the National Planning Policy Framework 2018, and the associated online National Planning Practice Guidance.
- 1.2 This FRA is produced on behalf of Allensway Housing, in respect of their Full Planning application relating to the change of use of an existing dwelling into 3 No. apartments, erection of a two storey extension to provide **a place of refuge** and the retention of the existing building for use as 5 no. apartments.

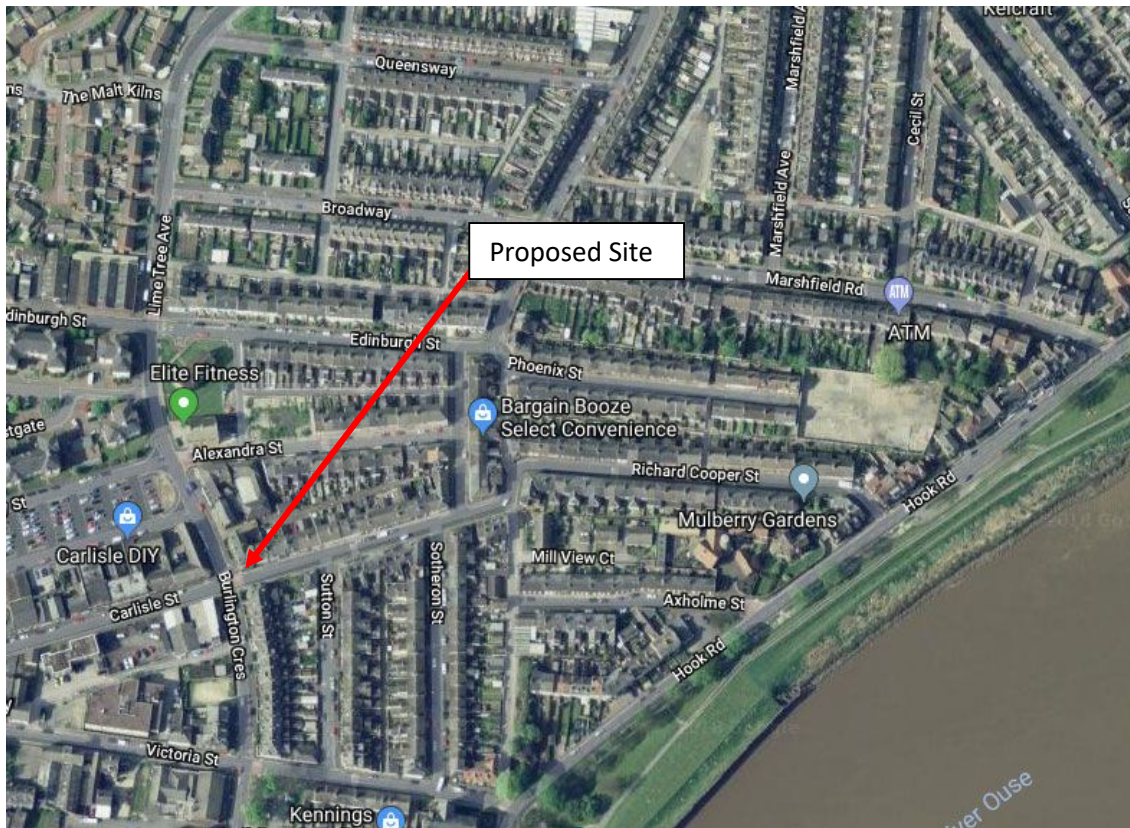
Data Used

- 1.3 This FRA is based on the following information:
 - Topographical Survey information
 - Proposed Site Layout Plan
 - Environment Agency Data
 - East Riding of Yorkshire Council Strategic Flood Risk Assessment

Existing Site

- 1.4 The Site is located within the Principal Town of Goole, where new development is expected to be delivered. The Site fronts on to the western side of Burlington Crescent, just to the north of the junction with Carlisle Street. The Site lies in a predominantly residential area and is occupied by two existing buildings; one is a dwelling with accommodation spread over 3 floors and one has two retail units at ground floor level with three apartments located on the upper floors. Drawing Number S101 B provides existing details of the buildings and their uses. The Site measures 0.04 ha and the two buildings are separated by a narrow driveway, which provides access to the rear yard. The Site is flat and is located some 200 m to the west of the banks of the River Ouse.

- 1.5 The position of the Site is identified on the Google extract below and it can be seen that the surrounding area is built up predominantly of dwellings. The distance to the River Ouse is also apparent.



- 1.6 Topographic Survey information confirms that the adjacent road level is set at between 3.07 to 3.14 m AOD. The finished floor levels of the two existing buildings (No.s 54 and 56 Burlington Crescent) are set at 3.55 m AOD; a minimum of 0.41m above adjacent road level.

Proposed Development

- 1.7 The proposed development consists of changing the use of an existing dwelling into 3 No. apartments, erection of a two-storey extension and the retention of the existing building for use as 5 no. apartments. The scheme incorporates 3 ground floor apartments, which have ground floor sleeping accommodation. The proposed two-storey link would however contain a first-floor place of refuge only accessible by the ground floor apartment residents.

This place of refuge would contain bathroom and kitchen facilities as well sitting/sleeping facilities. Drawing number: 22040/F102 B provides details of the proposed internal layout of the apartments.

2.0 Flood Risk Planning Policy

National Planning Policy Framework (“NPPF”)

- 2.1 The NPPF delivers the Government’s aims of promoting a pro-growth planning system, which has at its core a presumption in favour of sustainable development. Paragraph 163 of the NPPF sets out the approach LPAs should take to the determination of planning applications. It places the emphasis on LPAs to ensure that flood risk is not increased elsewhere and only to consider development appropriate in areas at risk of flooding where, informed by a site-specific FRA, the relevant Sequential and Exception Tests are passed, if required.
- 2.2 Further advice is found in the National Planning Practice Guidance (“NPPG”) tool. This provides a ‘Site Specific Flood Risk Assessment: Checklist’. This checklist has been used to inform the production of this FRA.
- 2.3 The guidance uses four *Flood Zones* to characterise flood risk which refer to the probability of river and sea flooding, ignoring the presence of defences.
- 2.4 The Flood Zones do not consider the projected effects of climate change and may not represent potential flooding from smaller watercourses.
- 2.5 The aim is to steer new development to Flood Zone 1 and, where there are no reasonably available sites in Flood Zone 1, local planning authorities in their decision making should consider the flood risk vulnerability of land uses and consider reasonably available sites in Flood Zone 2, applying the Exception Test if required.
- 2.6 Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 be considered, considering the flood risk vulnerability of land uses and applying the Exception test if required.

Flood Zone Definition

Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

2.7 The guidance also sets out the vulnerability to flooding of different land uses and these are detailed below.

Flood Risk Vulnerability Classification

Essential infrastructure	Transport infrastructure; Utility infrastructure.
Water Compatible	Flood control infrastructure; water and sewage infrastructure; navigation facilities.
Highly Vulnerable	Emergency services which are required in times of flood; Basement dwellings; mobile home parks; installations requiring hazardous substances consent.
More Vulnerable	Hospitals and other health services; residential establishments; educational establishments; caravan and camping sites.
Less Vulnerable	Commercial establishments; emergency services not required in times of flood; agriculture and forestry land.

Appropriate Development

2.8 Based on the vulnerability of a development, the guidance states what Flood Zone(s) the development is appropriate within. The flood risk compatibility is set out over the page.

	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	x	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	x	x	x	✓*

2.9 The NPPG also states that all sources of flooding should be considered when preparing an FRA.

Local Planning Policy

2.10 The adoption of the East Riding Local Plan Strategy Document (“the SD”) in April 2016 means that its policies can now be afforded full weight. Likewise, the policies within the Allocations Document (“the AD”) can be afforded full weight. The SD sets out the settlement hierarchy within the District and identifies Goole as a Principle Town (Policy S3A). Policy S3, criterion (D) states:

Principal Towns

D. Principal Towns will be centres of economic development and housing growth and cater for the service needs of significant parts of the East Riding. They will be a key focus for services and facilities, including shopping, leisure, transport, education, health, entertainment, tourism, recreation and cultural activities.

2.11 The Proposals Map confirms that the Site is located within the Principle Town’s development limit and that it has no specific allocation. The proposal would therefore represent a windfall housing re-development.

2.12 Criterion (D1. V) of Policy ENV6 confirms that new development should have a safe access/egress route to/from Flood Zone 1 **or establish that it will be safe to seek refuge at a place of safety within the development.** Given the low-lying nature of the Principle Town and the flat topography of the wider area, there would be no quick means of escape to an area of Flood Zone 1. Each apartment would however either be located on an upper floor **or have safe access to the first-floor place of refuge.** This place of refuge contains

a full range of facilities for residents seeking refuge, where they may be trapped for extended periods.

Policy ENV6

- D. Flood risk will be proactively managed by:
- I. Ensuring that new developments:
 - i. limit surface water run-off to existing run-off rates on greenfield sites, and on previously developed land reduce existing run-off rates by a minimum of 30%, or to greenfield run-off rate;
 - ii. do not increase flood risk within or beyond the site;
 - iii. incorporate Sustainable Drainage Systems (SuDS) into major development proposals and proposals at risk of flooding, unless demonstrated to be inappropriate;
 - iv. do not culvert or otherwise build over watercourses, unless supported by the Risk Management Authority;
 - v. have a safe access/egress route from/to Flood Zone 1 or establish that it will be safe to seek refuge at a place of safety within a development;
 - vi. incorporate high levels of flood resistant and resilient design if located in a flood risk area;
 - vii. are adequately set-back from all watercourses including culverted stretches; and
 - viii. adhere to other relevant SFRA recommendations.

2.13 The LPA has produced a Strategic Flood Risk Assessment and for Goole this includes a Level 1 and Level 2 assessment. These were produced in 2011 and have been adopted as supplementary planning guidance. Given the age of these documents and the more recent adoption of the Strategy Document, along with the most recent EA Humber modelling, the SFRA is out of date and has been superseded by Policy ENV6.

Development proposal therefore need to meet the requirements of formally adopted Policy ENV6 and not out of date guidance.

Sequential Test

2.14 Paragraph 164 of the NPPF confirms that the Sequential Test need not be applied to some minor developments and changes of use. Footnote 51 confirms that, in relation to changes of use, the only exception to this would be where the development relates to the siting of a caravan(s) or park home site. Householder development and small non-residential extensions (with a footprint of less than 250sq.m) are also exempt. As this proposal relates to the change of use of an existing building into apartments and as the first-floor extension is modest and seeks only to provide a place of refuge from flood risk, the Sequential Test does not need to be carried out.

Exception Test

- 2.15 The Exception test is a method to demonstrate and help ensure that flood risk to people and property will be managed satisfactorily, whilst allowing necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available.
- 2.16 The first part of the Exception Test is to show that the proposed development will provide wider sustainability benefits to the community that outweigh flood risk. The second part is the requirement for an FRA to demonstrate that it will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall. This FRA is considered to fulfil this second part.
- 2.17 As the proposal is exempt from having the Sequential Test applied there is no requirement for the Exception Test to be applied. The proposed development would however provide wider sustainability benefits to the community that outweigh flood risk by providing much needed smaller housing in an area that benefits from a multitude of local services and facilities, without having to be reliant on the use of motor vehicles.

Development Proposal

- 2.18 The proposed development consists of linking and changing the use of existing buildings to create 8 apartments with a separate place of refuge from flooding. The Flood Zone map extract is shown over the page, which confirms the site is in Flood Zone 3 and protected by defences, which cannot be taken into account. The proposed apartments will not have basements and are therefore identified as being more vulnerable. An FRA is required to show that the development can be made safe for its lifetime.

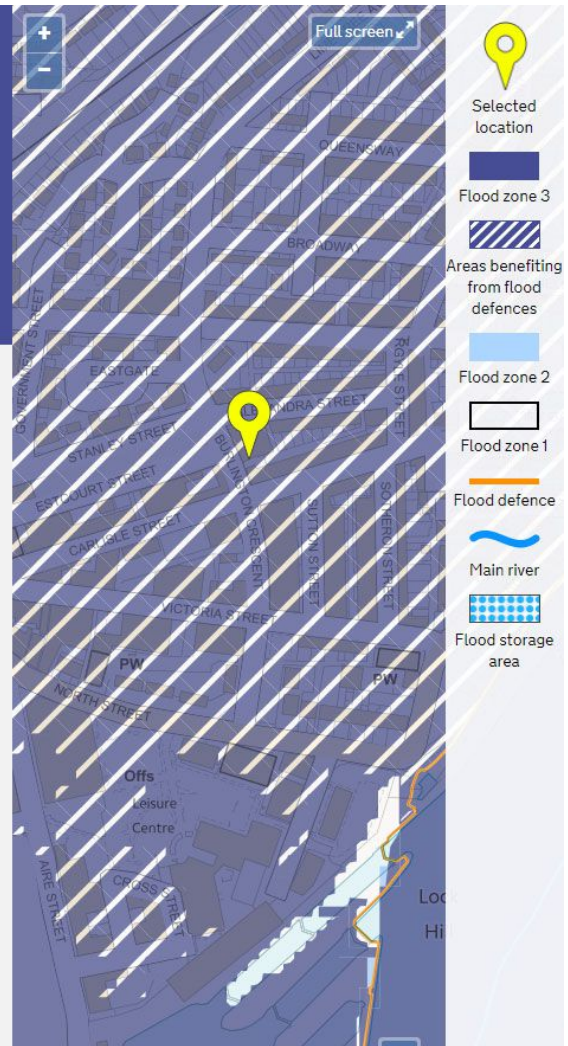
FLOOD ZONE 3 area that benefits from flood defences

Land and property in this flood zone would have a high probability of flooding without the local flood defences. These protect the area against a river flood with a 1% chance of happening each year, or a flood from the sea with a 0.5% chance of happening each year.

[More information about flood zones](#)

- 1** You may need to complete a [flood risk assessment](#) for development in an area benefiting from flood defences
- 2** Find out about the level of flood protection offered at your development's location. You can do this by [contacting the Environment Agency](#). You'll also need to obtain a Flood Defence Breach Hazard Map (also known as a 'Product 8' by planning authorities).
- 3** For some types of development in flood zone 3 you must follow the [Environment Agency's standing advice for carrying out a flood risk assessment](#)
- 4** You can also [read more about flood risk assessments for planning applications](#)

[Learn more about the potential sources of flood risk in](#)



3.0 Climate Change

3.1 The NPPF sets out how the planning system should help minimise vulnerability and provide resilience to the impacts of climate change.

revised climate change allowances to support the NPPF on 19 February 2016.

3.2 As the Government's expert on flood risk, the Environment Agency ("EA"), published

3.3 The climate change allowances are based on projections and different scenarios of carbon dioxide (CO₂) emissions to the atmosphere and provide predictions of anticipated change for:

- Peak river flow by river basin district;
- Peak rainfall intensity;
- Sea level rise;
- Offshore wind speed and extreme wave height.

Peak River Flow Allowances

3.4 The peak river flow allowances show the anticipated changes to peak flow by River Basin District ("RBD"), with three allowances; central, higher central and upper end.

3.5 This proposed development is in the Humber RBD.

3.6 The appropriate allowance depends on the Flood Zone and vulnerability classification of the development and for this proposal it is appropriate to use the higher central and upper end allowances.

3.7 The allowances change over three periods of time over the next century. The appropriate period should be chosen based on the expected lifetime of the development and for residential is 100 years.

3.8 The climate change allowances in peak river flows to be applied are therefore; 50% for the Upper End category and 30% for the Higher End category.

Peak Rainfall Intensity Allowance

- 3.9 Increased rainfall affects river levels and land and urban drainage and should be applied to surface water drainage systems.
- 3.10 These allowances are uniform across England and change over three periods of time over the next century. The appropriate period should be chosen based on the expected lifetime of the development and for residential is 100 years.
- 3.11 The detailed design of the surface water system will need to assess both the central and upper end allowances to understand the range of impact. The climate change allowances in peak rainfall intensity will be applied as 40% increase for the Upper End category and 20% increase for the Higher Central.

Sea Level Allowances

- 3.12 There is a single regional allowance in mm per year for four time periods for sea level rise. The site falls within the “East, East Midlands, London, South East” area of England and the increases are:
- 1990 – 2025 4mm/year
 - 2026 – 2055 8.5 mm/year
 - 2055 – 2085 12 mm/year
 - 2086 – 2115 15 mm/year

4.0 Flood Risk Sources

- 4.1 The following flood risk sources have been identified and where mitigation is required to reduce the flood risk, this is discussed in Section 5.

Fluvial

- 4.2 The nearest EA Main River to the Site is the River Ouse approximately 0.5 km to the east of the Site. The River Ouse feeds into the River Humber which is approximately 5.5 km to the east.
- 4.3 Flood risk from the Main River is reduced due to the presence of raised defences (at least 3.5 m high). Information available shows this provides a current standard of protection of 1% annual chance of flooding.

- 4.4 Environment Agency information based on the latest Humber modelling (provided by the EA Nov 2018) confirms that risks to this site are not Fluvial based. The risk of flooding from fluvial sources is therefore considered to be low.

Tidal

- 4.5 The Site is approximately 0.5 km from the River Ouse to the east. Flood risk from the River Ouse is reduced due to the presence of raised defences.

- 4.6 The risk of flooding from tidal sources is low.

Climate Change

- 4.7 The SFRA does not include modelling using the upper end allowance of 50% for the River Ouse “with defences” situation. As such the 50% allowance needs to be factored in to any proposed mitigation.

Residual Risk

- 4.8 Whilst the fluvial and tidal flood risk to the Site is reduced by the presence of defences there is a residual flood risk should those defences be breached.

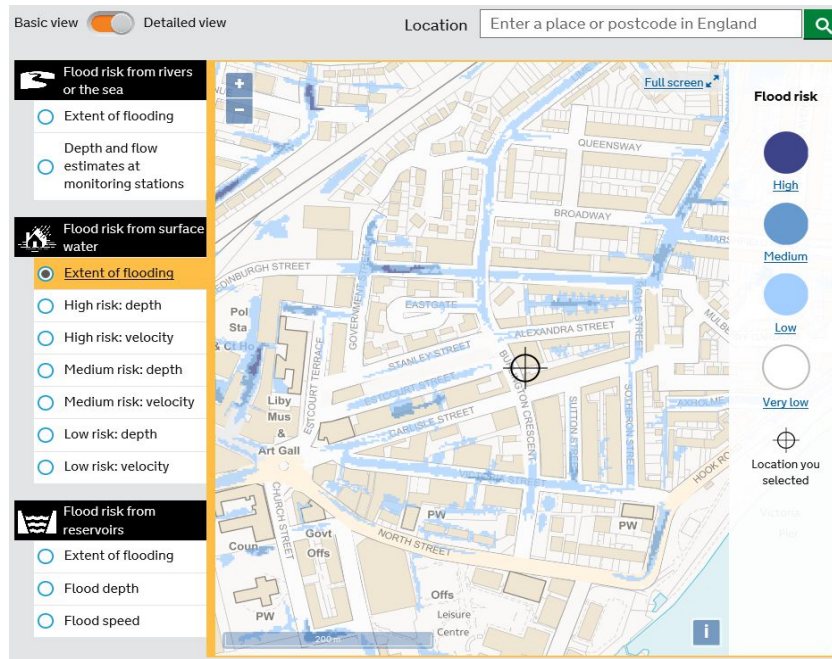
- 4.9 Recent information supplied by the EA can be found in Appendix A, this includes the most up to date Upper Humber modelling. It includes various breach scenarios, which confirm that likely breach depths at the site would be between 1 and 2 m deep, have flow velocities of between 0.0 and 1.0 m/s, and this equates to a ‘Danger for all’. The existing buildings have a finished floor level of 3.55 m AOD, which is at least 0.4 m above adjacent road level. Existing first floor levels are set at 2.6 m (No. 54) and 2.8 m (No.56) above existing FFL. This confirms that accommodation at first floor level or above will be above the worst-case scenario for residual flood risk. The proposed extension would have a finished floor level 3.7 m above the ground floor FFL. Residents of ground floor apartments would therefore have a place of refuge set well above the worst-case scenario of residual risk. The provision of this place of refuge is also planning policy compliant.

- 4.10 In terms of over topping, information available from the 2013 tidal surge, confirms that the Site did not flood, although over topping did occur further north, towards Hook.

- 4.11 The residual risk from flooding is therefore considered to be low.

Surface Water

- 4.12 The EA has produced maps showing flooding when rainwater lies or flows over the ground. The surface water flooding extents are shown below. The development is not at risk from surface water flooding.



Sewers

- 4.13 Public foul and surface water sewers run adjacent to the Site but are unlikely to pose a significant flood risk as they are well maintained. The risk to life from flooding from existing sewers is low.

Reservoirs

- 4.13 The Site is not at risk of flooding from reservoir failure.

Canals and Artificial Water Bodies

- 4.14 The Aire and Calder Canal and docks are located to the south of the Site, beyond other existing built development. Information provided by EA confirms that a failure of the lock gates within the docks could result in flooding to the Site. The identified risks are similar to those already identified as resulting from the River Ouse.

4.15 The risk to life from flooding is therefore considered to be low.

5.0 Mitigation

5.1 Section 4 has identified the potential sources of flooding which could potentially pose a risk to the Site and proposed development. This Section of the FRA sets out the mitigation measures which are to be incorporated within the proposed development to address and reduce the risk of flooding within acceptable levels.

Site Layout

5.2 The residual flood risk to the Site is low with potential flood depths of between 1.5 m and 3 m based on the 50% increase for climate change. The Site has existing FFLs of 3.55 m AOD, which 0.4 m above adjacent road level. Flood depths within the building could therefore range between 1.1 m and 2.6 m. The first floor level is set at 2.8 m above existing ground floor level, which puts the first floor above potential flood depths factoring in climate change. The proposed place of refuge is set at 3.7m above FFL so well above any potential flood waters and with a freeboard of 1.1 m.

5.3 The EA has issued local Flood Risk Standing Advice which, for operational developments of More Vulnerable uses, finished floor levels should be raised a minimum of 0.60 m above average site level or adjacent road frontage level, whichever is the higher. An additional 0.30 m of flood resilience measures above finished floor levels shall be included to speed the rate of recovery and minimise the impacts should flood waters enter the property.

5.4 This proposal relates to the change of use of an existing building (material change of use) rather than the erection of new buildings (operational development). It is not therefore possible to raise the existing FFL.

5.5 The development has been designed to accord with relevant planning policy in respect of mitigating for flood risk. It is accepted that there would be a residual risk for residents throughout the lifetime of the development, accounting for climate change, and the following mitigation measures are proposed:

- Provision of boundary wall to the site frontage to provide deflection to flood waters, directing them away and around the buildings.
- **Provision of a dedicated first-floor place of refuge for ground floor residents**

- Watertight external door construction
- No external letterboxes
- Ground floor lighting, sockets and switches to be served by wiring from first floor loops and will be situated 0.8 metres above finished floor level
- Foul water disposal systems to be fitted with non-return valves
- Non-permeable areas outside the building will not be increased
- Future residents would be provided with the Environment Agency's standing advice for residents living in flood zones
- Future residents will be made aware of the advance warning services available from the Environment Agency
- Each dwelling would be provided with a Flood Warning Notice (example set out in Appendix B)

6.0 EA Objection

6.1 The EA objected to the development on 1 October 2018. Advising that the FRA that was submitted with the Application failed to:

- have regard to the LPA's Level 2 SFRA which sort to prevent ground floor sleeping accommodation;
- reference the EA's latest modelling for the Upper Humber;
- reference climate change allowances clearly;
- consider how people would be kept safe from flood hazards identified.

6.2 Taking these matters in turn, Paragraphs 2.10 to 2.13 of this Report address the matter of adopted planning policy versus out of date supplementary planning guidance. Greater weight must be applied to adopted planning policy, particularly where that policy has been adopted after the publication of the supplementary planning guidance. In this instance, policy allows the provision of ground floor sleeping accommodation, providing there is a safe place of refuge on an upper floor. The proposed development complies in its entirety with Policy ENV6. The proposal is therefore acceptable in this location.

6.3 The latest Upper Humber modelling has been provided by the EA. This is contained at Appendix A. This information has been used to inform the content of this revised FRA. This element of the EA's objection has therefore been addressed.

6.4 Climate changed is clearly referenced in Section 3, Paragraphs 4.7 and 5.2 of this Report.

6.5 Paragraph 5.5 confirms how people will be kept safe from flood hazards identified. The residents of the upper floor apartments would be above any flood waters. The ground floor residents would be susceptible to flood water ingress. They would however have access to advance warning services, advice contained within Warning Notices to be provided would advise that they leave the premises if advance warning is received. In the event that advance warning is not received then the ground floor residents have a shared place of safety in the form of the purpose-built refuge located at first floor level. All ground floor residents would have access to this facility without having to leave their building. The residual risk to residents would therefore be low and they would have sufficient facilities to see them through a prolonged event, just the same as the upper floor residents.

7.0 Conclusion

- 7.1 This FRA is complainant with the requirements set out in the NPPF and the associated NPPG. This report demonstrates that the proposed development is not at significant flood risk, and will not increase flood risk to others, subject to the recommended flood mitigation strategies being implemented.