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# **FLOOD RISK ASSESSMENT**

## **Project:**

**PROPOSED DEMOLITION OF EXISTING DWELLING  
AND CONSTRUCTION OF 2NO. NEW DWELLINGS**

## **Proposed Site:**

15 Watery Lane,  
Butterwick,  
Boston  
Lincolnshire  
PE22 0HS

**Applicant:** Mr. P. Fisher

**Date:** February 2015

Prepared by:

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## 1.0 INTRODUCTION –

This Flood Risk Assessment has been written to support a formal planning application to Boston Borough Council for the proposed demolition of an existing dwelling and the construction of 2no. new dwellings at 15 Watery Lane, Butterwick, Boston, Lincolnshire PE22 0HS.

The following sections describe the site and its surroundings.

## 2.0 SITE APPRAISAL –

### 2.1 SITE LOCATION –

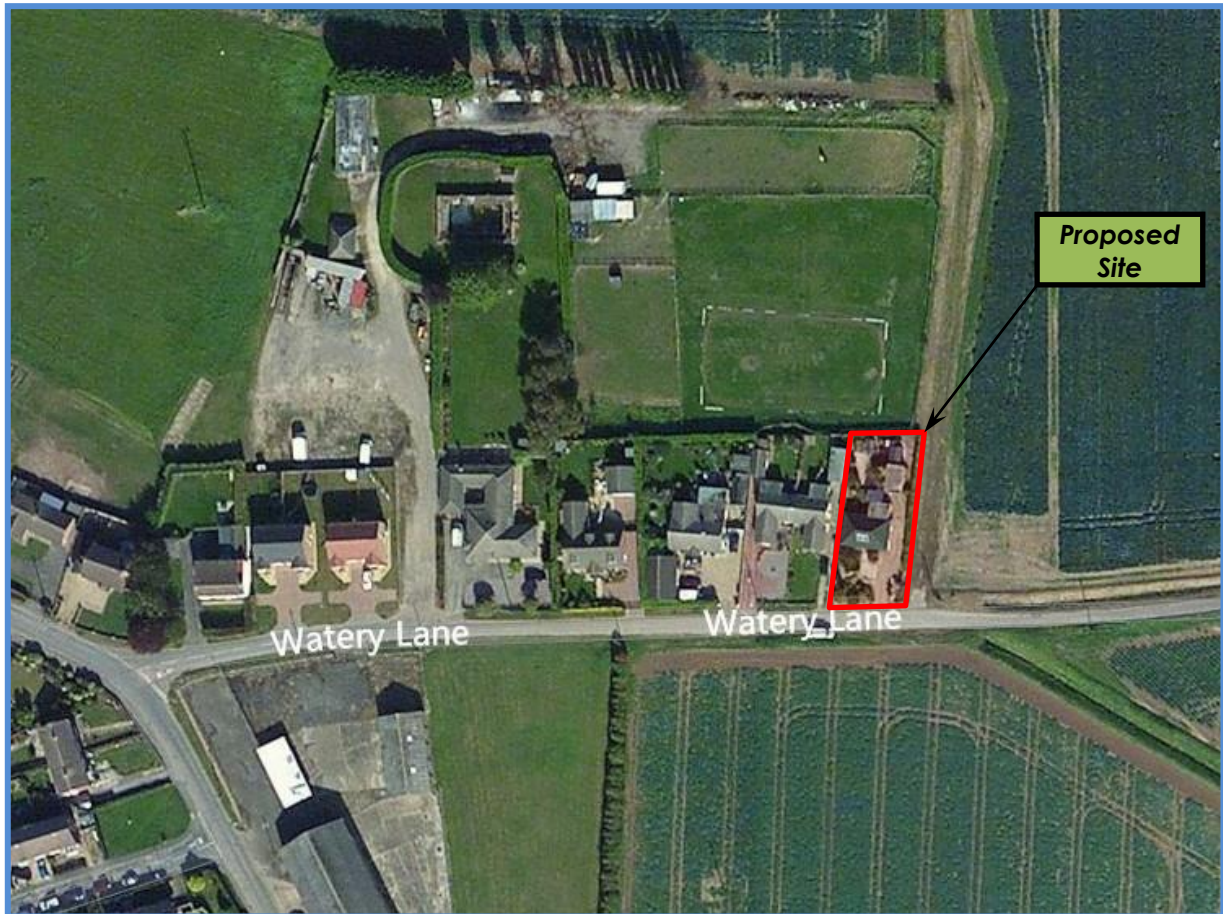
2.1.1 The site is located to the eastern edge of Butterwick off Watery Lane. The east boundary of the site forms the edge of the settlement boundary as indicated in the council's Local Plan maps.

2.1.2 The national grid reference for the site is 539233E 3443860N.



2.1.3 Watery Lane is a rural lane heading east out of the village towards the sea bank. The north side of the lane is lined by a mix of bungalows and two storey dwellings set back from the roadside with vehicular parking to the front.





- 2.1.4 To the west close to the junction of Watery Lane and Sea Lane, there is a traditional detached dwelling followed by two pairs of semi-detached properties (approved in 2007, Application Ref: B/07/0052)







- 2.1.5 Further east along Watery Lane, there is a series of dormer and single storey bungalows running up to the proposed site.



- 2.1.6 All of the properties are set back from the roadside to provide off road parking and an element of front garden.



- 2.1.7 There are no properties on the south side of Watery Lane, providing views across open countryside to all those on the north side.
- 2.1.8 Similarly the east and north site boundaries abut agricultural fields and paddocks giving potential for open views in these directions.



- 2.1.9 The nearest property to the east is approximately 240m away, sited on the north side of the road. The group of dwellings consists of a pair of semi-detached two storey houses followed by two detached bungalows.



## 2.2 SITE DESCRIPTION

2.2.1 The application site is on the east end of the bungalows in a large plot with mature planting to the front boundary.



2.2.2 The existing dwelling has buff facing brickwork, UPVC windows and a green interlocking concrete tile roof. The building has no real architectural merit nor does it add any particular character or interest to the street scene.

2.2.3 There are a series of further outbuildings and

timber sheds in the sizeable rear garden.

2.2.4 The plot itself measures approximately 17m in width to the front reducing to 16.5m at the rear and approximately 35m long.

2.2.5 The site area is approximately 593m<sup>2</sup>/0.59Ha. The ground across the site is predominantly level.



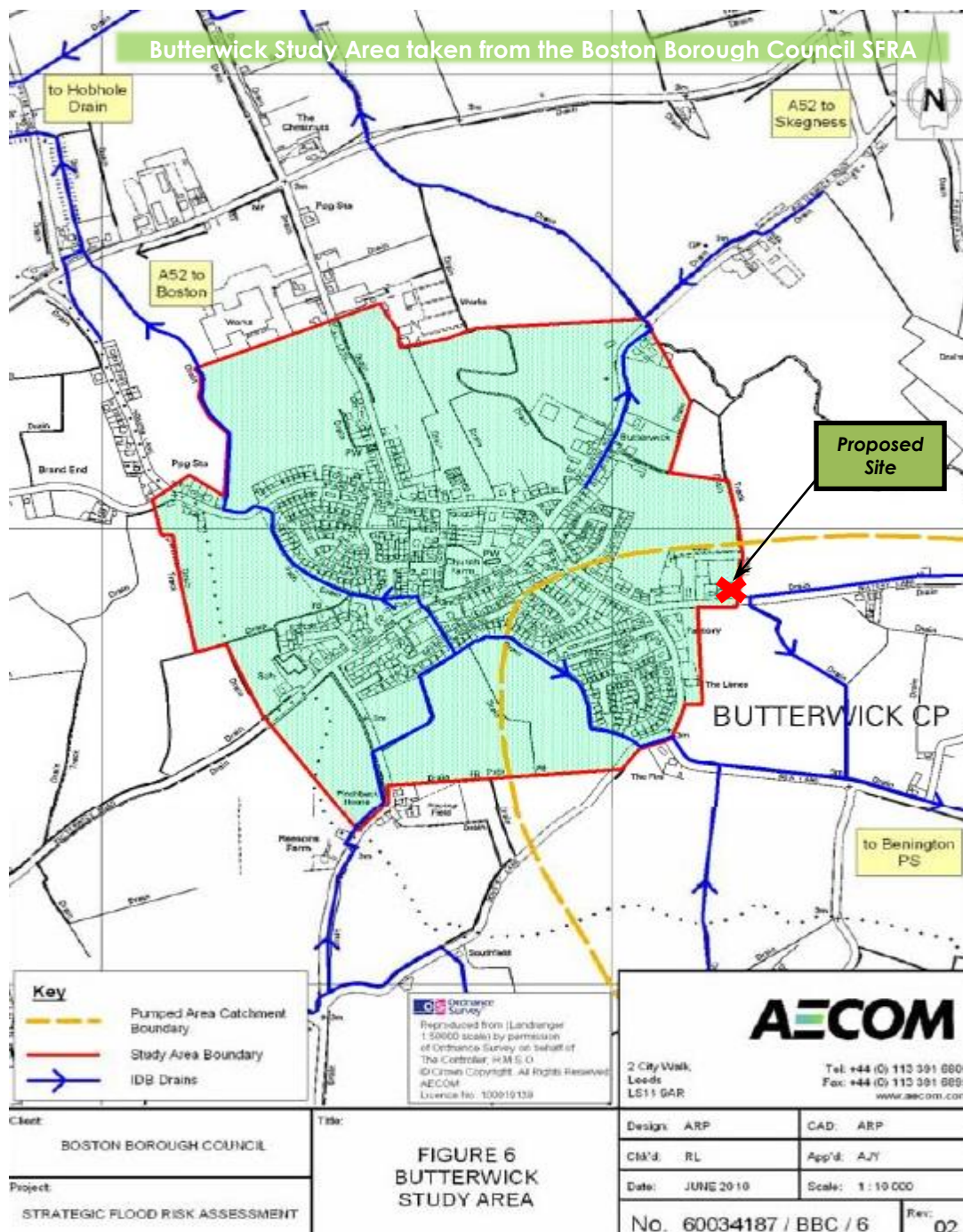


### 3.0 THE PROPOSAL –

3.0.1 This application seeks approval for the construction of 2no. new detached dwellings on the site of an existing bungalow and outbuildings which are to be demolished.

### 4.0 FLOOD SOURCES & EXISTING DEFENCES

4.0.1 Boston Borough Council commissioned a Strategic Flood Risk Assessment in 2010 to analyse the potential threats from flooding sources throughout the district. Butterwick was segregated as an individual study area and references to the findings of the SFRA will be made in this document. A plan of the study area is given below.



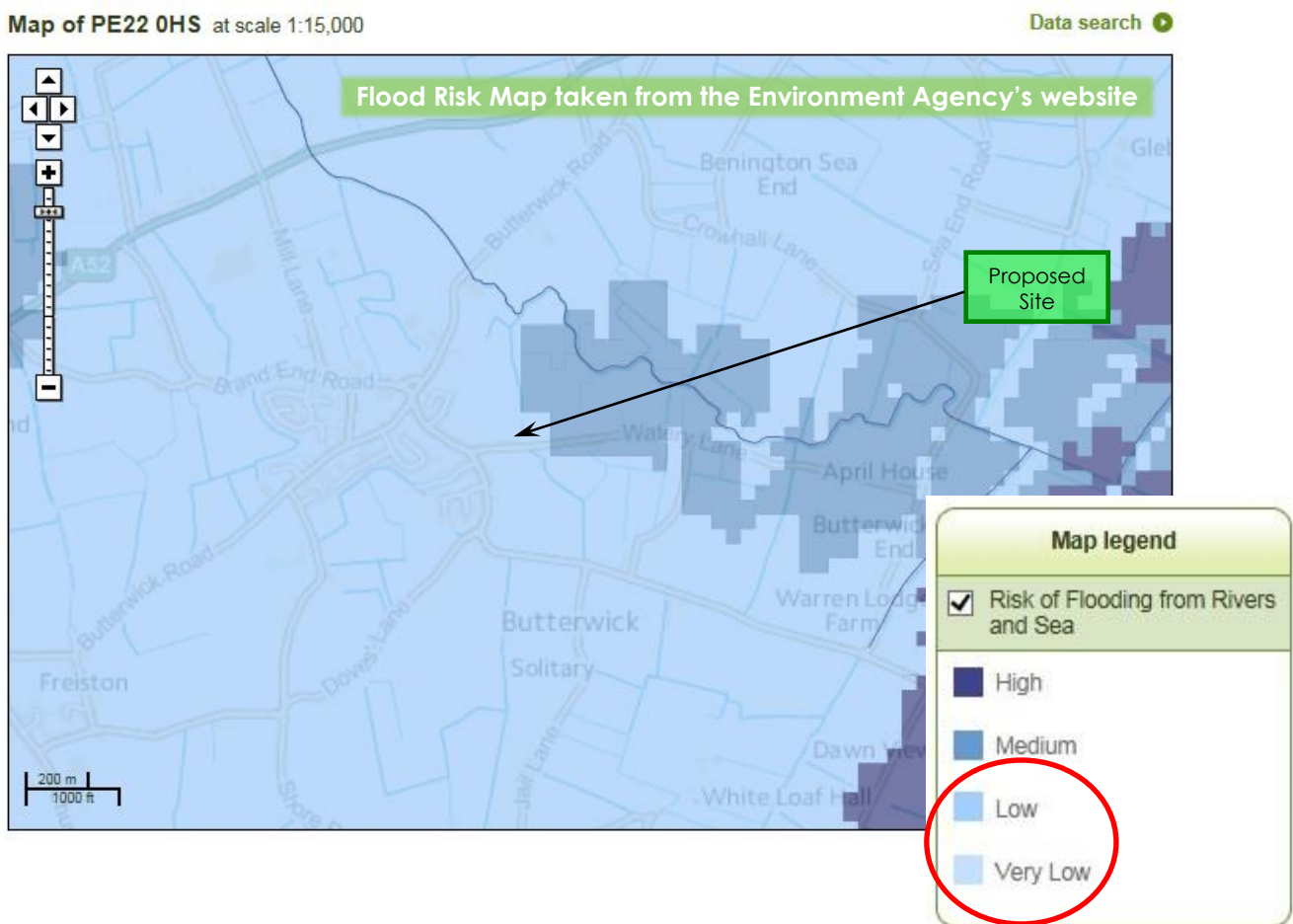
- 4.0.2 There is very little overall variation in elevation within Butterwick with all spot heights on the OS 1/10,000 map shown as 3m AOD. The highest point in the study area is 3.4m AOD in the centre of the village.
- 4.0.3 Butterwick village is served by a modern sewerage system, but this conveys only foul sewage. Surface water runoff from roofs and paved areas in the study area is piped to the nearest open watercourse or riparian ditch or disposed of by soakaways. Surface Water for the proposed properties will also be discharged into soakaways designed following percolation test to BRE Digest 365.
- 4.0.4 The Environment Agency's Flood Zone Map shows the whole of the study area to be in Flood Zone 3. However the Relative Probability of Flooding Figure 2, Sheet 2 shows the whole of the study area to be at a **low probability of flooding**.
- 4.0.5 The location of the village and study area on the silt ridge watershed and the absence of any substantial drains or watercourses in the study area mean that flood risk from local sources will be minimal. Any flooding that did occur would be shallow, localised and largely confined to waterlogging.
- 4.0.6 If an extreme flood event during which the discharge capacity of Benington PS was exceeded or if a residual risk equipment failure occurred it should not have any impact on the study area which is situated remote from the pumping station at the head of the catchment.
- 4.0.7 The NPPF aims to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas of highest risk. This is addressed in latter sections of this document.
- 4.0.8 The proposed site is potentially at risk, to a greater or lesser degree, from failure of any of the existing flood alleviation measures in the area.
- 4.0.9 Like most of the villages along the crest of the silt ridge north of Boston, there are relatively few arterial drains of any size within the Butterwick study area which appears to straddle the watershed between the Wash and the East Fen.
- 4.0.10 The two principal arterial drains on the northern side of the study area, the Benington Road and the Brand End Drains, both flow north to cross the A52 on either side of the A52 / Mill Lane junction. Both drains merge north of the A52 and the combined drain discharges to the Hobhole Drain just upstream (NW) of Haltoft End. Flood flows in the Hobhole Drain are discharged to the mouth of Boston Haven at the Witham Fourth District IDB's Hobhole PS.
- 4.0.11 The southern side of the study area drains via a network of minor IDB drains to the Witham Fourth District IDB's land drainage pumping station (Benington PS) which is



situated on the shores of the Wash near Butterwick Sea End, 3km east of the study area. However, the IDB drains in the Butterwick area are continuous across the watershed and within the study area the areas of land draining in each direction can vary depending on prevailing conditions.

#### 4.1 Tidal Sources:

- 4.1.1 The seas high water mark is approximately 2.7km to the East of the site.
- 4.1.2 The primary tidal flooding source is The Wash to the East. The coastal defences provide protection to 24km of the Lincolnshire Coastline between Mablethorpe and Skegness. The defences along the Lincshore coastline include beaches, groynes, dune systems, seawalls and promontories.



- 4.1.3 The tidal defences protecting the proposed site consist of earth embankments (Wash Tidal Defences) & concrete floodwalls supplemented by a programme of beach nourishment to maintain healthy beach levels. They are in good/fair condition and provide protection against a flood event with a 0.66% chance of occurring in any year. The Environment Agency inspects these defences regularly to ensure that any potential defects are identified early.

- 4.1.4 The Environment Agency's Coastal Hazard Mapping affects the proposed site. The Hazard Mapping shows the consequences should a breach or overtopping of existing sea defences occur. The results show the likely flood depths, velocities and overall hazard to the proposed site. The minimum mitigation measures required for proposals that do not include ground floor sleeping can be informed by the flood depths arising from the 2115 0.5% breach scenario.
- 4.1.5 The finished floor levels (FFL) of any new two storey dwellings should be informed by the predicted flood depths. The hazard maps show flood depths at 1.0m - 1.6m for the 2115 0.5% breach scenario as confirmed by the Environment Agency (see attachment).
- 4.1.6 The EA also recommend that all proposals must be a minimum of 2 storeys. FFL should be set a minimum of 1.0m above ground level with flood resilient construction incorporated to a minimum height of 300mm above the predicted flood level. In addition, demountable defences to a height of 600mm should be installed on ground floor doorways.
- 4.1.7 Tidal flooding occurs when an exceptionally high tide, almost always accompanied by a storm tide surge, overtops and/or breaches the tidal defences along a coastline or tidal estuary.
- 4.1.8 Clearly if weather conditions (such as Spring neap tide cycle, storm surges, strong on shore winds etc.) were such that they caused there to be a significant rise in high tide level above the maintained standard, there would be some overtopping for a period of time until the tide levels dropped.

## 4.2 **Fluvial Sources:**

- 4.2.1 The nearest main river is the Hobhole Drain.
- 4.2.2 Secondary flooding sources are the Benington Road and the Brand End Drains, both flow north across the A52 and merge with the Hobhole Drain. The drain is maintained by the Witham Fourth District IDB and is located approximately 460m to the West and 250m to the North of the site.
- 4.2.3 Water levels in the Hobhole Drain are controlled within the area by hard and soft banks constructed at such levels deemed necessary to hold back the highest tides at the current risk levels (i.e. high still water tides). Witham Fourth District IDB's land drainage pumping station (Benington PS) is situated on the shores of the Wash near Butterwick Sea End, 3km East of the site.
- 4.2.4 The minimum standard of defence offered by the IDB is 10% (1 in 10 years) which is the level generally maintained throughout the more rural areas by the Board. The Board has confirmed that where catchments serve urban areas or mixed rural and



urban areas, then the indicative standard is usually in excess of this standard and increases to the 2% (1 in 50 years) level.

- 4.2.5 There is also a network of several private land drains to the boundaries of surrounding land. Ultimately the surface water within them would find its way to the Hobhole Drain.

#### **4.3 Flooding from Groundwater:**

- 4.3.1 Whilst the proposal does increase the area of impermeable surfaces on the site, we see no reason why the ground would be unsuitable to install new soakaways (traditional or crate system) to accommodate the additional water.
- 4.3.2 If deemed necessary a perforated capture drain should be installed along the West boundary to avoid any adverse consequences of raising ground levels.

#### **4.4 Flooding from Sewers:**

- 4.4.1 Although localised flooding from sewers could occur there is therefore nothing to indicate that flooding from sewers is a particular problem in the area concerned nor that the proposal, would create potential for flooding from sewers in the locality.

#### **4.5 Climate Change**

- 4.5.1 The NPPF requires consideration of the effects of climate change on the flood risk at the proposed site. The predicted increase of rainfall intensities from 5% by 2025 to 30% by 2115 means that surface run-off may increase. However given the level and potential improvement of existing defences, this predicted increase should not significantly increase the flood risk at the site.
- 4.5.2 It is likely that the Environment Agency and Internal Drainage Board would continue to monitor and make improvements to prevent an increase in the occurrence of flooding in response to these predicted effects of climate change.

### **5.0 THE RISKS**

- 5.1 The EA'S flood map data (page 8) indicates that the site is in an area with low chances of flooding. The maps suggests that the chance of flooding each year is between 0.1% (1 in 1000) and 1in100 (1%). This takes into account the effect of any flood defences that may be in this area. Completion of the Haven tidal barrier (predicted for 2019) will improve this to 1in200 (0.5%) or better throughout the town.
- 5.2 If tidal surges were extreme enough to cause there to be a significant rise in high tide level above the existing flood defence levels, there would be some overtopping or potentially a breach.

- 5.3 Given the generally level nature of the site and the distance and obstacles between the proposed site and The Wash, we would suggest that the risk and inherent damage caused at the site would be minimal if breached water or water from overtopping ever did become a major threat.
- 5.4 Likewise overtopping of the fluvial drains identified above would only result in localised flooding to a relatively shallow depth due to the mixture of permeable catchment areas together with obstacles in between.
- 5.5 Floodwater from overtopping or breaching would take a significant period to even reach the site due to the many obstacles and varying surfaces between the site and the sources of floodwater. Nevertheless by the time water levels had risen sufficiently to cause a breach or overtopping, the evacuation plan (Appendix A) would have been employed and if necessary the site evacuated. The plan should be held within the dwellings so that all occupants are aware of the correct procedures to follow.
- 5.6 In the event of floodwater encroaching on the proposed site and occupants still inhabiting them, refuge would be available at first floor which would be at least 3.6m above current ground levels. The ground floor of the proposal would be a minimum of 1m above ground level. The EA recommend the installation of demountable door barriers also to prevent the entry of water if floodwater ever reached a depth of 1m.
- 5.7 Service entry and mounting points for service meters should be installed as high as practicably possible as a precautionary measure.
- 5.8 With the above in mind we can see no reason why there should be any flood risk related objections to the proposed dwellings.

## **6.0 SEQUENTIAL & EXCEPTIONS TEST**

### ***Application of the Sequential Test***

- 6.1 Section 10 of the National Planning Policy Framework (NPPF) sets out that development in Flood Zone 3 will need to pass the Sequential and Exceptions tests. The aim of these tests is to direct vulnerable development away from the areas at highest risk.
- 6.2 Given that all of Butterwick is within the same flood risk zone, it would be very difficult to ascertain the location of any other reasonably available and less vulnerable sites within Butterwick or surrounding villages.
- 6.3 Given the current shortfall of housing supply it should be more pertinent to consider that this windfall site is available now and has been demonstrated in the sections above as being at limited risk from flooding particularly given the proposed layout and floor levels.



### ***Application of the Exceptions Test***

- 6.4 The NPPF states that following passing the sequential test the exceptions test should be passed. For the test to be passed:
- a. It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a SFRA where one has been prepared.
  - b. The development should be on developable previously-developed land or, if it is not on previously developed land, that there are no reasonable alternative sites on developable previously-developed land; and
  - c. A FRA must demonstrate that the development will be safe, without increasing flood risk. This part of the test is covered in the main FRA document.
- 6.5 In relation to a), we believe this has been addressed above. The site can provide a small contribution to additional housing in a sustainable rural location within the confines of the development boundary. This has to provide a wider benefit to the community as a whole simply through its contribution to a current need.
- 6.6 Item b) is covered in the sequential test section.
- 6.7 Item c) has been covered in the sections above and illustrate that the floor levels of the proposed development would be sufficient to protect the building and occupants from the worst case scenario of predicted flood levels.

## **7.0 RECOMMENDATIONS**

Given the potential for flooding on the site and the classification of use it would be prudent to adopt a precautionary approach with regard to the proposed development to minimise structural damage and to safeguard human life. Such aspects can be addressed by implementing:

- flood proofing and flood resilience measures to at least 600mm above finished floor level such as:
- installation of electrical fittings (including consumer units and meters) at least 1.1m above the finished floor level
- constructing in masonry and consideration of moisture resistant coatings to lower level walls,
- fit non return valves to drains and water inlet pipes
- provision of a Flood Kit to include items such as important documents and contact numbers, torches and batteries, first aid kits, bottled water, blankets etc.

- an effective surface water drainage system including limiting impermeable surfaces and consideration of permeable paving, water retention systems etc.
- commitment to the production of an Emergency Plan at the detailed design stage outlining the procedures to be followed in the event of a flooding event.
- this will include instructions for the owner on how to register with the Environment Agency's Automated flood warning system (contact 01522 – 785877).




## **8.0 CONCLUSIONS**

- 8.1 According to information sought from the Boston Borough Council Strategic Flood Risk Assessment, the Environment Agency and Internal Drainage Board, the standard of tidal and fluvial defences appropriate to the proposed site will provide adequate protection against flooding to a 1in200 year standard of protection both now and for the lifetime of the development.
- 8.2 We are reassured by the fact that the appropriate organisations will continue to monitor, maintain and improve the existing drainage network in the prevention of flooding in response to the predicted effects of climate change. Such organisations have a responsibility to inform the public if these circumstances change.
- 8.3 Although the site has been classified as being a high flood risk area, it actually has a relatively low risk of flooding from tidal and fluvial sources due to the location, topography and standards of defence. The site is not within a functional flood plain of the coast or a main river.
- 8.4 However, the location is to be acknowledged and, although of very remote probability, it must never be ruled out that flooding, even of a scale greater than envisaged by this FRA, could occur.



### **Flood Warning & Evacuation Plan (FWEP)**

- The applicant will sign up to the Environment Agency's free Warnings Direct System (contact 01522 – 785877). Flooding from tidal events is predictable and if a flooding event is imminent the EA would advise the site owner accordingly.
- Upon the designated telephone number receiving the warning that the site is at risk of flooding, the assigned person will inform occupants of the situation within the shortest time possible.
- Visitors and occupants should familiarise themselves with the site and surroundings and take note of the proposed evacuation plan. Ensure that the owner has a contact mobile number for emergency contact.
- There are four stages of warning which will be issued by the Environment Agency:

	Status
	<b>Severe Flood Warning</b> Severe flooding. Danger to life.
	<b>Flood Warning</b> Flooding is expected. Immediate action required
	<b>Flood Alert</b> Flooding is possible. Be prepared.
	<b>Warning no longer in force</b> Flood warnings and flood alerts that have been removed in the last 24 hours

- **Flood Alert** – flooding is possible, be prepared. The owner should be prepared to act on their flood plan by preparing a flood kit of essential items.

- **Flood Warning** – Flooding is expected. Immediate action required. People, pets and valuables will be moved to a safe place of refuge at first floor level. Gas, electricity and water supplies will be turned off and flood protection equipment (demountable barriers, sandbags etc.) put in place as required.
- If the '**Severe Flood Warning**' is issued the site should not be occupied as there is likely to be threat to life. If for any reason, the site is occupied during a severe flood warning it will be evacuated to safe ground as recommended by the appropriate authority who will direct the evacuation towards Council operated centres outside the floodplain.

When evacuation has taken place regular contact will be made with the Environment Agency flood control centre to ensure that all current information is available to those affected. (EA Floodline – 0845 988 1188)

- **Warning No Longer In Force** – No further flooding is expected in the area. Upon receipt of the all clear message from the Environment Agency or the Police, the local area may re-open and a visual inspection of the site conditions carried out to determine whether it safe to return to the site.

General advice given by the EA is that property owners should still be careful as flood water may still be around for several days. If flooding has occurred on site the appropriate measures should be taken to make the site safe to return.