

# **FLOOD RISK ASSESSMENT**

**Version 1**

**June 2021**

**Land to the west of Grove Cottage, Fen Road,  
Stickford PE22 8HA**

## **Introduction**

This Flood Risk Assessment (FRA) has been prepared to support an outline planning application for the erection of 2 no. detached houses located on the front acre of a grass paddock adjacent to Grove Cottage, Fen Road, Stickford. The FRA follows the guidance set out within the Environment Agency's Flood Risk Standing Advice and the technical guidance to the National Planning Policy Framework. The Site Specific Flood Risk Assessment 'checklist' as contained within the NPPG has also been used in the preparation of this FRA.

The information provided within this flood risk assessment is considered to be fit for purpose and proportionate to the degree of flood risk. It makes optimum use of information already available in accordance with the NPPF

All conclusions and recommendations made in this report are based on extensive research of flooding within the area at the time of writing this report. However, additional information may exist or may become available after this report has been written which may have not been referred to and may have other flood risk implications.

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This document has been prepared solely in support of a planning application for land to the west of Grove Cottage, Fen Road, Stickford. It is to be used solely by the applicant and for no other purpose.

## **The site and proposal**

The application site is located on the southern side of Fen Road, Stickford within the built-up part of the settlement with residential properties to either side and opposite. The site consists of the front 0.4ha of an approximate 1.1ha grass paddock bounded by hedging and trees to the front and to the rear of the paddock. The paddock is served by internal drainage ditches to the front and western boundaries. Plans showing the indicative layout of the two proposed dwellings and the location of the application site in relation to the surrounding area is included with the planning application.

The site is located approximately 200m west of the East Fen Catchwater Drain, about 15km from the North Sea. The site is not within a functional flood plain. The surrounding area from the A16 road is drained to the East Fen Catchwater Drain by a network of minor drains and WFDIDB drains.

The proposed development is not classified as a 'major development' as defined within the Town and Country Planning (Development Management Procedure)(England) Order 2015.

## **The aims of the Flood Risk Assessment**

This site-specific flood risk assessment has been prepared in order to assess the risk of flooding from fluvial and tidal sources. The level of detail of this FRA is proportionate to the scale of the development. The assessment demonstrates how flood risk will be managed now and over the development's lifetime, taking climate change into account, with regard to the vulnerability of its users. It also includes the risks of localised flooding from various sources including surface water sewers, blocked drainage systems etc. This assessment also establishes whether the development will increase flood risk elsewhere and whether the development passes the Sequential and the Exception Tests.

## **Site topography**

The site includes the approximate 1.1ha grass paddock and access track. The OS plan shows the road level to be 3.0m ODN at the north eastern corner of the site and 2.9m ODN at the bridge traversing the East Fen Catchwater Drain. The site lies in between these two levels. This would suggest the road level fronting the site to be the same level ie at 3.0m ODN or thereabouts.

Although no comprehensive topographical survey of the site has been undertaken given the small scale of this development, a provisional site level assessment has been carried out which would suggest that the site levels are significantly lower at the proposed location of the two houses than the road level fronting the site ( ie in the region of around 0.5m ie 2.4-2.5m ODN). This would appear to be the lowest site level on site.

There is sufficient opportunity therefore for the finished floor level of the proposed houses to be an appropriate height above the lowest level of the site if required to accord with the Environment Agency's standing advice.

## **National Planning Policy Framework (2018)**

Para 155 of the revised version of the NPPF states that 'inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future)'. It adds that 'where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere'.

Paragraph 163 and 164 states:

'163 When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
- b) the development is appropriately flood resistant and resilient;
- c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;
- d) any residual risk can be safely managed; and
- e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

164. Applications for some minor development and changes of use should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments set out in footnote 50'.

**Table 1: Flood Zones definition (without defences)** ( NPPG (Paragraph: 065 Reference ID: 7-065-20140306)

**ZONE 1**- Low probability of flooding (<0.1%)

**ZONE 2** –Medium probability of flooding (0.1-1%)

**ZONE 3** - High probability of flooding (>1.0%).

The application site is within Zone 1 – low probability.

### **Witham Fourth District Internal Drainage Board**

The Witham Fourth District Internal Drainage Board is the authority which is responsible to control water levels and to reduce the risk of flooding in the Board's area. The site lies within the area covered by the Witham Fourth District Internal Drainage Board. From the WFDIDB's website it states that the 'Board's watercourses have been designed to provide a freeboards of 0.6m above the water level of a 1 in 10 year flood event to the lowest general land levels in that the system 'provides an overall level of protection of around 1 in 50 years'.

### **Environment Agency**

The Environment Agency is the authority that is responsible for reducing the risk of flooding from the sea and designated main rivers. The site is shown within a Low Risk of flooding from rivers or the sea on the Environment Agency's Flood Maps (without defences).

The information supplied by the Environment Agency indicates that they have no records of any flooding in the area around the application site and that the site is not affected by overtopping of the defences for the present day (2006) scenario.

## **Climate change**

The NPPF indicates that Flood Risk Assessments should take climate change into account given anticipated rises in sea levels and rainfall. Climate change may therefore increase the likelihood of overtopping or the probability of a breach.

Climate change allowances has increased from 20-30% as part of new national guidelines. The climate change allowances in the NPPF were updated on the 19<sup>th</sup> February 2016 and have been produced by the Environment Agency as the Government's expert of flood risk.

Climate change allowances are 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

## **Hazard Mapping**

The Environment Agency's Hazard Maps show the consequences should a breach or overtopping of the existing defences occur. The attached hazard maps have been obtained from the Environment Agency and form part of this FRA. The maps are attached.

## **Tidal Flooding**

The site is at a low risk of flooding from North Sea which is 15km from the application site.

## **Fluvial flooding**

This occurs when there is a breach or overflow of a watercourse ie when the water flows are greater than the capacity of the river channel. Flooding could also occur within the pump drained areas as a result of pump failure for instance, however any such malfunction is unlikely given the ongoing maintenance of the drains being carried out by the WFDIDB.

The fluvial flood risk source in relation to the application site is the East Fen Catchwater Drain (EFCD) which lies 200m away from the application site and the IDB arterial drains.

The probability of fluvial flooding is low because of the standards and future maintenance of the existing flood defences and the site's location in relation to fluvial

sources. Along this section of the drain, within the vicinity of the site, there is a significant amount of freeboard between the water and the top of the bank which is level with agricultural fields. If such flooding were to occur it would likely to be shallow and localised. The future occupiers of the proposed houses would have plenty of warning time to make the necessary evacuation and safety arrangements. Also, given the network of drains surrounding the site, it is likely that any breachwater would be accommodated within these drains which would either hold the water until the pumps and sluices have been opened to allow the breachwater to disperse or would redirect the water away from the site. If deemed necessary, minimum floor heights could be raised above the lowest point of the site which would provide sufficient mitigation to ensure breachwater does not encroach into the accommodation.

### **Surface water flooding**

This occurs when rainfall becomes too heavy and exceeds the drainage capacity of the surrounding land which causes the land to become waterlogged. Flooding from surface water is difficult to predict and the depth and degree of rainfall is often not accurate and hard to forecast. Parts of the site are slightly lower than Fen Road and is prone to surface water shallow 'ponding' during heavy rainfall, but water quickly disperses into the rest of the paddock and the surrounding drainage ditches. This does not cause any third party flooding. The Environment Agency's Risk of Flooding from surface water Map shows the subject building to be at low risk.

### **Flooding from groundwater**

Groundwater flooding often occurs when water levels in the ground rise above surface levels. The application site consists almost entirely of a grassed paddock with a track / driveway and hedging around much of its perimeter. This paddock is well drained land and is not prone to significant levels of groundwater flooding even during heavy rainfall. The risk of rising groundwater and overflowing drains is therefore unlikely and in any case, any overflow is likely to be accommodated by the existing drainage system which serves the surrounding environment.

There are no reservoirs within the immediate proximity of the site which would generate flooding onto the site.

## **Drainage Assessment**

### **Surface water**

Given the large size of the plots which will serve both properties, there is ample space within the site to accommodate soak-aways to serve the dwellings whilst avoiding the potential of third-party flooding.

It is recommended that all surface water from the development of the site is discharged into soak-aways within the site and all paved areas will be constructed using permeable materials. The soak-aways will be designed to accord with BRE 365

### **Foul water disposal**

Flooding from sewers may occur when they are either blocked or when heavy rainfall overwhelms capacity.

The new foul water from the site from the two dwellings will connect into the existing foul water sewer in Fen Road, Stickford. It is not intended to discharge surface water from the site to the foul water sewer.

There are no known recent problems relating to blocked foul drains within the vicinity of the site. The Anglian Water Services is responsible for the maintenance and upkeep of the foul sewer.

It is not considered that there will be any risk of flooding that may result from the surface water or foul water disposal schemes.

### **Sequential and exception tests**

The aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. The NPPF indicates that development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding.

Essentially, the Exceptions test is in 2 parts. Part (a) requires the proposed development to show that it will provide wider sustainability benefits to the community that outweigh flood risk, and (b) that it will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall.

The site is in a location amongst the very lowest flood risk categories in this area of Lincolnshire.

## **Warning and evacuation plan**

The National Planning Practice Guidance (paras 056-058) provides information on producing evacuation plans for development. It indicates that flood warning and evacuation plans will need to take account of the likely impacts of climate change, with particular regard to increased water depths and the impact and the practicalities on how people can be safely evacuated in time.

It adds that the practicality of safe evacuation from an area will depend on a number of factors including:

- the type of flood risk likely to be experienced and the extent to which advance warning may be given to future occupiers in a flood event;
- the number of people that would require evacuation from the area potentially at risk and how this may be achieved
- the adequacy of both evacuation routes and identified places that people could be evacuated to (and taking into account the length of time that the evacuation may need to last), and;
- the need to provide detailed and up to date evacuation plans.

The proposed warning and evacuation plan relating to this scheme to accord with the NPPG is as follows:

- The site is located within an area that can receive flood alerts from the Environment Agency's Floodline Direct Warning System which can be received via telephone, emails, text etc. The Environment Agency aim to issue flood warnings approximately 2 hours before existing defences are breached.
- The occupier will sign up to the Environment Agency's free warning Direct system ( contact 01522 785877). Flooding from tidal events is predictable and if a flooding event is imminent, the Environment Agency would advise the occupier accordingly.
- Upon receiving the warning from the Environment Agency that the site is at risk of flooding, the assigned person will immediately inform the occupants of both the annex and the host property
- Depending on circumstances a decision will be made by the occupants as to whether to fully evacuate the property and gain access onto the defined dry evacuation route away from the source of flooding or to gain access to the first floor place of refuge which will form part of the annex accommodation (see below)
- Occupants and visitors to the site should familiarise themselves with the site and its surroundings and be aware of the proposed evacuation plan.



- There are four stages of warning which will be issued by the Environment Agency- these are:
  - **Severe flood warning** – danger for life. The site should not be occupied given there is a potential danger to life. If for any reason the site is occupied during such an event, the occupants may need to be evacuated to a safe ground outside the floodplain as recommended by the appropriate authority
  - **Flood warning** – flooding is expected. Immediate action is required. Occupants should move to a safe place of refuge. Gas, electricity, water etc should be turned off and protection equipment put in place.
  - **Flood alert**- Flooding is possible. Be prepared. The occupant should be prepared to act quickly and obtain necessary flood kit and equipment should the risk of flooding increase
  - **Warning no longer in force**. Flood warnings and flood alerts that have been removed in the last 24 hours. Occupants may only return to property upon receipt of clear messages from the appropriate authorities (eg police, Environment Agency etc) that no further flooding is expected in the area and that that is safe to return to the site.
  - General advice from the Environment Agency is that property owners should remain vigilant as flood water may still be around following the flood event and that appropriate measures should be undertaken to make the site safe enough to return.

### Recommendations

Given the low risk for flooding on this site and the nature of the proposed development, it would be prudent to adopt a precautionary approach with regard to flood risk and to minimise structural damage and to safeguard human life.

It is recommended that:

- The finished floor levels of then two dwellings shall be set no lower than 500mm above the lowest part of the site (ie approx. 2.9m ODN) in accordance with the Environment Agency's Standing Advice.
- The two houses will be two storey with a place of refuge at first floor.

- Resilient and resistant construction measures shall be incorporated throughout the development at least 300mm above finished predicted flood depth
- All electrical fittings ( including boilers, consumer units) shall be above 1.1m above the finished level
- Fit non return valves to all external drainage pipes, drains and water inlet pipes to prevent flood water entering the dwelling
- Future occupiers to sign-up to the Environment Agency's Flood-line Warnings Direct Service to obtain advance warning of any potential flood event.
- A percolation test will be undertaken in accordance with BRE Digest 365 to assess the capacity of the site to accommodate soakaway systems. Should the land be unable to accommodate soakaways, another suitable surface water discharge scheme will need to be investigated to avoid any potential of on site or third-party flooding.
- All service ducting to be routed at high level where practical.

## **Conclusion**

The information provided within this flood risk assessment is considered to be fit for purpose and proportionate to the development proposed and the degree of flood risk. It makes optimum use of information already available in accordance with the NPPF. The proposed dwellings will be subject to flood risk although the site has protection from both fluvial and tidal defences which are maintained by both the Environment Agency and the Witham Fourth District Internal Drainage Board.

Climate change allowances have increased significantly as per new national guidelines and the recommendations contained within this FRA takes climate change into account.

It is considered that the risk of flooding from both tidal and fluvial sources is low. The site is not within a functional flood plain. However it must be acknowledged that the remote possibility of flooding of the site cannot be ruled out.

The proposed development also includes a place of refuge at first floor which may be used in an extreme flood event.

Furthermore, future occupiers will sign up to the Environment Agency's Flood-line Warnings Direct Service to obtain advance warning of any potential flood event.

The site will not be affected by flooding from other sources and the development will not increase the risk of flooding elsewhere.

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