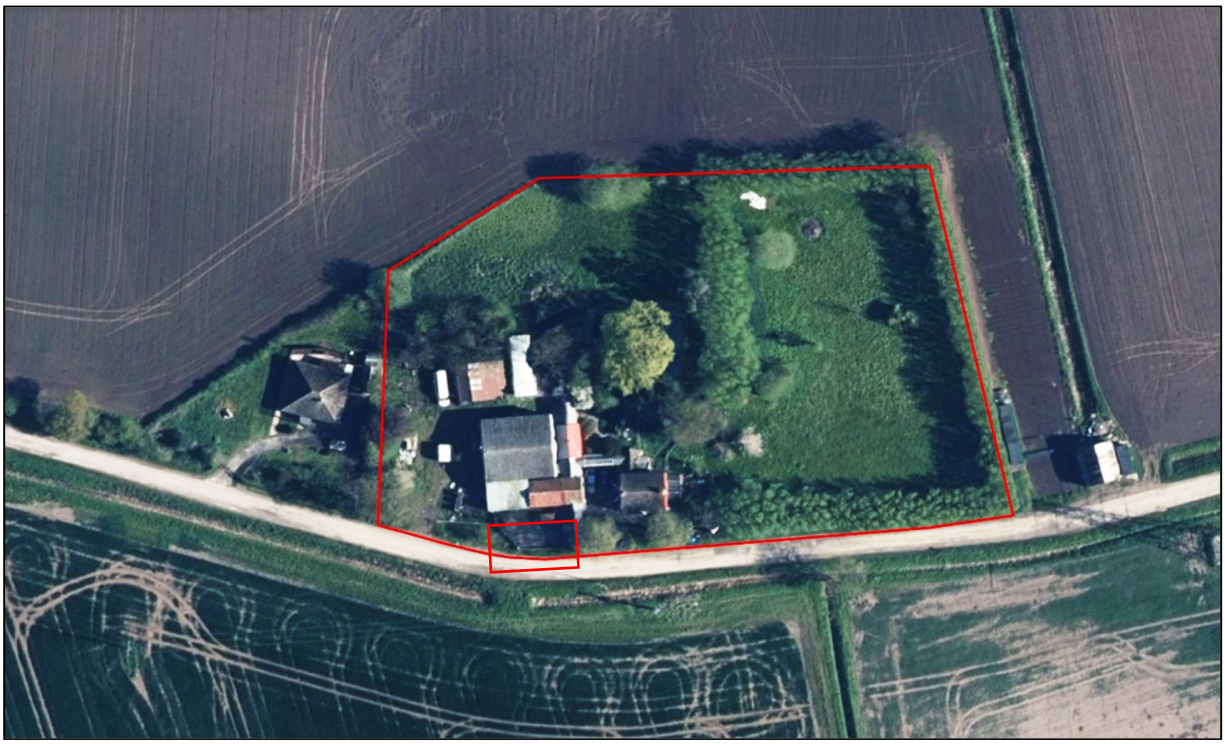
FLOOD RISK ASSESSMENT FOR:

PROPOSED CHANGE OF USE OF OUTBUILDINGS TO RESIDENTIAL / HOLIDAY ACCOMMODATION

AT:

LIME TREE FARM, STREETWAY, WYBERTON, BOSTON, LINCS, PE201BE



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Overview:

Government guidelines state: ‘Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere.’

The aim of this report is to demonstrate the appropriateness of the proposed development in relation to this guideline.

The assessment has been produced with reference to ‘’Preparing a Flood Risk Assessment: Standing Guidance’’ by DEFRA and the Environment Agency.

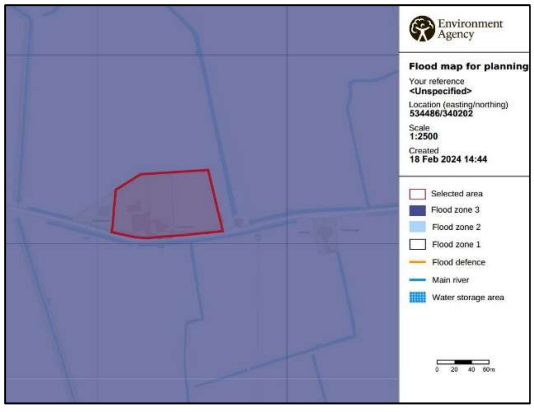
Site description and outline of proposed works:

The site is in a rural area at Lime Tree Farm to the North side of Wyberton Roads.
Location: PE20 1BE (52° 56' 31" N, 00° 00' 00" W) 52.942, 00.000

The site lies within flood zone 3 of the Environment Agency flood map and is therefore considered to have a high probability of flooding. The site is at approximately 3.0m AOD in a relatively flat landscape. The GOV.UK on-line check for long term flood risk shows the site to be at ‘low risk’ with a chance of flooding between 0.1% (1:1000) and 1% (1:100) each year from rivers and the sea with a ‘very low risk’ of surface water flooding.

The site is approximately 1.2km west of the River Haven. There is network of ditches surrounding the site which drain the local farm land through man-made channels out-falling to main rivers. This drainage is maintained by Black Sluice Internal Drainage Board and is pumped into the sea at Hobhole to the southeast of the site.

There is no history of the site flooding and it was not affected by the 1978 and 2013 events.



Outline of Proposal:

The proposal is for the change of use and partial rebuild of a small group of ancillary buildings to form a 1 bedroom single storey dwelling.

SITE PLAN

EXISTING LAYOUT

PROPOSED LAYOUT

There is no increase to the footprint of the buildings nor any increase in hard surface surroundings.

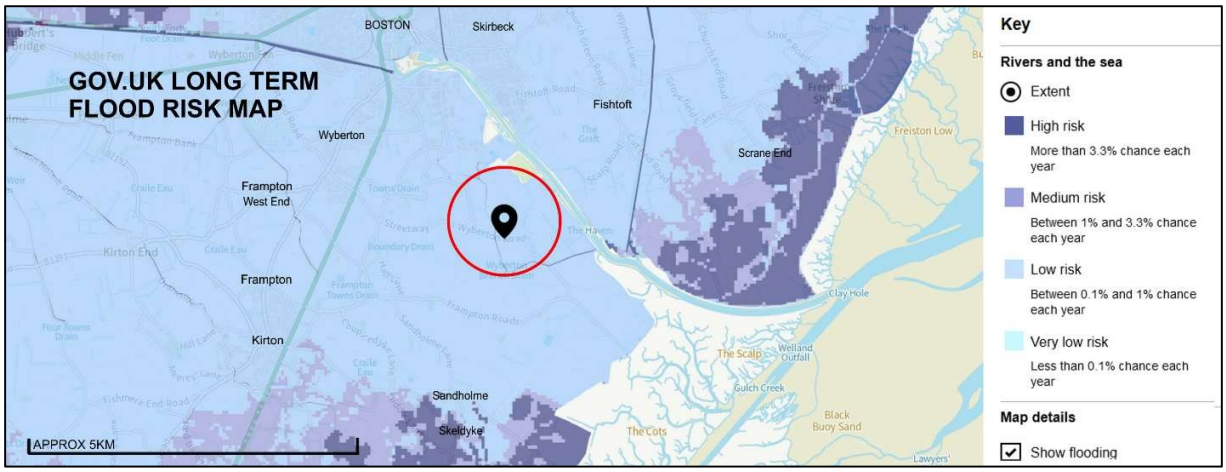
Sequential and Exception Test:

Buildings used for dwellings are classed as 'More Vulnerable' (Table 2 NPPF) Table 3 of the Technical Guidance suggests that dwelling houses are appropriate for Flood Zone 3a subject to passing the Sequential and Exceptions Tests.

Once the Sequential Test has been satisfied the development must pass the Exceptions Test, for this it must be demonstrated that:

1. The development provides wider sustainability benefits to the community that outweigh flood risks, informed by the Strategic Flood Risk Assessment; and

2. A site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking into account the vulnerability of its users, without increasing flood risk elsewhere.



As can be seen above the site is within a large area under the same potential flood risk - including the town of Boston.

The aim of the Sequential Test, as set out in the Planning Practice Guidance, is to ensure that a sequential approach is followed to steer new development to areas with the lowest probability of flooding through a review of available sites in the local area and their relative flood risk categorisation. In this instance the whole site and the surrounding area is within the same flood zone and therefore there is no local alternative. In addition the proposal is for a conversion of - and is essentially a 'change of use' for - a group of existing buildings and infrastructure and therefore in principle a Sequential Test should not need to be applied.

Exception Test:

The Boston Borough Council Core Strategy, as with the sequential test, provides a table which identifies the type of site that is automatically deemed to have passed Part 1 of the Exception Test. This includes holiday accommodation and housing on brownfield sites. The proposal seeks a change of use from what is land occupied by a permanent structure (defined as brownfield under Annex 2 of the NPPF) to a dwelling to be used as a seasonal holiday let. It is however also considered that the dwelling may be used occasionally as accommodation by the owner.

The application seeks to retain and contribute to the character of a small group of rural buildings and therefore will not compromise the visual aspects or amenity of the area. This will effectively preserve and enhance the local character of the site whilst refurbishing the main elements to ensure that they have a valid future. The proposal essentially promotes the efficient reuse of existing buildings and allows for the inclusion of energy saving measures to be incorporated within the design. In addition there is the potential to provide some economic diversification in so far as the development can be readily used as a holiday let - thus generating a small income and providing a valid facility for visitors to the local bird sanctuary at Frampton Marsh and the historical town of Boston. As there is no increase to the footprint of the buildings there is no loss to the local ecology but a potential increase in green space with the proposed garden area replacing part of the yard.

On balance it is concluded that the proposed development would provide wider sustainability benefits that outweigh the flood risks, particularly given that the buildings exist and flood risks are able to be mitigated through appropriate design

Flood Risk Assessment:

The nearest OS datum shows the site to be at 3.0m AOD. The proposed ground level of the dwelling would be a minimum of 300mm above this, measured from the road. The area is protected with extensive EA flood defence measures.

The closest threat to the site is the river Haven (with tidal influence) at approximately 1.2km to the North-east. The site is also approximately 2km from the wash to the South-east. There are no immediate site specific risks that would adversely affect the flood risk categorisation of the site. EA modelling shows a 1:200 tidal level of 5.93m (Hobhole) ODN and the existing flood defences in the area are in good condition, are well maintained and have been designed to reduce the risk of flooding to a 0.67% (1in150) chance of occurring in any year.

Environment Agency

Tidal Water Levels for The Wash

The table below shows still water levels for locations, from the above location map, around the South Humber Estuary, East Coast and The Wash. It is important to note the following:

- The base date for the data is 2014 for the South Humber and 2006 for the East Coast and The Wash.
- The data are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
- The water level quoted is the 'Best Estimate' water level. Depending on the use of the data it may be necessary to carry out sensitivity testing. Upper and Lower 95% confidence bandings are available upon request.
- Levels for other annual chance scenarios are available if required.

Ref	Location	Easting	Northing	Annual Chance (1 in x) of Tide Level metres ODN					
				1	10	50	100	200	1000
Wash									
~	Hobhole	536610	339940	4.82	5.30	5.64	5.78	5.93	6.27
~	Lawyers Sluice	540750	334550	4.84	5.32	5.66	5.80	5.95	6.29
~	West Lighthouse	549150	325750	4.88	5.37	5.71	5.86	6.01	6.35
~	Grand Sluice	532400	344500	4.88	5.33	5.65	5.78	5.93	~
~	Fosdyke Bridge	531700	332200	4.91	5.38	5.71	5.85	5.99	~
~	Marsh Road	526000	324000	5.04	5.44	5.73	5.85	5.98	~
~	Wisbech	546100	310000	4.83	5.25	5.53	5.66	5.78	~
~	Dog In Doublet	527300	299300	3.67	4.00	4.22	4.32	4.42	~

It is anticipated that the EA will continue to maintain and upgrade as necessary the existing flood defence system within this area as the land is considered strategically important for the production of crops. The local drainage board (Black Sluice) maintain and operate the system of land drains and pumping facilities in the vicinity of the site and their maximum modelled predictions from incidental flooding to this area are below the 3.0m AOD mark.

Summary of Flood Risk:

Source of Flooding	Description	Significance of risk pre mitigation			Mitigation Measures	Significance of risk post mitigation		
		L	M	H		L	M	H
Rivers	River Haven is 1.2km from the site			●	Investigate modelled river levels for a range of events. Propose GFL above 1 in 100 cc flood. Propose flood resilient construction measures and recommend flood action plan	●		
Water Courses	Several ordinary water courses contribute to the IDB systems but are not known to affect the site.	●				●		
Tidal/Coastal	The site is in flood zone 3a (unprotected) and is therefore classified as high-risk tidal flooding. The Lincolnshire coastal defences provide protection against tidal flooding			●	Investigate existing flood defences and assess breach scenario. Propose welfare FFL above 1 in 200 cc flood. Propose flood resilient construction measures and recommend flood action plan		●	
Groundwater	BGS identifies the site as being at low risk	●				●		
Overland flow (Surface Water)	Gov.uk data shows the site and surrounding area as 'very low risk'	●				●		
Ponds/Swales	N/A	●				●		
Public infrastructure failure	There is no record of public infrastructure failure in the vicinity of the site	●				●		
Pluvial (urban drainage)	No additional impermeable roof or driveways areas are proposed	●				●		
Artificial sources	Manmade resources from Black Sluice IDB are available	●				●		

Planning policy generally requires development to be designed to accommodate 1 in 100 (1%) annual probability flood events from rivers and pluvial sources and 1 in 200 (0.5%) annual probability flood events from seas. The flood map for rivers and seas from the Government 'flood map for planning' service (page 2 above) shows the site to be fully within Flood zone 3 and therefore at risk of flooding, assuming no flood defences exist.

The EA have no historic records of the site having flooded

The Boston Combined Strategy (BCS) consists of five phases which provides Boston town with a 1 in 300 (0.33%) annual chance standard of protection against tidal flooding over the next 100 years. This is achieved through the provision of the tidal barrier which was completed in 2020 and initial improvements to the Haven banks downstream of Boston which were completed in 2021. Additional improvements will be required in the future to adapt to further sea level rise.

This site is considered to be at risk from tidal flooding. The existing tidal defences protecting this site consist of a tidal barrier, earth embankments and concrete floodwalls. They are in fair condition and reduce the risk of flooding (at the defence) to a 0.33% (1 in 300) chance of occurring in any year. These defences are inspected routinely by the EA to ensure potential defects are identified.

Tidal Hazard Mapping – Breaches

The breach mapping for Boston is based on the pre-tidal barrier scenario. Following completion of the barrier in late 2020 levels upstream of it will be restricted to a maximum of 5.3mAOD. The site is not affected by overtopping of the defences for the present day (2006) scenarios.

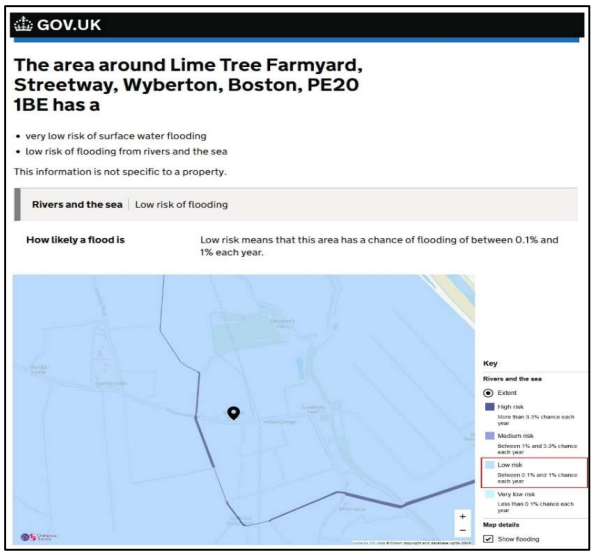
The current Environment Agency data in the tables below clarify the latest breach and overtopping flood information for the application site.

Scenario Year and Hazard Type	Hazard Mapping Scenario Results 0.5% (1 in 200) Annual Probability		
	Max Hazard Category	Max Flood Depth (m)	Max Flood Velocity (m/s)
2115 Breach Hazard	Danger for Most	1.0-1.6	1.5-2.5
2115 Overtopping Hazard	Danger for Most	0.5-1.0	1.0-1.5

Scenario Year and Hazard Type	Hazard Mapping Scenario Results 0.1% (1 in 1000) Annual Probability		
	Max Hazard Category	Max Flood Depth (m)	Max Flood Velocity (m/s)
2115 Breach Hazard	Danger for Most	1.6+	2.5+
2115 Overtopping Hazard	Danger for Most	0.5-1.0	1.0-1.5

The latest mapping confirms the same result, that the worst-case overtopping and breach scenarios would represent danger to the future occupants of the site.

The 0.5% (1 in 200) annual probability breach scenario is the most onerous of the breach scenarios relative to the site. To mitigate risk to occupants, floor levels and resilient measures should be designed such that occupied areas are not inundated during 0.5% (1 in 200) annual probability events. The breach event predictions suggest a maximum flood depth of 1 to 1.6m above ground level, the proposed floor levels are 0.3m above ground level. It is thus proposed that mitigation measures extend to 1.3m above floor level.



The GOV.UK on line check for long term flood risk shows the site to be at low risk with a chance of flooding between 0.1% and 1% each year from rivers and the sea with a very low risk of surface water flooding.

As the proposal is for a change of use for an existing group of buildings relocation is not an option. The key consideration is in that it constitutes a change of use from Less Vulnerable (Class B8) to More Vulnerable (Class C3).

The proposal is not within 20m of any main river or flood defence. There is a change of use to residential. The proposed footprint is a little less than the existing footprint and thus has no impact on surface water drainage.

Proposed Mitigation:

In accordance with the environment agency recommendations the new ground floor levels will be above that of the existing ground floor levels (3.3m AOD). Although essentially a single storey dwelling there will be a readily accessible storage/study area on an upper floor which would provide a safe haven in the event of a severe flood as it would be above maximum predicted flood levels. In addition it is proposed to include flood damage mitigation resilient measures as follows:

- All new electrical installations to be a minimum height of 1.3m above floor level.
- Carcassing for kitchen units etc. not to be constructed from particle board.
- Where practical kitchen appliances, water heaters etc. to be above worktops.
- Skirting's, architraves and cills to be constructed from solid timber and not MDF.
- Floor finishes to be in ceramic tiles and not timber or laminate boards.
- Internal walls to be finished with water resilient cement render and not plaster.
- Below ground block work to be cavity filled with lean mix concrete to DPC level.
- Waterproof screed to be implemented on new ground floor.
- Closed cell foam insulation to be used in external wall cavities and within floor.
- All new foul drainage to be fitted with non-return valves – including GF WC's.
- Occupiers to register property with the government 'Flood-line' alert scheme.
- A flood event emergency plan can be made available for use by occupants.

It is believed that the above resilient measures will greatly mitigate any damage caused by worst case scenario flooding, the nature of a breach flood would mean that flood water would quickly disperse and that the property could be returned to normal use within a relatively short time.

It is concluded that the proposed development could be constructed, safely and sustainably, to meet the requirements of the Boston Borough Council Development Plan Policies and the National Planning Policy Framework.