

# Howard J Wroot

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Date: 1 February 2024

## FLOOD RISK ASSESSMENT



**Proposal:** Carryout repairs and residential conversion to Listed Tithe Barn with granting of planning permission for 2 Building Plots as enabling development.

**Site Location:** N Axe & Son, Axholme Poultry Farm, Station Road, Owston Ferry, Doncaster, DN9 1AW.

**Application ref:**

**Applicant:** Mr Adrian Axe.



Howard J Wroot Chartered Surveyor  
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## 1. National Planning Policy Framework

1.1 Section 10 of the National Planning Policy Framework sets out the requirements for applications/developments to meet climate change flooding and coastal change.

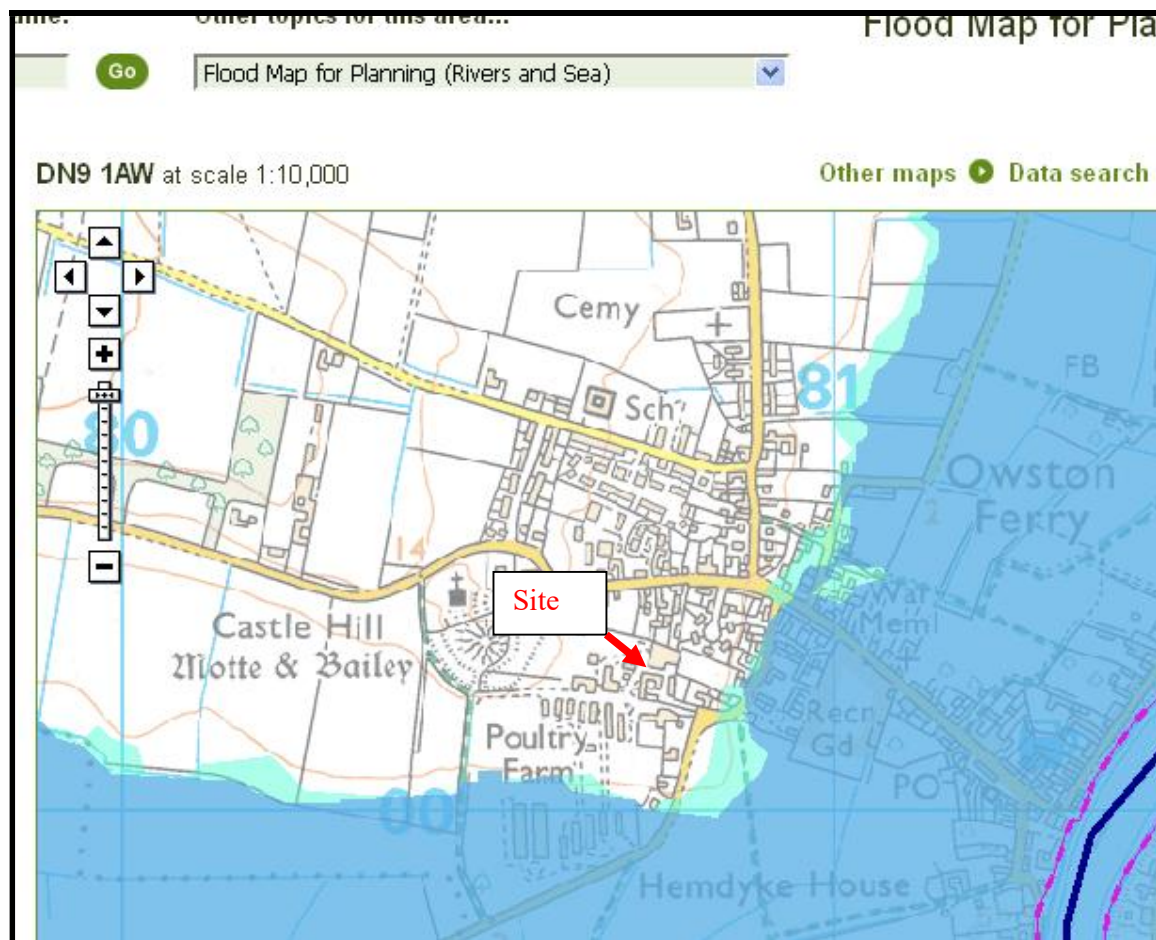
1.2 This guidance directs LPA's that inappropriate developments in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary making it safe without increasing flood risk elsewhere.

## 2. Site Location

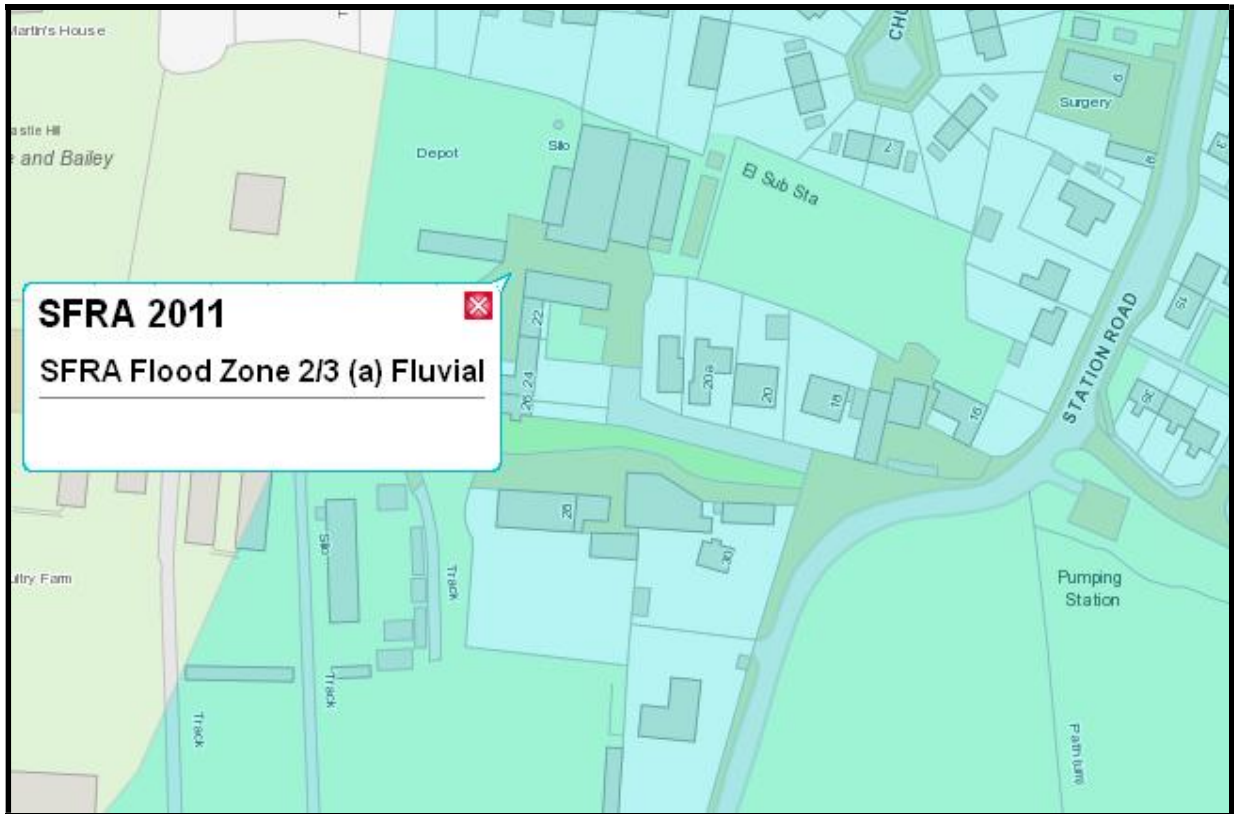
2.1 As can be seen from the accompanying site location plans and maps plus the Environment Agency Flood Risk Map below the proposed new dwelling will be sited within a Flood Risk Zone 2/3a

## 3. Environment Agency Flood Map and SFRA

Environment Agency Flood Risk Map



## SFRA Map 2011



### 4. Proposed Use & Compatible Uses

4.1 The proposed use of this site is the residential conversion of an agricultural barn to form 1 dwelling it is therefore a residential development, which is classified in the NPPF Technical Guidance as a “more vulnerable use”.

4.2 The technical guidance to the NPPF then directs which uses are compatible within each classification of flood zone. In Table 1 of that document it advises that within a Flood Risk Zone 2 more vulnerable uses are compatible, thus a residential use would be compatible within this flood zone.

4.3 However, that within a Flood Zone 3a more vulnerable uses may be permitted if the Exception Test is passed.

### 5. Exception Test

5.1 Notwithstanding the above however, the exception test requires two conditions to be met before it can be said to have been passed,



A. The site specific FRA must show the development is safe from flood.

i) The North Lincolnshire SFRA contains critical flood levels for this area and site in particular, therefore this critical flood level which is a fluvial 1 in 100 return period and a tidal 1 in 200 return period with allowances for climate change. Refer Table 1 below.

**Table 1 - Critical Flood Level (mAOD)**

Water Level	Ground Level
4.10	4.00 – 4.60

This table shows the critical flood level for the site is 4.1m AOD. This means that during a 1:100 year event with allowance for climate change water level at the site could be expected to reach 4.1m AOD.

ii) The site level is 5.1m AOD as is shown on the attached plans 5 of 5, therefore for the development to be deemed as being safe from flood the Environment Agency accept that a ground floor level 300mm above external ground at 4.1m AOD, level will achieve this standard.

iii) The ground floor level (**FFL**) of the proposed dwellings will be at **5.3m AOD** and thus 1.2m above critical flood levels and thus safe from flood.

B. The development provides wider sustainability benefits to the community that outweigh flood risk.

This development will benefit the community of Owston ferry in the following ways and thus show that it will indeed provide wider sustainability benefits to the community, not withstanding the fact that the development will be safe in terms of Flood Risk.

a) *Social*

1. The construction of new dwellings will provide employment for local tradesmen of all ages thus local skills will be enhanced, local employment created, increased opportunities for the employment of apprentices thus improving chances of longer term employability.
2. The new dwellings will be within walking distance of all local facilities this will thus promote a healthier community.
3. The dwelling will be designed in accordance with Police guidelines to minimise possible burglaries and thus reduce crime in the area.
4. The adjacent and neighbouring housing mix varies from semi detached and detached houses and bungalows and also similar barn conversions, there is therefore no firm housing type.



5. This will also accord to the NPPF in promoting rural business to provide thriving rural communities.

b) *-Environmental*

1. The development is safe in terms of flood risk.
2. The development of the proposed dwelling will make the best use of this brownfield site and retain the original building.
4. The new proposed dwelling will be carbon efficient and have lower than average emissions thus making a contribution to the improvement of air quality.
5. The site is within walking distance of all facilities and amenities plus local bus routes thus this will contribute to the reduction in private vehicle use and emissions.
6. All additional housing within rural villages will contribute to the use of public transport and thus additional demand will enhance it's long term provision.
7. The house will be built to Code 3 level Sustainable Housing which is above the required level of energy efficiency required by the Building Regulations and thus further contribute to a reduction in the carbon footprint of new housing provision..
8. All materials used in the construction of the building will be sourced locally thus promoting sustainability in the construction process.
9. In addition the residential conversion of this building will retain a listed structure rather than have it fall into further disrepair which would be of great environmental and social benefit to the Owston Ferry.

c) *Economic*

1. Construction of this dwelling will provide much needed new jobs and play a part in small degree in the governments stated intention to build the country out of recession.
2. All local rural villages need vibrant centers and the construction of a new family dwelling will bring additional children into the village which will promote use of the local facilities and amenities.
3. The construction of a new dwelling will not only bring jobs to the local tradesmen but also have the spinoff of increased orders for building materials, Kitchen fittings, iron mongery, glazing etc, thus securing employment in jobs not immediately related to the site.

## **6. Sequential Test**

6.1 The Sequential Test is passed because this is the residential conversion of a specific building therefore by definition it is the only one available for the conversion and thus there are no alternative barns available.

6.2 In addition the enabling development is also washed over by this as such development is required to be contiguous.




## 7. Mitigation in time of flood.

7.1 Ground floor level will be 5.3m AOD 300mm above external GL.

7.2 Flood proofing measures will be used to a height of at least 1200mm above Finished GFL, see below.

Feature	Considerations To Improve Flood Proofing
External Walls	Careful consideration of materials: use low permeability materials to limit water penetration if dry proofing required. Avoid using timber frame and cavity walls. Consider applying a water resistant coating. Provide fitting for flood boards or other temporary barriers across openings in the walls.
Internal Walls	Avoid use of gypsum plaster and plasterboards; use more flood resistant linings (e.g. hydraulic lime, ceramic tiles). Avoid use of stud partition walls.
Floors	Avoid use of chipboard floors. Use concrete floors with integrated and continuous damp proof membrane and damp proof course. Solid concrete floors are preferable; if a suspended floor is to be used, provide facility for drainage of sub-floor void. Use solid insulation materials.
Fitting, Fixtures and Services	If possible, locate all fittings, fixtures and services above design floor level. Avoid chipboard and MDF. Consider use of removable plastic fittings. Use solid doors treated with waterproof coatings. Avoid using double-glazed window units that may fill with flood water. Use solid wood staircases. Avoid fitted carpets. Locate electrical, gas and telephone equipment and systems above flood level. Fit anti-flooding devices to drainage systems.


7.3 In addition to the above Flood Barriers will be fitted to GF openings see below




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**Flood Angel® Flood Defender™ has the BSI kitemark accreditation. This superior flood defence barrier is a bespoke, made to measure product. Suitable for either standard inward or outward opening doors, the system can be produced using six different fixing systems so that it can be fitted to virtually any door opening.**

- Lightweight yet strong
- Easy to install
- Six different fixing systems
- Bespoke to suit each situation
- Virtually invisible fixings
- Choice of heights, up to maximum 1000mm
- 2 year manufacturer's guarantee



All locations where flood defence products are installed can be fitted with a **telemetry early warning system.**

7.4 All electrical wiring will be run from ceiling downwards sockets to GF will be at 1200mm min height from GFL.

## 8. Evacuation.

8.1 It is estimated that there will be a 6 hour max window for the Environment Agency to provide warnings of flood. This is an adequate amount of time for occupants to be able to either vacate the property and put into place their evacuation plan, please refer below.

8.2 From the Table below it is clear the site is in a Danger for most category.

**Table 12.2 - Danger to people from breaching relative to distance from defence**

Distance from breach (m)	Head above floodplain (m)						
	0.5	1	2	3	4	5	6
100	Yellow	Yellow	Red	Red	Red	Red	Red
250	Yellow	Yellow	Red	Red	Red	Red	Red
500	Yellow	Yellow	Red	Red	Red	Red	Red
1000	Yellow	Yellow	Red	Red	Red	Red	Red
1500	Yellow	Yellow	Yellow	Yellow	Red	Red	Red
2000	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red
2500	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
3000	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
3500	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
4000	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
4500	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
5000	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow

**Key:**  
 Danger for some  
 Danger for most  
 Danger for all

8.2 Therefore in this case as access for evacuation by emergency vehicles may not be practicable and it would be more sensible and reasonable for any occupant of the dwelling to remain inside until flood waters had receded to a level whereby emergency vehicles could access the site safely. **It is therefore proposed that the dwellings will be two storey** with NO bedrooms on the Ground Floor.

8.3 Please see the attached document Evacuation Arrangements of Individual Buildings produced by Humber Emergency Planning Services see Appendix 1. To the FRA

8.4 In this respect I would draw your attention to paragraph 2.3 of this document which states that *“buildings can provide significant protection against most risks, in the case of flooding it may be safer to advise people to seek refuge in the upper storeys of a building so evacuation should not always be adopted as the best measure”*






8.5 However in the first instance Evacuation of the building prior to any flood event must be made the priority. The evacuation will be to a place of safety outside the flood zone in which the proposed dwelling lies.

8.6 This will be likely to be with friends or family within flood zone 1, the location will be for the actual occupants of the dwelling to choose with alternatives should they be required. The details i.e. address, phone numbers etc will be entered into the plan below.

8.7 The occupants will also sign up to the Environment Agency Flood Warnings system so as to be able to more accurately rate the degree of risk that they are in, please see below.

Appendix 1 – Environment Agency Flood Warnings

	<p><b>Flooding is possible. Be alert. Used two hours to two days in advance of flooding.</b></p> <ul style="list-style-type: none"> <li>• Be prepared to act on your flood plan</li> <li>• Prepare a flood kit of essential items</li> <li>• Monitor local water levels and the flood forecast on the EA website</li> </ul>
	<p><b>Flooding is expected. Immediate action required. Used half an hour to one day in advance of flooding.</b></p> <ul style="list-style-type: none"> <li>• Move family, pets and valuables to a safe place. Turn off gas, electricity and water supplies if safe to do so.</li> <li>• Put flood protection equipment in place.</li> </ul>
	<p><b>Severe Flooding. Danger to life. Used When flooding poses a significant threat to life.</b></p> <ul style="list-style-type: none"> <li>• Stay in a safe place with a means of escape.</li> <li>• Be ready should you need to evacuate from your home.</li> <li>• Co-operate with the emergency services.</li> <li>• Call 999 if you are in immediate danger.</li> </ul>
<p><b>Warnings no longer in force</b></p>	<p><b>No further flooding is currently expected in your area. Used when river or sea conditions begin to return to normal.</b></p> <ul style="list-style-type: none"> <li>• Be careful. Flood water may still be around for several days.</li> <li>• If you've been flooded, ring your insurance company as soon as possible.</li> </ul>



SELF ASSESSMNT TOOL TO CHECK THE CONTENTS OF  
FLOOD/EMERGANCY EVACUATION PLAN

Detail	Evidenced in Plan?			Evidence / Comments
	Yes	Partially	No	
<p>The flood evacuation / emergency plan is based on an assessment of the flooding risk, which identifies:</p> <ul style="list-style-type: none"> <li>the type of flood risk present (e.g. the extent, depth and velocities of flooding, the routes of flooding, the duration of flood, the worst case flood risk, the potential for a no-notice flood – e.g. breach of flood defences)</li> <li>the availability of the Environment Agency flood warnings for that property / site.</li> <li>a description of the warnings (see appendix 1) and the extent of the advance warning can be given</li> <li>the method of delivery of the EA warnings (phone, text, email or fax)</li> <li>The availability of any flood defences for the property (e.g. door flood barriers) ) and how deployment may affect evacuation routes.</li> </ul>		Y		<p>Indicates three different flooding scenarios, but no specific information about the likely impact and potential hazards (e.g. danger of fast flowing water, displaced manhole covers, contamination etc) .</p> <p>It mentions that flood warnings are available, but not that the household will be signed up to them.</p> <p>Description of the EA warnings are not included (see Appendix 1).</p>
		Y		
			N	
			N	
			N	

Detail	Evidenced in Plan?			Evidence / Comments
	Yes	Partially	No	
The flood emergency / evacuation plan allows all residents of a property / site to evacuate to a place of safety before a flood happens, or allows all residents of a property / site to shelter in a refuge on site for the duration of a flood	Y			Scenario A allows for an evacuation to a place of safety, and scenario C allows for a shelter on site.
Where the decision to evacuate is taken by the occupants, the plan is not reliant on rescue from the emergency services.		Y		Scenarios 2 relies on support from the emergency services.
The flood emergency / evacuation plan includes information on how to switch off services (water, gas and electricity) prior to evacuation.			N	Add prompt with the location of the cut-off valves/switches
Off-site places of safety have been assessed and are not at risk of flooding.		Y		Assume that 14m AOD is safe from flooding, but not explicitly stated.
If the occupants take the decision to evacuate the building the plan documents the shelter arrangements.			N	If Humberside Police recommend evacuation, North Lincolnshire Council will normally assist them in providing temporary shelter for evacuees. However, the plan should, ideally, identify shelter arrangements. For example, relocate to [relatives/hotel/village hall] etc.



Detail	Evidenced in Plan?			Evidence / Comments
	Yes	Partially	No	
Suitable refuges are provided if there is a risk of a no-notice flood event (e.g. breach of defences)		Y		Lack of information on the suitability of refuge – see below*
On-site refuges have been risk assessed and would be free from flooding during a worst case flooding scenario and would provide a suitable shelter for the duration of the flooding event.			N	No indication given of likely flood depths, duration of flood, or how long residents could remain in refuge. Assumption is await rescue.
On-site refuges are provided with appropriate facilities proportionate to the likely duration of the flood (e.g. warmth, provisions, medications, communications)			N	Residents are required to take resources with them, rather than store them in the refuge. Will there be time and presence of mind to gather during an inundation event? No indication of heat, light etc.
The flood emergency / evacuation plan will operate during all times of the day (e.g. in the middle of the day and the middle of the night), in all weather conditions (rain and cold are usually associated with flooding) and at all times of the year (e.g. in the middle of winter and the middle of summer).			N	Not referenced, but Scenario 2 does not seem suited for all times / all weathers, or for a Scenario 2 leading to a scenario 3.  Not sure about heat in refuge.
Evacuation routes should be clearly stated.	Y			

Detail	Evidenced in Plan?			Evidence / Comments
	Yes	Partially	No	
The plan contains clear actions to follow in the event of a flood warning being issued. If flood warnings are not available for that area then the plan has identified another clear trigger / alert.		Y		There are actions to take, not clear about flood warning issue / receipt.  (see Appendix 1)
The actions / procedures outlined in the flood emergency / evacuation plans can be followed by people of all abilities (e.g. wheel chairs users, the visually impaired)			N	
If pets are allowed in the property / on site, then they are catered for in the flood emergency / evacuation plan			N	
The plan is adequate for visitors to the site / property without local knowledge to find the safe route to the designated refuge(s)		Y		Use of the term 'to the north' and 'travelling north along...' may be better written as 'turn left out of the front door' etc.



Detail	Evidenced in Plan?			Evidence / Comments
	Yes	Partially	No	
<u>Plan review</u> To be fit for purpose, the whole of the contents of the plan must be reviewed annually and the date of the next review clearly stated.  Additionally, the plan should document the date the plan owner contacted the Environment Agency Floodline Service on 08459881188 or <a href="http://environment-agency.gov.uk">http://environment-agency.gov.uk</a> to check on any changes to the flood risk to the property			N	No indication in the plan
<u>Plan awareness</u> All people in the premises must be made aware of the plan and the actions they should take on receipt of flood warnings or should flooding occur.			N	No indication in the plan (See Appendix 1)
<u>Plan testing</u> The plan should be tested periodically and a record kept of the date of the test.			N	No indication in the plan

## 9. Surface Water run-off

9.1 Surface water run-off from the land will not be increased.

9.2 This can be achieved by the fact that the proposed development has the same footprint/roof plan area as the existing barn and that any hard surfaced area will be SUDS compliant allowing any surface rainwater to pass through the material and soak into the sub-strata beneath.



## **10. Summary**

10.1 The sequential Test is passed as there are no other sites of lower flood risk available within a reasonably wide geographical area taking into account available flood defences.

10.2. The Exception Test is passed as

a) It has been demonstrated there are wider sustainability benefits to the community that outweigh flood risk in respect of this development.

b) It has been demonstrated that the building will be safe for its lifetime from flood – refer Site Plan the occupants will be safe from the effects of flood refer Evacuation Plan and that the effects of flooding will not be increased elsewhere.

c) This is a brownfield site or previously developed land the site having been used for a variety of mixed uses.

Appendices relevant to the FRA

1. Appendix 1 Evacuation Arrangements of Individual Buildings

## **11. Conclusion**

11.1 I therefore consider that 1) the development is safe in terms of flood risk and is allowable as a more vulnerable use and 2) that the development passes the exception and sequential tests.

