PROPOSED EXTENSION (SUN LOUNGE) AT NORTHCOTE, MILL GREEN ROAD, PINCHBECK, SPALDING, PE11 3PU

FLOOD RISK ASSESSMENT



View of existing house

S M Hemmings B Sc C Eng MICE MIWEM,
13 Lea Gardens,
Peterborough,
PE3 6BY

This flood risk assessment has been prepared solely to support the planning application for a proposed extension at Northcote, Mill Green Road, Pinchbeck. The author has made every effort to provide an accurate assessment of the flood risk but accepts no liability should the information be found to be incorrect or incomplete, or if it is used for any other purposes other than for which it was originally commissioned.

Introduction

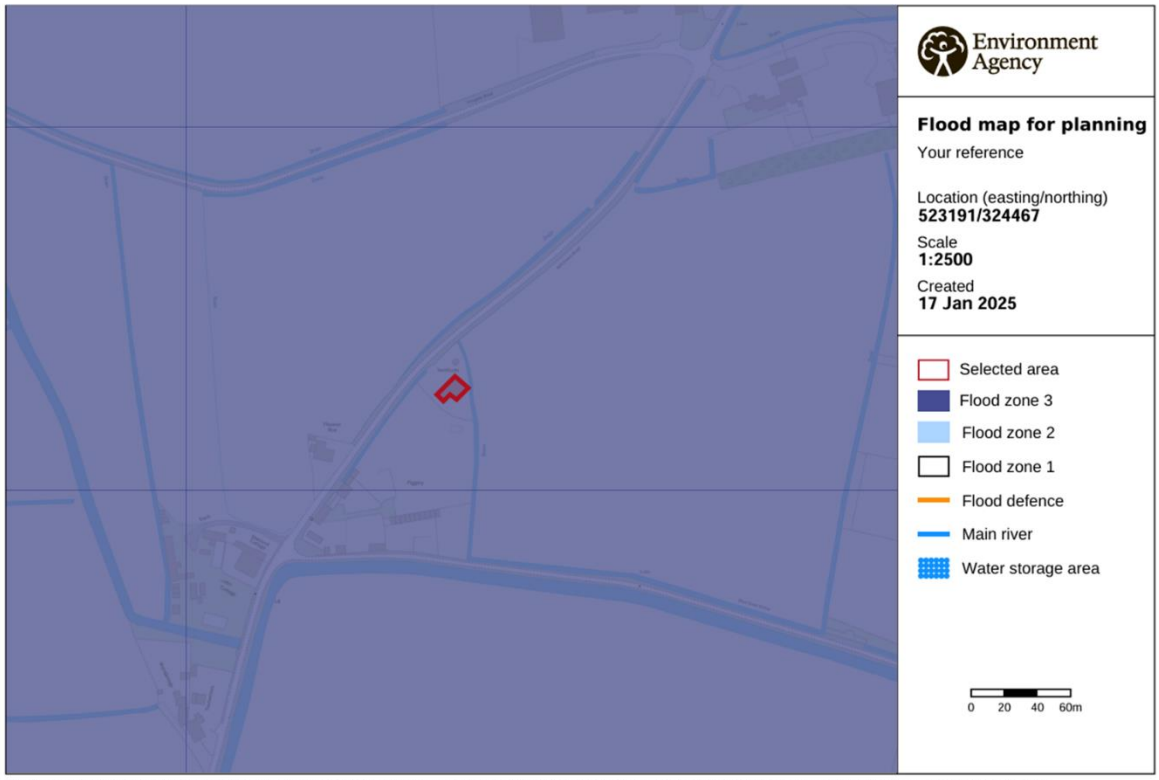
A planning application is due to be submitted to South Holland District Council for permission to demolish the existing conservatory and construct a Sun Lounge extension on the south west side of the house called Northcote, Mill Green Road, Pinchbeck, Spalding, PE11 3PU.

The site is within Flood Zone 3 as shown on the Environment Agency's Flood Zone Map. These maps do not take into account existing flood defences.

The site is shown within the defended area of the South Holland District Council's Strategic Flood Risk Assessment (SHDC SFRA) map and is located in the Welland and Deepings Internal Drainage Board district.

Environment Agency (EA) Flood Zones

The map below is taken from the Environment Agency website and shows the flood zones in the area.



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It can be seen that all of this area of west of Pinchbeck is within flood zone 3.

Application Site

The site is approximately 2km west of the village of Pinchbeck. The National Grid Reference of the site is 523191 324465.

The location of the site is shown on the plan at the end of this document.

As the site is within a defended area the proposed development can be considered to be within Flood Zone 3(a) as detailed on the Environment Agency's flood zone maps without defences, as defined in Table 1 of the Technical Guidance.

Applying the flood risk vulnerability classification in Table 2 of the Guidance, a development consisting of a dwelling house is classified as "more vulnerable".

Table 3 of the Guidance is shown below:

Flood Zones	Flood Risk Vulnerability Classification				
	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	✓*

The above table states that to be satisfactory the sequential and exception test should be applied to the development. However the guidelines state that these tests do not need to be applied to a development of an extension to an existing dwelling.

Information on Surface Water Flooding on Environment Agency Website

The map below shows areas around the site where there is a low risk of surface water flooding. The light blue areas indicate the low risk of up to 300mm of surface water flooding, and the darker blue areas indicate that between 300mm and 900mm of surface water flooding could occur.



It can be seen the map does not predict any significant surface water flooding at the site. However there is a very small area on the site immediately west of the building which is shown light blue indicating possibility of surface water flooding on the site.

Road Levels Near The Site

The following road levels are shown on the ordnance survey maps:

Mill Green Road 275 metres north east of the site …… 3.4m OD

Blue Gowt Drove 165 metres south east of the site …… 3.0m OD

Mill Green Road 350 metres south west of the site …… 3.7m OD

Therefore it can estimated that the road level immediately north west of the property is between 3.20m and 3.40m OD, and the level on the site is approximately the same level.

Therefore as the ground floor level of the existing building is 150mm above the level of the site the ground floor level can be approximated to between 3.35m and 3.55m OD.

Existing Flood Alleviation Measures

The site is within a defended flood plain, as defined in Appendix 1 of the Environment Agency's "Policy and Practice for the Protection of Flood Plains", which is considered to be passive until such time that a flood greater than the defences can withstand occurs. The likelihood of flooding occurring due to overtopping or failures of the defences is considered to be very low.

The site is located approximately 2.8 km west of the tidal section of the River Welland, which is maintained by the Environment Agency.

The site is located approximately 1.35 km south of the River Glen, which is maintained by the Environment Agency.

The site is located approximately 790 metres north west of the Vernatts Drain which is maintained by Welland and Deepings IDB.

The main watercourses in this area west of Pinchbeck are maintained by Welland and Deepings IDB.

Potential Sources of Flooding

The potential sources of flooding to the site are:-

1. Failure or overtopping of tidal defences of the River Welland
2. Failure or overtopping of tidal defences of the River Glen
3. Failure or overtopping of defences of Vernatts Drain.
4. High water levels in IDB drainage channels.
5. Localised surface water flooding.

1. **Failure or overtopping of tidal defences of the River Welland**

The River Welland is tidal north of Fulney Lock, which is approximately 2.8 km east of the site. The SFRA states that the defences are adequate to withstand a 1 in 200 year (0.5%) probability event for present day. In the future in 2115 some of the banks would be overtopped with a 0.5% probability event. However if overtopping or a breach occurred water would flow westwards from the tidal Welland and would flood into Vernatts Drain which would reduce the impact of this flood.

It is reasonable to presume that within the next one hundred years works will be undertaken on this section of the bank to ensure that there will be a 1 in 200 year standard of defence continuing into the future, especially considering the value of the industrial and residential properties protected by these defences.

If a breach were to occur in this section of the River Welland the site is unlikely to be affected as the railway line would prevent the most of the flood water from reaching the site.

The maps in the updated South East Lincolnshire SFRA do not predict any flooding in the 1 in 200 year or the 1 in 1000 year event in 2115.

Therefore this source of flooding can be considered to be adequately mitigated.

2. **Flooding from the the River Glen.**

The predicted maximum 1 in 100 year water level at the present time is 4.32m OD and the predicted 1 in 1000 year water level at the present time is 4.47m OD. These predicted levels are lower than the defence levels on this section of the bank of the River Glen which are all higher than 4.75m OD.

Predicted water levels with climate change are 4.91m OD for the 1 in 100 year event and 4.98 OD for the 1 in 1000 year event. Therefore some flooding is possible in a 1 in 100 year event in 2115.

Although the actual risk is extremely low there is a residual risk if the defences were to fail. The River Glen does not have a 1 in 100 year standard of service at the present time, and the flood risk will increase in the future unless work is carried out by the EA to raise banks. The most common reason for breaches is overtopping of earth banks. This type of failure is more likely to happen at locations to the west of Pinchbeck where the earth banks are lower.

Flooding is more likely from this source, but the risk of flood water reaching the site following a breach in the south bank of the river is extremely low.

Therefore this source of flooding can be considered to be adequately mitigated.

3. **Flooding from Vernatts Drain.**

The SFRA states that the maximum water level in Vernatt's Drain is 3.79m OD. This is 450mm below the bank levels on the east side of 4.25m OD. This maximum water level is only approximately 350mm higher than the estimated level of the ground floor

of the house, and therefore this source of flooding can be considered to be adequately mitigated.

4. <u>High water levels in IDB drainage channels.</u>

Surface water from this area of Pinchbeck drains into the Blue Gowt No 1 Drain which flows eastwards north of Wardentree Lane to Pinchbeck Marsh Pumping Station at Marsh Road. The flow can also flow westwards to Pode Hole Pumping Station in certain conditions where it is pumped into Vernatts Drain.

W & D IDB have stated that although all of this system operates well at the present time if more development is approved in the area further improvements will be carried out to ensure that the standard of drainage is maintained in the future

If a failure occurred in any part of the IDB system levels would rise in the drainage channels and eventually lower agricultural land could start to flood.

Drainage channels maintained by the Welland and Deeping IDB generally have a 1 in 10 year standard with up to 1.0 metre of freeboard, which generally provides between 1 in 50 and 1 in 100 year standard against flooding.

The risk of water levels rising to above 3.00m OD in the IDB drains are remote and therefore this source of flooding can be considered to be adequately mitigated.

5. <u>Flooding from Failures of IDB Pumping Stations</u>

As stated above the water in the Blue Gowt No 1 Drain can either flow to Pode Hole Pumping Station to the west or to Pinchbeck Marsh Pumping station to the east.

Pode Hole Pumping Station is the main pumping station operated by W & D IDB, and there are both diesel and electrically powered pumps available in the pumping station. All of these pumps are kept in very good order by the IDB and the scenario of no pumping capacity being available at Pode Hole is remote.

The original pumps at Pinchbeck Marsh had a capacity of 1.5 cumecs, and the new part of the pumping station built approximately ten years ago added a further 1.5 cumecs of capacity. The catchment area that the pumps serve is 850 hectares.

Maximum predicted water levels in the IDB catchment controlled by Pode Hole Pumping Station in a 1 in 100 year event in 2115 are below 1.00m OD and therefore this source of flooding can be considered to be adequately mitigated.

6. <u>Surface Water Flooding</u>

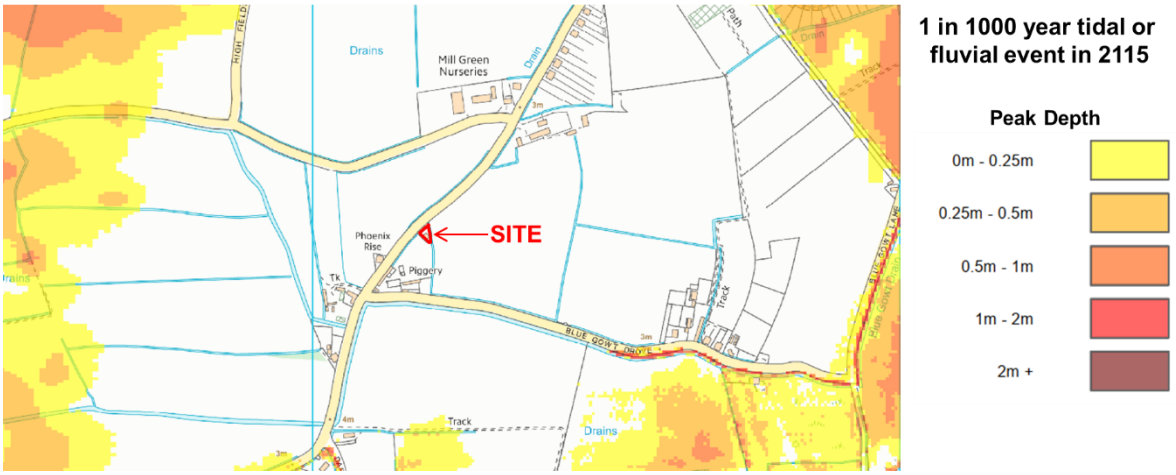
It is noted that the house is 150mm higher than all of the surrounding gardens and driveways. Therefore any accumulations of surface water will soakaway before there is a risk of flooding from this source. It is noted that the Environment Agency surface water flood map does indicate a small area of flooding could occur, but there has been no instances of this in the past.

Climate Change

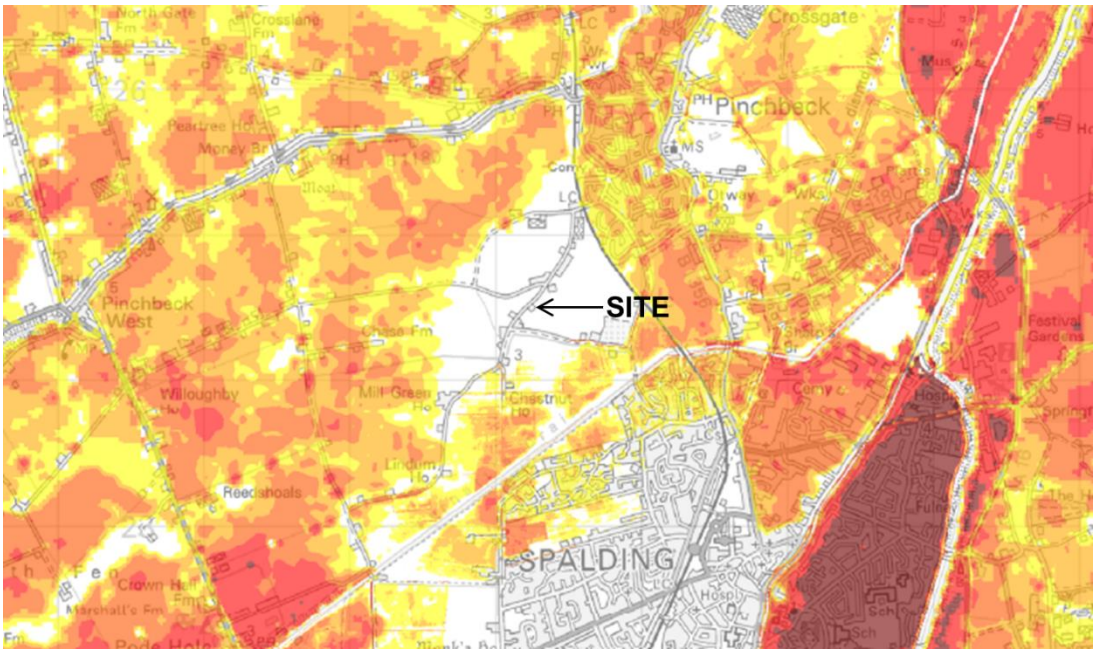
The recommendations for flood depths for this flood risk assessment use information mostly taken from the South Holland DC SFRA which was last updated in 2010. The EA have issued new guidance on recommended contingency allowances for predicted sea rises, fluvial flows and rainfall intensities which from 19th February 2016 needs to be considered in this FRA. The effects of these new recommendations have been considered and it is concluded that no extra mitigation measures are necessary to comply with the new guidance on climate change.

Summary of Flood Risk

Part of the map in the South East Lincolnshire SFRA which shows the predicted residual peak depths in 2115 for the 0.1% (1 in 1000 year) tidal or fluvial event probability is shown below and this does not predict any flooding in the vicinity of the site of the proposed extension.



Part of the map showing the predicted flood depths in a 1 in 200 year tidal or 1 in 100 year fluvial event in 2115 is shown below.



This map shows the area west of the railway line is not predicted to flood but areas west of the site towards Pinchbeck West and the area immediately south of the River Glen would be flooded. This indicates that if a bank of the River Glen were to breach the ensuing flood water would be unlikely to flood the site in a 1 in 100 year event in 2115.

Conclusions

The proposed development is not in a functional flood plain as defined by the Technical Guidance.

Although the site is in flood zone 3, the actual risk of the site flooding from any Environment Agency watercourse is extremely low.

The map of predicted flood depths shown above does not predict any flooding will occur to the site from either the tidal River Witham or the River Glen in a 1 in 1000 year event in 2115.

The risk of flooding from a breach in the Vernatts Drain or from the Blue Gowt Drain has been shown to be extremely low.

In a flood risk area there is always a risk of an event occurring of greater magnitude than has been considered in this flood risk assessment.

Conclusions

The Environment Agency have a very advanced and robust warning system for predicting high tide levels in coastal waters and high water levels in the rivers. This can predict a very high tide which could overtop the defences of the Haven, and high river levels in the River Glen.

The owners of the dwelling should sign up for advanced flood warnings so that they can prepare for the risk of flooding.

There is a refuge on the first floor of the property where residents of the house can stay safe if flooding does occur.

The proposed extension does not create any additional sleeping accommodation and therefore it is assumed no additional people will be at risk of flooding after the extension has been completed.

Recommendations

It is recommended that the ground floor of the proposed extension should be constructed with the finished ground floor level at the same level as the existing dwelling.

It is recommended that the new extension should be designed and constructed with flood resilient measures incorporated. These measures will include;

- All electrical services should be placed at first floor level and cables dropped down to the sockets, which should be a minimum of 600mm above the floor level.

- Skirting boards and plaster finishes should be able to withstand flood damage if 150mm of water entered the building and remained for a few days.
- Suitable tiles should be used as flooring in the new extension.

The owner of the property should register with the Environment Agency's Floodline Warnings Direct Service.

22nd January 2025

Stuart Hemmings B Sc C Eng MICE MIWEM

Tel: 01733 566966 or Mobile: 07804 189365

stuart.hemmings@btinternet.com

APPENDIX

FLOOD WARNING AND EVACUATION PLAN

Future owners of the property should register with the Environment Agency's Floodline Warnings Direct Service.

If a warning is received from the Environment Agency all occupants of the house should be informed of the situation. If there are visitors at the house who do not normally live there they should leave the house as soon as possible and return to their own residencies.

Details of Flood Warnings.

The Plan will have **four** trigger points:

1. **Flood Alert**



The Environment Agency will issue a Flood Alert status when flooding is possible. Issued 2 hours to 2 days in advance of flooding.

Means; - A very high tide is expected which could overtop or breach the banks of the River Welland, or high water levels are predicted in the River Glen.

What to do;

- Monitor local news and weather forecasts
- Check on an hourly basis with Floodline for updates
- Be aware of water levels near you. Check if river levels are rising. If water is already on the floodplain, consider leaving the site.
- Be prepared to act on your Flood Plan
- Charge mobile phones.

Think about what items you would want to move to safety during a flood.

As this site is immediately north of the Haven the automated Environment Agency Flood Alert or Flood Warning will normally warn of the possibility of very high tide levels:

The owner of the house should listen to Local Radio to ascertain the probability of flooding in the Pinchbeck area.

2. **Flood Warning**



The flood warning will be issued, half an hour to 1 day, in advance of flooding, when water levels are rising, it is advised to safeguard the property and prepare to evacuate.

The owner of the house will ensure upon receipt of this warning that steps are taken to reduce the damage that could occur to the ground floor of the property. In the case of the situation deteriorating but if there is water already on the flood plain, be aware that parts of the evacuation route may be flooded.

Means; Flooding of homes and businesses is expected to ACT NOW.

What to do.

- Act on the flood plan
- Move all cars to safety
- Prepare to turn off gas, water and electricity from all equipment. Safety lockout procedures should be used
- Protect yourself, and help others

3. **Severe Flood Warning**



A severe flood warning means that severe flooding is expected. This will be issued when flooding poses a significant threat to life and different actions are required. There will be an extreme danger to life and property and people are advised to act immediately i.e. **Evacuate if safe to do so.**

If this situation occurs then the occupants of the house will see the water level in the Blue Gowt Drain very high then starting to flood onto adjacent fields. This flood water will only be rising slowly. It is assumed that as this situation will have taken at least a day or two to develop the owner of the house will either have evacuated the area or have moved everything possible onto the first floor of the property.

Before evacuating the house, the owner must ensure that the site is secure. If flood waters have entered the site, switch off all power by removing the mains isolators, to minimise risk of fire or electrocution.

Means: Act now as severe flooding is expected and extreme danger to life and property.

What to do;

- If safe to do, stay in a high place, with a means of escape or evacuate the site as stated in the plan or as advised by the Emergency Services.
- Avoid electricity sources
- Avoid walking or driving through flood water
- In danger, call 999 immediately
- Listen to emergency services.

Act on the flood plan.

4. **Warnings no Longer in Force-**

Means: - No further flooding is expected. Water levels will go down.

What to do;

- Listen to emergency service.
- Keep listening to weather reports
- Only return to evacuated sites when told to do so.
- Beware of sharp objects and pollution in floodwaters.

When the Environment Agency has issued the all clear notice for the area, the owner of the house should contact the local authority to check that it is safe to return to their property.

All occupants of the house should be aware that if floodwaters have flooded the house the latter will need to be cleaned disinfected and repaired and fully dried out prior to reoccupation. Ask for advice before cleaning up. The building must be checked to ensure it is safe before entering the building, and if there are any doubts professional opinion should be sought.

If there is any doubt that appliances may be water damaged, they must be checked before switching the power or gas back on. Contact the insurance company as soon as possible to get their approval before arranging any clean-up or repairs.

Annual Review

This Flood Evacuation Plan should be reviewed at least annually, in accordance with Environment Agency guidance and considering the rise in sea/river level due to global warming and the following actions: -

- Read and understand the plan and update the contact lists.
- Contact the Environment Agency to check that the flood risk to the property has not changed.
- Contact the Environment Agency Floodline Service to ensure that you are still registered to receive flood alerts by your preferred method.
- Know how and where to isolate gas, water and electric supplies.
- At least once a year a test, of the evacuation plan will be carried out will all staff to ensure that all they are familiar with the plan and its procedures.

An Emergency grab kit must be provided on site within a safe area and maintained on a regular basis, which contains the following: -

- Bottled water
- A first-aid kit, including a supply of any essential medication.
- A windup or battery torch radio and supply of batteries.
- A list of useful telephone numbers.
- Wellington boots or similar waterproof boots.
- Know how to turn off the gas, electricity and water mains supplies.
- A copy of the insurance cover – ensure it covers flood damage.

REMEMBER

Do not walk through flowing water- Currents can be deceptive and shallow fast flowing water can knock you off your feet.

Do not swim through fast flowing water- You may get swept away or struck by an object in the water

If you must walk in standing water- Use a pole to ensure that you do not step into deep water, open manholes or ditches.

Do not drive through a flooded Area-You may not be able to see abrupt drop offs and depths over 0.5m can carry a car away.

Avoid contact with flood Water-It may be contaminated with sewage, oil chemicals or other substances.

The **Floodline** telephone number is **0345 988 1188** for up to date flood information