Flood Risk Assessment for change of use change of use at
St Hughs Community Hall, Martin Dales, Lincolnshire. LN10 6ZX

1. The site

St Hughs Community Hall is located on Martin Dales Drove, in the village of Martin Dales, Lincolnshire, as shown on the map below. National Grid Reference TF1750061975.

Site Location Map

Land levels in the village generally fall as you move westwards from the River Witham, where they are around 2.mAOD next to the flood defences, falling to around 1.0mAOD on the western edge of the village. The wider fenland area, the fields to the west of the village are generally below 1mAOD.

Land level at the site, taken from the tarmac in front the building, are around 1.8mAOD and a new floor has recently been laid in the property at a level of around 1.90mAOD

Site Photograph – front facade

2. Proposed Development

The site is with Flood Zone 3a, which is defined as being at risk in a flood with an annual chance of 1% [1:100] assuming no defences exist.

In terms of Flood Risk Vulnerability Classification, as set out in the National Planning Policy Framework [NPPF] both the existing use [church hall] and proposed used [retail] as classed as Less Vulnerable.

Therefore, whilst a change of use is proposed is terms of normal planning policy, in terms of flood risk vulnerability there is no change.

As the proposal represents no increase in flood risk vulnerability or increase in hard surface leading to increase run off, a full detailed flood risk assessment is not considered to be necessary. However consideration of the main risk to the site has been undertaken, at an appropriate level of detail.

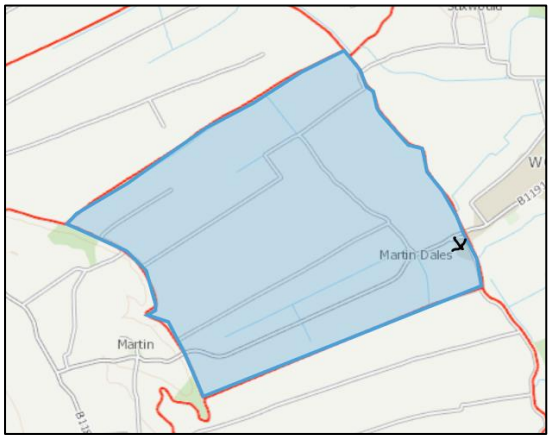
3. Sources of Flood Risk

The primary source of flood risk to the site is the River Witham, approx. 140m to the east of the site, which has large earth embankments as its main defence along it.

Flood level in the River Witham is approx. 4.4mAOD which is around 2.6m higher than the site level. Flood flows are around 105 cumecs. Levels in the River Witham are governed by a number of factors, noticeably the rate at which water can be discharged to sea, at Grand Sluice in Boston some 25km downstream. Although this appears to be some distance away, the very flat gradient of the river system means there is little difference in flood level from Grand Sluice to the site.

Whilst the risk from these flood levels is reduced by the embankment defences, such that overtopping of these banks would not be expected in a normal flood, there always remains a residual risk of the defence failing [breaching] and it is necessary to consider the impact of this.

The flood cell associated with a breach in the right bank of the River Witham at Martin Dales is around 22Km^2 in size, being bounded by the Witham, Timberland Delph, Carr Dyke and Methringham Depth.



Flood Cell Extent

As has been stated land levels fall away from the River Witham to a general level of 1mAOD [maximum] for the majority of the flood cell. Water flowing through a breach would flow past the site and spread out in the wider flood cell. As the tidal gates at Grand Sluice close twice a day with high tide and given the flat gradient on the river system, any breach in the River Witham bank would effectively become the new tidal outfall with a large proportion of the river flow passing through it.

Current local Environment Agency guidance is to consider a breach remaining open for 72 hours before it can be effectively sealed. Therefore if it is assumed 75% of the flow in the river can pass through the breach, over a period of 72 hours this gives a flood volume of around 20.4million m^3.

Volume = [0.75 x 105] x [60 x 60 x72] = 20,412,000 m3

Spread over an area of 22,000,000m^2 [22Km^2] this gives an average depth of 0.92m, which assuming a general land level of 1mAOD, would give possible **FLOOD level of 1.92mAOD**

This could give a flood depth of 0.12m at the property entrance and 0.02m [ie minimal] internal flooding.

4. Mitigation

The above simple calculation shows the site could be at risk of flooding following a failure of the River Witham defences.

Whilst the resultant flood depths are likely to be less than 0.1 metres there is a chance that, in the unlikely event of a breach in line with the end of Martin Dales road, flood depths could be slightly higher as water flows from the River Witham to the surrounding lowland.

A breach elsewhere in the River Witham defence will not flow past the property and only the resultant flood depth, of less than 0.1m, needs would be of concern.

However, to mitigate against the small risk of slightly deeper water flowing past the site the following mitigation measures are suggested:

- Flood resilient construction to a level of 0.3m above finished floor level.
- Sign up to Environment Agency Flood Warning Service.