# PROPOSED BAKERY EXTENSION

HAYWOOD & PADGETT
THE BAKERY
SHAWFIELD ROAD
BARNSLEY
S71 3HS

## FLOOD RISK ASSESSMENT

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## 1.0 INTRODUCTION

This Flood Risk Assessment (FRA) has been prepared to assess the flood risk at a proposed development at Haywood and Padgett, The Bakery, Shawfield Road, Carlton, Barnsley.

Reference has also been made to the Barnsley Preliminary Flood Risk Assessment Report, July 2011. This is referred to as the PFRAR within this report.

In addition, the Barnsley Strategic Flood Risk Assessment (SFRA), September 2010, has also been referenced.

The Environment Agency flood risk map has been assessed through the Environment Agency website, but no specific consultation has been made to them.

This Flood Risk Assessment has been prepared in accordance with the National Planning Policy Framework and the associated Planning Practice Guidance.

This report is commensurate with the scale and type of development proposed and utilises information available to determine the flood risk at this site and if necessary to plan a methodology to allow this site to be developed with minimum flood risk. It considers and assesses:-

- Whether the proposed development is likely to be affected by flooding and whether the proposals will increase the risk of flooding elsewhere.
- Determination of any sources of flood risk.
- An initial assessment of pre-development and post-development surface water drainage.
- Any recommended mitigation measures.

## 2.0 SITE LOCATION

The proposed site is situated within the Carlton Industrial Estate with access off Shawfield Road.

The pre-development site is generally a rectangular shaped site extending to approximately 9700 square metres (0.97hectares).

The pre-development use of the site is an access road; buildings and hard-standings constructed from concrete, tarmac and also softer materials.

The approximate national grid coordinates of the site are 436600E, 408800N. A location plan is included as Figure 2.0.



Figure 2.0 Location Plan.

## 3.0 TOPOGRAPHICAL SURVEY

A detailed topographical survey has been undertaken of this site.

The topographical survey was carried out to Ordnance Survey levels obtained by using GPS.

The detailed topographical survey shows that the development site has existing levels varying from around 59.00m adjacent to Shawfield Road to around 61.50m AOD on the far east of the site. The site generally falls from east to west, towards Shawfield Road.

## 4.0 POST-DEVELOPMENT SITE

The development proposal is for an extension of the existing buildings to bakery and warehouse and a second bakery building. There will also be an access road, parking spaces and associated hard-standing. The total impermeable area of the development is approximately 8800 square metres (0.88 hectares).

An outline plan of the post-development site is shown below.

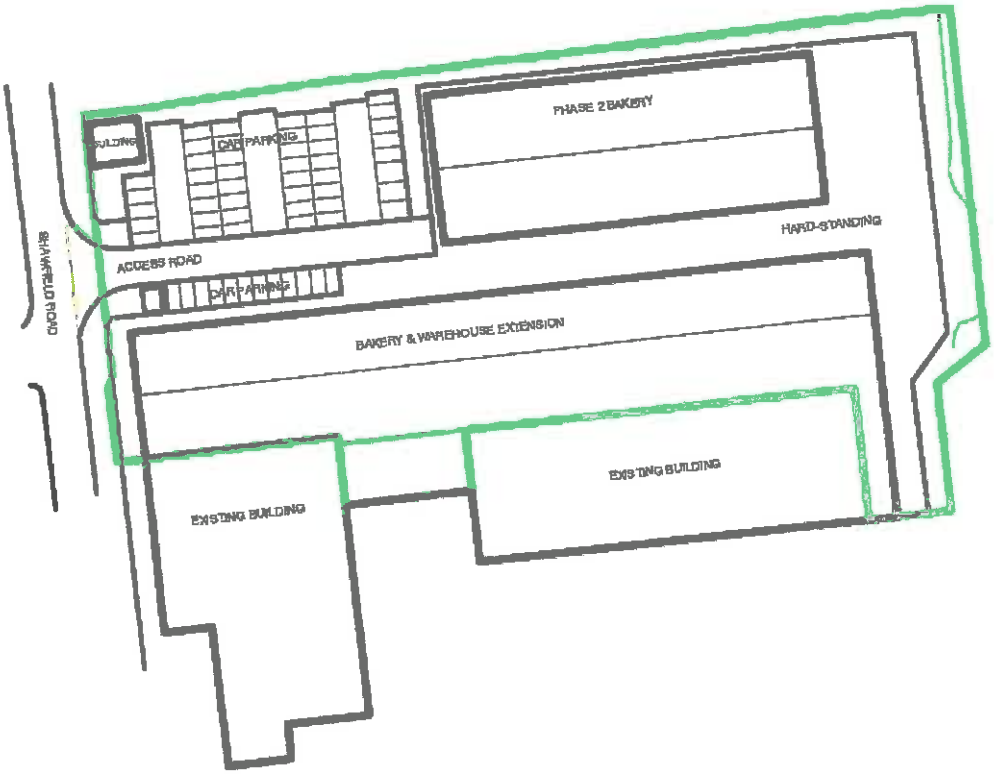



Figure 4.0 Post-development Site - Outline Plan

## 5.0 FLOOD RISK ZONE

The Environment Agency flood map, published on their website, shows that the development site is located in flood zone 1. This means that the development site is at low risk of flooding from rivers.

As the site is in flood zone 1, the chance of flooding in extreme flood events is more than 1 in 1000 each year.

Because the site is located in flood zone 1 the development site is suitable for any type of development.

The Environment Agency flood map is shown below.




Figure 5.0 Environment Agency Flood Map

## 6.0 HISTORICAL FLOODING

The PFRAR does not indentify this area as been at risk of flooding in the past and does not show any historical flood events within this area.

## 7.0 FLOODING FROM ARTIFICIAL DRAINAGE SOURCES

Yorkshire Water keeps records of any property that is of risk of flooding from the public sewerage system. This information includes flooding from foul sewers, combined sewers and surface water sewers. The PFRAR provides details of these areas and none are within the proximity of this development.

Further, if the public sewers adjacent to this site do flood, then the flood water would flow away for the development and will not be a problem to the development.

## 8.0 SURFACE WATER FLOODING

The Environment Agency provide plans of areas that may be susceptible to surface water flooding. The map shows that some small areas on the site have some vulnerable to low surface water flooding. In addition, some deeper surface water flooding may occur on Shawfield Road. The SFRA has also considered surface water

flooding and considers that the surface water flooding on Shawfield Road would be 0.15m to 0.3m deep.

Any surface water flooding on Shawfield Road at this depth would not affect the development site. This is because the development site is elevated above Shawfield Road and rises above Shawfield Road by at least 0.3m and continues to rise.

The small amount of possible surface water flooding on site would be dealt with by the installation of a high standard surface water drainage system.

The EA surface water flood map and an extract of the surface water flood map from the SFRA are provided below.



Figure 8.0 Environment Agency Susceptible To Surface Water Flooding Map

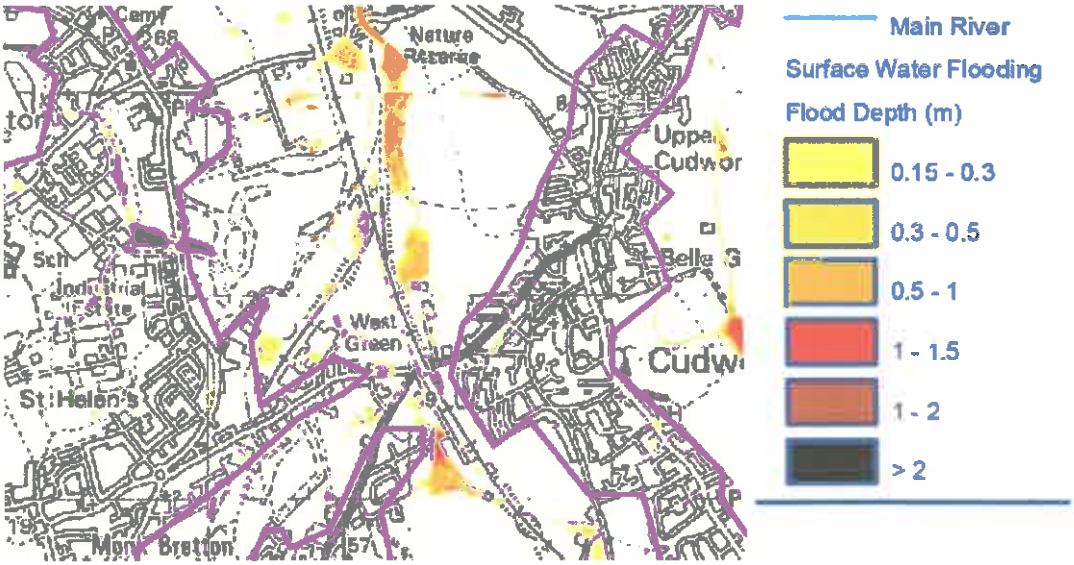



Figure 8.1 SFRA Susceptible To Surface Water Flooding Map with Flood Depths

## 9.0 FLOODING FROM RESERVOIRS

The Environment Agency provides information on any areas that are potentially at risk of reservoir flooding. They advise that reservoir flooding is very unlikely to happen. A search of this information has showed that this area is at risk. However, the risk should be considered very low. A map is shown below as figure 8.0.




Figure 9.0 Environment Agency Flooding From Reservoir Map

## 10.0 FLOODING FROM GROUNDWATER

The PFRAR describes ground water flooding as follows 'Groundwater flooding can occur when groundwater rises up from the underlying aquifer to flood sub-surface infrastructure or to emerge at the ground surface. The two forms of groundwater flooding which are most prevalent include the:

• Rise of groundwater levels to extreme high levels in permeable consolidated aquifers (primarily Chalk) in response to prolonged above average rainfall; and

• Rise of groundwater levels in permeable superficial deposits which are in hydraulic continuity with high water levels in adjacent rivers.'

The PFRAR does not indentify this area as being at risk from flooding from groundwater. The SFRA suggests a few areas within the Barnsley area that may be at risk from groundwater flooding. This site is not one of them.

Overall, the risk to this site from possible ground water flooding should be considered low.

## 11.0 SURFACE WATER MANAGEMENT

This site is at low risk of flooding. The surface water from the re-development of the site should be managed in the post-development site to ensure no flooding will take place on or off site.

## 12.0 POST-DEVELOPMENT SURFACE WATER SYSTEM

The proposals are to provide new buildings, parking and an access road.

The building regulations require that we look at a hierarchy of surface water disposal, which is infiltration, watercourse or sewer.

A stage one site investigation has been carried out and this shows that the site is unlikely to have ground conditions suitable for infiltration.

A surface water culvert is present in Shawfield Road. This culvert is used as the surface water outfall for the existing development. This would be a suitable outfall for the proposed development.

Surface water discharge rates to this culvert should be agreed with Barnsley MBC, as Lead Local Flood Authority. The post-development discharge rates should be less than existing discharge rates and it is usual practice to reduce rates from pre-development levels by 30%.

There is no surface water sewer in the vicinity. This is because surface water flows from the Industrial Estate is to the surface water culvert within Shawfield Road.

Post-development surface water drainage systems should be designed so that no flooding occurs off site within the 1 in 100 year storm event, with an added allowance for climate change.

A flood path away from the development should be provided in the unlikely event any flood water materialises on site. This would be onto Shawfield Road, to follow the natural contours of the development site.

## 13.0 CLIMATE CHANGE

This post-development site surface water system should be designed with an allowance for climate change. In line with good practice this is for a 30% increase in flows.

## 14.0 FLOOD RISK ELSEWHERE

The post-development site has a similar impermeable area compared to the pre-development site. Although the pre-development site may allow some infiltration through 'softer' impermeable areas, it is unmanaged and during larger storm events, run-off will be from the entire pre-development area.

The post-development surface water system will be managed carefully on site to ensure no flood water leaves the site. Any water leaving the site will do so in a controlled manor, as agreed with the Lead Local Flood Authority.

Therefore, there will be no increase of flood risk elsewhere.

## 15.0 SAFE ACCESS AND EGRESS

Safe access and egress from the development will be to Shawfield Road.

## 16.0 RESIDUAL FLOOD RISK - MITIGATION

Although this site is at low risk of flooding, it is always prudent to incorporate some residual flood risk measures to protect the proposed development. This can be provided by setting the floor levels of the building above the adjacent ground level and/or by providing a safe flood route away from the buildings.

## 17.0 CONCLUSIONS

- This proposed development site is in flood zone 1. There are no identified flood risks to the site and so the site is suitable for any type of development.

- The post-development site will have a surface water managed system that will prevent any surface water flooding on or off site. And discharge at a controlled rate to the surface water culvert in Shawfield Road.

- No additional flood risk elsewhere will be created by this development.

Report by

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