FRITH:BLAKE
CONSULTING LTD

FLOOD RISK ASSESSMENT

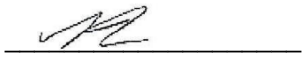
PROPOSED REPLACEMENT OFFICE, CAWTHORNE, BARNSLEY

On behalf of Naylor Drainage Ltd

Revision V1

Quality Assurance

Report Title:	Flood Risk Assessment
Project:	Proposed Replacement Office, Acton Works, Lane head Road, Cawthorne, Barnsley, S75 4AD
Project No.:	4300
Client:	Naylor Drainage Ltd
Revision:	V1

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1. Introduction:

Frith Blake Consulting Ltd have been instructed by Naylor Drainage Ltd to prepare a Flood Risk Assessment in accordance with the:

- National Planning Policy Framework (NPPF).
- Flood Risk and Coastal Change Planning Practice Guidance (PPG).
- Non-Statutory Technical Standards.

This report will form part of the supporting technical documentation to accompany a planning application for a modular office building to replace the existing offices at Naylor Drainage, Acton Works, Lane Head Road, Cawthorne, Barnsley, S75 4AD.

The application will be submitted by Frith Blake Consulting to Barnsley Metropolitan Borough Council and the purpose of this report shall be to:

- Provide information on the flood risks associated with the application site and to present appropriate mitigation measures for the proposed development where flood risk has been identified.

This is to enable the development to obtain planning permission without objection from the Local Planning Authority (LPA) or their consultees and so that the site, its occupants and the surrounding development is at the minimum risk of flooding.

Additional details relating to the drainage strategy will be submitted to the LLFA during the planning consultation stage with the aim of avoiding pre-commencement planning conditions in relation to drainage.

2. Development Details:

2.1 Site Location

The application site is located:

- **Site Address:** – Naylor Drainage, Acton Works, Lane Head Road, Cawthorne, Barnsley, S75 4AD.
- **Grid Reference: –** 881992 1091431

Figure 2.1 and 2.2 below show the proposed development location.

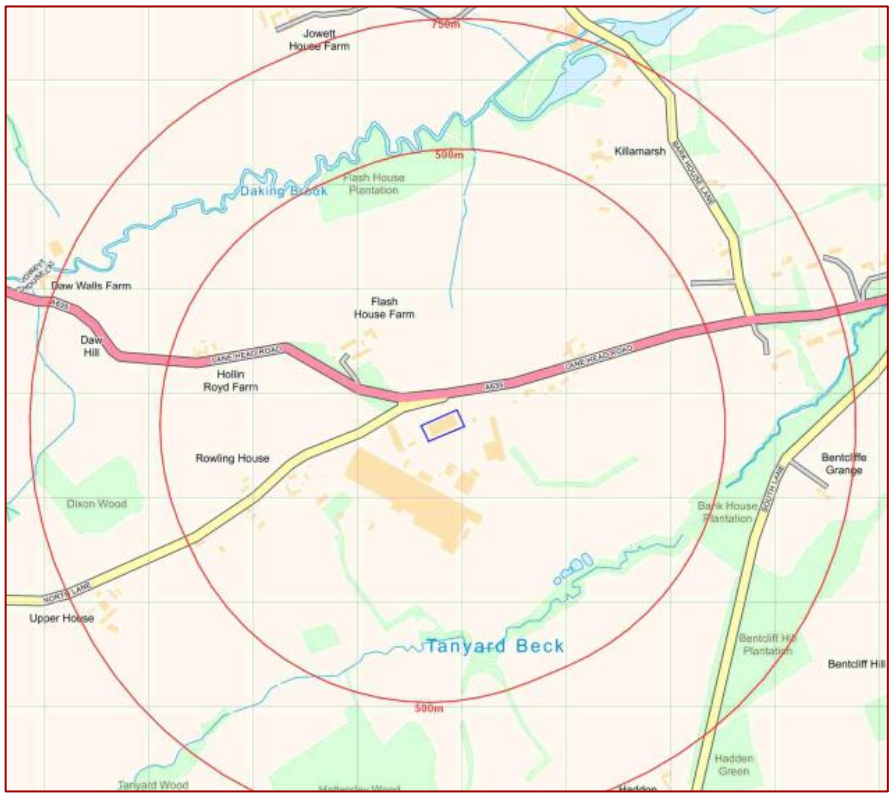


Figure 2.1 - Site Location Plan



Figure 2.2 - Aerial Photograph

2.2 Existing Site Description

The proposed development is positioned in the location of the former brickworks within the wider factory site for Naylor Drainage. The original building was demolished in 2021 and the outline of the original building can be seen in the aerial photograph as Figure 2.2.

The site boundaries are defined by the following:

- To the north is hard paved car parking for staff at the factory;
- To the east are hard paved areas used for storage of materials and produce;
- To the south is a hard paved area used for storage of materials and produce;
- To the west are hard paved areas used for storage as well as the access to the proposed development and principal access road to site from the public highway.

A topographical survey has not been undertaken at this stage but the site is broadly flat with an average level of 122.66m AOD.

The existing site has a positive drainage system that discharges to a number of settlement lagoons to the south east. Water is pumped back to the factory for process and the remaining discharges at a controlled rate over a weir and spillway to Tanyard Beck. Naylor Drainage have an agreed discharge agreement with the Environment Agency and undertake sample testing to demonstrate suitable levels of suspended organic solids within the outfall water.

2.3 Development Proposal

The proposed development as shown below comprises an office development formed using modular pre-fabricated construction. The offices will provide replacement accommodation for the existing offices on site that are inefficient, have structural defects and do not support the operational needs of the company.

Until recently the development site was occupied by buildings constructed as part of the original brickworks located at the site. The buildings were demolished in 2021 to ground slab level. The site and all surrounding area is hard paved and positively drained to settlement lagoons to the south east. Water from the lagoons is either pumped to the factory for use in the process of discharge at a controlled rate into the adjacent beck.

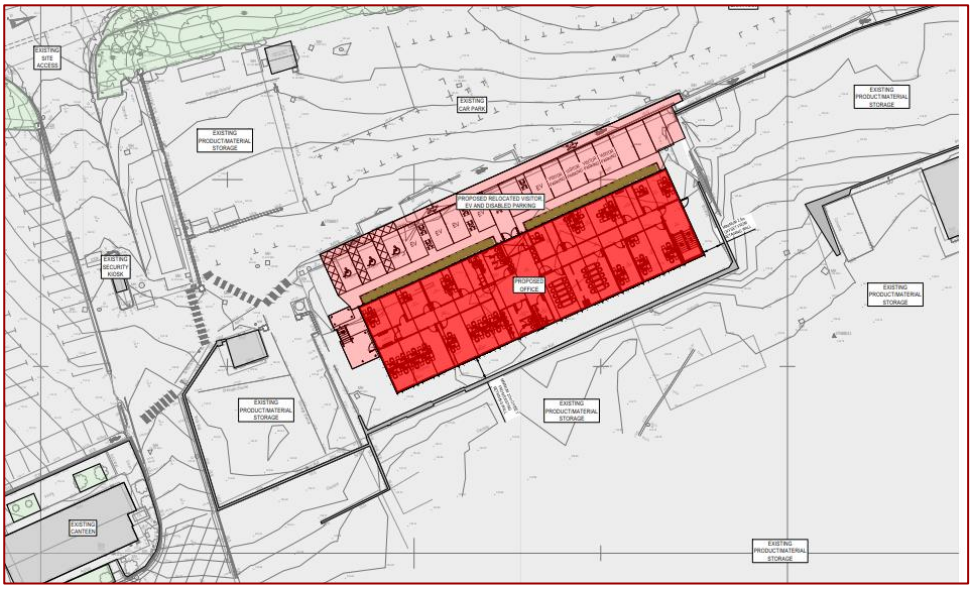


Figure 2.3 - Proposed .Development

The proposed development layout has impermeable area of 0.1025 ha comprising roof area and hard paving. This replaces the existing hard paved development and there is no net increase in impermeable area as the proposed building is smaller than the original.

3. Flood Hazard Review:

3.1 Flood Maps for Planning

The flood maps for planning indicate that the building is within Flood Zone 1 (Low Risk).



Figure 3.1 – Flood Map for Planning

3.2 Source of Flooding

Fluvial Flooding is caused by rivers and occurs when the river channel capacity is exceeded by the flow. Most rivers have a natural floodplain which in built up areas is sometimes encroached upon by development.

The fluvial and tidal flood mapping available on the GOV.UK website and as shown in Figure 3.2 below, demonstrates that the entire development site is located outside any areas identified as being at an increased risk of flooding.

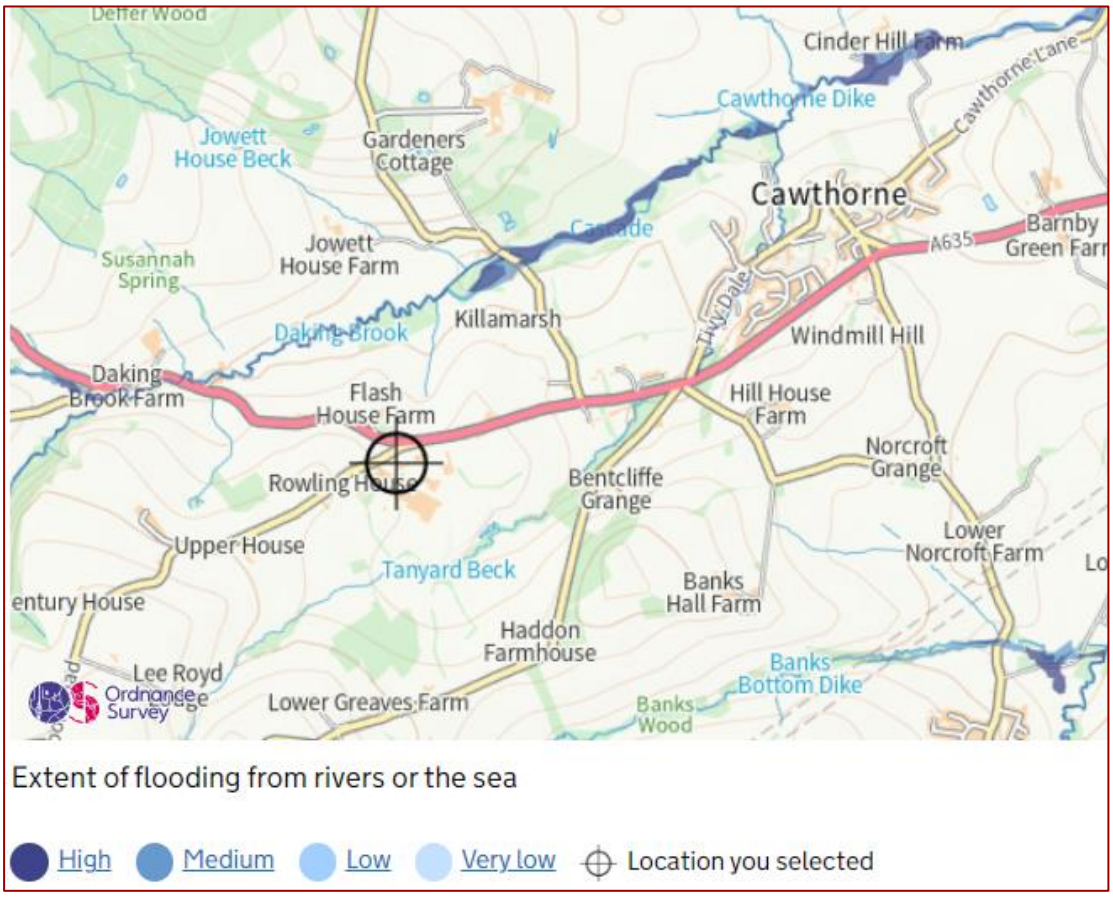


Figure 3.2 - Fluvial & Tidal Indicative Flood Mapping

Therefore, the proposed development is considered to be at a 'VERY LOW RISK' of flooding from this source.

Tidal Flooding from the sea occurs when high tides and storm surges raise the level of tidal waters above the level of the shore or river bank. They can be sudden and severe, but are dependent upon a number of factors.

As shown within Figure 3.2 above, the proposed development site is located outside of any areas of increased risk.

Therefore, the development is also considered to be at a VERY LOW RISK of flooding from this source.

Surface Water Flooding can occur within a dense developed area where there are large areas of impermeable surfacing e.g. roof areas, apron slabs and roads. It is possible during high intensity rainfall storms for surface water runoff to be unable to soak into the ground or enter the man-made drainage system at a quick enough rate. Where this occurs, the excess water can flow across land and potentially cause flooding.

The indicative Surface Water Flood Mapping associated with the proposed development site have been included within Figure 3.3 and highlights that the site falls within an area at very low risk of surface water flooding. There is a small area of higher risk flooding shown to the east of

the development site. A review of the topographical survey highlights that the overland route for surface water in this area would divert around the development site to the east.

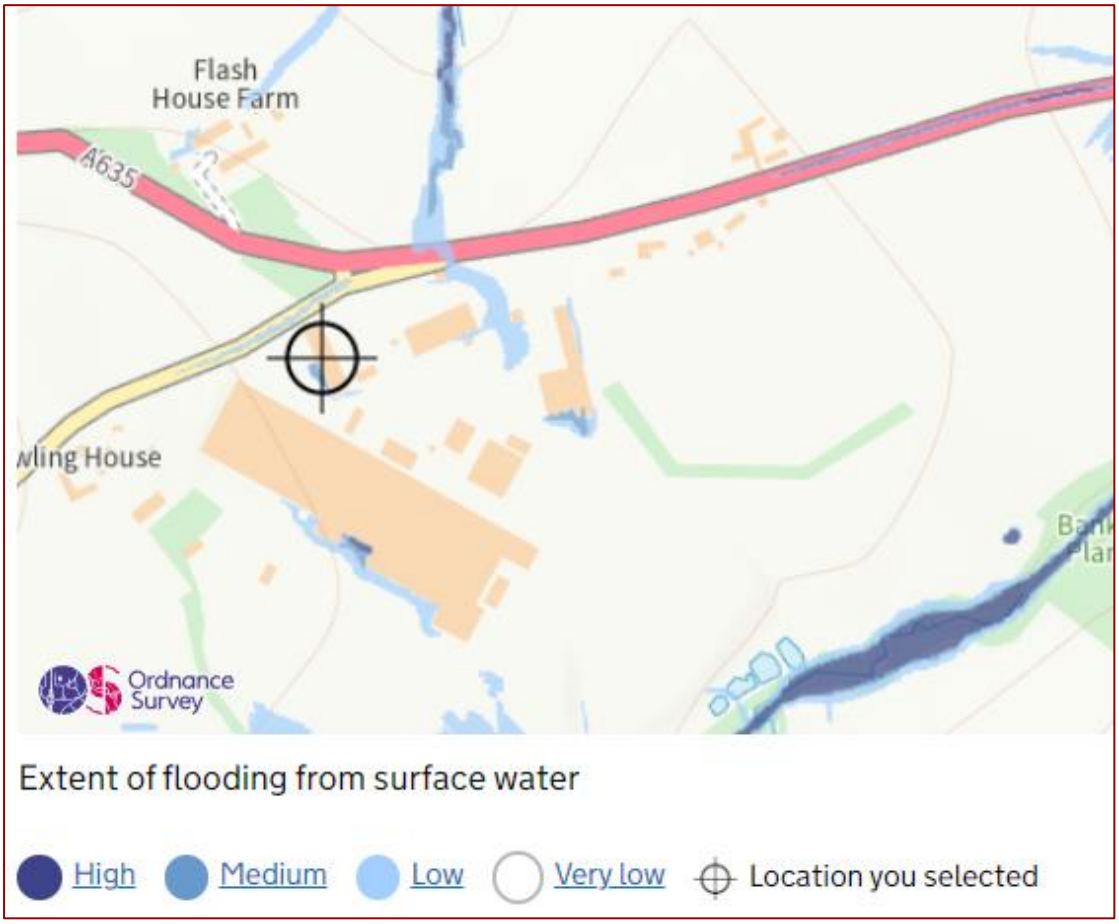


Figure 3.3 - Surface Water Flood Map

Therefore, the development is also considered to be at a low risk of flooding from this source. However, the location of the building within a hard paved industrial site increases the risk of flooding associated with blockages to the surface water drainage system. Therefore we have deemed the overall risk rating to be MEDIUM.

Groundwater Flooding occurs in areas where the level of groundwater is high; rainfall that soaks into the ground can raise it to a level where structures within the ground are at risk of flooding. Structures such as basements or detention ponds can be at risk, although this is dependent upon the ground conditions of the site.

The below extract from the GEO-Insight data sheets highlights that the site is at LOW RISK of ground water flooding.



Figure 3.3 - Surface Water Flood Map

Non-natural or artificial Flooding can include reservoirs, canals and lakes where water is retained above the natural ground level and flooding may occur as a result of the facility being overwhelmed and/or as a result of dam or bank failure. The potential effects of flood risk management infrastructure should also be considered.

The reservoir flood mapping available on the GOV.UK website and as shown in Figure 3.5 below demonstrates that the proposed development is outside of areas of higher risk.

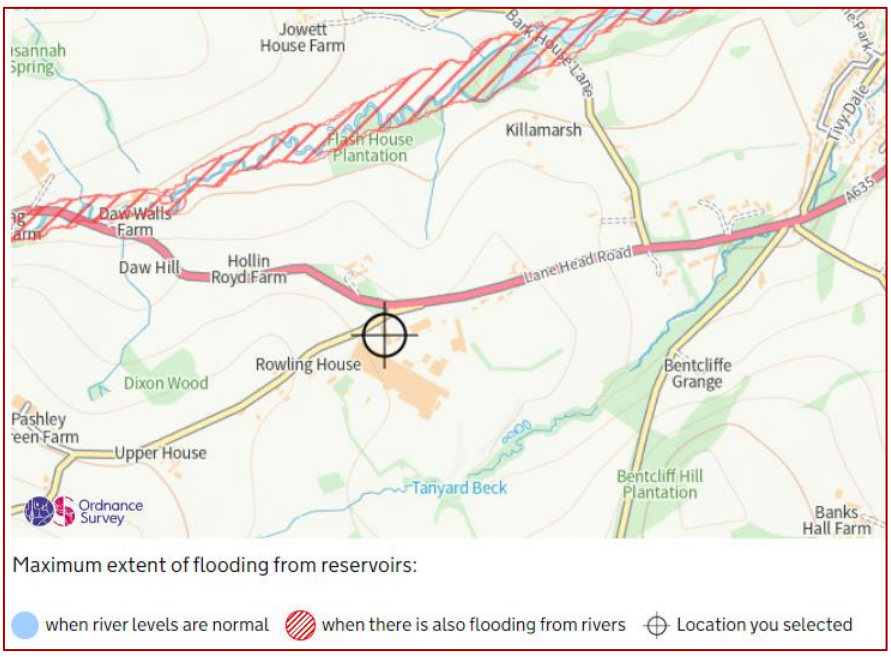


Figure 3.5 - Reservoir Indicative Flood Mapping

Therefore, the risk of flooding from this source is considered to be VERY LOW.

3.3 On-site Observations

No additional observations were made in relation to flood risk and surface water drainage which would appear to affect the development of the site.

3.4 Description of Flooding

The site is considered to be at LOW RISK of flooding with the exception of risk of flooding from the following sources:

- Surface water flooding which is considered to present a MEDIUM RISK due to the impermeable area created by and surrounding the proposed development site.

Therefore the focus of this report will be to mitigate the flood risks posed from this source by;

- Implementing the Finished Floor Level (FFL) and site level design during the detail design stage;
- Designing an appropriate surface water drainage strategy to take into consideration the existing surface water flood risk and to ensure that the design does not increase the risk of localised flooding to third parties;
- Implement a robust maintenance strategy to ensure that the piped network and attenuation lagoons are well maintained throughout the life of the development.

3.5 Access and Egress

In accordance with the NPPF and the Flood Risk and Coastal Change PPG, access and egress to the site during a range of storm events should be considered with preference being over dry land, however, where this is not possible evacuation should fall within the white cells as classified within Table 13.1 of FD2320_TR2.

The proposed development is located within Flood Zone 1 and therefore access and egress associated with wider flood events is not considered an issue. However, the proposed drainage design and levels will be coordinated to ensure that safe access and egress can be maintained during periods at higher risk of surface water flooding.

3.6 Vulnerability Classification

Table 2 of the Flood Risk and Coastal Change PPG provides a list of different types of development which fall into the vulnerability classifications also defined within the NPPF.

The proposed development is intended for commercial/office use and therefore the flood risk classification indicates that this falls within the **"More Vulnerable"** classification.

3.7 Sequential and Exception Tests

The proposed development is classified as More Vulnerable development in accordance with Table 2 of the Flood Risk and Coastal Change Planning Practice Guidance (PPG) and is shown to be within Flood Zone 1on the Government's indicative flood mapping as shown in Figure 3.1 and 3.2.

- The proposed development is suitable within Flood Zone 1 from a Sequential perspective;

- The Exception Test is not required to be undertaken by the Local Planning Authority as part of the planning process.

4. Flood Risk Management Measure:

To enable the site to be considered in line with the NPPF and the Flood Risk and Coastal Change PPG, appropriate flood mitigation measures need to be set in place. The measures laid out below, are put forward as those that will be incorporated within the detailed design and operation of the proposed development

4.1 Level Regime

The Finished Floor Level (FFL) of the proposed offices will be dictated by the links to the existing car park and pedestrian routes from the existing car parking to the north. The levels will be designed to ensure that the external levels fall away from the building and that overland flows from the surrounding hard paved areas are routed around the building.

4.2 Surface Water Drainage Strategy

The proposed development is on the footprint of a former building demolished in 2021. The site is positively drained to a managed surface water system of settlement ponds. Water is pumped from the ponds for use in the factory and excess water outfalls into Tanyard Beck as a monitored. discharge agreed with the Environment Agency.

The proposed development does not increase the surface water flow rates or volumes when compared to existing.

As the detailed design is progressed a detailed drainage layout will be prepared and submitted to the LPA to support the application and to try and avoid any pre-commencement conditions.

5. Off-site Impact:

Impact of the Development on the Hydrological Morphology

The application site is located within Flood Zone 1. The proposed development is on the site of a positively drained former building that discharges to an existing attenuation system with a controlled outfall to the adjacent beck.

Therefore the development will have no significant impact on the hydrological morphology of the surrounding area.

Impact of the Surface Water Drainage Strategy

The proposed development is on the site of a former positively drained former building that was demolished in 2021. The existing drainage network will be utilised to discharge flows to the existing settlement lagoons designed to accommodate the critical storm events in accordance with the NPPF and the Flood Risk and Coastal Change PPG.

Therefore there will be no significant increase in the risk of surface water flooding to the site, its occupants or existing surrounding development.

6. Residual Risk:

Remaining Flood Risk

The residual flood risk to be considered within this report:

- The residual flood risk is associated with poor maintenance resulting in a reduction in the capacity of the drainage network, settlement lagoons and the surrounding area. If the maintenance of these elements is not undertaken there is an increased risk that they could cause onsite flooding.

Risk Management Responsibility

The risk management measures below are recommended to reduce the residual risk to the site and its occupants.

The maintenance of the private sewer network, settlement lagoons, weir and spillway are located within the wider site area and will be undertaken by the Naylor Drainage.

Maintenance Regime

The maintenance of the private sewer network and surface water attenuation located within the site can be dealt with through the implementation of a maintenance regime which will be undertaken by the Naylor Drainage.

The preliminary maintenance regime for the private storm and foul water drainage network is set out below;

- Inspection and clearance of all Catchpit Gullies, Inspection Chambers (IC) and Manholes to be undertaken on a six month basis.
- Inspection and clearance of all gutters and filter meshes to be undertaken on an annual basis.
- Inspection and clearance of the flow control weir, spillway and settlement ponds should be undertaken on a six month basis.

The maintenance regime recommended above is put in place to minimise the risk of blockages occurring and to prevent surface water surcharging from the inspection chambers and manholes. However, the final maintenance regime should be undertaken during the detail design stage to ensure the proposal suits the final design of the surface water drainage network. If flooding from the drainage system occurs, then the cause should be identified and dealt with immediately and if considered appropriate, the maintenance regime should be adapted to ensure the cause of flooding does not occur again in the future.

7. Discussion and Conclusions:

This Flood Risk Assessment has been undertaken in accordance with the National Planning Policy Framework (NPPF) and the Flood Risk and Coastal Change PPG.

The report demonstrates that the development site;

- is located within Flood Zone 1.
- is considered to pass the requirements of the Sequential test.
- is not subject to the Exception test during the planning process.
- Does not increase the impermeable area and will utilise the existing managed surface water system discharging to a series of settlement ponds before discharging to Tanyard Beck over a weir and spillway in accordance with the discharge agreement with the Environment Agency.

Therefore, the proposed development is considered appropriate from a flood risk perspective subject to the implementation of the recommended mitigation measures put forward as part of this report and the development of a sustainable surface water drainage strategy.