SUPPLEMENTARY

FLOOD RISK ASSESSMENT

Change of use

from garage to retail with extension;

FORMER GARAGE,

BROOKFIELD DINTING, GLOSSOP

DERBYSHIRE, SK13 6JF

26 June 2013

Note: Previous Application and FRA were for complete new build

Revised in response to:

- **EA letter ref: LT/2013/116074/03-L01**
- **Receipt of site specific flood levels,**

Evacuation procedure has been revised and amended

GLNK Ltd

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If this report has been released electronically, the appendices referred to herein can be found in the annexed zip folder/s as .pdf or .dwg files. If this report has been released in hard copy the appendices will be bound into the back of this report. Plans may be annexed separately as A1 or A0 copies where a bound-in A3 copy is not appropriate.

1.0 Scope

This report contains the details of a supplementary Flood Risk Assessment carried out by GLNK Consulting Limited ("GLNK Ltd") for the proposed change of use at former Prestige Garage, Brookfield Dinting, Glossop, Derbyshire, SK13 6JF, henceforth referred to as "the site" in this report.

This report has been prepared for Tim Turner of Blue Deer Ltd and must not be relied upon by any other party without the explicit written permission of GLNK Ltd.

All parties to this report do not intend any of the terms of the Contracts (Right of Third Parties Act 1999) to apply to this report.

Please note this report does not purport to provide definitive legal advice nor can it be used to demonstrate that the site will never flood in the future.

The Executive Summary contains an overview of key findings and conclusions. However, no reliance should be placed on the Executive Summary until the whole of the report has been read.

Other sections of the report may contain information which puts into context the findings noted within the Executive Summary.

2.0 Executive Summary

This FRA has been carried out in accordance with the 27th March 2012 National Planning Policy Framework (NPPF) which replaced "PPS25: Development and Flood Risk". It is to be used to assist the Local Planning Authority (LPA) and Environment Agency (EA) when considering the flooding issues of the proposed development as part of a planning application.

The scheme is a change of the use from a former garage to a retail outlet requiring internal alterations and extension to the north. Appropriate Flood Resilient measures commensurate with the refurbishment can be incorporated into the scheme as recommended in this report.

The site is located within Environment Agency Flood Zone 3 (high probability of flooding); The main source of flooding is fluvial from Glossop Brook and potential surface water flooding.

The existing and proposed uses are categorized as a "Less Vulnerable" landuse in accordance with the NPPF classifications; the NPPF Exception test will not need to be passed.

The FRA has been revised in response to EA letter ref: LT/2013/116074/03-L01, receipt of site specific flood levels, which has led to a revision of the evacuation procedure.

Raised floor levels are not possible due to re-use of existing structure and need to tie in to levels for the extension attached to the north; as an appropriate response, the proposed development will implement:

1) a "**water entry strategy**" to minimise structural damage in the event of a flood
2) **robust resilient construction techniques** in order to minimise the damage caused by water entry and also to reduce the time taken to return the property to use after a flood

The site will continue to flood as existing, hence no flood compensation is considered necessary.

Given the extreme event residual risk flood setting, the level, extent and depth of flooding on the site can be managed in terms of resilient measures, the EA Flood warning and easy evacuation to areas in Flood Zone 1, less than 250m to the south of the site.

The site is not likely to flood to depths greater than 290mm in the 1 in 100 year event, however, Glossop Brook is a flashy river in terms of speed of flooding. Regardless, evacuation should be undertaken upon flood warning regardless due to also unlikely event of a breach in the flood defences combined with a 1 in 100 year or 1 in 1000 year event.

A preliminary evacuation procedure has been provided; the site management and each individual tenant will need to coordinate in order to ensure clear communication of the risk and consistency of response to the EA flood warning.

Based on the likely flooding risk, less vulnerable landuse, good flood warning and response management and the small scale of the proposed development (conversion of existing), it is considered that the proposed development can be constructed and operated safely in flood risk terms, without increasing flood risk elsewhere; it is therefore considered appropriate development in accordance with the NPPF.

3.0 Introduction

The site boundary is provided in the location plan in Appendix A.

This supplementary FRA report is required because the proposed development has changed since the previous planning application; the existing building is now to be re-used.

This supplementary FRA therefore refers to the previous FRA where baseline conditions have not changed (eg: location of watercourses) and then provides a site and scheme specific FRA given the change in scheme and the fact there are updated data for the site.

However where previous data are relevant to the updated scheme and risk assessment, for example topography, this report has re-assessed and reported those elements in this report.

The FRA combined a desktop study, review of available information, consultations and an assessment of all sources of flooding posed to and from the site and proposed development, in accordance with National Planning Policy Framework (NPPF). Appropriate flood mitigation measures were then considered, either as already incorporated within the scheme or recommended for inclusion at detailed design stage. The suitability of the proposed development was also reviewed in the context of the NPPF and the technical guidance accompanying the NPPF.

4.0 Purpose of the Report

This FRA has been carried out in accordance with National Planning Policy Framework (NPPF). It is to be used to assist the Local Planning Authority (LPA) and Environment Agency (EA) when considering the flooding issues of the proposed development as part of a planning application.

The report provides supplementary information to the FRA submitted with a previous planning application in order to update the following key objectives:

- An assessment of the flood risk posed to the site based on flood information and mapping provide by the EA and Strategic Flood Risk Assessment (SFRA);
- An assessment of the proposed development in terms of surface water run-off; and

- Proposals for measures to mitigate the flood risks posed to and from the development where appropriate.

5.0 Report Information Sources

The information source used to undertake this FRA has been collected from the following sources:

- British Geological Survey Website (accessed May 2013)
- EA Website (accessed June 2013);
- High Peak Borough Level 1 Council Strategic Flood Risk Assessment (2007);
- High Peak Borough Council Website (accessed May 2013);
- Anecdotal evidence from local people; and
- Internet mapping and searches.

7.0 Overview of British Legislation

7.1 National Planning Policy

The National Planning Policy Framework (NPPF) and accompanying Technical Guidance was published on the 27th March 2012. This supercedes all Planning Policy Statements (PPS's) and remaining Planning Policy Guidance (PPG's). Flood risk is retained as a key development consideration and is incorporated within Section 10: "Meeting the challenge of climate change, flooding and coastal change":

> "Inappropriate development 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."

The Sequential and Exception Tests (as per PPS25) are retained as part of the NPPF. The accompanying NPPF Technical Guidance also includes Tables 2 and 3 (similar to Tables D2 & D3 of PPS25) to assist with flood risk vulnerability classifications and development suitability.

7.2 Local Policy

High Peak Borough Council (HPBC) authority considers flood risk through relevant environmental and climate change policies which enforce the requirements of the NPPF.

The Strategic Flood Risk Assessment (SFRA) is a key source of flood risk specific information for the area. The SFRA provides a more detailed review of flood risks and recommendations for ensuring developments can be constructed and operated safely in accordance with the NPPF. Greater detail of the SFRA is provided in the report.

8.0 Site Status and Environmental Setting

8.1 Site Location and Status

The site is c. 0.5 hectares of which the existing building is c. 0.15ha and located adjacent to the A57 within Glossop. The site is a former garage / car dealership. The site location plans can be seen in Appendix A.

8.2 Current Site Description

The following description is based on information made available from internet mapping and aerial photography.

The site is currently 100% impermeable comprising a building and hardstanding associated with the former garage / car dealership use. The site is bounded by the A57 to the northeast and other properties of mixed use (predominantly commercial / industrial) to the south, west and east. The site's surrounding is predominantly commercial and industrial, together with the residential properties of Glossop.

8.3 Topography

A site specific topographic survey has been undertaken by MHLS for the previous FRA. The site is generally flat and between 121.4m AOD and 120.68m AOD; there is a slight gradient between the northwest and southeast of the site.

The building perimeter is

8.3 Existing Flood Risk

Fluvial and Tidal

There are no surface water features present on the site.

From an inspection of ordnance survey plans the nearest water feature to the site is Glossop Brook located c. 50m to the west of the site.

The site is mostly in EA Flood Zone 3a, but given the site is slightly raised from surrounding areas, it is also potentially partially within EA Flood Zone 2, indicating potential inundation only in extreme events (1 in 1000 year event).

The site is within an area that now receives EA Flood Warnings.

The Glossop Brook Flood Alleviation Scheme has also been completed, offering additional protection to the Glossop area. The FAS was essentially designed to increase channel capacity such that the brook could transfer flood waters more easily through and away from the populated areas.

For further fluvial baseline details refer to pages 3 and 5 of the previous FRA in Appendix A.

The EA website Flood Map can be seen in Figure 1.

The site is not directly protected by flood defences; it is considered that a breach in the defences located 450m to the north would not have an impact on the site.

Although Glossop Brook is a flashy river in terms of speed of flooding, the main access / egress, the A57 is not a main flood flow path.

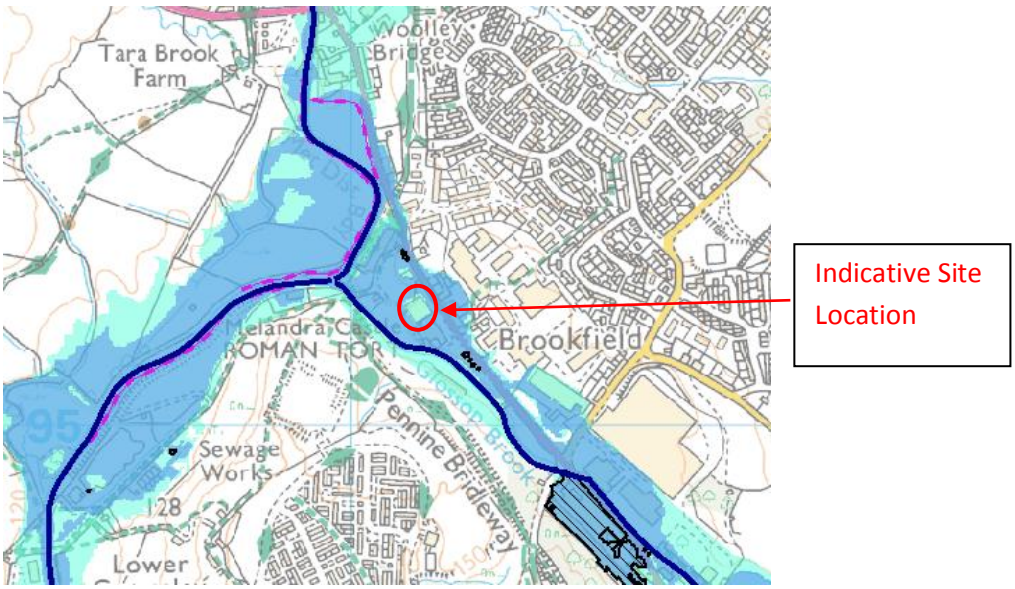


Figure 1: EA flood map (environment-agency.gov.uk, accessed June 2013)

Strategic Flood Risk Assessment

The 2007 Level 1 SFRS notes:

> *"Glossop Brook is a major tributary of the River Etherow. Both the brook and its tributaries pose fluvial flood risk in Glossop, even though the Flood Zones are relatively narrow. There are issues with Flood Zone misalignments (i.e. the Flood Zone maps do not follow the path of the associated watercourse) and culverted sections which show Flood Zones (tabulated in Section 4.6). At the downstream end of Glossop Brook where the Flood Zones are slightly wider, flood risk affects an industrial estate and the A57."*

Importantly since the 2007 SFRA it is understood that the EA flood zones have been updated and do include accommodation for climate change.

The SFRA does not indicate any other specific sources of flooding posed to the area or site.

The Level 2 SFRA was not available at the time of writing.

8.4 Updated Modelled Flood Levels and Evacuation

In discussion with the EA, updated flood levels indicate that the site would be potentially subject to depths of flood waters in the extreme event, which would be forewarned as part of the EA Flood Warning scheme; hence the assessment has considered in detail the Flood Evacuation Response and Management Plan specific to the site.

Updated Flood Levels

The EA have provided site specific flood levels for the site, reproduced in Appendix A.

This confirms the following likely flood levels, and using the topographic survey, the likely flood depths at the site.

The table below confirms the likely effect of a range of flooding events as requested by the EA. The Evacuation and vulnerability sections then address this in terms of keeping site users safe for the lifetime of the development.

It should be noted that the levels received from the EA were the same for defended vs undefended for above the 1 in 75year flood event.

Range of 3 Nodes Provided (Upstream, At Site, Downstream)	Flood Level (m AOD)	Site Levels surrounding shop and available access / egress points (m AOD)	Likely flood depth
1 in 100 year	121.26 – 121.49	121.20	40mm to 290mm (Less than 300mm)
1 in 1000 year	122.02 – 122.21	121.20	820mm – 1010mm

The velocities provided by the EA also confirm the flashy nature of the Glossop Brook.

However, it should be noted that the A57 is at c. 120.9m AOD adjacent to the site, this is addressed in the flood evacuation section.

Groundwater

Refer to previous FRA in Appendix A.

There is however always the potential for localized flooding from superficial geological perched groundwater.

There is no ground investigation data available for the site to confirm the geology and groundwater levels on the site.

However, there are no records from the existing site users of the site being flooded as result of groundwater.

The proposed development does not include any works which could increase the risk of flooding to or from the development from groundwater sources.

Artificial Sources of Flooding

There are sections of Glossop Brook which are culverted in the surrounding area; these have been accommodated in the flood modelling. Refer to previous FRA in Appendix A.

There are no known reservoirs, lakes, canals or lost rivers on or close to the site.

Other Sources of Flooding (Infrastructure)

United Utilities is responsible for storm water and foul water sewer systems in the area of the site. Sewer asset plans have been purchased; there is a public sewer passing through the site, an appropriate construction management plan will ensure there is no unacceptable impact on this sewer. The exact condition, depth and exact location of sewers within the

A57 is not known at this stage. It is assumed the existing connection to surface and foul sewers will be reused as part of the scheme; surface water will however continue to be discharged unattenuated to Glossop Brook, as agreed previously with the EA on the 2nd April 2008 (see previous FRA).

At the time of writing a Surface Water Management Plan (SWMP) was not available.

Refer to previous FRA in Appendix A.

Flood History

Refer to previous FRA in Appendix A.

Key Flooding Sources

A summary of the key flooding sources (sources discounted above are not included) relative to the site that have been identified from available sources is provided in Table 2:

Table 2: Summary of Flooding Sources and Pathway / Risk

Flooding Source	Potential			Comments on Pathway Likelihood
	High	Medium	Low	
Fluvial / Tidal			x	Site is Located in Flood Zone 3a. Data indicates that flood depths could be potentially above acceptable levels in the extreme event. However, given the EA flood warning, evacuation is appropriate and safe passage to Flood Zone 1 is feasible. The site is not likely to flood to depths greater than 290mm in the 1 in 100 year event, however, evacuation should be undertaken upon flood warning regardless due to also unlikely event of a breach in the flood defences combined with a 1 in 100 year or 1 in 1000 year event. See evacuation procedure.
Other sources of flooding (e.g. infrastructure)		x		No history of sewer flooding for the immediate area though it is understood there are general capacity issues in parts of the district. Residual risk to be managed as part of design.

9.0 Assessment of Proposed Development

9.1 Proposed Development

The proposed development can be seen in Appendix B.

The proposed development is to change the use of the existing building from a garage to a retail use. There are to be no new structures on the site; flood compensation is therefore not considered necessary.

There will be no changes to the existing ground finished floor levels.

Raised floor levels are not possible due to re-use of existing structure and need to tie in to levels for the extension attached to the north; as an appropriate response, the proposed development will implement:

1) a "**water entry strategy**" to minimise structural damage in the event of a flood

2) **robust resilient construction techniques** in order to minimise the damage caused by water entry and also to reduce the time taken to return the property to use after a flood

The site will continue to flood as existing, hence no flood compensation is considered necessary.

The following flood resilient measures are to be incorporated as appropriate:

9.2 Water Entry and Flood Resilience

Water Entry

Given the likely flood depths would be potentially higher than 0.6m in the extreme flood event, a water entry strategy is appropriate in accordance with national guidance such as "Improving the flood performance of new buildings" (Defra, EA DCLG 2007).

The following key aims for the design will be incorporated into the detailed design.

- Materials with low permeability up to 0.3m (to allow time for removal of items depending on flood warning level)
- Accept water passage through building at higher water depths (some sacrificial materials can be used that do not reduce the performance of the house during non flood events)
- Design to drain water away after flooding
- Access to all spaces to permit drying and cleaning
- Flood resilient construction

Flood Resilience

The proposed development will utilize the flood resilient techniques recommended in the NPPF Technical Guidance where appropriate and also the recommendations that have previously been issued by various London Borough Councils.

These include:

- Plasterboards will be installed in horizontal sheets rather than conventional vertical installation methods to minimise the amount of plasterboard that could be damaged in a flood event
- The ground floor slab will be concrete (existing groundfloor slab to be reused) in order to minimise damage and reduce the turnaround time for returning the property to full operation after a flood event
- Wall sockets will be raised to as high as is feasible and practicable in order to minimise damage if flood waters inundate the property
- Any wood fixings on ground floor will be robust and/or protected by suitable coatings
- in order to minimise damage during a flood event
- Goods that are vulnerable to water damage will not be stored below the 1 in 100 year + climate change flood level where feasible
- Airbricks will be raised to as high as is feasible and practicable

- Where necessary to install new, any waterproofing will be installed above the main floor slab and tied in to the walls where appropriate, to reduce the turnaround time for returning the property to full operation after a flood event.

9.5 Sequential Test

The sequential test is a guidance designed to ensure that areas at little or no risk of flooding are developed in preference to areas at higher risk.

The proposal is for a commercial Less Vulnerable landuse, such that the sequential test does not actually apply. However the below provides support to the considered suitability of the scheme.

As existing, the majority of the centre of Glossop is within Flood Zone 3, undefended. The proposal is to re-use an existing disused building.

There are no alternative existing suitable vacant buildings.

9.3 Flood Risk Vulnerability

The site and surroundings is already in commercial use. The proposal is to keep the structure on site, but change to a retail use.

According to the NPPF retained Flood Risk Vulnerability Classification as per the former Table D2 in PPS25, the proposed retention of residential land use would be classified as "Less Vulnerable."

The NPPF also retained Flood Risk Vulnerability and Flood Zone "Compatibility" Classification as per the former Table D3 of PPS25; this states that a "Less Vulnerable" development in Flood Zone 3a does not requires the Exception Test (retained by NPPF) to be passed.

Based on the data reviewed to date, the flood risk assessment recommends the property could be operated safely in flood risk terms, but the evacuation safe management needs to be followed.

9.5 Safe Evacuation Management Plan

The site is not directly protected by flood defences; it is considered that a breach in the defences located 450m to the north would not have an impact on the site; floodwaters are therefore not likely to inundate the site in a short period of time from a breach.

The effect of a range of flooding events

The site is not likely to flood to depths greater than 290mm in the 1 in 100 year event, however, Glossop Brook is a flashy river (as evidenced by the modelled velocities) in terms of speed of flooding. Regardless, evacuation should be undertaken upon flood warning regardless due to also unlikely event of a breach in the flood defences combined with a 1 in 100 year or 1 in 1000 year event.

Based on the likely flood risk and associated warning time that is feasible it is considered likely that there would be sufficient time to evacuate to an area of Flood Zone 1 within 100m.

Based on the available emergency planning guidance, the following is in principle the procedure to be followed specific to the site.

All staff to be trained to:

A. Understand the EA Flood Warning process

B. Understand the response: communication and coordination

C. Provide written copies of procedure and a map of the evacuation route, location of safe refuge and contact details to all staff and in appropriate location within the building i.e. health and safety noticeboard.

Upon Flood Alert received from the Environment Agency:

1) Staff to monitor the warning levels (website / phone)

2) Managers to make decision if a flood warning is posted before next operational day as to whether the outlet closed as a precautionary measure until warning is reduced / removed

If the flood warning is then deemed to potentially exceed the level of protection as advised by the EA, then:

3) Managers are to be responsible for communicating and organizing all staff and to ensure customers are informed

4) Customers to take cars and staff to assess if there are any dependent / vulnerable customers that require assistance in evacuation

5) Customers should be made aware of emergency safe location (to be confirmed) and safest route; however it will be the responsibility of the customer to decide on final destination

6) The Safest evacuation route has been revised upon receipt of the EA data and review of the levels of the A57. (The A57 rises to the north)

7) It is considered that the safest route would be north on the A57 for 45m then 50m northeast on the access track direct to Tavern Road, wholly within Flood Zone 1.

8) This means site users can reach Flood Zone 1 in less than 100m.

9) Site Management and Tenants to agree safe refuge location in Flood Zone 1 for all staff or agree staff to return home and await further notice that site is back to operation and safe.

10) See Appendix A

11) Tenants not to reopen until flood warning removed;

12) Site managers make decision when to return to site and that site is safe for continued use (particularly if the site has been inundated).

Clear communication in Flood Warning Event

The future tenants will need to understand and sign up, understand and train staff with regards the EA Flood Warning scheme.

It is recommended that all staff are trained to communicate and coordinate the necessary measures upon receiving a flood warning of appropriate level that evacuation is required.

The staff member receiving the call should immediately use the public address / involve other staff in alerting customers on the floor calmly that there is a need to evacuate the premises, and where customers should go, depending on their mode of transport.

9.6 Surface Water Runoff – Flood Risk from the Development

In accordance with the NPPF, this FRA also considers the risks posed from the development to surrounding areas.

Due to the small size of the proposal (conversion), the proposed development will likely reutilize existing connections to the existing sewers in adjacent roads.

The proposed development is a change of use of an existing building. The proposals will incorporate new low-water demand devices such that the increase in peak flow and volume of flow is likely to be negligible.

Given the small scale of the proposed development it is considered likely that the development will have a negligible effect on surrounding infrastructure. There will not be any significant increase in overland flow from the site and, given the site setting, no other sensitive assets would likely be affected.

9.7 Climate Change

The impact of climate change in accordance with the NPPF is likely to be an increase in the rainfall intensity in the future, which will increase peak storm flows to sewer. The proposed development will incorporate low flush and reduced water demand showers and toilets, such that the combined flows to sewer are likely to have a negligible impact. It is considered therefore that flows in the future are not likely to have a significant impact, even with an allowance for climate change.

There is unlikely to be an unacceptable impact on the receiving sewers owing to the small scale of the development.

Confirmation from water company should be sought as appropriate.

Importantly the EA flood zones have been updated since the previous application, regardless both versions of the modelling include an accommodation for climate change.

10.0 Conclusion

The site is considered to be generally at a low risk from all sources of flooding except fluvial; the EA website map and SFRA indicate the site is in Flood Zone 3a (High probability).

The proposed development is categorised as “Less Vulnerable” in accordance with the NPPF; it is therefore an appropriate type of development within Flood Zone 3a if the Exception Test can be passed.

A preliminary evacuation procedure has been provided; the site management and each individual tenant will need to coordinate in order to ensure clear communication of the risk and consistency of response to the EA flood warning.

The proposed scheme can incorporate suitable flood resilient measures.

All future tenants would have access to areas within Flood Zone 1 and there would be suitable warning time; there will be a formal evacuation management in place flowing the preliminary procedure provided in this report.

Based on the likely flooding risk, it is considered that the proposed development can be constructed and operated safely in flood risk terms, without increasing flood risk elsewhere and is therefore appropriate development in accordance with the NPPF.

It is recommended that the property signs up to the EA Flood Warning scheme.

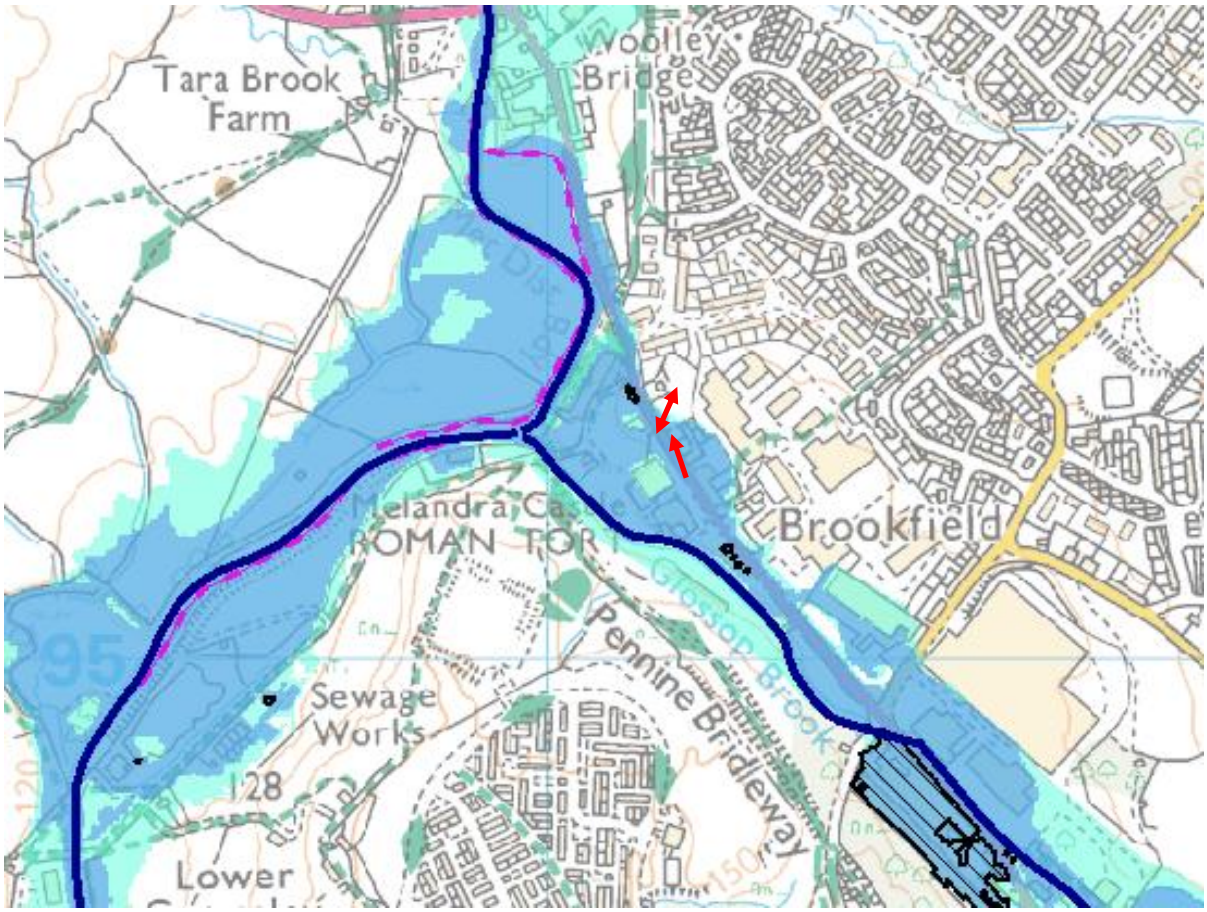
10.1 Recommendations for Further Work

1. If additional site specific flood levels become available, the residual flood risk should be re-evaluated
2. Produce a Flood Evacuation Plan with tenants
3. Sign up property to EA Flood Warning scheme
4. Site management / tenants to agree location of safe refuge in Flood Zone 1

11.0 Appendices

A. Site Location,
B. Proposed Development Plans

Appendix A



A review of the modelled flood levels and topographic survey has led to the above revised evacuation route.

This is because the A57 rises to the north and hence persons leaving the site will be safer to reach Tavern Road via the access road adjacent to Brookfield Service Station.

They will reach Flood Zone 1 quicker and also not have to venture through a long section of FZ3 to reach FZ1.

Indicative evacuation routes upon flood warning

Site Management and Tenants to agree safe refuge location in Flood Zone 1 for all staff / agree staff to return home and await call that site is back to operation and safe.

Appendix B