BRIGHT YOUNG

FLOOD RISK ASSESSMENT (FRA)

Garden House Close, Barnsley
For Big City Co MB

Date 17/06/2022
Ref **4019/FRA001**

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Report Details

Client	**Big City Co MB**
Report Title	FLOOD RISK ASSESSMENT (FRA)
Project	Garden House Close, Barnsley
Ref.	4019/FRA001
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Quality Assurance

Issue No.	Status	Issue Date	Comments	Author	Technical Review
1	Approval	17/06/2022	-		
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Contents

INTRODUCTION

Project Understanding

Big City Co MB intend to develop a parcel of land at Garden House Close, Barnsley, in accordance with design proposals developed by Nieman Architects to provide 76 new houses and retaining the 6 terrace properties of Walkers Terrace.

Bright Young Consulting Ltd have been engaged to prepare a FLOOD RISK ASSESSMENT (FRA)in support of a detailed planning application for the development.

Scope of Works

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 considers, if necessary, 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.
- Determination of any sources of flood risk.
- Whether the proposals will increase the risk of flooding elsewhere.
- Details of how any flood risk will be managed so that the development remains safe.

Sources of Information

The following sources of information have been reviewed and assessed for the purpose of this Flood Risk Assessment:

- Environment Agency (EA) opensource data.
- The Barnsley Strategic Flood Risk Assessment (SFRA)
- Barnsley MBC Preliminary Flood Risk Assessment

Any pertinent information regarding this development site has been included within this FRA.

SITE DESCRIPTION

The site is adjacent to Garden House Close Barnsley at Grid reference SE 36269 08045 (436269E, 408045N).

The pre-development site is a large vacant school building on the west of the development site, existing houses and buildings centrally and then an area of open grass land to the east side of the development. For this FRA, the site should be considered a mixture of brown and greenfield.

A topographical survey has been undertaken of the site and the gross area of the development site is approximately 2 Hectares. The site slopes from west to east, from levels around 106.0m – 108m in the west down to around 100m – 97.0m in the east.

An aerial location plan of the site is shown below, outlined red.

Site Location Plan

RELEVANT POLICY AND GUIDANCE

Introduction

The aim of this section of the report is to discuss the main aspects of the local and national planning policies that are relevant to any proposed development on the site and relevant guidance and legislation.

Policy

This Flood Risk Assessment has been prepared in accordance with the National Planning Policy Framework (NPPF).

Consultations

No consultation has taken place at this point with the approving local authorities in respect of flood risk. Appropriate Environment Agency published data has, however, been reviewed in relation to the development proposals. It is expected that detailed consultation will take place as the scheme develops with the regulators through the planning process.

FLOOD RISK ASSESSMENT

Flooding from Rivers

The Environment Agency (EA) flood map of fluvial flooding has the site within flood zone 1. The site is not potentially at risk of flooding from nearby rivers.

Overall, the EA class this site has being of very low risk of flooding and is suitable for this type of development.

Below are extracts from the Environment Agency (EA) flood data, confirming the site is within flood zone 1. The site also no recorded history of flooding:

EA Fluvial Flooding data

The proposed development new housing. The EA class this type of development as more vulnerable. Using the EA flood risk vulnerability classification (shown below) determines that the type of development proposed is suitable for this location and flood zone. No sequential test or exception test is required.

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 †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

Flooding from Surface Water

The Environment Agency publish on their website details of potential surface water flood areas. These are areas where intense rainfall or other events causes overland flow before water entering a watercourse or sewer.

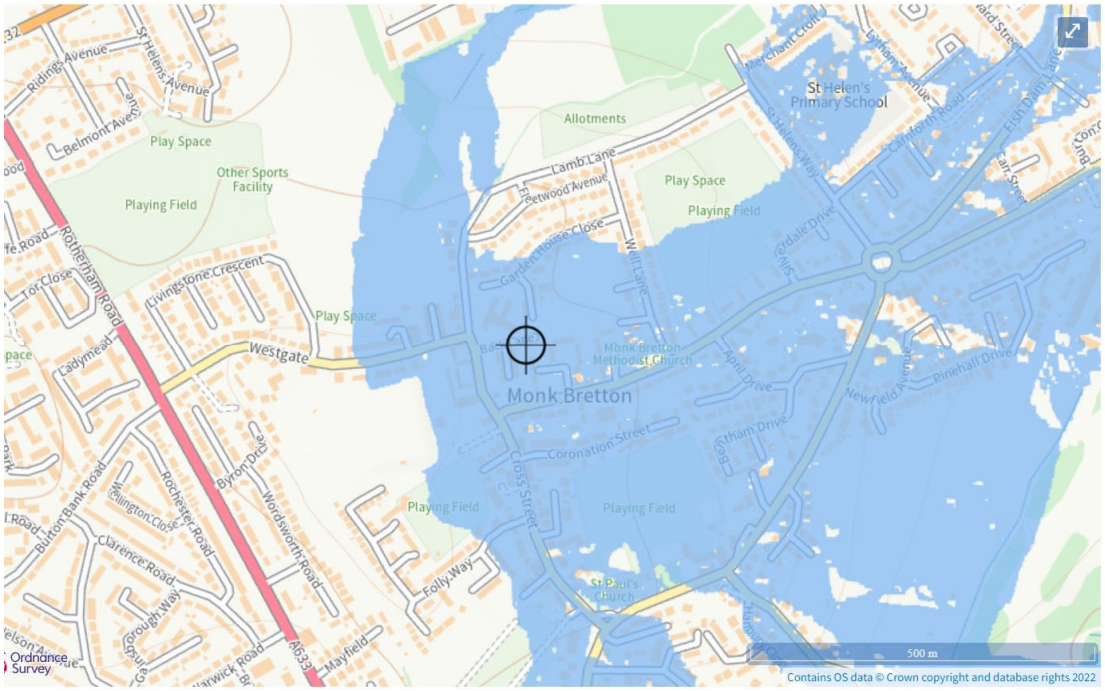
The Surface Water flood map for the development site shows that there is a small area at low risk of potential for surface water flooding. The low risk of potential surface water flooding (between 1 in 100 year and 1 in 1000 year) occurs through the lowest part of the site and fairly central. The risk is low but during detailed design of the development site, proposed levels will be determined that would provide a safe flood route away from proposed houses.

The surface water flood map is shown below.

EA Surface Water Flooding data

Flooding from Reservoirs

The flood risk from reservoirs is very small and unlikely to happen. The EA publish flood risk maps for areas that may be affected by a reservoir failure. The site is at risk from reservoir flooding as shown in the reservoir flood map below. However, the risk of this event happening is very low and so overall the risk to flooding is low.



EA Reservoir Flooding data

Groundwater Flooding

Groundwater flooding usually occurs in low lying areas underlain by permeable rocks and aquifers that allow groundwater to rise to the surface through the permeable subsoil following long periods of wet weather. Low lying areas may be more prone to flooding because the water table is usually at a much shallower depth and groundwater paths tend to travel from high to low ground.

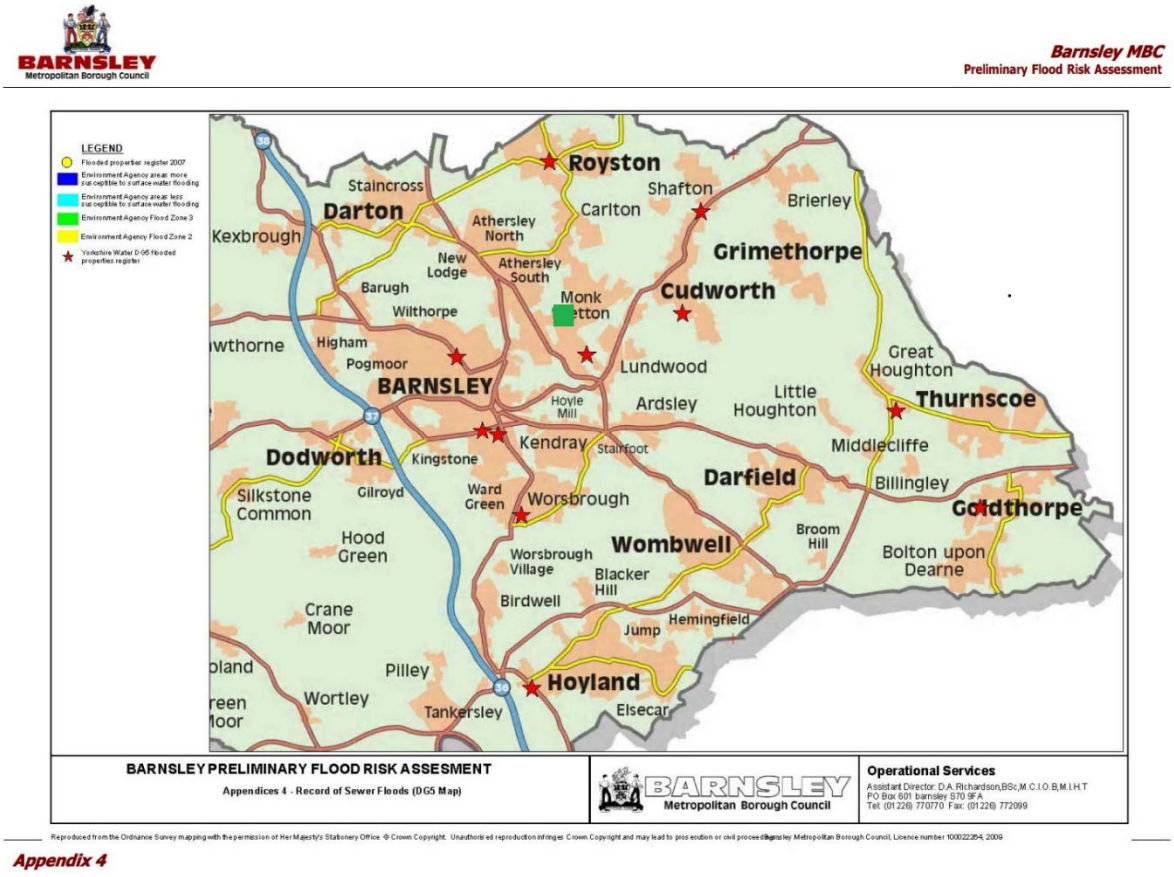
The site is not low lying and it would be expected that if any water to occur on site, then this would flow to the east from the site following the natural contours and present drainage routes.

Given that the site is not low lying and ground levels fall away from the site, then the risk of ground water flooding is likely to be low.

Sewer Flooding

The Barnsley Preliminary Flood Risk Assessment has published locations of recorded sewer flood incidents that have affected housing. An extract from the map is shown below with the sewer flooding locations shown as red stars and the proposed development site shown by a green square.

No flood incidents have been recorded on or close to the development site.



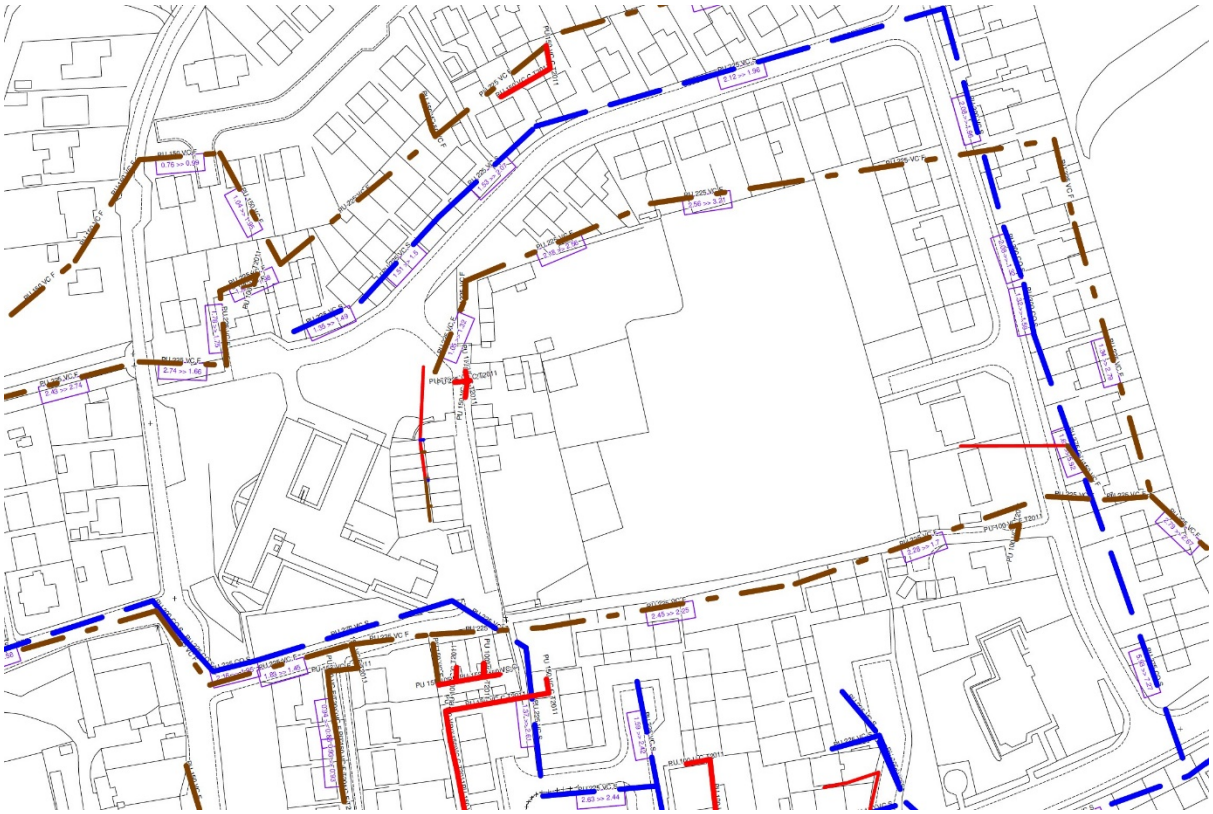
Appendix 4

Public Sewer Flood Incidents

The sewer records have been obtained and these show that public sewers are present near the development site. The sewers generally surround the site and will not directly be affected by the development. Any necessary work to these sewers for the development would be in agreement with Yorkshire Water.

Any flooding of these public sewers would flow the existing flood routes available and to the east and so unlikely to affect the development.

Overall, sewer flooding should be considered low for this proposed development.



Public Sewer Records

Surface Water Run-Off

The pre-development site is both brownfield and greenfield. To determine the pre-development surface water run-off destinations from the site, a detailed drainage survey has been undertaken. This shows that the surface water from the large school building on site is drained to the public surface water sewer in Garden House Close. This surface water sewer follows the route of Garden House Close and then turns southwards along the route of Well Lane, mainly located in front gardens.

It is likely that the post-development surface water run-off destination will be the same as the pre-development site. Therefore, it is expected that the new development site will drain to the public surface water sewer and, due to site levels, is likely to be a new connection adjacent to Well Lane.

It is recommend that this surface water discharge to sewer is limited to the 1 in 1 year pre-development discharge rate, with a reduction of 30% in line with good practice and Yorkshire Water requirements.

To assess the pre-development surface water run-off rate, it is assumed that the school roof only is connected to sewer. The school roof extends to 1218 sq m, as determined by the topographical survey. The 1 in 1 year discharge rate is taken as 140l/s/hectare.

The pre-development discharge rate is 1218sq m x 140l/s/hectare = 17l/s.

Post-development discharge rate is proposed to be a maximum of 17l/s – 30% = 11.9l/s.

Flood Risk Elsewhere

This development site is within flood zone 1 and so it's development will not affect flood risk elsewhere.

The proposed surface water run-off from the development will be maintained at pre-development levels and, as such, there is no increase in surface water discharge rates created by this new development.

Potential flood risk elsewhere created by this proposal should be considered to be low.

A preliminary plan of the post-development site is shown below, which is likely to be updated as the scheme design develops.

Post-Development site plan

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- This proposed development site is in flood zone 1.
- All sources of flood risk have been considered and the overall flood risk for this site should be considered low and so suitable for the development proposed.
- This development will not increase flood risk on or off site.
- Post–development surface water flows should be limited to 11.9l/s.

Recommendations

- Floor levels for all properties should be set at least 150mm above the adjacent finished ground levels.

APPENDICES

APPENDIX A – Limitations

The discussion, conclusions and recommendations contained in this Report represent the professional opinions of Bright Young Consulting Limited (BYC), based upon the information listed in the Report, exercising the duty of care required of an experienced Engineering Consultant. BYC does not warrant the accuracy of the information or data forming the basis of the report and will not be responsible for any opinions which BYC has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

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