



FLOOD RISK ASSESSMENT

ISKON

20 Mayfield Road, Manchester, M16 8FT

Oct 2023

1.0 INTRODUCTION

This statement has been prepared by Northedge Architecture in reference to the below address –

20 Mayfield Road, Manchester, M16 8FT

And the below application reference

138203/FO/2023

Erection of a single storey side and rear extension with associated basement entrance and fire escape to front

This document has been prepared solely as a Flood Risk Assessment for the owner of this site.

2.0 FLOOD RISK REQUIREMENTS

A flood risk assessment should be undertaken for most developments located within one of the flood zones. This included developments:

- in flood zone 2 or 3 including minor development and change of use,
- more than 1 hectare (ha) in flood zone 1,
- less than 1 ha in flood zone 1, including a change of use in development type to a more vulnerable, where they could be affected by sources of flooding other than rivers and the sea (eg, surface water drains, reservoirs),
- in an area within flood zone 1 which has critical drainage problems as notified by the Environment Agency.

The Environment Agency's standing advice should be followed if carrying out a flood risk assessment of a development classed as:

- a minor extension (household extensions or non-domestic extensions less than 250 square metres) in flood zone 2 or 3
- 'more vulnerable' in flood zone 2 (except for landfill or waste facility sites, caravan or camping sites)
- 'less vulnerable' in flood zone 2 (except for agriculture and forestry, waste treatment, mineral processing, and water and sewage treatment)
- 'water compatible' in flood zone 2.

3.0 PLANNING POLICY

The revised National Planning Policy Framework was published on 24 July 2018 and sets out the government's planning policies for England. The NPPF sets out planning and policies related to development planning and flood risk using a sequential characterisation of risk based on planning zones and the Environment Agency's Flood Maps.

The aim of the flood risk assessment is to identify which Flood Zones the site is located in and vulnerability classification relevant to the proposed development, based on an assessment of current and future conditions.

The Flood Zones refer to the probability of river and sea flooding which ignores the presence of defences. The national flood maps have been developed by the Environment Agency that shows the risk of tidal and/or fluvial flooding across England and Wales for different return period events. The Environment Agency's Flood Maps are the maps which have been developed using broad scale hydraulic modelling. It is therefore important to understand that the flood maps may not be very accurate at a site-specific level which may need further field observation and measurements. The Flood Zones do not take into account of the climate change impacts which must be considered in any flood risk assessment as required by the NPPF.

Table 1 below shows the NPPF Flood Zones and the requirements and policy aims in terms of undertaking site-specific flood risk assessment.

Table 1 - NPPF Flood Zones and Requirements (NPPF Technical Guidance Table 1)

Zone 1: Low Probability Flood Zone	This is defined as the land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).
Appropriate uses	All uses of land are appropriate in this zone.
FRA requirements	For development proposals on sites comprising 1 ha or above the vulnerability to flooding from other sources as well as from river and sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off, should be incorporated in a FRA.
Policy aims	Developers and local authorities should seek opportunities to reduce the overall level of flood risk through the layout and form of the development, and the appropriate application of sustainable drainage techniques.
Zone 2: Medium Probability Flood Zone	This is defined as the land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1%) in any year.
Appropriate uses	The water-compatible, less vulnerable and more vulnerable uses of land and essential infrastructure in Table 2 are appropriate in this zone. Highly vulnerable uses in Table 2 are only appropriate in this zone if the Exception Test is passed.
FRA requirements	All proposals in this zone should be accompanied by a FRA.
Policy aims	Developers and local authorities should seek opportunities to reduce the overall level of flood risk through the layout and form

	of the development, and the appropriate application of sustainable drainage techniques.
Zone 3a: High Probability Flood Zone	This is defined as the land assessed as having a 1 in 100 or greater annual probability of river flooding (<1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
Appropriate uses	The water-compatible and less vulnerable uses of land in Table 2 are appropriate in this zone. The highly vulnerable uses (Table 2) should not be permitted in this zone. The more vulnerable and essential infrastructure uses in Table 2 should only be permitted in this zone if the Exception Test is passed.
FRA requirements	All proposals in this zone should be accompanied by a FRA.
Policy aims	Developers and local authorities should seek opportunities to: -reduce the overall level of flood risk through the layout and form of the development and the appropriate application of sustainable drainage techniques; -relocate existing development to land with a lower probability of flooding; -create space for flooding to occur by allocating and safeguarding open space for flood storage.
Zone 3a: High Probability Flood Zone	This is the land where water has to flow or be stored in times of flood. This zone is generally defined as the land which would flood with an annual probability of 1 in 20 (5%AEP) or greater in any year. The Local Council may define the Functional Floodplain area with a different annual probability of event.
Appropriate uses	Only the water-compatible uses and the essential infrastructure listed in Table 2 that has to be there should be permitted. It should be designed and constructed to: -remain operational and safe for users in times of flood; -result in no net loss of floodplain storage; -not impede water flows; -not increase flood risk elsewhere.
FRA requirements	All proposals in this zone should be accompanied by a FRA.
Policy aims	In this zone, developers and local authorities should seek opportunities to: -reduce the overall level of flood risk through the layout and form of the development and the appropriate application of sustainable drainage techniques; -relocate existing development to land with a lower probability of flooding.

Table 2 - Flood Risk Vulnerability Classification (NPPF Technical Guidance Table 2)

Essential Infrastructure	Essential transport infrastructure and strategic utility infrastructure, including electricity generating power stations and grid and primary substations.
Highly Vulnerable Infrastructure	Police stations, Ambulance stations and Fire stations and Command Centres and telecommunications installations and emergency dispersal points. - Basement dwellings, caravans, mobile homes and park homes intended for permanent residential use. - Installations requiring hazardous substances consent
More Vulnerable	Hospitals, residential institutions such as residential care homes, children's homes, - Social services homes, prisons and hostels. - Buildings used for: dwelling houses, student halls of residence, drinking establishments, nightclubs, hotels and sites used for holiday or short-let caravans and camping. - Non-residential uses for health services, nurseries and education. - Landfill and waste management facilities for hazardous waste.
Less Vulnerable	Buildings used for shops, financial, professional and other services, restaurants and cafes, offices, industry, storage and distribution, and assembly and leisure. - Land and buildings used for agriculture and forestry. - Waste treatment (except landfill and hazardous waste facilities), minerals working and processing (except for sand and gravel). - Water treatment plants and sewage treatment plants (if adequate pollution control measures are in place).
Water Compatible Development	- Flood control infrastructure, water transmission infrastructure and pumping stations. - Sewage transmission infrastructure and pumping stations. - Sand and gravel workings. - Docks, marinas and wharves, navigation facilities. - MOD defence installations. - Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location - Water-based recreation (excluding sleeping accommodation). - Lifeguard and coastguard stations. - Amenity open space, nature conservation and biodiversity, outdoor sports and recreation. - Essential sleeping or residential accommodation for staff required by uses in this category, subject to a warning and evacuation plan.

Table 3 - Flood Risk Vulnerability and Flood Zone 'compatibility' – Refer to Table 2 for further details.

Classification	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone 1	/	/		/	/
Flood Zone 2	/	/	Exception Test	/	/
Flood Zone 3a	Exception Test	/	x	Exception Test	/
Flood Zone 3b	Exception Test	/	x	x	x

/ - Development is appropriate

X – Development should not be permitted

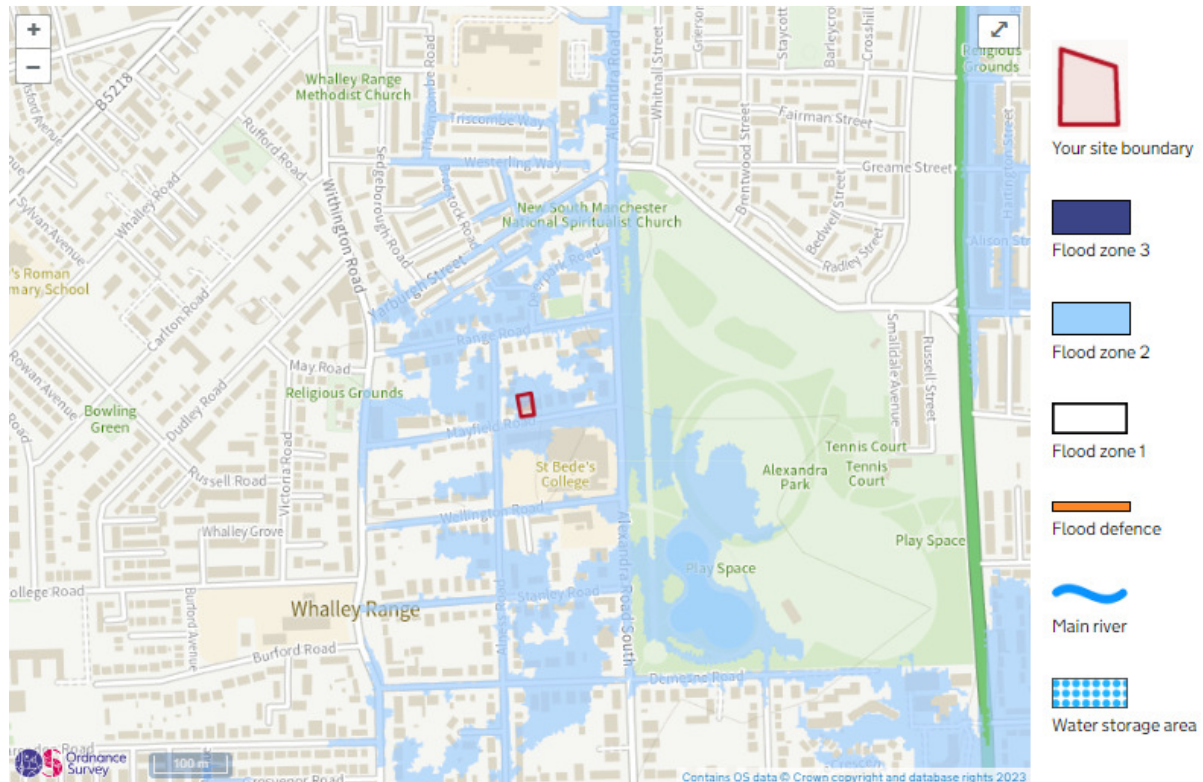
The property is located Flood zone 2 and as a public/educational building is considered 'More vulnerable' under the Flood Risk Vulnerability Classification.

On the above table this is deemed acceptable and appropriate for development.

There is no part of the site that is within Flood zone 3.

4.0 SITE

The Environment Agency's Flood Maps show that the site largely lies within the Flood Zone 2. This is considered as a medium risk.



The flood maps also show that site is located in an area not benefiting from the flood defences.

There is no indefinable water course nearby that is the source of flood water.

The overall site area is approximately 525sqm.

The existing building footprint is circa 148sqm

The existing external curtilage (excluding the footprint of build structures) is 377sqm.

The proposed external curtilage following the development work will be 345 sqm.

This is less than 10% reduction in the external curtilage that is available for surface drainage.

5.0 PROPOSAL

The proposal is only a circa 32sqm addition. The proposal is to serve the needs of the community with improved amenities.

6.0 RISK OF FLOODING

Risk of Fluvial Flooding

The site is not located near any identifiable water course.

The Environment Agency's Flood Map shows the site lies within the Flood Zone 2. There is no part of the property within Zone 3.

Risk of Tidal Flooding

As there is no identifiable water course it is expected there is no by tidal waves at this location. The risk of tidal flooding is therefore low.

Risk of Flooding from Artificial Water Bodies

There were no known flood risks from any artificial water bodies near the site.

Risk of Groundwater Flooding

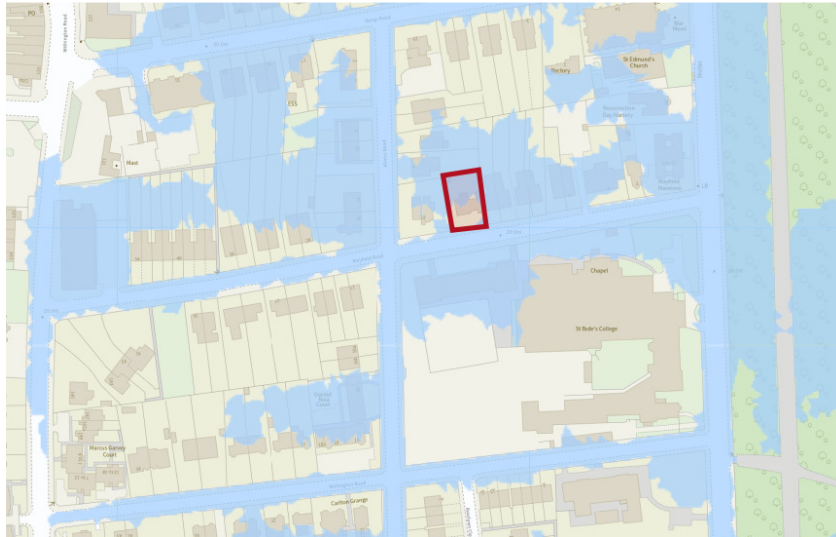
In recent years groundwater has been recognised as a significant source of flooding in the UK. According to the British Geological Survey, groundwater flooding occurs when the water table in permeable rocks rises to enter basements/cellars or comes up above the ground surface. Groundwater flooding is not necessarily linked directly to a specific rainfall event and is generally of longer duration than other causes of flooding (possibly lasting for weeks or even months). Evidence of historical groundwater flooding within the SFRA is very limited, however it is important to recognise that the risk of groundwater flooding is highly variable and heavily dependent upon local conditions at any particular time.

According to the information available from the landowner, there were no records of any groundwater flooding incidents around the site. Based on these evidences and information, it is reasonable to consider that the risk of groundwater flooding to the site is low.

Risk of Surface Water Flooding

The surface water flooding arises when the infiltration capacity of land or the drainage capacity of a local sewer network is exceeded and the excess rainwater flows overland. The severity of surface water flooding depends on several factors such as the degree of saturation of the soil before the event, the permeability of soils and geology, hill slope steepness and the intensity of land use.

The Environment Agency's Surface Water Flood Risk Maps indicate that the risk of surface water flooding to the site is 'medium'.



A more detailed look at the mapping suggests there is wider flooding associated with drains on neighbouring streets including Alexandra Road South, Alness Road, Wellington Road, Range Road.

Risk of Reservoir Flooding

The Environment Agency's reservoir flood map indicated that the proposal site is not located in an area at risk from Reservoir flooding.

According to the Environment Agency, the reservoir flooding is extremely unlikely to happen and reservoirs in the UK have an extremely good safety record. The Environment Agency is the enforcement authority for the Reservoirs Act 1975 in England and Wales. All large reservoirs must be inspected and supervised by reservoir panel engineers on a regular basis. It is therefore assumed that these reservoirs are regularly inspected and essential safety work is carried out. These reservoirs therefore present a managed residual risk.

7.0 MITIGATION MEASURES

The Environment Agency has issued a guidance (Ver 3.1, April 2012) on 'Householder and other minor extensions in Flood Zones 2 and 3' (**Appendix D**). This guidance is for domestic extensions and non-domestic extensions where the additional footprint created by the development does not exceed 250m². The additional footprint created by the development is approximately 32m². As such, there are two options available for flood mitigation from which the applicant needs to choose one option as shown in the table below –

Table 4 - Flood Mitigation Measures for Minor Extensions in Flood Zone 2 and 3

Applicant to choose one or other of the flood mitigation measures below	Applicant to provide the LPA with the supporting Information detailed below as part of their FRA	Applicant to indicate their choice in the box below. Enter 'yes' or 'no'
Either ; Floor levels within the proposed development will be set no lower than existing levels AND, flood proofing of the proposed development has been incorporated where appropriate.	Details of any flood proofing / resilience and resistance techniques, to be included in accordance with ' <i>Improving the flood performance of new buildings</i> ' CLG (2007)	Yes
Or; Floor levels within the extension will be set 300mm above the known or modelled 1 in 100 annual probability river flood (1%) or 1 in 200 annual probability sea flood (0.5%) in any year. This flood level is the extent of the Flood Zones	This must be demonstrated by a plan that shows finished floor levels relative to the known or modelled flood level. All levels should be stated in relation to Ordnance Datum ¹	

For the proposed development, the first option has been chosen for flood mitigation. According to this option, the floor level is to be set no lower than the existing levels of the property. It is recommended that flood resilient measures are used in the development as far as practicable to manage the residual risk, reduce the damage and clean up time following a flood. The flood resilient measures have been briefly discussed below.

8.0 FLOOD RESILIENT MEASURES

- The patio / pavement areas surrounding the extension to be permeable surface treatment i.e permeable resin or open jointed flags / block paving.
- A threshold drain is to be installed at the external threshold of doorways and gravel drains around the perimeter of the extension ensure run off of excess rain water on the surface of the terrace.
- The size of the property is sufficient to accommodate rain water harvesting tanks for storage and later use for gardening/external cleaning use.

In addition, any renovation works will have the following resilient measures adopted to minimise the damage and to enable quick recovery and clean up after the flooding event:

- Water, electricity and gas meters will be located above predicted flood level.
- Non-return valves will be used in the drainage system to prevent back-flow of diluted sewage in situations where there is an identified risk of the foul sewer surcharging.
- All service entries will be sealed (e.g. with expanding foam or similar closed cell material).
- Closed cell insulation will be used for pipes which are below the predicted flood level.
- Boiler units and ancillary devices will be installed above predicted flood level and preferably on the first floor of two-storey properties.
- Wiring for telephone, TV, Internet and other services will be protected by suitable insulation to minimise damage.

9.0 SuDs

The surface runoff from the site will be improved by implementing appropriate SuDS. The requirements for SuDS will ensure that any redevelopment or new development does not negatively contribute to the surface water flood risk of other properties and instead provides a positive benefit to the level of risk in the area. It will also ensure that appropriate measures are taken to increase the flood resilience of new properties and developments in surface water flood risk areas, such as those identified as being locally important flood risk areas.

Table 5 - General Hierarchy of SuDS Measures

Measures	Definition
Prevention	The use of good site design and housekeeping measures to prevent runoff and pollution (e.g. rainwater harvesting/reuse).
Source control	Control of runoff at or very near its source (e.g. soakaways, porous and pervious surfaces, green roofs).
Site control	Management of water in a local area on site (e.g. routing water to large soakaways, infiltration or detention basins)
Regional control	Management of runoff from a site or several sites (e.g. balancing ponds, wetlands).

Below presents the feasibility assessment of the SuDS measures for the site.

SuDs		
Source Control Porous and pervious materials/soakaways/green roof/infiltration trenches/disconnect downpipes to drain to lawns or infiltrate to soakaway.	Permeable patio on adjustable mounts will be provided which will improve the surface runoff from the site.	Yes
Site and Regional Control Infiltration/detention basins/balancing ponds/wetlands/underground storage/swales/retention ponds.	Balancing pond/storage will not be feasible due to limited space available.	No

Based on the general assessment of the potential SuDS measures above, it is proposed that permeable finishes will be implemented in order to improve the surface runoff from the site. The landowners will be fully responsible for the repair and the management of implemented SuDS throughout the lifetime of the proposed development.

ASSESSMENT OF DEVELOPMENT IMPACT

The extension and replacement external finishes are within Flood Zone 2.

The proposal largely uses the existing footprint of the house with a small increase in building footprint of circa 10%. Where this potential impact is considered, improved measures are put in place to mitigate flood risk with threshold and gravel drains where necessary.

This means the amount of displaced floodwater due to the increase in building footprint is not significant. The development will not give rise to backwater affects or divert water towards other properties.

CONCLUSION

The overall risk of surface water flooding to the site is 'medium'.

The flood risk from other sources including underground water, sewer and reservoir is low.

In order to provide a level of protection against flooding, the floor level of the proposal will be set no lower than the existing level of the property, and flood proofing measures will be incorporated where appropriate, including threshold/perimeter drains and potential for rainwater harvesting.

As the site is located within a flood zone area, it will be necessary to make sure that the residents are fully aware of the flood risk and flood warning and evacuation during an extreme event. If necessary, during a flood event the first floor will provide a safe haven for the occupants

The residents are advised to utilise the Environment Agency's Flood Warning Service available in the area.

This report demonstrates that the proposal will be safe, in terms of flood risk, for its design life and will not increase the flood risk elsewhere.