EXECUTIVE SUMMARY

The findings of this report and recommendations are summarised below:

The development is located adjacent to River Mersey and of the following flood risk attributes:

- Flood Zone 2 with an (< 0.1% to 0.55% AEP)
- Low risk at flooding from rivers and sea, although the site is in close proximity to River Mersey
- Very low flood risk from Surface Water
- No risk from infrastructure failure based on normal river levels

Area geology indicates the development may be able to benefit from infiltration and is recommended, subject to site tests.

There are not known historical reports of flooding in the vicinity of this development.

Development proposes to extend an existing residential dwelling utilising space that is currently hard surfaced, serving a garage and driveway to the gable end, and patio to the rear. The proposal does not increase impermeable area entering into the drainage system.

The development will extend from the current dwelling forming and extension to the principal structure. Therefore, existing floor level will need to be maintained across the entire area, and must not be lower.

Flood resilient construction materials and methods should be adopted wherever possible to alleviate and mange flood risk. Guidance is provided in ‘Improving the Flood Performance of New Buildings’ (May 2007).

The proposal along with recommendations and design approaches aforementioned, is deemed acceptable

1. INTRODUCTION

1.1. Terms of Reference

1.1.1. Manchester City Council has requested a Flood Risk Assessment (FRA) for the proposed residential extension at 13 Morningside Drive, Manchester, M20 5PQ.

1.1.2. This report assesses flood risk at the development site from all potential sources and describes measures adopted to manage such risks where possible. It has been prepared in compliance with current policies and best practices to support planning submission to Manchester LPA.

1.2. Policy Framework and Key Stakeholders

1.2.1. The National Planning Policy Framework (NPPF) (February 2019) sets strict tests to protect people and property from flooding which all local planning authorities are expected to follow. Where these tests are not met, national policy is clear that new development should not be allowed.

1.2.2. In areas at risk of flooding or for sites of one hectare (ha) or more, developers must undertake a site-specific flood risk assessment to accompany applications for planning permission (or prior approval for certain types of permitted development).

1.2.3. In decision-taking, Local Planning Authorities (LPA) must ensure a sequential approach to site selection and master planning is followed so that a development is, as far as reasonably possible, located where the risk of flooding (from all sources) is lowest, taking account of climate change and the vulnerability of future uses to flood risk.

1.2.4. Where development needs to be in locations where there is a risk of flooding, local planning authorities and developers must ensure development is appropriately flood resilient and resistant, safe for its users for the development's lifetime, and will not increase flood risk elsewhere.

1.2.5. The Environment Agency (EA) is a statutory consultee on applications where there is a risk of flooding from the sea or main rivers.

1.2.6. Lead local flood authorities (unitary authorities or county councils) are responsible for managing local flood risk from ordinary watercourses, surface water or groundwater, and for preparing local flood risk management strategies. Local planning authorities work with Lead Local Flood Authorities (LLFA) to ensure local planning policies are compatible with the local flood risk management strategy.

1.2.7. Manchester City Council (MCC) is the lead local flood authority and its strategy for managing local flood risk is set out in Local Flood Risk Management Strategy (March 2014).

1.2.8. Where relevant, local planning authorities and developers must also take advice from:

1.2.9. Internal drainage boards; to identify the scope of their interests.

1.2.10. Sewerage undertakers; to ensure they can assess the impact of new development on their assets and plan any required improvements. United utilities is the local sewerage undertaker.

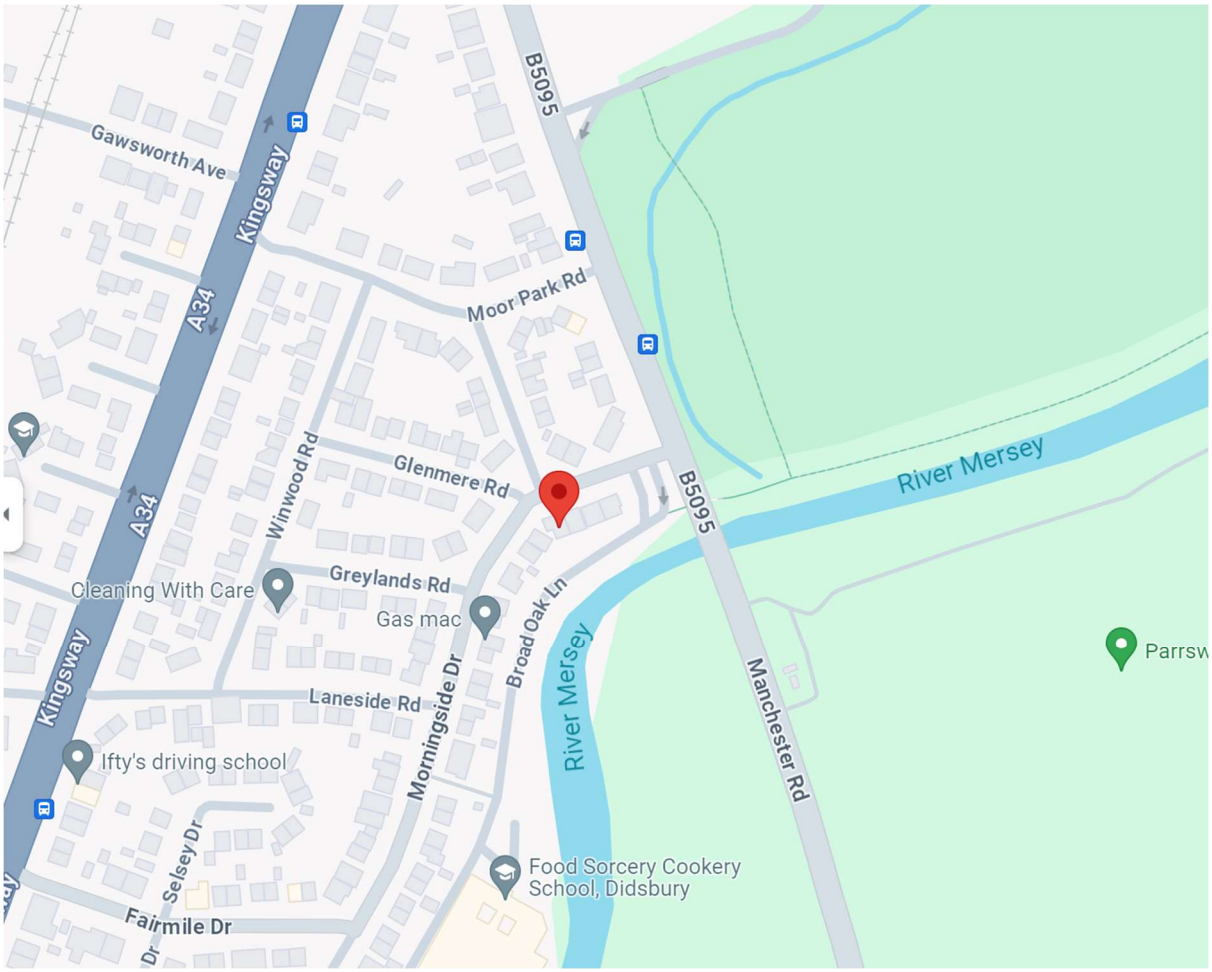
1.2.11. Reservoir undertakers; to avoid an intensification of development within areas at risk from reservoir failure and ensure they can assess the cost implications of any reservoir safety improvements required due to change in land use downstream of their assets.

2. APPLICATION SITE

2.1 Location

2.1.1. The development site is an existing residential dwelling at 13 Morningside Drive in Manchester, M20 5PQ that is proposing a single storey extension to the rear side elevations.

2.1.2. The dwelling is located in a residential area adjacent to River Mersey to the East, residential housing to the near surrounds and Parrs Wood High School playing fields to the North.



2.2. Topography

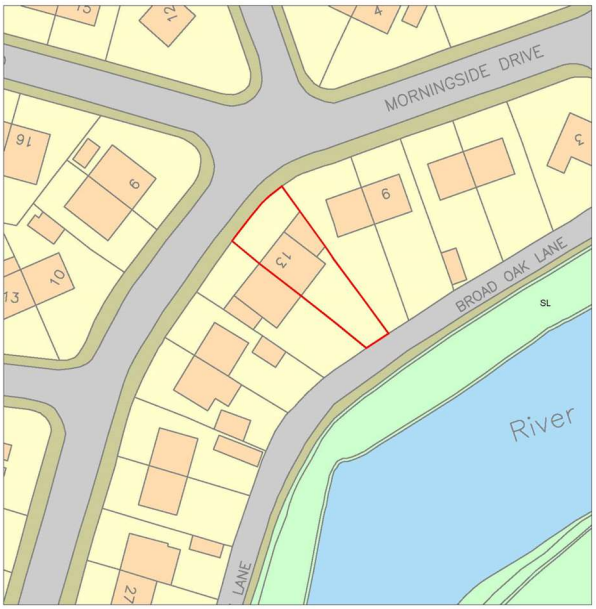
2.2.1. LIDAR information shows ground levels within the development site range between 34.900m AOD and 35.100m AOD, falling with an average slope of 1:22 towards Morningside Drive to the west, and River Mersey to the east.

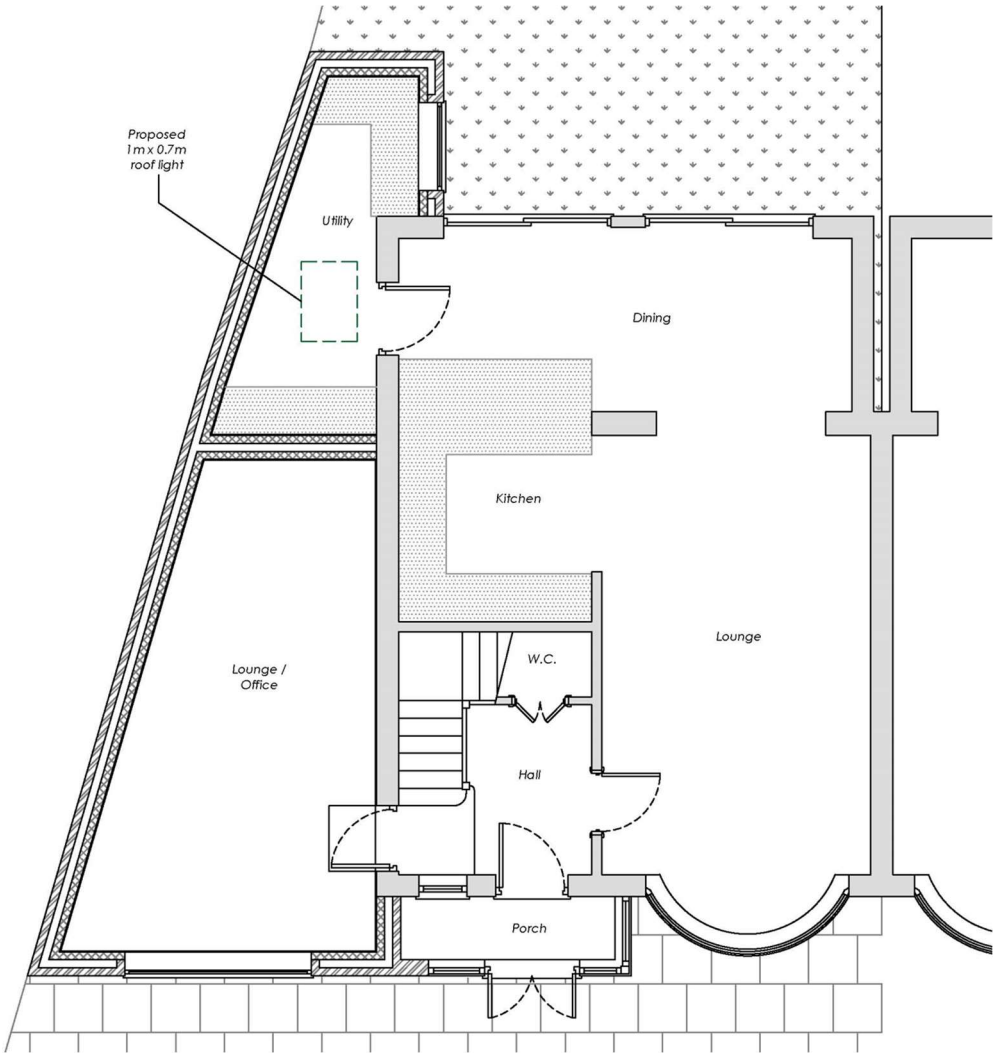
2.3. Hydrology

2.3.1. River Mersey flows North-South along the Eastern boundary of the development and carries on is a western direction.

3. PROPOSED DEVELOPMENT

3.1.1. The proposed development comprises 26m2 of residential extension which is made up of impermeable surfaces (e.g. roofs).





4. FLOOD RISK ASSESSMENT

4.1. Overview

4.1.1. All potential sources of flood risk at the development site have been assessed based on the information listed in Section 1.3 and are summarised in. The key sources of flood risk to the proposed development are further described in the ensuing sections.

Table 4.1: Potential Sources of Flood Risk

Source	Flood Risk
Fluvial	Low/medium risk in general, but medium to high risk near river Mersey.
Surface Water	Very low risk in general, but low to medium risk along the main overland flow paths.
Groundwater	Undetermined risk. Potential for ground water emergence near the river, where the water table is thought to be naturally high.
Sewers	No risk (no existing sewers crossing the site).
Infrastructure Failure	Very low risk.

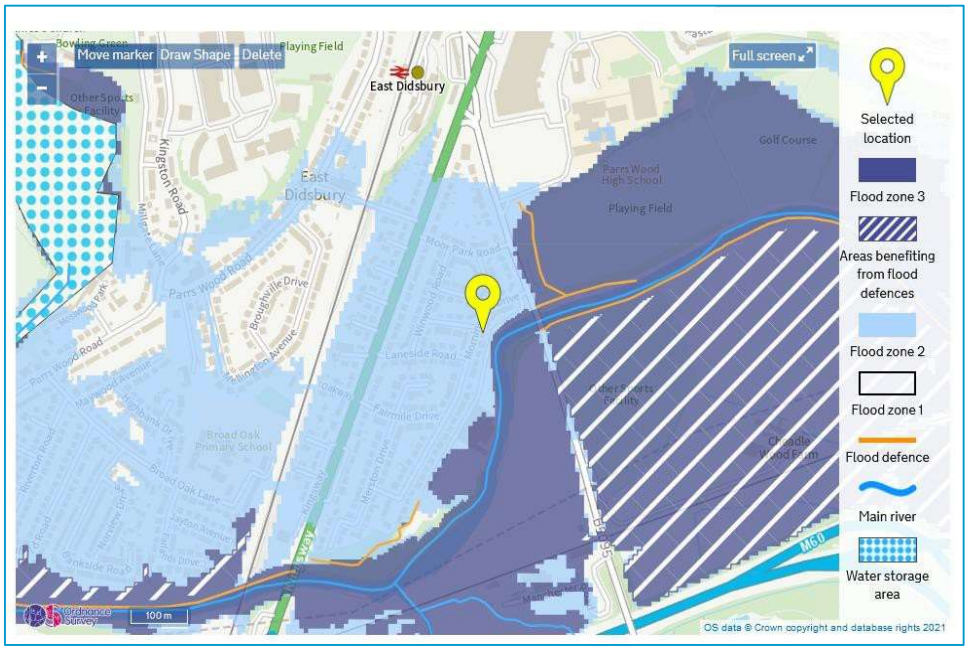
4.2. Coastal Flood Risk

4.2.1. Coastal flooding occurs when normally dry, low-lying land is flooded by seawater. It usually occurs when storm surges coincide with high astronomical tides and may lead to overtopping or breaching of natural or manmade barriers.

4.2.2. Besides posing a direct flood risk to low-lying areas, high sea levels can exacerbate other sources of flood risk by surcharging / locking outfalls, thus preventing the normal discharge of flows or even back flowing into tributary drainage systems.

4.2.3. In accordance with the EA's Flood Map for Planning (Appendix A) and most of the development site is in Flood Zone 2 (< 0.1% to 0.5 AEP). However, the site is in close proximity to River Mersey Flood Zone 3 (>0.5% AEP).

Figure 4.1: Flood Map for Planning



4.2.4. MCC Strategic Flood Risk Assessments (SFRA) is based on the EA's Flood Map for Planning and does not provide any additional information regarding coastal flood risk.

4.2.5. The EA's historic flood does not report historic flood events at the site.

4.2.6. Management measures proposed to manage flood risks are described in Section 5.3.

4.3. Fluvial Flood Risk

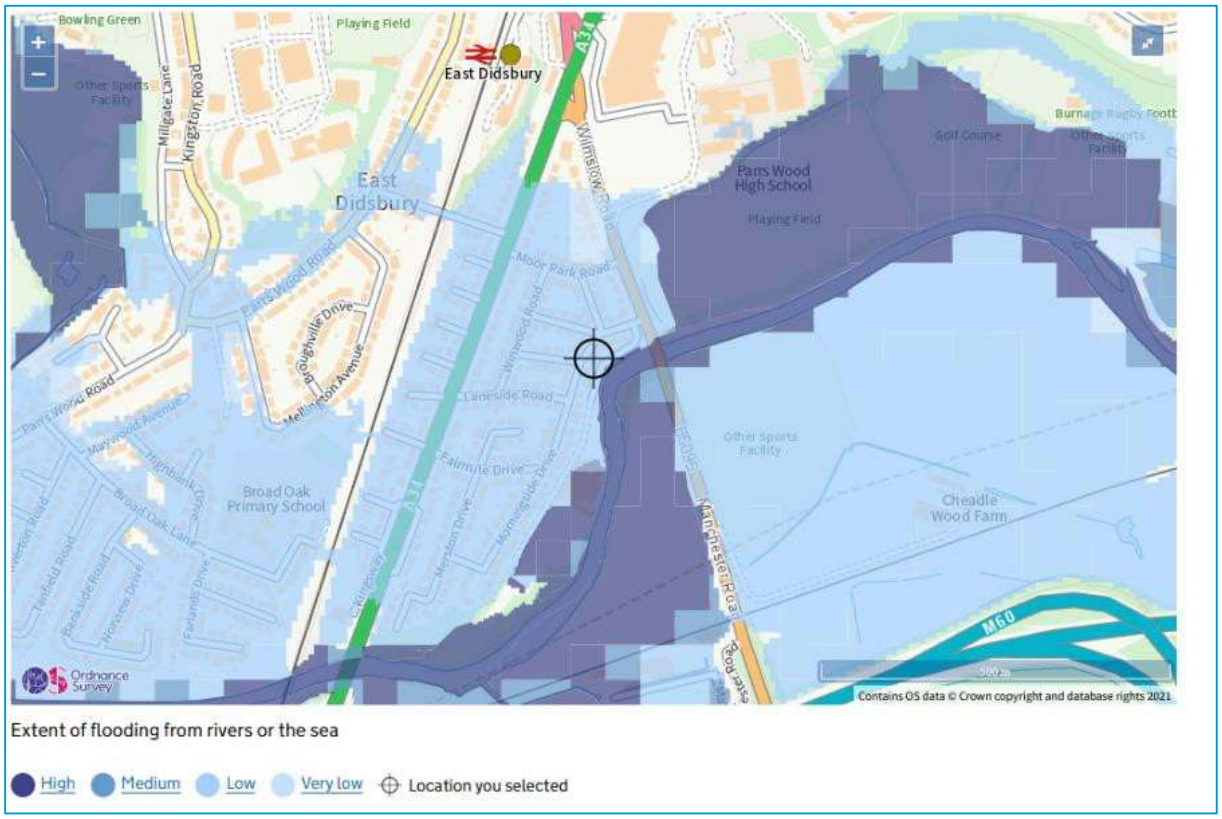
4.3.1. Fluvial flooding occurs when a catchment area receives greater than usual amounts of water (e.g. rainfall or snow melt). When the converging runoff exceeds the conveyance capacity of the receiving channel, water spills onto the surrounding floodplains and fluvial flooding occurs.

4.3.2. Fluvial flooding usually occurs hours or days after heavy and / or prolonged rainfall and its effects often last several hours or days.

4.3.3. Besides posing a direct flood risk to floodplain areas, high water levels in watercourses can exacerbate other sources of flood risk by surcharging / locking outfalls, thus preventing the normal discharge of flows or even back flowing into tributary drainage systems.

4.3.4. In accordance with the EA's Long Term Flood Information (Appendix A), most of the development site lies in low to medium risk of flooding from rivers or seas. However, areas nearer to River Mersey and are high flood risk.

Figure 4.2: Flood Map for Rivers or the Sea



4.3.5. The site does not benefit from formal flood defences.

4.3.6. Management measures proposed to manage flood risks are described in Section 5.3.

4.4. Surface Water Flood Risk

4.4.1. Surface water flooding is a description for excessive overland flows that have yet to enter a natural or manmade receptor (e.g. aquifer, watercourse or sewer). Surface water flooding also occurs when the amount of runoff exceeds the capacity of the collecting system and spills onto overland flow routes.

4.4.2. Surface water flooding is usually the result of very intense, short lived rainfall events, but can also occur during milder, longer lived rainfall events, when collecting systems are at capacity or the ground is saturated. It often results in the inundation of low points in the terrain.

4.4.3. In accordance with the EA's Long Term Flood Risk Information (Appendix A) the development site is mostly at very low (< 0.1% AEP) risk of surface water flooding. However, areas near prominent overland flow paths are at low (0.1% to 1.0% AEP), medium (1.0% to 3.3% AEP) flood risk

Figure 4.3: Flood Risk from Surface Water



4.4.4. MCC's strategic flood risk assessments are based on the EA's Long Term Flood Risk Information and do not provide any additional information regarding surface water flood risk.

4.4.5. The available information suggests there is very low risk of surface water flooding.

4.4.6. Management measures proposed to manage flood risks are described in Section 5.3.

4.5. Groundwater Flood Risk

4.5.1. Groundwater flooding occurs when the level of water filling the pores and / or cracks in the underlying soil and / or rock (i.e. water table) rises and emerges on the surface. The level of the water table varies seasonally and depends upon long term rainfall, thickness and porosity of the underlying strata and groundwater abstraction.

4.5.2. Groundwater flooding is most common in areas where the underlying bedrock and superficial deposits are very porous, but it can also happen at locations where superficial layers of sand or gravel overlay impermeable bedrock.

4.5.3. Groundwater flooding usually occurs after days or weeks of prolonged rainfall and often lasts for days or weeks, as subsiding of the water table can be a very slow process.

4.5.4. Besides posing a direct flood risk to developments (particularly basements), high water table levels can exacerbate other sources of flood risk by preventing infiltration and / or leaking into drainage systems. In accordance with MCC's strategic flood risk assessments, the development site is in an area no recorded issues of groundwater flooding. There are several recorded incidents of groundwater flooding in in adjacent districts, Salford and Trafford.

4.5.5. Management measures proposed to manage flood risks are described in Section 5.3.

4.6. Infrastructure Failure Flood Risk

4.6.1. Infrastructure failure flooding occurs when a feature holding water above natural ground levels (e.g. reservoir or canal) is overtopped or breached. Infrastructure failure flooding is usually the result of extreme events in excess of the high standards of protection usually considered in the design of such structures (namely reservoirs).

4.6.2. In accordance with the EA's Long Term Flood Risk Information, the development site is not at risk from reservoirs where rivers are at normal levels.

4.6.3. Reservoir failures are extremely rare in the UK, as the Reservoir Act ensures strict inspection and maintenance of all structures above a certain threshold. Structures under the Reservoir Act are also covered by comprehensive emergency plans and warning systems developed in liaison with the relevant civil protection authorities to ensure populations potentially at risk can be safely evacuated in critical situations.

Figure 4.4 Flood Risk from Reservoirs



5. FLOOD RISK MANAGEMENT

5.1. Flood Levels

5.1.1. Recent flood level data could not be sourced at the time writing. However, given no flood events have been reported in MCC's SFRA (see section 4.2), it can be assumed current floor levels of the dwelling are not at immediate risk of flooding. Additionally, the extension will form part of the main dwelling, maintaining existing floor levels.

5.2. Sustainable Drainage Systems (SuDS)

5.2.1. Use of soakaways cannot be confirmed without intrusive testing infiltration testing. Based on ground geology of the wider area, some infiltration may be possible and is recommended. It is important to note the need to remove silt from runoff prior to discharge into SUDS features. SuDS such as filter drains, swales are sustainable alternatives to proprietary treatment systems otherwise required to manage silt.

5.2.2. Given an existing garage and driveway will be largely replaced by the proposed extension, proposed impermeable area will not be increased.

5.3. Flood Resistance and Resilience

5.3.1. Vulnerable developments that cannot be raised above or defended against flood risk will dispose of the following flood resistance and resilience measures:

5.3.2. Flood depth up to 300mm: buildings will be designed to keep water out as much as possible using low permeability materials and construction (e.g. impermeable concrete) Appendix E.

5.3.3. The development site is in an area covered by the EA's flood warning system, which should allow users enough time to deploy flood defences and / or evacuate the site.

5.3.4. Safe refuge will be provided in the upper floors of buildings without a permanent safe access

/ egress route.

5.4. Flood Performance Building Materials

5.4.1. Flood performance of residential developments can be achieved by utilising materials resilient to water penetration and resistant to moisture.

5.4.2. Improving the Flood Performance of New Buildings (2007) makes a number of recommendations of which a key extracts can be found in appendix E

5.5. Environmental Agency Guidance

5.5.1. The EA have additional guidance information for flood action planning

5.5.2. A completed personal flood plan with key contact information and EA: 'Would you know what to do in a flood' should be provided to the property occupant(s) upon completing of construction works

6. DRAINAGE

6.1. Existing Drainage

6.1.1. The area of development is currently serving a driveway and garage to the gable end and patio area to the rea. The remainder garden area is does not benefit from formal surface water drainage system.

6.1.2. Runoff generated within the existing development is intercepted by gullies/drains and sewers and conveyed to the downstream drainage system.

6.2. Proposed Drainage

6.2.1. The proposed surface water drainage will be designed in accordance with Building Regulations Part H and in compliance with the NPPF, local requirements and current best practices, to convey runoff from all impermeable areas to the drainage system.

6.2.2. *Rainwater downpipes which are currently serving rear and gable end of the property will be repositioned around the proposed extension and connect into exiting sewers as per the current arrangement. Additional rainwater pipes and upsized conduits to suit increased roof area to be provided to suit.*

7. CONCLUSIONS AND RECOMMENDATIONS

The findings of this report and recommendations are summarised below:

7.1.1. The development is located adjacent to River Mersey and of the following flood risk attributes:

- Flood Zone 2 with an (< 0.1% to 0.55% AEP)
- Low risk at flooding from rivers and sea, although the site is in close proximity to River Mersey
- Very low flood risk from Surface Water
- No risk from infrastructure failure based on normal river levels

7.1.2. Area geology indicates the development may be able to benefit from infiltration and is recommended, subject to site tests.

7.1.3. There are not known historical reports of flooding in the vicinity of this development.

7.1.4. Development proposes to extend an existing residential dwelling utilising space that is currently hard surfaced, serving a garage and driveway to the side elevation, and patio to the rear. The proposal does not increase impermeable area entering into the drainage system.

7.1.5. The development will extend from the current dwelling forming and extension to the principal structure. Therefore, existing floor level will need to be maintained across the entire area, and must not be lower.

7.1.6. Flood resilient construction materials and methods should be adopted wherever possible to alleviate and mange flood risk. Guidance is provided in '*Improving the Flood Performance of New Buildings' (May 2007)*.

7.1.7. The proposal along with recommendations and design approaches aforementioned, is deemed acceptable.