

St Michael's Place

Flood Risk Assessment

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Glossary

Term	Definition
Annual Exceedance Probability (AEP)	The probability that a storm event will be exceeded in any given year.
Attenuation	A method to reduce a flood peak to prevent flooding, often utilising temporary storage, but increasing the duration of the flow.
Flood Risk	The level of risk to personal safety and damage to property resulting from flooding due to the frequency or likelihood of flood events.
Flood Risk Assessment (FRA)	An assessment of the flood risks to the Proposed Development over its expected lifetime and the possible flood risks to the surrounding areas, assessing flood flows, flood storage capacity and runoff.
Fluvial Flooding	Flooding resulting from an exceedance event in a river or watercourse.
Groundwater	Water present within underground strata known as aquifers.
Groundwater Flooding	Water occurring below ground in natural formations (typically rocks, gravels and sands).
Impermeable Surface	A surface that does not permit the infiltration of water and, therefore, generates surface water runoff during periods of rainfall.
Inundation	Flooding of land with water
Mitigation	Positive measures taken to reduce either the probability of flooding or the consequences of flooding or a combination of the two.
Permeability	The measures of ease with which a fluid can flow through a porous medium.
Resilience	The degree to which an asset or development can recover from a flooding event.
Return Period	The average frequency of a specified condition. An 'n' year event is one that occurs on average over the long term, once every 'n' years
Risk	Risk is the probability that an event will occur and the impact (or consequences) associated with that event.
Runoff	Water flow over surfaces to the drainage system. Runoff occurs when rainfall exceeds the rate of permeability of a surface.
Strategic Flood Risk Assessment (SFRA)	An SFRA is the assessment and 'categorisation' of flood risk on an area-wide basis in accordance with the NPPF, usually carried out by the Local Planning Authority.
Surface Water Flooding	Surface water flooding occurs when the volume of water is unable to filtrate through the ground to enter drainage systems, and therefore runs quickly off land and results in localised flooding. This type of flooding is usually associated with intense rainfall.
Sustainable Drainage Systems (SuDS)	SuDS are used as a strategy to manage surface water in a sustainable manner or least damaging solution through management practices and physical structures.

Abbreviations

Term	Definition
AEP	Annual Exceedance Probability
EA	Environment Agency
FRA	Flood Risk Assessment
KC	Knowsley Metropolitan Borough Council
LCRCA	Liverpool City Region Combined Authority
NPPF	National Planning Policy Framework
SFRA	Strategic Flood Risk Assessment
SuDS	Sustainable Drainage Systems
UU	United Utilities

1 Executive Summary

This site-specific Flood Risk Assessment (FRA) has been prepared by Buro Happold on behalf of Genr8 Kajima Regeneration Limited, to support the hybrid planning application for the "Proposed Development" at St Michael's Place in the Knowsley Metropolitan Borough Council.

The assessment has been prepared in accordance with the National Planning Policy Framework (NPPF) (February 2025) and the Flood risk and coastal change Planning Practice Guidance (September 2025).

Subject		Findings
Site Description		The 3.80 ha site is located in Huyton town centre, within Knowsley Council (KC), north of Huyton Station. It sits on a gentle slope with ground levels ranging from ~34m to ~39m AOD. The nearest Flood Zone 2/3 area lies ~200m northwest, near the River Alt.
Proposal Description		The proposed development is a mixed-use scheme located in Huyton town centre, comprising a hybrid planning application as follows: • Part A (Detailed): Detailed application for the erection of a new Council Headquarters, hotel, public realm, change of use of Cavendish Walk to flexible Class E and/or F1 uses, site-wide enabling and associated works following demolition of existing buildings. • Part B (Outline): Outline application for a mixed-use development comprising residential (Classes C2 and C3) uses, commercial and community uses (Classes E and F1), replacement car parking provision at Lathom Road, public realm and associated works, with provision for meanwhile uses.
Application of the NPPF and PPG	Vulnerability Classifications	Proposed residential and hotel buildings are more vulnerable; proposed Council Headquarters, commercial, community uses and car parking provisions are less vulnerable, and public realm as water compatible.
	Design Flood Event (DFE)	Due to residential uses as part of the Proposed Development, a 100 year design life has been considered as part of the assessment. The 1 in 100 year event with an allowance for climate change over the next 100 years has been considered as the DFE.
	Sequential & Exception Test	According to the Environment Agency's (EA) Flood Map for Planning, the site lies entirely within Flood Zone 1 (low risk) and this FRA demonstrates that the site is at a low risk from other sources of flooding with mitigation measures in place. As such, the site is considered to pass the Sequential Test and an Exception Test is not required for this development.
Site Flood Risk	Fluvial & Tidal	According to the EA's Flood Map for Planning, the entire site is located within Flood Zone 1, which is defined as having a low risk of fluvial/tidal flooding, with a probability of flooding of less than 1 in 1,000 years (0.1%) in any given year, from rivers and the sea. The nearest river to the Proposed Development is the River Alt, approximately 500m from the Proposed Development. Tidal and fluvial flood risk is considered to be low now and in the future and additional measures to reduce this risk will not be required.
	Surface Water	The EA surface water flood map indicates that the majority of the west site is classified as having a low/very low risk of surface water flooding with a localised area at medium to high risk, as well as areas within the east site also at medium to high risk. This risk has been taken into account as part of the proposals and should be considered as part of the future design of the east site.
	Groundwater	The SFRA does not identify the Proposed Development as being at high risk from groundwater flooding and there are no recorded incidents of groundwater flooding in the vicinity of the site. The risk of flooding caused by groundwater flooding is therefore considered to be low.
	Sewers	There are no historic records of sewer flooding at the site. Consultation with United Utilities has been undertaken for the west site that confirmed there is sufficient

		sewerage capacity in the adjacent combined sewer network to serve the Proposed Development.
	Artificial Sources	There are no other artificial sources of flood risk in the vicinity of the site. The risk of flooding caused by the failure of a reservoir is therefore considered to be low.
Mitigation Measures	Design Methodology	To ensure the site is at a low risk now and in the future the proposed drainage strategy for the west site meets the requirements of Knowsley Council Sustainable Drainage & Surface Water Management Technical Guidance for Developers. Betterment to existing surface water discharge rates have been met to help reduce impacts of future climate change, utilising Sustainable Drainage Systems where possible. Consultation with United Utilities confirms that the site's foul water discharge meets the receiving public sewer network capacity. The drainage strategy for the east site should also be developed in line with the requirements of the Knowsley Council technical guidance. To ensure surface water flood risk is not increased to surrounding areas, proposed ground levels will generally be in keeping with existing ground levels and the proposed design site layout should consider the safety of users.

With the mitigation measures in place, it is concluded that the Proposed Development is at a low risk of flooding now and in the future and will not increase the flood risk to surrounding areas.

2 Introduction

2.1 Background

This site-specific Flood Risk Assessment (FRA) has been prepared by Buro Happold on behalf of Genr8 Kajima Regeneration Limited in support of an application for the hybrid planning application for St Michael's Place. The planning application is for a mixed-use development scheme within Huyton town centre comprising: (Part A) Detailed application for the erection of a new Council Headquarters, hotel, public realm, change of use of Cavendish Walk to flexible Class E and/or F1 uses, site-wide enabling and associated works following demolition of existing buildings; (Part B) Outline application for a mixed-use development comprising residential (Classes C2 and C3) uses, commercial and community uses (Classes E and F1), replacement car parking provision at Lathom Road, public realm and associated works, with provision for meanwhile uses, hereafter referred to as the 'Proposed Development'.

The assessment has been developed in accordance with the NPPF (February 2025) and the KC Level 2 SFRA (October 2012), Local Flood Risk Management Strategy (October 2017), Local Plan Core Strategy (January 2016) and the LCRCA SFRA (November 2023). This FRA considers potential flood risk to the Proposed Development from the following sources: tidal, fluvial, surface water, sewer, groundwater and artificial sources.

2.2 Site Description

The Proposed Development is located in the Knowsley Metropolitan Borough Council, centred on Ordnance Survey grid reference SJ 44211 90875. The proposed development land comprises Civic Way, Cavendish Walk and Lathom Road and Municipal Buildings, 20 Archway Road, Huyton, Liverpool L36 9UX. The Proposed Development is split between a west and east site and its location is shown in Figure 2.1.

The Proposed Development area is approximately 3.8 ha and is bordered by the Huyton Village Shopping Centre to the east, Asda petrol station to the west, residential areas to the north, and the rail line to the south. The west site is currently occupied by the existing Knowsley Council Headquarters, Huyton Village Library, car parks associated to these buildings, and existing hardstanding areas. The vast majority of the existing site is considered to be impermeable, with only small areas of soft landscaping. Ground levels rise from around ~34mAOD in the west/northwest to approximately 39mAOD in the northeast and 37mAOD in the southeast. In the vicinity of Lathom Road, levels range from 35mAoD in the northeast, reaching a maximum of 37mAOD to the southwest. These variations are shown in Figure 2.2.

The nearest watercourse to the site is the River Alt, approximately 585m to the north of the site and is designated as a Statutory Main River.



Figure 2.1 Site Location Plan.

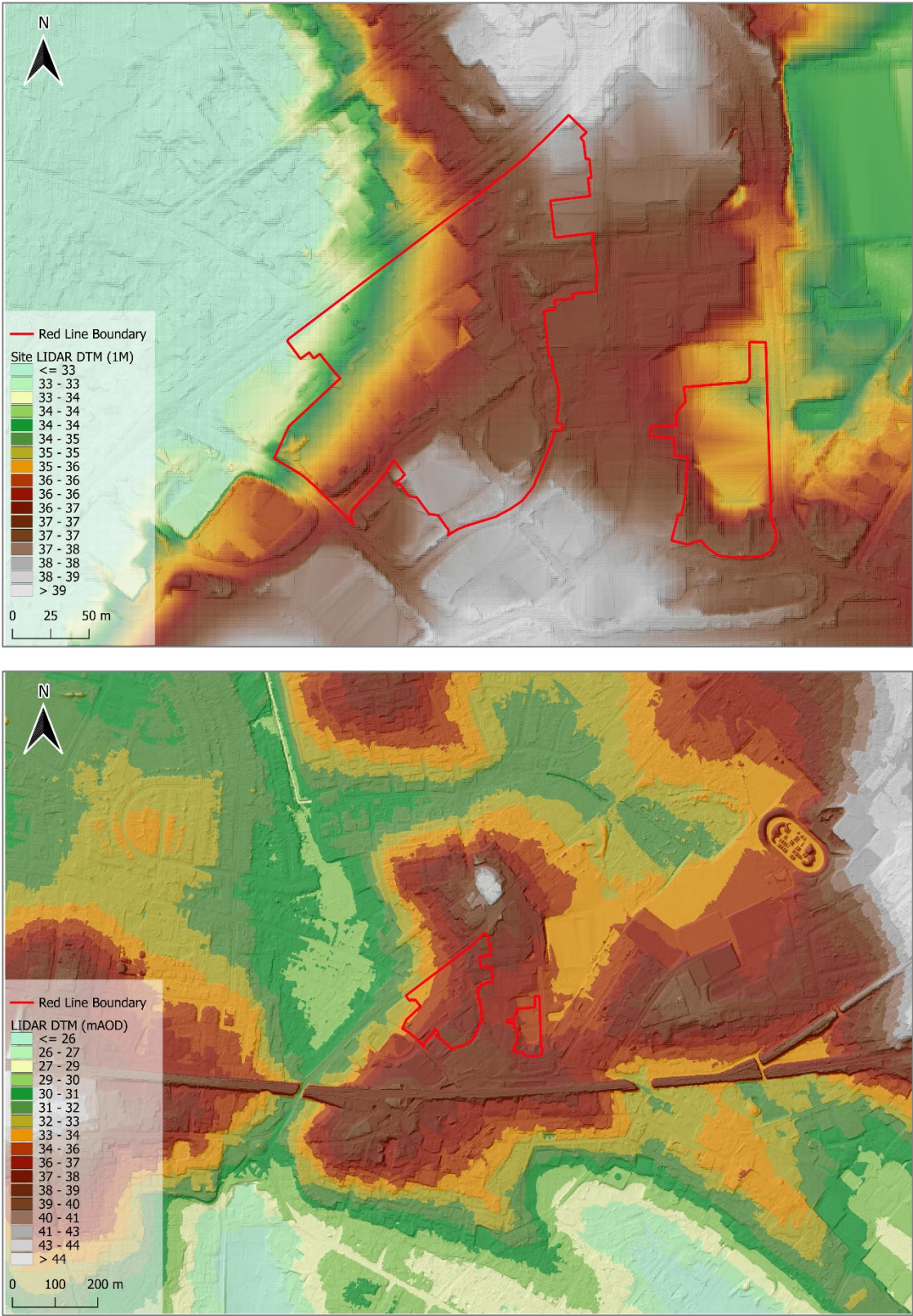


Figure 2.2 Environment Agency LIDAR Composite DTM 2022 1m data (© Environment Agency copyright and/or database right 2025. All rights reserved. © Environment Agency copyright and/or database right 2025. All rights reserved)

2.3 Proposed Development

The Proposed Development consists of a mixed-use development within Huyton town centre. The Hybrid planning application comprises of the following:

- **Part A** Detailed application for the erection of a new Council Headquarters, hotel, public realm, change of use of Cavendish Walk to flexible Class E and/or F1 uses, site-wide enabling and associated works following demolition of existing buildings.
- **Part B** Outline application for a mixed-use development comprising residential (Classes C2 and C3) uses, commercial and community uses (Classes E and F1), replacement car parking provision at Lathom Road, public realm and associated works, with provision for meanwhile uses.

The proposed plot arrangement is shown within Figure 2.3, Figure 2.4 and Figure 2.5.

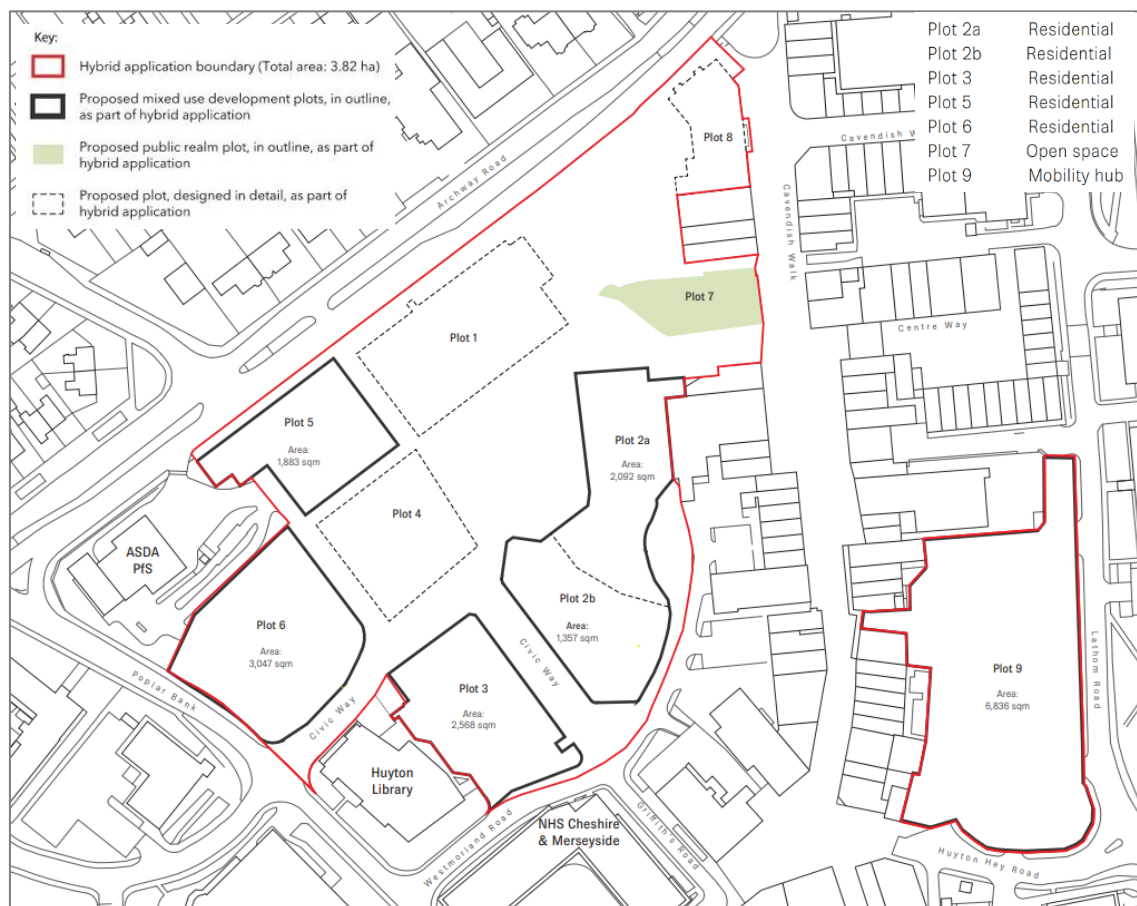


Figure 2.3 Proposed red line boundaries and development plots - Proposed (Lucid Design Studio, Drawing no. SMP-LUD-MP-ZZ-DR-U-90-13-00 Rev. 01, October 2025)



Figure 2.4 Public Realm General Arrangement Plan - (for full details refer to Lucid Design Studio, Drawing no. SMP-LUD-MP-ZZ-DR-L-91-02-00 Rev. 06, April 2025)



Figure 2.5 Proposed Development Parameter Plan - (Lucid Design Studio, Drawing no. SMP-LUD-MP-ZZ-DR-U-90-13-04 Rev. 01, October 2025)

3 Planning Context

3.1 Overview

This FRA has been prepared in accordance with the policies and guidance applicable to the Proposed Development, contained within the following publications:

- National Planning Policy Framework (NPPF) (February 2025);
- NPPF Flood risk and coastal change Planning Practice Guidance (September 2025);
- Liverpool City Region Combined Authority (LCRCA) Strategic Flood Risk Assessment (SFRA) (November 2023);
- Knowsley Metropolitan Borough Council Level 2 SFRA (October 2012);
- Knowsley Metropolitan Borough Council Local Flood Risk Management Strategy (LFRMS) (October 2017);
- Knowsley Metropolitan Borough Council Local Plan Core Strategy (January 2016).

3.2 National Planning Policy Framework

The NPPF directs that planning decisions should apply a sequential risk-based approach to the location of development, with the aim of steering new development to areas with the lowest risk of flooding (paragraphs 167 and 168). The Planning Practice Guidance (PPG) to the NPPF contains a series of tables that help identify the risk of flooding to a development:

- Table 1 defines four Flood Zones based on the annual exceedance probability (AEP) of rivers or sea flooding;
- Table 2 identifies what development is appropriate for each flood risk vulnerability classification based on the Flood Zones and whether the Exception Test is required; and,
- Annex 3 identifies specific land uses types for each of the five flood vulnerability classifications.

The NPPF further notes that, if it is not possible for development to be located in areas with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied. The need for the exception test will depend on the potential vulnerability of the site and of the development proposed, in line with the Flood Risk Vulnerability Classification set out in Annex 3 (paragraph 169).

3.2.1 Flood Zone Assessment

The Flood Zones defined in the NPPF are given within Table 3.1.

Table 3.1 Summary of Flood Zone definitions according to Table 1 of the NPPF

Flood Zone	Annual Exceedance Probability of Flooding from Rivers or the Sea	Probability
1	Land having a less than 0.1% (1 in 1000 year) annual probability of river or sea flooding	Low
2	Land having between a 1% and 0.1% (1 in 100 and 1 in 1000 year) annual probability of river flooding; or land having between a 0.5% and 0.1% (1 in 200 and 1 in 100 year) annual probability of sea flooding	Medium
3a	Land having a 1% (1 in 100 year) or greater annual probability of river flooding; or land having a 0.5% (1 in 200 year) or greater annual probability of sea flooding	High
3b	Comprises land where water from rivers or the sea has to flow or be stored in times of flood. This normally comprises land having a 3.3% (1 in 30 year) or greater annual probability of flooding; or land that is designed to flood (e.g. flood attenuation)	Functional Floodplain

According to the Environment Agency's Flood Maps for Planning, the Proposed Development is located within Flood Zone 1 as shown in Figure 4.2.

3.2.2 Flood Risk & Vulnerability

The PPG accompanying the NPPF outlines the Vulnerability Classifications of land use types and building uses. The mixed use development includes residential blocks, offices, a hotel, flexible commercial building uses and amenity open space and parking facilities.

For this FRA, the various uses within the masterplan have been separated to allocate the appropriate vulnerability classification based on the descriptions provided in the NPPF (Annex 3) to each use. The classifications can be seen in Table 3.2.

Table 3.2 - Proposed land uses and associated Flood Risk Vulnerability Classification

Land Use	Vulnerability Class
Residential	More Vulnerable
Hotel	More Vulnerable
Offices	Less Vulnerable
Retail	Less Vulnerable
Car Park	Less Vulnerable
Amenity open space	Water-compatible development

Table 3.3 is an extract of Table 2 within the NPPF and outlines the compatibility of the proposed land uses within each Flood Zone. The green box highlights the classification appropriate to this FRA.

Table 3.3 - NPPF Flood Risk Vulnerability and EA Flood Zone compatibility

Flood Zone	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 'Functional Floodplain'	Exception Test required	✗	✗	✗	✓

✓ = Exception test is not required

✗ = Development should not be permitted

With respect to the sequential test, the entirety of the Proposed Development is located within Flood Zone 1. Localised pockets in the west site and the east site are at a medium to high risk of surface water flooding. Water compatible and less vulnerable uses are proposed in these locations respectively. This risk reduces to low when the proposed flood mitigation measures are in place. Having regard to NPPF (Paragraph: 172), a sequential approach to siting of development has appropriately been applied and therefore, the Sequential Test is considered to be passed. With respect to the Exception Test, all proposed uses are appropriate for Flood Zone 1 and therefore an Exception Test is not required. Further details of the flood risk can be found in Section 4.

3.2.3 Climate Change

Allowances for the predicted effects of climate change should be taken into account when preparing site-specific flood risk assessments. The guidance¹ published by the EA to support the NPPF contains sensitivity ranges that are recommended to be applied.

The EA also provides guidance on the magnitude of allowance that should be applied according to the vulnerability classification. As residential uses form part of the proposals, the Proposed Development is classed as More Vulnerable and the design life for the Development is set at 100 years to the year 2125, and the upper end and central allowances are considered appropriate to be used within this FRA. The value pertaining to the central and upper end allowances up to the end of the design life of the development in the year 2125 are, therefore, highlighted within Table 3.4.

Table 3.4: Climate change allowances for Alt and Crossens Management Catchment peak rainfall allowances

Allowance Category	Total potential change anticipated for the '2050s' up to 2060	Total potential change anticipated for the '2070s' 2071 to 2125
Upper End	+40%	+45%
Central	+25%	+30%

¹ Environment Agency. September 2023. *Flood Risk Assessments: Climate Change Allowances*. Available at: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>.

3.3 Strategic Flood Risk Assessment

SFRAs are required to be carried out by Local Authorities to guide developers on the authority's strategies to avoid, reduce and manage flood risk. The LCRCA and KC SFRAs consider the risk of flooding from the following potential sources:

- Fluvial (rivers);
- Tidal;
- Surface water;
- Sewers;
- Groundwater; and
- Artificial sources.

The risk of flooding to the Proposed Development from each flood source listed above will be assessed in Section 4.

3.4 Knowsley Metropolitan Borough Council Local Plan Core Strategy

The KC published the Local Plan Core Strategy in January 2016, which is a strategic overview of development across Liverpool Region until 2028, including frameworks relating to economic, environmental, social and transport factors. It includes specific policies on flood risk management and the use of sustainable drainage.

The Local Plan requires for developments to follow NPPF guidance and use regional/ local SFRAs relevant to the development to identify areas where particular flood risk issues exist and develop actions and policy approaches aimed at reducing these risks, particularly through redevelopment of sites at risk of flooding and identifying specific opportunities for flood risk management measures.

The Local Plan also encourages developments to adopt sustainable drainage systems (SuDS), unless there are practical reasons for not doing so, and states that developments should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with the following drainage hierarchy:

1. Store rainwater for later use;
2. Use infiltration techniques, such as porous surfaces in non-clay areas;
3. Attenuate rainwater in ponds or open water features for gradual release;
4. Attenuate rainwater by storing in tanks or sealed water features for gradual release;
5. Discharge rainwater direct to a watercourse;
6. Discharge rainwater to a surface water sewer/drain;
7. Discharge rainwater to the combined sewer.

4 Appraisal of Flood Risk

4.1 Overview

This section assesses the sources of flood risk to the Proposed Development and outlines the proposed flood mitigation measures to ensure that the Proposed Development is safe for users and does not increase the flood risk elsewhere. The following sources of flood risk have been assessed:

- Flooding from rivers (fluvial);
- Flooding from the sea (tidal);
- Flooding from surface water runoff (pluvial) and sewer surcharge;
- Flooding from groundwater; and,
- Flooding from artificial sources.

4.2 Historical Flooding

The KC SFRA indicates that there is no recorded flooding at the Proposed Development, see Figure 4.1, although sewer related surface water flooding incidents are noted in the wider area.

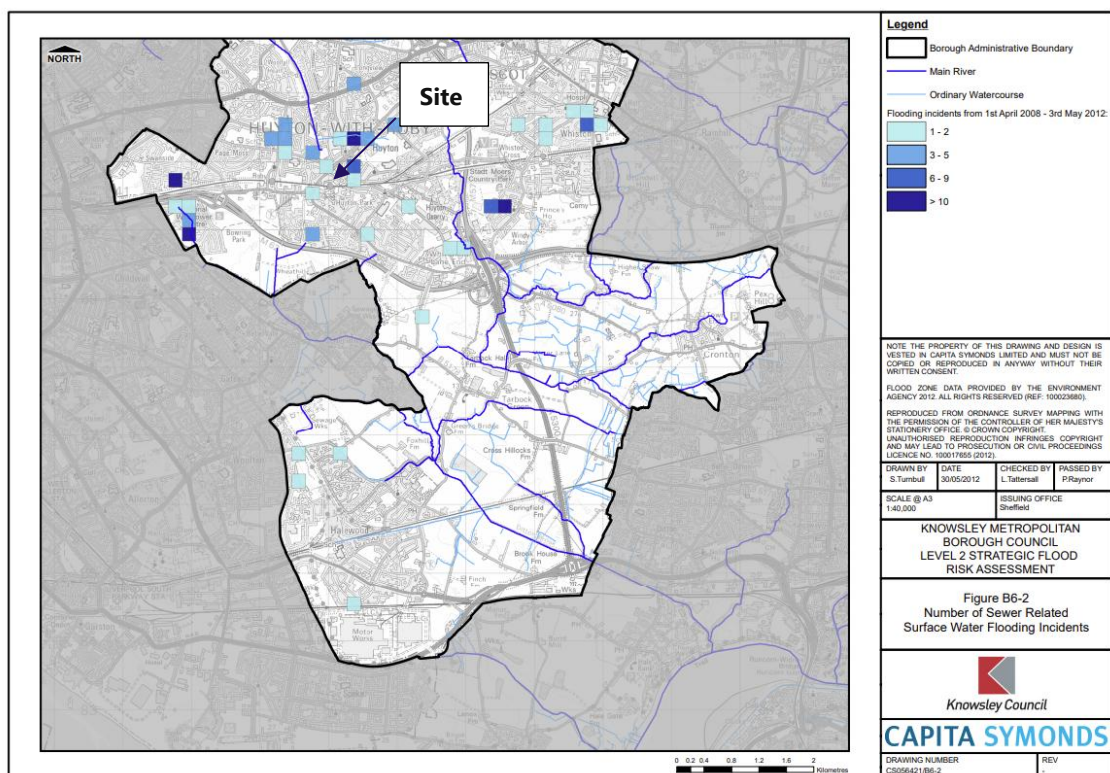


Figure 4.1 Historic flooding showing flooding incidents from 1st April 2008 to 3rd May 2012

4.3 Fluvial & Tidal Flooding

4.3.1 Flood Zones

The Flood Zones (Figure 4.2) produced by the EA for their Flood Map for Planning shows that the site is located entirely within Flood Zone 1. Flood Zone 1 is defined as an area with an annual probability of flooding from rivers or the sea of less than 0.1%. The latest EA flood maps also show that the site remains in Flood Zone 1 in the future (2070 – 2125), including an allowance for climate change.

The risk of flooding from rivers or the sea in Flood Zone 1 is classified as low, having an annual exceedance probability of 0.1% or 1 in 1,000 years. In accordance with EA guidance, the focus of this FRA will therefore be on the management of surface water run-off and the risk of flooding from other sources.



Figure 4.2 Environment Agency Flood Zone map with the site boundary marked in red (© Environment Agency copyright and / or database rights 2025. All rights reserved. © Crown Copyright and database right 2025).

4.3.2 Flood Risk Vulnerability Classification

The NPPF Planning Practice Guidance contains a series of tables that identify where development should be permitted, based on the Flood Zone in which the development is located and the proposed uses of that development. These tables are included in Section 3.2.

The Proposed Development is for a of a mixed-use development within Huyton town centre comprising a new Council Headquarters, hotel, public realm, active travel hub, residential and commercial floorspace with associated works. All of the above land uses are considered appropriate for development within Flood Zone 1, in accordance with the NPPF Planning Practice Guidance.

4.3.3 Flooding Assessment

Fluvial flooding occurs when sustained or intense rainfall events increase the flow in rivers causing the water level to rise above the level of the banks and into the surrounding areas.

Tidal flooding occurs when high tides coincide with storm surges. Storm surges are caused by low atmospheric pressure events resulting in temporary localised raising of sea levels.

The EA flood maps for planning and the KC SFRA show that the Proposed Development is entirely located within Flood Zone 1, which is defined as land having a low annual probability of flooding from rivers or from the sea. This is land having less than 1 in 1,000 annual probability of flooding (less than 0.1% AEP).

The nearest watercourse is the River Alt, which is approximately 500m northwest and 400m northeast of the site.

Since the site is located entirely within Flood Zone 1, the baseline fluvial and tidal flood risk to the site is considered to be low, therefore additional measures to reduce this risk will not be required in present and future scenarios.

4.4 Surface Water Flooding

Surface water flooding occurs when intense rainfall is unable to naturally soak into the ground due to impermeable ground covering such as concrete or tarmac, or low permeability ground conditions preventing infiltration. This excess surface water can flow through built-up areas and open space and pond in lower-lying areas, causing localised flooding.

4.4.1 Baseline

The existing brownfield site consists almost entirely of impermeable paving or roofing. During a rainfall event, there is therefore very little potential for infiltration, and almost all of the rainfall falling on the site would be converted to surface water run-off, which, in turn, can result in surface water flooding.

The surface water flood map produced by the EA (Figure 4.4) indicates that the majority of the site is classified as having a very low probability of surface water flooding. It is noted that an area of medium to high risk of surface water flooding exists in the east side of the west site where localised ponding is likely to be occurring and within the east site in the existing multi-storey car park in Lathom Road. Part of the pedestrian route Cavendish Walk/Derby Road, in between both sites, is also subject to medium to high risk from surface water flooding.

In the east site, the base of the pedestrian ramp within the entrance point of the south side of the existing multi-storey car park in Lathom Road may allow runoff from Lathom Road into the car park. An overland flow path derived from the east of the site may also flow and pond immediately north of the multistorey car park where land levels are at their lowest. Door openings into the multi-storey car park are generally raised above existing ground level and may therefore reduce the potential for floodwater entering the car park. The flood mapping indicates that estimated flood depths are generally below 0.3m with few isolated locations less than 0.6m.

Based on the available information (refer to the Buro Happold 2025 Drainage Strategy), it is assumed that all surface water is currently discharged to the existing United Utilities combined sewer network via six existing

sewer connections for the west site and to the existing sewer networks in Lathom Road and Huyton Hey Road for the east site.



Figure 4.3 Environment Agency Surface Water flood map zoomed out with the site location marked in red (© Environment Agency copyright and / or database rights 2025. All rights reserved. © Crown Copyright and database right 2025)

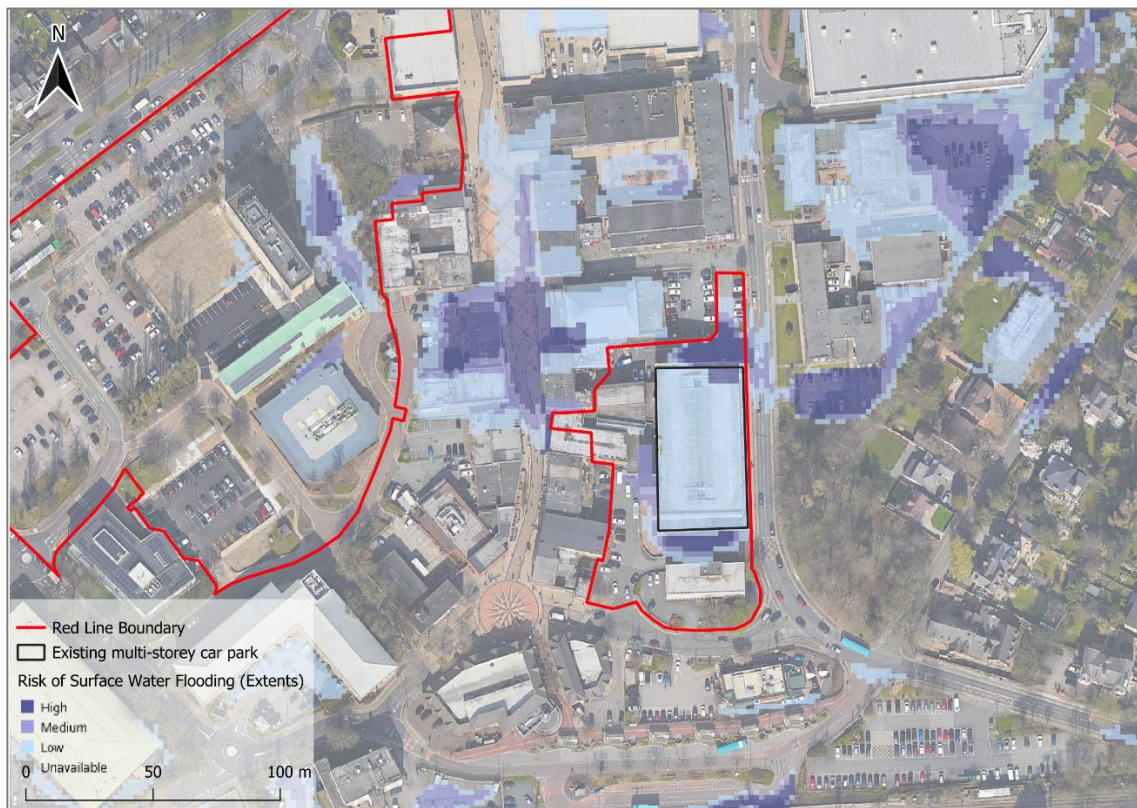


Figure 4.4 Environment Agency Surface Water flood map zoomed out and zoomed in with the site location marked in red and existing multi-storey car park marked in black (© Environment Agency copyright and / or database rights 2025. All rights reserved. © Crown Copyright and database right 2025)

4.4.2 Proposed

The proposed drainage strategy for the west plot has been developed in accordance with the KC Local Flood Risk Management Strategy, and discussions with KC and United Utilities (UU). The proposed drainage strategy recommends separate systems for surface and foul water.

A summary of the existing and the proposed surface water drainage strategy has been extracted from the Drainage Strategy for the west site in the 0054419-BHE-XX-XX-RP-C-0001 Drainage Strategy, Buro Happold, October 2025 where further details can be found.

The drainage strategy aims to adhere to the SuDS drainage hierarchy as detailed in the KC Local Plan Core Strategy, managing rainwater as close to source as possible: rainwater as a resource; infiltration; attenuation in green infrastructure; discharge to watercourse; discharge to surface water sewer; discharge to existing combined sewer.

The proposed surface water drainage strategy uses a combination of green roofs, permeable paving, gravity drainage, and geocellular storage to manage runoff sustainably. Rainwater attenuates in geocellular tanks through permeable paving in hardstanding areas, reducing surface runoff and filtering pollutants. Infiltration is deemed unsuitable for this site due to ground conditions identified during site investigation. Attenuated water is conveyed via a gravity-fed drainage network to a geocellular storage tank located in the central soft

landscaping area. Water is then discharged offsite at an agreed rate. A swale is also included to manage exceedance flows during extreme rainfall events.

Key features of the proposed drainage strategy include:

- The design follows CIRIA C753 and BS 8582:2013 principles, incorporating SuDS including permeable paving, swales, and geocellular tanks to manage water quality, conveyance, and attenuation.
- Whenever possible, positive drainage from buildings is used to guide water away from structures. Rain gardens, treepits, rills, and channel drains play a role in managing water flow.
- Biodiverse green roofs are proposed on Plot 1 - CHQ and the Plot 4 - Hotel building roofs. These living roofs not only enhance biodiversity but also offer rainwater harvesting opportunities. Reusing rainwater within community garden spaces aligns with the overall water management strategy.
- Attenuation is achieved through geocellular tanks (95% void ratio) and permeable paving (30% void ratio, 300mm depth). Tanks are sized for 1% AEP events with a 45% climate change allowance.
- A section of swale is proposed in the village green to provide management of exceedance flows, and also to provide biodiversity and amenity benefits.
- Discharge rates will be reduced from existing rates, providing a betterment of at least 50% reduction in discharge rates compared to existing conditions.

The proposed landscaping and drainage strategy will mitigate the impacts of the localised surface water flooding identified in the east of the west site. Civic Way provides alternative access route to and from the west site that avoids the surface water flooding on Cavendish Walk/Derby Road, if required.

In order to reduce the surface water flood risk now and in the future to the east site, the drainage strategy is to meet the requirements of the Knowsley Council Sustainable Drainage & Surface Water Management Technical Guidance for Developers. Proposed ground levels are generally in keeping with existing ground levels. This will maintain existing overland flow paths from offsite areas, reducing the potential impact of displacing floodwater and increasing the flood risk to other sites. The proposed design layout of the Mobility Hub should consider localised low points that are subject to potentially deep depths during an extreme storm event, to ensure the safety of users of the site. Huyton Hey Road provides an alternative access route to and from the east site that is at a low risk from surface water flooding if required.

With the measures identified in the proposed drainage strategy, it is considered that flood risk from surface water flooding is low.

4.5 Flooding from Combined Sewers

Flooding from combined sewers may occur during periods of intense rainfall when high volumes of surface water run-off exceed the capacity of the sewer and cause the pipes to back up and overflow.

4.5.1 Baseline

Due to aging infrastructure, the KC SFRA identifies that there may be localised flooding associated with the existing public sewerage system. The drainage system may be under capacity and/or subject to blockages resulting in localised flooding of roads and property. The KC SFRA indicates that UU does not hold records of

flooding issues relating to surface and foul water sewers in their DG5 register in the location of the Proposed Development. It is assumed that all foul water from the existing buildings on Proposed Development site is discharged unrestricted to the existing UU combined sewers located to the south, including connections under Archway Road, Westmorland Road and Lathom Road.

4.5.2 Proposed

The foul water drainage strategy comprises of a traditional gravity drainage network sized to convey flows from connection points within the office building and hotel building, using existing connections where feasible. Each plot will be served by its own dedicated foul drainage network and outfall. While most buildings will connect via gravity, a separate pumped system is proposed for the cycle store in Plot 1 – CHQ due to site levels. Peak discharge rates have been calculated for the hotel and office buildings, and UU has confirmed acceptance of unrestricted foul flows from the site into their public sewer network.

As the proposed strategy utilises existing infrastructure with sufficient capacity and accounts for peak flows, it is deemed not to increase flood risk. Therefore, the risk of flooding from foul sewers is considered low.

4.6 Groundwater Flooding

Groundwater flooding generally occurs in low-lying areas above permeable rock aquifers where the water table meets, and rises above, the ground surface.

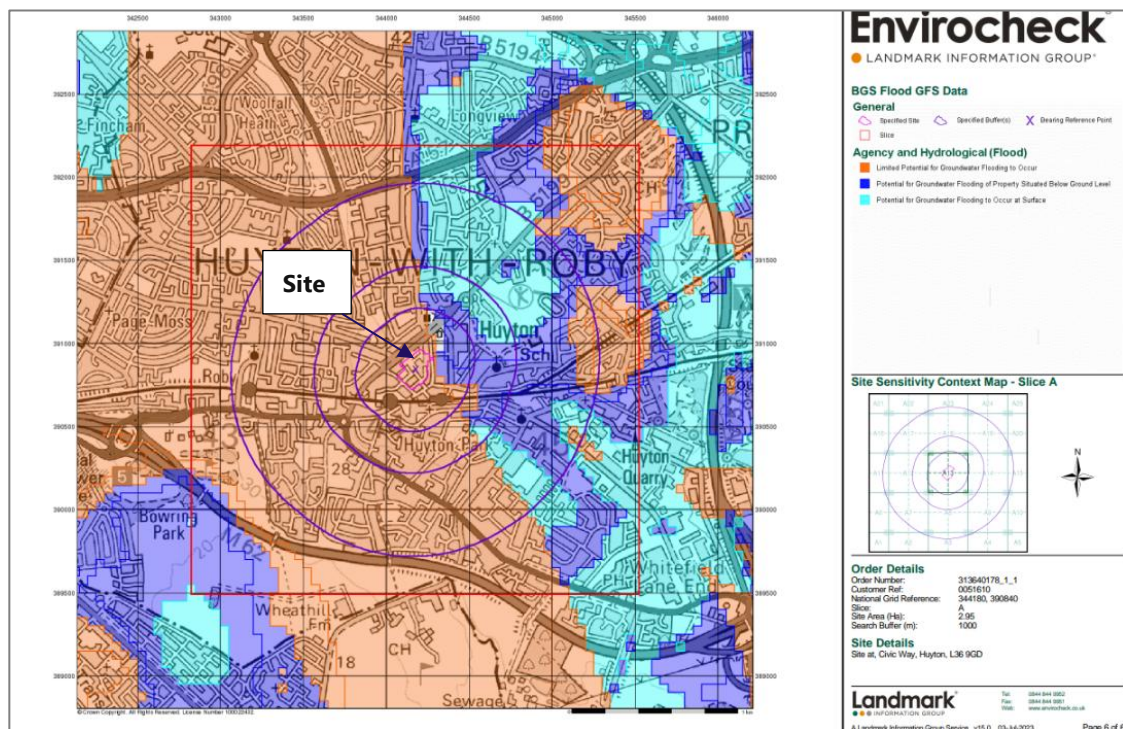


Figure 4.5 BGS Groundwater Emergence map

The British Geological Survey and the KC SFRA maps indicate that the eastern boundaries of the Proposed Development are not located in an area susceptible to groundwater flooding. Ground Investigations

undertaken at the site in 2023 indicate that recorded groundwater levels are approximately 5-6m below ground level (bgl), with localised areas between 1-2m bgl.

The EA long term flood risk service and the KC SFRA do not identify the Proposed Development as being at high risk from groundwater flooding with no recorded groundwater flood incidents occurred in the vicinity of the site. The risk of flooding caused by groundwater flooding is therefore considered to be low.

4.7 Flooding from Artificial Sources

Flooding from artificial sources includes flooding from reservoirs, canals and lakes, where water is retained above the natural ground level. The failure of an artificial source of water has the potential to cause catastrophic damage to its surroundings due to the sudden release of large volumes of water. However, the likelihood of such a failure occurring is very low.

The EA long term flood risk services indicates that the site is not located within the maximum extent of flooding that would occur if an upstream reservoir were to fail (Figure 4.6). The nearest reservoir is located approximately 4km northeast. The EA also advise that flood risk from reservoir flooding is extremely low due to the regular safety work undertaken at reservoirs to meet the Reservoirs Act 1975. There are no other artificial sources of flood risk in the vicinity of the site. The risk of flooding caused by artificial sources is therefore considered to be low.



Figure 4.6 Environment Agency Reservoir with the site location marked in red (© Environment Agency copyright and / or database rights 2025. All rights reserved. © Crown Copyright and database right 2025)

5 Summary and Conclusion

This FRA has been carried out as part of the planning application for the Proposed Development of St Michael's Place in the Knowsley Metropolitan Borough Council.

The Proposed Development consists of a mixed-use development within Huyton town centre comprising a new Council Headquarters, hotel, public realm, active travel hub, residential and commercial floorspace with associated works, with a total area of approximately 3.8 ha. The Hybrid planning application includes Part A and Part B. Part A is for the detailed application for the erection of a new Council Headquarters, hotel, public realm, change of use of Cavendish Walk to flexible Class E and/or F1 uses, site-wide enabling and associated works following demolition of existing buildings. Part B is for outline application for a mixed-use development comprising residential (Classes C2 and C3) uses, commercial and community uses (Classes E and F1), replacement car parking provision at Lathom Road, public realm and associated works, with provision for meanwhile uses.

According to the national flood map produced by the EA, the entirety of the site is located within Flood Zone 1, which is defined as having a low risk of flooding, less than 1 in 1,000 years (0.1%) in any given year, from rivers and the sea. Tidal and fluvial flood risk is therefore considered to be low and additional measures to reduce this risk will not be required.

In accordance with the NPPF, all the land uses for the Proposed Development are appropriate for Flood Zone 1. The proposed land uses in the Proposed Development are classified as less vulnerable, more vulnerable and water compatible within the NPPF.

The west site is primarily at low/very low risk from surface water flooding. A localised area in the east side of the west site is at a medium to high risk. The proposed landscaping and drainage strategy will mitigate the impacts of the localised surface water flooding. Civic Way provides alternative access route to and from the west site that avoids the surface water flooding identified on Cavendish Walk/Derby Road, if required.

The proposed surface water drainage strategy for the west site will limit discharge rates, providing at least a 50% reduction from the estimated rates during the existing condition. This reduction is to be achieved through a combination of permeable paving, gravity drainage, and geocellular storage. Rainwater will infiltrate through permeable surfaces where possible, with excess flows directed to a central storage tank via a gravity-fed network. Water will then be discharged offsite at a controlled rate. A swale will also be included to manage exceedance flows during extreme rainfall events.

The Proposed Development foul water will discharge into the existing UU network as agreed in consultation with UU who has confirmed there is sufficient sewerage capacity in the adjacent combined sewer network to serve the Proposed Development.

The drainage strategy for the east site should also be developed in line with the requirements of the KC Sustainable Drainage & Surface Water Management Technical Guidance for Developers. A medium to high risk of surface water flooding is identified to the north and south sides of the existing multi-story car park. To ensure surface water flood risk is not increased to surrounding areas, proposed ground levels will generally be in keeping with existing ground levels and the proposed design site layout should consider the safety of users. Huyton Hey Road provides an alternative access route to and from the east site that is at a low risk from surface water flooding if required.

The KC SFRA does not identify the Proposed Development as being at high risk from groundwater flooding and there are no recorded incidents of groundwater flooding in the vicinity of the site. The risk of groundwater flooding is therefore considered to be low.

The map showing the risk of flooding from reservoirs produced by the EA indicates that the site is not located within the maximum extent of flooding from reservoirs. There are no other artificial sources of flood risk in the vicinity of the site. The risk of flooding caused by the failure of a reservoir is therefore considered to be low.

It is concluded that the Proposed Development is at a low risk of flooding from all sources assessed for the entirety of its design life and will not increase the risk of flooding elsewhere.

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