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Express Solicitors
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Express Solicitors
Northenden, Greater Manchester
Flood Risk Assessment

Birmingham
Livery Place, 35 Livery Street, Colmore Business District, Birmingham, B3 2PB
T: 0121 233 3322

Leeds
Whitehall Waterfront, 2 Riverside Way, Leeds
LS1 4EH
T: 0113 233 8000

London
11 Borough High Street
London, SE1 9SE
T: 0207 407 3879

Manchester
11 Portland Street, Manchester, M1 3HU
0161 233 4260

Nottingham
Waterfront House, Station Street, Nottingham NG2 3DQ
T: 0115 924 1100

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Author:	Craig Crowe BSc (Hons) MSc GradCIWEM
Checked:	Keith Alger BSc (Hons) MSc
Approved:	Matthew Day BA (Hons) MSc FRGS MCIWEM C.WEM C.Sci C.Env

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EXECUTIVE SUMMARY

This Flood Risk Assessment (FRA) has been prepared in accordance with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance (PPG). It has been produced on behalf of Express Solicitors in respect of a planning application for a residential development off Palatine Road within Northenden, Greater-Manchester (approximate grid reference: SJ830903).

This report demonstrates that the proposed development is at an acceptable level of flood risk, subject to the recommended flood mitigation strategies being implemented.

The Environment Agency (EA) Flood Map for Planning shows the site to be located entirely within Flood Zone 2 of the River Mersey.

The Upper Mersey model (JBA, 2018) has been provided by the EA and updated to inform this FRA. The model results show the site is located outside of the extents associated with the 1 in 30-year flood event.

The updating and running of the hydraulic model, most notably to account for climate change, shows the site to be located within the flood extents of the 1 in 100-year, 1 in 100-year +41% and 1 in 1000-year flood events. Within the 1 in 100-year +41% climate change event peak depths within the site are shown to reach up to 0.53m.

Correspondence with the EA has confirmed that as there is no increase in built footprint, compensatory floodplain storage will not be required as the existing building footprint can be 'banked'.

The Level 2 Strategic Flood Risk Assessment (SFRA) recommends that floor levels for habitable uses are raised to an agreed freeboard (which may typically be 600mm) above the maximum water level during a 1 in 100 year flood event plus climate change.

The site is located within the 'Middle River Mersey catchment including areas near Bramhall, Stockport, Sale, Altrincham and Urmston' EA Flood Alert Area and the 'River Mersey at Northenden' EA Flood Warning Area. It is recommended that site owners and users sign up to receive EA alerts and warnings to understand when flooding may occur so the appropriate action can be taken.

The site is considered to be at a medium risk of flooding from groundwater sources. It is considered that the raising of FFLs 600mm above the 1 in 100-year +41% peak flood level will provide a level of mitigation against the groundwater and pluvial risk.

In the event groundwater is encountered during on-site excavations, an appropriate groundwater specialist should be consulted and appropriate dewatering undertaken as necessary.

The site is considered to be at a low risk from other sources of flooding including canals, reservoirs and large waterbodies, and sewers.

Surface water from the development will discharge to the local combined sewers in Palatine Road and at a restricted runoff rate that will provide betterment on the existing conditions.

In compliance with the requirements of NPPF, and subject to the mitigation measures proposed, the development could proceed without being subject to significant flood risk. Moreover, the development will not increase flood risk to the wider catchment area subject to suitable management of surface water runoff discharging from the site.

CONTENTS

EXECUTIVE SUMMARY III
1. INTRODUCTION 1
Sources of Data 1
Existing Site 2
Proposed Development 3
2. FLOOD RISK PLANNING POLICY & GUIDANCE 4
National Planning Policy Framework 4
Flood Map for Planning 4
The Design Flood 5
Climate Change 5
Strategic Flood Risk Assessment 7
Preliminary Flood Risk Assessment 7
Local Flood Risk Management Strategy 7
River Basin Flood Risk Management Plan 8
Surface Water Management Plan 8
Section 19 Flood Investigation Reports 8
Local Plan 9
Other Relevant Policy and Guidance 9
3. POTENTIAL SOURCES OF FLOOD RISK 11
Fluvial Flood Risk 12
Groundwater Flood Risk 14
Flood Risk from Reservoirs & Large Waterbodies 16
Pluvial Flood Risk 17
Flood Risk from Sewers 18
Effect of Development on Wider Catchment 18
4. FLOOD RISK MITIGATION 19
Floodplain Compensation 19
Development Levels 19
Flood Contingency Plan and Evacuation Procedures 20
Safe Access and Egress 20
Groundwater Considerations 20
Surface Water Drainage 21
Foul Water Drainage 21
5. CONCLUSIONS AND RECOMMENDATIONS 22

FIGURES

Figure 1.1: Site Location
Figure 2.1: Flood Map for Planning
Figure 3.1: Modelled Peak Flood Extents
Figure 3.2: BGS Underlying Bedrock Geology
Figure 3.3: EA Reservoir Failure Mapping
Figure 3.4: EA Risk of Flooding from Surface Water Mapping

TABLES

Table 1.1: Site Summary
Table 2.1: Flood Zone Classifications
Table 2.2: Peak River Flow Climate Change Allowances for the Upper Mersey Management Catchment within the North West River Basin District
Table 2.3: Application of Appropriate Peak River Flow Climate Change Allowances
Table 2.4: Hazard to People
Table 3.1: Pre-Mitigation Sources of Flood Risk
Table 3.2: Modelled Peak Flood Levels
Table 4.1: Development Levels based on Level 2 SFRA Guidance
Table 5.1: Summary of Flood Risk Assessment

APPENDICES

Appendix 1: Topographical Survey
Appendix 2: Illustrative Proposals
Appendix 3: NPPF Flood risk Vulnerability and Flood Zone Compatibility
Appendix 4: EA Pre-Application Advice
Appendix 5: Modelled Peak Flood Depth Maps
Appendix 6: United Utilities Sewer Records

1. INTRODUCTION

1.1 This FRA has been prepared in accordance with the requirements set out in the NPPF and the associated PPG. The FRA has been produced on behalf of Express Solicitors in respect of a planning application for residential development off Palatine Road, Northenden, Greater-Manchester

1.2 This FRA is intended to support an outline planning application, the level of detail included is commensurate and subject to the nature of the proposals at the planning stage. Summary information is included as **Table 1.1**.

Table 1.1: Site Summary

Site Name	Northenden
Location	Greater Manchester
NGR (approx.)	SJ830903
Application Site Area (ha)	0.16 (approx.)
Development Type	Residential
Flood Zone Classification	Flood Zone 2
NPPF Vulnerability	More Vulnerable
Anticipated Development Lifetime	100+ years
Environment Agency Office	Greater Manchester, Merseyside and Cheshire
Lead Local Flood Authority	Manchester City Council
Local Planning Authority	Manchester City Council

Sources of Data

i. Topographical Survey undertaken by Chris Partington Land Surveyors in April 2023, drawing reference: 120423JC-01

ii. EA 2022 2m resolution Light Detection and Ranging (LiDAR) data

iii. EA Consultation and Upper Mersey Hydraulic Model (JBA, 2018)

iv. EA Risk of Flooding from Surface Water Mapping (RoFSW) data

v. Manchester City, Salford City and Trafford Councils Level 1 SFRA[1]

vi. Manchester City, Salford City and Trafford Councils Level 2 SFRA[2]

[1] Manchester City, Salford City and Trafford Councils Level 1 Strategic Flood Risk Assessment (JBA Consulting, March 2010)
[2] Manchester City, Salford City and Trafford Councils Level 2 Strategic Flood Risk Assessment (JBA Consulting, March 2011)

vii. Manchester City Council Preliminary Flood Risk Assessment (PFRA)[3]

viii. Manchester City Council PFRA Addendum[4]

ix. Manchester City Council Local Flood Risk Management Strategy (LFMRS)[5]

x. North West River Basin Flood Risk Management Plan (FRMP)[6]

xi. Manchester's Local Development Framework Core Strategy Development Plan[7]

xii. United Utilities Sewer Records

xiii. British Geological Survey (BGS) Drift & Geology Maps

Existing Site

1.3 The site is located within the Northenden area of Greater-Manchester, approximately 8km south of Manchester City centre. The site is bound by Palatine Road which forms the western boundary of the site. Commercial and residential development bind the site along the remaining boundaries. The site's location is illustrated within **Figure 1.1**.

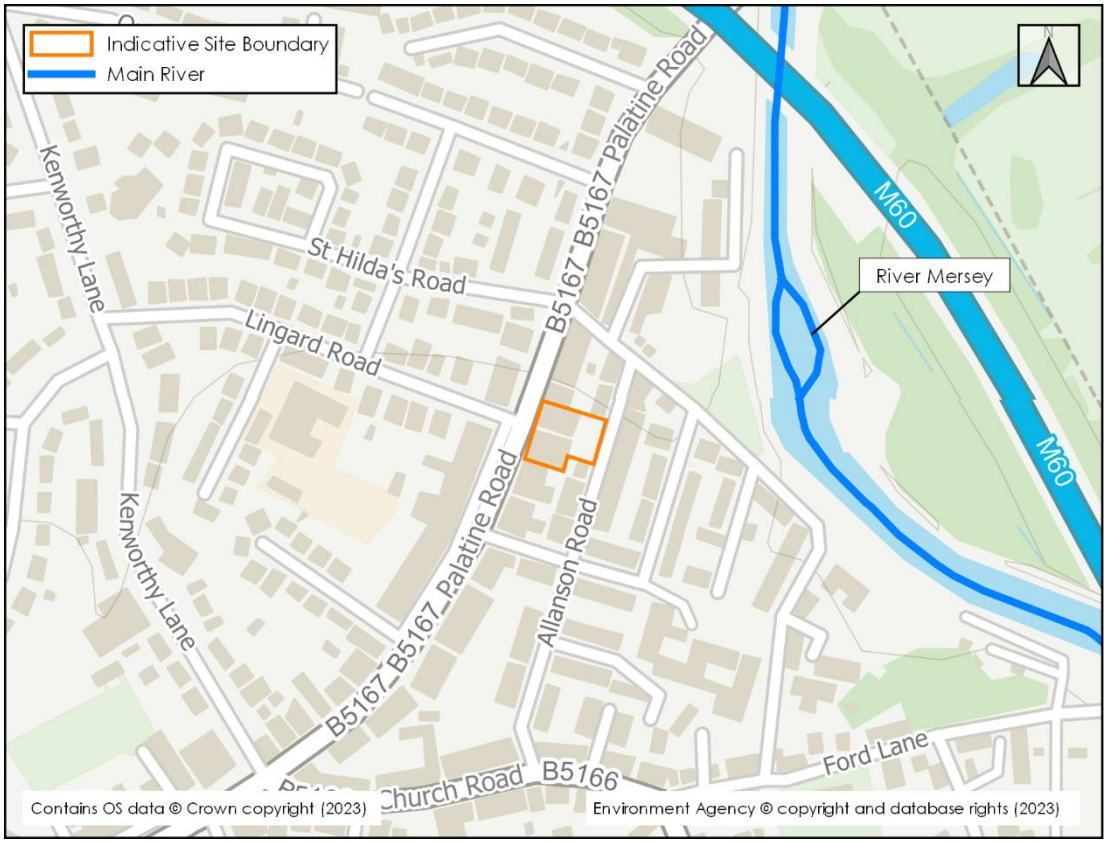


Figure 1.1: Site Location

1.4 A topographical survey of the site has been undertaken and is included as **Appendix 1**. The site demonstrates a generally flat topography, ground levels range between 29.37metres Above Ordnance Datum (mAOD) and 29.65mAOD.

[3] Manchester City Council Preliminary Flood Risk Assessment (JBA Consulting, May 2011)
[4] Manchester City Council Preliminary Flood Risk Assessment Addendum (Manchester City Council, December 2017)
[5] Manchester City Council Local Flood Risk Management Strategy (Manchester City Council, March 2014)
[6] North West River Basin Flood Risk Management Plan (Environment Agency, December 2022)
[7] Manchester's Local Development Framework Core Strategy Development Plan (Manchester City Council, Adopted July 2012)

1.5 The existing site is brownfield in nature, currently comprised of commercial development.

Proposed Development

1.6 The proposals are for outline planning application for demolition of the existing structure and erection of a new residential development on land off Palatine Road. The total proposed building footprint within the site will not increase compared to the existing footprint. Illustrative proposals are included as **Appendix 2**.

2. FLOOD RISK PLANNING POLICY & GUIDANCE

National Planning Policy Framework

2.1 The NPPF[8] sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. The PPG is also available online[9].

2.2 The PPG sets out the vulnerability to flooding of different land uses. It encourages development to be located in areas of lower flood risk where possible and stresses the importance of preventing increases in flood risk off site to the wider catchment area.

2.3 The PPG also states that alternative sources of flooding, other than fluvial (river flooding), should be considered when preparing a FRA.

2.4 The PPG includes a series of tables that define Flood Zones (Table 1), the flood risk vulnerability classification of development land uses (Table 2) and 'compatibility' of development within the defined Flood Zones (Table 3). Table 2 and Table 3 are recreated within **Appendix 3** of this report for reference.

2.5 This FRA is written in accordance with the NPPF and the PPG.

Flood Map for Planning

2.6 With particular reference to planning and development, the Flood Map for Planning identifies Flood Zones in accordance with Table 1 of the PPG. Further details on the Flood Zone classifications are outlined in **Table 2.1**.

Table 2.1: Flood Zone Classifications

Flood Zone	Description
Flood Zone 1 (Low Probability)	Land having less than a 1 in 1000 annual probability of river or sea flooding (<0.1% Annual Exceedance Probability). All land outside of Flood Zone 2 and 3.
Flood Zone 2 (Medium Probability)	Land having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1% AEP); or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1% AEP).
Flood Zone 3a (High Probability)	Land having a 1 in 100 or greater annual probability of river flooding (>1% AEP); or land having a 1 in 200 or greater annual probability of flooding from the sea (>0.5% AEP). This is represented by "Flood Zone 3" on the Flood Map for Planning.
Flood Zone 3b (The Functional Floodplain)	Flood Zone 3b (The Functional Floodplain) is defined as land where water must flow or be stored in times of flood. This is not identified or separately distinguished from Zone 3a on the Flood Map for Planning.

[8] Revised National Planning Policy Framework, Ministry of Housing, Communities & Local Government, amended 2021
[9] Planning Practice Guidance: https://www.gov.uk/government/collections/planning-practice-guidance

2.7 The EA Flood Map for Planning (**Figure 2.1**) shows site to be located entirely within Flood Zone 2.

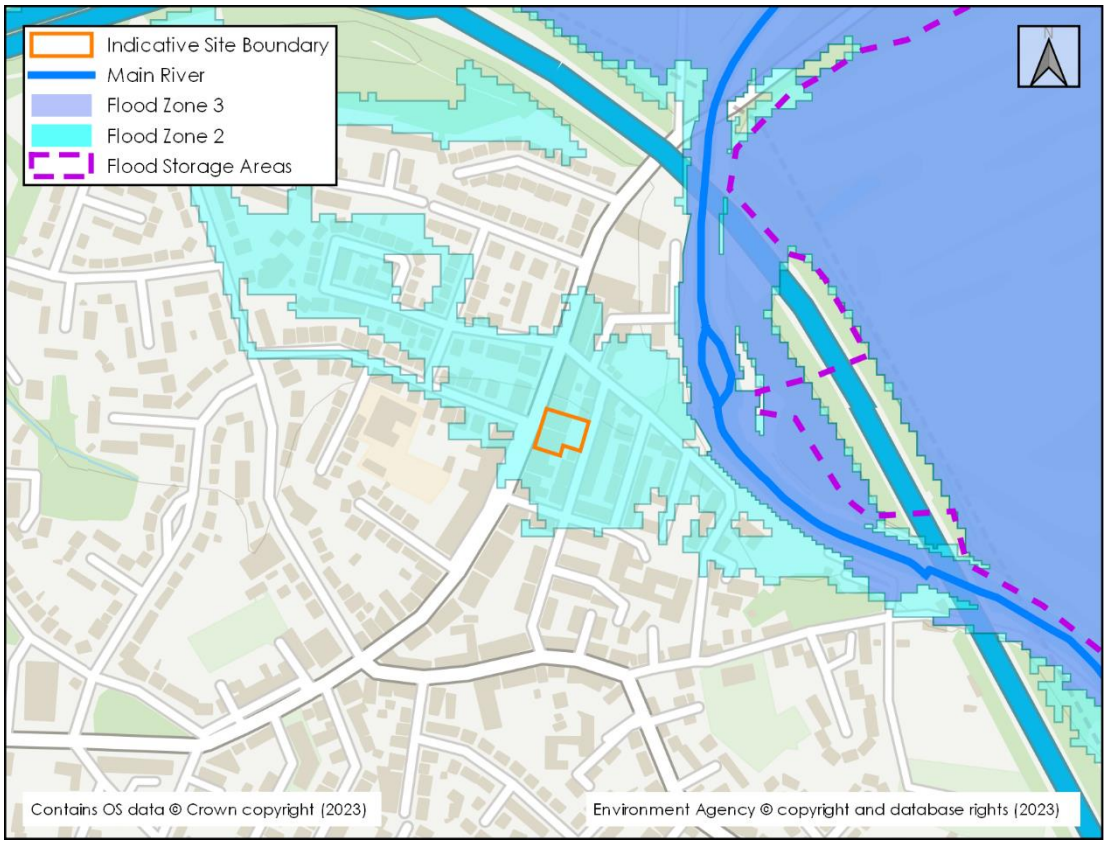


Figure 2.1: Flood Map for Planning

The Design Flood

2.8 The PPG identifies that new developments should be designed to provide adequate flood risk management, mitigation, and resilience against the 'design flood' for their lifetime.

2.9 This is a flood event of a given annual flood probability, which is generally taken as fluvial (river) and surface water (pluvial) flooding likely to occur with a 1% annual probability (a 1 in 100 chance each year), or tidal flooding with a 0.5% annual probability (1 in 200 chance each year), against which the suitability of a proposed development is assessed and mitigation measures, if any, are designed.

Climate Change

2.10 Predicted future changes in peak river flows caused by climate change are provided by the EA[10], with a range of projections applied to regionalised 'River Basin Districts', which are further subdivided into Management Catchments.

[10] Environment Agency, Flood risk assessments: climate change allowances: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances. Last Accessed June 2023.

2.11 The site falls within the Upper Mersey Management Catchment of the North West River Basin District. **Table 2.2** identifies the relevant peak river flow climate change allowances from this Management Catchment.

Table 2.2: Peak River Flow Climate Change Allowances for the Upper Mersey Management Catchment within the North West River Basin District

Allowance Category	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2125)
Upper End	27%	51%	85%
Higher Central	17%	31%	53%
Central	15%	22%	41%

2.12 When determining the appropriate allowance for use in a FRA the Flood Zone classification, flood risk vulnerability and the anticipated lifespan of the development should be considered. **Table 2.3** provides a matrix summarising the EA's guidance on determining the appropriate allowance(s).

Table 2.3: Application of Appropriate Peak River Flow Climate Change Allowances

Flood Zone	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
1	Use the central allowance where a location may fall within Flood Zone 2 or 3 in the future.				
2	Use the higher central allowance	Use the central allowance			
3a	Use the higher central allowance	Development should not be permitted	Use the central allowance		
3b	Use the higher central allowance	Development should not be permitted			Use the central allowance
If development is considered appropriate by the local authority when not in accordance with Flood Zone vulnerability categories, then it would be appropriate to use the higher central allowance.					

2.13 The site is located entirely within Flood Zone 2, the proposed development is classified as 'More Vulnerable', and it has an anticipated lifespan of 100+ years. Therefore, the Central allowance for the '2080s' epoch will be considered.

2.14 Therefore, to ensure the development is designed adequately for its lifetime an allowance of 41% will be applied to the design flood to identify minimum development levels.

2.15 When determining the potential off-site impacts of a proposed development its vulnerability is not critical, instead the land use in the wider floodplain needs to be considered. In their online guidance, the EA advise that generally it is appropriate to use the central allowance. Therefore, the 1 in 100-year+41% will be used to calculate any floodplain compensatory storage if considered necessary.

Strategic Flood Risk Assessment

2.16 A SFRA is a study carried out by one or more local planning authorities to assess the risk to an area from flooding from all sources, now and in the future.

2.17 The Manchester City, Salford City and Trafford Councils Level 1 SFRA[1] has been reviewed in the production of this FRA. The SFRA provides information specific to the site location in the form of fluvial, surface water and groundwater flood risk mapping, as well as records of historical flooding. It also includes flood risk policy and guidance for the area. Information from the Level 1 SFRA will be referenced within **Section 3**, where applicable.

2.18 The Manchester City, Salford City and Trafford Councils Level 2 SFRA[2] was produced to facilitate the application of Sequential and Exception Tests to screen allocated development sites. The proposed application site is not referenced within the Level 2 SFRA.

Preliminary Flood Risk Assessment

2.19 A PFRA is an assessment of floods that have taken place in the past and floods that could take place in the future. It generally considers flooding from surface water runoff, groundwater and ordinary watercourses, and is prepared by the Lead Local Flood Authorities (LLFAs).

2.20 The Manchester City Council PFRA[3] considers flooding from surface water runoff, groundwater, ordinary watercourses and canals. It also references the historical river flooding which occurred in the local area in 1981, 1991, 2001, 2004 and 2007. Information from the PFRA will be referenced within **Section 3**, where applicable.

2.21 An addendum to the PFRA[4] was produced in December 2017. No changes to the understanding of past and future flood risk are reported within the addendum. There are also no further historical flooding events reported within the addendum.

Local Flood Risk Management Strategy

2.22 A LFRMS is prepared by an LLFA to help understand and manage flood risk at a local level.

2.23 The LFRMS aims to ensure that the knowledge of local flood risk issues is communicated effectively so that they can be better managed. The LFRMS also aims to promote sustainable development and environmental protection.

2.24 The Manchester City Council LFRMS[5] has been reviewed; however, no applicable information in relation to flood risk at the site or immediate surrounding area, was identified.

River Basin Flood Risk Management Plan

2.25 FRMPs explain the risk of flooding from rivers, the sea, surface water, groundwater and reservoirs. FRMPs set out how risk management authorities will work with communities to manage flood and coastal risk. Risk management authorities include the EA, Natural Resources Wales, local councils, internal drainage boards, Highways England and LLFAs.

2.26 The first FRMPs were published in March 2016 and have since been updated in December 2022. They describe actions to manage flood risk across England between 2021 to 2027.

2.27 The site is located within the North West River Basin District, and the North West FRMP[6] has been reviewed; however no relevant site scale objectives were found within the report.

Surface Water Management Plan

2.28 Surface Water Management Plan SWMPs are non-statutory plans which preceded the introduction of the Flood and Water Management Act 2010. They can provide an important evidence base of local flood risk issues which can include surface water drains, groundwater and small watercourses.

2.29 Manchester City Council have not produced a SWMP for the area.

Section 19 Flood Investigation Reports

2.30 Under their duties of the Flood and Water Management Act 2010, LLFAs have a responsibility to publish reports of investigations of flood incidents. A Section 19 flood investigation report is a public statement of the circumstances of a historical flood event and what parties have a role in managing the risks. The investigation does not always give an in-depth analysis of the flood risk or mechanisms, but it can provide a valuable record of past events.

2.31 Greater Manchester Combined Authority have published one Section 19 report on their website[11], which documents the flooding that occurred in December 2015. The reports have been reviewed in relation to the site's location, but no evidence of flooding at the site was identified.

[11] Flood Investigation Report Greater Manchester (Greater Manchester Combined Authority, September 2016)

Local Plan

2.32 The Core Strategy[7] was adopted by Manchester City Council on 11th July 2012, as part of Manchester's Local Development Framework and covers a period of 15 years from 2012 to 2027 and outlines the Council's vision for Manchester in 2027.

2.33 Policy *EN14 Flood Risk* has been reviewed and is summarised below:

i. "Development should be directed away from sites at the greatest risk of flooding, and towards sites with little or no risk of flooding; this should take account of all sources of flooding identified in the SFRA."

ii. "In addition to the requirements for site-specific FRAs set out in PPS25, an appropriate FRA will also be required for all development proposals, including changes of use, on sites greater than 0.5ha within Critical Drainage Areas (CDAs) and Canal Hazard Zones identified in the SFRA."

iii. "All new development should minimise surface water run-off, including through Sustainable Drainage Systems (SuDS) and the appropriate use of Green Infrastructure. Developers should have regard to the surface water run-off rates in the SFRA User Guide. In CDAs, evidence to justify the surface water run-off approach/rates will be required."

iv. "The City of Manchester contains many sections of rivers which are culverted or 'hidden'; where these are indicated in the SFRA beneath the proposed development site, further investigation will be required and the development proposals should take this into account; where feasible and appropriate development should seek to open up culverted/hidden rivers to reduce the associated flood risk and danger of collapse, taking advantage of opportunities to enhance biodiversity and Green Infrastructure."

Other Relevant Policy and Guidance

<u>Flood Risk to People and New Developments</u>

2.34 The Flood Risk to People (FD2321/TR1)[12] document was prepared as a research project considering flood hazard and factors that affect it.

2.35 Flood Risk Assessment Guidance for New Development (FD2320/TR2)[13] provides a framework and guidance for assessing and managing flood risks for new developments and sets flood hazard thresholds.

2.36 Hazard ratings are derived using the following equation in line with the above:

$$Hazard\ Rating = D * (V+0.5) + DF$$

Where:
D = depth
V = velocity
DF = debris factor

[12] Flood Risk to People Methodology (FD2321/TR1), Defra/Environment Agency, 2006
[13] Flood Risk Assessment Guidance for New Development (FD2320/TR2), Defra/Environment Agency, 2005

2.37 A supplementary note[14] provides clarification of the hazard rating thresholds which should be used for development planning and control use. **Table 2.4** identifies the thresholds of the flood hazard categories.

Table 2.4: Hazard to People[15]

Threshold for Flood Hazard Rating	Degree of Flood Hazard	Description
< 0.75	Low	**Caution** "Flood zone with shallow flowing water or deep standing water"
0.75 - 1.25	Moderate	**Danger for some (i.e.: children, the elderly and the infirm)** "Danger: Flood Zone with deep or fast flowing water"
1.25 - 2.0	Significant	**Danger for most (includes the general public)** "Danger: Flood Zone with deep fast flowing water"
2.0 >	Extreme	**Danger for all (includes the emergency services)** "Extreme Danger: Flood Zone with deep fast flowing water"

Improving the Flood Performance of New Buildings; Flood Resilient Construction

2.38 The Flood Resilient Construction[16] document is the outcome of a joint research project between Communities and Local Government and the Environment Agency. A Research and Development Technical Report[17] is also available.

2.39 The document provides guidance on flood resilient design and construction and possible techniques and building materials. These documents are referred to in this Flood Risk Assessment and have been considered when recommending mitigation and resilience measures.

[14] Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purpose – Clarification of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1. (http://randd.defra.gov.uk/Document.aspx?Document=FD2321_7400_PR.pdf)
[15] 2008, DEFRA. Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purposes.
[16] Improving the Flood Performance of New Buildings; Flood Resilient Construction, CLG, May 2007
[17] Flood Resistance and Resilience Solutions; an R&D Scoping Study, Defra/Environment Agency, 2007

3. POTENTIAL SOURCES OF FLOOD RISK

3.1 Flooding can occur from a variety of sources, or combination of sources, which may be natural or artificial. **Table 3.1** below identifies the potential sources of flood risk to the site in its current condition, and the impacts which the development could have in the wider catchment, prior to mitigation. These are discussed in greater detail in the forthcoming section. The mitigation measures proposed to address flood risk issues and ensure the development is appropriate for its location are discussed within **Section 4**.

Table 3.1: Pre-Mitigation Sources of Flood Risk

Flood Source	Potential Risk				Description
	High	Medium	Low	None	
Fluvial		X			The EA Flood Map for Planning shows the site to be located entirely within Food Zone 2. Updates to the Upper Mersey Model (JBA, 2018) shows the site is located within the 1 in 100-year, 1 in 100-year +41% climate change and 1 in 1000-year modelled flood extents.
Coastal				X	The River Mersey is not considered to be tidally influenced adjacent to the site.
Canals				X	The nearest canal is located approximately 7km north of the site. Any exceedance from the canal would be intercepted by intervening topography.
Groundwater		X			The site is considered to be at a medium risk of groundwater flooding, based upon the underlying geology and shallow groundwater shown to have been encountered by nearby BGS borehole logs.
Reservoirs and waterbodies			X		The site is shown to fall within the area at risk of reservoir failure.
Pluvial runoff			X		The site is considered to be at a very low risk of surface water flooding. The access/egress is at a low to medium risk of surface water flooding.
Sewers			X		There is a public sewer network in the surrounding roads in the event of exceedance flows would be directed away from the site.

Flood Source	Potential Risk				Description
	High	Medium	Low	None	
Effect of Development on Wider Catchment		X			The development has the potential to displace the 1 in 100-year +41% fluvial floodplain, unless appropriately mitigated.
			X		There will be no impact on existing run-off rates as a result of development, due to there being no increase in impermeable areas post-development.

Fluvial Flood Risk

3.2 Flooding from watercourses occurs when flows exceed the capacity of the channel, or where a restrictive structure is encountered, which leads to water overtopping the banks into the floodplain. This process can be exacerbated when debris is mobilised by high flows and accumulates at structures.

3.3 The site is located approximately 100m south-west of the River Mersey, an EA Main River, which flows in a north-westerly direction under the M60 and Palatine Road 240m north of the site. There are no ordinary watercourses within the vicinity of the site.

Upper Mersey Model (JBA, 2018)

3.4 The EA Flood Map for Planning shows the site to be located entirely within Flood Zone 2 of the River Mersey. It is not expected that the Flood Map for Planning accounts for site-specific detail and demonstrates a strategic scale representation of fluvial flood risk in the area.

3.5 BWB has acquired the Upper Mersey model (JBA, 2018) from the EA. The model has been reviewed and an exercise undertaken to update the model for use in this site-specific FRA.

3.6 The minor amendments made to the Upper Mersey model are outlined below:

- Latest 2022 2m EA LiDAR added across the 2D model domain.
- The 1 in 100-year inflow hydrographs have been scaled to provide inflows for the 1 in 100-year +41% climate change event.

3.7 Following the minor changes, the model was run for the 1 in 30-year, 1 in 100-year, 1 in 100-year +41% climate change and 1 in 1000-year flood events.

3.8 An extract of the modelled peak flood extents for these return periods is shown in **Figure 3.1**. Peak flood levels for the critical events are reported in **Table 3.2**. The site is located outside of the floodplain for the 1 in 30-year event. However, for completeness a flood level for this event has been extracted from the model results at the closest location to

the site. Peak flood depths for the 1 in 100-year, 1 in 100-year +41% and 1 in 1000-year events are included as **Appendix 5**.

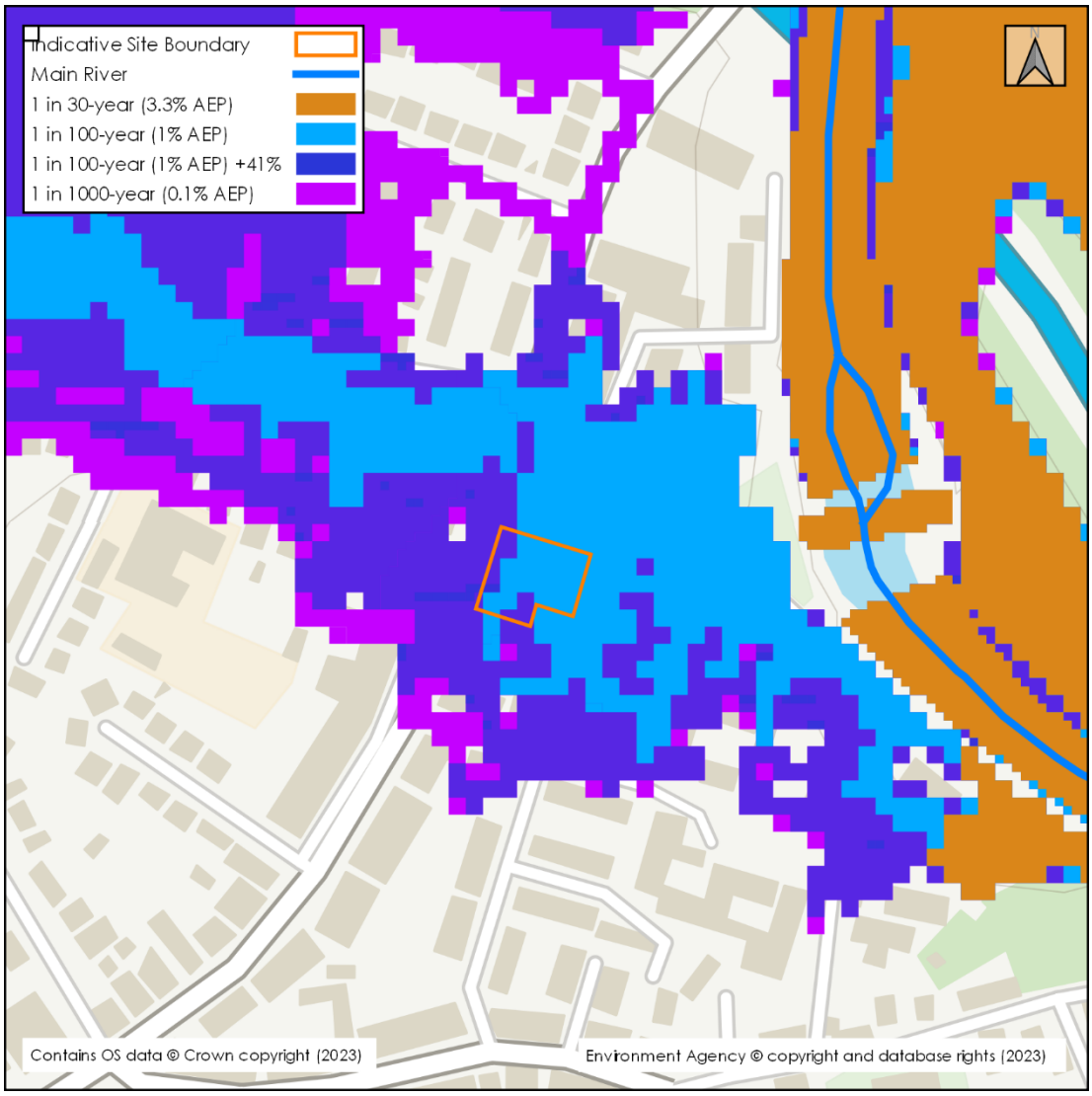


Figure 3.1: Modelled Peak Flood Extents

Table 3.2: Modelled Peak Flood Levels

Existing Site Levels (m AOD)	Modelled Peak Flood Level at Site (m AOD)			
	1 in 30-year	1 in 100-year	1 in 100-year +41%	1 in 1000-year
29.37-29.65	29.26*	29.58	29.78	29.82

*Nearest Peak Flood Level to the Site

3.9 The site shown to be located outside of the 1 in 30-year flood extents. The nearest extents for this event are located approximately 100m north-east of the site. The extents are shown to be predominantly confined to the channel of the watercourse at this point.

3.10 The site is shown to be partially located within the extents of the 1 in 100-year event and fully within the extents of the 1 in 100-year +41% and 1 in 1000-year flood extents.

3.11 Within the 1 in 100-year +41% climate change event peak depths within the site are shown to reach up to 0.53m. The results in this event indicate a predominantly 'Low' to 'Moderate' hazard rating, as per the classification shown in **Table 2.4**.

Historical Flooding

3.12 The PFRA reports historical flooding of the River Mersey in 1872, it is reported that properties within Northenden experienced significant flooding; however, it is unknown if the site specifically was impacted by this event. The Level 1 SFRA references historical flooding in Northenden from the River Mersey in 1998, it is not reported if this event impacted the site. An EA Recorded Flood Outline is shown to have impacted the site and refers to an event in 1964. However, the source and cause of flooding is not reported.

EA Pre-Application Consultation

3.13 Pre application advice was sought with the EA in July 2023 on the following points:

i. Whether floodplain compensation would be required.
ii. If compensation was to be required, would this be only for any increase upon the existing footprint?
iii. Whether the EA were happy with the model updates undertaken and whether they would want to review the minor model updates.

3.14 The email correspondence with the EA and the subsequent formal response is included as **Appendix 4**. The response is summarised below:

i. Compensatory flood storage will not be required in the event that the footprint of the new building is identical to that of the existing building.
ii. This is correct, compensation is required for any 'additional' building footprint to what's currently there.
iii. The EA do not wish to review the model changes.

3.15 Overall, the site is considered to be at a medium risk of flooding from fluvial sources. Appropriate mitigation measures are outlined in **Section 4**.

Groundwater Flood Risk

3.16 Groundwater flooding occurs when the water table rises above ground elevations, or it rises to depths containing basement level development. It is most likely to happen in low lying areas underlain by permeable geology. This is most common on regional scale chalk aquifers, but there may also be a risk on sandstone and limestone aquifers or on thick deposits of sands and gravels underlain by less permeable strata such as that in a river valley.

3.17 BGS Mapping (**Figure 3.2**) shows the site to be underlain entirely by Helsby Sandstone Formation – Sandstone, Pebbly (Gravelly). This is designated by the EA as a Principal Aquifer, defined as layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

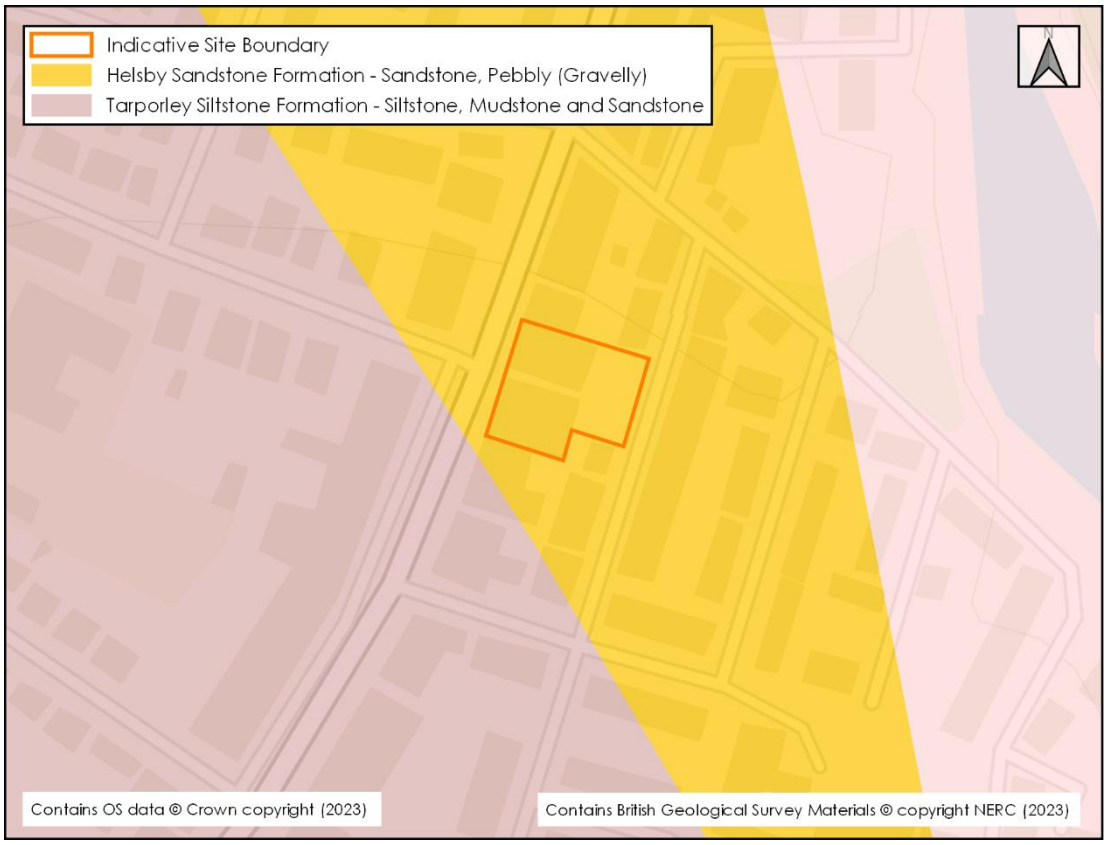


Figure 3.2: BGS Underlying Bedrock Geology

3.18 Superficial deposits of Glaciofluvial Sheet Deposits, Devensian - Sand and Gravel are expected to be present within the site. These deposits are designated Secondary A Aquifers, defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

3.19 There are no BGS borehole logs located within the site. Three logs from previous excavations (SJ89SW819, SJ89SW820, SJ89SW818) are located approximately 70m east of the site, they show the same geology as underlays the site. During the previous excavations, groundwater was encountered between 1.8 metres below ground level (bgl) and 2.3m bgl.

3.20 Mapping within the Level 1 SFRA shows the site to be outside of areas at risk of groundwater flooding. There are no records of historical groundwater flooding within the SFRA

3.21 It is expected that as the current site is wholly brownfield that there is limited opportunity for groundwater emergence.

3.22 Overall, based on shallow groundwater previously encountered in nearby boreholes, the site is considered to be at a medium risk of flooding from ground water sources. Appropriate mitigation measures are discussed in **Section 4**.

Flood Risk from Reservoirs & Large Waterbodies

3.23 Flooding can occur from large waterbodies or reservoirs if they are impounded above the surrounding ground levels or are used to retain water in times of flood. Although unlikely, reservoirs and large waterbodies could overtop or breach leading to rapid inundation of the downstream floodplain.

3.24 To help identify this risk, reservoir failure flood risk mapping has been prepared by the EA, this shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. The map displays a worst-case scenario and is only intended as a guide. An extract of the mapping is included as **Figure 3.3**.

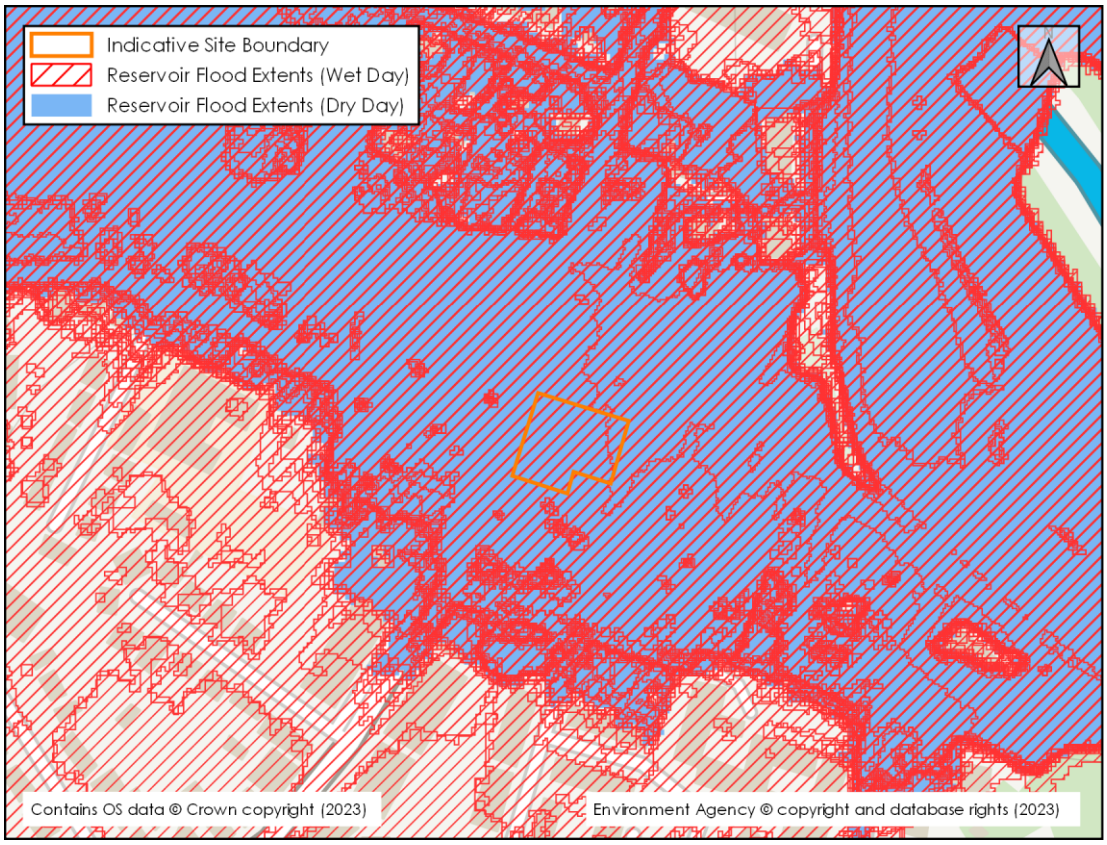


Figure 3.3: EA Reservoir Failure Mapping

3.25 There are two flooding scenarios shown on the reservoir flood maps: a 'dry-day' and a 'wet-day'. The 'dry-day' scenario predicts the flooding that would occur if the dam or reservoir failed when rivers are at normal levels. The 'wet-day' scenario predicts how much worse the flooding might be if a river is already experiencing an extreme flood.

3.26 The site is located within the 'dry-day' and 'wet day' extents of 30 reservoirs. These reservoirs are operated and maintained by the United Utilities and Canal and Rivers Trust who have ultimate responsibility for the safety of their reservoir assets. Their responsibilities

include regular safety inspections, any necessary design or repairs undertaken where required and an annual statement produced on the operation and maintenance regime.

3.27 Based on the safety legislation in place and the maintenance and repair responsibilities of United Utilities and Canal and Rivers Trust, the actual probability of a significant failure is considered to be low. Therefore the risk of flooding from this source is considered to be low.

Pluvial Flood Risk

3.28 Pluvial flooding can occur during prolonged or intense storm events when the infiltration potential of soils, or the capacity of drainage infrastructure is overwhelmed leading to the accumulation of surface water and the generation of overland flow routes.

3.29 Risk of Flooding from Surface Water (RoFSW) mapping has been collated and published by the EA, this shows the potential flooding which could occur when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead. An extract from the mapping is included as **Figure 3.4**.

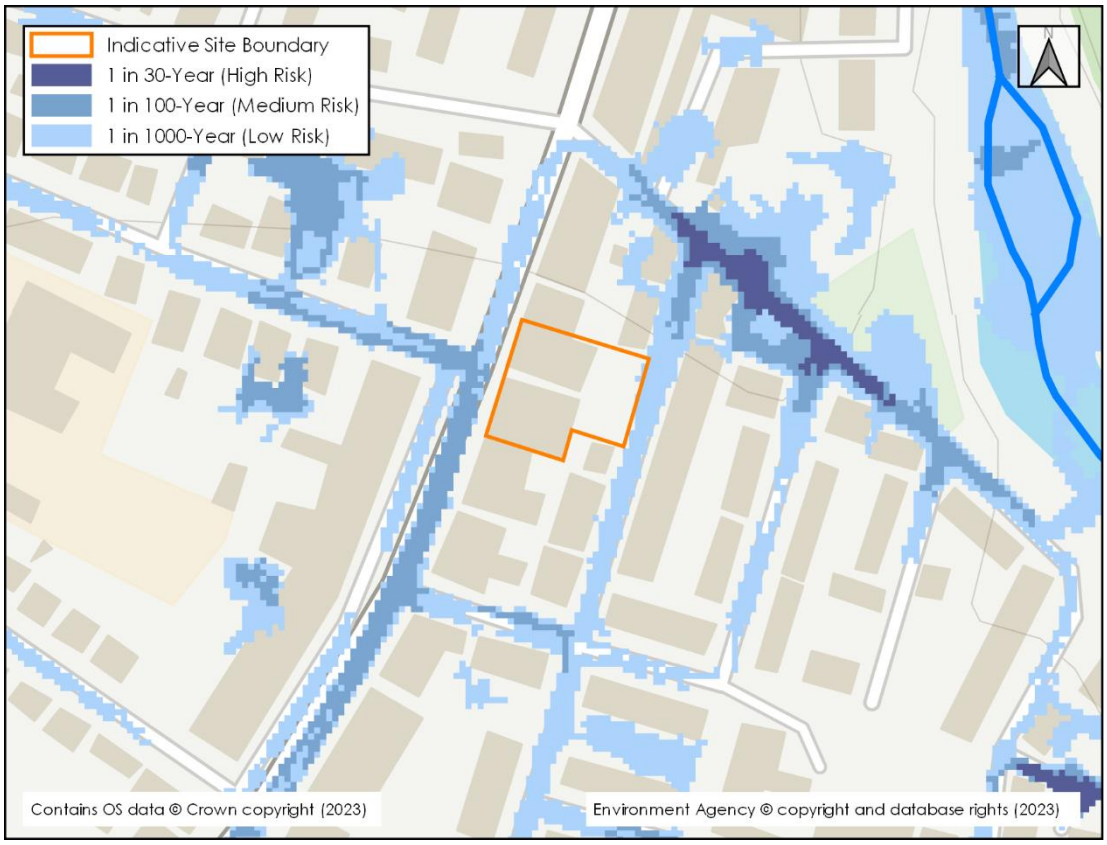


Figure 3.4: EA Risk of Flooding from Surface Water Mapping

3.30 The site is shown to be at a very low risk of flooding from surface water. The mapping shows low (1 in 1000-year) to (medium (1 in 100-year) risk within the access road of Palatine Road.

3.31 The depth of flooding within the 1 in 100-year design event in the road is predominantly less than 150mm, with some areas between 150mm and 300mm. These depths demonstrate a predominantly 'Low' hazard rating, as per the classification in **Table 2.4**.

3.32 United Utilities sewer records (**Appendix 6**) shows there to be existing public drainage assets within Palatine Road. The EA RoFSW mapping does not take these drainage features into account explicitly. It is therefore anticipated that the risk shown within the site and surrounding areas is over estimated, up to the design standard of the surrounding sewer network.

3.33 Overall, the site is considered to be at a low risk of flooding from pluvial sources. Appropriate mitigation for any residual risk is discussed in **Section 4**.

Flood Risk from Sewers

3.34 Sewer flooding can occur when the capacity of the infrastructure is exceeded by excessive flows, or as a result of a reduction in capacity due to collapse or blockage, or if the downstream system becomes surcharged. This can lead to the sewers flooding onto the surrounding ground via manholes and gullies, which can generate overland flows.

3.35 The United Utilities sewer records for the site are included as **Appendix 6**. The nearest assets to the site are two public 300mm combined sewers with Palatine Road and Allanson Road. At the points closest to the site these sewers have depths to invert of 3m and 2.05m respectively.

3.36 In the event that these sewers were to exceed capacity, flood water would be directed to the north towards Mill Lane.

3.37 The Level 1 SFRA notes Northenden as an area with sewer and drainage problems during rainfall events and references historical sewer flooding in Northenden in 1965. However, it is unknown if the site was impacted during this event.

3.38 Overall, the site is considered to be at low of flooding from sewer sources. Appropriate mitigation measures are discussed in **Section 4**.

Effect of Development on Wider Catchment

Displacement of Floodplain

3.39 The total building footprint within site will not increase compared to the existing. Therefore the development will not lead to an displacement of the floodplain.

Development Land Use/Drainage Considerations

3.40 There will be no impact on existing run-off rates as a result of development.

4. FLOOD RISK MITIGATION

4.1 **Section 3** has identified the sources of flooding which could potentially pose a risk to the site and the proposed development. This section of the FRA sets out the mitigation measures which are to be incorporated within the proposed development to address and reduce the risk of flooding to within acceptable levels.

Floodplain Compensation

4.2 The existing site is brownfield in nature and comprises an existing commercial building with footprint within the 1 in 100-year +41% climate change design event floodplain.

4.3 As discussed in **Section 3**, pre-application consultation with the EA has been undertaken (**Appendix 4**) to clarify their position on the banking of built footprint within the floodplain of the River Mersey. It was stated by the EA that "Compensatory flood storage will not be required in the event that the footprint of the new building is identical to that of the existing building".

4.4 An assessment of the existing built footprint within the design event floodplain was undertaken using building outlines included within the topographical survey. This demonstrates that there is an existing built footprint within the 1 in 100-year +41% design event floodplain of 946m^2 in the site.

4.5 The total building footprint area within the site will not increase compared to the existing footprint area within the site. Therefore, floodplain compensation measures are not required to be implemented.

Development Levels

4.6 The Level 2 SFRA states that "It is recommended that floor levels for habitable uses (defined as living rooms, dining rooms, kitchens depending on their use within the household and bedrooms) are raised to an agreed freeboard (which may typically be 600mm) above the maximum water level during a 1 in 100 year flood event plus climate change."

4.7 Based on this guidance the minimum Finished Floor Levels (FFLs) for the site are summarised in **Table 4.1**.

Table 4.1: Development Levels based on Level 2 SFRA Guidance

Existing Site Level (m AOD)	1 in 100-year +41% Modelled Peak Flood Level (m AOD)	FFL Freeboard (mm)	Minimum FFL (m AOD)
29.27-29.65	29.78	600	30.38

4.8 FFLs should therefore be set no lower than 30.38m AOD.

4.9 At this outline stage, it is noted that the proposed final use of the development is subject to change, and the FFL may be subject to review in accordance with levels and accessibility requirements.

4.10 It is considered that the raising of FFL 600mm above the 1 in 100-year +41% climate change peak flood level will also provide mitigation against groundwater, sewer, and pluvial flood risk.

Flood Contingency Plan and Evacuation Procedures

Flood Warning and Evacuation

4.11 The site is located within the 'Middle River Mersey catchment including areas near Bramhall, Stockport, Sale, Altrincham and Urmston' EA Flood Alert Area and the 'River Mersey at Northenden' EA Flood Warning Area. It is recommended that site owners and users sign up to receive EA alerts and warnings to understand when flooding may occur so the appropriate action can be taken.

4.12 In the event that flooding is expected it is recommended that the site is evacuated to the nearest area that is located outside of the 1 in 100-year +41% climate change floodplain and is at a low risk of flooding from surface water. This area is considered to be Church Road approximately 160m south of the site.

4.13 It is also recommended that site owners and users sign up to receive extreme weather warnings to provide an awareness of heavy rainfall events which could lead to surface water flooding around the access on Palatine Road.

Safe Refuge

4.14 In the event that safe access/egress cannot be achieved, it is recommended that safe refuge is provided within upper floors of the proposed development until flood water has receded.

Safe Access and Egress

4.15 Access/egress from the site via Palatine Road is located within the 1 in 100-year +41% climate change floodplain and demonstrates a risk of surface water flooding. Given the risk to the access/egress it is recommended that the Flood Warning and Evacuation procedure/Safe Refuge approach outlined above is adhered to.

Groundwater Considerations

4.16 The site is considered to be at a medium risk of groundwater flooding. In the event groundwater is encountered during on-site excavations, an appropriate groundwater specialist should be consulted and appropriate dewatering undertaken as necessary.

Surface Water Drainage

4.17 It is considered that due to the brownfield nature of the existing site, the proposed development will not have an impact on the existing runoff rates. However, it is proposed to incorporate surface water attenuation and storage as part of the development proposals to provide betterment on the existing conditions.

4.18 Further information on the drainage approach is provided within the accompanying Sustainable Drainage Statement, reference NDM-BWB-ZZ-XX-RP-CD-0001_SDS.

4.19 In brief, the development will discharge surface water to the local combined sewers in Palatine Road at a restricted runoff rate that will provide betterment on the existing conditions. Attenuated surface water storage will be provided with capacity for the 1 in 100-year storm with an allowance for climate change.

Foul Water Drainage

4.20 It is proposed to drain foul water from the development separately to surface water.

4.21 Further information on the drainage approach is provided within the accompanying Sustainable Drainage Statement, reference NDM-BWB-ZZ-XX-RP-CD-0001_SDS.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 This FRA has been prepared in accordance with the requirements set out in the NPPF and the associated PPG. The FRA has been produced on behalf of Express Solicitors in respect of a planning application for a residential development on land off Palatine Road, Northenden, Greater-Manchester.

5.2 This FRA is intended to support an outline planning application, the level of detail included is commensurate and subject to the nature of the proposals at the planning stage.

5.3 This report demonstrates that the proposed development is at an acceptable level of flood risk, subject to the recommended flood mitigation strategies being implemented. The identified risks and mitigation measures are summarised within **Table 5.1**:

Table 5.1: Summary of Flood Risk Assessment

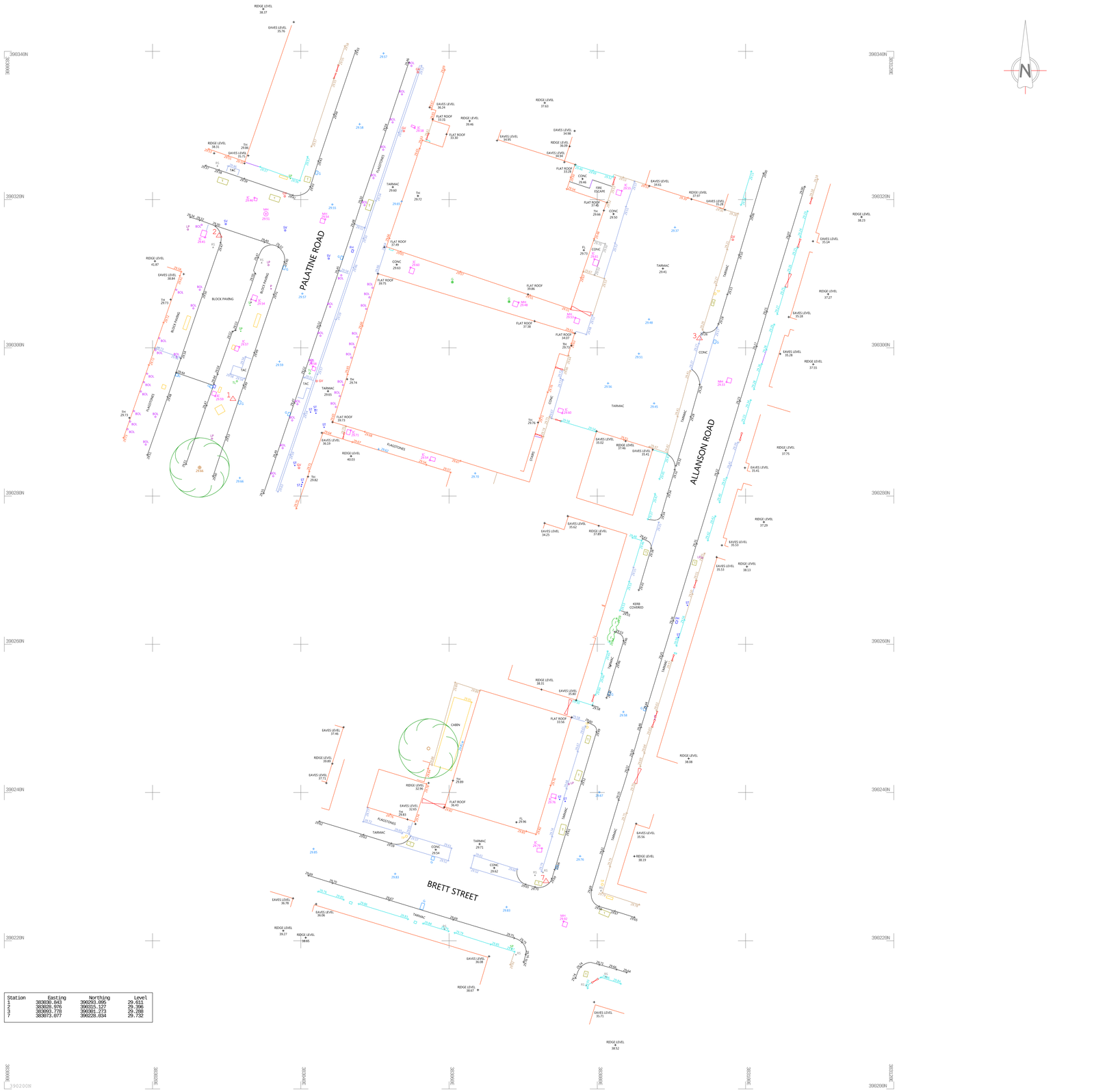
Flood Source	Risk & Proposed Mitigation Measures
Fluvial	Updates to the Upper Mersey model (JBA, 2018) provided by the EA, show the site is removed from the 1 in 30-year flood extents. The site is shown to be located within the extents of the 1 in 100-year, 1 in 100-year +41% climate change and 1 in 1000-year flood events of the River Mersey. The Level 2 SFRA recommends that floor levels for habitable uses (are raised to an agreed freeboard (which may typically be 600mm) above the maximum water level during a 1 in 100 year flood event plus climate change. A minimum FFL of 30.38mAOD is therefore proposed for the site. Access/egress from the site via Palatine Road is located within the 1 in 100-year +41% climate change floodplain and demonstrates a residual risk of surface water flooding. It is recommended that site users sign up to receive EA alerts and warnings and extreme weather warnings to understand when flooding may occur and to ensure the appropriate action can be taken. In the event the site cannot be evacuated, it is recommended that safe refuge is sought within upper floors of the proposed development.
Pluvial/Ground water/Sewers	Ground levels should be profiled to encourage pluvial runoff and overland flows away from built development and towards the nearest drainage point. In the event groundwater is encountered during on-site excavations, an appropriate groundwater specialist should be consulted and appropriate dewatering undertaken as necessary.
Other Sources of Flood Risk	The site is considered to be at a low risk from other sources of flooding including canals, reservoirs and large waterbodies.
Impact of the Development	Correspondence with the EA has confirmed that if there is no increase in built footprint, compensatory storage will not be required. Floodplain compensation measures are therefore not required for site.

	The development will discharge surface water to the local combined sewers in Palatine Road at a restricted runoff rate, with associated attenuation, this will provide betterment on the existing conditions. It is proposed to drain foul water from the development separately to surface water.
This summary should be read in conjunction with BWB's full report. It reflects an assessment of the Site based on information received by BWB at the time of production.	

5.4 In compliance with the requirements of NPPF, and subject to the mitigation measures proposed, the development could proceed without being subject to significant flood risk. Moreover, the development will not increase flood risk to the wider catchment area subject to suitable management of surface water runoff discharging from the site.

APPENDICES

Appendix 1: Topographical Survey



Station	Easting	Northing	Level
1	383030.843	390293.095	29.611
2	383028.976	390315.127	29.396
3	383093.778	390301.273	29.288
7	383073.077	390228.834	29.732

Abbreviations/Symbols (Measured Building Surveys):

C:	Window Cill Height
H:	Window Head Height
BH:	Beam Height
DH:	Door Height
COL:	Column
SVP:	Soil Vent Pipe
FL:	Floor Level
TH:	Threshold Level
2.56	Floor to Ceiling Height
	Vaulted Ceiling

Line types

	Hedge Lines
	Drainage Runs
	Overhead Electricity Cables
	Overhead Telephone Cables

Symbols

	Tree/Bush		Glass House
	Control Station		Osbm
	Borehole		
	Trial Hole		

Abbreviations (Topographic Survey):

AH:	Arch Height
AV:	Air Valve
BB:	Belisha Beacon
BOX:	Electricity Box, Cables Box, Etc.
BOL:	Bollard
BT/IC:	British Telecom Inspection Chamber
BS:	Bus Stop
BS/LP:	Bus Stop / Lamp Post
CATV:	CATV Inspection Chamber
CCTV:	Closed Circuit Television
CL:	Cellar Light
C.PIT:	Catch Pit
ER:	Earth Rod
EC:	Electricity Inspection Chamber
EP:	Electricity Pole
FH:	Fire Hydrant
FP:	Flag Pole
GV:	Gas Valve
G:	Gully
IC:	Inspection Chamber
KO:	Kerb Outlet
LP:	Lamp Post
LB:	Letter Box
LC:	Lighting Column
MKR:	Marker
MH:	Manhole
MP:	Mooring Point
MS:	Mile Stone
NYNEX:	Nynex Inspection Chamber
O/H:	Over Hang
P:	Post
PO/IC:	Post Office Inspection Chamber
R/S:	Road Sign
RE:	Rodding Eye
RTW:	Retaining Wall
S/P:	Sign Post
SNP:	Street Name Plate
ST:	Stop Tap
SV:	Stop Valve
T:	Telecom Inspection Chamber
TCB:	Telephone Call Box
TH:	Threshold Level
TL:	Traffic Light
TP:	Telegraph Pole
TROUGH:	Trough
WO:	Water Outlet
WM:	Water Meter

Fence Descriptions:

B/W:	Barbed Wire
C/B:	Close Boarded
C/BARRIER:	Crash Barrier
C/L:	Chain Link
C/P:	Chestnut Paling
C/I:	Corrugated Iron
I/R:	Iron Railing
MISC:	Miscellaneous
P/R:	Post & Rail
P/W:	Post & Wire
P/C:	Post & Chain
S/PAL:	Steel Palisade
W/M:	Wire Mesh

Survey Notes:

Coordinates and Levels related to Ordnance Survey Datum - GPS OSGB36

Revision	Date	Description

CPLS
Chris Partington Land Surveyors
44a Green Lane
Sale
Cheshire
M33 5PP
t: 0161 976 1194
www.cpls.co.uk e:survey@cpls.co.uk

Client

AEW Architects and Designers LTD

Project

Express Solicitors, Palatine Road, Northenden
Site Survey

Scale 1:200	Surveyed By J C	Date 12.04.23
Drawing No. 120423JC-01	Checked By CPLS	Date 13.04.23
	Drawn By J C	Date 13.04.23

Appendix 2: Illustrative Proposals

NOTES

AEWTP029C

- All dimensions and levels are to be checked on site.
- Any discrepancies are to be reported to the architect before any work commences
- This drawing shall not be scaled to ascertain any dimensions. Work to figured dimensions only.
- This drawing shall not be reproduced without express written permission from AEW.
- Title overlay drawings and ownership boundaries are produced using all reasonable endeavors. AEW cannot be responsible for the accuracy or scale discrepancy of base plans supplied to them.
- All works are to be undertaken in accordance with Building Regulations and the latest British Standards.
- All proprietary materials and products are to be used strictly in accordance with the manufacturers recommendations.

CDM 2015

Client notified of duties: **TBC**
Principal Designer: **TBC**

Unless noted below, all known hazards have been highlighted on the drawing:

0 5 10 15 20 25m

Scale 1:500 @ A3

Application Boundary
0.2 ha / 0.56 ac

REV	Date	Drawn by: -	Checked by: -
P02	24/07/23	RP	BR
Initial issue			
P01	21/07/23	RP	BR
Initial issue			

Status	Purpose of Issue
S2	For Comment

drawing stage **Planning**

client
RPC Planning

project
Northenden, Palatine Road

drawing title
Proposed Site Plan

date	19/07/2023	drawn	RP
scale@A3	1:500	checked	BR

Rev **P02**

Job No **12165-AEW-SI-XX-DR-A-0502**

aew architects
0161 214 4370
www.aewarchitects.com

AEW Reference Number 12165

Appendix 3: NPPF Flood risk Vulnerability and Flood Zone Compatibility

Flood Risk Vulnerability Classifications (recreated from the NPPF Planning Practise Guidance)

Vulnerability Classification	Description
Essential infrastructure	• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including infrastructure for electricity supply including generation, storage and distribution systems; including electricity generating power stations, grid and primary substations storage; and water treatment works that need to remain operational in times of flood. • Wind turbines. • Solar farms.
Highly Vulnerable	• Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure'.)
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 and hotels. • Non–residential uses for health services, nurseries and educational establishments. • Landfill* and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	• Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'more vulnerable' class; 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 working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place. • Car parks.
Water-Compatible Development	• Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of 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 and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

Flood Zone Compatibility (recreated from the NPPF Planning Practise Guidance)

Flood Zone	Vulnerability Classification				
	Essential infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone 1 (Low Probability)	Development is appropriate	Development is appropriate	Development is appropriate	Development is appropriate	Development is appropriate
Flood Zone 2 (Medium Probability)	Development is appropriate	To be deemed appropriate an exception test is required to demonstrate: • The development will be safe for its life time without increasing flood risk elsewhere, and where possible reduce overall flood risk • the sustainability benefits of the development to the community outweigh the flood risk.	Development is appropriate	Development is appropriate	Development is appropriate
Flood Zone 3a (High Probability)	To be deemed appropriate an exception test is required to demonstrate: • The development will be safe for its life time without increasing flood risk elsewhere, and where possible reduce overall flood risk the sustainability benefits of the development to the community outweigh the flood risk. Additionally, essential infrastructure should be designed and constructed to remain operational and safe in times of flood.	Development should not be permitted	To be deemed appropriate an exception test is required to demonstrate: • The development will be safe for its life time without increasing flood risk elsewhere, and where possible reduce overall flood risk • the sustainability benefits of the development to the community outweigh the flood risk.	Development is appropriate	Development is appropriate

Flood Zone	Vulnerability Classification				
	Essential infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone 3b (The Functional Floodplain)	To be deemed appropriate an exception test is required to demonstrate: • The development will be safe for its life time without increasing flood risk elsewhere, and where possible reduce overall flood risk • the sustainability benefits of the development to the community outweigh the flood risk. Additionally, development 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 and not increase flood risk elsewhere.	Development should not be permitted	Development should not be permitted	Development should not be permitted	Development is appropriate if 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 and not increase flood risk elsewhere.

Appendix 4: EA Pre-Application Advice

BWB Consulting Ltd
5th Floor
Waterfront House 35 Station Street
NOTTINGHAM
NG2 3DQ

Project ref: **ENVPAC/1/GMC/00515**
Our ref: SO/2023/123342/01-L01
Your ref: 2211015

Date: 11 July 2023

Dear Craig Crowe,

1 HOUR MEETING 10/7/23 - RESIDENTIAL DEVELOPMENT ON BROWNFIELD SITE.

PALATINE ROAD, NORTHENDEN.

Thank you for accepting our offer to provide detailed planning advice. We are providing this advice under Agreement No. ENVPAC/1/GMC/00515.

Environment Agency advice

BWB Consulting are seeking clarification on the following matters in relation to flood risk:

1) The position of the EA on banking of the existing building footprints such that floodplain compensation is not required.

EA comment: Compensatory flood storage will not be required in the event that the footprint of the new building is identical to that of the existing building.

2) If compensation was to be required, would this be only for any increase upon the existing footprint?

EA comment: This is correct, compensation is required for any 'additional' building footprint to what's currently there.

3) Whether the EA would review the model changes.

EA comment: We would not look to review the model changes.

Yours sincerely,

Miss India Blythin
Planning Advisor
India.blythin@environment-agency.gov.uk

Disclaimer
Our opinion is based on the information available to us at the time of the enquiry. When the formal planning application is submitted, our position may change if there have been changes to environmental risk or evidence, and/or planning policy.

End

From:
Sent: 11 July 2023 14:10
To:
Subject: RE: Cost Recovered Advice: Palatine Road, Northenden : ENVPAC/1/GMC/00515

Follow Up Flag: Follow up
Flag Status: Flagged

This email originated from outside of our organisation. Please exercise caution with content, links and attachments.

I have just now sent over a document clarifying the matters. Apologies for the delay in getting back to you.

Many thanks,

Planning Advisor | Sustainable Places | Greater Manchester, Merseyside, Cheshire
Environment Agency | Richard Fairclough House, Knutsford Road, Latchford, Warrington WA4 1HT
Email:

From:
Sent: 11 July 2023 13:37
To:
Cc:
Subject: RE: Cost Recovered Advice: Palatine Road, Northenden : ENVPAC/1/GMC/00515

Would you be able to provide an indication on when we may receive a response on the actions below?

Many thanks,

BSc (Hons) MSc GradCIWEM
Graduate Consultant | BWB Consulting Limited

5th Floor, Waterfront House, Station Street, Nottingham, NG2 3DQ
W

From:
Sent: Monday, July 10, 2023 12:23 PM
To: >
Cc: >
Subject: RE: Cost Recovered Advice: Palatine Road, Northenden : ENVPAC/1/GMC/00515

Many thanks for arranging this mornings meeting. I just wanted to confirm the actions we discussed.

to confirm the following:

-The position of the EA on banking of the existing building footprints such that floodplain compensation is not required.

-If compensation was to be required, would this be only for any increase upon the existing footprint?

-Whether the EA would review the model changes.

Kind regards,

BSc (Hons) MSc GradCIWEM
Graduate Consultant | BWB Consulting Limited

5th Floor, Waterfront House, Station Street, Nottingham, NG2 3DQ
W

From: >
Sent: Thursday, July 6, 2023 3:56 PM
To: >
Subject: RE: Cost Recovered Advice: Palatine Road, Northenden : ENVPAC/1/GMC/00515

This email originated from outside of our organisation. Please exercise caution with content, links and attachments.

Many thanks for confirming.

We look forward to meeting and discussing further on Monday.

Kind regards,

Planning Advisor | Sustainable Places | Greater Manchester, Merseyside, Cheshire
Environment Agency | Richard Fairclough House, Knutsford Road, Latchford, Warrington WA4 1HT
Email:

From: >
Sent: 06 July 2023 15:42
To: >
Subject: RE: Cost Recovered Advice: Palatine Road, Northenden : ENVPAC/1/GMC/00515

At this stage it is proposed as fully residential, comprised of traditional residential dwellings and an apartment block.

We should be able to share further details on the proposals during the meeting.

Hope this helps.

Kind regards,

BSc (Hons) MSc GradCIWEM
Graduate Consultant | BWB Consulting Limited

5th Floor, Waterfront House, Station Street, Nottingham, NG2 3DQ

W

From: >
Sent: Thursday, July 6, 2023 3:23 PM
To: >
Subject: RE: Cost Recovered Advice: Palatine Road, Northenden : ENVPAC/1/GMC/00515

This email originated from outside of our organisation. Please exercise caution with content, links and attachments.

Many thanks for sending over this additional information.

Are you able to confirm, please, what the proposed development type is?

Many thanks,

Planning Advisor | Sustainable Places | Greater Manchester, Merseyside, Cheshire
Environment Agency | Richard Fairclough House, Knutsford Road, Latchford, Warrington WA4 1HT
Email:

From: >
Sent: 06 July 2023 14:21
To: >
Cc: >
Subject: RE: Cost Recovered Advice: Palatine Road, Northenden : ENVPAC/1/GMC/00515

Thank you for sending across the meeting invite.

Prior to the meeting I just want to provide some background information and a summary of the works to date.

The site comprises two parcels of brownfield land located in Northenden, off Palatine Road and Brett Street respectively, Site location plan attached. The site is located entirely within Flood Zone 2 of the River Mersey according to the Flood Map for Planning.

A preliminary Flood Risk Scoping Study was undertaken. During this an exercise was carried out on the Upper Mersey Model, provided by yourselves to scale hydrographs to simulate a 1 in 100-year +41% climate change scenario. The site is shown to be located entirely within the floodplain of this event. As a result, it was decided to consult with yourselves on the scheme prior to producing the necessary Flood Risk Assessment for the proposed development.

I hope this helps provide some context prior to the meeting.

I look forward to meeting with you, in the meantime if you have any further questions please let me know.

Kind regards,

BSc (Hons) MSc GradCIWEM
Graduate Consultant | BWB Consulting Limited

5th Floor, Waterfront House, Station Street, Nottingham, NG2 3DQ
W

From: _____>
Sent: Thursday, July 6, 2023 11:28 AM
To: _____>
Subject: RE: Cost Recovered Advice: Palatine Road, Northenden : ENVPAC/1/GMC/00515

This email originated from outside of our organisation. Please exercise caution with content, links and attachments.

Thank you for sending over the completed pro-forma.

I have sent a teams invite over now. If you have any relevant documents you wish us to have sight of prior to the meeting such as a site plan, please could you send them over?

We look forward to meeting with you on Monday.

Kind regards,

Planning Advisor | Sustainable Places | Greater Manchester, Merseyside, Cheshire
Environment Agency | Richard Fairclough House, Knutsford Road, Latchford, Warrington WA4 1HT
Email: _____

From: _____>
Sent: 05 July 2023 10:18
To: _____>
Subject: RE: Cost Recovered Advice: Palatine Road, Northenden : ENVPAC/1/GMC/00515

Apologies pro-forma attached

BSc (Hons) MSc GradCIWEM
Graduate Consultant | BWB Consulting Limited

5th Floor, Waterfront House, Station Street, Nottingham, NG2 3DQ
W _____

From:
Sent: Wednesday, July 5, 2023 10:17 AM
To: _____>
Cc: _____ _____>
Subject: RE: Cost Recovered Advice: Palatine Road, Northenden : ENVPAC/1/GMC/00515

Please find attached the completed pro-forma.

If the below meeting days remain viable can we please request a meeting on either Monday the 10th or Tuesday the 11th.

Our availability is as follows:

Monday the 10th: Available after 11am
Tuesday the 11th: Available after 11.30am

If these dates are no longer feasible can you please provide some new meeting times.

Many thanks,

BSc (Hons) MSc GradCIWEM
Graduate Consultant | BWB Consulting Limited

5th Floor, Waterfront House, Station Street, Nottingham, NG2 3DQ
W

From: >
Sent: Thursday, June 29, 2023 3:55 PM
To: >
Subject: RE: Cost Recovered Advice: Palatine Road, Northenden : ENVPAC/1/GMC/00515

This email originated from outside of our organisation. Please exercise caution with content, links and attachments.

Please see below some preliminary dates for a meeting, please note, these may be subject to change and we cannot book the meeting in until we have received the completed pro-forma.

Thursday 6th July: 10:30am - 13:30pm
Monday 10th July: all day
Tuesday 11th July: 10am- 13:00pm
Friday 14th July: 9:30am-12pm

If you have any queries please don't hesitate to contact me.

Kind regards,

Planning Advisor | Sustainable Places | Greater Manchester, Merseyside, Cheshire
Environment Agency | Richard Fairclough House, Knutsford Road, Latchford, Warrington WA4 1HT
Email:

From: >
Sent: 27 June 2023 16:55
To: >
Subject: RE: Cost Recovered Advice: Palatine Road, Northenden : ENVPAC/1/GMC/00515

Thank you for this we will get the pro-forma across once complete.

In the meantime would you be able to provide some preliminary dates for a meeting?

Kind regards,

BSc (Hons) MSc GradCIWEM
Graduate Consultant | BWB Consulting Limited

5th Floor, Waterfront House, Station Street, Nottingham, NG2 3DQ
W

From: >
Sent: Thursday, June 22, 2023 12:37 PM

To: _____>
Subject: Cost Recovered Advice: Palatine Road, Northenden : ENVPAC/1/GMC/00515

This email originated from outside of our organisation. Please exercise caution with content, links and attachments.

I am pleased to confirm that we can provide you with planning advice for this site as requested. We expect the cost of our advice to be £800 (8 hours) plus VAT charged at 20%.

I have attached a breakdown of our quote estimate and a pro-forma. Our standard terms can be found at (https://www.gov.uk/government/publications/planning-and-marine-licence-advice-standard-terms-for-our-charges/planning-and-marine-licence-advice-standard-terms-for-our-charges). Please complete and return the pro-forma by email reply along with confirmation you accept the agreement for us to proceed.

We welcome your feedback on our service. Please tell us what you think by completing our survey https://www.smartsurvey.co.uk/s/PlanningAdviceServiceCustomerSurvey/ .

We look forward to working with you to provide advice on your proposal. If you have any queries, please don't hesitate to contact me.

Kind regards,

Planning Advisor | Sustainable Places | Greater Manchester, Merseyside, Cheshire
Environment Agency | Richard Fairclough House, Knutsford Road, Latchford, Warrington WA4 1HT
Email: _____
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VAT Reg No. 648 1142 45

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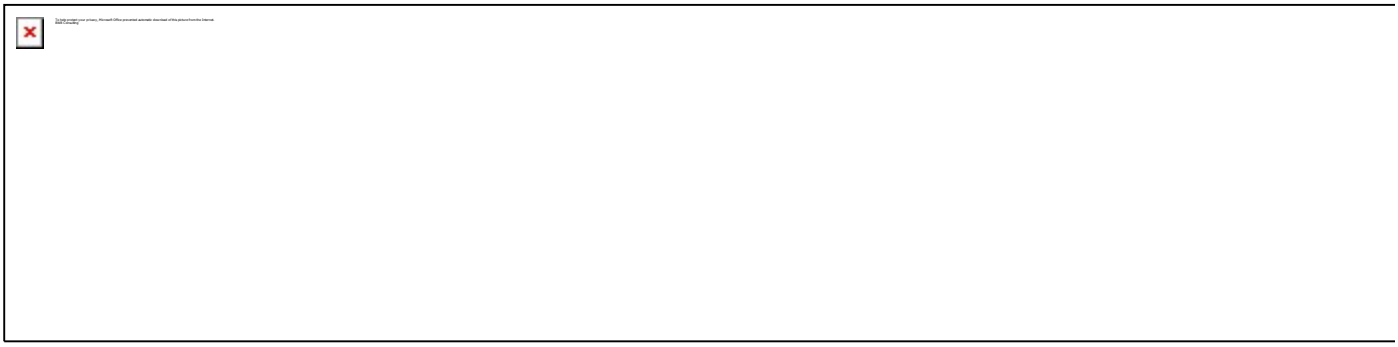

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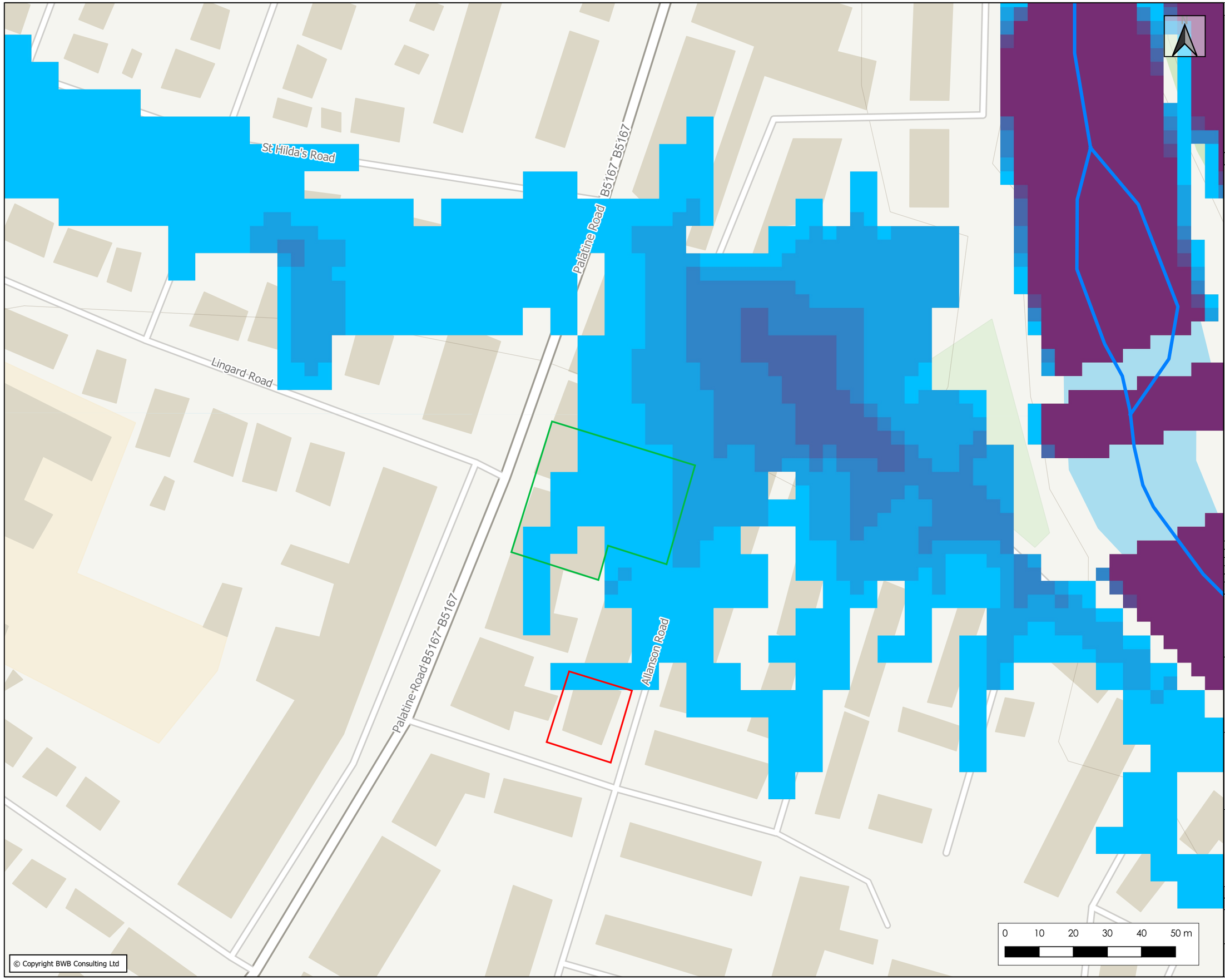
Appendix 5: Modelled Peak Flood Depth Maps



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2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.

4. Any discrepancies noted on site are to be reported to the engineer immediately.

5. Contains OS data © Crown copyright (2023)

6. Floodplain extents and depths based on update to Upper Mersey Modell (2018), © Environment Agency.

Key

- Parcel A
- Parcel B
- River Mersey

Peak Flood Depths (m)

- <= 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- > 1.25

Rev	Date	Details of issues/ revision	Drw	Rev
P01	31.05.23	PRELIMINARY ISSUE	CC	MD

Issues & Revisions

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■ Manchester | 0161 233 4260
☐ Nottingham | 0115 924 1100
www.bwbconsulting.com

Client

Express Solicitors

Project Title

Northenden, Manchester

Drawing Title

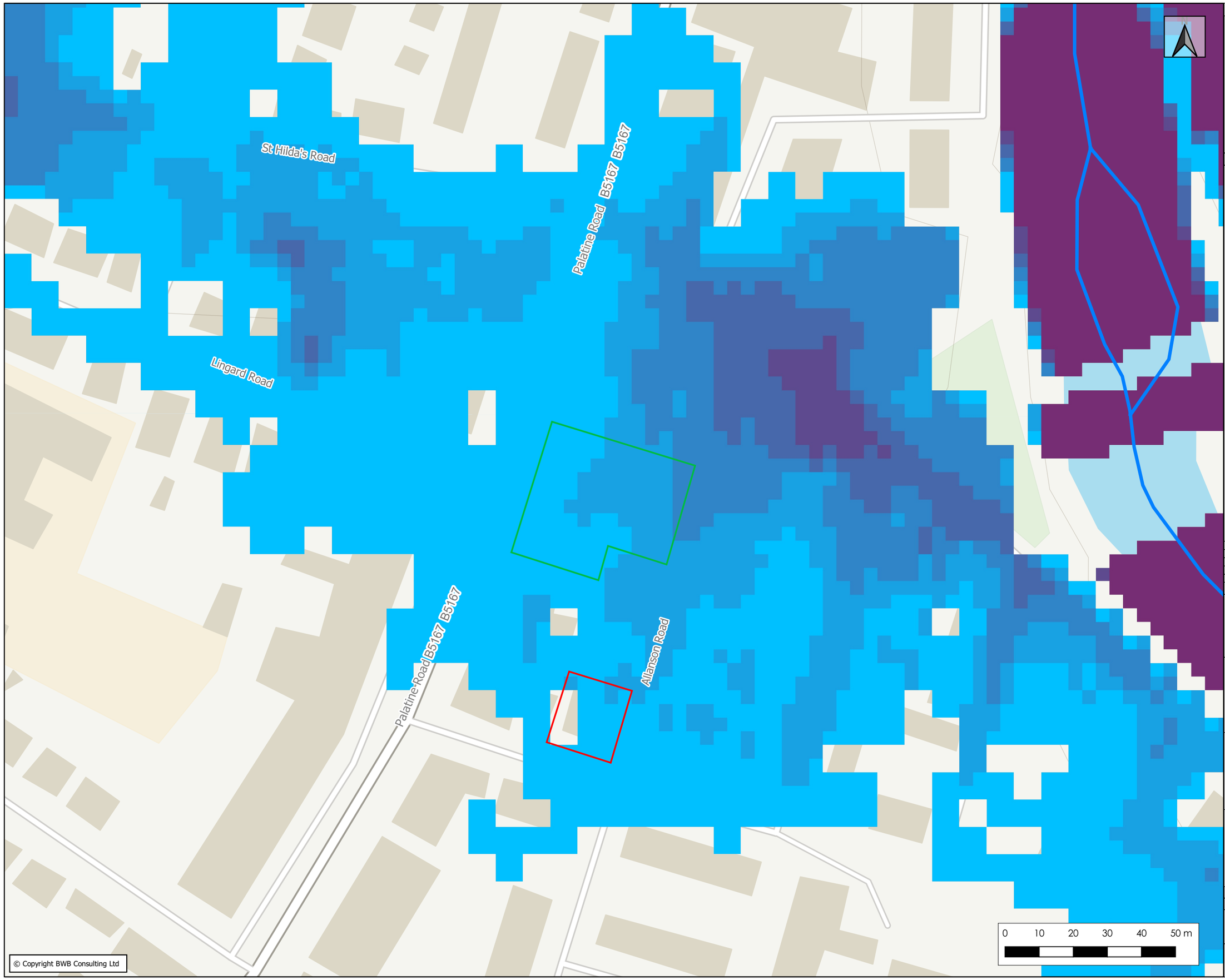
1 in 100-year Modelled Peak Flood Depths

Drawn:	C Crowe	Reviewed:	M Day		
BWB Ref:	221105	Date:	31.05.23	Scale@A3:	1:1,000

Drawing Status

PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
NDM-BWB-ZZ-XX-DR-YE-5001	S2	P01



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5. Contains OS data © Crown copyright (2023)

6. Floodplain extents and depths based on update to Upper Mersey Modell (2018), © Environment Agency.

Key

- Parcel A
- Parcel B
- River Mersey

Peak Flood Depths (m)

- <= 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- > 1.25

Rev	Date	Details of issues/ revision	Drw	Rev
P01	31.05.23	PRELIMINARY ISSUE	CC	MD

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Client

Express Solicitors

Project Title

Northenden, Manchester

Drawing Title

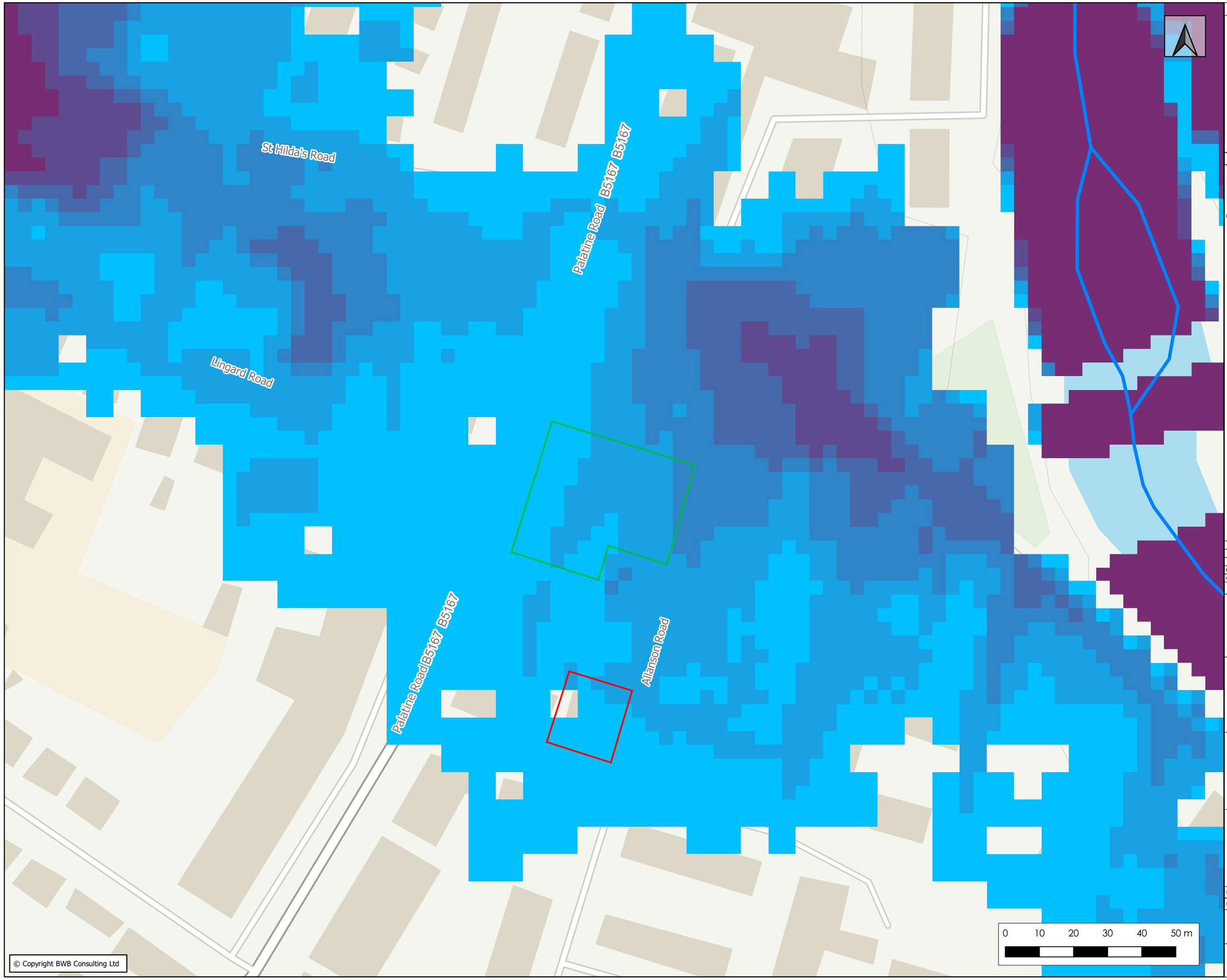
1 in 100-year +41% Climate Change Modelled Peak Flood Depths

Drawn:	C Crowe		Reviewed:	M Day	
BWB Ref:	221105	Date:	31.05.23	Scale@A3:	1:1,000

Drawing Status

PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
NDM-BWB-ZZ-XX-DR-YE-5002	S2	P01



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4. Any discrepancies noted on site are to be reported to the engineer immediately.

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6. Floodplain extents and depths based on update to Upper Mersey Modell (2018), © Environment Agency.

Key

- Parcel A
- Parcel B
- River Mersey

Peak Flood Depths (m)

- <= 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- > 1.25

Rev	Date	Details of issues/ revision	Drw	Rev
P01	31.05.23	PRELIMINARY ISSUE	CC	MD

Issues & Revisions

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Client

Express Solicitors

Project Title

Northenden, Manchester

Drawing Title

1 in 1000-year Modelled Peak Flood Depths

Drawn:	C Crowe		Reviewed:	M Day	
BWB Ref:	221105	Date:	31.05.23	Scale@A3:	1:1,000

Drawing Status

PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
NDM-BWB-ZZ-XX-DR-YE-5003	S2	P01

Appendix 6: United Utilities Sewer Records

United Utilities
Water for the North West

How to contact us:

United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

BWB Consulting Limited

35
Station Street,
Nottingham, Nottinghamshire
NG2 3DQ

FAO:

Your Ref: 221105 - Northenden
Our Ref: UUPS-ORD-475372
Date: 28/03/2023

Dear Sirs

Location: 295A PALATINE ROAD, MANCHESTER, M22 4HH

I acknowledge with thanks your request dated 28/03/2023 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. http://www.unitedutilities.com/work-near-asset.aspx .

I trust the above meets with your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please contact us .

Yours Faithfully,

Karen McCormack
Property Searches Manager

United Utilities Water Limited
Registered In England & Wales No. 2366678
Registered Office Haweswater House, Lingley Mere Business Park,
Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP

Water for the North West

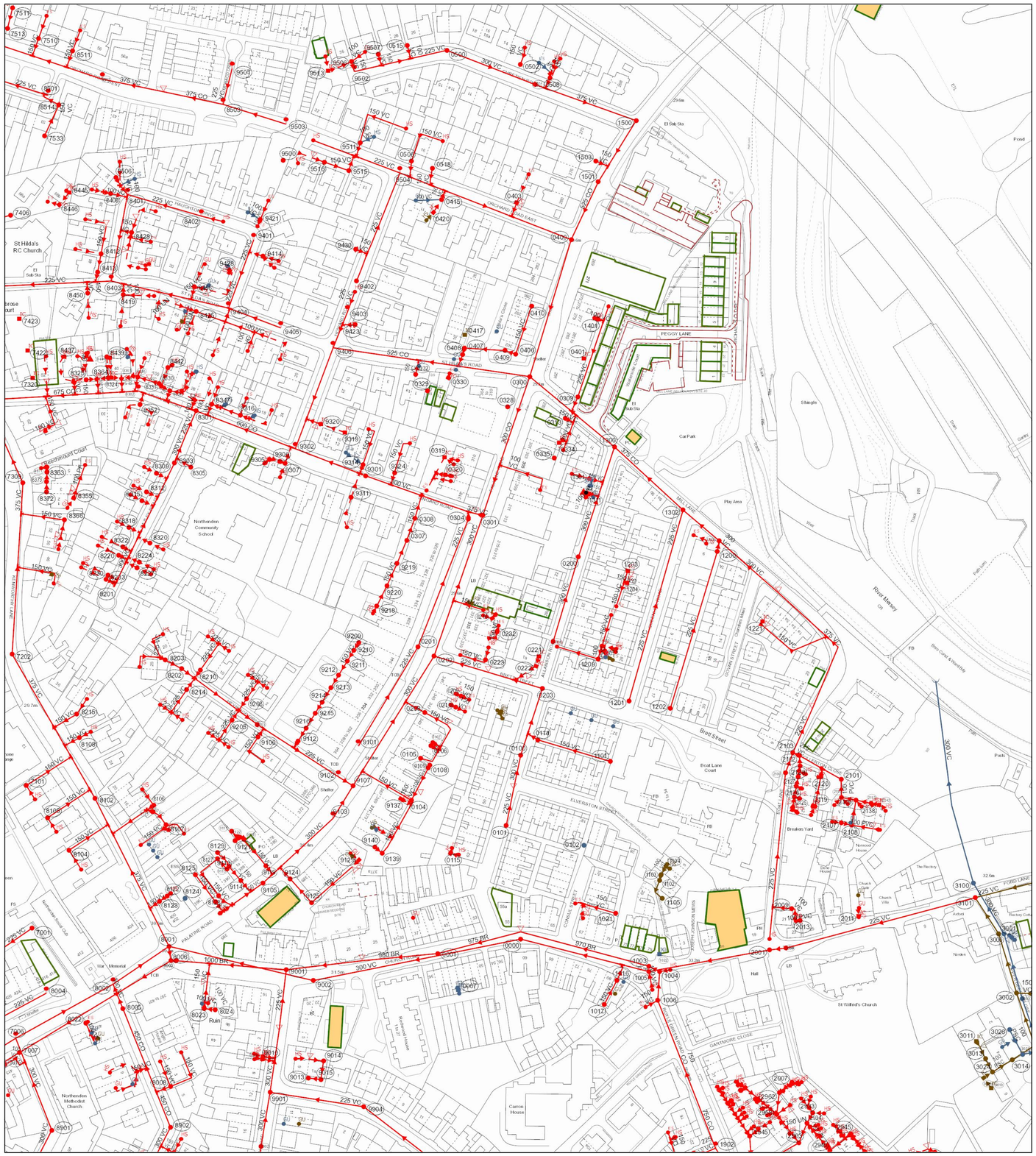
TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

TERMS AND CONDITIONS:

- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.

United Utilities Water Limited
Registered In England & Wales No. 2366678
Registered Office Haweswater House, Lingley Mere Business Park,
Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP



The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
0407		CO		150			VC	3.761791	
9421		CO		150			VC	4.128489	
9904	34.09	CO	31.68	225			VC	52.61179	1 in 88
9216		CO	0	150			VC	4.418973	
0406		CO		150			VC	6.375649	
9214		CO	0	150			VC	7.186689	
3025		SW		150			PSC	9.886889	
9503	28.77	CO	26.25	375			CO	36.68787	1 in 3669
8403	27.95	CO	26.4	225			VC	88.09086	1 in 1762
1202	29.66	CO	28.31	225			VC	90.80188	1 in 93
3101	33.24	CO	31.57	225			VC	108.6692	1 in 68
9301		CO	26.76	300			VC	41.78516	1 in 28
9107		CO	0	300			VC	84.90583	
8126		CO	0	150			VC	7.188332	
0508		CO		150			VC	6.320009	
1101		CO		150			VC	41.9866	
8114		CO	0	150			VC	10.5367	
9401	28.37	CO	27.23	225			VC	40.49691	1 in 119
2001	32.66	CO	29.87	300			VC	68.06615	1 in 155
8128		CO	0	150			VC	9.330446	
8005	31.5	CO	27.8	450			CO	8.982993	1 in 898
0309		CO		225			VC	8.699121	
2120		CO		0			UN	4.648556	
8001	30.96	CO	27.71	300			VC	8.062258	
0408		CO		150			VC	6.820599	
0332		CO		150			VC	8.072744	
9324		CO		150			VC	6.869614	
9210		CO	0	150			VC	6.783986	
8371		CO		100			PF	2.834328	
0400	29.69	CO	26.13	525			CO	79.40403	1 in 331
1500	29.52	CO	26.35	525			CO	39.96248	1 in 400
1005	33.01	CO	29.42	300			VC	73.24618	1 in 156
0232		CO		150			VC	3.504153	
0104		CO		150			VC	31.6972	
2107		CO		100			PVC	6.001225	
2119		CO		0			UN	16.64445	
3026		SW		100			PSC	15.47309	
1104		FO		100			VC	5.385839	
0108		CO		100			VC	13.43641	
2126		CO		0			UN	5.272593	
9102	30.22	CO	27.86	225			VC	9.433981	
9211		CO	0	150			VC	9.329331	
9212		CO	0	150			VC	8.061211	
9004	32.84	CO	31.04	225			VC	59.05929	1 in 102
0300	29.49	CO	25.86	525			CO	110.1681	1 in 193
3014		FO		100			VC	14.7689	
9516		CO		150			VC	14.18079	
8301	28.86	CO	24.56	675			CO	33.83785	1 in 121
0000	30.99	CO	28.95	300			VC	117.2775	1 in 192
0106		CO		150			VC	4.982683	
7101		CO	0	150			VC	29.49034	
7202	29.7	CO	27.42	375			VC	95.18929	
9106		CO	0	150			VC	5.625227	
0307		CO		150			VC	13.01874	
2100	29.82	CO	28.32	225			VC	11.8683	
9515		CO		150			VC	8.793622	
0501	29.13	CO	26.72	375			VC	59.46428	1 in 283
8108		CO	0	150			VC	9.261077	
1210		CO		150			VC	7.420393	
8501	27.87	CO	26.17	225			VC	36.68787	1 in 160
0001	30.87	CO	27.48	980			BR	42.19004	1 in 2110
1503		CO		150			VC	7.326347	
3003	34.63	SW	31.61	300			VC	37.36308	1 in 133
0518		CO		150			VC	9.667844	
9406	28.99	CO	25.27	525			CO	59.80803	1 in 214
9115		CO	0	150			VC	10.04305	
9213		CO	0	150			VC	9.607693	
9203	30.32	CO	28.63	225			VC	53.53503	1 in 71
8352		CO		150			VC	6.814192	
3000	34.24	SW	31.28	300			VC	32.75668	1 in 86
8511		CO		150			VC	9.663353	
3001	34.24	FO	31.83	225			VC	23.85372	1 in 108
0114		CO		150			VC	6.61661	
7513		CO		150			VC	18.11158	
0101	30.36	CO	0	225			VC	20.39808	
9114		CO	0	150			VC	8.825279	
8023		CO		100			VC	3.47705	
8002	31.42	CO	28.16	300			VC	37.44329	1 in 94
1016		CO		150			VC	9.366618	
2933		CO		150			UN	6.601655	
1004	33.02	CO	27.73	750			CO	6.708204	
0022		CO		100			VC	1.432068	
1902	33.63	CO	29.6	750			CO	88.02273	1 in 326
7511		CO		150			VC	11.73978	
8419		CO	0	100			VC	6.049855	
9101	30	CO	29.2	225			VC	64.14047	
0304	24.44	CO	0	225			VC	4	
8347		CO		100			VC	6.599234	
2101		CO	0	225			VC	26.55485	
9218		CO		150			VC	12.63847	
9122		CO	0	150			VC	2.237566	
8006		CO	0	1000			BR	35.06937	
7001	32.85	CO	31.43	225			VC	26.62705	1 in 95
1401		CO		100			VC	3.789927	
8008		CO	0	150			VC	8.407424	
2940		CO		150			UN	2.170677	
2000	32.81	CO	29.95	300			VC	9.055386	1 in 226
0109		CO		100			VC	1.791038	
7533		CO		150			VC	18.94084	
9140		CO		150			VC	5.283675	
1302	28.7	CO	26.78	375			CO	51.66236	1 in 161
8502	27.94	CO	25.96	375			VC	63.24555	1 in 287
7510		CO		150			VC	10.26625	
2958		CO		150			UN	5.582458	
3002	34.59	FO	32.12	225			VC	34.48188	1 in 144
9112		CO	0	150			VC	4.556185	
9015		CO		100			VC	6.864402	
8202	30.29	CO	29.05	225			VC	8.967265	
0204		CO	0	300			VC	49.0408	
9124		CO		150			VC	8.559769	
0208		CO	0	150			VC	12.17311	
3100	33.2	SW	30.79	300			VC	114.4136	
8233		CO		0			UN	5.682087	
8230		CO		0			UN	5.875223	
8220		CO		0			UN	5.263593	
8322		CO		0			UN	5.336445	
8227		CO		0			UN	6.913589	
8224		CO		0			UN	6.744694	
8318		CO		0			UN	6.909597	
8320		CO		0			UN	7.249603	
8315		CO		0			UN	7.004049	
8428		CO	0	150			VC	6.046971	
1945		CO		0			UN	18.57197	
0107		CO		150			VC	4.967554	
0200	29.27	CO	27.22	300			VC	64.19501	1 in 401
8129		CO	0	150			VC	11.33933	
0201	29.66	CO	0	225			VC	76.32169	
1303	28.76	CO	26.86	375			CO	26.24881	1 in 328
9119		CO	0	150			VC	5.958077	
0515		CO		100			VC	7.472993	
2102		CO	0	225			VC	4.003847	
8215		CO	0	150			VC	14.47444	
9404	28.2	CO	26.88	225			VC	66.70832	1 in 145
0415		CO		150			VC	5.324394	
1501	29.6	CO	26.24	525			CO	35.34119	1 in 505
9902	33.03	CO	31.09	300			VC	30.41381	1 in 434
9113		CO	0	150			VC	7.67065	
8105		CO	0	150			VC	28.21193	
0301	29.48	CO	26.48	375			VC	4.123106	
9103	30.32	CO	27.06	300			VC	21.09502	
8413		CO	0	150			VC	5.432846	
2125		CO		0			UN	6.020431	
2934		CO		150			UN	11.76205	
8338		CO		150			VC	5.732666	
2103		CO	0	225			VC	26.46077	
0203	29.85	CO	27.45	300			VC	31.32092	1 in 104
8514		CO		150			VC	10.91267	
1301		CO		150			VC	7.786741	
1006	33.32	CO	29.31	750			CO	16.03122	1 in 107
8373		CO		100			PF	5.144284	
9302	29.17	CO	24.92	600			CO	58.87275	1 in 184
2903		CO	0	225			CO	20.89718	
7406		CO		100			VC	23.98348	
8114		CO	0	150			VC	3.441449	
7007	32.38	CO	27.3	1000			BR	72.34493	
0210		CO	0	150			VC	5.615971	
8330		CO		100			VC	5.685913	
3024		FO		100			PSC	12.94817	
7006	32.4	CO	28.78	300			VC	61.77378	1 in 103
9314		CO		150			VC	5.168443	
9506		CO	0	150			VC	5.745263	
0209		CO	0	150			VC	4.859156	
8401	28.1	CO	26.71	225			VC	48.83646	1 in 163
9501	28.61	CO	26.46	225			VC	20.61553	1 in 103
8003	31.04	CO	27.33	1000			BR	3	
1017		CO		150			VC	15.13364	
1021		CO		150			VC	23.27319	
0313		CO		150			VC	4.976815	
8104		CO	0	150			VC	25.91762	
2128		CO		0			UN	5.694143	
1209		CO		150			VC	23.61521	
9001	31.5	CO	27.45	1000			BR	61.20457	1 in 612
9105		CO	0	300			VC	53.07542	
9405	28.37	CO	27.17	225			VC	31.01612	1 in 115
1003	33.11	CO	27.71	970			BR	73.4983	
8336		CO	0	150			VC	7.98454	
9215		CO	0	150			VC	9.59328	
0308		CO		150			VC	13.09192	
1200	28.91	CO	27.32	225			VC	6.082763	1 in 29
8363		CO		150			VC	3.19949	
0506		CO		150			VC	8.737122	
9403	29.13	CO	27.75	225			VC	21.54071	1 in 10
9014		CO		100			VC	10.31254	
9219		CO		150			VC	13.91723	
8122		CO	0	150			VC	5.262977	
0100	30.01	CO	28.18	300			VC	38.8973	1 in 71
1214		CO		100			VC	2.320711	
0223		CO		150			VC	15.66098	
8201	30.13	CO	27.91	300			VC	76.61443	1 in 54
9121		CO	0	150			VC	2.271388	
8408		CO	0	100			VC	9.232462	
2009		CO		100			VC	10.60525	
8210		CO	0	225			VC	5.451579	
8001	30.96	CO	27.72	375			VC	91.67879	1 in 655
8125		CO	0	150			VC	18.6336	
0410		CO		150			VC	27.97085	
3013		FO		100			PSC	8.322952	
8127		CO	0	150			VC	28.32181	
1311		CO		150			VC	5.238233	
1300	28.69	CO	26.46	375			CO	61.07373	1 in 139
9208		CO	0	225			VC	7.975545	

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
9117		CO	0	150			VC	7.539165	
0105		CO		150			VC	30.59618	
8366		CO		150			VC	24.42754	
8450		CO	0	150			VC	6.005923	
0202	29.69	CO	26.83	300			VC	82.5409	1 in 250
8102	30.17	CO	27.56	375			VC	92.28217	1 in 769
9118		CO	0	150			VC	19.27162	
8123		CO	0	150			VC	6.379192	
9423		CO		150			VC	7.109595	
8456		CO		150			VC	7.336164	
2127		CO		0			UN	2.982305	
9504	29.28	CO	27.73	225			VC	101.9515	1 in 276
8402	28.15	CO	26.93	225			VC	42.72002	1 in 214
9125		CO		150			VC	17.68608	
9507		CO	0	150			VC	6.304737	
9209		CO	0	150			VC	5.061538	
9901	32.88	CO	30.89	300			VC	34.36568	1 in 66
1103		FO		100			VC	3.160949	
8425		CO	0	100			VC	17.15154	
8203		CO	0	225			VC	10.22423	
0409		CO		150			VC	22.41846	
9220		CO		150			VC	13.65791	
8372		CO		100			PF	5.809789	
9002	31.57	CO	28.34	300			VC	82.2253	1 in 142
8503	28.64	CO	26.22	375			CO	33.73426	1 in 281
8303	29.58	CO	26.46	300			VC	16.15549	1 in 108
2945		CO		0			UN	3.951781	
8106		CO	0	150			VC	4.510809	
8024		CO		100			VC	6.319664	
2110		CO		100			PVC	10.12962	
9511		CO		150			VC	8.019537	
9205		CO	0	225			VC	6.335982	
9502	29.14	CO	27.46	225			VC	52.59644	1 in 146
8412		CO	0	150			VC	10.38809	
1201	29.65	CO	28.16	225			VC	110.1635	1 in 104
0500	29.04	CO	27.05	300			VC	52.55473	1 in 210
8312		CO		0			UN	6.984646	
8309		CO		0			UN	6.524613	
8305		CO		0			UN	9.326449	
9306		CO		0			UN	3.275146	1 in
9311		CO		0			UN	14.09172	
9139		CO		150			VC	34.884	
2109		CO		100			PVC	8.226006	
2108		CO		100			PVC	14.08024	
2112		CO		0			UN	8.554796	
8302	28.79	CO	24.26	675			CO	85.14903	1 in 194
8337		CO		0			UN	5.306547	1 in
8442		CO		0			UN	10.97587	1 in
9316		CO		0			UN	11.88845	1 in
9414		CO		0			UN	7.893897	
9305		CO		0			UN	6.149798	1 in
9307		CO		0			UN	9.553486	
7015		CO		100			VC	14.37795	
8901	33.93	CO	31.87	300			VC	54.78138	1 in 19
8902	32.93	CO	28.63	450			CO	71.01398	1 in 91
2962		CO		0			UN	12.235	
2007		CO		0			UN	2.585571	
9402		CO	28.46	225			VC	64.62978	1 in 96
9430		CO		150			VC	6.777522	
8506		CO	0	150			UN	4.892454	1 in
1102		FO		100			VC	12.28944	
7309		CO	0	375			VC	26.40076	
8214		CO	0	225			VC	7.759471	

LEGEND

Abandoned | Foul | Surface Water | Combined

- Public Sewer
- Private Sewer
- Section 104
- Rising Main
- Sludge Main
- Overflow
- Water Course
- Highway Drain

All point assets follow the standard colour convention:
red - combined, blue - surface water, brown - foul, purple - overflow

- Manhole
- Head of System
- Extent of Survey
- Rodding Eye
- Inlet
- Discharge Point
- Vortex
- Penstock
- Washout Chamber
- Valve
- Air Valve
- Non Return Valve
- Soakaway
- Gully
- Cascade
- Flow Meter
- Hatch Box
- Oil Interceptor
- Summit
- Drop Shaft
- Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- Inspection Chamber
- Bifurcation Chamber
- Lamp Hole
- T Junction / Saddle
- Catchpit
- Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- Network Storage Tank
- Sewer Overflow
- Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- Control Kiosk
- Change of Characteristic

MANHOLE FUNCTION

- FO Foul
- SW Surface Water
- CO Combined
- OV Overflow

SEWER SHAPE

- CI Circular
- EG Egg
- OV Oval
- FT Flat Top
- RE Rectangular
- SQ Square
- TR Trapezoidal
- AR Arch
- BA Barrel
- HO HorseShoe
- UN Unspecified

SEWER MATERIAL

- AC Asbestos Cement
- BR Brick
- PE Polyethylene
- RP Reinforced Plastic Matrix
- CO Concrete
- CSB Concrete Segment Bolted
- CSU Concrete Segment Unbolted
- CC Concrete Box Culverted
- PSC Plastic / Steel Composite
- GRC Glass Reinforced Plastic
- DI Ductile Iron
- PVC Polyvinyl Chloride
- CI Cast Iron
- SI Spun Iron
- ST Steel
- VC Vitrified Clay
- PP Polypropylene
- PF Pitch Fibre
- MAC Masonry, Coursed
- MAR Masonry, Random
- U Unspecified

Address or Site Reference:

295A PALATINE ROAD,
MANCHESTER,
M22 4HH

Scale: 1:1250 **Date:** 28/03/2023

Sheet: 1 of 1

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SEWER RECORDS

United Utilities
Water for the North West

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