



Flood Risk Assessment

**3 - 4 Liverpool Buildings, Worthing
BN11 1SY**

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1. Introduction

The following document is a Flood Risk Assessment carried out by Eco 360, and includes details of the site, vulnerability classification, flood linkages and an evaluation of risk.

1.1 Project Overview

The proposed development comprises a change of use and internal reconfiguration to create a single two-bedroom residential unit at first floor level within the existing building at 3–4 Liverpool Buildings, Liverpool Road, Worthing, West Sussex (BN11 1SY).

1.2 Purpose of Investigation

The objectives of the Flood Risk Assessment were to:

- Develop a detailed assessment of the site.
- Apply the Sequential Test, where applicable
- Identify potential flood sources, receptors and pathways at the site.
- Assess the level of potential flood risk.
- Determine the requirement or scope of further investigations or mitigation measures.

1.3 Scope of Work

- Brief introductory information has been noted to provide context to the report and include an Introduction, Project Overview, Scope of Work and Limitations.
- To develop a detailed assessment of the site and apply the Sequential Test and Exception Test, desk studies have been carried out to collate information obtained from sources including the Environment Agency, Local & National Authorities, Strategic Flood Risk Assessments and Digital Terrain Model (DTM) LiDAR topographical surveys.
- This information has been used to identify potential flood sources, receptors and pathways at the site, as part of an initial Conceptual Site Model.
- To assess the level of potential flood risk, a Conceptual Site Model has been produced to categorise the potential severity of the impact of the flood linkage on the receptor and the probability of the flood linkage being present.
- Following the assessment of flood linkages, an evaluation of flood risk, mitigation measures, surface water management and safe access and egress has been conducted to determine the requirement or scope of further investigations.
- Supporting appendix include photographs, maps, and plans of the site.

1.4 Limitations

Eco 360 has exercised such professional skill, care and diligence as may reasonably be expected of a properly qualified and competent consultant when undertaking works of this nature. This report is only valid when used in its entirety and any information or advice contained within the report should not be relied upon until considered in the context of the whole report. Eco 360 disclaims any responsibility to the client, as named on the front of this report ("the client"), and others in respect of any matters outside the scope of this work. Any comments made on the basis of information obtained from the client or other third parties are given in good faith on the assumption that the information is accurate. This report has been prepared solely for the benefit of the client and any other party using or placing reliance upon any information contained in this report does so at their own risk. Eco 360 accepts no responsibility or liability for the contents of this report being used for any purpose or project for which it was not commissioned. Eco 360 accepts no liability whatsoever for any loss or damage arising from the interpretation or use of this report and in no event shall the company be liable for any punitive, exemplary or other special damages, or for any indirect, incidental or consequential damages, including with respect to the performance or non-performance of any services, whether arising under breach of contract, tort or any other legal theory, and regardless of whether the company has been advised of, knew of, or should have known of the possibility of such damages. Furthermore, Eco 360 does not accept any liability for the consequences of any legislative changes or the release of subsequent guidance documentation and following delivery of the report has no obligation to advise the client or any other party of such changes or their repercussions.

This report excludes consideration of potential hazards arising from any activities at the site other than normal use and occupancy for the intended land uses. Hazards associated with any other activities have not been assessed and must be subject to a specific risk assessment by the parties responsible for those activities. Eco 360 does not warrant or guarantee that the site is free of hazardous or potentially hazardous materials or conditions. It should be noted that this report has been produced for environmental purposes only.

2. Site

The following section provides a description of the site, location, proposed development and vulnerability classification, utilising information obtained from the client and publicly available sources.

2.1 Site Description and Location

The site is located at 3–4 Liverpool Buildings, Liverpool Road, Worthing, West Sussex, BN11 1SY, within an established urban area of Worthing Borough. The site comprises an existing mixed-use building, with commercial use at ground floor level and upper floors historically used for residential purposes.

The site is situated within a dense town-centre context, characterised by continuous frontage buildings, commercial premises at ground floor level, and residential accommodation above. Liverpool Road is a principal route through Worthing, and the surrounding area comprises a mix of retail, commercial and residential uses. The site lies within an area influenced by coastal and tidal flood mechanisms, given its proximity to the seafront and low-lying topography.

A LiDAR-derived Digital Terrain Model (DTM) has been analysed to understand local ground levels across the site. The analysis indicates that ground levels across the site are relatively uniform, elevation of approximately 5.48 mAOD. This confirms that the site is effectively flat, with no significant local gradients that would materially influence overland surface water flow routing at the site scale.

National Grid Reference (OSGB36 / British National Grid): TQ 14883 02580

Easting / Northing: 514883 , 102580

2.2 Proposed Development

The proposed development comprises a change of use and internal reconfiguration to facilitate the creation of a single two-bedroom residential unit at first-floor level within the existing building at 3–4 Liverpool Buildings.

The proposals do not involve any extension, increase in building footprint, ground level alterations, or land raising, and no habitable accommodation is proposed at ground floor level. The development is therefore confined entirely within the existing built form.

2.3 Vulnerability Classification

The vulnerability classification of the proposed development has been assessed in accordance with Annex 3 of the National Planning Policy Framework (NPPF) and the Flood Risk and Coastal Change Planning Practice Guidance (PPG).

The proposed development comprises a change of use and internal reconfiguration within an existing building to provide residential accommodation at first-floor level only. No habitable accommodation is proposed at ground floor level, and no basement accommodation is proposed.

Buildings used as dwelling houses are classified as 'More Vulnerable' development under Annex 3 of the NPPF. In accordance with PPG guidance, where a development contains different elements of vulnerability, the highest vulnerability classification has been applied.

The proposed residential accommodation will:

- be occupied year-round,
- include sleeping accommodation located solely at first-floor level.
- be occupied on a 24-hour basis, consistent with typical residential use.

The development is intended for general residential occupation and is not designed for institutional use, assisted living, or occupation by persons requiring continuous care. Access to the residential accommodation is via existing stair access to upper floor level.

The proposal constitutes a **change of use** which increases the vulnerability classification of the building from a less vulnerable/non-residential use to a more vulnerable residential use. In accordance with PPG guidance on changes of use in flood risk areas, the assessment considers whether the proposal can be made safe for its lifetime and whether opportunities exist to reduce flood risk or vulnerability.

The proposal does not involve:

- any increase in building footprint;
- any ground level raising or excavation;
- any loss of floodplain storage; or
- the introduction of habitable accommodation at ground or basement level.

Given that all residential accommodation is located above ground floor level, and that the proposals do not result in additional floodplain encroachment or loss of storage, the development accords with the principles set out in the PPG for managing flood risk in changes of use.

The purpose of this Flood Risk Assessment is therefore to demonstrate that the proposed development can be delivered safely and in accordance with national and local flood risk policy.

It should be noted that Flood Zones shown on the Flood Map for Planning do not take account of the presence or performance of flood defences, residual flood risk mechanisms, or site-specific mitigation measures, which are considered further within this assessment.

Table 1: Flood Risk Vulnerability Classification table from National Planning Policy Framework Technical Guidance

Flood Risk Vulnerability Classification					
Flood Zones	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	•	•	•	•	•
Zone 2	•	Exception Test required	•	•	•
Zone 3a	Exception Test required	✘	Exception Test required	•	•
Zone 3b	Exception Test required	✘	✘	✘	•

Key: • Development is appropriate
 ✘ Development should not be permitted

3. Sequential Test

3.1 Introduction

The Sequential Test seeks to direct development to areas at the lowest probability of flooding, taking account of the vulnerability of the proposed development, in accordance with the National Planning Policy Framework (NPPF).

The proposed development at 3–4 Liverpool Buildings, Worthing (BN11 1SY) comprises a change of use and internal reconfiguration within an existing building to provide residential accommodation at first-floor level only. No new building footprint is proposed, and no habitable accommodation is introduced at ground or basement level.

3.2 Applicability of the Sequential Test

The Planning Practice Guidance (PPG) confirms that the Sequential Test should be applied proportionately, recognising that in cases of minor development or changes of use within existing buildings, it is generally not appropriate or practicable to consider alternative sites, as there is no realistic flexibility in site location.

In this instance, the proposed development is intrinsically linked to the existing building at Liverpool Buildings and cannot reasonably be relocated to an alternative site at a lower probability of flooding. The proposal does not involve site selection, land release, or expansion into undeveloped land.

Furthermore, the development does not increase the site footprint, raise ground levels, or encroach into the functional floodplain. As such, a conventional Sequential Test involving the identification and assessment of alternative sites is not applicable in this case.

3.3 Sequential Risk Context

The Environment Agency Flood Map for Planning indicates that the site lies within Flood Zone 3 (High Probability). The 2024 Adur and Worthing Level 1 Strategic Flood Risk Assessment (SFRA) confirms that the site is not located within Flood Zone 3b (Functional Floodplain).

The proposed development adopts a sequentially preferable layout within the site, with all habitable and sleeping accommodation located at first floor level, thereby reducing exposure to flood risk. No ground floor residential use or basement accommodation is proposed.

Whilst residual flood risks may remain due to extreme events, climate change, or defence exceedance, these risks are addressed through the vertical arrangement of accommodation and are considered further within subsequent sections of this Flood Risk Assessment. The Sequential Test is therefore considered to be satisfied on a proportionate basis, consistent with national policy and guidance for changes of use in flood risk areas.

3.4 Conclusion

The proposed development comprises a change of use and internal reconfiguration within an existing building to provide residential accommodation at first floor level only, with no habitable accommodation at ground floor and no increase in building footprint. The development is intrinsically linked to the existing building and its location, and therefore there is no realistic scope to identify or consider alternative sites at a lower probability of flooding.

In accordance with the Planning Practice Guidance, the Sequential Test is applied proportionately. For developments involving changes of use within existing buildings, where relocation is not feasible, the Sequential Test does not require the identification of alternative sites.

Given that:

- the proposal involves a change of use within an existing building and does not constitute new-build development;
- all residential accommodation is located above ground floor level;

- there is no increase in built footprint, ground level alteration, or loss of floodplain storage;
- the site is not located within Flood Zone 3b (Functional Floodplain); and
- flood risk to future occupants can be appropriately managed through the proposed layout and proportionate mitigation measures.

Accordingly, the Sequential Test is considered to be satisfied for the purposes of this planning application.

Flood risk considerations are therefore appropriately addressed through the accompanying site-specific Flood Risk Assessment, which demonstrates that the proposed development can be made safe for its lifetime in accordance with national and local planning policy.

4. Flood Risk Assessment

The following section outlines the potential sources, pathways and receptors of flooding relevant to the site, utilising information gathered from the Environment Agency, West Sussex County Council, and the 2024 Adur and Worthing Level 1 Strategic Flood Risk Assessment (SFRA).

4.1 Potential Flood Sources

Rivers & Seas (Tidal)

The site is located within the coastal zone (within 250 m) influenced by tidal processes and lies within Flood Zone 3 (High Probability) as defined by the Environment Agency Flood Map for Planning. Flood risk at the site is therefore primarily associated with tidal flooding from the English Channel, including potential interaction with local drainage and watercourse systems during extreme tidal conditions.

The 2024 Adur and Worthing Level 1 SFRA confirms that the site is not located within Flood Zone 3b (Functional Floodplain).

Review of the SFRA fluvial and tidal modelling with climate change allowances indicates that the site does not fall within the mapped 1% AEP fluvial or 0.5% AEP tidal flood extents, including higher central and upper end climate change scenarios.

In addition, the SFRA historic flooding datasets, incorporating Environment Agency recorded flood outlines and West Sussex County Council incident records, indicate that there are no recorded incidents of historic tidal flooding affecting the site or its immediate surroundings.

Residual tidal flood risk associated with extreme events, defence exceedance or climate change is therefore considered to be low and manageable, and is addressed further through development layout and mitigation measures within this assessment.

Surface Water

Surface water flooding occurs when intense rainfall exceeds the capacity of drainage systems, resulting in overland flow and localised ponding in low-lying areas.

The Environment Agency Risk of Flooding from Surface Water mapping indicates that the site lies within areas shown to be susceptible to surface water flooding during extreme rainfall events, including the 1 in 100 year and 1 in 1000 year return period scenarios.

The mapped risk represents modelled surface water flow paths and shallow ponding associated with intense rainfall events.

The proposed development does not introduce basement accommodation or ground-floor habitable use and does not materially increase the impermeable area of the site. As such, the vulnerability to surface water flooding is limited, and the development will not increase surface water flood risk elsewhere.

On this basis, surface water flood risk is considered manageable and acceptable for the proposed development.

Groundwater

Flooding from groundwater can occur when groundwater levels rise to the ground surface, allowing water to emerge through permeable soils or enter below-ground spaces such as basements or cellars. Groundwater flooding typically develops gradually following prolonged or intense rainfall and may persist for extended periods.

The site is underlain by the Lewes Nodular Chalk Formation, with River Terrace Deposits (undifferentiated sands, silts and clays) present locally. River Terrace Deposits can be associated with increased groundwater permeability where extensive and hydraulically connected to nearby watercourses; however, in this location they are limited in extent and are not associated with known groundwater emergence or spring lines.

The 2024 Adur and Worthing Level 1 Strategic Flood Risk Assessment and the Environment Agency Susceptibility to Groundwater Flooding mapping indicate that the site lies within an area of low susceptibility to groundwater flooding, with groundwater levels typically more than 5 m below ground level.

There are no recorded incidents of groundwater flooding affecting the site or its immediate surroundings within the SFRA historic flooding datasets. In addition, the proposed development does not include basement accommodation or other below-ground structures that would be vulnerable to groundwater ingress.

On this basis, the risk of flooding from groundwater at the site is considered to be **low**.

Sewers

Sewer flooding may occur when intense rainfall exceeds the hydraulic capacity of the local sewer network, when blockages or structural failures occur, or where high river or tidal levels restrict discharge from sewer outfalls.

The site is located within the Southern Water sewerage catchment. Review of publicly available information, including the Adur and Worthing Level 1 Strategic Flood Risk Assessment (2024) and associated historic flooding datasets, does not identify the site or its immediate surroundings as having experienced recorded incidents of sewer flooding.

The proposed development does not introduce basement accommodation, does not increase the building footprint, and does not materially increase impermeable area. As such, it is unlikely to increase pressure on the local sewer network.

On this basis, the risk of flooding from sewers is considered to be low.

Reservoirs

Flooding from reservoirs is extremely unlikely due to the stringent design, inspection and maintenance regimes applied to reservoir infrastructure in England under the Reservoirs Act.

The Environment Agency Risk of Flooding from Reservoirs mapping indicates that, in the highly unlikely event of a reservoir failure, the site could theoretically be affected by reservoir flooding. Such an event would be exceptional and would result in widespread flooding across large areas rather than localised impacts.

No site-specific historic incidents of reservoir flooding are recorded within the Adur and Worthing area.

On this basis, the risk of flooding from reservoirs at the site is considered to be very low.

4.2 Potential Flood Receptors

Given the proposed use of the site, the following receptors are considered:

- Future residential occupants of the proposed first floor dwelling
- The existing building fabric, including internal residential accommodation at first-floor level

No habitable accommodation is proposed at ground floor or basement level.

4.3 Potential Flood Pathways

Based on the expected on-site receptors, relevant pathways for the above receptors include:

- Tidal flooding from the coastal and tidal system associated with the River Adur and the English Channel, including residual mechanisms such as defence exceedance under extreme events
- Overland flow during intense or prolonged rainfall events (surface water flooding)
- Local public sewer network surcharge during extreme rainfall events

Flood pathways between off-site sources and off-site receptors are beyond the scope of this assessment

4.4 Risk Assessment Methodology

The potential level of risk posed by a particular source is determined by assessing the potential severity of the impact of the flood linkage on the receptor, if it is assumed to be present, and the probability of the flood linkage being present.

Severities are categorised from Minor to Severe and probabilities are categorised from Unlikely to High Likelihood to give a potential level of risk output.

Table 5: Risk Matrix

Probability	Severity of Consequence			
	Severe	Medium	Mild	Minor
High Likelihood	Very High Risk	High Risk	Moderate Risk	Low / Moderate Risk
Likely	High Risk	Moderate Risk	Low / Moderate Risk	Low Risk
Low Likelihood	Moderate Risk	Low / Moderate Risk	Low Risk	Very Low Risk
Unlikely	Low / Moderate Risk	Low Risk	Very Low Risk	Very Low Risk

Very High Risk

There is a high probability that severe harm could arise to a designated receptor from an identified source; or there is evidence that severe harm to a designated receptor is currently happening.

High Risk

Harm is likely to arise to a designated receptor from an identified source.

Moderate Risk

It is possible that harm could arise to a designated receptor from an identified source. It is relatively unlikely that any such harm would be severe or if any harm were to occur it is more likely that the harm would be relatively mild.

Low Risk

It is possible that harm could arise to a designated receptor from an identified source, however, it is likely that this harm, if realised, would normally be mild.

Very Low Risk

There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

5. Conclusions

5.1 Risk Evaluation

- Based on the assessment of flood sources, pathways and receptors, the following residual flood risks have been identified:
- There is a low residual risk to future residential occupants from tidal flooding, noting that the site lies within Flood Zone 3 but outside the Functional Floodplain (Flood Zone 3b) and that no habitable accommodation is proposed at ground or basement level.
- Environment Agency mapping indicates the presence of surface water flow routes within the vicinity of the site during the 1 in 100 year and 1 in 1000 year rainfall events; however, the mapping does not indicate significant ponding depths or hazard affecting the site footprint.
- There is a low risk from groundwater flooding, based on SFRA groundwater mapping and the absence of recorded groundwater flooding incidents at or near the site.
- There is a low risk from sewer flooding, with no recorded incidents affecting the site and no increase in impermeable area proposed.

5.2 Proposed Flood Mitigation Measures

Based on the identified flood risk, flood mitigation measures are not considered necessary.

5.3 Surface Water Management

The proposed development does not involve external extensions or an increase in impermeable area. Surface water runoff rates and volumes will therefore remain broadly unchanged from the existing condition.

5.4 Safe Access and Egress

Based on available Environment Agency mapping and SFRA evidence, the site is not predicted to be subject to inundation during the design flood event at ground level.

Safe access and egress routes are expected to remain available during flood events, without reliance on emergency services. Given the site's location within a tidal flood risk area, future occupants should be encouraged to register for the Environment Agency Flood Warning Service.

5.5 Conclusions

The site at 3–4 Liverpool Buildings, Worthing (BN11 1SY) lies within Flood Zone 3 as defined by the Environment Agency Flood Map for Planning. However, the site is not located within Flood Zone 3b (Functional Floodplain) and no increase in floodplain encroachment or vulnerability at ground level is proposed.

The development comprises a change of use and internal reconfiguration within an existing building, with all residential accommodation located at first-floor level only. The proposals do not increase flood risk elsewhere and adopt a sequentially preferable layout within the site.

On this basis, and subject to the findings of this Flood Risk Assessment, the proposed development can be **made safe for its lifetime**, taking account of climate change, and is considered to comply with **national and local flood risk planning policy**.

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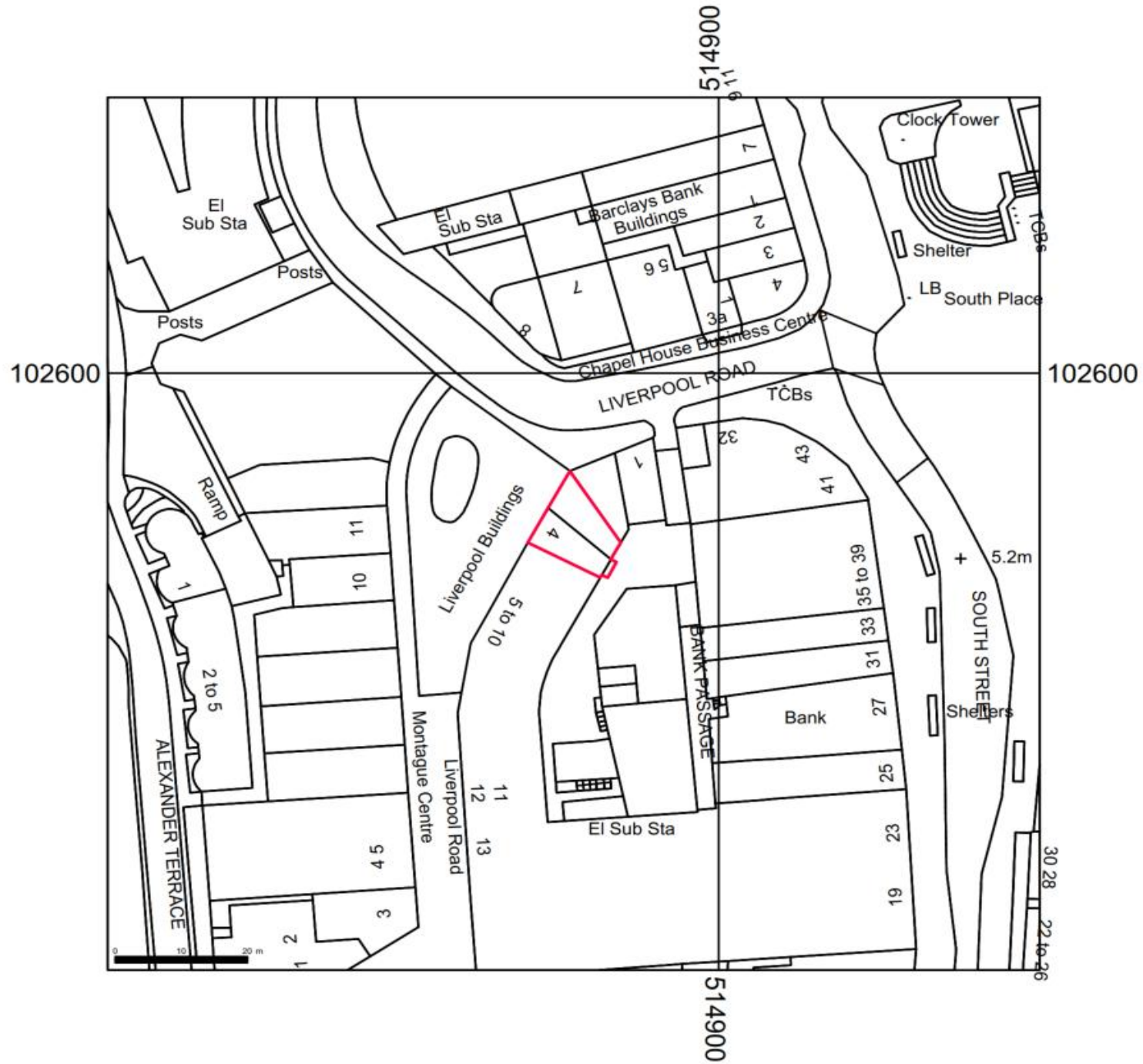
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





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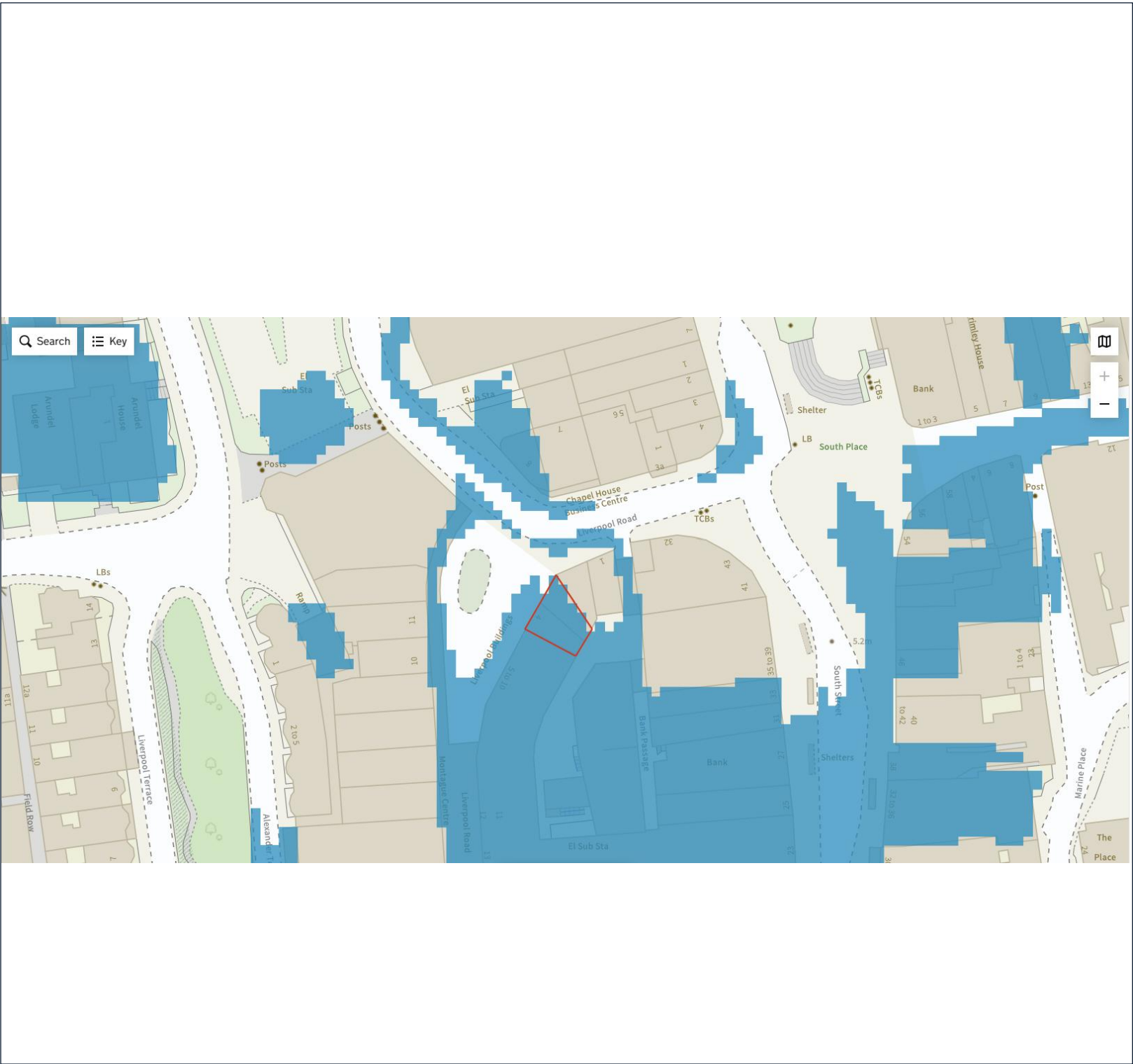


Appendix - Site Maps & Plans	
Description	
Site location plan	
Sources	
Enhance Architecture	
Key	
	Site boundary
	North



Appendix – Flood Risk Maps

Description	
Flood map for planning	
Sources	
Environment Agency OS data © Crown copyright and database rights	
Key	
	Site boundary
	Flood Zone 1
	Flood Zone 2
	Flood Zone 3
	Main river
	Flood defence
	North



Appendix - Flood Risk Maps




Description

Environment Agency map showing the predicted extent of surface water flooding for a 1 in 100 year (1% Annual Exceedance Probability) rainfall event. The mapping indicates areas susceptible to surface water ponding and overland flow during intense rainfall events.

Sources

Environment Agency
OS data © Crown copyright and database rights

Key

	Site boundary
	Surface water flood risk
	North

Appendix - Flood Risk Maps




Description

Environment Agency map showing the predicted extent of surface water flooding for a 1 in 1000 year (0.1% Annual Exceedance Probability) rainfall event. The mapping identifies areas that could be susceptible to surface water ponding and overland flow during extreme rainfall events.

Sources

Environment Agency
OS data © Crown copyright and database rights

Key

	Site boundary
	Surface water flood risk
	North

