FLOOD RISK ASSESSMENT

Site Address
Unit West of Becket Buildings
Littlehampton Road
BN13 1QD
Worthing

Client
Jacob Weiner
Almond Initiatives

Date
01/06/2026

1 Document Control

FLOOD RISK ASSESSMENT

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3 Abbreviations

Abbreviation	Description
STM	STM Environmental Consultants Limited
BGS	British Geological Survey
EA	Environment Agency
OS	Ordnance Survey of Great Britain
FRA	Flood Risk Assessment
NPPF	National Planning Policy Framework
FWD	Floodline Warning Direct
FRMS	Flood Risk Management Strategy
AWBC	Adur and Worthing Borough Council
WSCC	West Sussex County Council
SWMP	Surface Water Management Plan
SFRA	Strategic Flood Risk Assessment
CDA	Critical Drainage Area
AEP	Annual Exceedance Probability
CC	Climate Change
SuDS	Sustainable Urban Drainage Systems
GWSPZ	Groundwater Source Protection Zone
LLFA	Lead Local Flood Authority
mbgl	metres below ground level
DCLG	Department for Communities and Local Government
PPGPS	Planning practice guidance and Planning system

4 Disclaimer

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STM 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. However, STM gives no warranty, representation or assurance as to the accuracy or completeness of any information, assessments or evaluations presented within this report.

5 Executive Summary

SECTION	SUMMARY
Location	Unit West of Becket Buildings, Littlehampton Road, BN13 1QD, Worthing Grid Reference: 513284, 104604
Area	414m^2
Proposed Development	The demolition of existing workshop buildings to the rear (South) of 1 Becket Buildings to develop 3no. 1-bedroom dwelling houses with landscaping to the communal courtyard to the East.
Flood Zone	The site is located in Flood Zone 1.
Topography	15.94mAOD (South) to 16.19mAOD (West).
Sequential and Exception Tests	A sequential test was completed and no sequentially preferable sites were identified. Please see report SEQ-2026-000004.
Main Sources of Flooding	Pluvial flooding.
Flood Defences	None.
Records of Historic Flooding	The EA Historic Flood Map contains no recorded incidents of historic fluvial flooding onsite and no records of fluvial flooding in the vicinity.
Fluvial (River) and Tidal (Sea) Flood Risk	Very Low - The site is located in Flood Zone 1.
Pluvial (Surface Water) Flood Risk	Low to Medium – The site is at low risk of witnessing flood depth of up to 0.3m. The proposed is at medium risk of witnessing 0.2m of flood depth, with an indicative surface water flood level of 16.3mAOD being witnessed on site. It should be noted that the indicative flood flow routes are likely restricted heavily by the existing building and walls situated on site.
Flood Risk from Artificial (Canals and Reservoirs) Sources	Very low – No significant artificial sources identified.
Groundwater Flood Risk	Low – Potential for groundwater flooding to occur at surface. The groundwater is likely to be > 5 m below ground surface.
Development Impacts on Local Flood Risk	The development will increase the built-up area, decreasing the impermeable surface and therefore will have no adverse impact on local flood risk.
Proposed Flood Risk Mitigation Measures	• The FFL will be 300mm above the ground level of the proposed units. • Construction will utilise flood resistant materials and services will be placed as high as practicable to reduce impact of flooding; • Safe egress to Flood Zone 1 is available on site.
Surface Water Management (SuDS)	SuDS would reduce current surface water run-off. Consideration should be given to rainwater butts, rainwater harvesting and infiltration (soakaways, permeable paving, rain gardens) where possible.
Conclusions	Based on the information reviewed and taking into account the proposed mitigation measures, it is considered that overall flood risk to the proposed development is acceptable and that it will not increase local flood risk. As such, the development is considered to be in compliance with local planning policy and the NPPF.

6 Introduction

STM Environmental Consultants Limited (STM) were appointed by Jacob Weiner of Almond Initiatives (Client) to provide a Flood Risk Assessment (FRA) at a site located at Unit West of Becket Buildings, Littlehampton Road, BN13 1QD, Worthing.

7 Development Proposal

The FRA is required to support a planning application for the demolition of existing workshop buildings to the rear (South) of 1 Becket Buildings to develop three 1-bedroom dwelling houses with landscaping to the communal courtyard to the East.

Further details including drawings of the development plans are available in Appendix 2.

8 Report Aims and Objectives

The purpose of this report is to establish the flood risk to the site from all potential sources and, where possible, to propose suitable mitigation methods to reduce any risks to an acceptable level. It aims to make an assessment of whether the development will be safe for its lifetime, taking into account climate change and the vulnerability of its users, without increasing flood risk elsewhere.

The FRA assesses flood risk to the site from tidal, fluvial, surface water, groundwater, sewers and artificial sources. The FRA has been produced in accordance with the National Planning Policy Framework (NPPF) and its supporting guidance.

9 Legislative and Policy Context

9.1.1 Local Planning Policy – Worthing Borough Council

DM20 - FLOOD RISK AND SUSTAINABLE DRAINAGE

a) The Council will work with relevant bodies to ensure that flood risk in Worthing is managed and reduced. Development should be directed away from areas of highest risk of flooding from any source and opportunities should be taken to reduce flooding through sustainable drainage systems and natural flood management to deliver multi-functional benefits for people and wildlife.

Flood Risk Assessment

b) A site-specific Flood Risk Assessment must be submitted with planning applications for:

i) sites of 1 hectare or greater in Flood Zone 1;

ii) all new development (including minor development and change of use) in Flood Zones 2 and 3;

iii) development that would introduce a more vulnerable class on land at increased flood risk in future or subject to other sources of flooding identified by the Strategic Flood Risk Assessment.

c) The Flood Risk Assessment should be proportionate to the degree of flood risk and appropriate to the scale, nature and location of development. It will need to demonstrate that:

i) the site has passed the sequential test (this has already been undertaken for all sites allocated in the Local Plan) and within the site the most vulnerable development is located in areas at lowest flood risk from any source unless there are overriding reasons for not doing so;

ii) Where required by national policy, demonstrate both parts of the exception test have been passed:

- the development would provide wider sustainability benefits to the community that outweigh the flood risk; and
- the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

iii) current and future flooding from all sources including in-combination and cumulative effects, and any residual risk can be safely managed;

iv) ensure safe access and egress to and from the development, where necessary as part of an agreed flood warning and evacuation plan;

v) development will not increase flood risk elsewhere, and where possible will reduce the overall level of flood risk; and

vi) development should be appropriately flood resistant and resilient so in the event of a flood it can be quickly brought back into use without significant refurbishment.

Surface Water Drainage

d) The surface water drainage scheme should use Sustainable Drainage Systems, unless there is clear evidence that this would be inappropriate, and be designed to:

i) limit runoff to greenfield 1 year rates for events up to and including the 100 year plus climate change event where possible, and always ensure no increase in flows as a result of development;

ii) follow natural drainage flow paths and work with existing site topography;

iii) provide adequate capacity for the 30 year plus climate change event to be contained within the drainage system, and demonstrate that the development is safe for the 100 year plus climate change event scenario and does not increase in flood risk off site;

iv) incorporate green infrastructure and maximise multi-functional benefits ensuring adequate treatment of surface water prior to discharge to ensure that the quality of local water is not adversely affected;

v) be sensitively located and designed to promote an enhanced landscape/ townscape and good quality spaces that improve public amenity;

vi) discharge run-off according to the following hierarchy: (1) into the ground (infiltration), (2) to a surface water body, (3) to a surface water sewer, (4) to a combined sewer. Surface water connections to the public sewerage network should only be made with prior agreement of the relevant sewerage undertaker and where it can be demonstrated that there are no feasible alternatives (this applies to new developments and redevelopments) and where there is no detriment to existing users.

e) Clear management arrangements and funding for their ongoing maintenance over the lifetime of the development should be proposed. Planning conditions or obligations will be used to secure these arrangements.

DM21 - WATER QUALITY AND SUSTAINABLE WATER USE

a) Development should protect and enhance groundwater, surface water features and control aquatic pollution. Development will be permitted provided that it does not have an unacceptable impact on the quality and potential yield of local water resources, the water environment and its ecology.

b) The Council will support proposals to replace existing traditional drainage systems with suitable Sustainable Drainage Systems to further reduce water pollution and improve water quality.

c) Potentially polluting development should be steered away from the most sensitive areas. As a minimum a preliminary risk assessment will be required for any development where there is potential risk of contamination of controlled waters. New development within Groundwater Source Protection Zones will only be permitted provided that it has no adverse impact on the quality of the groundwater source or a risk to its ability to maintain a public water supply.

d) Development must be phased to take into account the timing of any water and/or wastewater infrastructure required which must be in place prior to the occupation of development.
e) All new residential development must achieve as a minimum the optional requirement set through Building Regulations for water efficiency that requires an estimated water use of no more than 110 litres per person per day.

9.2 EA Standing Advice on Flood Risk

The Environment Agency's standing advice lays out the process that must be followed when carrying out flood risk assessments for developments.

Flood Risk Assessments are required for developments within one of the Flood Zones. This includes developments:

- In Flood Zone 2 or 3 including minor development and change of use more than 1 hectare (ha) in Flood Zone 1;
- Less than 1 ha in Flood Zone 1, including a change of use in development type to a more vulnerable class (for example from commercial to residential), where they could be affected by sources of flooding other than rivers and the sea (for example surface water drains, reservoirs);
- In an area within Flood Zone 1 which has critical drainage problems as notified by the Environment Agency.

10 Summary of Data Review Undertaken

The following research has been undertaken as part of the FRA:

- Desktop assessment of topographical, hydrological and hydrogeological settings through review of the information sourced from the British Geological Survey (BGS), the Environment Agency (EA) and the Ordnance Survey (OS);
- Review of publicly available flood risk mapping provided by the EA;
- Review of the Preliminary Flood Risk Assessment (PFRA) and Level 1 Strategic Flood Risk Assessment (SFRA) produced by the LLFA outlining flood risk from various sources within the borough.

11 Site Description and Environmental Characteristics

11.1 Site Access

The site is accessed via Littlehampton Road.

11.2 Local Planning Authority

The site falls within the jurisdiction of Adur and Worthing Borough Council in terms of the planning process.

11.3 Lead Local Flood Authority

West Sussex County Council is the Lead Local Flood Authority (LLFA).

11.4 Site and Surrounding Land Uses

11.4.1 Site Current Land Use

The site is currently used for workshop buildings.

11.4.2 Surrounding Land Uses

The surrounding land use is predominantly residential, with a park to the Northwest and a primary school to the Southeast. Besides that, there is a high concentration of commercial buildings

11.5 Hydrology

There is no watercourse within 250m of the site.

11.6 Site Location and Area

The site is located at Unit West of Becket Buildings, Littlehampton Road, BN13 1QD, Worthing and is centred at national grid reference 513284, 104604. The site has an area of 414m^2.

A site location map and aerial photo are shown below. Photographs of the site are available in Appendix 1.



Figure 1 Site Location Map



Figure 2 Site Aerial Map

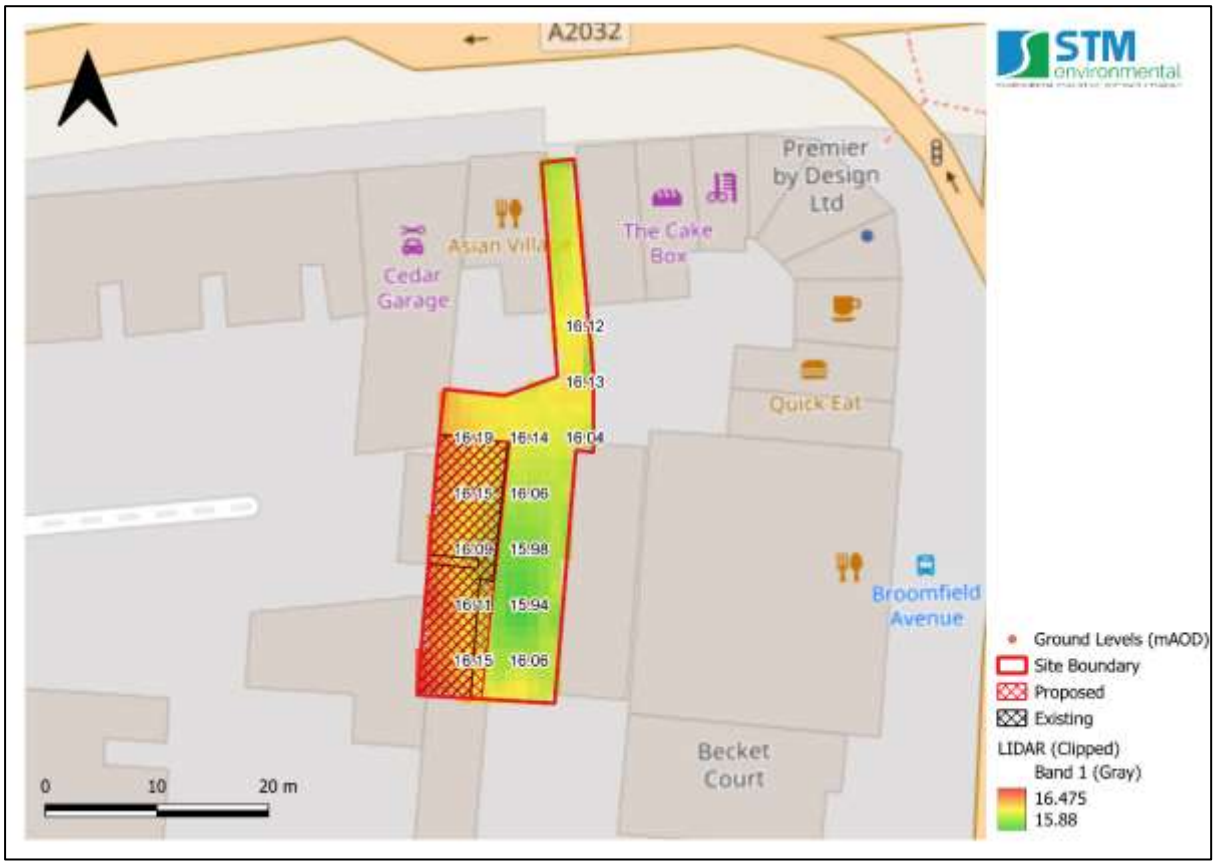
11.7 Hydrogeology

BGS – Hydrogeology	Value
Superficial Geology	River Terrace Deposits (Undifferentiated) (Sand, Silt and Clay [Unlithified Deposits Coding Scheme])
Superficial Aquifer	Secondary B
Bedrock Geology	Lambeth Group (Clay, Silt and Sand)
Bedrock Aquifer	Secondary A

11.8 Topography

A LIDAR DTM map showing the topography of the site and surrounding area is available in Appendix 3.

The LIDAR DTM data indicates that the ground level onsite ranges from a low of 15.94mAOD (South), within the courtyard to a high of 16.19mAOD (West), in the location of the existing workshops.



The LiDAR indicates a shallow depression located centrally within the site. The LiDAR levels within this area fluctuate between 16.10 and 16.0mAOD.

The ground levels to the west of the site form an elevated upstream catchment area, whilst to the east of the site fall away sharply to 15.3m. The flow routes towards and off site appear to be constrained by the existing buildings and surrounding courtyard walls.



Figure 3: LiDAR DTM 2022 Site and Surrounding Area

12 The Sequential and Exception Tests

12.1 The Sequential Test

A sequential test was completed and no sequentially preferable sites were identified. Please see report SEQ-2026-000004.

12.2 The Exception Test

The requirements for an Exception Test are given in Table 1 and are defined in terms of Flood Zone and development vulnerability classification.

Table 1 NPPF Flood Zone vulnerability compatibility (source: NPPF)

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a	Exception Test required	✗	Exception Test required	✓	✓
Zone 3b	Exception Test required	✗	✗	✗	✓

Key:

✓ Development is appropriate

✗ Development should not be permitted.

The Exception Test should not be required by the LLFA.

13 Site Specific Flood Risk Analysis

The PFRA and Level 1 SFRA produced by the LLFA and maps from the EA provide information regarding historic flooding events and incidents as well as predictions of flood extents and depths during extreme rainfall events.

13.1 Fluvial (River) and Tidal (Sea) Flood Risk

EA – Fluvial Flood Risk	Risk
Flood Zone	1
Historic (Onsite)	None
Historic (Within 250m)	None
Defences	None

The fluvial flood risk maps are available in Appendix 4.

13.1.1 Long Term Fluvial/Tidal Flood Risk Considering Flood Defences

The EA's long term flood risk maps give an indication of the actual risk associated with flooding after taking into account the effect of any flood defences in the area. Copies of maps for the site, which are available in Appendix 9, indicate that the long-term risk from fluvial flooding to the site is 'Very low' for the Present Day (2025) modelled event and 'Very low' for the Climate Change (2036 – 2069) modelled event.

13.2 Pluvial (Surface Water) Flood Risk

13.2.1 Main Potential Sources of Local Pluvial Flooding

The main potential source of pluvial flooding to the site is considered to be surface water ponding and flooding associated with heavy rainfall.

13.2.2 Records of Historic Pluvial Flooding Incidents

The LLFA's SFRA provided no records of specific pluvial flooding on or in the vicinity of the site, but rather, one map which shows every single flood event in the area.

13.2.3 Surface Water Flood Risk from Artificial Sources (Reservoirs and Canals)

The EA's reservoir flood risk map indicates that the site does not lie within an area that is at risk of reservoir flooding.

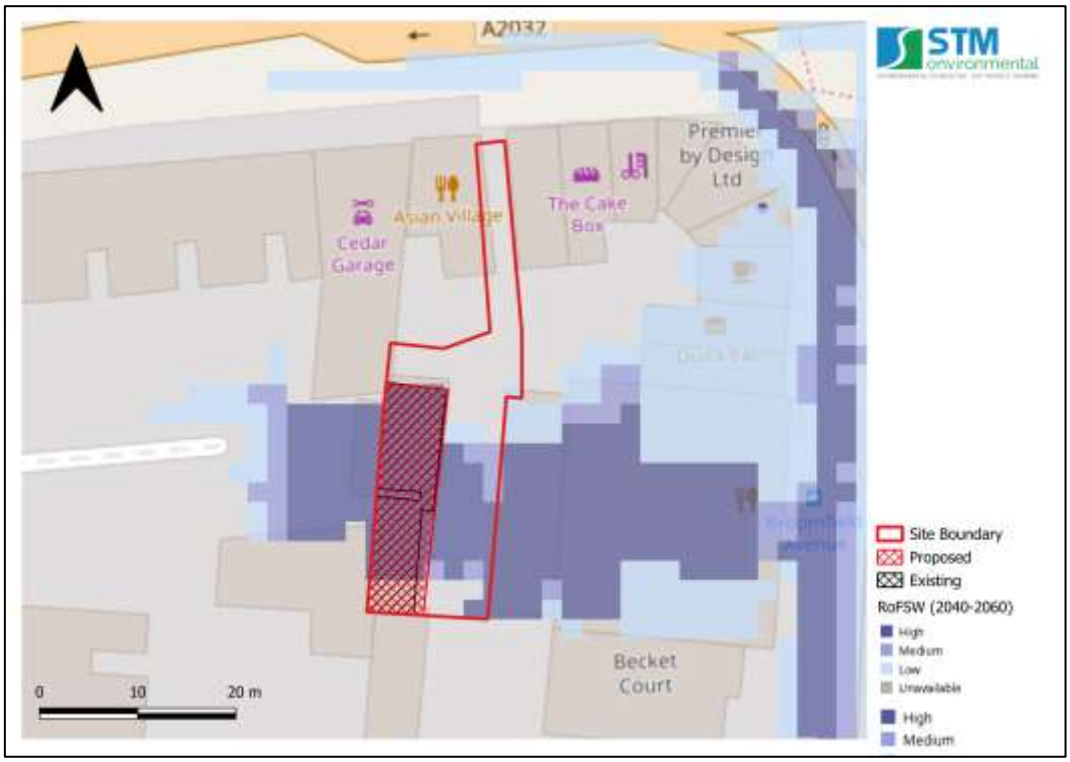
13.2.4 Sewer Flooding

The LLFA's SFRA provided no records of specific sewer flooding on or in the vicinity of the site, but rather, one map which shows every single flood event in the area.

13.2.5 Climate Change - Modelled Predictions of Surface Water Run-off Flooding

EA – Pluvial Flood Risk	Risk (Development)
Risk (Present-Day)	Medium
Depth	0.2
Risk (2040-2060)	Medium
Depth	0.2m
Risk (2040-2060)	Low Risk
Maximum Depth	0.3m (1 cell)

Based on the LiDAR DTM and estimate flood depths during the 1% AEP plus CC, the surface water flood depth is indicated to be 16.3mAOD.



A surface water flood flow route is indicated within the EA precipitation flood model data set.

A large part of the site is indicated to witness flood depths of less than 0.2m during the present and future climate change events. There is a low risk of witnessing ponding of 0.3m in the location of the proposed and existing workshop.

When comparing the surface water flood extents to the LiDAR and a detailed review of the site, the surface water flood flow routes are likely unrealistic, as the upstream catchments flow routes onto the site are heavily developed, with a large brick wall which coverers the entire boundary enclosing the site.

13.2.6 Long Term Surface Water Flood Risk

The EA's long term flood risk maps, which are available in Appendix 9, indicate that the long-term risk of flooding from surface water is 'medium' for the Present Day (2025) modelled event and 'medium' for the Climate Change (2040 – 2060) modelled event.

13.3 Groundwater Flood Risk

Groundwater flooding occurs when water rises from an underlying aquifer (i.e. at the location of a spring) to such a level where it intersects the ground surface and inundates the surrounding land. Groundwater flooding tends to occur after long periods of intense precipitation, in often low-lying areas where the water table is likely to be at a shallow depth. Groundwater flooding is known to occur in areas underlain by principal aquifers, although increasingly it is also being associated with more localised floodplain sands and gravels. A high groundwater table also has the potential to exacerbate the risk of surface water and fluvial flooding by reducing rainfall infiltration capacity, and to increase the risk of sewer flooding through sewer/groundwater interactions.

13.3.1 Historic Records of Groundwater Flooding

The LLFA's SFRA provided no evidence of groundwater flooding at or in the vicinity of the site.

13.3.2 Susceptibility to Groundwater Flooding

BGS - Risk of Groundwater Flooding	Risk
Susceptibility to Groundwater Flooding	Potential for groundwater flooding to occur at surface
Depth to Groundwater	> 5 m below ground surface

The Groundwater Flood Susceptibility Map and Depth to Water Table Map, provided by BGS, are presented in Appendix 10.

The superficial deposits on site are indicated to be the River Terrace Deposits. The granular nature of the deposits will mean they are heavily interlinked with the river

levels, and groundwater level will potentially rise during continuous rainfall or fluvial flood events.

13.4 Critical Drainage Area

A Critical Drainage Area (CDA) may be defined as “a discrete geographic area (usually a hydrological catchment) where multiple and interlinked sources of flood risk (surface water, groundwater, sewer, main river and/or tidal) cause flooding in one or more Local Flood Risk Zones during severe weather thereby affecting people, property or local infrastructure”. A CDA is defined in the Town and Country Planning (General Development Procedure) (Amendment) (No. 2) (England) Order 2006 as “an area within Flood Zone 1 which has critical drainage problems and which has been notified to the local planning authority by the Environment Agency”.

No information regarding Critical Drainage Areas was provided by the LPA or LLFA. Therefore, it is assumed that the site does not lie within a CDA.

14 Potential Impacts of the Development on Local Flood Risk

14.1 Changes to Impermeable Area and Building Footprint

Changes in ground cover arising from the development are presented in Table 4 and Table 5 below.

Table 2 Existing and proposed site ground cover

	Impermeable Area (m^2)	Permeable Area (m^2)	Total Area (m^2)
Existing	414	0	414
Proposed	414	0	414

Table 3 Break down of existing and proposed site uses

Use	Existing (m^2)	Proposed (m^2)	Difference (m^2)
Building	124	125	+1
Hard Standing	290	289	-1
Soft Landscaping	0	0	0
Total	414	414	-

The proposed development will not increase the impermeable area of the site, as the site is completely formed from hard standing or existing buildings.

Detailed landscape plans were not available at the time of writing.

The introduction of permeable areas (soft landscaping or alternative permeable surfaces) would have a positive impact on the development site and surrounding area.

Given the small increase in building footprint, the development site is not likely to impact upon flood storage capacity.

However, there is significant scopes to reduce surface water runoff rates, through the introduction of SuDS mitigation measures will need to be introduced.

14.2 Impacts on Flood Storage and Flood Flow Routes

As the development will not change the site's built-up area, it is unlikely to have an impact on local flood storage and alter flood flow paths as it is not impacted by any modelled fluvial or modelled pluvial flood events.

15 Flood Risk Mitigation Measures

15.1 SuDS

Planning practice guidance (PPG) which is prepared by the Ministry of Housing, Communities and Local Government (DCLG) states that developers and Local Authorities should seek opportunities to reduce the overall level of flood risk in the

area through the layout and form of the development, and the appropriate application of sustainable drainage techniques.

As such, the developer has the option to implement a SuDS strategy in line with the drainage hierarchy as outlined in Table 6 below to reduce surface water discharges from the site.

Table 4 SuDS Options

- Store rainwater for later use;
- Use infiltration techniques, such as porous surfaces in non-clay areas;
- Attenuate rainwater in ponds or open water features for gradual release;
- Attenuate rainwater by storing in tanks or sealed water features for gradual release;
- Discharge directly to a water course;
- Discharge rainwater directly to a surface water sewer/drain;
- Discharge to a combined sewer.

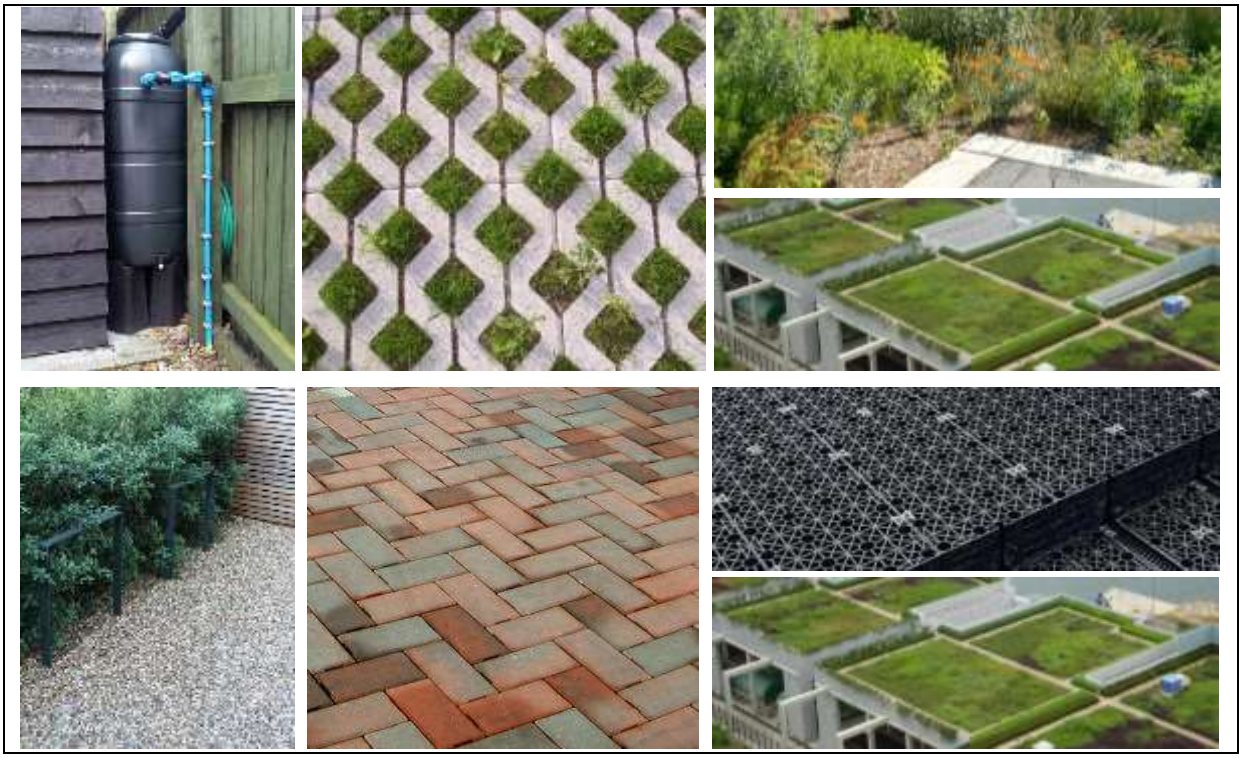


Figure 4 Surface water storage facilities and potential SuDS features - rainwater harvesting, on-site tank storage, rain garden soak-away and green roofs. (Source: UK SuDS Manual)

Given the nature of the development and the size of the site, it is considered that there are good opportunities for implementing SuDS. Measures such as rainwater butts, green roofs, rainwater harvesting and infiltration (soakaways, permeable paving, rain gardens) should be considered.

A full SuDS strategy is outside the scope of works of this FRA.

15.2 Flood Resilience

Flood resilient construction uses methods and materials that reduce the impact from a flood, ensuring that structural integrity is maintained, and the drying out and cleaning required, following inundation and before reoccupation, is minimised.

15.2.1 Finished Floor Levels

The finished floor level will be 300mm above the ground level in the position of the proposed.

15.2.2 Water Exclusion and Water Entry Strategy

There are two main strategies, whose applicability is dependent on the water depth the property is subjected to and the potential for structural damage it may cause.

- Water Exclusion (Flood Resistance) Strategy - should be employed where predicted flood depths are less than 0.3m and are likely to be for short duration. Emphasis is placed on minimising water entry and giving occupants time to relocate ground floor contents, maintaining structural integrity, and on using materials and construction techniques to facilitate drying and cleaning.
- Water Entry (Flood Resilience) Strategy - Flood resilience measures are designed to allow water in but to limit damage and allow rapid re-occupancy. Resilience measures should be employed where flood depths are greater than 0.6m and where it is likely that structural damage will occur due to excessive water pressure.

As the indicative flood depths are less than 0.3m in extreme scenarios, exclusion is considered most applicable for this site.

Water Exclusion Strategy:

There are a range of flood protection devices/methods that can be used in the Water Exclusion Strategy including:

- Using materials and construction with low permeability;
- Raising thresholds and finished floor levels (e.g. porches with higher thresholds than main entrance);
- Flood gates with waterproof seals;
- Sump and pump for floodwater to remove waste water faster than it enters;
- Door guards and airbrick covers.

15.2.3 Flood resilience design and measures

Flood resilience design and measures that may be implemented are outlined below. Water-resistant and resilient materials that should be utilized throughout the construction to minimize the flood risk and potential impacts.

Floor construction:

- Use of resilient flooring materials as ceramic tiles or stone floor finishes;
- Use of a concrete slab 150mm thick;
- Use of ceramic tiles or stone floor finishes is recommended;
- Maintain existing under floor ventilation by UPVC telescopic vents above 400 mm to external face of extension;
- Damp proof membrane of impermeable polythene at least 1200 gauge;
- Avoid the use of MDF carpentry.

Wall construction:

- Include in the external face of the extension a damp – proof course, 250 mm above ground level, to prevent damp rising through the wall;
- Use rigid closed – cell material for insulation above the DPC;

- Spread hardcore over the site within the external walls of the building to such thickness as required to raise the finished surface of the site concrete. The hardcore should be spread until it is roughly level and rammed until it forms a compact bed for the oversite concrete. This hardcore bed will be 100 mm thick and composed by well compacted inert material, blinded with fine inert material.

Doors:

- Seal doors around edges and openings. UPVC or composite material will be used with passive protection meaning that minimal intervention will be required in the event of flooding.

Underground drainage:

- Avoid use of metal for any underground piping;
- Use closed cell insulation for pipes that are below the predicted flood level;
- Provide non – return valves for the drainage system to prevent back water flow;
- Use UPVC or clay pipework for fouls and surface water drainage.

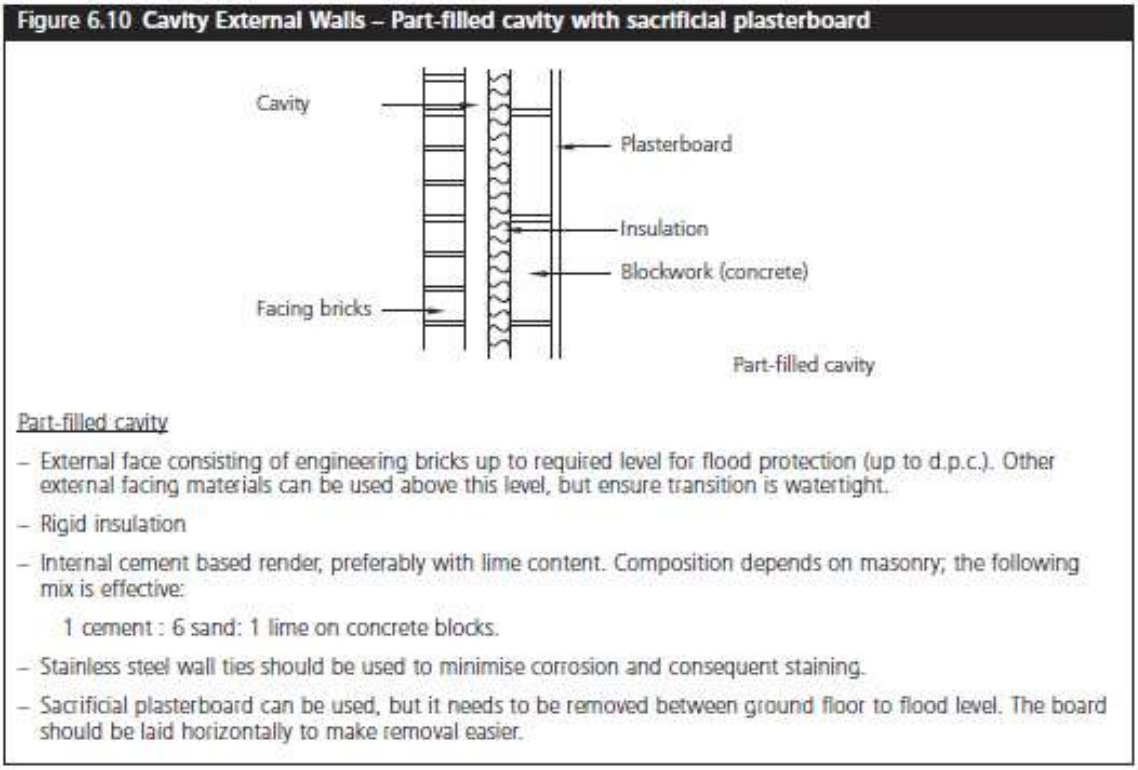


Figure 5 Cavity External Walls

As well as the above the following flood resilience features should be applied as part of the development:

- Electrical sockets should be installed above flood level for the ground floor;
- Utility services such as fuse boxes, meters, main cables, gas pipes, phone lines and sockets will be positioned as high as practicable;
- All external openings for pipes or vents below 400mm to be sealed around pipe or vent with expanding foam and mastic.

15.2.4 Compensatory Flood Storage (CFS)

As the site is not impacted during the 1% AEP + % CC modelled fluvial or the 1% AEP + CC modelled pluvial events, CFS is not required.

16 Emergency Plan

16.1.1 Assessment of Danger to People

The dangers associated with flood water to people are possible injury and/or death. This can occur as a result of drowning or being carried along by the waters into hard objects or vice versa. The risk to life is largely a function of the depth and velocity of the floodwater as it crosses the floodplain. Fast flowing deep water that contains debris would represent the greatest hazard.

The assessment of danger to people from walking in floodwater is described in the Flood Risks to People guidance documents (FD2321_TR1 and FD2321_TR2) by DEFRA/EA.

Danger can be estimated by the simple formula:

$$HR = d \times (v + 0.5) + DF$$

where, HR = (flood) hazard rating; d = depth of flooding (m); v = velocity of floodwaters (m/sec); and DF = debris factor.

The scoring methodology and calculation matrix for this is summarised in Appendix 13.

Given the level of flood risk witnessed onsite, the flood hazard rating is considered to be ‘Very Low’.

16.1.2 Access and Safe Egress

Safe access and egress to Flood Zone 1 is available on site.

16.1.3 Safe Refuge

As the site is located entirely within Flood Zone 1, sufficient safe refuge is provided onsite.

17 Conclusions

This assessment has considered the potential risks to the application site associated with flooding from fluvial, tidal, surface water, artificial and groundwater sources and the potential impacts of climate change.

The proposed development is considered to be in general compliance with local planning policy and the NPPF.

18 References

1. Communities and Local Government - National Planning Policy Framework NPPF, July, 2021.
2. Communities and Local Government - Planning Practice Guidance: Flood Risk and Coastal Change, Updated 06 March 2014.
3. Strategic Flood Risk Assessment, Worthing Borough Council
4. Local Plan, Worthing Borough Council
5. Surface Water Management Plan, Worthing Borough Council
6. CIRIA, Defra, Environment Agency – UK SuDS Manual, 2015.

19 Appendices

19.1 Appendix 1 – Site Photographs

NO
PARKING
YARD FOR USE OF GARAGE
& WORKSHOP USERS ONLY

THIS CAR PARK IS F
THE USE OF GARAGE
WORKSHOP OWNER
ONLY.

ANY UNAUTHORISED VEHI
WILL BE CLAMPED WIT
REMOVAL COSTS

Commercial Waste
01273 263050

NO PARKING
YARD FOR USE OF GARAGE & WORKSHOP USERS ONLY

THIS CAR PARK IS FOR THE USE OF GARAGE & WORKSHOP OWNERS ONLY.

ANY UNAUTHORISED VEHICLE WILL BE CLAMPED WITH REMOVAL COSTS

Fire exit
Keep clear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19.2 Appendix 2 – Development Plans

See next page.

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REMOVAL COSTS

















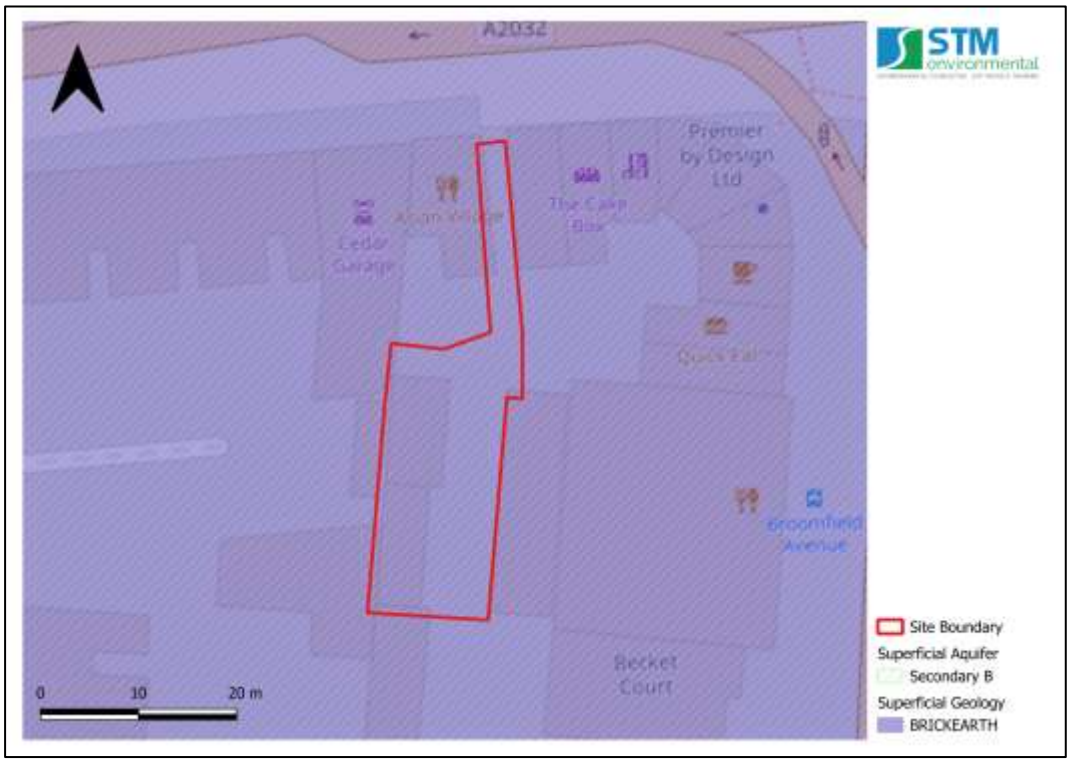




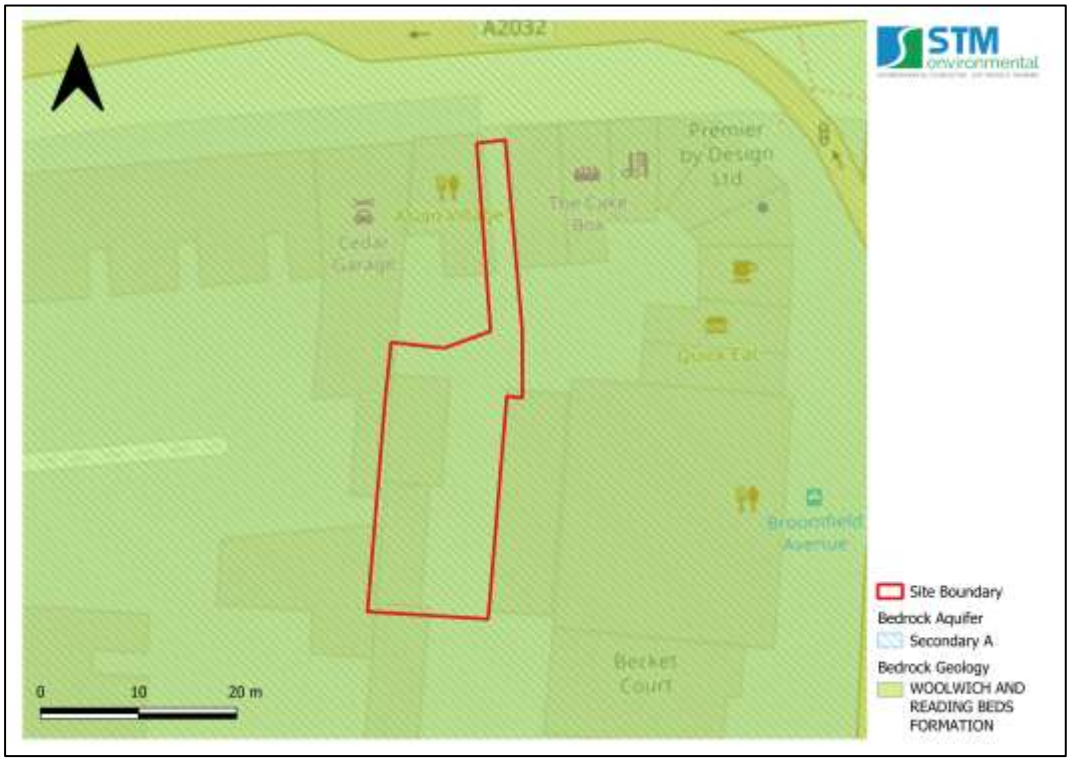


19.3 Appendix 3 – Environmental Characteristics

19.3.1 Superficial Hydrogeology Map



19.3.2 Bedrock Hydrogeology Map



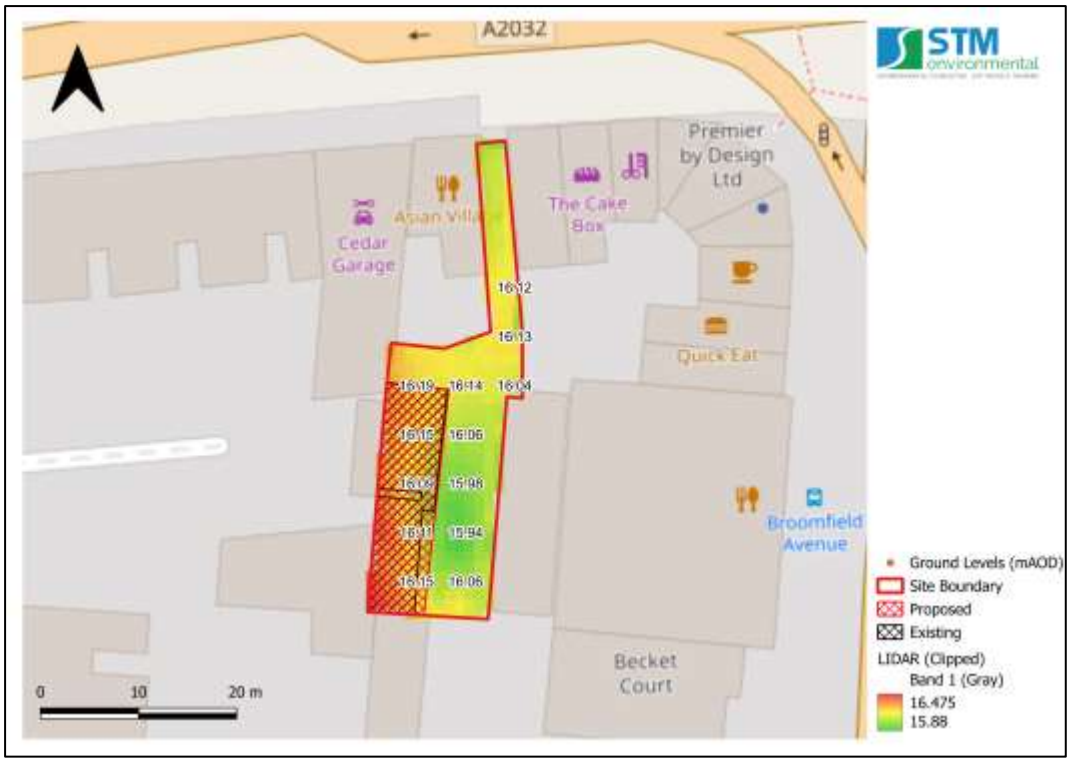
19.3.3 Hydrology Map



19.3.4 Topography Map – Area



19.3.5 Topography Map – Site

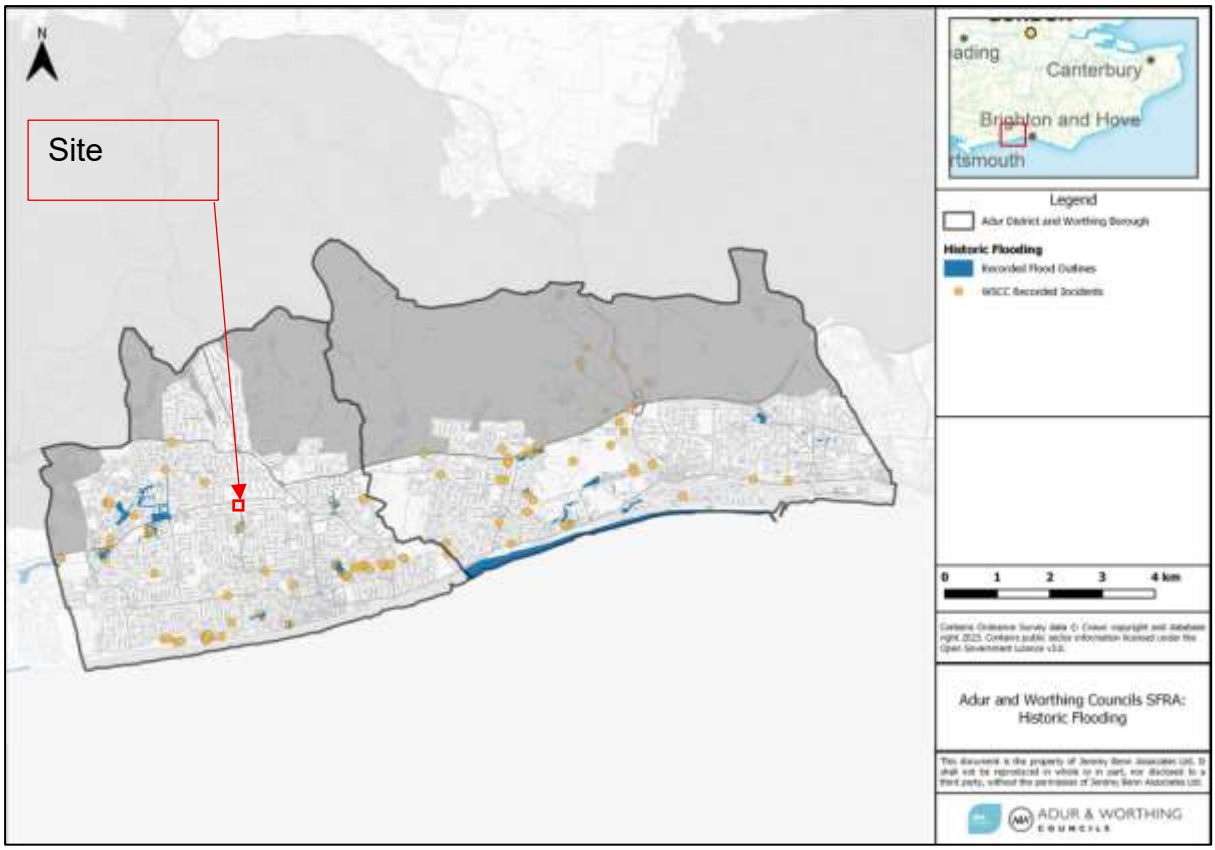


19.4 Appendix 4 – Historical Flood Incident Maps

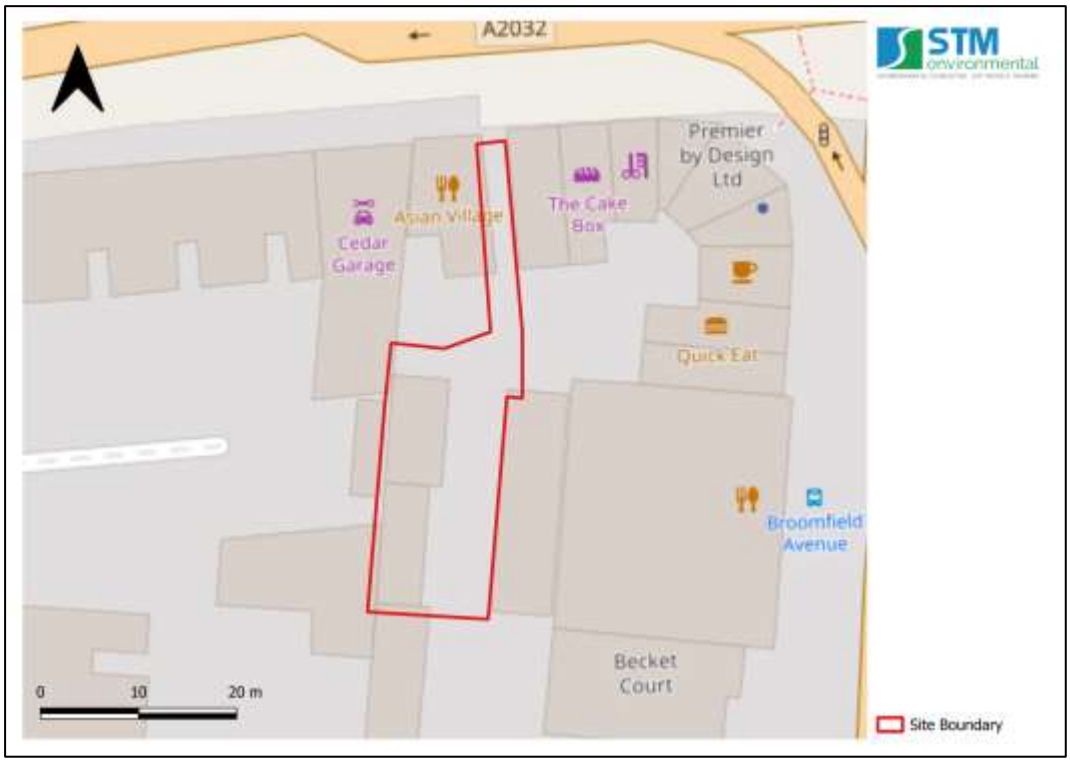
19.4.1 EA Historic and Recorded Flood Outlines



19.4.2 Map Recorded Historic Flooding

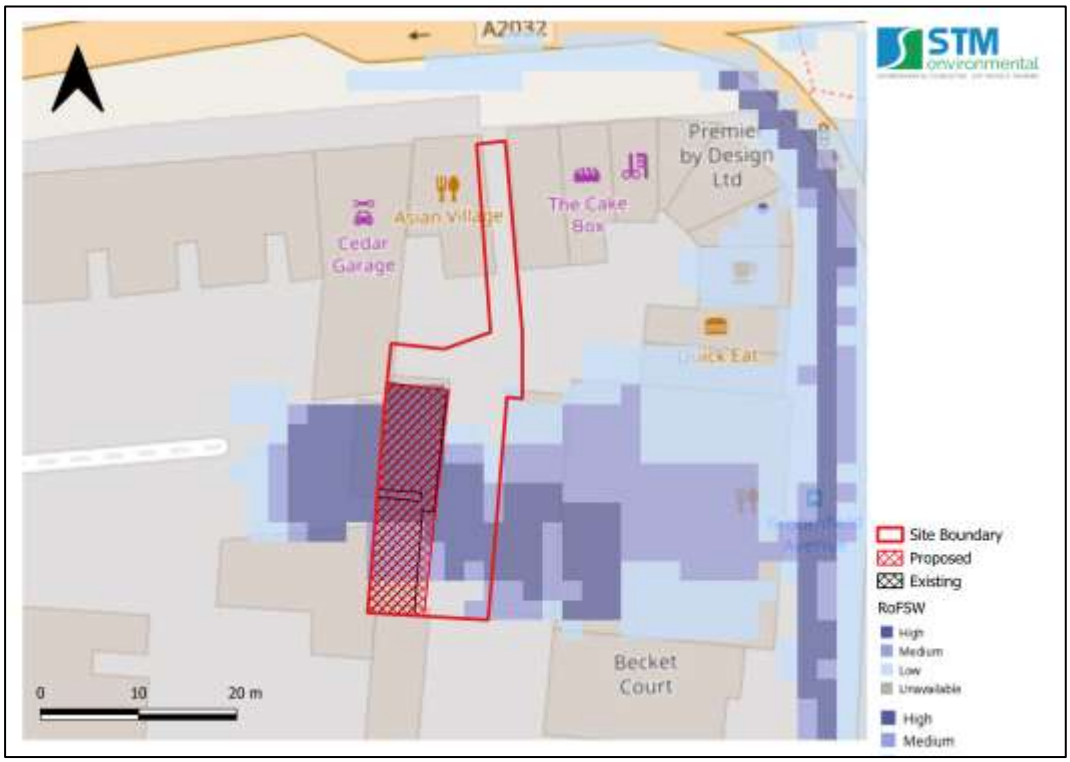


19.5 Appendix 5 - Flood Zone Maps

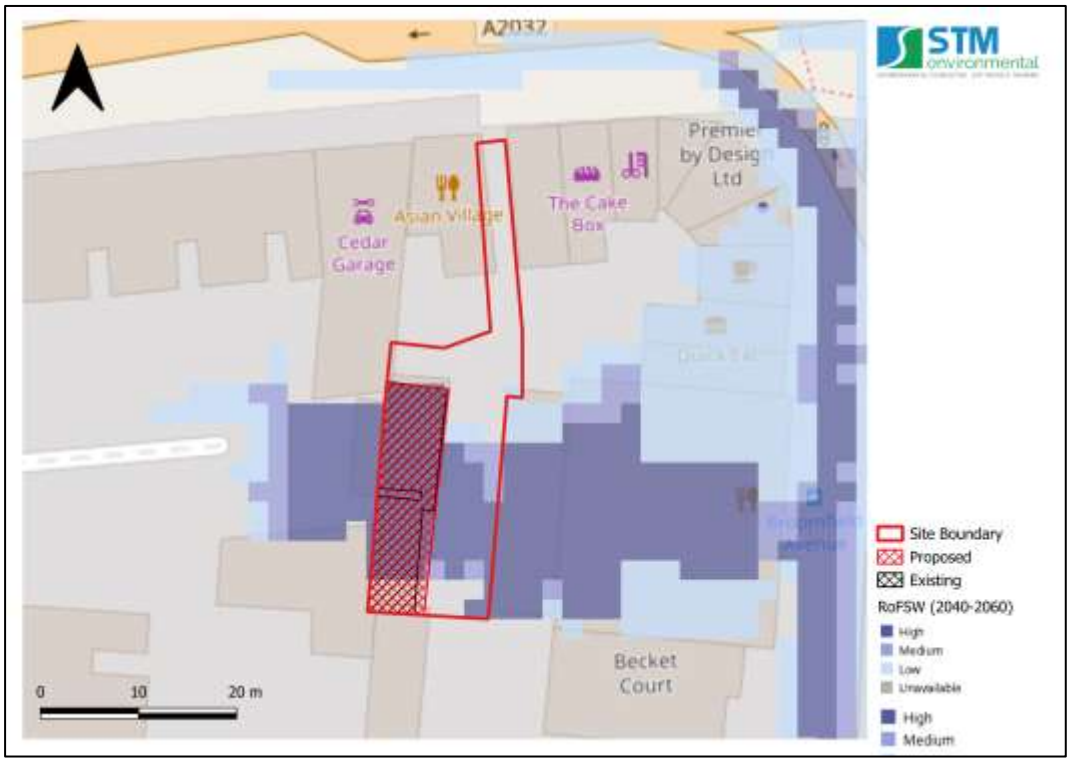


19.6 Appendix 6 – Surface Water Flood Extent and Depth Maps

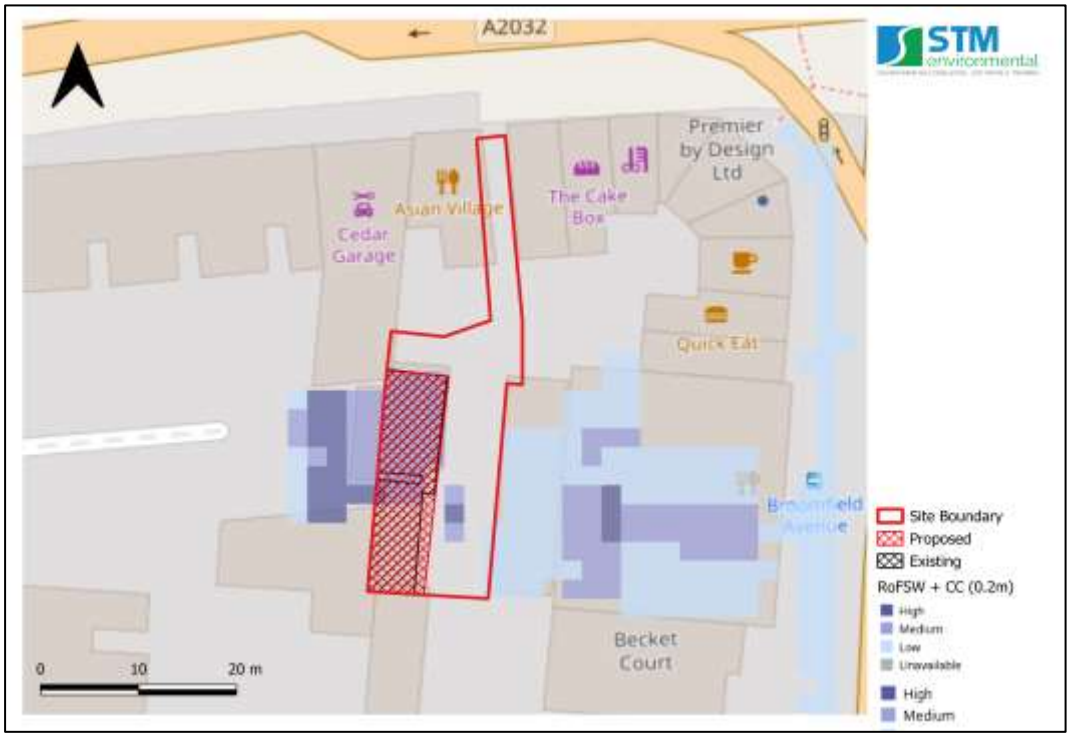
19.6.1 Predicted surface water flood depth – Present Day (2025)



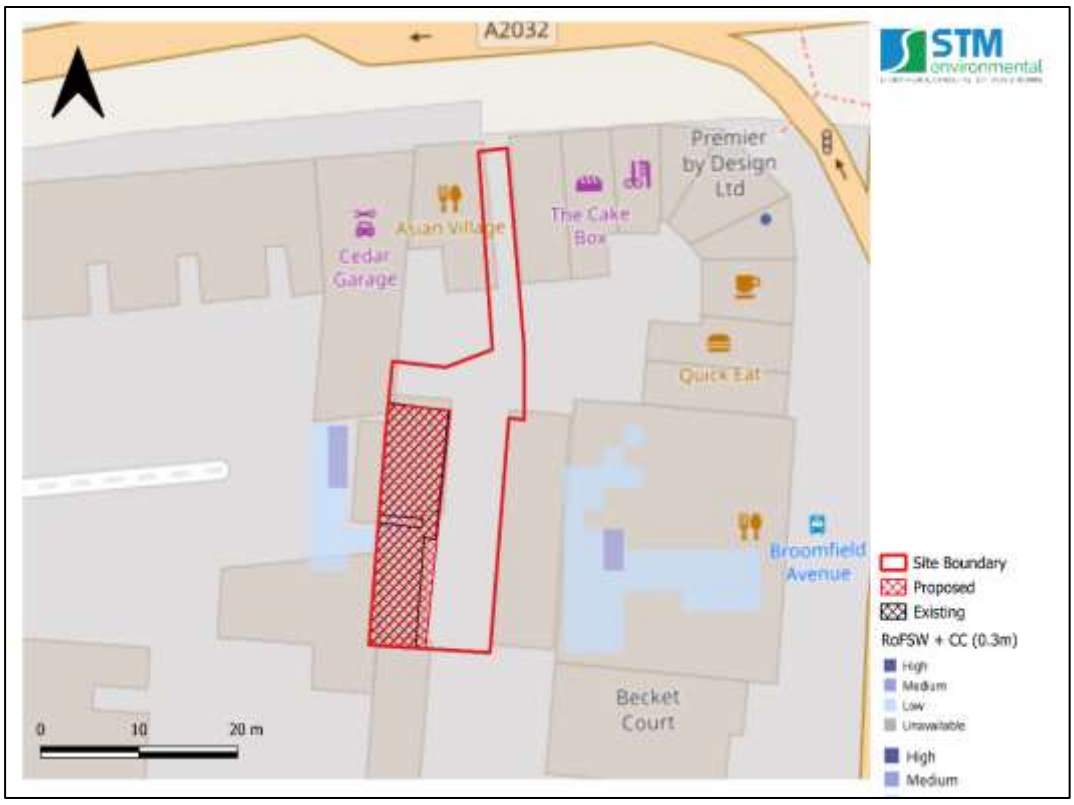
19.6.2 Predicted surface water flood depth – Climate Change (2040 – 2060)



19.6.3 Predicted surface water flood depth – Climate Change (2040 – 2060) – 0.2m Depth



19.6.4 Predicted surface water flood depth – Climate Change (2040 – 2060) – 0.3m Depth



19.7 Appendix 7 – Flood Defence Mapping

19.7.1 EA Flood Defence Map

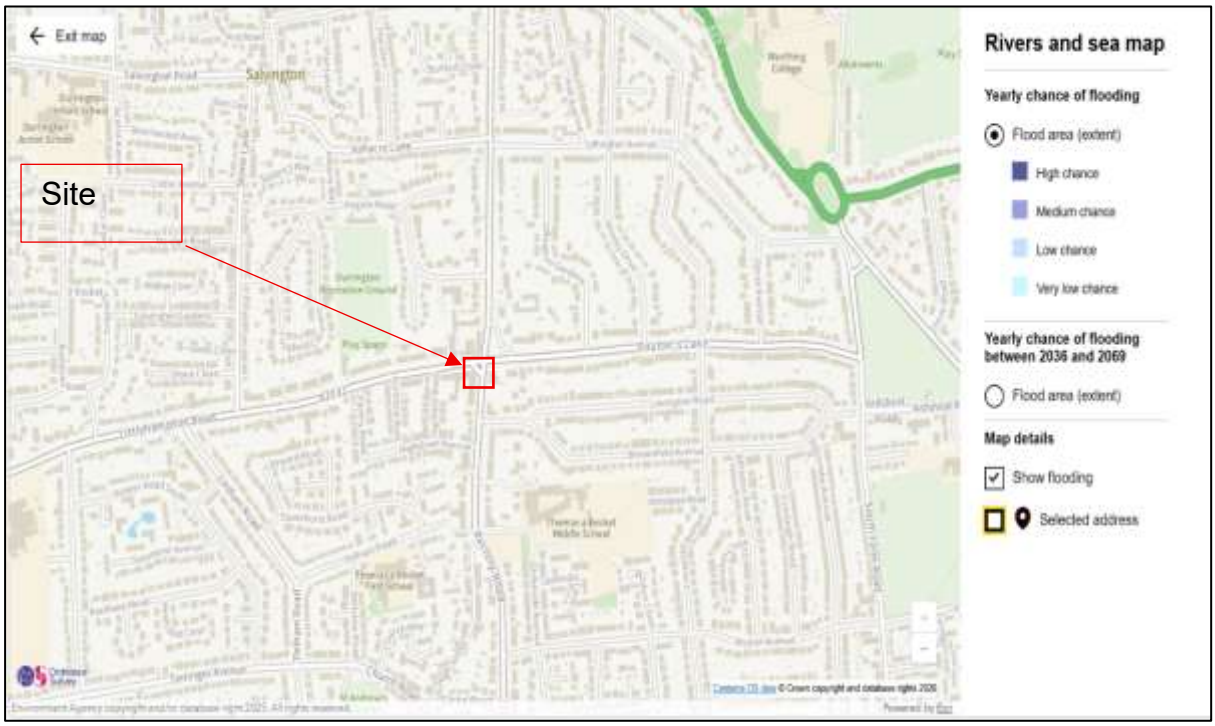


19.8 Appendix 8 – Risk of Flooding from Artificial Sources

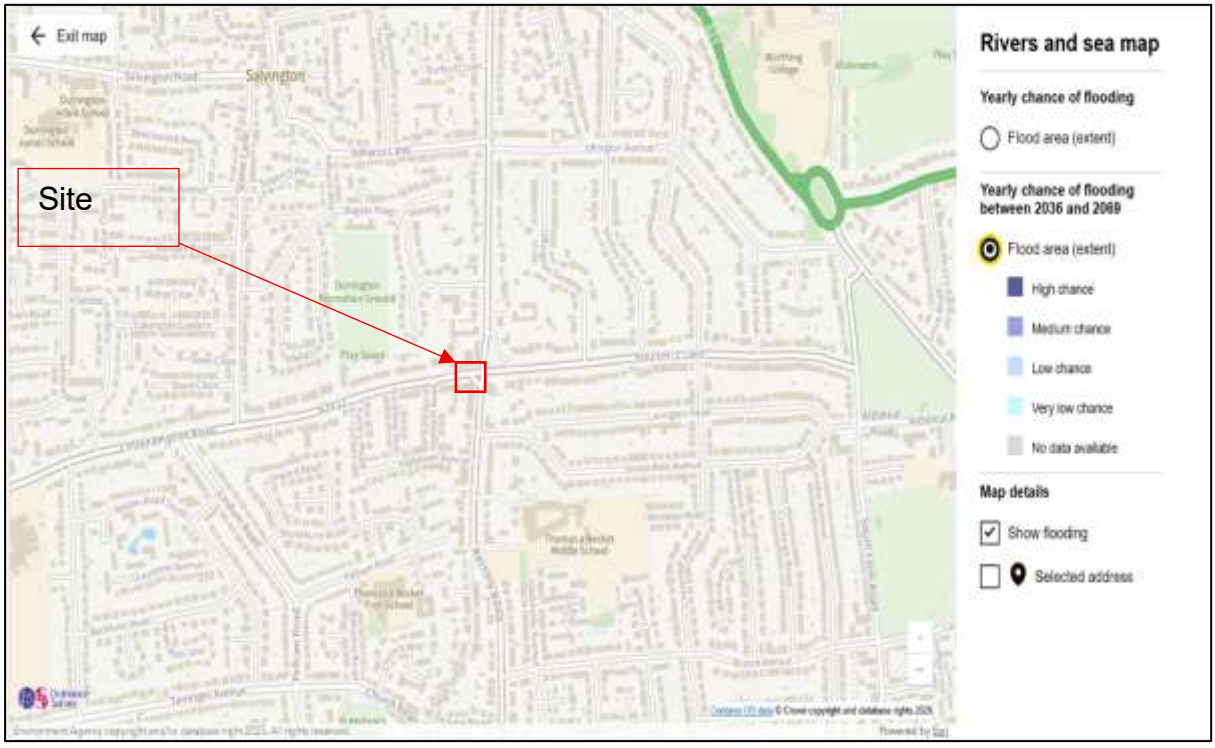
Not applicable.

19.9 Appendix 9 – EA's Long Term Flood Risk Maps

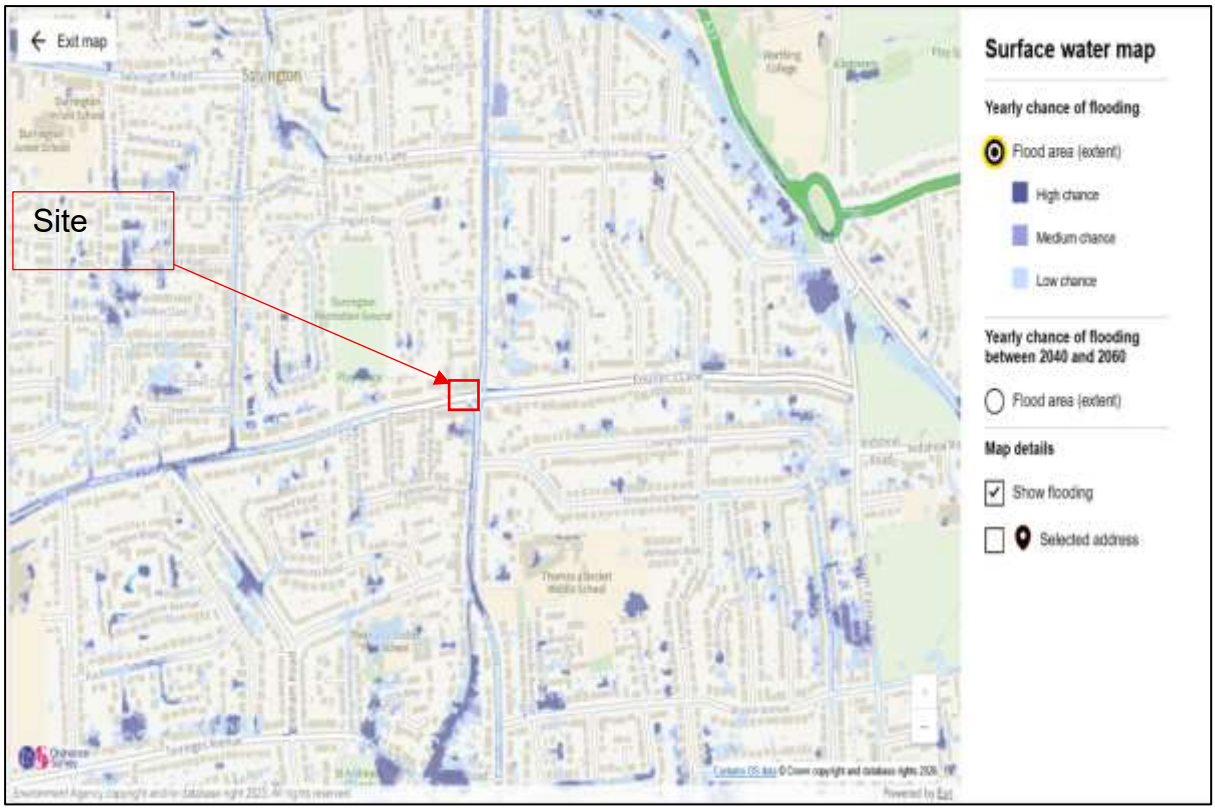
19.9.1 Rivers and the Sea – Present Day (2025)



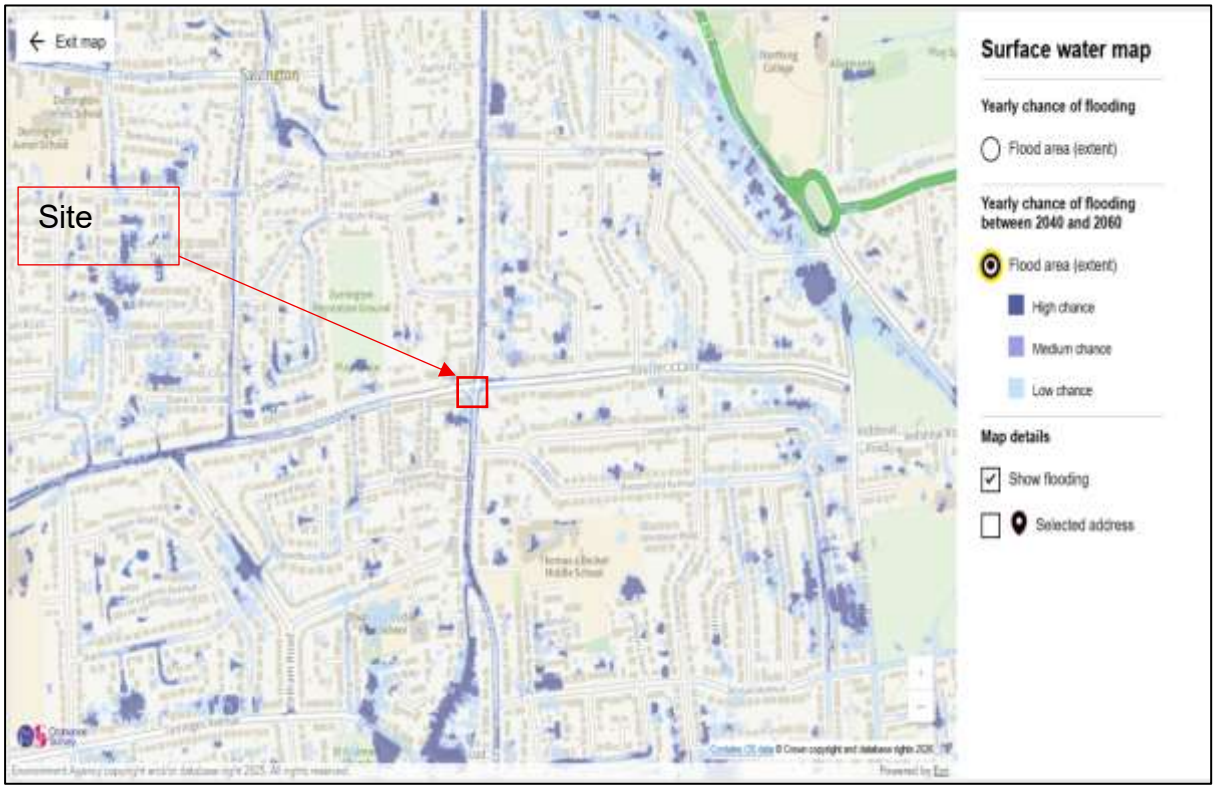
19.9.2 Rivers and the Sea – Climate Change (2036 – 2069)



19.9.3 Surface Water – Present Day (2025)

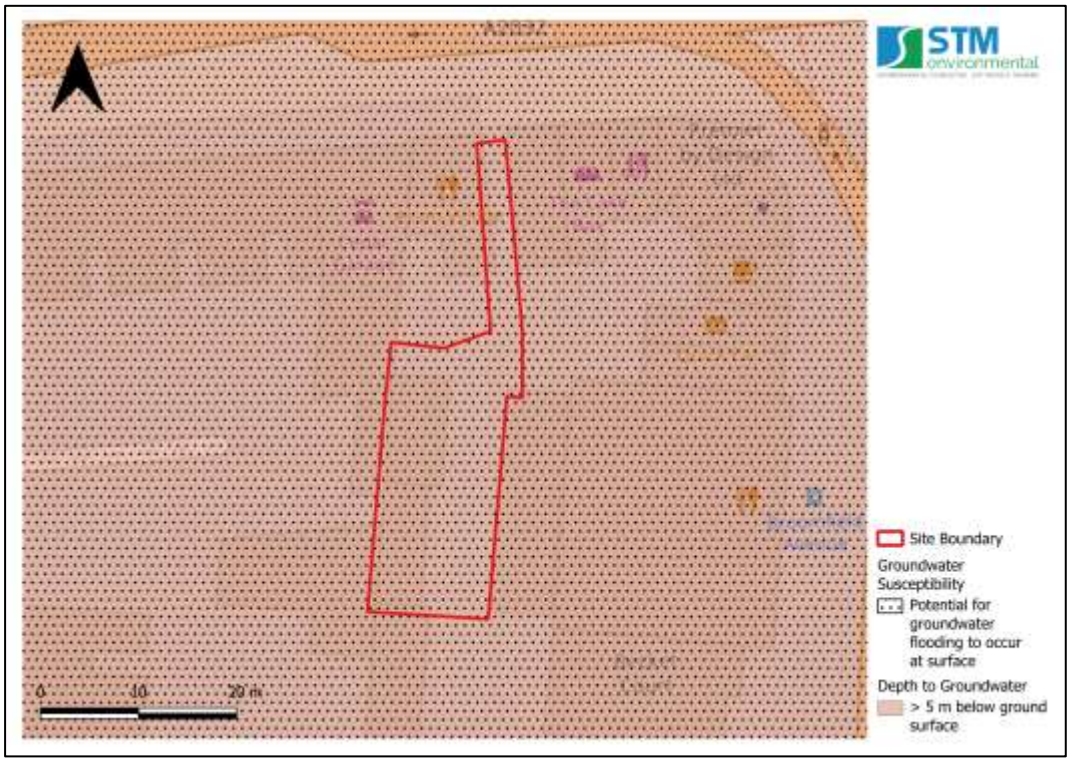


19.9.4 Surface Water – Climate Change (2040 – 2060)



19.10 Appendix 10 – Groundwater Flood Maps

19.10.1 Groundwater Flooding (Susceptibility) Map (BGS) and Potential Depth to the Groundwater Water Map (BGS)



19.11 Appendix 11 - EA Product 4 (Detailed Flood Risk) Data

The site is located in Flood Zone 1, so no modelled data was available.

19.12 Appendix 12 – Safe Egress to Flood Zone 1 Map

Flood Zone 1 is located on site.

19.13 Appendix 13 – Calculation of Flood Hazard Rating

Flood Hazard Rating Scores – based on DF score of 0

Velocity	Depth									
	0.25	**0.50**	**0.75**	**1.00**	**1.25**	**1.50**	**1.75**	**2.0**	**2.25**	**2.50**
0.0	0.13	0.25	0.38	0.50	0.63	0.75	0.88	1.00	1.13	1.25
0.5	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50
1.0	0.38	0.75	1.13	1.50	1.88	2.25	2.63	3.00	3.38	3.75
1.5	0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00
2.0	0.63	1.25	1.88	2.50	3.13	3.75	4.38	5.00	5.63	6.25
2.5	0.75	1.50	2.25	3.00	3.75	4.50	5.25	6.00	6.75	7.50
3.0	0.88	1.75	2.63	3.50	4.38	5.25	6.13	7.00	7.88	8.75
3.5	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
4.0	1.13	2.25	3.38	4.50	5.63	6.75	7.88	9.00	10.13	11.25
4.5	1.25	2.50	3.75	5.00	6.25	7.50	8.75	10.00	11.25	12.50
5.0	1.38	2.75	4.13	5.50	6.88	8.25	9.63	11.00	12.38	13.75

Summary of Scores

	Score From	Score To	Flood Hazard	Description
	Less than 0.75	0.75	Low	Exercise Caution
Class 1	0.75	1.5	Moderate	Danger for some
Class 2	1.5	2.5	Significant	Danger for most
Class 3	2.5	20.0	Extreme	Danger for all

Values for Debris Factor for different flood depths

Depths	Pasture/Arable Land	Woodland	Urban
0 to 0.25	0	0	0
0.25 to 0.75	0.5	1	1
D greater than 0.75 and/or v greater than 2	0.5	1	1

- The “danger to some” category includes vulnerable groups such as children, the elderly and infirm. “Danger: Flood zone with deep or fast
- flowing water”
- The “danger to most” category includes the general public.
- The danger to all category includes the emergency services.

A flood emergency plan is considered to be an acceptable way of managing flood risk where the flood hazard has been given a “very low hazard” rating. In some instances, flood emergency plans may also be acceptable where the rating is “danger for some”. However, it is unlikely to be an acceptable way of managing residual flood risk where the hazard to people classification is “danger for most” or “danger for all”.