EVOLVE

Building 810, Winnersh Triangle Business Park

Flood Risk Assessment

3514-EVE-01-XX-T-C-0001

Revision B

08/08/25

www.evolveuk.biz

Prepared by:	Paul White, HND Civil Eng, Civil Engineer
Checked by:	Richard Mayo CEng MICE MIStructE, Associate

Revision	Date	Prepared By	Checked By	Purpose
A	17.07.25	PW	MP	For Information
B	08.08.25	PW	RM	For Planning

Contents

1 Introduction

1.1 Scope

Evolve Consulting Engineers Limited has been appointed by Burnley Wilson Fish in respect to the proposed development centred at approximate National Grid Reference SU 77425 71641 (E 477425, N 171641) What3Words gain.mini.undulation, Building 810, Winnersh Triangle Business Park, Eskdale Rd, Winnersh Triangle, Reading RG41 5TS.

The planning application area is 1.202ha

The proposed development comprises the demolition of existing buildings and erection of a replacement building for flexible use within use classes E(g), B2 and/or B8, together with access, parking, landscaping and associated works.

This report has been produced in support of the planning application for the development and should be read in conjunction with the other relevant planning documents.

1.2 Sources of Information

This report has been prepared based on the following set of information.

- Proposed Site Layout produced by The Harris Partnership, drawing reference 17922-1-THPW-XX-XX-DR-A-0010, dated July 2025
- Topographical Survey by Midland Survey Ltd, drawing reference 33009/R8 2 dated November 2019
- Utilities records – Midland Survey Ltd, drawing reference 33009/R8 2 dated November 2019
- Geo-Environmental Assessment by Delta Simons, report reference 93445.565584, dated June 2023
- Thames Water Asset Location Search by Thames Water, report reference ALS Standard/2023_4882231, dated Sept 2023
- Environment Agency (EA) online flood maps at https://flood-map-for-planning.service.gov.uk/
- British Geological Survey (BGS) online mapping available at https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/
- Magic website mapping available at https://magic.defra.gov.uk/magicmap.aspx
- Lead Local Flood Authority (LLFA) information – Wokingham Borough Council - Strategic Flood Risk Assessment, dated May 2023, available at https://www.wokingham.gov.uk/sites/wokingham/files/2024-05/WBC%20Level%201%20SFRA%202023%20-%20Main%20report.pdf
- Lead Local Flood Authority (LLFA) information – Wokingham Borough Council – Level 2 Strategic Flood Risk Assessment, dated Aug 2023, available at https://www.wokingham.gov.uk/sites/wokingham/files/2024-05/WBC%20Level%202%20SFRA%202023%20-%20Main%20report.pdf
  National Planning Policy guidance on Flood Risk and Coastal Change, UK Government, published 6 March 2014, last updated 25 August 2022, available at https://www.gov.uk/guidance/flood-risk-and-coastal-change
- The National Planning Policy Framework (NPPF): Annex 3, Flood risk vulnerability classification – UK Government, published March 2012, available at https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification

1.3 Limitations

This report has been prepared in accordance with the NPPF and Local Planning Policy. The proposed flood management (including ground floor level recommendations) and surface water management strategies are based on the relevant British Standards (BS8533), the standing advice provided by the EA or based on common practice. The findings of this report are based on the information available at the time of the production.

The Construction (Design and Management) Regulations 2015 (CDM Regulations) will apply to any future development of this site which involves “construction” work, as defined by the CDM Regulations. As such it is the responsibility of the proposed developer (ultimate Client) to fulfil its duties under the CDM Regulations.

2 Site Setting

2.1 Existing Site

The site is located within Winnersh Triangle Business Park, approximately 0.28 kilometres (km) northeast of Winnersh Triangle train station in a mixed-use commercial and industrial area.

The area of the site is 12,020m^2. Most of this area is currently classed as impermeable, with this being split into 10,608m^2 of roof area and hardstanding and 1,412m^2 of perimeter landscaping.

The CCTV drainage survey shows that the surface water from the site is discharged to a below ground drainage system, which in turn outfalls approx. 50% of the sites flow to the sewer in Eskdale Rd to the North and the remaining 50% to a sewer in the access road to the south of the site. There are currently no flow restrictions or attenuation shown.

According to the Wokingham Borough Council SFRA, no Critical Drainage Areas (CDA) have been defined by the Environment Agency within Wokingham Borough therefore the site is not shown to be located in a CDA.

Figure 2.1 – Site location plan

2.2 Proposed Development

The proposed development comprises the demolition of existing buildings and erection of a replacement building for flexible use within use classes E(g), B2 and/or B8, together with access, parking, landscaping and associated works.

The proposed site layout Plan is shown in Figure 2.2.

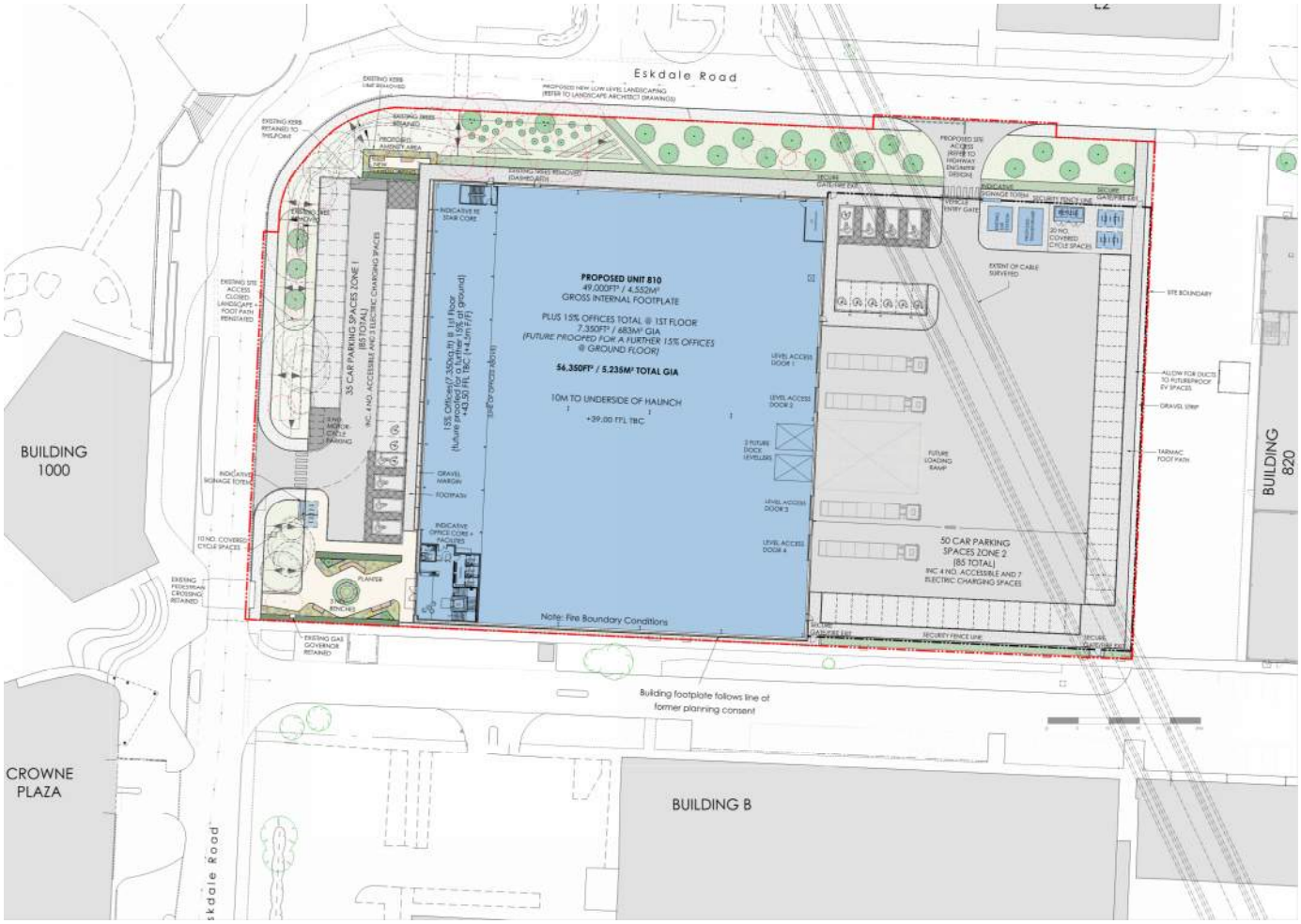

Figure 2.2 Proposed site layout plan

2.3 Topography

The topographical site survey shows the levels of the site to be formed in peaks and troughs to fall towards the existing drainage channels/gullies within the car park between 38.8 and 38.7mAOD to the west of the site and 38.98 and 38.72mAOD within the service yard to the east of the site.

There are landscaped mounds to the north that rise approximately 0.6m above the surrounding levels.

Levels adjacent to the building vary somewhat but seem to show the FFL for the existing building to be around 39.000mAOD.

The FFL of the recently completed, adjacent building (Building 820) is also 39.000mAOD.

2.4 Hydrology

Reference to OS Mapping shows that the River Loddon flows broadly northeast (clockwise around the site), some 220m at its closest to the north-northwest. This tributary of the River Thames discharges into the Thames at Shiplake Lock, many kilometres to the north. The nature reserve, Dinton Pastures, which includes White Swan Lake and Black Swan Lake is approximately 180m north of the site. These lakes appear to be linked to the Loddon. A small pond is approximately 400m to the east. A number of ditches and drains to the east and southeast appear to be linked with the pond and Black Swan Lake in Dinton Pastures,

2.5 Geology

Based on the information available from BGS online mapping:

- Bedrock geology description – London Clay Formation - Clay and Silt
- Superficial deposits – River Terrace Deposits - Sand And Gravel

The nearest borehole records with similar geological profiles to the site available from this website are summarised in Table 2.1.

Table 2.1 – Summary of nearby BGS borehole records

BGS Borehole Reference	SU77SE298	SU77SE166	SU77SE164
Date Drilled	2008	1986	1986
Grid Reference	477240E, 171650N	477710E, 171660N	477650E, 171510N
Cover level m (AOD)	Not Given	33.66 m	33.97 m
Proximity to site	160m west of site	180m east of site	300 m south east of site
Borehole depth	130.0 m	3.5 m	5.50 m
Depth to Bedrock	15.9 m	1.4 m	3.3 m
Groundwater depth	4.65m from surface	Not recorded	Not recorded

Soilscape information available from Magic Maps service indicate this area as:

- Loamy soils with naturally high groundwater

As part of the Geo-Environmental Assessment undertaken by Delta Simons, a Ground Investigation comprising a range of geotechnical testing, sampling and groundwater monitoring was carried out to ascertain geotechnical information. The work included (but was not limited to) Drilling of three cable percussive boreholes (BH1 to BH3) to a maximum depth of 15.0 m bgl; and the excavation of 4 foundation inspection pits (TP1 to TP4) to a maximum depth of 1.2 m bgl. The locations of the dynamic boreholes and rotary borehole are shown on Figure 2.3.

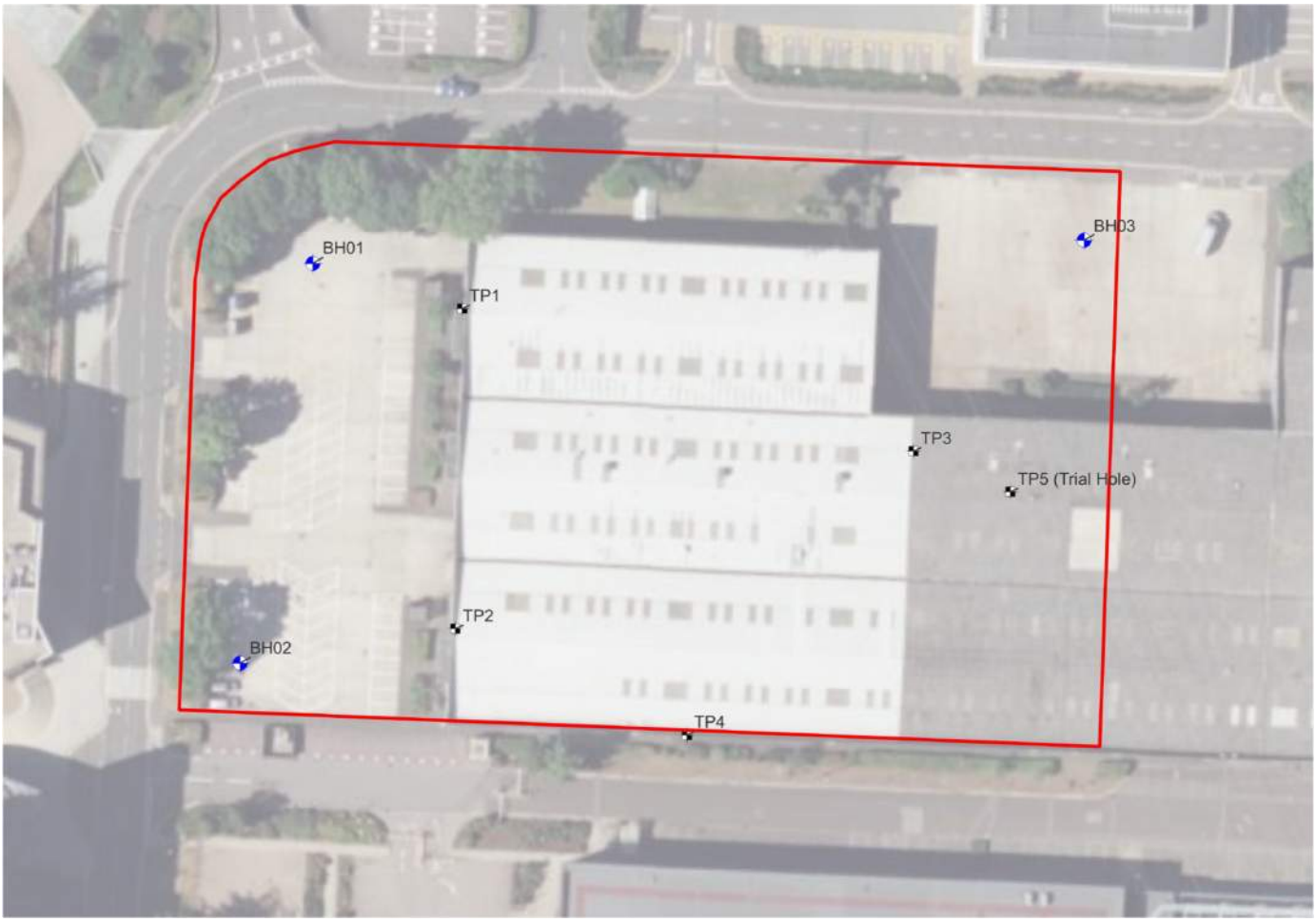

Figure 2.3 - Location of Delta Simons boreholes

The following summary of ground conditions encountered during the site investigation was extracted from the Delta Simons Geo-Environmental Assessment report.

Strata	**Strata Description**	**Depth Range of Strata Top m bgl (m AOD)**	**Depth Range of Strata Base m bgl (m AOD)**	**Thickness Range (m)**
Hard standing	Concrete or asphalt	*Ground Level (40.59 – 36.01)*	*0.10 – 0.30 (40.34 – 35.81)*	*0.10 – 0.30*
Made Ground	This was then underlain by gravelly SAND.	*0.20 – 0.30 (38.83 – 35.81)*	*1.60 – 1.70 (37.83 – 35.01)*	*1.40 – 1.60*
Kempton Park Gravel Member	Brown very sandy slightly silty angular to subrounded, fine to coarse flint GRAVEL with a low cobble content.	*1.20 – 1.80 (37.83 – 36.91)*	*2.30 – 2.80 (36.51 – 36.01)*	*0.60 – 1.60*
London Clay	Stiff grey CLAY.	*2.30 – 2.80 (36.51 – 36.01)*	*Not Proven*	*Not Proven*

The site is underlain by hardstanding, typically concrete with macadam over the top and was encountered to depths of up to 0.3m bgl with variable Made Ground deposits consisting of gravelly sands beneath. This was overlying the Kempton Park Gravel Member which was of limited thickness overlying the London Clay Formation to a proven depth of 15m bgl.

2.6 Hydrogeology

The following hydrogeological information was obtained from the online Magic Maps service.

- Aquifer destination (Bedrock) – Unproductive
- Aquifer Designation Map (Superficial Drift) – Secondary A
- Groundwater Vulnerability – Medium Low

BSG borehole log SU77SE298 (dated 2008) to the west of the site recorded a groundwater level of 4.65 m below a cover ground level.

The following summary of onsite groundwater monitoring carried out by Delta Simons was extracted from the Delta Simons Geo-Environmental Assessment report.

> *Groundwater levels during monitoring varied between 2.16m and 2.26m bgl (36.55 to 36.77m AOD) within the Kempton Park Gravel Member and generally groundwater falls towards the south west.*

Groundwater provides a third of the drinking water in England and Wales and maintains the flow in many of our rivers. In some areas of Southern England, groundwater supplies up to 80% of the drinking water, therefore it is crucial that these sources are looked after thus ensuring that the water is completely safe to drink.

The Environment Agency has identified Source Protection Zones (SPZs) for 2000 groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. The maps show three main zones (inner, outer and total catchment) and a fourth zone of special interest, which is occasionally applied to a groundwater source.

According to Environment Agency data, the site is not located in a groundwater Source Protection Zone (SPZ).

2.7 Existing Drainage

Thames Water asset record reference ALS Standard/2023_4882231 indicates separate foul and surface water trunk sewers running in Eskdale Rd generally parallel to the northern and western site boundary. The surface water sewer run connects to manhole 3650 before heading north away from the site. The foul sewer runs east to west adjacent to the northern boundary before continuing south adjacent to the western boundary.

A schematic excerpt from the Thames Water asset record is reproduced in Figure 2.4.

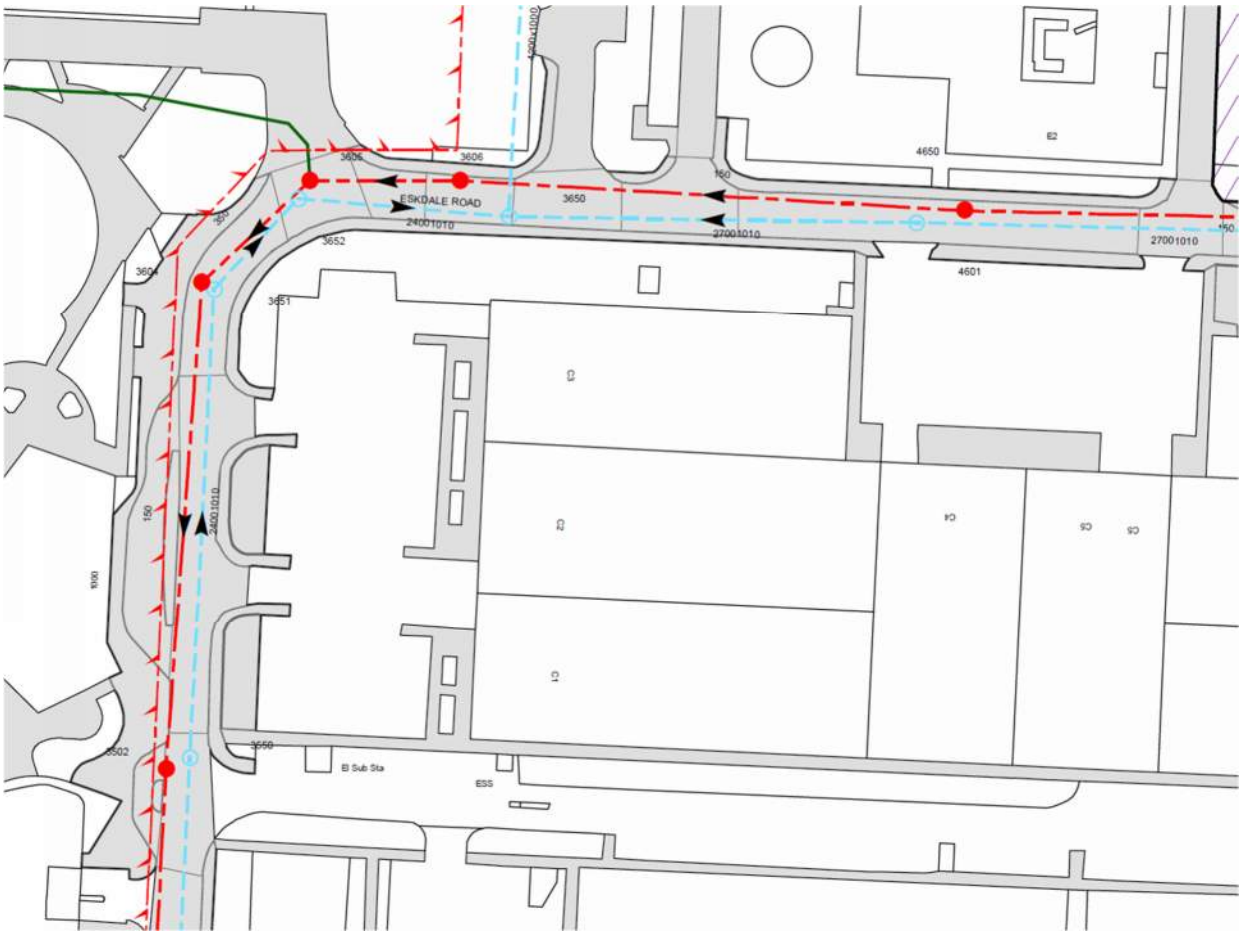

Figure 2.4 – Thames Water asset record extract ref: ALS Standard/2023_4882231

The utilities records shown on the Midland Survey Ltd drawing (reference 33009/R8 2 dated November 2019) shows an extensive network of surface water gullies surrounding the site buildings and a 525Ø connection leaving the site in the north which is assumed to connect to the public sewer in Eskdale Rd.

3 Flood Risk

The flood risk elements that need to be considered for any site are defined in BS 8533- 'Assessing and managing flood risk in development Code of practice' (October 2011) as the "Forms of Flooding" which are listed as:

- Flooding from rivers (fluvial flood risk)
- Flooding from the sea (tidal flood risk)
- Flooding from the land/surface water (pluvial flood risk)
- Flooding from groundwater
- Flooding from sewers (sewer and drain exceedance, pumping station failure etc)
- Flooding from reservoirs, canals and other artificial structures

The following section reviews each of these in respect of the subject site.

3.1 Fluvial & Tidal Flood Risk

Fluvial sources include rivers, streams, and ditches. Fluvial flooding occurs when a river cannot cope with the amount of water draining into it from the surrounding land.

Tidal flooding happens when there are high tides and stormy conditions.

3.1.1 EA Flood Map for Planning

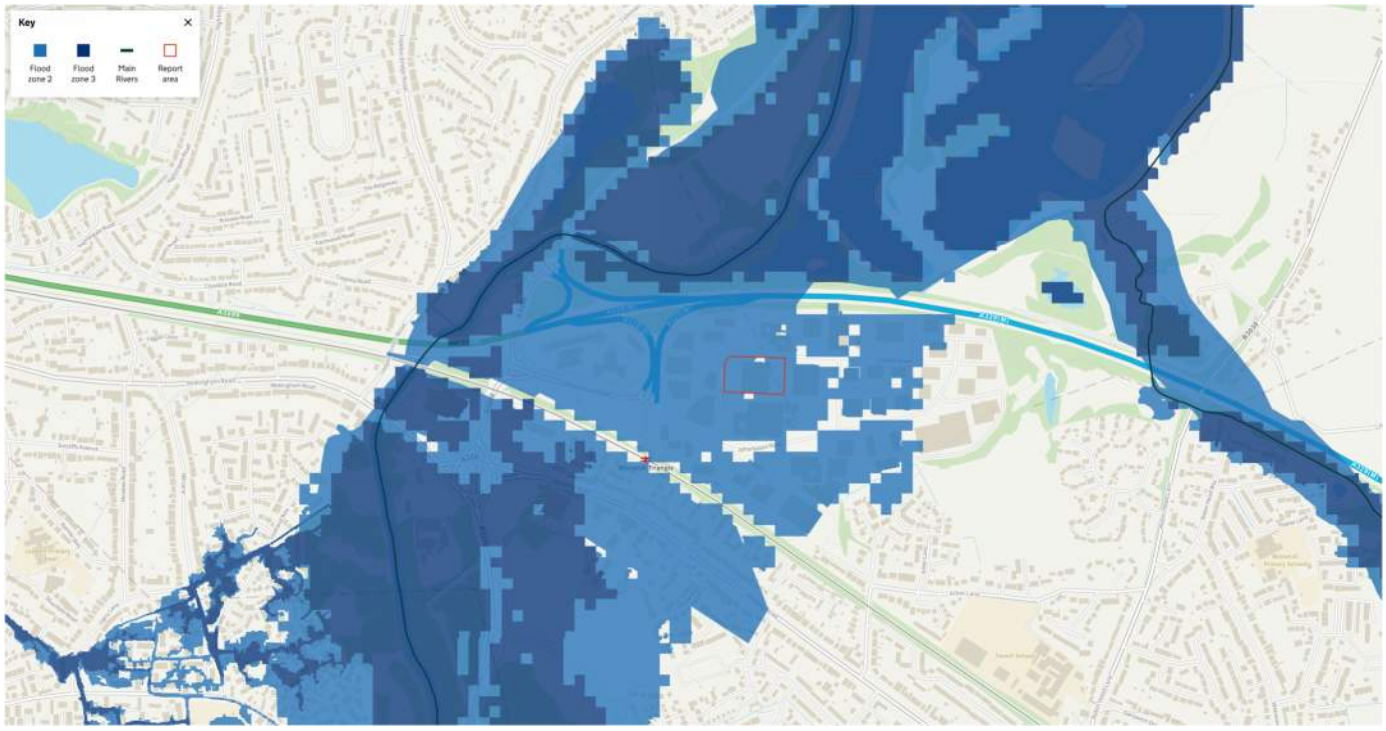

Figure 3.1 – EA Flood Zones 2 & 3

The development boundary for the site sits partially within flood zone 1 and flood zone 2 as identified on the EA flood zone mapping showing areas at risk of flooding from rivers or sea.

Areas deemed to be in flood zone 1 have been shown to be at less than 0.1% chance of flooding in any year, this is sometimes known as having a 1:1000-year chance. Areas deemed to be in flood zone 2 have been shown to have between 0.1% – 1% chance of flooding from rivers in any year (between 1:1000 and 1:100 chance) or between 0.1% – 0.5% chance of flooding from the sea in any year (between 1:1000 and 1:200 chance).

The extents of the current flood zones across the site are tabulated below.

Flood Zone	1	2	3a	3b	Total
Extent (ha)	0.1448	1.0572	0	0	1.2020
Coverage (%)	12.0	88.0	0	0	

The flood zone 2 areas are associated to River Loddon adjacent to the site for the 1:1000yr event only. Refer to the following maps.

3.1.2 EA Data - Rivers and Sea with Defences – Rivers and Sea 1:30yr

The site is not shown to be affected by fluvial or tidal flooding for the 1:30yr return period when any flood defences are taken into account

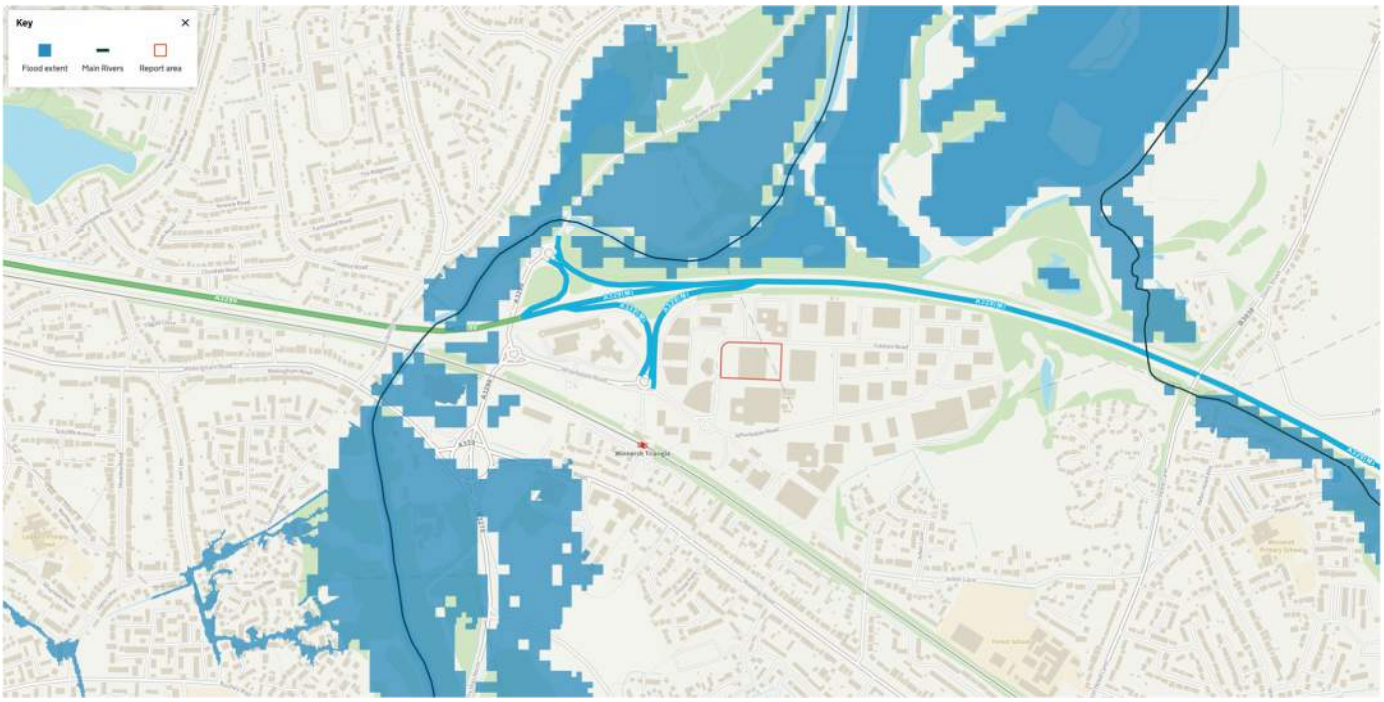

Figure 3.2 – EA Flood Zones Rivers and Sea with Defences - 1:30yr

3.1.3 EA Data - Rivers and Sea with Defences – Rivers 1:00yr and Sea 1:200yr

The site is not shown to be affected by fluvial or tidal flooding for the 1:100yr rivers and 1:200yr sea return period when any flood defences are taken into account

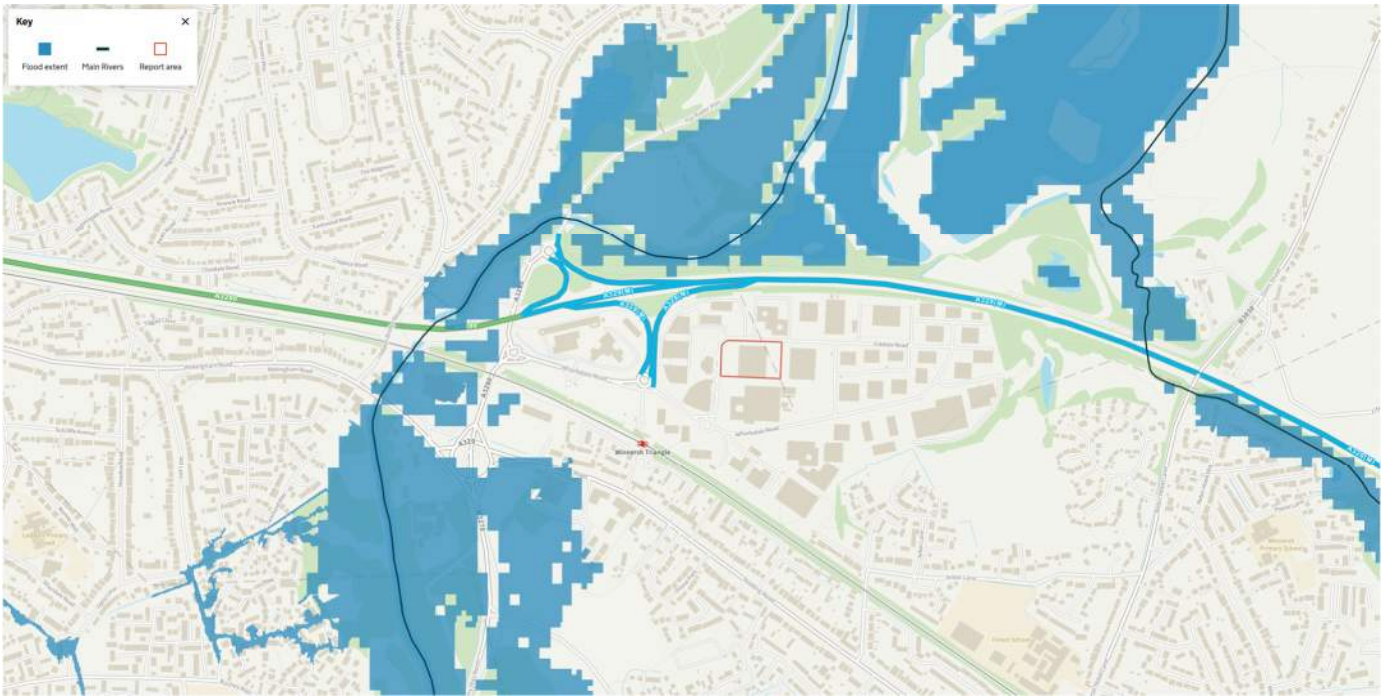

Figure 3.3 – EA Flood Zones Rivers and Sea with Defences - Rivers 1:00yr and Sea 1:200yr

3.1.4 EA Data - Rivers and Sea with Defences – Rivers and Sea 1:1000yr

The site is shown to be affected by fluvial or tidal flooding for the 1:1000yr return period when any flood defences are taken into account. The majority of the site is shown to be in Flood Zone 2

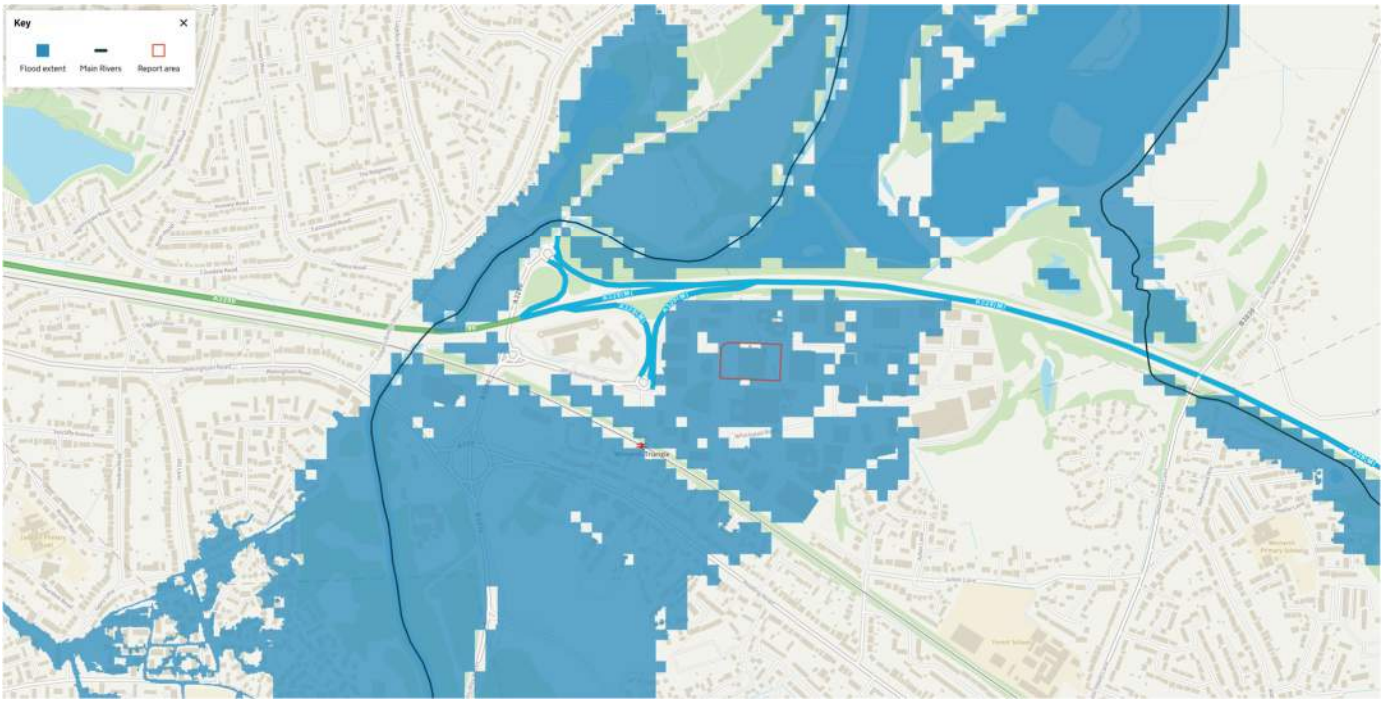

Figure 3.4 – EA Flood Zones Rivers and Sea with Defences - 1:1000yr

3.1.5 EA Data - Rivers and Sea with Defences – Rivers and Sea 1:30yr with Climate Change

The site is not shown to be affected by fluvial or tidal flooding for the 1:30yr with climate change return period when any flood defences are taken into account

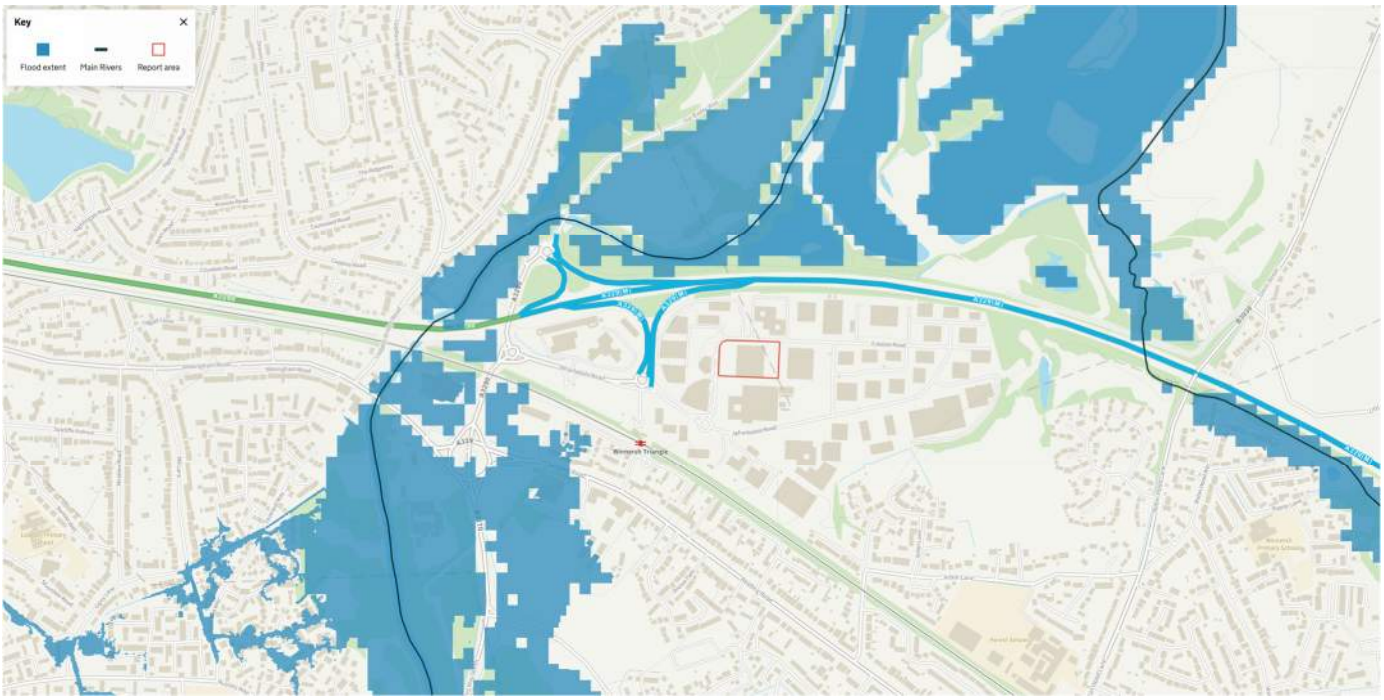

Figure 3.5 – EA Flood Zones Rivers and Sea with Defences - 1:30yr with Climate Change

3.1.6 EA Data - Rivers and Sea with Defences – Rivers 1:00yr and Sea 1:200yr with Climate Change

The site is not shown to be affected by fluvial or tidal flooding for the 1:100yr rivers and 1:200yr sea with climate change return period when any flood defences are taken into account

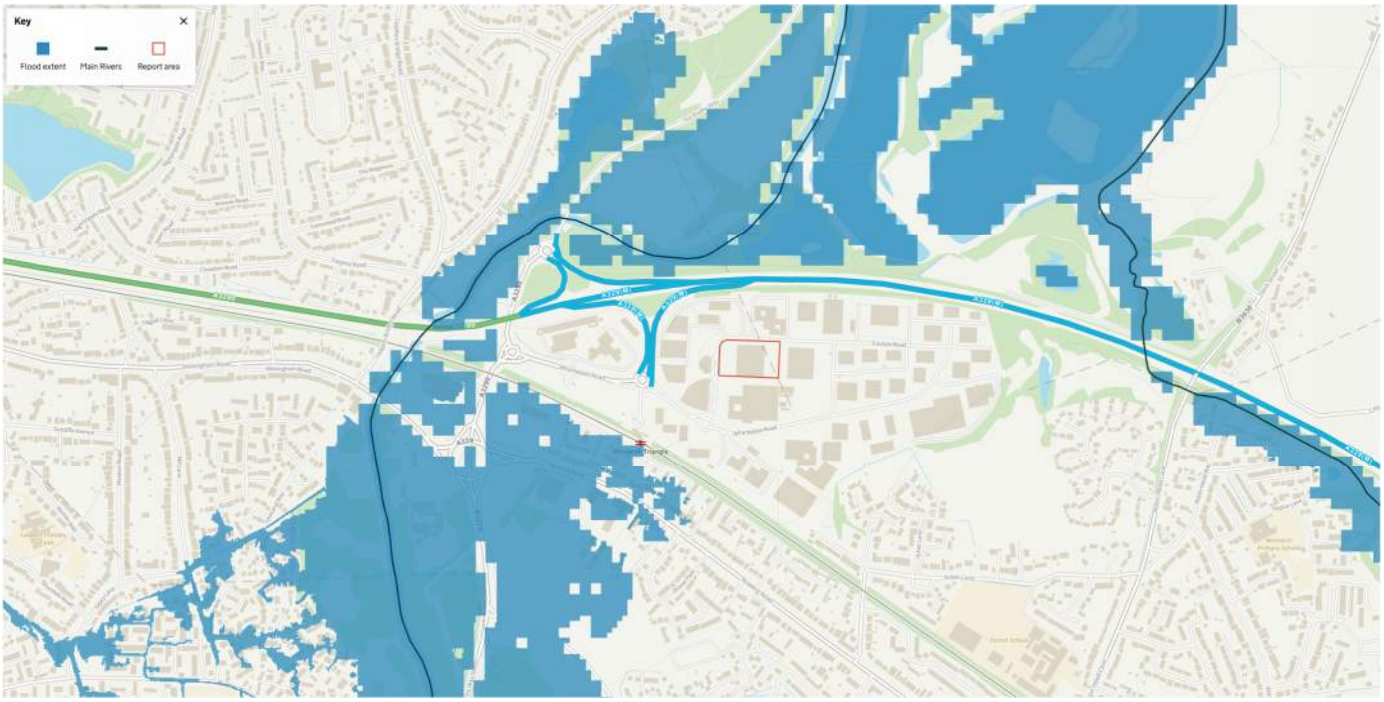

Figure 3.6 – EA Flood Zones Rivers and Sea with Defences - Rivers 1:00yr and Sea 1:200yr with Climate Change

3.1.7 EA Data - Rivers and Sea with Defences – Rivers and Sea 1:1000yr with Climate Change

The site is shown to be affected by fluvial or tidal flooding for the 1:1000yr with climate change return period when any flood defences are taken into account. The majority of the site is shown to be in Flood Zone 2

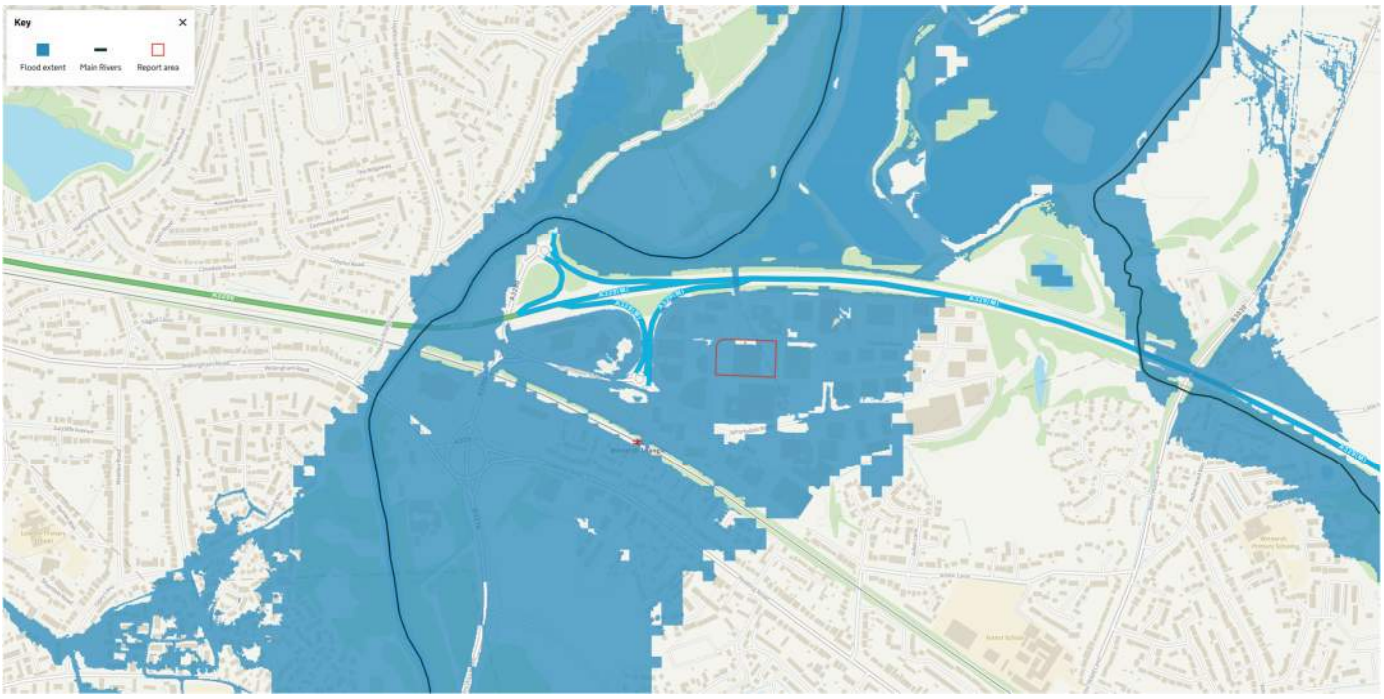

Figure 3.7 – EA Flood Zones Rivers and Sea with Defences - 1:1000yr with Climate Change

3.1.8 EA Data - Rivers and Sea without Defences – Rivers 1:00yr and Sea 1:200yr

The site is not shown to be affected by fluvial or tidal flooding for the 1:100yr rivers and 1:200yr sea return period without flood defences.

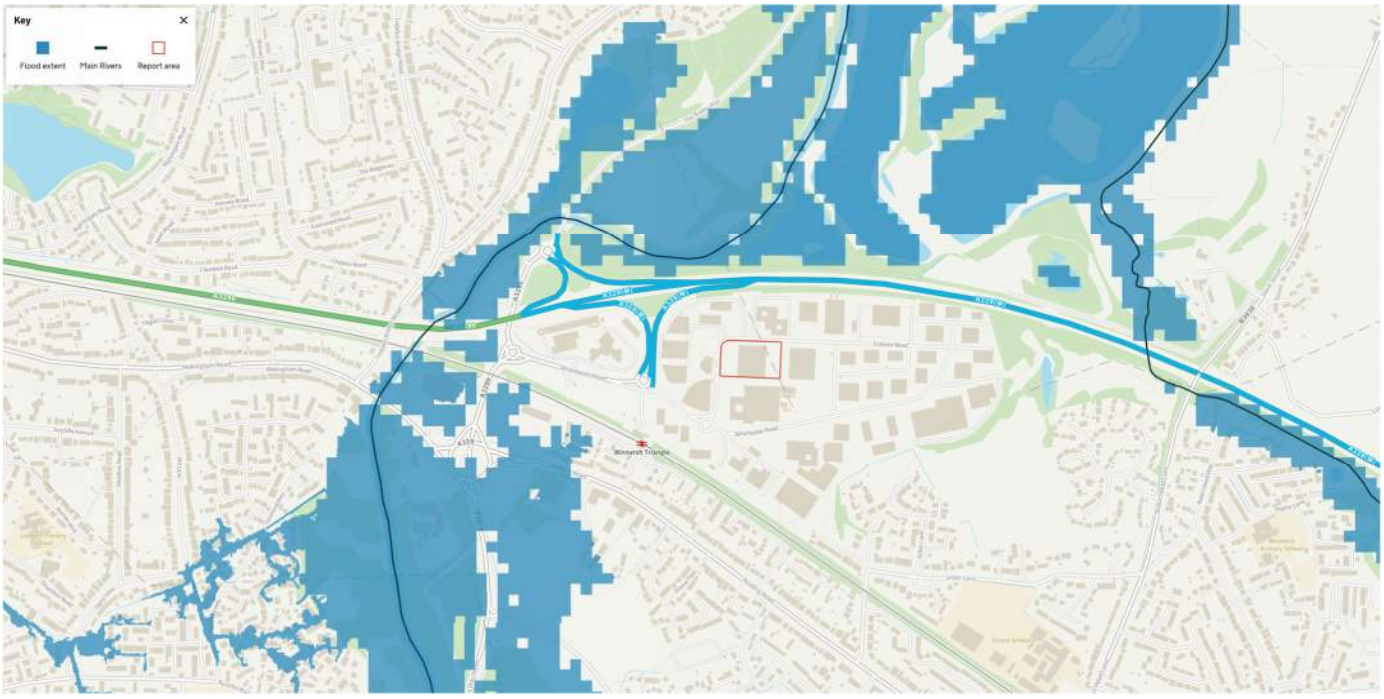

Figure 3.8 – EA Flood Zones Rivers and Sea with no Defences - Rivers 1:00yr and Sea 1:200yr

3.1.9 EA Data - Rivers and Sea without Defences – Rivers and Sea 1:1000yr

The site is shown to be affected by fluvial or tidal flooding for the 1:1000yr return period without flood defences. The majority of the site is shown to be in Flood Zone 2

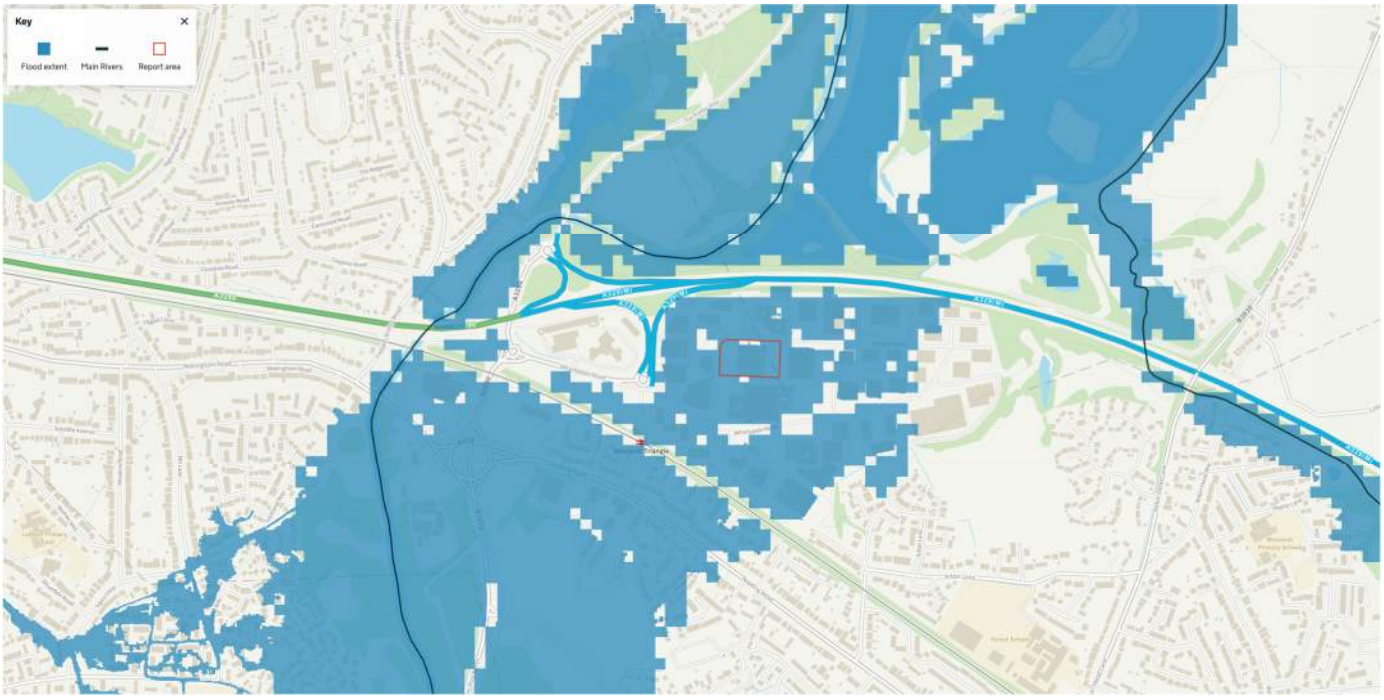

Figure 3.9 – EA Flood Zones Rivers and Sea with no Defences - 1:1000yr

3.1.10 EA Data - Rivers and Sea without Defences – Rivers 1:00yr and Sea 1:200yr with Climate Change

The site is not shown to be affected by fluvial or tidal flooding for the 1:100yr rivers and 1:200yr sea return period with climate change without flood defences.

Figure 3.10 – EA Flood Zones Rivers and Sea without Defences - Rivers 1:00yr and Sea 1:200yr with Climate Change

3.1.11 EA Data - Rivers and Sea without Defences – Rivers and Sea 1:1000yr with Climate Change

The site is shown to be affected by fluvial or tidal flooding for the 1:1000yr with climate change return period without flood defences. The majority of the site is shown to be in Flood Zone 2

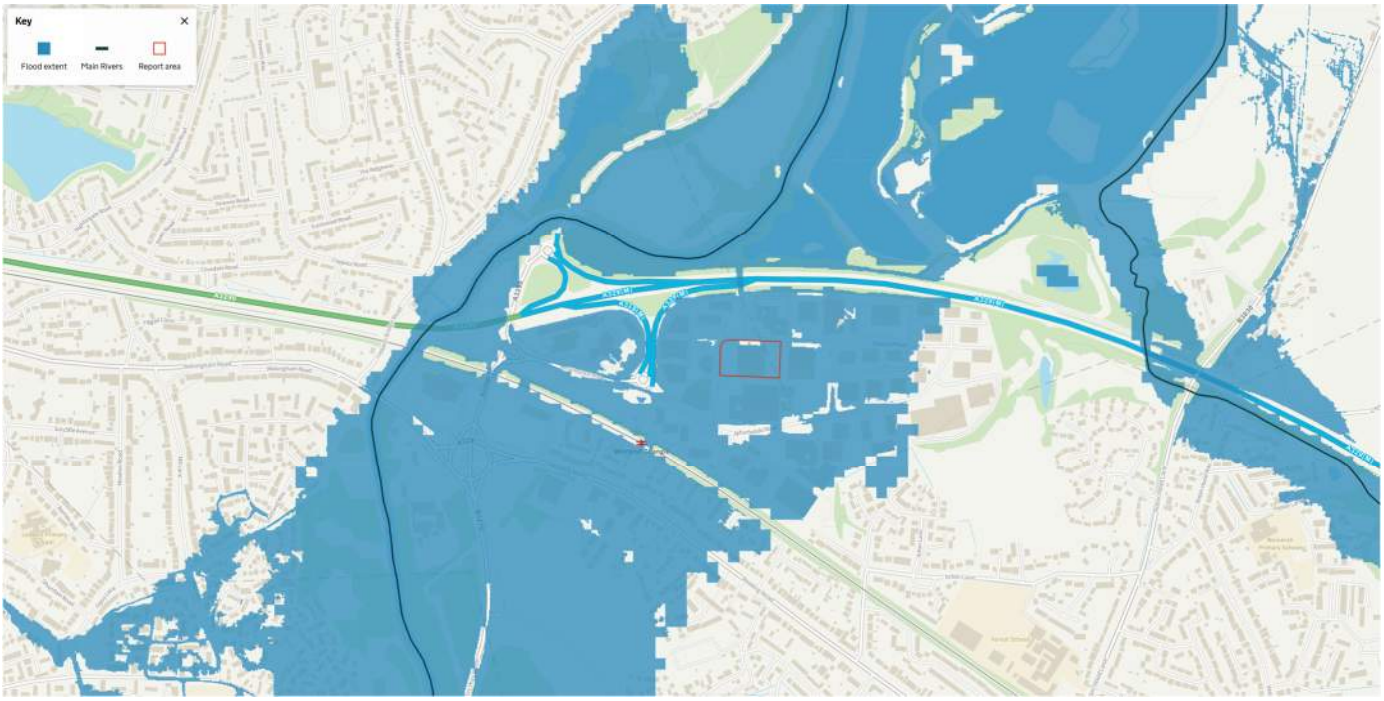

Figure 3.11 – EA Flood Zones Rivers and Sea with Defences - 1:1000yr with Climate Change

3.1.12 EA Product 4 Data

The Environment Agency Product 4 information shows modelled in-channel flood flows and levels taken from the Lower Loddon Detailed Flood Risk Mapping study which was completed in January 2009. The Model accuracy is levels +/- 250mm

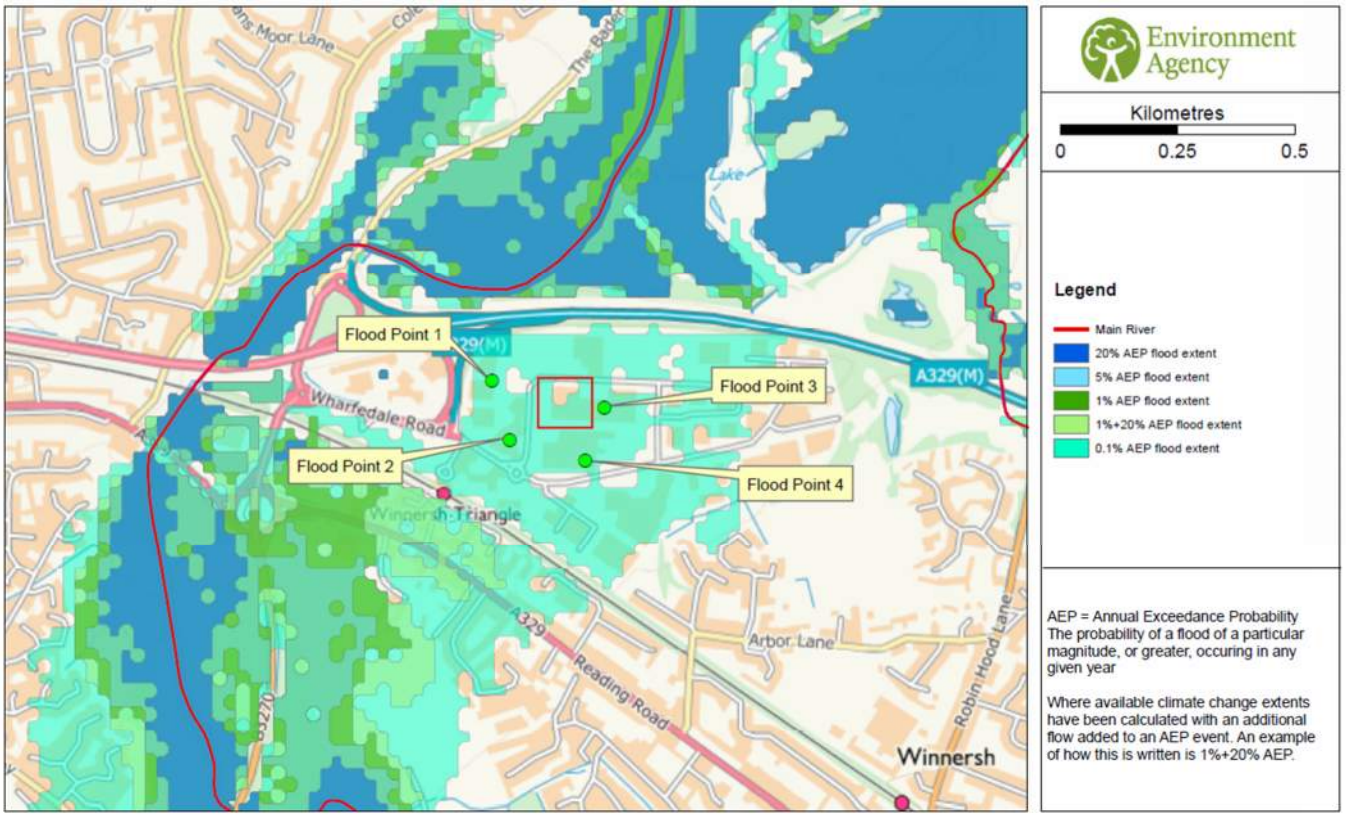

Figure 3.12 – EA Product 4 Map.

3.1.13 Fluvial Flood Levels

The Environment Agency Product 4 information shows modelled in-channel flood flows and levels as tabulated below;

Node ID	Easting	Northing	MODELLED Flood Level for Annual Exceedance Probability Shown in MAOD				
			20% AEP	5% AEP	1% AEP	1%AEP Plus Climate Change	0.1% AEP
Point 1	477265	171663	No Data	No Data	No Data	No Data	39.030
Point 2	477308	171548	No Data	No Data	No Data	No Data	39.140
Point 3	**477504**	**171611**	**No Data**	**No Data**	**No Data**	**No Data**	**39.000**
Point 4	477464	171496	No Data	No Data	No Data	No Data	39.070

3.1.14 Fluvial and Tidal Flood Risk Summary

The yearly chance of rivers and sea flooding is currently Low, staying at Low between 2036 to 2069. Low flood risk means Between 0.1% and 1% chance of a flood each year.

At this location there's:

- Low chance of flooding to 20cm. Between 2036 and 2069 this stays at a Low chance of flooding to 20cm
- Very low chance of flooding to 30cm Between 2036 and 2069 this increases to a Low chance of flooding to 30cm
- Very low chance of flooding to 60cm Between 2036 and 2069 this stays at a Very low chance of flooding to 60cm

3.2 Pluvial Flood Risk

Surface water flood risk to the site has been assessed using EA mapping. The maps were produced using 'direct rainfall' modelling. Although they consider local drainage capacity, non-surface water influences such as rivers, seas or groundwater are not considered.

Surface water flooding happens 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.

3.2.1 EA Data – Surface Water – 30yr

The site is not shown to be affected by surface water flooding for the 1:30yr return period.

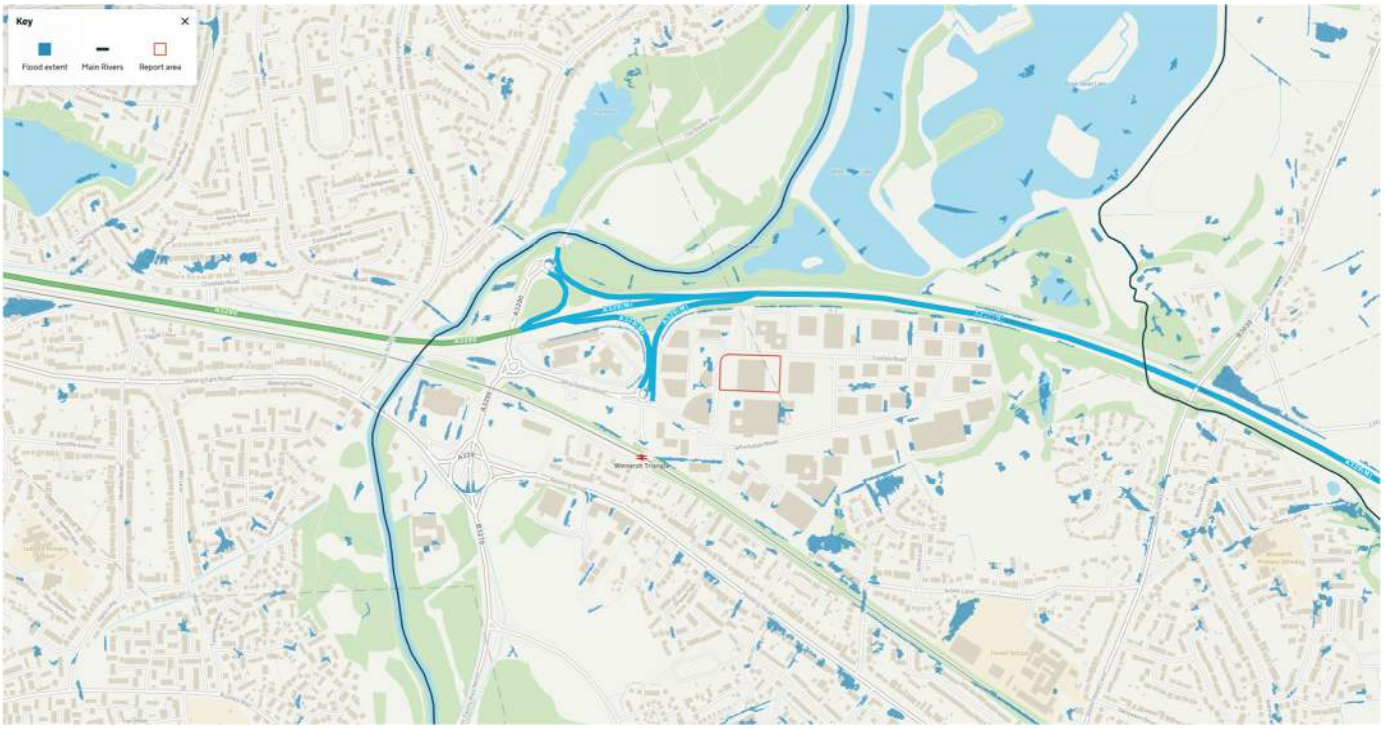

Figure 3.13 – EA Surface Water Flooding - 1:30yr

3.2.2 EA Data – Surface Water – 100yr

A small amount of surface water flooding is shown on the site. The flooding shown on the site is likely to be the result of rainfall filling localised depressions in the hydraulic model used to develop the extents rather than distinct flow paths.

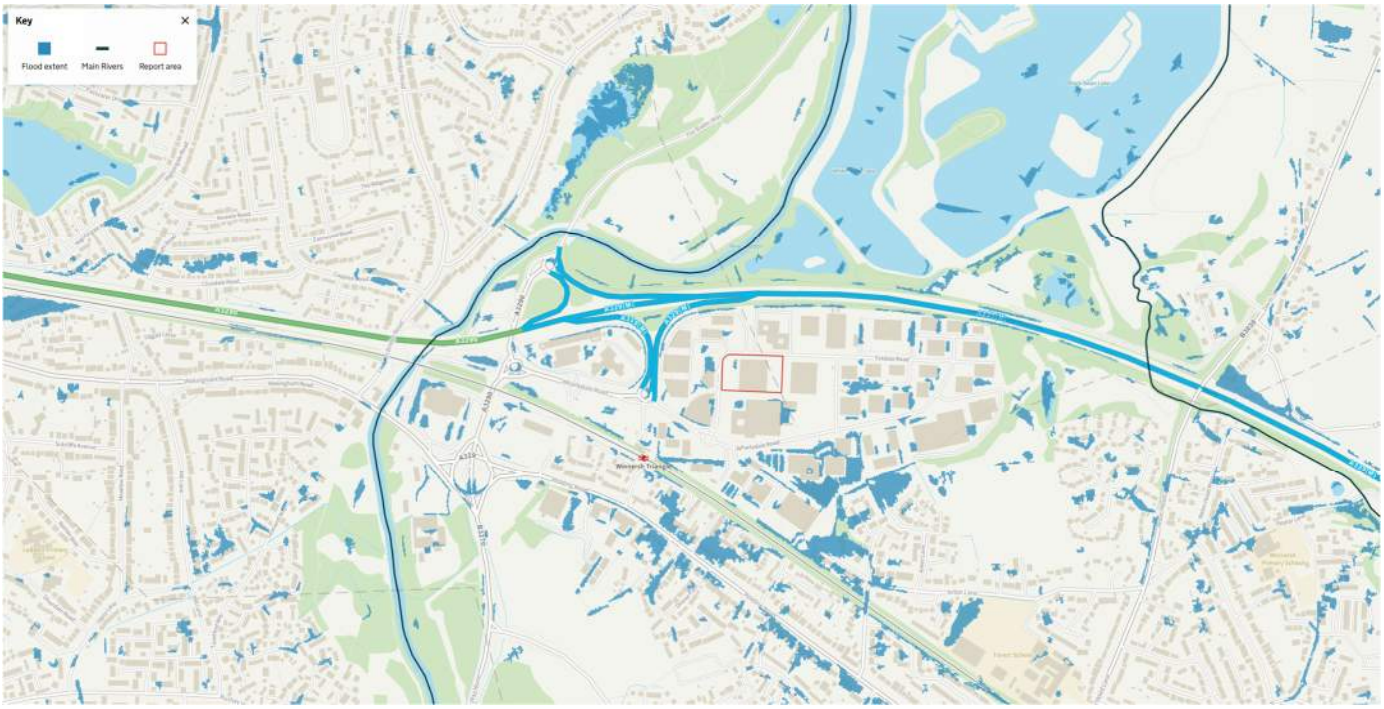

Figure 3.14 – EA Surface Water Flooding - 1:100yr

3.2.3 EA Data – Surface Water – 1000yr

The surface water flooding shown to the west of the site is attributed to the site to the south which is shown to be covered by surface water for the 1:1000yr event. This overtops the boundary levels at this point and follows the topography of the existing site. The other areas of surface water flooding shown is likely to be the result of rainfall filling localised depressions in the hydraulic model used to develop the extents rather than distinct flow paths.

Figure 3.15 – EA Surface Water Flooding - 1:1000yr

3.2.4 Defra Risk of Surface Water Flooding (RoFSW)

Reference to the Defra Risk of Surface Water Flooding (RoFSW) data contained in tile SP71.

Event AEP	3.33% (1:30)	1% (1:100)	0.1% (1:1000)
Extent (ha)	0.000	0.000	0.1824
Coverage (%)	0.0	0.0	15.2

According to the Defra data, the site is affected by 1:100yr events based on the information taken from the RoFSW.

3.2.5 Surface Water Flood Risk Summary

The yearly chance of surface water flooding is currently Very Low, increasing to Low between 2040 to 2060. Very Low flood risk means less than 0.1% chance of a flood each year. Low flood risk means between 0.1% and 1% chance of a flood each year.

At this location there's a

- Very Low chance of flooding to 20cm. Between 2040 and 2060 this increases to a Low chance of flooding to 20cm
- Very low chance of flooding to 60cm Between 2040 and 2060 this stays at a Very low chance of flooding to 30cm
- Very low chance of flooding to 60cm Between 2040 and 2060 this stays at a Very low chance of flooding to 60cm

3.3 Groundwater Flood Risk

The SFRA for Wokingham Borough Council shows 17 historical cases of groundwater flooding across the borough. Of those 17, two are shown within the Winnersh area. The closest to the site is approximately 1.55km to the south east and is reported to be un-natural groundwater flooding likely caused by a pipe. In addition to historical incidents, which are typically sparse, the risk of groundwater flooding can be estimated by consideration of the underlying ground characteristics. The BGS's online geology map shows that the bedrock is London Clay (clay, silt and sand). This is overlain by a stratum of River Terrace Deposits (sand and gravel).

Groundwater flooding can occur when groundwater rises up from the underlying aquifer to flood subsurface infrastructure or to emerge at the ground surface. This is generally caused by the rise of groundwater levels to extreme high levels in permeable consolidated aquifers (primarily chalk) in response to prolonged above average rainfall, - or from hydraulic continuity with high water levels in adjacent rivers. Given the widespread Clay with overlying sand/gravels, this site may be at risk of flooding from this source.

High groundwater levels are most likely to be a problem for substructure construction, basements and for infiltration SuDS.

The Geo-Environmental Assessment undertaken by Delta Simons reported that groundwater was encountered during drilling at depths between 2.0 and 2.5m bgl. Subsequent monitoring works recorded the groundwater at depths between 2.16m and 2.26m bgl. Groundwater monitoring is still on going and these levels may change.

Significant groundwater would not be anticipated during the excavations required as part of the proposed development. Should any perched groundwater be encountered, then local dewatering via sump and pump should be suitable. If deeper excavations (<2m) are required, then groundwater control measures may be required.

The proposed development does not include a new basement level, therefore this small risk can be discounted.

The EA reports that flooding from groundwater is unlikely in this area.

Based on the evidence available at the time of assessment, the risk of groundwater flooding to the site is considered to be low.

3.4 Sewer/Drainage Flood Risk

Sewer flooding is often caused by excess surface water entering the drainage network. Water companies, in this case Thames Water, are obliged under the Water Industry Act to facilitate drainage of surface water up to a 1 in 20-year return period event.

Table 5.3 in section 5.6 of the SFRA Map 11 shows where these occurrences are. The postcode RG41 5 shows the following incidents of sewer flooding:

- Number of Incidents Recorded in 2022 0
- Number of Incidents Recorded in 2021 7
- Number of Incidents Recorded in 2020 7
- Number of Incidents Recorded in 2019 4
- Number of Incidents Recorded in 2000 -2019 205

The RG41 5 postcode given covers a very large area.

Figure 3.16 – Postcode Area

Given the number of incidents reported over the years, the chances that these affect the site are Low

Thames Water is the statutory undertaker for the local public sewer network. The Thames Water asset records do not indicate any foul or surface water sewers to cross the site boundary. However, an extensive network of onsite surface water drains are indicated from the topographic survey and privately maintained foul water sewers are expected to exist onsite.

Based on the above, the risk of sewer flooding to the site is considered to be low.

3.5 Reservoirs/Canal Flood Risk

The SFRA states within the Wokingham Borough, there are 7 designated reservoirs. These are all over 25,000m^3. The two closest are listed below:

Event AEP	Distance from Site	Heading
South Lake	1.77km	NW
Black Swan Lake	**0.81km**	**NE**

Although Black Swan Lake is situated less than a km to the north east of the site, reference to the EA Reservoir Flood Map data for Black Swan Lake shows that the site is not situated in the maximum flood extent for the reservoir should failure occur. The remaining reservoirs in the borough are too far away from the site to affect the development in the event of failure.

The EA has produced a Reservoir Flood Map that shows that the site is not at risk from reservoir flooding but when there is also flooding from rivers the site is shown to be affected.

.

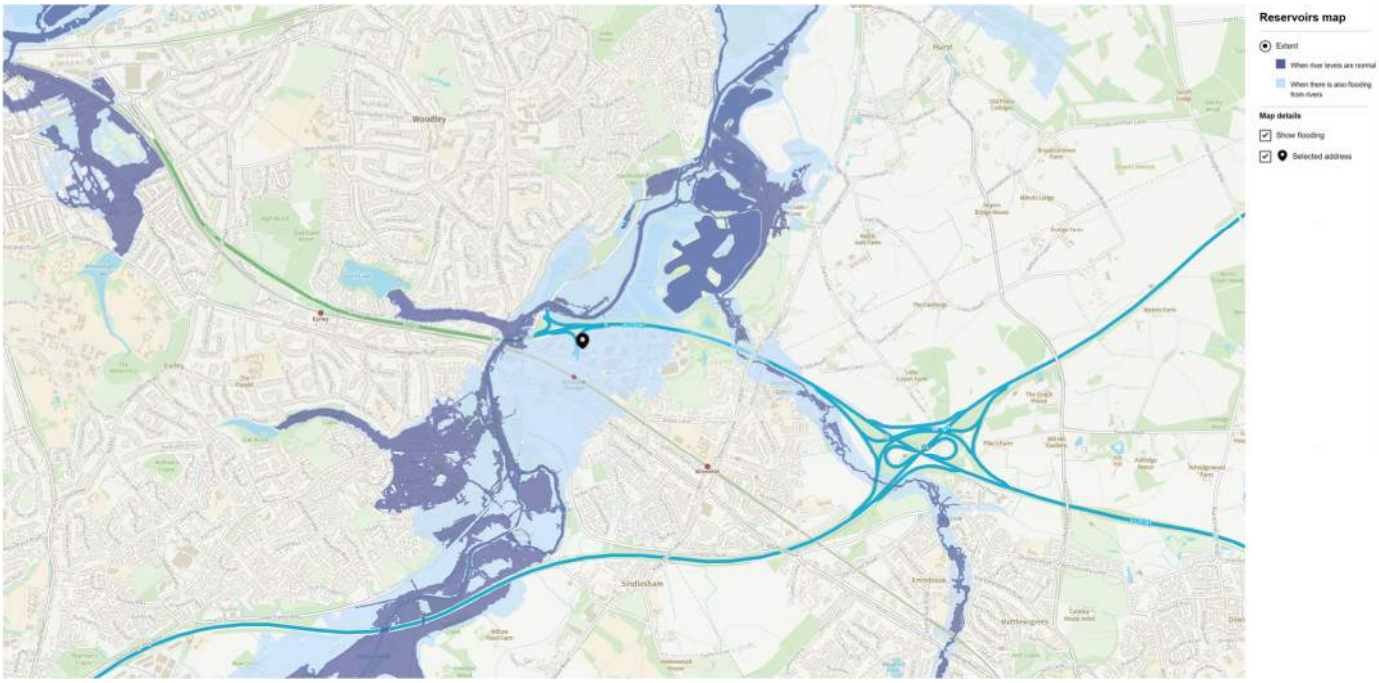

Figure 3.17 – EA reservoir flood risk map

It should also be emphasised that the risk of flooding from reservoir breach is very small since the EA is the enforcement authority for the Reservoirs Act (1975) and all large raised reservoirs are inspected and supervised by reservoir panel engineers.

On this basis, the risk from reservoir flooding to the site is considered to be low.

3.6 Land Drainage

There is no known land drainage on the sites.

3.7 Hydraulic Structures

No hydraulic structures are present on-site.

3.8 Summary of Flood Risk

The following table provides a summary of flood risk for the site:

Table 3.1 – Summary of sources of flood risk

Source of Flooding	Risk Level	Source of Data	Comments, Mitigation Requirements
Fluvial and Tidal	Low	EA mapping	The yearly chance of rivers and sea flooding Low staying at Low between 2036 to 2069. Low flood risk means Between 0.1% and 1% chance of a flood each year.
Surface water (Pluvial)	Low	EA mapping	The yearly chance of surface water flooding Very low increasing to Low between 2040 to 2060. Very Low flood risk means less than 0.1% chance of a flood each year. Low flood risk means between 0.1% and 1% chance of a flood each year.
Groundwater	Low	BGS mapping, Delta Simons Geo-Environmental Assessment and LLFA information	The closest reported groundwater flooding to the site is approximately 1.55km to the south east and is reported to be un-naturel groundwater flooding likely caused by a pipe. The EA reports that flooding from groundwater is unlikely in this area.
Sewers	Low	Thames Water and LLFA information	The RG41 5 postcode given covers a very large area. Given the number of incidents reported over the years, the chances that these affect the site are Low.
Reservoirs, Canals	Negligible	EA mapping	Site not affected.

Key	Description
	Low/Negligible Risk – No noticeable impact to site and not considered to be a constraint to development.
	Medium Risk – Issue requires consideration but not a significant constraint to development
	High Risk – Major constraint to development requiring active consideration in mitigation proposals

4 Flood Risk Mitigation

Appropriate flood mitigation measures are to be considered when developing the design for the site.

4.1 Climate Change Allowances

Appropriate climate change allowances should be applied when developing the surface water drainage design. In line with the latest government guidance, the surface water drainage design must be able to cater with a rainfall event up to and including the 1 in 100 year + 40% allowance for climate change at this location.

4.2 Overland Flow

EA mapping does not identify any overland flows through the site. However, the surface water flood mapping indicated a limited strip of low-risk surface water flooding extending close to the line of the western boundary, which from assessment of the topographic survey, appears to migrate north before finding a route westward towards the neighbouring Business Park. The proposed development should consider mitigation options such as landscaping and levels design to direct any excess surface water towards drainage features.

SuDS measures should be provided on-site to control and store the surface water as a part of the surface water design for the development, as required. Surface flows may be generated on-site due to drainage capacity exceedance, which can be conveyed into the SuDS features via surface flows along the hard standing areas.

4.3 Finished Floor Levels

As this site is unlikely to be affected by fluvial flooding there is no need to incorporate any freeboard levels into the finished floor levels of the design. If practicable, it would be beneficial to raise ground floor levels at least 150 mm above surrounding land to protect against ingress of ponded surface water or groundwater. However, consideration should be given to the access requirements and tie in levels when assessing proposed finished floor levels.

4.4 Flood Compensation

Planning policy requires that new developments cannot cause detrimental flooding impacts to areas upstream or downstream of a site.

Developments within a surface water floodplain may remove areas where floodwater is stored during a flood and can displace floodwaters. There is thus the potential that flood levels surrounding the site could be increased without careful design consideration.

To ensure there is not a detrimental surface water flood risk impact to neighbouring areas, any development resulting in a loss of floodplain storage may be required to provide compensatory storage to negate these potential impacts.

The amount of compensation required is dependent on

a) the footprint of any development within the floodplain, and

b) the potential depth of flooding in these areas.

Together these factors indicate the potential volume of floodwater that could be displaced by development.

An assessment of surface water flood storage compensation will need to be completed once external levels and building levels have been worked up. If compensatory storage is required a direct or 'level for level' compensation will be promoted where the levels are lowered to ensure that the same volume of flood storage is available at all levels of flooding and existing flood flow routes are protected to maintain ingress and egress of the surface water.

The site is shown to be outside the 1 in 100-year climate change floodplain, so floodplain compensatory measures are not deemed necessary.

4.5 Safe Access/Egress

Flood Zone 1 refers to land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1 %) i.e. lowest risk level. As the site lies outside of the 1 in 1,000-year flood extent, safe access and egress will be available up to this extreme storm event.

5 Planning Context

5.1 Land Use Vulnerability

Table 2 of the National Planning Policy Guidance on Flood Risk and Coastal Change, indicates the compatibility of various land uses in each flood zone, dependent on their vulnerability to flooding. Figure 5.1 below is reproduced from the information available at the government website.

Flood Risk Vulnerability Classification	**Essential Infrastructure**	**Water Compatible**	**Highly Vulnerable**	**More Vulnerable**	**Less Vulnerable**
Zone 1	Development is Appropriate	Development is Appropriate	Development is Appropriate	Development is Appropriate	Development is Appropriate
Zone 2	Development is Appropriate	Development is Appropriate	Exception Test Required	Development is Appropriate	Development is Appropriate
Zone 3a	Exception Test Required	Development is Appropriate	Development Not Permitted	Exception Test Required	Development is Appropriate
Zone 3b	Exception Test Required	Development is Appropriate	Development Not Permitted	Development Not Permitted	Development Not Permitted

Figure 5.1 – Table 2 of National Planning Policy Guidance on Flood Risk and Coastal Change

Annex 3 of the PPG classifies buildings used for 'professional and other services', 'offices', 'general industry' and 'storage and distribution' as 'Less vulnerable'. Hence the intended use is appropriate for a site located in Flood Zone 1/2.

5.2 Sequential Test

The Sequential Test aims to direct new development to areas with the lowest probability of flooding.

Sequential Test	**Response**
Site	Building 810, Winnersh Triangle- Business Park, Eskdale Rd, Winnersh Triangle, Reading RG41 5TS
Allocation	Commercial/Business
Flood Zone	Zone 1 & Zone 2
Reasonable alternative site available in same or lower flood zone?	No. There are no reasonable alternatives located within the area.

Overall, given that the site is not at a significant risk of flooding and is therefore already in a sequentially preferable location, the site is considered to pass the Sequential Test.

5.3 Exception Test

In accordance with Table 3 of PPG, there is no requirement to apply the Exception Test for a 'Less vulnerable' development within Flood Zone 1/2.

6 Conclusion

This FRA has been undertaken for the proposed development located at Building 810, Winnersh Triangle Business Park, Eskdale Rd, Winnersh Triangle, Reading RG41 5TS. The site covers approximately 1.202ha. The proposed development comprises the demolition of existing buildings and erection of a replacement building for flexible use within use classes E(g), B2 and/or B8, together with access, parking, landscaping and associated works.

This FRA complies with the NPPF and Planning Practice Guidance and demonstrates that flood risk from all sources has been considered in relation to the proposed development. It is also consistent with the Local Planning Authority requirements with regards to flood risk.

The proposed development site lies in an area designated by the EA as Flood Zone 2 only for the 1:1000yr event. A summary of the flood risk and any associated mitigation measures are summarised in Table 6.1.

Table 6.1 – Flood risk summary

Source of Flooding	Risk Level	Mitigation
Fluvial	Low	N/A
Tidal	Low	N/A
Surface water (Pluvial)	Low	N/A
Groundwater	Low	N/A
Sewers	Low	N/A
Reservoirs, Canals	Negligible	N/A

The surface water drainage design for the site is to be developed in line with the LLFA requirements and applying appropriate mitigation factors.

Overall, taking into account the provided information, the development of the site should not be precluded on flood risk grounds.

- Attenuation and flow rate restriction should be considered for the proposed surface water drainage to achieve a significant reduction on the existing runoff rates.
- The proposals satisfy relevant national and local policy.
- There is no flooding shown for a 100-year event.
- The level of the 1000-year flood event is shown to be 39.000mAOD.
- The recently completed adjacent building has a FFL of 39.000mAOD
- Raising the floor level of the proposed building will raise the external levels which may affect the flood plain volume.
- It is recommended to retain the existing FFL at 39.000mAOD.

The Flood Risk Assessment demonstrates that the Proposed Development would be safe, without increasing flood risk elsewhere, and that a positive reduction in flood risk would be achieved through the inclusion of surface water attenuation in accordance with national policy.

EVOLVE

www.evolveuk.biz