



Flood Risk Assessment & SuDS Strategy

Project: 1 Ilbury Close, Shinfield, Wokingham, RG2 9DE

Reference: 261486

Prepared for: Cameron Jones Planning Ltd

11 August 2026



EXECUTIVE SUMMARY

This Flood Risk Assessment (FRA) has been prepared in accordance with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance. It has been produced on behalf of Cameron Jones Planning Ltd in support of a planning application for the construction of two three-bedroom semi-detached dwellings, granted permission in principle under application 261486, on land adjacent to the existing dwelling at 1 Ilbury Close, Shinfield, Wokingham, RG2 9DE.

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

The site is located within **Flood Zone 1**, as identified on the Environment Agency's Flood Map for Planning. It is also assessed against the following flood sources:

- River and sea (Fluvial) — **Low** risk
- Surface Water (Pluvial) — **Medium** risk
- Groundwater — **Low** risk
- Sewer Flooding — **Medium** risk
- Artificial Sources — **Low** risk

Flood risk at the site and surrounding sites is not considered to increase as a result of the development.

In line with the NPPF requirements, and subject to the mitigation measures outlined within this report, the proposed development is at an acceptable level of flood risk for its lifetime.



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INTRODUCTION

Background

The purpose of this Flood Risk Assessment (FRA) is to evaluate the flood risks associated with the proposed development at 1 Ilbury Close, Shinfield, Wokingham, RG2 9DE. The FRA seeks to ensure that future occupants of the development will remain safe throughout the lifetime of the development, that the proposals will not increase flood risk either on-site or elsewhere, and, where practicable, that opportunities to reduce overall flood risk are incorporated. This assessment addresses flood risk in accordance with the requirements set out in national and local planning policies, and includes recommendations for appropriate mitigation measures where necessary.

Site Proposals

The proposed development consists of the construction of two three-bedroom semi-detached dwellings, granted permission in principle under application 261486, on land adjacent to the existing dwelling. A copy of the proposed development plans is included within Appendix A.

National and Local Planning Policy

The National Planning Policy Framework (NPPF) outlines the Government's national approach to land use planning in England, specifically in relation to flood risk. It requires that flood risk be taken into account at all stages of the planning process. The accompanying Planning Practice Guidance (PPG) provides the technical direction and is available online.

The PPG classifies the vulnerability of different land uses to flooding and guides planning decisions accordingly. It promotes the siting of development in areas of lowest flood risk wherever feasible and emphasises the need to avoid any increase in flood risk beyond the site boundary, ensuring that flood risk to the wider catchment is not exacerbated.

At the local level, flood risk and surface water management for the site are addressed by Policy CC09 (Development and Flood Risk from all sources) of the Managing Development Delivery Local Plan (2014), which requires flood risk from all sources, including areas of known historic flooding, to be taken into account, requires the Strategic Flood Risk Assessment to be used, and requires a Flood Risk Assessment where the Strategic Flood Risk Assessment provides evidence of risk from any source. The site falls within the administrative area of Wokingham Borough. The Council's Level 1 Strategic Flood Risk Assessment (JBA Consulting, May 2023) has informed this assessment.

The development plan policies of most relevance to flood risk and drainage at this site, and the way this assessment responds to each, are set out below.

Policy	Title	Relevance to this assessment
MDD Policy CC09	Development and Flood Risk (from all sources)	This assessment addresses all six sources of flooding, uses the Level 1 SFRA (2023) as the policy authority for groundwater and sewer flooding, and sets out flood response arrangements under criterion 4(c).



Policy	Title	Relevance to this assessment
MDD Policy CC10	Sustainable Drainage	Surface water management is to be demonstrated through a separate Surface Water Drainage Strategy, which will reproduce greenfield runoff rates and volumes and apply the drainage hierarchy. Drainage design is outside the scope of this assessment.
MDD Policy CC04	Sustainable Design and Construction	Flood resilient construction and water efficiency measures are recommended in the Mitigation and Recommendations section.
MDD Policy CC03	Green Infrastructure, Trees and Landscaping	Retention of permeable surfaces and soft landscaping across the plot is recommended, consistent with criterion 4(c) on improvements to green infrastructure that minimise flood risk.
Core Strategy Policy CP1	Sustainable Development	Criterion 9 requires that development avoids increasing, and where possible reduces, risk from all forms of flooding including groundwater. Climate change over the lifetime of the development is assessed in the Surface Water Flooding section.
Core Strategy Policy CP3	General Principles for Development	Criterion (c) requires no detrimental impact on watercourses. The nearest ordinary watercourse lies approximately 180 m east of the site and is not affected by the proposals.
Emerging Policy FD1	Development and flood risk (from all sources), Local Plan Update	The Local Plan Update was submitted for examination in February 2025 and has not been adopted. Policy FD1 carries limited weight; its Flood Zone 1 assessment triggers are nonetheless satisfied by this report.

The National Planning Policy Framework (NPPF) outlines the requirements for site-specific Flood Risk Assessments. A FRA is required for proposals that:

- Are greater than 1 hectare in area within Flood Zone 1;
- Involve new development (including minor development and changes of use) within Flood Zones 2 and 3;
- Are located in an area within Flood Zone 1 that has been identified as having critical drainage problems, and where the proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding;
- Are located in an area in Flood Zone 1 identified in a Strategic Flood Risk Assessment as being at increased future flood risk or subject to other sources of flooding.

This FRA has been prepared to provide sufficient information to demonstrate compliance with the requirements of the NPPF, Planning Practice Guidance (PPG), and relevant regional and local government policies. The assessment evaluates the risk of flooding from all sources, including tidal, fluvial, surface water, groundwater, sewer, and artificial sources. It also proposes mitigation measures to ensure that flood risk to the site is minimised and that flood risk elsewhere is not increased as a result of the proposed development.



Sources of Information

This FRA has been based on the following sources of information:

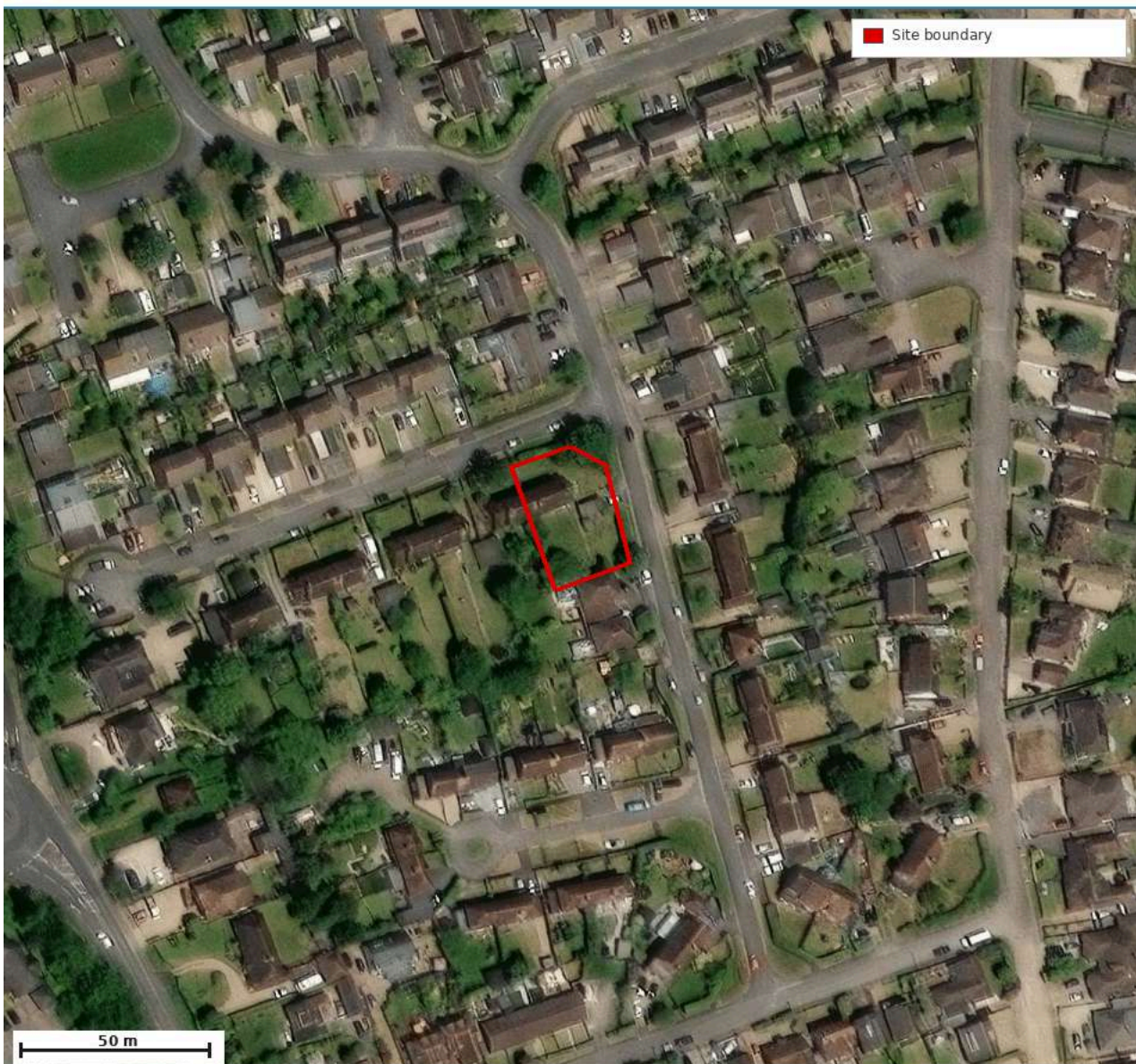
- National Planning Policy Framework (NPPF)
- Flood Risk and Coastal Change Planning Practice Guidance (PPG)
- Site Layout Plan
- Ordnance Survey mapping
- Environment Agency National LiDAR Programme 1 m Composite Digital Terrain Model
- DEFRA MAGIC mapping
- Environment Agency mapping, consultation and model information
- Web-based soil mapping (Cranfield LandIS Soilscales)
- British Geological Survey drift & bedrock geology maps and borehole records
- Wokingham Borough Council Level 1 Strategic Flood Risk Assessment (JBA Consulting, May 2023)
- Thames Water sewer flooding records 1965–2026, released to Air & Flood Consultants under the Environmental Information Regulations (reference EIR 26-27-352)
- EA Flood Map for Planning — Surface Water Spatial Planning extents and depths (NaFRA2)
- EA Risk of Flooding from Surface Water (NaFRA2) — hazard and speed
- EA climate change allowances for peak river flow (management catchment)
- EA Flood Warning and Flood Alert Areas
- EA Hydrology API (groundwater level monitoring)
- Natural England statutory designation datasets
- Defra/EA FD2320 & FD2321 — Flood Risks to People
- Wokingham Borough Council Managing Development Delivery Local Plan (2014) and Core Strategy (2010)
- Wokingham Borough Council Local Validation List (September 2025)
- Wokingham Borough Council Flood Investigation Reports Winter 2013/2014 (WSP | Parsons Brinckerhoff, January 2016)



EXISTING SITE & HYDROLOGY CHARACTERISTICS

Site Location

The site is located at 1 Ilbury Close, Shinfield, Wokingham, RG2 9DE, within Wokingham Borough. The site location is shown outlined in red in Figure 1. The approximate central grid reference for the site is E: 473429; N: 168288.



Aerial imagery © Esri, Maxar, Earthstar Geographics and the GIS User Community.

Figure 1: Site location (site outlined in red)



Topography

EA LiDAR data indicates that ground levels across the site are gently sloping (between 53.06 and 54.03 m AOD); see Figure 2. This should be read alongside the client topographical survey where available.



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Topography — EA LiDAR 1 m DTM (elevation)

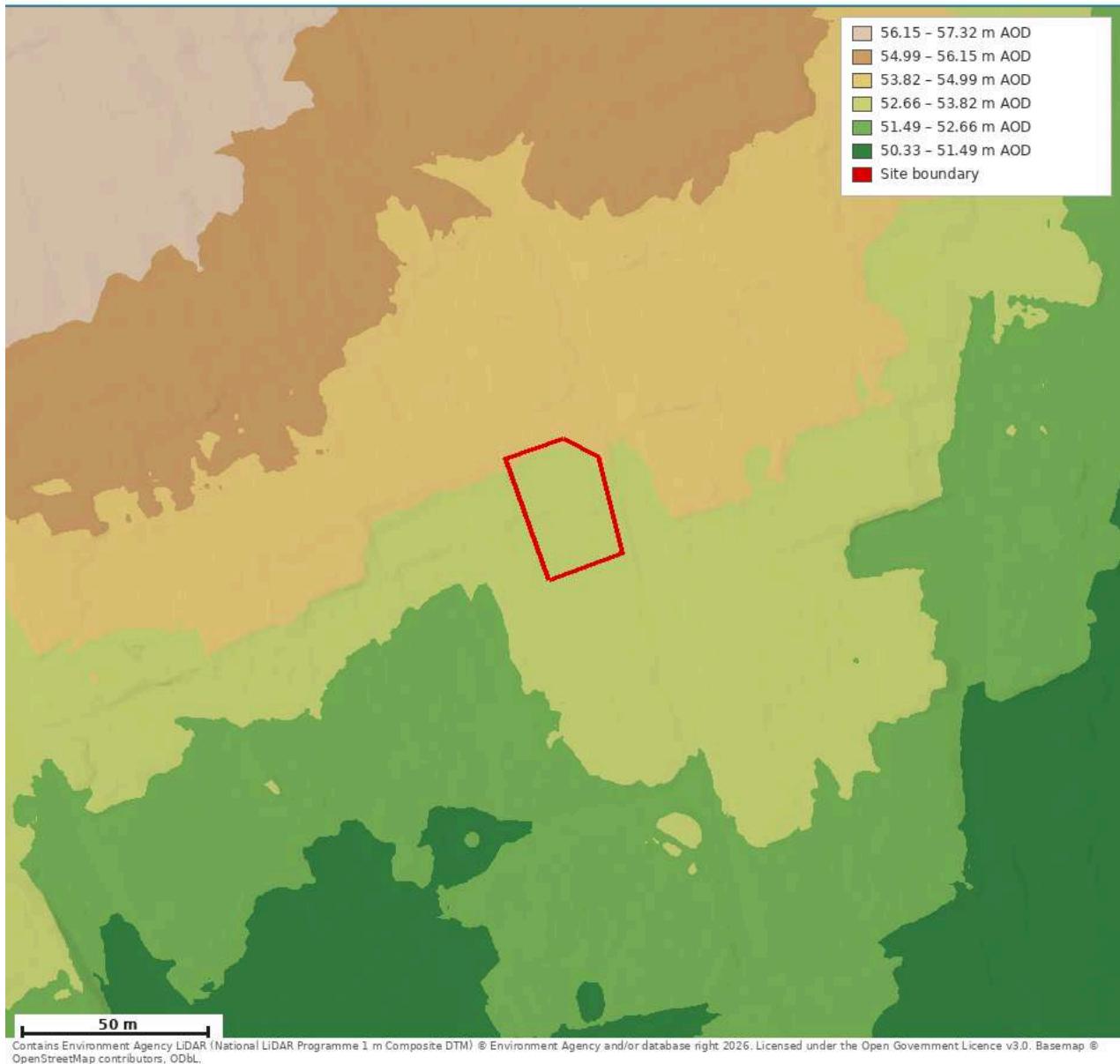


Figure 2: EA LiDAR-derived ground levels across the site

Ground Conditions

Geological mapping from the British Geological Survey (BGS) indicates that the site is underlain by the **London Clay Formation** as bedrock geology. The recorded superficial deposit is **no superficial deposits recorded**. The nearest BGS record (SU76NW56, 'Arborfield Horticultural Station', approximately 262 m from the site) is a



borehole record to a depth of about 100.58 m. The archived record does not include a stratum-by-stratum geological log (the summary of geological section is not completed), so it confirms the shallow ground conditions but does not provide a detailed sequence. A copy of the record is reproduced in Appendix C. The bedrock and superficial geology are shown in Figure 3 and Figure 4, and the nearby BGS borehole records in Figure 5.

Soilscapes maps the site as Soilscape 18, Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (texture loamy and clayey, drainage classified as impeded drainage). Infiltration is likely to be poor. Soakaways should not be assumed; confirm by testing to BRE Digest 365.



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BGS Bedrock Geology (1:50 000)

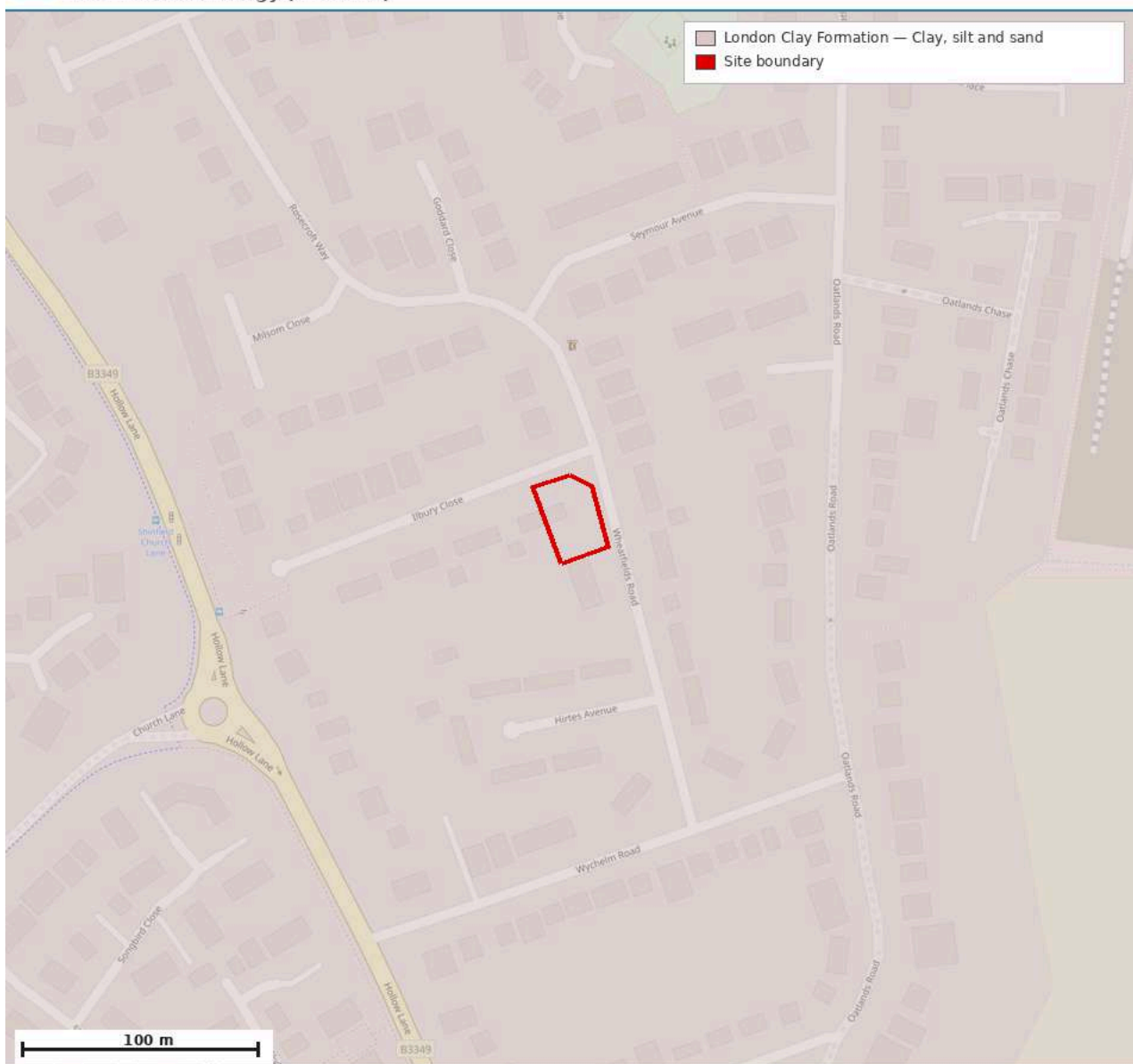
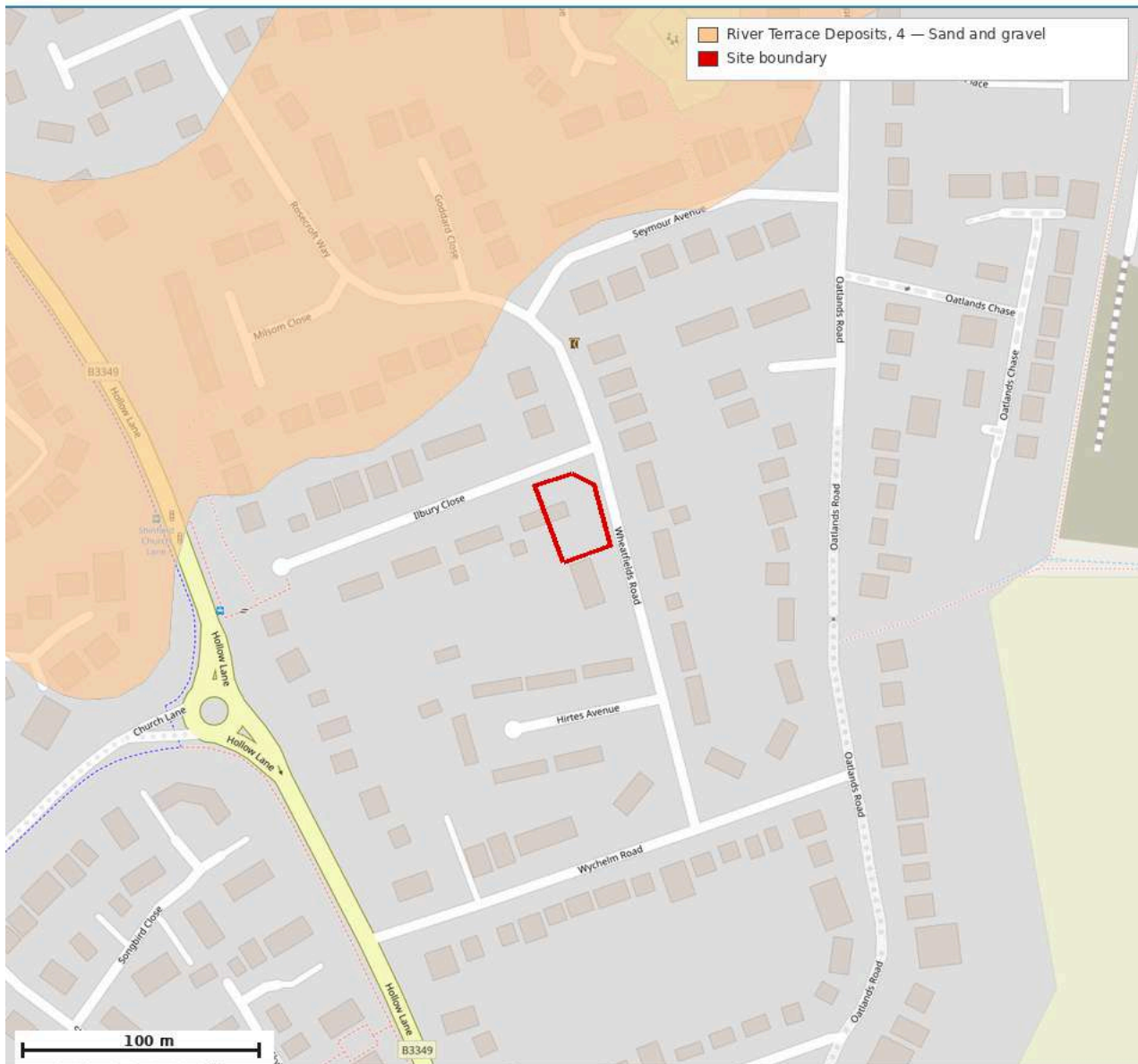


Figure 3: BGS bedrock geology



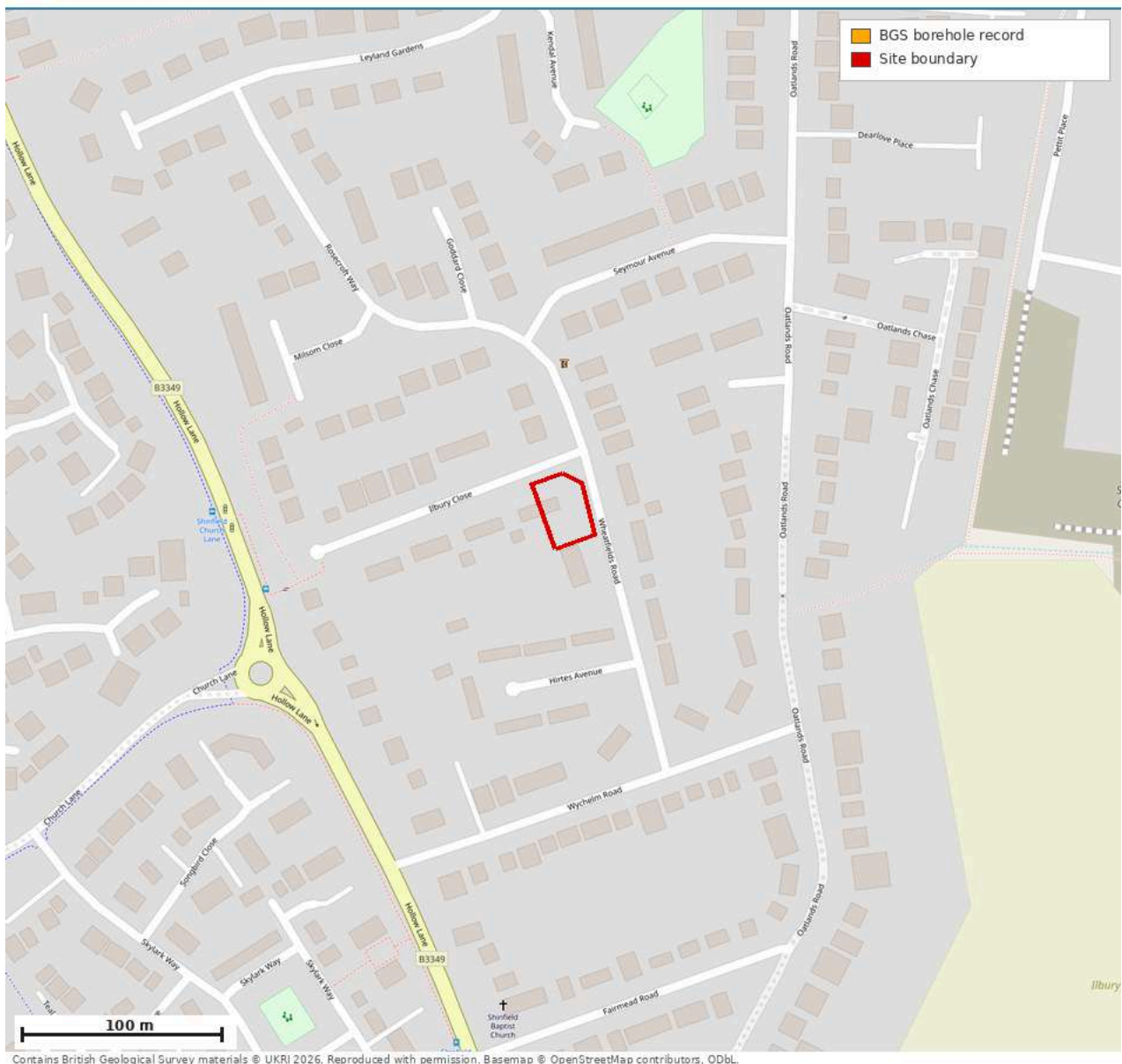
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BGS Superficial Deposits (1:50 000)



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Figure 4: BGS superficial deposits

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BGS Borehole Records

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Figure 5: BGS borehole records in the vicinity of the site

Existing Drainage & Hydrology

The nearest ordinary watercourse is an unnamed drain approximately 180 m east of the site. The nearest watercourse designated as a Main River under the Environment Agency Statutory Main River Map lies approximately 1.01 km east-south-east, on the River Loddon. Foudry Brook lies approximately 3.05 km west. The Section 19 flood investigation for Shinfield records that no formal watercourse flows through the village and that surface water is conveyed by a series of surface water and highway drainage ditches. The existing dwelling at 1 Ilbury Close drains to the public sewer network operated by Thames Water. The foul drainage



arrangements for the two proposed dwellings are to be confirmed at detailed design and are to be agreed with Thames Water.

No designated sites of hydrological significance nearby — the development is unlikely to affect environmentally sensitive receptors.

Environmental Designations

A search of the Natural England statutory designation datasets was carried out for a 500 m radius around the site, as shown in Figure 6. Ancient Woodland recorded within 500 m of the site.

Designation	Within 500 m	Detail
Sites of Special Scientific Interest	None	—
Special Areas of Conservation	None	—
Special Protection Areas	None	—
Potential Special Protection Areas	None	—
Ramsar Sites	None	—
National Nature Reserves	None	—
Local Nature Reserves	None	—
Ancient Woodland	Yes	(Tithe: The Shaw), (Tithe:Coppice adjoining Home Close), (Tithe:The Shaw)



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Environmental Designations within 500 m

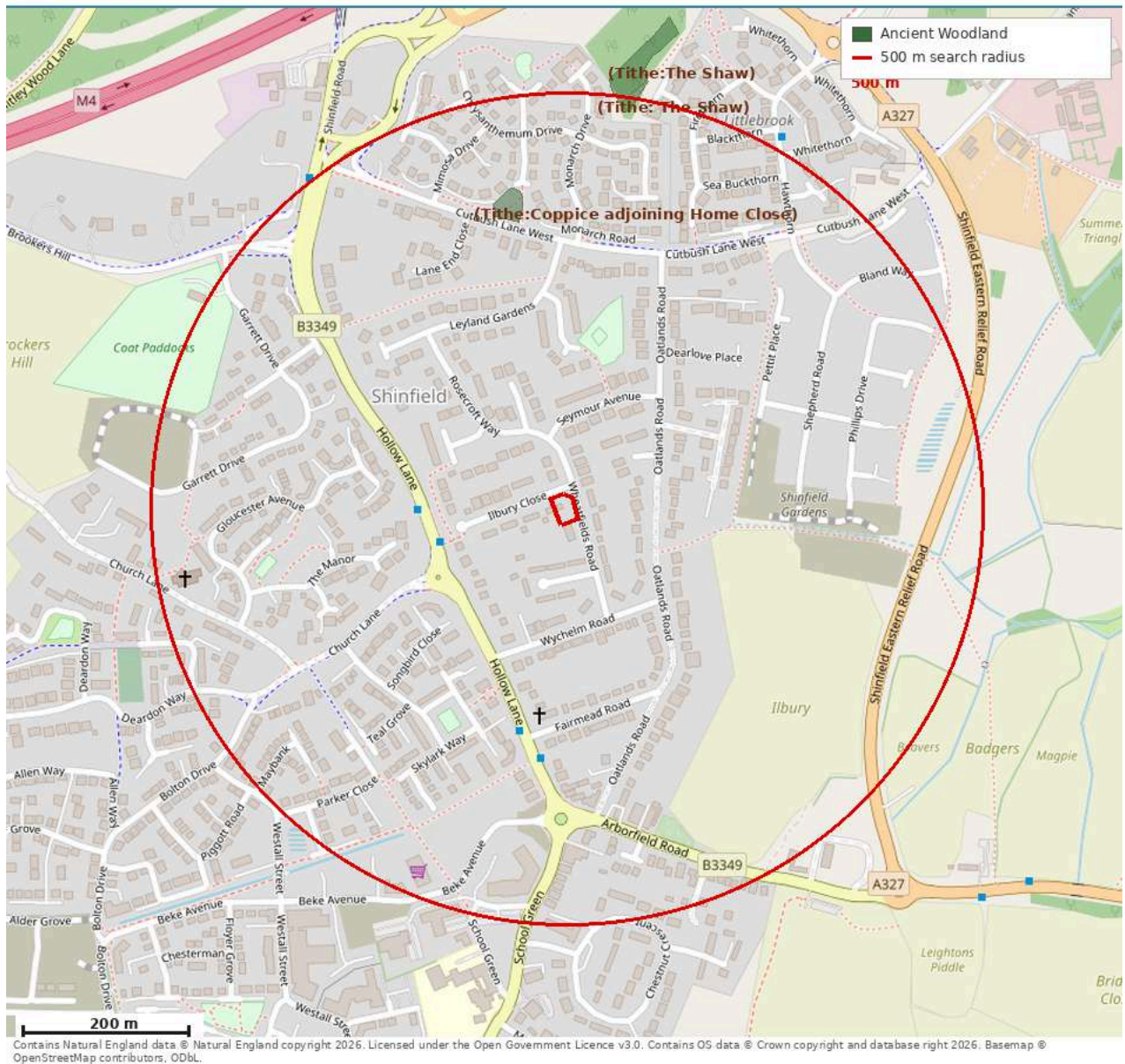


Figure 6: Environmental designations within 500 m of the site



DEVELOPMENT VULNERABILITY & FLOOD ZONE CLASSIFICATION

National Planning Policy Framework

Local Planning Authorities (LPAs) have a statutory duty to consult the Environment Agency (EA) on relevant planning applications where flood risk may be a concern. The EA will review such applications in line with the National Planning Policy Framework (NPPF). The NPPF requires that, as part of the planning process, a site-specific Flood Risk Assessment is undertaken for any site with flood risk potential; that flood risk is minimised by applying a sequential approach to locating vulnerable land uses; that sustainable drainage systems are used for surface water disposal where practical; that flood risk is managed using flood-resilient and resistant techniques; and that residual risk is identified and safely managed.

The NPPF categorises flood zones as follows:

- Zone 1 — Low risk: less than 0.1% Annual Exceedance Probability (AEP) (< 1 in 1000 years);
- Zone 2 — Medium risk: between 0.1% and 1% AEP (1 in 1000 to 1 in 100 years);
- Zone 3a — High risk: 1% AEP or greater (> 1 in 100 years);
- Zone 3b — Functional Floodplain: land where water has to flow or be stored in times of flood. The extent is set by the borough SFRA, not nationally — many authorities use the 5% AEP (1 in 20) event, others 3.33% (1 in 30). The extent of Flood Zone 3b at any location is set by the borough Strategic Flood Risk Assessment.

Flood Risk Vulnerability Classification

Annex 3 of the National Planning Policy Framework classifies the vulnerability of land uses to flooding. The classification describes the **use**, not the building works, and together with the flood zone it determines whether the Exception Test is required. The five classes are summarised below.

Vulnerability classification	Development types
Essential Infrastructure	Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generation, storage and distribution, grid and primary substations, and water treatment works that need to remain operational in times of flood. Wind turbines. Solar farms.
Highly Vulnerable	Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. Emergency dispersal points. Basement dwellings. Caravans, mobile homes and park homes intended for permanent residential use. Installations requiring hazardous substances consent.



Vulnerability classification	Development types
More Vulnerable (this development)	Hospitals. Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. Buildings used for dwelling houses , student halls of residence, drinking establishments, nightclubs and hotels. Non-residential uses for health services, nurseries and educational establishments. Landfill and sites used for waste management facilities for hazardous waste. Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	Police, ambulance and fire stations which are not required to be operational during flooding. Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'more vulnerable' class; and assembly and leisure. Land and buildings used for agriculture and forestry. Waste treatment (except landfill and hazardous waste facilities). Minerals working and processing (except for sand and gravel working). Water treatment works which do not need to remain operational during times of flood. Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place. Car parks.
Water-Compatible Development	Flood control infrastructure. Water transmission infrastructure and pumping stations. Sewage transmission infrastructure and pumping stations. Sand and gravel working. Docks, marinas and wharves. Navigation facilities. Ministry of Defence installations. Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. Water-based recreation (excluding sleeping accommodation). Lifeguard and coastguard stations. Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

On this basis the proposed development is classified as **More Vulnerable** development.

Environment Agency Flood Map for Planning

The Environment Agency's Flood Map for Planning provides the most up-to-date representation of flood risk from rivers and the sea, assuming the absence of existing flood defences. These maps serve as a planning tool to determine whether sites fall within designated flood risk zones and inform the need for further assessment.

The site at 1 Ilbury Close, Shinfield, Wokingham, RG2 9DE is located within **Flood Zone 1**, as identified on the Environment Agency's Flood Map for Planning (Figure 7). Flood Zone 1 is defined as land at low probability of fluvial or tidal flooding, with an annual probability of flooding of less than 0.1%.

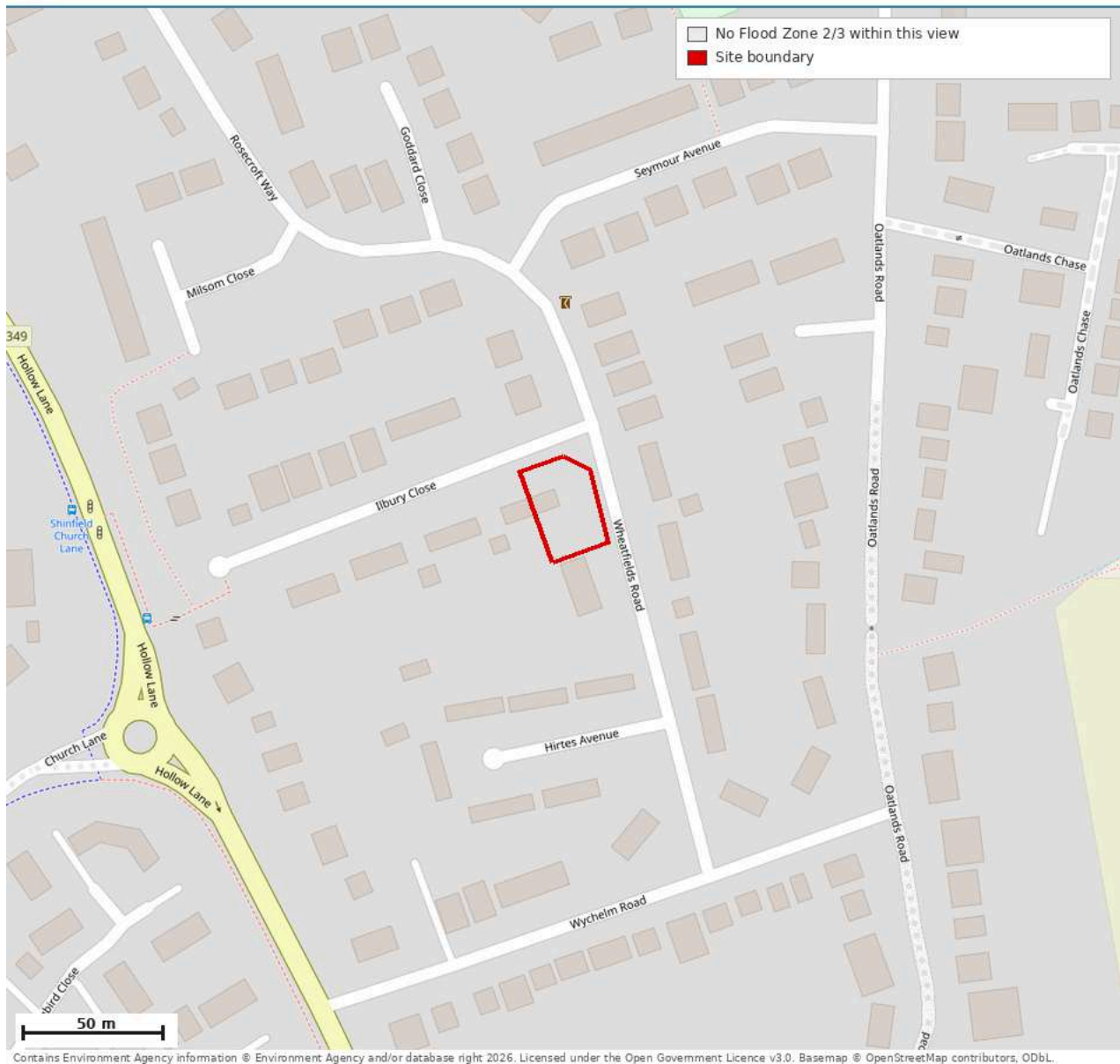


Figure 7: Environment Agency Flood Map for Planning

Development Vulnerability and the Sequential Test

The proposed development is classified as **More Vulnerable** development under Annex 3 of the NPPF, and the site lies within **Flood Zone 1**.

The Environment Agency Flood Map for Planning identifies the site as being at risk of surface water flooding, which engages the Sequential Test for development in Flood Zone 1. Paragraph 027 of the Flood risk and coastal change Planning Practice Guidance provides that where a site-specific flood risk assessment demonstrates clearly that the proposed layout, design and mitigation measures would ensure that occupiers



and users would remain safe from current and future surface water flood risk for the lifetime of the development, without increasing flood risk elsewhere, the Sequential Test need not be applied.

The surface water risk at the site arises from the 1 in 1000-year (0.1% AEP) extent under present-day conditions and from the 1 in 100-year (1% AEP) extent with a climate change allowance. The predominant mapped depth is less than 150 mm and the deepest mapped band is 150 mm to 300 mm. Environment Agency hazard mapping records a hazard rating of 0.5 or greater at Low likelihood across 336.0 m² of the site under present-day conditions, which sits below the FD2321 danger for some threshold. Finished floor levels set 150 mm above surrounding ground, flood resilient construction to that height, retention of the overland flow route along the Wheatfields Road frontage and restriction of surface water discharge to greenfield rates are set out under Flood Mitigation and Resilience Measures.

On the evidence set out in this report, and subject to the mitigation measures adopted, the Sequential Test is not considered to be required for this application.

The **Exception Test is not required**, as the development is classified as **More Vulnerable** in Flood Zone 1, for which the NPPF does not require the Exception Test.



CLIMATE CHANGE ALLOWANCES

Climate change allowances are derived from UKCP18 percentiles. The **central** allowance (50th percentile) is the design allowance; the **higher central** (70th) tests higher scenarios; and the **upper end** (95th) tests more extreme change and exceedance. The site falls within the **Loddon and tributaries** management catchment of the **Thames** river basin district, for which the Environment Agency's peak river flow allowances are:

Epoch	Central (50th)	Higher central (70th)	Upper end (95th)
2020s	7%	11%	23%
2050s	4%	10%	25%
2080s	14%	23%	46%

The drainage and flood mitigation design should adopt the central allowance for the development's lifetime, with the higher central allowance used to test sensitivity.



SITE SPECIFIC FLOOD RISK ASSESSMENT

National Planning Policy Framework (NPPF)

In line with the NPPF, this Flood Risk Assessment considers all potential sources of flooding, including tidal flooding from the sea; fluvial flooding from rivers and streams; pluvial flooding from surface water runoff and exceedance flows; groundwater flooding from elevated groundwater tables or springs; flooding from sewers, including surcharge from combined or surface water systems; and artificial sources, such as reservoirs, canals or infrastructure failure.

Historic Flooding

The Environment Agency Historic Flood Map records no flooding at the site, and the site lies outside every Recorded Flood Outline held for the area. The nearest outlines lie approximately 400 m east-south-east and are attributed to channel capacity exceedance on the River Loddon in the winters of 1990 and 1991 and in July 2007. The Level 1 SFRA records flooding within Character Area 6, which includes Shinfield, in September 1968, June 1971, November 1974, February 1990, February 1991, September 1992, 2000, January 2003, July 2007 and 2013, attributed to the River Loddon on the eastern boundary of the character area and to Foudry Brook to the north-west, together with surface water runoff at a number of locations. The Council's Section 19 flood investigation for winter 2013/2014 (WSP | Parsons Brinckerhoff, January 2016) records two properties flooded internally in Shinfield, both on the A327 Arborfield Road approximately 1 km south-east of the site, and confirms that no formal watercourse flows through the village. No record of flooding at Ilbury Close or Wheatfields Road was identified in the Council, Environment Agency or SFRA sources reviewed.

Tidal Flooding

Tidal flooding typically results from extreme sea levels due to high tides, storm surges or wind-driven wave action, and affects areas that are hydraulically connected to tidal waters. Tidal flooding is **not a credible mechanism** at this location. The site lies above the tidal limit model, and there are no tidal waterbodies in the vicinity that present a risk to the site.

The risk of tidal flooding at this location is considered to be **Low**.

Fluvial Flooding

Fluvial flooding occurs when watercourses exceed their capacity and overflow into adjacent land. The site is located within Flood Zone 1. This classification identifies the land as being at low risk of fluvial or tidal flooding, with an annual probability of flooding from rivers or the sea of less than 0.1%. The site lies outside the mapped design flood extents and will not encroach upon floodplain storage or increase flood risk elsewhere.

The Flood Map for Planning is an **undefended** dataset and has only three broad zones, so it describes a policy category rather than the likelihood of flooding at the site. The Environment Agency's Risk of Flooding from Rivers and the Sea (RoFRS) mapping has therefore also been reviewed: it is probabilistic, it takes account of the presence and condition of flood defences, and it is the dataset the Environment Agency uses to communicate flood risk to the public. No RoFRS band is mapped across the site, which places it in the Environment Agency's Very Low band for the likelihood of flooding from rivers and the sea. This is shown in the figure below.

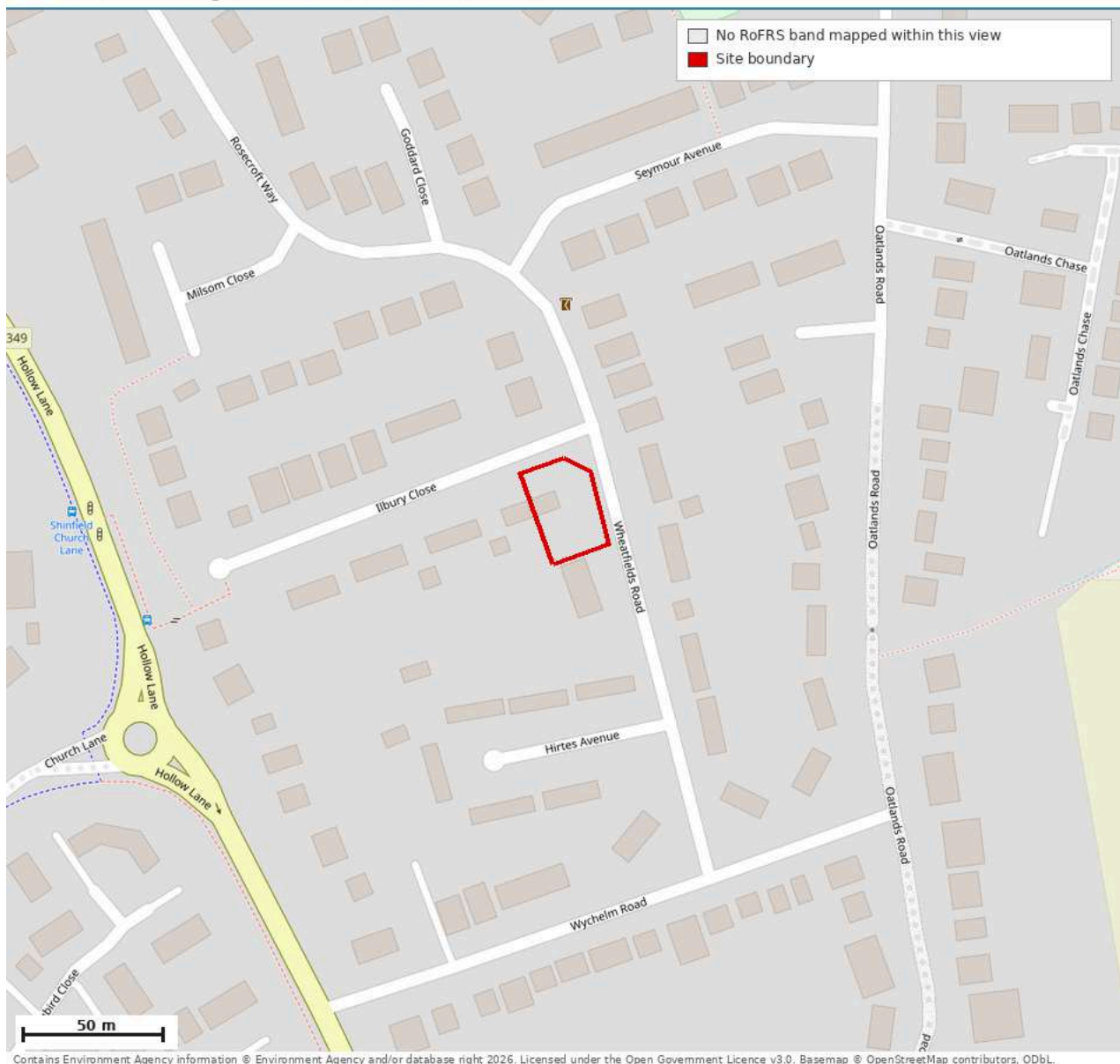


Figure 8: Risk of Flooding from Rivers and the Sea (Environment Agency RoFRS)

The Risk of Flooding from Rivers and the Sea places the site in the None band, which is consistent with its Flood Zone 1 classification.

Taking the Flood Map for Planning and the Risk of Flooding from Rivers and the Sea together, the risk of fluvial flooding to the proposed development is considered to be **Low**.

Pluvial Flooding

Pluvial flooding arises when intense or prolonged rainfall exceeds the infiltration capacity of the ground or overwhelms local drainage infrastructure, leading to surface water accumulation and overland flow. Surface



water flood risk mapping from the Environment Agency (Figure 9) shows the modelled extent of potential surface water flooding for the 1 in 30, 1 in 100 and 1 in 1000-year events. The Flood Map for Planning results for this site boundary identify surface water as the source of flood risk at the site.

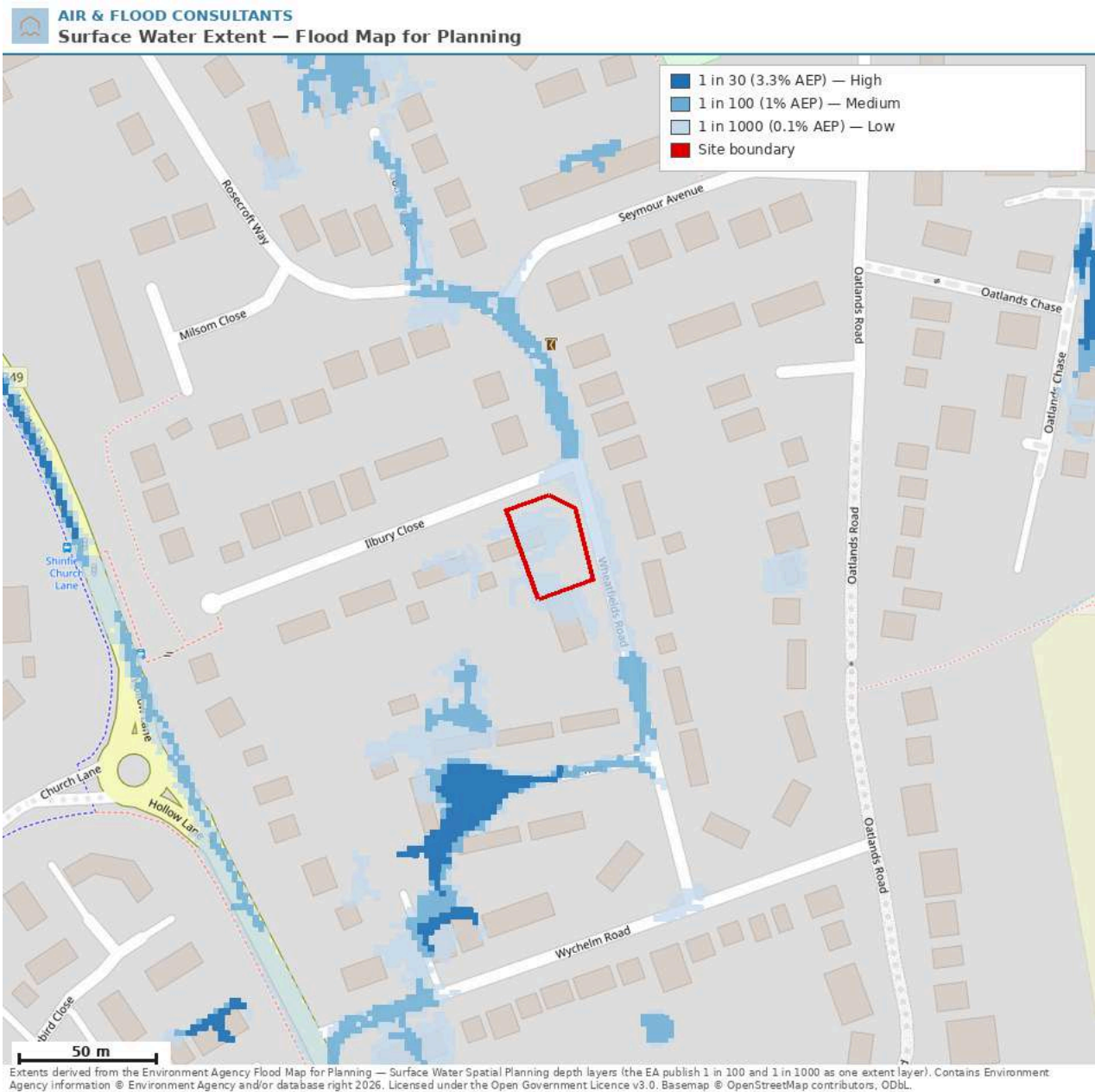


Figure 9: Surface water extent — Environment Agency Flood Map for Planning



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Surface Water Extent at the Site — Detail

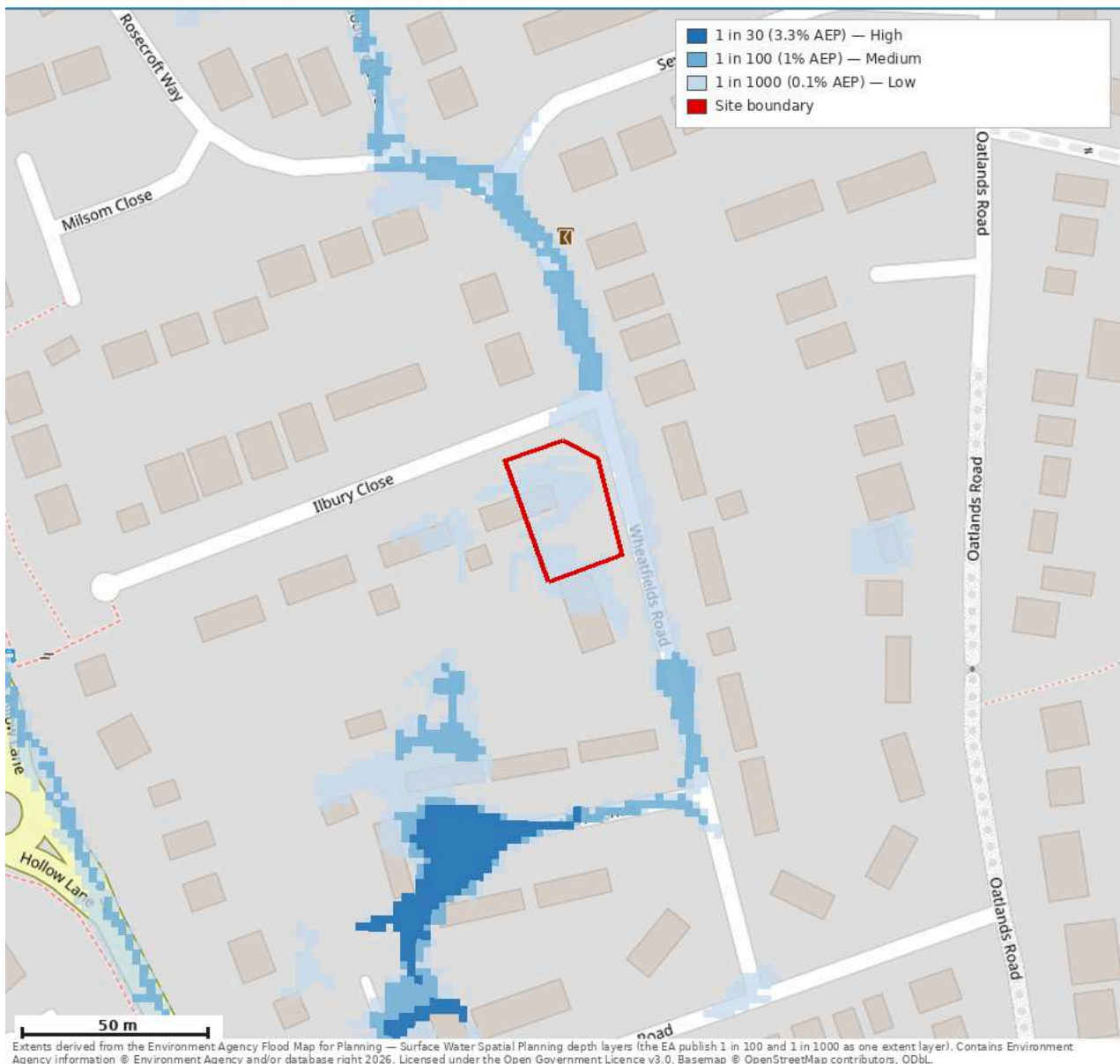
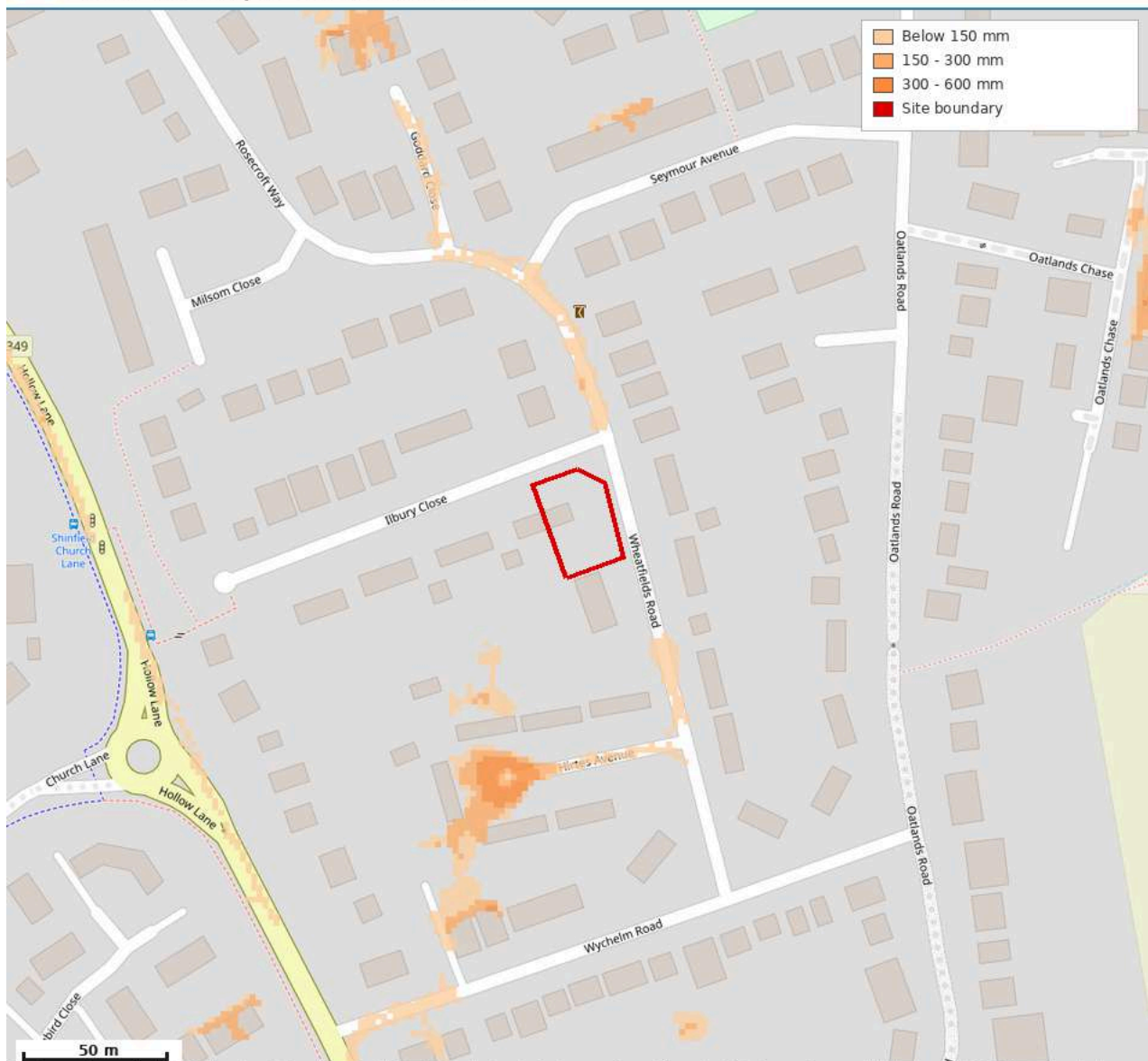


Figure 10: Surface water extent at the site — detail



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Surface Water Depth — 1% AEP (1 in 100)



Environment Agency Flood Map for Planning — Surface Water Spatial Planning Depths. Contains Environment Agency information © Environment Agency and/or database right 2026. Licensed under the Open Government Licence v3.0. Basemap © OpenStreetMap contributors, ODbL.

Figure 11: Modelled surface water depth (1% AEP)

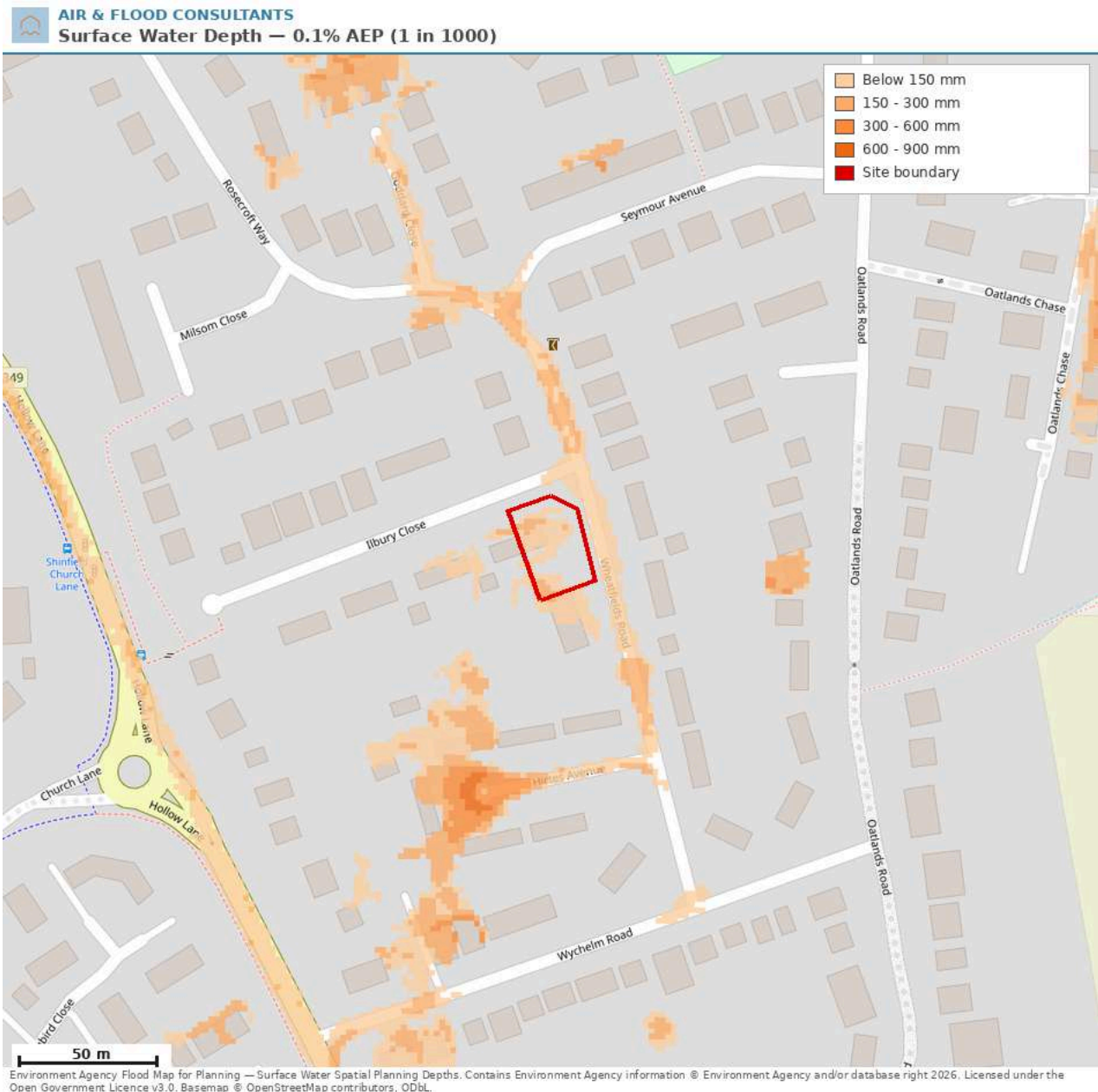


Figure 12: Modelled surface water depth (0.1% AEP, 1 in 1000)

The site lies outside the 1 in 30-year (3.3% AEP) and 1 in 100-year (1% AEP) surface water extents under present-day conditions. It falls within the 1 in 1000-year (0.1% AEP) extent over approximately 335.9 m², or 44.8% of the site, with depths predominantly in the less than 150 mm band over approximately 270.2 m² and reaching the 150 mm to 300 mm band over approximately 65.7 m². Sampling the mapped extent across the whole site polygon at 0.25 m resolution shows the water concentrated on the western half of the plot, where approximately 68% of the area is affected, against approximately 24% of the eastern half. The two dwellings are proposed on the western part of the plot.



The 0.1% AEP (1 in 1000-year) depth mapping is shown in Figure 12. This is included because a site lying outside the 1% extent shows no depth at all on the 1% figure, and the meaningful depths are then only visible in the lower-probability event.

With a climate change allowance the 1 in 100-year extent covers approximately 283.2 m² of the site, or 37.7%, with depths predominantly in the less than 150 mm band over approximately 244.9 m² and reaching 150 mm to 300 mm over approximately 38.2 m². Approximately 57% of the western half of the plot is affected. The 1 in 1000-year extent with a climate change allowance covers approximately 523.4 m², or 69.8% of the site, and 150 mm to 300 mm becomes the predominant depth band.

Beyond the site boundary the mapping is deeper. Within 50 m of the site the 1 in 30-year event is mapped over 29.8 m², predominantly at 150 mm to 300 mm and reaching 300 mm to 600 mm over 7.0 m², along the flow route that follows the Wheatfields Road frontage.



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Surface Water Extent including Climate Change

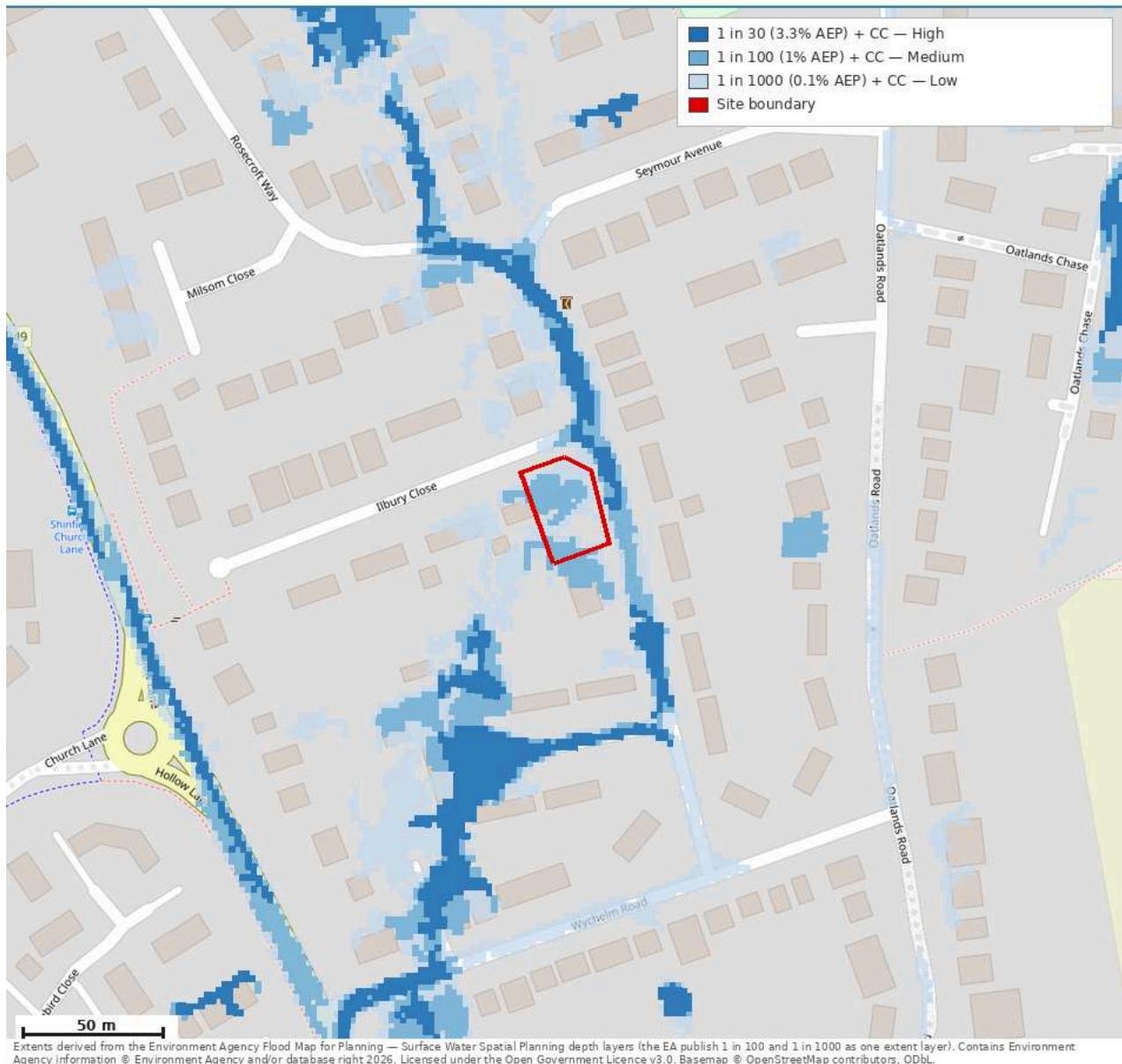


Figure 13: Surface water extent including climate change (Environment Agency, CCP1)

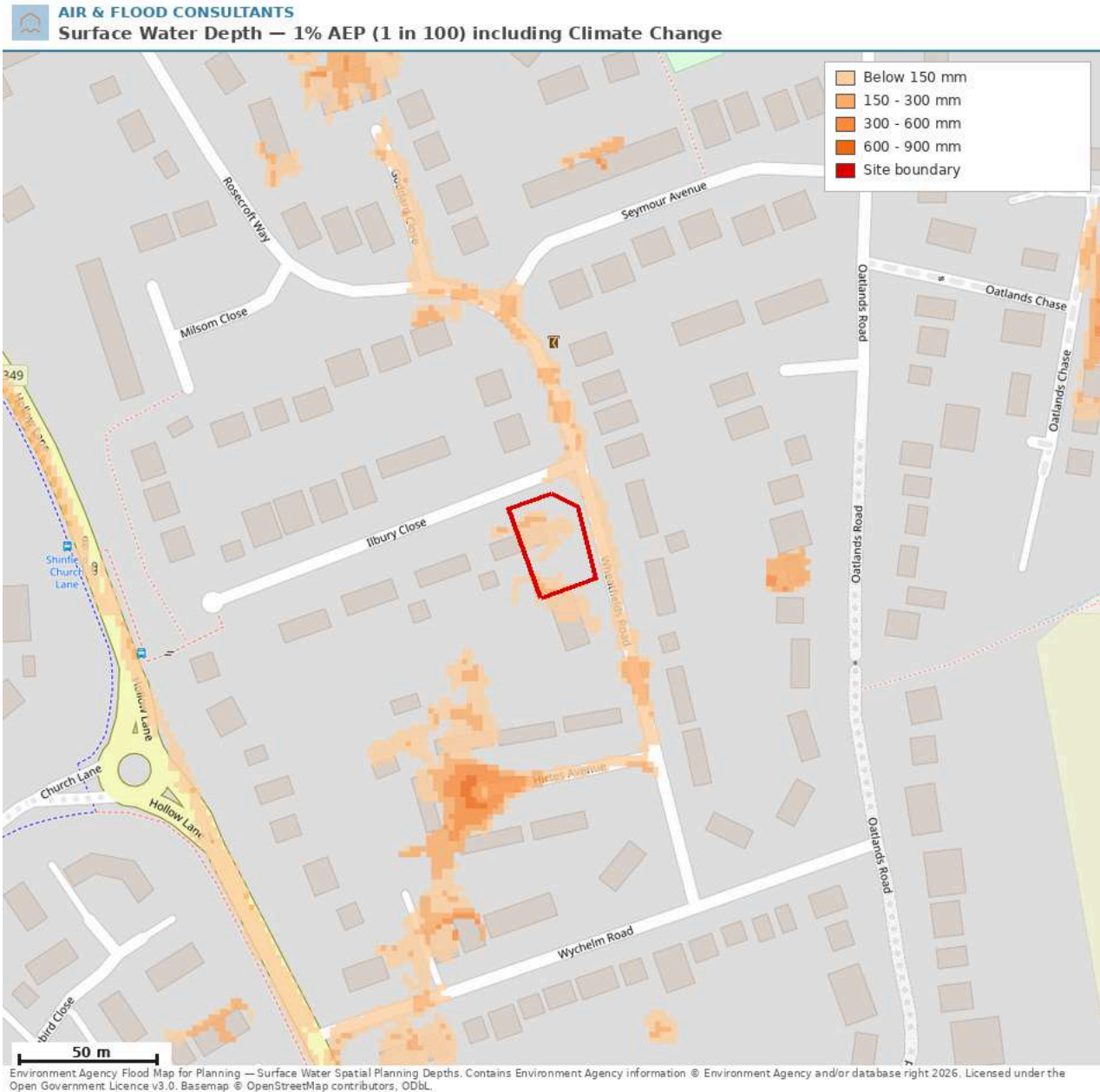


Figure 14: Modelled surface water depth (1% AEP including climate change, CCP1)

The site is outside the mapped surface water extents in the present-day 1 in 100-year event. A climate change allowance brings 37.7% of the plot within that extent, including the western part on which the dwellings are proposed, and mapped depths on the site reach the 150 mm to 300 mm band. On that evidence the risk of pluvial flooding to the proposed development is considered to be **Medium**, and finished floor levels are to be raised as set out under Flood Mitigation and Resilience Measures.

Groundwater Flooding

Groundwater flooding occurs when the water table rises above the surface, typically in low-lying areas underlain by permeable geology such as chalk or sand and gravel aquifers. At 1 Ilbury Close, Shinfield,



Wokingham, RG2 9DE, the underlying bedrock is London Clay Formation. The Level 1 SFRA uses the Environment Agency Areas Susceptible to Groundwater Flooding mapping as its screening dataset, carried in the Appendix A geo-referenced map sheets rather than in the report body. The site falls on Map D1, on which the 1 km square containing the site is mapped in the lowest susceptibility band, less than 25 per cent. The adjoining square approximately 292 m to the south is mapped at 75 per cent or greater, and the SFRA records that land surrounding the River Loddon has greater than 50 per cent susceptibility. The JBA Groundwater Emergence mapping carried on the same sheet records no emergence band at the site; the nearest mapped emergence, at 0.025 m to 0.5 m below ground surface, lies approximately 490 m to the south-east around School Green. The SFRA states that the susceptibility mapping is a hazard dataset rather than a risk dataset and does not show the likelihood of groundwater flooding occurring.

Environment Agency groundwater level monitoring stations within approximately 4 km of the site, the nearest being Hartley Court Farm approximately 3.1 km away, recorded levels between 35.04 mAOD and 42.32 mAOD against site ground levels of 53.07 mAOD to 54.07 mAOD. These stations lie at some distance and on differing ground, so the records are indicative only and are no substitute for site-specific groundwater monitoring. The stations are shown in Figure 16.

The site has been screened using the [proprietary Air & Flood Consultants groundwater flood risk model](#), which returns a groundwater flood risk rating of **Negligible** with high confidence. The screening is indicative and prioritises further assessment; it is not a substitute for site-specific ground investigation, and the borough Strategic Flood Risk Assessment remains the policy authority for this source.



Groundwater Flood Risk Screening (indicative, 1% AEP basis)

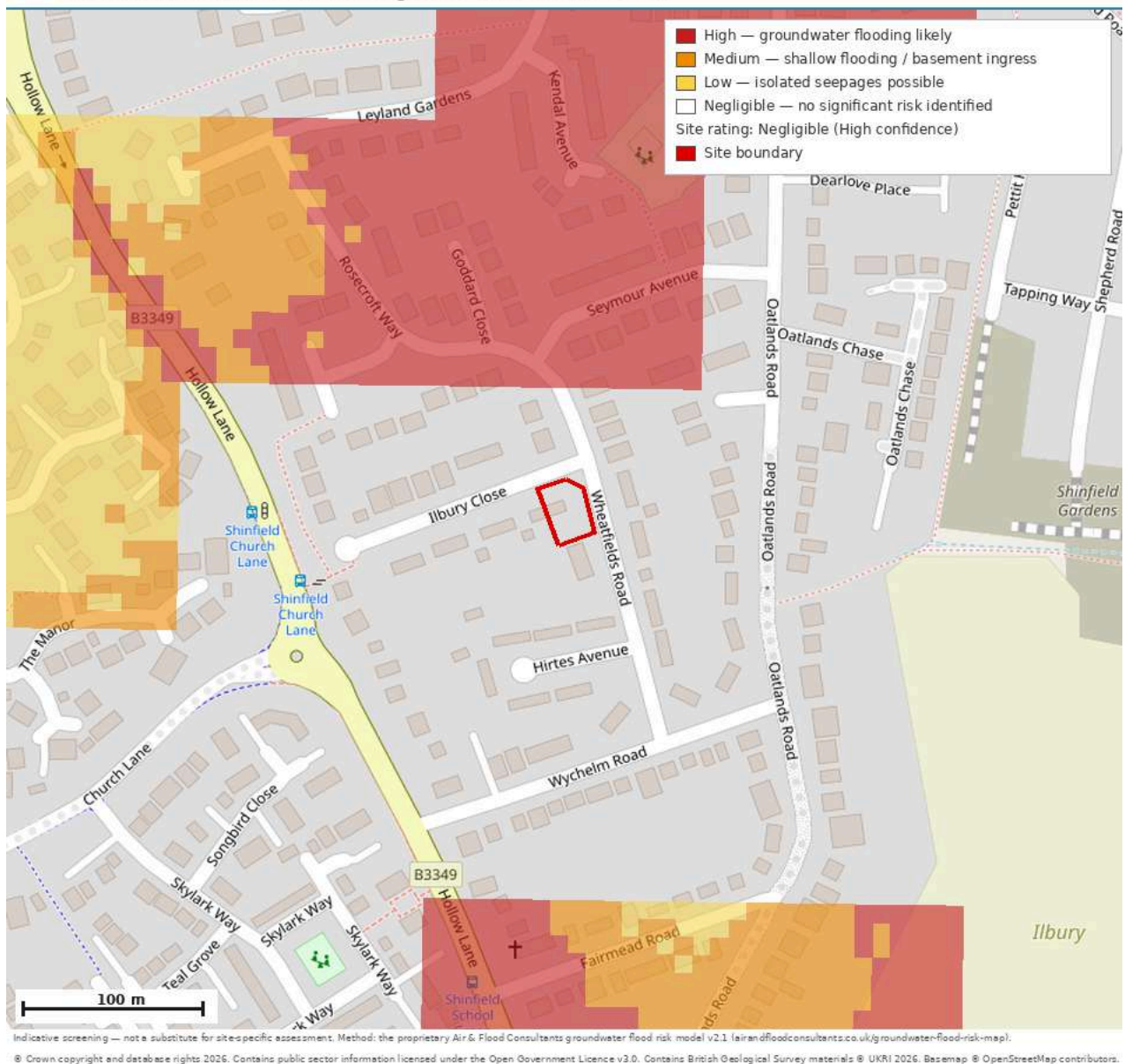
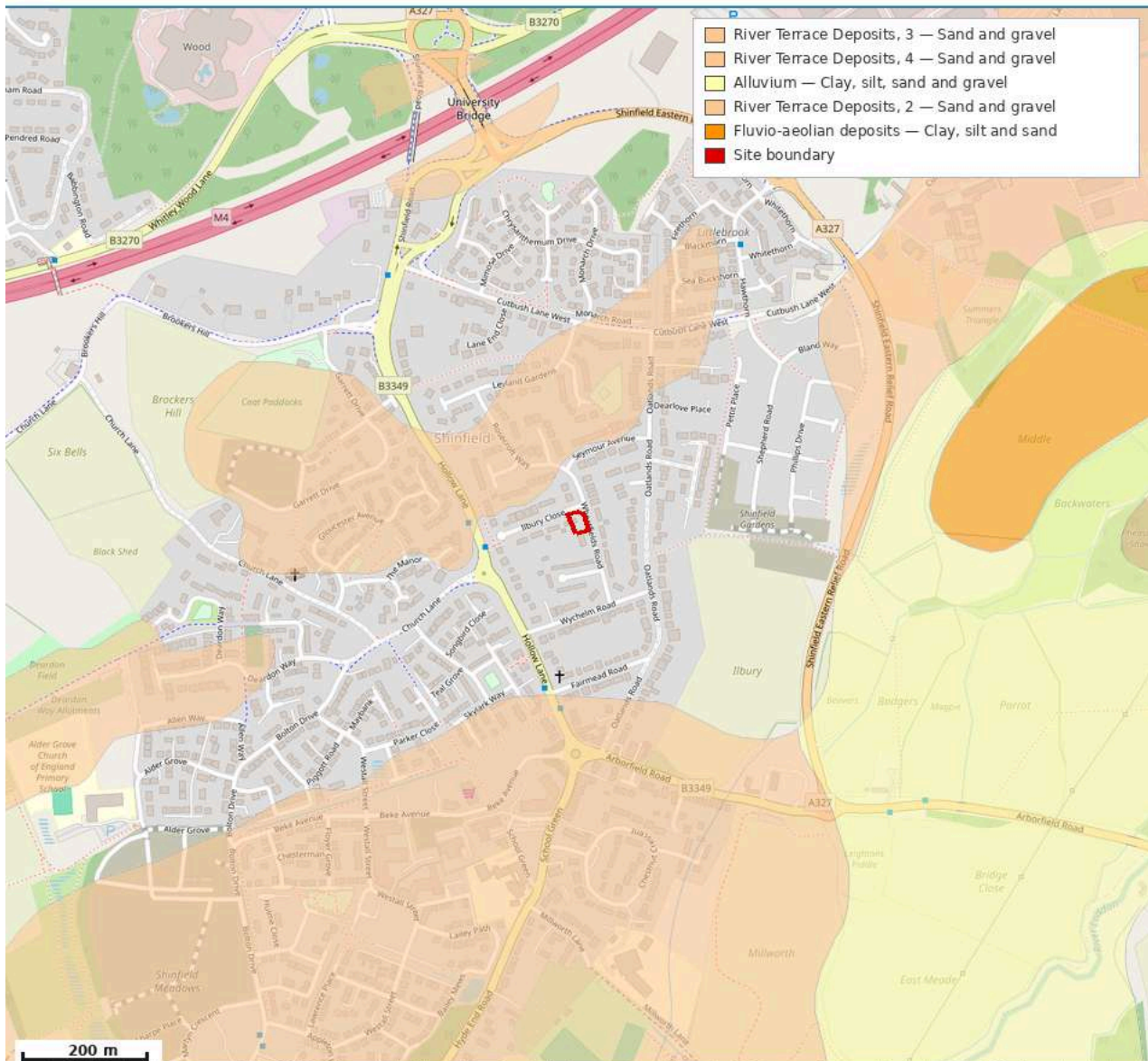


Figure 15: AFC model — groundwater flood risk (indicative, 1% AEP basis)



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Groundwater - Superficial Deposits (BGS 1:50 000)



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Figure 16: Superficial deposits and EA groundwater monitoring levels

The risk of groundwater flooding is therefore considered to be **Low**.

Sewer Flooding

Sewer flooding occurs when the capacity of a foul, surface water or combined sewer is exceeded, or when a sewer becomes blocked or fails, causing surcharge at ground level. The existing dwelling at 1 Ilbury Close drains to the public sewer network operated by Thames Water. The foul drainage arrangements for the two proposed dwellings are to be confirmed at detailed design and are to be agreed with Thames Water.



Table 5-3 of the Level 1 SFRA records sewer flooding incidents reported to Thames Water between January 2000 and May 2022 by postcode sector. Postcode sector RG2 9, which contains the site, records 172 incidents, the third highest total in the Borough after RG5 4 and RG41 5. Appendix D of the same document records 280 incidents across Character Area 6, clustered around the urban centres including Shinfield. No DG5 register extract or hotspot schedule for RG2 is published in the SFRA.

The postcode sector containing the site records ten internal hydraulic sewer flooding incidents in the ten years to July 2026, a rate of 21.13 incidents per 10,000 households against a Thames Water regional rate of 8.78, and sits at the 81st percentile of sectors recording any internal hydraulic flooding. The screening returns a rating of Medium with high confidence. A further 54 of the 77 incidents recorded in the sector over the same period are attributed to blockage rather than hydraulic overload, which indicates a network prone to obstruction rather than a capacity shortfall. Three grid-referenced highway flooding incidents are recorded within 250 m of the site, on Oatlands Road at 92 m and 136 m and on Wychelm Road at 169 m, each attributed to blockage.



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Figure — Sewer flood risk screening

1 Ilbury Close, Shinfield · sector RG2 9 · Medium · window 2016-07-14 to 2026-07-14

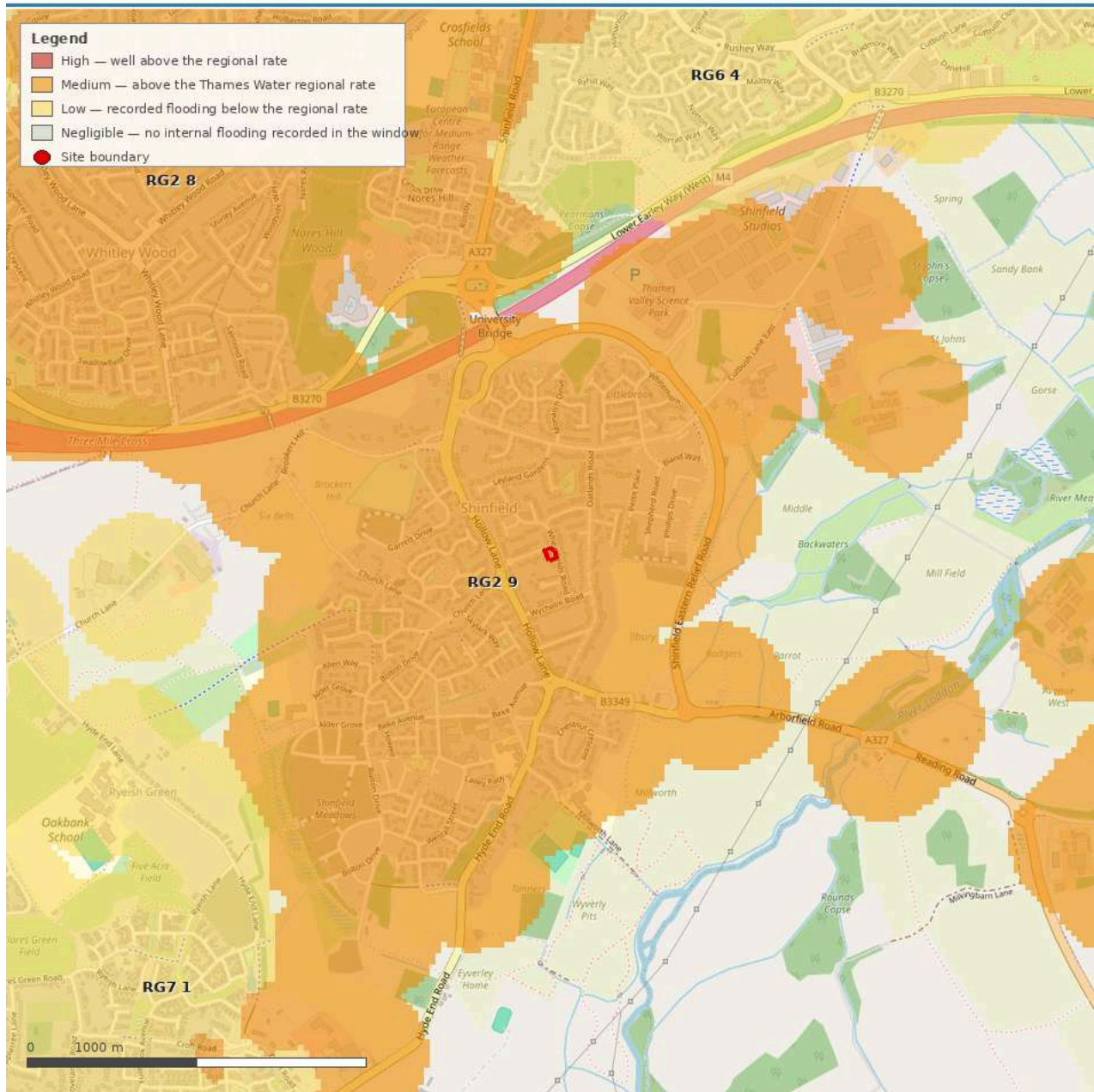


Figure 17: Sewer flood risk screening by postcode sector (Thames Water record 1965–2026, released under the Environmental Information Regulations)



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Figure — Recorded sewer flooding near the site

1 Ilbury Close, Shinfield · 14 non-property incidents within 1000 m · property records held at postcode sector only

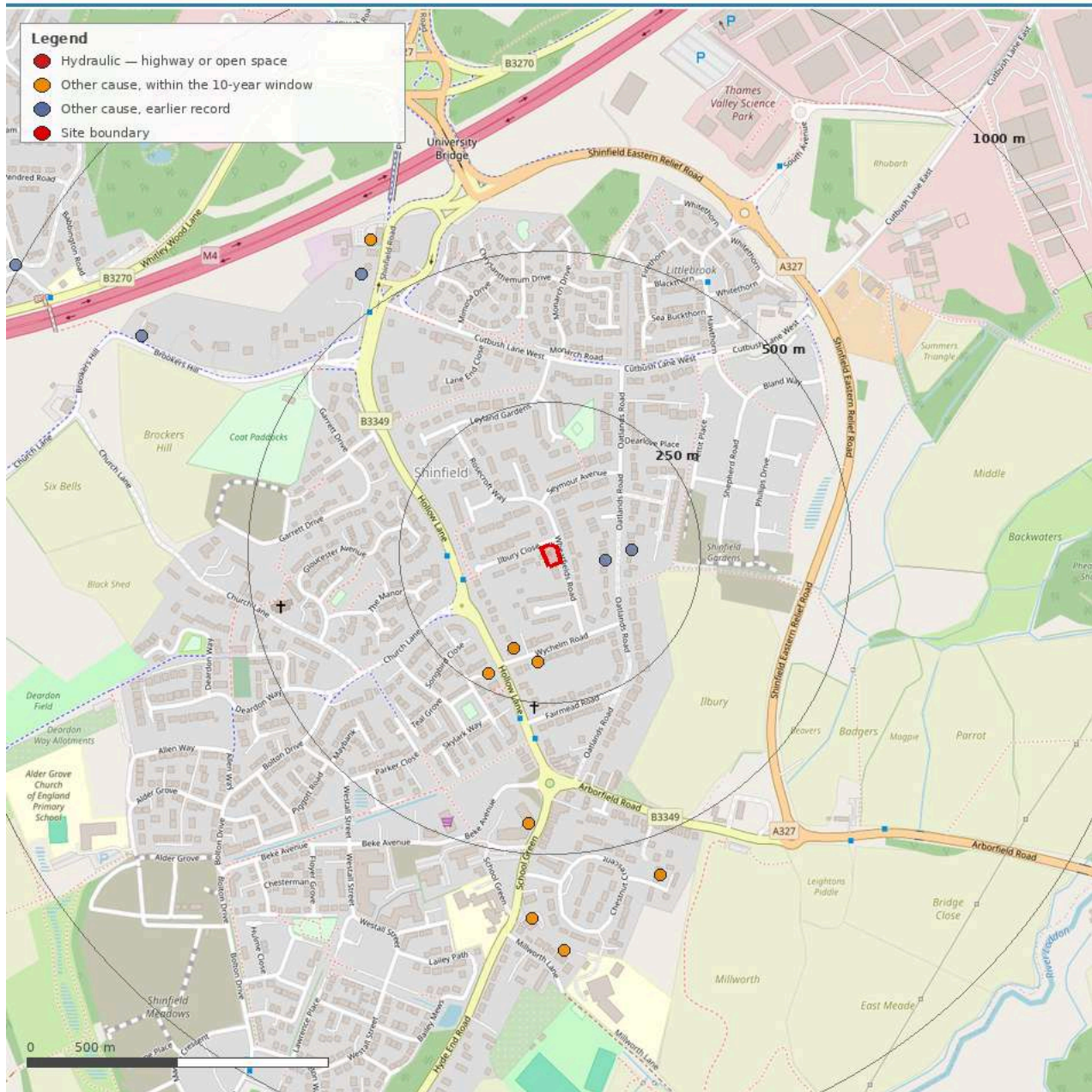


Figure 18: Recorded sewer flooding near the site — grid-referenced highway and open space incidents

As such, the risk of sewer flooding to the proposed development is considered to be **Medium**.



Flooding from Artificial Sources

Flooding from artificial sources can occur as a result of structural failure of large waterbodies or reservoirs, particularly those retained above natural ground levels. While such events are highly unlikely due to stringent regulation and maintenance, they are considered as a precautionary measure. The Environment Agency provides reservoir breach flood mapping for a 'dry-day' scenario (failure when rivers are at normal levels) and a 'wet-day' scenario (failure during an extreme natural flood). Review of the reservoir failure flood mapping confirms that the site lies outside any modelled reservoir inundation extent. The mapped extents are shown in Figure 19.

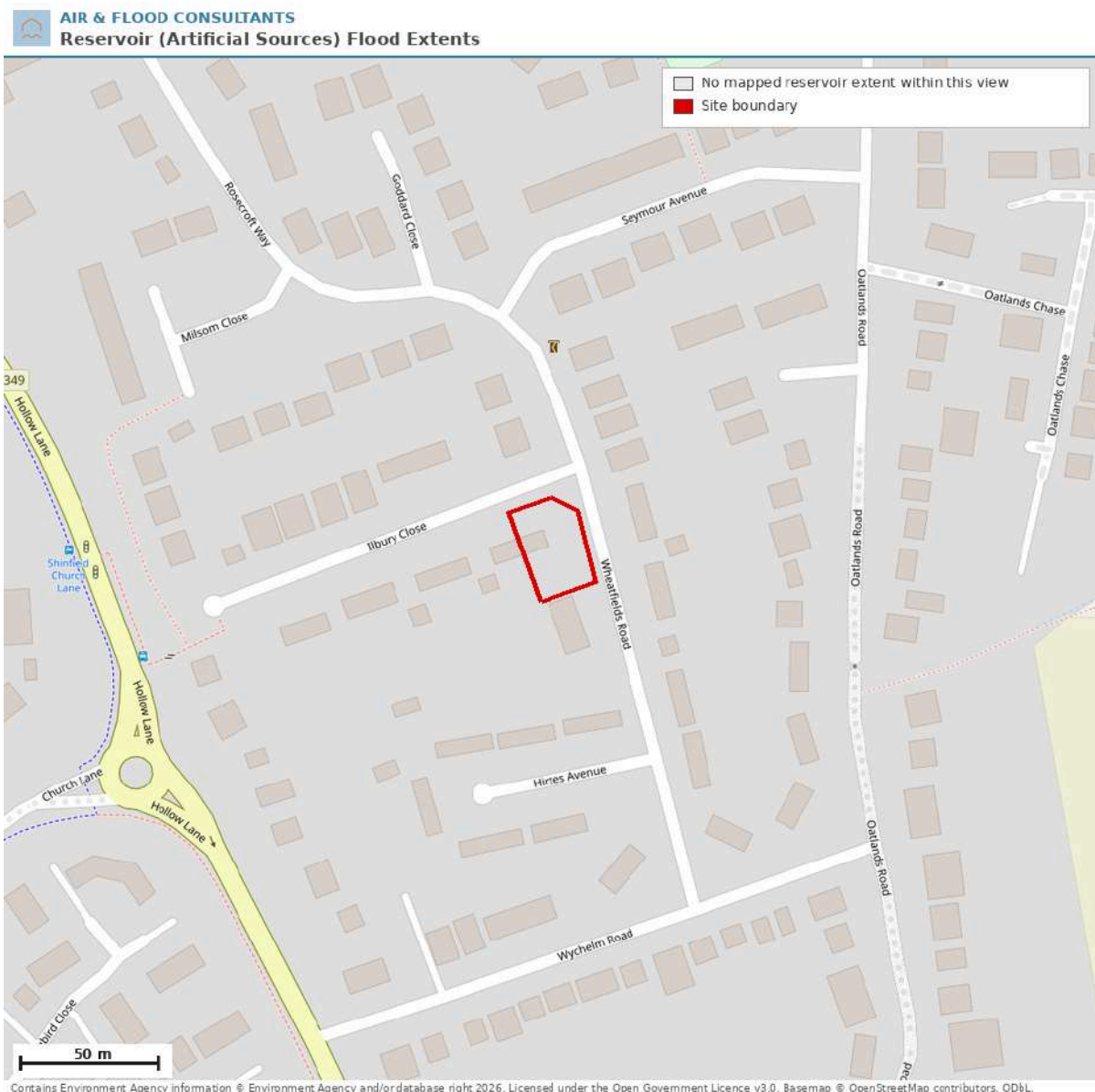


Figure 19: Reservoir (artificial sources) flood extents

The risk of flooding from reservoirs or other artificial sources is therefore considered to be **Low**.



FLOOD MITIGATION AND RESILIENCE MEASURES

It is critical to ensure that future users of the development are not exposed to flood hazards throughout the building's lifetime and that flood risk is not increased elsewhere. The following measures are proposed, categorised by the primary flood risk types defined under the National Planning Policy Framework (NPPF):

1. Pluvial Flooding – from surface water runoff and exceedance flows

Given the assessed **Medium** risk of surface water (pluvial) flooding, the following measures are proposed:

- Finished floor levels to both dwellings to be set a minimum of 150 mm above the adjacent finished external ground level, and to be confirmed in mAOD against a topographical survey of the site before construction.
- Existing ground levels across the plot to be maintained, with no lowering of levels on the western part of the site where the surface water extent is mapped.
- The overland flow route along the Wheatfields Road frontage to be kept clear of built development, boundary walls and raised landscaping, so that exceedance flows are not diverted onto neighbouring land.
- Design ground profiles to avoid local depressions and to direct runoff towards the drainage system.
- Surface water discharge to be restricted to greenfield runoff rates and volumes in accordance with Policy CC10 of the Managing Development Delivery Local Plan (2014) and the Council's SuDS Strategy, to be set out in a separate Surface Water Drainage Strategy.
- Sealed thresholds to doors and windows, with air bricks raised above the finished floor level.
- Flood resilient construction to 300 mm above finished floor level, including moisture-resistant plaster or board and sealed pipework.

2. Flooding from Sewers – including surcharge from combined or surface water systems

Given the assessed **Medium** risk of sewer flooding, the following measures are proposed:

- Install a positive pump device or non-return valve to protect against backflow.
- Ensure all new connections to public sewers include backflow prevention measures.
- Provide sealed manhole covers or raise them above known surcharge levels.
- Design plumbing layouts to minimise low-level entry points for foul water.

No specific mitigation is required for tidal, fluvial, groundwater and artificial-source flooding, each of which is assessed as **Low** risk. The resilience measures set out above nevertheless provide broad protection to both dwellings.



FLOOD WARNING AND EVACUATION PLAN

Introduction, Scope & Objective

The objective of this plan is to raise awareness of the risk of flooding at 1 Ilbury Close, Shinfield, Wokingham, RG2 9DE, to set out the flood warnings available and the estimated lead time, and to describe the evacuation procedure and the need for safe refuge. It should be issued to every occupant of both dwellings.

Flood Warnings and the Floodline Register

The site does not fall within a designated Environment Agency flood warning area. Occupants should nonetheless monitor the flood forecast and register for flood alerts where available.

Floodline Warnings Direct is a free service operated by the Environment Agency providing warnings by phone, text or email. Occupants must register at gov.uk/sign-up-for-flood-warnings or by calling Floodline on **0345 988 1188**. The Environment Agency issues warnings using the following recognised codes:

Warning code	Key message	When it is issued	Actions
Flood Alert	Flooding is possible. Be prepared.	Two hours to two days in advance of flooding.	Be prepared to act on your flood plan. Prepare a flood kit of essentials. Monitor local water levels and the flood forecast.
Flood Warning	Flooding is expected. Immediate action required.	Half an hour to one day in advance of flooding.	Move vehicles, family, pets and valuables to safety. Turn off gas, electricity and water. Deploy flood protection products. Evacuate if advised.
Severe Flood Warning	Severe flooding. Danger to life.	When flooding poses a significant threat to life.	Stay in a safe place with a means of escape. Co-operate with the emergency services. Call 999 if in immediate danger.
Warning no longer in force	No further flooding is currently expected.	When river or sea levels begin to fall.	Be careful — flood water may still be present. Do not re-enter the property until it is confirmed safe.

Estimated Flood Warning Time

The available lead time depends on the source and the catchment. EA flood warnings cover river (and, where applicable, tidal) flooding only: for larger rivers an alert may precede flooding by many hours, whereas small urbanised watercourses may give only one to two hours' notice, and no warning service exists for surface water flooding, for which the effective lead time in an intense storm may be minutes. Occupants should therefore act on the earliest available signal — a Flood Alert, a severe weather warning for rain, or observed rising water — rather than waiting for a Flood Warning. A more precise lead time is given at the point each warning is issued.



Command & Control

The building owner or their nominated responsible person holds overall responsibility for initiating and coordinating the response, and this plan should name that role on issue. On receipt of a flood alert or warning they will review the warning, recent weather and the estimated impact time, and decide whether to deploy flood protection, evacuate, or both. Where any occupant has a sensory or mobility impairment, warnings will be communicated directly and additional time allowed for assisted evacuation.

Access, Egress and the Evacuation Route

The site lies outside the current Flood Zone 2 and 3 extents; a walked evacuation route is not required by zone membership. Retain warning arrangements for surface water.

Flood Hazard on the Access Route

The hazard on the access route has been sampled against the Environment Agency Risk of Flooding from Surface Water (NaFRA2) hazard mapping across the site and a 50 m surround. Within 50 m of the site a hazard rating of 0.75 or greater is recorded at High likelihood over 216.2 m², and at Low likelihood over 50.8 m² within 25 m. On the site itself the highest rating recorded is 0.5 or greater, at Low likelihood under present-day conditions and at Medium likelihood over 110.5 m² with a climate change allowance. The classification of these ratings is set out under Flood Hazard to People.

Safe Refuge

In a no-notice event, or where the evacuation route has become impassable, occupants should move to an upper floor of the building, above the design flood level, take a charged mobile phone and the flood kit, and call 999. The proposed development retains habitable accommodation at first-floor level and therefore provides an inherent place of safe refuge.

Flood Protection Measures

- Demountable flood barriers to be available for all ground-floor external doors, providing protection to at least 600 mm above external ground level;
- Barriers to be stored in a readily accessible location within the dwelling and deployed on receipt of a flood warning;
- Non-return valves to be fitted to all drainage connections to prevent backflow;
- Air bricks to be of the automatically-sealing type or fitted with removable covers.

Reoccupation of the Site

The property must not be reoccupied until it is confirmed safe. Electrical systems are to be inspected by a qualified electrician and the gas supply checked by a Gas Safe registered engineer before reinstatement. Flood debris and contaminated materials are to be removed, and all flood-affected surfaces cleaned and disinfected. Depending on severity, reoccupation may take from 24 hours to several days.



Plan Review

This plan is owned and maintained by the homeowner. It will be reviewed annually, following any flood event affecting the site, on any change of occupancy, and following any update to Environment Agency flood mapping or warning systems.



FLOOD HAZARD TO PEOPLE

The Defra and Environment Agency **Flood Risks to People** research (FD2320 and FD2321) provides a method for assessing the danger that floodwater presents to people. The flood hazard rating is expressed as:

$HR = d \times (v + 0.5) + DF$, where d is the depth of flooding (m), v is the velocity of floodwaters (m/s) and DF is a debris factor.

The resulting hazard rating is classified as follows:

Hazard rating (HR)	Degree of hazard	Description
Less than 0.75	Low	Caution — flood zone with shallow flowing water or deep standing water
0.75 – 1.25	Moderate	Danger for some — includes children, the elderly and the infirm
1.25 – 2.0	Significant	Danger for most — includes the general public
Over 2.0	Extreme	Danger for all — includes the emergency services

The Environment Agency publish this calculation as part of the Risk of Flooding from Surface Water (NaFRA2) mapping, applied to the modelled depth and speed at each point. The published layers are thresholds: each one maps how likely a flood at or above a given hazard rating is, expressed as a likelihood of **High** (a 3.3% or greater chance in any given year), **Medium** (between 1% and 3.3%) or **Low** (between 0.1% and 1%). Ground outside the mapped extent falls in the Environment Agency's Very Low band. The Environment Agency national mapping applies a debris factor of 0.5 for depths up to 0.25 m and 1.0 above it, irrespective of land use.

Across the site the highest hazard rating mapped is **0.5 or greater**, over approximately 336.0 m² of the plot, at a **Low** likelihood, that is between a 0.1% and a 1% chance in any given year. No reading at or above the 0.75 threshold is recorded within the site boundary in either the present-day or the climate change mapping. The hazard on the plot therefore falls in the **Low** class: caution, shallow flowing water or deep standing water. The hazard extents are shown in Figure 20.

Allowing for climate change, the Environment Agency mapping records a hazard rating of **0.5 or greater** over approximately 438.2 m² of the site at a **Medium** likelihood, between a 1% and a 3.3% chance in any given year. The 0.75 threshold is still not reached within the site boundary. The effect of climate change at this site is therefore to raise the frequency of the hazard rather than its severity.

Beyond the site boundary the mapping records higher ratings. Within 25 m a rating of **0.75 or greater**, the danger for some threshold, is recorded at a Low likelihood over approximately 50.8 m², and within 50 m at a High likelihood over approximately 216.2 m². A rating of **1.25 or greater**, the danger for most threshold, is recorded within 50 m at a Medium likelihood over approximately 18.0 m². With a climate change allowance the corresponding areas are approximately 631.8 m² at a High likelihood for the 0.75 threshold and approximately 34.5 m² at a High likelihood for the 1.25 threshold. The governing flow path lies in the adjoining highway rather than on the plot.



The current EA Risk of Flooding from Surface Water (NaFRA2) Hazard layers apply the FD2320 expression cell by cell to simultaneous modelled depth and speed, so they are the hazard evidence and no hand calculation is offered alongside them. Combining the deepest water anywhere on a site with the fastest water anywhere on it would pair values that do not occur together. Note also that the EA national mapping uses a debris factor of 0.5 below 0.25 m depth where FD2321 Table 3.1 gives 0.0 in an urban setting, so an FD2321 hand calculation sits below the EA rating in shallow water.

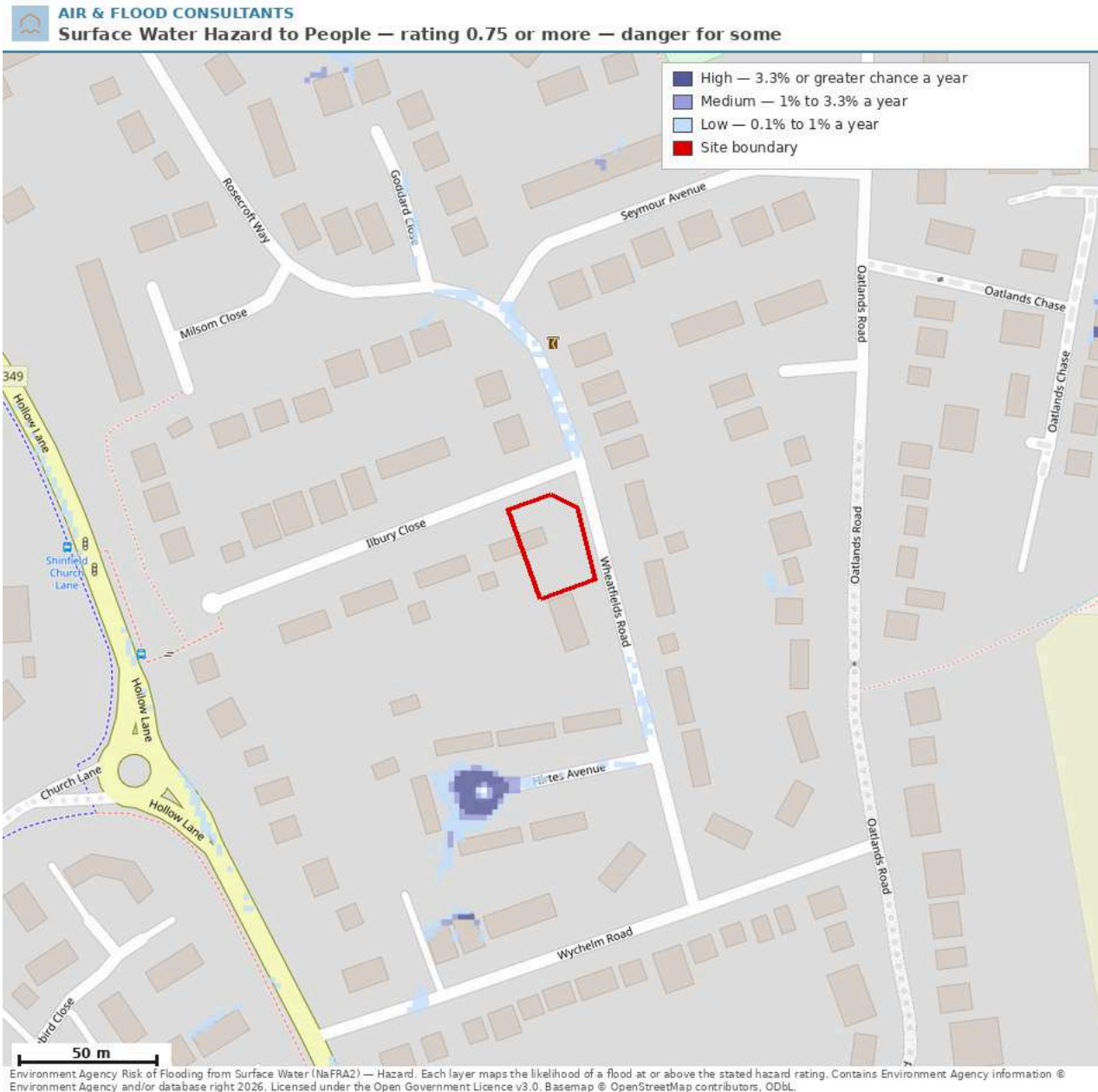


Figure 20: Surface water hazard to people — likelihood of a hazard rating of 0.75 or more (Environment Agency, NaFRA2)

On this basis the flood hazard on the plot itself remains below the danger for some threshold in both the present-day and the climate change mapping, and is classified as **Low**: caution. Floodwater in the adjoining



highway reaches the danger for most classification over approximately 18.0 m² within 50 m of the site, so evacuation on foot during the event is not appropriate. Occupants are to remain within the building at a level above the modelled flood depth until the water has receded or the emergency services advise otherwise. The layout is to keep habitable accommodation and access clear of the mapped flow route so far as practicable.



SUDS STRATEGY

Introduction

Sustainable Drainage Systems (SuDS) are designed to replicate the natural drainage processes of a site before development. By managing rainfall close to where it falls, SuDS reduce both the quantity and rate of surface water runoff and, in doing so, lower the risk of flooding. Additionally, they enhance water quality and provide wider environmental benefits including amenity and biodiversity gains.

The SuDS management train considers three core objectives: flood risk reduction, pollution control, and landscape/ecosystem enhancement. Disposal of surface water should follow the SuDS hierarchy, in decreasing order of preference:

- Discharge to ground (infiltration and re-use);
- Discharge to a surface water body;
- Discharge to a surface water sewer;
- Discharge to a combined sewer (as a last resort).

The philosophy of SuDS is to manage runoff as close to source as possible, while also improving water quality before discharge. The benefits of this approach include:

- Reduction of runoff rates, thereby reducing downstream flood risk;
- Reduction in pollutant loading to watercourses;
- Support for groundwater recharge where appropriate;
- Improved visual and recreational amenity;
- Creation of ecological niches for biodiversity in developed areas.

Existing Drainage

The existing dwelling drains to the public sewer network operated by Thames Water. 189.6 m² of the 750 m² plot, 25.3%, is impermeable, comprising the dwelling footprint and its access and parking. The remaining 560.7 m² is garden and soft landscaping.

Proposed Drainage

In accordance with the National Planning Policy Framework (NPPF) and best practice guidance, the proposed development at 1 Ilbury Close, Shinfield, Wokingham, RG2 9DE will incorporate a Sustainable Drainage System (SuDS). This system has been designed to manage rainfall on-site, reduce surface water runoff, and ensure that flood risk is not increased on or off-site.

The proposed layout increases the impermeable area to 220.9 m², 29.5% of the site, an increase of 31.3 m² over the existing condition. Against that increase, 159.8 m² of permeable paving is introduced to the parking and access areas, and 368.8 m² of the plot is retained as garden.

Drawings illustrating the proposed drainage layout and features are provided in Appendix D.



Site Specific SuDS

The selection of SuDS features for the development at 1 Ilbury Close, Shinfield, Wokingham, RG2 9DE has been guided by site-specific opportunities and constraints, as well as the principles outlined in the CIRIA SuDS Manual (C753). The objective is to apply the SuDS management hierarchy as far up the hierarchy as possible, while acknowledging feasibility based on site layout, geology, and drainage requirements.

As outlined in the CIRIA SuDS Manual (C753), open surface SuDS are generally preferred to subsurface or end-of-pipe solutions because:

- They offer greater visibility, allowing for easier inspection and maintenance;
- Malfunctions can be more readily identified and rectified;
- They often provide added biodiversity, amenity, and aesthetic value to developments.

The table below provides a summary of the SuDS options considered, along with their suitability for this development:

SuDS Feature	Description	Suitability / Comment
Rainwater harvesting (water butts)	Re-use of rainwater for non-potable use.	A water butt of at least 200 litres is proposed to each rainwater downpipe, providing re-use for garden watering at the top of the drainage hierarchy. Both dwellings have private gardens, so a demand exists.
Pervious pavements	Permeable surfacing to allow water to infiltrate through construction layers.	159.8 m ² of permeable paving is proposed to the parking and access areas, with a 300 mm sub-base providing 12.0 m ³ of storage. The paving also receives runoff from the roofs, a contributing ratio of 1.4:1, within the 2:1 guidance. The sub-base provides the infiltration surface, subject to the soakage testing described under Design and Modelling Criteria.
Trees	Intercept rainfall and promote infiltration via soft landscaping.	368.8 m ² of the plot, 49% of the site area, is retained as garden and soft landscaping. Tree and shrub planting within it provides interception and evapotranspiration at source.
Proprietary treatment systems	Prefabricated treatment devices (e.g., catchpits, silt traps).	A silt trap and catchpit are proposed upstream of the outfall to retain sediment and to give a maintainable access point. No dedicated treatment unit is required for the clean runoff profile of domestic roofs and lightly trafficked paving.



SuDS Feature	Description	Suitability / Comment
Rainwater planters	Downpipe-fed planters that store, treat and evapotranspire roof runoff before slow release.	Viable where a downpipe meets paving beside a wall. Held as a fallback should the water butts prove insufficient to meet the interception objective; not required by the current layout.
Bioretention systems	Vegetated depressions (e.g., rain gardens) to store and treat runoff.	A rain garden could be formed in the garden strip beside the permeable paving. Held in reserve: the low permeability of the London Clay would require an underdrain, and the paving sub-base already provides the required storage.
Attenuation storage tanks	Below-ground tanks to hold back runoff.	Geocellular storage beneath the garden is held as the fallback should soakage testing not support the modelled infiltration rate, alongside tanking the paving and deepening its sub-base. Not proposed at this stage, as surface and sub-base storage is preferred under WokBC-LS20.
Infiltration systems	Soakaways and boreholes allow runoff to percolate into the ground.	Adopted at shallow depth only, through the permeable paving sub-base. Deep soakaways are not viable: the site is underlain by the London Clay Formation with no superficial deposits, and the screening returns Low Infiltration Potential across the whole site. The screening does leave shallow systems with a formation 0.5 m to 1 m below ground potentially feasible, and the paving is designed on that basis, subject to confirmation by BRE Digest 365 soakage testing.
Green roofs	Vegetated roofs that reduce discharge rates and provide ecological benefits.	The proposed roofs are pitched at 33 degrees (drawing KICR PL-402). A sedum system is not appropriate to that pitch, and no flat roof is proposed.
Blue roofs	Temporary roof-level stormwater attenuation.	Blue roofs require a flat roof designed to retain water. No flat roof is proposed.
Swales	Grass channels to convey and treat surface water.	A swale requires a linear run with fall and a downstream outfall. The developable area outside the building footprints and parking is 368.8 m ² of garden across a 2.2% gradient, which does not accommodate one.



SuDS Feature	Description	Suitability / Comment
Filter drains	Gravel-filled trenches to convey or infiltrate surface water.	A filter drain would serve the same function as the permeable paving sub-base, which already provides both the storage and the infiltration surface for this catchment, and there is no separate contributing area for one to drain.
Detention basins	Temporary storage basins for runoff during storm events.	A basin sized for this catchment would occupy a substantial share of the private garden serving two family dwellings. Space precludes it.
Ponds & wetlands	Permanent open water features for amenity and biodiversity.	Permanently wet features are not proposed in private domestic gardens on health and safety grounds, and the site has no baseflow to maintain a permanent pool.
Filter strips	Grass strips that slow runoff, encourage sedimentation.	A filter strip requires sheet flow across a gently graded vegetated margin upstream of a receiving feature. The layout drains to a piped connection rather than to a surface feature, so no strip can be positioned to serve it.

Strategy Summary

Surface water from the roofs and the paved areas is to be conveyed to the permeable paving sub-base, which provides 12.0 m³ of storage and infiltrates to the underlying ground where conditions allow. The residual discharges to the combined sewer in Wheatfields Road. Water butts to each downpipe provide re-use at source.

Surface Water Drainage Strategy

The proposed drainage layout is presented in Appendix D. To prevent sedimentation and maintain system performance, all SuDS elements and associated drainage infrastructure will be protected through the inclusion of catchpits and silt traps, incorporated into inspection chambers, gullies, and connecting pipework.

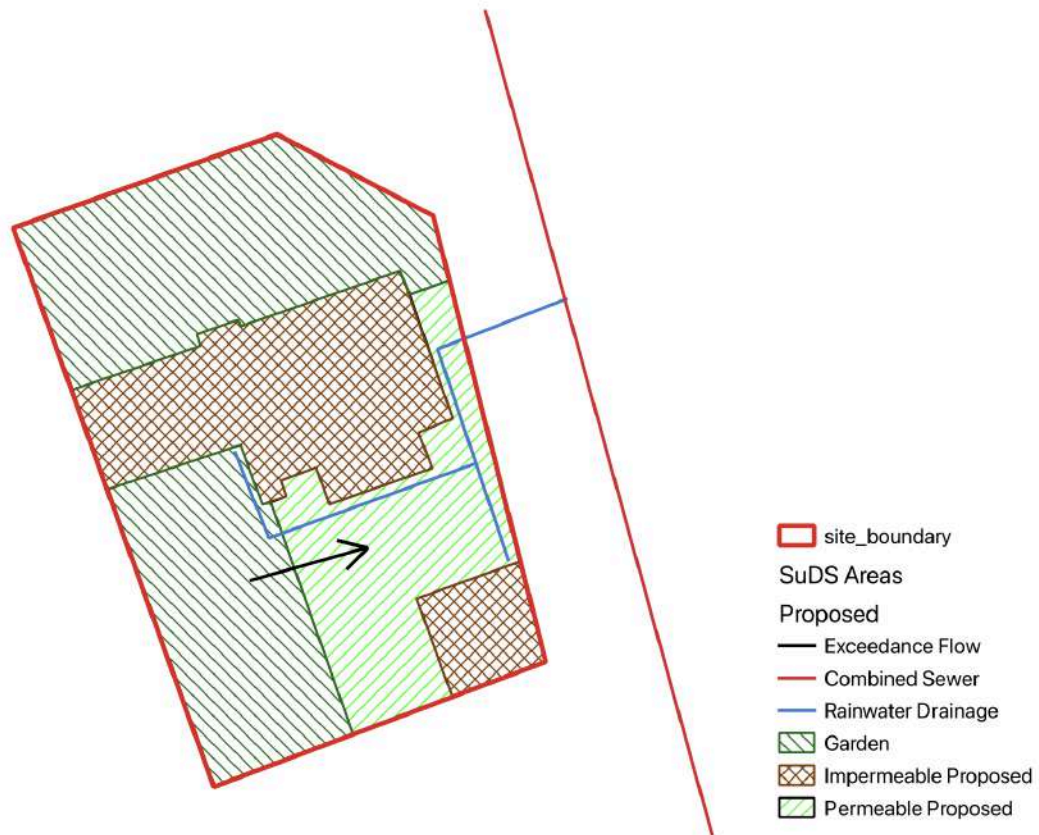


Figure 21: Proposed SuDS layout — permeable paving and proposed impermeable areas

Runoff Calculations

- Total site area: Approx. 750.0 m²
- Existing impermeable area: Approx. 189.6 m²
- Proposed impermeable area: Approx. 220.9 m²
- Proposed permeable (paving) areas: Approx. 159.8 m²
- Proposed landscaping areas: Approx. 368.8 m²

The table below compares pre- and post-development runoff rates, including the greenfield runoff baseline.

- Existing and Proposed peak runoff rates were calculated using the HR Wallingford StopUP Interception Tool (model version 1.2.5), run on networks built directly from the digitised surface polygons.
- Greenfield rates are derived using the IH124 methodology with FSSR14 regional growth curves, computed in the HR Wallingford uksuds greenfield runoff rate estimation tool (model version 2.2.3).

Water Disposal Hierarchy

The water disposal hierarchy recommended by the Lead Local Flood Authority (LLFA), the sewerage undertaker, the SuDS Manual (CIRIA C753), and national planning guidance follows the order:

- Re-use at source



- Infiltration to ground
- Discharge to watercourse
- Discharge to surface water sewer
- Discharge to combined sewer (only if no alternatives are available)

This hierarchy ensures surface water runoff is managed as close to its source as possible, mimicking the site's natural (predevelopment) hydrological response. The proposed development complies with this hierarchy, as summarised below:

Discharge Method	Comment
Rainwater re-use at source	Adopted in part. Water butts to each downpipe serve garden watering. The demand of two dwellings does not justify a rainwater harvesting system with a treated supply.
Infiltration to the ground	Adopted in part. Deep soakaways are not viable in the London Clay, but the permeable paving sub-base infiltrates at shallow depth where ground conditions allow. The assumed rate requires confirmation by BRE Digest 365 testing at detailed design.
Discharge to a surface water body	Not available. The nearest ordinary watercourse lies approximately 180 m east of the site and the nearest Main River approximately 1.01 km east-south-east. No connection can be made across intervening third-party land.
Discharge to a surface water sewer	No separate surface water sewer has been identified in Wheatfields Road. The position is to be confirmed with Thames Water at detailed design; a separate sewer would be adopted in preference to the combined sewer if one is found.
Discharge to a combined sewer	Adopted for the residual. Surface water not infiltrated is to discharge via the existing connection to the combined sewer in Wheatfields Road through a flow control, after attenuation in the permeable paving sub-base.

Peak Flow and Volume Control

Attenuation Storage

12.0 m³ of storage is provided in the permeable paving sub-base, calculated as 159.8 m² at a depth of 300 mm and a design porosity of 0.25. The sub-base both attenuates runoff and provides the infiltration surface; where soakage testing does not support the modelled infiltration rate, the same footprint accepts a deeper sub-base or a tanked construction with a flow control.

The greenfield runoff rate for the site is 0.3 l/s in the 1 in 1-year event, rising to 0.8 l/s in the 1 in 30-year and 1.1 l/s in the 1 in 100-year event. Rates of this order cannot be delivered by any practical flow control: the smallest orifice that avoids blockage passes several litres per second. No restriction to greenfield rates is therefore proposed. The strategy instead delivers substantial betterment against the existing discharge, reducing the 1 in 100-year peak from 10.06 l/s to 2.24 l/s, a reduction of 78%. With a 40% climate change allowance the proposed peak is 2.79 l/s, still 72% below the existing rate without any allowance for climate



change. The modelling reports no flooding from the drainage system in any event run, including the 1 in 100-year event with the climate change allowance.

Water Quality

The SuDS strategy manages water quality through source control. All surfaces will be treated through filtration, infiltration or sediment control structures (e.g. catchpits and silt traps).

The first 5 mm of rainfall — which contains the highest concentration of pollutants — will be retained and treated on-site as far as practicable, ensuring that water leaving the site meets acceptable quality standards.

In accordance with SuDS Manual guidance, the following levels of treatment have been applied based on surface types:

- Roofs – 1 level of treatment (e.g. infiltration, filtration through permeable surfaces).
- Pedestrian areas and lightly trafficked roads – 2 levels of treatment.
- Distribution roads (if applicable) – 3 levels of treatment (e.g. permeable paving, catchpits, soakaways).

Surface runoff from the proposed surfaces will receive:

- Roofs — one treatment stage is required. The silt trap upstream of the outfall provides it.
- Parking and access paving, lightly trafficked — two treatment stages are required. The permeable paving surface and sub-base provide the first, and the silt trap and catchpit the second.

Amenity and Biodiversity

The SuDS Manual (CIRIA C753) sets four design pillars — water quantity, water quality, amenity and biodiversity — and expects a scheme to be judged against all four. On a constrained urban plot the amenity and biodiversity gains are necessarily modest, and it is more honest to state what they are than to claim a wider benefit the site cannot deliver.

SuDS pillar	Measures	Outcome
Water quantity	159.8 m ² permeable paving, 300 mm sub-base at 0.25 design porosity (12.0 m ³), infiltrating at shallow depth; restricted outfall; 368.8 m ² garden retained.	The 1 in 100-year peak discharge falls from 10.06 l/s existing to 2.24 l/s proposed, a reduction of 78%, and to 2.79 l/s with a 40% climate change allowance. 368.8 m ² of the plot, 49% of the site area, is retained as garden and continues to contribute no piped runoff. No flooding from the drainage system is reported in any modelled event.



SuDS pillar	Measures	Outcome
Water quality	Permeable paving surface and sub-base; silt trap and catchpit upstream of the outfall.	Two treatment stages are provided to the parking and access paving and one to the roofs, meeting the CIRIA C753 simple index requirement for these surfaces. The permeable paving surface and sub-base give the first stage and a silt trap and catchpit upstream of the outfall the second. No dedicated treatment unit is required for the clean runoff profile of domestic roofs and lightly trafficked paving.
Amenity	Drainage integrated into the parking and access surface; water butts to each downpipe; no open water.	The drainage is integrated into surfaces the occupants use rather than occupying garden space. The permeable paving serves as the parking and access area, and water butts to each downpipe give a visible, usable water supply for the gardens. No open water is proposed, which suits two family dwellings.
Biodiversity	368.8 m ² of garden retained with tree and shrub planting; permeable rather than sealed frontage.	368.8 m ² of garden and soft landscaping is retained, with tree and shrub planting proposed within it. Planting provides interception, evapotranspiration and habitat, and the permeable surfacing avoids the sealed forecourt that would otherwise replace the existing garden frontage.

The strategy is assessed against the four pillars of sustainable drainage design set out in the CIRIA SuDS Manual (C753): water quantity, water quality, amenity and biodiversity. The proposals respond to each as set out below.

Design and Modelling Criteria

The drainage system has been designed to accommodate a 1 in 100-year storm event with a 40% climate change allowance, in line with current Environment Agency guidance (a 40% allowance for climate change, as required by local standard WokBC-LS11 of the Wokingham Borough Council SuDS Strategy for long-term storage in the 1 in 100-year event).

Supporting calculations, presented in Appendix C, confirm that the proposed SuDS infrastructure is sufficient to manage all runoff volumes generated by the critical design storm. Hydraulic modelling assumptions include:

- PAF (Proportion of Area Flowing): 1.0 for impermeable areas; 0.25 for permeable areas (reflecting infiltration loss);
- Catchment runoff coefficient (Cv): 1.0 applied for both winter and summer conditions;



- Urban creep: no additional allowance made, due to application of maximum PAF.

Infiltration has been screened using the Air & Flood Consultants infiltration potential model, which returns Low Infiltration Potential across 100% of the site with moderate confidence. Ten British Geological Survey borehole logs were read and classified over the 0.5 m to 3.0 m soakaway zone; the site is underlain by the London Clay Formation with no superficial deposits recorded. The screening rules out deep soakaways, but expressly leaves shallow systems with a formation 0.5 m to 1 m below ground, such as permeable paving, as potentially feasible. The permeable paving has therefore been modelled as an infiltrating system, with site infiltration rates of 1×10^{-6} m/s to 1×10^{-5} m/s (after Bettess, 1996). That range sits above the band the screening indicates for London Clay, and it is the single assumption on which the modelled discharge rates depend. Soakage testing to BRE Digest 365, with winter groundwater monitoring, is required at detailed design to confirm it. Should testing not support the modelled rate, the paving is to be tanked and the sub-base storage deepened, or geocellular storage added beneath the garden, with a flow control at the outfall sized to the rate then agreed with the Lead Local Flood Authority. The 160 m² of paving and the space available in the garden are sufficient for either outcome.



AIR & FLOOD CONSULTANTS

SuDS Infiltration Potential Screening (indicative)

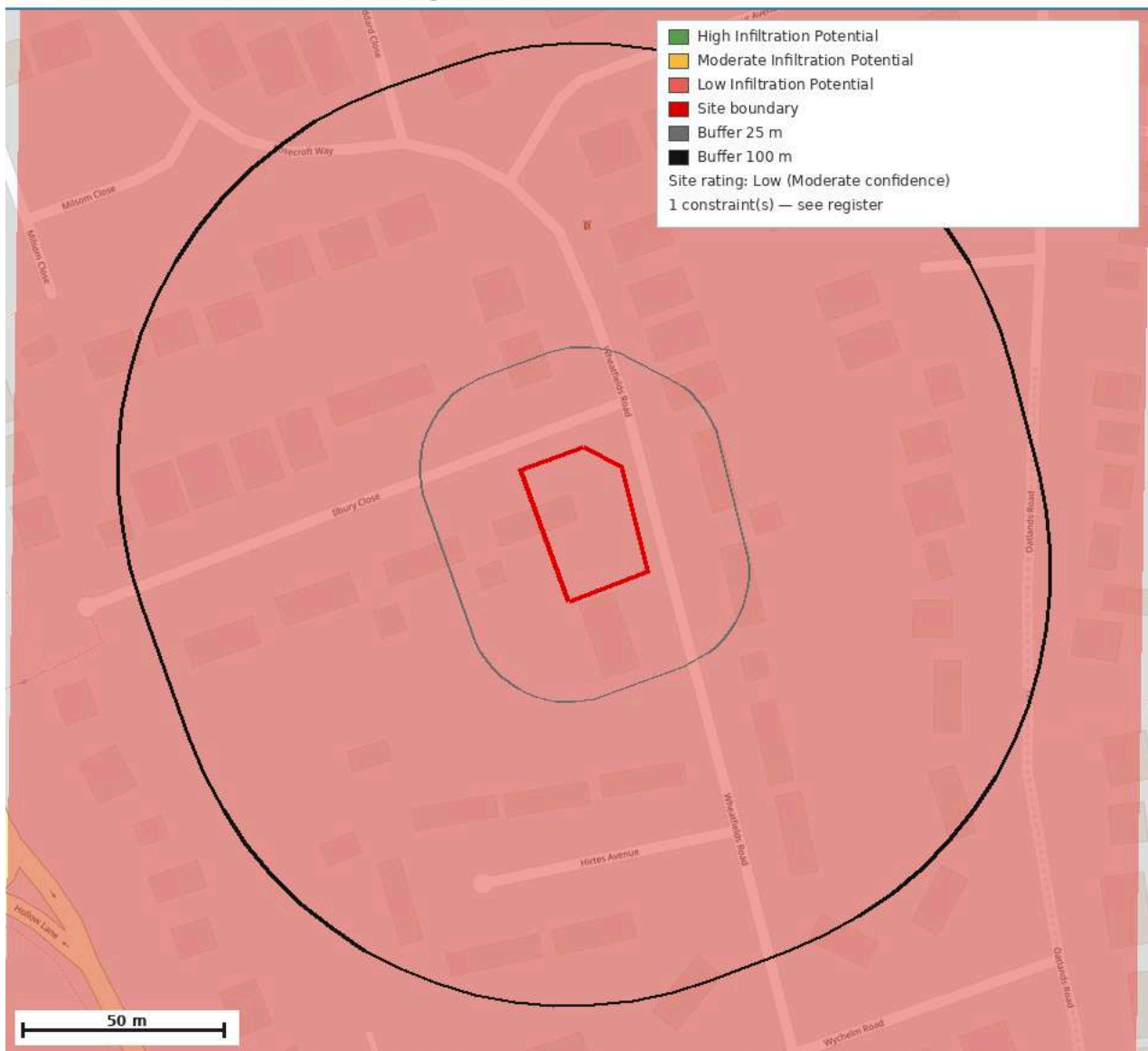


Figure 22: AFC infiltration potential screening

Surface Water Modelling

Peak discharge rates have been established using the HR Wallingford StopUP Interception Tool (model version 1.2.5), which routes each contributing area through the proposed drainage features and applies FEH22 design rainfall with a soil moisture and depression storage runoff model. Two networks were built directly from the digitised surface polygons, so the model uses the same geometry as the figures in this report. The baseline network carries the existing impermeable area of 190 m² to the sewer with no drainage features. The proposed network carries the 221 m² of roof and hardstanding to the 160 m² permeable paving store, and from there to the sewer. Storms of 60 and 1,440 minutes duration were run at each return period; the 60-minute storm is



critical in every case. Catchment parameters were set for the site: latitude 51.409, catchment slope 2.2% from Environment Agency LiDAR, and a relatively impermeable soil type consistent with the WRAP class 4 classification. The paving was modelled with site infiltration rates of 1×10^{-6} m/s to 1×10^{-5} m/s, subject to the confirmation set out above.

Return Period	Existing Peak Runoff Rate [l/s]	Greenfield Runoff Rate [l/s]	Proposed Peak Runoff Rate [l/s]	Betterment from existing (%)
1 in 1 year	1.9	0.3	0.1	96%
1 in 30 years	7.7	0.8	1.8	76%
1 in 100 years	10.1	1.1	2.2	78%
1 in 100 years (+CC)	n/a	n/a	2.8	n/a

- QBAR = 0.3 l/s

Interception is the retention of the first 5 mm of rainfall, so that no runoff leaves the site in the small, frequent events that carry most of the annual pollutant load. It is provided here at source: the water butts capture the first flush from each downpipe, and the permeable paving retains rainfall in its surface course and sub-base before any discharge occurs. The modelling reported below uses design storms rather than a long-term rainfall series, and so quantifies peak flows rather than the proportion of annual events fully retained. Where the Lead Local Flood Authority requires the interception performance to be demonstrated numerically, a continuous simulation against the 5 mm threshold can be run at detailed design.

Exceedance Flow Management

Exceedance flows in events greater than the design event are to be routed overland to the south-east across the permeable paving and towards Wheatfields Road, away from the two dwellings, following the existing 2.2% site gradient. Finished floor levels set 150 mm above the adjacent external ground level, as recommended in the flood risk assessment, provide the freeboard for this route.

Maintenance Strategy

All proposed SuDS elements and drainage infrastructure will be maintained for the full lifecycle of the development by the freehold owner of each dwelling.

A detailed maintenance schedule, in accordance with the CIRIA SuDS Manual (C753), is provided in Appendix D.



CONCLUSIONS

The site is located within **Flood Zone 1**, as identified on the Environment Agency's Flood Map for Planning. It is also assessed against the following flood sources:

- River and sea (Fluvial) — **Low** risk
- Surface Water (Pluvial) — **Medium** risk
- Groundwater — **Low** risk
- Sewer Flooding — **Medium** risk
- Artificial Sources — **Low** risk

Flood risk at the site and surrounding sites is not considered to increase as a result of the development.

The proposed development results in a increase in impermeable area from approximately **189.6 m² to 220.9 m²**.

To manage the impermeable area and support sustainable drainage, the development incorporates the following SuDS features:

- Permeable paving to 159.8 m² of parking and access areas, with a 300 mm sub-base at a design porosity of 0.25 giving 12.0 m³ of storage;
- Infiltration to ground through the permeable paving sub-base;
- Water butts of at least 200 litres to each rainwater downpipe, providing re-use for garden watering;
- 368.8 m² of garden and soft landscaping retained across the plot, 49% of the site area, with tree and shrub planting for interception;
- A silt trap and catchpit upstream of the outfall, providing sediment retention and a maintainable access point;
- A restricted outfall from the paving sub-base to the combined sewer, taking the residual discharge.

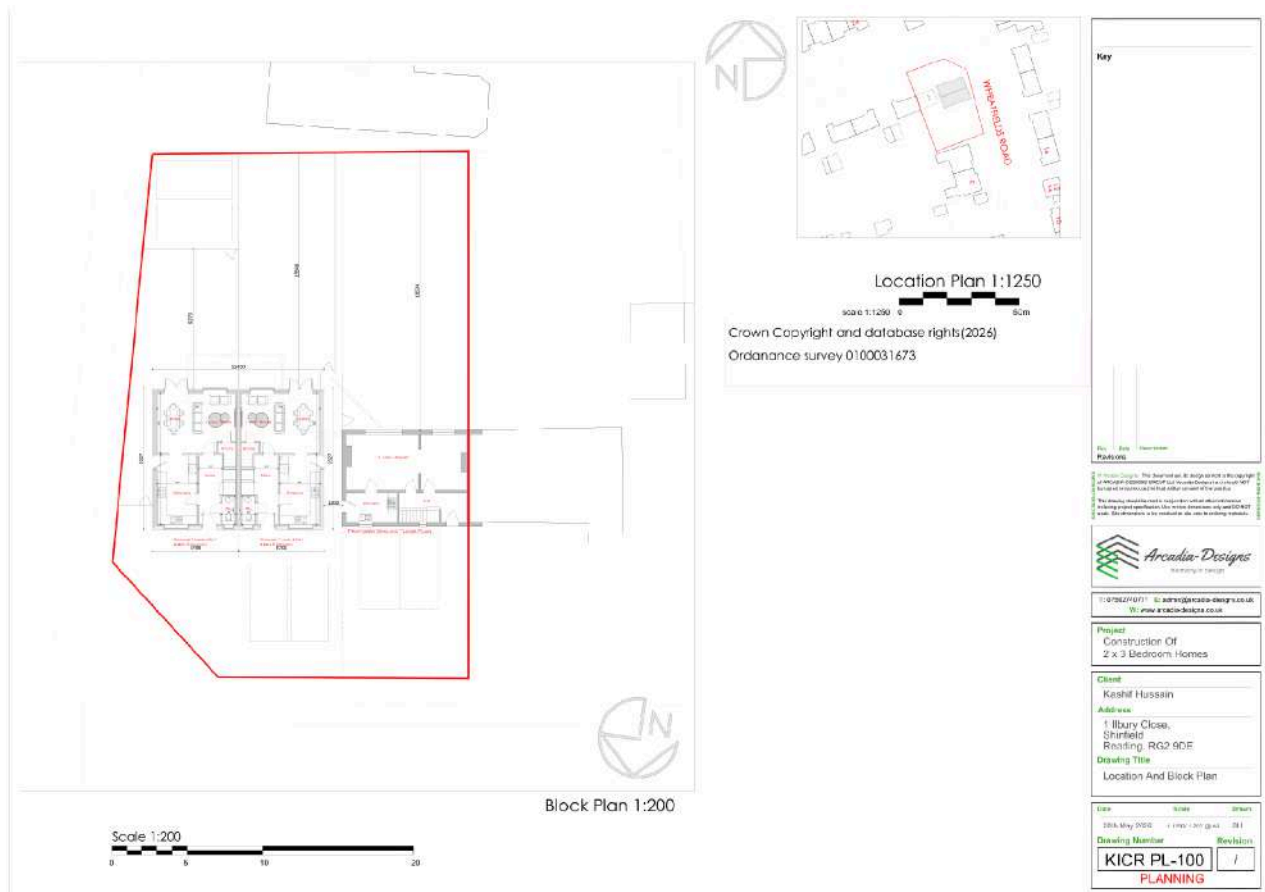
These features collectively reduce peak surface water discharge, support infiltration where soil conditions allow, and align with the drainage hierarchy. The proposed surface water network is to be designed to the 1 in 100 year storm event with an allowance of 40% for Climate Change.

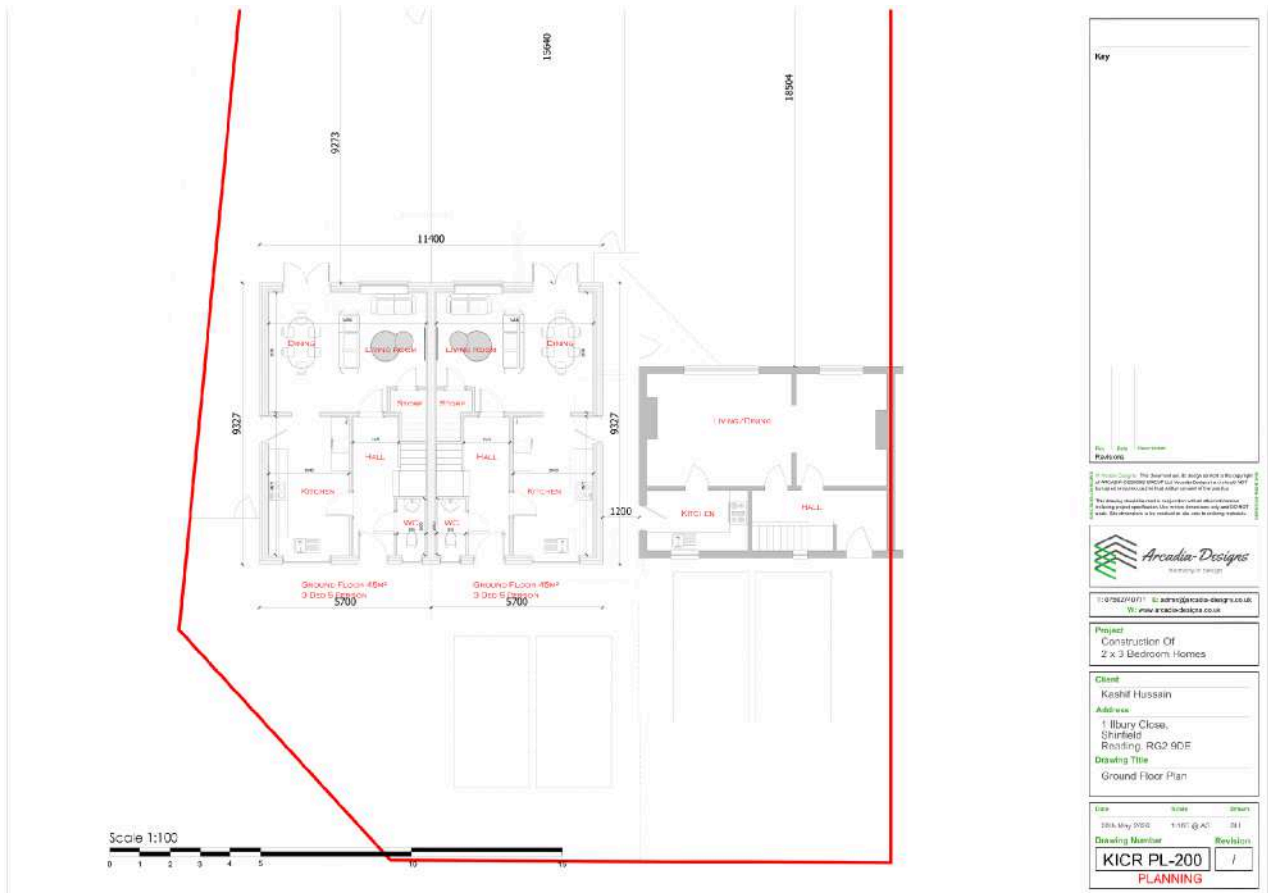
In line with the NPPF requirements, and subject to the measures outlined within this report, the proposed development is acceptable in surface water drainage terms, and surface water flood risk to the surrounding area is not increased.

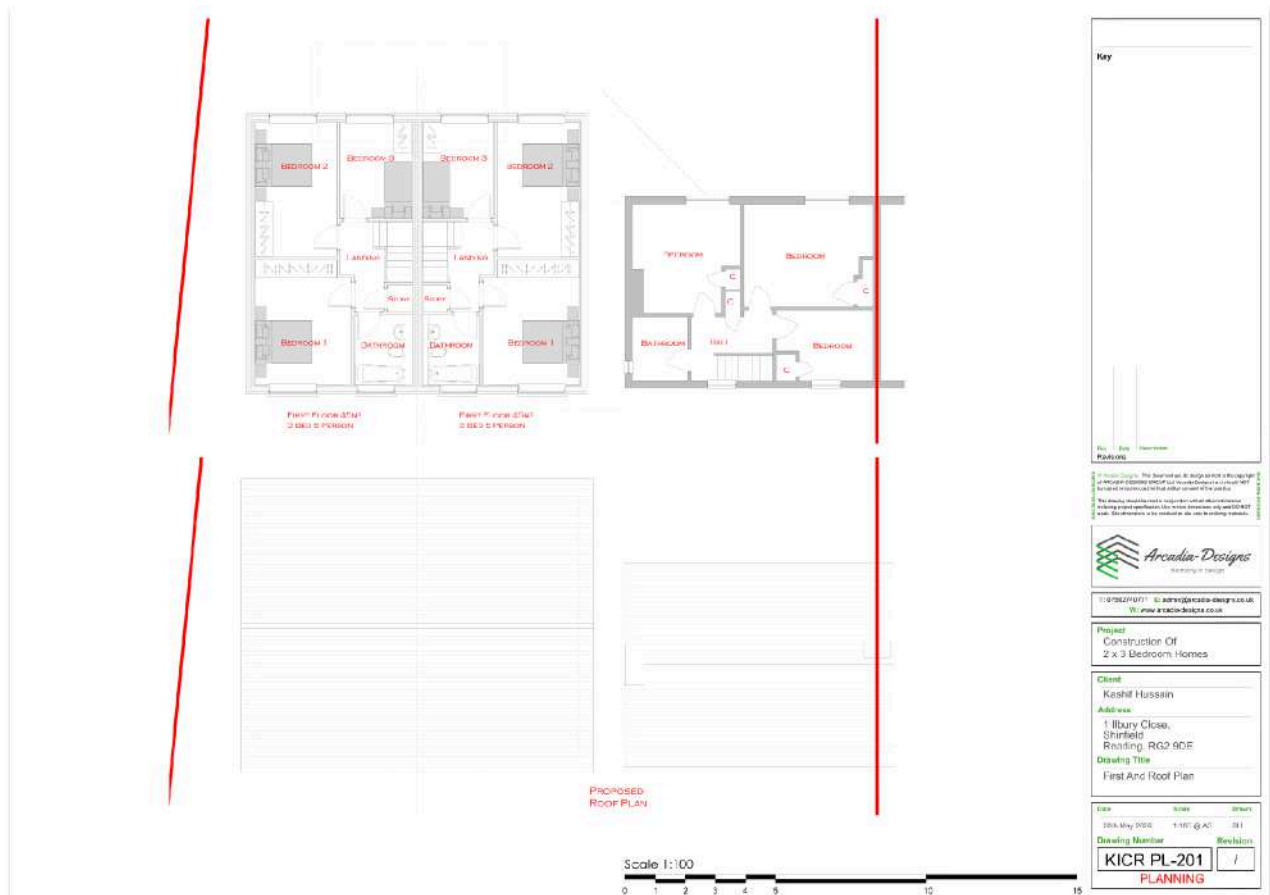


APPENDIX A – PROPOSED DEVELOPMENT DRAWINGS

The proposed development drawings prepared by the project architect are reproduced below.

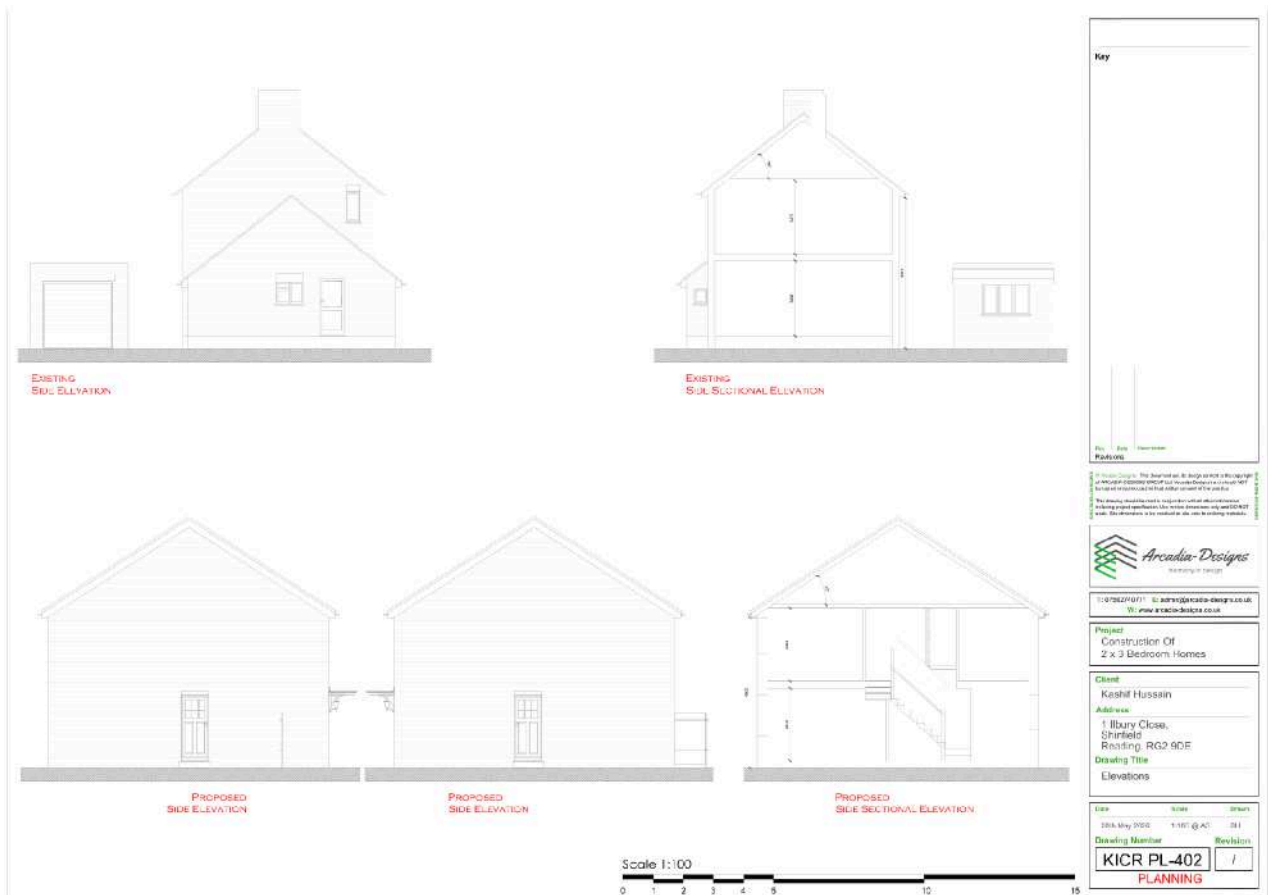














APPENDIX B – ENVIRONMENT AGENCY FLOOD MAP FOR PLANNING

The official Environment Agency Flood Map for Planning report for the site boundary is reproduced below. It was generated from the Environment Agency's Flood map for planning service for the red-line boundary assessed in this report.



Flood map for planning

Your reference	Location (easting/northing)	Created
Unspecified	473424/168288	10 August 2026 18:26

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following**:

- bigger than 1 hectare (ha)
- in an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

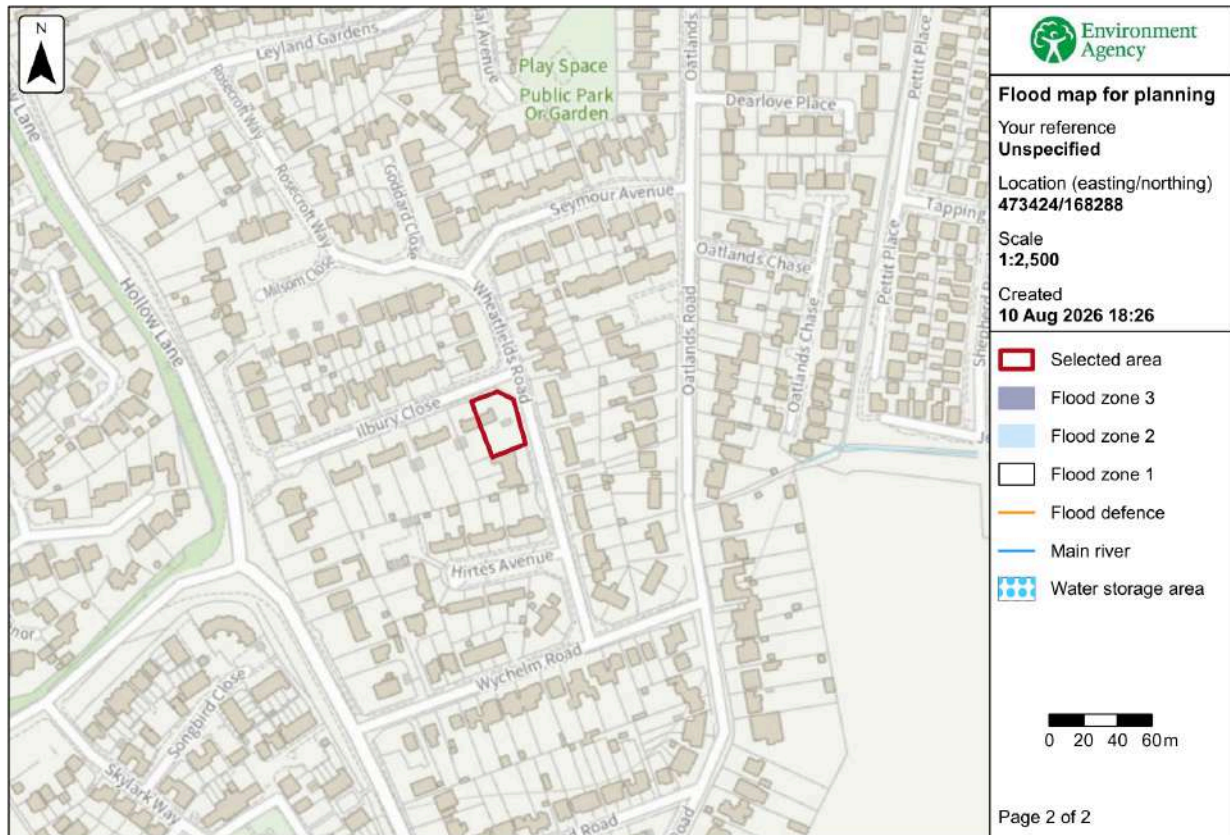
Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2026 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



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APPENDIX C – BGS BOREHOLE RECORD

The nearest British Geological Survey record to the site is **SU76NW56** ('Arborfield Horticultural Station'), approximately 262 m from the site boundary and drilled to a depth of about 100.58 m. The archived record is reproduced below and was obtained from the BGS Single Onshore Borehole Index.

British
Geological
SurveyBGS ID: 427163 : BGS Reference: SU76NW56
British National Grid (27700) : 473430, 168550

SU76 NW | 56
1343 6855
(For Survey use only: N2653
1-inch Map Registered No.)

1063 Wk 2248/284 10W 7/45 (45) F.C.B.

RECORD OF WELL (SHAFT OR BORE)

At Cutbush Lane,
Town or Village (near Reading) Shinfield
County Reading Six-inch quarter sheet 5-4-15
For the University of Reading
Exact site of well 8" H.P. Bore about XXXVII S.E. Attach a tracing from a map, or a sketch-map, if possible.
Level of ground surface above sea level (O.D.) 186.2 ft. If well-top is not at ground level, state how far ... (above: ... ft. below: ... ft.)
SHAFT — ft.; diameter — ft. Details of headings —

BORE 33.0 ft.; diameter of bore: at top 8 ins.; at bottom 4 1/2 ins. Lengths, diameters, perforations, etc., of lining tubes 8" Lining Tube 3'3" at 236.6"

Water struck at depths below well top, of (feet) 188' & 224'
Rest level of water 20.7 ft. below well-top. Suction at 200 ft. Yield on 8 hours' pumping 5000 gal. per hour, with depression 12 ft. below well-top. Capacity of pump 5000 g.p.h. Recovery to rest level in immediate hours. Date of measurements 15/3/49. Date of well 25.6.1849
Quality of water (attach copy of analysis if available)
Well made by GUTHRIE ALLSEBROOK & CO. LTD.
Information from ARTESIAN WORKS, CROWN STREET,
READING, REF. 665

Additional notes in READING.

GEOLOGICAL CLASSIFICATION	NATURE OF STRATA	THICKNESS		DEPTH	
		Feet	Ins.	Feet	Ins.
DRIFT	If measurements start below ground surface, e.g., from bottom of an existing shaft, state how far			0	0
	<u>Gravel</u>	2	0	2	0
LONDON CLAY	<u>Gravel</u>	3	6	5	6
	<u>Blue clay</u>	11	3	15	9
READING	<u>" with stones 1/2" to 1"</u>	90	3	104	0
	<u>" sandy clay</u>	23	0	140	0
RB BEDS	<u>"</u>	12	0	152	0
	<u>Hotbed clay</u>	2	0	154	0
UPPER CHALK	<u>Brown to green sand</u>	9	0	163	0
	<u>Blue to green sand</u>	2	0	165	0
	<u>Very hard reddish clay</u>	50	0	215	0
	<u>Dark sandy clay</u>	9	0	224	0
	<u>Dark sandy clay</u>	12	0	236	0
	<u>Chalk</u>	23	0	259	0
	<u>Faintly banded chalk & flints</u>	12	0	271	0
	<u>" - light flint</u>	10	0	281	0
	<u>Total depth</u>	281	0		

Visited to ensure the irrigation etc. 7.3 h.p.d. usually, at 2500 g.p.h. in dry weather (pumps) 12 h.p.d. Electric ambrosable pump. 2.7.51. 2500

Continued over leaf

BRITISH GEOLOGICAL SURVEY AND MUSEUM,
SOUTH LONDON AVENUE,
LONDON, S.W.7

Date reported 6.7.49 Conts. printed 1 New Map 1 Old Map 1 New Map 1 Old Map 1 New Map 1 Old Map 1

Contact BGS: ngdc@bgs.ac.uk

British
Geological
SurveyBGS ID: 427163 : BGS Reference: SU76NW56
British National Grid (27700) : 473430,168550

1063 Wt. 22438/0384 10m 7/45 (S1) F.B.S.

RECORD OF WELL (SHAFT OR BORE)

At Cutbush Lane,
Town or Village Shinfield Horticultural Station,
County Reading Six-inch quarter sheet 3756/E
For Mr. The University of Reading.
Exact site of well 6" Map. Grid XXXVII 3.E.
835 yds. N.E. of St. Mary's Church, Shinfield. R.D.M. 1937.
Level of ground surface 186.2 ft. If well-top is not at ground level, state how far ... above; ... below; ... ft.
SHAFT — ft.; diameter — ft. Details of headings SU76/5
BORE 330. ft.; diameter of bore: at top 8 ins.; at bottom 4 1/2 ins. Lengths, diameters, perforations, etc., of lining tubes 8" Lining tube 3'3" to 236'6".
Water struck at depths below well top, of (feet) 155' & 224'.
Rest-level of water 72'9" above well-top. Suction at 200 ft. Yield on 8 hours' pumping, 5000 gal. per hour, with depression of 4" below well-top. Capacity of pump 5000 g.p.h. Recovery to rest level in immediate hours. Date of measurements 15/2/27. Date of well July 1927.
Quality of water (attach copy of analysis if available)
Well made by GUTHRIE ALLSEBROOK & CO. LTD.
Information from ARTESIAN WORKS, CROWN STREET,
READING. REF 665.

Additional notes in READING. REF 665.

(For Survey use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA	THICKNESS		DEPTH	
		Feet	Ins.	Feet	Ins.
	If measurements start below ground surface, e.g., from bottom of an existing shaft, state how far			0	0.
	<u>Top soil.</u>	<u>2</u>	<u>0.</u>	<u>2</u>	<u>0.</u>
<u>Drift</u>	<u>Brown clay</u>	<u>3</u>	<u>6.</u>	<u>5</u>	<u>6.</u>
	<u>Gravel.</u>	<u>11</u>	<u>3</u>	<u>16</u>	<u>9.</u>
	<u>Blue clay.</u>	<u>90</u>	<u>3.</u>	<u>101</u>	<u>0.</u>
<u>LC</u>	<u>" " with stones & pebbles.</u>	<u>33</u>	<u>0.</u>	<u>140</u>	<u>0.</u>
	<u>" sandy clay.</u>	<u>12</u>	<u>0.</u>	<u>152</u>	<u>0.</u>
	<u>Mottled clay.</u>	<u>2</u>	<u>0.</u>	<u>154</u>	<u>0.</u>
	<u>Brown & green sand.</u>	<u>9</u>	<u>0.</u>	<u>163</u>	<u>0.</u>
<u>RB</u>	<u>Rock stone with "</u>	<u>2</u>	<u>0.</u>	<u>165</u>	<u>0.</u>
	<u>Very hard reddish clay.</u>	<u>50</u>	<u>0</u>	<u>215</u>	<u>0.</u>
	<u>Sand - sandy clay - clay - chalky.</u>	<u>9</u>	<u>0</u>	<u>224</u>	<u>0.</u>
	<u>Chalk.</u>	<u>12</u>	<u>0.</u>	<u>236</u>	<u>0.</u>
<u>UCA</u>	<u>Fairly hard chalk & flints.</u>	<u>20</u>	<u>0.</u>	<u>256</u>	<u>0.</u>
	<u>Chalk.</u>	<u>14</u>	<u>0.</u>	<u>270</u>	<u>0.</u>
	<u>" - little flint.</u>	<u>60</u>	<u>0.</u>	<u>330</u>	<u>0.</u>
	<u>Total depth</u>	<u>330</u>	<u>0.</u>		
	<u>Visited. In use for irrigation etc 2-3 h.p.d. normally, at 2500 gph. In dry weather (as now) 12 h.p.d. Electric submersible pump. 2.7.59. RBK.</u>				
	Continued over leaf				

GEOLOGICAL SURVEY AND MUSEUM, SOUTH KENSINGTON, LONDON, S.W.7.	Date received <u>12.7.47</u>	Correspond- ence File No.	1" N.S. Map No. <u>26S</u>	1" O.S. Map No.	Site marked (use symbol) on 1" Map <u>0</u>	on 6" Map <u>0</u>
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Contact BGS: ngdc@bgs.ac.uk



British
Geological
Survey

BGS ID: 427163 : BGS Reference: SU76NW56
British National Grid (27700) : 473430,168550

(For Survey use only)
GEOLOGICAL
CLASSIFICATION

NATURE OF STRATA (Continued)

THICKNESS

DEPTH

Feet

Ins.

Feet

Ins.

27



268
424

Agricultural Station, Shinfield This is TWA 40/5
University of Reading

This bore is still used for irrigation purposes. It is now surrounded
by houses but the University retains a right of way. It pumps to a
reservoir in the station & thence to distribution points. Detailed bore
details copied by station manager.

Sent 29/1/79.

ADDITIONAL NOTES

Contact BGS: ngdc@bgs.ac.uk



APPENDIX D – SUDS MAINTENANCE PLAN

Operation and Maintenance Requirements for RWH Systems

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Inspection of the tank for debris and sediment build-up, inlets/outlets/withdrawal devices, overflow areas, pumps, filters	Annually (and following poor performance)
Regular maintenance	Cleaning of tank, inlets, outlets, gutters, withdrawal devices and roof drain filters of silts and other debris	Annually (and following poor performance)
Occasional maintenance	Cleaning and/or replacement of any filters	Three monthly (or as required)
Remedial actions	Repair of overflow erosion damage or damage to tank	As required
Remedial actions	Pump repairs	As required

Operation and Maintenance Requirements for Pervious Pavements

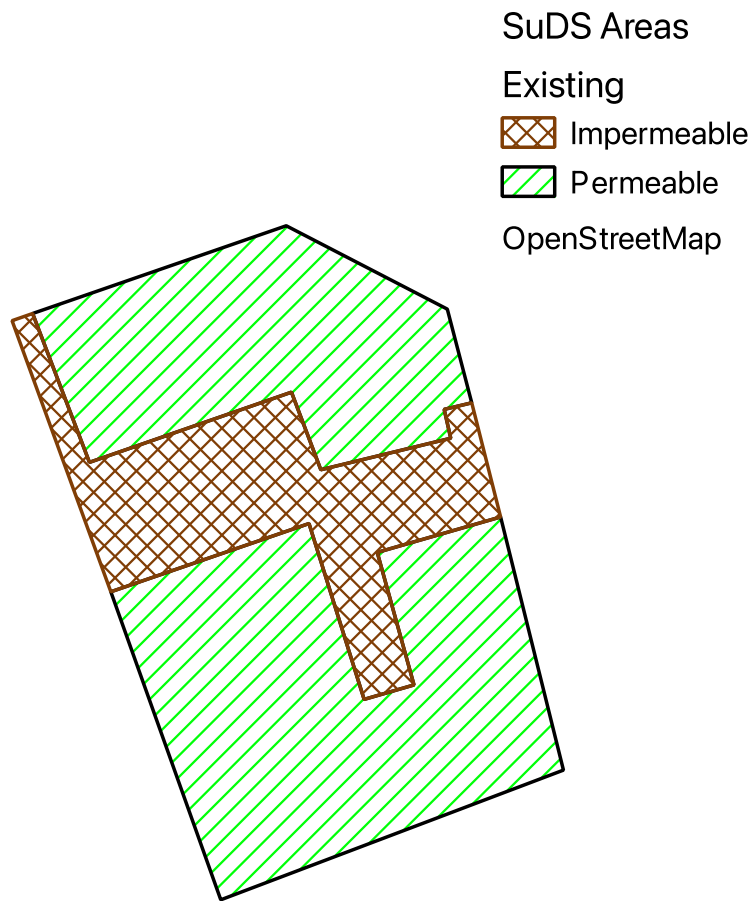
Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
Occasional maintenance	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required



Maintenance Schedule	Required Action	Typical Frequency
Remedial actions	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
Remedial actions	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (where inspection shows clogging has reduced infiltration performance)
Monitoring	Initial inspection	Monthly for three months after installation
Monitoring	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
Monitoring	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
Monitoring	Monitor inspection chambers	Annually



APPENDIX E – SUDS LAYOUT



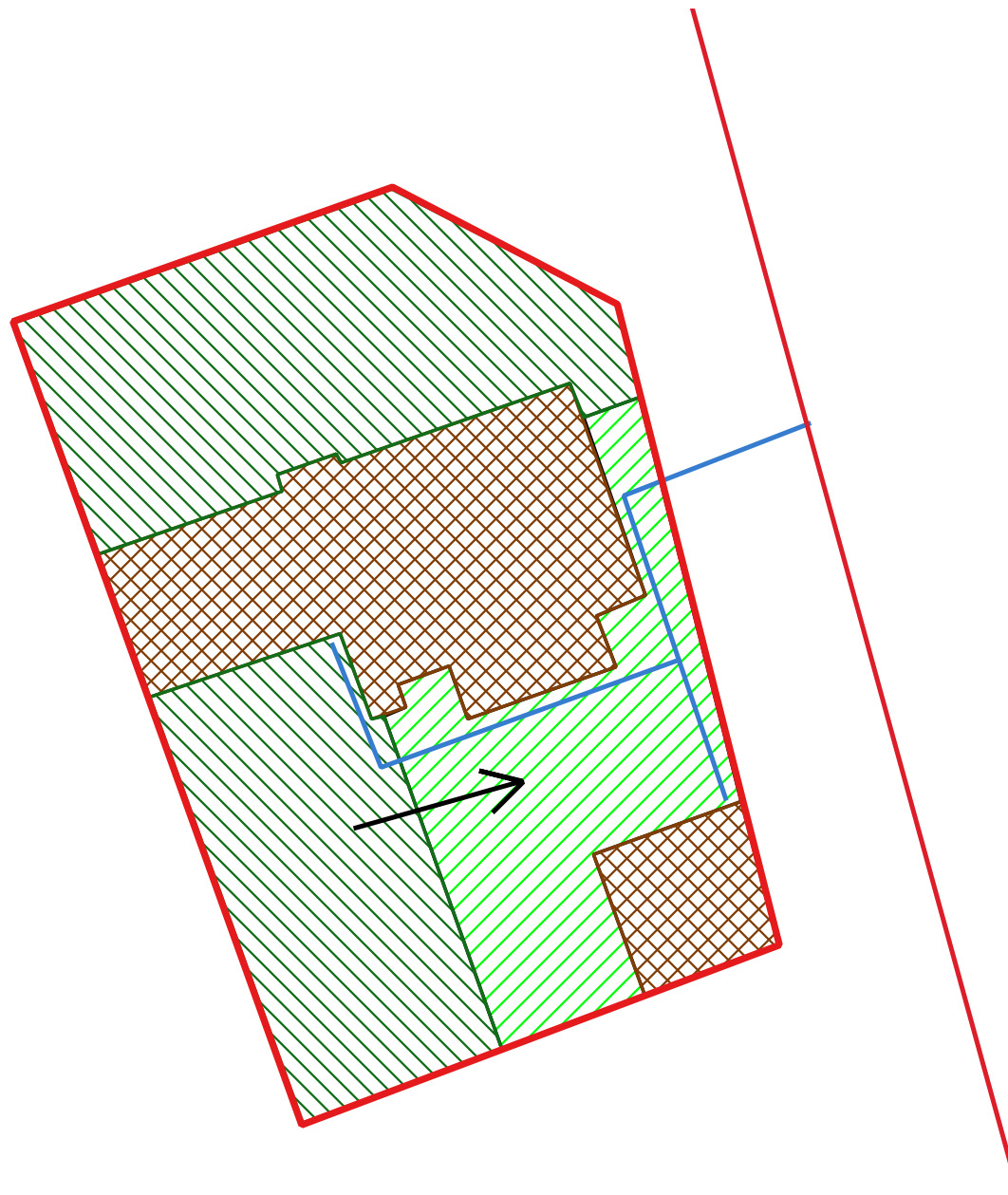
0 10 20 m



Existing Plan



Proposed Plan



-  site_boundary
- SuDS Areas
- Proposed
 -  Exceedance Flow
 -  Combined Sewer
 -  Rainwater Drainage
 -  Garden
 -  Impermeable Proposed
 -  Permeable Proposed



APPENDIX F – RUNOFF CALCULATIONS



Interception Model

Tue Aug 11 2026 15:16

Hydraulics

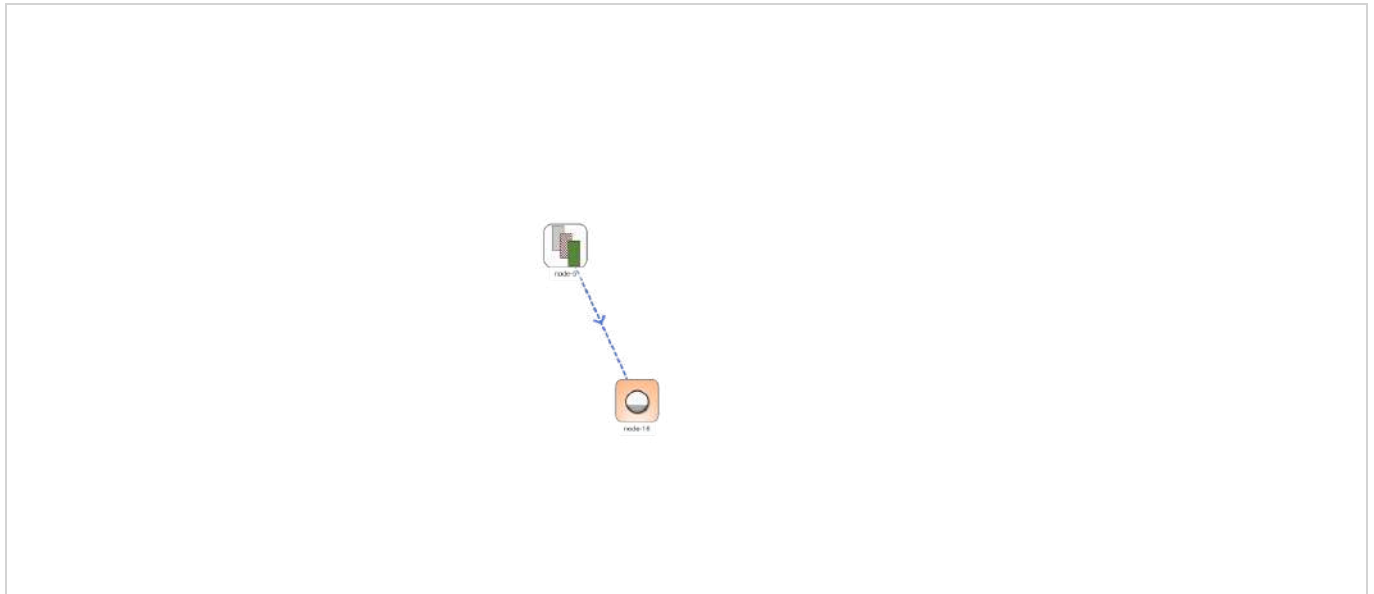
Proposed Site Information

Modeller	Air & Flood Consultants			
Organisation	Air & Flood Consultants			
Site Name	1 Ilbury Close, Shinfield, Wokingham, RG2 9DE			
Site Description	1 Ilbury Close, Shinfield, Wokingham, RG2 9DE			
Planning Reference	1 Ilbury Close, Shinfield, Wokingham, RG2 9DE			
Postcode	RG2 9DE			
Total Site Area (ha)	0.08			
Total Drained Areas (ha)	Paved	Roof	Grass / vegetated	Open SuDS
	0	0.019	0	0
Areas not served by the drainage network (ha)	0.061			
SuDS types	Type		Count	
	Sewer Outfall		1	
Model Signatures	Model Version		Signature	Model Run
	1.2.5		655620be	2026-08-11T14:16:34.438Z

Proposed SuDS Network

Node name	Node type	Downstream node	Contributing area - paved	Contributing area - roof	Contributing area - grass / vegetated
node-5	contributing_area	node-16	0	190	0
node-16	outfall_sewer		0	0	0

Proposed SuDS Layout



Rainfall & Runoff input data

Rainfall type	Design storm																																							
Design storm data source	FEH22																																							
Design storm data location																																								
Climate change factor (%)	0																																							
Design storm events	<table> <tr> <th>Name</th> <th>Return period (years)</th> <th>Duration (min)</th> <th>Depth (mm)</th> <th>Depth inc CC (mm)</th> </tr> <tr> <td>1 year, 1440 minutes</td> <td>1</td> <td>1440</td> <td>30.77</td> <td>30.77</td> </tr> <tr> <td>1 year, 60 minutes</td> <td>1</td> <td>60</td> <td>8.83</td> <td>8.83</td> </tr> <tr> <td>30 year, 1440 minutes</td> <td>30</td> <td>1440</td> <td>70.37</td> <td>70.37</td> </tr> <tr> <td>30 year, 60 minutes</td> <td>30</td> <td>60</td> <td>33.37</td> <td>33.37</td> </tr> <tr> <td>100 year, 1440 minutes</td> <td>100</td> <td>1440</td> <td>90.91</td> <td>90.91</td> </tr> <tr> <td>100 year, 60 minutes</td> <td>100</td> <td>60</td> <td>43.37</td> <td>43.37</td> </tr> </table>					Name	Return period (years)	Duration (min)	Depth (mm)	Depth inc CC (mm)	1 year, 1440 minutes	1	1440	30.77	30.77	1 year, 60 minutes	1	60	8.83	8.83	30 year, 1440 minutes	30	1440	70.37	70.37	30 year, 60 minutes	30	60	33.37	33.37	100 year, 1440 minutes	100	1440	90.91	90.91	100 year, 60 minutes	100	60	43.37	43.37
Name	Return period (years)	Duration (min)	Depth (mm)	Depth inc CC (mm)																																				
1 year, 1440 minutes	1	1440	30.77	30.77																																				
1 year, 60 minutes	1	60	8.83	8.83																																				
30 year, 1440 minutes	30	1440	70.37	70.37																																				
30 year, 60 minutes	30	60	33.37	33.37																																				
100 year, 1440 minutes	100	1440	90.91	90.91																																				
100 year, 60 minutes	100	60	43.37	43.37																																				
Grass / vegetated runoff method	Variable percentage runoff																																							
Soil type	Relatively impermeable soils																																							
Standard Percentage Runoff (%)	37.0																																							
Fixed percentage runoff (%)	Paved 100		Roof 100																																					
Depression storage (mm)	Paved 1		Roof 0.2																																					
			Grass / vegetated 5																																					
Range of infiltration rates given for the site (m/s)	Minimum 9.99e+2		Maximum 0e+0																																					

What is the peak flow rate at the site outfall for extreme events?

	1 year	30 year	100 year
Storm durations run (minutes)	60, 1440	60, 1440	60, 1440
Critical duration (minutes)	60	60	60
Peak drainage flow rate at site outfall for the critical duration storm (l/s)	1.95	7.65	10.06

	Rainfall depth (mm)	Peak drainage flow rate at site outfall (l/s)
100 year 60 minutes	43.37	10.06
30 year 60 minutes	33.37	7.65
1 year 60 minutes	8.83	1.95
100 year 1440 minutes	90.91	0.99
30 year 1440 minutes	70.37	0.76
1 year 1440 minutes	30.77	0.33

How much flooding occurs from the drainage system for extreme events?

	1 year	30 year	100 year
Storm durations run (minutes)	60, 1440	60, 1440	60, 1440
Critical duration (minutes)	60	60	60
Total volume of flooding from the site drainage system for the critical duration storm (m ³)	0	0	0

	Rainfall depth (mm)	Flooding volume (m ³)
100 year 60 minutes	43.37	0
30 year 60 minutes	33.37	0
1 year 60 minutes	8.83	0
100 year 1440 minutes	90.91	0
30 year 1440 minutes	70.37	0
1 year 1440 minutes	30.77	0

Evaluation

Runoff Destination

Rainwater Harvesting	There are roofs on this site that do not drain to rainwater harvesting systems. Rainwater harvesting systems should be considered for roof drainage wherever practical to minimise resource consumption.
Infiltration	None of the proposed drainage components allow for infiltration. Infiltration should be considered if infiltration rates on the site are greater than 1x10 ⁻⁶ m/s.
Discharge to a sewer	Some of the proposed discharge points are to sewers. Wherever possible, discharges should be to a watercourse or other surface water body to help protect the capacity of subsurface pipework. If the discharge has to be to a sewer, then surface water sewers should always be preferred. Discharges to combined sewers should only be used in exceptional circumstances, with the approval of the organisation responsible for that sewer.
Discharge to a surface water body	-

Flow Control

Peak flow rate at the site outfall for extreme events	No criteria have been set for peak flow rate from the site. This a key design criteria that should be agreed with the authorities responsible for the receiving system and planning.
Critical duration for the 1 year return period event	For the 1 year return period event, 2 storm durations have been run. The storm duration rainfall event causing the worst (outfall peak flow rate/system flooding) may not have been run. Check whether any other storm durations may result in greater peak flow rates at the outfall or flooding from the drainage system.
Critical duration for the 30 year return period event	For the 30 year return period event, 2 storm durations have been run. The storm duration rainfall event causing the worst (outfall peak flow rate/system flooding) may not have been run. Check whether any other storm durations may result in greater peak flow rates at the outfall or flooding from the drainage system.
Critical duration for the 100 year return period event	For the 100 year return period event, 2 storm durations have been run. The storm duration rainfall event causing the worst (outfall peak flow rate/system flooding) may not have been run. Check whether any other storm durations may result in greater peak flow rates at the outfall or flooding from the drainage system.

Amenity and Biodiversity

Amenity and Biodiversity	The proportion of impervious area drained using blue-green vegetated SuDS is 0%. Check whether amenity and biodiversity benefits of the system could be improved by draining a greater proportion of impervious area using well designed blue-green vegetated SuDS.
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Interception Model

Tue Aug 11 2026 15:16

Hydraulics

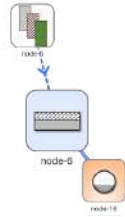
Proposed Site Information

Modeller	Air & Flood Consultants			
Organisation	Air & Flood Consultants			
Site Name	1 Ilbury Close, Shinfield, Wokingham, RG2 9DE			
Site Description	1 Ilbury Close, Shinfield, Wokingham, RG2 9DE			
Planning Reference	1 Ilbury Close, Shinfield, Wokingham, RG2 9DE			
Postcode	RG2 9DE			
Total Site Area (ha)	0.08			
Total Drained Areas (ha)	Paved	Roof	Grass / vegetated	Open SuDS
	0	0.022	0	0.016
Areas not served by the drainage network (ha)	0.042			
SuDS types	Type		Count	
	Pervious Pavement		1	
	Sewer Outfall		1	
Model Signatures	Model Version		Signature	Model Run
	1.2.5		178794d	2026-08-11T14:26:14.367Z

Proposed SuDS Network

Node name	Node type	Downstream node	Contributing area - paved	Contributing area - roof	Contributing area - grass / vegetated
node-5	contributing_area	node-6	0	221	0
node-6	pervious_pavement	node-16	0	0	0
node-16	outfall_sewer		0	0	0

Proposed SuDS Layout



Rainfall & Runoff input data

Rainfall type	Design storm																																							
Design storm data source	FEH22																																							
Design storm data location																																								
Climate change factor (%)	40																																							
Design storm events	<table> <tr> <th>Name</th> <th>Return period (years)</th> <th>Duration (min)</th> <th>Depth (mm)</th> <th>Depth inc CC (mm)</th> </tr> <tr> <td>1 year, 1440 minutes + CC</td> <td>1</td> <td>1440</td> <td>30.77</td> <td>43.08</td> </tr> <tr> <td>1 year, 60 minutes + CC</td> <td>1</td> <td>60</td> <td>8.83</td> <td>12.36</td> </tr> <tr> <td>30 year, 1440 minutes + CC</td> <td>30</td> <td>1440</td> <td>70.37</td> <td>98.52</td> </tr> <tr> <td>30 year, 60 minutes + CC</td> <td>30</td> <td>60</td> <td>33.37</td> <td>46.72</td> </tr> <tr> <td>100 year, 1440 minutes + CC</td> <td>100</td> <td>1440</td> <td>90.91</td> <td>127.27</td> </tr> <tr> <td>100 year, 60 minutes + CC</td> <td>100</td> <td>60</td> <td>43.37</td> <td>60.72</td> </tr> </table>					Name	Return period (years)	Duration (min)	Depth (mm)	Depth inc CC (mm)	1 year, 1440 minutes + CC	1	1440	30.77	43.08	1 year, 60 minutes + CC	1	60	8.83	12.36	30 year, 1440 minutes + CC	30	1440	70.37	98.52	30 year, 60 minutes + CC	30	60	33.37	46.72	100 year, 1440 minutes + CC	100	1440	90.91	127.27	100 year, 60 minutes + CC	100	60	43.37	60.72
Name	Return period (years)	Duration (min)	Depth (mm)	Depth inc CC (mm)																																				
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100 year, 1440 minutes + CC	100	1440	90.91	127.27																																				
100 year, 60 minutes + CC	100	60	43.37	60.72																																				
Grass / vegetated runoff method	Variable percentage runoff																																							
Soil type	Relatively impermeable soils																																							
Standard Percentage Runoff (%)	37.0																																							
Fixed percentage runoff (%)	Paved 100		Roof 100																																					
Depression storage (mm)	Paved Roof 1 0.2		Grass / vegetated 5																																					
Range of infiltration rates given for the site (m/s)	Minimum 1e-6		Maximum 1e-5																																					

What is the peak flow rate at the site outfall for extreme events?

	1 year +CC	30 year +CC	100 year +CC
Storm durations run (minutes)	60, 1440	60, 1440	60, 1440
Critical duration (minutes)	60	60	60
Peak drainage flow rate at site outfall for the critical duration storm (l/s)	0.32	2.37	2.79

	Rainfall depth (mm)	Peak drainage flow rate at site outfall (l/s)
100 year 60 minutes +CC	60.72	2.79
30 year 60 minutes +CC	46.72	2.37
100 year 1440 minutes +CC	127.27	0.67
1 year 60 minutes +CC	12.36	0.32
30 year 1440 minutes +CC	98.52	0.2
1 year 1440 minutes +CC	43.08	0

How much flooding occurs from the drainage system for extreme events?

	1 year +CC	30 year +CC	100 year +CC
Storm durations run (minutes)	60, 1440	60, 1440	60, 1440
Critical duration (minutes)	60	60	60
Total volume of flooding from the site drainage system for the critical duration storm (m ³)	0	0	0

	Rainfall depth (mm)	Flooding volume (m ³)
100 year 60 minutes +CC	60.72	0
30 year 60 minutes +CC	46.72	0
100 year 1440 minutes +CC	127.27	0
1 year 60 minutes +CC	12.36	0
30 year 1440 minutes +CC	98.52	0
1 year 1440 minutes +CC	43.08	0

Evaluation

Runoff Destination

Rainwater Harvesting	There are roofs on this site that do not drain to rainwater harvesting systems. Rainwater harvesting systems should be considered for roof drainage wherever practical to minimise resource consumption.
Infiltration	Some or all of the proposed SuDS components allow for infiltration. To ensure the designs of these components are robust you need to confirm that: • The infiltration component is protected from sediment buildup by putting adequate pre-treatment measures in place • The highest likely groundwater level is more than 1m below the base of the infiltration system, or appropriate design risk management has been undertaken • Any underlying aquifer is adequately protected from infiltration of potentially contaminated runoff • Infiltration will not exacerbate any groundwater flooding risk • Infiltration will not cause geotechnical or structural instability • Infiltration will not mobilise any soil contamination.
Discharge to a sewer	Some of the proposed discharge points are to sewers. Wherever possible, discharges should be to a watercourse or other surface water body to help protect the capacity of subsurface pipework. If the discharge has to be to a sewer, then surface water sewers should always be preferred. Discharges to combined sewers should only be used in exceptional circumstances, with the approval of the organisation responsible for that sewer.
Discharge to a surface water body	-

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Critical duration for the 100 year return period event	For the 100 year return period event, 2 storm durations have been run. The storm duration rainfall event causing the worst (outfall peak flow rate/system flooding) may not have been run. Check whether any other storm durations may result in greater peak flow rates at the outfall or flooding from the drainage system.

Amenity and Biodiversity

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