

FloodSmart Pro



Flood Risk Assessment

Site Address

Land adj to Leafields House
Three Mile Cross
RG7 1NP

Date Updated

2026-06-04

Date Issued

2024-04-04

Grid Reference

471305, 168581

Report Status

FINAL

Report Prepared for

James Frankham

Site Area

0.46 ha

Report Reference

80950.00.01R1



RISK – Very Low to Medium

The Site is located in Flood Zones 1, 2 and 3, which equates to a Very Low – High probability of flooding from the nearby Foudry Brook. It is noted that the areas proposed for building development are located in Flood Zones 1 and 2. The risk of flooding from rivers and sea is Very Low to High, taking flood defences into account, and following further analysis, this is reduced to Very Low to Low.

Following analysis of the baseline data, the Site is considered to be at a Very Low to Low risk of surface water flooding, a Moderate risk of groundwater flooding, and a Low risk from artificial sources (i.e. canals, reservoirs and sewers).

Mitigation measures are recommended in this report to reduce the risks to an acceptable level over the lifetime of the development.

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Version Control

Report Version	Date	Report Author	Report Checker & Reviewer
80950R1	04/04/2024	Daniel Howlett Project Consultant Toby Kay Consultant	Mike Piotrowski Principal Hydrologist Bob Sargent Associate
80950.00.01R1	04/06/2026	Harriet Parker Consultant	Nathan Montgomery Project Consultant

1. Executive summary



A review has been undertaken of national environmental data sets to assess the flood risk to the Site from all sources of flooding in accordance with the National Planning Policy Framework (NPPF) (2024) and National Planning Practice Guidance (NPPG) (Published in 2014 and updated in September 2025). A site-specific flood risk assessment, to assess the flood risk to and from the development Site, is provided within this concise interpretative report written by an experienced GeoSmart consultant. Baseline flood risk and residual risks that remain after the flood risk management and mitigation measures are implemented are summarised in the table below.

Site analysis

Source of Flood Risk	Baseline ¹	After analysis ²	After Mitigation ³
River (fluvial) flooding	Very Low to High	Very Low to Low	Very Low
Sea (coastal/tidal) flooding	Very Low		N/A
Surface water (pluvial) flooding	Very Low to High	Very Low to Low	Very Low
Groundwater flooding	Moderate		Low
Other flood risk factors present	Yes (sewers)		Yes
Is any other further work recommended?	Yes (see below)		

1 BASELINE risks assigned for the whole Site, using national risk maps, including the benefit of EA flood defences and the impacts of climate change.

2 AFTER ANALYSIS modification of risk assessment based on detailed site specific analysis including some or all of the following: flood model data, high resolution mapping, building location, access routes, topographic and CCTV surveys. Reasons for the change in classification are provided in the text.

3 AFTER MITIGATION risks include risks to proposed development / asset and occupants if mitigation measures recommended in this report are implemented, including the impacts of climate change.

*N/A indicates where mitigation is not required.

Summary of existing and proposed development

The present nature of the Site is disused brownfield, containing brick fill material in the centre of the Site, a small wooden shed in the south of the site and stored cleared vegetation across the rest of the Site. Drainage ditches are noted to constrain the Site to the north and the east, with boundary fencing located to the west and south.

Development proposals comprise the introduction of two static caravans with bike storage, as well as a dayroom building in the north west of the Site. An area of hardstanding enclosed by hedges is proposed in the north east with bin storage and parking spaces. Associated access is located on the north east boundary, and the remainder of the Site is to comprise of landscaped areas.

Summary of flood risks

The flood risks from all sources have been assessed as part of this report and are as follows:

River (fluvial) and Sea (Estuarine/Coastal) flooding

According to the Environment Agency's (EA) Flood Map for Planning Purposes, the Site is located within fluvial Flood Zones 1 (Low Probability), 2 (Medium Probability) and 3 (High Probability). It is noted that the majority of the area for development is located in Flood Zone 1, with minor areas located in Flood Zone 2.

According to the EA's Risk of Flooding from Rivers and Sea (RoFRS) map, which considers the type, condition and crest height of flood defences, the Site has a Very Low to High risk of flooding in both the present day and climate change (2036 to 2069) scenarios.

Modelled flood data obtained from the EA has been analysed in line with the most up to date guidance on climate change (EA, 2022), to confirm a maximum "design" flood level at the Site.

- In a 1 in 100 year plus 21% climate change allowance event the flood level at the Site would be 40.50 mAOD. Flood depths on Site could be up to 0.83 m, however, analysis of flood extents confirms that the proposed caravans and day room are not anticipated to flood during this event. Flood mitigation measures are included in the next section.

Emergency evacuation routes are available to the north east.

Baseline mapping indicates a Very Low to High risk. However, a review of the flood model data, local topography and proposed development plans indicates the risk is reduced to Very Low to Low.

Surface water (pluvial) flooding

According to the EA's Surface Water Spatial Planning dataset included in the flood map for Planning, the Site has a Low risk of pluvial flooding in the present day, which rises to ranging from Very Low to High when climate change (2070s) is applied.

- Flooding is not anticipated on Site during the 1 in 100 year present day scenario event.
- During the 1 in 100 year plus climate change event, flood depths on Site could be up to 0.30-0.60 m. Flooding is not anticipated within the proposed development area during this event.

Baseline mapping indicates a Very Low to High risk. However, following a review of the proposed development plans, this is reduced to Very Low to Low due to proposed buildings not being anticipated to flood until the Low risk climate change event, where depths are shallow.

A SuDS strategy has been prepared separately (ref: 80950.01) to ensure surface water runoff from the Site is managed over the lifetime of the proposed development.

Groundwater flooding

Groundwater Flood Risk screening data indicates there is a Moderate potential risk of groundwater flooding at the surface in the vicinity of the Site during a 1 in 100 year event.

- According to a review of the hydrogeology (Section 3), the Site is underlain by permeable superficial deposits above low permeability bedrock. A shallow groundwater table could potentially exist above the contact between the superficial and bedrock layers, resulting in a 'perched' groundwater table. Groundwater levels may rise in the superficial aquifer in a seasonal response to prolonged rainfall recharge which may cause an unusually high peak in groundwater levels during some years.
- Groundwater levels may also rise in the superficial aquifer in response to high river events due to the potential hydraulic continuity with the nearby Foudry Brook, with the 1 in 100 year flood level estimated to be 40.50 mAOD within the Site, compared with Site levels of 39.67 to 41.18 mAOD.

Artificial sources of flooding

The risk of flooding from artificial (man-made) sources such as reservoirs, sewers and canals has been assessed:

- The EA's Risk of Flooding from Reservoir map confirms the Site is not at risk of reservoir flooding. The potential for a breach of a reservoir to occur and flooding affecting the Site is low.
- Ordnance Survey (OS) data confirms there are no canals near to the Site.
- The Strategic Flood Risk Assessment (SFRA) has identified a total of 181 incidences of flooding as a result of surcharging sewers within the RG7 1 postcode. However, it is

recognised that this four digit postcode covers a large area and instances of flooding are not specific to the Site (JBA Consulting, 2023).

- Records held by Thames Water indicate that there have been no incidences of flooding related to the surcharging of public sewers at the Site (Thames Water, 2023).

The risk of flooding from artificial sources is considered to be Low.

Recommendations

Recommendations for flood mitigation are provided below, based upon the proposed development and the flood risk identified at the Site.

- There is a risk of flooding from fluvial sources, where flood depths could be up to 0.83 m on Site during the design flood event. Finished Floor Levels (FFL) of the proposed structures should be set to a minimum level of 40.80 mAOD¹. Despite flood extents indicating that the proposed caravans and building would not flood during this event, standard flood resilient design measures should be incorporated where feasible as a precautionary measure.
- A Very Low to Low risk of pluvial flooding has been identified for the Site. Alongside the mitigation measures recommended for fluvial flooding, ground levels should be designed to channel any overland flows from off-Site (to the east) away from the development and Site drainage systems.
- As there is a risk from groundwater sources at the surface, the risk to buried infrastructure should be considered along with standard flood resilient design and non-return valves on the sewer inlet. French drains and/or pumping systems may also be considered.
- A Flood Warning and Evacuation Plan (FWEP) is recommended to ensure persons using the Site can evacuate safely on receipt of a Flood Warning.
- Occupants of the Site should also be signed up to receive EA Flood Alerts and Flood Warnings.
- The ongoing management and maintenance of existing and any proposed drainage networks, under the riparian ownership of the developer, should be undertaken in perpetuity with the development.

GeoSmart recommend the mitigation measures discussed within this report are considered as part of the proposed development where possible and evidence of this is provided to the Local Planning Authority as part of the planning application.

¹ 0.3 m above the 1 in 100 year plus climate change flood level of 40.50 mAOD.

2. Introduction



Background and purpose

A site-specific flood risk assessment has been undertaken, to assess the flood risk to and from the development Site. This assessment has been undertaken by firstly compiling information concerning the Site and the surrounding area. The information gathered was then used to construct a 'conceptual site model', including an understanding of the appropriateness of the development as defined in the NPPF (2024) and the source(s) of any flood risk present, guided by the NPPG (Published in 2014 and updated in September 2025). Finally, a preliminary assessment of the steps that can be taken to manage flood risk to the development was undertaken.

This report has been prepared with reference to the NPPF (2024) and NPPG (2025)..

"The National Planning Policy Framework set out the Government's planning policies for England and how these are expected to be applied" (NPPF, 2024).

The NPPF (2024) and NPPG (2025) promote a sequential, risk based approach to the location of development. This also applies to locating a development within a Site which has a variable risk of flooding.

"The approach is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. This means avoiding, so far as possible, development in current and future medium and high flood risk areas considering all sources of flooding including areas at risk of surface water flooding" (Paragraph: 023. NPPG, 2025).

The purpose of this report is to provide clear and pragmatic advice regarding the nature and potential significance of flood hazards which may be present at the Site.

Report scope

In accordance with the requirements set out within NPPG 2025 (Paragraph: 021 Reference ID: 7-021-20220825), a thorough review of publicly and commercially available flood risk data and EA supplied data indicating potential sources of flood risk to the Site from rivers and coastal sources, surface run-off (pluvial), groundwater and reservoirs, including historical flood information and modelled flood extent. Appropriate measures are recommended to manage and mitigate the flood risk to the property.

Information obtained from the EA and a review of the Wokingham Borough Council Strategic Flood Risk Assessment (SFRA) (JBA Consulting, 2023) is used to ascertain local flooding issues and, where appropriate, identify information to support a Sequential and/or Exception test required as part of the NPPF (2024).

The existing and future flood risk to and from the Site from all flood sources is assessed in line with current best practice using the best available data. The risk to the development has been assessed over its expected lifetime, including appropriate allowances for the impacts of climate change. Residual risks that remain after the flood risk management and mitigation

measures are implemented, are considered with an explanation of how these risks can be managed to keep the users of the development safe over its lifetime.

An indication of whether the Site will potentially increase flood risk elsewhere is provided, including where the proposed development increases the building footprint at the Site.

Report limitations

It is noted that the findings presented in this report are based on a desk study of information supplied by third parties. Whilst we assume that all information is representative of past and present conditions, we can offer no guarantee as to its validity and a proportionate programme of site investigations would be required to fully verify these findings.

The basemap used is the OS Street View 1:10,000 scale, however the Site boundary has been drawn using BlueSky aerial imagery to ensure the correct extent and proportion of the Site is analysed.

This report excludes consideration of potential hazards arising from any activities at the Site other than normal use and occupancy for the intended land uses. Hazards associated with any other activities have not been assessed and must be subject to a specific risk assessment by the parties responsible for those activities.

Datasets

The following table shows the sources of information that have been consulted as part of this report:

Table 1. Datasets consulted to obtain confirmation of sources of flooding and risk

Source of flooding	Datasets consulted				
	Commercial Flood Maps	Local Policy & Guidance Documents*	Environment Agency (Appendix C)	Utility provider (Appendix D)	OS Data
Historical	X	X	X		
River (fluvial) / Sea (tidal/coastal)	X	X	X		
Surface water (pluvial)	X	X	X		

Source of flooding	Datasets consulted				
	Commercial Flood Maps	Local Policy & Guidance Documents*	Environment Agency (Appendix C)	Utility provider (Appendix D)	OS Data
Groundwater	X	X			
Sewer		X		X	
Culvert/bridges		X			X
Reservoir		X	X		

*Local guidance and policy, referenced below, has been consulted to determine local flood conditions and requirements for flood mitigation measures.

Local policy and guidance

For this report, several documents have been consulted for local policy and guidance and relevant information is outlined below:

Wokingham Borough Council Level 1 Strategic Flood Risk Assessment (JBA Consulting, 2023):

8.2.5 Raised floor levels

If raised floor levels are proposed, these should be agreed with WBC and the EA. The minimum Finished Floor Level (FFL) may change dependent upon the vulnerability and flood risk to the development.

The EA advises that minimum finished floor levels should be set 300mm above the 1% AEP plus climate change peak flood level, where the appropriate new climate change allowances have been used (see Section 4.2 for the climate change allowances). An additional allowance may be required because of risks relating to blockages to the channel, culvert or bridge and should be considered as part of an FRA. Lowering existing FFLs below the existing levels within the 1% AEP plus climate change floodplain would not be acceptable and should be discouraged. New development offers opportunities to improve the resilience of buildings.

Allocating the ground floor of a building for less vulnerable, non-residential, use is an effective way of raising living space above flood levels. Single storey buildings such as ground floor flats or bungalows are especially vulnerable to rapid rise of water (such as that experienced during a breach). This risk can be reduced by use of multiple storey construction and raised areas that provide an escape route.

Similarly, the use of basements should be avoided. Habitable uses of basements within Flood Zone 3 and areas at risk of surface water flooding in the surface water flood zone B should not be permitted, whilst basement dwellings in Flood Zone 2 will be required to pass the exception test. Access should be situated 300mm above the design flood level and waterproof construction techniques used.

3.2.1 Flood Zones - rivers risk

The definition of the Flood Zones is provided below. The Flood Zones do not consider defences. This is important for planning long term developments as long-term policy and funding for maintaining flood defences over the lifetime of a development may change over time.

The Flood Zones do not consider surface water, sewer, or groundwater flooding or the impacts of reservoir failure. They do not consider climate change. Hence there could still be a risk of flooding from other sources and that the level of flood risk will change over the lifetime of a development.

The Flood Zones are:

- Flood Zone 1: Low risk: less than a 0.1% chance of river and sea flooding in any given year.
- Flood Zone 2: Medium risk: between a 1% and 0.1% chance of river flooding in any given year.
- Flood Zone 3a: High risk: between a 3.3% and 1% chance of river flooding in any given year.
- Flood Zone 3b: Functional Floodplain: land where water has to flow or be stored in times of flood (greater than 3.3% AEP). SFRAs identify this Flood Zone in discussion with the LPA and the EA. The identification of functional floodplain takes account of local circumstances. Only water compatible and essential infrastructure are permitted in this zone and should be designed to remain operational in times of flood, resulting in no loss of floodplain or blocking of water flow routes. It may be required to consider climate change on the functional floodplain; this would need hydraulic modelling to confirm extents and therefore it is recommended that this is considered in a FRA and a suitable approach is agreed with the EA.
 - o FZ3b is based on the best available model data:
 - 3.3% Annual Exceedance Probability (AEP) where available
 - 1% AEP where the 3.3% is not available
 - Where model data is not available, FZ3a (1% AEP) is used as a conservative proxy.

It is noted that, in the absence of modelled data for the 3.3% AEP event at the Site, the full extent of Flood Zone 3 is defined as Flood Zone 3b, however, the proposed development is located fully outside this extent.

Guidance

Strategic Flood Risk Assessments are carried out by local authorities, in consultation with the Environment Agency, to assess the flood risk to the area from all sources both now and in the future due to climate change. They are used to inform planning decisions to ensure inappropriate development is avoided (NPPF, 2024).

3. Site analysis



Site information

The Site is located in Three Mile Cross in a setting of agricultural and residential land use at National Grid Reference SU 71305 68581.

Figure 1. Aerial imagery of the Site (Bluesky, 2026)

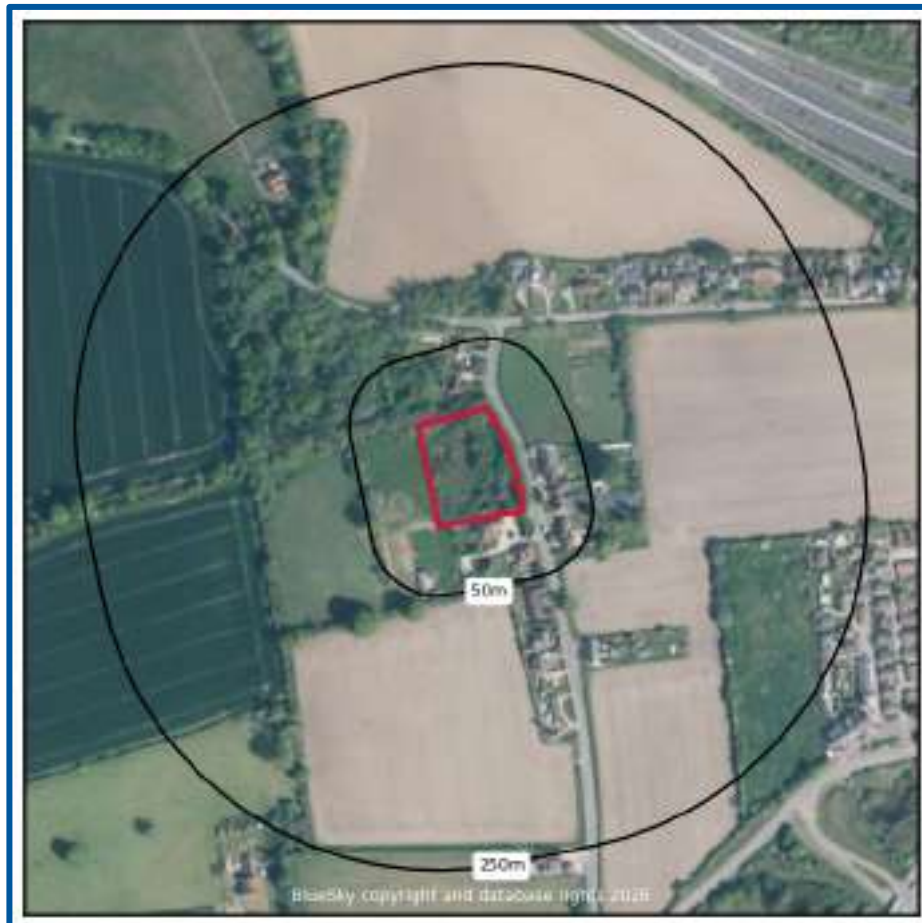


Figure 2 indicates ground levels within 250 m of the Site are relatively level, with a small area of depressed ground noted to the northwest of the Site. Raised ground associated with the M4 and A40 is located to the northeast.

Figure 2. Site Location and Environment Agency LiDAR ground elevation data (GeoSmart, 2026)

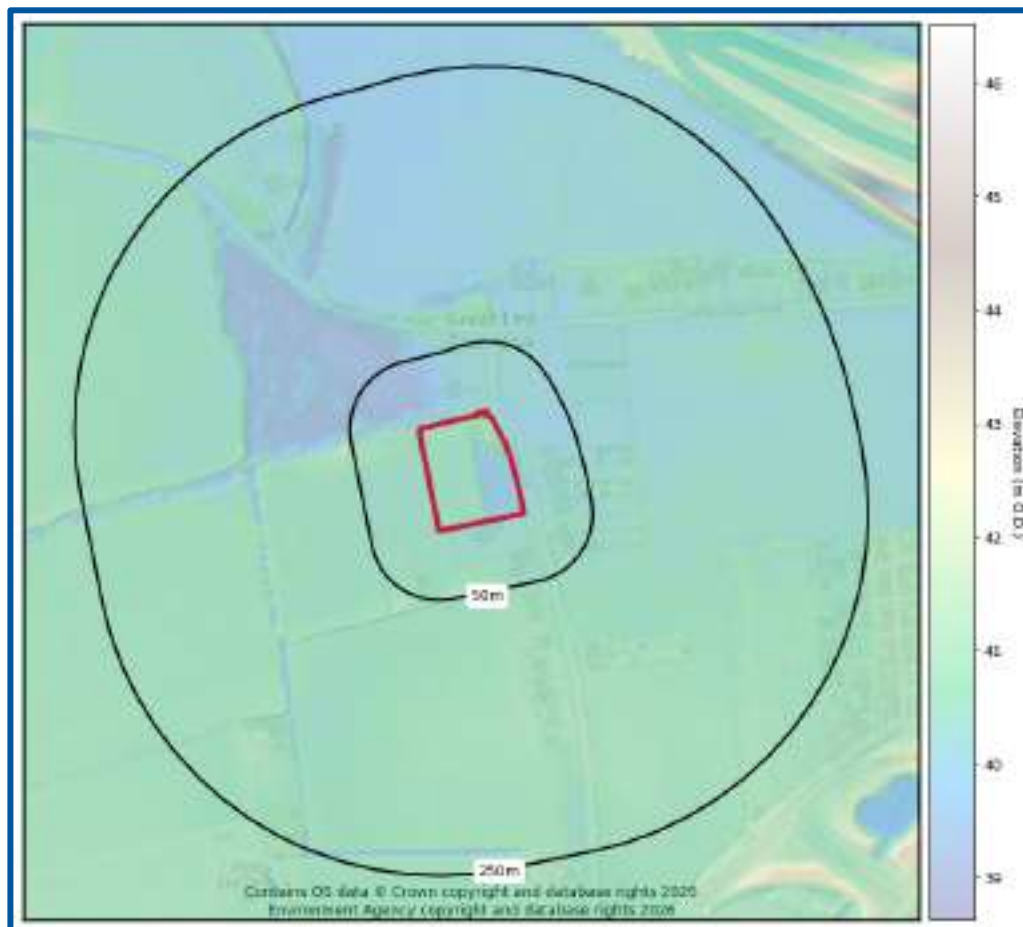
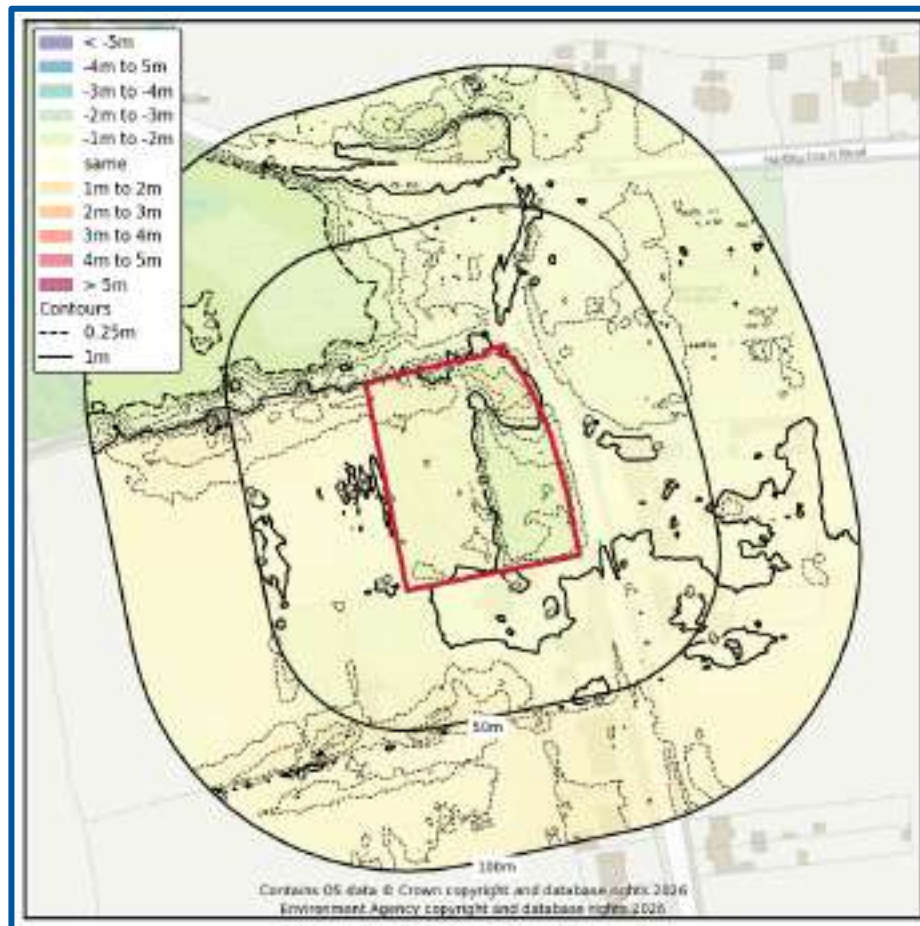


Figure 3 (overleaf) indicates that the general ground levels on the Site are between 41.18 and 39.67 m AOD with the Site generally level, with a depression in the south east. This is based on EA elevation data obtained for the Site to a 1 m resolution with a vertical accuracy of ± 0.15 m.

Figure 3. Relative Elevations (GeoSmart, 2026)



Development

The present nature of the Site is disused brownfield land, containing brick fill material in the centre of the Site, a small wooden shed in the south of the site and stored cleared vegetation across the rest of the Site. Drainage ditches are noted to constrain the Site to the north and the east, with boundary fencing located to the west and south.

Development proposals comprise the introduction of two static caravans with bike storage, as well as a dayroom building in the northwest of the Site. An area of hardstanding enclosed by hedges is proposed in the northeast with bin storage and parking spaces. Associated access is located on the northeast boundary, and the remainder of the Site is to comprise of landscaped areas. Site plans are included within Appendix A.

The effect of the overall development will result in an increase in number of occupants and/or users of the Site and will result in the change of use, nature or times of occupation. According to Annex 3 of the NPPG (2025), the vulnerability classification of the existing development is Sui Generis and proposed development is Highly Vulnerable. The estimated lifespan of the development is 100 years.

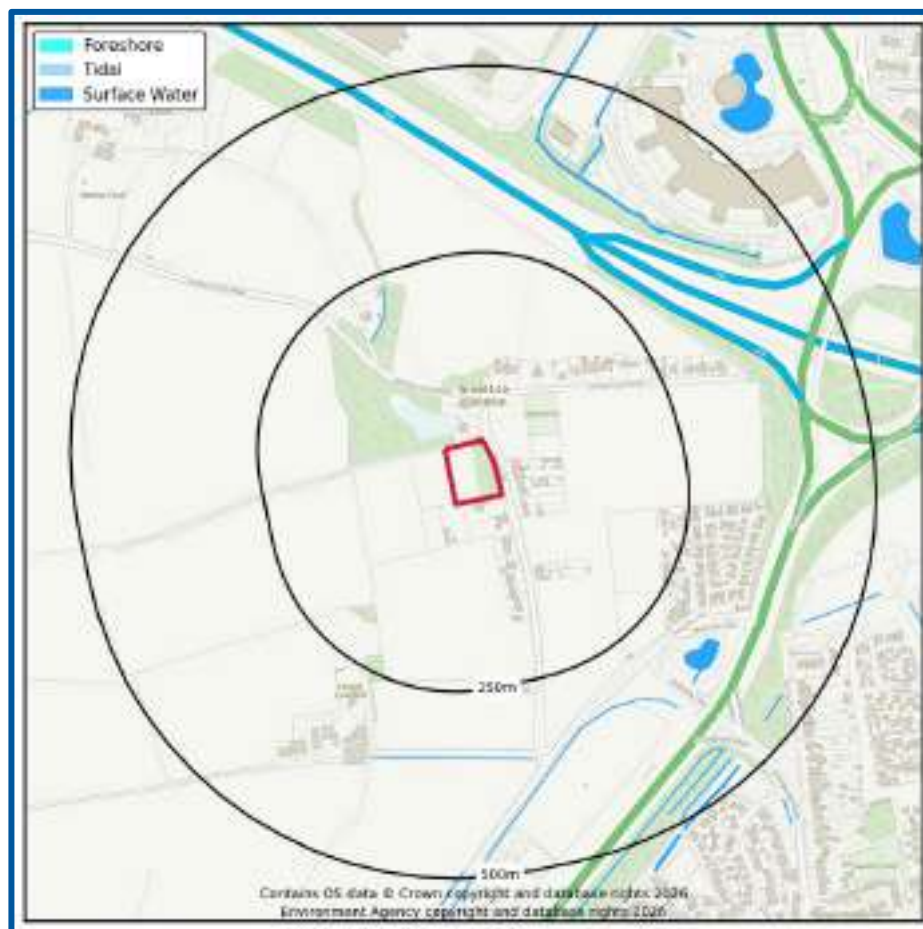
Hydrological features

According to Ordnance Survey (OS) mapping included in the following figure, there are numerous surface water features within 500 m of the Site.

- Multiple drainage ditches are located within 500 m of the Site, the closest of which is c. 200 m to the northwest of the Site.
- Foudry Brook is located over 500 m from the Site, at c. 780 m to the west.

During the Site walkover, additional drainage ditches were identified in the north and east of the Site as well as a further drainage ditch located c. 10 m to the east of the Site

Figure 4. Surface water features (EA, 2026)



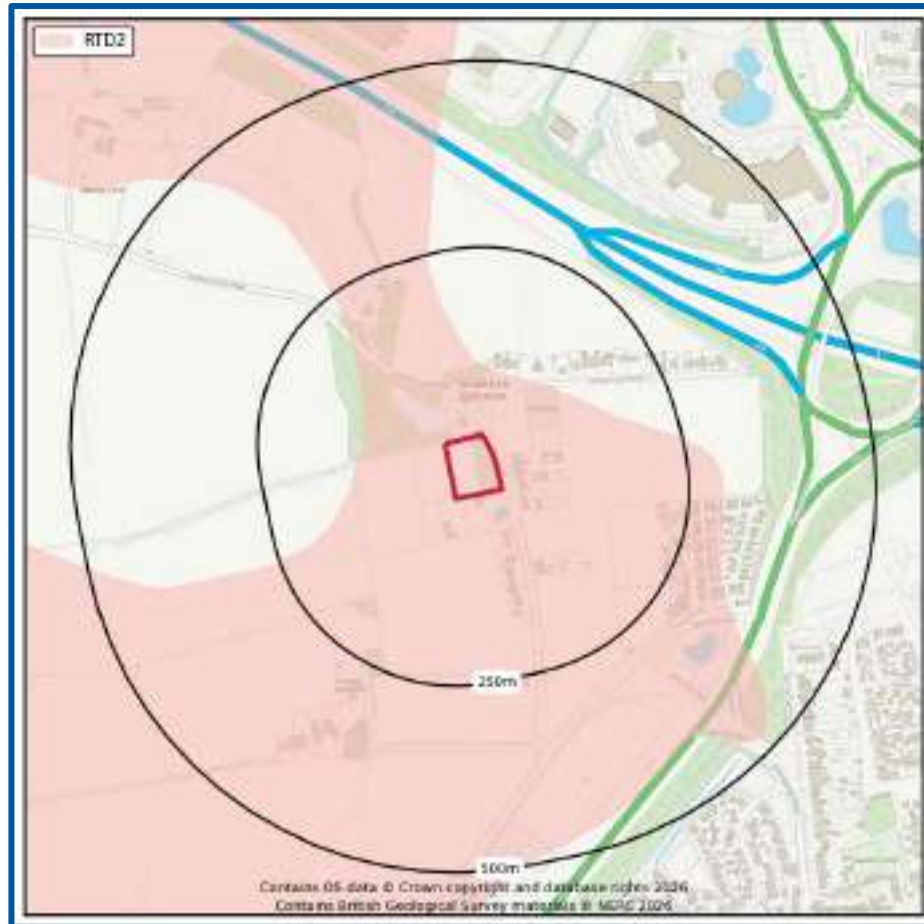
Proximity to relevant infrastructure

No relevant infrastructure pertaining to flooding is indicated by OS mapping to be located in the vicinity of the Site.

Hydrogeological features

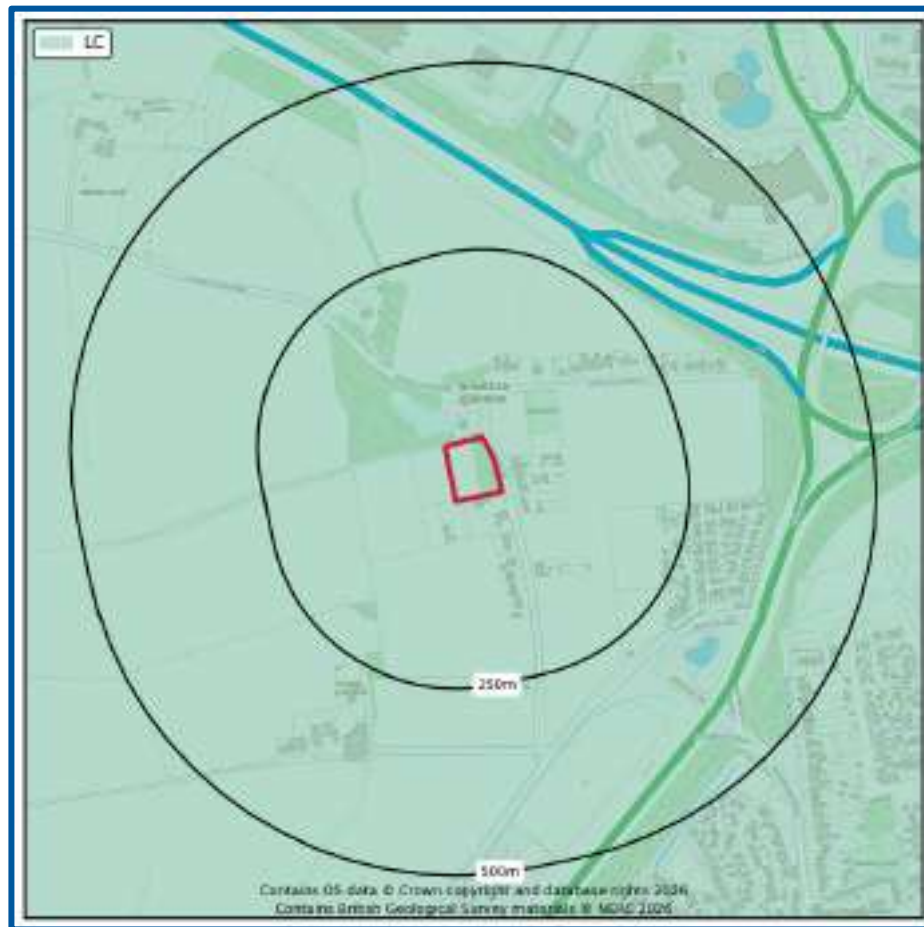
British Geological Survey (BGS) mapping indicates the underlying superficial geology (Figure 5) consists of River Terrace Deposits (RTD2) (BGS, 2026) and is classified as a Secondary (A) Aquifer (EA, 2026).

Figure 5. Superficial Geology (BGS, 2026)



BGS mapping indicates the underlying bedrock geology (Figure 6) consists of the London Clay Formation (LC) (BGS, 2026) and is classified as a Unproductive Strata (EA, 2026).

Figure 6. Bedrock Geology (BGS, 2026)



Geological conditions

A review of the BGS borehole database (BGS, 2026) indicates the nearest and most relevant borehole to the Site (ref: SU76NW292) is located 230 m to the north west of the Site boundary at an elevation of 39 mAOD (taken from the borehole record). An additional borehole (ref: SU76NW66) is located 280 m to the north west of the Site boundary at an elevation of 41 mAOD (taken from the borehole record).

It should be noted that the boreholes were drilled a reasonable distance (>200 m) from the Site and therefore is unlikely to be fully representative of the underlying Site conditions; however, it has been included for completion in the absence of more relevant data.

Table 2. Summary of BGS borehole information

Strata encountered	BGS borehole SU76NW292		BGS borehole SU76NW66	
	Depth to base of stratum (m bgl)	Strata composition	Depth to base of stratum (m bgl)	Strata composition
Topsoil	N/A	Not encountered	0.5	Topsoil
River terrace deposits			5.0	Gravel
London Clay	11.0	London Clay	19.0	Soft blue clay
			38.0	Thin beds of clay and sand
Woolwich and Reading beds	30.0	Woolwich and Reading beds	N/A	Not encountered
Thanet Sands	35.0	Thanet Sands		
Chalk	>71.0 (base of borehole)	Chalk and flint	131.5	Chalk and flints

Groundwater

Borehole ref: SU76NW292 and SU76NW66 do not contain any measurements from which the groundwater level can be confirmed.

4. Site Walkover



A Site walkover was conducted on 22/01/2024 by Daniel Howlett, Project Consultant to obtain a better understanding of conditions on the Site and in surrounding areas and how flood risk may be influenced by features on-Site or within the vicinity of the Site.

Site Setting

The Site was found to be located in a setting of suburban residential and commercial land use, constrained by neighbouring residential properties to the north and south, greenfield to the west of the Site and the highway of Great Lea Road located adjacent to the east of the Site.

At the time of visit, the Site consisted largely of open grass/ earth, vegetation and fill material (Image 1, Appendix B), with more substantial vegetation located along the eastern boundary growing alongside/ within the drainage ditches present at the northern and eastern site boundaries. A disused storage shed was present in the south of the site (Image 2, Appendix B). A review of Google Street View Imagery indicates that the Site consisted of open greenfield throughout 2009/10, before becoming overgrown during 2019-2023 and subsequently cleared prior to visiting the Site (Images 3-7, Appendix B).

Condition of Drainage Features

During the Site visit shallow surface water ponding was visible in parts, most predominantly in the centre of the Site (Images 8-9, Appendix B) following a period of heavy rainfall. Surface water ponding was also confirmed to have occurred a few weeks prior, also following heavy rainfall. No clear flow routes into or out of the Site were observed.

The drainage ditches located in the north and east of the Site were partially vegetated and mostly filled with water (Images 10-12, Appendix B), the eastern drainage ditch accepts runoff from Great Lea Road, the inlet of which appeared partially blocked (Image 13, Appendix B) and appeared to discharge to the neighbouring property to the south but access could not be gained to this property to investigate further.

During discussion with the landowner, it was explained that the drainage ditch to the east of the Site is the responsibility of Highways England, and is in need of maintenance.

Historical Flooding

Local residents that were happy to discuss the hydrological regime in the area and stated that the local area experiences regular flooding, attributed to surface water flooding once the capacity of the drainage ditches are exceeded. Anecdotally, this affected the properties to the north of the Site as well as the property to the east, resulting in an additional drainage ditch being constructed to the northeast of the Site (Image 16, Appendix B).

5. Flood risk to the development

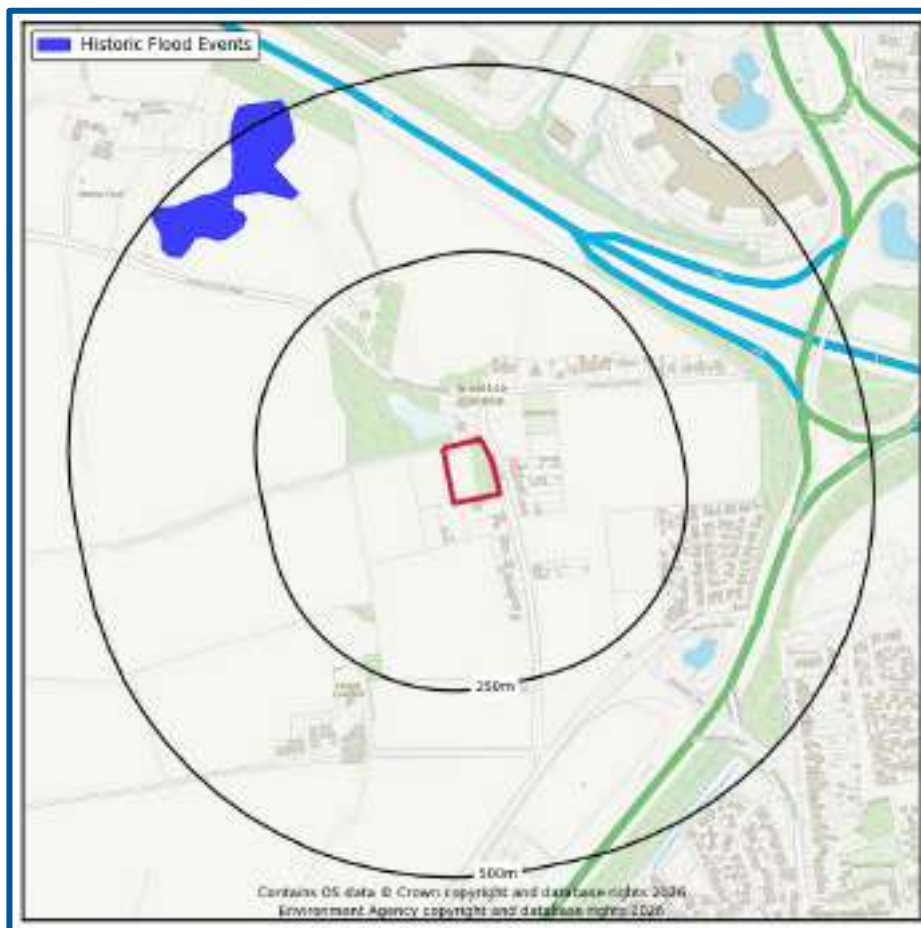


Historical flood events

According to the EA's Historical Flood Map (Figure 7), interactive mapping included in Appendix A of the SFRA (JBA Consulting, 2023) and Figure 5-1 of the PFRA (Halcrow Group Limited, 2011), there have been no flooding events affecting the Site.

The purpose of historical flood data is to provide information on where and why flooding may have occurred in the past. The absence of any recorded events does not mean flooding has never occurred on-Site or that flooding will never occur at the Site.

Figure 7. EA Historic Flood Map (EA, 2026)



Rivers (fluvial) / Sea (coastal) / Estuarine (tidal) flooding

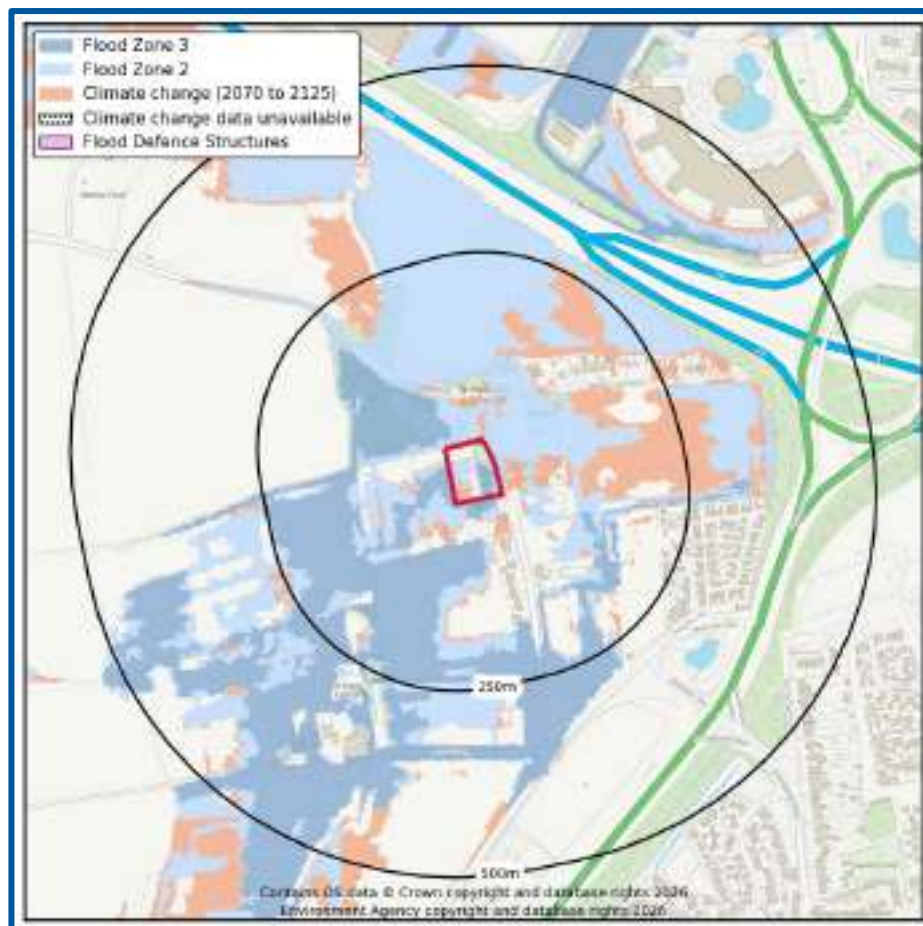
The predominant risk at the Site is from flooding from rivers, termed as fluvial flooding. The Site is located in an inland location and the risk of flooding from coastal and tidal processes are therefore considered to be Negligible.

River (fluvial) flooding occurs during times of heavy rainfall or snow melt when watercourses' capacity can be exceeded, over topping the banks and flood defences.

According to the EA's Flood Map for Planning Purposes (Figure 8), the Site is located within fluvial Flood Zones 1, 2 and 3 and is therefore classified as having a Low to High probability of fluvial flooding from the Foudry Brook.

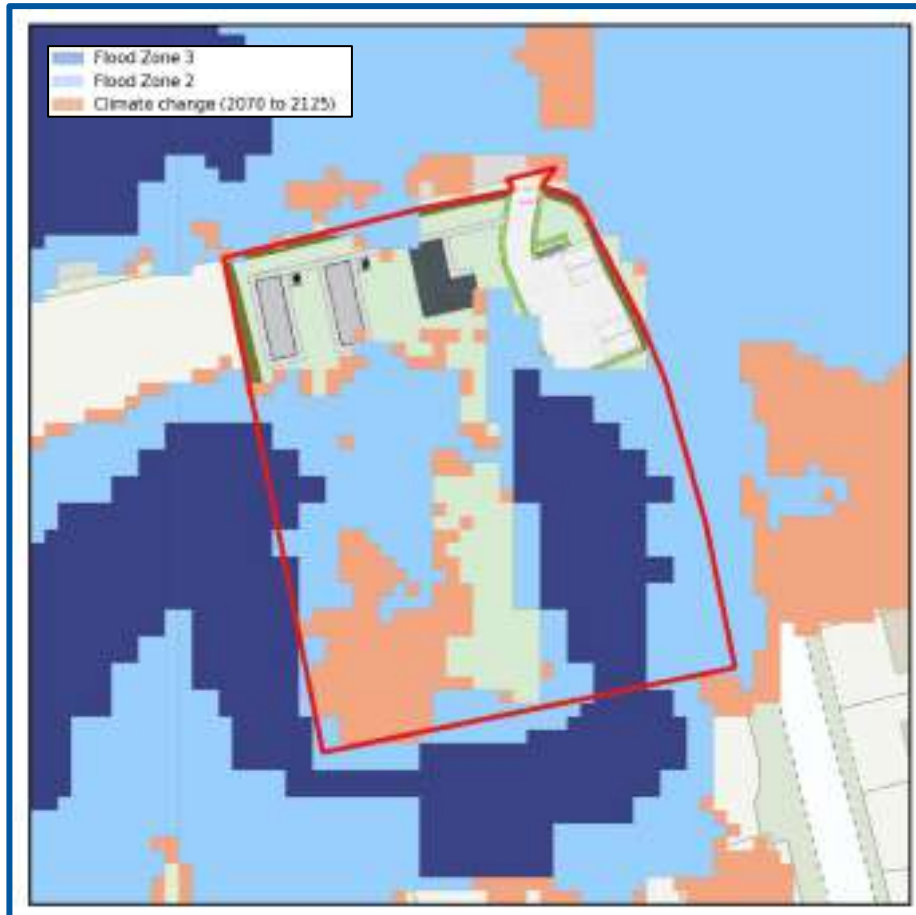
Approximately 35% of the Site (predominantly to the east and west, with a minor area to the north) is located within Flood Zone 2, while c. 17% of the Site in the south east and on the western boundary is located within Flood Zone 3. The remainder of the Site (approximately 48%) of the Site area is located within Flood Zone 1. The majority of the proposed built area is located within Flood Zone 1, with minor areas adjacent to the caravans and within the proposed day room footprint located in Flood Zone 2.

Figure 8. EA Flood Map for Planning Purposes (EA, 2026)



Interactive mapping of the SFRA (JBA Consulting, 2023) confirms that the Flood Zone 3 extent at the Site is considered to be Flood Zone 3b due to the limited model data available for the Site, however, it is noted that the proposed development area is located fully outside this extent, as shown in Figure 9 below.

Figure 9. EA Flood Map for Planning Purposes with proposed development plans (EA, 2026)



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When the impacts of climate change are applied (up to the 2080s epoch), the majority of the south of the Site as well as a minor area in the north is located within the flood zone extent. This indicates that the Site has either a Medium or High probability of fluvial flooding in the future, ignoring the presence of any existing flood defences and assuming that no future defence raising will occur. The remaining half of the Site remains located outside of the 'flood zone plus climate change' extent.

Guidance

As defined in the NPPF (2024):

Ignoring the presence of any defences, land located in a Flood Zone 1 is considered to have a Low probability of flooding, with less than a 1 in 1000 annual probability of fluvial or coastal flooding in any one year.

Development of all uses of land is appropriate in this zone (see glossary for terminology).

Ignoring the presence of any defences, land located in a Flood Zone 2 is considered to have a Medium probability of flooding, with between a 1 in 100 and 1 in 1000 annual probability of fluvial flooding or between a 1 in 200 and 1 in 1000 annual probability of coastal flooding in any one year.

Development of "Water-Compatible", "Essential Infrastructure", "Less Vulnerable" and "More Vulnerable" land uses are suitable for this zone with "Highly Vulnerable" land uses requiring an Exception Test to be passed prior to development taking place (see glossary for terminology).

Ignoring the presence of any defences, land located in a Flood Zone 3 is considered to have High probability of flooding with a 1 in 100 year or greater annual probability of fluvial flooding or a 1 in 200 or greater annual probability of coastal flooding in any one year.

The site is located in a functional flood plain therefore only development of "Water-Compatible" and "Essential Infrastructure" land uses are suitable for this zone (see glossary for terminology).

Flood defences

Guidance

Sites that are located close to flood defences are likely to be zones where rapid inundation will occur in the event of the flood defences being overtopped or breached. A Site located close to flood defences (within 250 m) may require a more detailed FRA subject to local topography.

Existing flood defences

The EA's Asset Information Management Systems (AIMS) dataset (2026) identifies the following assets within the vicinity of the Site:

- An area of natural high ground (asset ID: 10959) is located along the eastern bank of the Foudry Brook approximately 780 m to the west of the Site with a standard of protection of a 1 in 2 year event. The crest height and condition of these defences was not included within the dataset at the time of writing.
- Based on the available information it can be considered that the Site does not benefit from formal flood defences, with the only protection afforded to the Site through the capacity of the watercourse.

Future flood defences

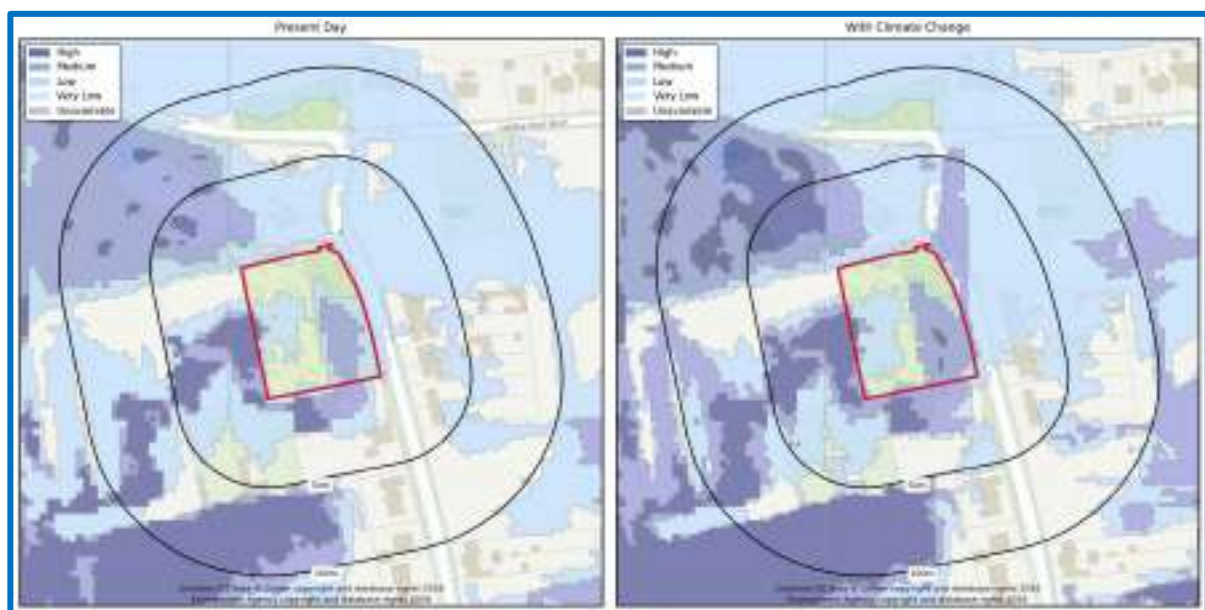
From the available information, the likelihood of future flood schemes for the Great Lea Common area could not be ascertained at the time of writing; it is therefore assumed that the risk presented by the Foudry Brook (Grazeley Upstream of M4) Modelling Study (Hallam Land Consulting, 2017) is likely to be sufficiently representative of the future fluvial flood risk at the Site.

Flood risk including the benefit of defences

The type and condition of existing flood defences influence the 'actual' risk of fluvial flooding to the Site, albeit the long-term residual risk of flooding (ignoring the defences) should be considered when proposing new development.

According to the EA's Risk of Flooding from Rivers and Sea (RoFRS) map (Figure 10), which considers the type, condition and crest height of flood defences, the Site has a risk of flooding ranging from Very Low to High from the nearby watercourse, the Foudry Brook in both the present day and climate change (2036 to 2069) modelling. It is noted that the proposed caravans and day room building are located within areas at Very Low to Low risk.

Figure 10. Risk of Flooding from Rivers and Sea map (EA, 2026)



Model data

As the Site is located within the EA's fluvial floodplain, modelled flood elevation data was obtained from the EA and has been used to assess flood risk and to provide recommendations for mitigation for the proposed development.

Defended modelled data from the Foudry Brook (Grazeley Upstream of M4) Modelling Study (Hallam Land Consulting, 2017) has been extracted from the 2D floodplain data provided at the Site². The data is provided in Table 3 and is included within Appendix C.

² The accuracy of the modelled flood levels are not known. These are dependent on the accuracy of input datasets such as LiDAR data, used to model the impacts of flooding within the 2D domain. Confirmation of the accuracy of the modelled flood data can be obtained separately from the Environment Agency.

Table 3. EA present day modelled flood data

Flood data	Modelled Flood Levels		
	1 in 20 year	1 in 100 year	1 in 1000 year
Flood level (mAOD)	N/A	40.48	40.51
Flood depths on Site (m)*	No flooding anticipated	Up to 0.81	Up to 0.84
Flood depths within proposed caravan and building locations (m)**	No flooding anticipated***		

*Compared to ground levels at the Site between 39.67 and 41.18 mAOD.

**Compared to ground levels within the proposed built footprints between 40.29 and 40.93 mAOD.

***Despite comparisons of LiDAR data and flood levels indicating that the proposed development area would flood during the 1 in 100 year and 1 in 1000 year events, flood extents included in Figure 11 confirm these areas will remain flood free during these events.

Figure 11 confirms the flood extent associated with overtopping of the flood defences in the present day flooding scenarios. It is likely that the majority of fluvial flooding will be confined to the topographical low point in the southeast of the Site (where no development is proposed) as shown in Figure 3, and is not anticipated to impact the proposed development.

Figure 11. Modelled present day flooding scenarios (Hallam Land Consulting, 2017)



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Climate change factors

The EA's Flood risk assessments: climate change allowances guidance (Published 19 February 2016 and updated May, 2022) has been used to inform a suitable increase in peak river flows for the proposed development. The updated guidance confirms 'Highly Vulnerable' developments are required to undertake a Basic assessment approach.

As the Site is located within the Kennet and Tributaries Management Catchment, within the Thames region and the proposed development is classed as Highly Vulnerable, where the proposed lifespan is approximately 100 years, the Central (21%) allowance has been used to determine a suitable climate change factor to apply to river data.

The Foudry Brook (Grazeley Upstream of M4) Modelling Study (Hallam Land Consulting, 2017) provides a modelled scenario for the 1 in 100 year plus 20% climate change event, therefore the design flood level for a 1 in 100 year + 21% climate change fluvial event (Appendix C) has been interpolated from the 1 in 100 year, 1 in 100 year + 20% and 1 in 1000 year 2D flood levels on-Site.

The in-channel flood data has been related to the Site through a calculation of the relationship between the EA's modelled in-channel water levels and modelled 2D floodplain node points.

Table 4. Flood levels plus climate change allowances

Flood data	Climate Change Modelled Flood Levels	
	1 in 100 year plus 20% allowance (Hallam Land Consulting, 2017)	1 in 100 year plus 21% 2080 central allowance derived from flood levels
Flood level (mAOD)	40.50	40.50
Flood depths on Site (m)*	Up to 0.83	
Flood depths within proposed caravan and building locations (m)**	No flooding anticipated***	

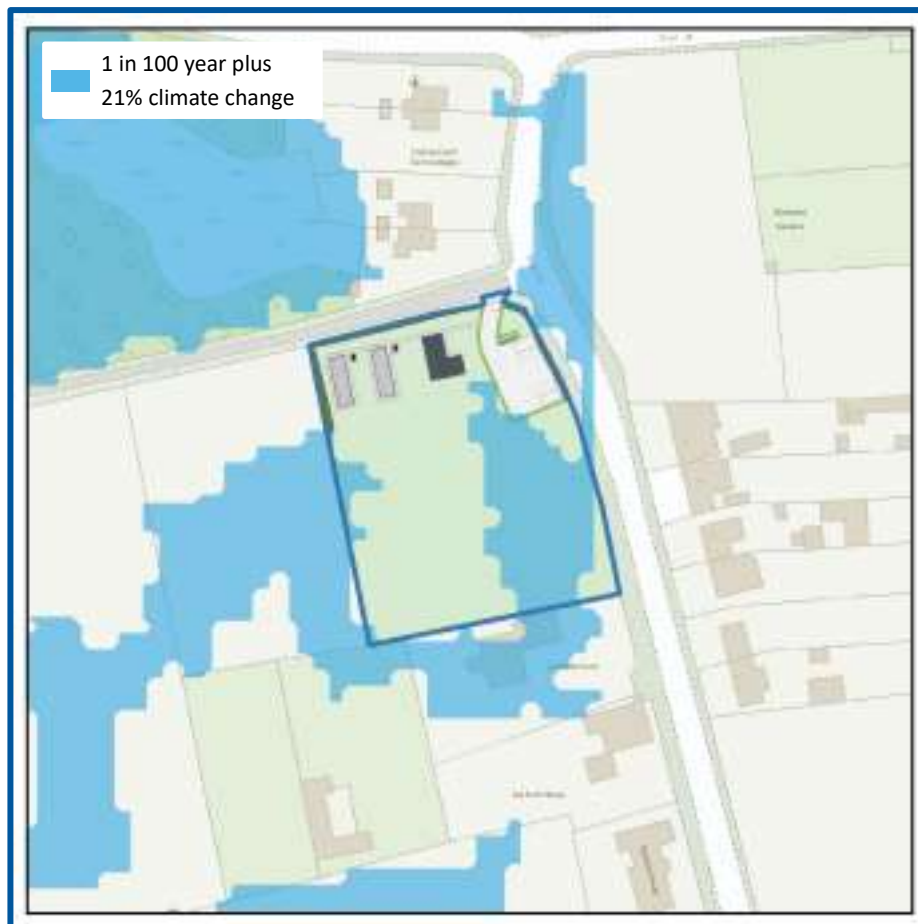
*Compared to ground levels at the Site between 39.67 and 41.18 mAOD.

**Compared to ground levels within the proposed built footprints between 40.29 and 40.93 mAOD.

***Despite comparisons of LiDAR data and flood levels indicating that the proposed development area would flood during the climate change event, flood extents included in Figure 12 confirm these areas will remain flood free where the flood level is 40.50 mAOD.

As the modelled and derived flood levels indicate the same flood level at the Site, the 1 in 100 year plus 20% climate change flood extent included in the Foudry Brook (Grazeley Upstream of M4) Modelling Study (Hallam Land Consulting, 2017) has been included in Figure 12 to provide an indication of the extent of the 21% climate change allowance flood event at the Site.

Figure 12. Modelled future climate change flooding scenario (Hallam Land Consulting, 2017)



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Whilst baseline mapping indicates there is a Very Low to High risk of flooding in the climate change (2036 to 2069) scenario, further analysis of Site ground levels and modelled flood data across the lifetime of the development indicate the development area would not be impacted in the 1 in 100 year plus 21% climate change overtopping scenario. The risks are therefore considered to be lower than the baseline, and range from Very Low to Low following further analysis to account for uncertainties relating to flood levels at the Site.

Surface water (pluvial) flooding

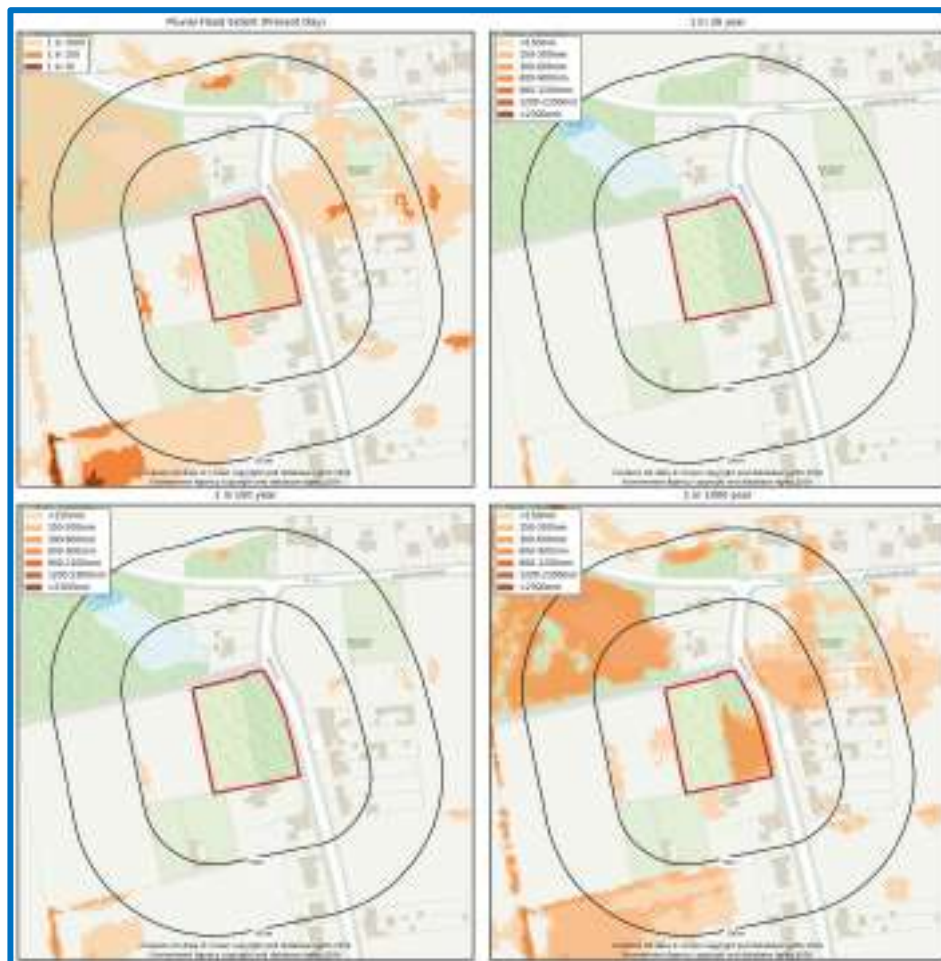
Surface water flooding occurs when intense rainfall exceeds the infiltration capacity of the ground and overwhelms the drainage systems. It can occur in most locations even at higher elevations and at significant distances from fluvial and coastal floodplains.

According to the EA's Surface Water Spatial Planning dataset included within the Flood Map for Planning, the Site has a Very Low to Low risk of pluvial flooding.

Figure 13 confirms the extent and depth of flooding in multiple modelled flood scenarios in the present day:

- During the Medium to High risk events (>3.3 -1% AEP), the Site is modelled to be unaffected by pluvial flooding.
- During the Low risk event (1 - 0.1% AEP), flooding of up to 0.30-0.60 m would impact the south east of the Site and is not anticipated to impact the proposed development, excluding a minor area of the proposed hardstanding in the north east of the Site. Contours derived from LiDAR data at the Site indicate a flood level of approximately 40.3 mAOD.

Figure 13. EA present day surface water flood extent and depth map (EA, 2026)



Surface water flooding flow routes

Analysis of OS mapping, ground elevation data and the EA's pluvial flow route mapping in the 1 in 1000-year (Low probability) event and Overland Flow Pathways mapping confirms the Site is not located on a potential overland flow route.

Based on the available data, the majority of the mapped pluvial flood risk during this event is considered representative of ponding in a topographic low rather than significant overland flow.

Climate change factors

Paragraph 002 of the National Planning Practice Guidance (2025) requires consideration of the 1% AP (1 in 100 year) event, including an appropriate allowance for climate change.

As the Site is located within the Kennet and Tributaries Management Catchment and the proposed development is classed as Highly Vulnerable, where the proposed lifespan is approximately 100 years, the Upper End (40%) allowance is required to determine a suitable climate change factor to apply to rainfall data.

As part of the EA's Surface Water Spatial Planning dataset, climate change scenarios have been produced to indicate the predicted impacts of climate change on future surface water flood risk. The upper end allowance for the 2070s epoch (2061-2125) has been used for the climate change scenarios which is considered suitable to assess the risk of flooding over the lifetime of the proposed development.

According to the climate change modelling (Figure 14, overleaf):

- During the High risk event (>3.3% AEP), flooding of less than 0.15 m is mapped in the landscaped area in the south east of the Site.
- During the Medium risk event (3.3 - 1% AEP), flooding of up to 0.30-0.60 m is anticipated in the landscaped area in the south east of the Site. Contours derived from LiDAR data at the Site indicate a flood level of approximately 40.2 mAOD.
- During the Low risk event (1 - 0.1% AEP), flooding of up to 0.60-0.90 m is anticipated across the southeast of the Site. Flooding is anticipated within a minor area of the proposed dayroom building footprint, however depths are less than 0.15 m in this location. LiDAR data at the Site indicates a flood level of approximately 40.4 mAOD for this event.

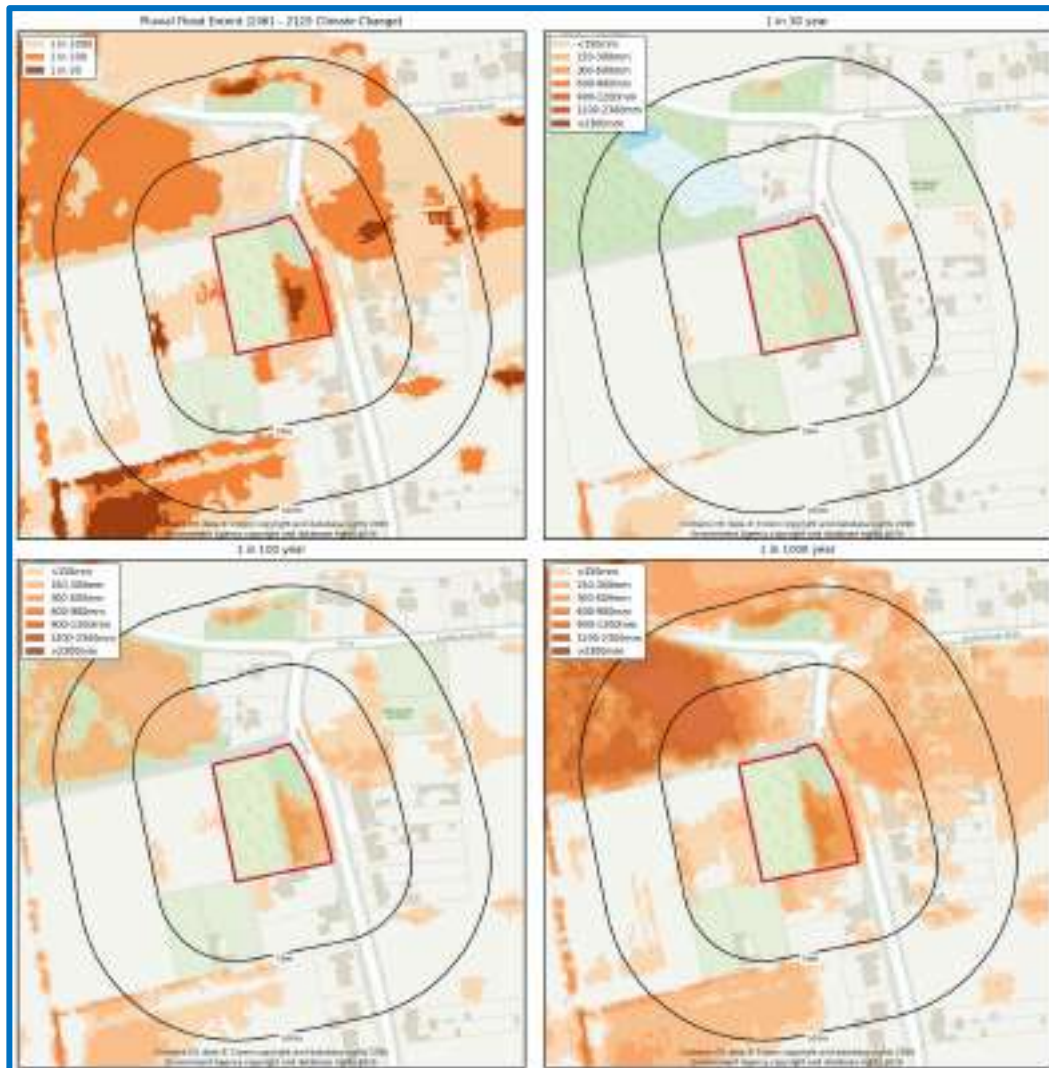
Guidance

According to EA's surface water flood risk map the Site is at:

- Very Low risk - chance of flooding of less than 1 in 1000 (0.1%).
- Low risk - chance of flooding of between a 1 in 1000 & 1 in 100 (0.1% and 1%).
- Medium risk - chance of flooding of between a 1 in 100 and 1 in 30 (1% and 3.3%).
- High risk - chance of flooding of greater than 1 in 30 (3.3%).

The SFRA does not confirm whether any incidents of historical surface water flooding have occurred within 50 m of the Site. The SFRA does confirm that the Site is not located within a Critical Drainage Area (CDA), as none have been identified within the Wokingham Borough Council area (JBA Consulting, 2023).

Figure 14. EA future (2070s) surface water flood extent and depth map (EA, 2026)



Guidance

According to EA's surface water flood risk map the following advisory guidance applies to the Site:

Flood Depth

- 0.15 to 0.3 m - Flooding would: typically exceed kerb height, likely exceed the level of a damp-proof course, cause property flooding in some areas

- 0.3 to 0.9 m - Flooding is likely to exceed average property threshold levels and cause internal flooding. Resilience measures are typically effective up to a water depth of 0.6 m above floor level.

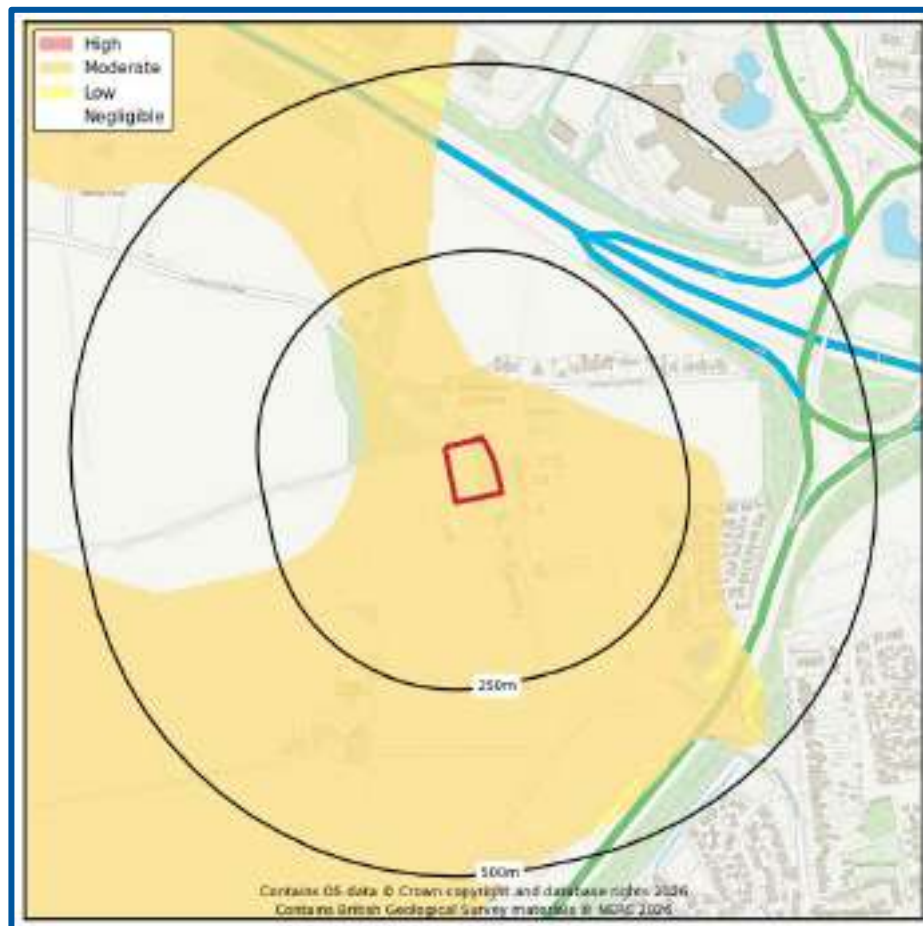
Baseline mapping indicates a Very Low to High risk. However, following a review of the proposed development plans, this is reduced to Very Low to Low due to proposed buildings not being anticipated to flood until the Low risk climate change event, where depths are shallow.

Groundwater flooding

Groundwater flooding occurs when sub-surface water emerges from the ground at the surface or into Made Ground and structures. This may be as a result of persistent rainfall that recharges aquifers until they are full; or may be as a result of high river levels, or tides, driving water through near-surface deposits. Flooding may last a long time compared to surface water flooding, from weeks to months. Hence the amount of damage that is caused to property may be substantially higher.

Groundwater Flood Risk screening data (Figure 15) indicates there is a Moderate risk of groundwater flooding at surface in the vicinity from permeable superficial deposits during a 1 in 100-year event.

Figure 15. GeoSmart GW5 Groundwater Flood Risk Map (GeoSmart, 2026)



Mapped classes within the screening map combine likelihood, possible severity and the uncertainty associated with predicting the subsurface system. The map is a national scale screening tool to prompt site-specific assessment where the impact of groundwater flooding would have significant adverse consequences. Mapping limitations and a number of local factors may reduce groundwater flood risk to land and property even where it lies within mapped groundwater flood risk zones, which do not mean that groundwater floods will occur across the whole of the risk area.

A site-specific assessment has been undertaken to refine the groundwater risk screening information on the basis of site-specific datasets (see Section 3) including BGS borehole data, and the EA's fluvial and tidal floodplain data to develop a conceptual groundwater model. The risk rating is refined further using the vulnerability of receptors including occupants and the existing and proposed Site layout, including the presence of basements and buried infrastructure. The presence of any nearby or on-Site surface water features such as drainage ditches, which could intercept groundwater have also been considered.

- It is understood there are no existing basements and a basement is not proposed as part of the development.
- According to a review of the hydrogeology (Section 3), the Site is underlain by permeable superficial deposits above low permeability bedrock. A shallow groundwater table could potentially exist above the contact between the superficial and bedrock layers, resulting in a 'perched' groundwater table. Groundwater levels may rise in the superficial aquifer in a seasonal response to prolonged rainfall recharge which may cause an unusually high peak in groundwater levels during some years.
- Groundwater levels may also rise in the superficial aquifer in response to high river events due to the potential hydraulic continuity with the nearby Foudry Brook.
- The design of the proposed development should consider the groundwater pathway through permeable formations.
- Despite the presence of an aquifer the Site would only be at risk of groundwater flooding if the water table reaches the base of the Site development or the ground surface when groundwater seepage could lead to overland flow and ponding. The surrounding topography suggests that groundwater seepage is more likely to occur downgradient of the proposed development area within the lower landscaped areas, or within the nearby drainage ditches and lower lying land.
- According to a review of the hydrogeology (Section 3), the nearby boreholes (ref: SU76NW292 and SU76NW66) did not record the presence or absence of groundwater within its 71 m bgl depth.
- The groundwater level may be influenced by the adjacent river levels with the 1 in 100 level estimated to be 40.08 mAOD within the Site, compared with Site levels of 39.67 to 41.18 mAOD.
- Interactive mapping included in Appendix A of the SFRA indicates that the Site is located within an area where groundwater is less than 0.025 m below the surface (JBA Consulting, 2023).
- The mapping also includes the EA's Areas Susceptible to Groundwater Flooding mapping, which was developed as a screening tool for Local Authorities at a strategic scale. This mapping indicates that the Site is located at the edge of a 1 km square where less than 25% of the land is susceptible to groundwater emergence, with the neighbouring square indicating that between 50 and 75% of the area is susceptible (JBA Consulting, 2023).
- Spring lines have not been identified in close proximity to the Site.

- The local topography and drainage is such that the development threshold is likely to be higher than the area where groundwater emerges in adjacent low points.

The hydrogeological characteristics suggest there is potential for a groundwater table beneath the Site.

The baseline groundwater flood risk rating is Moderate, and further analysis confirms that this would be appropriate for the Site.

Guidance

Moderate Risk - There will be a significant possibility that incidence of groundwater flooding could lead to damage to property or harm to other sensitive receptors at, or near, this location.

Climate change predictions suggest an increase in the frequency and intensity of extremes in groundwater levels.

- Rainfall recharge patterns will vary regionally resulting in changes to average groundwater levels.
- A rise in peak river levels will lead to a response of increased groundwater levels in adjacent aquifers subject to the predicted climate change increases in peak river level for the local catchment.

The impact of climate change on groundwater levels beneath the Site is linked to the predicted risk in both peak river levels and also the variation in rainfall recharge which is uncertain.

Flooding from artificial sources

Artificial sources of flood risk include waterbodies or watercourses that have been amended by means of human intervention rather than natural processes. Examples include reservoirs (and associated water supply infrastructure), docks, sewers and canals. The flooding mechanism associated with flood risk from artificial sources is primarily related to breach or failure of structures (reservoir, lake, sewer, canal, flood storage areas, etc.)

Sewer flooding

Figure 5-3 of the SFRA has identified a total of 181 incidences of flooding as a result of surcharging sewers within the RG7 1 postcode, with 28 of these recorded between 2019 and 2021. However, it is recognised that this four digit postcode covers a large area and instances of flooding are not specific to the Site (JBA Consulting, 2023).

Records held by Thames Water indicate that there have been no incidences of flooding related to the surcharging of public sewers at the Site (Thames Water, 2023; Appendix D).

Guidance

Properties classified as “at risk” are those that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system either once or twice in the ten year reference period. Records held by the sewage utility company provide information relating to reported incidents, the absence of any records does not mean that the Site is not at risk of flooding.

Canal failure

According to Ordnance Survey (OS) mapping, there are no canals within 500 m of the Site.

Water supply infrastructure

Water supply infrastructure is comprised of a piped network to distribute water to private houses or industrial, commercial or institution establishments and other usage points. In urban areas, this represents a particular risk of flooding due to the large amount of water supply infrastructure, its condition and the density of buildings. The risks of flooding to properties from burst water mains cannot be readily assessed.

If more information regarding the condition and history of the water supply infrastructure within the vicinity of the Site is required, then it is advisable to contact the local water supplier (Thames Water).

Culverts and bridges

The blockage of watercourses or structures by debris (that is, any material moved by a flowing stream including vegetation, sediment and man-made materials or refuse) reduces flow capacity and raises water levels, potentially increasing the risk of flooding. High water levels can cause saturation, seepage and percolation leading to failure of earth embankments or other structures. Debris accumulations can change flow patterns, leading to scour, sedimentation or structural failure.

A culvert has been identified on the drainage ditch located along the northern and eastern site boundary. The culvert may pose a flood risk to the Site should it become blocked or damaged.

Due to the absence of detailed hydrological modelling including blockage scenarios, the risk to the Site in the event of a culvert blockage cannot be fully assessed.

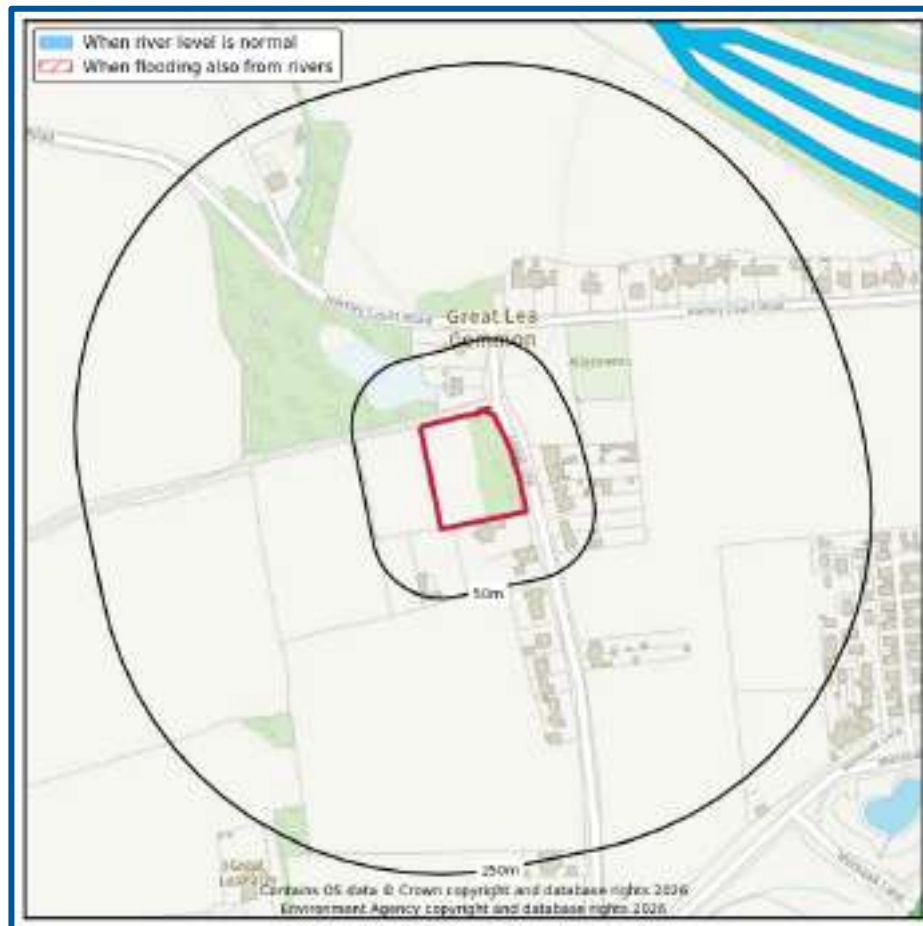
Discussions should be held with the Local authority, adjacent landowner and/or Environment Agency to ascertain the responsibility of maintenance for the infrastructure. Where no such schedule is already in effect it is recommended that an appropriate maintenance regime is put in place to maintain effective operation of the nearby culverts.

The SFRA has not identified any historic drainage issues within the Site area (JBA Consulting, 2023).

Reservoir flooding

According to the EA's Risk of Flooding from Reservoir mapping the Site is not at risk of flooding from reservoirs (Figure 16) (EA, 2026).

Figure 16. EA Risk of Reservoir Flooding (EA, 2026)



Guidance

The risk of reservoir flooding is related to the failure of a large reservoir (holding over 25,000 m³ of water) and is based on the worst-case scenario. Reservoir flooding is extremely unlikely to occur (EA, 2026).

6. Flood risk from the development



Floodplain storage

Where flood storage from any source of flooding is to be lost as a result of development, on-site level-for-level compensatory storage, accounting for the predicted impacts of climate change over the lifetime of the development, should be provided. Where it is not possible to provide compensatory storage on site, it may be acceptable to provide it off-site if it is hydraulically and hydrologically linked.

The loss of floodplain storage is less likely to be a concern in areas benefitting from appropriate flood risk management infrastructure or where the source of flood risk is solely tidal.

The proposed development area is partially located within fluvial Flood Zone 2 and involves an increase in building footprint but would not be impacted by the 1 in 100 year plus 21% climate change fluvial event. Therefore, there would be no displacement of flood water and compensatory flood storage is not required.

Drainage and run-off

Based on the topography and surface water flood risk in the vicinity, interference or interaction with overland flow paths and inflows from off-Site is considered possible. It is recommended that steps are taken to manage these potential inflows within the Site drainage system.

The proposed development involves an increase of impermeable surfaces at the Site. An estimation of run-off is therefore required to permit effective Site water management and prevent any increase in flood risk to off-Site receptors from the Site.

A Sustainable Drainage Strategy has been prepared separately by GeoSmart (ref: 80950.01) to manage the increase in runoff from the Site.

7. Suitability of the proposed development



The information below outlines the suitability of proposed development in relation to national and local planning policy.

National policy and guidance

The aims of the national planning policies are achieved through application of the Sequential Test and in some cases the Exception Test.

Guidance

Sequential test: The aim of this test is to steer new development towards areas with the lowest risk of flooding (NPPF, 2021). Reasonably available sites located in Flood Zone 1 should be considered before those in Flood Zone 2 and only when there are no reasonably available sites in Flood Zones 1 and 2 should development in Flood Zone 3 be considered.

Exception test: In some cases, this may need to be applied once the Sequential Test has been considered. For the exception test to be passed it must be demonstrated that the development would provide wider sustainability benefits to the community that outweigh flood risk and a site-specific FRA must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

Suitability of the proposed development, and whether the Sequential and Exception Tests are required, is based on the Flood Zone the Site is located within and the flood risk vulnerability classification of the existing and proposed development. Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

This report has been produced to assess all development types, prior to any development. The vulnerability classification and Flood Zones are compared within the table overleaf (Table 2 of the NPPG (2025)).

Although the Site is located within Flood Zones 1, 2 and 3b, the proposed development is located outside of the Flood Zone 3b extent. Therefore, as the proposed development is located in Flood Zones 1 and 2 and is defined as Highly Vulnerable; the proposals are acceptable, but are subject to the Sequential and Exceptions Test. It is noted that the Site has been developed in a sequential nature, with the proposed caravans and dayroom located outside of flood extents in the north of the Site.

Where the Sequential Test is required, it must be demonstrated that there are no alternative reasonably available Sites at lower risk of flooding within an area agreed with the council e.g. as stipulated by relevant national policy NPPF (2024).

Table 5. Flood risk vulnerability and flood zone 'incompatibility' (taken from NPPG, 2025)

Flood risk vulnerability classification		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood Zone	Zone 1 – low probability	✓	✓	✓	✓	✓
	Zone 2 – medium probability	✓	✓	Exception test required	✓	✓
	Zone 3a – high probability	Exception test required	✓	X	Exception test required	✓
	Zone 3b – functional flood plain	Exception test required	✓	X	X	X

EA Flood Risk Standing Advice for vulnerable developments located in Flood Zones 2 or 3 (February, 2022)

For all relevant vulnerable developments (i.e. more vulnerable, less vulnerable and water compatible), advice on the points should be followed:

- Surface water management;
- Access and evacuation; and
- Floor levels.

Surface water management

Plans for the management of surface water need to meet the requirements set out in either the local authority's:

- Surface water management plan where available; OR
- Strategic flood risk assessment.

They also need to meet the requirements of the approved building regulations Part H: drainage and water disposal. Read section H3 rainwater drainage.

Planning permission is required to use a material that can't absorb water (e.g. impermeable concrete) in a front garden larger than 5m².

Access and evacuation

Details of emergency escape plans should be provided for any parts of a building that are below the estimated flood level:

Plans should show:

- Single storey buildings or ground floors that don't have access to higher floors can access a space above the estimated flood level, e.g. higher ground nearby;
- Basement rooms have clear internal access to an upper level, e.g. a staircase;
- Occupants can leave the building if there's a flood and there's enough time for them to leave after flood warnings.

Floor levels

The following should be provided:

- average ground level of your site
- ground level of the access road(s) next to your building
- finished floor level of the lowest room in your building

Finished floor levels should be a minimum of whichever is higher of 300mm above the:

- average ground level of the site
- adjacent road level to the building
- estimated river or sea flood level

You should also use construction materials that have low permeability up to at least the same height as finished floor levels.

If you cannot raise floor levels to meet the minimum requirement, you will need to:

- raise them as much as possible
- consider moving vulnerable uses to upper floors
- include extra flood resistance and resilience measures

When considering the height of floor levels, you should also consider any additional requirements set out in the SFRA. Flood water can put pressure on buildings causing structural issues. If your design aims to keep out a depth of more than 600mm of water, you should get advice from a structural engineer. They will need to check the design is safe.

Extra flood resistance and resilience measures

Follow the guidance in this section for developments in flood risk areas where you cannot raise the finished floor levels to the required height. You should design buildings to exclude flood water where possible and to speed recovery in case water gets in.

Make sure your flood resilience plans for the development follow the guidance in the CIRIA Property Flood Resilience Code of Practice. Please note that the code of practice uses the term 'recovery measures'. In this guide we use 'resilience measures'.

Flooding can affect the structural stability of buildings. If your building design would exclude more than 600mm of flood water, you should get advice from a structural engineer. They will need to check the design is safe. Only use resistance measures that will not cause structural stability issues during flooding. If it is not possible to safely exclude the estimated flood level, exclude it to the structural limit then allow additional water to flow through the property.

The design should be appropriately flood resistant and resilient by:

- using flood resistant materials that have low permeability to at least 600mm above the estimated flood level
- making sure any doors, windows or other openings are flood resistant to at least 600mm above the estimated flood level
- using flood resilient materials (for example lime plaster) to at least 600mm above the estimated flood level
- by raising all sensitive electrical equipment, wiring and sockets to at least 600mm above the estimated flood level
- making it easy for water to drain away after flooding such as installing a sump and a pump
- making sure there is access to all spaces to enable drying and cleaning
- ensuring that soil pipes are protected from back-flow such as by using non-return valves

Temporary or demountable flood barriers are not appropriate for new buildings. Only consider them for existing buildings when:

- there is clear evidence that it would be inappropriate to raise floor levels and include passive resistance measures
- an appropriate flood warning or other appropriate trigger is available

If proposals involve the development of buildings constructed before 1919, refer to Flooding and Historic Buildings guidance produced by Historic England.

8. Resilience and mitigation



Based on the flood risk identified at the Site, the national and local policies and guidance and proposed development, the mitigation measures outlined within this section of the report are likely to help protect the development from flooding.

Sea (coastal/tidal) flood mitigation measures

As the Site is not identified as being at risk of flooding from the sea, mitigation measures are not required.

Rivers (fluvial) flood mitigation measures

The Site is located within an area which is affected by flooding from rivers, the following table confirms the flood depths associated with the area proposed for development.

Table 6. Flood levels compared to ground levels in the area proposed for development

Flood data	Modelled Flood Levels (mAOD)		
	1 in 100 year	1 in 100 year plus 21% CC	1 in 1000 year
Flood level (mAOD)	40.48	40.50	40.51
Flood depths on Site (m)*	Up to 0.81	Up to 0.83	Up to 0.84
Flood depths within proposed caravan and building locations (m)**	No flooding anticipated***		

*Compared to ground levels at the Site between 39.67 and 41.18 mAOD.

**Compared to ground levels within the proposed built footprints between 40.29 and 40.93 mAOD.

***Despite comparisons of LiDAR data and flood levels indicating that the proposed development area would flood during these events, however, flood extents confirm these areas will remain flood free.

Raising minimum floor levels

The vulnerability classification of the Site and the Flood Zone means proposals for the Site fall under the EA's Flood Risk Standing Advice (FRSA) for more vulnerable developments.

In this instance, in line with the EA's FRSA the recommended minimum Finished Floor Level (FFL) or base of the structures should be set at least 0.3 m above the 1 in 100 year plus 21% allowance for climate change flood level of 40.50 mAOD to 40.80 mAOD.

As it is expected that the majority of flooding will be confined to the topographic low point in the southeast of the Site, if finished floor levels can be raised to the recommended level, this could reduce the flood risk to the development from Very Low - Low down to Very Low.

Alternative mitigation measures for consideration

Given the uncertainty relating to flood levels and ground elevations at the Site, as well as the Highly Vulnerable classification of this, the following mitigation measures are provided for consideration to reduce the risk to the development. It is noted that structural recommendations may be more applicable to day room building rather than the caravans.

Where it is not possible to raise the minimum finished floor levels to the recommended elevation, it may be appropriate to adopt a water exclusion strategy for flood depths up to 0.3 m in line with the EA's Standing Advice. A water exclusion strategy, using avoidance and resistance measures, is appropriate where floods are expected to last for short durations. Potential water exclusion strategies include:

- Passive flood door systems;
- Temporary flood barriers;
- Air brick covers (manual or automatic closing);
- Non-return flap valves on sewer outfalls.
- Construction of local bunds;
- Landscaping to divert water away from the property;
- Boundary walls/fencing;

Avoidance and resistance measures are unlikely to completely prevent floodwater entering a property, particularly during longer duration flood events. Therefore, it is recommended that the following flood resilience measures are also considered.

- Flood resilient materials and designs:
 - Use of low permeability building materials up to 0.3 m such as engineering bricks (Classes A and B) or facing bricks;
 - Hard flooring and flood resilient metal staircases;
 - The use of internal lime plaster/render or where plasterboards are used these should be fitted horizontally instead of vertically and/or using moisture resistant plasterboard at lower levels;

- o Water, electricity and gas meters and electrical sockets should be located above the predicted flood level;
- o Communications wiring: wiring for telephone, TV, Internet and other services should be protected by suitable insulation in the distribution ducts to prevent damage.

If these mitigation measures are implemented this could reduce the flood risk to the development from Very Low - Low to Very Low.

Surface water (pluvial) flood mitigation measures

The mitigation measures detailed above for fluvial flood risk are likely to be suitable for the flood depths which could be experienced in a 1 in 1000 year pluvial flood event.

In addition, the regular maintenance of any drains and culverts surrounding/on the Site should be undertaken to reduce the flood risk.

If these mitigation measures are implemented this would reduce the flood risk to the development from Very Low – Low to Very Low.

Groundwater flood mitigation measures

It is likely the flood mitigation measures recommended for fluvial and surface water (pluvial) risk will reduce the groundwater flood risk at the development. However specific additional groundwater measures that may also be considered for the Moderate risk identified include:

- Interceptor drains;
- Automatic sump to extract flood water; and
- Non-return flap valves on the proposed foul and surface water sewer lines.

If these mitigation measures are implemented this could reduce the flood risk to the development from Moderate to Low.

Reservoir flood mitigation measures

The Site is not a risk of flooding from reservoirs; therefore, mitigation measures are not required.

Other flood risk mitigation measures

As the Site is not identified as at risk from other sources, mitigation measures are not required.

Residual flood risk mitigation measures

The risk to the Site has been assessed from all sources of flooding and appropriate mitigation and management measures proposed to keep the users of the development safe over its lifetime. There is however a residual risk of flooding associated with the potential for failure of mitigation measures if regular maintenance and upkeep isn't undertaken. If mitigation

measures are not implemented or maintained, the risk to the development will remain as the baseline risk.

Further flood mitigation information

More information on flood resistance, resilience and water entry can be found here:
http://www.planningportal.gov.uk/uploads/br/flood_performance.pdf
www.knowyourfloodrisk.co.uk

Emergency evacuation - safe access / egress and safe refuge

Emergency evacuation to land outside of the floodplain should be provided if feasible. Where this is not possible, 'more vulnerable' developments and, where possible, development in general (including basements), should have internal stair access to an area of safe refuge within the building to a level higher than the maximum likely water level. An area of safe refuge should be sufficient in size for all potential users and be reasonably accessible to the emergency services.

Emergency evacuation from the development and the Site should only be undertaken in strict accordance with any evacuation plans produced for the Site, with an understanding of the flood risks at the Site including available mitigation, the vulnerability of occupants and preferred evacuation routes.

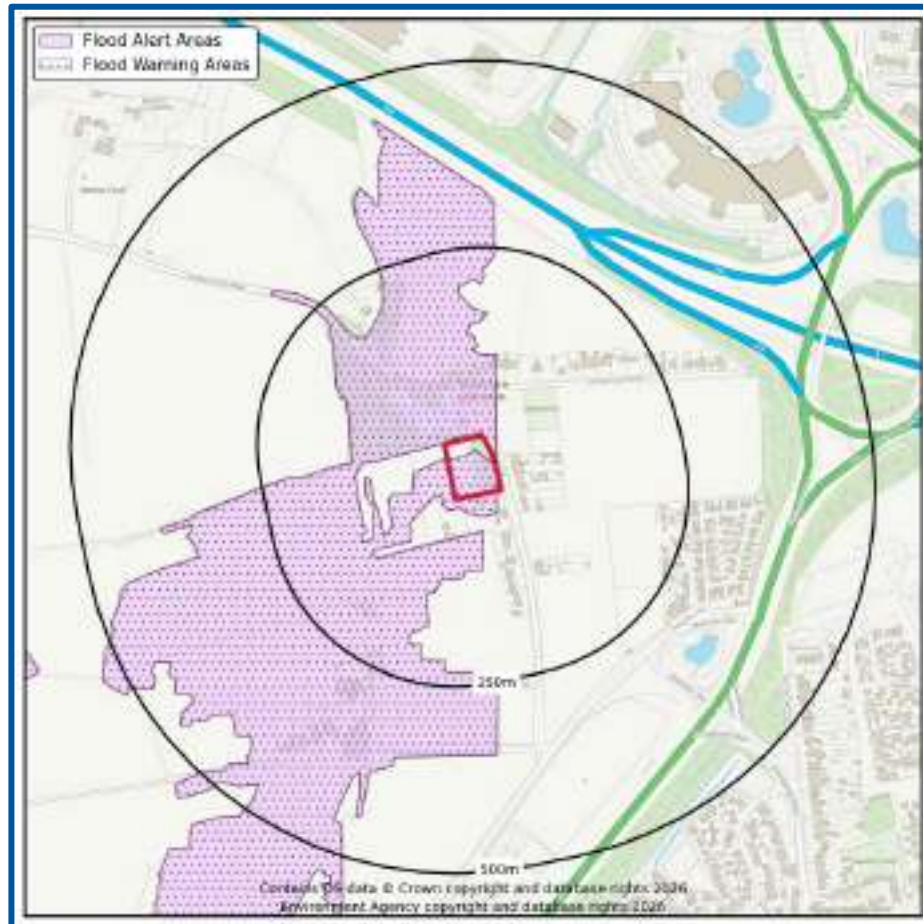
Flood warnings

The EA operates a flood warning service in all areas at risk of flooding; this is available on their website: <https://www.gov.uk/check-flood-risk>. The Site is located within an EA Flood Alerts and Warning coverage area so is able to receive alerts and warnings (Figure 17). All warnings are also available through the EA's 24 hour Floodline Service 0345 988 1188.

- **Flood Alert:** 061WAF22EnbnFdry; Quick Dial code: 171021
- **Flood Warning:** 061FWF22FoudryBk; Quick Dial code: 171019

The EA aims to issue Flood Warnings 2 hours in advance of a flood event. Flood Warnings can provide adequate time to enable protection of property and evacuation from a Site, reducing risk to life and property.

Figure 17. EA Flood Warning Coverage for the local area (EA, 2026)



Emergency evacuation

Where possible, a safe access and egress route with a 'very low' hazard rating from areas within the floodplain to an area wholly outside the 1 in 100 year flood event including an allowance for climate change should be demonstrated.

Based on the EA's Flood Zone Map the closest dry evacuation area within Flood Zone 1 is along Great Lea Road (c. 20 m southeast of the Site – direct measurement). It is advised that evacuation from the premises would be the preferred option in a flood event if safe to do so. It is recommended that residents prepare to evacuate as soon as an EA Flood Warning is issued in order to completely avoid flood waters.

On-Site refuge

Due to the current configuration of the development, on-Site refuge is not available. As such, evacuation of the Site should be considered on the immediate receipt of a flood warning.

Other relevant information

A Flood Warning and Evacuation Plan (FWEP) is recommended, and occupants should be signed up to receive EAs Flood Warnings.

Registration to the Environment Agency's flood warning scheme can be done by following this link: <https://www.gov.uk/sign-up-for-flood-warnings>.

It is recommended that main communication lines required for contacting the emergency services, electricity sockets/meters, water supply and first aid stations and supplies are not compromised by flood waters. Where possible these should all be raised above the extreme flood level.

9. Conclusions and recommendations



Table 7. Risk ratings following Site analysis

Source of Flood Risk	Baseline ¹	After analysis ²	After Mitigation ³
River (fluvial) flooding	Very Low to High	Very Low to Low	Very Low
Sea (coastal/tidal) flooding	Very Low		N/A
Surface water (pluvial) flooding	Very Low to High	Very Low to Low	Very Low
Groundwater flooding	Moderate		Low
Other flood risk factors present	Yes (sewers)		Yes
Is any other further work recommended?	Yes (see below)		

1 BASELINE risks assigned for the whole Site, using national risk maps, including the benefit of EA flood defences.

2 AFTER ANALYSIS modification of risk assessment based on detailed site specific analysis including some or all of the following: flood model data, high resolution mapping, building location, access routes, topographic and CCTV surveys. Reasons for the change in classification are provided in the text.

3 AFTER MITIGATION risks include risks to proposed development / asset and occupants if mitigation measures recommended in this report are implemented, including the impacts of climate change.

*N/A indicates where mitigation is not required.

The table overleaf provides a summary of where the responses to key questions are discussed in this report. Providing the recommended mitigation measures are put in place it is likely that flood risk to this Site will be reduced to an acceptable level.

The proposed development is partially located in Flood Zone 2 and the development is classed as Highly vulnerable which will require review and discussion of mitigation measures with the Local Authority.

Table 8. Summary of responses to key questions in the report

Key sources of flood risks identified	Fluvial, pluvial and groundwater (see Section 5).
---------------------------------------	---

Are standard mitigation measures likely to provide protection from flooding to/from the Site?	Yes (see Section 8).
Is any further work recommended?	Yes (See exec summary and Section 8).

10. Further information



The following table includes a list of additional products by GeoSmart:

Additional GeoSmart Products			
	Additional assessment: EnviroSmart Report		Provides a robust desk-based assessment of potential contaminated land issues, taking into account the regulatory perspective. Our EnviroSmart reports are designed to be the most cost effective solution for planning conditions. Each report is individually prepared by a highly experienced consultant conversant with Local Authority requirements. Ideal for pre-planning or for addressing planning conditions for small developments. Can also be used for land transactions. Please contact info@geosmartinfo.co.uk for further information.

11. References and glossary



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Glossary

General terms

BGS	British Geological Survey
EA	Environment Agency
GeoSmart groundwater flood risk model	GeoSmart's national groundwater flood risk model takes advantage of all the available data and provides a preliminary indication of groundwater flood risk on a 50m grid covering England and Wales. The model indicates the risk of the water table coming within 1 m of the ground surface for an indicative 1 in 100 year return period scenario.
Dry-Island	An area considered at low risk of flooding (e.g. In a Flood Zone 1) that is entirely surrounded by areas at higher risk of flooding (e.g. Flood Zone 2 and 3)
Flood resilience	Flood resilience or wet-proofing accepts that water will enter the building, but through careful design will minimise damage and allow the re-occupancy of the building quickly. Mitigation measures that reduce the damage to a property caused by flooding can include water entry strategies, raising electrical sockets off the floor, hard flooring.
Flood resistance	Flood resistance, or dry-proofing, stops water entering a building. Mitigation measures that prevent or reduce the likelihood of water entering a property can include raising flood levels or installation of sandbags.
Flood Zone 1	This zone has less than a 0.1% annual probability of river flooding
Flood Zone 2	This zone has between 0.1 and 1% annual probability of river flooding and between 0.1% and 0.5 % annual probability sea flooding
Flood Zone 3	This zone has more than a 1% annual probability of river flooding and 0.5% annual probability of sea flooding
Functional Flood Plain	An area of land where water has to flow or be stored in times of flood.
Hydrologic model	A computer model that simulates surface run-off or fluvial flow. The typical accuracy of hydrologic models such as this is $\pm 0.25\text{m}$ for estimating flood levels at particular locations.
OS	Ordnance Survey

Residual Flood Risk	The flood risk remaining after taking mitigating actions.
SFRA	Strategic Flood Risk Assessment. This is a brief flood risk assessment provided by the local council
SuDS	A Sustainable drainage system (SuDS) is designed to replicate, as closely as possible, the natural drainage from the Site (before development) to ensure that the flood risk downstream of the Site does not increase as a result of the land being developed. SuDS also significantly improve the quality of water leaving the Site and can also improve the amenity and biodiversity that a Site has to offer. There are a range of SuDS options available to provide effective surface water management that intercept and store excess run-off. Sites over 1 Ha will usually require a sustainable drainage assessment if planning permission is required. The current proposal is that from April 2014 for more than a single dwelling the drainage system will require approval from the SuDS Approval Board (SABs).

Aquifer Types

Principal aquifer	These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.
Secondary A aquifer	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.
Secondary B aquifer	Predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.
Secondary undifferentiated	Has been assigned in cases where it has not been possible to attribute either category A or B to a rock type due to the variable characteristics of the rock type.
Unproductive Strata	These are rock layers or drift deposits with low permeability that has negligible significance for water supply or river base flow.

NPPF (2024) terms

Exception test	Applied once the sequential test has been passed. For the exception test to be passed it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk and a site-specific FRA must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.
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Sequential test	Aims to steer new development to areas with the lowest probability of flooding.
Essential infrastructure	Essential infrastructure includes essential transport infrastructure, essential utility infrastructure and wind turbines.
Water compatible	Water compatible land uses include flood control infrastructure, water-based recreation and lifeguard/coastal stations.
Less vulnerable	Less vulnerable land uses include police/ambulance/fire stations which are not required to be operational during flooding and buildings used for shops/financial/professional/other services.
More vulnerable	More vulnerable land uses include hospitals, residential institutions, buildings used for dwelling houses/student halls/drinking establishments/hotels and sites used for holiday or short-let caravans and camping.
Highly vulnerable	Highly vulnerable land uses include police/ambulance/fire stations which are required to be operational during flooding, basement dwellings and caravans/mobile homes/park homes intended for permanent residential use.

Data Sources

Aerial Photography	Contains Ordnance Survey data © Crown copyright and database right 2026 BlueSky copyright and database rights 2026
Bedrock & Superficial Geology	Contains British Geological Survey materials © NERC 2026 Ordnance Survey data © Crown copyright and database right 2026
Flood Risk (Flood Zone/RoFRS/Historic Flooding/Pluvial/Surface Water Features/Reservoir/ Flood Alert & Warning)	Environment Agency copyright and database rights 2026 Ordnance Survey data © Crown copyright and database right 2026
Flood Risk (Groundwater)	GeoSmart, BGS & OS GW5 (v2.4) Map (GeoSmart, 2026) Contains British Geological Survey materials © NERC 2026 Ordnance Survey data © Crown copyright and database right 2026
Location Plan	Contains Ordnance Survey data © Crown copyright and database right 2026

Topographic Data	OS LiDAR/EA Contains Ordnance Survey data © Crown copyright and database right 2026 Environment Agency copyright and database rights 2026
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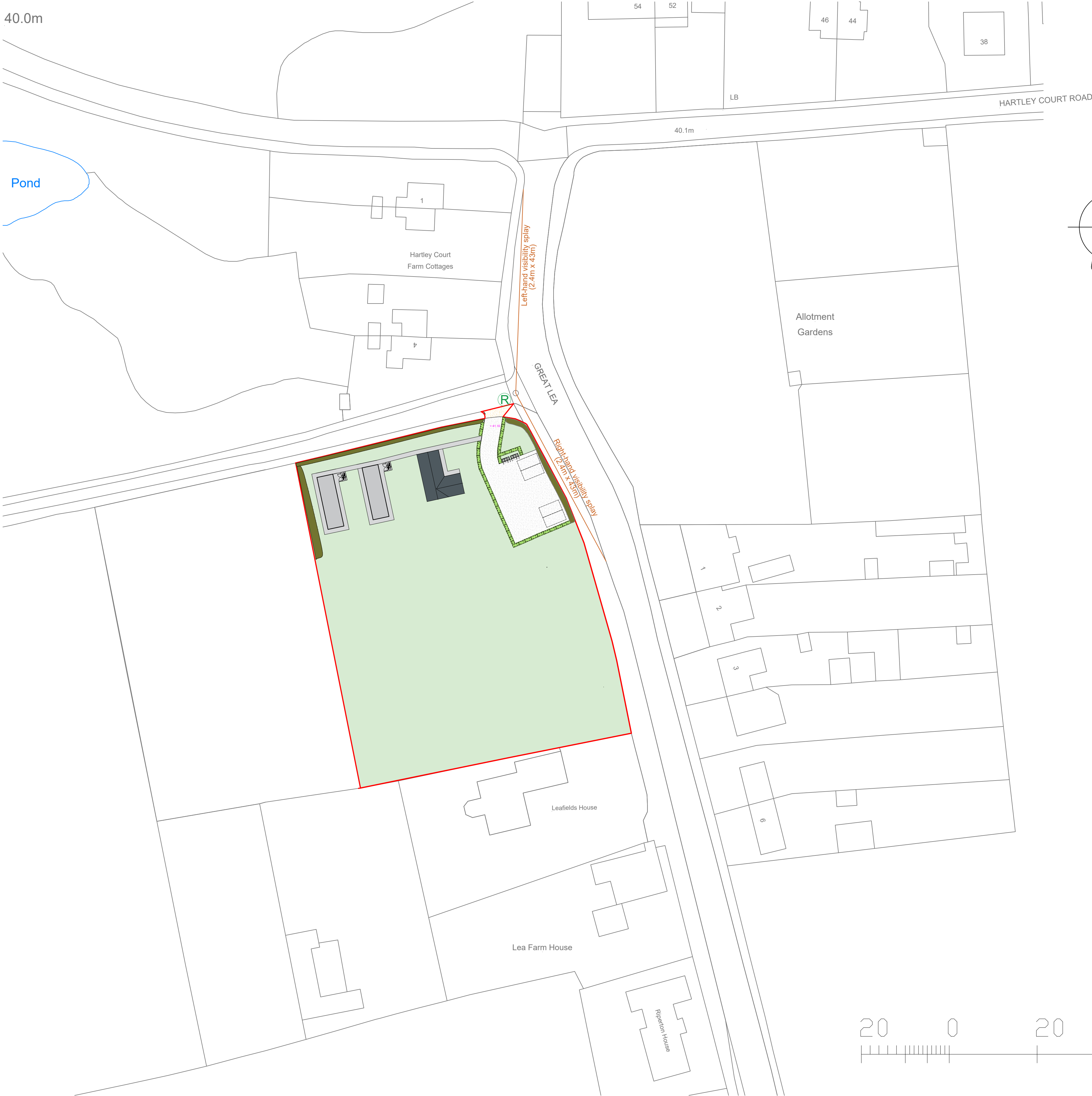
12. Appendices



Appendix A



Site plans



PROPOSED KEY

Site area : 4596 m2

Proposed static

Proposed dayroom nuclear fallout compliant (see GP/04/26)

grass area

Existing access drive

Proposed hardstanding

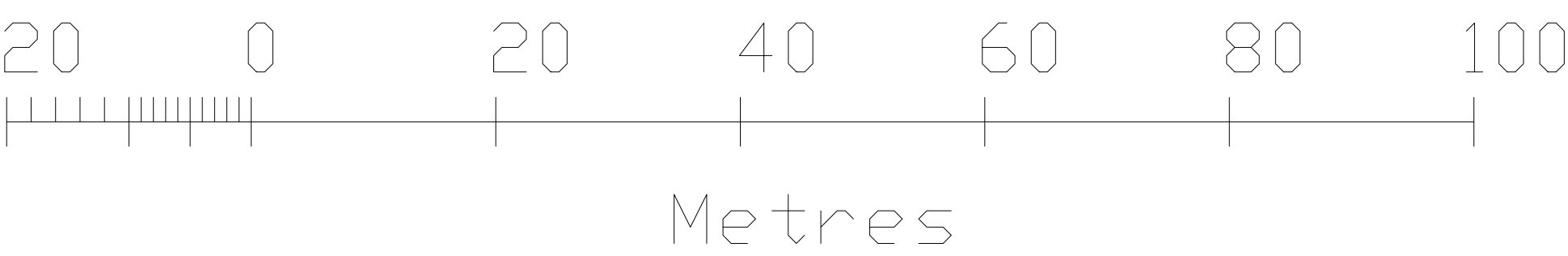
Proposed 2n° standard parking spaces

Proposed hedges / native planting

Proposed bicycle storage (see GP/05/26 and GP/06/26)

Proposed refuse / recycling (see GP/07/26)

Refuse recycling collection point



Drawing title	Proposed block plan with visibility splays	
Project	Proposed travellers site	
Address	Three Mile Cross Wokingham, RG7 1NP	
Client		
Scales	1:500	
Date	March 2026	
Drawing Number:	GP/03/26	Rev
Architectural elements Imagon Designs Ltd Le Cannerie, Montville Jouveux, Normandie, France, 27260 Tel: office 0033 (0)3 43 41 89 91 - 0033 (0)3 43 41 89 39 email: imagondesigns@orange.fr Registered Company No. 311167 - 80011 Address: Suite 2, Broomhill 165, Lutterford Road, Leicester, LE8 4DY © 2025 Imagon Designs Ltd		



Location plan 1/1250
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