

FloodSmart Plus



Flood Risk Assessment

Site Address

5 Shipton Road
Ascott-under-Wychwood
Chipping Norton
OX7 6AF

Date

2023-11-24

Report Status

FINAL

Grid Reference

429961, 218609

Site Area

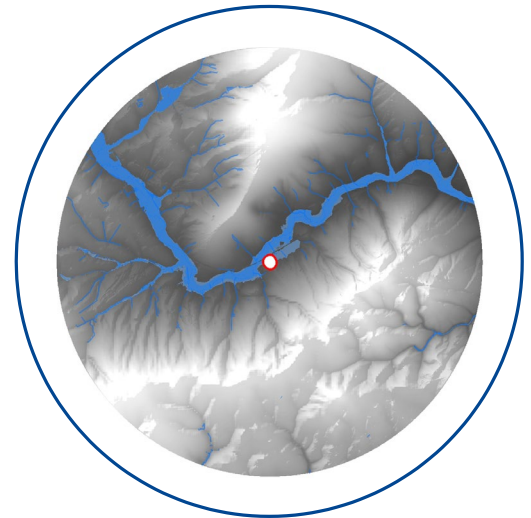
0.28 ha

Report Prepared for

James Withey

Report Reference

80684R1



RISK – Very Low to Medium

The Site is located in Flood Zone 1 and 2, this equates to a Medium risk of flooding from rivers and the sea. Surface water (pluvial) flood risks are Very Low. Groundwater flood risks are Low to Moderate and flooding risks from artificial sources (i.e. canals, reservoirs and sewers) are Low. Mitigation measures are recommended in this report to reduce the risks to an acceptable level over the lifetime of the development.

Report Author

Alistair Budden
Consultant

Report Checker

Jessica Bayliff
Senior Consultant

Report Reviewer

Bob Sargent
Associate

GeoSmart Information Ltd
Suite 9-11, 1st Floor, Old Bank Buildings,
Bellstone, Shrewsbury, SY1 1HU
+44(0)1743 298 100
info@geosmartinfo.co.uk
www.geosmartinfo.co.uk

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) (2023) and National Planning Practice Guidance (NPPG) (Published in 2014 and updated in August 2022). 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*	Final **
River (fluvial) flooding	Very Low to Medium	Very Low to Medium
Sea (coastal/tidal) flooding	Very Low	N/A
Surface water (pluvial) flooding	Very Low	N/A
Groundwater flooding	Low to Moderate	Low to Moderate
Other flood risk factors present	Yes	N/A
Is any other further work recommended?	Yes	Yes (see below)

*BASELINE risks have been calculated for the whole Site, using national risk maps, including the benefit of EA flood defences. **FINAL RISK RATING Includes a detailed analyses of flooding risks over the lifetime of the proposed development, including allowances for climate change AND assumes recommended mitigation measures are implemented. N/A indicates where mitigation is not required.

Summary of existing and proposed development

The Site is currently used within a residential capacity as a single story detached dwelling with flat roofed conservatory, a standalone shed and separate garage and large area of landscaped garden surrounding the property. The Site also includes the base of a former outbuilding and dilapidated outbuilding to the southeast boundary. To the north of the existing dwelling there is an underground tank.

Development proposals comprise the demolition of the existing buildings on the Site and the construction of four new dwellings, including the formation of new surface water soakaways. Site plans are included within Appendix A.

Summary of flood risks

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

- Historical flooding related to the 2007 floods is understood to have previously occurred in the vicinity of the Site as a result of the channel capacity of the River Evenlode being exceeded.

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

- According to the Environment Agency's (EA) Flood Map for Planning Purposes, the Site is located within a fluvial Flood Zone 1 (c.21%, low probability) and 2 (c.79%, medium probability).
- The Site benefits from the presence of flood defences, in the form of natural high ground on the embankments of the River Evenlode. This location is offered protection up to a 1 in 5 year standard (20% chance of occurring annually), from the Swale and Bund improvements constructed after the Summer 2007 floods. The swale and bund encourage the flow of water over the floodplain towards the railway bridge.
- 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 Medium risk of flooding.
- Buildings and important features on the Site are outside the mapped flood extents.
- 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.

During a 1 in 100 year plus 40% climate change allowance event the flood level at the Site would be under 1cm in depth.

Surface water (pluvial) flooding

- According to the EA's Risk of Flooding from Surface Water (pluvial) flood mapping, the Site has a Very Low risk of pluvial flooding.
- Therefore flooding would not affect the area proposed for development in the 1 in 100 year present day or climate change scenario event.
- A SuDS strategy has not been prepared by GeoSmart however to ensure surface water runoff from the Site is managed over the lifetime of the proposed development it is recommended.

Groundwater flooding

- Groundwater Flood Risk screening data indicates there is a variable potential risk of groundwater flooding at the surface in the vicinity of the Site, during a 1 in 100 year event ranging from Low to Moderate.

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 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) (AECOM, 2016) confirms no recorded instances of sewer flooding at or within the vicinity of the Site/ has identified no incidences or modelled incidences of flooding as a result of surcharging sewers within the vicinity of the site (Appendix F)

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

In accordance with paragraphs 161, 168 and footnote 56 of the NPPF (2023), as the development proposals are comprised of additional buildings within Flood Zone 2 and the Site has not been allocated within the Councils Local Plan the sequential test will be required, to compare flood risk at the Site with other available sites to find out which has the lowest flood risk.

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 1 cm in depth on the north site boundary. The development should set Finished Floor Levels should be set 300mm above the ground level. Or to develop the dwellings at the top of the slope adjacent to the north of the site.
- Due to the area proposed for the dwellings being within Flood Zone 2 and affected by the 1 in 1000 scenario, finished floor levels should be 300mm above the estimated 95.86 mAOD flood levels.
- 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.

- A Sustainable Drainage Strategy (SuDS) should be developed for the Site, for effective management of surface water runoff over the lifetime of the proposed 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.

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 (2023) and the source(s) of any flood risk present, guided by the NPPG (Published in 2014 and updated in August 2022). 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 (2023) and NPPG (2022).

"The National Planning Policy Framework set out the Government's planning policies for England and how these are expected to be applied" (NPPF, 2023).

The NPPF (2023) and NPPG (2022) 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, 2022).

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 2022 (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 West Oxfordshire Strategic Flood Risk Assessment (SFRA) (AECOM, 2016) 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 (2023).

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. A drainage strategy to control runoff can be commissioned separately if identified as a requirement within this report.

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 program 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	Utility provider (Appendix D)	OS Data
Historical	X	X	X		
River (fluvial) / Sea (tidal/coastal)	X	X	X		

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

*Local guidance and policy, referenced in Section 6, 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:

West Oxfordshire District Council Strategic Flood Risk Assessment (AECOM, 2016):

- All More Vulnerable and Highly Vulnerable development within Flood Zones 2 and 3 should set finished floor levels 300mm above the known or modelled 1 in 100 annual probability (1% AEP) flood level including an allowance for climate change.
- There have been numerous historical flood events in the West Oxfordshire study area. The most notable in recent memory was on the July 20th 2007 when extensive areas of the District were affected by fluvial and overland flooding as a result of a number of intensive rainfall events which commenced in the morning and subsided in the evening. A daily total rainfall measurement of 126.2mm was recorded at RAF Brize Norton on 20th July 2007.
- It should be noted that much of the sewer network dates back to Victorian times, some of which is of unknown capacity and condition. More recent sewers are likely to have been designed to the guidelines in 'Sewers for Adoption' (WRC, 2006). These sewers tend to have a design standard of up to the 1 in 30 year storm event (equating

to approximately a 1 in 5 year flood flow), although in many cases, it is thought that this design standard is not achieved, especially in privately owned systems.

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, 2023).



Site information

The Site is located in Ascott-under-Wychwood in a setting of residential land use at National Grid Reference SP 29961 18609.

Figure 1. Aerial imagery of the Site (Bluesky, 2023)



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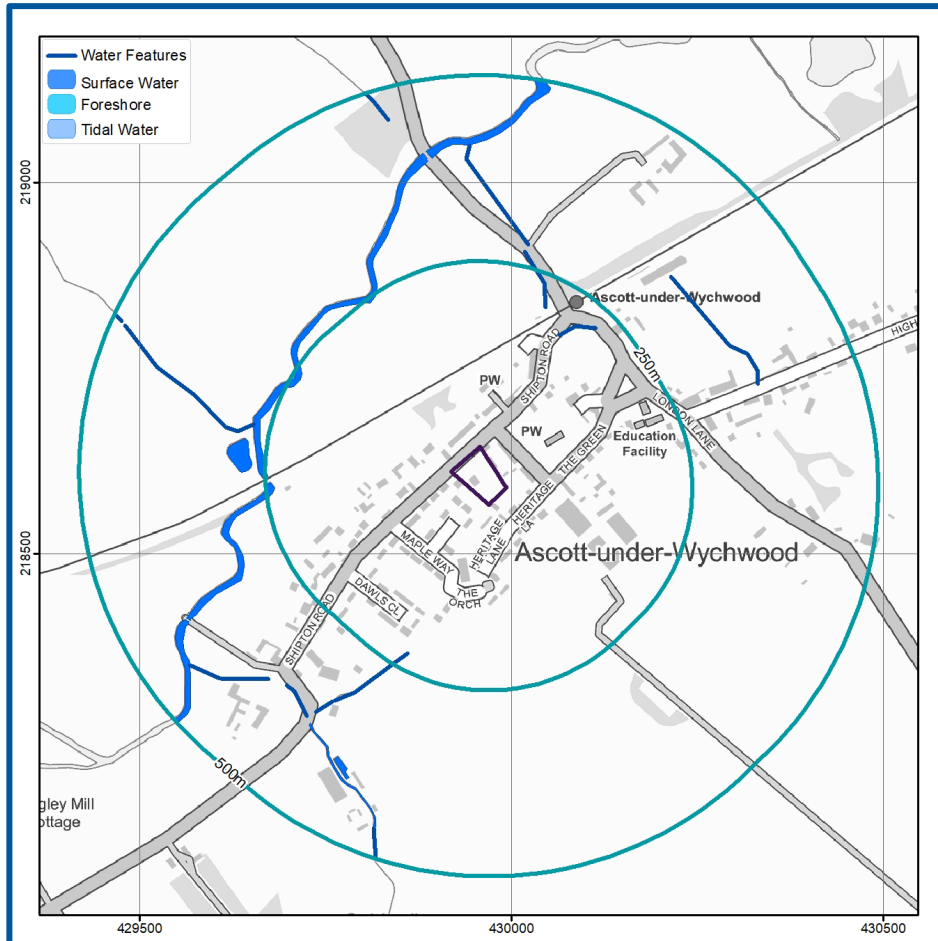
Figure 2 overleaf indicates ground levels within 500m of the Site fall in a north westerly direction.

The general ground levels on the Site are between 94.9 and 97.9m AOD with the Site falling gradually in a north westerly direction. This is based upon a Site specific topographic survey undertaken by GWP consultants (Appendix B).

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.

Figure 3. Surface water features (EA, 2023)



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The River Evenlode is approximately 250 m to the northwest of the Site at a lower elevation of 92 to 91m AOD.

280m to the east of the Site there is a small pool off the main river channel. There are also a number of smaller watercourses to the southwest of the Site joining the main river channel.

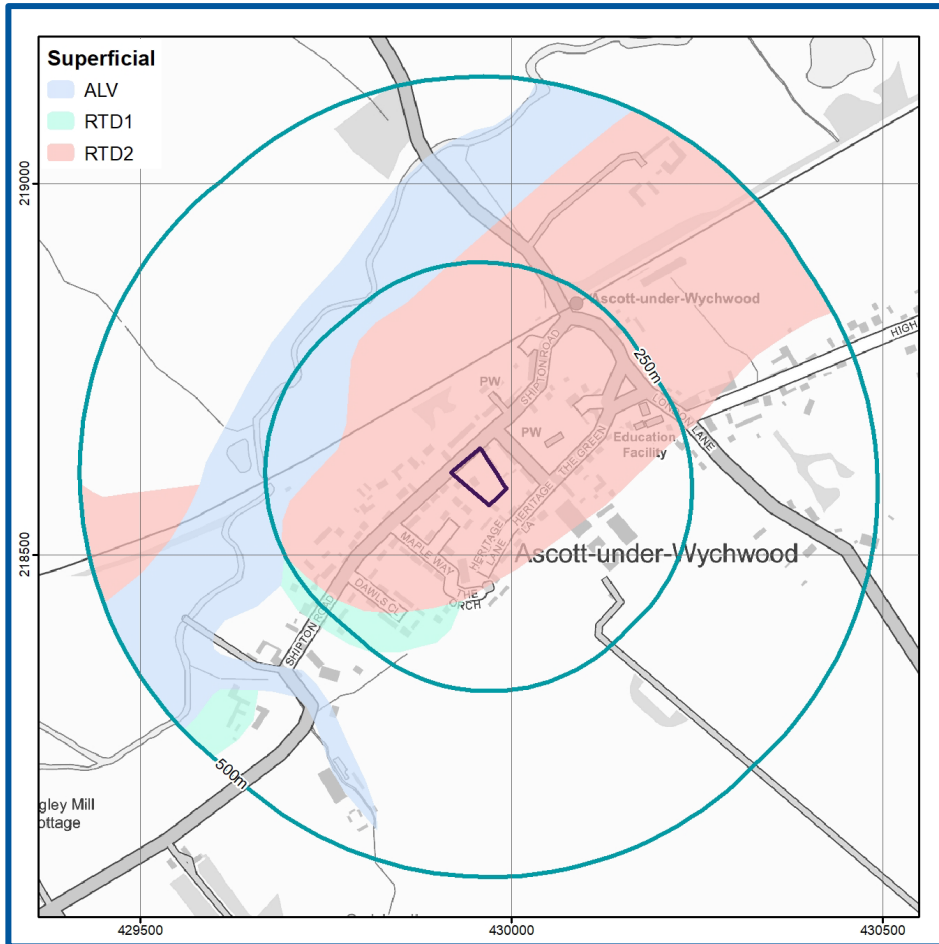
Proximity to relevant infrastructure

A railway bridge over the River Evenlode is located approximately 250 m to the west of the Site.

Hydrogeological features

British Geological Survey (BGS) mapping indicates the underlying superficial geology (Figure 4) consists of River Terrace Deposits, 2 (sand and gravel) (RTD2) (BGS, 2023) and is classified as a Secondary (A) Aquifer (EA, 2023).

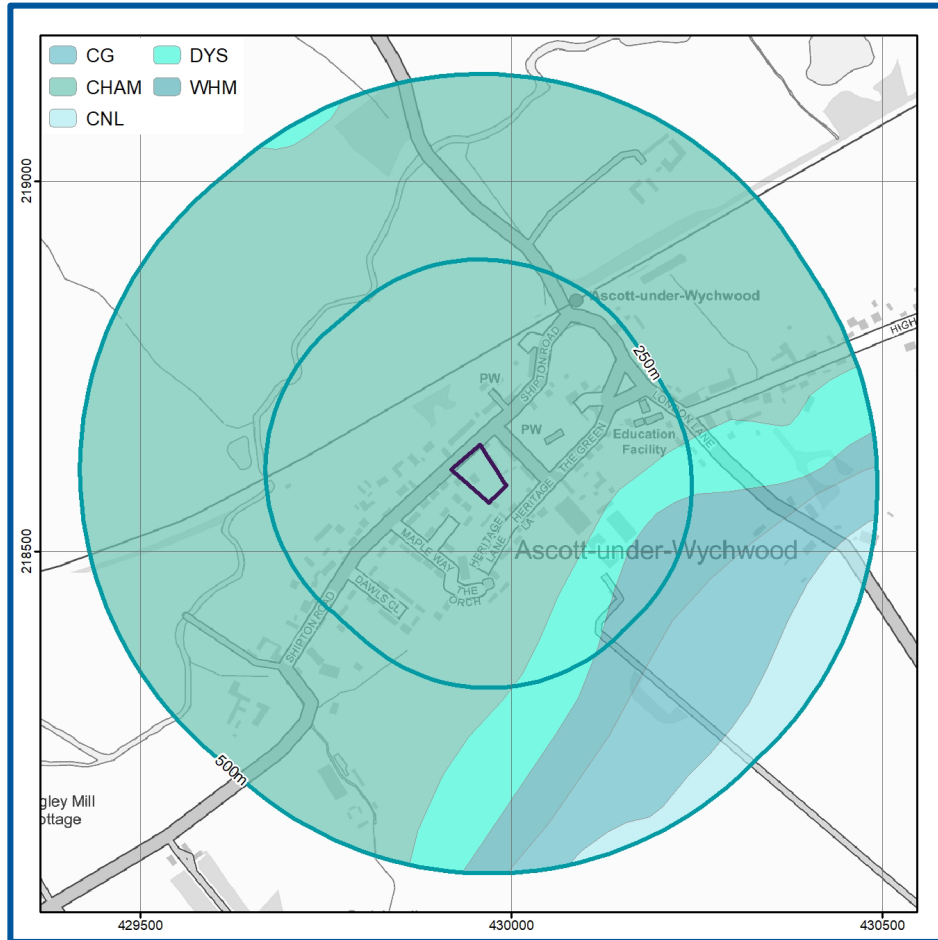
Figure 4. Superficial Geology (BGS, 2023)



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BGS mapping indicates the underlying bedrock geology (Figure 5) consists of Charmouth Mudstone Formation (CHAM) (BGS, 2023) and is classified as a Secondary Undifferentiated Aquifer (EA, 2023).

Figure 5. Bedrock Geology (BGS, 2023)



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Geological conditions

A review of the BGS borehole database (BGS, 2023) indicates the nearest and most relevant borehole to the Site (ref: SP31NW26, SP31NW27, SP31NW28) are located 128 m to the east of the Site boundary at an elevation of 97.2 mAOD, and indicates the underlying geology to consist of firm to stiff red brown silty clay with occasional gravel to a depth of 1.20 m below ground level (bgl) overlaying yellow brown, orange brown sandy clayey gravel to a depth of 3.10 m bgl.

Groundwater

Groundwater levels are recorded at 2.6 m bgl (REF: SP31NW28) and 2.9m bgl (REF: SP31NW27) below ground level on 12/01/1999 date, subject to seasonal variations.

4. Flood risk to the development

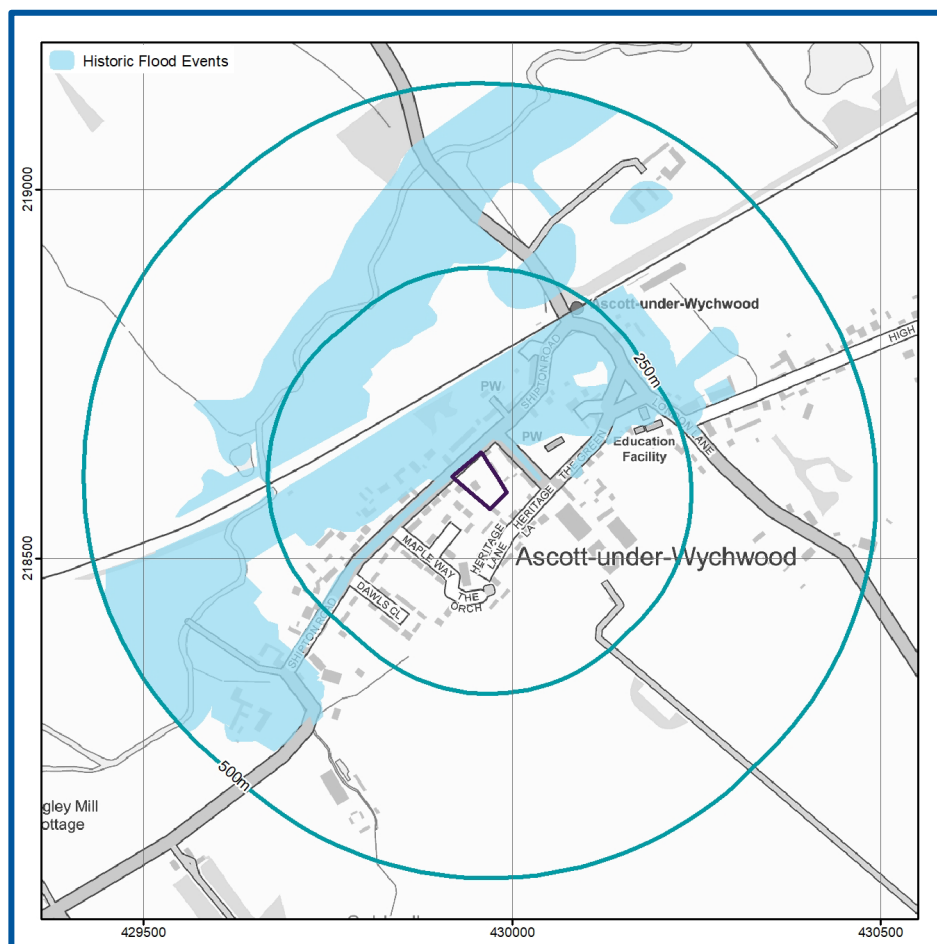


Historical flood events

According to the EA's Historical Flood Map (Figure 6) and Ascott-Under-Wychwood parish flood report (2008) there has been a flood event which occurred adjacent to the north of the site along Shipton Road. The 2007 July flooding events were caused channel capacity being exceeded, with no raised defences.

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 6. EA Historic Flood Map (EA, 2023)



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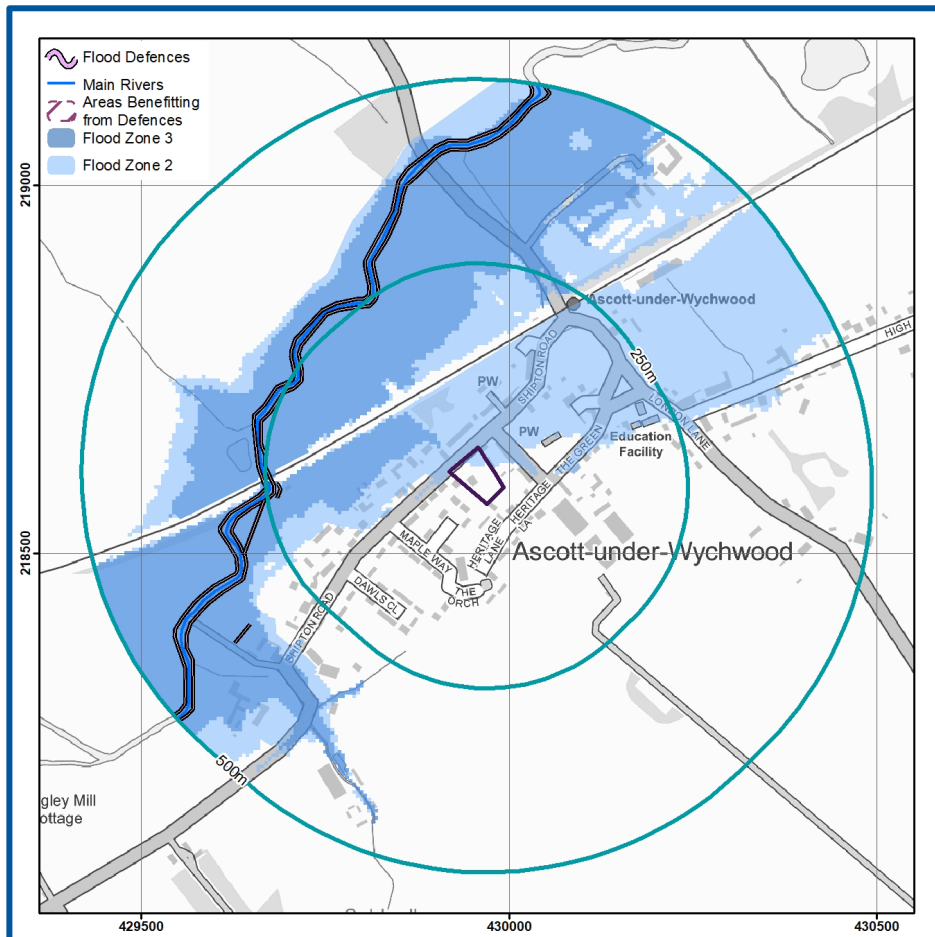
Rivers (fluvial) / Sea (coastal) / Estuarine (tidal) flooding

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 7), the Site is located within fluvial Flood Zone 1 (c.21%) and 2 (c.79%) is therefore classified as having a Low to Medium probability of fluvial flooding from the River Evenlode. The adjacent access road to the Site (Shipton Road) is mapped as being located within Flood Zone 2, which could impact evacuation routes from the Site during a flood event.

Figure 7. EA Flood Map for Planning Purposes (EA, 2023)



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As defined in the NPPF (2023):

Flood Zone 2

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).

Flood Zone 1

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).

Flood defences

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

- There are informal flood defences within 250 m of the Site. Natural high ground is present on both the left and right side of the River Evenlode, the specific elevation is unknown.

Information from the EA relating to the flood defences is outlined below.

- This location is offered protection up to a 1 in 5 year standard (20% chance of occurring annually), from the Swale and Bund improvements constructed after the Summer 2007 floods. The swale and bund encourage the flow of water over the floodplain towards the railway bridge.
- The railway bridge in Ascott was also widened to increase its capacity and to improve the conveyance of water along this section of the Evenlode.
- A surface water drainage scheme has been implemented in Ascott Earl, which is not represented within the detailed fluvial modelling.

- Property Level. Protection (PLP) has also been installed in most properties in this area, however this is not represented in the fluvial modelling. This is due to the non-permanency of demountable PLP and the nature and timing of flood events.
- The EA inspects the defences with the most recent being on the 04/10/2023.

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 Wychwood Modelling Study (Halcrow, 2012) has been extracted from the 2D floodplain data provided at the Site.¹ The data is provided in the table below and is included within Appendix C.

Table 2. EA present day modelled flood data

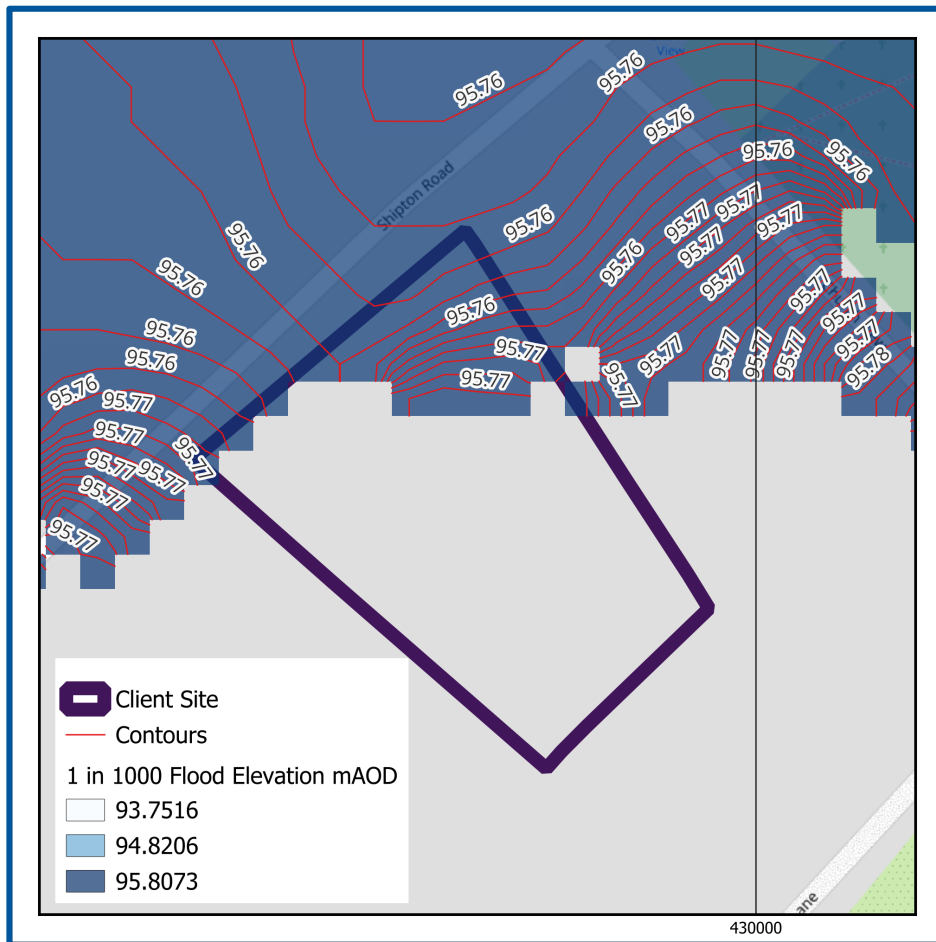
Ground levels on-Site proposed for development (mAOD)	Modelled Flood Levels (mAOD)			
	1 in 20 year	1 in 75 year	1 in 100 year	1 in 1000 year
94.9 to 97.9	0	0	0	95.86
Flood depths (m)	No flooding	No flooding	No Flooding	0.96

Modelled data shows c.10% of the Site would be impacted during the 1 in 1000 year scenario with depths recorded up to 0.96m recorded in the northwest of the site along the boundary with Shipton Road. This would be inclusive of the area proposed for development so mitigation would be required.

Figure 8 overleaf confirms the flood extent associated with overtopping of the flood defences in the 1 in 1000 year present day flooding scenarios.

¹ 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.

Figure 8. Modelled 1 in 1000 flooding scenario (REF, EA 2023)



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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 'More Vulnerable' developments are required to undertake a Basic assessment approach.

As the Site is located within the Cotswolds Management Catchment, and the proposed development is classed as More Vulnerable, where the proposed lifespan is approximately 100 years, the Central (30%) allowance has been used to determine a suitable climate change factor to apply to river data.

A stage / discharge (level/flow) relationship graph (Appendix B) has been produced using the EA's modelled flood level data.

In the Thames region, the 1 in 1000 year event flow is approximately 60% greater than the 1 in 100 year flow, therefore the following flood levels apply.

Ground levels on-Site proposed for development (mAOD)	Modelled Flood Levels (mAOD)
	1 in 100 year plus 30% Climate change
94.9 to 97.9	94.79
Flood depths (m)	No Flooding

Figure 9 shows the flooding extent from the 1 in 100 year plus climate change allowance at the site. There limited flooding that will affect the site at an elevation of 94.53m AOD this would result in no flooding occurring 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 9), which considers the type, condition and crest height of flood defences, the Site has a risk of flooding ranging from Very Low to Medium from the nearby watercourse, the River Evenlode.

Figure 9. Risk of Flooding from Rivers and Sea map (EA, 2023)



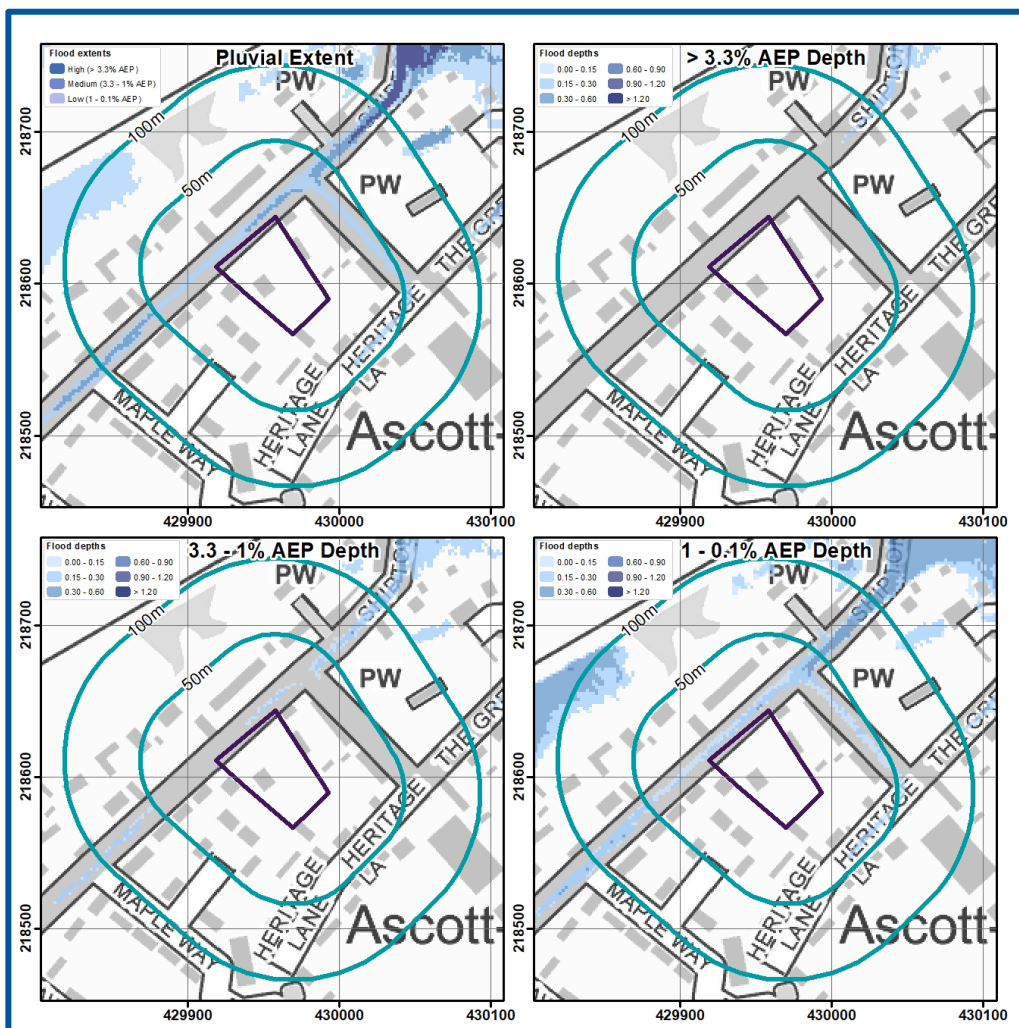
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Surface water (pluvial) flooding

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 river and coastal floodplains.

According to the EA's Risk of Flooding from Surface Water (pluvial) flood mapping (Figure 10), the Site has a Very Low risk of pluvial flooding². There are areas of Medium and High risk running adjacent to the Site on Shipton Road.

Figure 10. EA surface water flood extent and depth map (EA, 2023)



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² Environment Agency. April 2019. What is the Risk of Flooding from Surface Water map? Version 2.0. Accessed from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/842485/What-is-the-Risk-of-Flooding-from-Surface-Water-Map.pdf

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%).

The SFRA does not indicate reported incidents of historical surface water flooding within 100 m of the Site and does not confirm the Site is located within a Critical Drainage Area (CDA)³ (AECOM,2016).

Flooding depths of up to 0.60 m are mapped adjacent to the Site, but these are likely to be contained within the highway of Shipton Road.

Climate change factors

Paragraph 002 of the National Planning Practice Guidance (August, 2022) 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 Cotswolds Management Catchment and the proposed development is classed as More 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.

The 0.1% AP (1 in 1000 year) surface water flooding event has been used as a proxy in this instance for the 1% AP (1 in 100 year) plus climate change event.

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 confirms the Site is not located on a potential overland flow route.

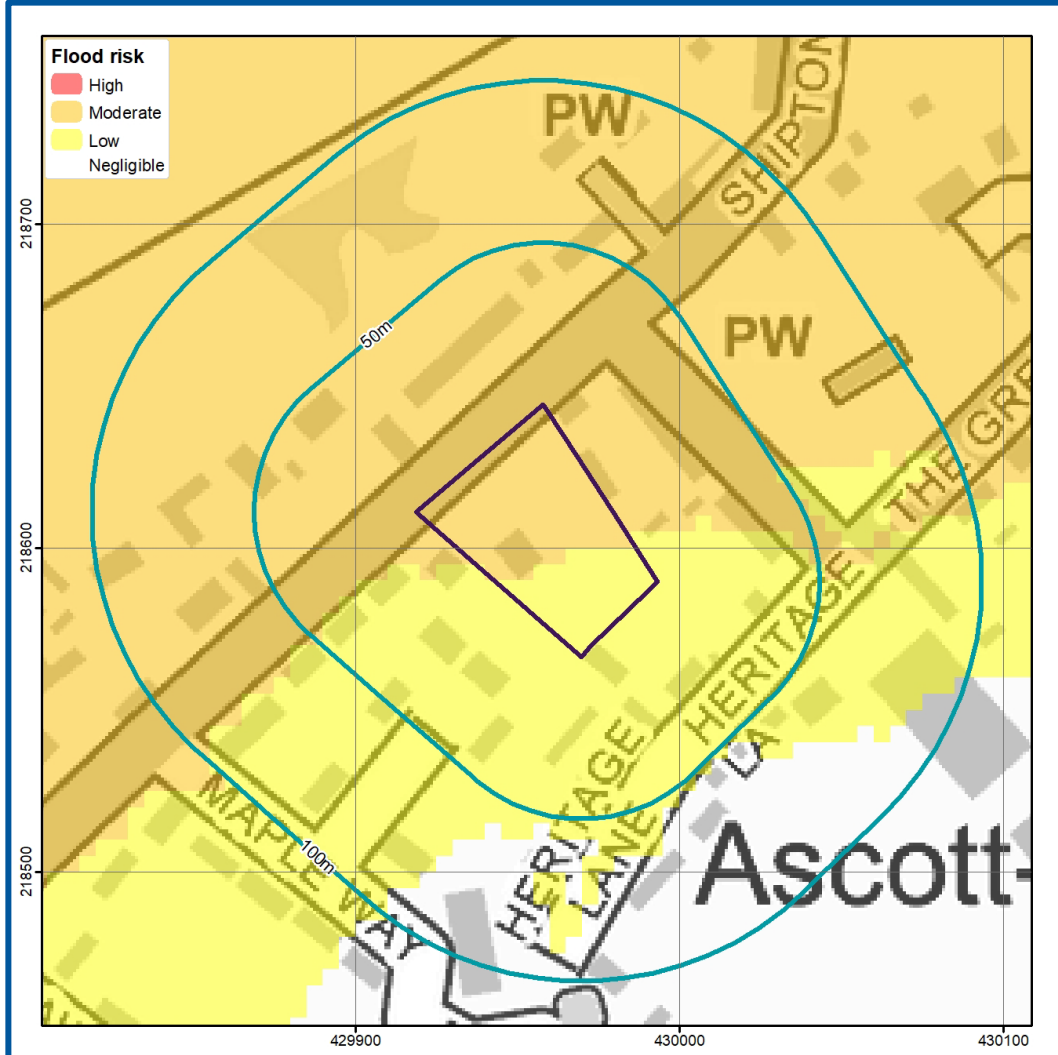
Groundwater flooding

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.

³ A Critical Drainage Area (CDA) is an area that has critical drainage problems and which has been notified to the local planning authority as such by the Environment Agency in line with the National Planning Policy Framework (NPPF, 2023). CDA's are specific to Flood Zone 1, defined as areas where runoff can and may have historically contributed to flooding downstream, although they are not necessarily areas where flooding problems may occur. Where a Site is located in Flood Zone 1 and within a CDA, a Flood Risk Assessment (FRA) is required and the Council may also request Sustainable Drainage Scheme (SuDS) features to be included within the proposed development.

Groundwater Flood Risk screening data (Figure 11) indicates there is a Low to Moderate risk of groundwater flooding at surface in the vicinity from permeable bedrock and superficial deposits during a 1 in 100 year event.

Figure 11. GeoSmart GW5 Groundwater Flood Risk Map (GeoSmart, 2023)



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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 (where available) 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 permeable bedrock. Groundwater levels may rise in the bedrock and superficial aquifers in a seasonal response to prolonged rainfall recharge which may cause an unusually high peak in groundwater levels during some years.

The design of the properties 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.

According to a review of the hydrogeology (Section 3), the nearby boreholes (ref: SP31NW28) encountered groundwater at a depth of 2.6 m bgl and at a depth of 2.9 m bgl (ref:SP31NW27) within the permeable superficial geology.

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 Low to Moderate, and on the basis of the site-specific assessment the groundwater flood risk is considered to be Low to Moderate.

Guidance

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

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. Sea level rises of between 0.4m and 1m are predicted by 2100, leading to a rise in average groundwater levels in the adjacent coastal aquifer systems, and potential increases in water levels in the associated drainage systems. The 'backing up' of groundwater levels from both coast and tidal estuary locations may extend a

significant distance inland and affect infrastructure previously constructed above average groundwater levels.

The impact of climate change on groundwater levels beneath the Site is linked to the predicted rise in peak river levels.

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

Within the Ascott-Under-Wychwood parish flood report (2008) there are incidences of flooding as a result of surcharging sewers within a 100m vicinity of the site.

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 C).

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.

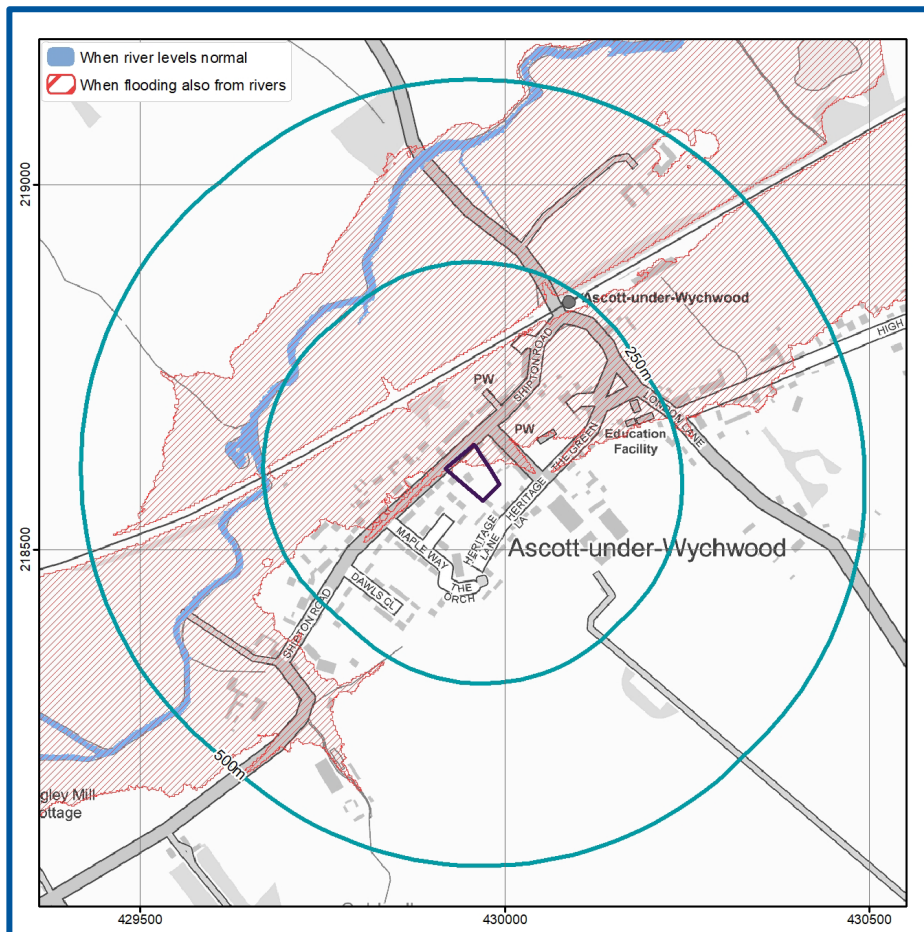
Culverts and bridges have not been identified within 50 m of the Site.

Reservoir flooding

According to the EA's Risk of Flooding from Reservoir mapping shows the north east of the development Site is at risk of flooding from reservoirs (Figure 12) (EA, 2023).

The Site is considered to be at risk of flooding from the Sarsden Lake Reservoir, located c. 4 km northwest of the Site.

Figure 12. EA Risk of Reservoir Flooding (EA, 2023)



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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, 2023).

5. 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 development is located within fluvial Flood Zone 1 and 2 and involves an increase in building footprint, but would not be impacted by the 1 in 100 year plus 30% climate change event due to the area proposed for development being at a distance away from the area impacted by flooding. The site is not impacted by the 1 in 100 + 40% climate change pluvial flooding scenario. Therefore, there would be no displacement of flood water and compensatory flood storage is not required.

Drainage and run-off

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.

The potential surface water run-off generated from the Site during a 1 in 100 year return period should be calculated, using FEH 2013 rainfall data from the online Flood Estimation Handbook (FEH), developed by NERC (2009) and CEH (2016).

The NPPF (2023) recommends the effects of climate change are incorporated into FRA's. As per the most recent update to the NPPG (May 2022) the applicable climate change factor for the 1 in 30 ($\geq 3.3\%$ AEP) and 1 in 100 (< 3.3 to 1% AEP) year event to apply to surface water flooding is dependent upon the management catchment.

As the proposed development is being changed to residential, the lifespan of the development and requirements for climate change should allow up to the 1% AEP central allowance. As the Site is located within the Cotswolds Management Catchment the following peak rainfall allowances are to be applied.

Table 3. Climate change rainfall allowances

Cotswolds Management Catchment	3.3% Annual exceedance rainfall event		1% Annual exceedance rainfall event	
	2050s	2070s	2050s	2070s

Upper end	35%	35%	40%	40%
Central	20%	25%	20%	25%

Sustainable Drainage System (SuDS)

It is recommended that attenuation of run-off is undertaken on-Site to compensate for proposed increases in impermeable surface areas. Attenuation may comprise the provision of storage within a Sustainable Drainage System (SuDS). SuDS can deliver benefits from improving the management of water quantity, water quality, biodiversity and amenity. Potential SuDS options are presented in the table below, subject to further investigation:

Table 4. SuDS features which may be feasible for the Site

Option	Description
Rainwater harvesting	Rainwater harvesting can collect run-off from the roofs for use in non-potable situations, using water butts for example.
Green roof	Having part/all of the roof as a green roof covered in vegetation can intercept and store a proportion of the rainfall to result in an overall reduction in the amount of surface water run-off generated from a building structure. They comprise a substrate (growth medium) layer which can be seeded with specially selected plants suitable for the local climatic conditions. Beneath the growth medium is a geotextile filter layer which filters out the substrate from entering the aggregate/geo-composite drainage layer below. At the very bottom of the green roofing, a waterproof membrane protects the roof structure below.
Permeable paving	Permeable pavements can be used for driveways, footpaths and parking areas to increase the amount of permeable land cover. Suitable aggregate materials (angular gravels with suitable grading as per CIRIA, 2007) will improve water quality due to their filtration capacity. Plastic geocellular systems beneath these surfaces can increase the void space and therefore storage but do not allow filtration unless they are combined with aggregate material and/or permeable geotextiles.
Swales	Shallow, wide and vegetated channels that can store excess run-off whilst removing any pollutants.
Soakaways	An excavation filled with gravel within the Site. Surface water run-off is piped to the soakaway.

6. 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, 2023). 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 (2022)).

As the Site is located within Flood Zone 1 and 2 and the proposed development is defined as More Vulnerable; the proposals would be acceptable, but may be subject to the Sequential Test.

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. West Oxfordshire District Council NPPF (2023).

Table 5. Flood risk vulnerability and flood zone ‘incompatibility (taken from NPPG, 2022)

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.

7. 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 impacted by the 1 in 1000 year flooding scenario with flood depths up to 0.96m (95.86 mAOD).

Raising minimum floor levels

Table 6. Recommended Minimum Finished Floor Level Required

Ground Level (mAOD)	Flood Level (mAOD)	Freeboard above Flood Level (m)	Recommended FFL (mAOD)
94.9 to 97.9	95.86	0.3	96.16

By setting the finished floor levels at 96.16 mAOD there will be no impact to the proposed development in the 1 in 1000 flooding event.

Alternative Mitigation

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.

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

Surface water (pluvial) flood mitigation measures

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

A Sustainable Drainage Strategy (SuDS) should be developed for the Site, for effective management of surface water runoff from the proposed development.

Groundwater flood mitigation measures

A Moderate to Low risk of groundwater flooding has been identified at the Site. In order to ensure the development includes sufficient flood mitigation measures to reduce the risk of groundwater flooding over its lifetime, the following mitigation measures are recommended:

- Finished floor levels of the proposed development should be set at least 0.3 m above the adjacent ground levels to 95.2 to 98.2m mAOD.
- Waterproof tanking of the ground floor;
- 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 to Low.

Reservoir flood mitigation measures

According to EA data, the nearest reservoir is situated approximately 4 km northwest of the Site. There would be a relatively high rate and onset of flooding associated with a reservoir breach, it is therefore unlikely that safe access could be achieved unless a long warning period was provided. Therefore, occupants should get to the highest level of the building as possible and contact the emergency services.

As the majority of residential areas of the development will in an area that is not at risk safe refuge could be provided for residents in the event of a reservoir breach on the first floor of a dwelling.

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.

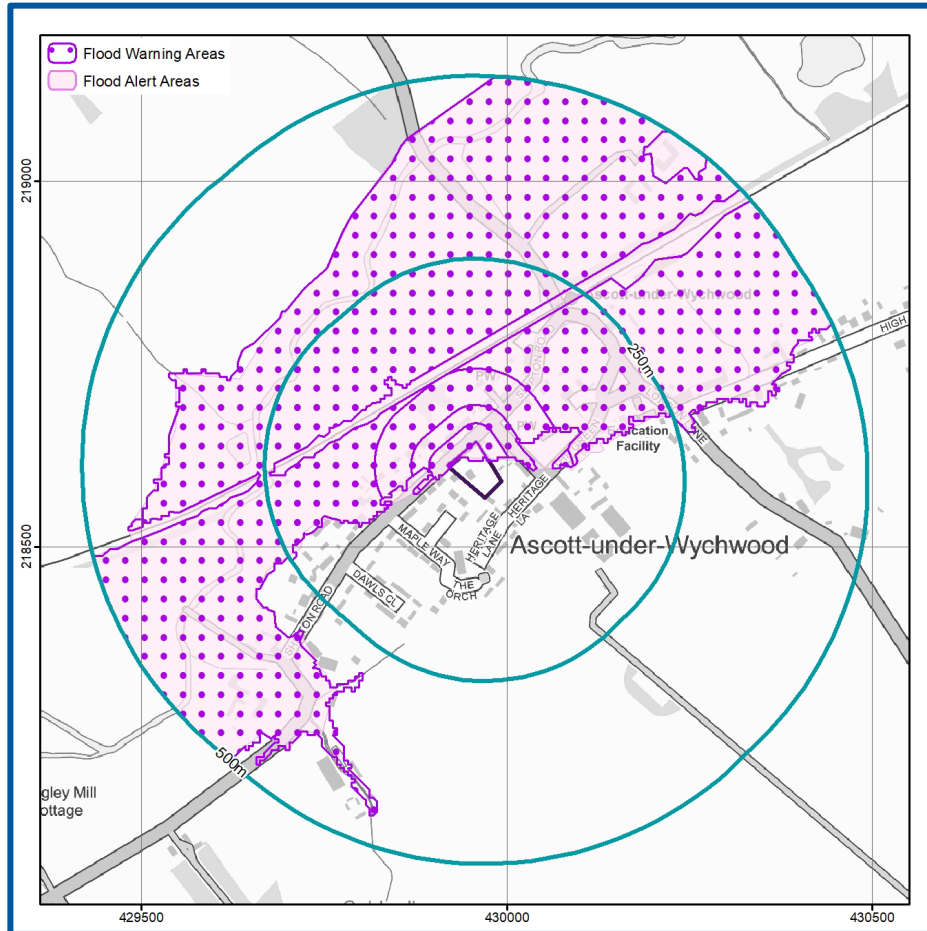
Emergency evacuation from the development and the Site should only be undertaken in strict accordance with any evacuation plans produced for the Site, with an understanding of the flood risks at the Site including available mitigation, the vulnerability of occupants and preferred evacuation routes.

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 coverage area (ref: 061WAF12Evenlode) so is able to receive alerts (Figure 14). All warnings are also available through the EA's 24 hour Floodline Service 0345 988 1188.

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 13. EA Flood Warning Coverage for the local area (EA, 2023).



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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 in the south of the site. 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

Evacuation should be the primary action in preference, however safe refuge could be sought at first floor level in a worst-case scenario as the residential areas of the development are situated on the first and second floor.

8. 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 Medium	Very Low to Medium	Very Low to Low
Sea (coastal/tidal) flooding	Very Low	Very Low	N/A
Surface water (pluvial) flooding	Very Low	Very Low	N/A
Groundwater flooding	Low to Moderate	Low to Moderate	Low to Moderate
Other flood risk factors present	Yes	Yes	N/A
Is any other further work recommended?	Yes	Yes	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 below 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.

More vulnerable developments in a Flood Zone 1 and 2 are acceptable according to the NPPF and providing the recommended mitigation measures are put in place (see previous sections) it is likely that flood risk to this Site will be reduced to an acceptable level.

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

Key sources of flood risks identified	Groundwater and Fluvial flooding
Are standard mitigation measures likely to provide protection from flooding to/from the Site?	Yes (see Section 7).
Is any further work recommended?	Yes (See exec summary and section 7)

9. Further information



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

Additional GeoSmart Products			
✓	<p>Additional assessment:</p> <p>SuDSmart Report</p>		<p>The SuDSmart Report range assesses which drainage options are available for a Site. They build on technical detail starting from simple infiltration screening and work up to more complex SuDS Assessments detailing alternative options and designs.</p> <p>Please contact info@geosmartinfo.co.uk for further information.</p>
✓	<p>Additional assessment:</p> <p>EnviroSmart Report</p>		<p>Provides a robust desk-based assessment of potential contaminated land issues, taking into account the regulatory perspective.</p> <p>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.</p> <p>Ideal for pre-planning or for addressing planning conditions for small developments. Can also be used for land transactions.</p> <p>Please contact info@geosmartinfo.co.uk for further information.</p>



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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).
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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.
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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.
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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.
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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.
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Unproductive Strata	These are rock layers or drift deposits with low permeability that has negligible significance for water supply or river base flow.
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NPPF (2023) 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.
----------------	---

Sequential test	Aims to steer new development to areas with the lowest probability of flooding.
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Essential infrastructure	Essential infrastructure includes essential transport infrastructure, essential utility infrastructure and wind turbines.
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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

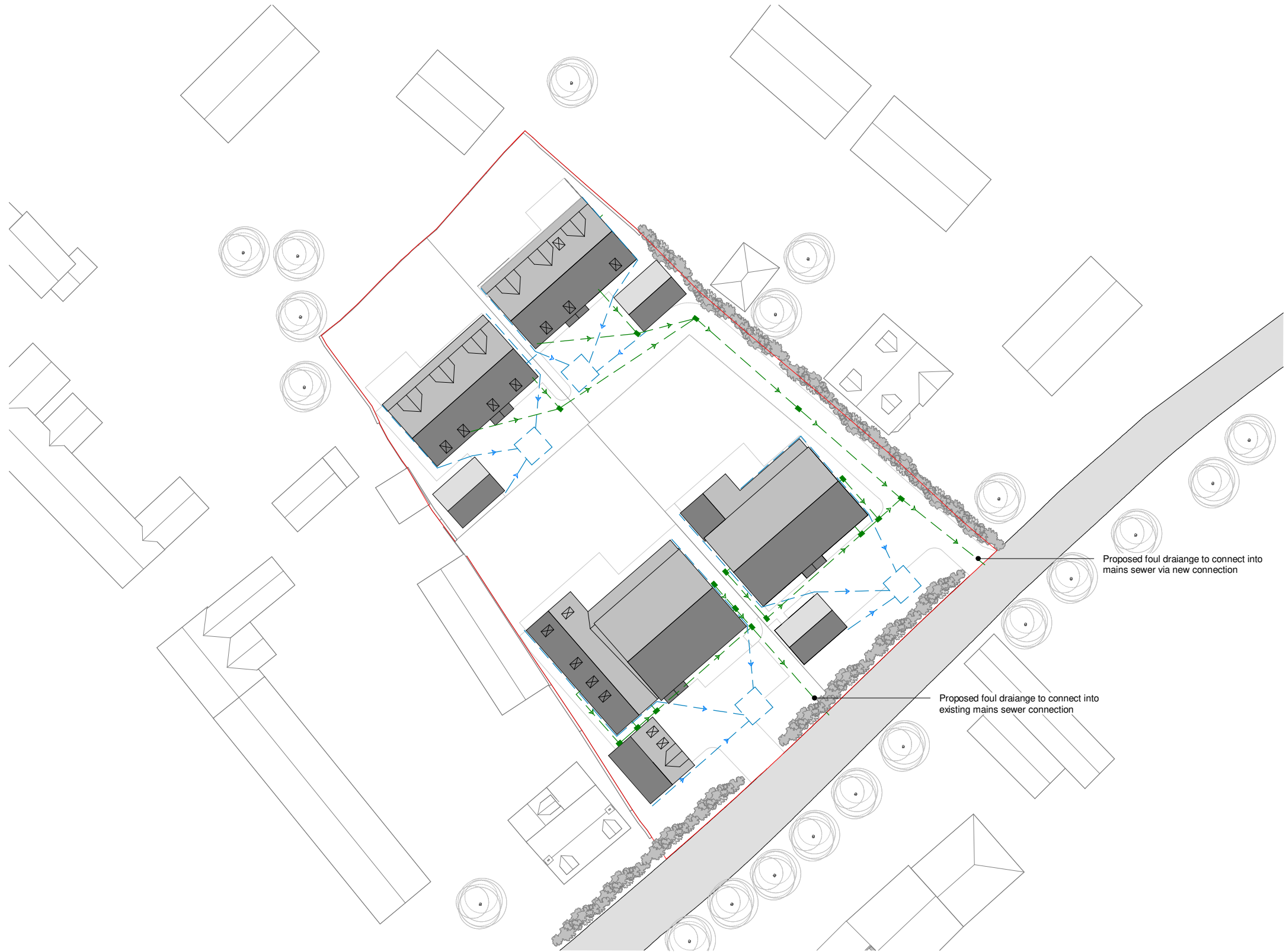
Aerial Photography	Contains Ordnance Survey data © Crown copyright and database right 2023 BlueSky copyright and database rights 2023
Bedrock & Superficial Geology	Contains British Geological Survey materials © NERC 2023 Ordnance Survey data © Crown copyright and database right 2023
Flood Risk (Flood Zone/RoFRS/Historic Flooding/Pluvial/Surface Water Features/Reservoir/ Flood Alert & Warning)	Environment Agency copyright and database rights 2023 Ordnance Survey data © Crown copyright and database right 2023
Flood Risk (Groundwater)	GeoSmart, BGS & OS GW5 (v2.4) Map (GeoSmart, 2023) Contains British Geological Survey materials © NERC 2023 Ordnance Survey data © Crown copyright and database right 2023
Location Plan	Contains Ordnance Survey data © Crown copyright and database right 2023
Topographic Data	OS LiDAR/EA Contains Ordnance Survey data © Crown copyright and database right 2023 Environment Agency copyright and database rights 2023

11. Appendices









Site plans



PRELIMINARY

Rev	Date	Description	Drawn
A	03/10/2023	Site drainage amended	MH

Floor Plan Key

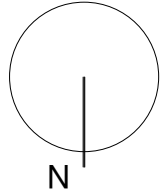
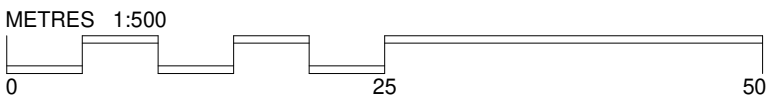
-  New Foul Drainage run - 110mm dia to min 1:40 falls
-  Surface water drainage run - 110mm dia to min 1:80 falls
-  Foul Water Manhole (FW MH)
-  Surface Water Soakaway

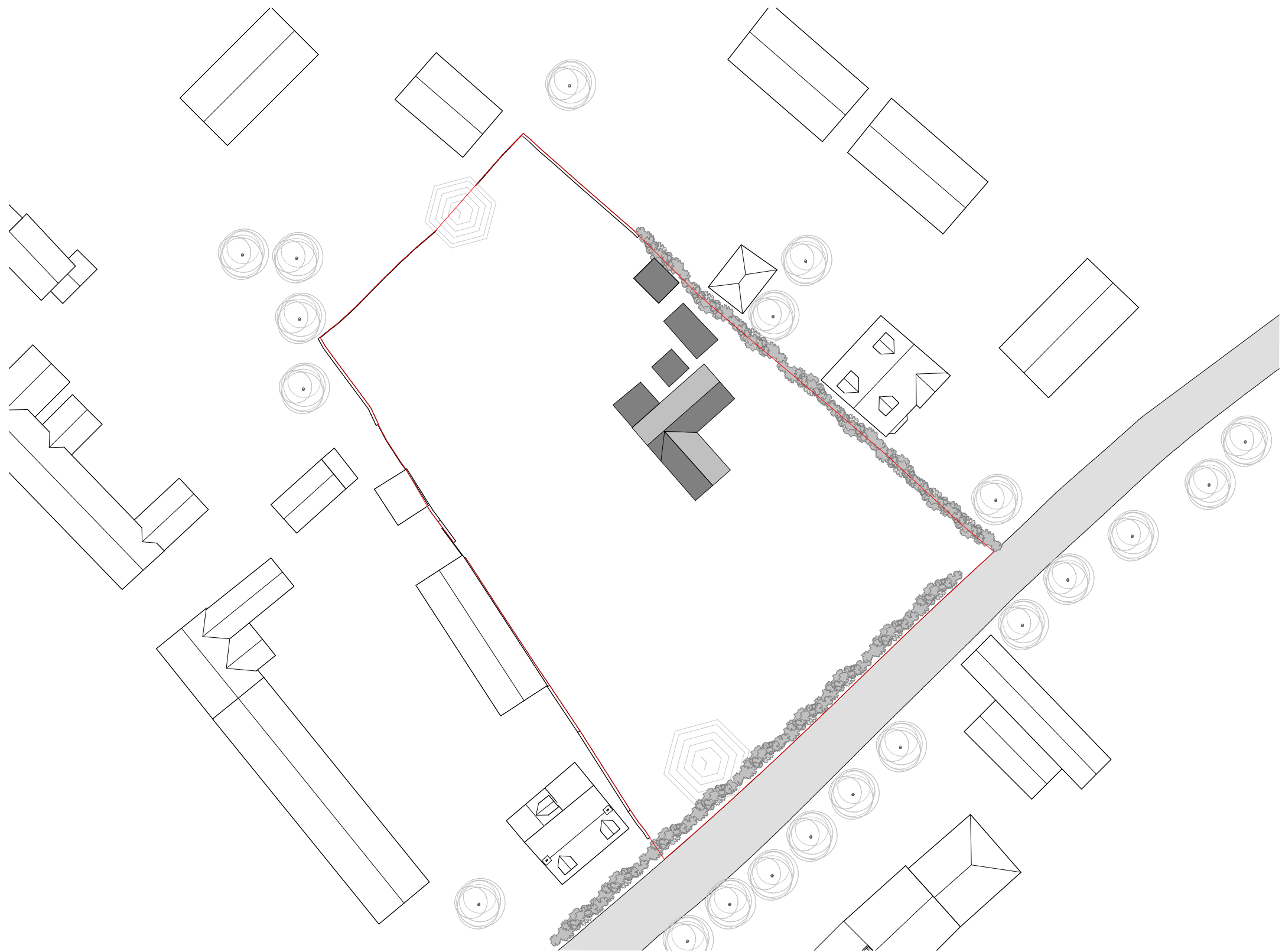
Palmer+ Partners

James Witney
 5 Shipton Road, Ascott-under-Wychwood
 4 New Dwellings

23028 PL 98 A

Proposed Site Plan Drainage
 Scale As indicated A3
 Date: September 2023
 Drawn by: MH





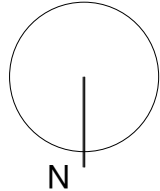
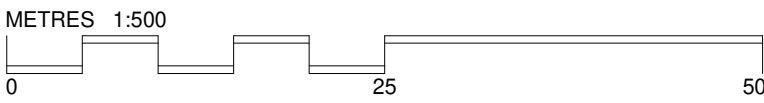
PRELIMINARY

Rev	Date	Description	Drawn
A	03/10/2023	Existing site plan amended	

Palmer+
Partners

James Witney
5 Shipton Road, Ascott-under-Wychwood
4 New Dwellings

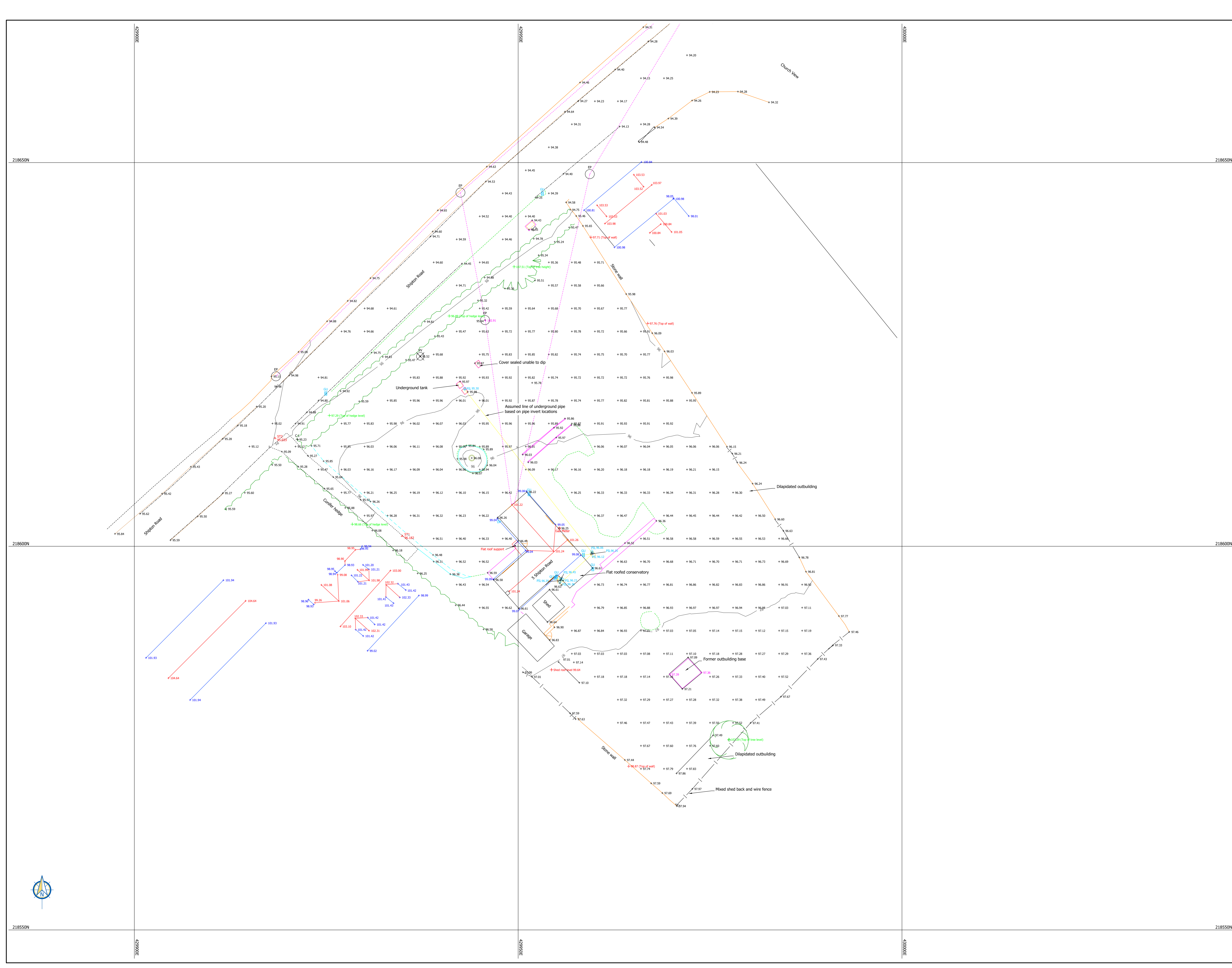
23028 EX 90 A



Existing Site Plan
Scale 1:500 @A3
Date: September 2023
Drawn by: MH



Topographic Survey



- LEGEND**
- Crest of better Tie
 - Wall and level on top of wall
 - Ground surface contours 1m intervals mAAD
 - Building outline
 - Building ridge and level mAAD
 - Building eave and level mAAD
 - Selected survey level mAAD
 - Window
 - Edge of concrete
 - Electricity pole and overhead wires
 - Tree position, spread and height
 - Gate
 - Fence
 - Hedge
 - Manhole cover
 - Gully
 - Stopcock
 - Survey nail
 - Downpipe
 - Lamp column
 - Tree stump
 - Pipe invert level mAAD
 - Cover level
 - Edge of driveway
 - Mains gas pipe and meter location
 - Doorway
 - Edge of grass
 - Crest of kerb Tie

ST2		
Easting	Northing	Level mAAD
429918.32	218614.088	95.033

NOTES

- Survey undertaken by GWP Consultants 27th July 2023 to Ordnance Survey grid and datum (OSN15)

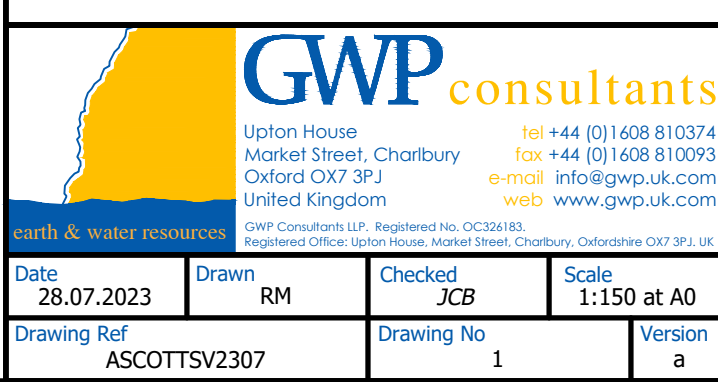
Version	Revision and completion notes	Date
1	Issued to Client	28.07.2023

Client: Mr James Whyte

Project: S Sligton Road, Accott-Under-Wychwood

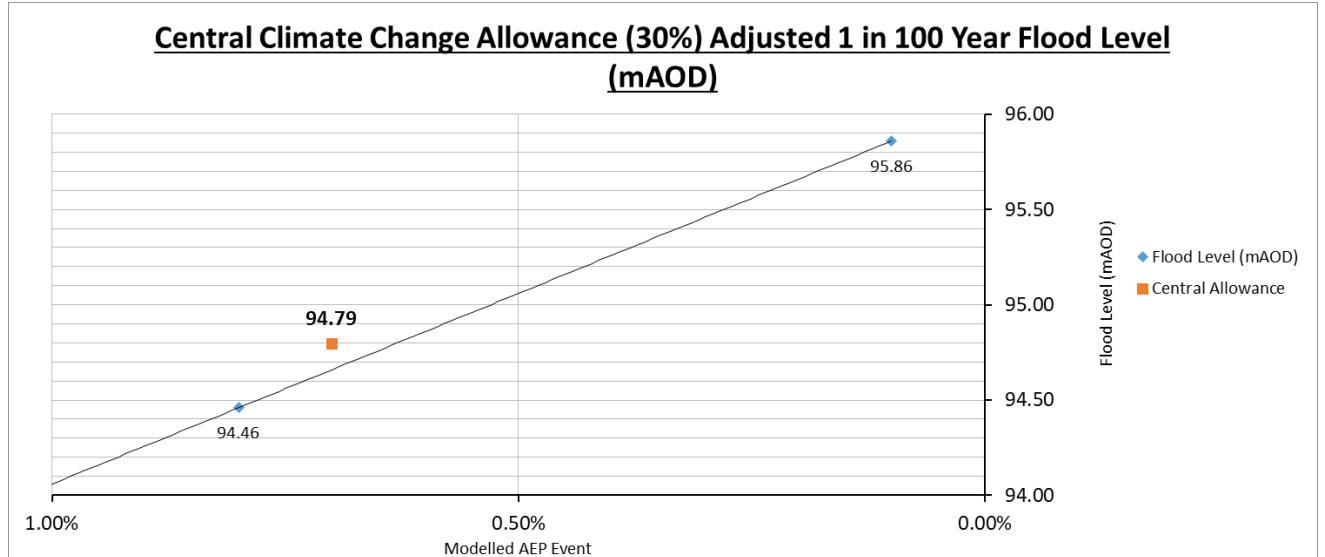
Topographic survey 27th July 2023

Date: 28.07.2023	Drawn: RM	Checked: JCB	Scale: 1:150 at A0
Drawing Ref: ASCOTTSV2307	Drawing No: 1	Version: 1	





Environment Agency data



Appendix D



Thames Water

Sewer Flooding

History Enquiry



Property Searches

GeoSmart Information Ltd

Bellstone

Search address supplied Boundary House
Shipton Road
Ascott-Under-Wychwood
Chipping Norton
OX7 6AF

Your reference 80684

Our reference SFH/SFH Standard/2023_4905438

Received date **1 November 2023**

Search date **1 November 2023**



Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW



searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk



0800 009 4540

Sewer Flooding

History Enquiry



Property Searches

Search address supplied: Boundary House, Shipton Road, Ascott-Under-Wychwood, Chipping Norton, OX7 6AF

This search is recommended to check for any sewer flooding in a specific address or area

TWUL, trading as Property Searches, are responsible in respect of the following:-

- (i) any negligent or incorrect entry in the records searched;
- (ii) any negligent or incorrect interpretation of the records searched;
- (iii) and any negligent or incorrect recording of that interpretation in the search report
- (iv) compensation payments



Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW



searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk



0800 009 4540

History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

For your guidance:

- A sewer is “overloaded” when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- “Internal flooding” from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- “At Risk” properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties 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 more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company’s reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0800 316 9800 or website www.thameswater.co.uk



Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW



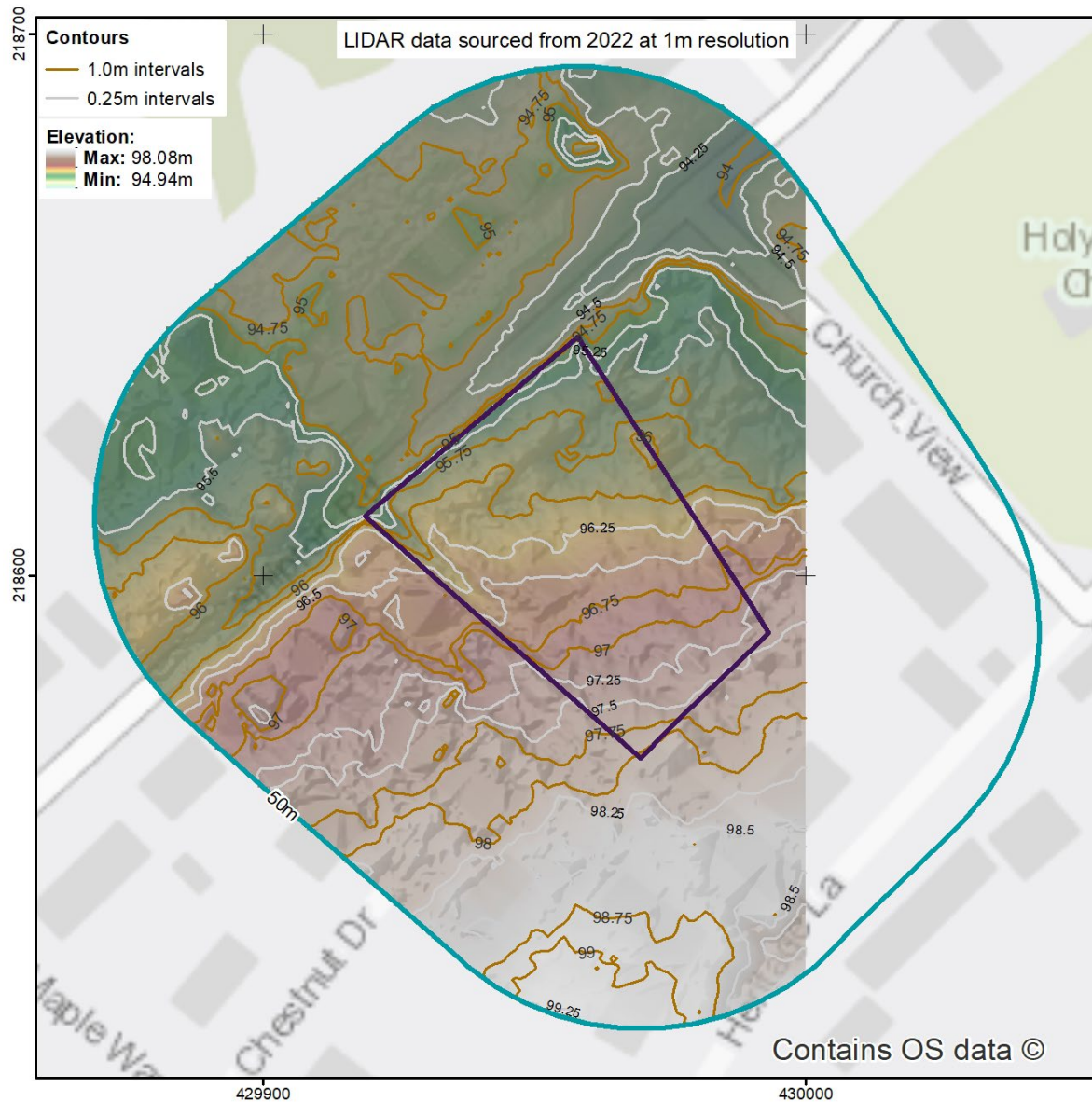
searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk



0800 009 4540

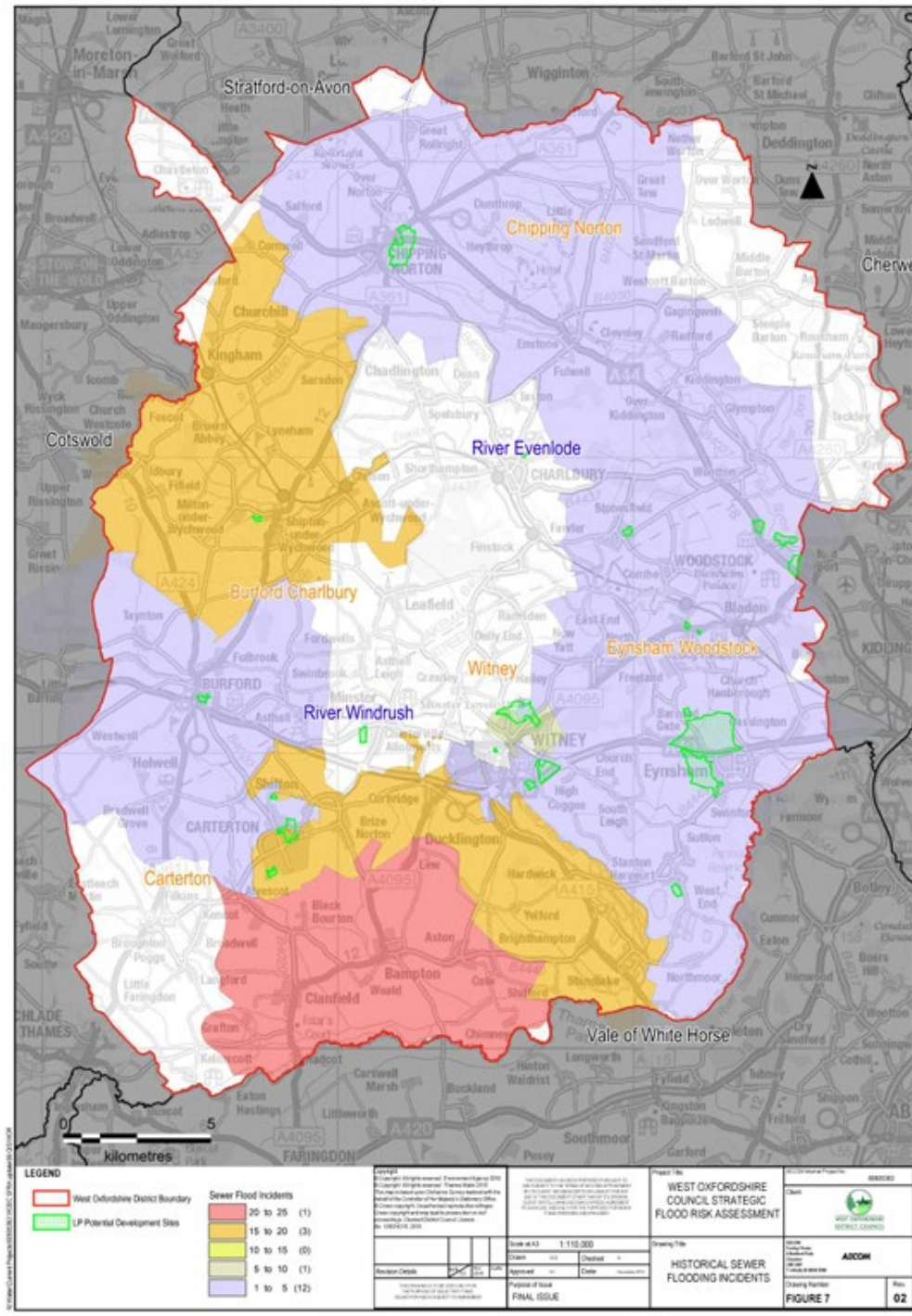


Environment Agency LiDAR ground elevation data





Local Council document mapping





Borehole Results



British Geological Survey

BGS ID: 320000 ; BGS Reference: SP31NW28
British National Grid (27700) : 430120,218600

SP31NW 28 3012 1860

IGES		19 Talsman Square, KENILWORTH, CV8 1JB, Tel: 01926 851113 Fax: 01926 851394		Job No. 6893	Site : ASCOTT-U-WYCHWOOD, OXFORDSHIRE Client : EMPIRE HOMES LTD Engineer :	TRIAL PIT LOG			
Method 360a TRACKED EXCAVATOR		Date 12/01/99	Ground Slope Level	Logged By NM	Scale 1:25				
Length 1.80	Breadth 0.65	Depth 3.10	Ground Level m. R.L.						
Depth m.	SOIL SAMPLES/TESTS		Water Level	LL/PL %	M/C %	Ease of Dig	Depth m.	Description of Strata	Legend
	Type	Strength							
0.30								Turf over TOPSOIL	
0.50	V	88				E/M		Firm to stiff red brown silty CLAY with occasional to some subrounded to rounded gravel.	
0.90	D/V	91							
1.10	V	86							
1.20								Yellow brown, orange brown silty sandy clayey GRAVEL/gravelly CLAY.	
1.60	D					E/M			
2.40	D		∩			E/M			
							3.10		

GROUNDWATER DETAILS :
1/ Water strike at 2.6m, slight seepage

STABILITY OF PIT WALLS :
1/ Slight belting in pit walls from 2.6m

GENERAL REMARKS :

KEY

EASE OF DIG : E = EASY DIGGING
M = MODERATE DIGGING
D = DIFFICULT DIGGING
VH = VERY HARD DIGGING

SAMPLES : B = BULK
D = JAR
W = WATER

STRENGTH : V = HAND VANE SHEAR STRENGTH (kN/m²)
P = HAND PENETROMETER SHEAR STRENGTH

GROUNDWATER : ∩ = ENTRY
∩ = STANDING LEVEL

Disclaimer

This report has been prepared by GeoSmart in its professional capacity as soil, groundwater, flood risk and drainage specialists, with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client and is provided by GeoSmart solely for the internal use of its client.

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Tel: 01743 298 100

Email: info@geosmartinfo.co.uk

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The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom.
- sets out minimum standards which firms compiling and selling search reports have to meet.
- promotes the best practice and quality standards within the industry for the benefit of consumers and property professionals.
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.
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Firms which subscribe to the Search Code will:

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- act with integrity and carry out work with due skill, care and diligence.
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- conduct business in an honest, fair and professional manner.
- handle complaints speedily and fairly.
- ensure that products and services comply with industry registration rules and standards and relevant laws.
- monitor their compliance with the Code.

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If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award up to £5,000 to you if the Ombudsman finds that you have suffered actual financial loss and/or aggravation, distress or inconvenience as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs contact details:

The Property Ombudsman scheme

Milford House

43-55 Milford Street

Salisbury

Wiltshire SP1 2BP

Tel: 01722 333306

Fax: 01722 332296

Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk. Please ask your search provider if you would like a copy of the search code

Complaints procedure

GeoSmart Information Limited is registered with the Property Codes Compliance Board as a subscriber to the Search Code. A key commitment under the Code is that firms will handle any complaints both speedily and fairly. If you want to make a complaint, we will:

- Acknowledge it within 5 working days of receipt.
- Normally deal with it fully and provide a final response, in writing, within 20 working days of receipt.
- Keep you informed by letter, telephone or e-mail, as you prefer, if we need more time.
- Provide a final response, in writing, at the latest within 40 working days of receipt.
- Liaise, at your request, with anyone acting formally on your behalf.

If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman scheme (TPOs): Tel: 01722 333306, E-mail: admin@tpos.co.uk.

We will co-operate fully with the Ombudsman during an investigation and comply with his final decision. Complaints should be sent to:

Martin Lucass

Commercial Director

GeoSmart Information Limited

Suite 9-11, 1st Floor,

Old Bank Buildings,

Bellstone, Shrewsbury, SY1 1HU

Tel: 01743 298 100

martinlucass@geosmartinfo.co.uk

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CDM regulations can be found on our website:

<http://geosmartinfo.co.uk/knowledge-hub/cdm-2015/>

Data use and limitations can be found on our website:

<http://geosmartinfo.co.uk/data-limitations/>