LAND AT COOMBE FARM, SAYERS COMMON

FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY

June 2025

WELBECK STRATEGIC LAND LLP

RESIDENTIAL SCHEME
LAND AT COOMBE FARM
SAYERS COMMON

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FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY

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1. EXECUTIVE SUMMARY

1.1 This Flood Risk Assessment (FRA) and Drainage Strategy has been prepared by Paul Basham Associates on behalf of Welbeck Strategic Land LLP to support an outline planning application for a proposed residential development. The Land at Coombe Farm, Sayers Common is located to west of A23, Sayers Common, Hassocks. The nearest postcode is BN6 9HY.

1.2 Demonstrated in this assessment, the risk posed to the site by surface water flooding is minimal, with any high and low surface water flood risk confined to the western boundary of the site, located away from any proposed dwellings. This report has identified how the existing surface water flood risk will be managed and mitigated, as such the built development and access road will not be at risk of flooding. Which is in line with the PPG & NPPF section 175 and therefore it can be considered that a sequential test is not required.

1.3 The proposed development is in Flood Zone 1 and has been categorised as "more vulnerable", therefore in accordance with NPPF, the proposals are acceptable and the site will not require an exception test. The proposed housing development has a design lifetime of 100 years.

1.4 Groundwater levels were monitored over the winter months, The results identified that ground water was encountered at ground level in four of the standpipes. This is likely a result of perched water based of the underlying "Weald Clay" bedrock geology.

1.5 Summary of residual flood risk from:

- Fluvial and tidal flooding is considered **very low.**
- Reservoir flooding is considered **very low.**
- Surface water flooding is considered **Low.**
- Groundwater flooding is considered **Low.**
- Sewer flooding is considered **very low.**

1.6 Given underlying "Weald Clay" bedrock Geology and the falling head tests carried out by Ground & Water. Drainage by means of infiltration is not viable.

1.7 Attenuation basins within the site will be used to retain surface water runoff and then discharge it at a controlled rate to match the pre-development greenfield Q_{MED}. The site has been split into two catchments with Catchment 1 (Northern Catchment) discharging into the existing ditch running along the western site boundary at a controlled rate of 38.9l/s. Catchment 2 (Southern catchment discharging at a controlled rate of 14.6l/s into the ditch running parallel to the road running through the site.

2. INTRODUCTION

2.1 This Flood Risk Assessment (FRA) and Drainage Strategy has been prepared by Paul Basham Associates on behalf of Welbeck Strategic Land LLP to support an outline planning application for a proposed residential development. The land is located to west of A23 Road, Sayers Common. The site currently comprises agricultural land, bound to the north and south by woodland, to the west is bound by the B2118 and residential dwellings at Furzeland Way. To the east, the site is bound by the A23.

2.2 The nearest postcode is BN6 9HY. The site location plan is shown in *Figure 1* below.

2.3 The plot size is approximately 13.4 ha, and the land is currently an agricultural land and Woodland.

Figure 1: Site Location Plan (Source: Google Maps)

Development Proposals

2.4 The development aspirations are for a residential development comprising of up to 210 dwellings at the Land at Coombe Farm, Sayers Common. The proposed site layout is included in **Appendix A**.

3. SITE DESCRIPTION

Topography

3.1 The site's full topographical survey is included in **Appendix B** and indicates the site has two prominent high points, one in the northern section and another in the southern section. The northern high point reaches 32.71m AOD, while the southern high point is slightly higher at 34.94 AOD. From these high points, the topography of the site generally slopes downward. Most of the site slopes westward, except for a small area in the eastern section, which slopes towards the eastern boundary. Similarly, the northern section slopes towards its northern boundary.

Geology

3.2 A review of the British Geological Survey (BGS) mapping indicates that the bedrock geology beneath the entire site is *"Weald clay formation – mudstone. Sedimentary bedrock formed between 133.9 and 126.3 million years ago during the Cretaceous period".* There is a band that runs along the eastern boundary of the site which is recorded to have superficial deposits of "*Head-clay, silt, sand and gravel. Sedimentary superficial deposit formed between 2.588 million years ago and the present during the Quaternary period."* No superficial deposits were recorded elsewhere on site. See *Figure 2* below for the BGS map extract.

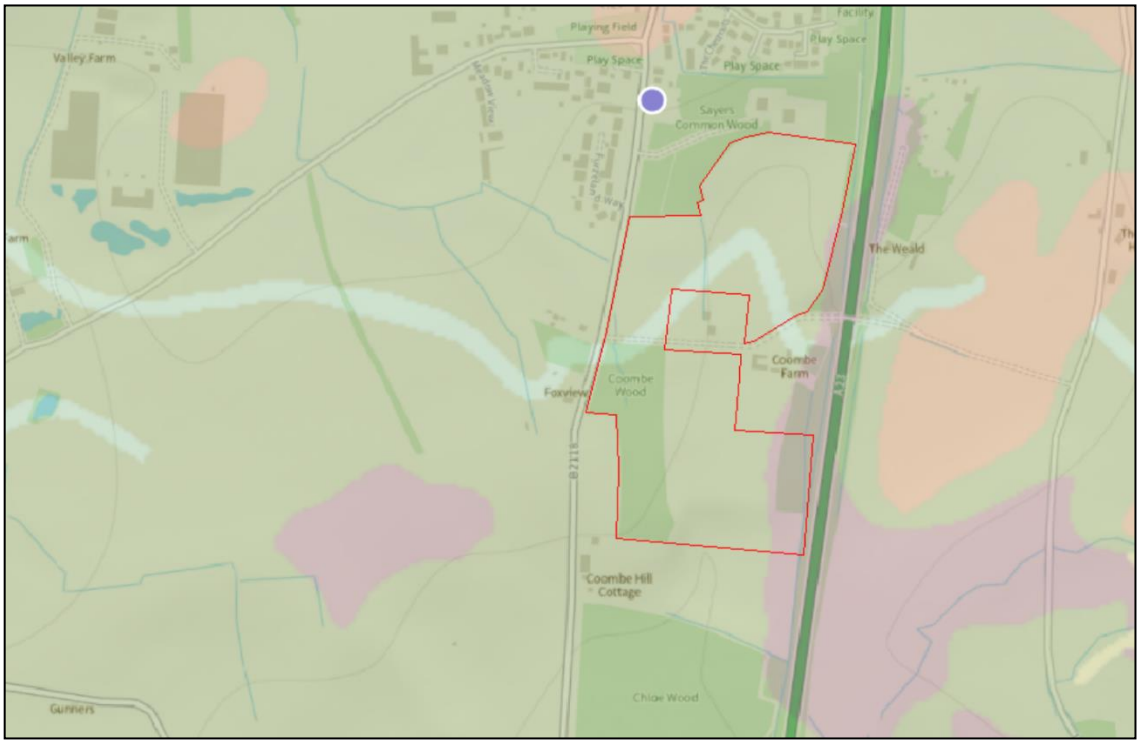

Figure 2: BGS Bedrock Mapping

3.3 A local BGS borehole (Ref: TQ21NE36) which lays in the superficial sedimentary deposits along the eastern boundary shows that below the topsoil layer there is 1.5m of firm mottled grey and orange, brown slightly silty clay. Between 2m below ground level (BGL) and 4.7m BGL the log indicated firm light brown and grey very sandy clay with occasional fine to medium flint gravel. Firm to stiff fissured brown silt clay with fine to coarse flint gravel was encountered at 5m BGL where the borehole terminated. Ground water was encountered at 2.5m BGL. Further north, borehole (Ref: TQ21NE33) from the BGS website shows below the topsoil level there is 1.5m of stiff to very stiff fissured orange-brown, cream and light grey very silty clay. Between 2-5m BGL the logs indicated stiff to very stiff fissured brown, locally mottled grey, silty clay. No ground water was encountered within the borehole.

3.4 The BGS borehole logs are included in **Appendix C**.

3.5 BGS borehole map is shown in the *Figure 3* below.

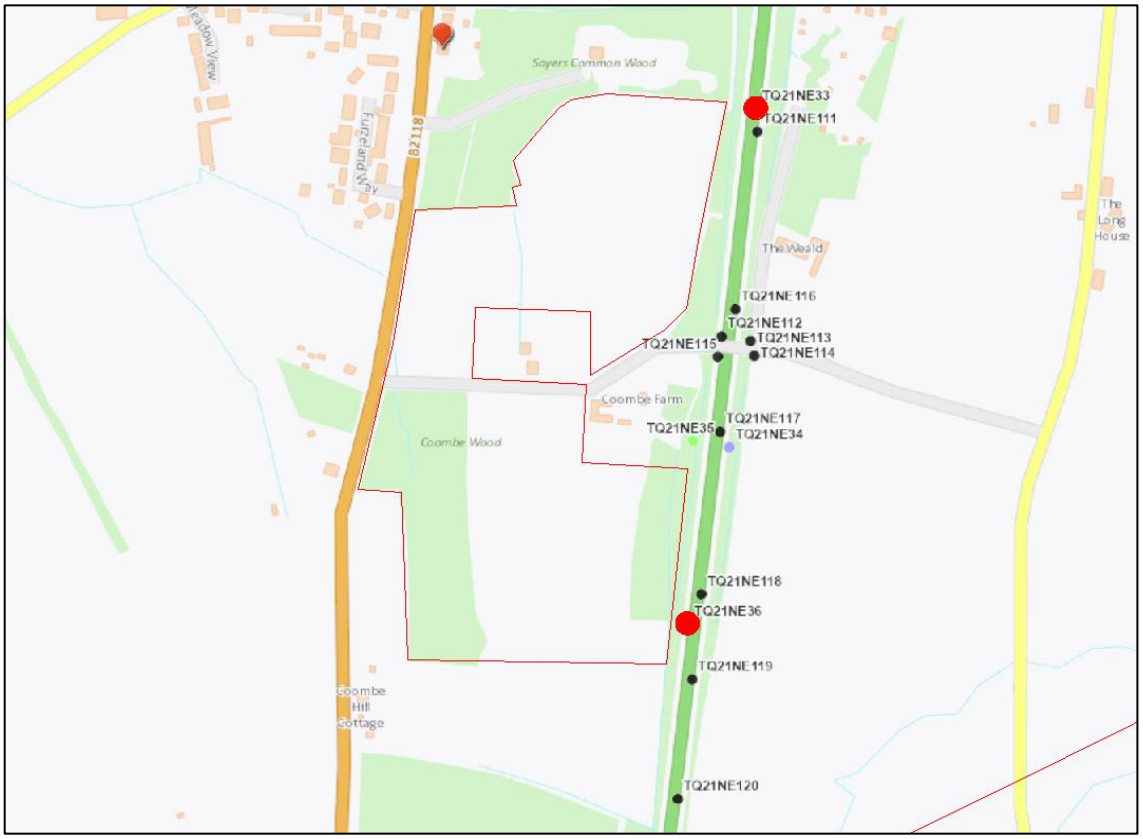

Figure 3: BGS Borehole map

Hydrology

3.6 Based on the topographic survey, there are several ditches running through the site. There are several ditches running through the site, see below *Figure* ***4*** identifying the location of these existing ditches marked in cyan. The closest Main River, as defined by the environment agency is Herrings Stream, which is located approximately 830 m north-west from the site boundary.

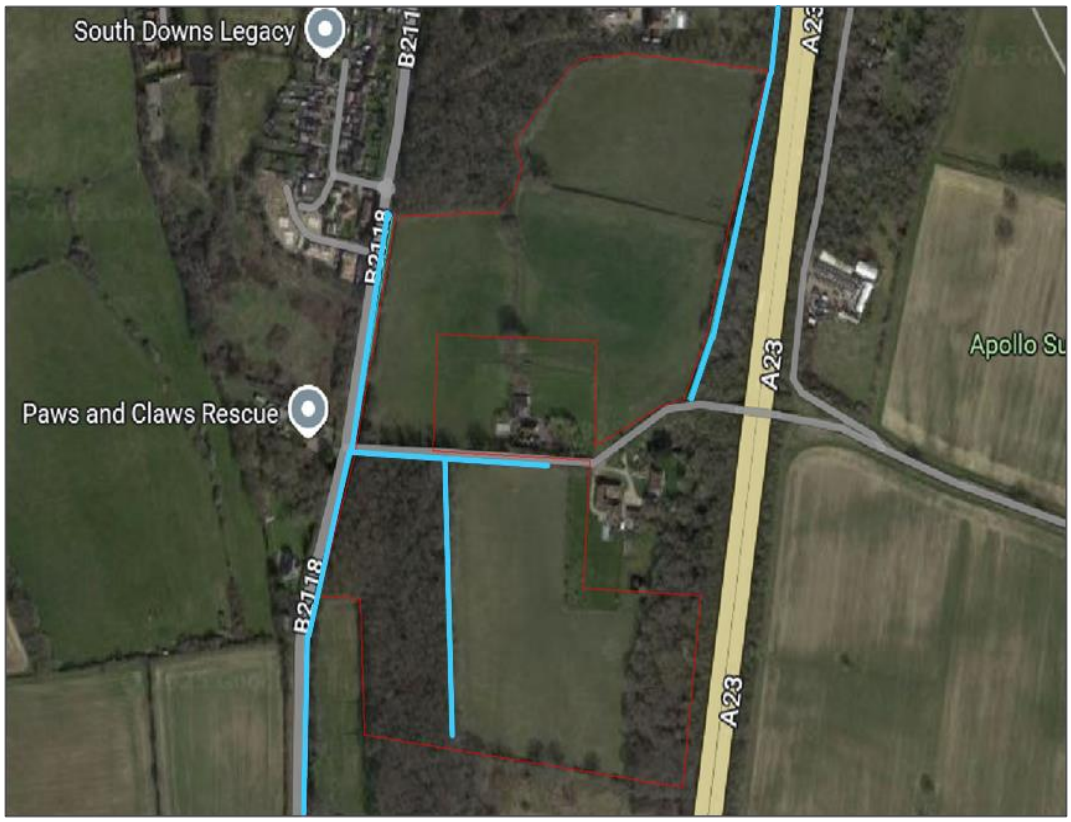

Figure 4: Existing Ditches

Hydrogeology

3.7 Groundwater monitoring has been undertaken between November 2023 and March 2024 and comprised of 9 sampler boreholes to a depth of between 4m and 5m. Monitoring visits revealed the depth of the groundwater within the standpipes have been recorded at the ground level in four of the windowless samples. WS8 & WS9 encountered no groundwater over the course of the winter period. The highest recorded water levels are shown below in **Table 1** and the full groundwater monitoring report is included in **Appendix D.**

Windowless Sample	WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8	WS9
Highest groundwater level (m bgl)	1.50	2.10	GL	0.35	GL	GL	GL	N/A	N/A

Table 1: Highest Recorded groundwater levels

3.8 In addition to groundwater monitoring, falling head test were undertaken in two of the windowless samples. Both tests exhibited no fall in the water level for a period of 240 minutes, therefore an infiltration rate was not obtained.

3.9 The Department for Environment, Food & Rural Affairs (DEFRA) Magic Map shows the location and classification of underlying aquifers. *Figure 5* below shows an extract from the online map and indicates that proposed development site does not lie in any source protection zones.

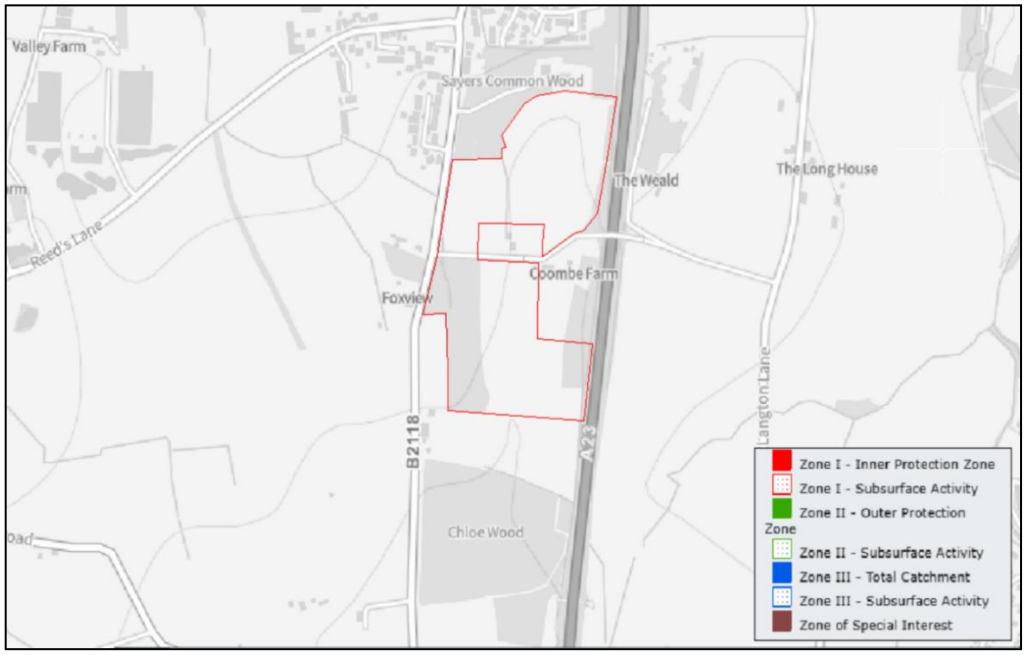

Figure 5: DEFRA Mapping – Source Protection Zones

Public Sewer

3.10 Based on the sewer mapping provided by Southern Water (**Appendix E**), there are surface and foul sewers, which serve the neighbouring development to the north of the proposed site and foul sewer which runs along western boundary of the site.

Pre-development drainage greenfield rates

3.11 The site is currently agricultural land and naturally drains via overland flow into the adjacent ditches.

3.12 The greenfield run-off rate for the existing site with an area of 13.4ha has been estimated using HR Wallingford online calculator on the UK SuDS website. The calculations were based on the FEH statistical approach. A summary of the greenfield runoff rates is shown in **Table 2** below and the full calculation report is included in **Appendix F**.

Greenfield Runoff Rates – Whole Site	
Q_{bar} (l/s)	123.46 l/s
1 in 2-year event (l/s)	104.9 l/s
1 in 30-year event (l/s)	284.0 l/s
1 in 100-year event (l/s)	393.8 l/s

Table 2: Greenfield runoff rates whole site

4. PLANNING POLICY

4.1 The planning policies and guidance that are relevant to the proposed Development with regard to flood risk and surface water management are outlined below.

National Planning policy

4.2 2025 updated National Planning Policy Framework (NPPF) and the associated 2025 updated Planning Practice Guidance (PPG) by the Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government.

- 2022 updated EA Standing Advice
- EA National Strategy for Flood and Coastal Erosion Risk Management 2020
- DEFRA Sustainable Drainage System: Non-Statutory Technical Standards 2015
- CIRIA C753 The SuDS Manual 2015
- Flood and Water Management Act 2010
- Flood Risk Regulations 2009
- Flood risk assessments: climate change allowances 2016 (updated in 2025).

Regional and local Planning Policy

- West Sussex County Council Local Risk Management Strategy 2021-2023
- West Sussex Local Flood Risk Management Strategy (2013-2018)
- West Sussex's LLFA Policy for Management of Surface Water. *Figure 6* below shows a summary of West Sussex LLFA Suds Policies

Table 5.1: West Sussex LLFA SuDS Policies

Policy	Summary
SuDS Policy 1	Follow the drainage hierarchy
SuDS Policy 2	Manage Flood Risk Through Design
SuDS Policy 3	Mimic Natural Flows and Drainage Flow Paths
SuDS Policy 4	Seek to Reduce Existing Flood Risk
SuDS Policy 5	Maximise Resilience
SuDS Policy 6	Design to be Maintainable
SuDS Policy 7	Safeguard Water Quality
SuDS Policy 8	Design for Amenity and Multi-Functionality
SuDS Policy 9	Enhance Biodiversity
SuDS Policy 10	Link to Wider Landscape Objectives

Figure 6: Extract from WSCC SuDS Policies

- Mid Sussex Level 1 Strategic Flood Risk Assessment 2024
- Mid Sussex Level 2 Strategic Flodd Risk Assessment Appendix A 2024

Horsham District Council local plan contains the following policies relating to flooding, drainage and surface water

- Local Plan, Policy 24 Environmental Protection
- Local Plan, Policy 35 Climate Change
- Local Plan, Policy 38 Flooding

4.3 Based on the above policies, the key requirements in relation to the surface water management and flood risk for the proposed Development are considered as to be follows:

- National Planning Policy Framework (2024): "A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use."
- Environment Agency Standing Advice: "The surface water management needs to meet requirements set out in either your local authority's Surface Water Management Plan (SWMP), Strategic Flood Risk Assessment (SFRA) and Building Regulations Part H. Emergency escape plans for any parts of a building that are below the estimated flood level are required"
- CIRIA C753 The SuDS manual 2015: "Control the quantity of runoff to support the management of flood risk and maintain and protect the natural water cycle. To ensure that the surface water runoff from a developed site does not have a detrimental impact on people, property, and the environment, it is important to control how fast runoff is discharged from the site (i.e., the peak runoff rate) and how much runoff is discharged from the site (i.e., the runoff volume). Suds that are designed to manage water quantity in this way reduce the likelihood of flooding caused by the development. They can help protect natural water cycles by promoting the recharge of soil moisture levels, by maintaining stream and river baseflows and by replenishing groundwater".
- SuDS Policy 2 of WSCC LLFA Policy for management of surface water states: "The drainage system must be designed to operate without any flooding occurring during any rainfall event up to (and including) the critical 1 in 30-year storm (3.33% AEP). The system must also be able to accommodate the rainfall generated by events of varying durations and intensities up to (and including) the critical, climate change adjusted 1 in 100-year storm (1% AEP) without any on-site property flooding and without exacerbating the off-site flood-risk. Sufficient steps are to be taken to ensure that any surface flows between the 1 in 30 and 1 in 100-year events are retained on site. Storage should be based upon analyses of a range of winter and summer storm profiles to determine a critical storm event."

- MSDC SFRA Level 2 Appendix 1 "Site Allocation Assessment" includes the below planning implications for the site based on the assessment undertaken for the allocated site. The site assessment summary extracted from Appendix 1 can be found in Appendix G of this report.

Planning implications
A Flood Risk Assessment and Foul Sewerage and Surface Water Assessment will be required to be submitted as the site covers an area greater than 1ha. Exception Test is not required in accordance with Table 2 of the Planning Practice Guidance Flood Risk and Coastal Change As the site is at risk of flooding from surface water, it will be necessary to assess the development under design flood conditions and provide appropriate mitigation in accordance with the guidance set out in the SFRA and the advice of the EA. Development should be avoided in flow paths. A surface water drainage strategy should be provided which utilises Sustainable Drainage Systems to reduce the rate of discharge to greenfield runoff rates in accordance with the guidance set out in the SFRA and advice of the LLFA (WSCC). The drainage strategy should address any isolated patches of surface water flooding on site. No development should be located in Present day or Future Flood Zone 3b unless can be demonstrated otherwise through modelling.

Figure 7: Planning implications for the allocated site based on SFRA level 2

5. CLIMATE CHANGE

Peak Rainfall Intensity Allowance

5.1 The "Flood Risk Assessments: Climate Change Allowances Guidance" 2016 (updated in 2022) published by the EA indicates that climate change is currently expected to result in increased peak rainfall and rising sea levels.

5.2 **Table 2** and **Table 3** shows anticipated changes in peak rainfall intensity in small and urban catchments within the Adur and Ouse Management Catchment. The development is classed as more vulnerable and design life of 100 years, the climate change will be based on the upper end allowance.

5.3 The peak rainfall intensity allowance is 40% during the 3.3% Annual Exceedance Probability (AEP) event.

Epoch	Central Allowance	Upper End Allowance
2050s	20%	35%
2070s	20%	40%

Table 3: Peak Rainfall Intensity allowance in small and urban catchments. 3.3%AEP Events*

*Source: https://environment.data.gov.uk/hydrology/climate-change-allowances/rainfall

5.4 The peak rainfall intensity allowance is 45% during the 1% Annual Exceedance Probability (AEP) event.

Epoch	Central Allowance	Upper End Allowance
2050s	20%	45%
2070s	25%	45%

Table 4: Peak Rainfall Intensity allowance in small and urban catchments. 1%AEP Events*

*Source: https://environment.data.gov.uk/hydrology/climate-change-allowances/rainfall

National Planning Policy Framework (NPPF)

5.5 This report has been prepared considering the National Planning Policy Framework (NPPF) Technical Guidance and the Environment Agency's (EA) flood risk standing advice.

5.6 Table 2 from the Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government Flood risk and coastal change guidance has been included as *Figure 8* below. This provides the classes of development (based on flood risk vulnerability) that are permitted within each of the flood zones. The Flood Risk Vulnerability Classification for the site is 'More Vulnerable' as it is a housing development, which is defined in Annexxe 3 of the NPPF.

5.7 The development is in Flood Zone 1 with areas of medium and high surface water flood risk , however these areas are along the western boundary and across the B2118 highway, with the high-risk surface water flooding contained in the existing Coombe Woodland, another 4 bands of low risk of surface water flooding running across the site. and do not have an impact on the proposed layout,the FRA will identify how the existing surface water flood risk will be managed for the built development and access road not to be at risk of flooding. This will be in line with the PPG and NPPF section 175.

5.8 The site lies entirely within Flood Zone 1 and is a draft allocated site within the MSDC District Plan (Ref: DPSC6). It has been assessed for the sequential and exception tests within the updated MSDC SFRA 2 (Please See **Appendix G** for an extract of the SFRA's assessment of the allocated site).

5.9 Since the NPPF has been updated in December 2024, MSDC has provided a response regarding the implications of the updated framework and the flood risk assessments for allocated sites undertaken as part of the SFRA. The district council has confirmed that there is "no change" in the assessment for the site at Land at Coombe Farm (Shelaa ID: 601), and the site selection is assessed as "very positive" based on the updated SFRA 1 and 2 in 2024. This document is included in **Appendix H** for reference and the updated assessment for the site is included in Appendix 1 of the document.

5.10 In light of the above, and in accordance with the latest NPPF, there will be no need for a sequential test nor an exception test as the site is allocated and has been confirmed there is no change in its assessment with the updated SFRA.

Flood Zones	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	X	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	X	X	X	✓*

Figure 8 - Flood risk vulnerability and flood zone 'compatibility'

Key: ✓ Exception test not required X Development should not be permitted.

Notes to table 2:

- *This table does not show the application of the Sequential Test which should be applied first to guide development to Flood Zone 1, then Zone 2, and then Zone 3; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;*
- *The Sequential and Exception Tests do not need to be applied to minor developments and changes of use, except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site;*
- *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.*

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

*" * "In Flood Zone 3b (functional floodplain) essential infrastructure that has passed the Exception Test, and water-compatible uses, should be designed and constructed to:*

- *remain operational and safe for users in times of flood;*
- *result in no net loss of floodplain storage;*
- *not impede water flows and not increase flood risk elsewhere.*

Figure 9: NPPF Planning Practice Guidance Table – Flood Risk Vulnerability and Flood Zone Compatibility

6. FLOOD RISK

6.1 In line with the EA Standing Advice, the estimated flood level is considered to be the higher of:

- A river flood level with a 1 in 100 or greater annual probability plus an allowance for climate change; and
- A tidal flood level with a 1 in 200 or greater annual probability plus an allowance for climate change.

6.2 The following Flood Zone definitions ignoring flood defence, are set out in the Planning Practice Guidance:

- Zone 1 Low Probability - Land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%);
- Zone 2 Medium Probability - Land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5%– 0.1%) in any year; and
- Zone 3 High Probability - Land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

Fluvial / Tidal Flood Risk

6.3 Flood mapping obtained from the government's 'flood map for planning' website has identified that the site falls entirely within Flood Zone 1. As shown below in *Figure 10.*

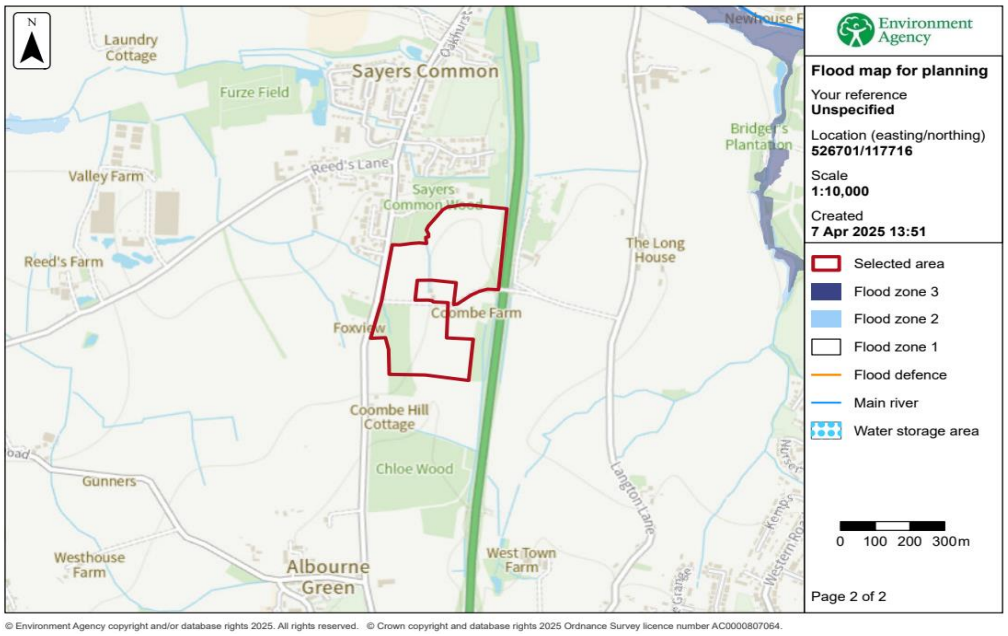

Figure 10: Flood Map for Rivers and Seas (obtained April 2025)

6.4 The long-term flood risk and from rivers and seas mapping shows the site is considered to be at very low risk of flooding from rivers and seas. As shown below in *Figure 11*.

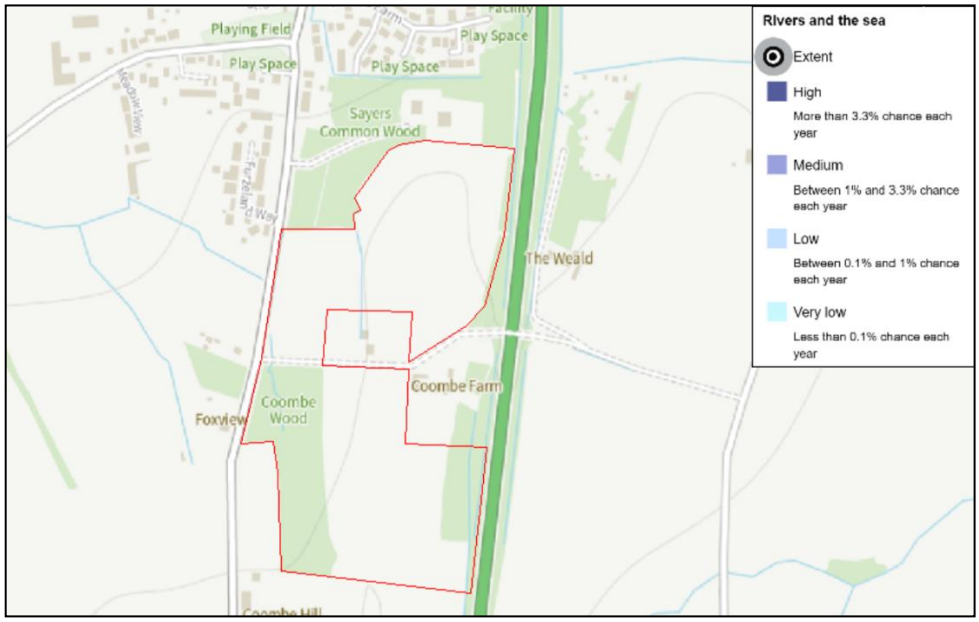

Figure 11: Long-term flood risk from rivers and seas map

Fluvial/tidal flooding – Residual Risk

6.5 In light of the above mapping, the site is considered to be at very low residual risk of flooding from rivers or seas.

Reservoirs Flood Risk

6.6 A reservoir is a large natural or artificial lake that is designed to collect and store water, reservoirs can also be underground storage features. Flooding from reservoirs is extremely low.

6.7 EA mapping in *Figure 12* below indicates that long-term flood risk from reservoirs is very low during both events, where conditions are dry and river levels are normal, and when local rivers have flooded.

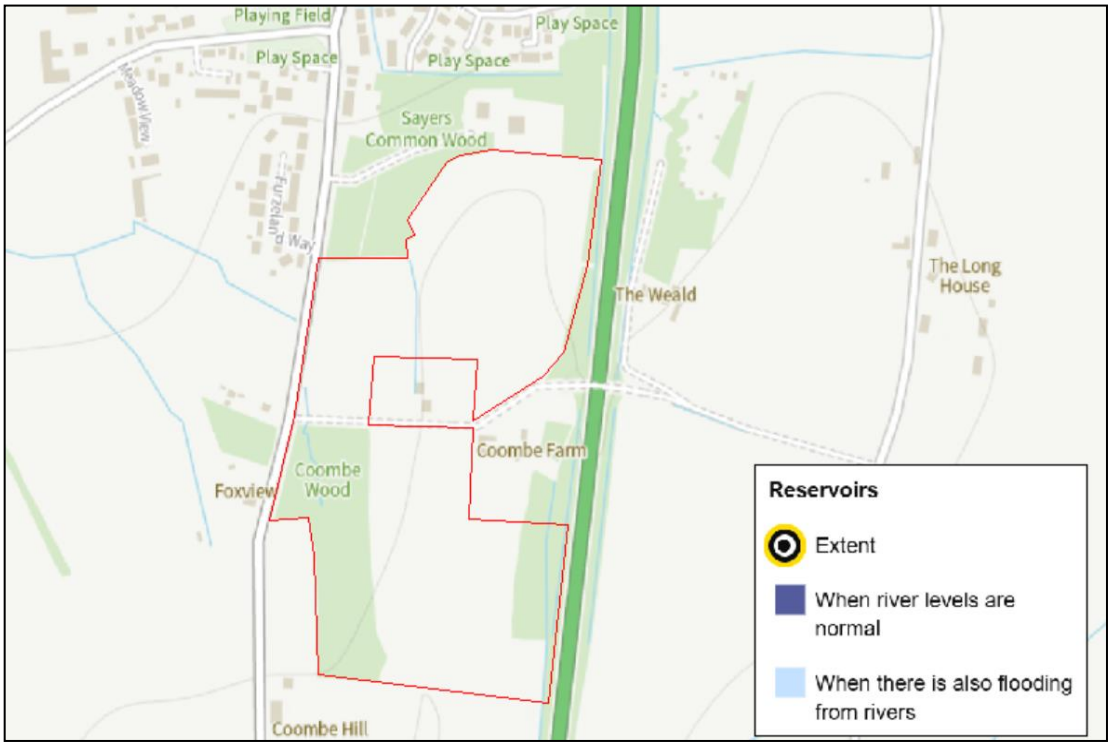

Figure 12: Long term flood risk from reservoirs map

6.8 An extract from the MSDC SFRA below shows the extents of reservoir flood events in relation to the site in the event of a reservoir failure on a “wet day” and a “dry day”. No flood extents are recorded within the vicinity of the site.

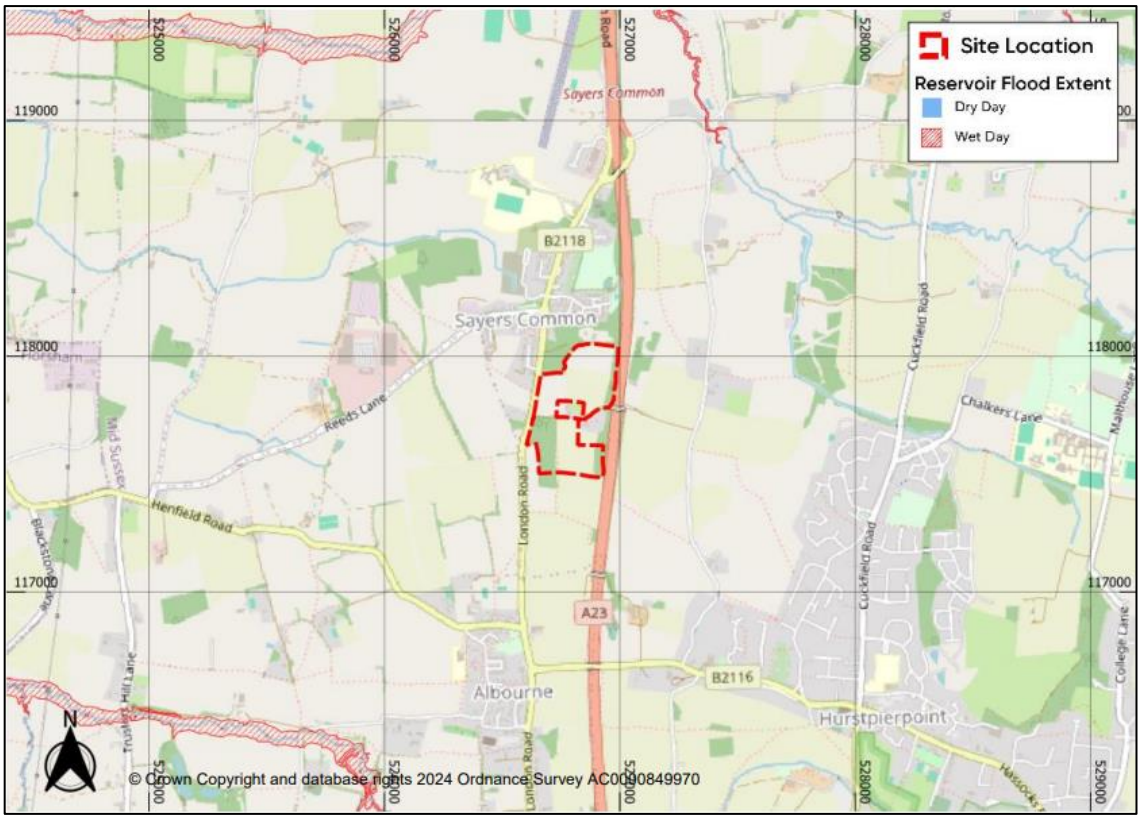

Figure 13: Reservoirs Flood Extent (MSDC SFRA Extract)

Reservoirs – Residual Risk

6.9 Based on the *Figure 12* and *Figure 13* above, it can be concluded that the site is considered to be at very low residual risk of flooding from reservoirs.

Surface Water Flood Risk

6.10 Surface water or 'pluvial' flooding results from rainfall running over ground before eventually entering a watercourse or sewer. It is usually associated with high intensity rainfall events but can also occur with lower intensity rainfall or melting snow where the ground is already saturated, frozen, developed (for example in an urban setting), or otherwise has low permeability.

6.11 The EA long term flood risk map for surface water flooding is shown in *Figure 14* and indicates that the majority of the site is considered to be at very low risk of surface water flooding. The mapping identifies high-risk of surface water flooding along the western boundary. A band of high-risk surface water flooding runs along the western boundary which crosses the B2118 highway with most of the high-risk surface water flooding being contained within the existing Coombe Woodland. Additionally, 4 bands of low risk of surface water flooding run laterally across the site.

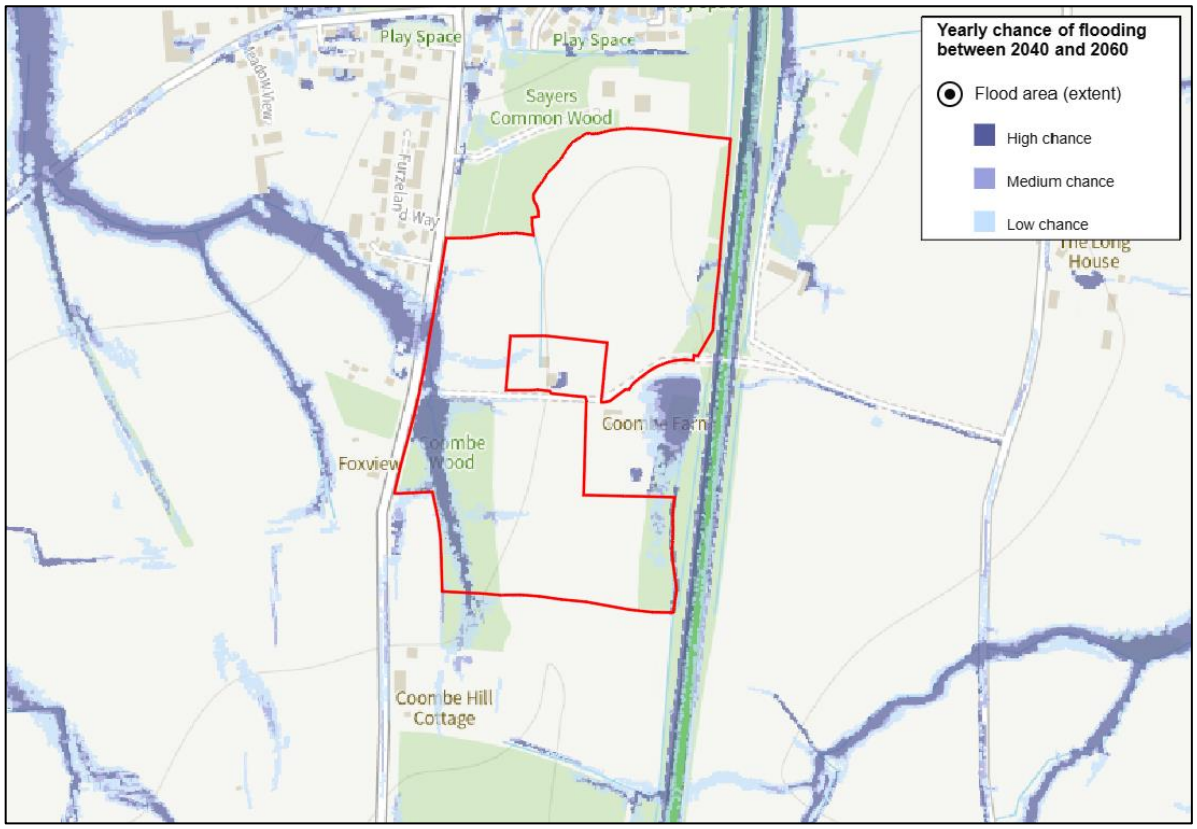

Figure 14: EA Long Term Flood Risk Mapping for Surface Water flooding (Yearly chance of flooding between 2040 and 2060)

6.12 *Figure 15* shows that the extent of flood risk for 30cm of flooding. The flooding on site is contained within the ditch on the western boundary of the site and Coombe woodland. *Figure 16* depicts the extent of flood risk for 90cm of flooding, which is contained within the watercourse on the western boundary and the Coombe woodland.

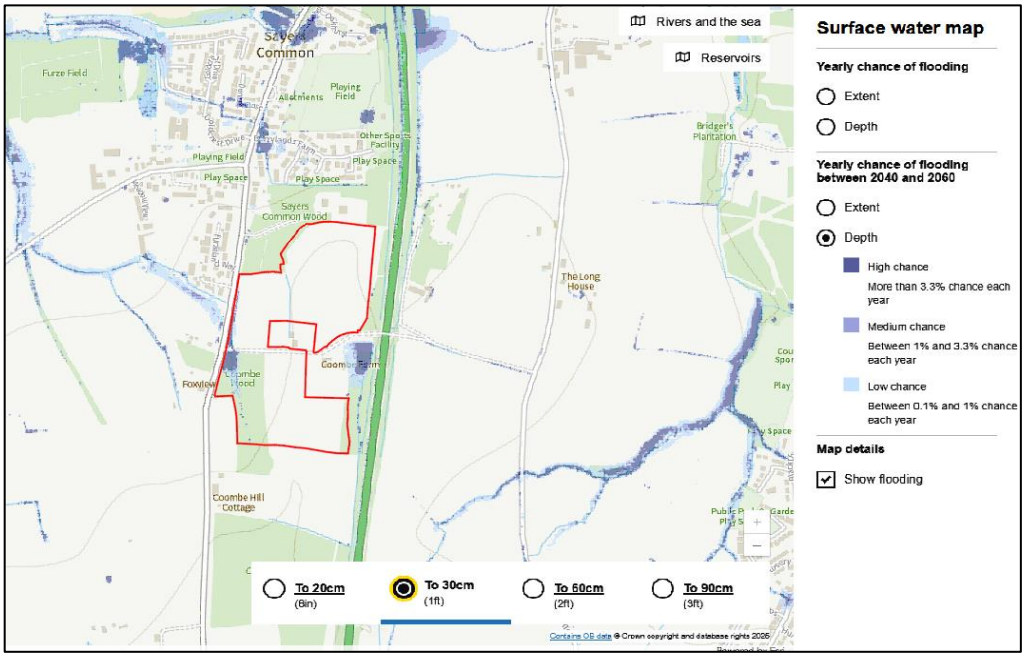

Figure 15: EA Long Term Flood Risk Mapping for Surface Water flooding 30cm depth (Yearly chance of flooding between 2040 and 2060)

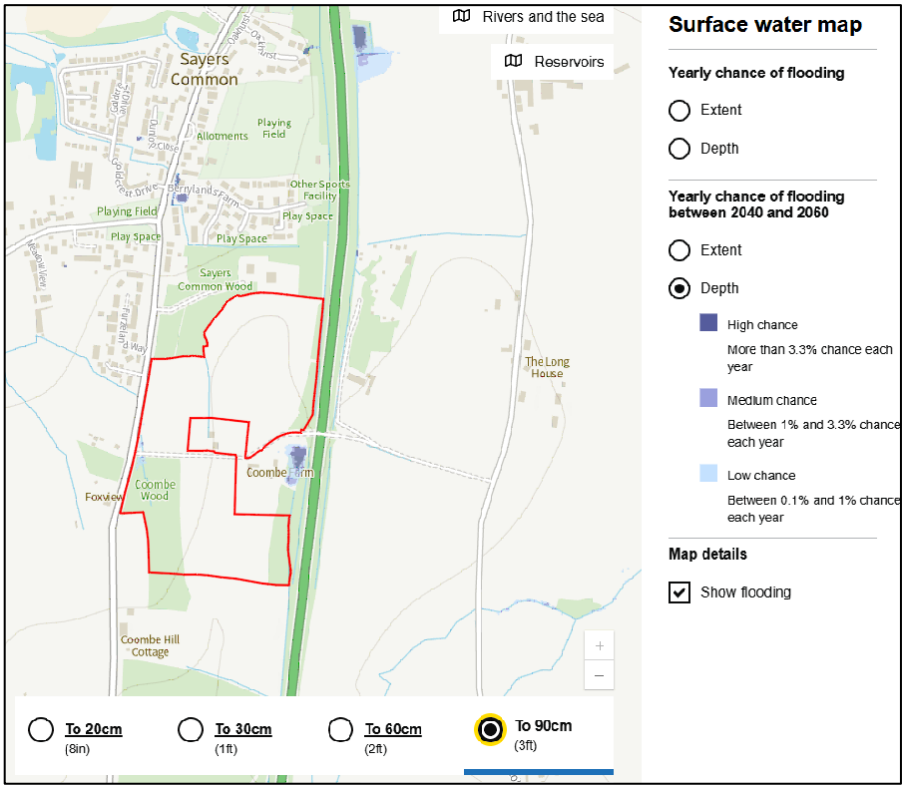

Figure 16: EA Long Term Flood Risk Mapping for Surface Water flooding 90cm depth (Yearly chance of flooding between 2040 and 2060)

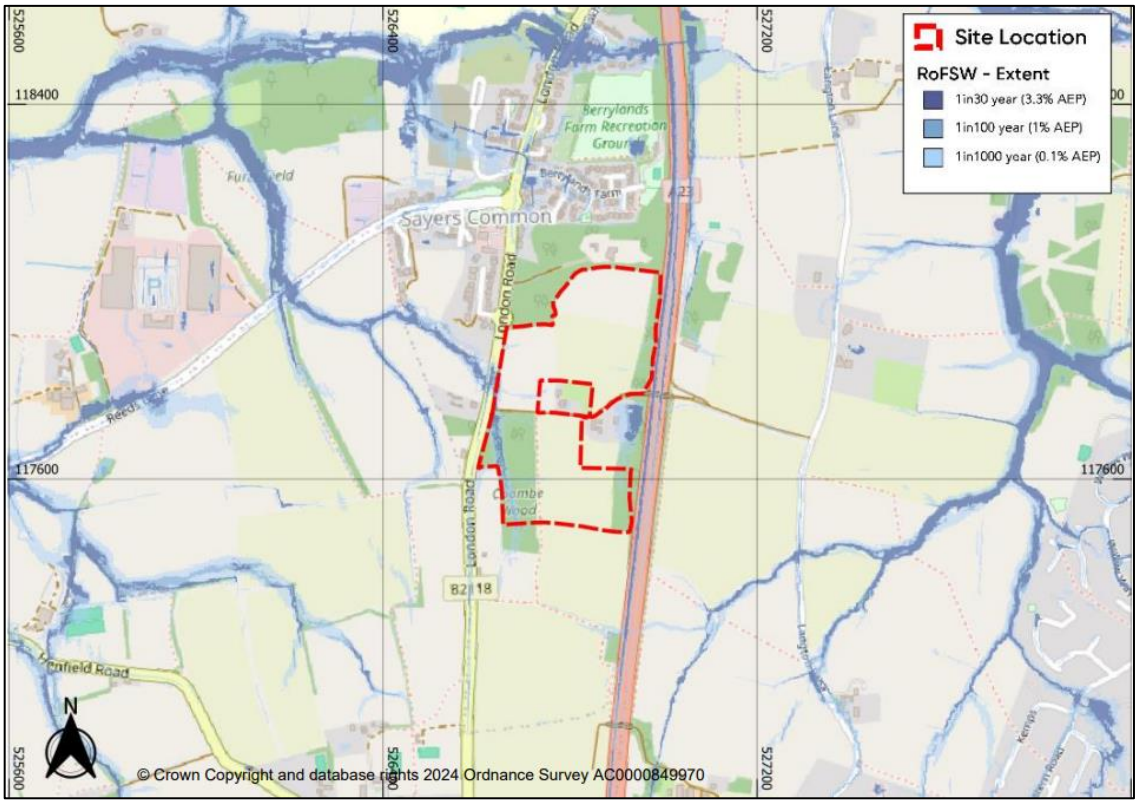

Figure 17: Risk of surface water flooding – MSDC Level 2 SFRA

Surface Water Flooding – Mitigation Measures and considerations

6.13 Access to the site has been located north, outside of the high-risk flooding area within and crossing the B2118 highway. The proposed access road will cross an existing ditch located within the site, along the western boundary. To accommodate this, a new culvert will be constructed beneath the access to bridge the watercourse. Flood mapping indicates that this ditch experiences flooding to depths between 0.3 m and 0.6 m, but the floodwaters are contained within the ditch channel. To prevent any increase in flood risk elsewhere, the proposed culvert will have a cross-sectional area larger than that of the existing ditch, ensuring adequate conveyance capacity.

6.14 Where bands of low-risk surface water flooding currently exist within developed zones, flood compensation areas have been proposed to offset the displaced flood volume resulting from the development, as illustrated in Figure 18 below. To achieve the flood compensation areas the land will be reprofiled, where banking will surround the proposed area and finish floor levels will be raised for the houses.

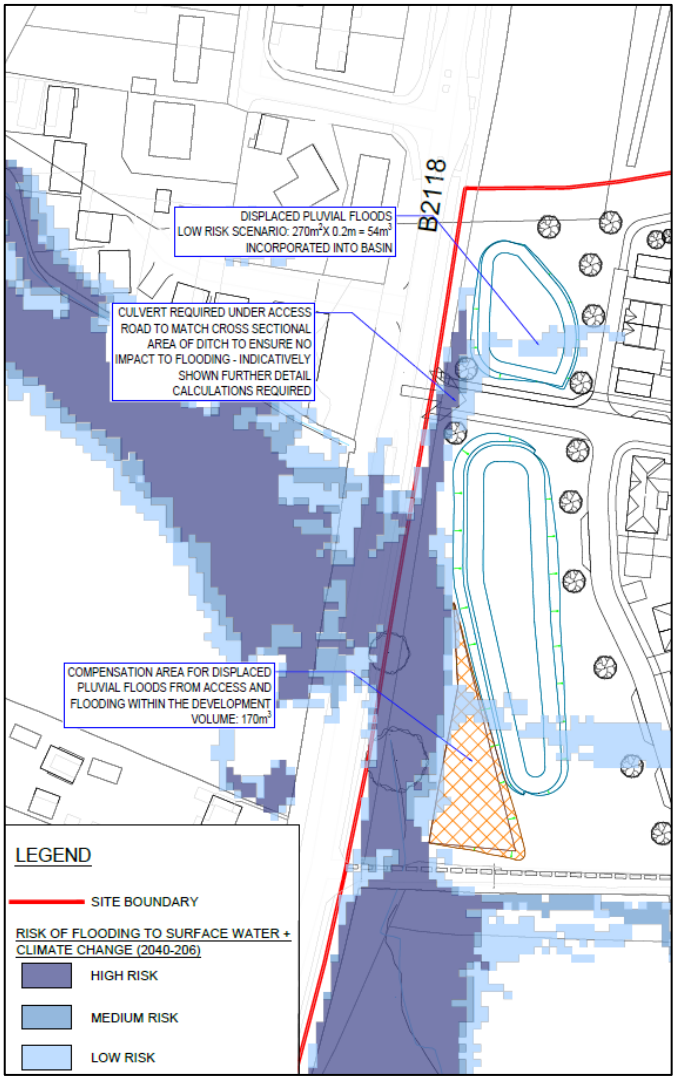

Figure 18: Flood Mitigation Proposal

6.15 In addition to the mitigation measures outlined above, a robust surface water drainage strategy is being developed. This strategy will manage surface water runoff at its source, store it on-site in attenuation basins, and discharge it at a controlled rate not exceeding the Q_{med} into the existing watercourse. As a result, the proposed development will not increase the risk of flooding or adversely affect the site's existing flood risk profile.

Surface Water Flooding – Residual Risk

6.16 Given that there are no development proposals within medium-high flood risk areas, residential dwellings are proposed within low-risk areas, however compensatory storage is provided to allow for the displaced low risk surface water flooding, the residual risk of surface water flooding form the site is considered to be very low.

Groundwater Flood Risk

6.17 Groundwater flooding occurs when groundwater levels increase sufficiently for the water table to intersect the ground surface. Groundwater flooding can occur in a variety of geological settings including valleys and in areas underlain by chalk, and in river valleys with thick deposits of alluvium and river gravels.

6.18 The EA flood risk map *Figure 19* indicates that groundwater flooding risk for the site is very low.

Other flood risks	
Groundwater	Flooding from groundwater is unlikely in this area.

Figure 19: EA Long term Flood Mapping

6.19 MSDC SFRA 2 states that the "The majority of the Mid Sussex area is considered to have low potential for groundwater flooding as a result of underlying geology. Groundwater concerns are most prevalent in the south of the district where permeable chalk geology can be found". Additionally, the site allocation details (Ref: DPSC5, Page 39 from MSDC SFRA 2) states that the site is classified as having <25% susceptibility to groundwater flooding.

6.20 The groundwater monitoring results identified groundwater to be approximately 0.4m BGL during winter periods with localised areas of groundwater being at ground level. However, this is not considered to be a reflection of the groundwater table as it is likely to be perched water. The underlying geology in this area consists of Weald Clay formation down to at least 5m below ground level, which has extremely low permeability. As such the site is considered to be at medium risk of groundwater flooding.

Groundwater Flooding – Mitigation Measures and Considerations

6.21 Finish floor levels of proposed dwellings will be raised above the existing ground level to reduce the impact of any potential groundwater flooding

Groundwater Flooding - Residual Risk

6.22 Given the standing water levels observed on site and the increase in finish floor levels the proposed site is considered to be at Low risk of flooding from groundwater.

Surface Water and Foul Water Sewers Flood Risk

6.27 Section 8.10 of West Sussex's SFRA refers to historic records of sewer flooding. The records refer to a number of areas affected within West Sussex, which experienced (internal and external) sewer floods, but Sayers Common was not identified as location at risk. Additionally, the Southern water public sewer mapping identified that no sewers passing through the site.

Public Sewers – Residual Risk

6.28 Based on the sewer mapping, it can be concluded that the risk or sewer flooding is considered to be very low for the proposed site.

7. RESIDUAL FLOOD RISK

7.1 **Table 4** outlines the initial qualitative assessment of risk posed by the potential sources of flooding, the mechanisms for flooding and the likely consequences. It also includes a review of possible mitigation measures and the effect that the proposed mitigation measures are likely to have on the residual risk posed by the potential flood source.

Flood Risk	Flood Mechanism and Possible Consequences	Existing Assessment of Risk	Mitigation Measures	Residual Risk
Fluvial / Tidal	Flooding from nearby rivers or seas due to climate change increasing river flows, sea level rises or breach of sea defences.	Very low	N/A	Very Low
Reservoirs	Flooding from reservoir failure	Very Low	NA	Very Low
Surface Water (Pluvial)	Flooding from surface water runoff collected in localised low points due to limited positive drainage	High	Access to the site has been located north, outside of the high-risk flooding area within and crossing the B2118 highway. The proposed access road will cross an existing ditch located within the site, along the western boundary. To accommodate this, a new culvert will be constructed beneath the access to bridge the watercourse. Flood mapping indicates that this ditch experiences flooding to depths between 0.3 m and 0.6 m, but the floodwaters are contained within the ditch channel. To prevent any increase in flood risk elsewhere, the proposed culvert will have a cross-sectional area larger than that of the existing ditch, ensuring adequate conveyance capacity. Where bands of low-risk surface water flooding currently exist within developed zones, flood compensation areas have been proposed to offset the displaced flood volume resulting from the development, as illustrated in Figure 19 below. To achieve the flood compensation areas the land will be reprofiled, where banking will surround the proposed area and finish floor levels will be raised for the houses.	Low
Groundwater	Underlying water table rising to the surface.	Medium	Finish floor levels of proposed dwellings will be raised above the existing ground level to reduce the impact of any potential groundwater flooding	Low
Public Sewers	Flooding caused by overloaded sewers	Very Low	N/A	Very Low

Table 5: Summary of Existing and Residual Flood Risk

8. DRAINAGE STRATEGY

8.1 With the falling head tests provided by Ground and Water infiltration is not viable. Additionally, any infiltration feature will need 1m of unsaturated zone below, based on the ground water monitoring (**Appendix D**) this will not be achievable.

8.2 The proposal is to use attenuation basins within the site to retain surface water runoff and then discharge at a controlled rate, to match the existing greenfield Q_{med} for up to a 1 in 100-year event plus climate change, to existing ditch running along the western site boundary.

8.3 The site will be divided in 2 separate catchments, catchment 1 located to in the north of the site and catchment 2 located in the south of the site. The greenfield run-off rates for the catchments have been estimated using HR Wallingford online calculator on the UK SuDS website and calculations were based on the FEH statistical approach. A summary of the greenfield rates for the 2 catchments is shown in tables below and the full calculation report is included in **Appendix F**

Catchment 2 (FEH)	Pre-Development Runoff Rate	Post Development runoff rate
Q_{MED} (l/s)	38.93	N/A
1 in 2-year event (l/s)	38.9	38.9
1 in 30-year event (l/s)	101.7	38.9
1 in 100-year event (l/s)	141.1	38.9

Table 6: Greenfield runoff rates Catchment 1

Catchment 2 (FEH)	Pre-Development Runoff Rate	Post Development runoff rate
Q_{MED} (l/s)	14.6	N/A
1 in 2-year event (l/s)	14.6	14.6
1 in 30-year event (l/s)	38.1	14.6
1 in 100-year event (l/s)	52.9	14.6

Table 7: Greenfield runoff rates Catchment 3

Hydraulic Calculations

8.4 Hydraulic calculations have been undertaken with InfoDrainage and show that in the 1 in 100-year storm event plus a 45% allowance for climate change there is no flooding. The full hydraulic calculations are shown in **Appendix J**.

8.5 The below table contains the parameters used in the supporting network modelling

Parameter	Input	Guidance/notes
Rainfall Data	FEH	
Urban Creep	10%	
CV (Summer and Winter)	1.0	SFA 7
Climate Change 3.3% AEP 1% AEP	 40% 45%	EA Climate change allowances for peak rainfall in England https://environment.data.gov.uk/hydrology/climate-change-allowances/rainfall

Table 8: Hydraulic Modelling Parameters

9. SUMMARY AND CONCLUSION

9.1 This Flood Risk Assessment (FRA) and Drainage Strategy has been prepared by Paul Basham Associates on behalf of Welbeck Strategic Land LLP to support an outline planning application for a proposed residential development. The Land at Coombe Farm, Sayers Common is located to west of A23, Sayers Common, Hassocks. The nearest postcode is BN6 9HY.

9.2 Demonstrated in this assessment, the risk posed to the site by surface water flooding is minimal, with any high and low surface water flood risk confined to the western boundary of the site, located away from any proposed dwellings. This report has identified how the existing surface water flood risk will be managed and mitigated, as such the built development and access road will not be at risk of flooding. Which is in line with the PPG & NPPF section 175 and therefore it can be considered that a sequential test is not required.

9.3 The proposed development is in Flood Zone 1 and has been categorised as "more vulnerable", therefore in accordance with NPPF, the proposals are acceptable and the site will not require an exception test. The proposed housing development has a design lifetime of 100 years.

9.4 Groundwater levels were monitored over the winter months, The results identified that ground water was encountered at ground level in four of the standpipes. This is likely a result of perched water based of the underlying "Weald Clay" bedrock geology.

9.5 Summary of residual flood risk from:

- Fluvial and tidal flooding is considered **very low.**
- Reservoir flooding is considered **very low.**
- Surface water flooding is considered **Low.**
- Groundwater flooding is considered **Low.**
- Sewer flooding is considered **very low.**

9.6 Given underlying "Weald Clay" bedrock Geology and the falling head tests carried out by Ground & Water. Drainage by means of infiltration is not viable.

9.7 Attenuation basins within the site will be used to retain surface water runoff and then discharge it at a controlled rate to match the pre-development greenfield Q_{MED}. The site has been split into two catchments with Catchment 1 (Northern Catchment) discharging into the existing ditch running along the western site boundary at a controlled rate of 38.9l/s. Catchment 2 (Southern catchment discharging at a controlled rate of 14.6l/s into the ditch running parallel to the road running through the site.