

**London Road,
Handcross**

**Prepared for
Welbeck Strategic Land III Limited**

by

**Stuart Michael
Associates Limited**



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Coombe House
Coombe Square
Thatcham
Berkshire
RG19 4JF

T: 01635 867711
F: 01635 861715
E: mail@stuartmichael.co.uk
W: www.stuartmichael.co.uk

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Registered Office: Coombe House, Coombe Square, Thatcham, Berkshire RG19 4JF.

Telephone: 01635 867711 Facsimile: 01635 861715.



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ACRONYMS AND ABBREVIATIONS

AEP	Annual Exceedance Probability
AOD	Above Ordnance Datum
BGS	British Geological Society
CC	Climate Change
CIRIA	Construction Industry Research and Information Association
DEFRA	Department for Environment, Food and Rural Affairs
DS	Drainage Strategy
DTM	Digital Terrain Model
EA	Environment Agency
ha	Hectares
km	Kilometers
l	Litres
LLFA	Lead Local Flood Authority
LFRMS	Local Flood Risk Management Strategy
LPA	Local Planning Authority
m	Metres
MSDC	Mid Sussex District Council
NPPF	National Planning Policy Framework
NSS	National Standards
PPG	Planning Practice Guidance to the National Planning Policy Framework
SAC	Special Areas of Conservation
SFRA	Strategic Flood Risk Assessment
SPA	Special Protection Area
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
SW	Southern Water
WSCC	West Sussex County Council
WFD	Water Framework Directive



EXECUTIVE SUMMARY

Flooding

The risk of coastal flooding, flooding from reservoirs, river flooding or groundwater flooding is shown to be low risk in the Site. The majority of the Site is indicated to be at very low risk of surface water flooding. There is an area of low to high surface water flood risk on the southwest of the Site that will be mitigated through additional storage provided within a retention basin proposed at the southwest of the Site.

Surface Water

Surface water calculations show that the proposed strategy can provide the storage requirements for all storm events up to and including the 1 in 100 year +45%CC event for all impermeable areas on Site, allowing 10% for urban creep.

Drainage systems will also incorporate and consider development runoff, with no flooding for all storms up to, and including, the 1 in 30-year event. Flooding to any new buildings will also not occur during a 1 in 100-year event, including +45%CC allowance. Exceedance routes will be managed to follow natural slopes using rainfall in excess of a 1% annual probability event +45%CC to minimise risk.

The proposed SuDS Management Train provides sufficient pollution treatment minimising risk to water quality. It is proposed, where possible, to maximise permeable pavements and bioretention within the development. It is proposed to provide a retention basin in the southwest of the Site.

Wastewater

It is proposed to discharge foul flows via pumped connection to MHREF3101. This is part of the existing Southern Water (SW) foul sewer located to the south of the Site on High Street.

Summary

This Report confirms that developing the Site would not increase the risk of flooding within the Site, or elsewhere, and that there is a satisfactory strategy, incorporating sustainable drainage techniques, for the disposal of surface water runoff and wastewater from the proposed development.



1.0 INTRODUCTION

- 1.1 Stuart Michael Associated Limited, Consulting Engineers, has prepared this Flood Risk Assessment and Drainage Strategy, hereafter referred to as the 'Report', on the instruction of Welbeck Strategic Land III Limited, hereafter referred to as the 'Client'.
- 1.2 This Report supports an outline application to Mid Sussex District Council by the Client for residential development at London Road, Handcross, hereafter referred to as the 'Site'.
- 1.3 The Site is approximately 2.84ha and is currently Greenfield.
- 1.4 The requirements and policies of Mid Sussex District Council (MSDC), West Sussex County Council (WSCC), Southern Water (SW) and the Environment Agency (EA) have been taken into account when considering flood risk and drainage issues.

Scope of Report

- 1.5 The flood risk assessment (FRA) section of the Report focuses on assessing flood risk issues at the Site as follows:
- Identification of all potential sources of flooding at the Site (i.e. fluvial, pluvial, groundwater, surface water, etc.);
 - Assessment of the existing flood risk at the Site and its potential impact on the proposals;
 - Consideration of flood risk implications, taking into account potential changes in risk due to climate change over the lifetime of the development, and the identification of measures to mitigate flood risk.
- 1.6 The purpose of the Report is:
- To confirm that the proposed development will not be subject to unacceptable flood risk or to show that flood risk can be managed acceptably;
 - To demonstrate that the proposed development will not increase flood risk elsewhere.



Policy Context

- 1.7 The Report presents an assessment of flood risk at the Site in accordance with the National Planning Policy Framework (NPPF), last updated February 2025, and its supporting Planning Practice Guidance (PPG) 'Flood Risk and Coastal Change', last updated September 2025, both published by the Department of Communities and Local Government, and the Flood Risk Assessment – Climate Change Allowances guidance, last updated May 2022.
- 1.8 The updated NPPF introduces additional guidance on the application of the sequential risk-based approach to individual proposals which are “...*known to be at risk now or in the future from any form of flooding*” (paragraph 173).
- 1.9 Paragraph 175 states that:
- The sequential test should be used in areas known to be at risk now or in the future from any form of flooding, except in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk).
- 1.10 The revised NPPF also sets out further guidance on the objectives of sustainable drainage systems within development. Paragraph 182 states:
- 1.11 Applications which could affect drainage on or around the site should incorporate sustainable drainage systems to control flow rates and reduce volumes of runoff, and which are proportionate to the nature and scale of the proposal. These should provide multifunctional benefits wherever possible, through facilitating improvements in water quality and biodiversity, as well as benefits for amenity.
- 1.12 The NPPF and supporting PPG provide guidance on how flood risk should be considered during the planning and development processes. The requirement to protect both new and established development from increased risk of flooding forms an essential part of the guidance. Moreover, implementation of Sustainable Drainage Systems (SUDS) for new development is encouraged.



- 1.13 A major change in the latest update to the PPG is Paragraph: 023 Reference ID: 7-023-20220825, 'The Sequential approach to the location of development' which requires development to be located in areas at little or no risk of flooding from any source by 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.
- 1.14 The Government published National standards for sustainable drainage systems (SuDS) in June 2025 (NSS). The document provides information for designers, property developers, local authorities and other interested parties. The standards are intended for application in the design of surface water drainage systems for new infrastructure and development. The document provides seven standards for which drainage must adhere to, these include runoff destinations, management of everyday rainfall interception), management of extreme rainfall and flooding, water quality, amenity, biodiversity, and the design of drainage for construction, operation, maintenance, decommissioning and structural integrity.
- 1.15 Mid Sussex District Council is the Local Planning Authority (LPA) controlling flood risk and water environment issues, through policies and guidance presented in the following documents:
- Mid Sussex District Council Strategic Flood Risk Assessment Level 1
 - Mid Sussex District Council Strategic Flood Risk Assessment Level 2
 - Mid Sussex District Plan 2014-2031, adopted March 2018
 - Slaugham Neighbourhood Plan 2014 – 2031
- 1.16 Relevant policies in the Mid Sussex District Plan include Policy DP41 – Flood Risk and Drainage. This states that proposals for development will need to follow a sequential risk-based approach, ensure development is safe across its lifetime and not increase the risk of flooding elsewhere. Particular attention will be paid to areas that have been identified as at risk of flooding or have experienced flooding in the past. Development proposals should seek to reduce the risk of flooding by achieving a reduction in run-off rates.



- 1.17 WSCC is the Lead Local Flood Authority (LLFA). In its role as LLFA, West Sussex County Council is a statutory consultee for all major applications in Mid Sussex in relation to surface water drainage.
- 1.18 The Flood and Water Management Act, 2010, requires the EA to develop, maintain and apply a National Flood and Coastal Erosion Management Strategy. Similarly, the LLFA is required to develop, maintain, apply and monitor a Local Flood Risk Management Strategy (LFRMS) for its area. The West Sussex County Council Local Flood Risk Management Strategy, published July 2025, sets out legislations and policies for local flood risk objectives for reducing flood risk, and identifies localised flooding in West Sussex.
- 1.19 The Water Framework Directive (WFD) (2000/60/EC) introduced a comprehensive river basin management planning system to help protect and improve the ecological health of waterbodies such as rivers, lakes, estuaries and coastal and groundwater. It is transposed into regulations through The Water Environment (Water Framework Directive) Regulations 2017. The WFD has two principal objectives, to prevent deterioration of the status of all water bodies and to protect, enhance and restore those water bodies. The development will be assessed in terms of the key aim of the WFD to achieve 'good' ecological and chemical status of all water bodies with a deadline set for 2027.

Climate Change

- 1.20 In considering flood risk to the Site, it is necessary to fully consider the potential impacts of climate change for the lifetime of the development within the mitigation measures.
- 1.21 In February 2016, the EA released new guidance on the application of climate change allowances in flood risk assessments, which was last updated in May 2022. Guidance can be found at:
- <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>.
- 1.22 This guidance provides contingency allowances for potential increases in peak river flow by management catchment, and for potential increases in rainfall intensity. The latter requires consideration in any surface water drainage strategy for new development.



- 1.23 Guidance for peak river flow climate change allowances states that the central allowance should be used for all assessments except for essential infrastructure, where the higher central allowance should be used. The upper end should be used for 'credible maximum scenario' assessments.
- 1.24 Guidance for peak rainfall climate change allowances were last updated in May 2022. Peak rainfall allowances are now provided by management catchments instead of at a national scale (for England). Peak rainfall allowances are provided for 1% annual exceedance probability (AEP) events and for 3.3% AEP events, and for 2 epochs rather than 3. The guidance on how to apply peak rainfall allowances has changed, using the central allowance for development with a lifetime up to 2100 and the upper end allowance for development with a lifetime from 2100 to 2125.



2.0 THE SITE

Location

- 2.1 The Site is located on land to the west of London Road, north of Handcross. Handcross is to the south of Crawley. See **Figure 1** for the Site location.
- 2.2 The Site is bound by a residential development to the south; London Road and a tree belt to the east; a track to the north, beyond which is grassland; and woodland and the A23 to the west.
- 2.3 The approximate centre of the Site is situated at OS national grid reference 526123E, 130702N.



Figure 1 - Site Location Map

Topography

- 2.4 A topographical survey of the Site was carried out by Greenhatch Group in April 2018 and provides levels for the Site. A copy of the topographical survey is contained in **Appendix A**.
- 2.5 The topographical survey indicates that the Site level varies slightly. The site is higher in the east of the Site and falls towards the west of the Site. Levels vary



between approximately 145.5m AOD at the southeast corner of the Site and 142m AOD in the west of the Site.

- 2.6 **Figure 2** below details the wider topographical area based on the Environment Agency's LiDAR Composite DTM 1m (2022) data. The wider topographical area indicates that elevation drops to the west of the Site. Elevation is also higher to the southeast of the Site.



Figure 2 - LiDAR Mapping Data (Source: Environment Agency)

Geology and Hydrogeology

Soils and Geology

- 2.7 Information contained in 'Soilscapes' defines the entirety of the Site as comprising of *"freely draining slightly acid loamy soils"*.
- 2.8 British Geological Survey (BGS) mapping indicates that the entire Site is underlain by bedrock geology of *"Upper Tunbridge Wells Sand-Sandstone and mudstone."* No data was available for superficial deposits underlying the Site. Extracts from the BGS mapping tool are found below in **Figure 3**.



- 2.9 Groundwater and Soakage Testing was undertaken by Ground and Water in February 2026. Two trial holes were dug, one in the southwest (TP1), where the basin is proposed, and another in the centre of the Site (TP2).
- 2.10 The strata depths encountered in TP1 was:
- Topsoil (Sand) – 0 - 0.2m
 - Upper Tunbridge Wells Sand (Sand) – 0.2 - 1.5m
- 2.11 The strata depths encountered in TP2 was:
- Topsoil (Sand) – 0 - 0.22m
 - Upper Tunbridge Wells Sand (Clay) – 0.22 - 1.4m
 - Upper Tunbridge Wells Sand (Sand) – 1.4 – 1.5m
- 2.12 The groundwater testing results indicate that at TP1, groundwater seepage was encountered at 0.8 and 1.0m. At TP2, groundwater was struck at 1.50m.
- 2.13 The soakage testing results indicate that infiltration rates could not be calculated due to water levels rising within both trial pits.
- 2.14 A copy of the Soakage Report is available in **Appendix B**.

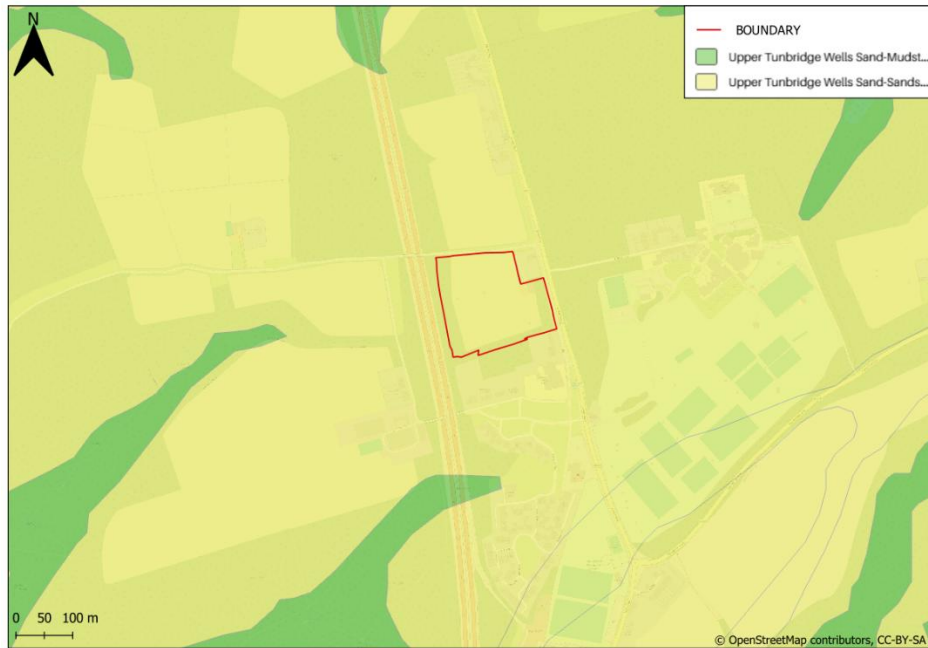


Figure 3 - BGS Mapping (Source: BGS)

Hydrogeology

2.15 UK Government DEFRA mapping indicates that the Site is:

- Located within a Nitrate Vulnerable Zone;
- Not Located in a Drinking Water Safeguard Zone (Surface Water);
- Underlain by a secondary A Bedrock Aquifer and underlain by an unproductive Superficial Drift Aquifer;
- Not located within a Source Protection Zone.

Existing Sewers

Wastewater Sewers

2.16 Southern Water (SW) asset records indicate there are no foul assets within the Site boundary. The nearest foul sewer is south of the Site within the residential development. It is a 100mm vitrified clay (VC) foul gravity sewer flowing southwest.

Surface Water Sewers

2.17 SW asset records indicate there are no surface water sewers within the Site boundary or within its vicinity.



- 2.18 A copy of SW sewer records is presented as **Appendix C**.

Existing Site Drainage Arrangements

- 2.19 The topographic survey, carried out by Greenhatch Group in April 2018, indicates that the Site falls to the western boundary, where an existing ditch is located within the Site. Levels are indicated to fall towards the centre of the ditch.
- 2.20 The topographic survey indicates ditch is indicated immediately west of the Site boundary which is indicated to have a pipe at the south.
- 2.21 The topographic survey also indicates a drainage ditch adjacent to the southern boundary of the Site, indicated to fall to the west of the Site where an existing pipe is located.
- 2.22 The topographic survey is included as included as **Appendix A**.
- 2.23 A Site visit, carried out on 21st January 2026 confirmed the presence of the ditches indicated by the topographic survey.
- 2.24 The Site visit also identified an existing pipe located in the centre of the ditch adjacent to the western boundary. This was located on the western side of the ditch, providing evidence that water is conveyed to the ditch located immediately west of the Site boundary. An existing drainage photo plan demonstrating the findings from the Site visit is included as **Appendix D**.

Hydrological Setting

- 2.25 The Site is located within the South East River Basin District, located within the Arun and Western Streams Management Catchment.
- 2.26 The topographical survey indicates that there are two ditches located adjacent to the western and southern Site boundaries., which convey water offsite to the south west.
- 2.27 There are no Main Rivers, managed by the EA, on the Site. The Main River nearest the Site, The River Ouse, is situated approximately 2.8km south of the Site. See **Figure 4** below.

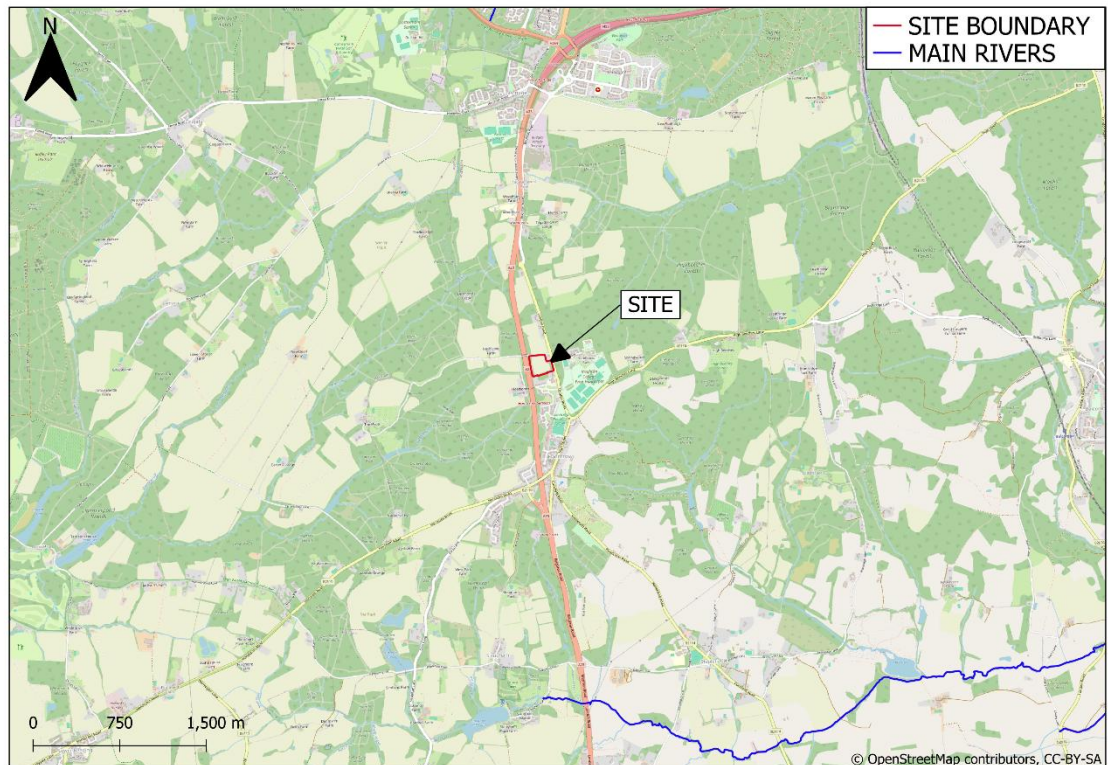


Figure 4 – Main Rivers Map (Source: Environment Agency)

Site Sensitivity

Designated sites

- 2.28 According to UK DEFRA mapping, the Site is not located within any statutory designated areas such as Ramsar, Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), and Special Protection Areas (SPA).
- 2.29 According to UK DEFRA mapping, the nearest SSSI is Cow's Wood and Harry's Wood located approximately 630m southeast of the Site.



3.0 DEVELOPMENT PROPOSALS

Site Layout

- 3.1. This Report has been prepared to inform the evidence base in support of the Client's development proposals at London Road, Handcross.
- 3.2. The proposed development is for the construction of up to 55 dwellings including affordable housing, together with recreational spaces and a single vehicular access.
- 3.3. The Site layout is presented in **Appendix E**.
- 3.4. The proposed mitigation is based on a design life for the development of 100 years, and the climate change allowances within the mitigation measures and drainage design are based on this assumption.

Vulnerability Classification

- 3.5. The NPPF PPG 'Flood Risk and Coastal Change' Annex 3, specifies the 'Flood risk vulnerability classification' of a Site, depending upon the proposed usage. This classification is subsequently applied to PPG Table 2 to determine whether:
 - The proposed development is suitable for the flood zone in which it is located, and;
 - Whether an Exception Test is required for the proposed development.
- 3.6. Annex 3 of the PPG classes the proposed residential development as a 'More Vulnerable' development.

NPPF Sequential Test

- 3.7. The NPPF requires the LPA to apply a Sequential Test in consideration of any new development. The NPPF follows a sequential risk-based approach in determining the suitability of land for development in areas at little or no risk of flooding from any source by 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. This is following the latest update to the PPG. The principle of the sequential test is applied on a site-specific basis.



- 3.8. The Site does not require a sequential test, in line with Paragraph 175 of the NPPF. This is detailed further within section 4 of this Report.



4.0 FLOOD RISK ASSESSMENT

Historical Flooding

- 4.1. The EA 'Historic Flooding' map is a GIS layer showing the maximum extent of individual Recorded Flood Outlines from river, the sea and groundwater springs that meet a set of criteria. It shows areas of land that have previously been subject to flooding in England. The map indicates that the Site has not previously experienced flooding, see **Figure 5** below.
- 4.2. The Mid Sussex District Council SFRA indicates the Site has not experienced flooding in the past.
- 4.3. SFRA extracts are included in **Appendix F**.



Figure 5 - Historic Flood Map (Source: Environment Agency)

Groundwater Flooding

- 4.4. Groundwater flooding occurs where groundwater levels rise sufficiently to intersect the ground surface and flow onto low-lying areas. Generally, groundwater flooding may be a problem where developments are situated over permeable soils or rocks.



- 4.5. The Mid Sussex District Council SFRA does not indicate that the Site is at risk of groundwater flooding.
- 4.6. SFRA extracts are included in **Appendix F**.

Fluvial Flooding

- 4.7. Flood Zones shown on the UK Government flood maps are the main constraints used to inform the LPA when to consult the EA and LLFA on flood risk in development control locations.
- 4.8. The Flood Zones, as described in the PPG, refer to the probability of flooding and this varies depending on the source of flooding being fluvial or coastal. Flood Zones 1, 2 and 3 refer to low, medium and high risk of flooding respectively. These zones for fluvial risks of flooding correspond to the Annual Exceedance Probabilities (AEP) of less than 0.1%, in the range of 0.1-1% and greater than 1% in any given year, respectively.
- 4.9. Flood Zones indicate the probability of flooding without the presence of defences and significant manmade structures such as bridges, culverts, and rail and motorway embankments.
- 4.10. An extract from the EA's 'Flood Map for Planning' in **Figure 6** shows that the Site is entirely in Flood Zone 1. *"Flood Zone 1 – Land having a less than 0.1% (1 in 1,000) annual probability of flooding."*

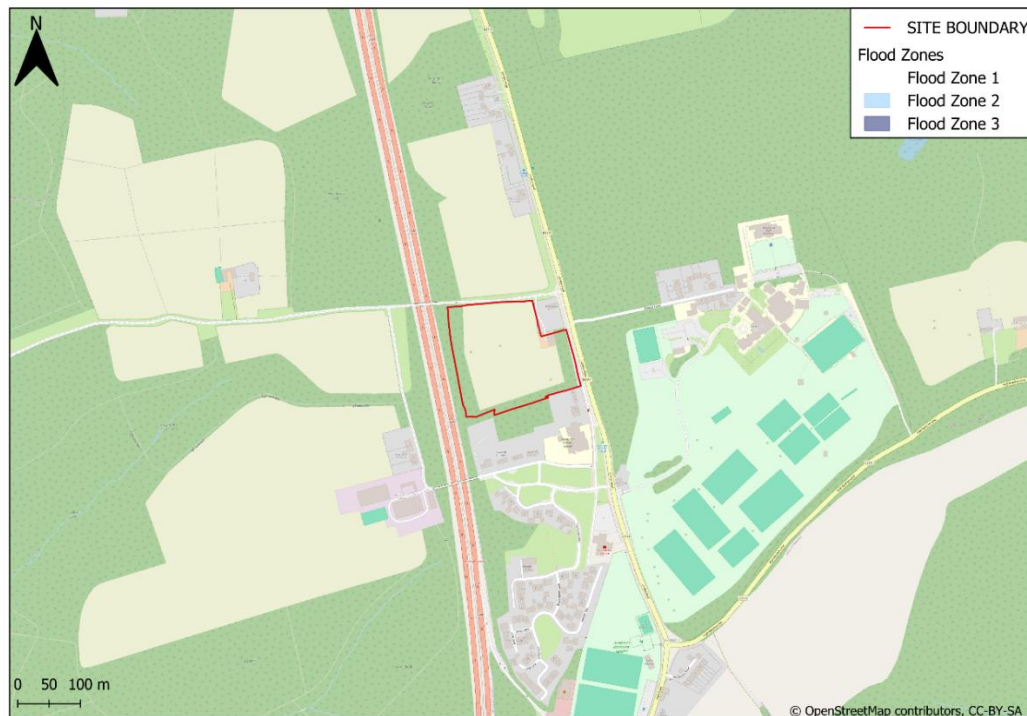


Figure 6 - Flood Map for Planning (Source: Environment Agency)

Risk of Flooding from Rivers and Sea

4.11. The government Risk of Flooding from Rivers and Sea mapping shows the chance of flooding from rivers and the sea taking into account the presence and condition of flood defences. The mapping is a probabilistic product that shows the overall risk, rather than the risk associated with a specific event or scenario. The risk is displayed as one of four likelihood bandings:

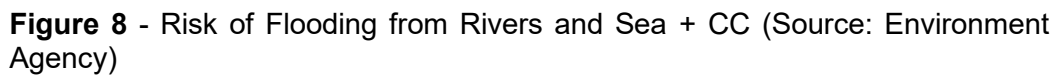
- High - greater than or equal to 3.3% chance in any given year (1 in 30)
- Medium - less than 3.3% (1 in 30) but greater than or equal to 1% (1 in 100) chance in any given year
- Low - less than 1% (1 in 100) but greater than or equal to 0.1% (1 in 1,000) chance in any given year
- Very Low - less than 0.1% chance in any given year (1 in 1,000)

4.12. **Figure 7** shows the EA's Risk of Flooding from Rivers and Sea GIS layer. It indicates that the Site is not at risk of flooding from rivers or the sea.



Figure 7 - Risk of Flooding from Rivers and Sea (Source: Environment Agency)

- 4.13. **Figure 8** shows the EA's Risk of Flooding from Rivers and Sea – Climate Change GIS layer. it indicates that the Site is not at risk of flooding from rivers or the sea, with climate change allowances incorporated.



4.14. Surface water flooding occurs when the intensity of rainfall exceeds ground infiltration. Typically, this can happen where ground is impermeable, such as roads and paved areas within urban development and where there are impermeable soils. The risk of flooding from surface water runoff is greater in locations that are situated adjacent to sloping land, within natural valleys and/or are within local depressions.

- 1 in 30 (3.3%) annual probability rainfall event ('High' risk);
- 1 in 100 (1%) annual probability rainfall event ('Medium' risk);
- 1 in 1000 (0.1%) annual probability rainfall event ('Low' risk).



- 4.16. Land at lower than 1 in 1000 (0.1%) annual probability of flooding is considered to be at 'Very Low' risk of flooding.
- 4.17. **Figure 9** below shows the risk of flooding from surface water in the area. It indicates that the majority of the Site is indicated to be at very low risk of surface water flooding. There is an area in the southwest of the Site which is indicated to be at low to high risk of surface water flooding.



Figure 9 - Risk of Surface Water Flooding Map (Source: Environment Agency)

- 4.18. **Figure 10** below shows the Risk of Flooding from Surface Water with climate change allowances incorporated. It also indicates that the majority of the Site is indicated to be at very low risk of surface water flooding. There is an area in the southwest of the Site which is at low to high risk of surface water flooding.

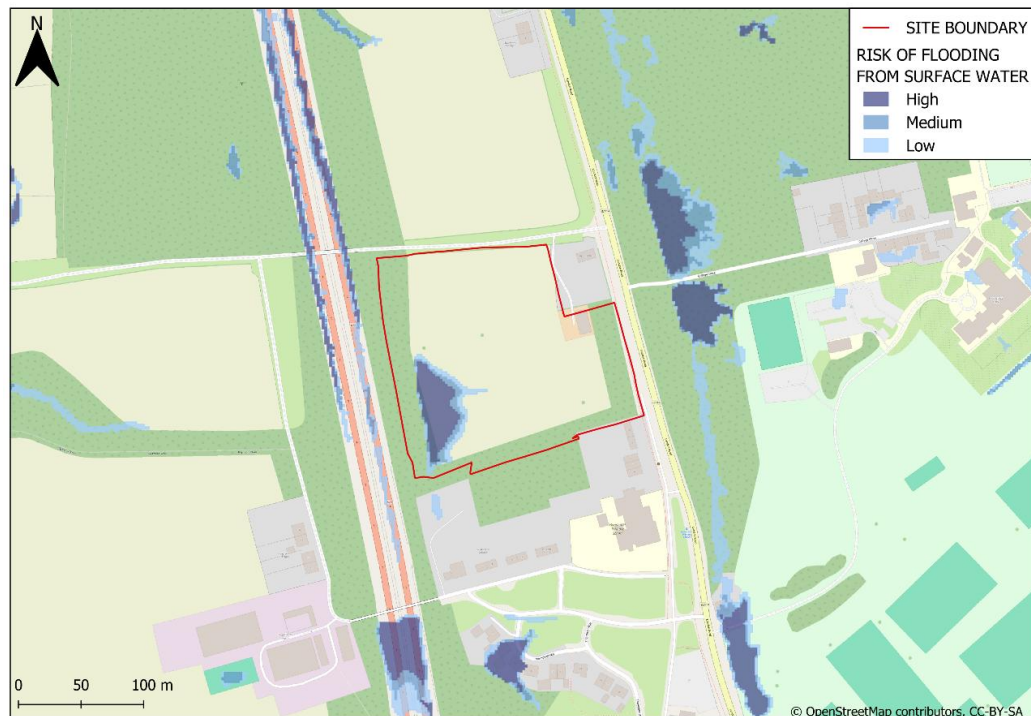


Figure 10 – Risk of Surface Water Flooding Map + Climate Change (Source: Environment Agency)

- 4.19. No built development is proposed within areas of low surface water risk or higher. A retention basin for the surface water drainage design has been proposed in the southwest corner of the Site and has been sized appropriately to accommodate the volume of surface water flood risk in this location.

Climate Change

- 4.20. In considering flood risk to the Site together with its mitigation, it is necessary to fully consider the potential impacts of climate change over the lifetime of the development. Making an allowance for climate change will help to minimise the vulnerability and provide resilience to flooding in the future.
- 4.21. In February 2016, the EA released guidance on the application of climate change allowances in flood risk assessments. Allowances are based on climate change projections and different scenarios of carbon dioxide (CO²) emissions to the atmosphere. There are different allowances for different epochs or periods of time over the next century. The guidance provides contingency allowances for potential increases in peak river flow and for potential increases in rainfall intensity.



- 4.22. The guidance recommends that a 'central' allowance should be used for all assessments except for essential infrastructure, where the 'higher central' allowance should be used. An 'upper end' allowance should be used for 'credible maximum scenario' assessments.
- 4.23. In accordance with PPG, residential development should be considered to have a minimum of 100 years life-span. Therefore, drainage design for the proposed development will consider rainfall adjustments for the most distant epoch (2070s) and will conservatively assume an upper end projection scenario (+45%).

Peak Rainfall Allowances

- 4.24. Increased rainfall affects river levels and land and urban drainage systems. **Table 1** shows the anticipated changes in extreme rainfall intensity in Arun and Western Streams management catchment.
- 4.25. For Flood Risk Assessments and Strategic Flood Risk assessments for developments with a lifetime beyond 2100, guidance states assess the upper end allowances. This must be done for both the 1% and 3.3% annual exceedance probability (AEP) events for the 2070s epoch (2061 to 2125). For development with a lifetime between 2061 and 2100 take the same approach by use the central allowance for the 2070s epoch. Development with a lifetime up to 2060, take the same approach but use the central allowance for the 2050s epoch (2022 to 2060).
- 4.26. An allowance for increased rainfall will require consideration in the surface water drainage strategy for the proposed development.

Table 1: Peak rainfall intensity allowance for Arun and Western Streams Management Catchment

		Total potential change anticipate d for the '2050s' (up to 2060) (1% AEP)	Total potential change anticipated for the '2050s' (up to 2060) (3.3% AEP)	Total potential change anticipated for the '2070s' (2061 to 2125) (1% AEP)	Total potential change anticipated for the '2070s' (2061 to 2125) (3.3% AEP)
Arun and Western	Upper end	45%	35%	45%	40%
	Central	20%	20%	25%	25%

Peak River Flow Allowances

- 4.27. The climate change allowances include predictions of anticipated change for peak river flows by management catchment.



- 4.28. Statutory Main Rivers near the Site are located within Arun and Western Management Catchment. River flow allowances for the management catchment are presented in **Table 2**.
- 4.29. Consideration of the river flow climate change allowance is not required as the Site is not exposed to medium or high fluvial flood risk.

Table 2: Peak river flow allowances for the Arun and Western Management Catchment.

Management Catchment	Allowance Category	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Arun and Western	Upper End	27%	36%	64%
	Higher Central	16%	19%	36%
	Central	11%	13%	25%

Flooding from Infrastructure Failure

- 4.30. Where infrastructure retains, transmits or controls the flow of water, flooding may occur if there is a structural, hydraulic, geotechnical, mechanical or operational failure. There are three main categories of infrastructure associated with this mechanism of flooding:
- Failure of infrastructure designed to store or carry water (e.g. dam break, canal leak, burst water mains or sewer, blockage or overflow).
 - Failure of infrastructure designed to protect an area from flooding (e.g. breached flood defences, flap valve or penstock failure, pumping station failure).
 - Failure of a pipe, bridge or culvert due to blockage.

- 4.31. The risk of flooding from infrastructure failure is considered to be low.

Flooding from Artificial Drainage Systems

- 4.32. Artificial drainage systems, such as pipes, land drains, sewers and drainage channels, are provided to manage and convey runoff from developed land. During heavy rainfall, flooding of these drainage systems may occur if: runoff exceeds the capacity of the systems; debris or sediment blocks the system; or, if the system becomes surcharged due to high water levels in the downstream system.



- 4.33. The Mid Sussex District Council SFRA indicates that the RH17 6 postcode area has experienced 8 incidents of external sewer flooding and no internal sewer flooding incidents. SFRA extracts are included in **Appendix F**. The Site is greenfield, there are no sewers present on Site, and any ditches are located downstream of proposed development, and so the risk of flooding from artificial drainage systems is considered to be low.

Flooding from Reservoirs

- 4.34. Major reservoirs throughout the UK are normally well maintained and the likelihood of a failure causing downstream flooding is extremely low. In the very unlikely event of a dam failure, a large volume of water could be released, quickly flooding a large area and possibly causing significant property damage or even loss of life.
- 4.35. **Figure 11** below uses EA reservoir flooding data, which indicates that the Site is not at risk of reservoir flooding.

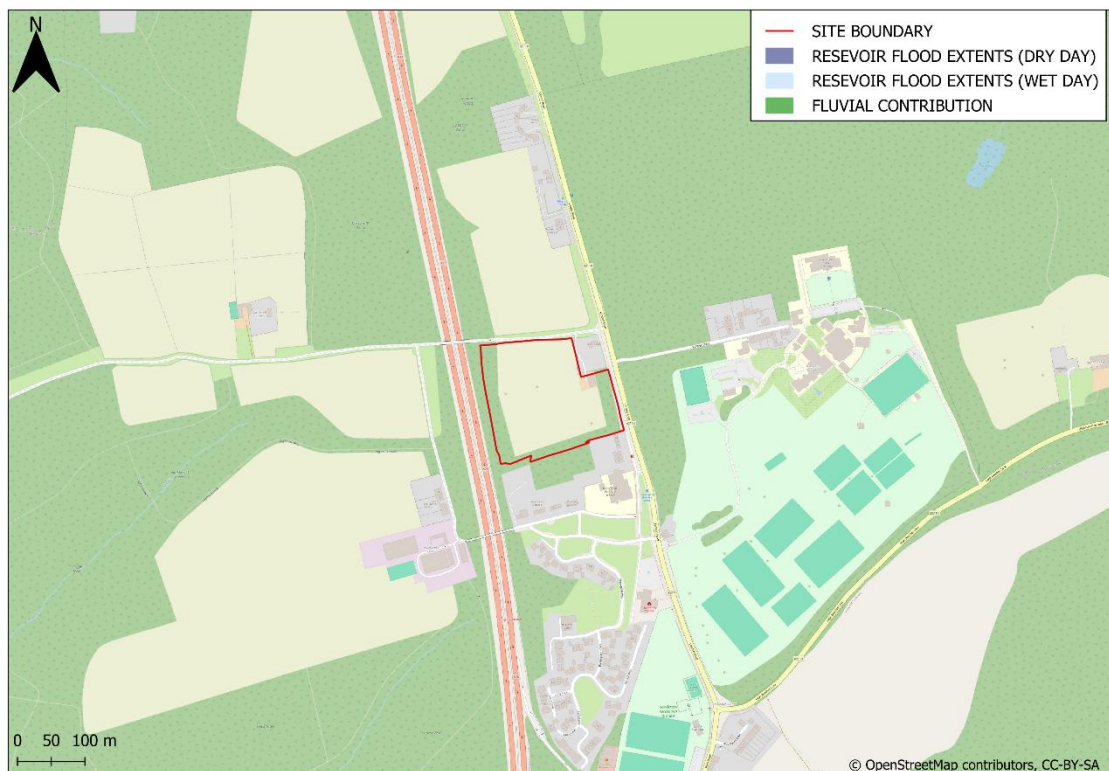


Figure 11 – Extent of Reservoir Flooding (Source: Environment Agency)



Coastal Flooding

- 4.36. The Site is located a sufficient distance inland and at an elevation in excess of approximately 142m AOD that does not expose it to a risk of tidal flooding.

Sequential and Exception Tests

- 4.37. The proposed development is indicated to be at low risk of reservoir flooding, artificial drainage systems, and groundwater flooding, and the Site solely resides in Flood Zone 1. The Site lies inland at an elevation in excess of 142m AOD and therefore the risk of tidal flooding is considered to be low. The majority of the Site is at very low risk of surface water flooding. There are some areas in the southwest of the Site at low to high risk of flooding from surface water.
- 4.38. All development should be steered towards the areas of lowest risk of all types of flooding, showing that the development will be safe for its lifetime taking into account the vulnerability of its users, and that it won't increase flood risk elsewhere.
- 4.39. According to Table 3 of the NPPF 'Flood Risk Vulnerability Classification', the 'More Vulnerable' residential development within the Site is appropriate for the flood destination, with the Site lying solely within Flood Zone 1.
- 4.40. All residential dwellings have been located within areas of very low risk of flooding; no dwellings are proposed in the areas of low, medium or high risk.
- 4.41. A retention basin has been proposed in the southwest corner of the Site. This is sized appropriately to accommodate surface water flood risk in this location.
- 4.42. The above is compliant with Paragraph 175 of the NPPF which states "*The sequential test should be used in areas known to be at risk now or in the future from any flooding, except in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future*" and with Paragraph 027 Reference ID: 7-027-20220825, which states that "*where site-specific flood risk assessment demonstrates clearly that the proposed layout, design, and mitigation measures would ensure that*



occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development”.

4.43. Therefore, the sequential test is not required for the proposed development.



5.0 SURFACE WATER DRAINAGE STRATEGY

Discharge Destination

- 5.1. In order to ensure that surface water runoff from a developed Site does not have a detrimental impact on the downstream catchment it is important to prioritise where surface water runoff is discharged, control how fast the runoff is discharged and also control how much runoff is discharged from the Site.
- 5.2. The proposed development will lead to an increase in impermeable area. As such, it is proposed to employ Sustainable Drainage Systems (SuDS) measures to ensure surface water is managed effectively.
- 5.3. Any development presents an opportunity to incorporate SuDS, which might include infiltration techniques or attenuation of flows to protect receiving sewers or watercourses. The choice of methods is dependent upon ground conditions and availability of suitable areas within the particular scheme layout.
- 5.4. In line with national and local planning policy, it is proposed to employ Sustainable Drainage Systems (SuDS) to manage surface water runoff close to source using guidance given in CIRIA report C753 'The SuDS Manual' and National Standards for sustainable drainage systems (SuDS) (June 2025). Runoff will be managed both at source and across the Site as a whole.
- 5.5. Water is a valuable resource and priority should be given to the reuse of runoff on Site (rainwater harvesting) once it has been appropriately treated. The destination of any surplus runoff should be prioritised in accordance with 'Requirement H3 Part 3' of the Building Regulations Approved Document H (2002 Edition), which states:
 - (a) *an adequate soakaway or some adequate infiltration system; or, where this is not reasonably practicable,*
 - (b) *a watercourse; or, where that is not reasonably practicable,*
 - (c) *a sewer*".
- 5.6. *"Rainwater from a system provided pursuant to sub-paragraphs (1) and (2) should discharge to one of the following listed in order of priority:*



5.7. This guidance is replicated in the PPG (Paragraph 056) which states: “*Where possible, preference should be given to multi-functional sustainable drainage systems, and to solutions that allow surface water to be discharged according to the following hierarchy of drainage options:*

- *Into the ground (infiltration);*
- *To a surface water body;*
- *To a surface water sewer, highway drain or another drainage system;*
- *To a combined sewer.”*

Surface Water Drainage Strategy

5.8. In accordance with the discharge destination hierarchies of the Building Regulation Approved Document H3 and the PPG, an assessment of the suitability of the Site to utilise infiltration drainage techniques has been undertaken.

5.9. Infiltration testing was undertaken at the Site and results indicate that due to high groundwater levels infiltration rates could not be calculated. Therefore, infiltration is considered an unfeasible method of surface water discharge.

5.10. The topographical survey indicates that drainage ditches are present on the Site. One ditch is indicated on the west of the Site. Levels are indicated to be lower towards the centre of the ditch.

5.11. The topographical survey indicated that a ditch is located adjacent to the southern boundary. Levels within the ditch are indicated to fall to the west where a pipe is located at the end of the ditch.

5.12. The topographical survey indicated another ditch located immediately to the west of the Site, which has a pipe at the southern end.

5.13. The Site visit confirmed the locations of these ditches identified by the topographic survey. The Site visit also identified an existing pipe in the ditch on the west of the Site. The pipe is located towards the centre of the ditch on the western side. The Site visit was undertaken during a period of rainfall and demonstrated that runoff from the Site outfalls into the ditch on the western



boundary, which is then conveyed to the offsite ditch to the west via the existing pipe.

- 5.14. SW sewer records indicate that there are no surface water sewers within the vicinity of the Site.
- 5.15. Therefore, it is proposed that surface water will discharge to the drainage ditch located on the western Site boundary, with the peak discharge restricted to the 1 in 1-year greenfield rate, mimicking the existing Site drainage arrangements.
- 5.16. Surface water from the Site is proposed to discharge into a retention basin in the southwest of the Site, which will discharge into the drainage ditch on the western Site boundary at a rate equivalent to the 1 in 1-year greenfield rate. This mimics the
- 5.17. Bioretention is proposed adjacent to the main access.
- 5.18. Porous paving can be provided in certain locations throughout the Site to provide attenuation, source control, conveyance of surface water, and water quality benefits.
- 5.19. The drainage strategy drawing has been included as **Appendix G**.
- 5.20. Surface water calculations are included as **Appendix H**, showing that the drainage strategy can provide the storage requirements for all storm events up to and including the 1 in 100 year +45% CC event, for all impermeable areas on Site including a 10% allowance for Urban Creep.
- 5.21. **Table 3** below provides a summary of SuDS components suitability at the Site.

Table 3: SuDS Components Suitability

SuDS Component	Site Suitability	Reasoning
Rainwater Harvesting	Maybe	The use of rainwater harvesting cannot count towards storage; however, it can be provided on dwellings to help deal with the first 5mm of rainfall.
Green Roofs	No	Green roofs are not appropriate for pitched roofs on residential dwellings and have high maintenance costs.
Infiltration Systems	No	Soakage testing indicated that infiltration rates could not be calculated due to high groundwater levels and water levels rising within the trial pits. Therefore, it is



		deemed that infiltration would not be a suitable drainage strategy, subject to infiltration testing.
Proprietary Treatment Systems	No	It is not expected that there will be highly contaminated roads within the proposed development and therefore are deemed unnecessary for the proposed development.
Filter Strips	No	Filter strips are best suited to treating runoff from relatively small drainage areas. Filter strips are typically located on cropland immediately adjacent to streams, lakes, ponds, ditches, sinkholes, wetlands, or groundwater recharge areas.
Filter Drains	No	Filter drains are typically used to drain roads, usually main roads.
Swales	No	Swales can be used as attenuation or conveyance features. Due to limited space on the Site, it is not proposed to provide swales.
Bioretention Systems	Yes	It is proposed to provide bioretention systems adjacent to the main Site access.
Pervious Pavements	Yes	Can be used on private drives and parking areas, either as a permeable system or with a connection to the piped drainage system.
Attenuation Basins	Yes	It is proposed to provide a retention basin in the southwest of the Site which will discharge to the existing drainage ditch adjacent located on the Site's western boundary

Development Runoff

- 5.22. In compliance with the NSS, the drainage systems across the Site will be designed so that the surface water runoff from the proposed development is contained within the drainage network, with no flooding for all storms up to, and including, the 1 in 30 year-event. Furthermore, the drainage system will be designed so that flooding to any new or existing buildings does not occur during a 1 in 100-year event, including +45% allowance for climate change.
- 5.23. Runoff rates for the existing Greenfield Site have been calculated using the FEH method and are provided in **Table 4** below and at **Appendix I**.



Table 4: Existing Runoff Rates

Return Period 1 in X year	Greenfield Discharge Rate (l/s/ha)
1	2.7
2	2.8
30	7.2
100	10.0

- 5.24. To provide betterment to the existing situation it is proposed to discharge surface water from the development to existing watercourses at a peak discharge rate of **2.7 l/s/ha**, which is equivalent to the 1 year Greenfield runoff rate. **Table 5** below shows the peak discharge rate.

Table 5: Proposed Discharge Rate

Impermeable Area (ha)	Discharge Rate (l/s)
0.77	2.0

- 5.25. A comparison of pre- and post-development runoff rates at the outfall location is provided in **Table 6** below, which demonstrates that the proposed drainage strategy complies with NSS requirements.

Table 6: Surface Water - Pre and Post-development Runoff Rates

Return Period 1 in X year	Pre-development Runoff Rates (l/s)	Post-development Runoff Rates (l/s)
1	2.0	2.0
2	2.1	2.0
30	5.5	2.0
100	7.7	2.0
100 + 40% cc	n/a	2.0

Exceedance Design

- 5.26. Very high rainfall intensities can overwhelm pipe-based drainage systems for brief periods, whereas SuDS tend to have longer-duration critical storm events. In all cases, there will be events that cause flooding at points in the network if the storm event exceeds the design event.



- 5.27. Flows resulting from rainfall in excess of a 1% annual probability event plus 45% climate change event will be managed in exceedance routes following the natural slope to minimise the risks to people and property.
- 5.28. The exceedance flow routes drawing showing the for the Site, showing how exceedance flows will be managed across the built development and along the access roads, is presented within **Appendix J**.

Surface Water Management & Treatment Train

- 5.29. In accordance with CIRIA report C753: The SuDS Manual, a 'SuDS Management Train' process will be undertaken to assure that the proposed drainage strategy mimics the natural catchment of the Site as closely as possible.
- 5.30. The proposed Management Train (**Table 8**) will provide appropriate levels of risk management to protect the receiving water body.

Table 8: SuDS Management Train

SuDS Component	Interception	Primary Treatment	Secondary Treatment	Tertiary Treatment
Porous Pavements	Y	Y		
Bioretention Systems	Y	Y	Y	
Retention Basin (Pond)			Y	Y

- 5.31. Source control techniques will be incorporated into the drainage strategy to ensure that storm water runoff is managed as close to source as possible.

Porous Paving

- 5.32. Porous pavements are structures that allow rainwater to infiltrate through the surface layer and into the underlying sub-structure, where it will be temporarily stored before being discharged into the surface water network.
- 5.33. As runoff percolates through the sub-layers, pollutants and contaminants are filtered out by the surfacing layer and biological process in the sub-base.
- 5.34. Porous pavements are built as an alternative to impermeable surfaces and therefore require no extra development space for their construction.



- 5.35. Permeable pavements can be provided, where possible, on all private drives and car park areas within the development.

Retention Basins (Ponds)

- 5.36. Ponds and wetlands are features with a permanent pool of water that provide both attenuation and treatment of surface water runoff. Ponds can be designed as natural features with shallow, grassed side slopes or can be hard landscaped features that complement the character of dense urban environments.
- 5.37. Attenuation storage is provided above the permanent pool of water at the base of the retention basin.
- 5.38. The standing pool of water helps settle out particulate pollutants and residual fine silts. The larger the storm event, the more time is provided for treatment to occur.
- 5.39. A retention basin is proposed in the southwest of the Site. The retention basin will then discharge surface water at a restricted rate to the existing ditch in the west of the Site.

Bioretention Systems

- 5.40. Bioretention systems are shallow landscaped depressions that can reduce runoff rates and volumes and treat pollution through the use of engineered soils and vegetation.
- 5.41. Bioretention areas will be located to the south of the Site access, adjacent to the road.

Water Quality Management

- 5.42. CIRIA C753 states that “*wherever possible, when discharging runoff from the Site to surface waters, SuDS should be designed to intercept (i.e. prevent) runoff (and the associated pollutants) for most rainfall events approximately 5mm in depth*”.
- 5.43. When runoff does occur, treatment within SuDS components is essential for frequent rainfall events, for example up to a 1:1 year return period event, where urban contaminants are being mobilised and washed off urban surfaces, and the aggregated contribution to the total pollutant load to the receiving body is potentially high.



- 5.44. **Table 9** details the pollution hazard indices for the Site as stated by CIRIA C753. The indices range from 0 (no pollution hazard for this contaminant type) to 1 (high pollution hazard for this contaminant type).

Table 9: Pollution Hazard indices for different land use classifications

Land Use	Pollution Hazard	Total Suspended solids (TSS)	Metals	Hydro-carbons
Individual property driveways, residential car parks, low traffic roads and non-residential car parking with infrequent change	Low	0.5	0.4	0.4
Total	-	0.5	0.4	0.4

- 5.45. To deliver adequate treatment, selected SuDS components must have a total pollution index (for each contaminant type) that equals or exceeds the pollution hazard index. Where two or more SuDS components are being used in combination, a factor of 0.5 is applied to account for the reduced performance of secondary or tertiary components associated with already reduced inflow concentrations.

Total SuDS mitigation index = mitigation index1 + 0.5 (mitigation index2)

- 5.46. **Table 10** lists the mitigation provided by each SuDS component and shows that sufficient measures are provided for within the Site using the above calculation.

Table 10: Indicative SuDS mitigation indices for discharges to surface waters.

SuDS Component	Total Suspended solids (TSS)	Metals	Hydro-carbons
Permeable Pavement	0.7	0.6	0.7
Retention Basin (Pond)	0.7	0.7	0.5
Bioretention Systems	0.8	0.8	0.8

- 5.47. Runoff from areas of the Site will at a minimum drain through one treatment stage which alone has a mitigation index which equals/exceeds the pollution hazard index for the Site.



- 5.48. It is considered that sufficient pollution treatment is provided within the proposed SuDS Management Train, minimising risk to water quality and to the receiving water bodies from the Site.

Maintenance

- 5.49. The long-term management of surface water drainage assets, including any SuDS components, is essential to ensure they continue to function to their design standard. As such, a management and maintenance plan will need to be developed in order to ensure the systems continue to work effectively.
- 5.50. A maintenance schedule (indicating with whom any responsibilities lie) will need to be produced as part of the detailed design works. Maintenance responsibilities will be with a management company. Management and maintenance schedules for the proposed SuDS features on-Site are included within **Appendix K**.



6.0 WASTEWATER DRAINAGE STRATEGY

- 6.1. SW sewer records indicate that the nearest viable foul sewer is located to the south of the Site on High Street.
- 6.2. It is proposed to provide a pumped connection to existing Southern Water foul water manhole reference 3101, located on High Street to the south of the Site. The foul water drainage strategy drawing is included as **Appendix L**.
- 6.3. A pre-development enquiry was submitted to SW to determine whether there is sufficient capacity within the existing network to accommodate the proposed development and a response was provided on 12/03/2026, confirming that the existing network can accommodate the proposed development, and that the proposed connection is feasible. SW's response is included as **Appendix C**.



7.0 SUMMARY & CONCLUSIONS

Summary

- 7.1. A Flood Risk Assessment and Drainage Strategy Report has been prepared to inform the preparation of a planning application at London Road Handcross.
- 7.2. This Report presents an assessment of flood risk in accordance with the guidelines set out in National Planning Policy Framework (NPPF) and its National Planning Policy Guidance (PPG). It also refers to, and complies with, DEFRA standard and the policies of the Environment Agency (EA), Mid Sussex District Council, West Sussex County Council, and Southern Water.

Flood Risk

- 7.3. The Site is indicated to be entirely in Flood Zone 1. The Site is indicated to be at very low risk of flooding from rivers and sea, groundwater, reservoirs, and artificial drainage systems. The Site is indicated to be largely at very low risk of surface water flooding. A small area in the southwest of the Site is indicated to be at low to high risk of surface water flooding. No dwellings are proposed within the areas of the Site at low to high risk of surface water flooding, and an appropriately sized retention basin is proposed to accommodate this surface water flood risk.

Surface Water Drainage Strategy

- 7.4. The proposed surface water drainage strategy for the development consists of a series of SuDS features such as a retention basin, porous paving and bioretention systems.
- 7.5. The proposed SuDS Management Train provides sufficient pollution treatment minimising risk to water quality.

Wastewater

- 7.6. It is proposed to discharge foul flows via pumped connection to the existing Southern Water foul sewer located to the south of the Site on High Street. SW has confirmed this connection is acceptable.

Conclusion

- 7.7. This Report confirms that developing the Site would not increase the risk of flooding within the Site, or elsewhere, and that there is a satisfactory strategy,



incorporating sustainable drainage techniques, for the disposal of surface water runoff and wastewater from the proposed development.

Appendix A

Topographical Survey

Appendix B

Soakage Report